

KIC 003952852

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 003952852-01 | OBS | No | 3.235501 | 134.574896 | 34.5 | 15.613 | 7.9 | 7.8 | 0.88 | 5741 | 0.51 | 426.82 |
| 003952852-02 | OBS | No | 206.449012 | 199.743290 | 546.9 | 22.287 | 11.7 | 10.4 | 0.88 | 5741 | 2.09 | 1.67 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 003952852-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | LPP_DV—CENT_UNRESOLVED_OFFSET |
| 003952852-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQU_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.

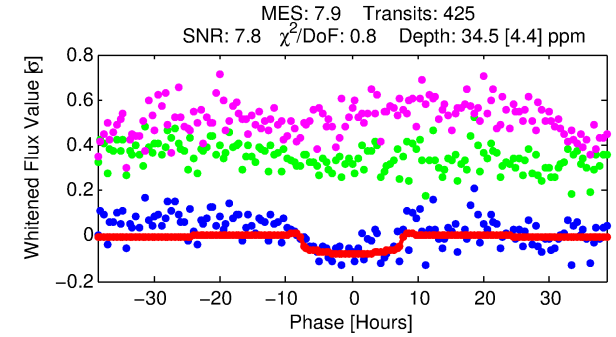
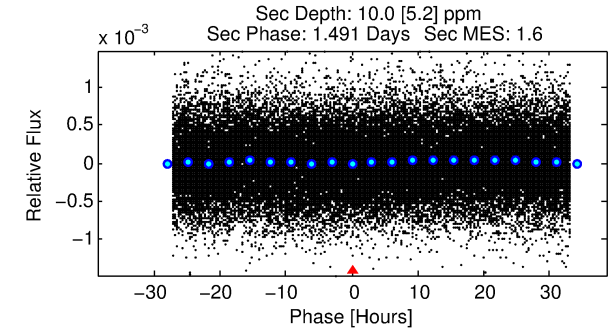
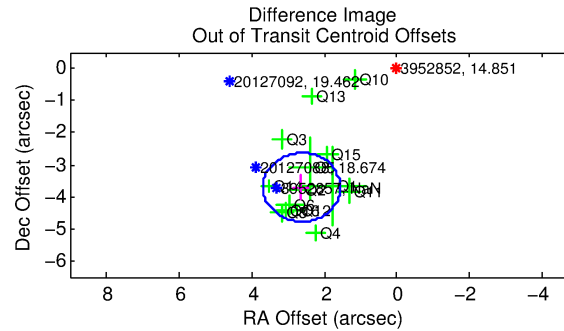
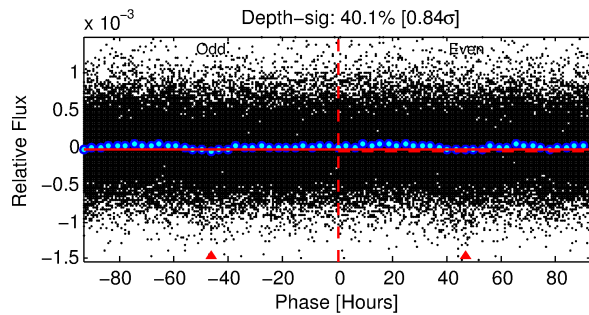
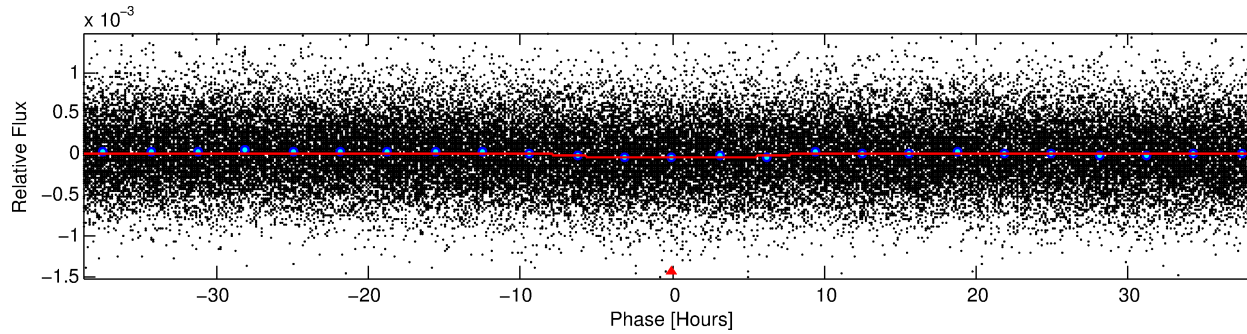
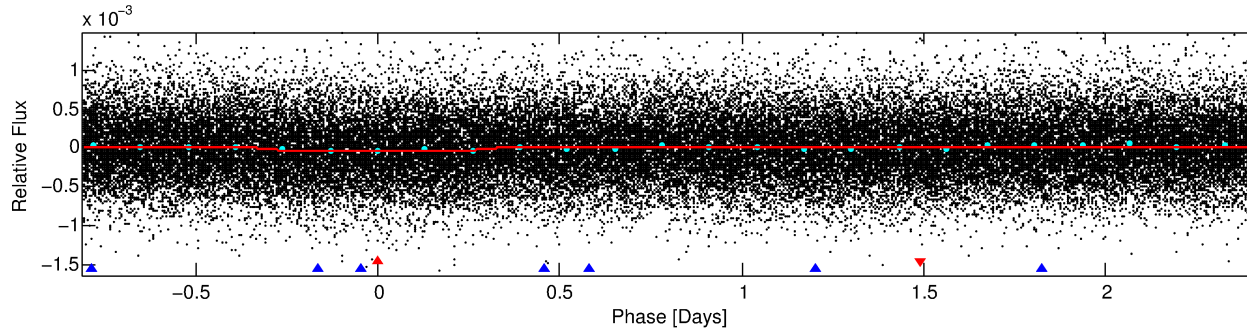
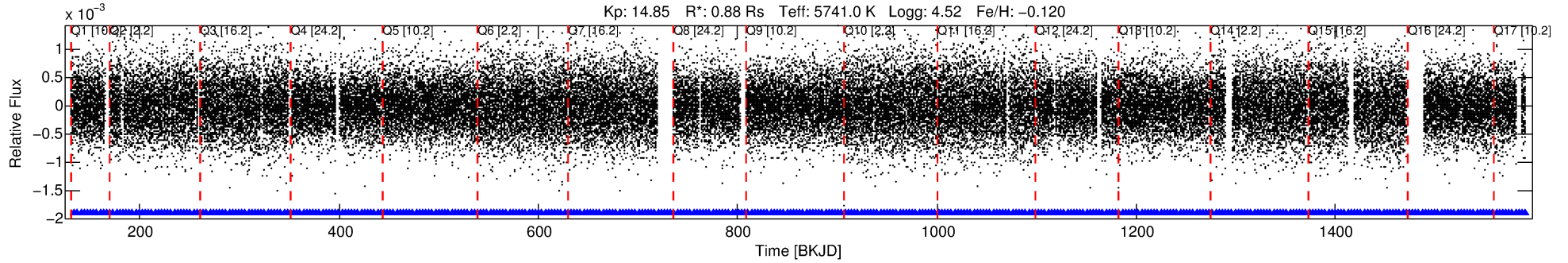
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003952852-01

No Significant Match Found

DV One-Page Summary

KIC: 3952852 Candidate: 1 of 2 Period: 3.236 d



DV Fit Results:

Period = 3.23550 [0.00010] d
Epoch = 134.5749 [0.0190] BKJD
Rp/R* = 0.0053 [0.0106]
a/R* = 1.69 [9.67]
b = 0.17 [52.27]
Seff = 426.82 [163.74]
Teq = 1159 [111] K
Rp = 0.51 [1.03] Re
a = 0.0420 [0.0105] AU
Ag = 36.69 [147.62] [0.24 σ]
Teffp = 4410 [4420] K [0.74 σ]

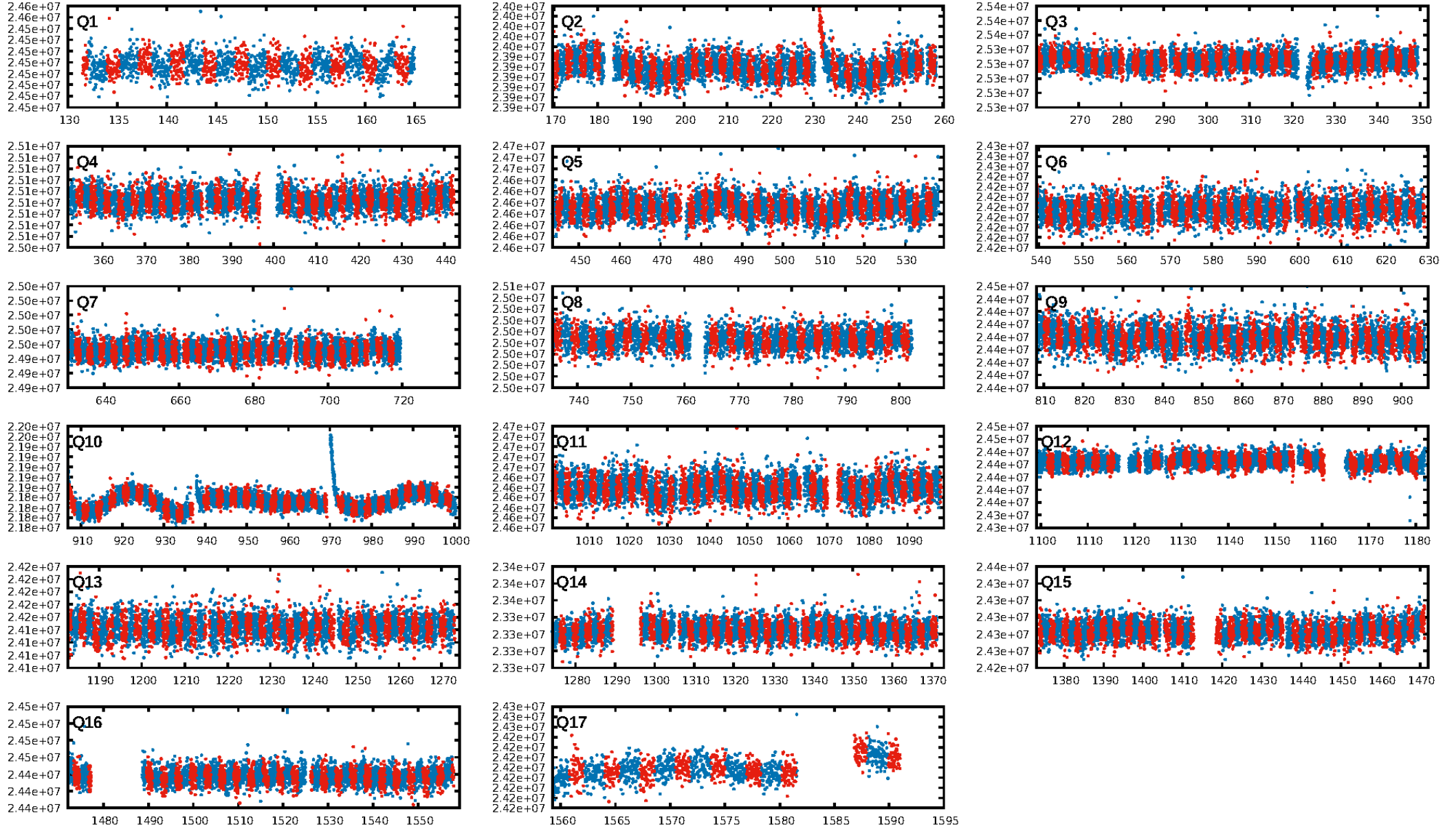
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [179.23 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 8.13e-14
RollingBand-fgt: 1.00 [405/405]
GhostDiagnostic-chr: 0.3888
Centroid-sig: 0.0%
Centroid-so: 14.929 arcsec [7.84 σ]
OotOffset-rm: 4.542 arcsec [12.74 σ]
KicOffset-rm: 4.996 arcsec [14.41 σ]
OotOffset-st: 4/3/4/3 [14]
KicOffset-st: 4/3/4/3 [14]
DiffImageQuality-fgm: 0.93 [13/14]
DiffImageOverlap-fno: 1.00 [17/17]

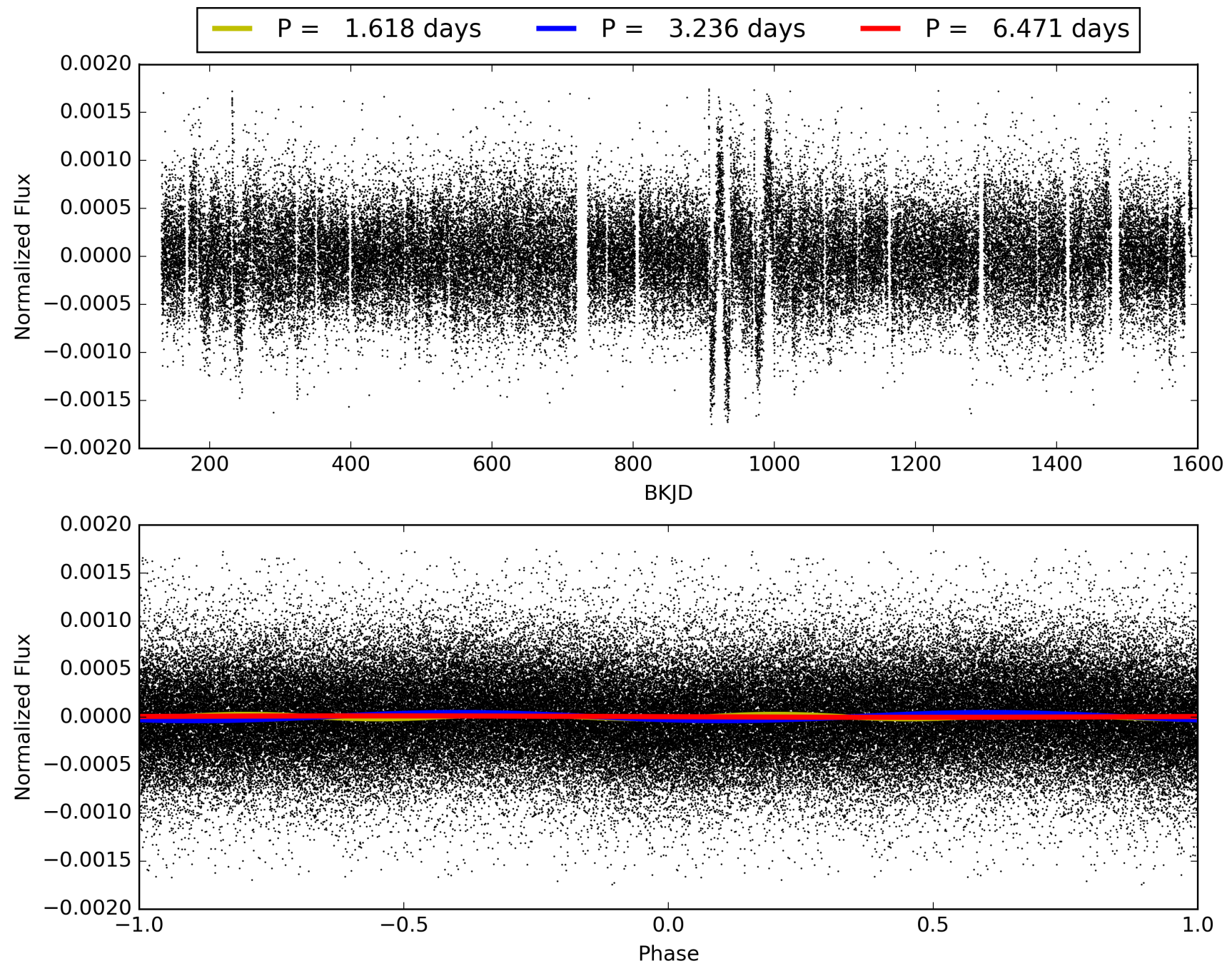
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:01:17 Z

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

TCE 003952852-01, PDC Light Curves

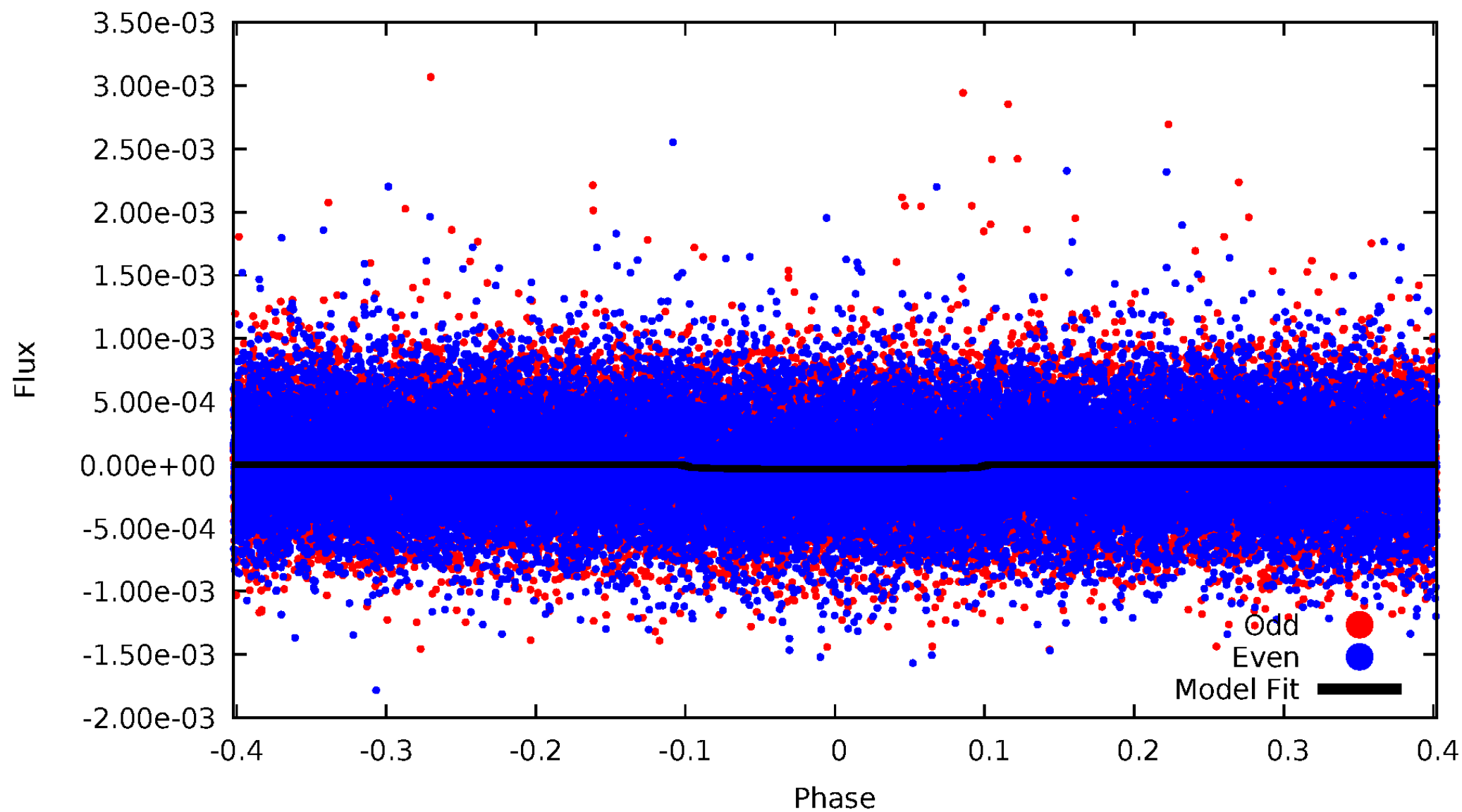


TCE 003952852-01



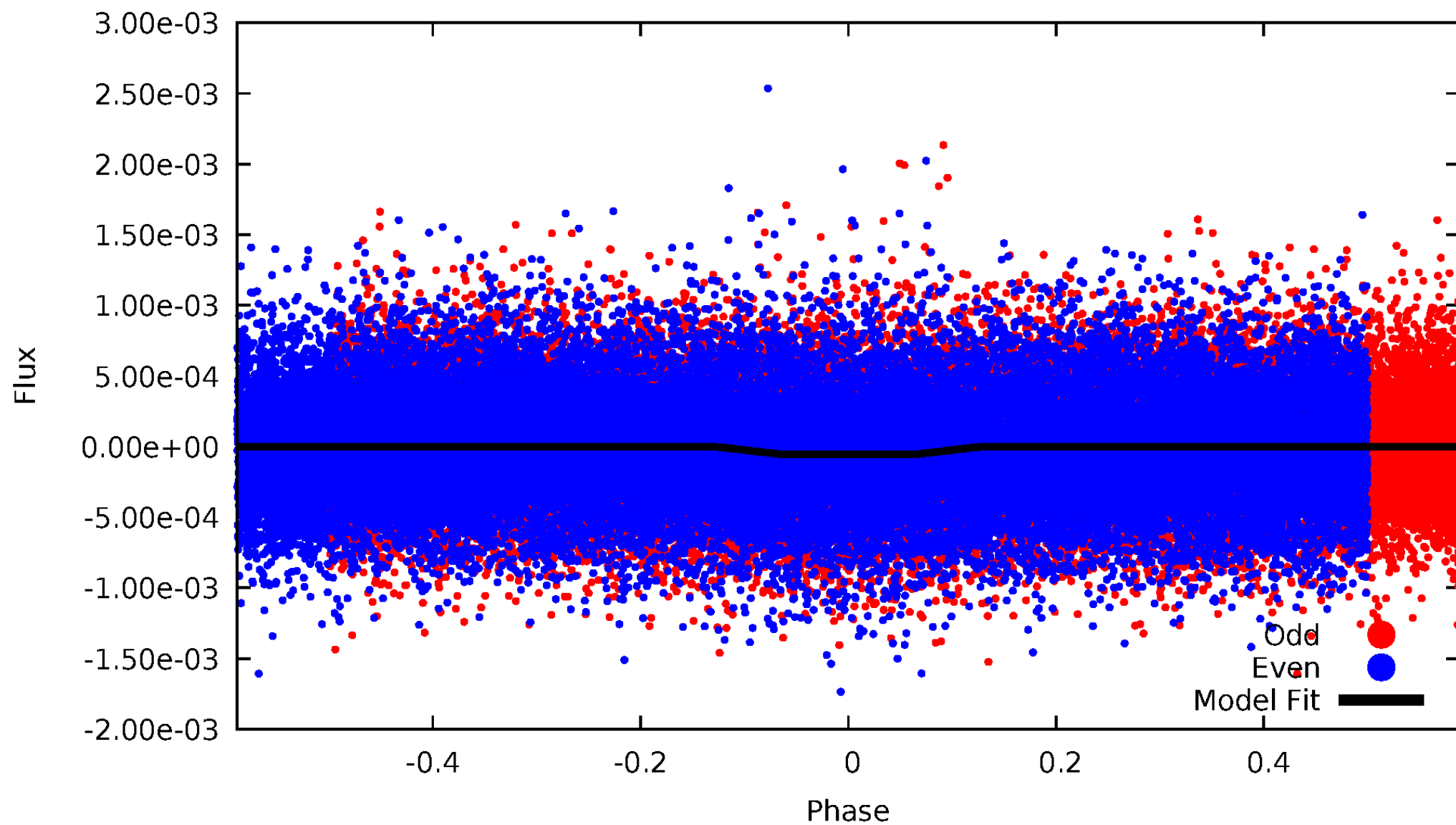
DV Odd/Even

TCE 003952852-01



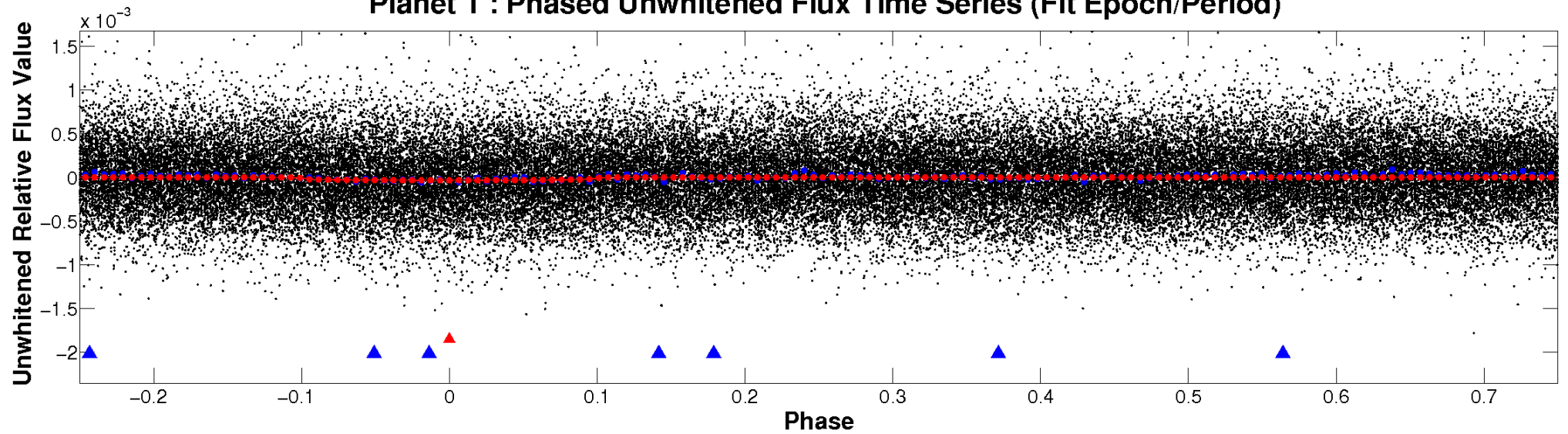
ALT Odd/Even

TCE 003952852-01

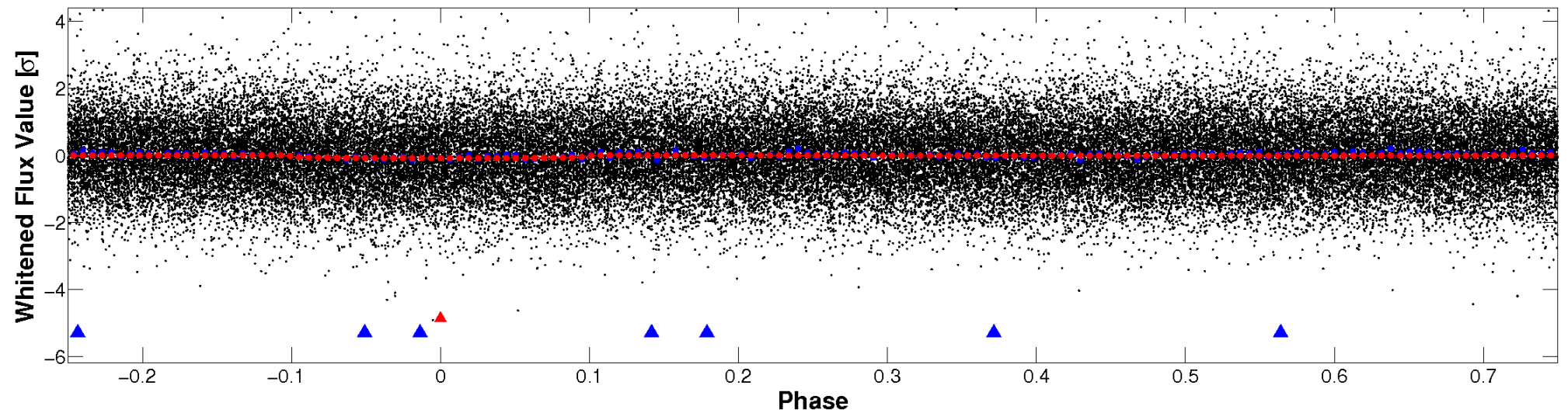


Non-Whitened Vs. Whitened Light Curve

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

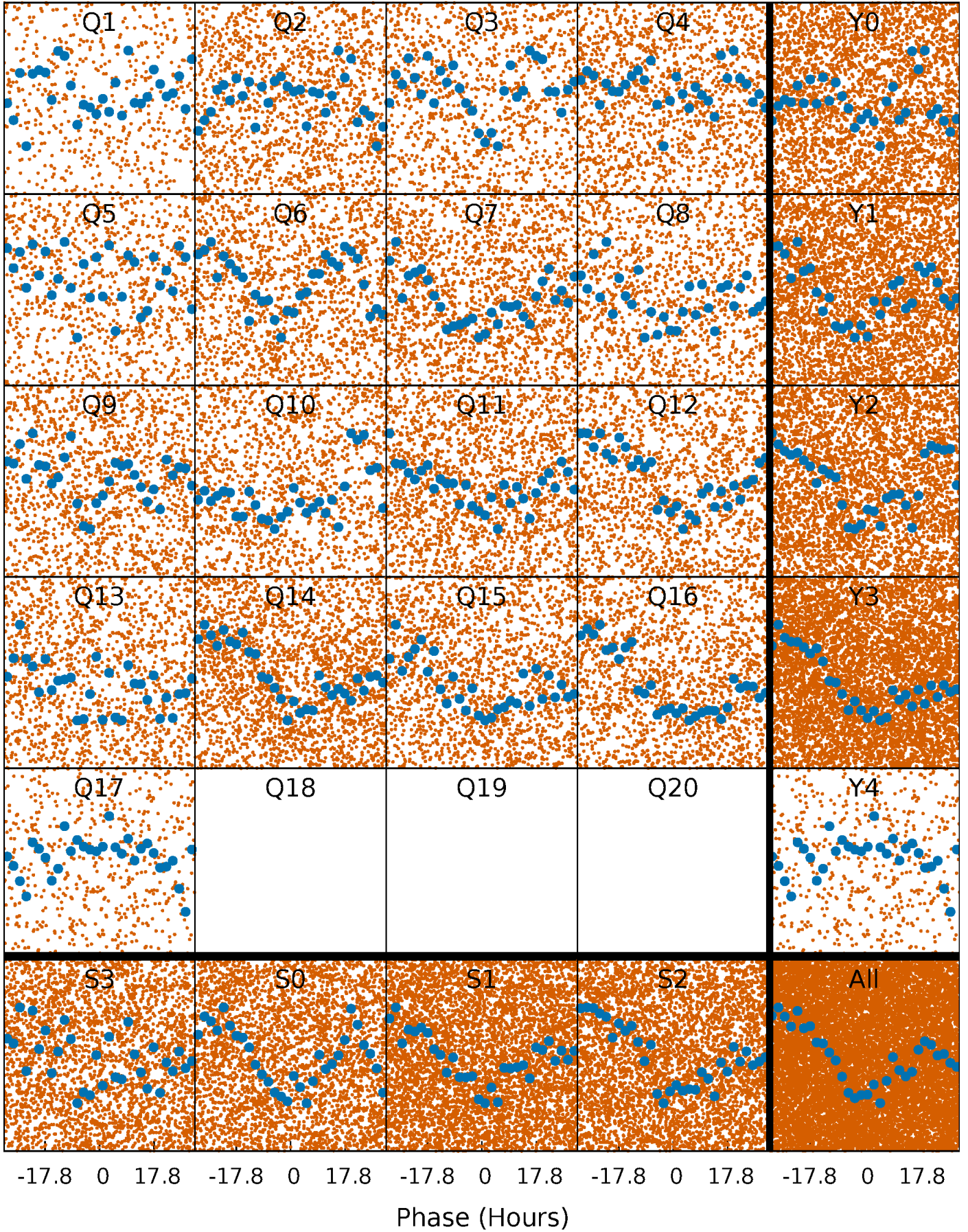


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



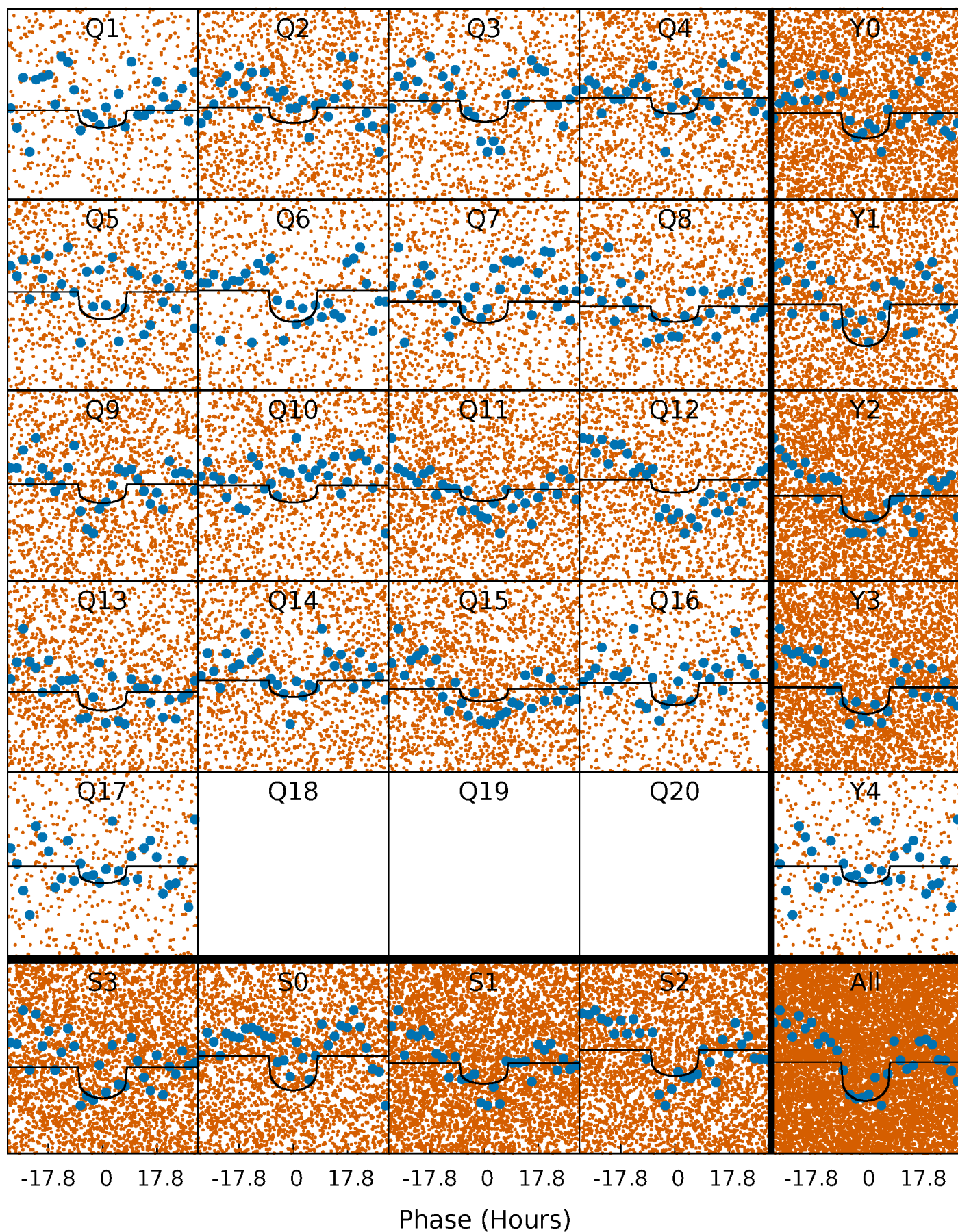
PDC Quarter-Phased Transit Curves

TCE 003952852-01 P= 3.235501 Days $T_0=134.574896$ (BKJD)



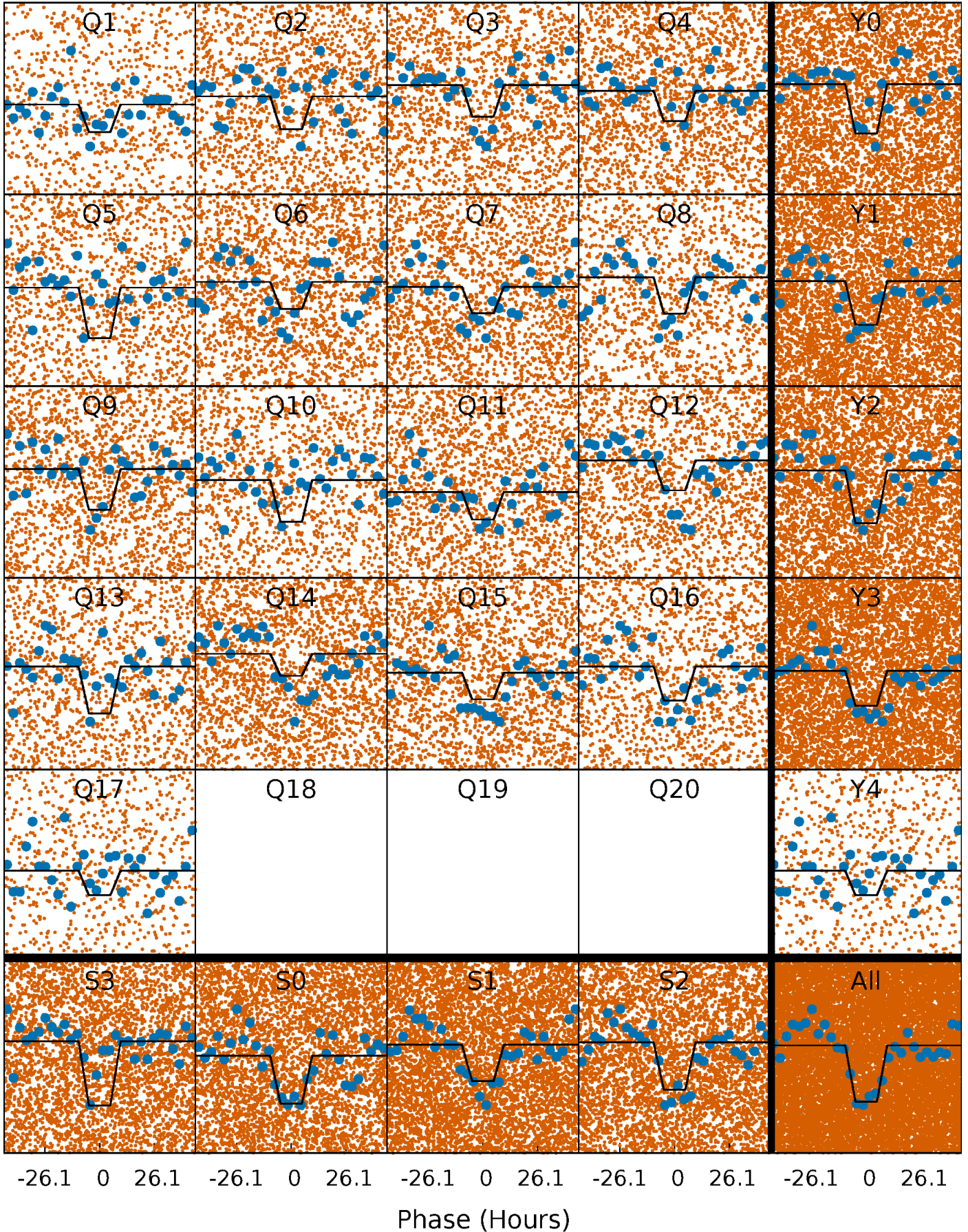
DV Quarter-Phased Transit Curves

TCE 003952852-01 P= 3.235501 Days $T_0=134.574896$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

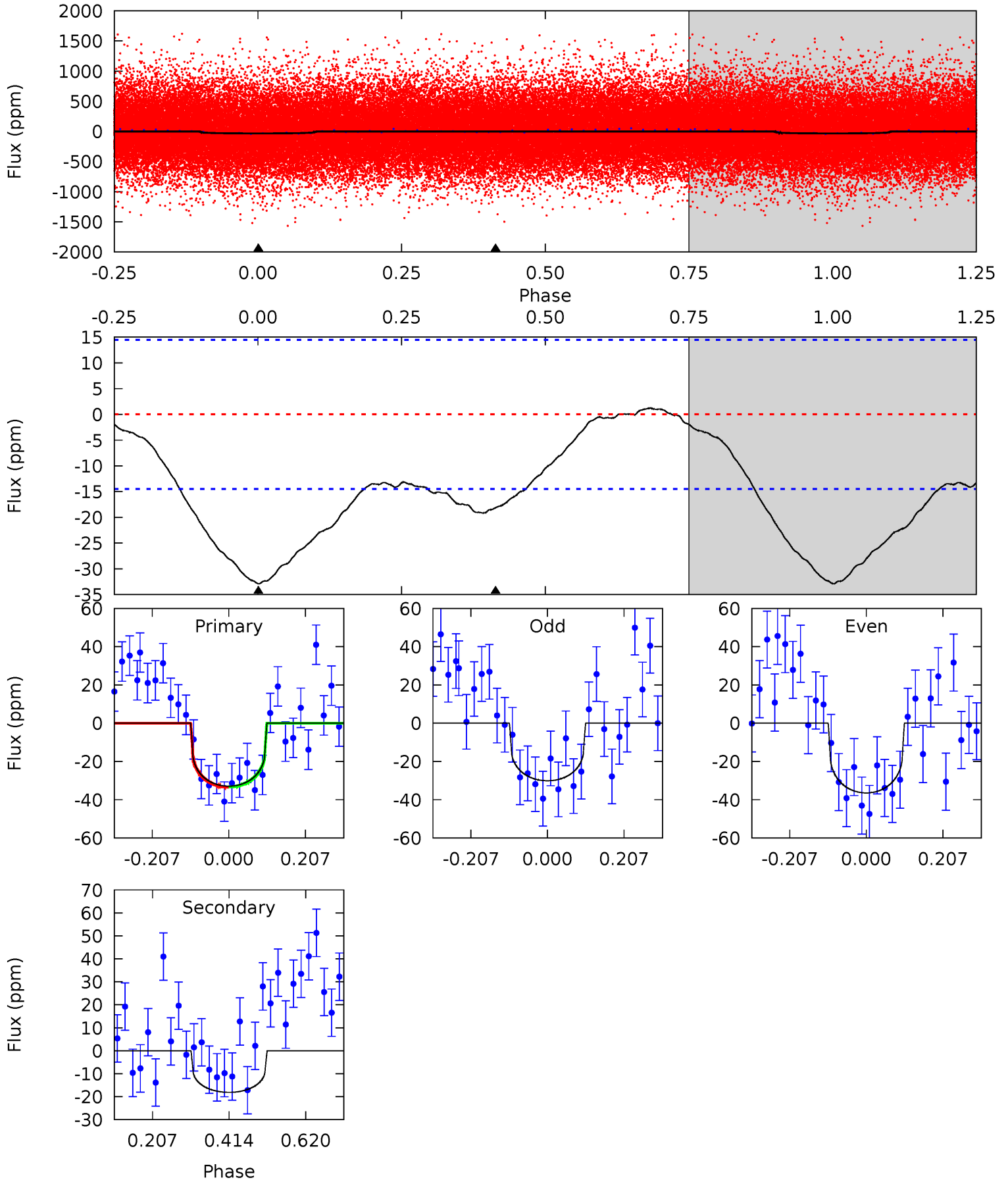
TCE 003952852-01 P= 3.235116 Days $T_0=134.621180$ (BKJD)



DV Model-Shift Uniqueness Test

003952852-01, P = 3.235501 Days, E = 131.339395 Days

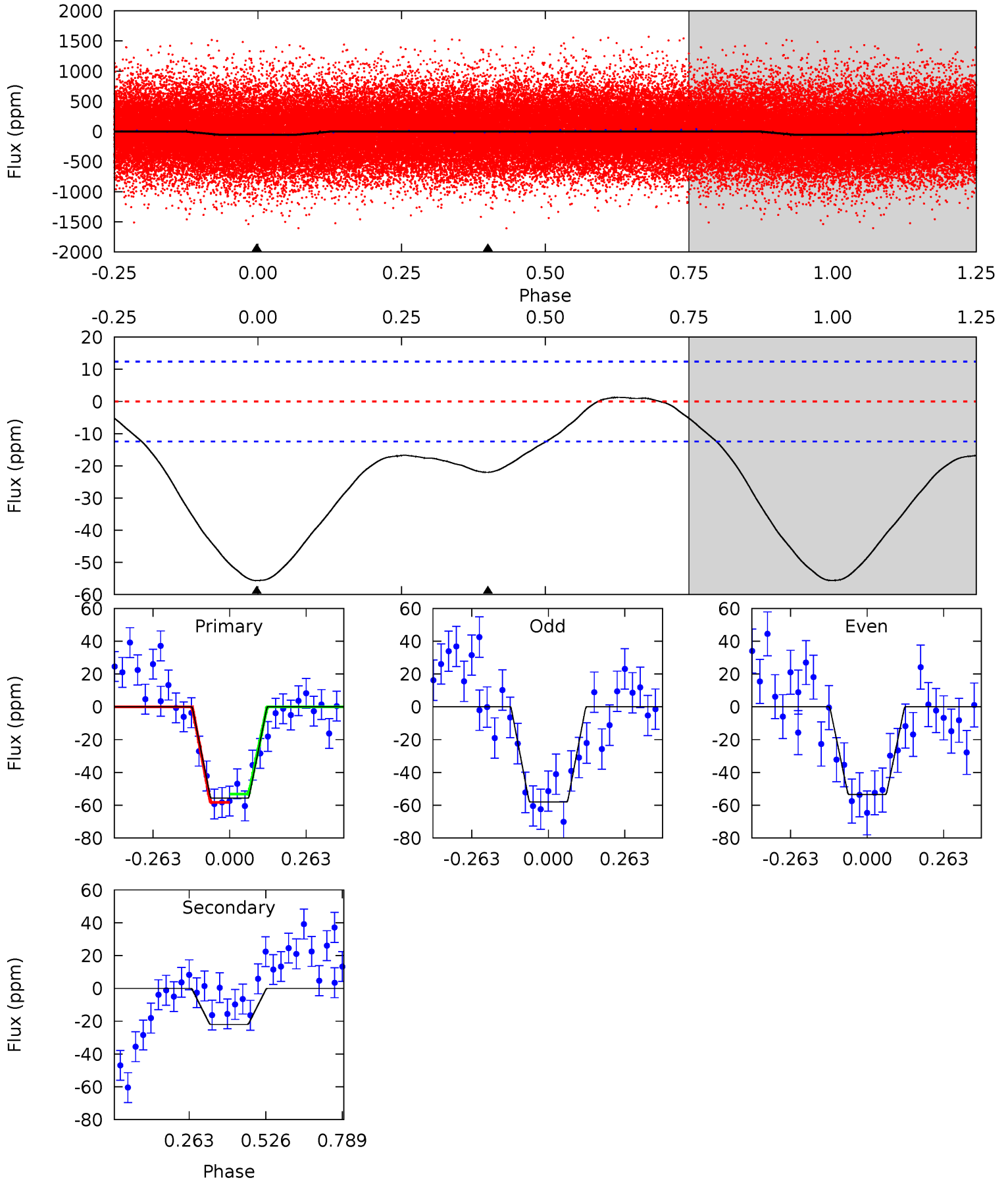
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.0 | 5.52 | 0 | 0 | 4.41 | 1.26 | 0.51 | 10.0 | 10.0 | 5.52 | 5.52 | 0.97 | 1.09 | 0.04 | 0.02 |



Alt Model-Shift Uniqueness Test

003952852-01, P = 3.235116 Days, E = 131.386064 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 19.5 | 7.72 | 0 | 0 | 4.36 | 1.12 | 0.65 | 19.5 | 19.5 | 7.72 | 7.72 | 0.80 | 1.04 | 0.02 | 0.88 |



Stellar Parameters For KIC 003952852

| | $T_{\text{eff}} (K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5741^{+153}_{-170} | $4.524^{+0.050}_{-0.200}$ | $-0.120^{+0.300}_{-0.300}$ | $0.879^{+0.260}_{-0.087}$ | $0.942^{+0.104}_{-0.104}$ | $1.950^{+0.492}_{-1.003}$ |
| | +3%/-3% | +1%/-4% | +250%/-250% | +30%/-10% | +11%/-11% | +25%/-51% |
| Source | PHO1 | 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 003952852-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|-----------------------|-------------------|
| DV | -18 ± 3 | $1.03^{+0.85}_{-0.72}$ | 1653^{+116}_{-80} | 4011^{+2753}_{-775} | 17^{+162}_{-13} |
| Alt. | -22 ± 3 | $1.12^{+0.90}_{-0.73}$ | 1652^{+112}_{-79} | 4043^{+2283}_{-749} | 17^{+117}_{-11} |

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

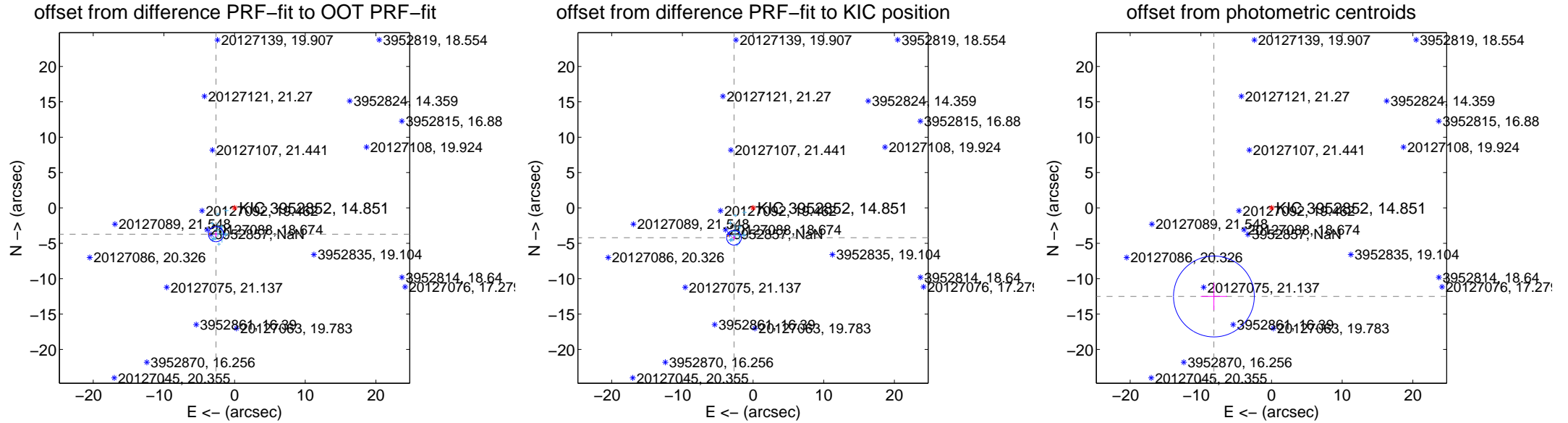
DV Centroid Data

Supplemental centroid analysis for 003952852-01. Kepler magnitude: 14.85. Transit SNR 7.81

There are 13 quarters with good PRF difference image offsets

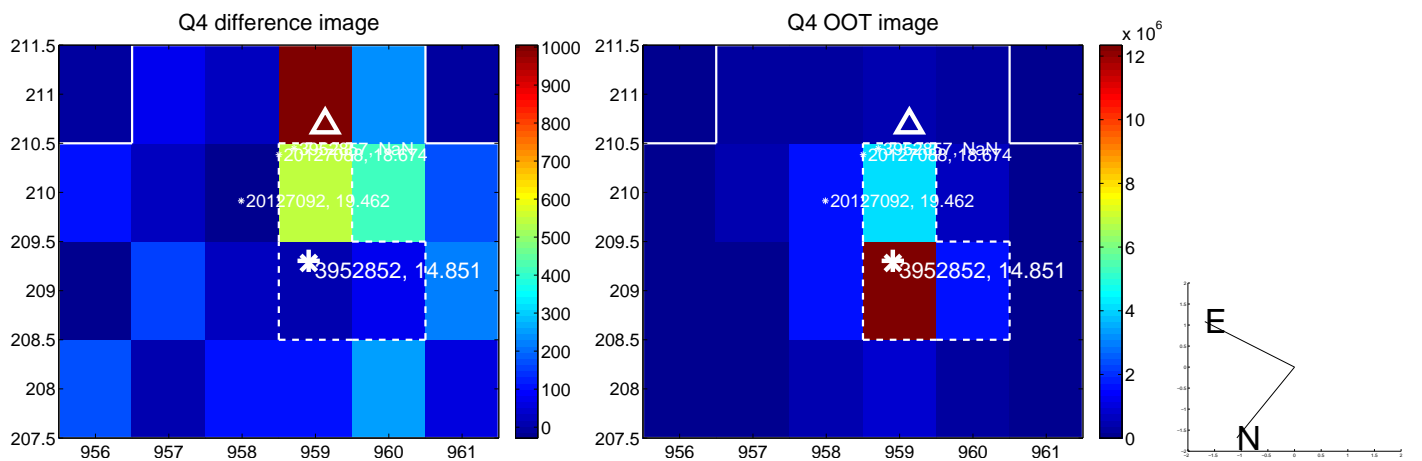
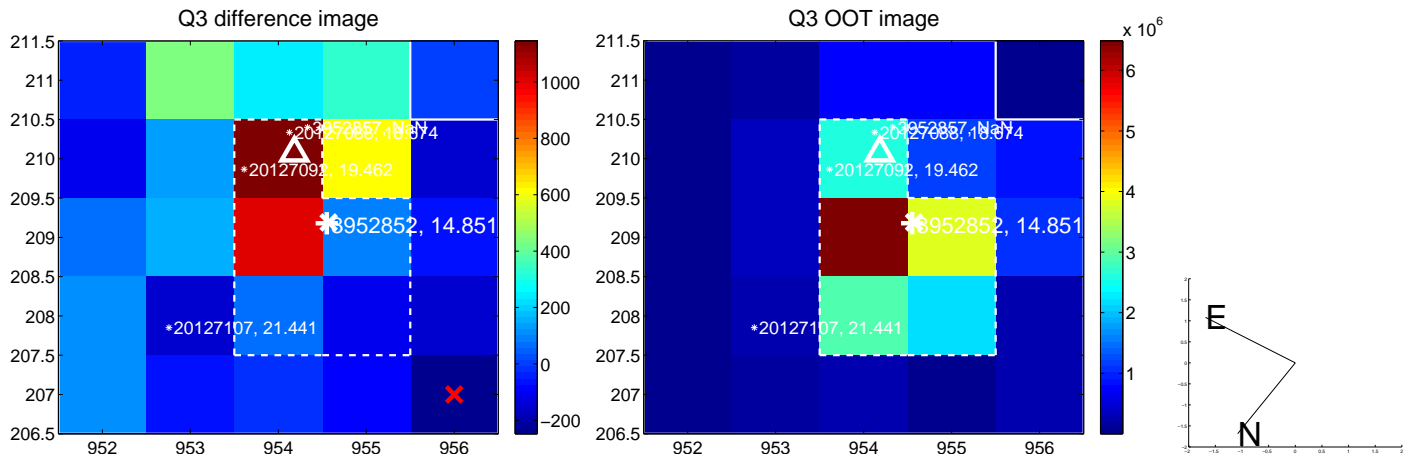
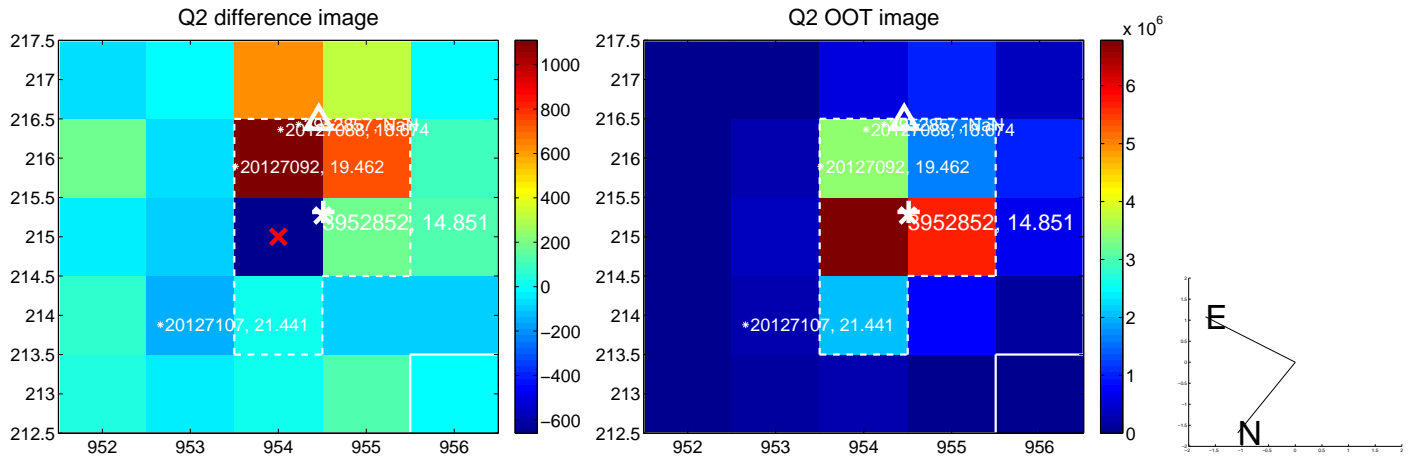
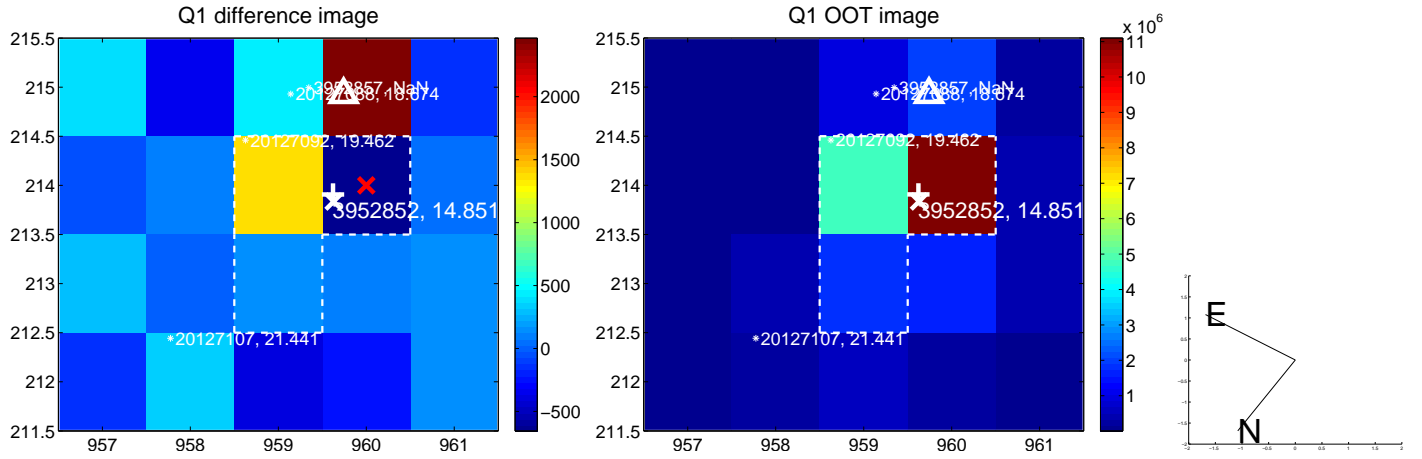
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 4.542 \pm 0.356 | 12.74 | 2.626 \pm 0.199 | -3.706 \pm 0.363 |
| PRF-fit source offset from KIC position | 4.996 \pm 0.347 | 14.41 | 2.694 \pm 0.195 | -4.207 \pm 0.356 |
| photometric centroid source offset | 14.93 \pm 1.90 | 7.84 | 8.15 \pm 1.86 | -12.51 \pm 1.92 |

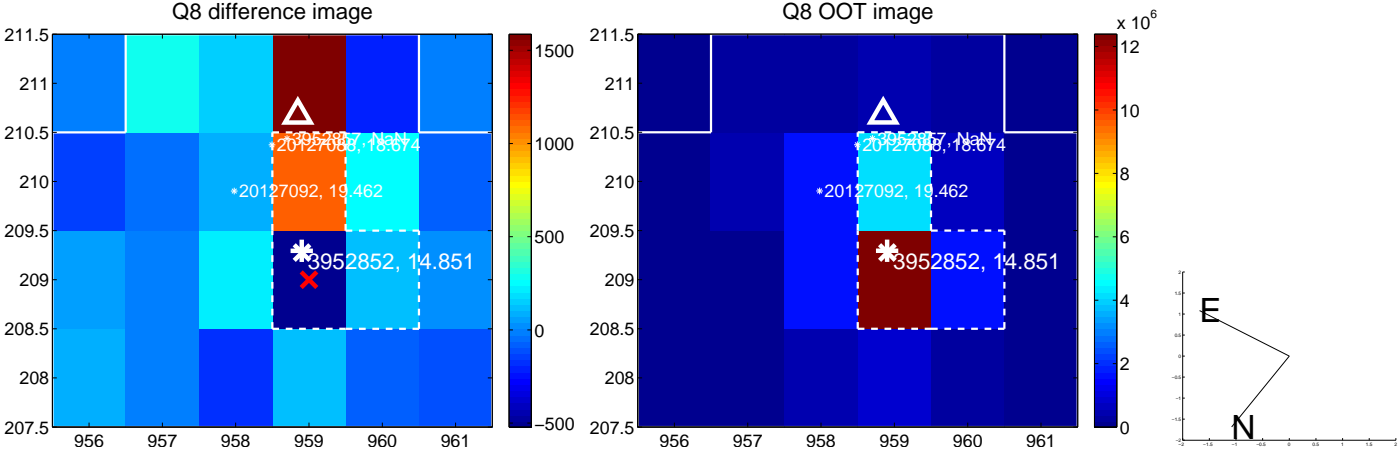
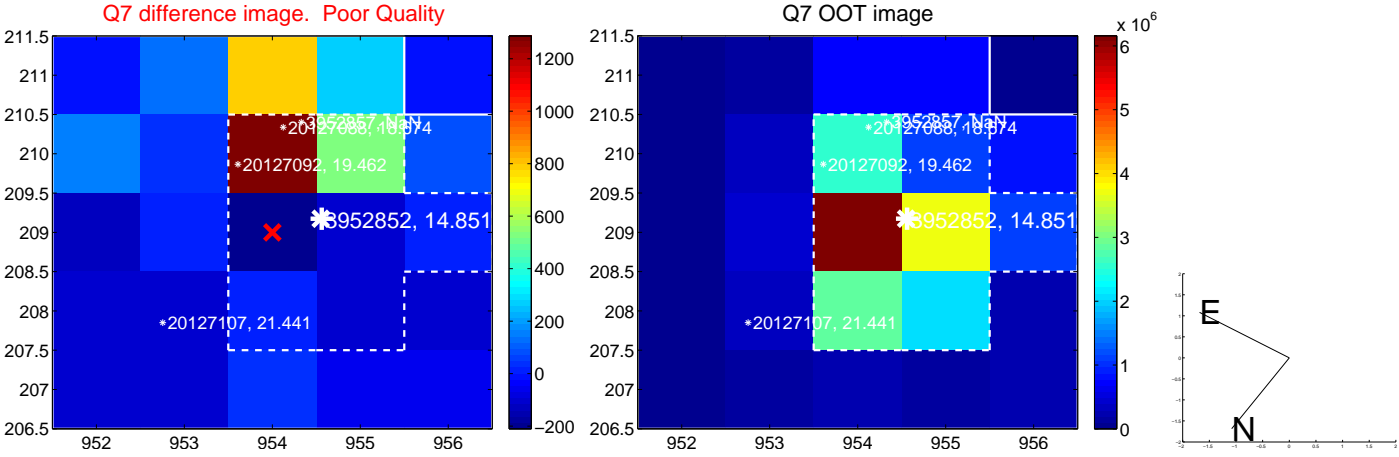
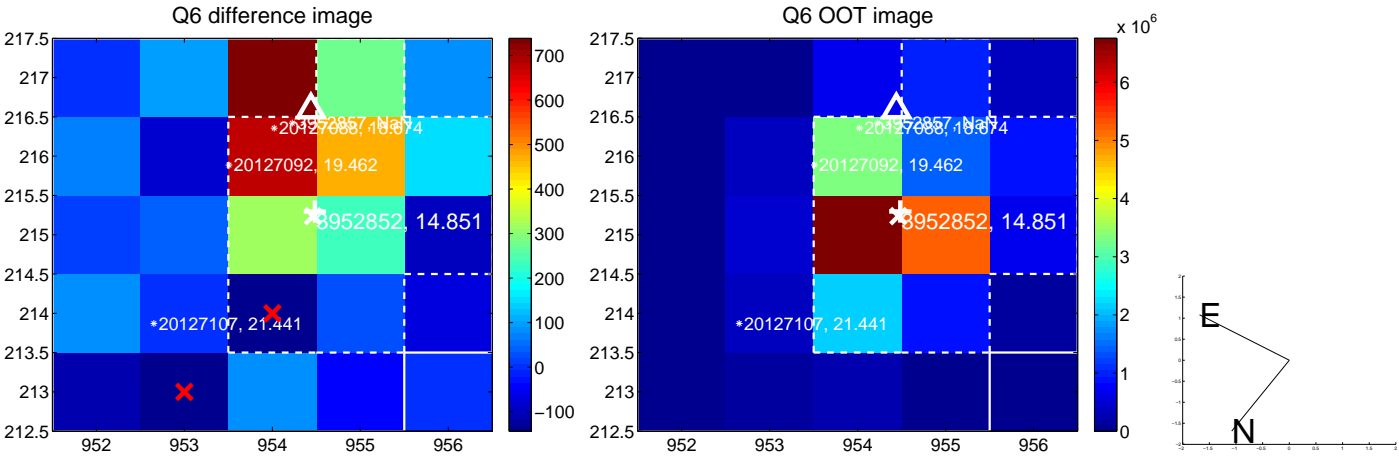
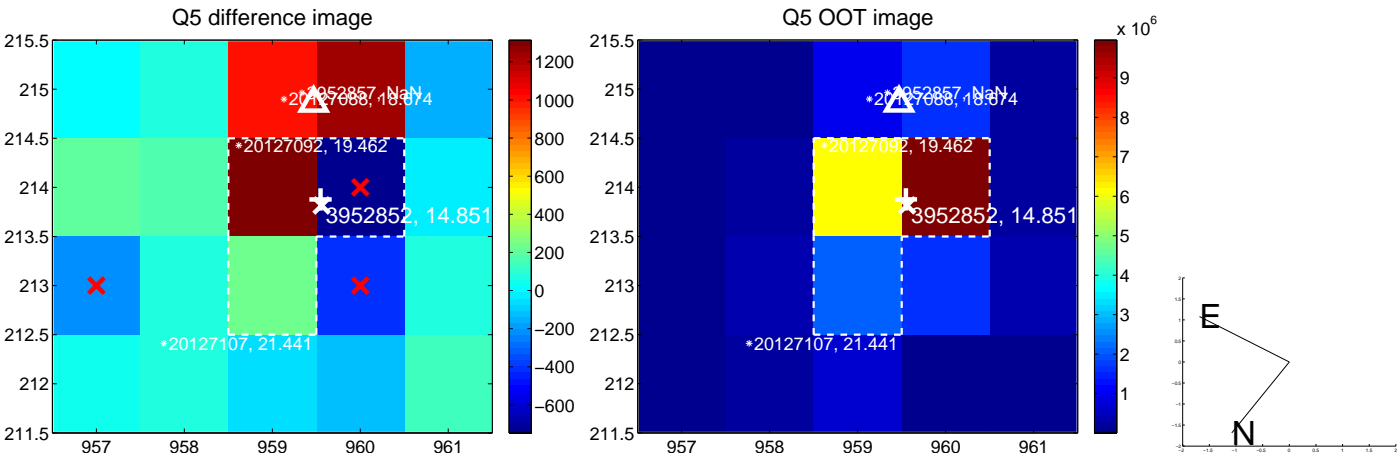


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

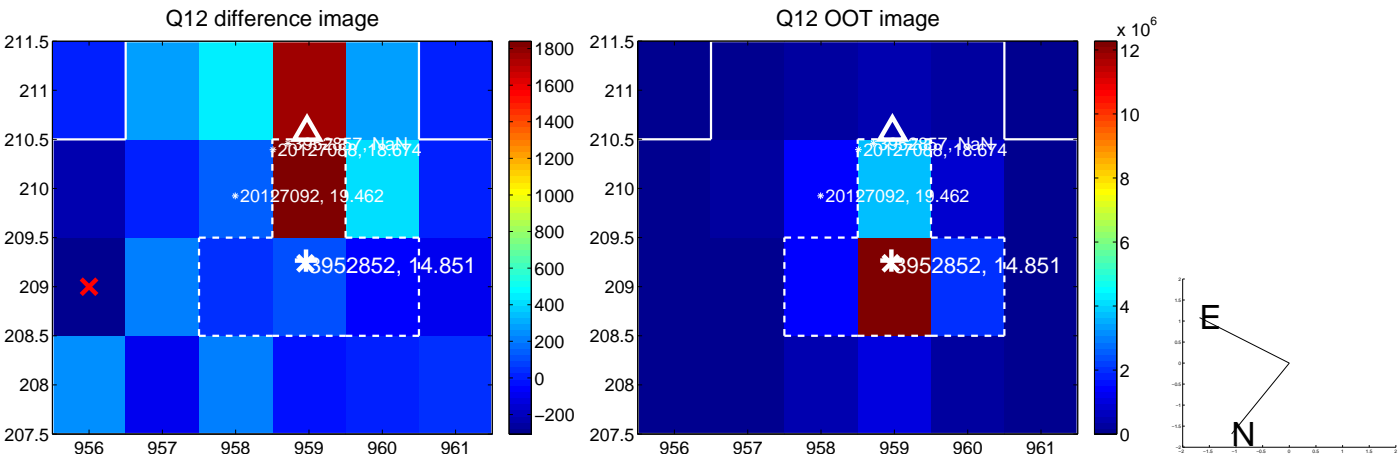
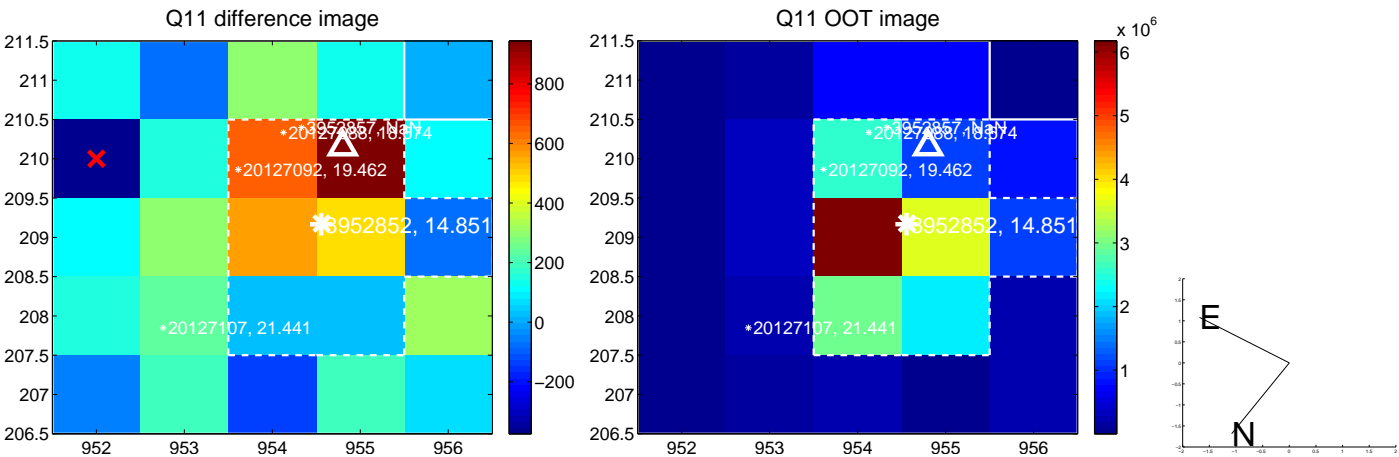
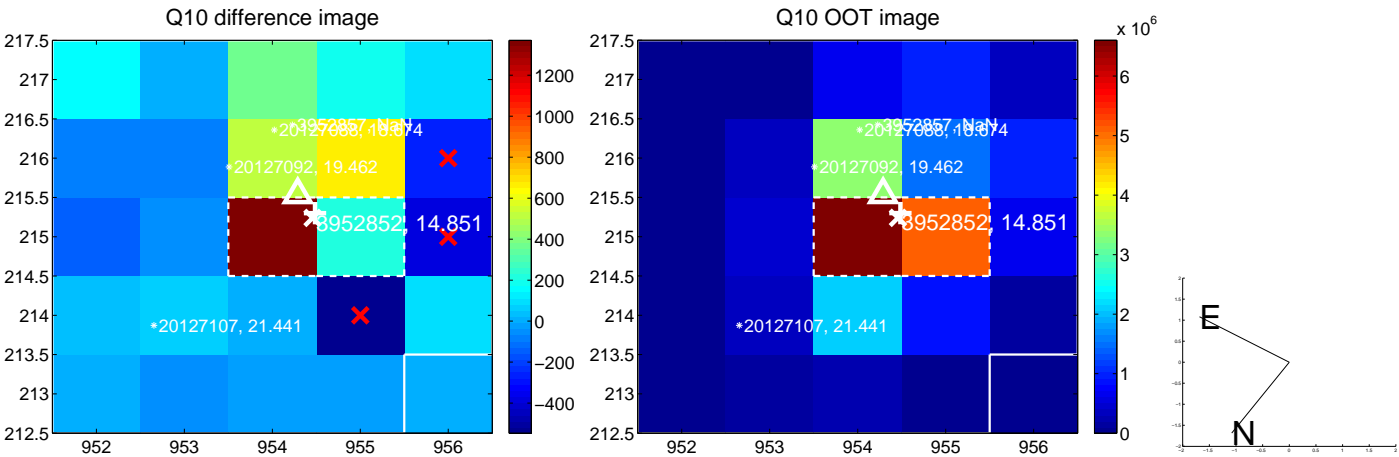
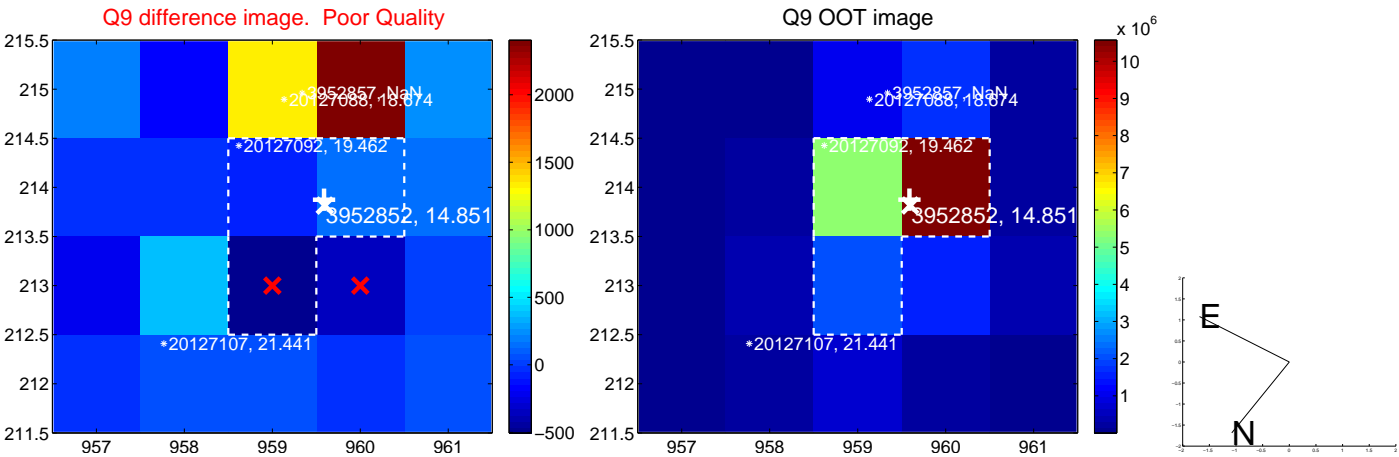
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



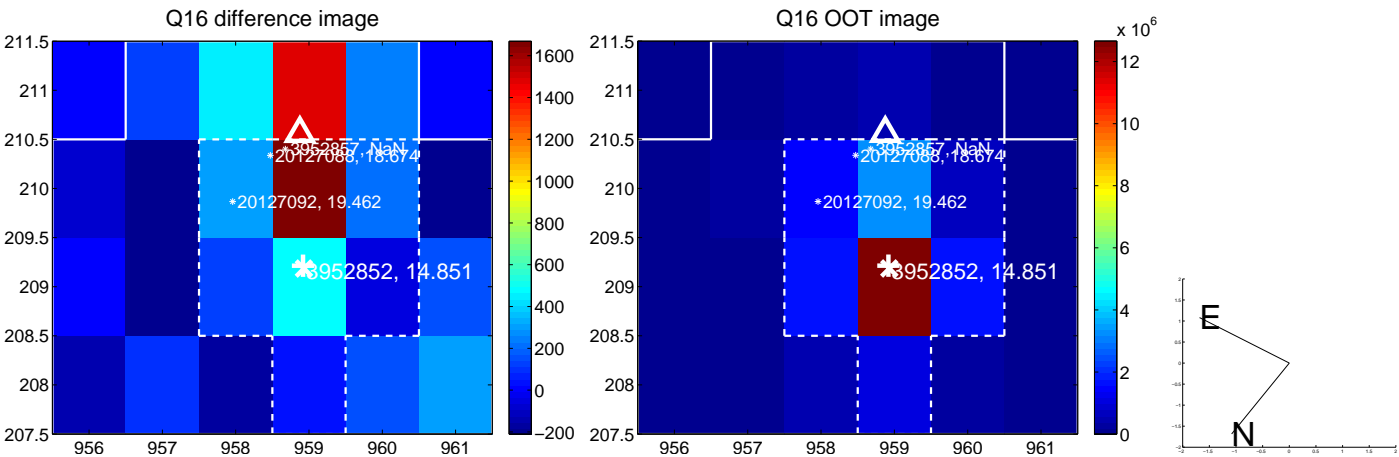
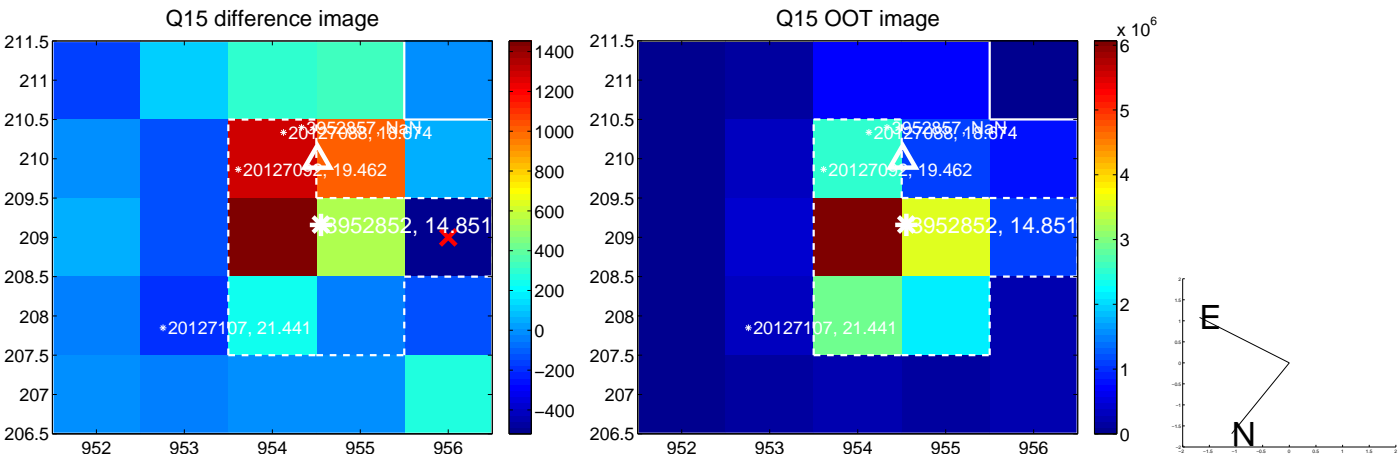
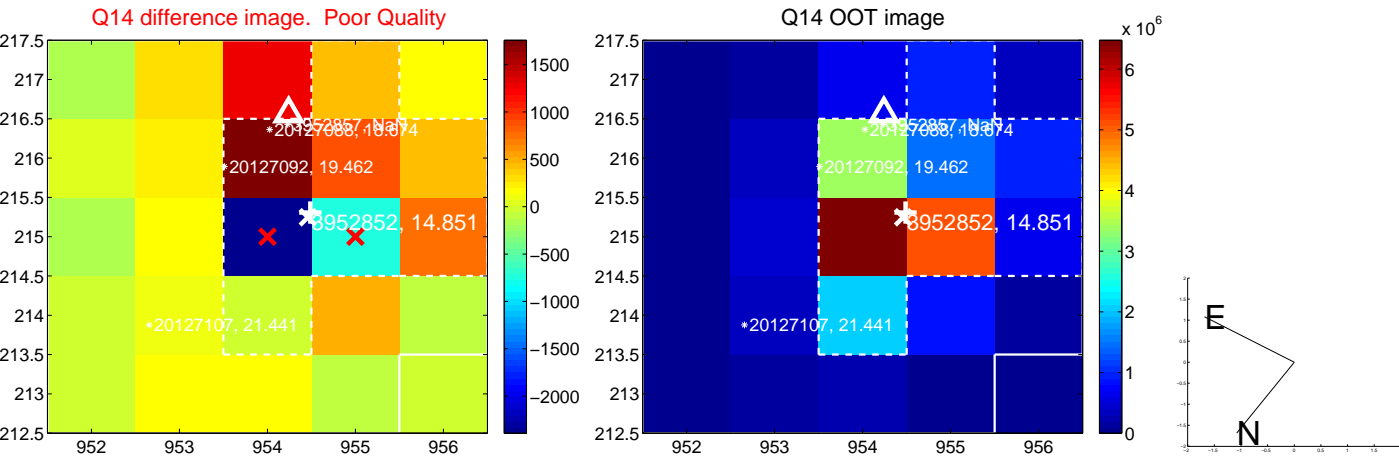
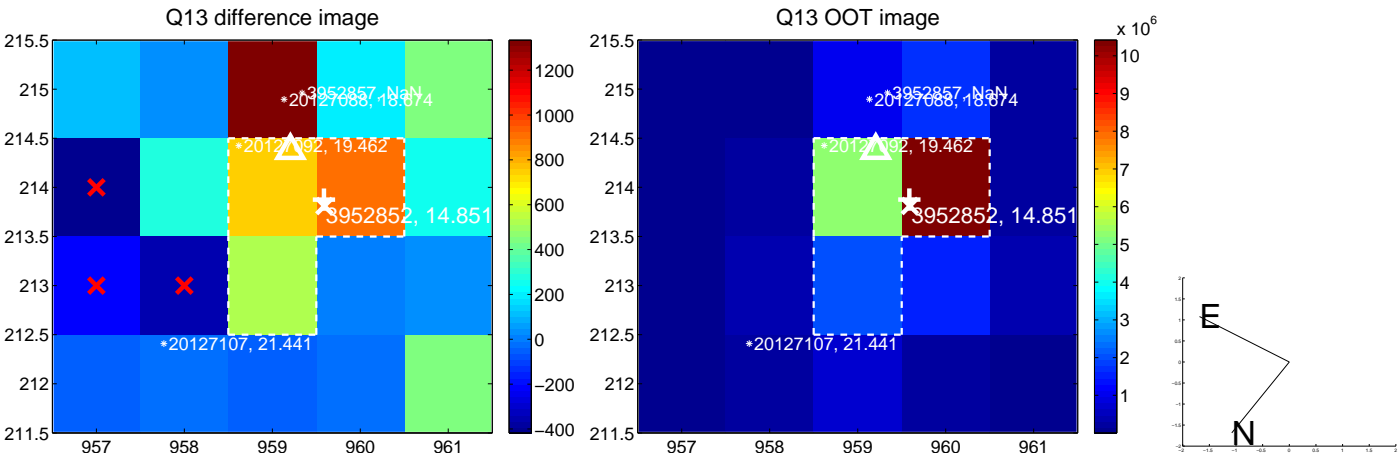
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



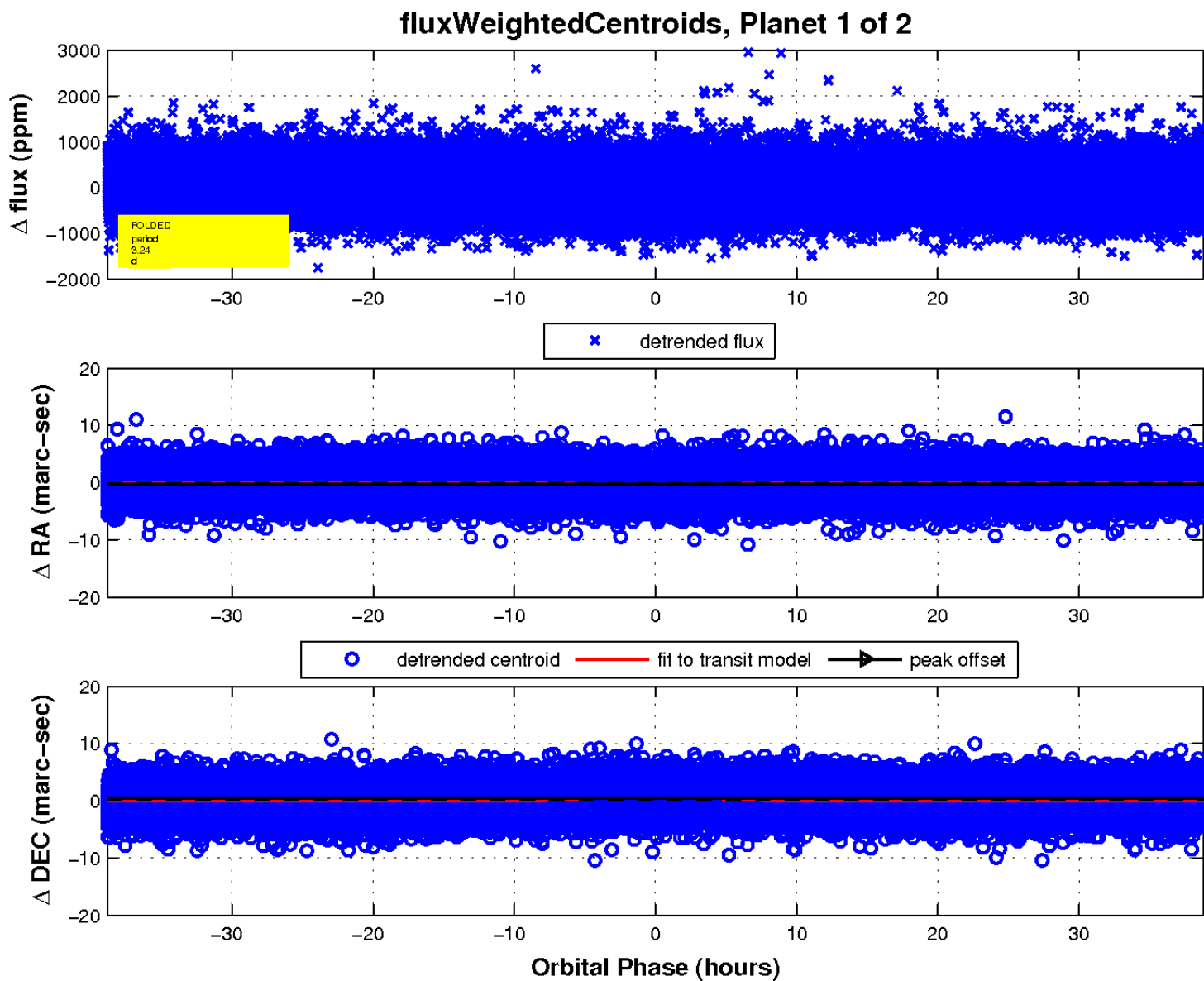
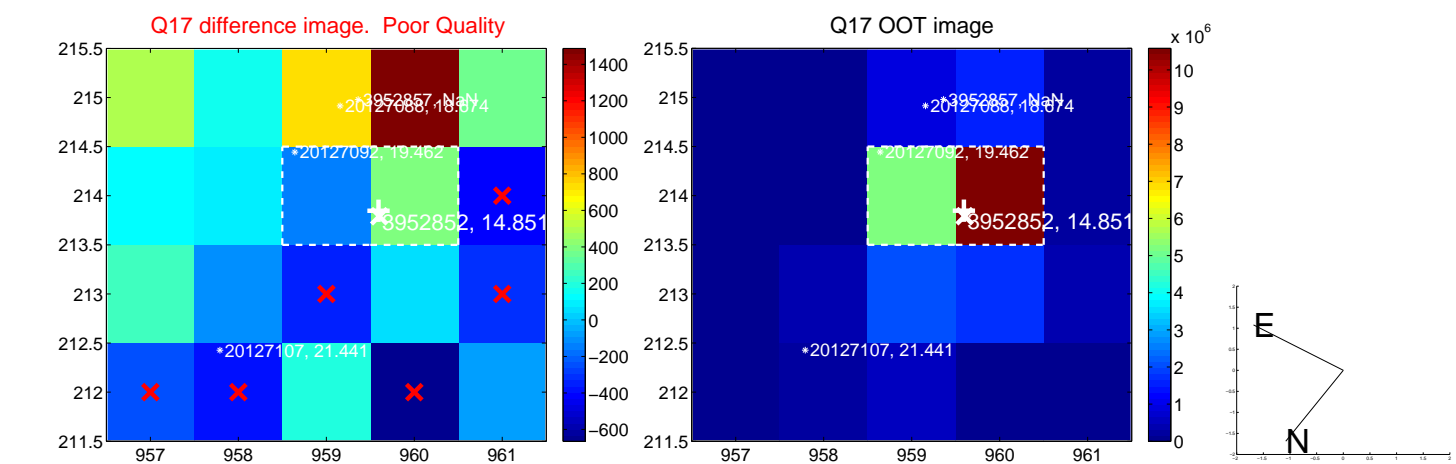
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

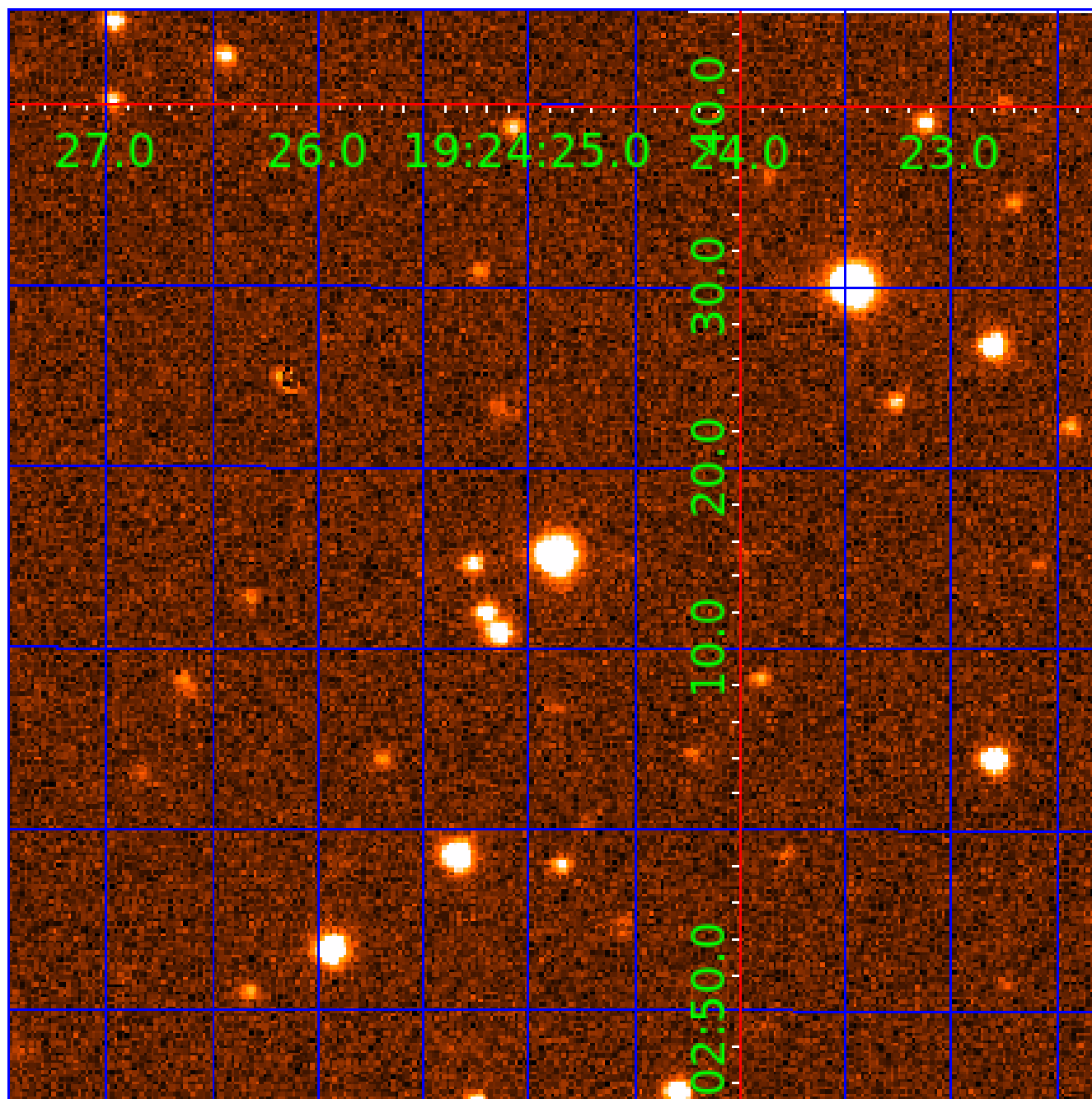


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 003952852

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 003952852-01 | OBS | No | 3.235501 | 134.574896 | 34.5 | 15.613 | 7.9 | 7.8 | 0.88 | 5741 | 0.51 | 426.82 |
| 003952852-02 | OBS | No | 206.449012 | 199.743290 | 546.9 | 22.287 | 11.7 | 10.4 | 0.88 | 5741 | 2.09 | 1.67 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 003952852-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | LPP_DV—CENT_UNRESOLVED_OFFSET |
| 003952852-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_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.

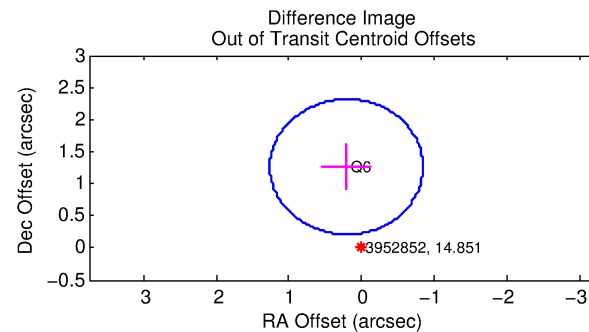
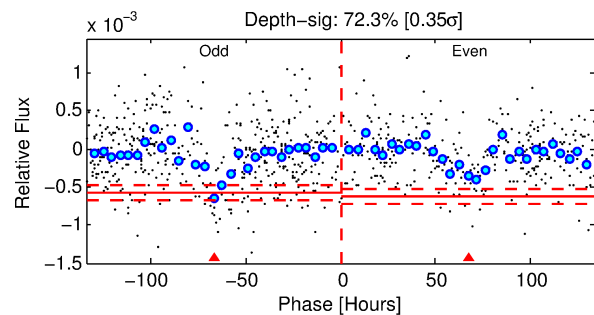
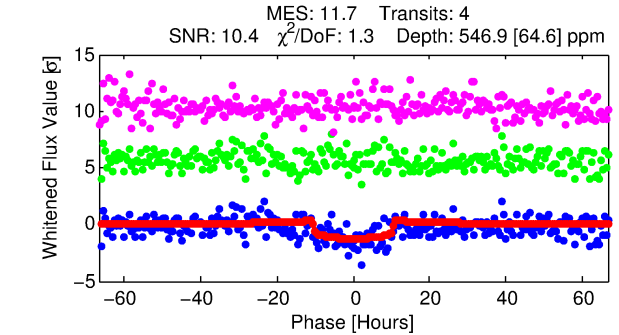
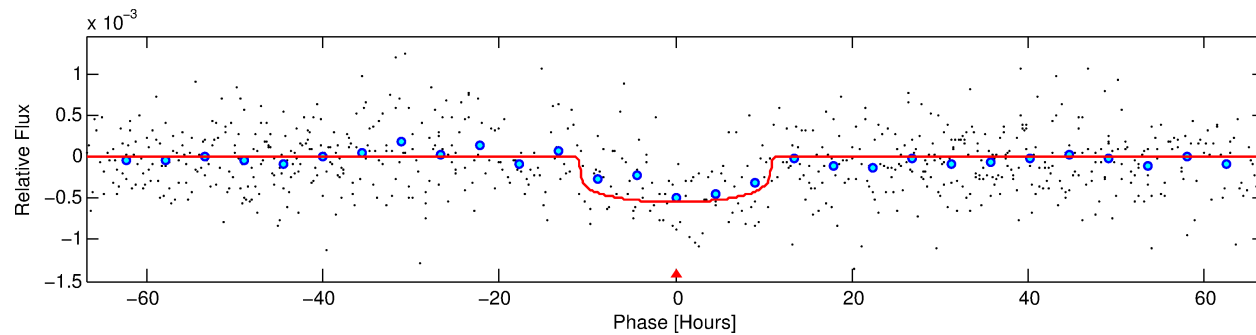
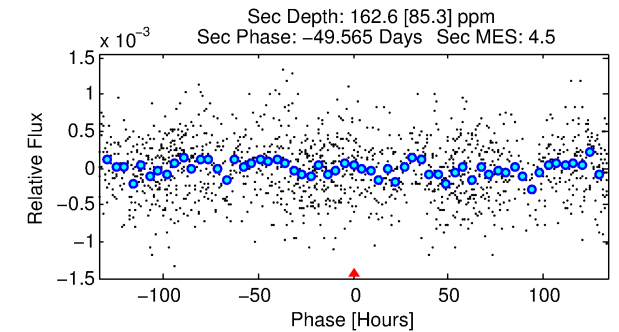
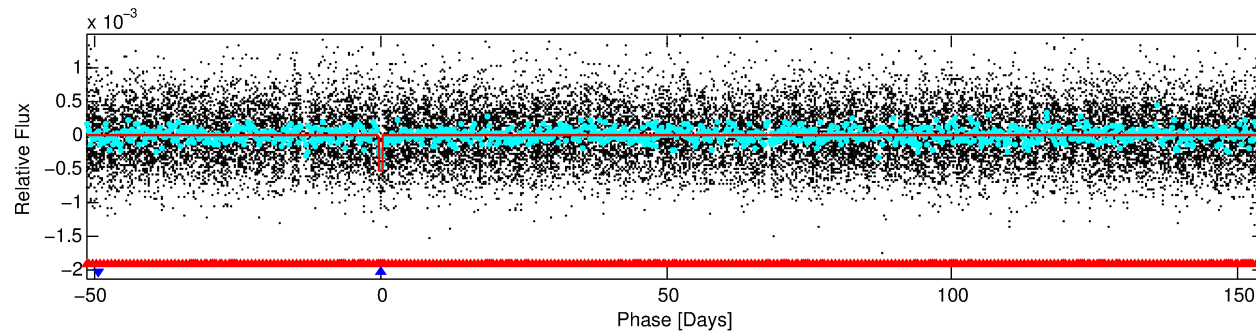
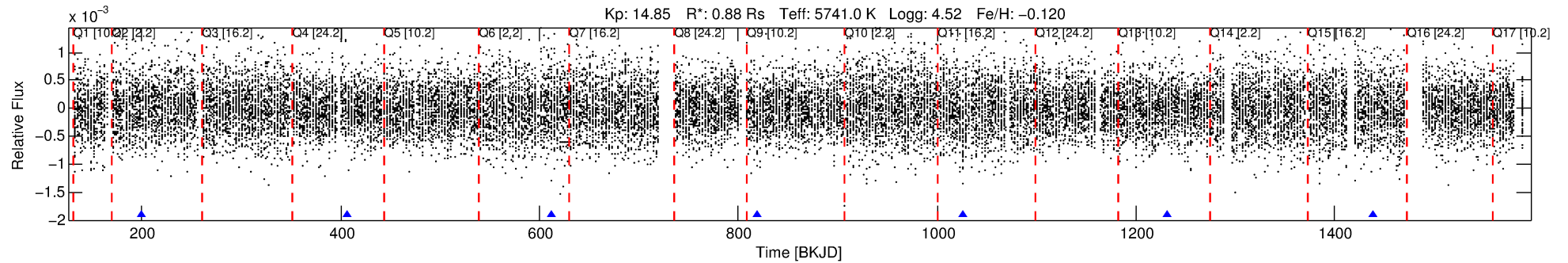
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 003952852-02

No Significant Match Found

DV One-Page Summary

KIC: 3952852 Candidate: 2 of 2 Period: 206.449 d



DV Fit Results:

Period = 206.44901 [0.03207] d
Epoch = 199.7433 [0.1162] BKJD
Rp/R* = 0.0218 [0.0155]
a/R* = 64.87 [200.99]
b = 0.45 [5.59]
Seff = 1.67 [0.64]
Teff = 290 [28] K
Rp = 2.09 [1.61] Re
a = 0.6702 [0.1675] AU
Ag = 9226.67 [14415.97] [0.64 σ]
Teffp = 4395 [1675] K [2.45 σ]

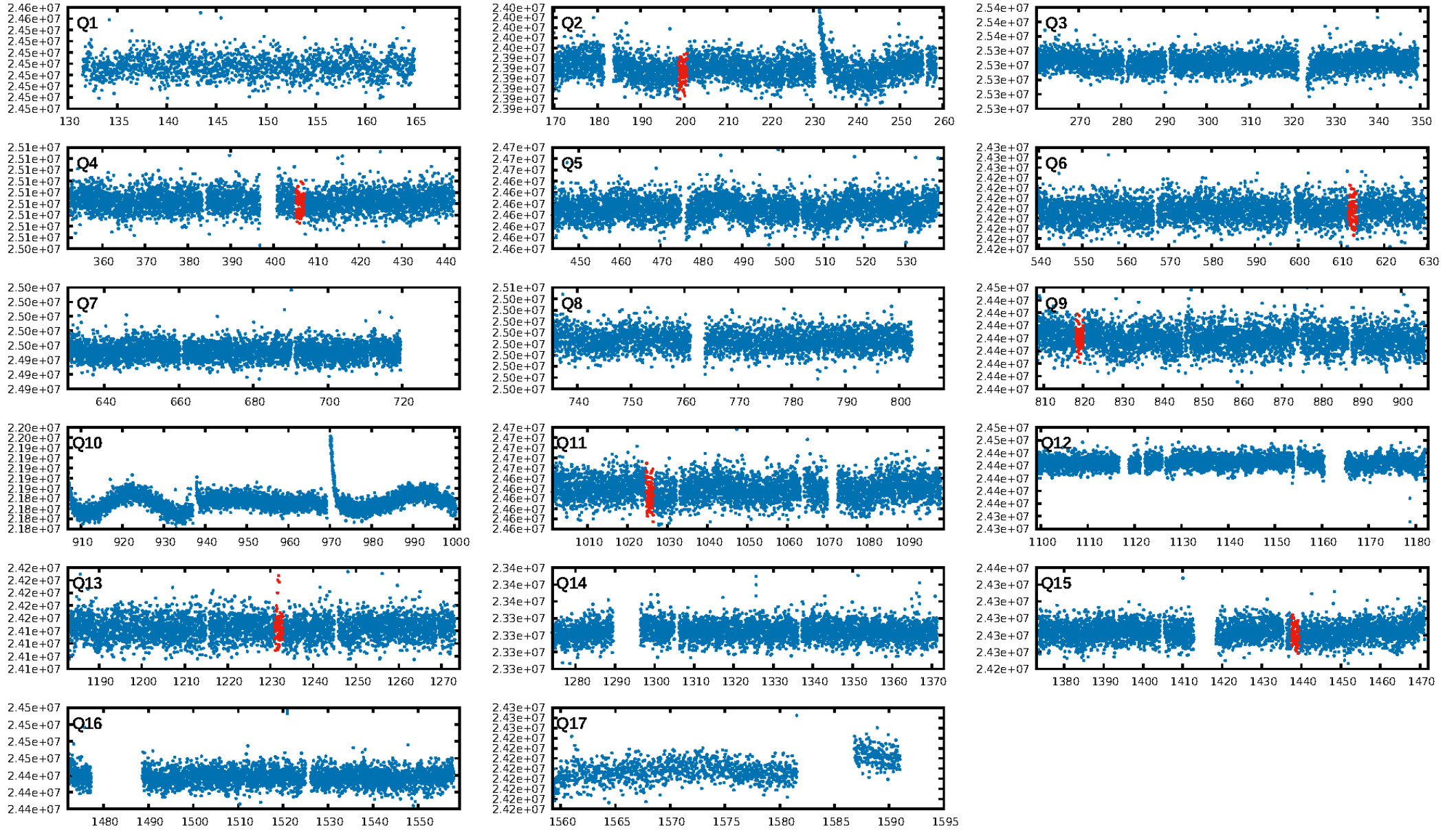
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [179.23 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 10.8%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.57e-18
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 5.266
Centroid-sig: 0.3%
Centroid-so: 1.827 arcsec [2.02 σ]
OotOffset-rm: 1.279 arcsec [3.65 σ]
KicOffset-rm: 1.031 arcsec [2.94 σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 0.00 [0/4]

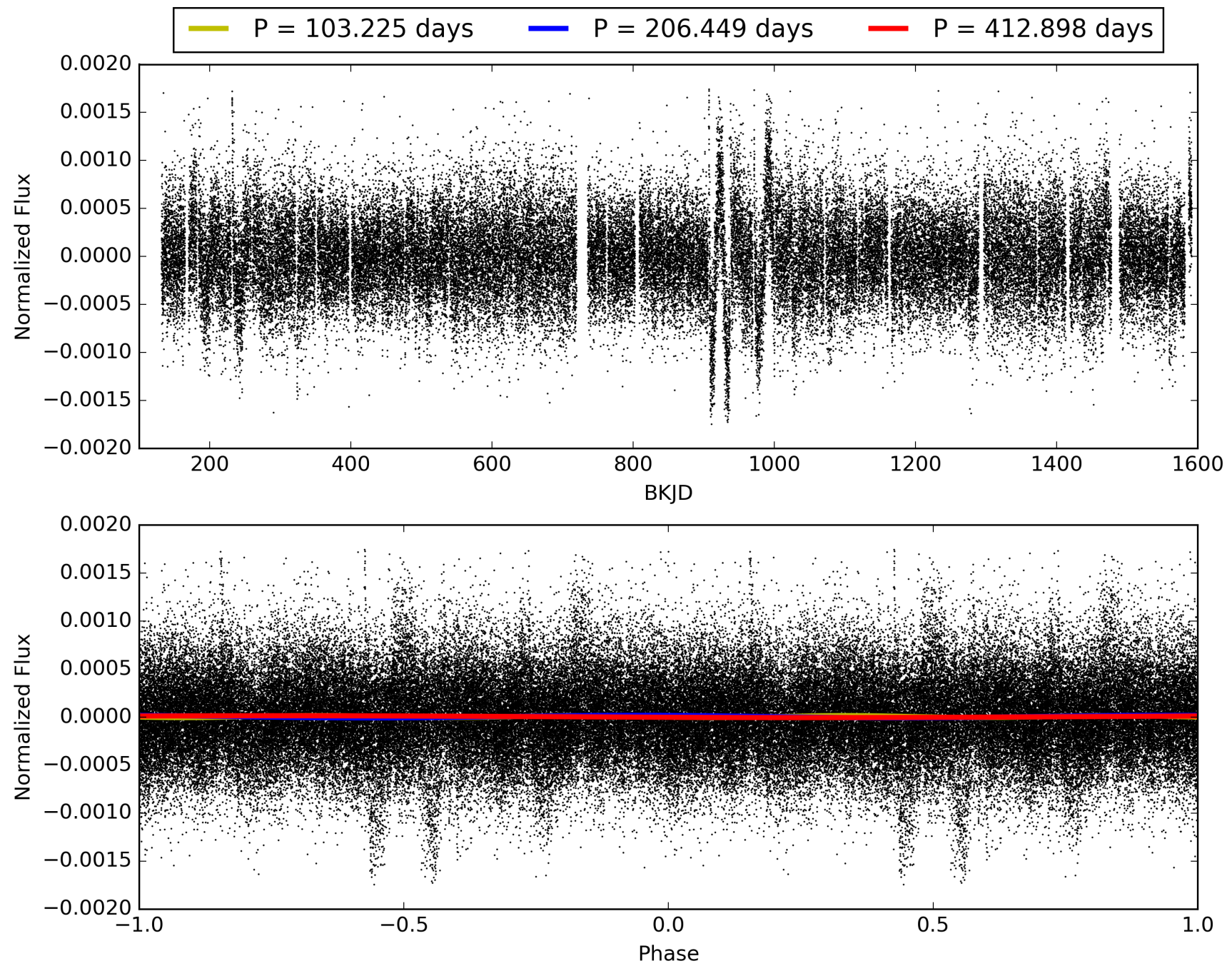
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:01:29 Z

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

TCE 003952852-02, PDC Light Curves

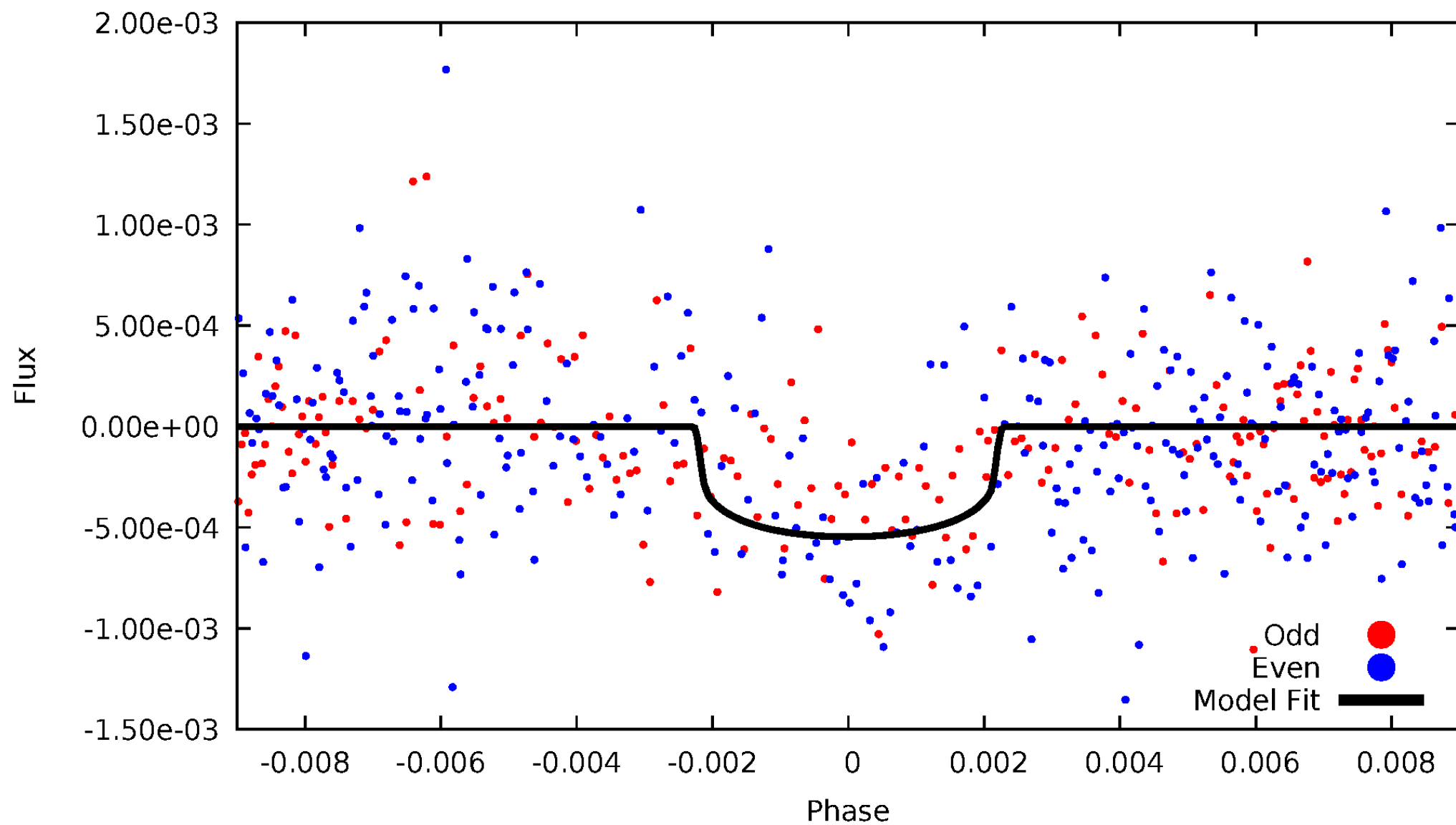


TCE 003952852-02



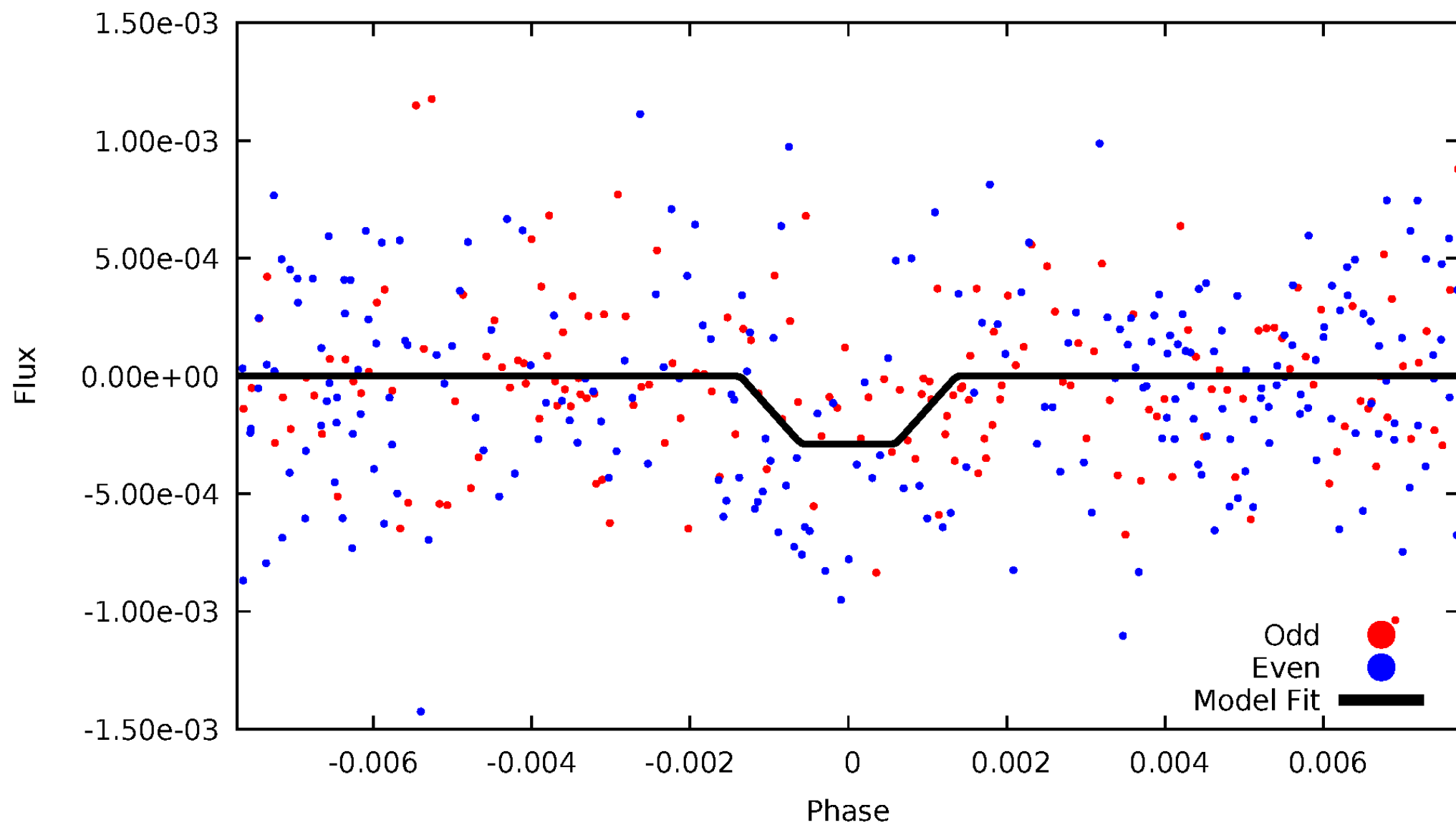
DV Odd/Even

TCE 003952852-02



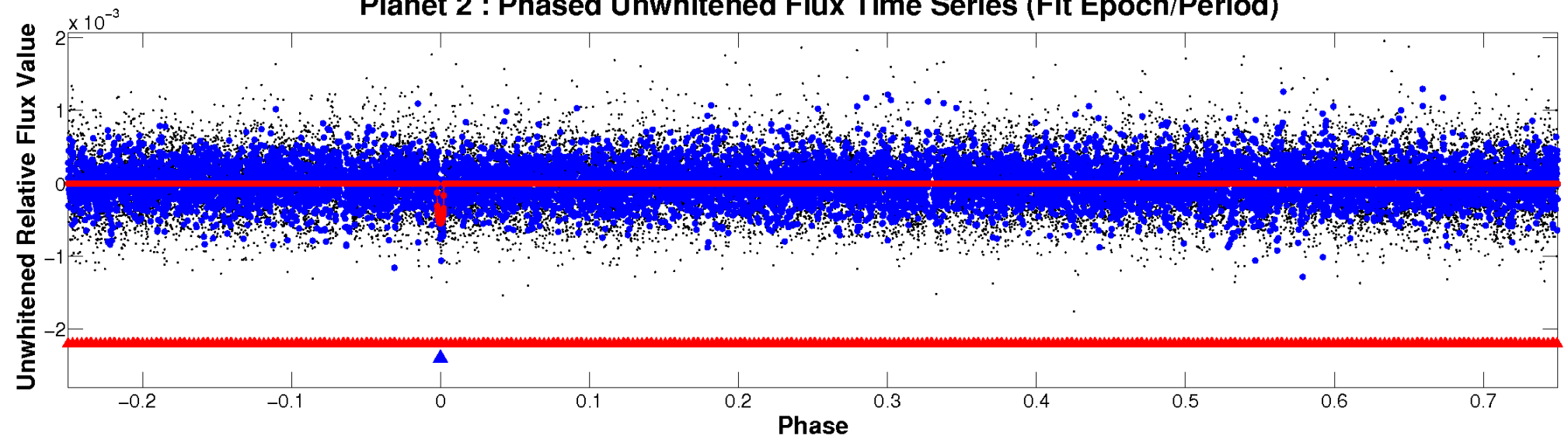
ALT Odd/Even

TCE 003952852-02

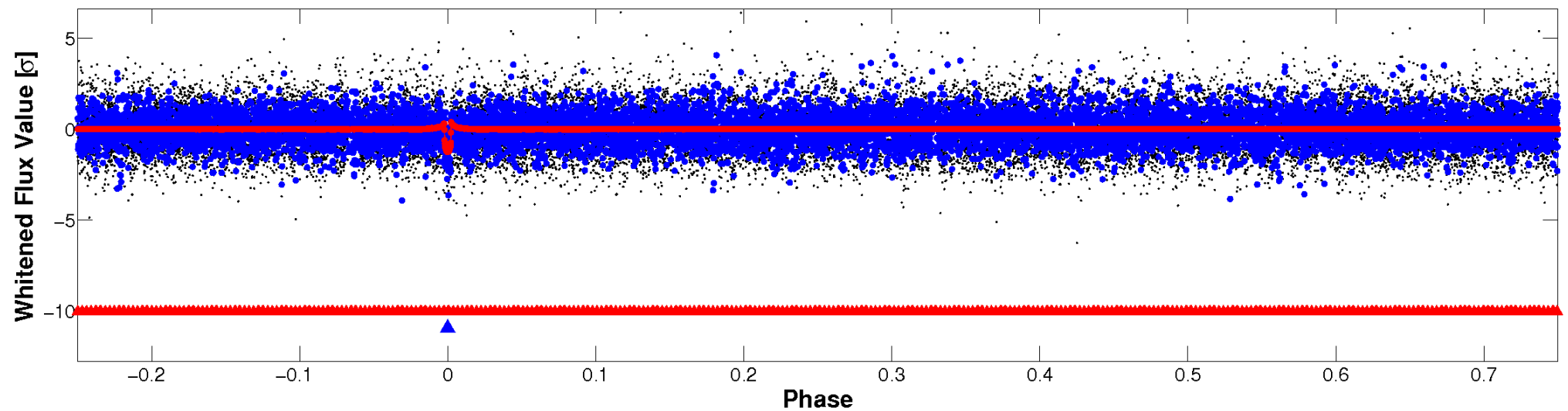


Non-Whitened Vs. Whitened Light Curve

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



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



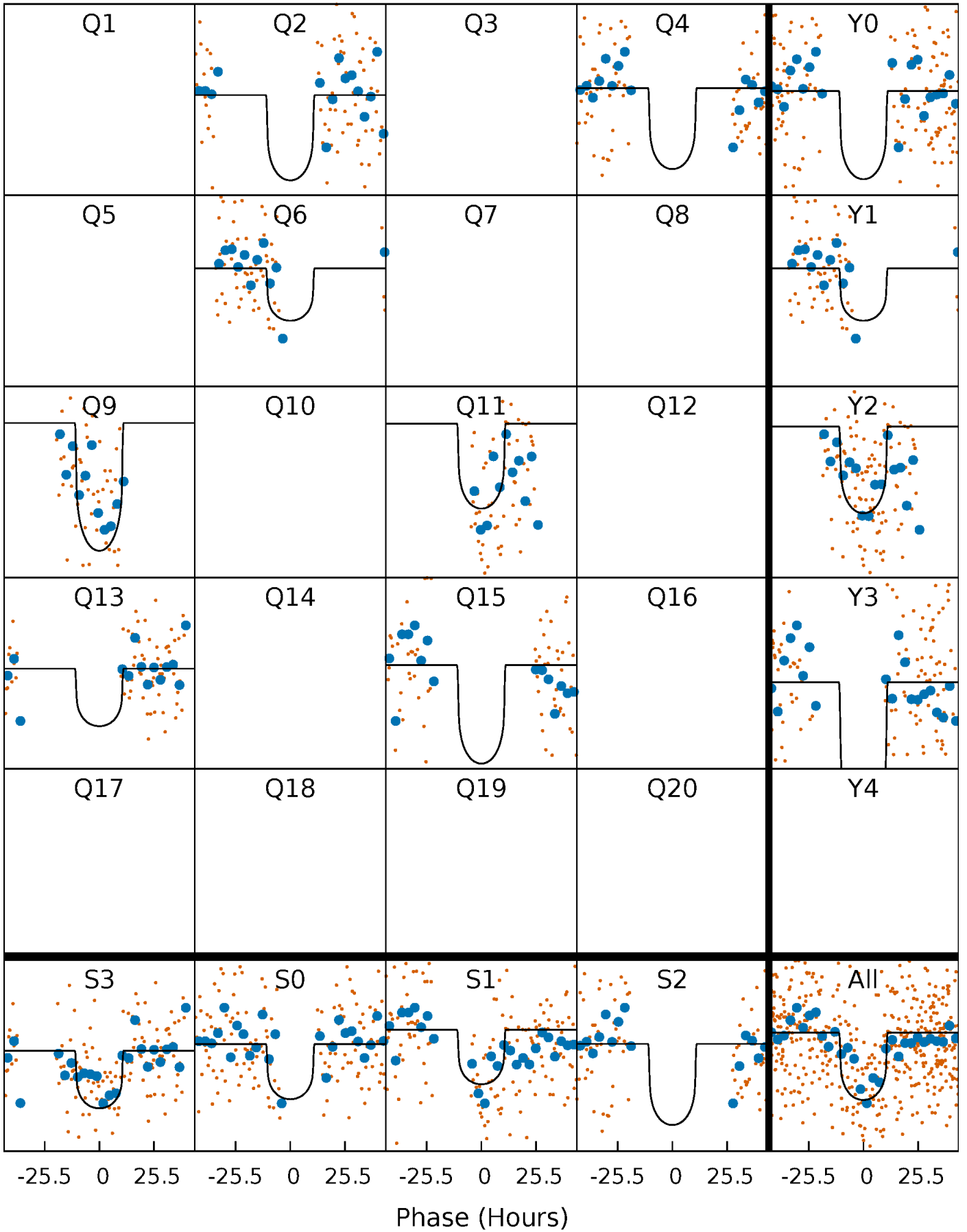
PDC Quarter-Phased Transit Curves

TCE 003952852-02 $P=206.449012$ Days $T_0=199.743290$ (BKJD)



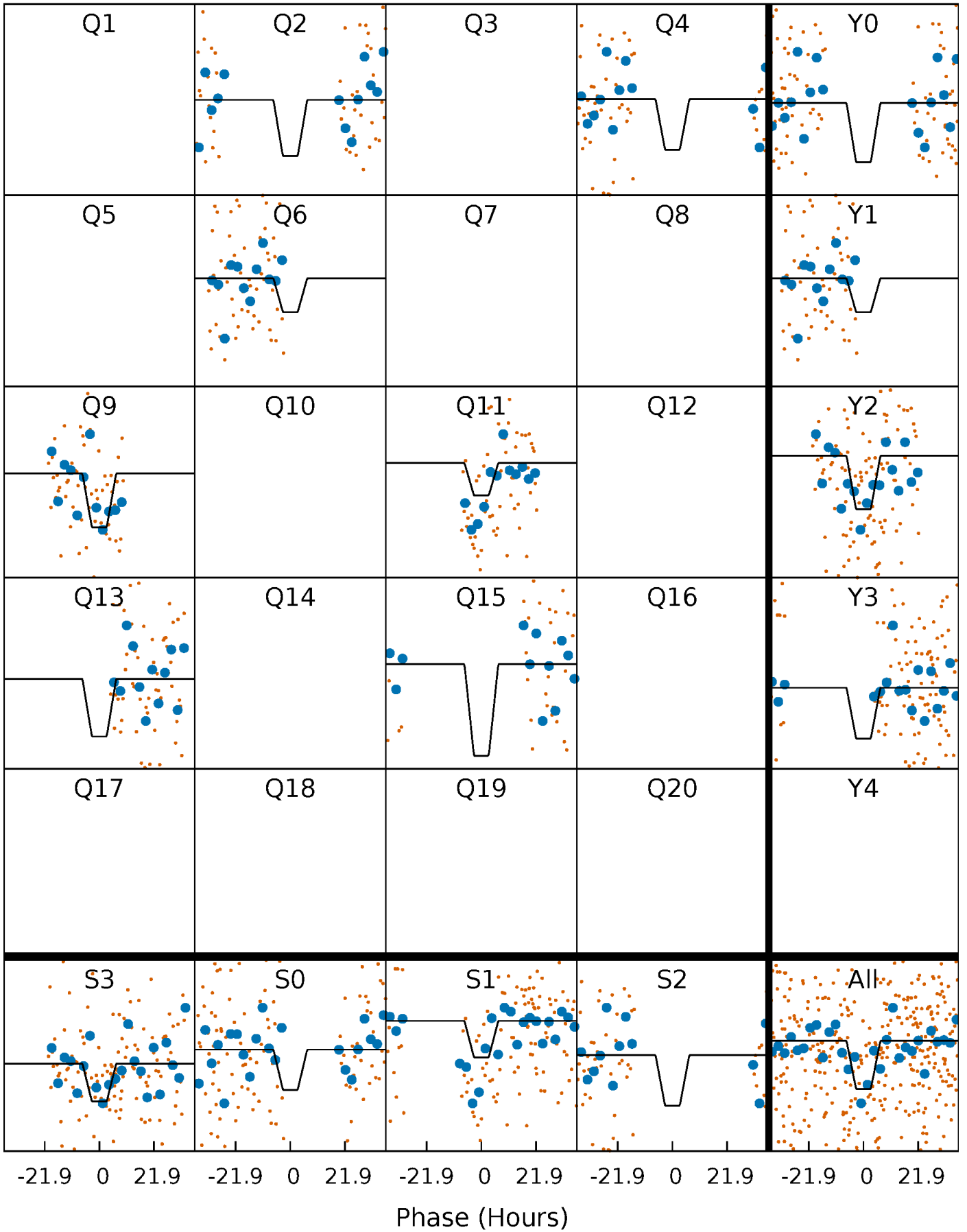
DV Quarter-Phased Transit Curves

TCE 003952852-02 $P=206.449012$ Days $T_0=199.743290$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

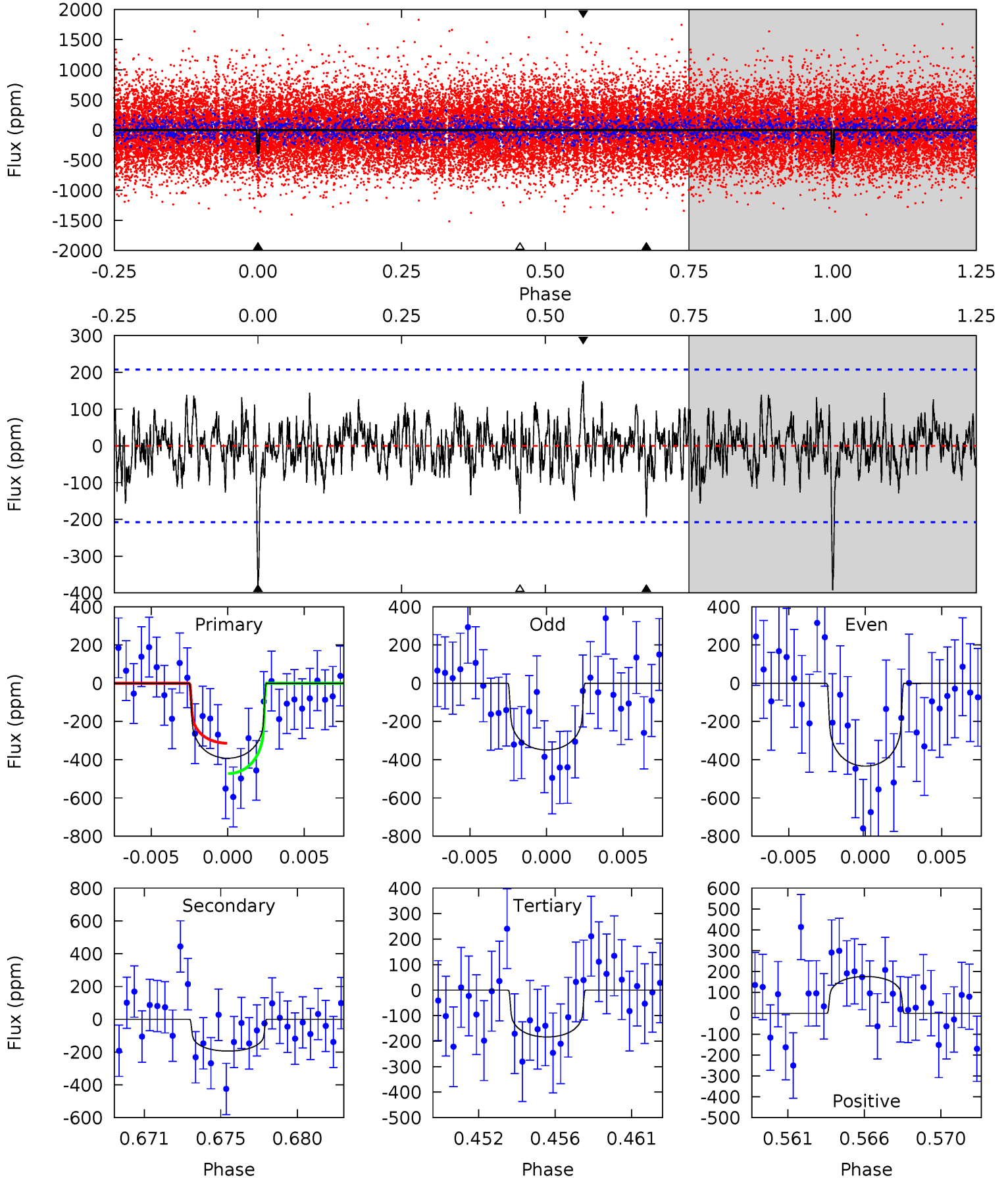
TCE 003952852-02 P=206.556047 Days $T_0=199.441184$ (BKJD)



DV Model-Shift Uniqueness Test

003952852-02, P = 206.449012 Days, E = 199.743290 Days

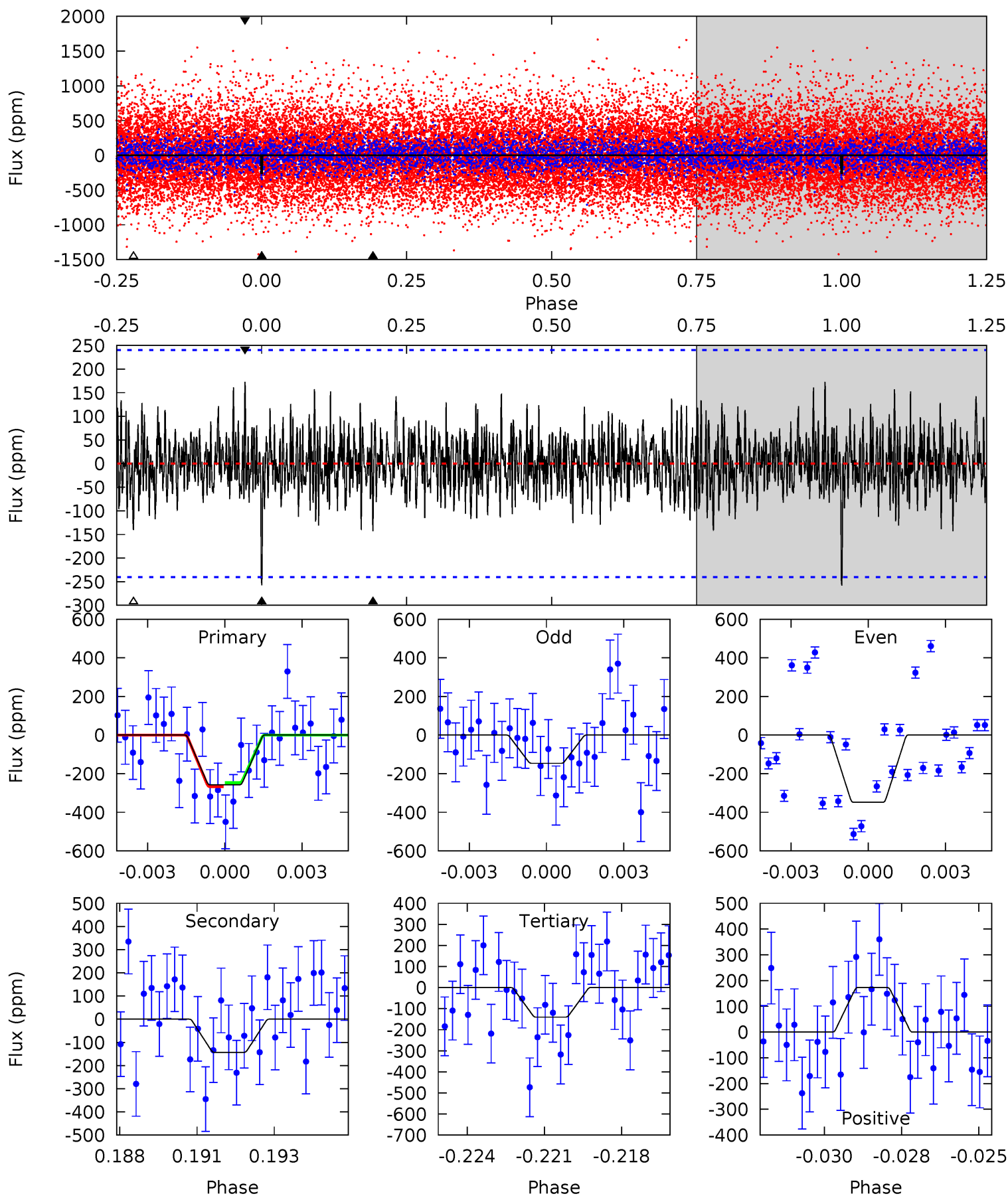
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.78 | 4.83 | 4.58 | 4.40 | 5.17 | 2.84 | 1.27 | 5.20 | 5.38 | 0.25 | 0.44 | 1.06 | 1.10 | 0.31 | 1.99 |



Alt Model-Shift Uniqueness Test

003952852-02, P = 206.556047 Days, E = 199.441184 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 5.64 | 3.14 | 3.07 | 3.79 | 5.27 | 2.99 | 1.06 | 2.57 | 1.86 | 0.06 | -0.65 | 2.24 | 1.96 | 0.40 | 0.22 |



Stellar Parameters For KIC 003952852

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5741^{+153}_{-170} | $4.524^{+0.050}_{-0.200}$ | $-0.120^{+0.300}_{-0.300}$ | $0.879^{+0.260}_{-0.087}$ | $0.942^{+0.104}_{-0.104}$ | $1.950^{+0.492}_{-1.003}$ |
| | +3%/-3% | +1%/-4% | +250%/-250% | +30%/-10% | +11%/-11% | +25%/-51% |
| Source | PHO1 | 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 003952852-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|-------------------|-----------------------|-------------------------|
| DV | -194 ± 40 | $2.21^{+1.61}_{-1.24}$ | 414^{+27}_{-19} | 4647^{+2139}_{-845} | 9244^{+39986}_{-6141} |
| Alt. | -143 ± 46 | $1.97^{+1.56}_{-1.22}$ | 413^{+29}_{-18} | 4574^{+2748}_{-921} | 8335^{+50575}_{-5896} |

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

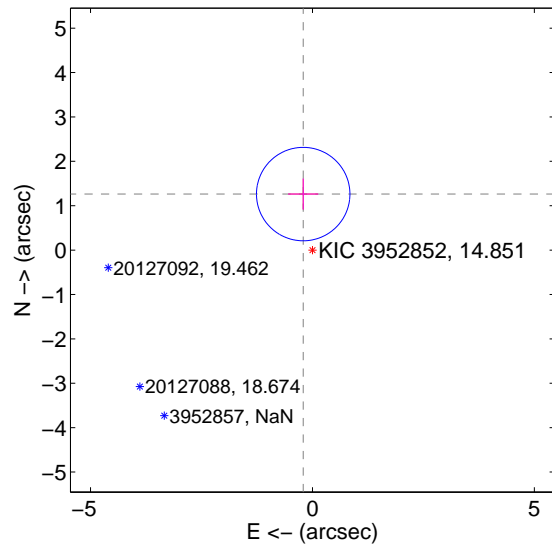
Supplemental centroid analysis for 003952852-02. Kepler magnitude: 14.85. Transit SNR 10.38

There are 0 quarters with good PRF difference image offsets

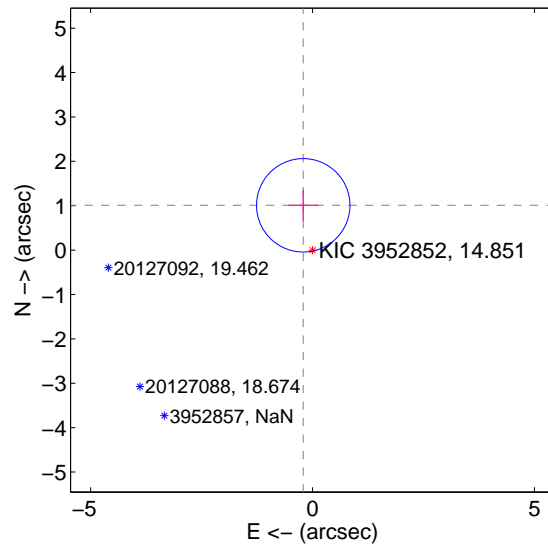
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 1.279 \pm 0.351 | 3.65 | 0.208 \pm 0.340 | 1.262 \pm 0.351 |
| PRF-fit source offset from KIC position | 1.031 \pm 0.351 | 2.94 | 0.209 \pm 0.340 | 1.009 \pm 0.351 |
| photometric centroid source offset | 1.83 \pm 0.91 | 2.02 | -0.64 \pm 0.81 | 1.71 \pm 0.92 |

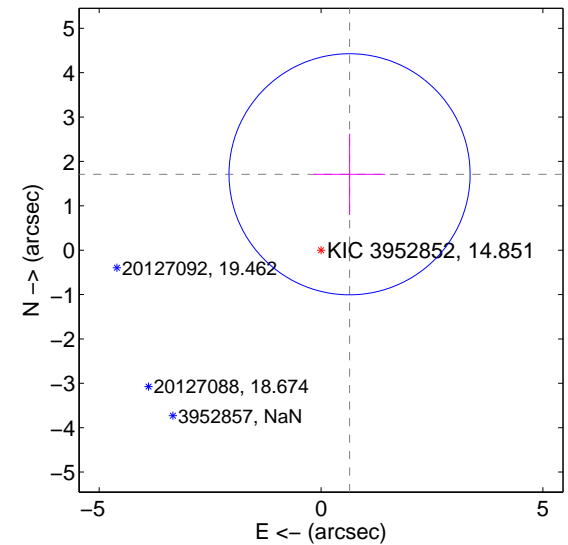
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

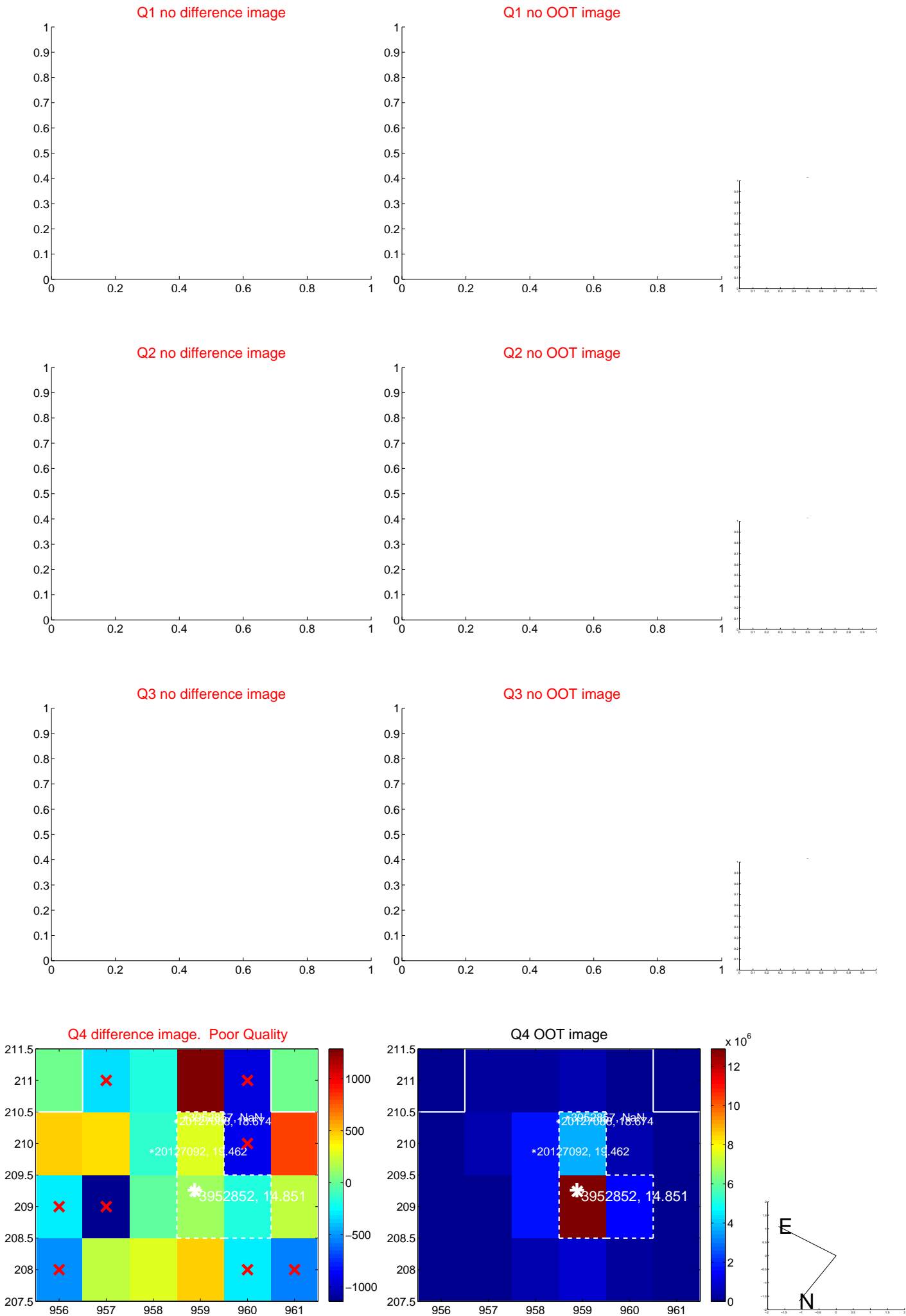


offset from photometric centroids

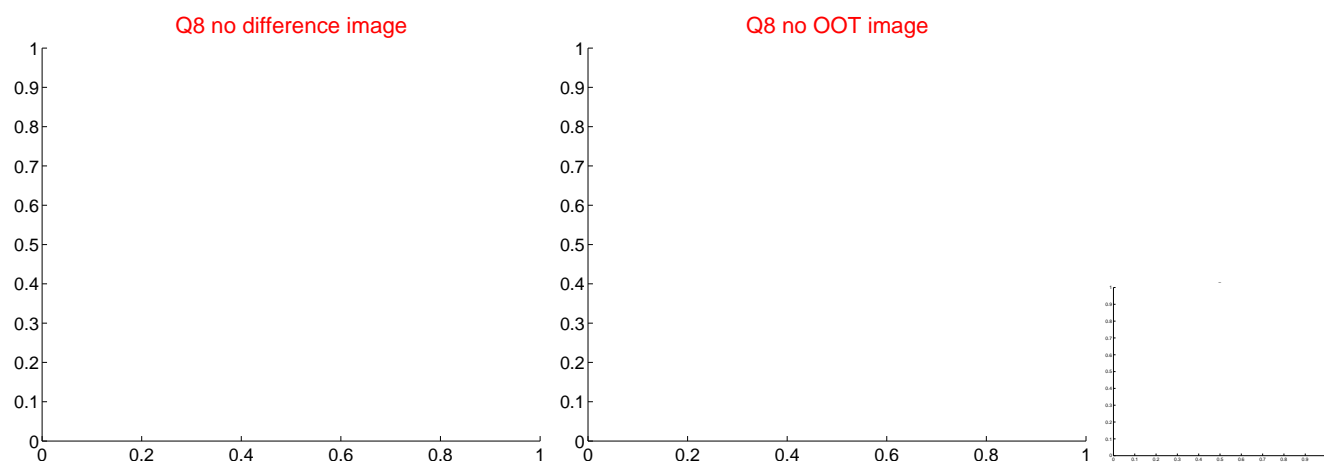
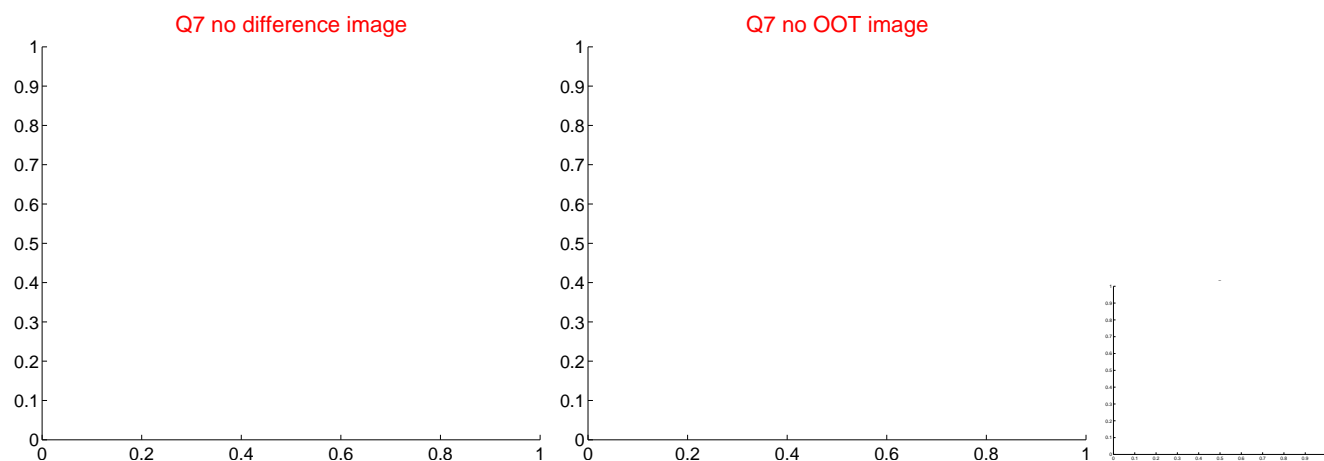
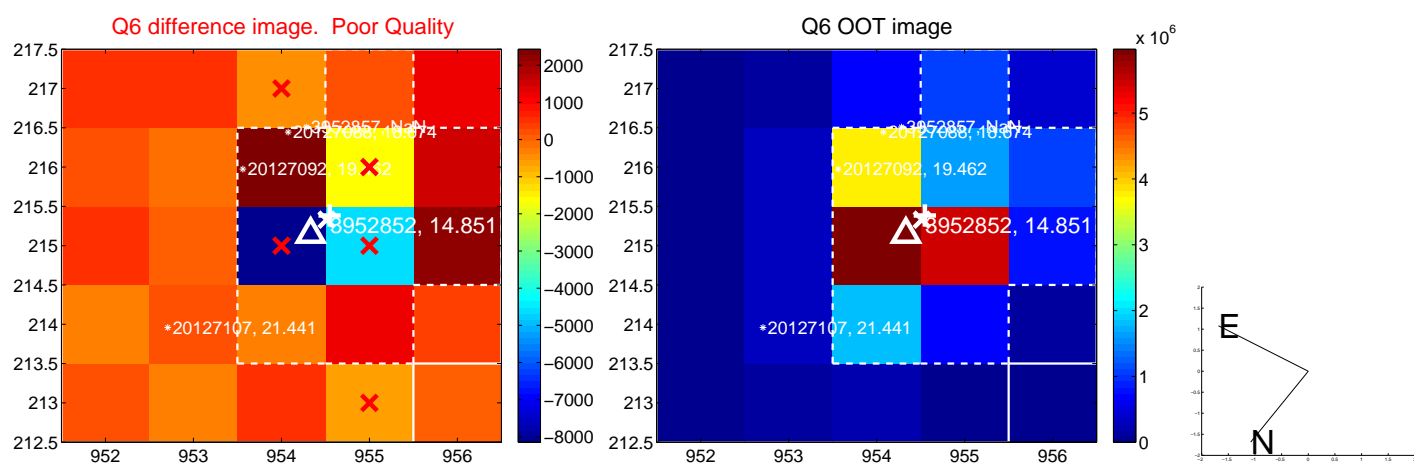
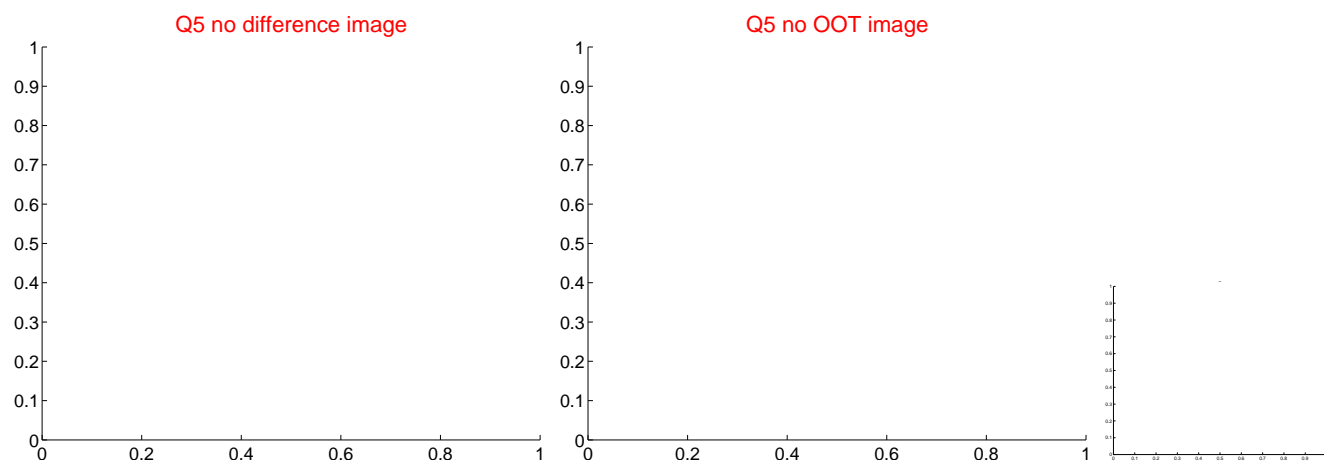


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

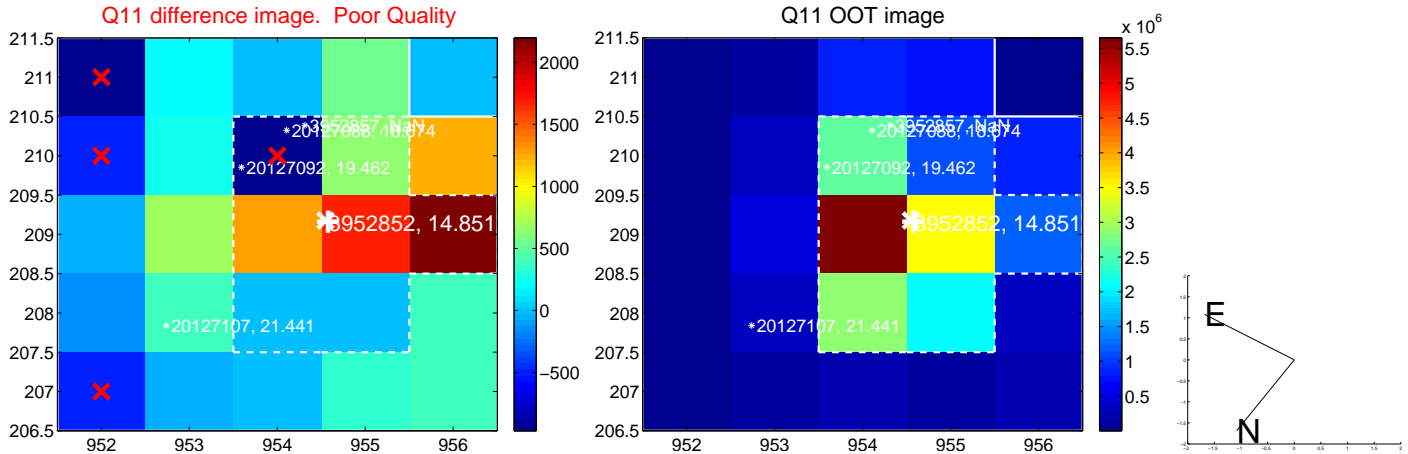
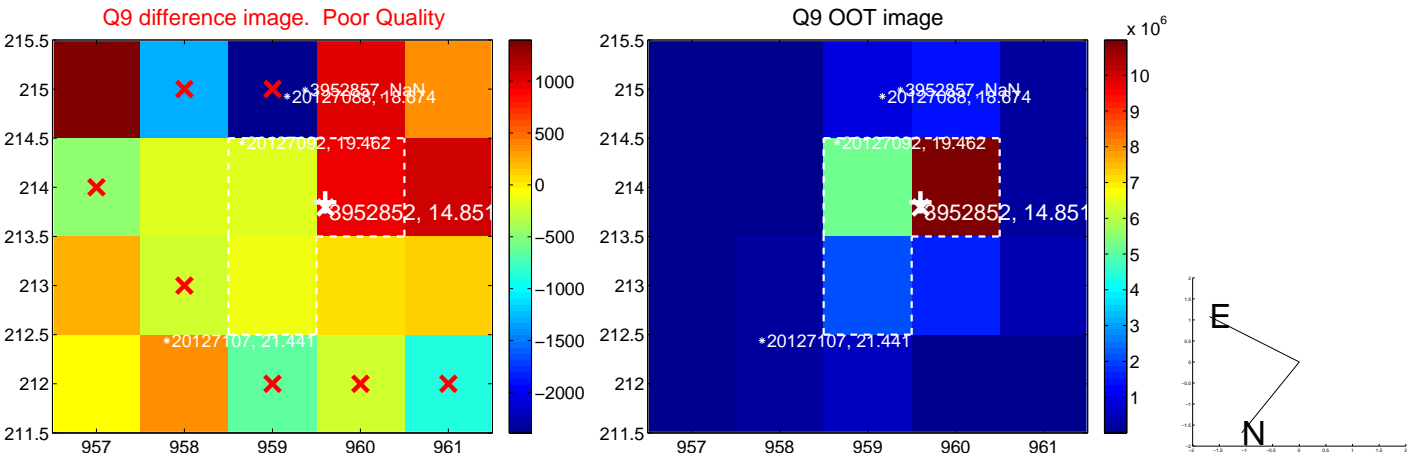
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



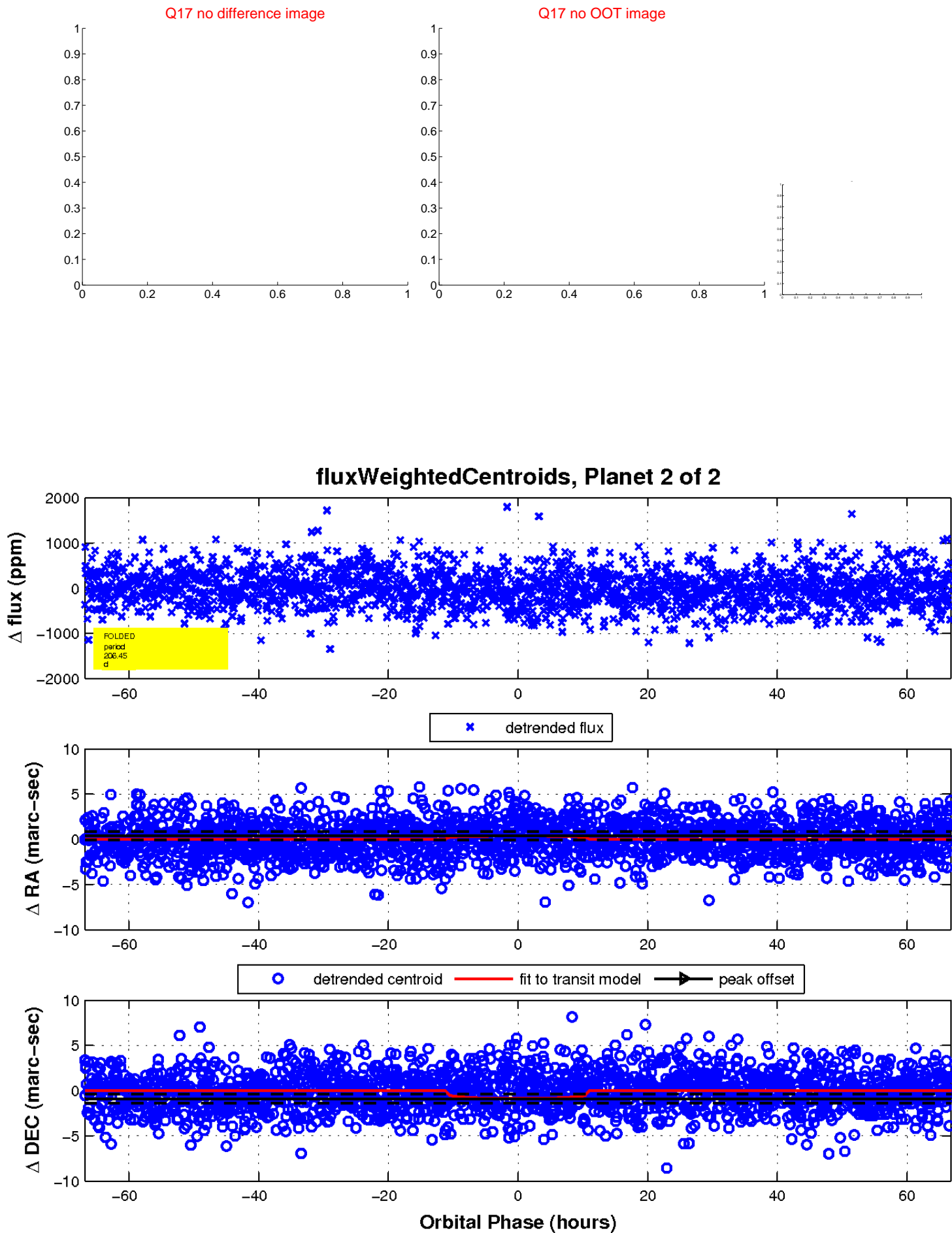
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

