

KIC 010407210

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 010407210-01 | OBS | 4662.01 | 0.933679 | 131.576116 | 8.1 | 4.938 | 10.3 | 8.4 | 1.86 | 6652 | 0.55 | 14079.32 |
| 010407210-02 | OBS | No | 258.478616 | 285.048159 | 124.4 | 16.727 | 9.7 | 7.3 | 1.86 | 6652 | 2.31 | 7.80 |
| 010407210-03 | OBS | No | 304.437252 | 157.194291 | 152.6 | 4.635 | 8.0 | 8.8 | 1.86 | 6652 | 2.68 | 6.27 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010407210-01 | OBS | FP | 0.00 | 0 | 0 | 1 | 1 | CENT_SATURATED—HALO_GHOST—EPHEM_MATCH |
| 010407210-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED |
| 010407210-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL_SKYE—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 010407210-01

| TCE (1) | KIC | Parent (2) | Parent KIC | $P_1:P_2$ | Dist ($''$) | Δ Row | Δ Col | m_2 | m_1 | D_2/D_1 | Mechanism | Flag | σ_P | σ_T |
|--------------|----------|---------------|------------|-----------|---------------|--------------|--------------|-------|-------|-----------|------------|------|------------|------------|
| 010407210-01 | 10407210 | V2083-Cyg-pri | 10342012 | 1:2 | 265.9 | 51 | -43 | 6.90 | 10.96 | 24790.00 | Direct-PRF | 0 | 1.21 | 2.40 |

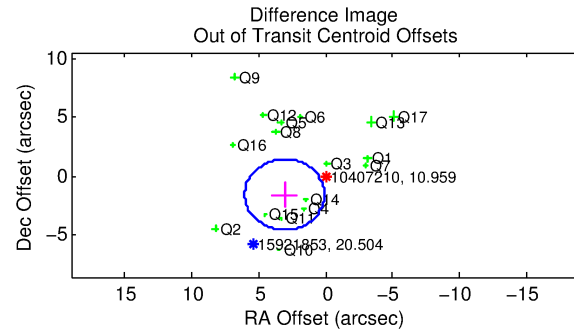
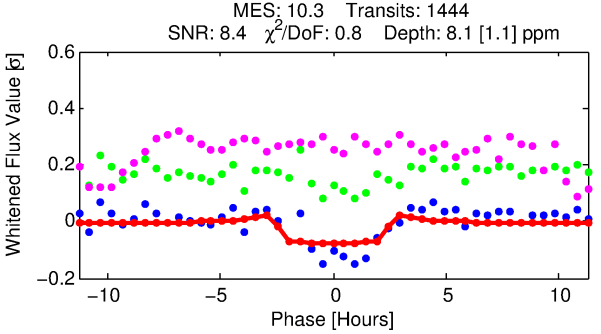
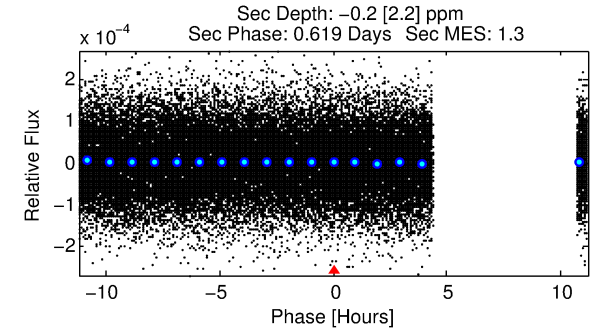
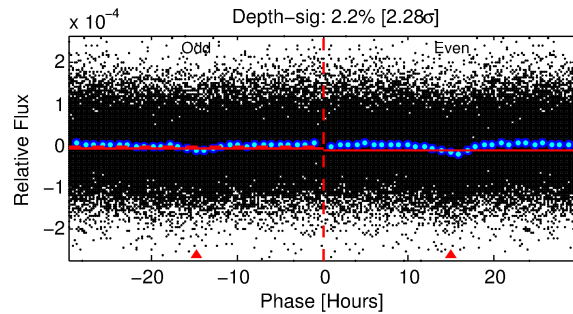
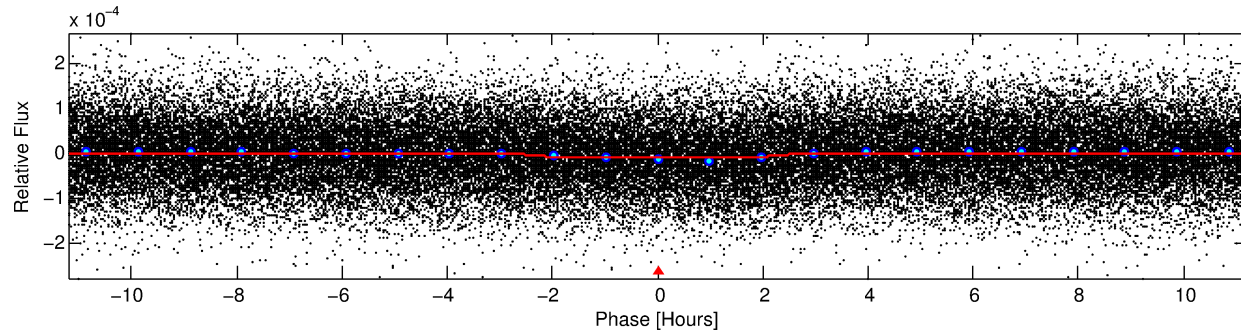
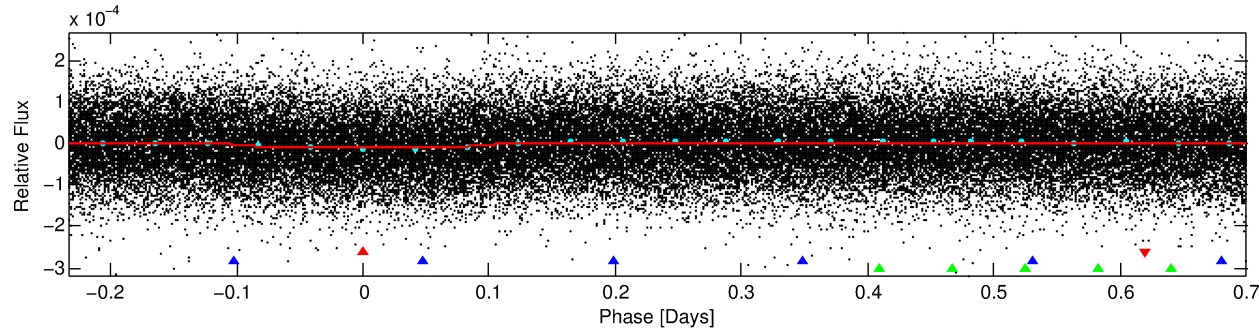
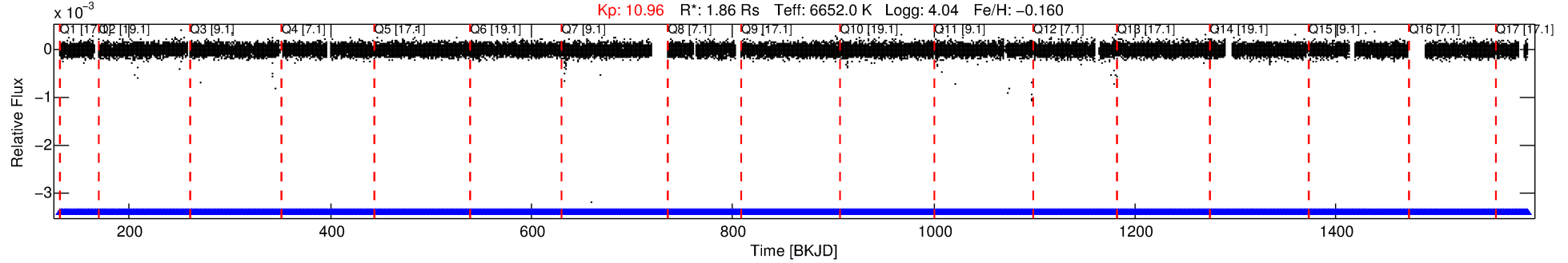
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match 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: 10407210 Candidate: 1 of 3 Period: 0.934 d

KOI: K04662.01 Corr: 0.898

Kp: 10.96 R*: 1.86 Rs Teff: 6652.0 K Logg: 4.04 Fe/H: -0.160



DV Fit Results:

Period = 0.93368 [0.00001] d
Epoch = 131.5761 [0.0045] BKJD
Rp/R* = 0.0027 [0.0007]
a/R* = 1.46 [1.14]
b = 0.47 [2.41]
Seff = 14079.32 [6763.73]
Teq = 2778 [334] K
Rp = 0.55 [0.22] Re
a = 0.0208 [0.0060] AU
Ag = N/A
Teffp = N/A

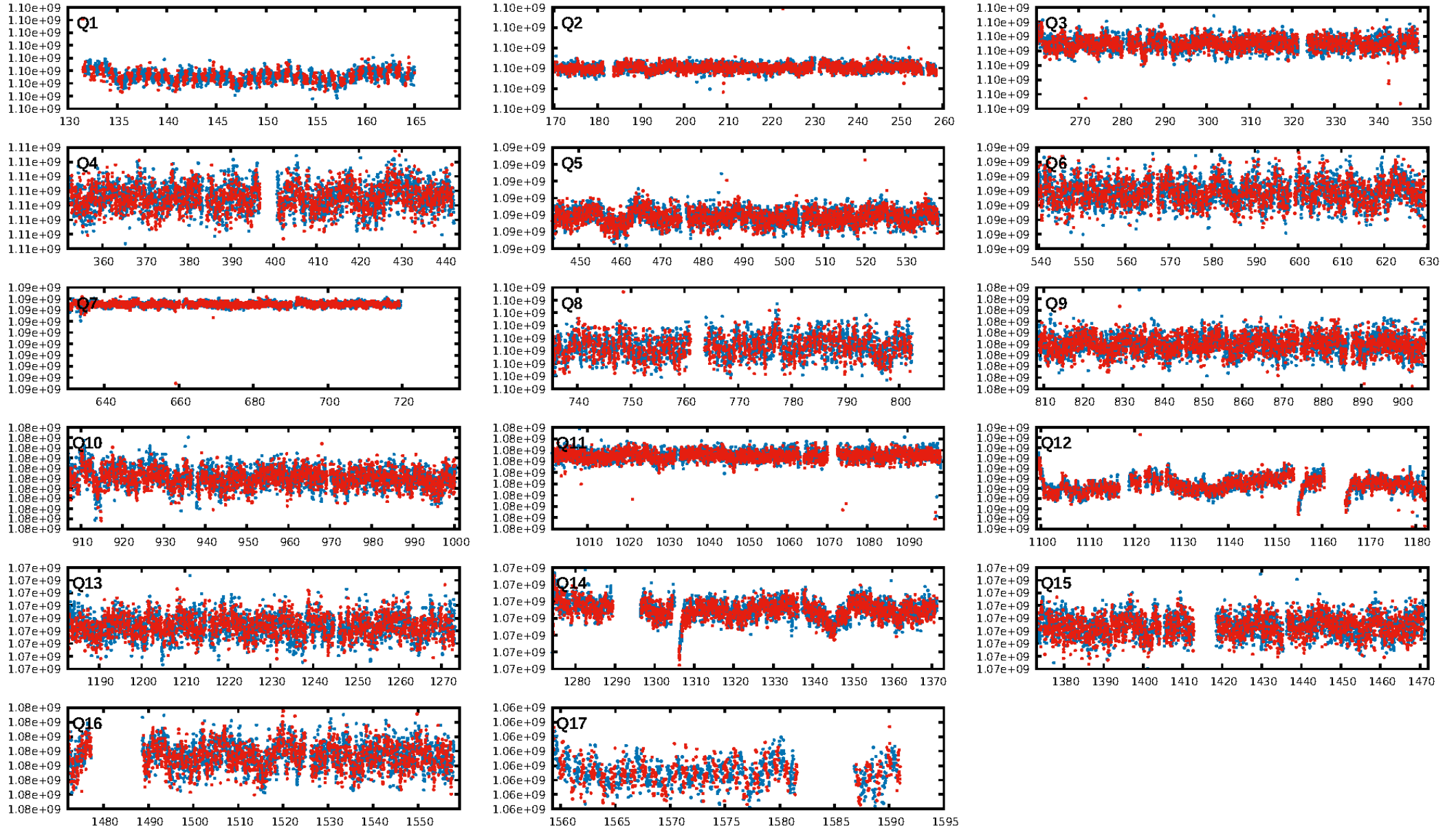
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [354.41σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.33e-15
RollingBand-fgt: 1.00 [1378/1378]
GhostDiagnostic-chr: 0.05876
Centroid-sig: 0.0%
Centroid-so: 4.512 arcsec [4.69σ]
OotOffset-rm: 3.421 arcsec [3.44σ]
KicOffset-rm: 3.548 arcsec [3.61σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.24 [4/17]
DiffImageOverlap-fno: 1.00 [17/17]

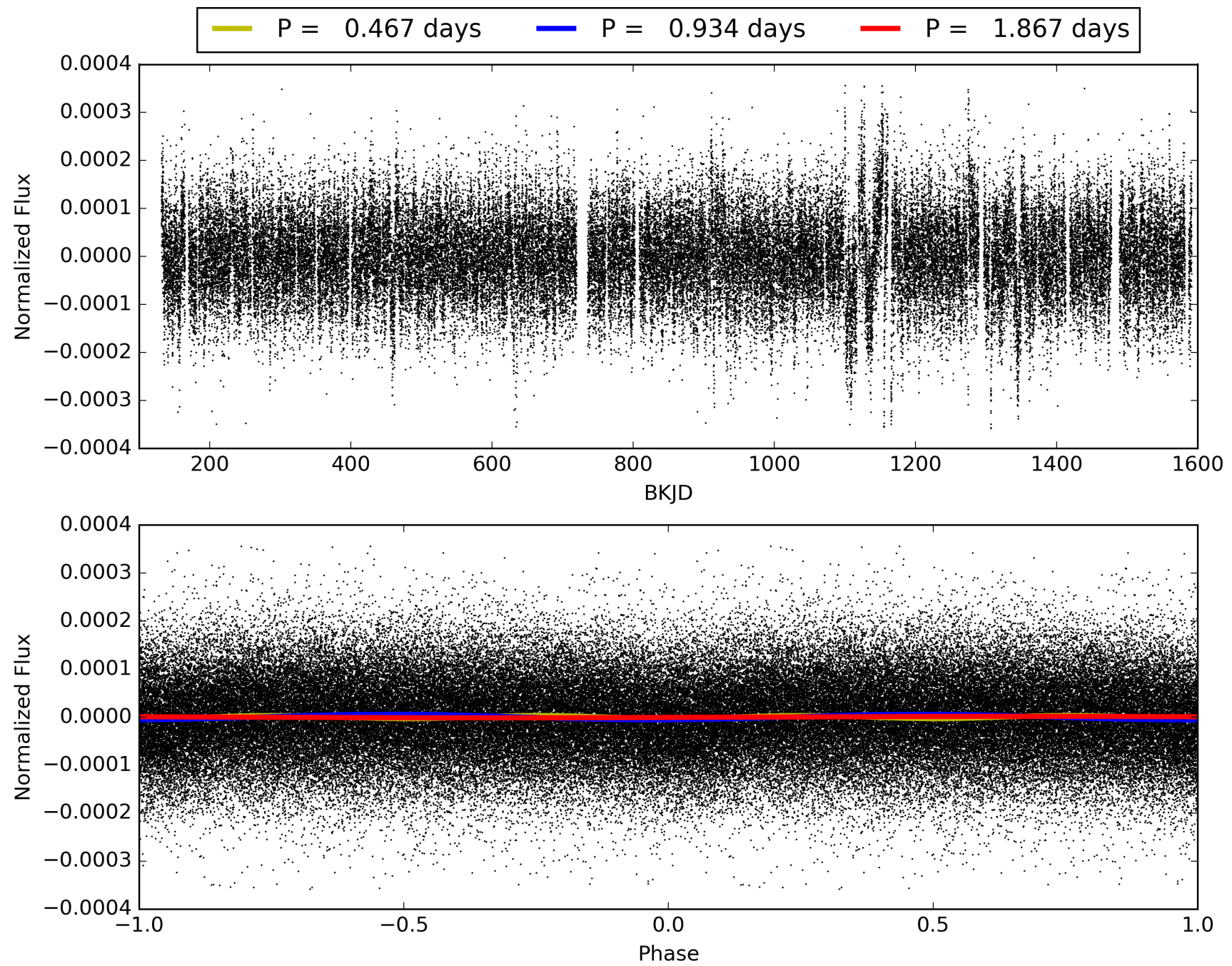
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:03:19 Z

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

TCE 010407210-01, PDC Light Curves

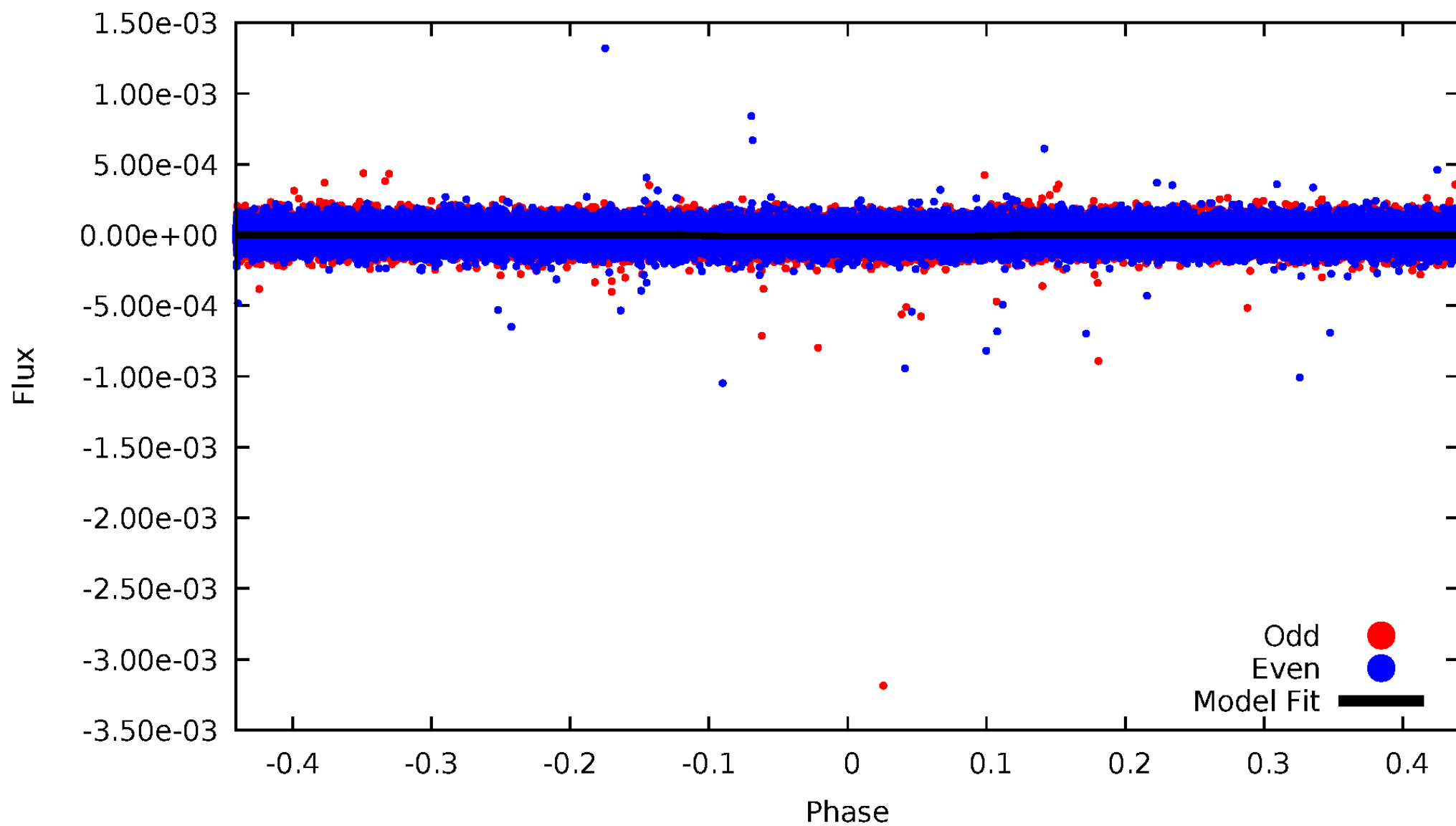


TCE 010407210-01



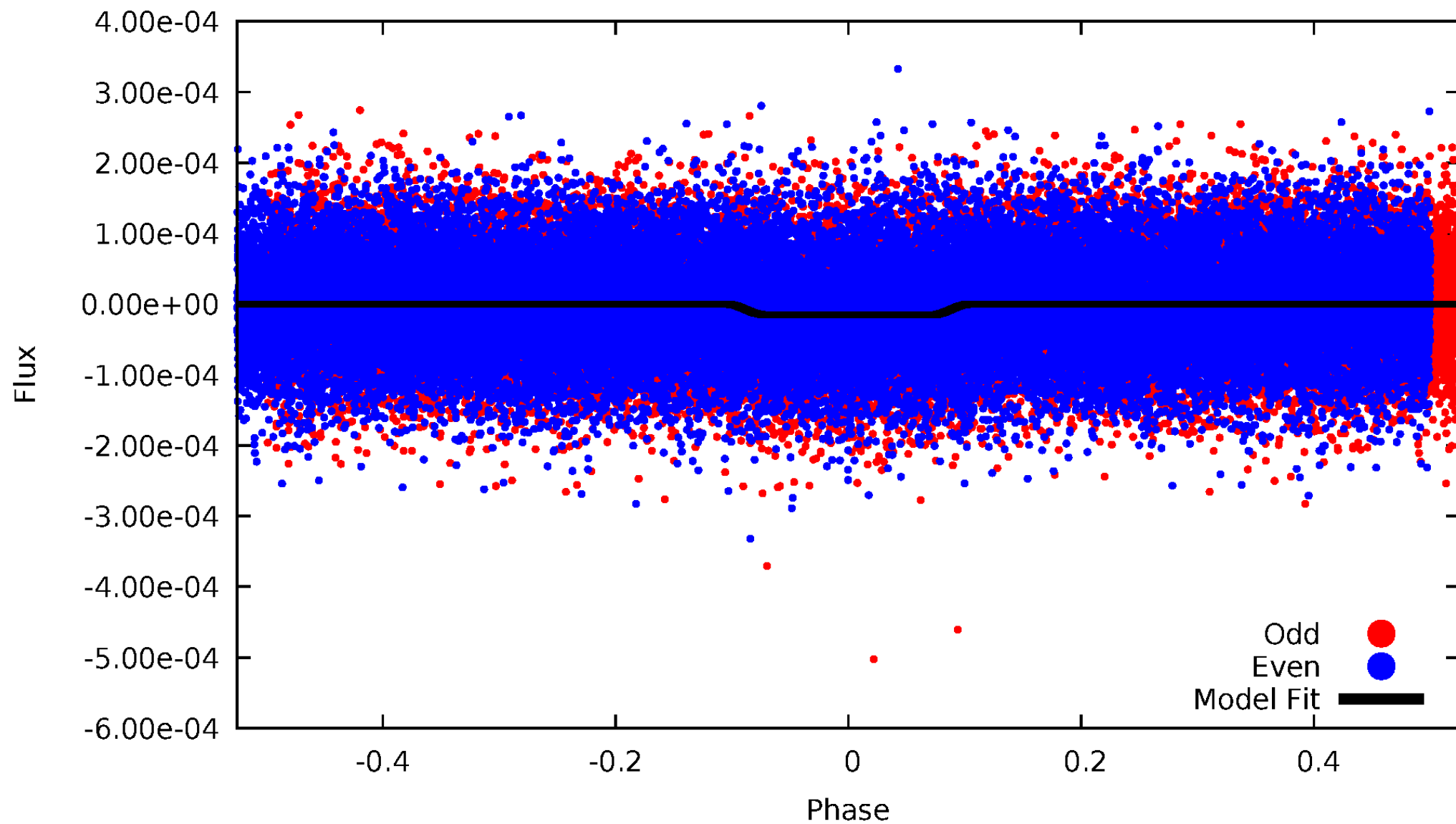
DV Odd/Even

TCE 010407210-01

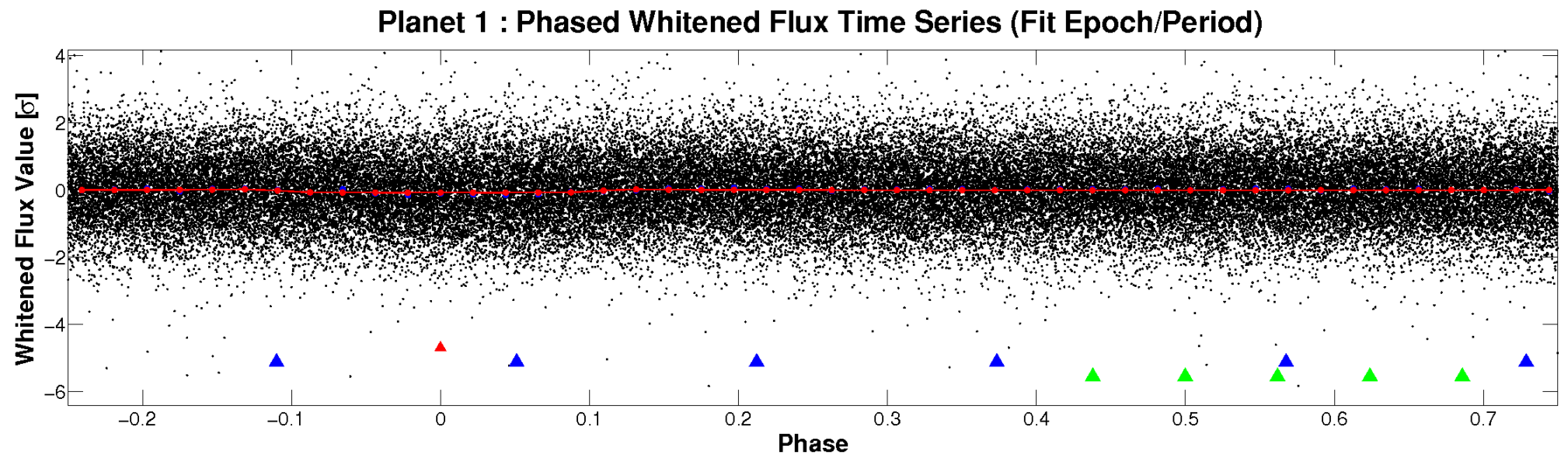
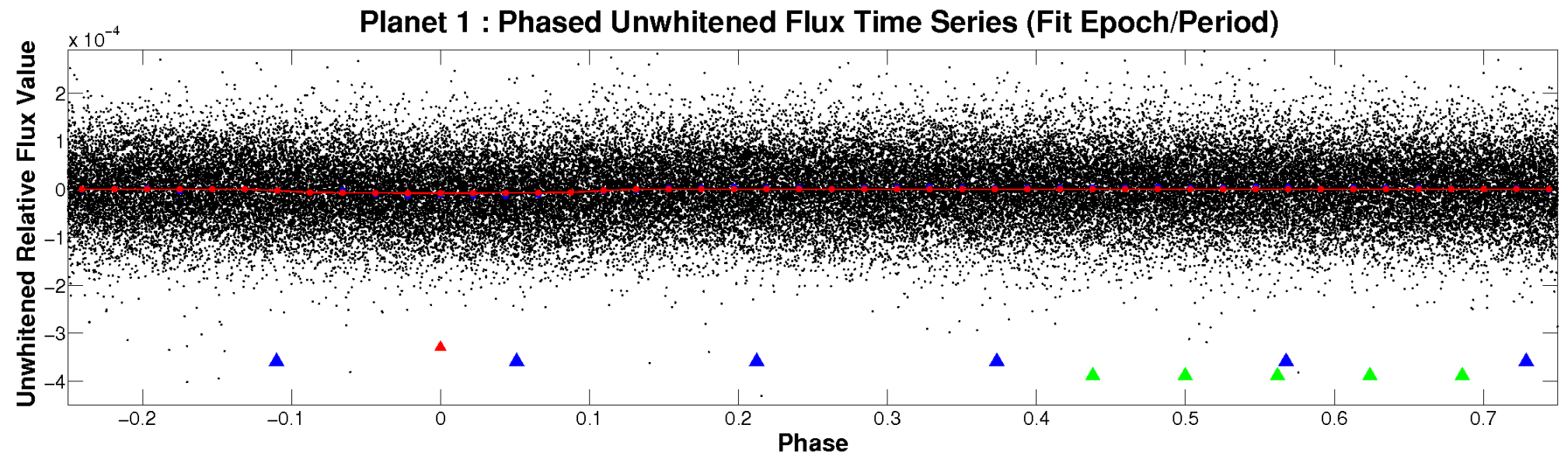


ALT Odd/Even

TCE 010407210-01

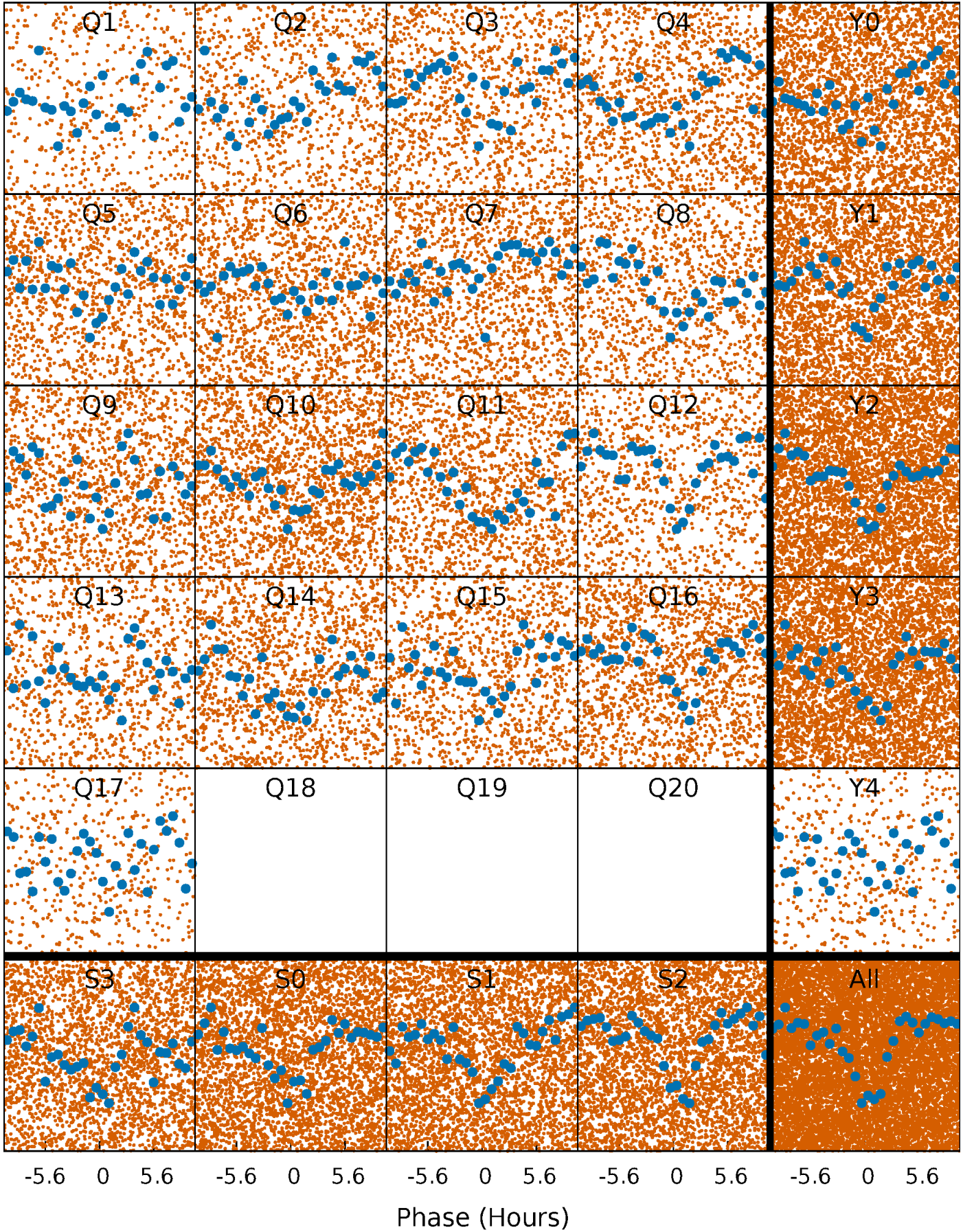


Non-Whitened Vs. Whitened Light Curve



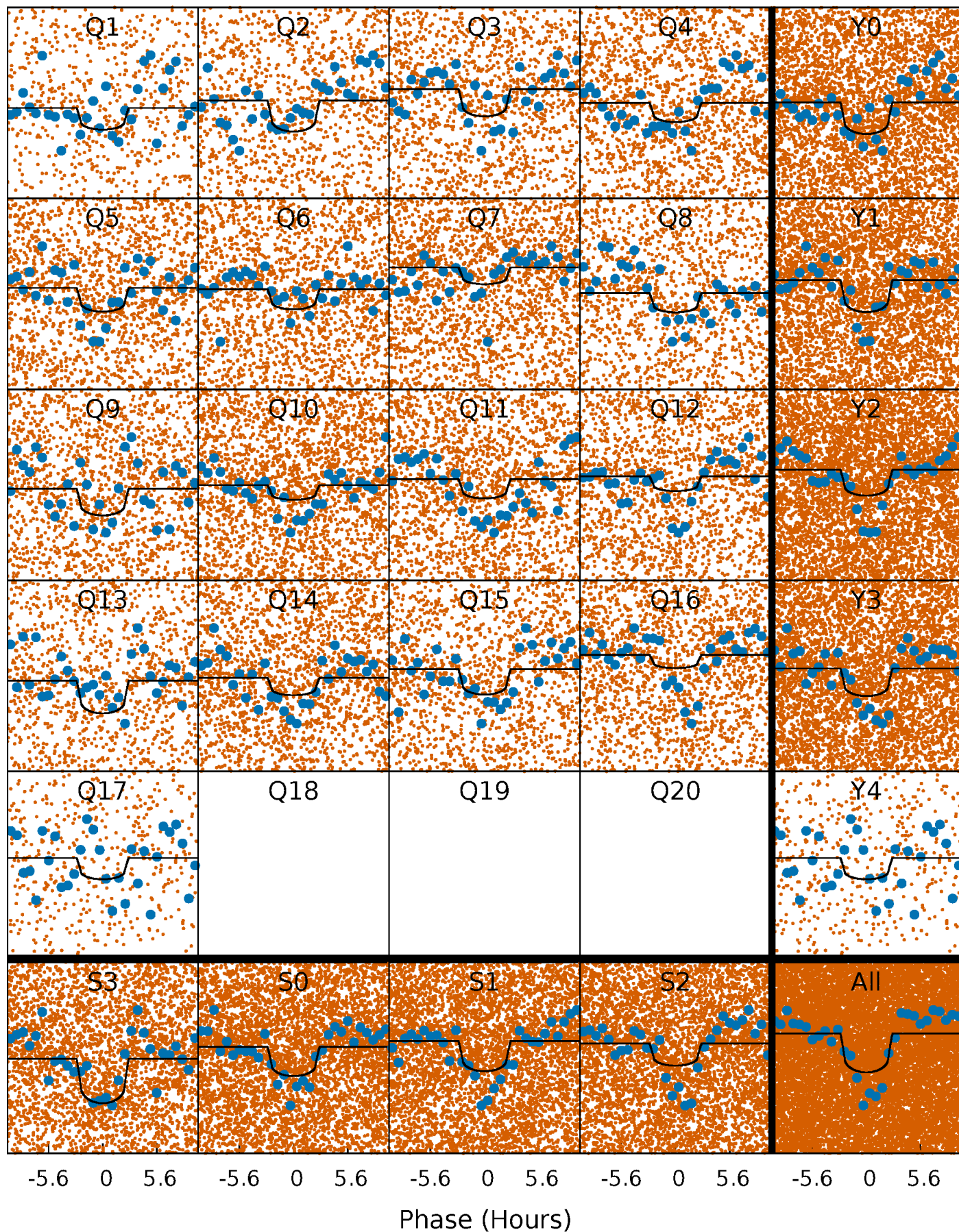
PDC Quarter-Phased Transit Curves

TCE 010407210-01 P= 0.933679 Days $T_0=131.576116$ (BKJD)



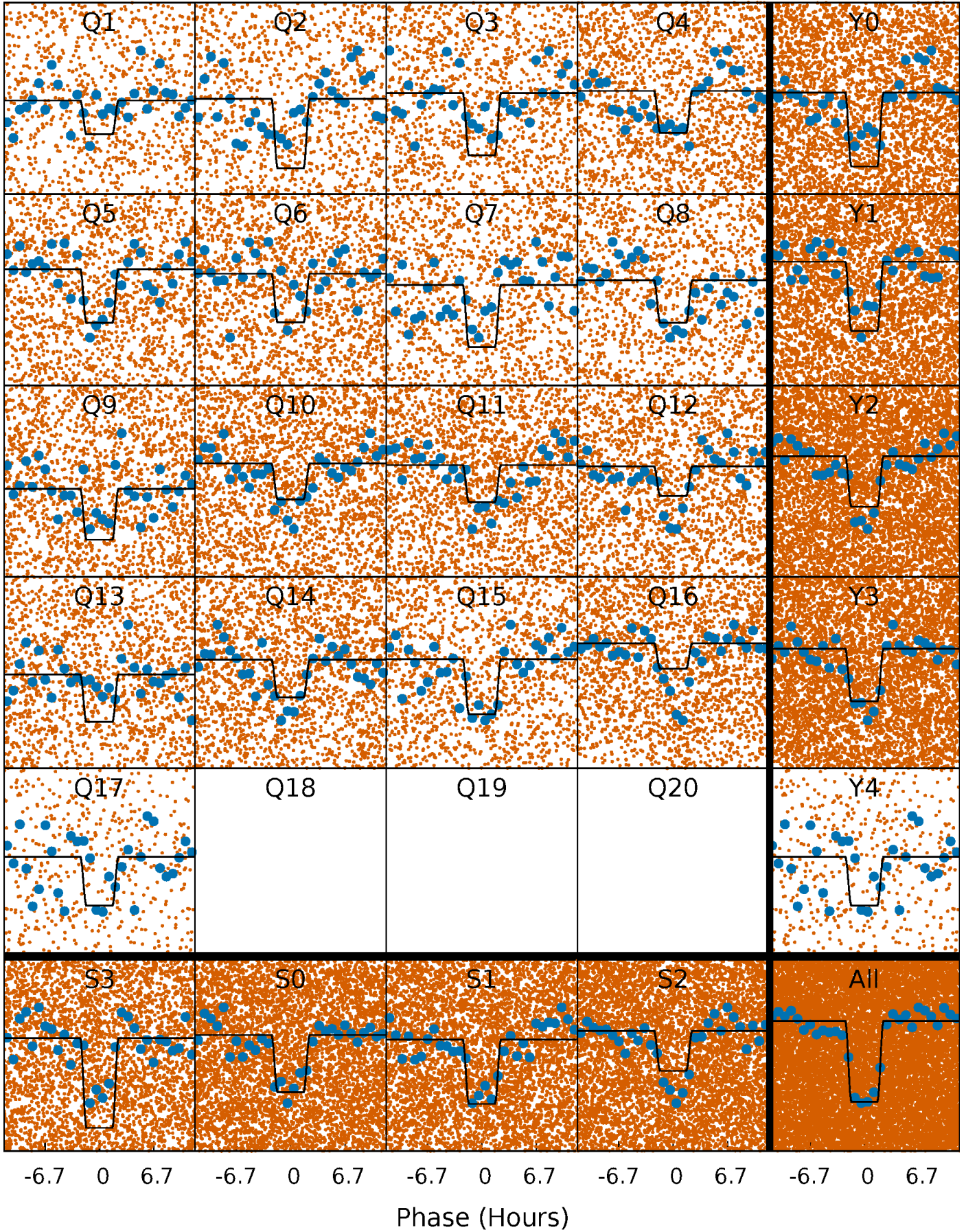
DV Quarter-Phased Transit Curves

TCE 010407210-01 P= 0.933679 Days $T_0=131.576116$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

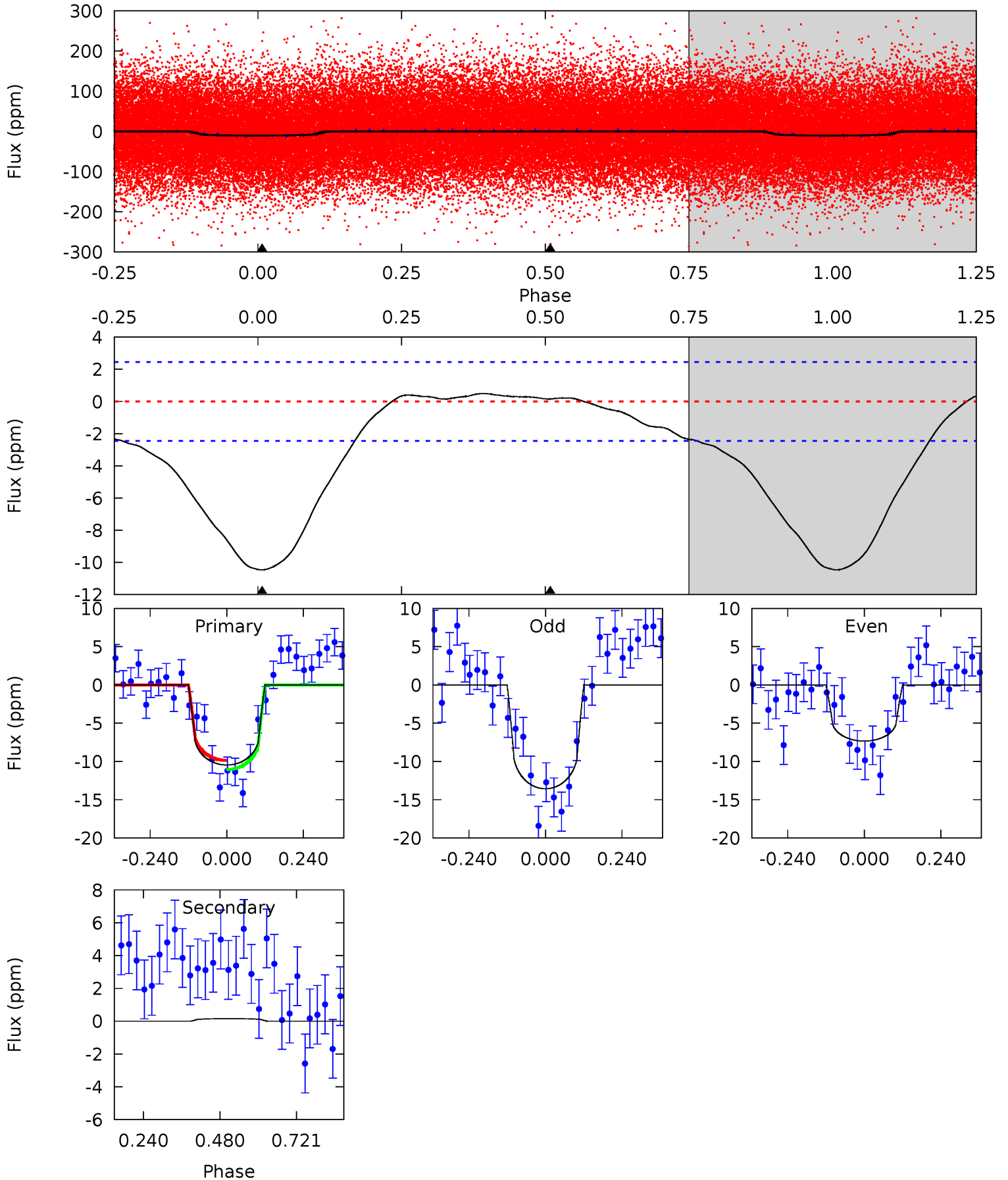
TCE 010407210-01 P= 0.933716 Days $T_0=131.553932$ (BKJD)



DV Model-Shift Uniqueness Test

010407210-01, P = 0.933679 Days, E = 130.642437 Days

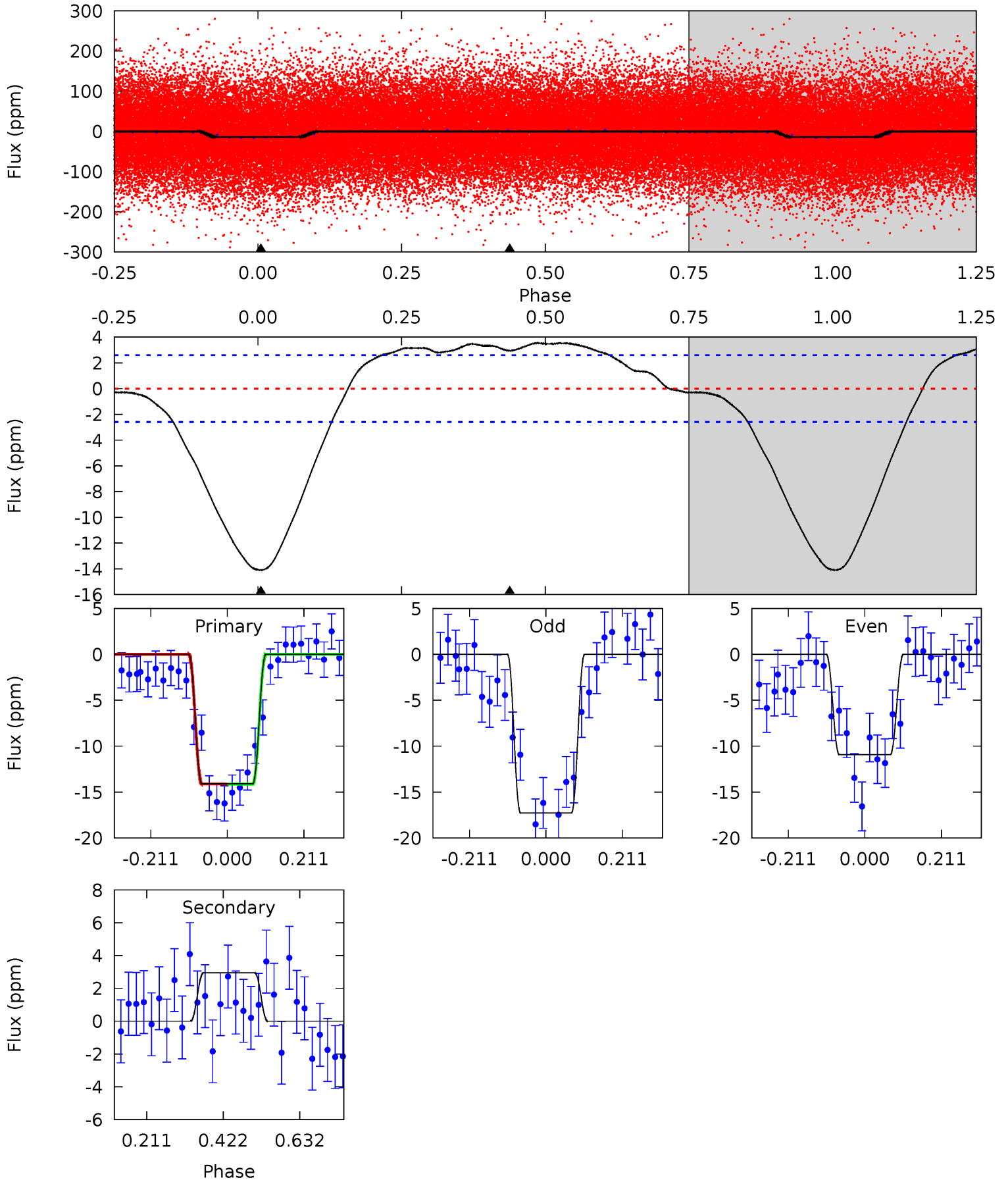
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 18.7 | -0.27 | 0 | 0 | 4.38 | 1.17 | 2.44 | 18.7 | 18.7 | -0.27 | -0.27 | 5.56 | 1.04 | 0.05 | 1.07 |



Alt Model-Shift Uniqueness Test

010407210-01, P = 0.933716 Days, E = 130.620216 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 23.9 | -5.00 | 0 | 0 | 4.41 | 1.25 | 1.54 | 23.9 | 23.9 | -5.00 | -5.00 | 5.36 | 1.11 | 0.20 | 0.02 |



Stellar Parameters For KIC 010407210

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6652^{+187}_{-258} | $4.036^{+0.264}_{-0.176}$ | $-0.160^{+0.250}_{-0.300}$ | $1.863^{+0.519}_{-0.576}$ | $1.378^{+0.186}_{-0.279}$ | $0.300^{+0.562}_{-0.142}$ |
| | +3%/-4% | +7%/-4% | +156%/-188% | +28%/-31% | +13%/-20% | +187%/-47% |
| Source | PHO54 | PHO54 | PHO54 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010407210-01 / KOI 4662.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|------------------------|----------------------------|
| DV | 0 ± 1 | $0.52^{+0.20}_{-0.17}$ | 3856^{+315}_{-330} | -3753^{+6678}_{-698} | $-0.091^{+0.473}_{-0.584}$ |
| Alt. | 3 ± 1 | $0.78^{+0.20}_{-0.19}$ | 3830^{+310}_{-296} | -4775^{+313}_{-414} | $-1.144^{+0.457}_{-0.868}$ |

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

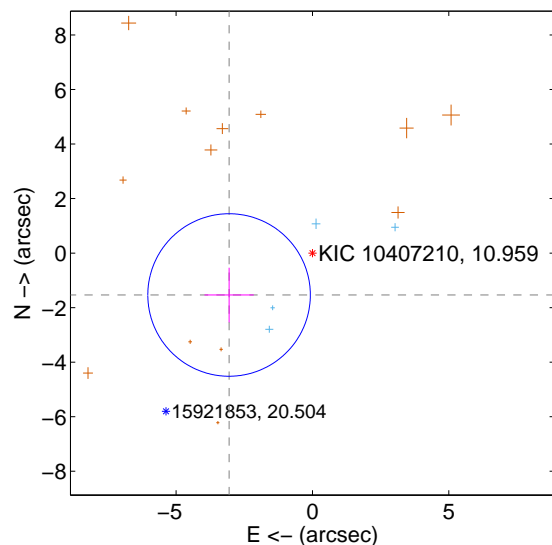
Supplemental centroid analysis for 010407210-01. **Kepler magnitude: 10.96.** Transit SNR 8.39

There are 4 quarters with good PRF difference image offsets

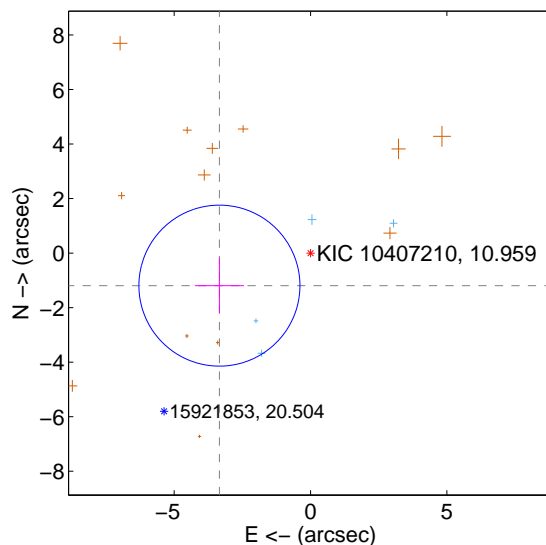
The direct PRF centroid is offset from the target star catalog position by about 0.82 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 3.421 ± 0.993 | 3.44 | 3.057 ± 0.903 | -1.536 ± 1.003 |
| PRF-fit source offset from KIC position | 3.548 ± 0.984 | 3.61 | 3.341 ± 0.901 | -1.193 ± 1.006 |
| photometric centroid source offset | 4.51 ± 0.96 | 4.69 | -0.80 ± 0.83 | 4.44 ± 0.97 |

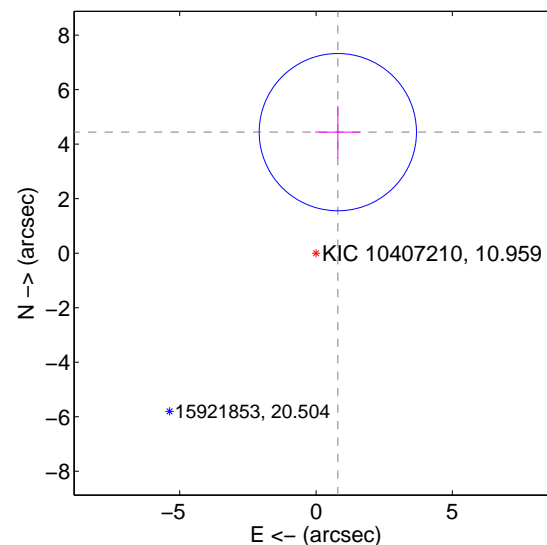
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

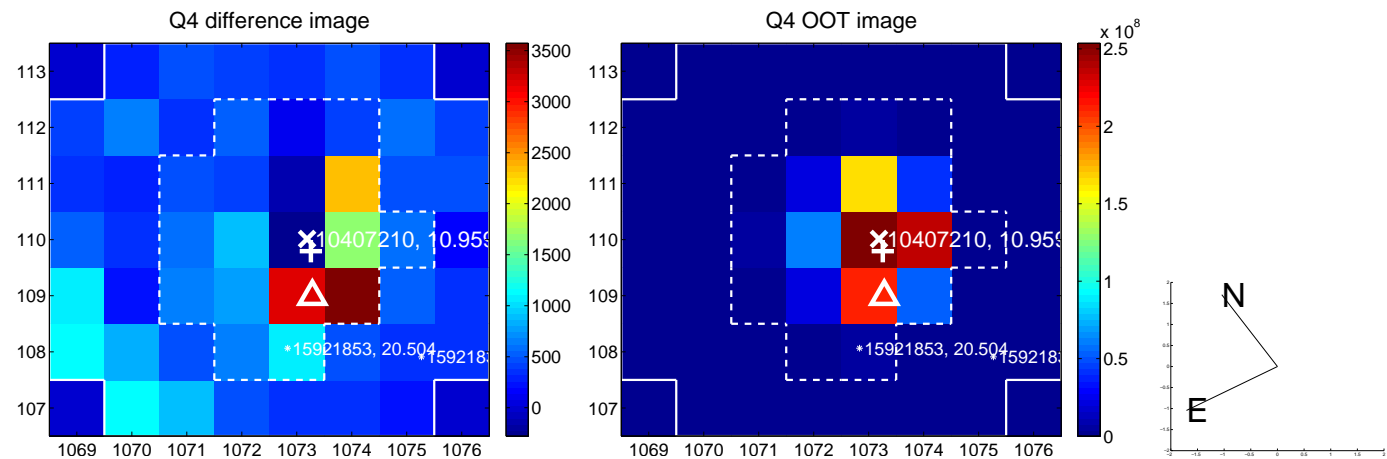
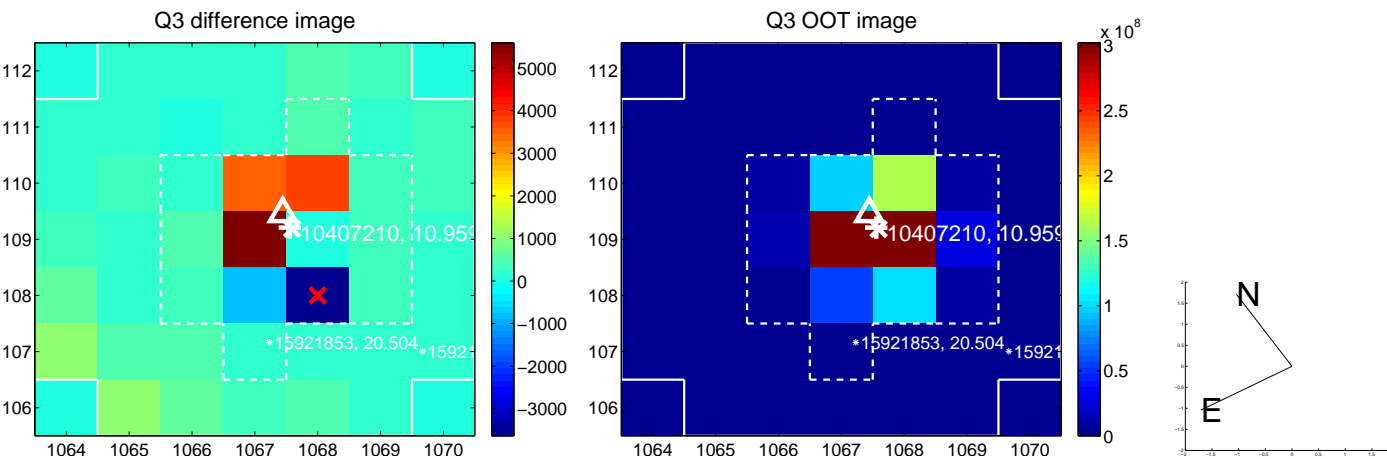
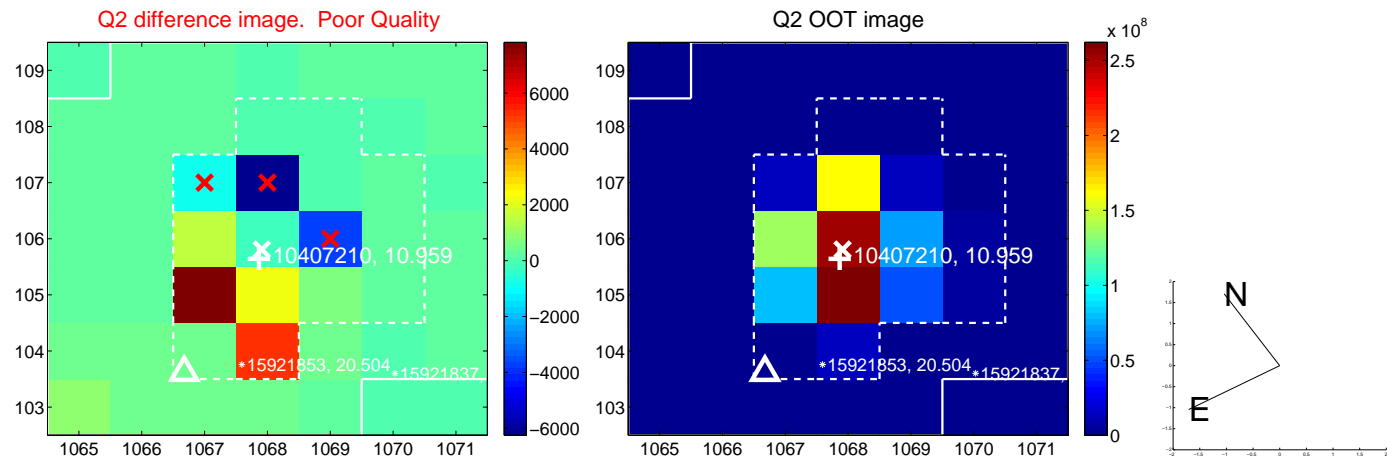
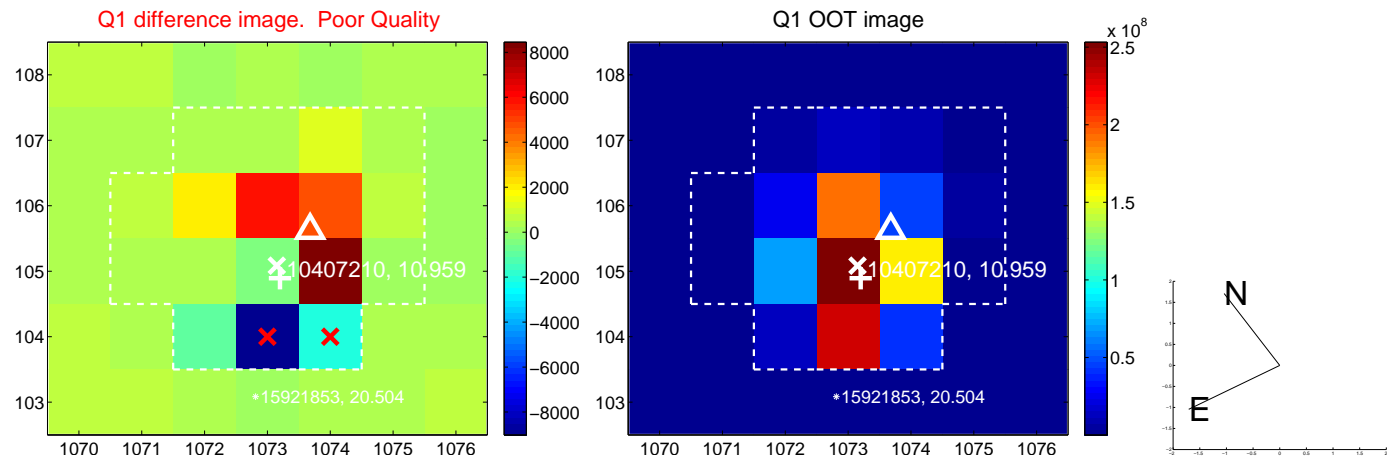


offset from photometric centroids

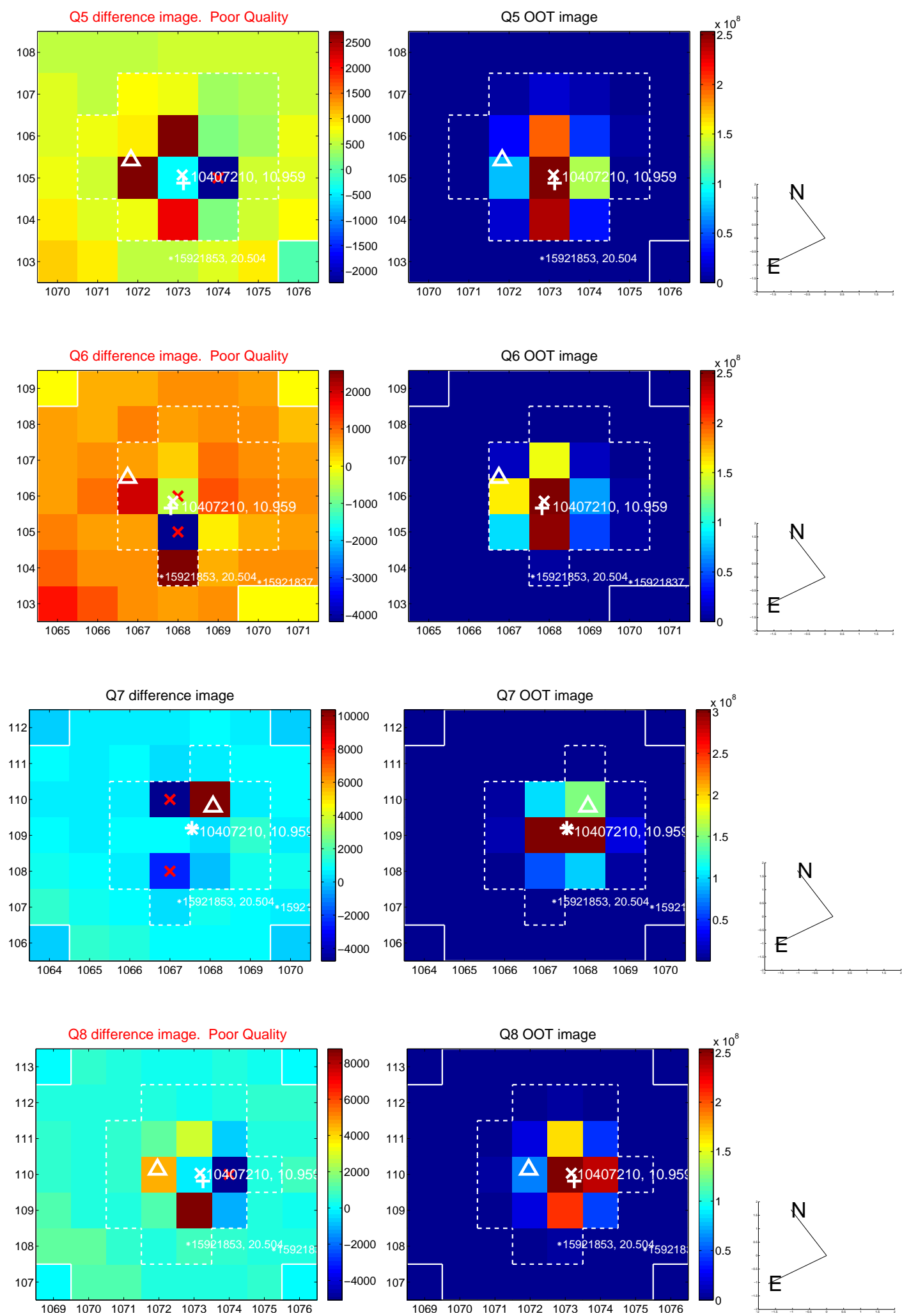


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

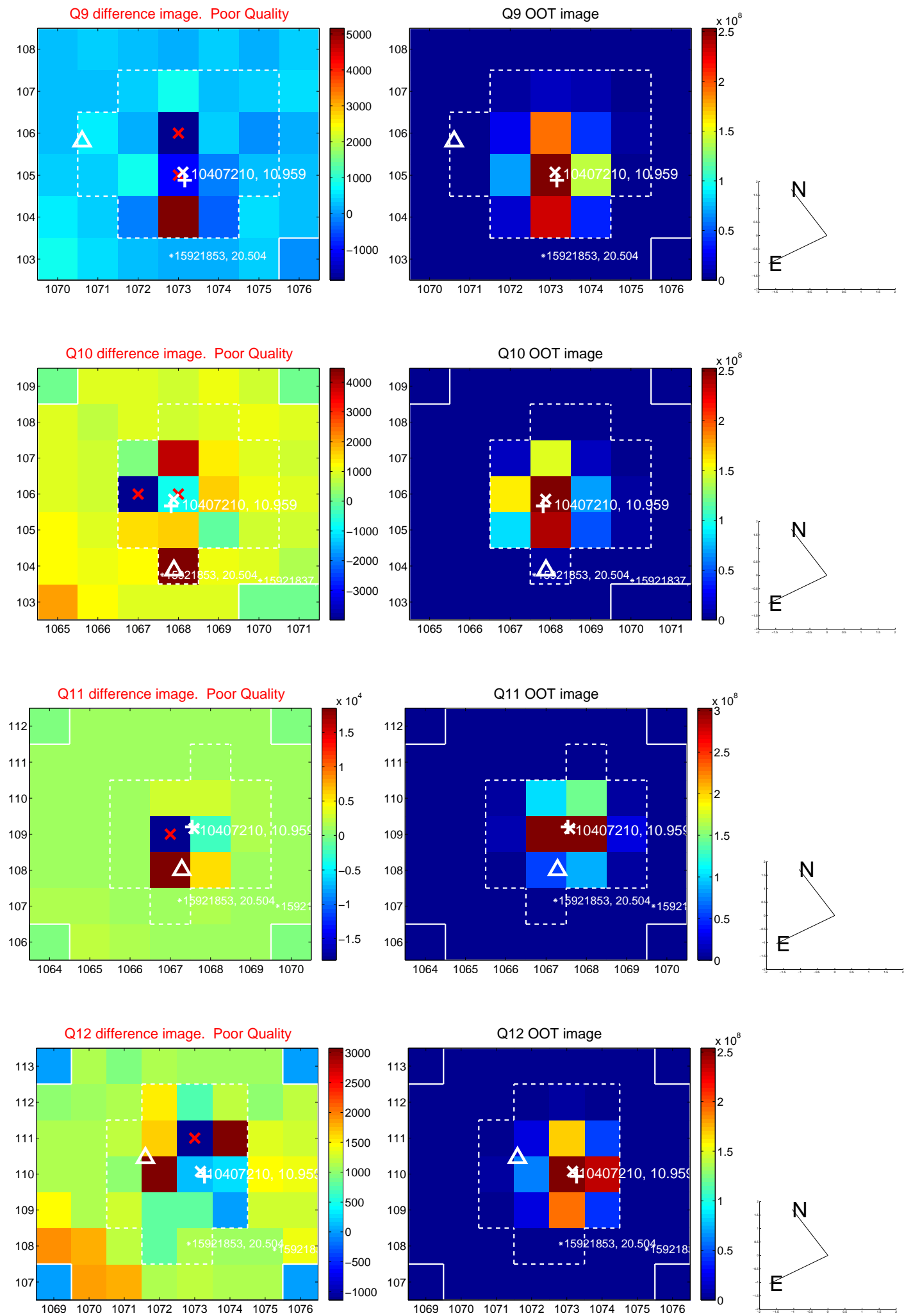
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



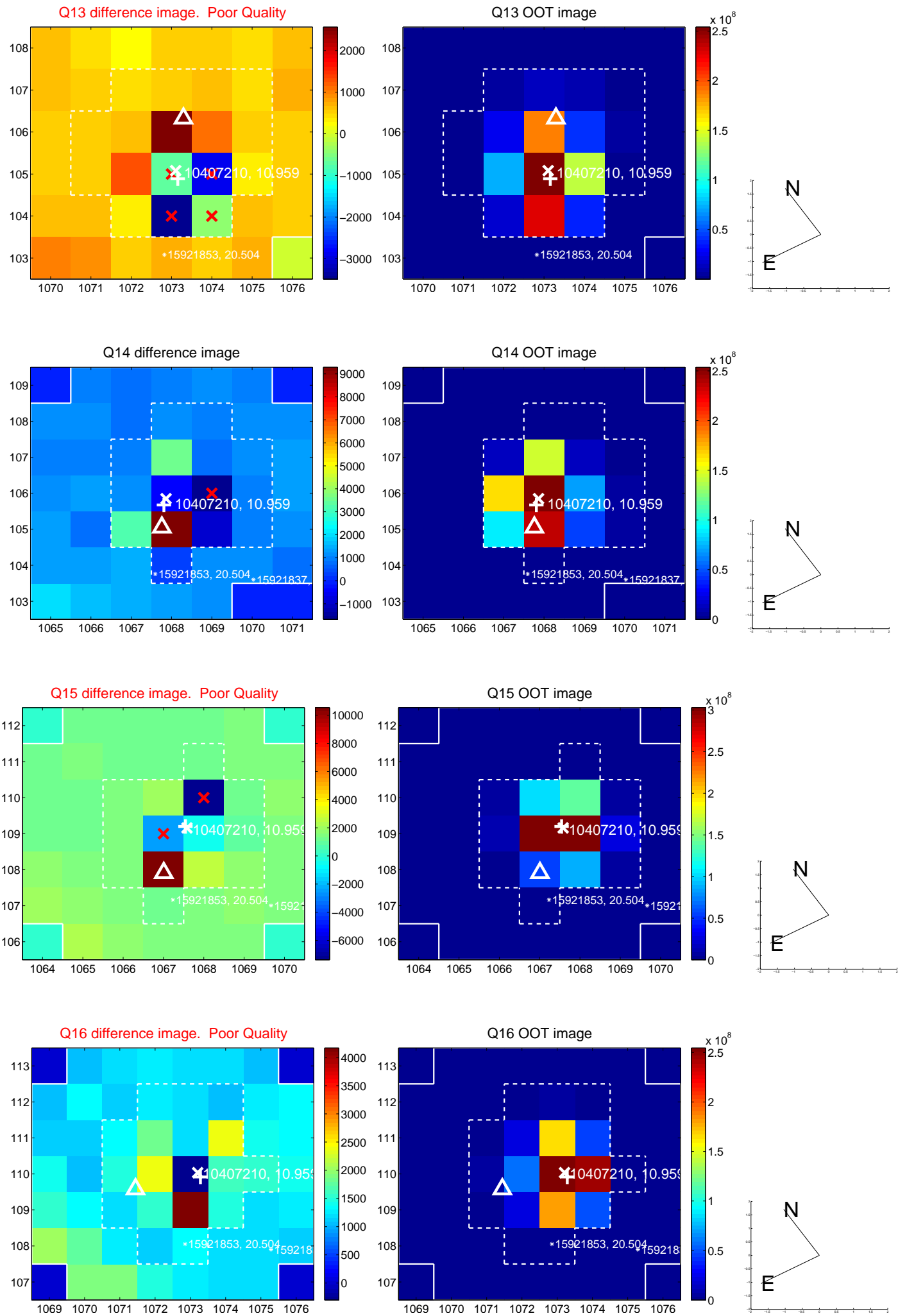
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



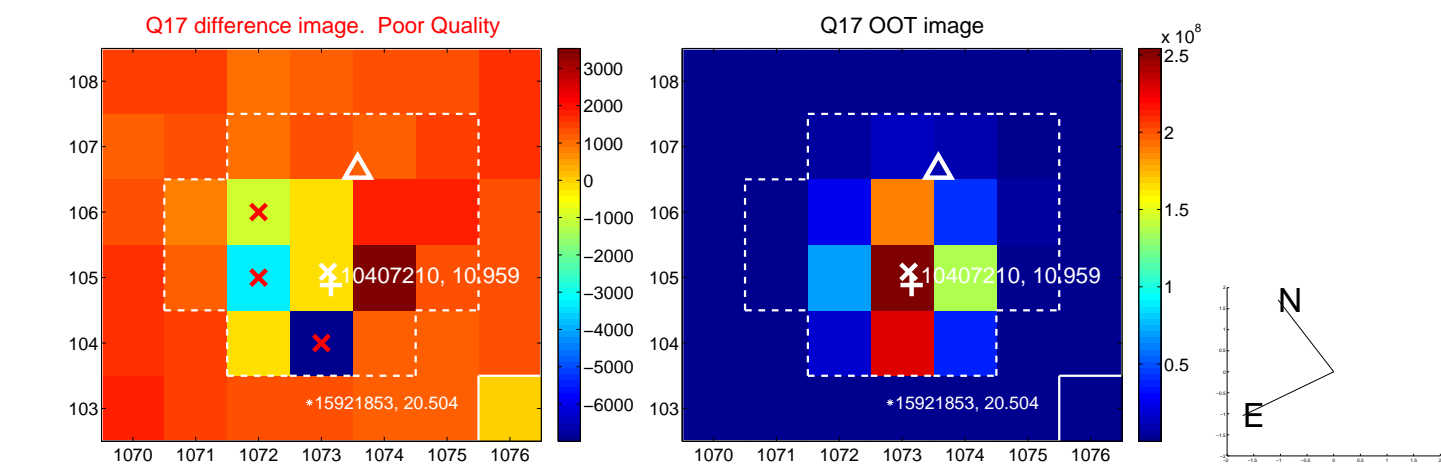
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



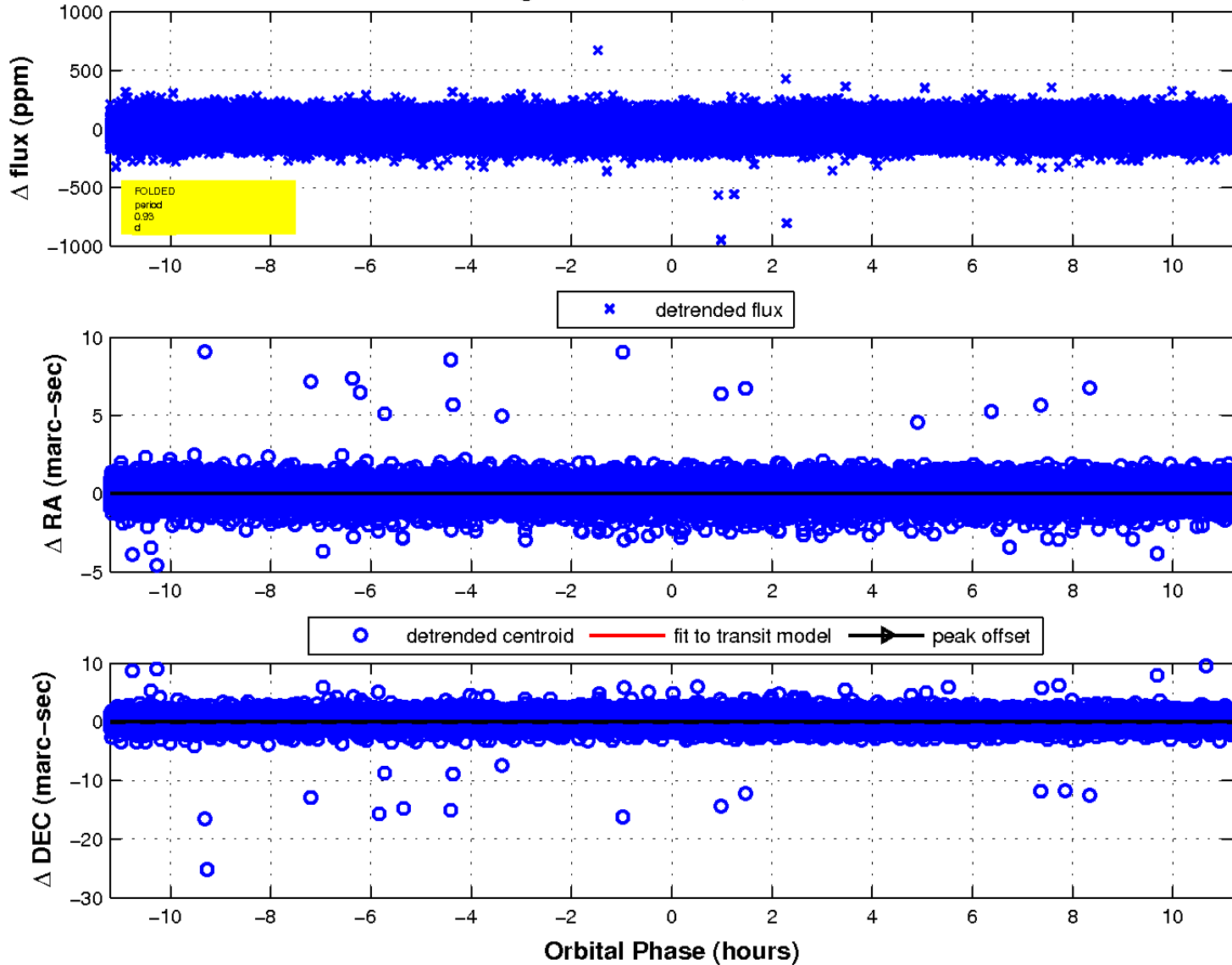
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

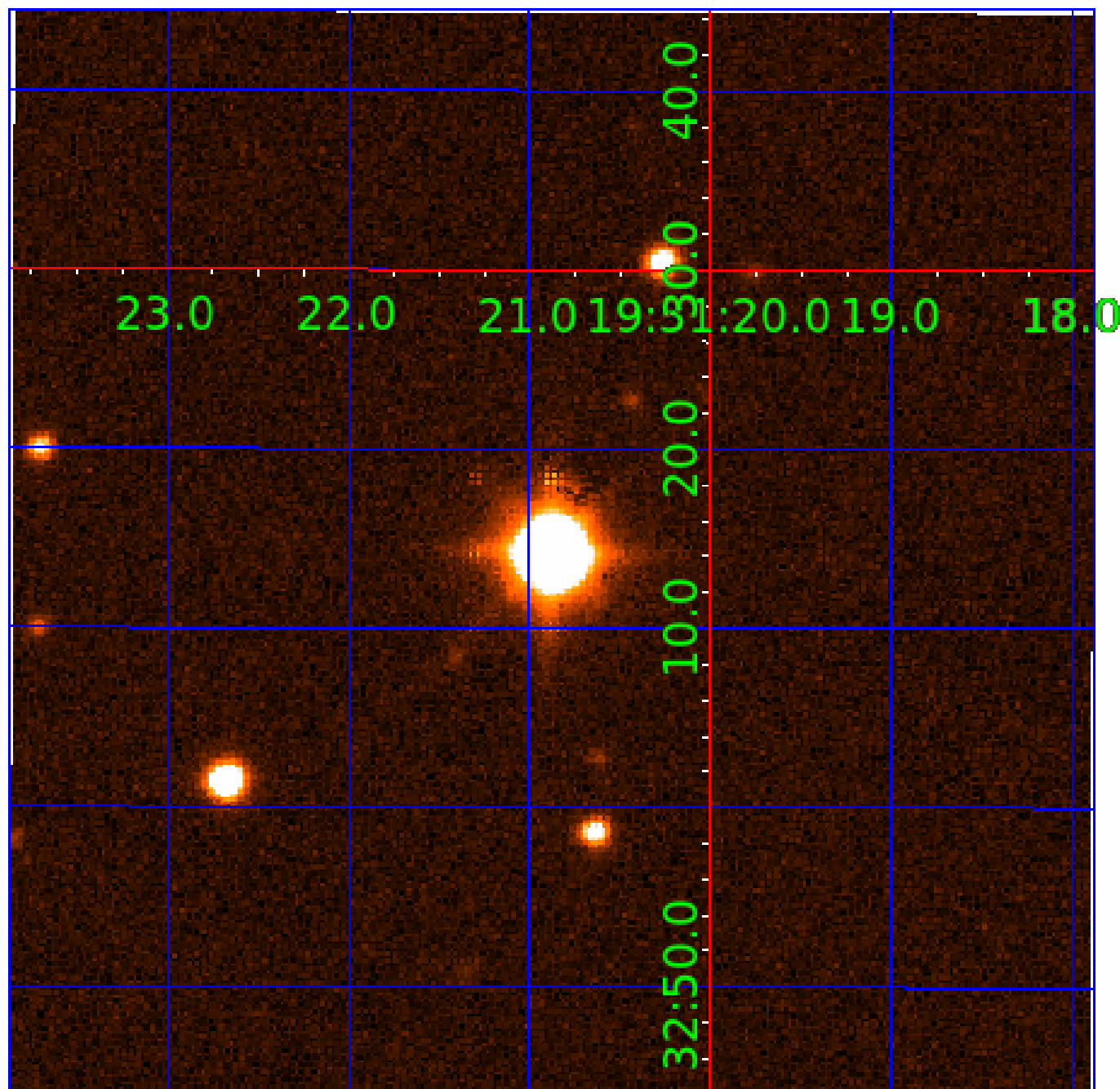


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination



KIC 010407210

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 010407210-01 | OBS | 4662.01 | 0.933679 | 131.576116 | 8.1 | 4.938 | 10.3 | 8.4 | 1.86 | 6652 | 0.55 | 14079.32 |
| 010407210-02 | OBS | No | 258.478616 | 285.048159 | 124.4 | 16.727 | 9.7 | 7.3 | 1.86 | 6652 | 2.31 | 7.80 |
| 010407210-03 | OBS | No | 304.437252 | 157.194291 | 152.6 | 4.635 | 8.0 | 8.8 | 1.86 | 6652 | 2.68 | 6.27 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010407210-01 | OBS | FP | 0.00 | 0 | 0 | 1 | 1 | CENT_SATURATED—HALO_GHOST—EPHEM_MATCH |
| 010407210-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED |
| 010407210-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL_SKYE—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 010407210-02

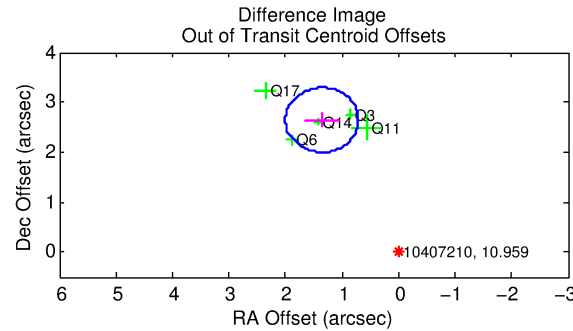
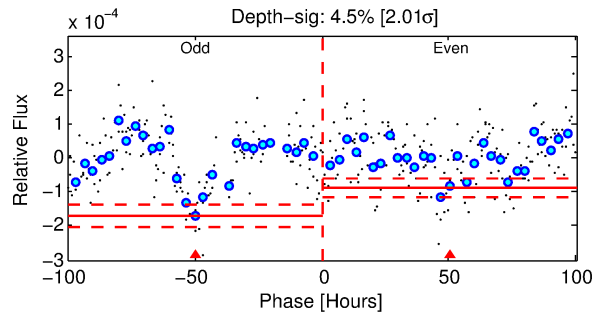
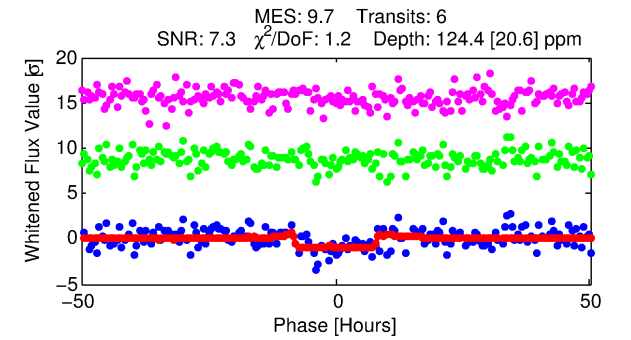
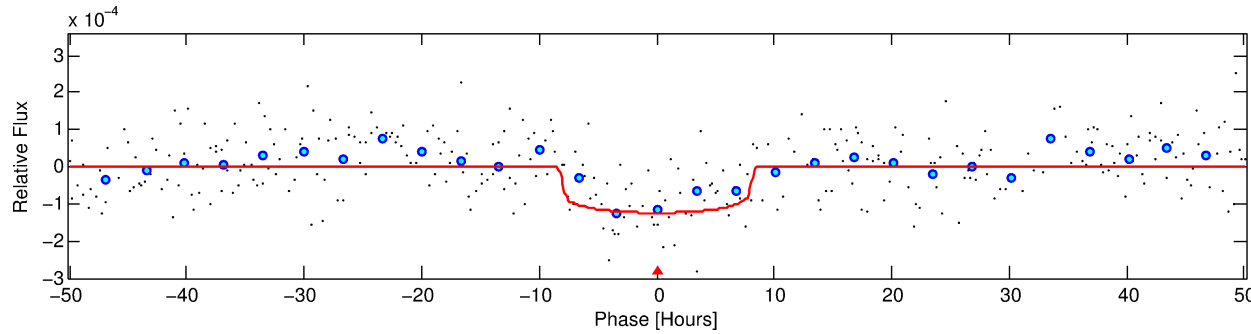
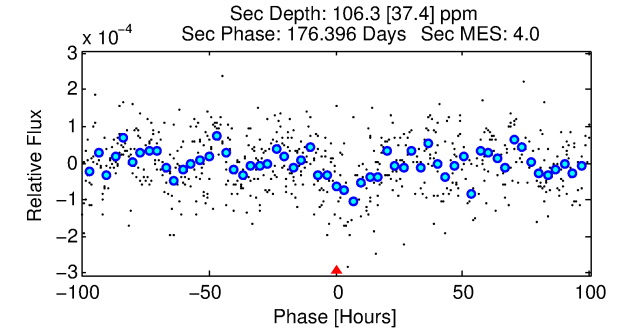
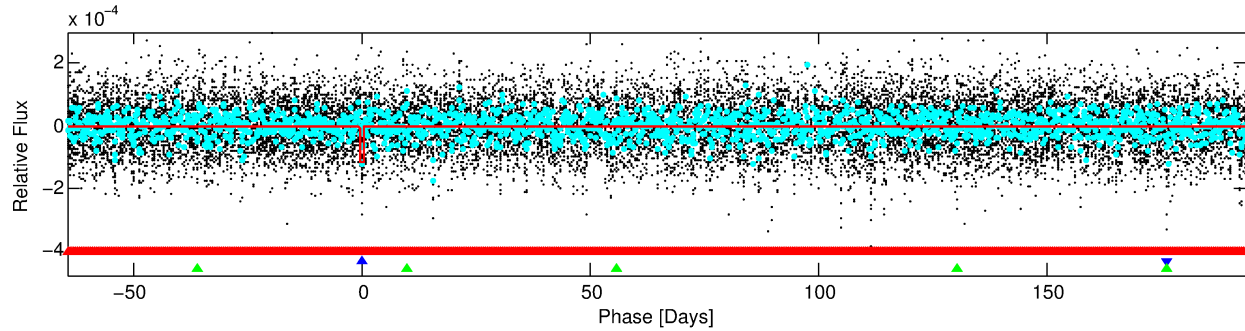
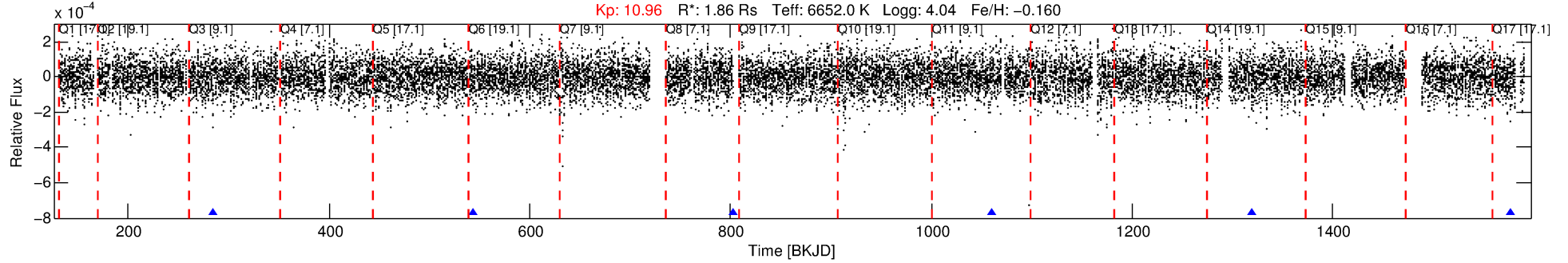
No Significant Match Found

DV One-Page Summary

KIC: 10407210 Candidate: 2 of 3 Period: 258.479 d

KOI: K04662 Corr: No Ephemeris Match

Kp: 10.96 R*: 1.86 Rs Teff: 6652.0 K Logg: 4.04 Fe/H: -0.160



DV Fit Results:

Period = 258.47862 [0.02163] d
Epoch = 285.0482 [0.0583] BKJD
Rp/R* = 0.0114 [0.0031]
a/R* = 69.54 [103.58]
b = 0.82 [0.58]
Seff = 7.80 [3.75]
Teq = 426 [51] K
Rp = 2.31 [0.96] Re
a = 0.8833 [0.2553] AU
Ag = 8516.51 [6772.01] [1.26σ]
Teff = 6330 [1061] K [5.56σ]

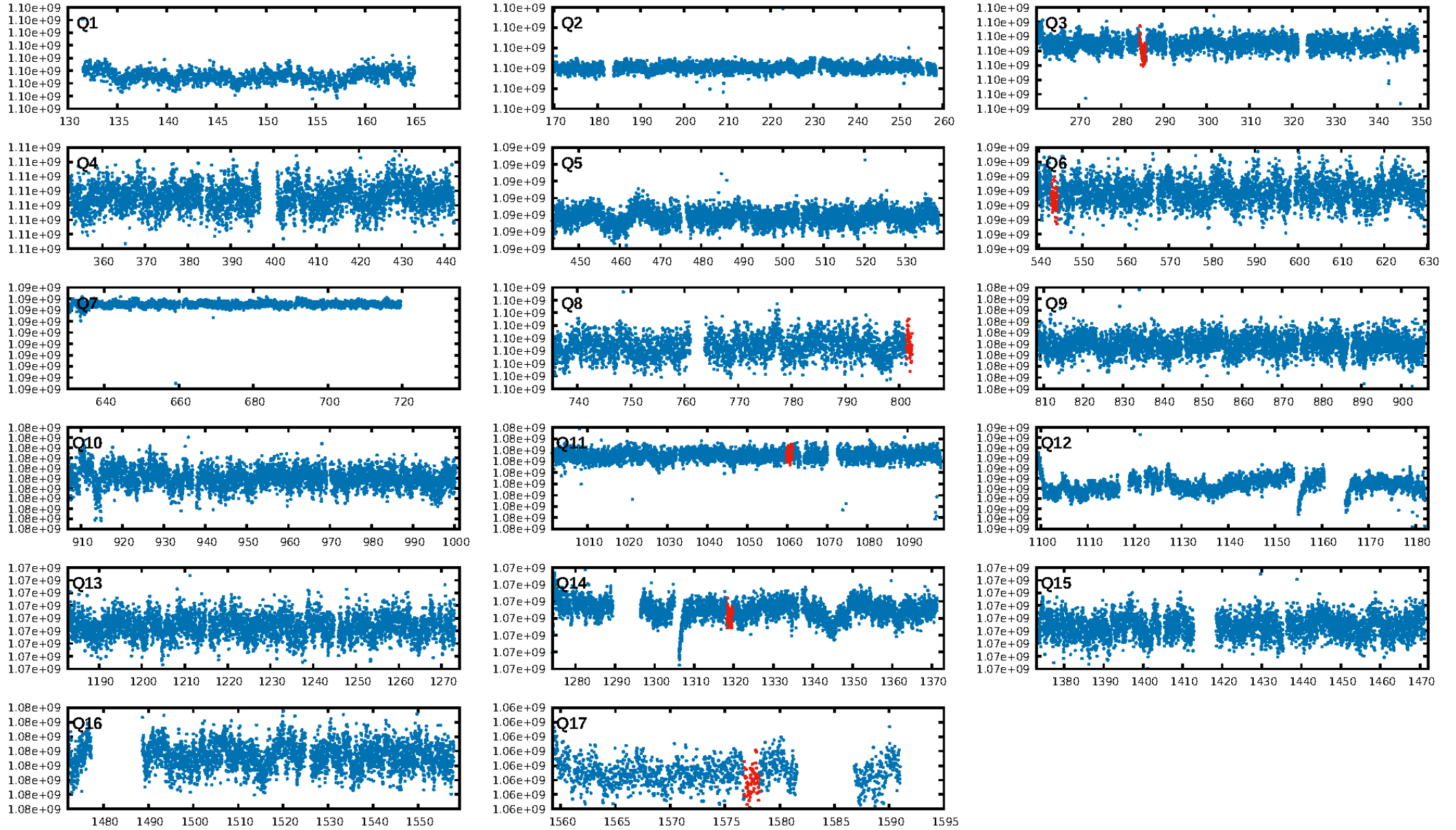
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [354.41σ]
LongPeriod-sig: 100.0% [63.55σ]
ModelChiSquare2-sig: 11.7%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: 5.80e-11
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 2.259
Centroid-sig: 1.4%
Centroid-so: 1.686 arcsec [2.19σ]
OotOffset-rm: 2.975 arcsec [13.81σ]
KicOffset-rm: 2.868 arcsec [8.41σ]
OotOffset-st: 2/2/0/1 [5]
KicOffset-st: 2/2/0/1 [5]
DiffImageQuality-fgm: 0.20 [1/5]
DiffImageOverlap-fno: 0.00 [0/5]

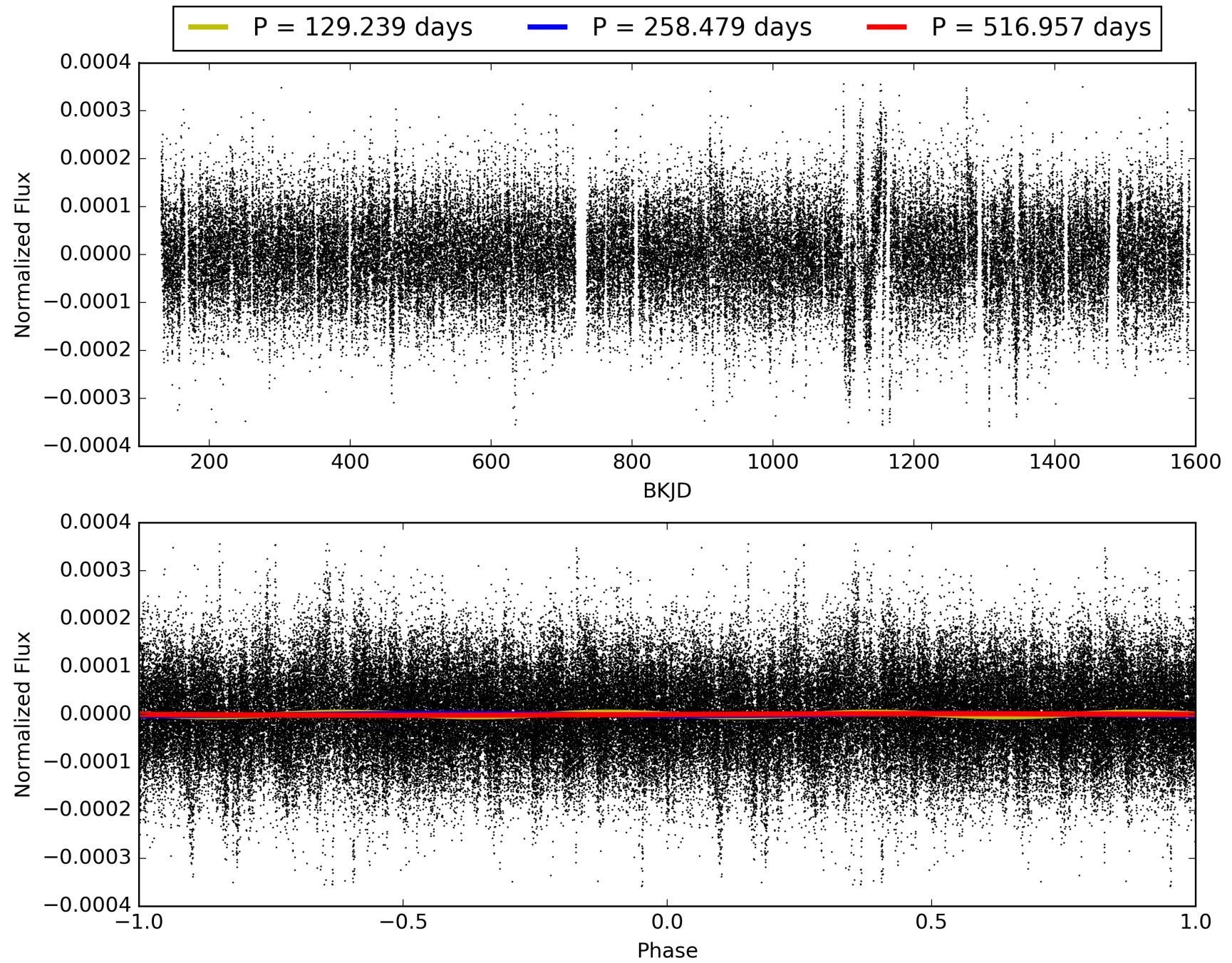
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:03:29 Z

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

TCE 010407210-02, PDC Light Curves

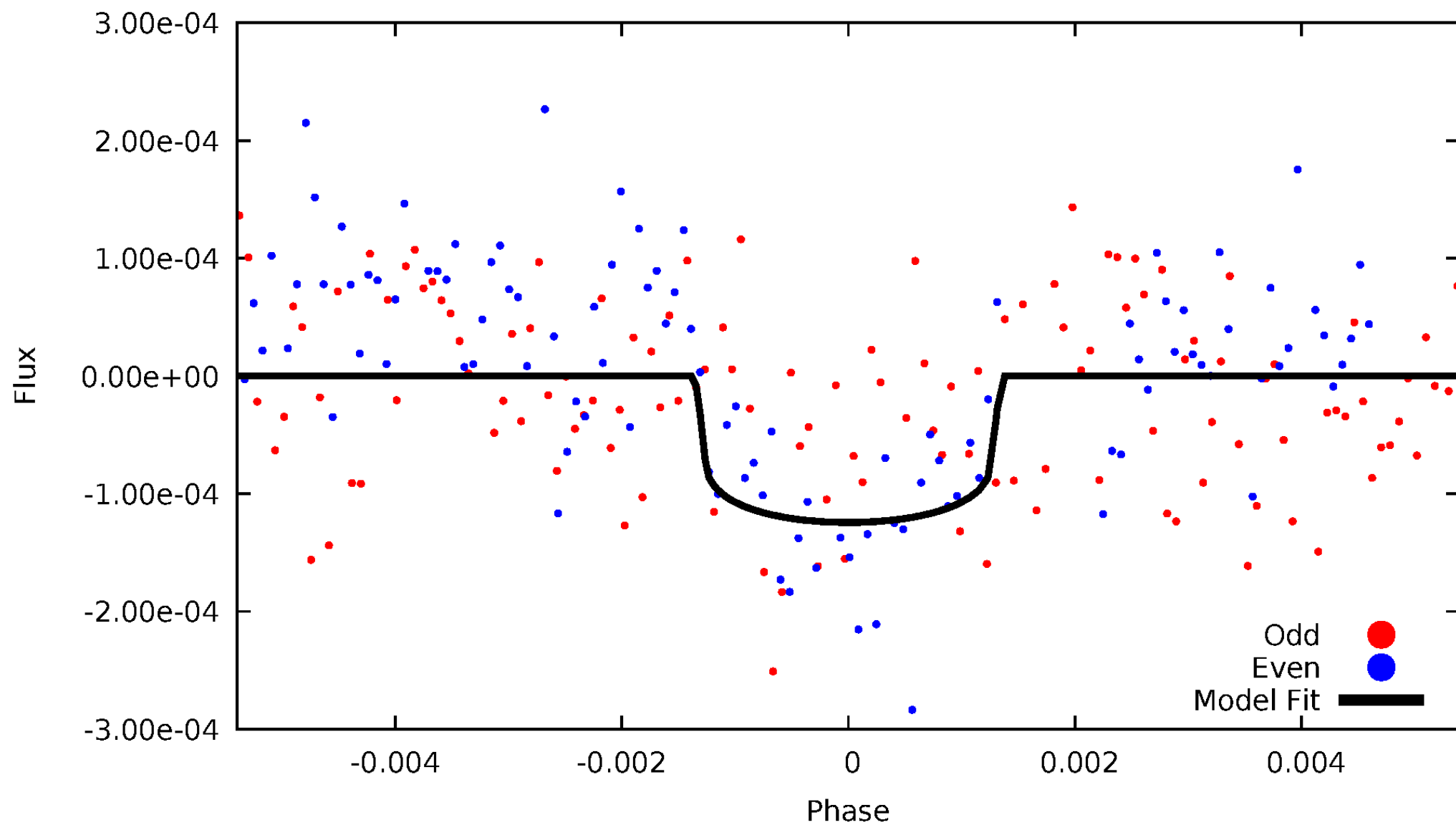


TCE 010407210-02



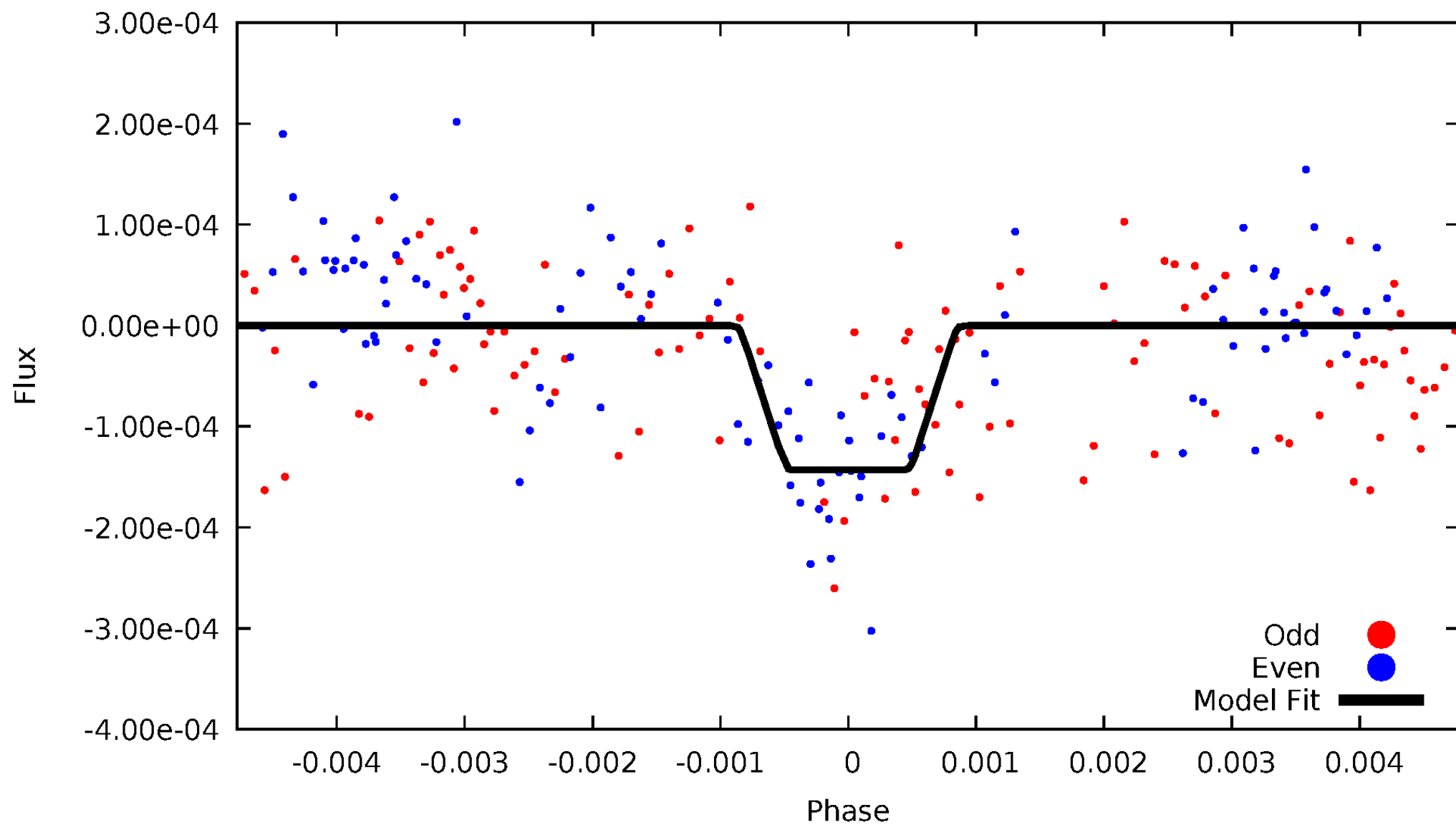
DV Odd/Even

TCE 010407210-02



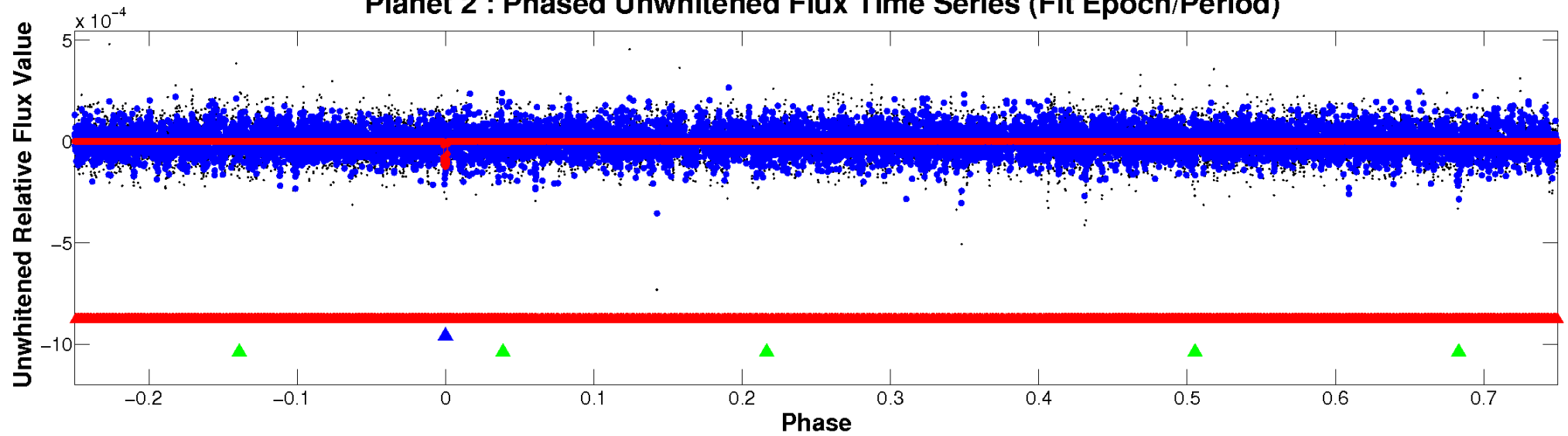
ALT Odd/Even

TCE 010407210-02

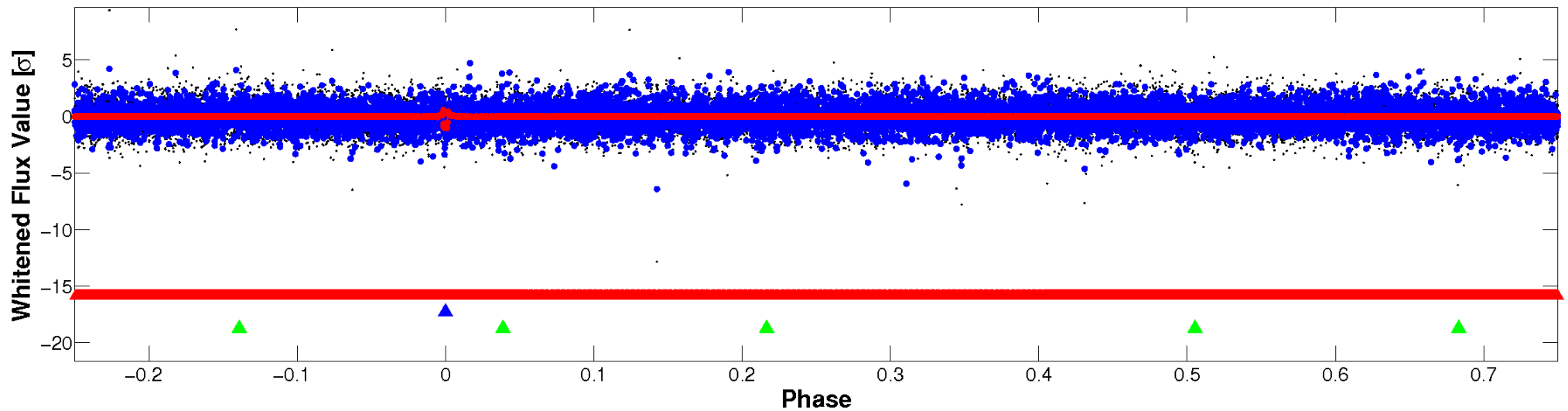


Non-Whitened Vs. Whitened Light Curve

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

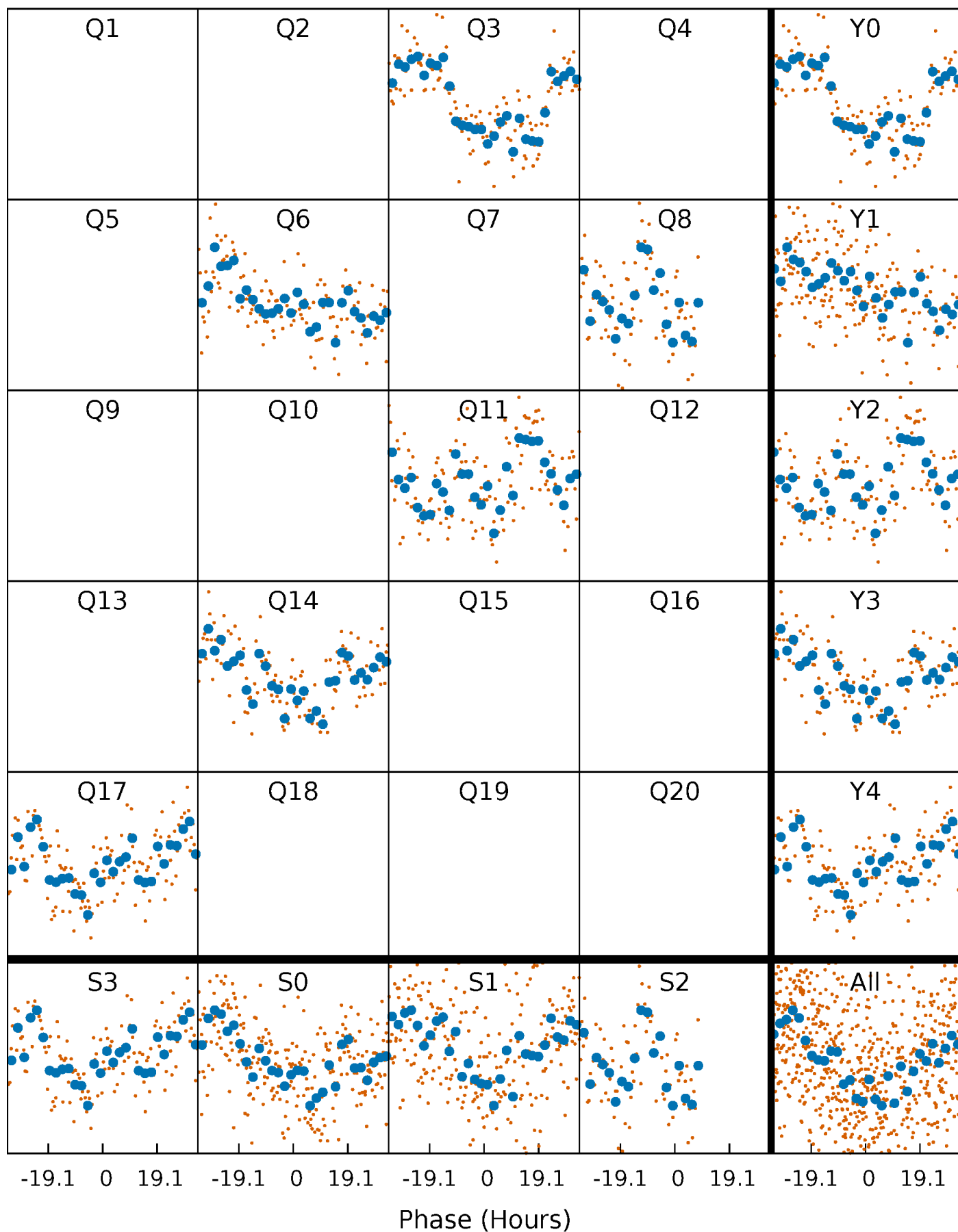


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



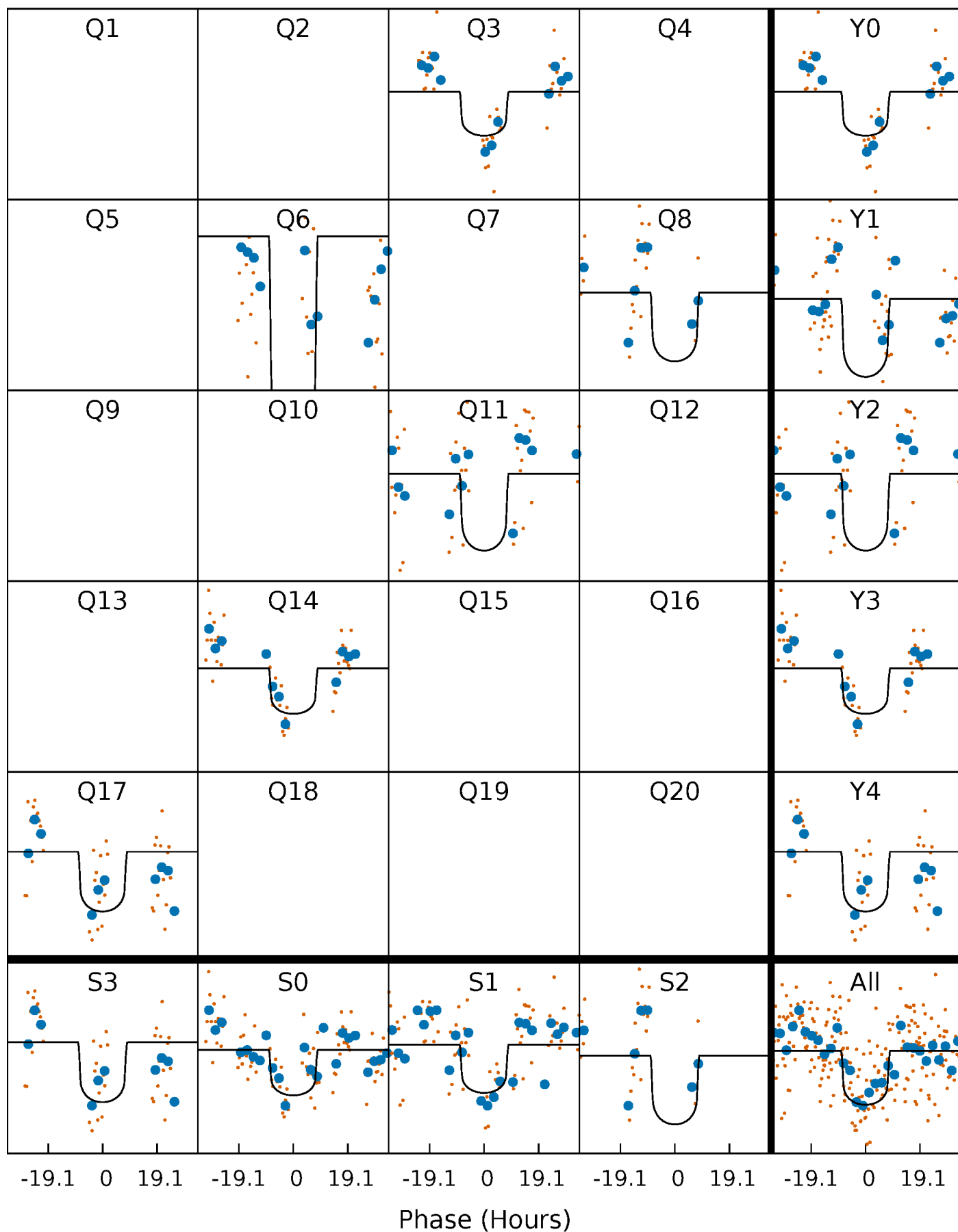
PDC Quarter-Phased Transit Curves

TCE 010407210-02 P=258.478616 Days $T_0=285.048159$ (BKJD)



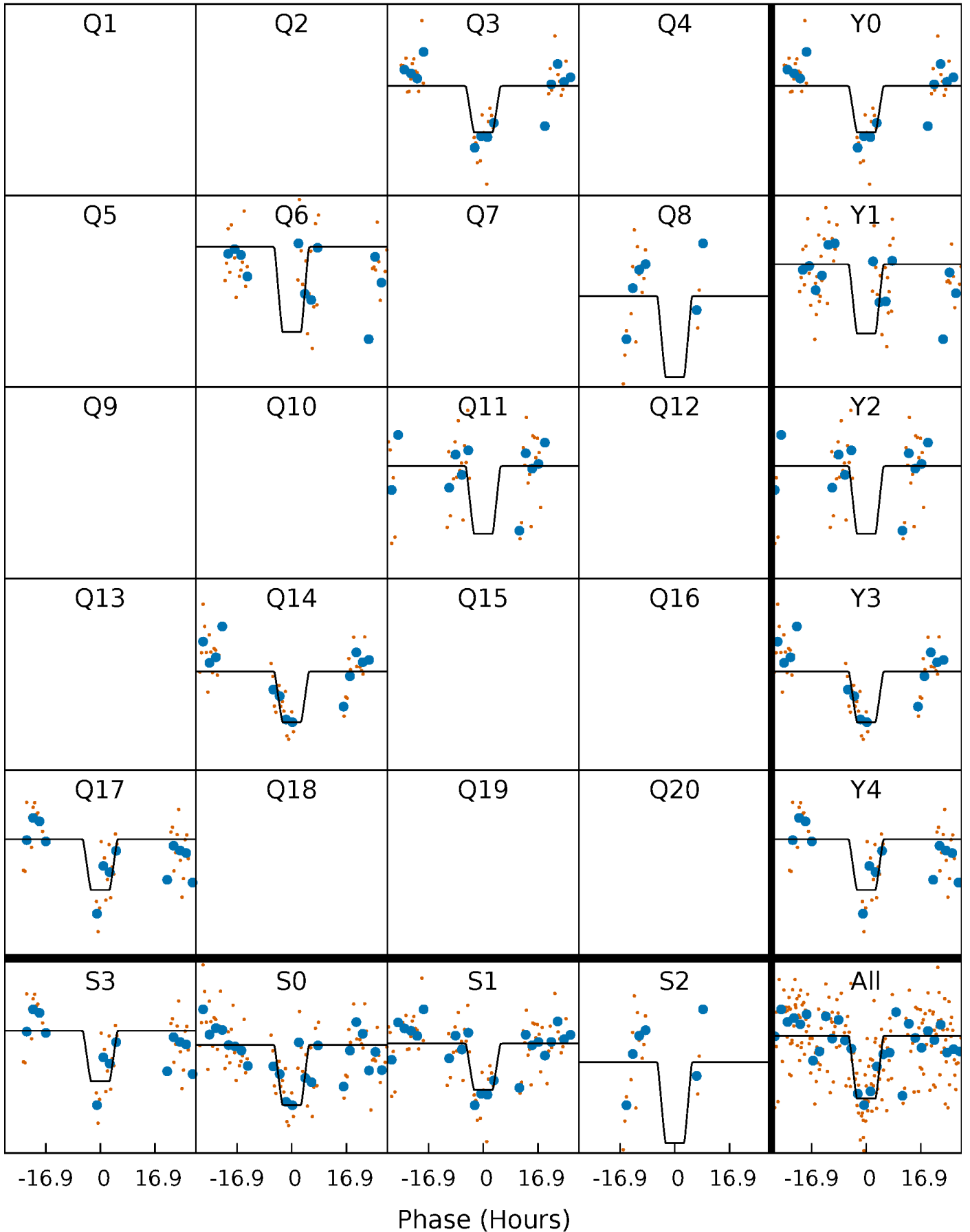
DV Quarter-Phased Transit Curves

TCE 010407210-02 P=258.478616 Days $T_0=285.048159$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

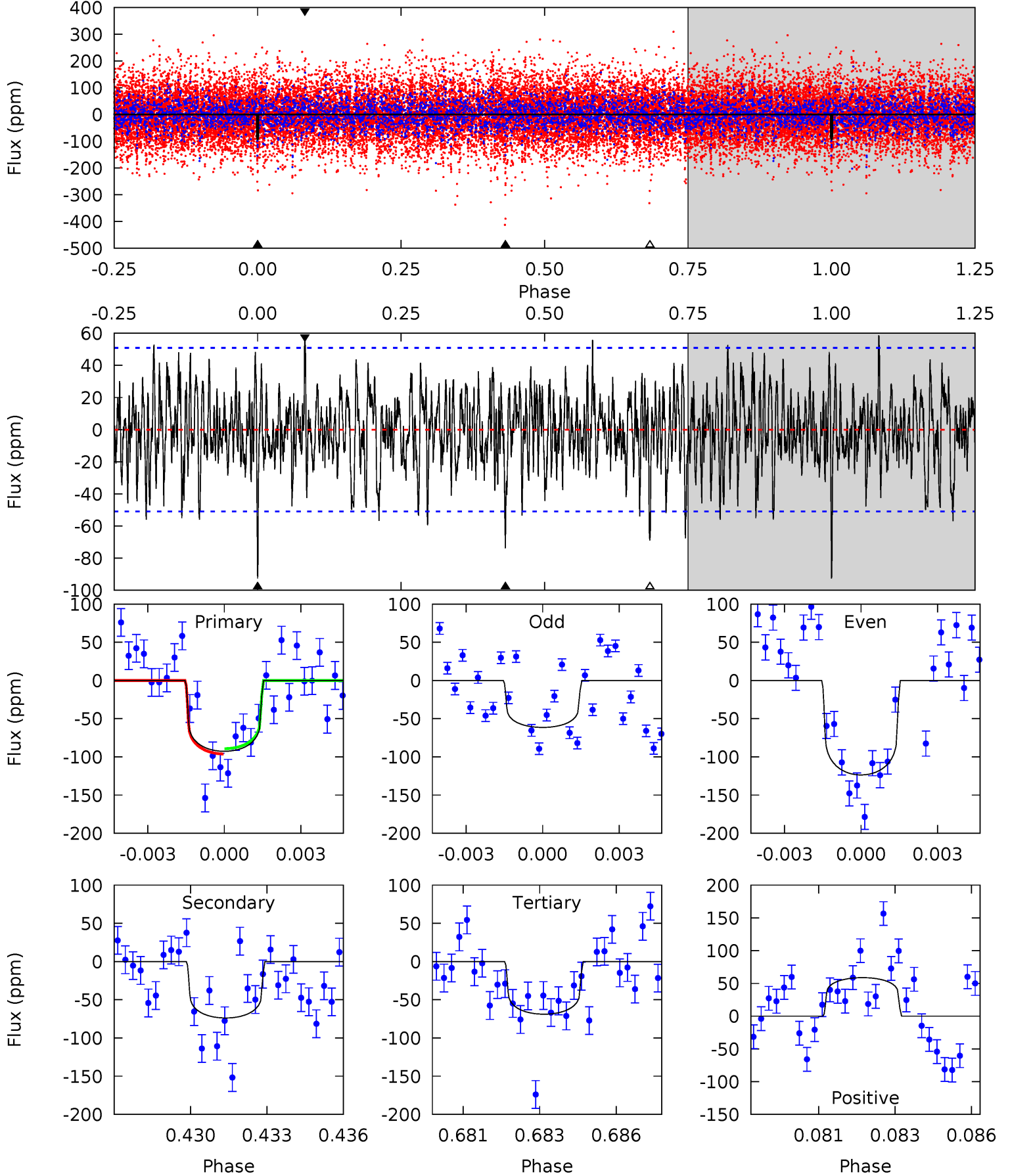
TCE 010407210-02 P=258.430045 Days $T_0=285.147601$ (BKJD)



DV Model-Shift Uniqueness Test

010407210-02, P = 258.478616 Days, E = 26.569543 Days

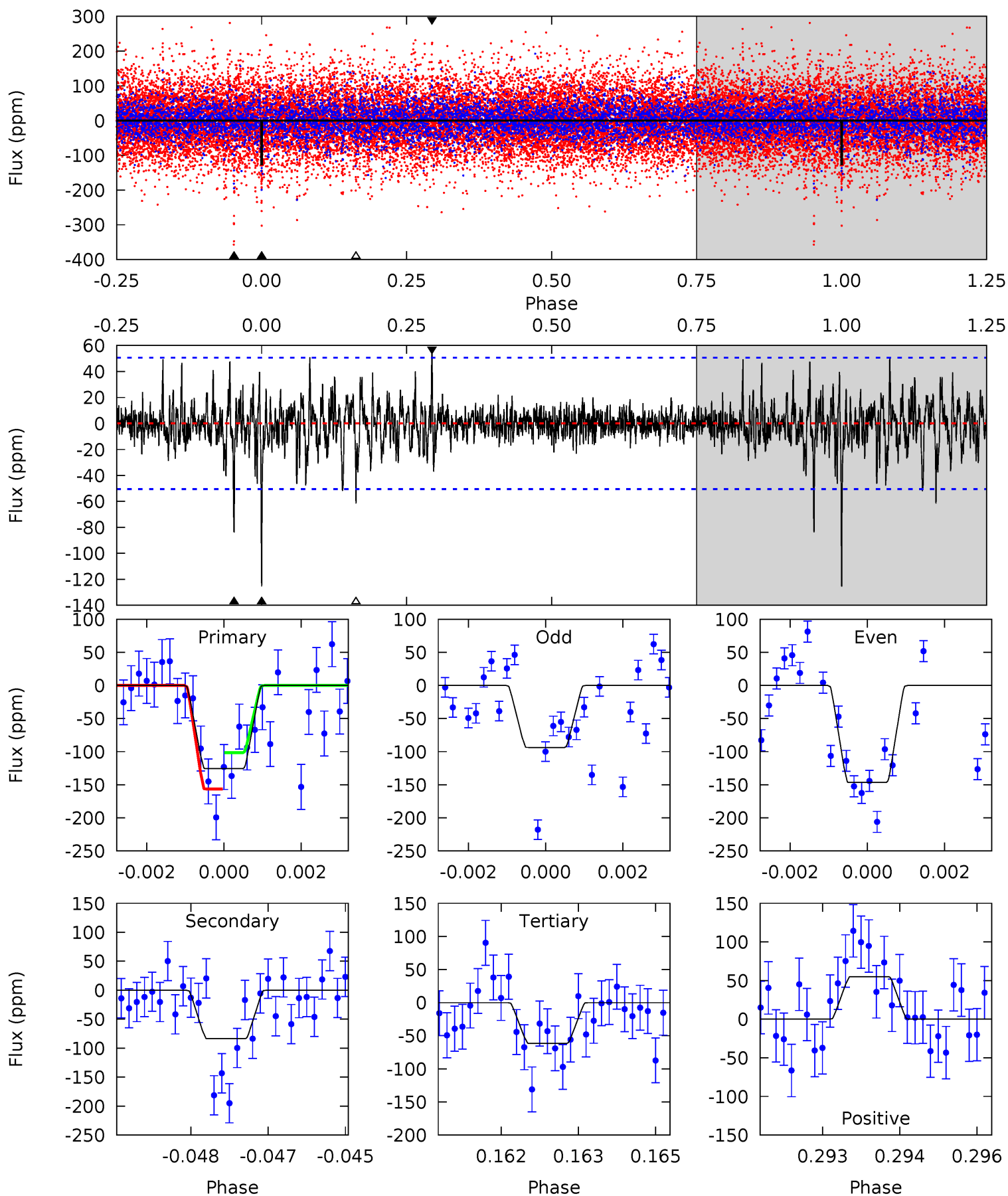
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.60 | 7.65 | 7.13 | 6.08 | 5.27 | 3.00 | 2.03 | 2.47 | 3.52 | 0.52 | 1.57 | 3.22 | 0.96 | 0.39 | 0.36 |



Alt Model-Shift Uniqueness Test

010407210-02, P = 258.430045 Days, E = 26.717556 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.3 | 8.85 | 6.51 | 5.82 | 5.35 | 3.12 | 1.28 | 6.76 | 7.45 | 2.34 | 3.02 | 2.79 | 0.61 | 0.30 | 2.88 |



Stellar Parameters For KIC 010407210

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|--|
| | 6652^{+187}_{-258} | $4.036^{+0.264}_{-0.176}$ | $-0.160^{+0.250}_{-0.300}$ | $1.863^{+0.519}_{-0.576}$ | $1.378^{+0.186}_{-0.279}$ | $0.300^{+0.562}_{-0.142}$ |
| | +3%/-4% | +7%/-4% | +156%/-188% | +28%/-31% | +13%/-20% | +187%/-47% |
| Source | PHO54 | PHO54 | PHO54 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010407210-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|--------------|------------------------|----------------------|-----------------------|------------------------|
| DV | -74 ± 10 | $2.26^{+0.74}_{-0.66}$ | 589^{+50}_{-49} | 5743^{+977}_{-674} | 6112^{+5999}_{-2781} |
| Alt. | -84 ± 9 | $2.35^{+0.80}_{-0.71}$ | 589^{+50}_{-51} | 5769^{+1037}_{-624} | 6549^{+6245}_{-3101} |

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

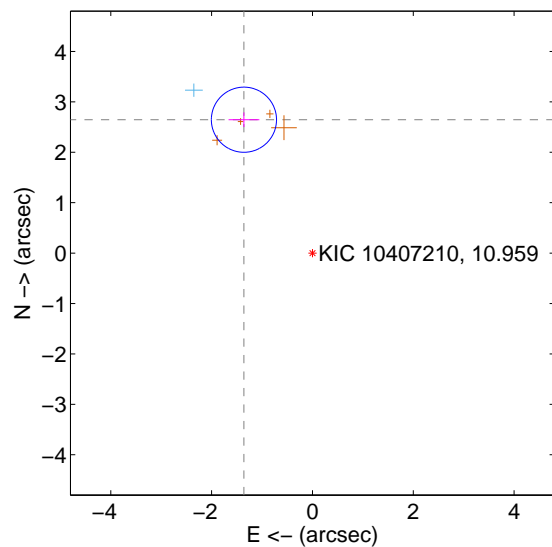
Supplemental centroid analysis for 010407210-02. **Kepler magnitude: 10.96.** Transit SNR 7.35

There are 1 quarters with good PRF difference image offsets

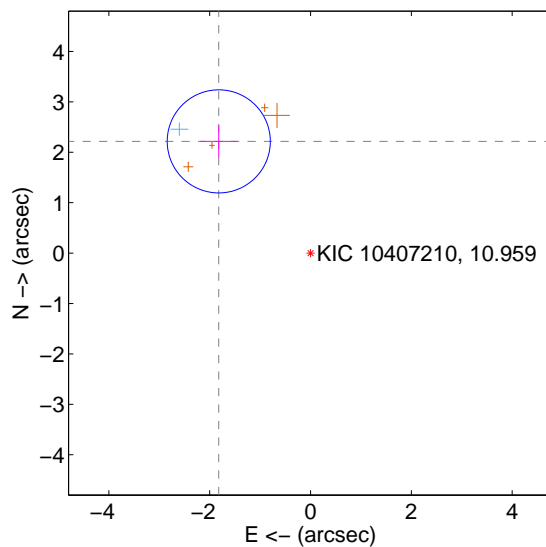
The direct PRF centroid is offset from the target star catalog position by about 0.81 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 2.975 ± 0.215 | 13.81 | 1.359 ± 0.306 | 2.646 ± 0.145 |
| PRF-fit source offset from KIC position | 2.868 ± 0.341 | 8.41 | 1.820 ± 0.372 | 2.216 ± 0.318 |
| photometric centroid source offset | 1.69 ± 0.77 | 2.19 | -1.65 ± 0.76 | -0.37 ± 0.99 |

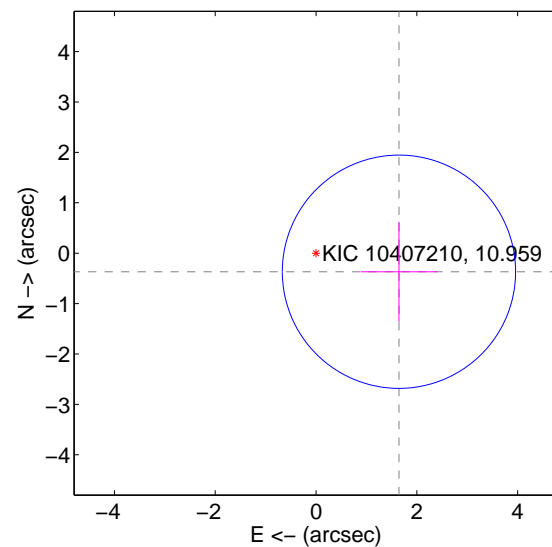
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

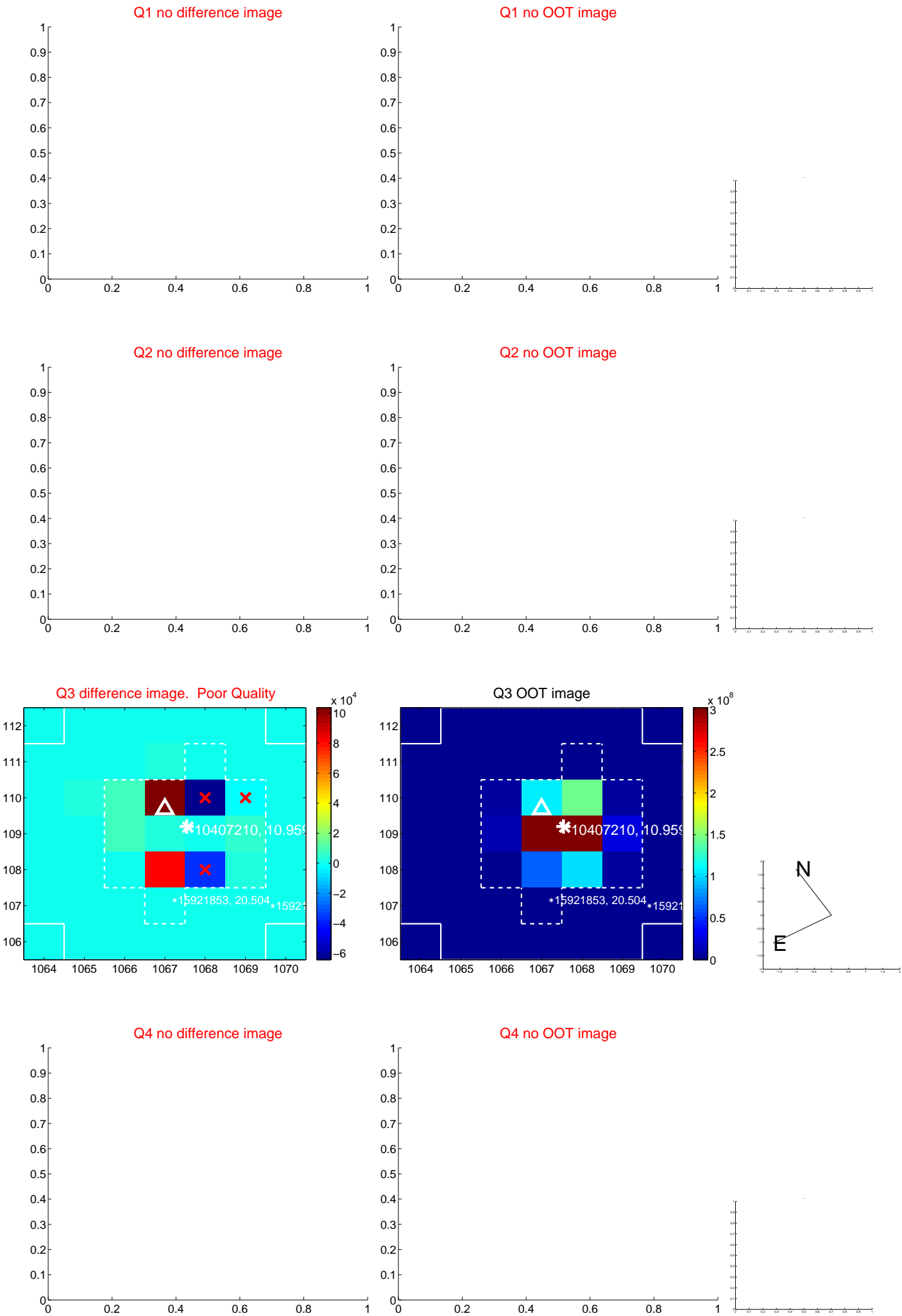


offset from photometric centroids

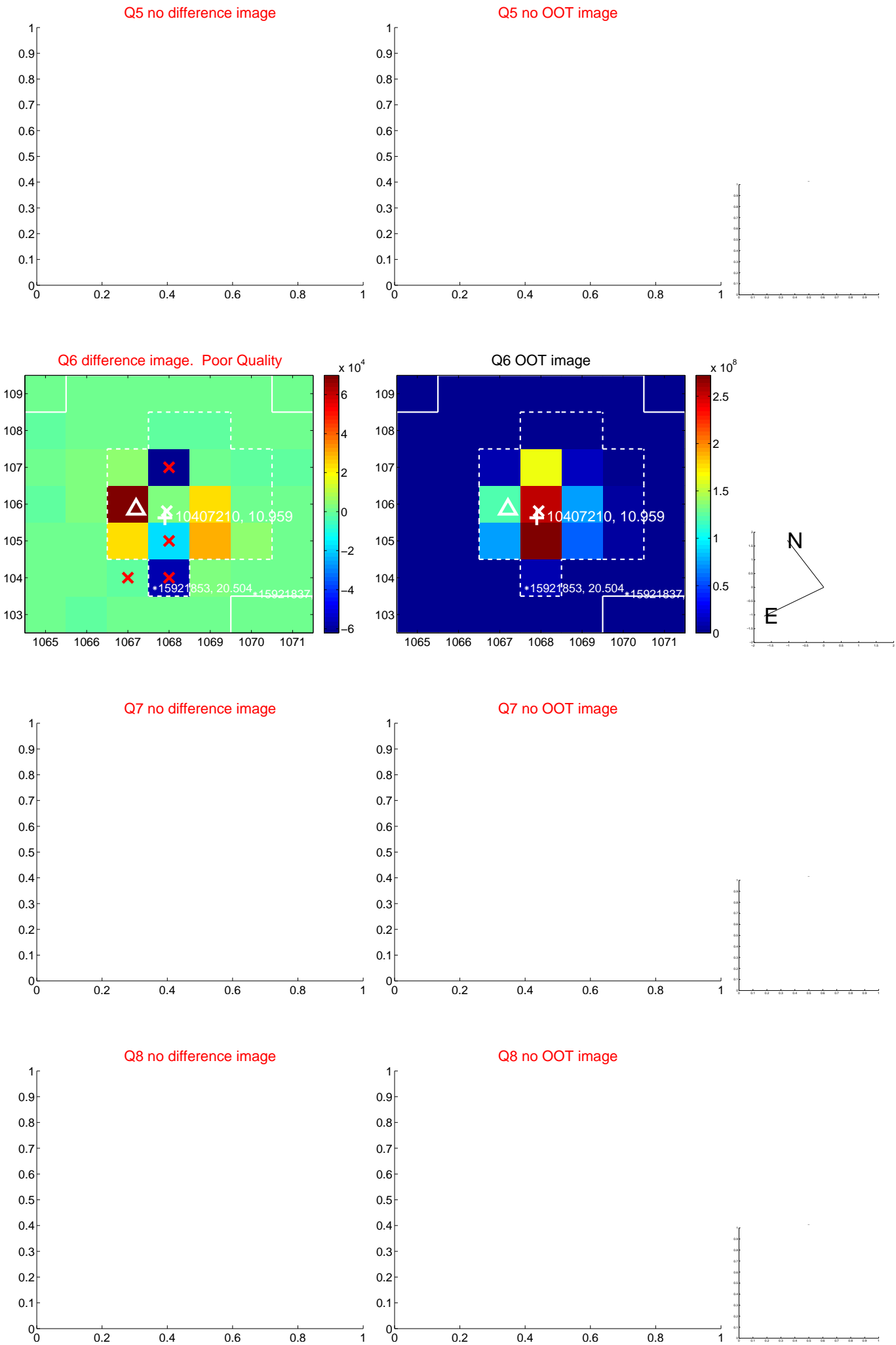


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

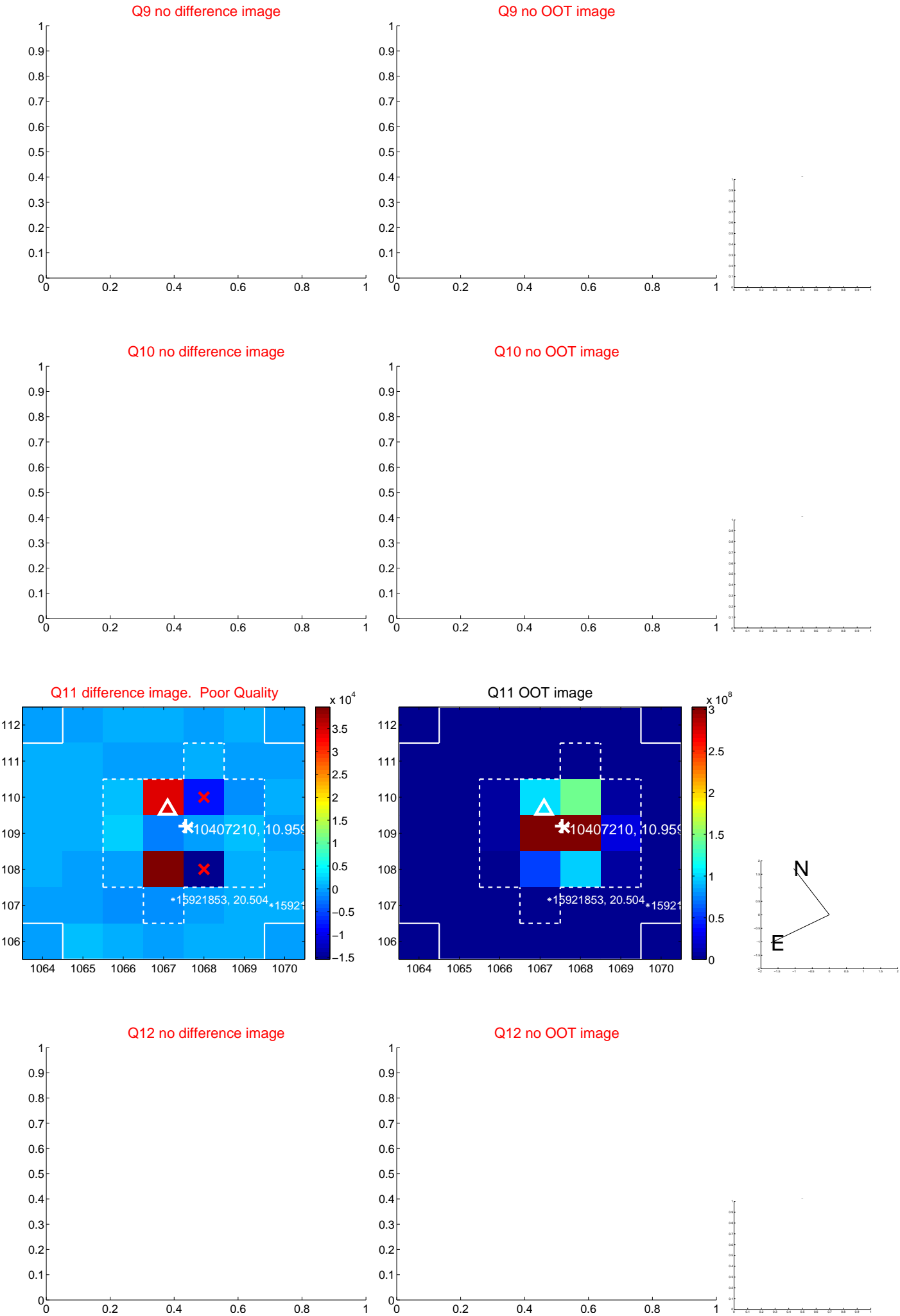
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

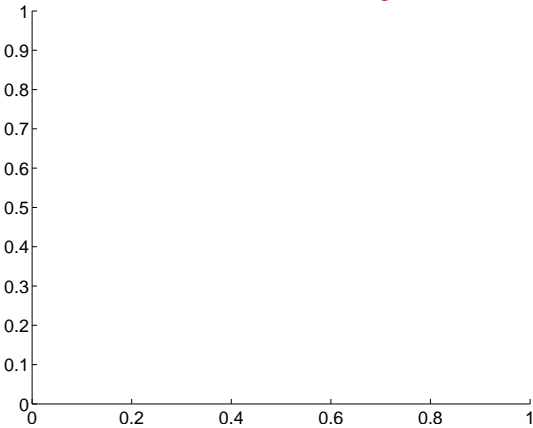


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

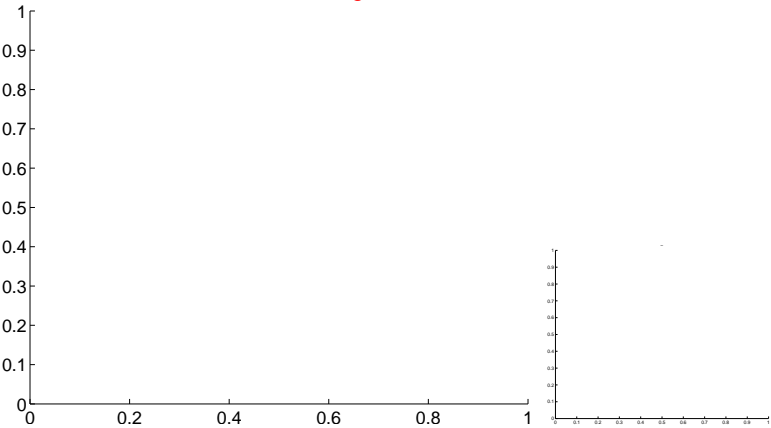


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

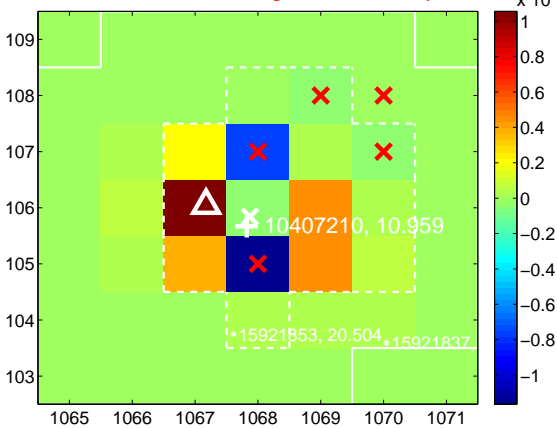
Q13 no difference image



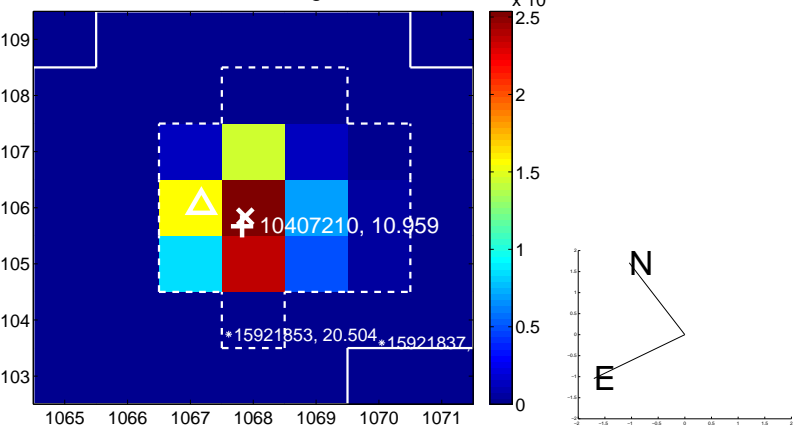
Q13 no OOT image



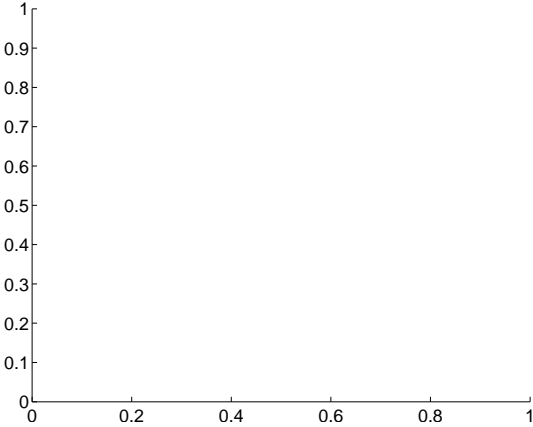
Q14 difference image. Poor Quality



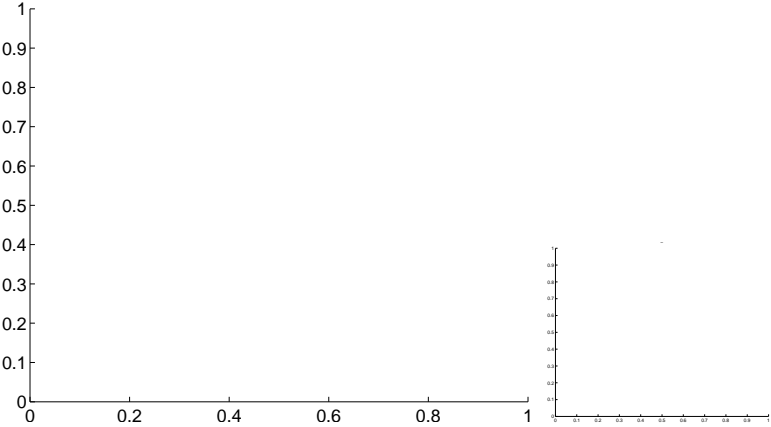
Q14 OOT image



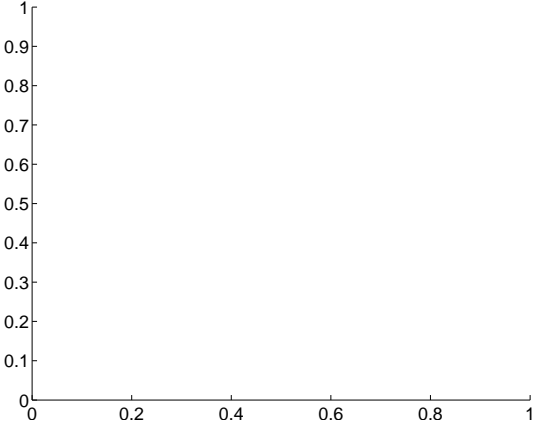
Q15 no difference image



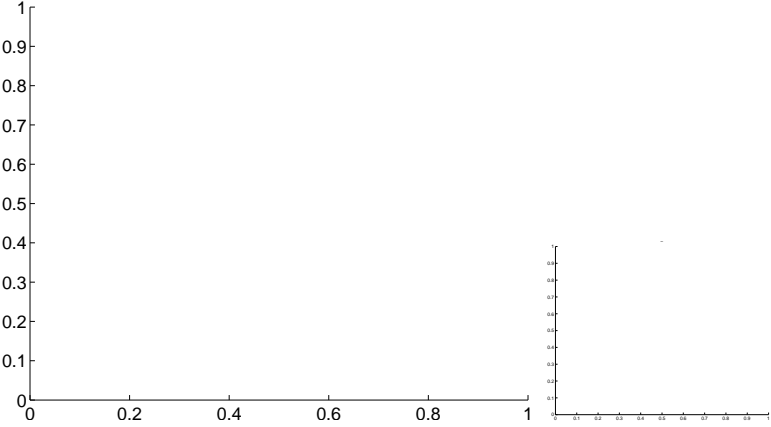
Q15 no OOT image



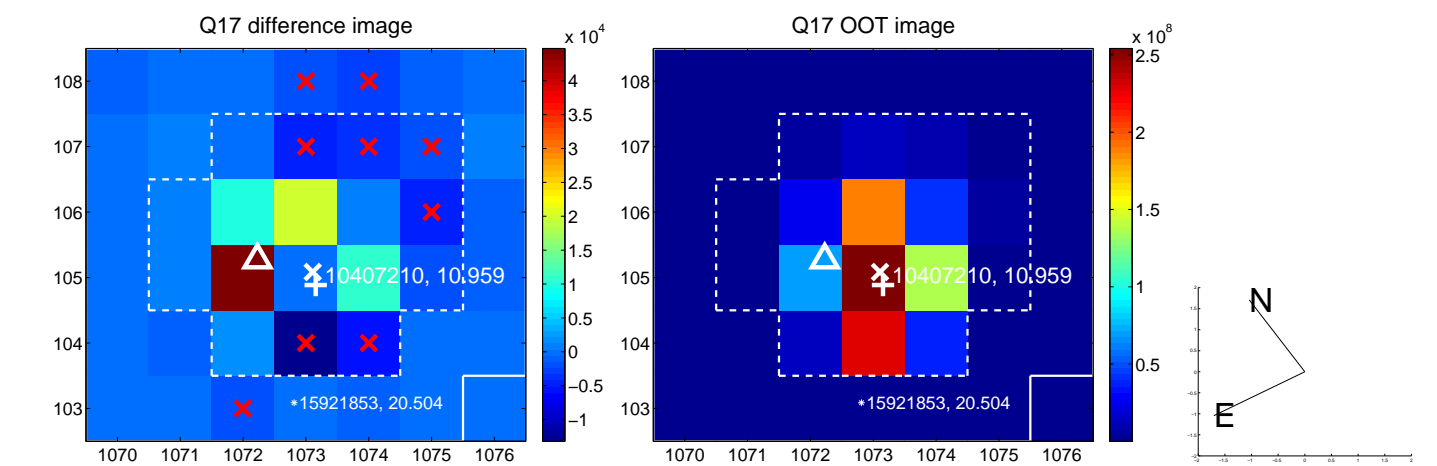
Q16 no difference image



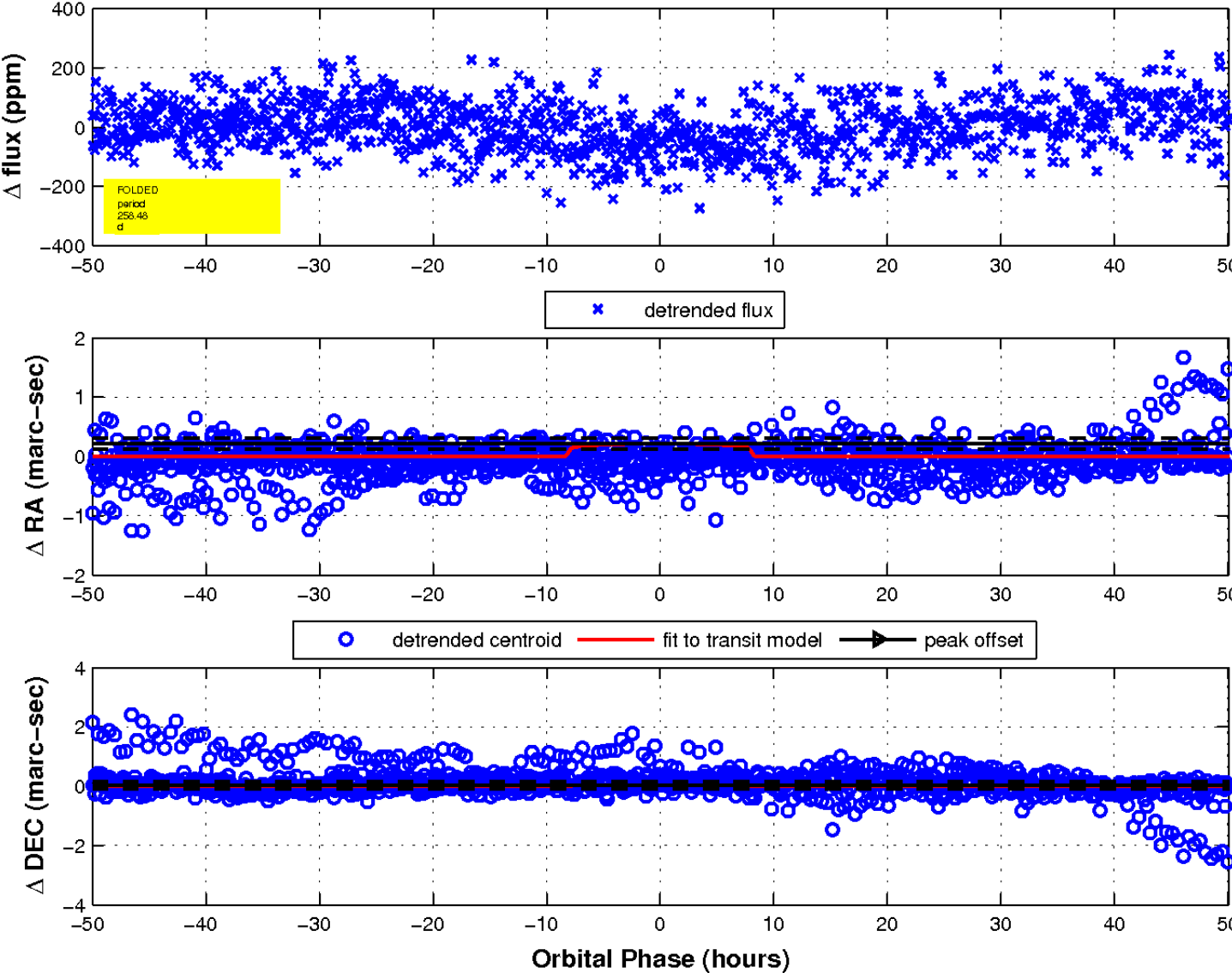
Q16 no OOT image



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

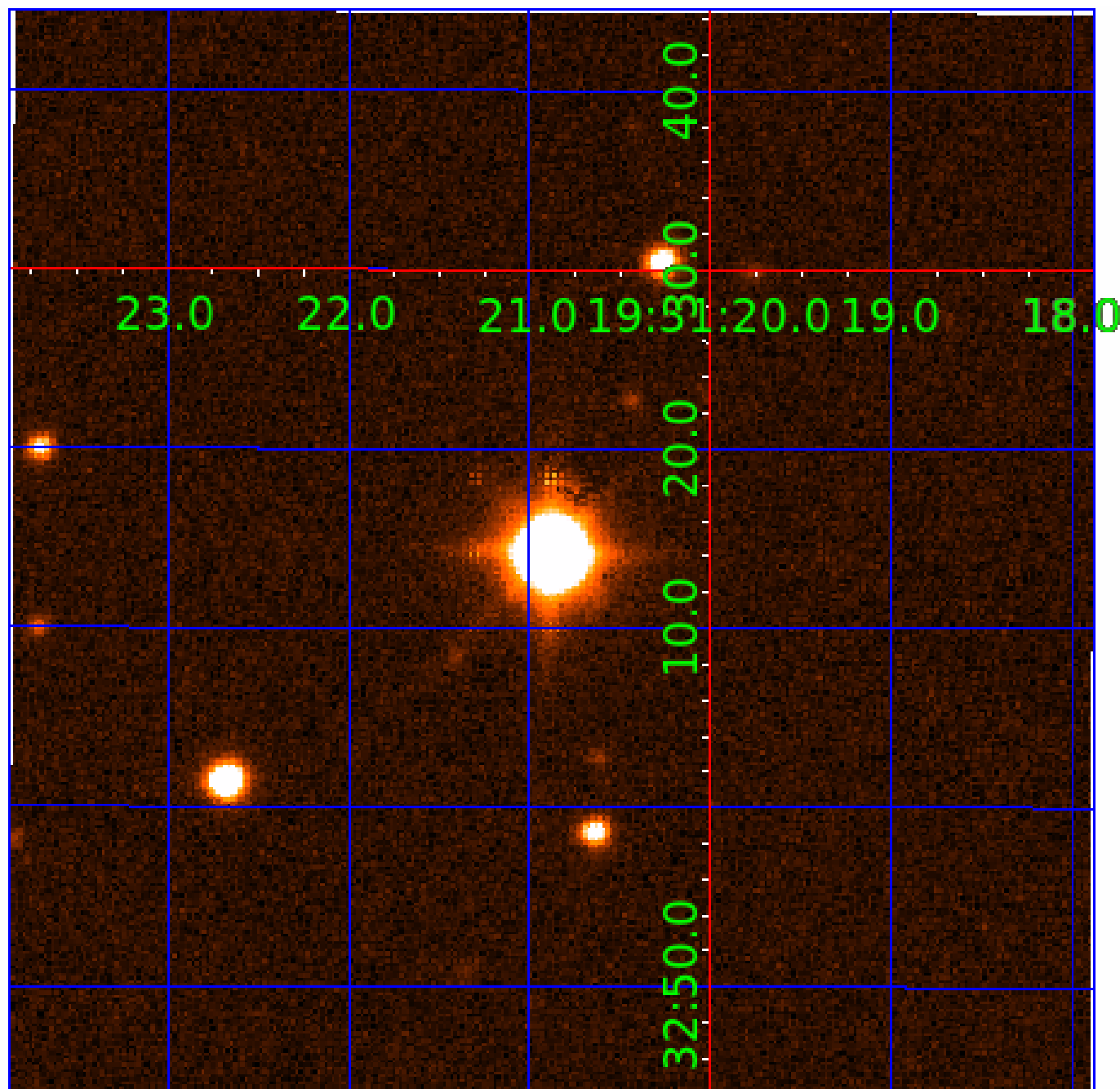


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



KIC 010407210

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 010407210-01 | OBS | 4662.01 | 0.933679 | 131.576116 | 8.1 | 4.938 | 10.3 | 8.4 | 1.86 | 6652 | 0.55 | 14079.32 |
| 010407210-02 | OBS | No | 258.478616 | 285.048159 | 124.4 | 16.727 | 9.7 | 7.3 | 1.86 | 6652 | 2.31 | 7.80 |
| 010407210-03 | OBS | No | 304.437252 | 157.194291 | 152.6 | 4.635 | 8.0 | 8.8 | 1.86 | 6652 | 2.68 | 6.27 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010407210-01 | OBS | FP | 0.00 | 0 | 0 | 1 | 1 | CENT_SATURATED—HALO_GHOST—EPHEM_MATCH |
| 010407210-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED |
| 010407210-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL_SKYE—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.

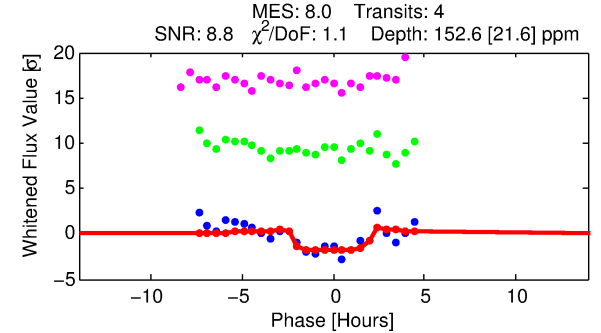
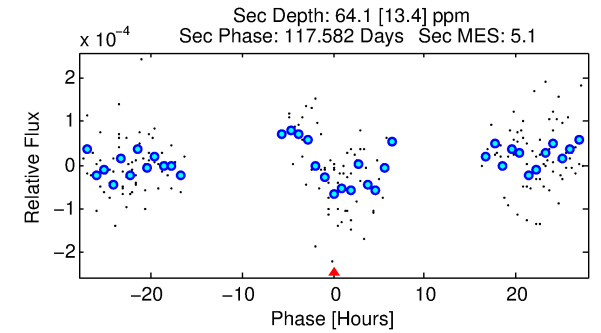
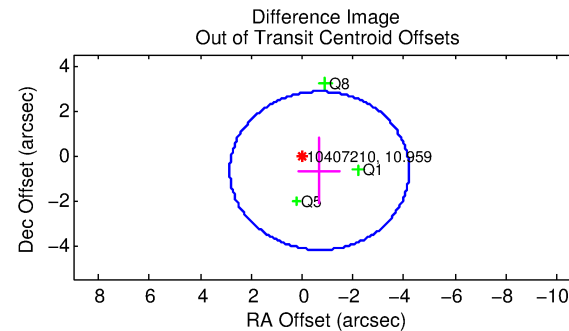
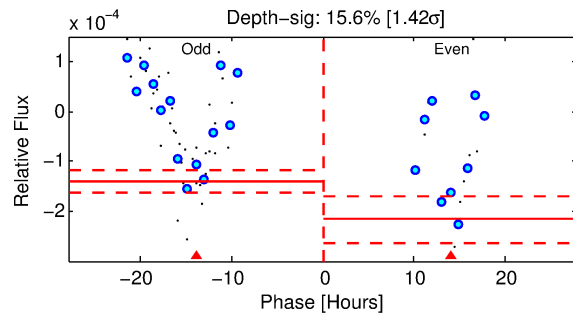
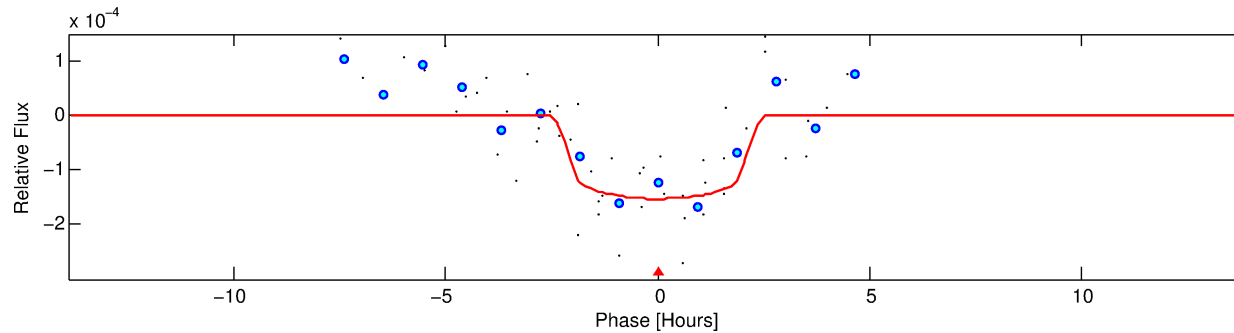
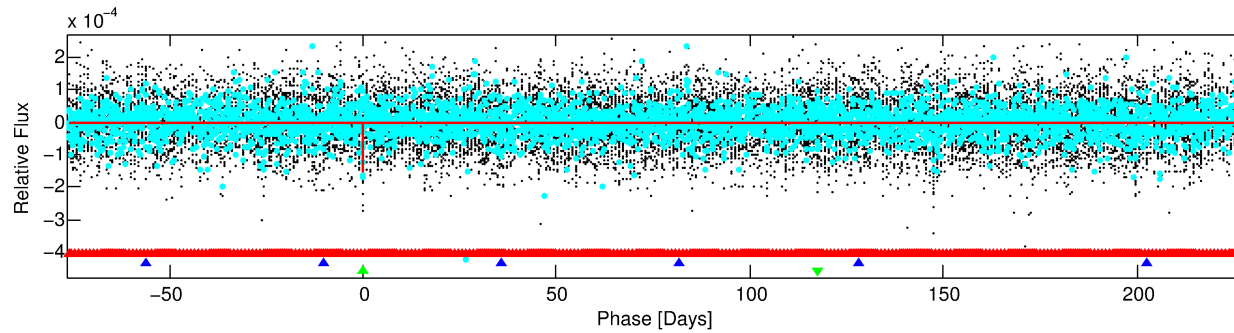
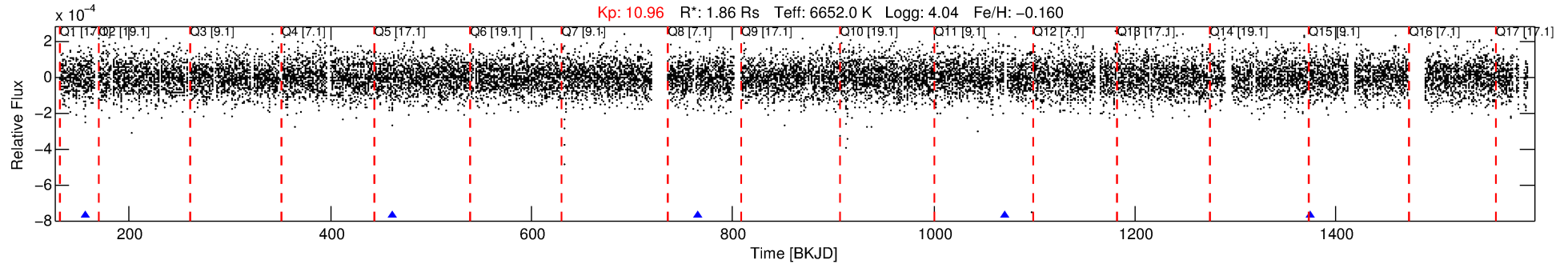
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010407210-03

No Significant Match Found

DV One-Page Summary

KIC: 10407210 Candidate: 3 of 3 Period: 304.437 d
KOI: K04662 Corr: No Ephemeris Match



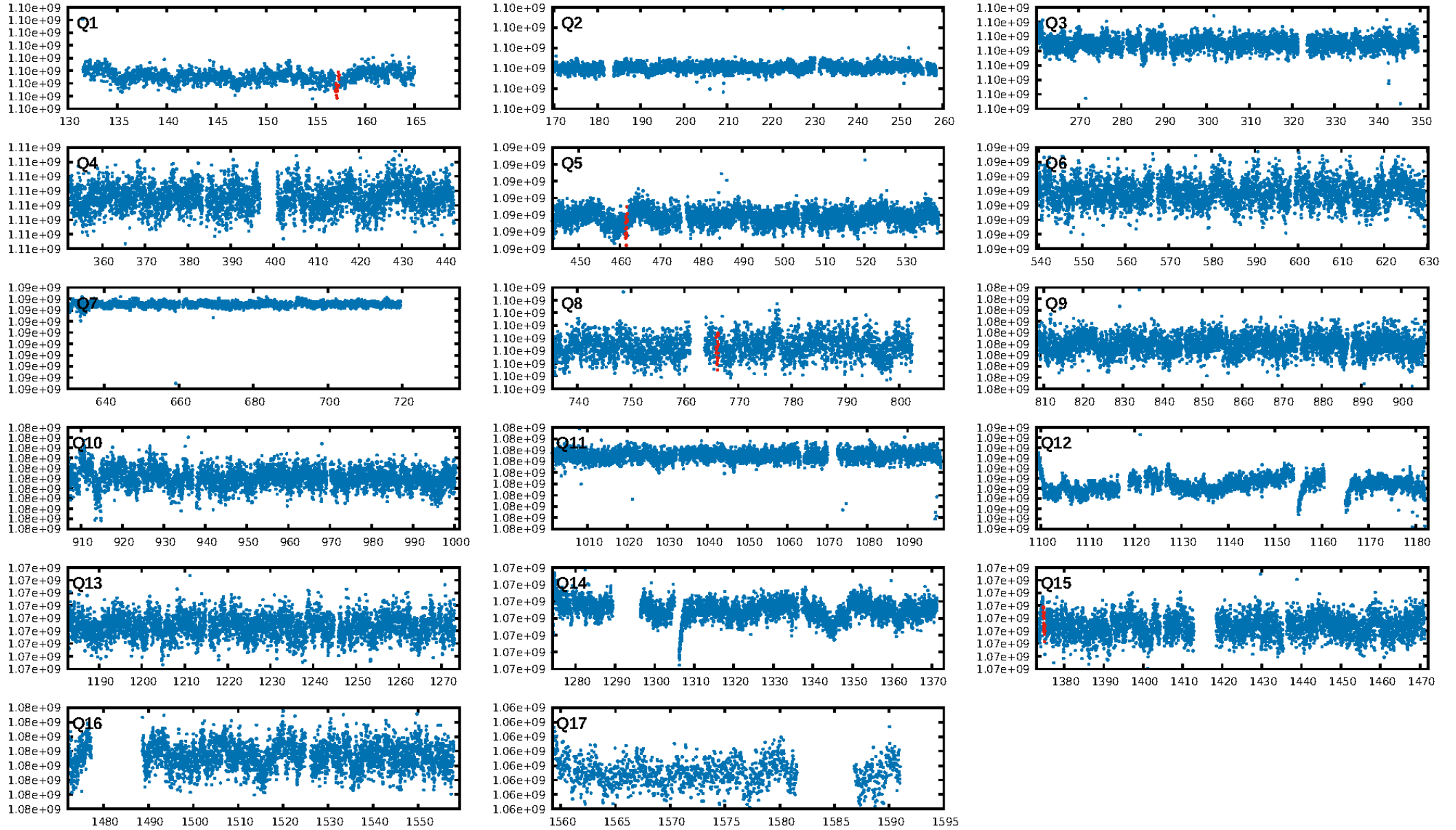
DV Fit Results:

Period = 304.43725 [0.00430] d
Epoch = 157.1943 [0.0090] BKJD
 R_p/R^* = 0.0132 [0.0065]
 a/R^* = 236.13 [678.91]
 b = 0.90 [0.63]
 Seff = 6.27 [3.01]
 T_{eq} = 404 [48] K
 R_p = 2.68 [1.57] R_e
 a = 0.9852 [0.2847] AU
 A_g = 4775.46 [5305.11] [0.90 σ]
 T_{eff} = 5187 [1330] K [3.59 σ]

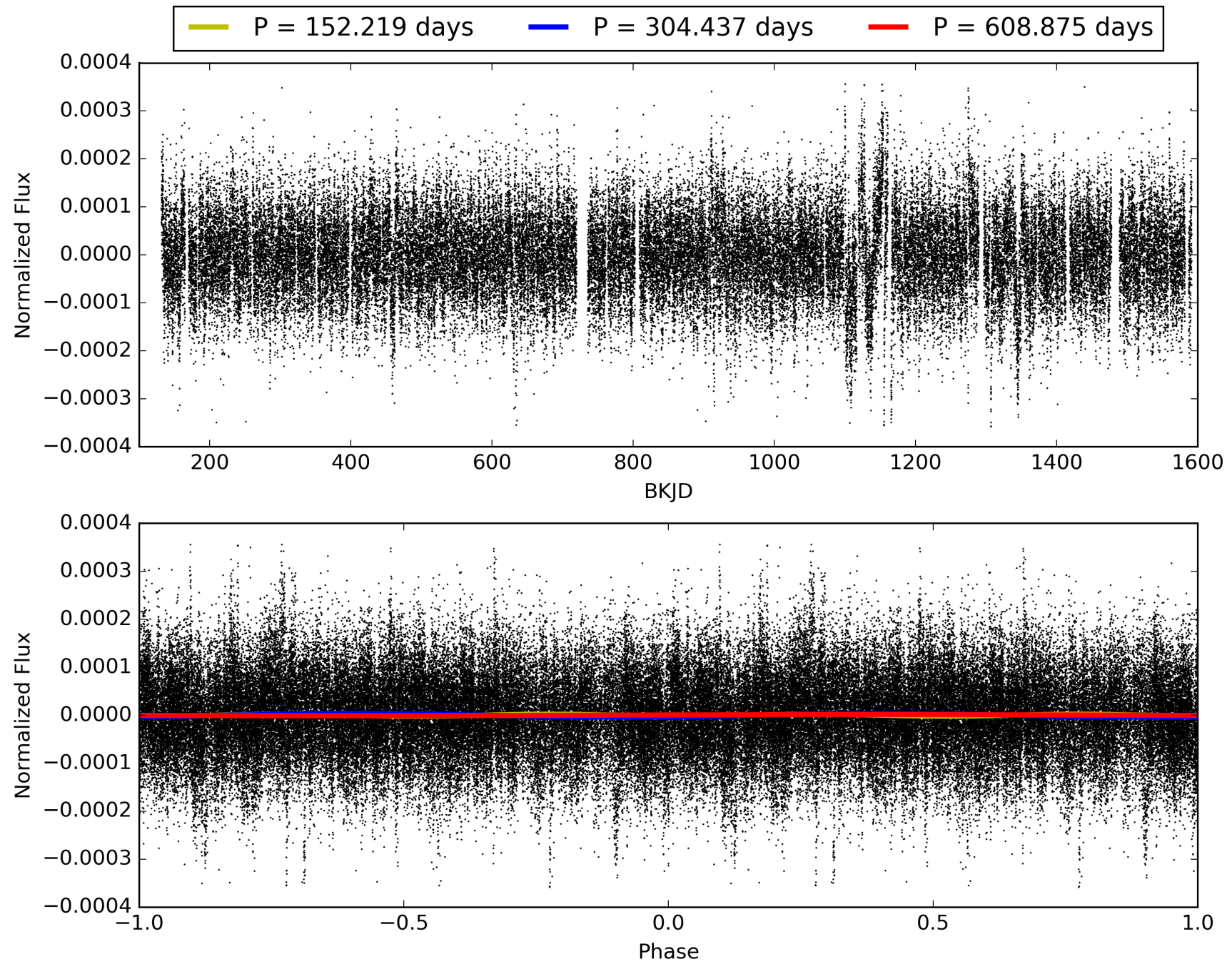
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [63.55 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 33.1%
ModelChiSquareGof-sig: 99.6%
Bootstrap-pfa: 6.48e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.051
Centroid-sig: 25.0%
Centroid-so: 0.973 arcsec [1.00 σ]
OotOffset-rm: 0.963 arcsec [0.82 σ]
OotOffset-st: 0/0/1/2 [3]
KicOffset-rm: 1.488 arcsec [1.01 σ]
KicOffset-st: 0/0/1/2 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 0.00 [0/4]

TCE 010407210-03, PDC Light Curves

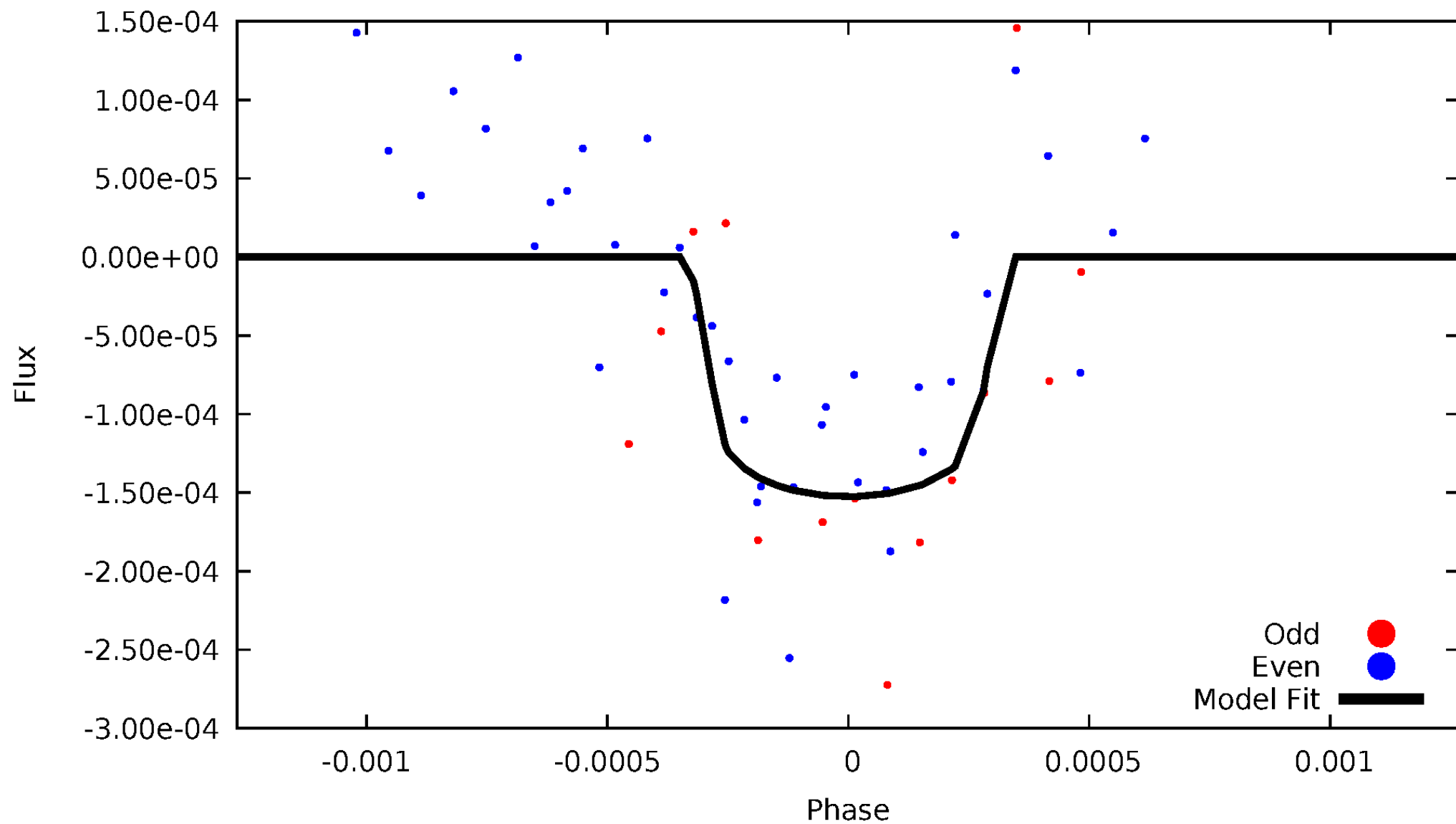


TCE 010407210-03



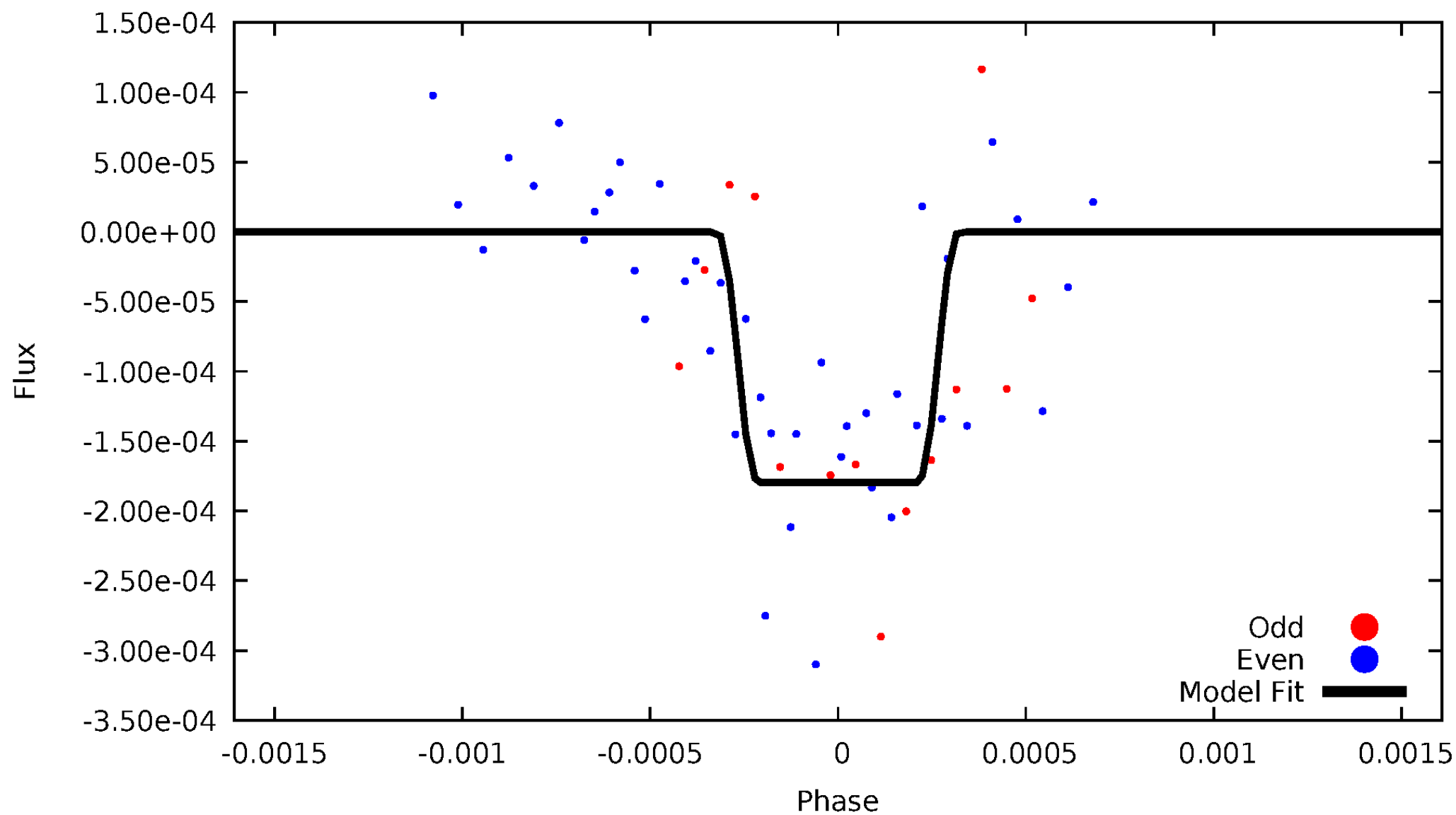
DV Odd/Even

TCE 010407210-03



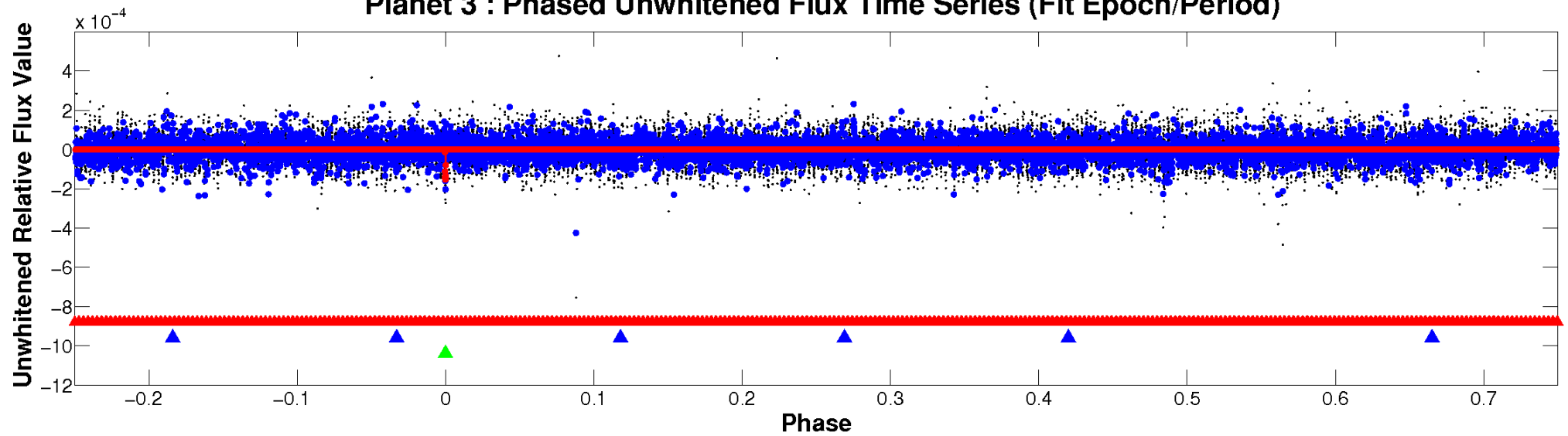
ALT Odd/Even

TCE 010407210-03

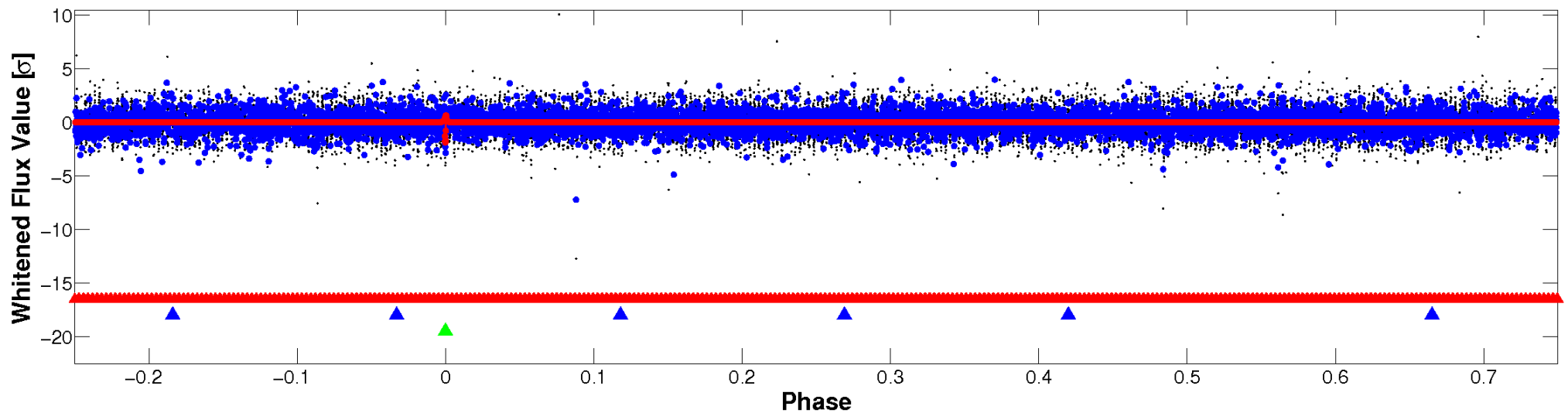


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

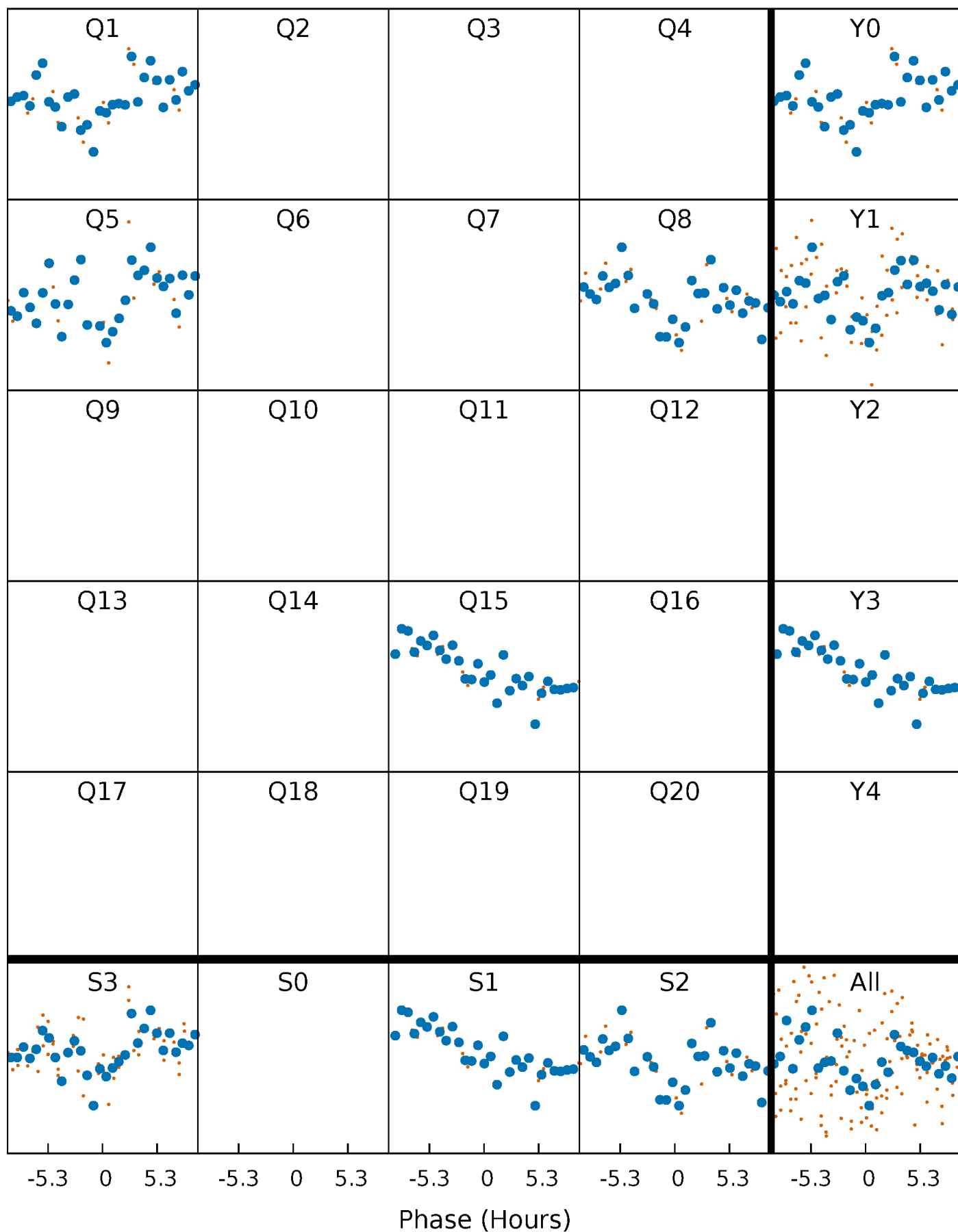


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



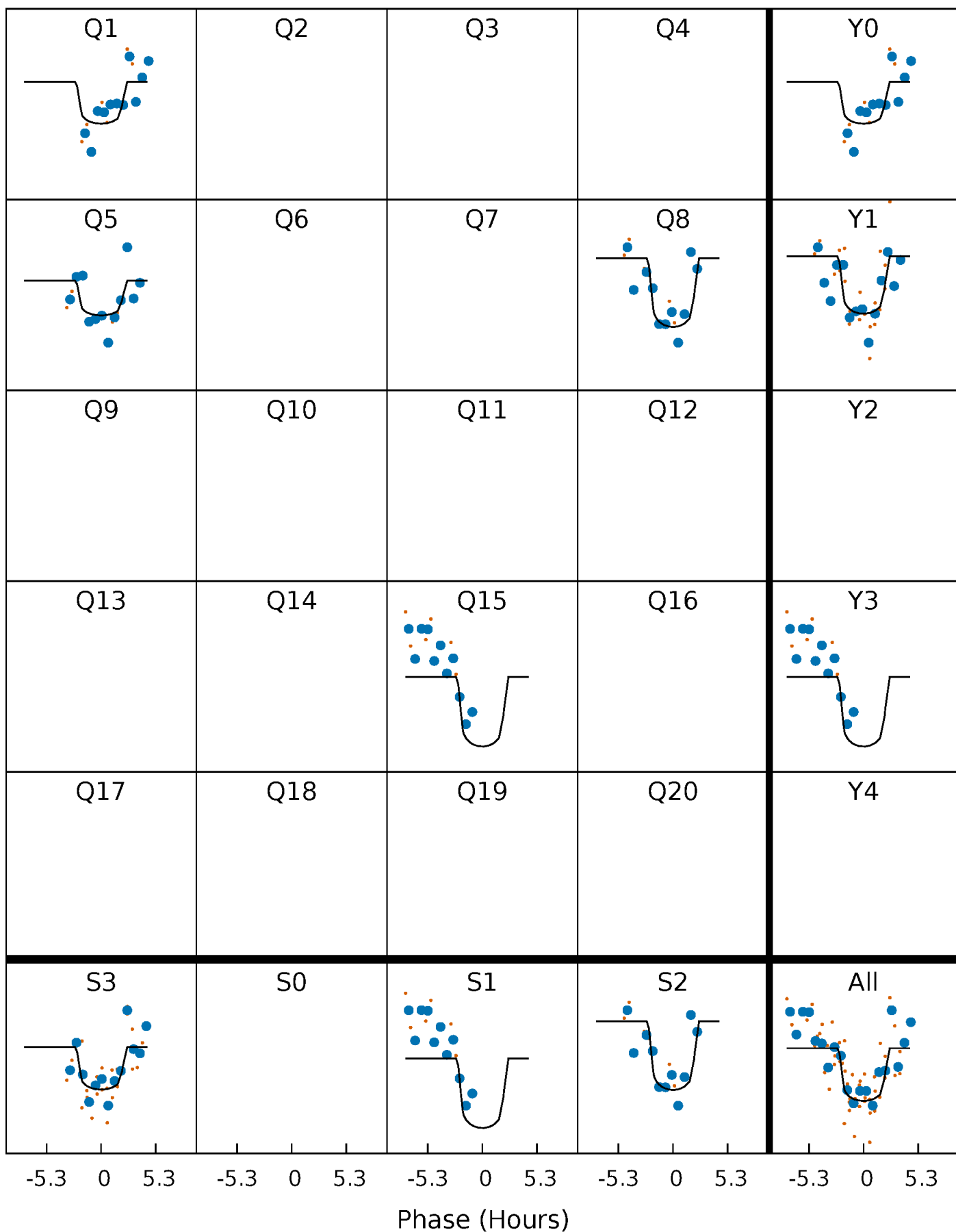
PDC Quarter-Phased Transit Curves

TCE 010407210-03 $P=304.437252$ Days $T_0=157.194291$ (BKJD)



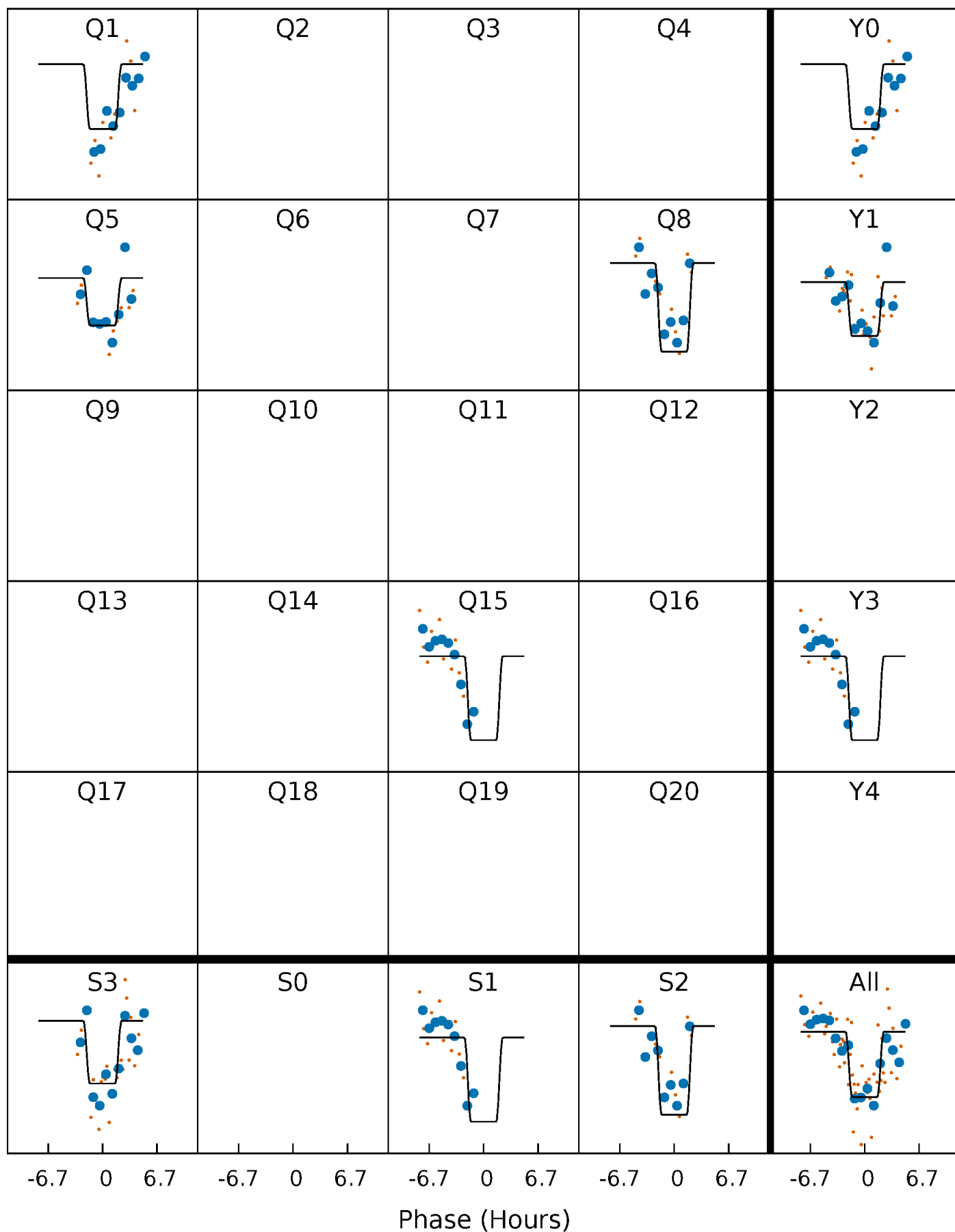
DV Quarter-Phased Transit Curves

TCE 010407210-03 $P=304.437252$ Days $T_0=157.194291$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

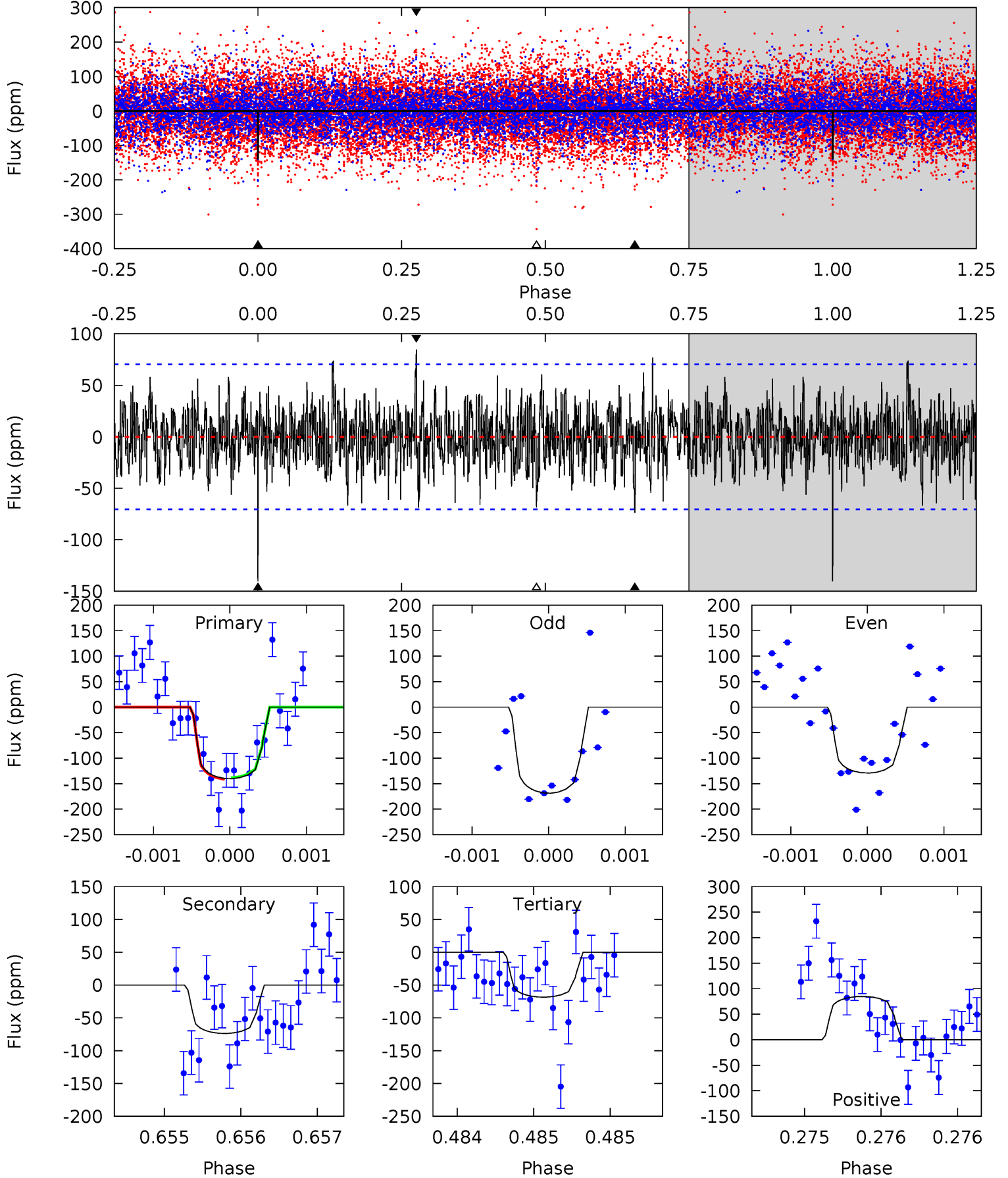
TCE 010407210-03 P=304.446422 Days $T_0=157.175077$ (BKJD)



DV Model-Shift Uniqueness Test

010407210-03, P = 304.437252 Days, E = 157.194291 Days

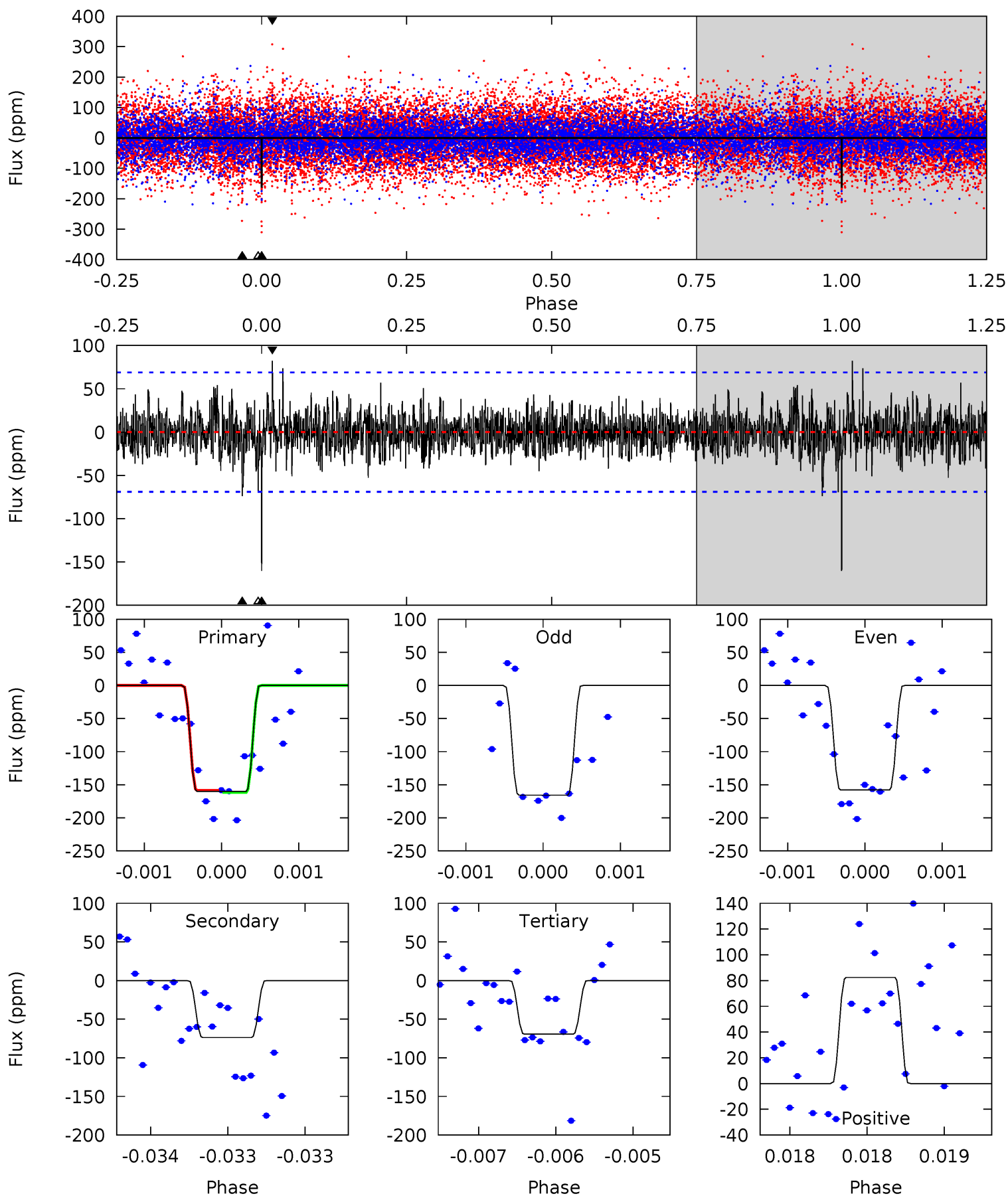
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.0 | 5.78 | 5.37 | 6.65 | 5.52 | 3.40 | 1.66 | 5.62 | 4.34 | 0.42 | -0.86 | 1.37 | 0.99 | 0.38 | 0.11 |



Alt Model-Shift Uniqueness Test

010407210-03, P = 304.446422 Days, E = 157.175077 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.9 | 5.91 | 5.57 | 6.61 | 5.53 | 3.41 | 1.29 | 7.28 | 6.25 | 0.34 | -0.69 | 0.30 | 1.00 | 0.34 | 0.11 |



Stellar Parameters For KIC 010407210

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6652^{+187}_{-258} | $4.036^{+0.264}_{-0.176}$ | $-0.160^{+0.250}_{-0.300}$ | $1.863^{+0.519}_{-0.576}$ | $1.378^{+0.186}_{-0.279}$ | $0.300^{+0.562}_{-0.142}$ |
| | +3%/-4% | +7%/-4% | +156%/-188% | +28%/-31% | +13%/-20% | +187%/-47% |
| Source | PHO54 | PHO54 | PHO54 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 010407210-03 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|--------------|------------------------|----------------------|-----------------------|-------------------------|
| DV | -74 ± 13 | $2.56^{+1.39}_{-1.29}$ | 555^{+50}_{-50} | 5337^{+2197}_{-840} | 5770^{+18462}_{-3302} |
| Alt. | -74 ± 12 | $2.65^{+1.50}_{-1.26}$ | 561^{+43}_{-49} | 5320^{+1947}_{-854} | 5458^{+14340}_{-3199} |

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

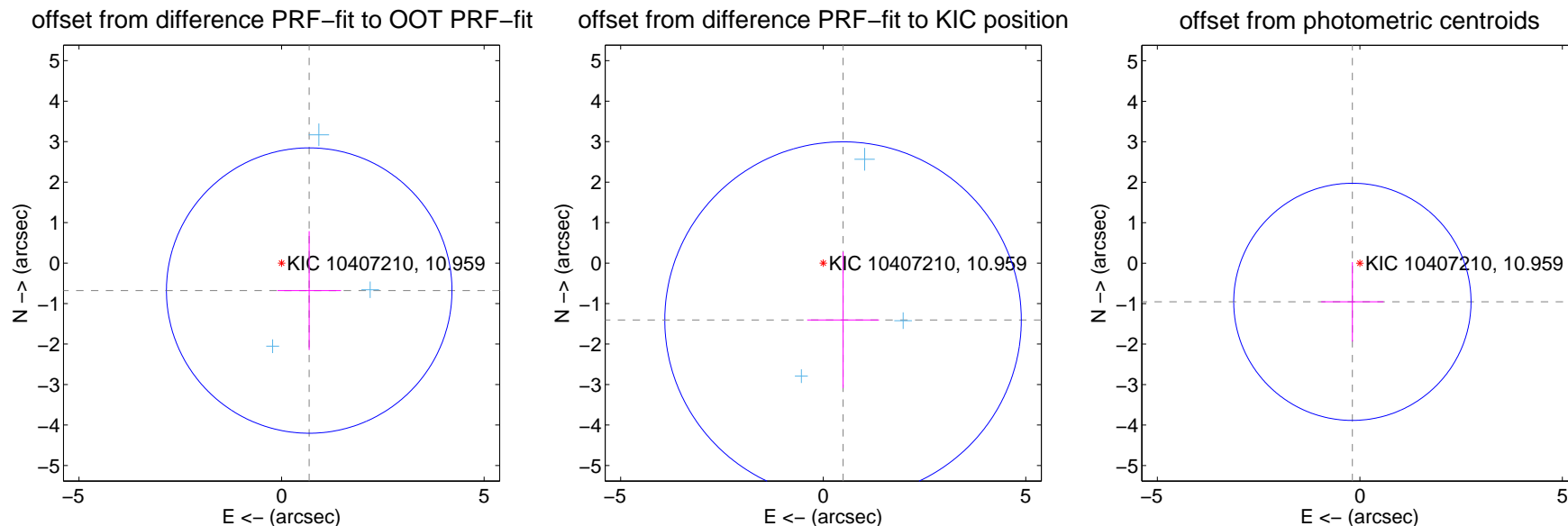
DV Centroid Data

Supplemental centroid analysis for 010407210-03. **Kepler magnitude: 10.96.** Transit SNR 8.83

There are 3 quarters with good PRF difference image offsets

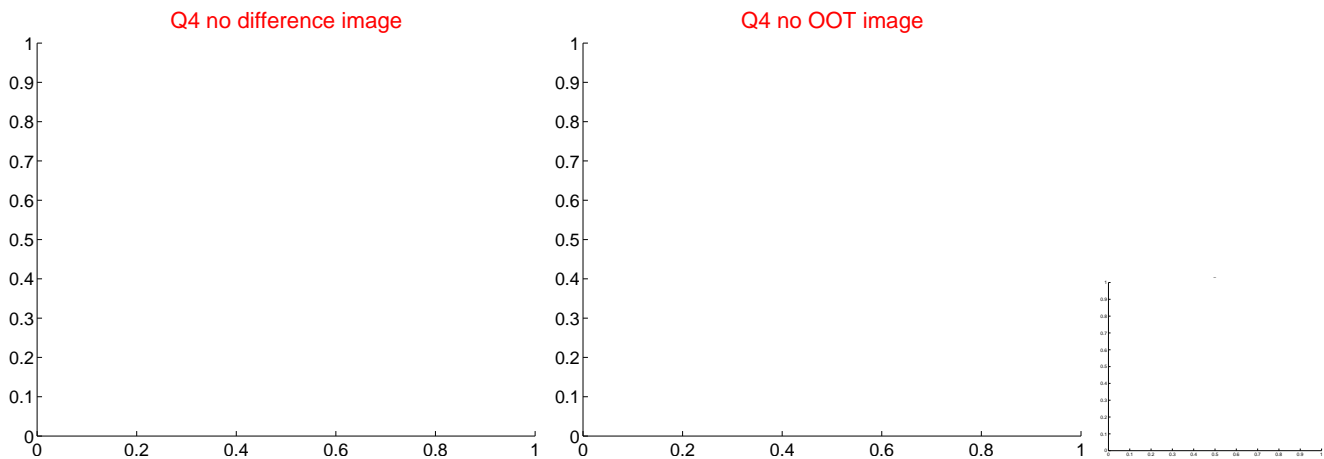
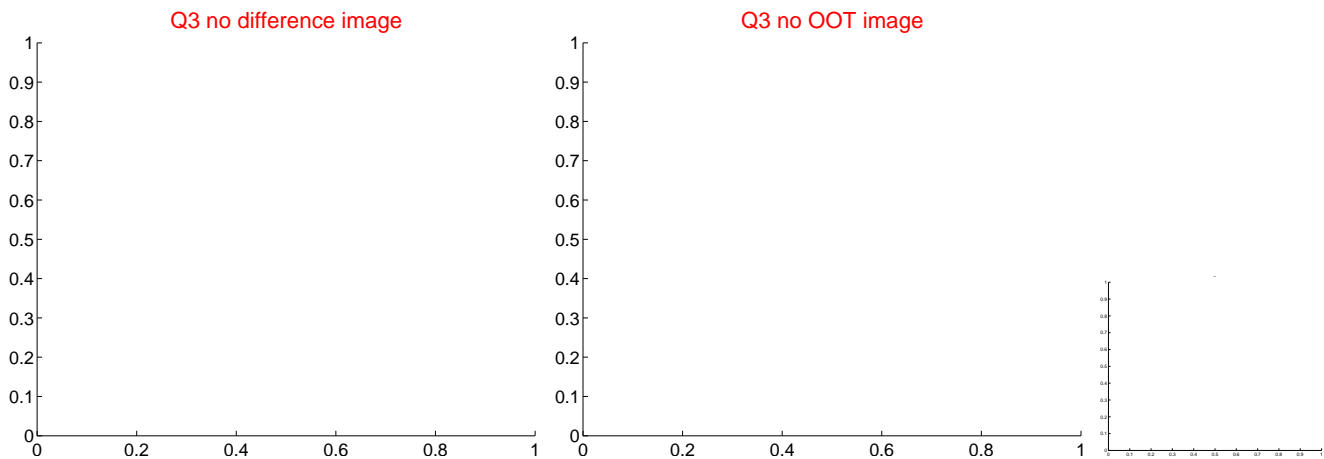
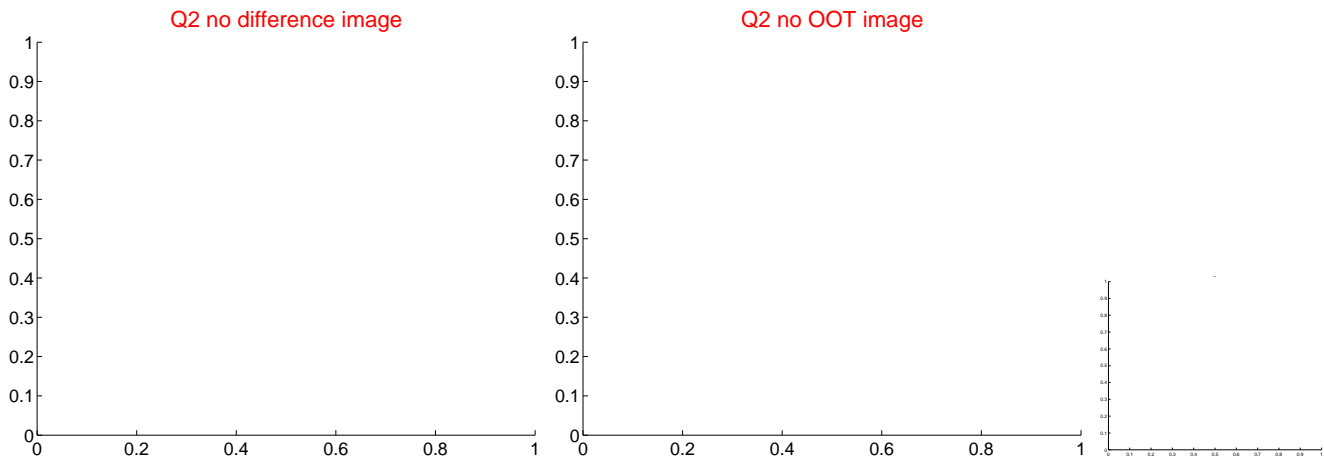
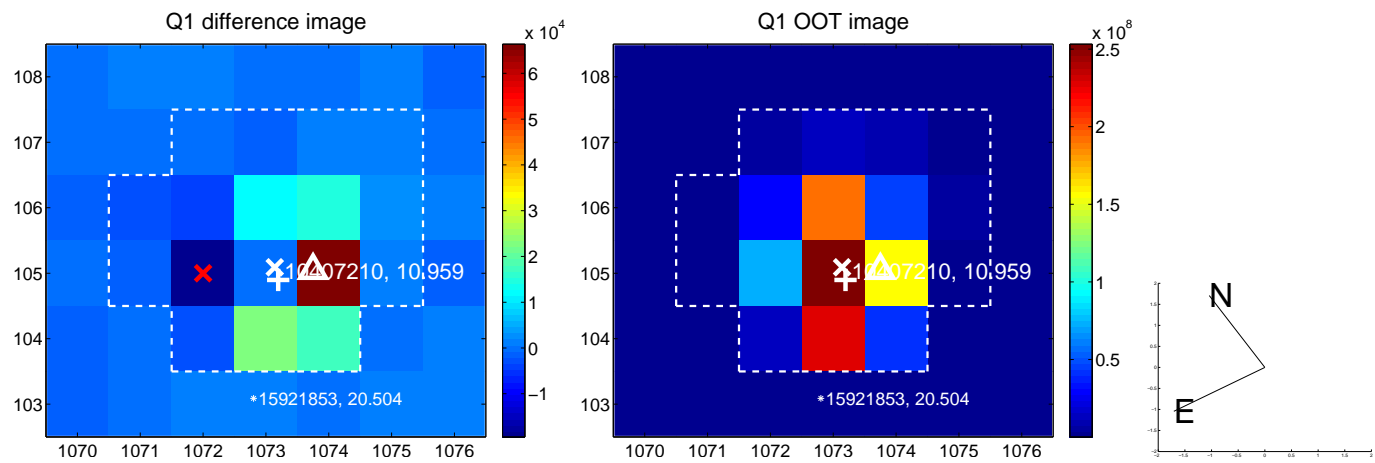
The direct PRF centroid is offset from the target star catalog position by about 0.61 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.963 ± 1.175 | 0.82 | -0.683 ± 0.786 | -0.679 ± 1.467 |
| PRF-fit source offset from KIC position | 1.488 ± 1.467 | 1.01 | -0.489 ± 0.887 | -1.406 ± 1.683 |
| photometric centroid source offset | 0.97 ± 0.98 | 1.00 | 0.18 ± 0.77 | -0.96 ± 0.98 |

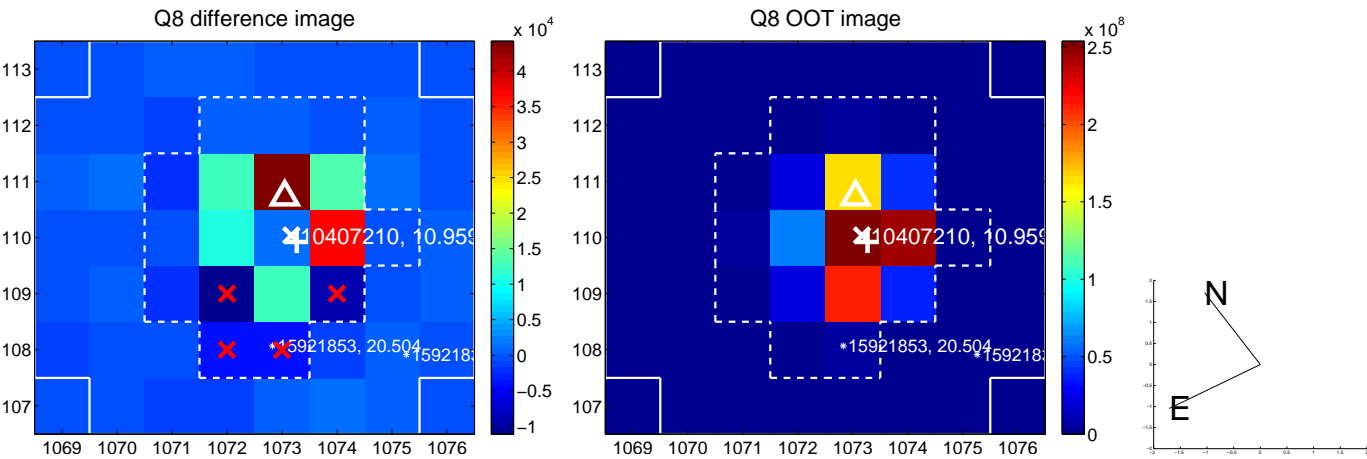
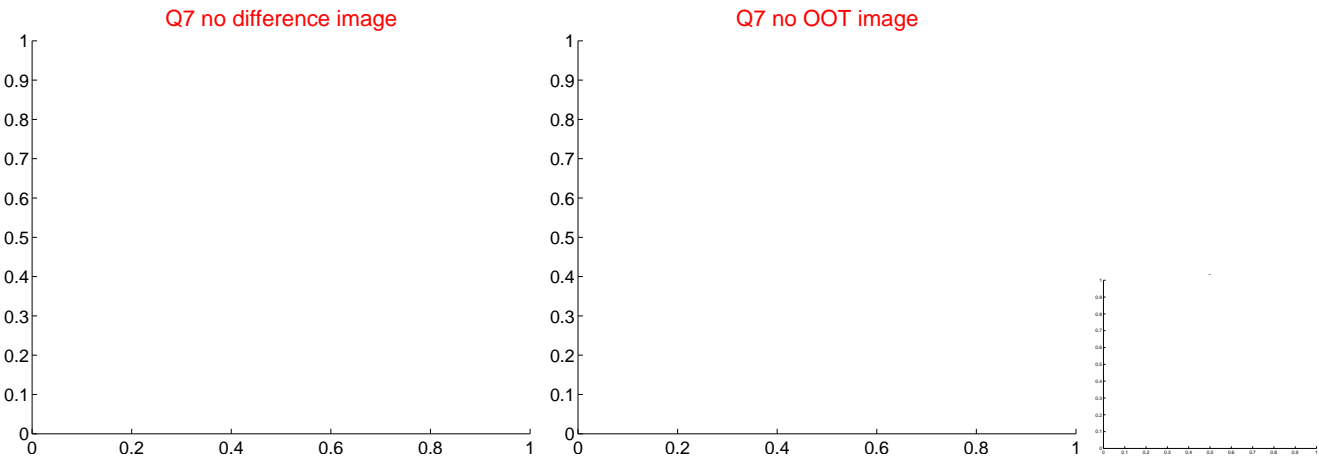
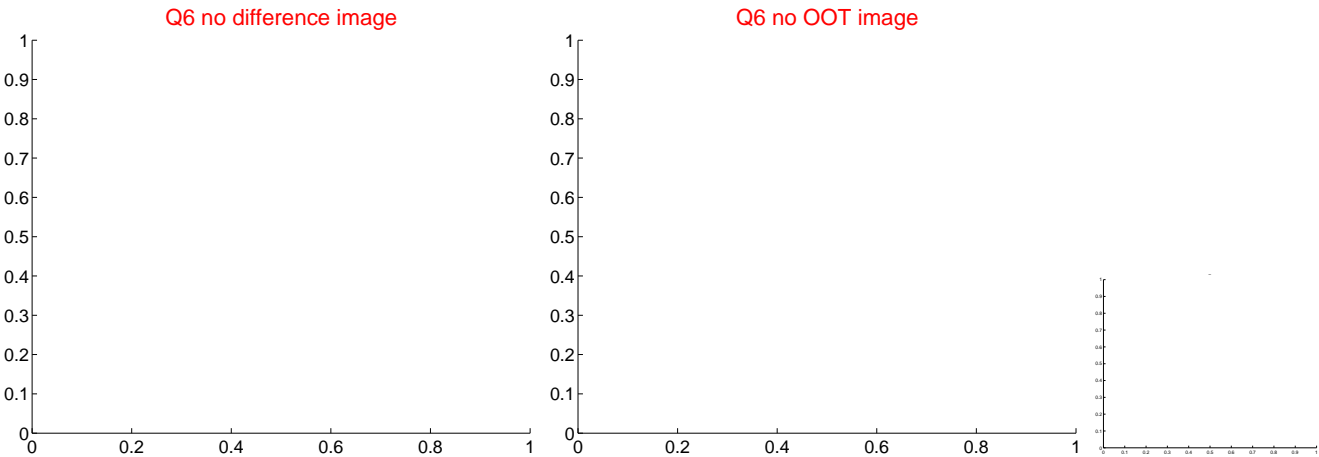
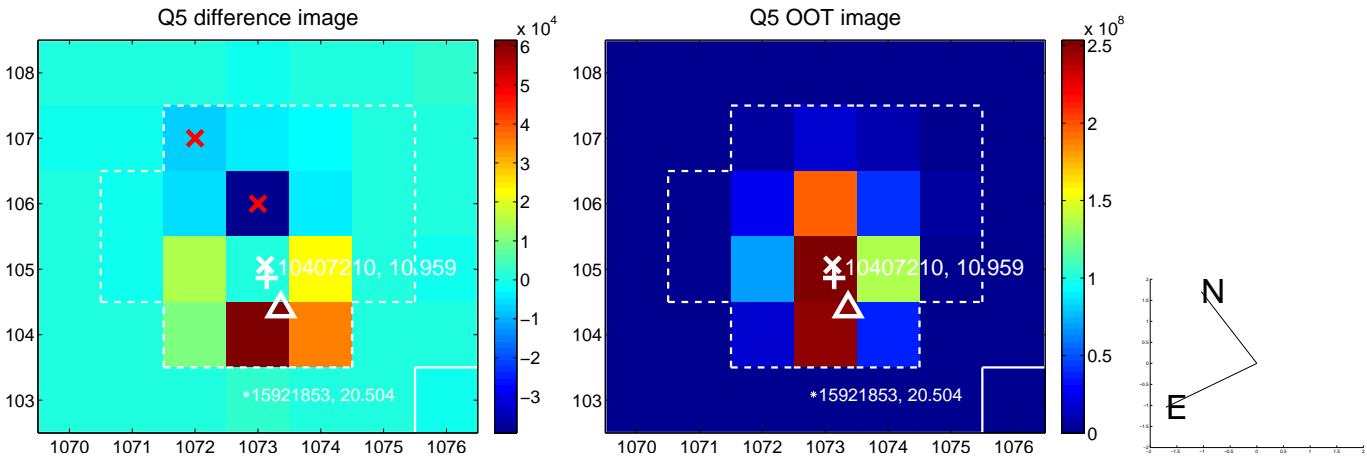


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



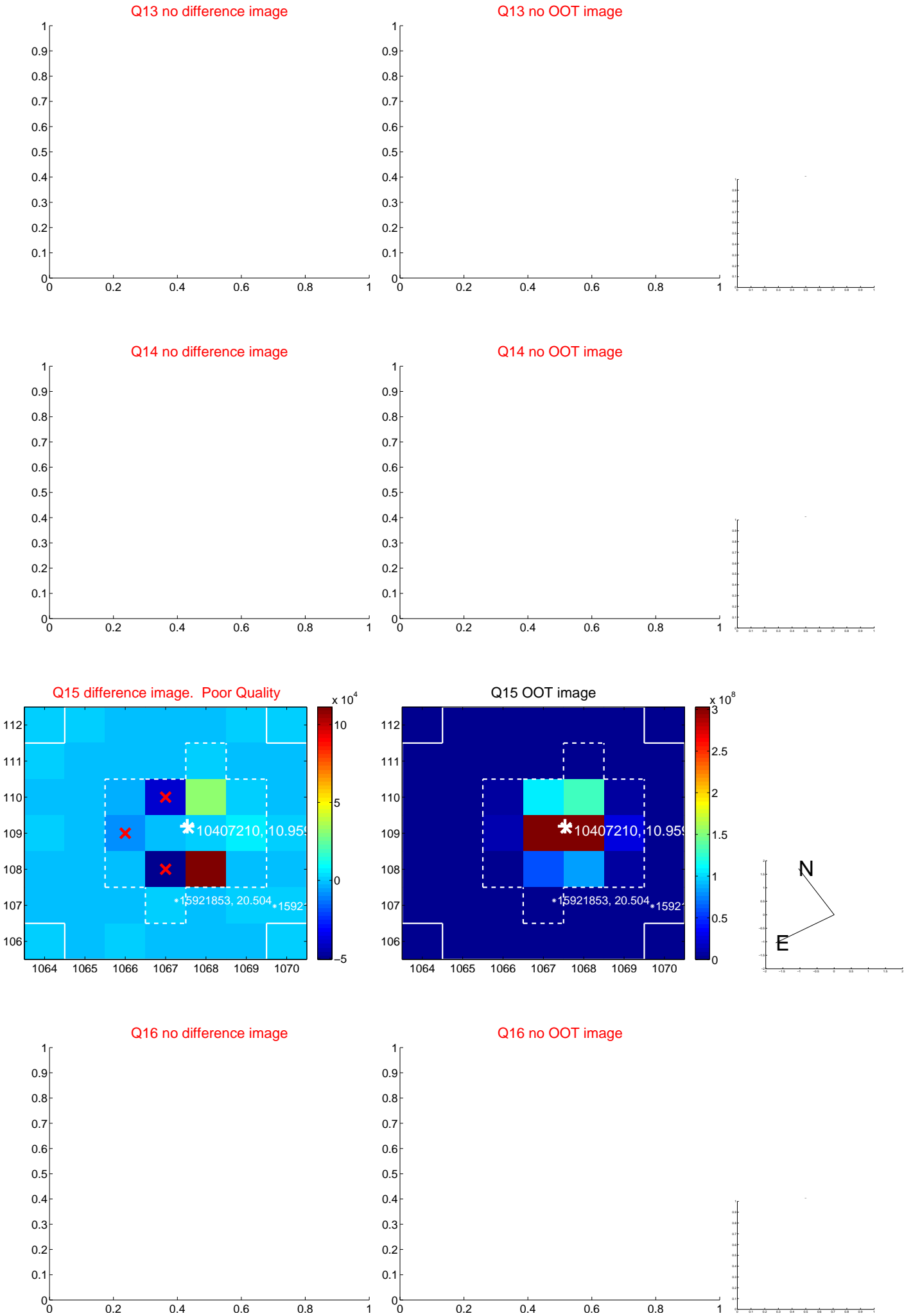
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



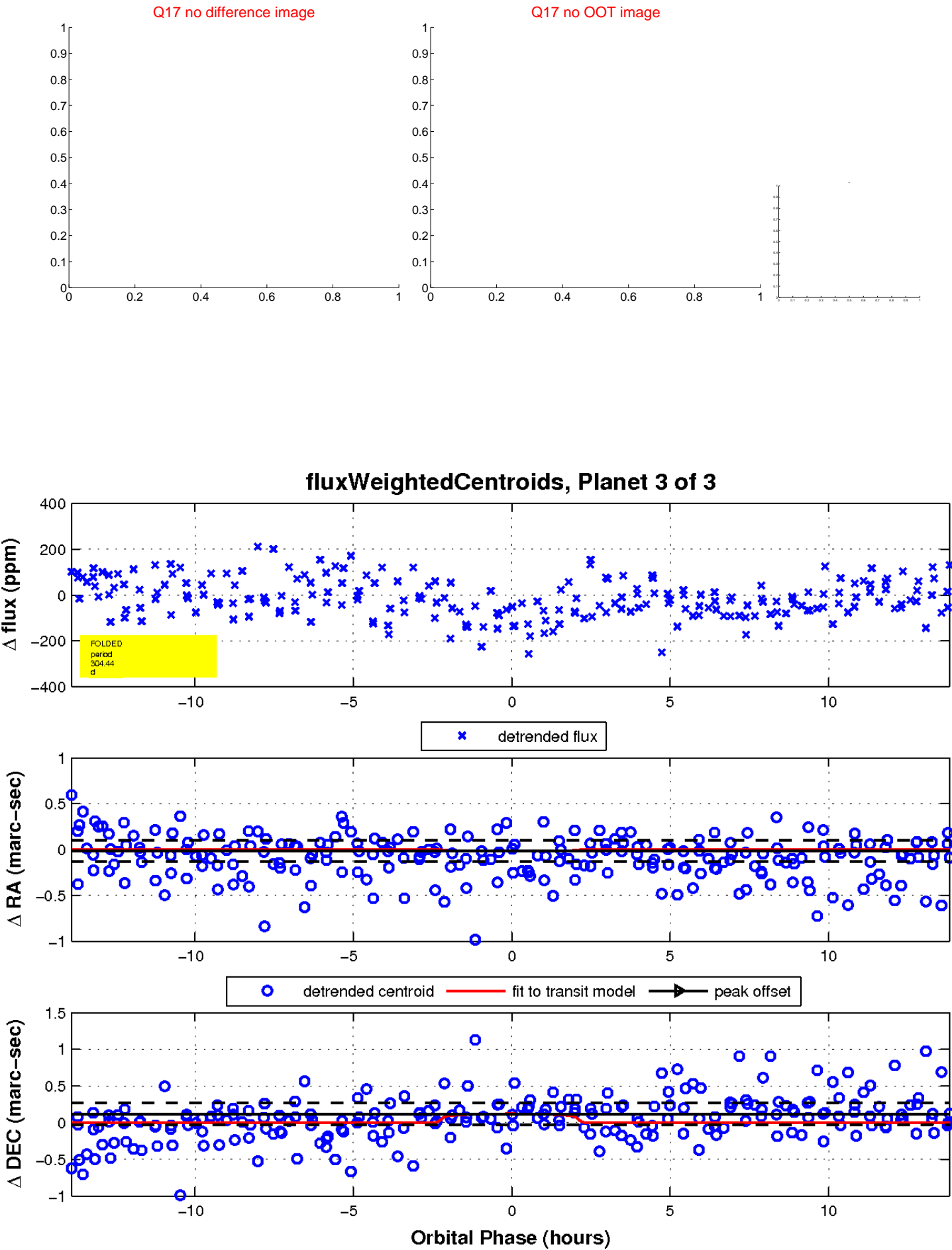
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

