

KIC 009813965

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009813965-01 | OBS | No | 556.723868 | 295.914142 | 1097.0 | 4.933 | 17.2 | 5.5 | 1.01 | 5936 | 3.37 | 0.65 |
| 009813965-02 | OBS | No | 434.398757 | 511.909243 | 734.6 | 3.299 | 17.1 | 5.4 | 1.01 | 5936 | 2.87 | 0.90 |
| 009813965-03 | OBS | No | 303.200218 | 411.638464 | 1145.0 | 3.192 | 16.3 | 7.9 | 1.01 | 5936 | 6.60 | 1.45 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 009813965-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS |
| 009813965-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 009813965-03 | 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—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.

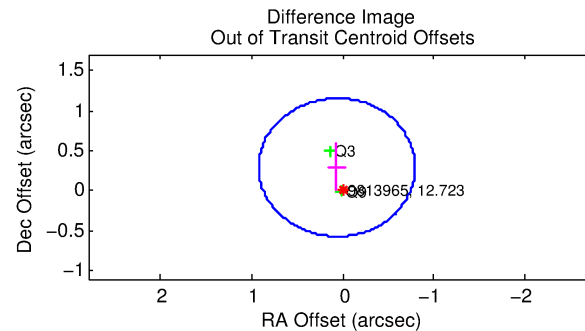
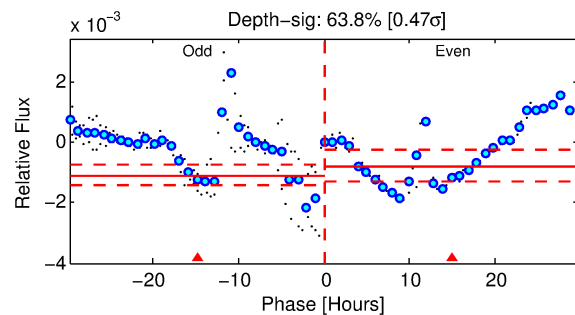
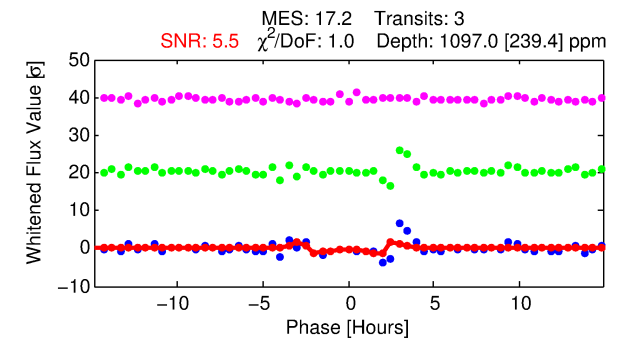
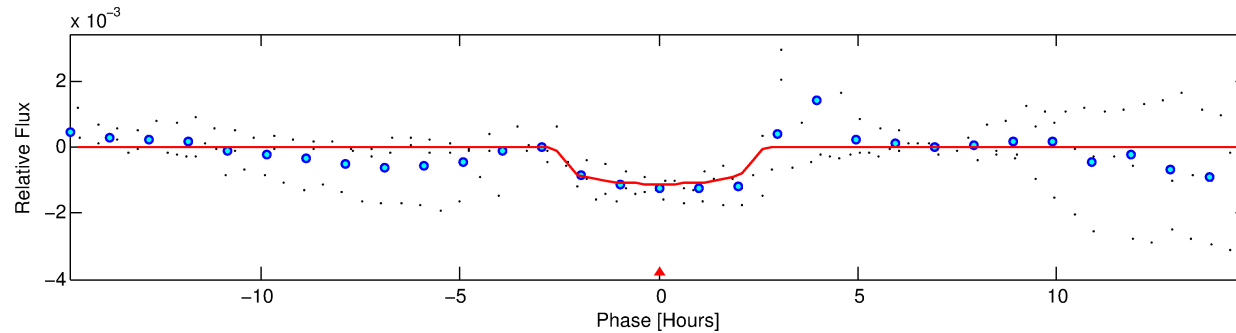
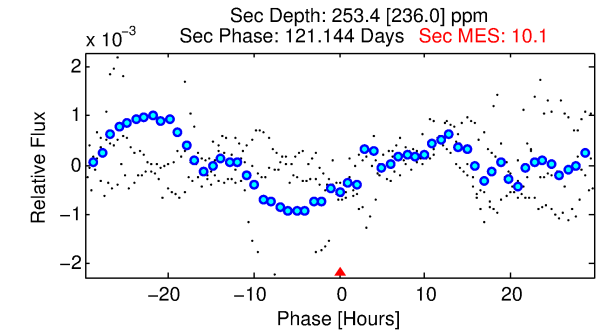
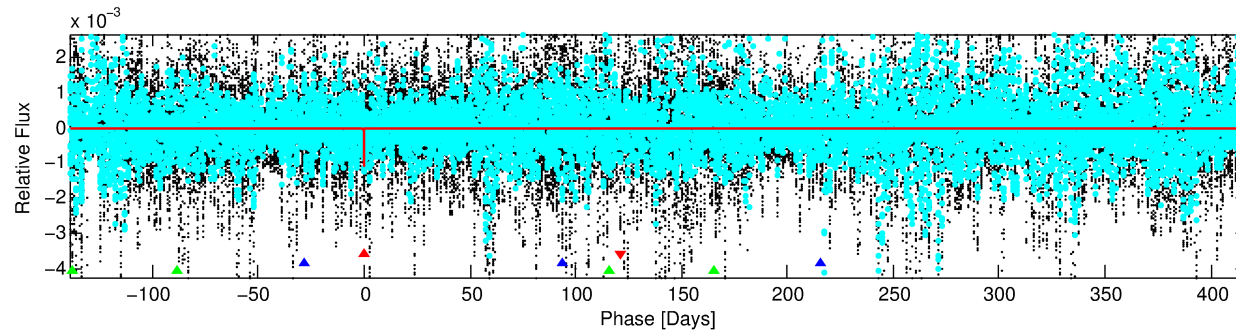
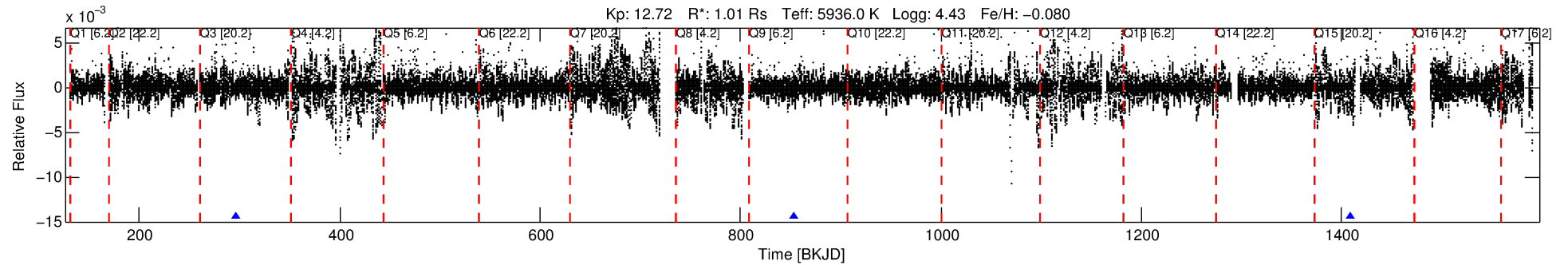
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009813965-01

No Significant Match Found

DV One-Page Summary

KIC: 9813965 Candidate: 1 of 3 Period: 556.724 d



DV Fit Results:

Period = 556.72387 [0.00396] d
Epoch = 295.9141 [0.0057] BKJD
Rp/R* = 0.0306 [0.0239]
a/R* = 834.94 [2861.60]
b = 0.35 [8.57]
Seff = 0.65 [0.26]
Teq = 229 [23] K
Rp = 3.37 [2.82] Re
a = 1.3235 [0.3371] AU
Ag = 21494.45 [39905.61] [0.54 σ]
Teffp = 4281 [1952] K [2.08 σ]

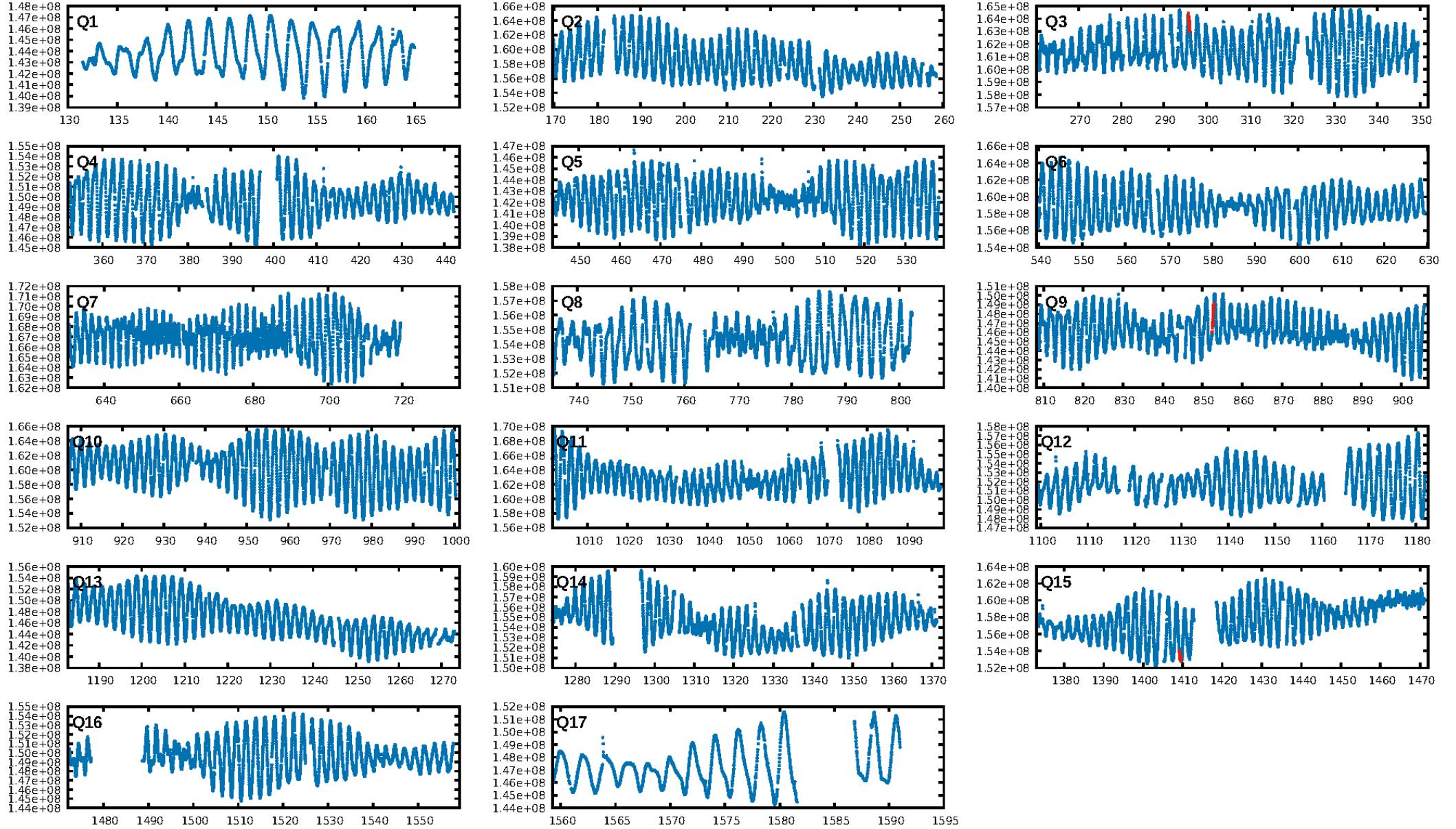
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [494.74 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 44.8%
ModelChiSquareGof-sig: 89.5%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.8875
Centroid-sig: 16.5%
Centroid-so: 0.250 arcsec [0.27 σ]
OotOffset-rm: 0.298 arcsec [1.04 σ]
OotOffset-st: 0/1/0/1 [2]
KicOffset-rm: 0.312 arcsec [1.52 σ]
KicOffset-st: 0/1/0/1 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [2/2]

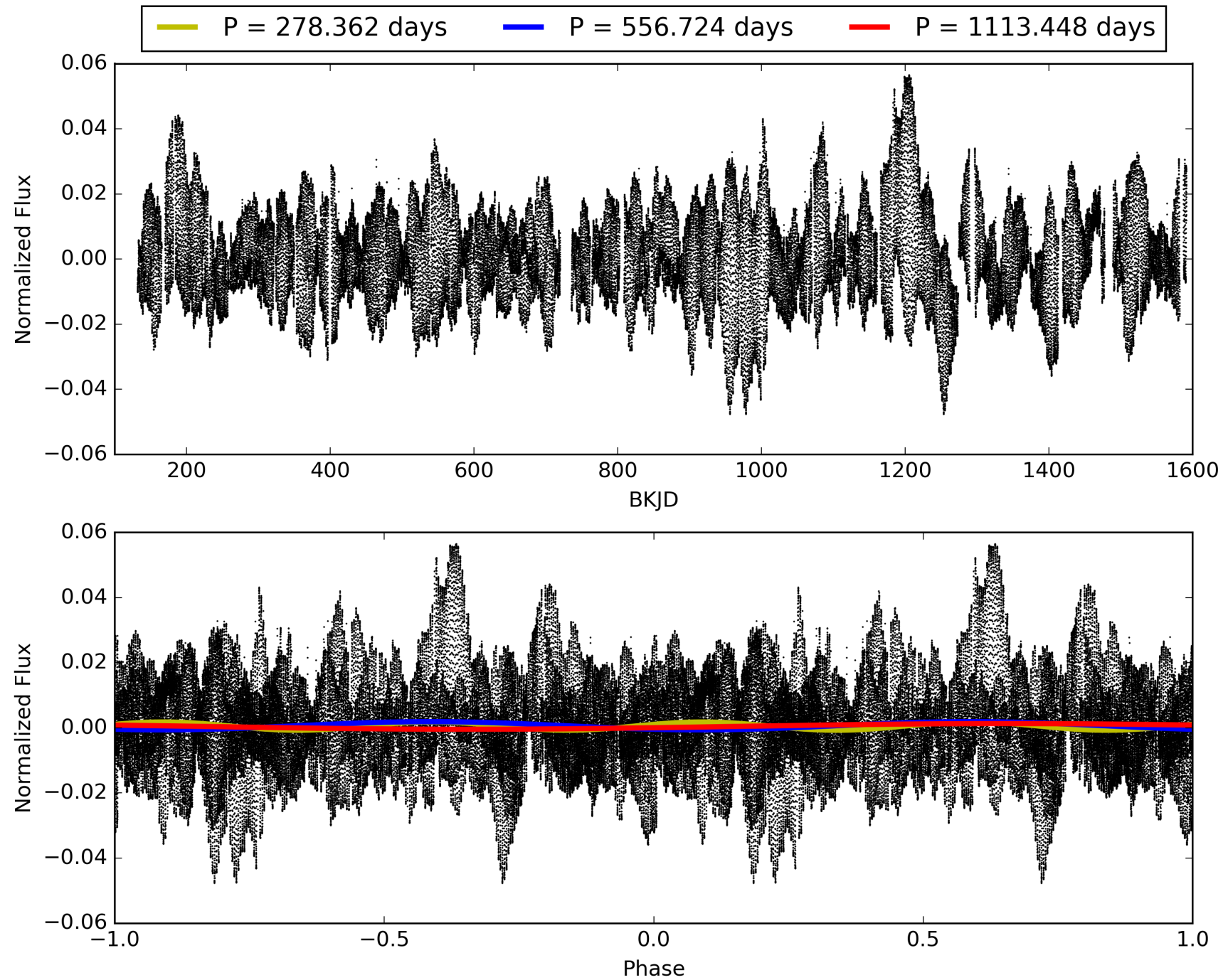
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:32:42 Z

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

TCE 009813965-01, PDC Light Curves

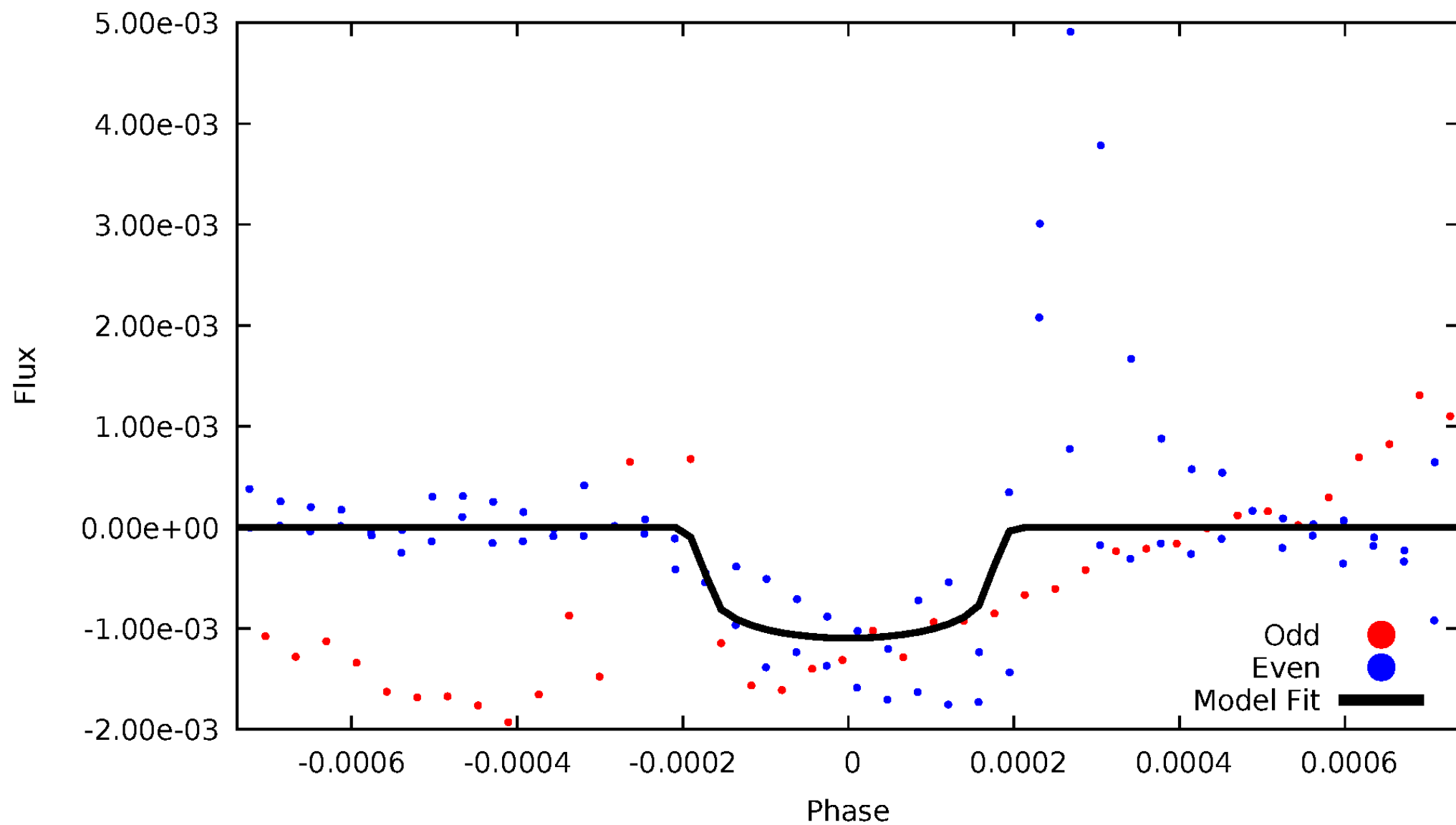


TCE 009813965-01



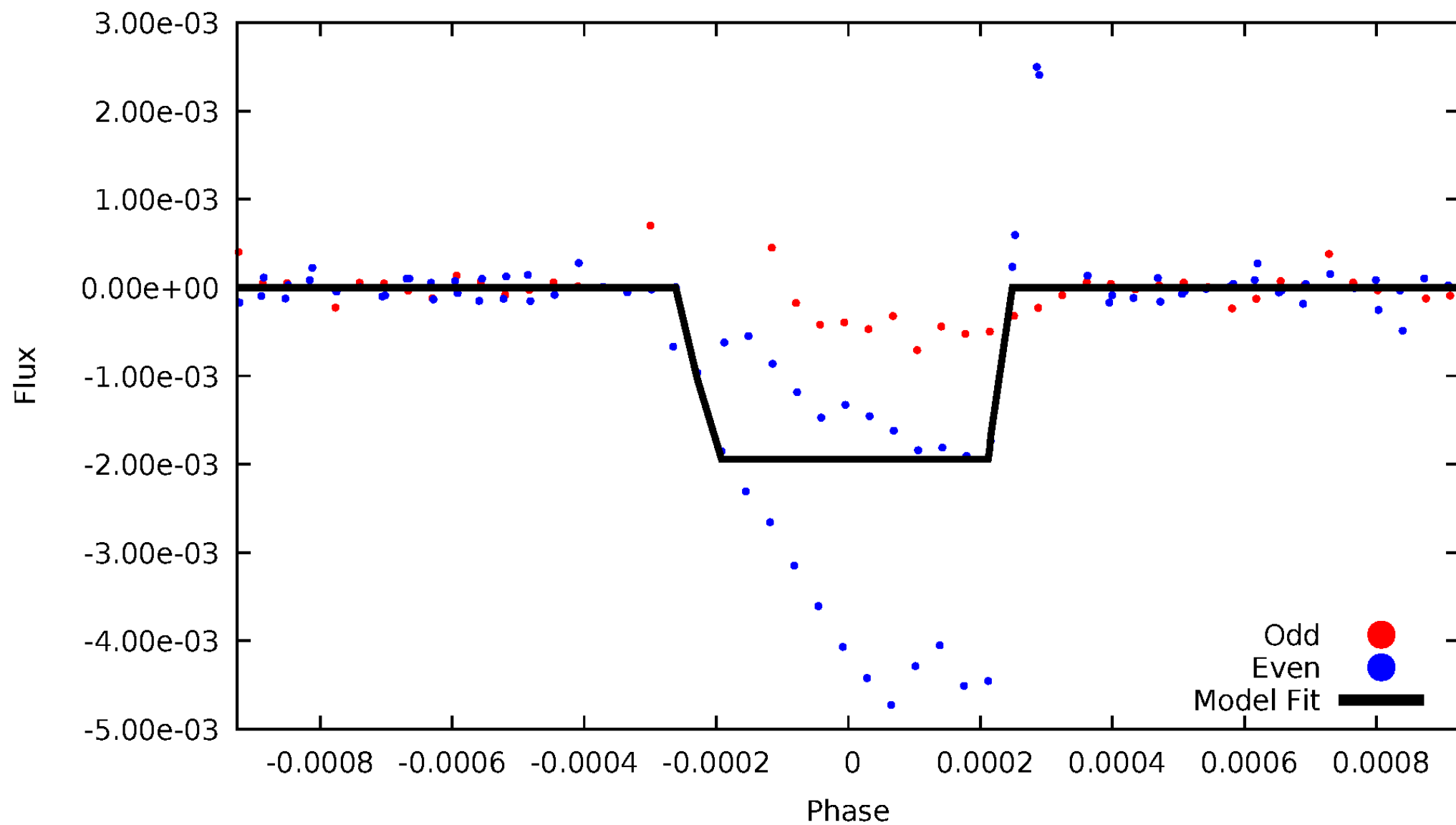
DV Odd/Even

TCE 009813965-01



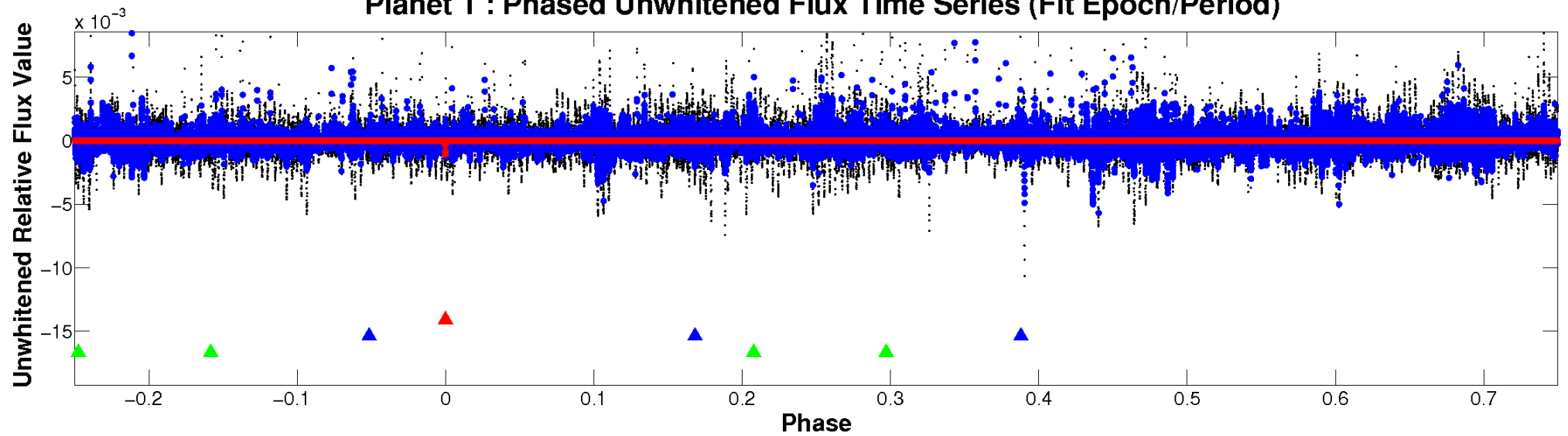
ALT Odd/Even

TCE 009813965-01

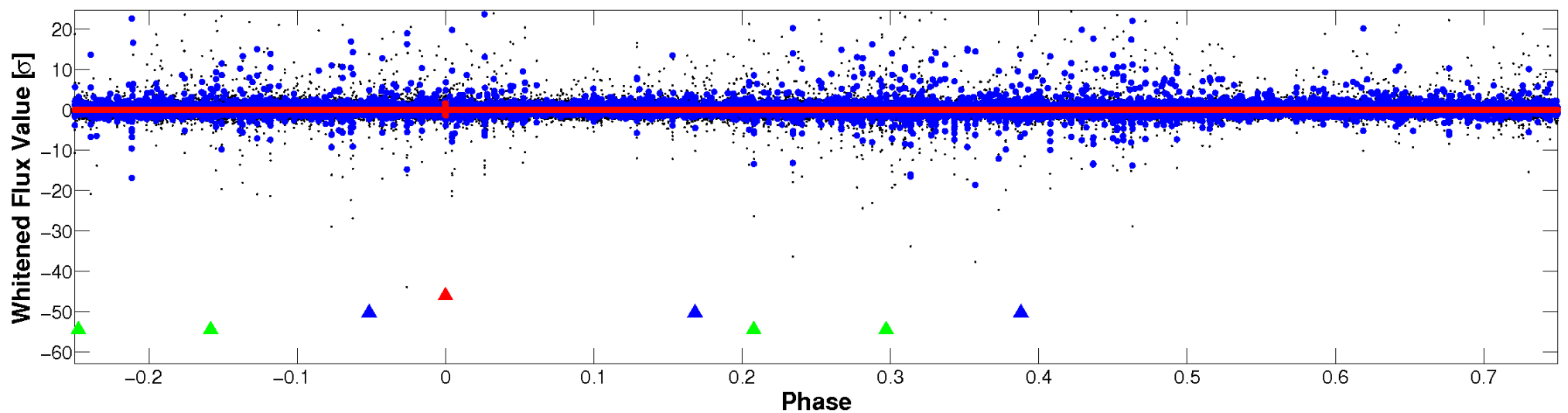


Non-Whitened Vs. Whitened Light Curve

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

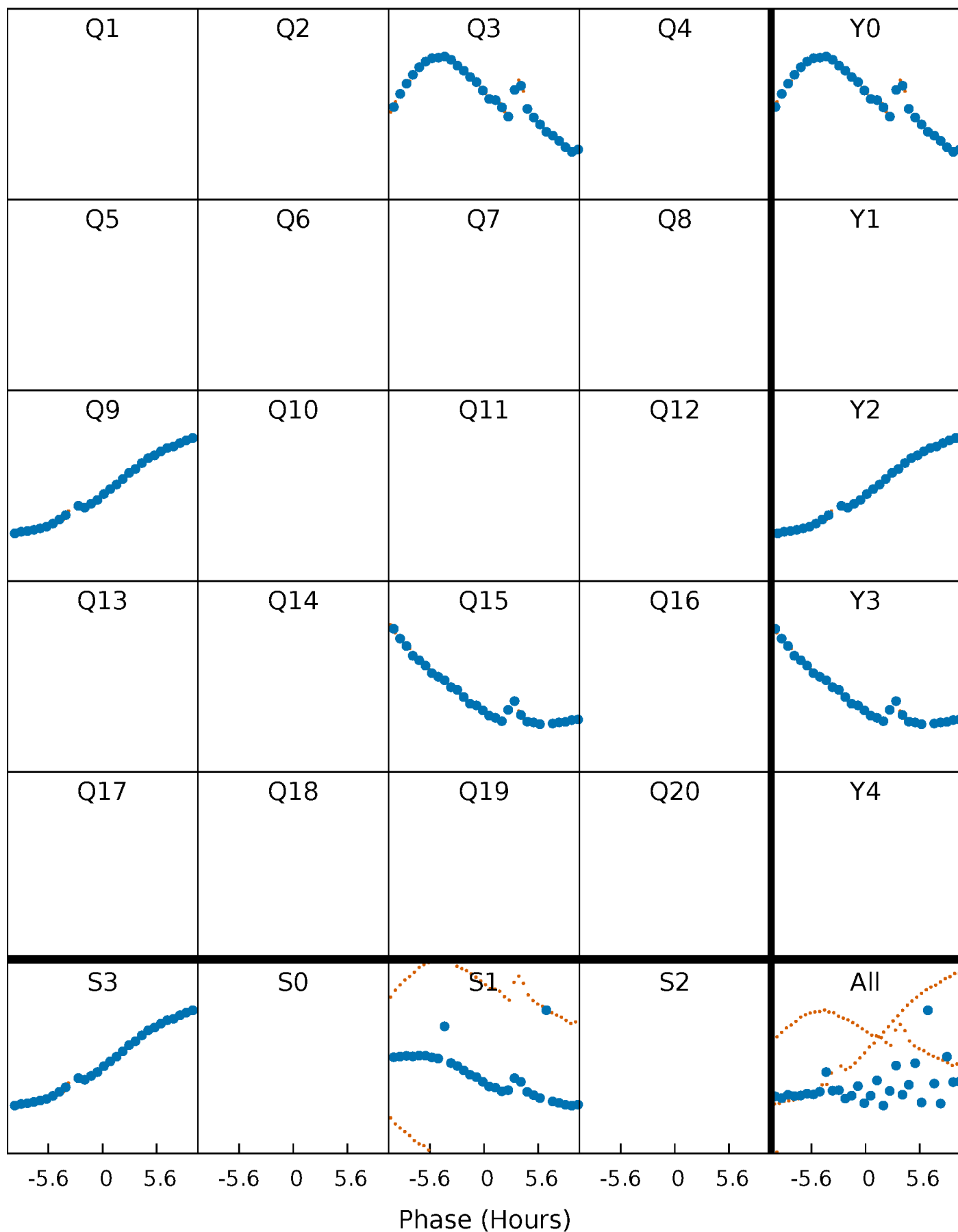


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 009813965-01 P=556.723868 Days $T_0=295.914142$ (BKJD)



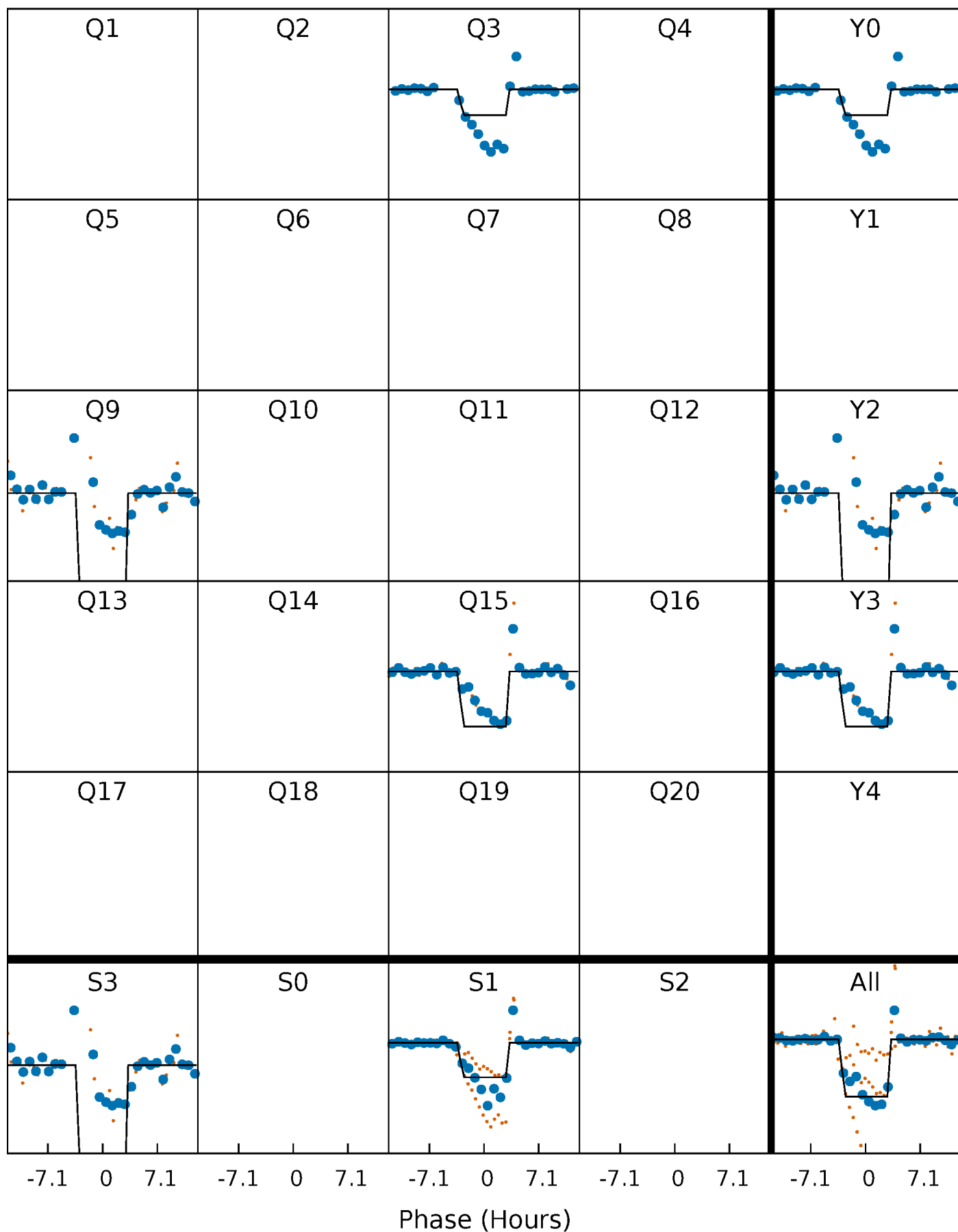
DV Quarter-Phased Transit Curves

TCE 009813965-01 P=556.723868 Days $T_0=295.914142$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

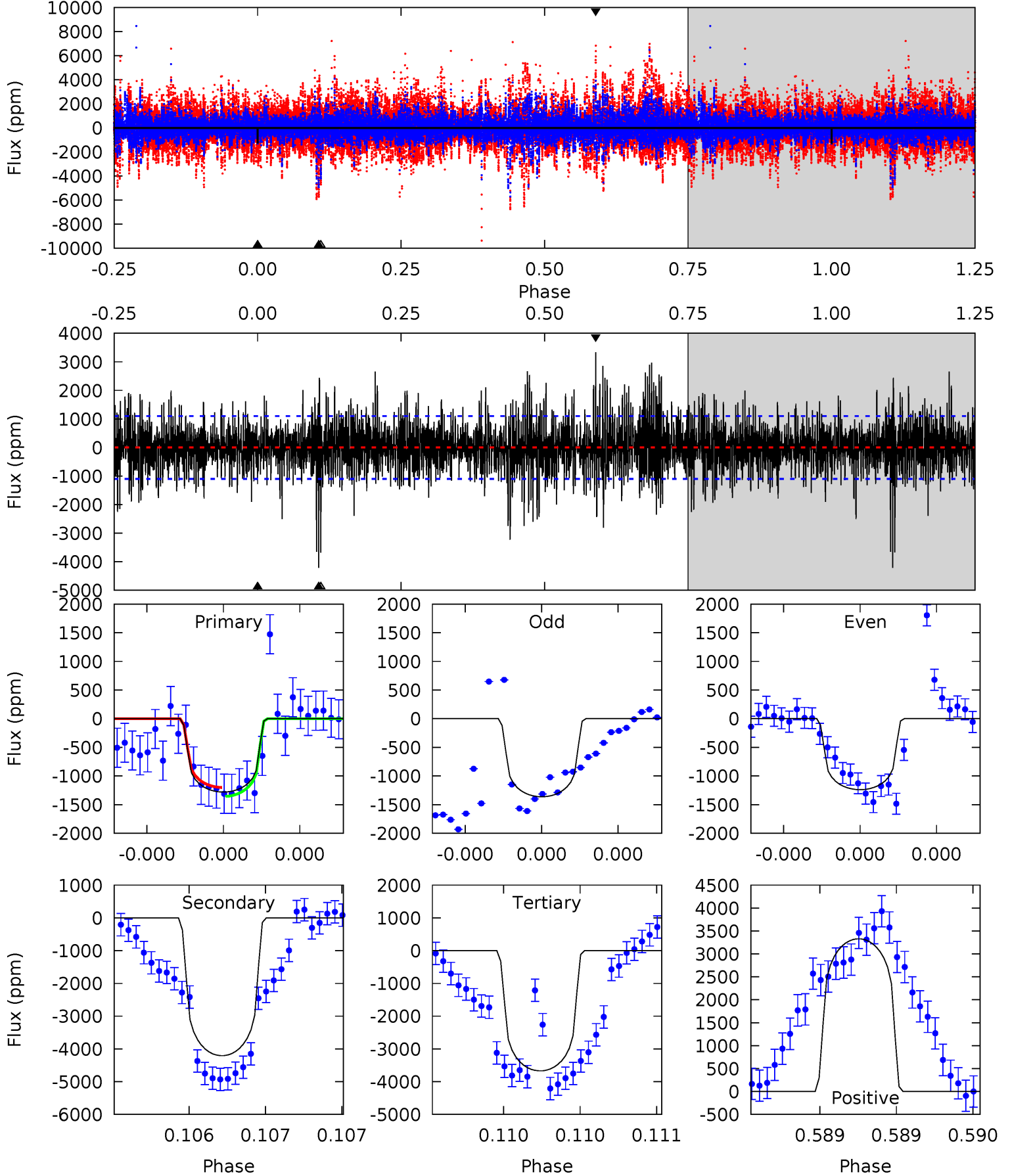
TCE 009813965-01 P=556.712342 Days $T_0=295.904670$ (BKJD)



DV Model-Shift Uniqueness Test

009813965-01, P = 556.723868 Days, E = 295.914142 Days

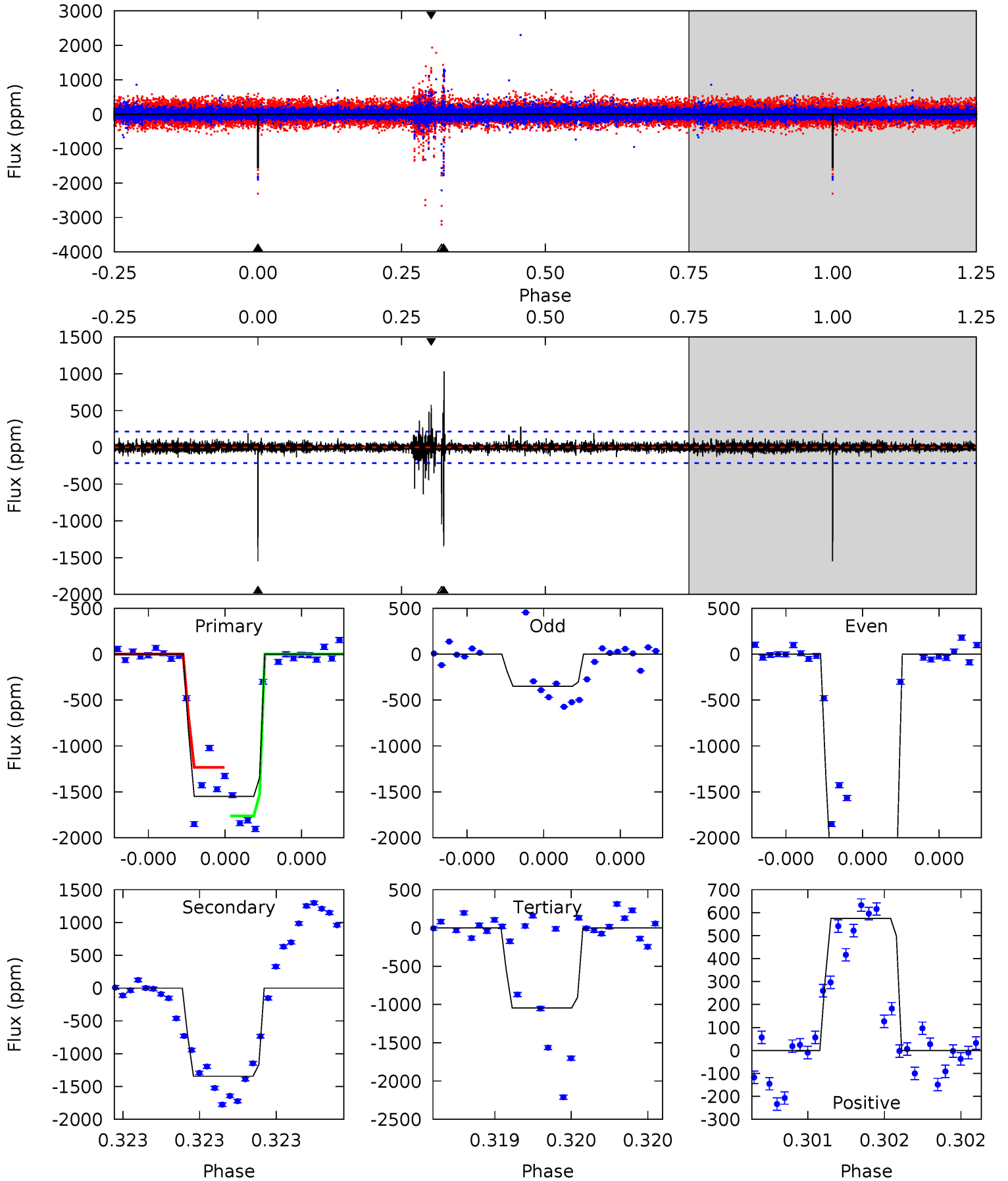
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.54 | 21.5 | 18.8 | 17.0 | 5.63 | 3.56 | 3.53 | -12.2 | -10.5 | 2.74 | 4.48 | 0.27 | 0.94 | 0.44 | 0.40 |



Alt Model-Shift Uniqueness Test

009813965-01, P = 556.712342 Days, E = 295.904670 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 40.5 | 35.1 | 27.3 | 15.0 | 5.58 | 3.49 | 1.11 | 13.2 | 25.4 | 7.82 | 20.1 | 34.9 | 1.30 | 0.40 | 6.71 |



Stellar Parameters For KIC 009813965

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5936^{+184}_{-205} | $4.429^{+0.087}_{-0.203}$ | $-0.080^{+0.250}_{-0.300}$ | $1.009^{+0.305}_{-0.131}$ | $0.999^{+0.138}_{-0.124}$ | $1.368^{+0.523}_{-0.732}$ |
| | +3%/-3% | +2%/-5% | +312%/-375% | +30%/-13% | +14%/-12% | +38%/-53% |
| Source | PHO54 | PHO54 | PHO54 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 009813965-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-----------------|------------------------|----------------------|------------------------|-------------------------------|
| DV | -4207 ± 196 | $3.83^{+2.63}_{-2.24}$ | 324^{+22}_{-18} | 8572^{+8249}_{-2208} | $277114^{+1339991}_{-182283}$ |
| Alt. | -1344 ± 38 | $5.19^{+2.76}_{-2.60}$ | 325^{+23}_{-18} | 5391^{+2359}_{-893} | $47377^{+143103}_{-27133}$ |

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

DV Centroid Data

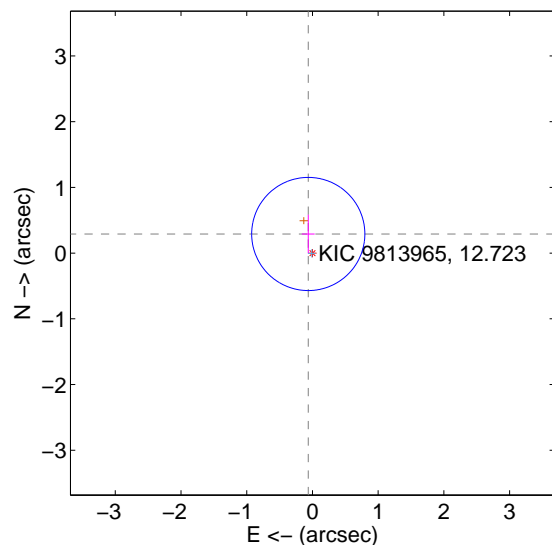
Supplemental centroid analysis for 009813965-01. Kepler magnitude: 12.72. Transit SNR 5.52

There are 1 quarters with good PRF difference image offsets

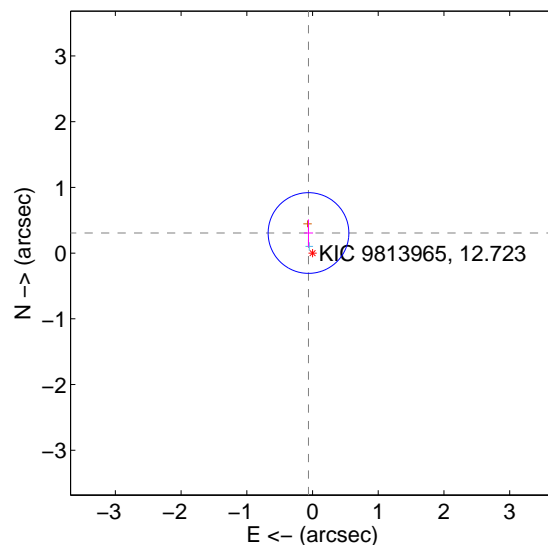
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 0.298 ± 0.287 | 1.04 | 0.064 ± 0.097 | 0.291 ± 0.293 |
| PRF-fit source offset from KIC position | 0.312 ± 0.205 | 1.52 | 0.061 ± 0.068 | 0.305 ± 0.208 |
| photometric centroid source offset | 0.25 ± 0.94 | 0.27 | 0.08 ± 0.61 | -0.24 ± 0.97 |

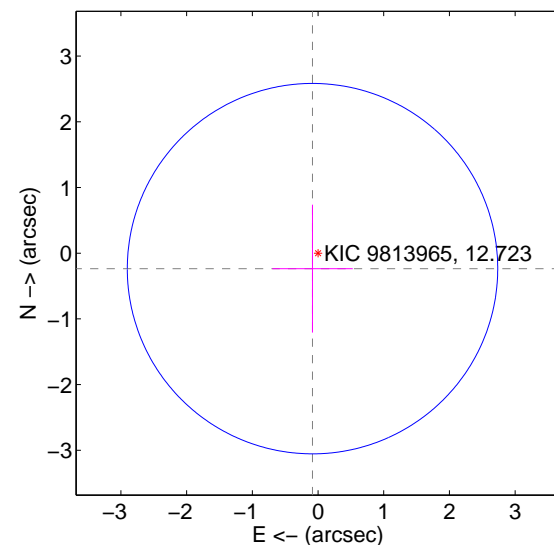
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

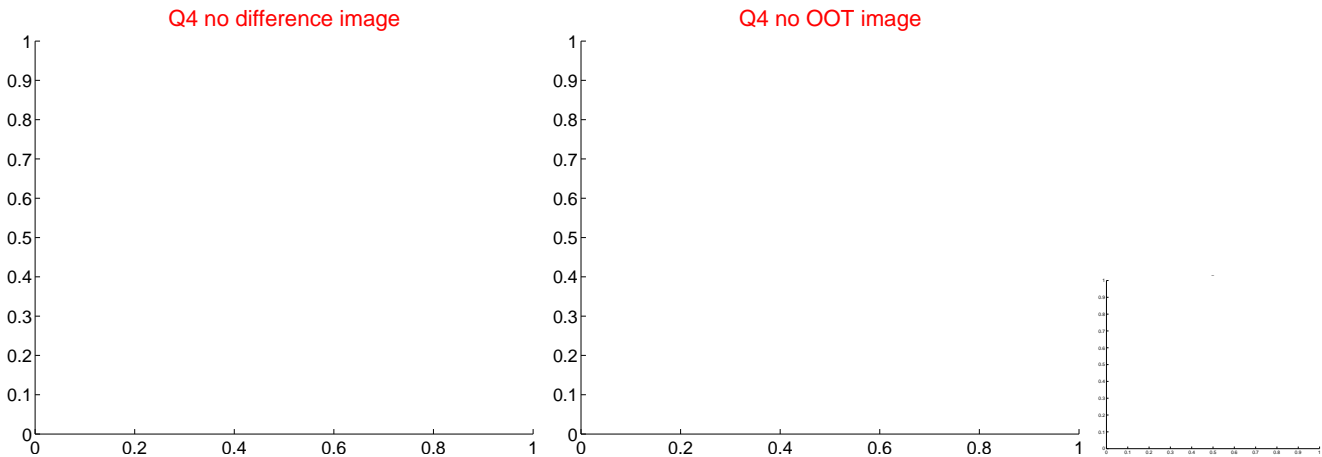
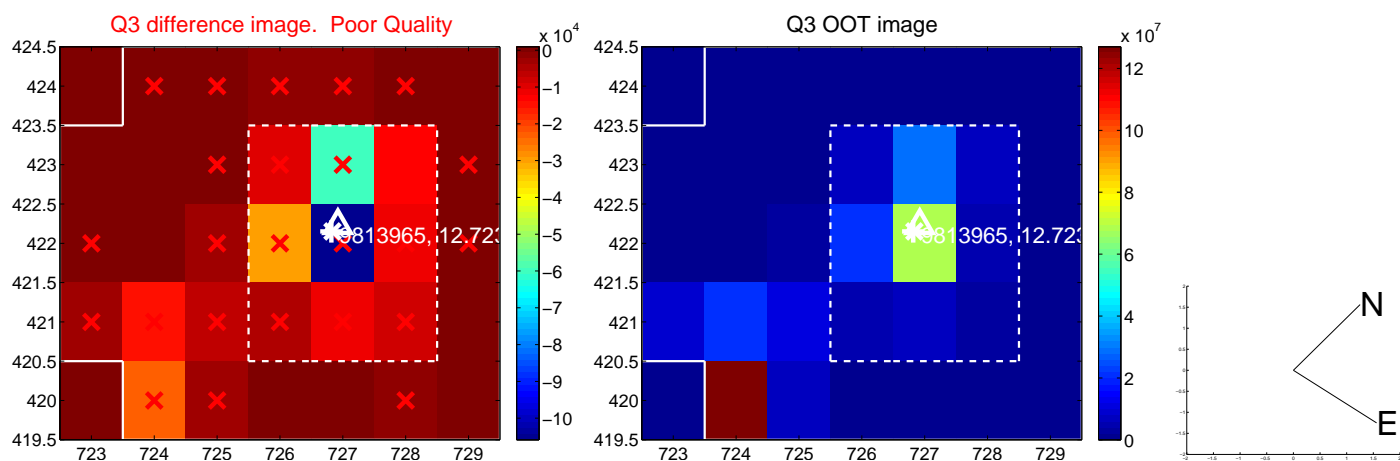
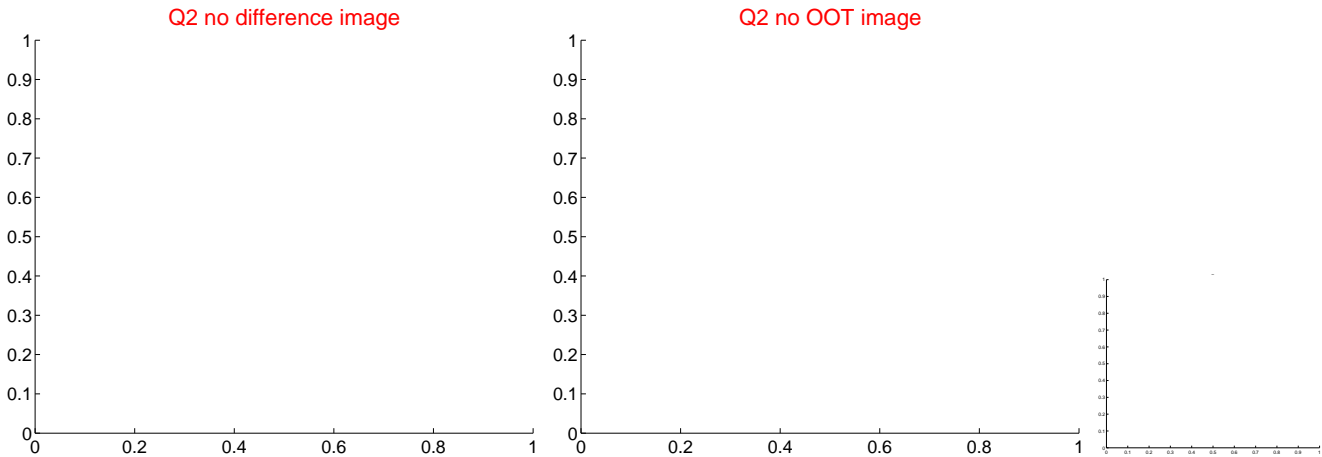
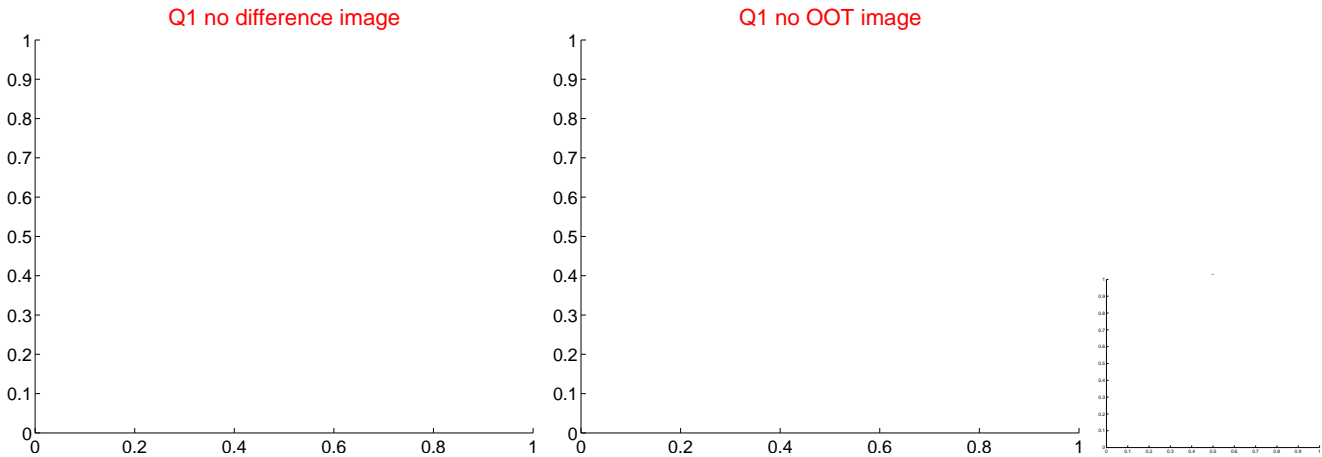


offset from photometric centroids



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

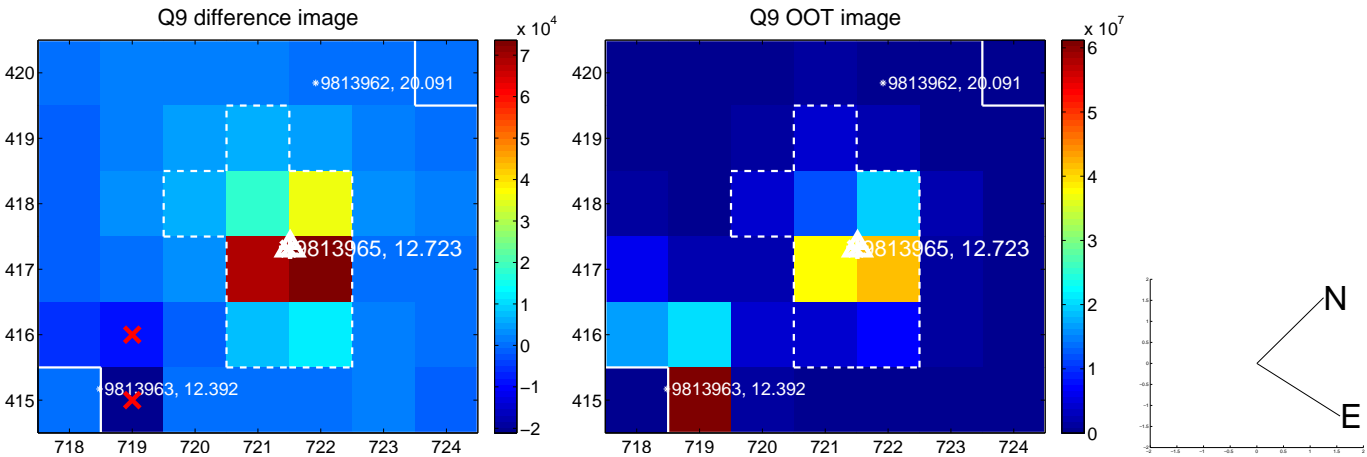
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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



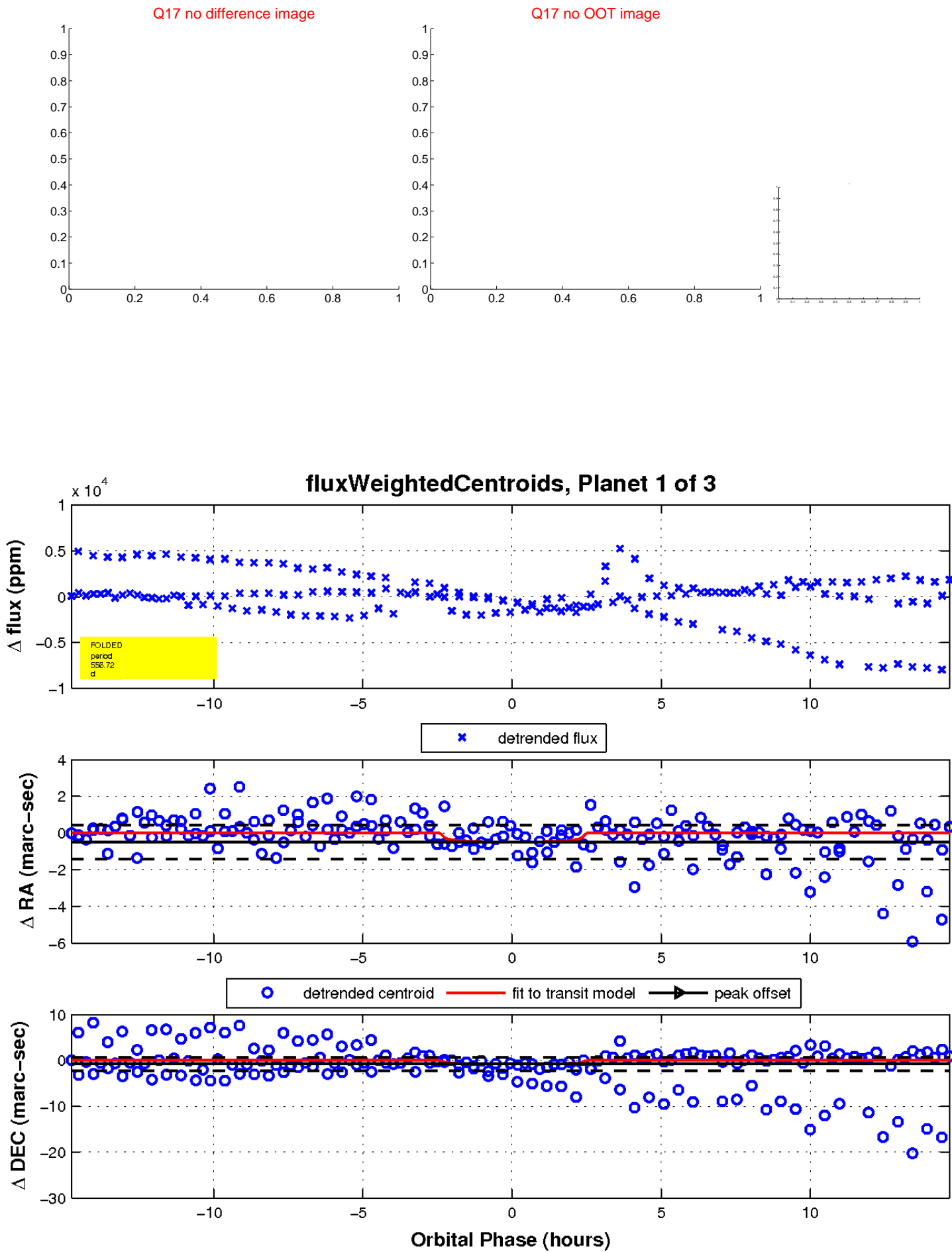
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

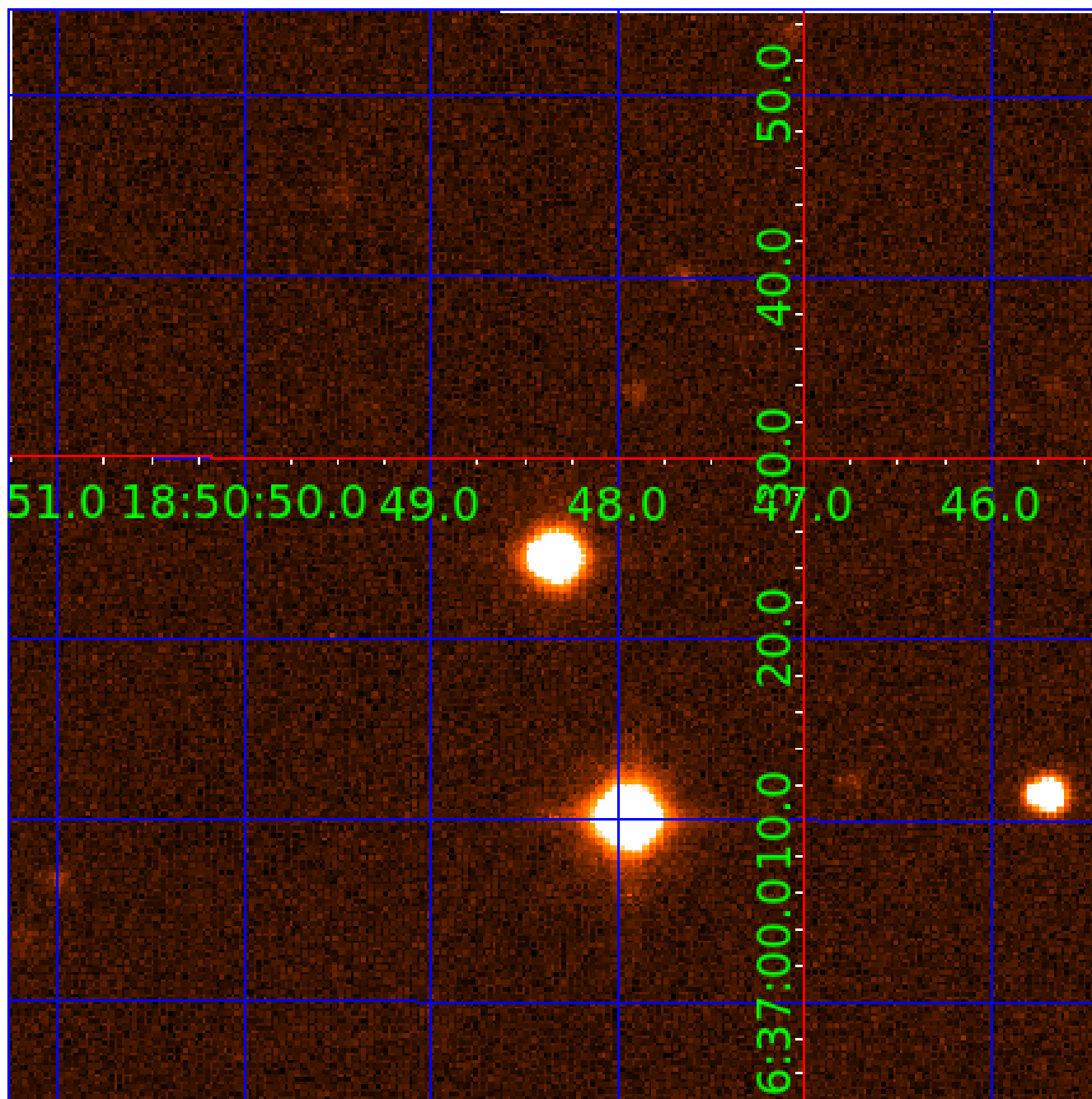


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009813965

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009813965-01 | OBS | No | 556.723868 | 295.914142 | 1097.0 | 4.933 | 17.2 | 5.5 | 1.01 | 5936 | 3.37 | 0.65 |
| 009813965-02 | OBS | No | 434.398757 | 511.909243 | 734.6 | 3.299 | 17.1 | 5.4 | 1.01 | 5936 | 2.87 | 0.90 |
| 009813965-03 | OBS | No | 303.200218 | 411.638464 | 1145.0 | 3.192 | 16.3 | 7.9 | 1.01 | 5936 | 6.60 | 1.45 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 009813965-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS |
| 009813965-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 009813965-03 | 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—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.

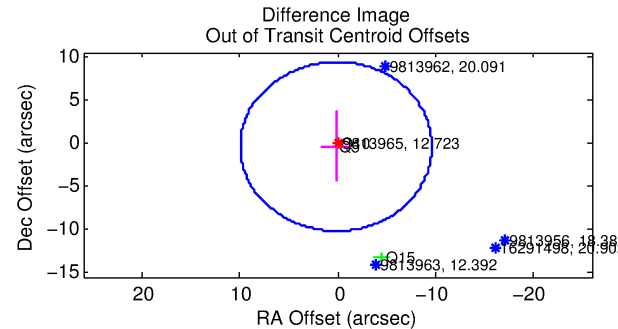
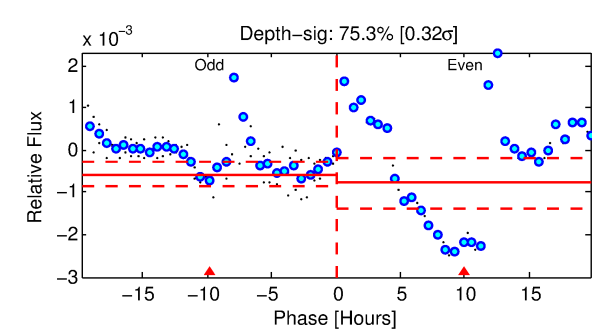
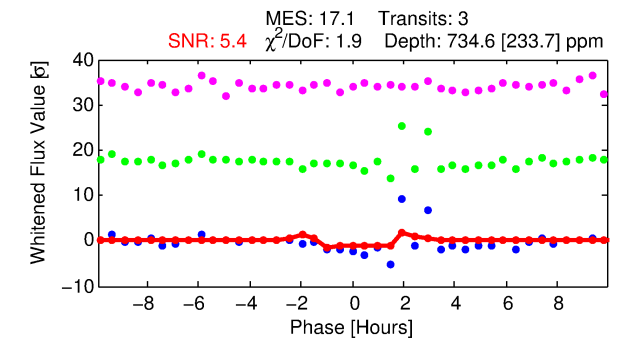
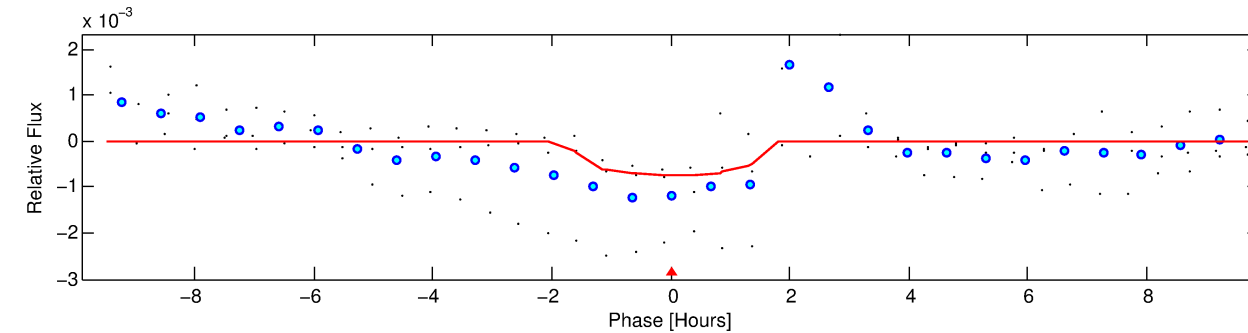
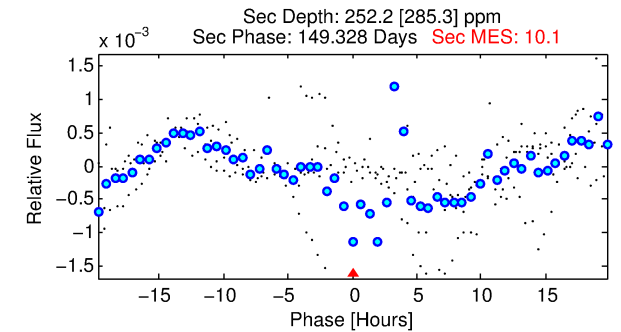
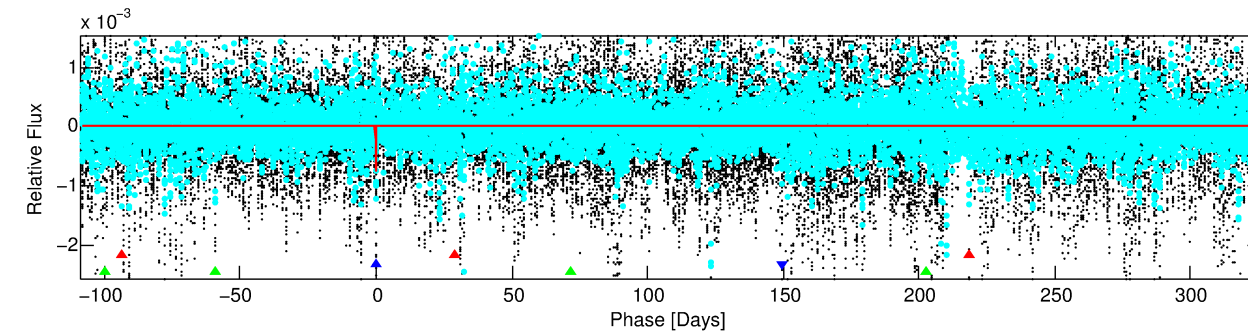
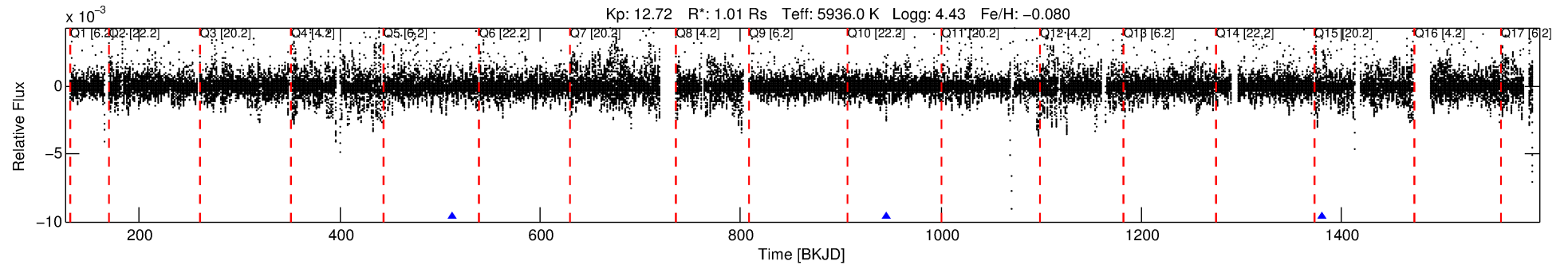
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009813965-02

No Significant Match Found

DV One-Page Summary

KIC: 9813965 Candidate: 2 of 3 Period: 434.399 d



DV Fit Results:

Period = 434.39876 [0.00663] d
Epoch = 511.9092 [0.0083] BKJD
Rp/R* = 0.0261 [0.0378]
a/R* = 814.17 [5206.59]
b = 0.63 [6.15]
Seff = 0.90 [0.36]
Teq = 248 [25] K
Rp = 2.87 [4.25] Re
a = 1.1217 [0.2857] AU
Ag = 21147.49 [66159.21] [0.32 σ]
Teffp = 4631 [3600] K [1.22 σ]

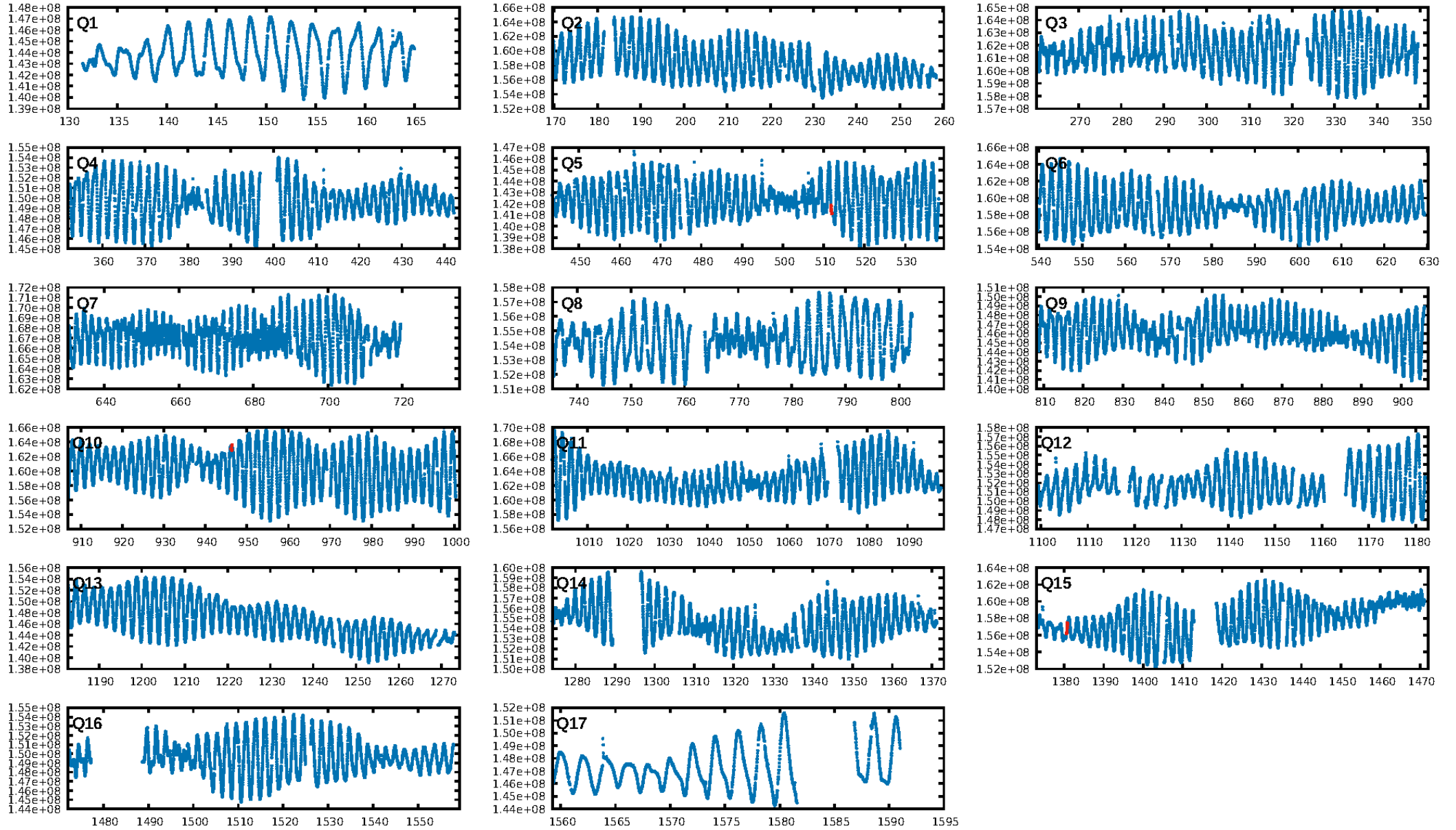
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [685.97 σ]
LongPeriod-sig: 100.0% [494.74 σ]
ModelChiSquare2-sig: 2.0%
ModelChiSquareGof-sig: 17.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -3.208
Centroid-sig: 0.0%
Centroid-so: 4.990 arcsec [2.18 σ]
OotOffset-rm: 0.427 arcsec [0.13 σ]
KicOffset-rm: 0.359 arcsec [0.15 σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

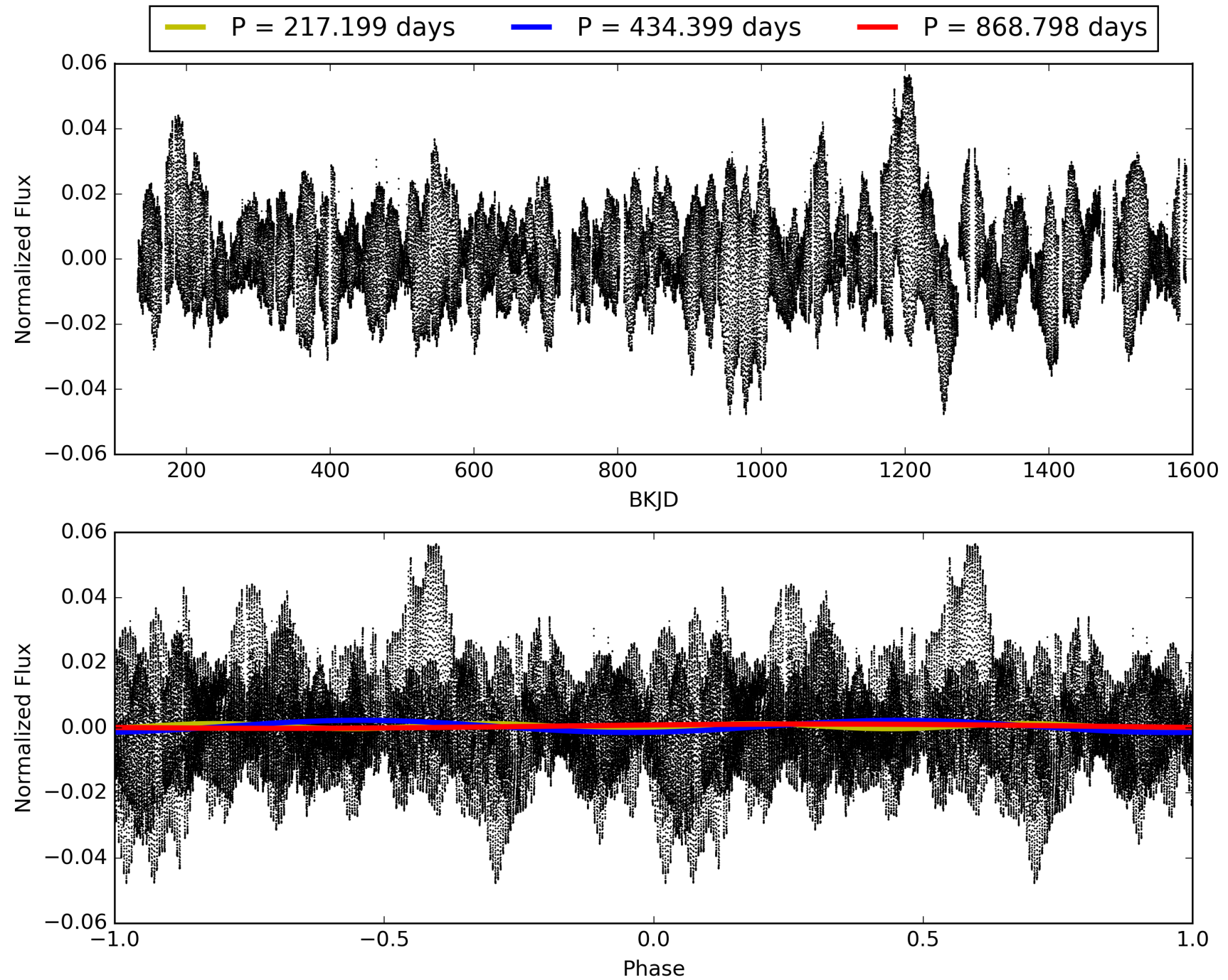
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:33:01 Z

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

TCE 009813965-02, PDC Light Curves

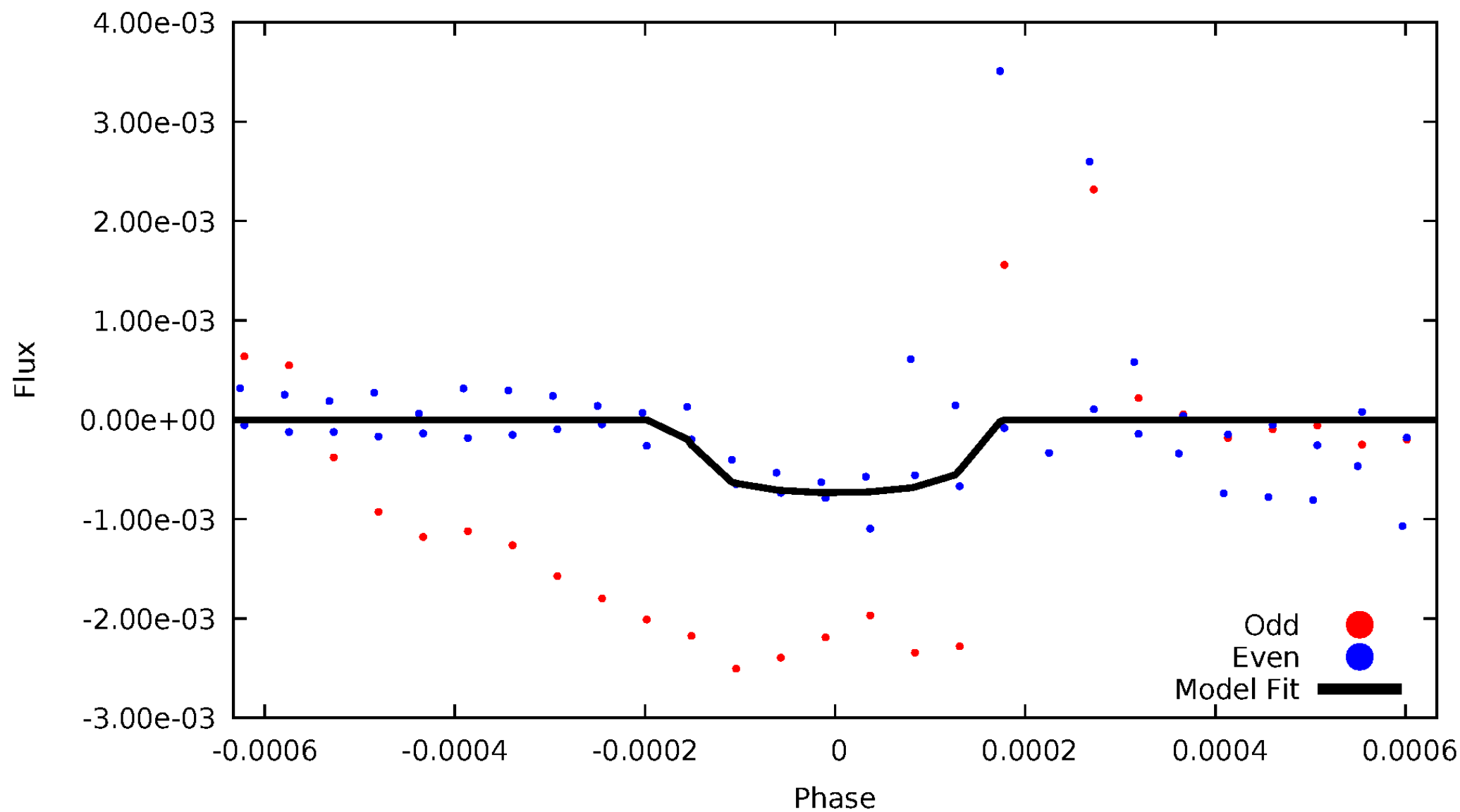


TCE 009813965-02



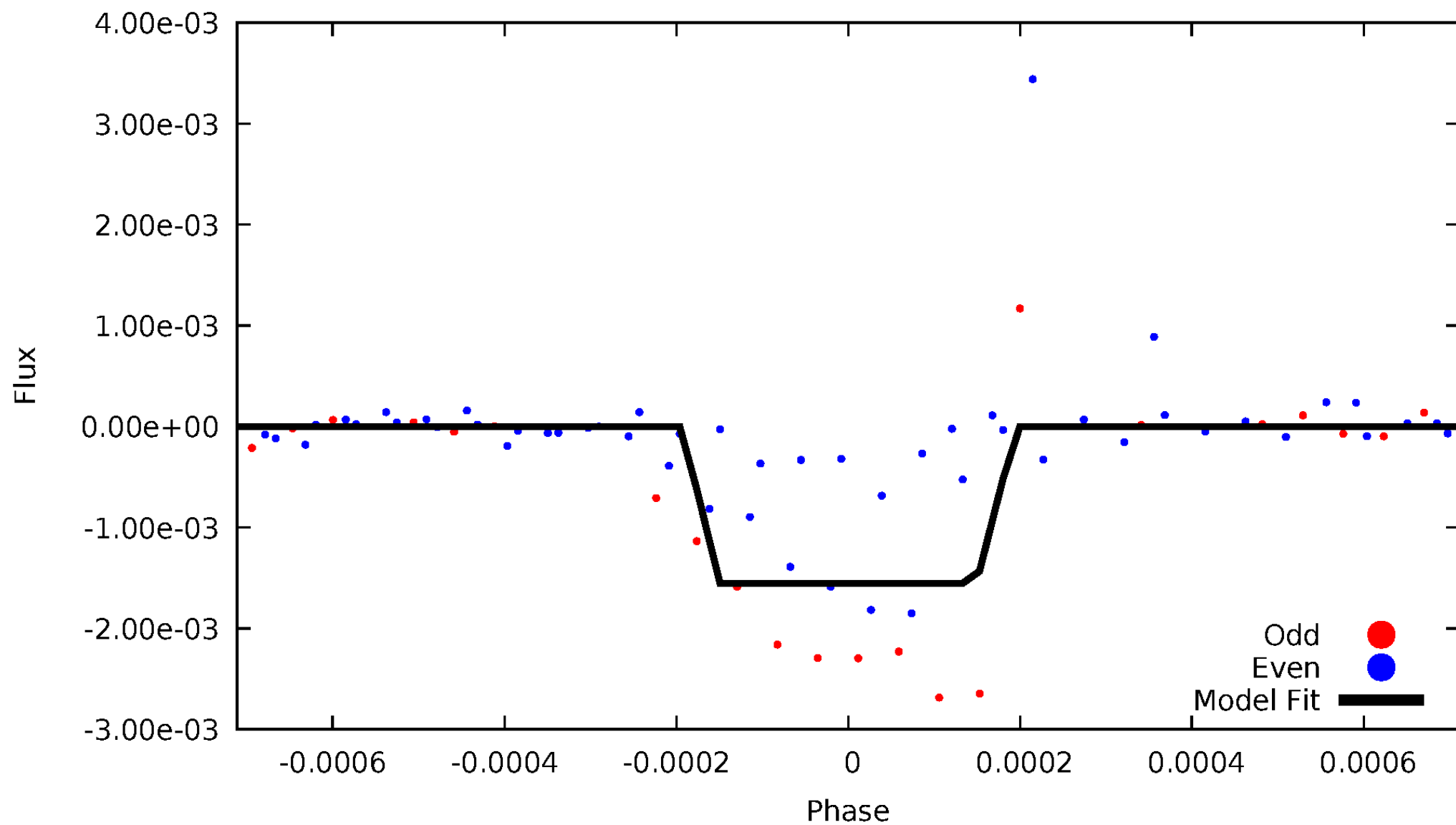
DV Odd/Even

TCE 009813965-02



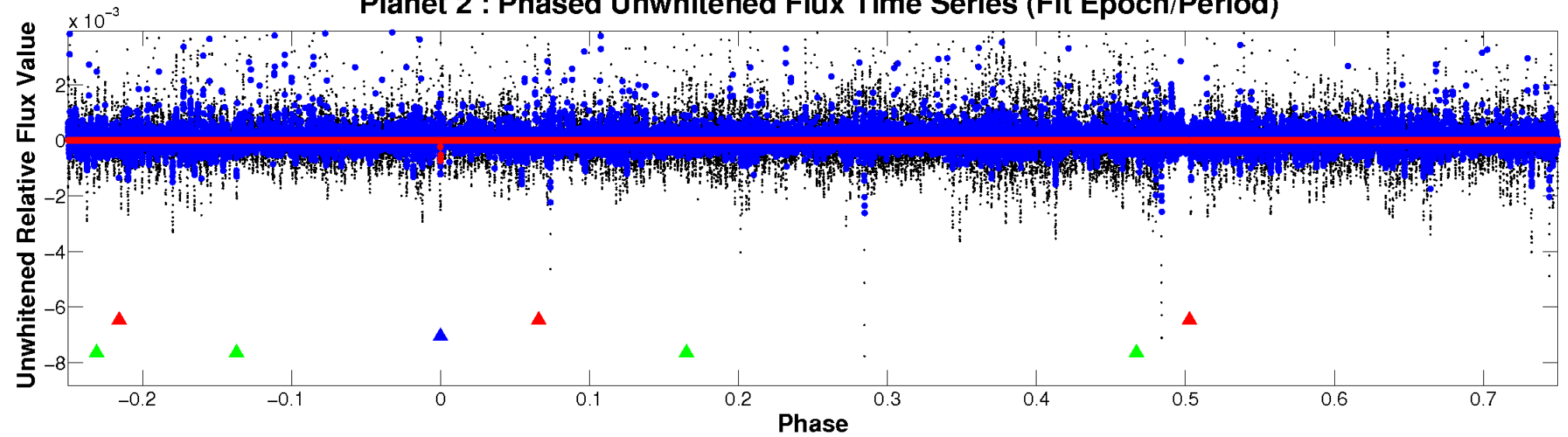
ALT Odd/Even

TCE 009813965-02

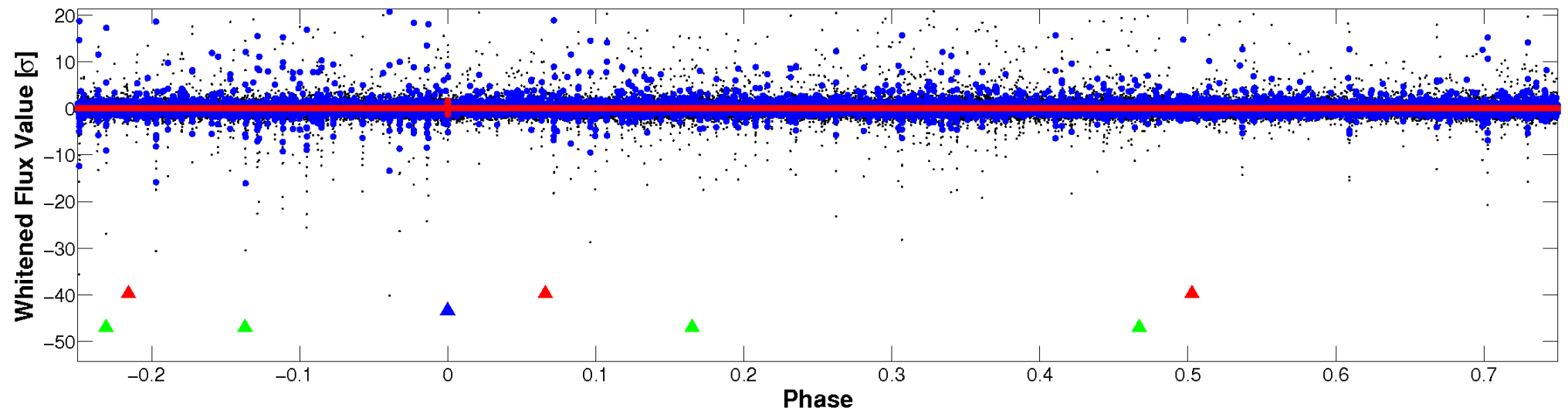


Non-Whitened Vs. Whitened Light Curve

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

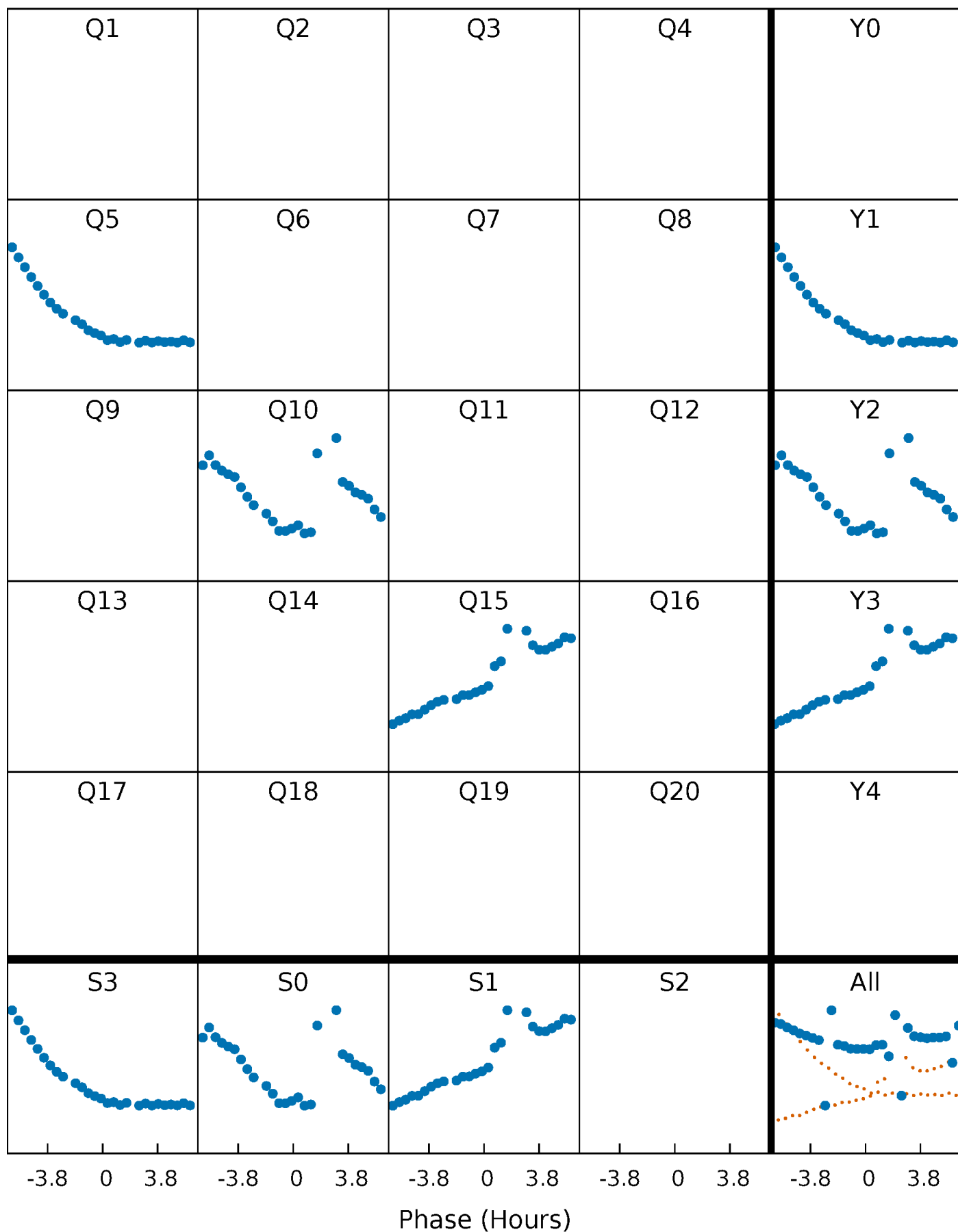


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



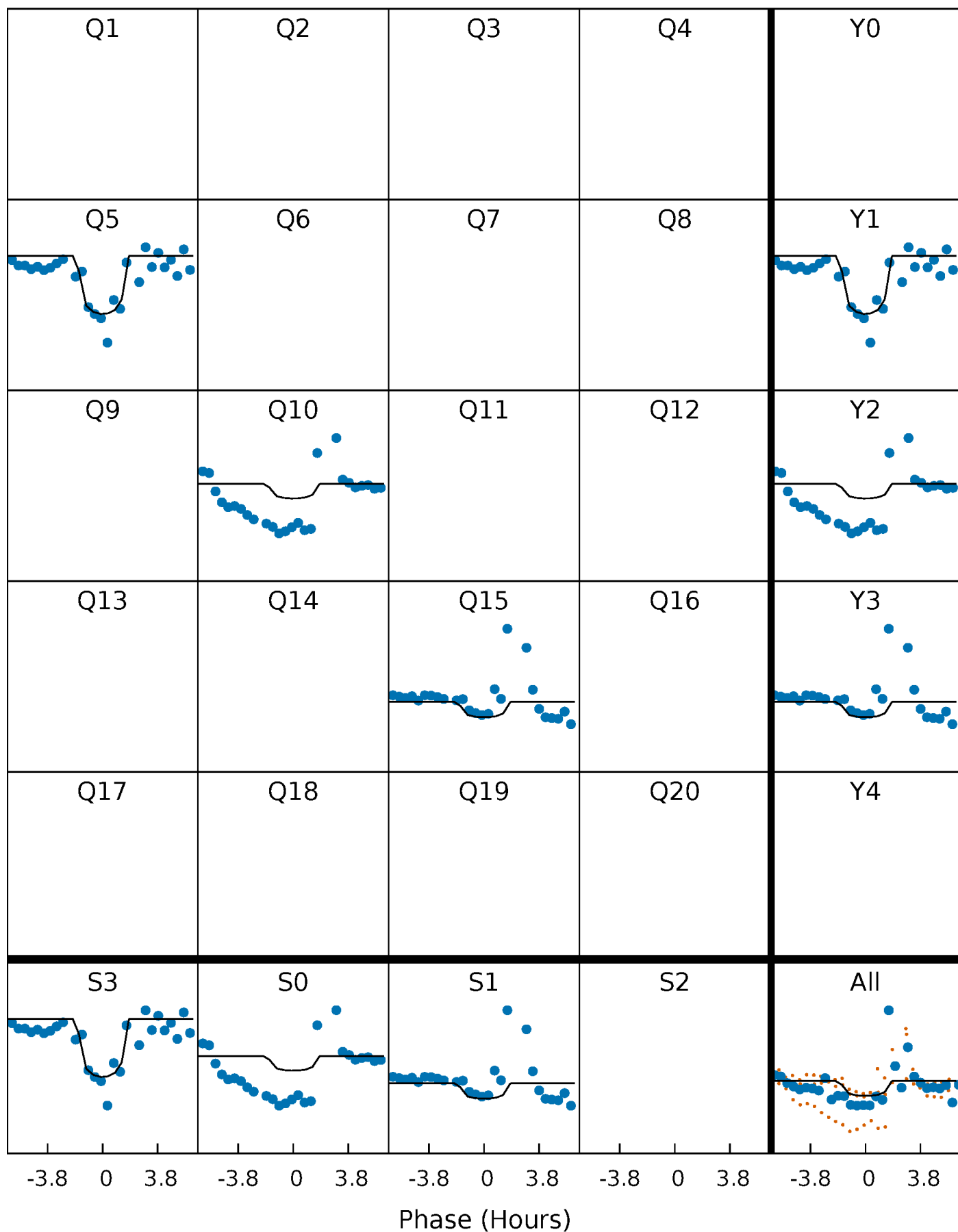
PDC Quarter-Phased Transit Curves

TCE 009813965-02 $P=434.398757$ Days $T_0=511.909243$ (BKJD)



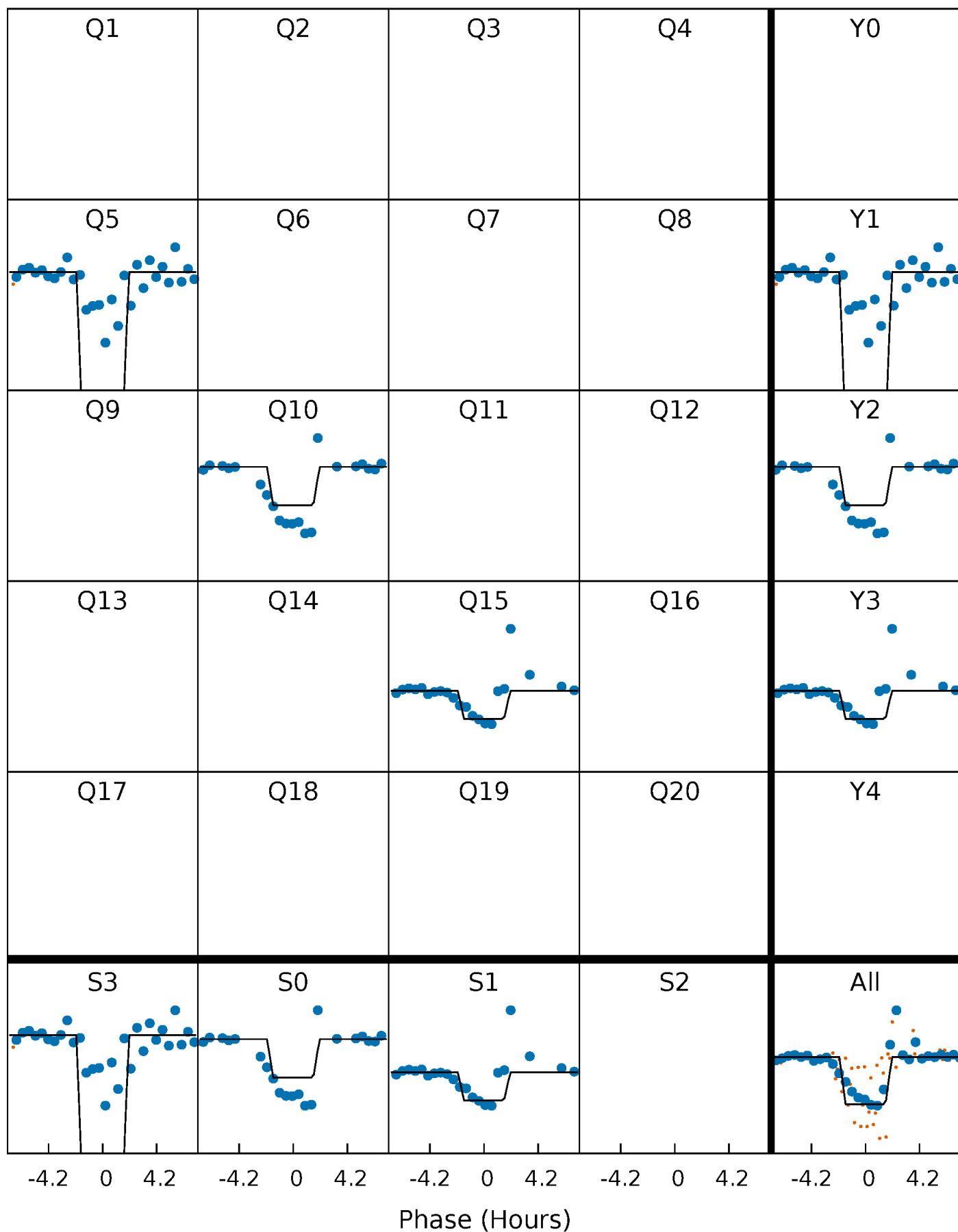
DV Quarter-Phased Transit Curves

TCE 009813965-02 $P=434.398757$ Days $T_0=511.909243$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

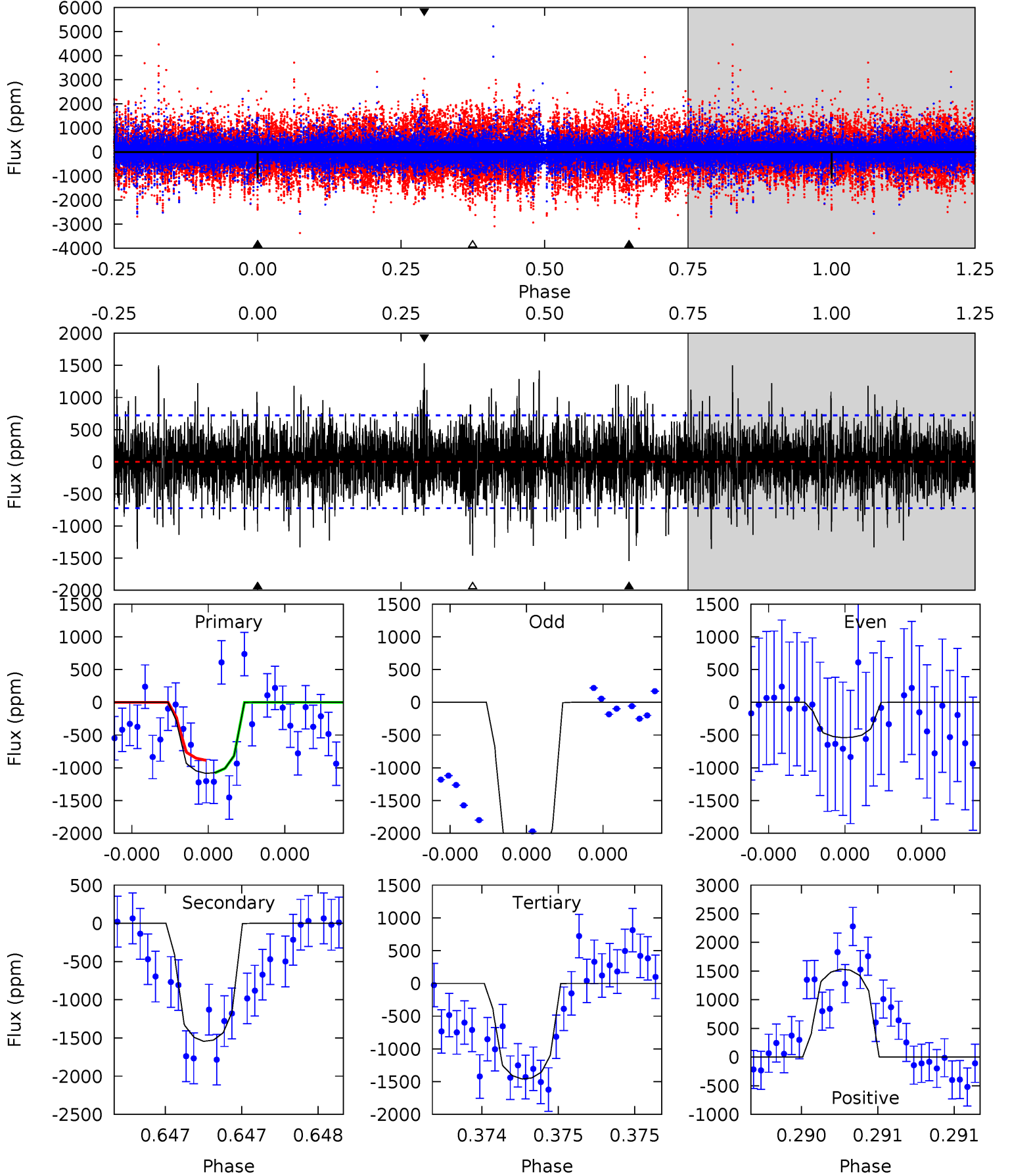
TCE 009813965-02 P=434.390241 Days $T_0=511.908382$ (BKJD)



DV Model-Shift Uniqueness Test

009813965-02, P = 434.398757 Days, E = 77.510486 Days

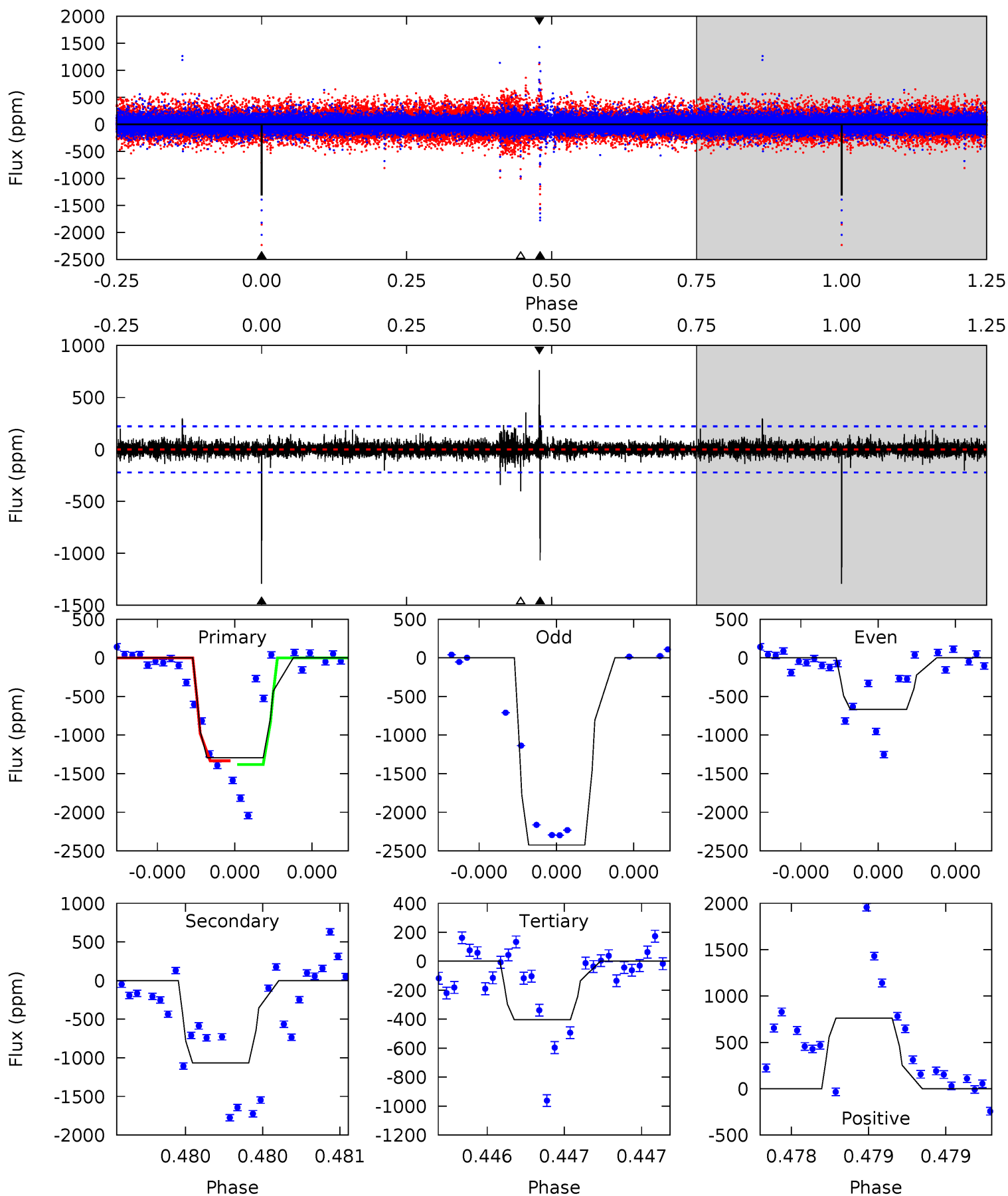
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.44 | 12.0 | 11.3 | 11.9 | 5.62 | 3.56 | 2.46 | -2.91 | -3.49 | 0.66 | 0.08 | 7.27 | 1.47 | 0.50 | 0.71 |



Alt Model-Shift Uniqueness Test

009813965-02, P = 434.390241 Days, E = 77.518141 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 32.9 | 27.1 | 10.3 | 19.4 | 5.63 | 3.57 | 0.97 | 22.7 | 13.5 | 16.9 | 7.77 | 21.4 | 1.09 | 0.37 | 0 |



Stellar Parameters For KIC 009813965

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5936^{+184}_{-205} | $4.429^{+0.087}_{-0.203}$ | $-0.080^{+0.250}_{-0.300}$ | $1.009^{+0.305}_{-0.131}$ | $0.999^{+0.138}_{-0.124}$ | $1.368^{+0.523}_{-0.732}$ |
| | +3%/-3% | +2%/-5% | +312%/-375% | +30%/-13% | +14%/-12% | +38%/-53% |
| Source | PHO54 | PHO54 | PHO54 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 009813965-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-----------------|------------------------|-------------------|------------------------|----------------------------|
| DV | -1544 ± 129 | $4.48^{+3.84}_{-2.93}$ | 352^{+25}_{-21} | 6020^{+5207}_{-1515} | $53750^{+379276}_{-38796}$ |
| Alt. | -1067 ± 39 | $5.29^{+4.14}_{-3.31}$ | 351^{+25}_{-19} | 5043^{+3332}_{-998} | $26748^{+162460}_{-18200}$ |

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

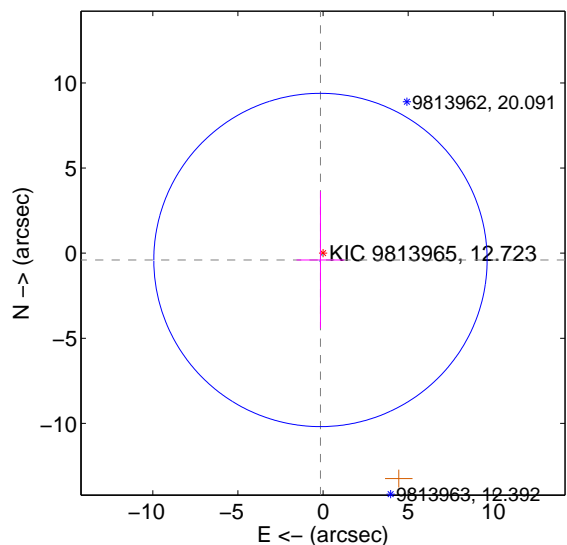
Supplemental centroid analysis for 009813965-02. Kepler magnitude: 12.72. Transit SNR 5.45

There are 2 quarters with good PRF difference image offsets

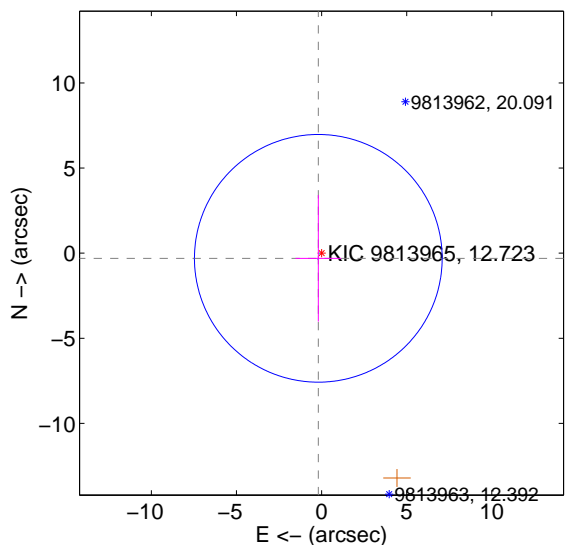
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.427 ± 3.263 | 0.13 | 0.151 ± 1.408 | -0.399 ± 4.019 |
| PRF-fit source offset from KIC position | 0.359 ± 2.425 | 0.15 | 0.192 ± 1.340 | -0.303 ± 3.719 |
| photometric centroid source offset | 4.99 ± 2.28 | 2.18 | 0.26 ± 1.33 | 4.98 ± 2.29 |

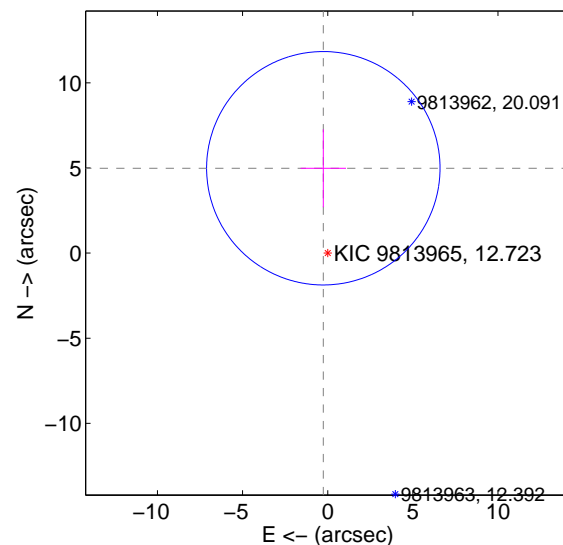
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

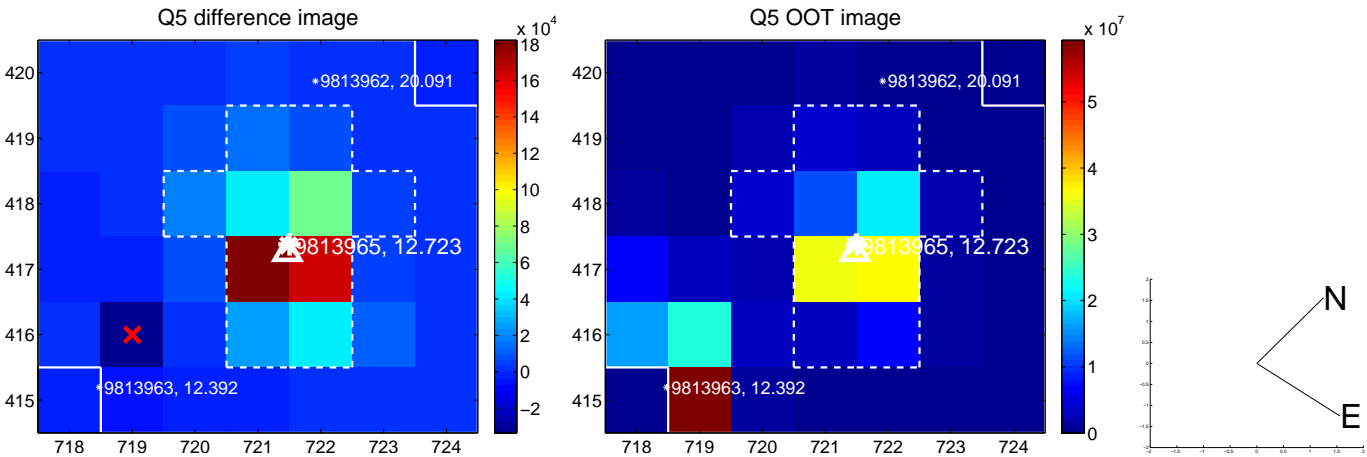


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

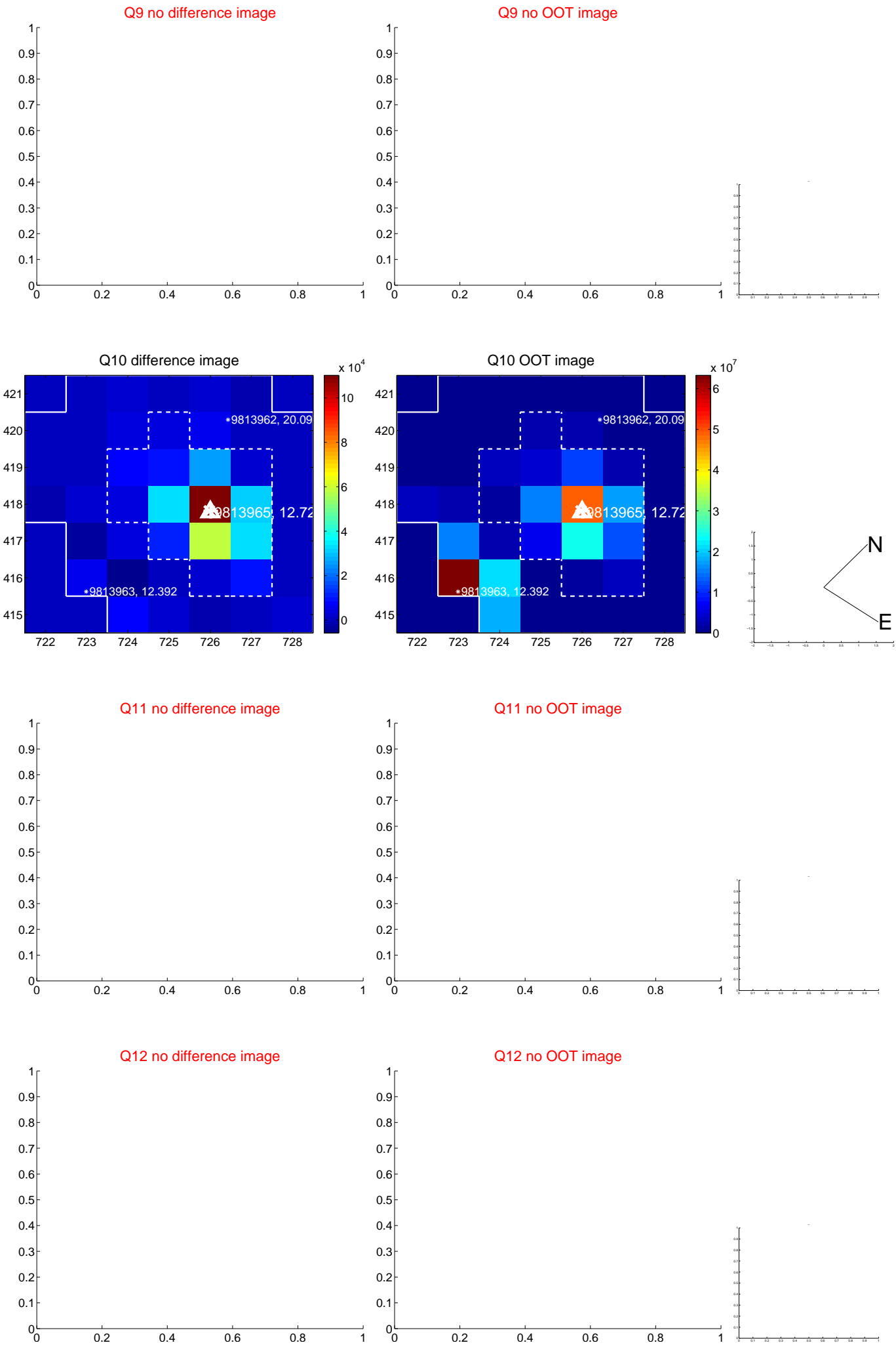
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



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

Q13 no difference image



Q13 no OOT image



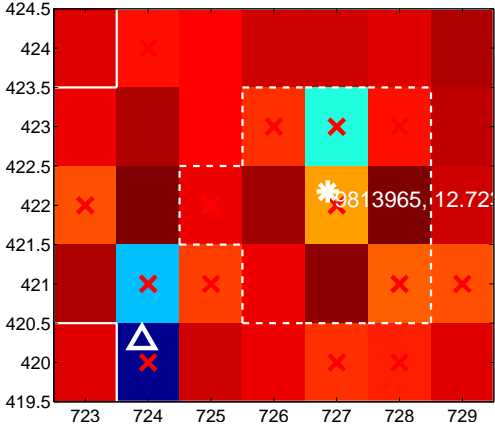
Q14 no difference image



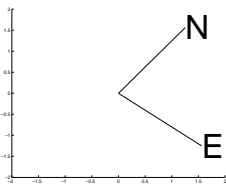
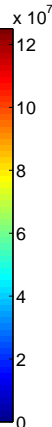
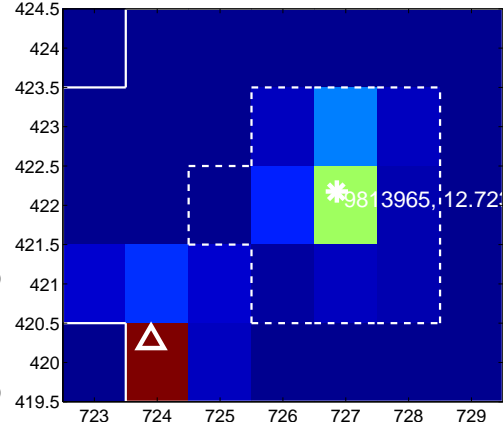
Q14 no OOT image



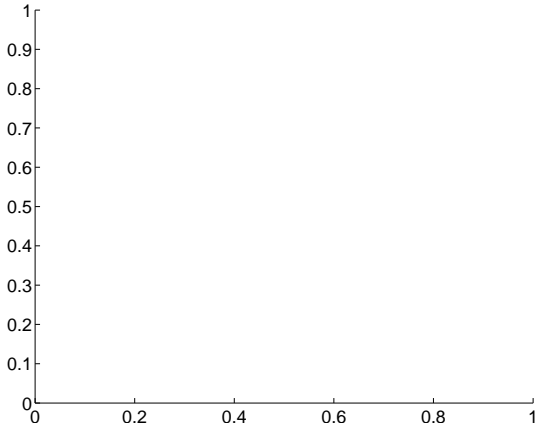
Q15 difference image. Poor Quality



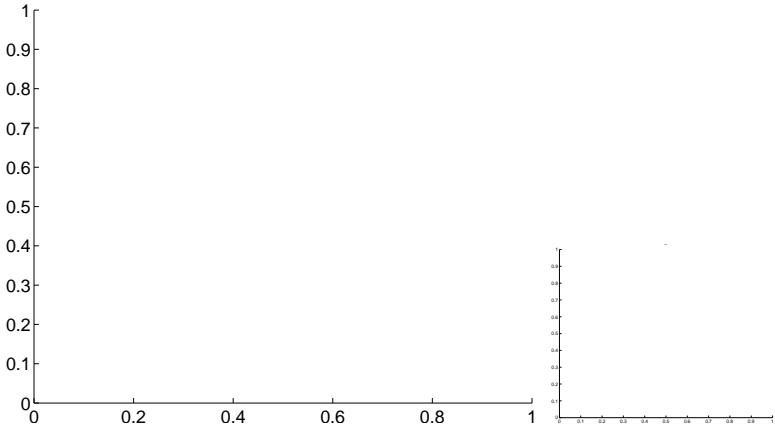
Q15 OOT image



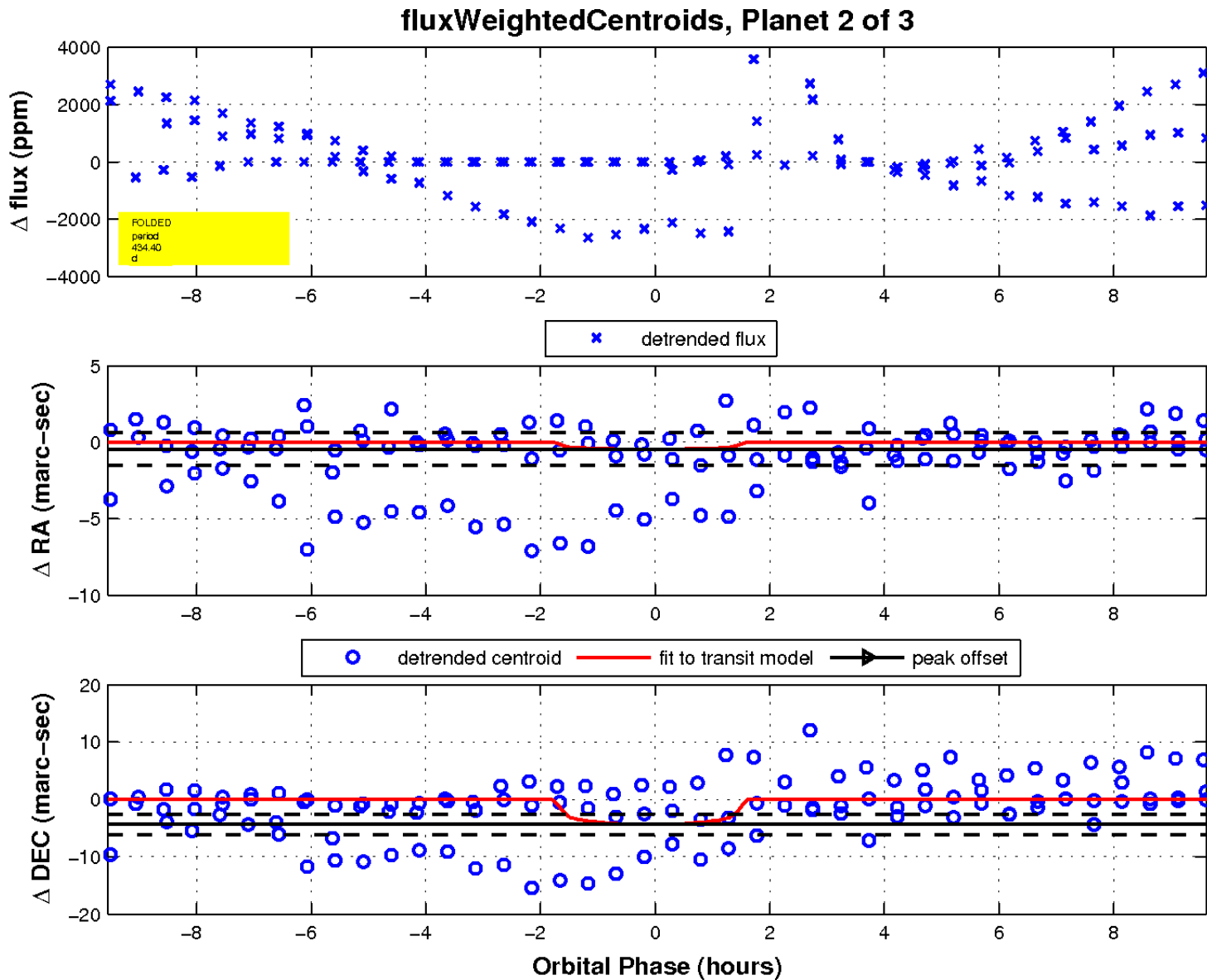
Q16 no difference image



Q16 no OOT image

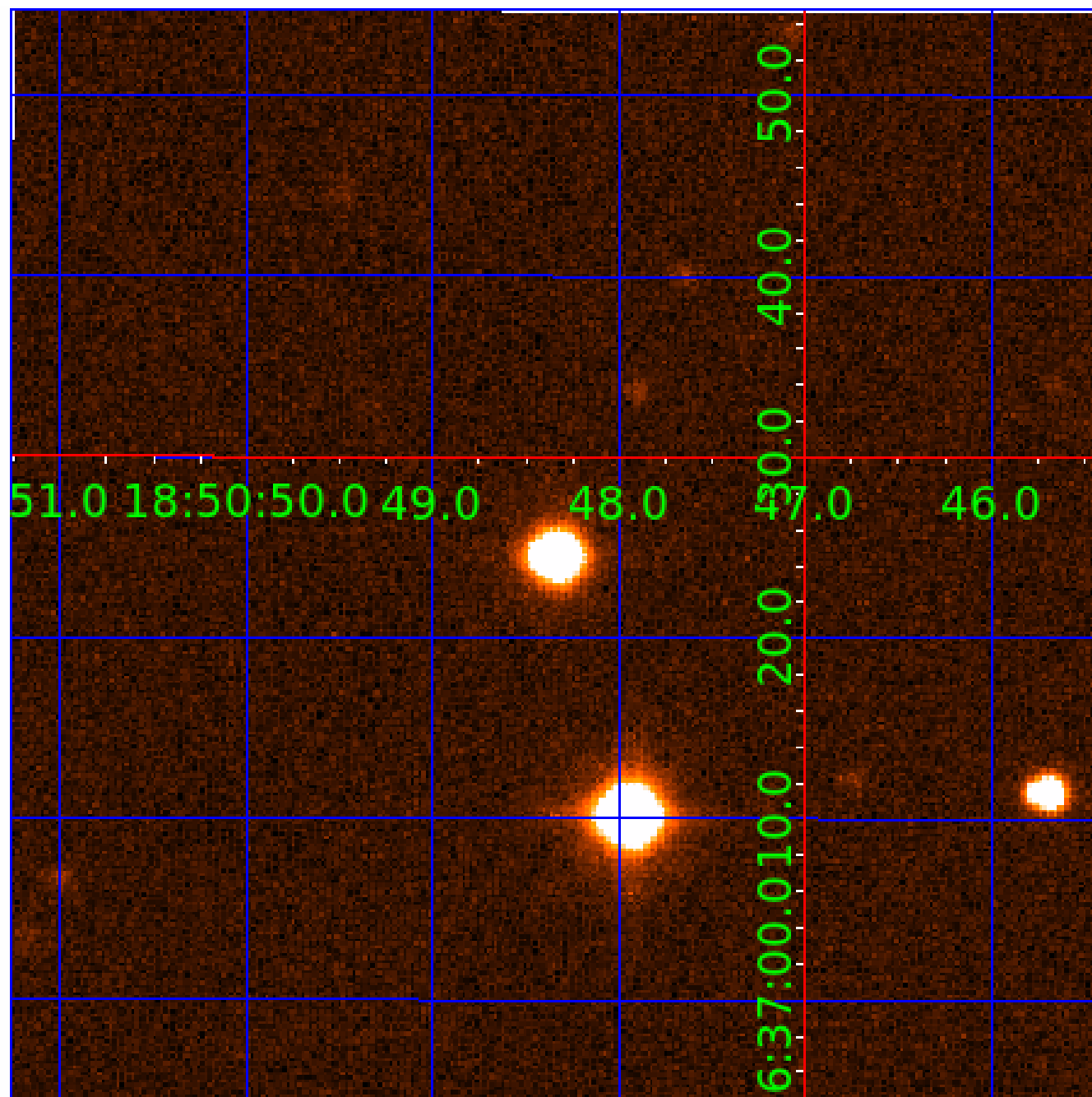


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009813965

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009813965-01 | OBS | No | 556.723868 | 295.914142 | 1097.0 | 4.933 | 17.2 | 5.5 | 1.01 | 5936 | 3.37 | 0.65 |
| 009813965-02 | OBS | No | 434.398757 | 511.909243 | 734.6 | 3.299 | 17.1 | 5.4 | 1.01 | 5936 | 2.87 | 0.90 |
| 009813965-03 | OBS | No | 303.200218 | 411.638464 | 1145.0 | 3.192 | 16.3 | 7.9 | 1.01 | 5936 | 6.60 | 1.45 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 009813965-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS |
| 009813965-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 009813965-03 | 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—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.

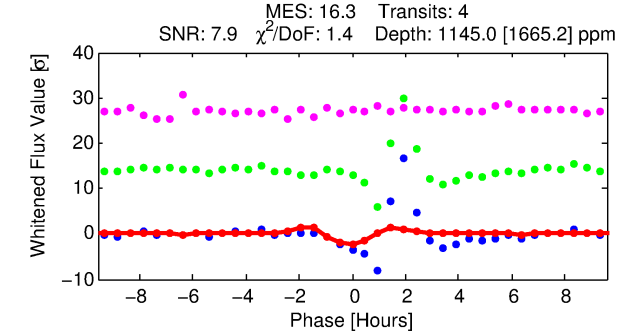
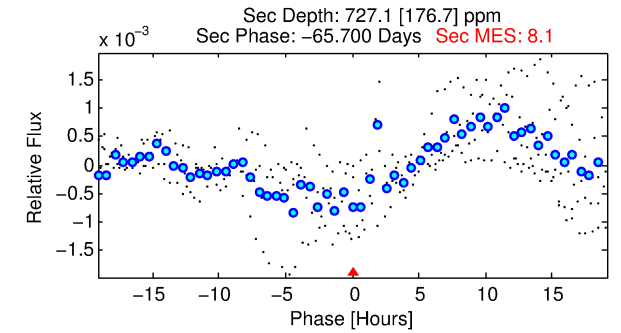
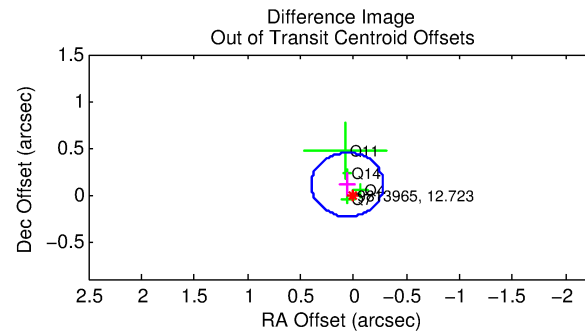
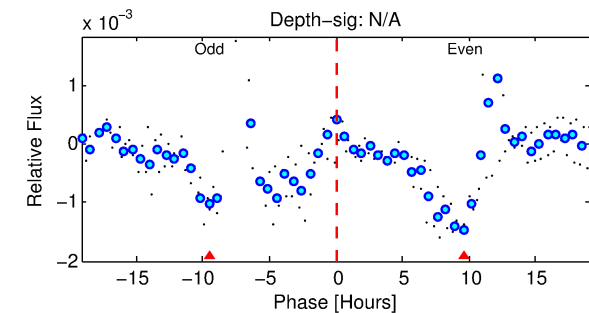
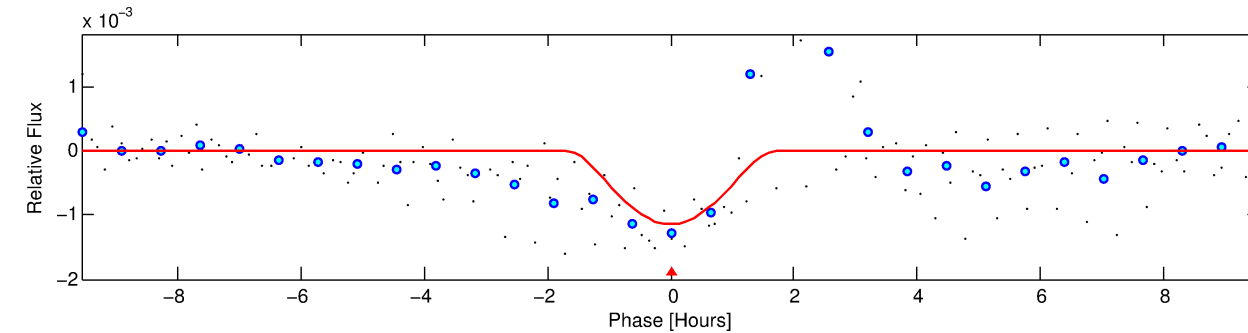
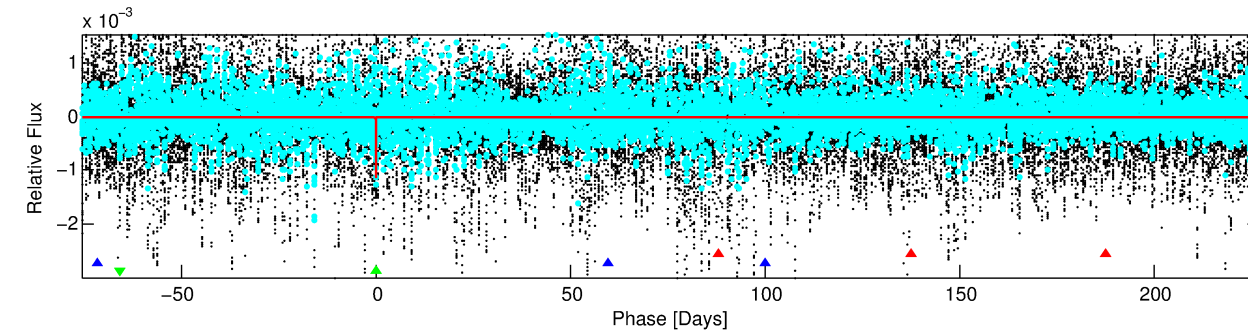
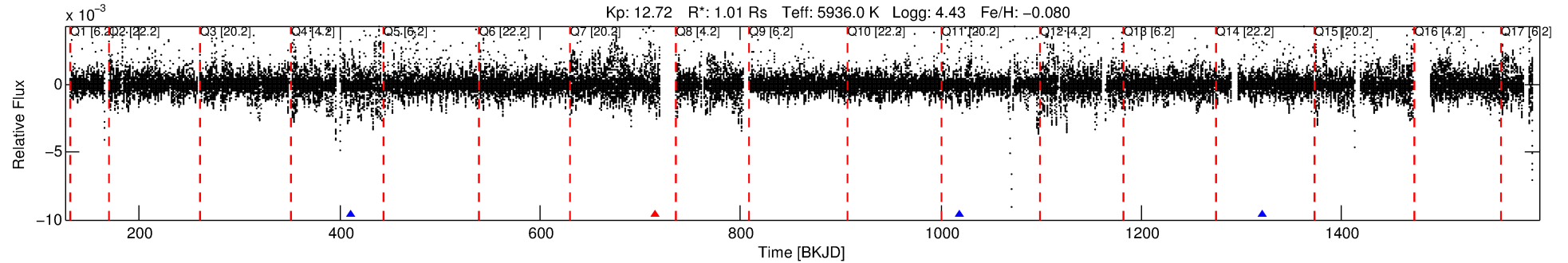
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009813965-03

No Significant Match Found

DV One-Page Summary

KIC: 9813965 Candidate: 3 of 3 Period: 303.200 d



DV Fit Results:

Period = 303.20022 [0.00554] d
Epoch = 411.6385 [0.0110] BKJD
Rp/R* = 0.0599 [0.2701]
a/R* = 255.07 [272.01]
b = 1.00 [0.44]
Seff = 1.45 [0.58]
Teq = 280 [28] K
Rp = 6.60 [29.81] Re
a = 0.8826 [0.2248] AU
Ag = 7152.51 [64532.44] [0.11] σ
Teffp = 3981 [8973] K [0.41] σ

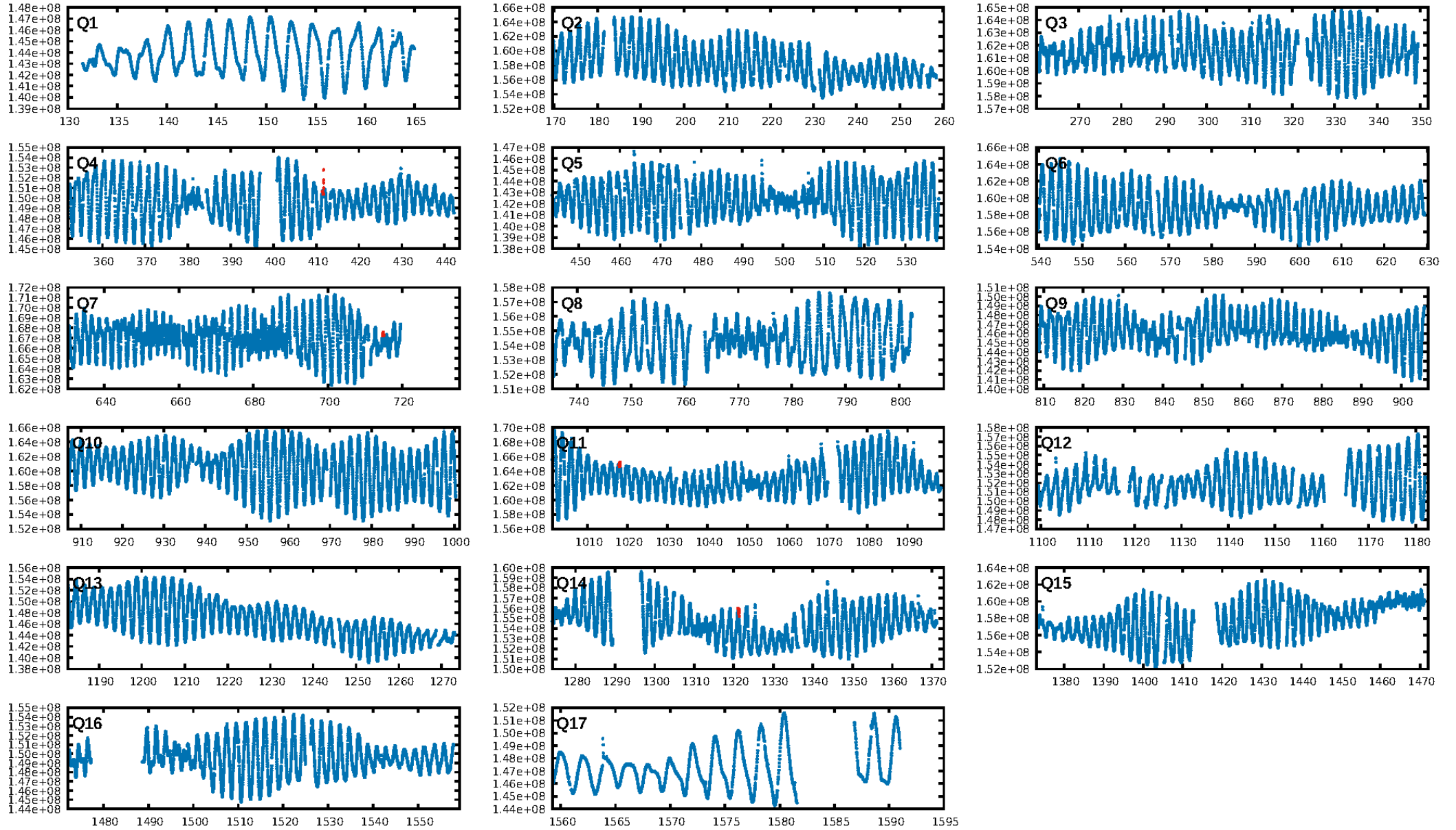
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [685.97] σ
ModelChiSquare2-sig: 2.0%
ModelChiSquareGof-sig: 41.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.75 [3/4]
GhostDiagnostic-chr: 3.712
Centroid-sig: 1.1%
Centroid-so: 1.470 arcsec [1.08] σ
OotOffset-rm: 0.120 arcsec [1.06] σ
OotOffset-st: 1/2/1/0 [4]
KicOffset-rm: 0.156 arcsec [1.26] σ
KicOffset-st: 1/2/1/0 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 1.00 [4/4]

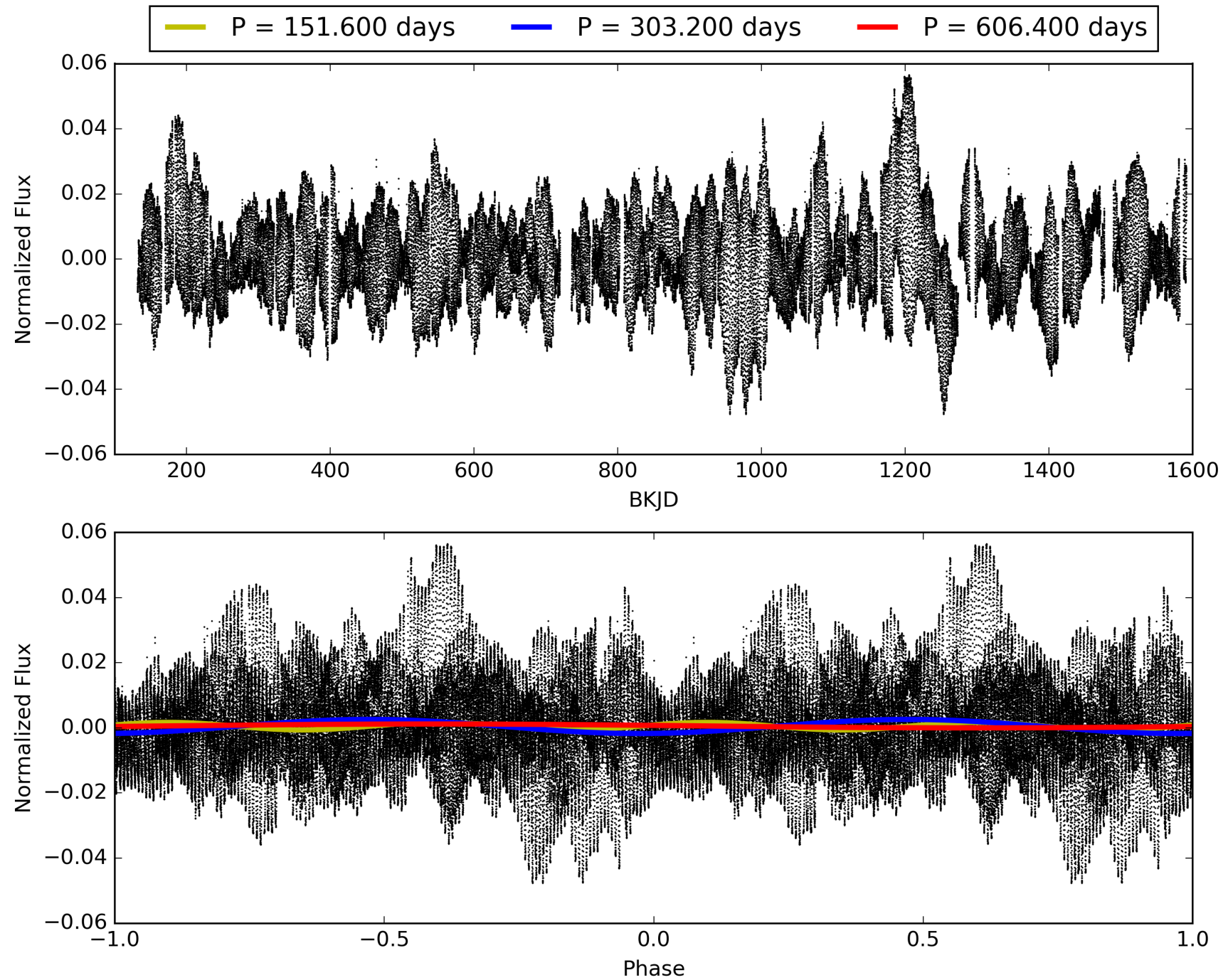
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:33:16 Z

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

TCE 009813965-03, PDC Light Curves

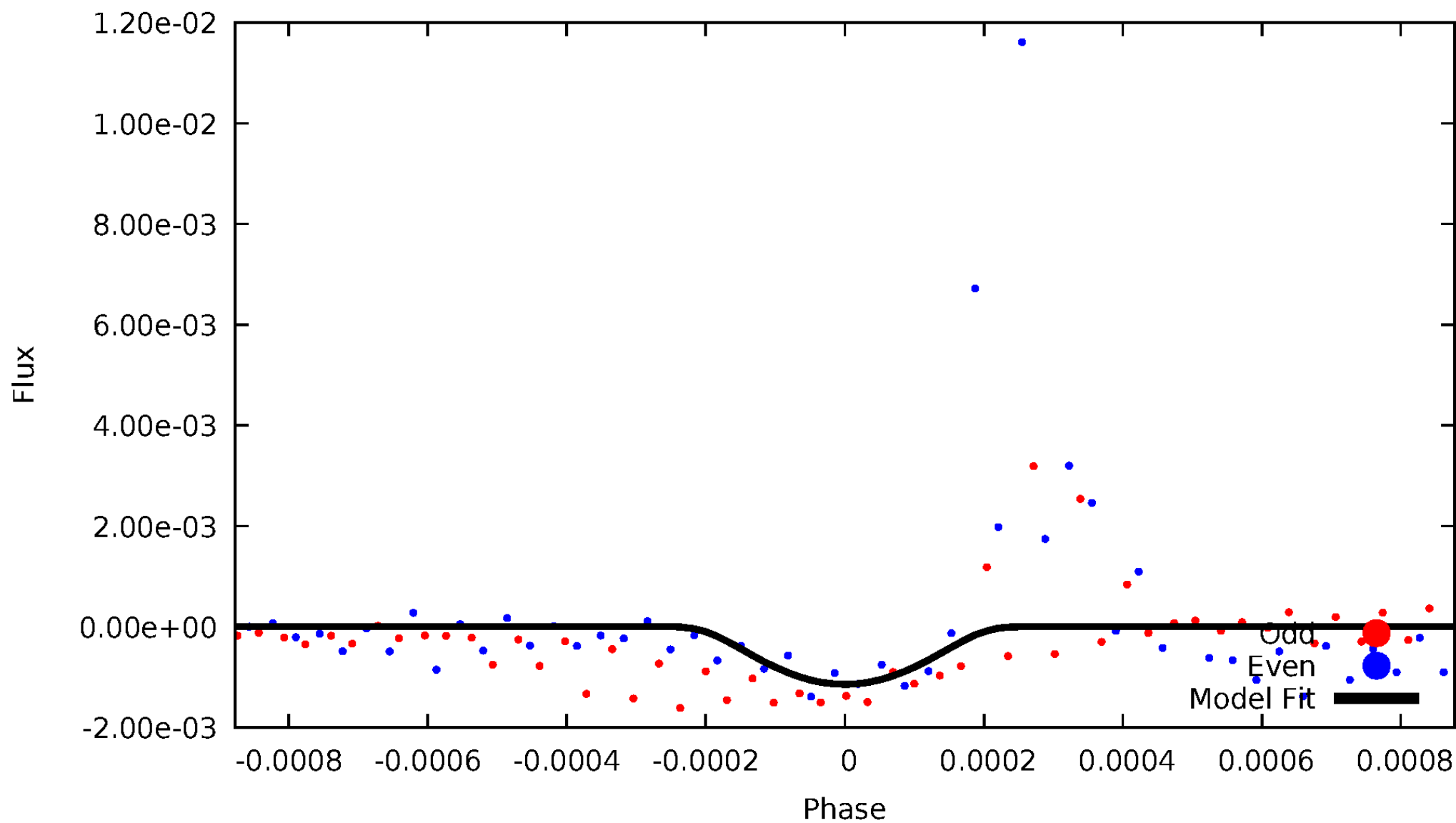


TCE 009813965-03



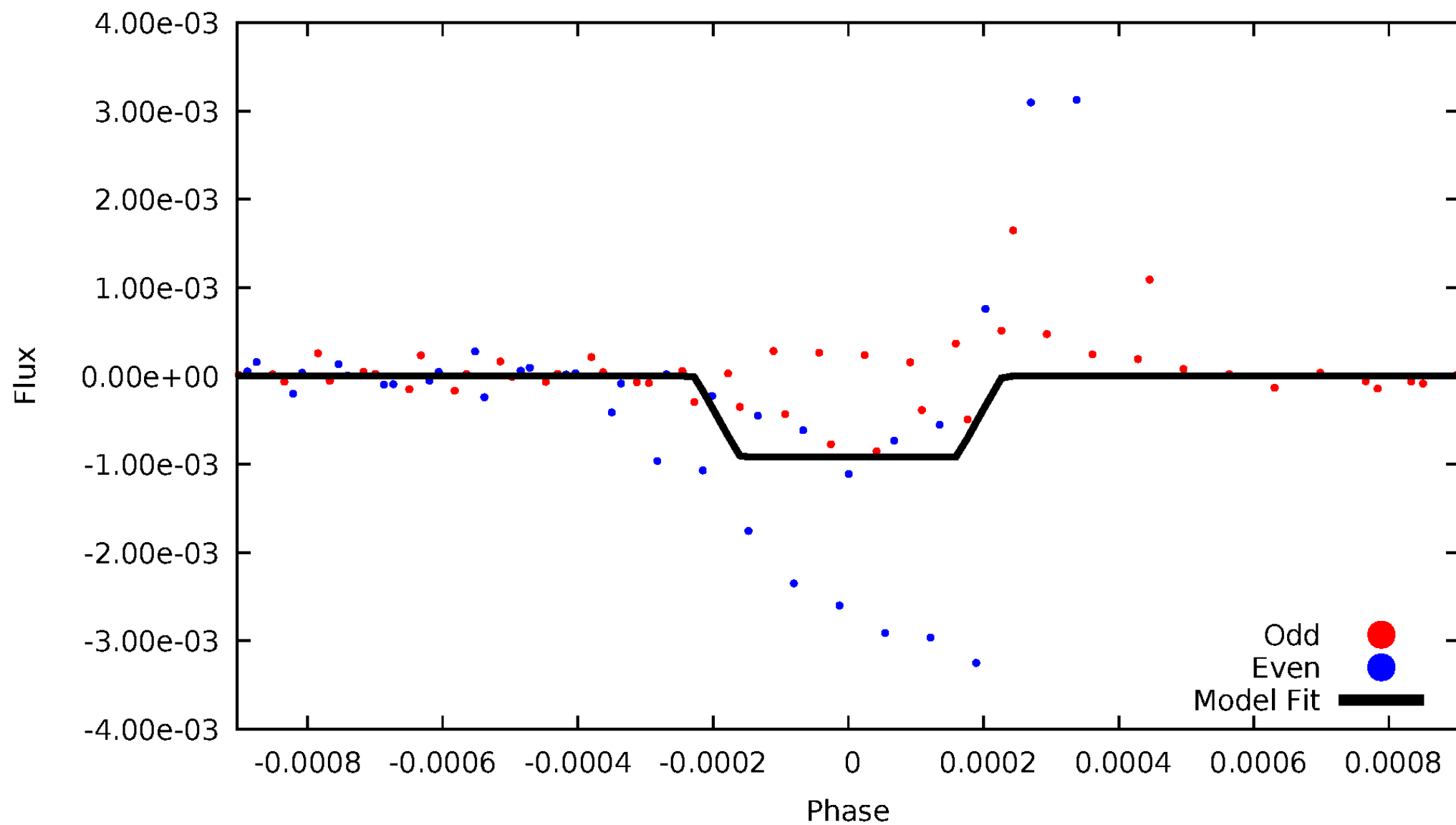
DV Odd/Even

TCE 009813965-03



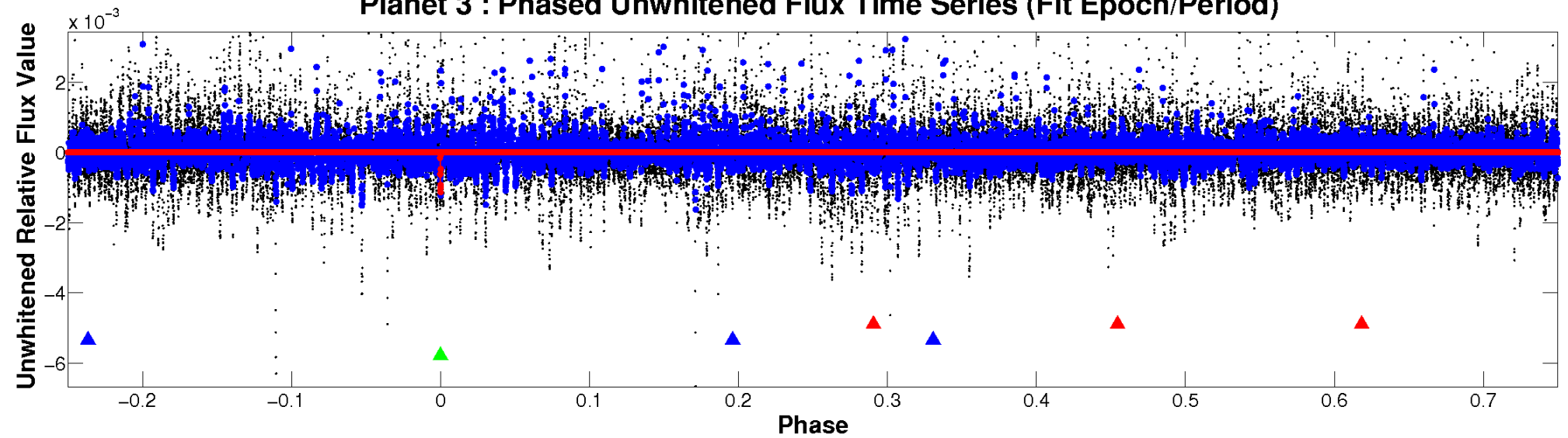
ALT Odd/Even

TCE 009813965-03

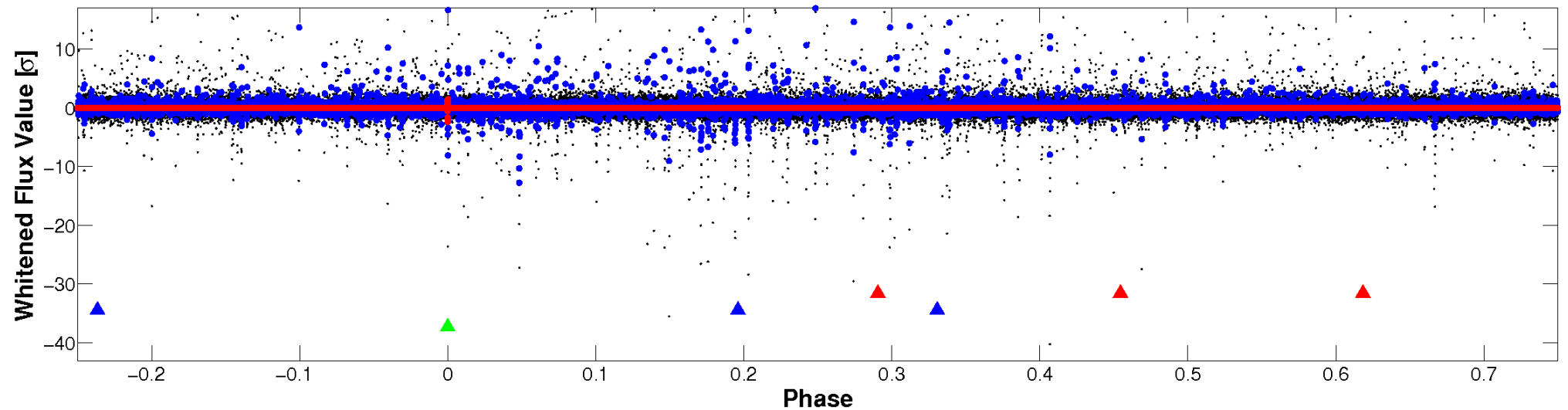


Non-Whitened Vs. Whitened Light Curve

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

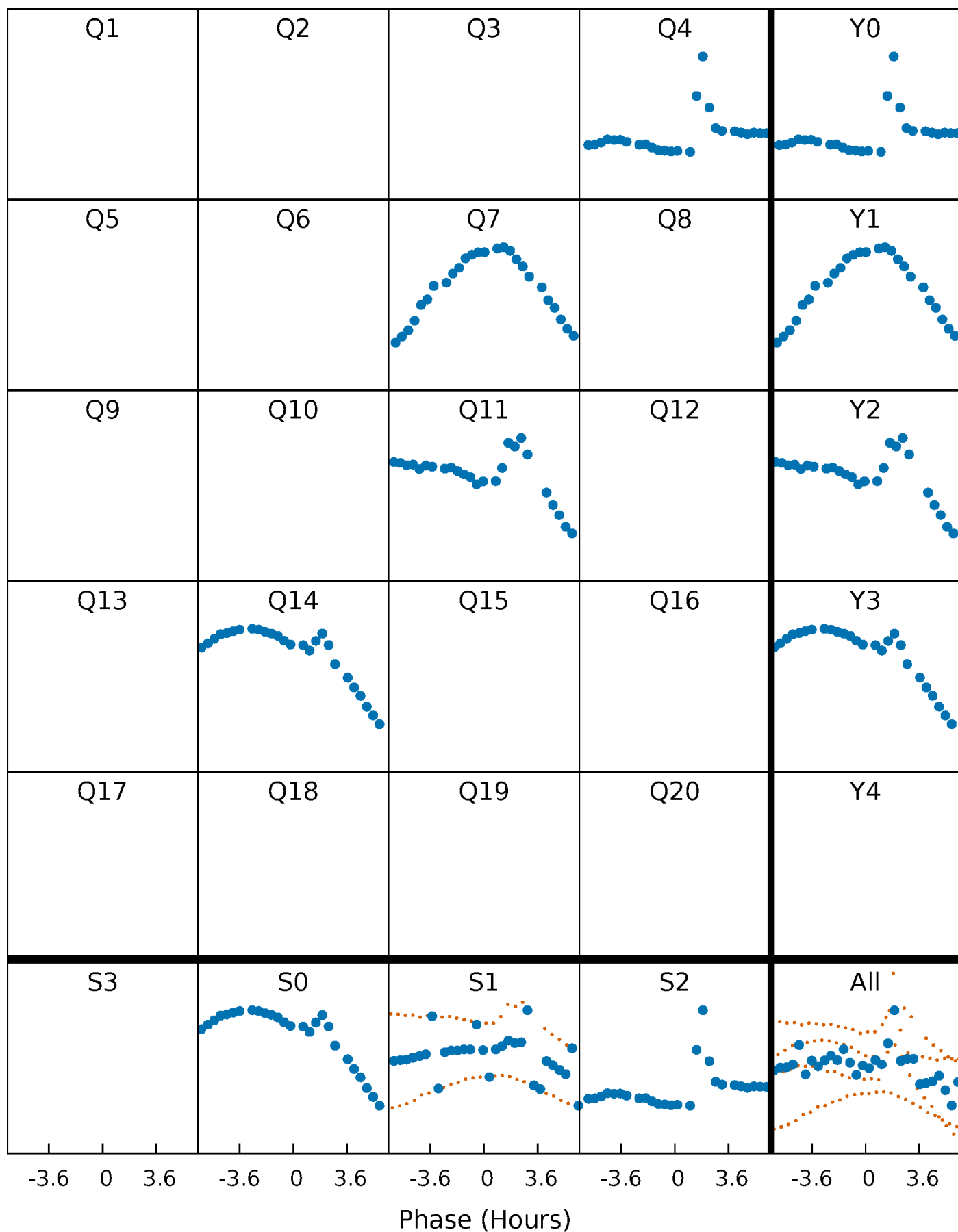


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



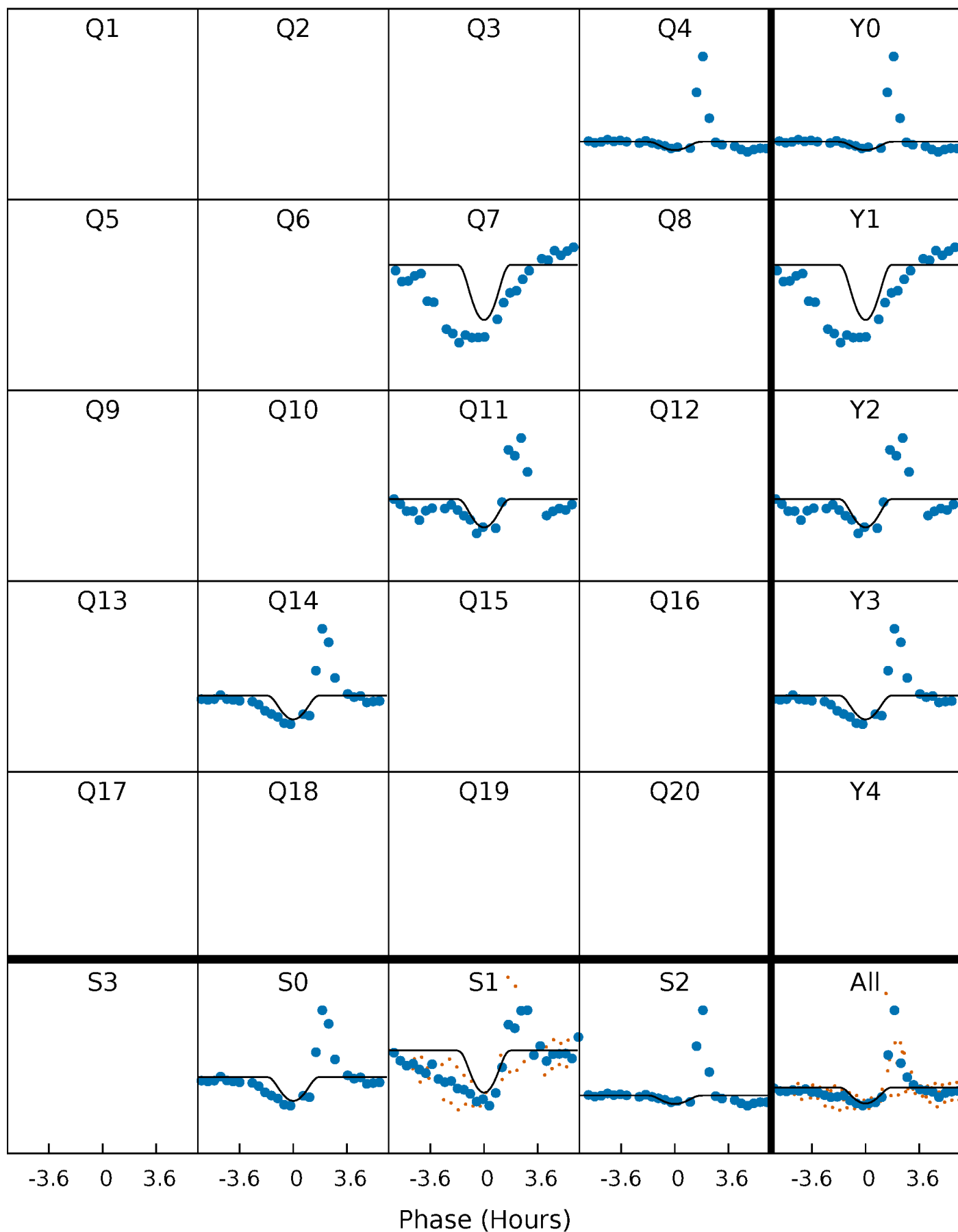
PDC Quarter-Phased Transit Curves

TCE 009813965-03 P=303.200218 Days $T_0=411.638464$ (BKJD)



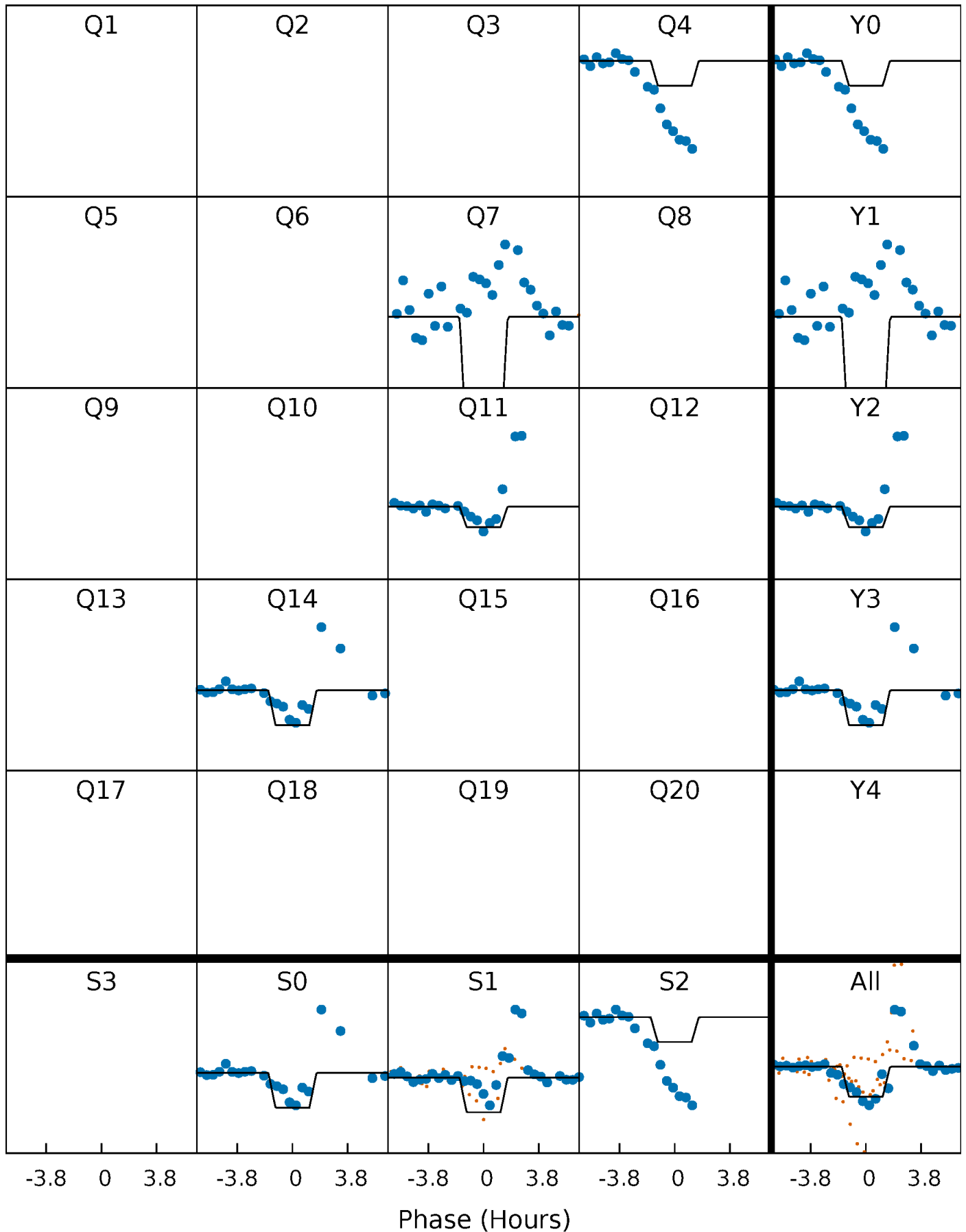
DV Quarter-Phased Transit Curves

TCE 009813965-03 $P=303.200218$ Days $T_0=411.638464$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

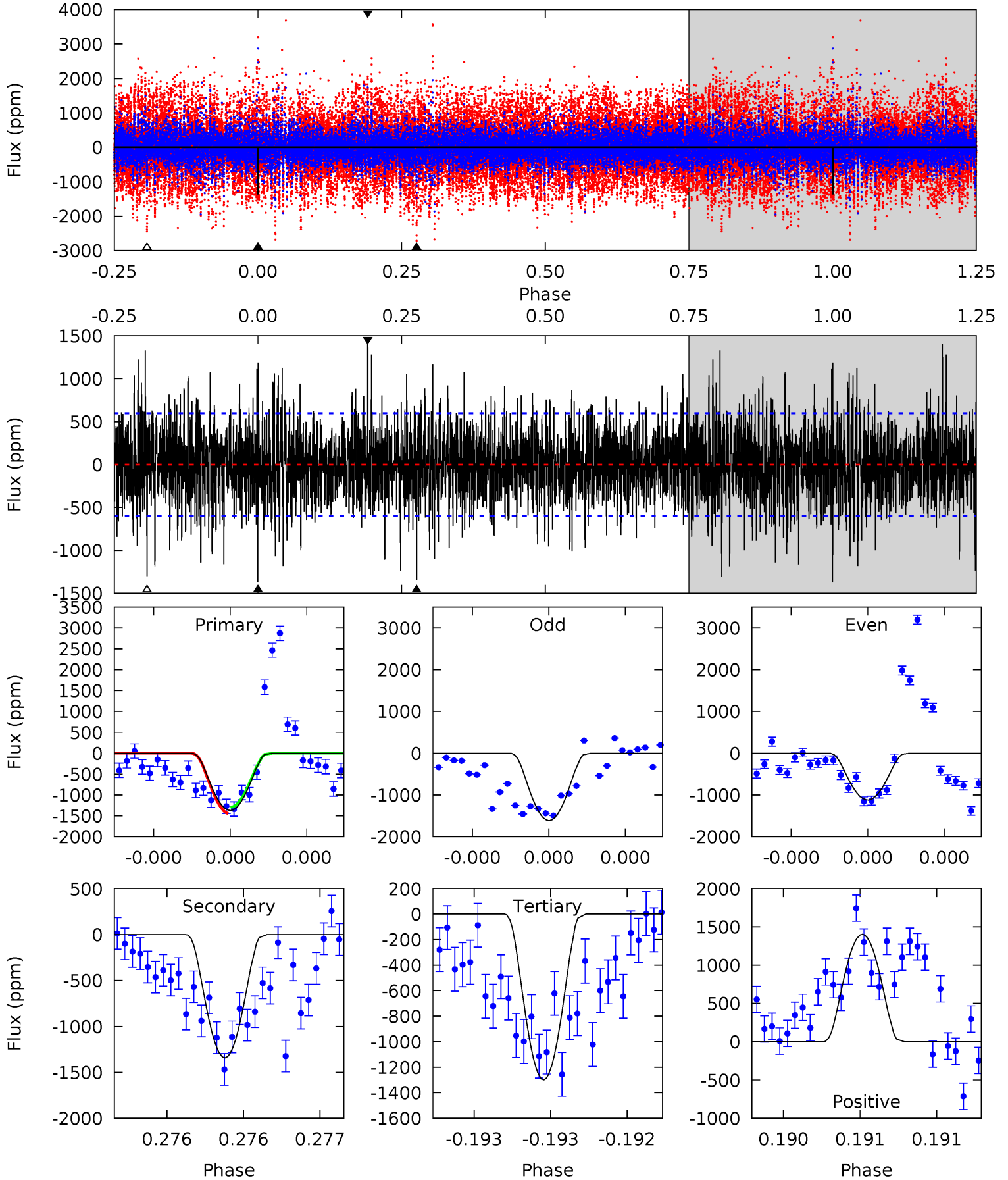
TCE 009813965-03 P=303.203172 Days $T_0=411.617626$ (BKJD)



DV Model-Shift Uniqueness Test

009813965-03, P = 303.200218 Days, E = 108.438246 Days

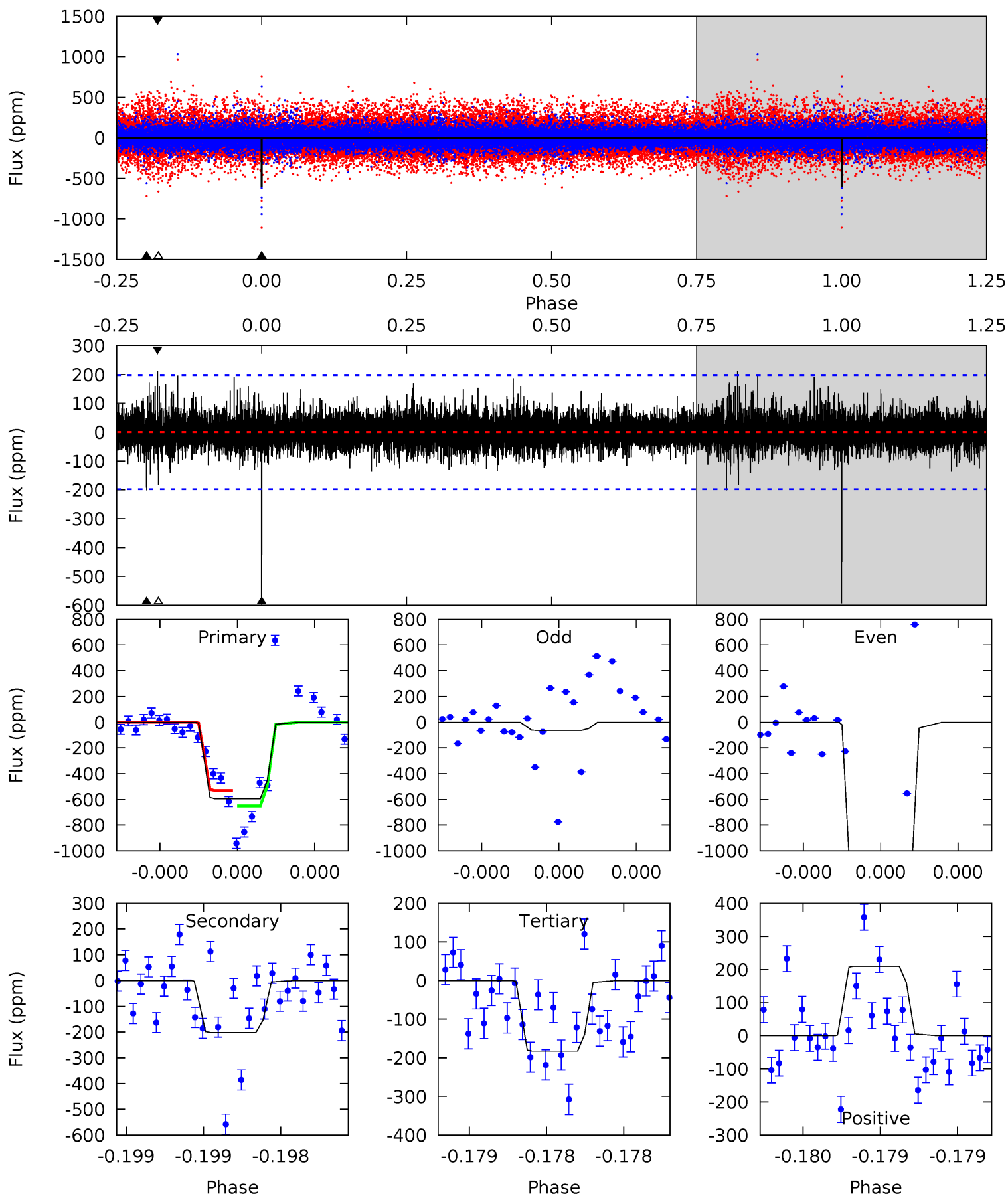
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.8 | 12.5 | 12.1 | 13.1 | 5.58 | 3.48 | 3.03 | 0.68 | -0.30 | 0.40 | -0.57 | 2.11 | 0.93 | 0.51 | 0.72 |



Alt Model-Shift Uniqueness Test

009813965-03, P = 303.203172 Days, E = 108.414454 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 16.7 | 5.69 | 5.15 | 5.94 | 5.59 | 3.51 | 1.04 | 11.6 | 10.8 | 0.54 | -0.25 | 26.0 | 1.55 | 0.26 | 0 |



Stellar Parameters For KIC 009813965

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5936^{+184}_{-205} | $4.429^{+0.087}_{-0.203}$ | $-0.080^{+0.250}_{-0.300}$ | $1.009^{+0.305}_{-0.131}$ | $0.999^{+0.138}_{-0.124}$ | $1.368^{+0.523}_{-0.732}$ |
| | +3%/-3% | +2%/-5% | +312%/-375% | +30%/-13% | +14%/-12% | +38%/-53% |
| Source | PHO54 | PHO54 | PHO54 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 009813965-03 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-----------------|---------------------------|-------------------|-----------------------|------------------------|
| DV | -1342 ± 107 | $22.26^{+26.14}_{-15.40}$ | 398^{+30}_{-23} | 3161^{+1595}_{-581} | 1134^{+11162}_{-890} |
| Alt. | -202 ± 35 | $22.31^{+24.12}_{-15.49}$ | 396^{+29}_{-22} | 2461^{+976}_{-378} | 174^{+1547}_{-135} |

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 $A_{obs} \gg 1.0$

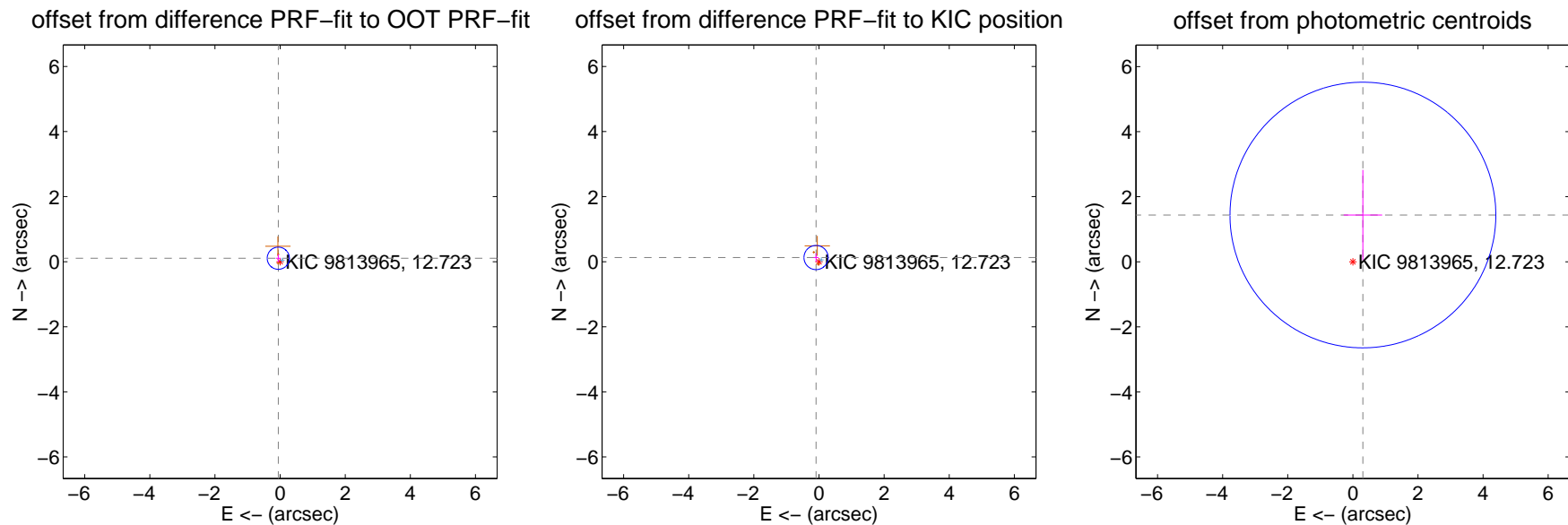
DV Centroid Data

Supplemental centroid analysis for 009813965-03. Kepler magnitude: 12.72. Transit SNR 7.91

There are 1 quarters with good PRF difference image offsets

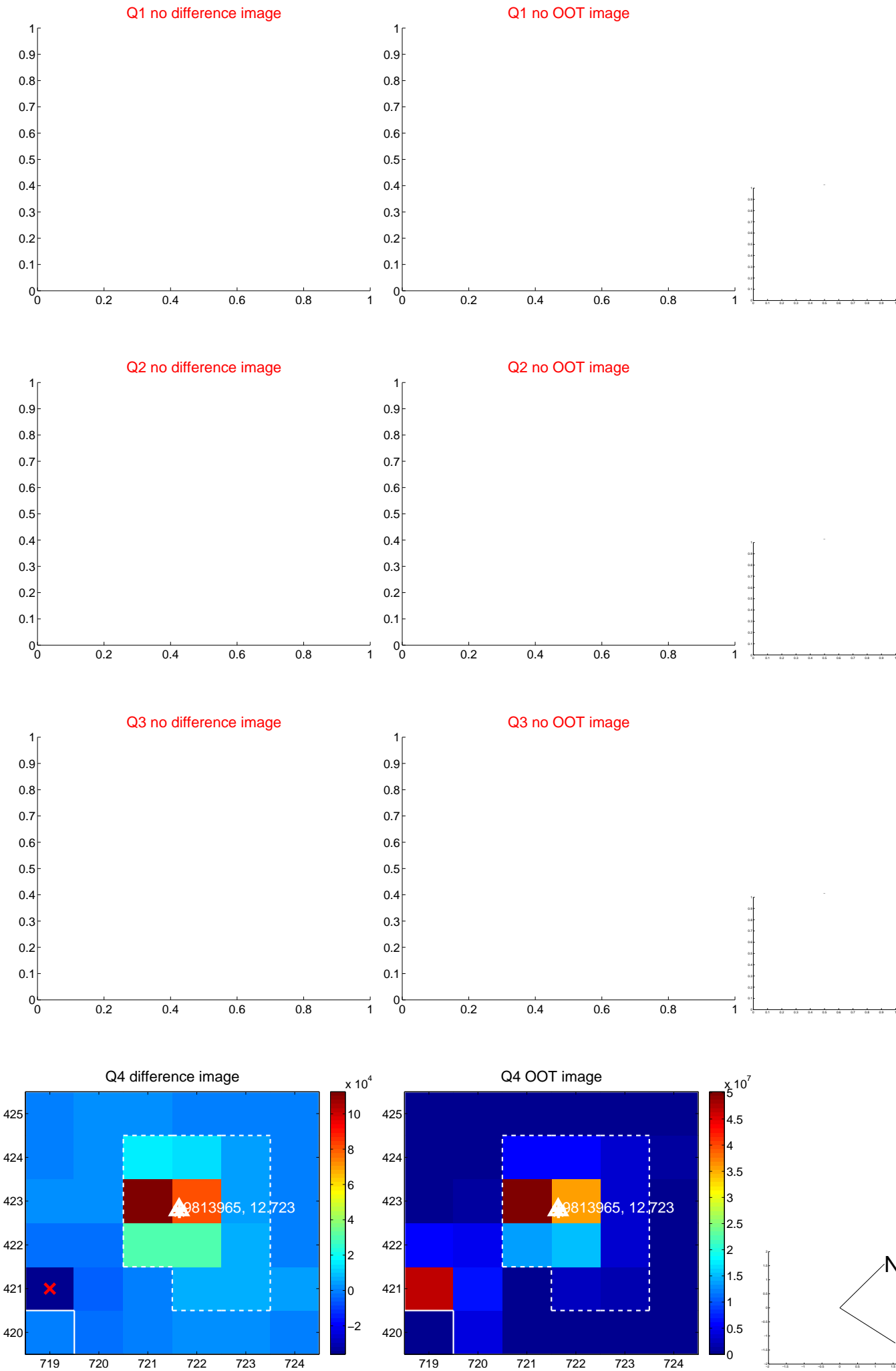
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 0.120 ± 0.114 | 1.06 | 0.056 ± 0.072 | 0.107 ± 0.118 |
| PRF-fit source offset from KIC position | 0.156 ± 0.124 | 1.26 | 0.090 ± 0.080 | 0.128 ± 0.129 |
| photometric centroid source offset | 1.47 ± 1.36 | 1.08 | -0.31 ± 0.59 | 1.44 ± 1.39 |

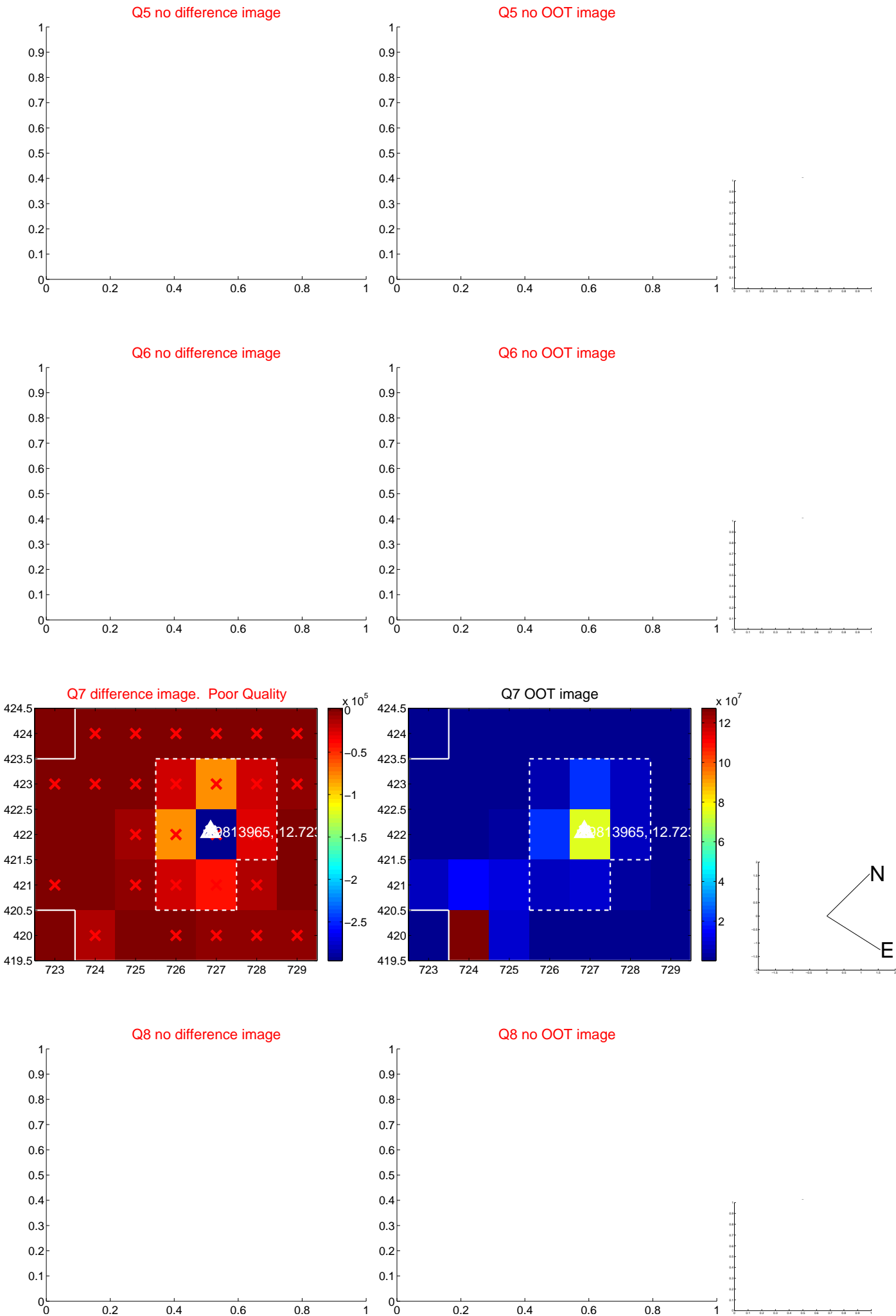


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

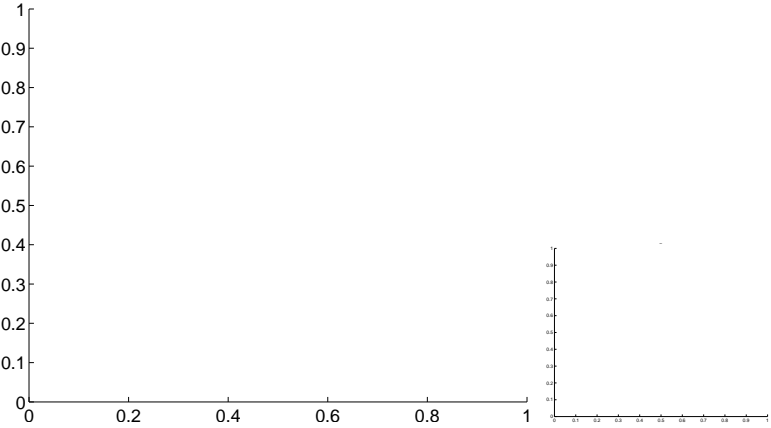


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q9 no difference image



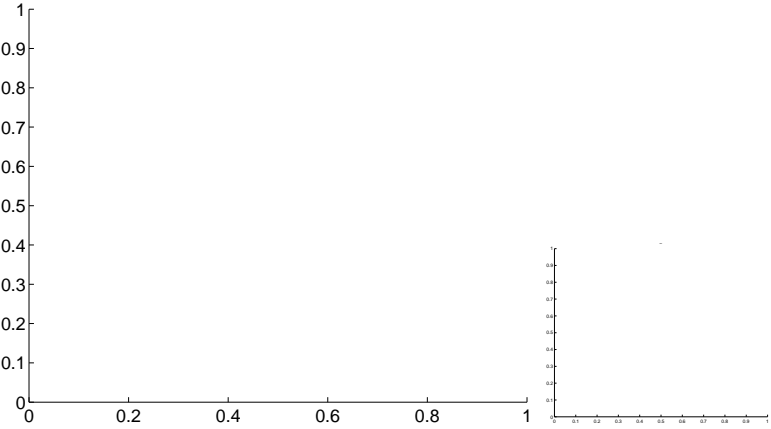
Q9 no OOT image



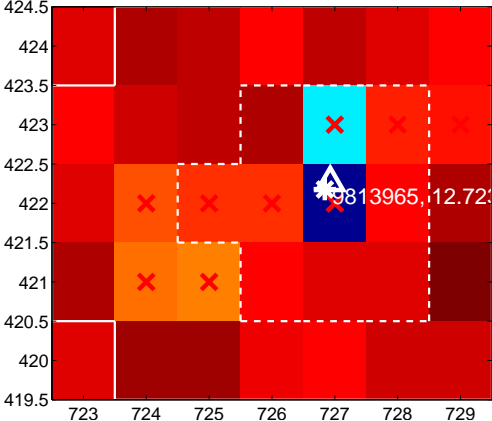
Q10 no difference image



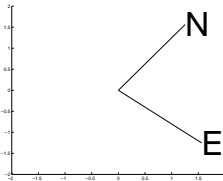
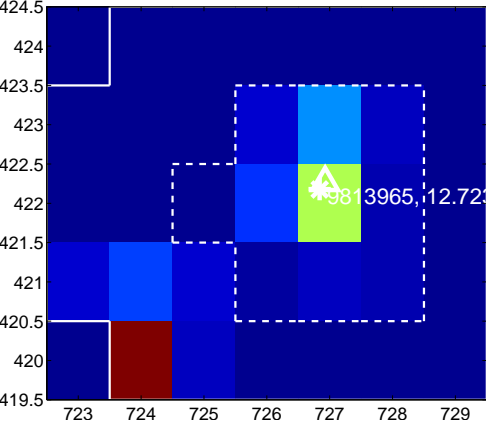
Q10 no OOT image



Q11 difference image. Poor Quality



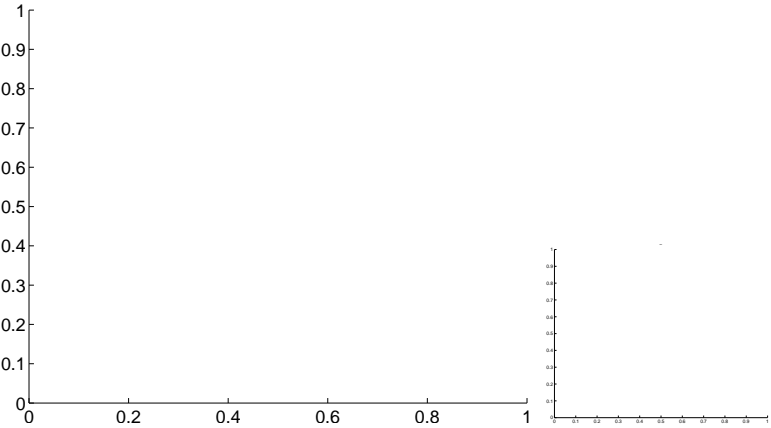
Q11 OOT image



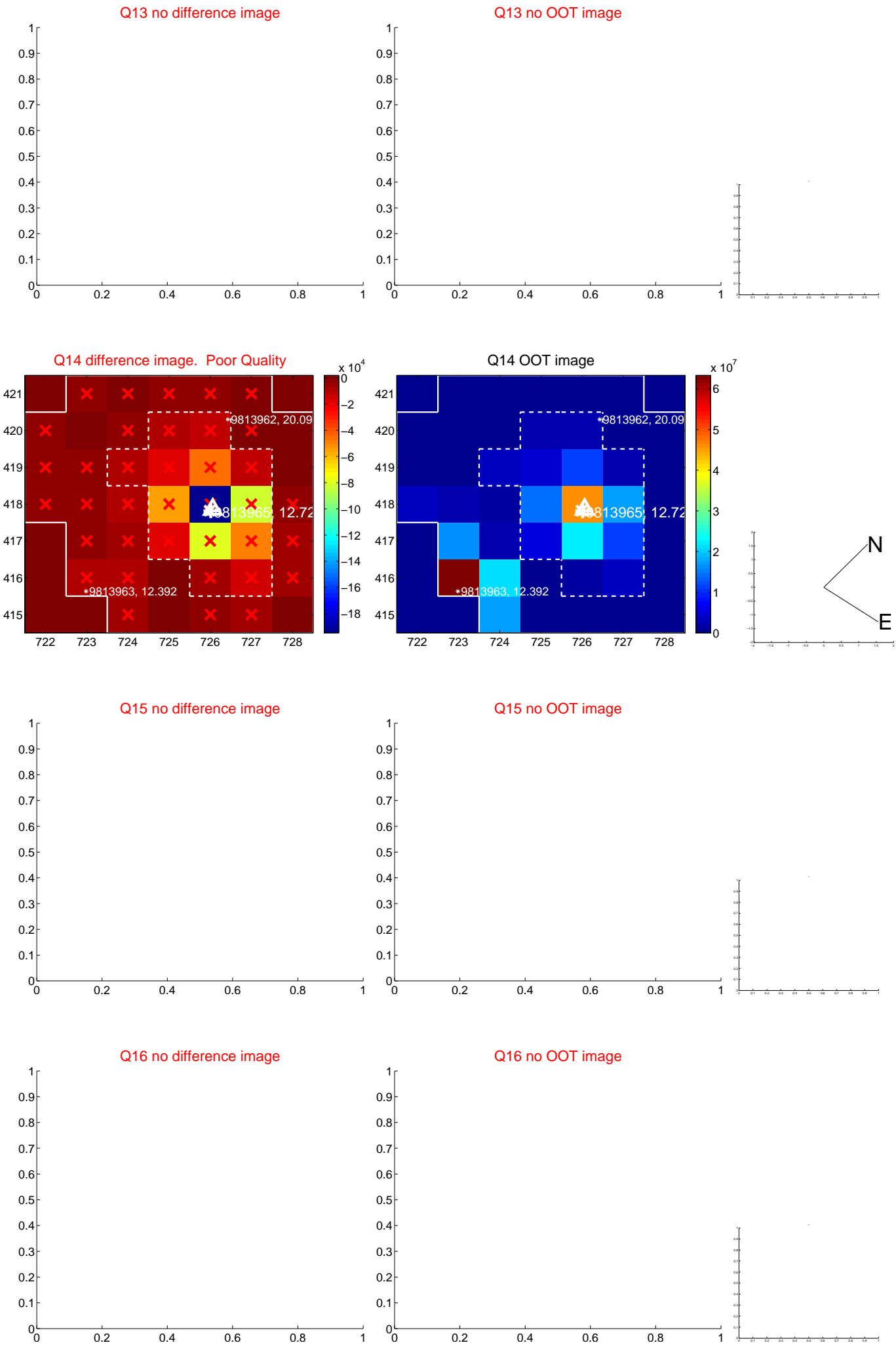
Q12 no difference image



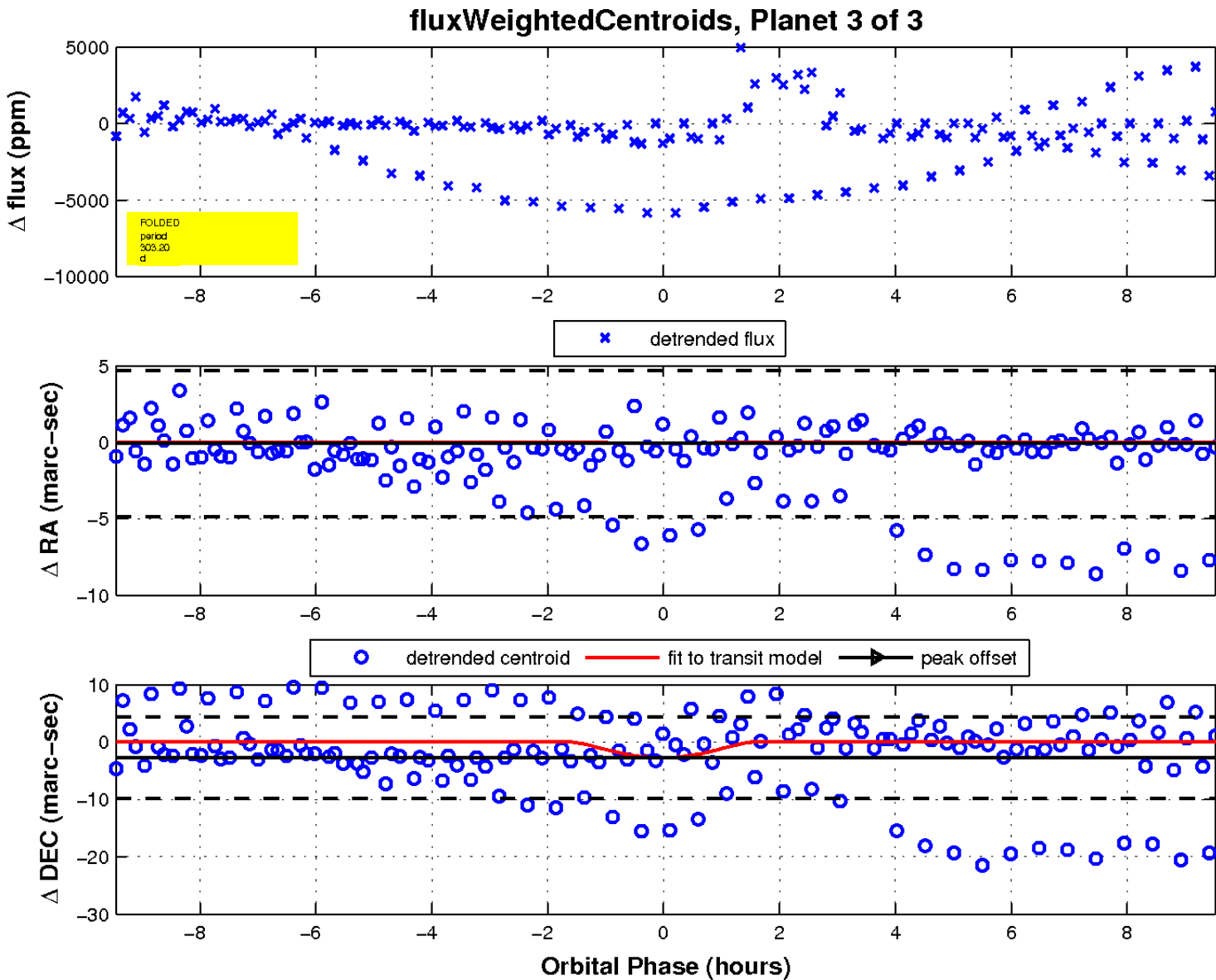
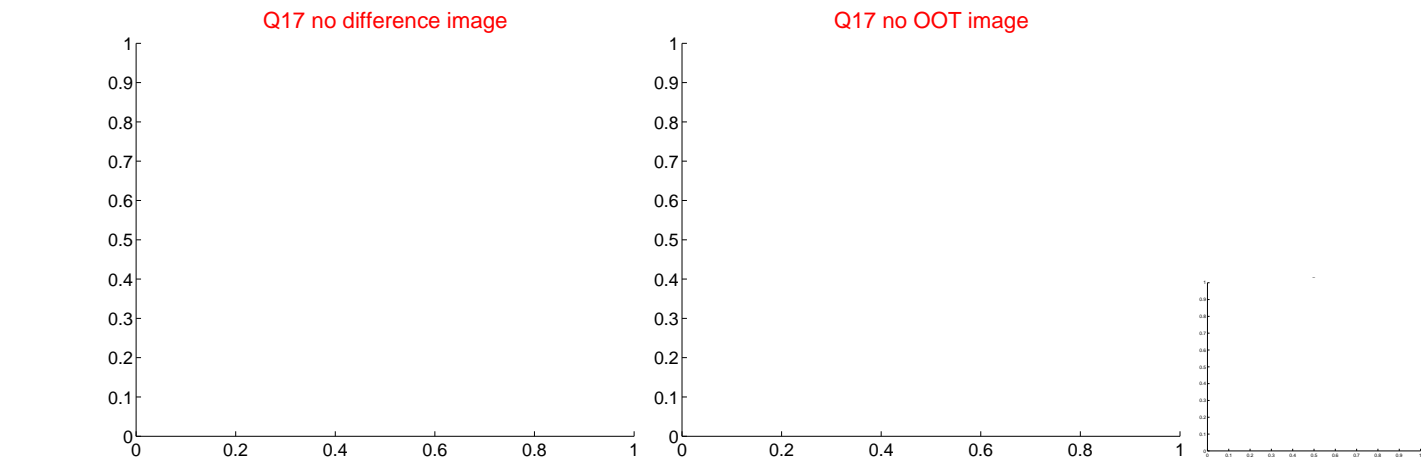
Q12 no OOT image



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

