

KIC 008043052

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 008043052-01 | OBS | 3695.01 | 2.244617 | 133.460603 | 7585.6 | 1.724 | 183.3 | 334.2 | 0.80 | 5256 | 8.61 | 475.09 |
| 008043052-02 | OBS | No | 2.244585 | 132.346669 | 1244.9 | 1.374 | 56.0 | 73.9 | 0.80 | 5256 | 3.44 | 475.10 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|------------------------------------|
| 008043052-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE |
| 008043052-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE |

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.

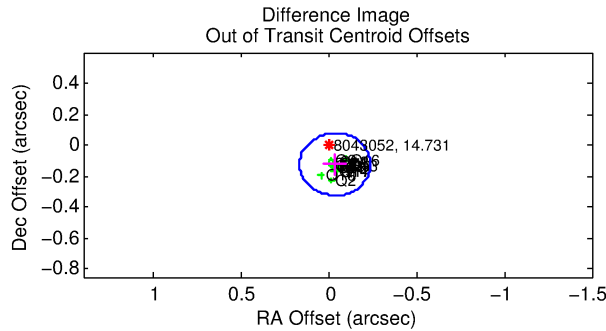
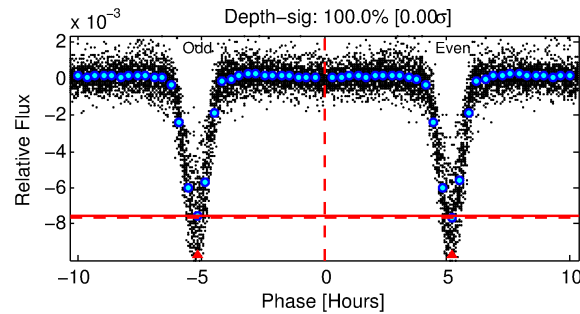
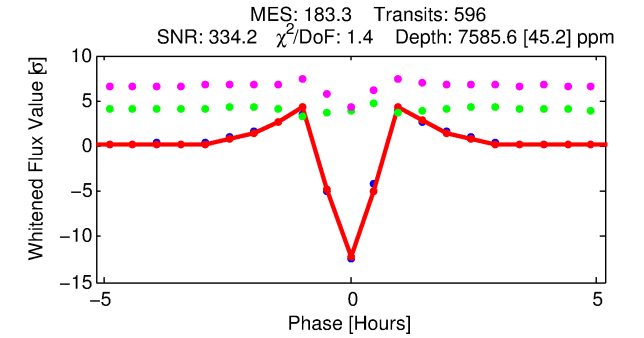
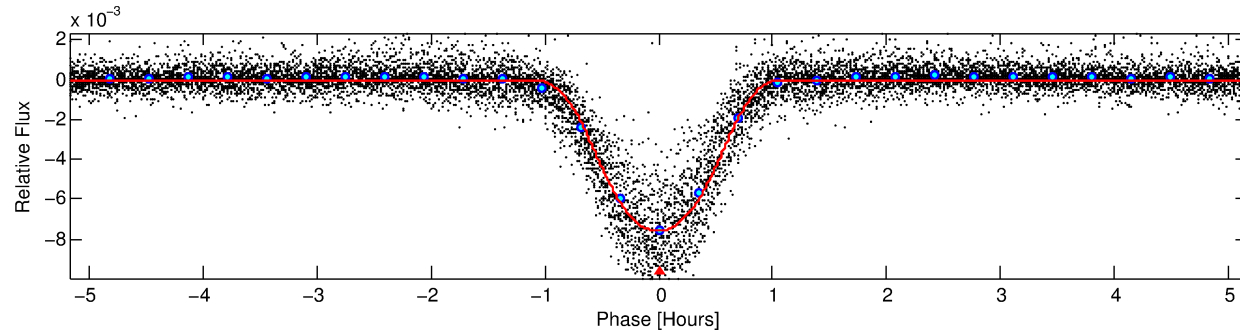
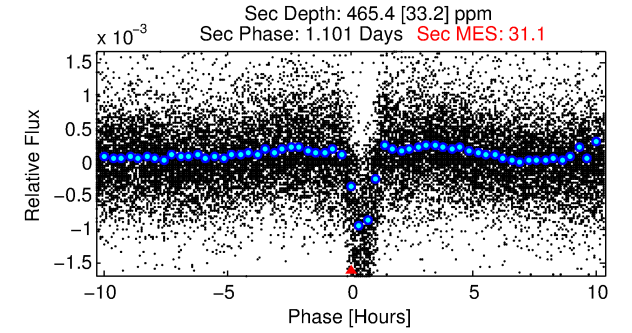
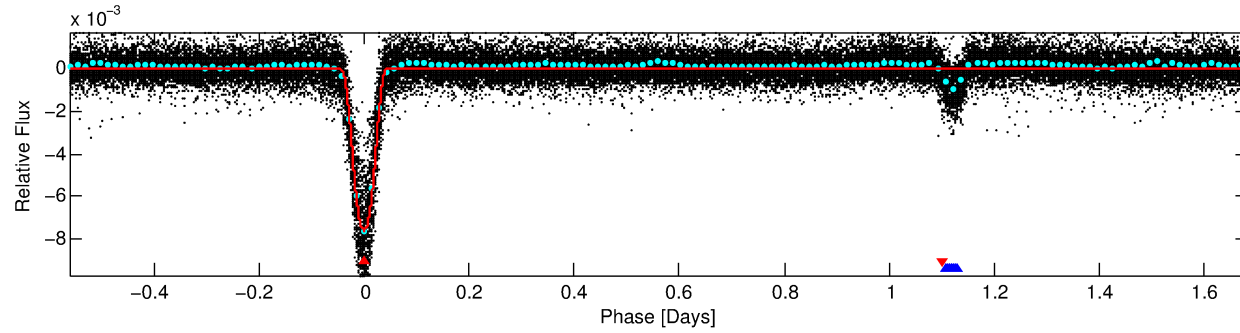
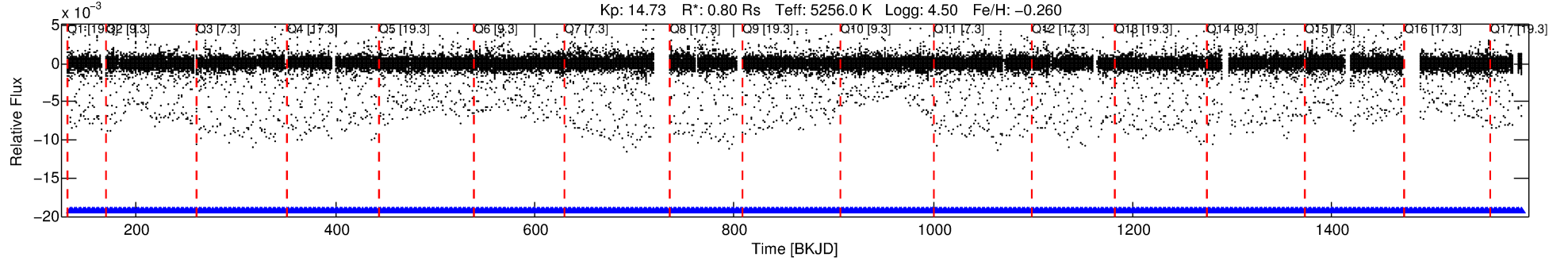
Ephemeris Match Information For 008043052-01

No Significant Match Found

DV One-Page Summary

KIC: 8043052 Candidate: 1 of 2 Period: 2.245 d
KOI: K03695.01 Corr: 0.950

Kp: 14.73 R*: 0.80 Rs Teff: 5256.0 K Logg: 4.50 Fe/H: -0.260



DV Fit Results:

Period = 2.24462 [0.00000] d
Epoch = 133.4606 [0.0001] BKJD
Rp/R* = 0.0984 [0.0007]
a/R* = 6.34 [0.06]
b = 0.90 [0.00]
Seff = 475.09 [104.79]
Teff = 1190 [66] K
Rp = 8.61 [1.17] Re
a = 0.0304 [0.0037] AU
Ag = 3.20 [0.64] [3.46σ]
Teffp = 2461 [87] K [11.70σ]

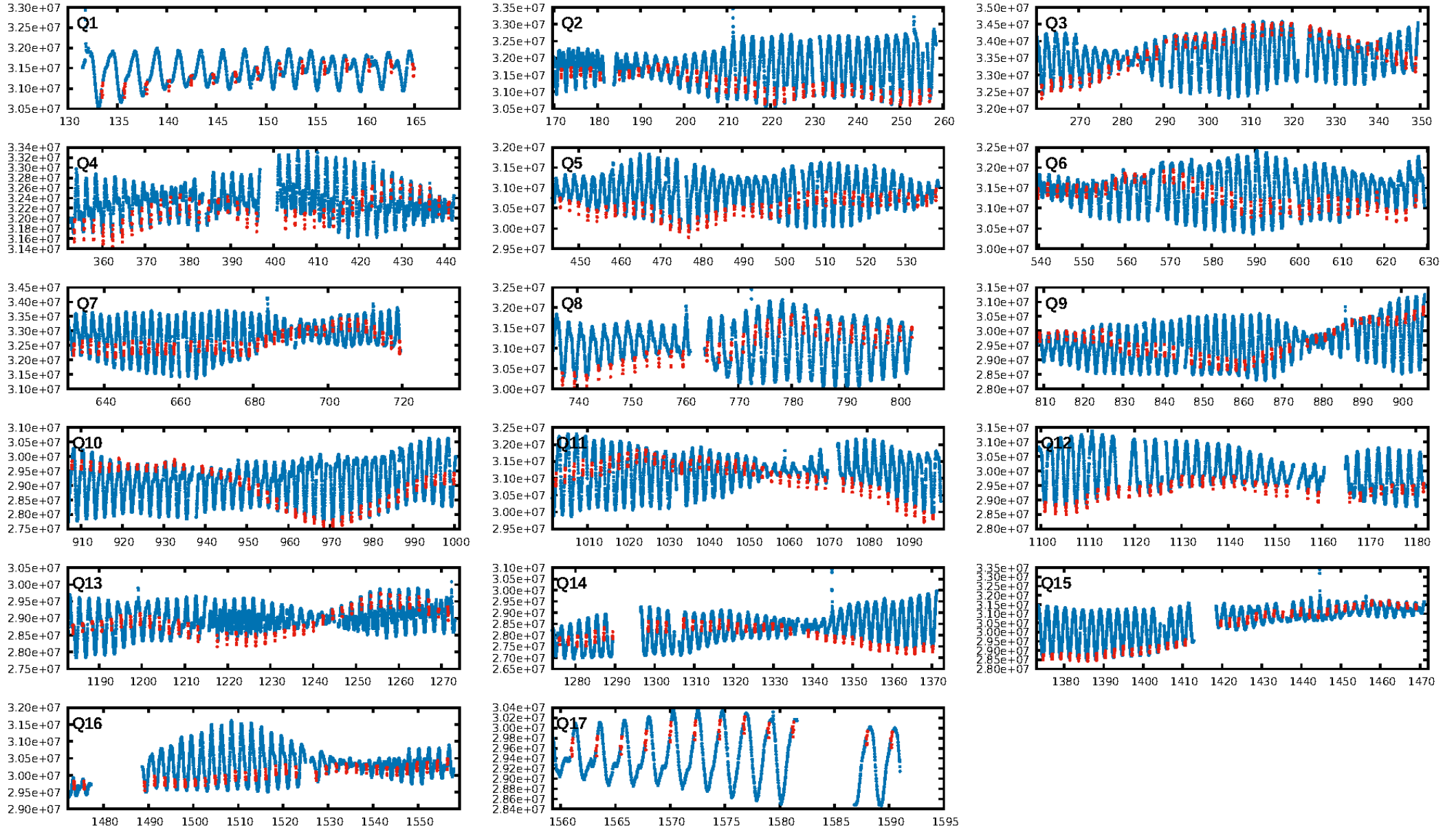
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [569/569]
GhostDiagnostic-chr: 1.631
Centroid-sig: 0.0%
Centroid-so: 0.221 arcsec [13.74σ]
OotOffset-rm: 0.128 arcsec [1.90σ]
KicOffset-rm: 0.112 arcsec [1.65σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

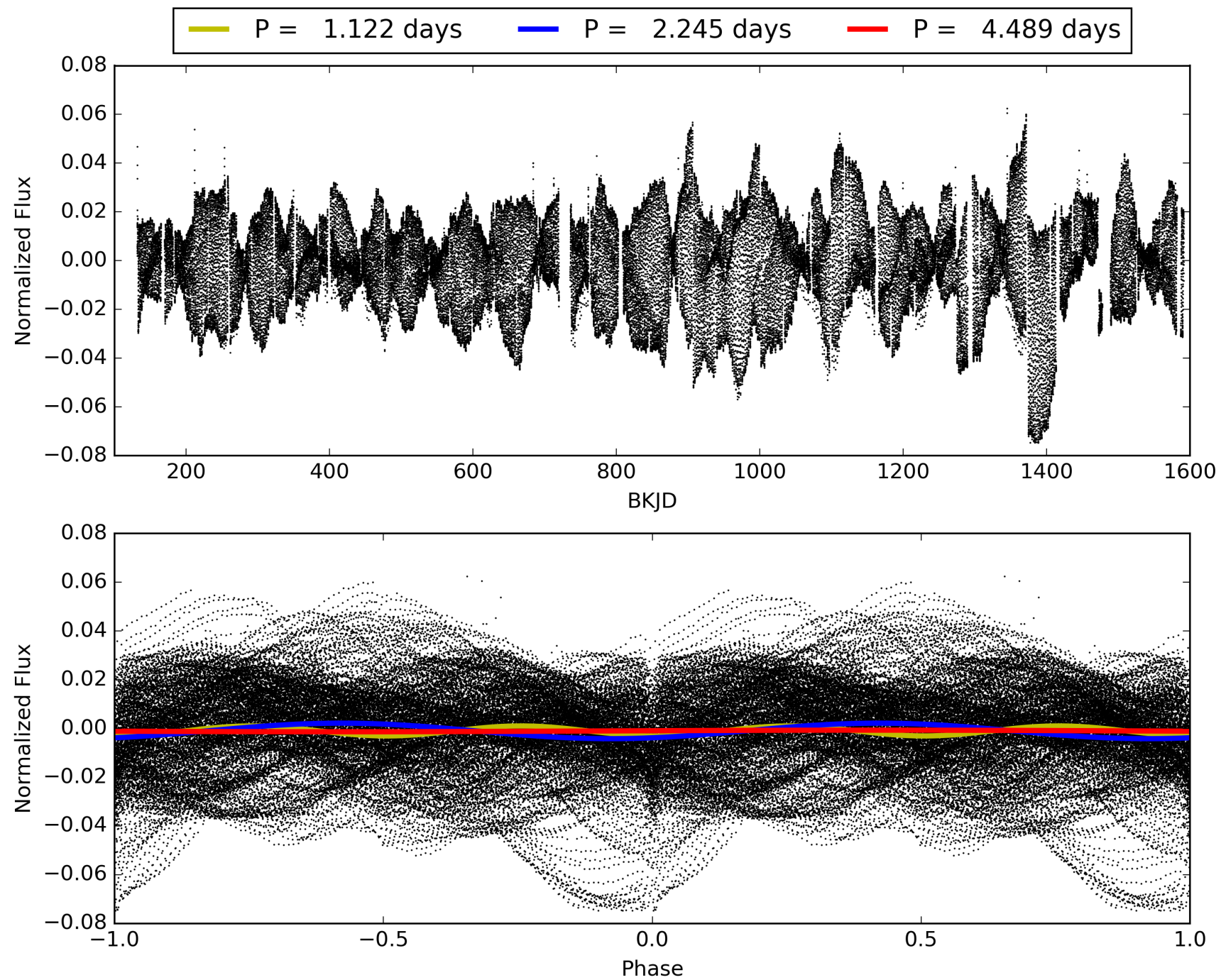
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 09:01:54 Z

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

TCE 008043052-01, PDC Light Curves

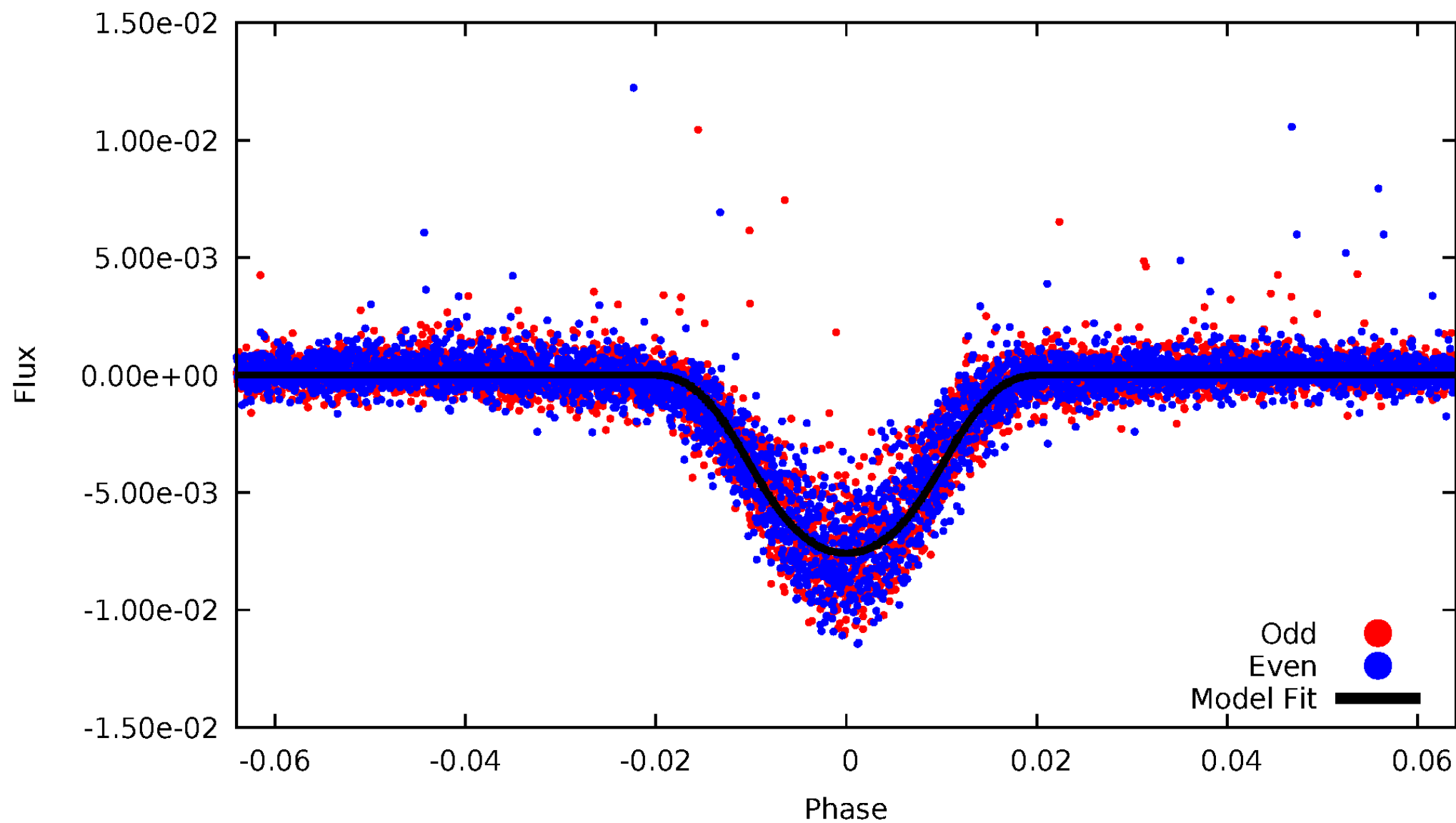


TCE 008043052-01



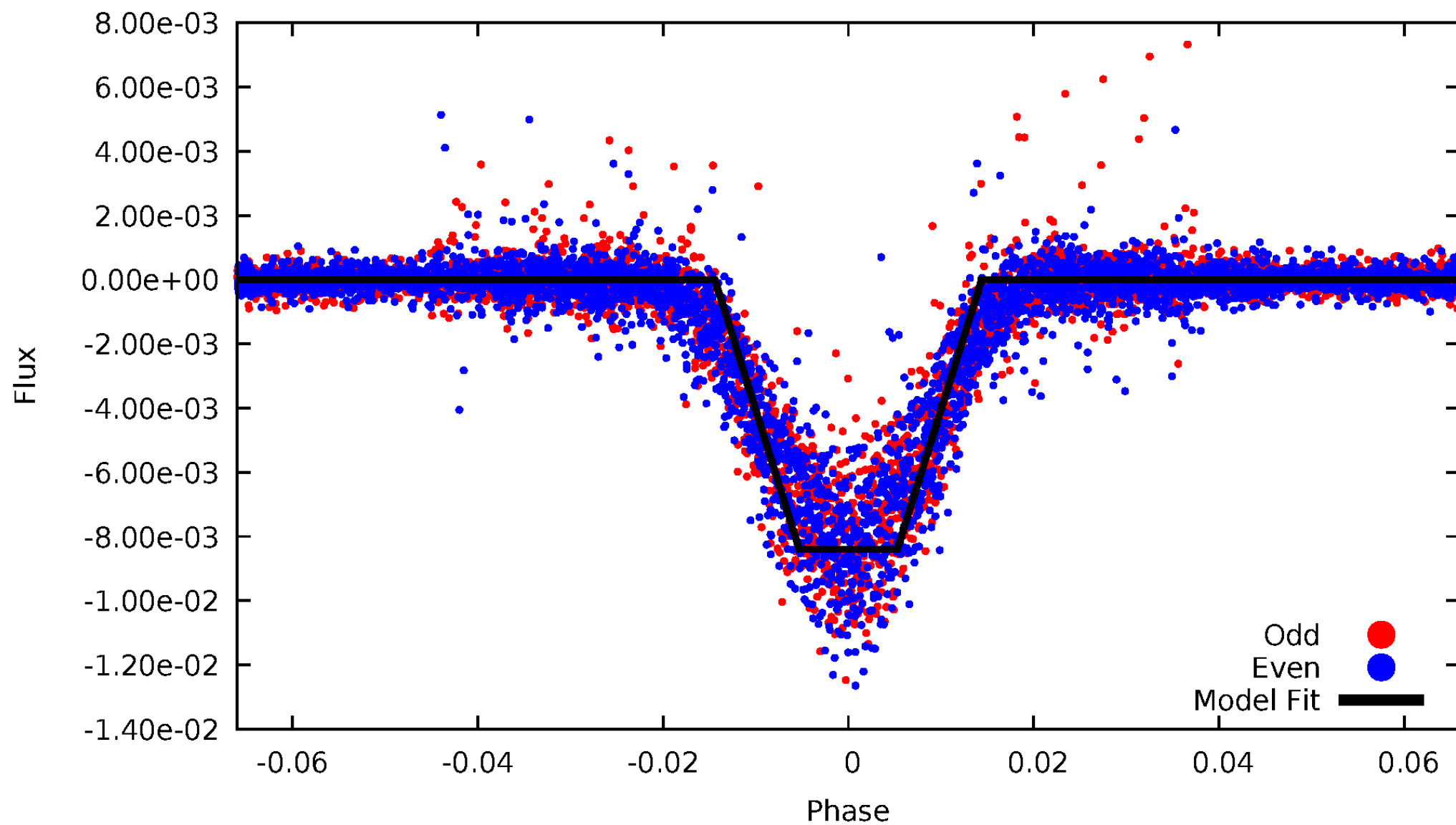
DV Odd/Even

TCE 008043052-01



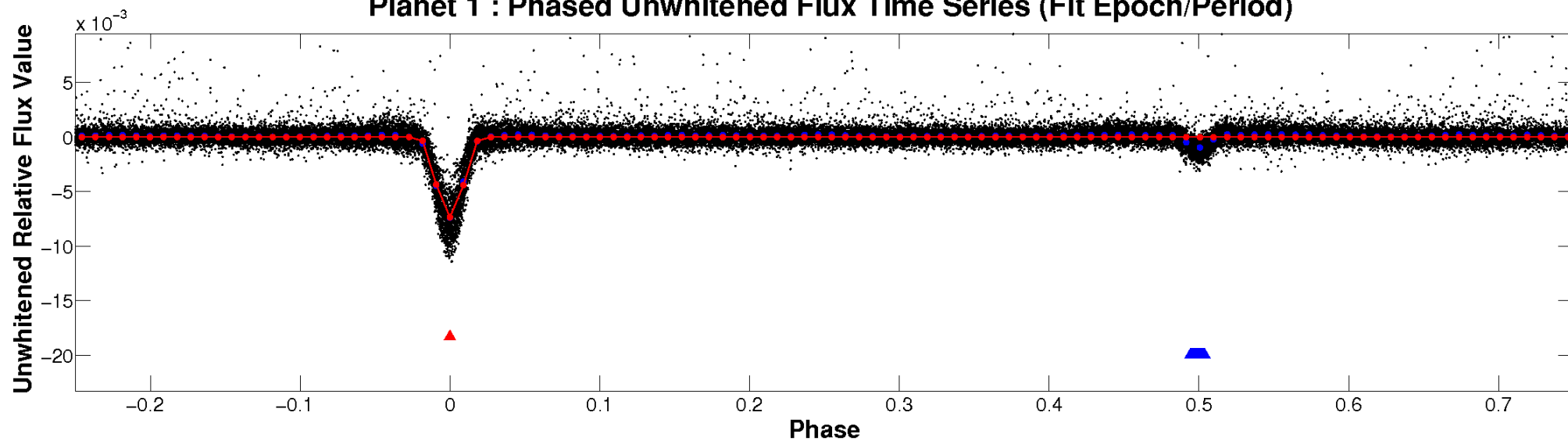
ALT Odd/Even

TCE 008043052-01

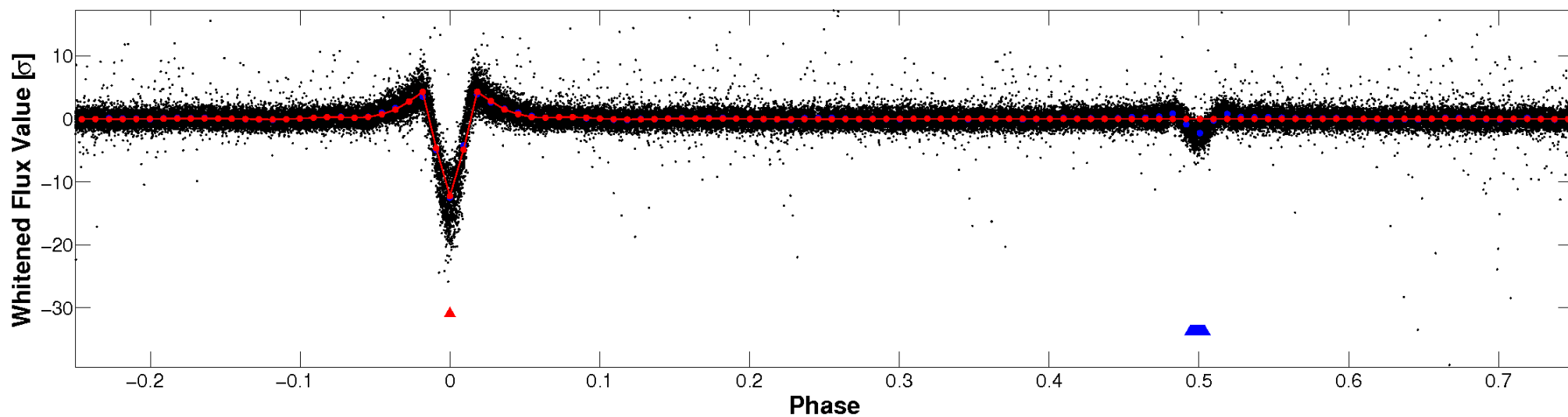


Non-Whitened Vs. Whitened Light Curve

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

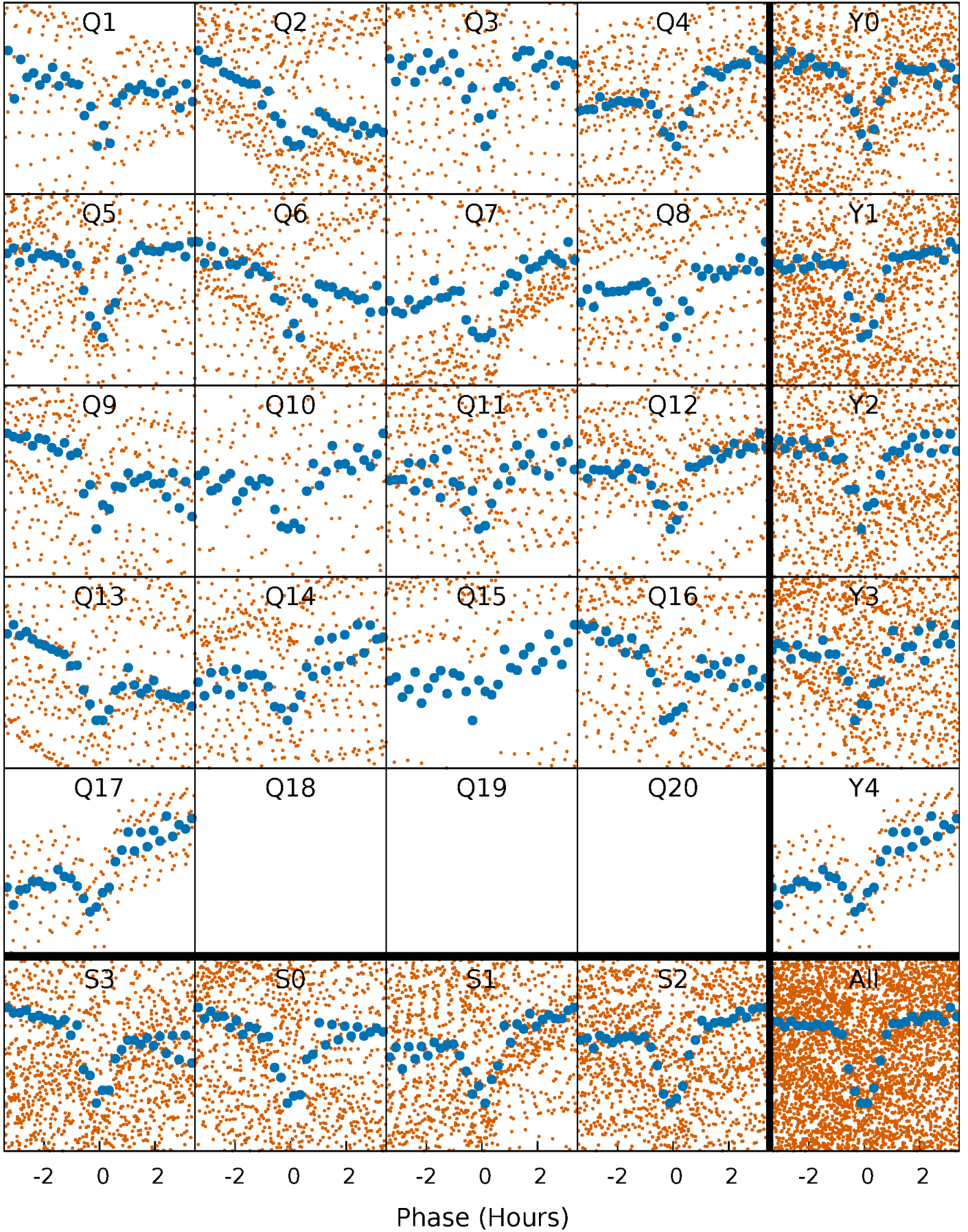


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



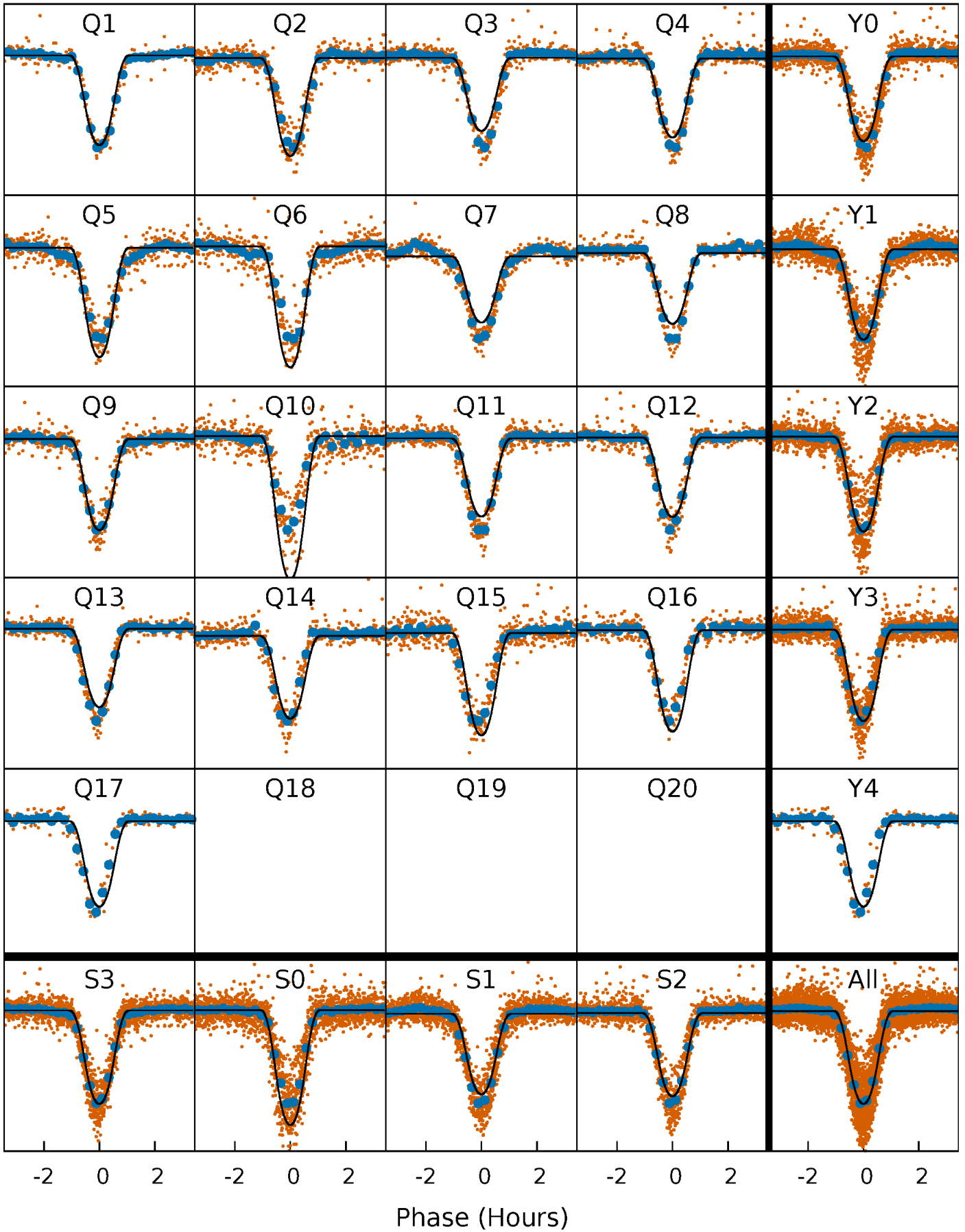
PDC Quarter-Phased Transit Curves

TCE 008043052-01 P= 2.244617 Days $T_0=133.460602$ (BKJD)



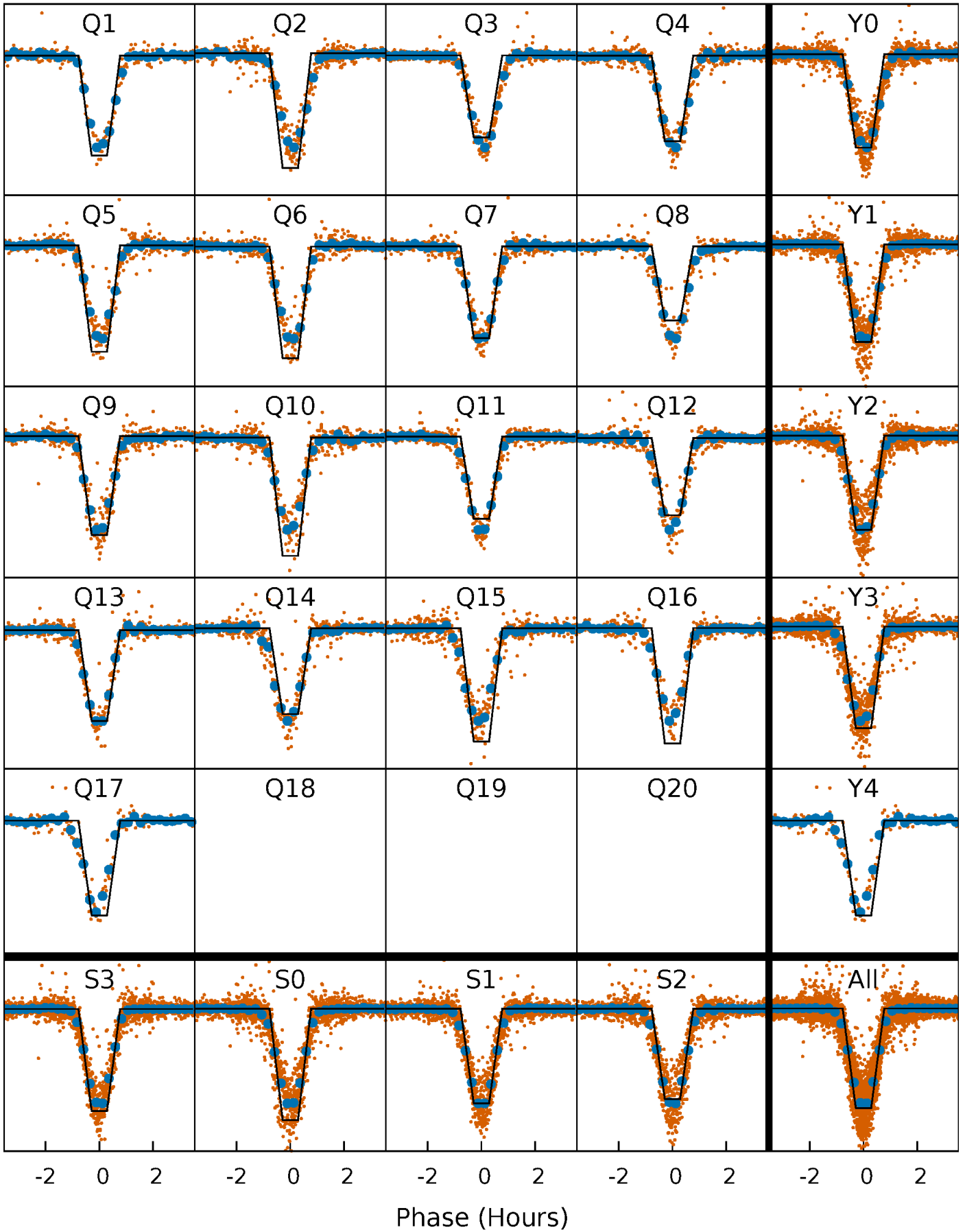
DV Quarter-Phased Transit Curves

TCE 008043052-01 P= 2.244617 Days $T_0=133.460602$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

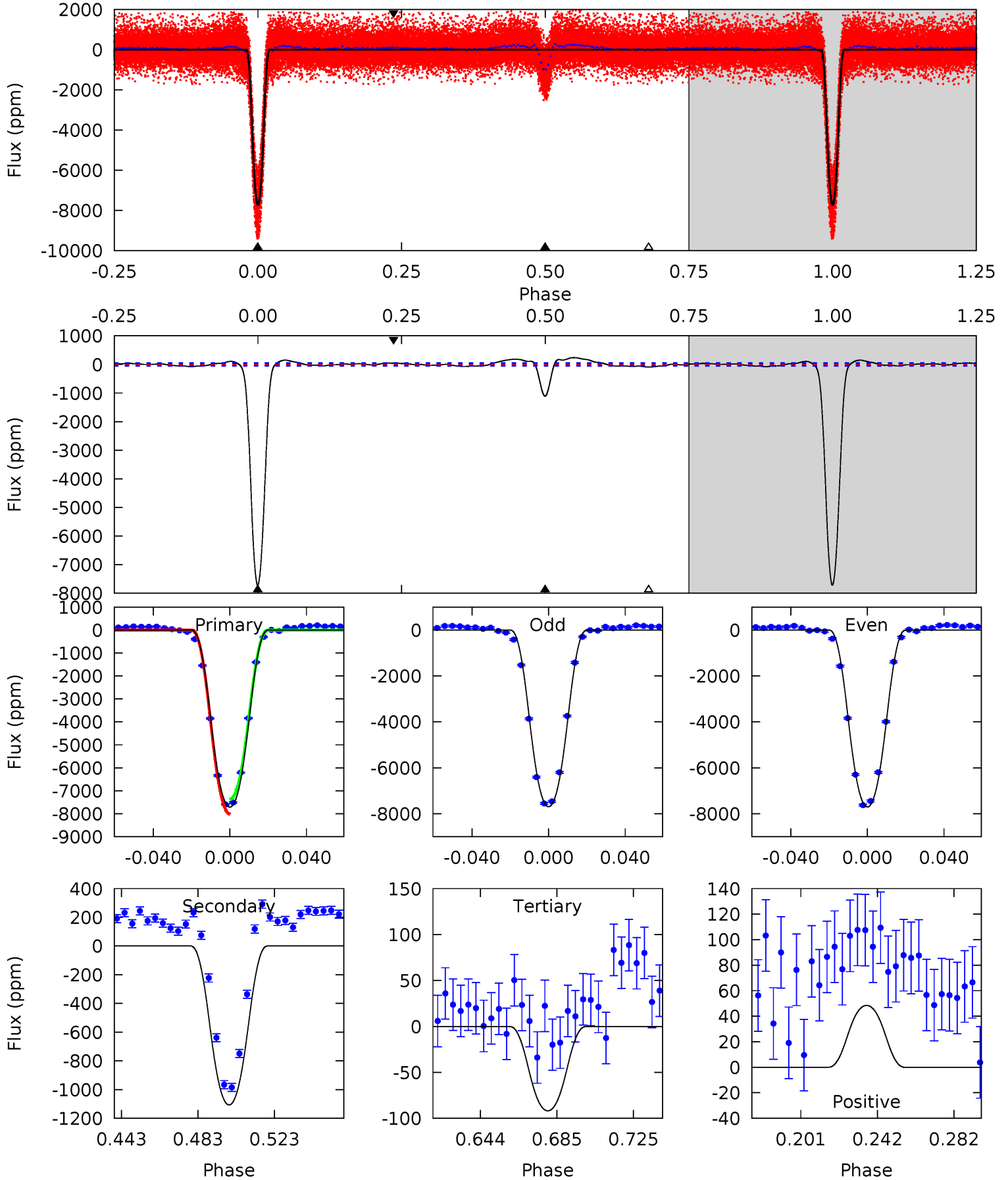
TCE 008043052-01 P= 2.244614 Days $T_0=133.460551$ (BKJD)



DV Model-Shift Uniqueness Test

008043052-01, P = 2.244617 Days, E = 131.215985 Days

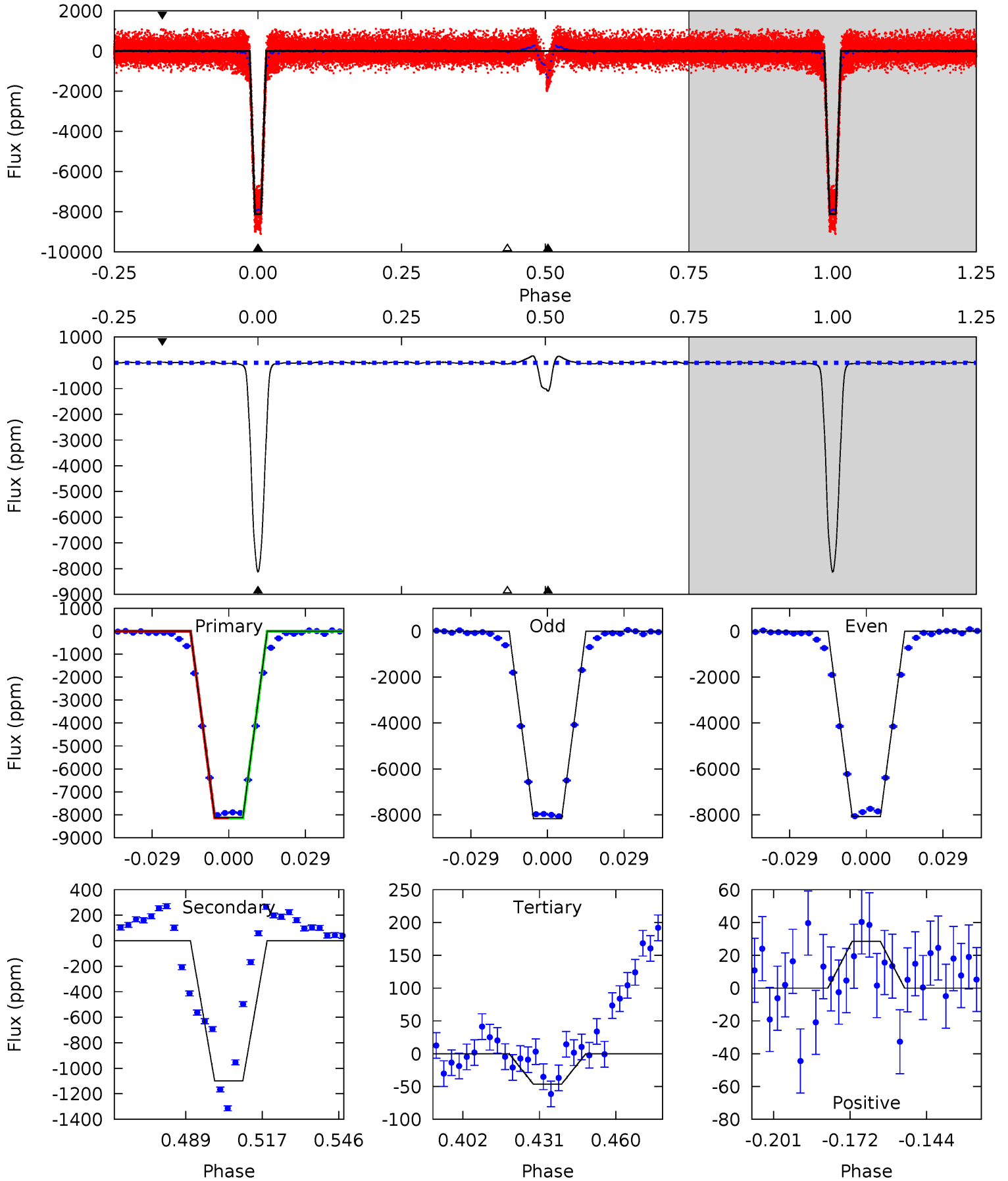
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|-------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 772.5 | 110.9 | 9.20 | 4.85 | 4.75 | 2.05 | 7.21 | 763.3 | 767.7 | 101.7 | 106.0 | 0.59 | 0.97 | 0.03 | 0 |



Alt Model-Shift Uniqueness Test

008043052-01, P = 2.244614 Days, E = 131.215937 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|-------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 928.2 | 125.7 | 5.31 | 3.26 | 4.82 | 2.19 | 3.49 | 922.9 | 924.9 | 120.4 | 122.5 | 4.89 | 1.00 | 0.03 | 0 |



Stellar Parameters For KIC 008043052

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5256^{+158}_{-142} | $4.502^{+0.105}_{-0.105}$ | $-0.260^{+0.350}_{-0.300}$ | $0.802^{+0.109}_{-0.098}$ | $0.745^{+0.109}_{-0.054}$ | $2.036^{+0.886}_{-0.620}$ |
| | +3%/-3% | +2%/-2% | +135%/-115% | +14%/-12% | +15%/-7% | +44%/-30% |
| Source | PHO1 | 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 008043052-01 / KOI 3695.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|----------------|------------------------|--------------------|--------------------|---------------------------|
| DV | -1107 ± 10 | $8.68^{+0.70}_{-0.67}$ | 1668^{+78}_{-76} | 3494^{+73}_{-72} | $7.592^{+1.203}_{-1.014}$ |
| Alt. | -1099 ± 9 | $8.07^{+0.79}_{-0.57}$ | 1664^{+89}_{-72} | 3566^{+80}_{-76} | $8.610^{+1.390}_{-1.139}$ |

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

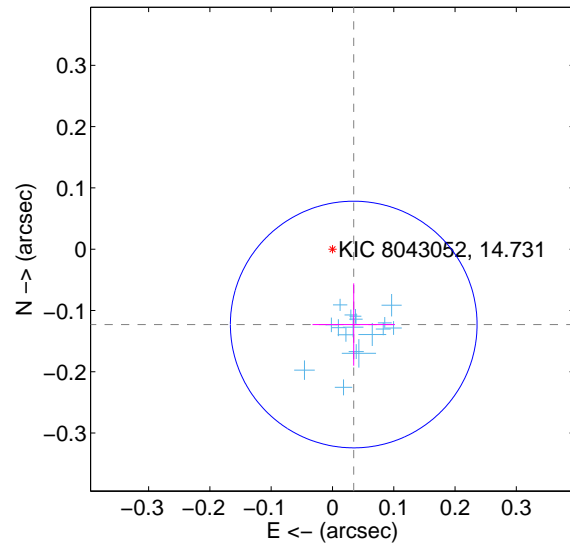
Supplemental centroid analysis for 008043052-01. Kepler magnitude: 14.73. Transit SNR 334.22

There are 17 quarters with good PRF difference image offsets

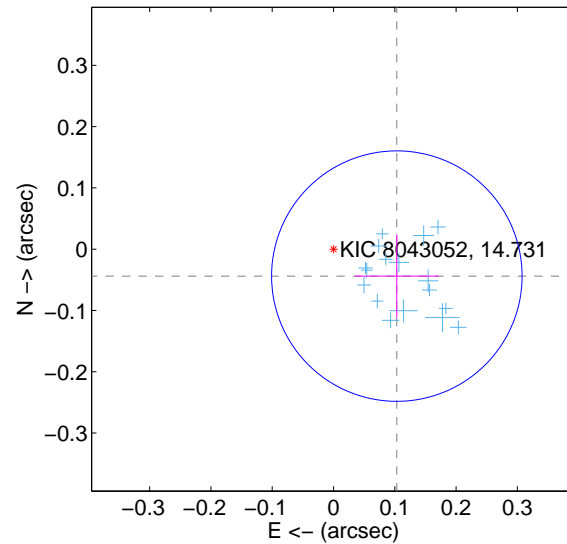
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.128 ± 0.067 | 1.90 | -0.035 ± 0.067 | -0.123 ± 0.067 |
| PRF-fit source offset from KIC position | 0.112 ± 0.068 | 1.65 | -0.103 ± 0.068 | -0.044 ± 0.068 |
| photometric centroid source offset | 0.22 ± 0.02 | 13.74 | -0.18 ± 0.02 | -0.13 ± 0.02 |

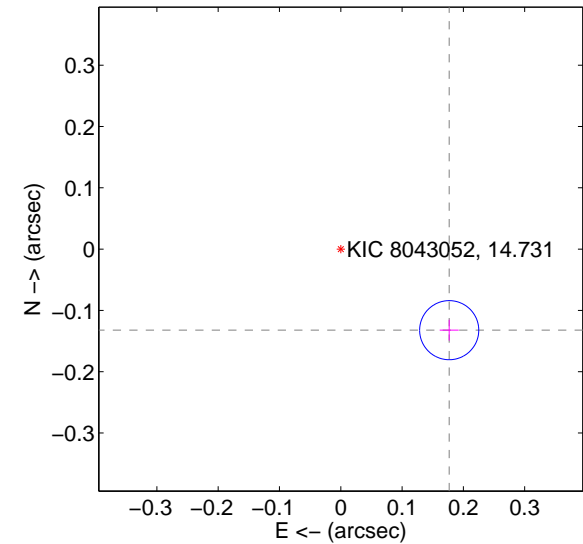
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

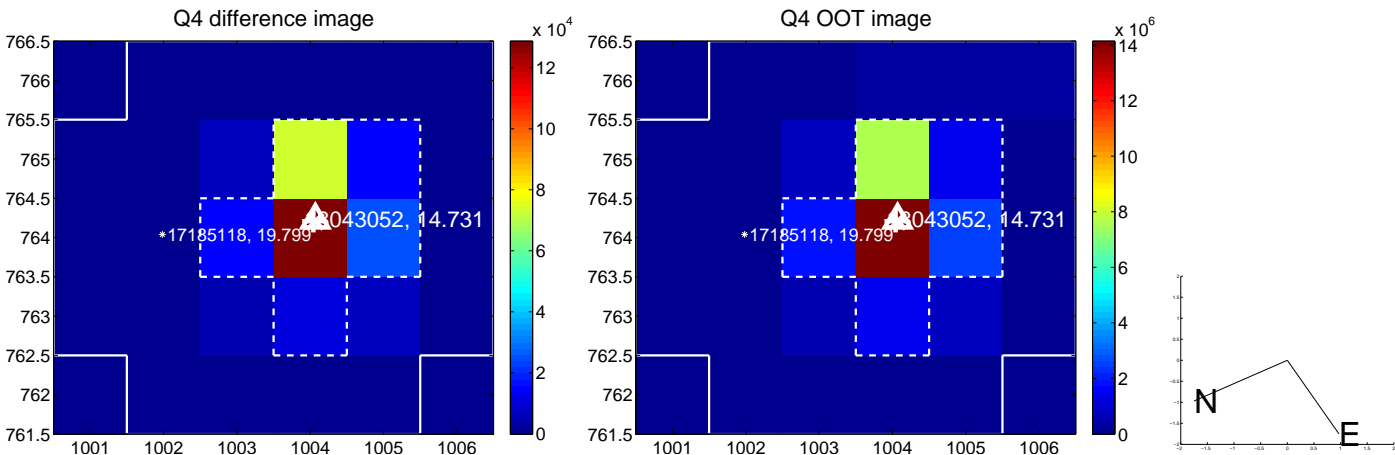
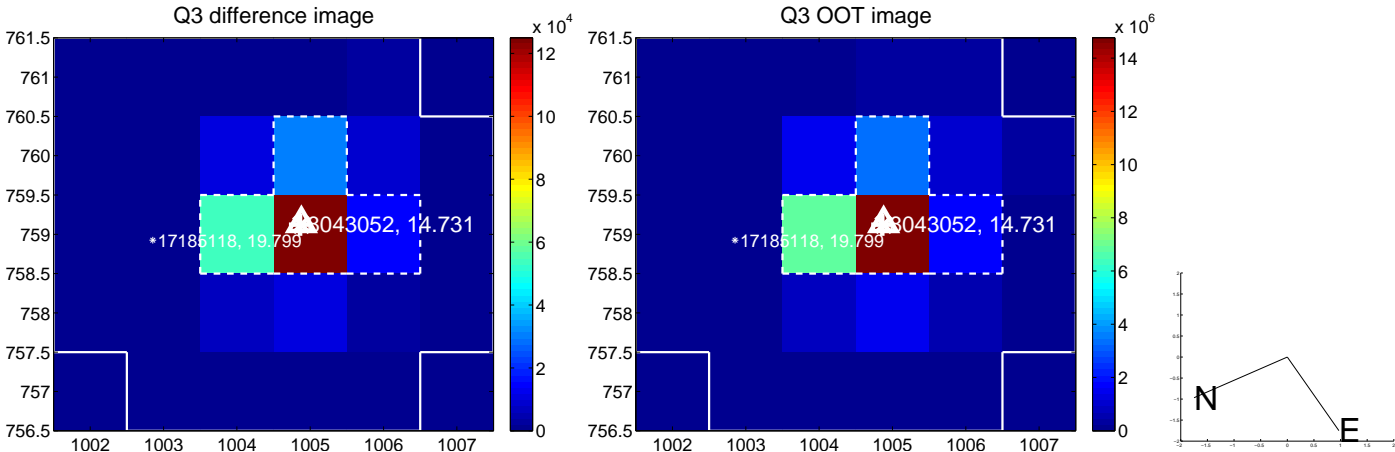
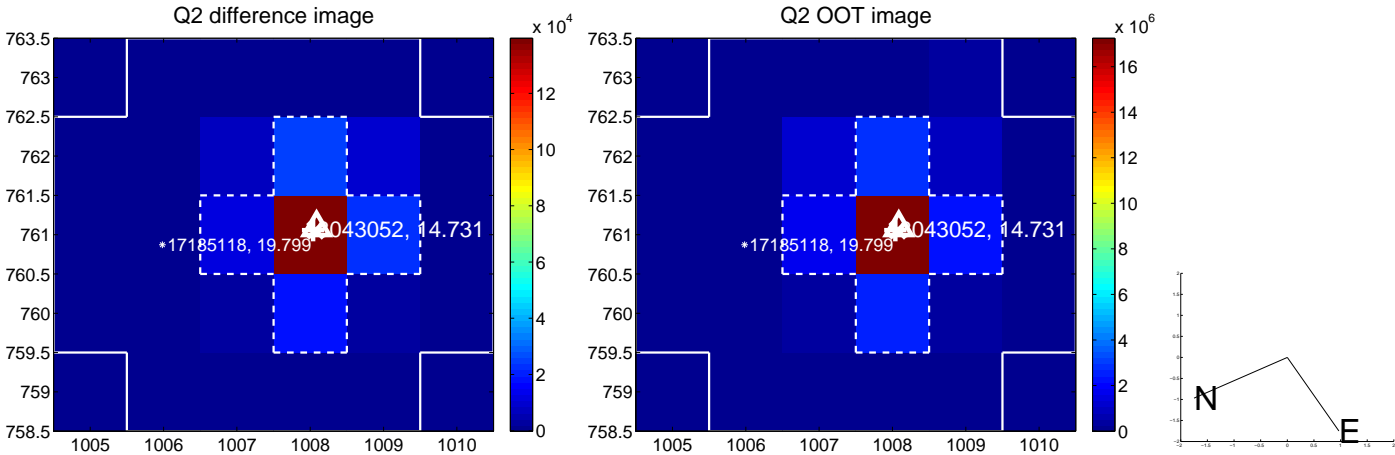
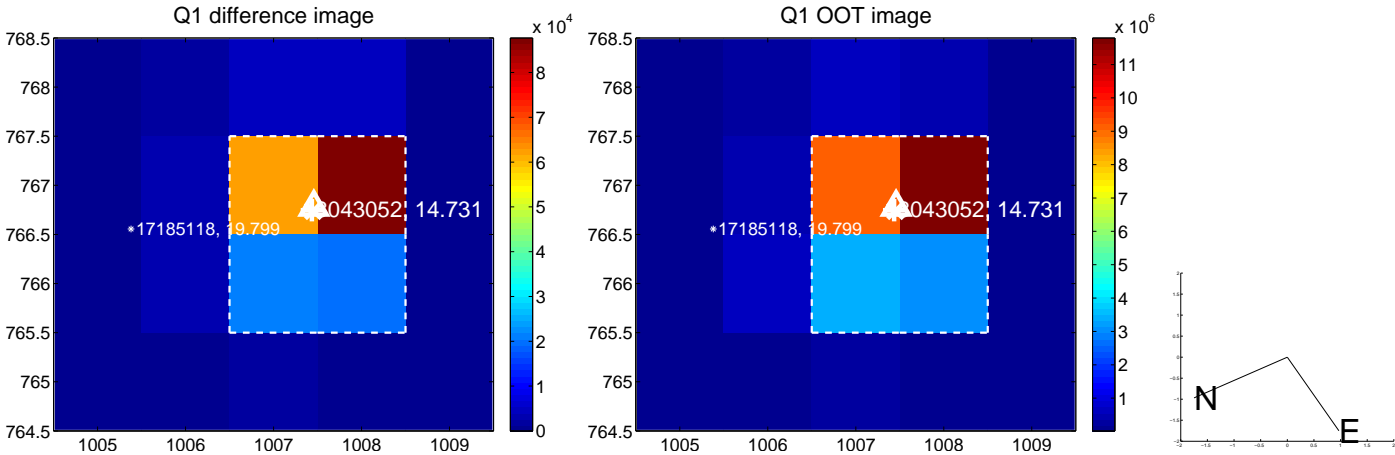


offset from photometric centroids

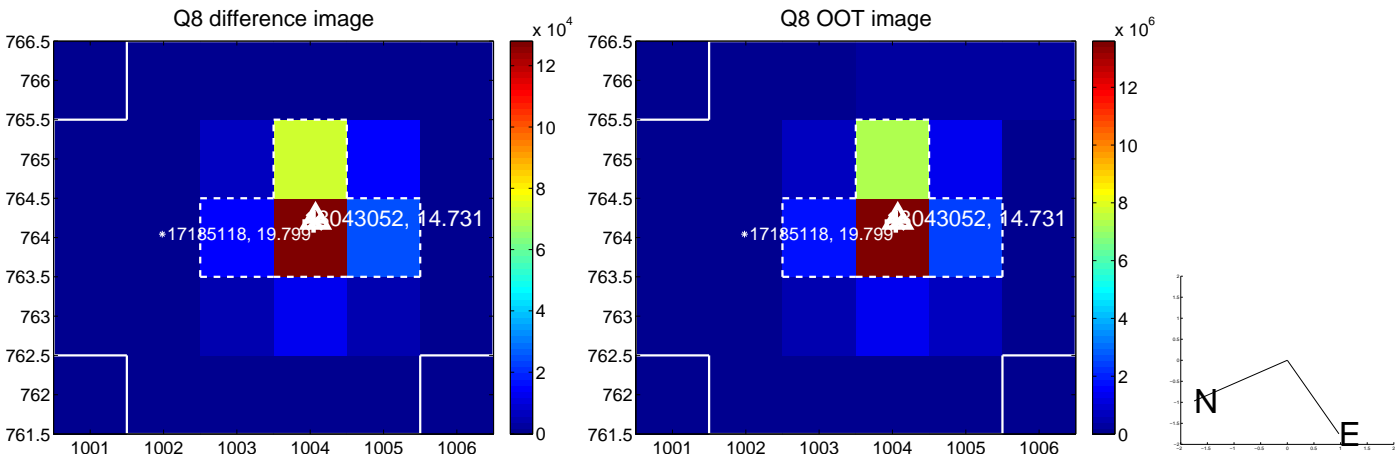
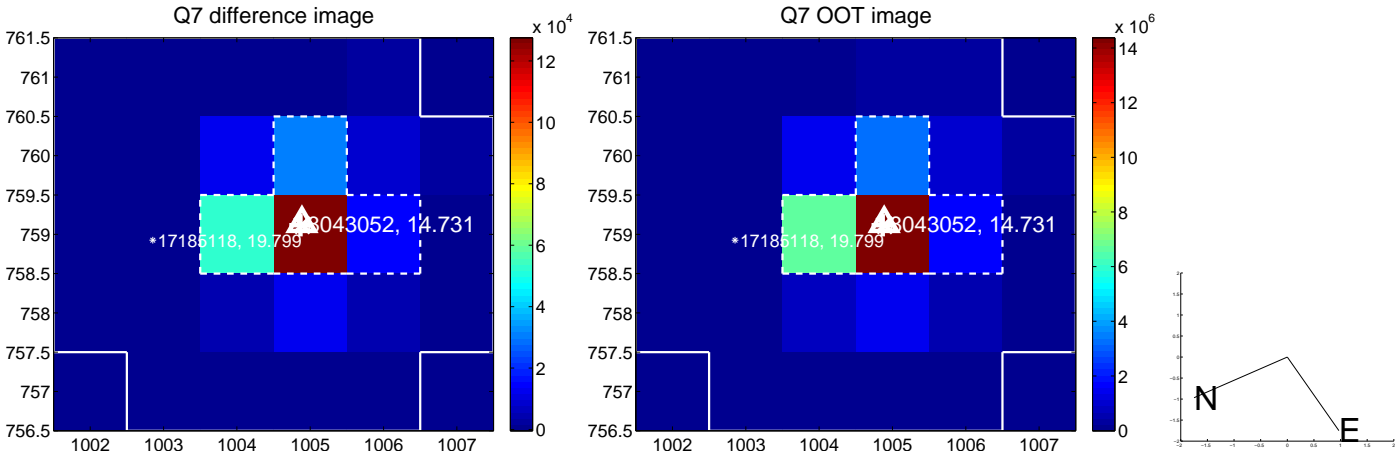
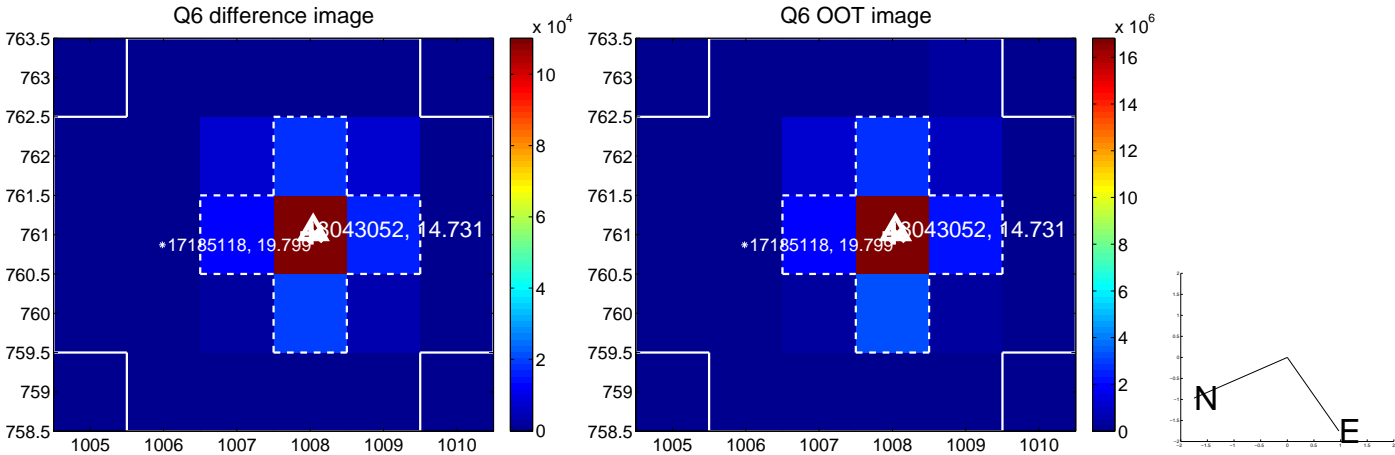
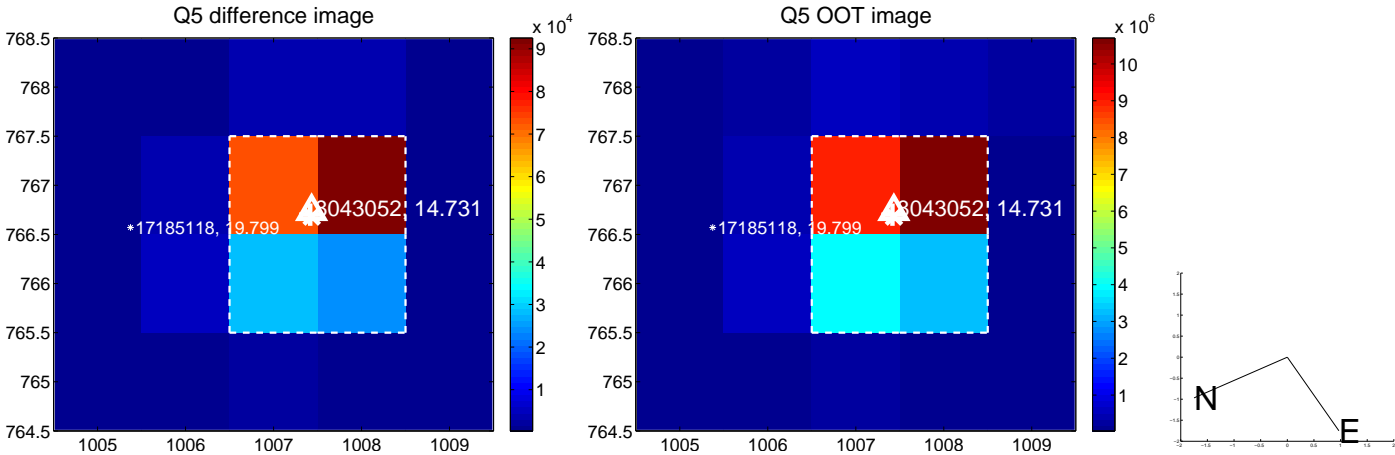


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

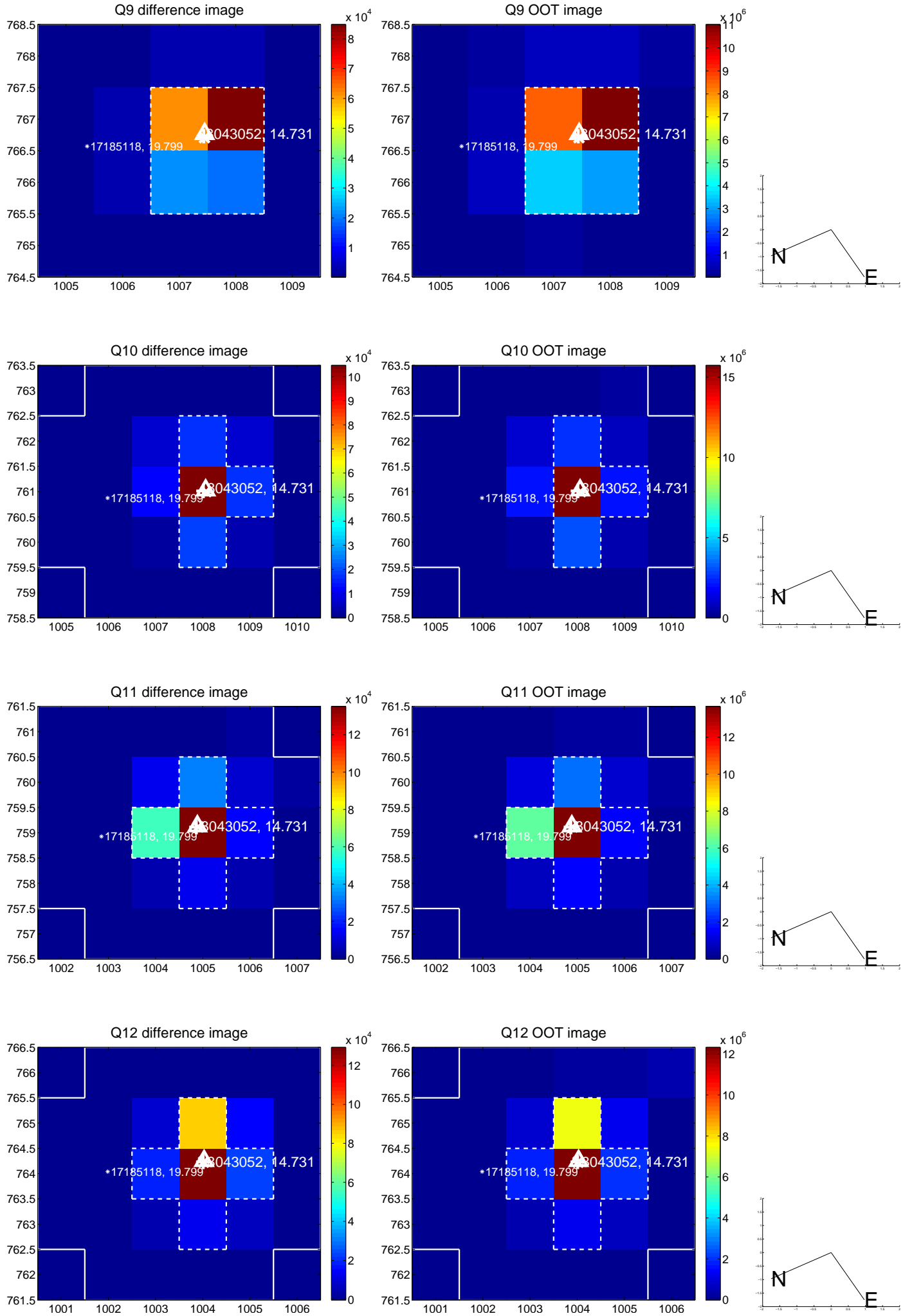
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



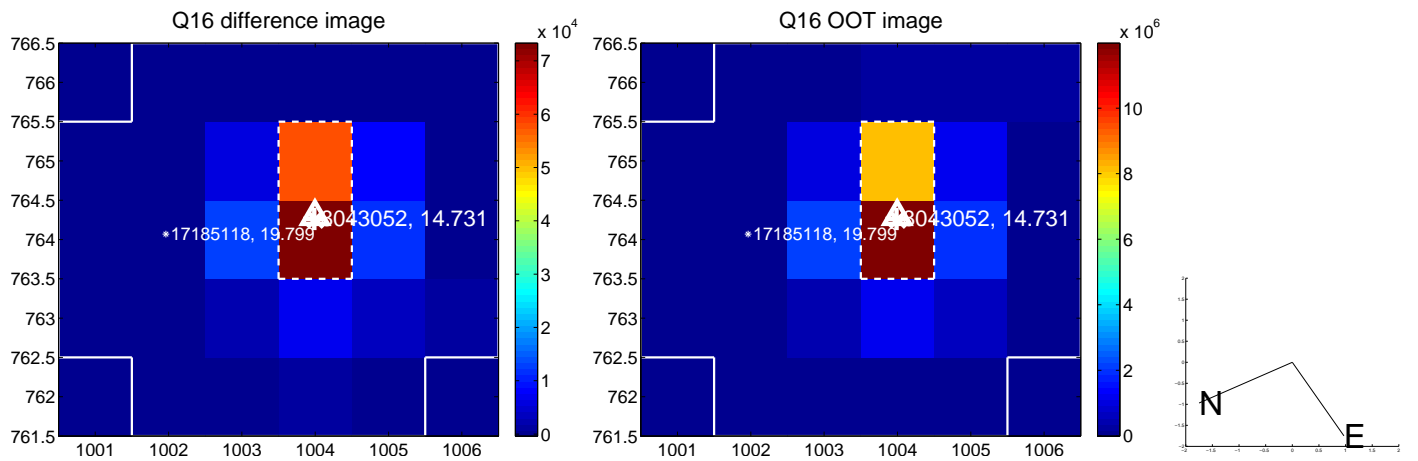
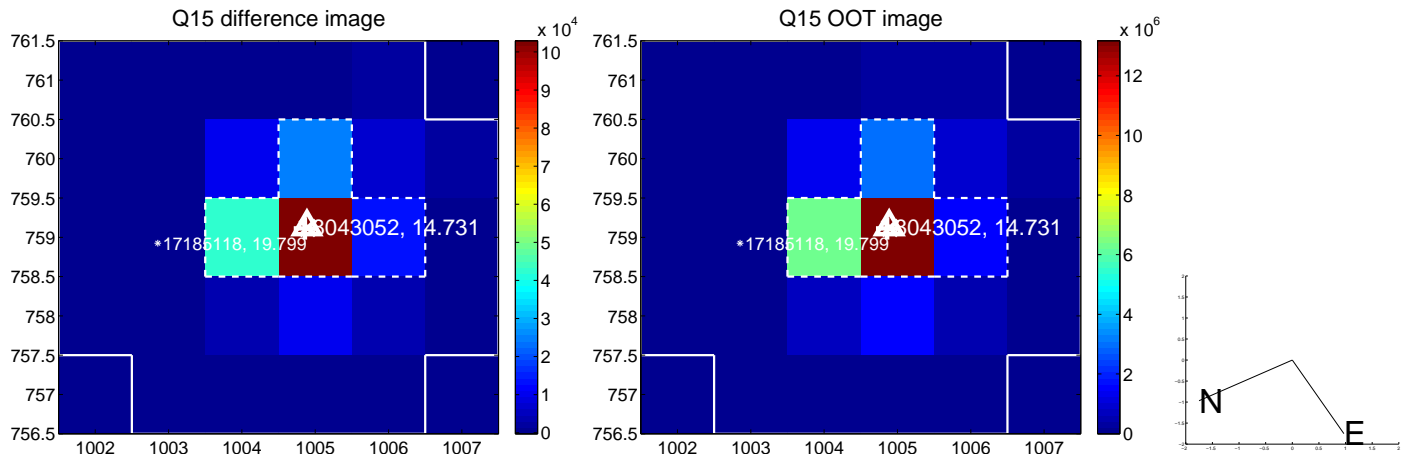
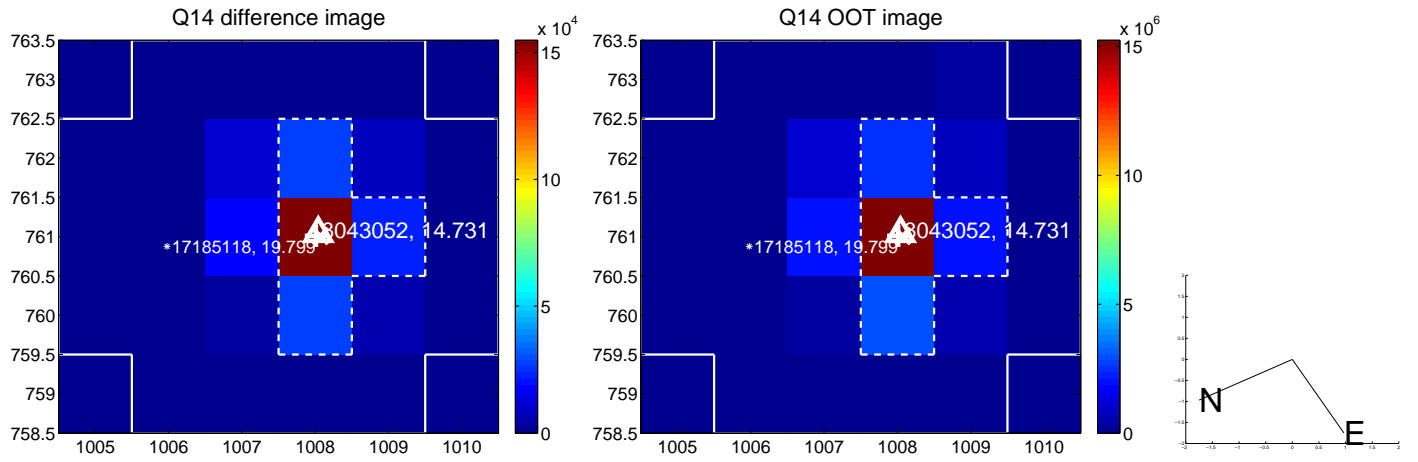
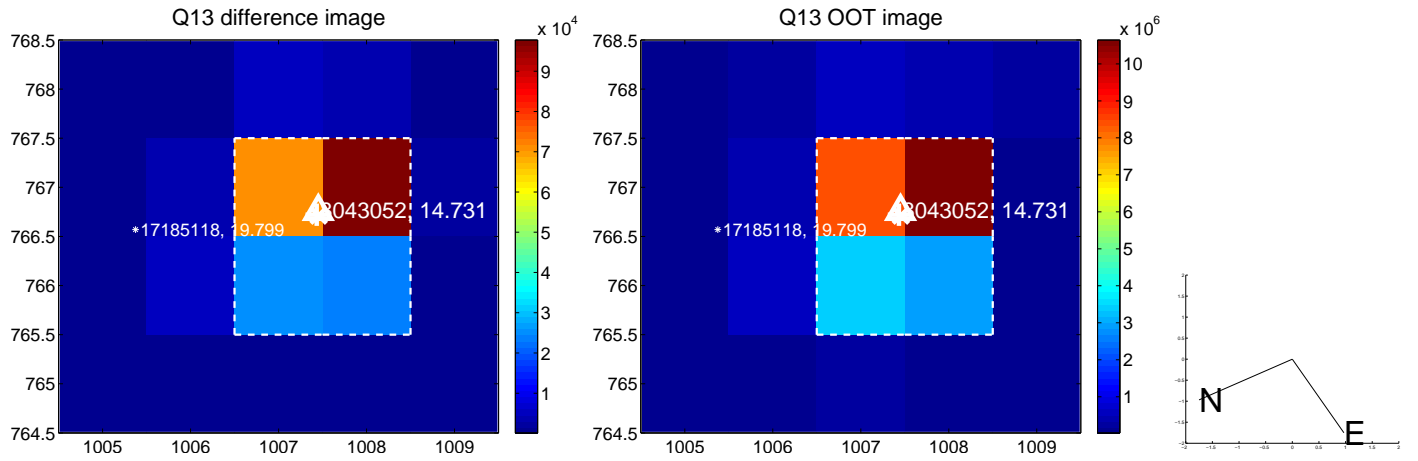
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



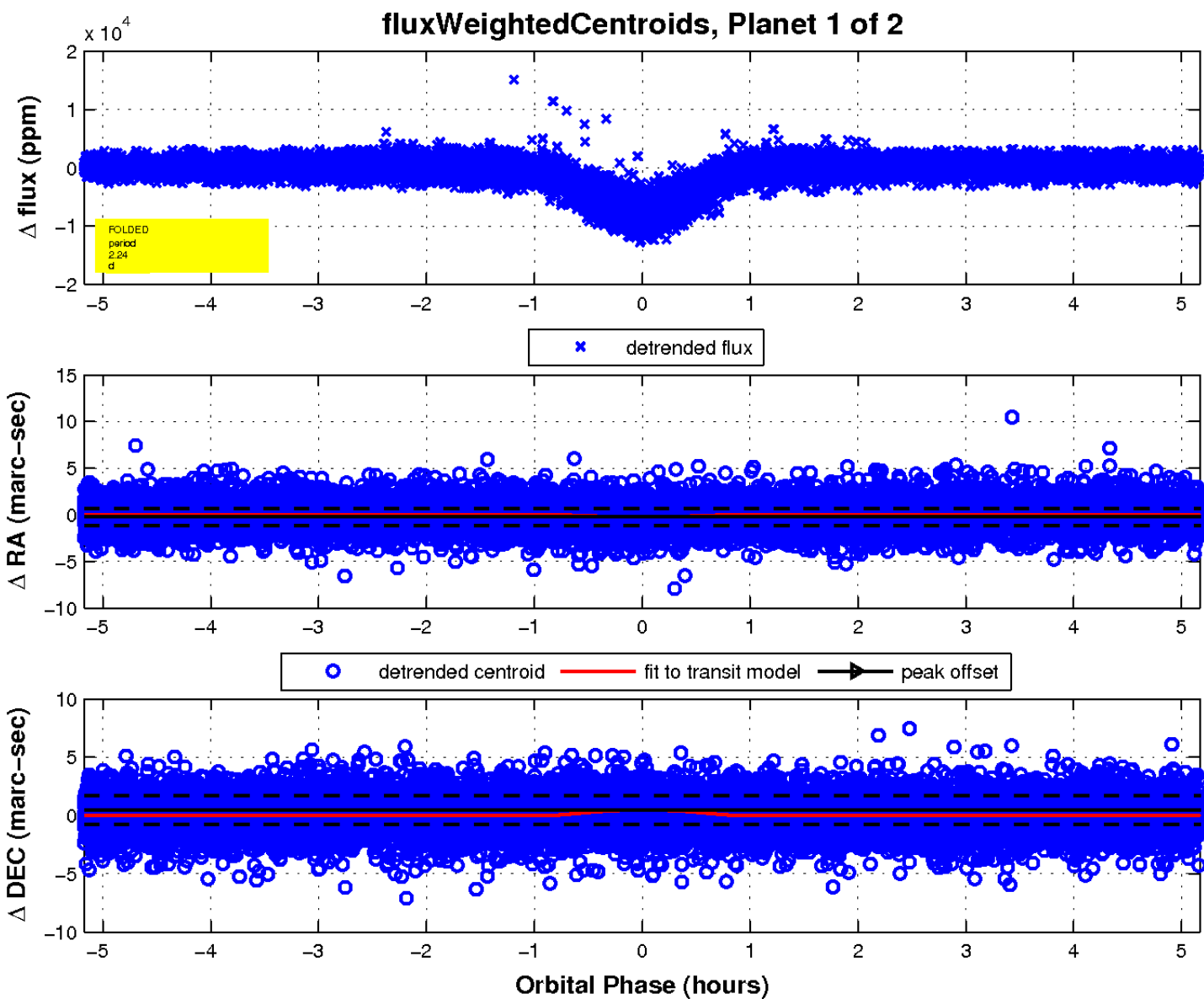
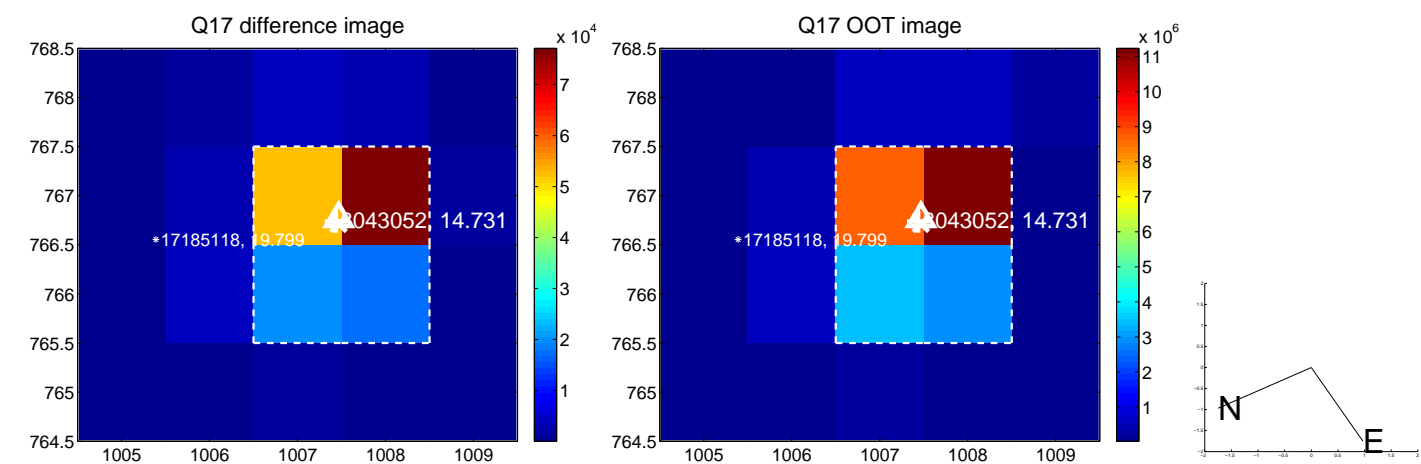
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

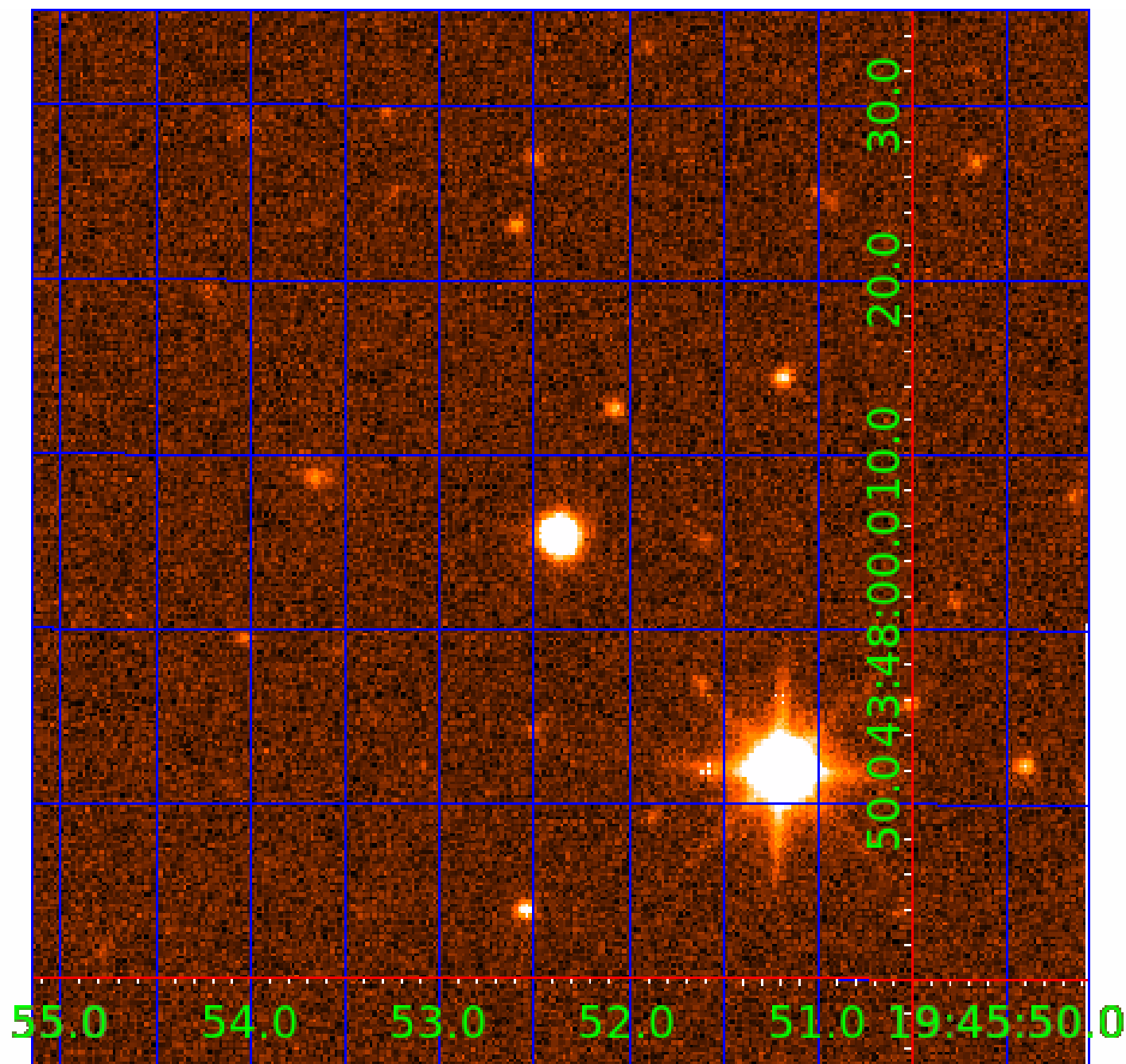


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008043052

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 008043052-01 | OBS | 3695.01 | 2.244617 | 133.460603 | 7585.6 | 1.724 | 183.3 | 334.2 | 0.80 | 5256 | 8.61 | 475.09 |
| 008043052-02 | OBS | No | 2.244585 | 132.346669 | 1244.9 | 1.374 | 56.0 | 73.9 | 0.80 | 5256 | 3.44 | 475.10 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|------------------------------------|
| 008043052-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE |
| 008043052-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE |

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.

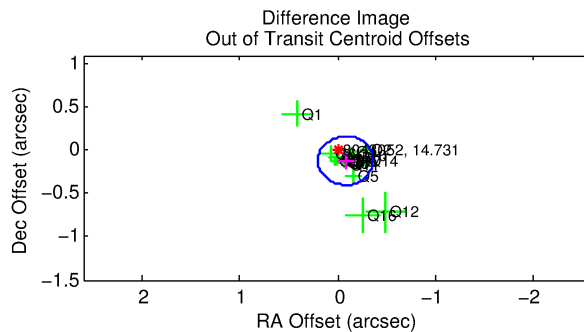
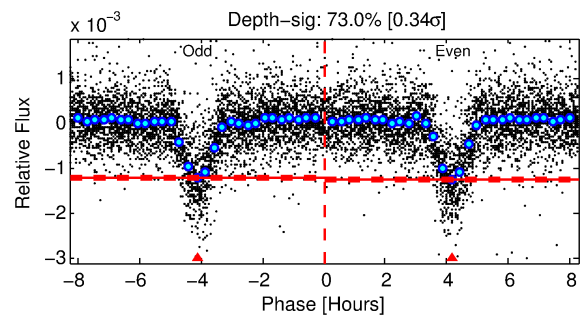
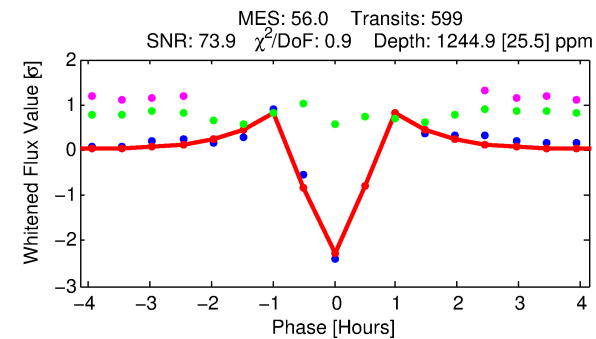
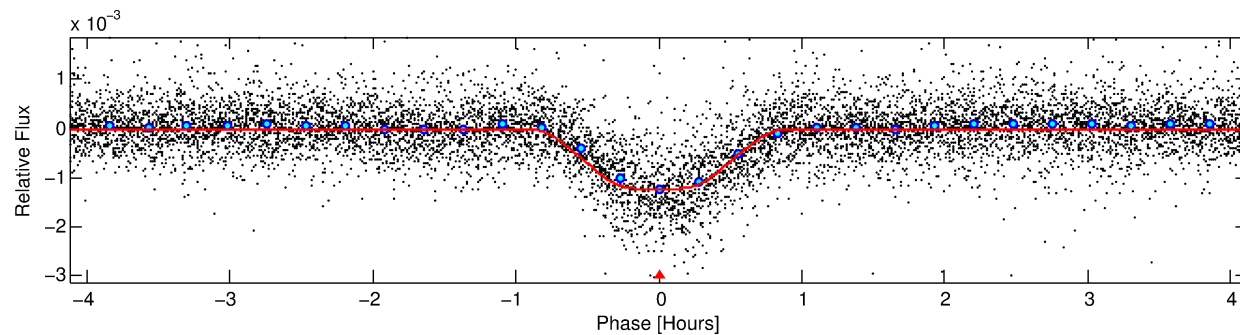
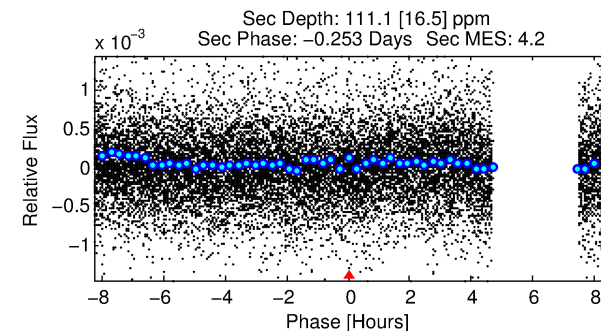
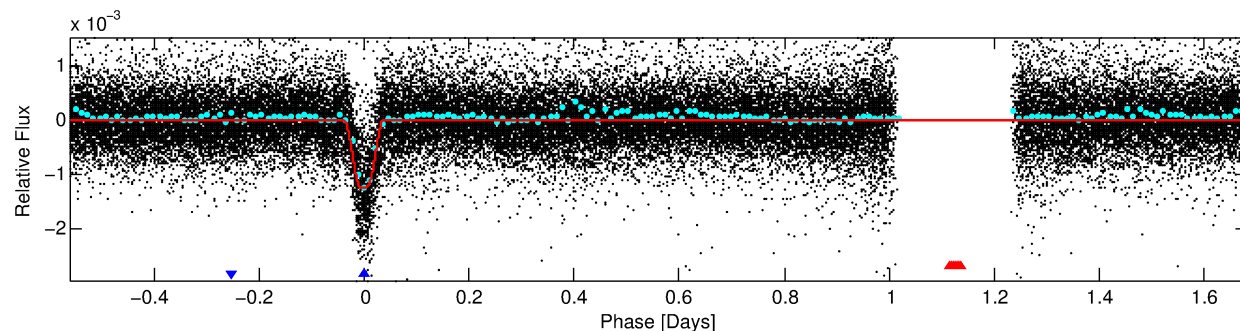
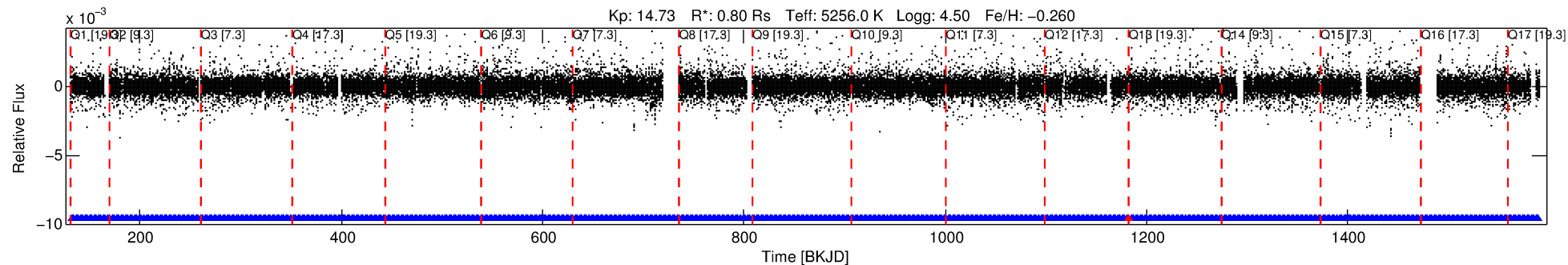
Ephemeris Match Information For 008043052-02

No Significant Match Found

DV One-Page Summary

KIC: 8043052 Candidate: 2 of 2 Period: 2.245 d

KOI: K03695 Corr: No Ephemeris Match



DV Fit Results:

Period = 2.24458 [0.00000] d
Epoch = 132.3467 [0.0002] BKJD
Rp/R* = 0.0393 [0.0016]
a/R* = 6.51 [0.95]
b = 0.90 [0.03]
Seff = 475.10 [104.79]
Teq = 1190 [66] K
Rp = 3.44 [0.49] Re
a = 0.0304 [0.0037] AU
Ag = 4.78 [1.20] [3.16σ]
Teffp = 2721 [141] K [9.83σ]

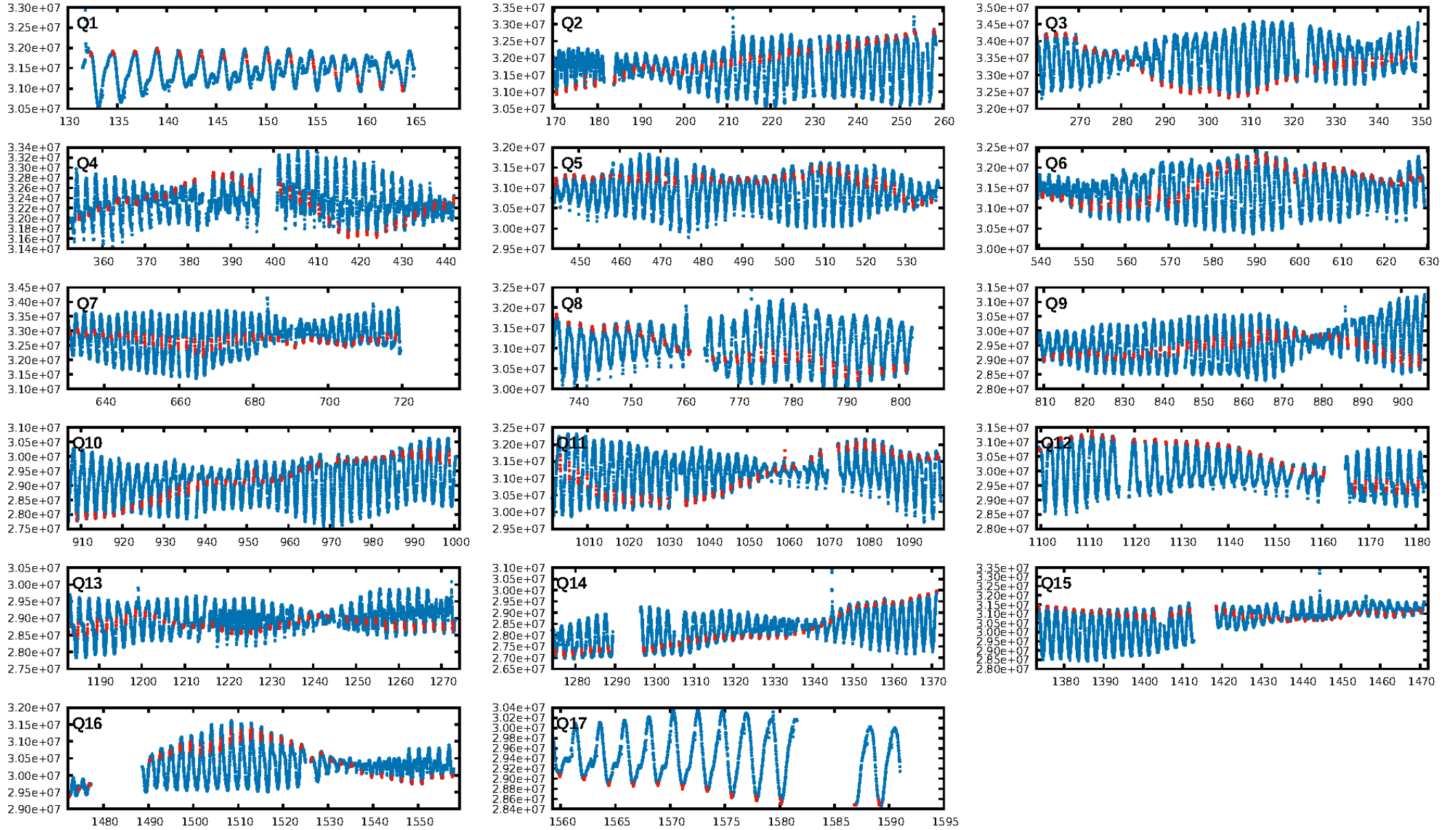
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [571/572]
GhostDiagnostic-chr: 1.261
Centroid-sig: 0.0%
Centroid-so: 0.251 arcsec [2.46σ]
OotOffset-rm: 0.143 arcsec [1.52σ]
KicOffset-rm: 0.148 arcsec [1.68σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

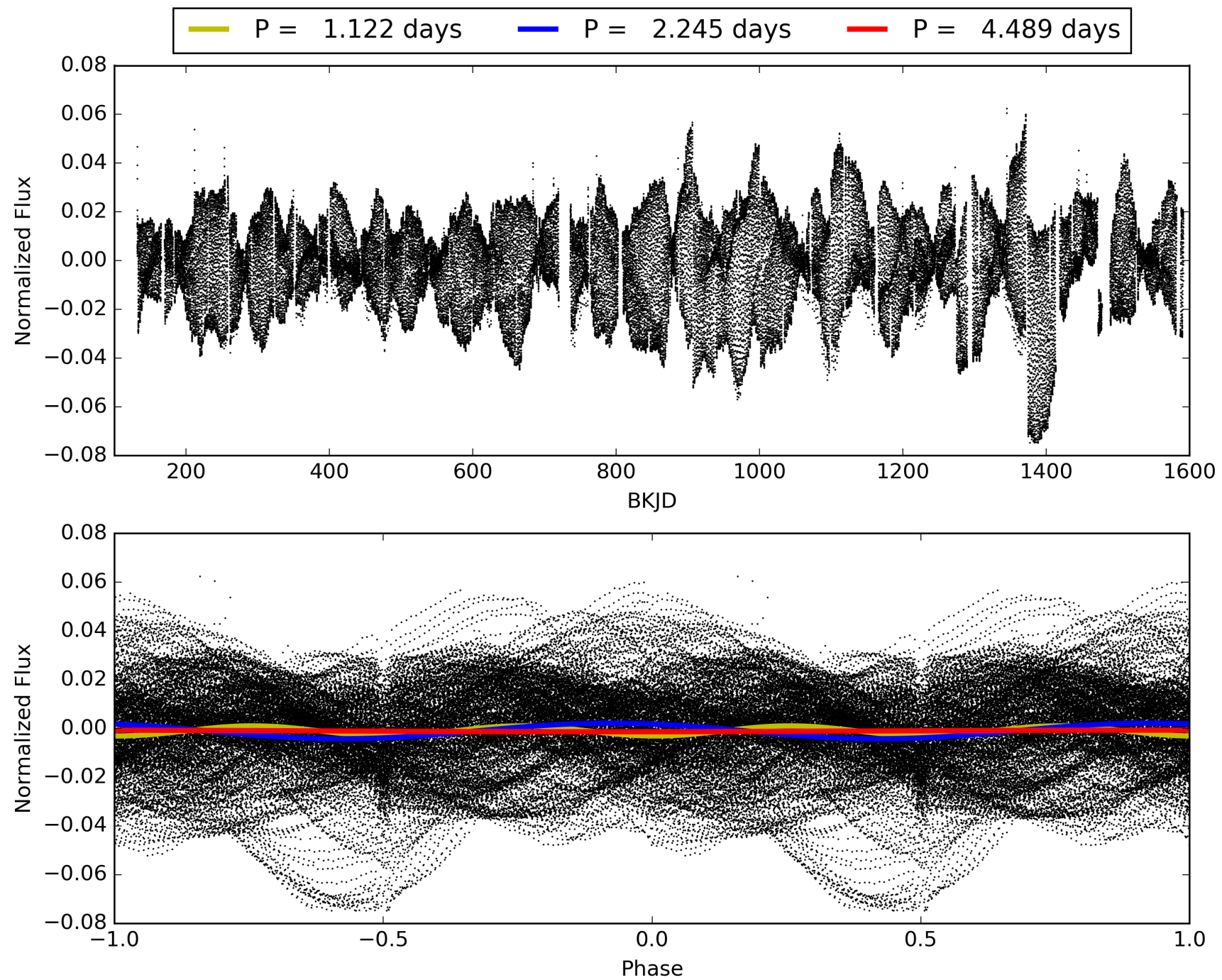
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 09:02:01 Z

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

TCE 008043052-02, PDC Light Curves

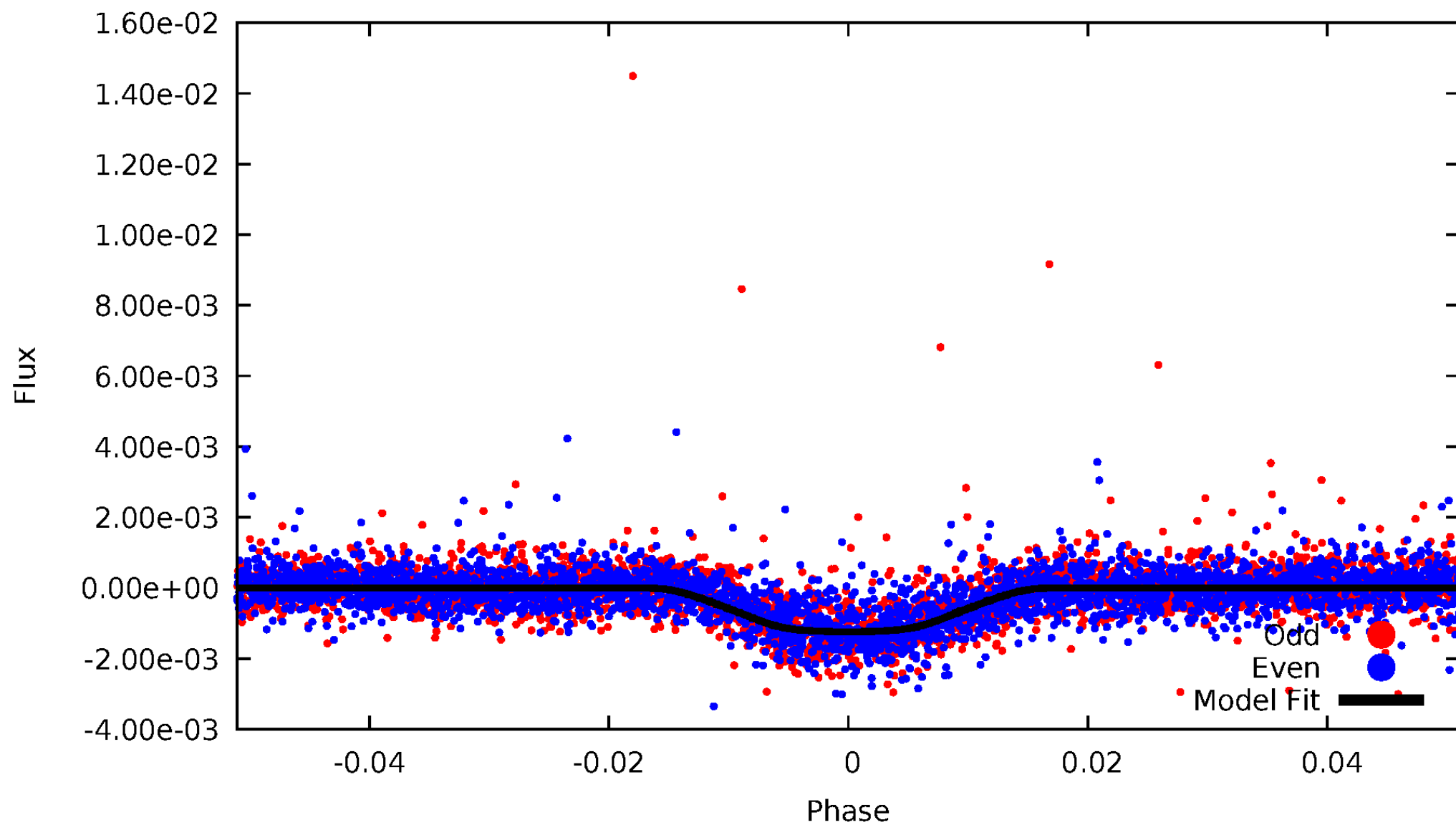


TCE 008043052-02



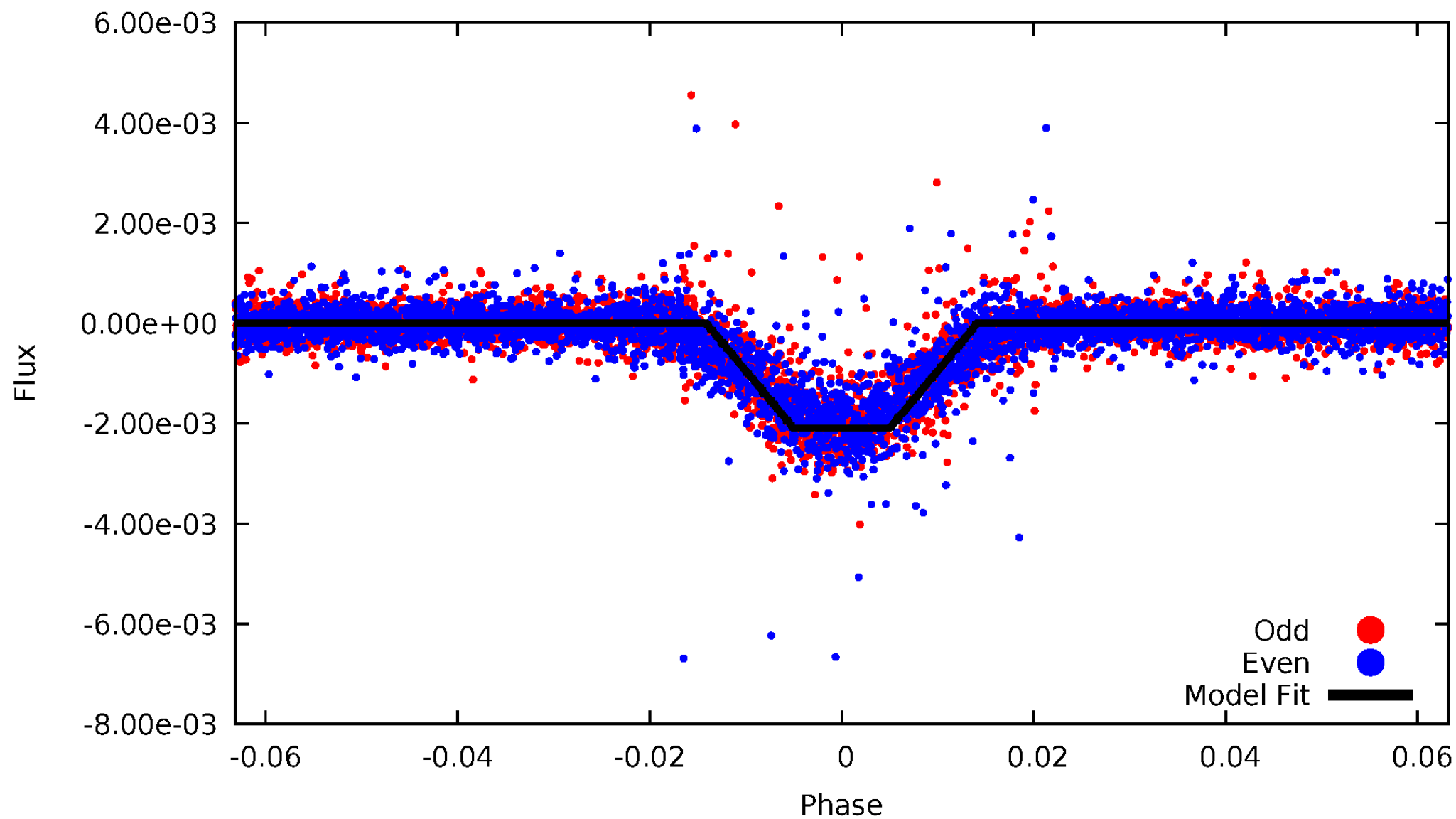
DV Odd/Even

TCE 008043052-02



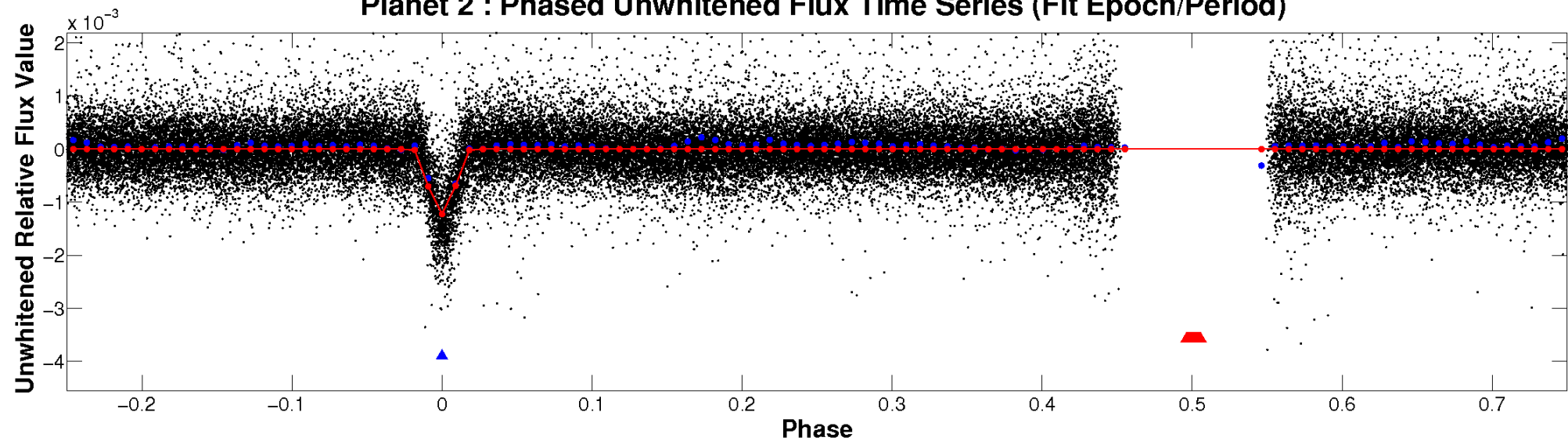
ALT Odd/Even

TCE 008043052-02

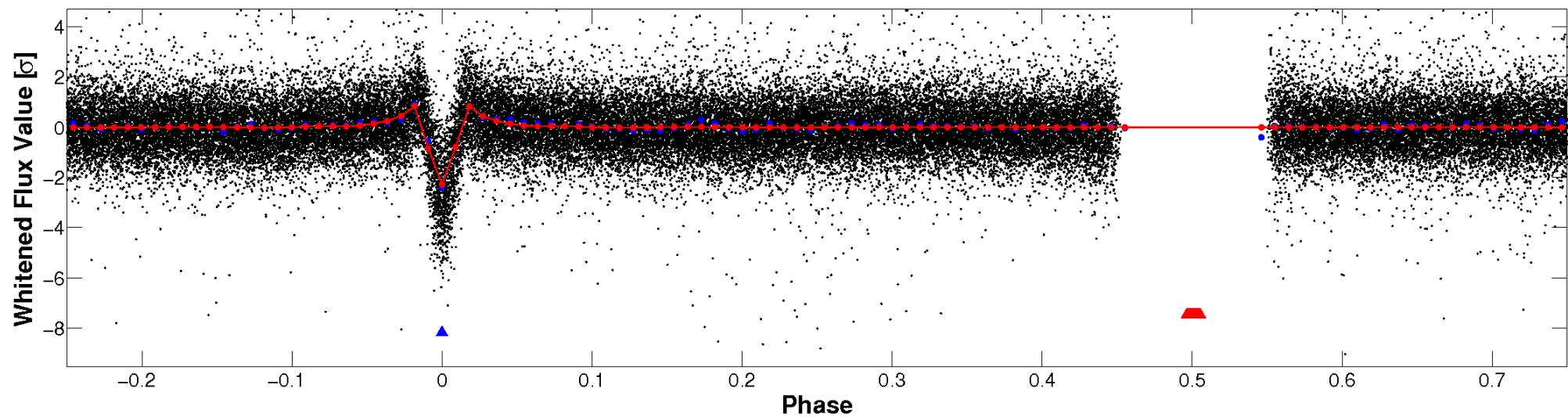


Non-Whitened Vs. Whitened Light Curve

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

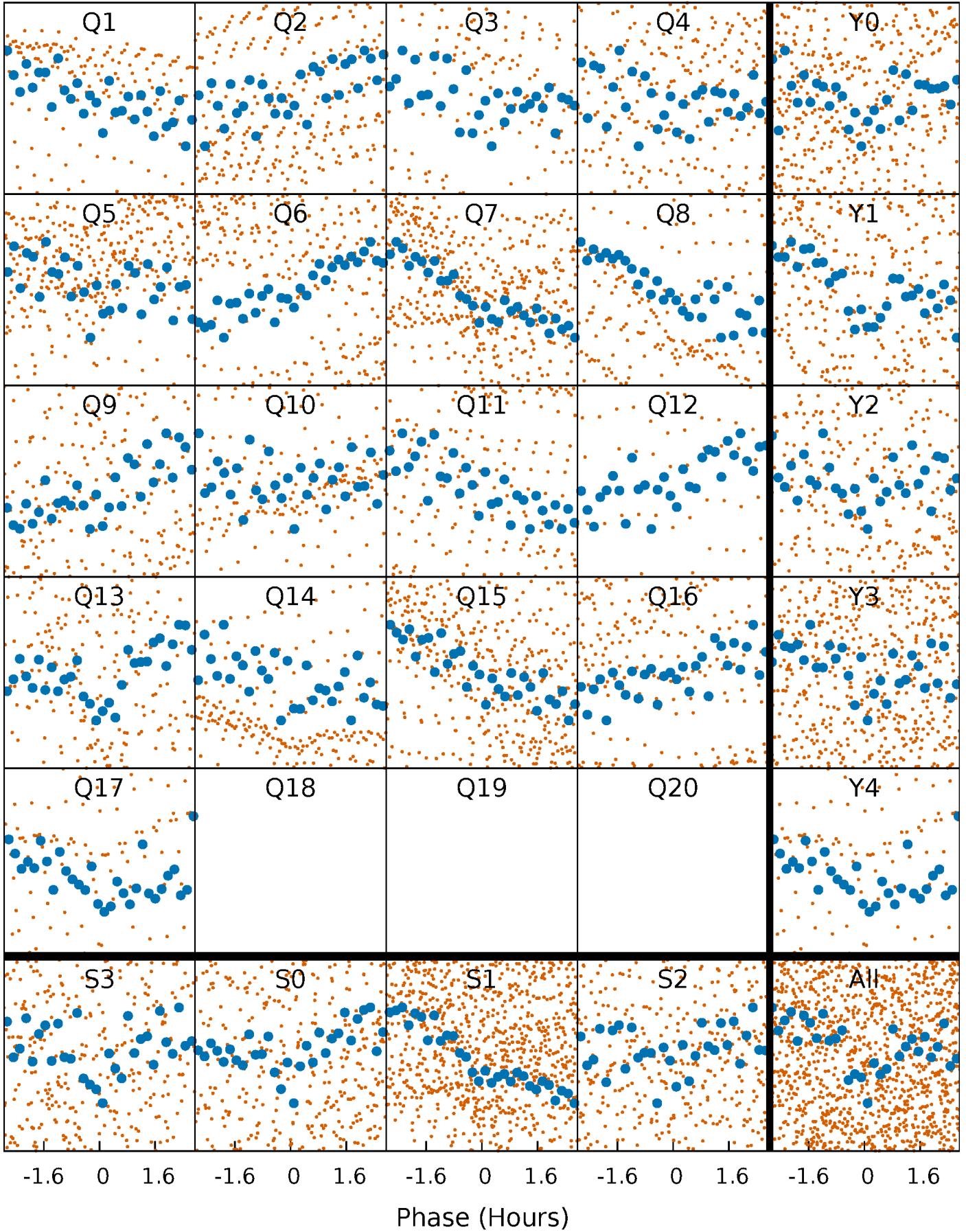


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



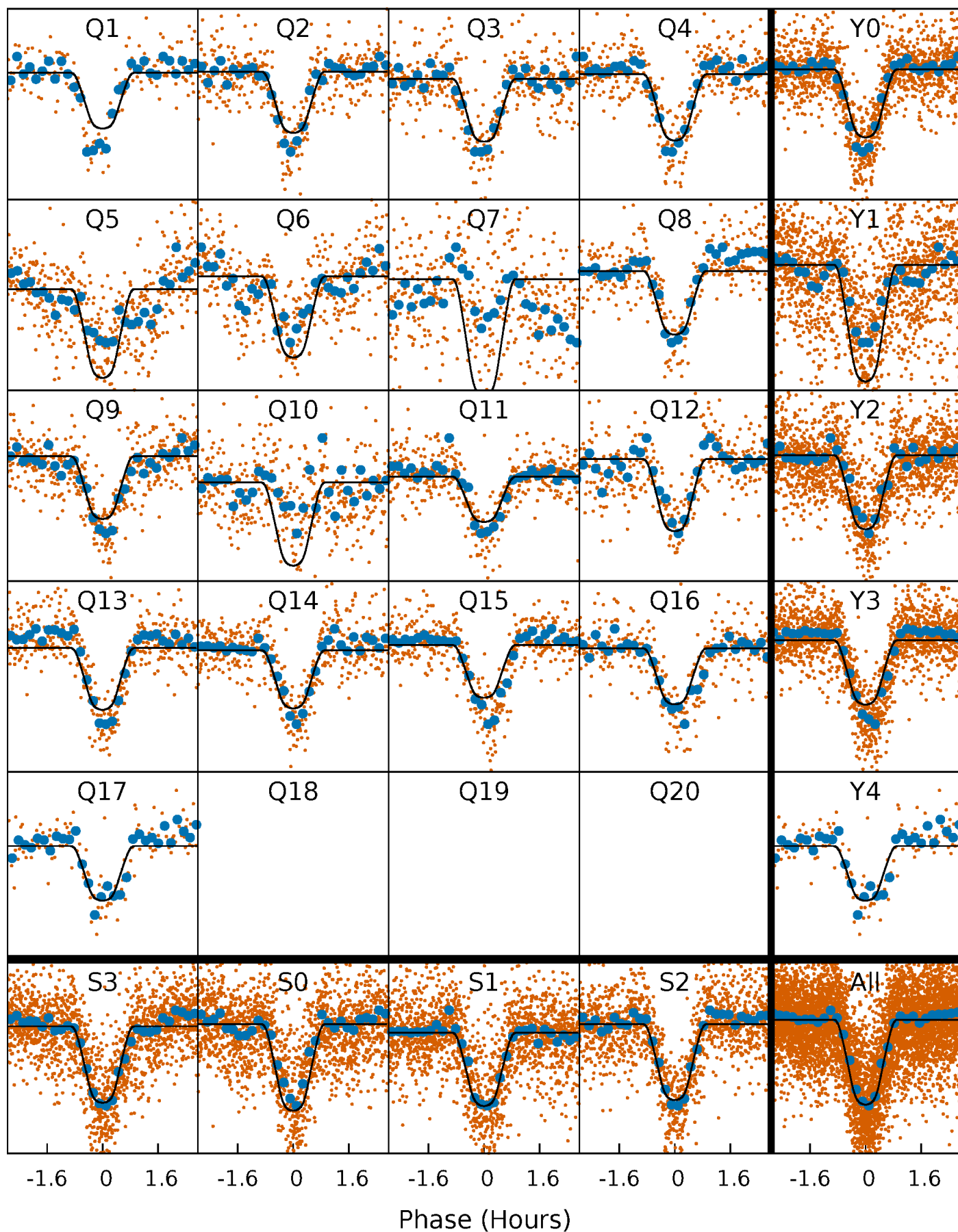
PDC Quarter-Phased Transit Curves

TCE 008043052-02 P= 2.244585 Days $T_0=132.346669$ (BKJD)



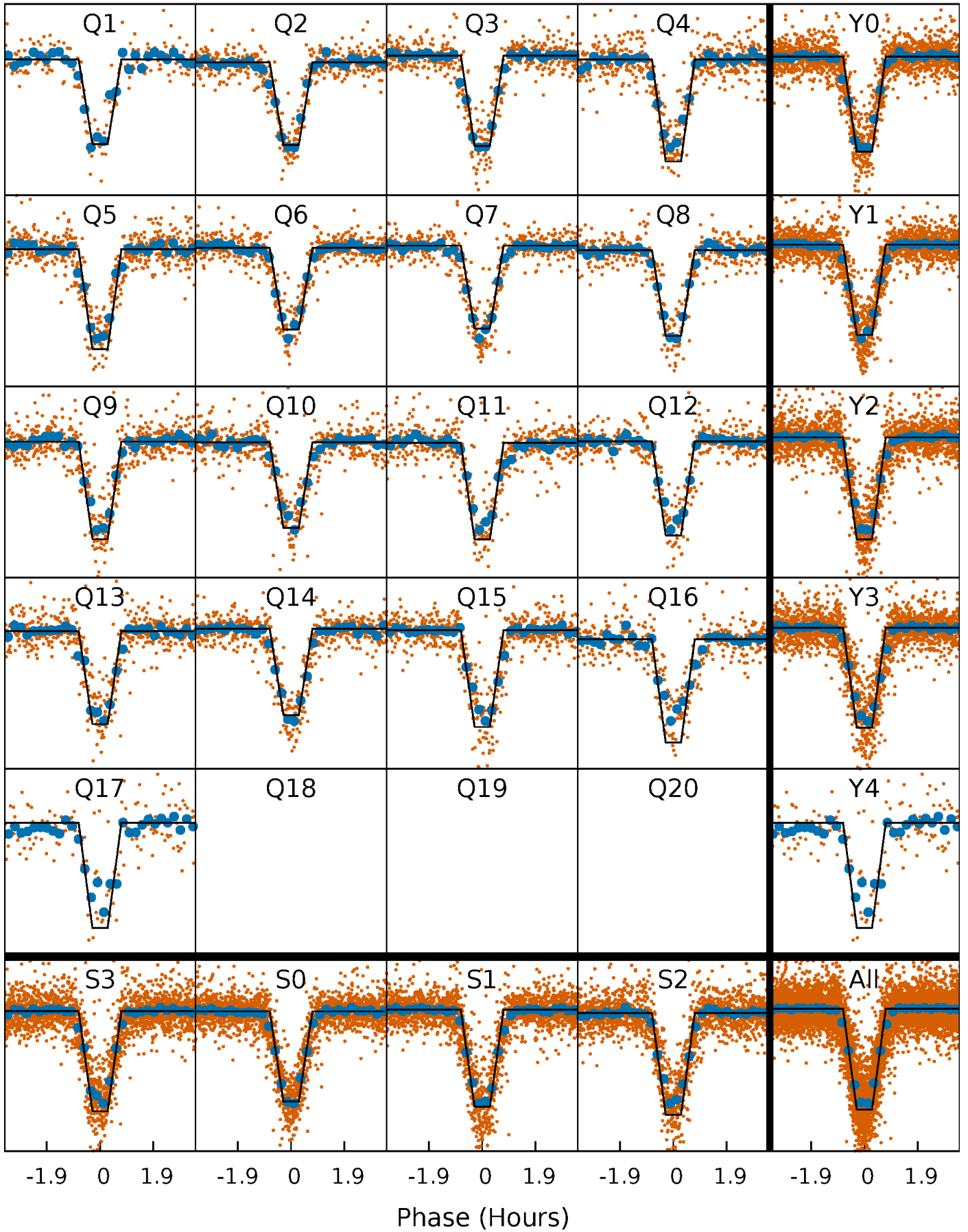
DV Quarter-Phased Transit Curves

TCE 008043052-02 P= 2.244585 Days $T_0=132.346669$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

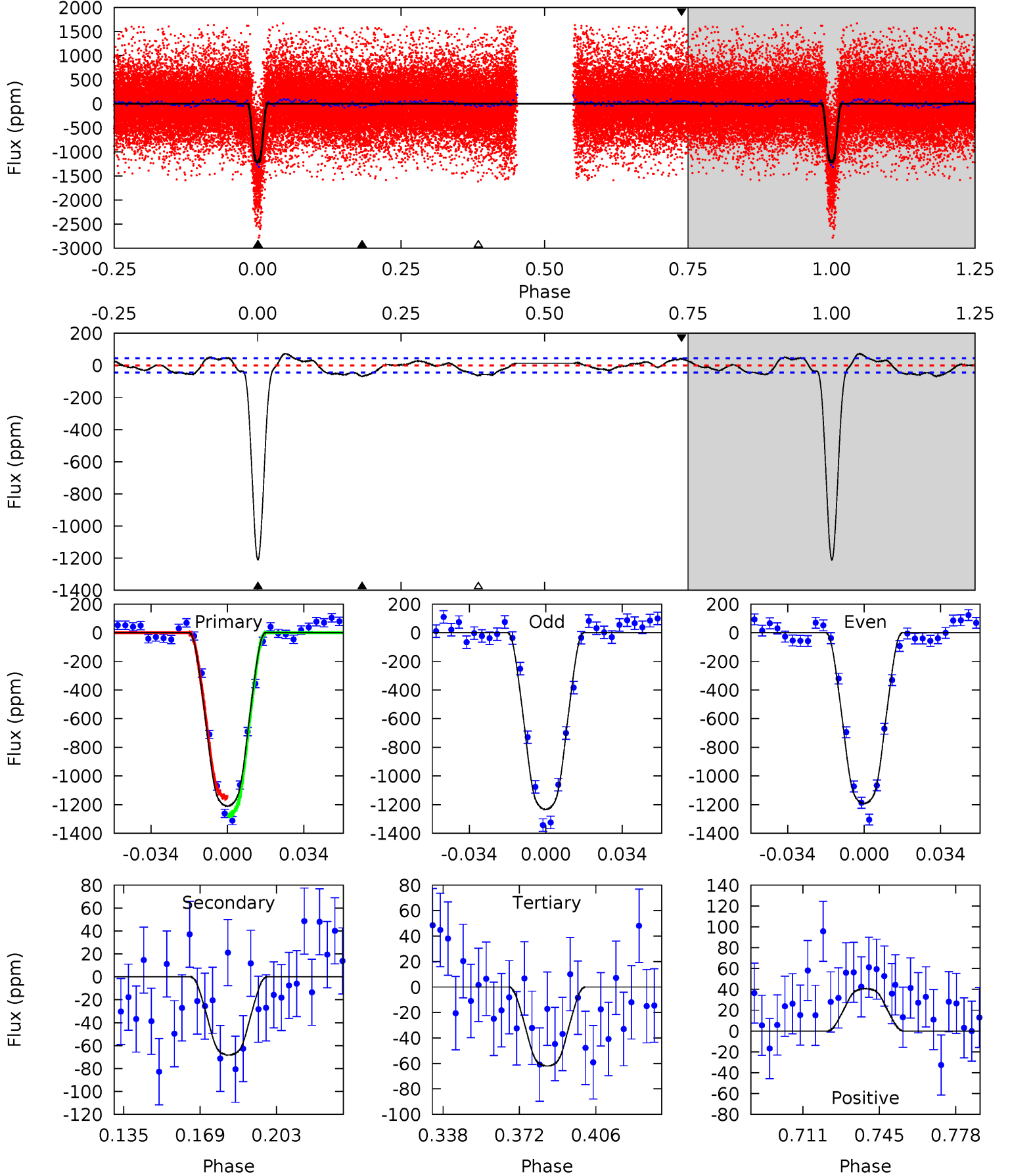
TCE 008043052-02 $P = 2.244592$ Days $T_0 = 132.345380$ (BKJD)



DV Model-Shift Uniqueness Test

008043052-02, P = 2.244585 Days, E = 130.102084 Days

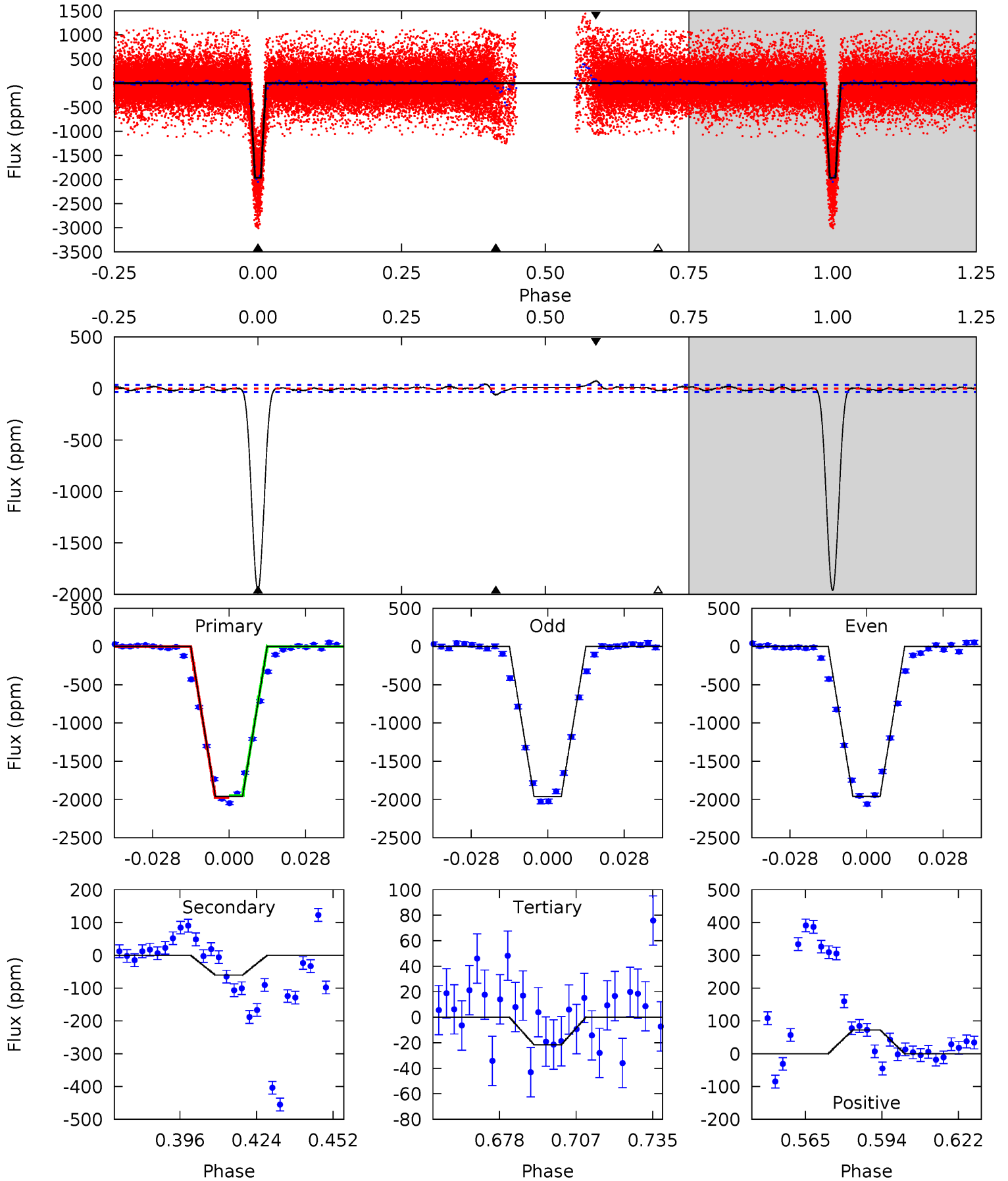
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 131.1 | 7.39 | 6.72 | 4.40 | 4.79 | 2.12 | 3.37 | 124.4 | 126.7 | 0.68 | 3.00 | 2.25 | 0.95 | 0.06 | 7.02 |



Alt Model-Shift Uniqueness Test

008043052-02, P = 2.244592 Days, E = 130.100788 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 283.3 | 8.73 | 3.12 | 10.5 | 4.82 | 2.19 | 1.85 | 280.2 | 272.8 | 5.60 | -1.77 | 0.06 | 1.00 | 0.04 | 1.70 |



Stellar Parameters For KIC 008043052

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5256^{+158}_{-142} | $4.502^{+0.105}_{-0.105}$ | $-0.260^{+0.350}_{-0.300}$ | $0.802^{+0.109}_{-0.098}$ | $0.745^{+0.109}_{-0.054}$ | $2.036^{+0.886}_{-0.620}$ |
| | +3%/-3% | +2%/-2% | +135%/-115% | +14%/-12% | +15%/-7% | +44%/-30% |
| Source | PHO1 | 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 008043052-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-------------|------------------------|--------------------|--------------------|---------------------------|
| DV | -68 ± 9 | $3.48^{+0.34}_{-0.30}$ | 1668^{+84}_{-74} | 2996^{+91}_{-91} | $2.892^{+0.700}_{-0.534}$ |
| Alt. | -60 ± 7 | $4.06^{+0.37}_{-0.34}$ | 1673^{+83}_{-78} | 2801^{+81}_{-75} | $1.882^{+0.425}_{-0.335}$ |

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 $A_{obs} \gg 1.0$

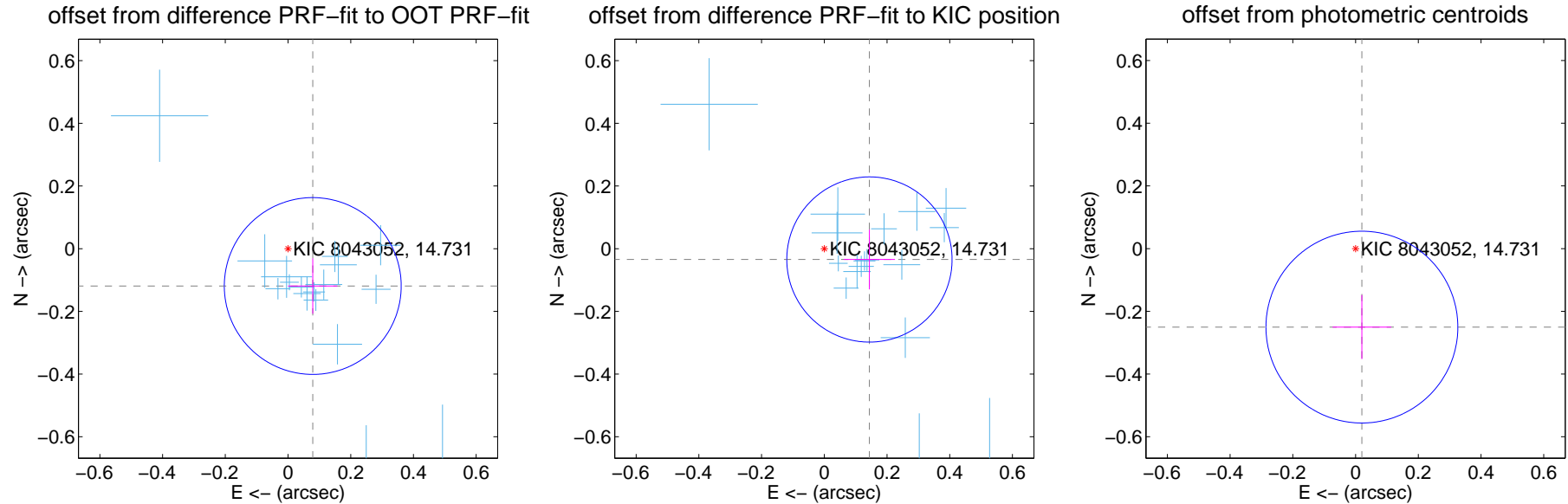
DV Centroid Data

Supplemental centroid analysis for 008043052-02. Kepler magnitude: 14.73. Transit SNR 73.92

There are 17 quarters with good PRF difference image offsets

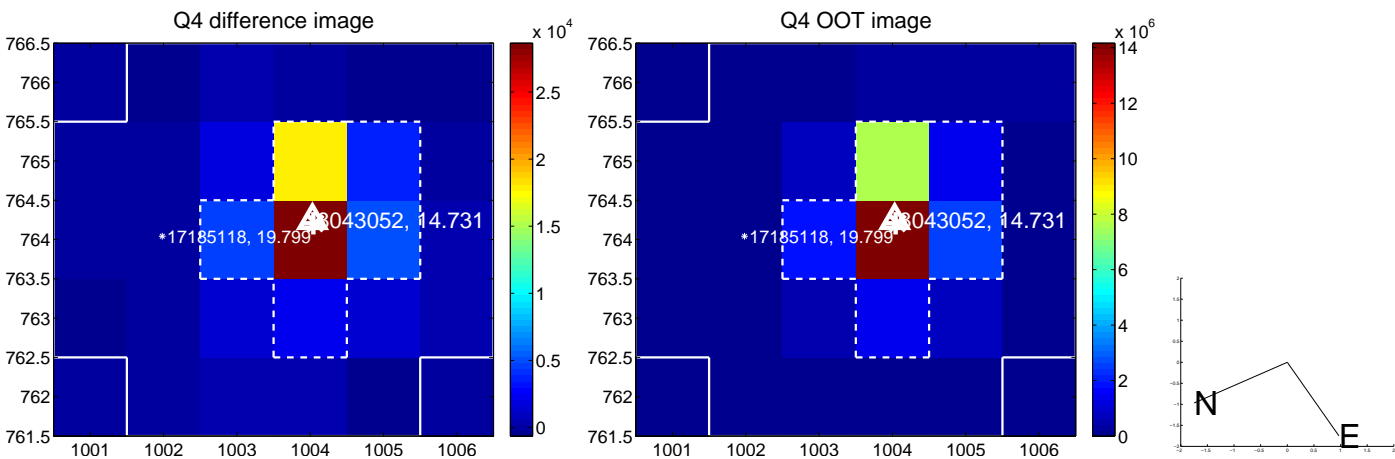
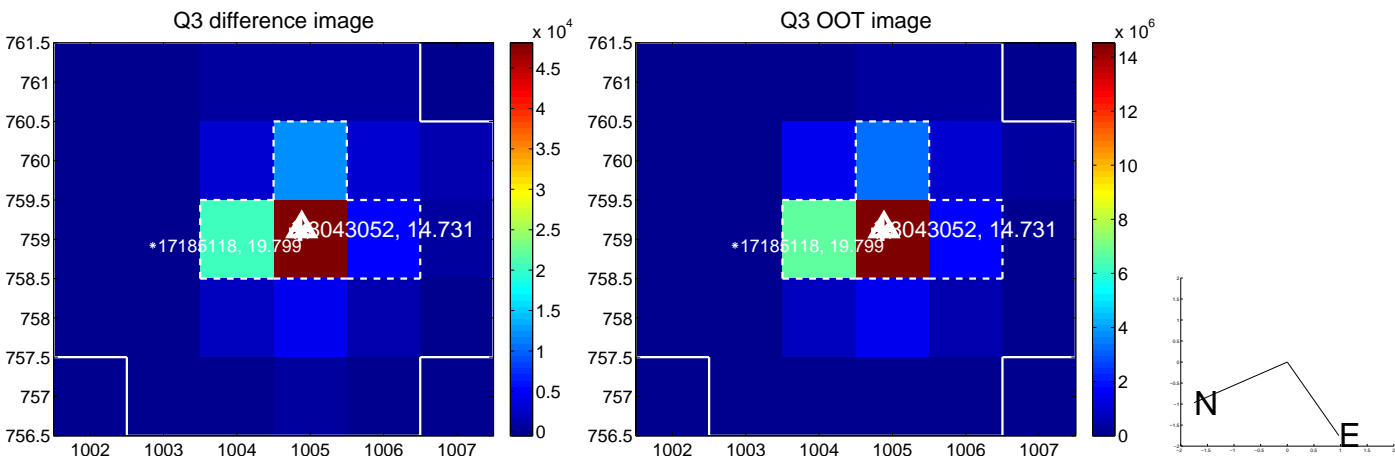
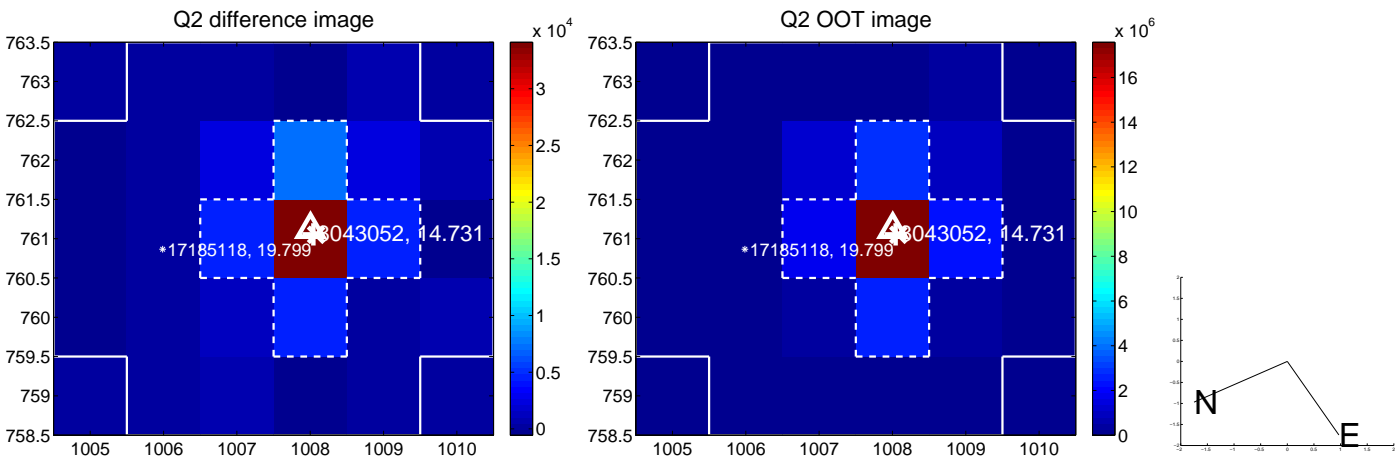
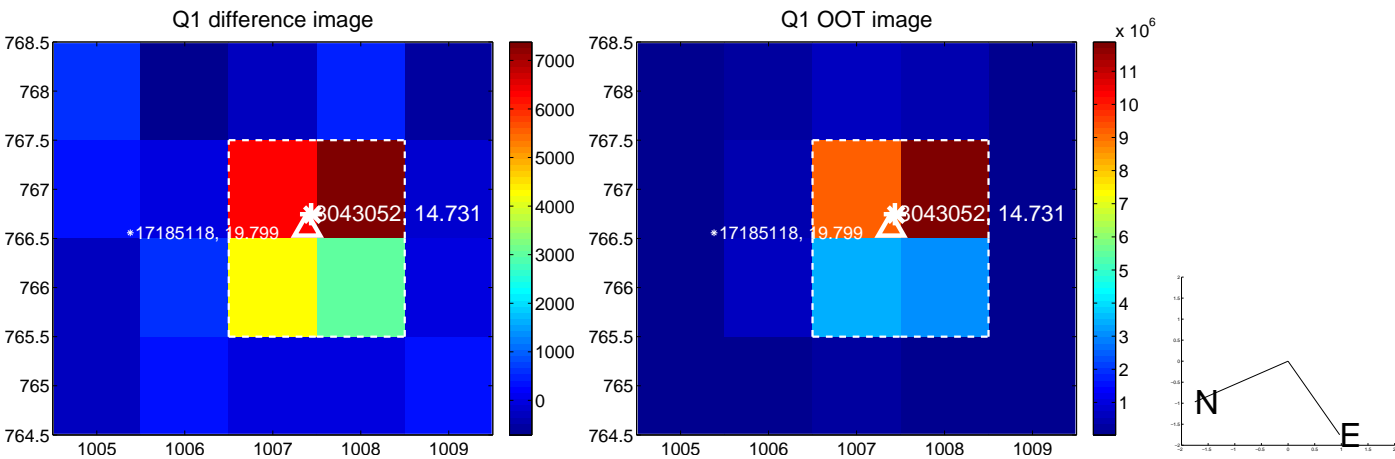
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.143 ± 0.094 | 1.52 | -0.079 ± 0.079 | -0.119 ± 0.088 |
| PRF-fit source offset from KIC position | 0.148 ± 0.088 | 1.68 | -0.144 ± 0.082 | -0.034 ± 0.095 |
| photometric centroid source offset | 0.25 ± 0.10 | 2.46 | -0.02 ± 0.09 | -0.25 ± 0.10 |

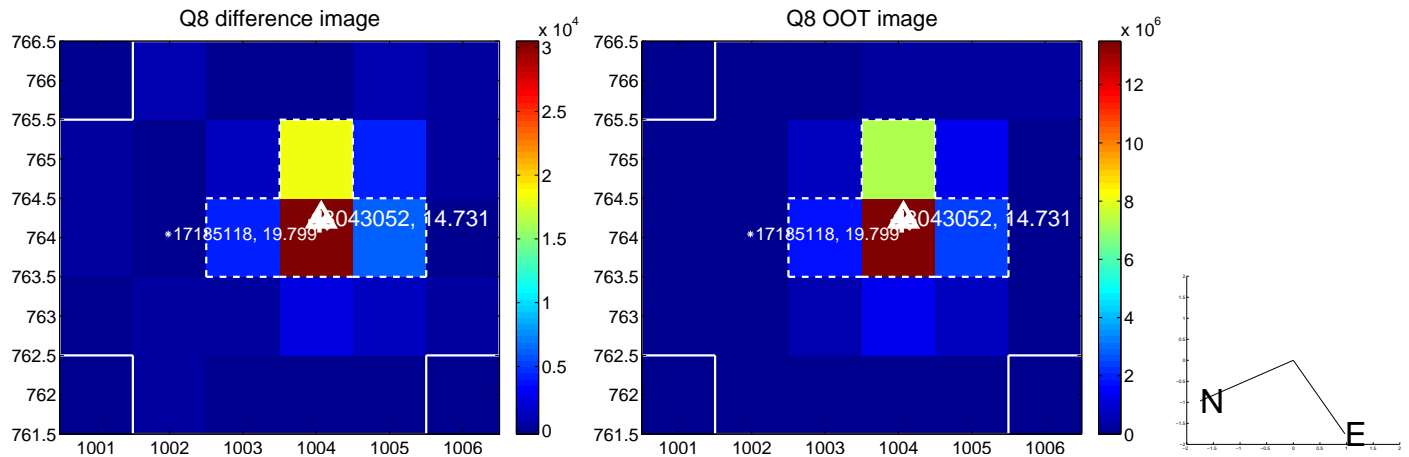
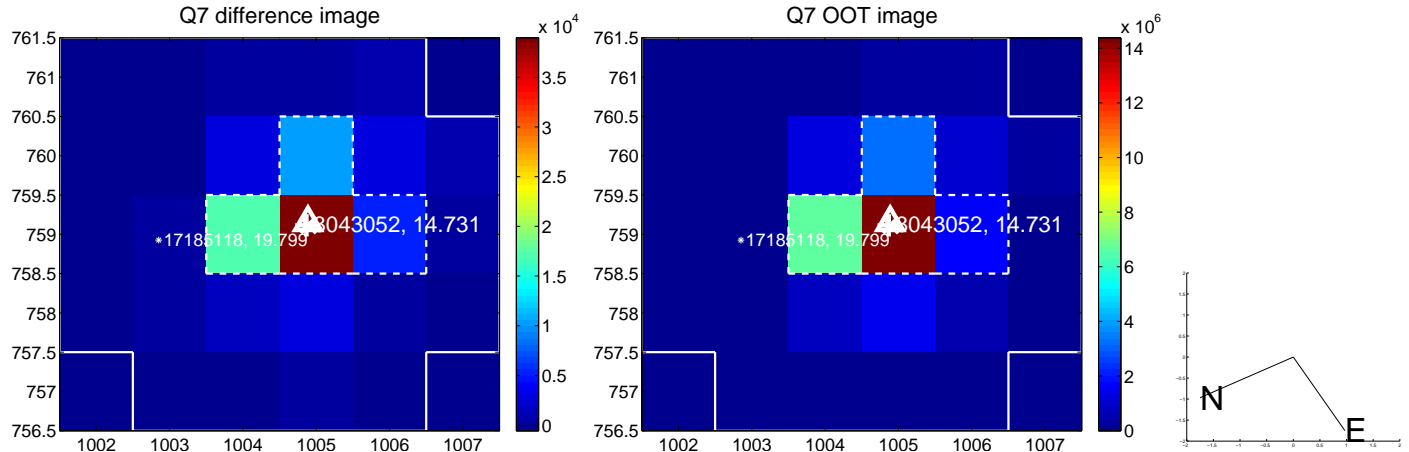
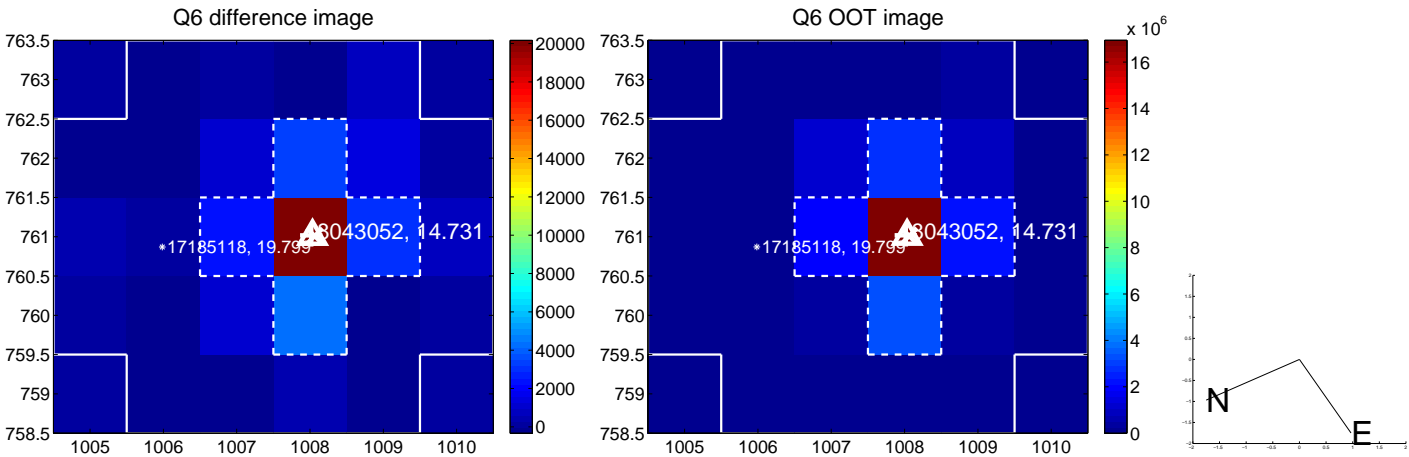
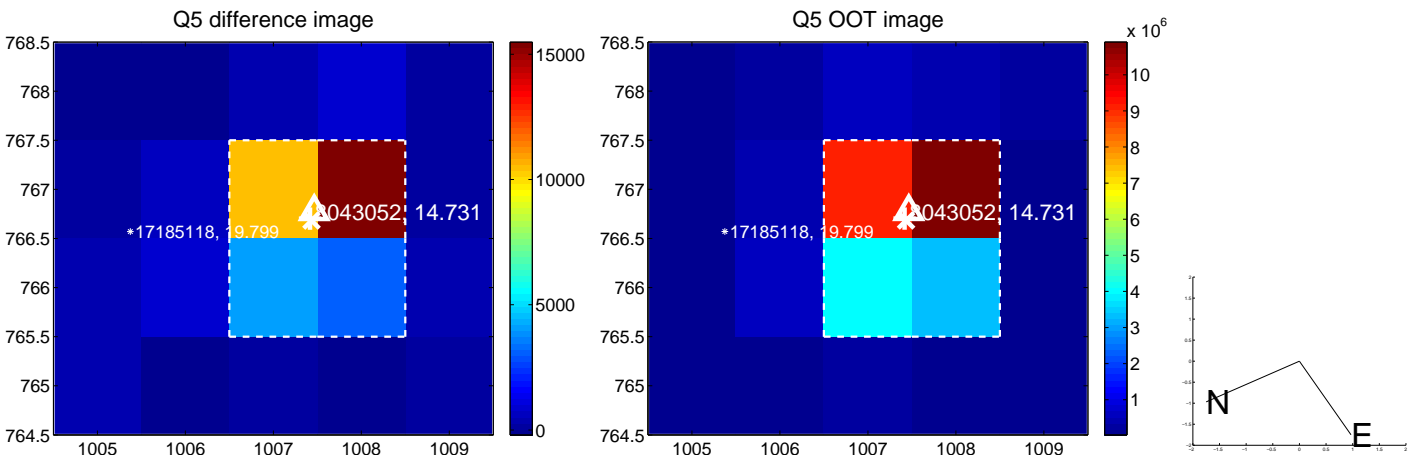


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

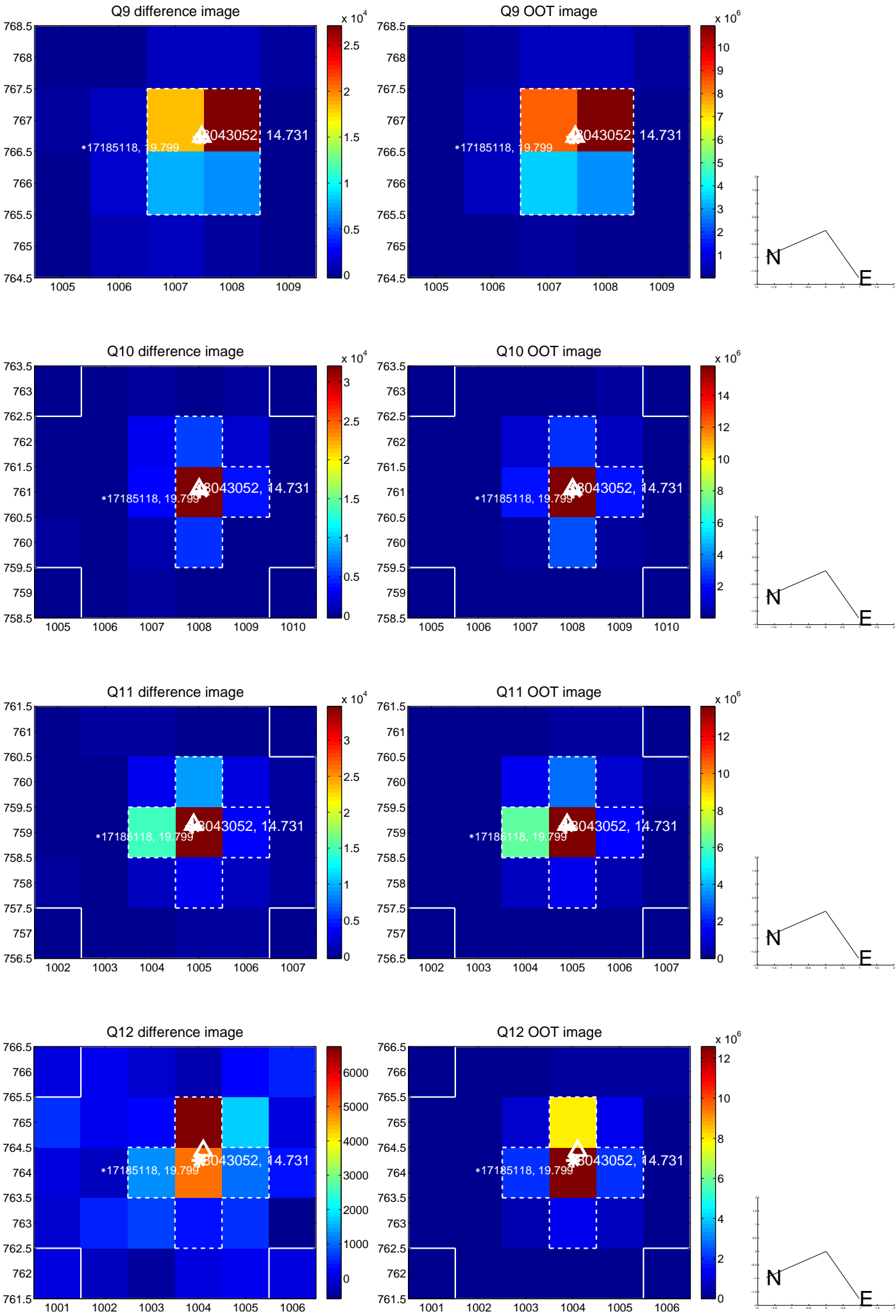
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



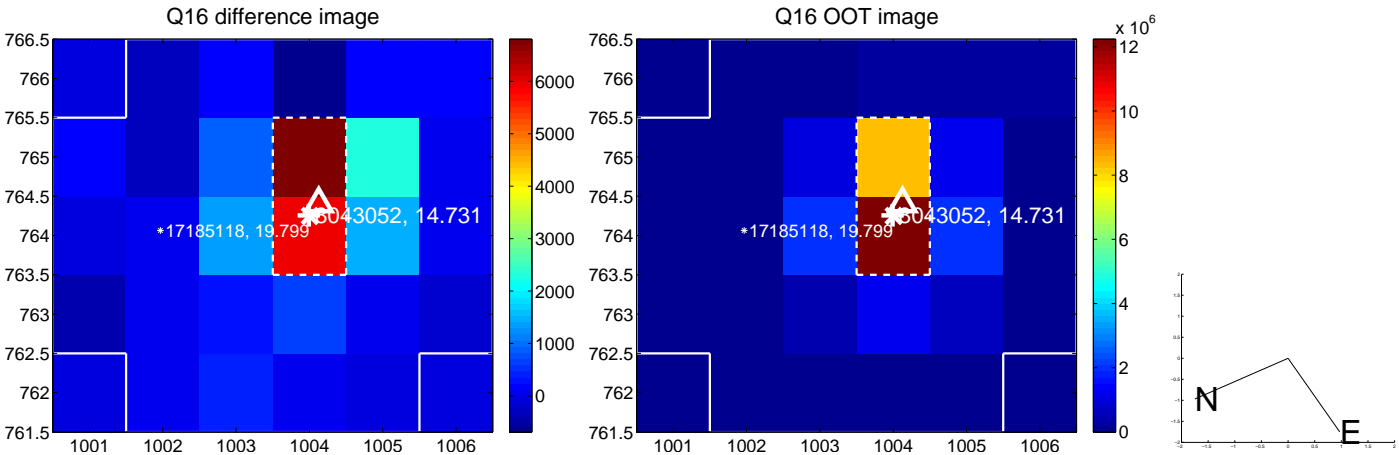
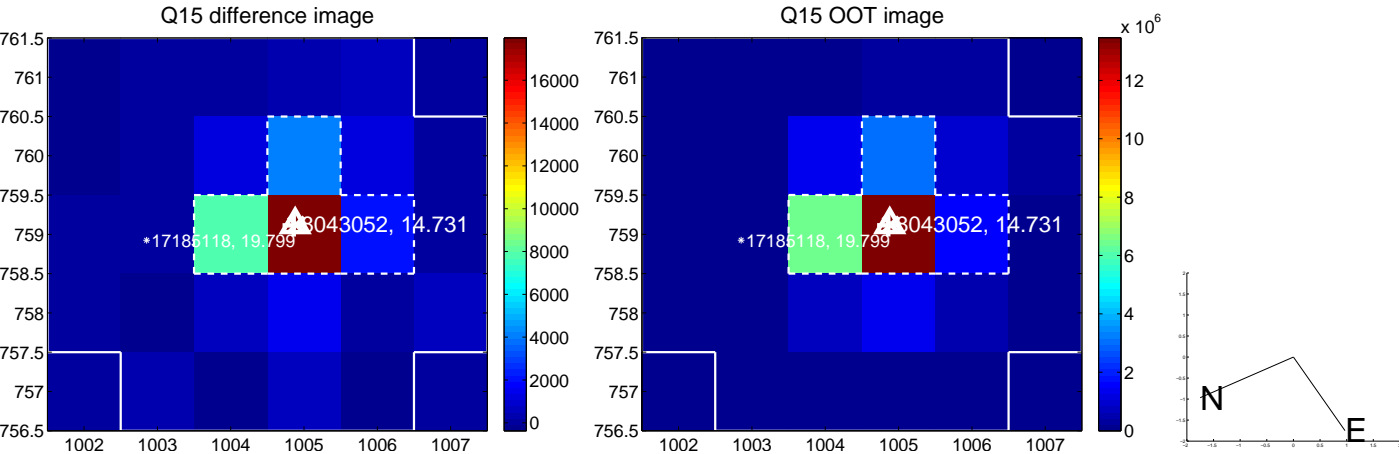
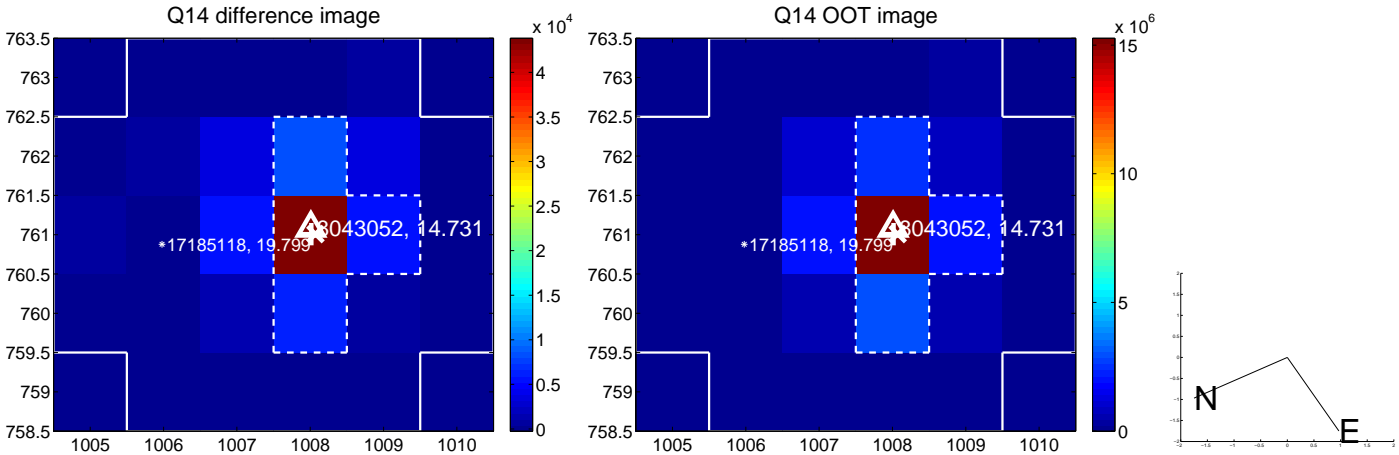
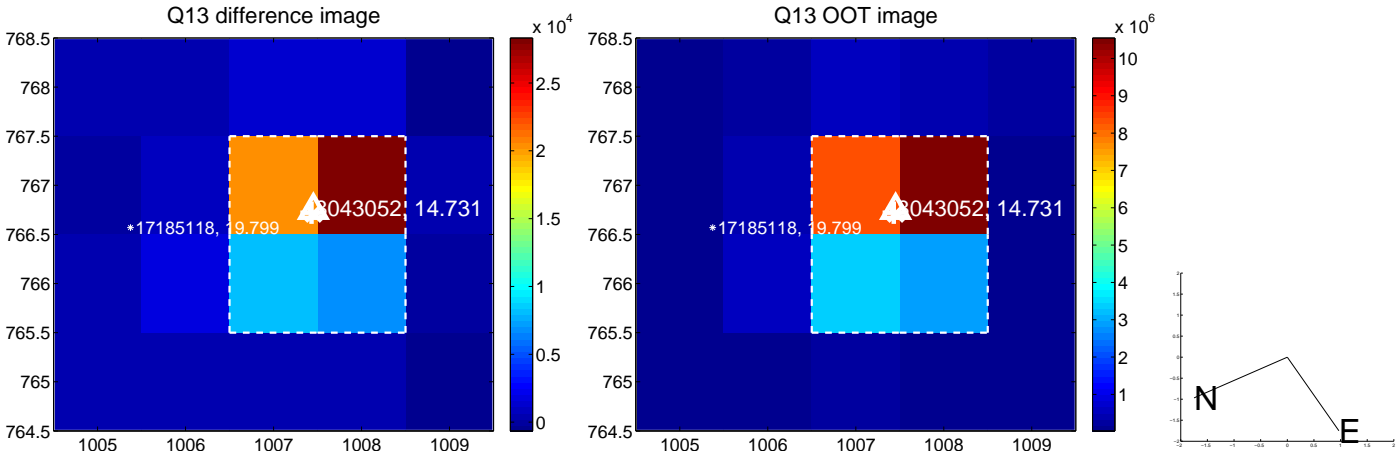
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



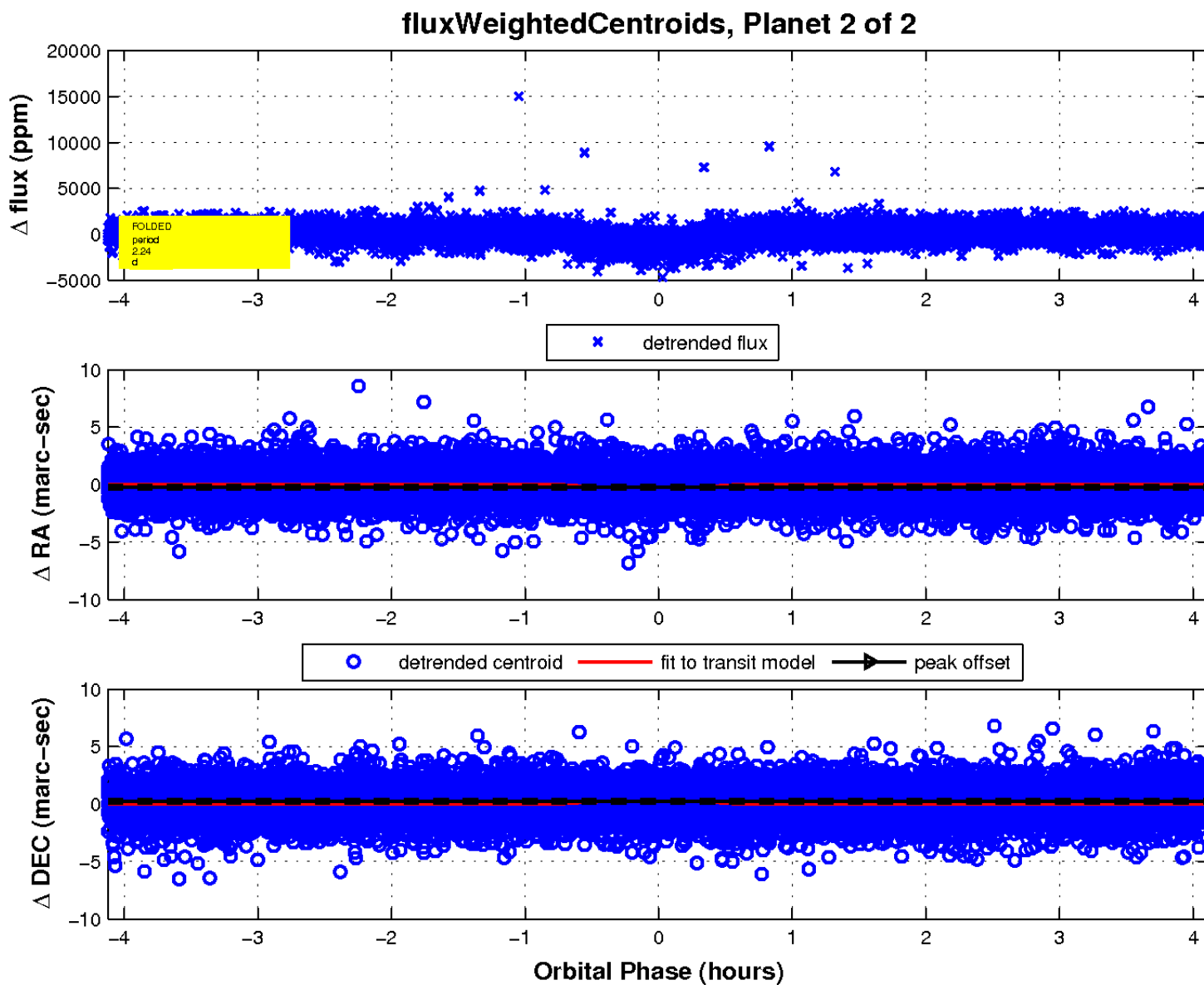
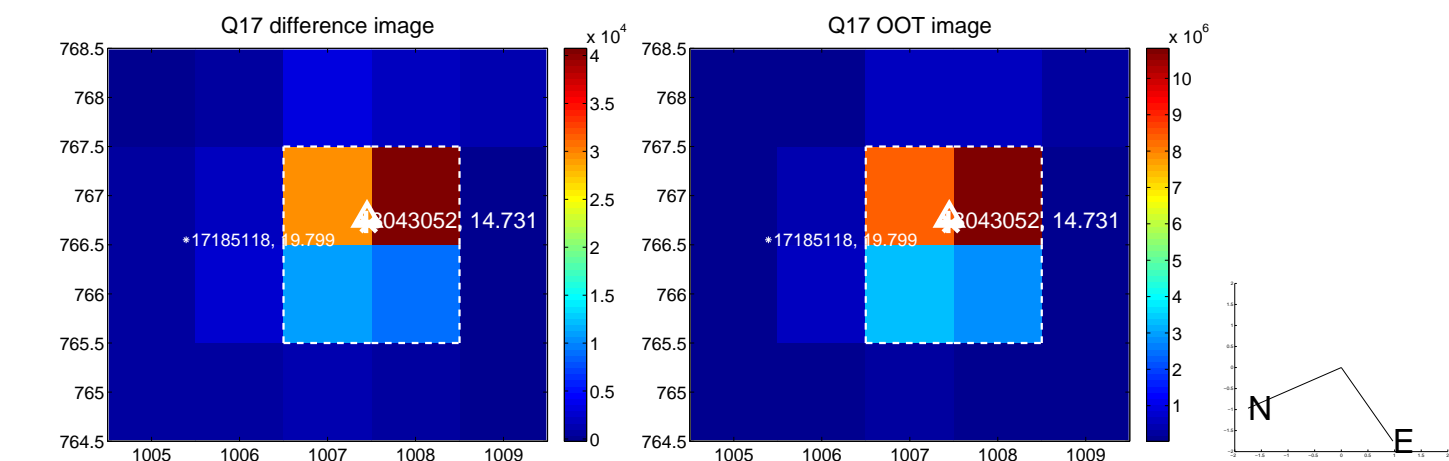
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

