

KIC 010604747

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 010604747-01 | OBS | No | 1.972557 | 132.077297 | 27.8 | 5.462 | 10.9 | 10.2 | 2.57 | 7126 | 1.62 | 11317.30 |
| 010604747-02 | OBS | No | 1.972256 | 133.394255 | 11.7 | 23.667 | 9.6 | 4.6 | 2.57 | 7126 | 0.91 | 11319.60 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010604747-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | SWEET_NTL—LPP_DV |
| 010604747-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS |

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

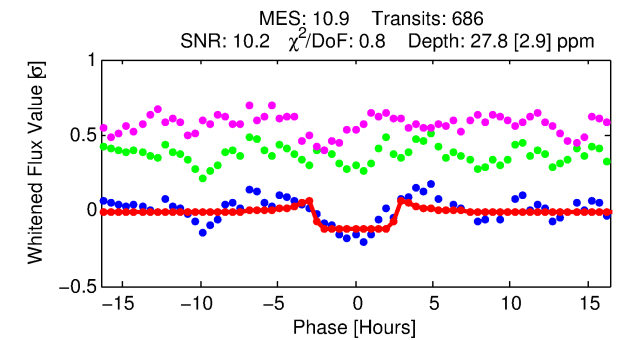
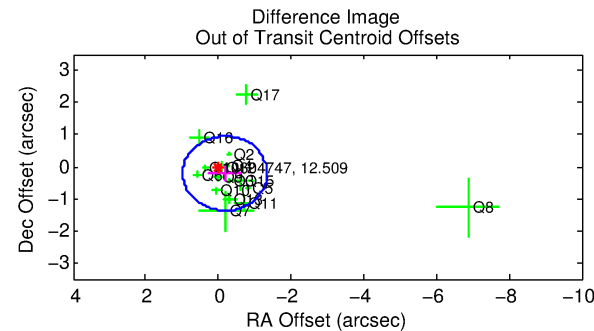
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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

Ephemeris Match Information For 010604747-01

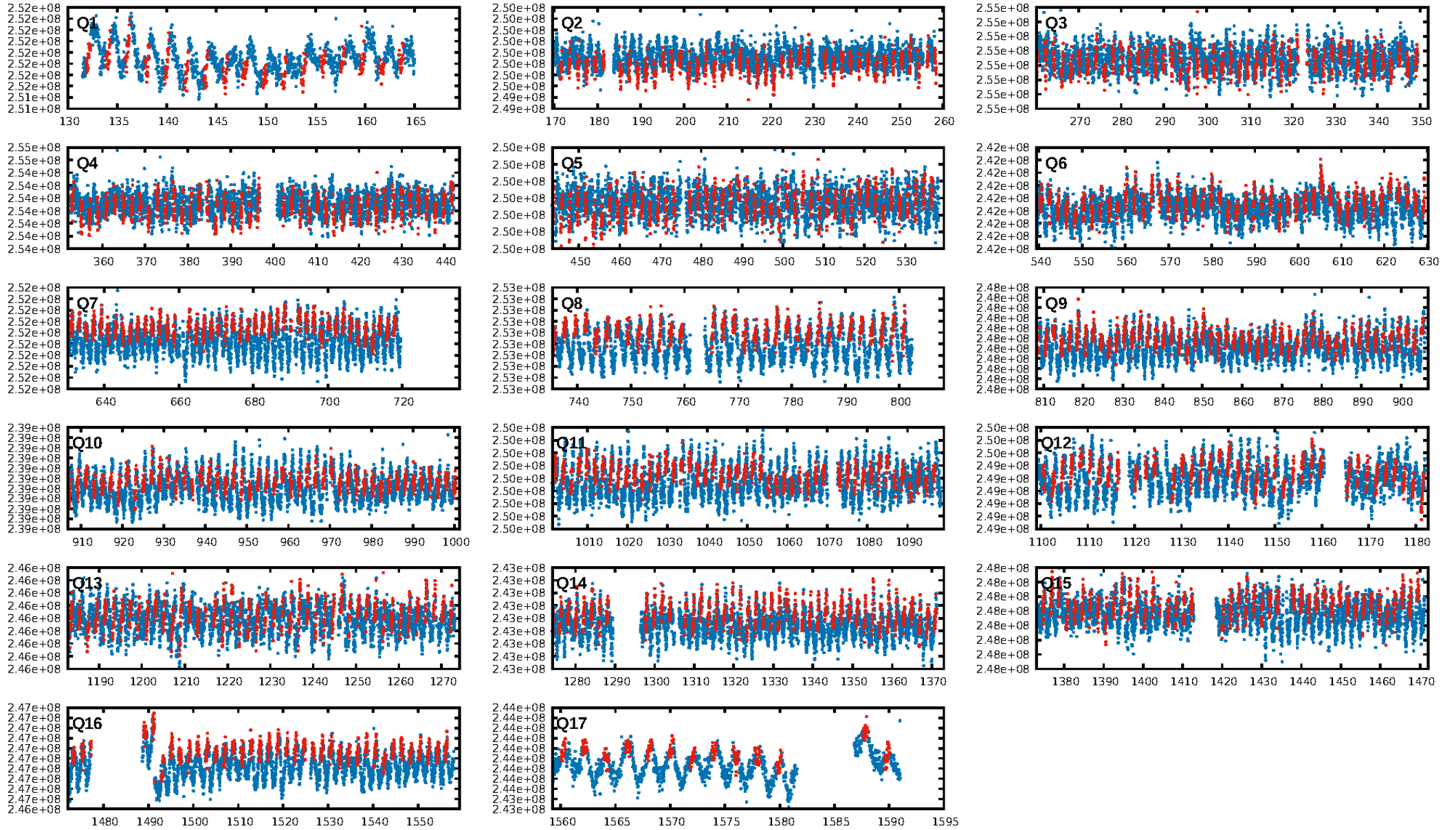
No Significant Match Found

KIC: 10604747 Candidate: 1 of 2 Period: 1.973 d

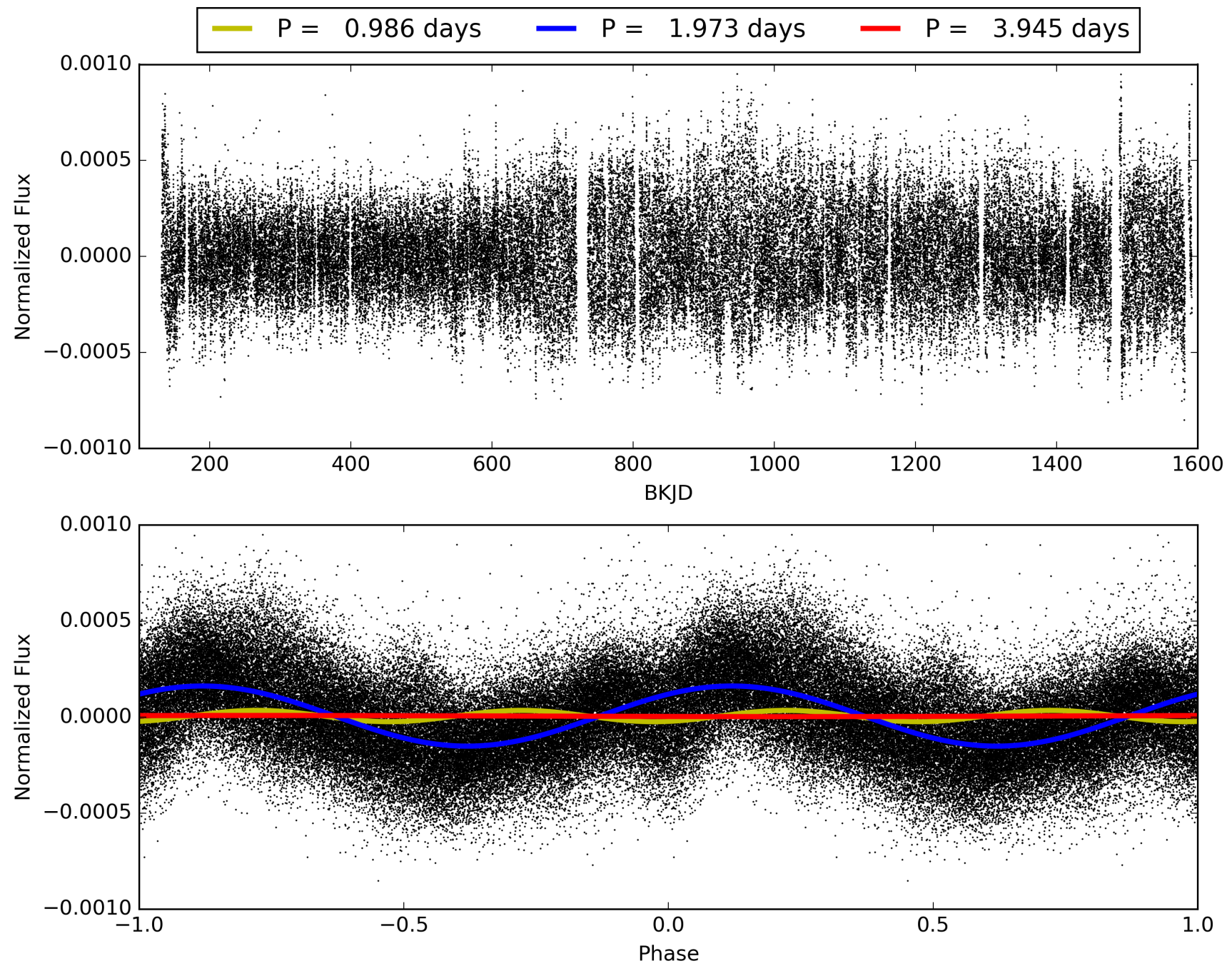


ShortPeriod-sig: 0.0% [0.00σ]
 LongPeriod-sig: N/A
 ModelChiSquare2-sig: N/A
 ModelChiSquareGof-sig: N/A
 Bootstrap-pfa: N/A
 RollingBand-fgt: 1.00 [656/656]
 GhostDiagnostic-chr: 1.047
 Centroid-sig: 43.5%
 Centroid-so: 0.408 arcsec [0.87σ]
 OotOffset-rm: 0.275 arcsec [0.71σ]
 KicOffset-rm: 0.101 arcsec [0.38σ]
 OotOffset-st: 3/4/4/5 [16]
 KicOffset-st: 3/4/4/5 [16]
 DiffImageQuality-fgm: 0.62 [10/16]
 DiffImageOverlap-fno: 0.00 [0/17]

TCE 010604747-01, PDC Light Curves

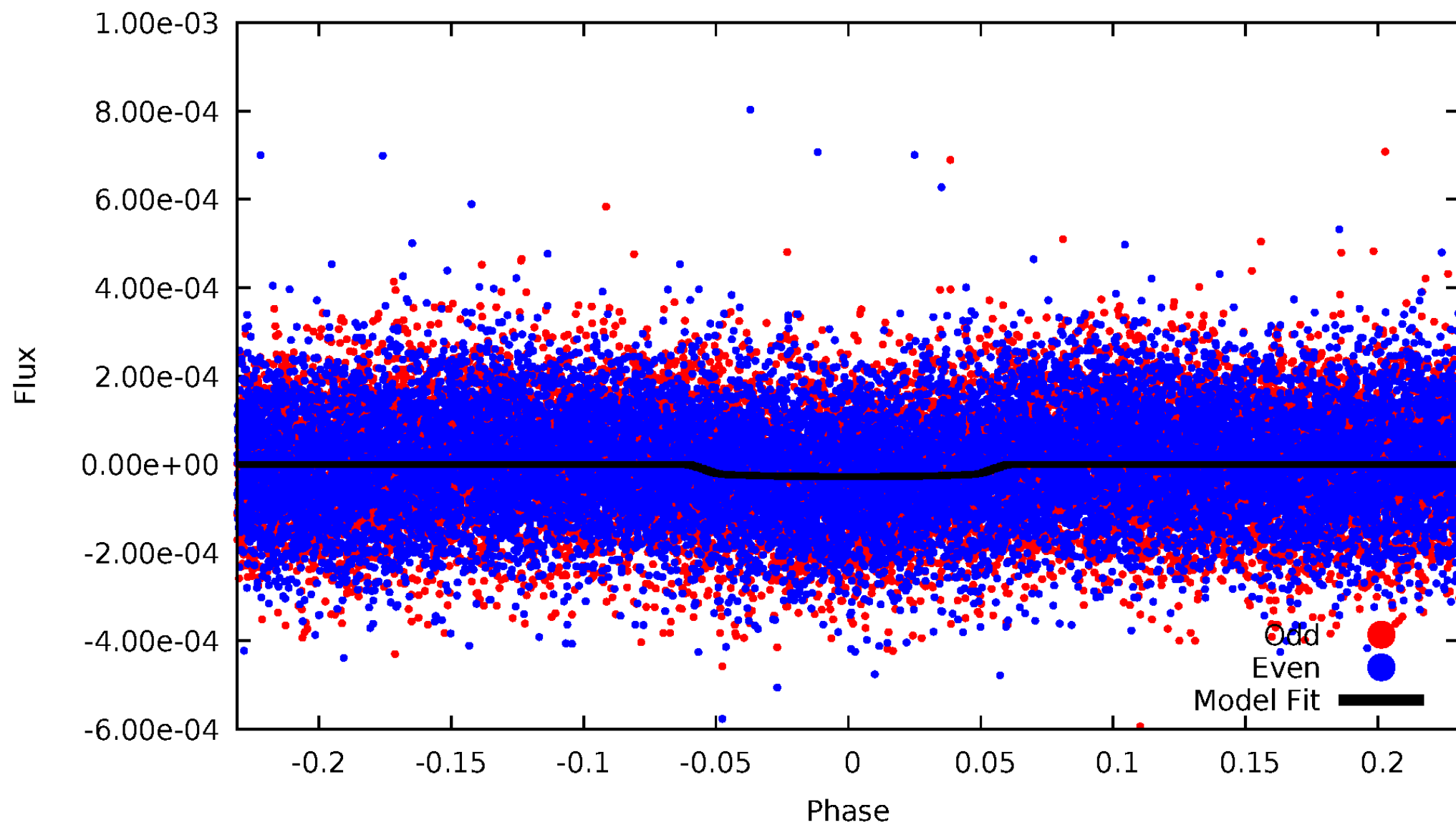


TCE 010604747-01



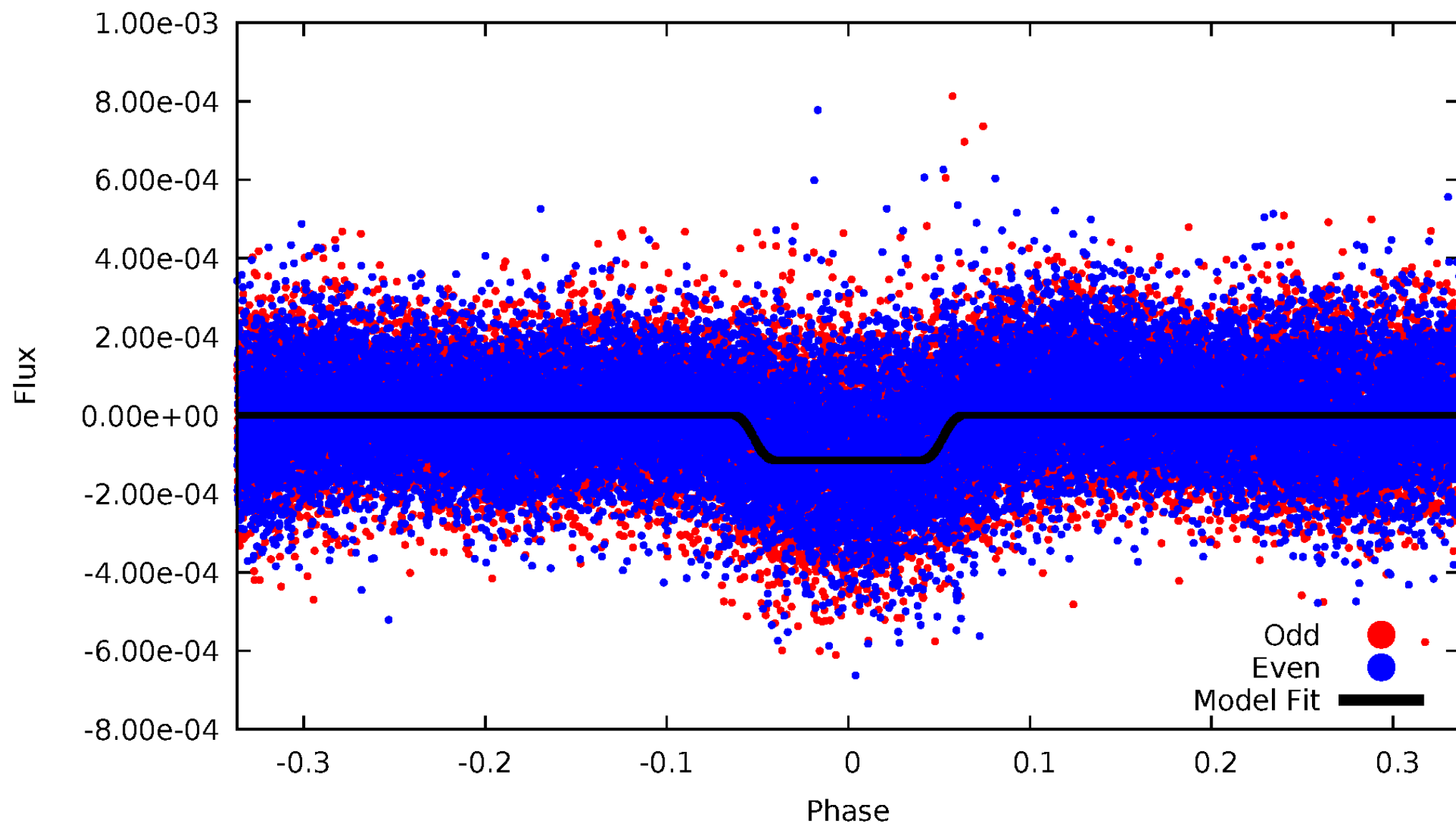
DV Odd/Even

TCE 010604747-01

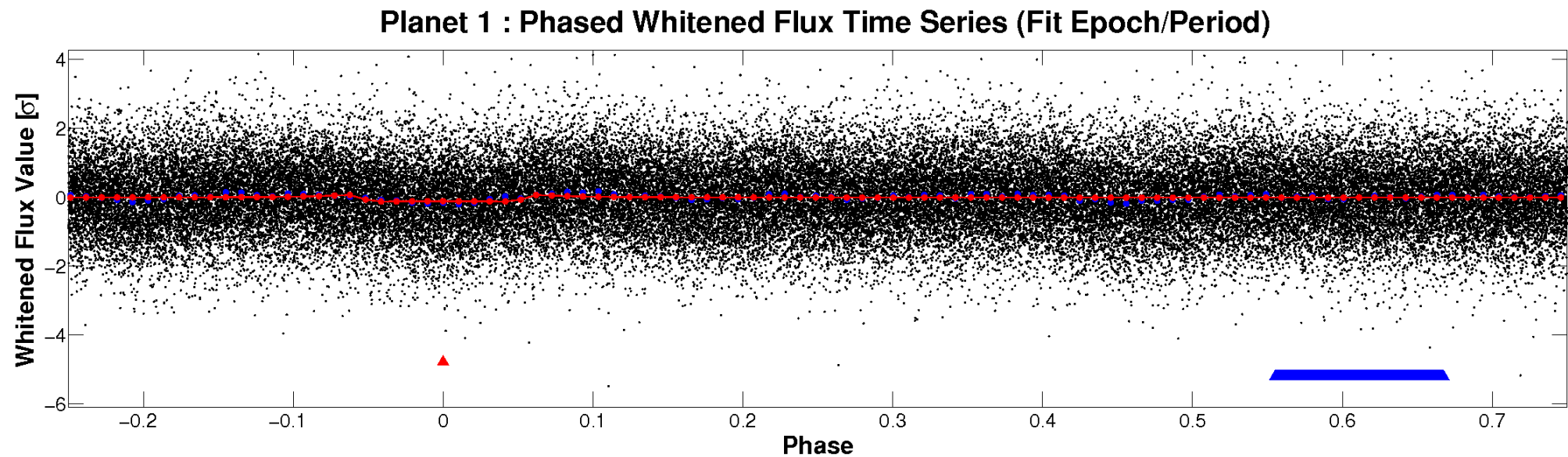
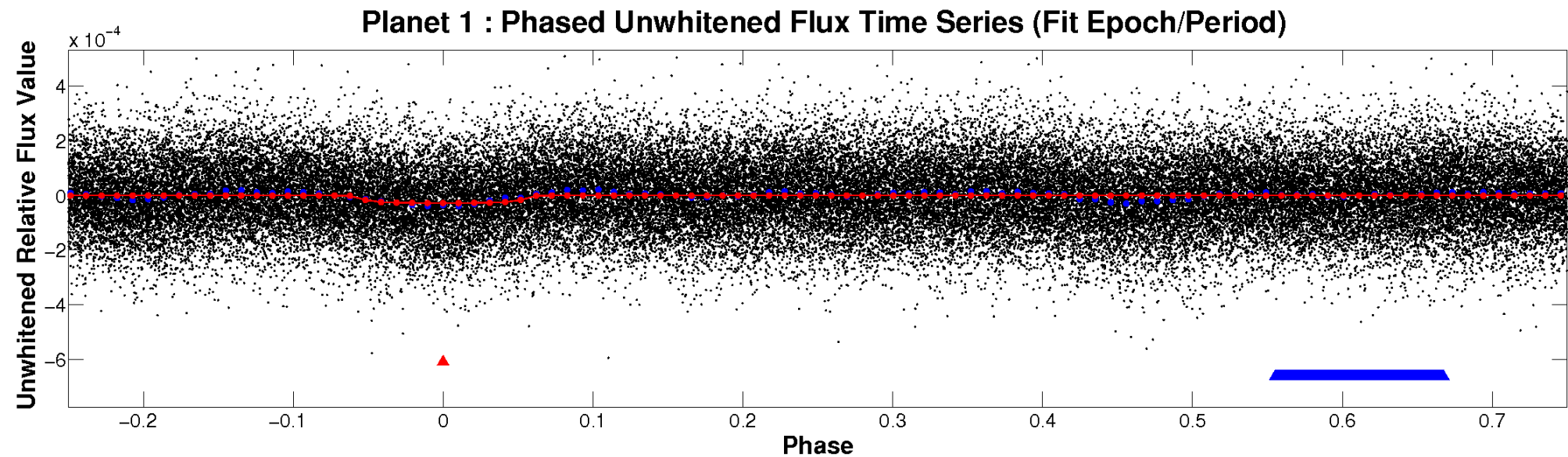


ALT Odd/Even

TCE 010604747-01

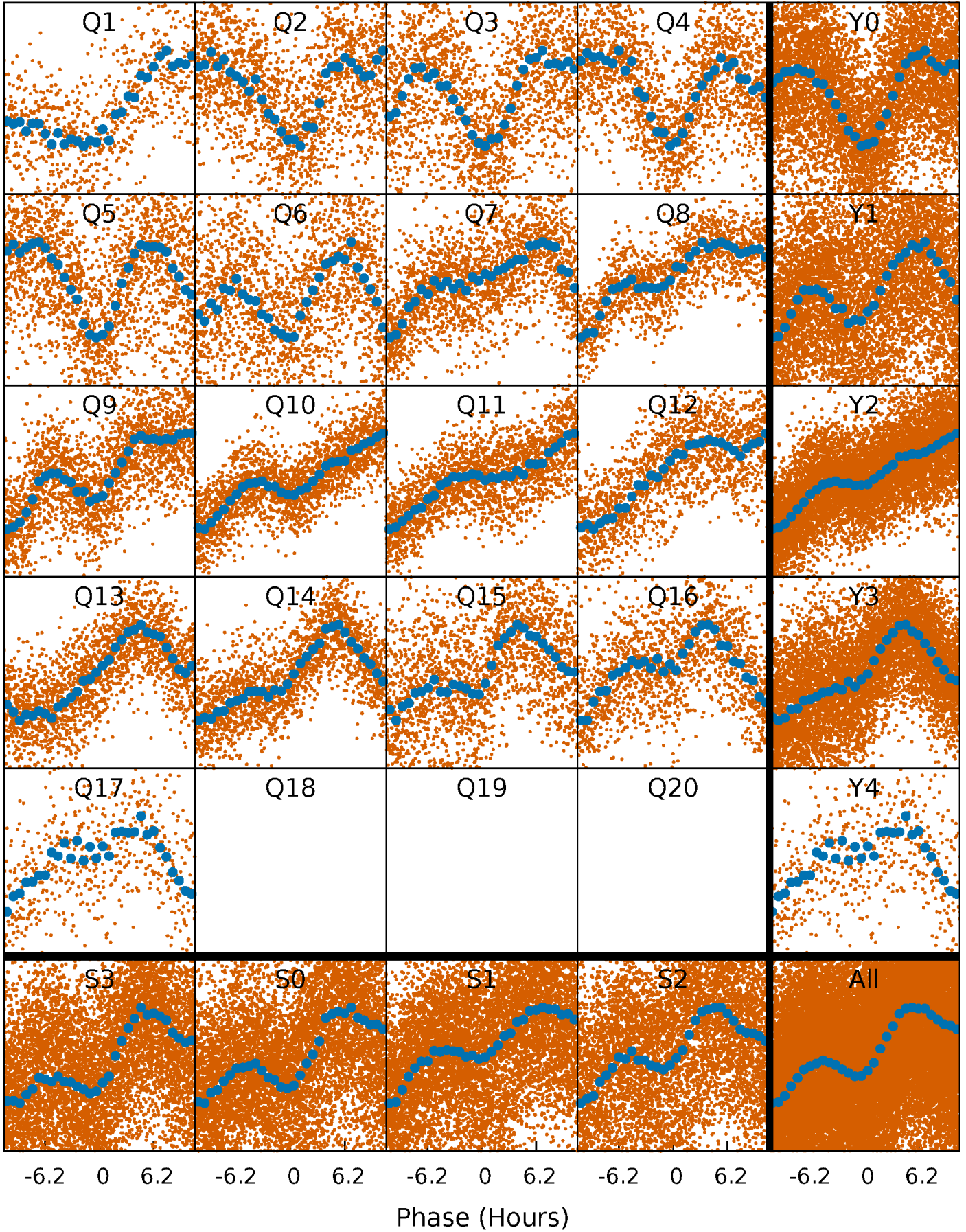


Non-Whitened Vs. Whitened Light Curve



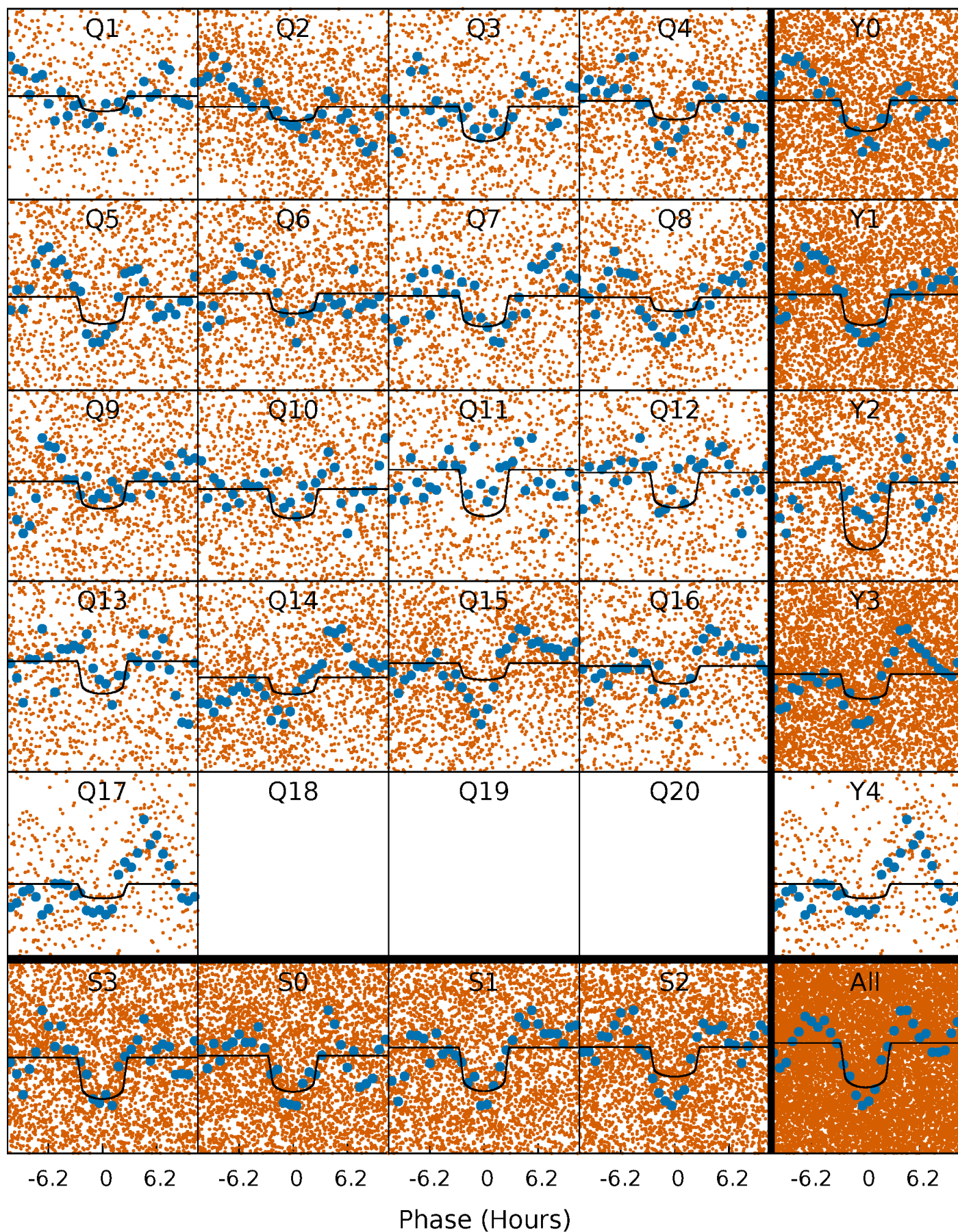
PDC Quarter-Phased Transit Curves

TCE 010604747-01 P= 1.972557 Days $T_0=132.077297$ (BKJD)



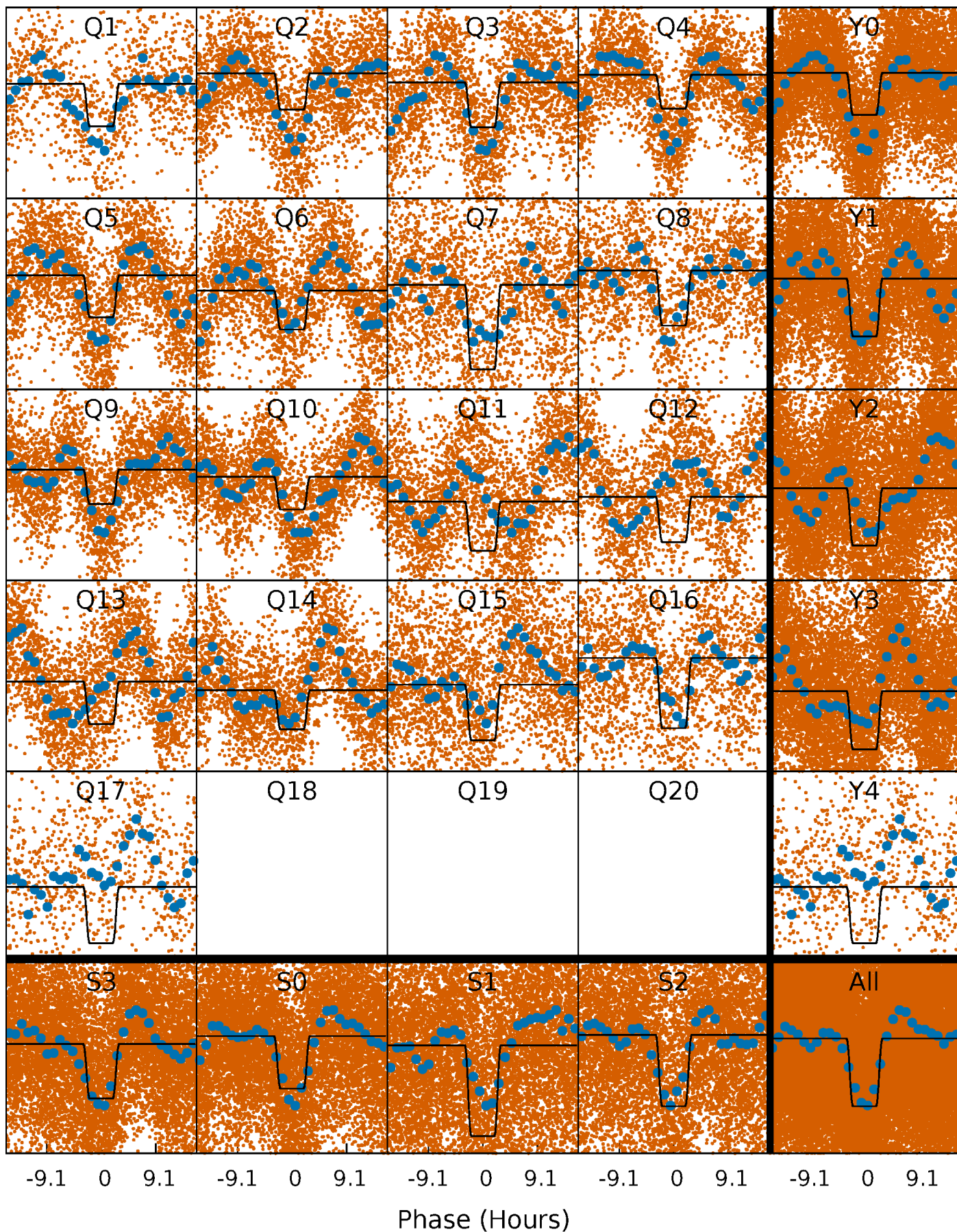
DV Quarter-Phased Transit Curves

TCE 010604747-01 P= 1.972557 Days $T_0=132.077297$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

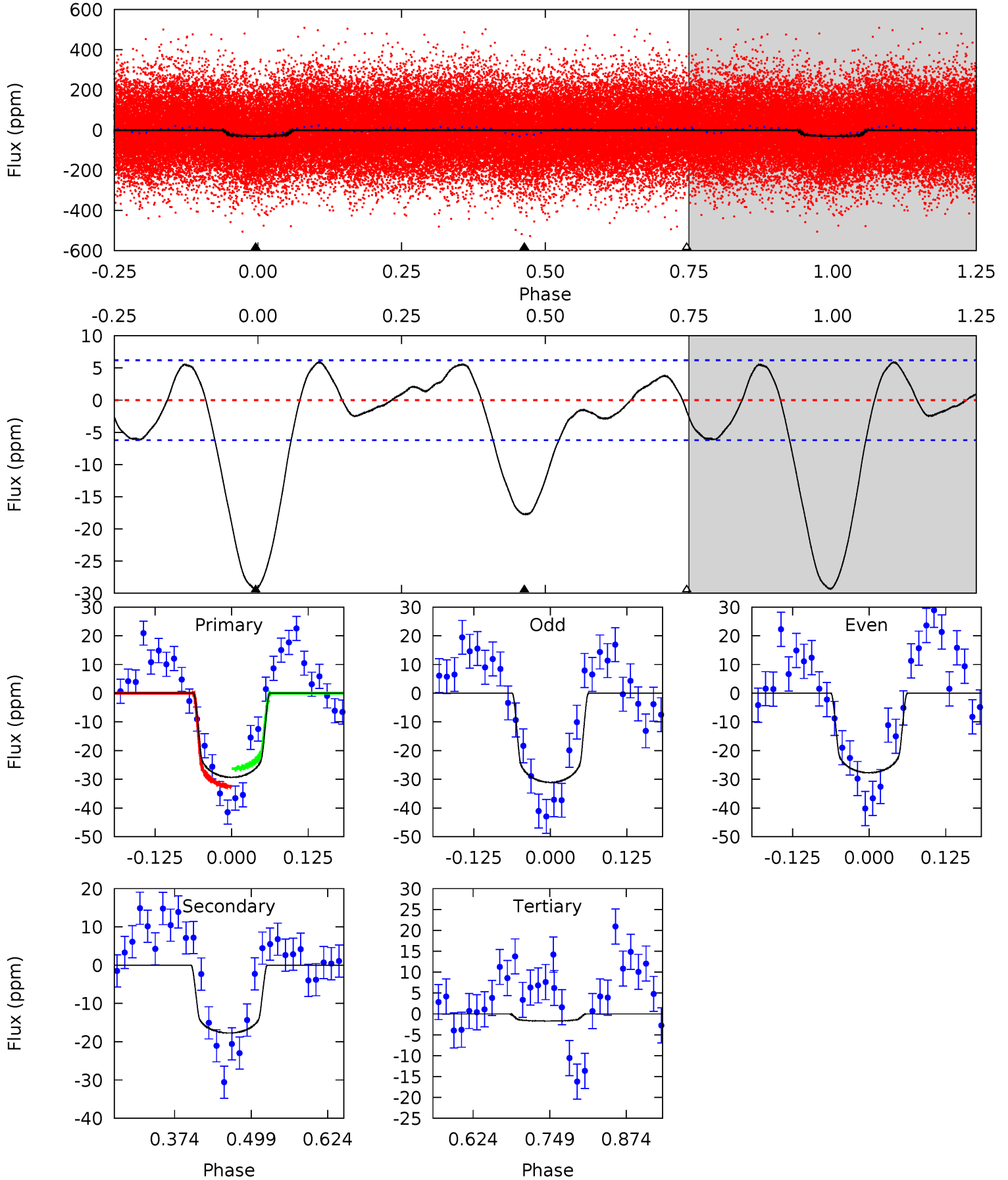
TCE 010604747-01 P= 1.972459 Days $T_0=132.093018$ (BKJD)



DV Model-Shift Uniqueness Test

010604747-01, P = 1.972557 Days, E = 130.104740 Days

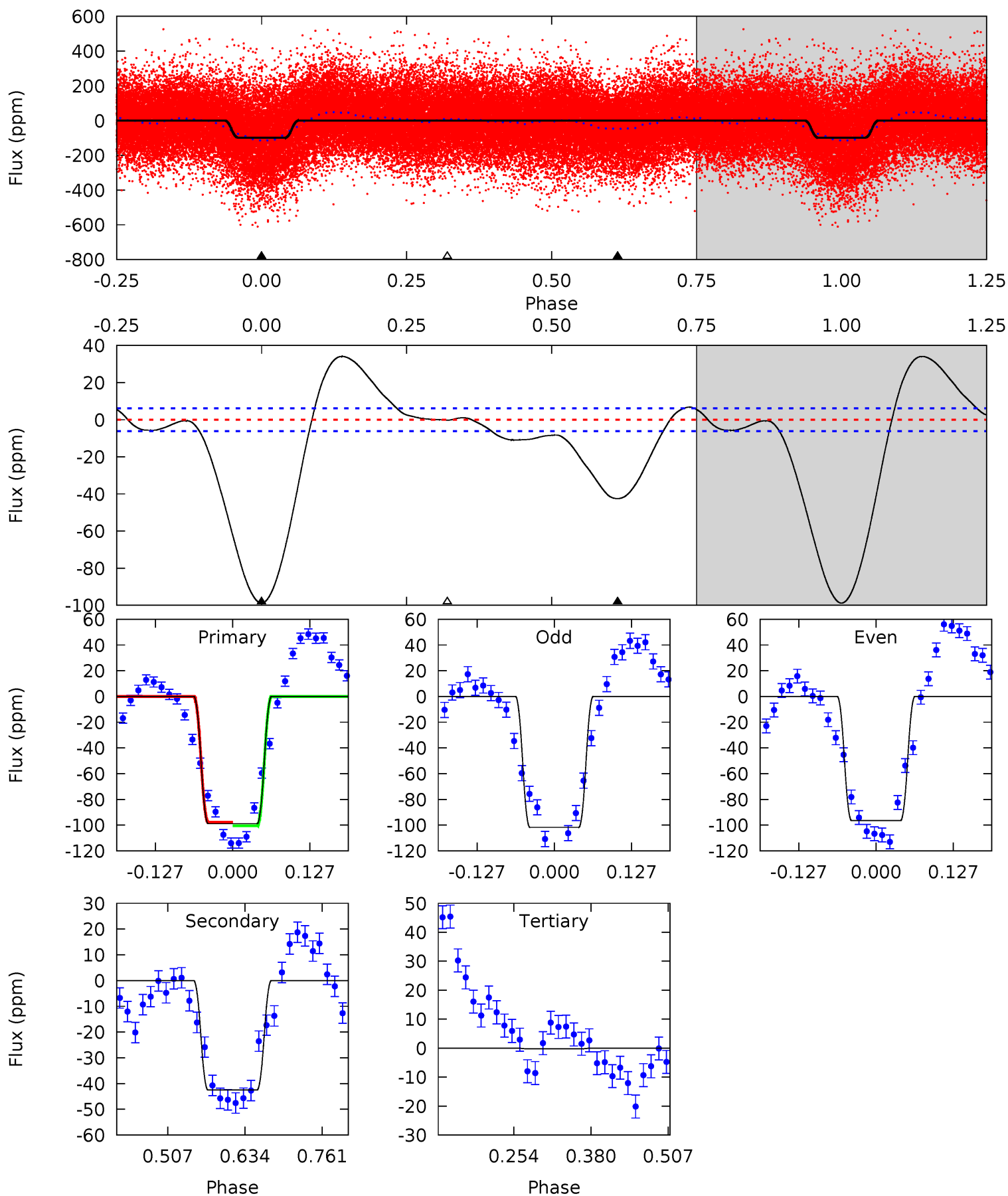
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 21.3 | 12.9 | 1.24 | 0 | 4.52 | 1.53 | 2.13 | 20.1 | 21.3 | 11.6 | 12.9 | 1.22 | 1.12 | 0.17 | 2.23 |



Alt Model-Shift Uniqueness Test

010604747-01, P = 1.972459 Days, E = 130.120559 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 72.7 | 31.3 | 0.18 | 0 | 4.51 | 1.53 | 9.03 | 72.6 | 72.7 | 31.1 | 31.3 | 1.91 | 0.93 | 0.26 | 1.06 |



Stellar Parameters For KIC 010604747

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|--|
| | 7126^{+222}_{-271} | $3.847^{+0.245}_{-0.105}$ | $-0.160^{+0.300}_{-0.300}$ | $2.566^{+0.511}_{-0.766}$ | $1.687^{+0.172}_{-0.320}$ | $0.141^{+0.223}_{-0.047}$ |
| | +3%/-4% | +6%/-3% | +188%/-188% | +20%/-30% | +10%/-19% | +158%/-33% |
| Source | PHO1 | FLK73 | 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 010604747-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|----------------------|---------------------------|
| DV | -18 ± 1 | $1.54^{+0.36}_{-0.34}$ | 3611^{+230}_{-288} | 5944^{+597}_{-525} | $5.430^{+3.398}_{-1.831}$ |
| Alt. | -43 ± 1 | $2.89^{+0.48}_{-0.51}$ | 3603^{+235}_{-288} | 5413^{+323}_{-270} | $3.770^{+1.558}_{-0.966}$ |

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

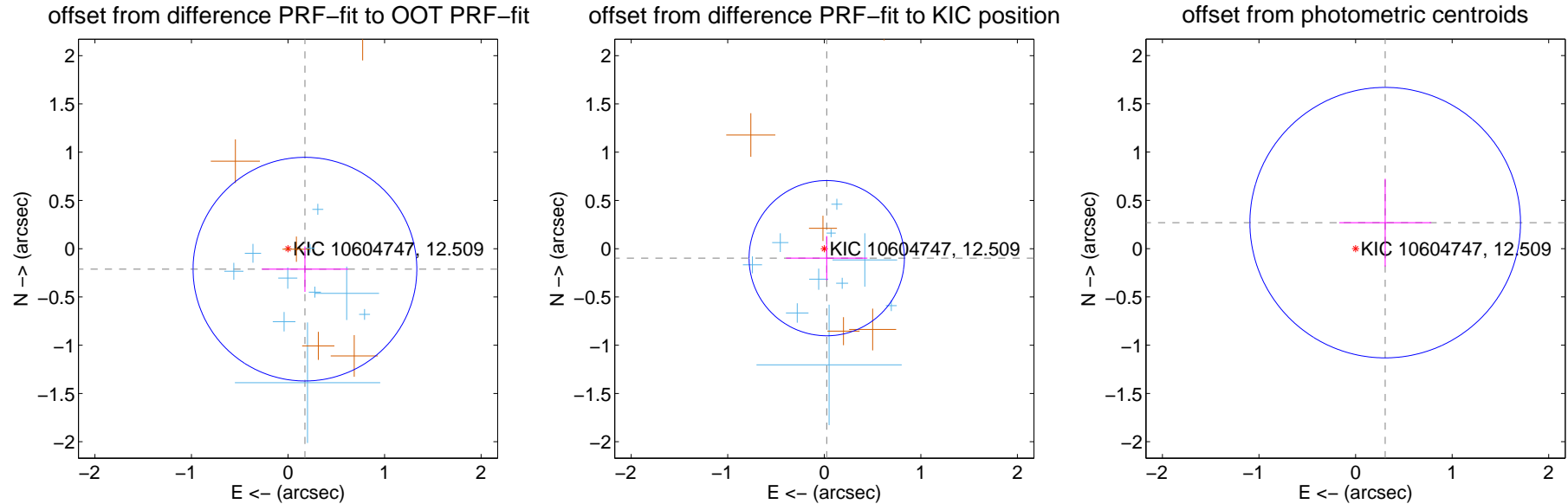
DV Centroid Data

Supplemental centroid analysis for 010604747-01. Kepler magnitude: 12.51. Transit SNR 10.18

There are 10 quarters with good PRF difference image offsets

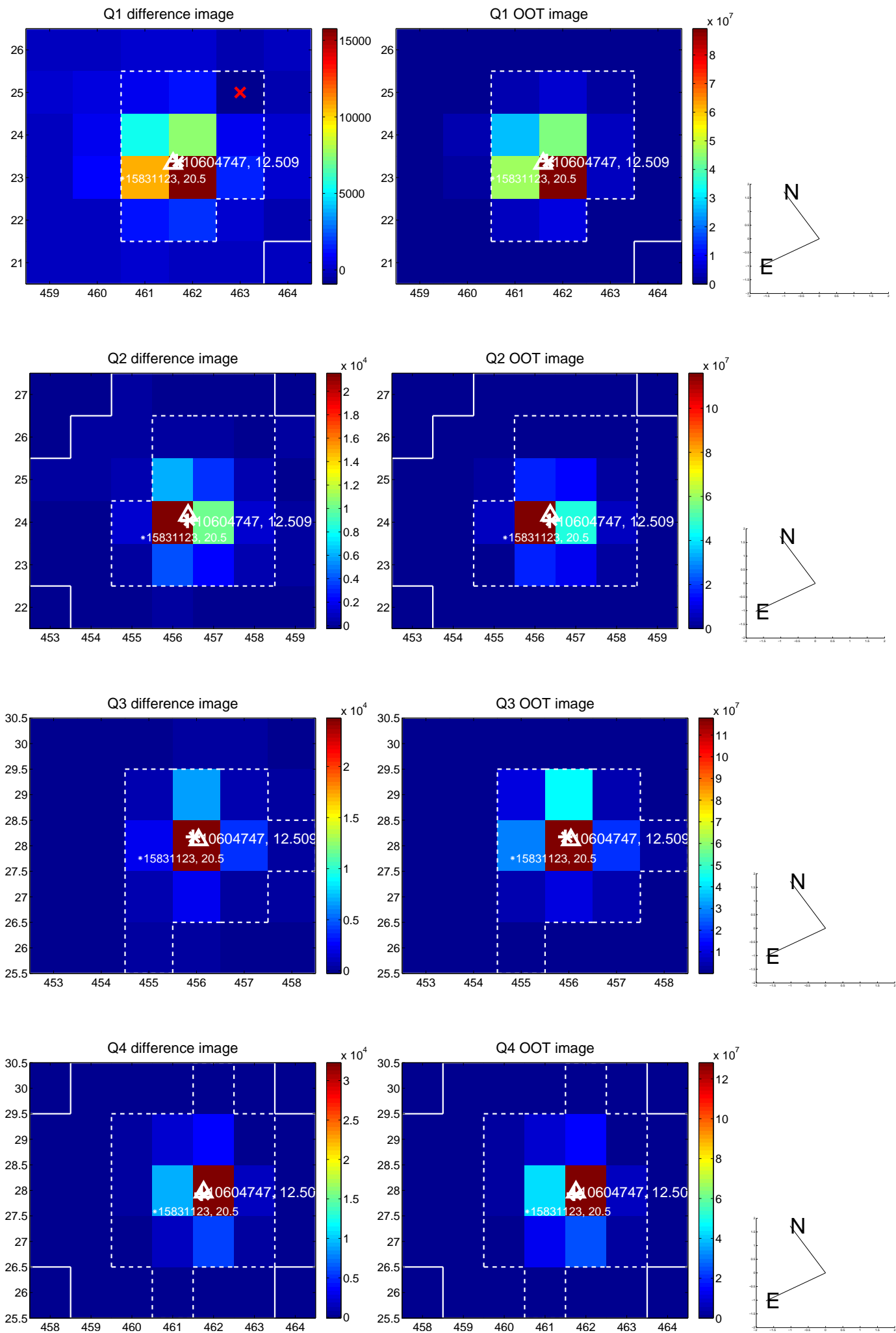
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.275 ± 0.386 | 0.71 | -0.175 ± 0.447 | -0.212 ± 0.235 |
| PRF-fit source offset from KIC position | 0.101 ± 0.268 | 0.38 | -0.025 ± 0.421 | -0.098 ± 0.229 |
| photometric centroid source offset | 0.41 ± 0.47 | 0.87 | -0.31 ± 0.48 | 0.27 ± 0.45 |

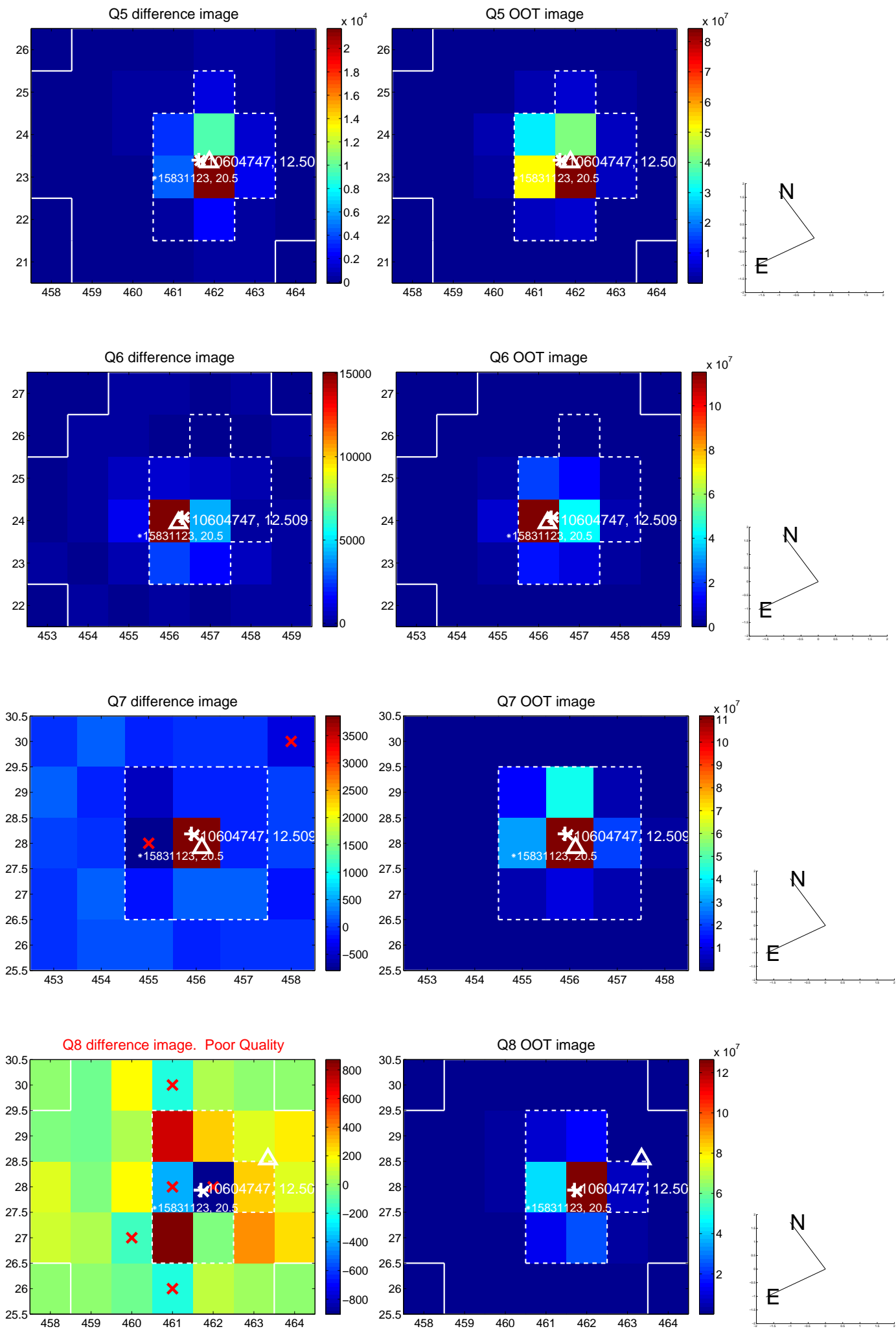


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

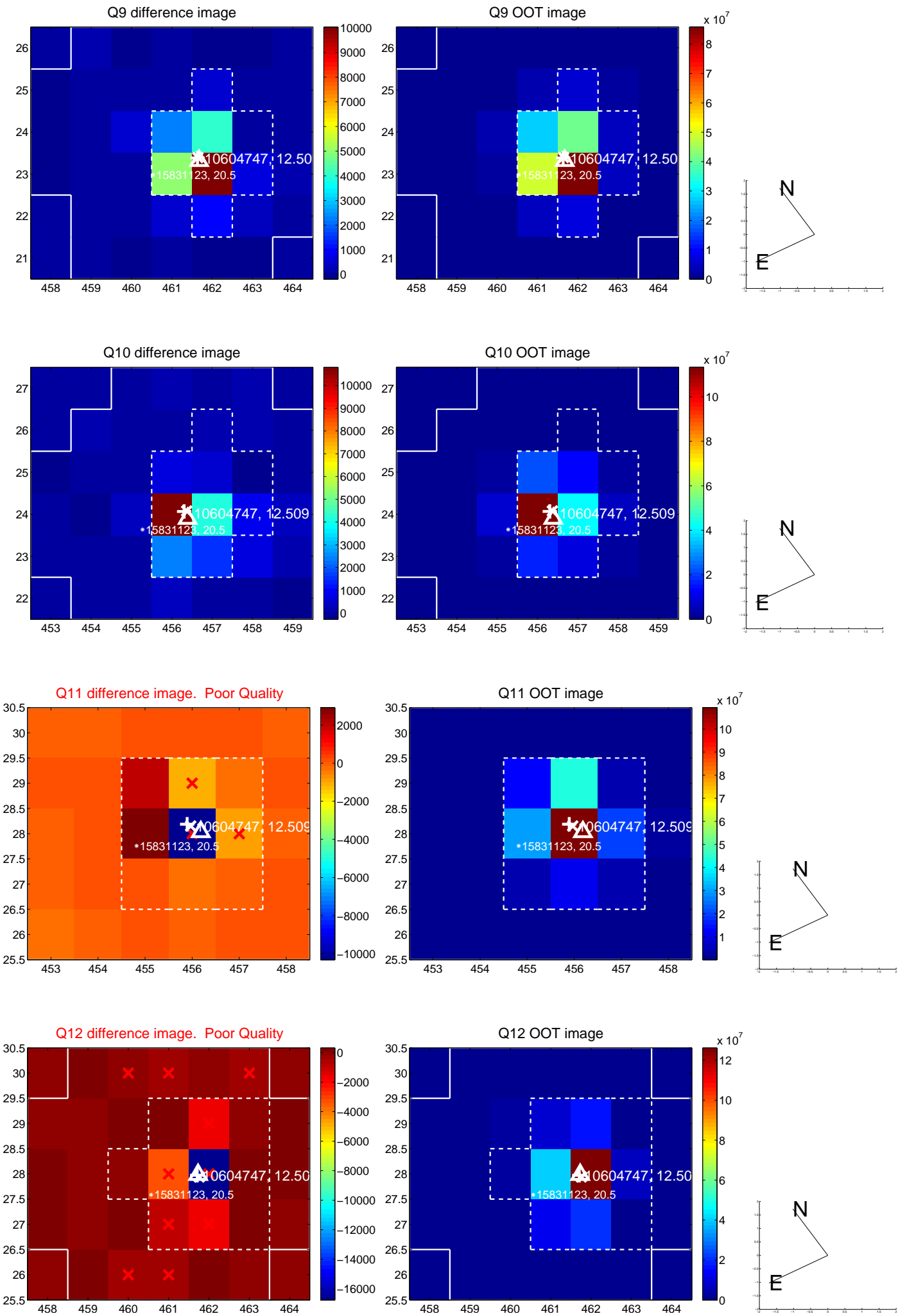
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



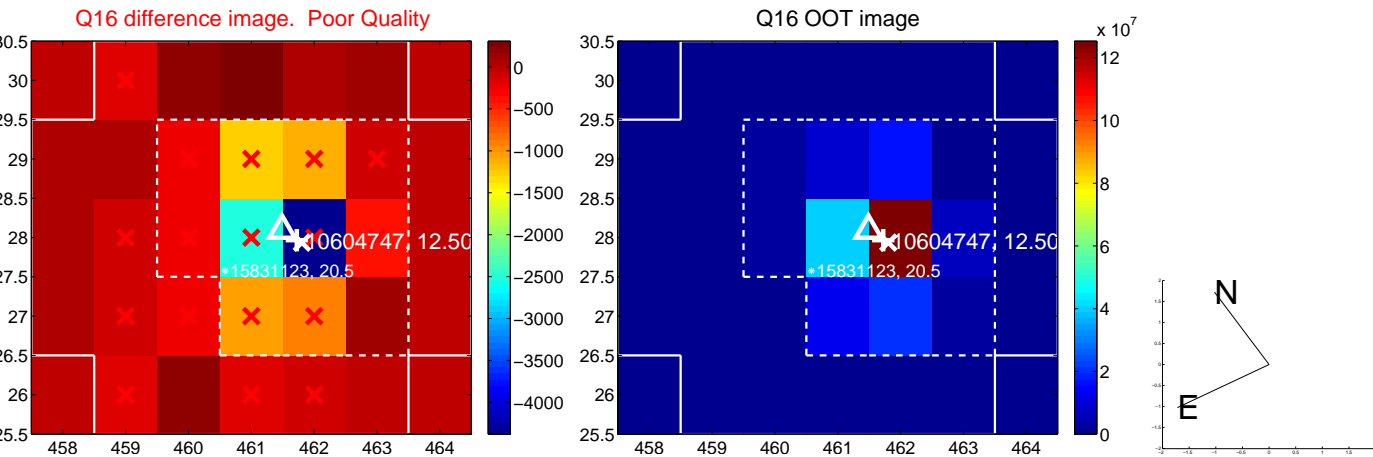
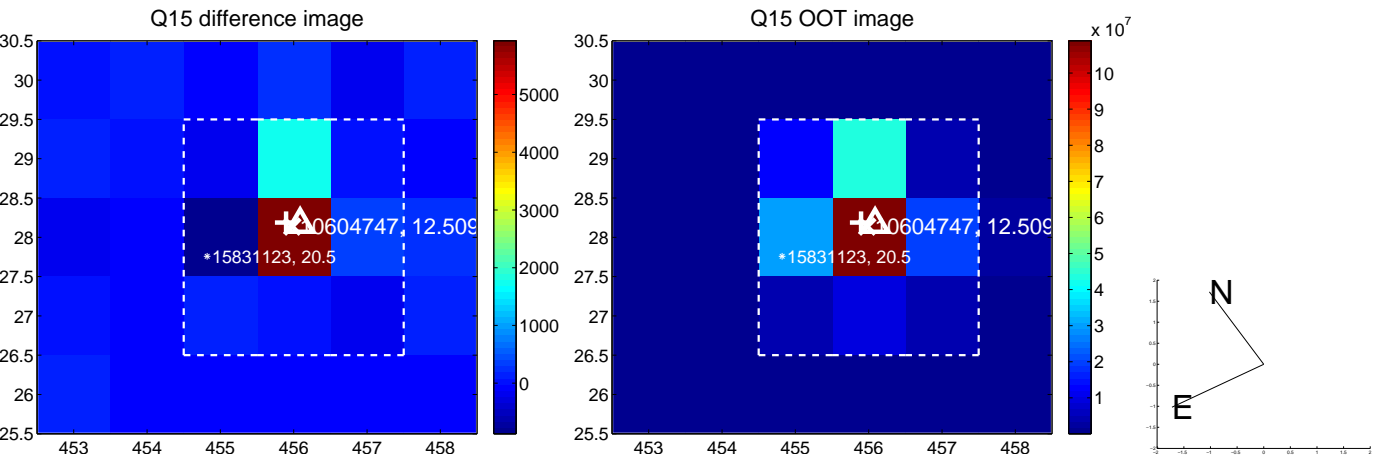
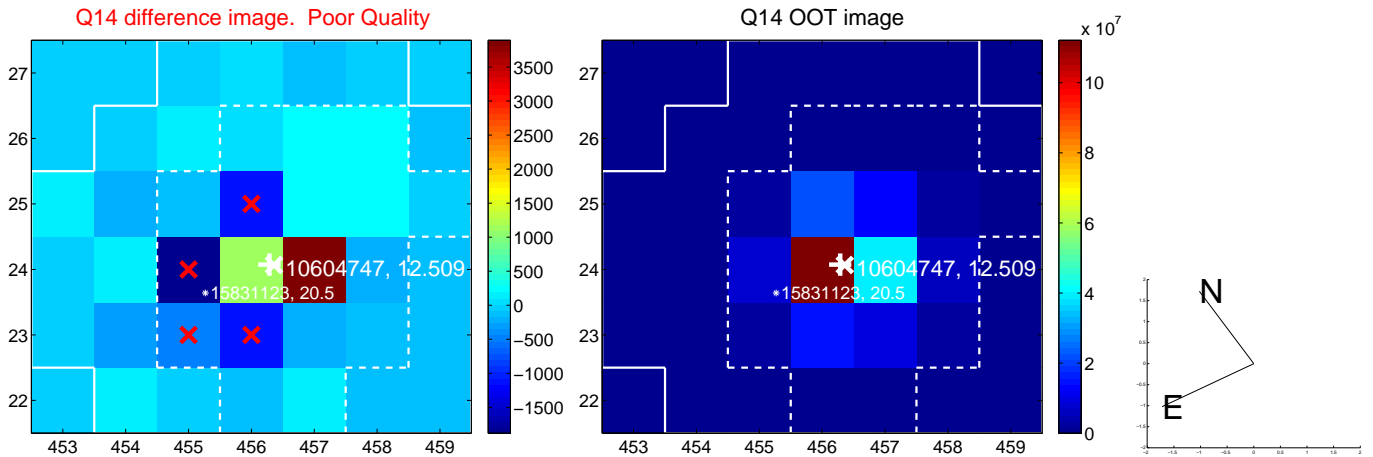
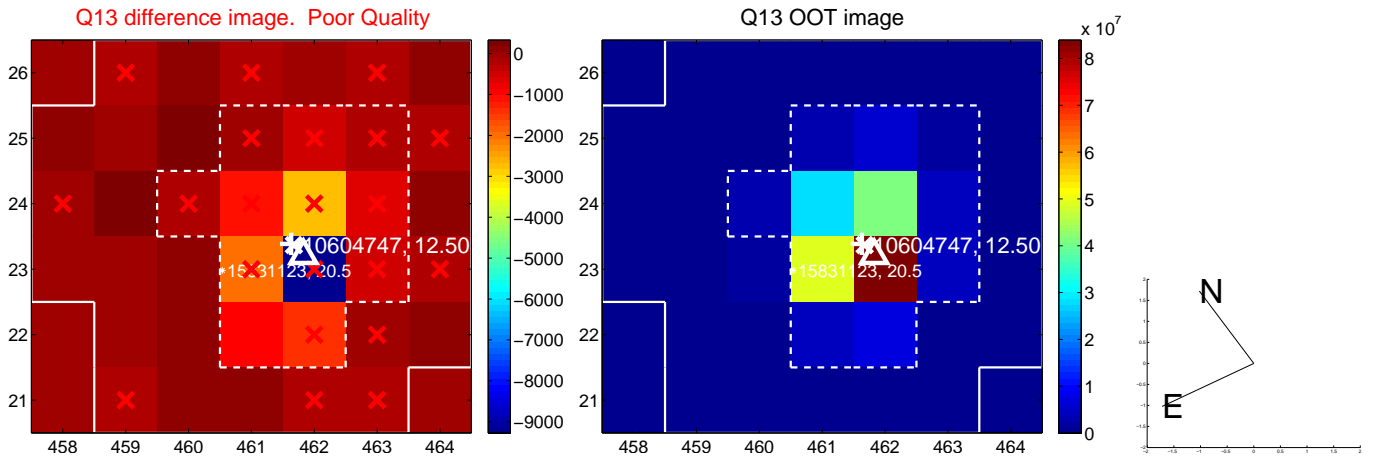
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



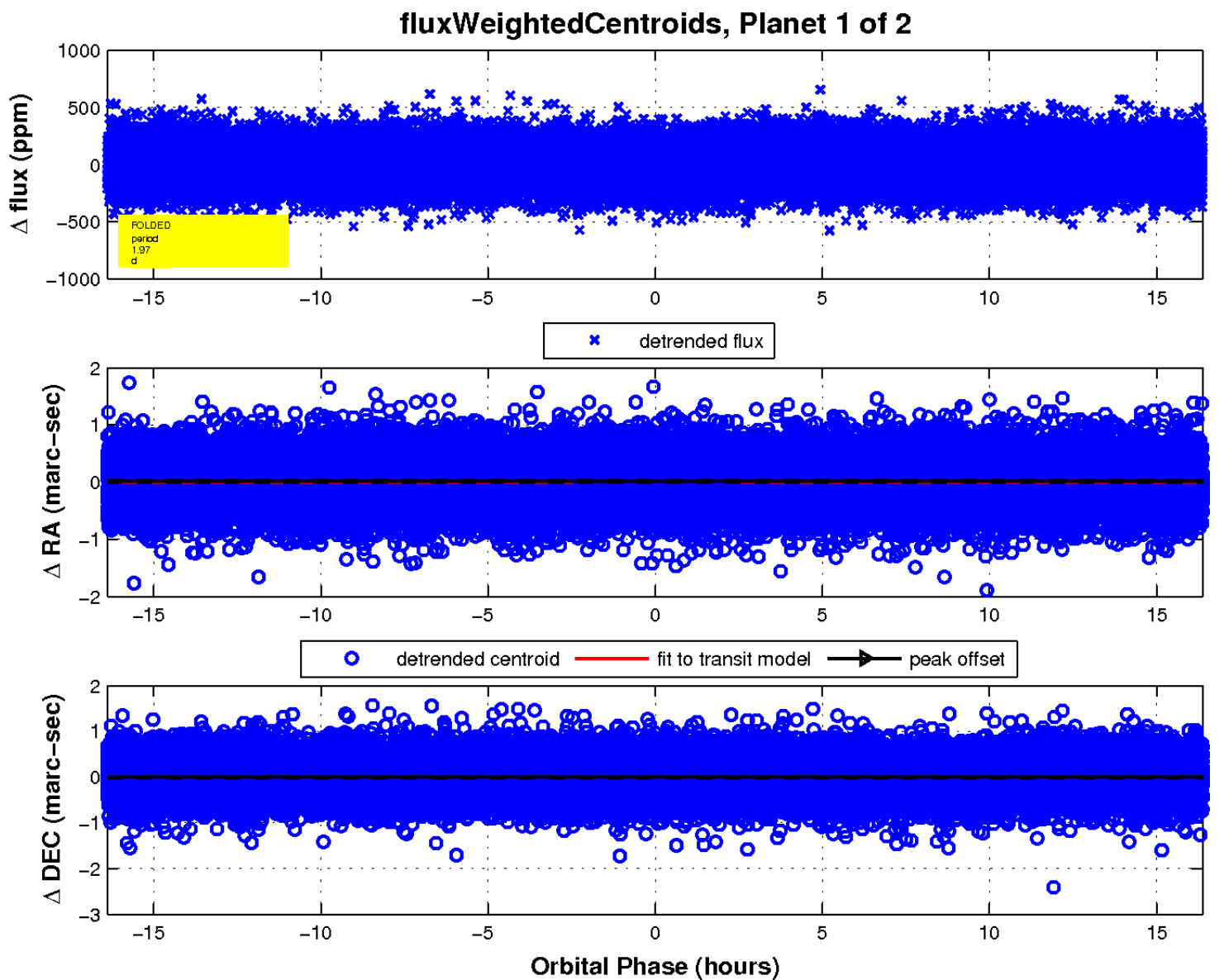
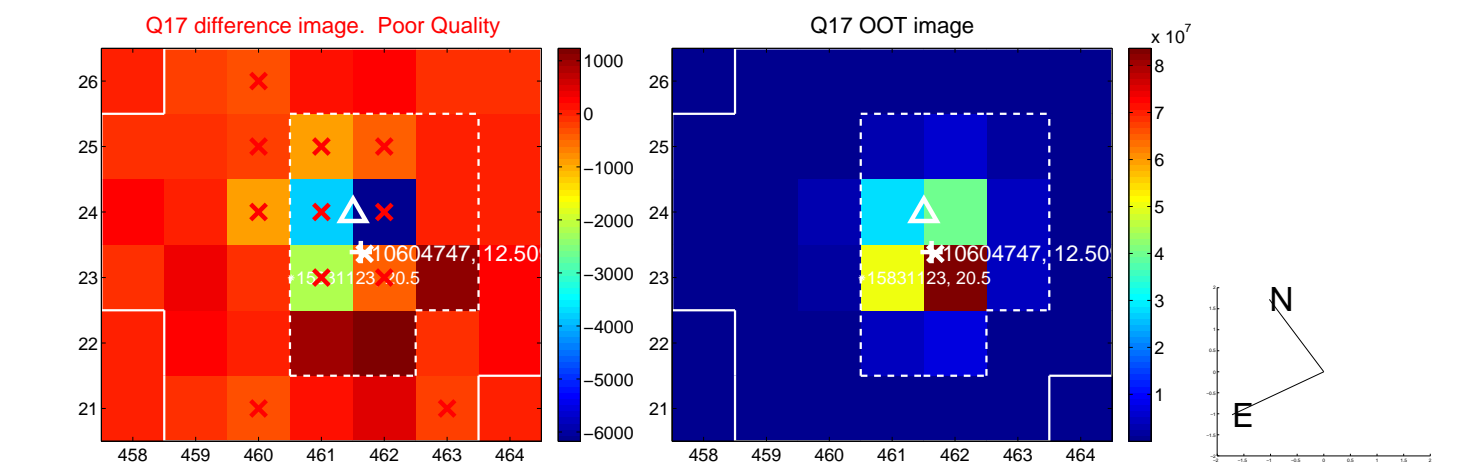
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

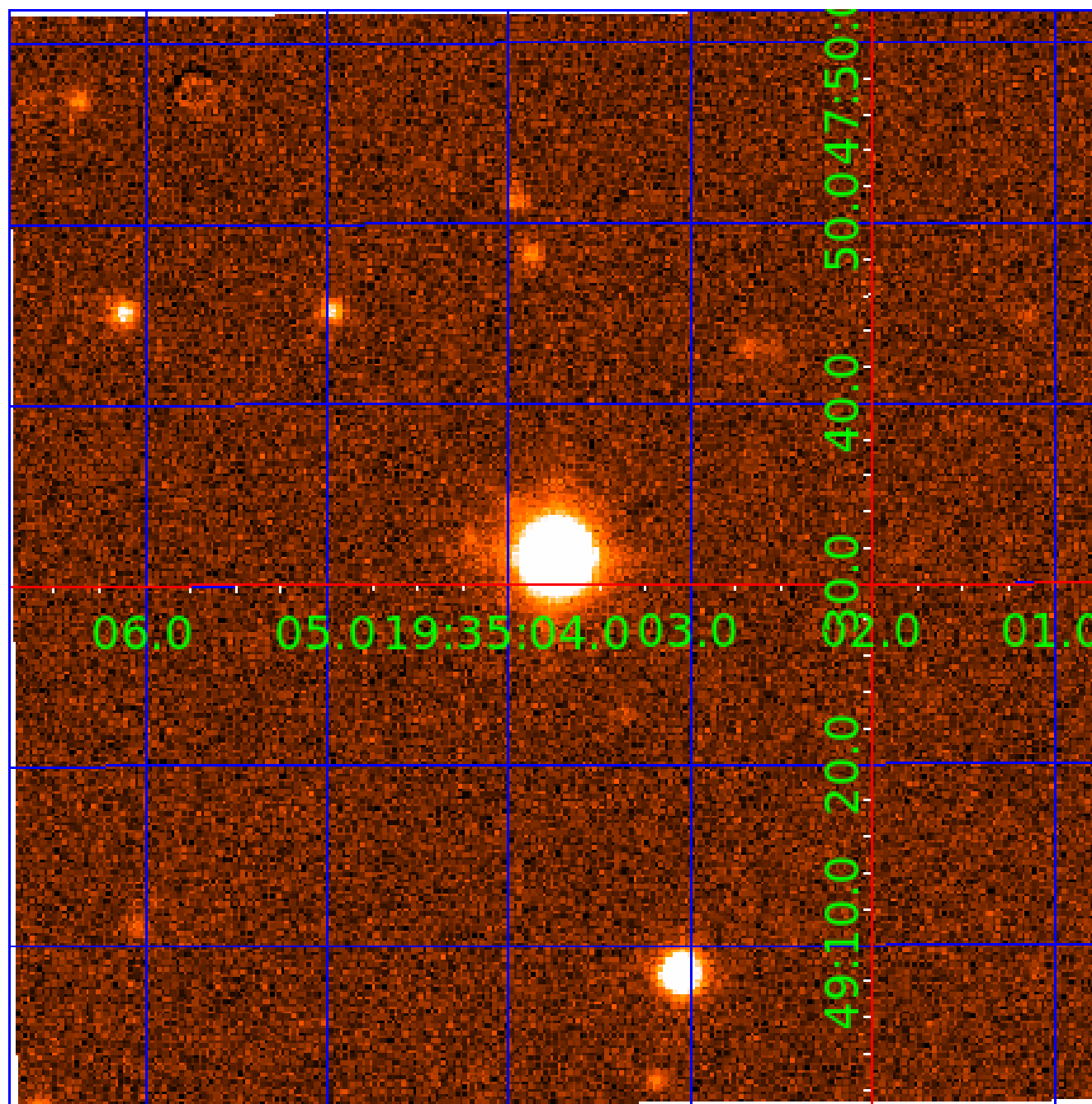


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010604747

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 010604747-01 | OBS | No | 1.972557 | 132.077297 | 27.8 | 5.462 | 10.9 | 10.2 | 2.57 | 7126 | 1.62 | 11317.30 |
| 010604747-02 | OBS | No | 1.972256 | 133.394255 | 11.7 | 23.667 | 9.6 | 4.6 | 2.57 | 7126 | 0.91 | 11319.60 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010604747-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | SWEET_NTL—LPP_DV |
| 010604747-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—SAME_NTL_PERIOD—CENT_FEW_DIFFS |

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

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

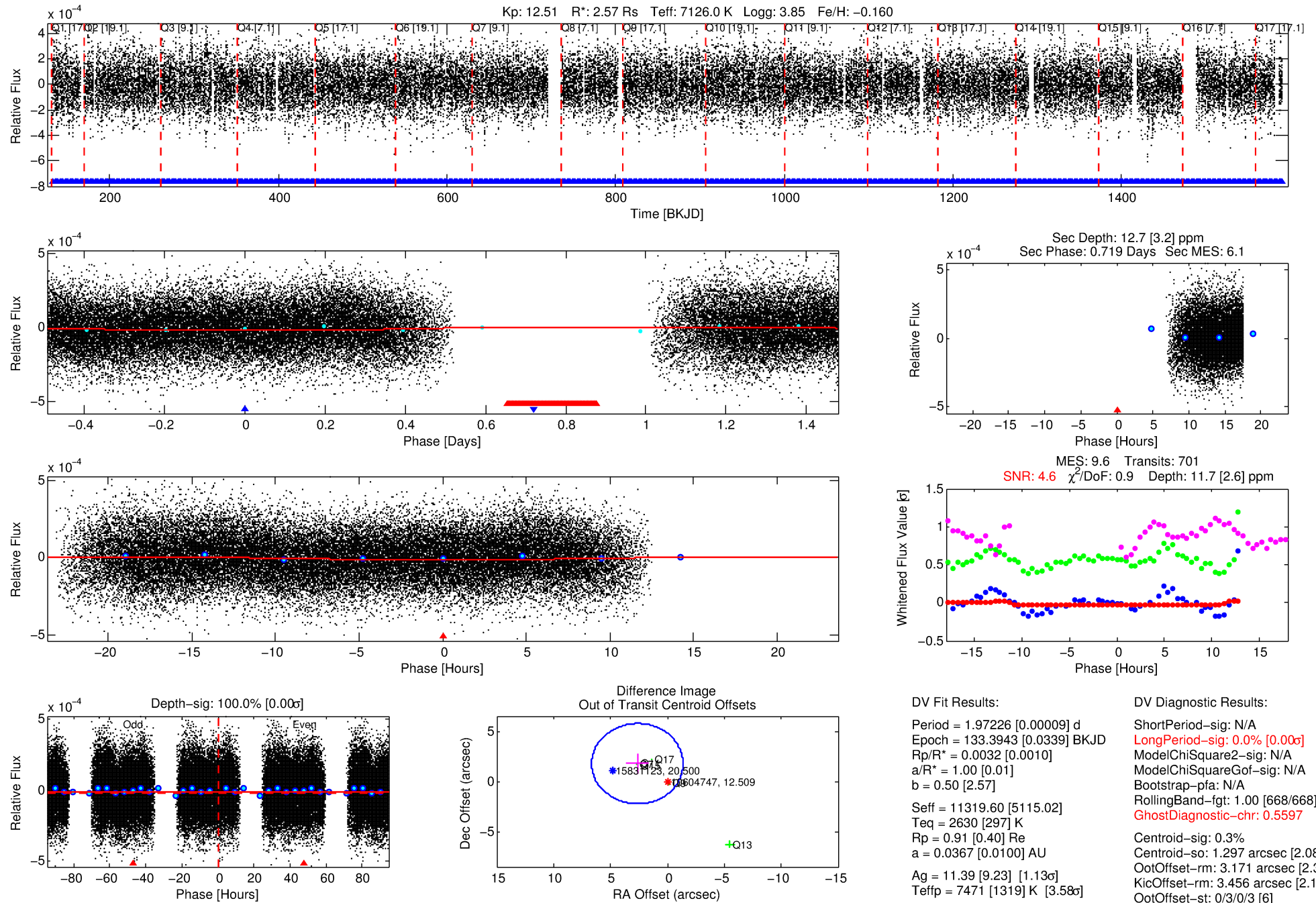
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010604747-02

No Significant Match Found

DV One-Page Summary

KIC: 10604747 Candidate: 2 of 2 Period: 1.972 d



DV Fit Results:

Period = 1.97226 [0.00009] d
Epoch = 133.3943 [0.0339] BKJD
Rp/R* = 0.0032 [0.0010]
a/R* = 1.00 [0.01]
b = 0.50 [2.57]
Seff = 11319.60 [5115.02]
Teq = 2630 [297] K
Rp = 0.91 [0.40] Re
a = 0.0367 [0.0100] AU
Ag = 11.39 [9.23] [1.13 σ]
Teffp = 7471 [1319] K [3.58 σ]

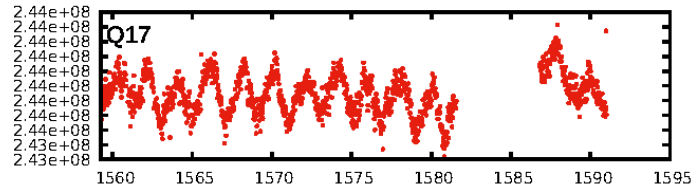
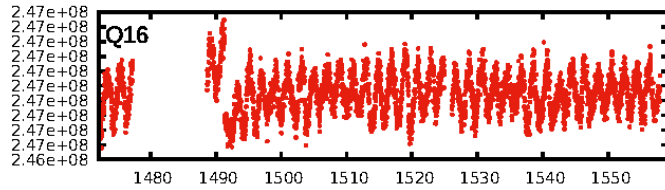
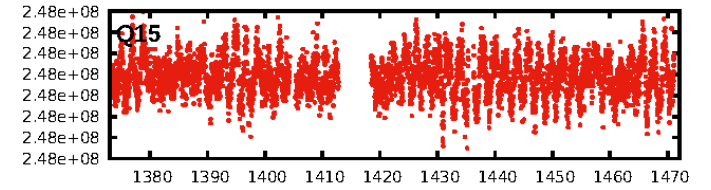
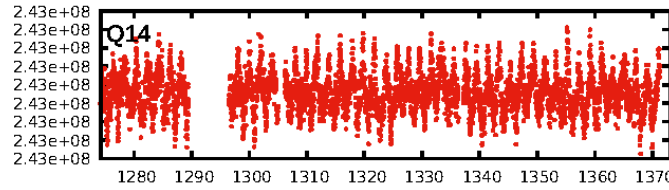
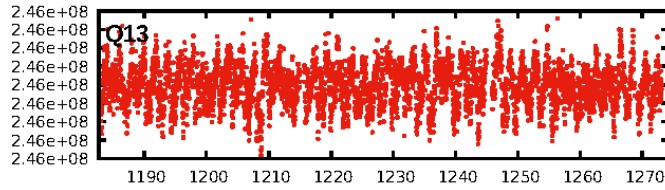
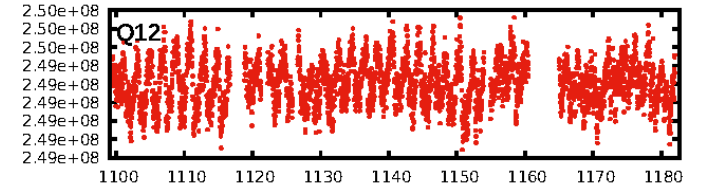
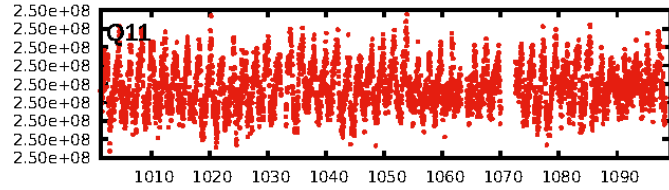
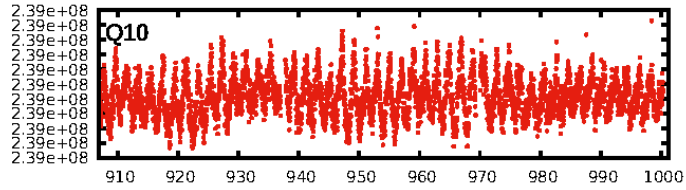
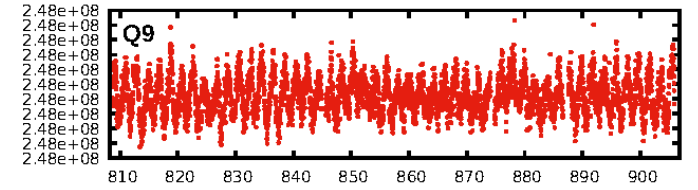
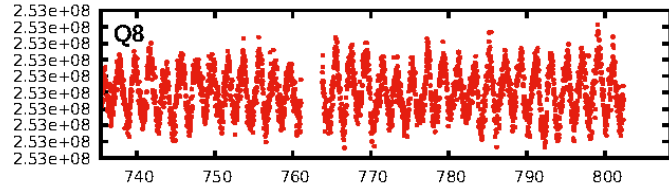
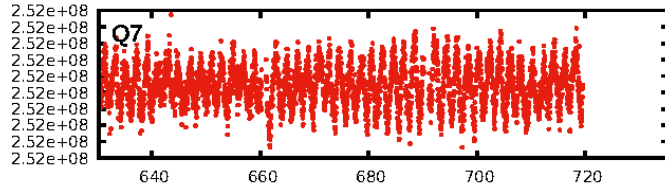
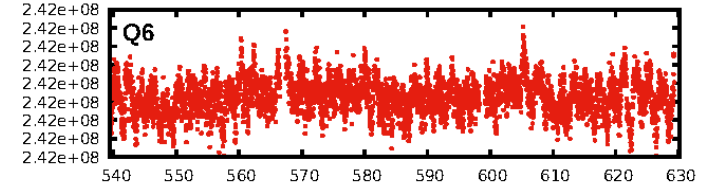
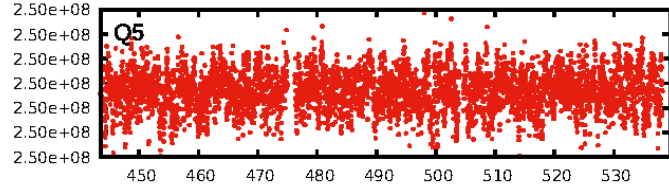
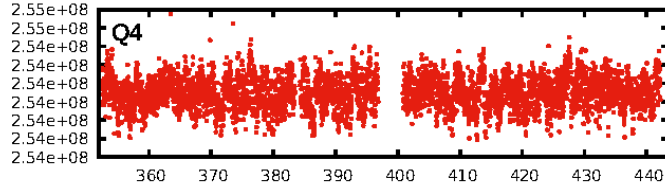
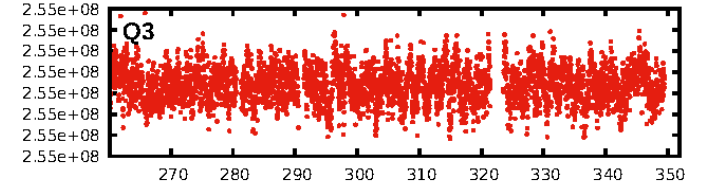
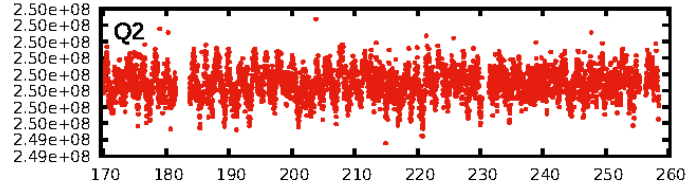
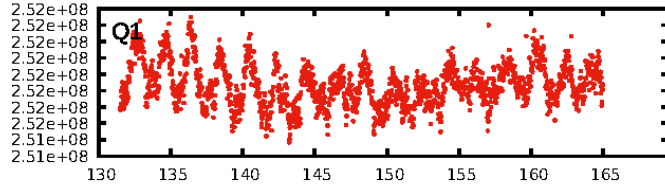
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [668/668]
GhostDiagnostic-chr: 0.5597
Centroid-sig: 0.3%
Centroid-so: 1.297 arcsec [2.08 σ]
OotOffset-rm: 3.171 arcsec [2.38 σ]
KicOffset-rm: 3.456 arcsec [2.15 σ]
OotOffset-st: 0/3/0/3 [6]
KicOffset-st: 0/3/0/3 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 0.00 [0/17]

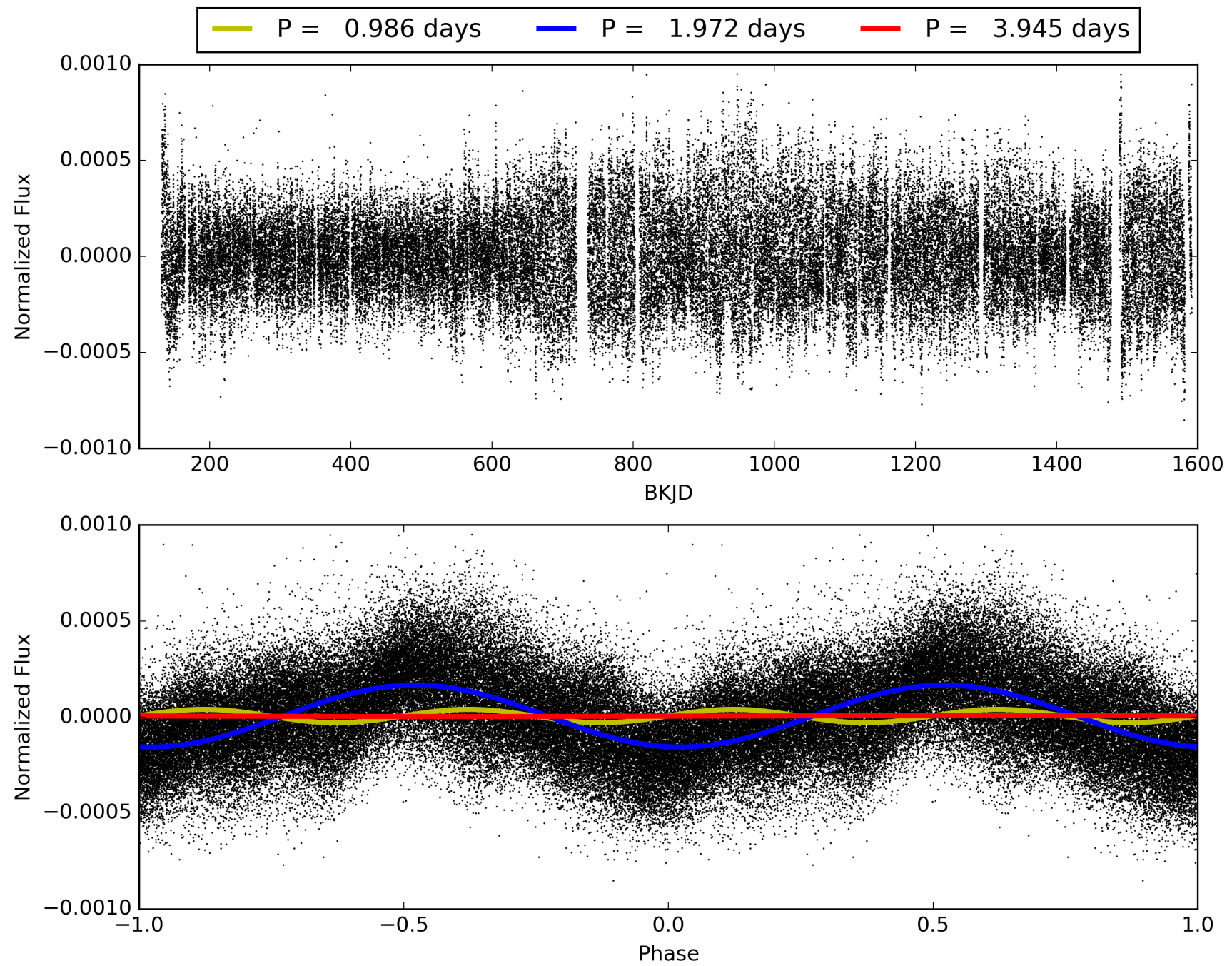
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:42:45 Z

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

TCE 010604747-02, PDC Light Curves

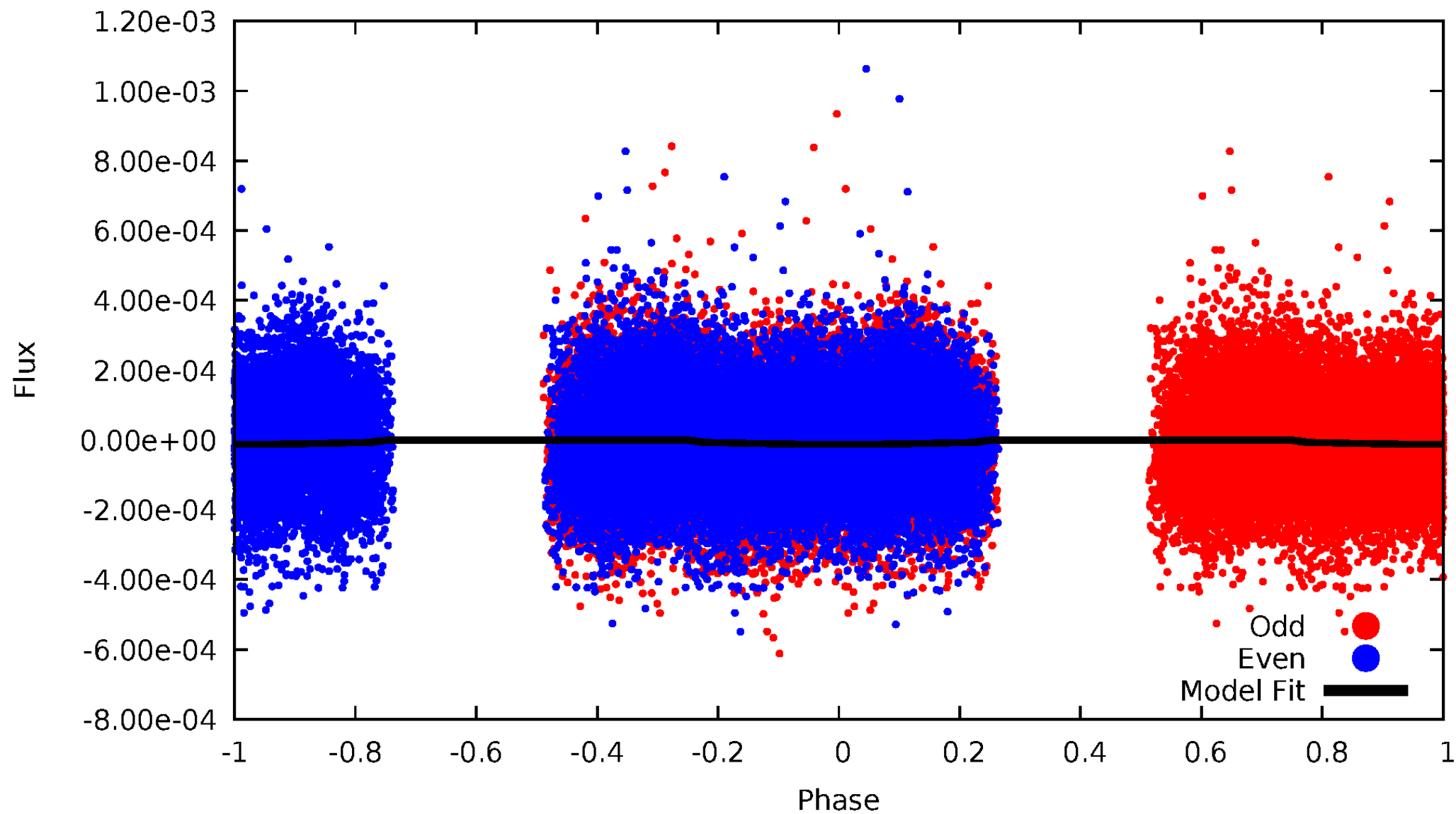


TCE 010604747-02



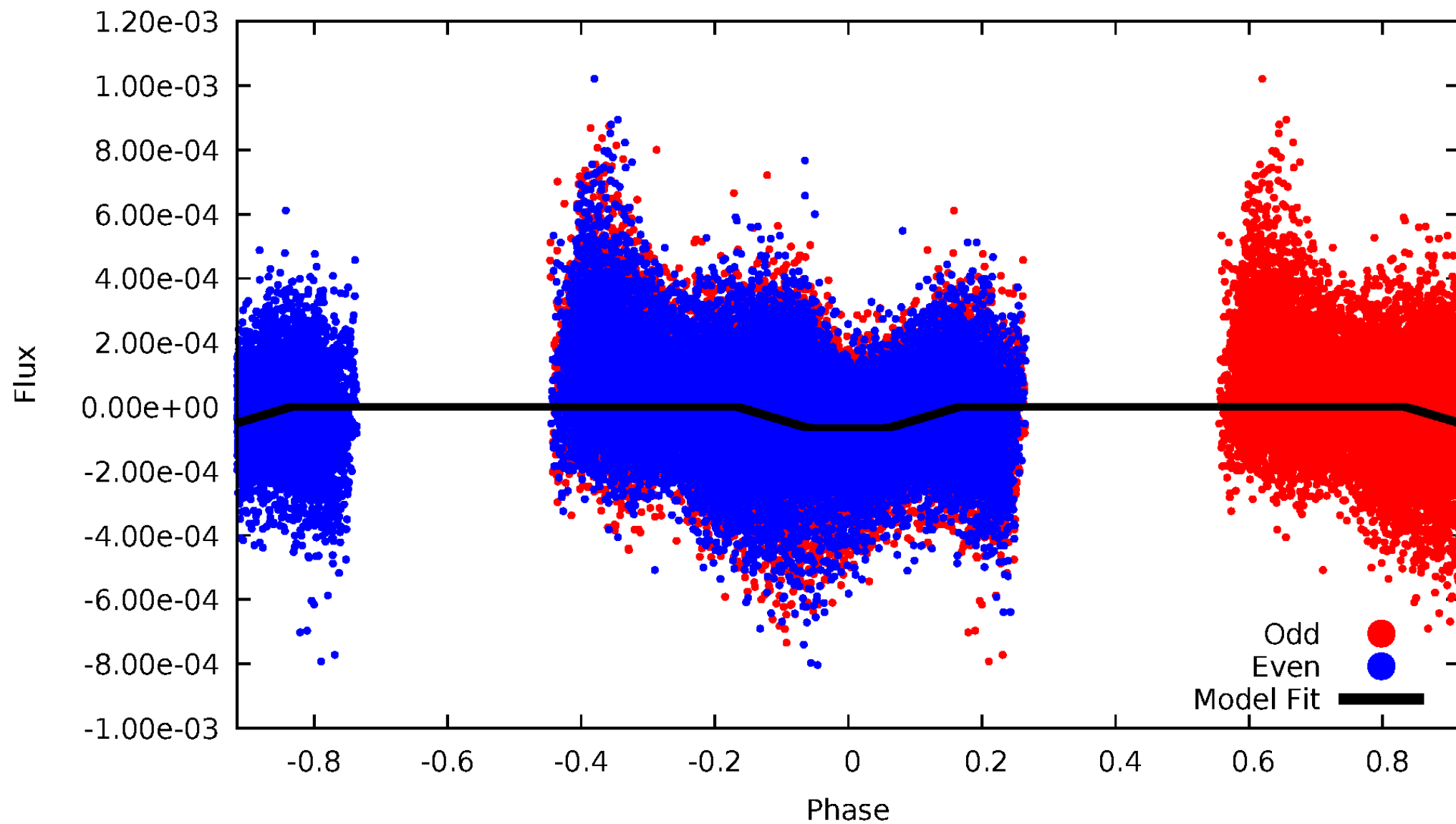
DV Odd/Even

TCE 010604747-02



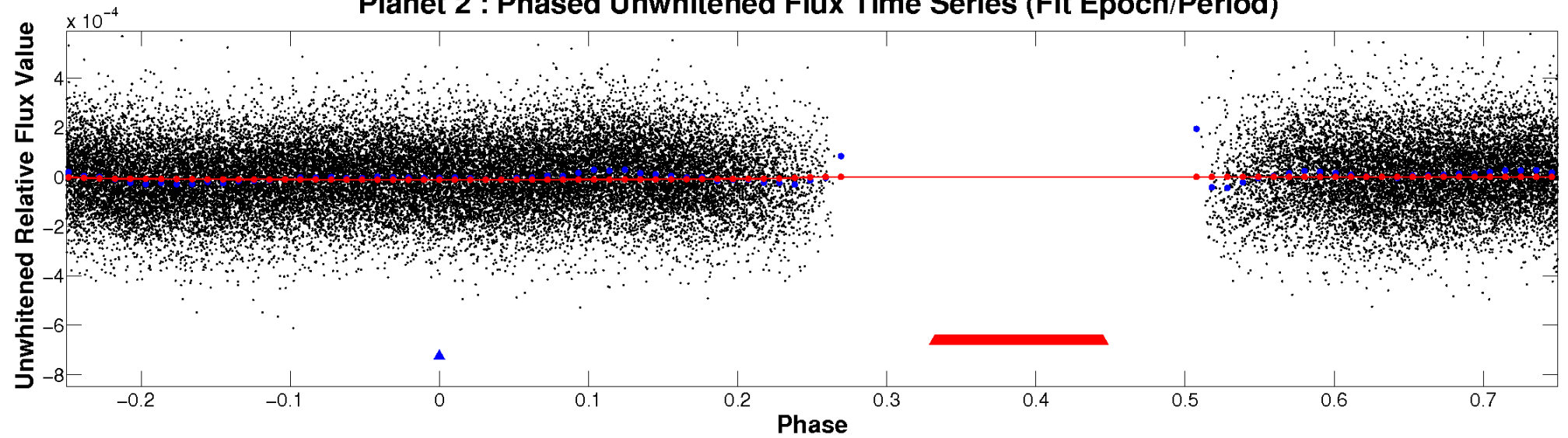
ALT Odd/Even

TCE 010604747-02

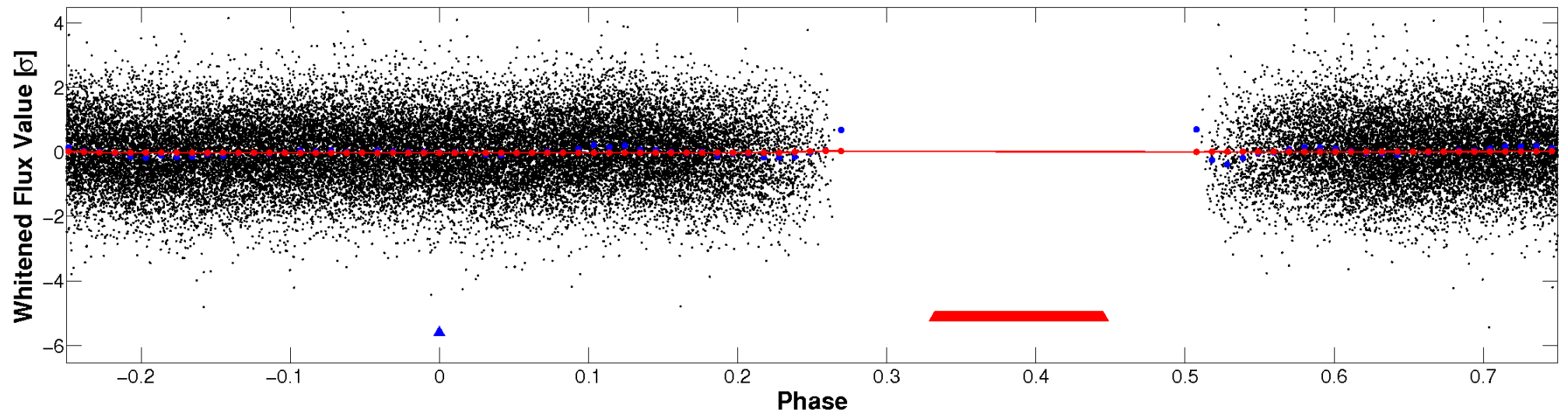


Non-Whitened Vs. Whitened Light Curve

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

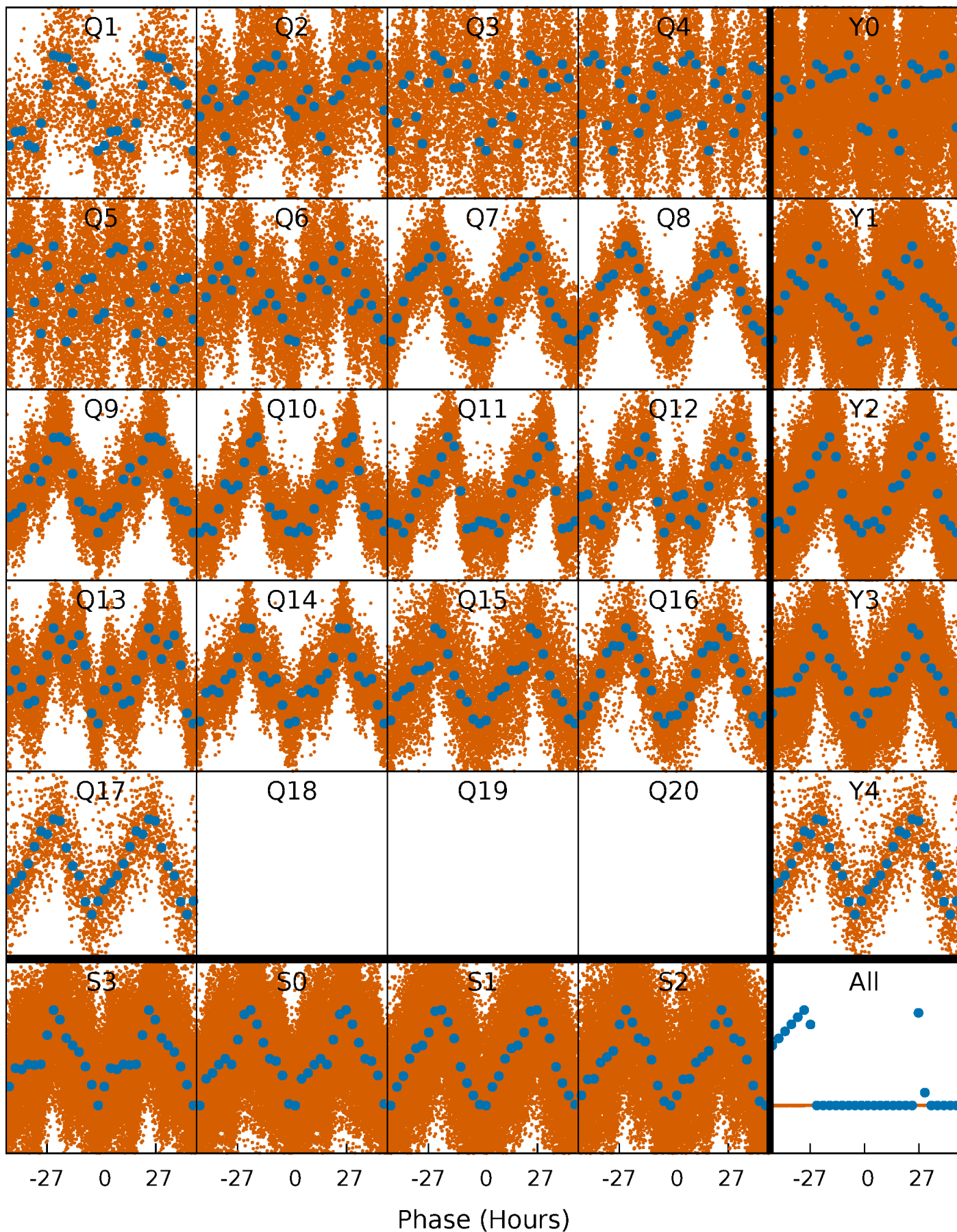


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



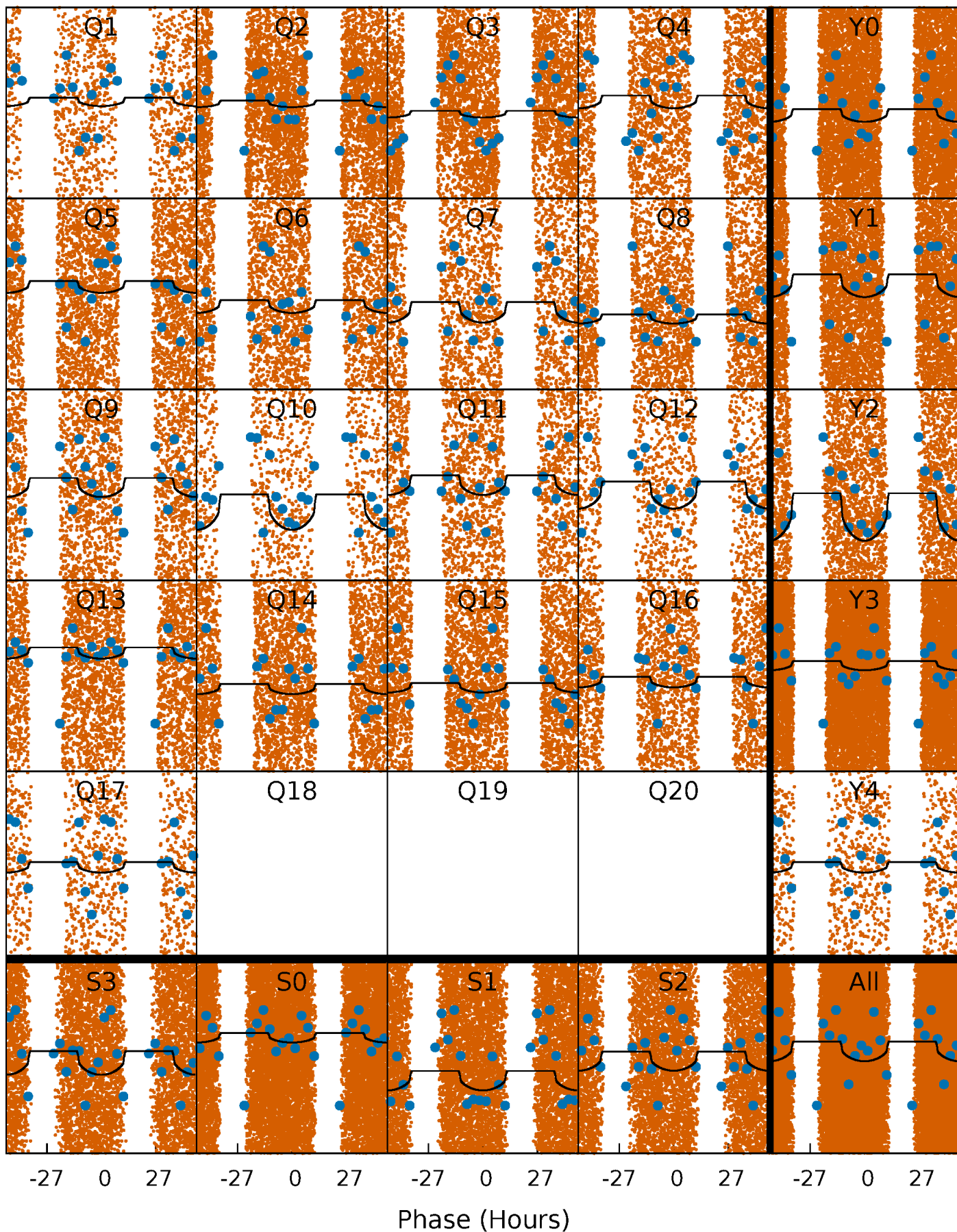
PDC Quarter-Phased Transit Curves

TCE 010604747-02 P= 1.972256 Days $T_0=133.394255$ (BKJD)



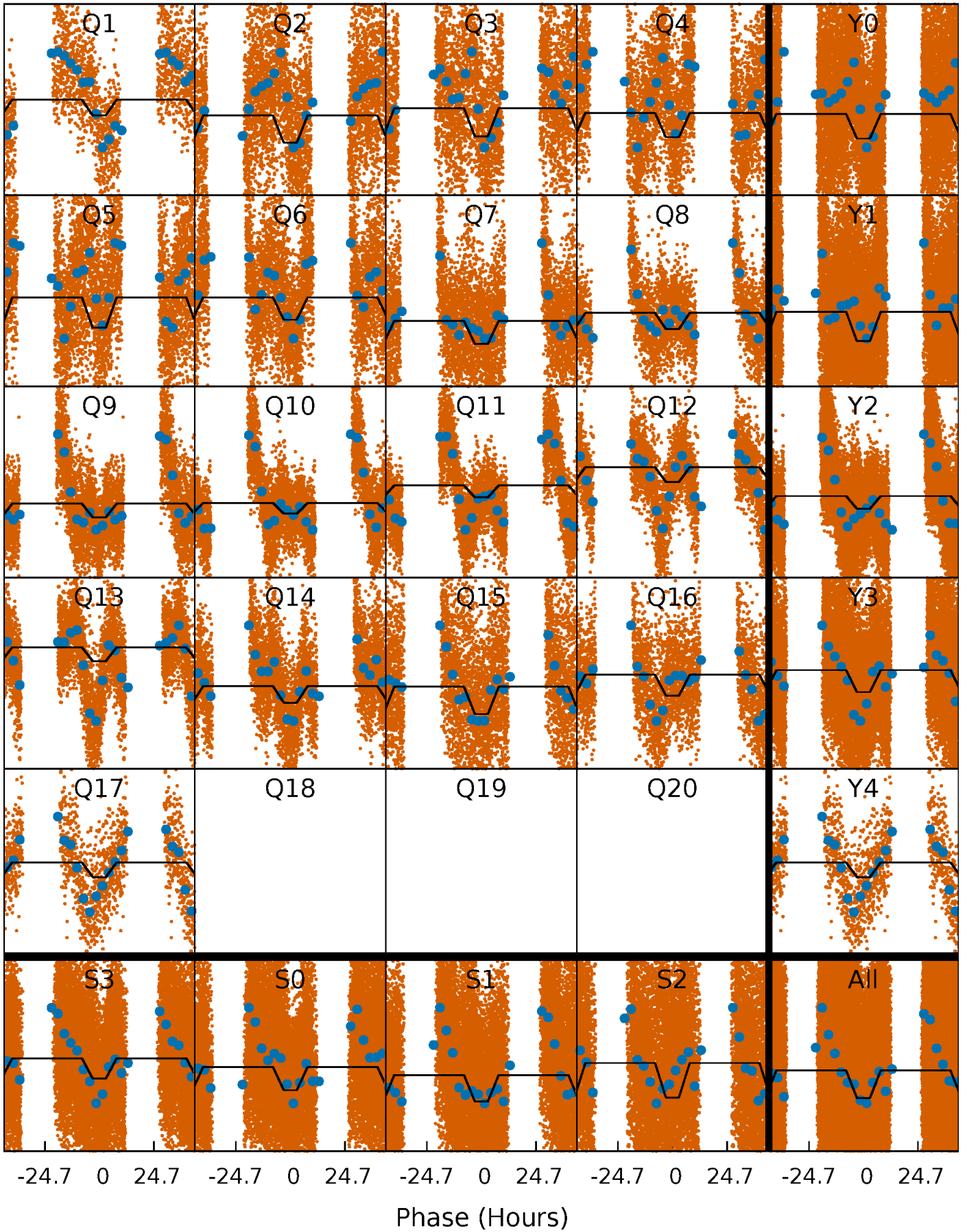
DV Quarter-Phased Transit Curves

TCE 010604747-02 $P = 1.972256$ Days $T_0 = 133.394255$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

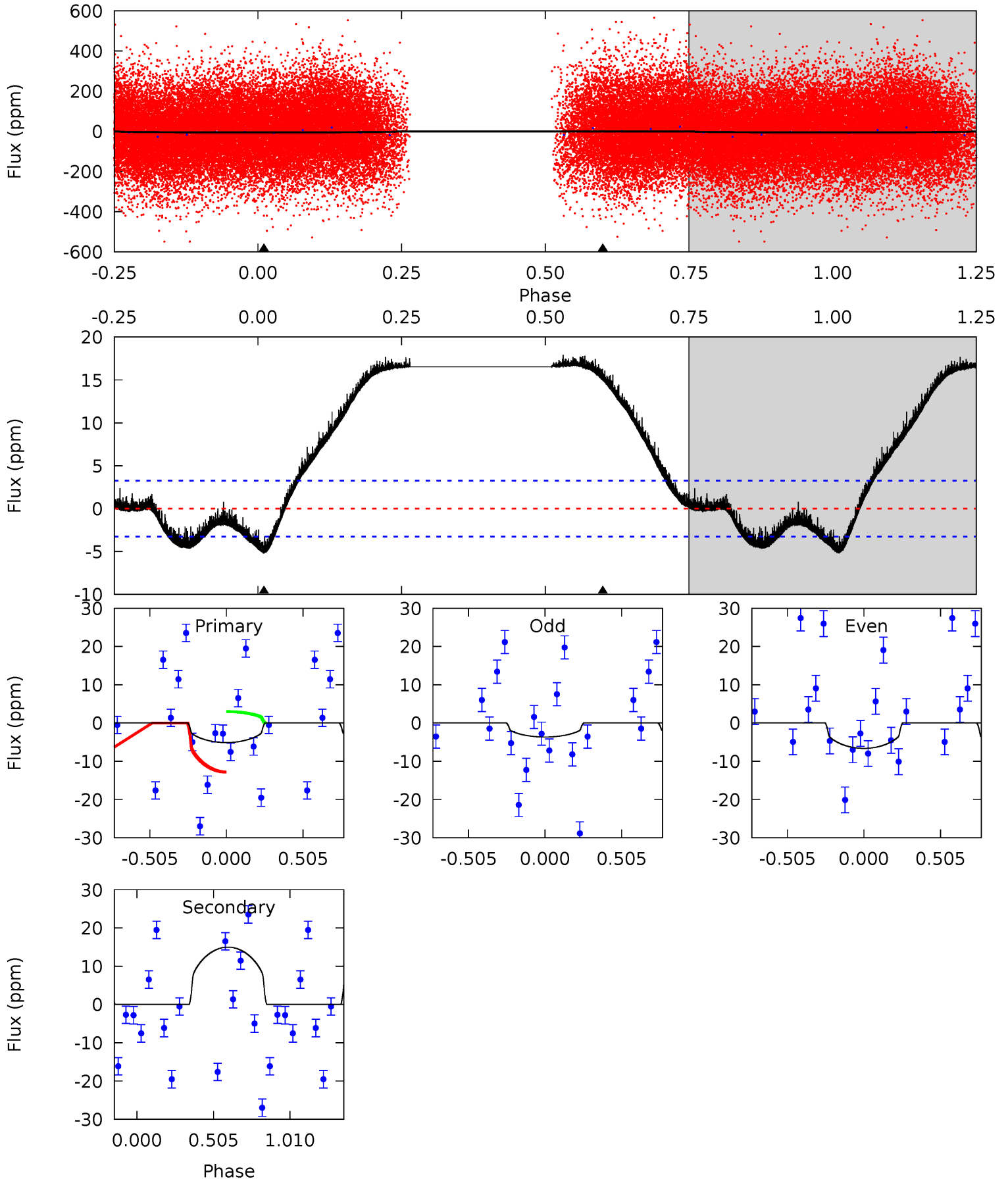
TCE 010604747-02 $P = 1.972368$ Days $T_0 = 133.309909$ (BKJD)



DV Model-Shift Uniqueness Test

010604747-02, P = 1.972256 Days, E = 131.421999 Days

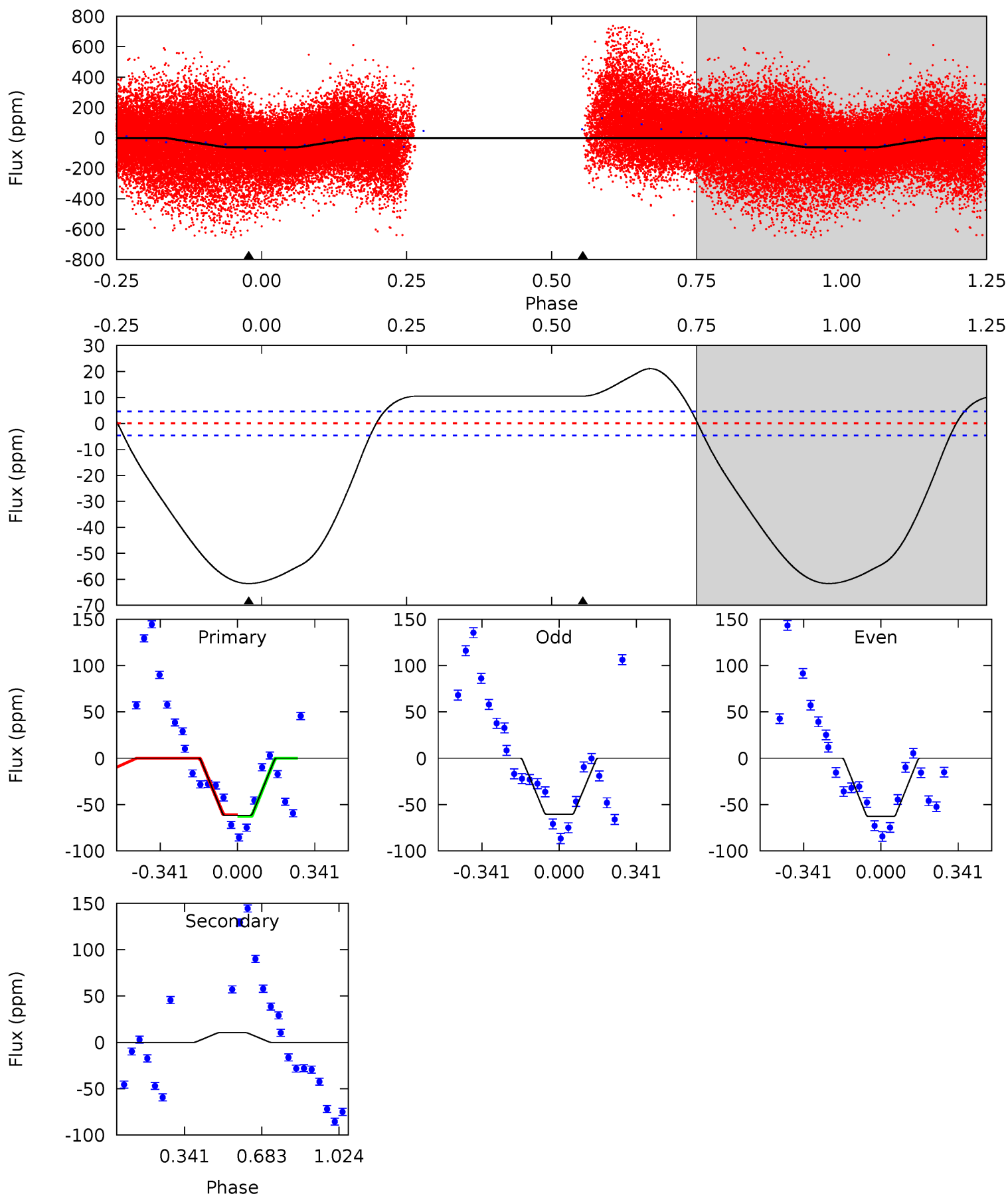
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.61 | -19.3 | 0 | 0 | 4.21 | 0.67 | 9.96 | 6.61 | 6.61 | -19.3 | -19.3 | 1.89 | 1.01 | 0.78 | 6.39 |



Alt Model-Shift Uniqueness Test

010604747-02, P = 1.972368 Days, E = 131.337541 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 57.5 | -9.79 | 0 | 0 | 4.30 | 0.95 | 5.70 | 57.5 | 57.5 | -9.79 | -9.79 | 1.07 | 1.24 | 0.26 | 0.90 |



Stellar Parameters For KIC 010604747

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|--|
| | 7126^{+222}_{-271} | $3.847^{+0.245}_{-0.105}$ | $-0.160^{+0.300}_{-0.300}$ | $2.566^{+0.511}_{-0.766}$ | $1.687^{+0.172}_{-0.320}$ | $0.141^{+0.223}_{-0.047}$ |
| | +3%/-4% | +6%/-3% | +188%/-188% | +20%/-30% | +10%/-19% | +158%/-33% |
| Source | PHO1 | FLK73 | 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 010604747-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|-------------------------|------------------------------|
| DV | 15 ± 1 | $0.87^{+0.30}_{-0.31}$ | 3614^{+236}_{-266} | -7980^{+1206}_{-2389} | $-14.791^{+6.821}_{-20.341}$ |
| Alt. | 10 ± 1 | $2.13^{+0.45}_{-0.41}$ | 3593^{+245}_{-280} | -4779^{+223}_{-275} | $-1.681^{+0.507}_{-0.883}$ |

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

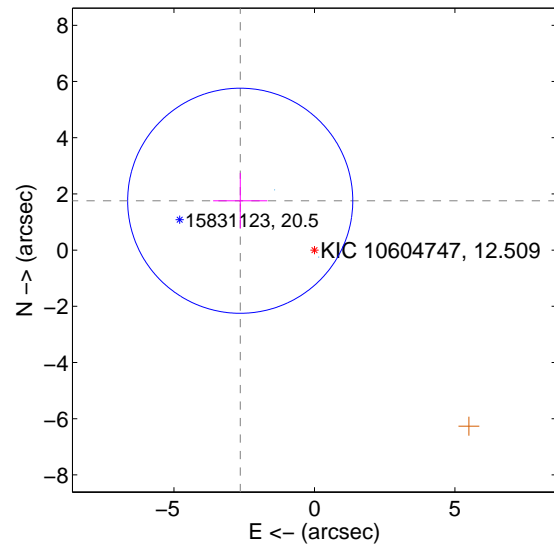
Supplemental centroid analysis for 010604747-02. Kepler magnitude: 12.51. Transit SNR 4.65

There are 2 quarters with good PRF difference image offsets

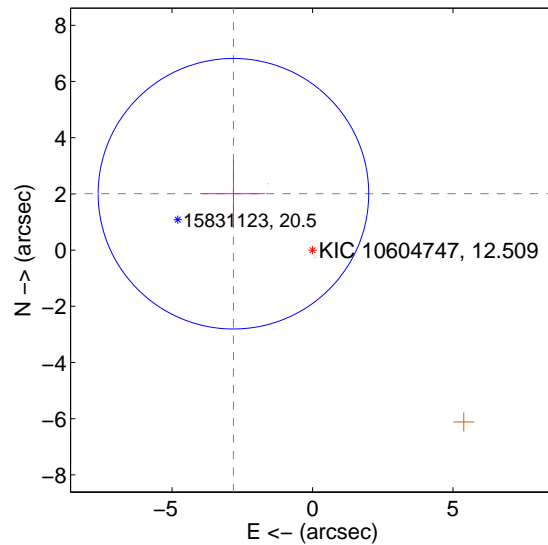
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 3.171 ± 1.335 | 2.38 | 2.641 ± 0.963 | 1.756 ± 0.988 |
| PRF-fit source offset from KIC position | 3.456 ± 1.605 | 2.15 | 2.814 ± 1.120 | 2.006 ± 1.210 |
| photometric centroid source offset | 1.30 ± 0.62 | 2.08 | 1.01 ± 0.63 | -0.82 ± 0.61 |

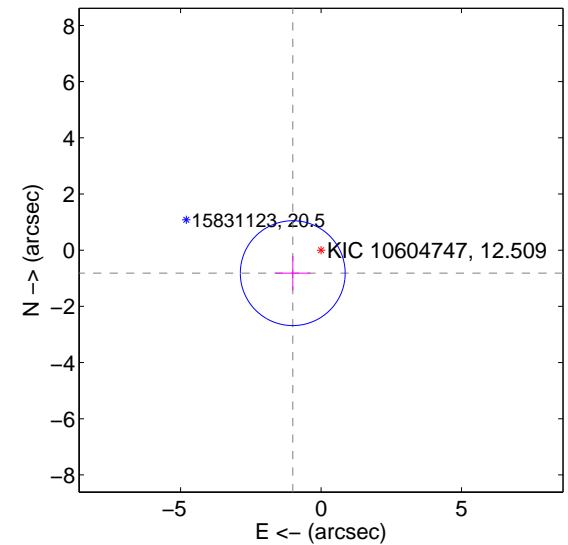
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

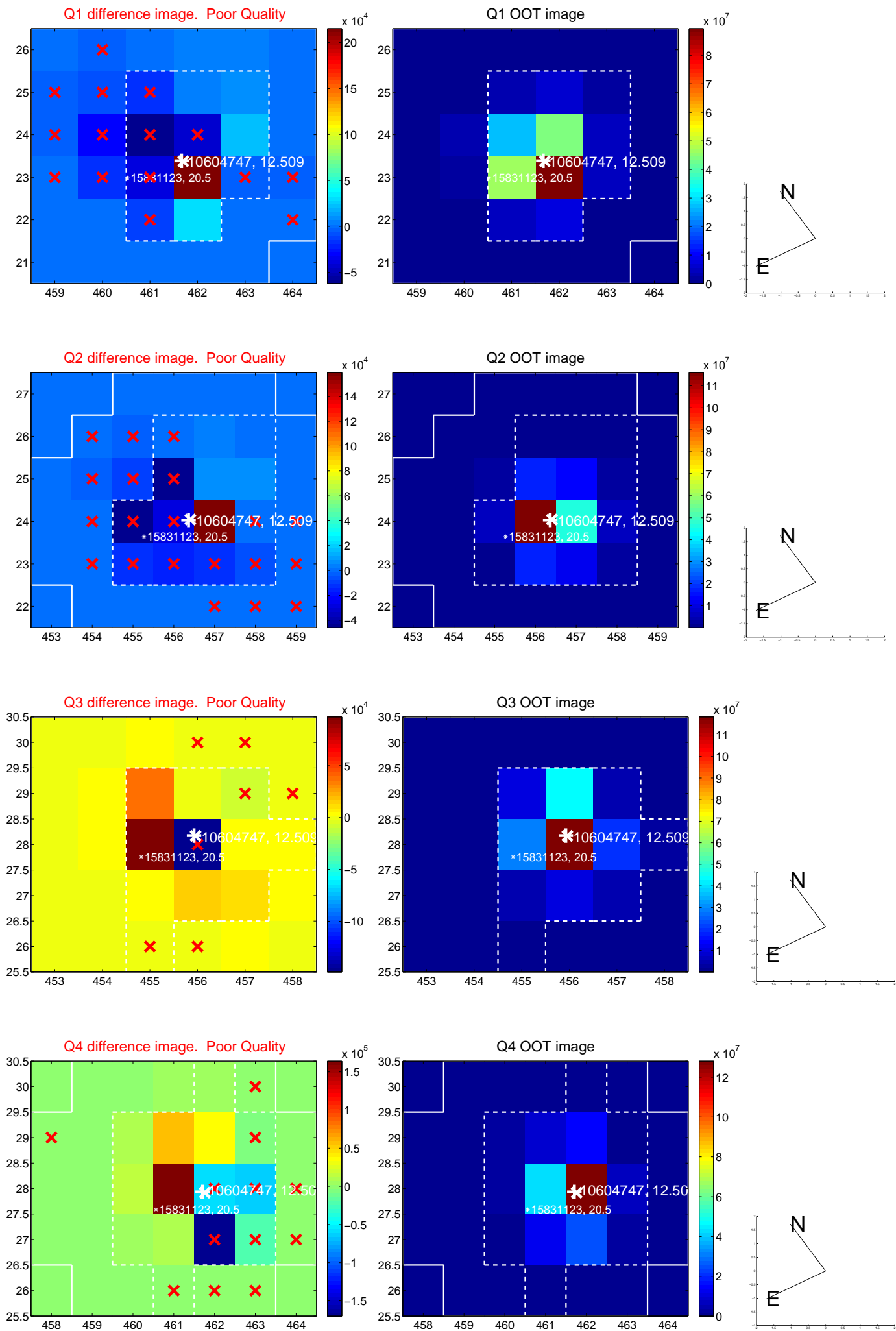


offset from photometric centroids

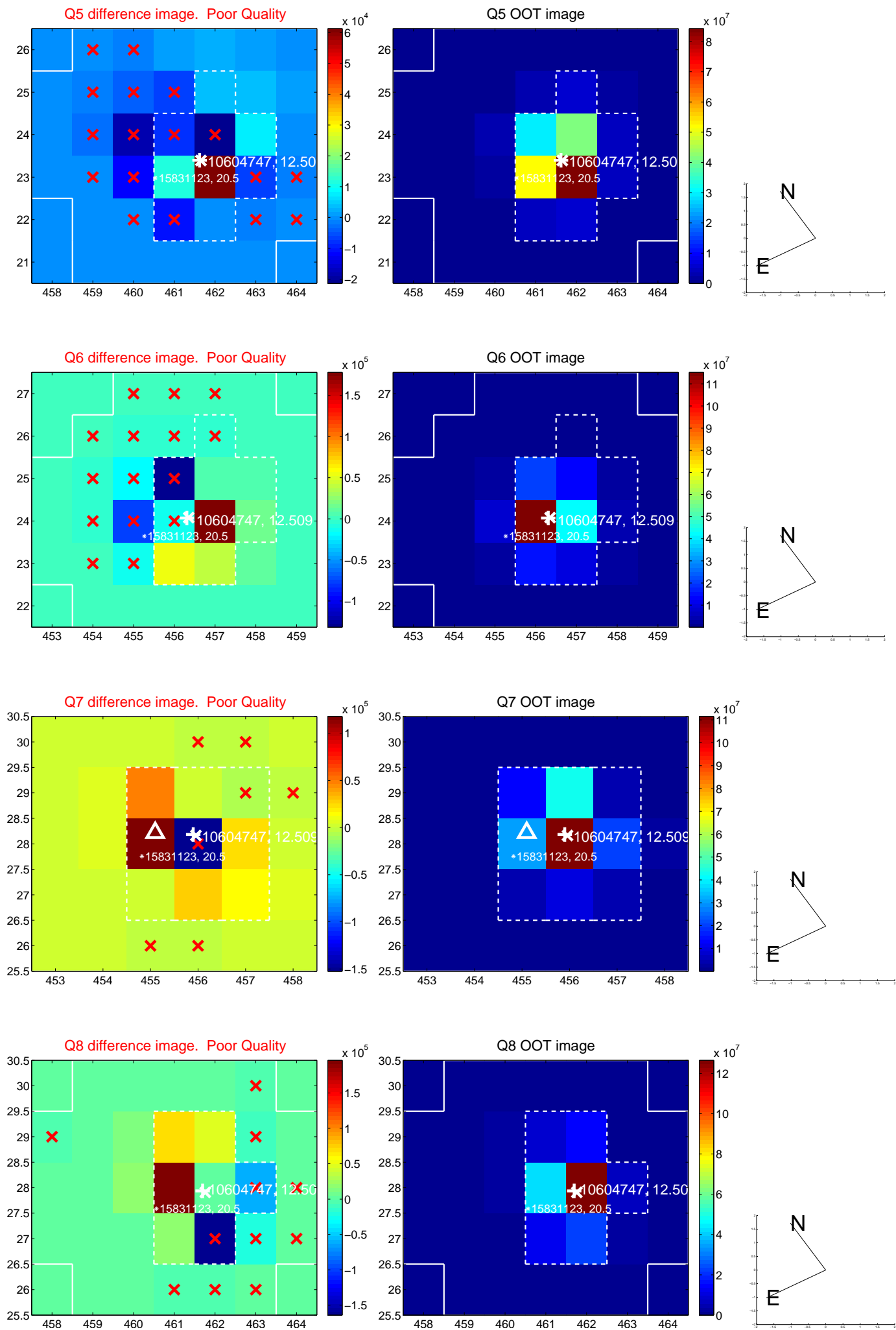


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

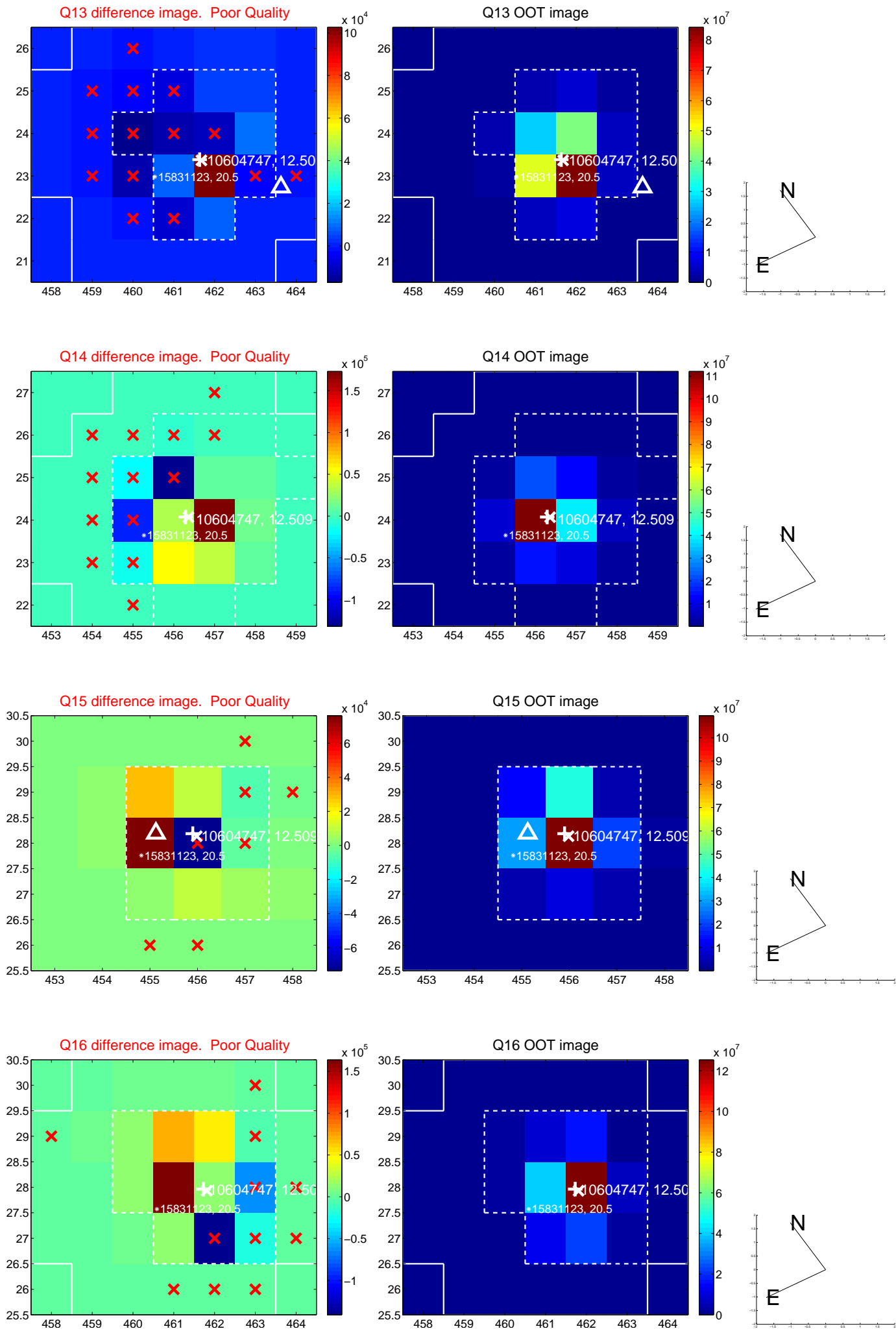
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



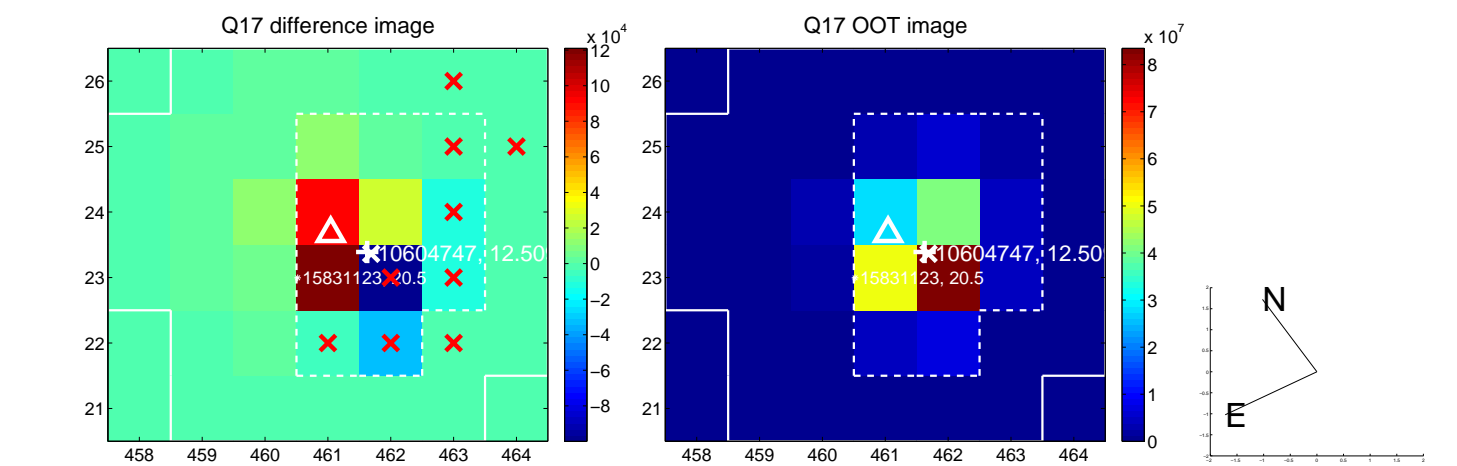
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



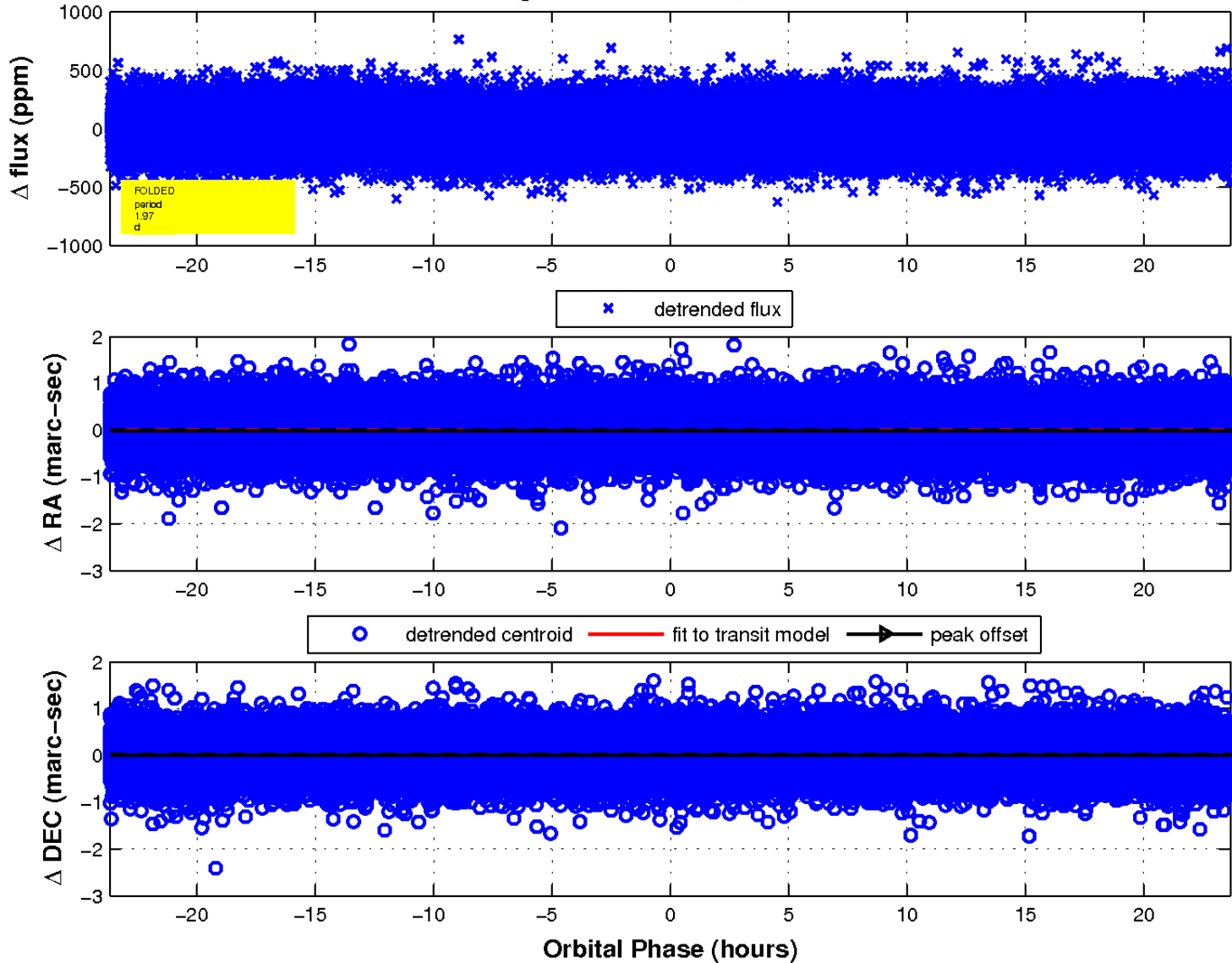
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

