

KIC 010405926

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|------|-----------------------------|-----------------|------------------------|------------------------|
| 010405926-01 | OBS | No | 0.933690 | 131.549238 | 21.5 | 6.021 | 7.6 | 5.5 | 0.74 | 4503 | 0.32 | 680.07 |
| 010405926-02 | OBS | No | 33.912281 | 158.979879 | 545.7 | 4.292 | 9.9 | 11.5 | 0.74 | 4503 | 1.92 | 5.65 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010405926-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 1 | LPP_DV—EPHEM_MATCH |
| 010405926-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—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.

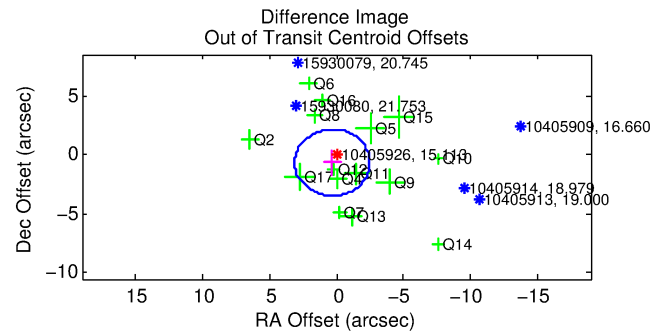
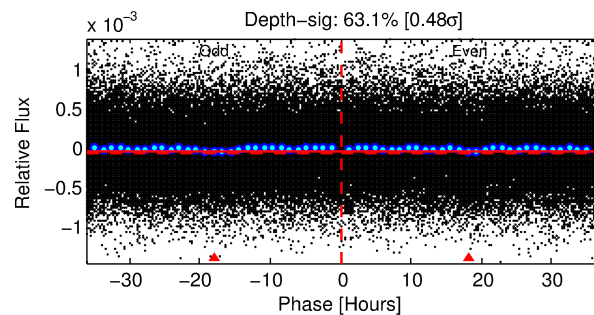
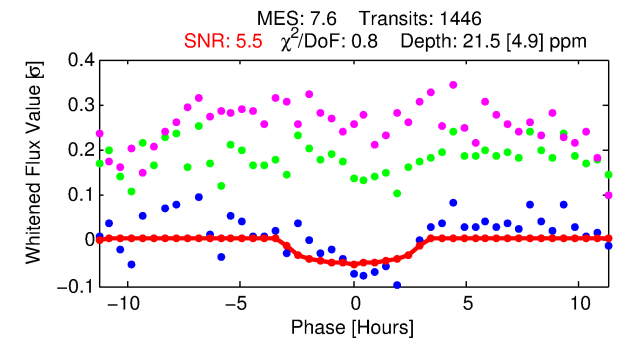
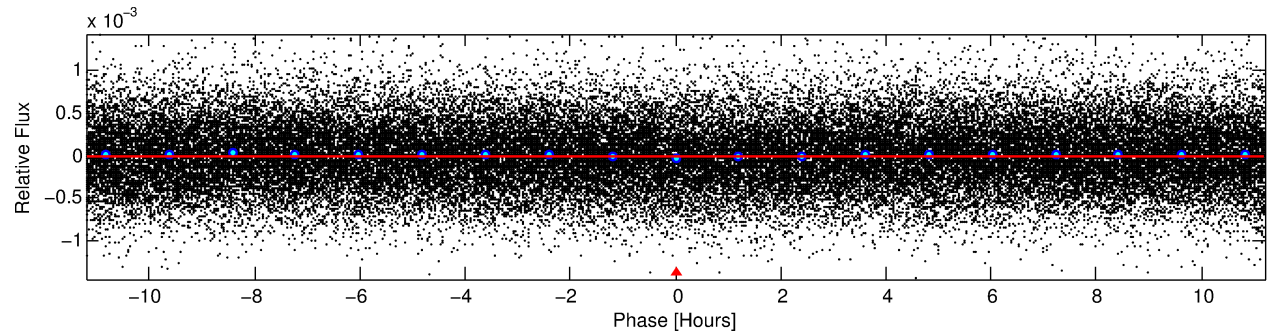
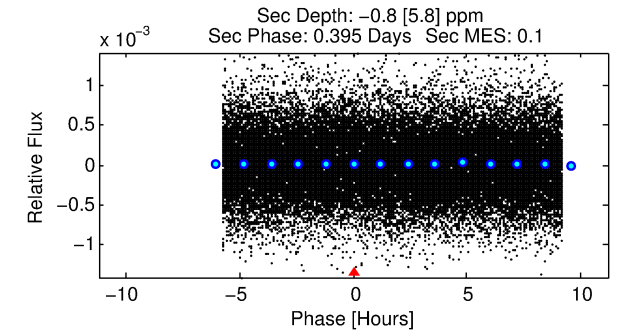
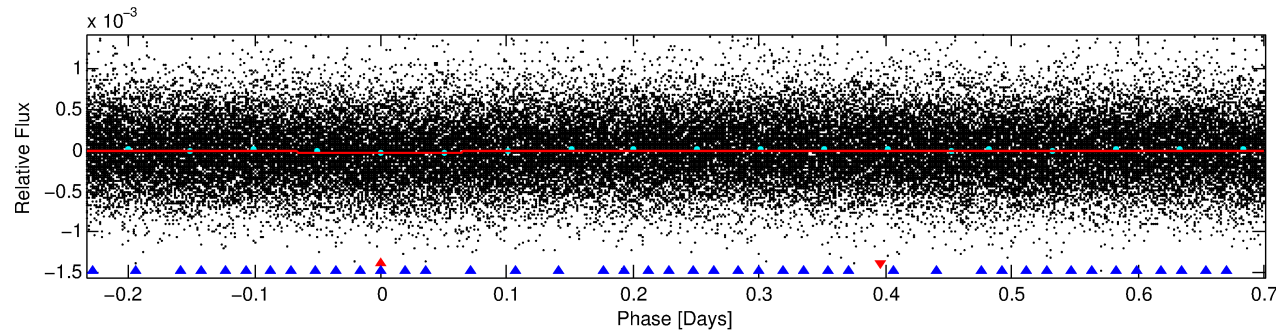
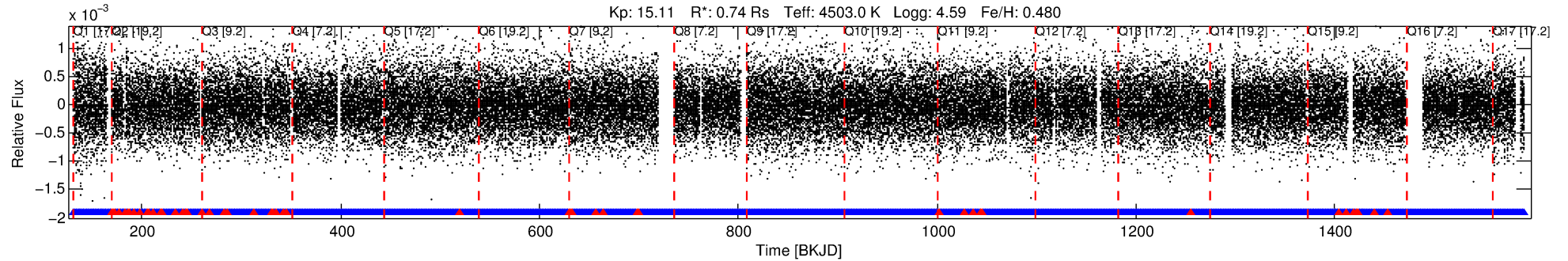
Ephemeris Match Information For 010405926-01

| TCE (1) | KIC | Parent (2) | Parent KIC | $P_1:P_2$ | Dist (") | ΔRow | ΔCol | m_2 | m_1 | D_2/D_1 | Mechanism | Flag | σ_P | σ_T |
|--------------|----------|---------------|------------|-----------|----------|--------------------|--------------------|-------|-------|-----------|------------|------|------------|------------|
| 010405926-01 | 10405926 | V2083-Cyg-pri | 10342012 | 1:2 | 1271.1 | 220 | -232 | 6.90 | 15.11 | 9014.60 | Direct-PRF | 0 | 3.44 | 4.41 |

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 10405926 Candidate: 1 of 2 Period: 0.934 d



DV Fit Results:

Period = 0.93369 [0.00003] d
Epoch = 131.5492 [0.0132] BKJD
Rp/R* = 0.0040 [0.0057]
a/R* = 1.34 [2.33]
b = 0.03 [139.19]
Seff = 680.06 [95.58]
Teff = 1302 [46] K
Rp = 0.32 [0.46] Re
a = 0.0171 [0.0009] AU
Ag = N/A
Teffp = N/A

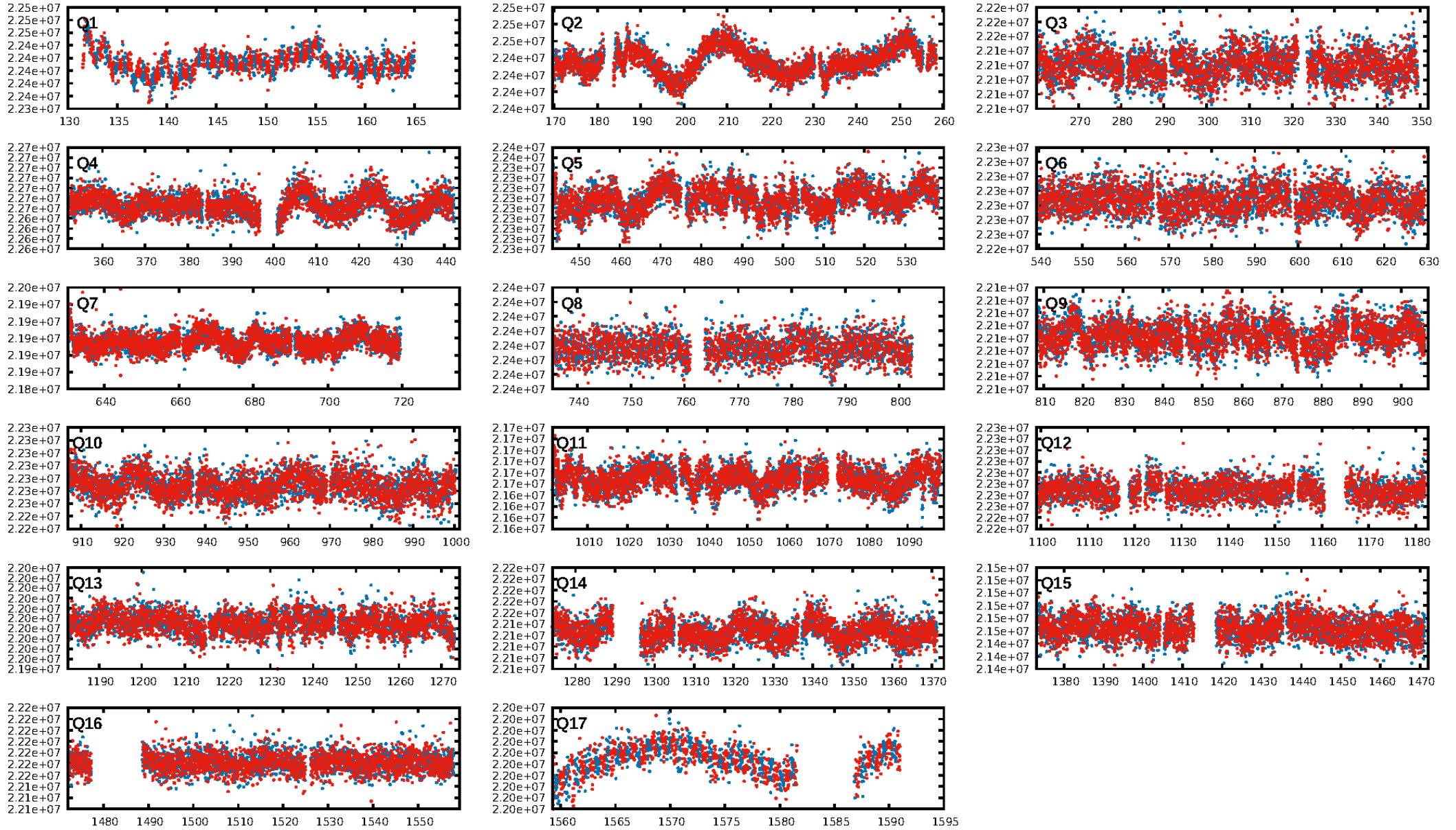
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [107.04 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.02e-07
RollingBand-fgt: 0.96 [1326/1380]
GhostDiagnostic-chr: -0.2788
Centroid-sig: 0.8%
Centroid-so: 4.492 arcsec [1.86 σ]
OotOffset-rm: 0.722 arcsec [0.77 σ]
KicOffset-rm: 0.866 arcsec [0.91 σ]
OotOffset-st: 4/3/4/4 [15]
KicOffset-st: 4/3/4/4 [15]
DiffImageQuality-fgm: 0.13 [2/15]
DiffImageOverlap-fno: 1.00 [17/17]

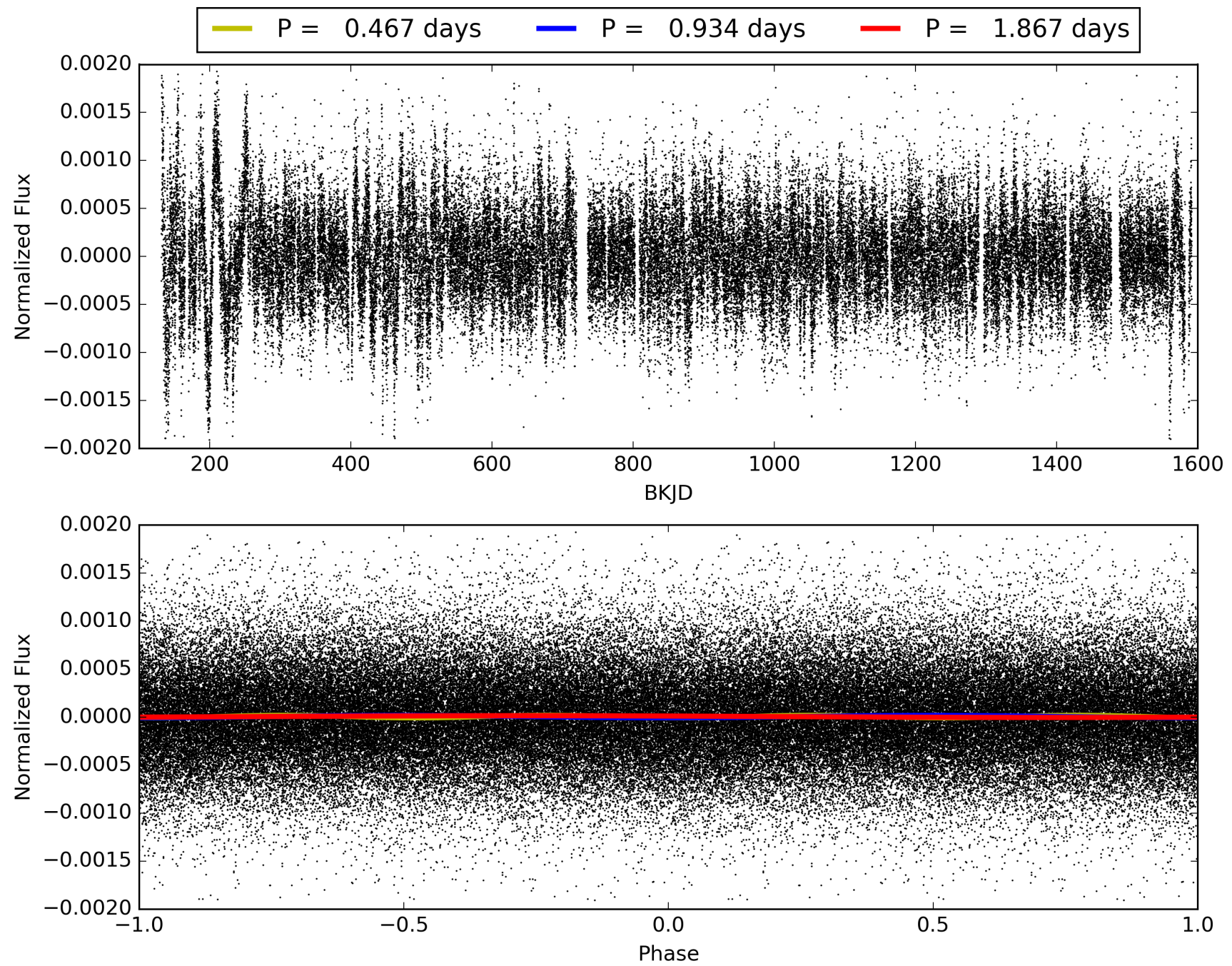
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 07:20:27 Z

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

TCE 010405926-01, PDC Light Curves

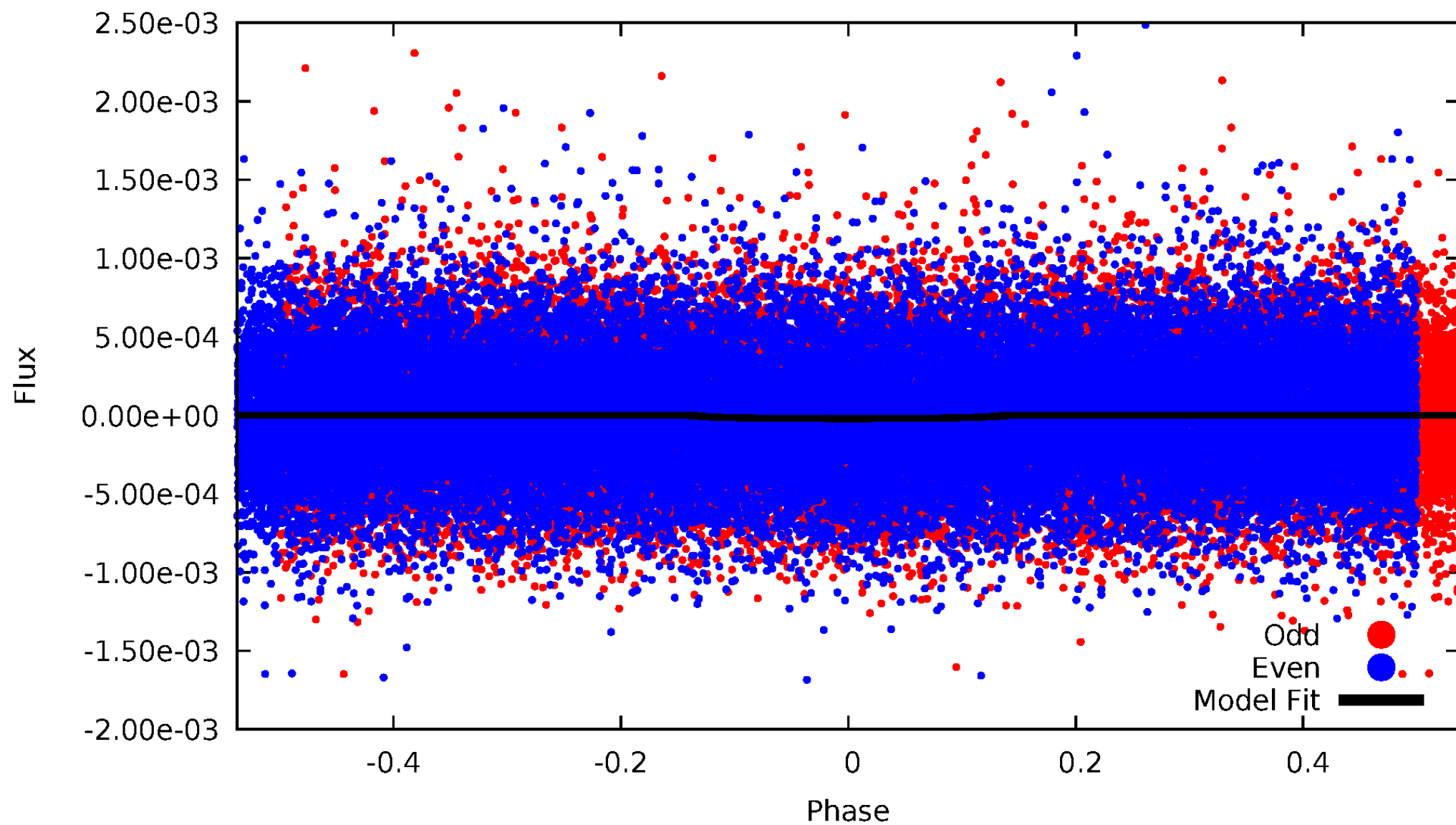


TCE 010405926-01



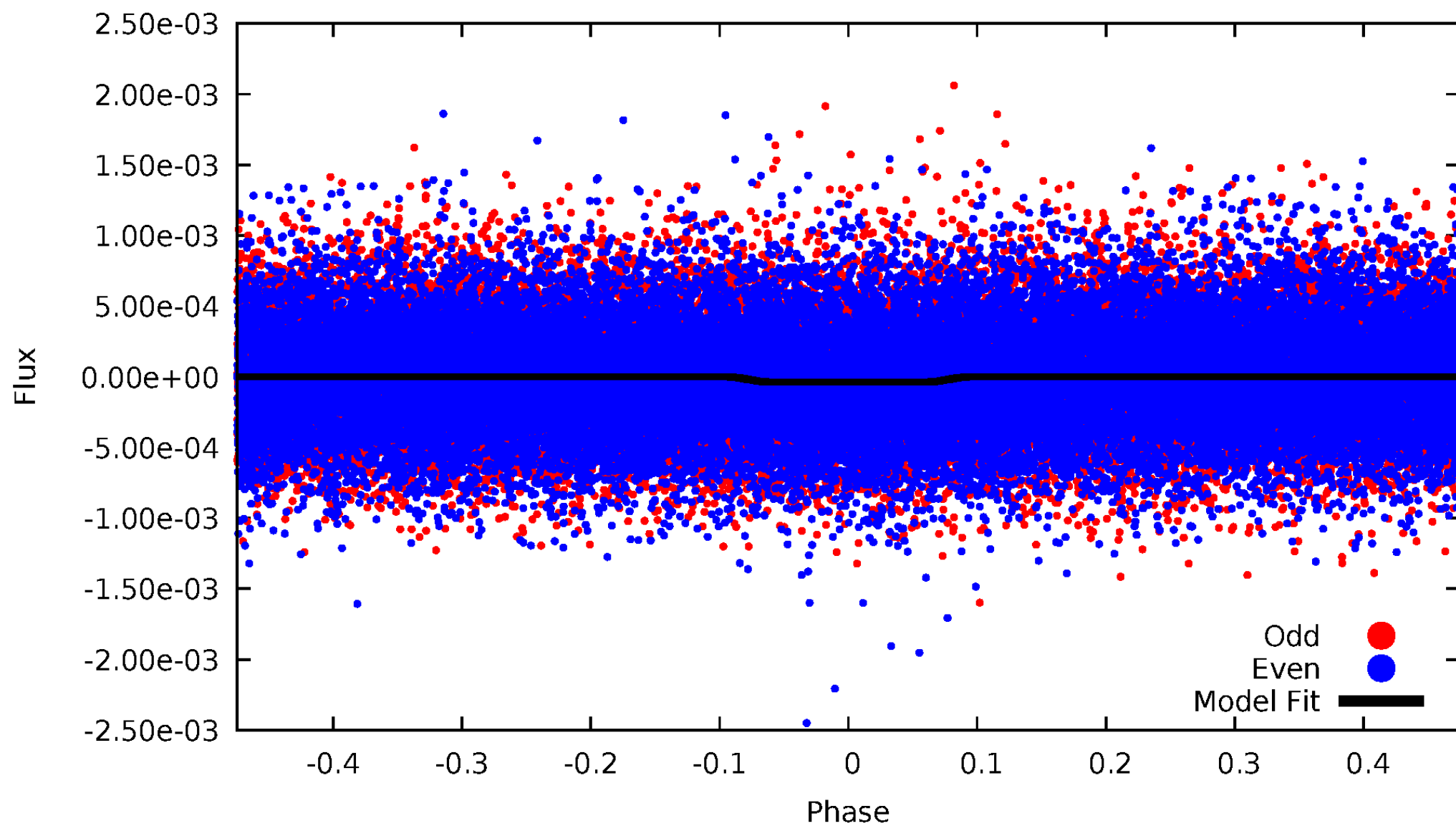
DV Odd/Even

TCE 010405926-01



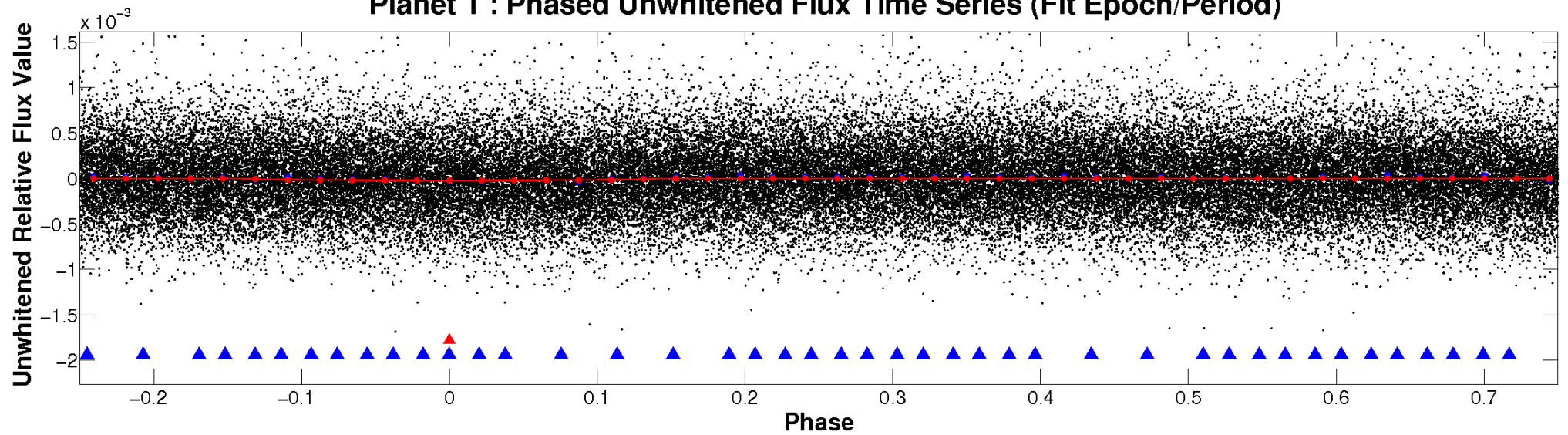
ALT Odd/Even

TCE 010405926-01

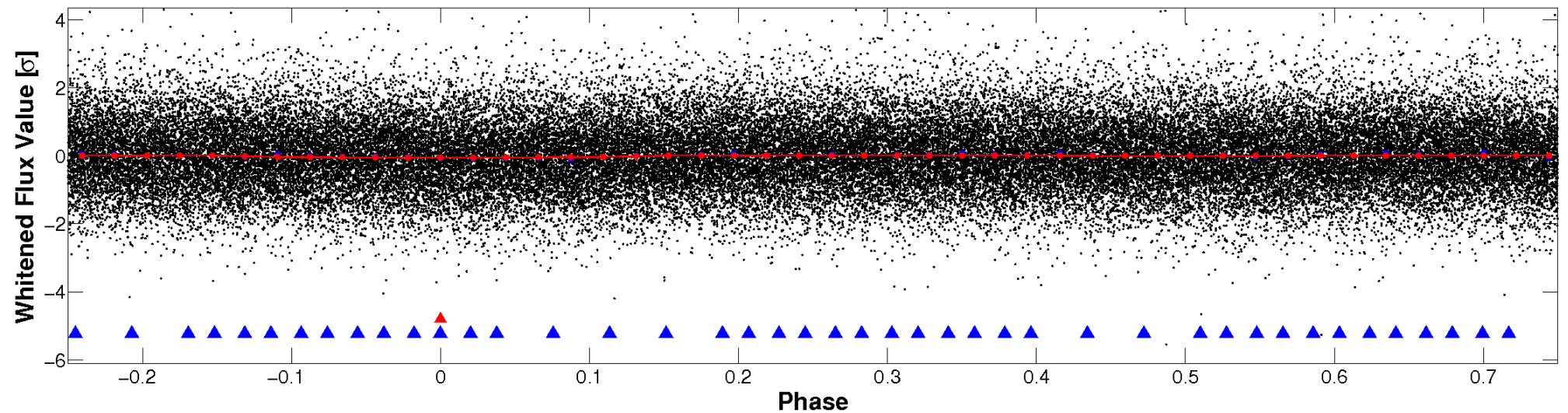


Non-Whitened Vs. Whitened Light Curve

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

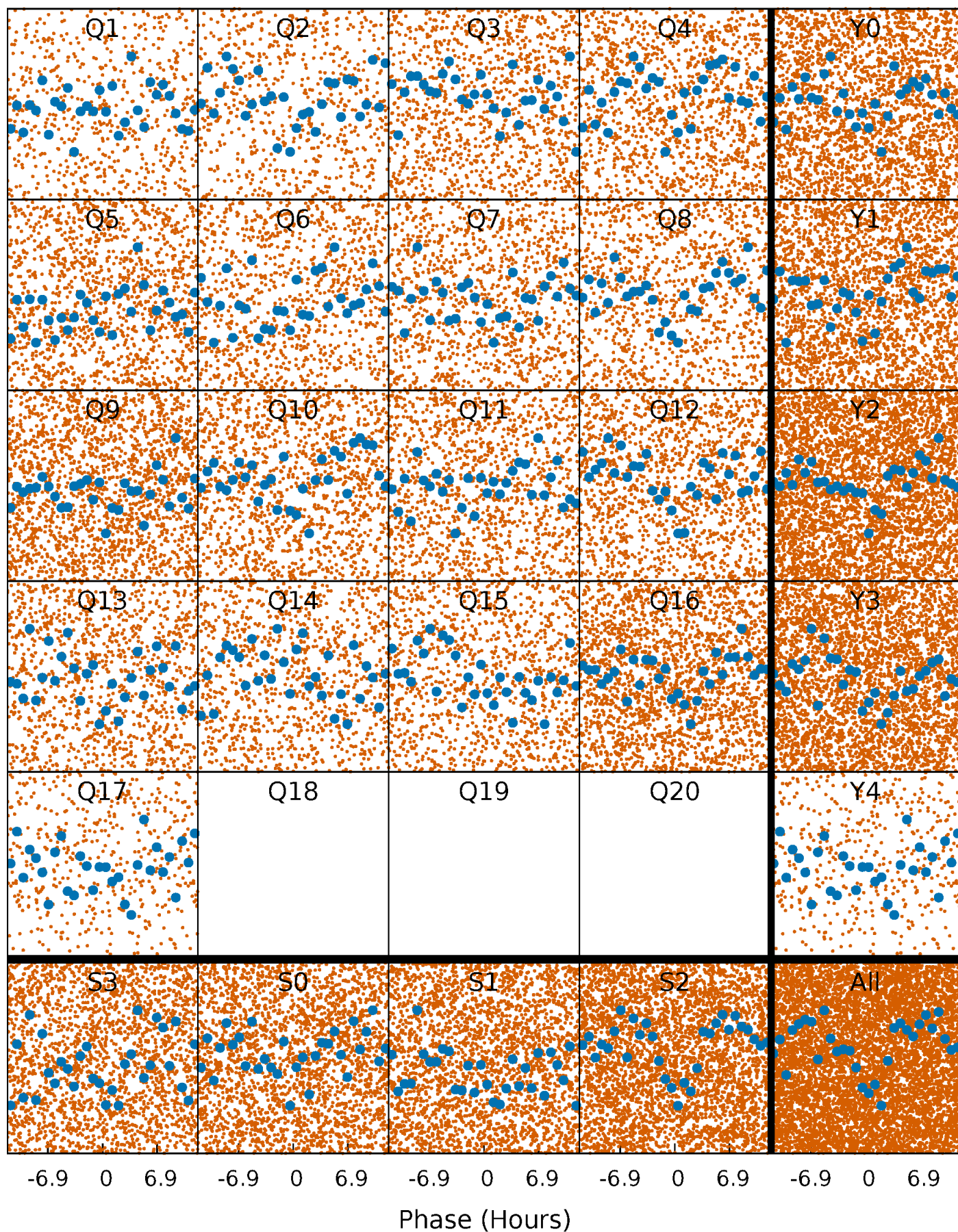


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



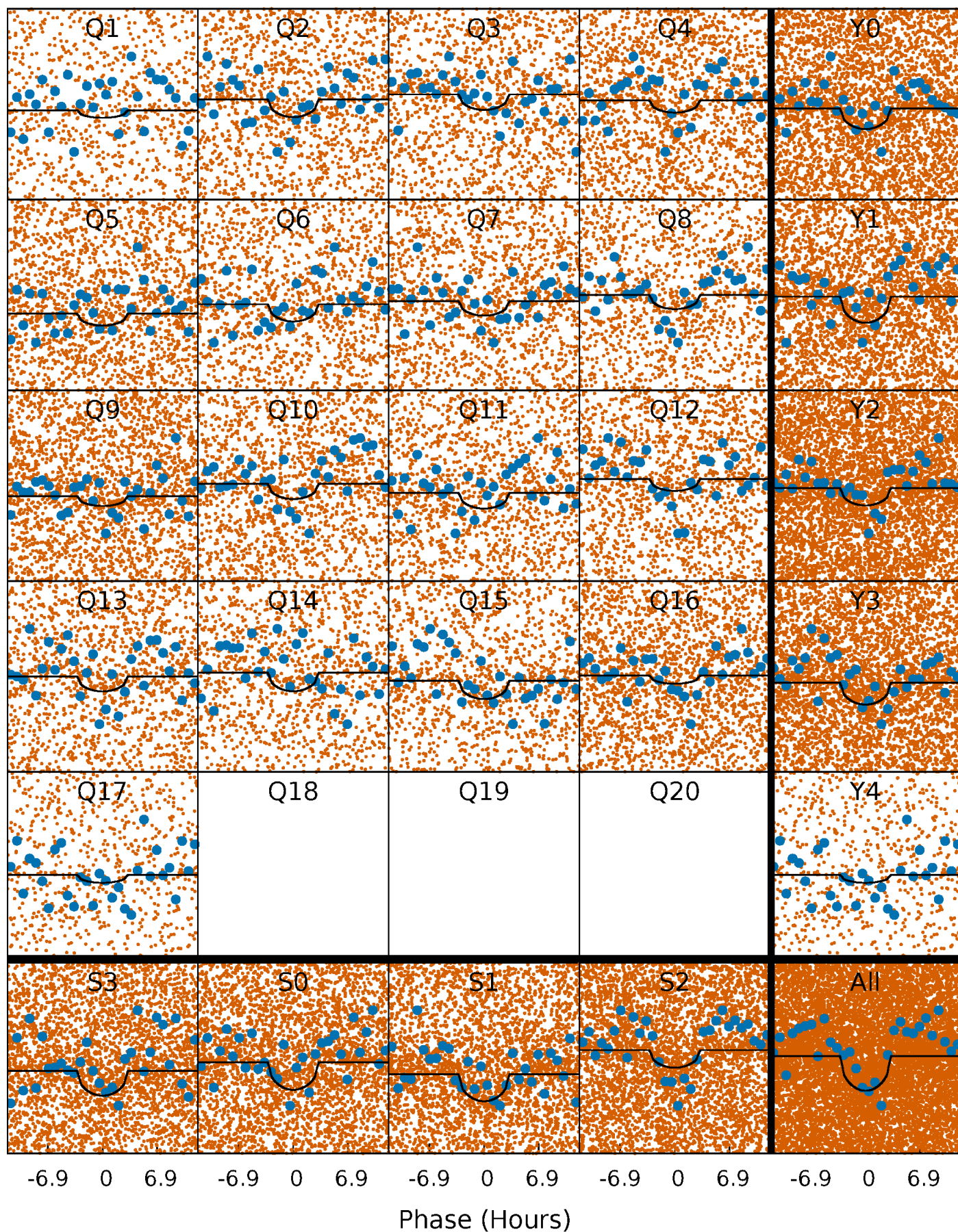
PDC Quarter-Phased Transit Curves

TCE 010405926-01 P= 0.933690 Days $T_0=131.549238$ (BKJD)



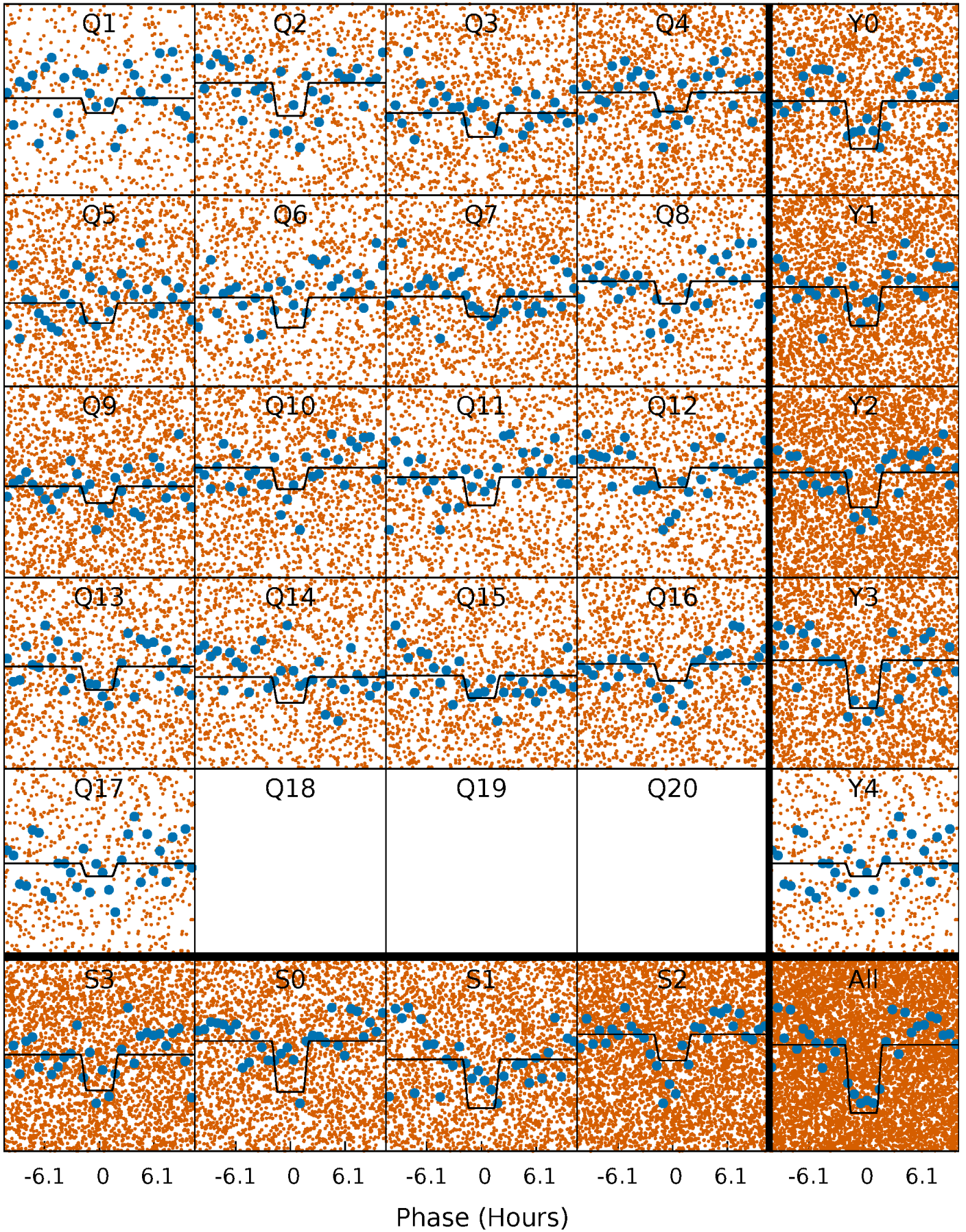
DV Quarter-Phased Transit Curves

TCE 010405926-01 P= 0.933690 Days $T_0=131.549238$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

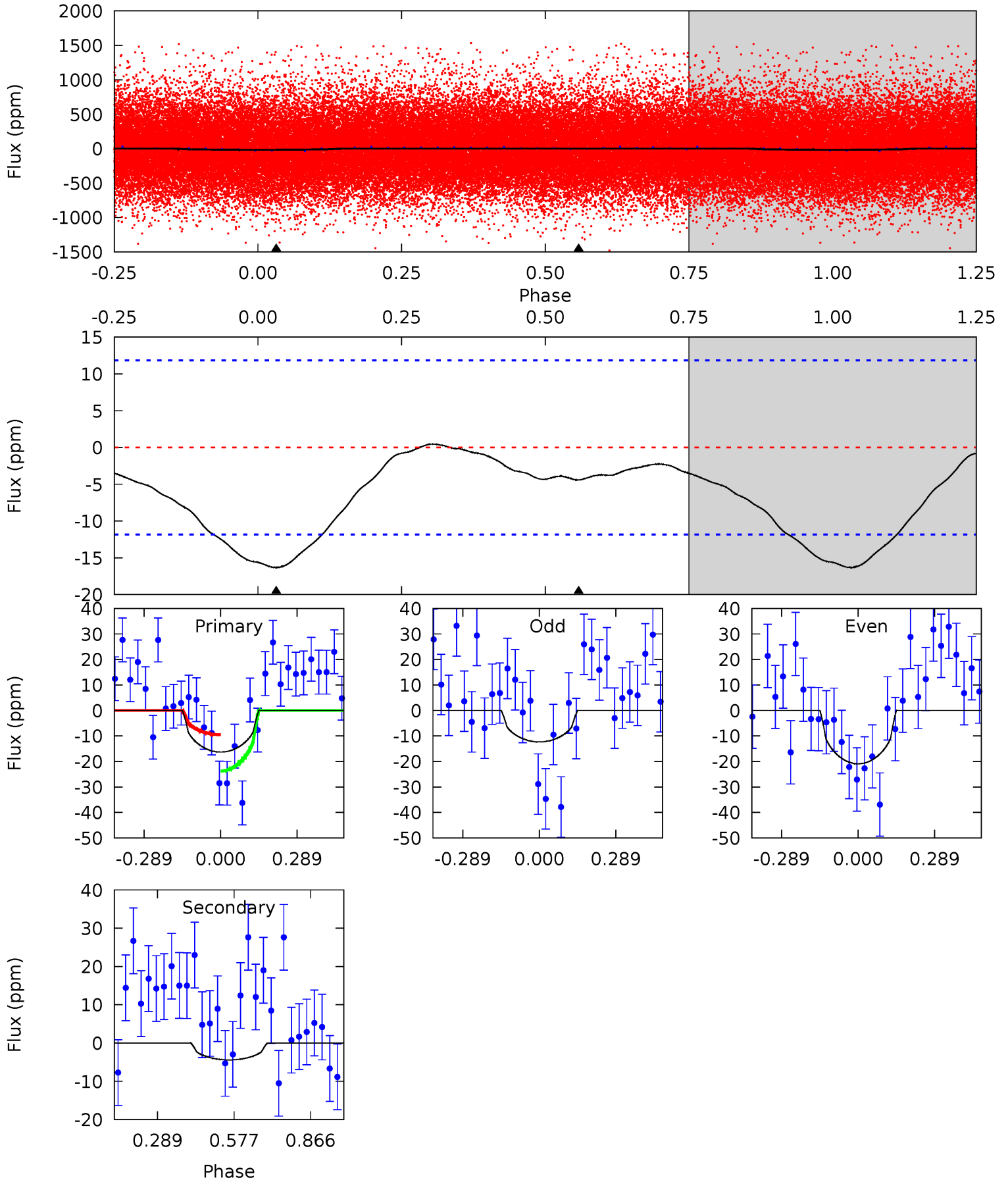
TCE 010405926-01 P= 0.933740 Days $T_0=131.542240$ (BKJD)



DV Model-Shift Uniqueness Test

010405926-01, P = 0.933690 Days, E = 130.615548 Days

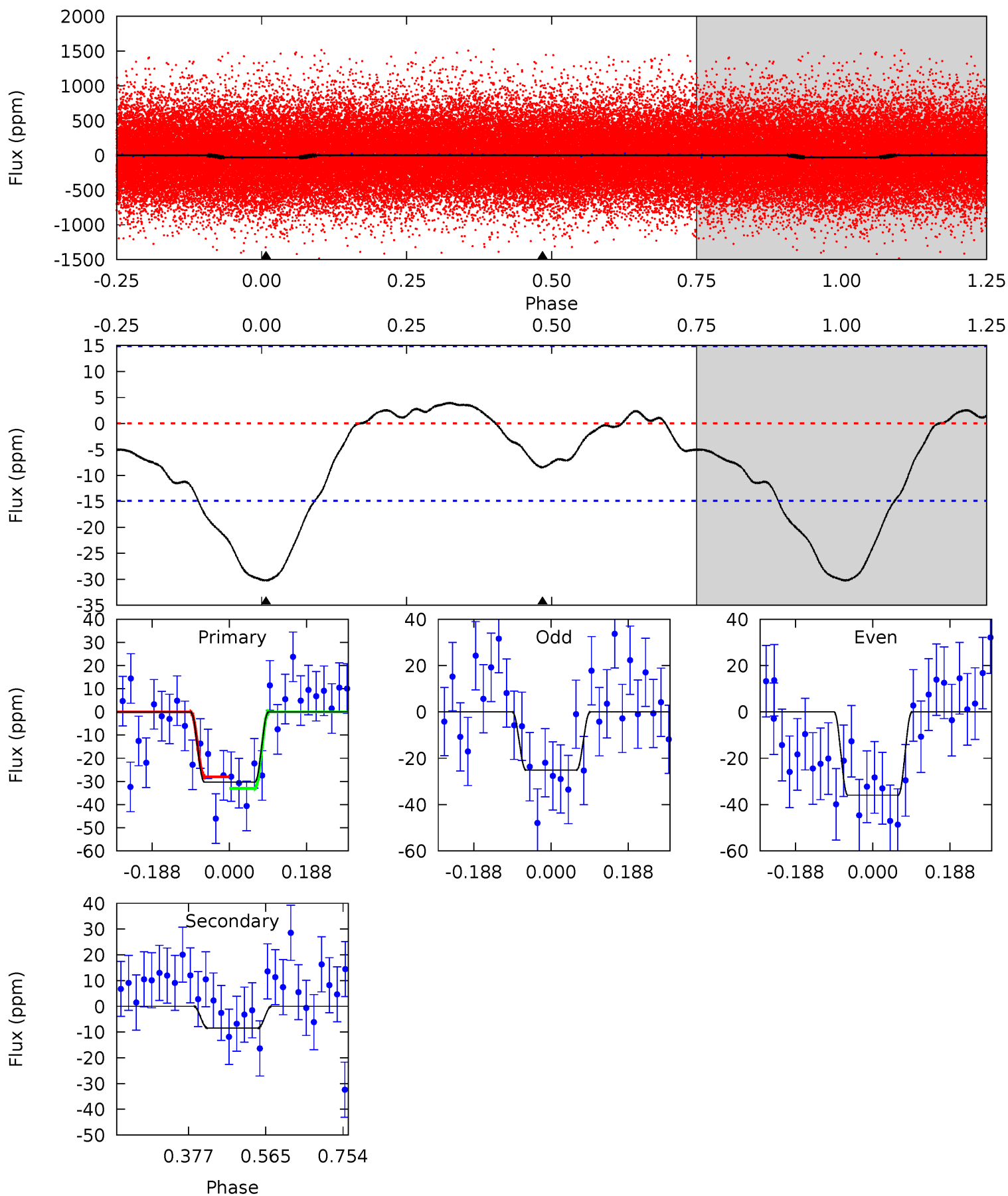
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 5.98 | 1.62 | 0 | 0 | 4.34 | 1.06 | 0.79 | 5.98 | 5.98 | 1.62 | 1.62 | 1.57 | 0.93 | 0.03 | 2.63 |



Alt Model-Shift Uniqueness Test

010405926-01, P = 0.933740 Days, E = 130.608500 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.01 | 2.52 | 0 | 0 | 4.43 | 1.32 | 1.13 | 9.01 | 9.01 | 2.52 | 2.52 | 1.61 | 0.92 | 0.12 | 0.74 |



Stellar Parameters For KIC 010405926

| | $T_{\text{eff}}(K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 4503^{+137}_{-137} | $4.590^{+0.036}_{-0.027}$ | $0.480^{+0.050}_{-0.250}$ | $0.736^{+0.029}_{-0.048}$ | $0.768^{+0.028}_{-0.052}$ | $2.716^{+0.438}_{-0.239}$ |
| | +3%/-3% | +1%/-1% | +10%/-52% | +4%/-7% | +4%/-7% | +16%/-9% |
| 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 010405926-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|-----------------------|----------------------------|
| DV | -4 ± 3 | $0.47^{+0.40}_{-0.31}$ | 1821^{+57}_{-59} | 3039^{+1367}_{-674} | $2.665^{+20.224}_{-2.060}$ |
| Alt. | -8 ± 3 | $0.55^{+0.43}_{-0.34}$ | 1818^{+56}_{-60} | 3285^{+1332}_{-586} | $4.175^{+22.958}_{-2.901}$ |

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

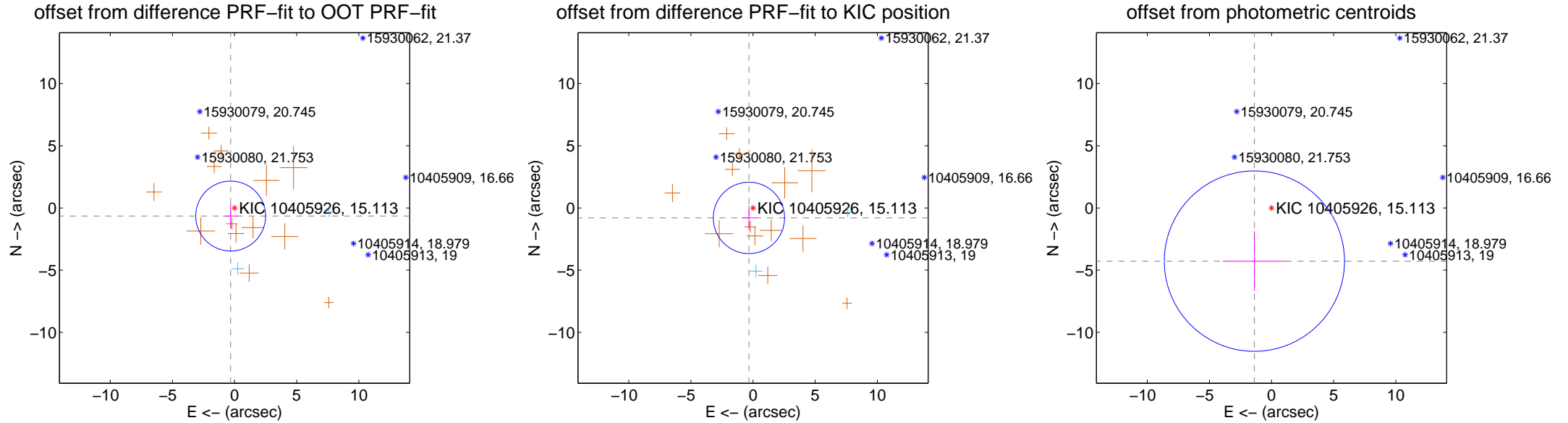
DV Centroid Data

Supplemental centroid analysis for 010405926-01. Kepler magnitude: 15.11. Transit SNR 5.46

There are 2 quarters with good PRF difference image offsets

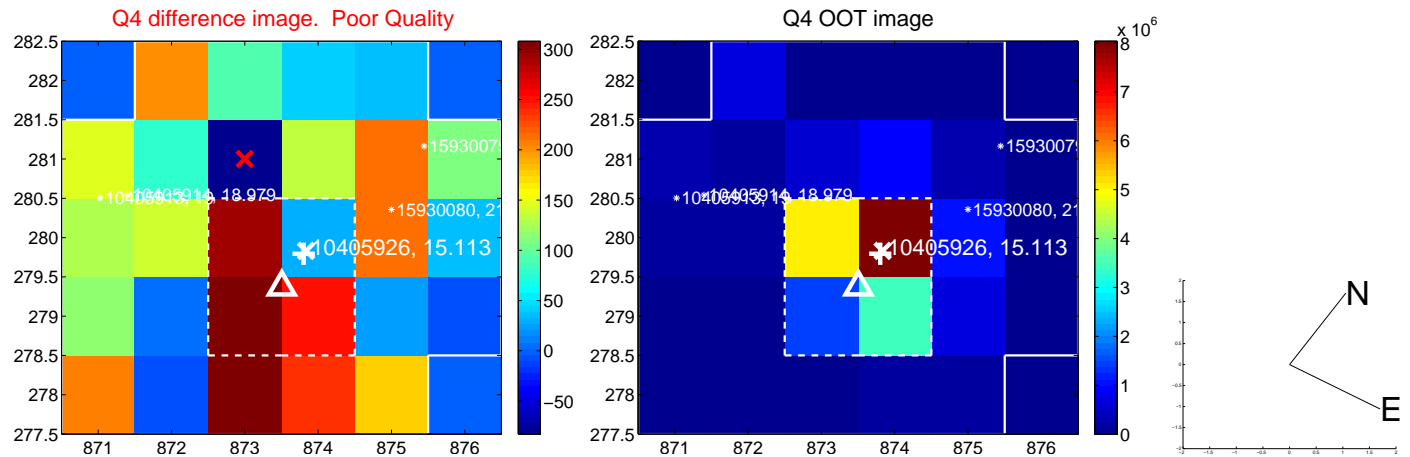
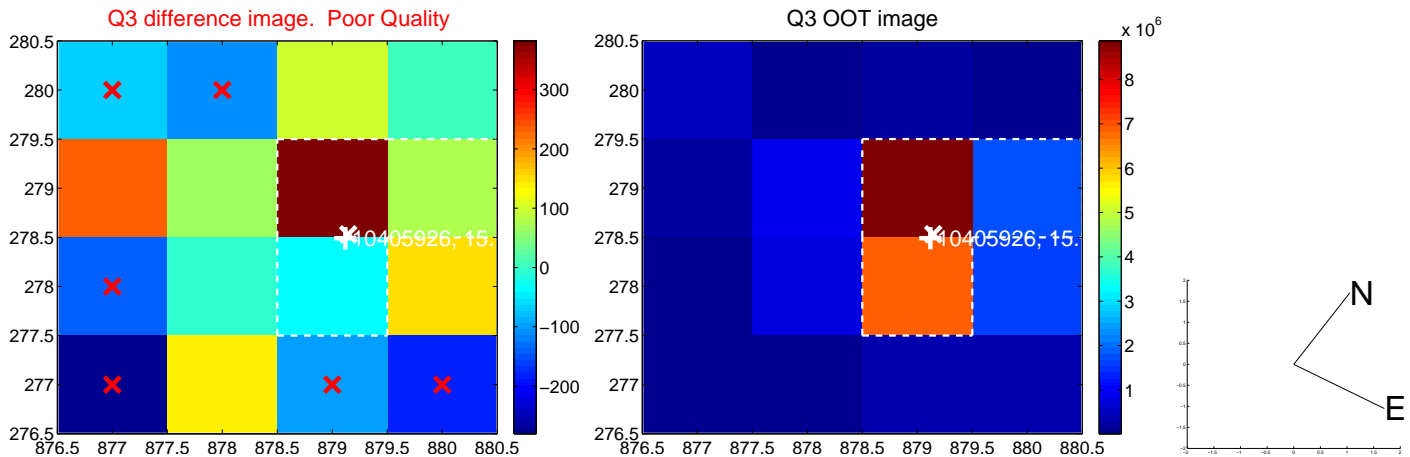
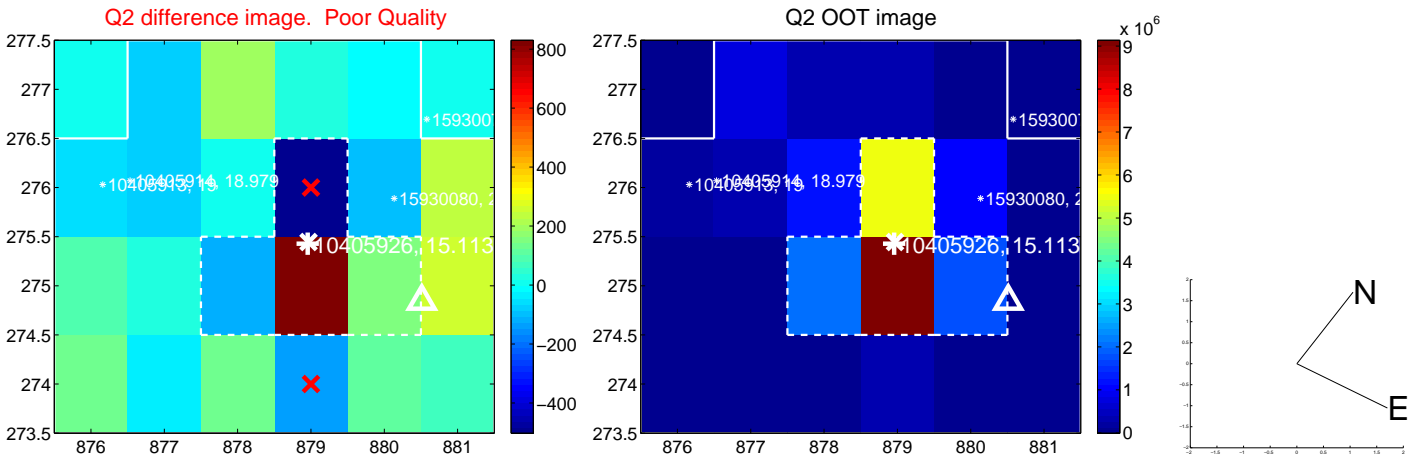
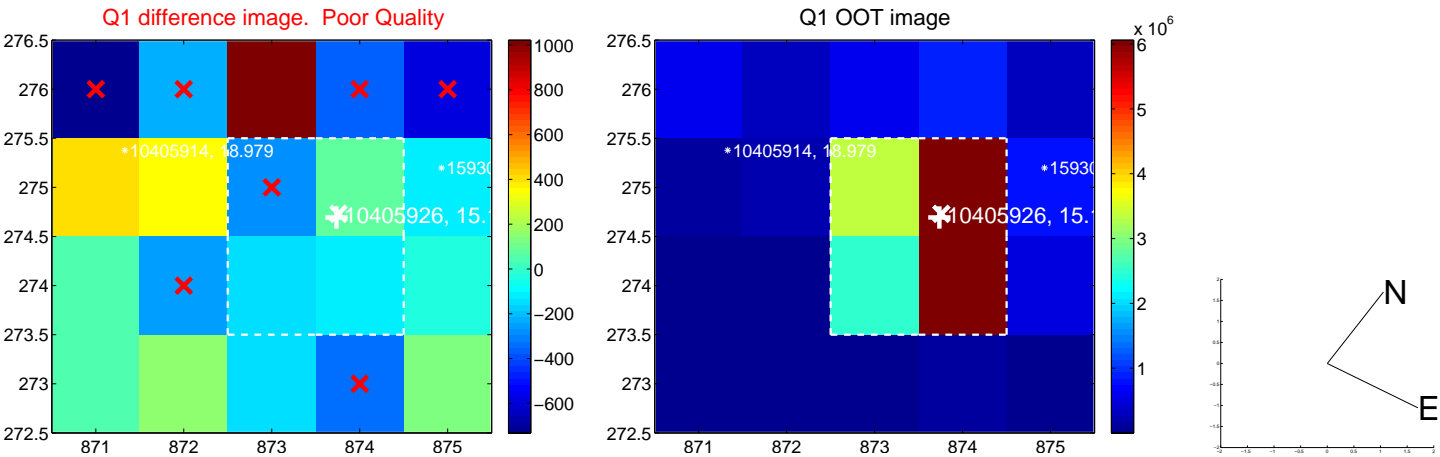
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.722 ± 0.936 | 0.77 | 0.314 ± 0.611 | -0.650 ± 0.997 |
| PRF-fit source offset from KIC position | 0.866 ± 0.956 | 0.91 | 0.332 ± 0.614 | -0.800 ± 1.003 |
| photometric centroid source offset | 4.49 ± 2.42 | 1.86 | 1.38 ± 2.54 | -4.28 ± 2.40 |

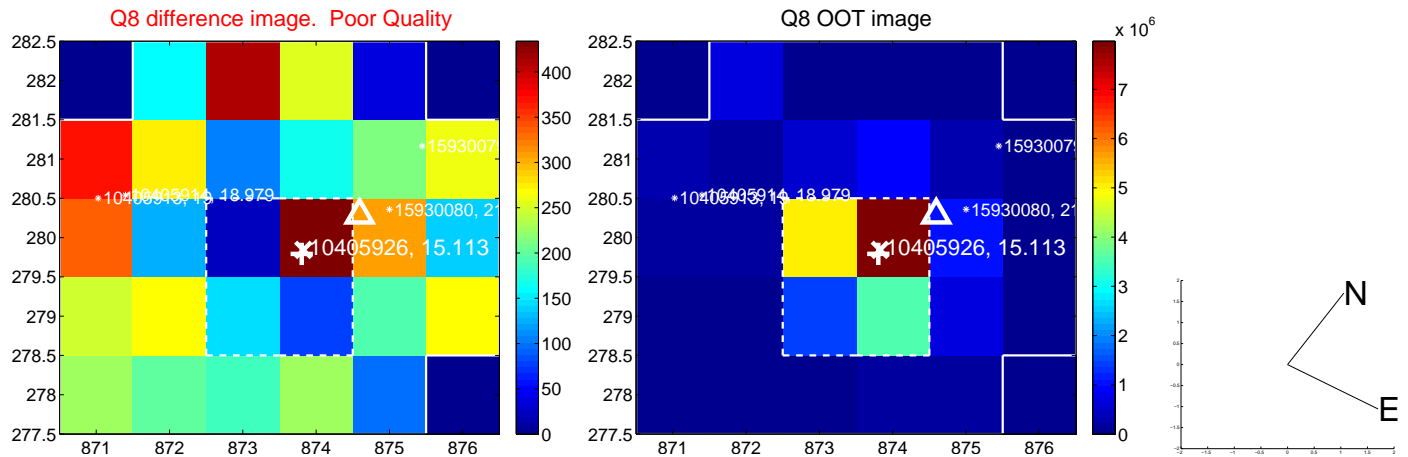
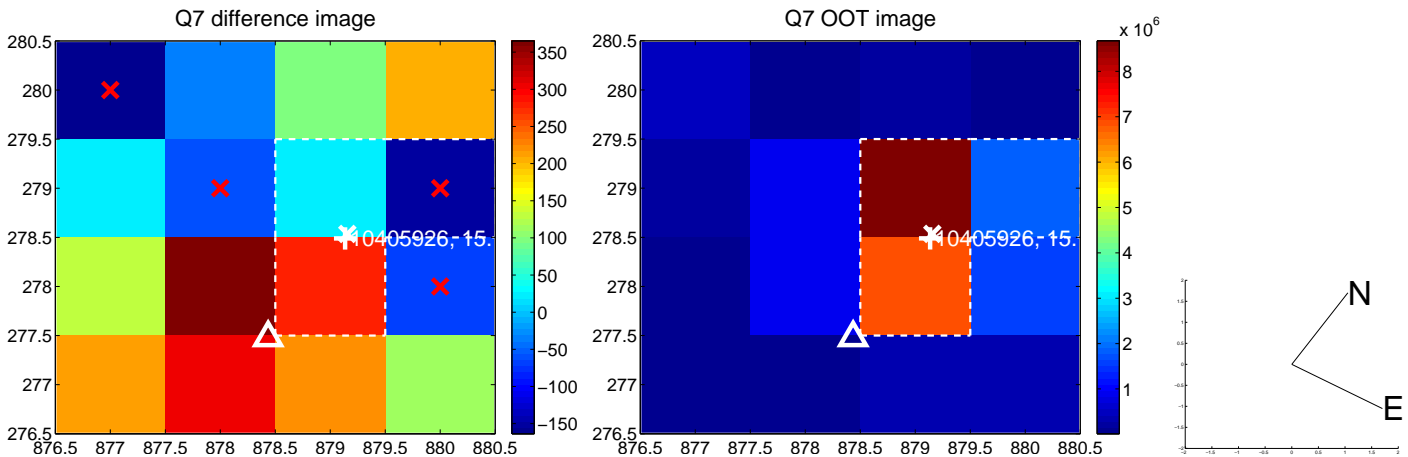
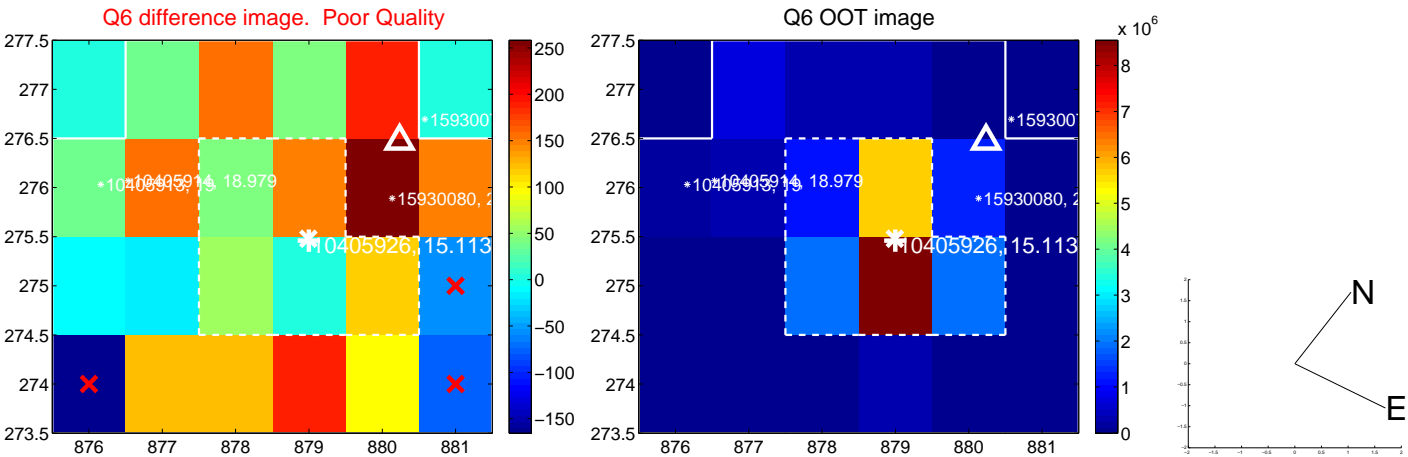
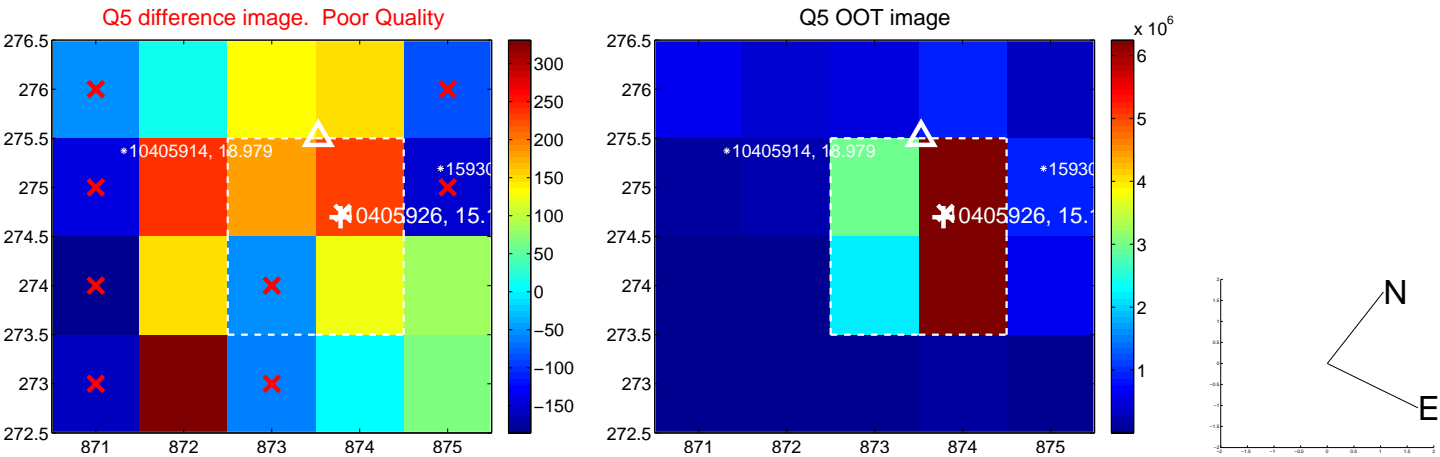


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

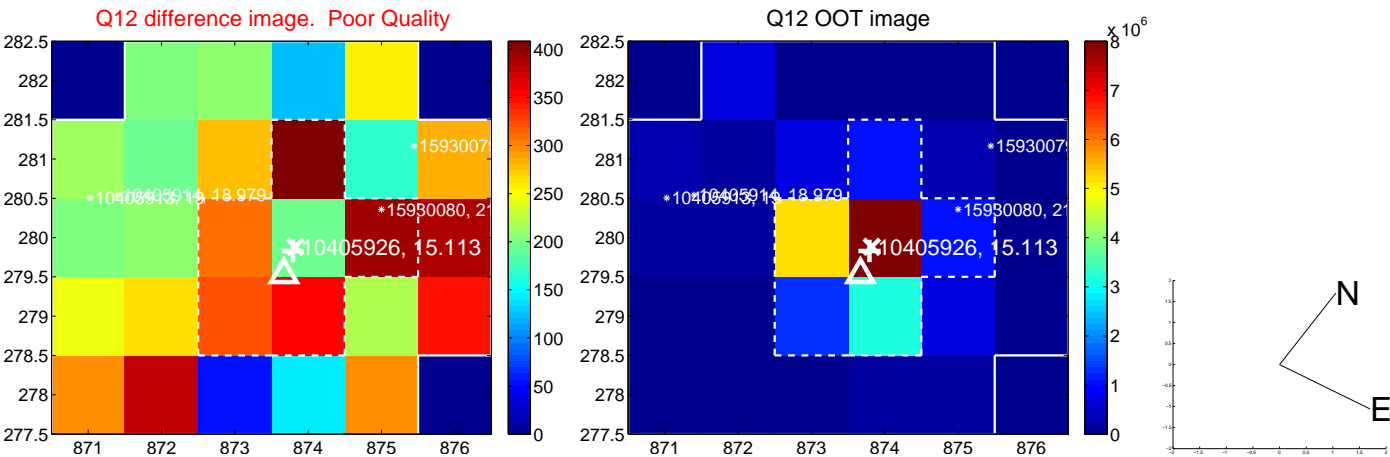
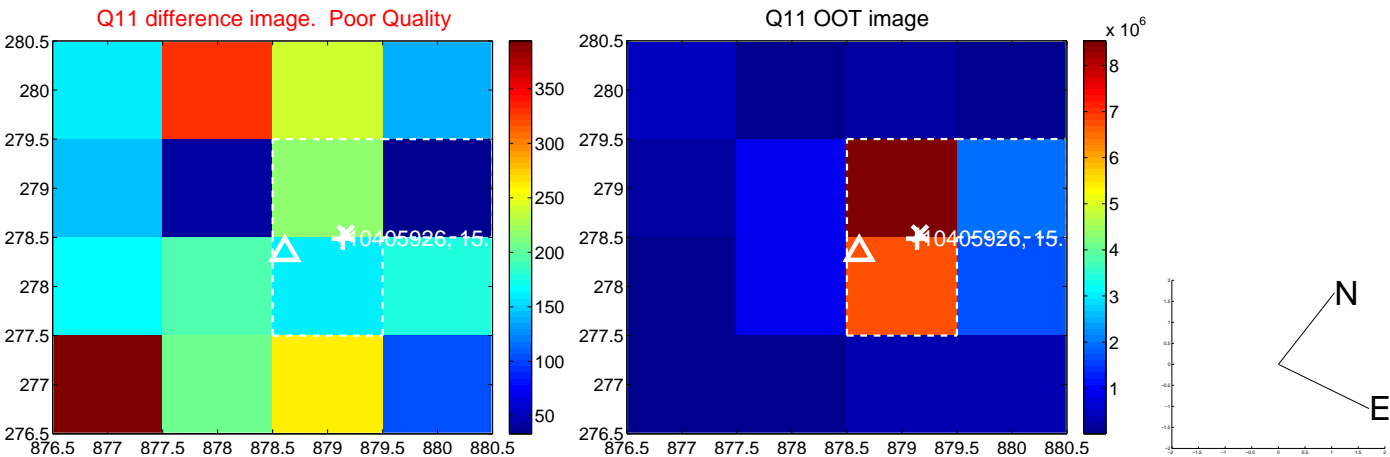
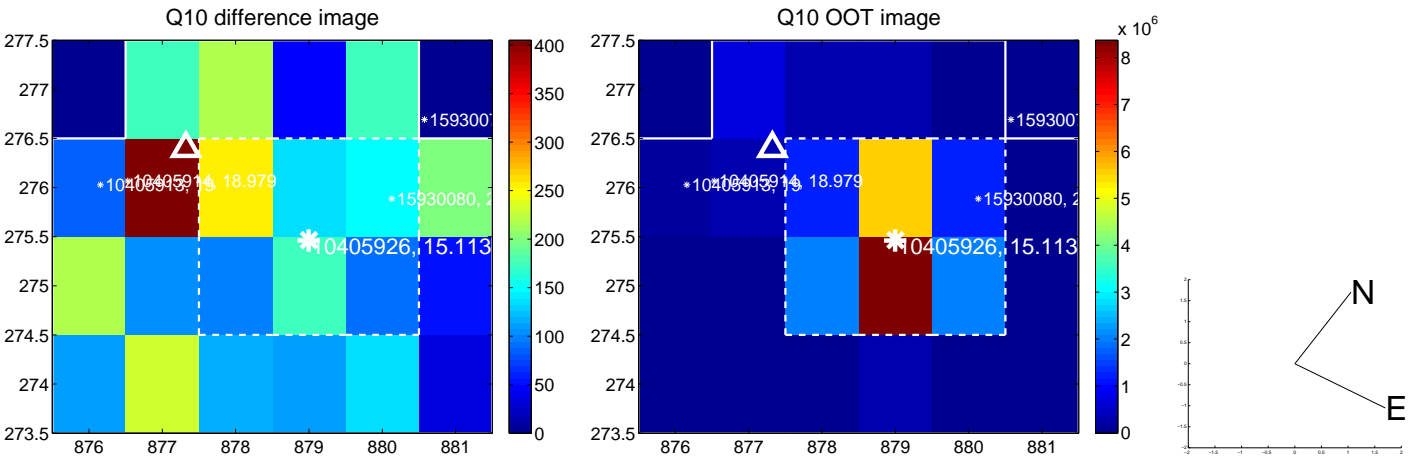
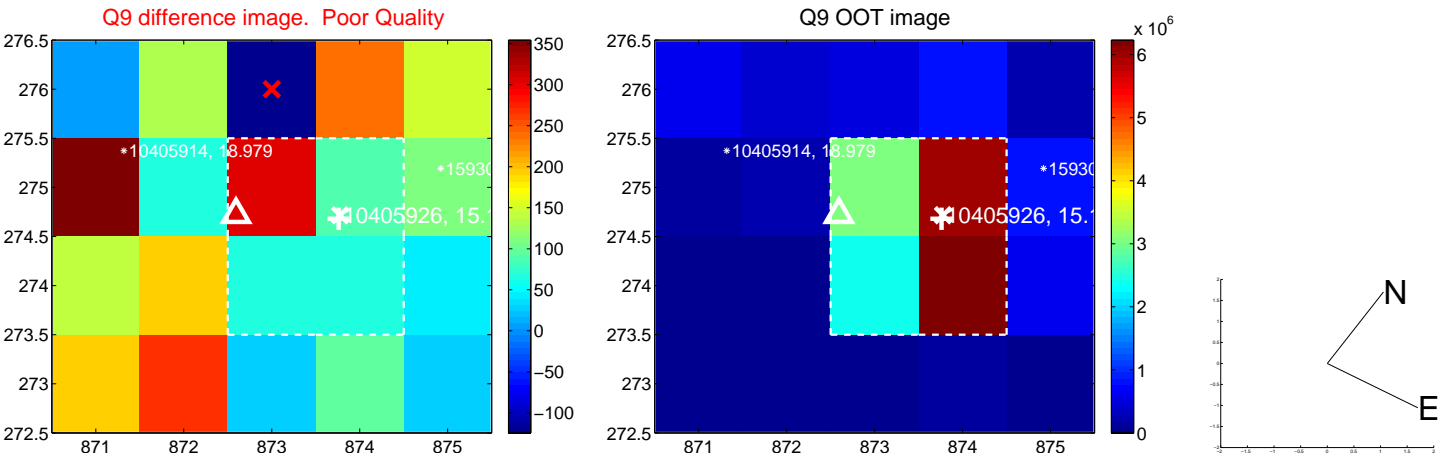
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



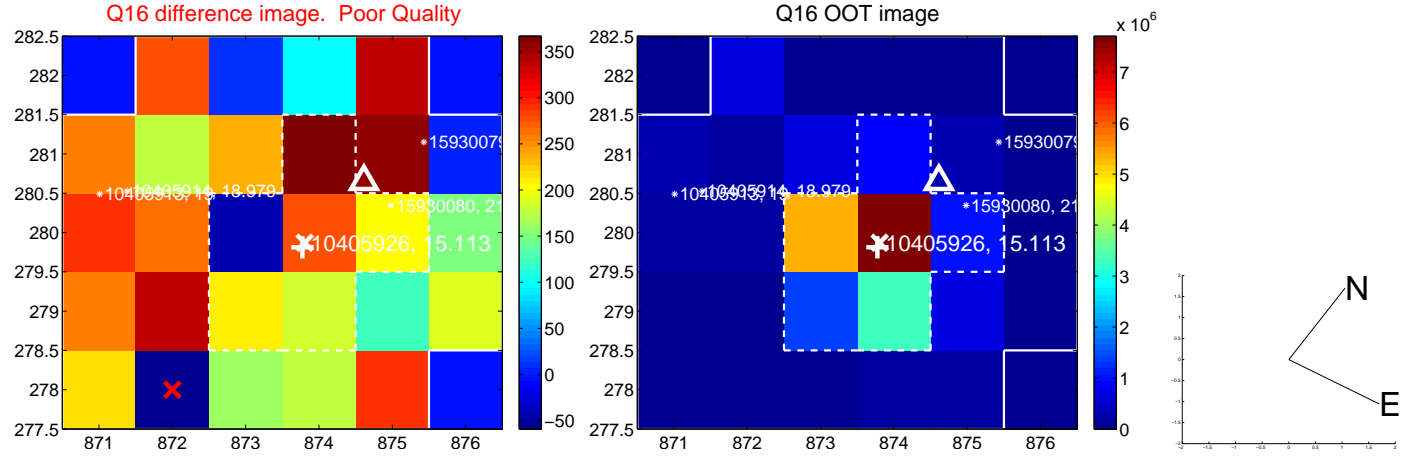
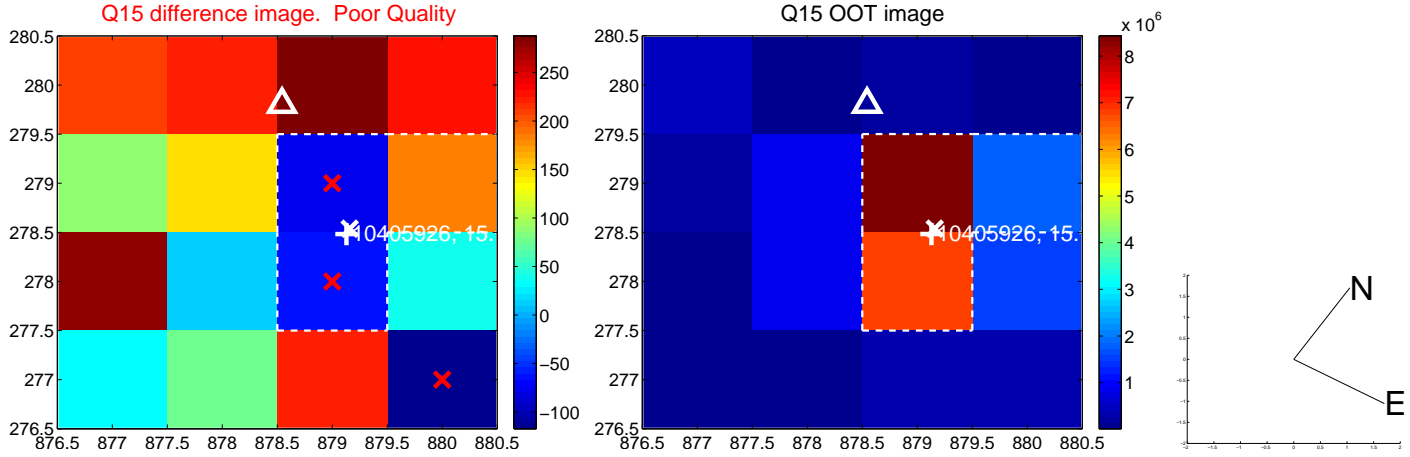
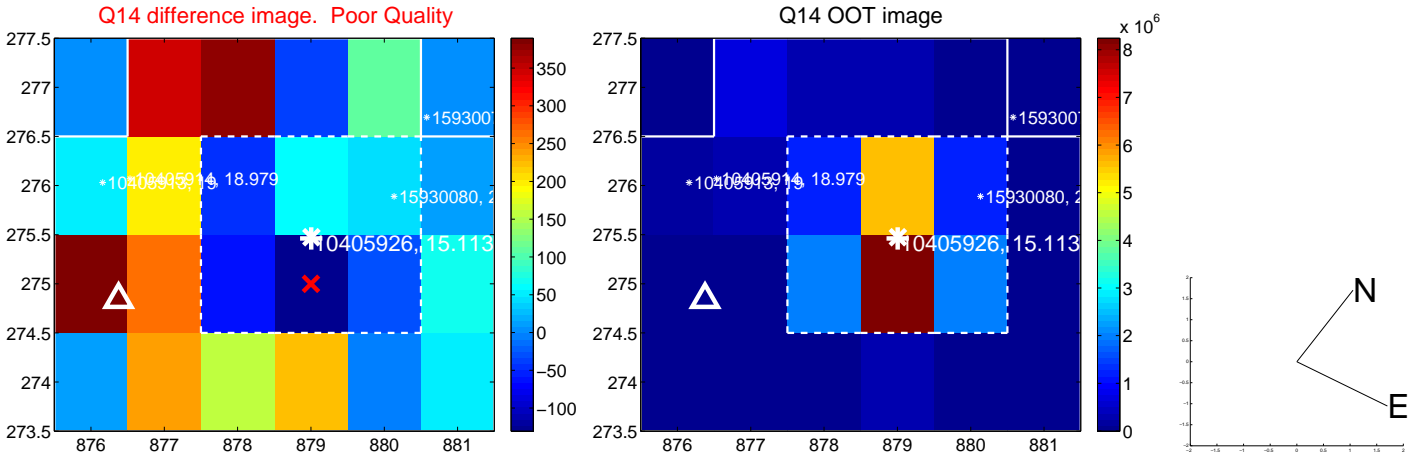
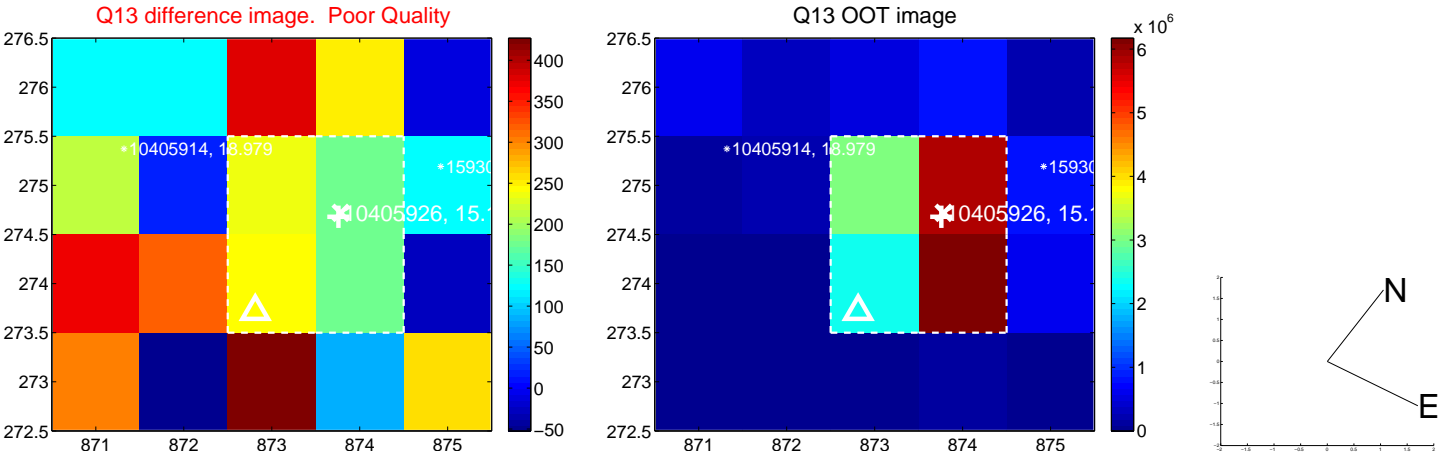
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



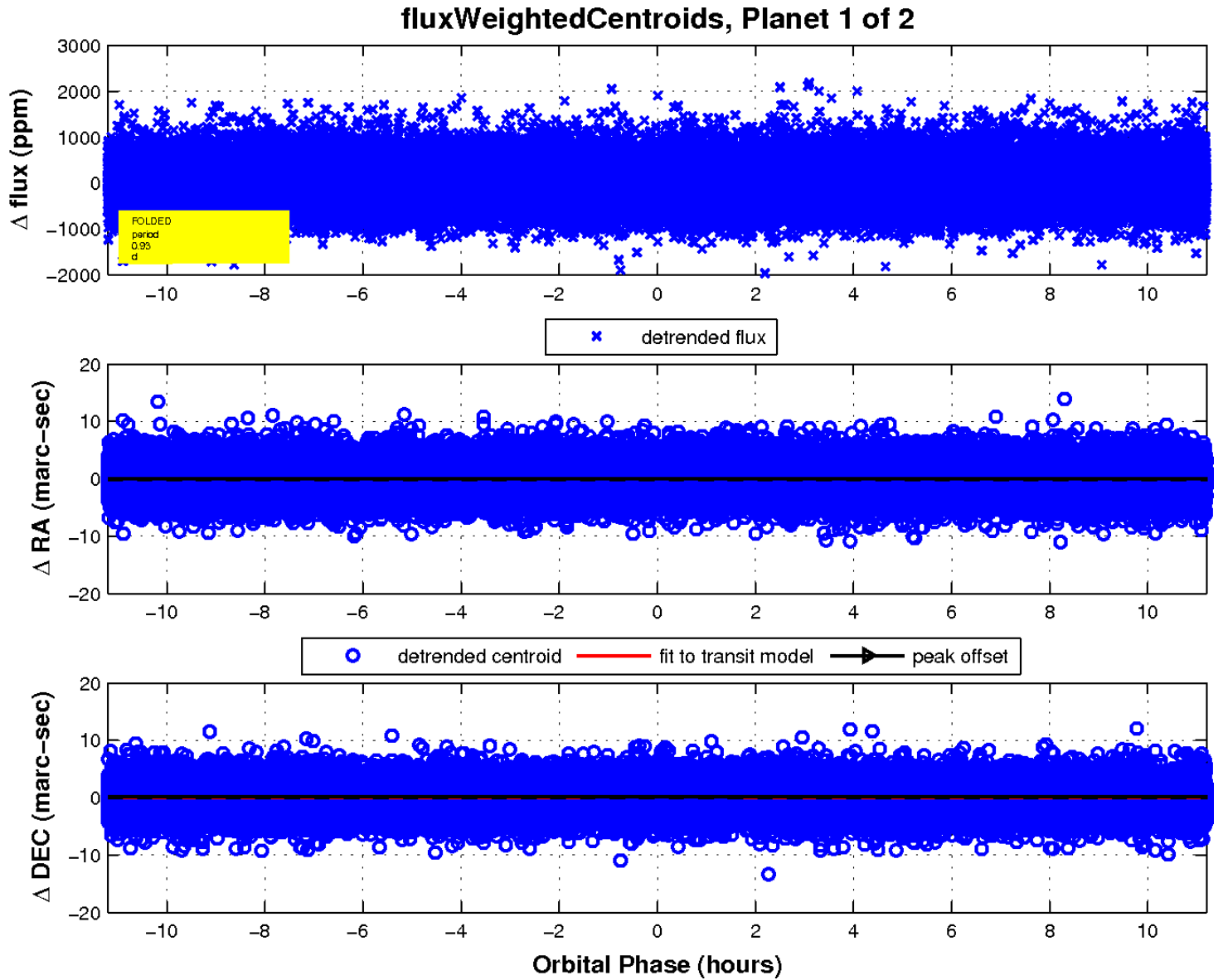
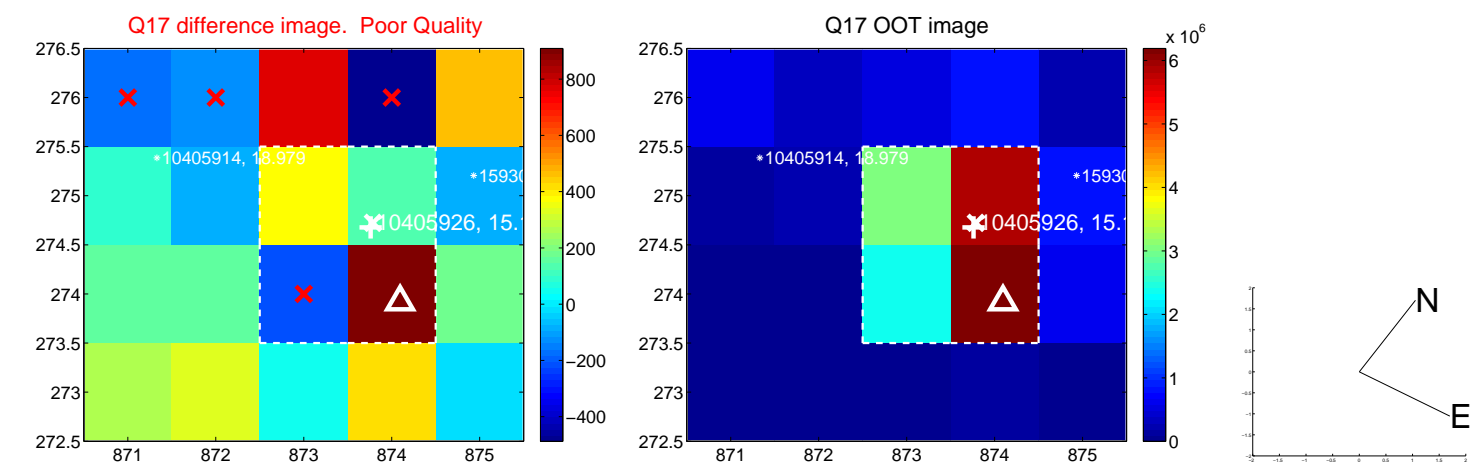
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

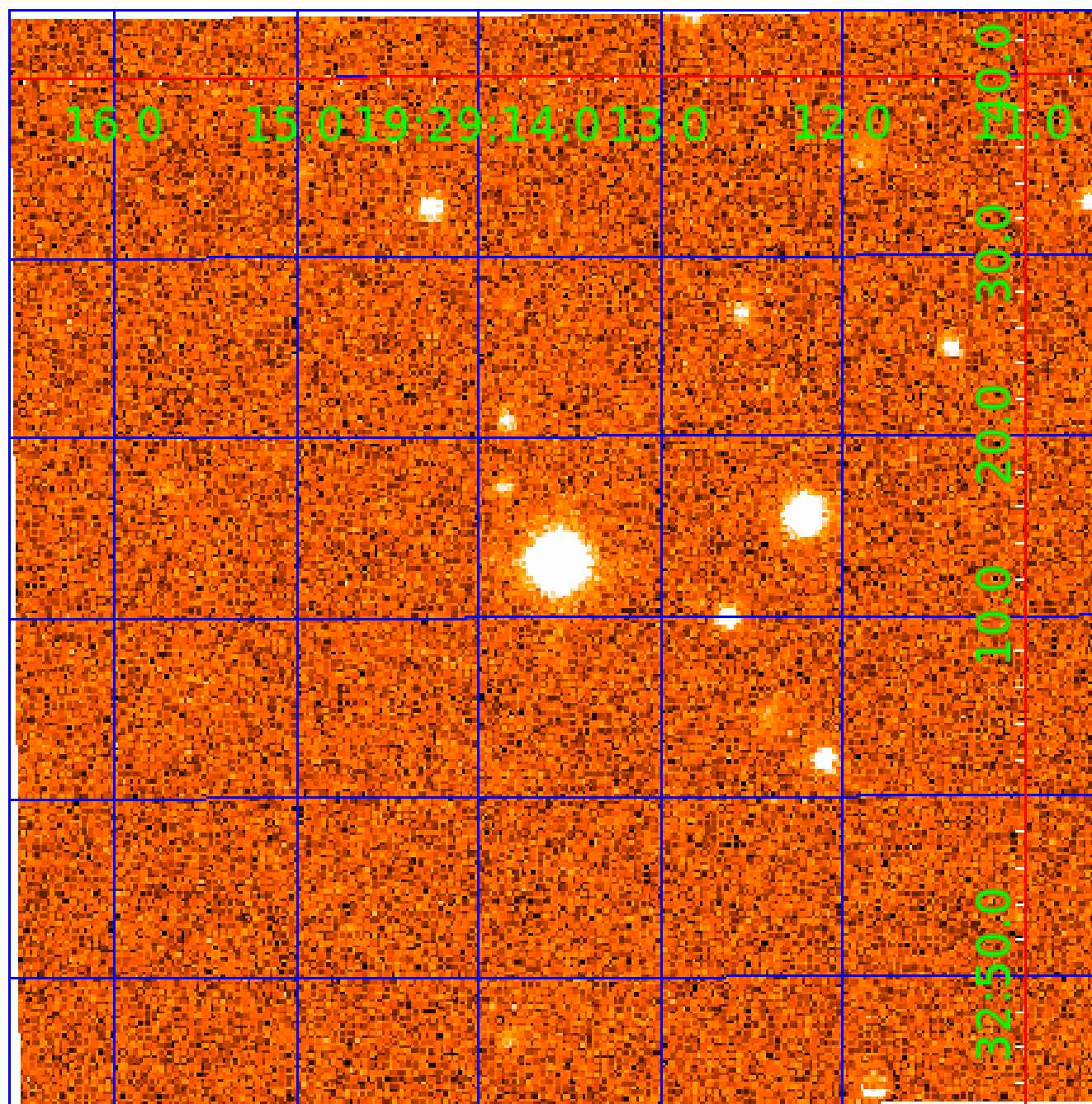


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010405926

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|------|-----------------------------|-----------------|------------------------|------------------------|
| 010405926-01 | OBS | No | 0.933690 | 131.549238 | 21.5 | 6.021 | 7.6 | 5.5 | 0.74 | 4503 | 0.32 | 680.07 |
| 010405926-02 | OBS | No | 33.912281 | 158.979879 | 545.7 | 4.292 | 9.9 | 11.5 | 0.74 | 4503 | 1.92 | 5.65 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010405926-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 1 | LPP_DV—EPHEM_MATCH |
| 010405926-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—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.

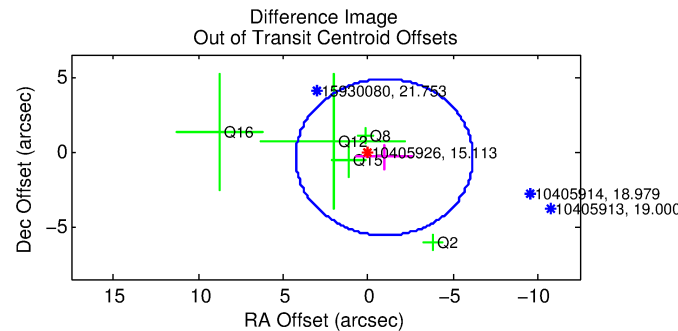
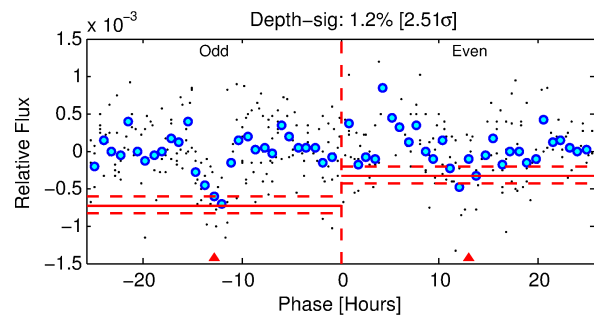
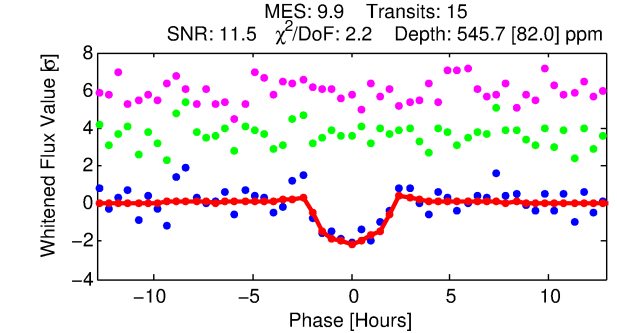
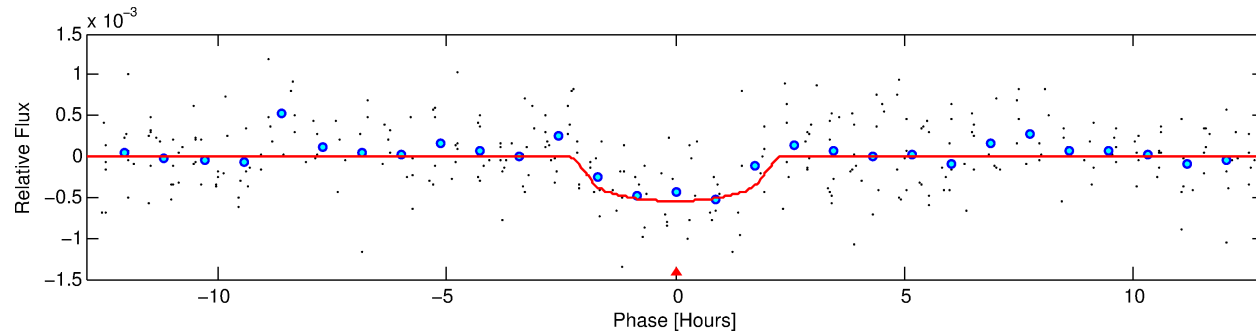
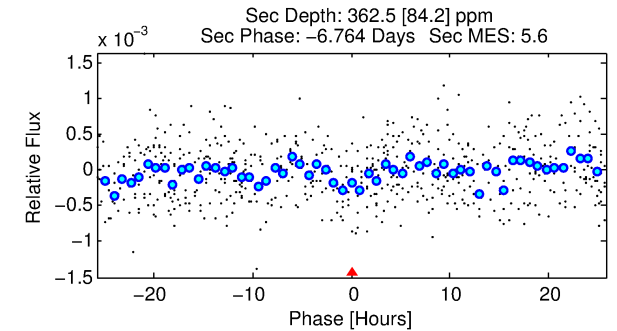
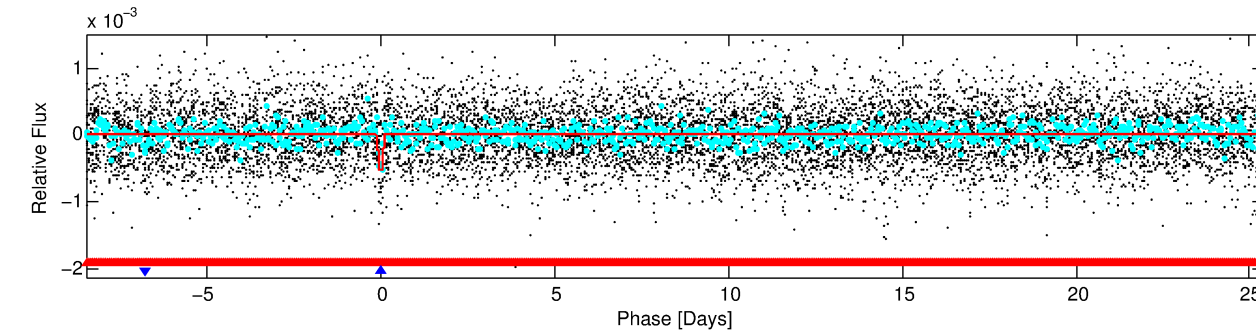
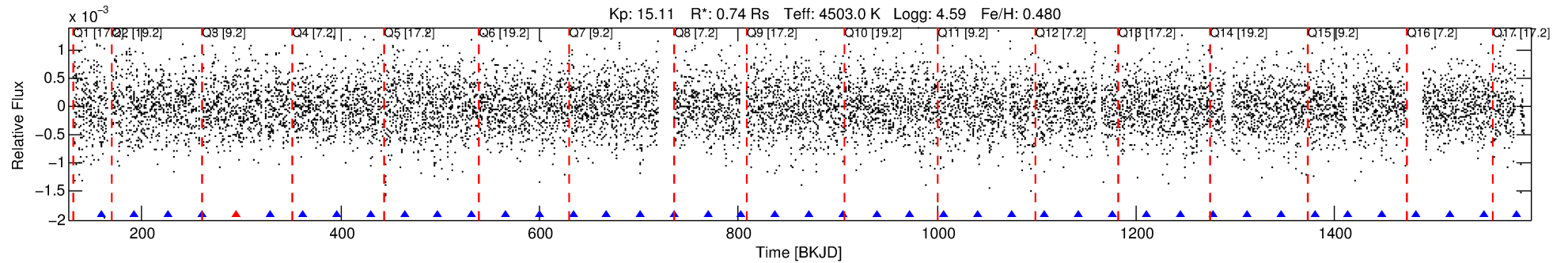
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010405926-02

No Significant Match Found

DV One-Page Summary

KIC: 10405926 Candidate: 2 of 2 Period: 33.912 d



DV Fit Results:

Period = 33.91228 [0.00044] d
Epoch = 158.9799 [0.0111] BKJD
Rp/R* = 0.0239 [0.0265]
a/R* = 40.06 [139.18]
b = 0.78 [1.81]
Seff = 5.65 [0.79]
Teff = 393 [14] K
Rp = 1.92 [2.13] Re
a = 0.1879 [0.0097] AU
Ag = 1917.96 [4288.53] [0.45σ]
Teffp = 4023 [2251] K [1.61σ]

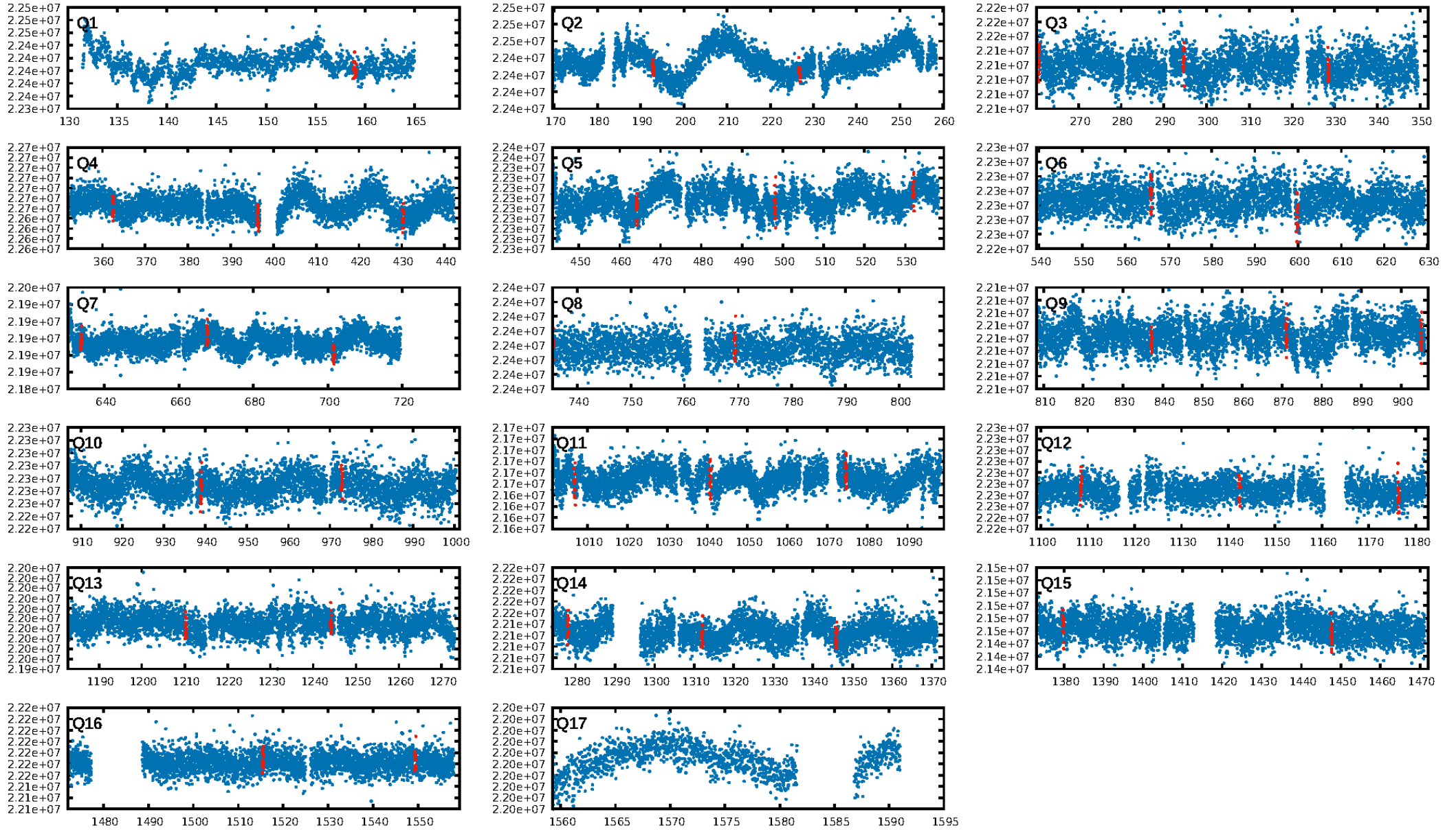
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [107.04σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 6.51e-11
RollingBand-fgt: 0.93 [13/14]
GhostDiagnostic-chr: 0.3347
Centroid-sig: 0.1%
Centroid-so: 1.930 arcsec [2.69σ]
OotOffset-rm: 1.046 arcsec [0.60σ]
KicOffset-rm: 1.154 arcsec [0.45σ]
OotOffset-st: 1/1/3/0 [5]
KicOffset-st: 1/1/3/0 [5]
DiffImageQuality-fgm: 0.20 [1/5]
DiffImageOverlap-fno: 0.00 [0/16]

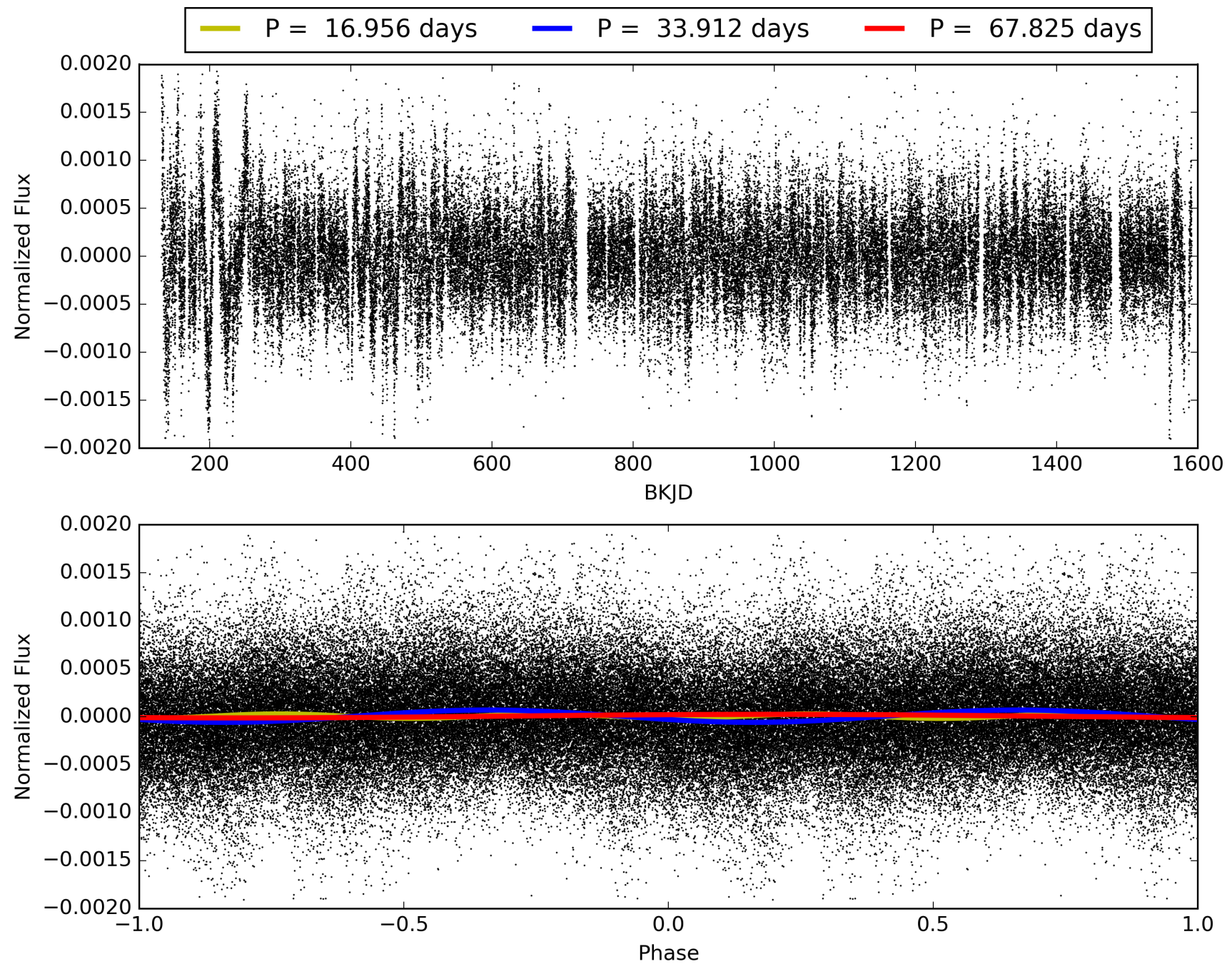
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 07:20:38 Z

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

TCE 010405926-02, PDC Light Curves

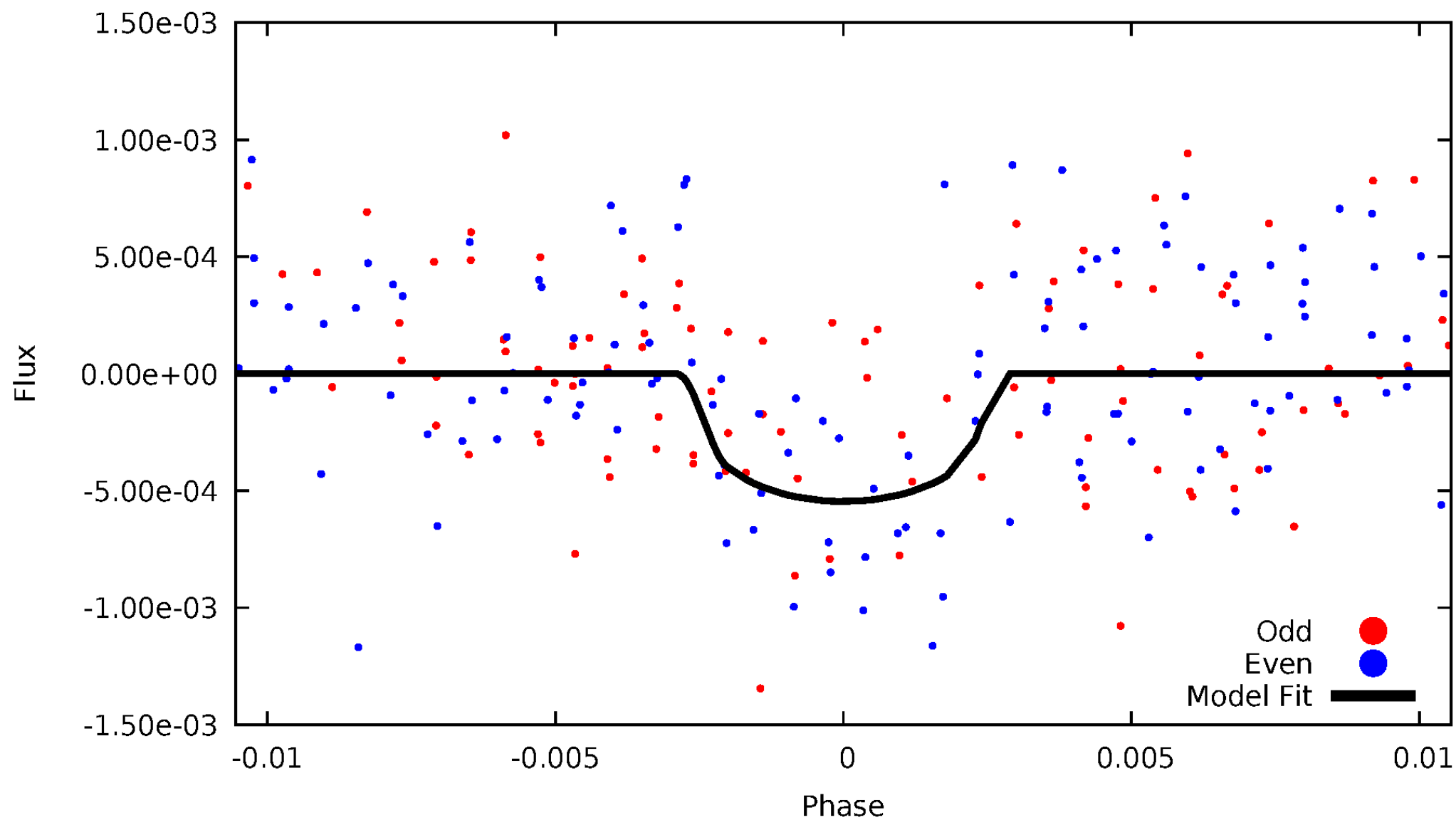


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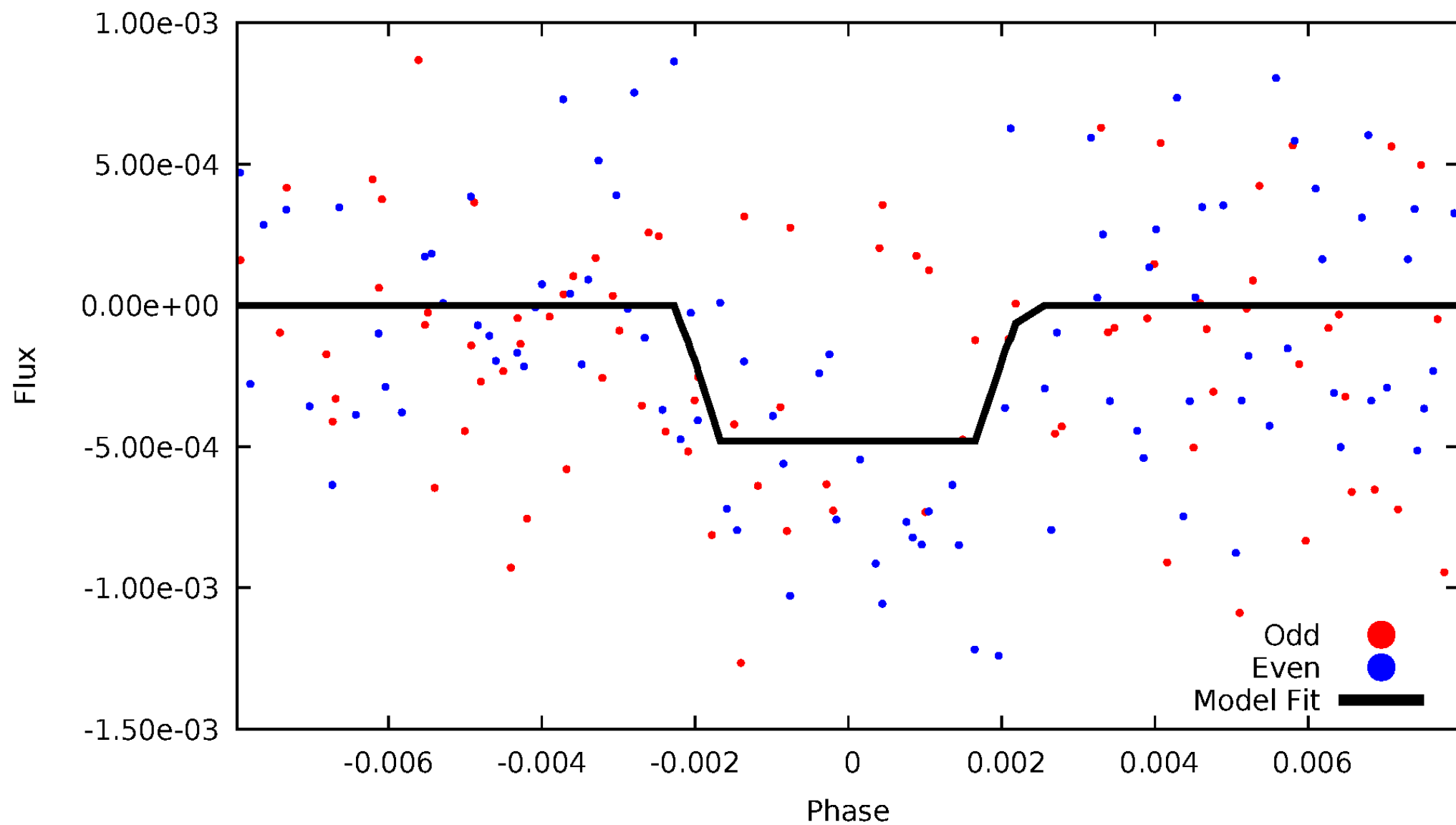
DV Odd/Even

TCE 010405926-02



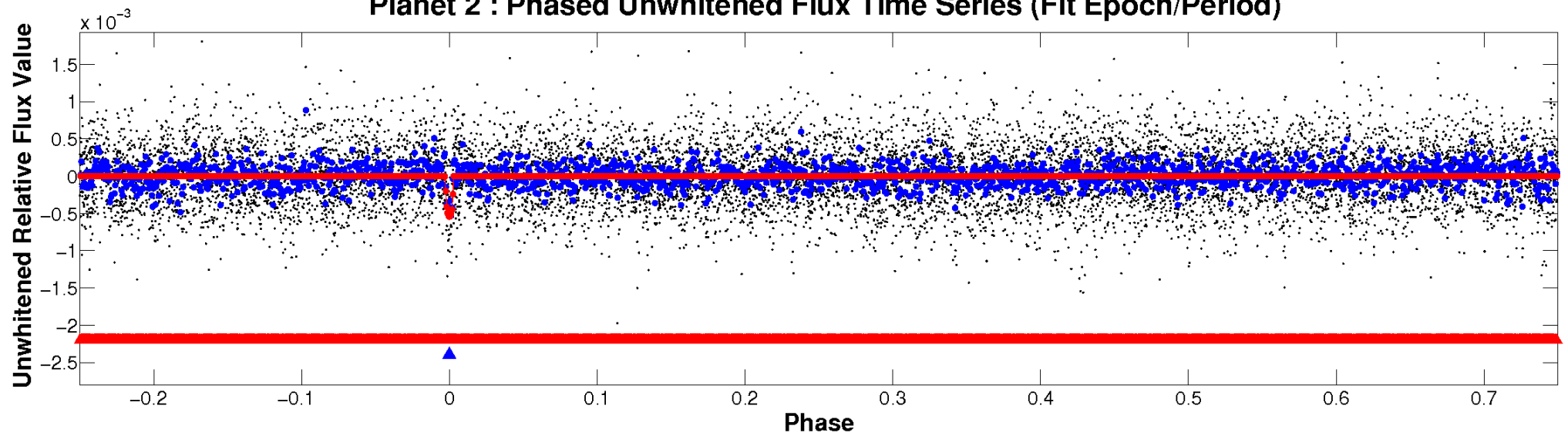
ALT Odd/Even

TCE 010405926-02

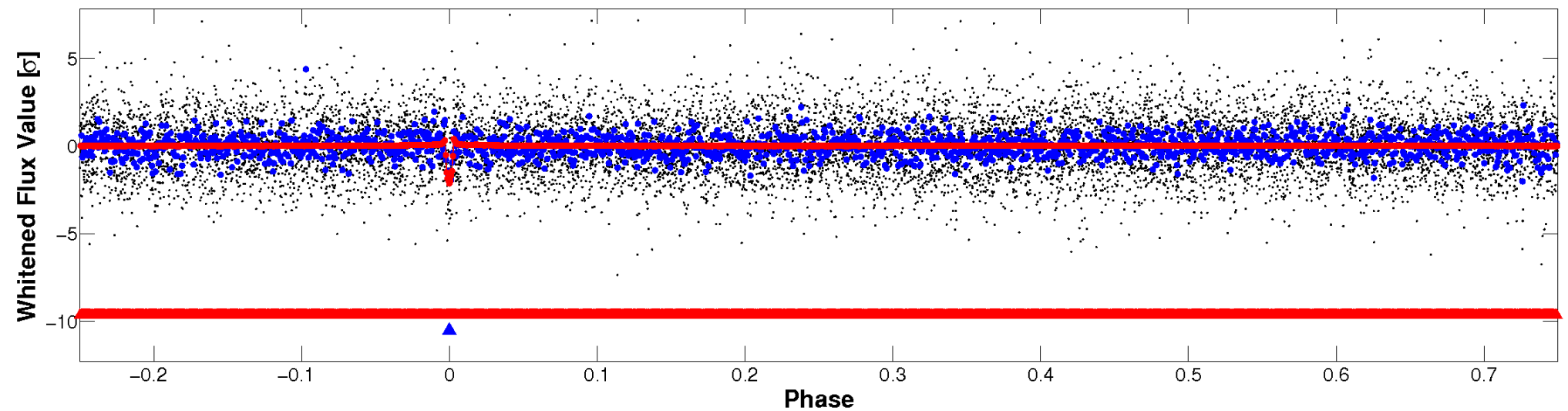


Non-Whitened Vs. Whitened Light Curve

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

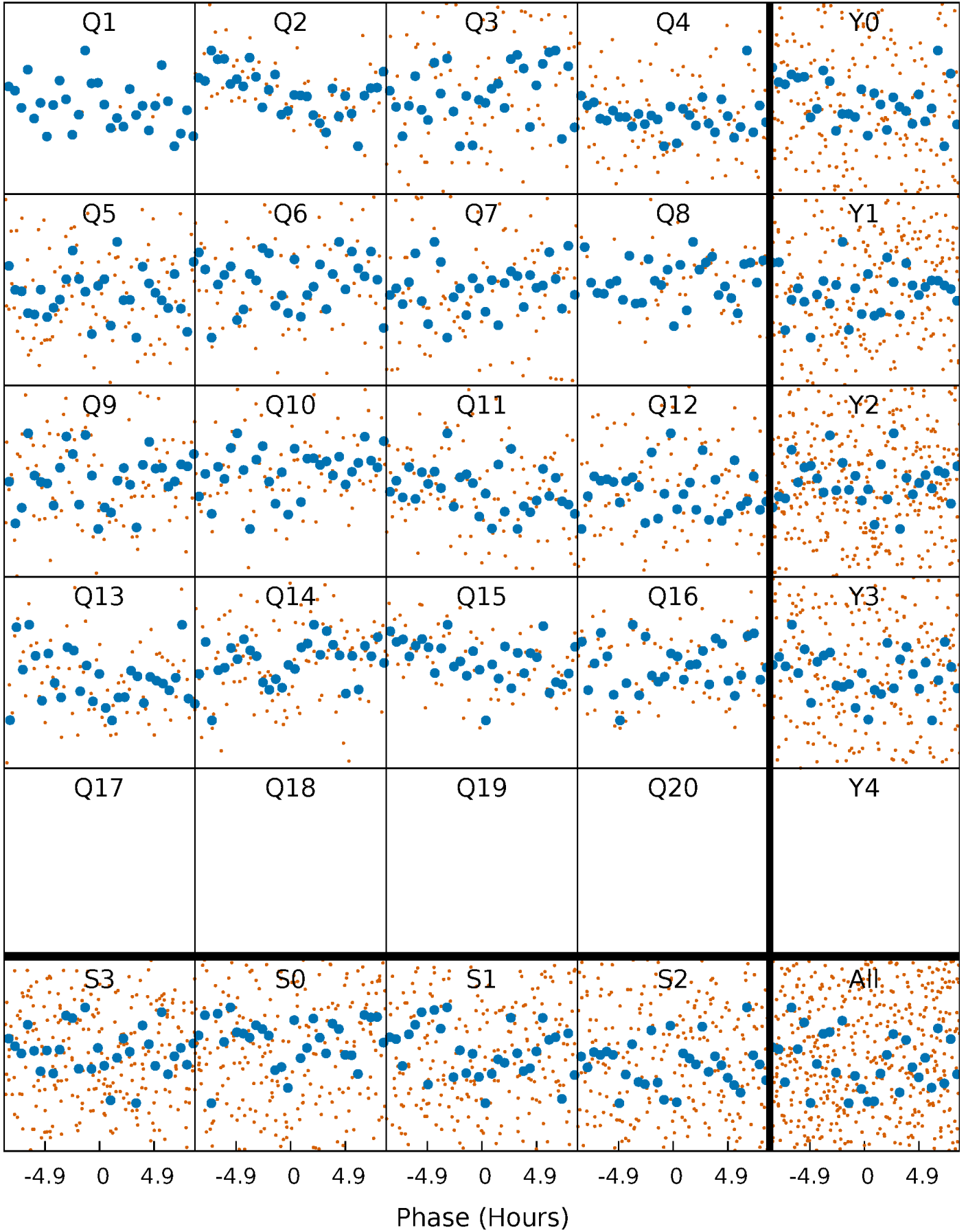


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



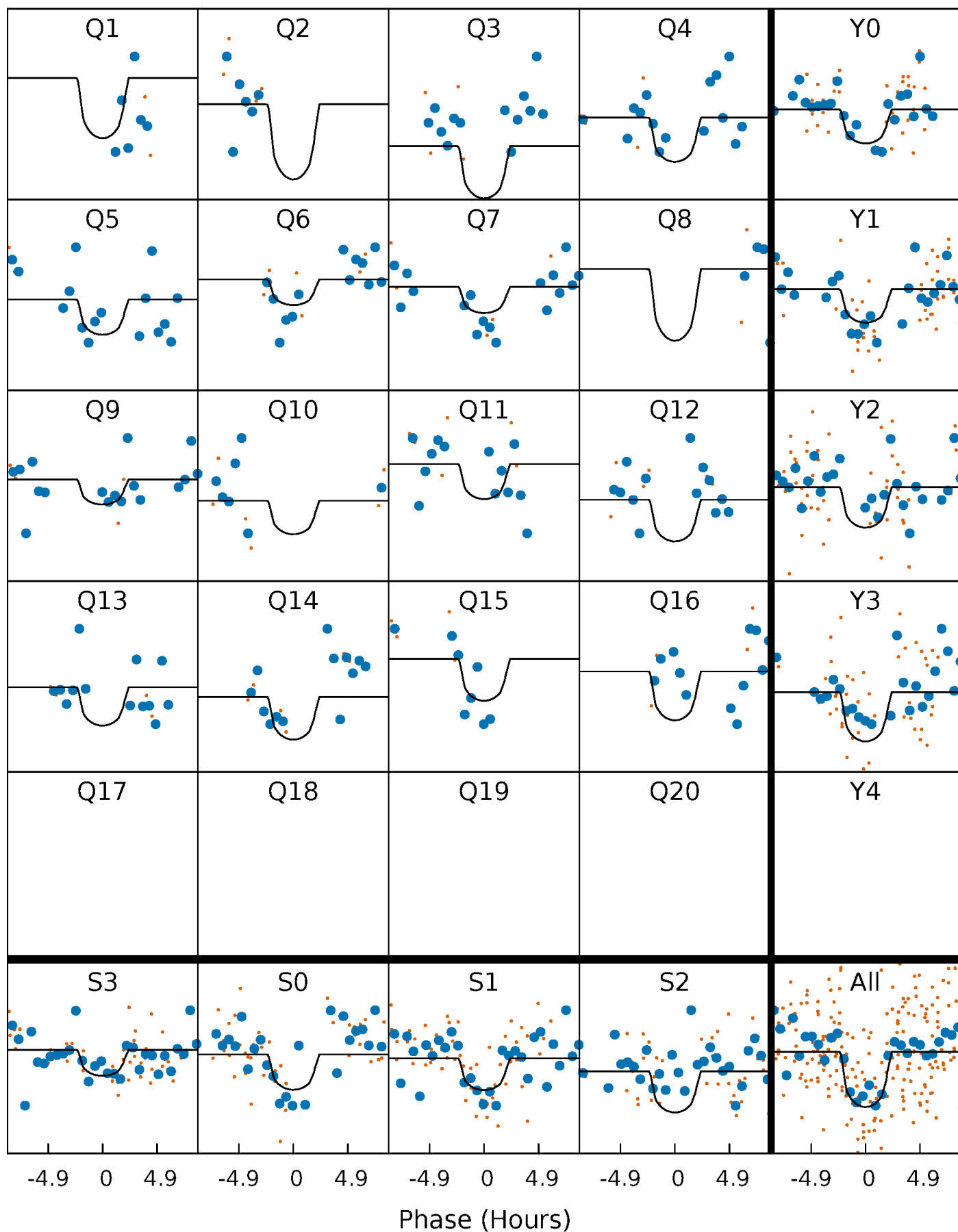
PDC Quarter-Phased Transit Curves

TCE 010405926-02 P= 33.912281 Days $T_0=158.979879$ (BKJD)



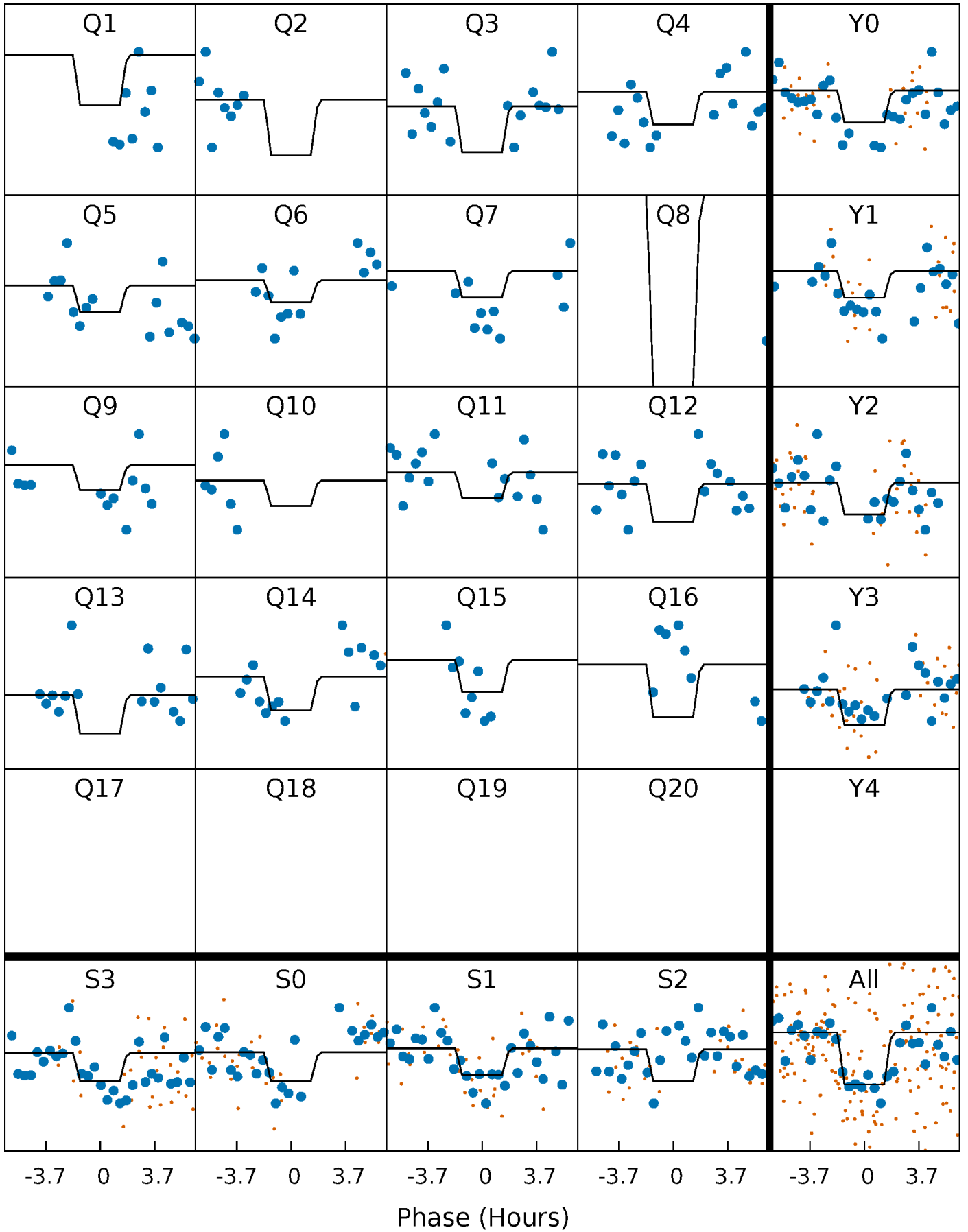
DV Quarter-Phased Transit Curves

TCE 010405926-02 P= 33.912281 Days $T_0=158.979879$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

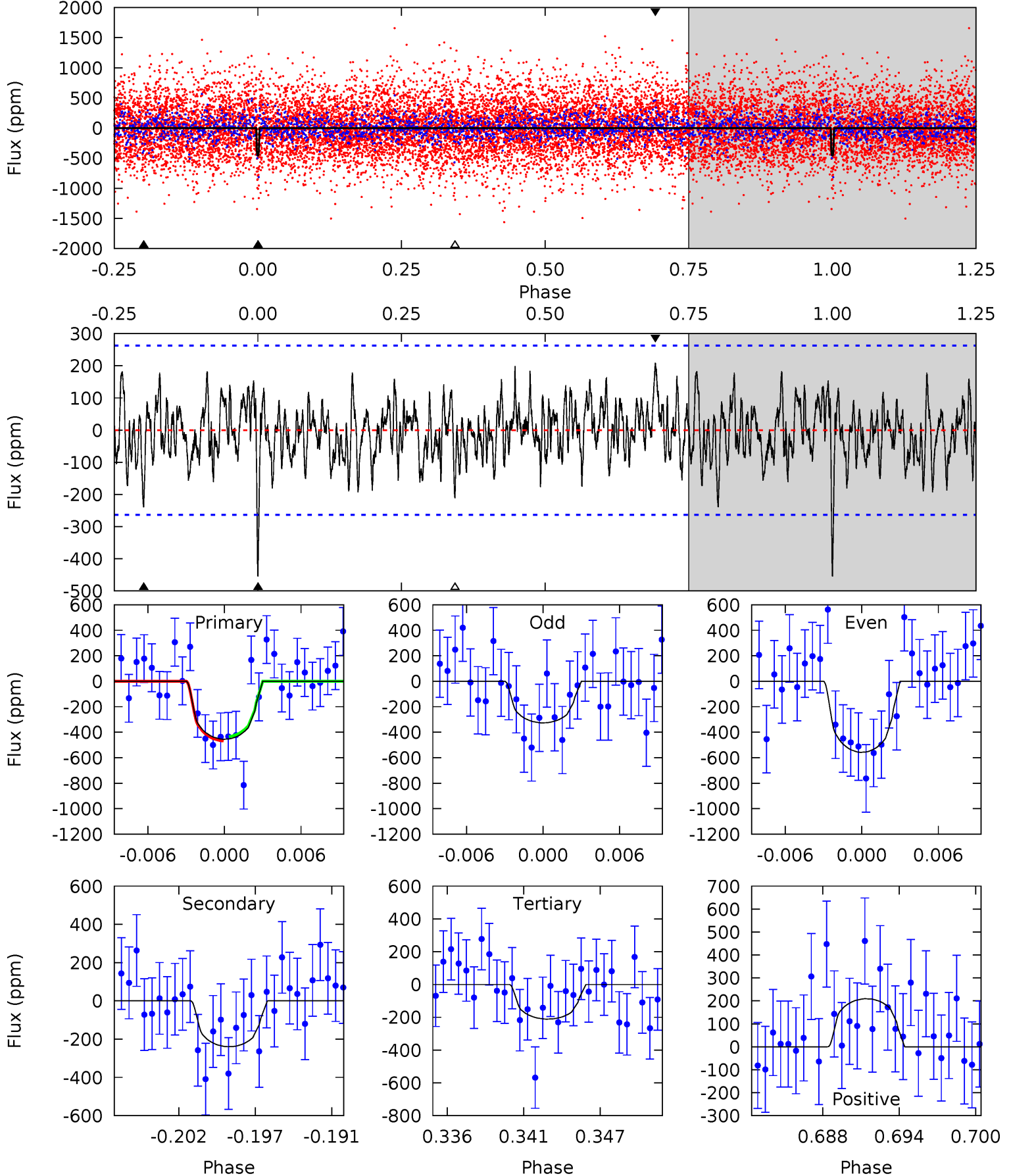
TCE 010405926-02 P= 33.911549 Days $T_0=158.988147$ (BKJD)



DV Model-Shift Uniqueness Test

010405926-02, P = 33.912281 Days, E = 125.067598 Days

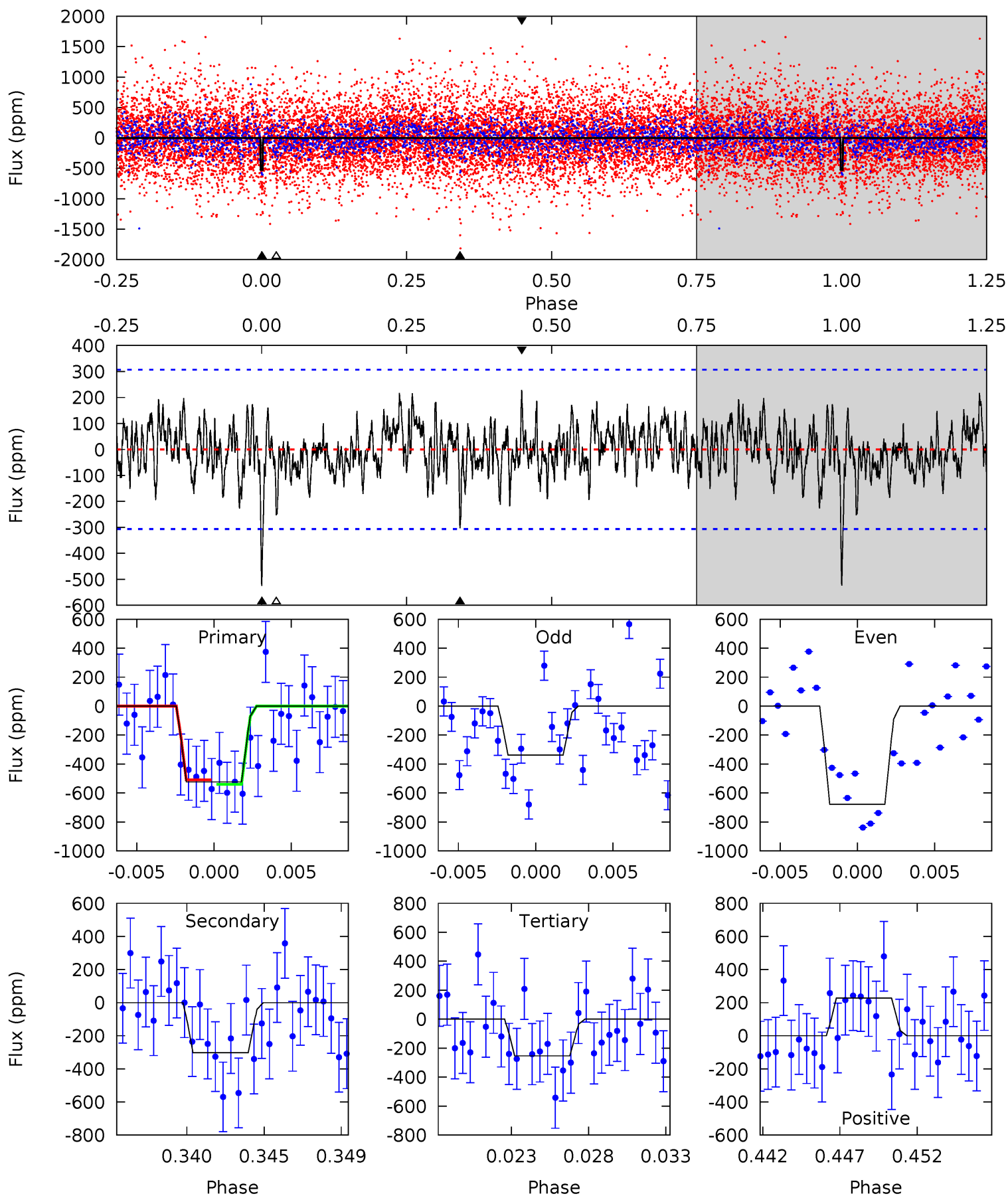
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.87 | 4.67 | 4.12 | 4.08 | 5.13 | 2.76 | 1.41 | 4.75 | 4.79 | 0.55 | 0.59 | 2.25 | 0.85 | 0.32 | 0.31 |



Alt Model-Shift Uniqueness Test

010405926-02, $P = 33.911549$ Days, $E = 125.076598$ Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.82 | 5.11 | 4.27 | 3.85 | 5.17 | 2.83 | 1.30 | 4.55 | 4.98 | 0.84 | 1.27 | 2.86 | 0.84 | 0.30 | 0.26 |



Stellar Parameters For KIC 010405926

| | $T_{\text{eff}}(K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 4503^{+137}_{-137} | $4.590^{+0.036}_{-0.027}$ | $0.480^{+0.050}_{-0.250}$ | $0.736^{+0.029}_{-0.048}$ | $0.768^{+0.028}_{-0.052}$ | $2.716^{+0.438}_{-0.239}$ |
| | +3%/-3% | +1%/-1% | +10%/-52% | +4%/-7% | +4%/-7% | +16%/-9% |
| 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 010405926-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|-----------------------|-----------------------|
| DV | -240 ± 51 | $2.37^{+1.87}_{-1.49}$ | 549^{+19}_{-18} | 3579^{+1652}_{-591} | 825^{+5323}_{-574} |
| Alt. | -303 ± 59 | $2.27^{+2.06}_{-1.49}$ | 549^{+18}_{-18} | 3784^{+1934}_{-711} | 1168^{+8523}_{-859} |

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

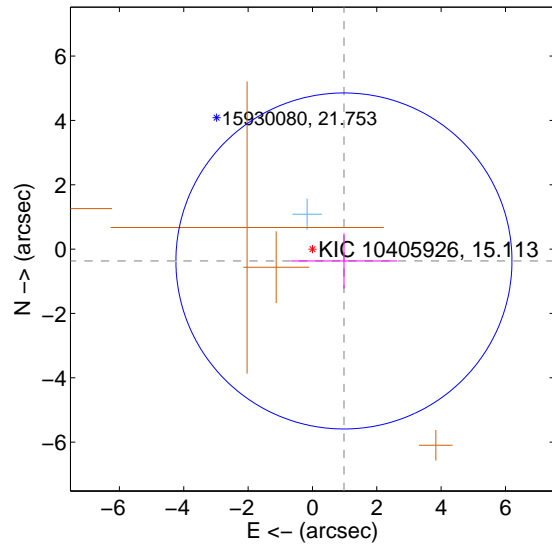
Supplemental centroid analysis for 010405926-02. Kepler magnitude: 15.11. Transit SNR 11.47

There are 1 quarters with good PRF difference image offsets

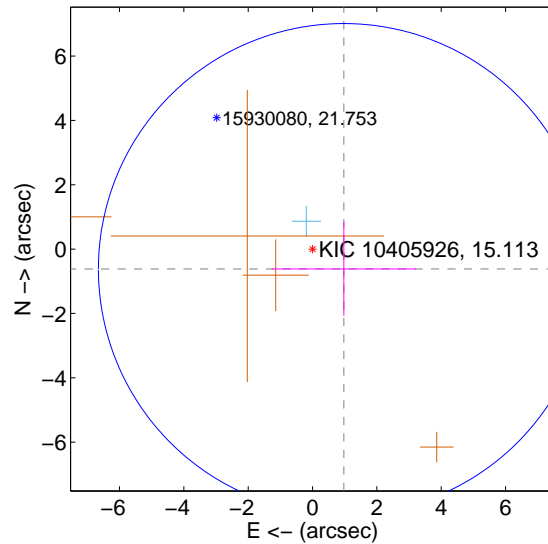
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 1.046 ± 1.741 | 0.60 | -0.979 ± 1.652 | -0.369 ± 0.857 |
| PRF-fit source offset from KIC position | 1.154 ± 2.543 | 0.45 | -0.974 ± 2.243 | -0.619 ± 1.452 |
| photometric centroid source offset | 1.93 ± 0.72 | 2.69 | 1.53 ± 0.73 | -1.18 ± 0.69 |

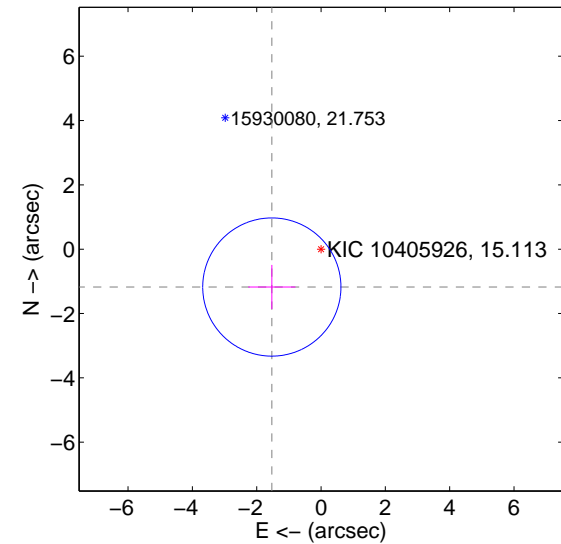
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

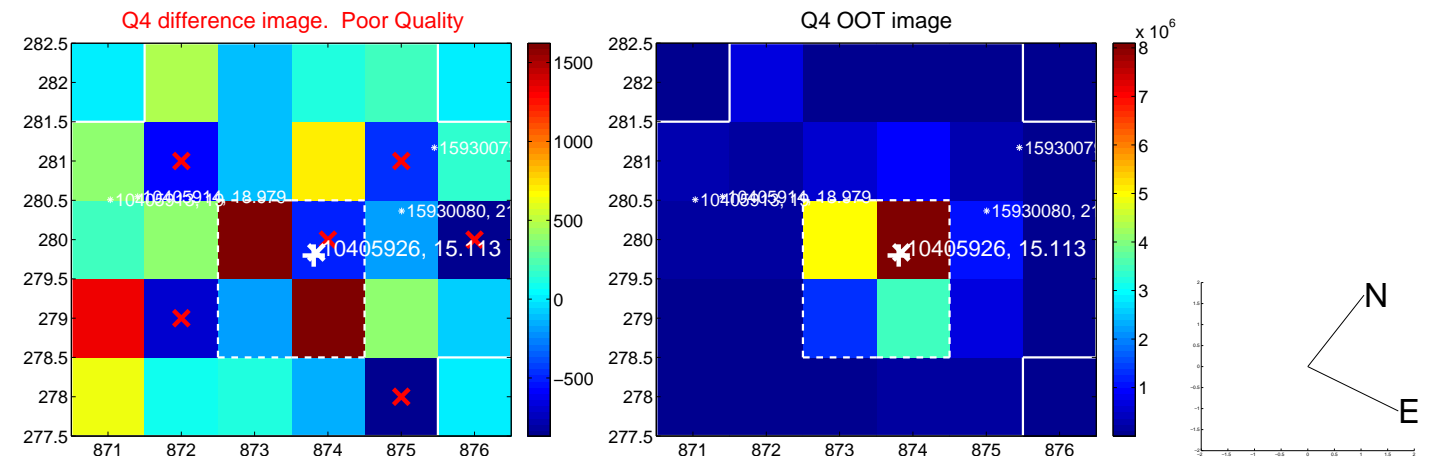
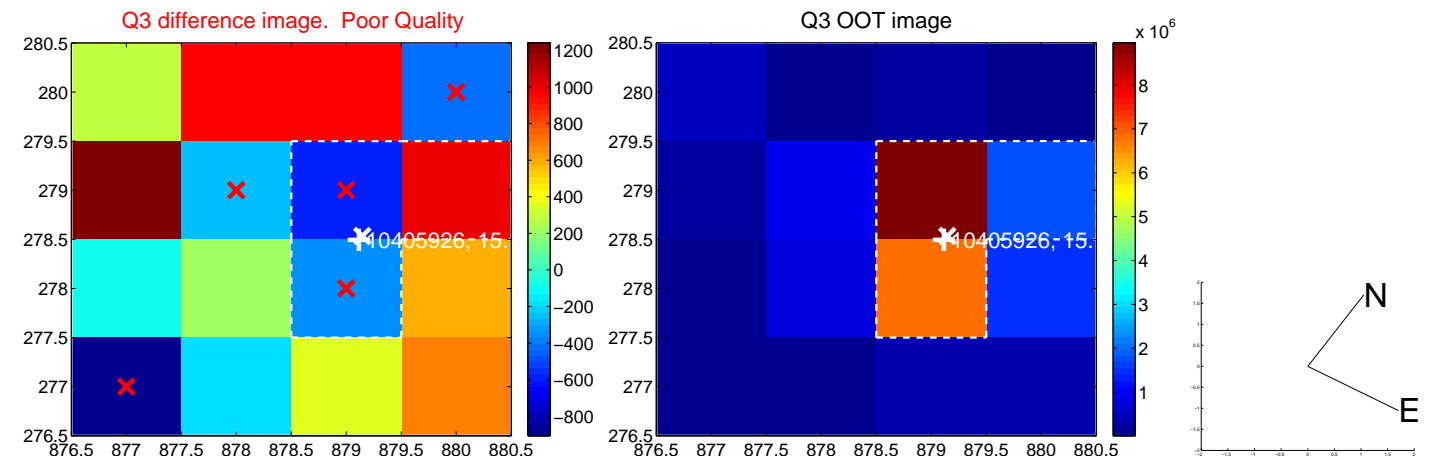
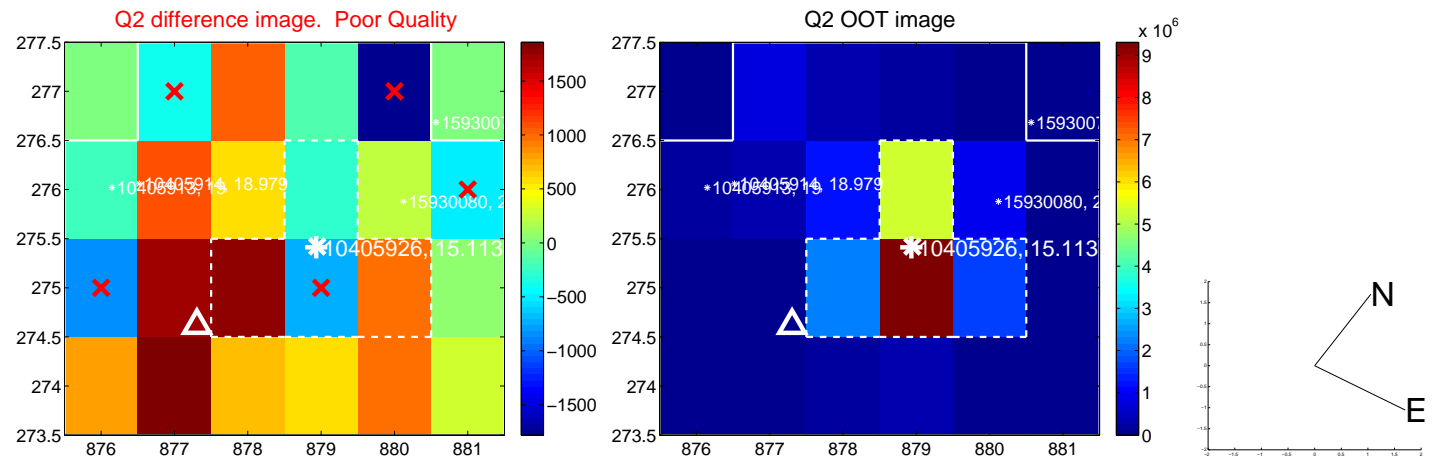
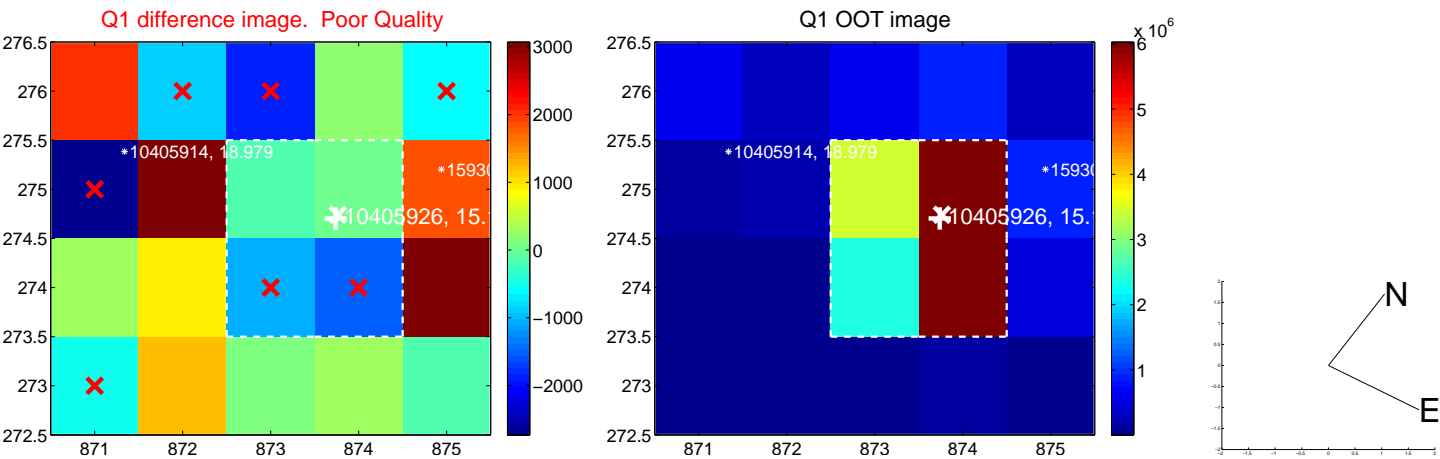


offset from photometric centroids

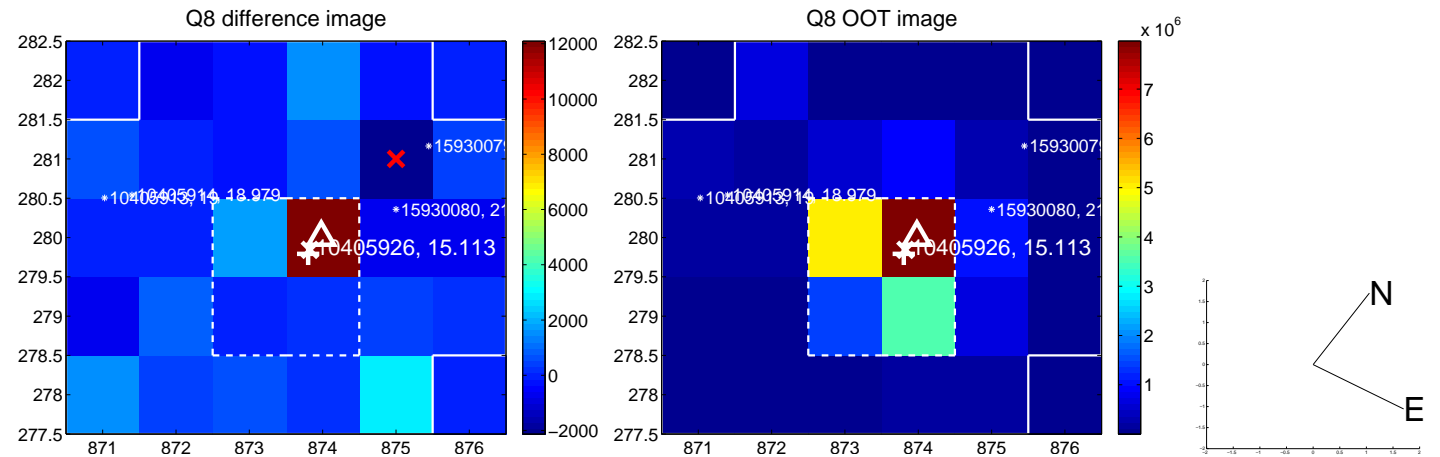
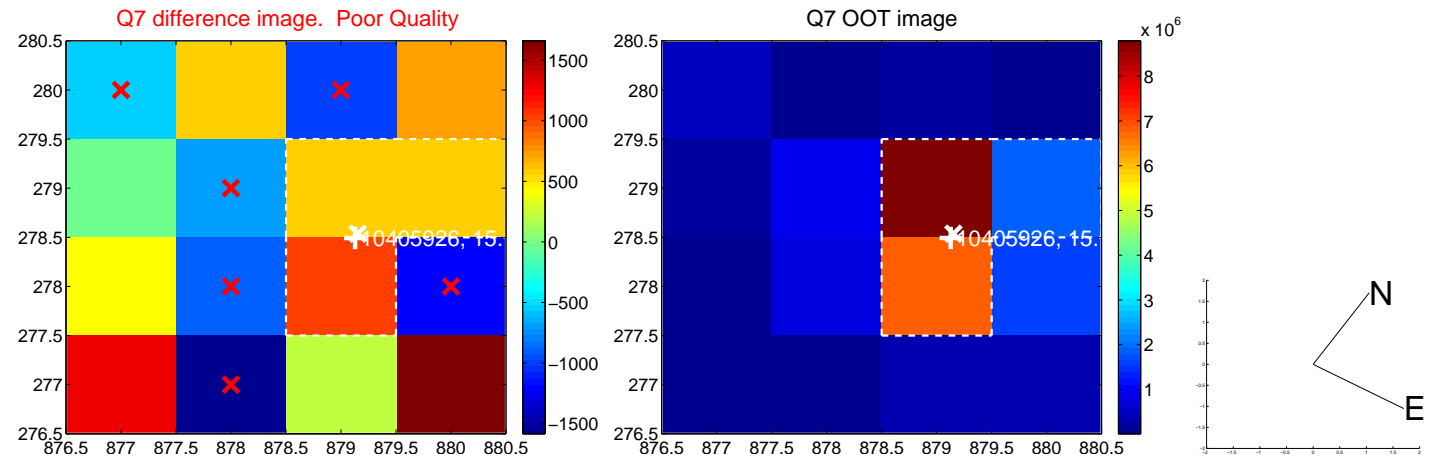
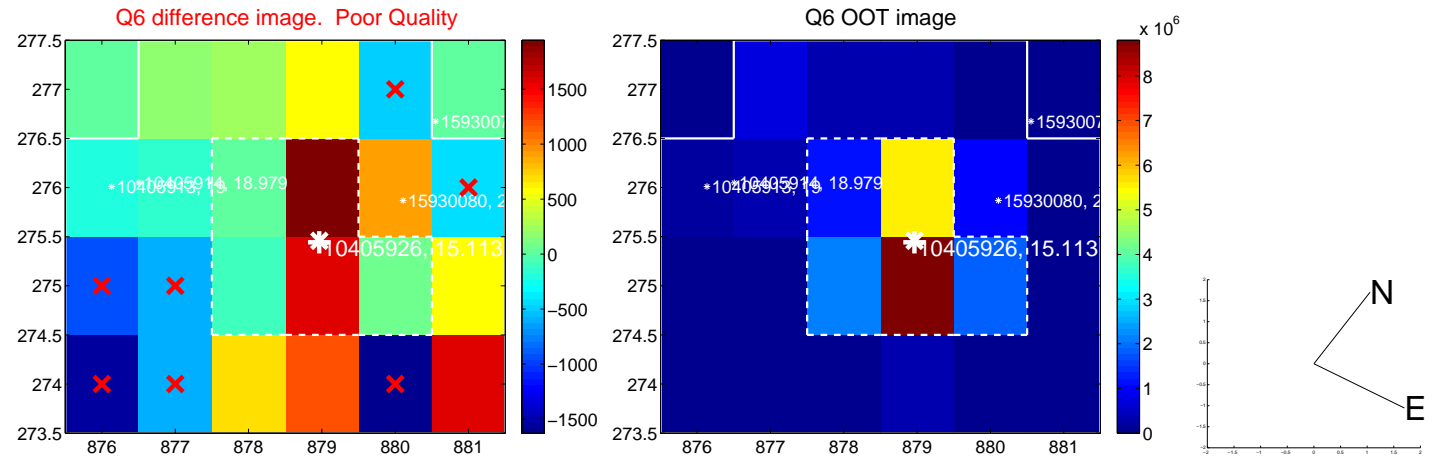
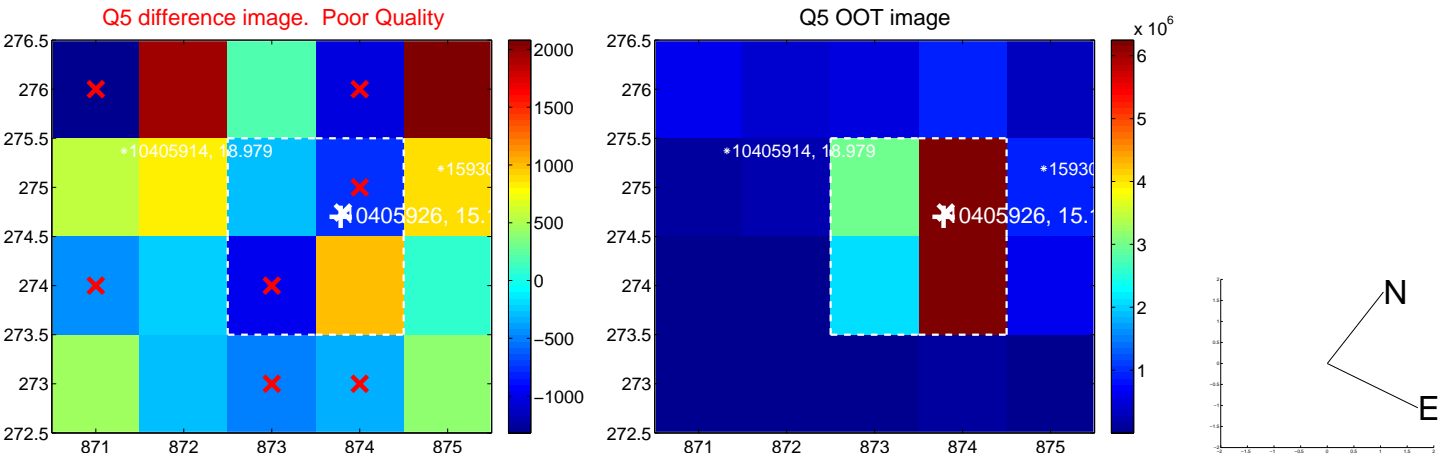


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

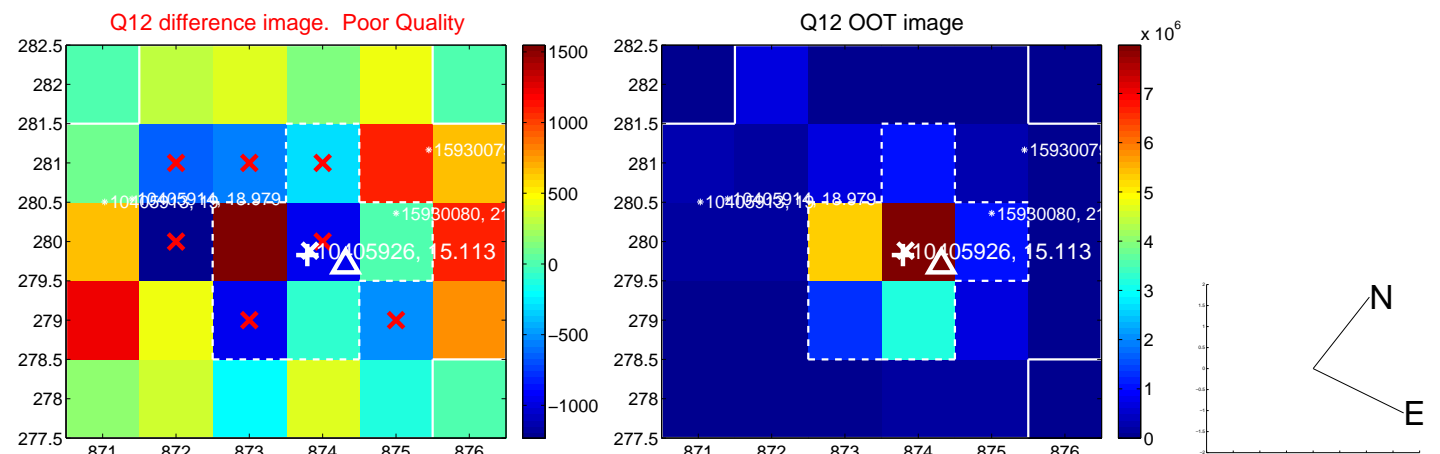
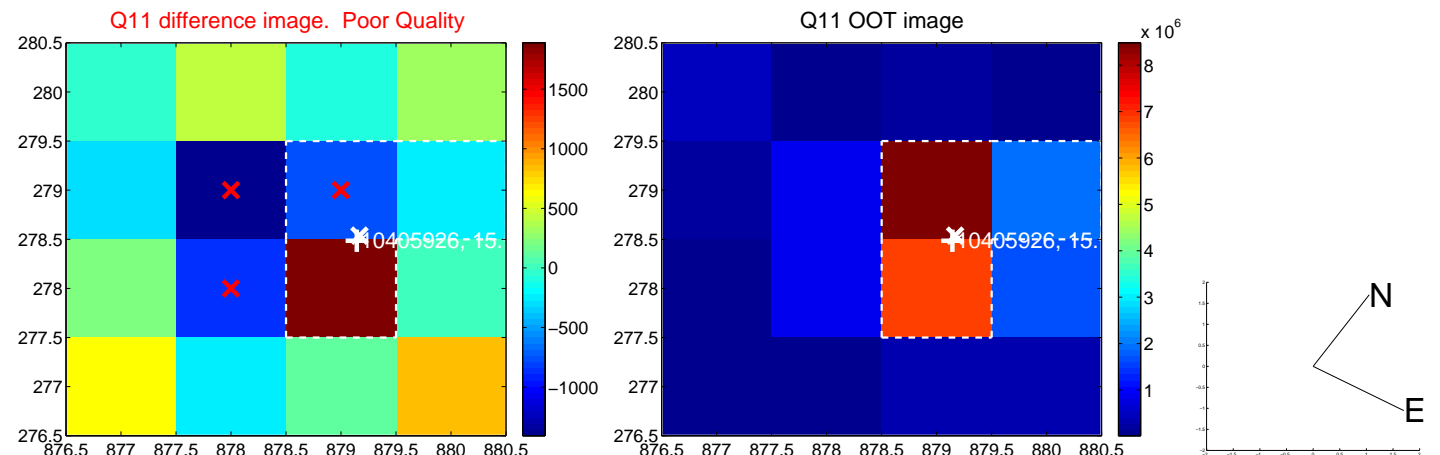
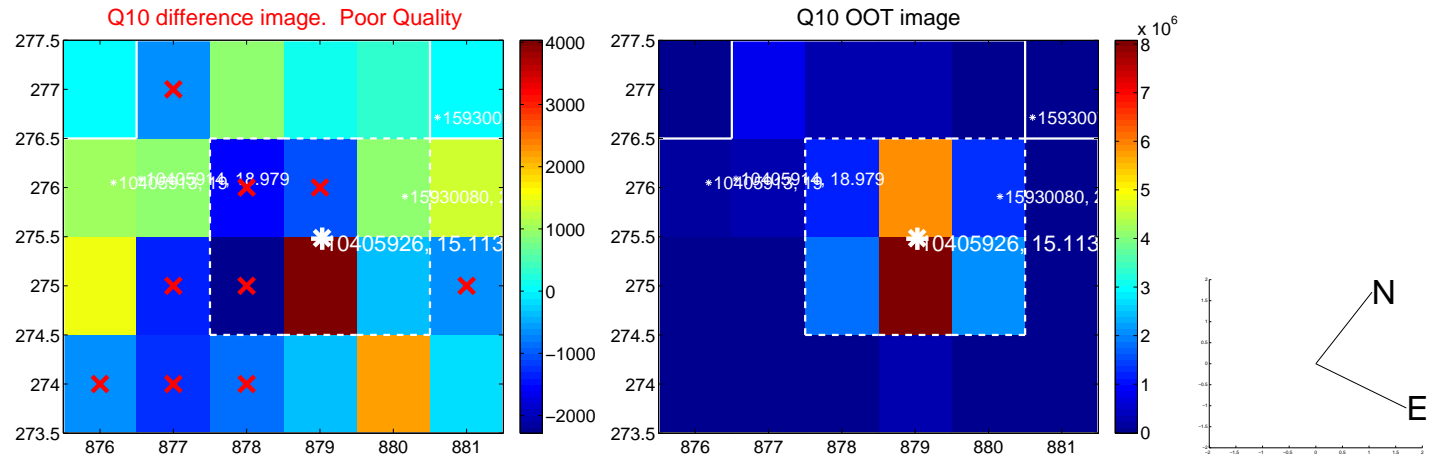
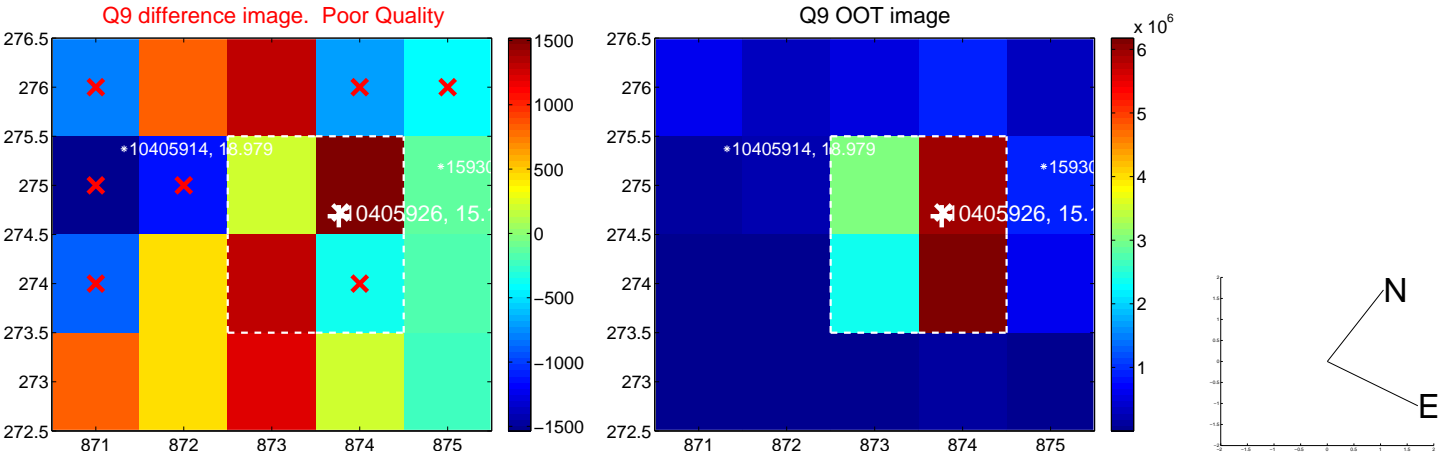
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



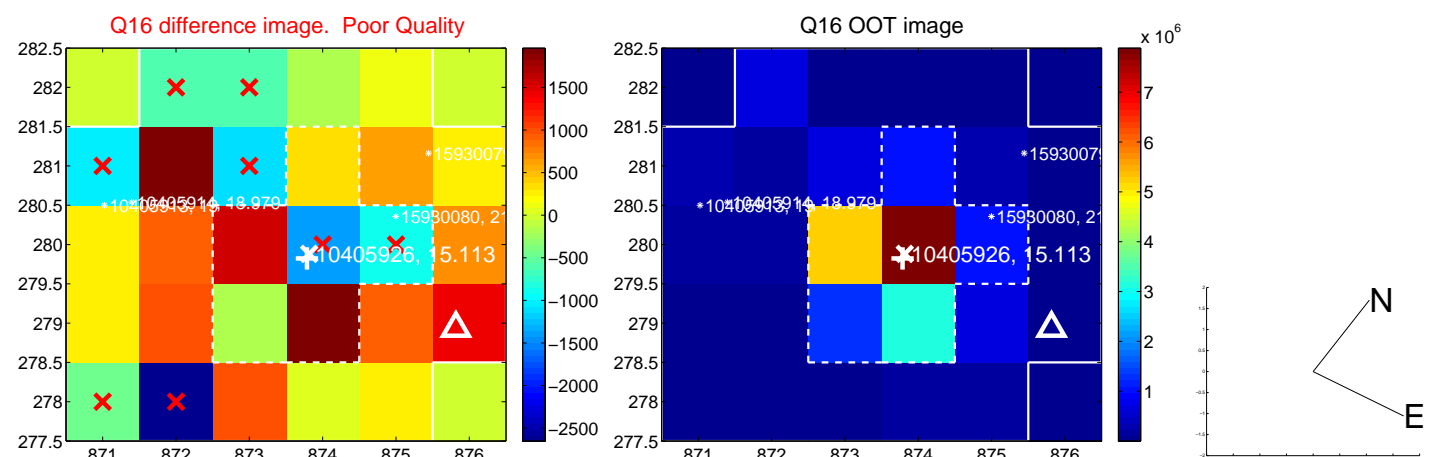
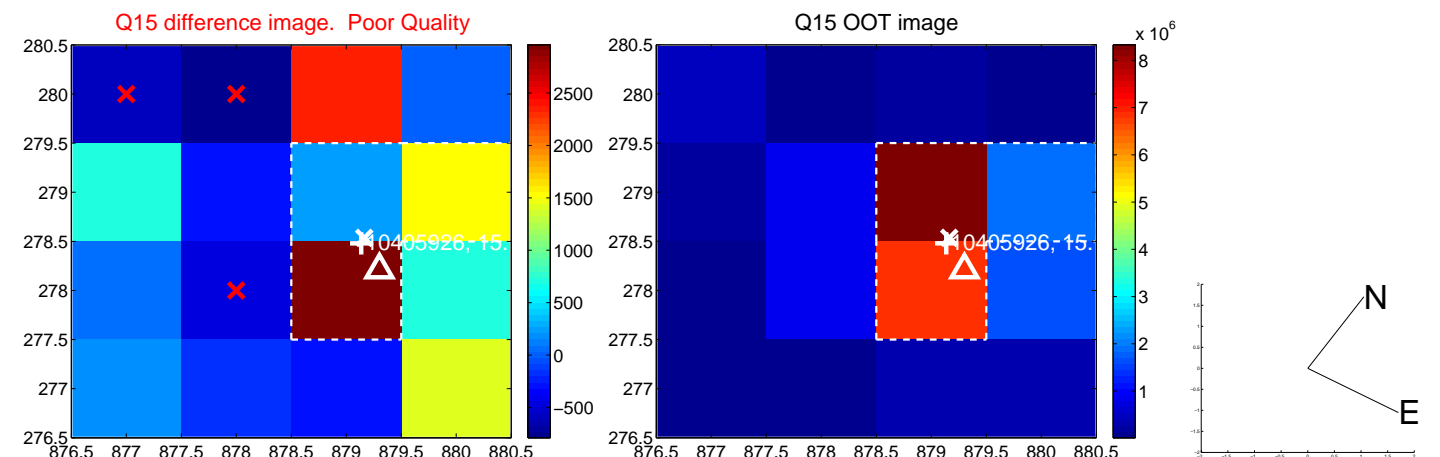
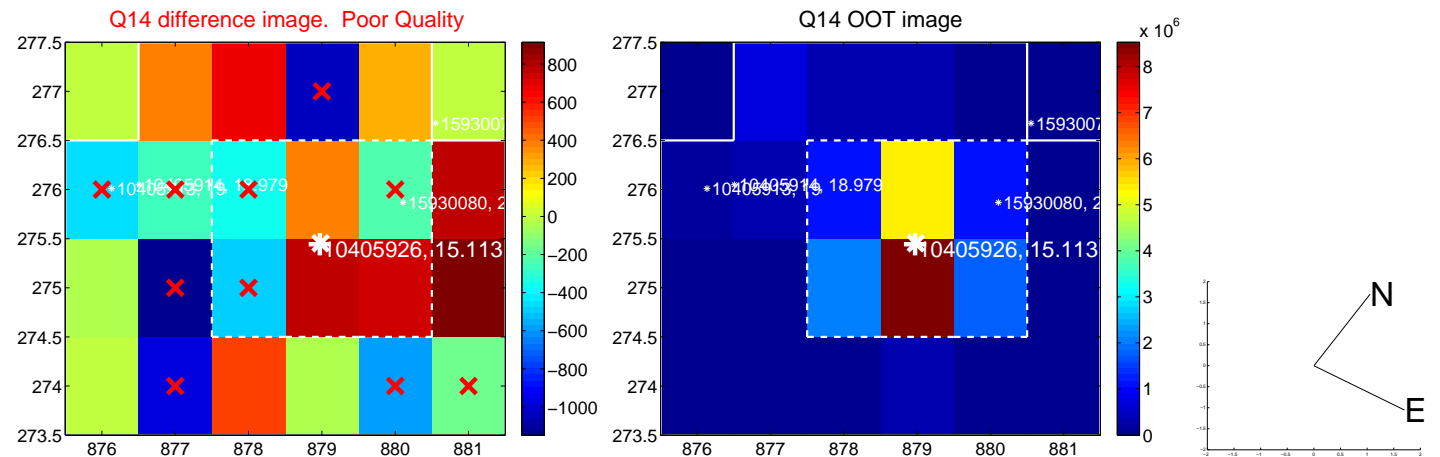
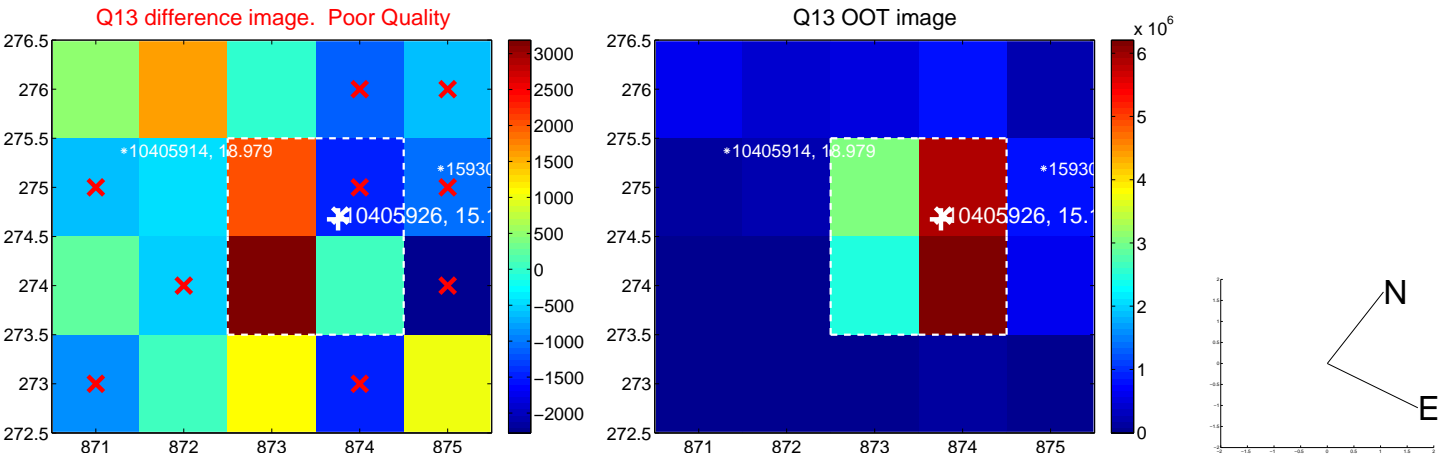
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



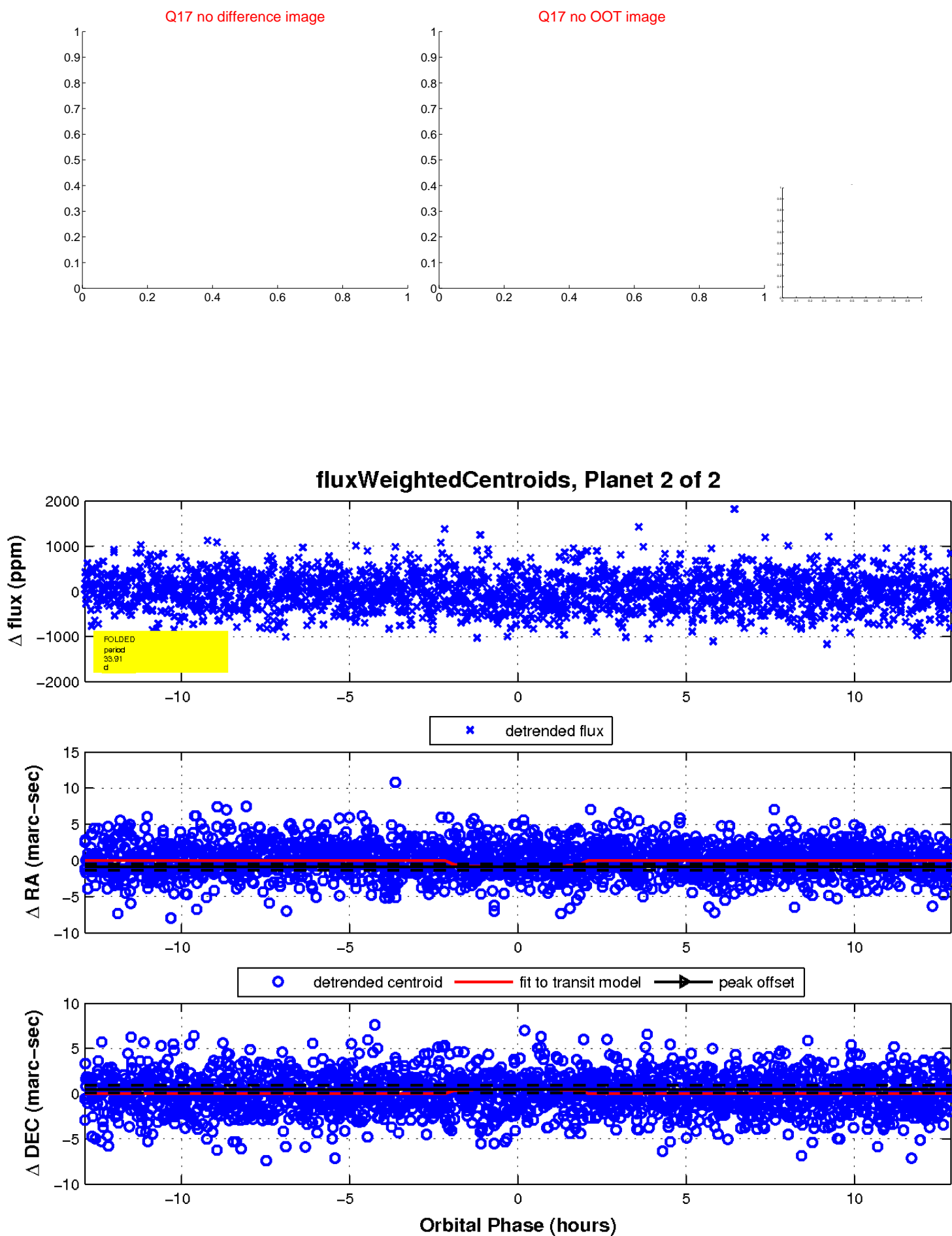
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

