

KIC 005784345

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005784345-01 | OBS | No | 462.205989 | 522.051510 | 503.2 | 11.143 | 7.2 | 6.8 | 0.88 | 5537 | 2.07 | 0.48 |
| 005784345-02 | OBS | No | 474.094654 | 510.821875 | 541.9 | 23.890 | 7.7 | 7.0 | 0.88 | 5537 | 2.54 | 0.46 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 005784345-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 005784345-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—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.

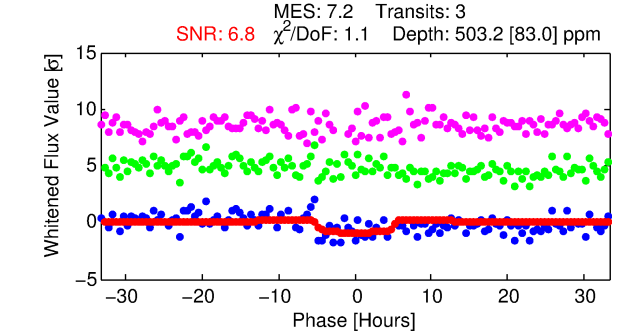
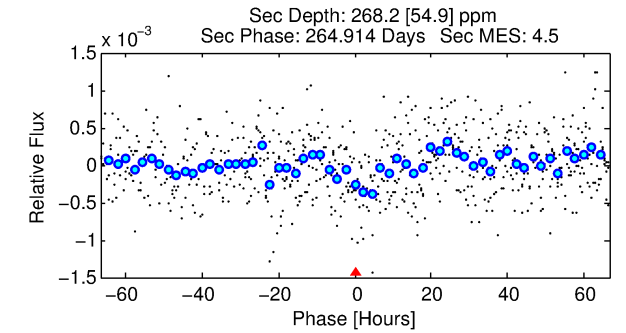
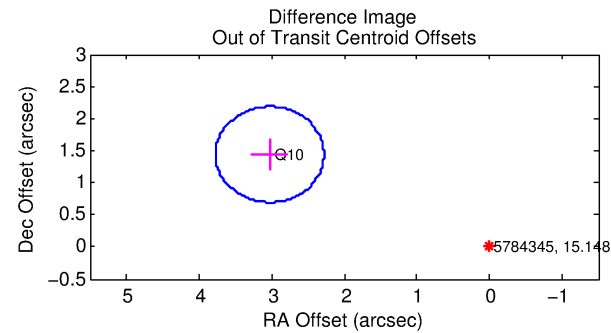
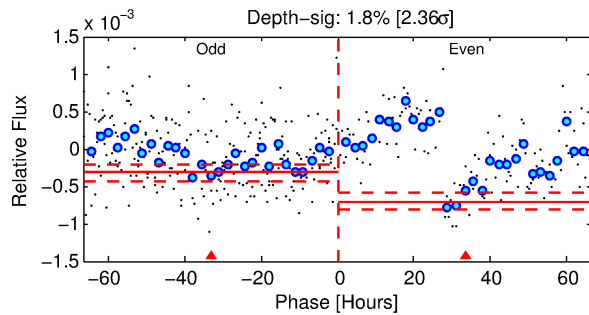
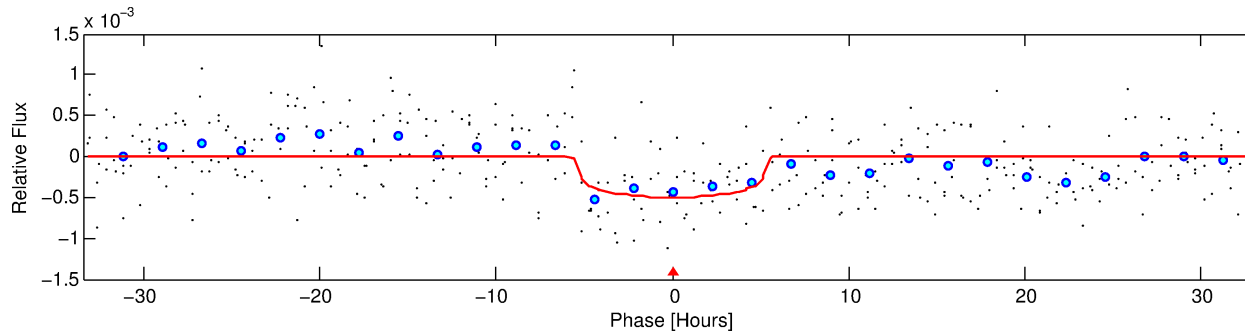
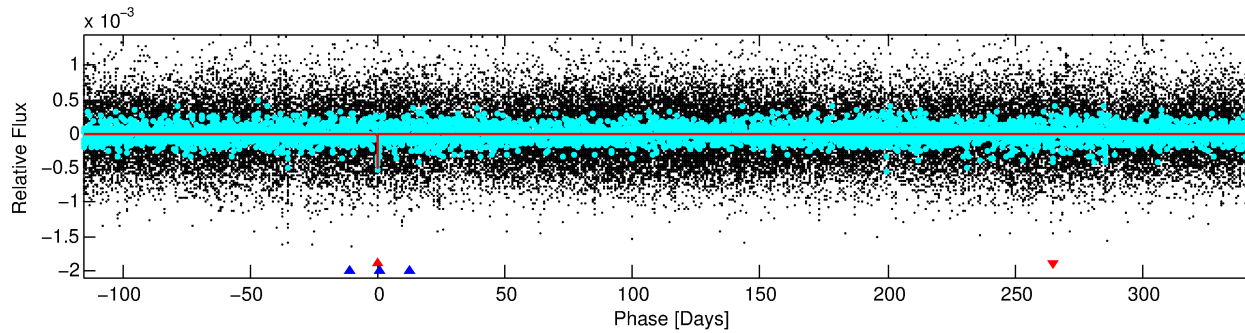
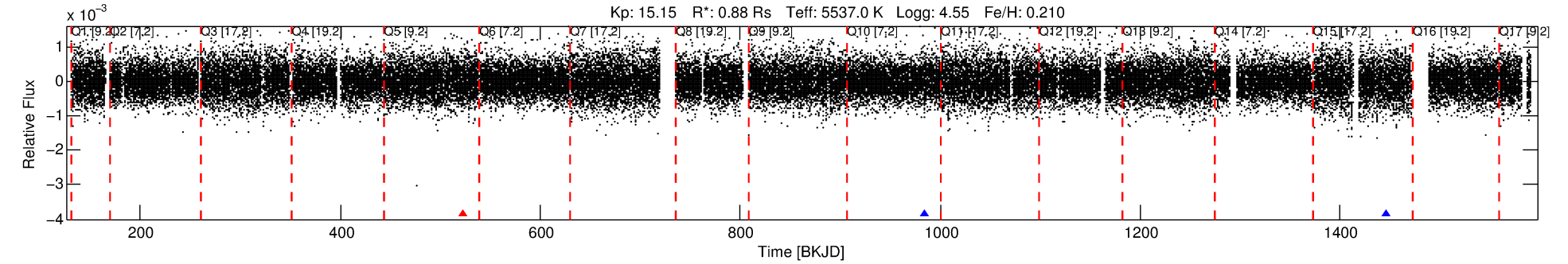
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005784345-01

No Significant Match Found

DV One-Page Summary

KIC: 5784345 Candidate: 1 of 2 Period: 462.206 d



DV Fit Results:

Period = 462.20599 [0.01776] d
Epoch = 522.0515 [0.0215] BKJD
Rp/R* = 0.0216 [0.0142]
a/R* = 250.78 [651.76]
b = 0.65 [2.36]
Seff = 0.48 [0.08]
Teq = 212 [9] K
Rp = 2.07 [1.38] Re
a = 1.1702 [0.1142] AU
Ag = 47113.61 [63376.23] [0.74 σ]
Teffp = 4825 [1614] K [2.86 σ]

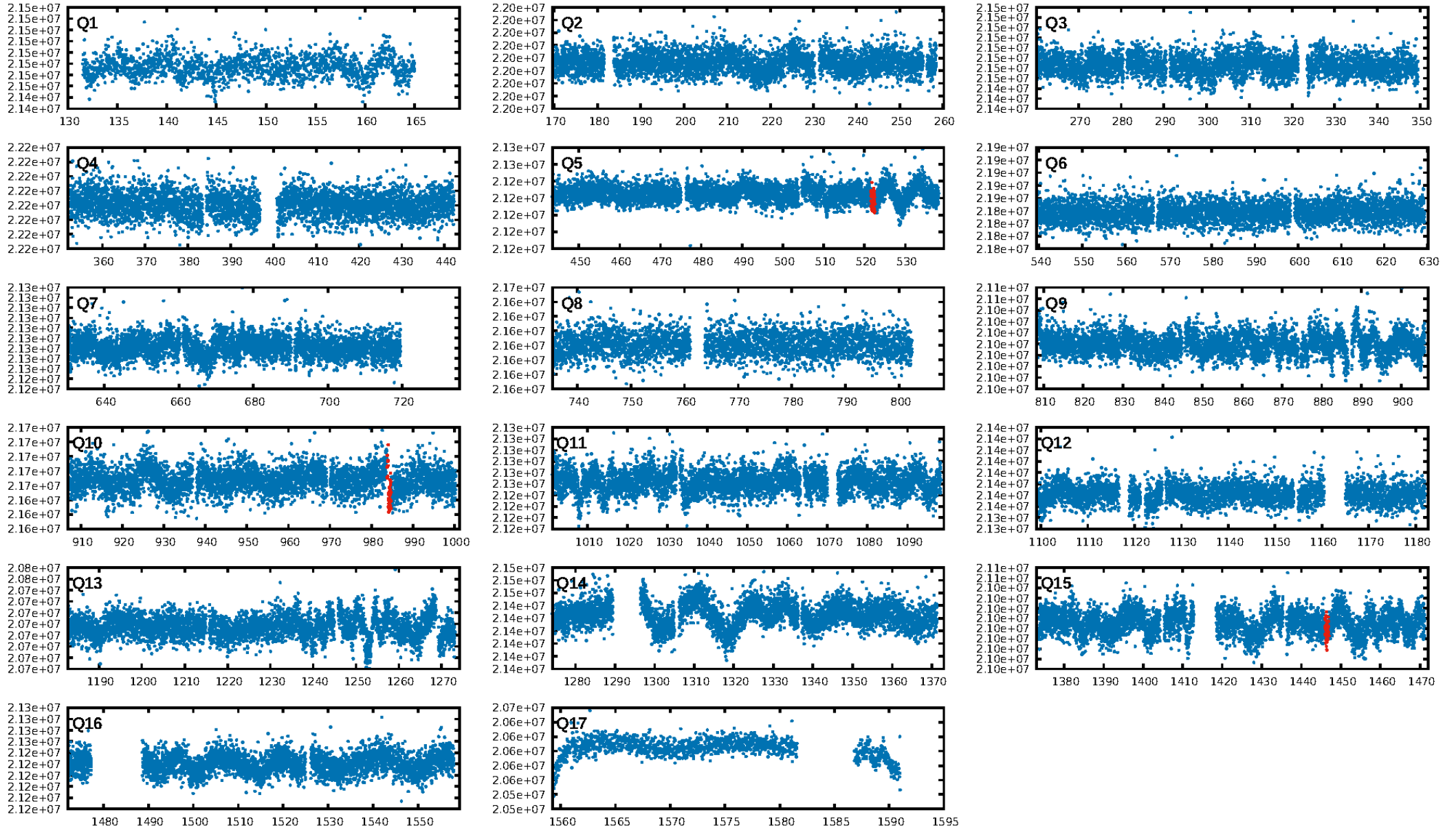
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [10.82 σ]
ModelChiSquare2-sig: 28.8%
ModelChiSquareGof-sig: 97.1%
Bootstrap-pfa: 8.83e-11
RollingBand-fgt: 0.67 [2/3]
GhostDiagnostic-chr: 3.689
Centroid-sig: 0.8%
Centroid-so: 2.993 arcsec [1.49 σ]
OotOffset-rm: 3.352 arcsec [13.47 σ]
KicOffset-rm: 3.215 arcsec [12.93 σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 0.67 [2/3]

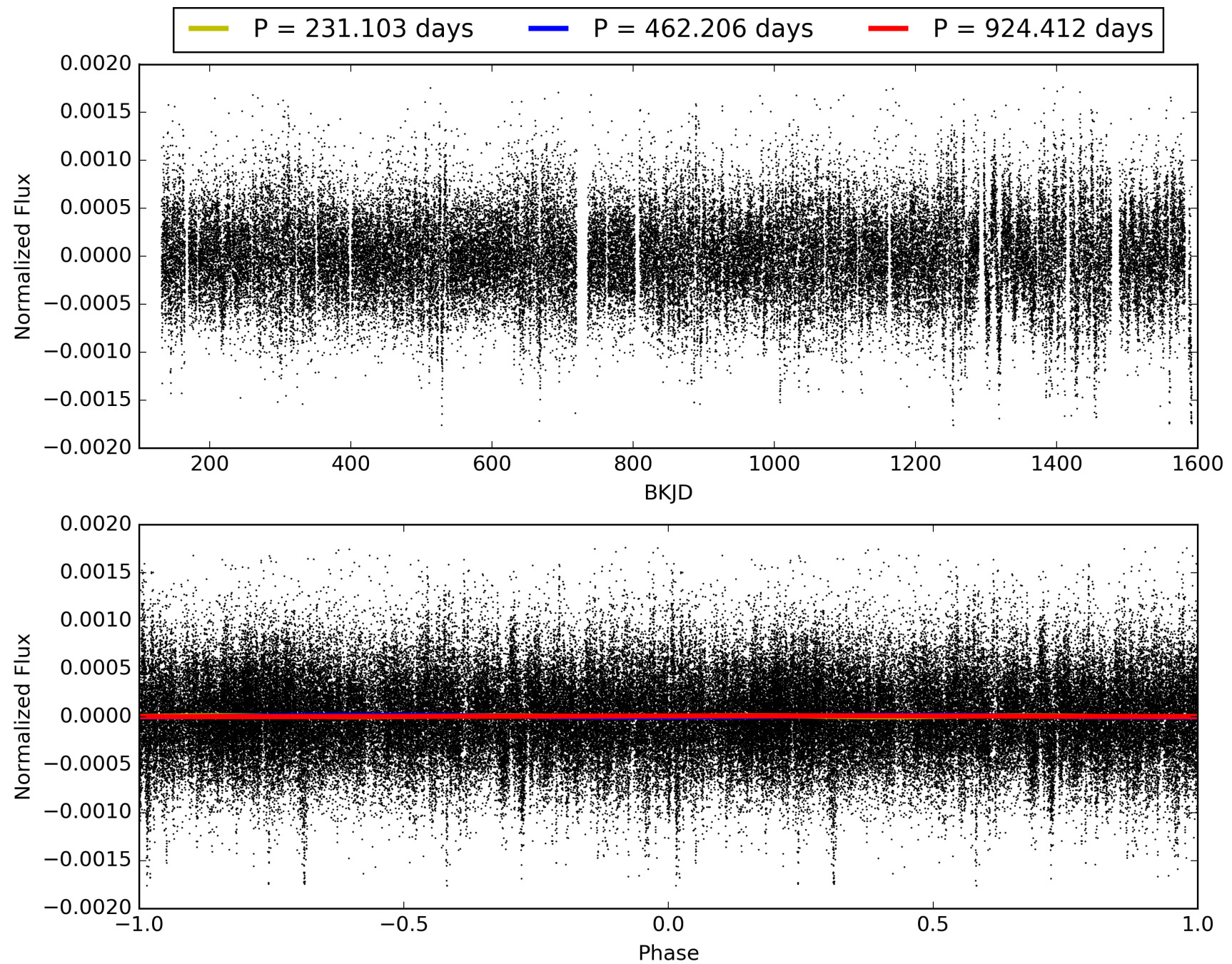
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 18:44:33 Z

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

TCE 005784345-01, PDC Light Curves

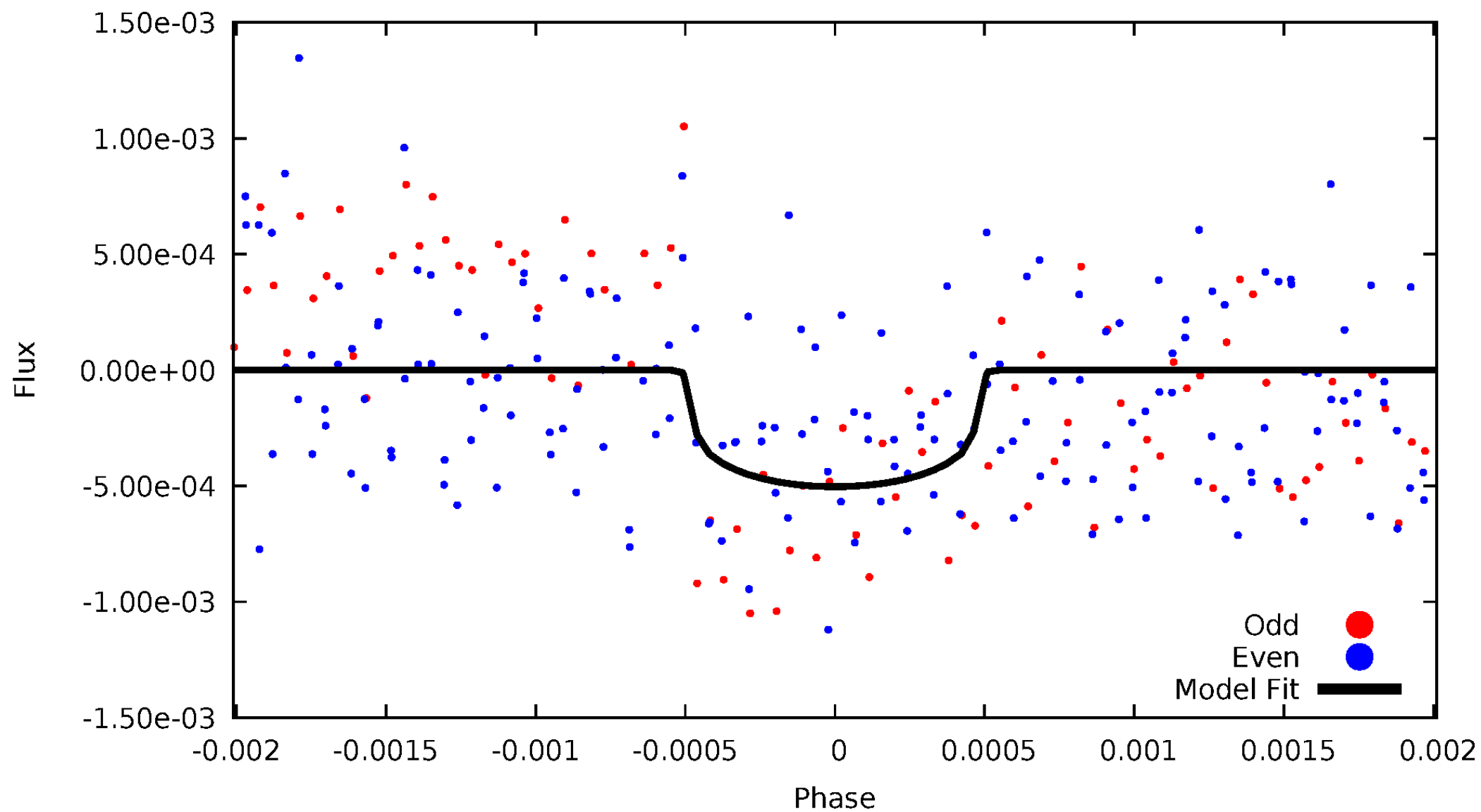


TCE 005784345-01



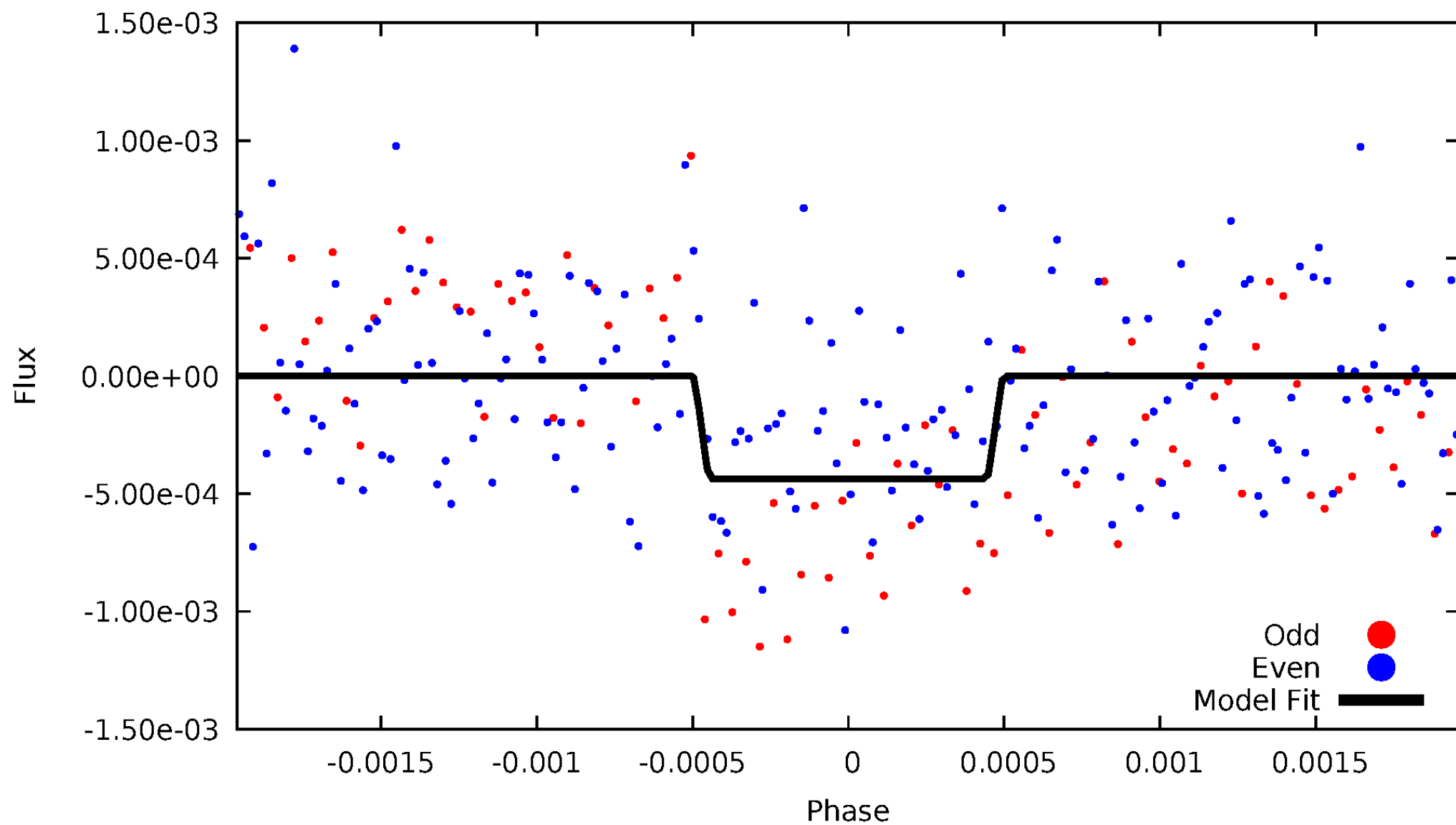
DV Odd/Even

TCE 005784345-01



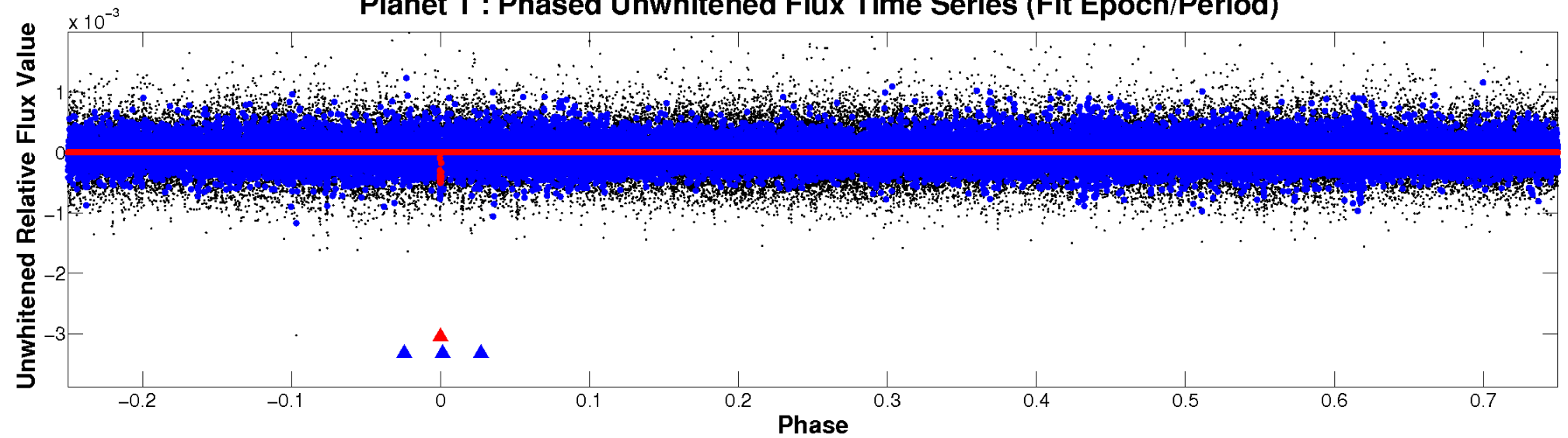
ALT Odd/Even

TCE 005784345-01

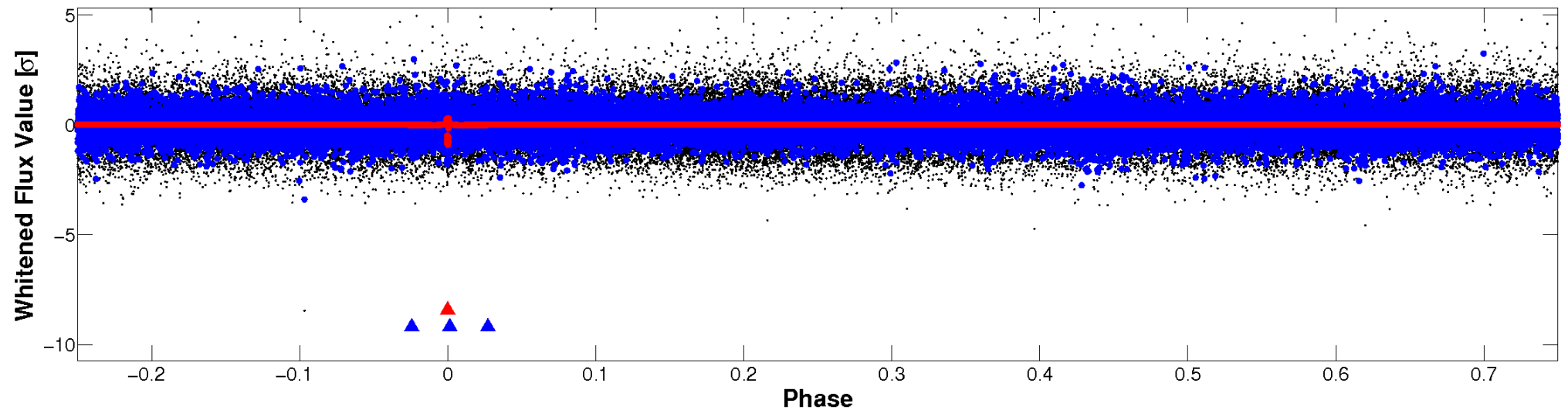


Non-Whitened Vs. Whitened Light Curve

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

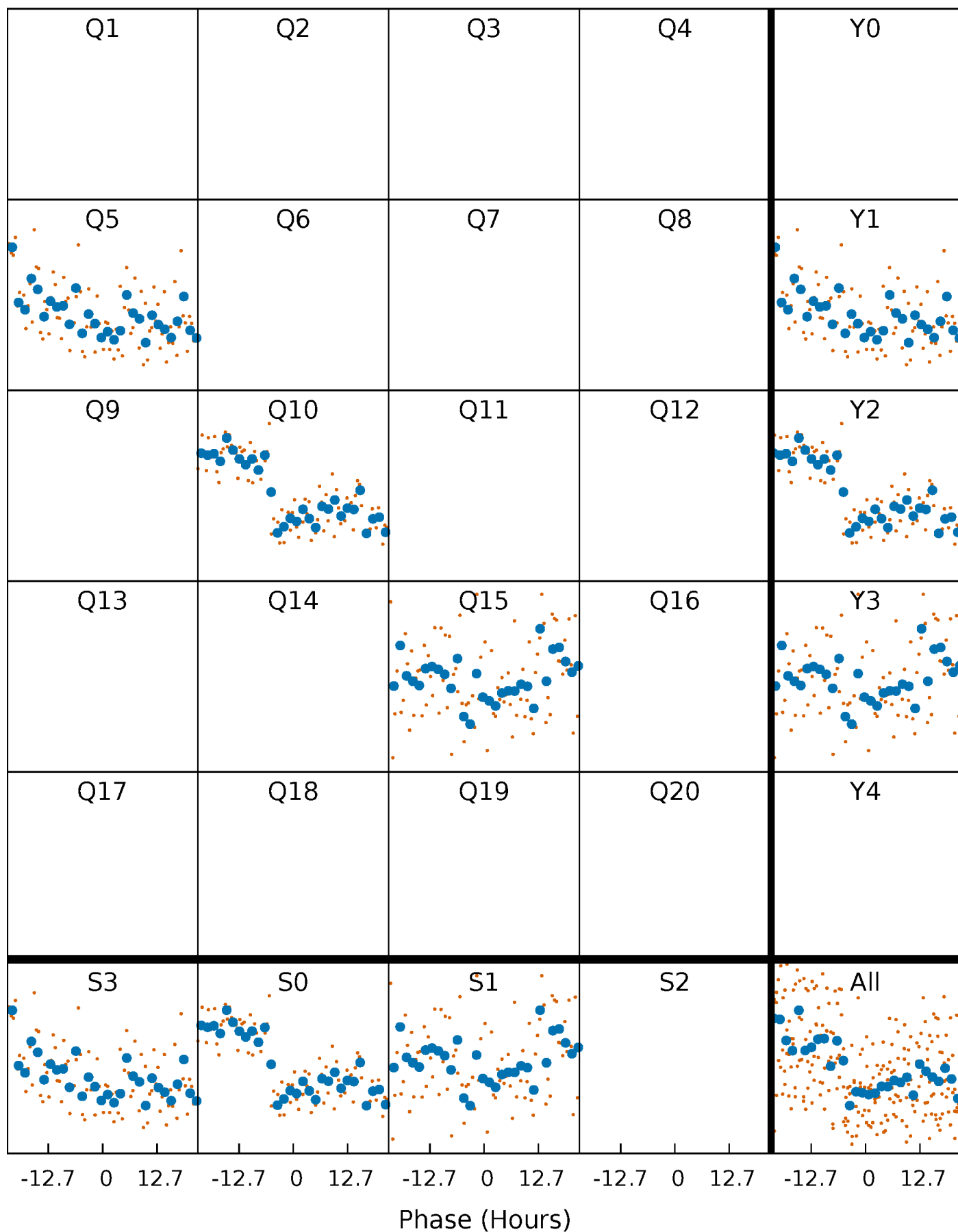


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 005784345-01 P=462.205989 Days $T_0=522.051510$ (BKJD)



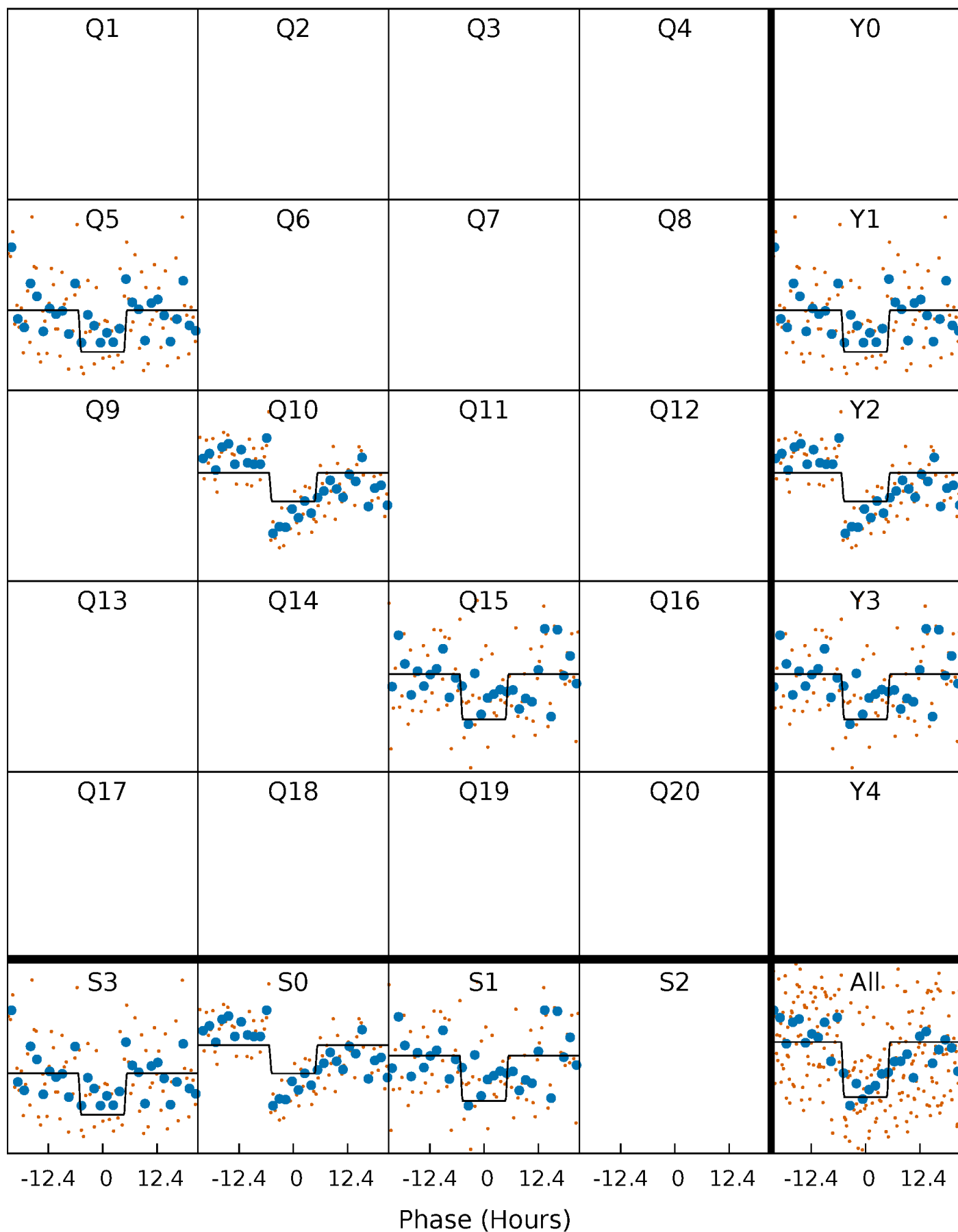
DV Quarter-Phased Transit Curves

TCE 005784345-01 P=462.205989 Days $T_0=522.051510$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

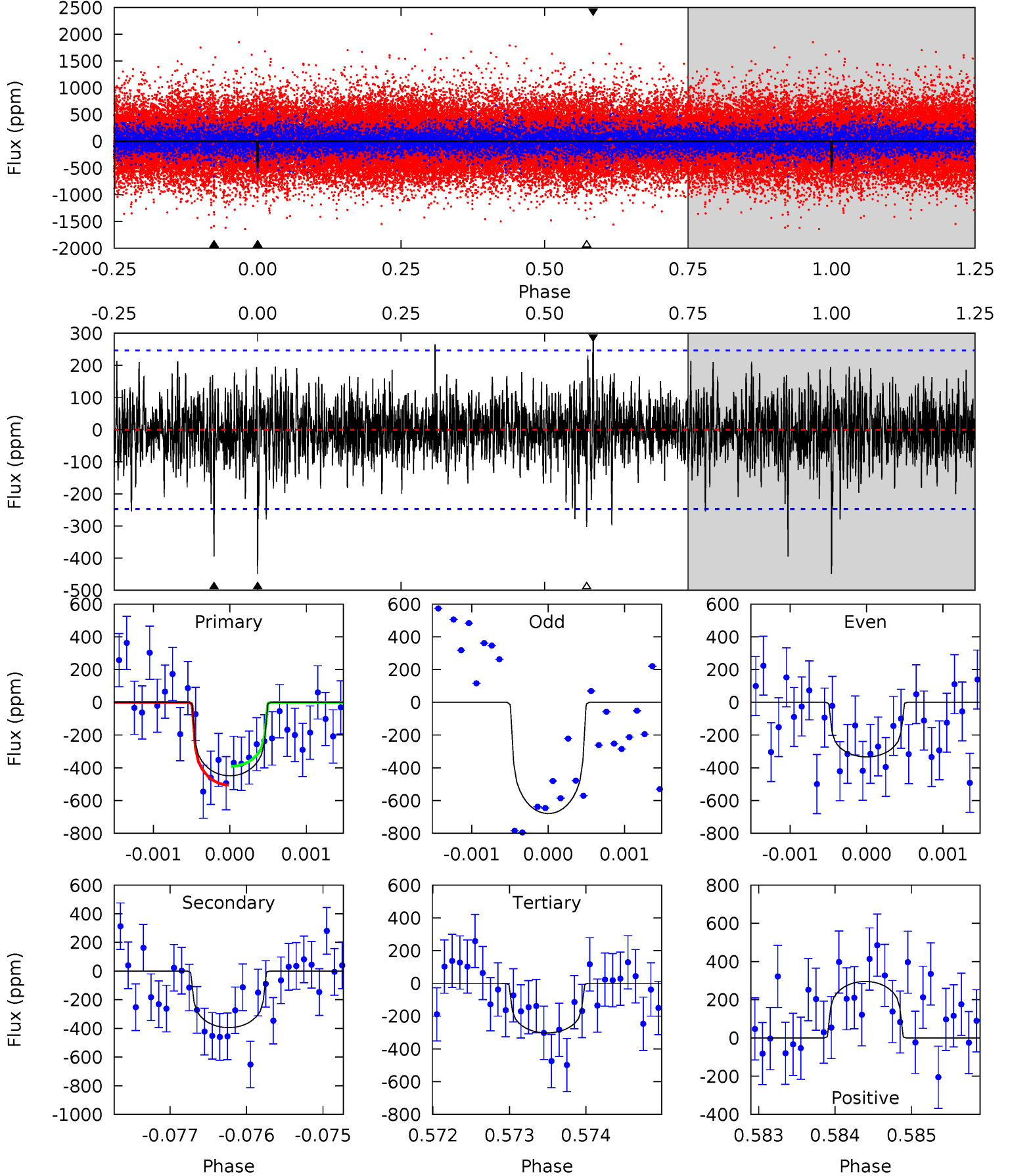
TCE 005784345-01 P=462.200316 Days $T_0=522.057469$ (BKJD)



DV Model-Shift Uniqueness Test

005784345-01, P = 462.205989 Days, E = 59.845521 Days

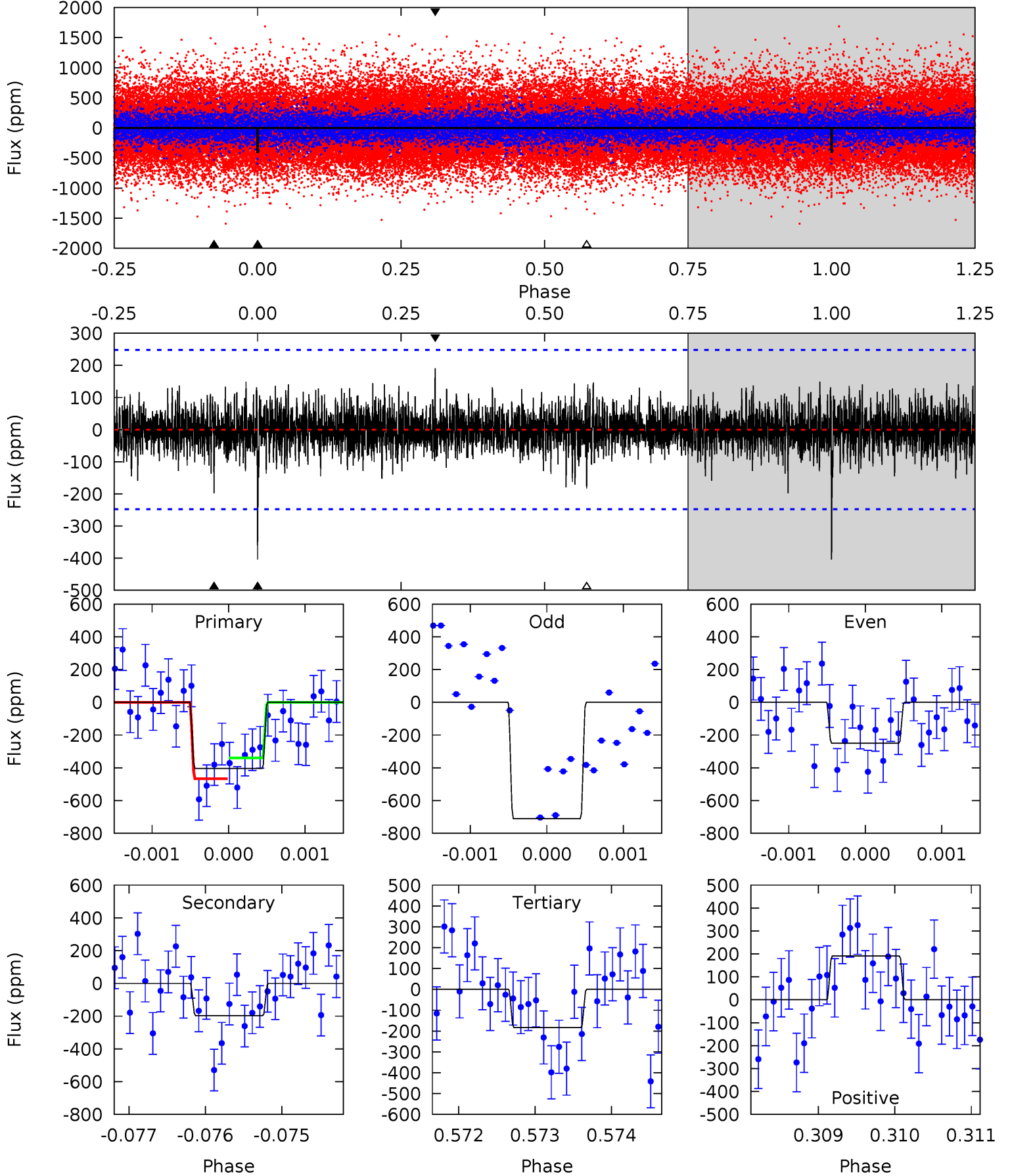
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.91 | 8.71 | 6.68 | 6.53 | 5.45 | 3.28 | 1.51 | 3.23 | 3.38 | 2.03 | 2.18 | 3.61 | 1.33 | 0.40 | 1.26 |



Alt Model-Shift Uniqueness Test

005784345-01, P = 462.200316 Days, E = 59.857153 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.88 | 4.35 | 4.03 | 4.20 | 5.45 | 3.29 | 0.98 | 4.86 | 4.68 | 0.32 | 0.15 | 4.81 | 1.53 | 0.32 | 1.40 |



Stellar Parameters For KIC 005784345

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5537^{+66}_{-91} | $4.549^{+0.017}_{-0.088}$ | $0.210^{+0.150}_{-0.200}$ | $0.880^{+0.093}_{-0.037}$ | $0.999^{+0.030}_{-0.077}$ | $2.066^{+0.158}_{-0.556}$ |
| | +1%/-2% | +0%/-2% | +71%/-95% | +11%/-4% | +3%/-8% | +8%/-27% |
| Source | SPE68 | SPE68 | SPE68 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 005784345-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|-----------------|-----------------------|----------------------------|
| DV | -394 ± 45 | $2.34^{+1.39}_{-1.25}$ | 299^{+8}_{-7} | 5097^{+2305}_{-869} | $53638^{+184795}_{-32274}$ |
| Alt. | -198 ± 45 | $2.09^{+1.36}_{-1.21}$ | 299^{+8}_{-6} | 4608^{+2306}_{-801} | $33630^{+159463}_{-22066}$ |

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

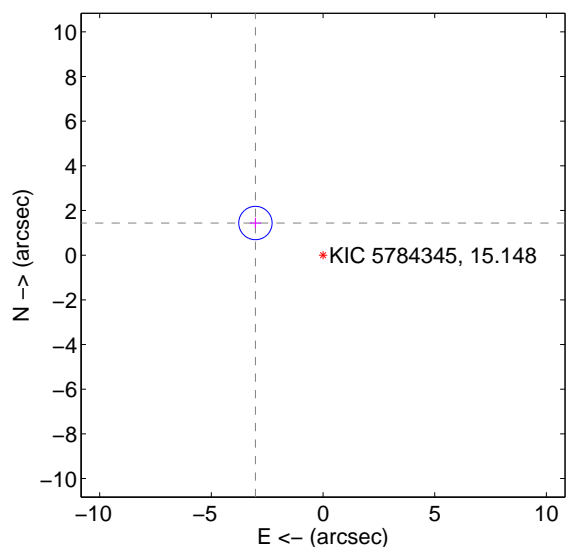
Supplemental centroid analysis for 005784345-01. Kepler magnitude: 15.15. Transit SNR 6.78

There are 1 quarters with good PRF difference image offsets

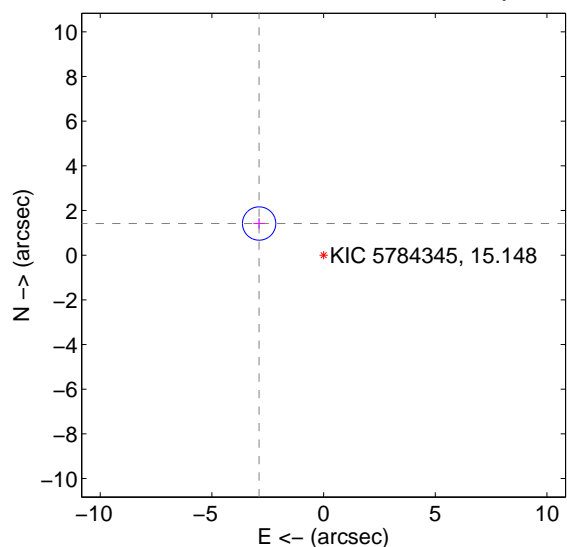
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 3.352 \pm 0.249 | 13.47 | 3.027 \pm 0.252 | 1.439 \pm 0.234 |
| PRF-fit source offset from KIC position | 3.215 \pm 0.249 | 12.93 | 2.886 \pm 0.252 | 1.417 \pm 0.234 |
| photometric centroid source offset | 2.99 \pm 2.01 | 1.49 | 0.63 \pm 2.35 | 2.93 \pm 1.99 |

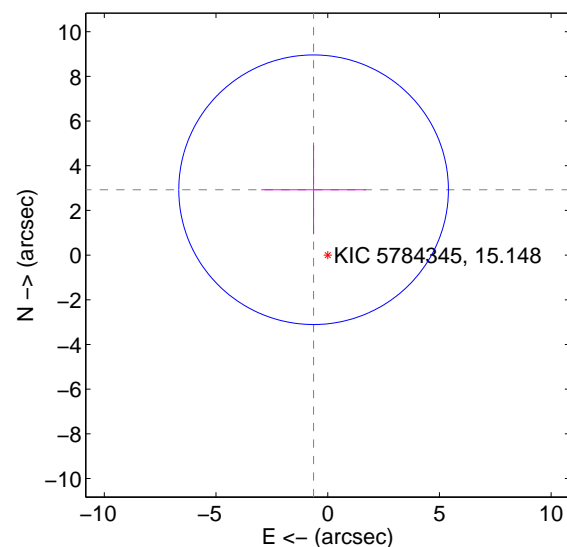
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

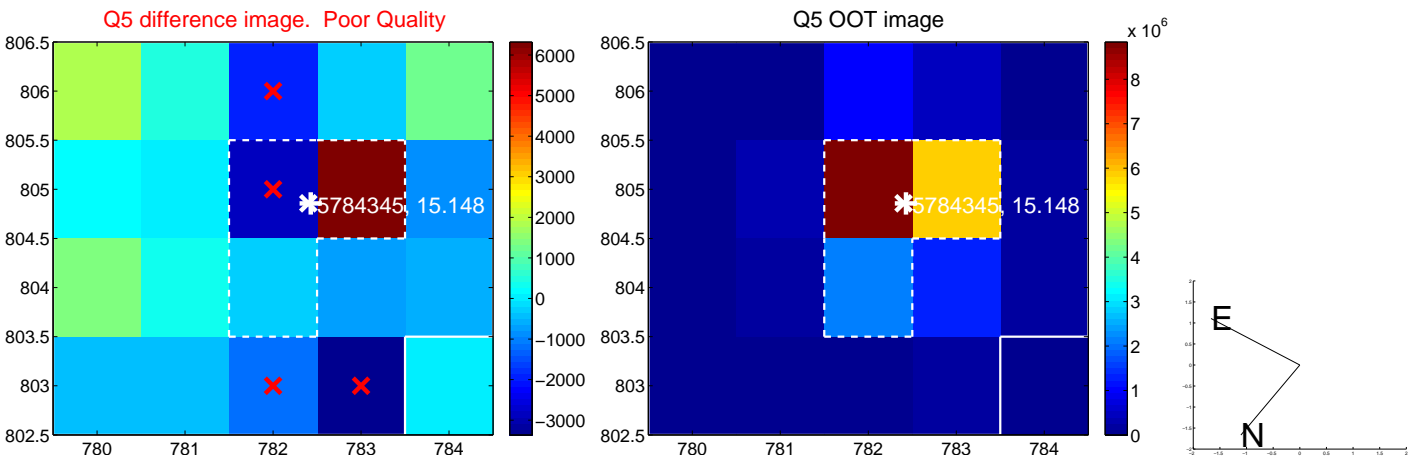


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

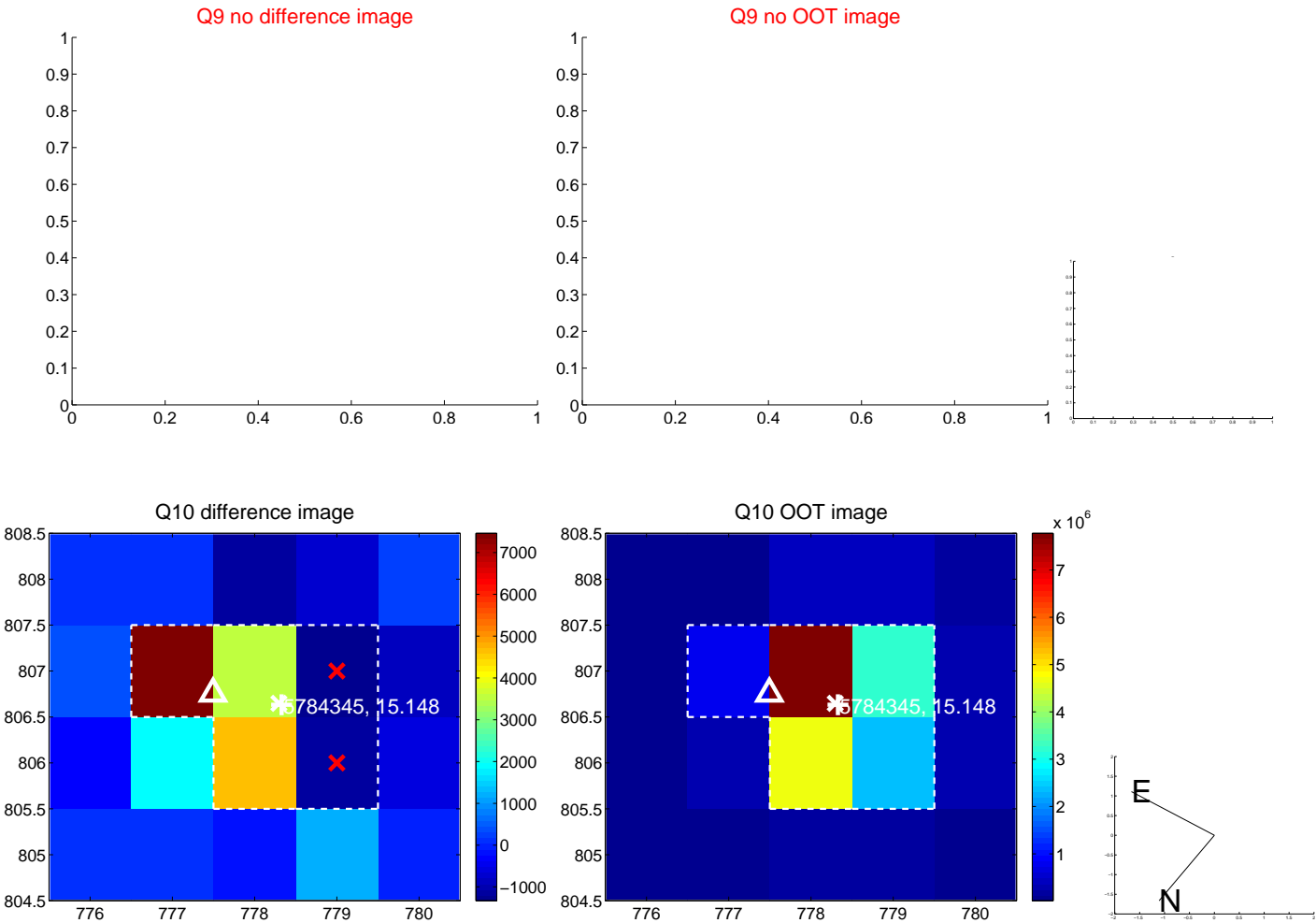
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



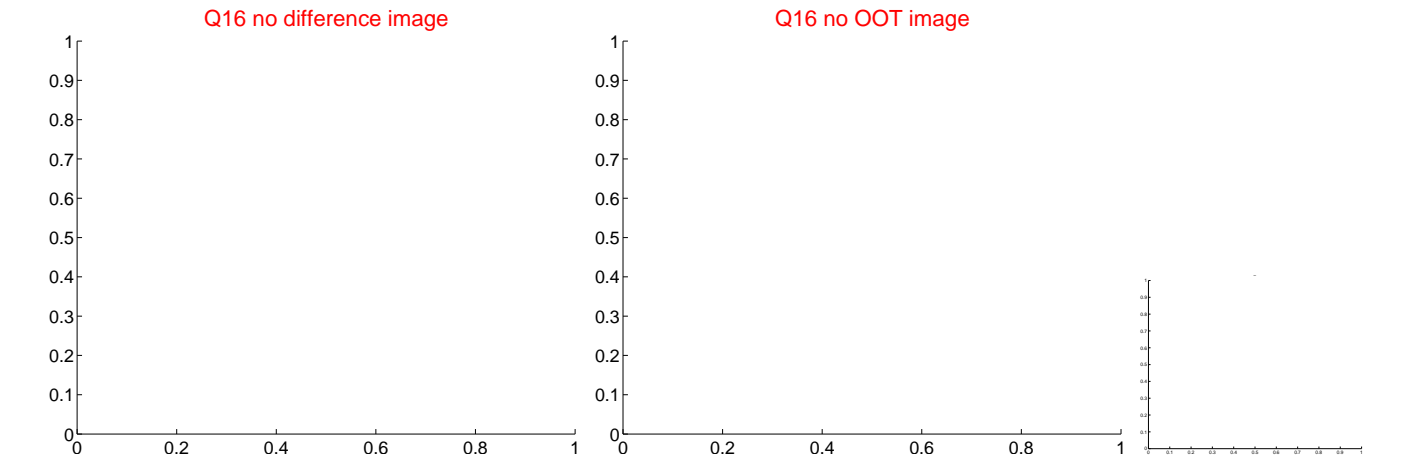
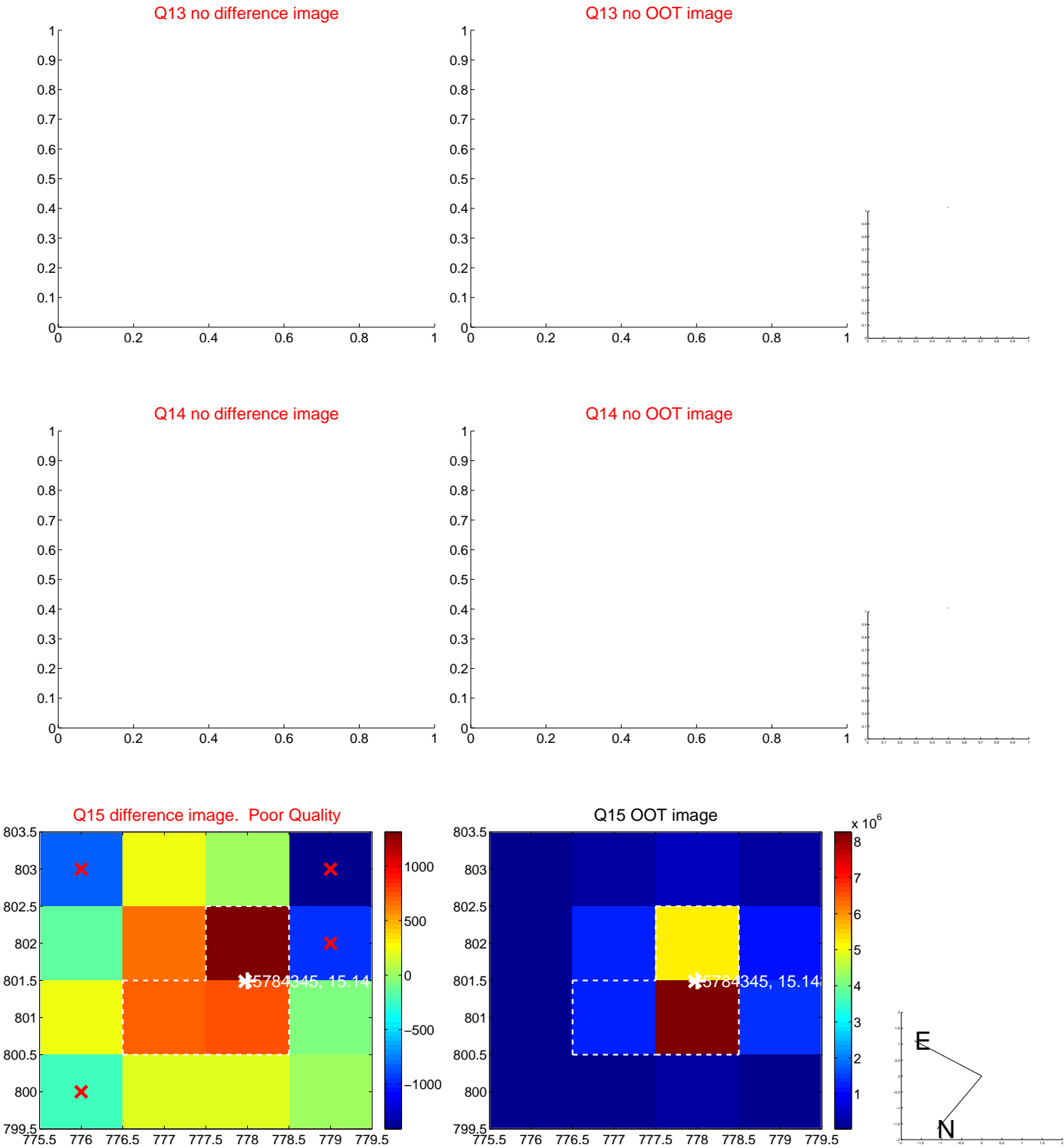
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



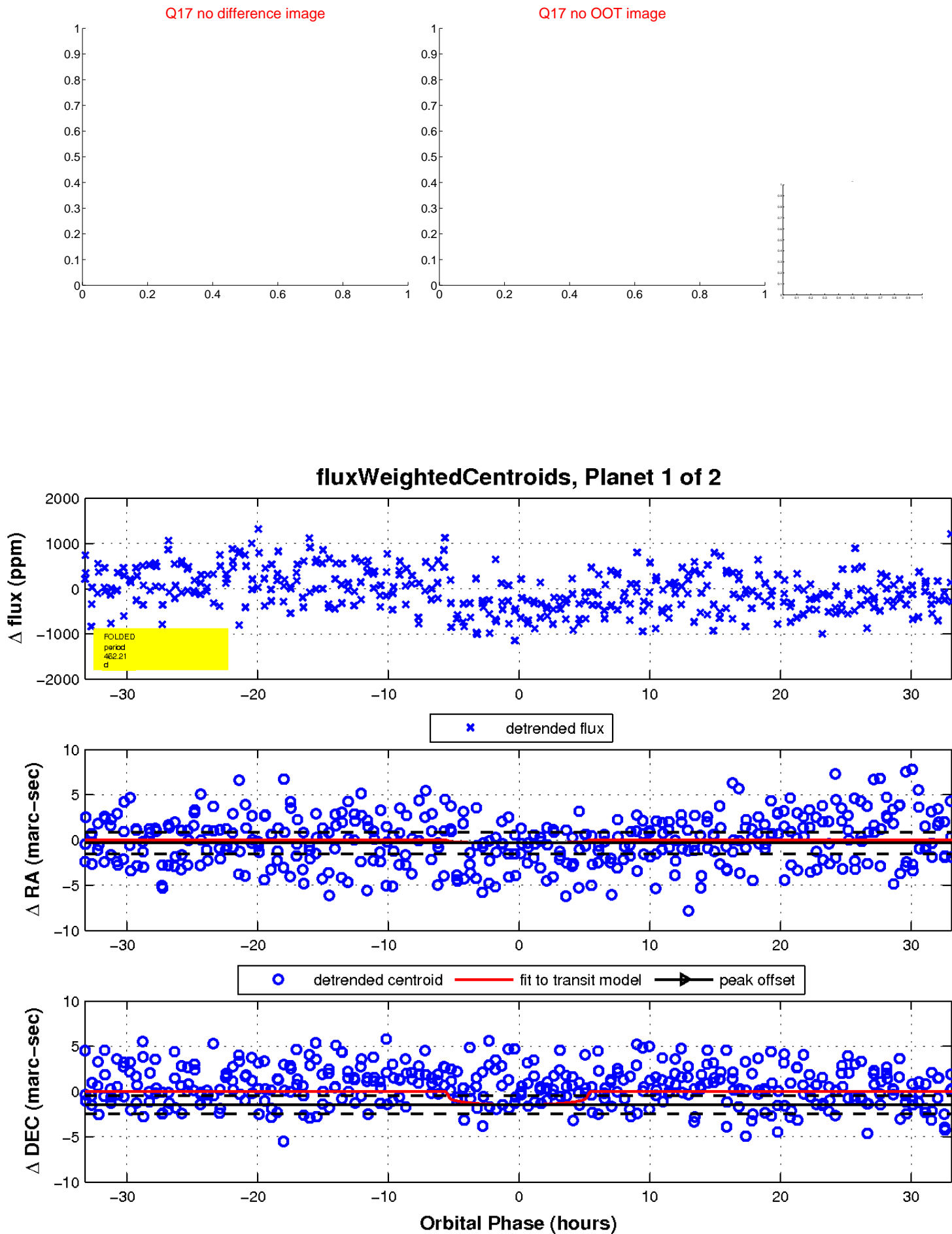
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

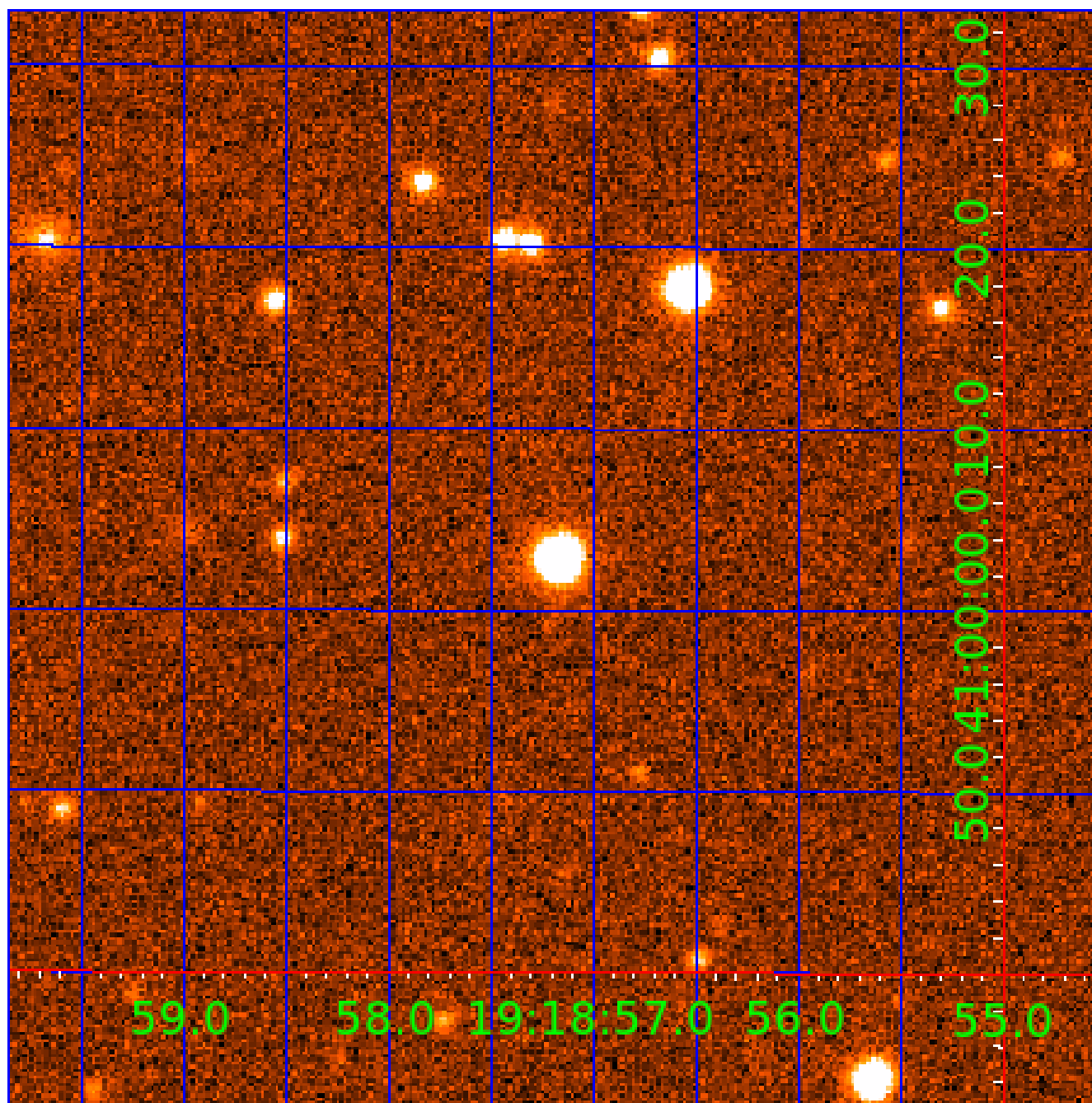


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005784345

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005784345-01 | OBS | No | 462.205989 | 522.051510 | 503.2 | 11.143 | 7.2 | 6.8 | 0.88 | 5537 | 2.07 | 0.48 |
| 005784345-02 | OBS | No | 474.094654 | 510.821875 | 541.9 | 23.890 | 7.7 | 7.0 | 0.88 | 5537 | 2.54 | 0.46 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 005784345-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 005784345-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—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.

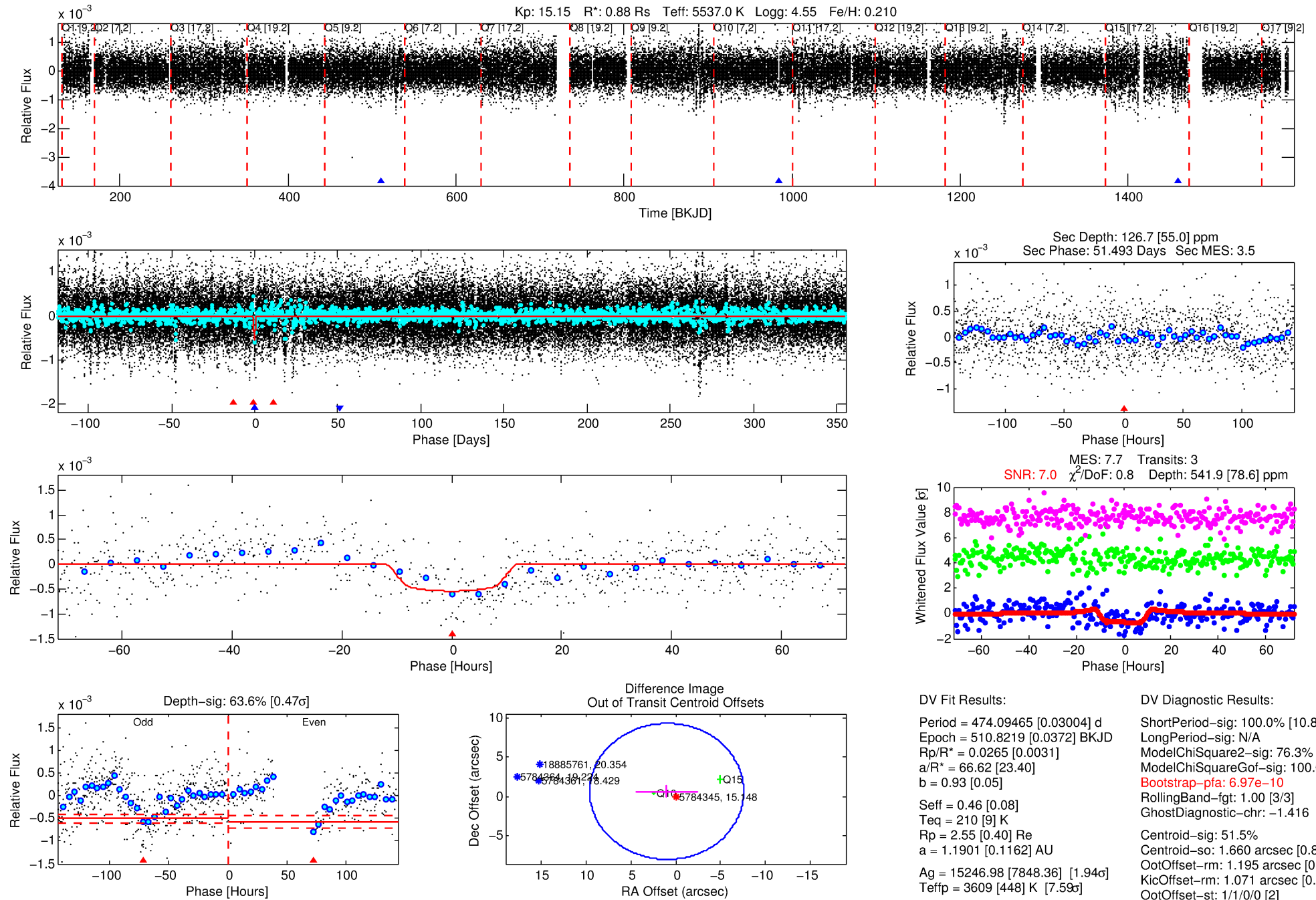
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005784345-02

No Significant Match Found

DV One-Page Summary

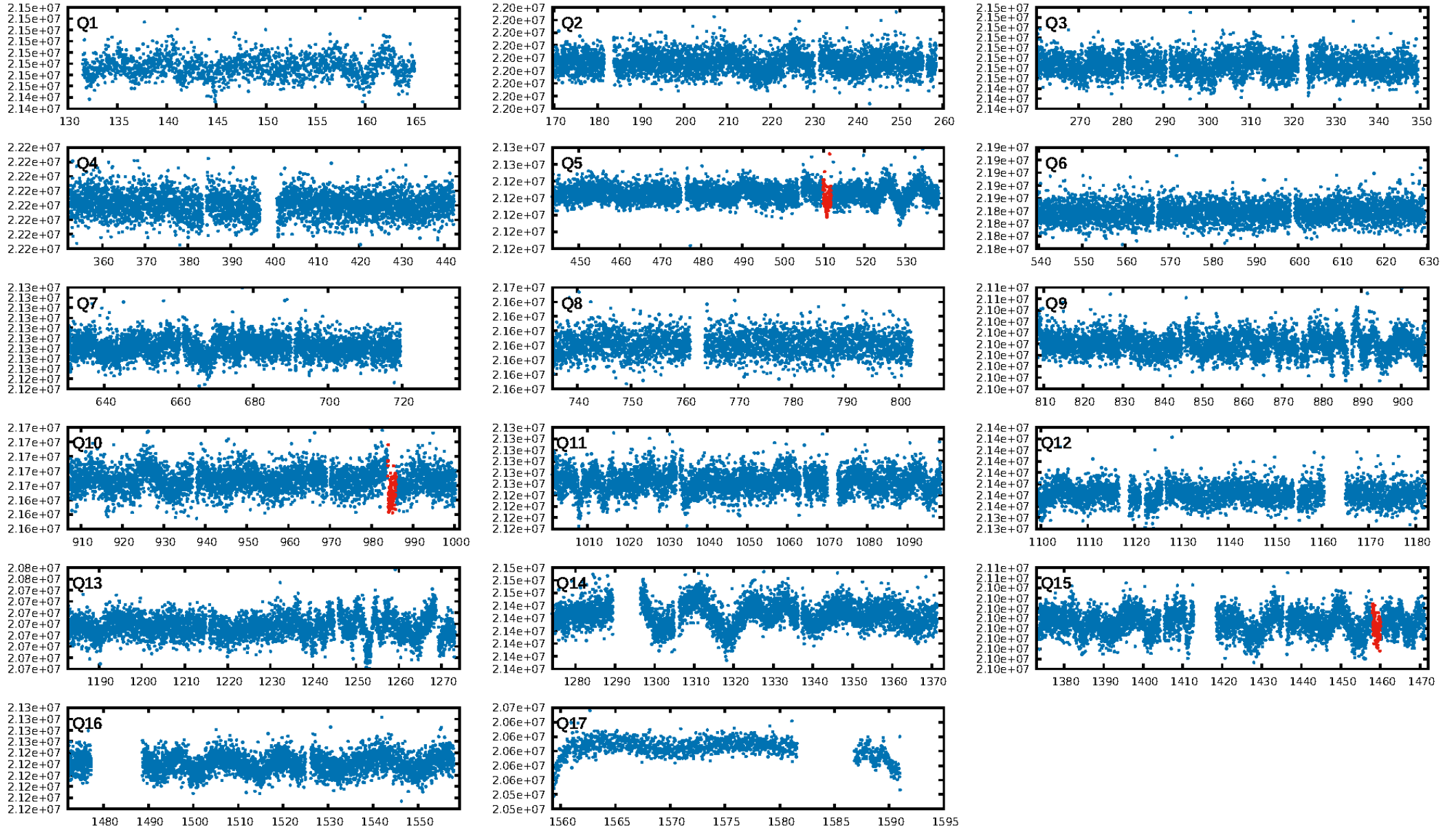
KIC: 5784345 Candidate: 2 of 2 Period: 474.095 d



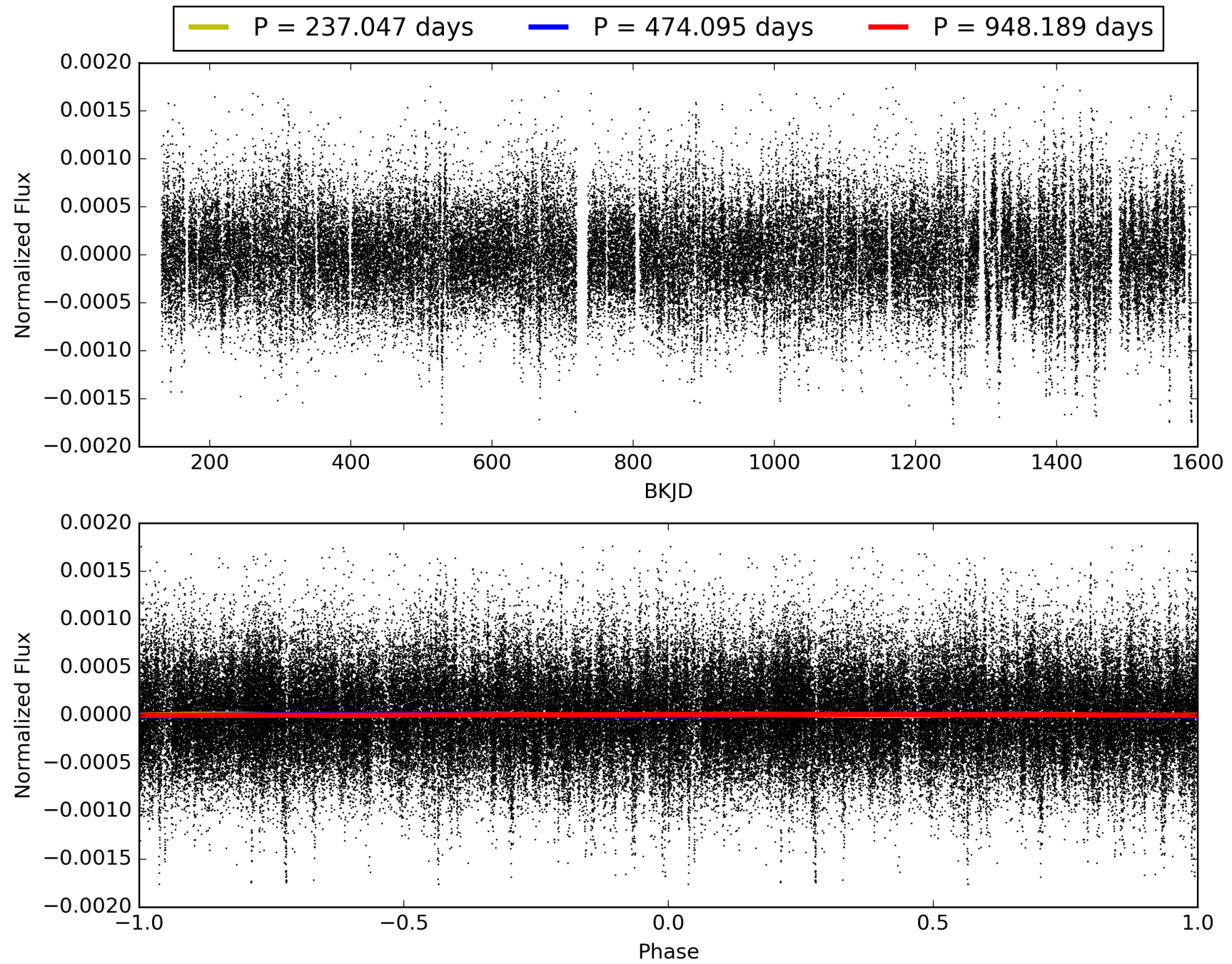
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 18:44:42 Z

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

TCE 005784345-02, PDC Light Curves

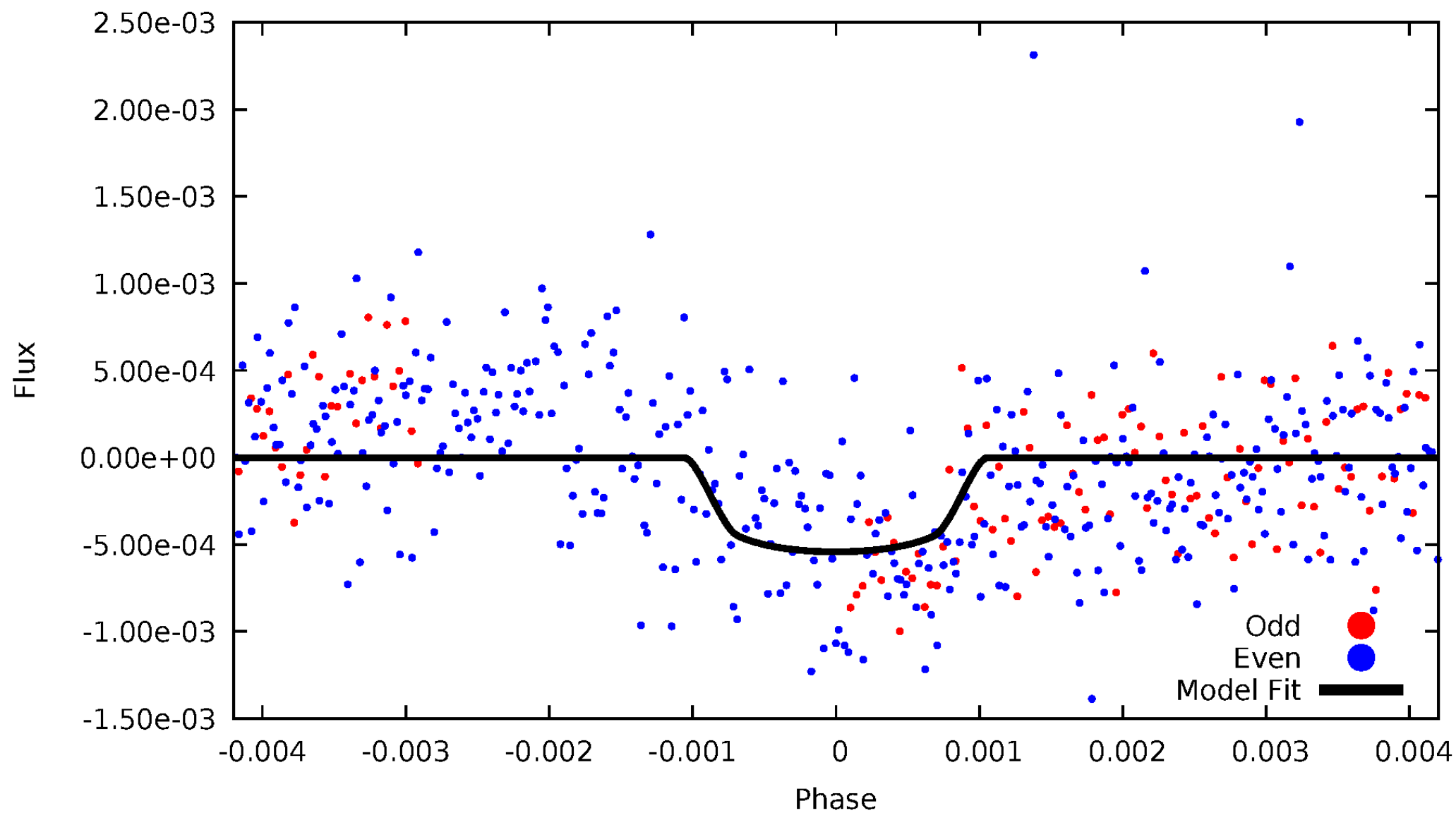


TCE 005784345-02



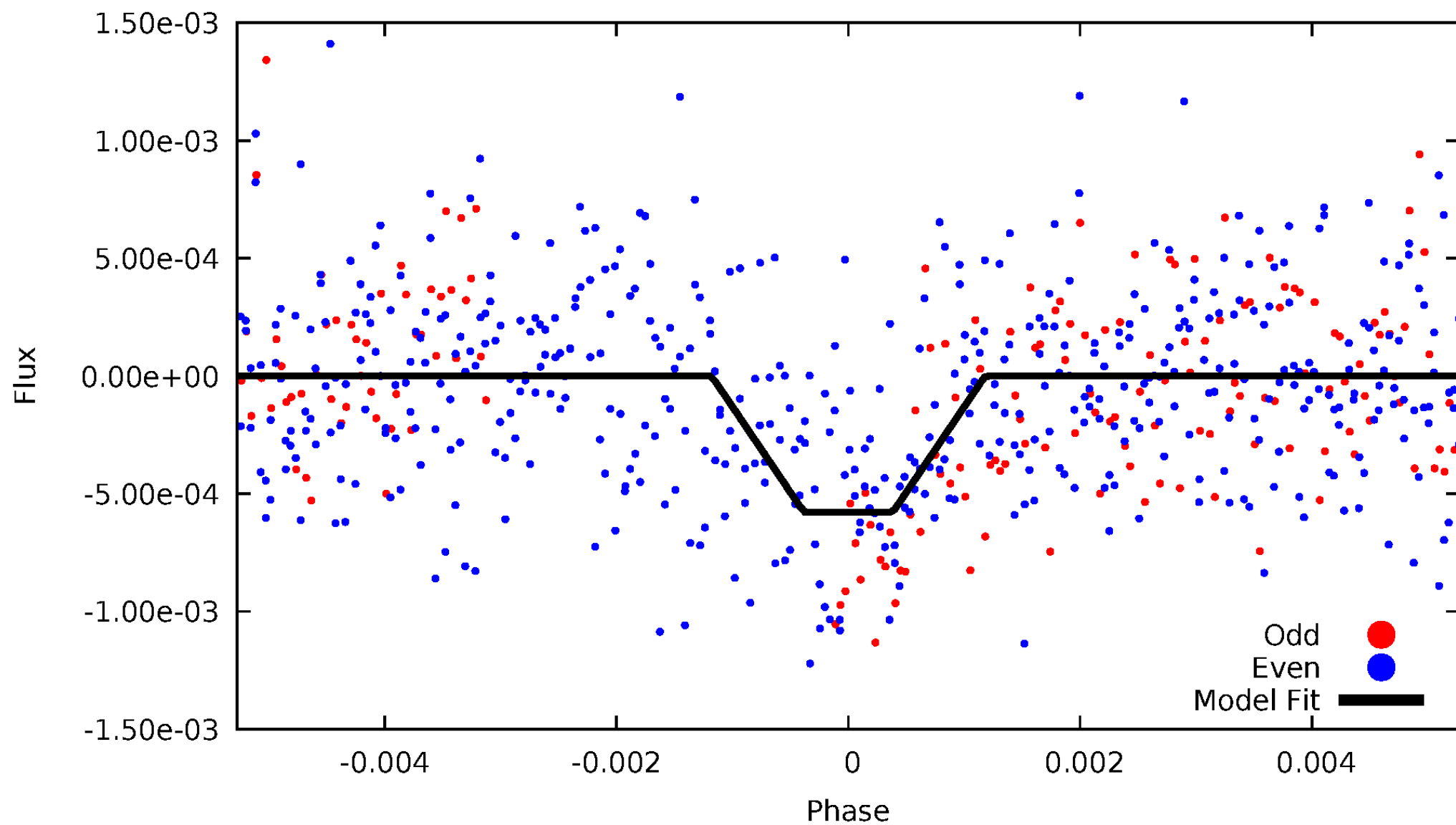
DV Odd/Even

TCE 005784345-02



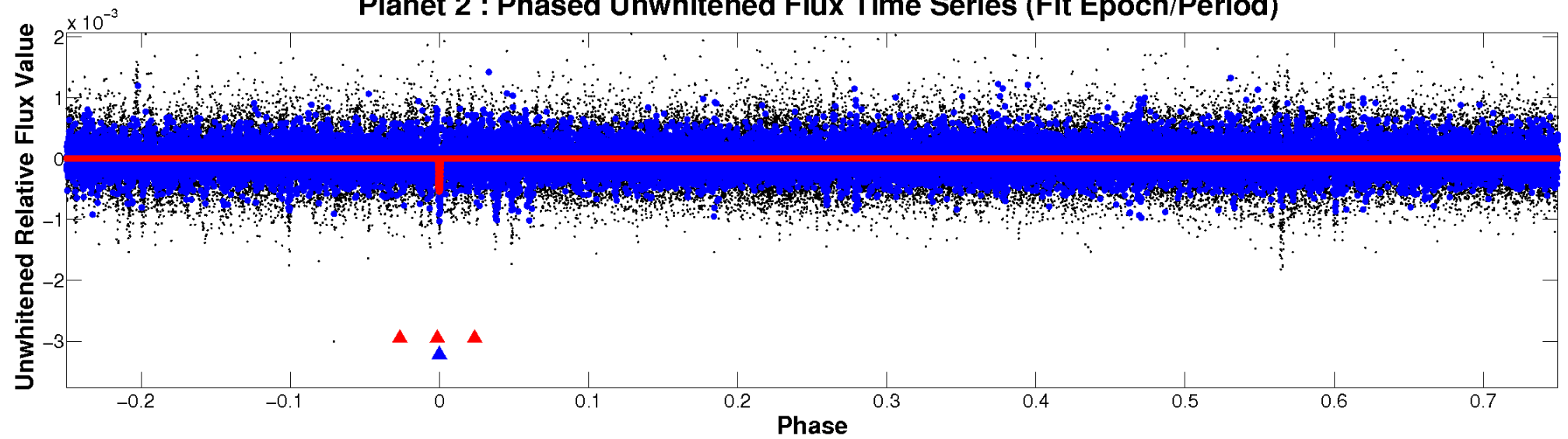
ALT Odd/Even

TCE 005784345-02

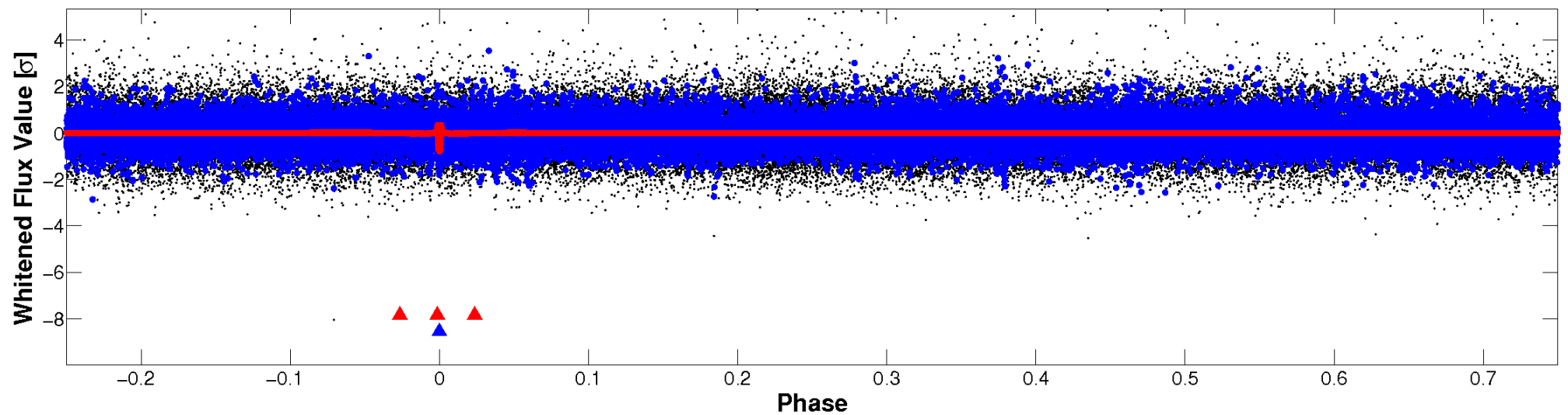


Non-Whitened Vs. Whitened Light Curve

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



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



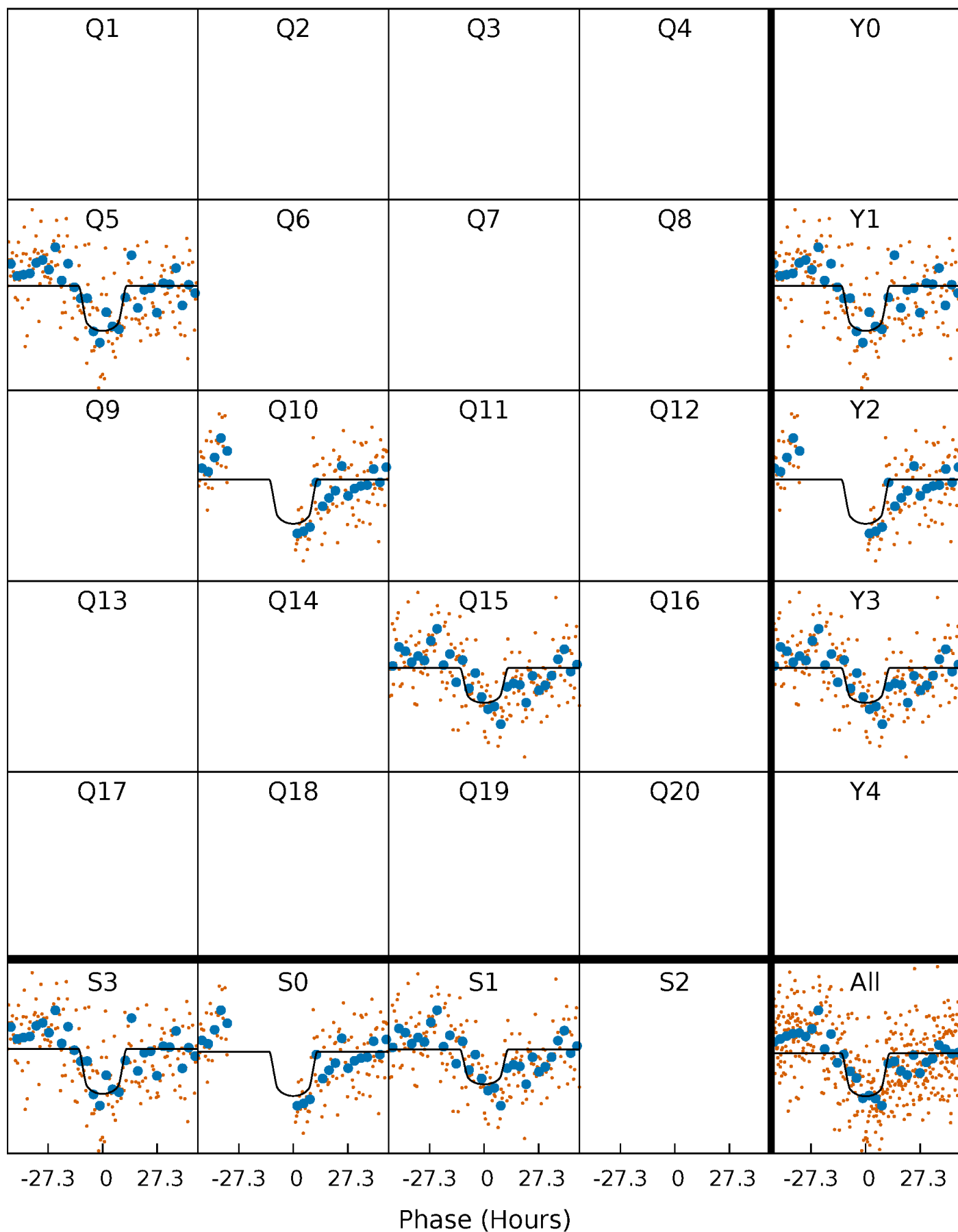
PDC Quarter-Phased Transit Curves

TCE 005784345-02 P=474.094654 Days $T_0=510.821875$ (BKJD)



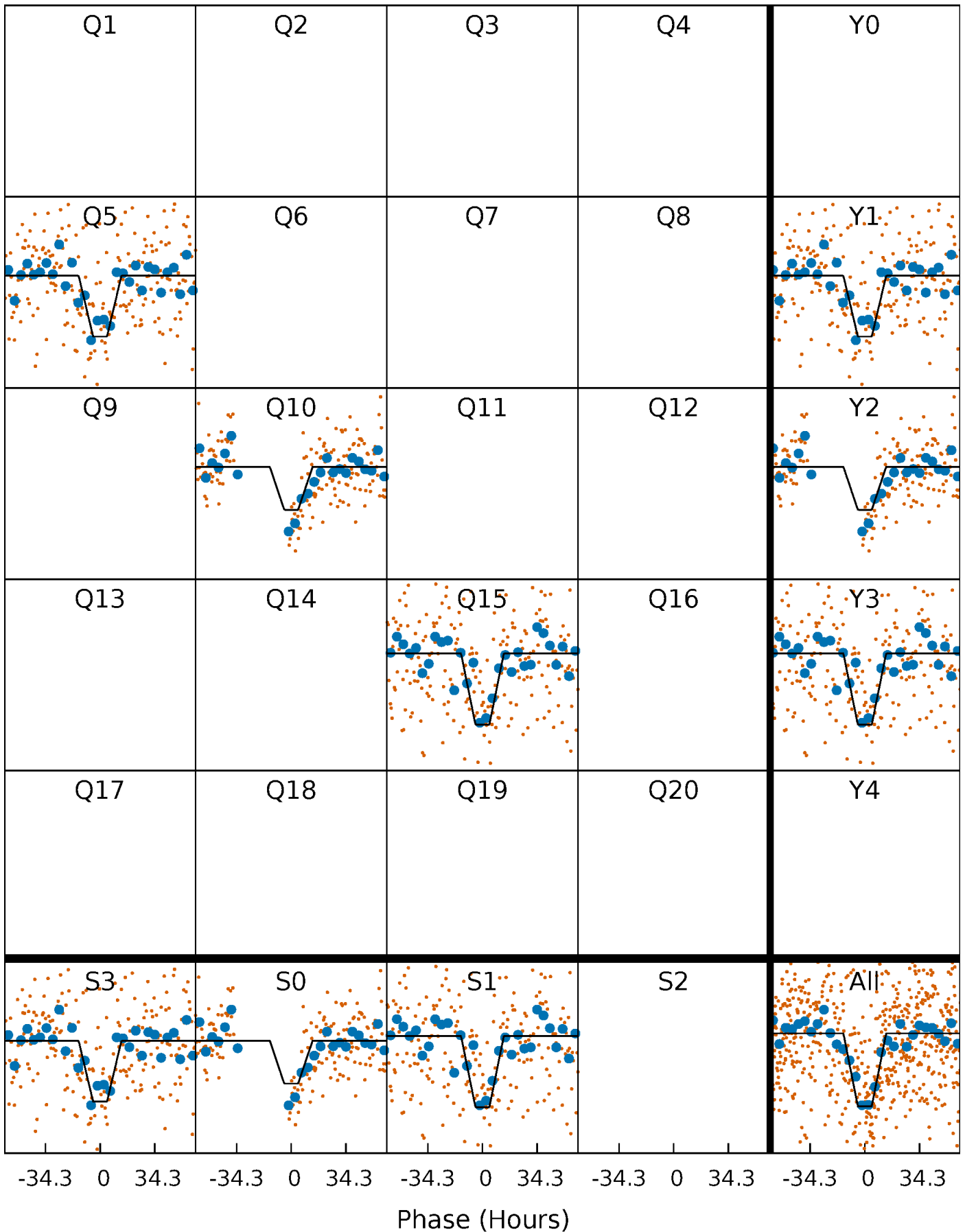
DV Quarter-Phased Transit Curves

TCE 005784345-02 $P=474.094654$ Days $T_0=510.821875$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

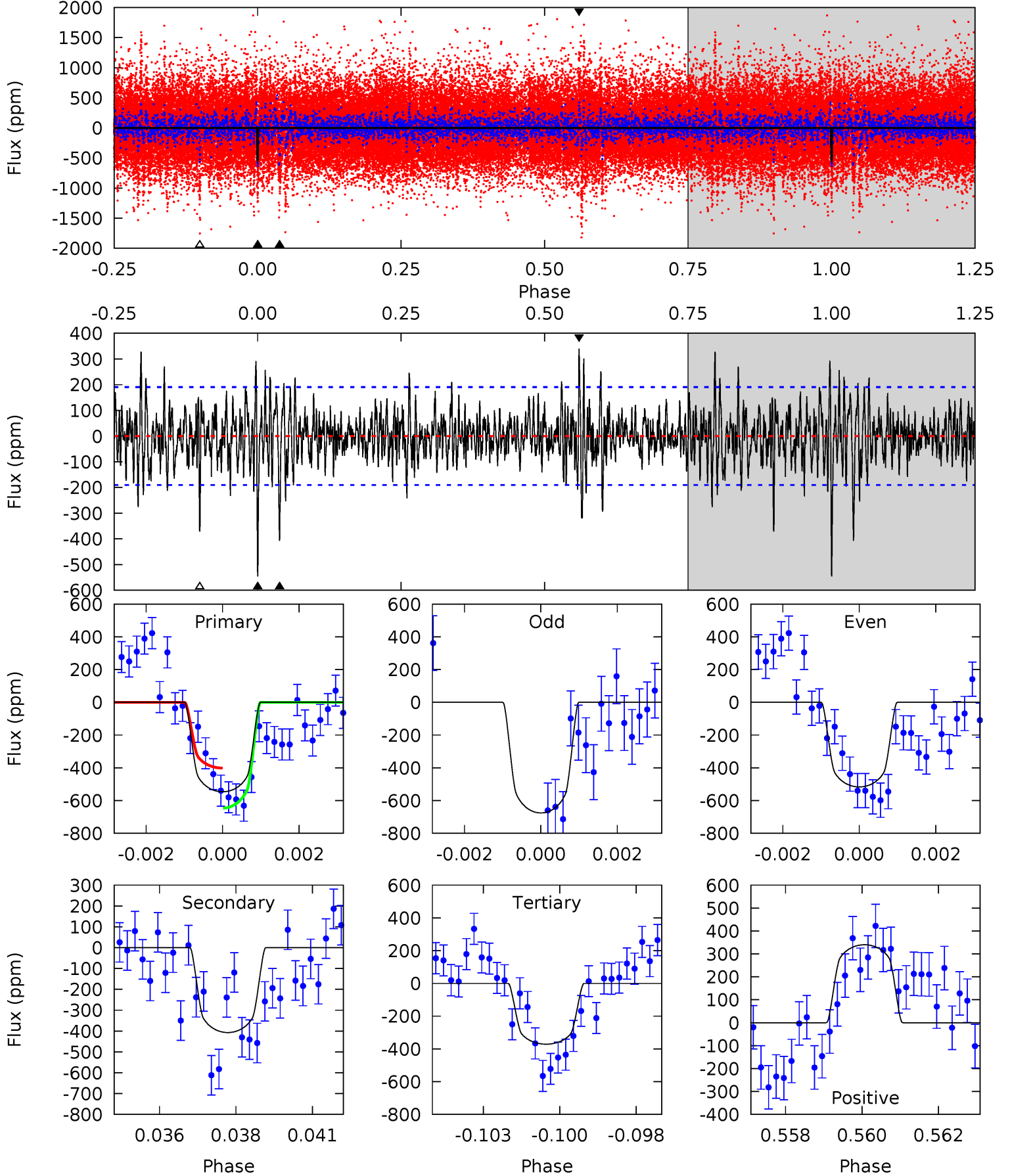
TCE 005784345-02 $P=474.119893$ Days $T_0=510.896964$ (BKJD)



DV Model-Shift Uniqueness Test

005784345-02, P = 474.094654 Days, E = 36.727221 Days

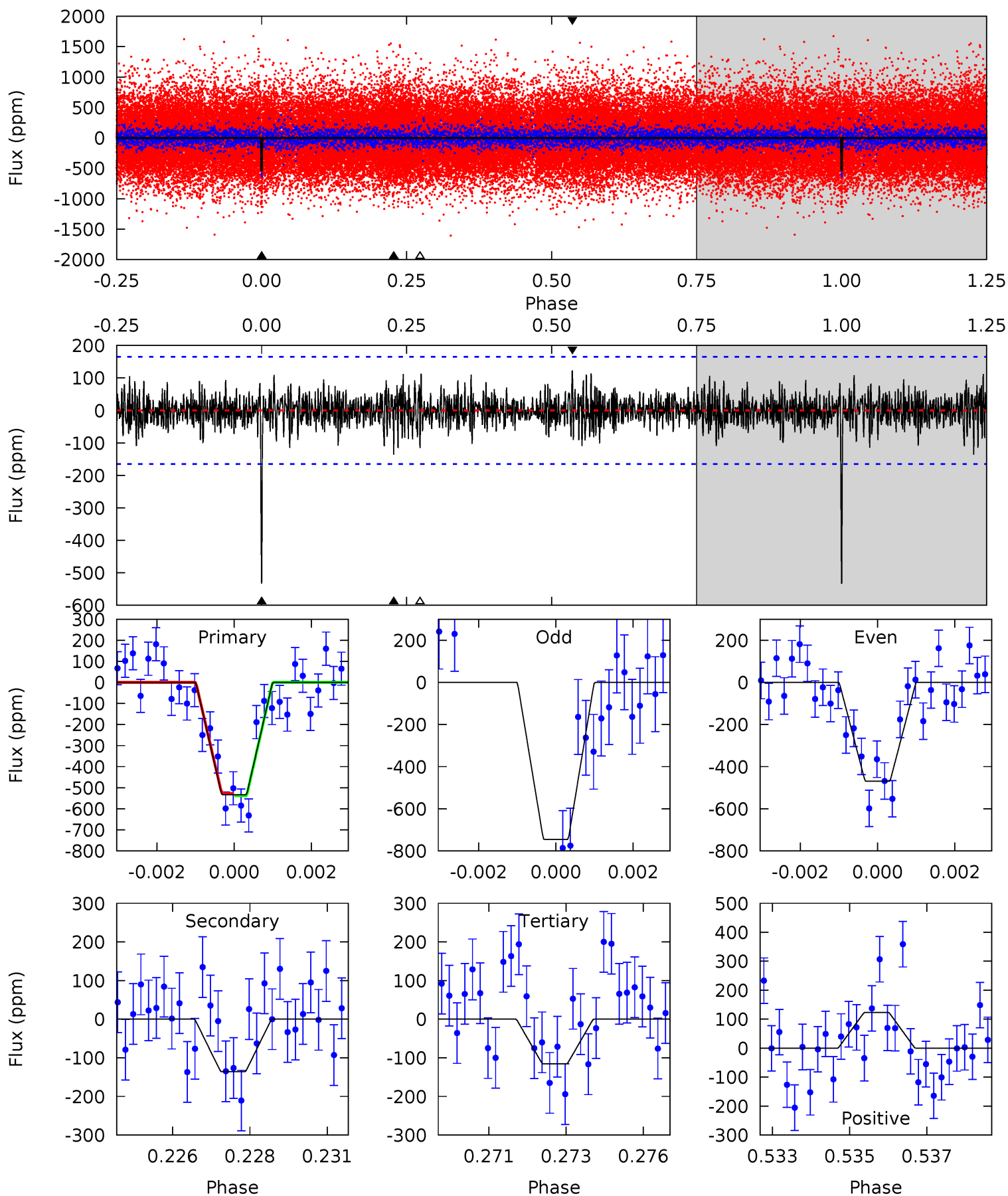
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 15.3 | 11.4 | 10.4 | 9.50 | 5.31 | 3.07 | 2.28 | 4.89 | 5.77 | 1.00 | 1.88 | 1.77 | 1.08 | 0.38 | 3.34 |



Alt Model-Shift Uniqueness Test

005784345-02, P = 474.119893 Days, E = 36.777071 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 17.1 | 4.36 | 3.72 | 3.95 | 5.30 | 3.04 | 1.13 | 13.4 | 13.2 | 0.64 | 0.41 | 3.68 | 1.14 | 0.19 | 0.18 |



Stellar Parameters For KIC 005784345

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | M (M_{\odot}) | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5537^{+66}_{-91} | $4.549^{+0.017}_{-0.088}$ | $0.210^{+0.150}_{-0.200}$ | $0.880^{+0.093}_{-0.037}$ | $0.999^{+0.030}_{-0.077}$ | $2.066^{+0.158}_{-0.556}$ |
| | +1%/-2% | +0%/-2% | +71%/-95% | +11%/-4% | +3%/-8% | +8%/-27% |
| Source | SPE68 | SPE68 | SPE68 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 005784345-02 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|------------------------|----------------------|----------------------|---------------------------|
| DV | -407 ± 36 | $2.62^{+0.33}_{-0.33}$ | 297^{+8}_{-6} | 4899^{+283}_{-259} | 45778^{+13926}_{-10593} |
| Alt. | -136 ± 31 | $2.34^{+0.33}_{-0.32}$ | 297^{+8}_{-7} | 4111^{+296}_{-243} | 18710^{+8265}_{-5635} |

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

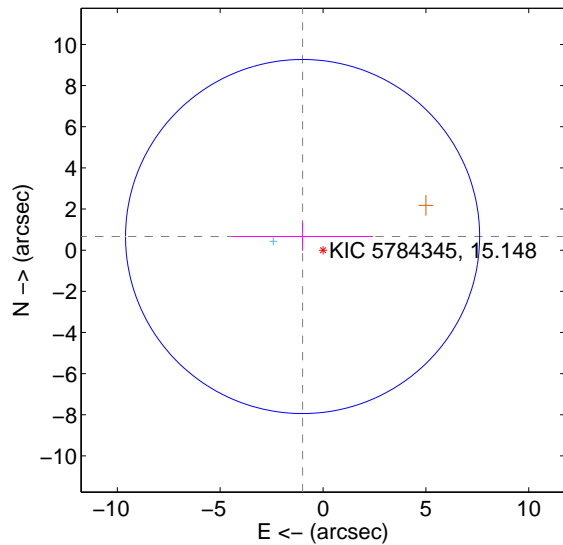
Supplemental centroid analysis for 005784345-02. Kepler magnitude: 15.15. Transit SNR 7.03

There are 1 quarters with good PRF difference image offsets

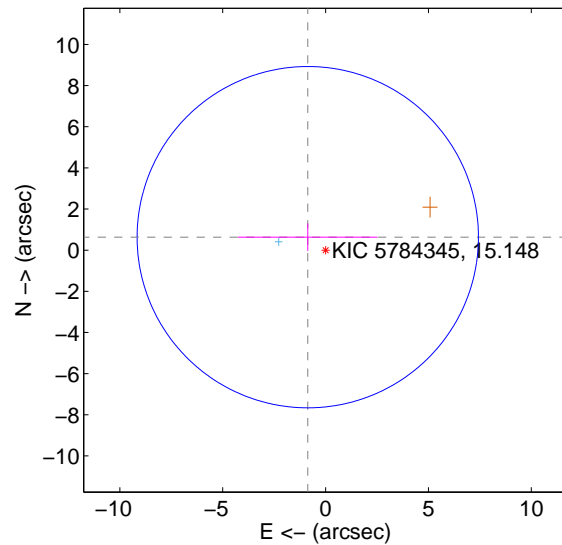
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 1.195 ± 2.868 | 0.42 | 0.994 ± 3.417 | 0.663 ± 0.692 |
| PRF-fit source offset from KIC position | 1.071 ± 2.765 | 0.39 | 0.865 ± 3.388 | 0.631 ± 0.667 |
| photometric centroid source offset | 1.66 ± 1.86 | 0.89 | -1.66 ± 1.86 | 0.01 ± 1.51 |

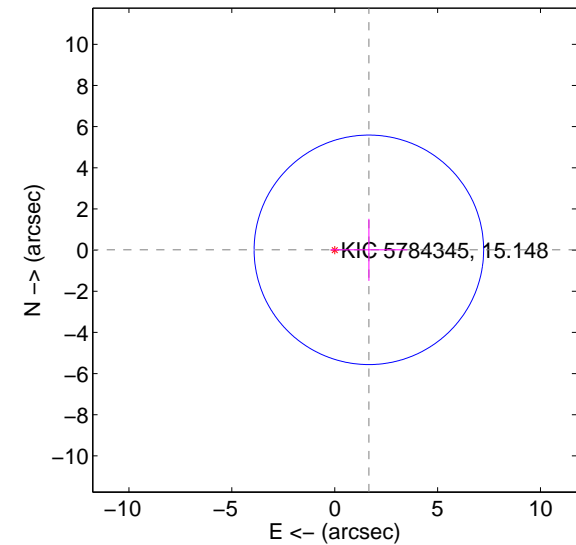
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

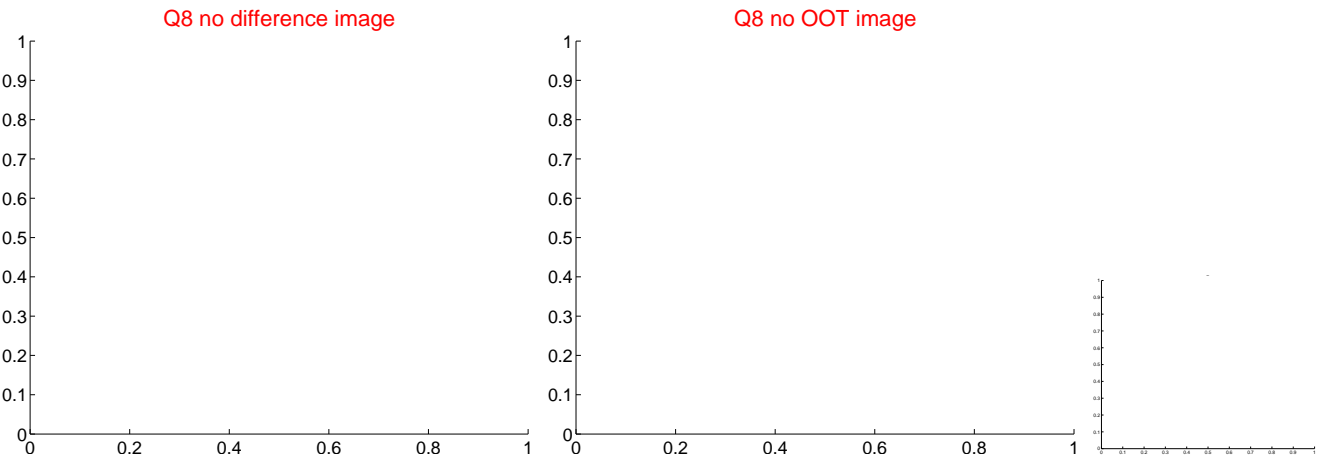
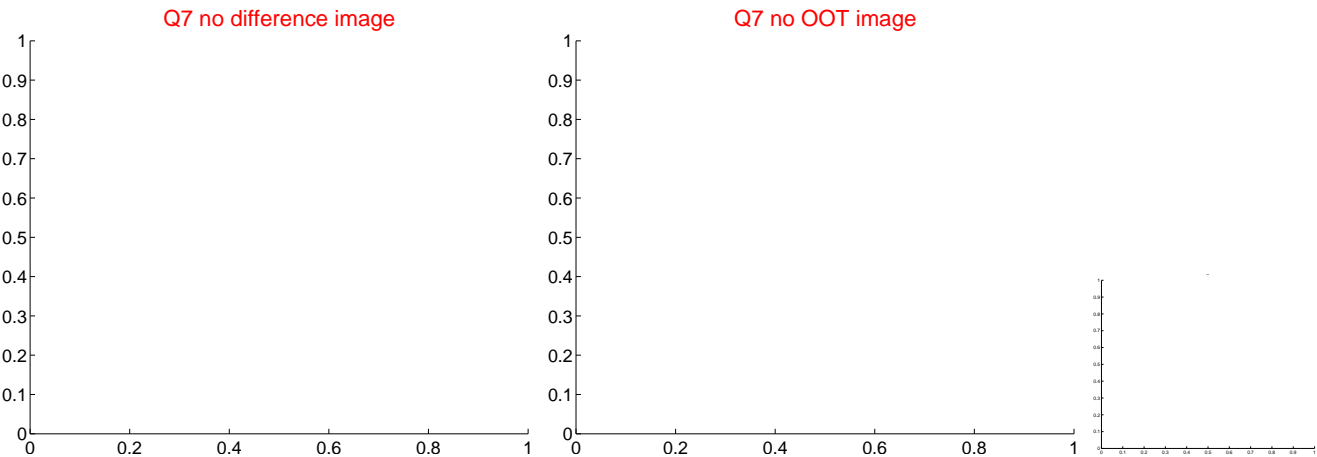
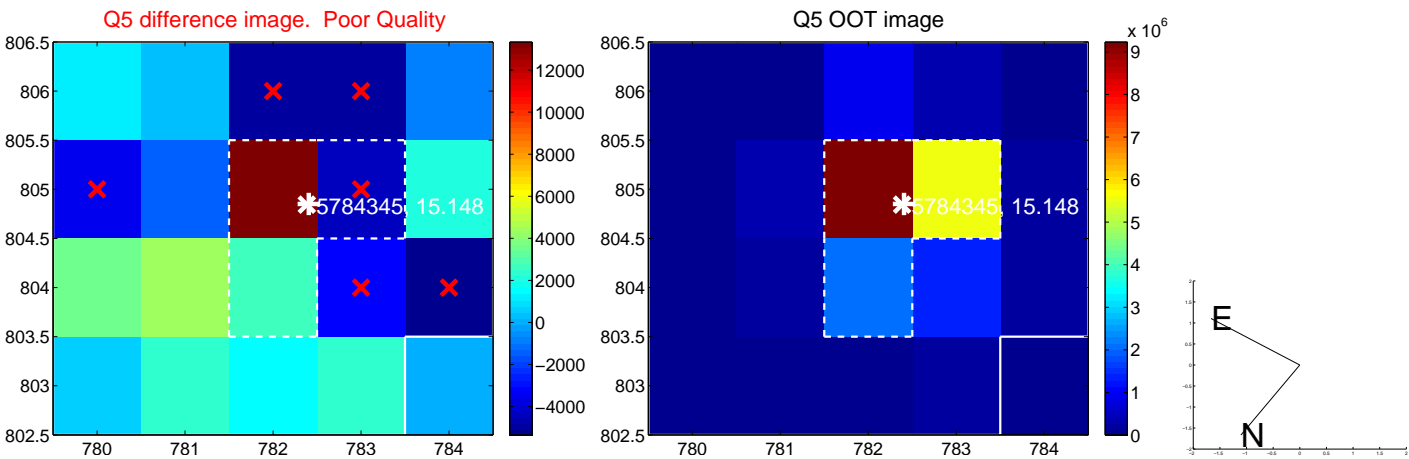


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

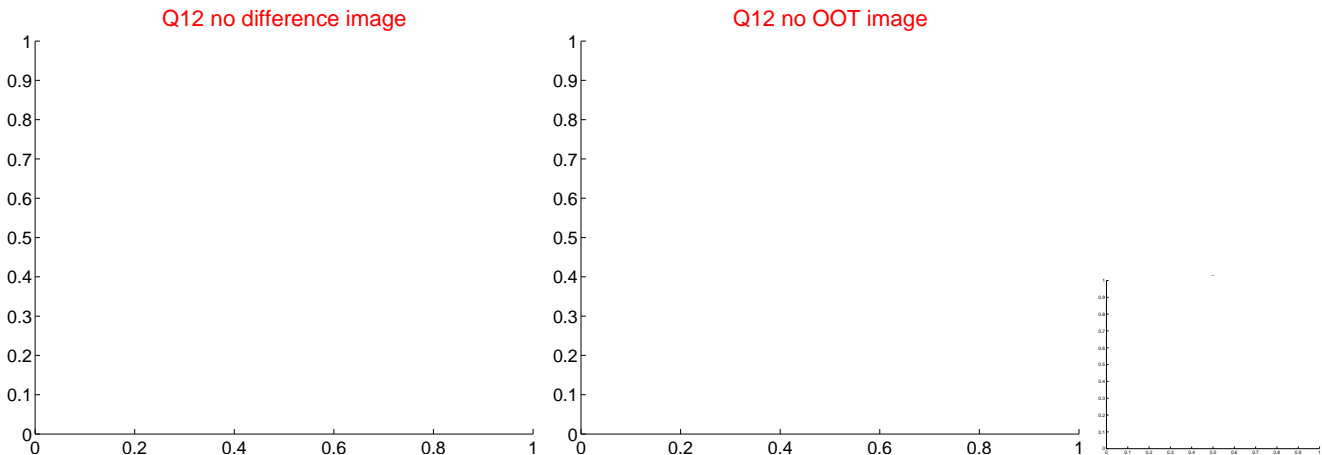
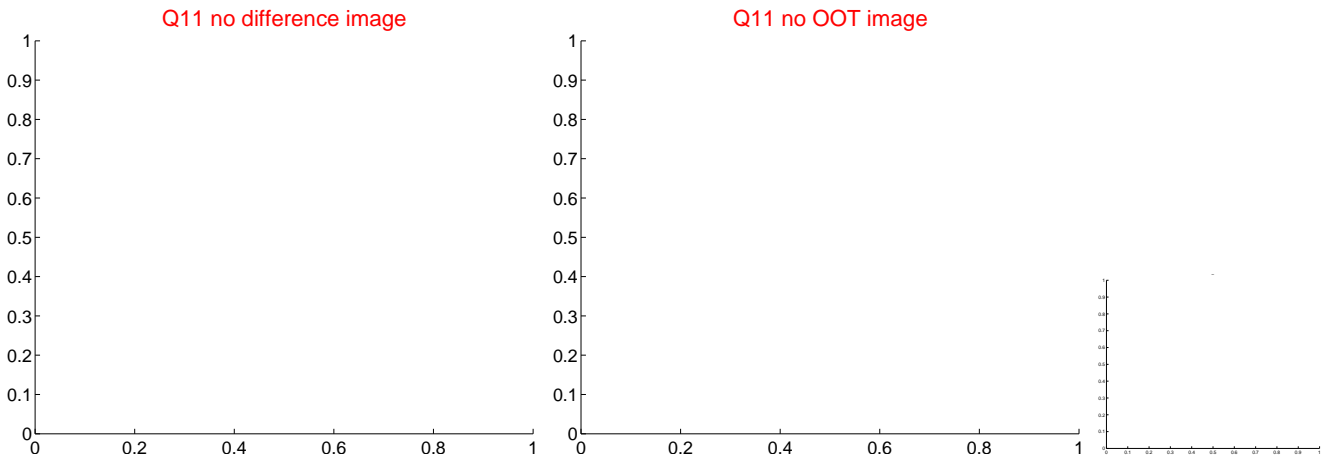
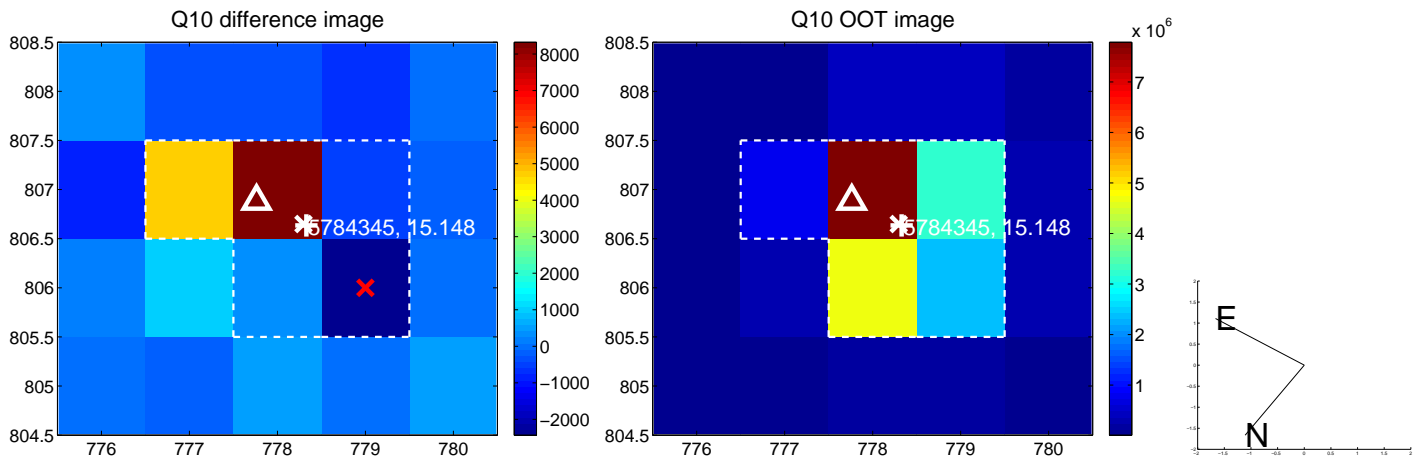
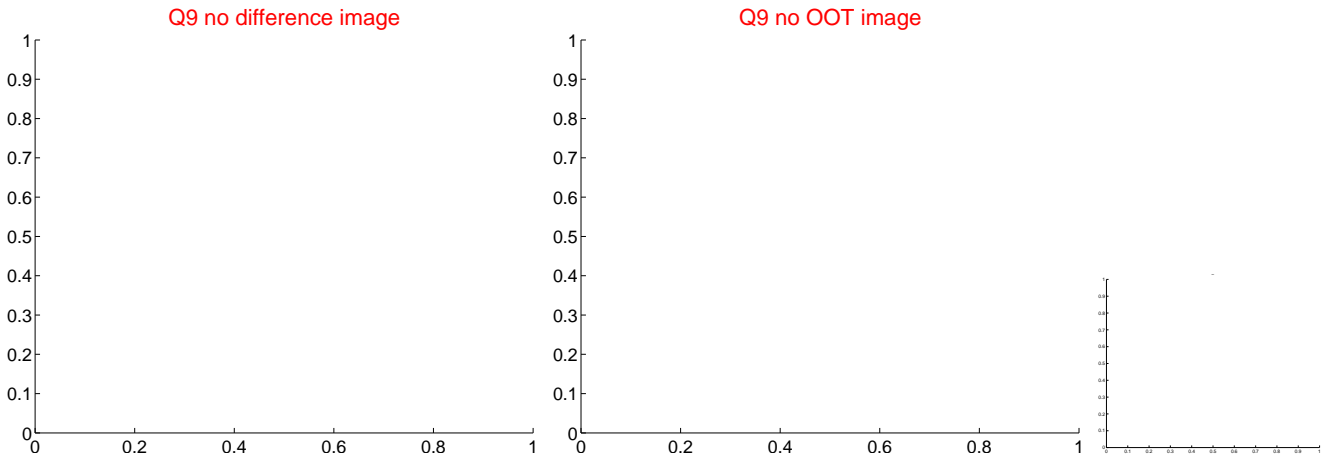
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



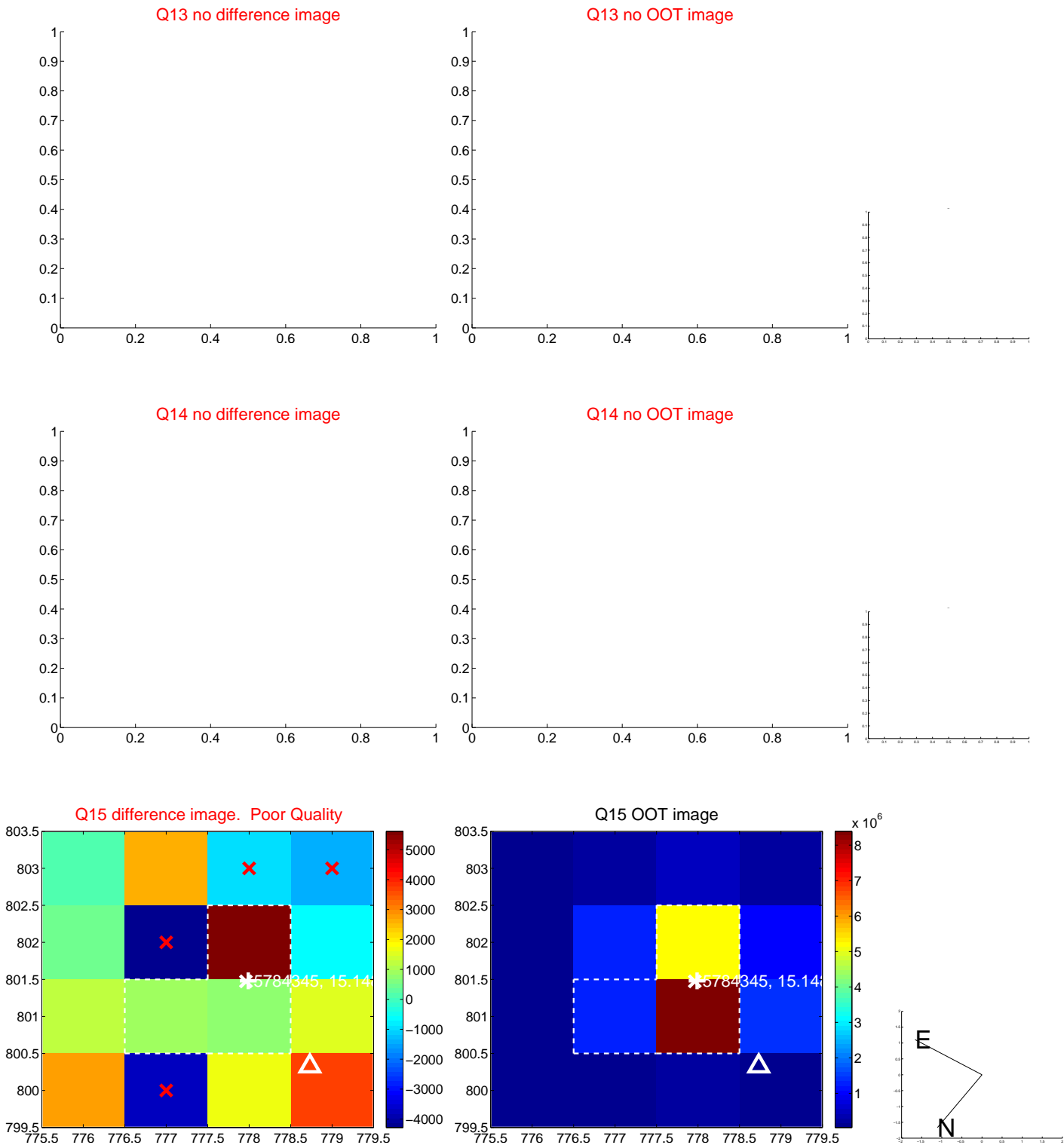
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



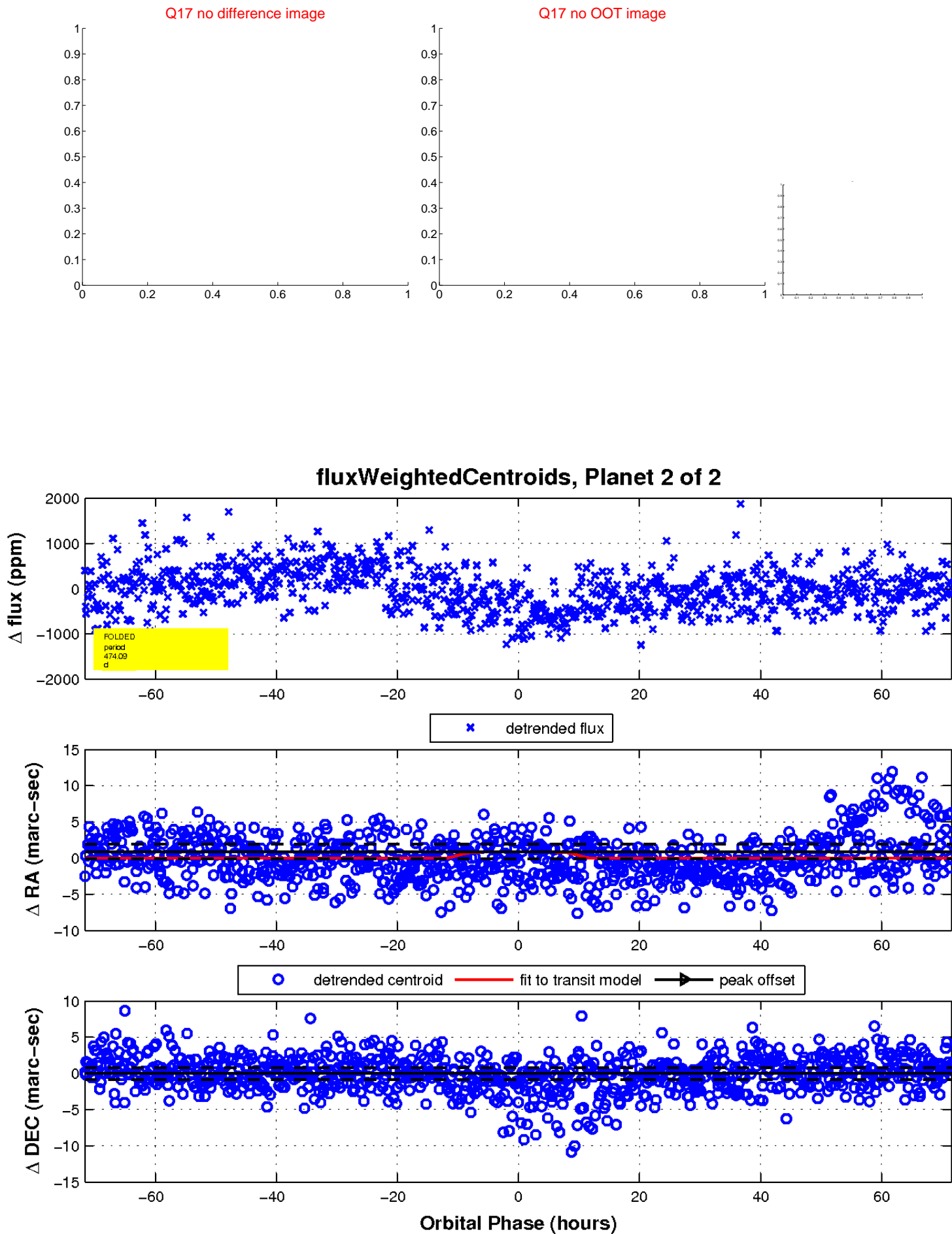
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

