

KIC 006431670

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|------|-----------------------------|-----------------|------------------------|------------------------|
| 006431670-01 | OBS | 3534.01 | 29.911333 | 153.592861 | 358289.4 | 4.500 | 3602.3 | -1.0 | 0.70 | 5303 | 38.41 | 11.70 |
| 006431670-02 | OBS | No | 29.911512 | 144.830269 | 366672.0 | 5.000 | 3551.7 | -1.0 | 0.70 | 5303 | 37.44 | 11.70 |
| 006431670-03 | OBS | No | 14.955586 | 138.941998 | 13405.1 | 15.000 | 78.3 | -1.0 | 0.70 | 5303 | 8.01 | 29.49 |
| 006431670-04 | OBS | No | 156.930302 | 169.510324 | 1996.2 | 2.675 | 11.8 | 6.5 | 0.70 | 5303 | 3.36 | 1.28 |
| 006431670-05 | OBS | No | 70.646192 | 198.621740 | 435.5 | 10.064 | 11.7 | 4.6 | 0.70 | 5303 | 1.56 | 3.72 |
| 006431670-06 | OBS | No | 115.313282 | 218.062208 | 1587.8 | 4.058 | 16.1 | 7.0 | 0.70 | 5303 | 2.89 | 1.94 |
| 006431670-07 | OBS | No | 300.041667 | 356.111204 | 1829.8 | 5.475 | 9.8 | 8.2 | 0.70 | 5303 | 3.29 | 0.54 |
| 006431670-08 | OBS | No | 272.059128 | 134.308141 | 933.6 | 13.392 | 11.4 | 5.4 | 0.70 | 5303 | 2.16 | 0.62 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 006431670-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS |
| 006431670-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_NOFITS |
| 006431670-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS |
| 006431670-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 006431670-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-07 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-08 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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 006431670-01

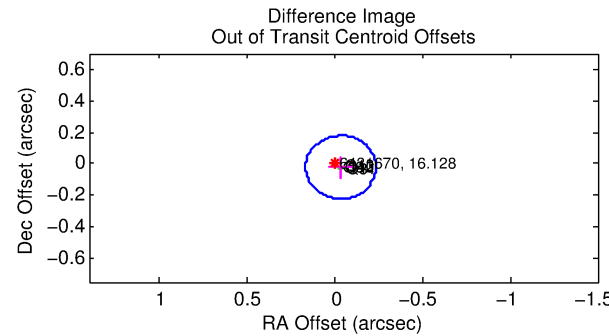
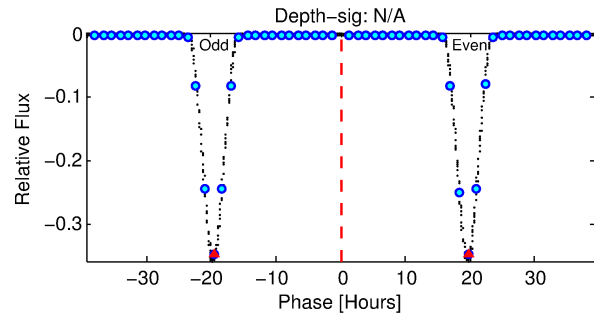
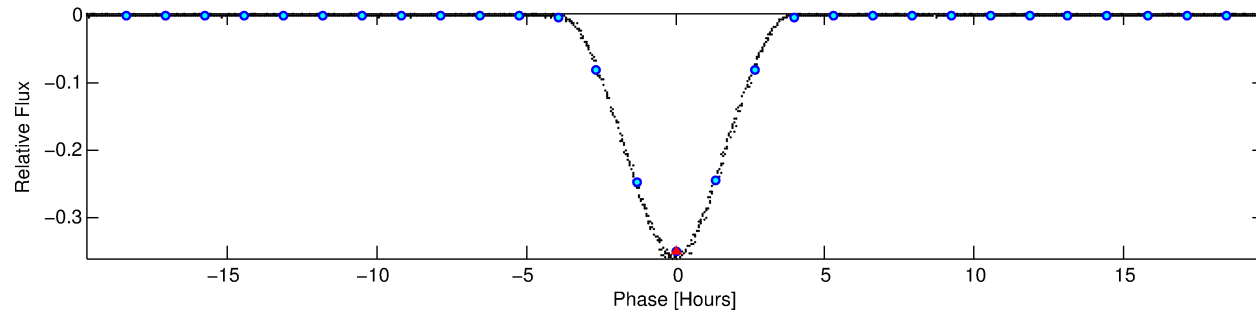
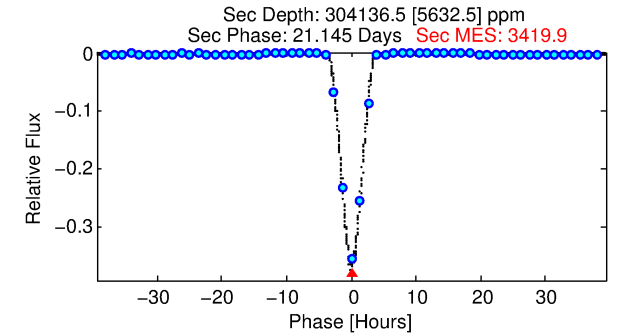
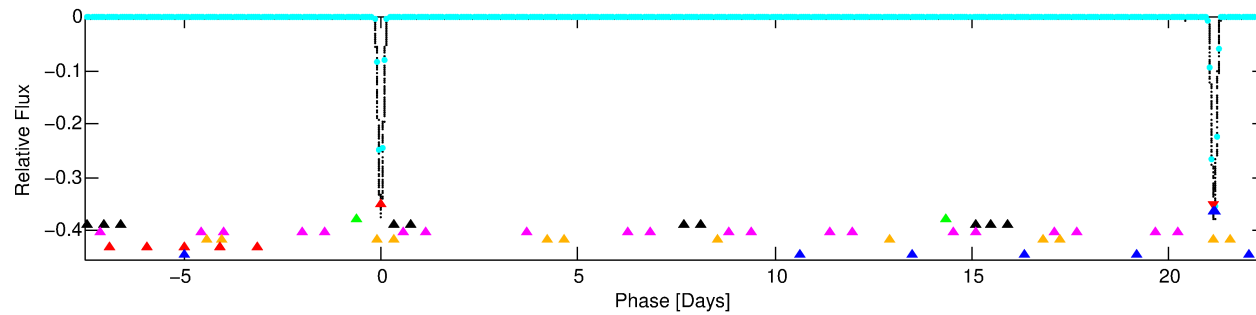
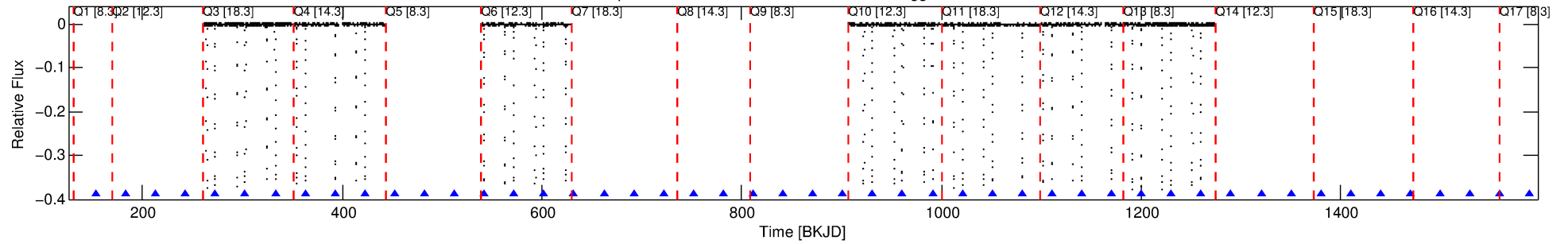
No Significant Match Found

DV One-Page Summary

KIC: 6431670 Candidate: 1 of 8 Period: 29.911 d

KOI: K03534.01 Corr: 0.784

Kp: 16.13 R*: 0.70 Rs Teff: 5303.0 K Logg: 4.63 Fe/H: -0.400



TPS TCE Results:

Period = 29.91133 d
Epoch = 153.5929 BKJD

DV fit results are unavailable

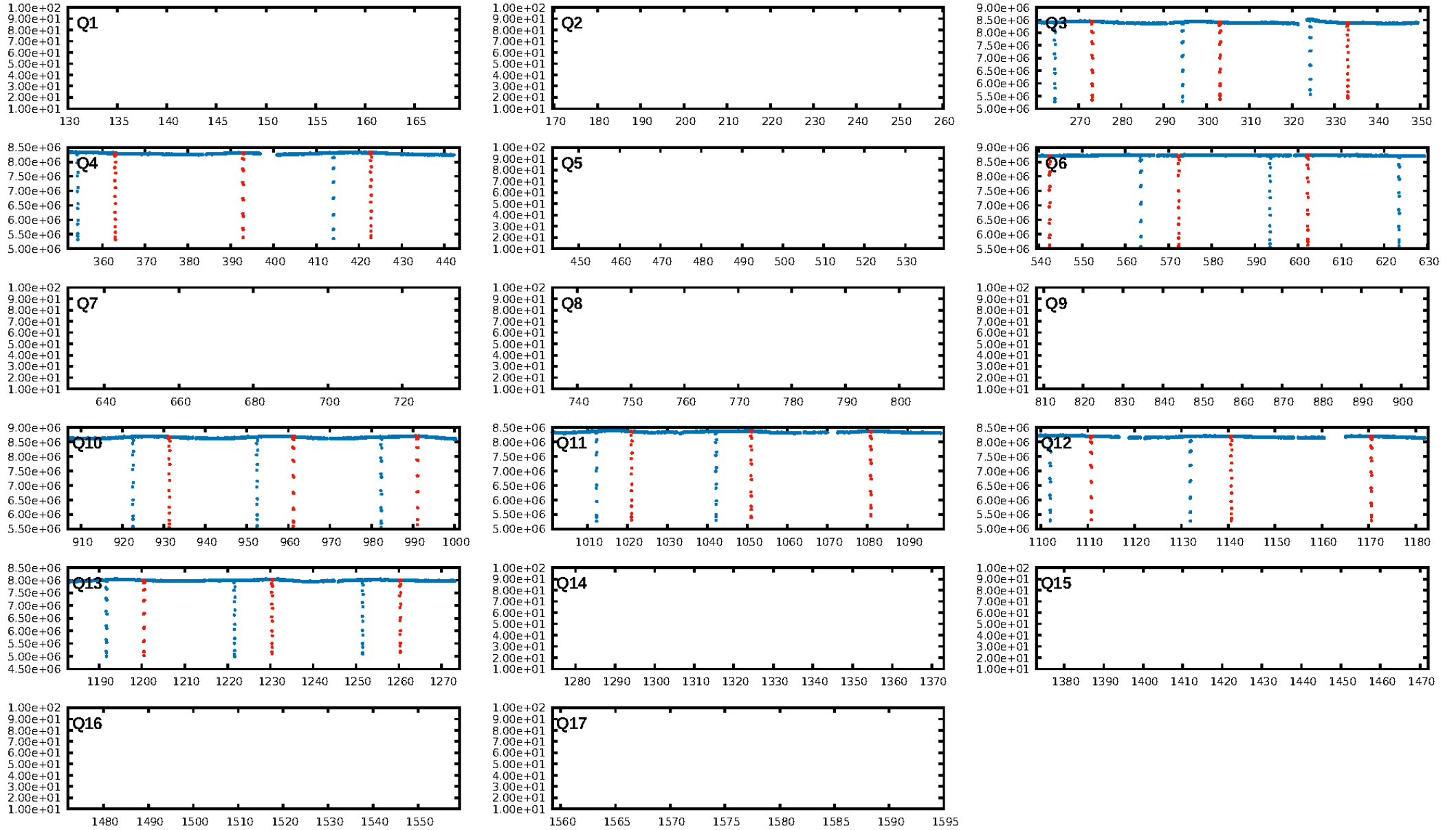
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [22.92σ]
LongPeriod-sig: 0.1% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [21/21]
GhostDiagnostic-chr: 6.361
Centroid-sig: 0.0%
Centroid-so: 0.184 arcsec [70.35σ]
OotOffset-rm: 0.041 arcsec [0.61σ]
KicOffset-rm: 0.160 arcsec [2.21σ]
OotOffset-st: 2/2/2/1 [7]
KicOffset-st: 2/2/2/1 [7]
DiffImageQuality-fgm: 1.00 [7/7]
DiffImageOverlap-fno: 1.00 [7/7]

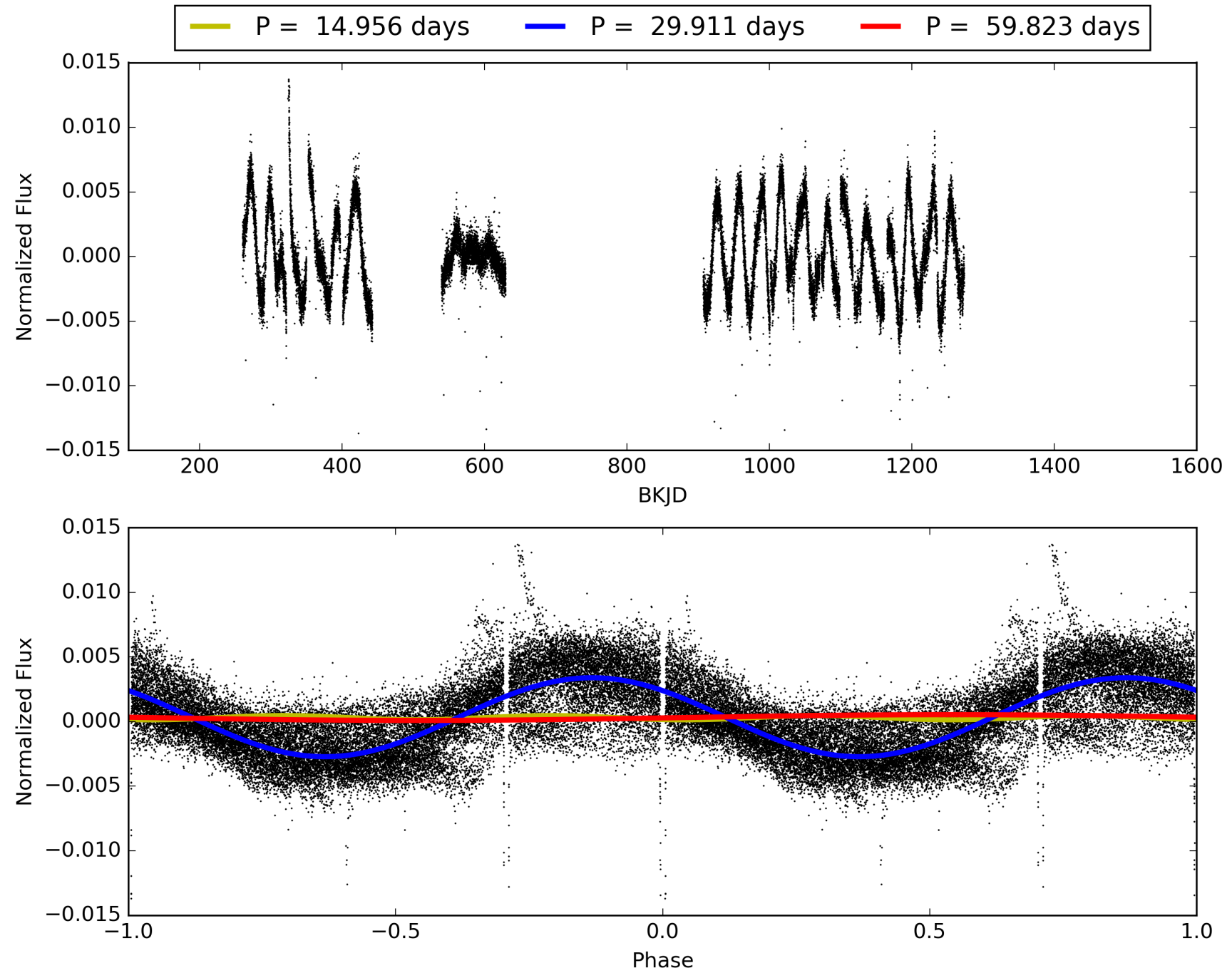
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:29:45 Z

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

TCE 006431670-01, PDC Light Curves

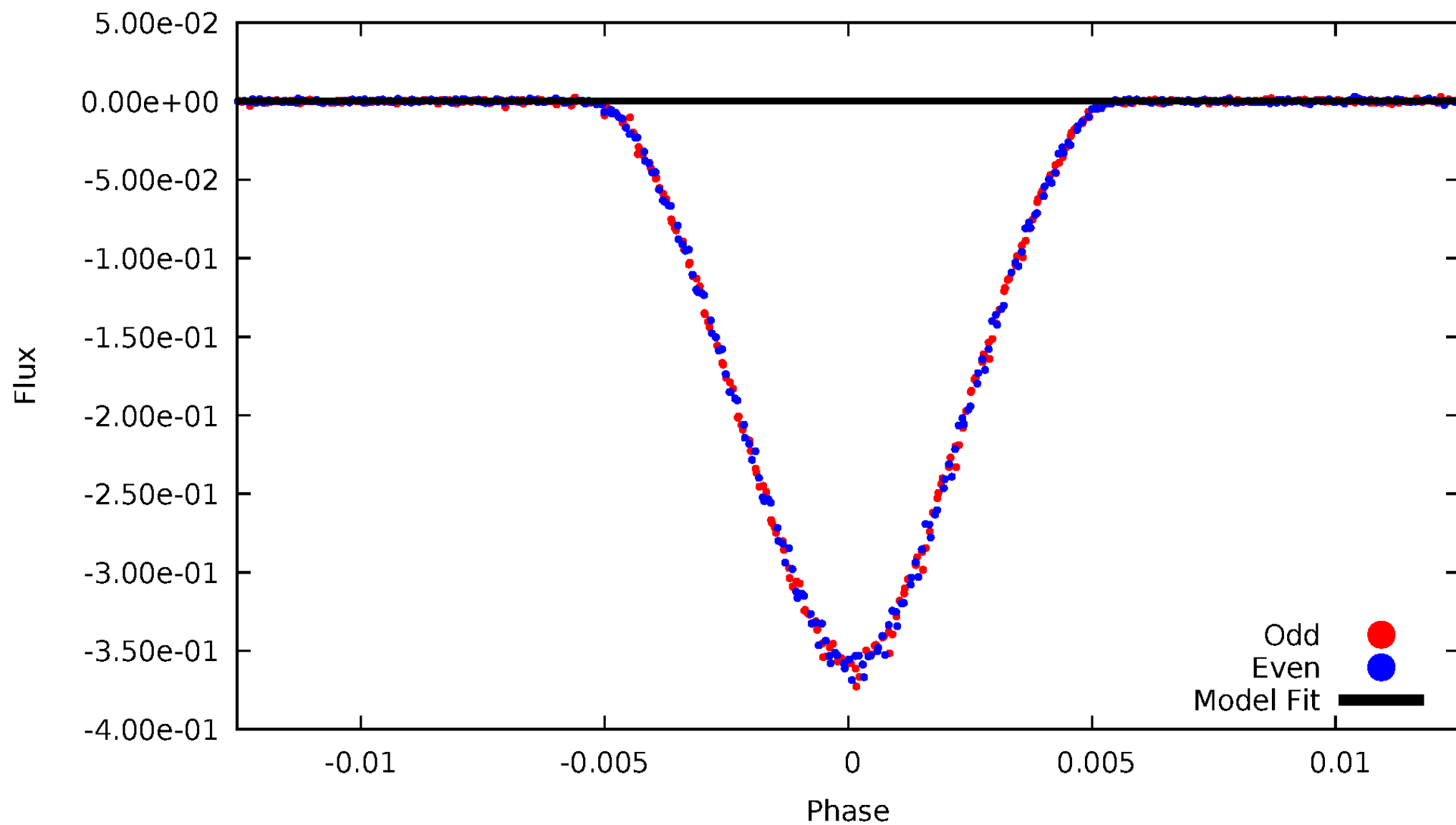


TCE 006431670-01



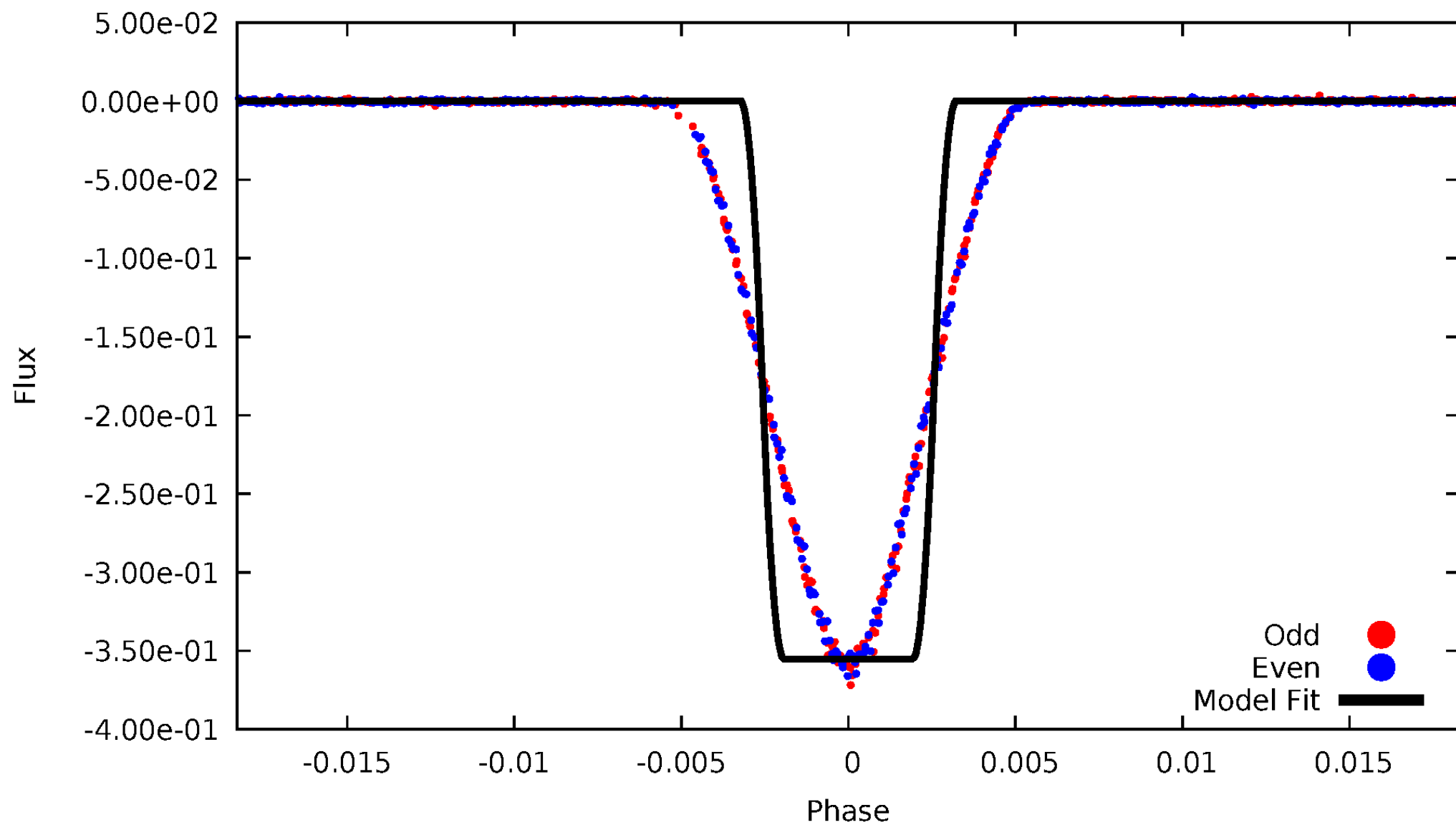
DV Odd/Even

TCE 006431670-01



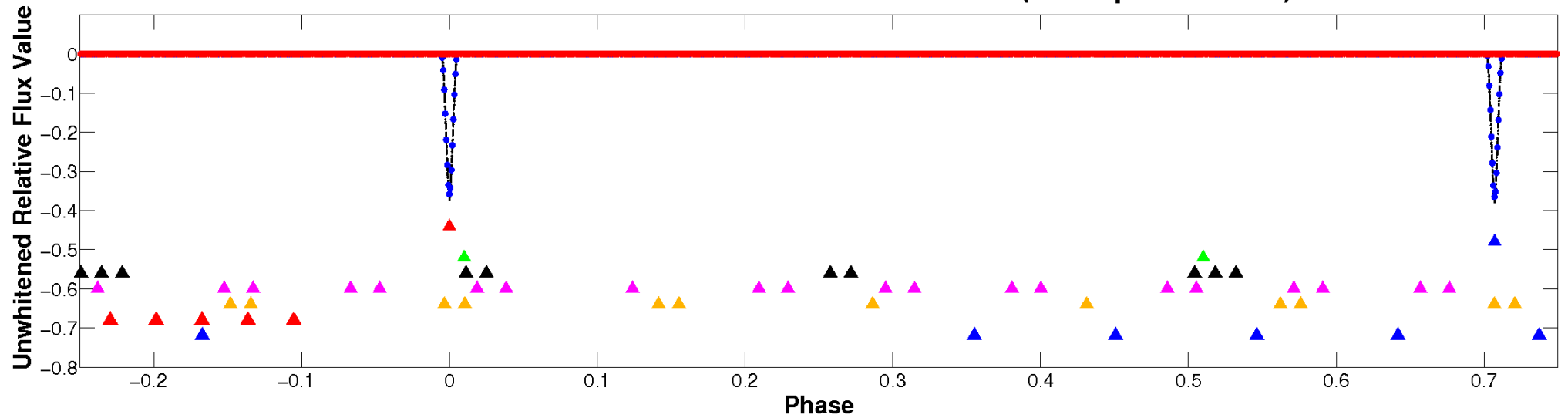
ALT Odd/Even

TCE 006431670-01



Non-Whitened Vs. Whitened Light Curve

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

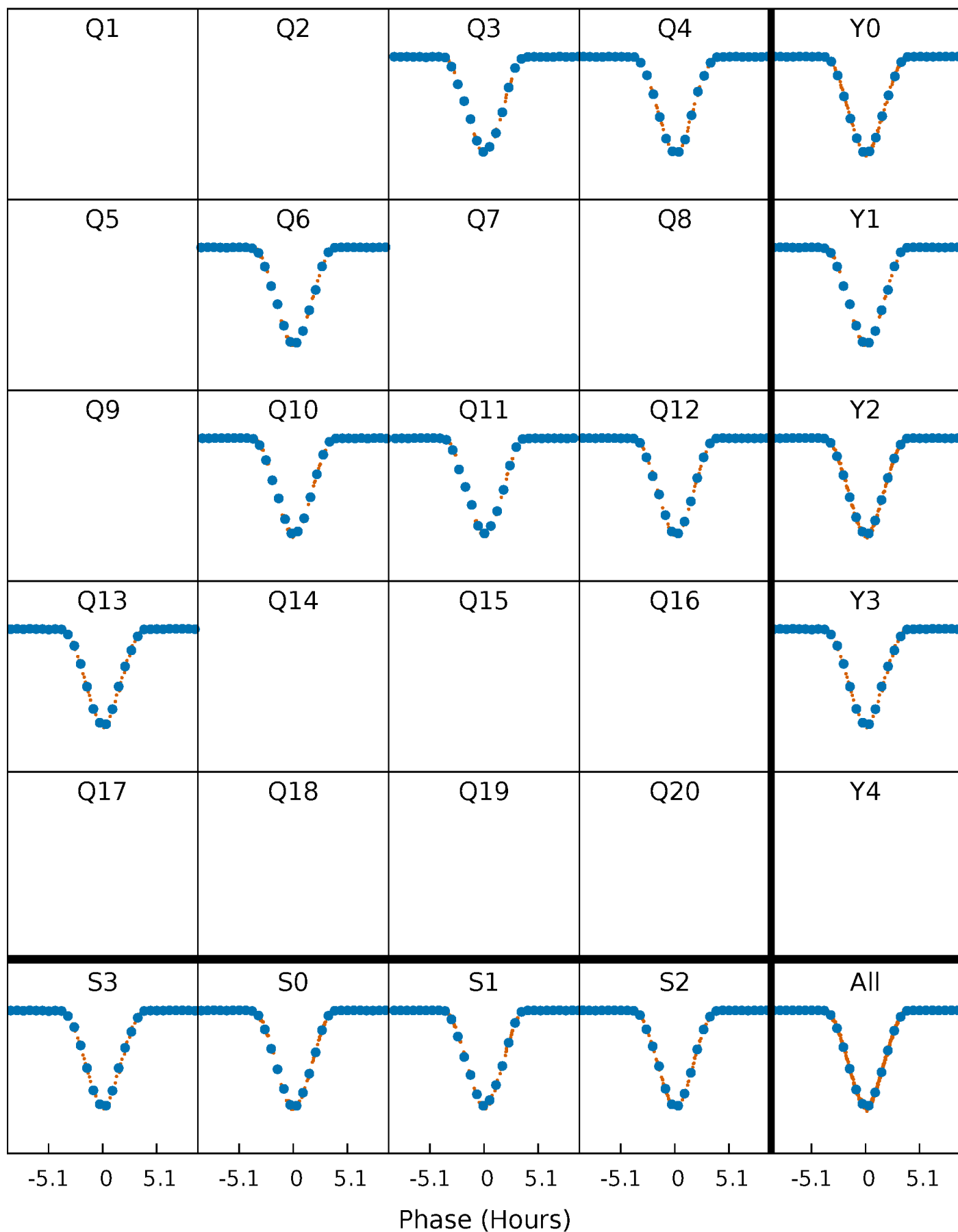


Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)



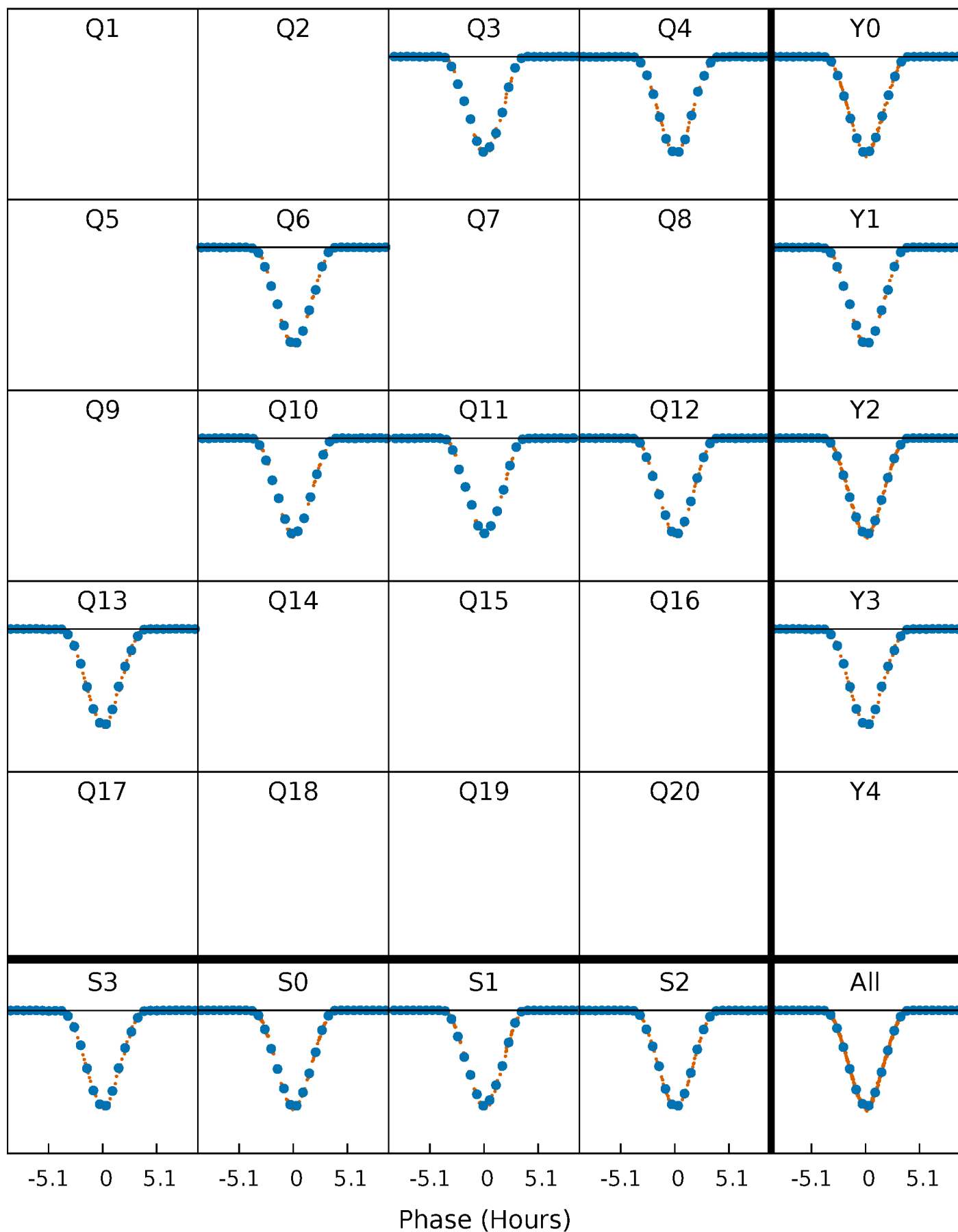
PDC Quarter-Phased Transit Curves

TCE 006431670-01 P= 29.911333 Days $T_0=153.592861$ (BKJD)



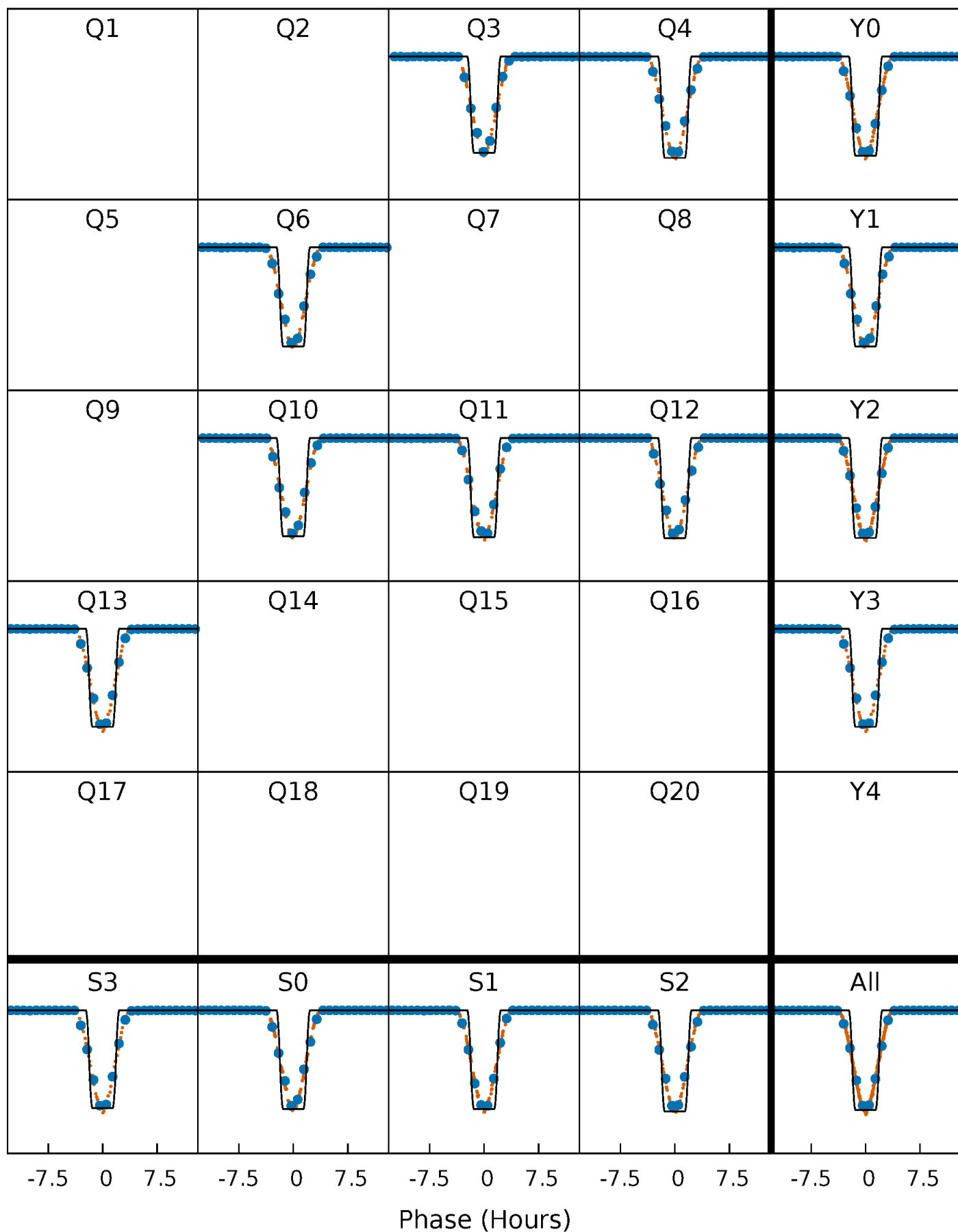
DV Quarter-Phased Transit Curves

TCE 006431670-01 P= 29.911333 Days $T_0=153.592861$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

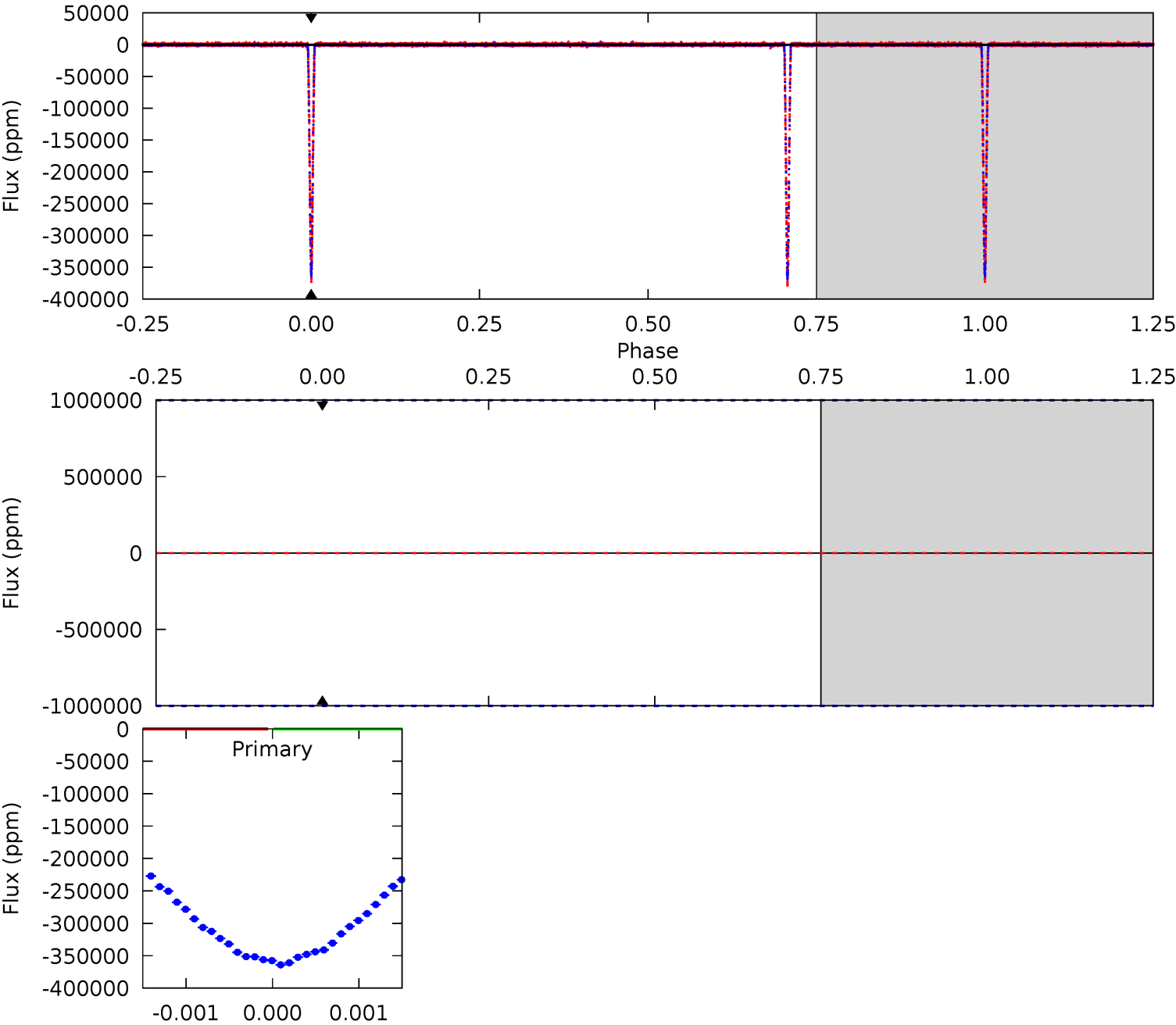
TCE 006431670-01 P= 29.911333 Days $T_0=153.595603$ (BKJD)



DV Model-Shift Uniqueness Test

006431670-01, P = 29.911333 Days, E = 153.592861 Days

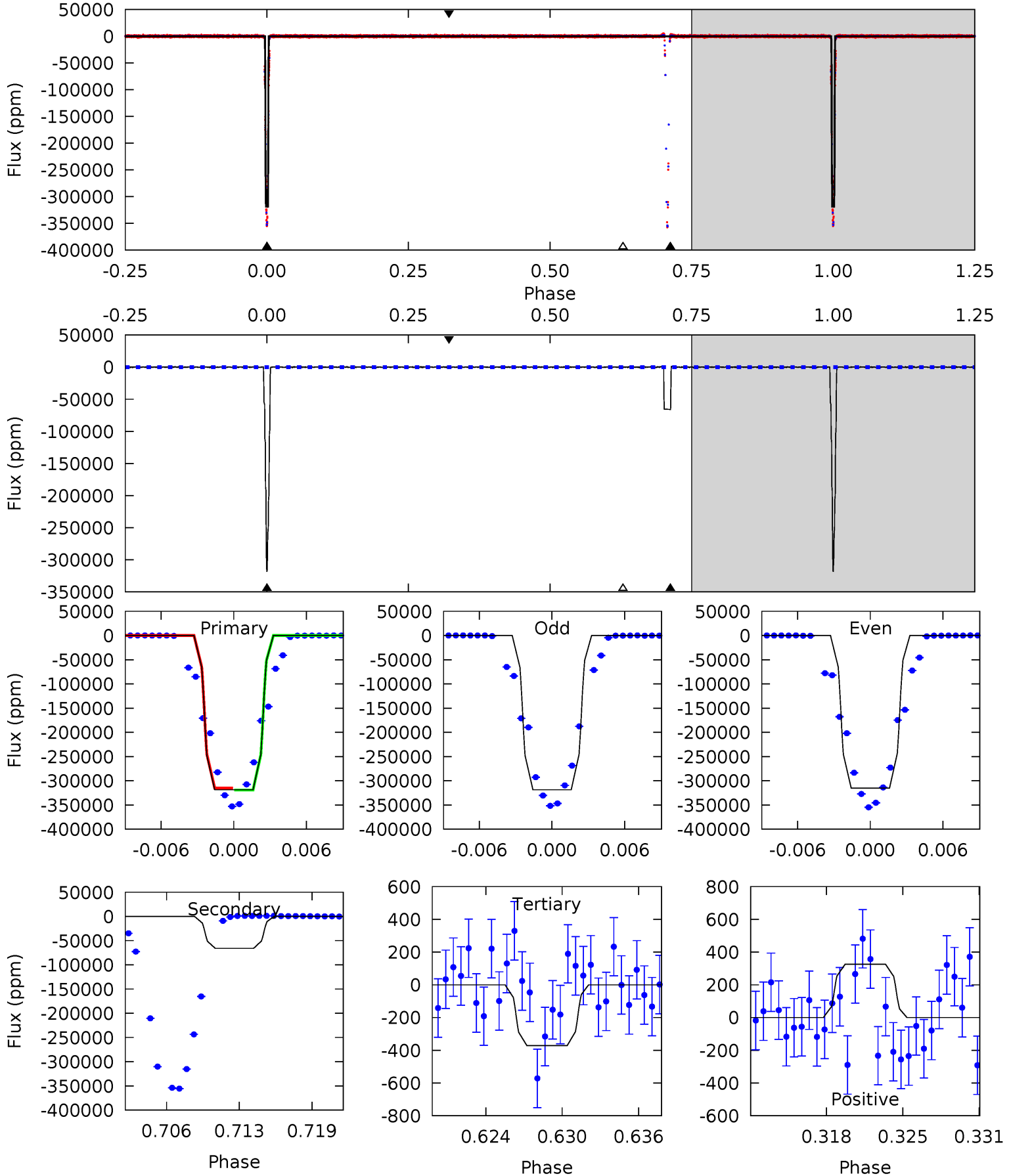
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-----|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-----|-------|-----|
| 0 | 0 | 0 | 0 | 1.00 | 1.00 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



Alt Model-Shift Uniqueness Test

006431670-01, P = 29.911333 Days, E = 153.595603 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 1132 | 234.4 | 1.32 | 1.16 | 5.11 | 2.73 | 5.96 | 1131 | 1131 | 233.1 | 233.2 | 6.49 | 1.00 | 0.01 | 0 |



Stellar Parameters For KIC 006431670

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5303^{+191}_{-191} | $4.632^{+0.032}_{-0.097}$ | $-0.400^{+0.300}_{-0.300}$ | $0.704^{+0.111}_{-0.051}$ | $0.785^{+0.074}_{-0.082}$ | $3.172^{+0.519}_{-1.000}$ |
| | +4%/-4% | +1%/-2% | +75%/-75% | +16%/-7% | +9%/-10% | +16%/-32% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 006431670-01 / KOI 3534.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|------------------|-------------------------|-------------------|------------------------|---------------------|
| DV | 0 ± 1000000 | $39.61^{+8.00}_{-7.67}$ | 667^{+30}_{-28} | 2530^{+2000}_{-6831} | 29^{+1215}_{-964} |
| Alt. | -65926 ± 281 | $46.84^{+8.71}_{-8.55}$ | 668^{+30}_{-29} | 3876^{+287}_{-232} | 531^{+243}_{-152} |

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 $A_{obs} \gg 1.0$

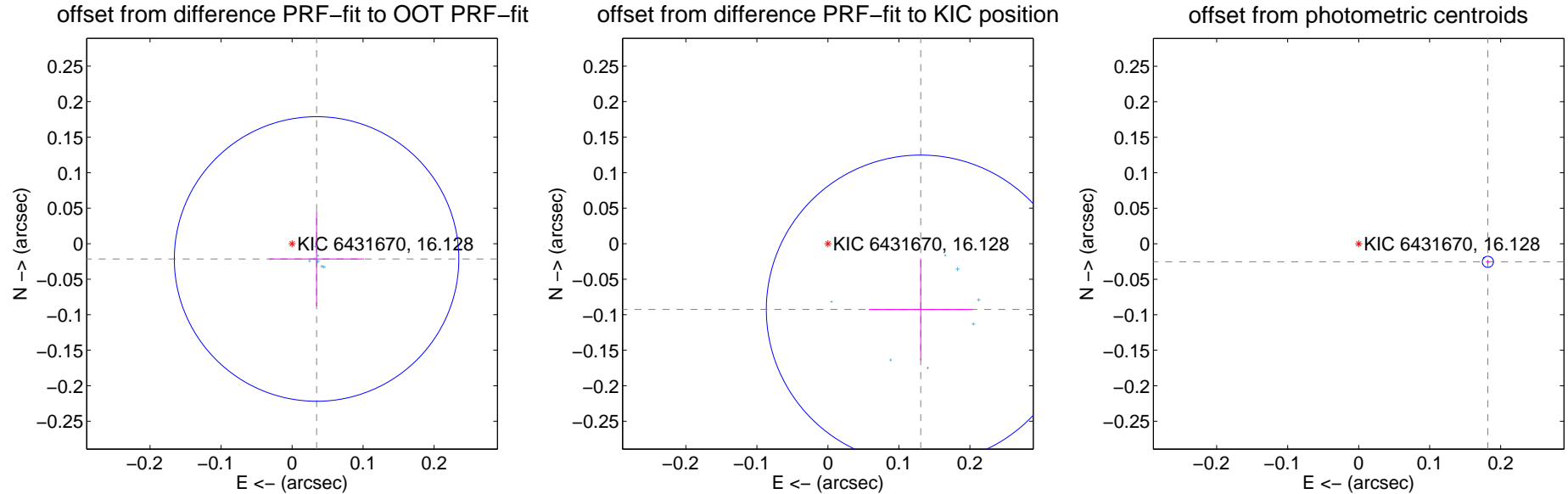
DV Centroid Data

Supplemental centroid analysis for 006431670-01. Kepler magnitude: 16.13. Transit SNR -1.00

There are 7 quarters with good PRF difference image offsets

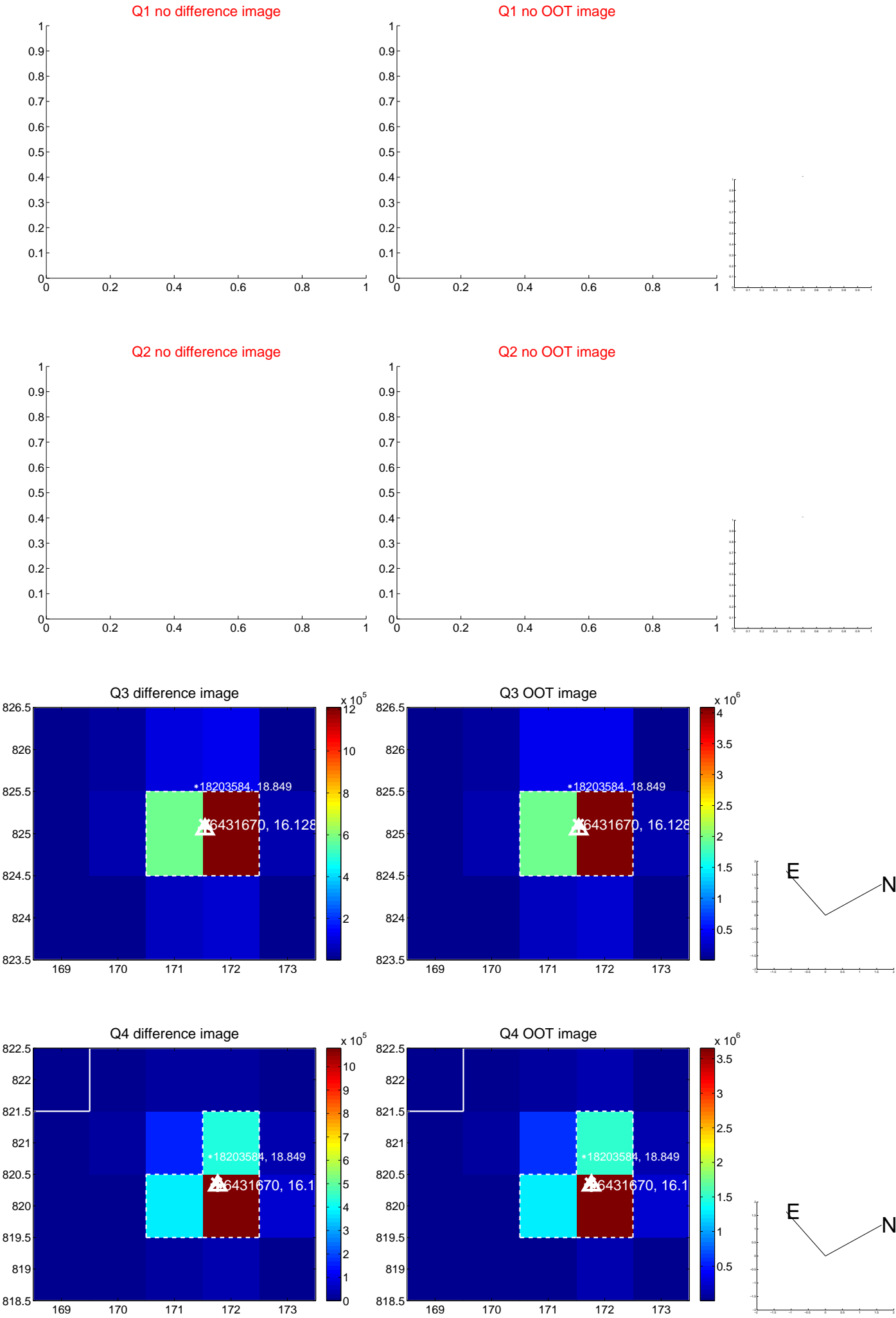
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.041 ± 0.067 | 0.61 | -0.035 ± 0.067 | -0.022 ± 0.067 |
| PRF-fit source offset from KIC position | 0.160 ± 0.072 | 2.21 | -0.131 ± 0.073 | -0.093 ± 0.072 |
| photometric centroid source offset | 0.18 ± 0.00 | 70.35 | -0.18 ± 0.00 | -0.03 ± 0.00 |

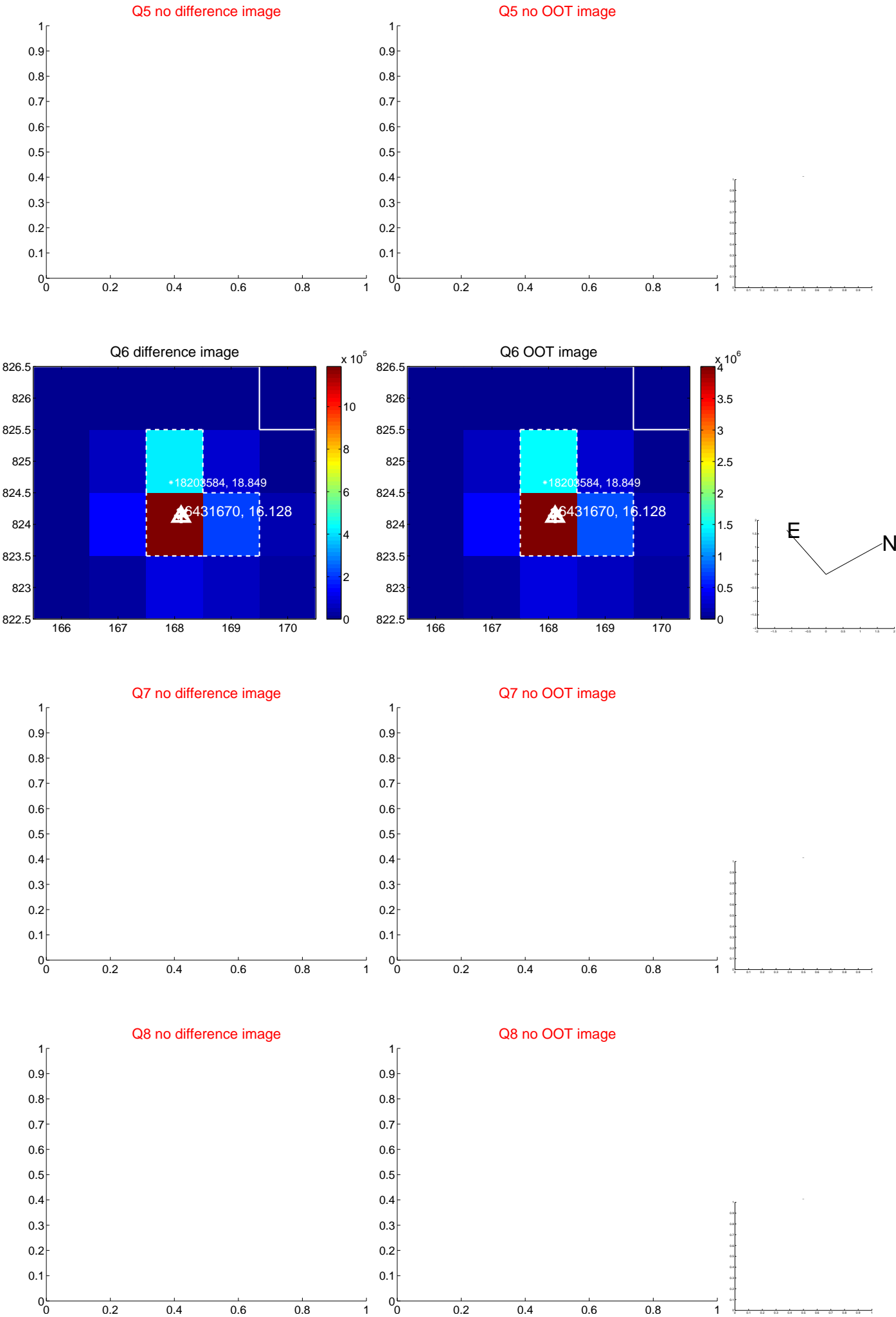


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

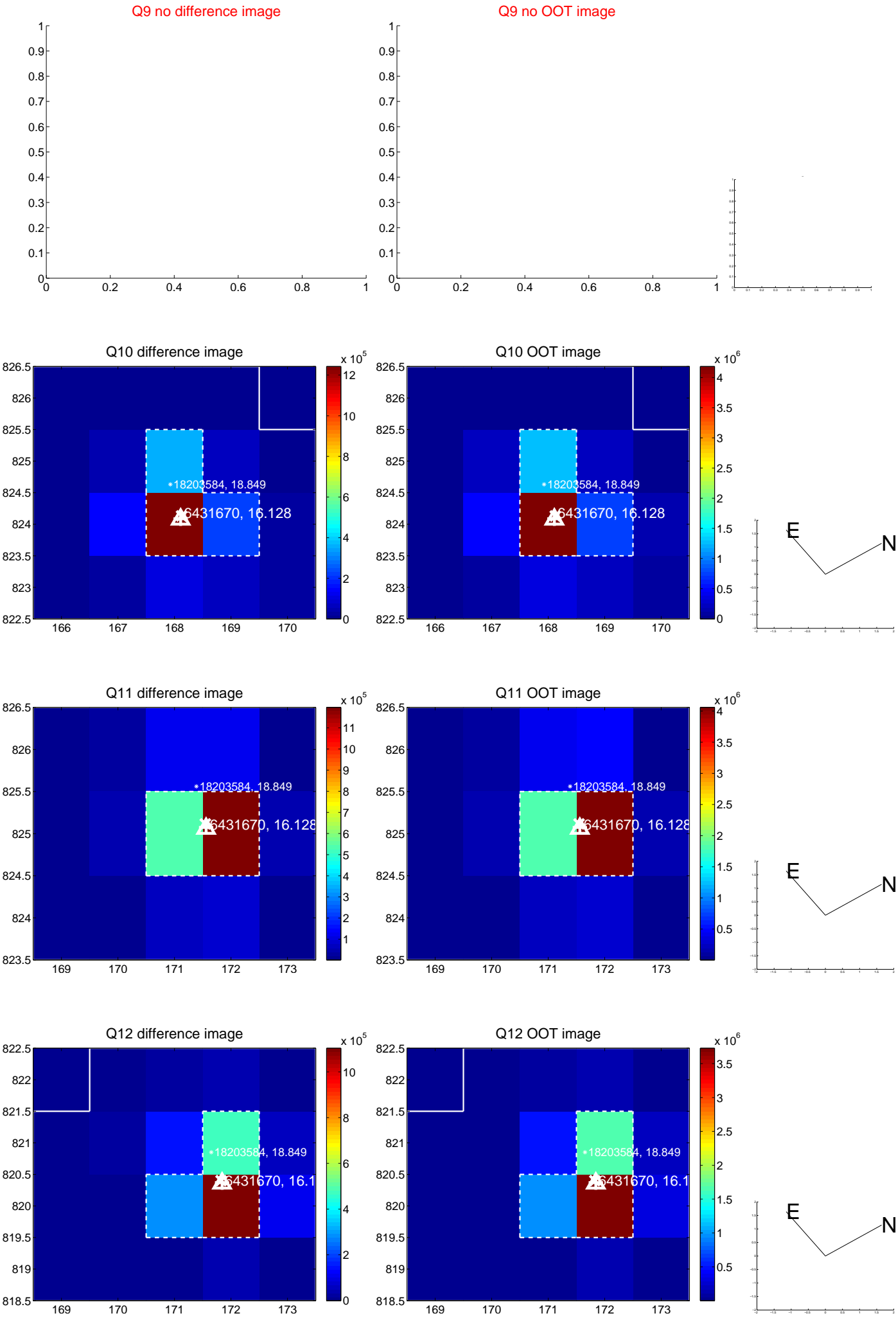
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



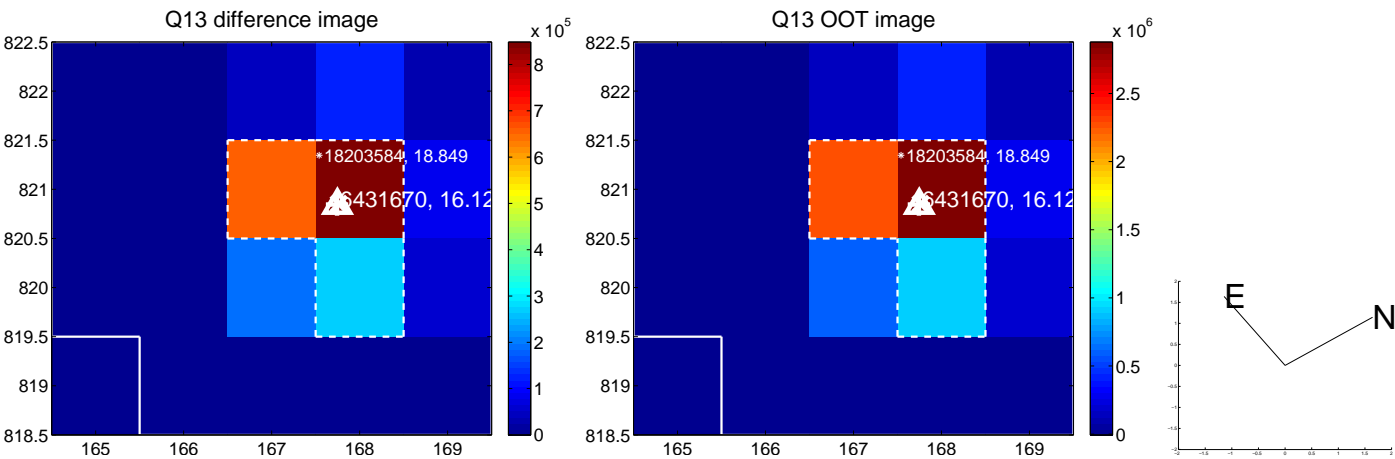
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



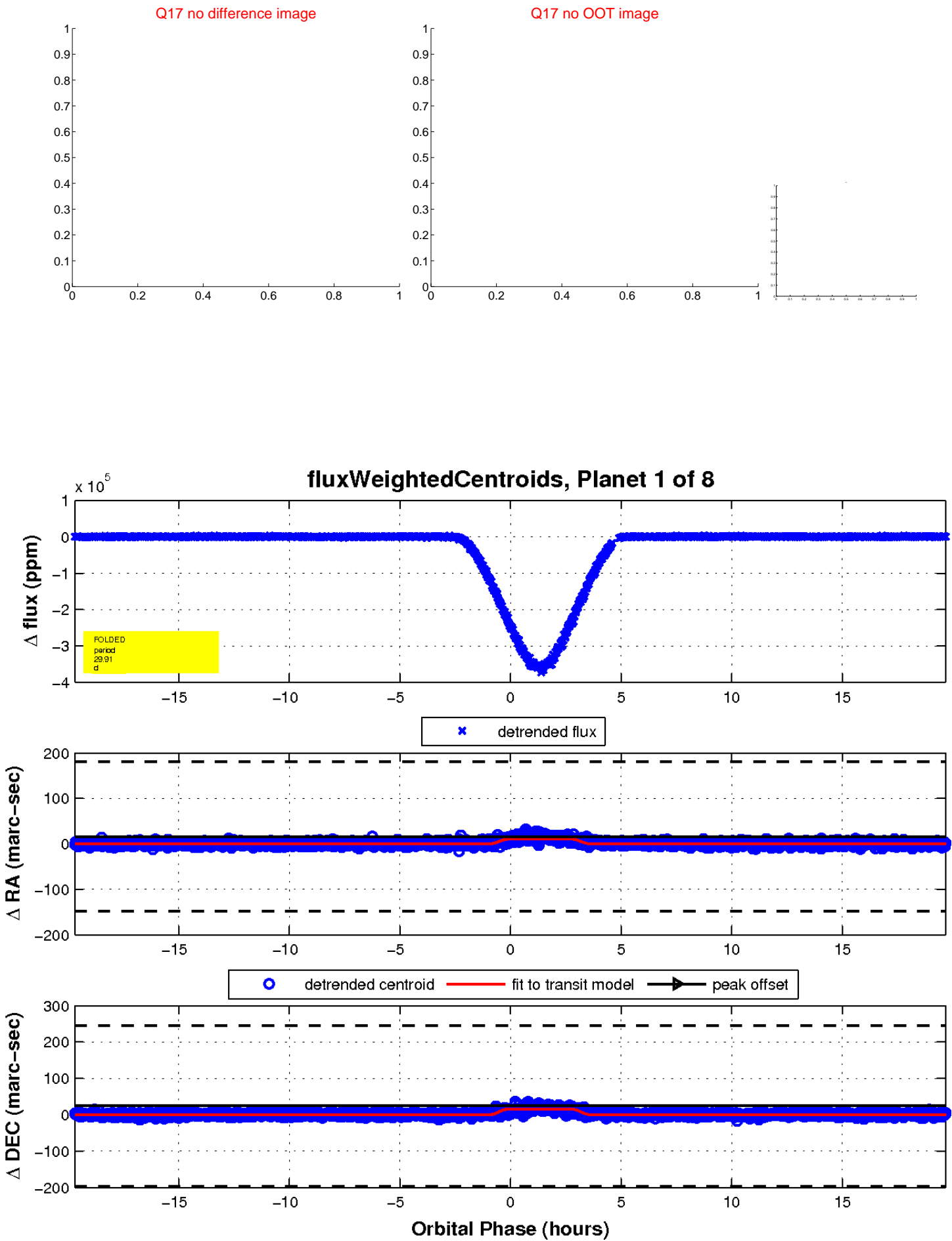
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

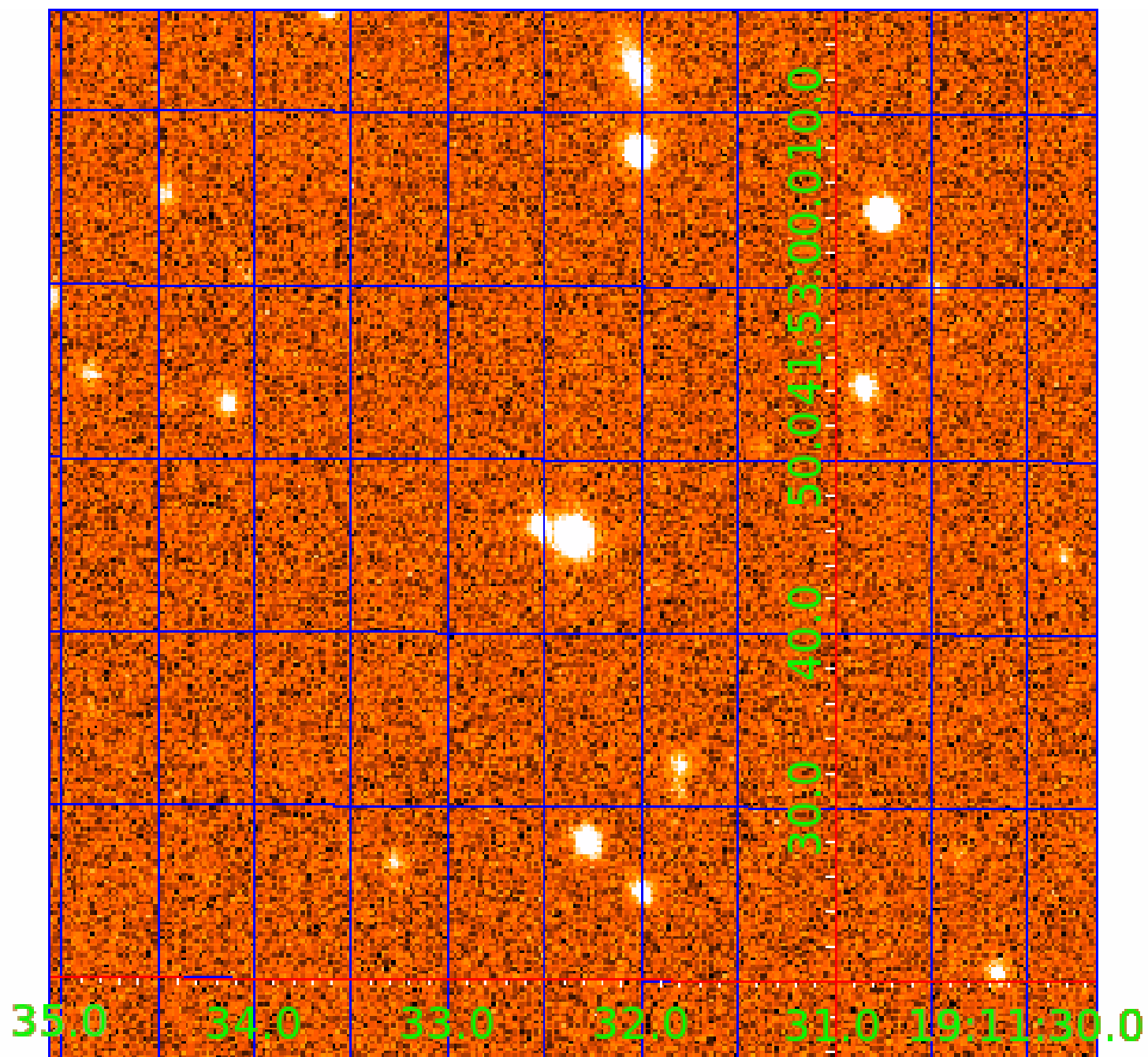


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006431670

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|------|-----------------------------|-----------------|------------------------|------------------------|
| 006431670-01 | OBS | 3534.01 | 29.911333 | 153.592861 | 358289.4 | 4.500 | 3602.3 | -1.0 | 0.70 | 5303 | 38.41 | 11.70 |
| 006431670-02 | OBS | No | 29.911512 | 144.830269 | 366672.0 | 5.000 | 3551.7 | -1.0 | 0.70 | 5303 | 37.44 | 11.70 |
| 006431670-03 | OBS | No | 14.955586 | 138.941998 | 13405.1 | 15.000 | 78.3 | -1.0 | 0.70 | 5303 | 8.01 | 29.49 |
| 006431670-04 | OBS | No | 156.930302 | 169.510324 | 1996.2 | 2.675 | 11.8 | 6.5 | 0.70 | 5303 | 3.36 | 1.28 |
| 006431670-05 | OBS | No | 70.646192 | 198.621740 | 435.5 | 10.064 | 11.7 | 4.6 | 0.70 | 5303 | 1.56 | 3.72 |
| 006431670-06 | OBS | No | 115.313282 | 218.062208 | 1587.8 | 4.058 | 16.1 | 7.0 | 0.70 | 5303 | 2.89 | 1.94 |
| 006431670-07 | OBS | No | 300.041667 | 356.111204 | 1829.8 | 5.475 | 9.8 | 8.2 | 0.70 | 5303 | 3.29 | 0.54 |
| 006431670-08 | OBS | No | 272.059128 | 134.308141 | 933.6 | 13.392 | 11.4 | 5.4 | 0.70 | 5303 | 2.16 | 0.62 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 006431670-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS |
| 006431670-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_NOFITS |
| 006431670-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS |
| 006431670-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 006431670-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-07 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-08 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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 006431670-02

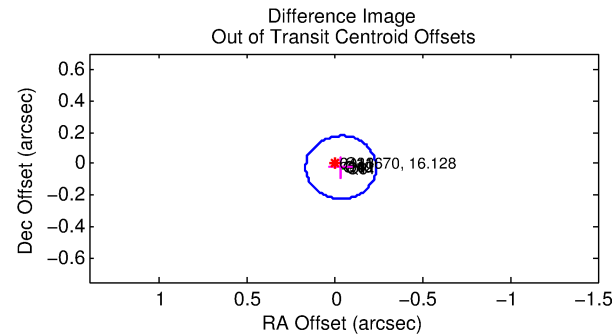
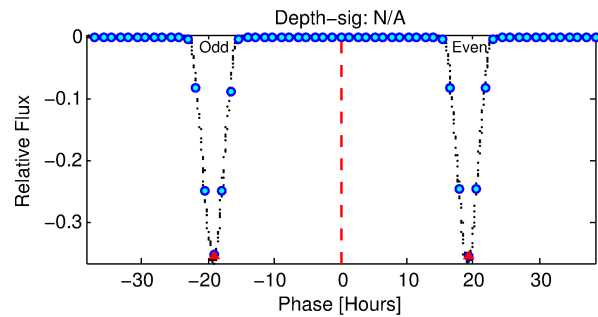
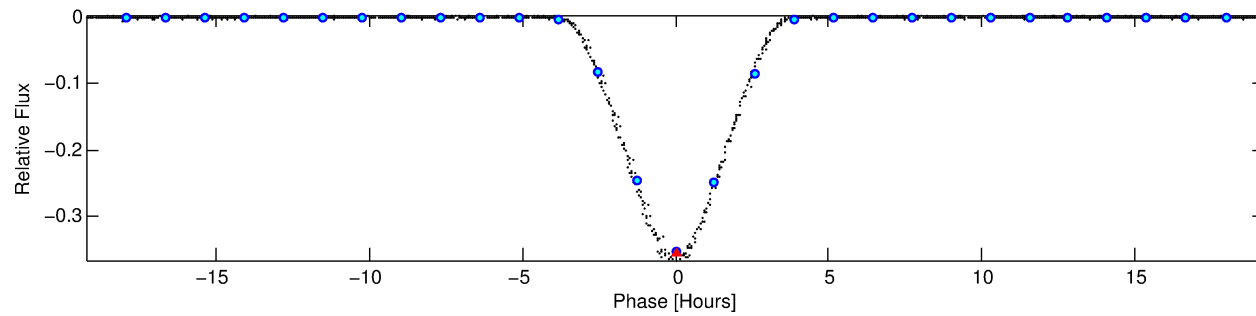
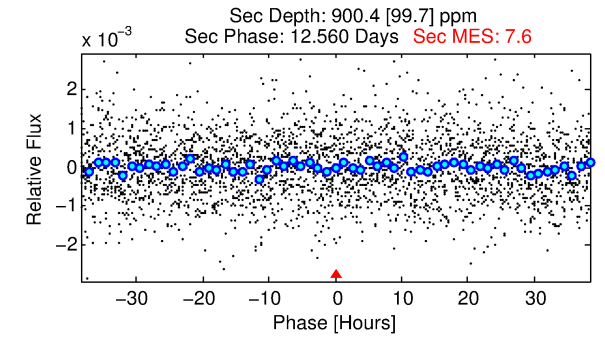
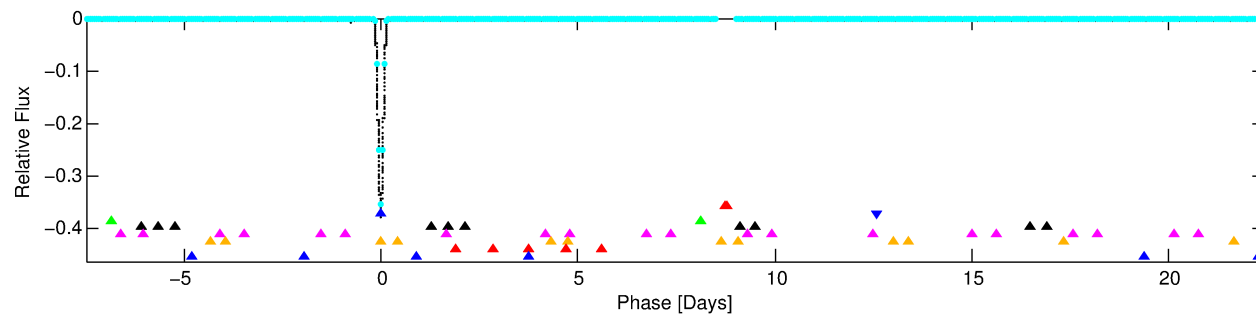
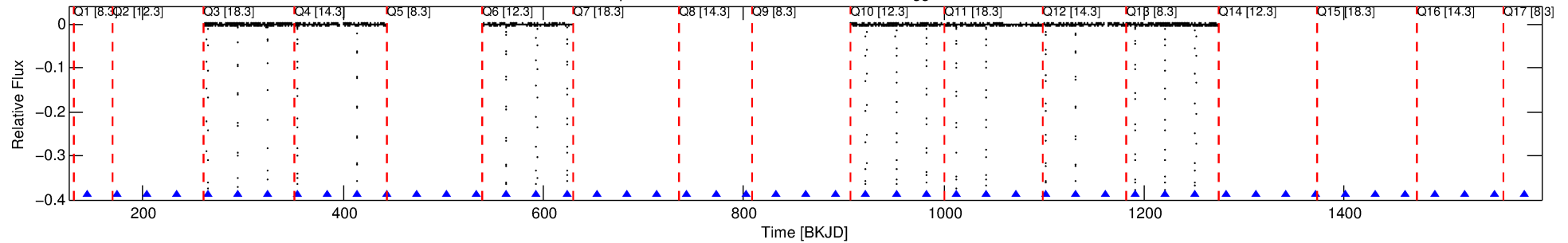
No Significant Match Found

DV One-Page Summary

KIC: 6431670 Candidate: 2 of 8 Period: 29.912 d

KOI: K03534 Corr: No Ephemeris Match

Kp: 16.13 R*: 0.70 Rs Teff: 5303.0 K Logg: 4.63 Fe/H: -0.400



TPS TCE Results:

Period = 29.91151 d
Epoch = 144.8303 BKJD

DV fit results are unavailable

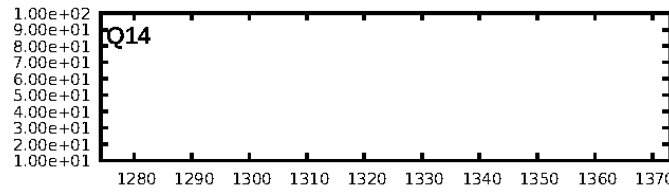
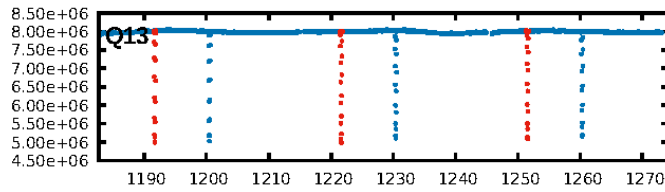
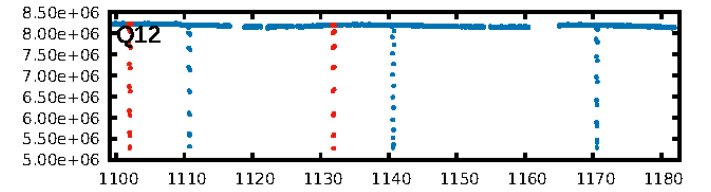
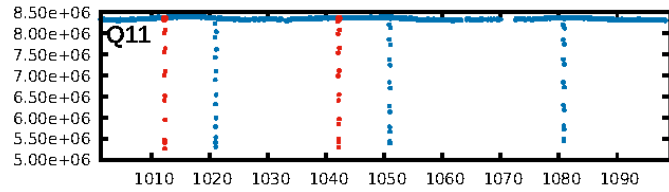
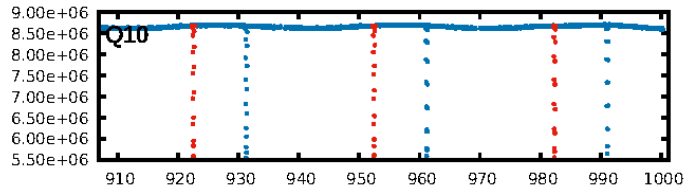
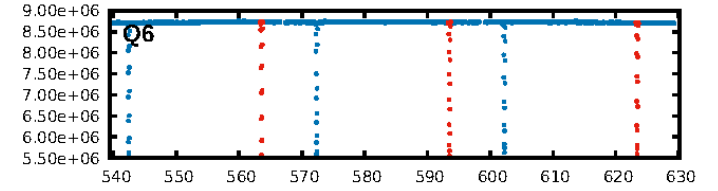
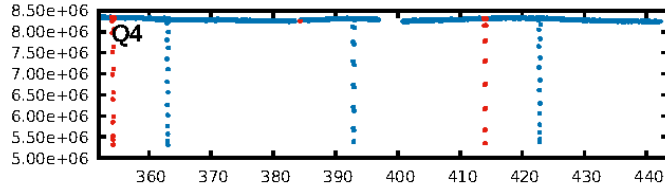
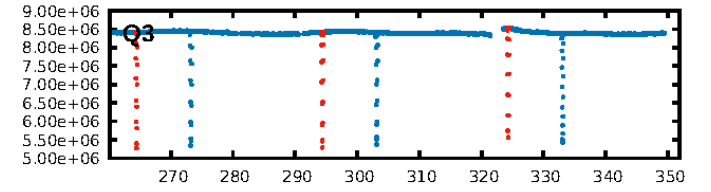
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]
LongPeriod-sig: 100.0% [87.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [18/18]
GhostDiagnostic-chr: 2.844
Centroid-sig: 0.0%
Centroid-so: 0.189 arcsec [68.20σ]
OotOffset-rm: 0.042 arcsec [0.63σ]
KicOffset-rm: 0.165 arcsec [2.30σ]
OotOffset-st: 2/2/2/1 [7]
KicOffset-st: 2/2/2/1 [7]
DiffImageQuality-fgm: 1.00 [7/7]
DiffImageOverlap-fno: 1.00 [7/7]

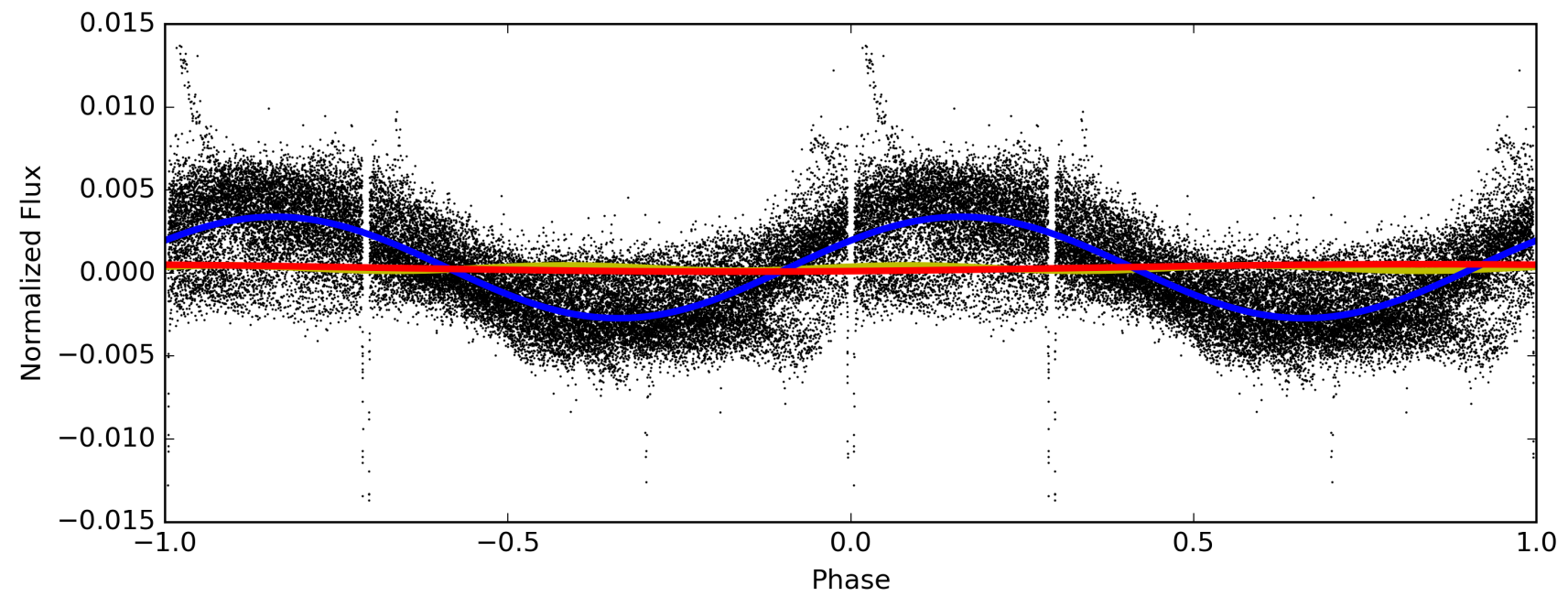
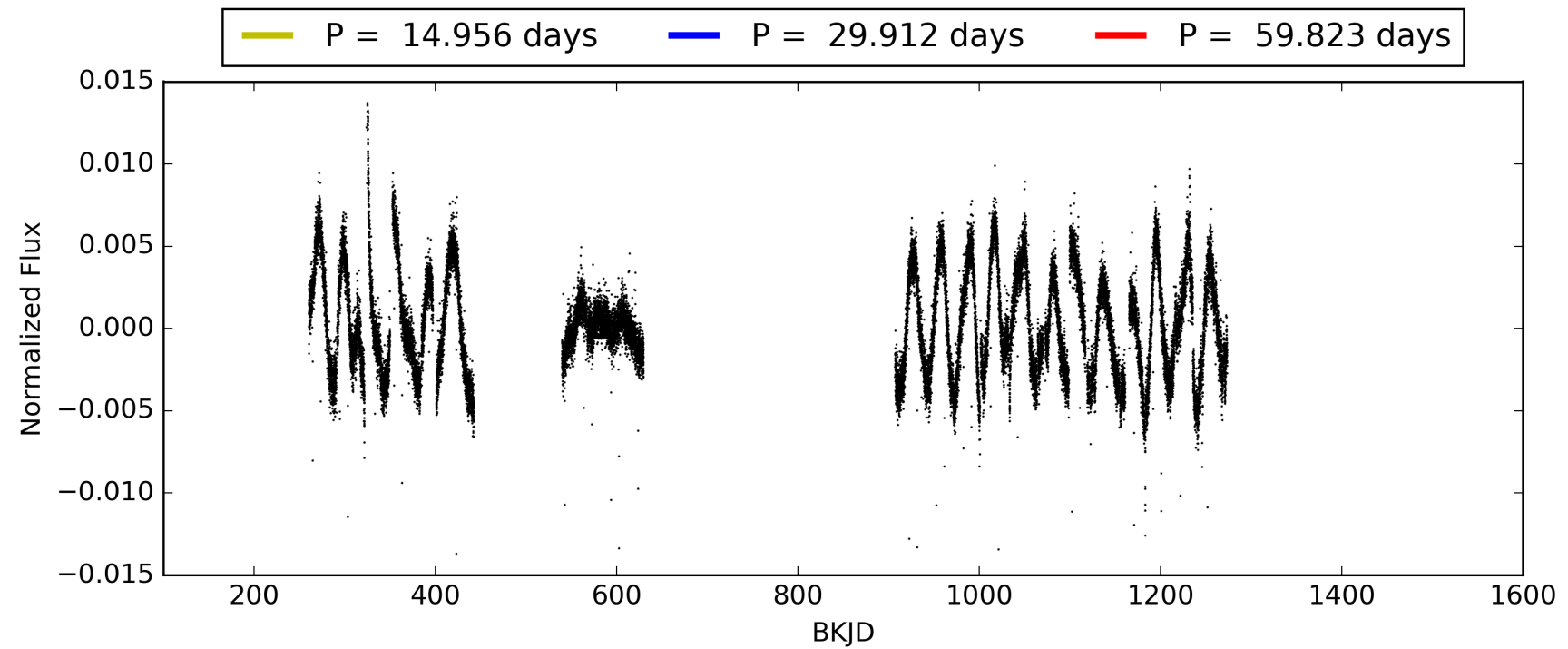
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:29:48 Z

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

TCE 006431670-02, PDC Light Curves

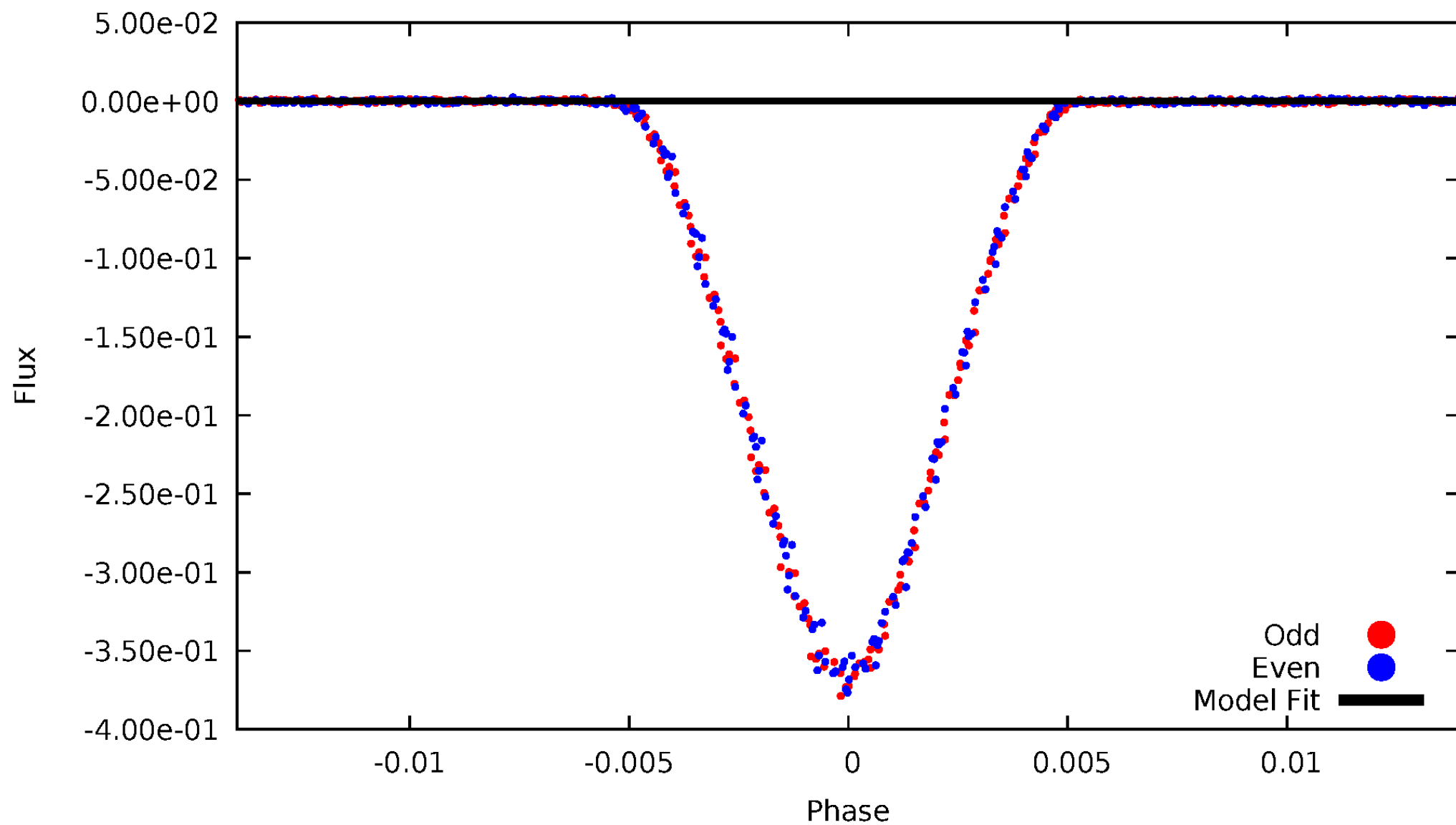


TCE 006431670-02



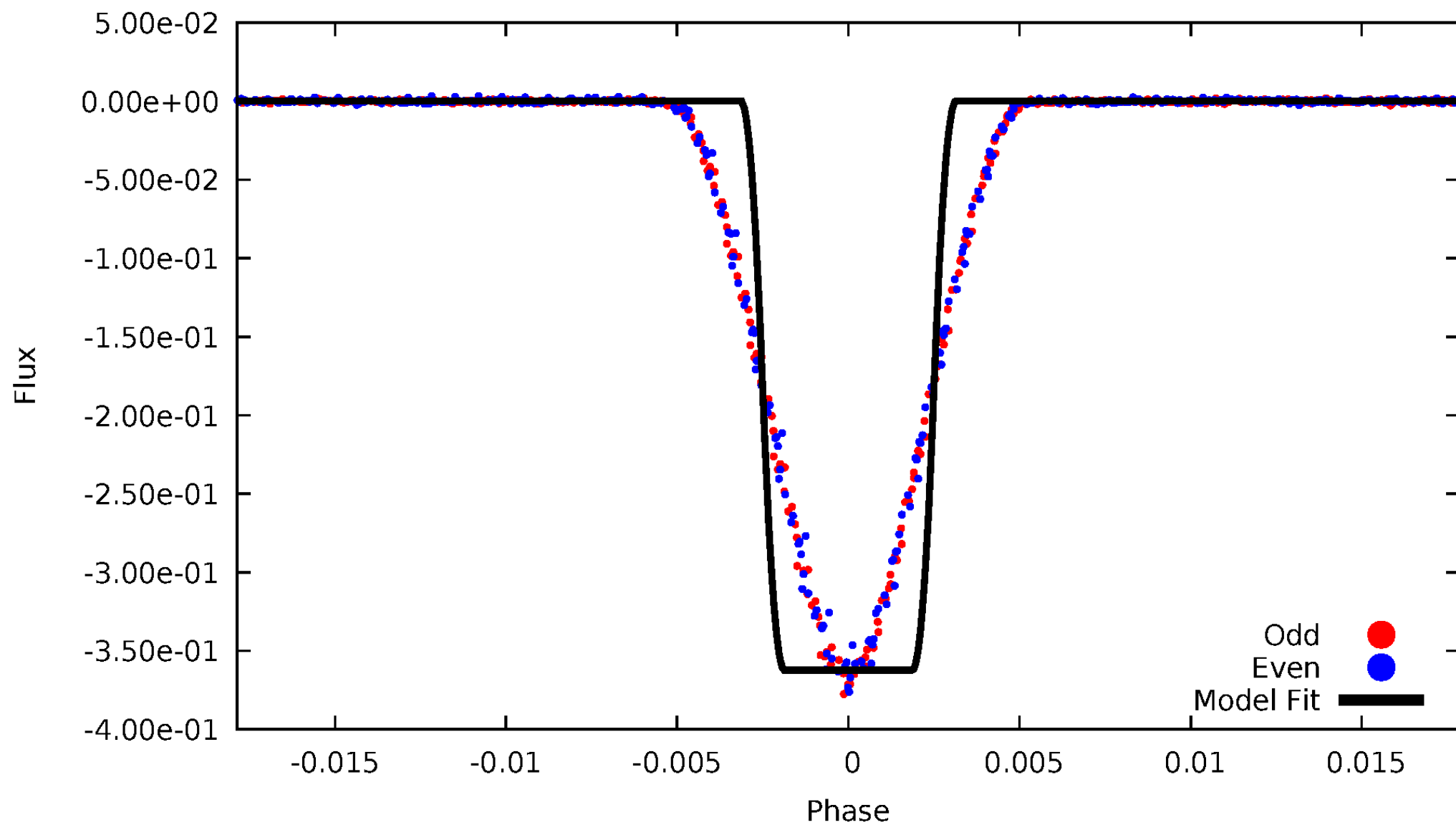
DV Odd/Even

TCE 006431670-02



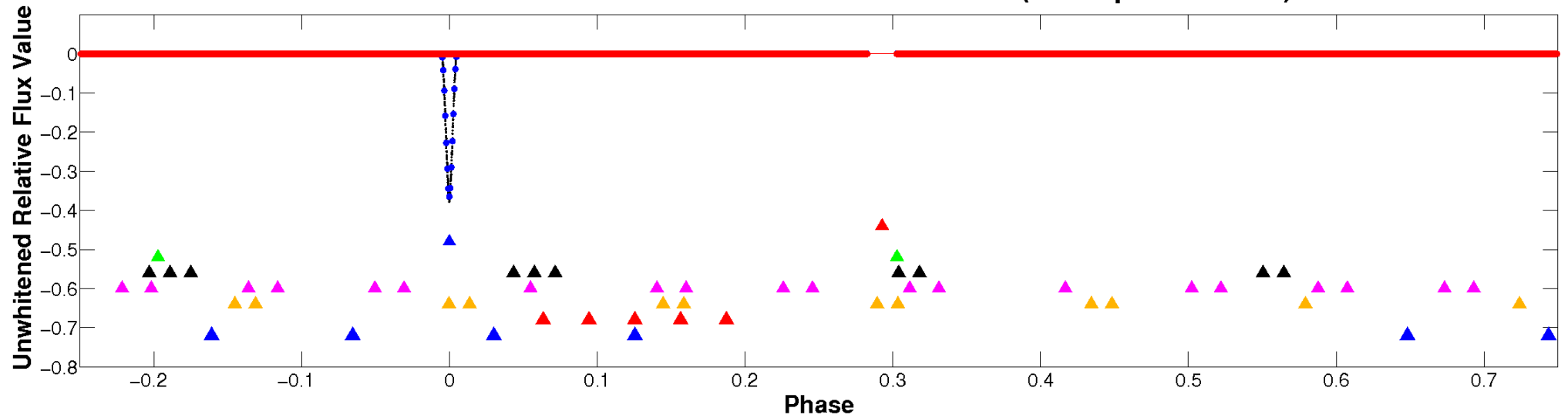
ALT Odd/Even

TCE 006431670-02

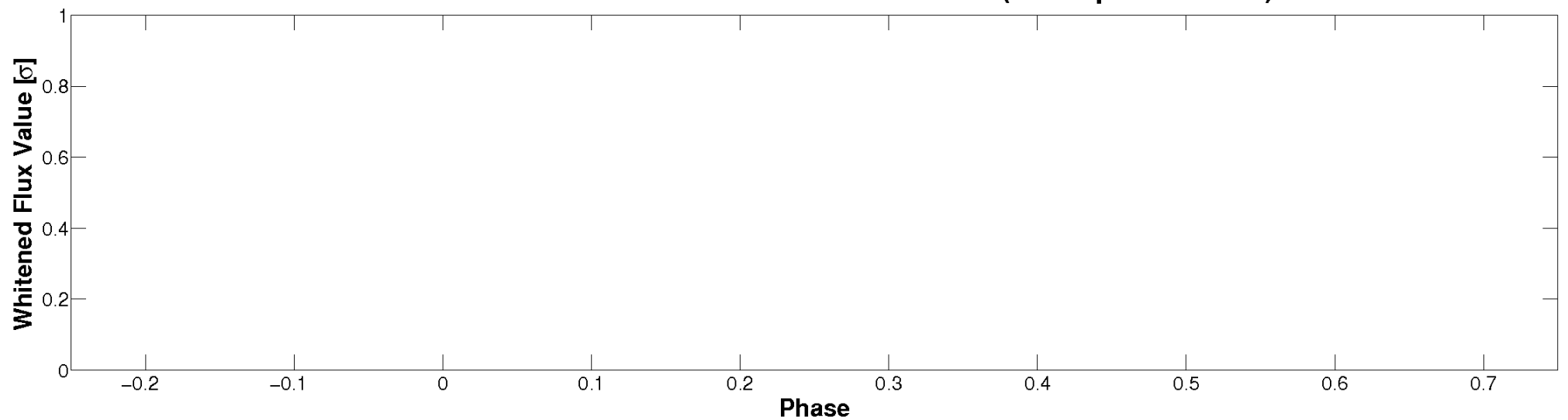


Non-Whitened Vs. Whitened Light Curve

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

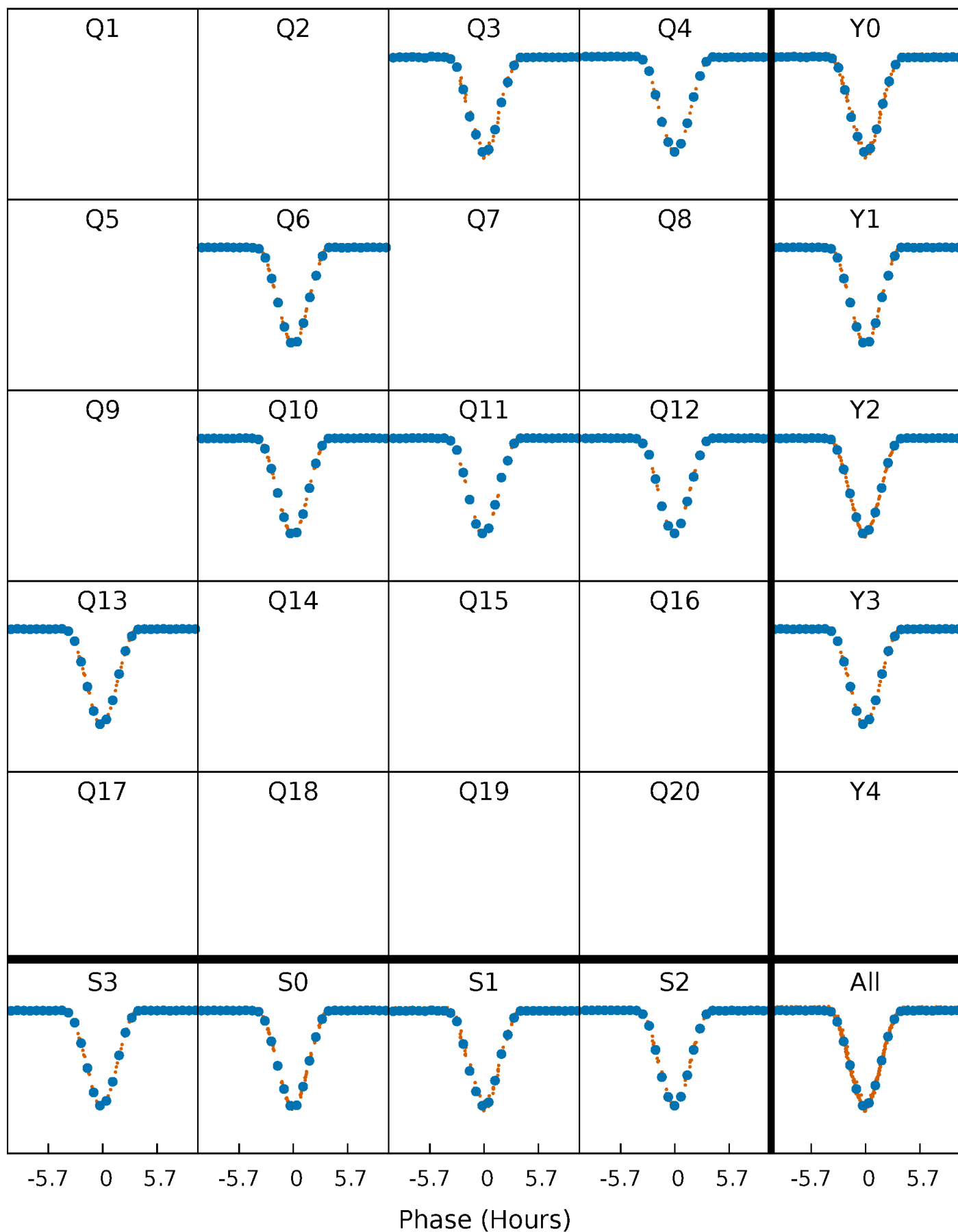


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



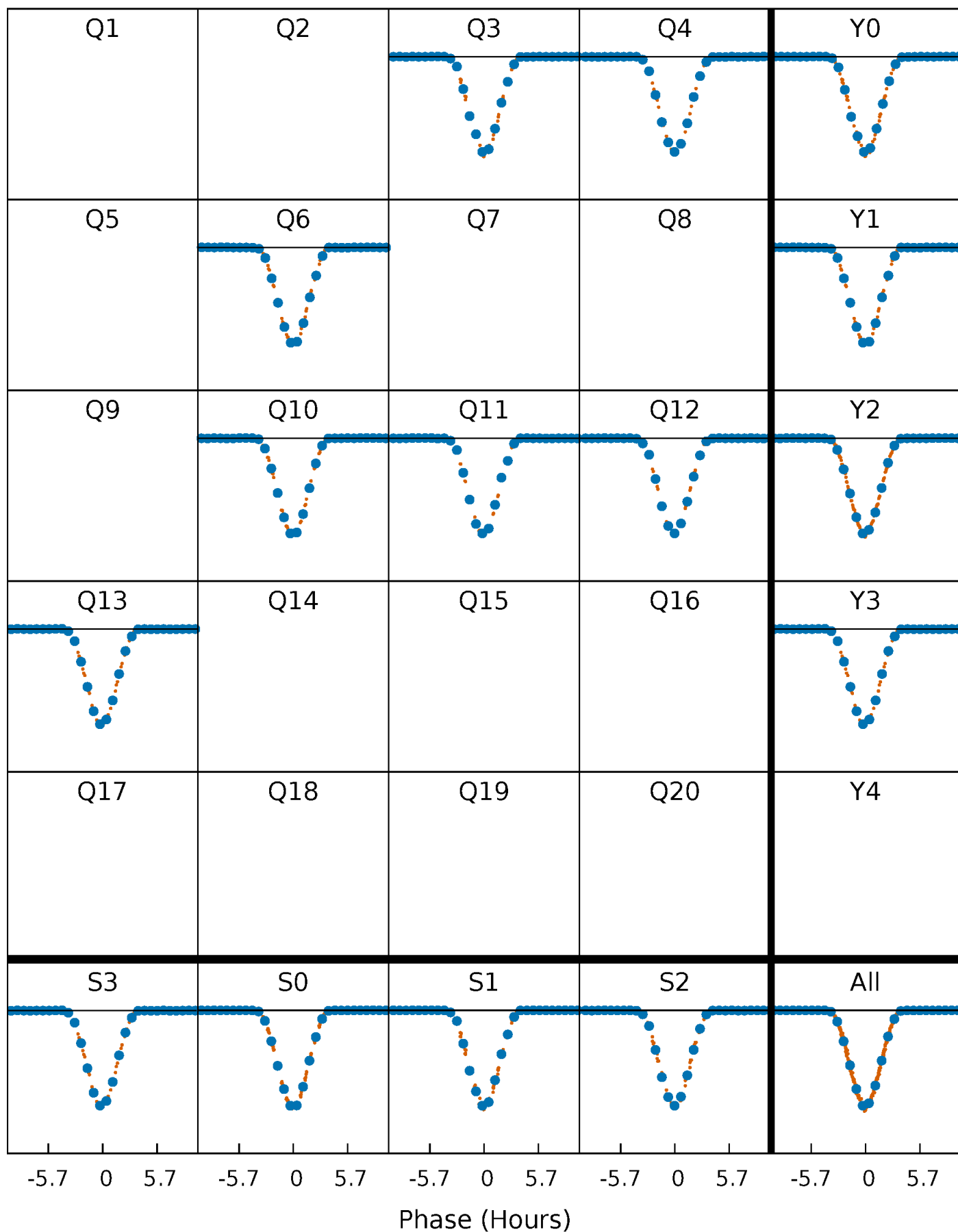
PDC Quarter-Phased Transit Curves

TCE 006431670-02 P= 29.911512 Days $T_0=144.830269$ (BKJD)



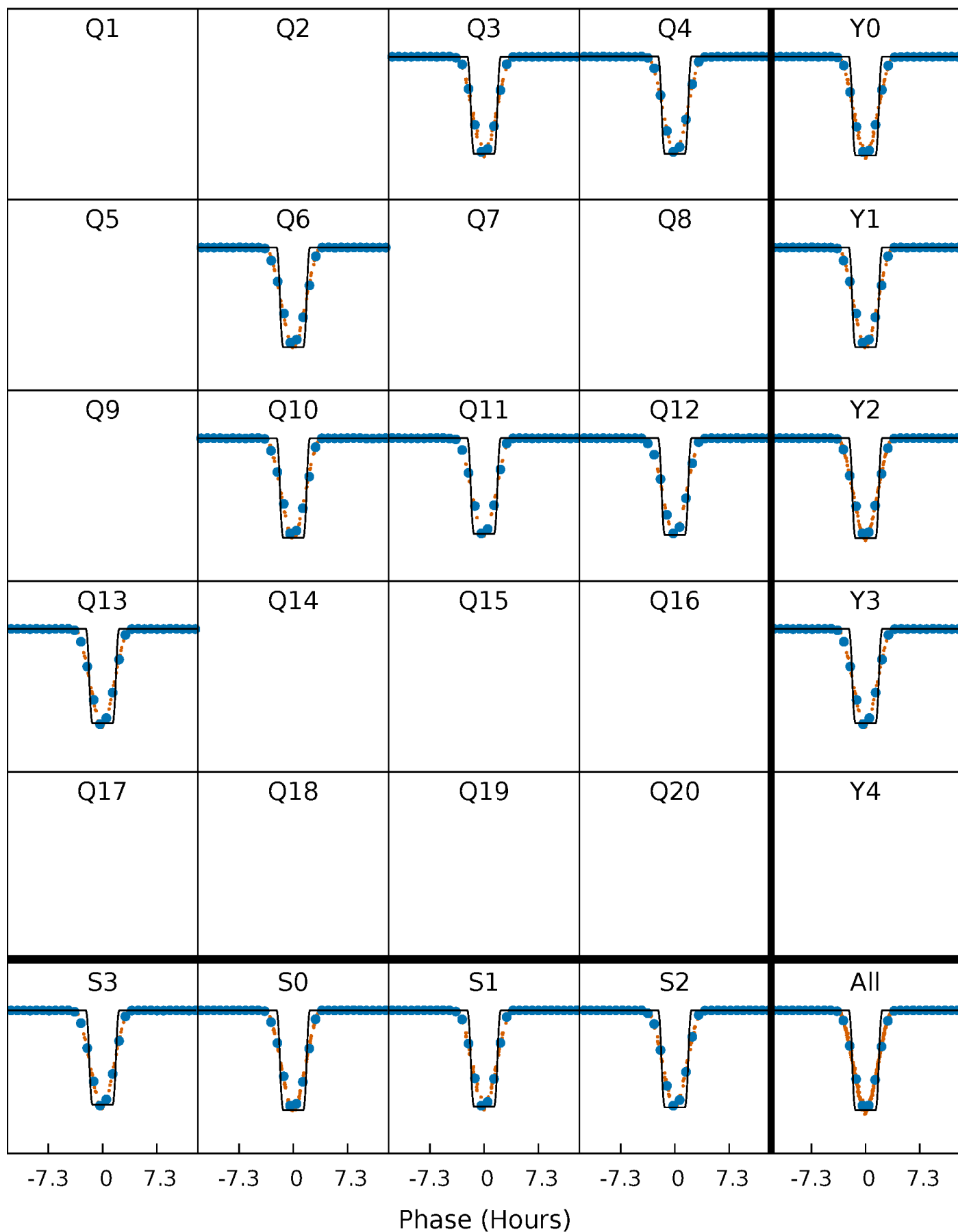
DV Quarter-Phased Transit Curves

TCE 006431670-02 P= 29.911512 Days $T_0=144.830269$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

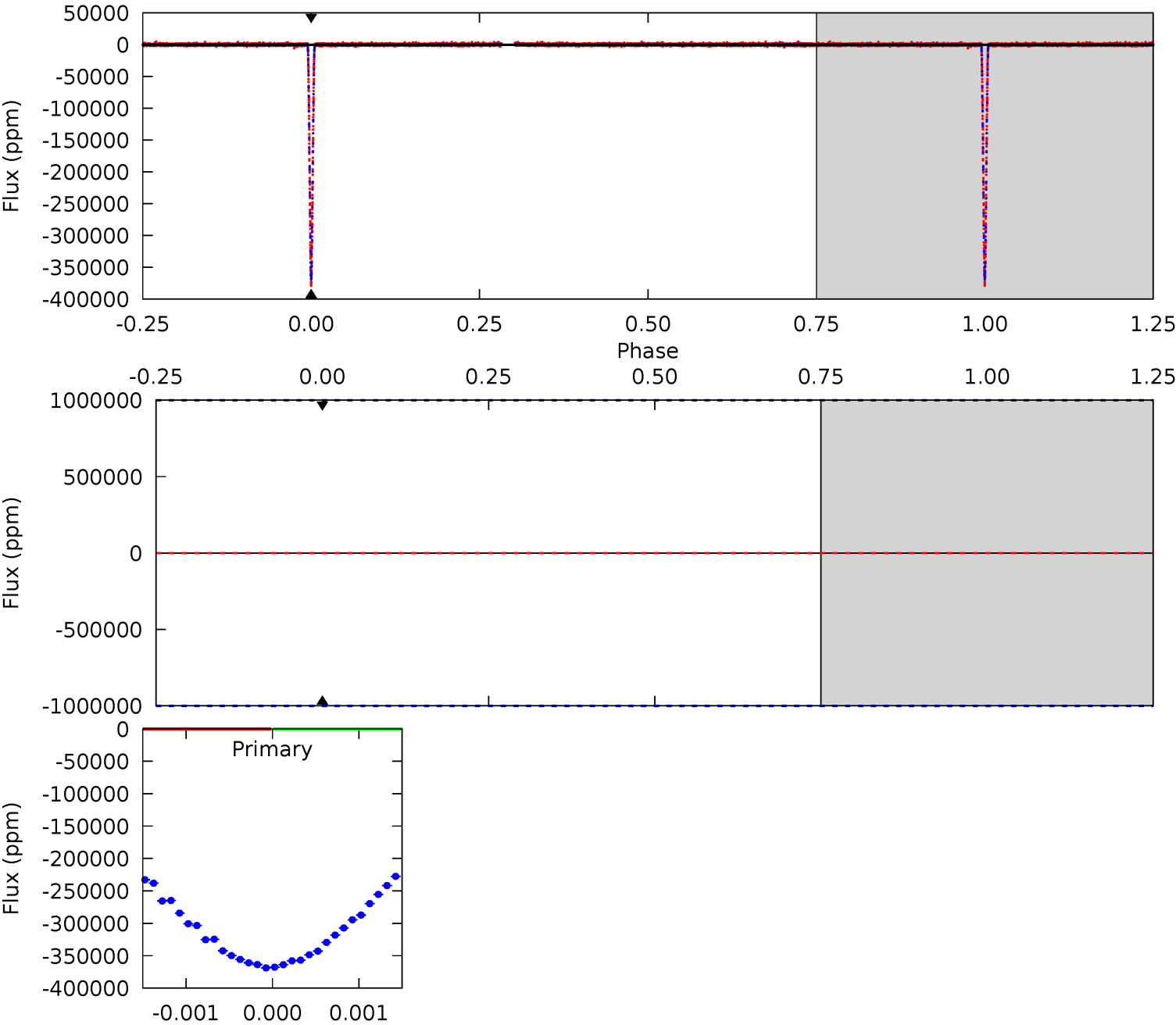
TCE 006431670-02 P= 29.911512 Days $T_0=144.829028$ (BKJD)



DV Model-Shift Uniqueness Test

006431670-02, P = 29.911512 Days, E = 144.830269 Days

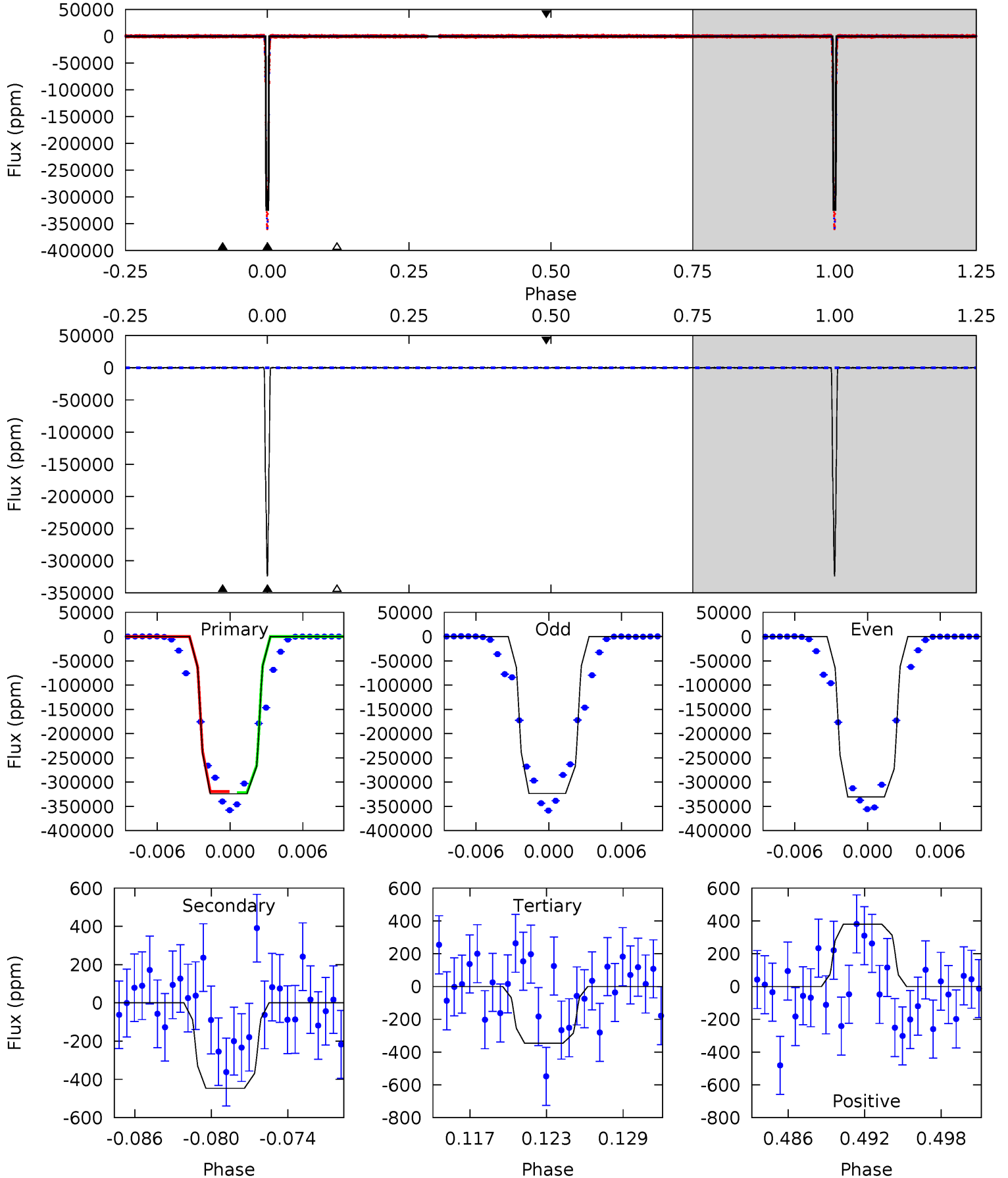
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-----|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-----|-------|-----|
| 0 | 0 | 0 | 0 | 1.00 | 1.00 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



Alt Model-Shift Uniqueness Test

006431670-02, P = 29.911512 Days, E = 144.829028 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 3308 | 4.56 | 3.53 | 3.88 | 5.12 | 2.74 | 1.20 | 3305 | 3304 | 1.03 | 0.68 | 38.3 | 1.00 | 0.00 | 0 |



Stellar Parameters For KIC 006431670

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5303^{+191}_{-191} | $4.632^{+0.032}_{-0.097}$ | $-0.400^{+0.300}_{-0.300}$ | $0.704^{+0.111}_{-0.051}$ | $0.785^{+0.074}_{-0.082}$ | $3.172^{+0.519}_{-1.000}$ |
| | +4%/-4% | +1%/-2% | +75%/-75% | +16%/-7% | +9%/-10% | +16%/-32% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 006431670-02 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-----------------|-------------------------|-------------------|------------------------|---------------------------|
| DV | 0 ± 1000000 | $38.00^{+9.15}_{-7.93}$ | 670^{+29}_{-29} | 2426^{+2163}_{-6881} | 17^{+1254}_{-1188} |
| Alt. | -447 ± 98 | $47.61^{+8.31}_{-8.47}$ | 667^{+28}_{-28} | 1962^{+104}_{-80} | $3.178^{+1.767}_{-1.010}$ |

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 $A_{obs} \gg 1.0$

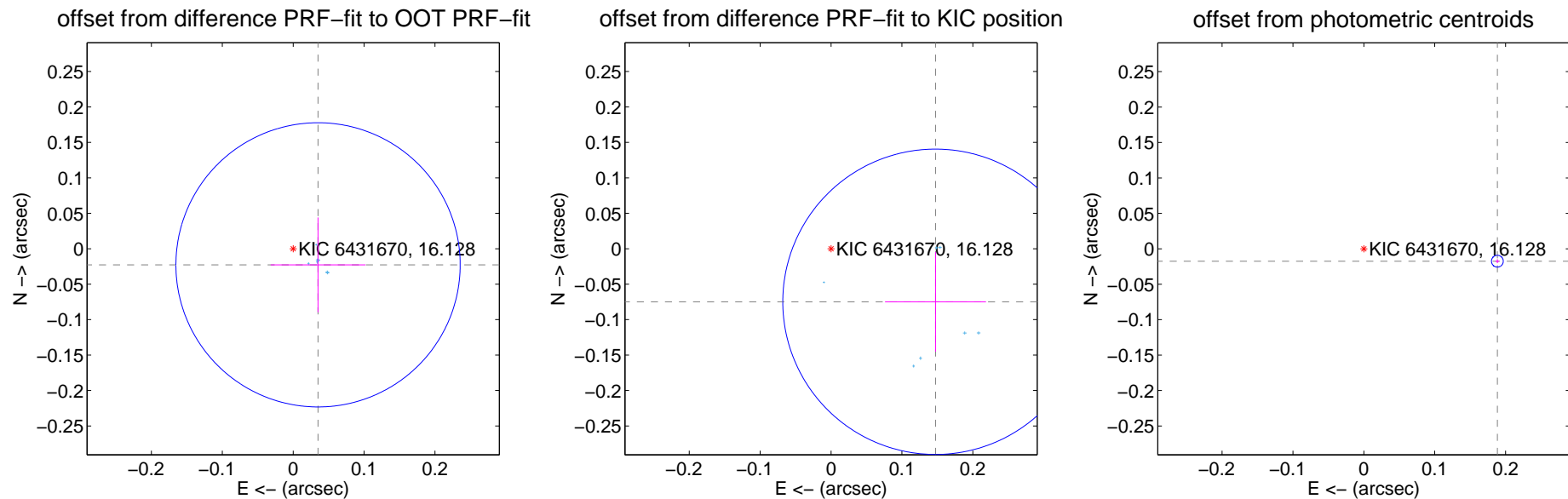
DV Centroid Data

Supplemental centroid analysis for 006431670-02. Kepler magnitude: 16.13. Transit SNR -1.00

There are 7 quarters with good PRF difference image offsets

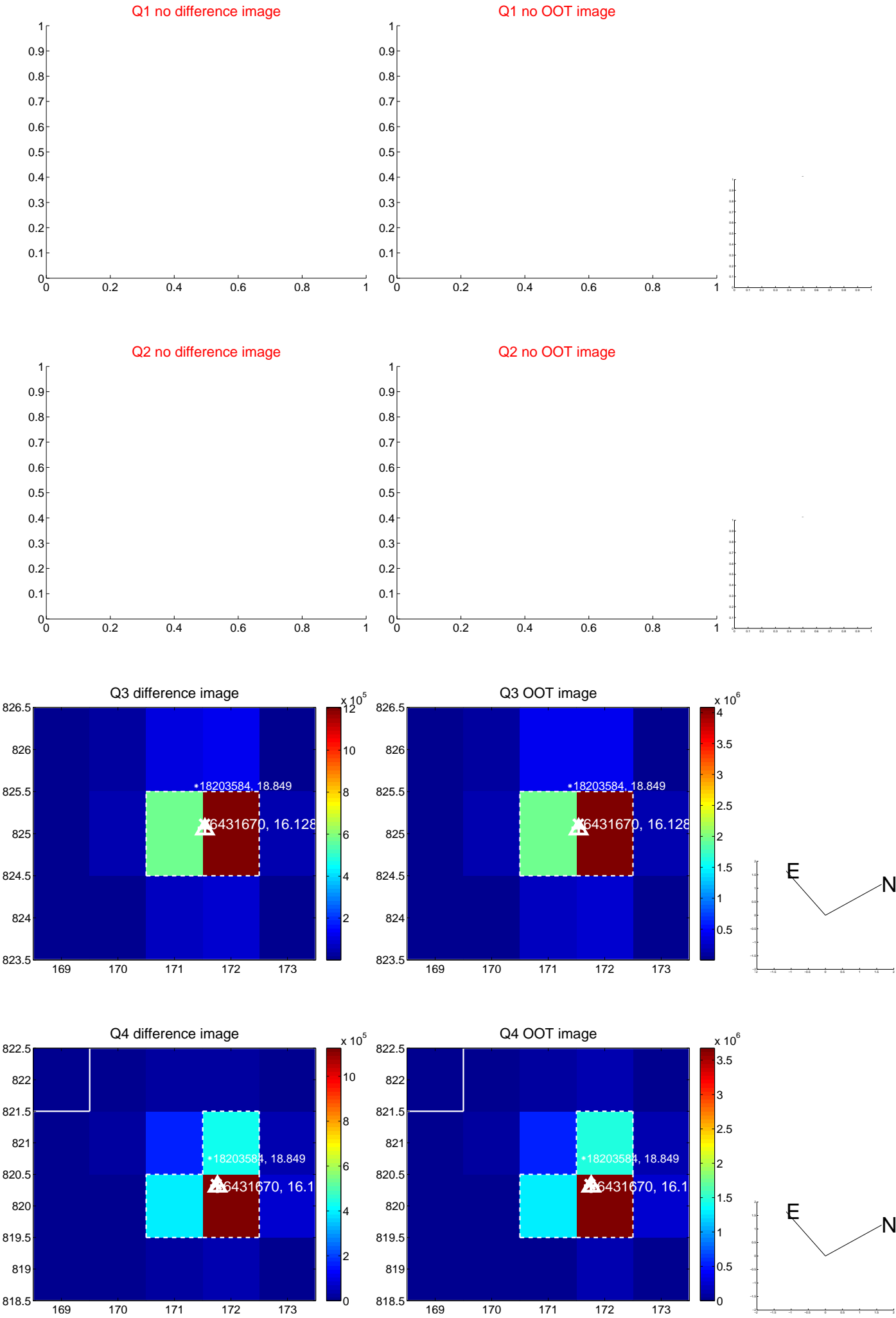
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.042 ± 0.067 | 0.63 | -0.035 ± 0.067 | -0.023 ± 0.067 |
| PRF-fit source offset from KIC position | 0.165 ± 0.072 | 2.30 | -0.147 ± 0.071 | -0.075 ± 0.070 |
| photometric centroid source offset | 0.19 ± 0.00 | 68.20 | -0.19 ± 0.00 | -0.02 ± 0.00 |

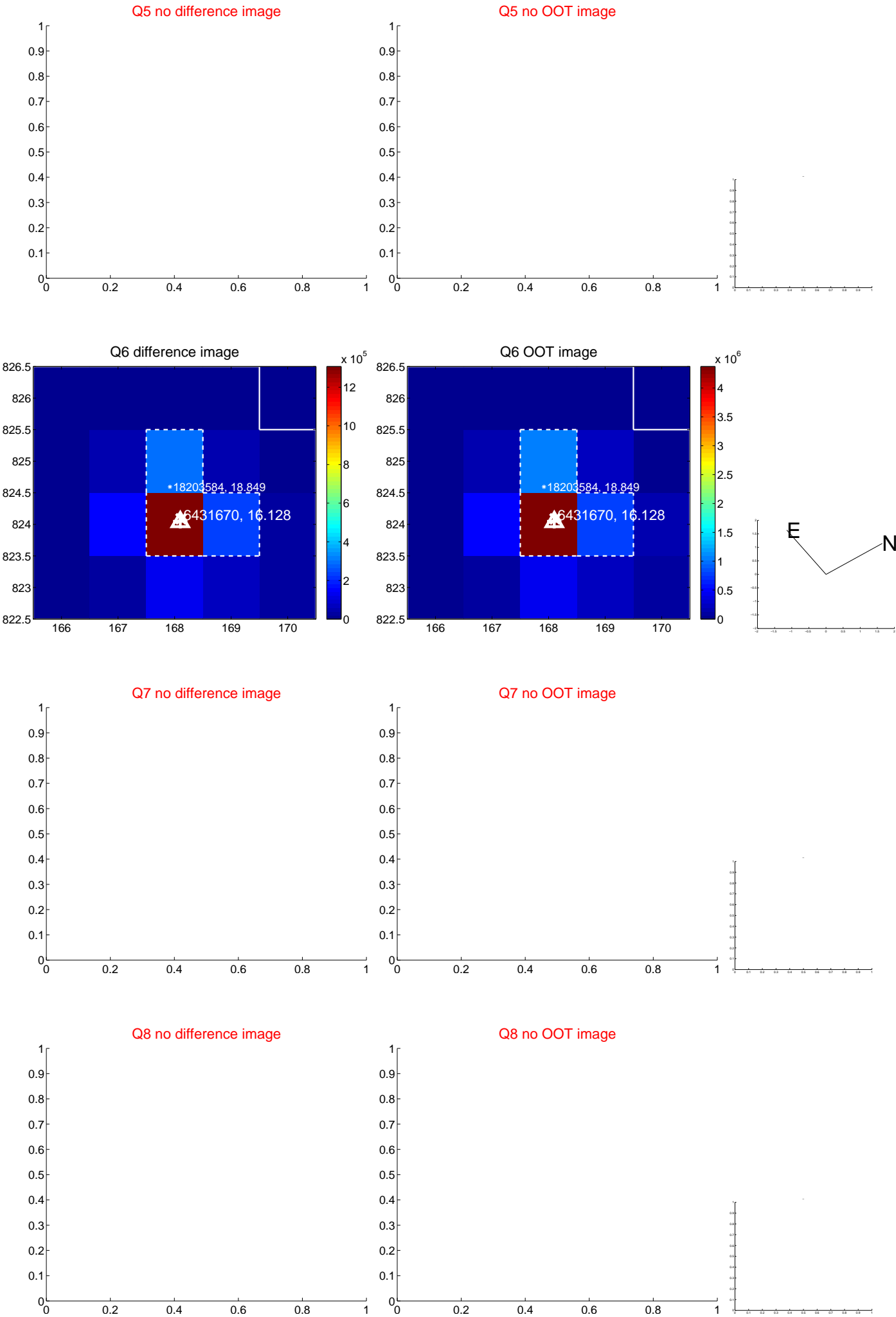


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

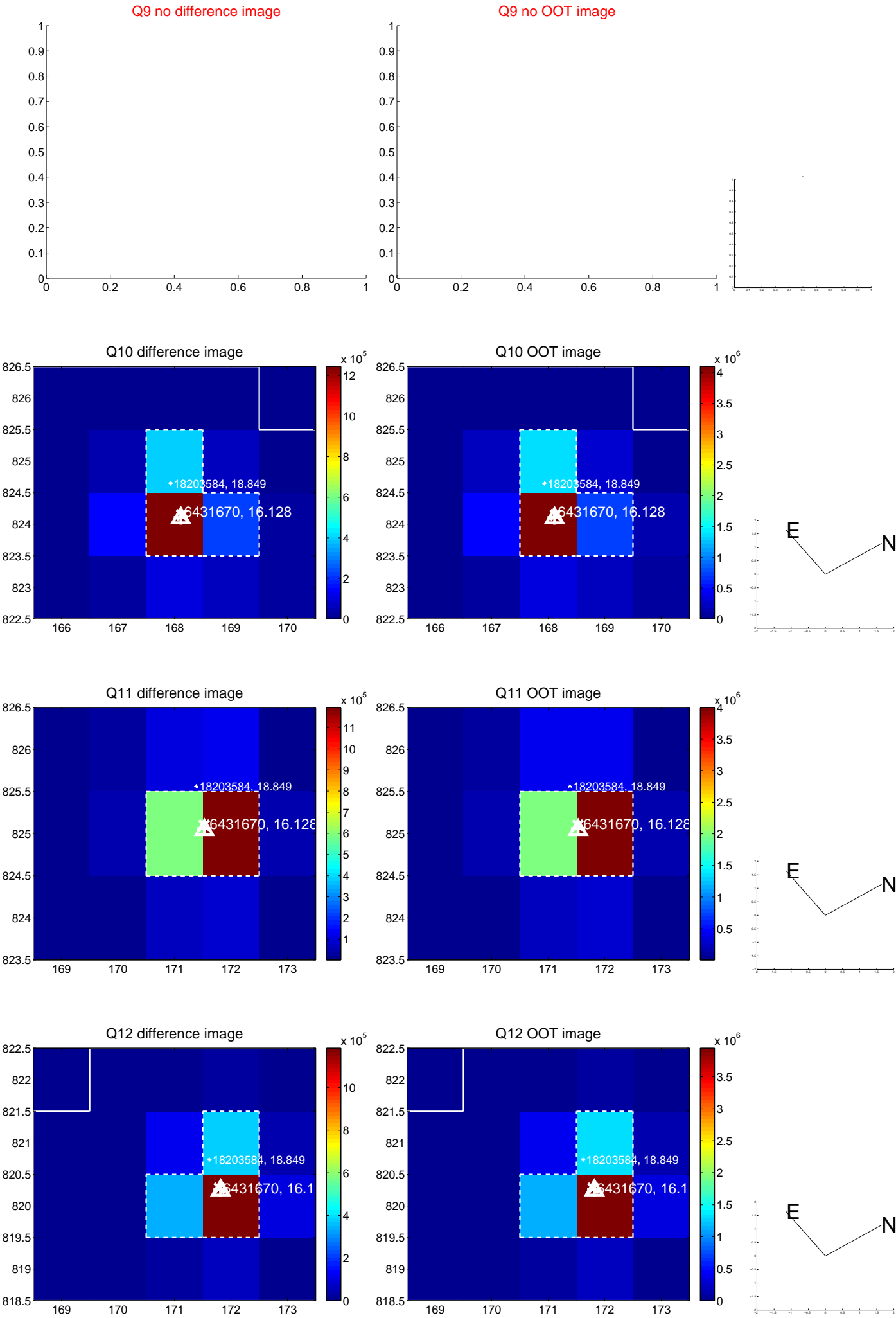
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



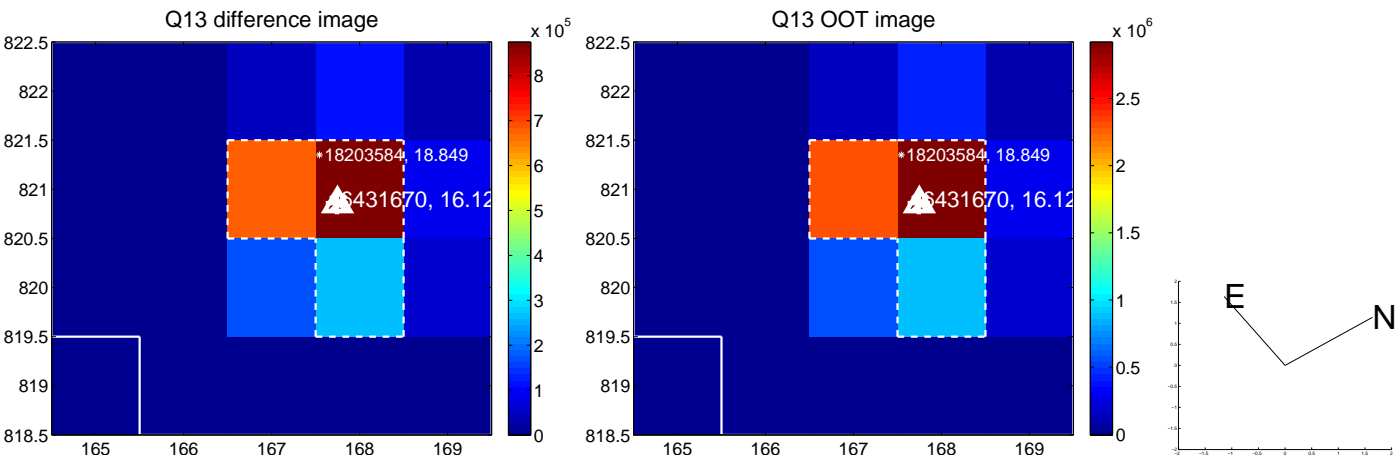
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



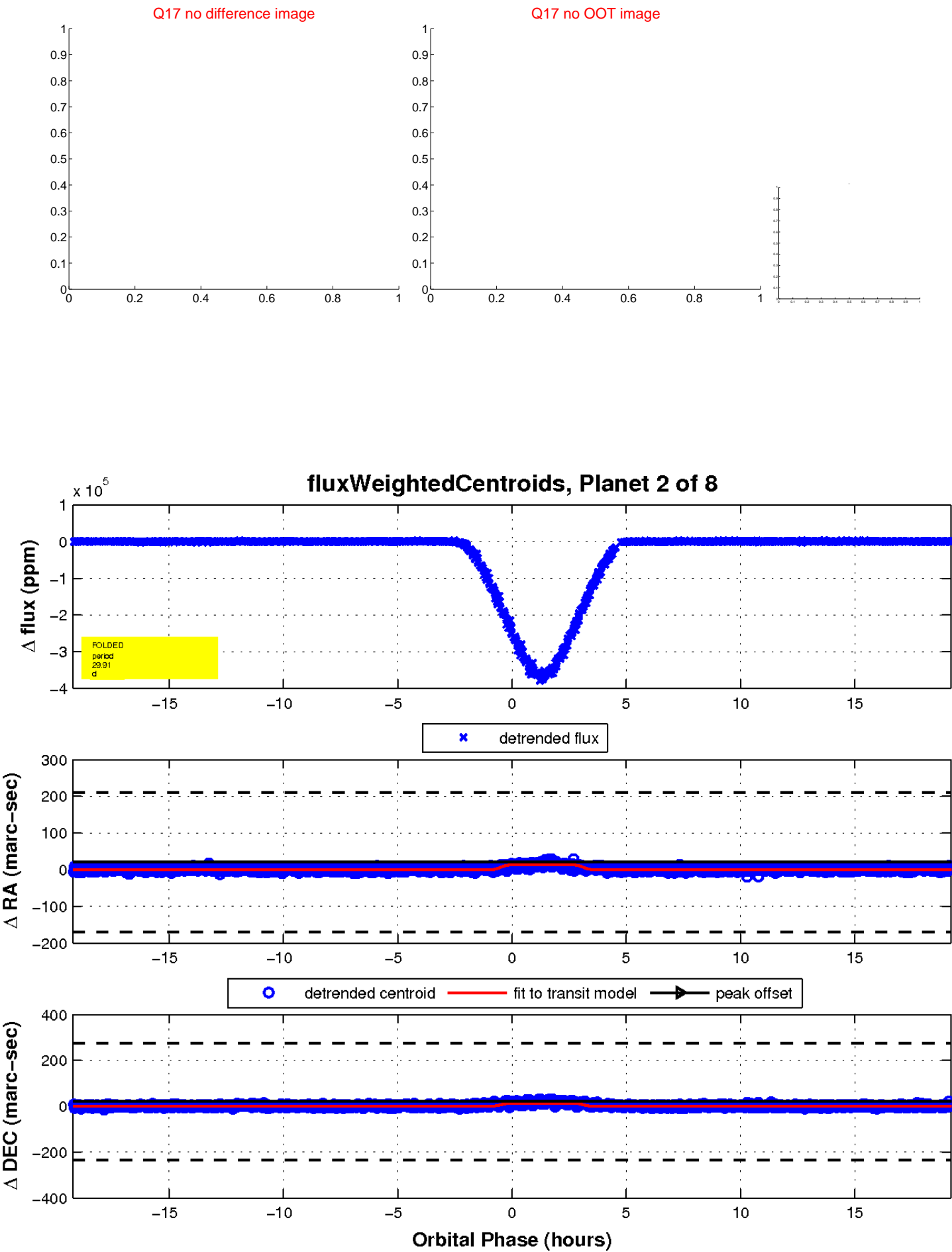
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

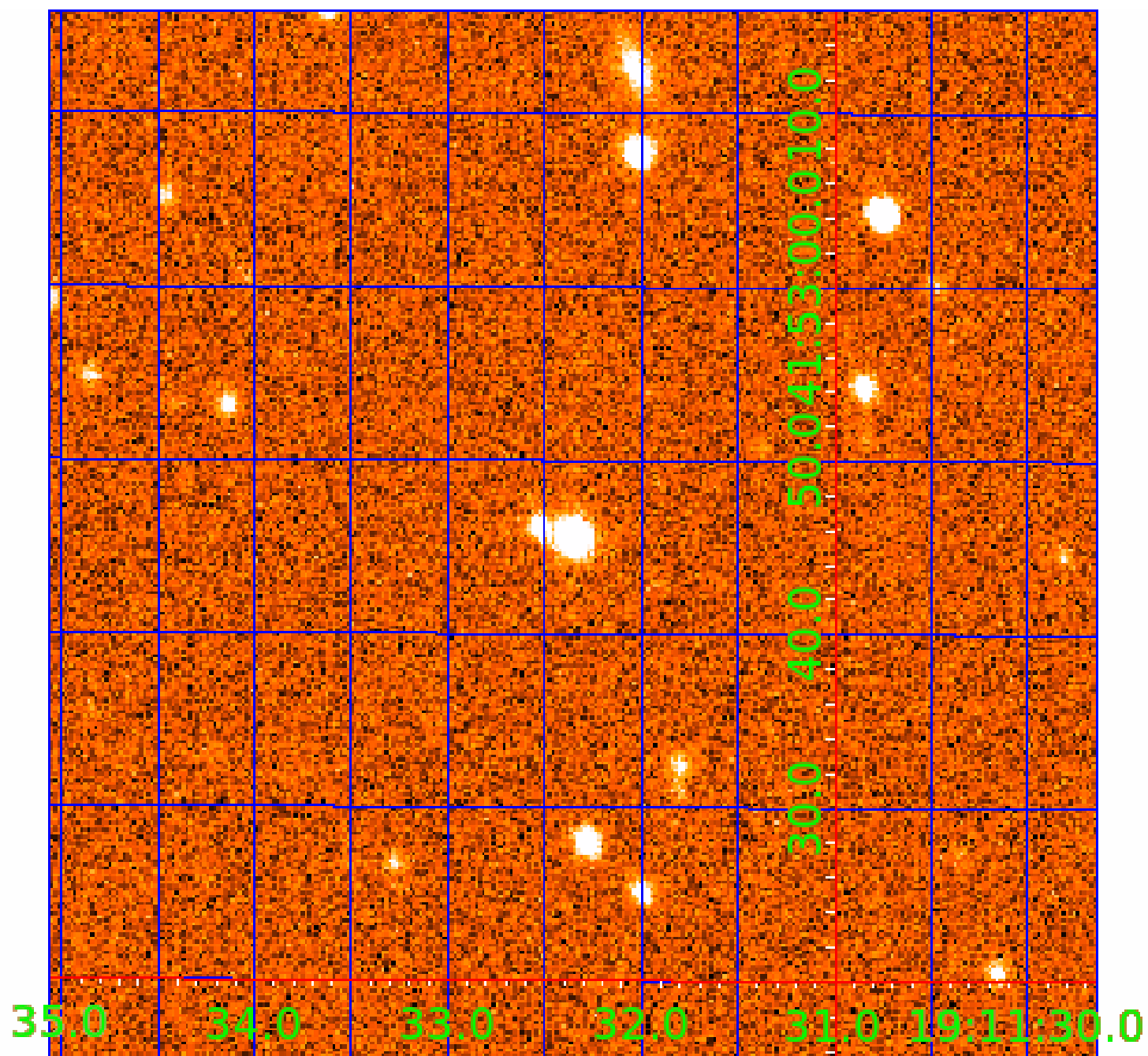


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006431670

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|------|-----------------------------|-----------------|------------------------|------------------------|
| 006431670-01 | OBS | 3534.01 | 29.911333 | 153.592861 | 358289.4 | 4.500 | 3602.3 | -1.0 | 0.70 | 5303 | 38.41 | 11.70 |
| 006431670-02 | OBS | No | 29.911512 | 144.830269 | 366672.0 | 5.000 | 3551.7 | -1.0 | 0.70 | 5303 | 37.44 | 11.70 |
| 006431670-03 | OBS | No | 14.955586 | 138.941998 | 13405.1 | 15.000 | 78.3 | -1.0 | 0.70 | 5303 | 8.01 | 29.49 |
| 006431670-04 | OBS | No | 156.930302 | 169.510324 | 1996.2 | 2.675 | 11.8 | 6.5 | 0.70 | 5303 | 3.36 | 1.28 |
| 006431670-05 | OBS | No | 70.646192 | 198.621740 | 435.5 | 10.064 | 11.7 | 4.6 | 0.70 | 5303 | 1.56 | 3.72 |
| 006431670-06 | OBS | No | 115.313282 | 218.062208 | 1587.8 | 4.058 | 16.1 | 7.0 | 0.70 | 5303 | 2.89 | 1.94 |
| 006431670-07 | OBS | No | 300.041667 | 356.111204 | 1829.8 | 5.475 | 9.8 | 8.2 | 0.70 | 5303 | 3.29 | 0.54 |
| 006431670-08 | OBS | No | 272.059128 | 134.308141 | 933.6 | 13.392 | 11.4 | 5.4 | 0.70 | 5303 | 2.16 | 0.62 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 006431670-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS |
| 006431670-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_NOFITS |
| 006431670-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS |
| 006431670-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 006431670-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-07 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-08 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

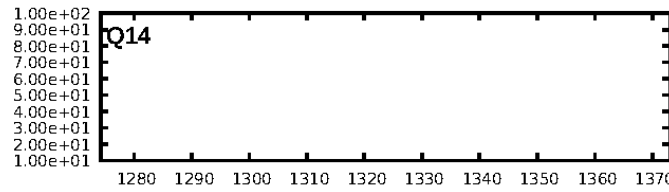
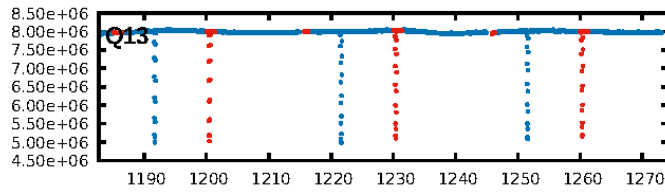
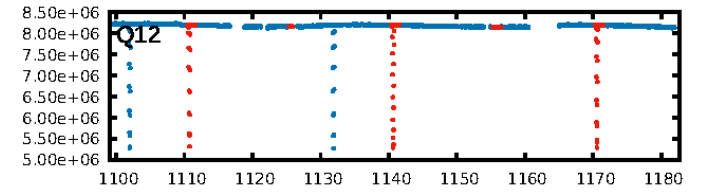
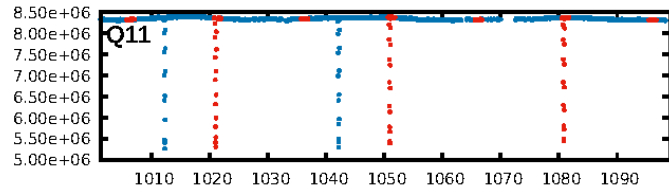
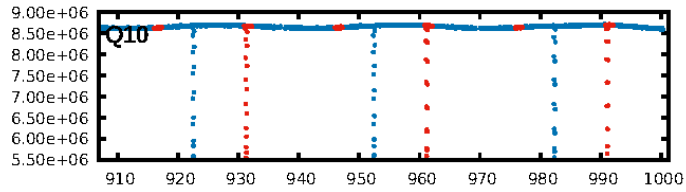
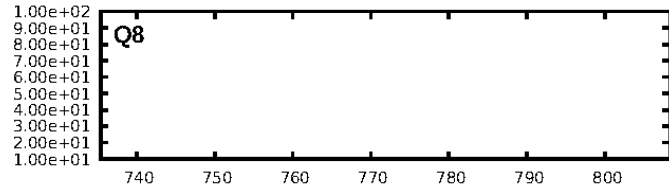
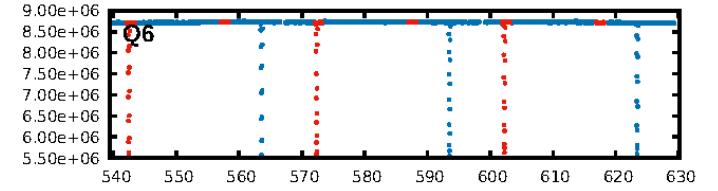
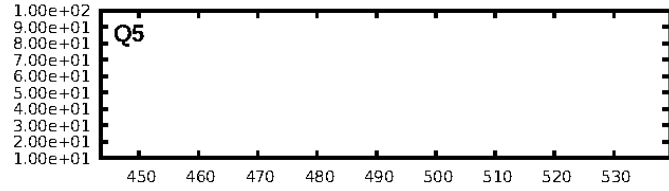
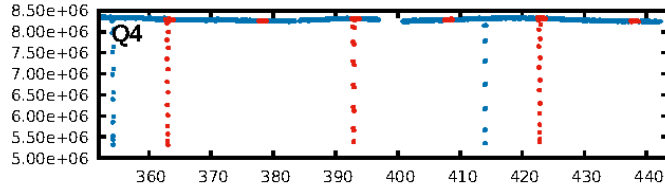
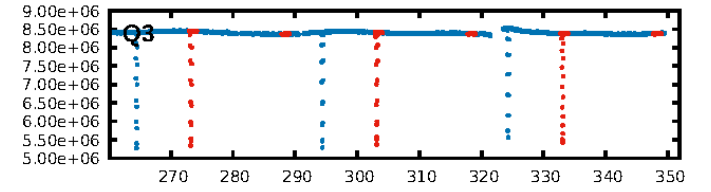
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006431670-03

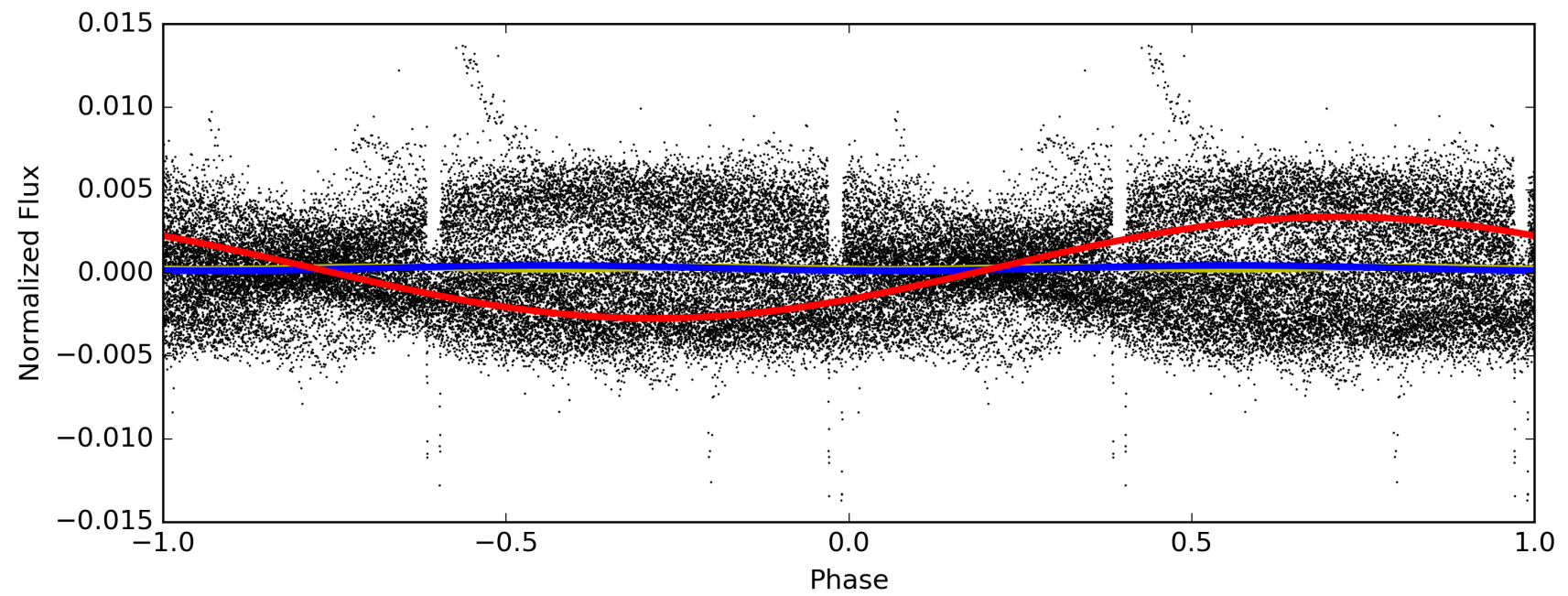
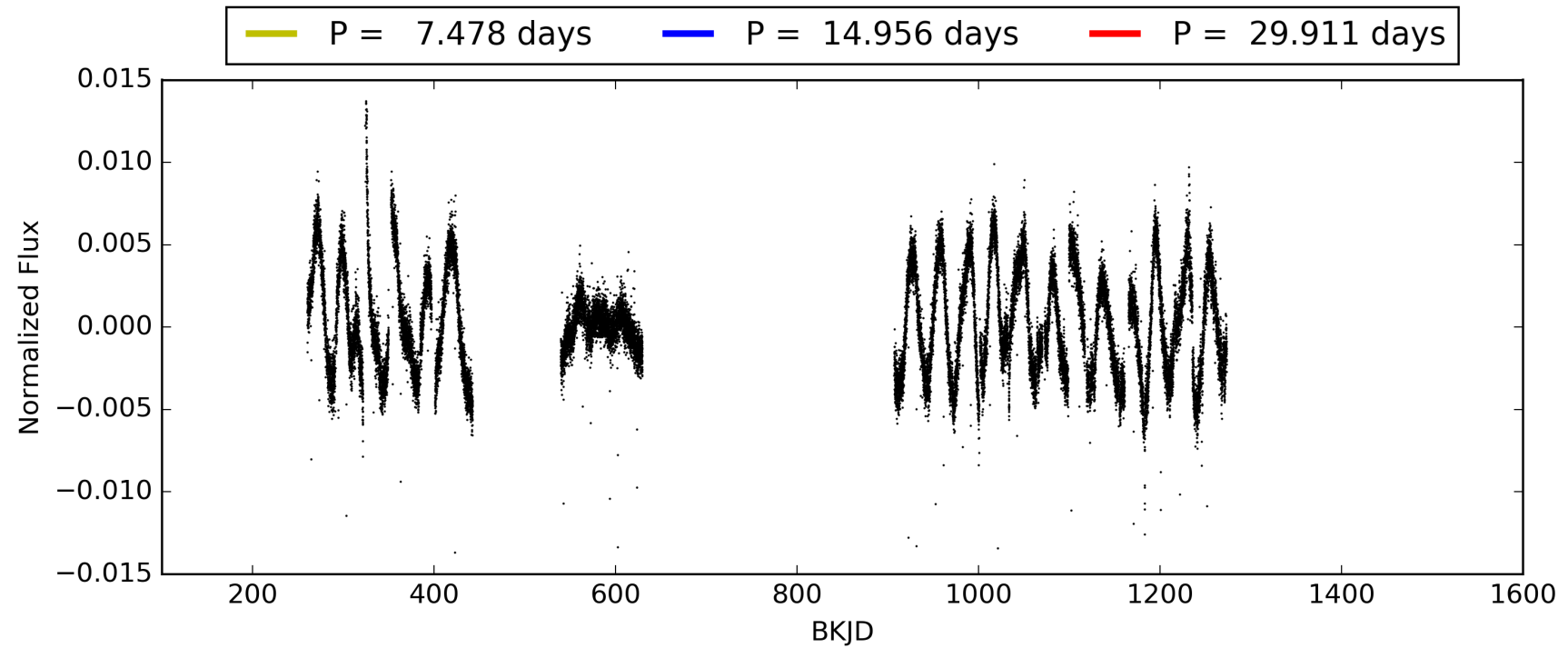
No Significant Match Found

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

TCE 006431670-03, PDC Light Curves

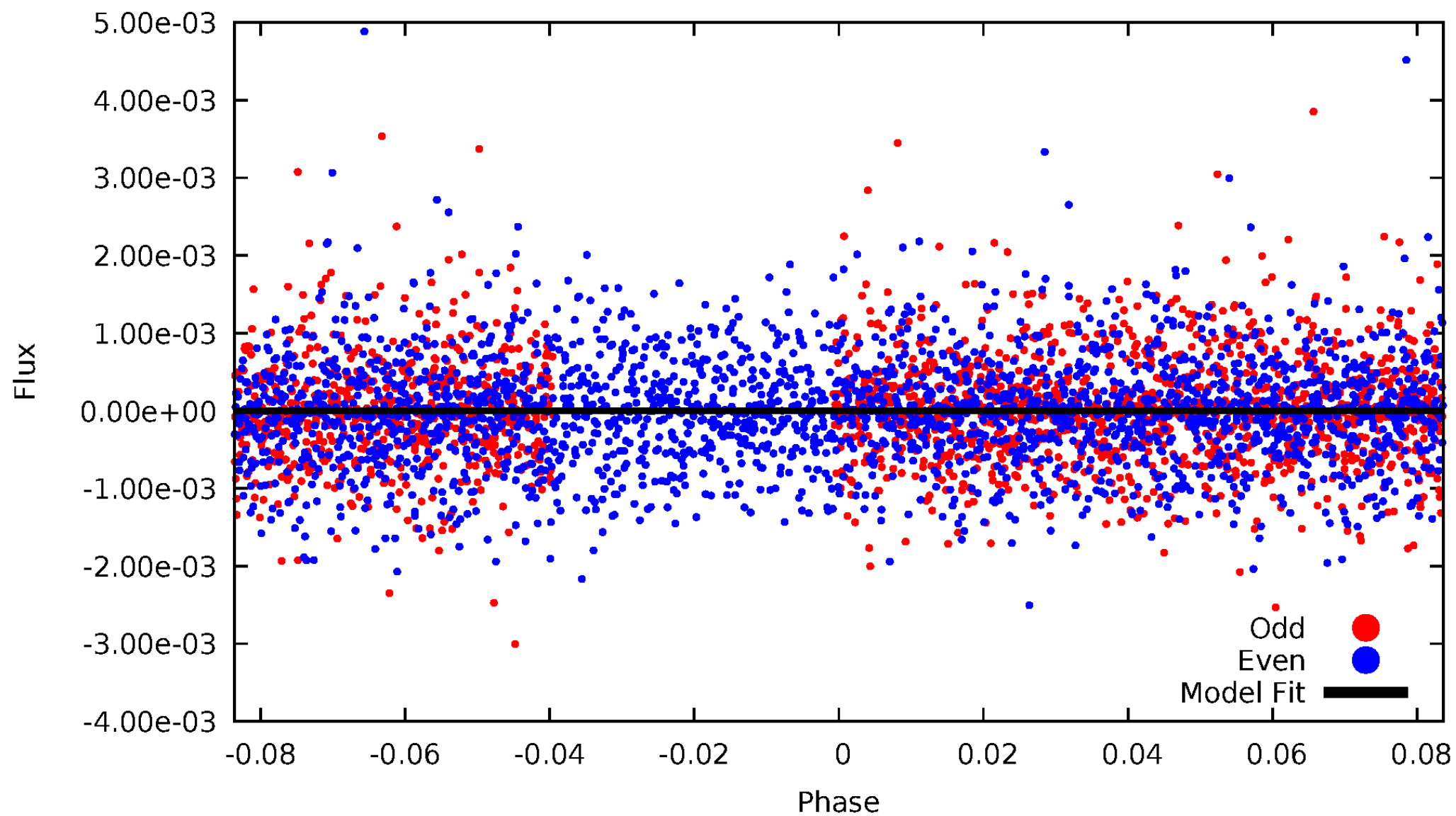


TCE 006431670-03



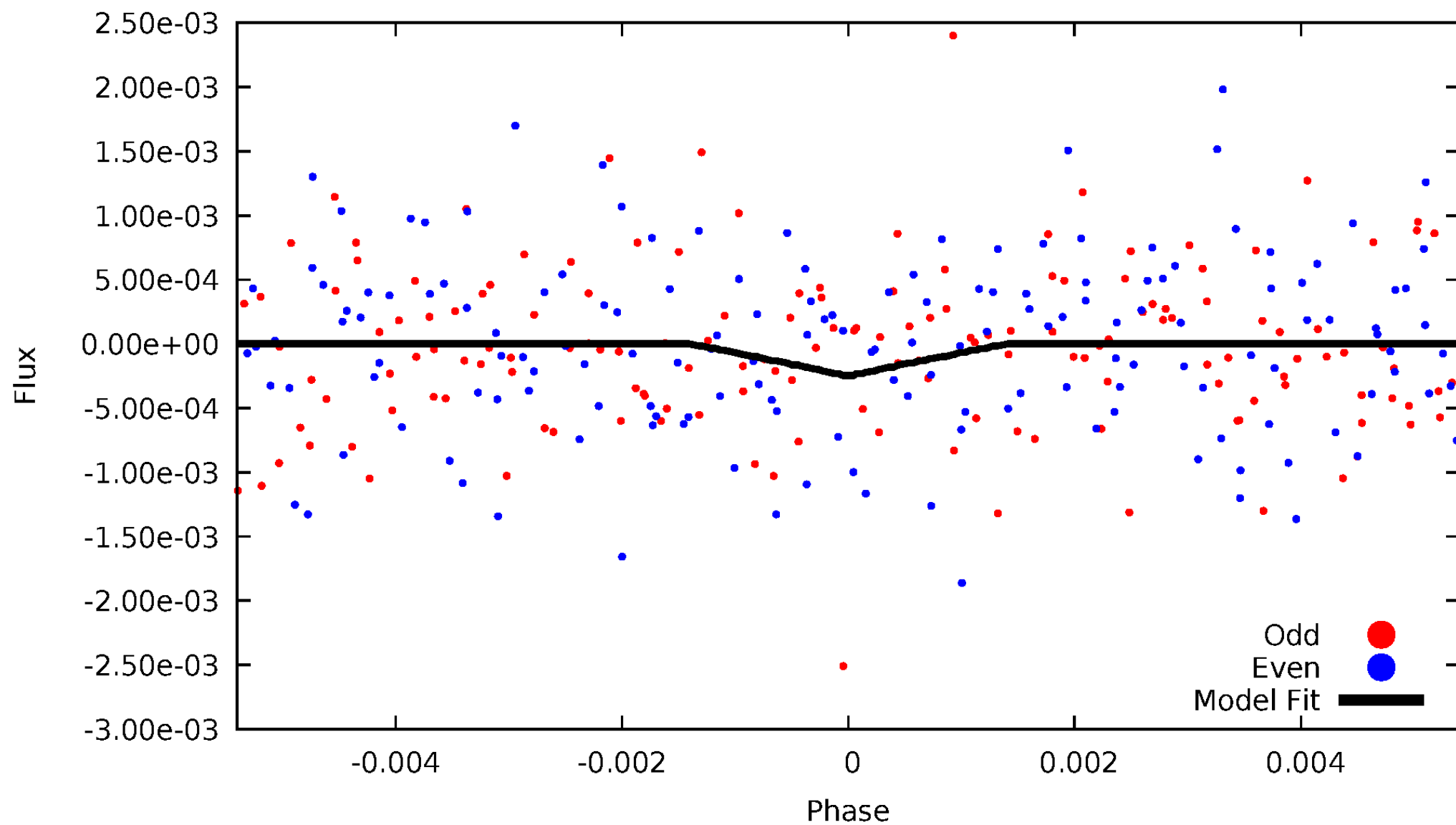
DV Odd/Even

TCE 006431670-03

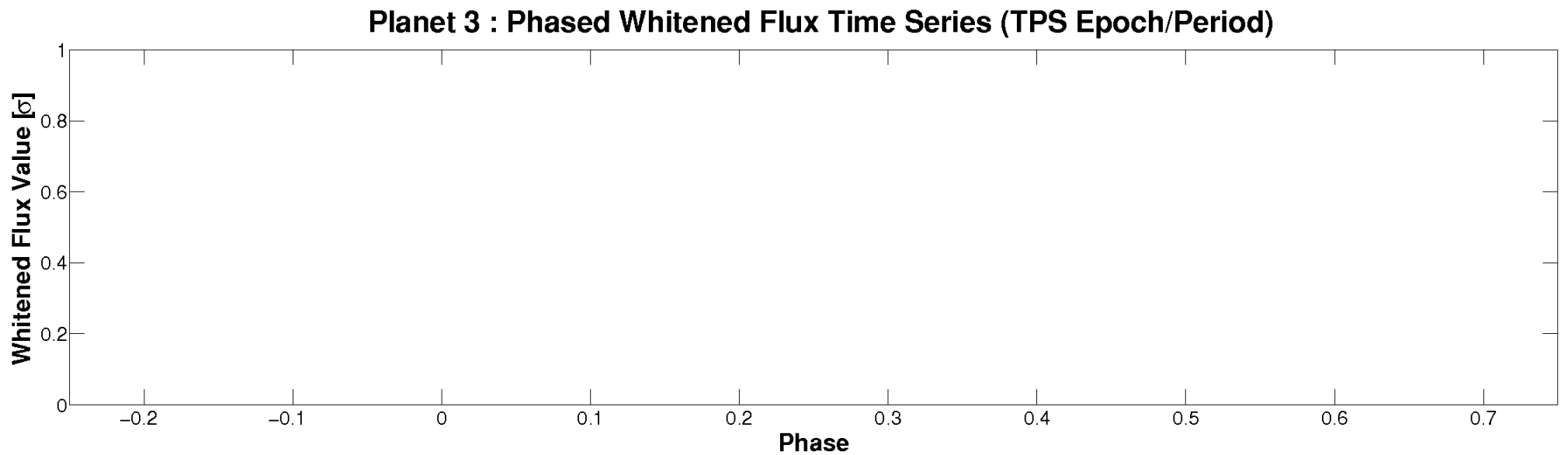
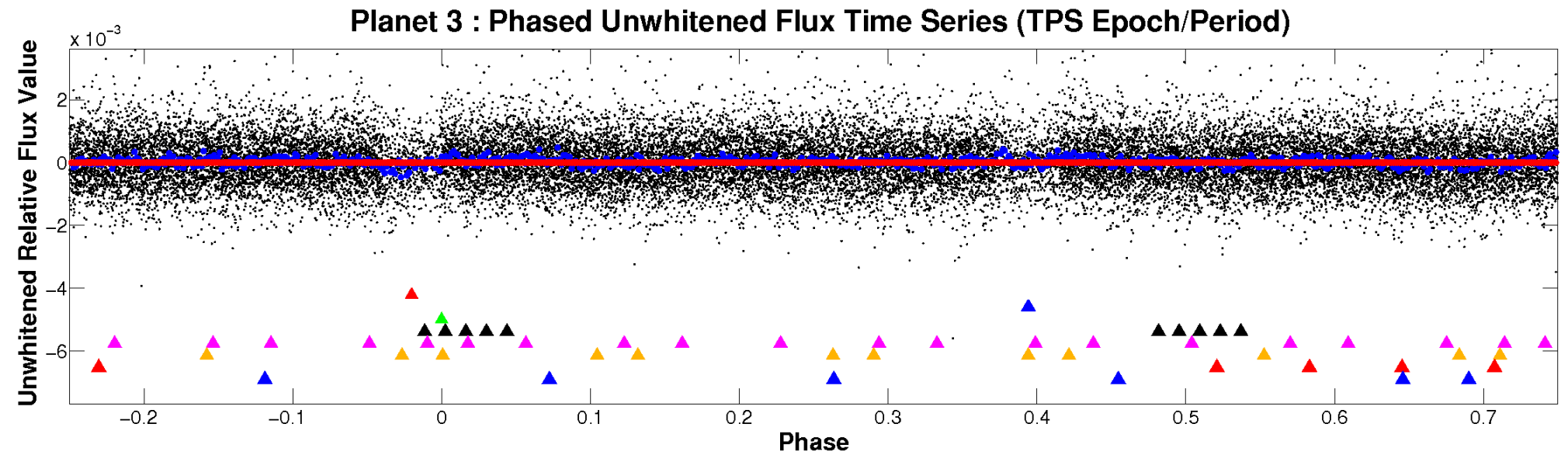


ALT Odd/Even

TCE 006431670-03

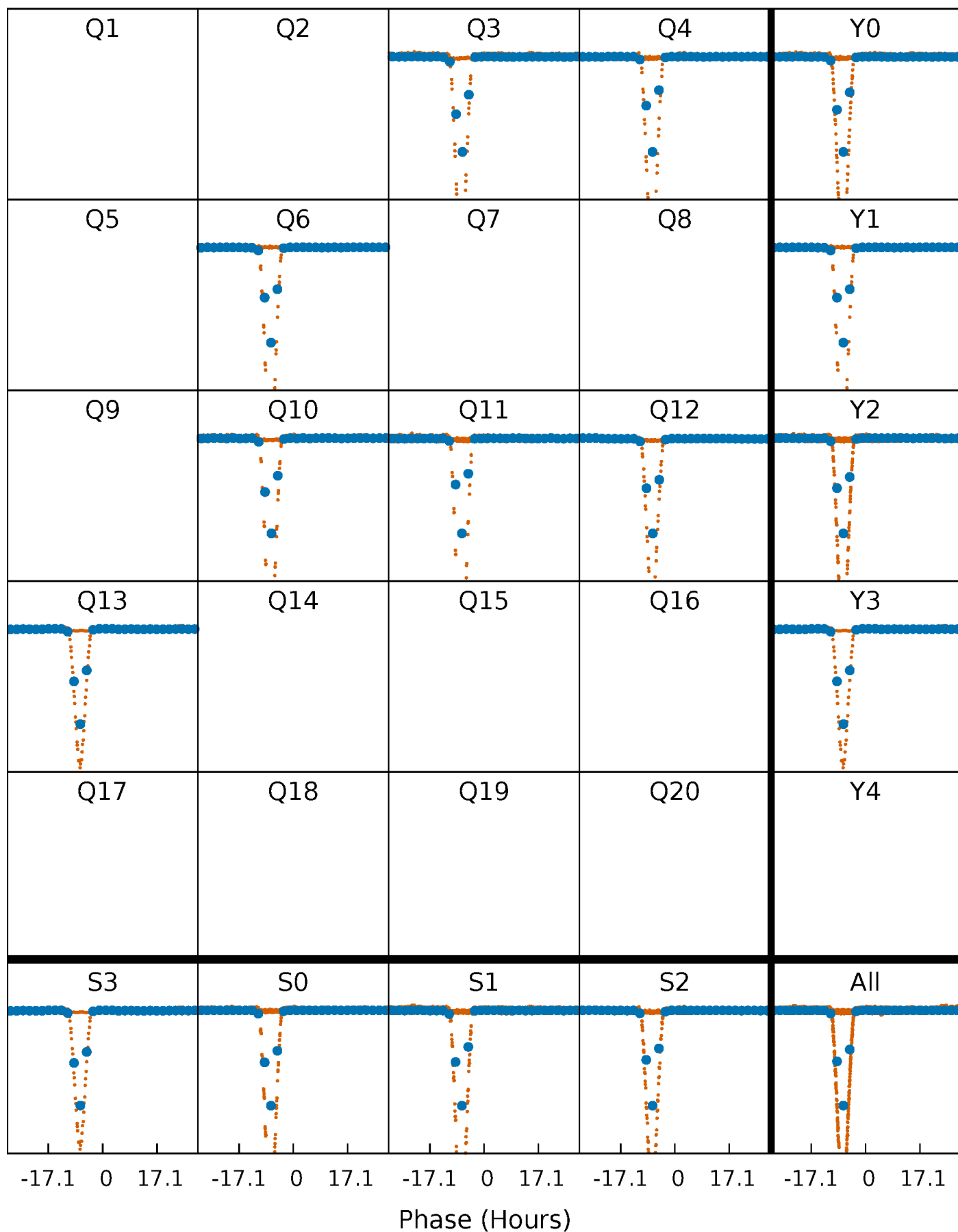


Non-Whitened Vs. Whitened Light Curve



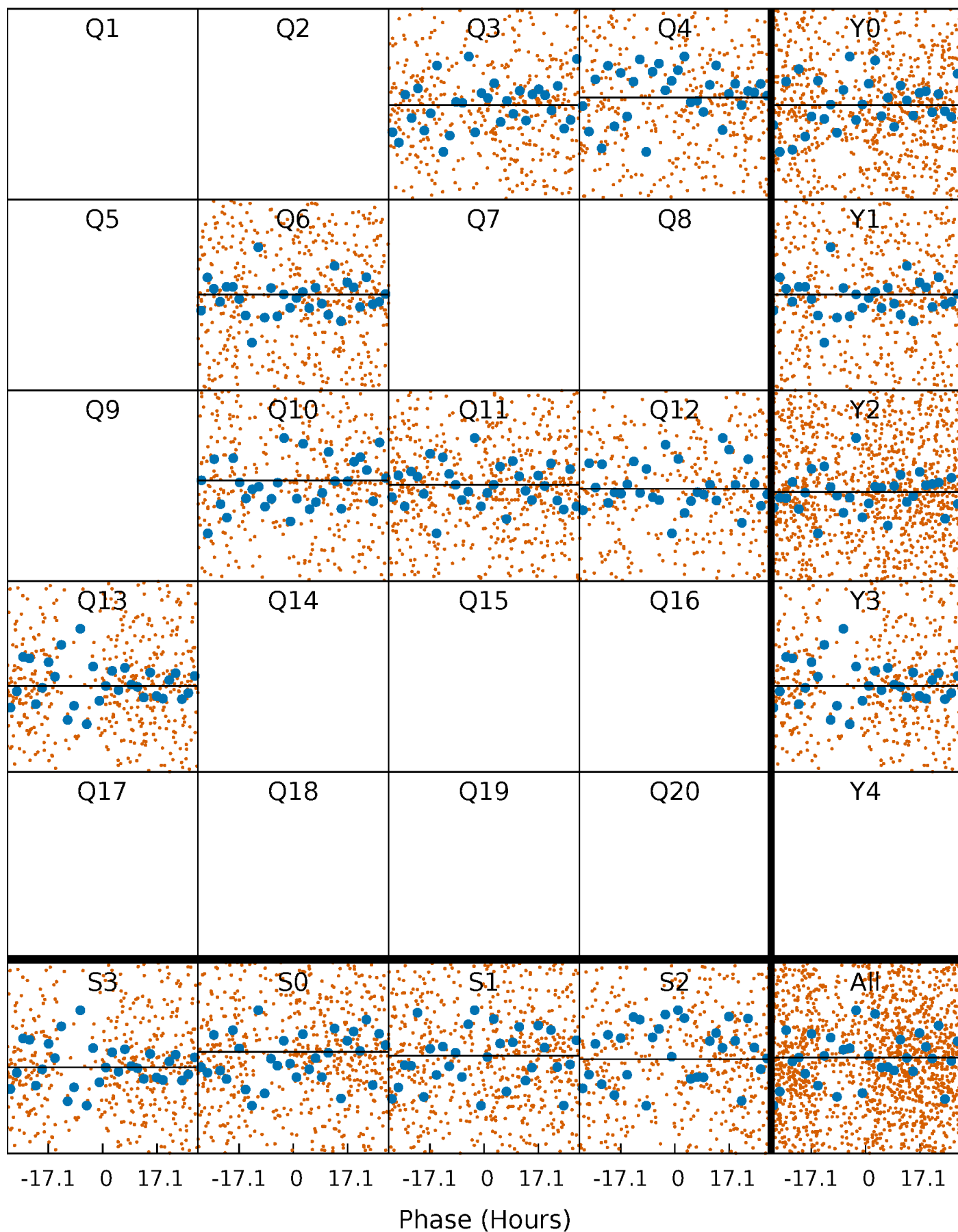
PDC Quarter-Phased Transit Curves

TCE 006431670-03 P= 14.955586 Days $T_0=138.941999$ (BKJD)



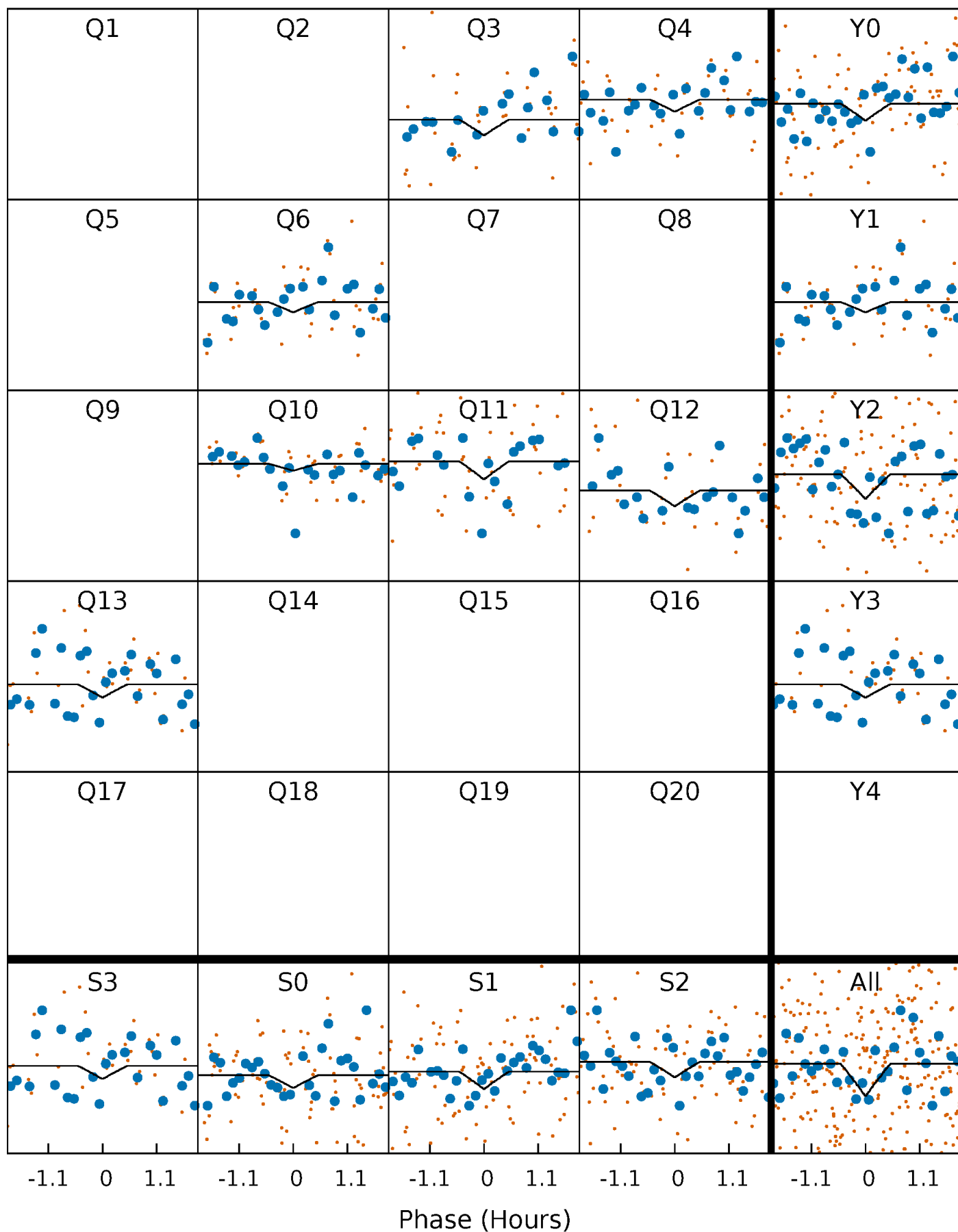
DV Quarter-Phased Transit Curves

TCE 006431670-03 P= 14.955586 Days $T_0=138.941999$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

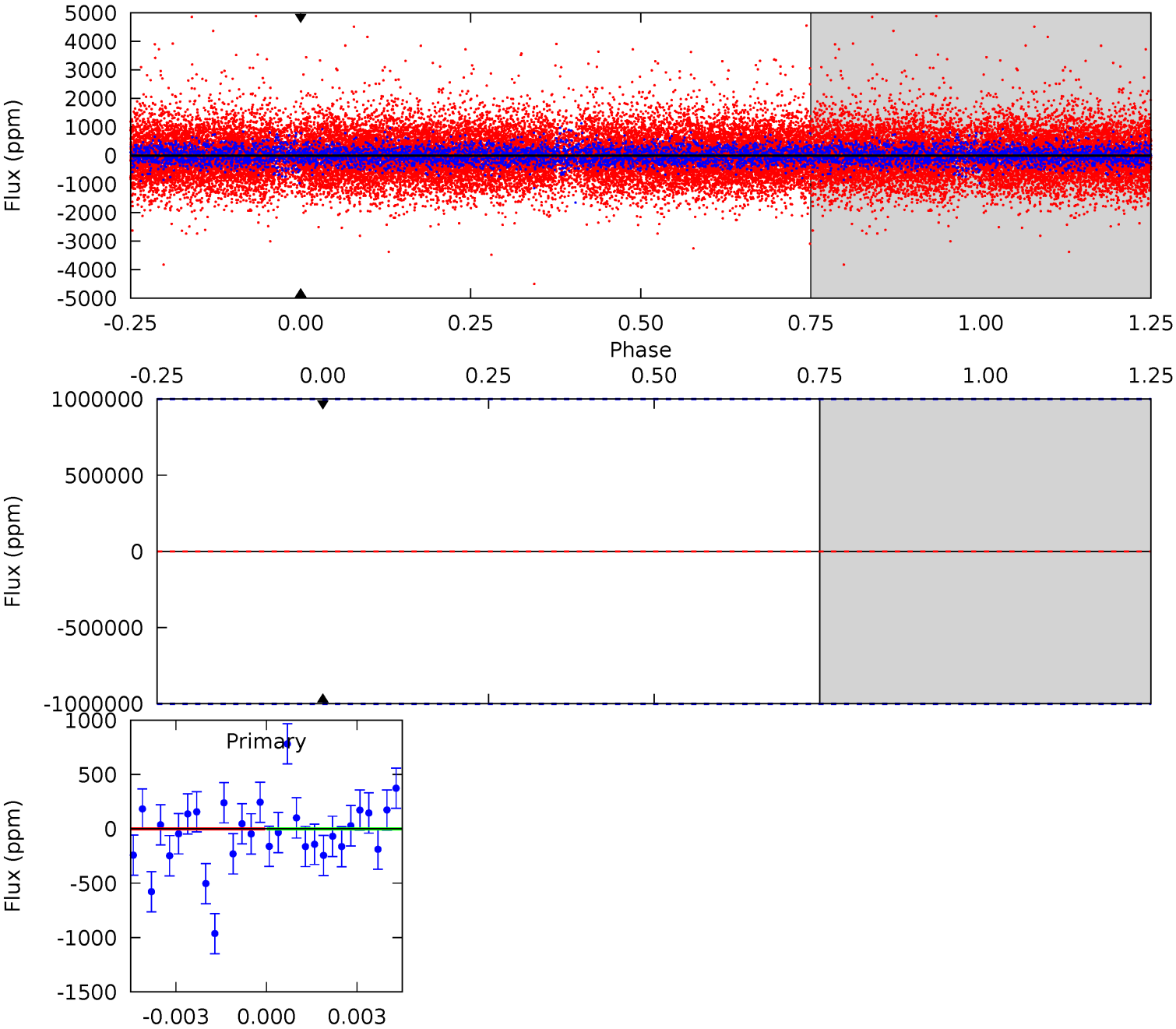
TCE 006431670-03 P= 14.955586 Days $T_0=138.013297$ (BKJD)



DV Model-Shift Uniqueness Test

006431670-03, P = 14.955586 Days, E = 138.941999 Days

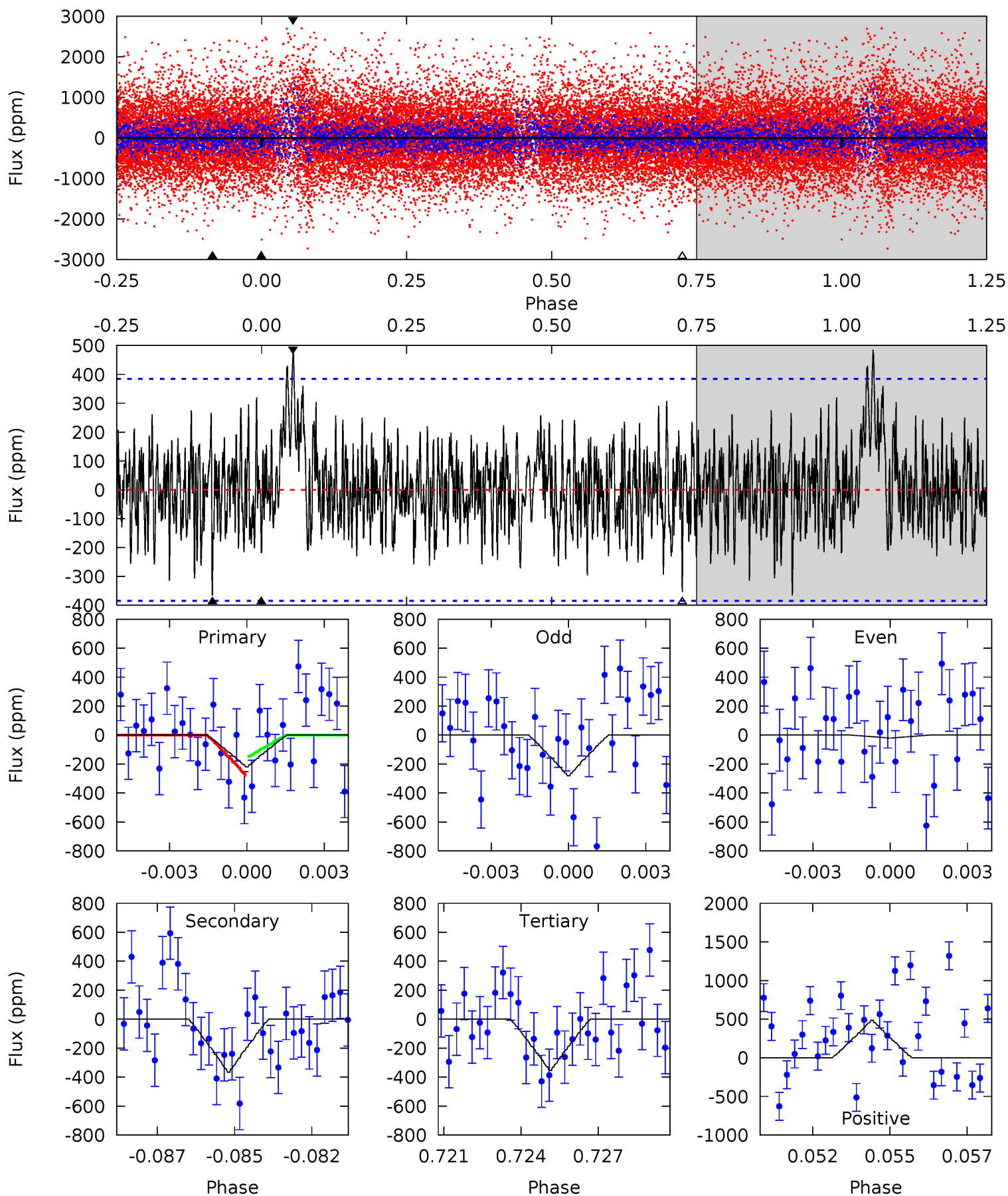
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-----|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-----|-------|-----|
| 0 | 0 | 0 | 0 | 1.00 | 1.00 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



Alt Model-Shift Uniqueness Test

006431670-03, P = 14.955586 Days, E = 138.013297 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 3.01 | 5.01 | 4.84 | 6.65 | 5.27 | 3.00 | 1.61 | -1.83 | -3.64 | 0.17 | -1.63 | 1.78 | 5.78 | 0.57 | 0.86 |



Stellar Parameters For KIC 006431670

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (g \cdot \text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|--------------------------------------|
| | 5303^{+191}_{-191} | $4.632^{+0.032}_{-0.097}$ | $-0.400^{+0.300}_{-0.300}$ | $0.704^{+0.111}_{-0.051}$ | $0.785^{+0.074}_{-0.082}$ | $3.172^{+0.519}_{-1.000}$ |
| | +4%/-4% | +1%/-2% | +75%/-75% | +16%/-7% | +9%/-10% | +16%/-32% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 006431670-03 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-----------------|------------------------|-------------------|-------------------------|-------------------------|
| DV | 0 ± 1000000 | $9.51^{+6.63}_{-6.07}$ | 843^{+43}_{-39} | 4083^{+6714}_{-14575} | 257^{+11546}_{-10446} |
| Alt. | -366 ± 73 | $5.81^{+5.72}_{-3.94}$ | 839^{+37}_{-37} | 3258^{+1470}_{-603} | 70^{+579}_{-53} |

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 $A_{obs} \gg 1.0$

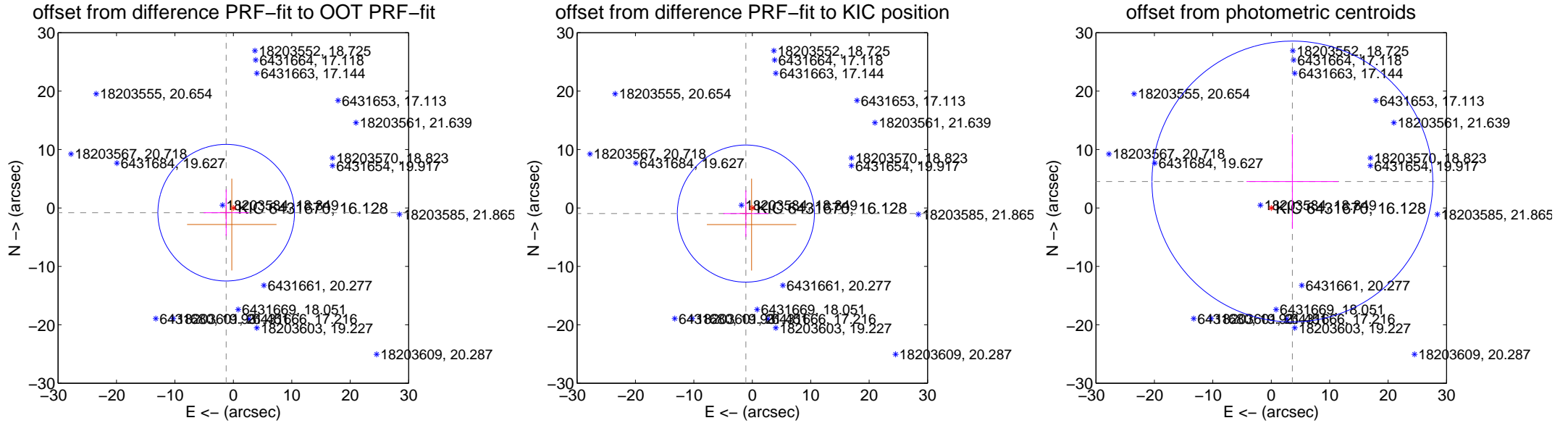
DV Centroid Data

Supplemental centroid analysis for 006431670-03. Kepler magnitude: 16.13. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

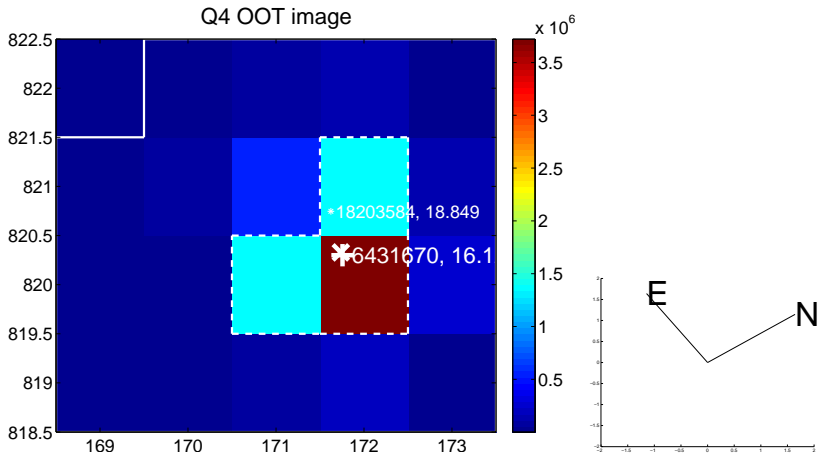
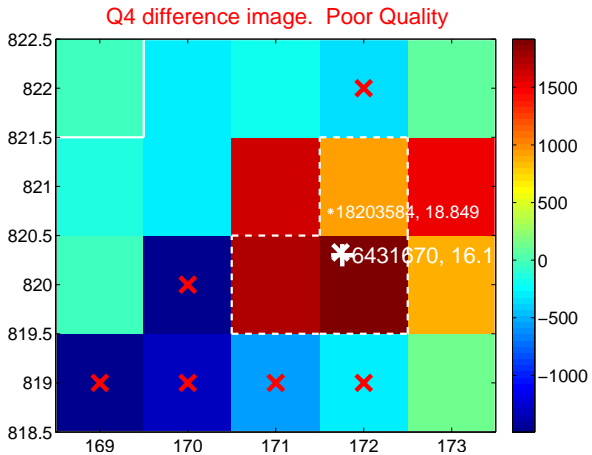
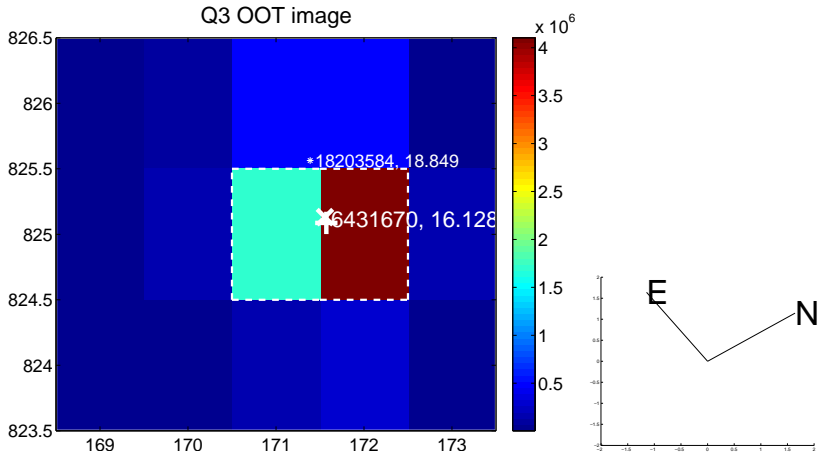
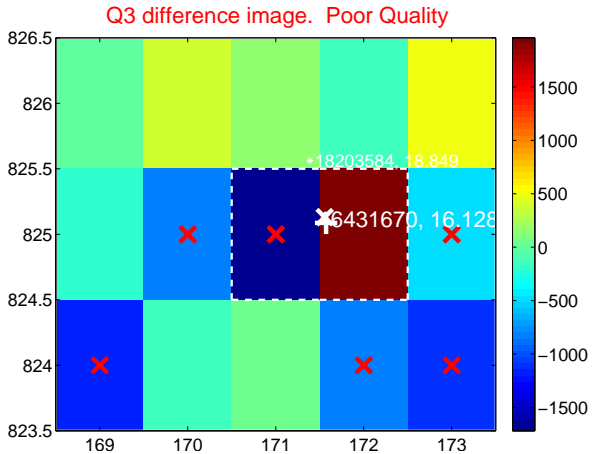
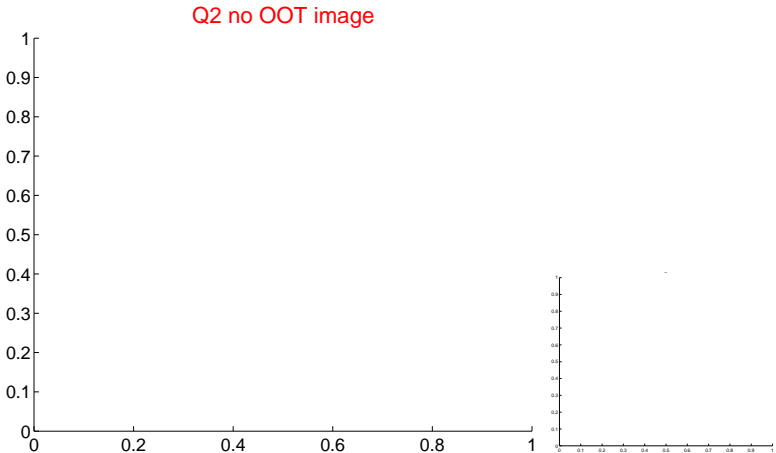
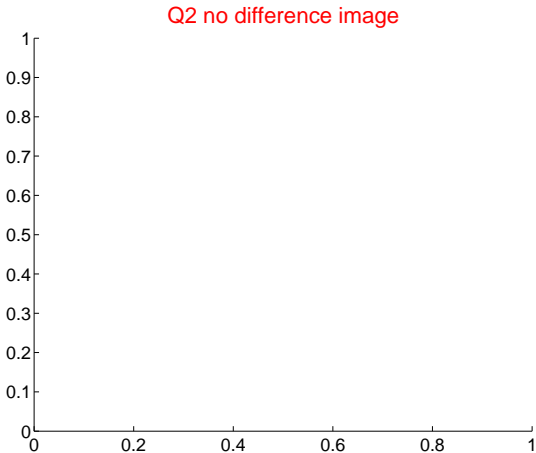
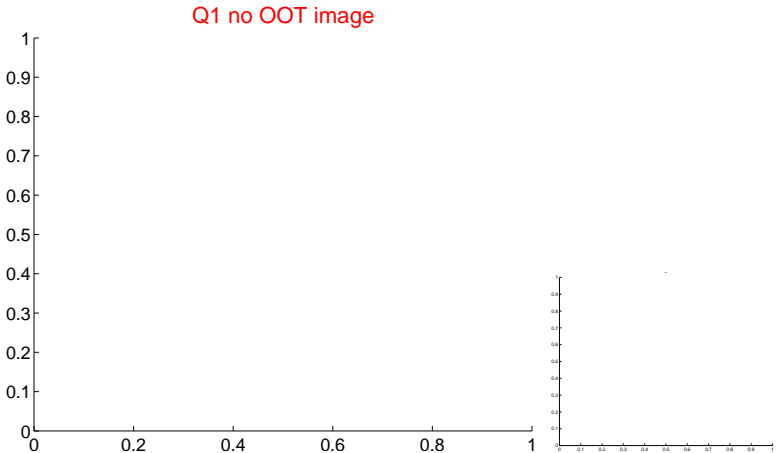
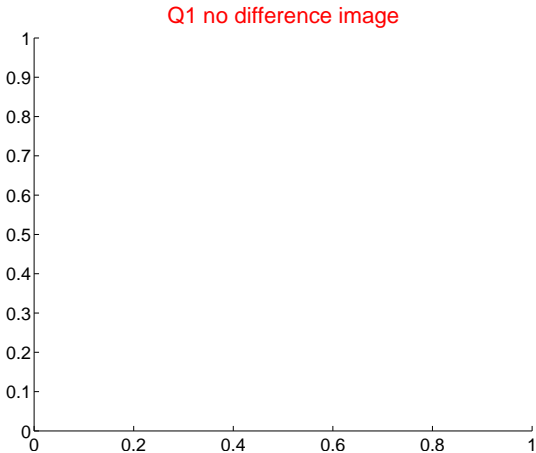
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 1.468 ± 3.896 | 0.38 | 1.223 ± 3.863 | -0.812 ± 3.972 |
| PRF-fit source offset from KIC position | 1.461 ± 3.911 | 0.37 | 1.099 ± 3.863 | -0.962 ± 3.972 |
| photometric centroid source offset | 5.79 ± 8.01 | 0.72 | -3.62 ± 7.86 | 4.52 ± 8.11 |

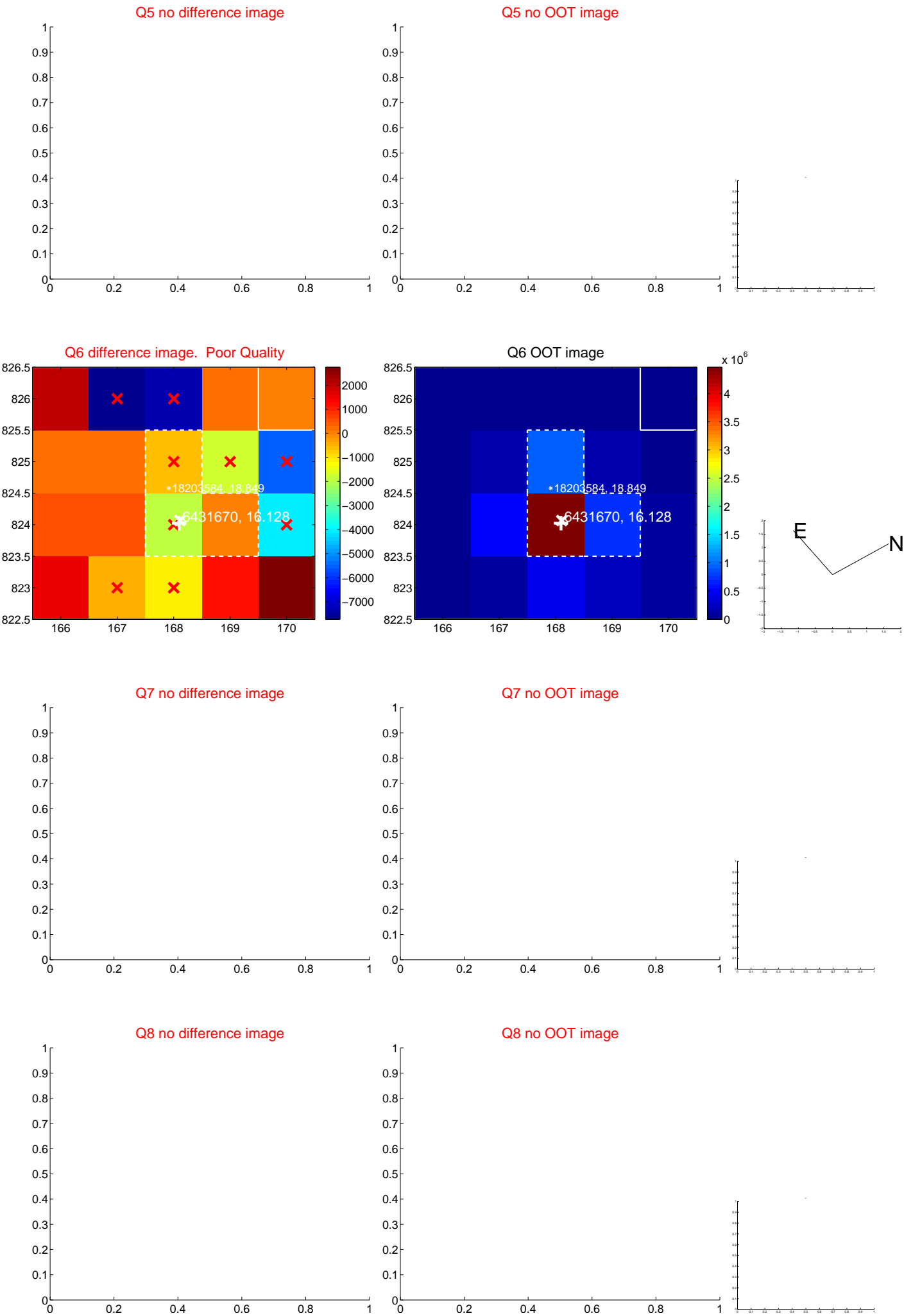


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

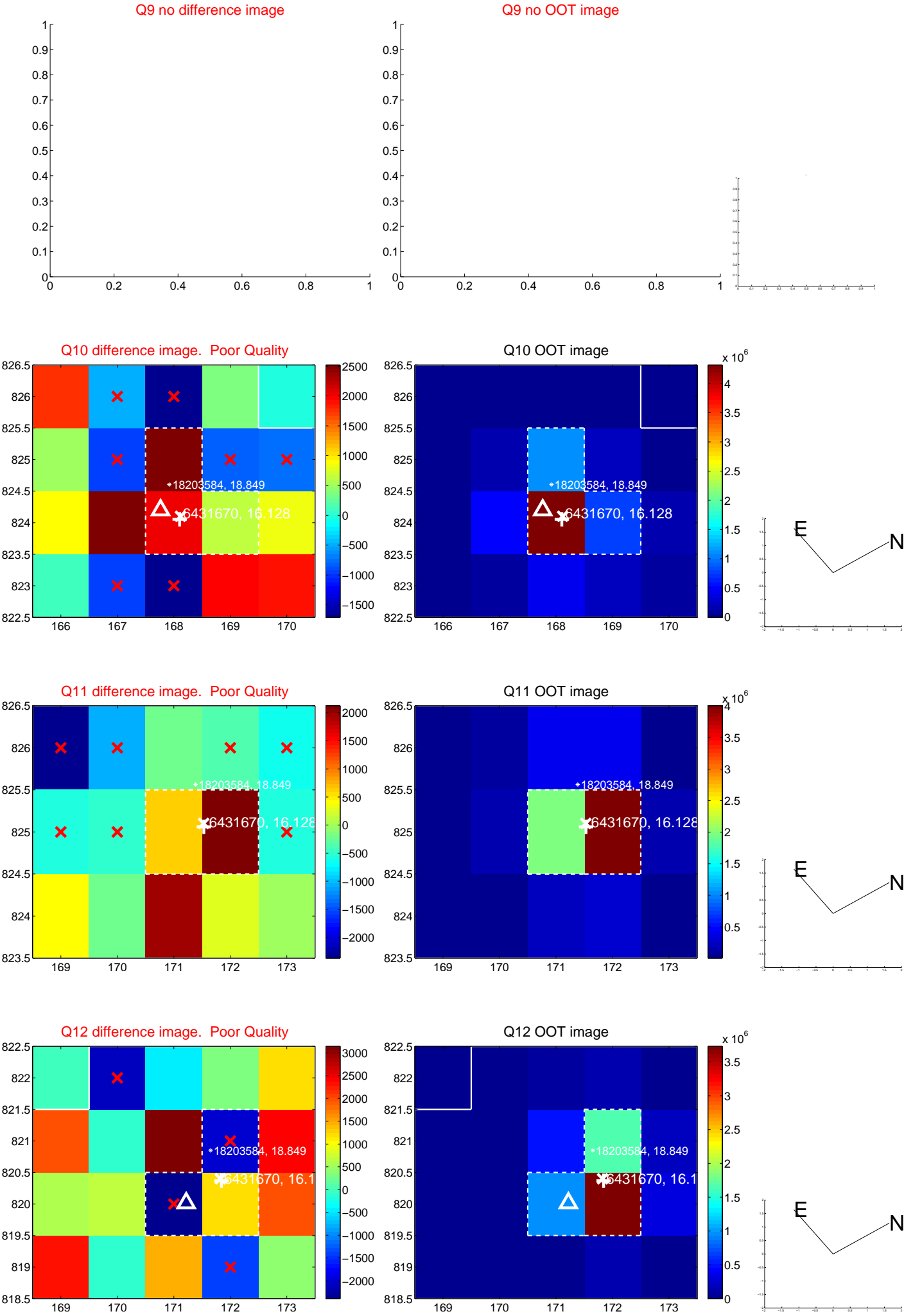
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



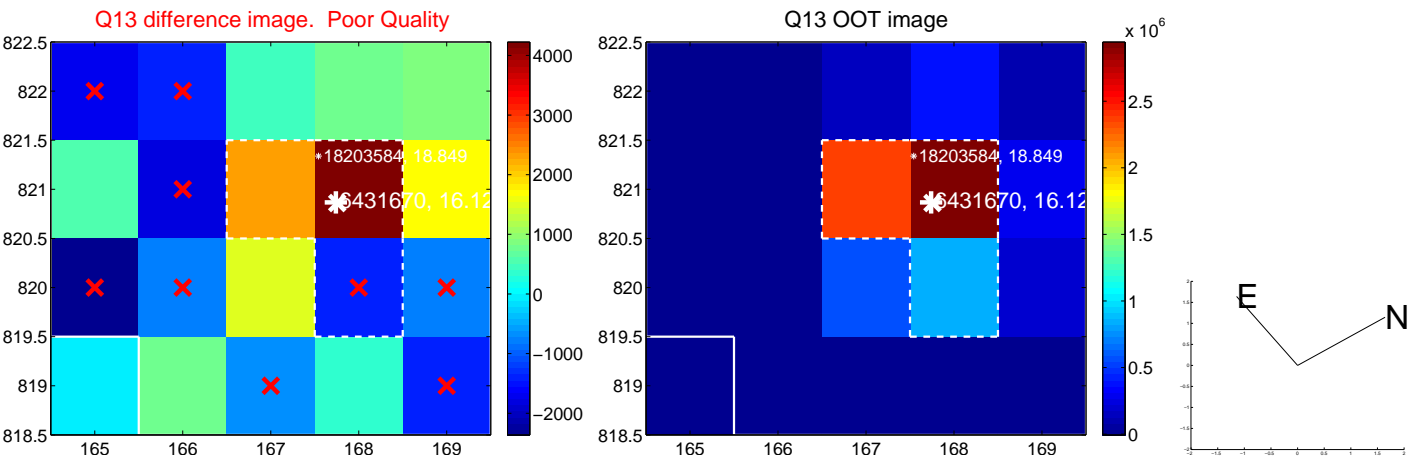
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



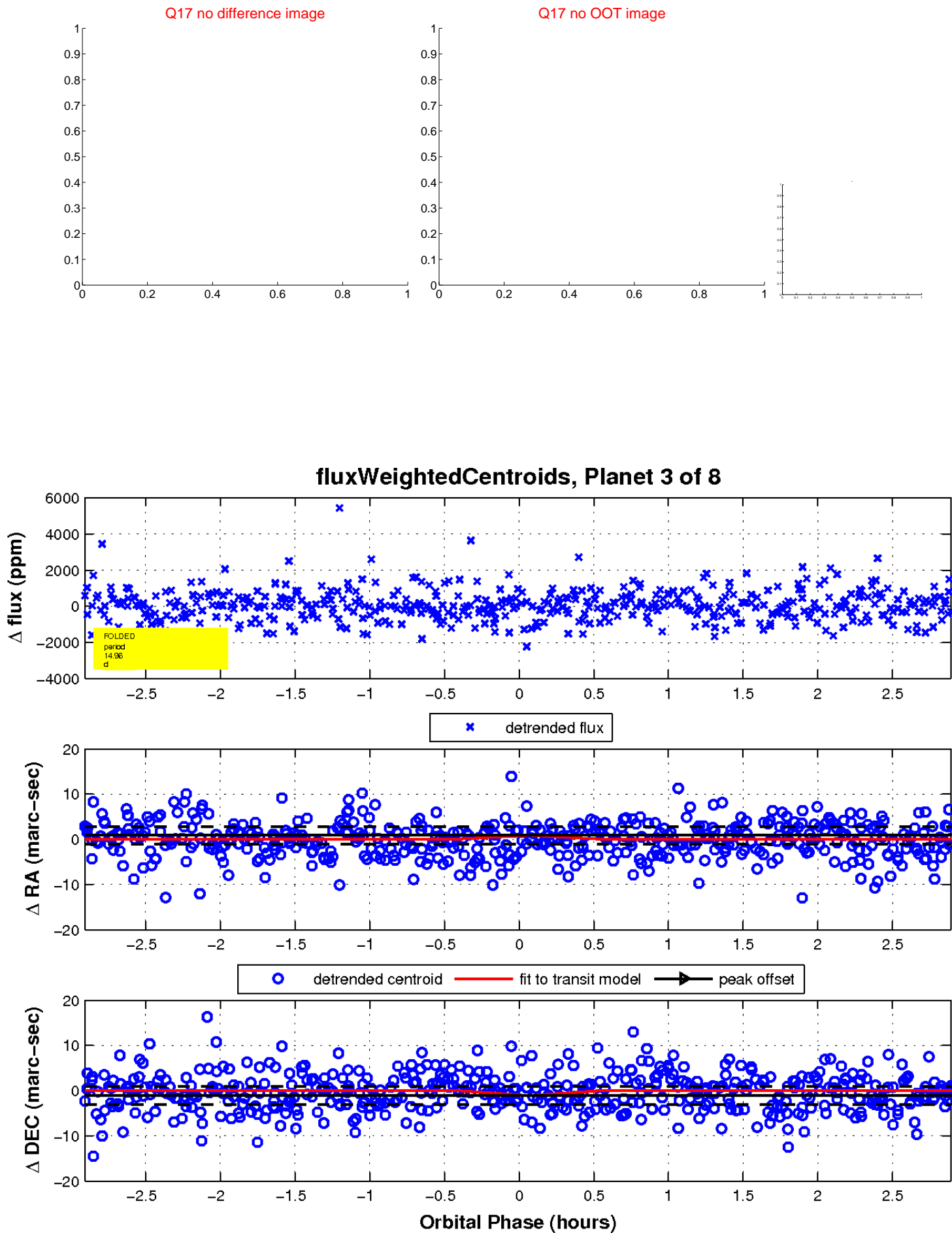
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

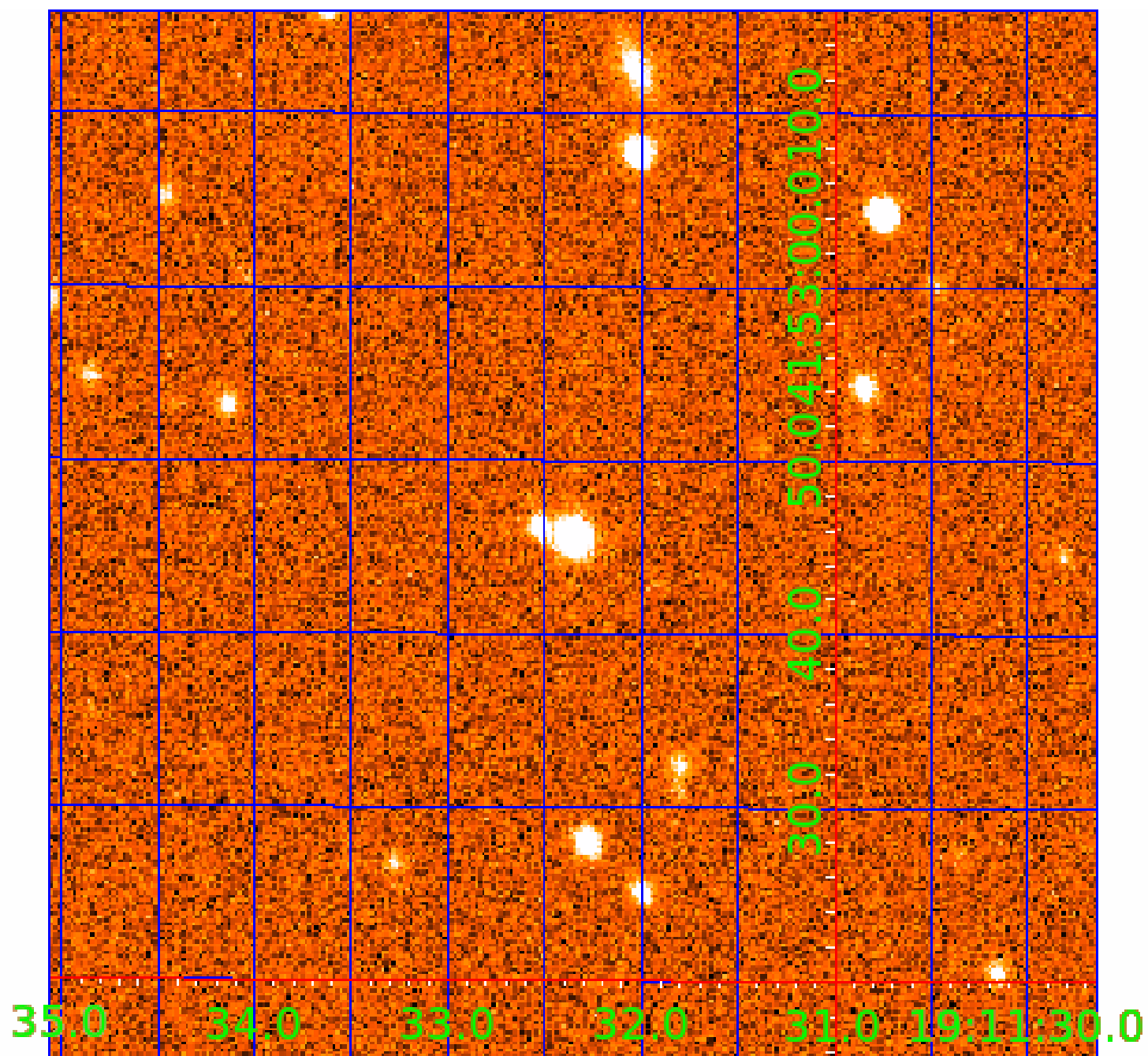


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006431670

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|------|-----------------------------|-----------------|------------------------|------------------------|
| 006431670-01 | OBS | 3534.01 | 29.911333 | 153.592861 | 358289.4 | 4.500 | 3602.3 | -1.0 | 0.70 | 5303 | 38.41 | 11.70 |
| 006431670-02 | OBS | No | 29.911512 | 144.830269 | 366672.0 | 5.000 | 3551.7 | -1.0 | 0.70 | 5303 | 37.44 | 11.70 |
| 006431670-03 | OBS | No | 14.955586 | 138.941998 | 13405.1 | 15.000 | 78.3 | -1.0 | 0.70 | 5303 | 8.01 | 29.49 |
| 006431670-04 | OBS | No | 156.930302 | 169.510324 | 1996.2 | 2.675 | 11.8 | 6.5 | 0.70 | 5303 | 3.36 | 1.28 |
| 006431670-05 | OBS | No | 70.646192 | 198.621740 | 435.5 | 10.064 | 11.7 | 4.6 | 0.70 | 5303 | 1.56 | 3.72 |
| 006431670-06 | OBS | No | 115.313282 | 218.062208 | 1587.8 | 4.058 | 16.1 | 7.0 | 0.70 | 5303 | 2.89 | 1.94 |
| 006431670-07 | OBS | No | 300.041667 | 356.111204 | 1829.8 | 5.475 | 9.8 | 8.2 | 0.70 | 5303 | 3.29 | 0.54 |
| 006431670-08 | OBS | No | 272.059128 | 134.308141 | 933.6 | 13.392 | 11.4 | 5.4 | 0.70 | 5303 | 2.16 | 0.62 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 006431670-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS |
| 006431670-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_NOFITS |
| 006431670-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS |
| 006431670-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 006431670-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-07 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-08 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

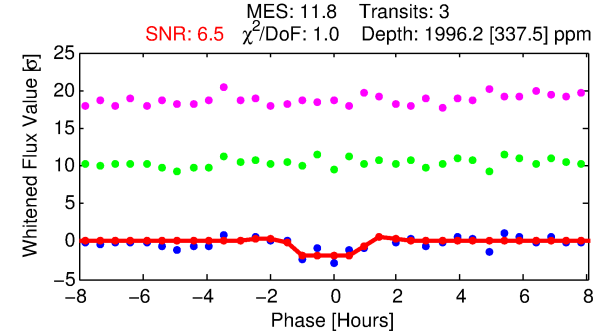
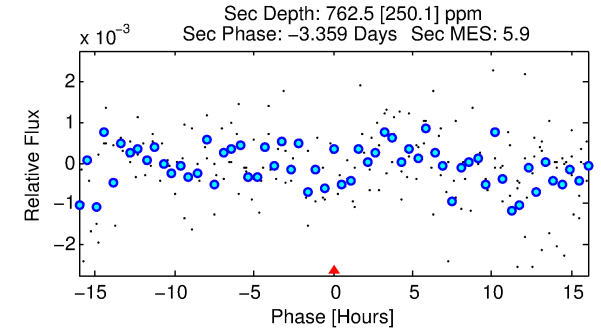
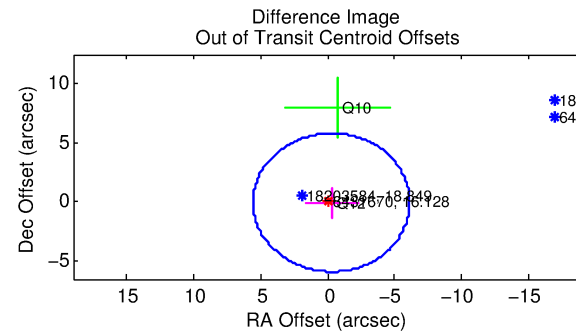
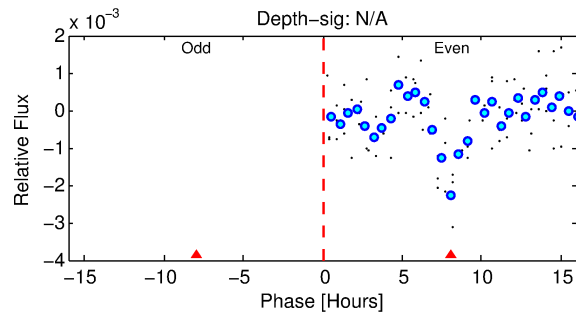
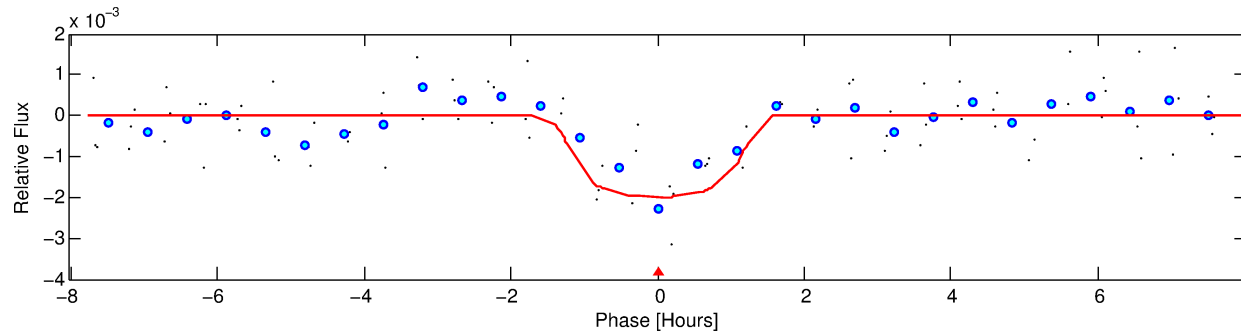
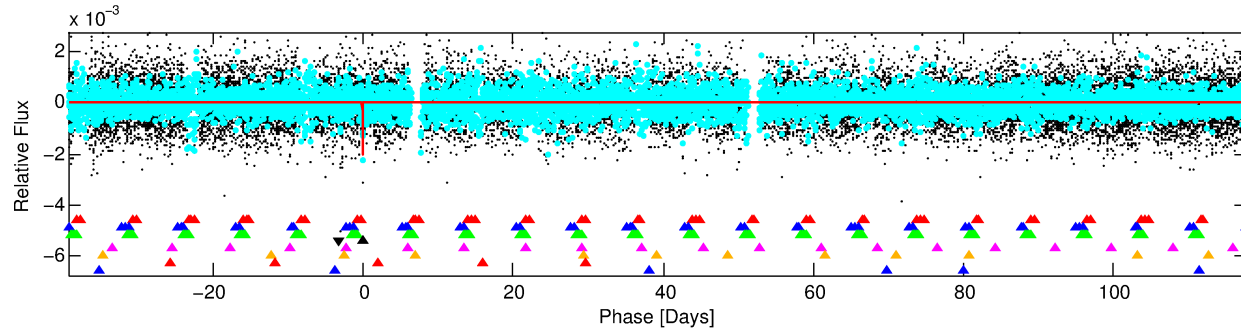
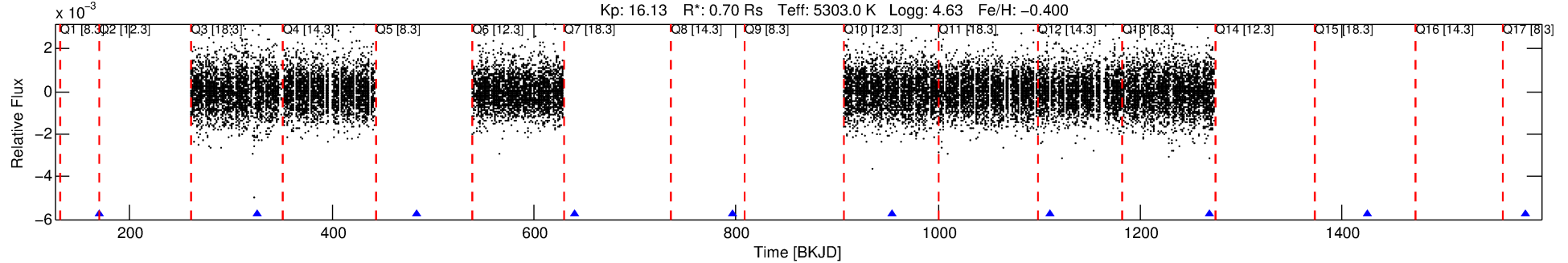
Ephemeris Match Information For 006431670-04

No Significant Match Found

DV One-Page Summary

KIC: 6431670 Candidate: 4 of 8 Period: 156.930 d
KOI: K03534 Corr: No Ephemeris Match

Kp: 16.13 R*: 0.70 Rs Teff: 5303.0 K Logg: 4.63 Fe/H: -0.400



DV Fit Results:

Period = 156.93030 [0.00177] d
Epoch = 169.5103 [0.0086] BKJD
Rp/R* = 0.0438 [0.2224]
a/R* = 346.46 [7005.79]
b = 0.70 [14.97]
Seff = 1.28 [0.30]
Teq = 271 [16] K
Rp = 3.36 [17.09] Re
a = 0.5231 [0.0674] AU
Ag = 10140.99 [103057.24] [0.10σ]
Teffp = 4211 [10698] K [0.37σ]

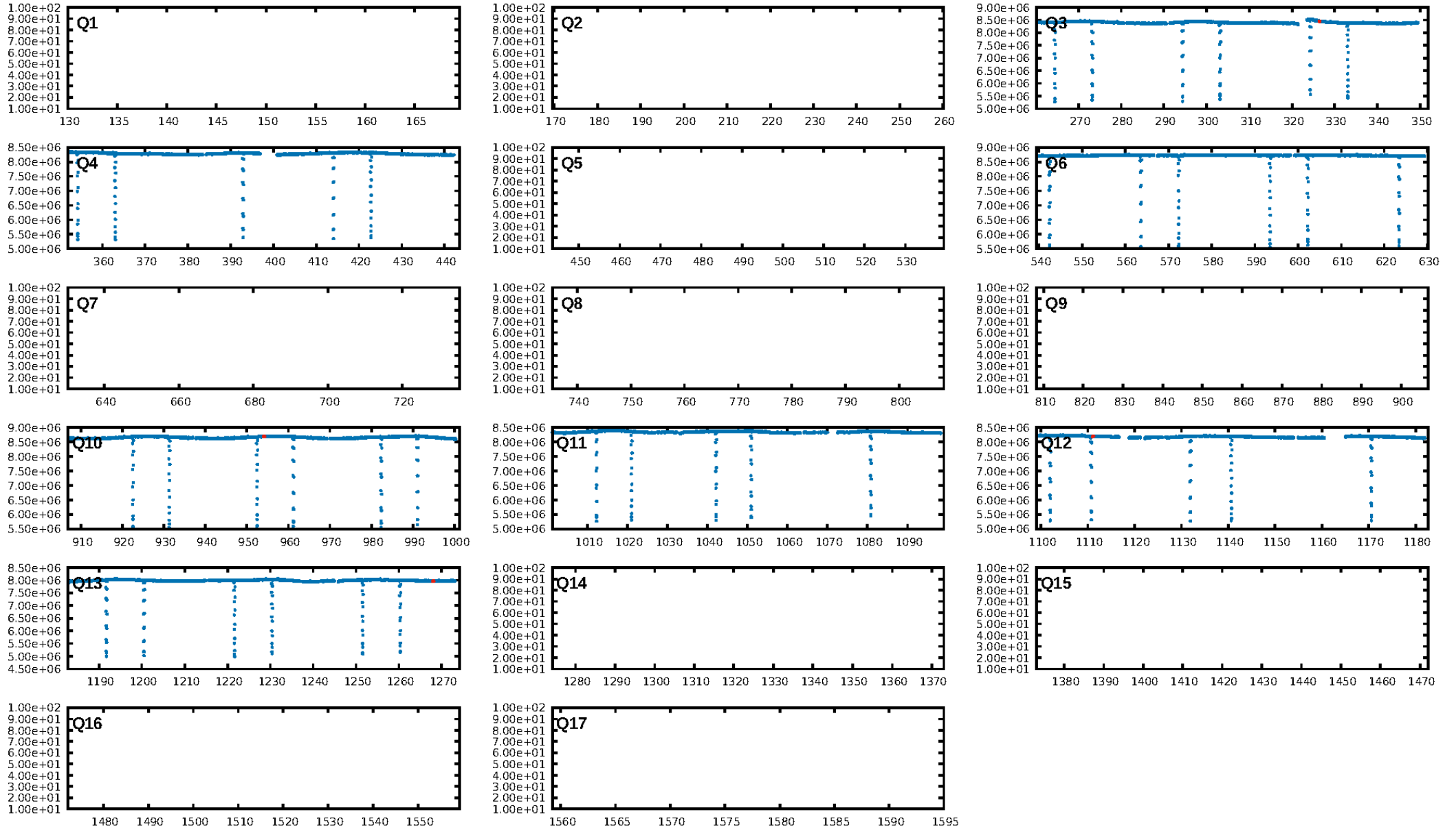
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [205.48σ]
LongPeriod-sig: 100.0% [202.33σ]
ModelChiSquare2-sig: 71.8%
ModelChiSquareGof-sig: 83.3%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.3678
Centroid-sig: 49.2%
Centroid-so: 0.836 arcsec [0.56σ]
OotOffset-rm: 0.289 arcsec [0.15σ]
OotOffset-st: 1/0/1/0 [2]
KicOffset-rm: 0.419 arcsec [0.21σ]
KicOffset-st: 1/0/1/0 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 0.75 [3/4]

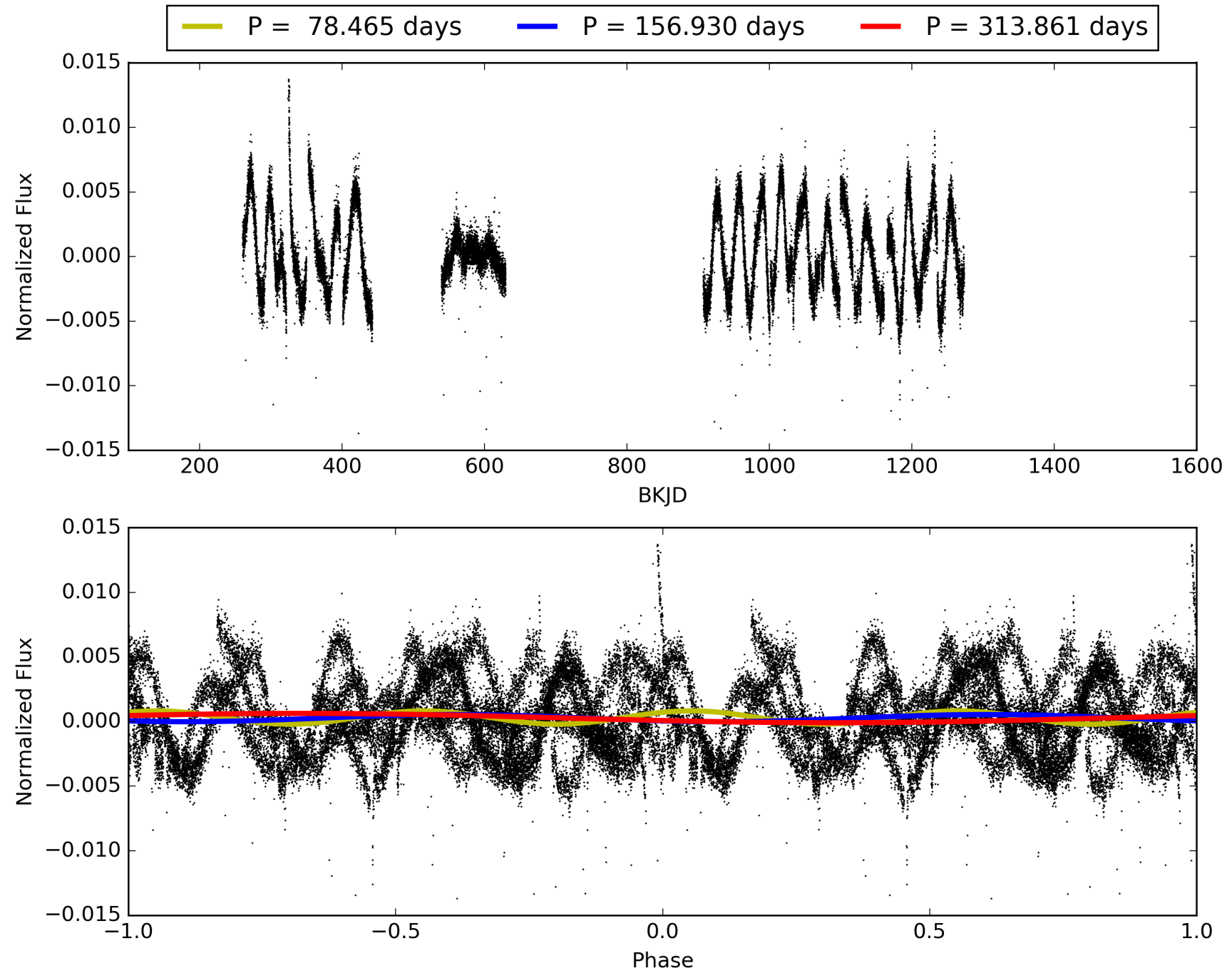
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:29:59 Z

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

TCE 006431670-04, PDC Light Curves

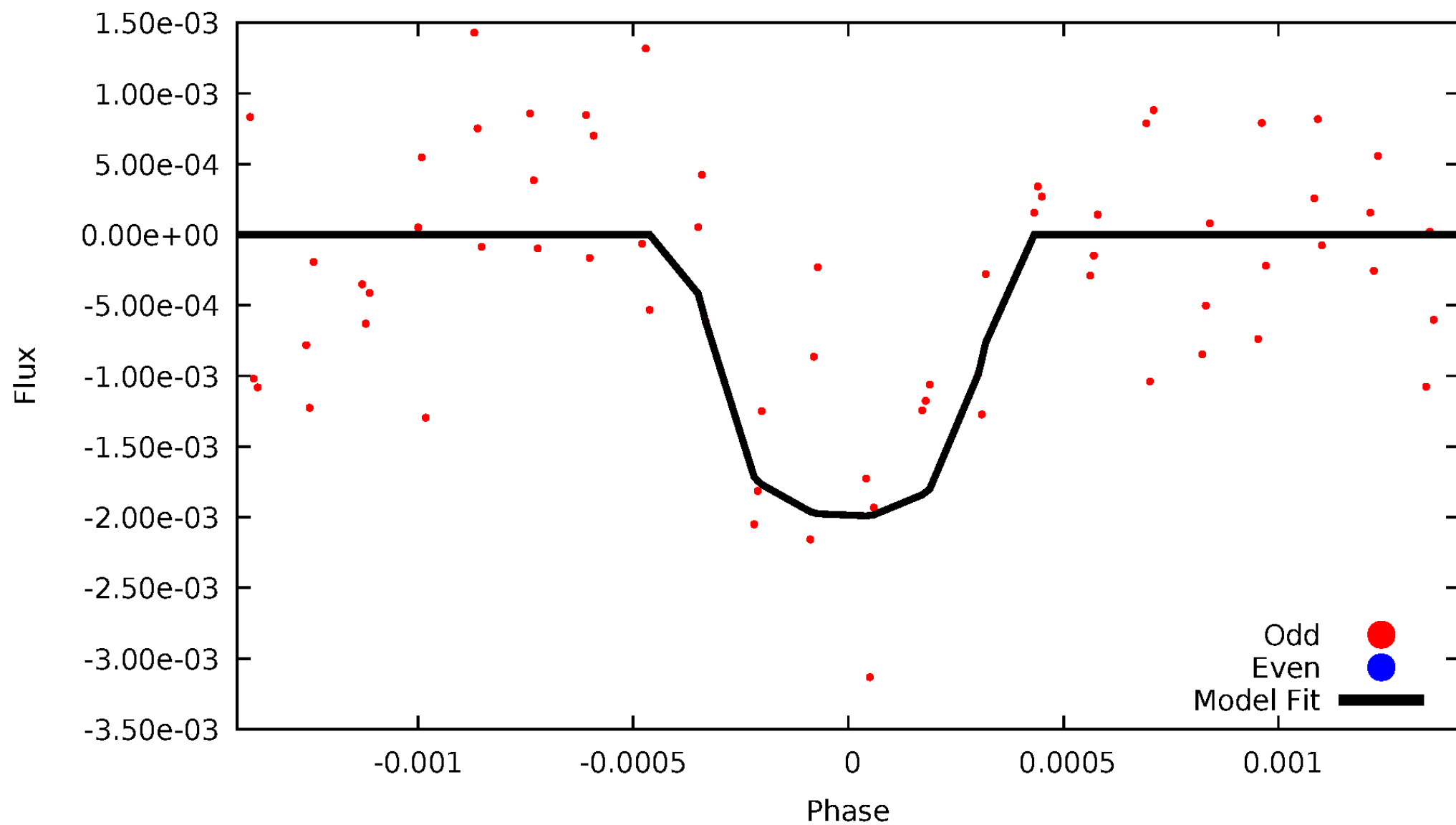


TCE 006431670-04



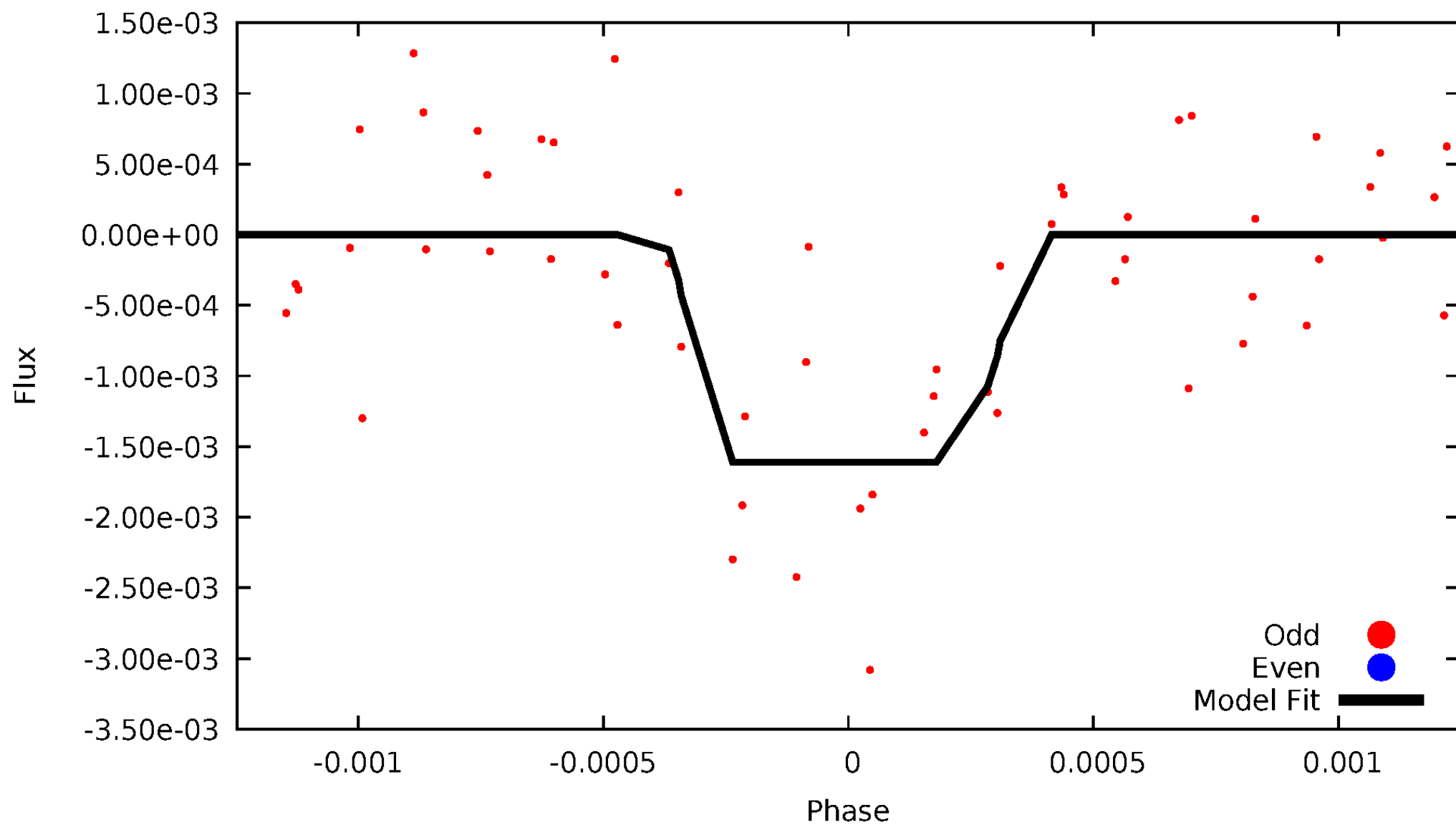
DV Odd/Even

TCE 006431670-04



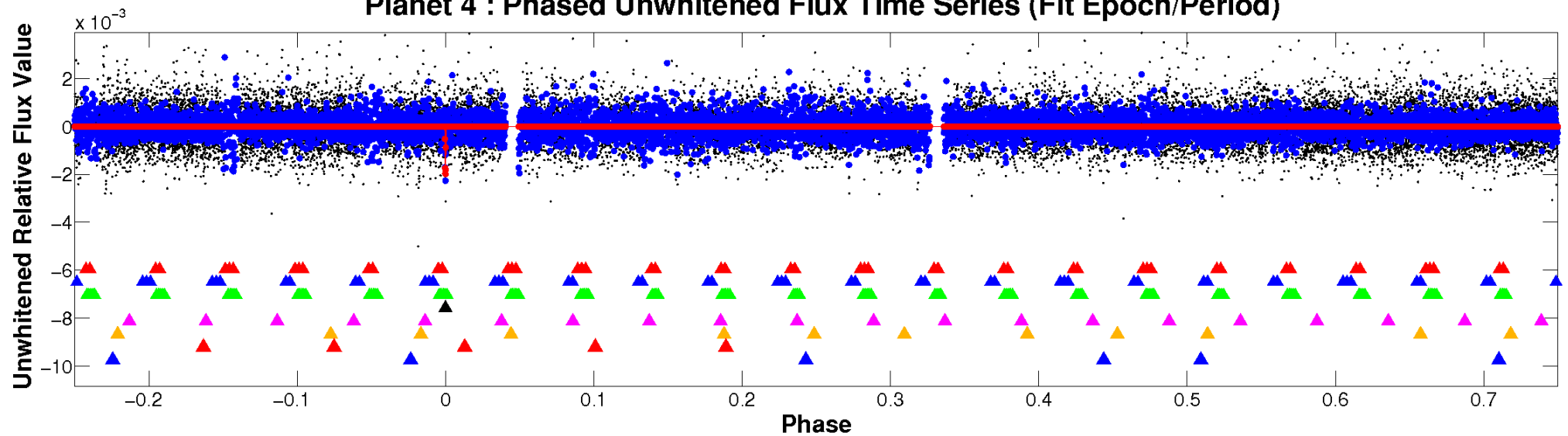
ALT Odd/Even

TCE 006431670-04

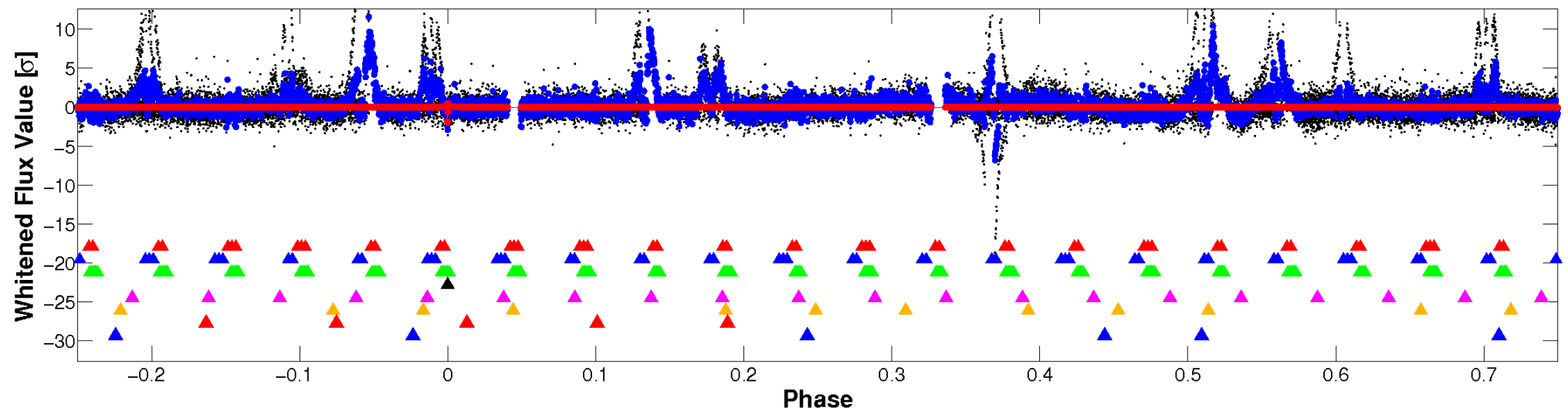


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

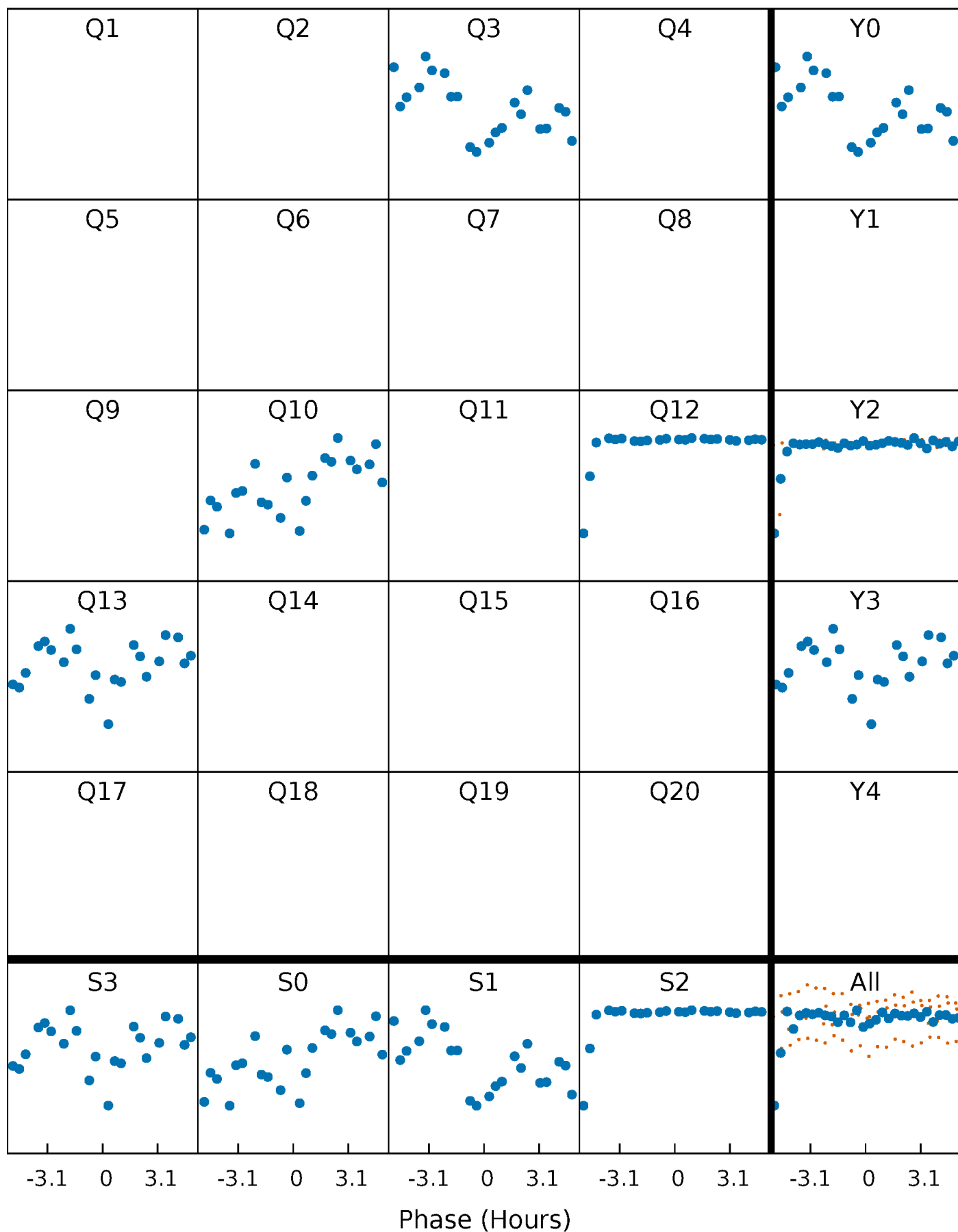


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



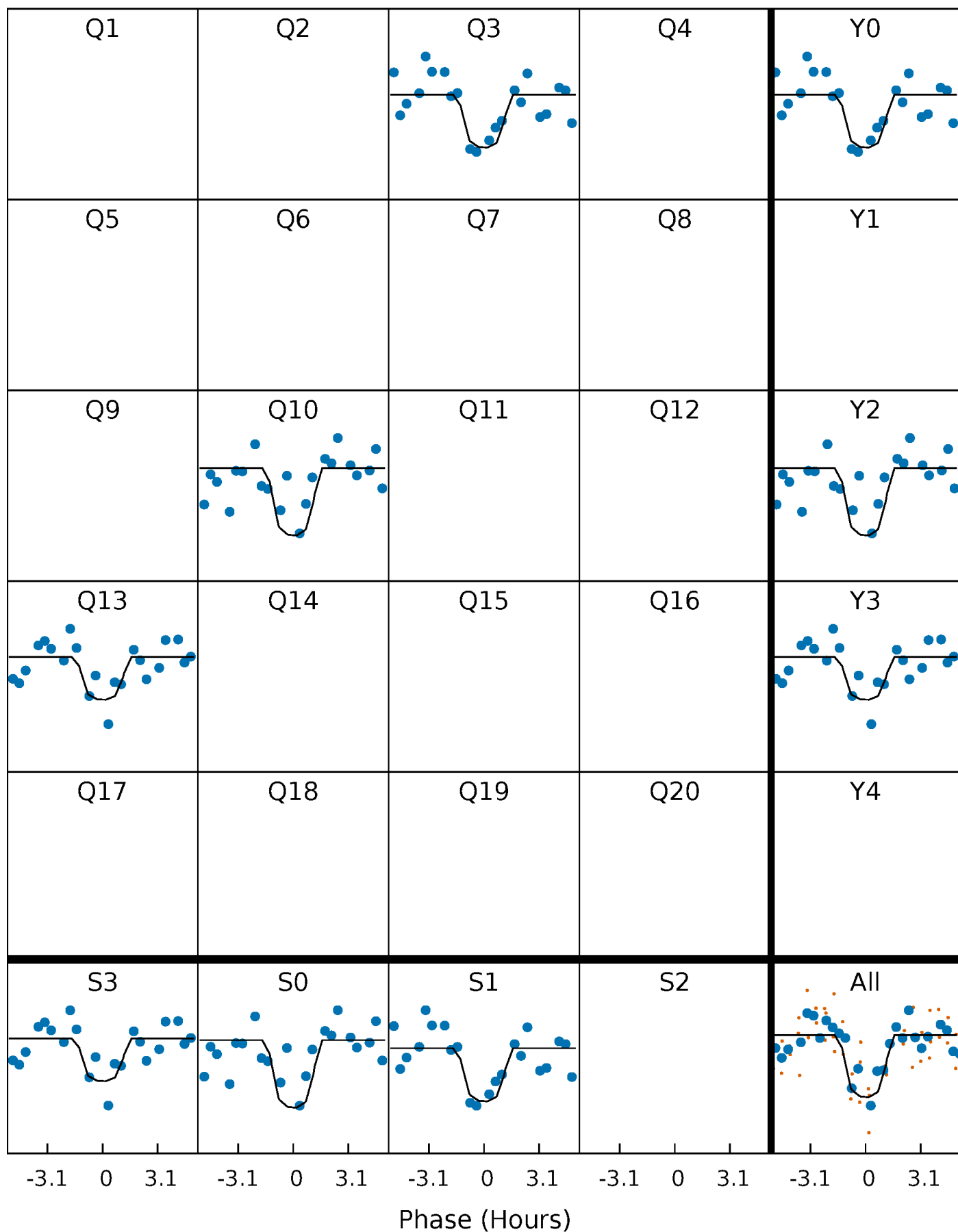
PDC Quarter-Phased Transit Curves

TCE 006431670-04 P=156.930302 Days $T_0=169.510324$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 006431670-04 P=156.930302 Days $T_0=169.510324$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

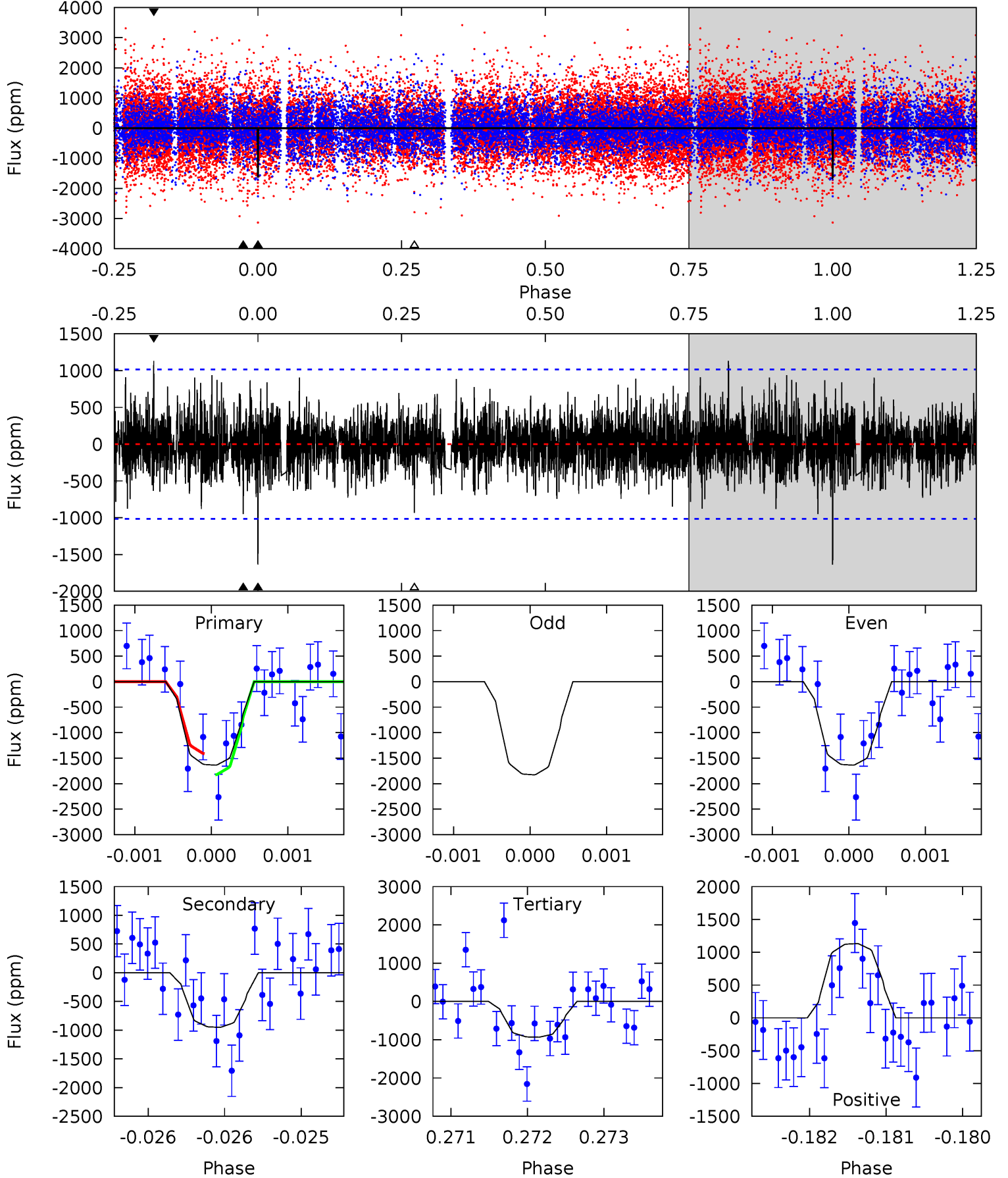
TCE 006431670-04 P=156.930002 Days $T_0=169.513320$ (BKJD)



DV Model-Shift Uniqueness Test

006431670-04, P = 156.930302 Days, E = 169.510324 Days

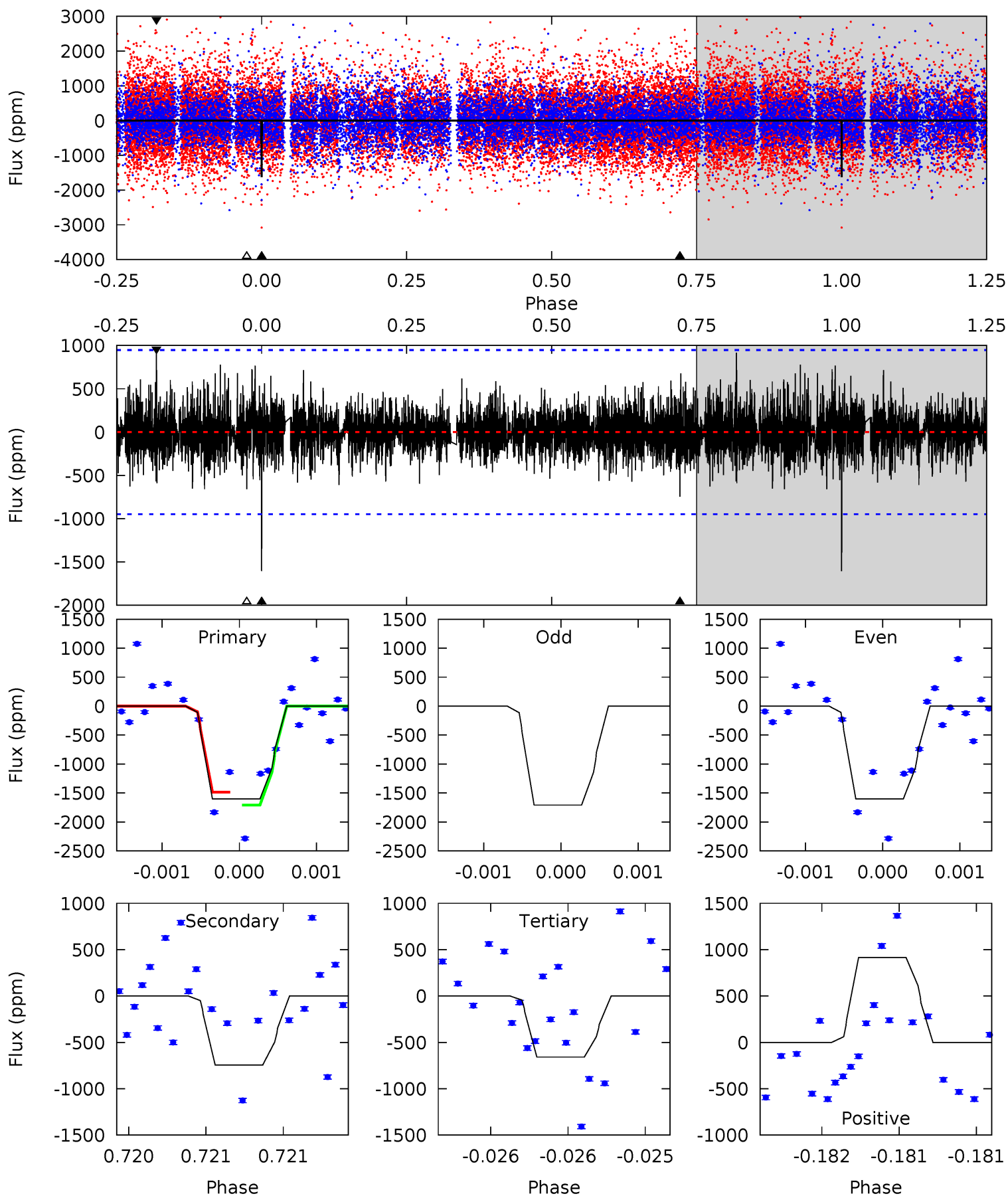
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.86 | 5.14 | 5.05 | 6.13 | 5.50 | 3.36 | 1.39 | 3.81 | 2.73 | 0.09 | -0.99 | 0.62 | 0.88 | 0.41 | 1.11 |



Alt Model-Shift Uniqueness Test

006431670-04, P = 156.930002 Days, E = 169.513320 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.34 | 4.34 | 3.83 | 5.33 | 5.52 | 3.40 | 1.11 | 5.51 | 4.01 | 0.51 | -0.99 | 0.36 | 0.90 | 0.36 | 0.66 |



Stellar Parameters For KIC 006431670

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | M (M_{\odot}) | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5303^{+191}_{-191} | $4.632^{+0.032}_{-0.097}$ | $-0.400^{+0.300}_{-0.300}$ | $0.704^{+0.111}_{-0.051}$ | $0.785^{+0.074}_{-0.082}$ | $3.172^{+0.519}_{-1.000}$ |
| | +4%/-4% | +1%/-2% | +75%/-75% | +16%/-7% | +9%/-10% | +16%/-32% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 006431670-04 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|----------------|--------------------------|-------------------|-----------------------|----------------------|
| DV | -950 ± 185 | $13.06^{+13.32}_{-8.96}$ | 385^{+20}_{-16} | 2961^{+1408}_{-500} | 863^{+7868}_{-662} |
| Alt. | -745 ± 172 | $12.84^{+13.93}_{-9.22}$ | 384^{+17}_{-16} | 2875^{+1375}_{-503} | 678^{+8105}_{-528} |

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

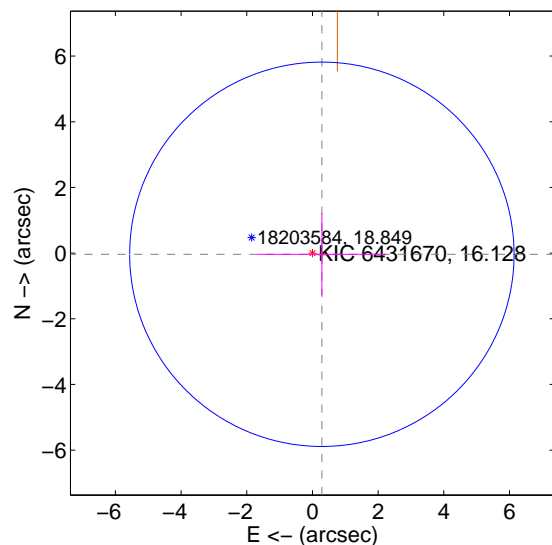
Supplemental centroid analysis for 006431670-04. Kepler magnitude: 16.13. Transit SNR 6.49

There are 0 quarters with good PRF difference image offsets

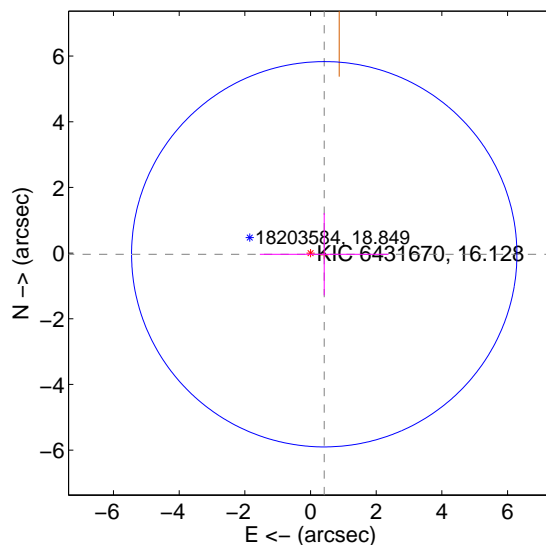
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.289 ± 1.951 | 0.15 | -0.287 ± 1.960 | -0.036 ± 1.253 |
| PRF-fit source offset from KIC position | 0.419 ± 1.955 | 0.21 | -0.418 ± 1.960 | -0.035 ± 1.253 |
| photometric centroid source offset | 0.84 ± 1.48 | 0.56 | 0.12 ± 1.40 | -0.83 ± 1.48 |

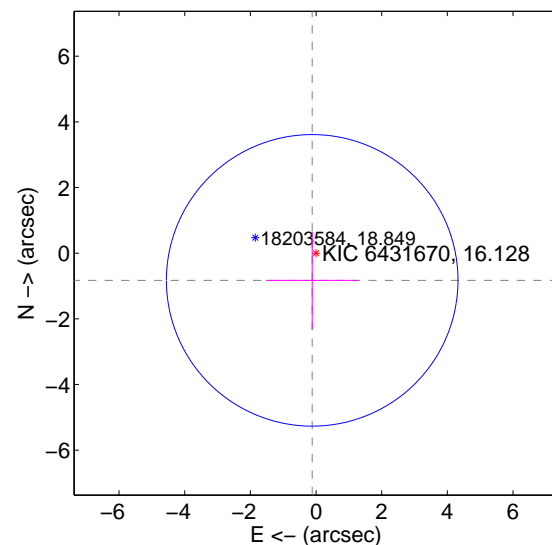
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

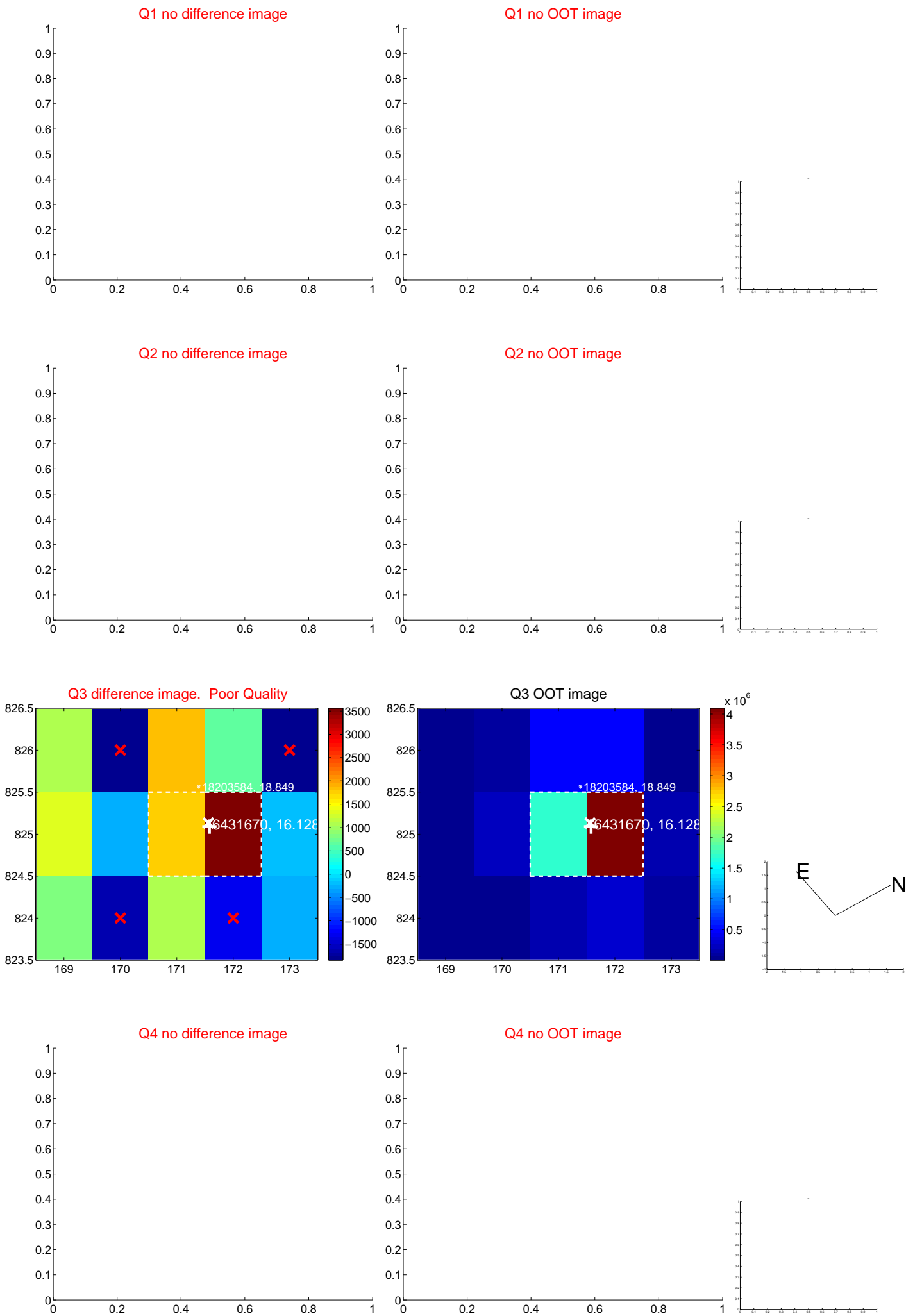


offset from photometric centroids



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.

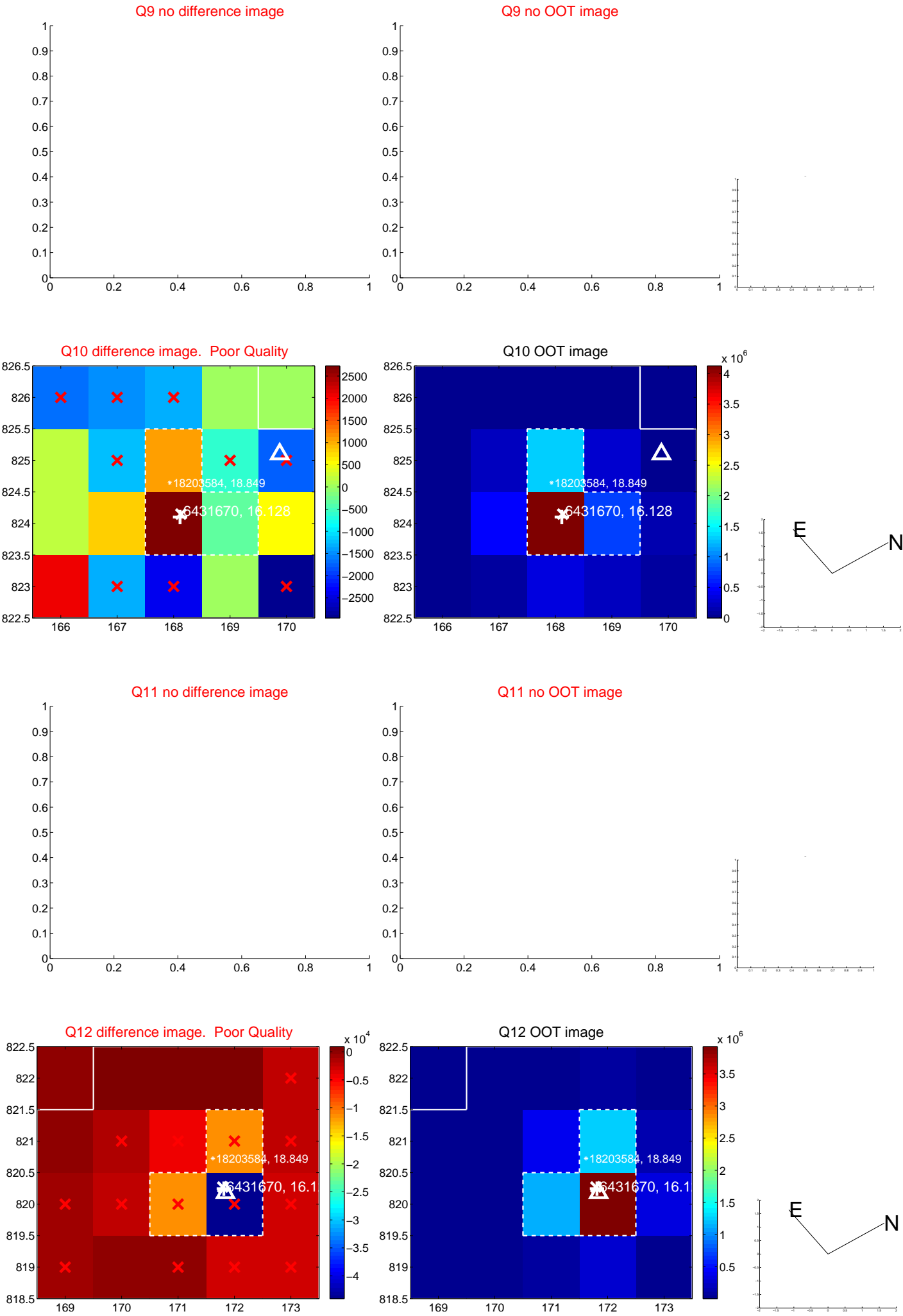
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



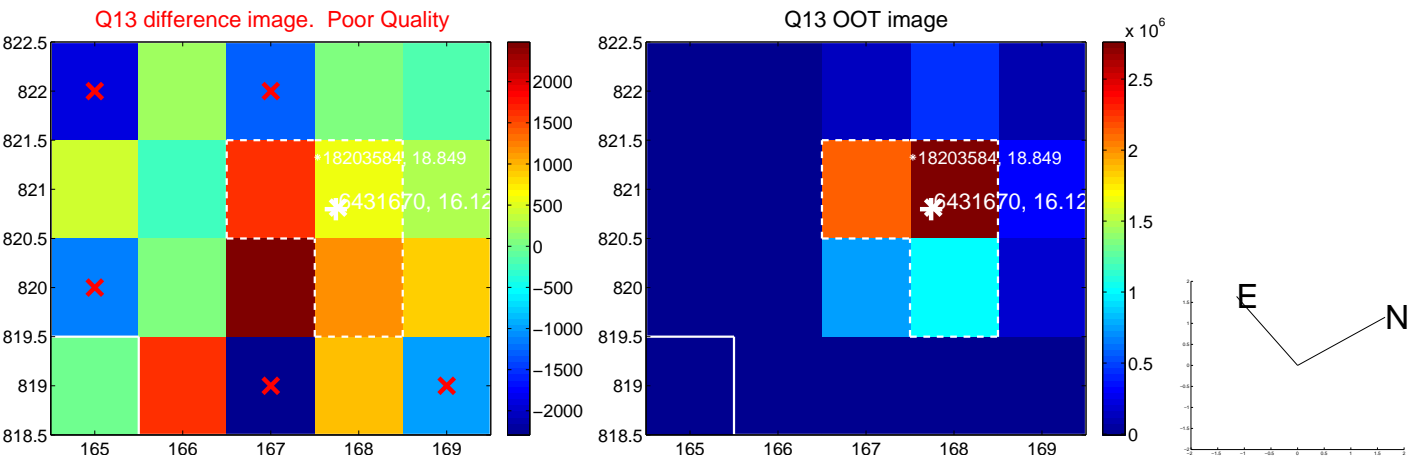
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



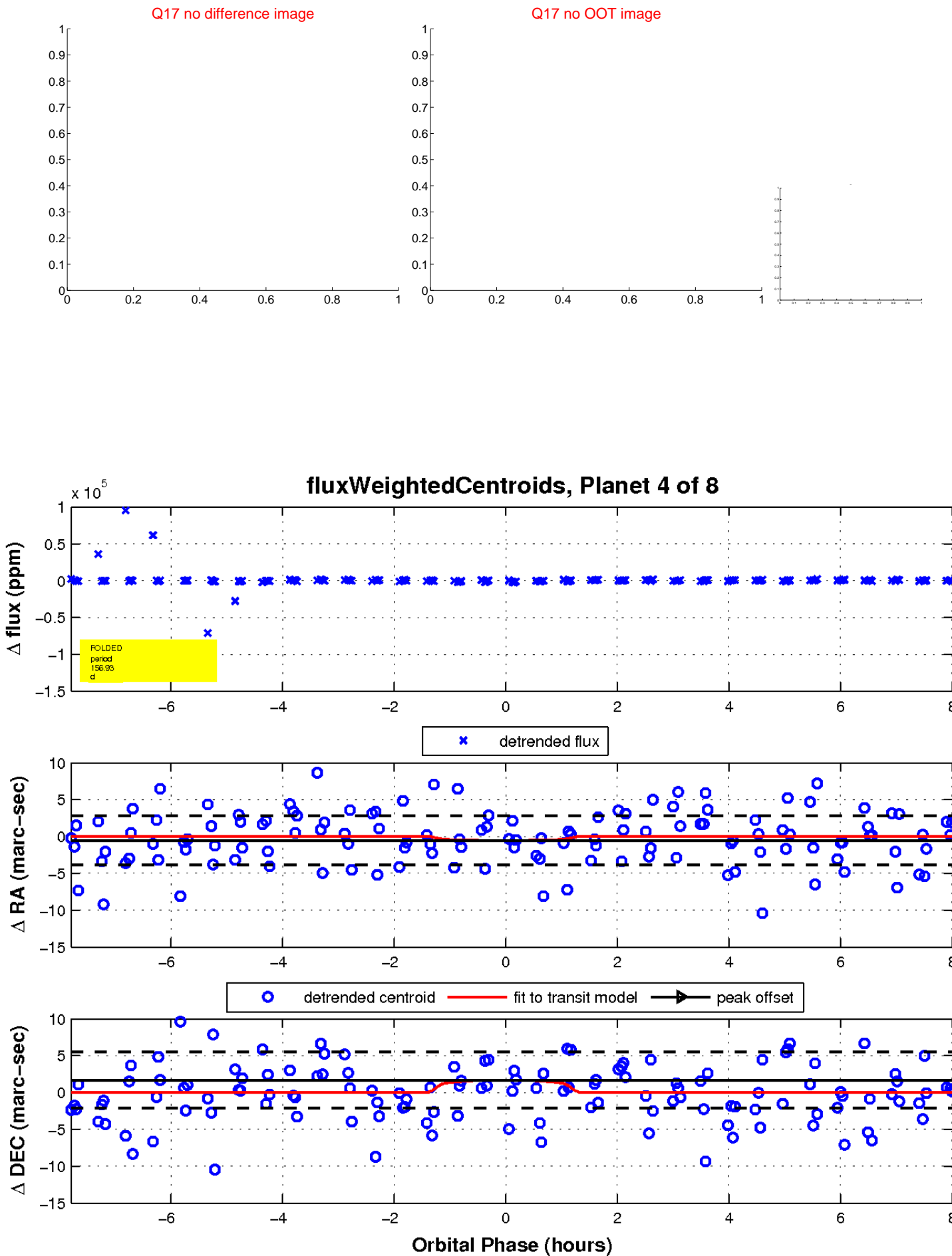
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

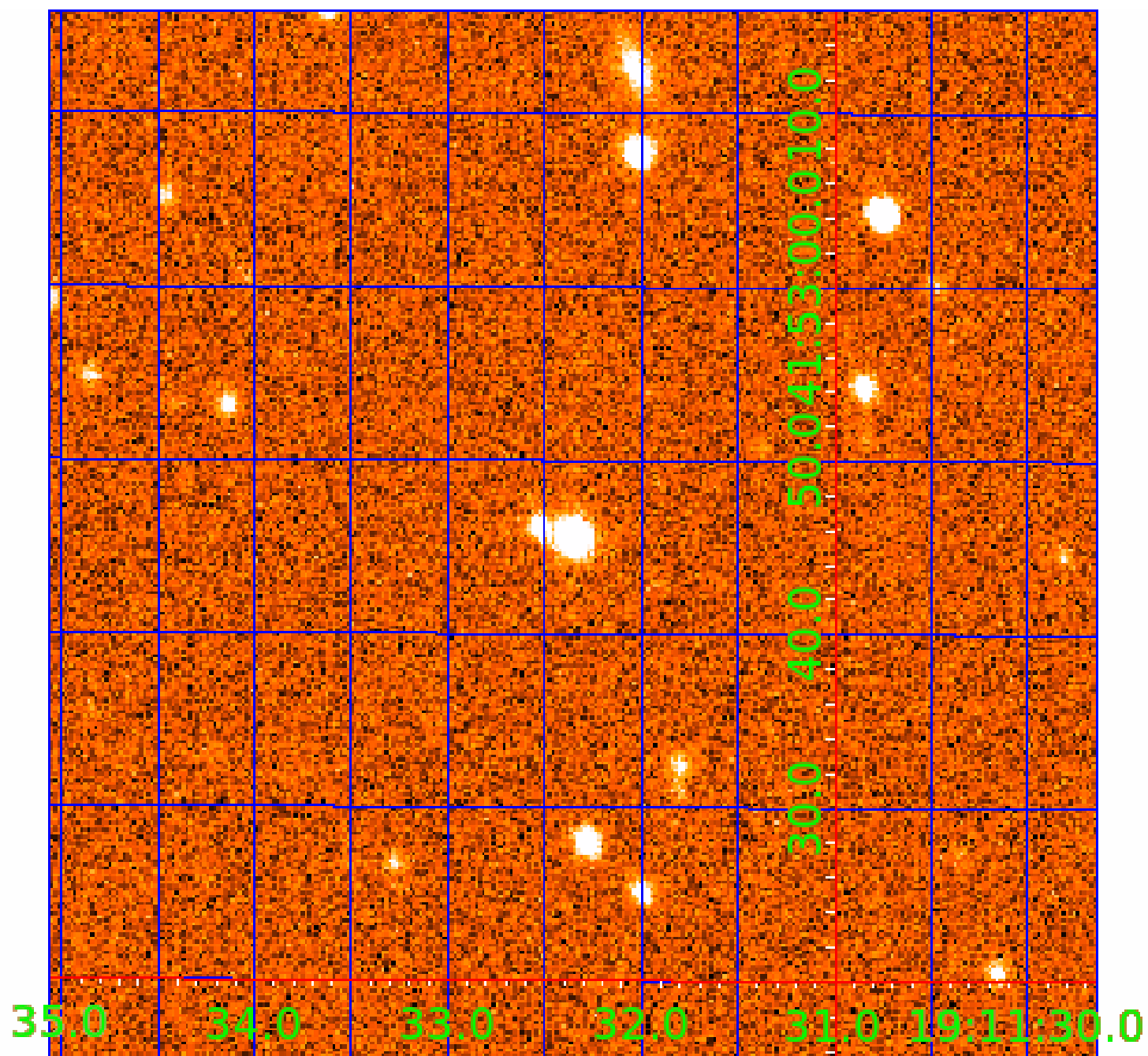


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006431670

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|------|-----------------------------|-----------------|------------------------|------------------------|
| 006431670-01 | OBS | 3534.01 | 29.911333 | 153.592861 | 358289.4 | 4.500 | 3602.3 | -1.0 | 0.70 | 5303 | 38.41 | 11.70 |
| 006431670-02 | OBS | No | 29.911512 | 144.830269 | 366672.0 | 5.000 | 3551.7 | -1.0 | 0.70 | 5303 | 37.44 | 11.70 |
| 006431670-03 | OBS | No | 14.955586 | 138.941998 | 13405.1 | 15.000 | 78.3 | -1.0 | 0.70 | 5303 | 8.01 | 29.49 |
| 006431670-04 | OBS | No | 156.930302 | 169.510324 | 1996.2 | 2.675 | 11.8 | 6.5 | 0.70 | 5303 | 3.36 | 1.28 |
| 006431670-05 | OBS | No | 70.646192 | 198.621740 | 435.5 | 10.064 | 11.7 | 4.6 | 0.70 | 5303 | 1.56 | 3.72 |
| 006431670-06 | OBS | No | 115.313282 | 218.062208 | 1587.8 | 4.058 | 16.1 | 7.0 | 0.70 | 5303 | 2.89 | 1.94 |
| 006431670-07 | OBS | No | 300.041667 | 356.111204 | 1829.8 | 5.475 | 9.8 | 8.2 | 0.70 | 5303 | 3.29 | 0.54 |
| 006431670-08 | OBS | No | 272.059128 | 134.308141 | 933.6 | 13.392 | 11.4 | 5.4 | 0.70 | 5303 | 2.16 | 0.62 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 006431670-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS |
| 006431670-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_NOFITS |
| 006431670-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS |
| 006431670-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 006431670-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-07 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-08 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

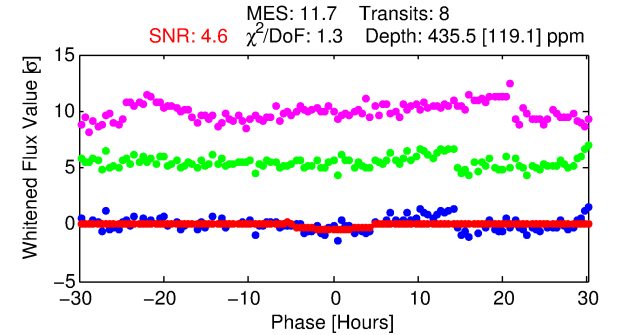
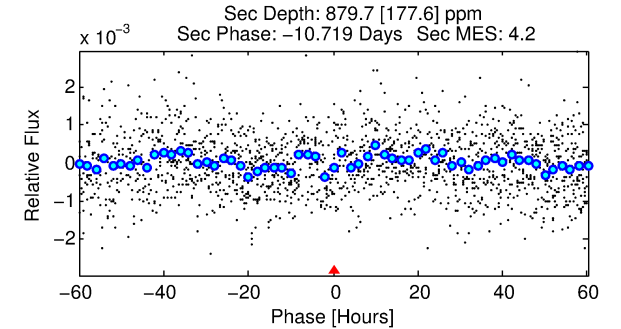
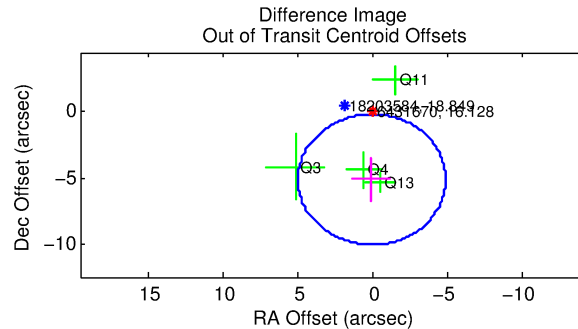
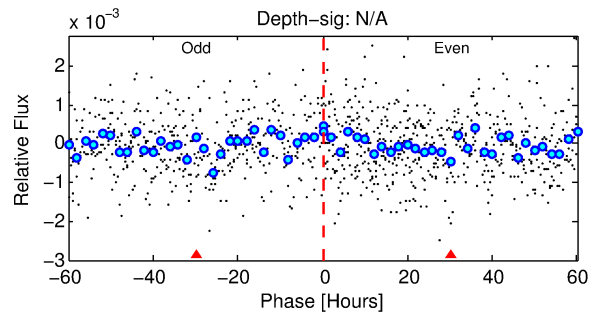
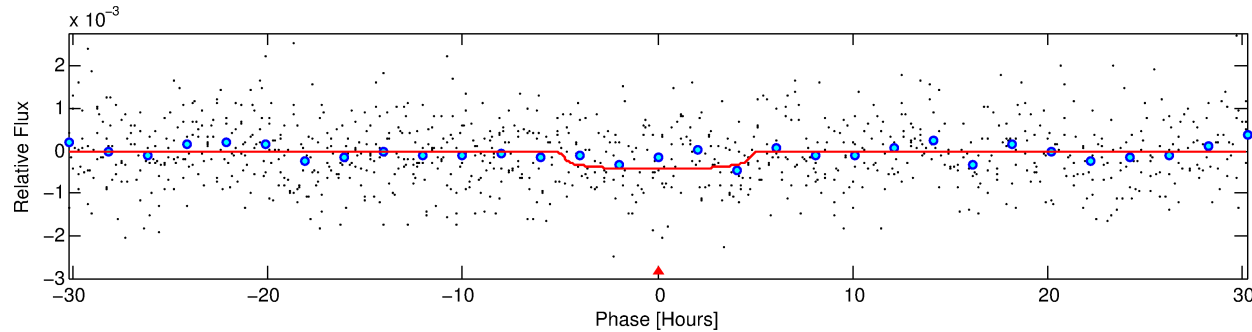
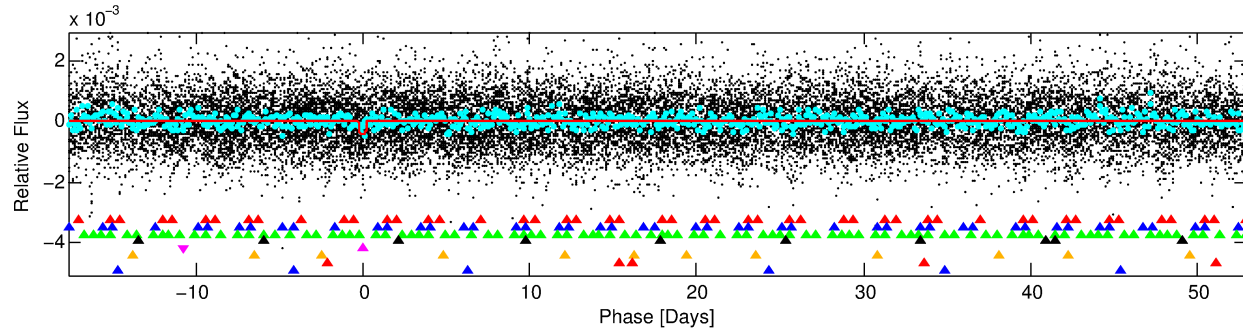
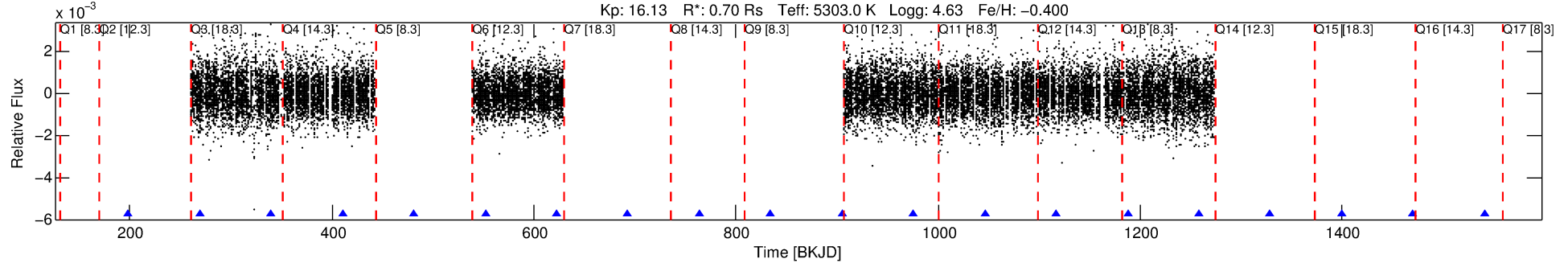
Ephemeris Match Information For 006431670-05

No Significant Match Found

DV One-Page Summary

KIC: 6431670 Candidate: 5 of 8 Period: 70.646 d
KOI: K03534 Corr: No Ephemeris Match

Kp: 16.13 R*: 0.70 Rs Teff: 5303.0 K Logg: 4.63 Fe/H: -0.400



DV Fit Results:

Period = 70.64619 [0.00395] d
Epoch = 198.6217 [0.0332] BKJD
Rp/R* = 0.0203 [0.0256]
a/R* = 40.16 [203.46]
b = 0.69 [3.83]
Seff = 3.72 [0.86]
Teq = 354 [21] K
Rp = 1.56 [1.98] Re
a = 0.3072 [0.0396] AU
Ag = 18700.84 [47278.44] [0.40σ]
Teffp = 6403 [4043] K [1.50σ]

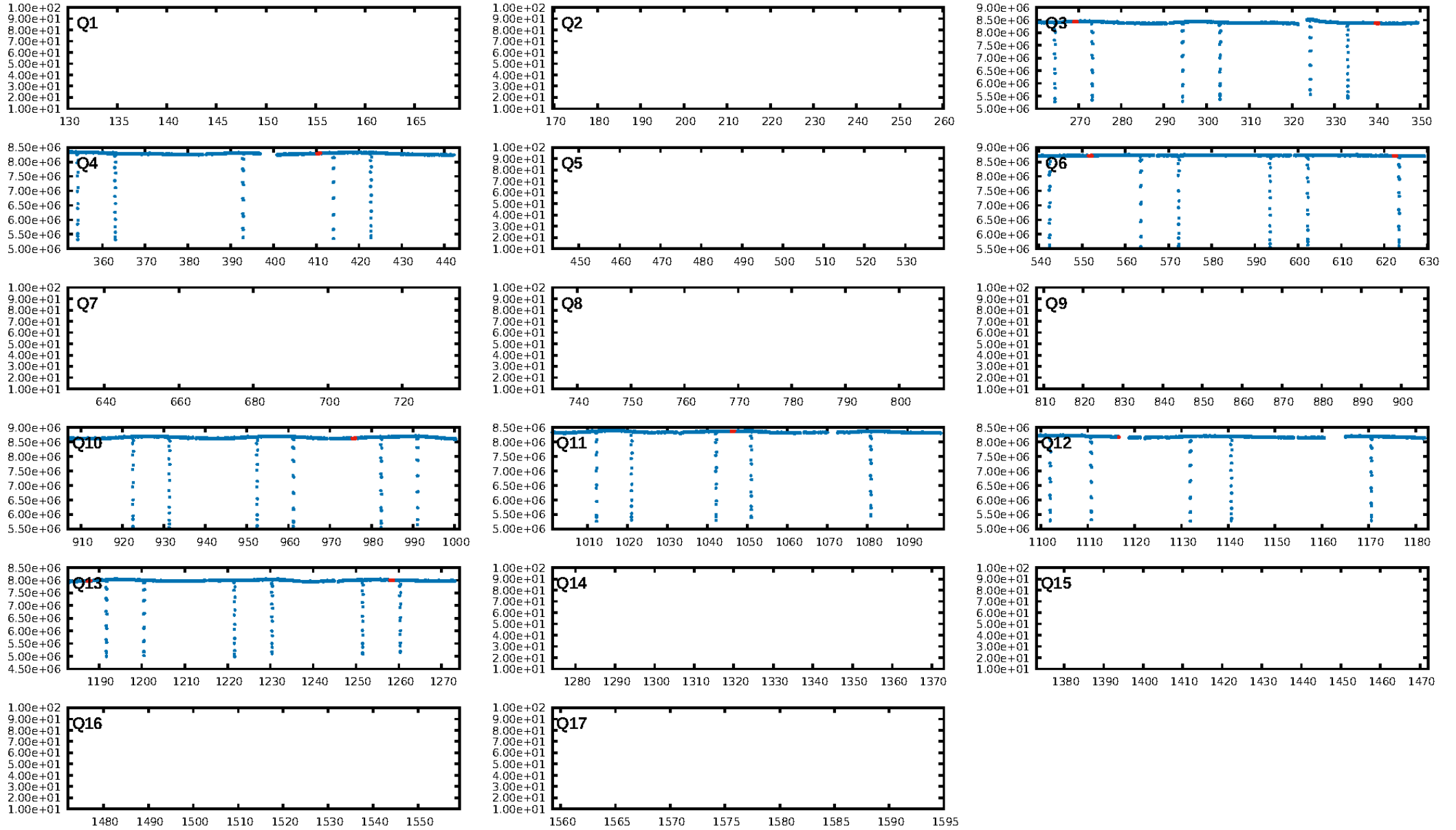
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [87.00σ]
LongPeriod-sig: 100.0% [98.79σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 85.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: 1.729
Centroid-sig: 35.1%
Centroid-so: 2.239 arcsec [1.08σ]
OotOffset-rm: 5.128 arcsec [3.11σ]
KicOffset-rm: 5.211 arcsec [4.48σ]
OotOffset-st: 0/2/1/1 [4]
KicOffset-st: 0/2/1/1 [4]
DiffImageQuality-fgm: 0.00 [0/4]
DiffImageOverlap-fno: 0.83 [5/6]

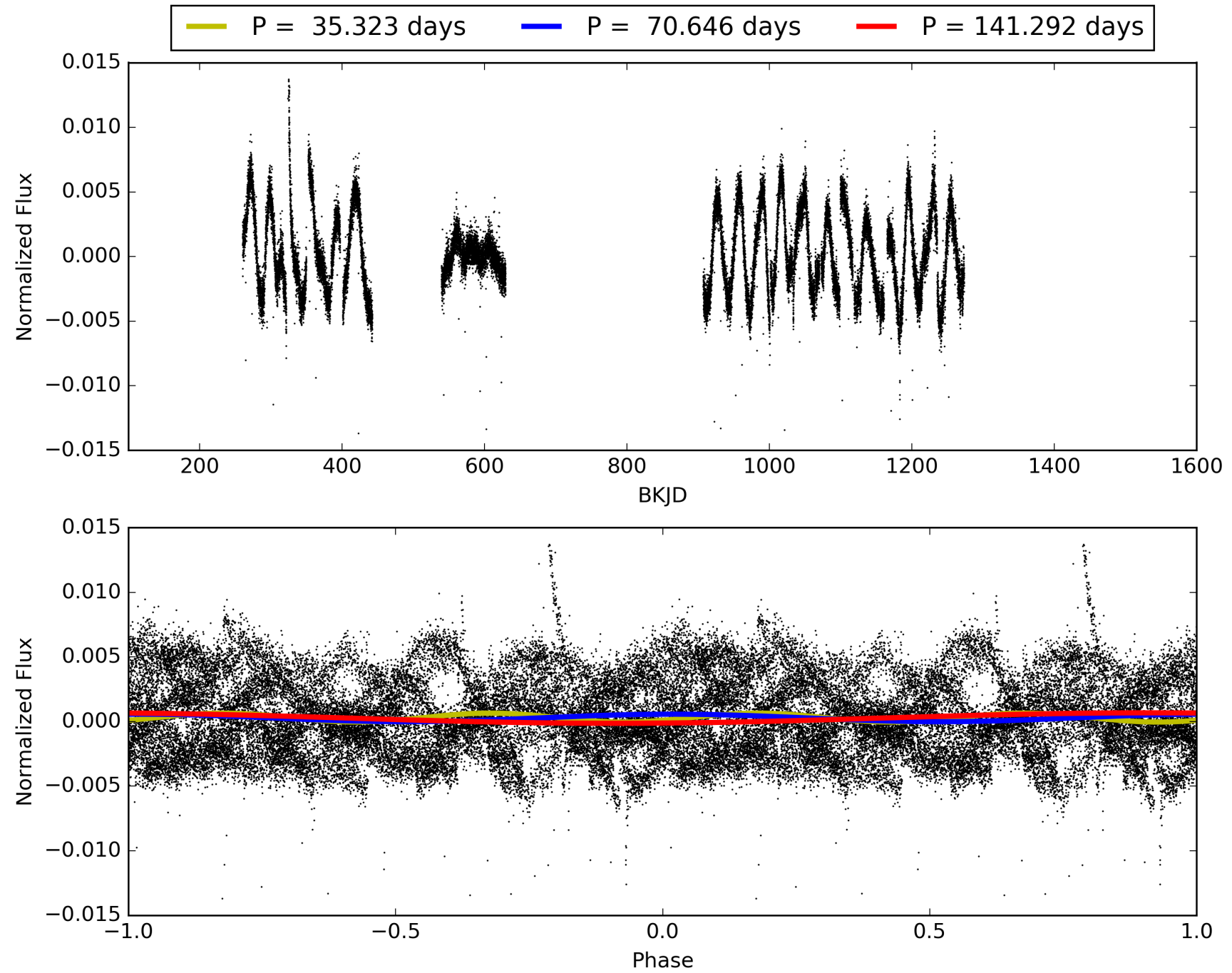
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:30:04 Z

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

TCE 006431670-05, PDC Light Curves

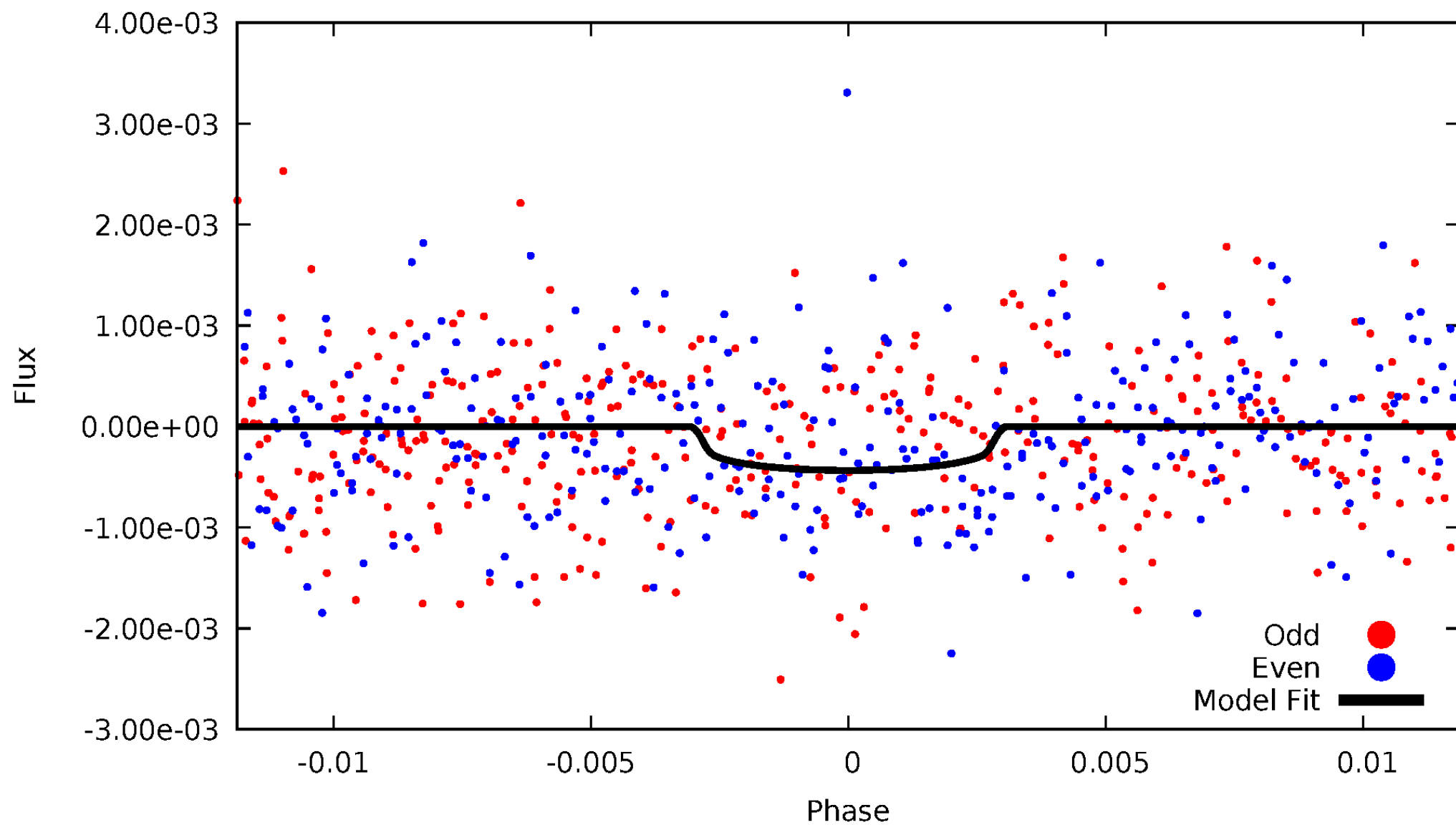


TCE 006431670-05



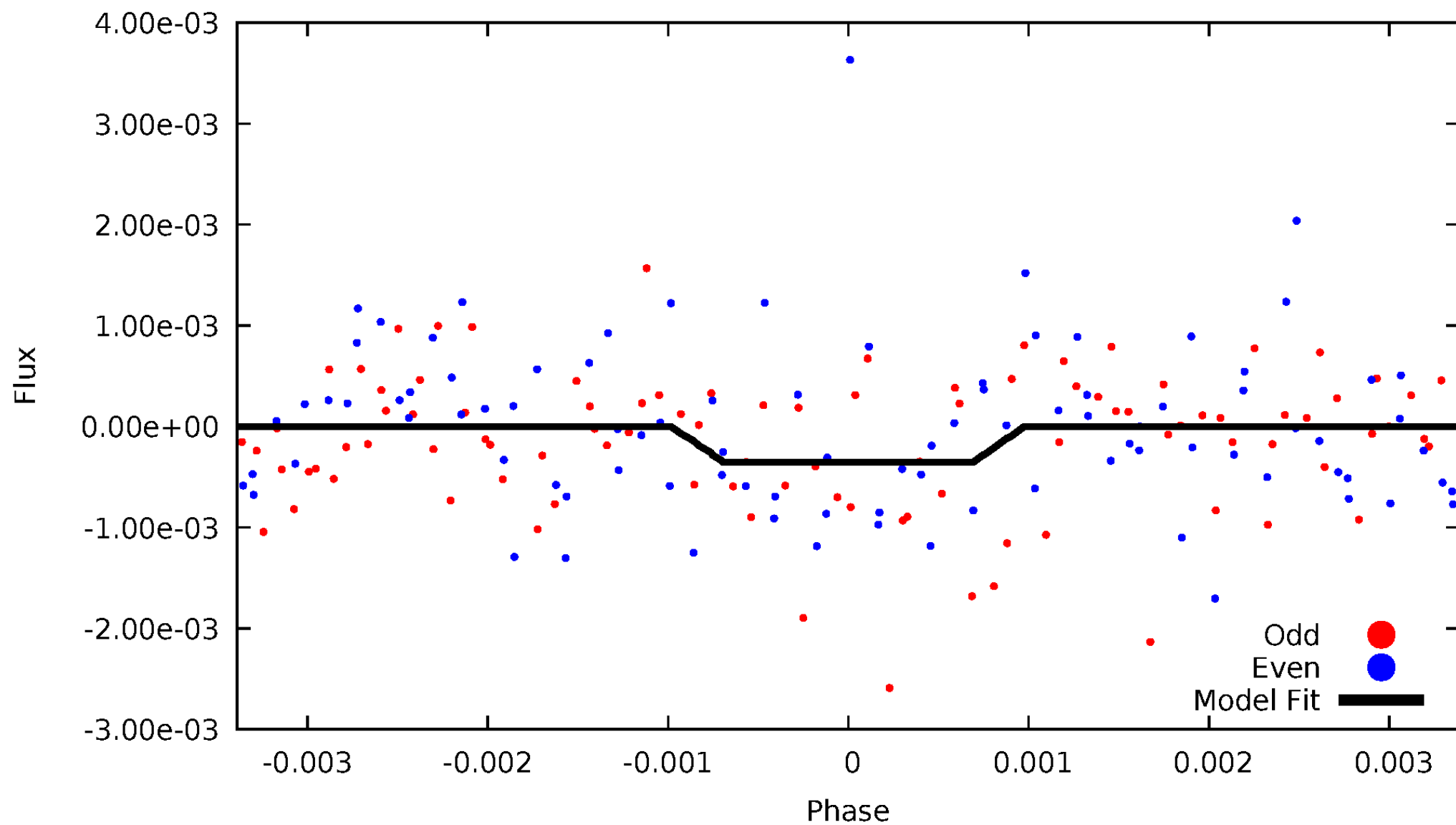
DV Odd/Even

TCE 006431670-05



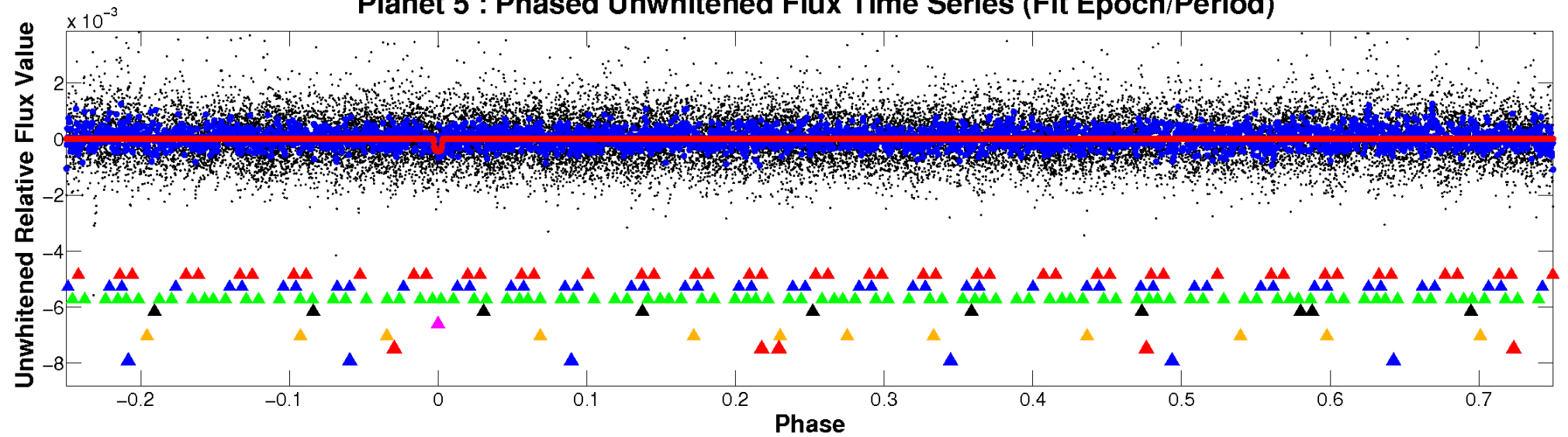
ALT Odd/Even

TCE 006431670-05

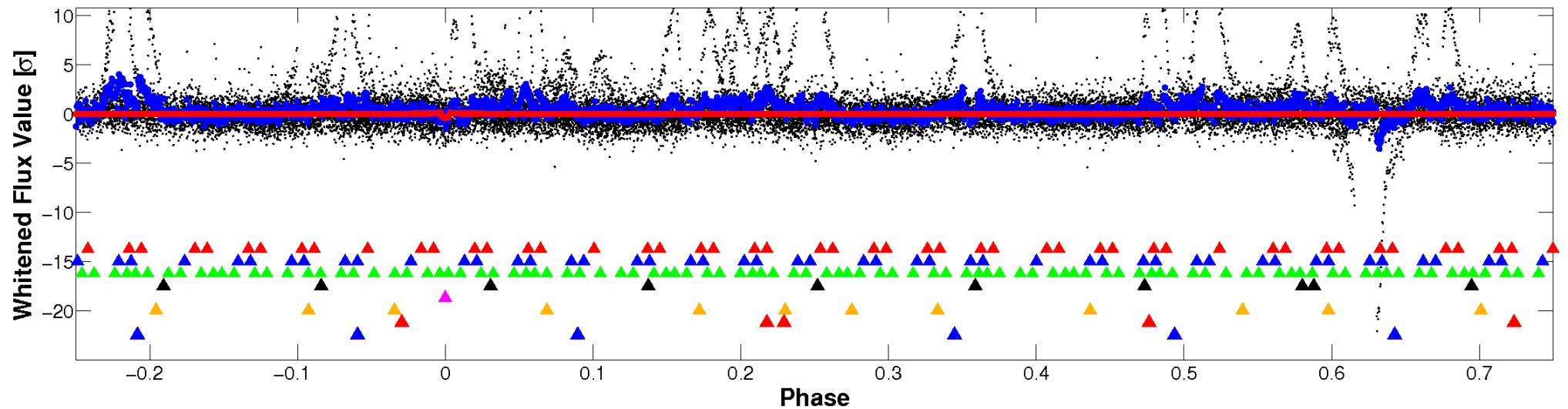


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

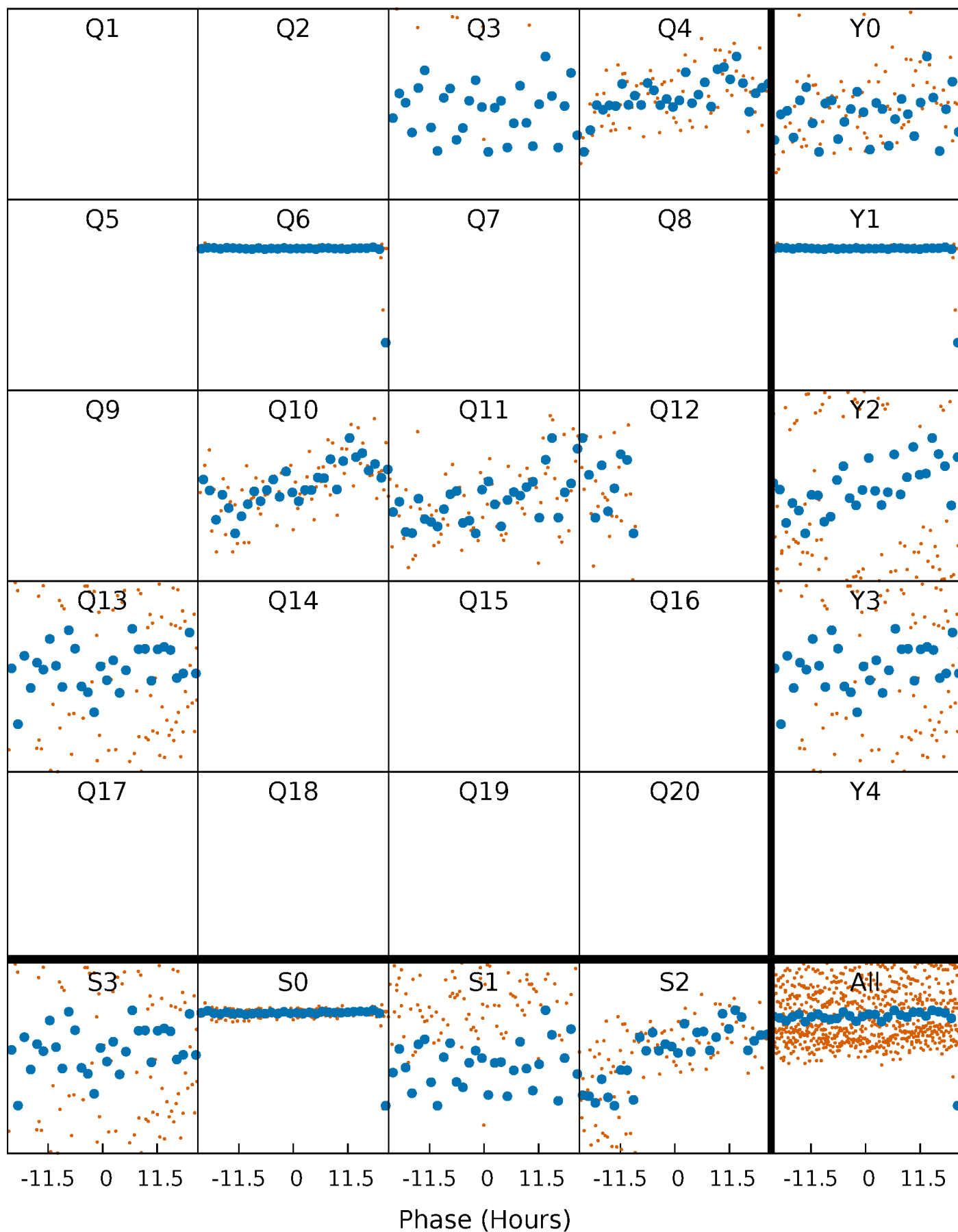


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



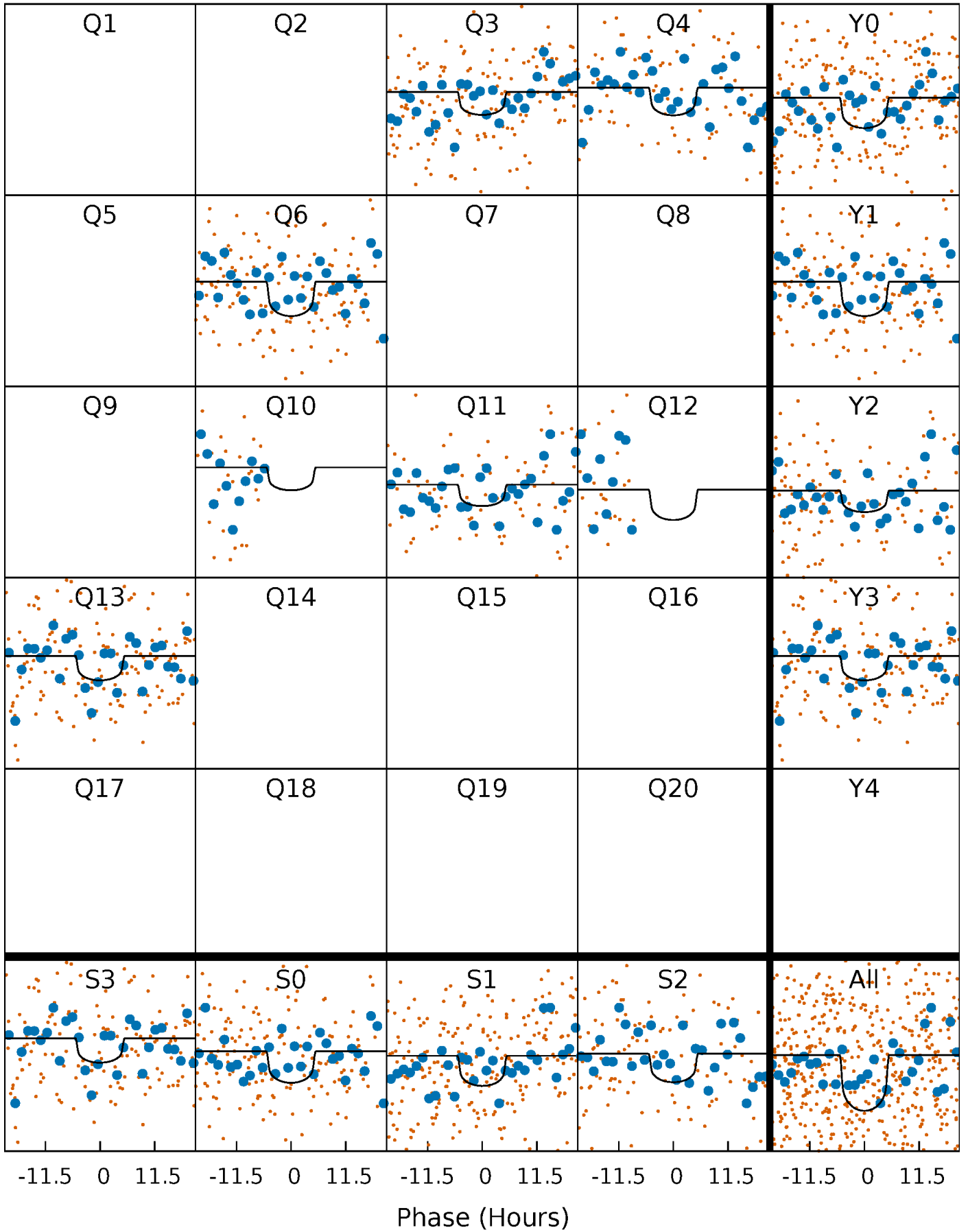
PDC Quarter-Phased Transit Curves

TCE 006431670-05 P= 70.646192 Days $T_0=198.621740$ (BKJD)



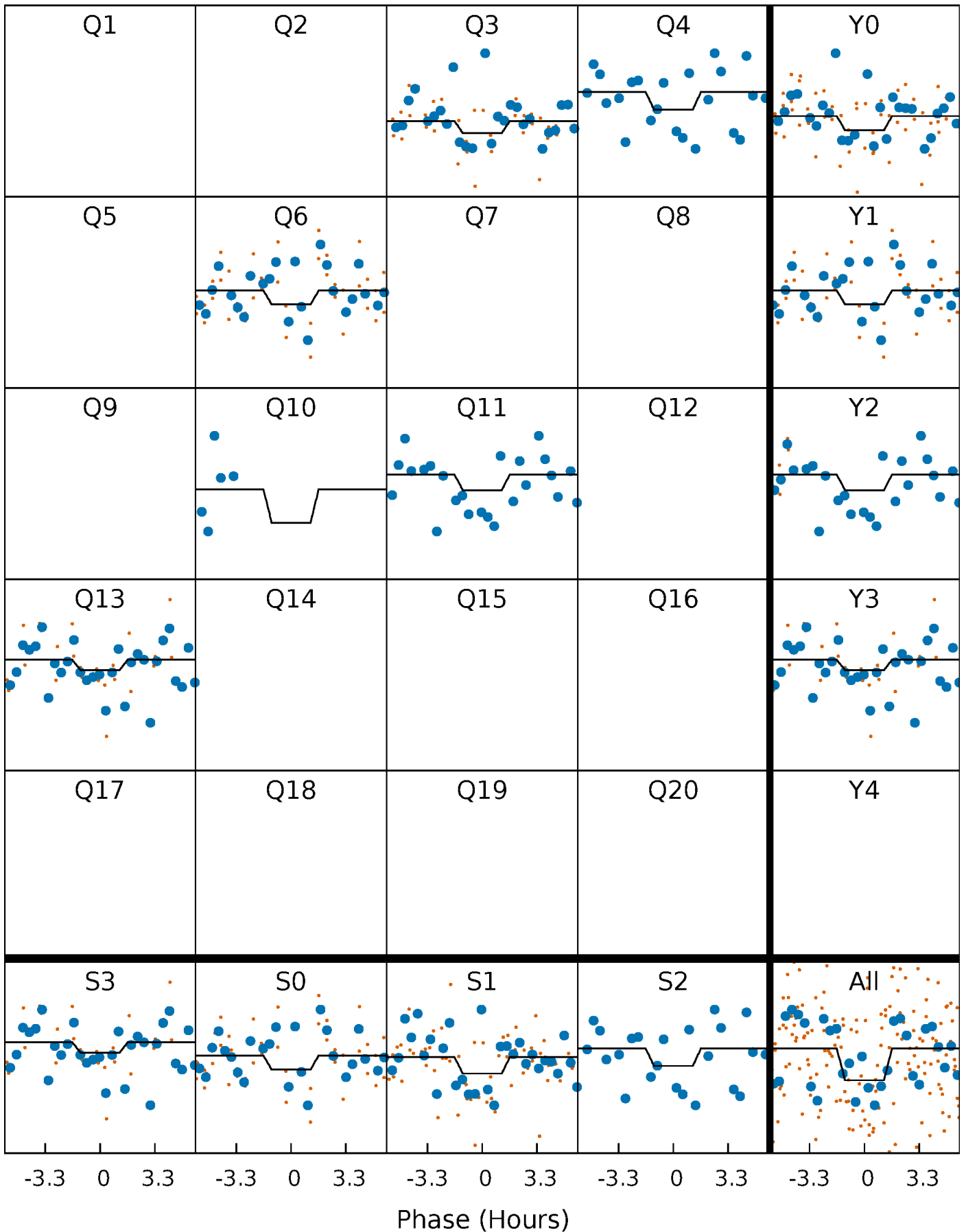
DV Quarter-Phased Transit Curves

TCE 006431670-05 $P = 70.646192$ Days $T_0 = 198.621740$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

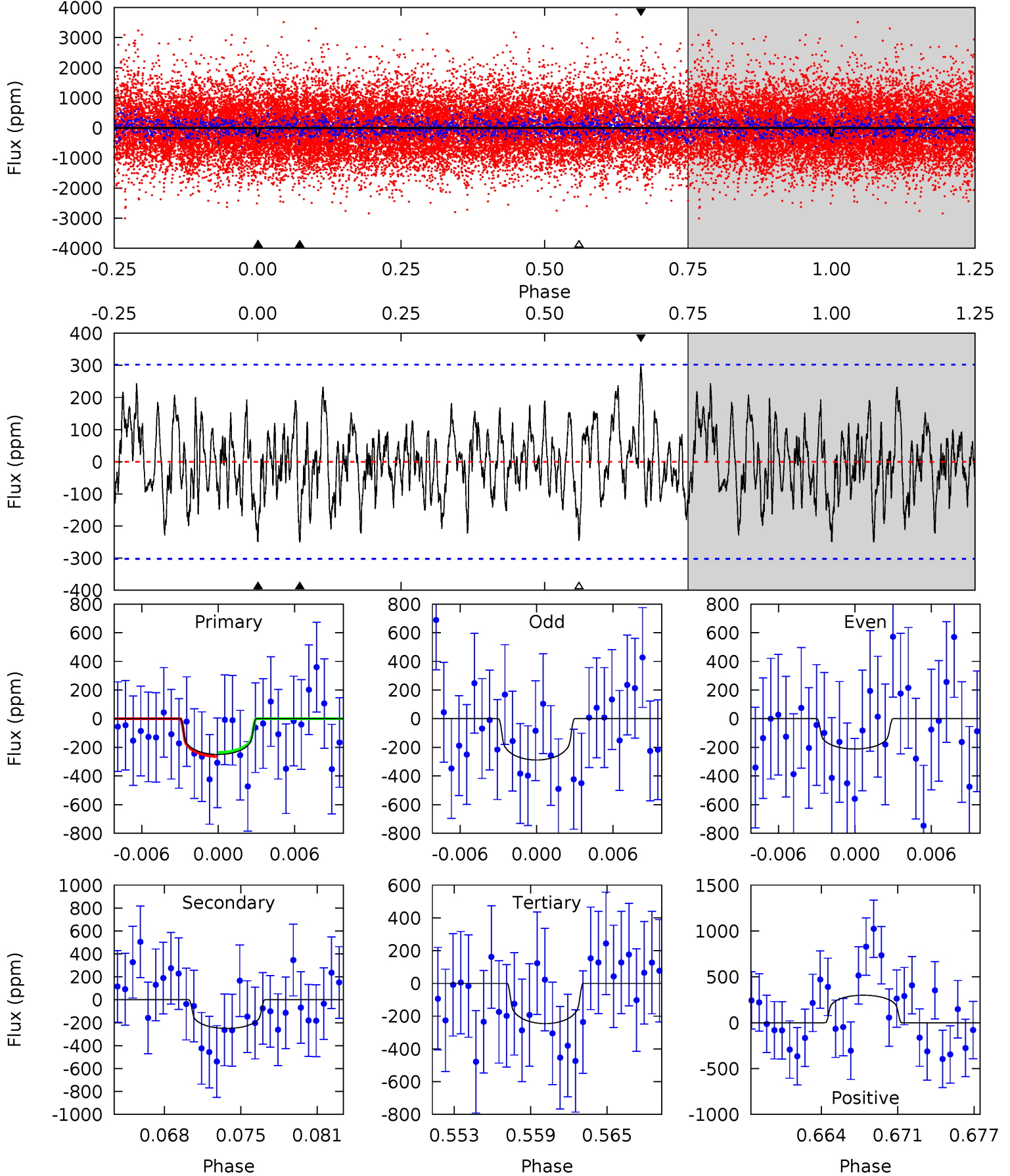
TCE 006431670-05 $P = 70.637997$ Days $T_0 = 198.635703$ (BKJD)



DV Model-Shift Uniqueness Test

006431670-05, P = 70.646192 Days, E = 198.621740 Days

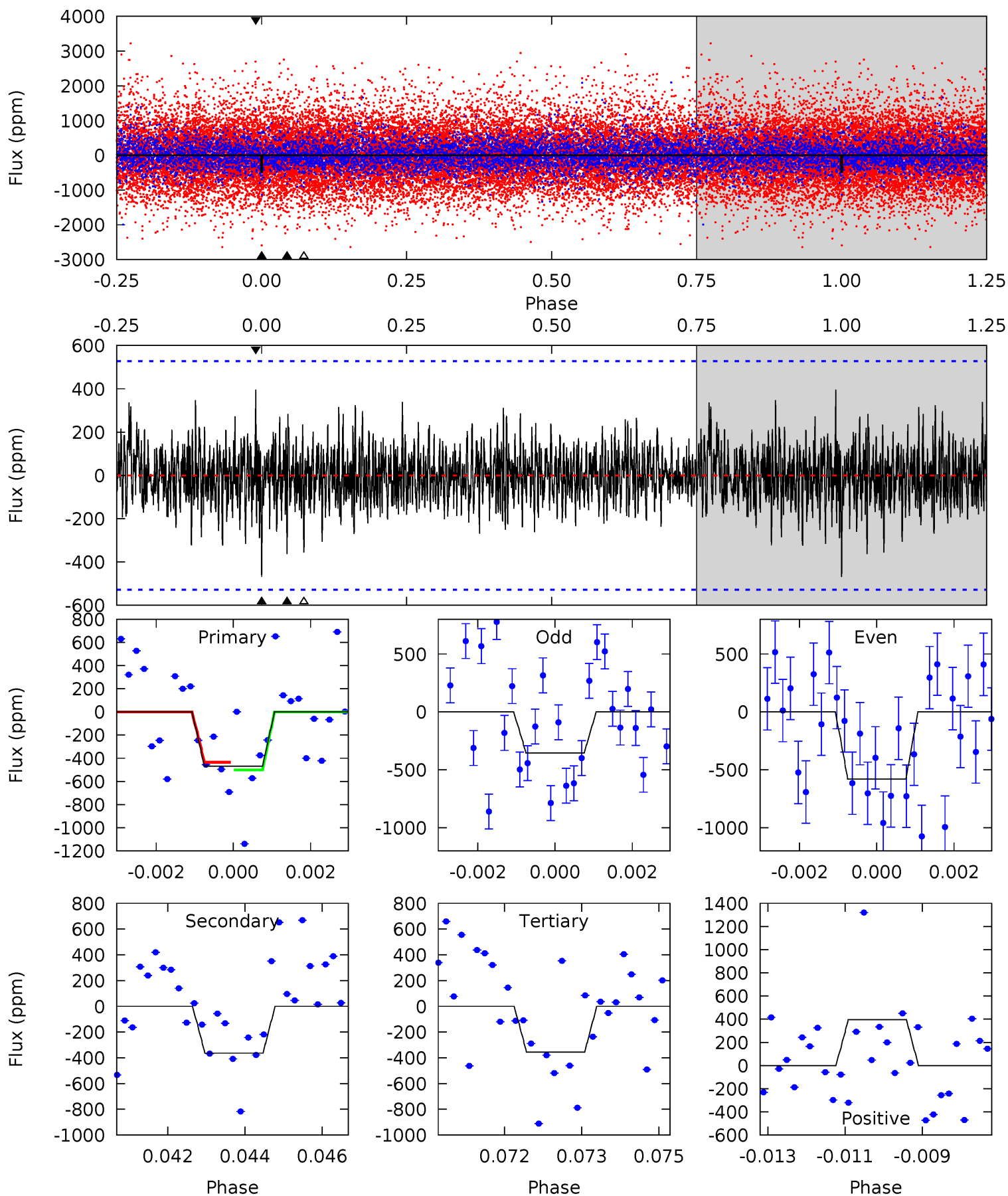
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 4.22 | 4.23 | 4.15 | 5.07 | 5.12 | 2.74 | 1.54 | 0.07 | -0.84 | 0.07 | -0.84 | 0.65 | 1.18 | 0.55 | 0 |



Alt Model-Shift Uniqueness Test

006431670-05, $P = 70.637997$ Days, $E = 198.635703$ Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 4.75 | 3.68 | 3.60 | 4.00 | 5.34 | 3.12 | 1.04 | 1.15 | 0.74 | 0.08 | -0.32 | 1.14 | 0.98 | 0.46 | 0.34 |



Stellar Parameters For KIC 006431670

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5303^{+191}_{-191} | $4.632^{+0.032}_{-0.097}$ | $-0.400^{+0.300}_{-0.300}$ | $0.704^{+0.111}_{-0.051}$ | $0.785^{+0.074}_{-0.082}$ | $3.172^{+0.519}_{-1.000}$ |
| | +4%/-4% | +1%/-2% | +75%/-75% | +16%/-7% | +9%/-10% | +16%/-32% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 006431670-05 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|------------------------|-------------------|-----------------------|-------------------------|
| DV | -250 ± 59 | $2.13^{+1.79}_{-1.39}$ | 500^{+24}_{-21} | 4224^{+2721}_{-788} | 2727^{+21211}_{-1922} |
| Alt. | -363 ± 99 | $2.17^{+1.74}_{-1.40}$ | 503^{+22}_{-23} | 4562^{+2761}_{-926} | 3963^{+27927}_{-2792} |

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

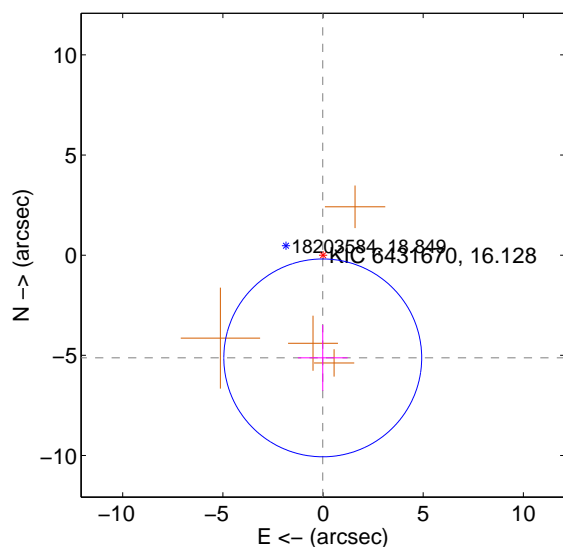
Supplemental centroid analysis for 006431670-05. Kepler magnitude: 16.13. Transit SNR 4.58

There are 0 quarters with good PRF difference image offsets

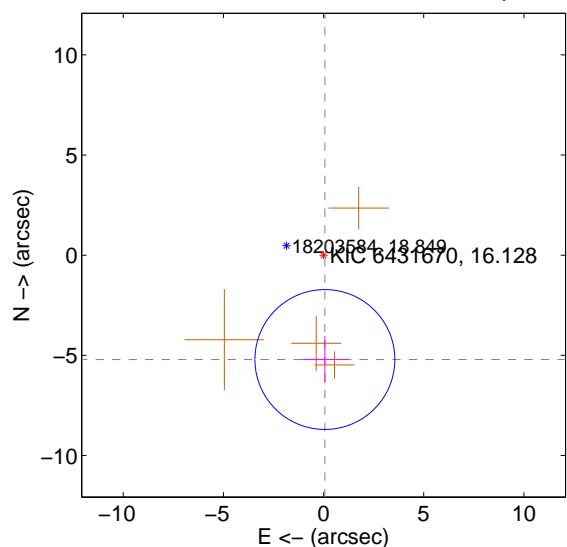
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 5.128 ± 1.646 | 3.11 | 0.014 ± 1.240 | -5.128 ± 1.646 |
| PRF-fit source offset from KIC position | 5.211 ± 1.164 | 4.48 | -0.065 ± 1.145 | -5.210 ± 1.173 |
| photometric centroid source offset | 2.24 ± 2.07 | 1.08 | -2.07 ± 2.06 | 0.84 ± 2.13 |

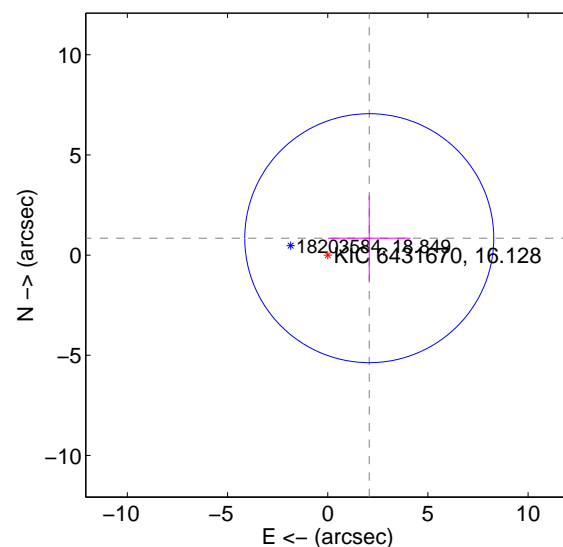
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

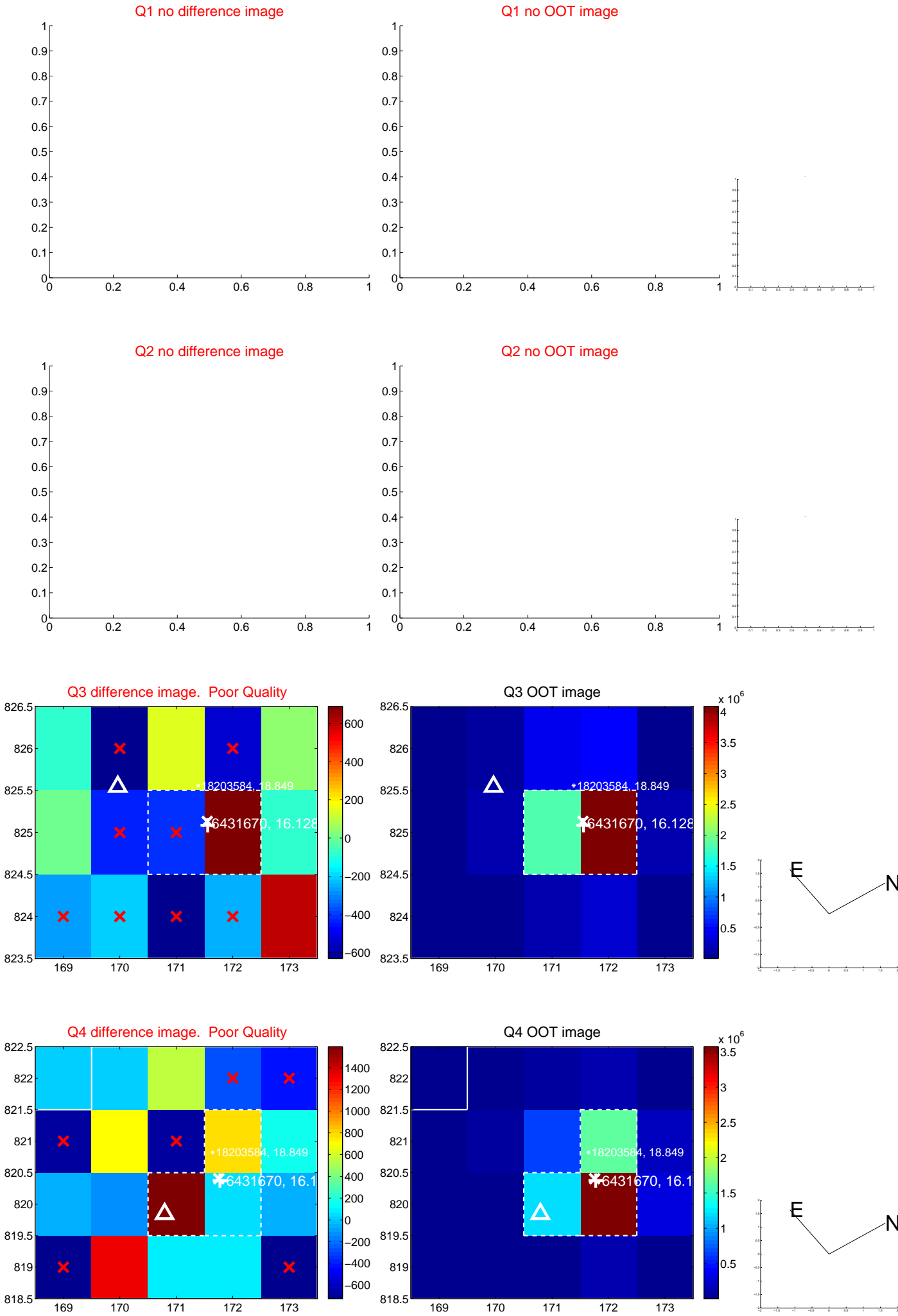


offset from photometric centroids

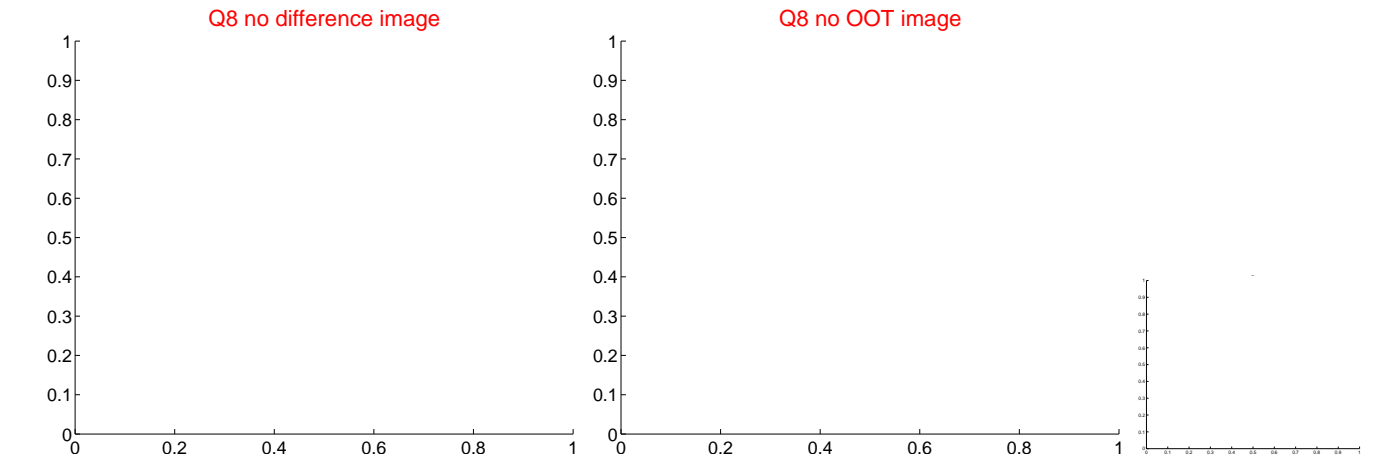
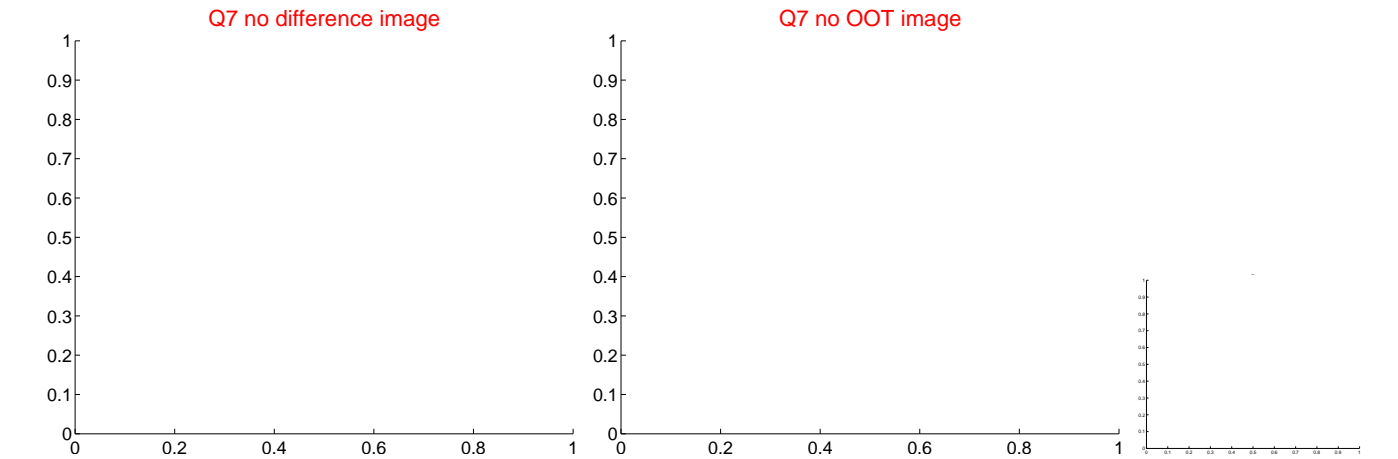
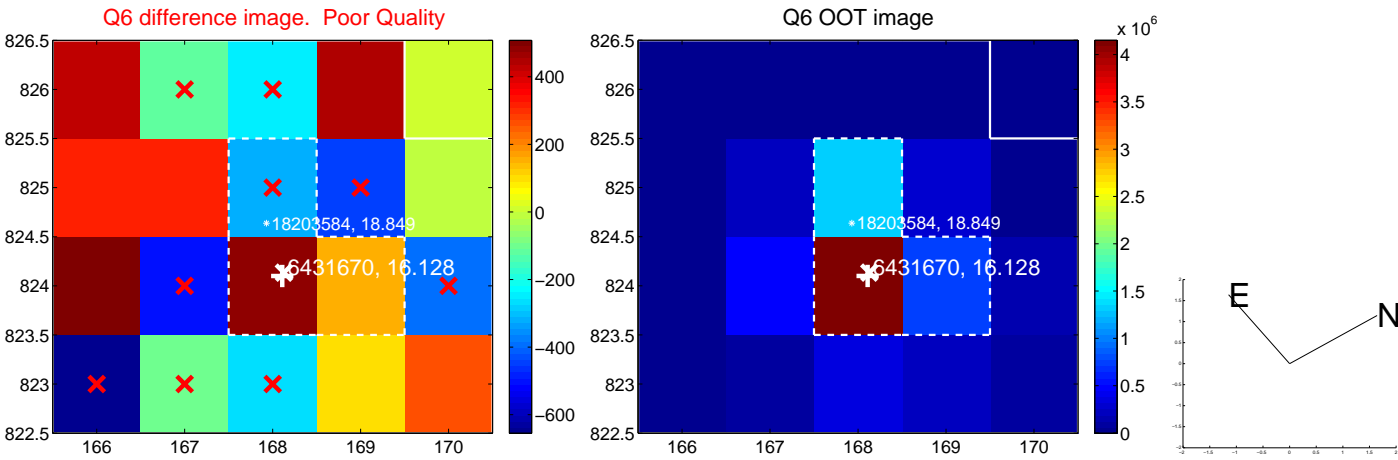
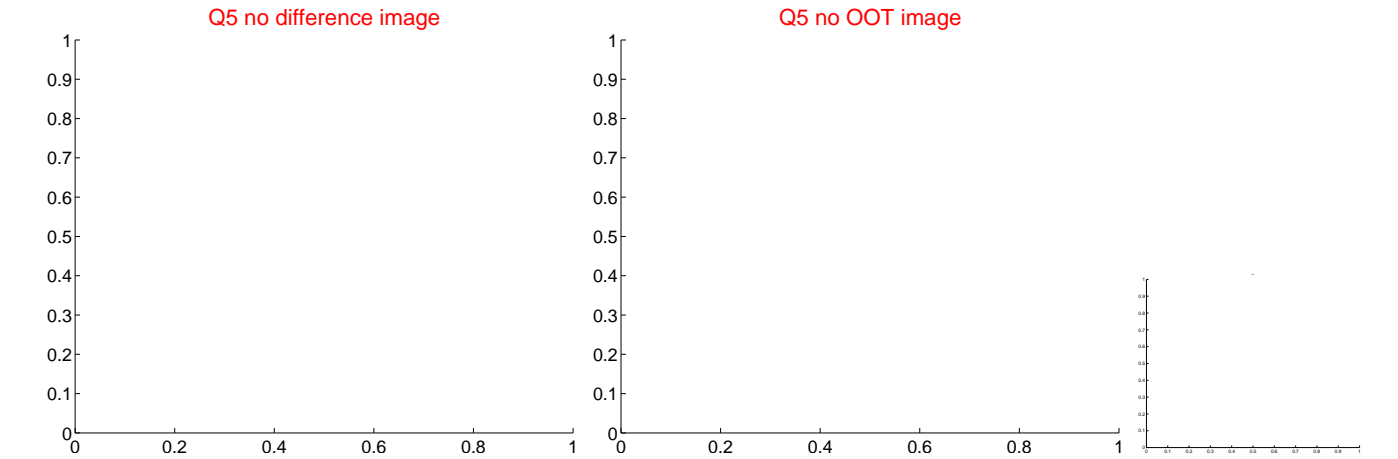


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

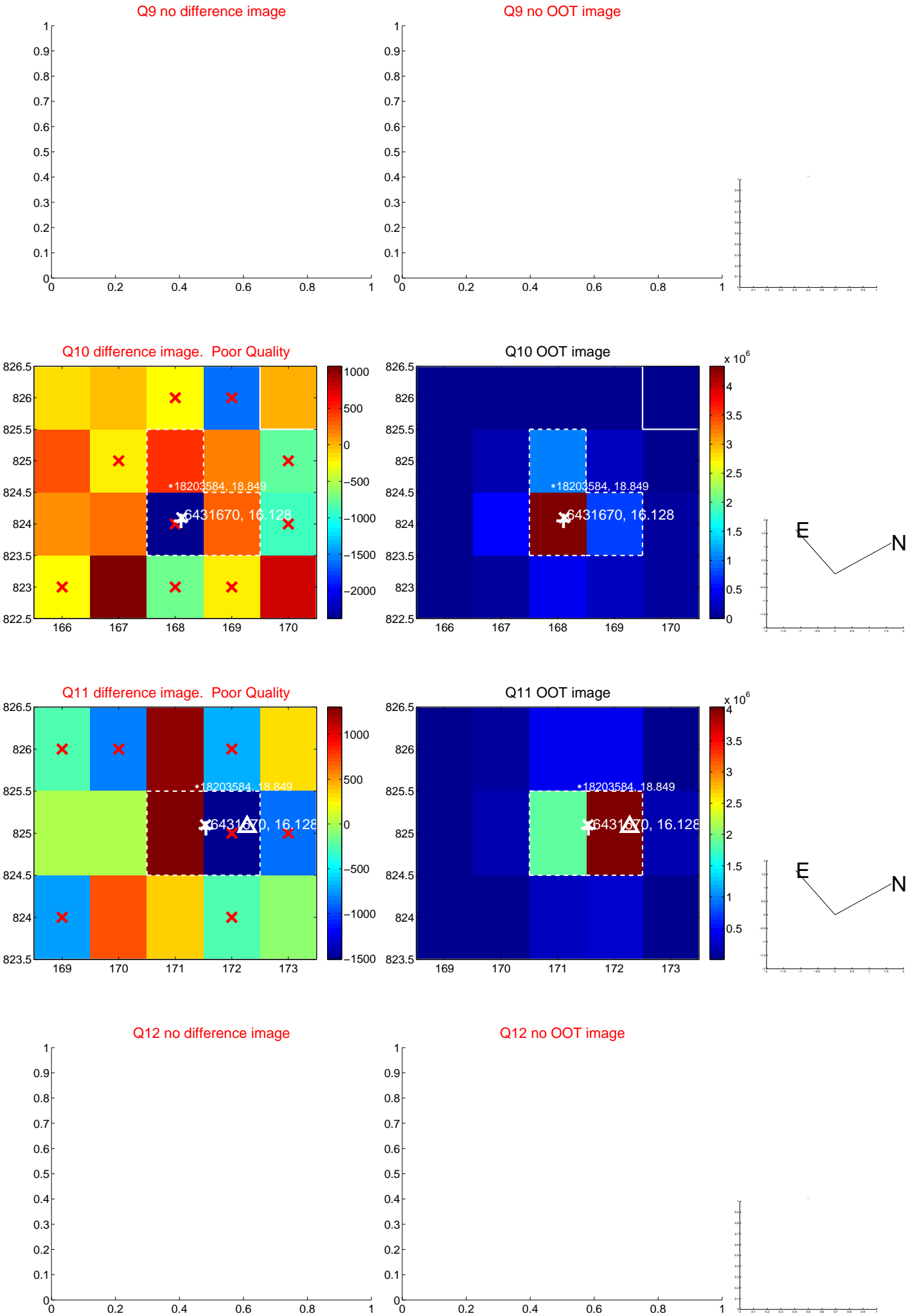
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



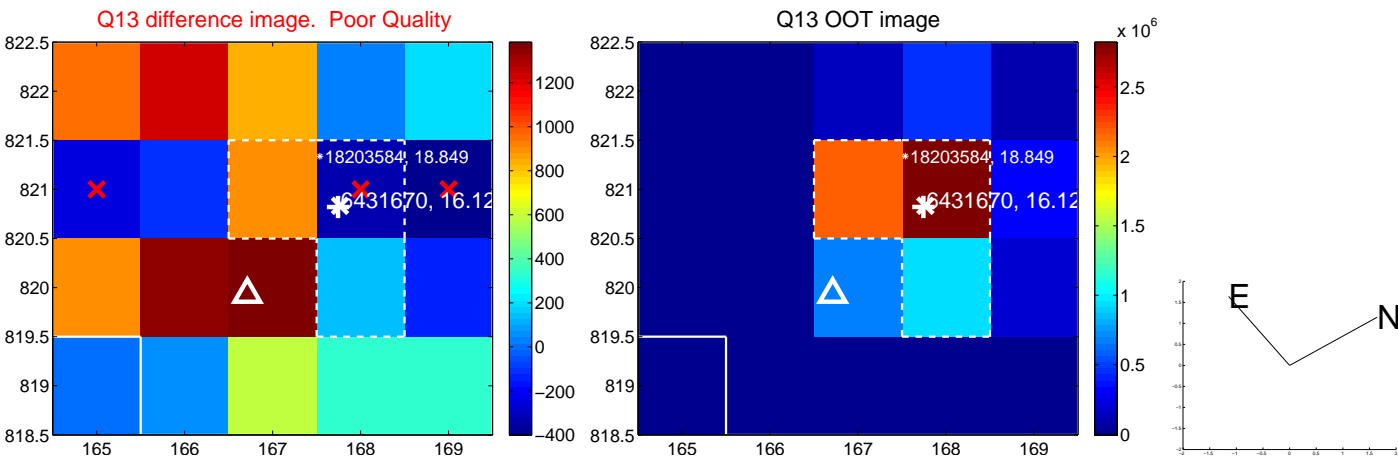
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



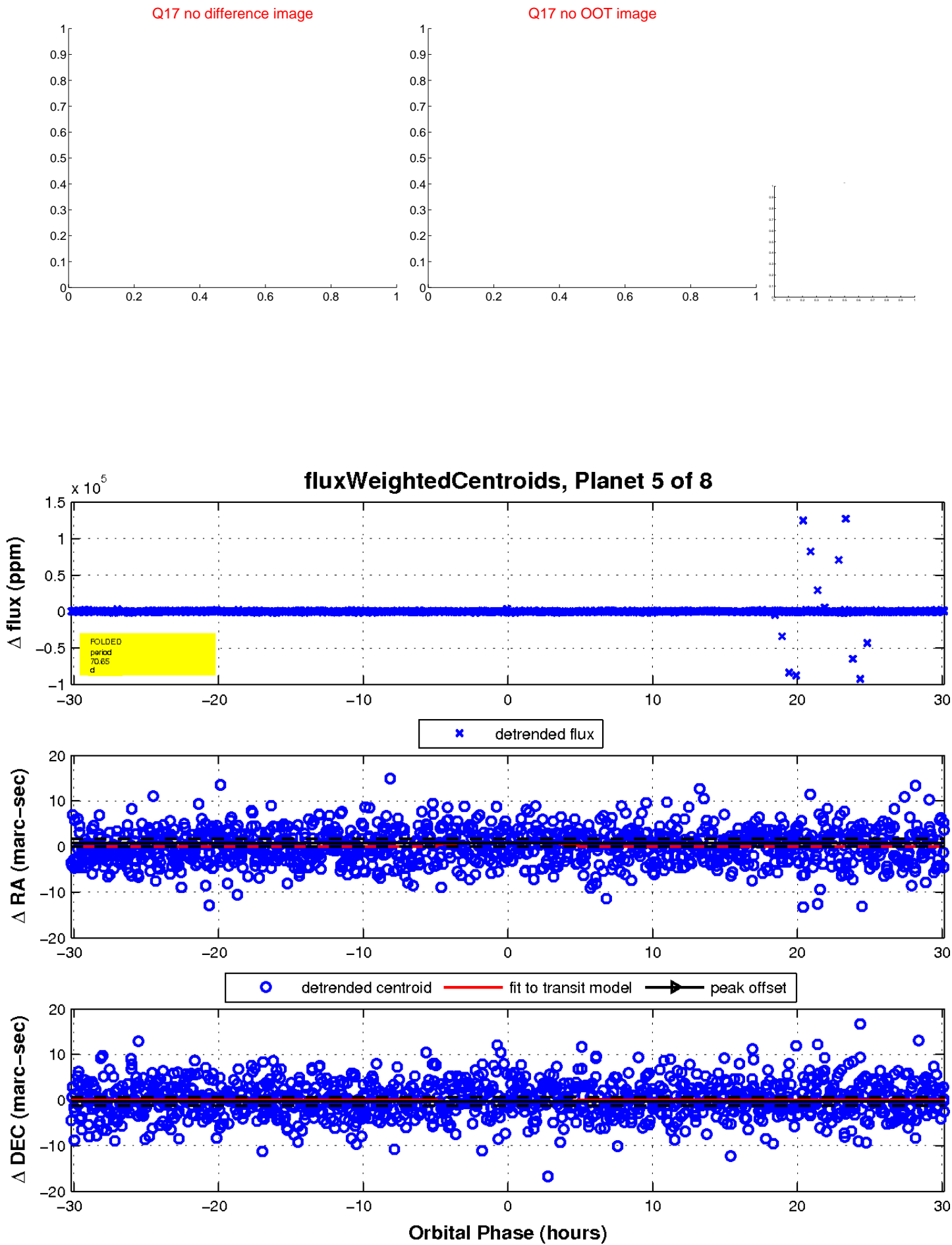
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

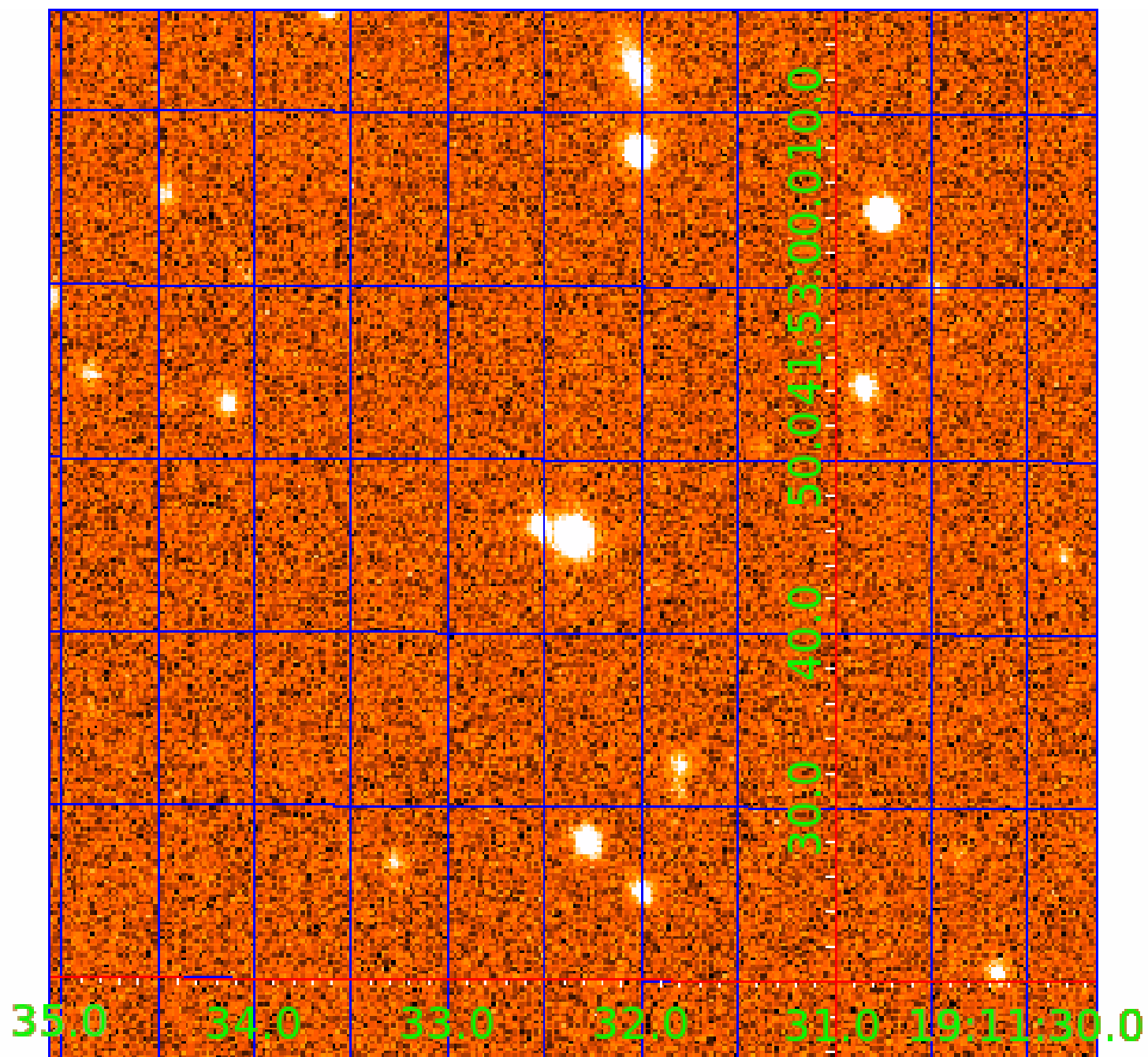


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006431670

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|------|-----------------------------|-----------------|------------------------|------------------------|
| 006431670-01 | OBS | 3534.01 | 29.911333 | 153.592861 | 358289.4 | 4.500 | 3602.3 | -1.0 | 0.70 | 5303 | 38.41 | 11.70 |
| 006431670-02 | OBS | No | 29.911512 | 144.830269 | 366672.0 | 5.000 | 3551.7 | -1.0 | 0.70 | 5303 | 37.44 | 11.70 |
| 006431670-03 | OBS | No | 14.955586 | 138.941998 | 13405.1 | 15.000 | 78.3 | -1.0 | 0.70 | 5303 | 8.01 | 29.49 |
| 006431670-04 | OBS | No | 156.930302 | 169.510324 | 1996.2 | 2.675 | 11.8 | 6.5 | 0.70 | 5303 | 3.36 | 1.28 |
| 006431670-05 | OBS | No | 70.646192 | 198.621740 | 435.5 | 10.064 | 11.7 | 4.6 | 0.70 | 5303 | 1.56 | 3.72 |
| 006431670-06 | OBS | No | 115.313282 | 218.062208 | 1587.8 | 4.058 | 16.1 | 7.0 | 0.70 | 5303 | 2.89 | 1.94 |
| 006431670-07 | OBS | No | 300.041667 | 356.111204 | 1829.8 | 5.475 | 9.8 | 8.2 | 0.70 | 5303 | 3.29 | 0.54 |
| 006431670-08 | OBS | No | 272.059128 | 134.308141 | 933.6 | 13.392 | 11.4 | 5.4 | 0.70 | 5303 | 2.16 | 0.62 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 006431670-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS |
| 006431670-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_NOFITS |
| 006431670-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS |
| 006431670-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 006431670-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-07 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-08 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

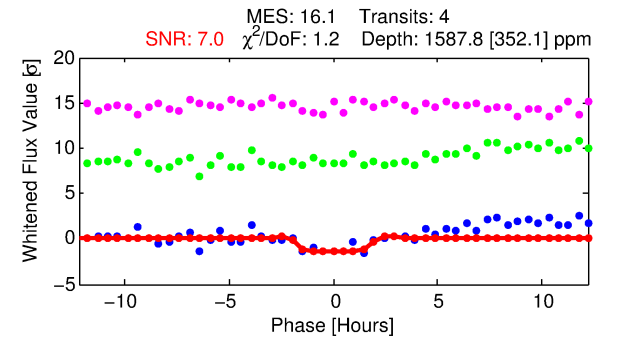
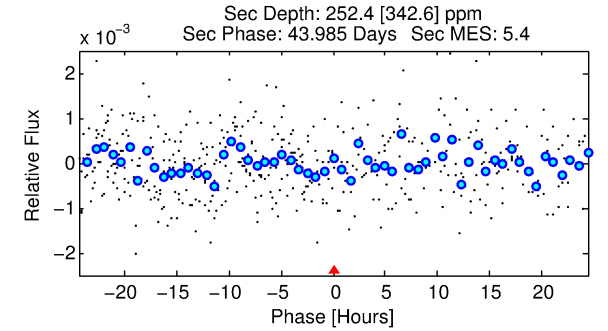
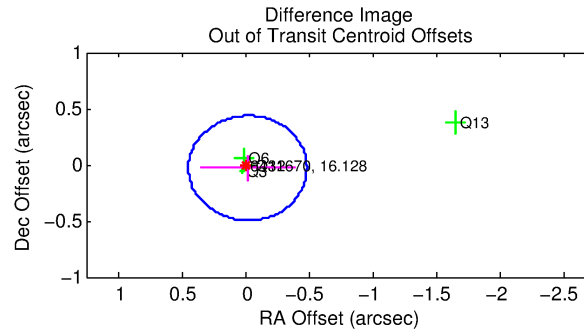
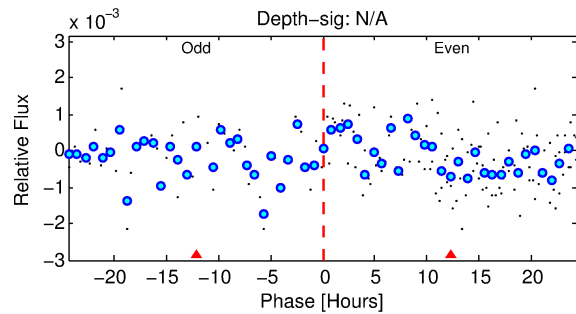
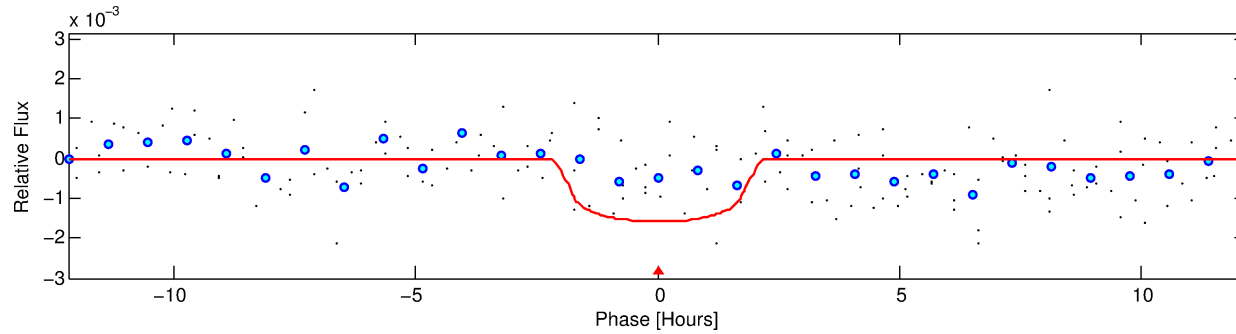
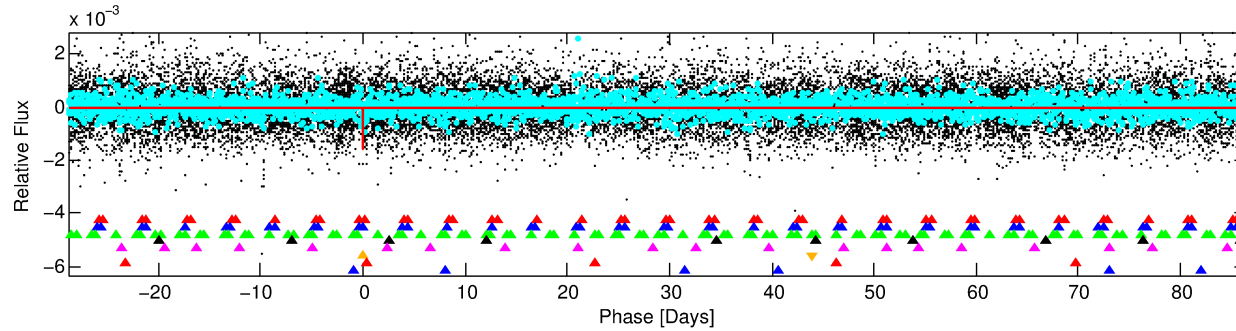
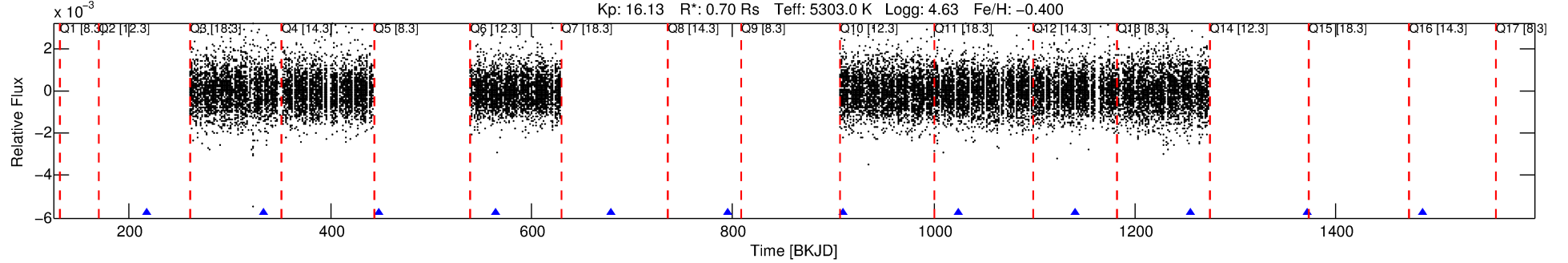
Ephemeris Match Information For 006431670-06

No Significant Match Found

DV One-Page Summary

KIC: 6431670 Candidate: 6 of 8 Period: 115.313 d
KOI: K03534 Corr: No Ephemeris Match

Kp: 16.13 R*: 0.70 Rs Teff: 5303.0 K Logg: 4.63 Fe/H: -0.400



DV Fit Results:

Period = 115.31328 [0.00329] d
Epoch = 218.0622 [0.0223] BKJD
Rp/R* = 0.0376 [0.0664]
a/R* = 187.98 [1310.70]
b = 0.57 [8.29]
Seff = 1.94 [0.45]
Teq = 301 [17] K
Rp = 2.89 [5.12] Re
a = 0.4259 [0.0549] AU
Ag = 3011.53 [11397.61] [0.26σ]
Teffp = 3445 [3258] K [0.97σ]

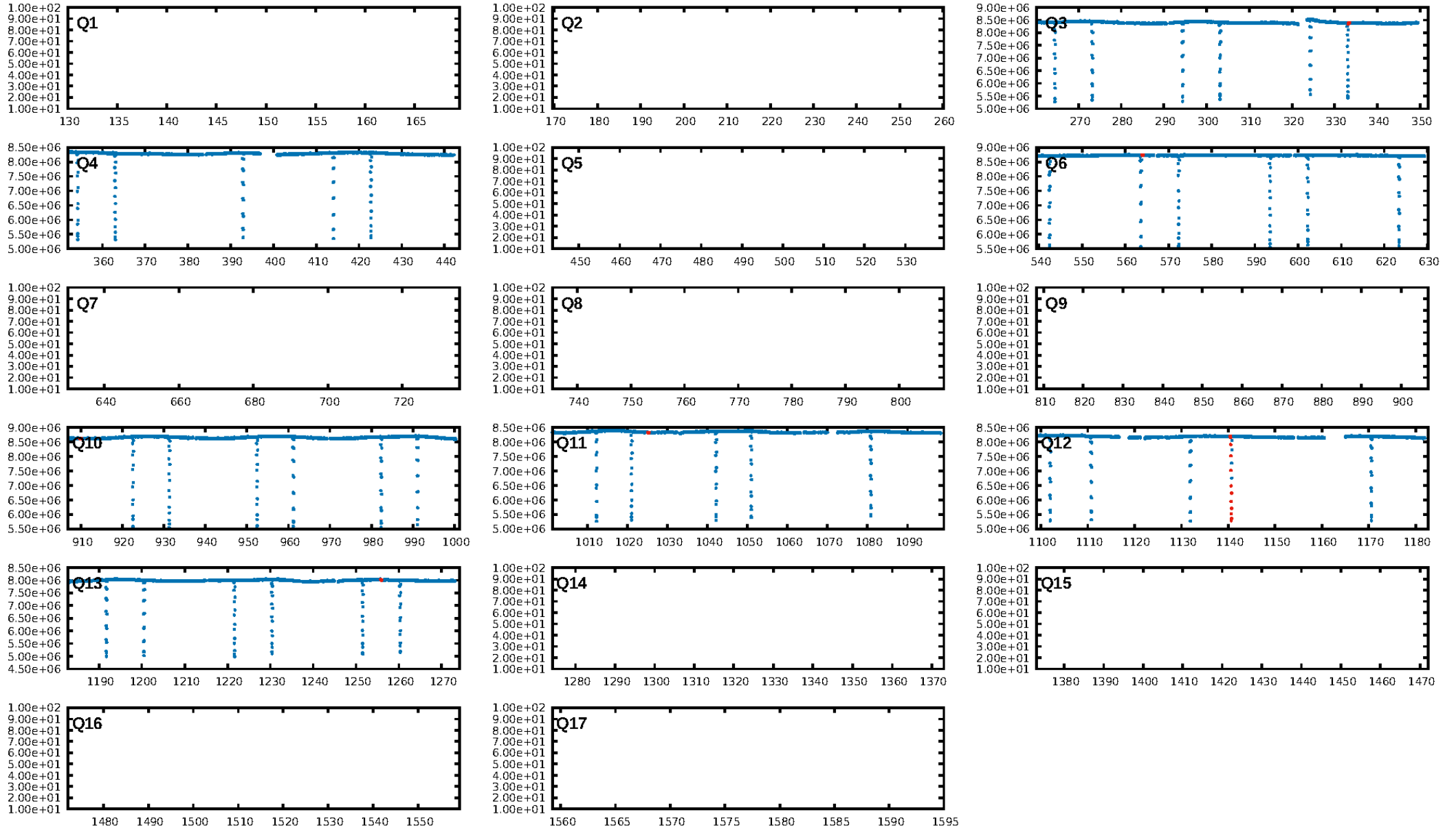
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [98.79σ]
LongPeriod-sig: 100.0% [205.48σ]
ModelChiSquare2-sig: 6.1%
ModelChiSquareGof-sig: 94.6%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.834
Centroid-sig: 49.5%
Centroid-so: 0.728 arcsec [0.63σ]
OotOffset-rm: 0.037 arcsec [0.24σ]
KicOffset-rm: 0.181 arcsec [0.66σ]
OotOffset-st: 1/1/1/1 [4]
KicOffset-st: 1/1/1/1 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 0.33 [2/6]

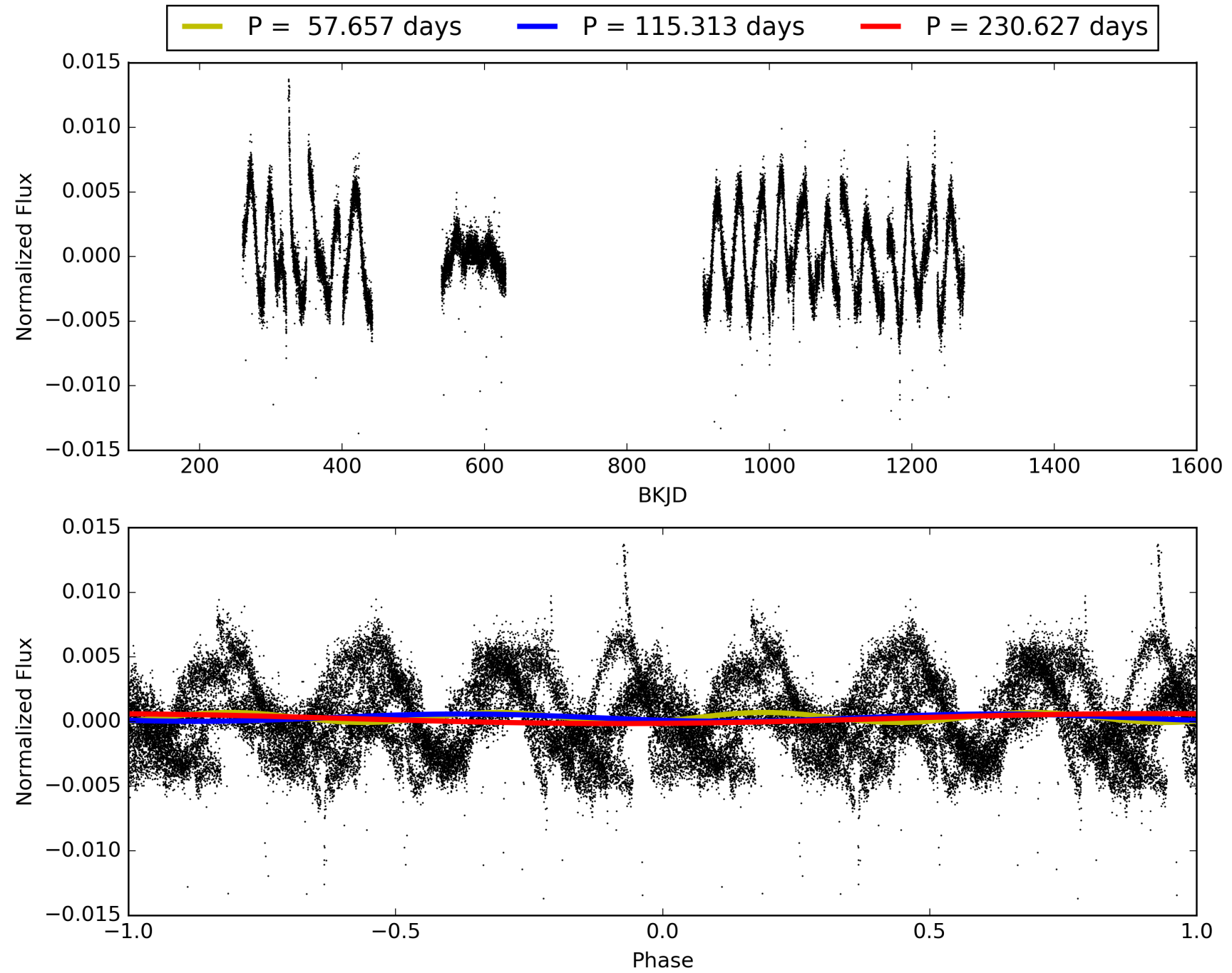
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:30:09 Z

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

TCE 006431670-06, PDC Light Curves

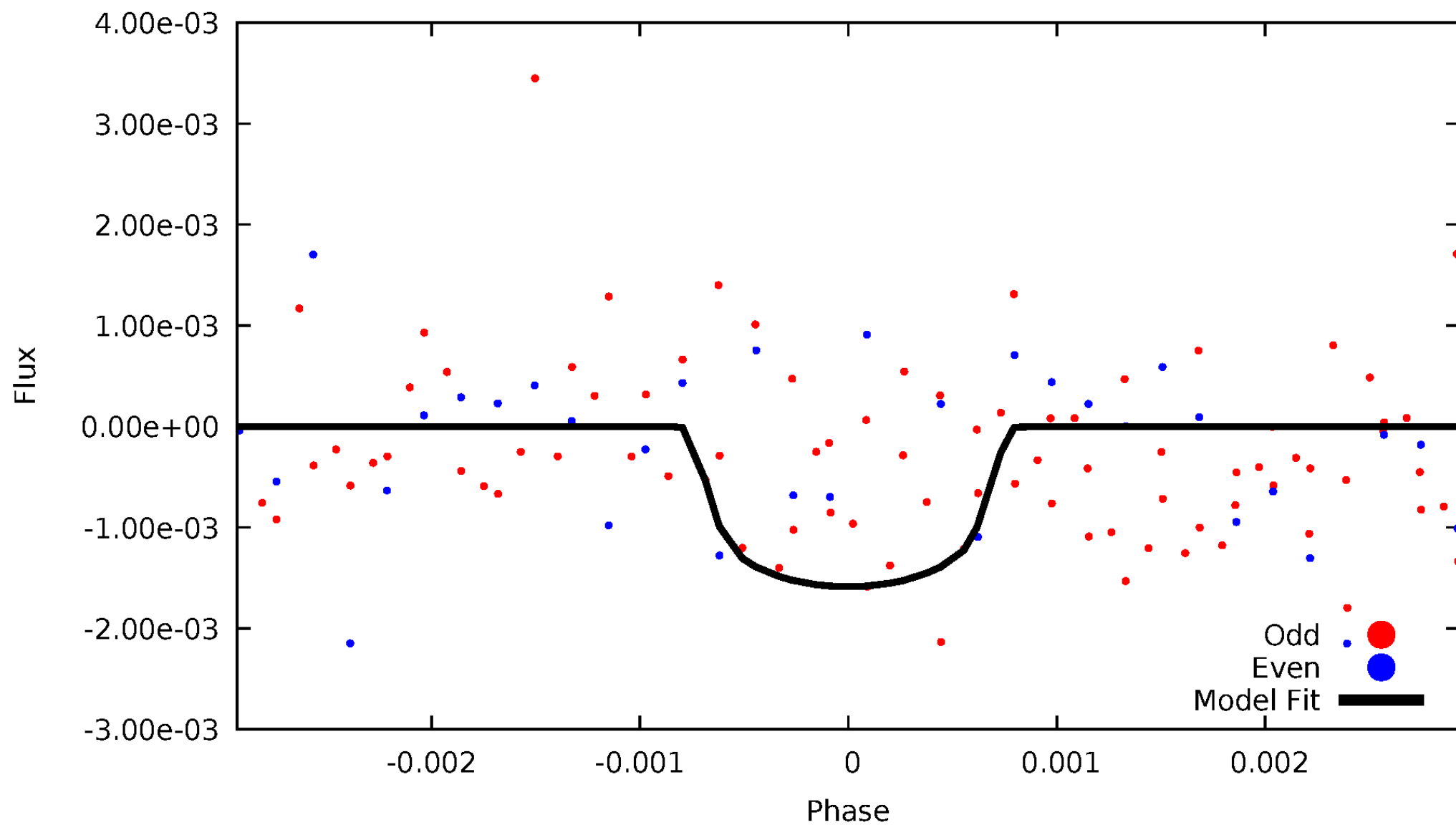


TCE 006431670-06



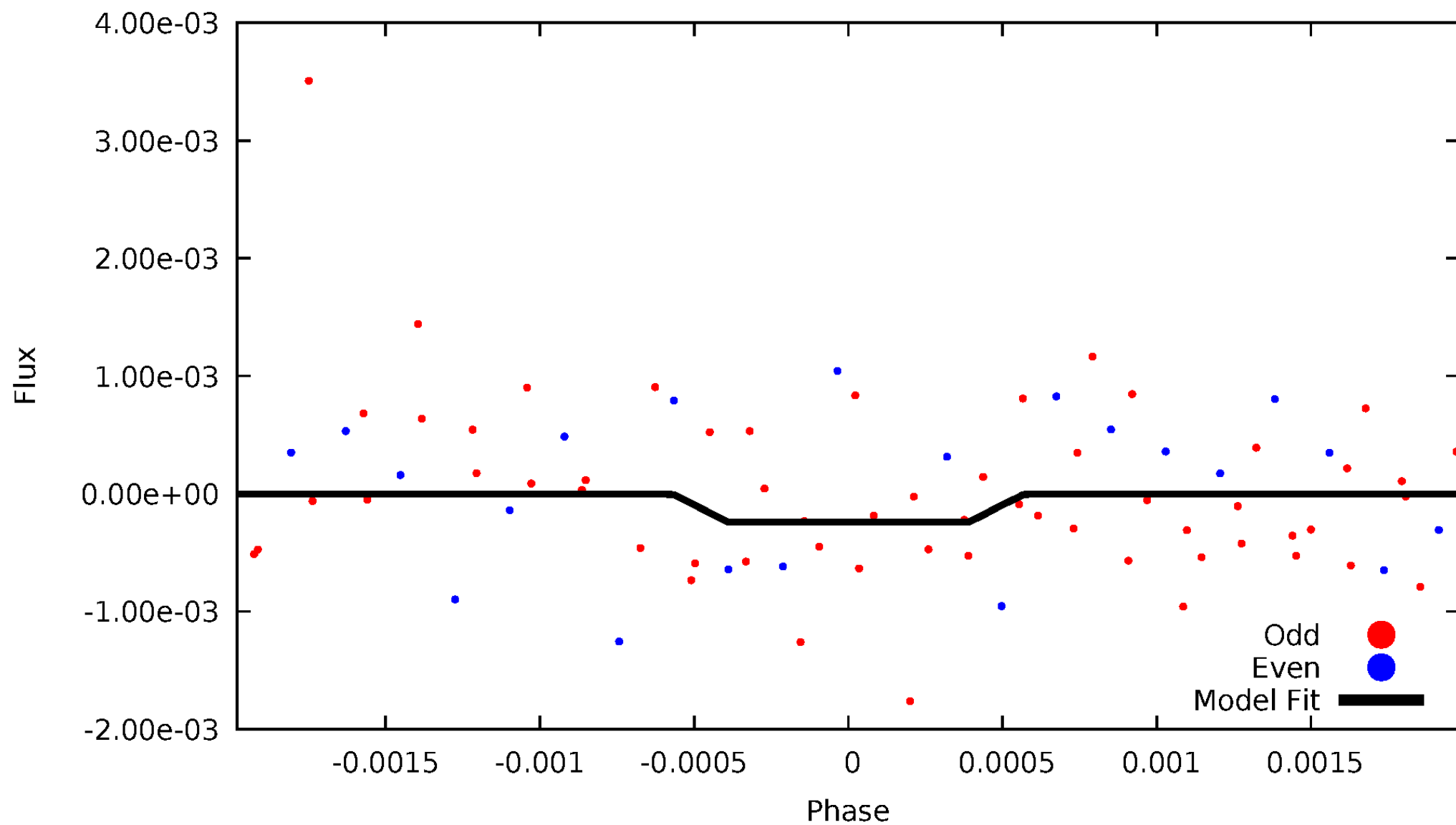
DV Odd/Even

TCE 006431670-06



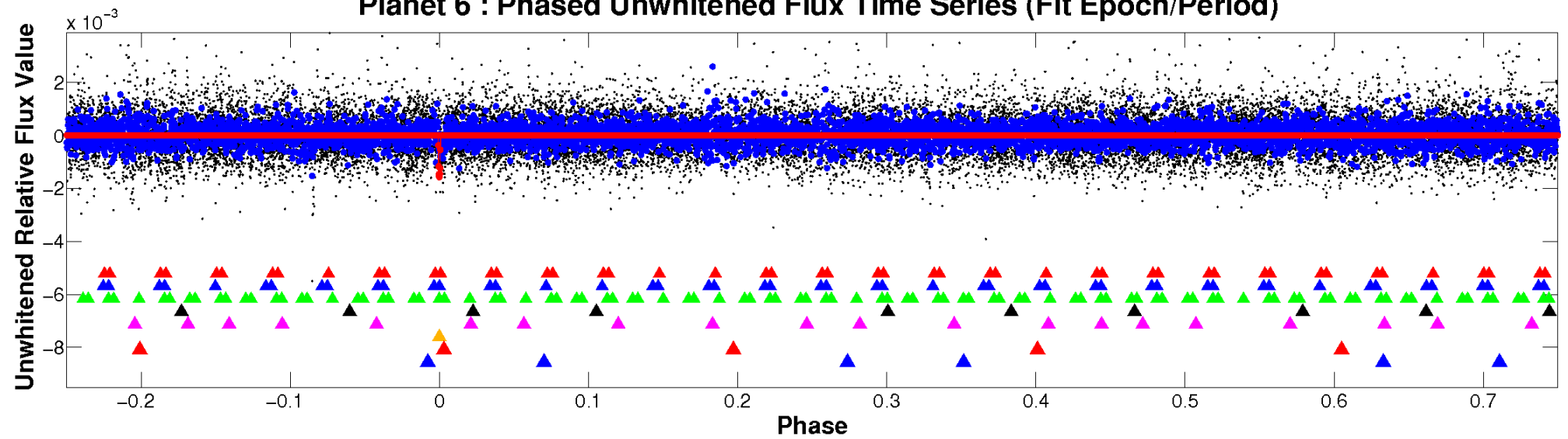
ALT Odd/Even

TCE 006431670-06

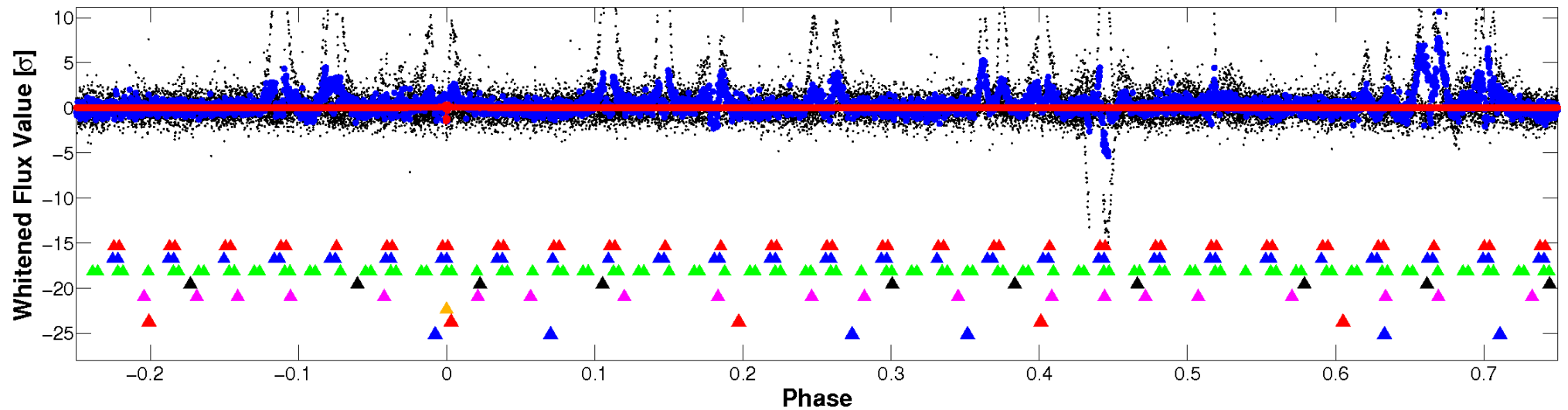


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

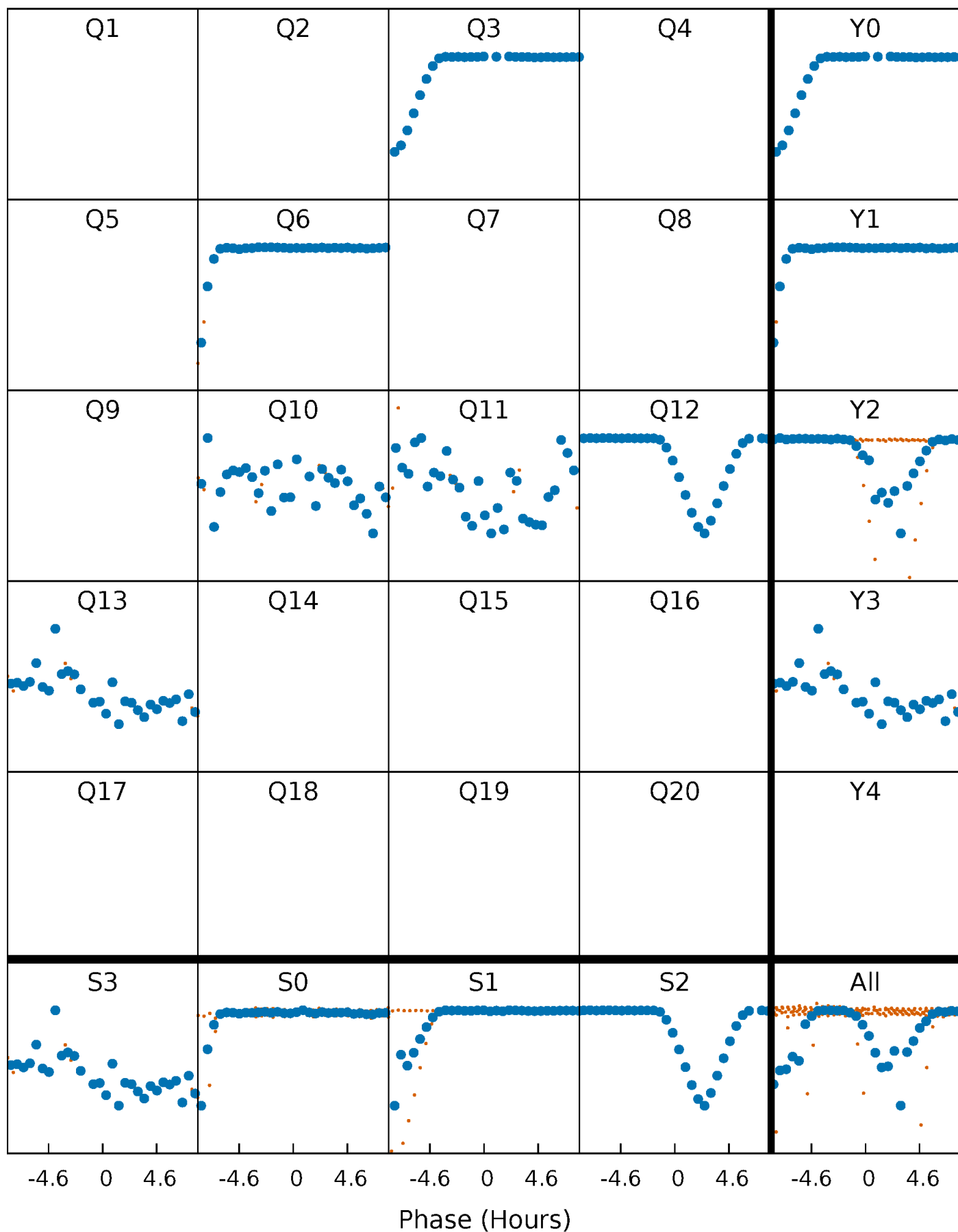


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



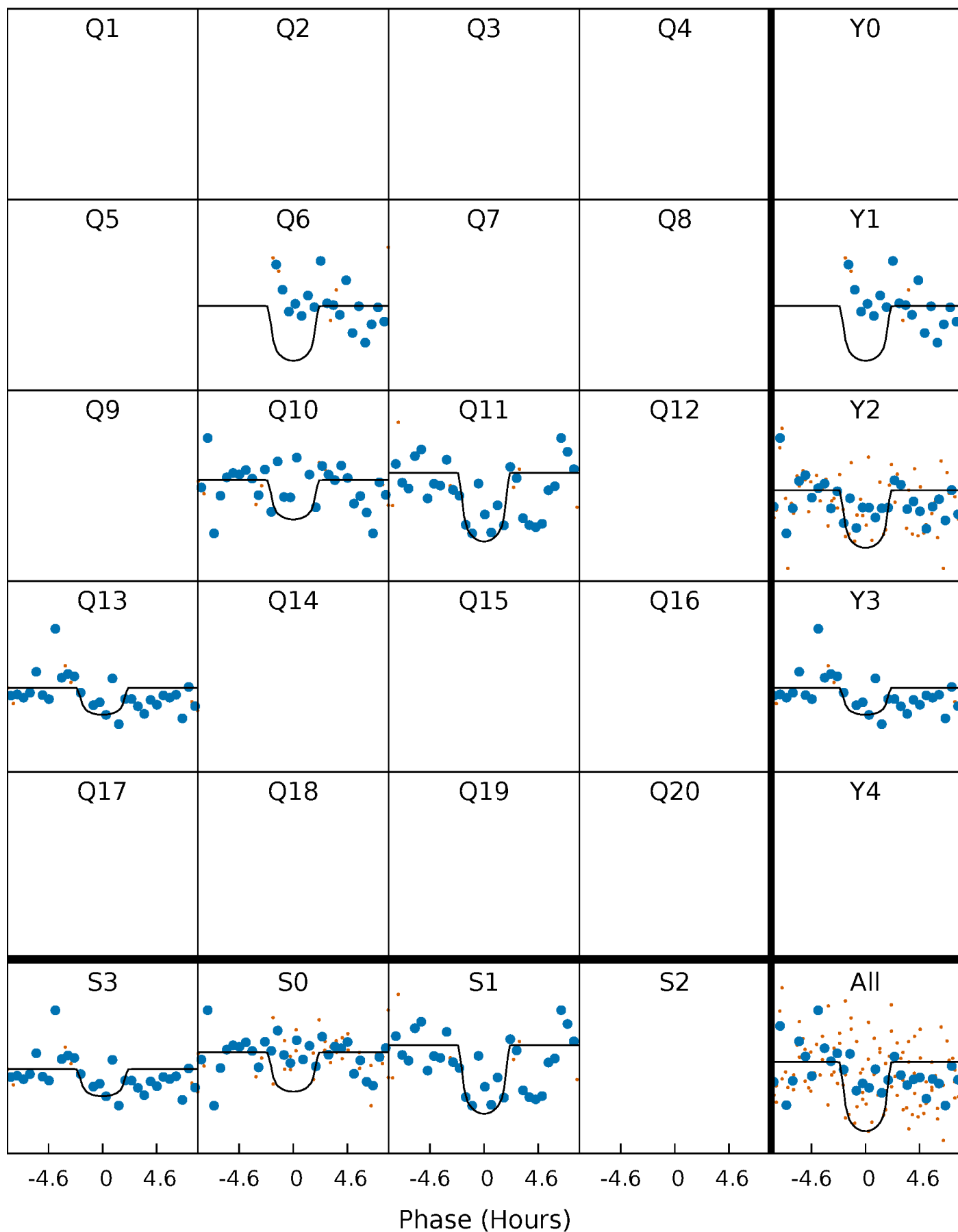
PDC Quarter-Phased Transit Curves

TCE 006431670-06 P=115.313282 Days $T_0=218.062208$ (BKJD)



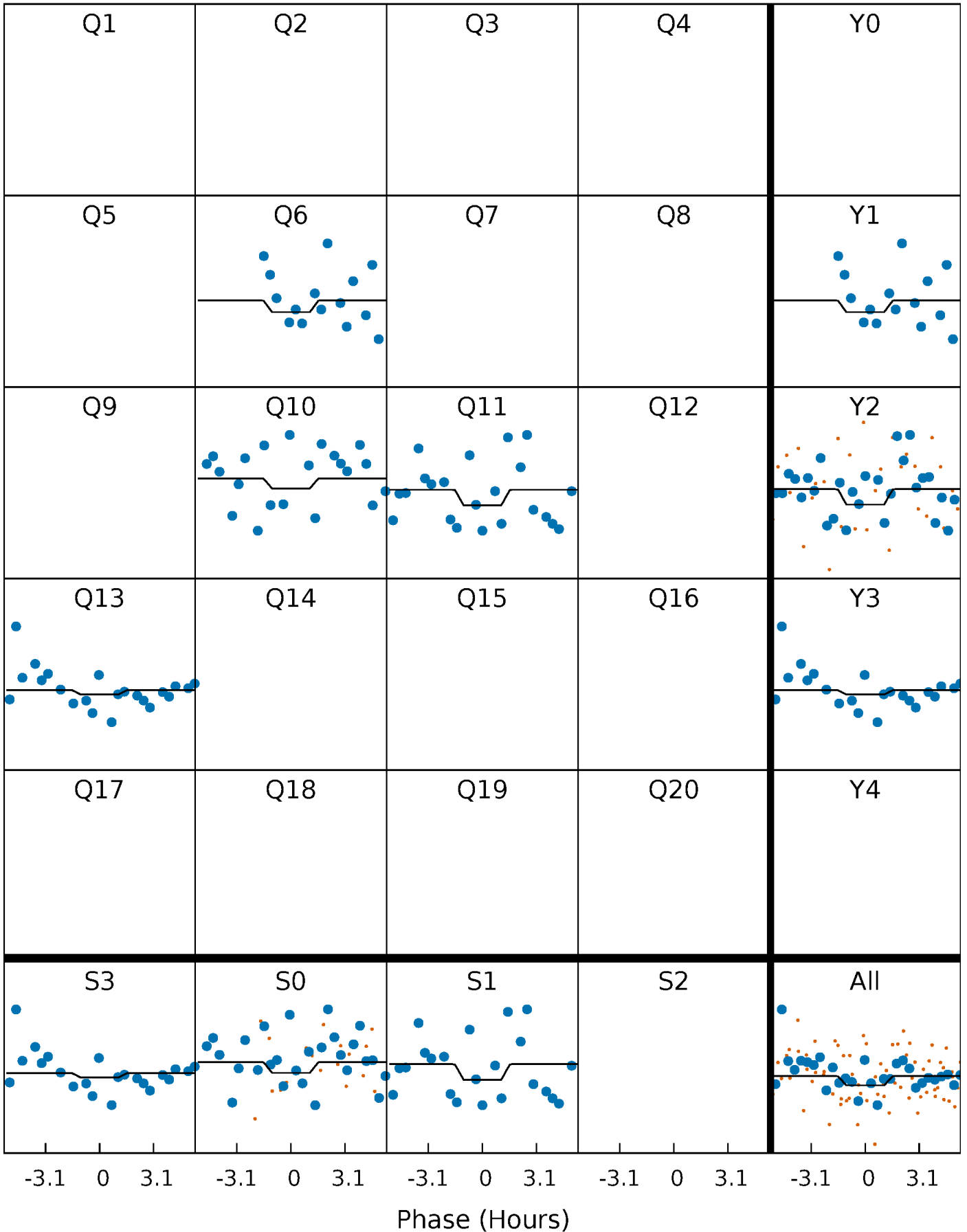
DV Quarter-Phased Transit Curves

TCE 006431670-06 P=115.313282 Days $T_0=218.062208$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

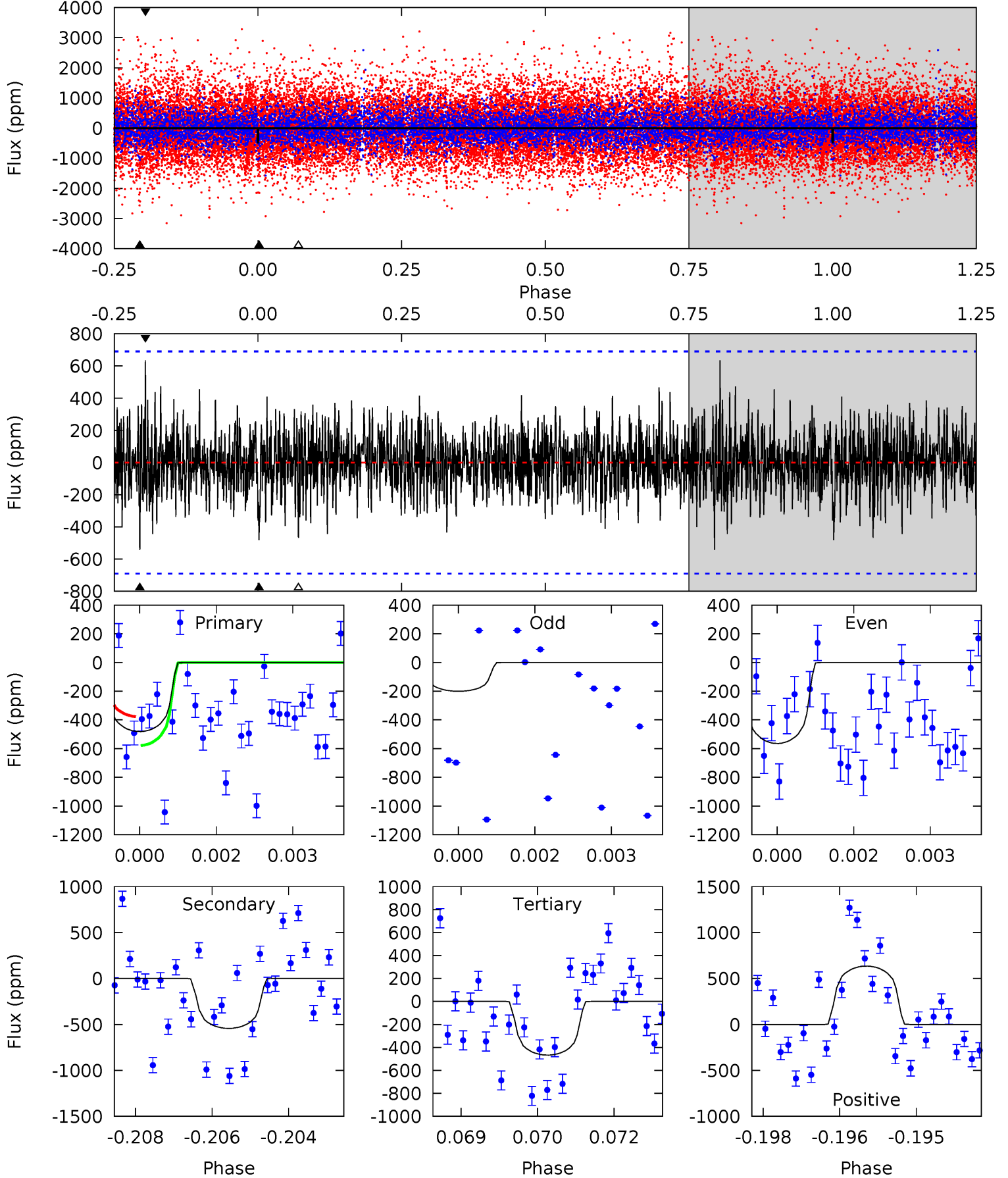
TCE 006431670-06 P=115.317958 Days $T_0=218.048505$ (BKJD)



DV Model-Shift Uniqueness Test

006431670-06, P = 115.313282 Days, E = 218.062208 Days

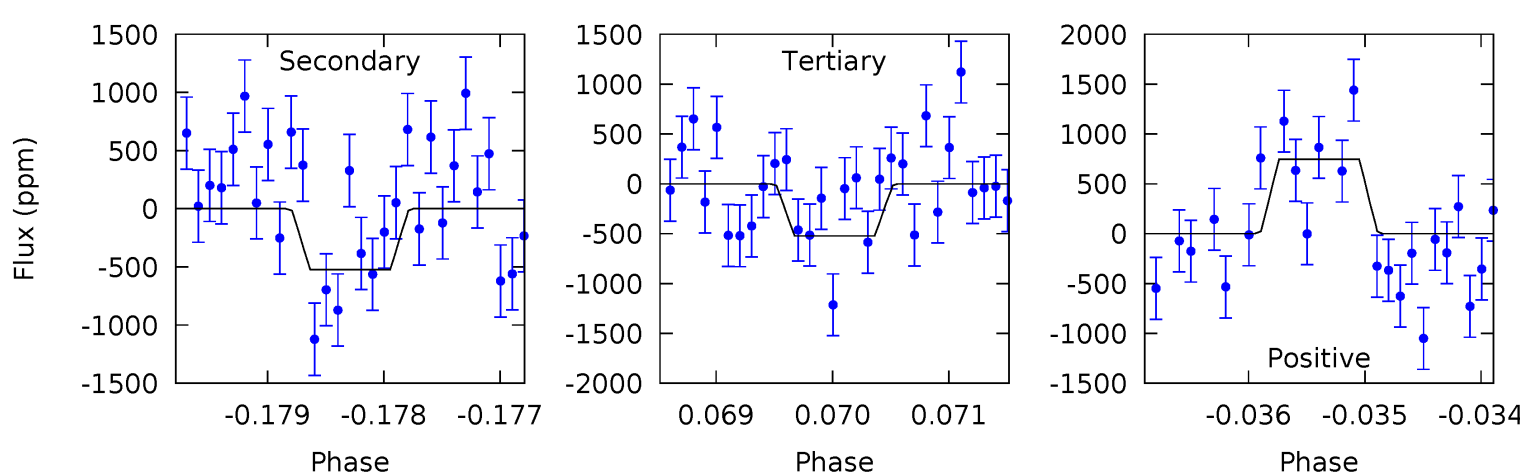
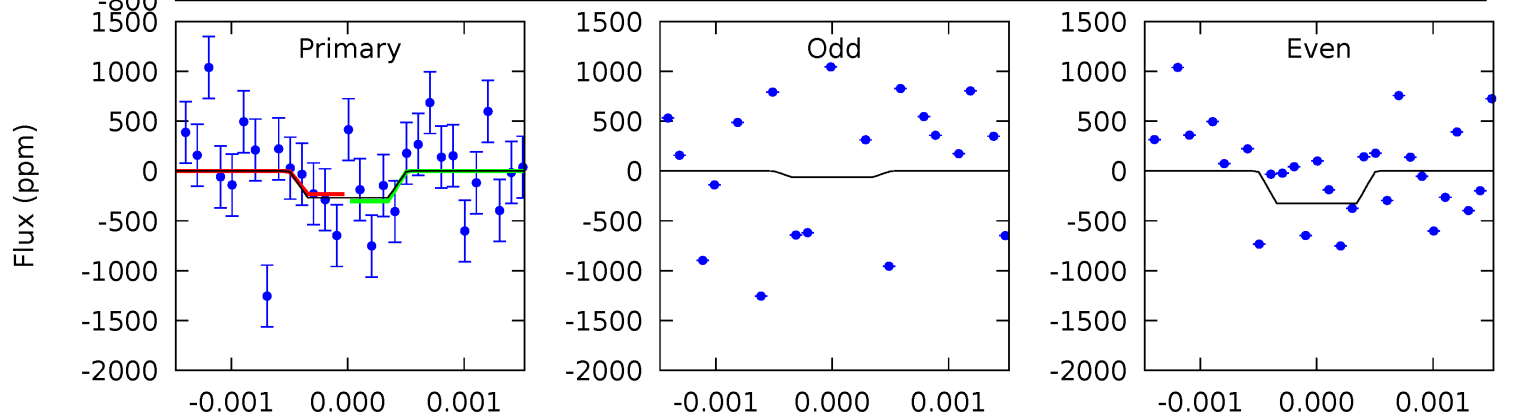
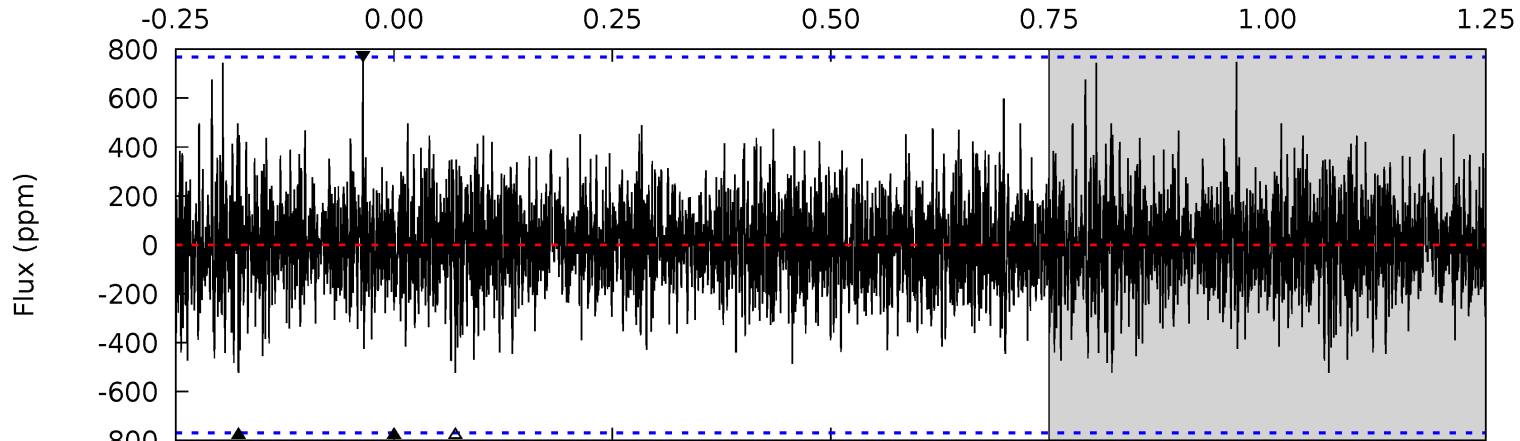
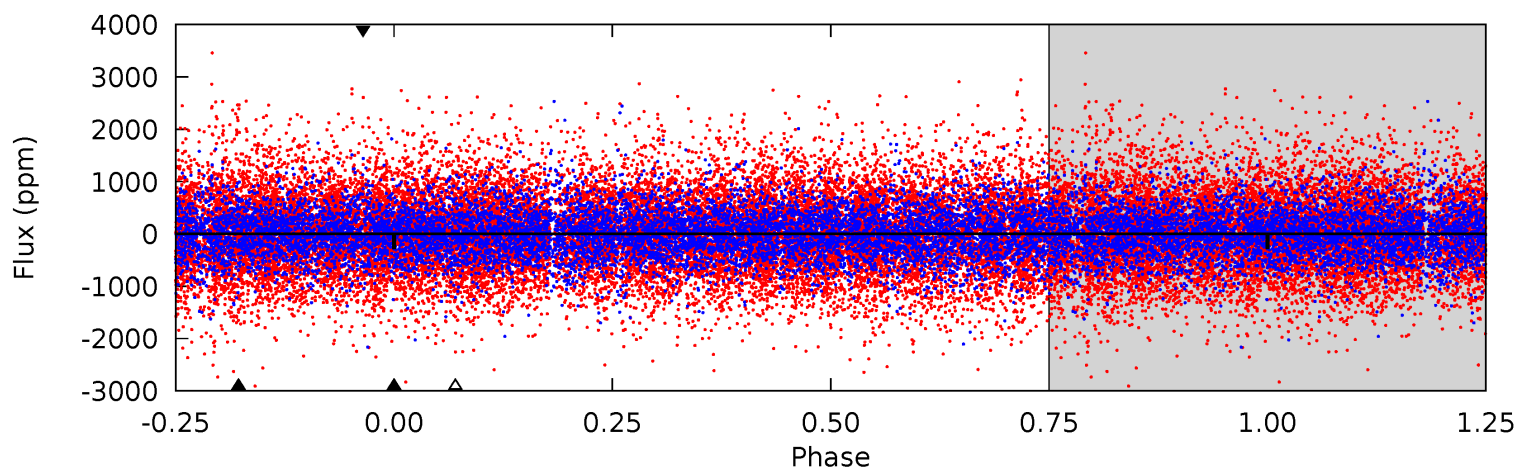
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 3.75 | 4.23 | 3.63 | 4.94 | 5.37 | 3.16 | 1.11 | 0.11 | -1.19 | 0.59 | -0.71 | 1.22 | 0.82 | 0.54 | 0.78 |



Alt Model-Shift Uniqueness Test

006431670-06, P = 115.317958 Days, E = 218.048505 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 1.89 | 3.69 | 3.69 | 5.28 | 5.43 | 3.26 | 1.13 | -1.80 | -3.39 | 0.00 | -1.59 | 0.76 | 1.54 | 0.59 | 0.25 |



Stellar Parameters For KIC 006431670

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5303^{+191}_{-191} | $4.632^{+0.032}_{-0.097}$ | $-0.400^{+0.300}_{-0.300}$ | $0.704^{+0.111}_{-0.051}$ | $0.785^{+0.074}_{-0.082}$ | $3.172^{+0.519}_{-1.000}$ |
| | +4%/-4% | +1%/-2% | +75%/-75% | +16%/-7% | +9%/-10% | +16%/-32% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 006431670-06 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|----------------|------------------------|-------------------|-----------------------|-------------------------|
| DV | -543 ± 129 | $4.74^{+4.90}_{-3.05}$ | 426^{+20}_{-18} | 3659^{+1847}_{-674} | 2302^{+16258}_{-1729} |
| Alt. | -523 ± 142 | $3.91^{+3.89}_{-2.63}$ | 426^{+20}_{-19} | 3905^{+2369}_{-773} | 3298^{+27458}_{-2464} |

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

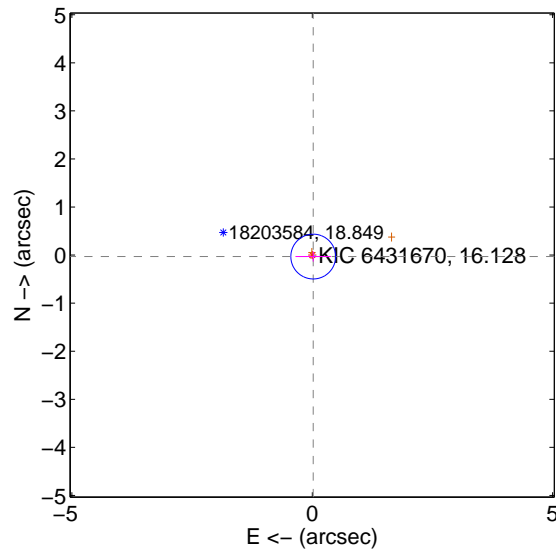
Supplemental centroid analysis for 006431670-06. Kepler magnitude: 16.13. Transit SNR 7.03

There are 1 quarters with good PRF difference image offsets

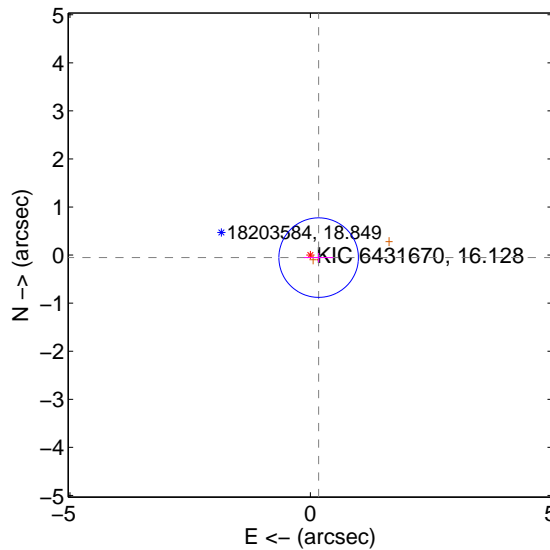
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.037 ± 0.155 | 0.24 | -0.021 ± 0.369 | -0.030 ± 0.105 |
| PRF-fit source offset from KIC position | 0.181 ± 0.276 | 0.66 | -0.173 ± 0.308 | -0.052 ± 0.097 |
| photometric centroid source offset | 0.73 ± 1.16 | 0.63 | 0.25 ± 1.14 | 0.68 ± 1.16 |

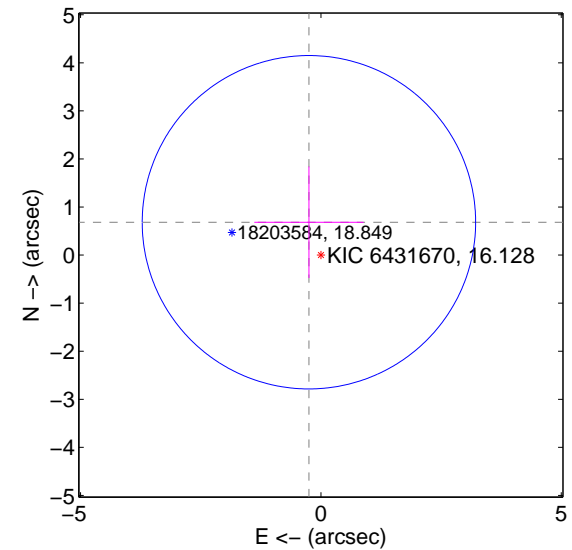
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

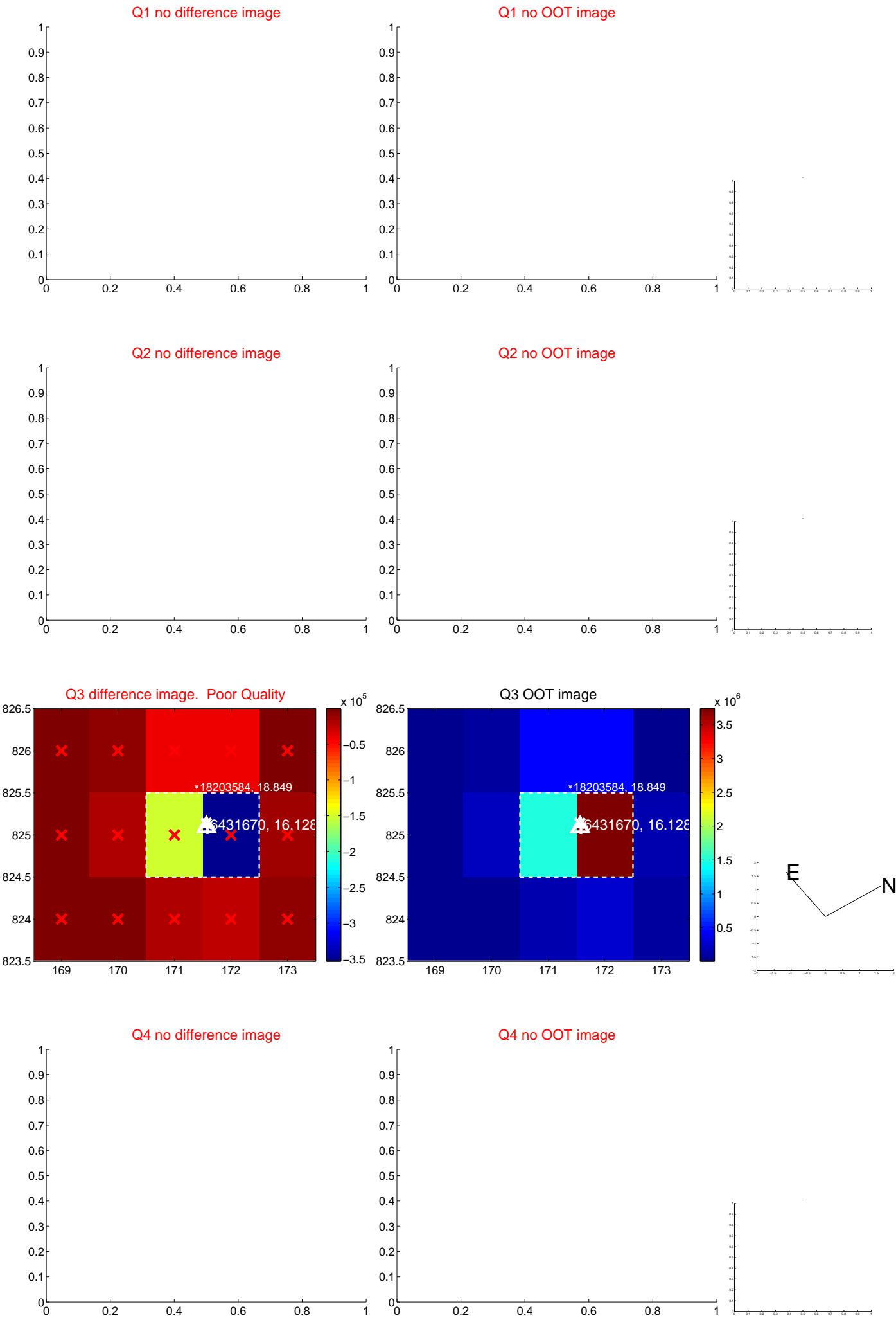


offset from photometric centroids

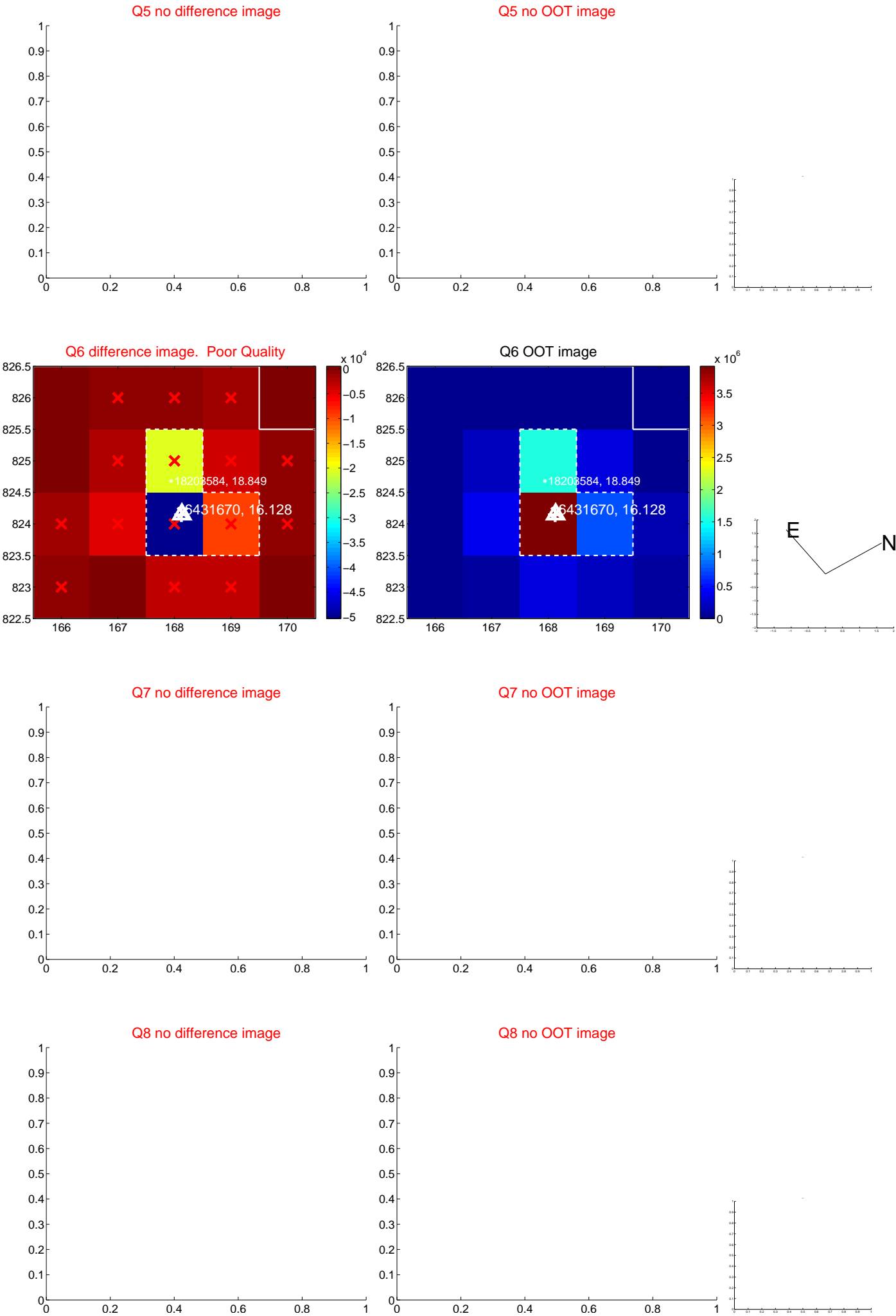


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

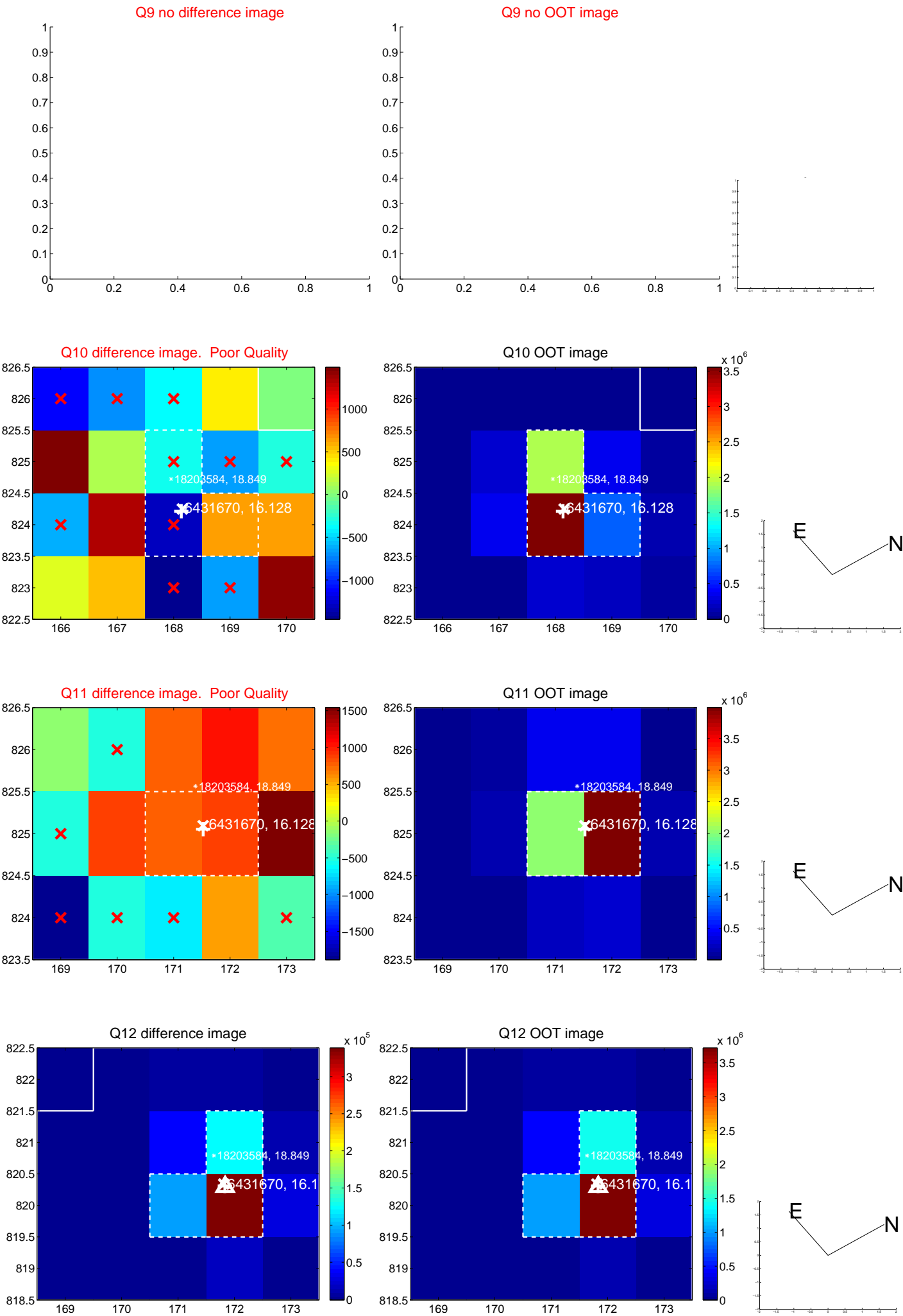
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



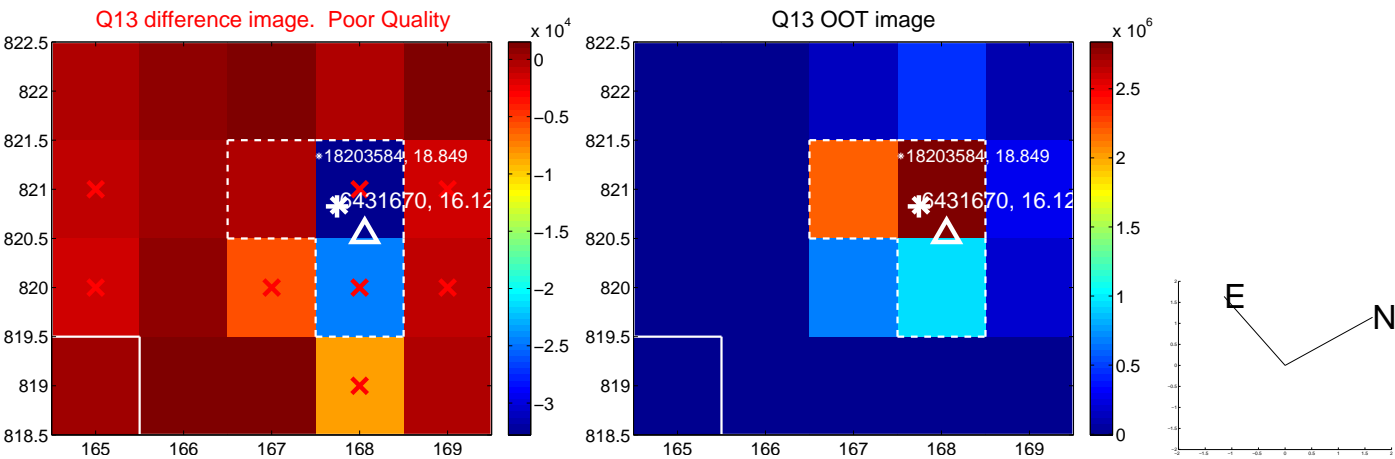
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



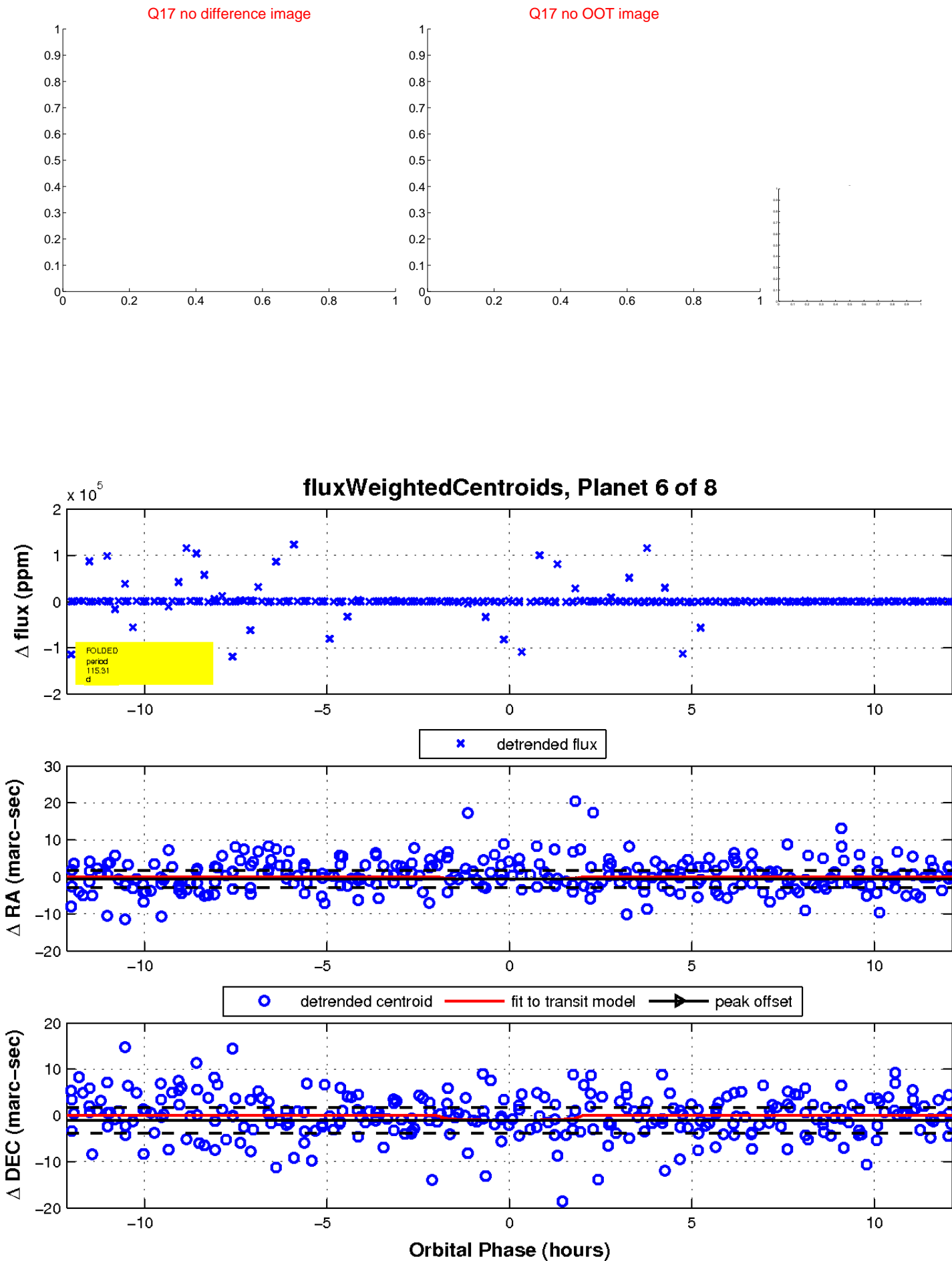
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

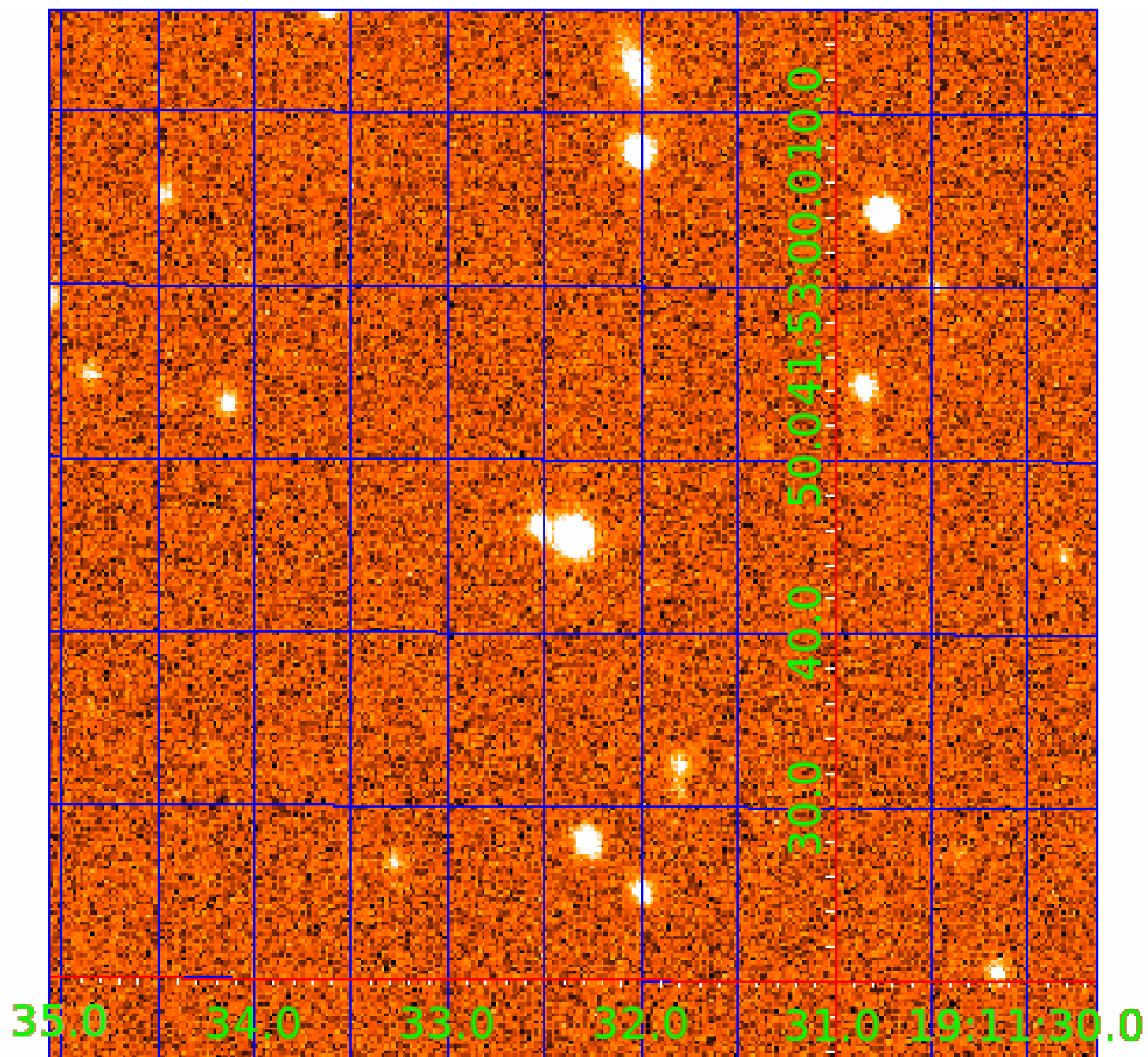


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006431670

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|------|-----------------------------|-----------------|------------------------|------------------------|
| 006431670-01 | OBS | 3534.01 | 29.911333 | 153.592861 | 358289.4 | 4.500 | 3602.3 | -1.0 | 0.70 | 5303 | 38.41 | 11.70 |
| 006431670-02 | OBS | No | 29.911512 | 144.830269 | 366672.0 | 5.000 | 3551.7 | -1.0 | 0.70 | 5303 | 37.44 | 11.70 |
| 006431670-03 | OBS | No | 14.955586 | 138.941998 | 13405.1 | 15.000 | 78.3 | -1.0 | 0.70 | 5303 | 8.01 | 29.49 |
| 006431670-04 | OBS | No | 156.930302 | 169.510324 | 1996.2 | 2.675 | 11.8 | 6.5 | 0.70 | 5303 | 3.36 | 1.28 |
| 006431670-05 | OBS | No | 70.646192 | 198.621740 | 435.5 | 10.064 | 11.7 | 4.6 | 0.70 | 5303 | 1.56 | 3.72 |
| 006431670-06 | OBS | No | 115.313282 | 218.062208 | 1587.8 | 4.058 | 16.1 | 7.0 | 0.70 | 5303 | 2.89 | 1.94 |
| 006431670-07 | OBS | No | 300.041667 | 356.111204 | 1829.8 | 5.475 | 9.8 | 8.2 | 0.70 | 5303 | 3.29 | 0.54 |
| 006431670-08 | OBS | No | 272.059128 | 134.308141 | 933.6 | 13.392 | 11.4 | 5.4 | 0.70 | 5303 | 2.16 | 0.62 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 006431670-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS |
| 006431670-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_NOFITS |
| 006431670-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS |
| 006431670-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 006431670-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-07 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-08 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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 006431670-07

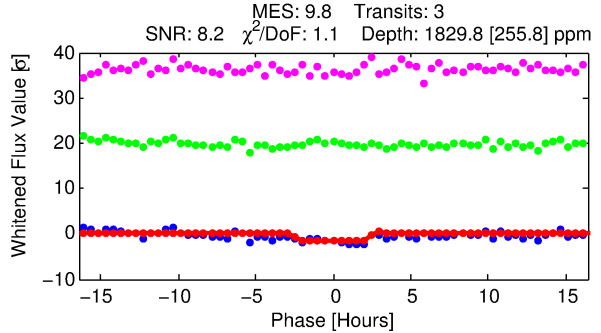
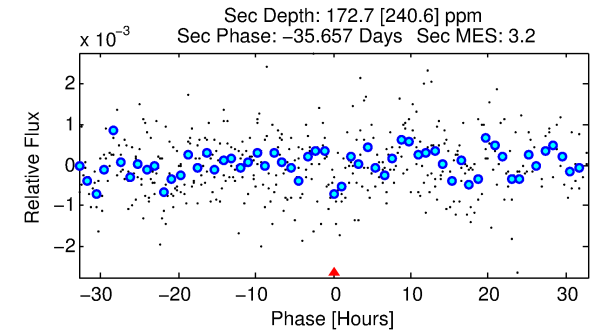
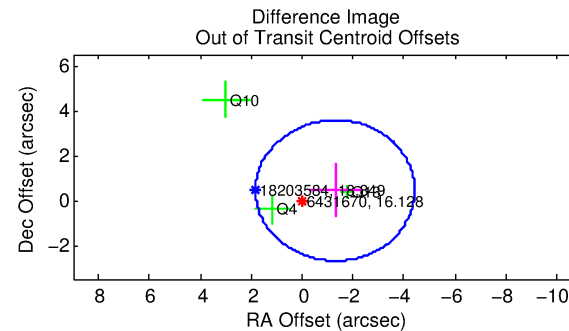
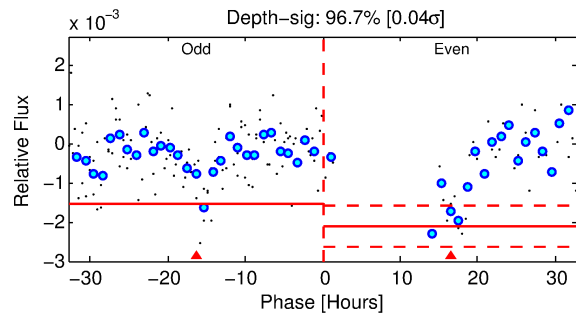
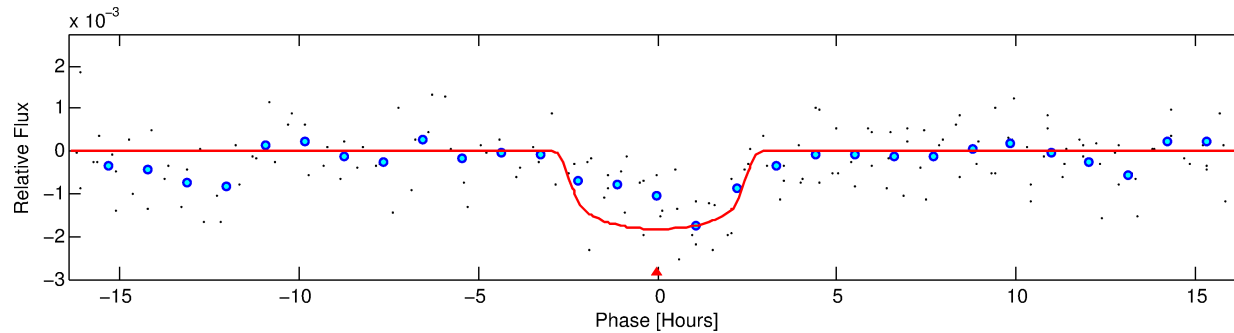
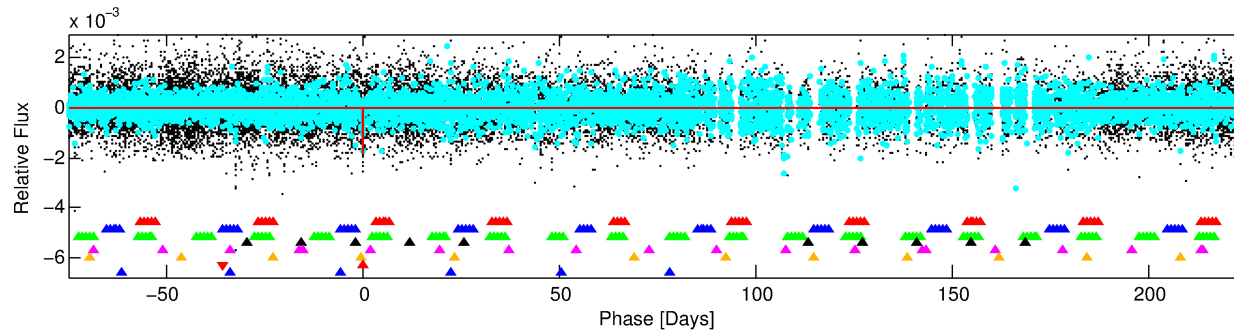
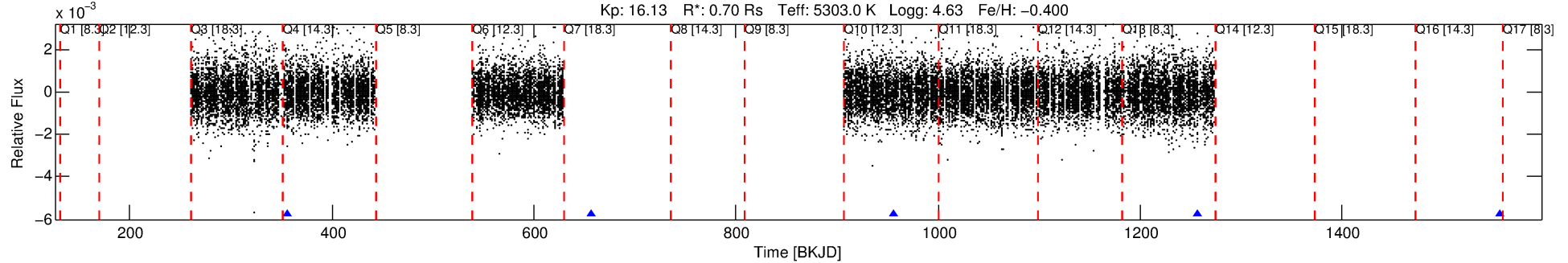
No Significant Match Found

DV One-Page Summary

KIC: 6431670 Candidate: 7 of 8 Period: 300.042 d

KOI: K03534 Corr: No Ephemeris Match

Kp: 16.13 R*: 0.70 Rs Teff: 5303.0 K Logg: 4.63 Fe/H: -0.400



DV Fit Results:

Period = 300.04167 [0.00587] d
Epoch = 356.1112 [0.0120] BKJD
Rp/R* = 0.0428 [0.0298]
a/R* = 299.32 [826.31]
b = 0.76 [1.57]
Seff = 0.54 [0.13]
Teq = 219 [13] K
Rp = 3.29 [2.35] Re
a = 0.8057 [0.1038] AU
Ag = 5709.60 [11293.56] [0.51σ]
Teffp = 2939 [1451] K [1.87σ]

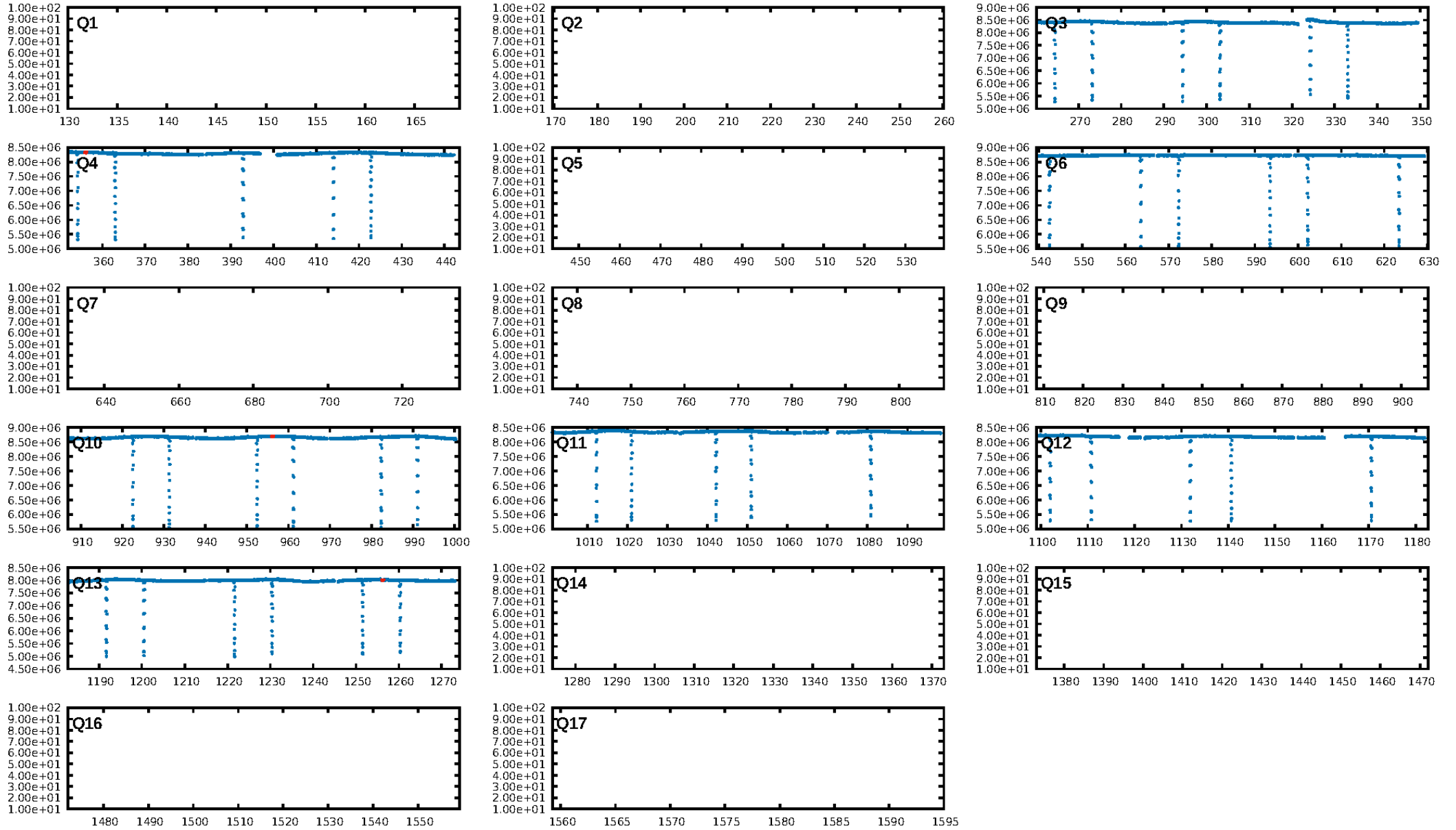
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [46.42σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.4%
ModelChiSquareGof-sig: 77.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 4.155
Centroid-sig: 52.4%
Centroid-so: 0.828 arcsec [0.64σ]
OotOffset-rm: 1.369 arcsec [1.31σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-rm: 1.342 arcsec [1.35σ]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.67 [2/3]

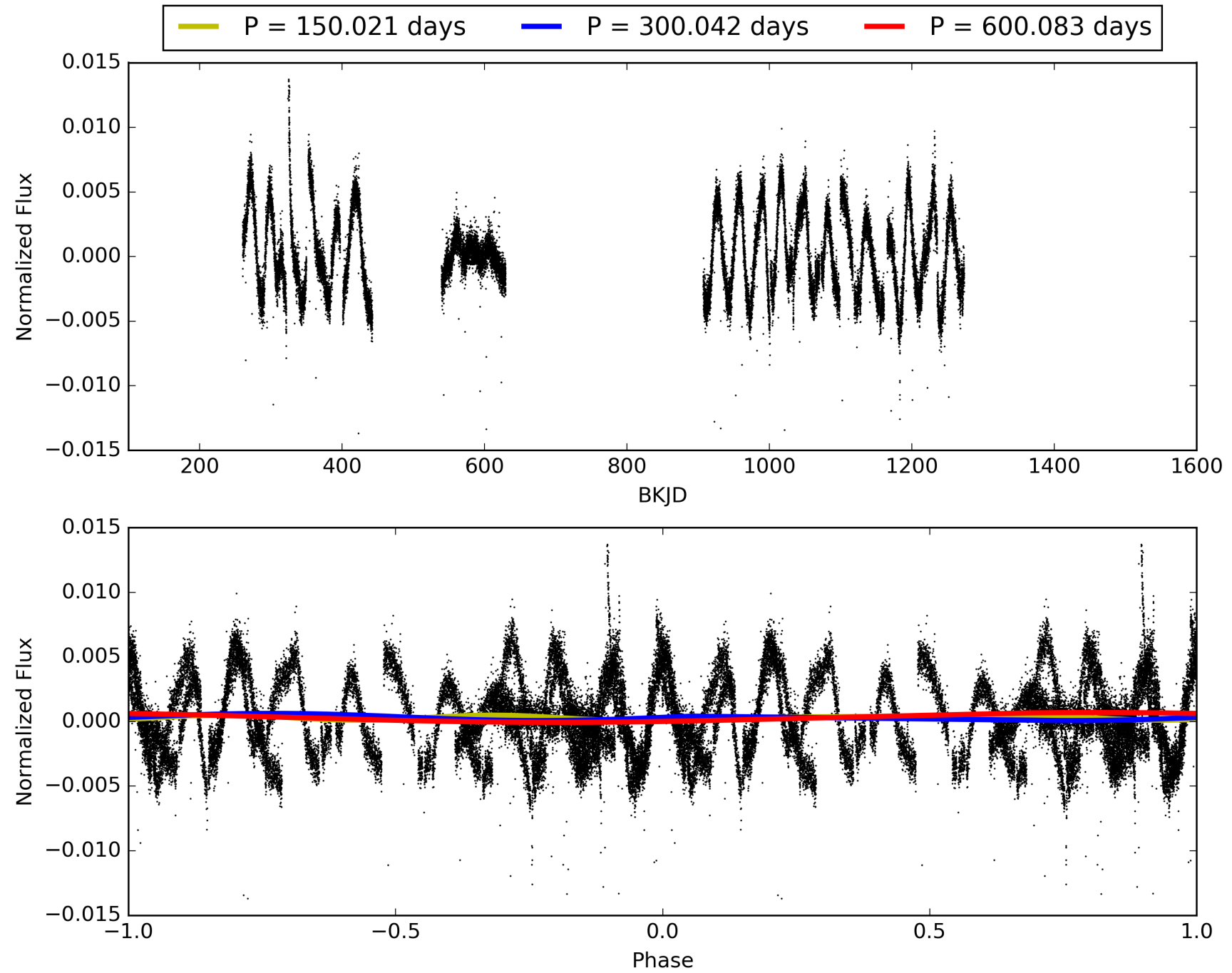
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:30:15 Z

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

TCE 006431670-07, PDC Light Curves

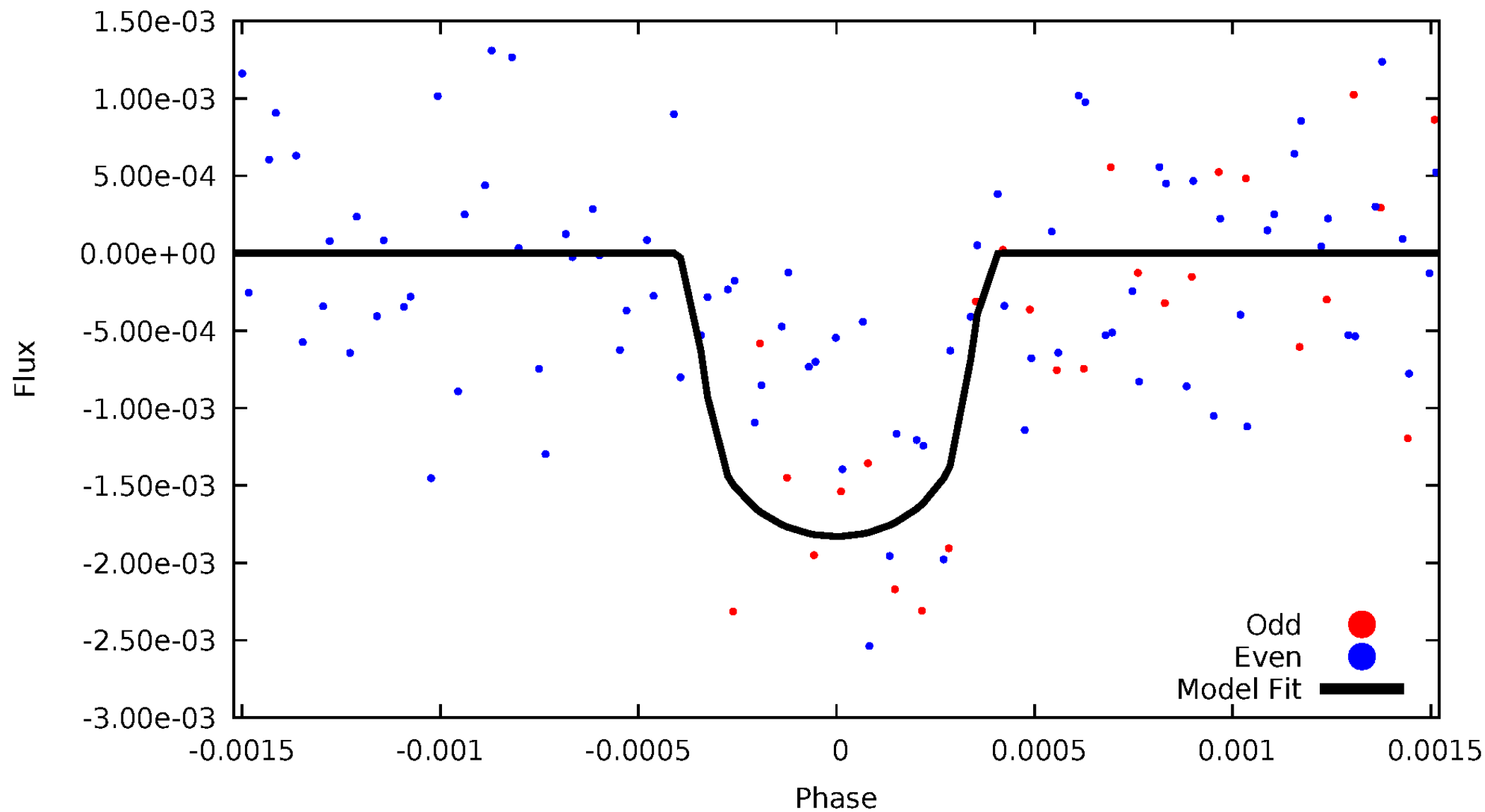


TCE 006431670-07



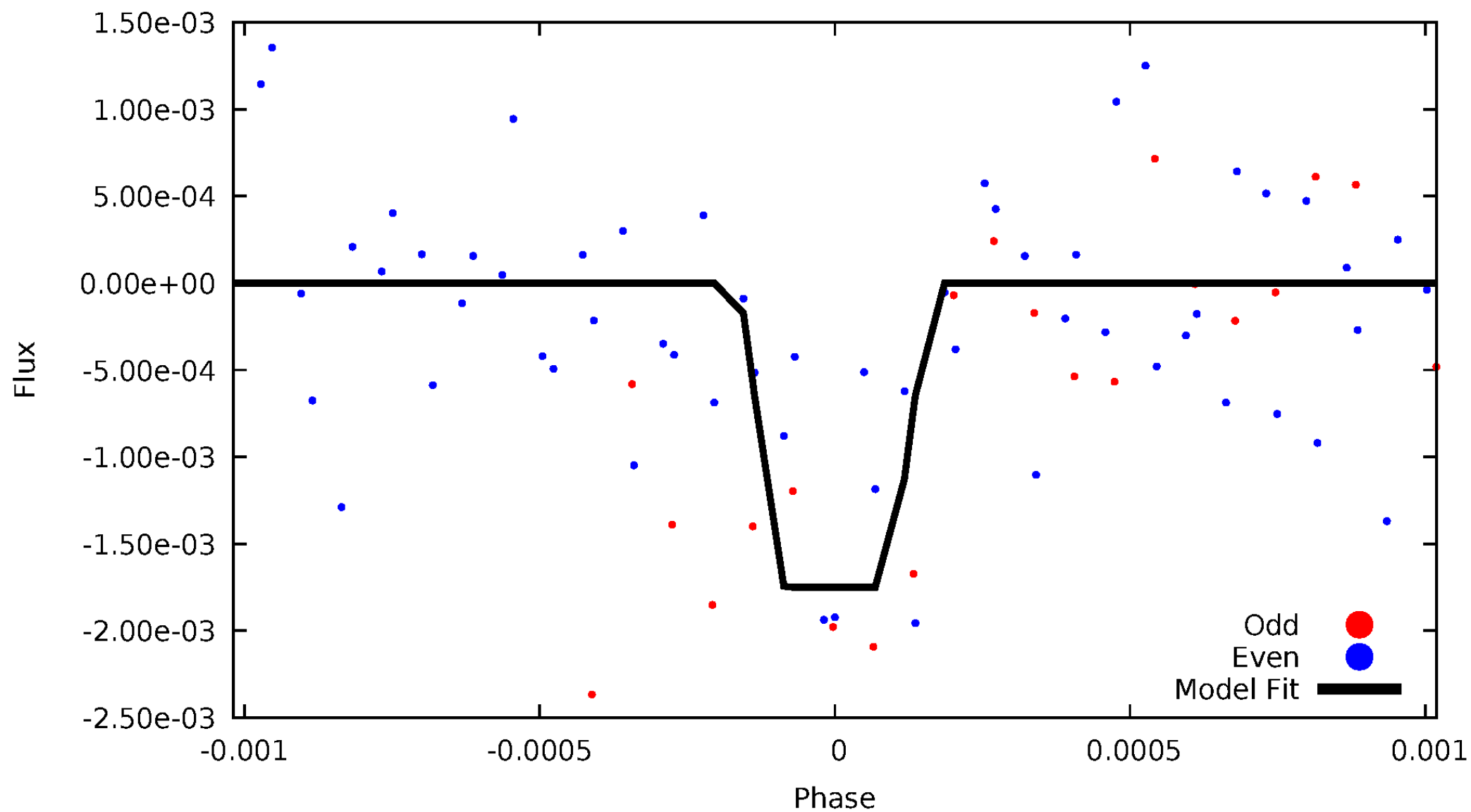
DV Odd/Even

TCE 006431670-07



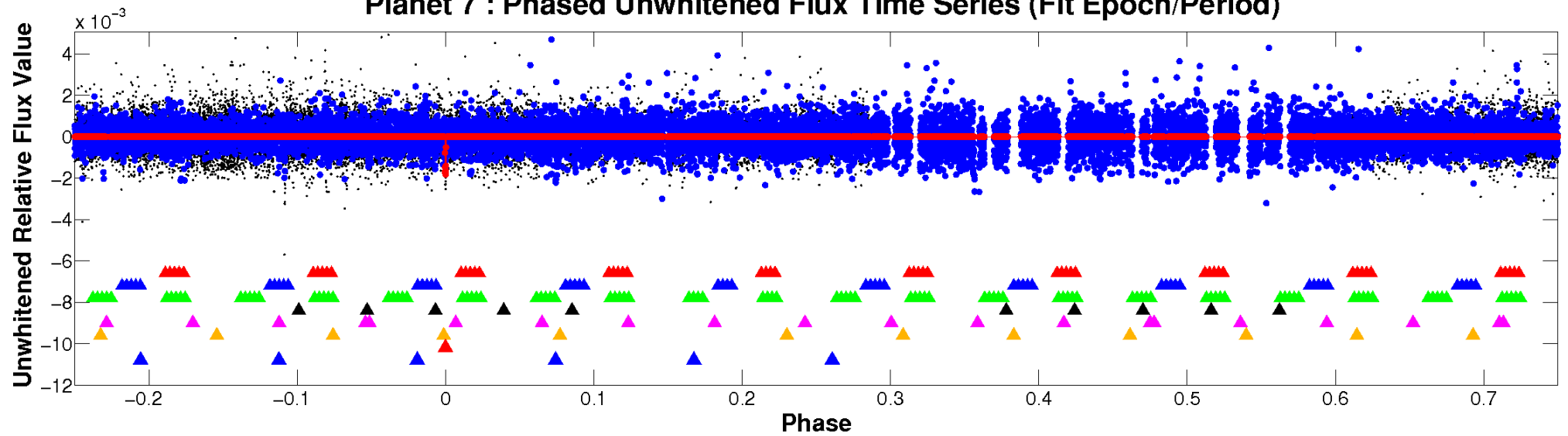
ALT Odd/Even

TCE 006431670-07

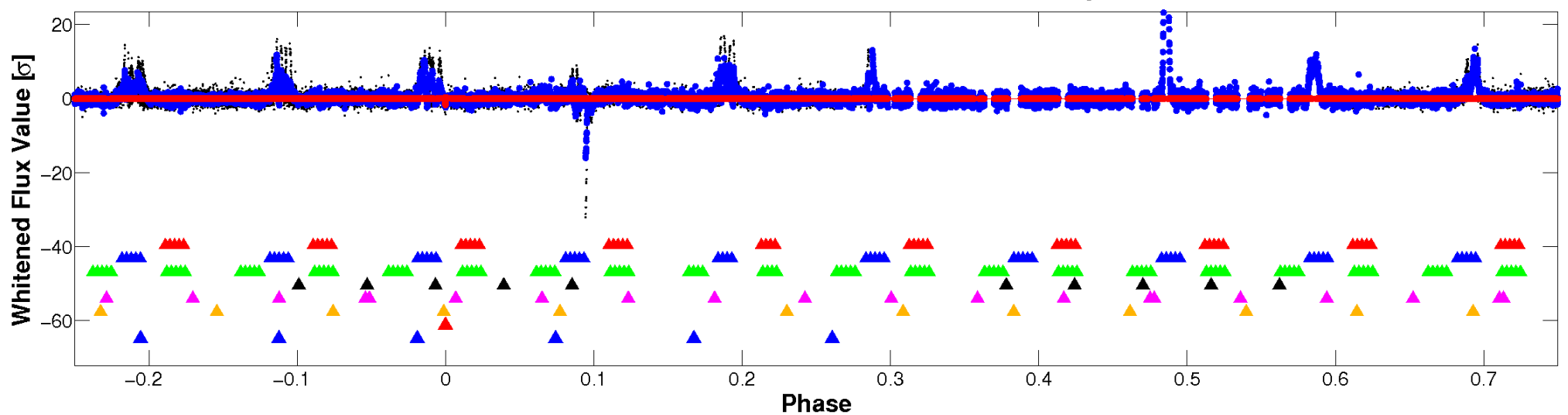


Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



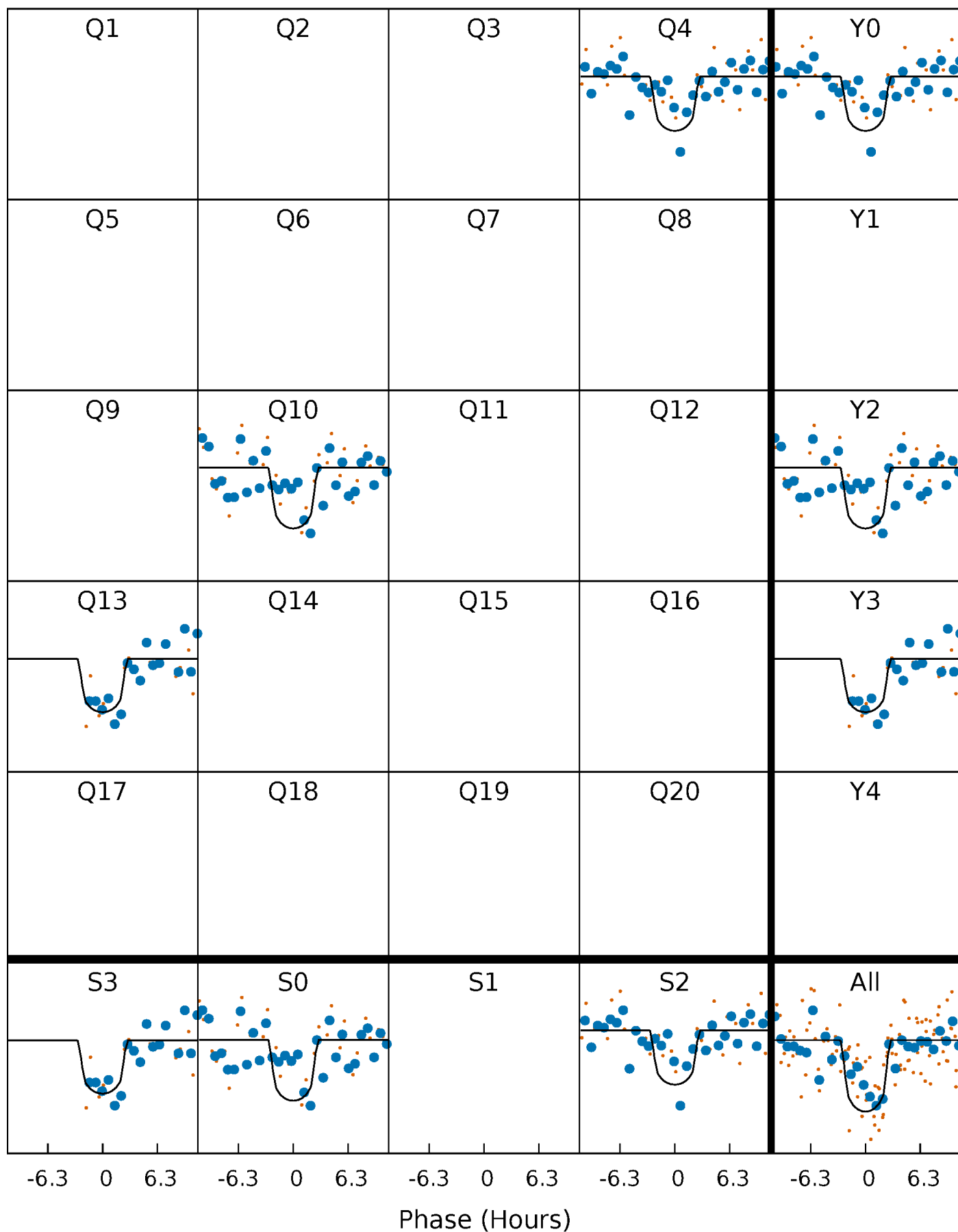
PDC Quarter-Phased Transit Curves

TCE 006431670-07 $P=300.041667$ Days $T_0=356.111204$ (BKJD)



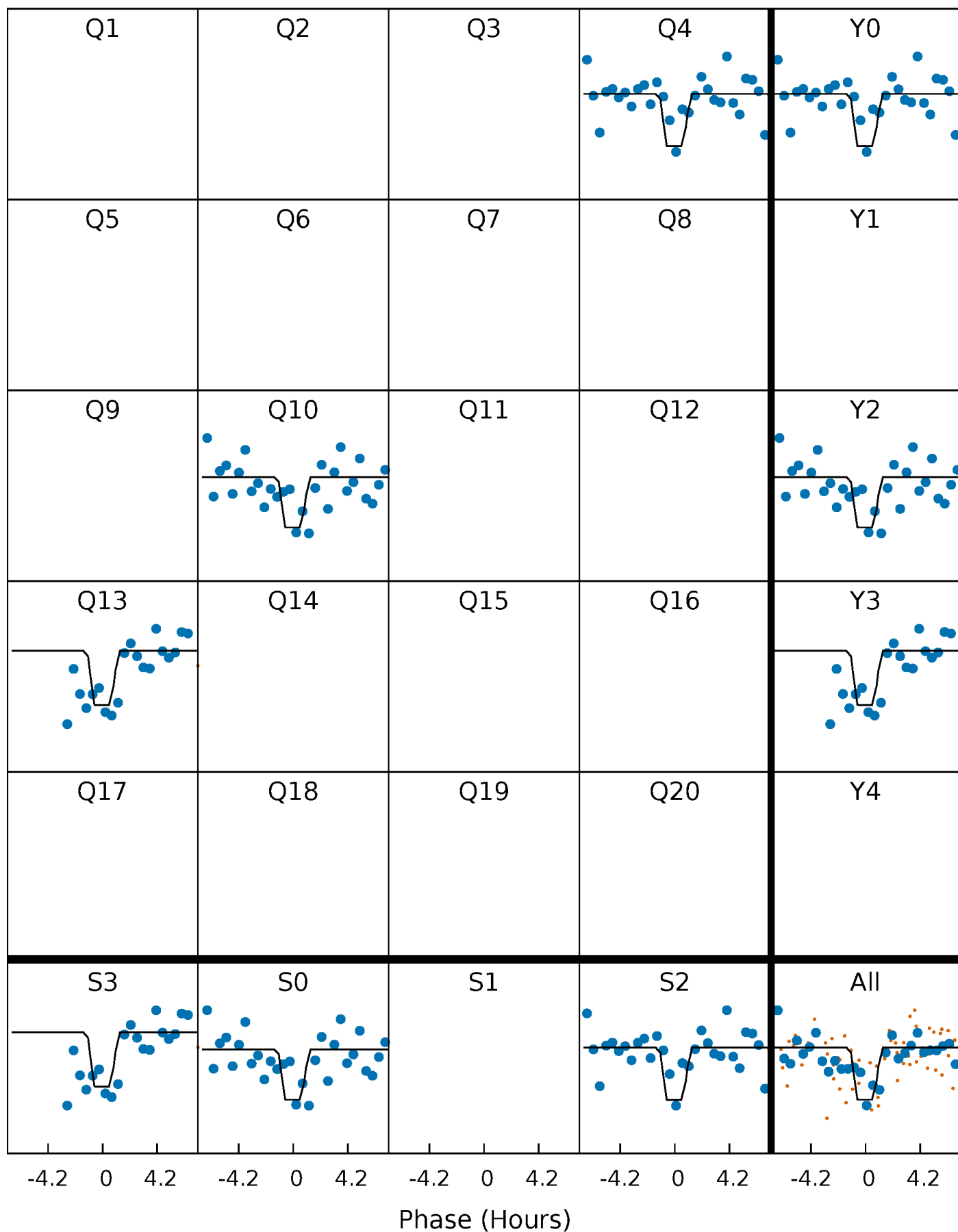
DV Quarter-Phased Transit Curves

TCE 006431670-07 $P=300.041667$ Days $T_0=356.111204$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

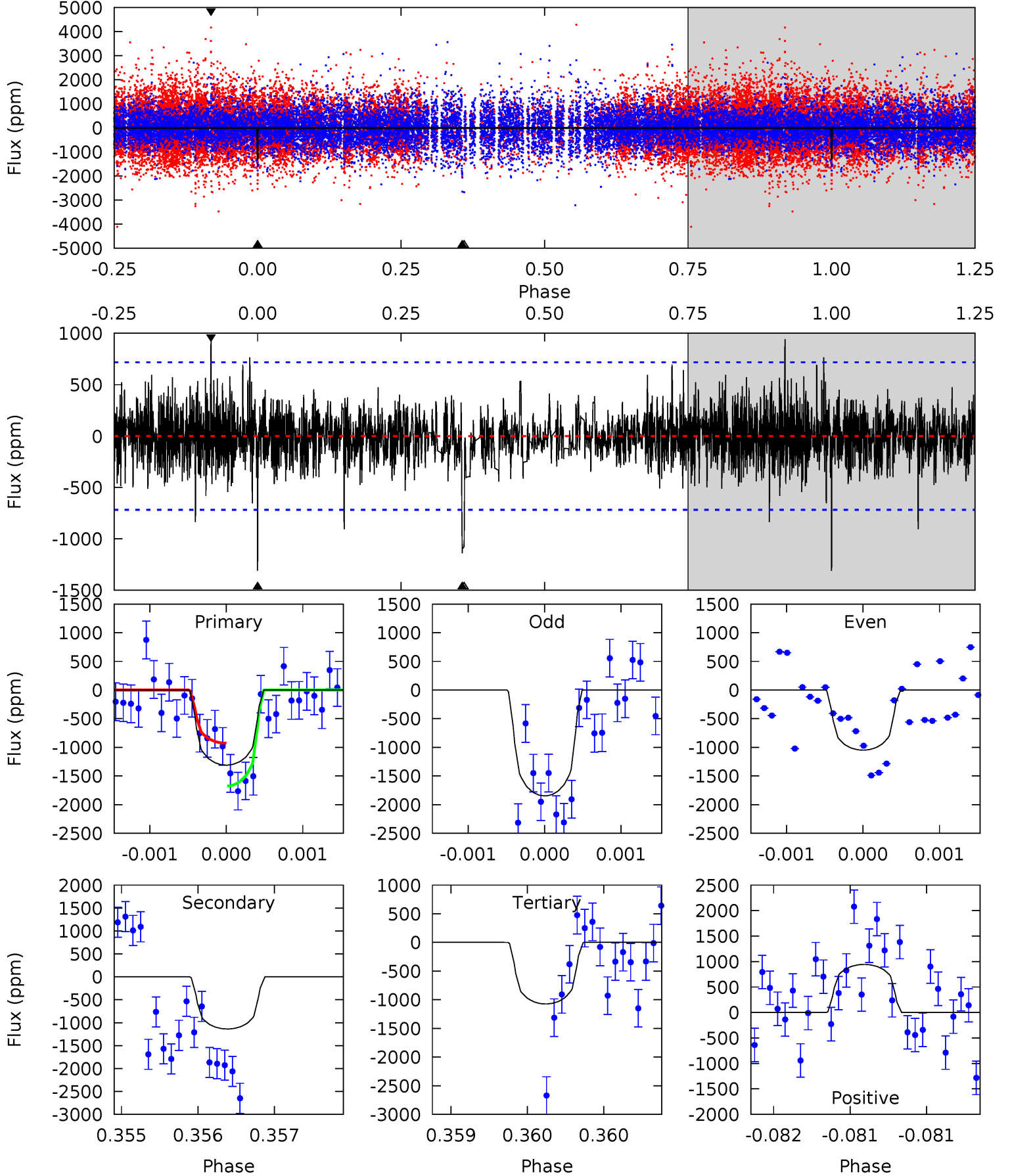
TCE 006431670-07 P=300.046565 Days $T_0=356.141730$ (BKJD)



DV Model-Shift Uniqueness Test

006431670-07, P = 300.041667 Days, E = 56.069537 Days

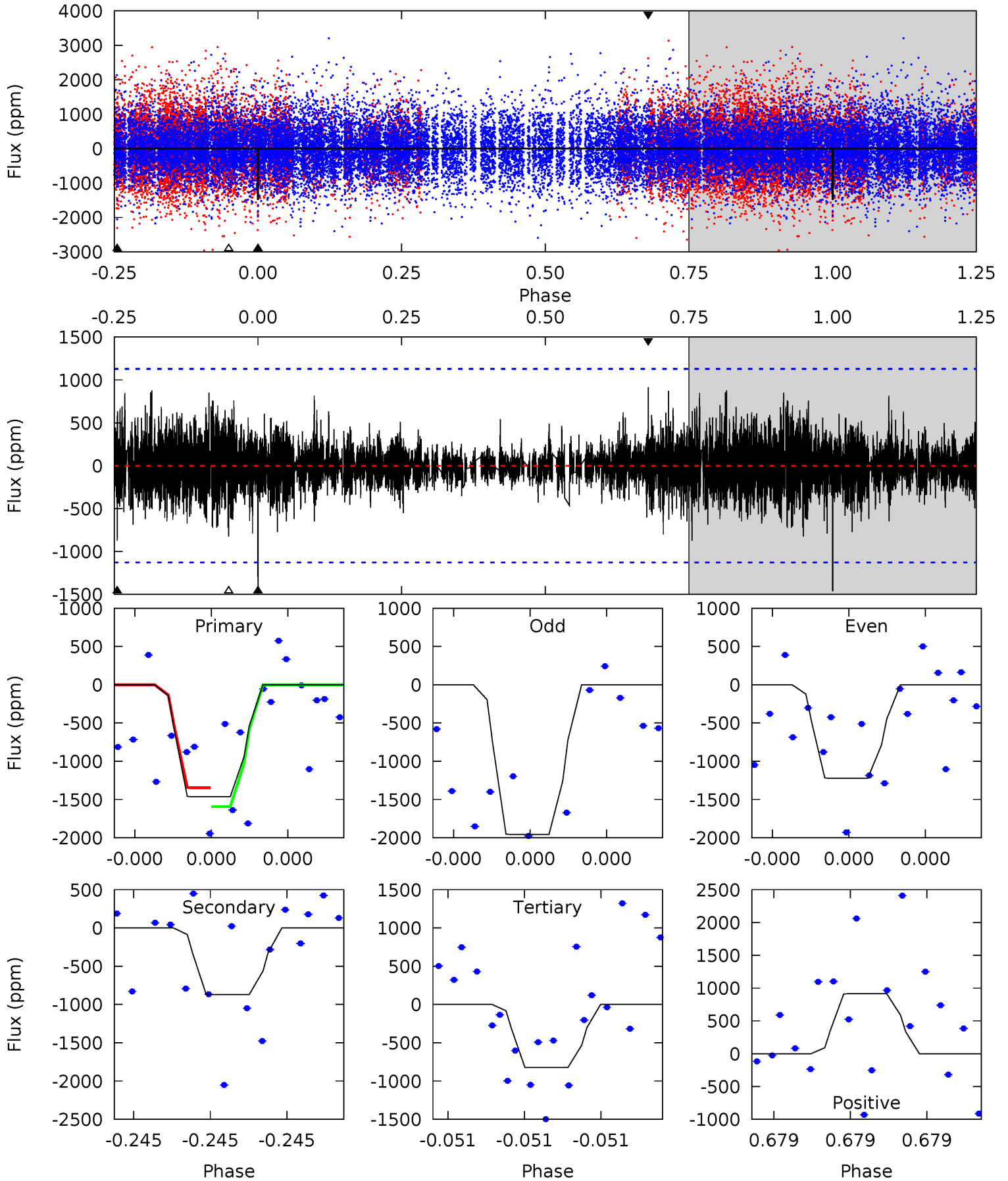
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.0 | 8.69 | 8.20 | 7.20 | 5.48 | 3.34 | 1.47 | 1.81 | 2.81 | 0.49 | 1.49 | 2.80 | 1.24 | 0.42 | 2.87 |



Alt Model-Shift Uniqueness Test

006431670-07, P = 300.046565 Days, E = 56.095165 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.36 | 4.39 | 4.15 | 4.60 | 5.68 | 3.64 | 1.04 | 3.21 | 2.76 | 0.24 | -0.21 | 1.73 | 1.08 | 0.38 | 0.63 |



Stellar Parameters For KIC 006431670

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5303^{+191}_{-191} | $4.632^{+0.032}_{-0.097}$ | $-0.400^{+0.300}_{-0.300}$ | $0.704^{+0.111}_{-0.051}$ | $0.785^{+0.074}_{-0.082}$ | $3.172^{+0.519}_{-1.000}$ |
| | +4%/-4% | +1%/-2% | +75%/-75% | +16%/-7% | +9%/-10% | +16%/-32% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 006431670-07 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-----------------|------------------------|-------------------|-----------------------|----------------------------|
| DV | -1138 ± 131 | $3.54^{+2.26}_{-1.89}$ | 310^{+14}_{-13} | 4710^{+2087}_{-829} | $32427^{+123216}_{-20367}$ |
| Alt. | -872 ± 199 | $3.75^{+2.12}_{-2.19}$ | 310^{+14}_{-14} | 4371^{+2186}_{-700} | $22100^{+108229}_{-13629}$ |

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

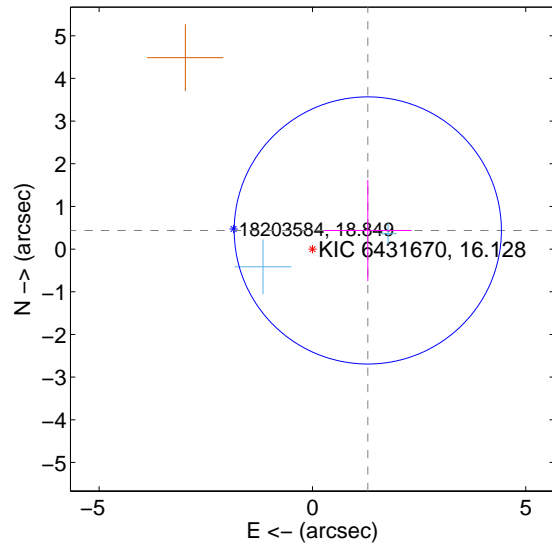
Supplemental centroid analysis for 006431670-07. Kepler magnitude: 16.13. Transit SNR 8.23

There are 2 quarters with good PRF difference image offsets

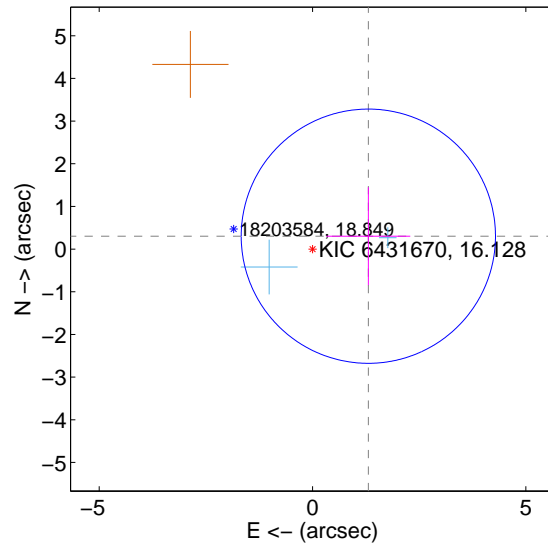
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 1.369 ± 1.044 | 1.31 | -1.298 ± 1.026 | 0.437 ± 1.185 |
| PRF-fit source offset from KIC position | 1.342 ± 0.993 | 1.35 | -1.308 ± 0.984 | 0.302 ± 1.145 |
| photometric centroid source offset | 0.83 ± 1.30 | 0.64 | 0.80 ± 1.30 | -0.20 ± 1.36 |

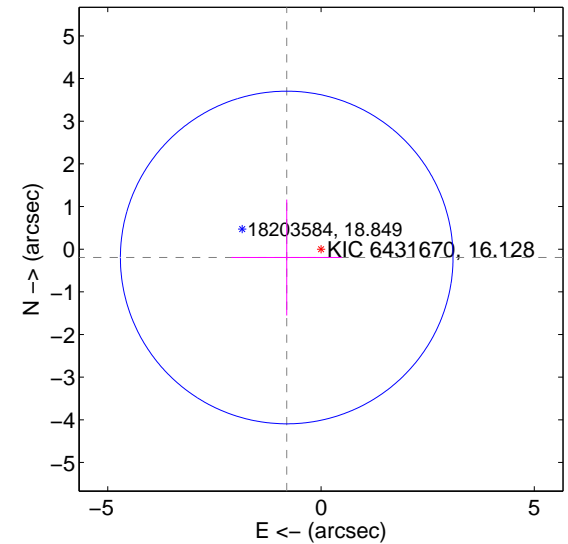
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

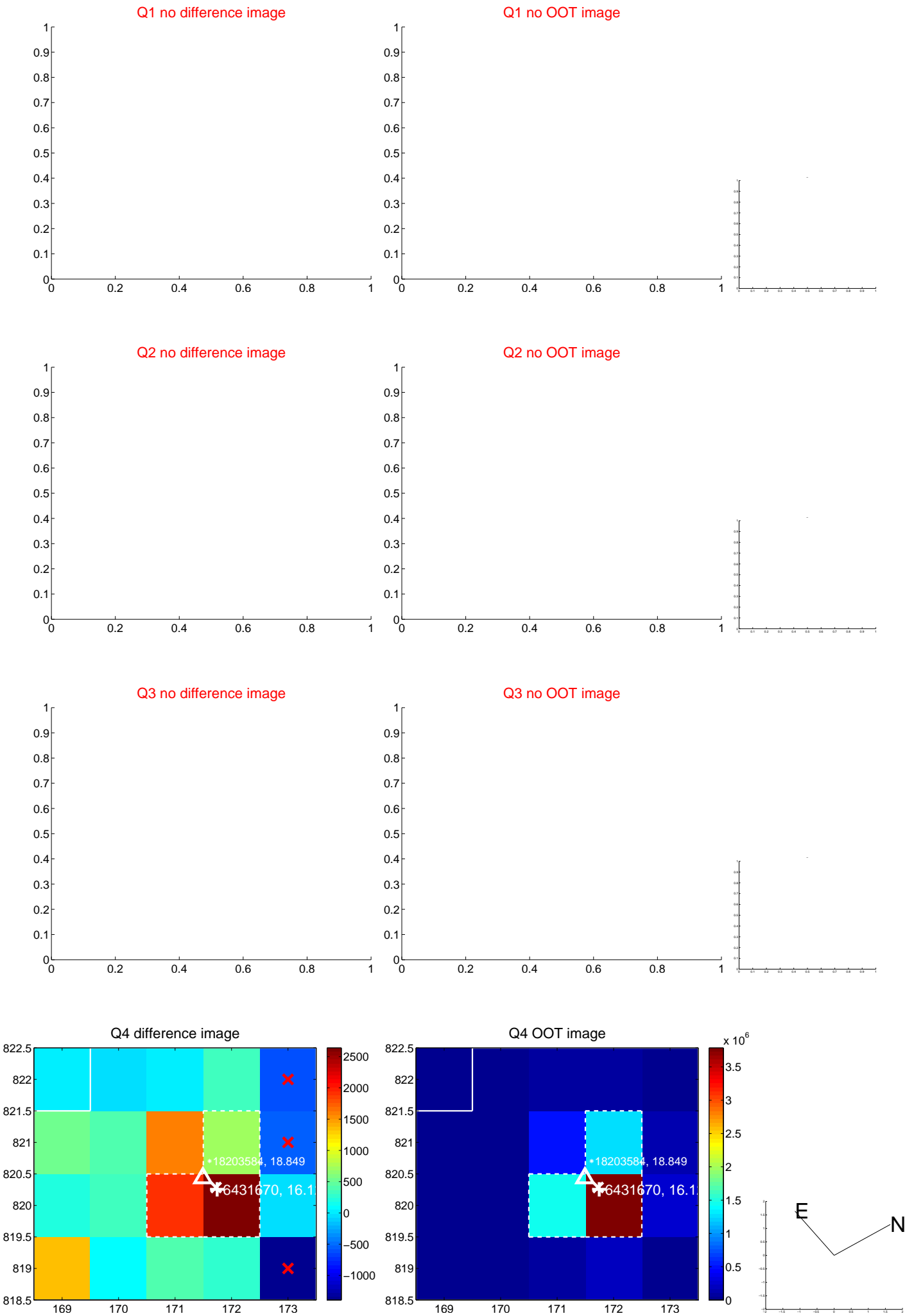


offset from photometric centroids



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.

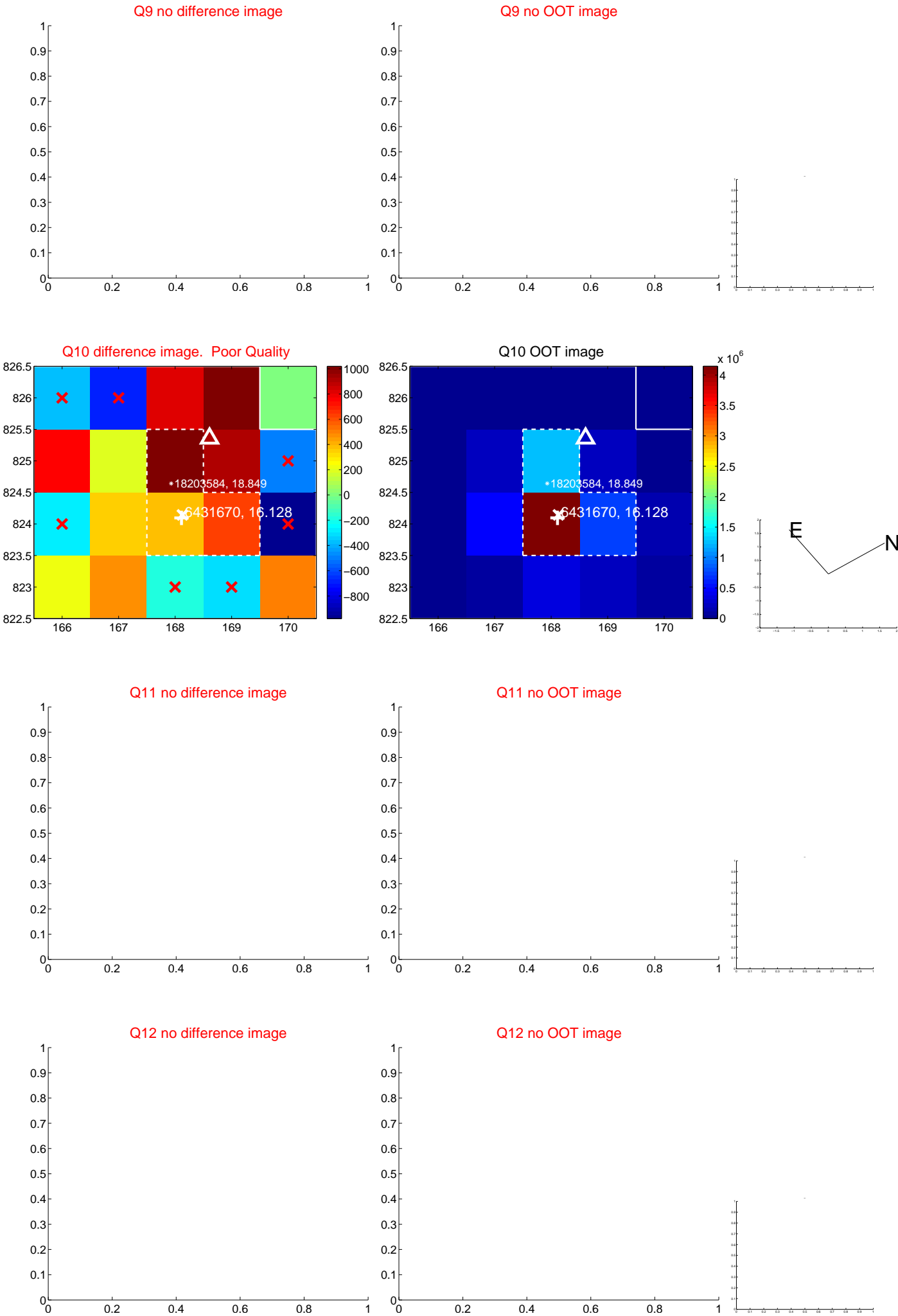
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



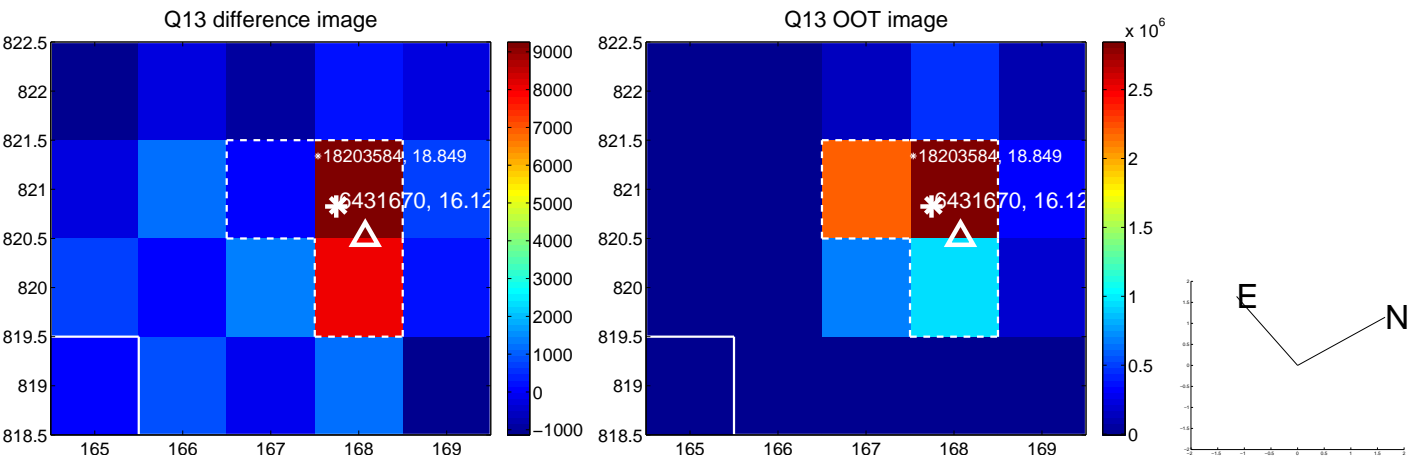
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



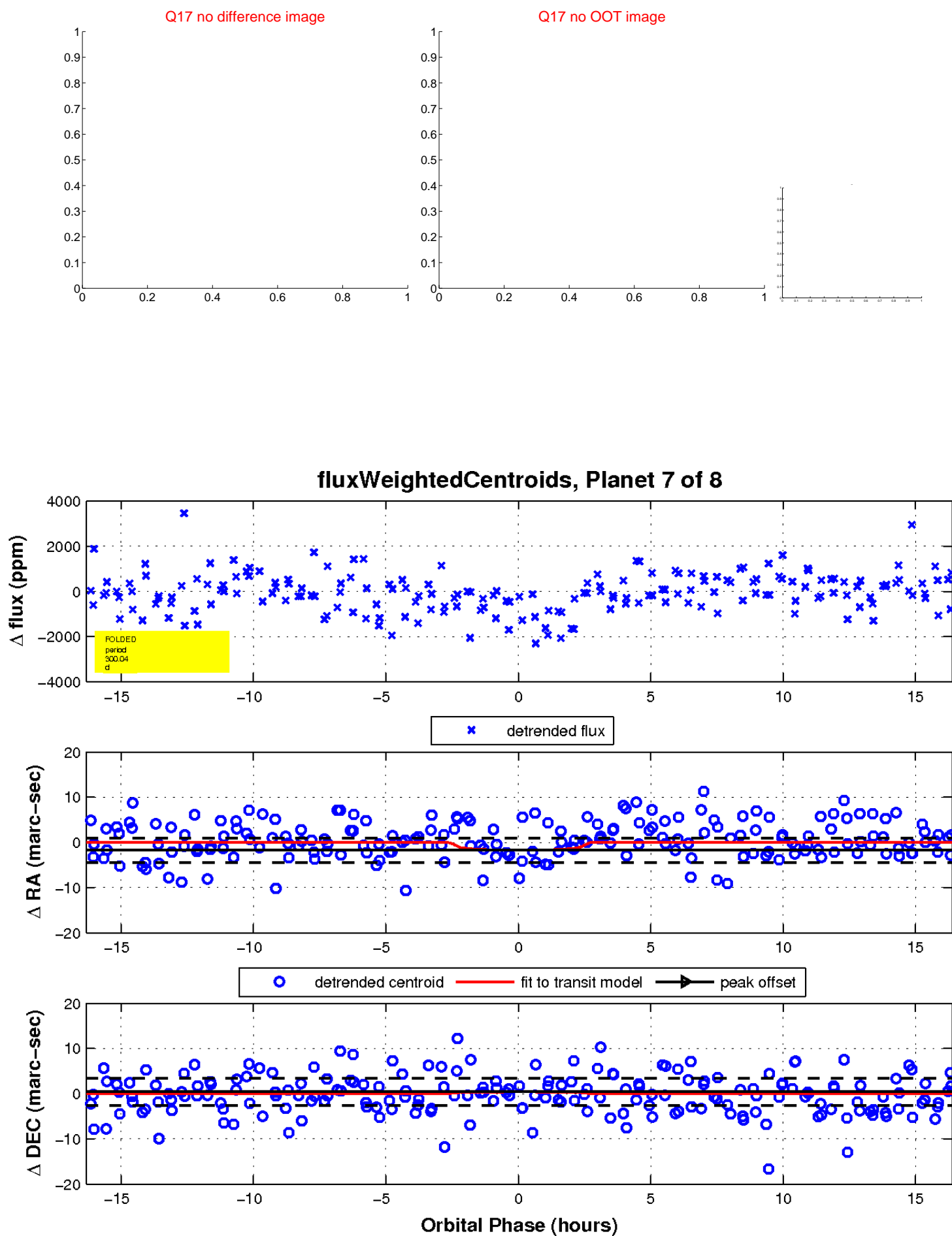
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

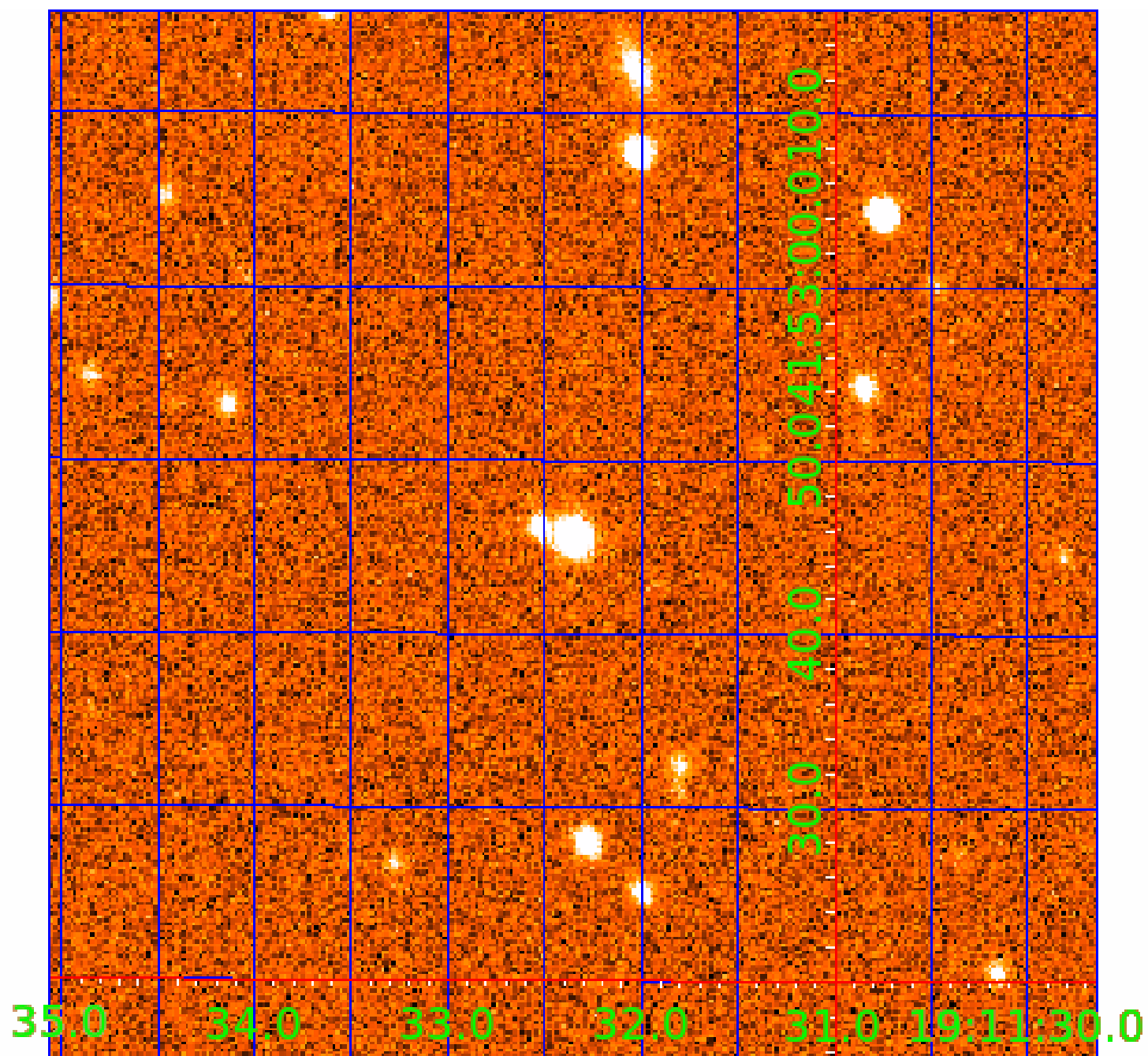


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006431670

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|------|-----------------------------|-----------------|------------------------|------------------------|
| 006431670-01 | OBS | 3534.01 | 29.911333 | 153.592861 | 358289.4 | 4.500 | 3602.3 | -1.0 | 0.70 | 5303 | 38.41 | 11.70 |
| 006431670-02 | OBS | No | 29.911512 | 144.830269 | 366672.0 | 5.000 | 3551.7 | -1.0 | 0.70 | 5303 | 37.44 | 11.70 |
| 006431670-03 | OBS | No | 14.955586 | 138.941998 | 13405.1 | 15.000 | 78.3 | -1.0 | 0.70 | 5303 | 8.01 | 29.49 |
| 006431670-04 | OBS | No | 156.930302 | 169.510324 | 1996.2 | 2.675 | 11.8 | 6.5 | 0.70 | 5303 | 3.36 | 1.28 |
| 006431670-05 | OBS | No | 70.646192 | 198.621740 | 435.5 | 10.064 | 11.7 | 4.6 | 0.70 | 5303 | 1.56 | 3.72 |
| 006431670-06 | OBS | No | 115.313282 | 218.062208 | 1587.8 | 4.058 | 16.1 | 7.0 | 0.70 | 5303 | 2.89 | 1.94 |
| 006431670-07 | OBS | No | 300.041667 | 356.111204 | 1829.8 | 5.475 | 9.8 | 8.2 | 0.70 | 5303 | 3.29 | 0.54 |
| 006431670-08 | OBS | No | 272.059128 | 134.308141 | 933.6 | 13.392 | 11.4 | 5.4 | 0.70 | 5303 | 2.16 | 0.62 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 006431670-01 | OBS | FP | 0.00 | 0 | 1 | 0 | 0 | MOD_SEC_ALT—HAS_SEC_TCE—CENT_NOFITS |
| 006431670-02 | OBS | FP | 0.00 | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_NOFITS |
| 006431670-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—RESIDUAL_TCE—CENT_NOFITS |
| 006431670-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 006431670-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-07 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 006431670-08 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

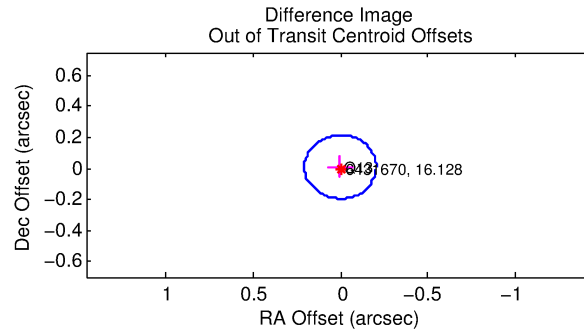
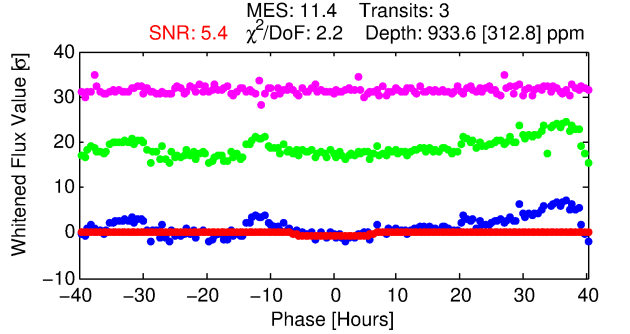
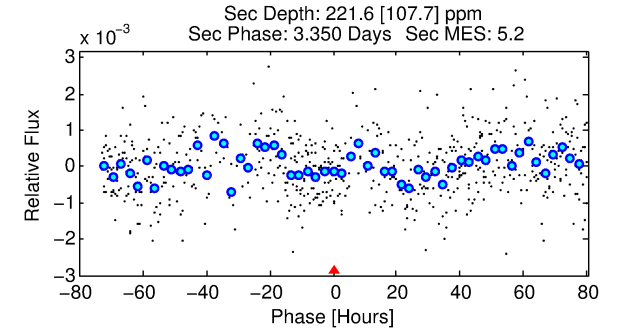
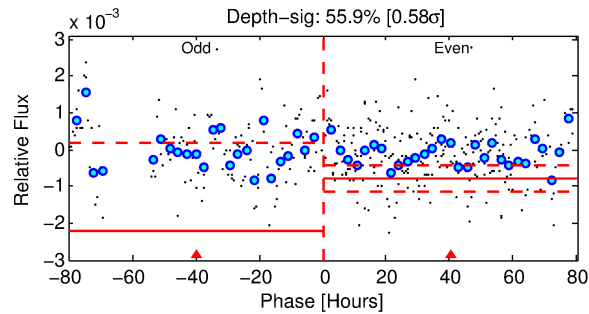
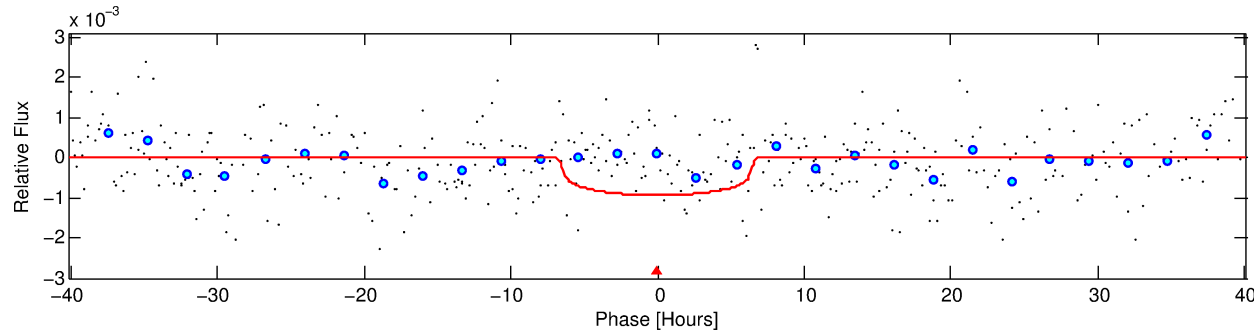
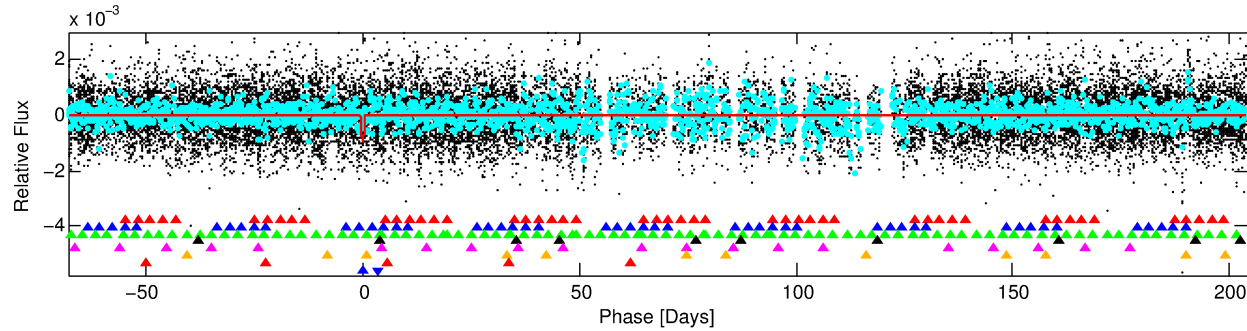
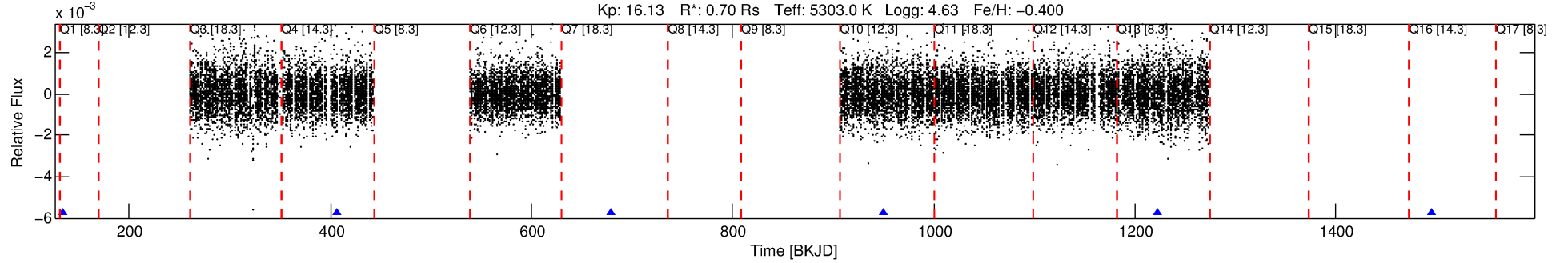
Ephemeris Match Information For 006431670-08

No Significant Match Found

DV One-Page Summary

KIC: 6431670 Candidate: 8 of 8 Period: 272.059 d
KOI: K03534 Corr: No Ephemeris Match

Kp: 16.13 R*: 0.70 Rs Teff: 5303.0 K Logg: 4.63 Fe/H: -0.400



DV Fit Results:

Period = 272.05913 [0.01975] d
Epoch = 134.3081 [0.0597] BKJD
Rp/R* = 0.0281 [0.0488]
a/R* = 147.19 [1018.97]
b = 0.40 [14.80]
Seff = 0.62 [0.14]
Teq = 226 [13] K
Rp = 2.16 [3.77] Re
a = 0.7548 [0.0972] AU
Ag = 14949.85 [52586.87] [0.28σ]
Teffp = 3863 [3395] K [1.07σ]

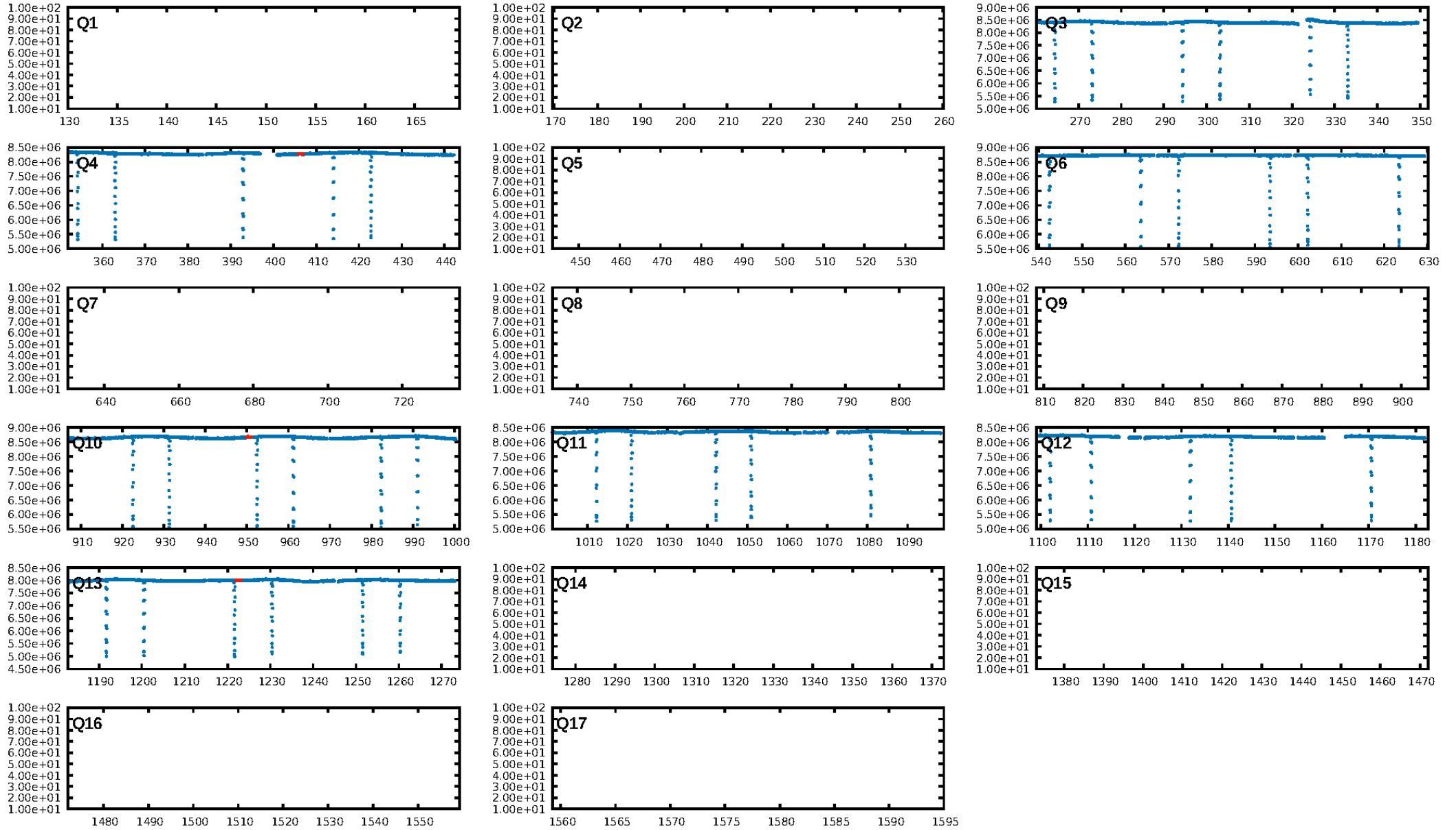
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [202.33σ]
LongPeriod-sig: 100.0% [46.42σ]
ModelChiSquare2-sig: 13.6%
ModelChiSquareGof-sig: 61.3%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.6411
Centroid-sig: 38.3%
Centroid-so: 1.542 arcsec [0.95σ]
OotOffset-rm: 0.010 arcsec [0.15σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-rm: 0.062 arcsec [0.90σ]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 0.33 [1/3]

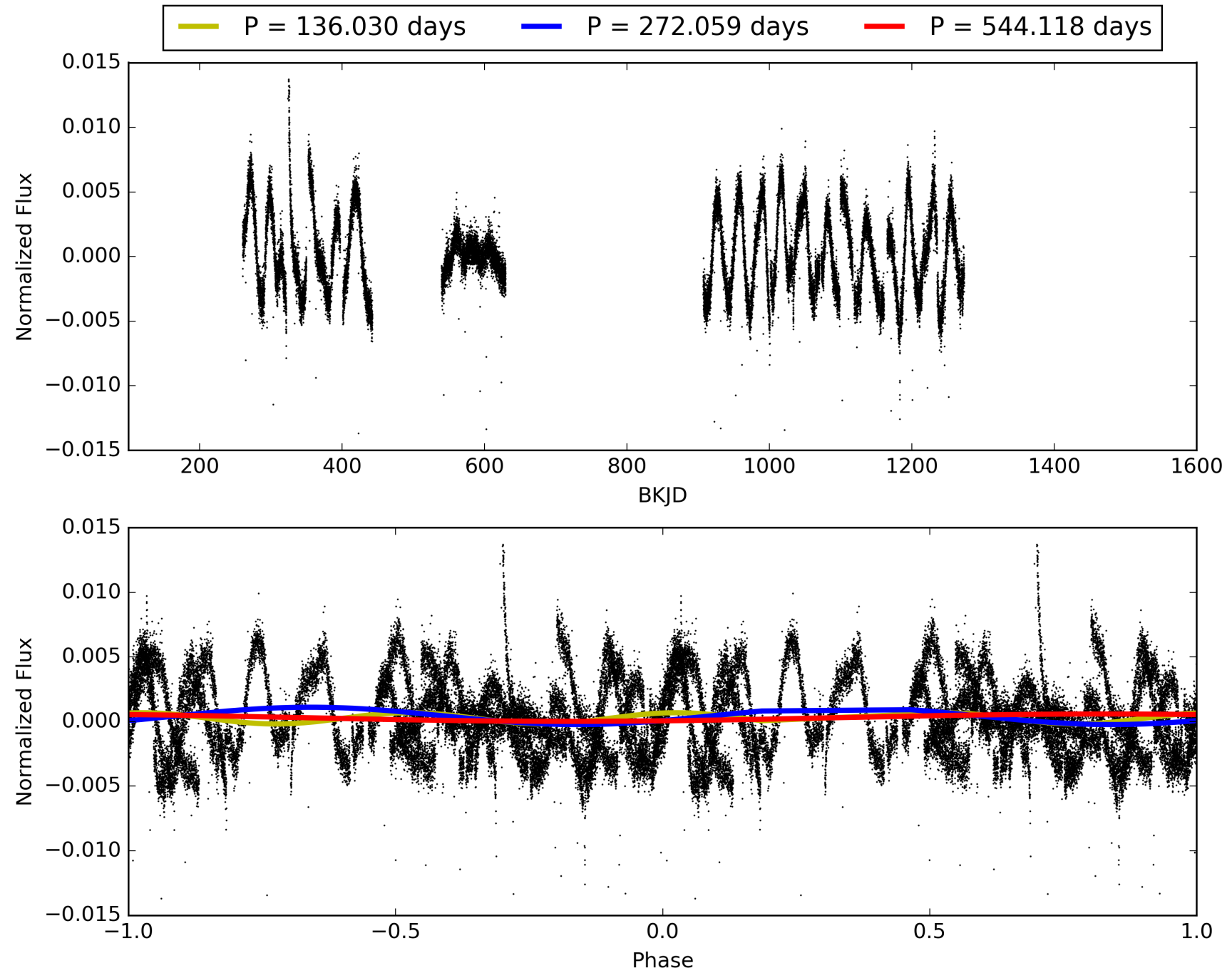
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:30:21 Z

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

TCE 006431670-08, PDC Light Curves

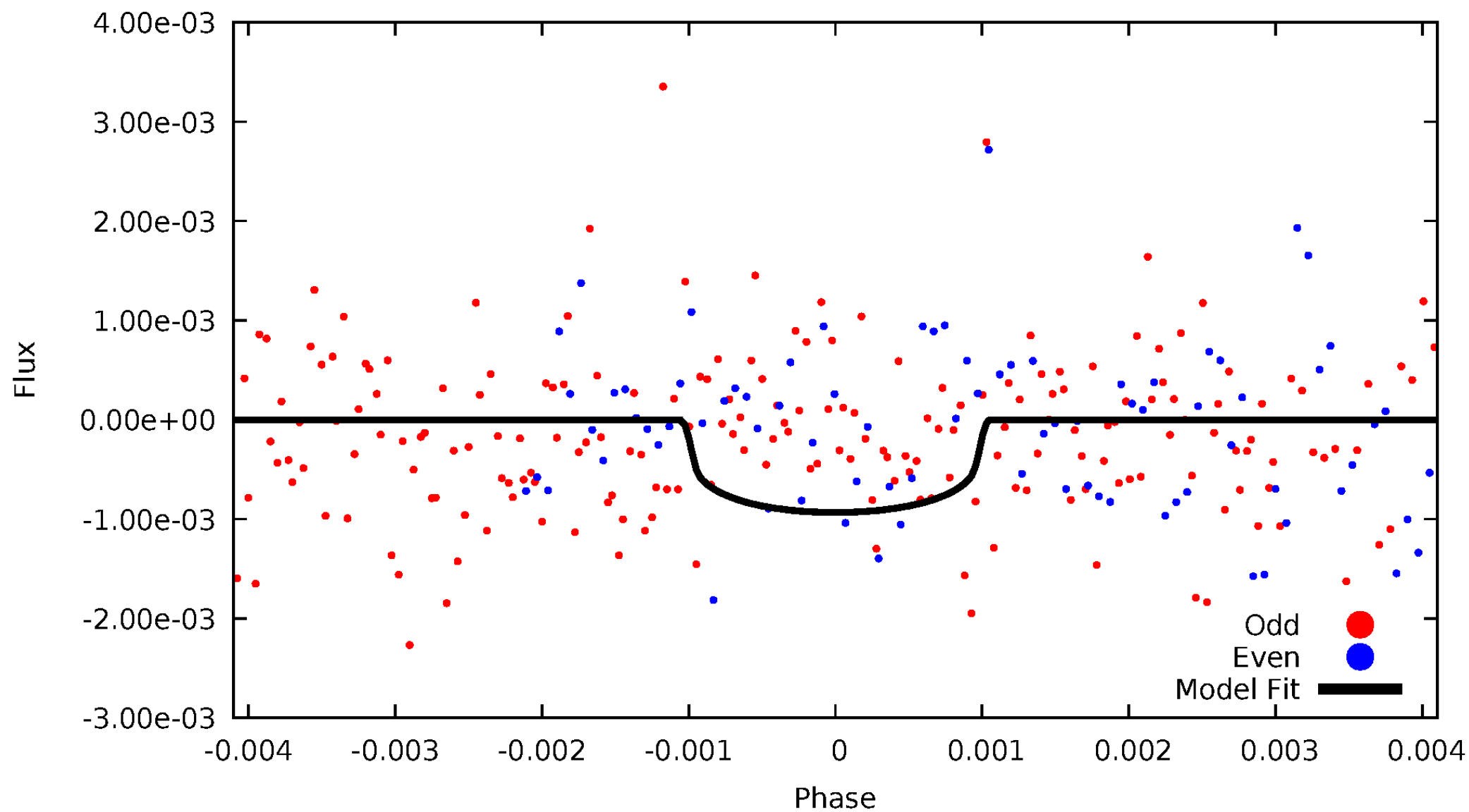


TCE 006431670-08



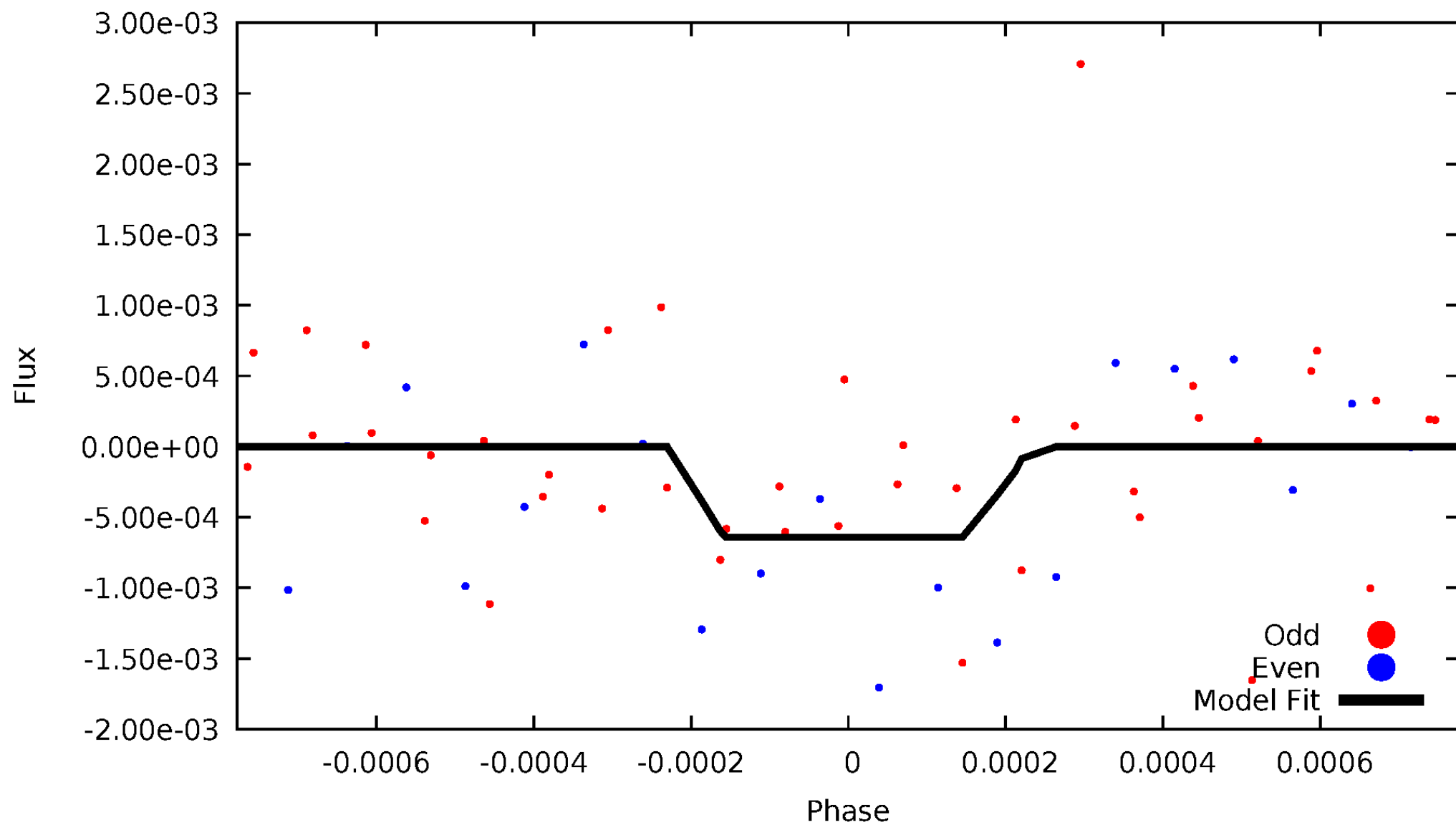
DV Odd/Even

TCE 006431670-08



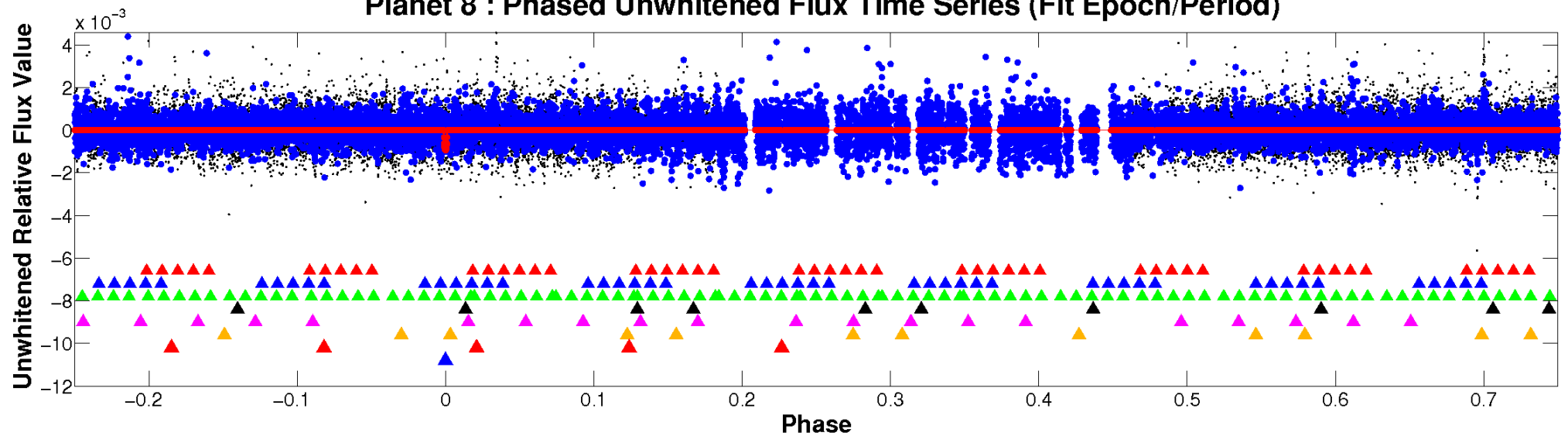
ALT Odd/Even

TCE 006431670-08

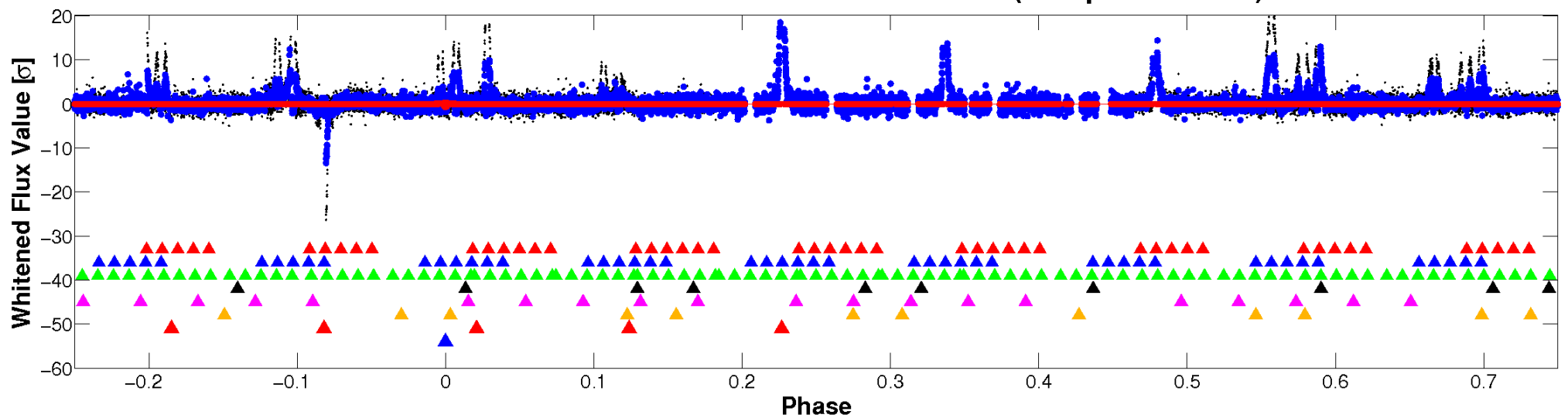


Non-Whitened Vs. Whitened Light Curve

Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

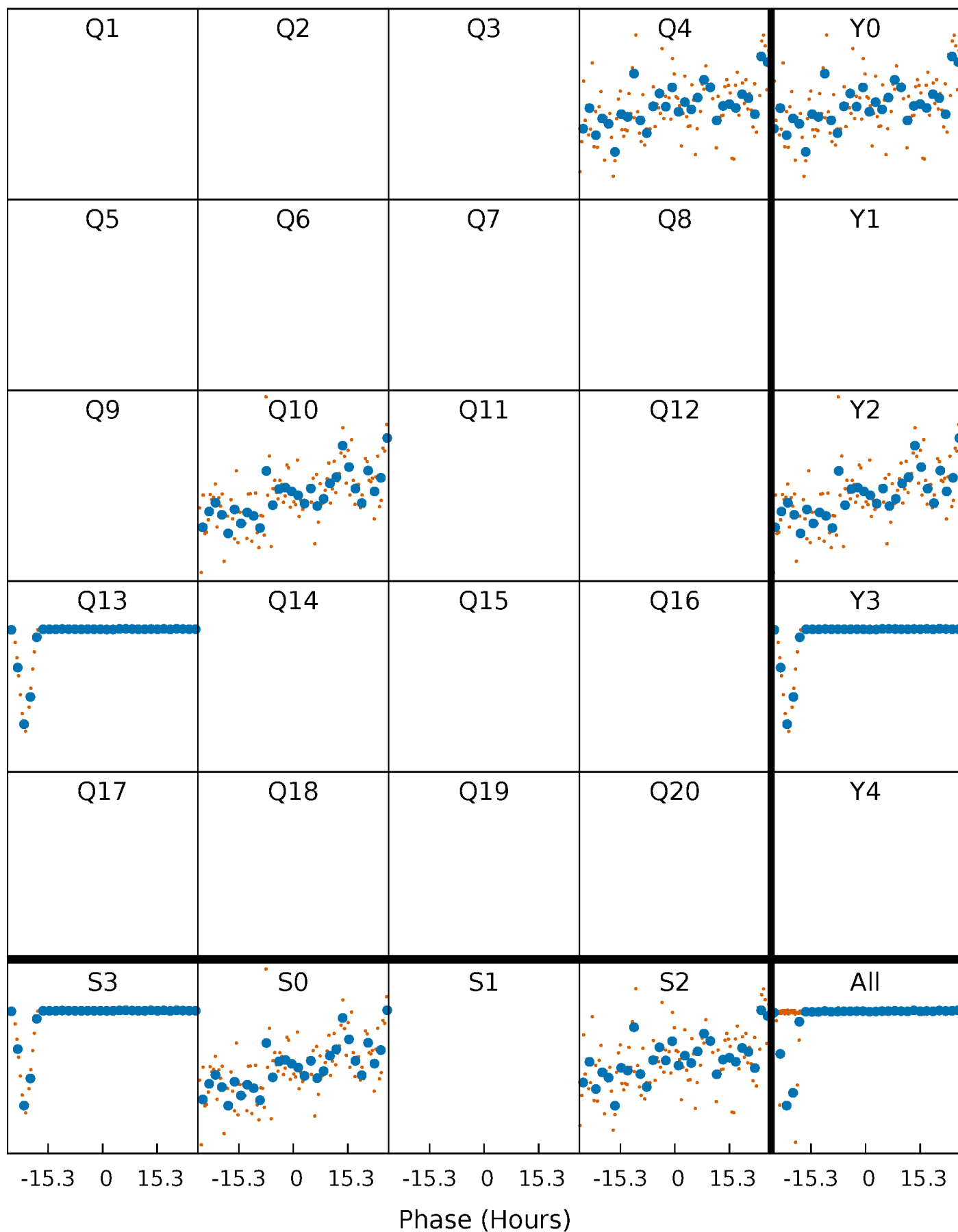


Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



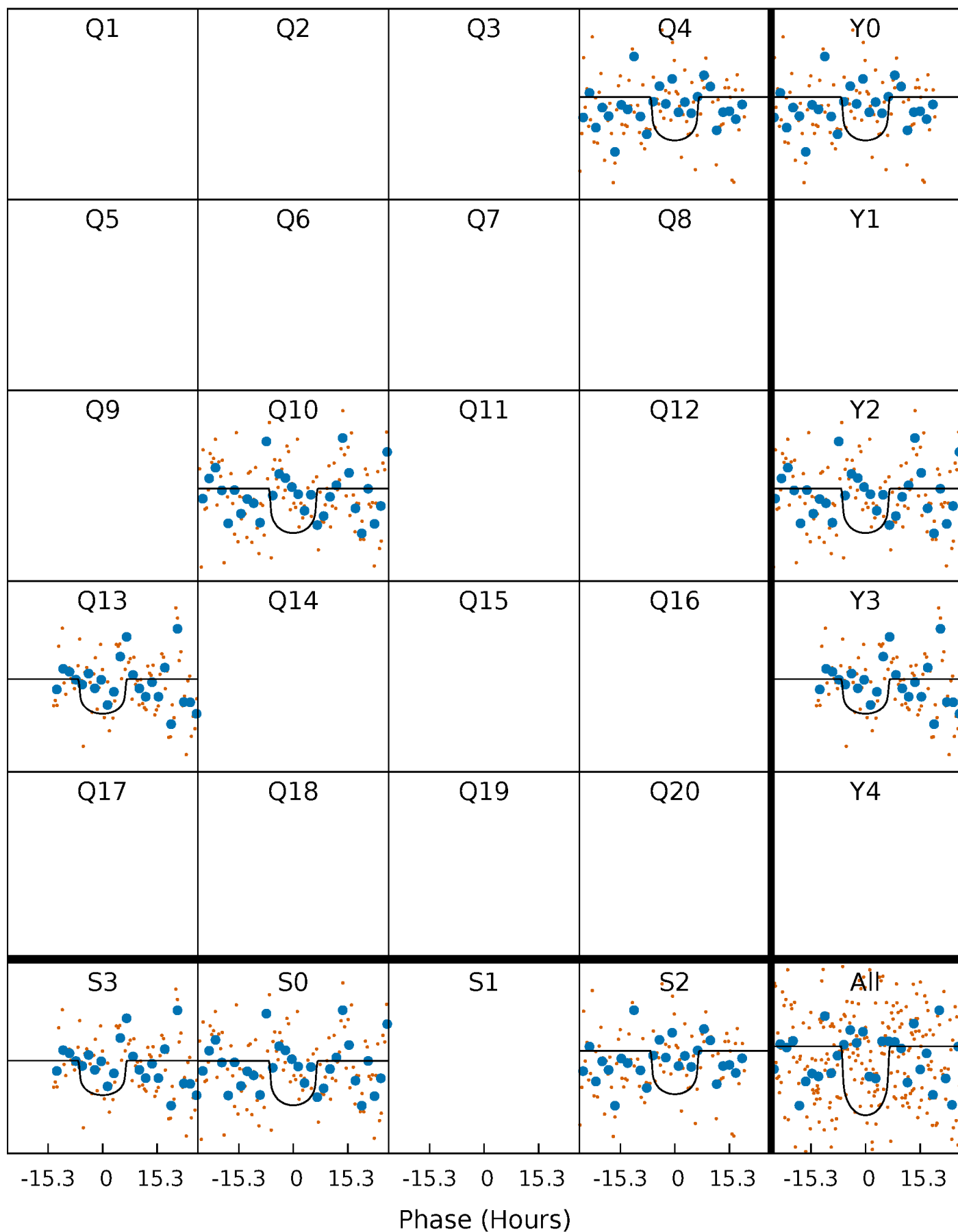
PDC Quarter-Phased Transit Curves

TCE 006431670-08 $P=272.059128$ Days $T_0=134.308141$ (BKJD)



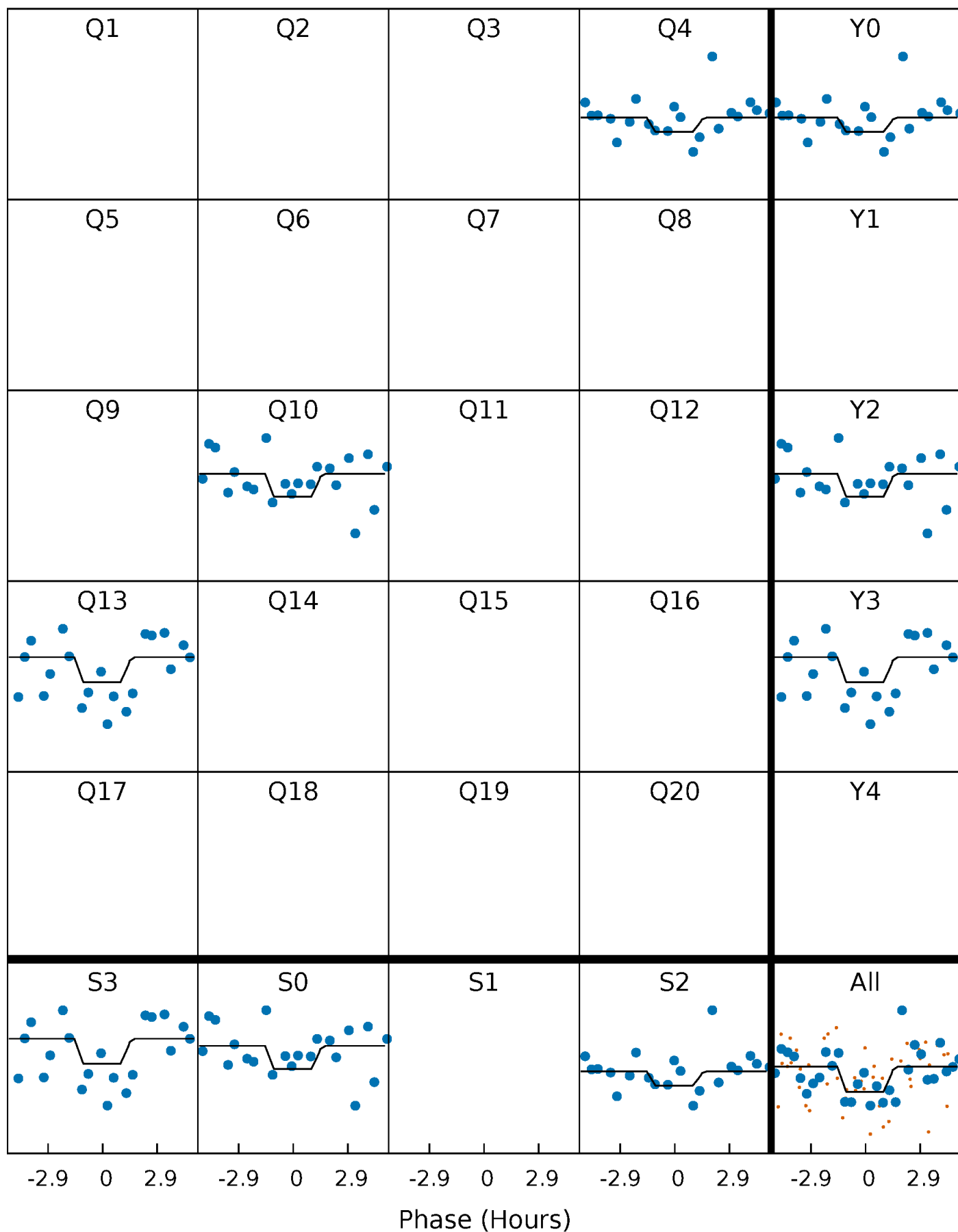
DV Quarter-Phased Transit Curves

TCE 006431670-08 $P=272.059128$ Days $T_0=134.308141$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

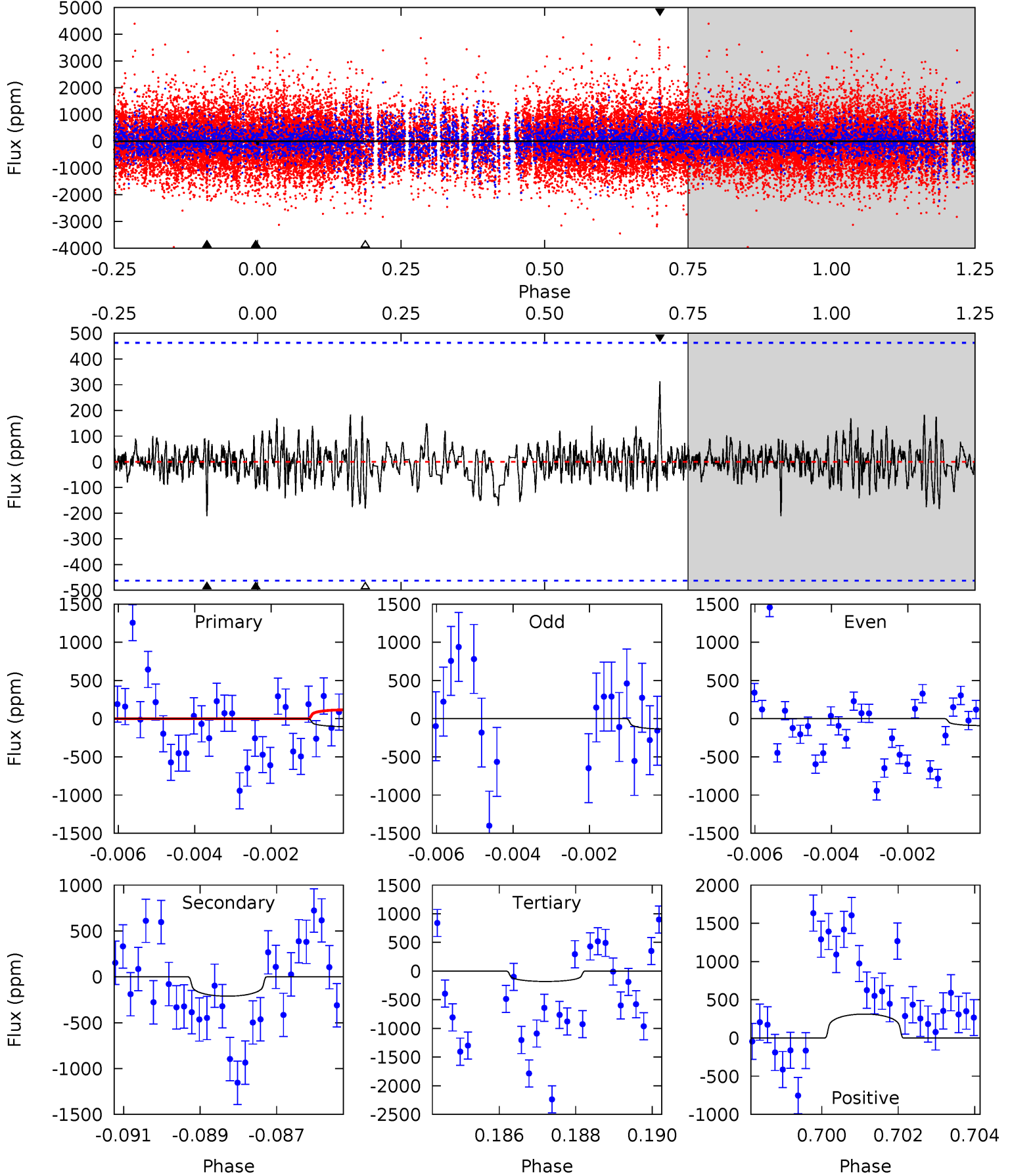
TCE 006431670-08 P=272.015665 Days $T_0=134.551648$ (BKJD)



DV Model-Shift Uniqueness Test

006431670-08, P = 272.059128 Days, E = 134.308141 Days

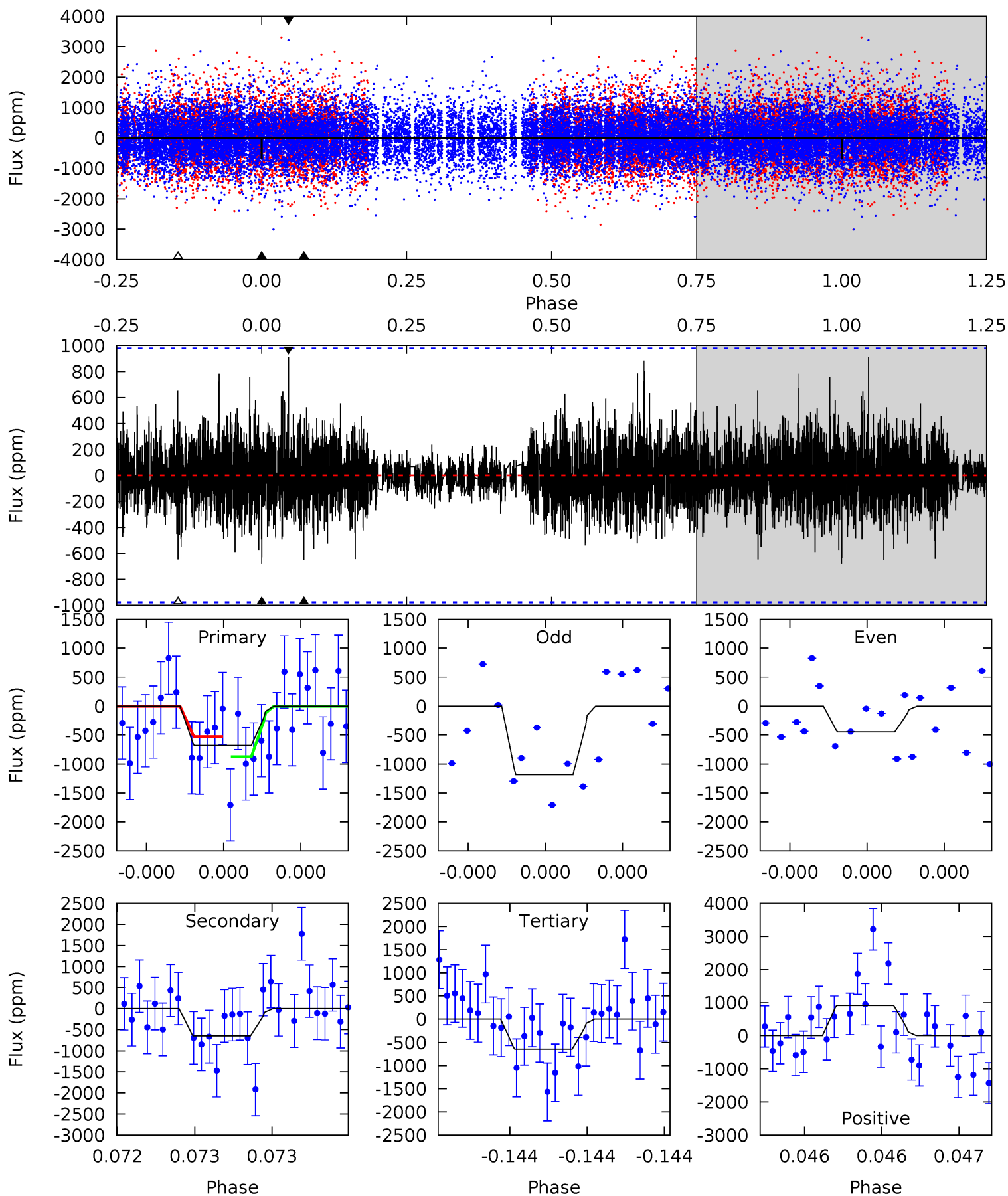
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 1.20 | 2.42 | 2.08 | 3.59 | 5.32 | 3.08 | 0.61 | -0.88 | -2.40 | 0.34 | -1.17 | 0.24 | 0.93 | 0.60 | 1.24 |



Alt Model-Shift Uniqueness Test

006431670-08, P = 272.015665 Days, E = 134.551648 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 3.90 | 3.72 | 3.72 | 5.21 | 5.61 | 3.54 | 1.01 | 0.19 | -1.31 | 0.00 | -1.49 | 1.94 | 1.48 | 0.57 | 1.00 |



Stellar Parameters For KIC 006431670

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | M (M_{\odot}) | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5303^{+191}_{-191} | $4.632^{+0.032}_{-0.097}$ | $-0.400^{+0.300}_{-0.300}$ | $0.704^{+0.111}_{-0.051}$ | $0.785^{+0.074}_{-0.082}$ | $3.172^{+0.519}_{-1.000}$ |
| | +4%/-4% | +1%/-2% | +75%/-75% | +16%/-7% | +9%/-10% | +16%/-32% |
| Source | KIC0 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 006431670-08 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|----------------|------------------------|-------------------|-----------------------|----------------------------|
| DV | -211 ± 87 | $3.46^{+3.46}_{-2.35}$ | 321^{+15}_{-14} | 3459^{+1812}_{-656} | 4937^{+44809}_{-3774} |
| Alt. | -648 ± 174 | $3.30^{+3.80}_{-2.26}$ | 319^{+16}_{-13} | 4283^{+3060}_{-966} | $17660^{+166992}_{-13627}$ |

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 $A_{obs} \gg 1.0$

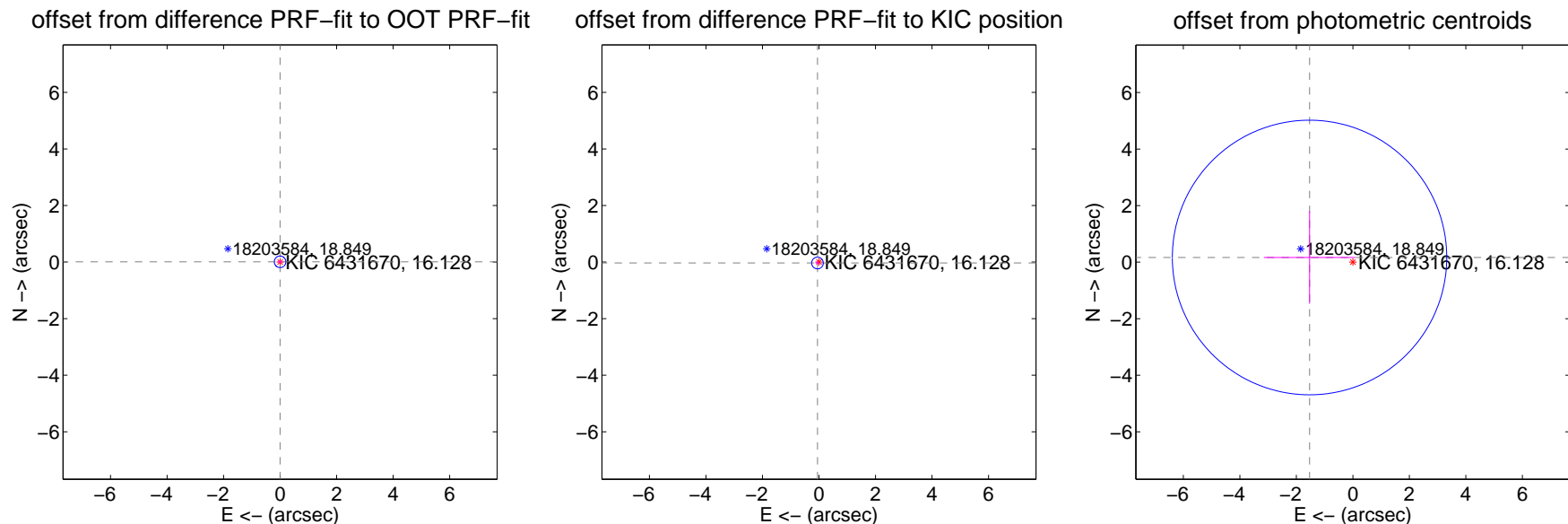
DV Centroid Data

Supplemental centroid analysis for 006431670-08. Kepler magnitude: 16.13. Transit SNR 5.40

There are 0 quarters with good PRF difference image offsets

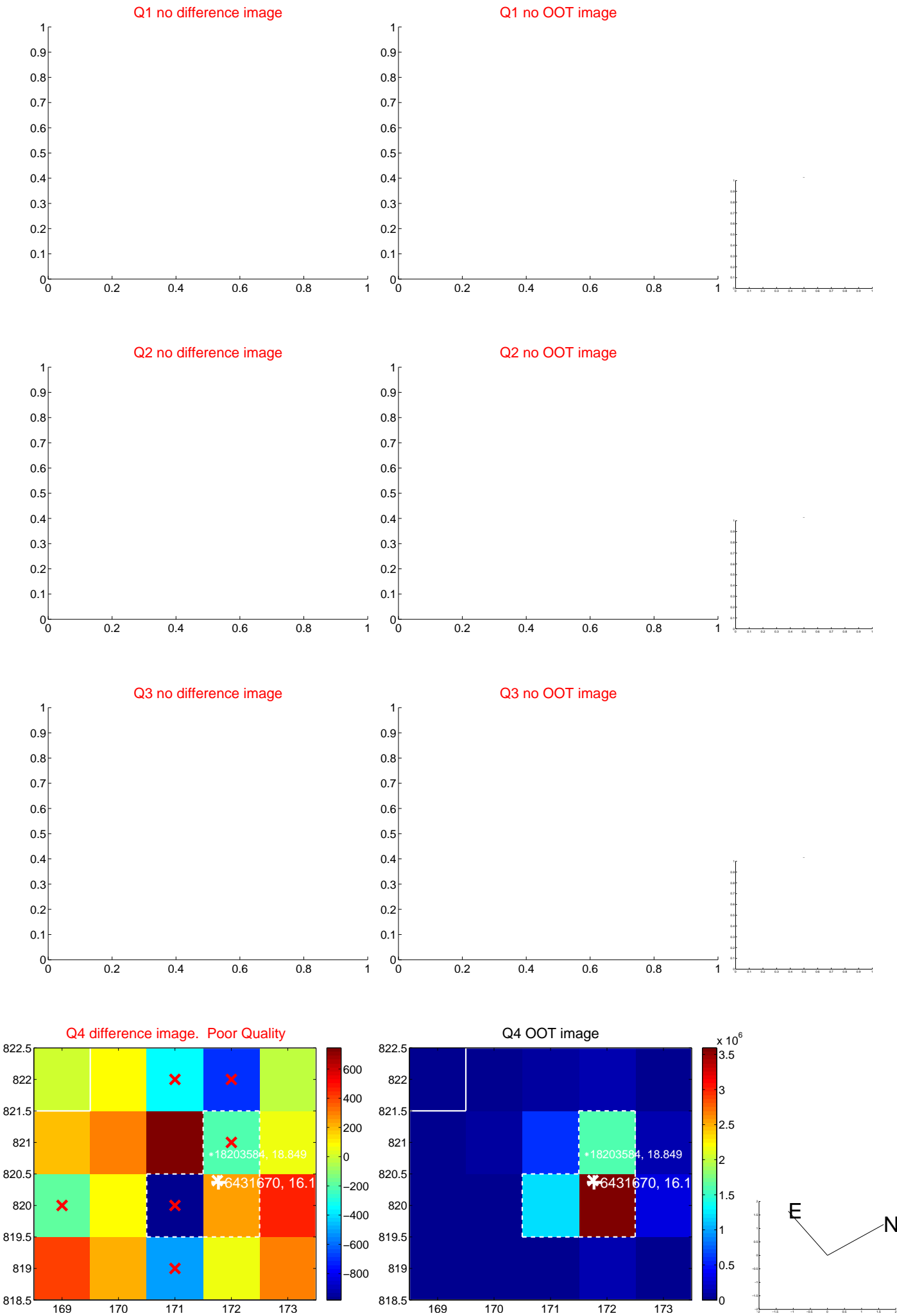
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.010 ± 0.068 | 0.15 | 0.001 ± 0.069 | 0.010 ± 0.068 |
| PRF-fit source offset from KIC position | 0.062 ± 0.069 | 0.90 | 0.053 ± 0.069 | -0.033 ± 0.068 |
| photometric centroid source offset | 1.54 ± 1.62 | 0.95 | 1.53 ± 1.62 | 0.16 ± 1.64 |



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.

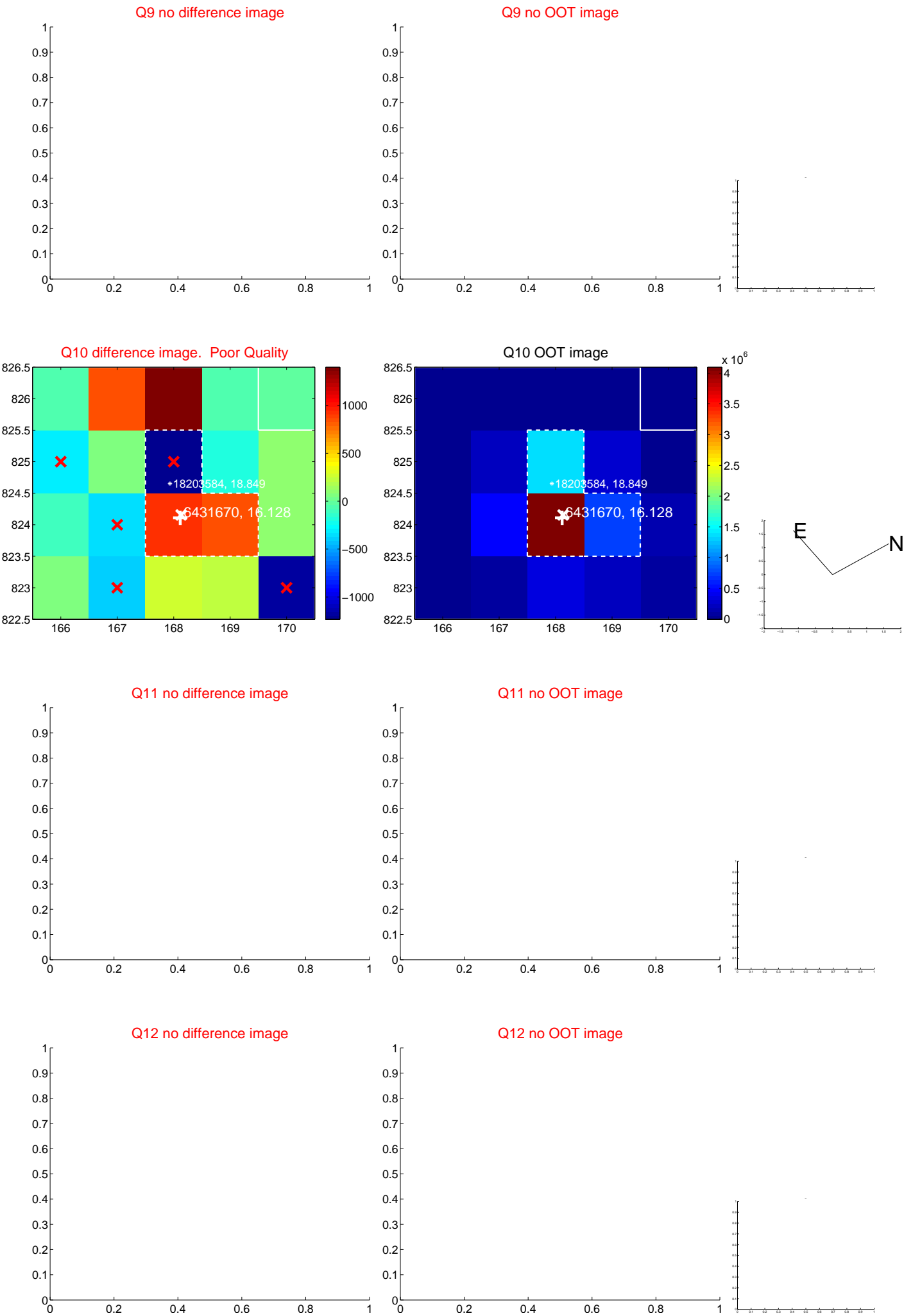
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



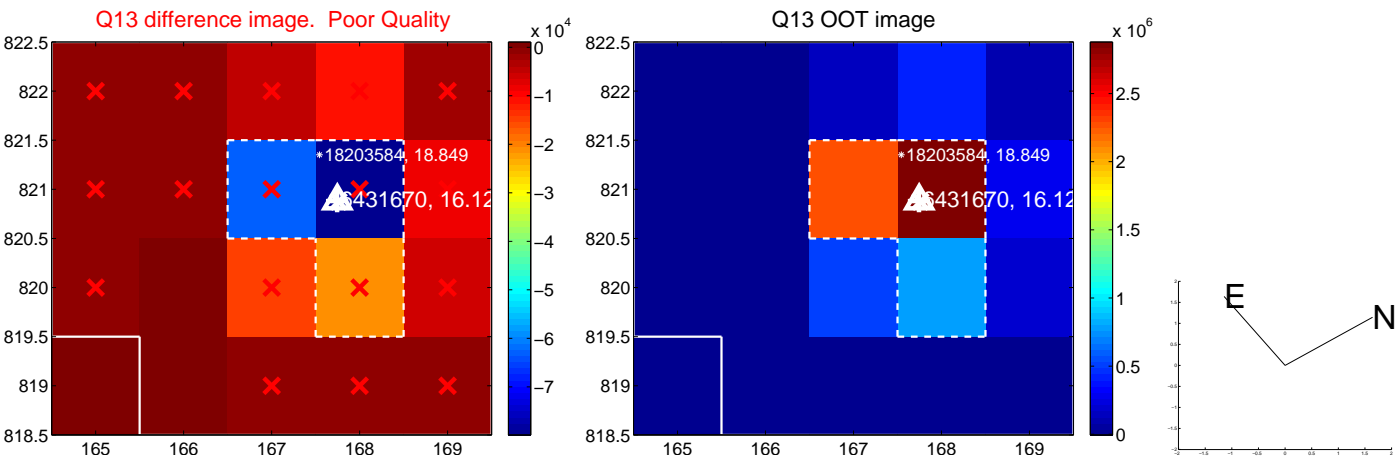
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



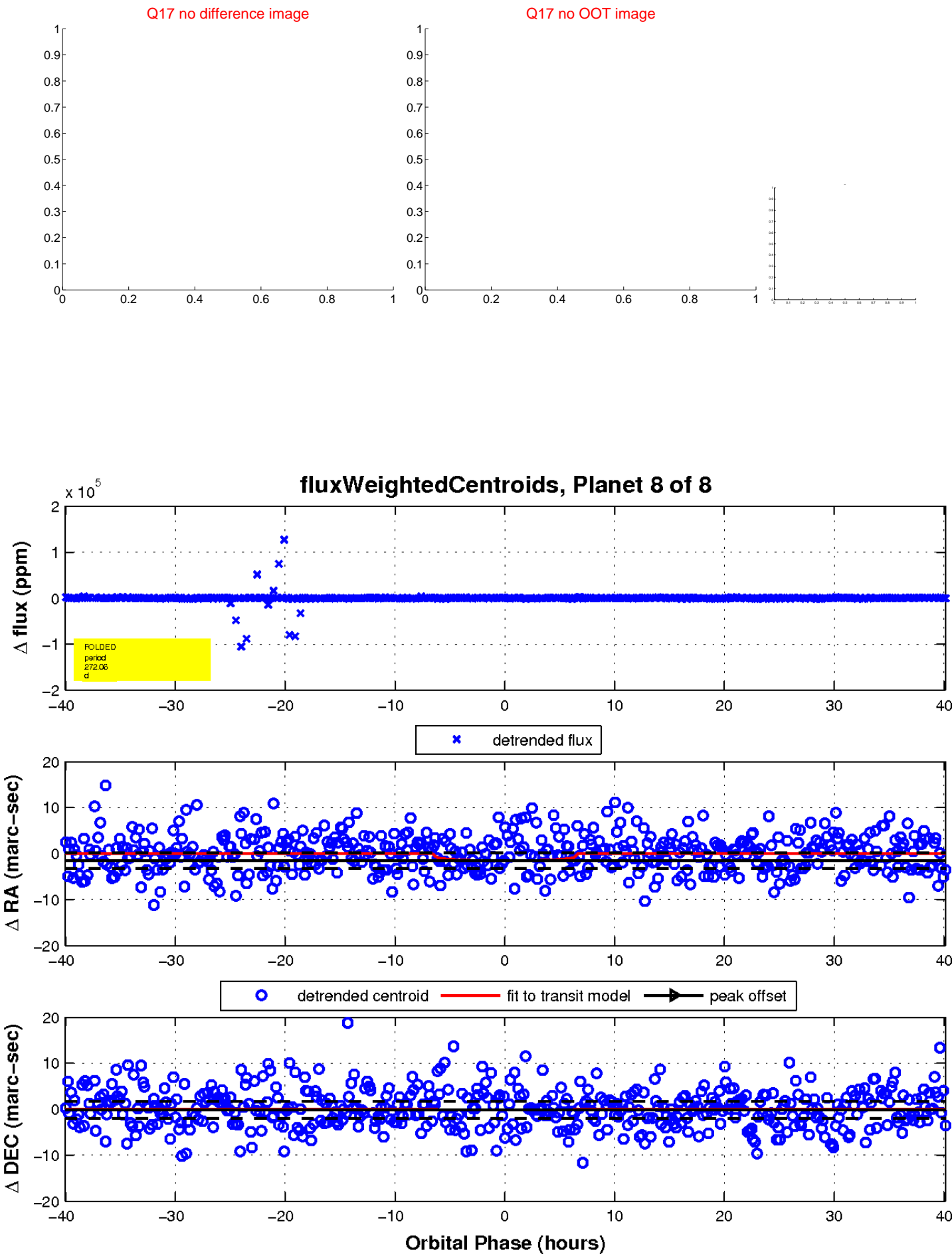
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

