

KIC 008545504

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008545504-01 | OBS | No | 262.707715 | 392.249294 | 283.8 | 6.612 | 10.3 | 5.2 | 8.03 | 5039 | 15.16 | 35.71 |
| 008545504-02 | OBS | No | 351.489323 | 476.205533 | 485.1 | 12.171 | 8.8 | 8.5 | 8.03 | 5039 | 20.23 | 24.22 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 008545504-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 008545504-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—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.

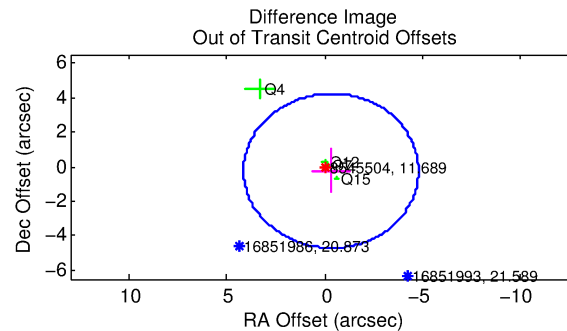
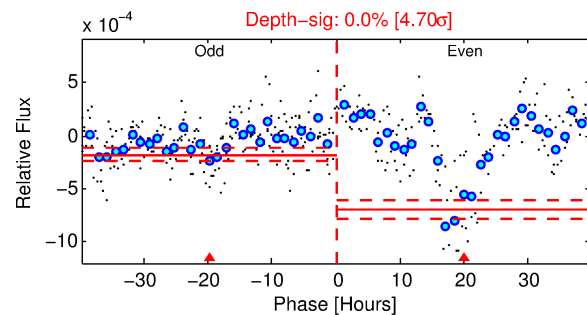
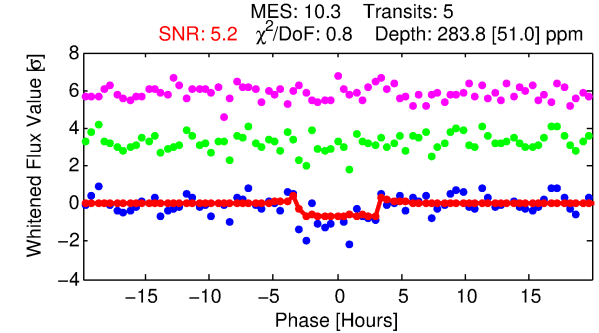
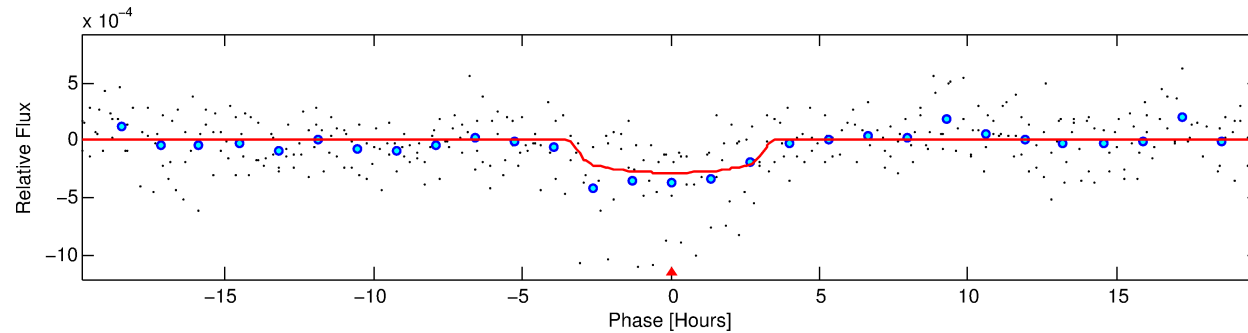
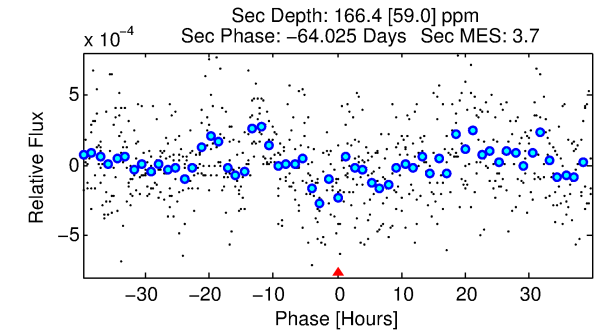
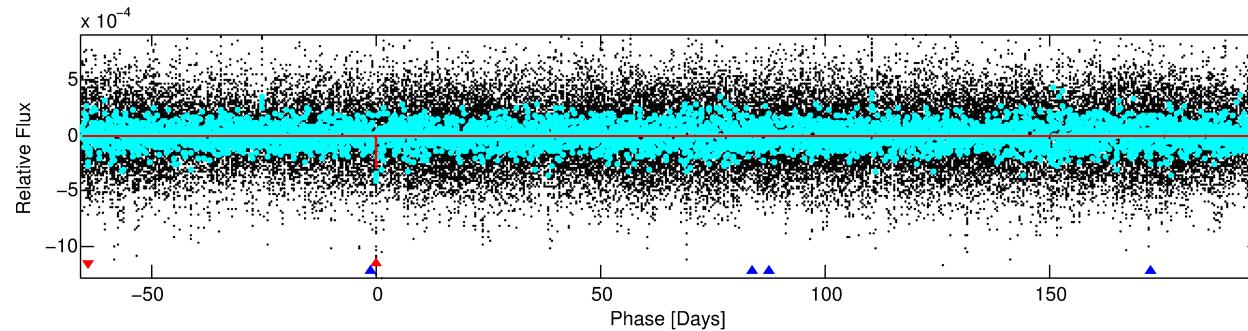
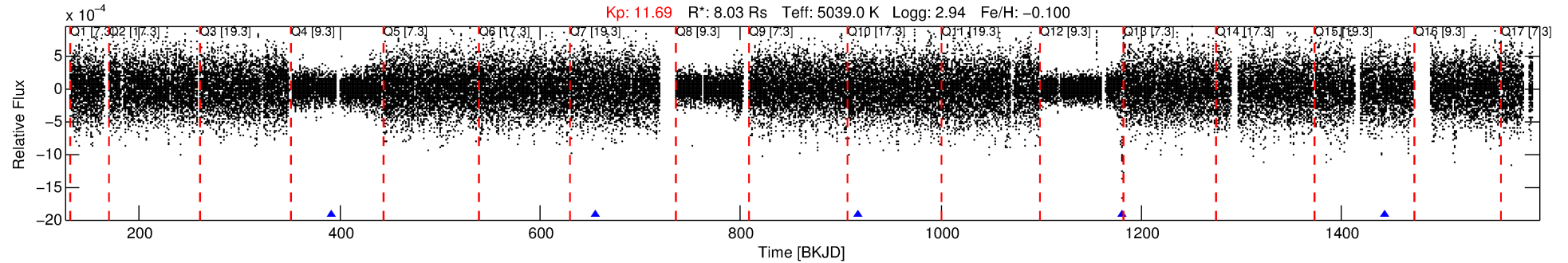
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008545504-01

No Significant Match Found

DV One-Page Summary

KIC: 8545504 Candidate: 1 of 2 Period: 262.708 d



DV Fit Results:

Period = 262.70772 [0.00337] d
Epoch = 392.2493 [0.0067] BKJD
 R_p/R^* = 0.0173 [0.0078]
 a/R^* = 188.80 [315.16]
 b = 0.80 [0.74]
 Seff = 35.71 [6.61]
 T_{eq} = 623 [29] K
 R_p = 15.16 [7.56] R_e
 a = 1.0214 [0.1455] AU
 A_g = 415.27 [407.71] [1.02σ]
 T_{eff} = 4351 [1063] K [3.51σ]

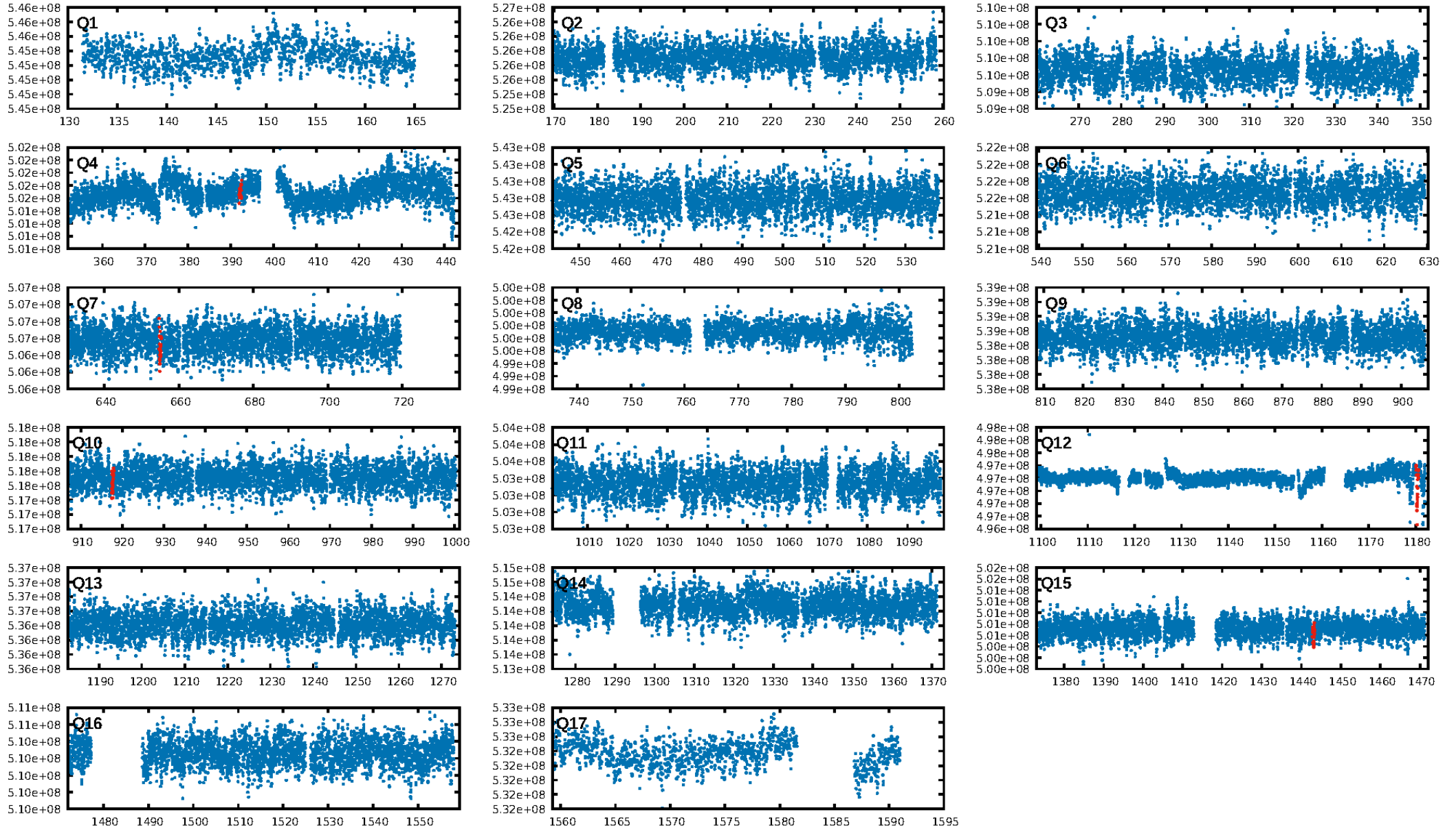
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [153.83σ]
ModelChiSquare2-sig: 0.9%
ModelChiSquareGof-sig: 99.7%
Bootstrap-pfa: 1.43e-21
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 6.958
Centroid-sig: 36.8%
Centroid-so: 0.294 arcsec [0.64σ]
OotOffset-rm: 0.410 arcsec [0.28σ]
KicOffset-rm: 0.491 arcsec [0.43σ]
OotOffset-st: 0/2/2/0 [4]
KicOffset-st: 0/2/2/0 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 1.00 [5/5]

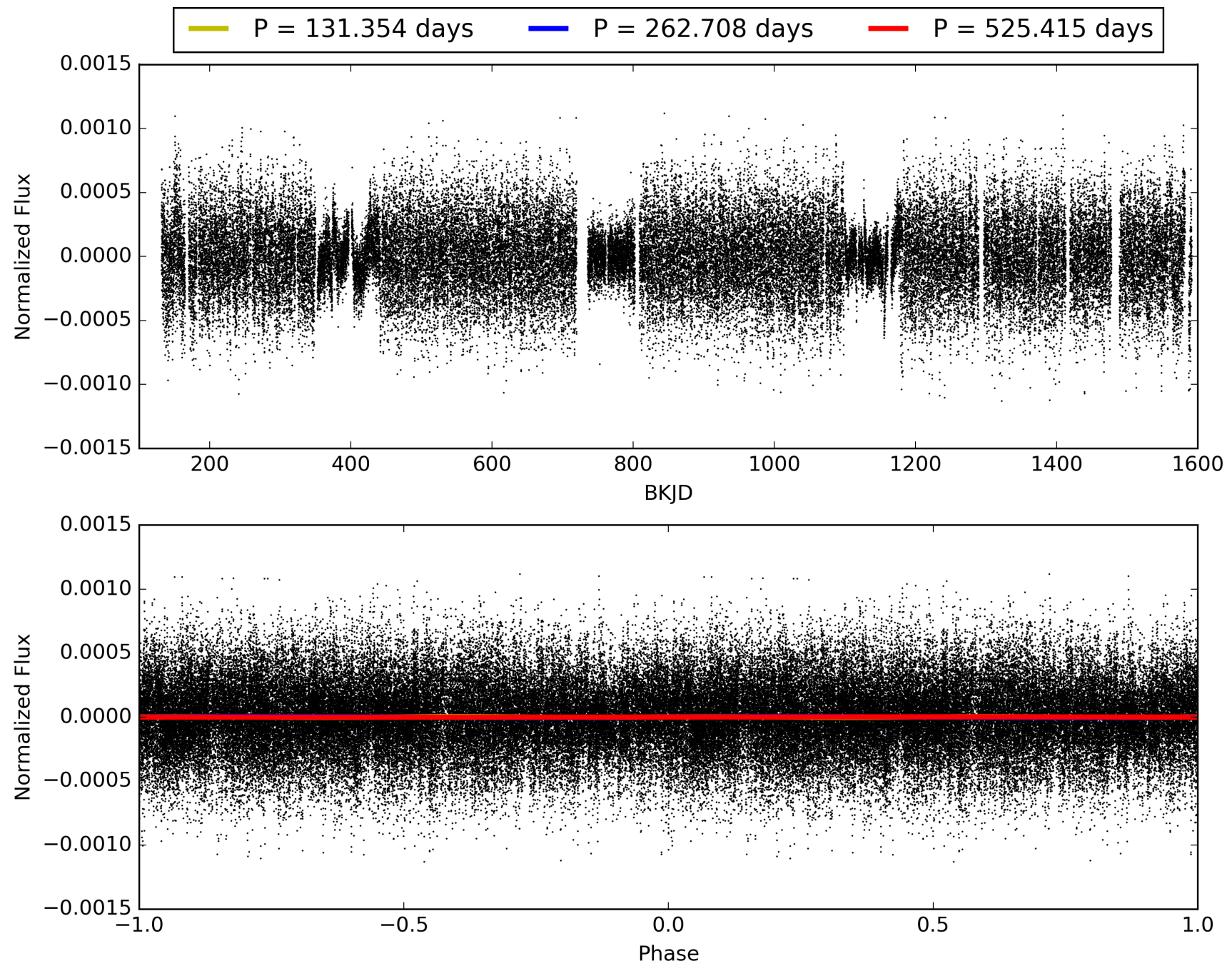
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:07:37 Z

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

TCE 008545504-01, PDC Light Curves

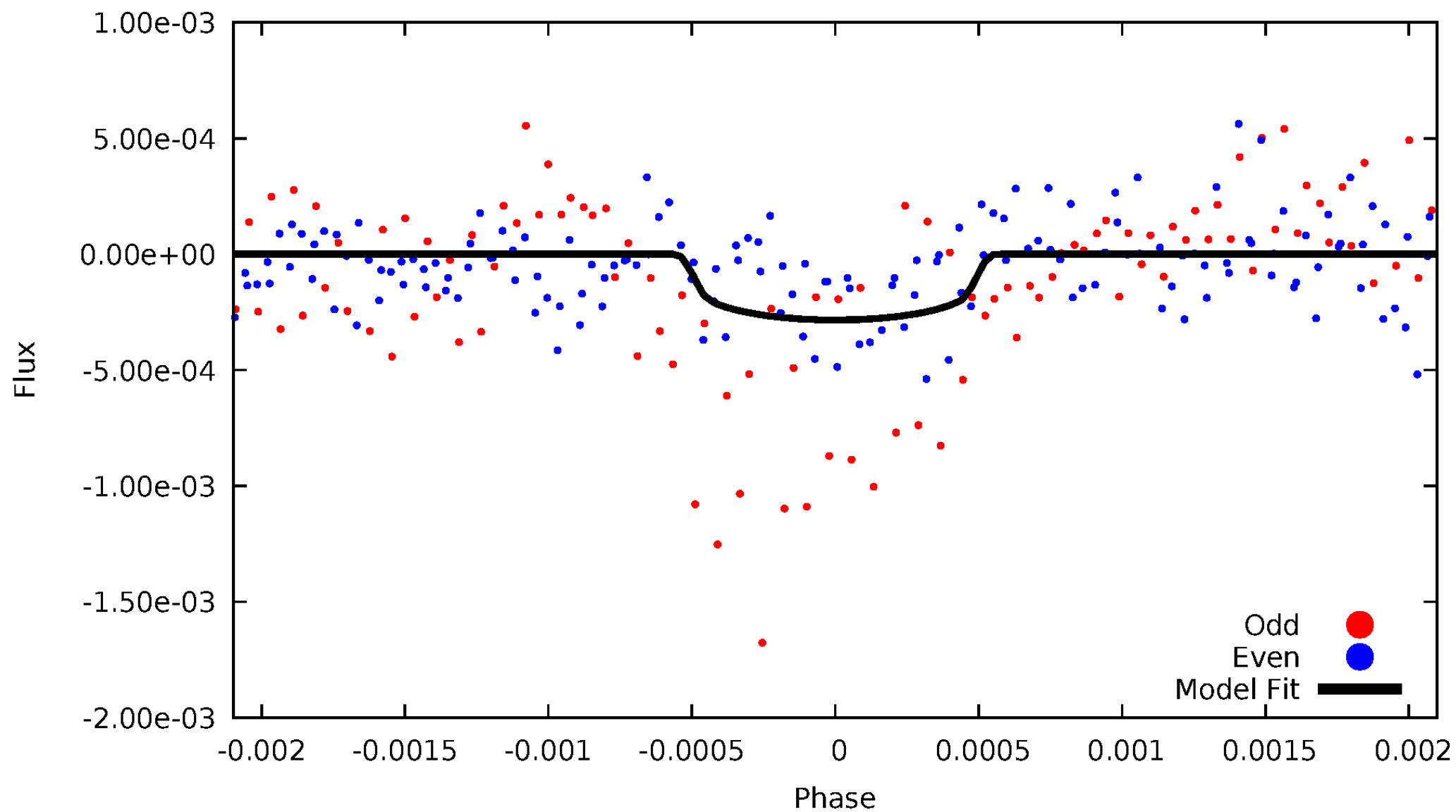


TCE 008545504-01



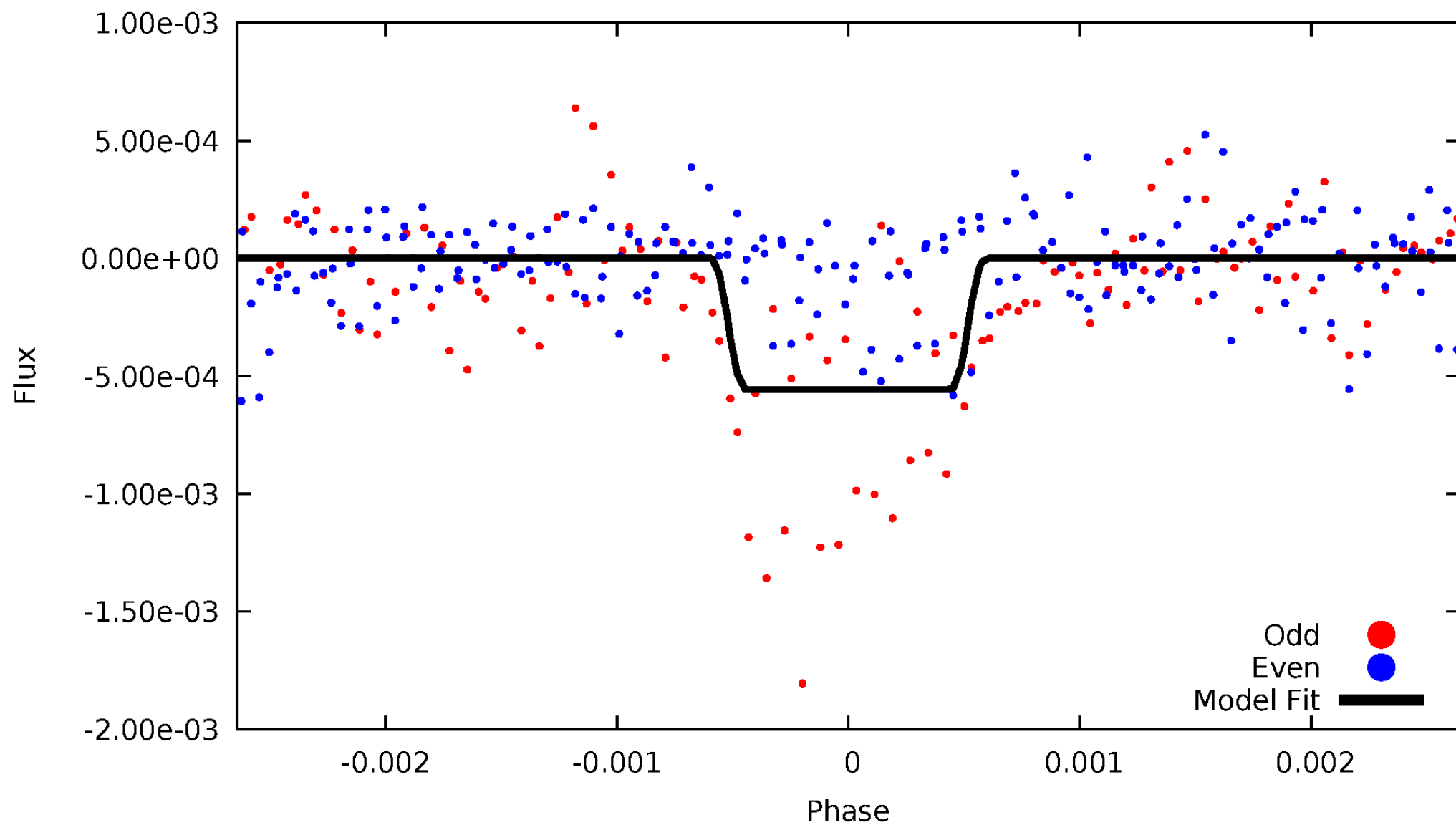
DV Odd/Even

TCE 008545504-01



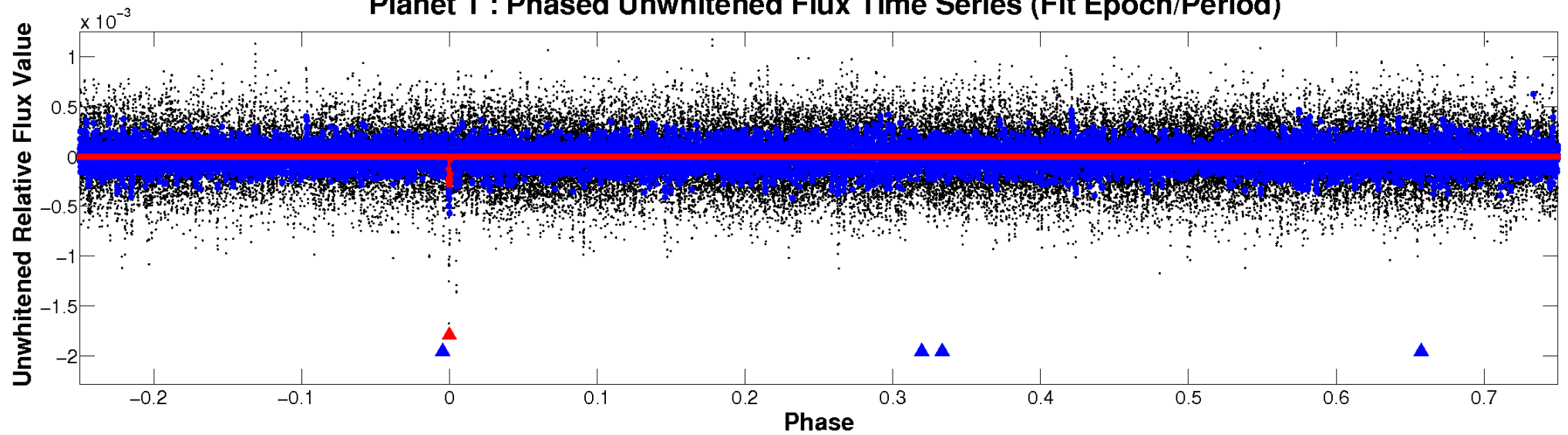
ALT Odd/Even

TCE 008545504-01

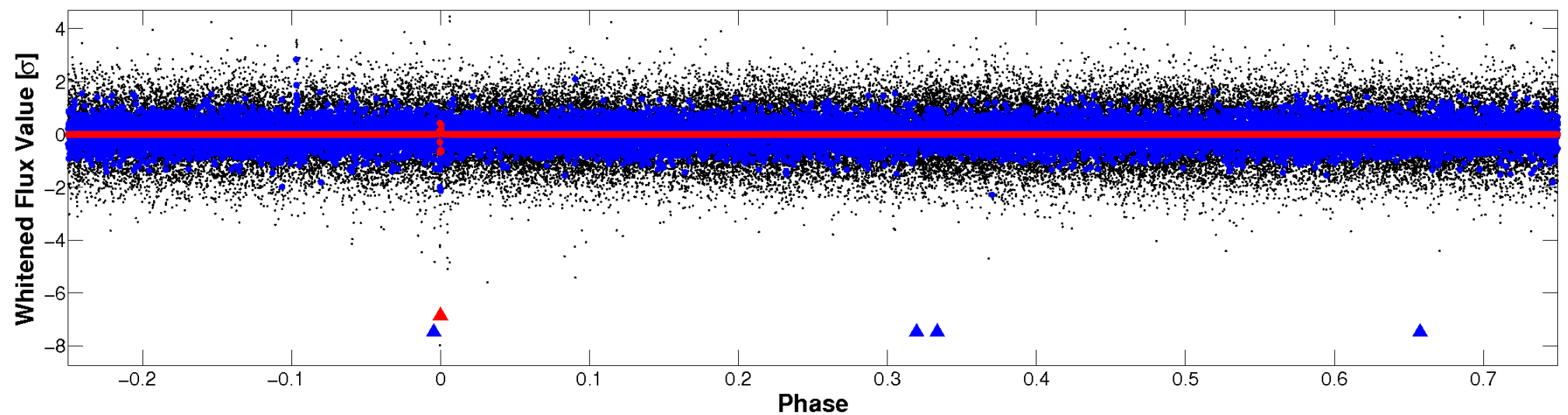


Non-Whitened Vs. Whitened Light Curve

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

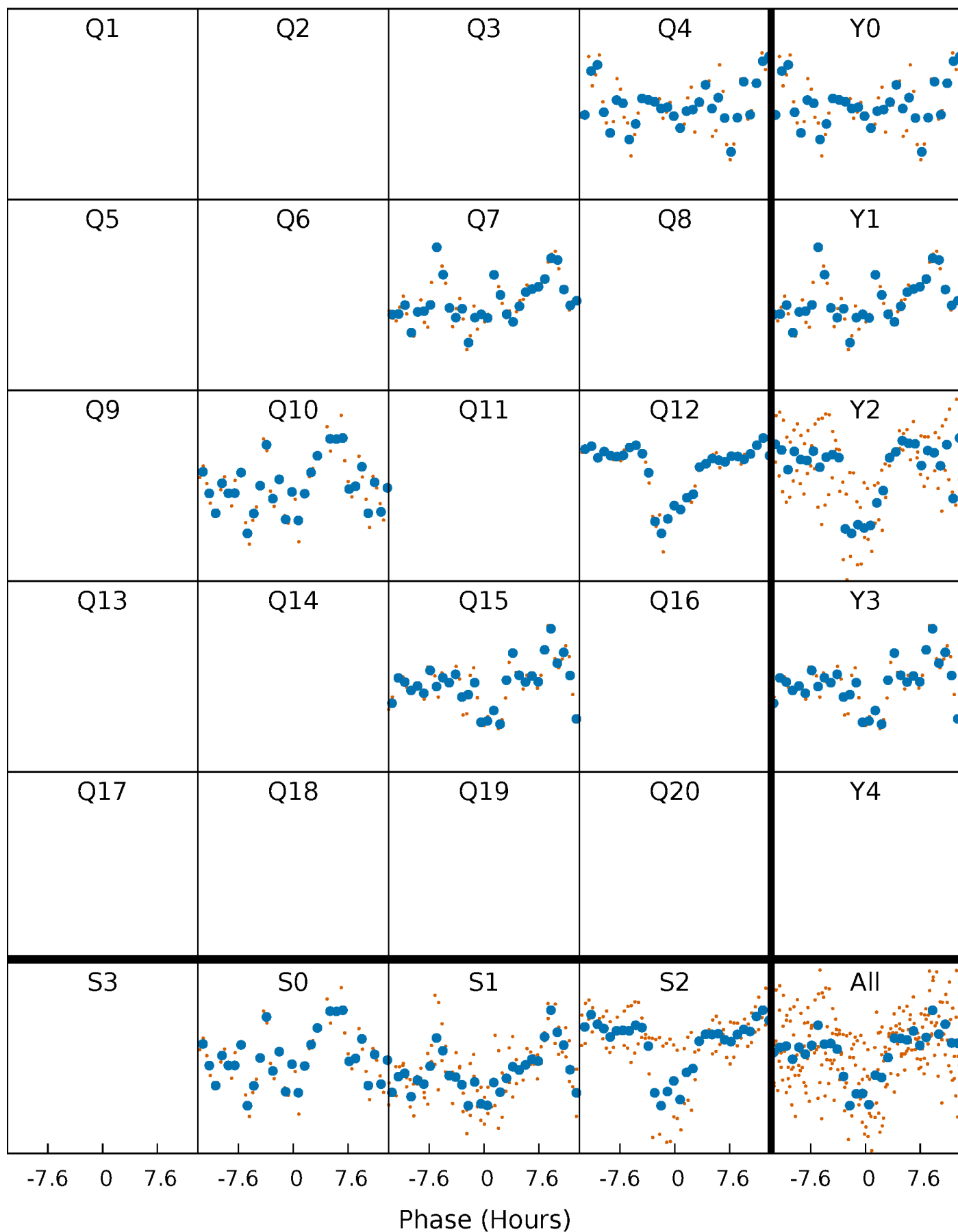


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



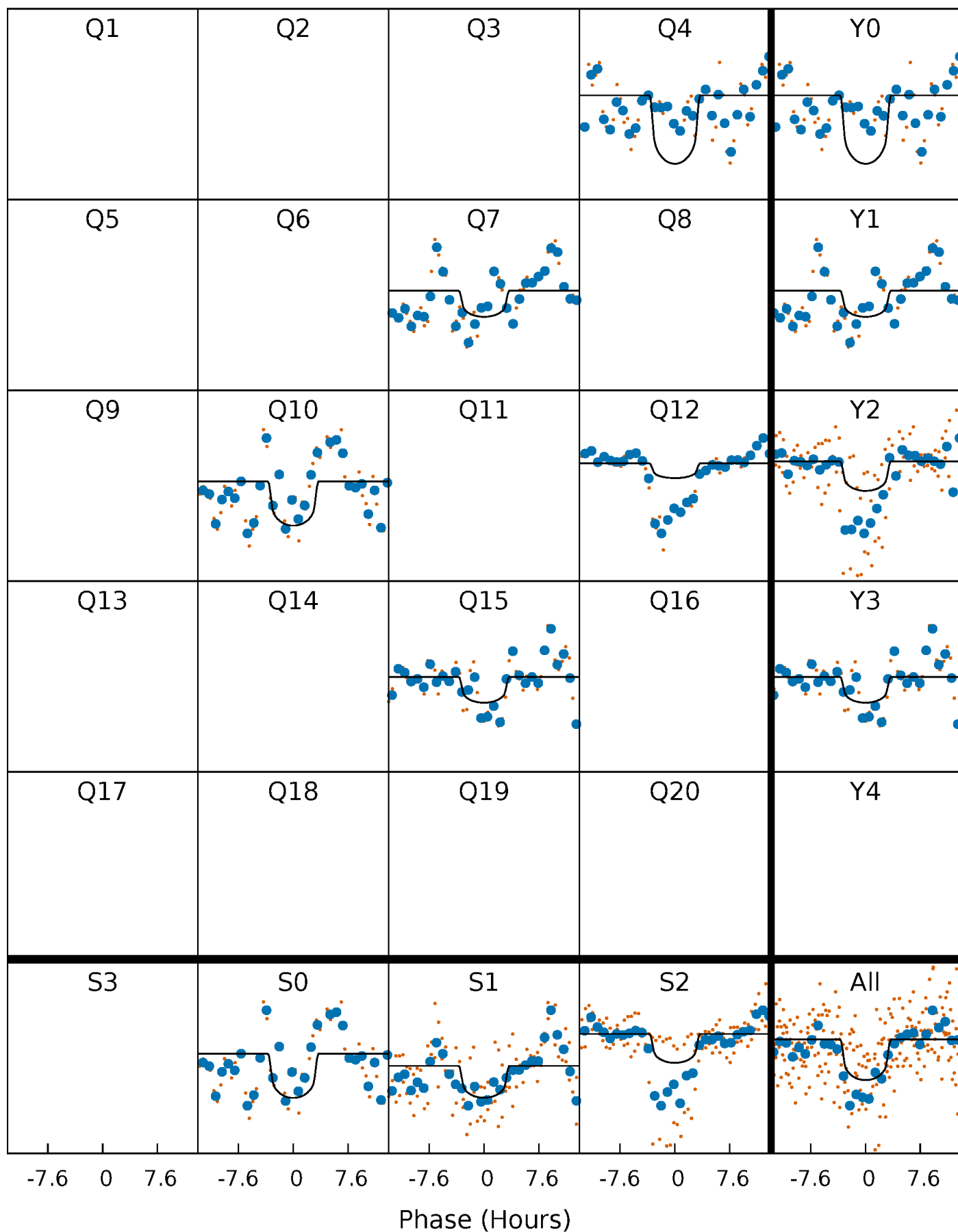
PDC Quarter-Phased Transit Curves

TCE 008545504-01 P=262.707715 Days $T_0=392.249294$ (BKJD)



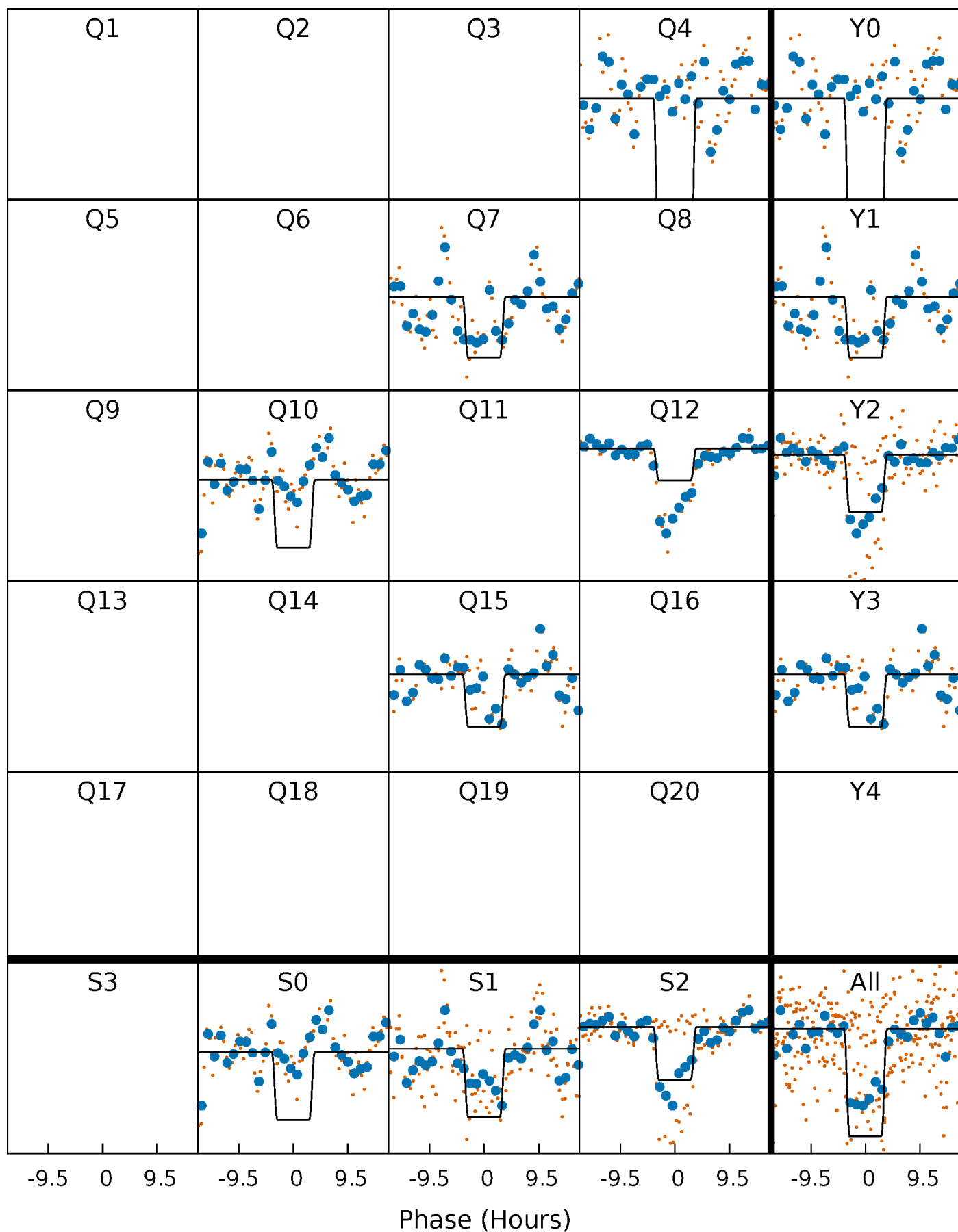
DV Quarter-Phased Transit Curves

TCE 008545504-01 P=262.707715 Days $T_0=392.249294$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

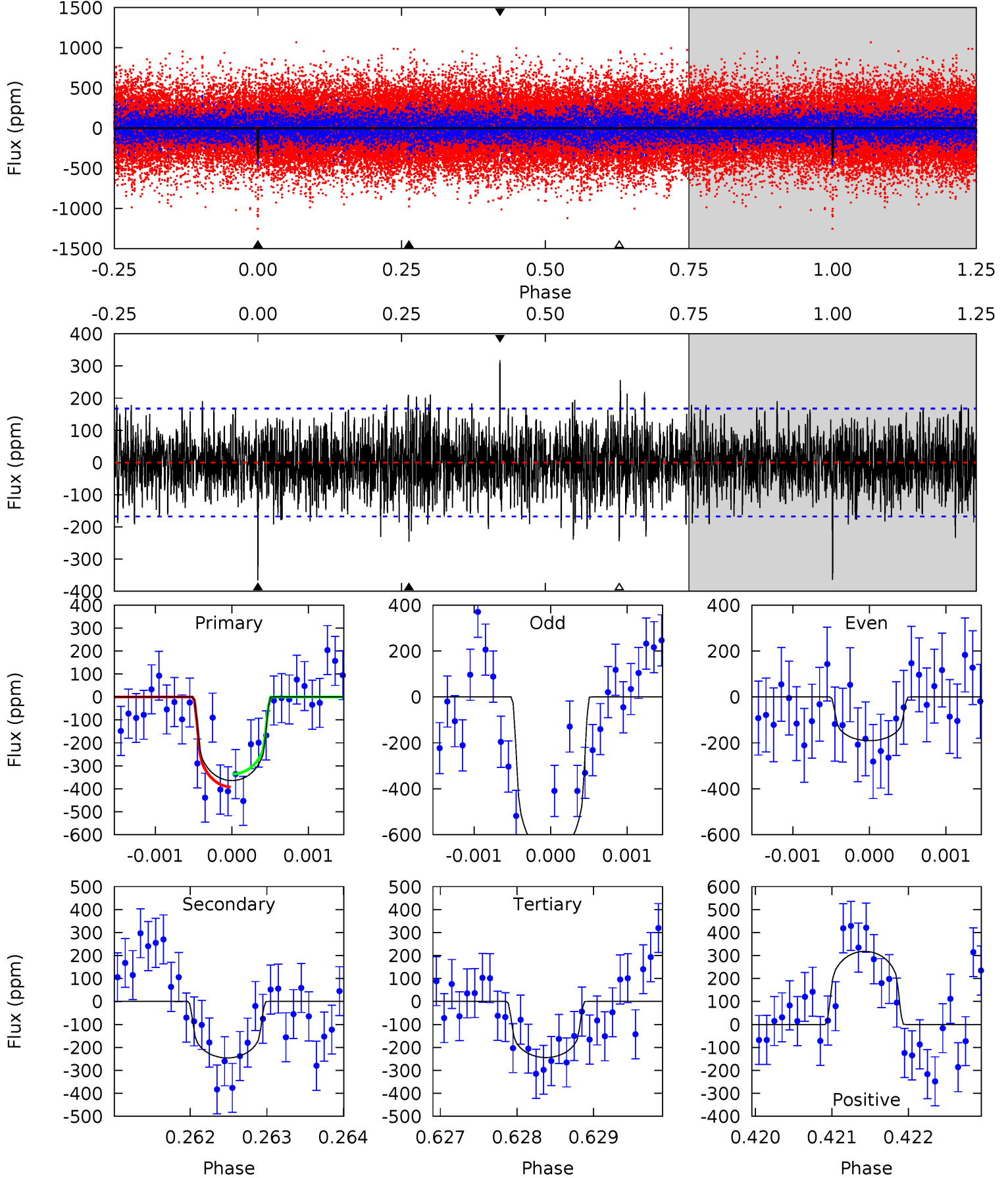
TCE 008545504-01 P=262.687036 Days $T_0=392.296594$ (BKJD)



DV Model-Shift Uniqueness Test

008545504-01, P = 262.707715 Days, E = 129.541579 Days

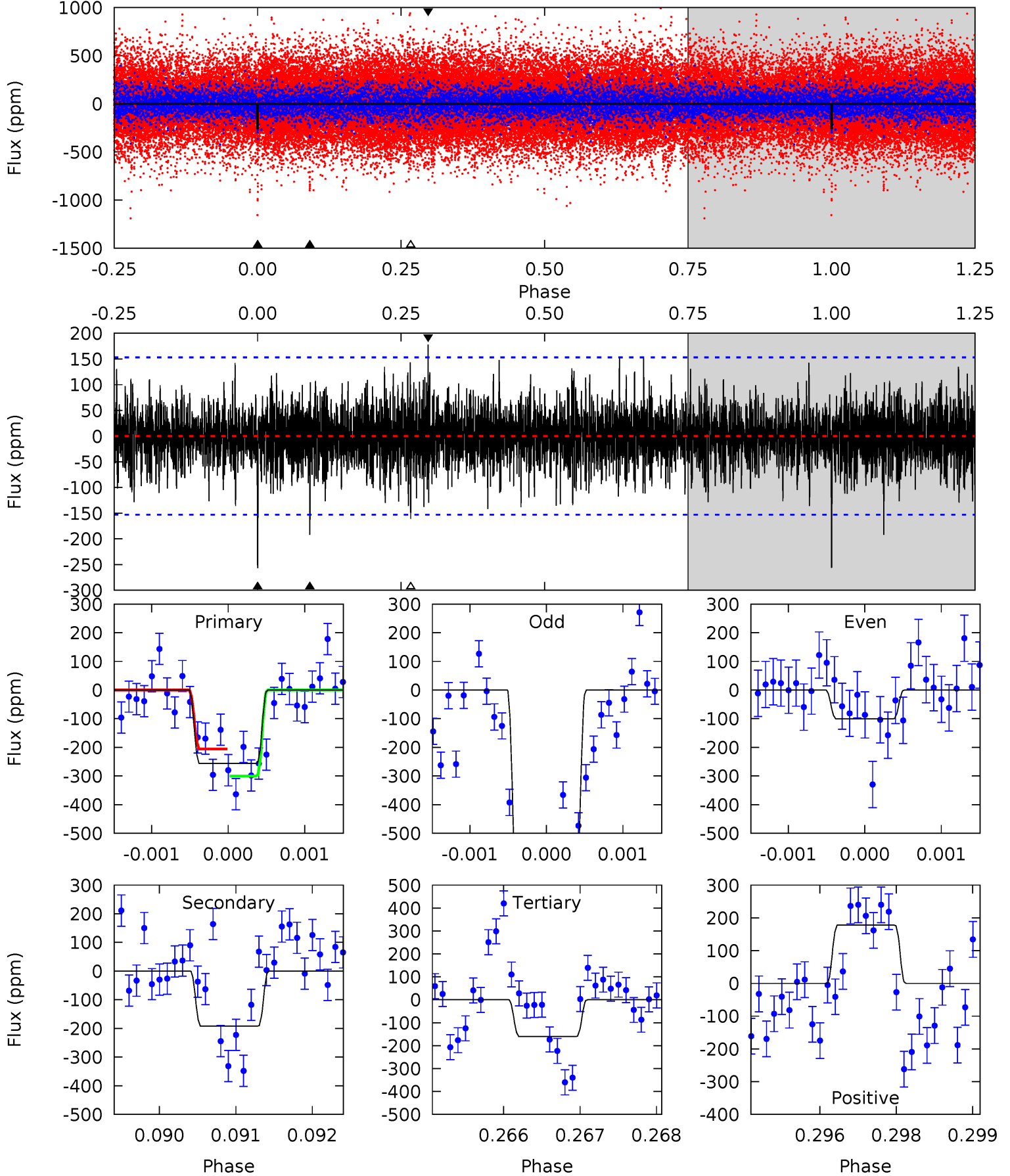
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.8 | 7.96 | 7.91 | 10.3 | 5.44 | 3.27 | 2.28 | 3.90 | 1.50 | 0.05 | -2.34 | 8.06 | 1.62 | 0.47 | 0.91 |



Alt Model-Shift Uniqueness Test

008545504-01, P = 262.687036 Days, E = 129.609558 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.09 | 6.82 | 5.70 | 6.31 | 5.42 | 3.25 | 1.55 | 3.39 | 2.77 | 1.12 | 0.51 | 11.8 | 1.33 | 0.41 | 1.67 |



Stellar Parameters For KIC 008545504

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5039^{+40}_{-140} | $2.942^{+0.030}_{-0.030}$ | $-0.100^{+0.100}_{-0.200}$ | $8.031^{+0.299}_{-1.694}$ | $2.057^{+0.040}_{-0.754}$ | $0.006^{+0.002}_{-0.000}$ |
| | +1%/-3% | +1%/-1% | +100%/-200% | +4%/-21% | +2%/-37% | +32%/-9% |
| Source | PHO55 | AST55 | SPE55 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 008545504-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|-------------------------|----------------------|-----------------------|----------------------|
| DV | -246 ± 31 | $15.18^{+6.18}_{-6.64}$ | 869^{+14}_{-27} | 4762^{+1413}_{-600} | 589^{+1265}_{-297} |
| Alt. | -192 ± 28 | $20.17^{+7.19}_{-6.72}$ | 869^{+15}_{-25} | 4071^{+702}_{-393} | 258^{+327}_{-113} |

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

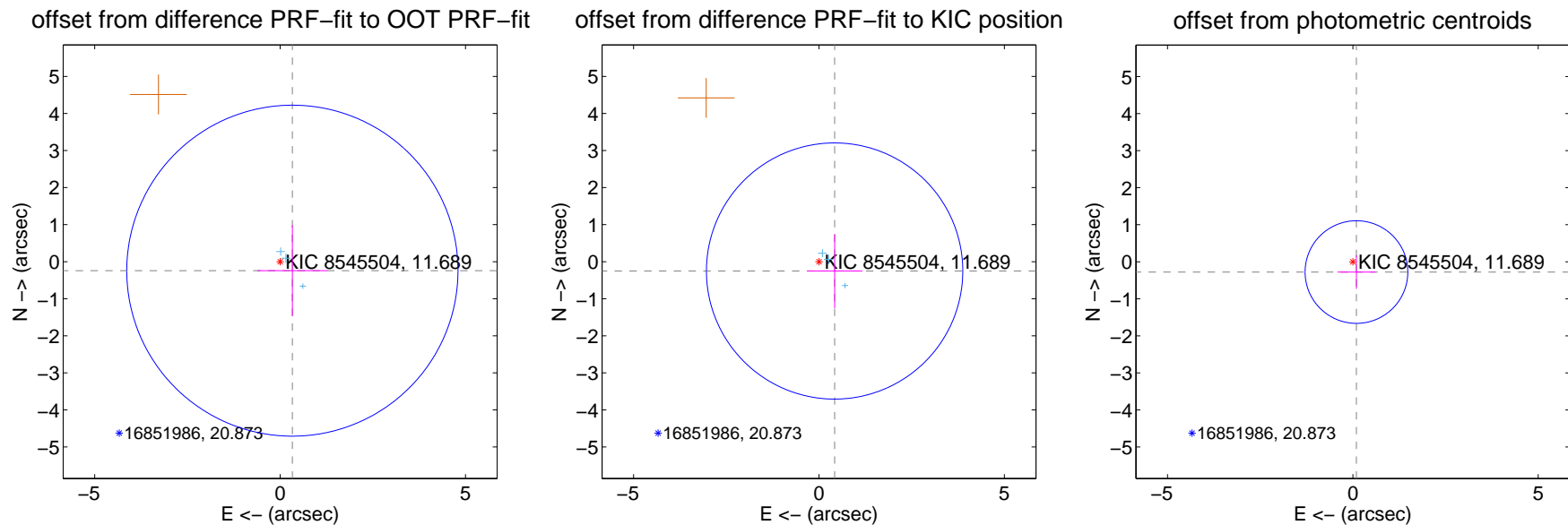
DV Centroid Data

Supplemental centroid analysis for 008545504-01. **Kepler magnitude: 11.69.** Transit SNR 5.23

There are 3 quarters with good PRF difference image offsets

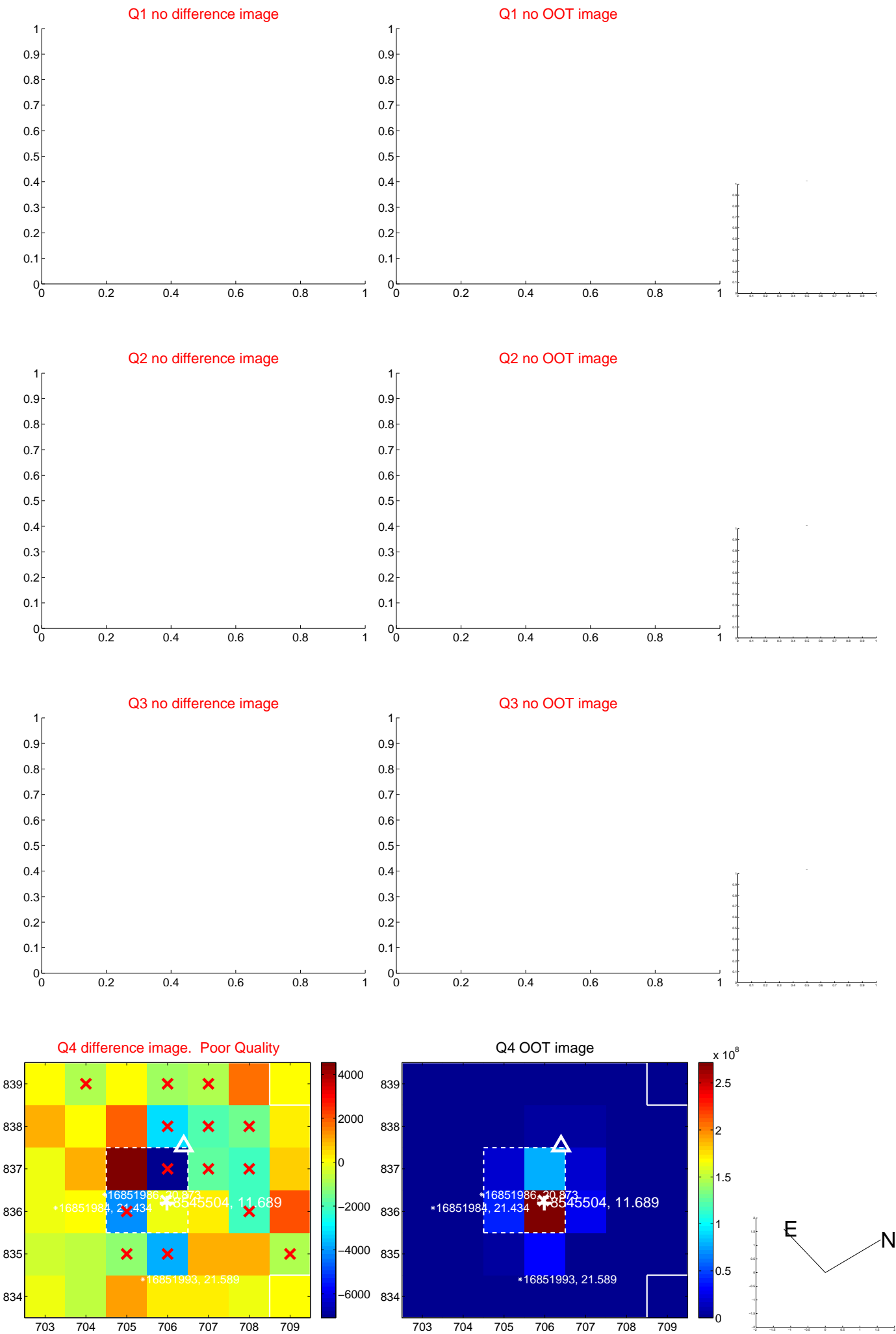
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.410 ± 1.489 | 0.28 | -0.331 ± 0.948 | -0.242 ± 1.228 |
| PRF-fit source offset from KIC position | 0.491 ± 1.152 | 0.43 | -0.422 ± 0.747 | -0.252 ± 1.000 |
| photometric centroid source offset | 0.29 ± 0.46 | 0.64 | -0.10 ± 0.51 | -0.28 ± 0.46 |

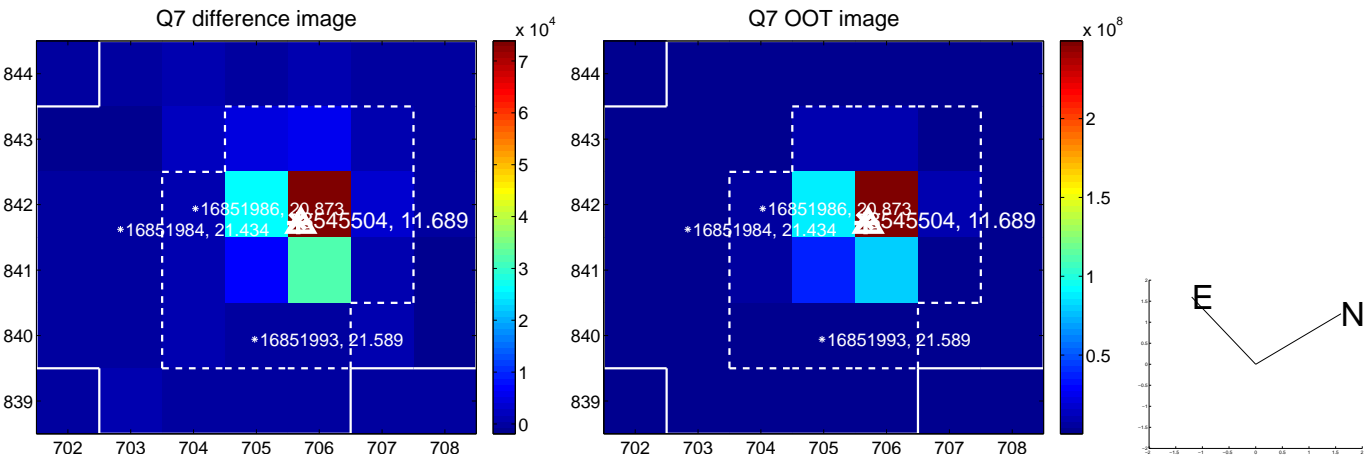


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

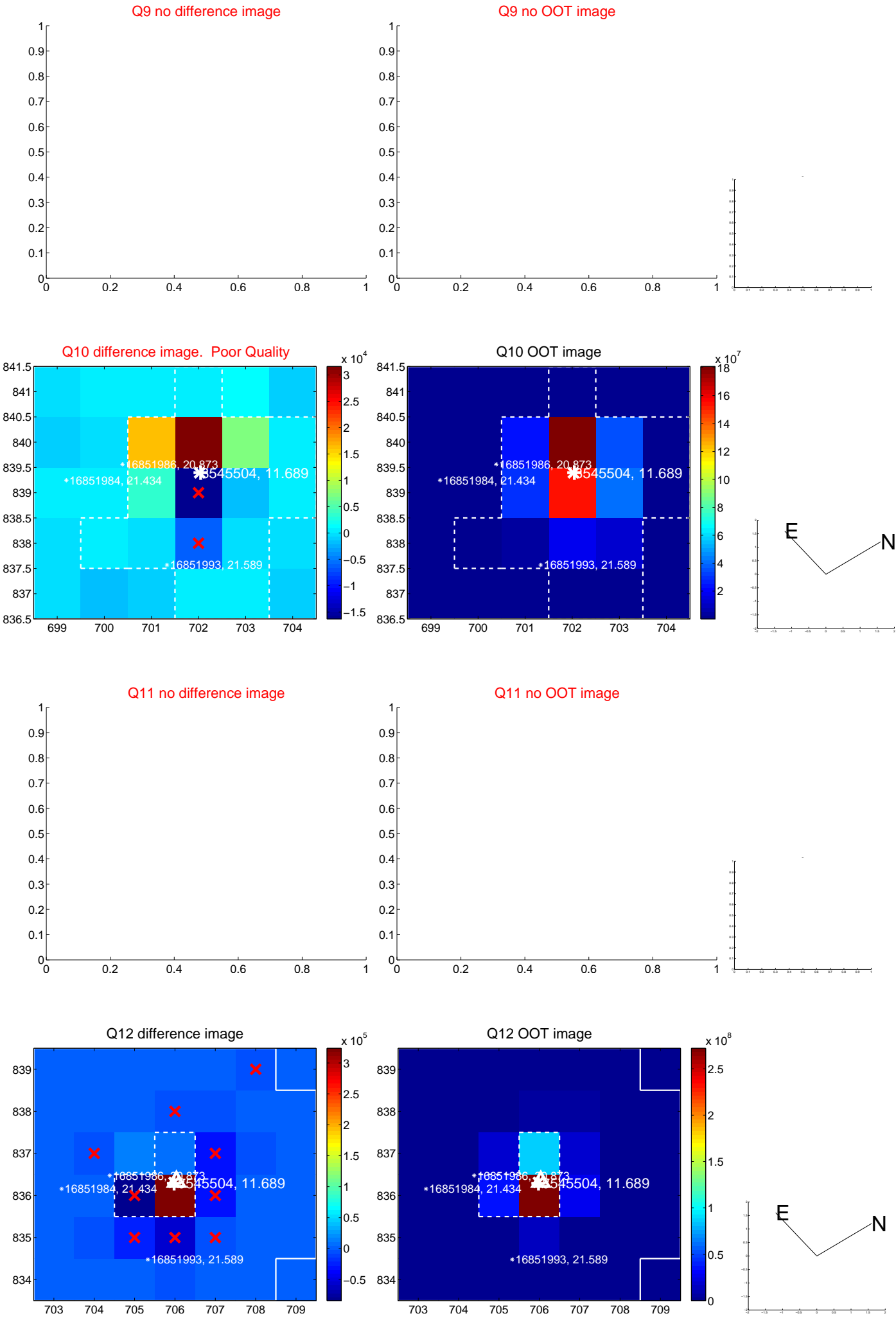
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



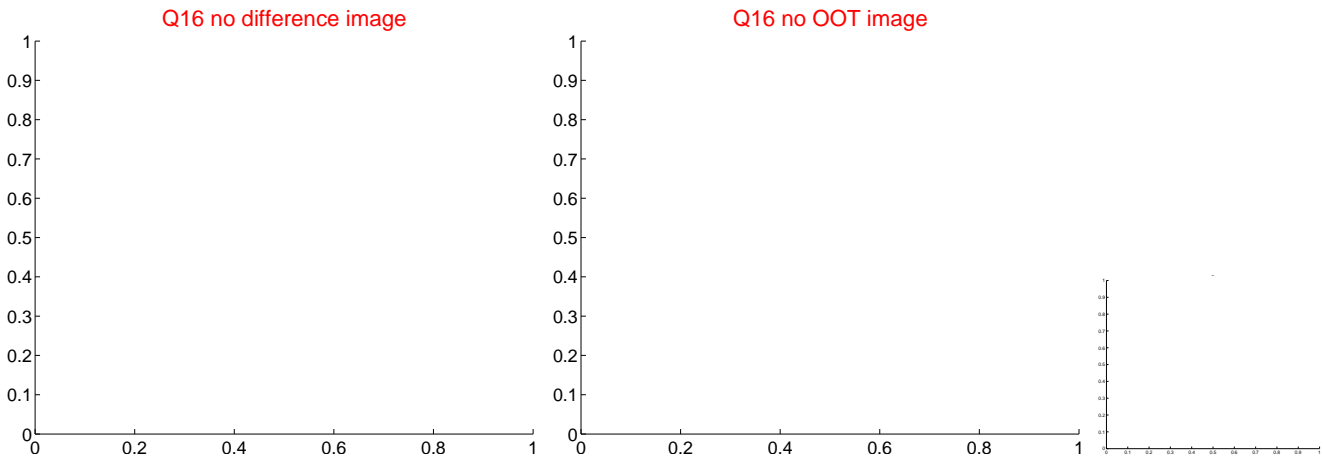
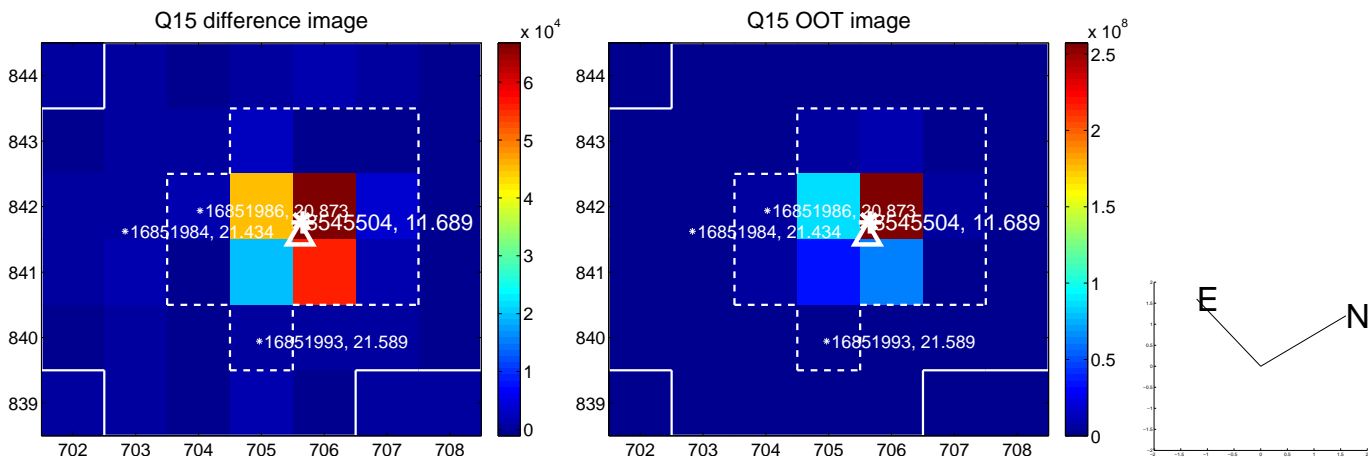
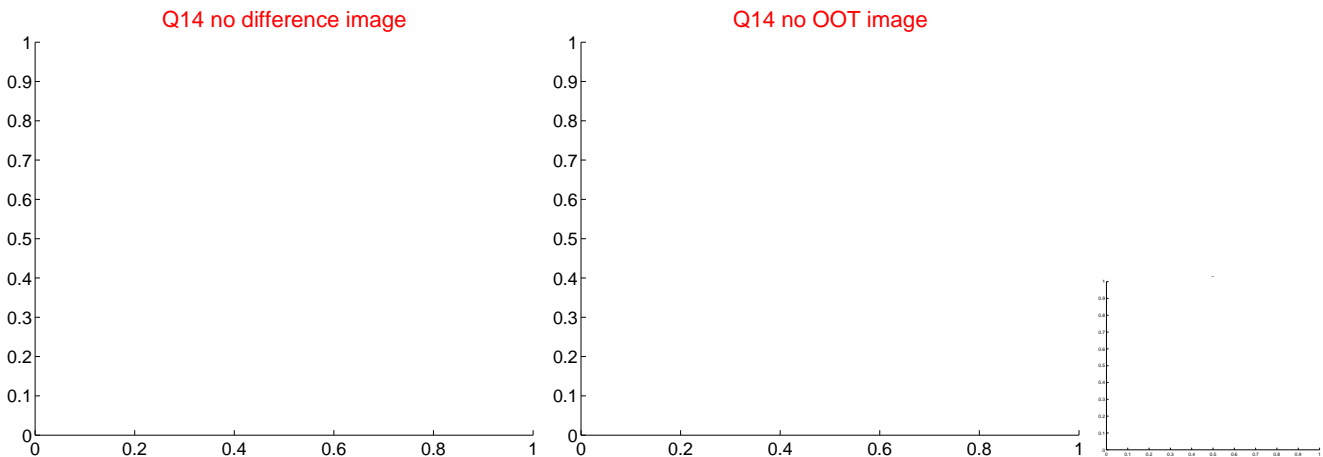
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



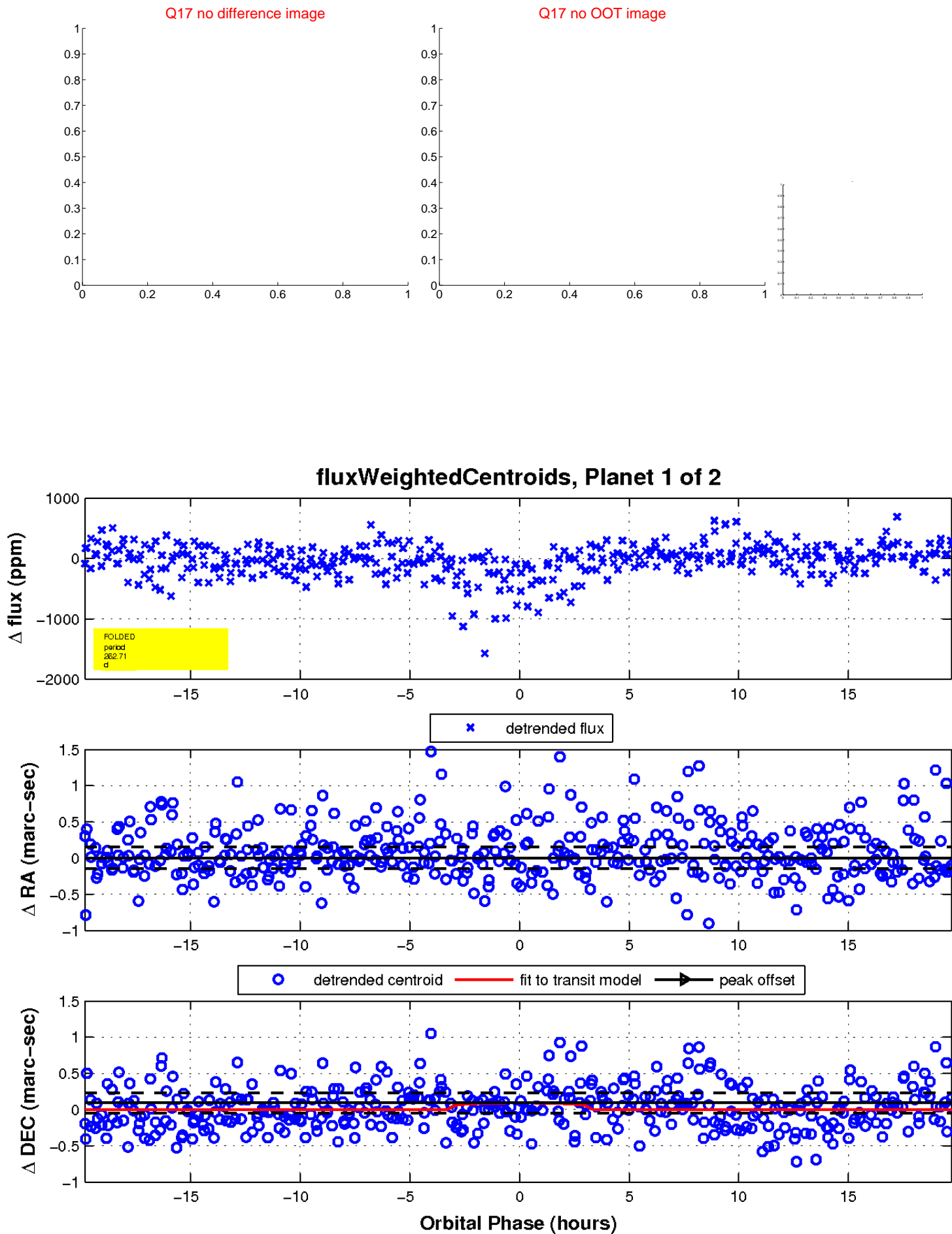
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

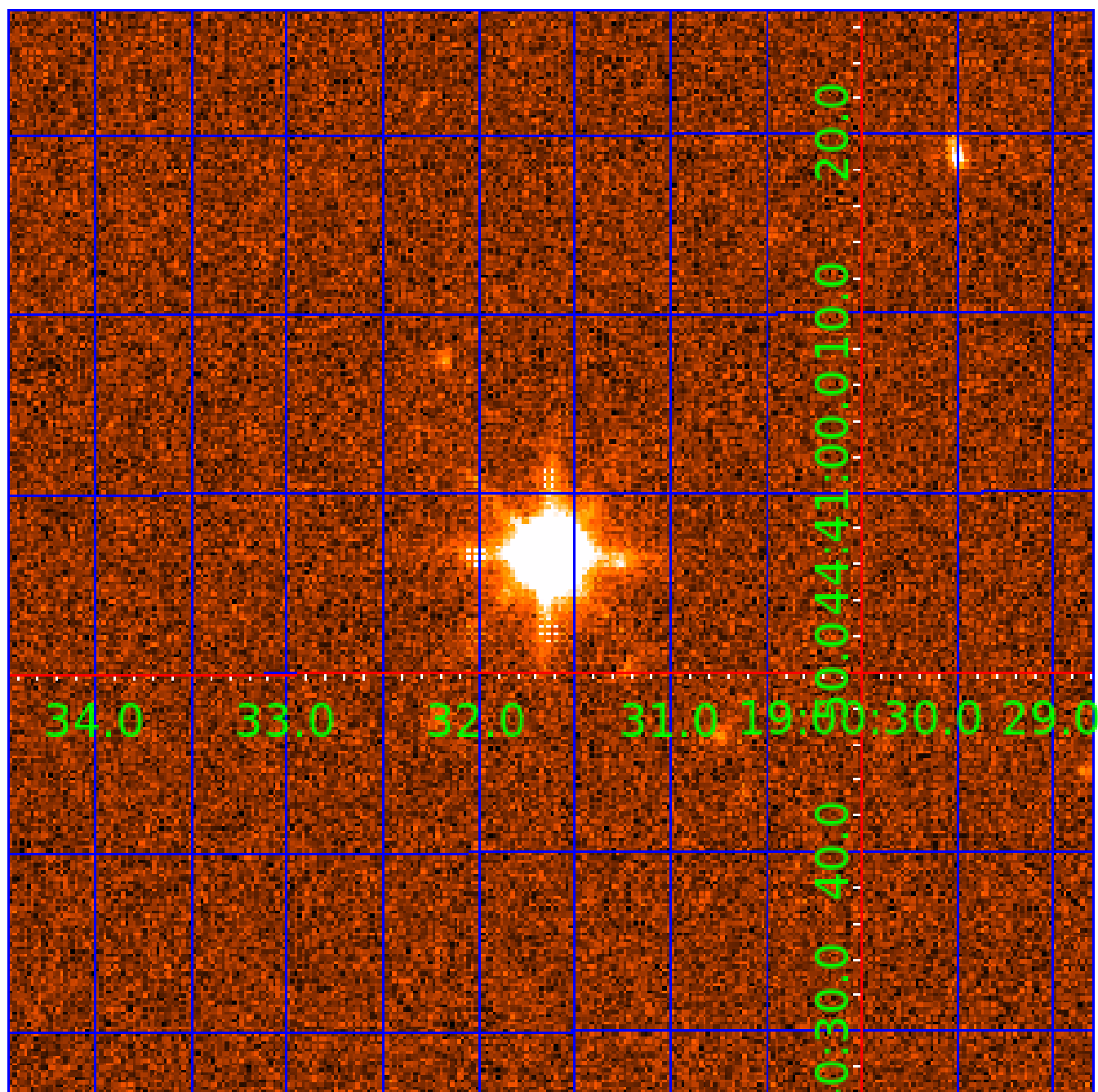


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008545504

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008545504-01 | OBS | No | 262.707715 | 392.249294 | 283.8 | 6.612 | 10.3 | 5.2 | 8.03 | 5039 | 15.16 | 35.71 |
| 008545504-02 | OBS | No | 351.489323 | 476.205533 | 485.1 | 12.171 | 8.8 | 8.5 | 8.03 | 5039 | 20.23 | 24.22 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 008545504-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 008545504-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—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.

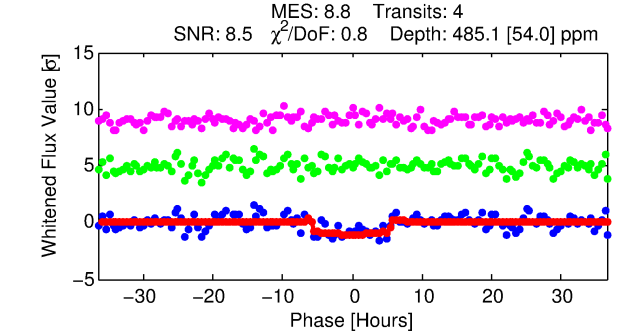
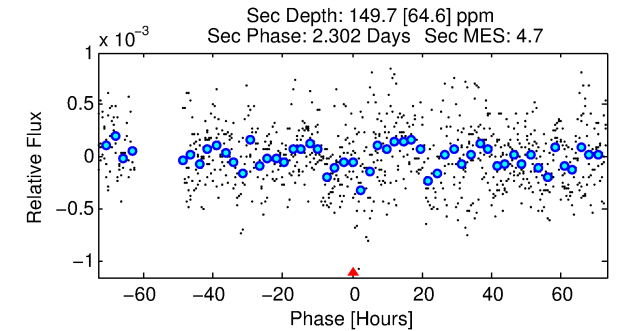
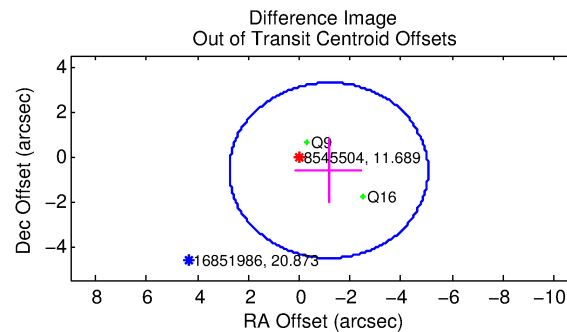
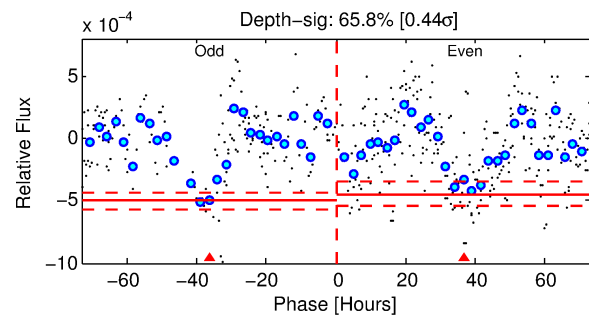
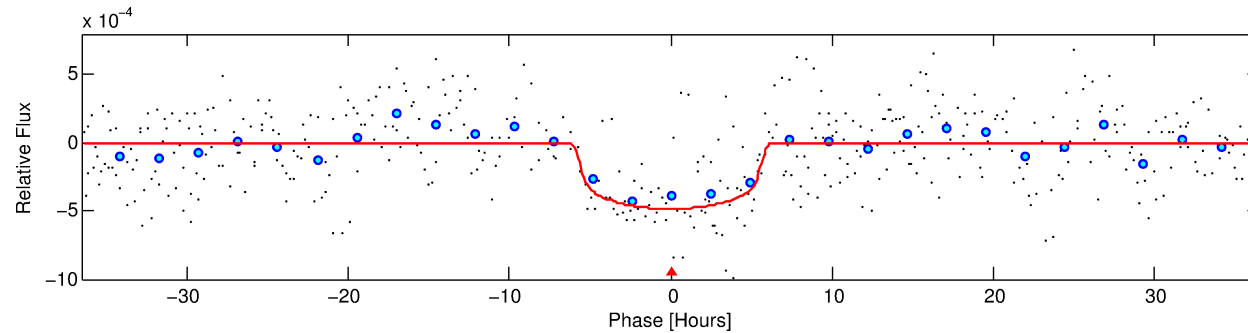
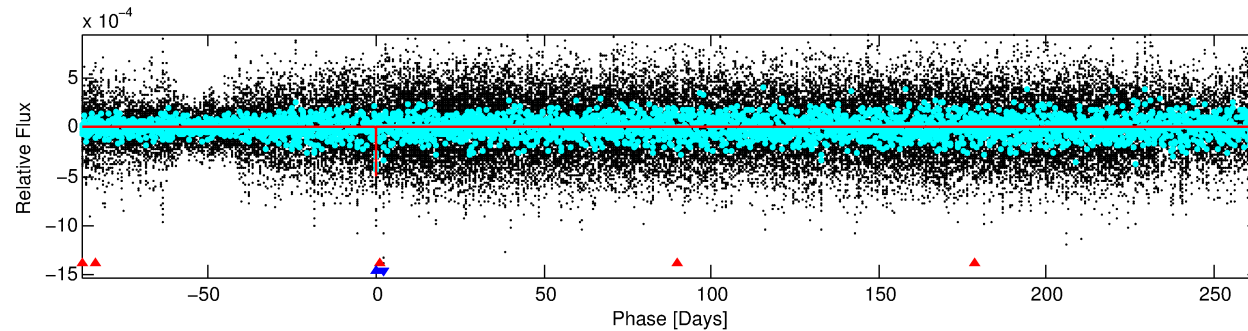
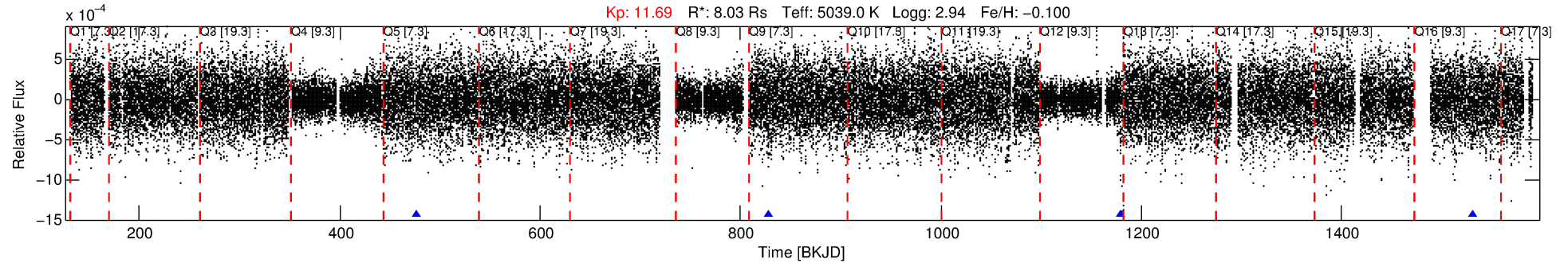
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008545504-02

No Significant Match Found

DV One-Page Summary

KIC: 8545504 Candidate: 2 of 2 Period: 351.489 d



DV Fit Results:

Period = 351.48932 [0.00770] d
Epoch = 476.2055 [0.0157] BKJD
Rp/R* = 0.0231 [0.0028]
a/R* = 130.01 [53.44]
b = 0.84 [0.15]
Seff = 24.22 [4.48]
Teq = 566 [26] K
Rp = 20.23 [4.92] Re
a = 1.2402 [0.1767] AU
Ag = 309.33 [159.71] [1.93 σ]
Teffp = 3668 [465] K [6.66 σ]

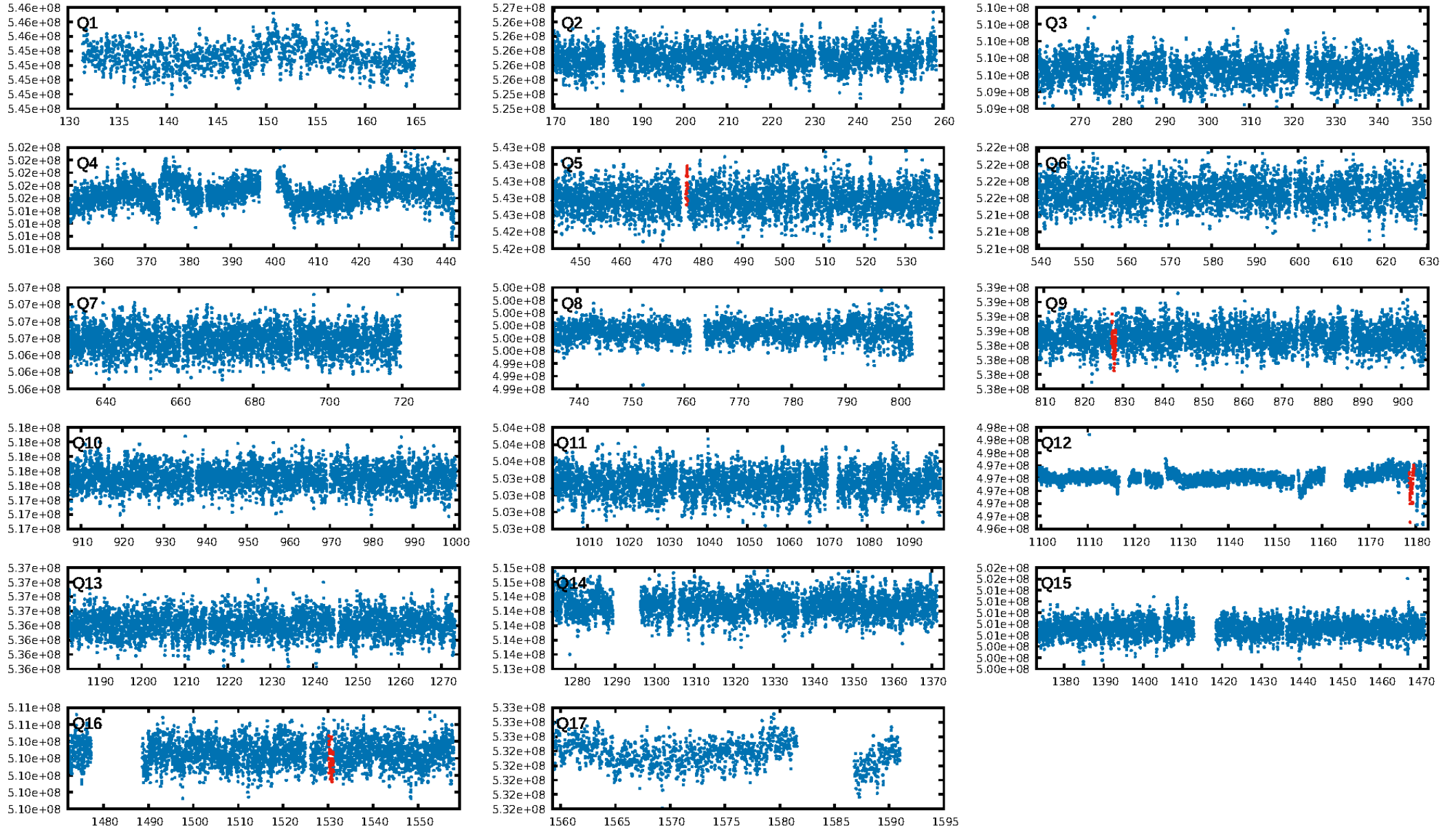
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [153.83 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 50.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.45e-18
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -5.644
Centroid-sig: 59.2%
Centroid-so: 0.154 arcsec [0.48 σ]
OotOffset-rm: 1.316 arcsec [1.01 σ]
KicOffset-rm: 1.392 arcsec [1.03 σ]
OotOffset-st: 0/0/1/1 [2]
KicOffset-st: 0/0/1/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

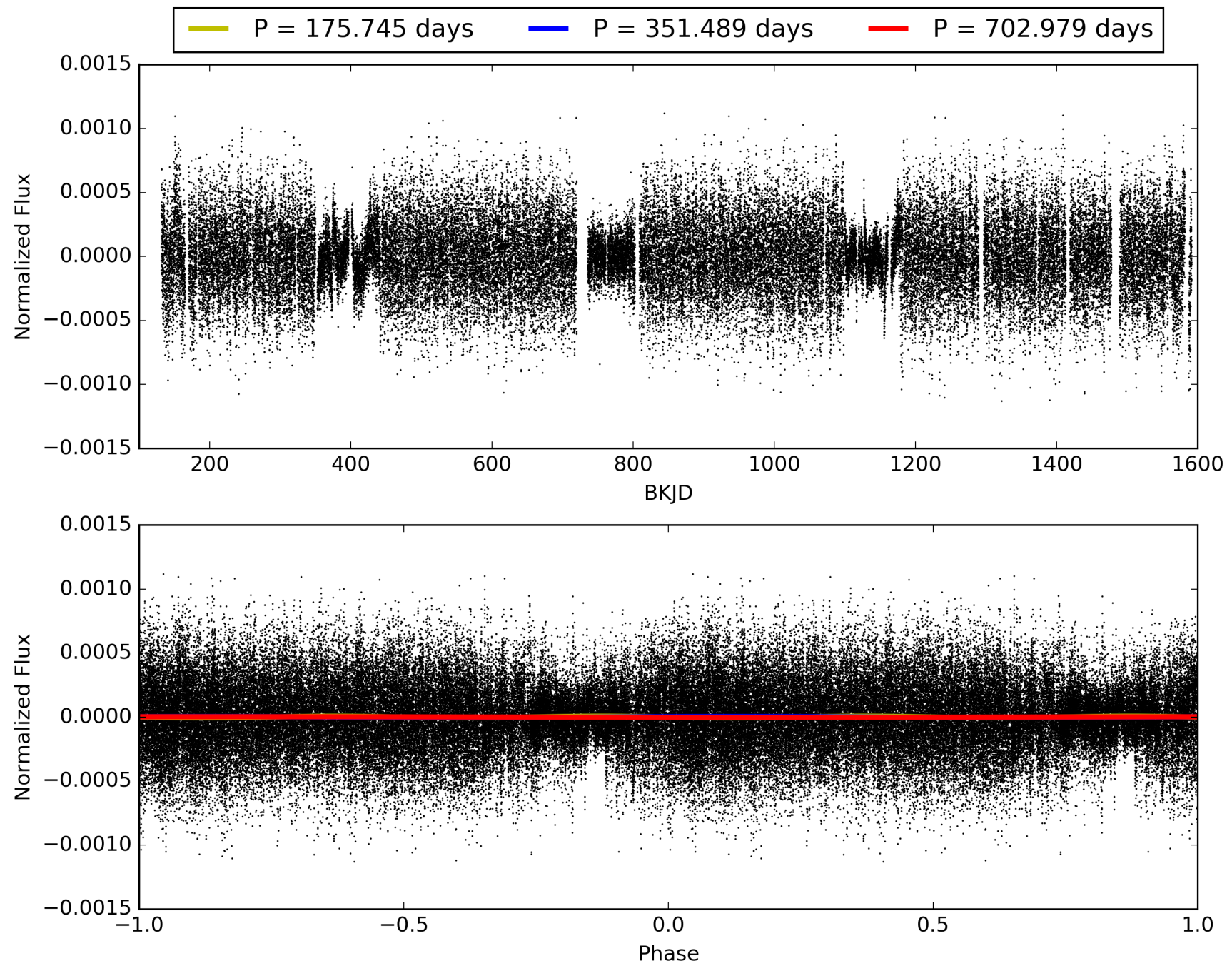
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:07:45 Z

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

TCE 008545504-02, PDC Light Curves

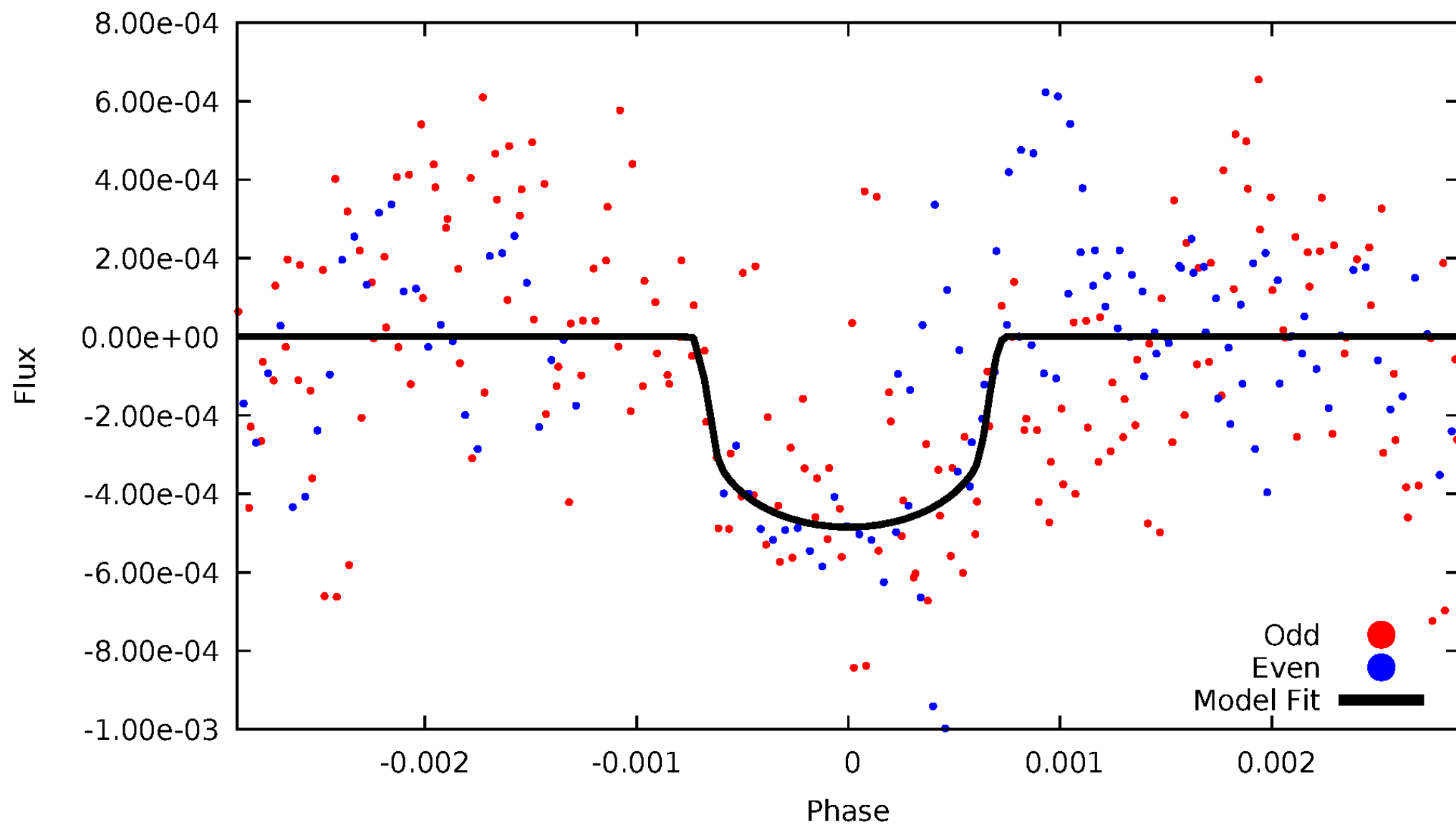


TCE 008545504-02



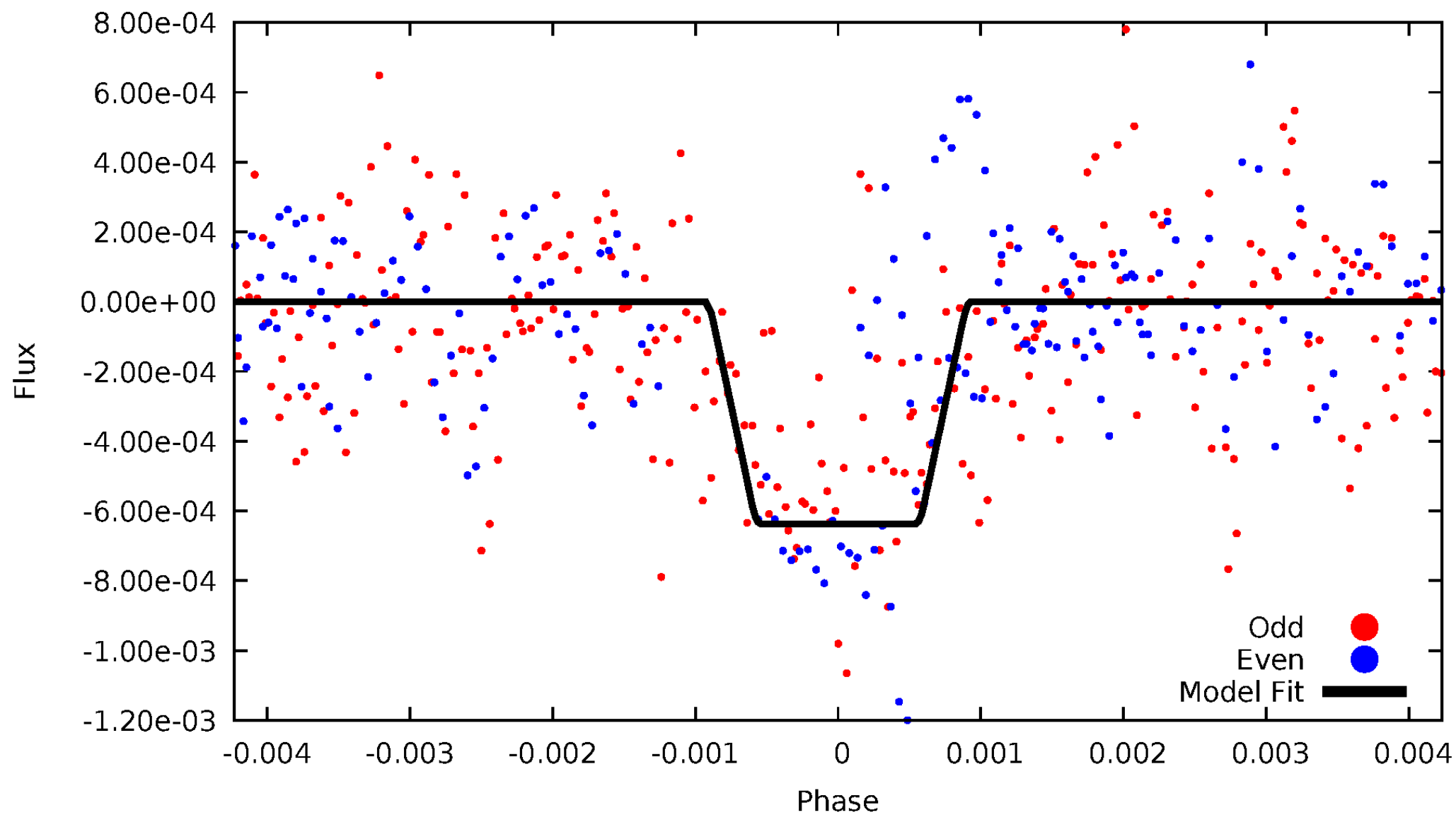
DV Odd/Even

TCE 008545504-02



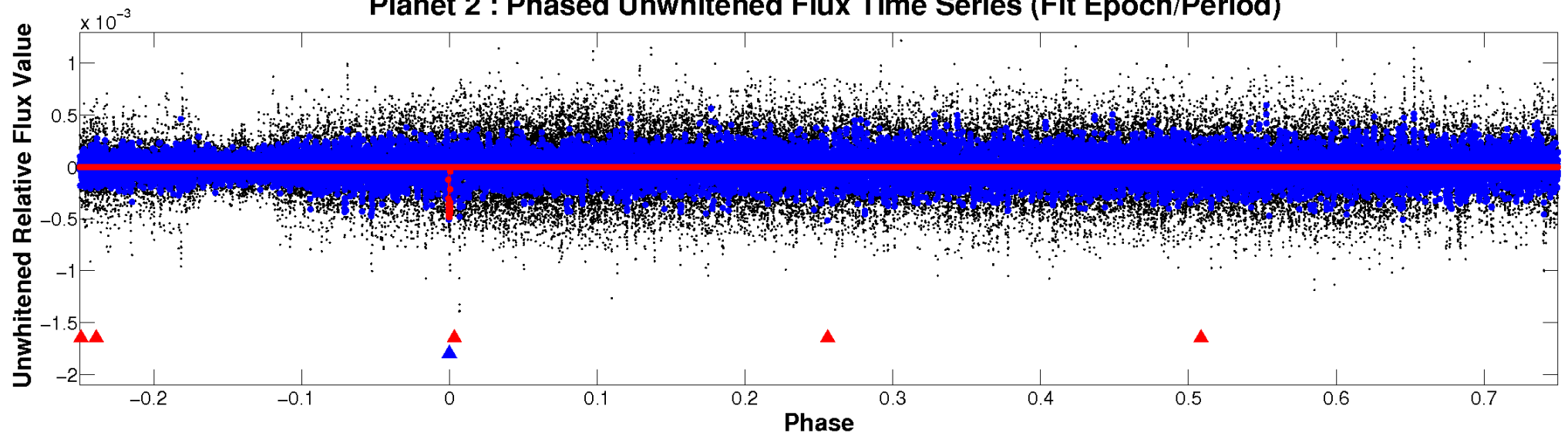
ALT Odd/Even

TCE 008545504-02

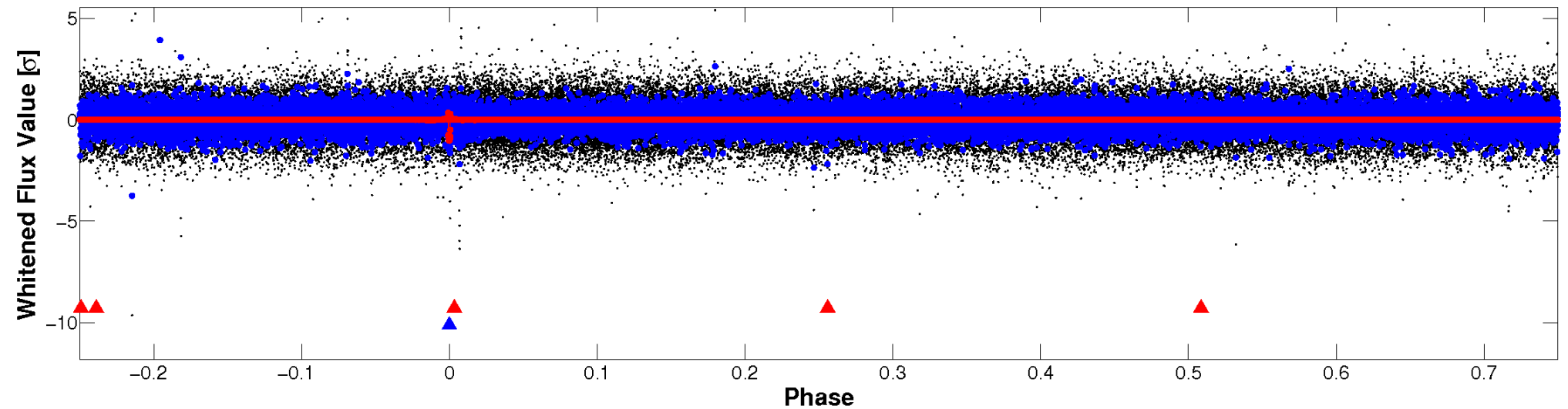


Non-Whitened Vs. Whitened Light Curve

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



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



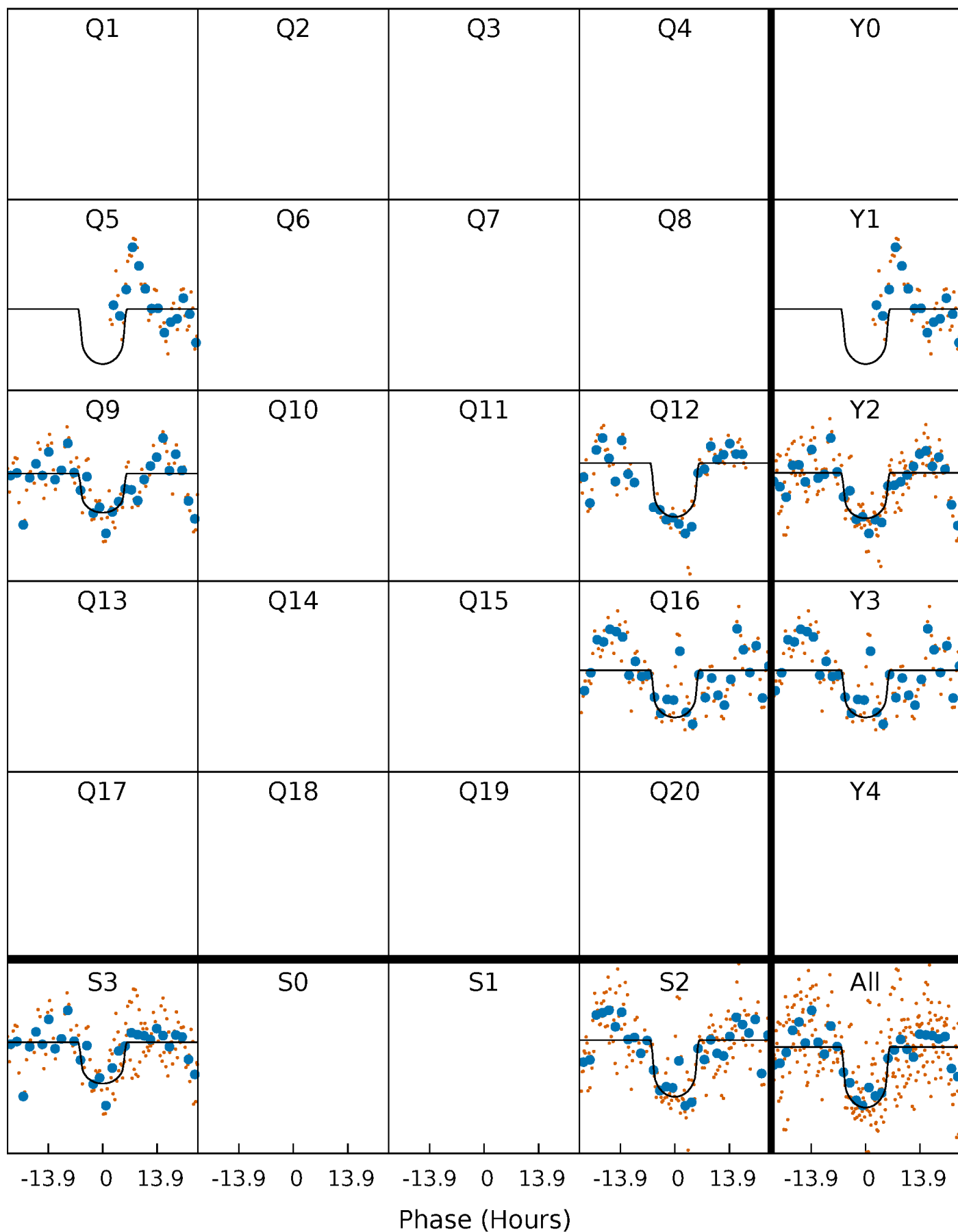
PDC Quarter-Phased Transit Curves

TCE 008545504-02 $P=351.489323$ Days $T_0=476.205533$ (BKJD)



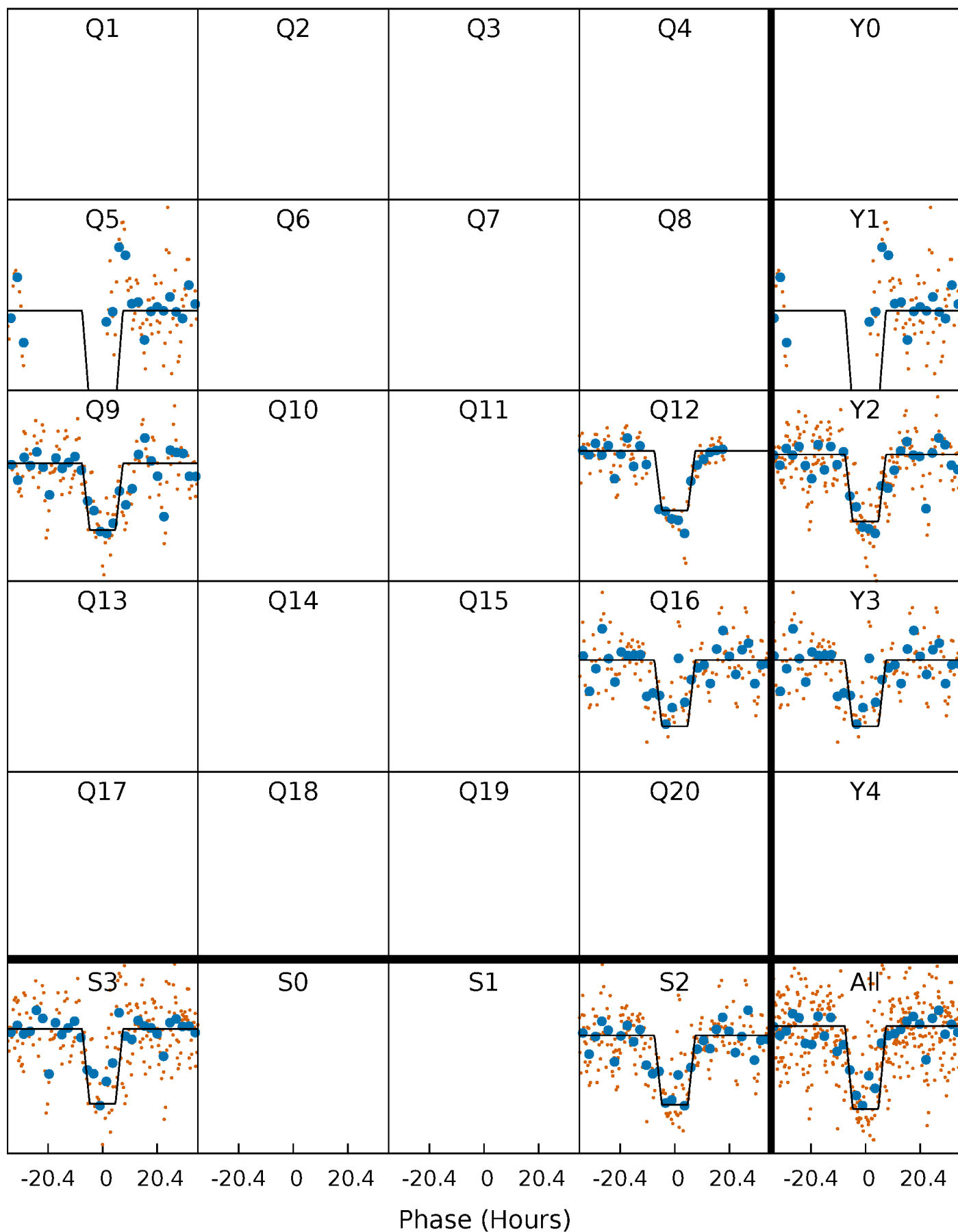
DV Quarter-Phased Transit Curves

TCE 008545504-02 P=351.489323 Days $T_0=476.205533$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

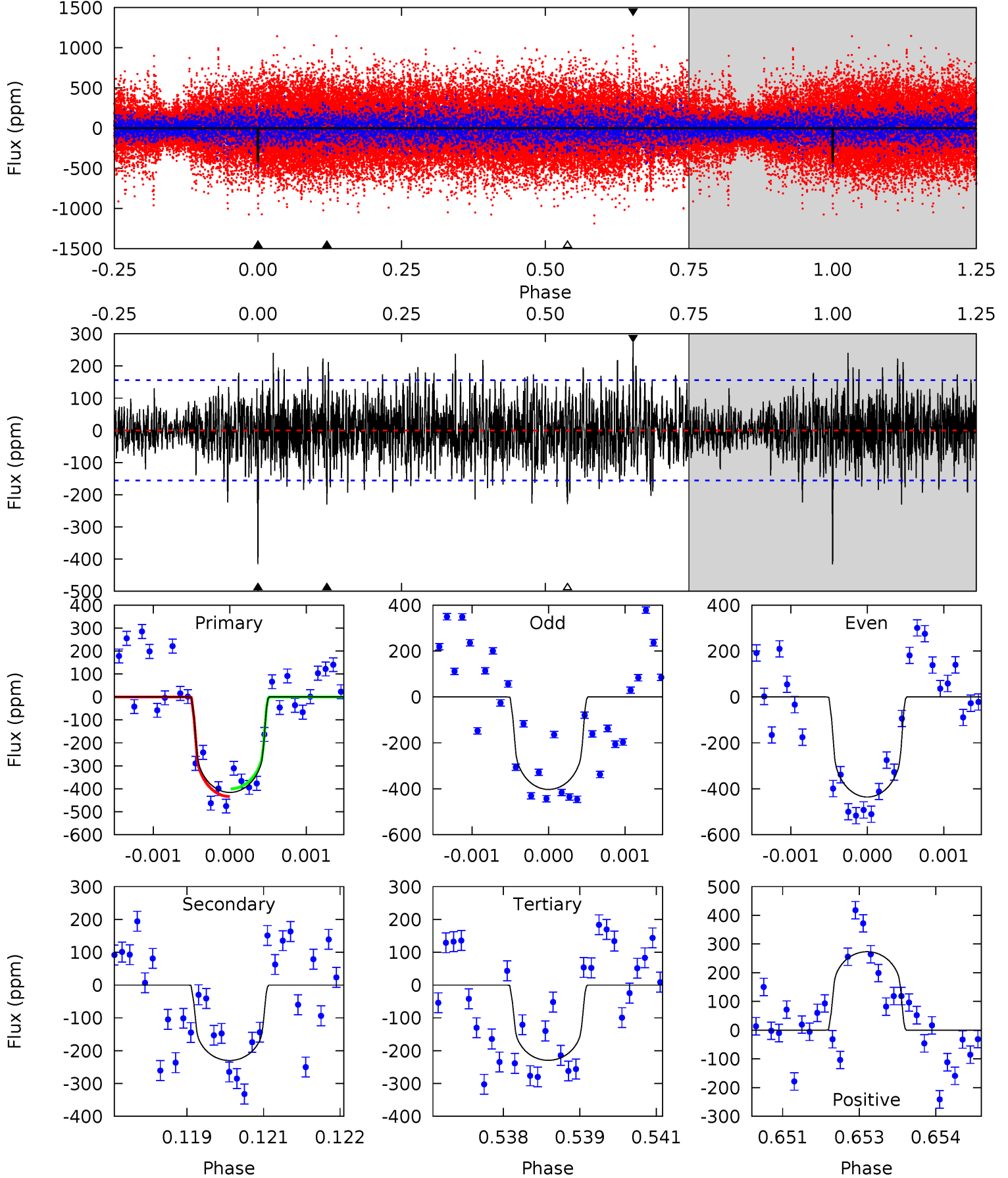
TCE 008545504-02 $P=351.470854$ Days $T_0=476.232672$ (BKJD)



DV Model-Shift Uniqueness Test

008545504-02, P = 351.489323 Days, E = 124.716210 Days

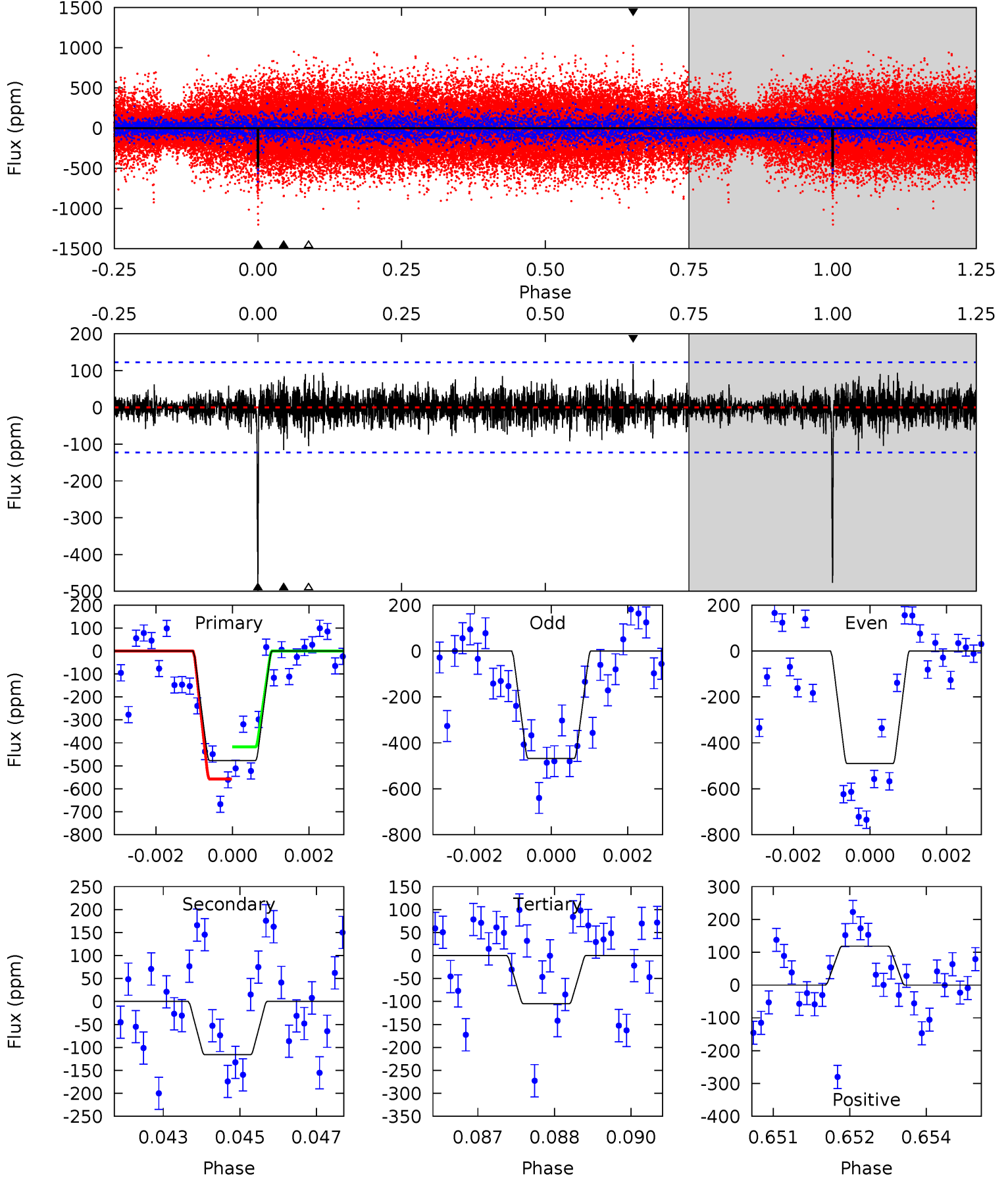
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.4 | 7.95 | 7.93 | 9.45 | 5.38 | 3.18 | 2.34 | 6.45 | 4.93 | 0.02 | -1.50 | 0.56 | 0.86 | 0.40 | 0.58 |



Alt Model-Shift Uniqueness Test

008545504-02, P = 351.470854 Days, E = 124.761818 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 20.8 | 5.05 | 4.57 | 5.17 | 5.35 | 3.12 | 1.14 | 16.2 | 15.6 | 0.48 | -0.11 | 0.47 | 0.86 | 0.20 | 3.05 |



Stellar Parameters For KIC 008545504

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5039^{+40}_{-140} | $2.942^{+0.030}_{-0.030}$ | $-0.100^{+0.100}_{-0.200}$ | $8.031^{+0.299}_{-1.694}$ | $2.057^{+0.040}_{-0.754}$ | $0.006^{+0.002}_{-0.000}$ |
| | +1%/-3% | +1%/-1% | +100%/-200% | +4%/-21% | +2%/-37% | +32%/-9% |
| Source | PHO55 | AST55 | SPE55 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 008545504-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|-------------------------|----------------------|----------------------|---------------------|
| DV | -230 ± 29 | $19.96^{+2.64}_{-2.78}$ | 791^{+13}_{-25} | 4254^{+233}_{-217} | 484^{+155}_{-119} |
| Alt. | -116 ± 23 | $22.24^{+2.76}_{-2.96}$ | 790^{+13}_{-23} | 3635^{+196}_{-193} | 195^{+70}_{-54} |

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

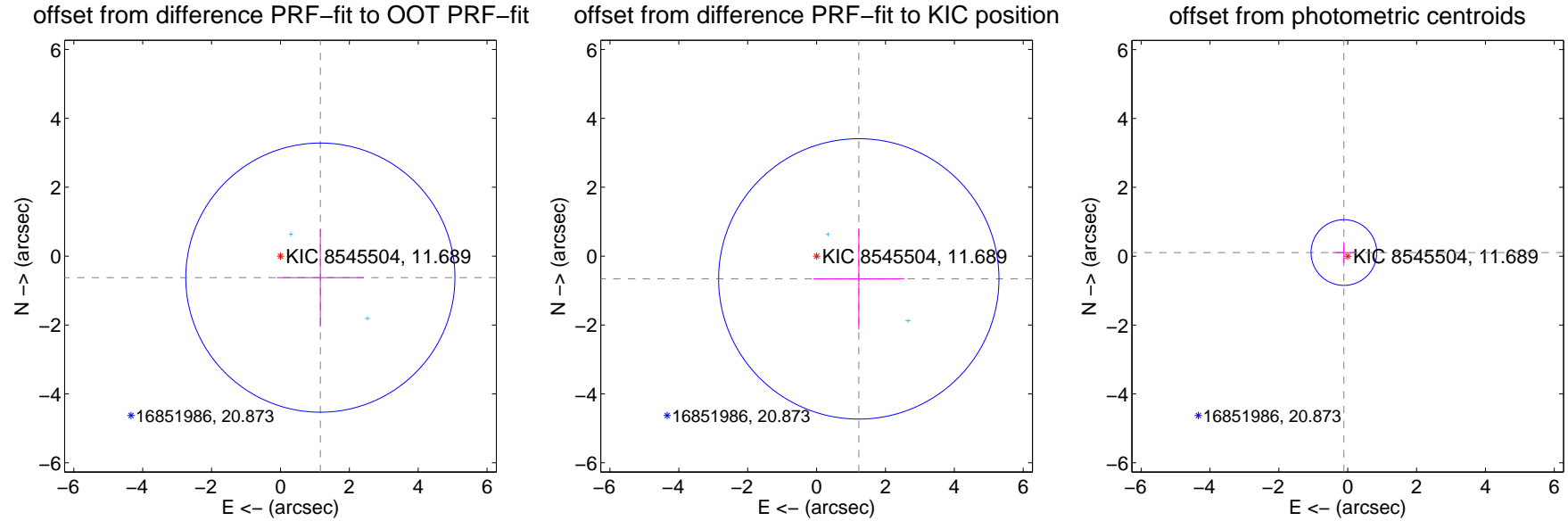
DV Centroid Data

Supplemental centroid analysis for 008545504-02. **Kepler magnitude: 11.69.** Transit SNR 8.49

There are 2 quarters with good PRF difference image offsets

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

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 1.316 ± 1.303 | 1.01 | -1.159 ± 1.264 | -0.624 ± 1.428 |
| PRF-fit source offset from KIC position | 1.392 ± 1.357 | 1.03 | -1.226 ± 1.323 | -0.661 ± 1.466 |
| photometric centroid source offset | 0.15 ± 0.32 | 0.48 | 0.11 ± 0.33 | 0.11 ± 0.30 |



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.

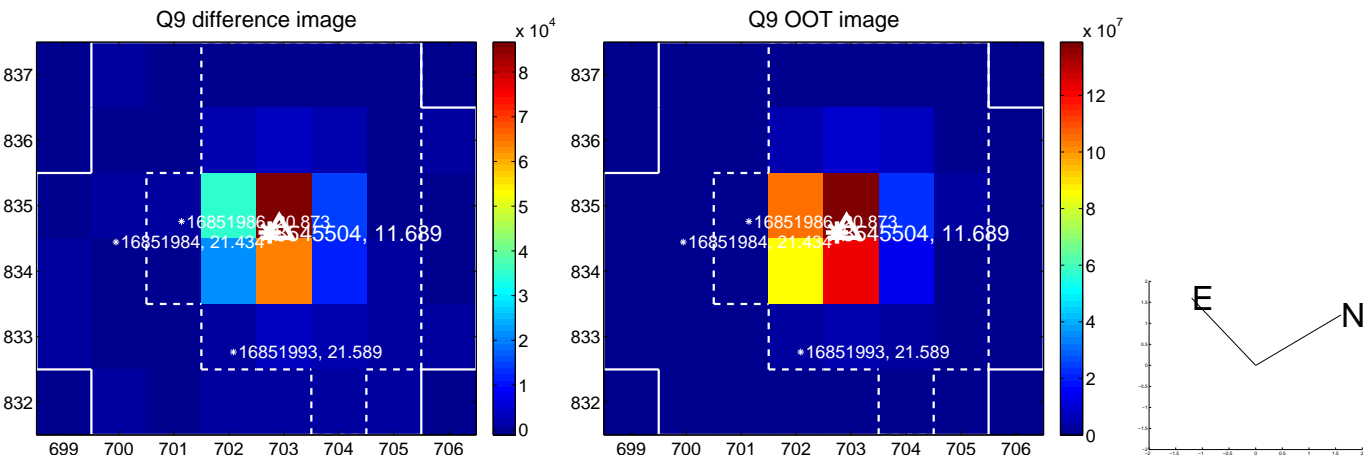
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



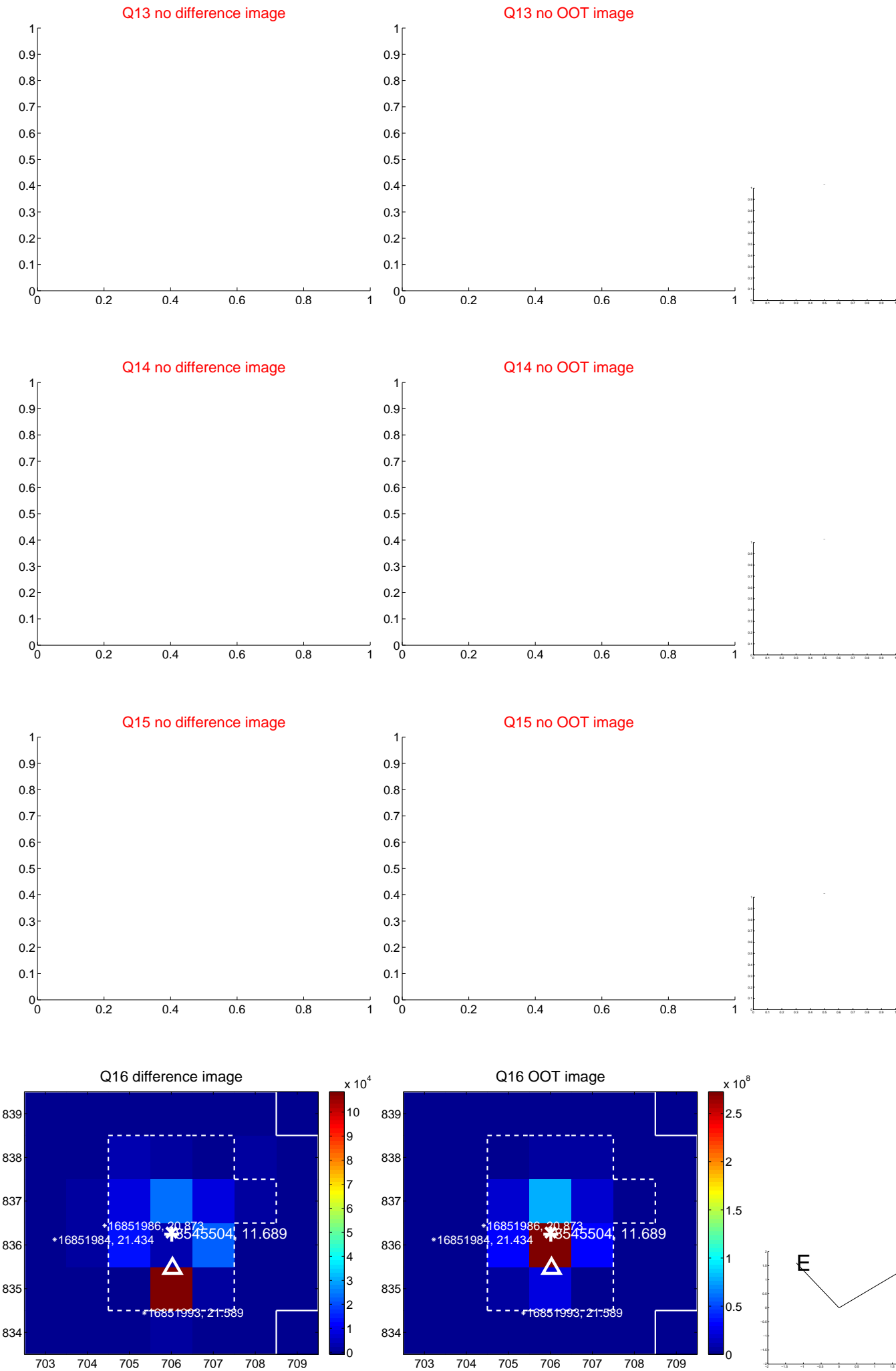
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



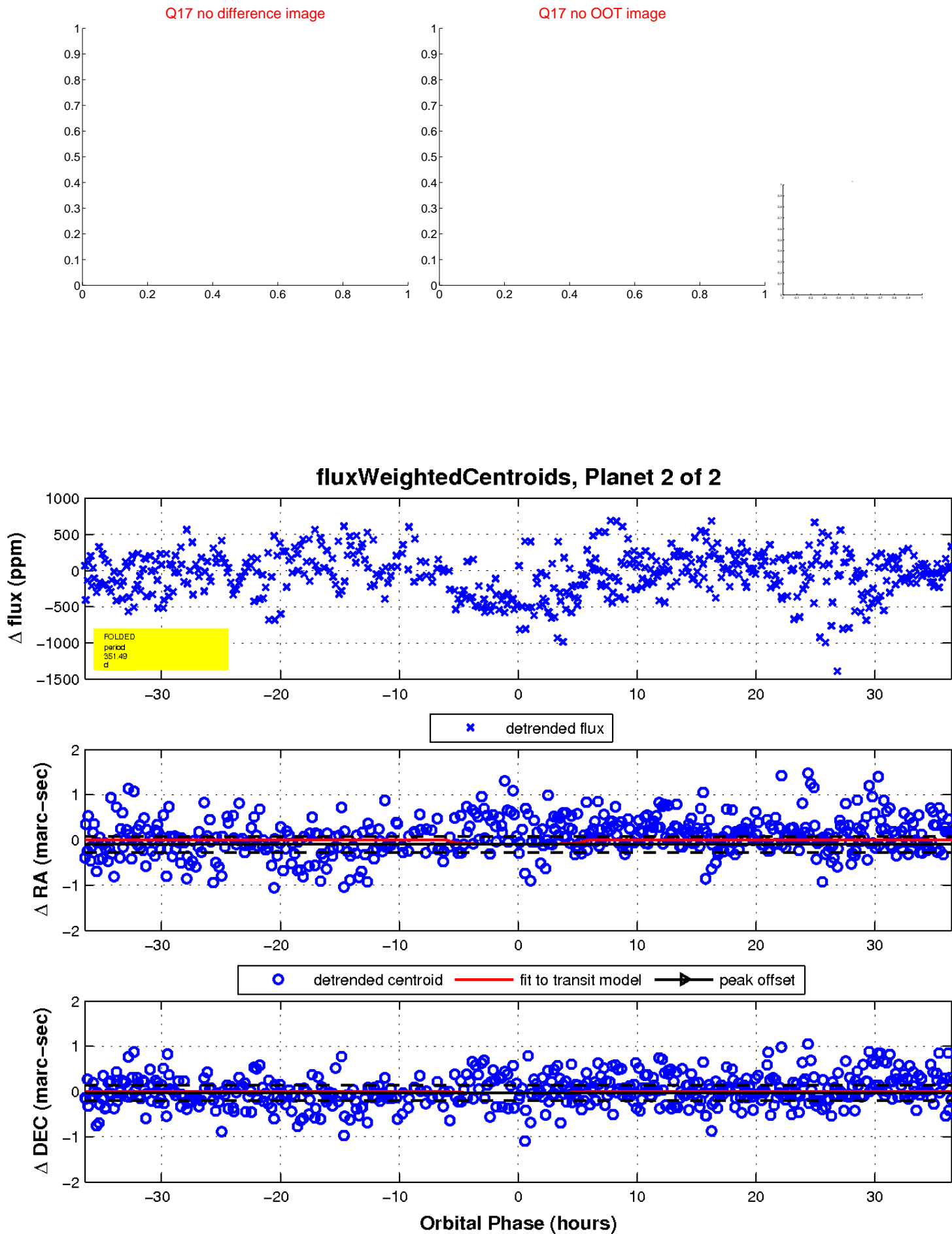
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

