

KIC 004249702

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 004249702-01 | OBS | No | 303.187962 | 281.349773 | 562.2 | 2.016 | 12.2 | 5.3 | 1.75 | 5432 | 4.26 | 2.99 |
| 004249702-02 | OBS | No | 214.057430 | 299.793270 | 717.2 | 2.697 | 14.5 | 7.3 | 1.75 | 5432 | 4.87 | 4.76 |
| 004249702-03 | OBS | No | 321.068744 | 338.016768 | 914.5 | 2.909 | 14.9 | 7.2 | 1.75 | 5432 | 5.55 | 2.77 |
| 004249702-04 | OBS | No | 490.514419 | 225.192055 | 452.5 | 4.500 | 13.9 | -1.0 | 1.75 | 5432 | 3.65 | 1.57 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 004249702-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS |
| 004249702-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES |
| 004249702-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 004249702-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS |

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

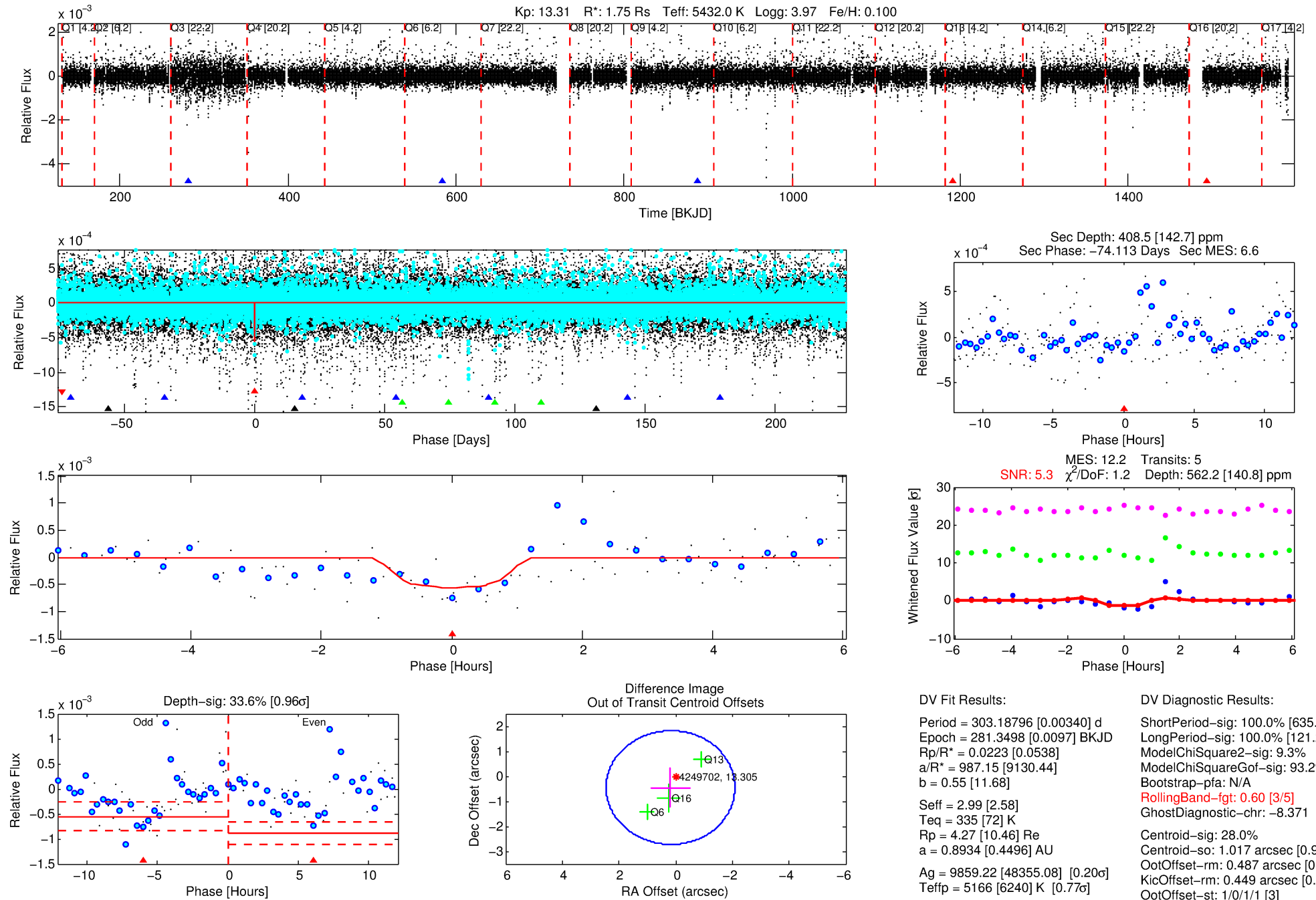
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004249702-01

No Significant Match Found

DV One-Page Summary

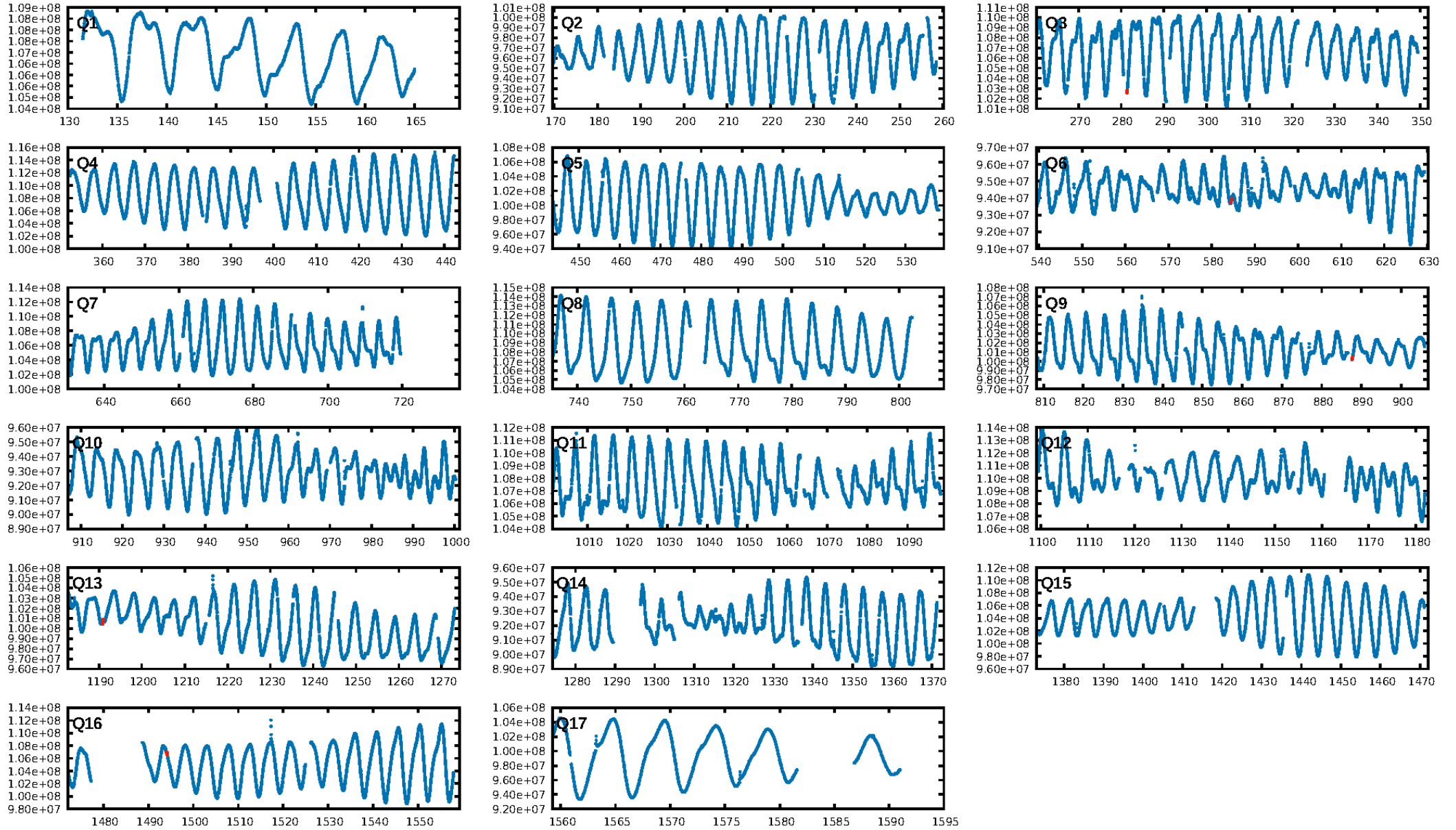
KIC: 4249702 Candidate: 1 of 4 Period: 303.188 d



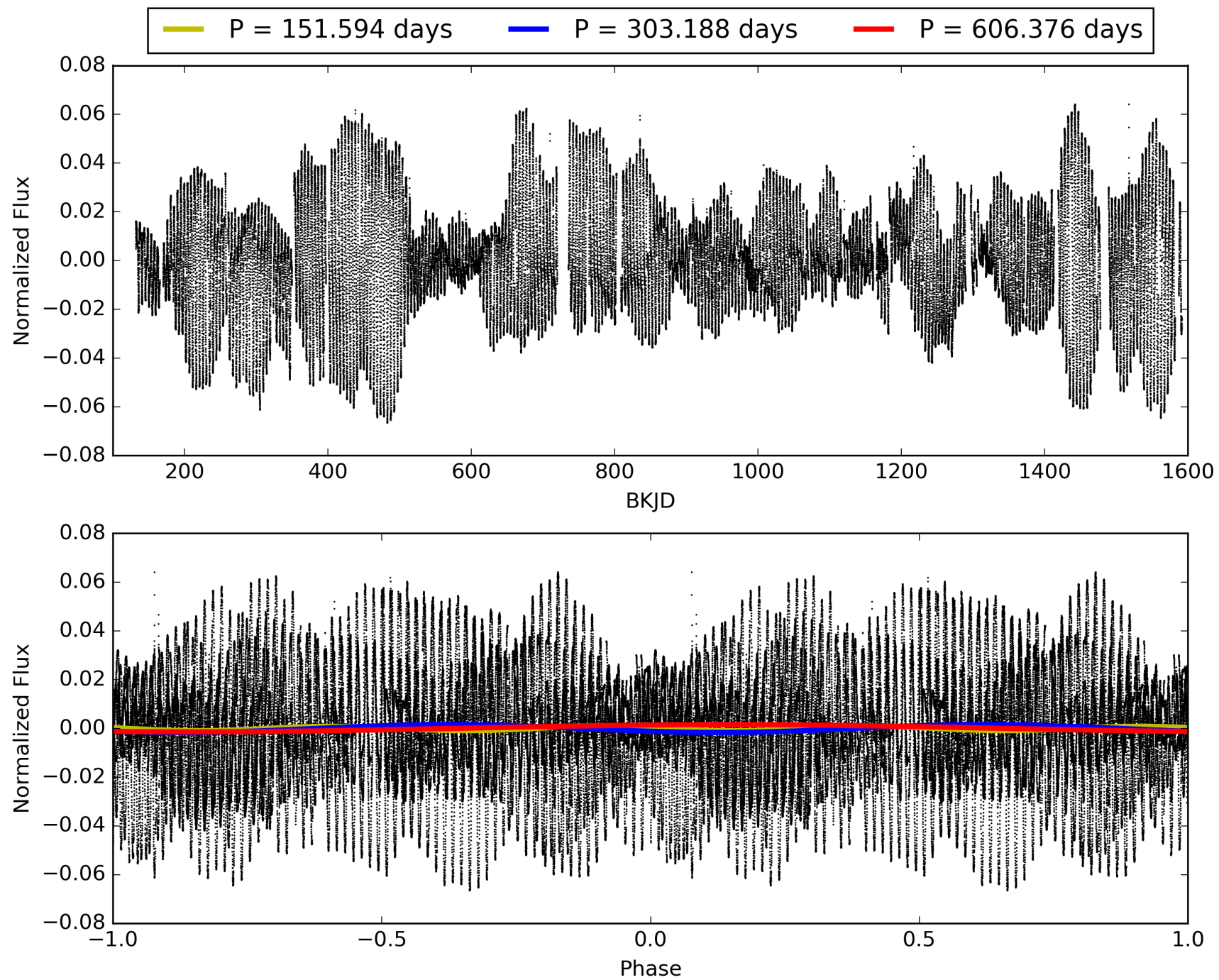
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:43:34 Z

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

TCE 004249702-01, PDC Light Curves

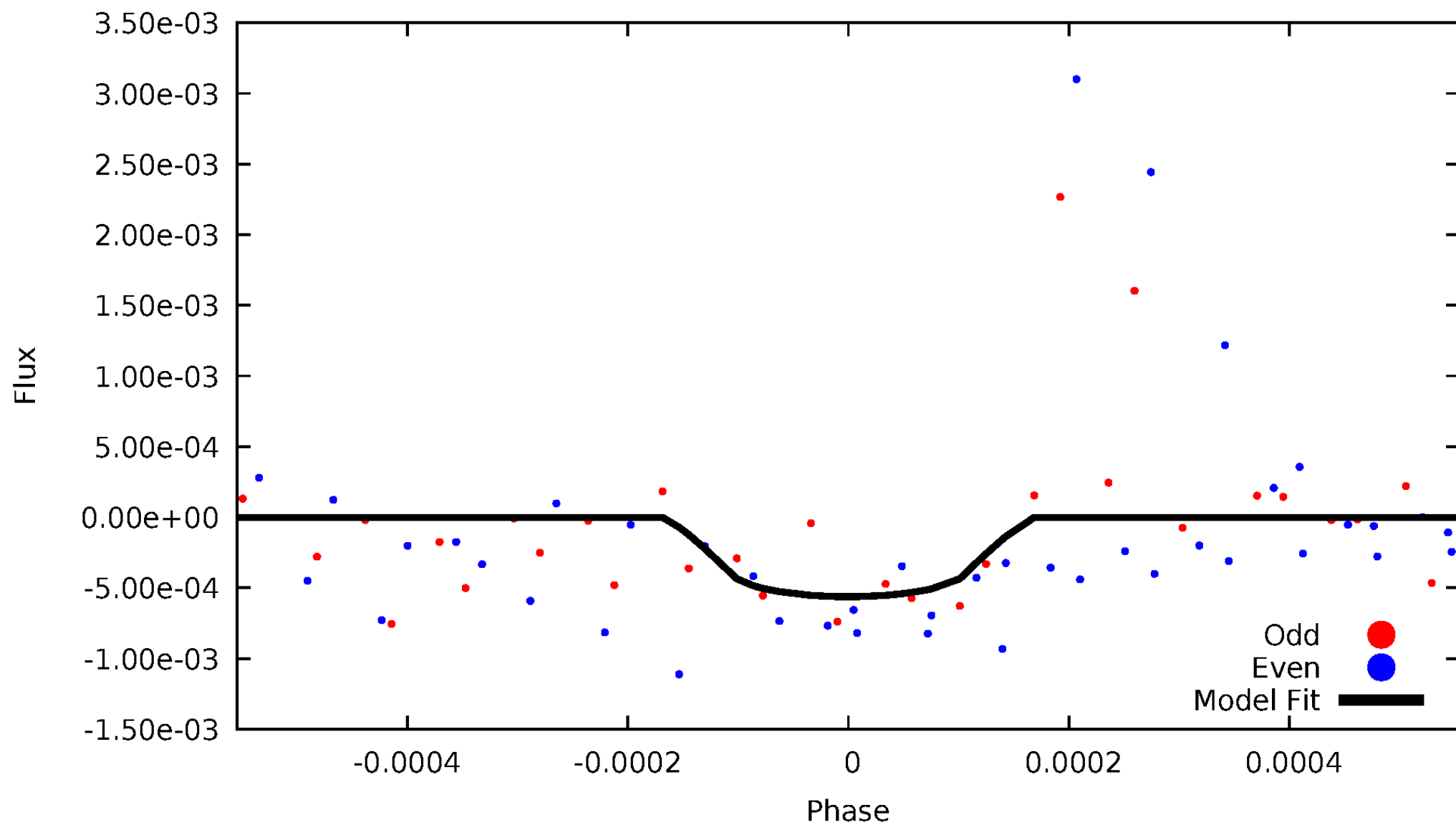


TCE 004249702-01



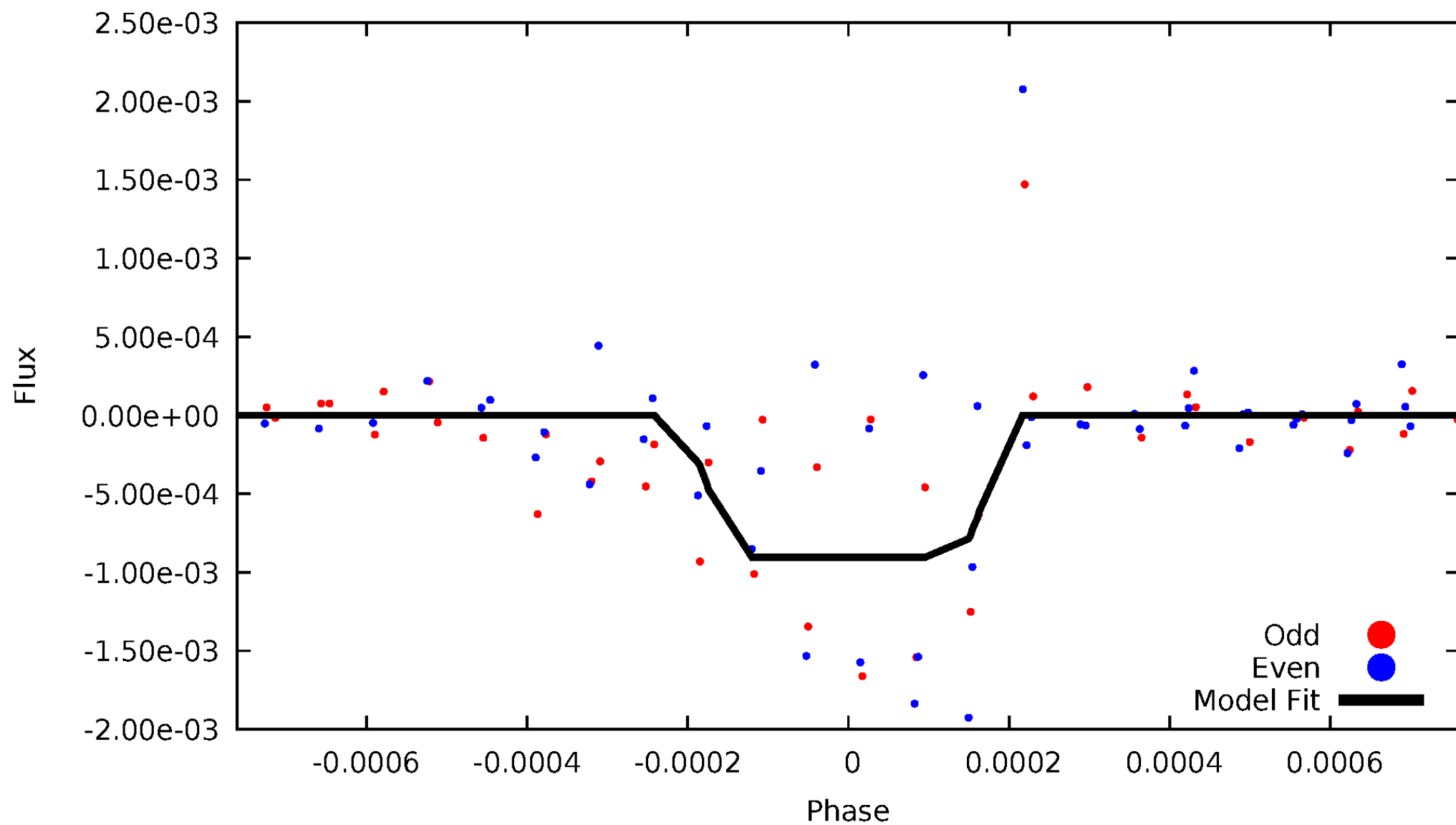
DV Odd/Even

TCE 004249702-01



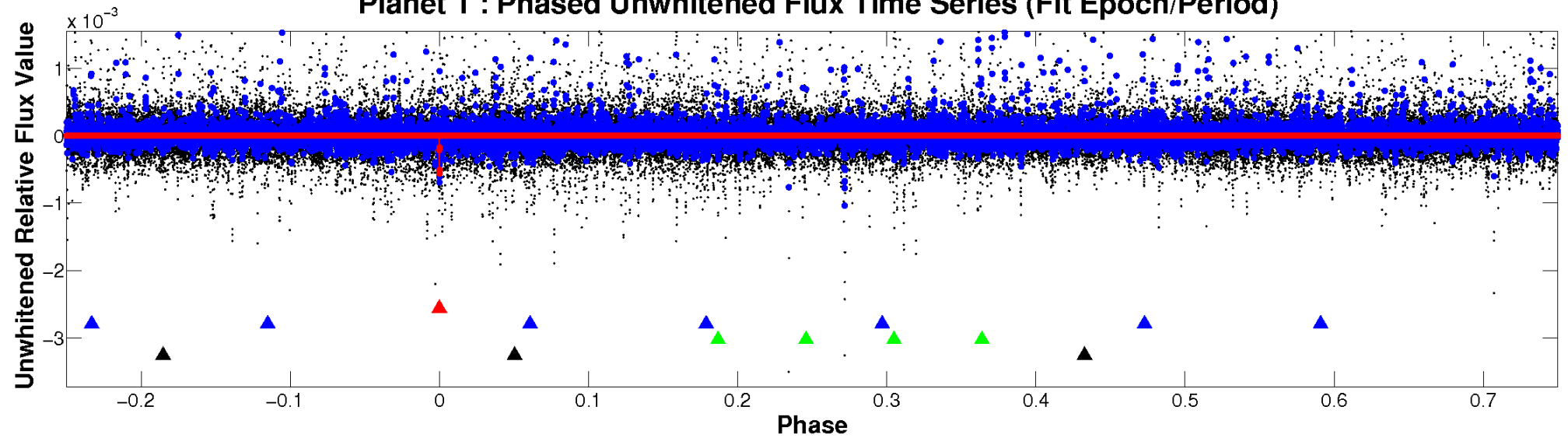
ALT Odd/Even

TCE 004249702-01

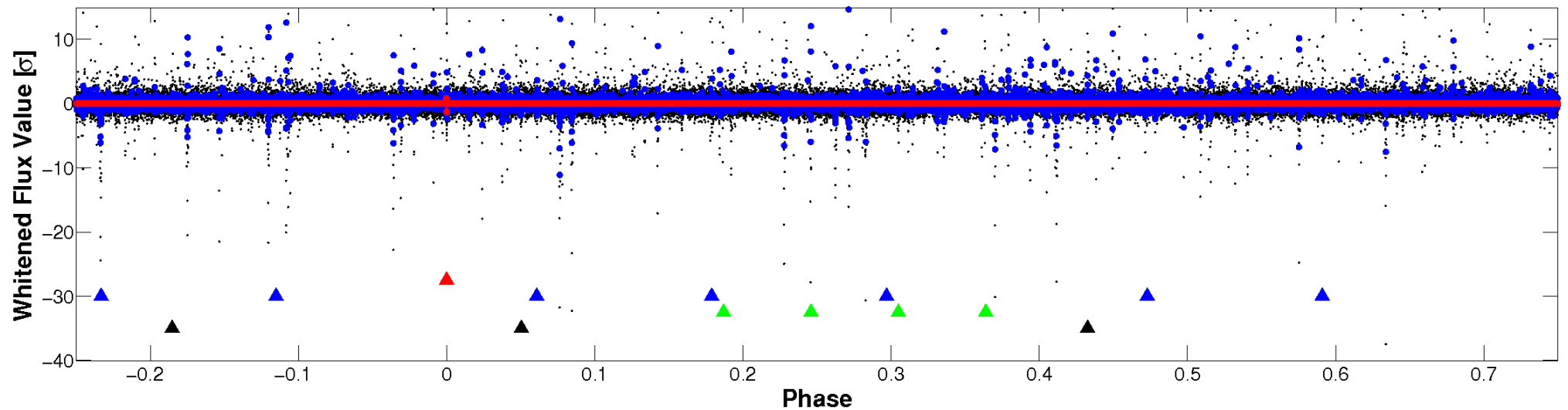


Non-Whitened Vs. Whitened Light Curve

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

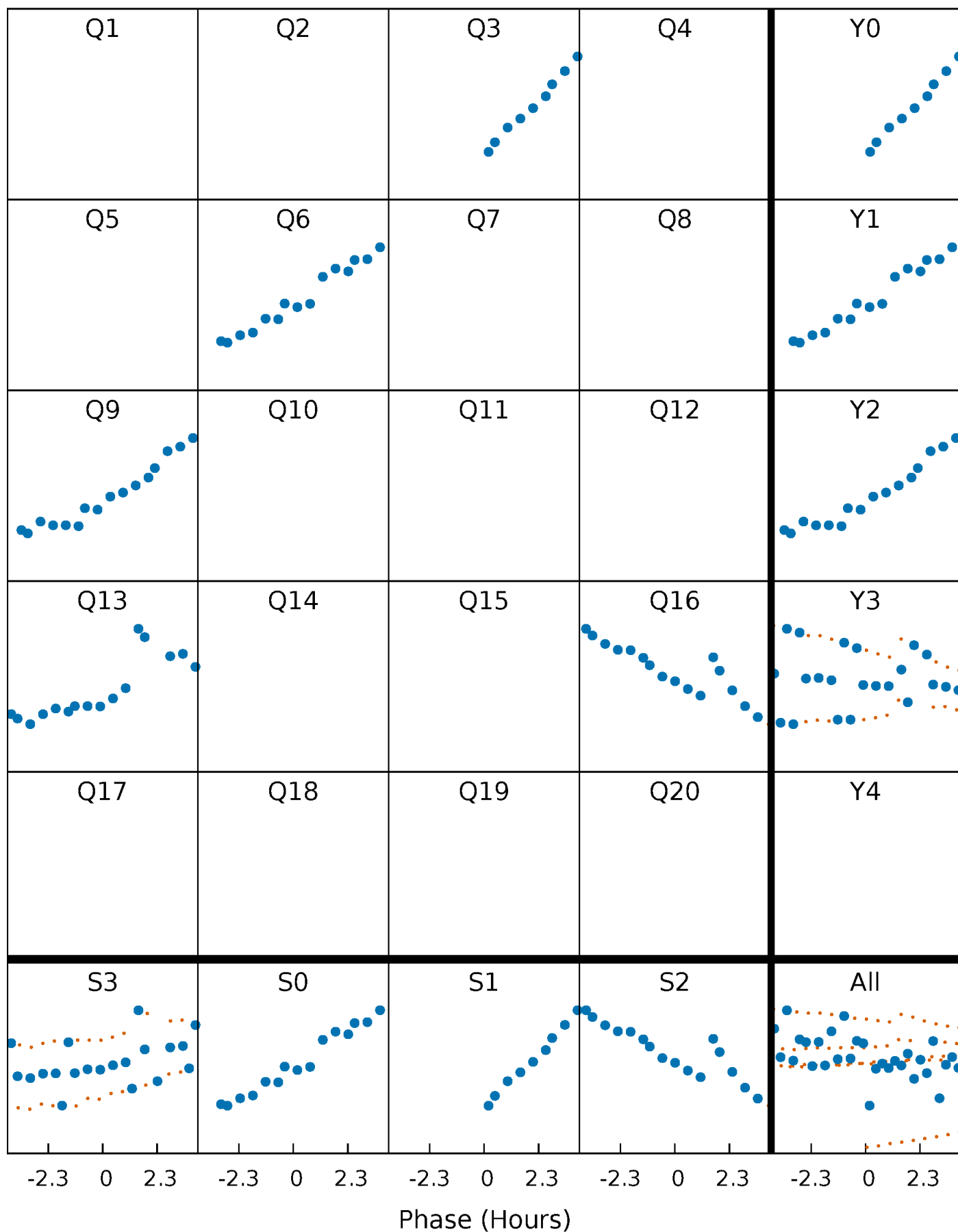


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



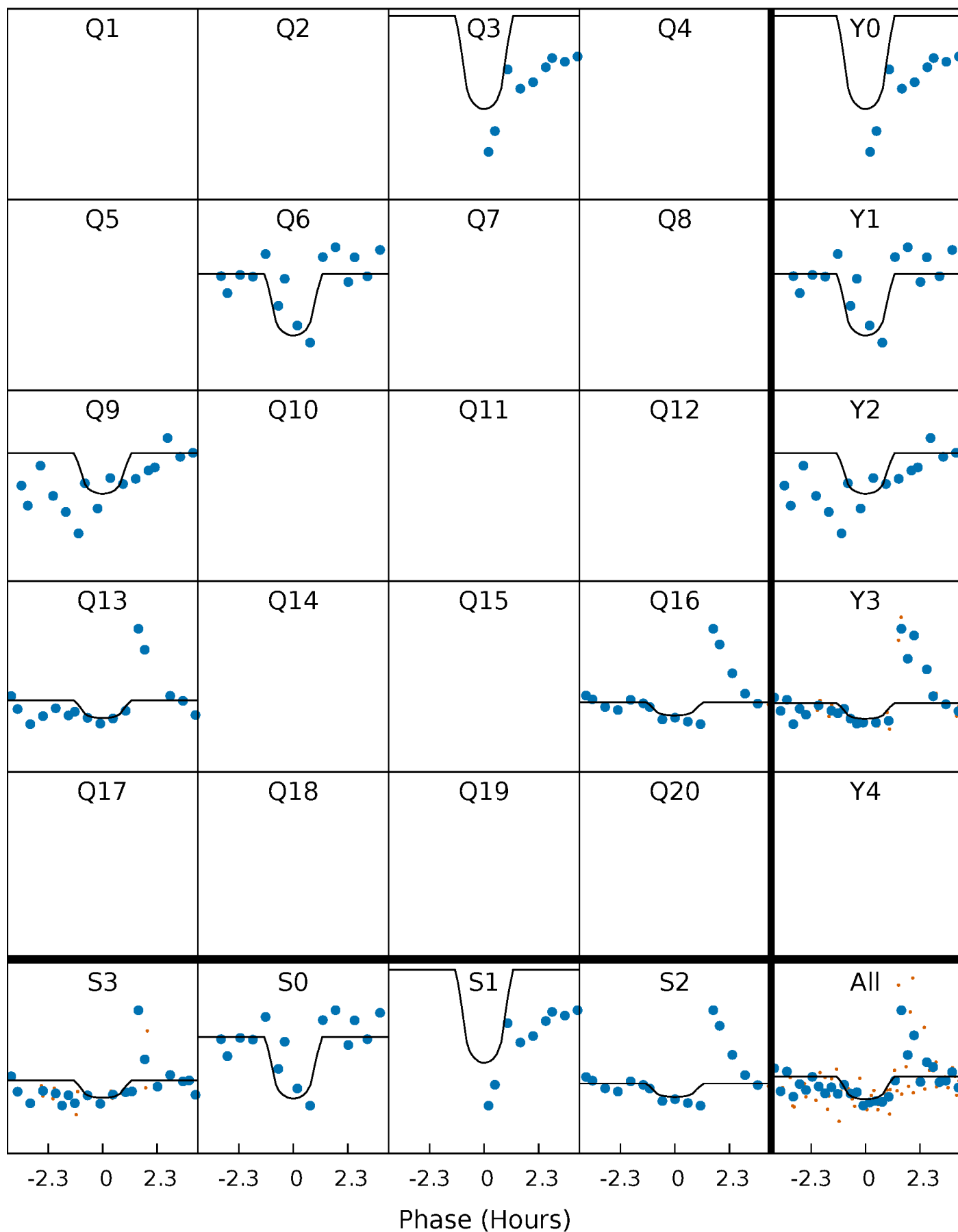
PDC Quarter-Phased Transit Curves

TCE 004249702-01 P=303.187962 Days $T_0=281.349773$ (BKJD)



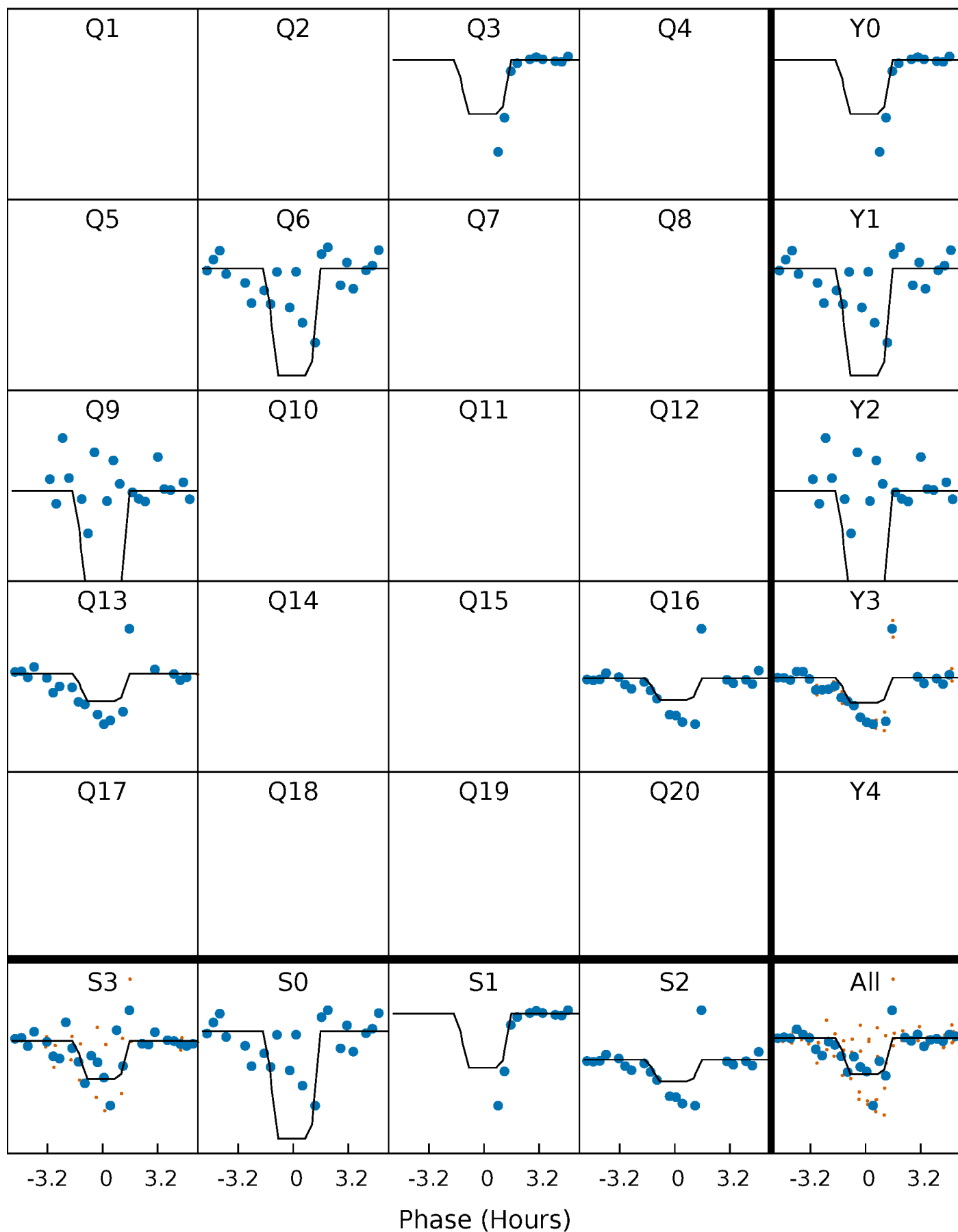
DV Quarter-Phased Transit Curves

TCE 004249702-01 P=303.187962 Days $T_0=281.349773$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

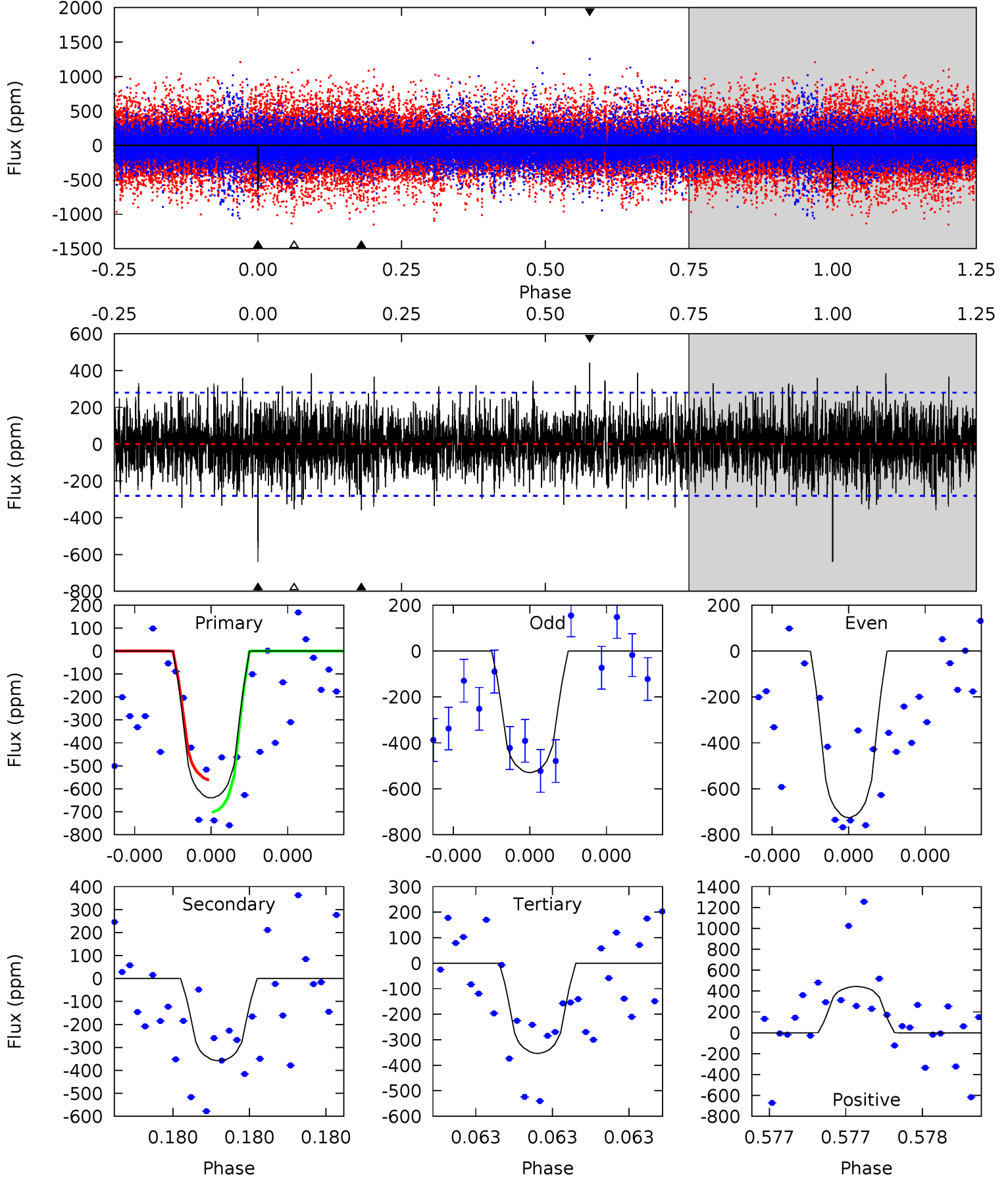
TCE 004249702-01 P=303.193172 Days $T_0=281.325842$ (BKJD)



DV Model-Shift Uniqueness Test

004249702-01, P = 303.187962 Days, E = 281.349773 Days

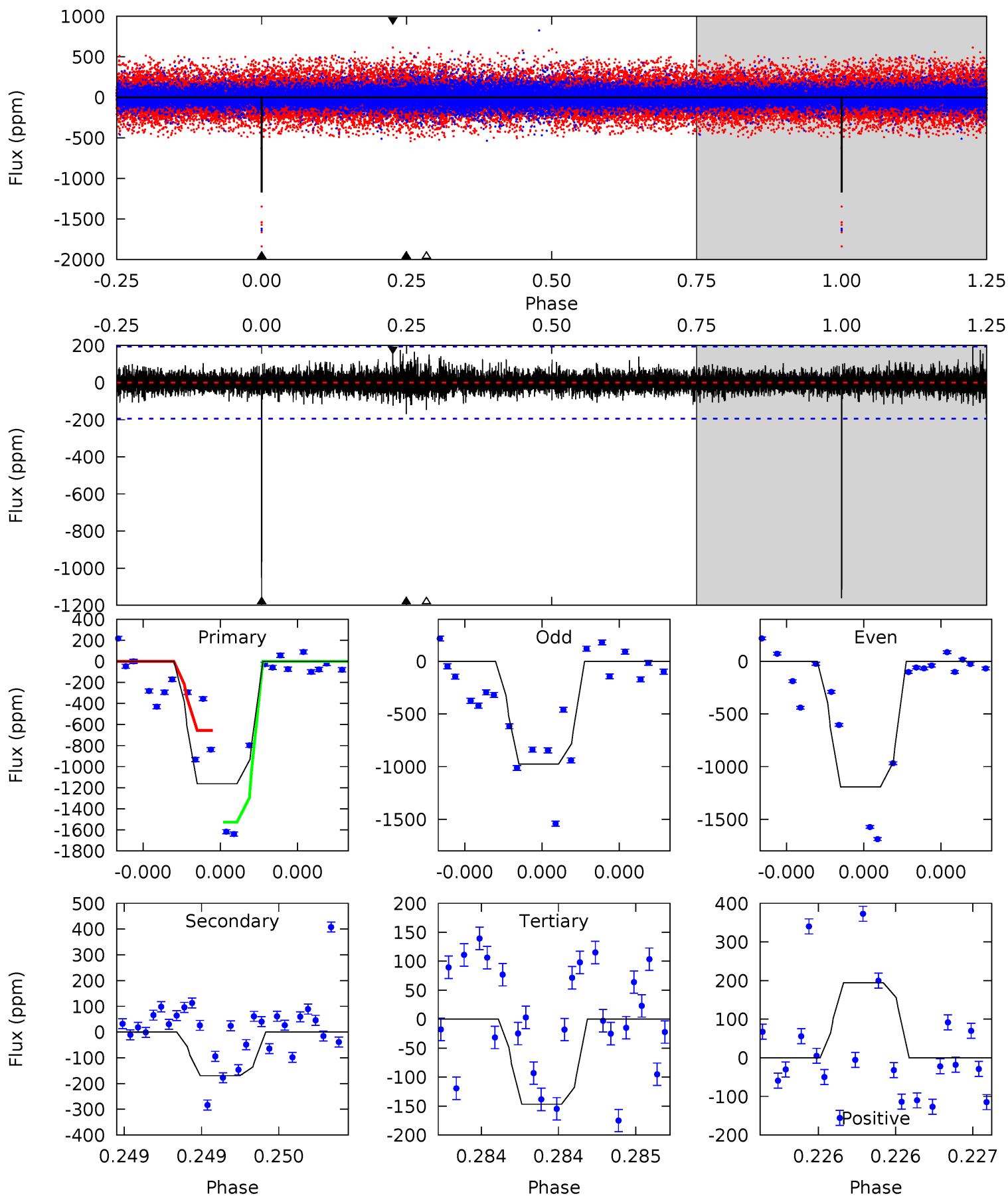
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.9 | 7.21 | 7.12 | 8.92 | 5.64 | 3.59 | 1.89 | 5.77 | 3.97 | 0.09 | -1.71 | 1.76 | 0.98 | 0.41 | 1.41 |



Alt Model-Shift Uniqueness Test

004249702-01, P = 303.193172 Days, E = 281.325842 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 33.6 | 4.89 | 4.24 | 5.62 | 5.61 | 3.54 | 0.91 | 29.3 | 28.0 | 0.65 | -0.73 | 3.37 | 0.67 | 0.14 | 12.0 |



Stellar Parameters For KIC 004249702

| | $T_{\text{eff}}(K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5432^{+180}_{-147} | $3.967^{+0.517}_{-0.172}$ | $0.100^{+0.250}_{-0.250}$ | $1.749^{+0.541}_{-0.812}$ | $1.033^{+0.120}_{-0.146}$ | $0.272^{+1.528}_{-0.130}$ |
| | +3%/-3% | +13%/-4% | +250%/-250% | +31%/-46% | +12%/-14% | +562%/-48% |
| 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 004249702-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|-------------------|-----------------------|-------------------------|
| DV | -358 ± 50 | $8.37^{+9.31}_{-5.91}$ | 464^{+40}_{-60} | 3804^{+2351}_{-761} | 2240^{+22349}_{-1749} |
| Alt. | -169 ± 35 | $8.61^{+8.75}_{-6.00}$ | 460^{+46}_{-59} | 3303^{+1781}_{-549} | 1002^{+9314}_{-751} |

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

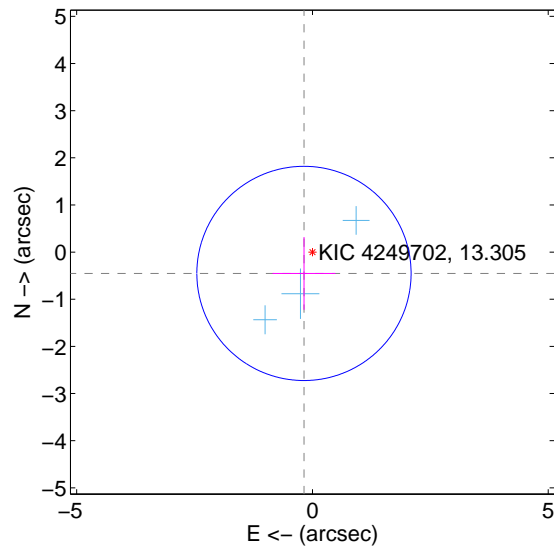
Supplemental centroid analysis for 004249702-01. Kepler magnitude: 13.30. Transit SNR 5.27

There are 3 quarters with good PRF difference image offsets

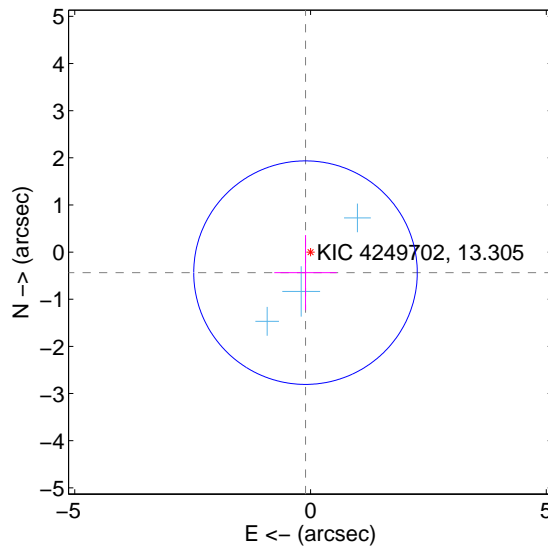
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.487 ± 0.757 | 0.64 | 0.180 ± 0.667 | -0.452 ± 0.771 |
| PRF-fit source offset from KIC position | 0.449 ± 0.790 | 0.57 | 0.107 ± 0.662 | -0.436 ± 0.797 |
| photometric centroid source offset | 1.02 ± 1.09 | 0.94 | -0.75 ± 0.97 | 0.69 ± 1.21 |

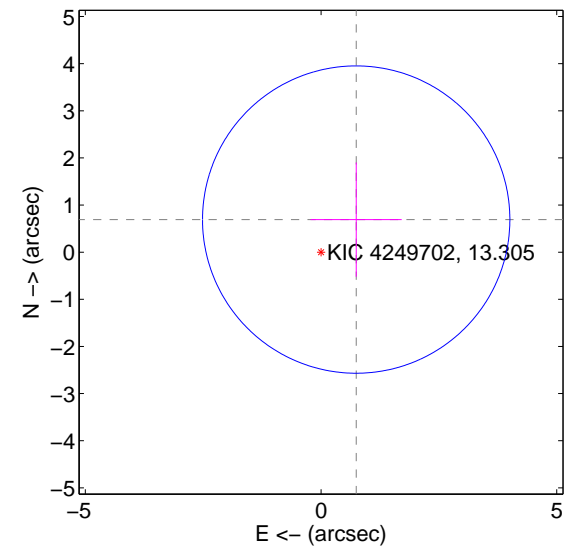
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

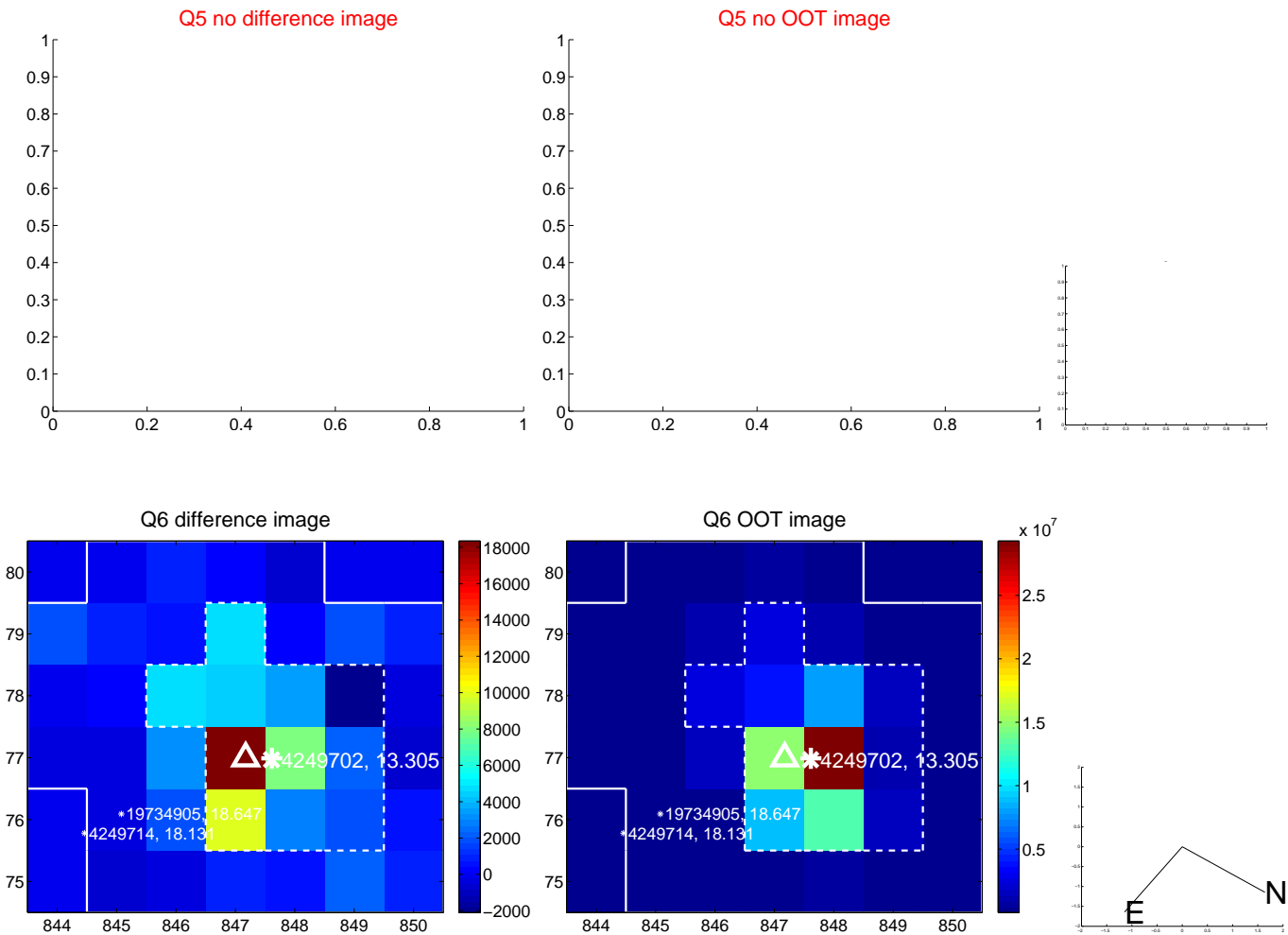


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



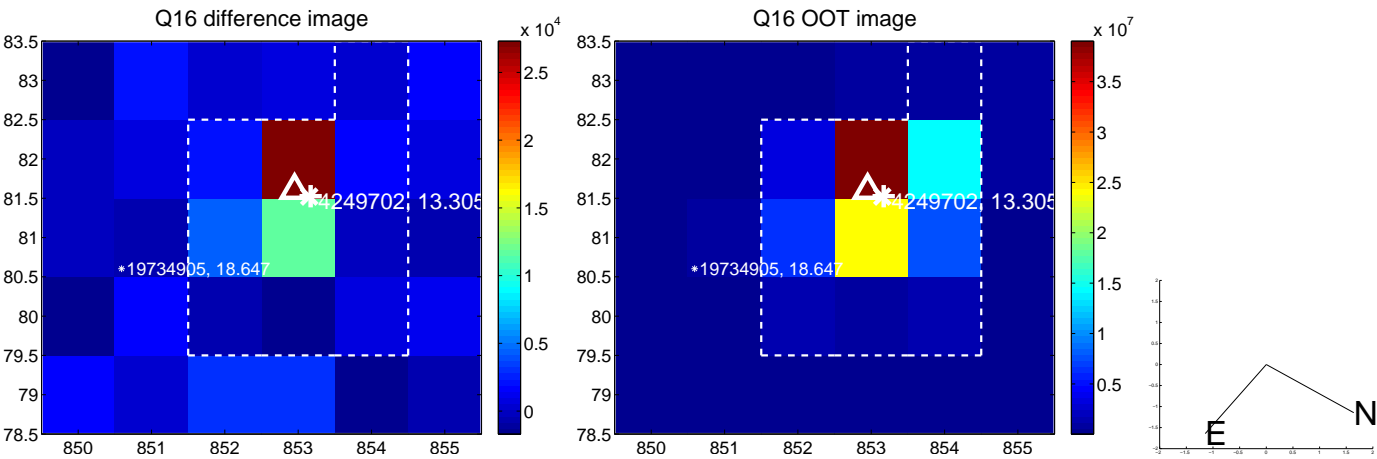
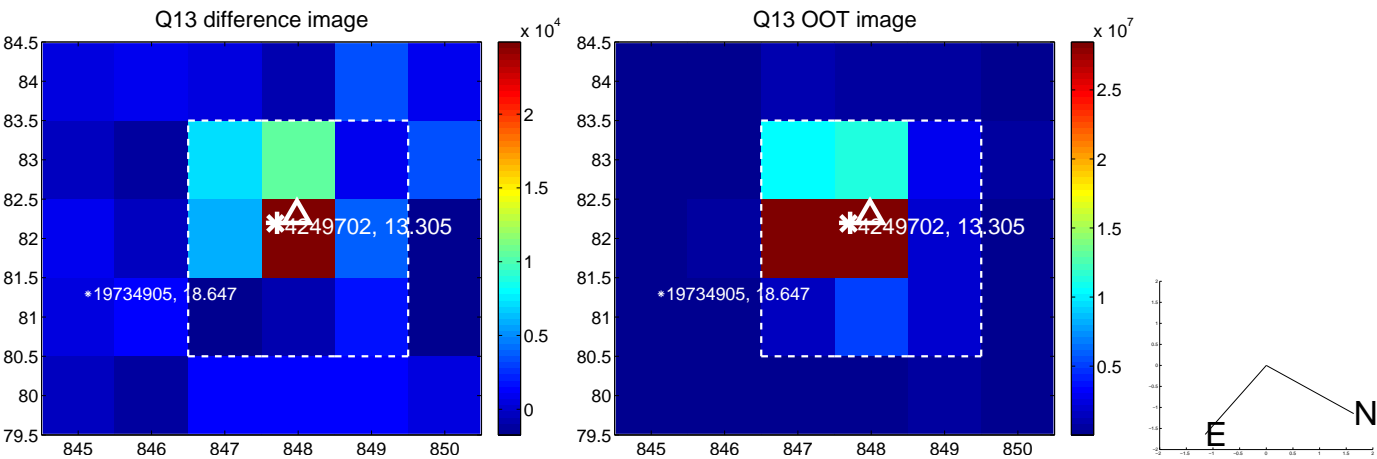
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



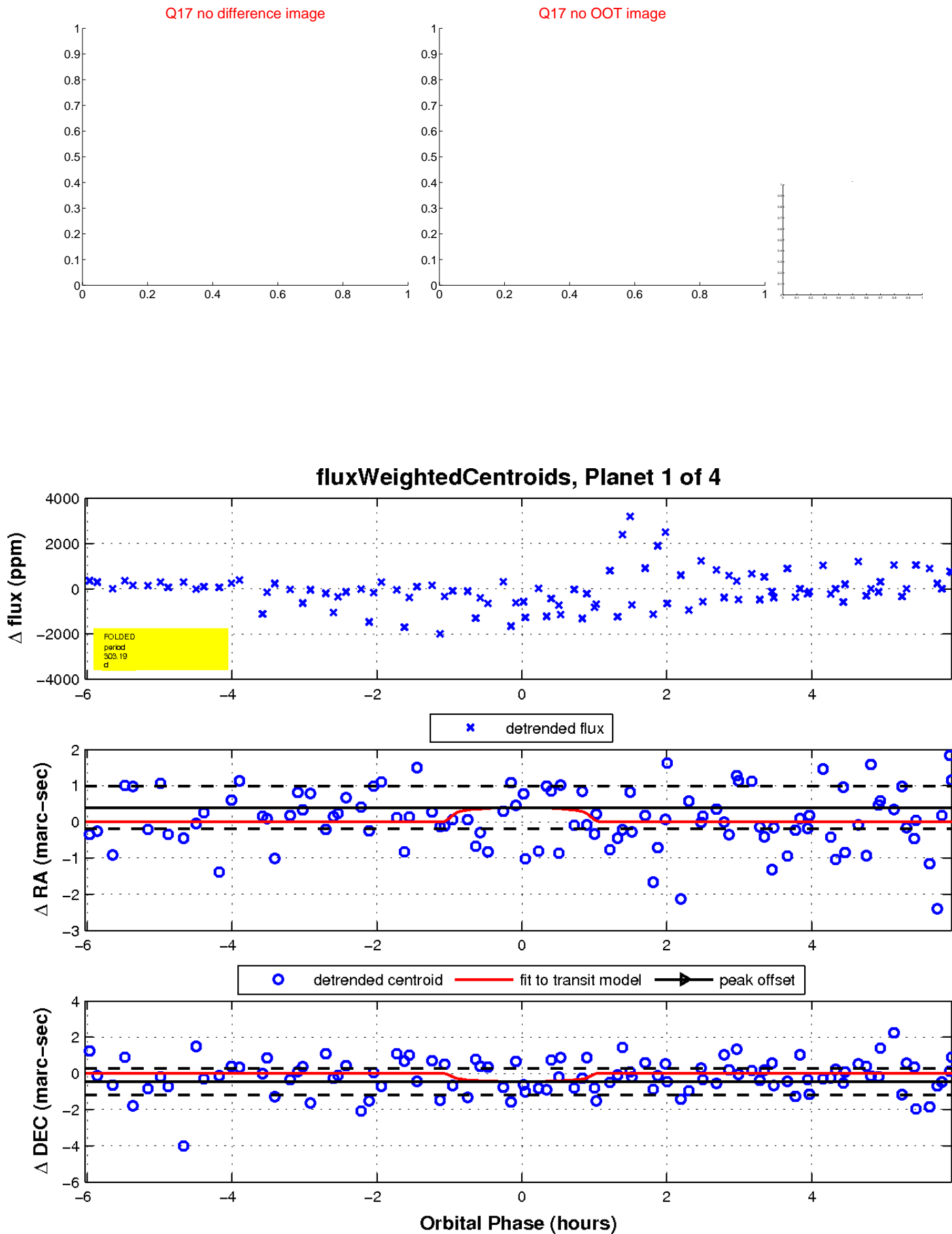
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

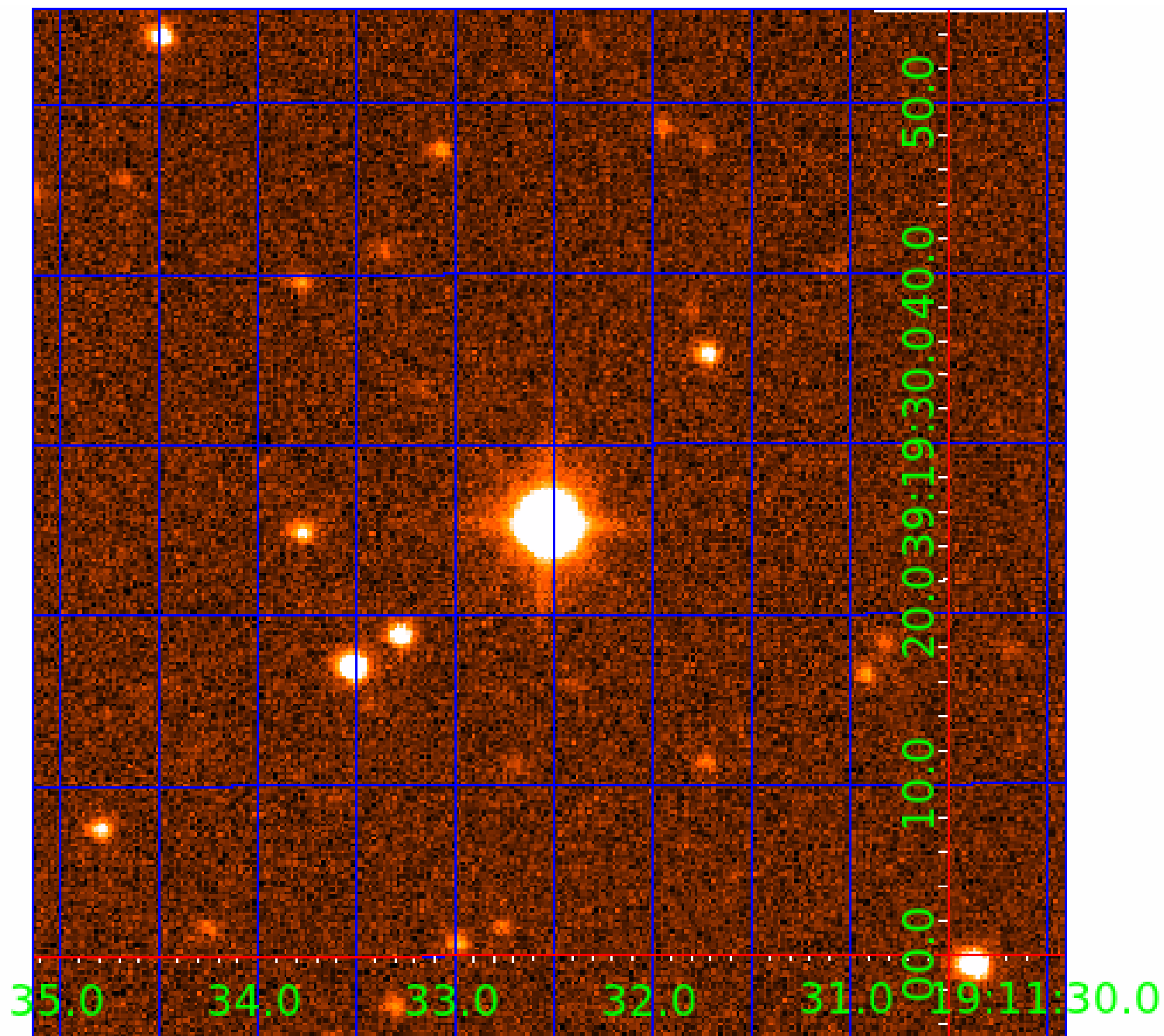


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004249702

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 004249702-01 | OBS | No | 303.187962 | 281.349773 | 562.2 | 2.016 | 12.2 | 5.3 | 1.75 | 5432 | 4.26 | 2.99 |
| 004249702-02 | OBS | No | 214.057430 | 299.793270 | 717.2 | 2.697 | 14.5 | 7.3 | 1.75 | 5432 | 4.87 | 4.76 |
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| 004249702-04 | OBS | No | 490.514419 | 225.192055 | 452.5 | 4.500 | 13.9 | -1.0 | 1.75 | 5432 | 3.65 | 1.57 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 004249702-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS |
| 004249702-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES |
| 004249702-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 004249702-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS |

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

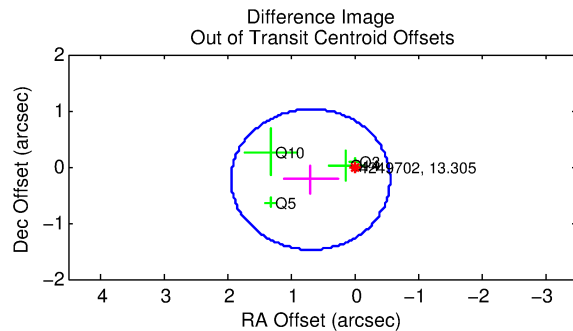
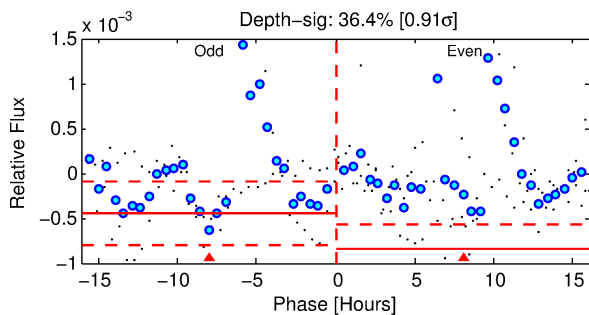
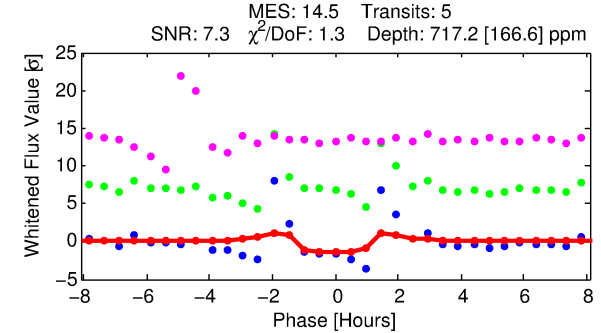
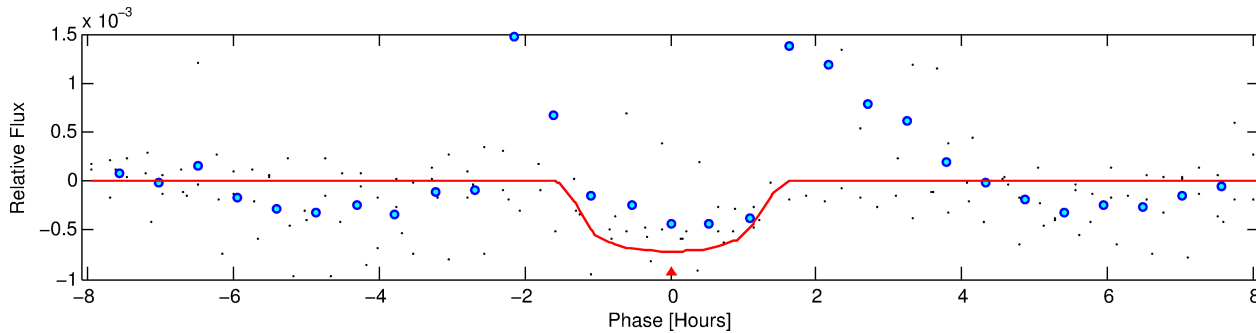
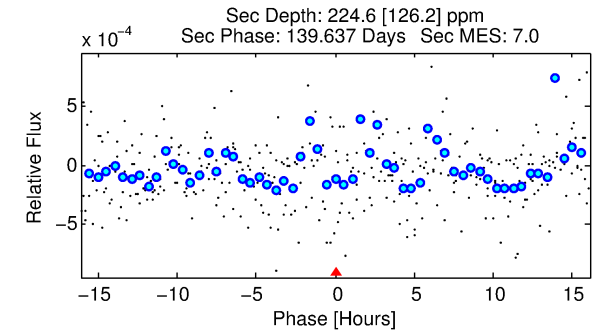
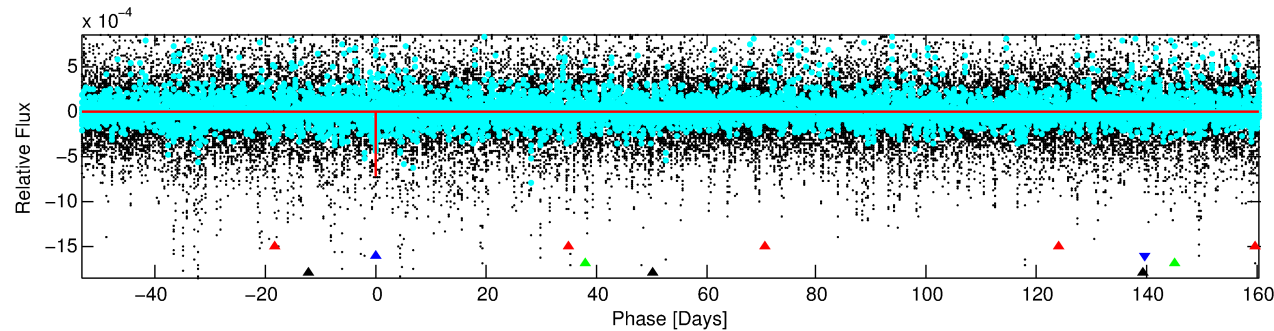
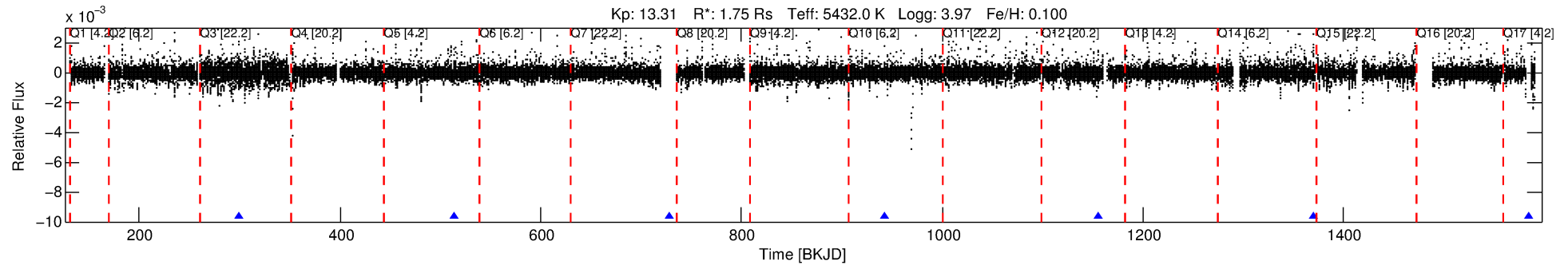
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004249702-02

No Significant Match Found

DV One-Page Summary

KIC: 4249702 Candidate: 2 of 4 Period: 214.057 d



DV Fit Results:

Period = 214.05743 [0.00224] d
Epoch = 299.7933 [0.0079] BKJD
Rp/R* = 0.0255 [0.0855]
a/R* = 502.49 [6535.85]
b = 0.60 [13.92]
Seff = 4.76 [4.10]
Teff = 377 [81] K
Rp = 4.87 [16.48] Re
a = 0.7083 [0.3565] AU
Ag = 2617.69 [17765.65] [0.15 σ]
Teffp = 4164 [7011] K [0.54 σ]

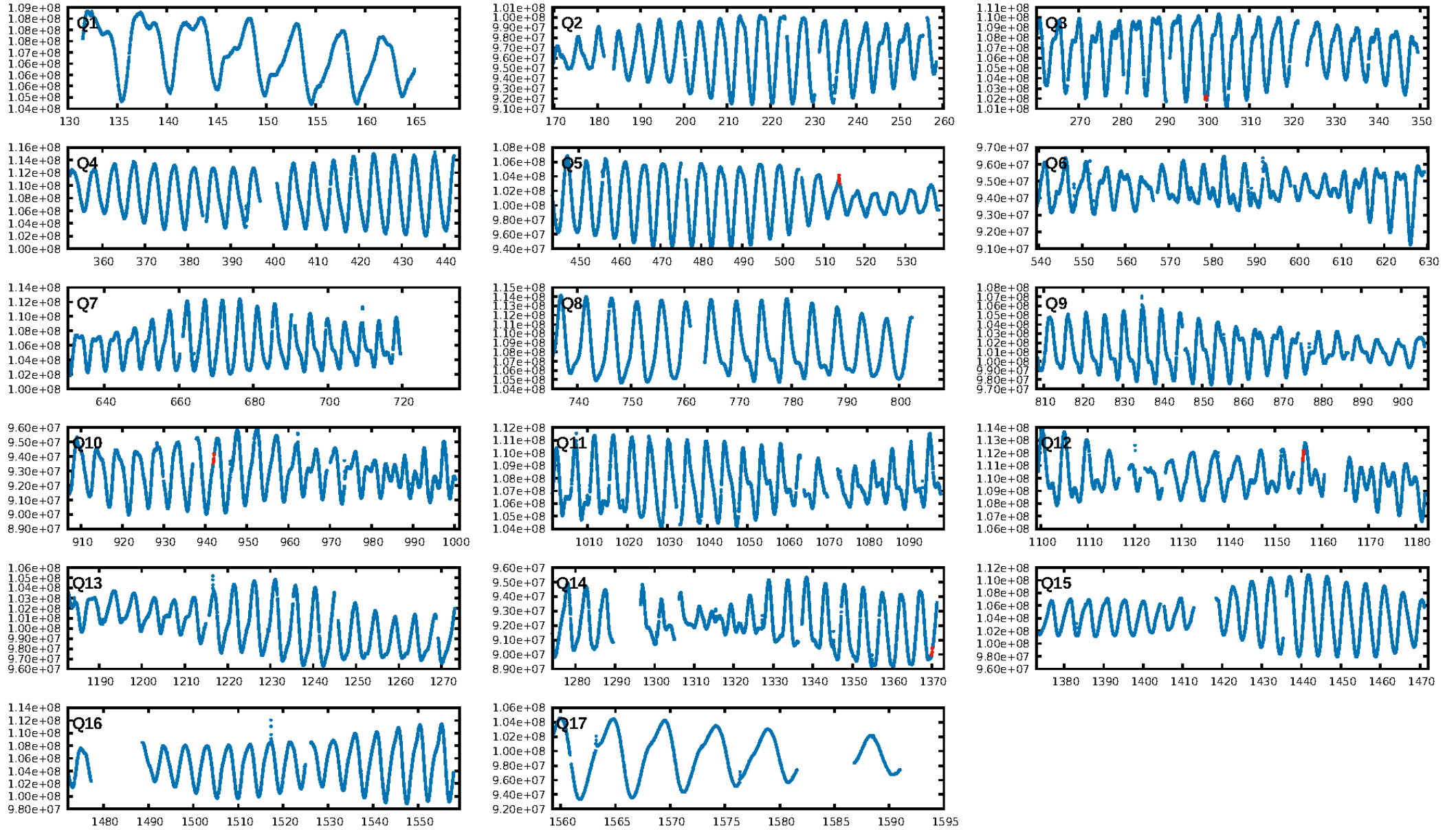
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [635.31 σ]
ModelChiSquare2-sig: 5.0%
ModelChiSquareGof-sig: 46.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 1.509
Centroid-sig: 36.5%
Centroid-so: 0.634 arcsec [0.86 σ]
OotOffset-rm: 0.722 arcsec [1.73 σ]
OotOffset-st: 2/1/0/1 [4]
KicOffset-rm: 0.646 arcsec [1.62 σ]
KicOffset-st: 2/1/0/1 [4]
DiffImageQuality-fgm: 0.75 [3/4]
DiffImageOverlap-fno: 1.00 [4/4]

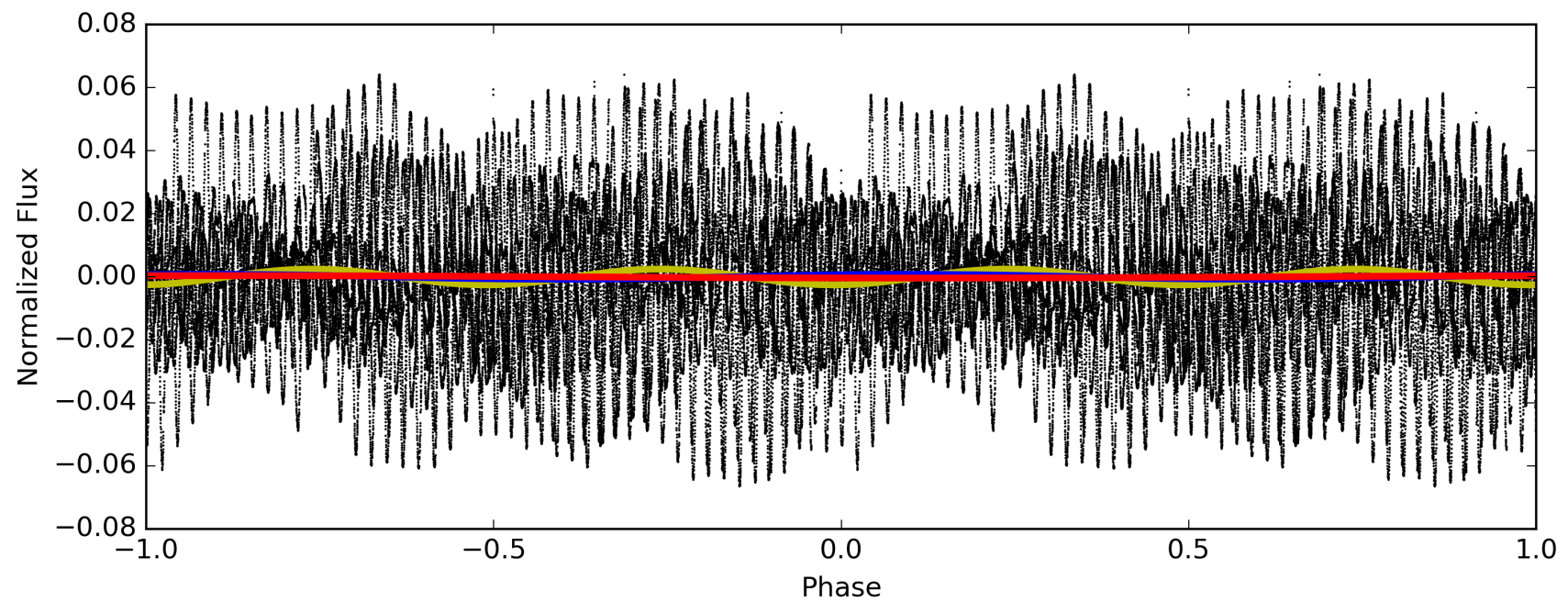
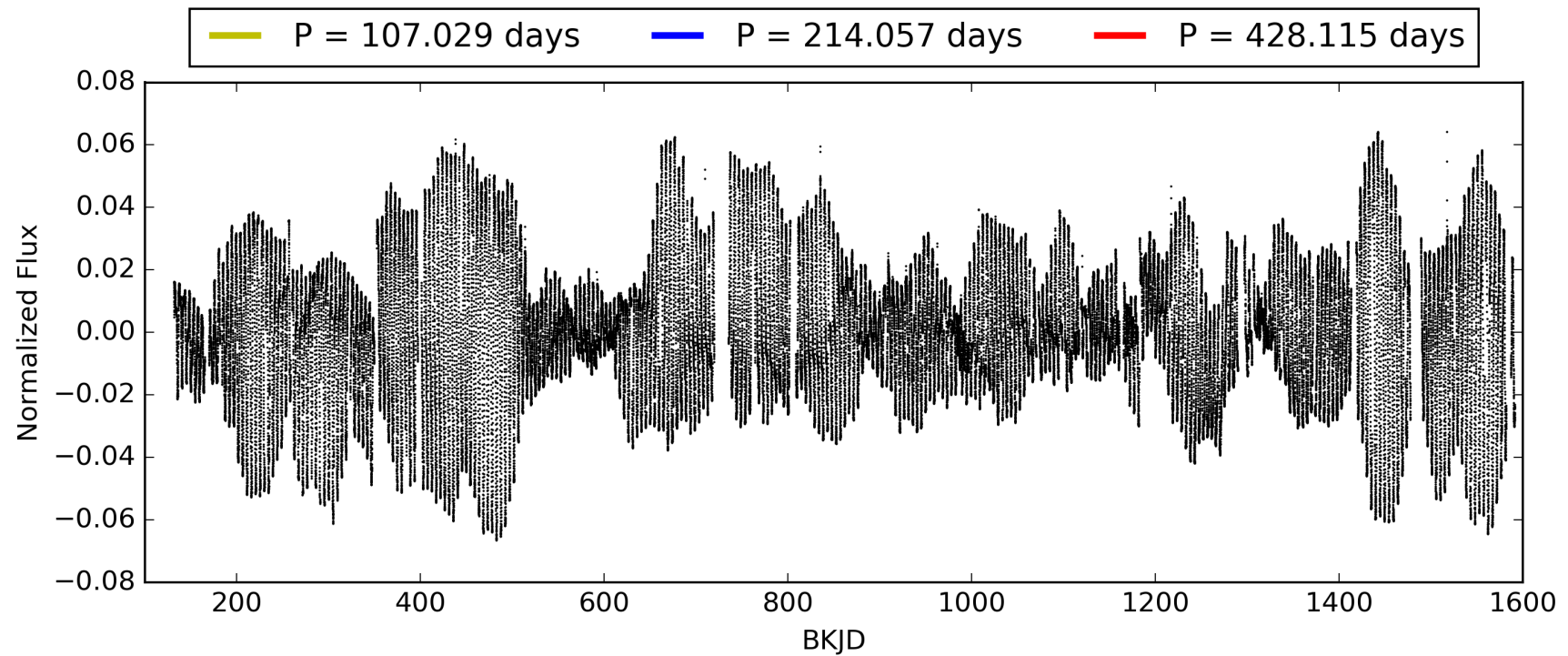
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:43:48 Z

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TCE 004249702-02, PDC Light Curves

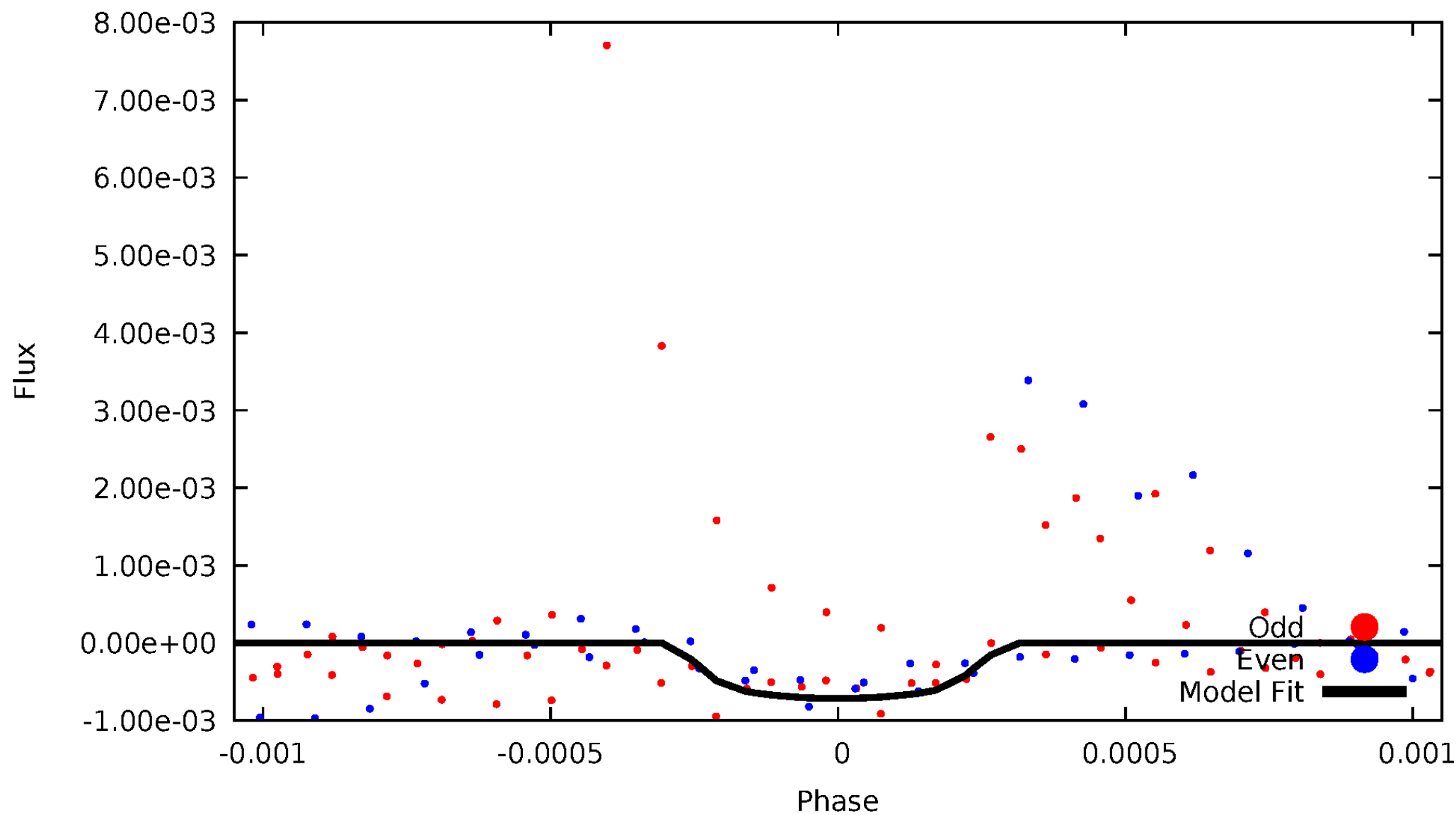


TCE 004249702-02



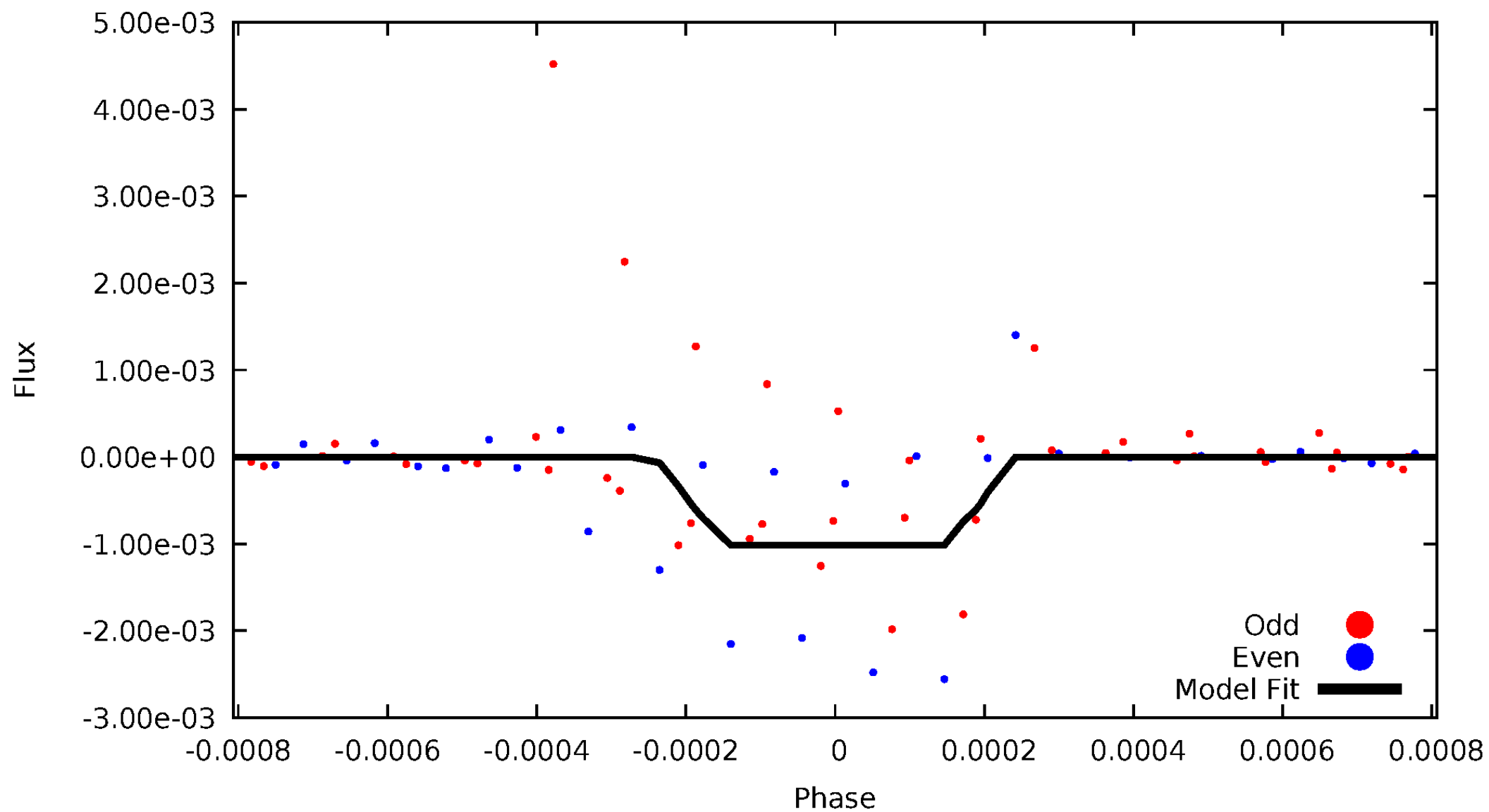
DV Odd/Even

TCE 004249702-02



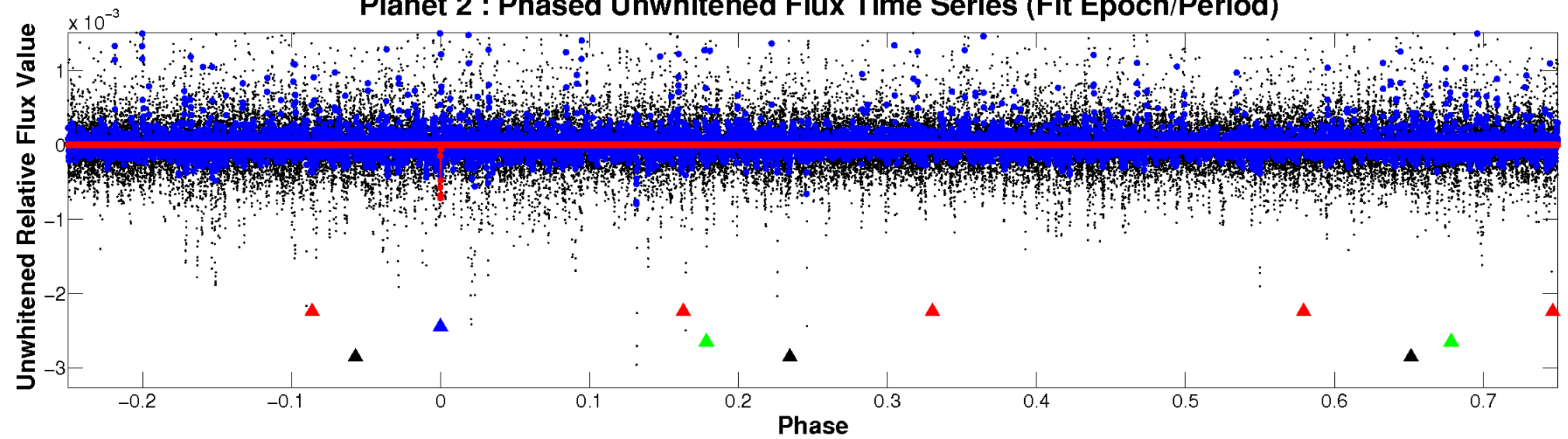
ALT Odd/Even

TCE 004249702-02

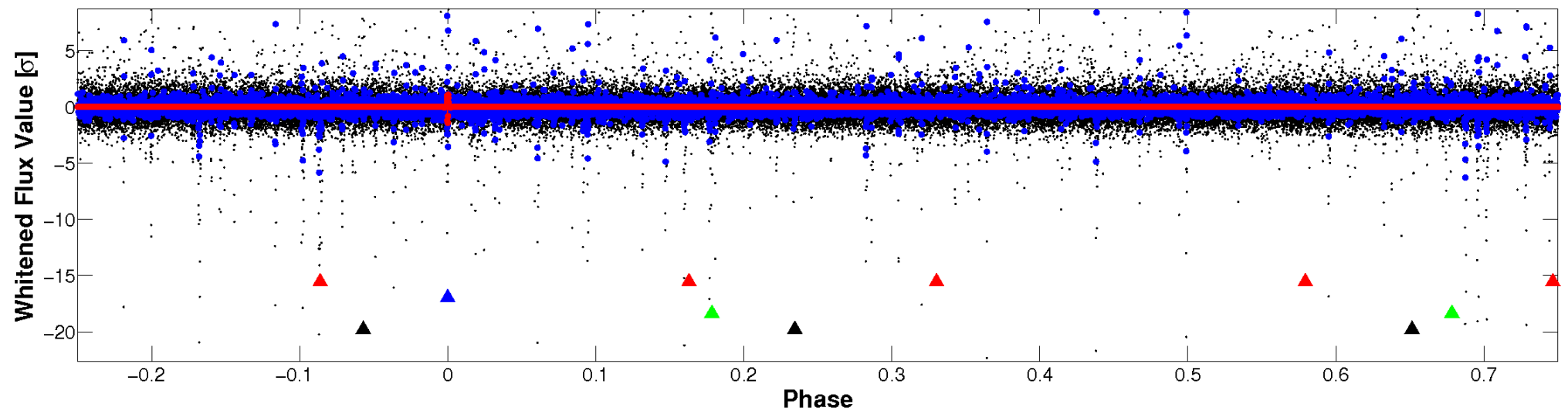


Non-Whitened Vs. Whitened Light Curve

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

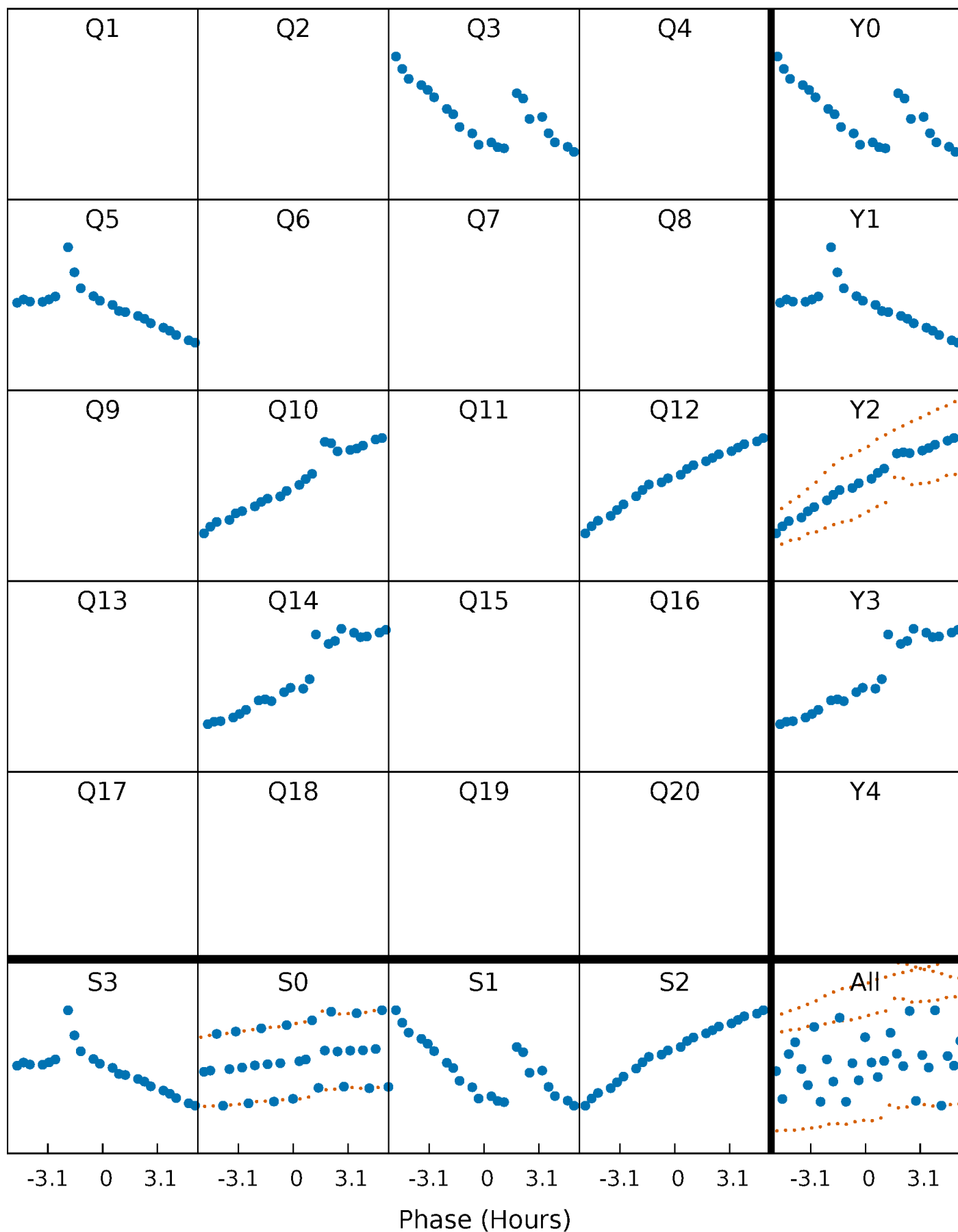


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



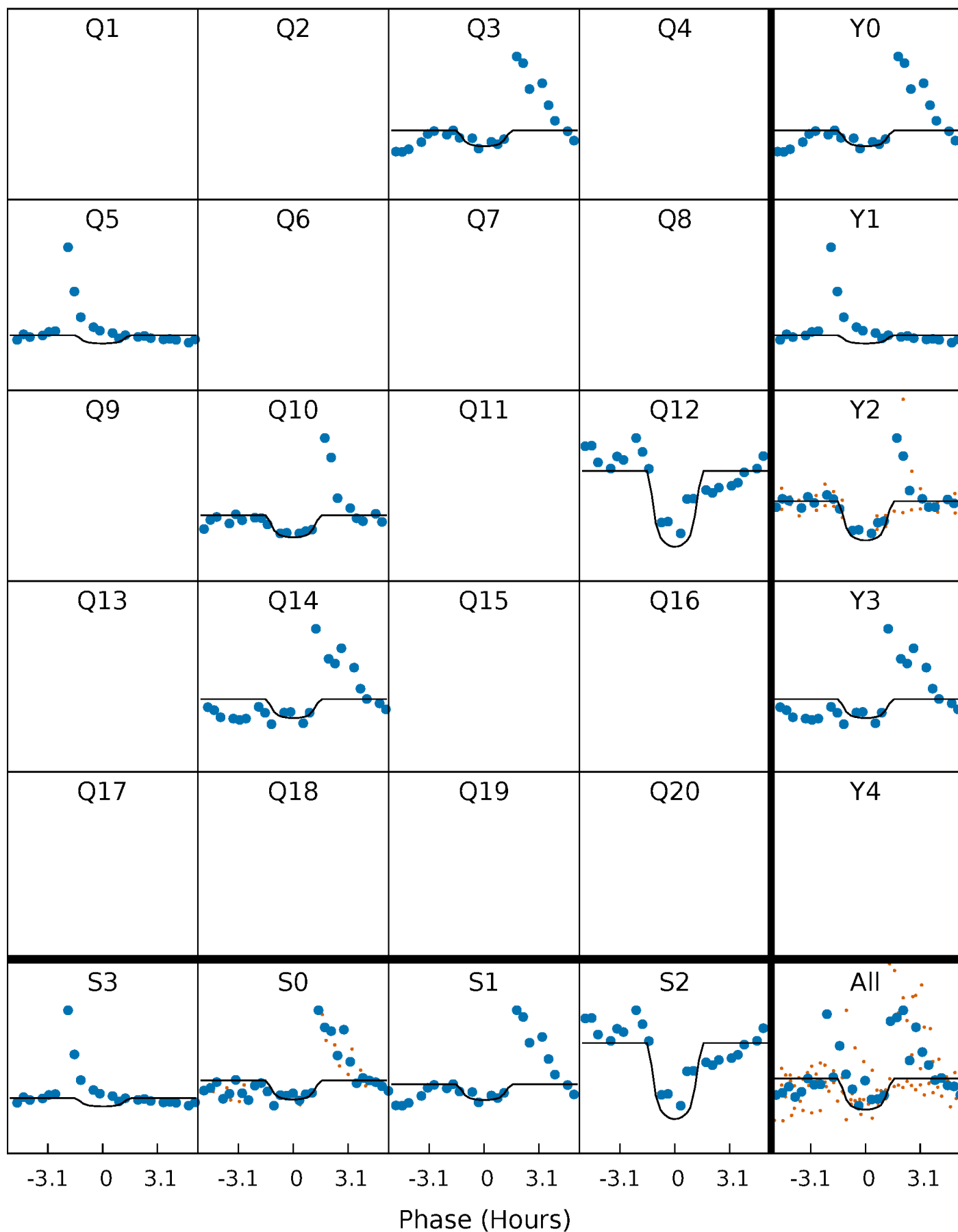
PDC Quarter-Phased Transit Curves

TCE 004249702-02 P=214.057430 Days $T_0=299.793270$ (BKJD)



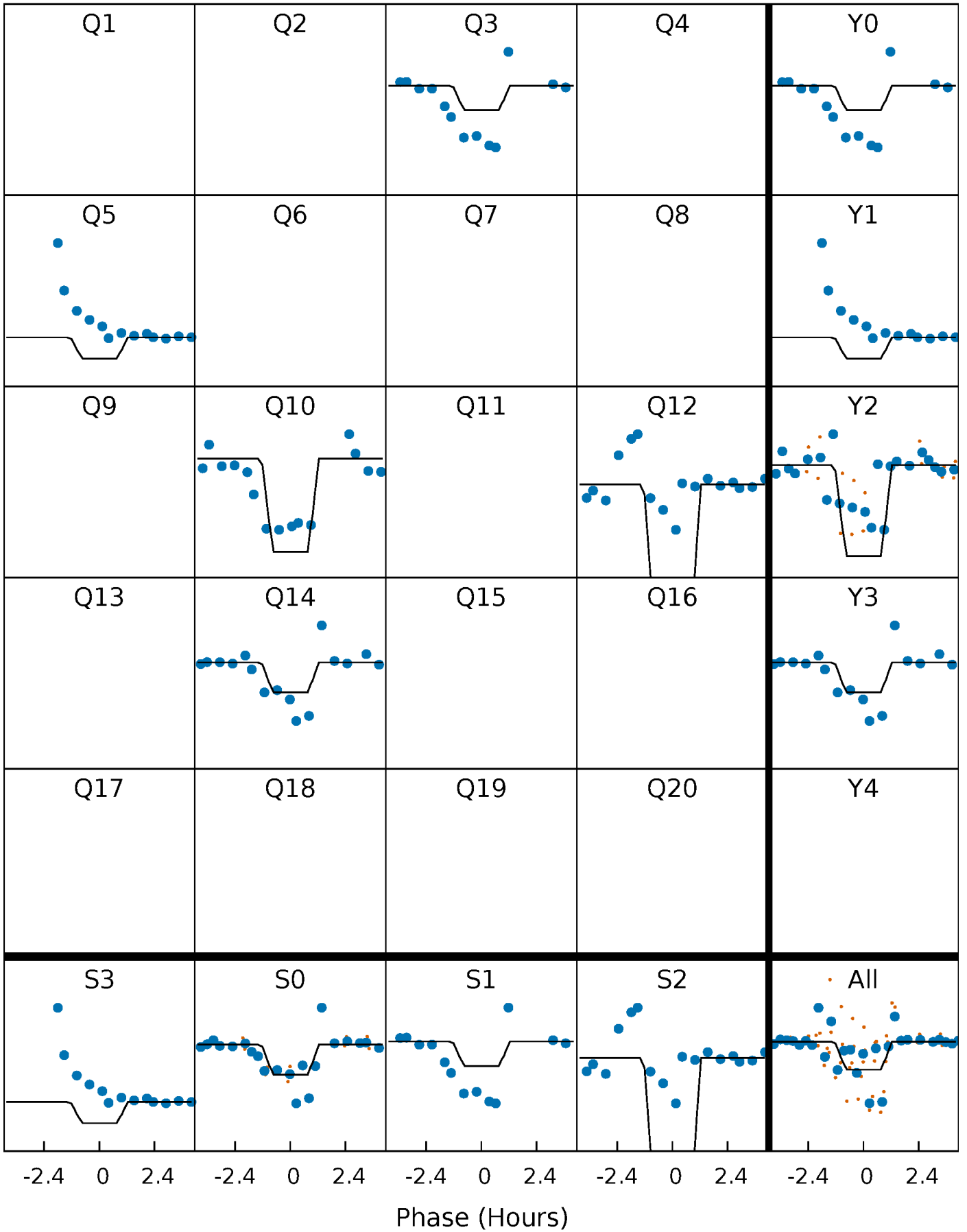
DV Quarter-Phased Transit Curves

TCE 004249702-02 $P=214.057430$ Days $T_0=299.793270$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

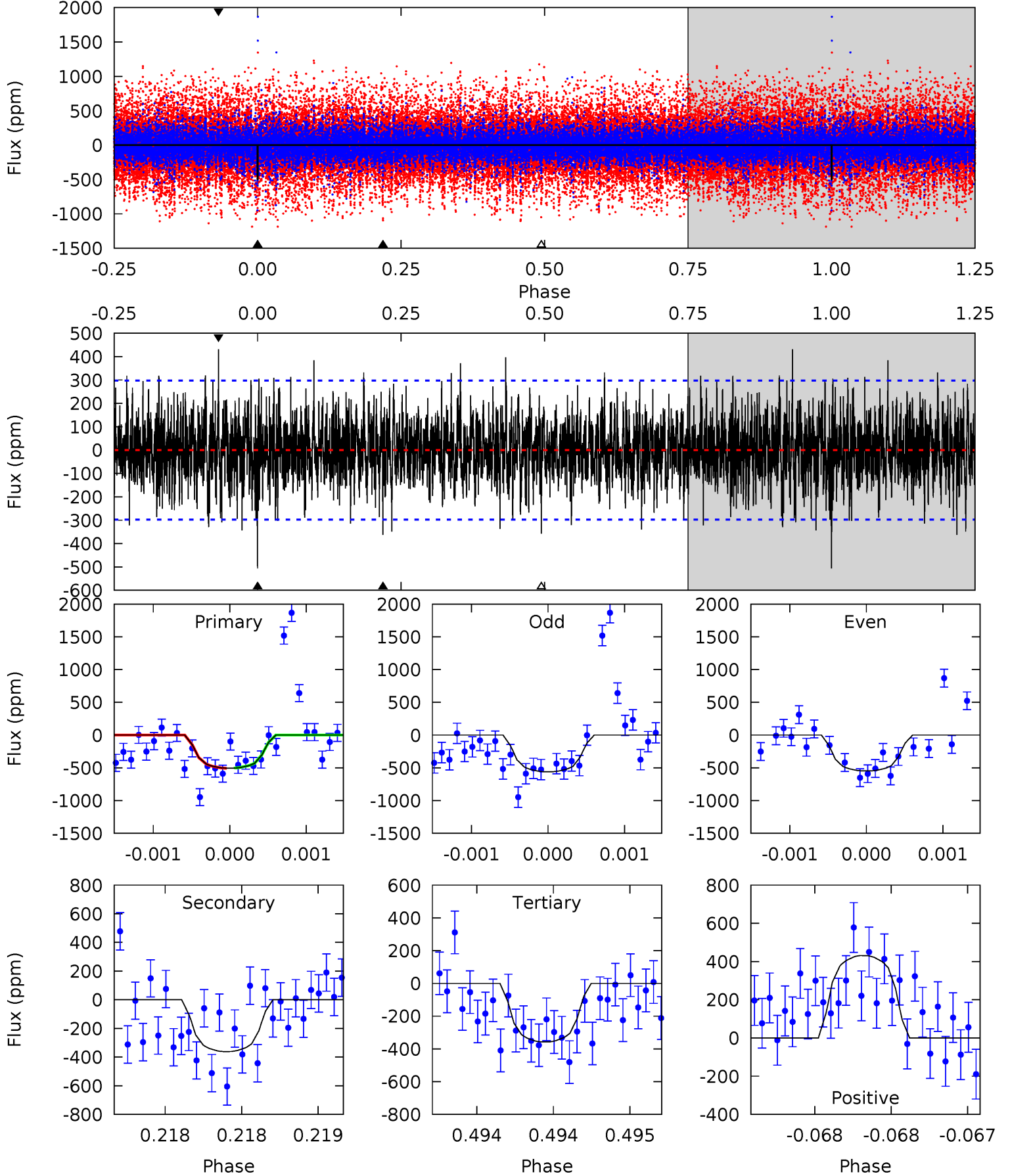
TCE 004249702-02 P=214.053528 Days $T_0=299.812367$ (BKJD)



DV Model-Shift Uniqueness Test

004249702-02, P = 214.057430 Days, E = 85.735840 Days

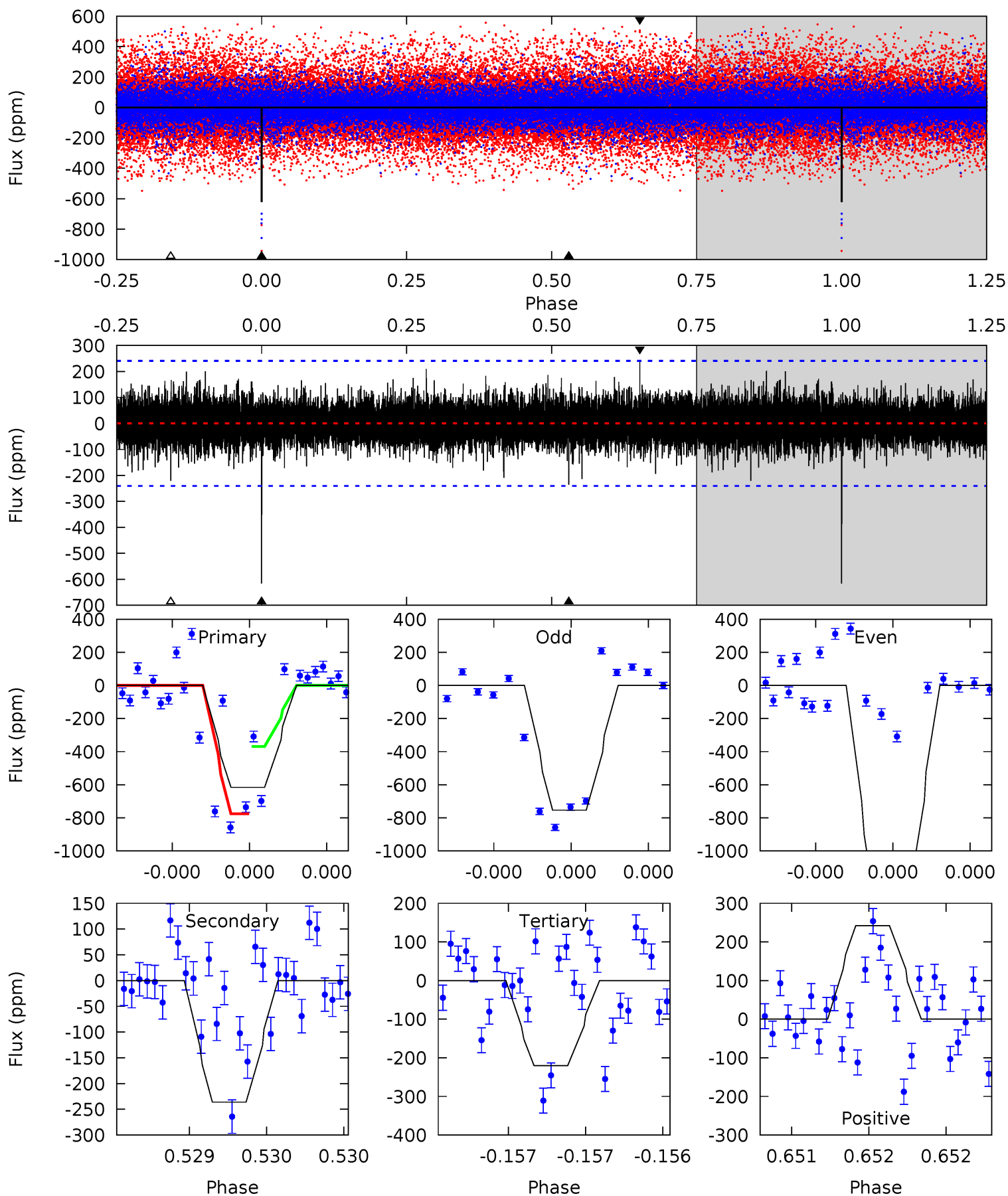
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.47 | 6.77 | 6.69 | 8.07 | 5.57 | 3.47 | 1.89 | 2.78 | 1.40 | 0.08 | -1.30 | 0.11 | 0.62 | 0.46 | 0.04 |



Alt Model-Shift Uniqueness Test

004249702-02, $P = 214.053528$ Days, $E = 85.758839$ Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.3 | 5.47 | 5.10 | 5.61 | 5.58 | 3.49 | 1.10 | 9.18 | 8.67 | 0.37 | -0.14 | 7.61 | 1.03 | 0.28 | 4.76 |



Stellar Parameters For KIC 004249702

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5432^{+180}_{-147} | $3.967^{+0.517}_{-0.172}$ | $0.100^{+0.250}_{-0.250}$ | $1.749^{+0.541}_{-0.812}$ | $1.033^{+0.120}_{-0.146}$ | $0.272^{+1.528}_{-0.130}$ |
| | +3%/-3% | +13%/-4% | +250%/-250% | +31%/-46% | +12%/-14% | +562%/-48% |
| 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 004249702-02 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|--------------------------|----------------------|-----------------------|----------------------|
| DV | -362 ± 53 | $12.18^{+12.75}_{-8.45}$ | 516^{+50}_{-61} | 3351^{+1839}_{-575} | 677^{+6590}_{-517} |
| Alt. | -236 ± 43 | $11.70^{+12.21}_{-7.64}$ | 513^{+49}_{-67} | 3142^{+1444}_{-517} | 466^{+3535}_{-361} |

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

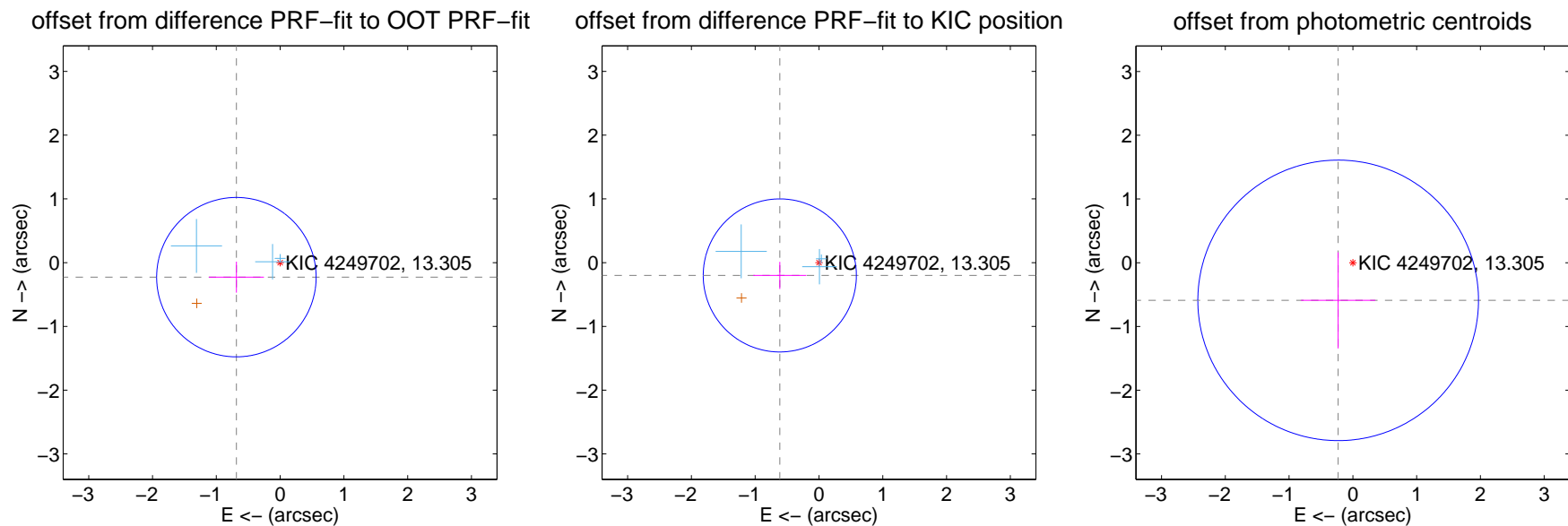
DV Centroid Data

Supplemental centroid analysis for 004249702-02. Kepler magnitude: 13.30. Transit SNR 7.26

There are 3 quarters with good PRF difference image offsets

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

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.722 ± 0.417 | 1.73 | 0.685 ± 0.432 | -0.228 ± 0.243 |
| PRF-fit source offset from KIC position | 0.646 ± 0.400 | 1.62 | 0.614 ± 0.415 | -0.201 ± 0.213 |
| photometric centroid source offset | 0.63 ± 0.73 | 0.86 | 0.23 ± 0.58 | -0.59 ± 0.75 |



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.

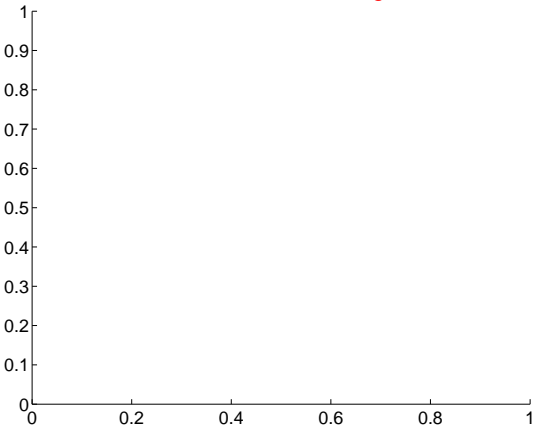
Q1 no difference image



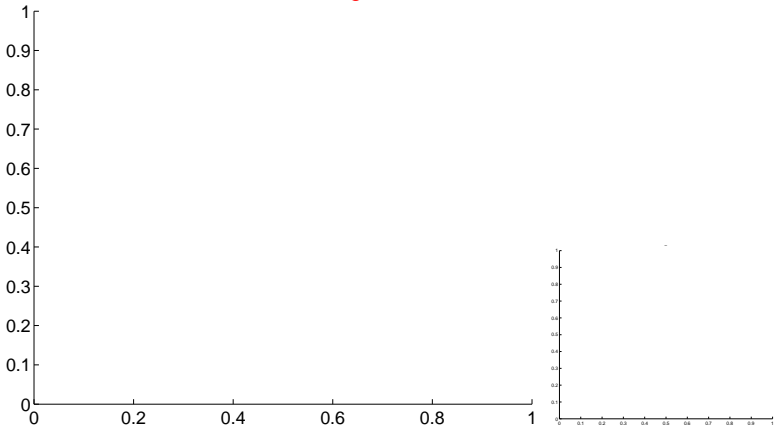
Q1 no OOT image



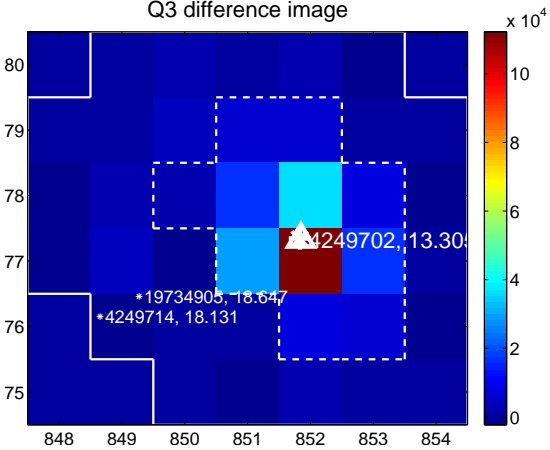
Q2 no difference image



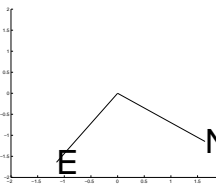
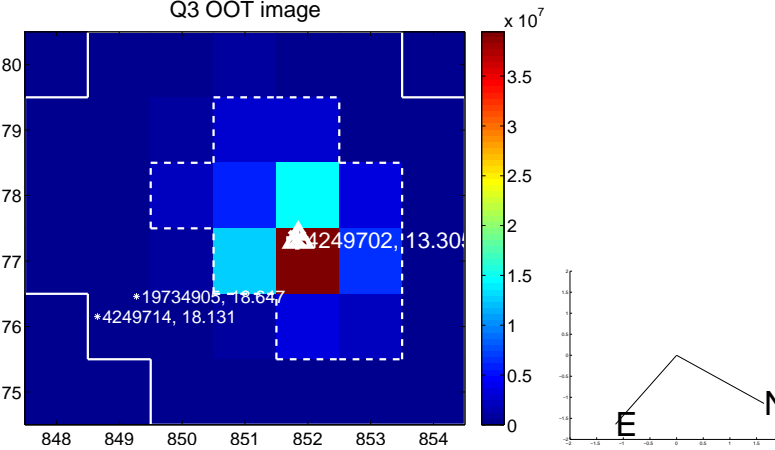
Q2 no OOT image



Q3 difference image



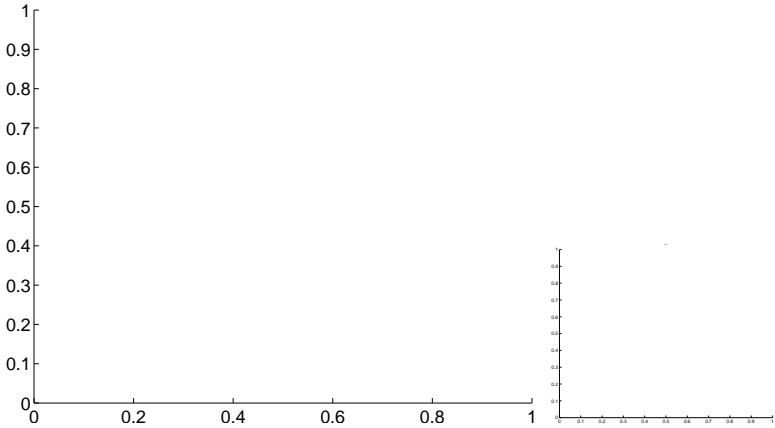
Q3 OOT image



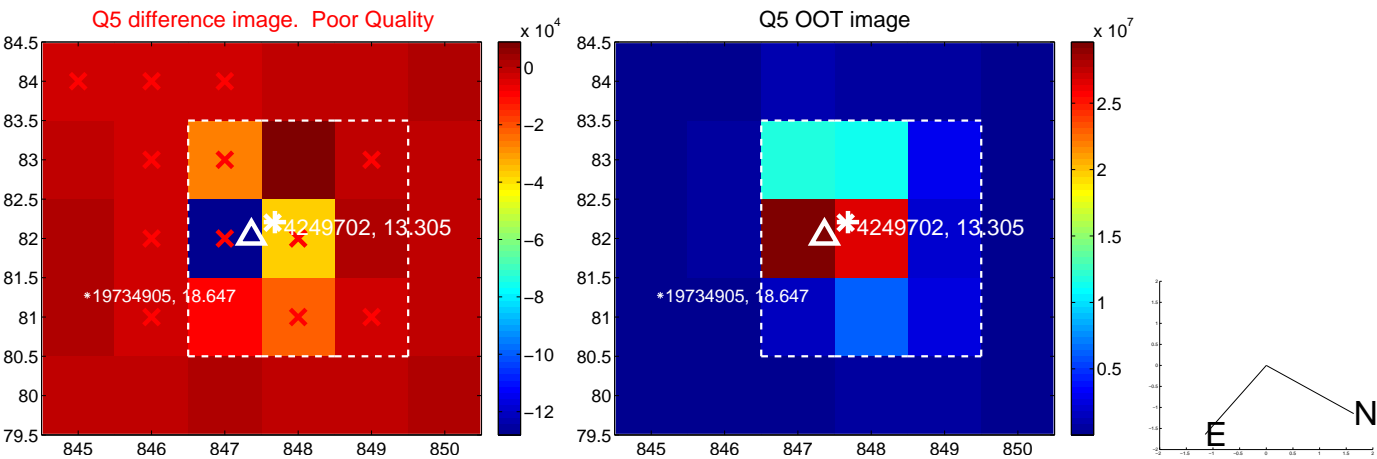
Q4 no difference image



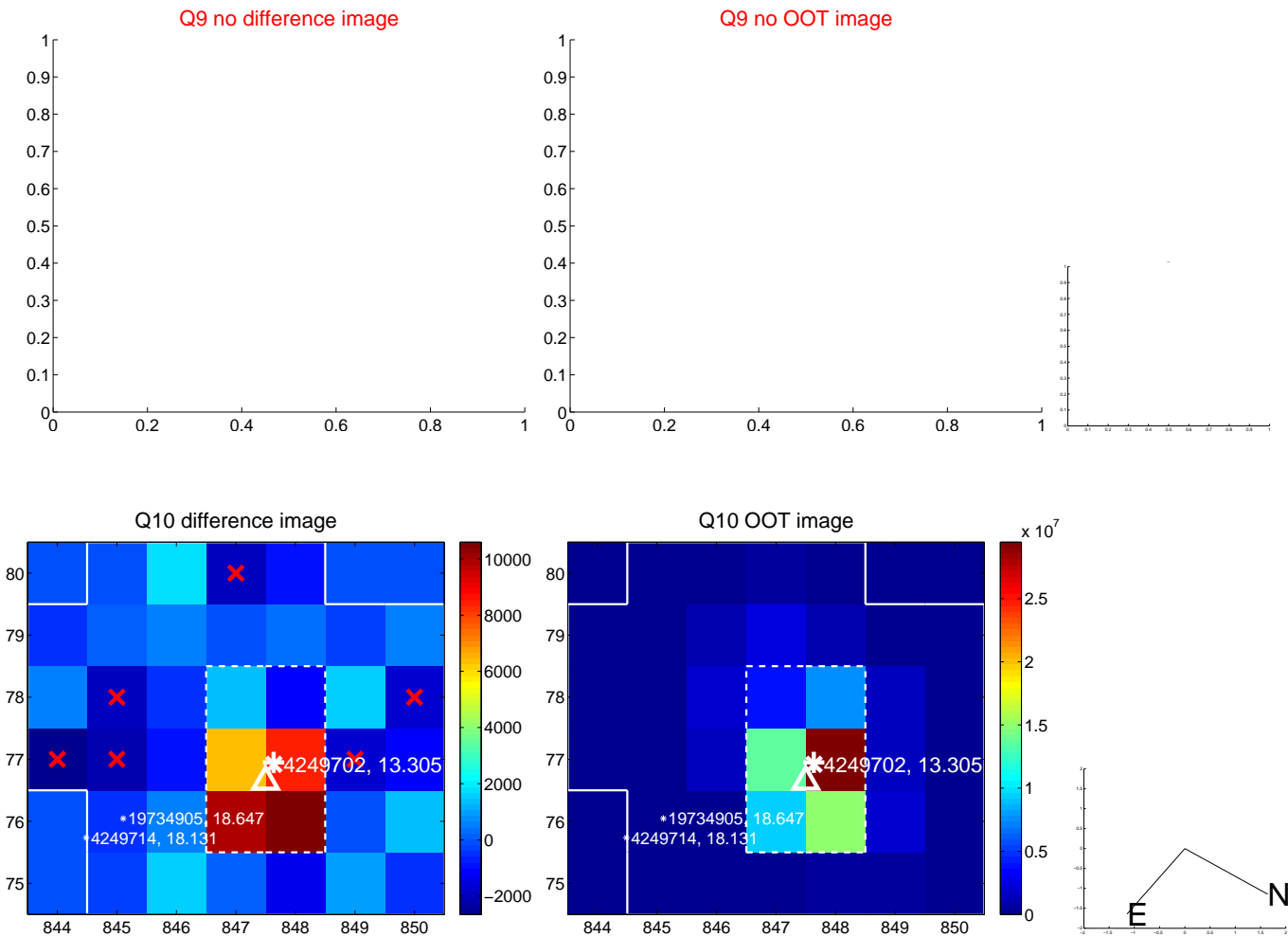
Q4 no OOT image



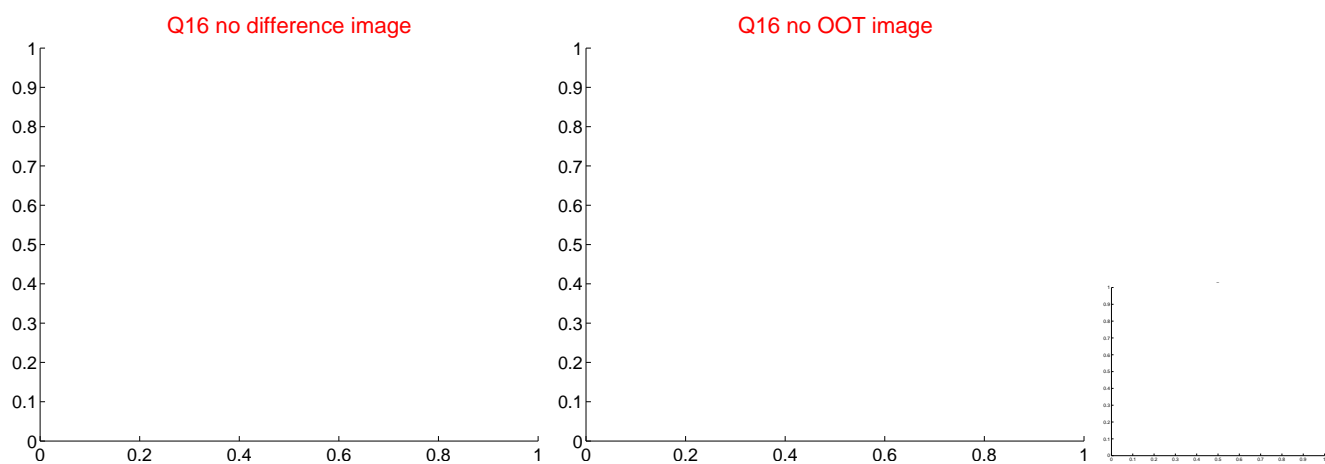
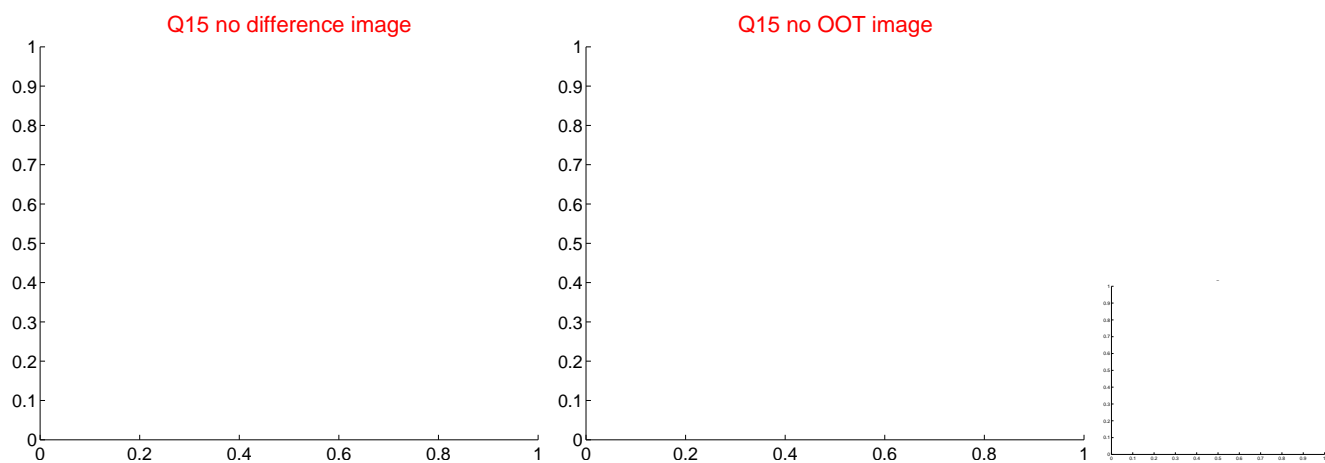
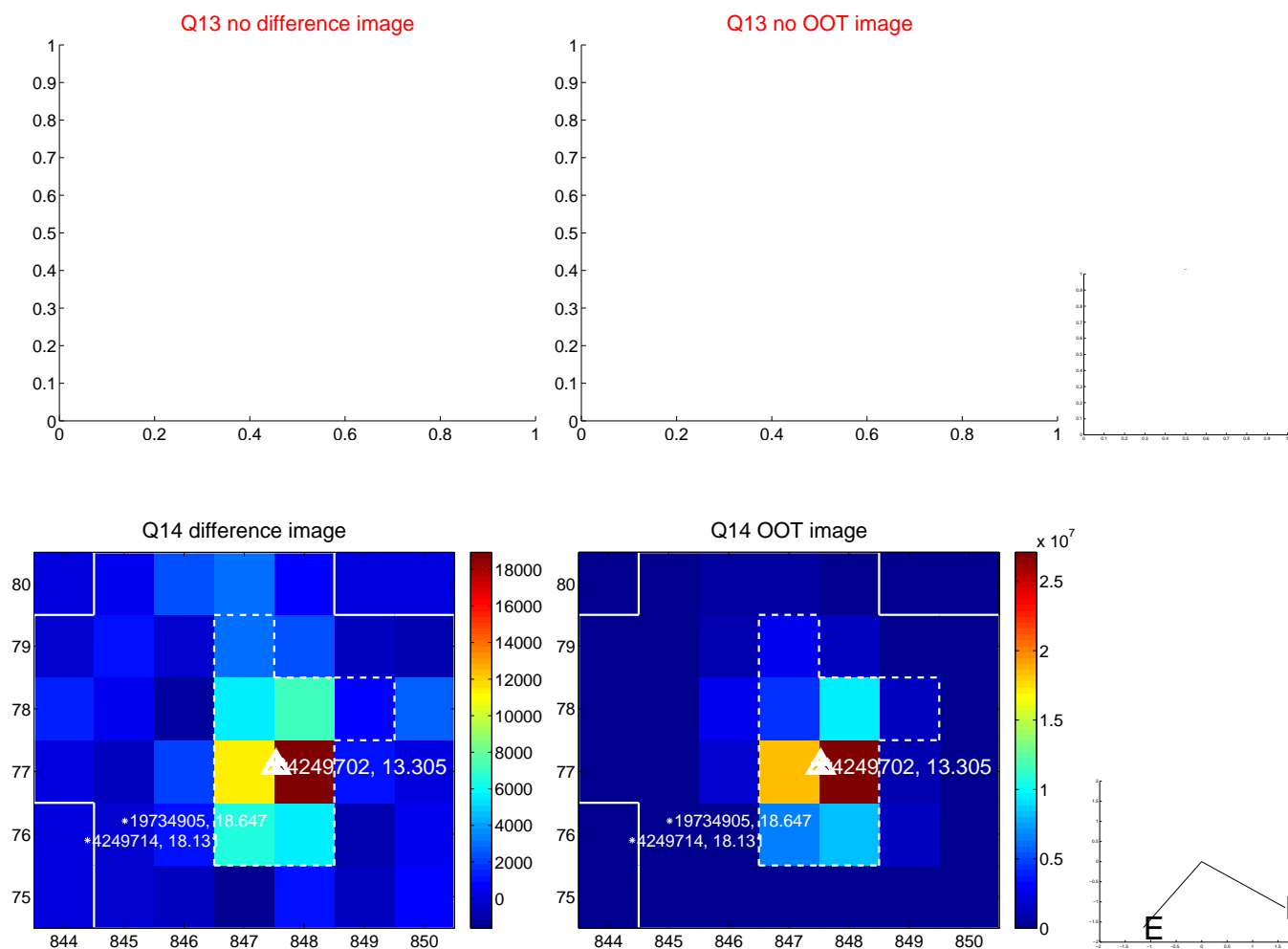
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



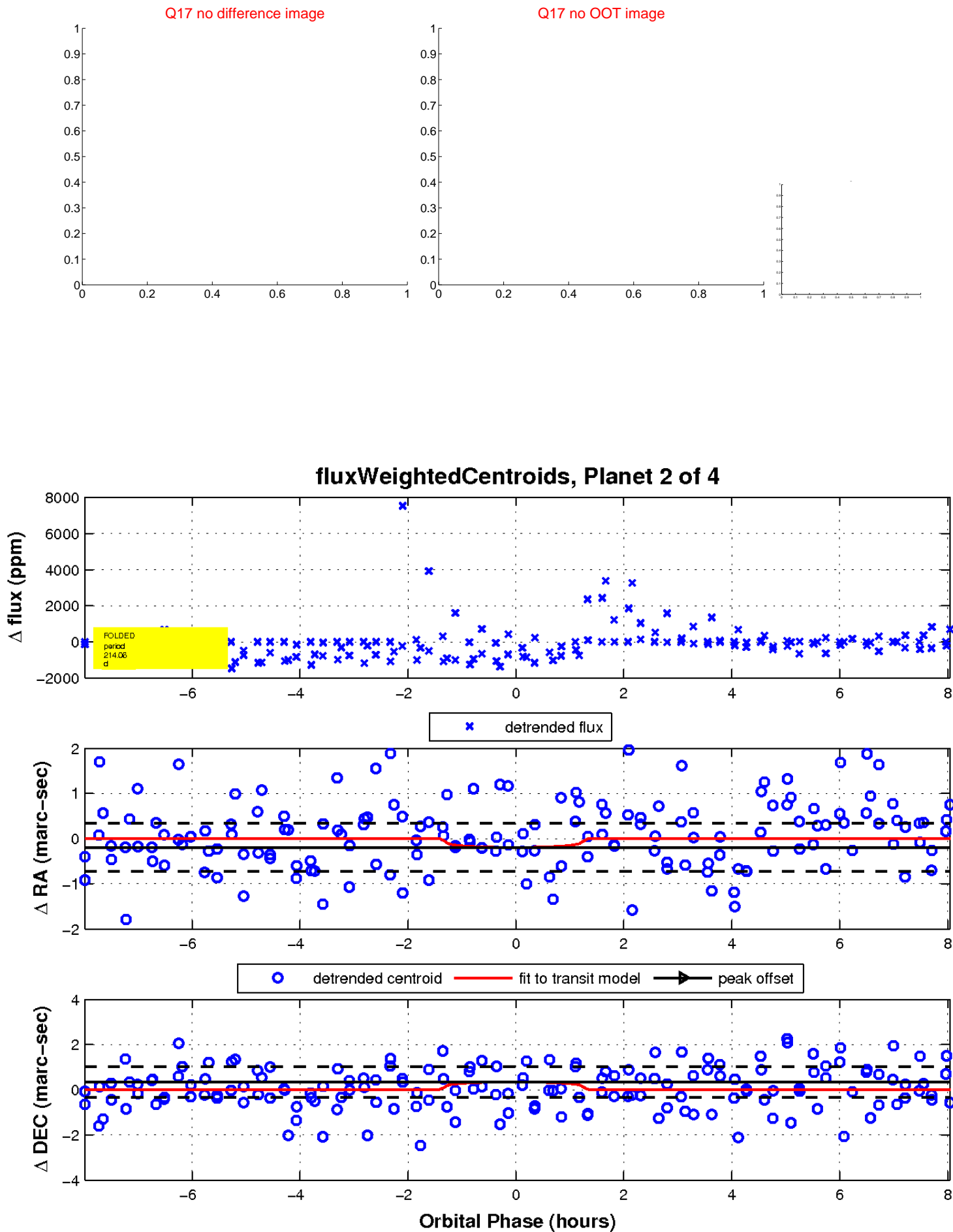
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

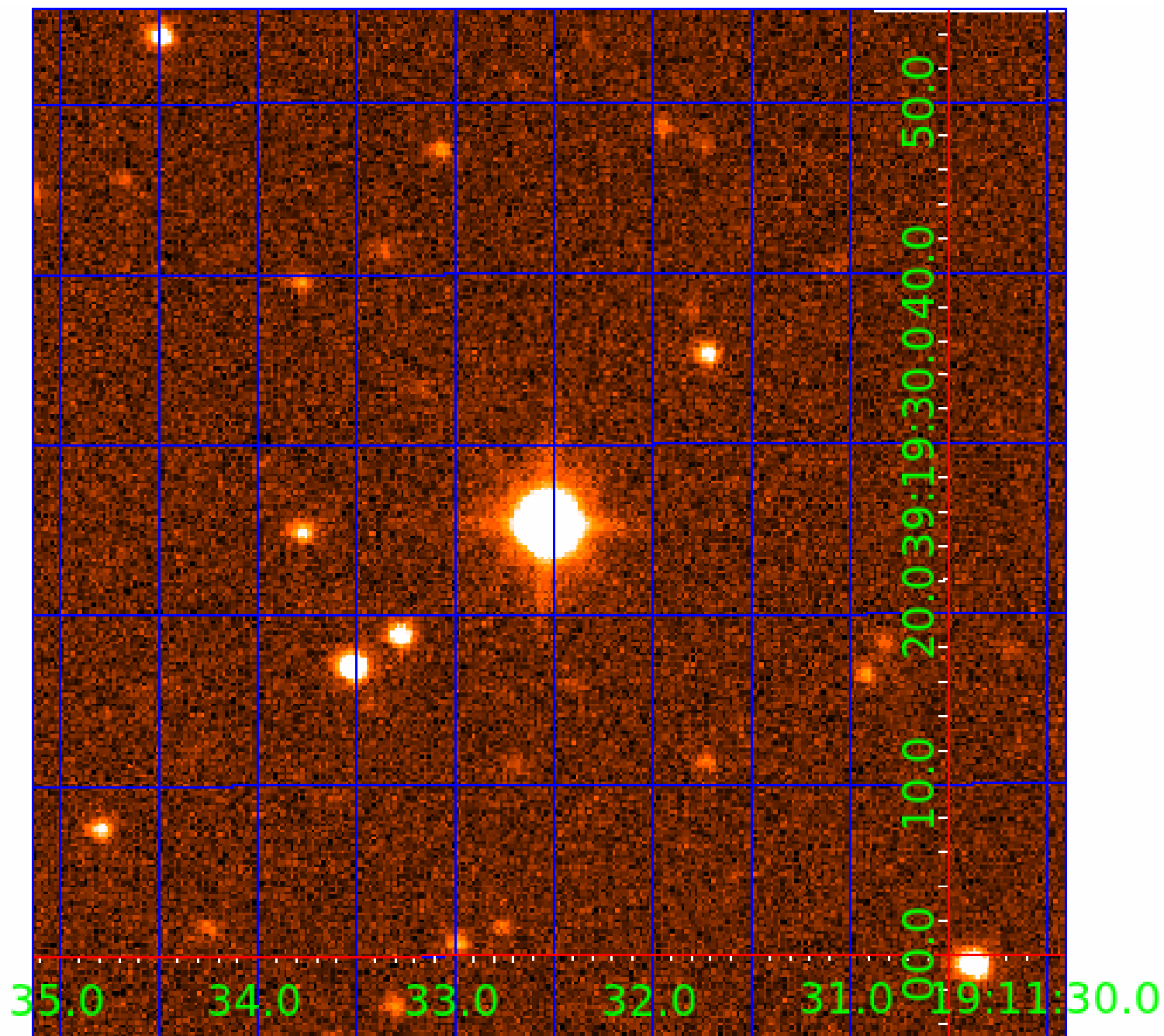


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004249702

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 004249702-01 | OBS | No | 303.187962 | 281.349773 | 562.2 | 2.016 | 12.2 | 5.3 | 1.75 | 5432 | 4.26 | 2.99 |
| 004249702-02 | OBS | No | 214.057430 | 299.793270 | 717.2 | 2.697 | 14.5 | 7.3 | 1.75 | 5432 | 4.87 | 4.76 |
| 004249702-03 | OBS | No | 321.068744 | 338.016768 | 914.5 | 2.909 | 14.9 | 7.2 | 1.75 | 5432 | 5.55 | 2.77 |
| 004249702-04 | OBS | No | 490.514419 | 225.192055 | 452.5 | 4.500 | 13.9 | -1.0 | 1.75 | 5432 | 3.65 | 1.57 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 004249702-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS |
| 004249702-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES |
| 004249702-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 004249702-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS |

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

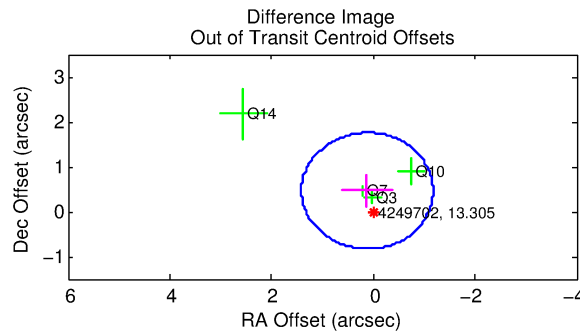
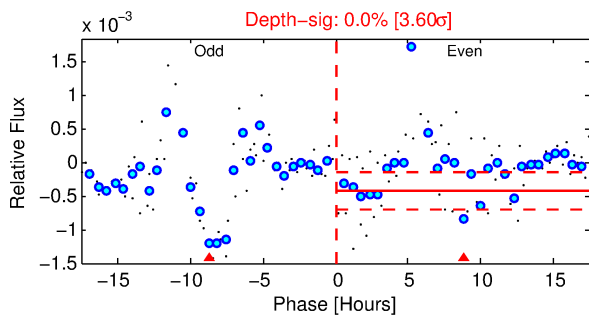
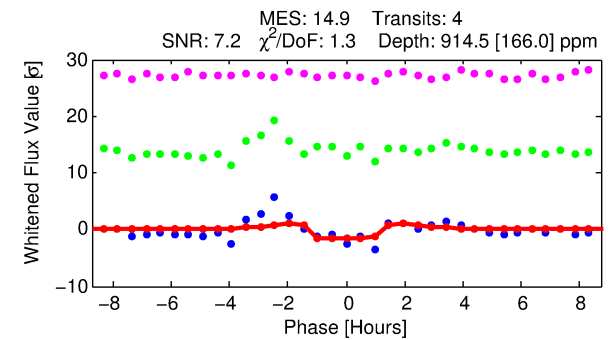
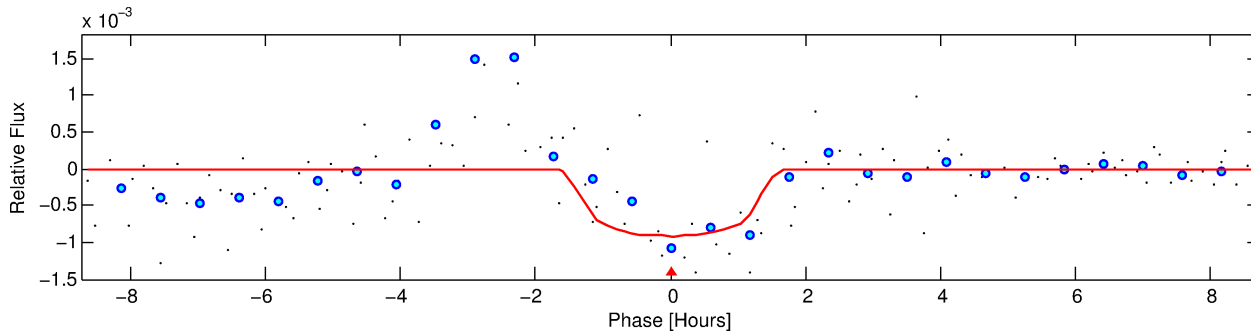
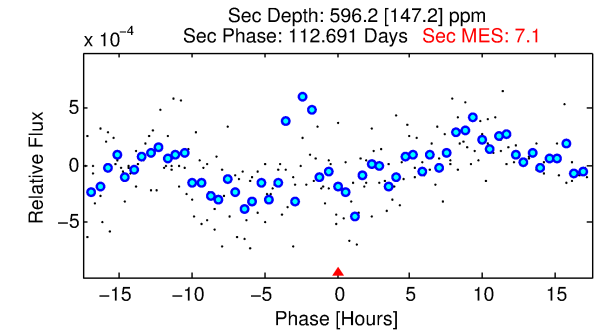
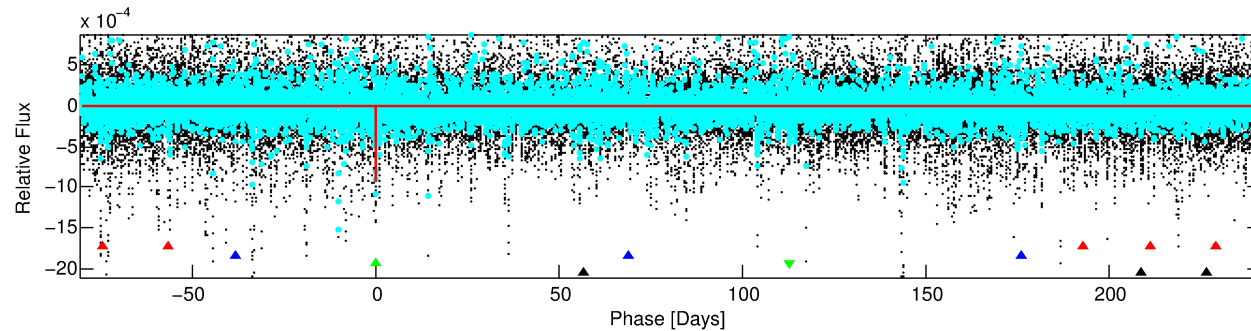
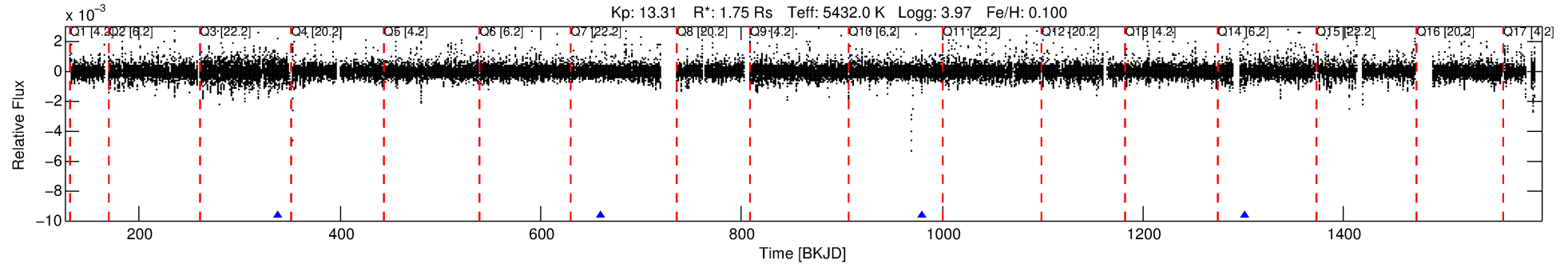
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004249702-03

No Significant Match Found

DV One-Page Summary

KIC: 4249702 Candidate: 3 of 4 Period: 321.069 d



DV Fit Results:

Period = 321.06874 [0.00343] d
Epoch = 338.0168 [0.0071] BKJD
Rp/R* = 0.0291 [0.0453]
a/R* = 677.40 [4045.79]
b = 0.64 [5.54]
Seff = 2.77 [2.39]
Teq = 329 [71] K
Rp = 5.55 [9.02] Re
a = 0.9282 [0.4671] AU
Ag = 9174.43 [29703.83] [0.31σ]
Teffp = 4978 [3891] K [1.19σ]

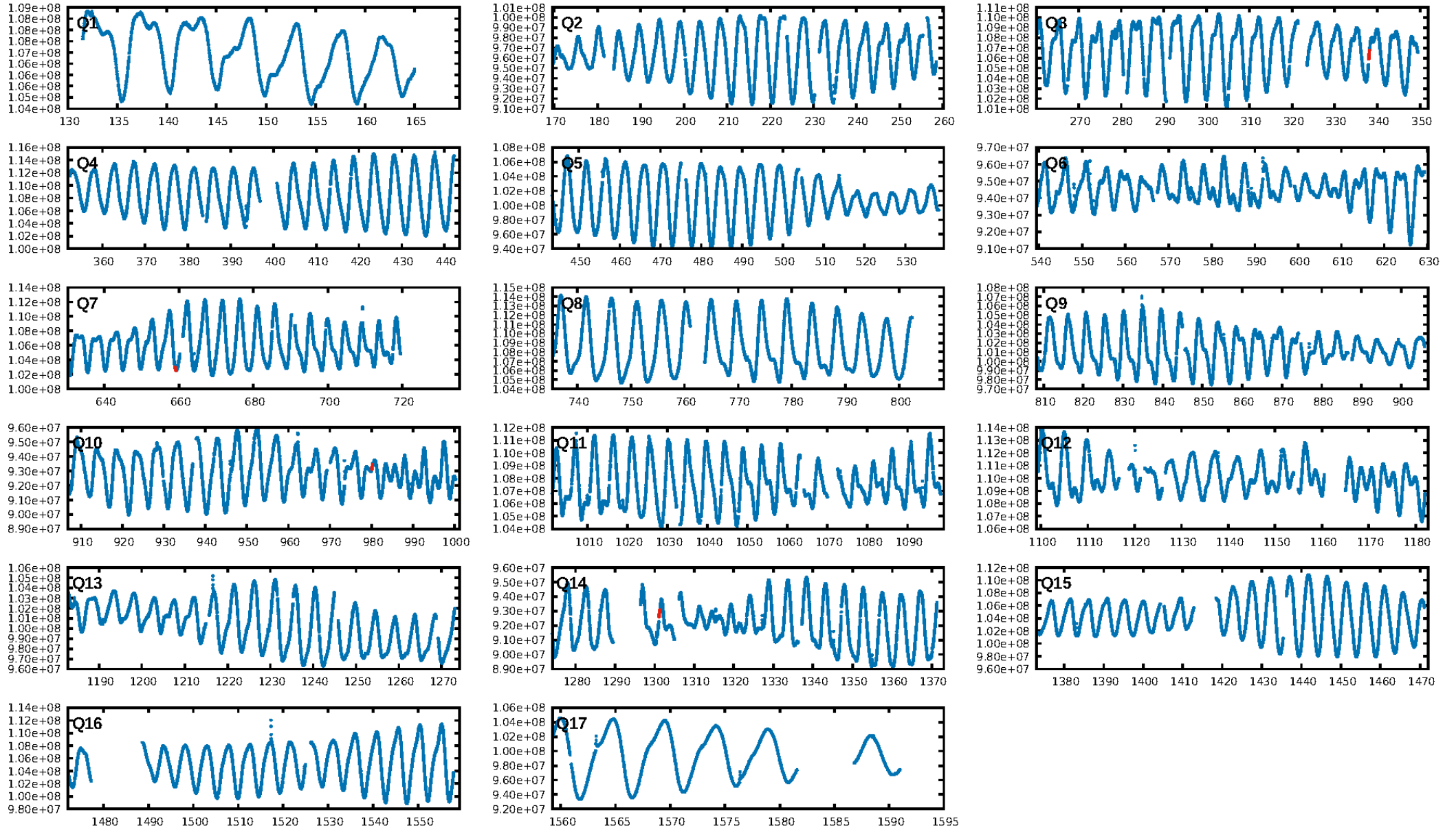
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [121.24σ]
LongPeriod-sig: 100.0% [758.91σ]
ModelChiSquare2-sig: 14.4%
ModelChiSquareGof-sig: 84.4%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.378
Centroid-sig: 57.9%
Centroid-so: 0.550 arcsec [0.83σ]
OotOffset-rm: 0.477 arcsec [1.10σ]
OotOffset-st: 2/2/0/0 [4]
KicOffset-rm: 0.477 arcsec [1.28σ]
KicOffset-st: 2/2/0/0 [4]
DiffImageQuality-fgm: 0.50 [2/4]
DiffImageOverlap-fno: 1.00 [4/4]

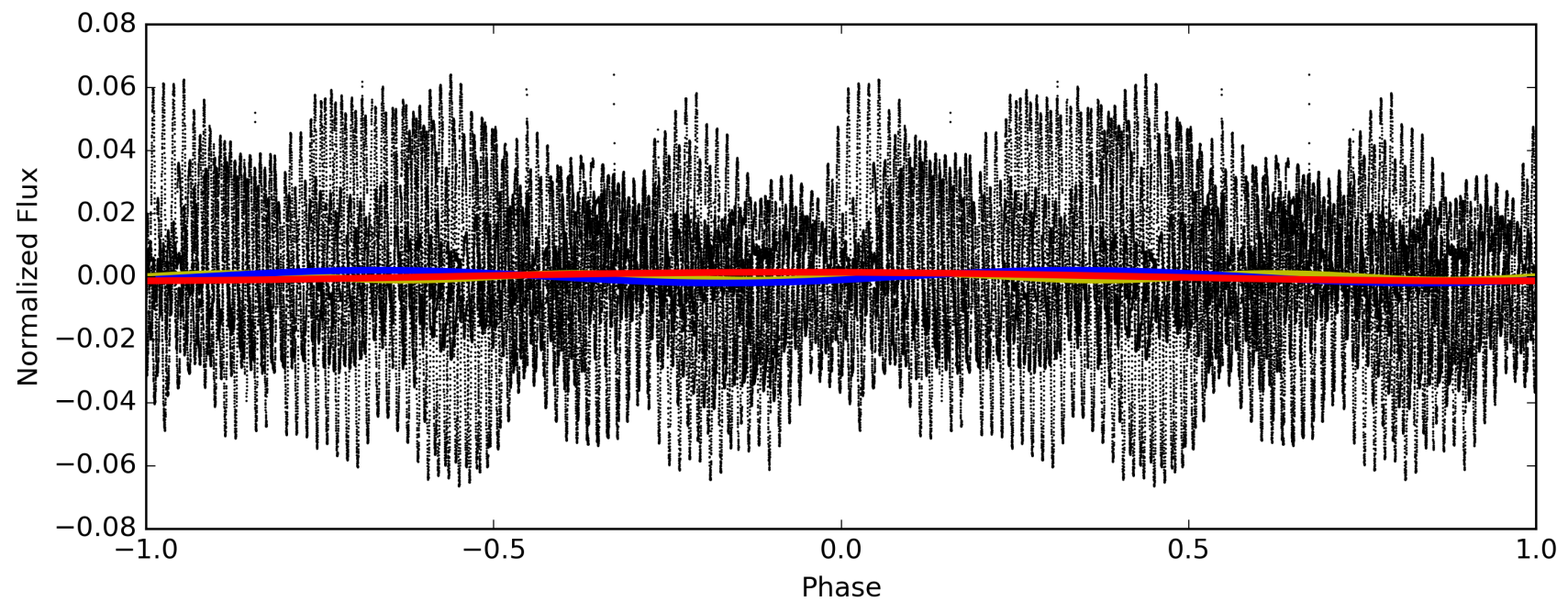
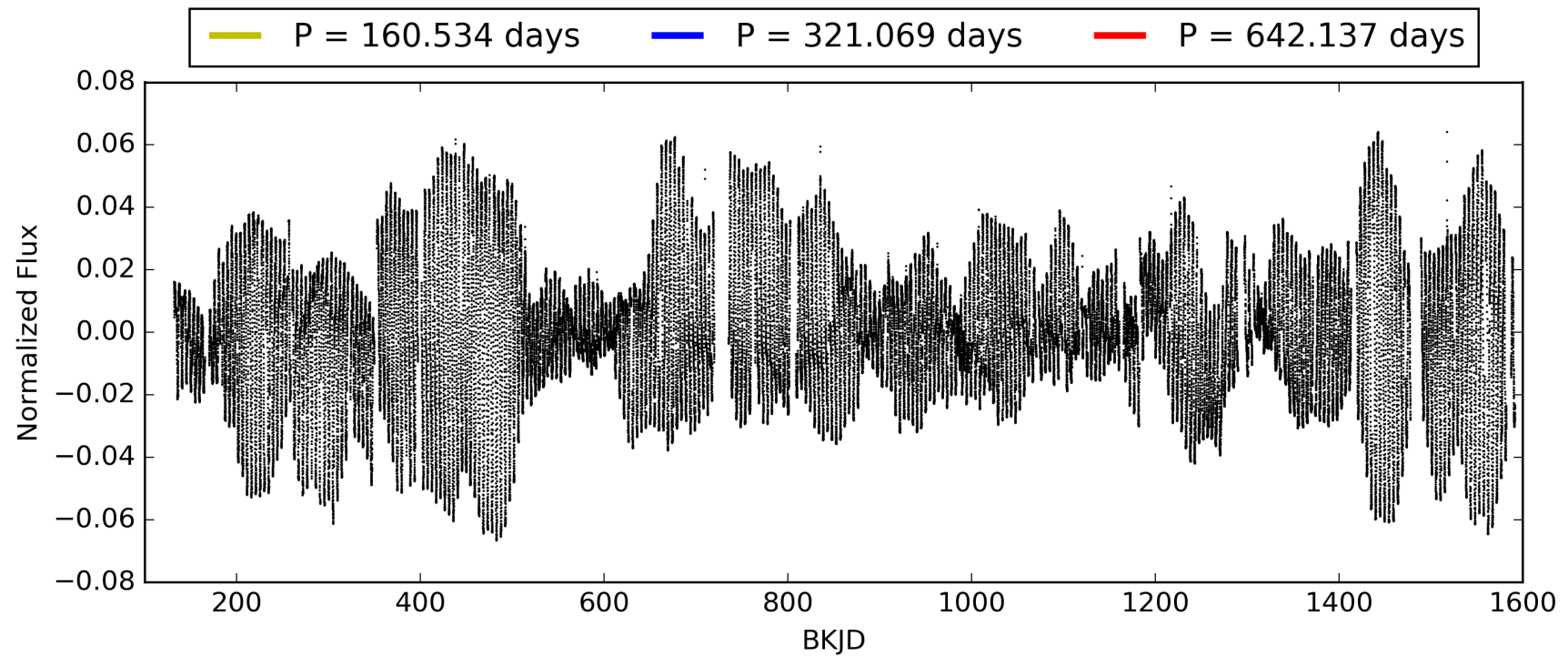
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:44:05 Z

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

TCE 004249702-03, PDC Light Curves

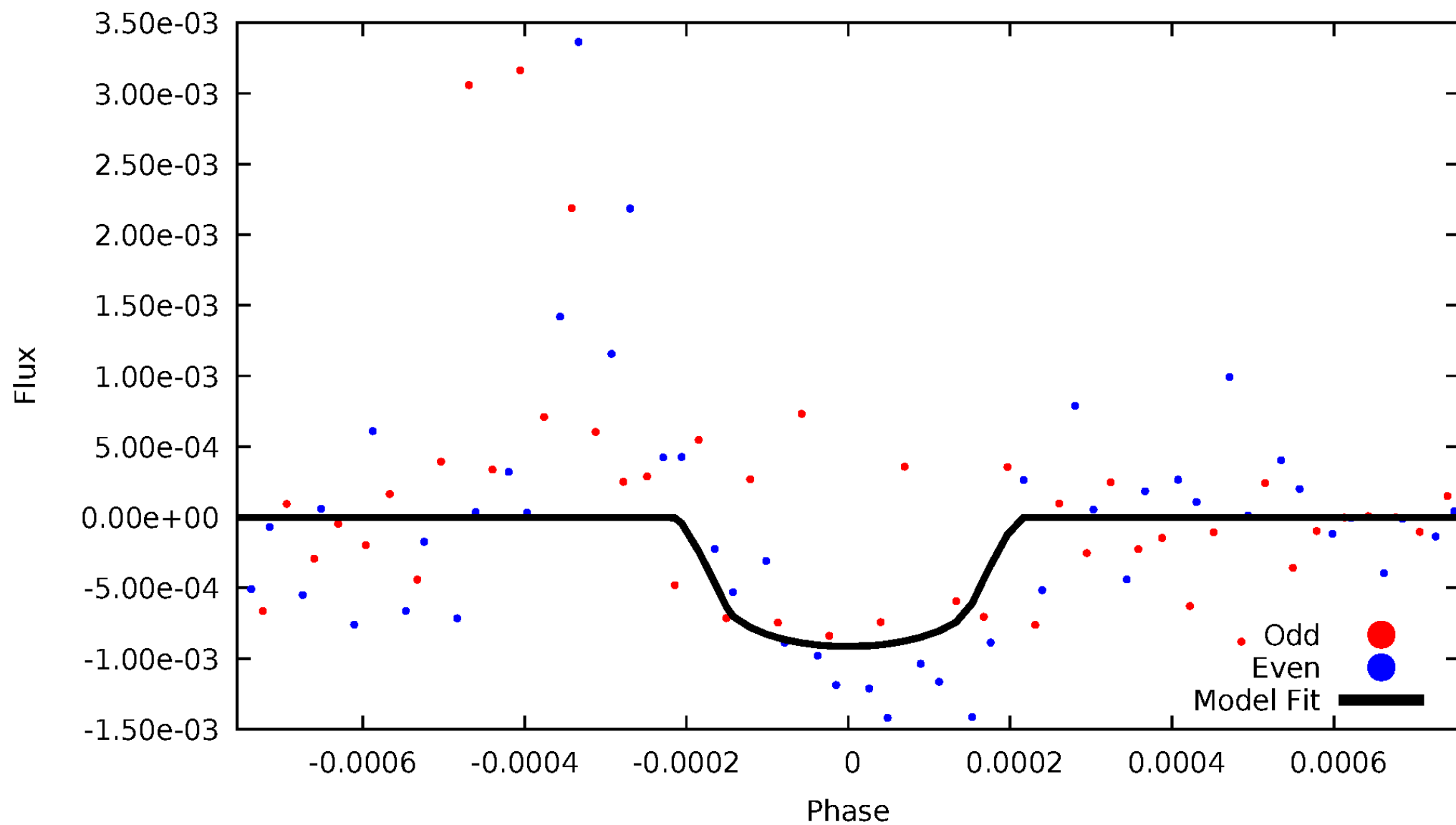


TCE 004249702-03



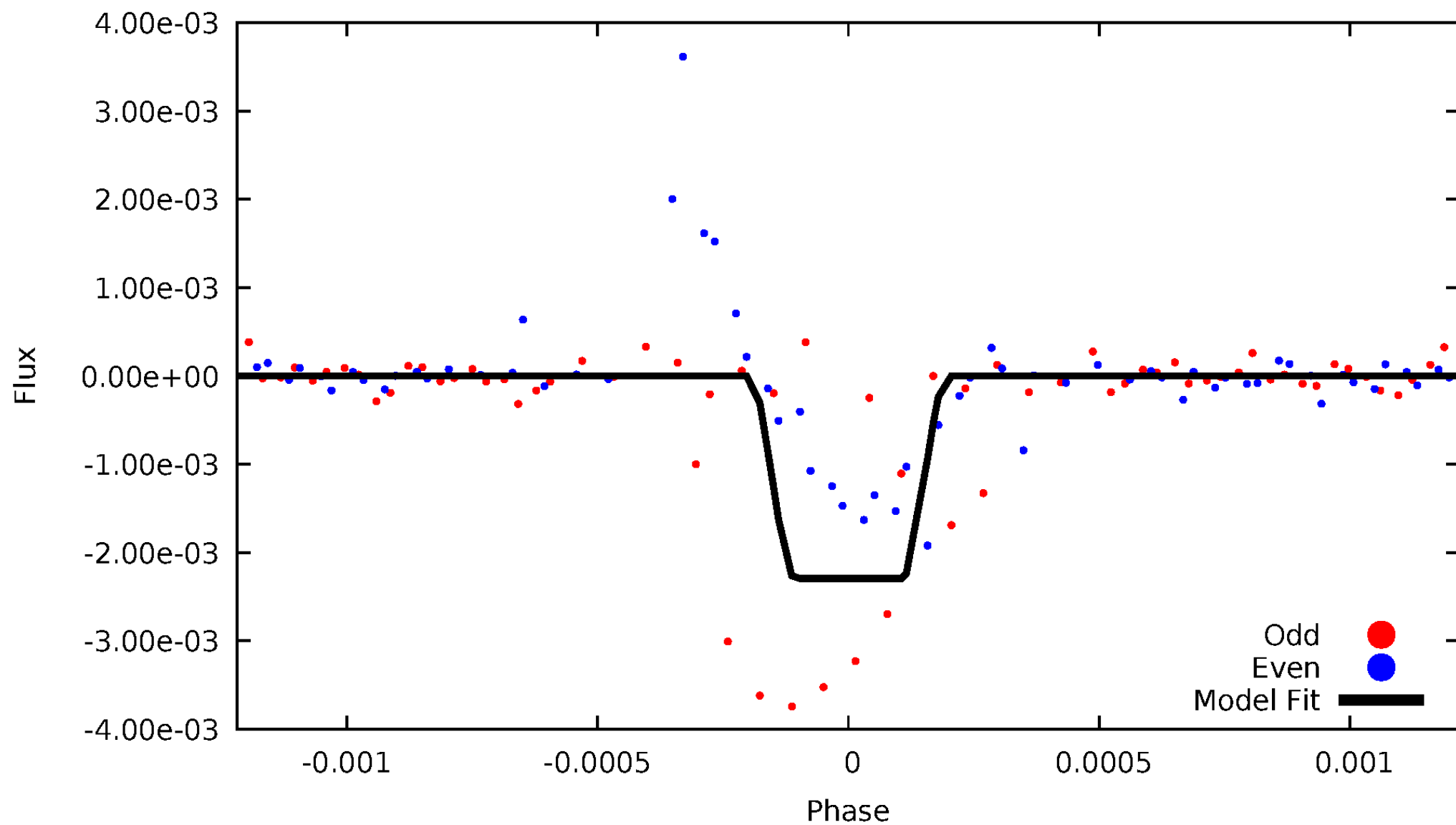
DV Odd/Even

TCE 004249702-03



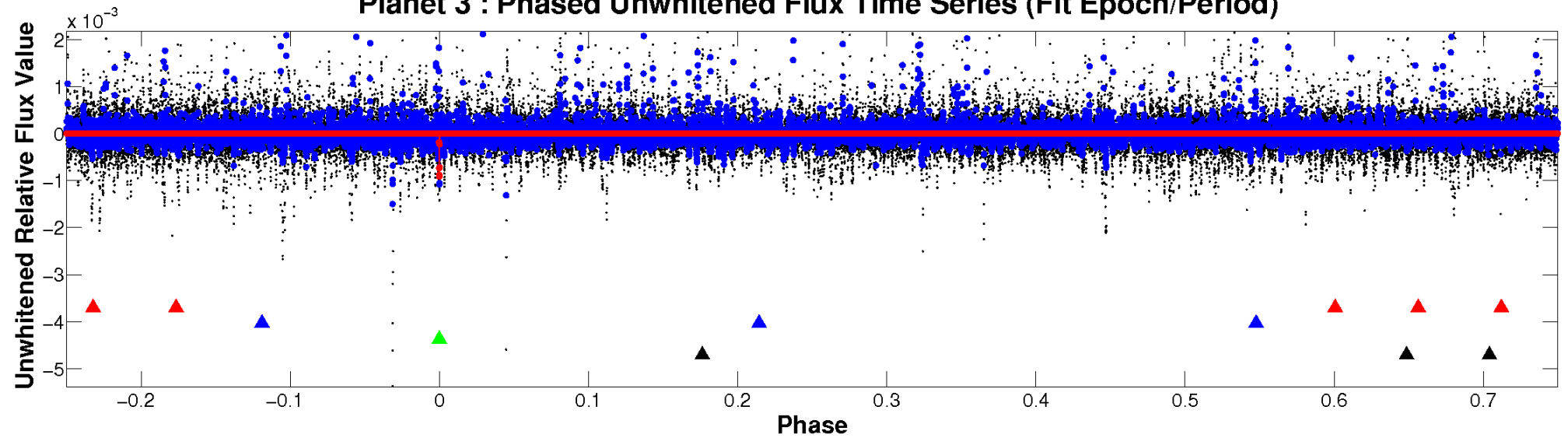
ALT Odd/Even

TCE 004249702-03

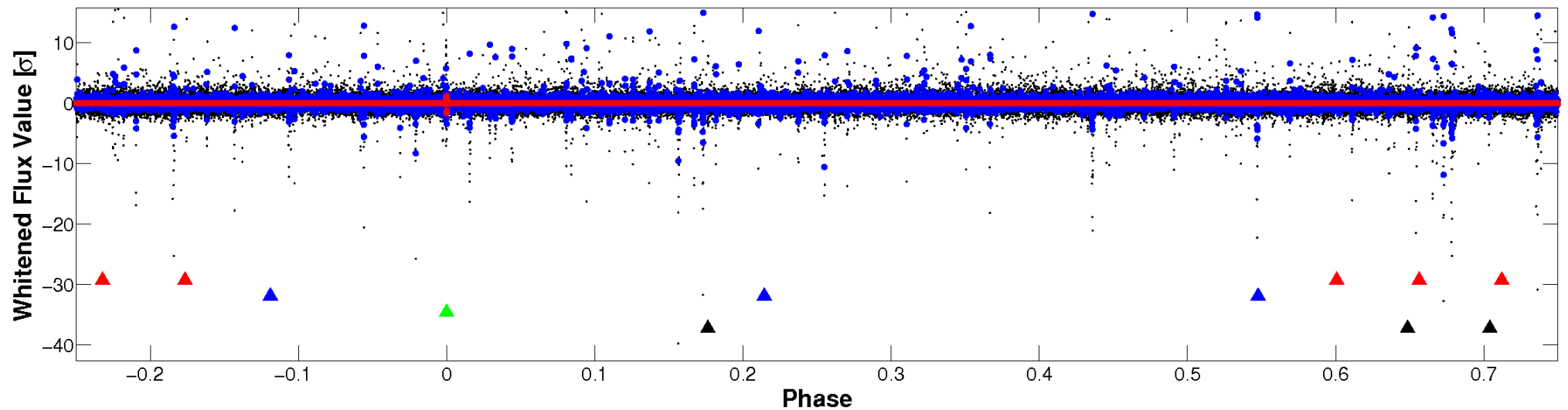


Non-Whitened Vs. Whitened Light Curve

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

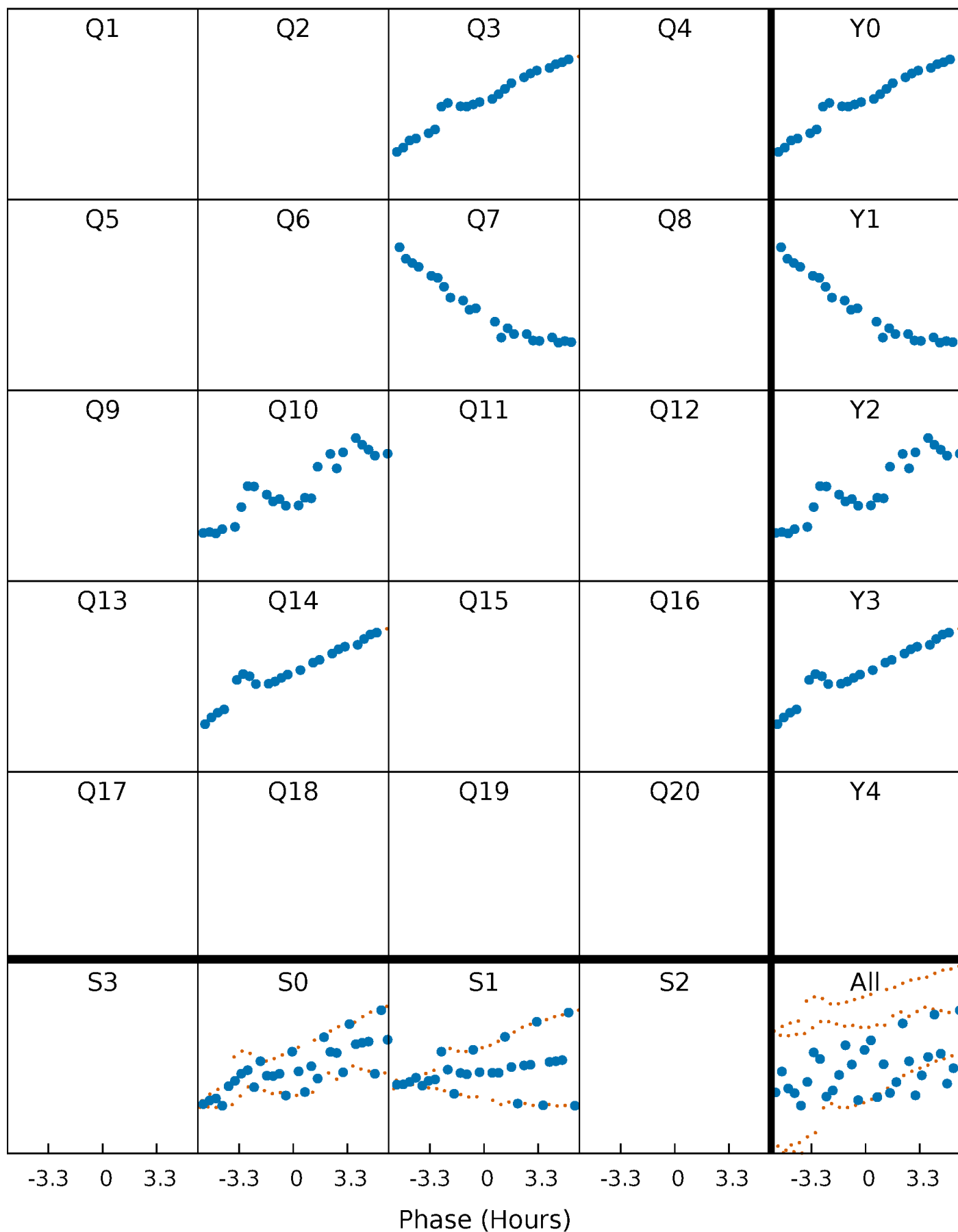


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



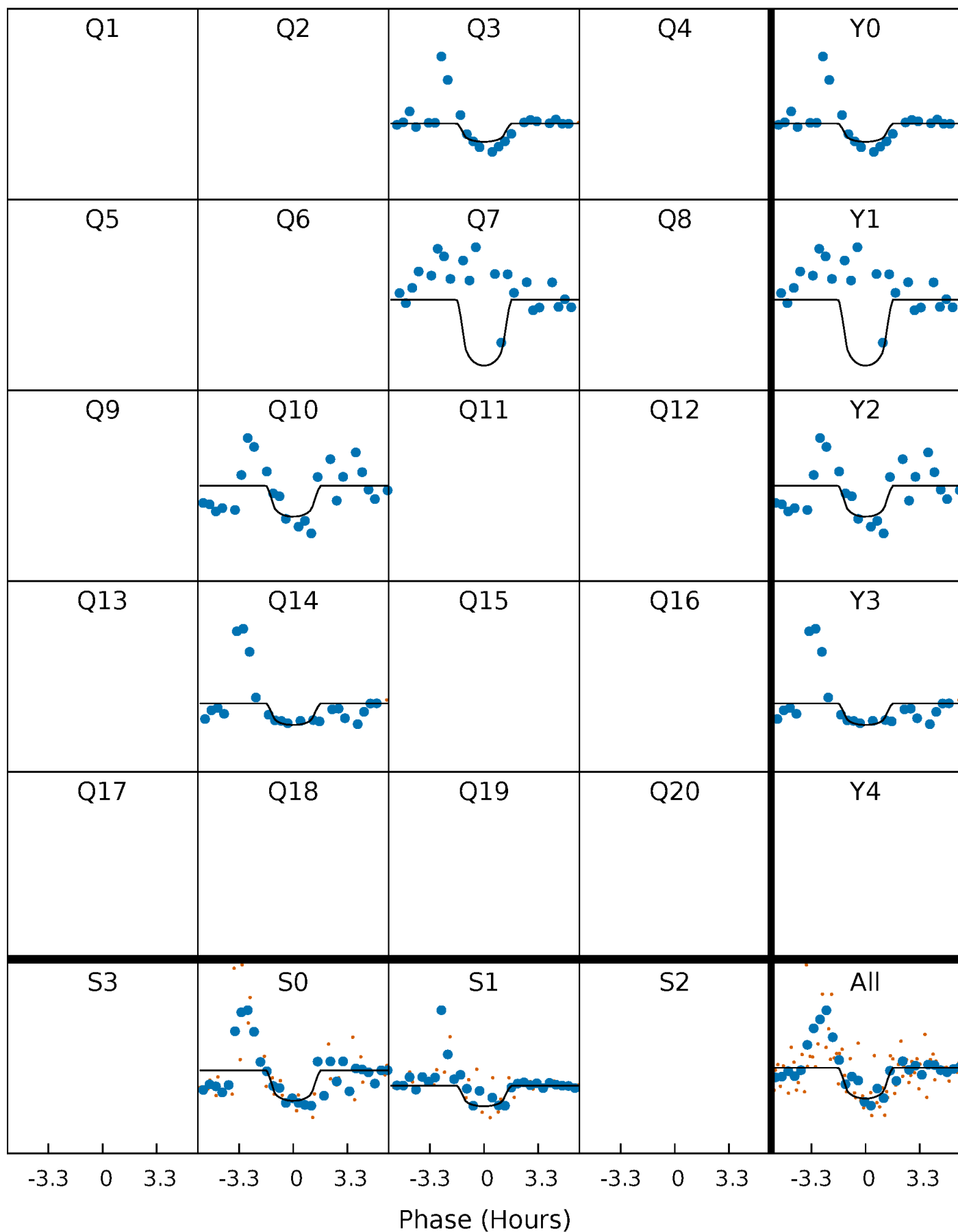
PDC Quarter-Phased Transit Curves

TCE 004249702-03 $P=321.068744$ Days $T_0=338.016768$ (BKJD)



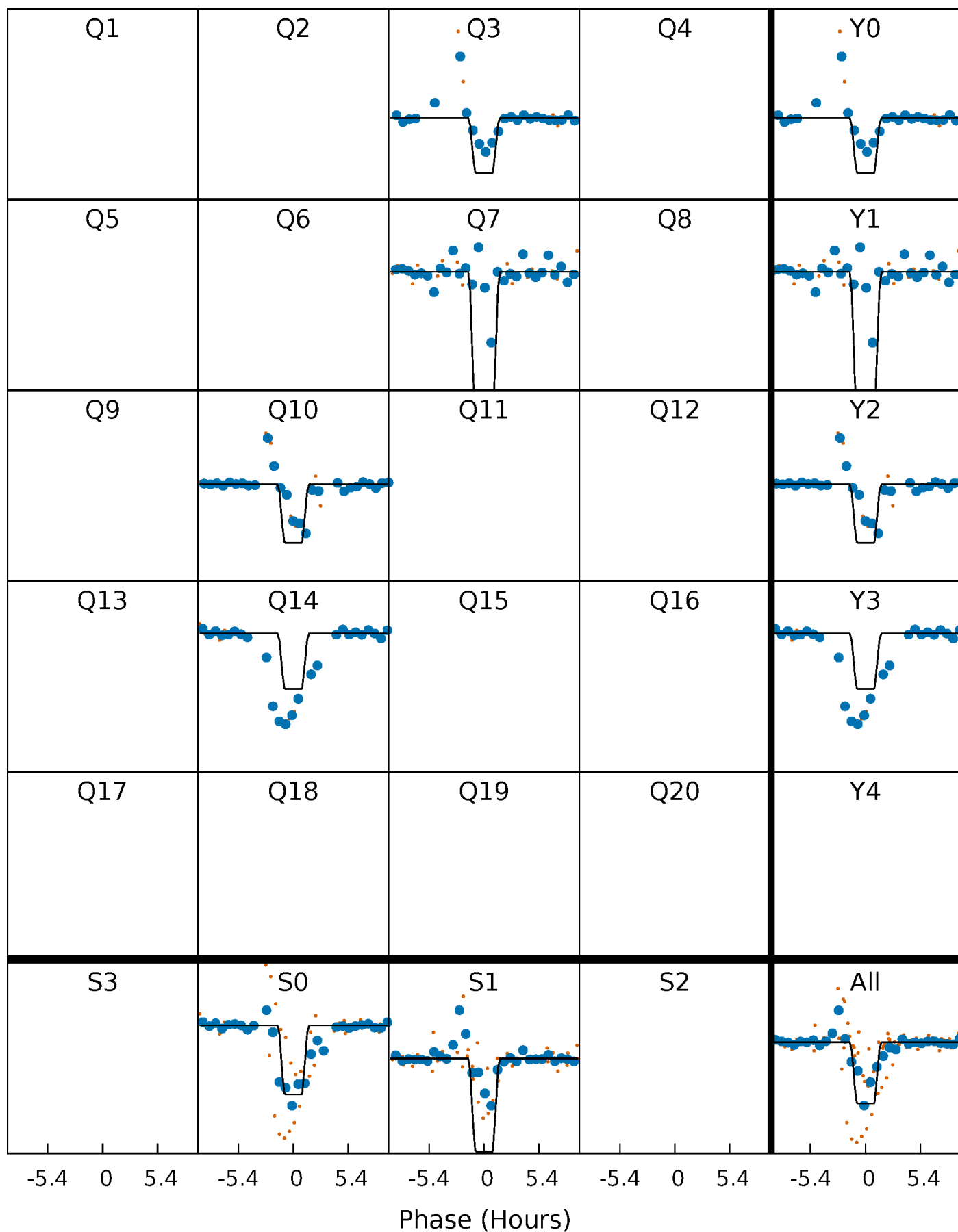
DV Quarter-Phased Transit Curves

TCE 004249702-03 $P=321.068744$ Days $T_0=338.016768$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

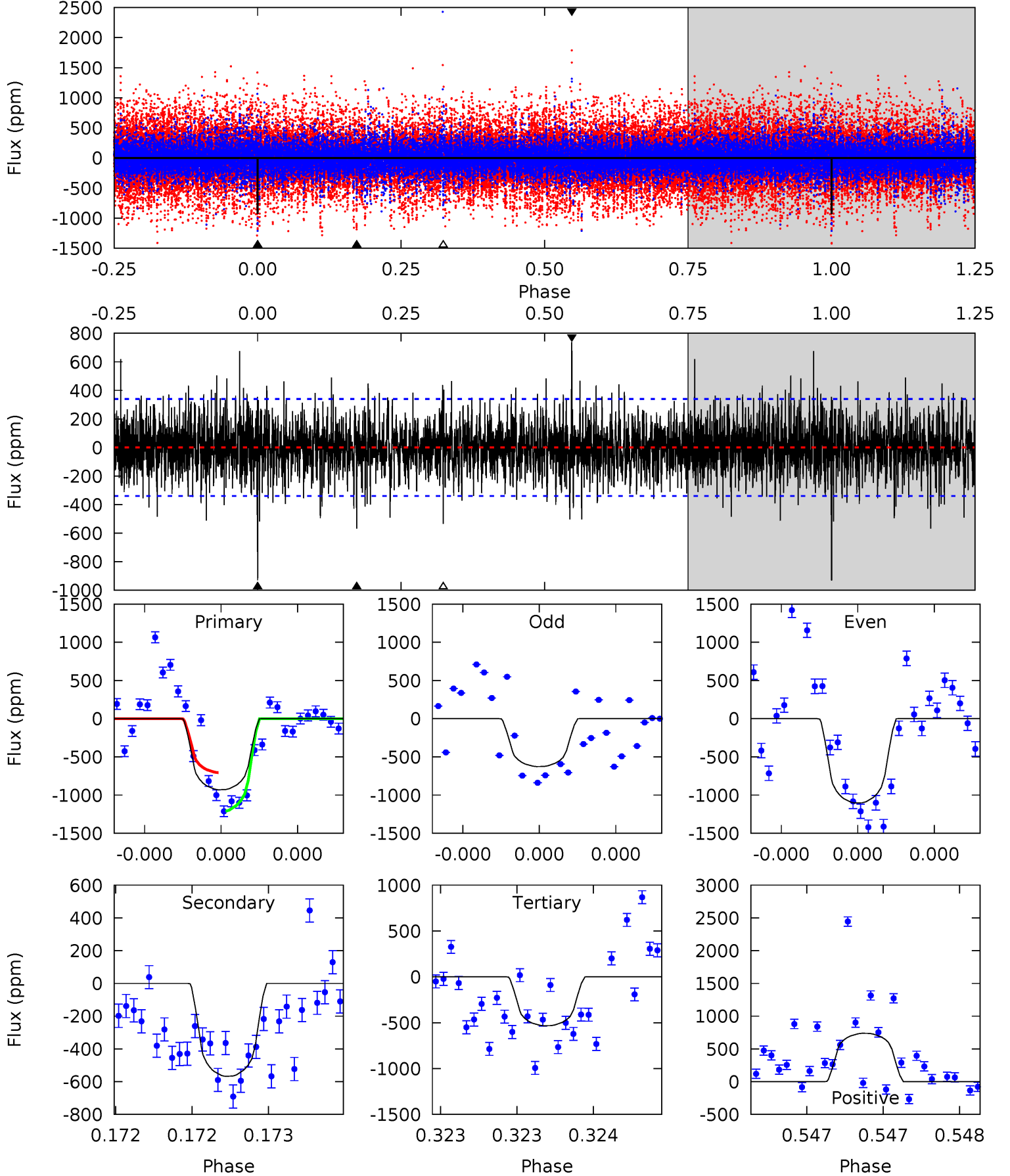
TCE 004249702-03 $P=321.058236$ Days $T_0=338.036122$ (BKJD)



DV Model-Shift Uniqueness Test

004249702-03, P = 321.068744 Days, E = 16.948024 Days

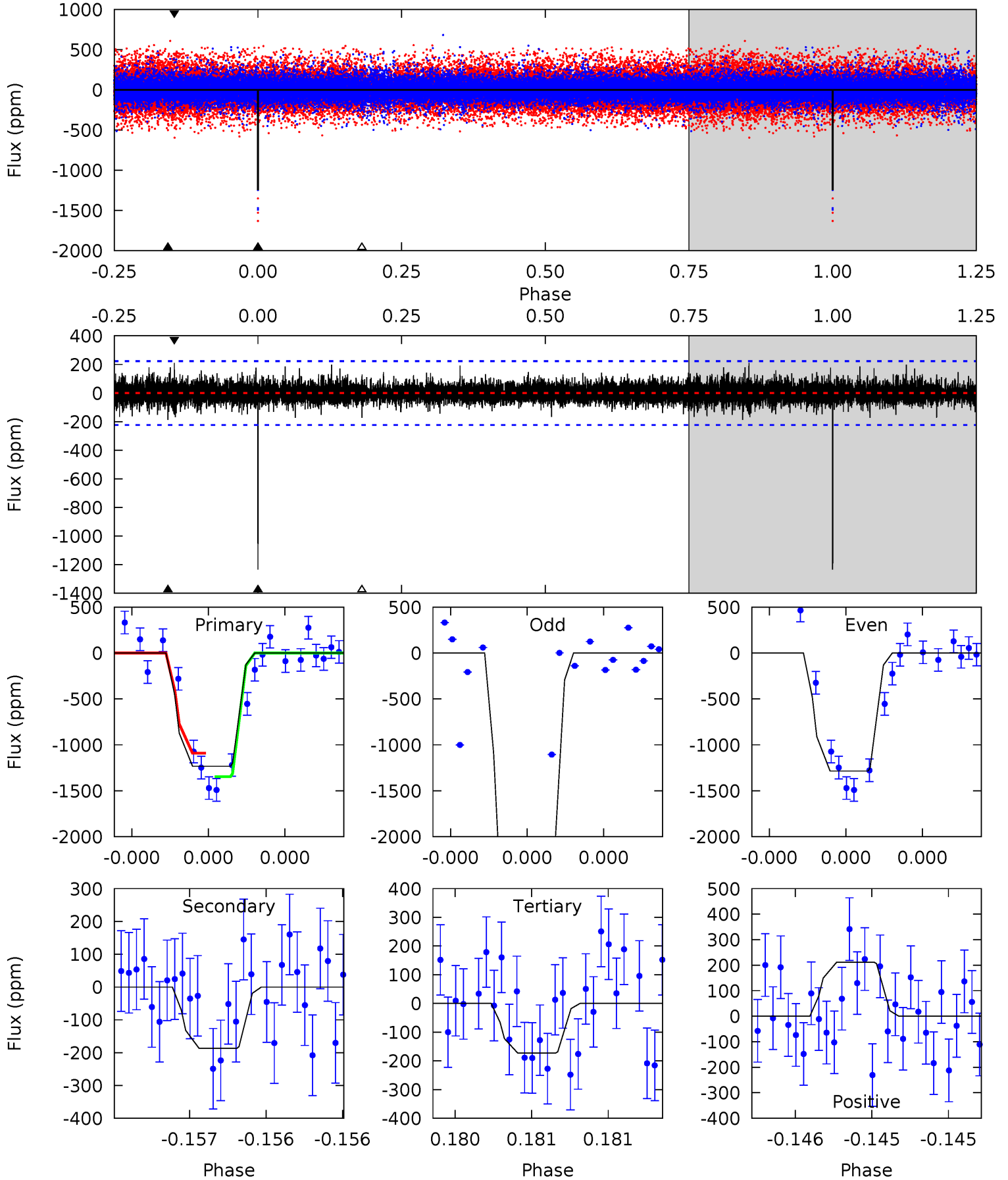
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 15.3 | 9.36 | 8.79 | 12.2 | 5.60 | 3.52 | 2.17 | 6.55 | 3.17 | 0.56 | -2.82 | 3.57 | 0.73 | 0.44 | 4.20 |



Alt Model-Shift Uniqueness Test

004249702-03, P = 321.058236 Days, E = 16.977886 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 31.1 | 4.70 | 4.36 | 5.33 | 5.63 | 3.56 | 0.98 | 26.7 | 25.8 | 0.34 | -0.62 | 22.1 | 1.25 | 0.15 | 3.21 |



Stellar Parameters For KIC 004249702

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5432^{+180}_{-147} | $3.967^{+0.517}_{-0.172}$ | $0.100^{+0.250}_{-0.250}$ | $1.749^{+0.541}_{-0.812}$ | $1.033^{+0.120}_{-0.146}$ | $0.272^{+1.528}_{-0.130}$ |
| | +3%/-3% | +13%/-4% | +250%/-250% | +31%/-46% | +12%/-14% | +562%/-48% |
| 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 004249702-03 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|------------------------|-------------------|-----------------------|-------------------------|
| DV | -568 ± 61 | $7.75^{+7.02}_{-5.04}$ | 450^{+42}_{-57} | 4193^{+2554}_{-748} | 4449^{+32056}_{-3210} |
| Alt. | -186 ± 40 | $9.72^{+8.31}_{-6.26}$ | 452^{+42}_{-59} | 3238^{+1312}_{-478} | 921^{+6559}_{-654} |

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 $A_{obs} \gg 1.0$

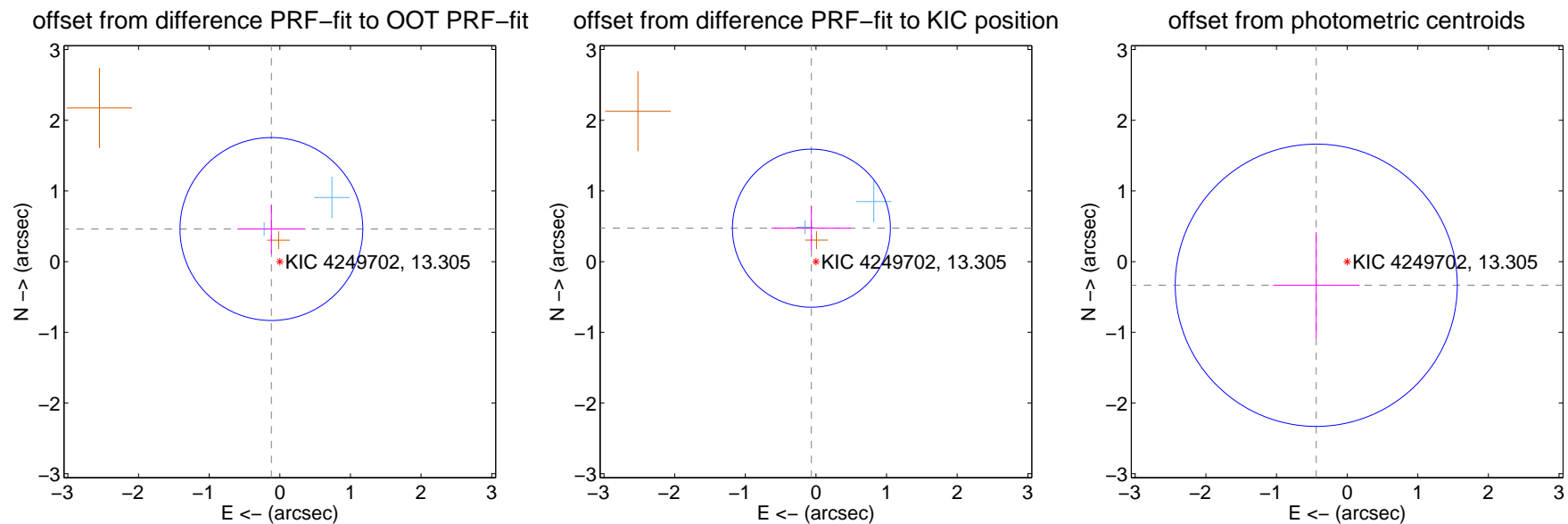
DV Centroid Data

Supplemental centroid analysis for 004249702-03. Kepler magnitude: 13.30. Transit SNR 7.22

There are 2 quarters with good PRF difference image offsets

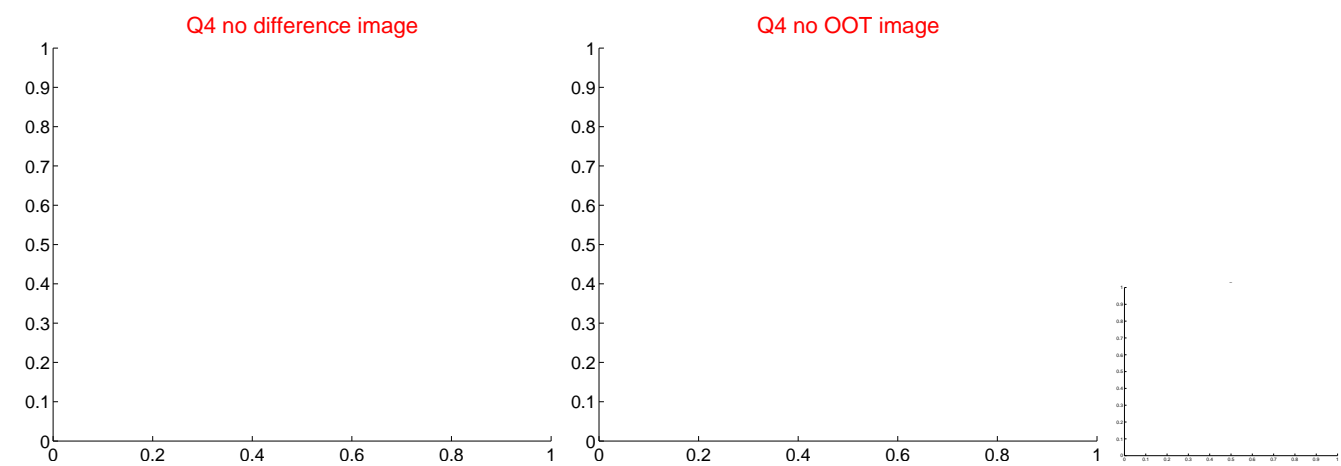
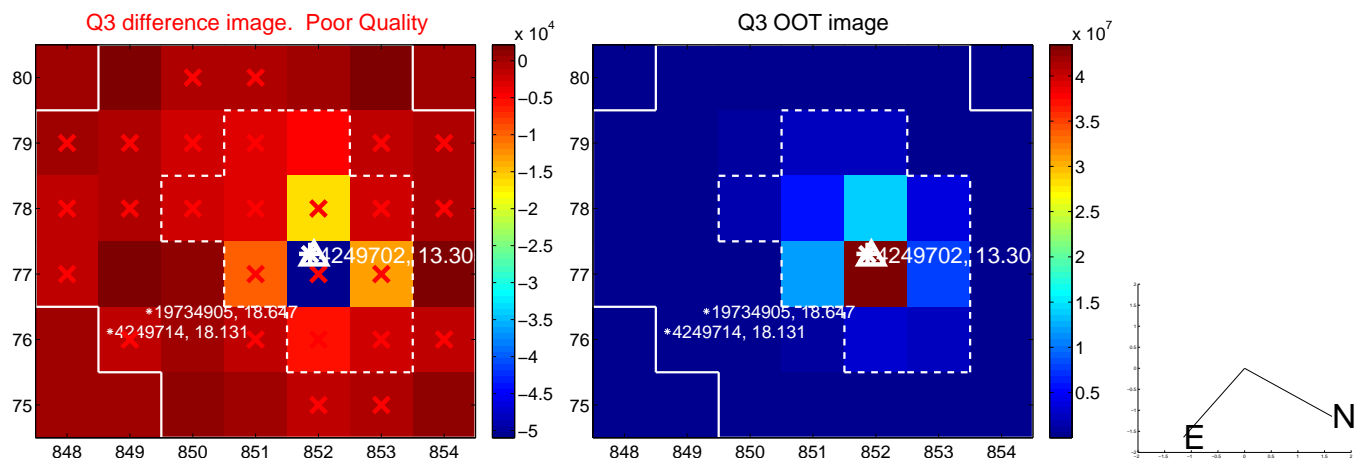
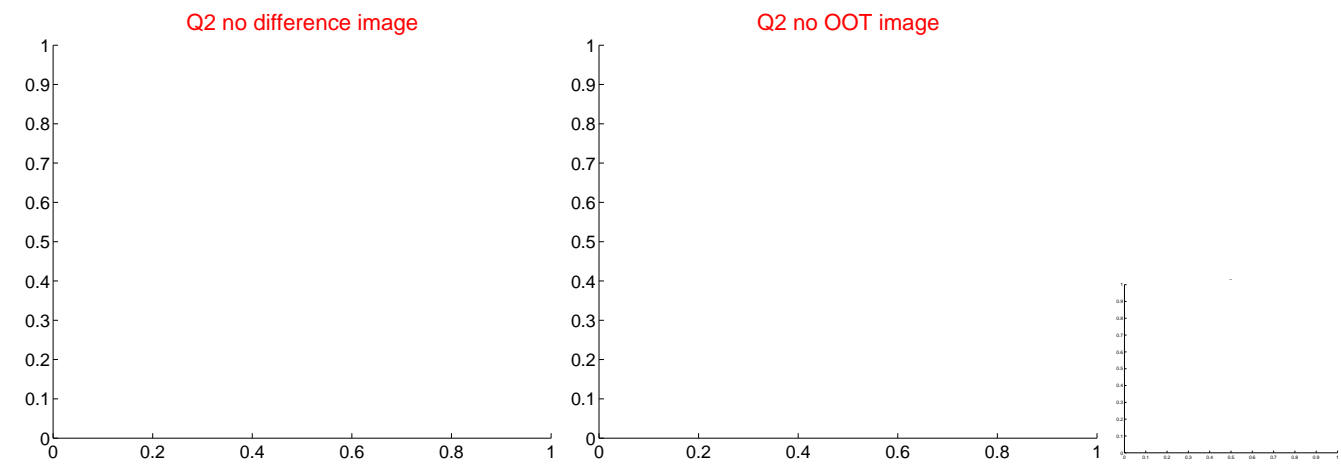
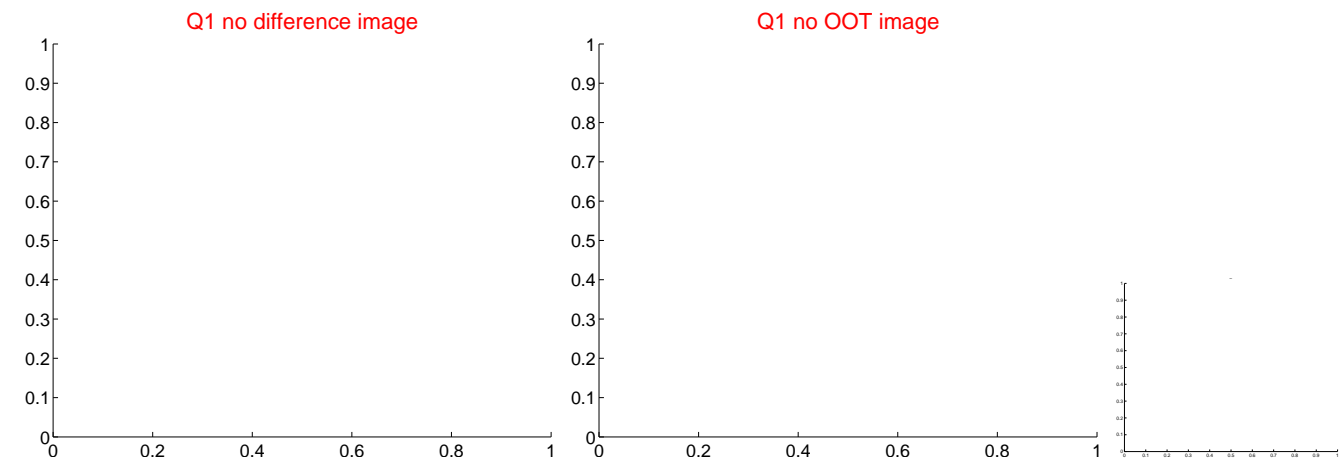
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 0.477 ± 0.431 | 1.10 | 0.119 ± 0.482 | 0.461 ± 0.349 |
| PRF-fit source offset from KIC position | 0.477 ± 0.373 | 1.28 | 0.064 ± 0.564 | 0.473 ± 0.309 |
| photometric centroid source offset | 0.55 ± 0.67 | 0.83 | 0.44 ± 0.61 | -0.33 ± 0.75 |

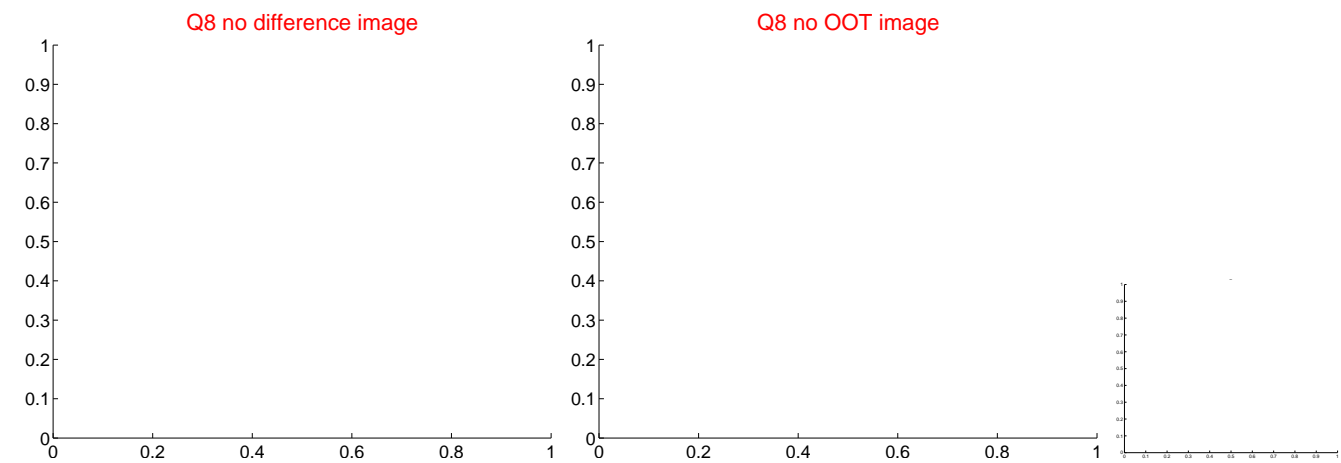
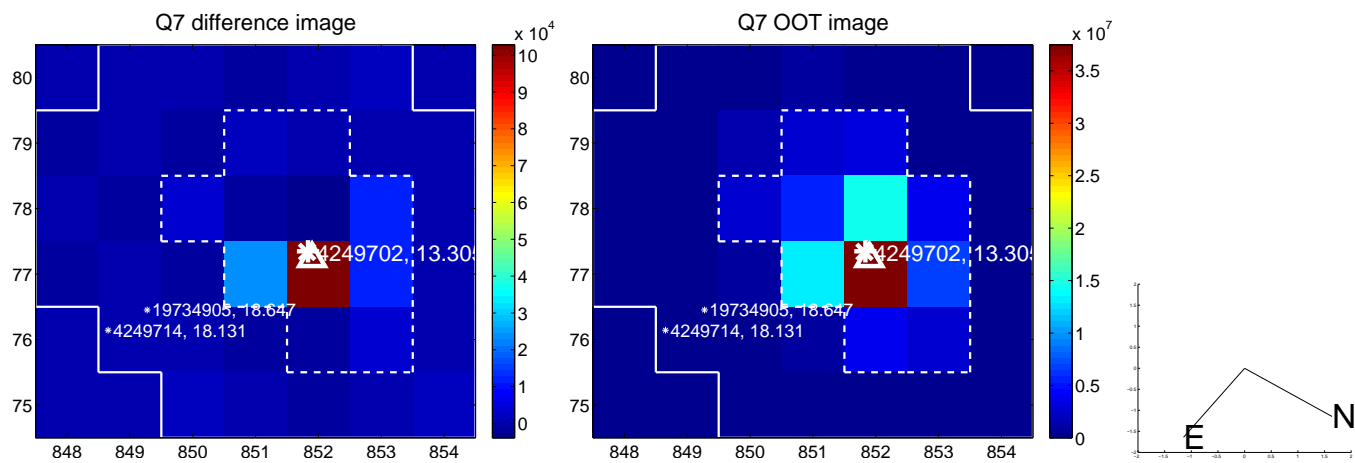
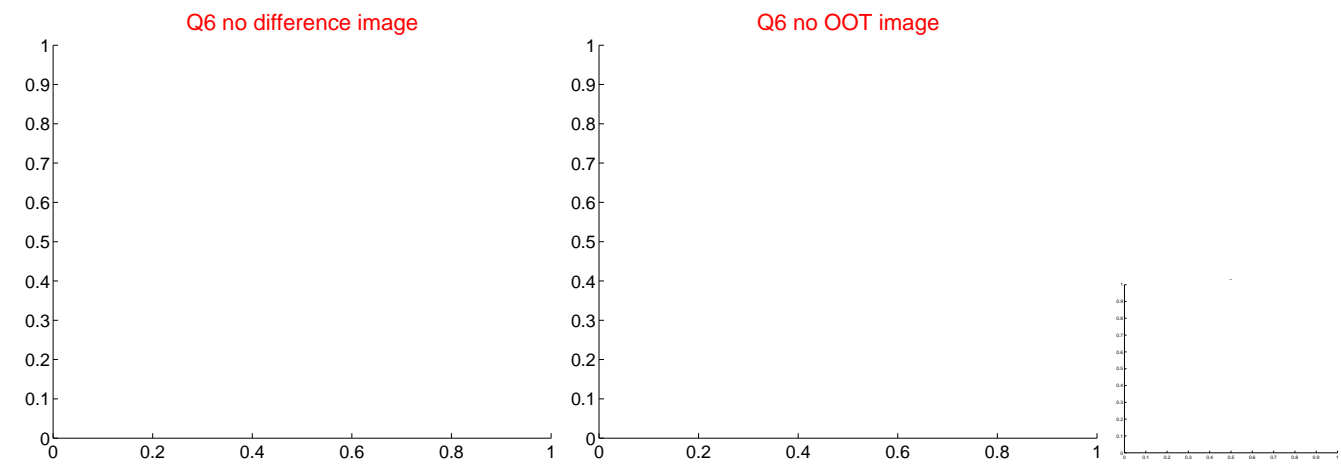
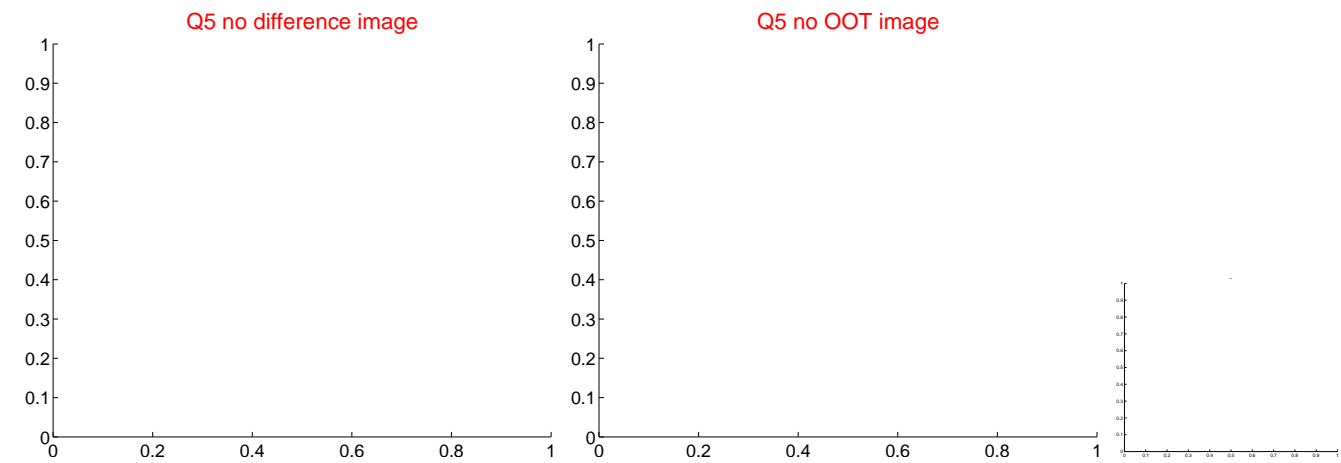


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

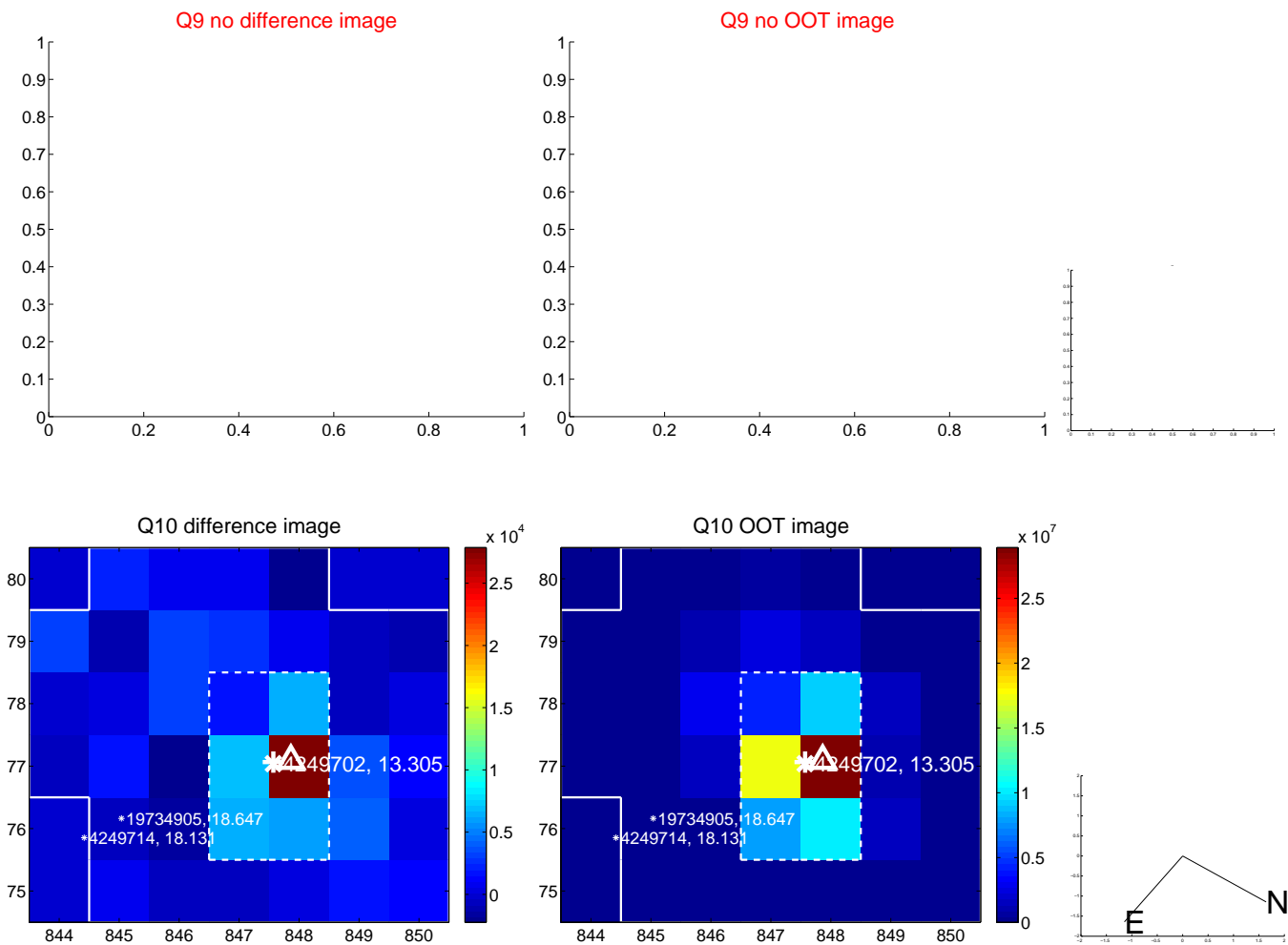
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



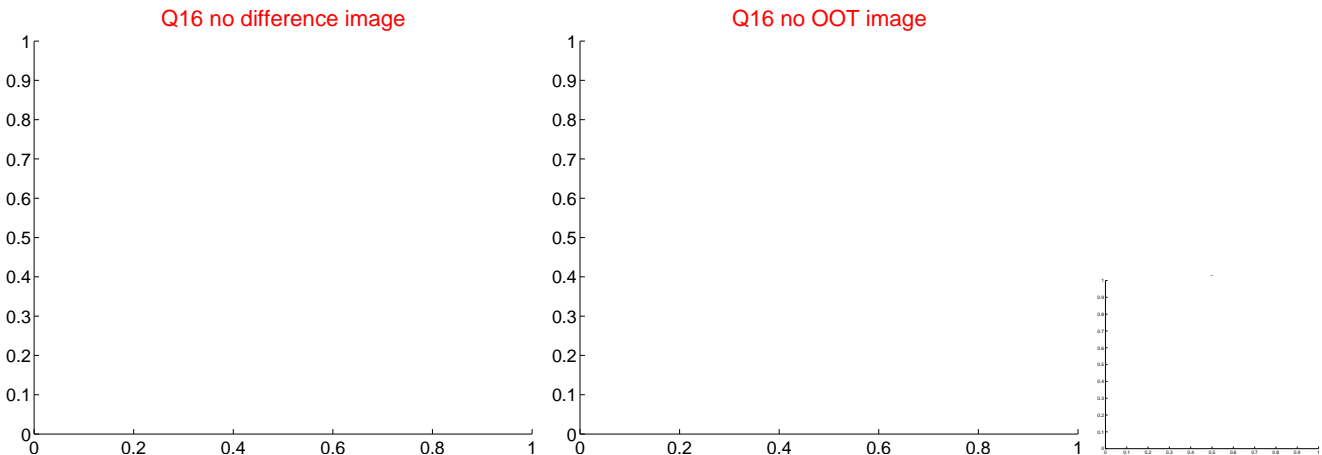
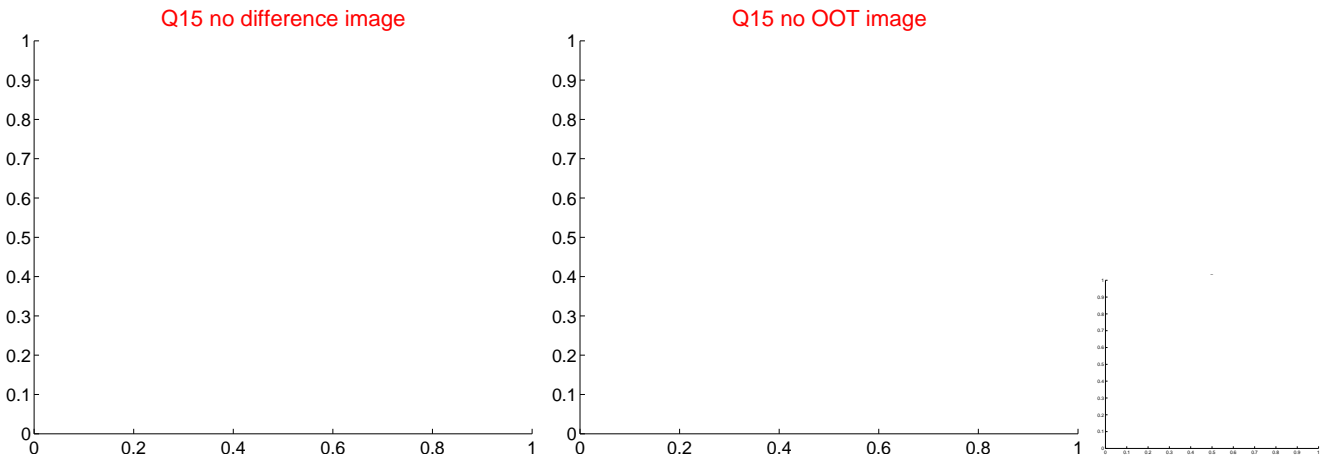
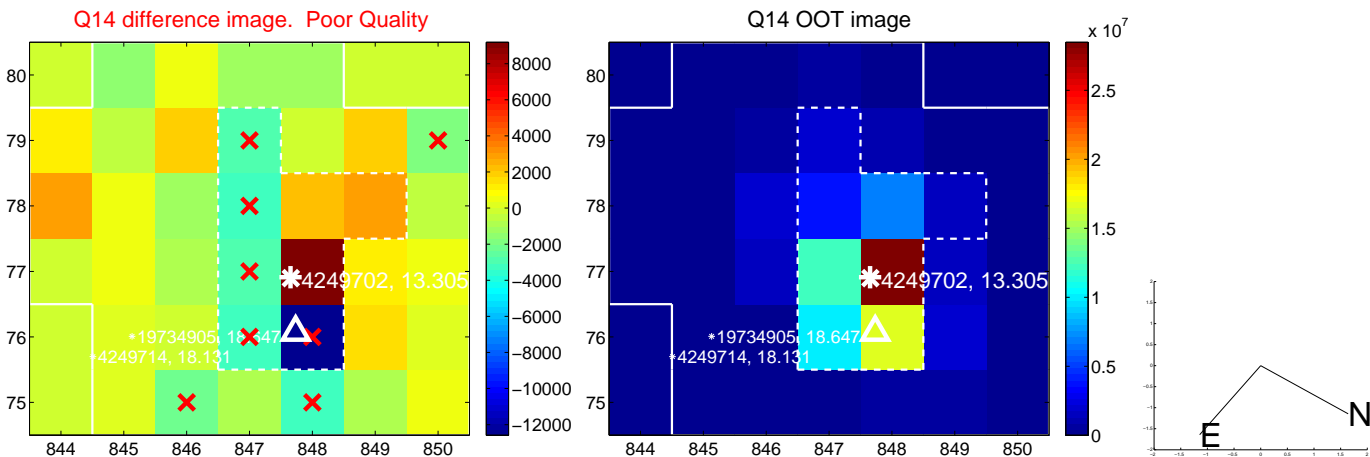
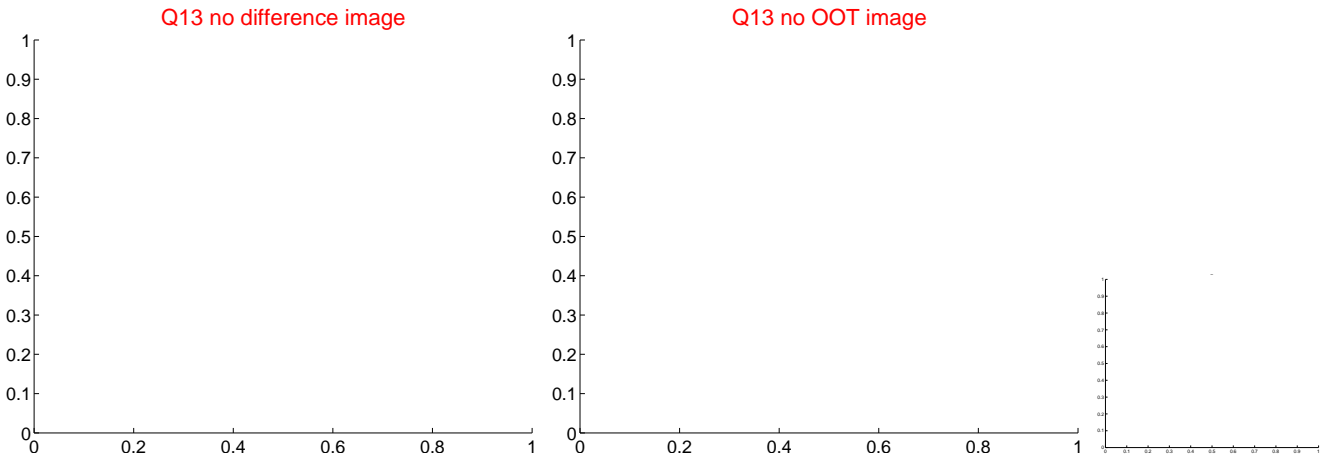
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



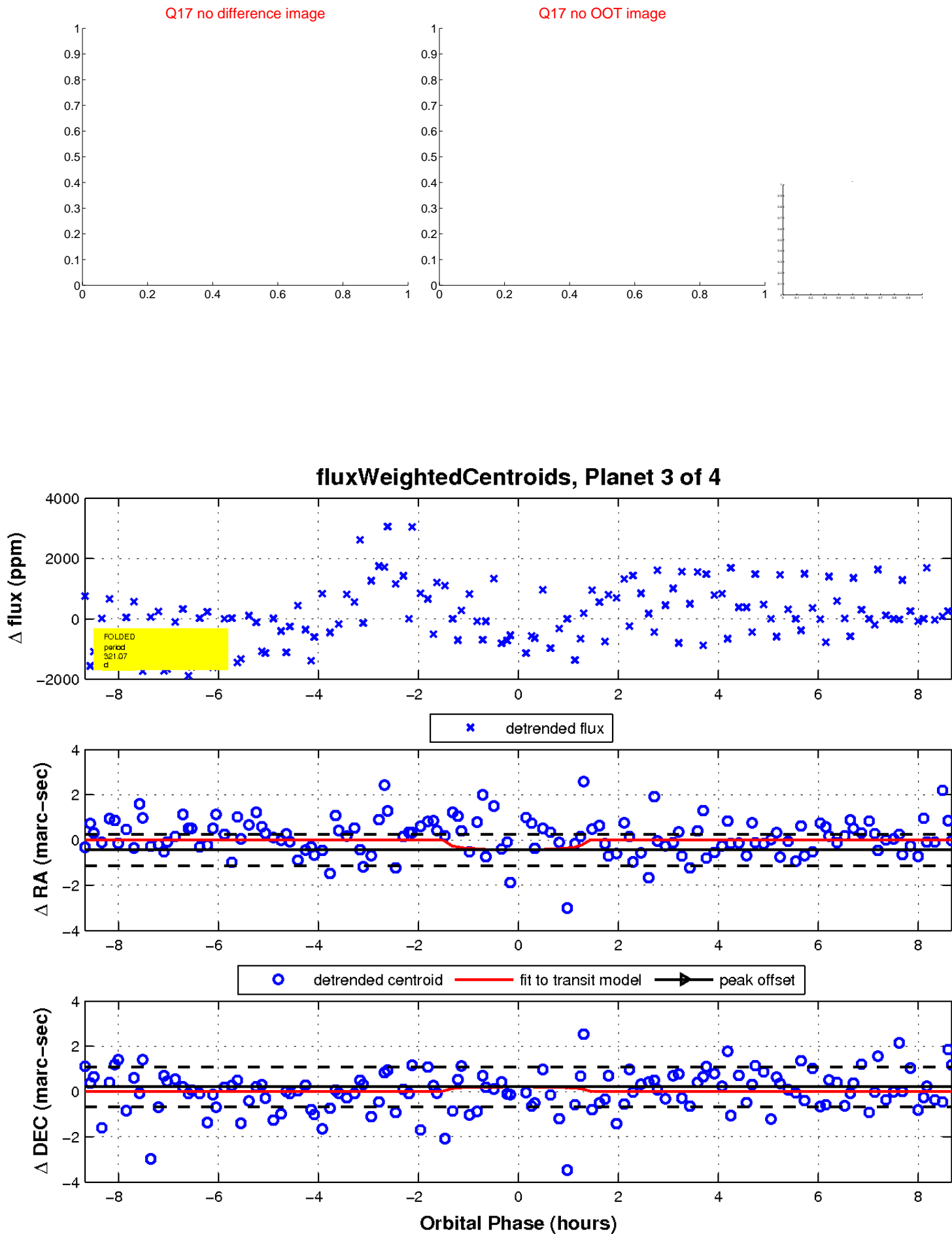
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

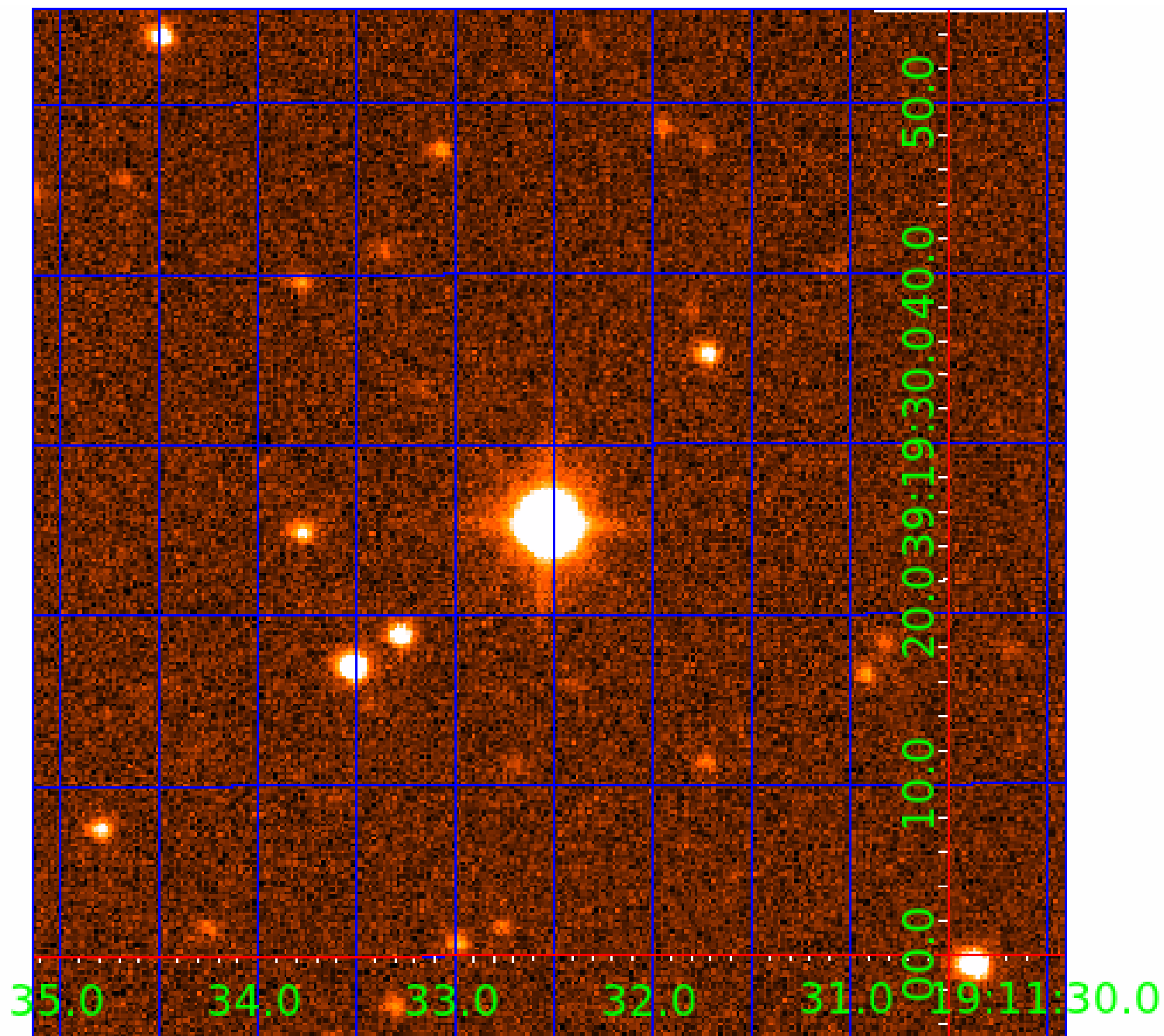


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004249702

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 004249702-01 | OBS | No | 303.187962 | 281.349773 | 562.2 | 2.016 | 12.2 | 5.3 | 1.75 | 5432 | 4.26 | 2.99 |
| 004249702-02 | OBS | No | 214.057430 | 299.793270 | 717.2 | 2.697 | 14.5 | 7.3 | 1.75 | 5432 | 4.87 | 4.76 |
| 004249702-03 | OBS | No | 321.068744 | 338.016768 | 914.5 | 2.909 | 14.9 | 7.2 | 1.75 | 5432 | 5.55 | 2.77 |
| 004249702-04 | OBS | No | 490.514419 | 225.192055 | 452.5 | 4.500 | 13.9 | -1.0 | 1.75 | 5432 | 3.65 | 1.57 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 004249702-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS |
| 004249702-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES |
| 004249702-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 004249702-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_NOFITS |

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

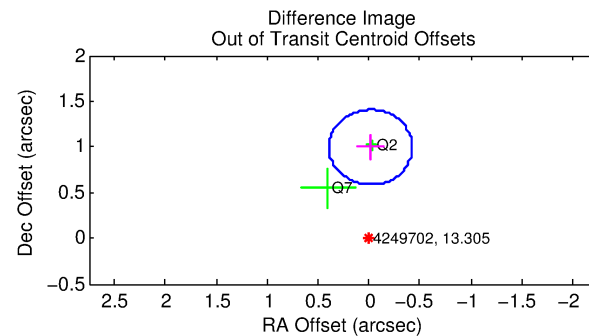
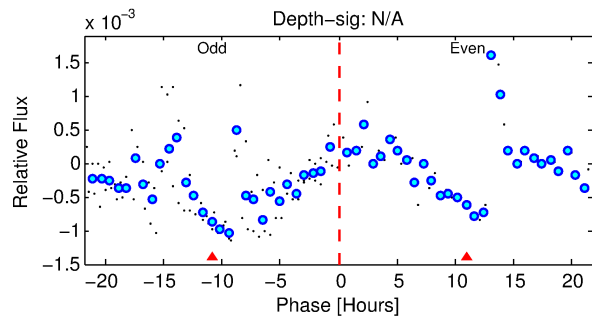
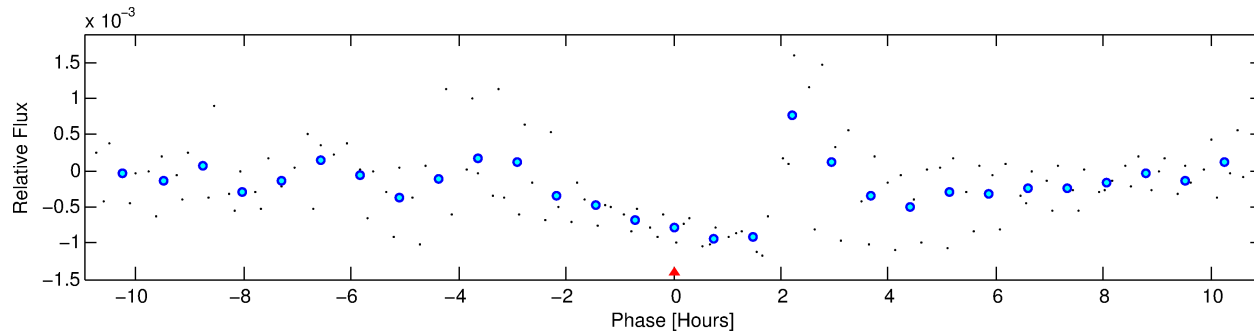
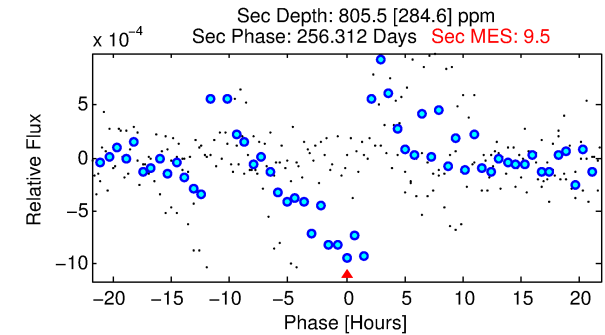
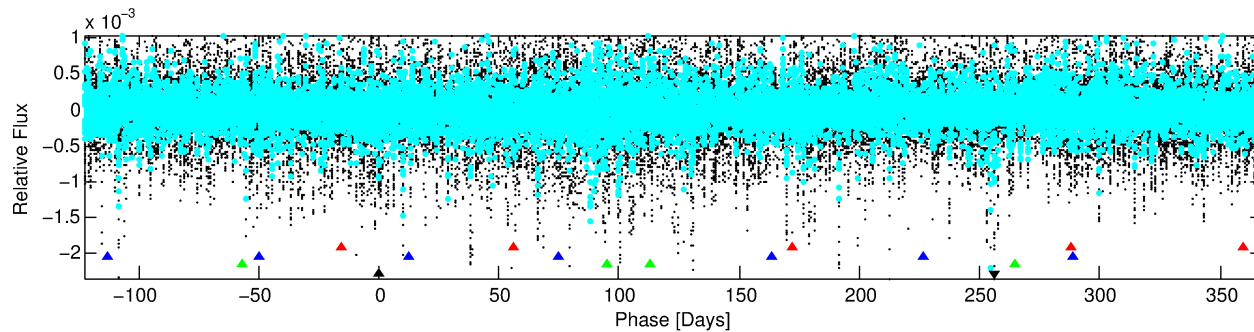
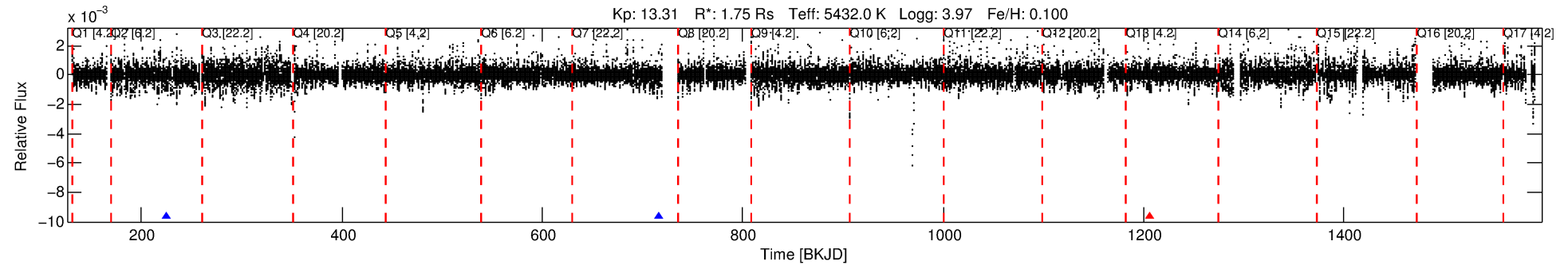
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004249702-04

No Significant Match Found

DV One-Page Summary

KIC: 4249702 Candidate: 4 of 4 Period: 490.514 d



TPS TCE Results:

Period = 490.51442 d
Epoch = 225.1921 BKJD

DV fit results are unavailable

DV Diagnostic Results:

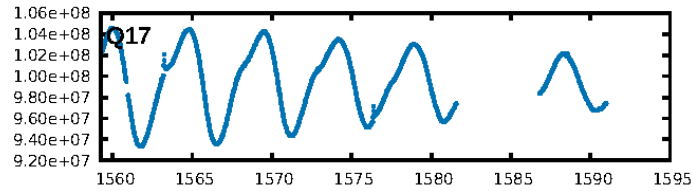
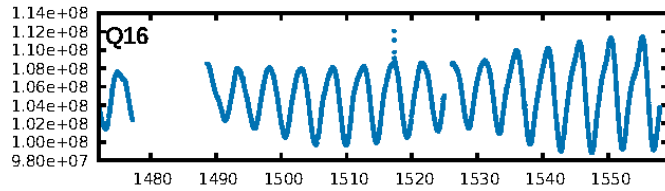
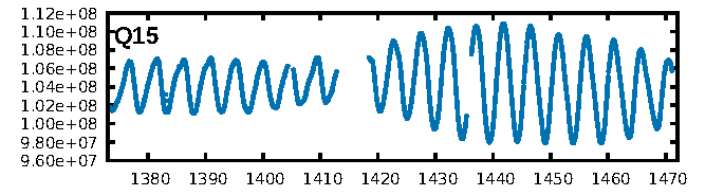
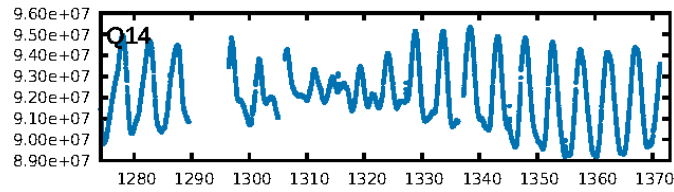
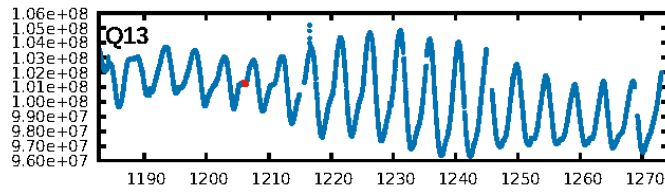
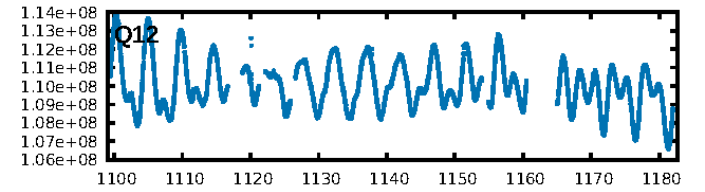
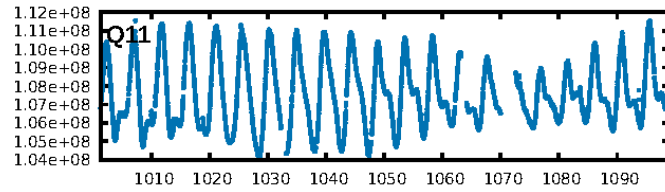
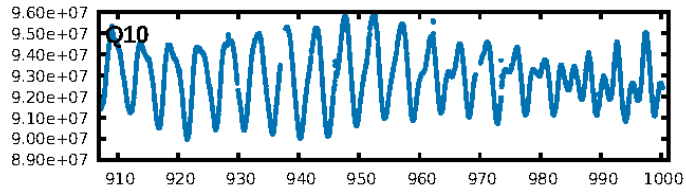
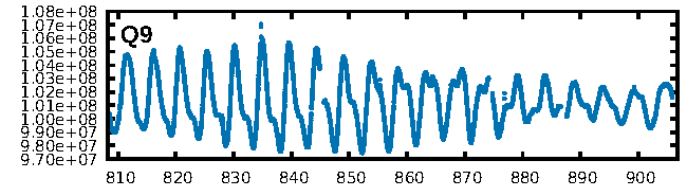
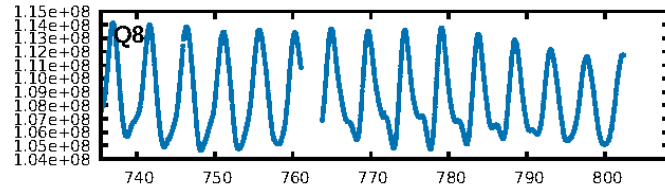
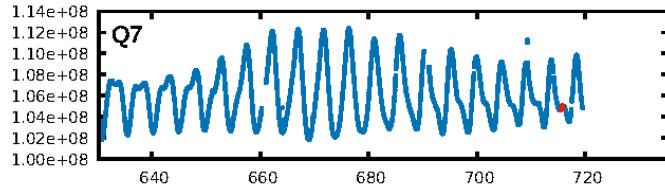
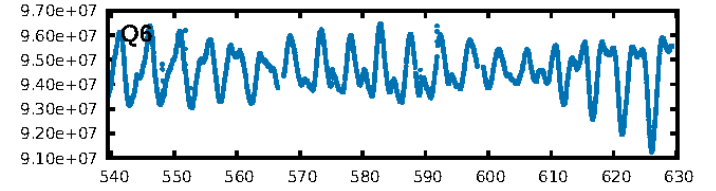
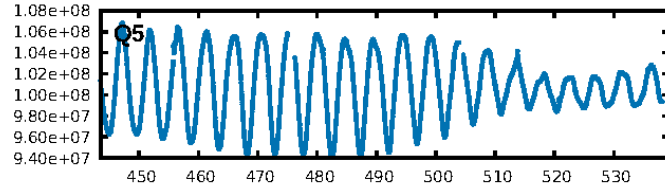
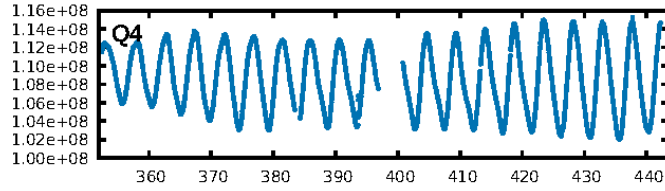
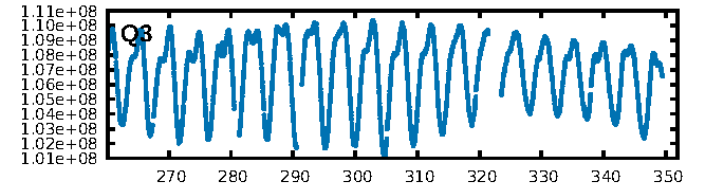
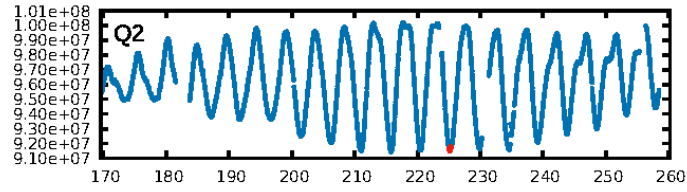
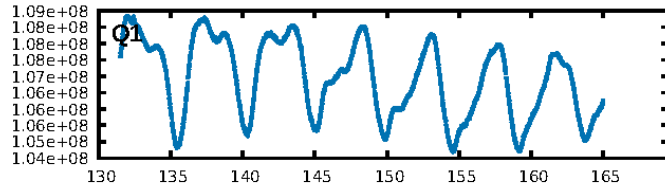
ShortPeriod-sig: 100.0% [758.91σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.67 [2/3]
GhostDiagnostic-chr: 34.52

Centroid-sig: 63.7%
Centroid-so: 0.285 arcsec [0.60σ]
OotOffset-rm: 0.997 arcsec [7.30σ]
KicOffset-rm: 1.043 arcsec [4.66σ]
OotOffset-st: 1/1/0/0 [2]
KicOffset-st: 1/1/0/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

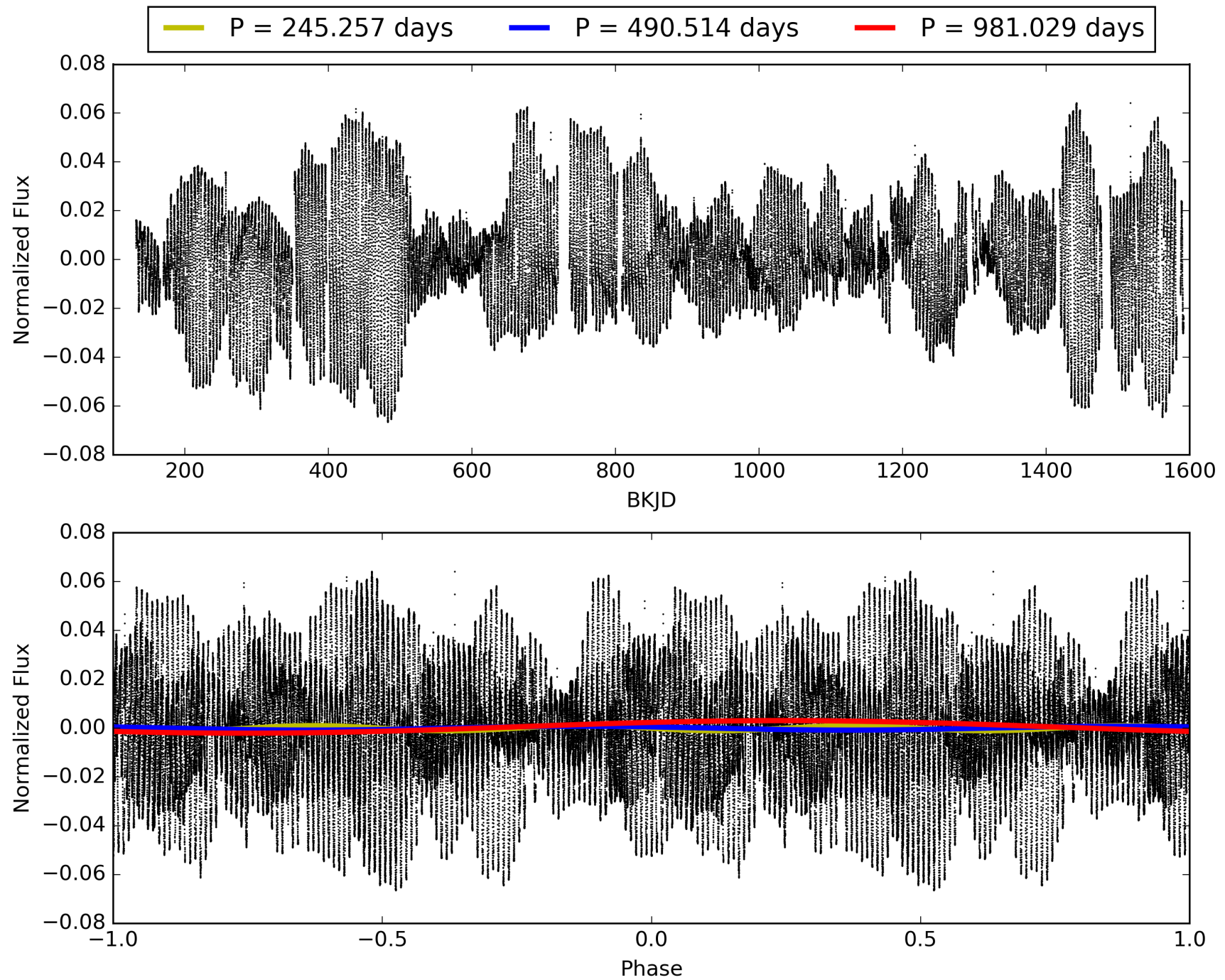
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:44:24 Z

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

TCE 004249702-04, PDC Light Curves

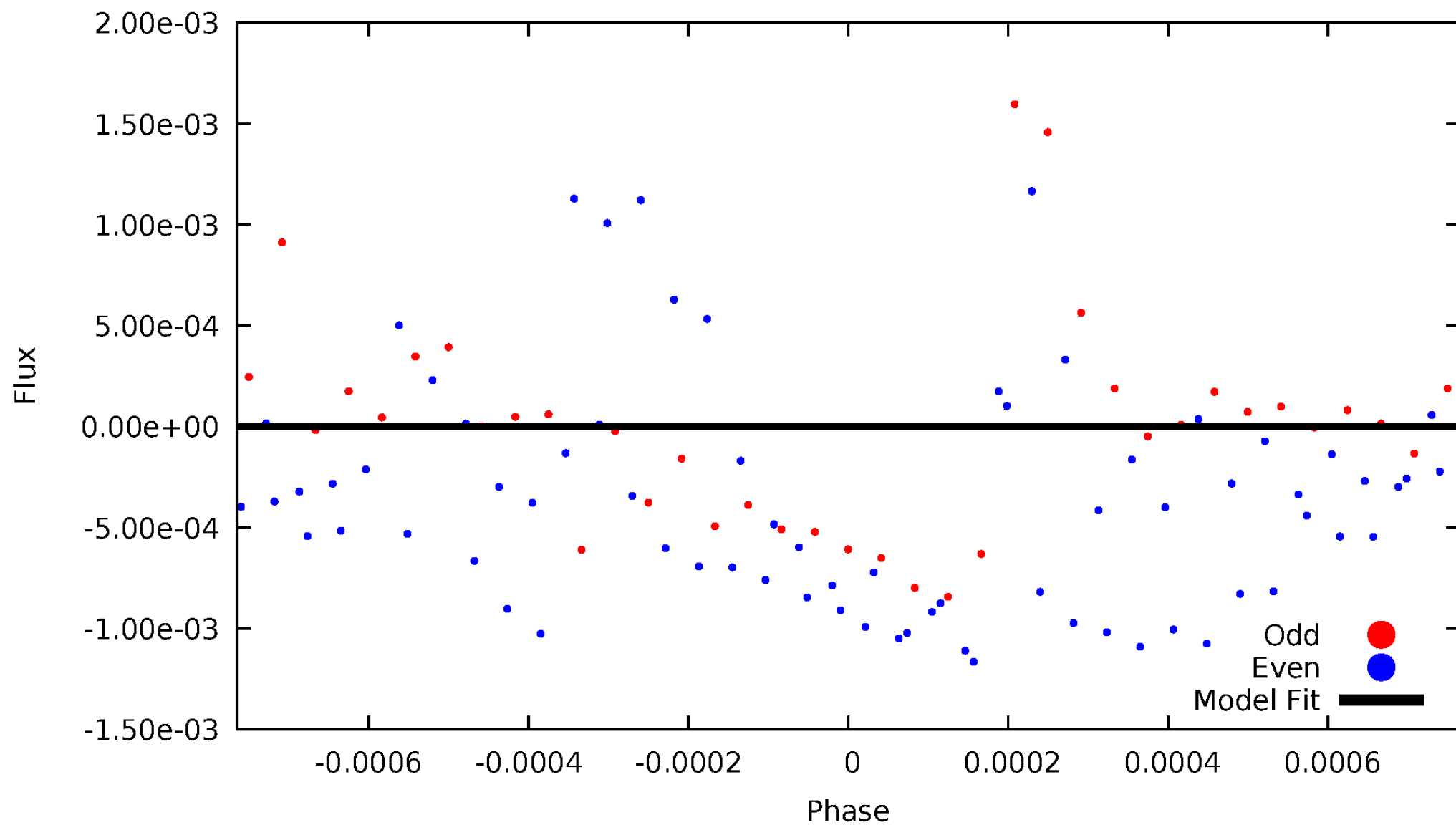


TCE 004249702-04



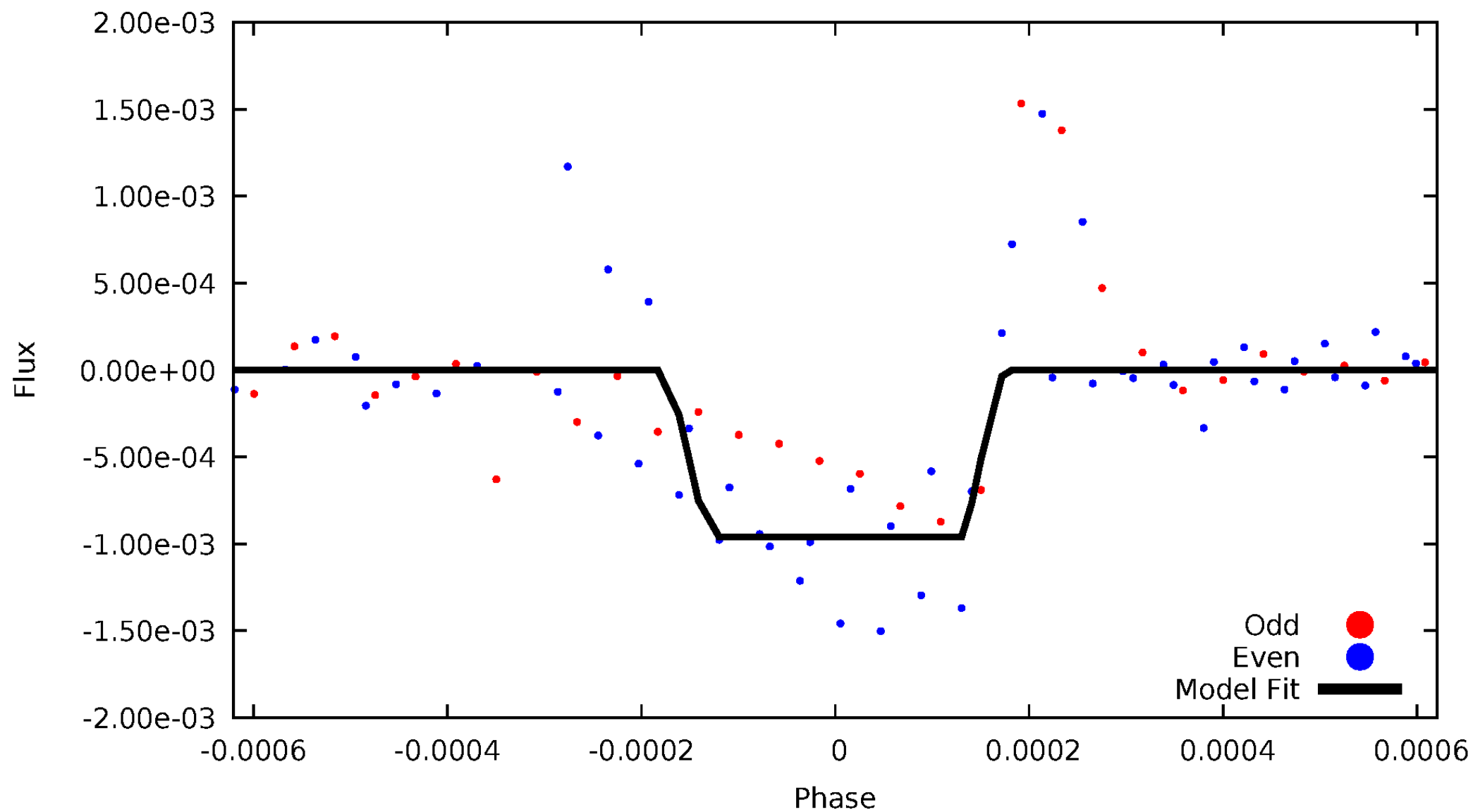
DV Odd/Even

TCE 004249702-04



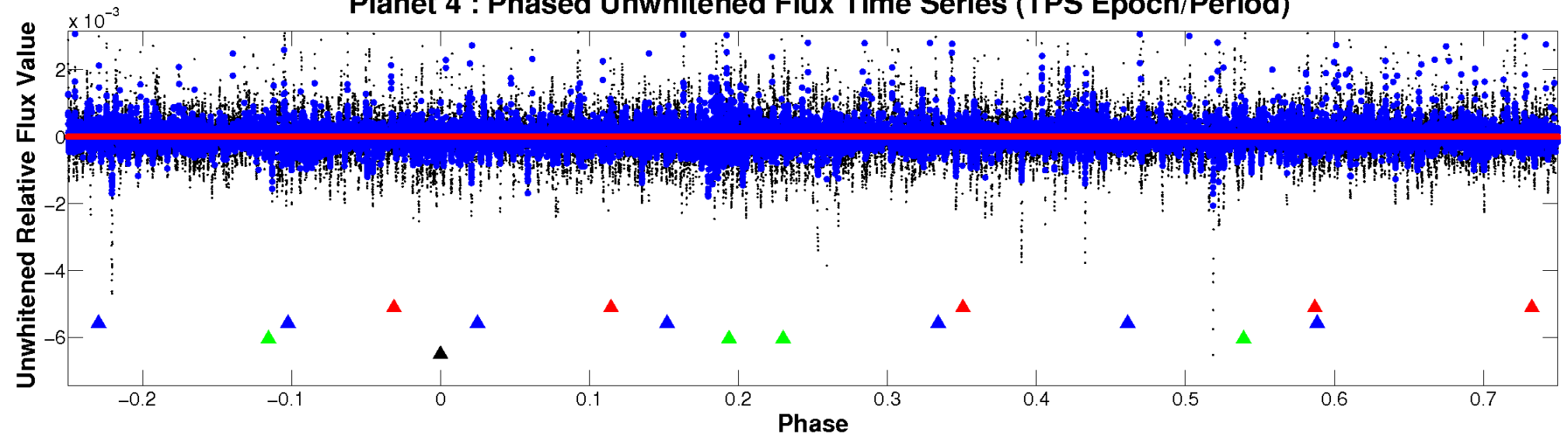
ALT Odd/Even

TCE 004249702-04



Non-Whitened Vs. Whitened Light Curve

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

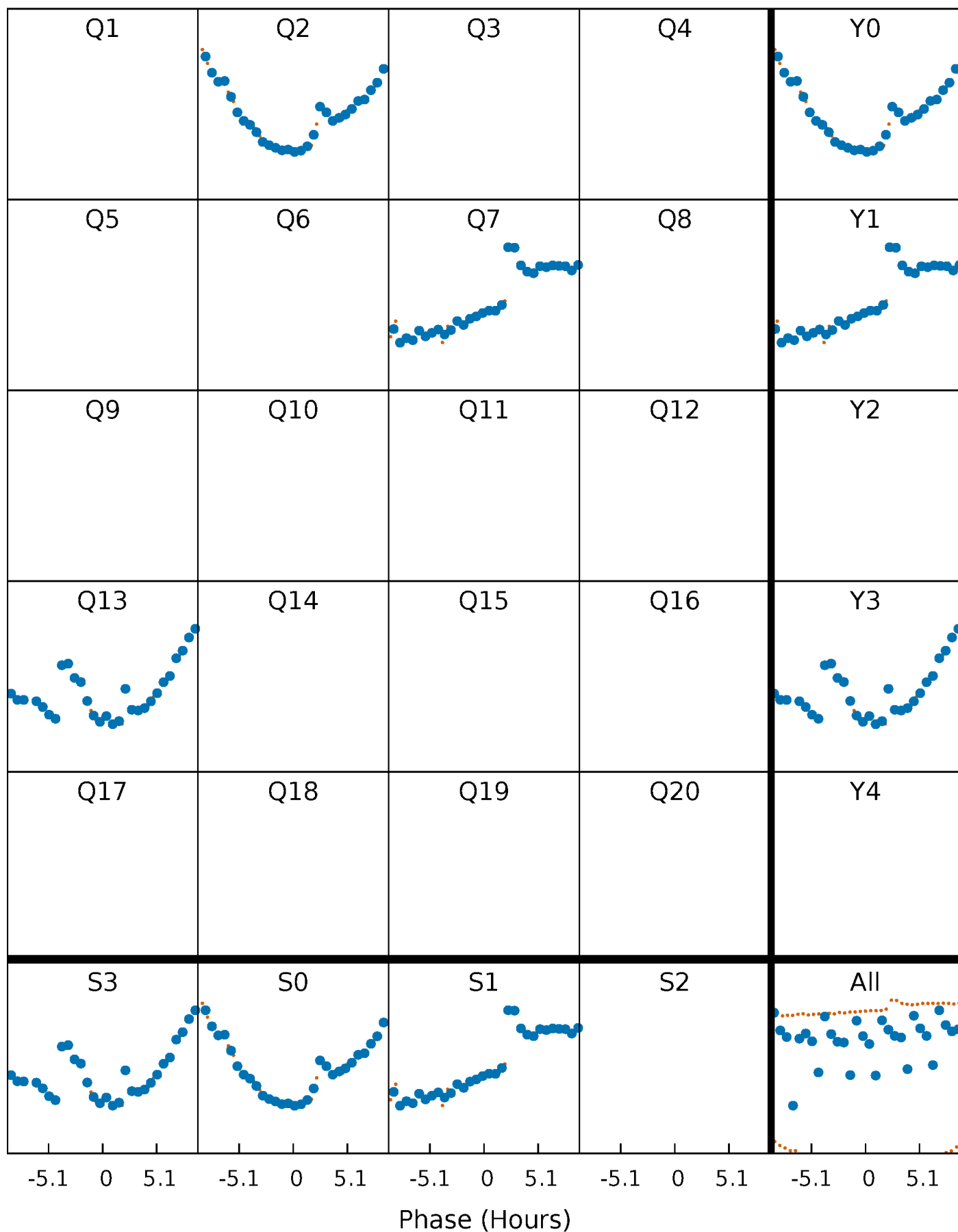


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



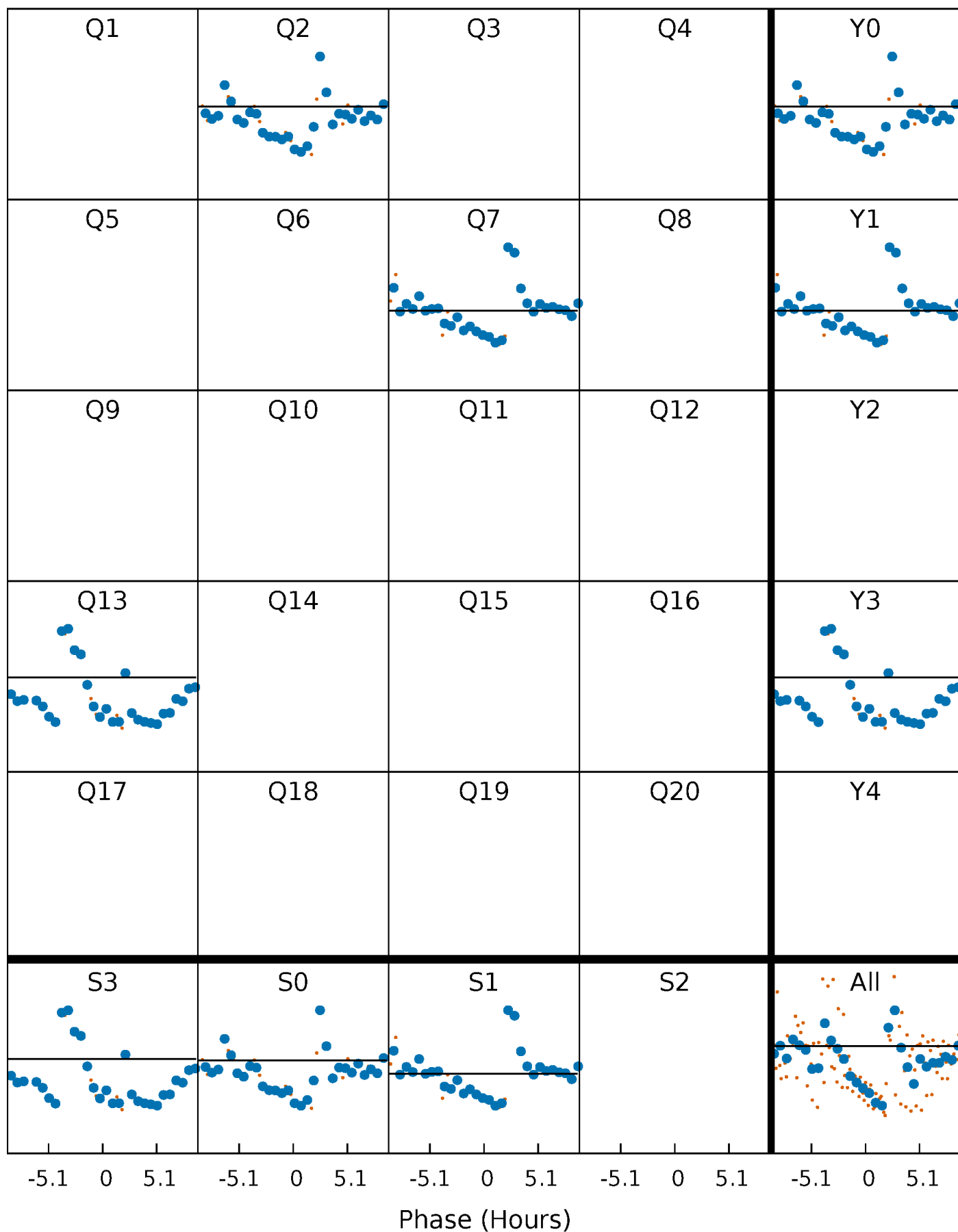
PDC Quarter-Phased Transit Curves

TCE 004249702-04 $P=490.514419$ Days $T_0=225.192055$ (BKJD)



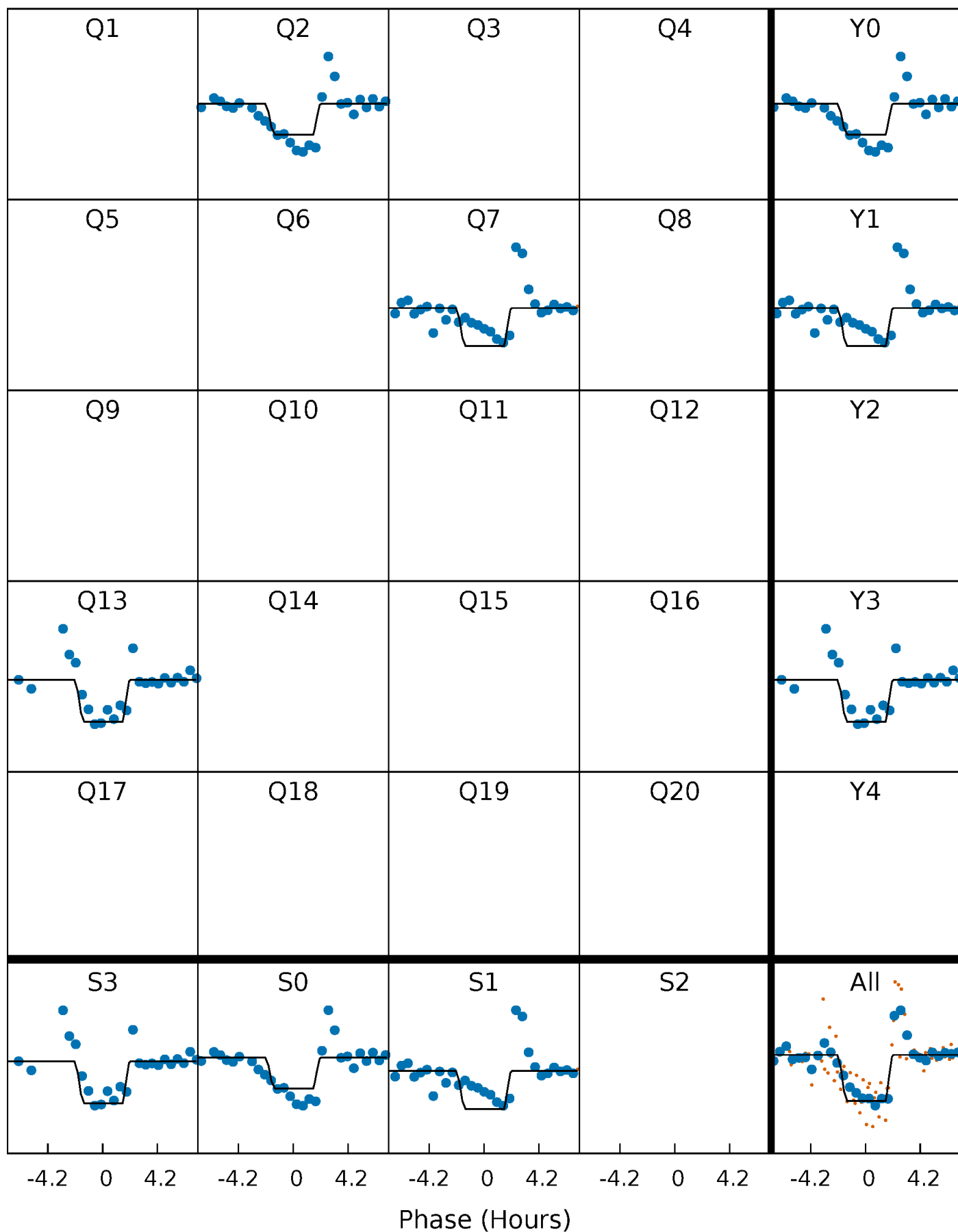
DV Quarter-Phased Transit Curves

TCE 004249702-04 $P=490.514419$ Days $T_0=225.192055$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

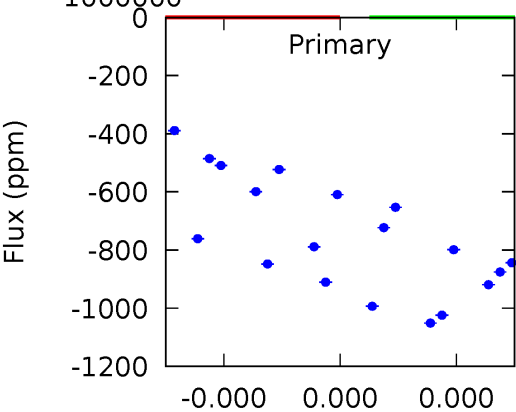
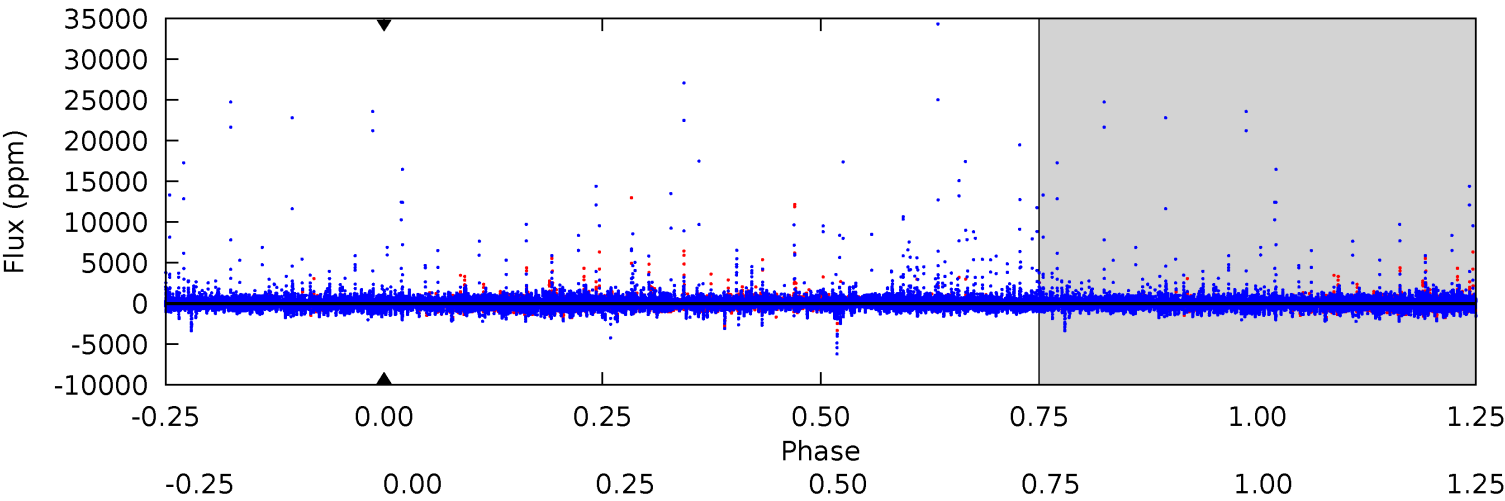
TCE 004249702-04 P=490.514419 Days $T_0=225.199936$ (BKJD)



DV Model-Shift Uniqueness Test

004249702-04, P = 490.514419 Days, E = 225.192055 Days

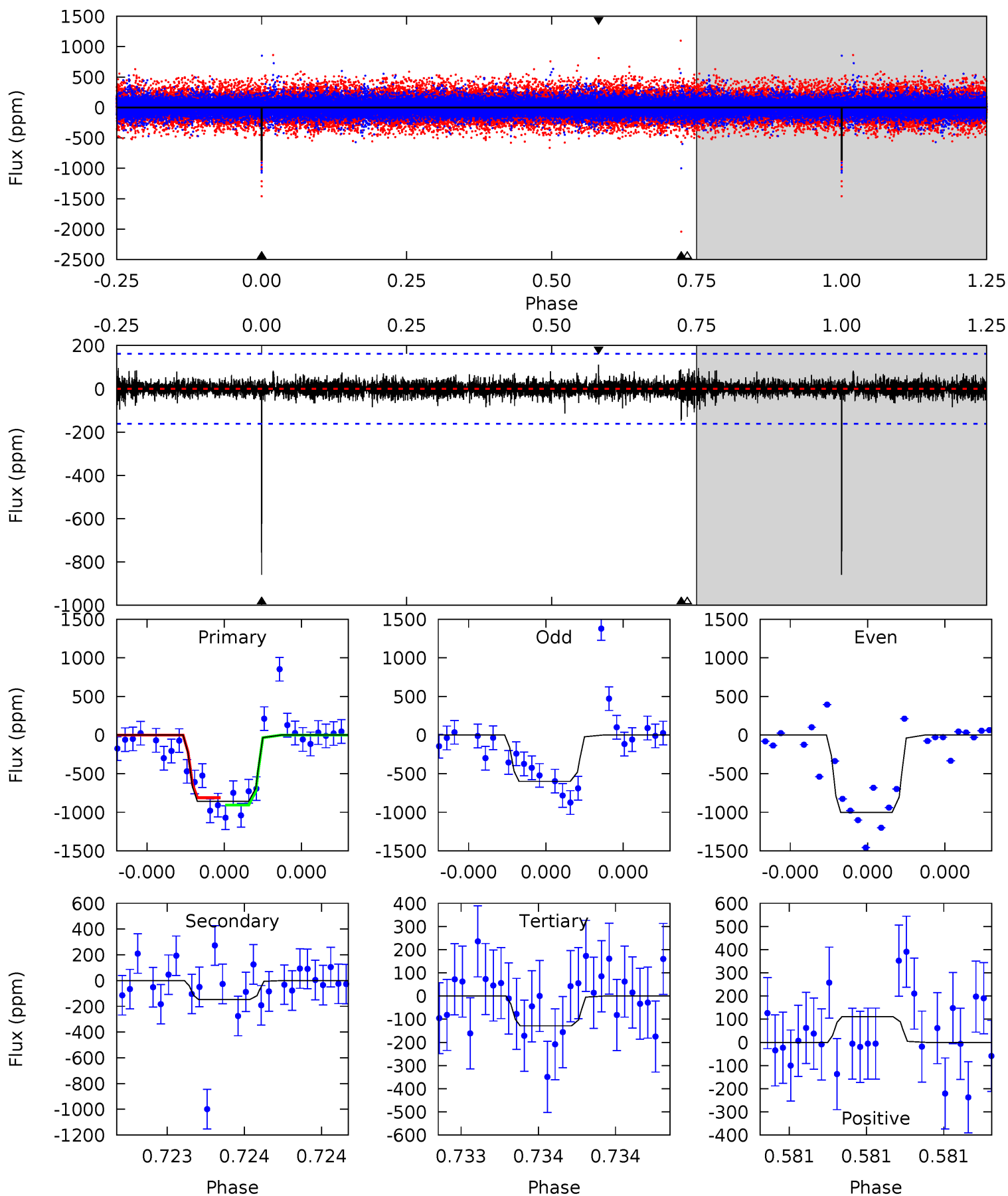
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-----|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-----|-------|-----|
| 0 | 0 | 0 | 0 | 1.00 | 1.00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



Alt Model-Shift Uniqueness Test

004249702-04, P = 490.514419 Days, E = 225.199936 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 30.0 | 5.15 | 4.50 | 3.86 | 5.64 | 3.58 | 0.66 | 25.5 | 26.1 | 0.65 | 1.29 | 6.77 | 1.10 | 0.11 | 1.68 |



Stellar Parameters For KIC 004249702

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5432^{+180}_{-147} | $3.967^{+0.517}_{-0.172}$ | $0.100^{+0.250}_{-0.250}$ | $1.749^{+0.541}_{-0.812}$ | $1.033^{+0.120}_{-0.146}$ | $0.272^{+1.528}_{-0.130}$ |
| | +3%/-3% | +13%/-4% | +250%/-250% | +31%/-46% | +12%/-14% | +562%/-48% |
| 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 004249702-04 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-----------------|--------------------------|----------------------|--------------------------|-----------------------------|
| DV | 0 ± 1000000 | $13.33^{+14.05}_{-9.42}$ | 390^{+36}_{-51} | 4360^{+15826}_{-18444} | $8607^{+1233553}_{-593873}$ |
| Alt. | -147 ± 29 | $13.69^{+16.75}_{-9.54}$ | 392^{+36}_{-50} | 2798^{+1354}_{-442} | 634^{+6483}_{-506} |

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

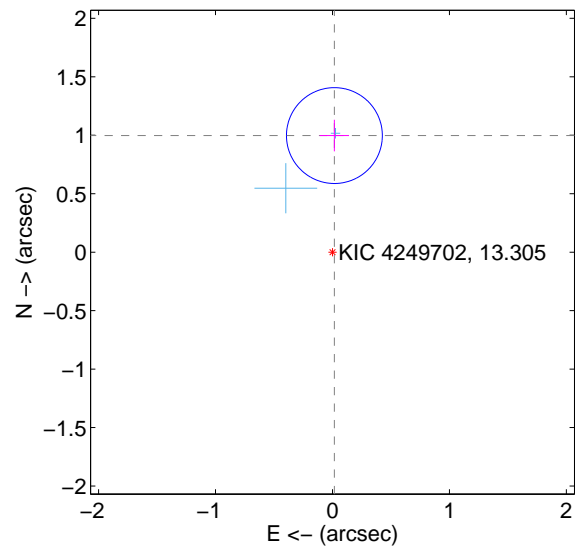
Supplemental centroid analysis for 004249702-04. Kepler magnitude: 13.30. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

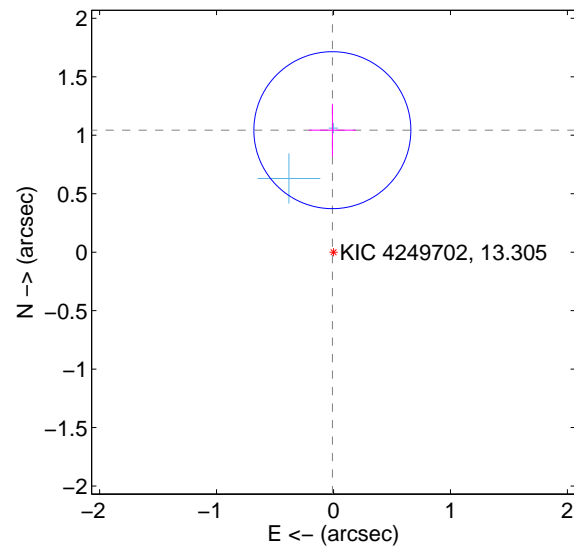
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.997 ± 0.137 | 7.30 | -0.017 ± 0.125 | 0.997 ± 0.135 |
| PRF-fit source offset from KIC position | 1.043 ± 0.224 | 4.66 | 0.010 ± 0.201 | 1.043 ± 0.225 |
| photometric centroid source offset | 0.29 ± 0.48 | 0.60 | -0.28 ± 0.47 | 0.07 ± 0.65 |

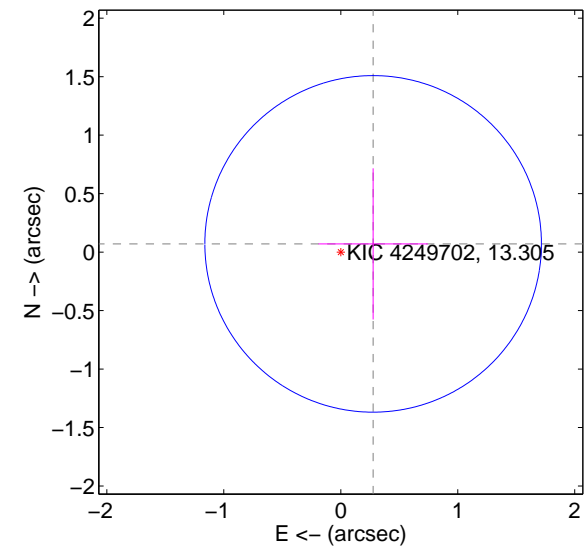
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

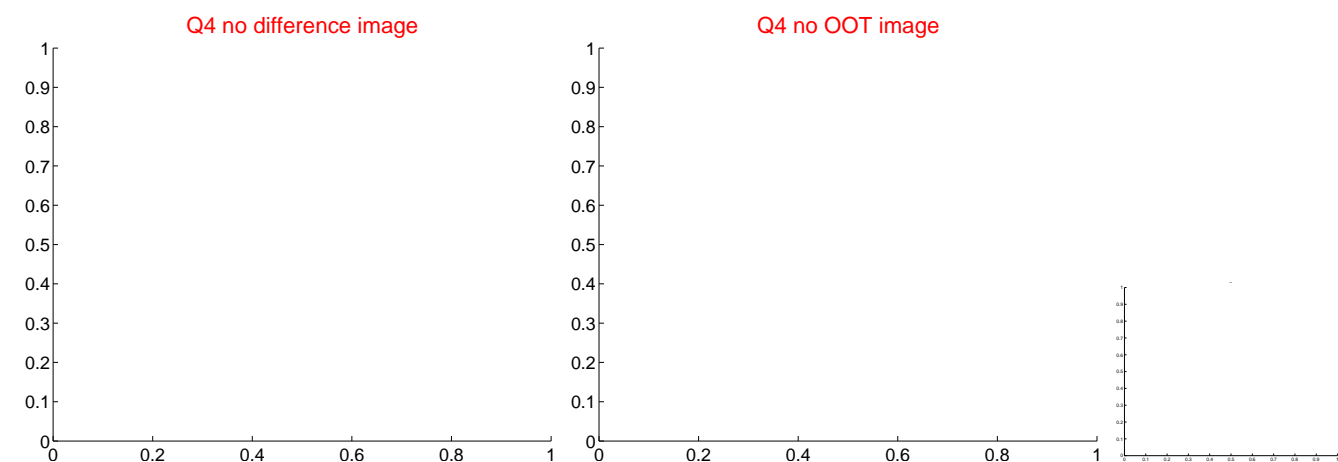
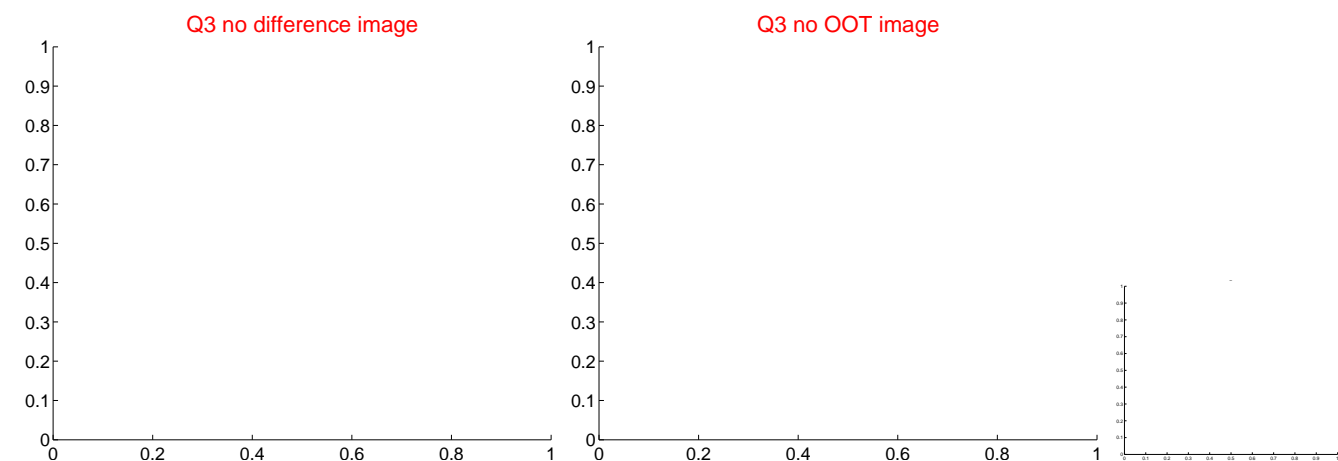
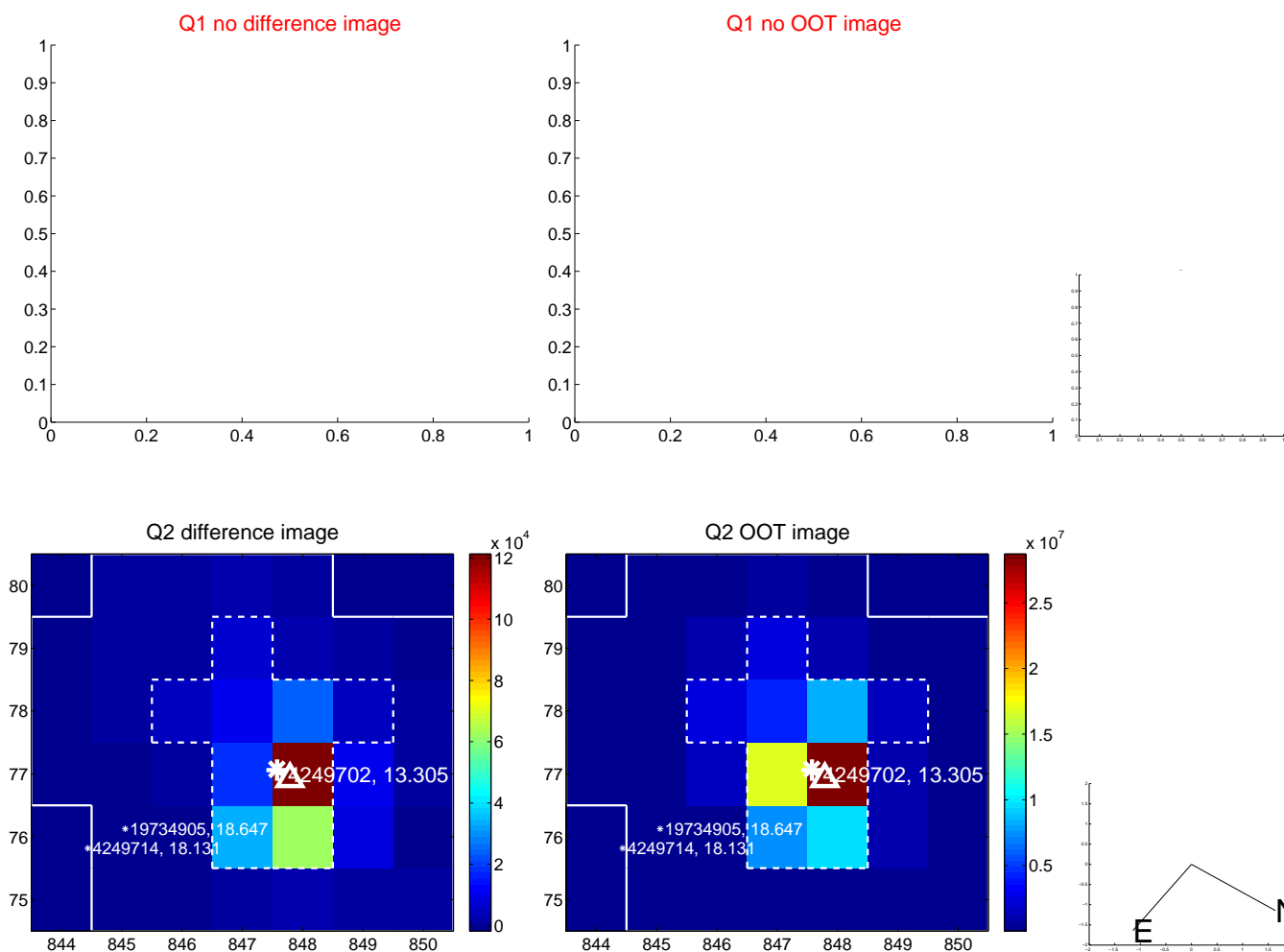


offset from photometric centroids

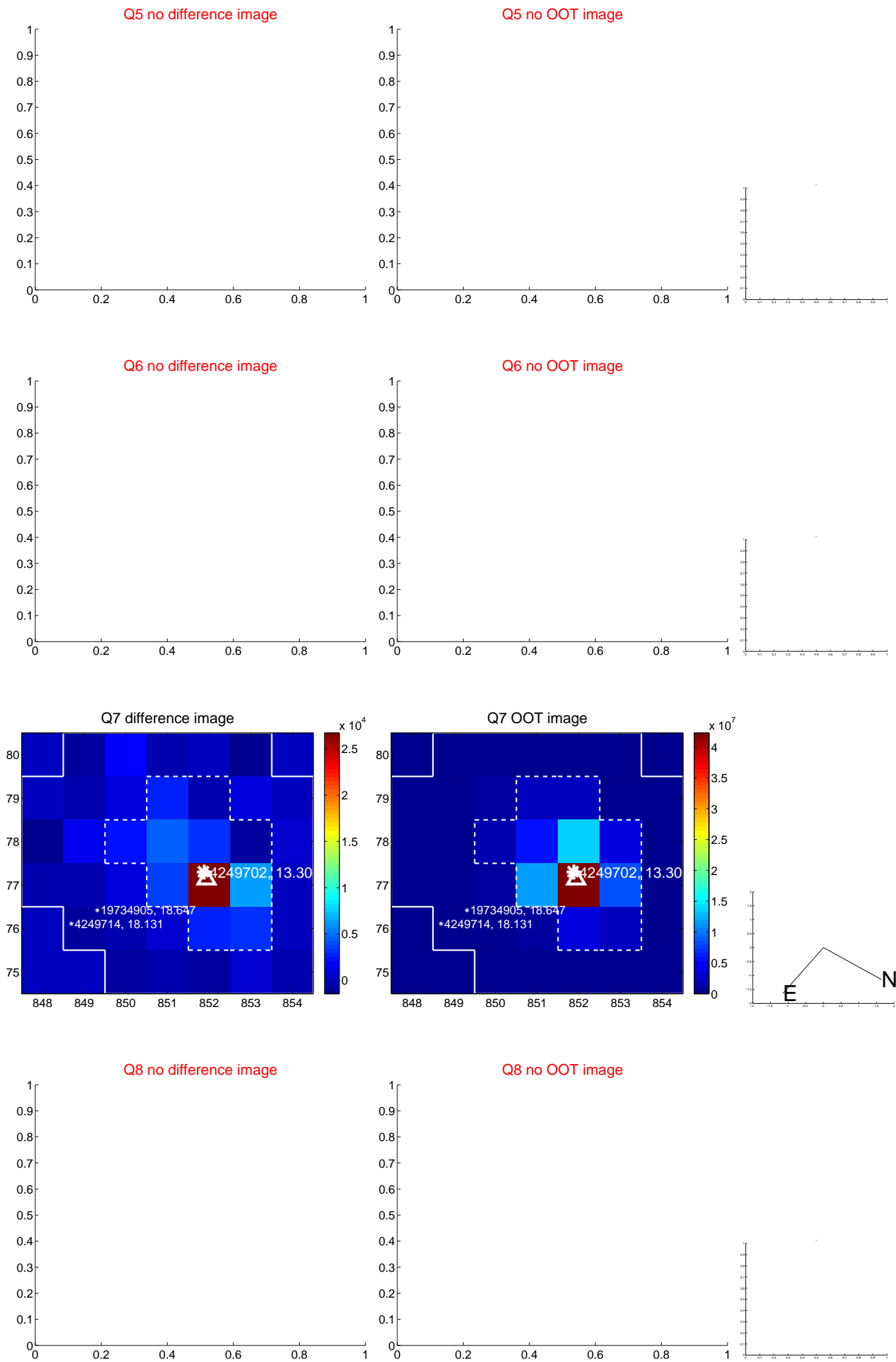


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



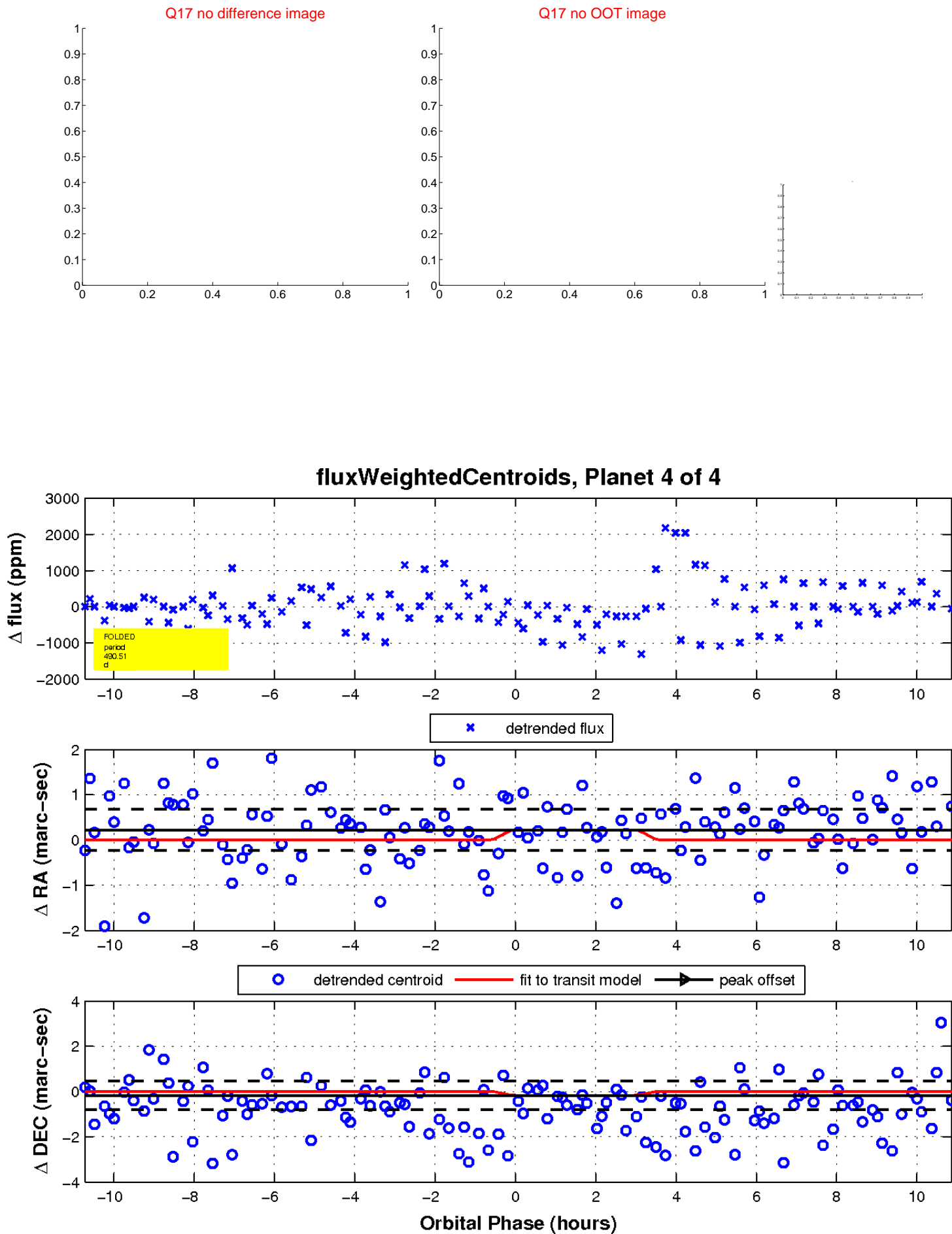
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

