

KIC 011391018

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|--------|-----------------------------|-----------------|------------------------|------------------------|
| 011391018-01 | OBS | 0189.01 | 30.360446 | 148.091491 | 21151.8 | 6.043 | 1091.1 | 1020.9 | 0.77 | 4939 | 11.05 | 10.49 |
| 011391018-02 | OBS | No | 361.033229 | 210.561388 | 660.3 | 23.966 | 14.4 | 11.3 | 0.77 | 4939 | 2.57 | 0.39 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 011391018-01 | OBS | PC | 0.98 | 0 | 0 | 0 | 0 | NO_COMMENT |
| 011391018-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS |

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

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

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

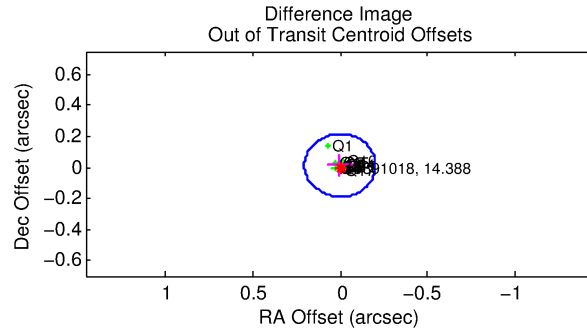
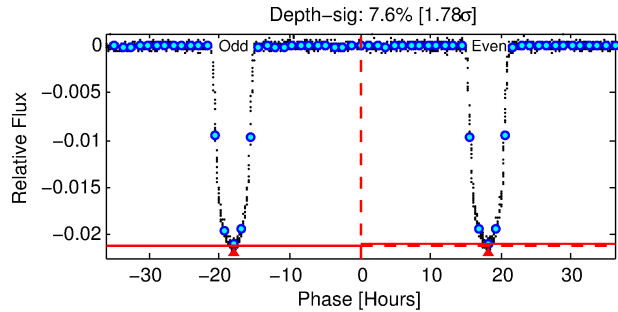
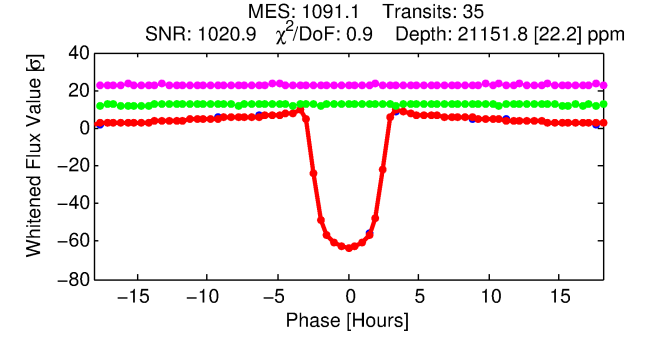
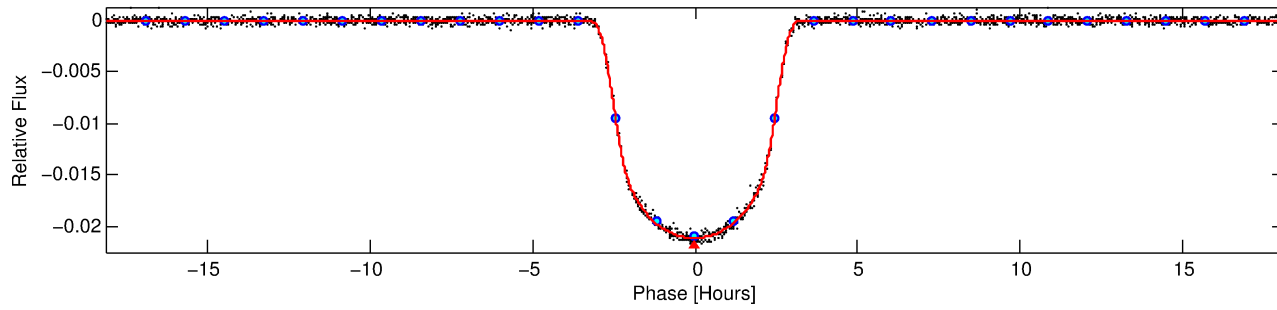
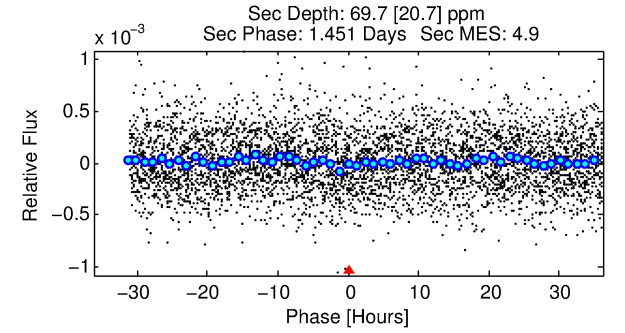
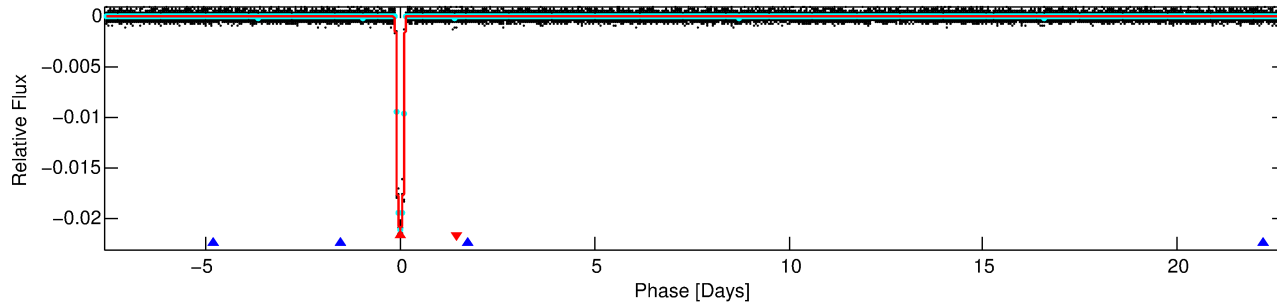
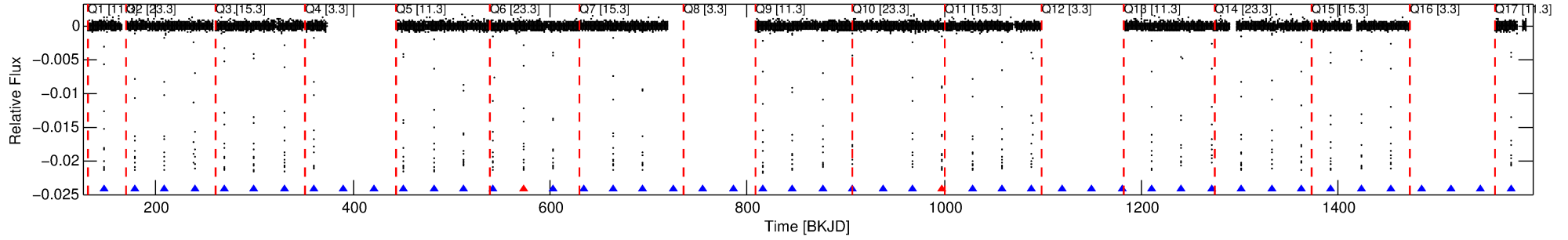
Ephemeris Match Information For 011391018-01

No Significant Match Found

DV One-Page Summary

KIC: 11391018 Candidate: 1 of 2 Period: 30.360 d
KOI: K00189.01 Corr: 0.998

Kp: 14.39 R*: 0.77 Rs Teff: 4939.0 K Logg: 4.54 Fe/H: -0.060



DV Fit Results:

Period = 30.36045 [0.00000] d
Epoch = 148.0915 [0.0001] BKJD
Rp/R* = 0.1324 [0.0003]
a/R* = 40.61 [0.26]
b = 0.40 [0.01]
Seff = 10.49 [1.85]
Teq = 459 [20] K
Rp = 11.05 [1.11] Re
a = 0.1725 [0.0150] AU
Ag = 9.34 [3.03] [2.75σ]
Teff = 1240 [100] K [7.69σ]

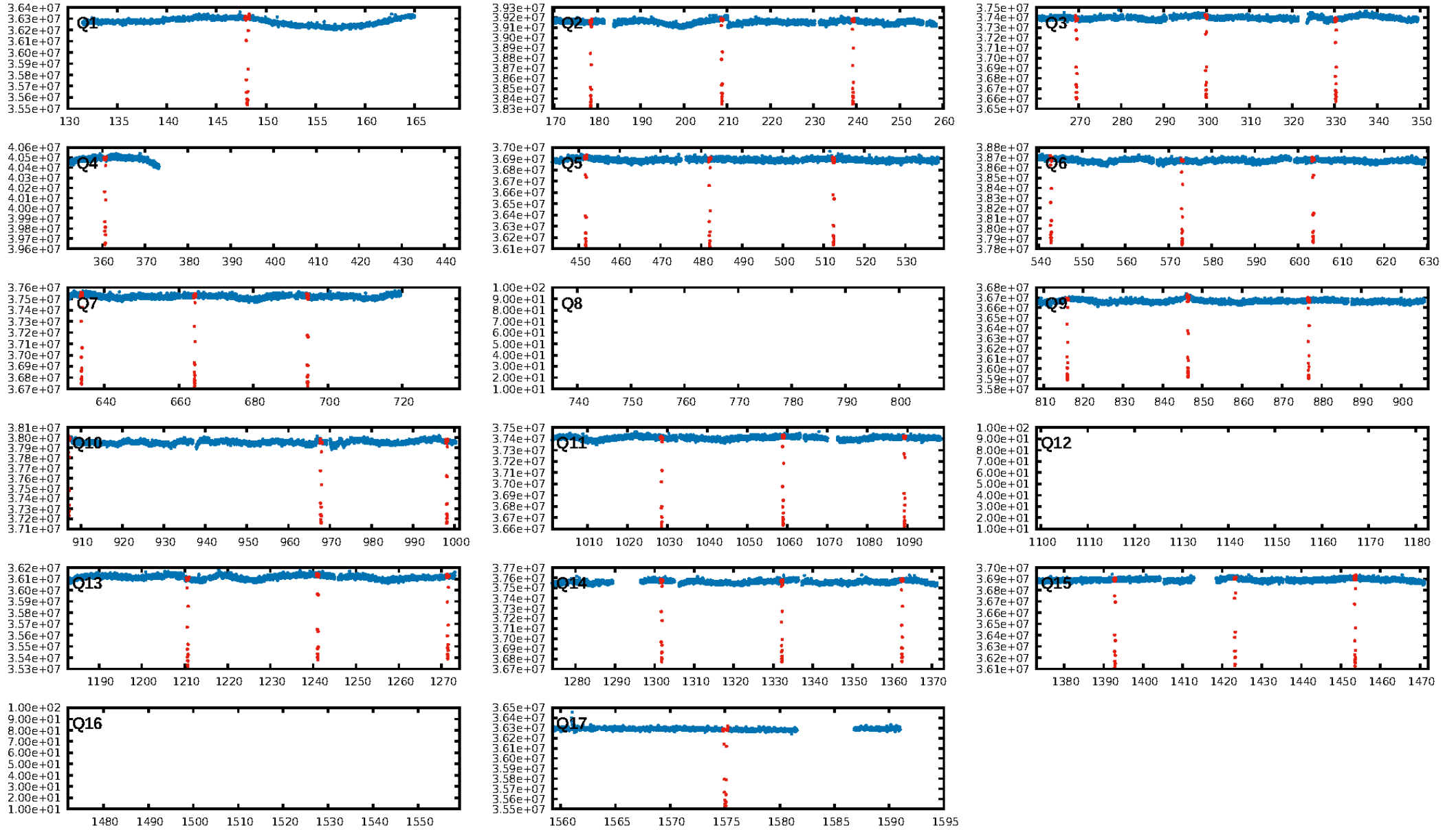
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [321.09σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 62.7%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.94 [30/32]
GhostDiagnostic-chr: 4.619
Centroid-sig: 0.4%
Centroid-so: 0.388 arcsec [31.34σ]
OotOffset-rm: 0.014 arcsec [0.21σ]
KicOffset-rm: 0.248 arcsec [3.41σ]
OotOffset-st: 4/4/1/5 [14]
KicOffset-st: 4/4/1/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

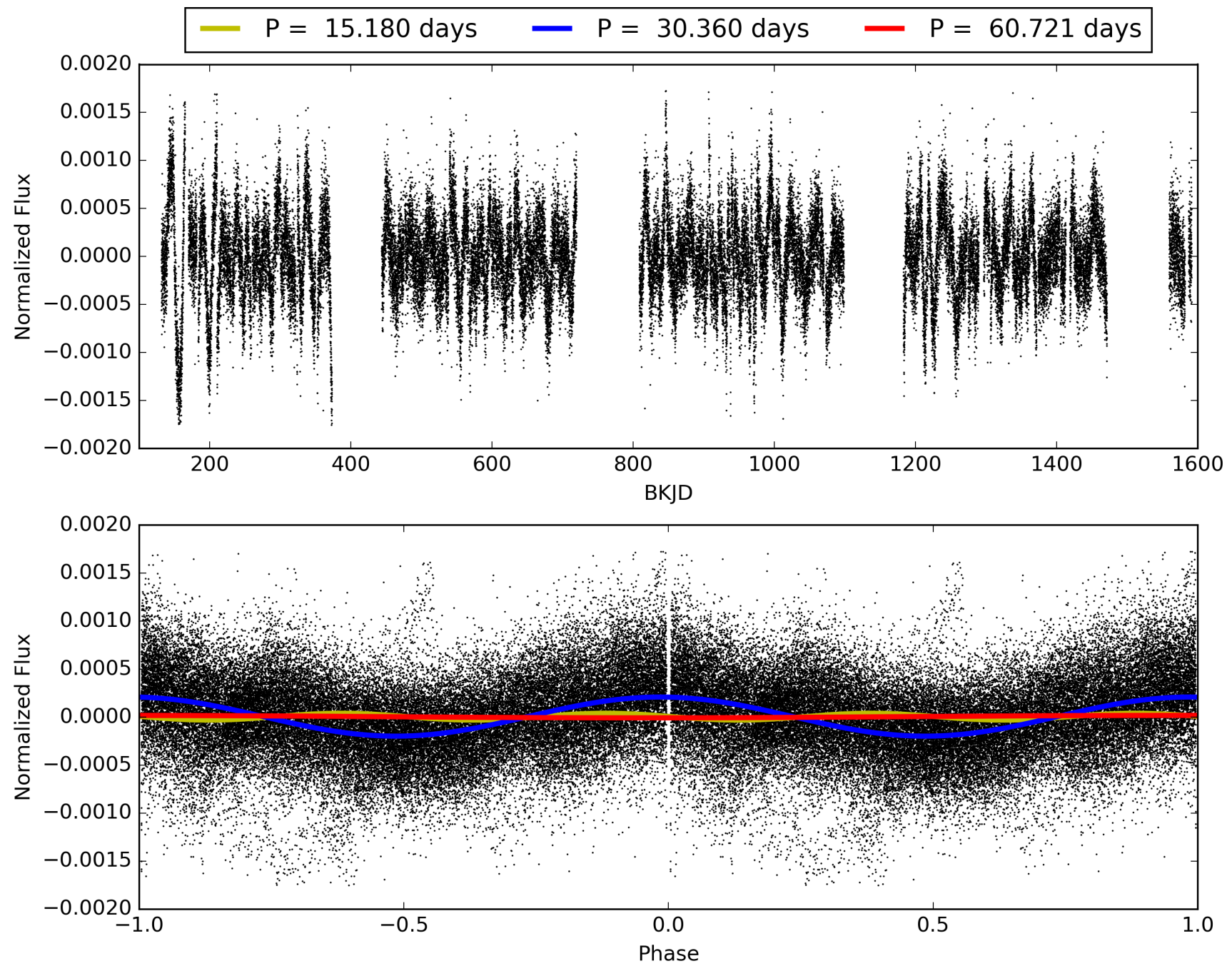
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 23:12:51 Z

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

TCE 011391018-01, PDC Light Curves

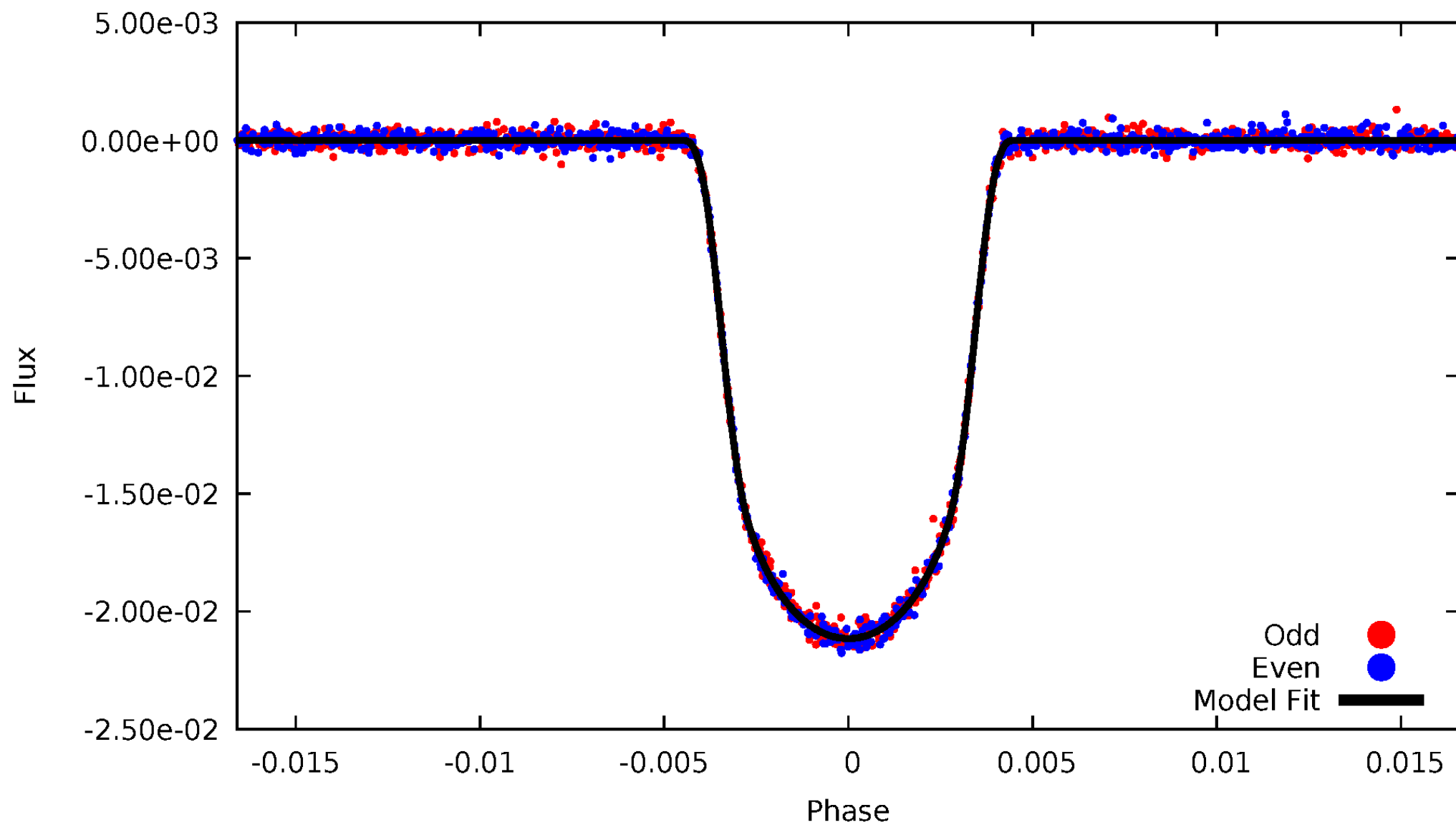


TCE 011391018-01



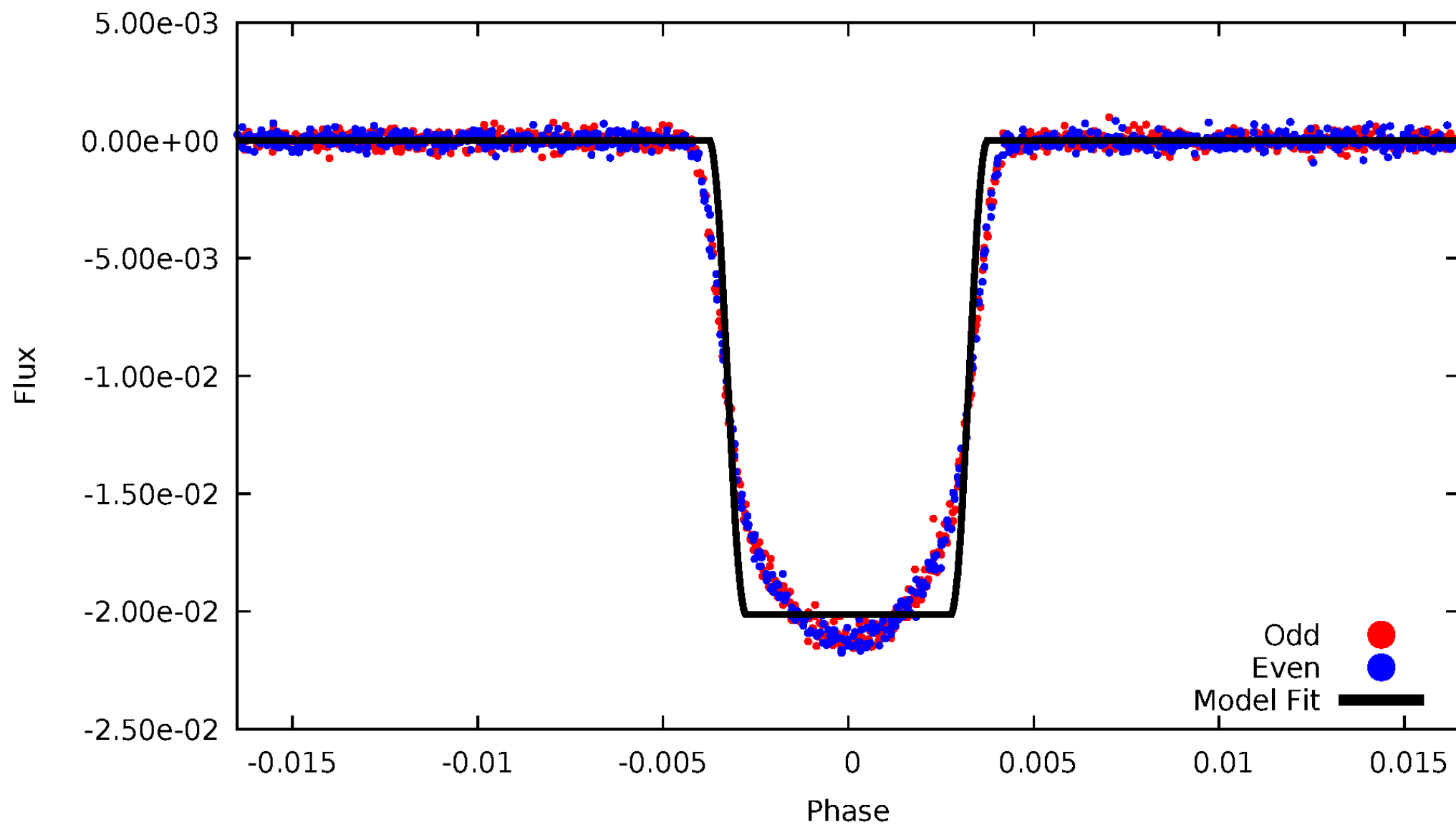
DV Odd/Even

TCE 011391018-01



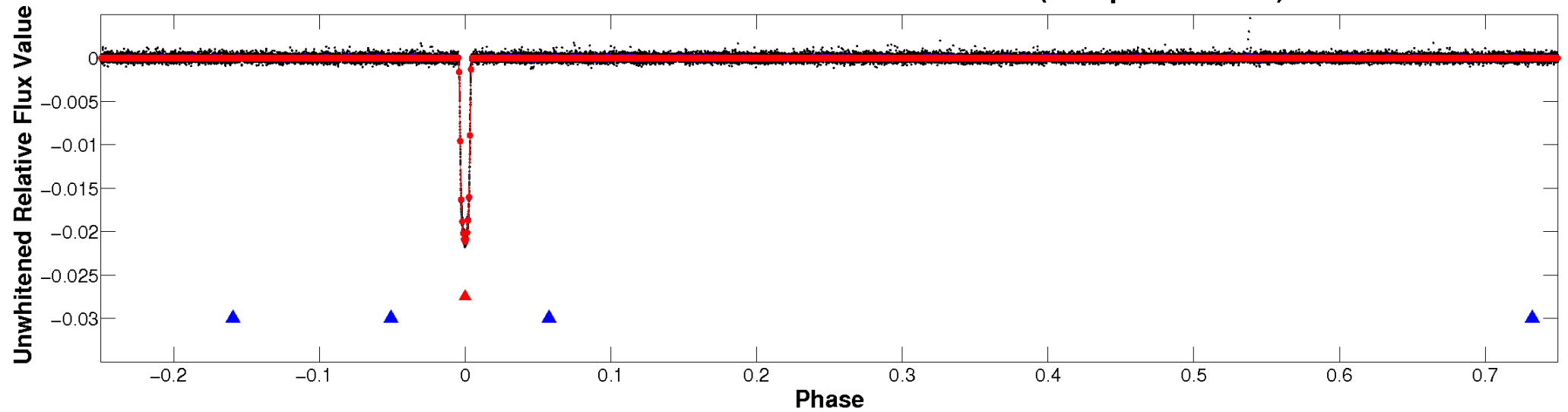
ALT Odd/Even

TCE 011391018-01

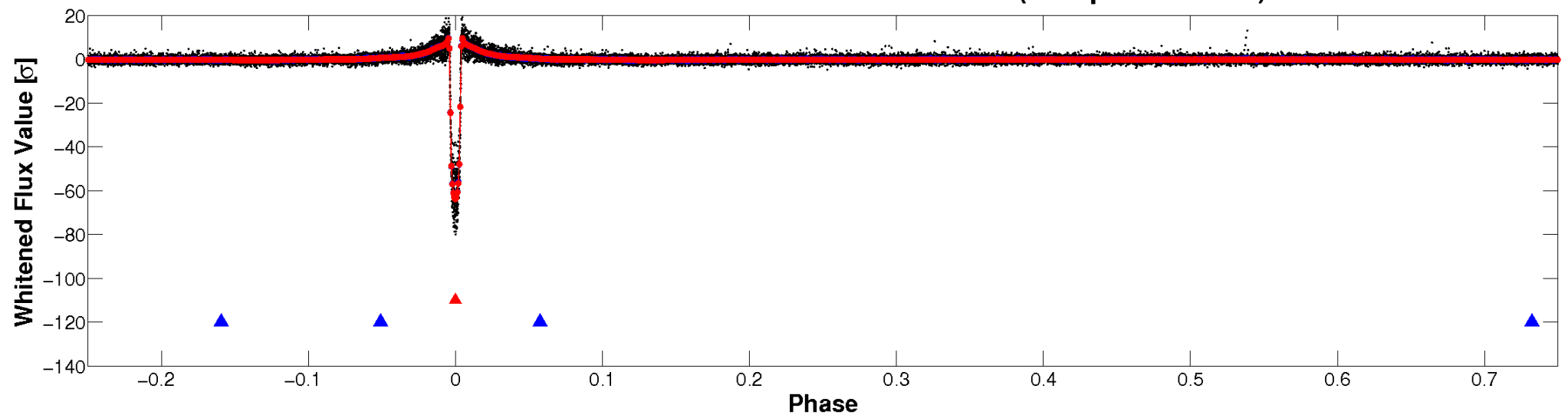


Non-Whitened Vs. Whitened Light Curve

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

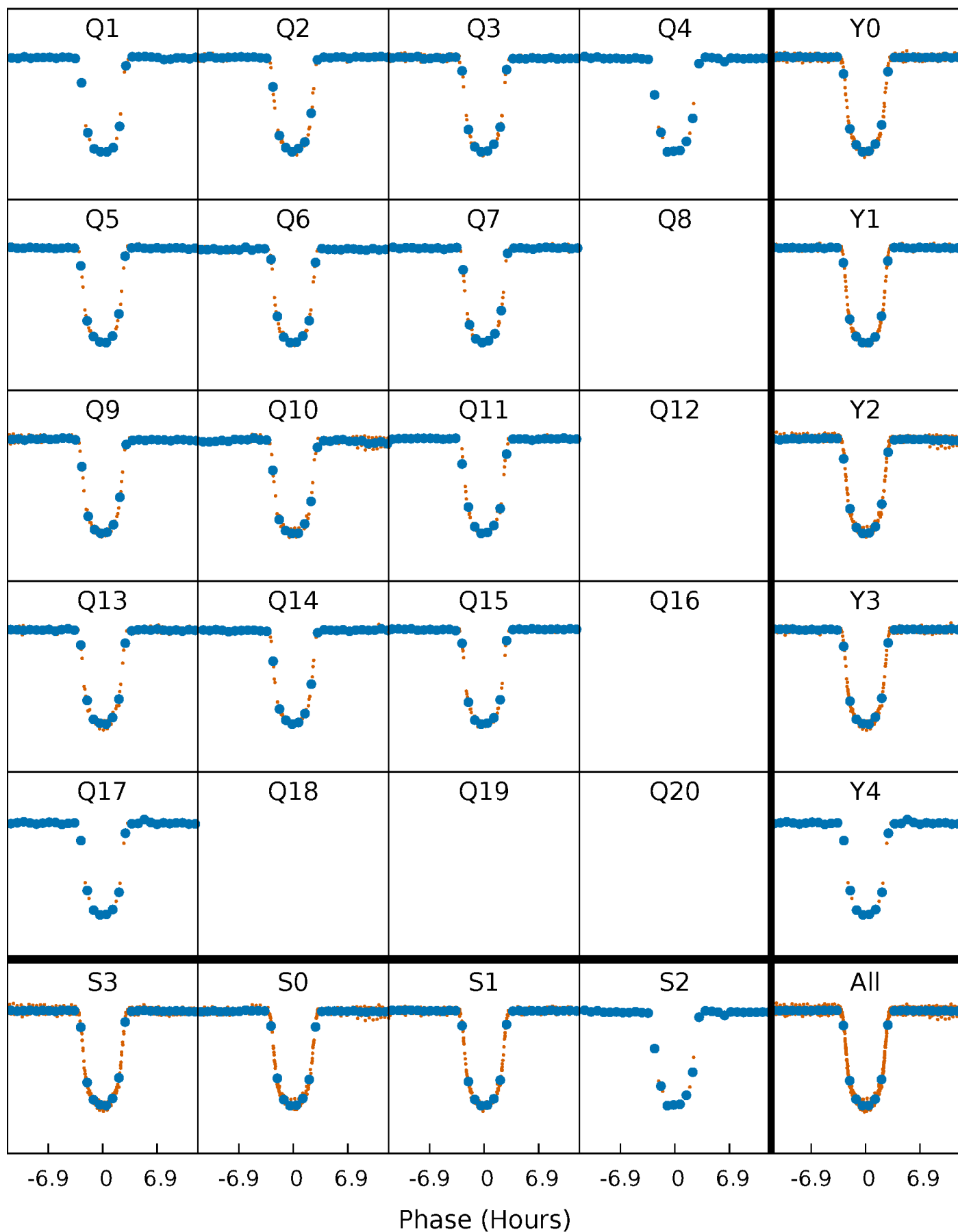


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



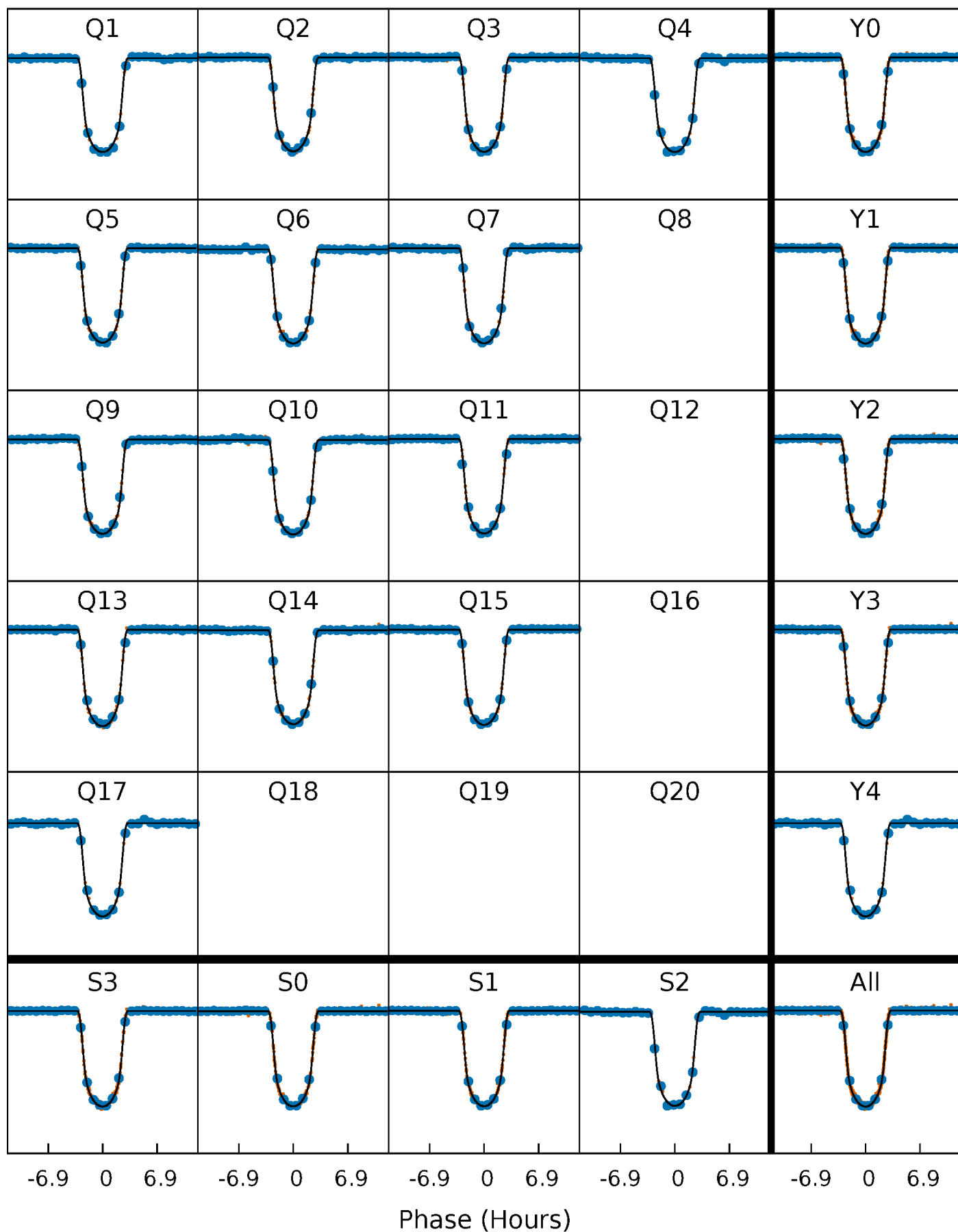
PDC Quarter-Phased Transit Curves

TCE 011391018-01 P= 30.360446 Days $T_0=148.091491$ (BKJD)



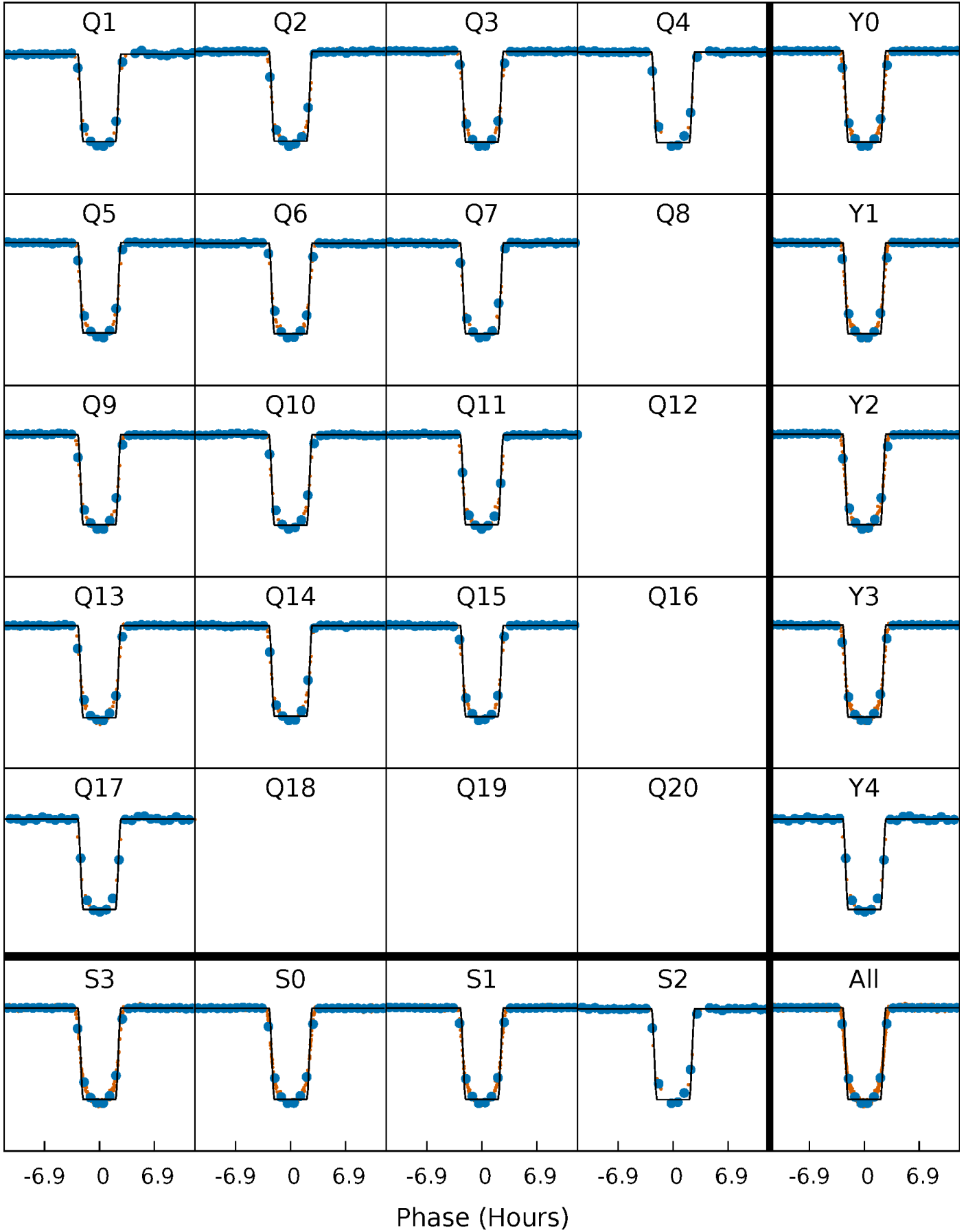
DV Quarter-Phased Transit Curves

TCE 011391018-01 P= 30.360446 Days $T_0=148.091491$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

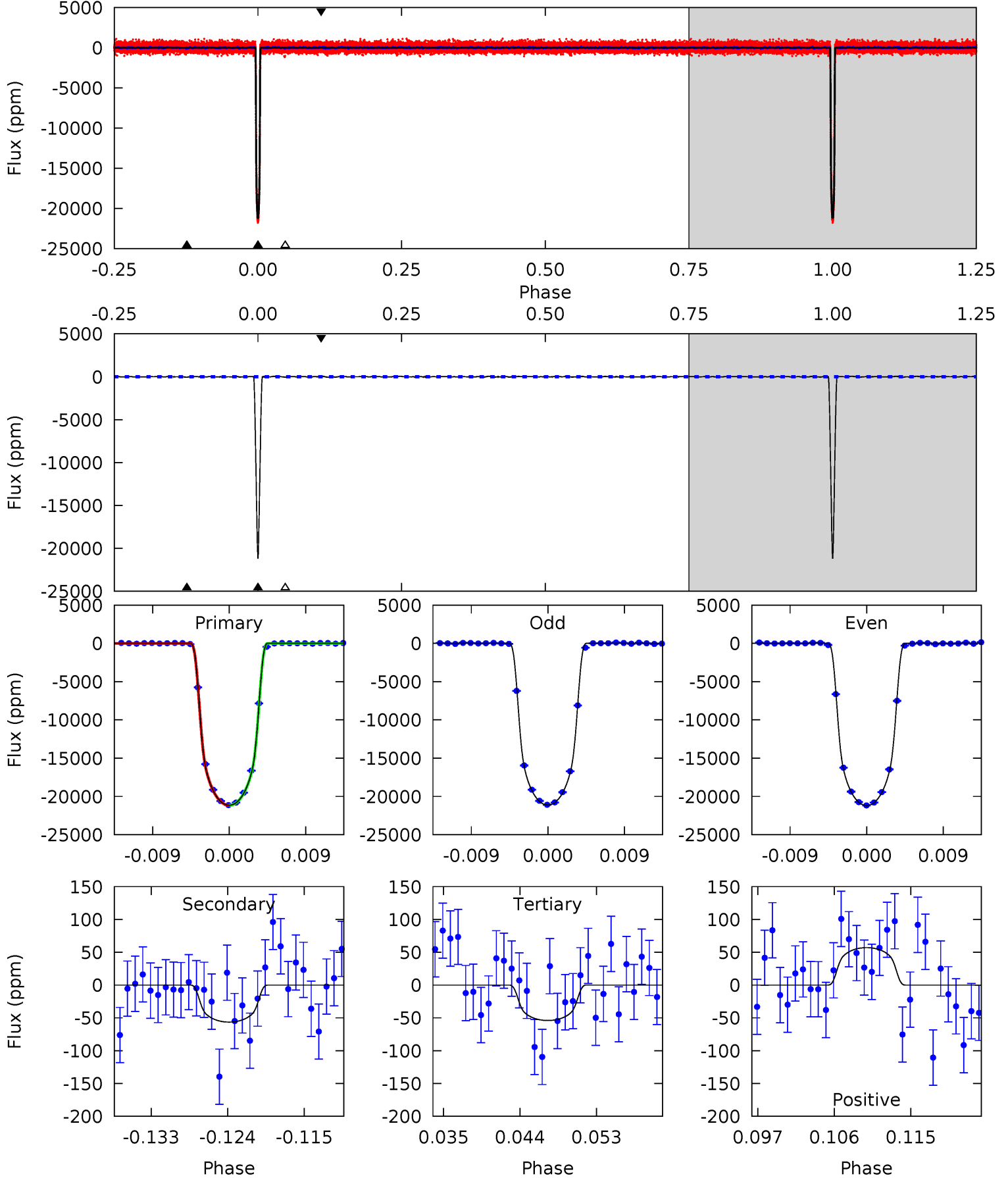
TCE 011391018-01 P= 30.360491 Days $T_0=148.090463$ (BKJD)



DV Model-Shift Uniqueness Test

011391018-01, P = 30.360446 Days, E = 117.731045 Days

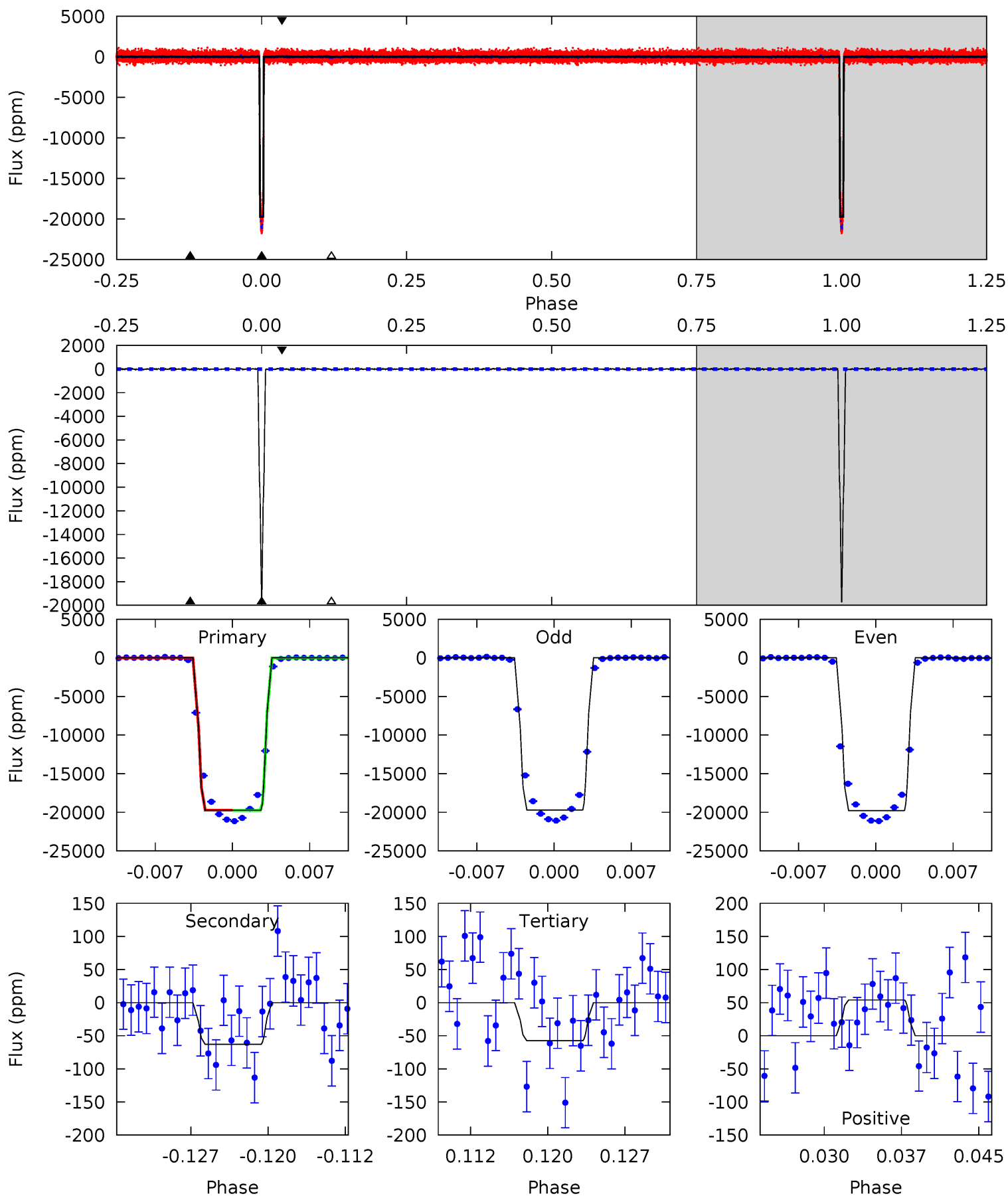
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 1694 | 4.52 | 4.33 | 4.57 | 5.05 | 2.62 | 1.39 | 1690 | 1689 | 0.20 | -0.05 | 2.31 | 1.00 | 0.00 | 0.06 |



Alt Model-Shift Uniqueness Test

011391018-01, P = 30.360491 Days, E = 117.729972 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 1309 | 4.18 | 3.82 | 3.58 | 5.08 | 2.67 | 1.10 | 1305 | 1305 | 0.36 | 0.60 | 2.58 | 1.00 | 0.00 | 1.50 |



Stellar Parameters For KIC 011391018

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 4939^{+148}_{-133} | $4.541^{+0.072}_{-0.044}$ | $-0.060^{+0.300}_{-0.300}$ | $0.765^{+0.063}_{-0.077}$ | $0.740^{+0.090}_{-0.055}$ | $2.332^{+0.662}_{-0.358}$ |
| | +3%/-3% | +2%/-1% | +500%/-500% | +8%/-10% | +12%/-7% | +28%/-15% |
| 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 011391018-01 / KOI 0189.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|--------------|-------------------------|----------------------|----------------------|---------------------------|
| DV | -56 ± 12 | $11.07^{+0.61}_{-0.65}$ | 639^{+22}_{-23} | 2122^{+57}_{-67} | $7.757^{+2.020}_{-1.742}$ |
| Alt. | -63 ± 15 | $11.83^{+0.66}_{-0.64}$ | 639^{+24}_{-24} | 2112^{+60}_{-72} | $7.451^{+1.869}_{-1.892}$ |

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

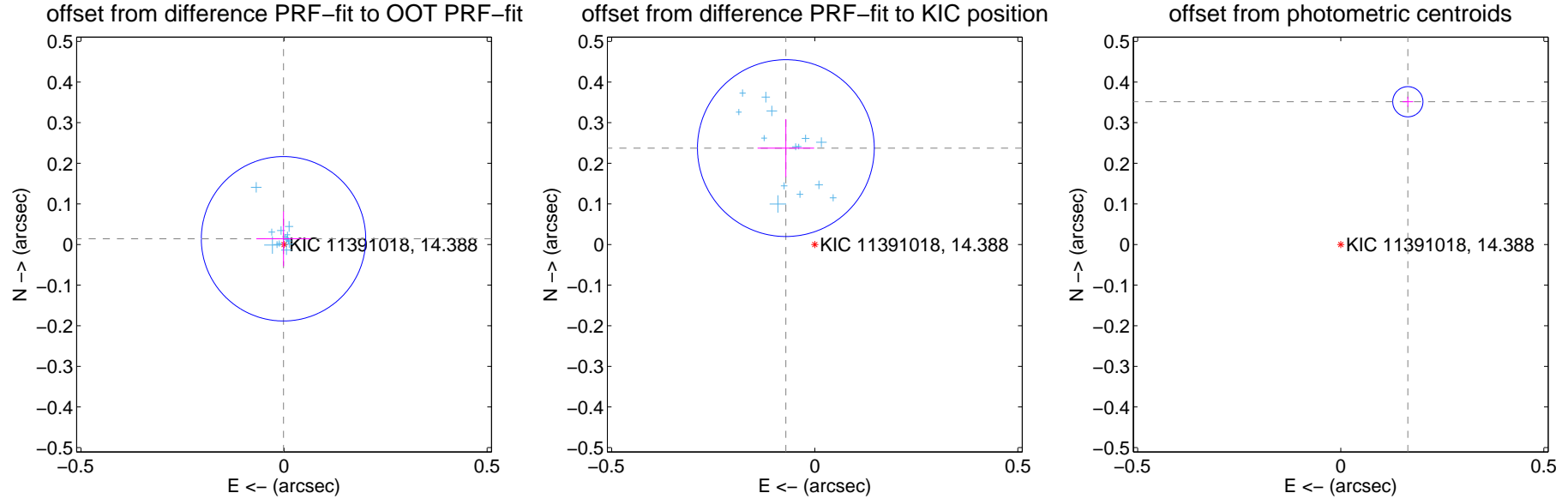
DV Centroid Data

Supplemental centroid analysis for 011391018-01. Kepler magnitude: 14.39. Transit SNR 1020.90

There are 14 quarters with good PRF difference image offsets

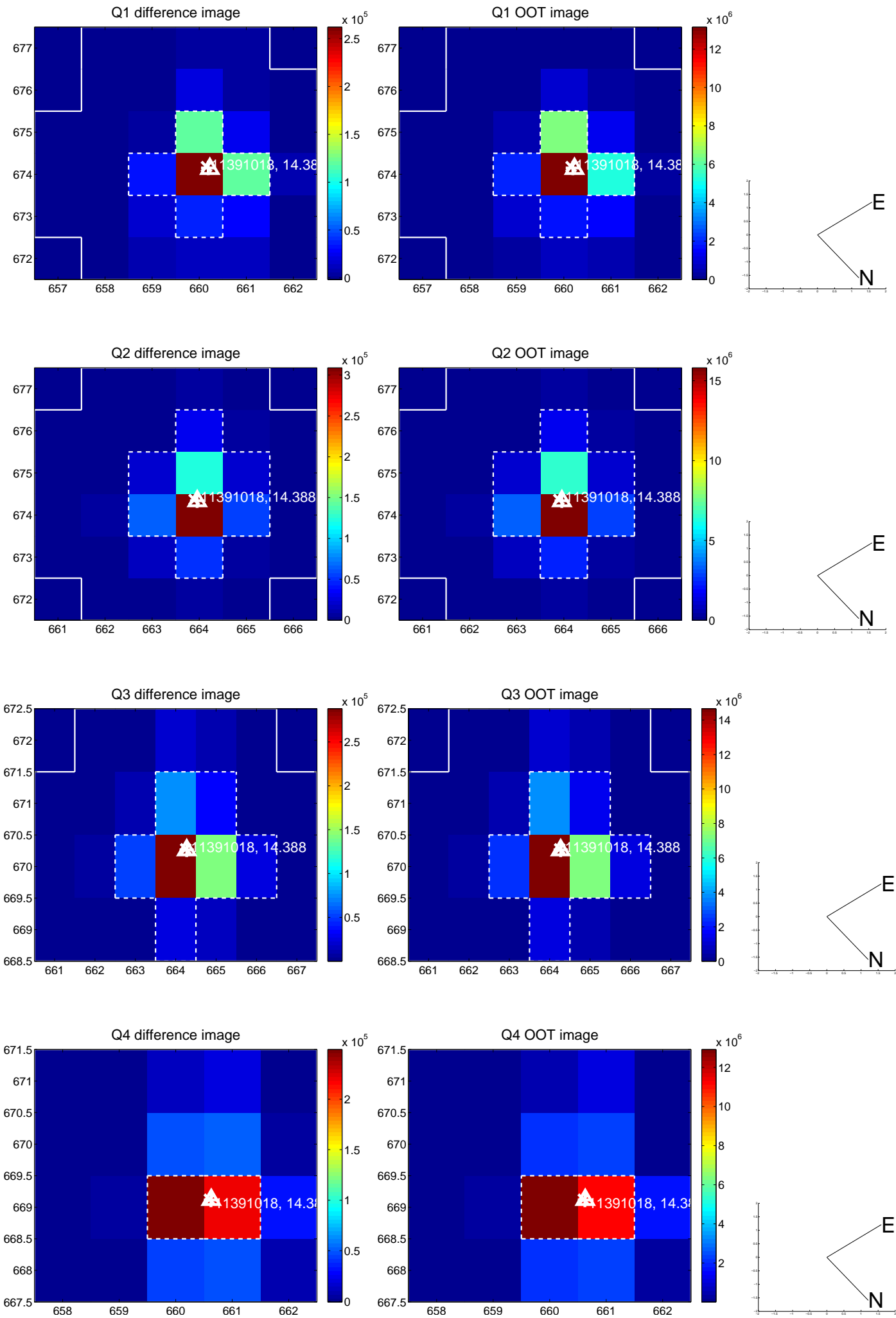
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 0.014 ± 0.067 | 0.21 | 0.001 ± 0.067 | 0.014 ± 0.067 |
| PRF-fit source offset from KIC position | 0.248 ± 0.073 | 3.41 | 0.071 ± 0.070 | 0.237 ± 0.071 |
| photometric centroid source offset | 0.39 ± 0.01 | 31.34 | -0.17 ± 0.01 | 0.35 ± 0.01 |

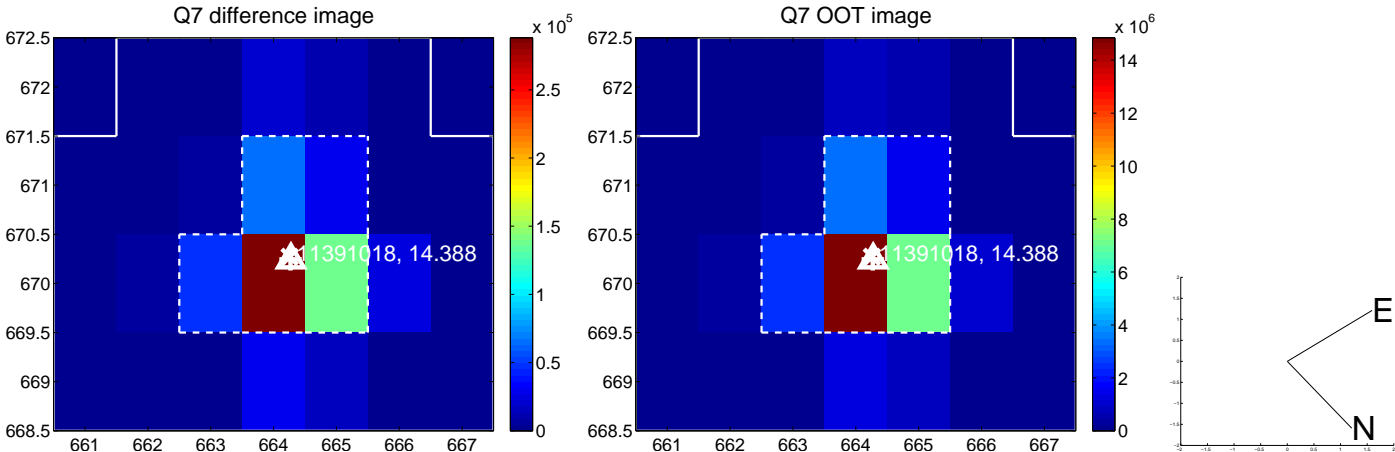
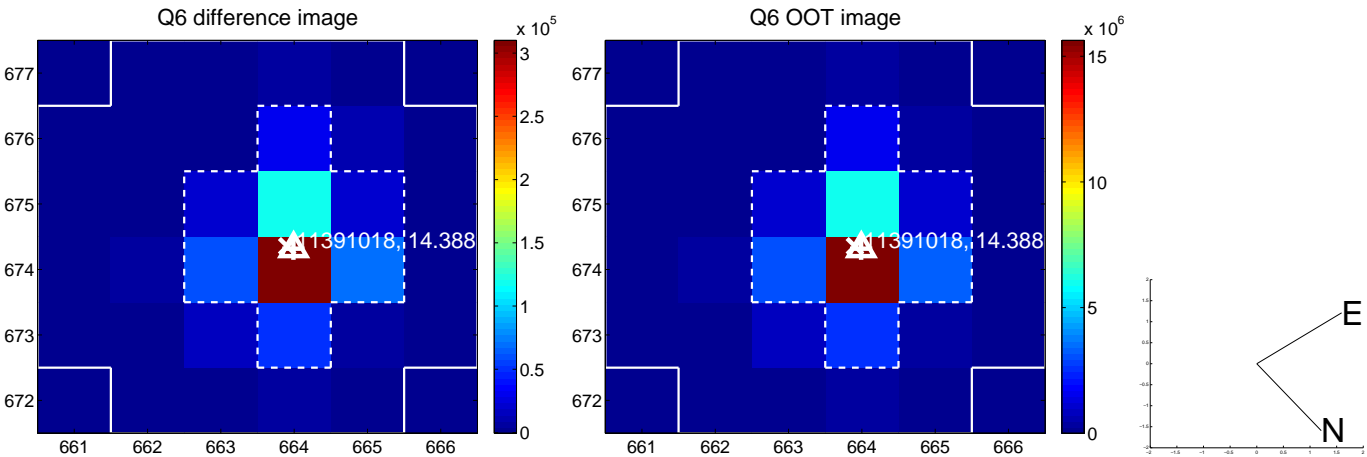
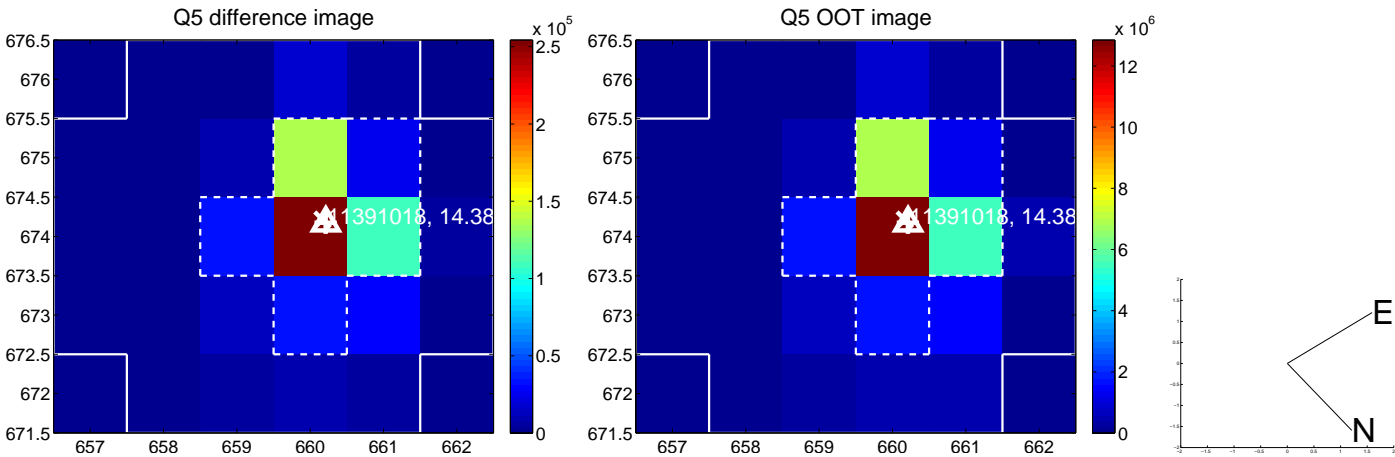


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

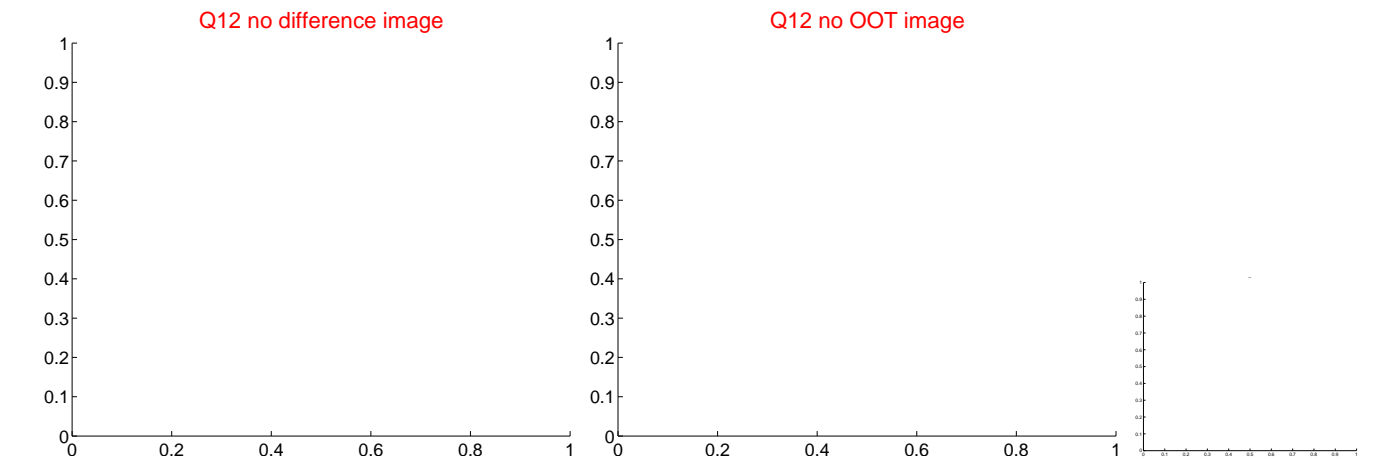
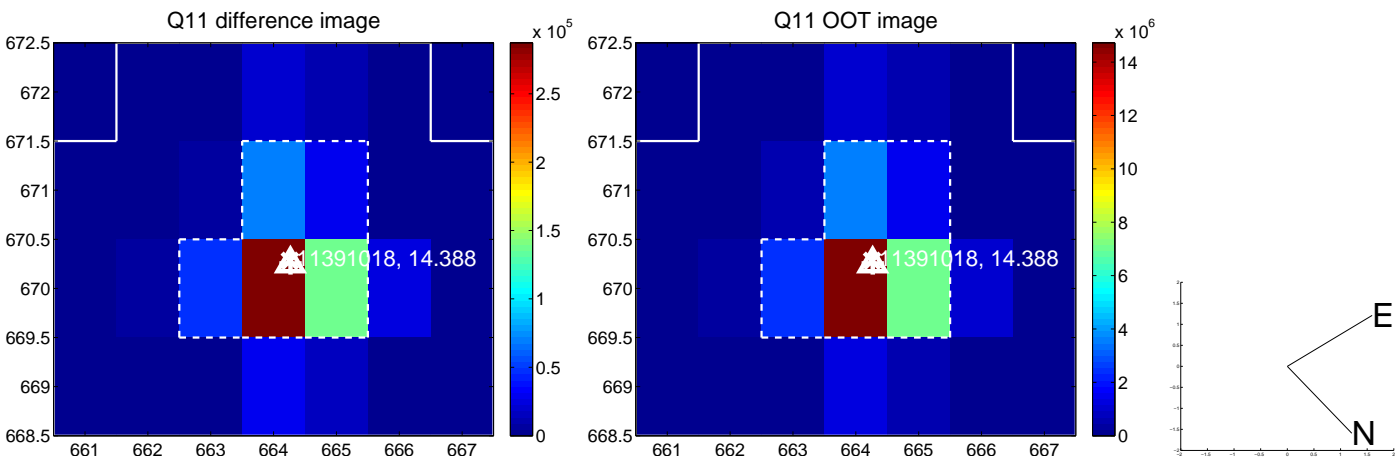
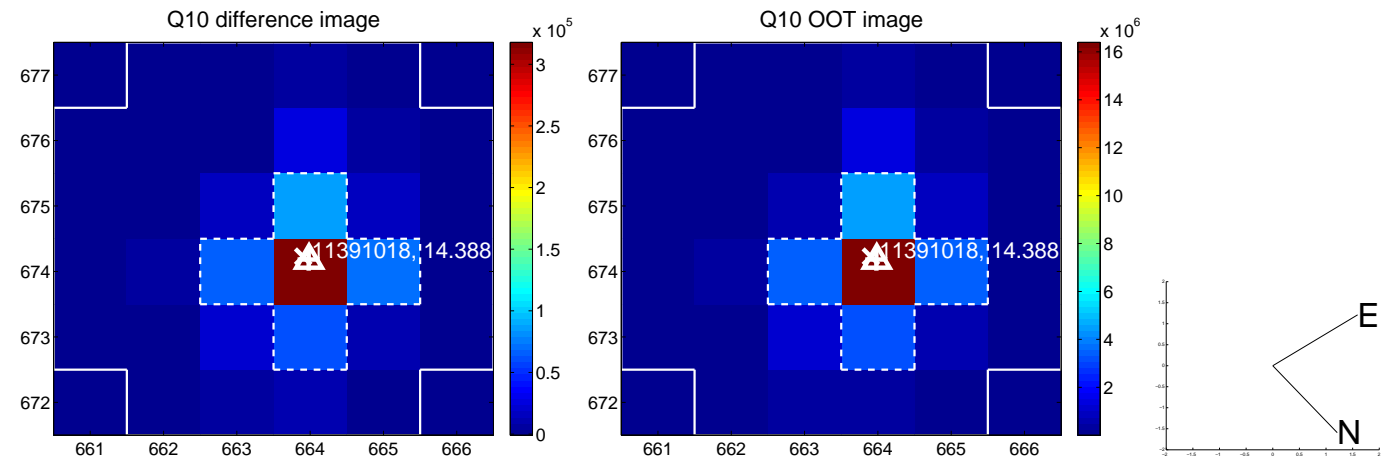
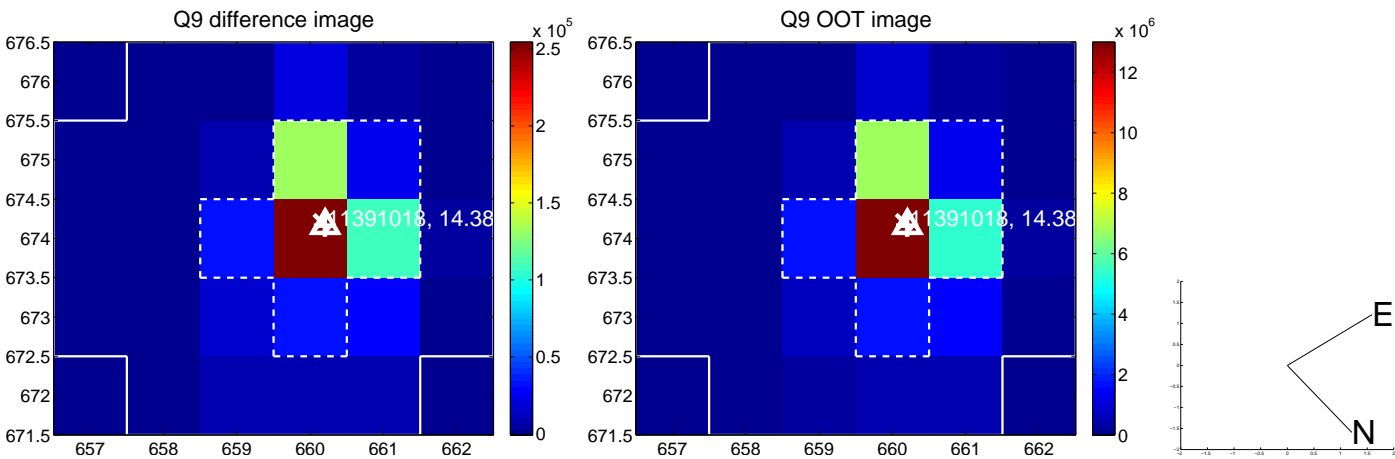
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



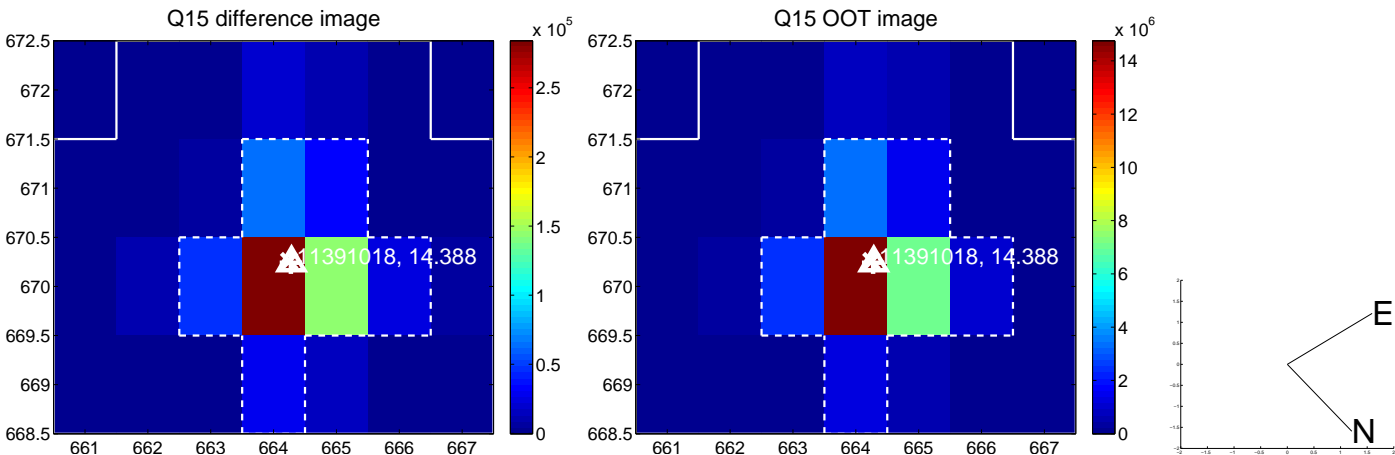
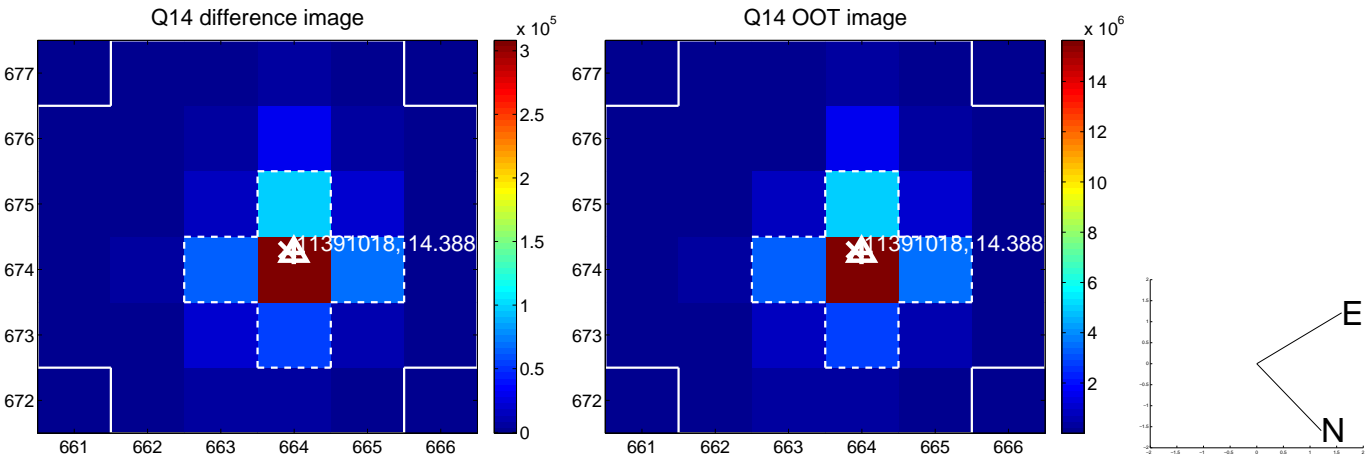
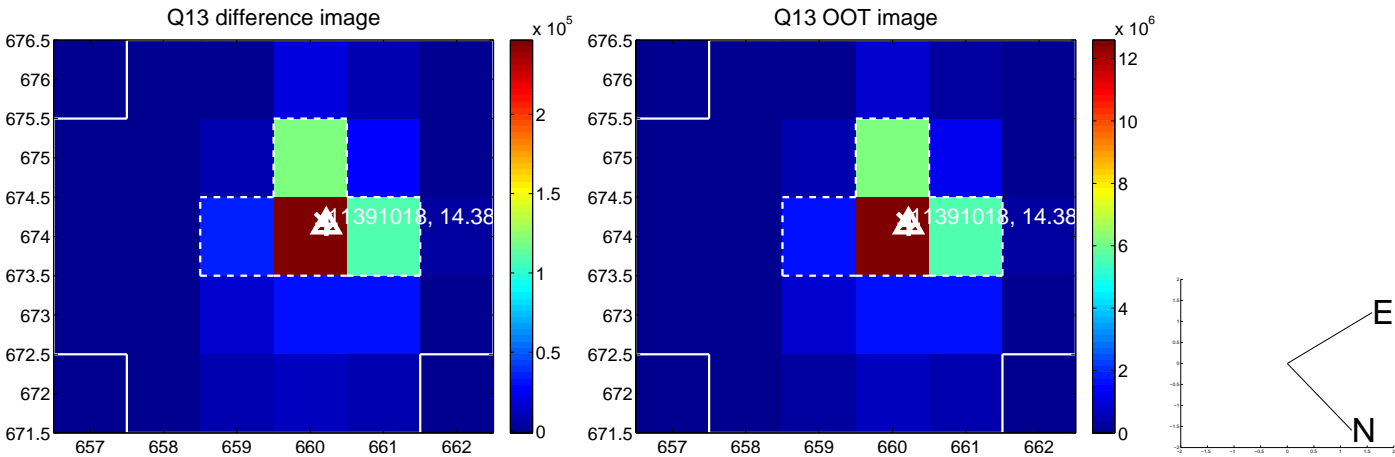
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



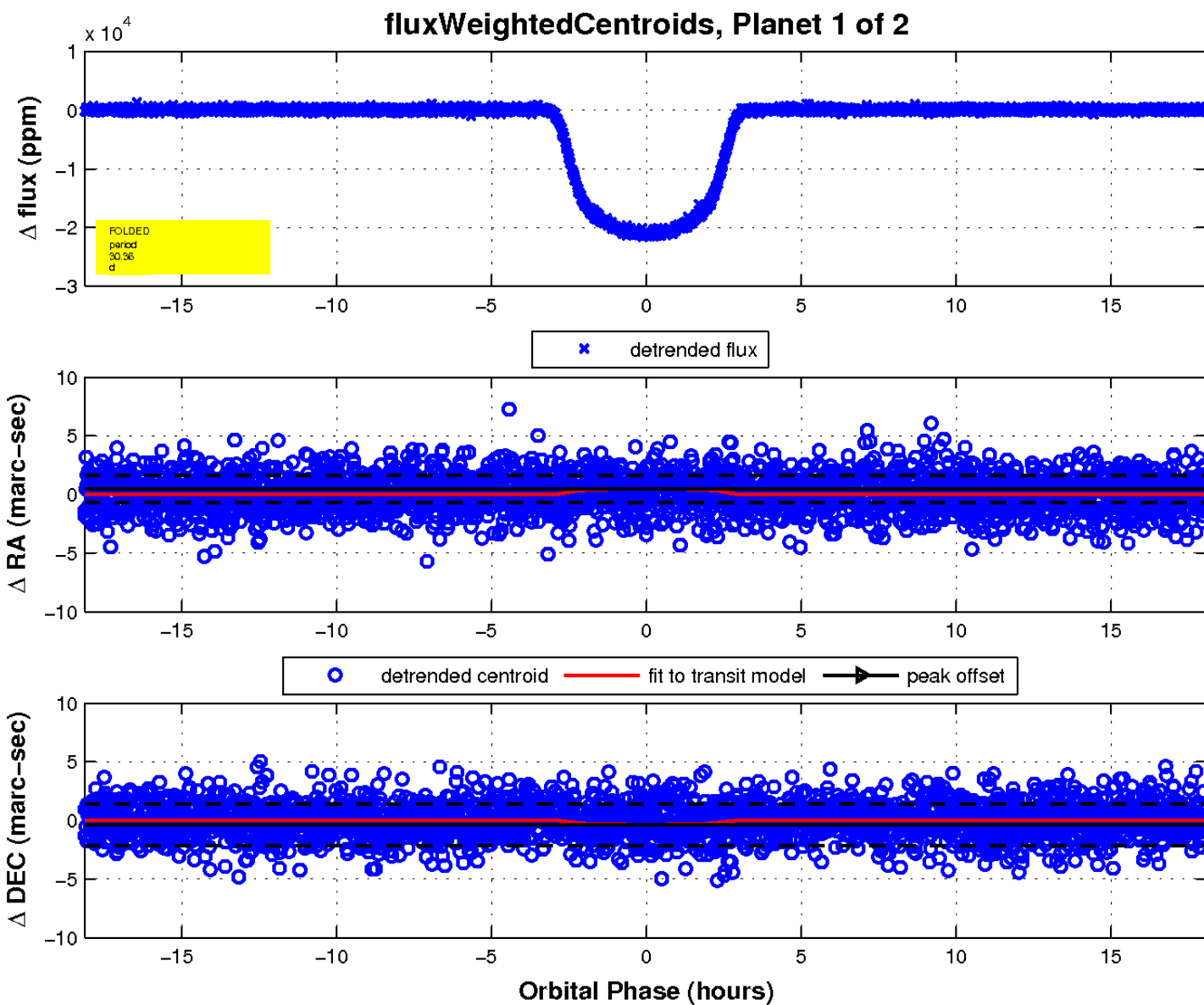
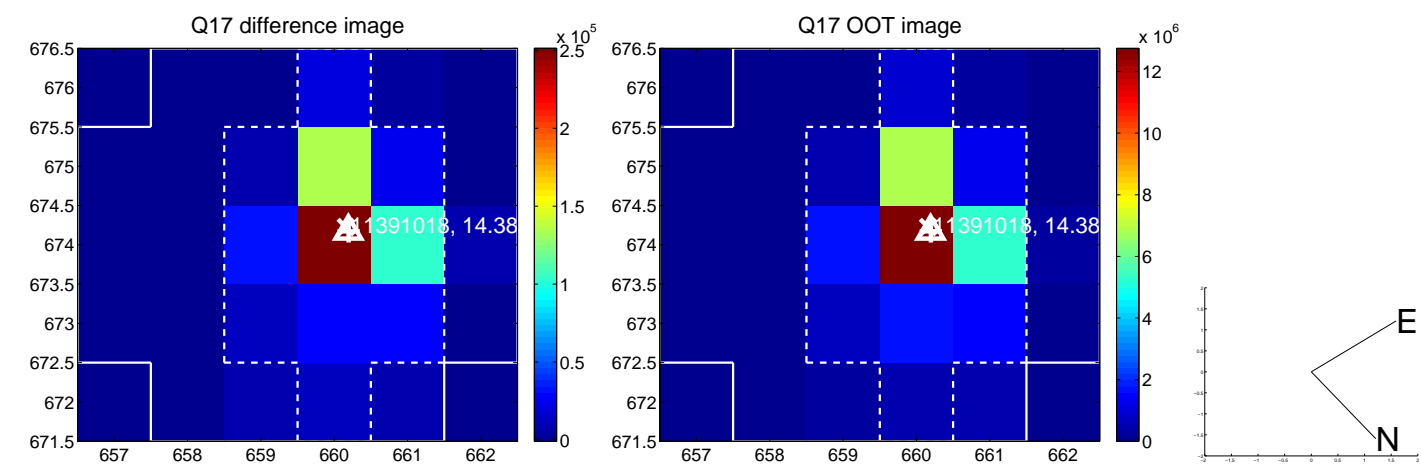
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

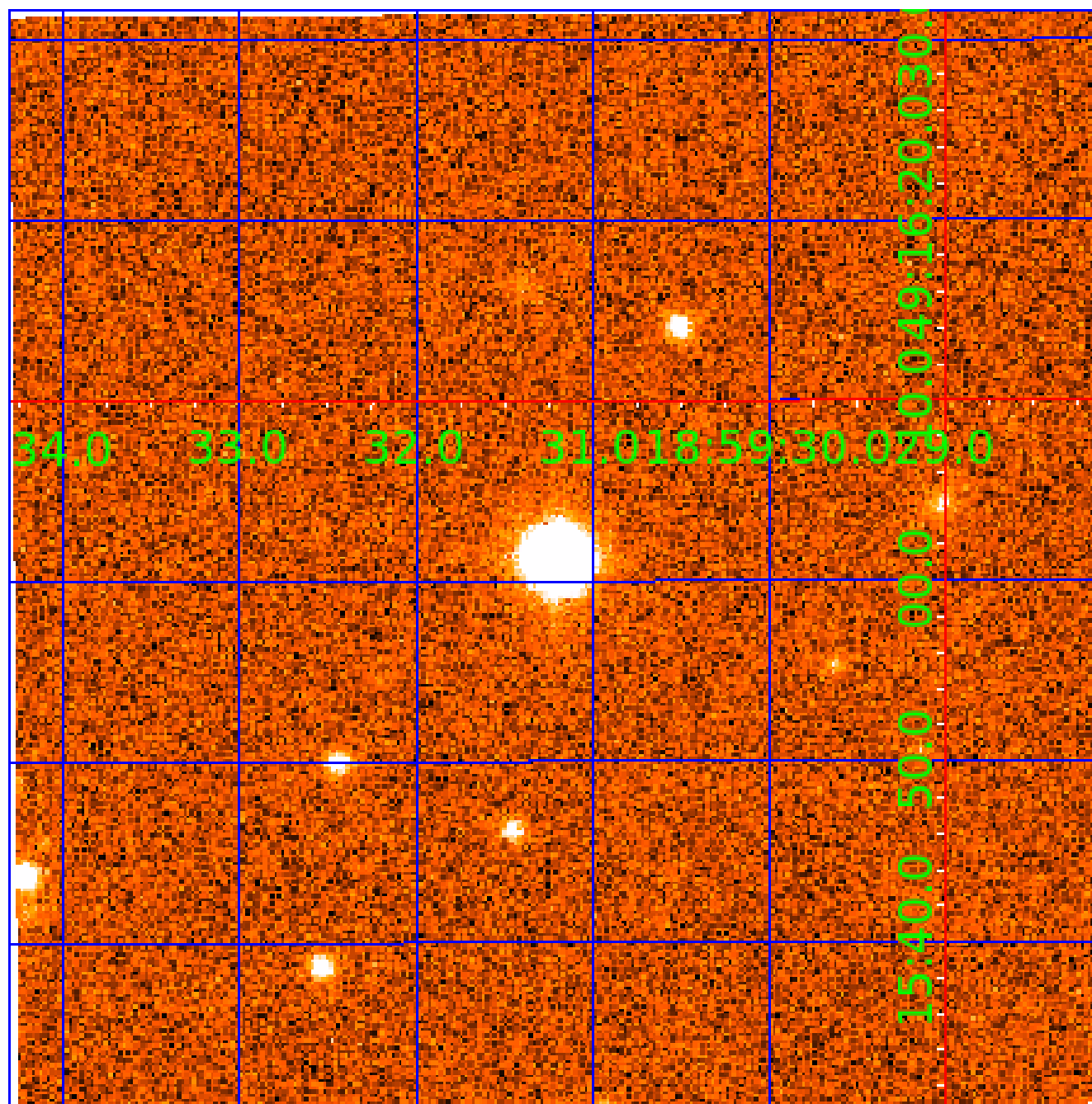


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 011391018

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|--------|-----------------------------|-----------------|------------------------|------------------------|
| 011391018-01 | OBS | 0189.01 | 30.360446 | 148.091491 | 21151.8 | 6.043 | 1091.1 | 1020.9 | 0.77 | 4939 | 11.05 | 10.49 |
| 011391018-02 | OBS | No | 361.033229 | 210.561388 | 660.3 | 23.966 | 14.4 | 11.3 | 0.77 | 4939 | 2.57 | 0.39 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 011391018-01 | OBS | PC | 0.98 | 0 | 0 | 0 | 0 | NO_COMMENT |
| 011391018-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS |

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

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

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

Ephemeris Match Information For 011391018-02

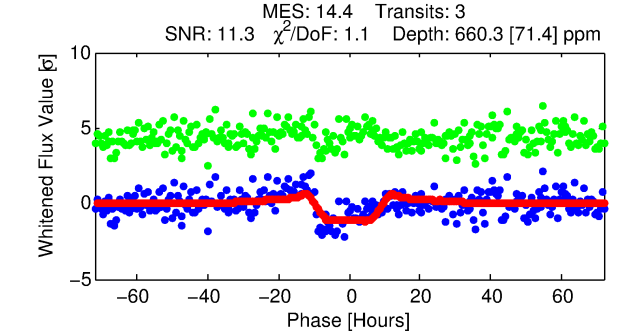
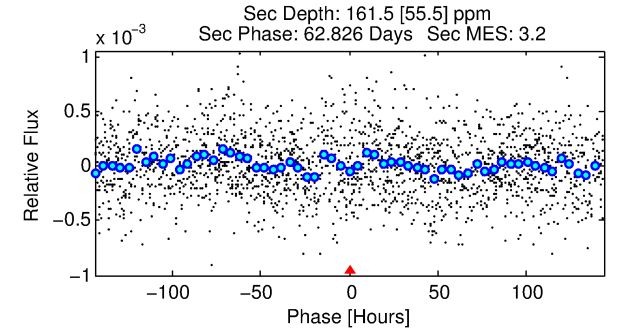
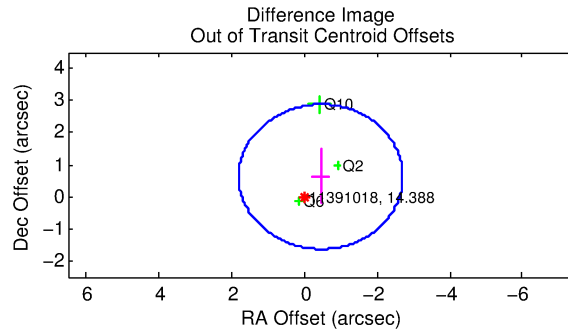
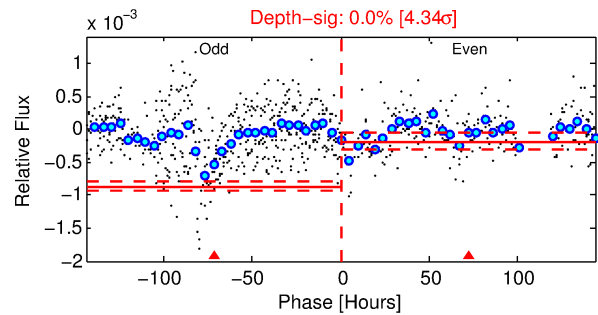
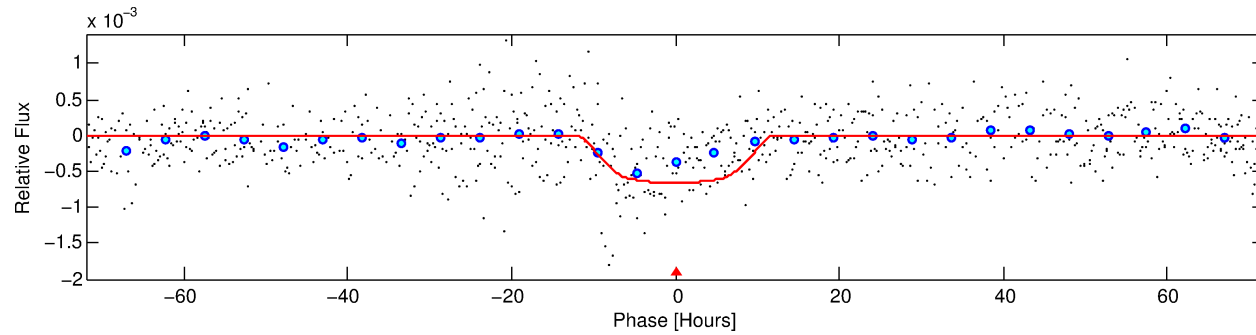
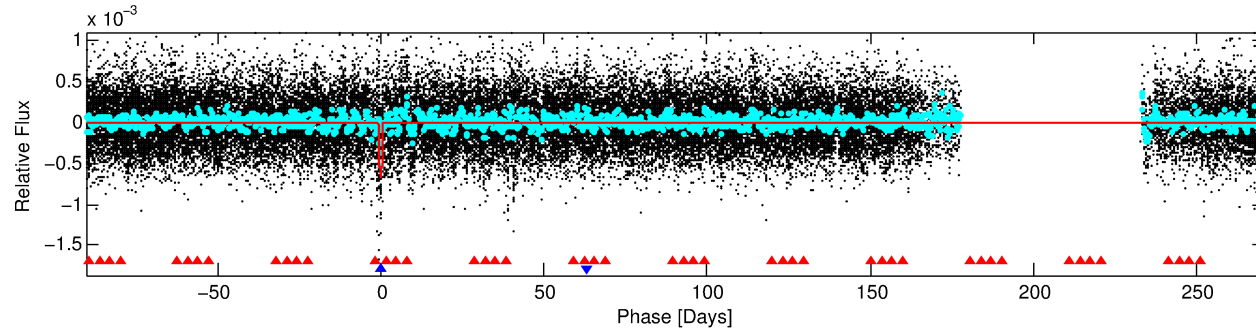
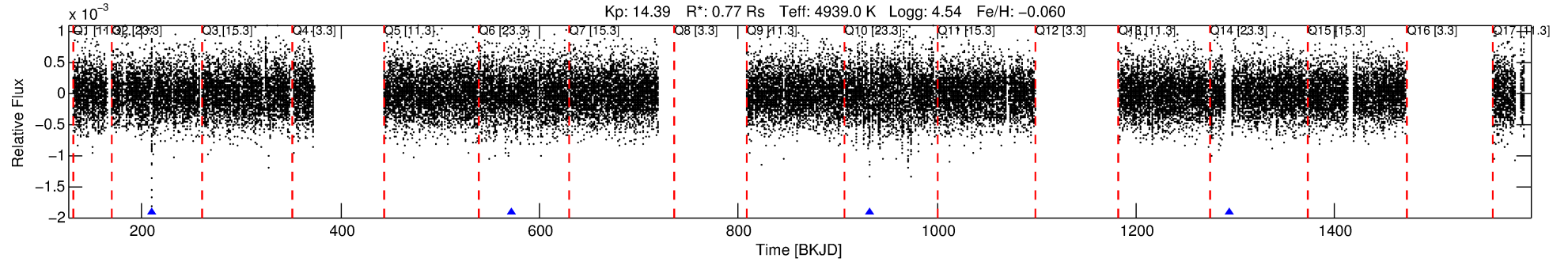
No Significant Match Found

DV One-Page Summary

KIC: 11391018 Candidate: 2 of 2 Period: 361.033 d

KOI: K00189 Corr: No Ephemeris Match

Kp: 14.39 R*: 0.77 Rs Teff: 4939.0 K Logg: 4.54 Fe/H: -0.060



DV Fit Results:

Period = 361.03323 [0.02243] d
Epoch = 210.5614 [0.0251] BKJD
Rp/R* = 0.0307 [0.0024]
a/R* = 47.51 [8.44]
b = 0.94 [0.02]
Seff = 0.39 [0.07]
Teq = 201 [9] K
Rp = 2.57 [0.33] Re
a = 0.8985 [0.0781] AU
Ag = 10892.30 [4340.38] [2.51σ]
Teffp = 3176 [314] K [9.47σ]

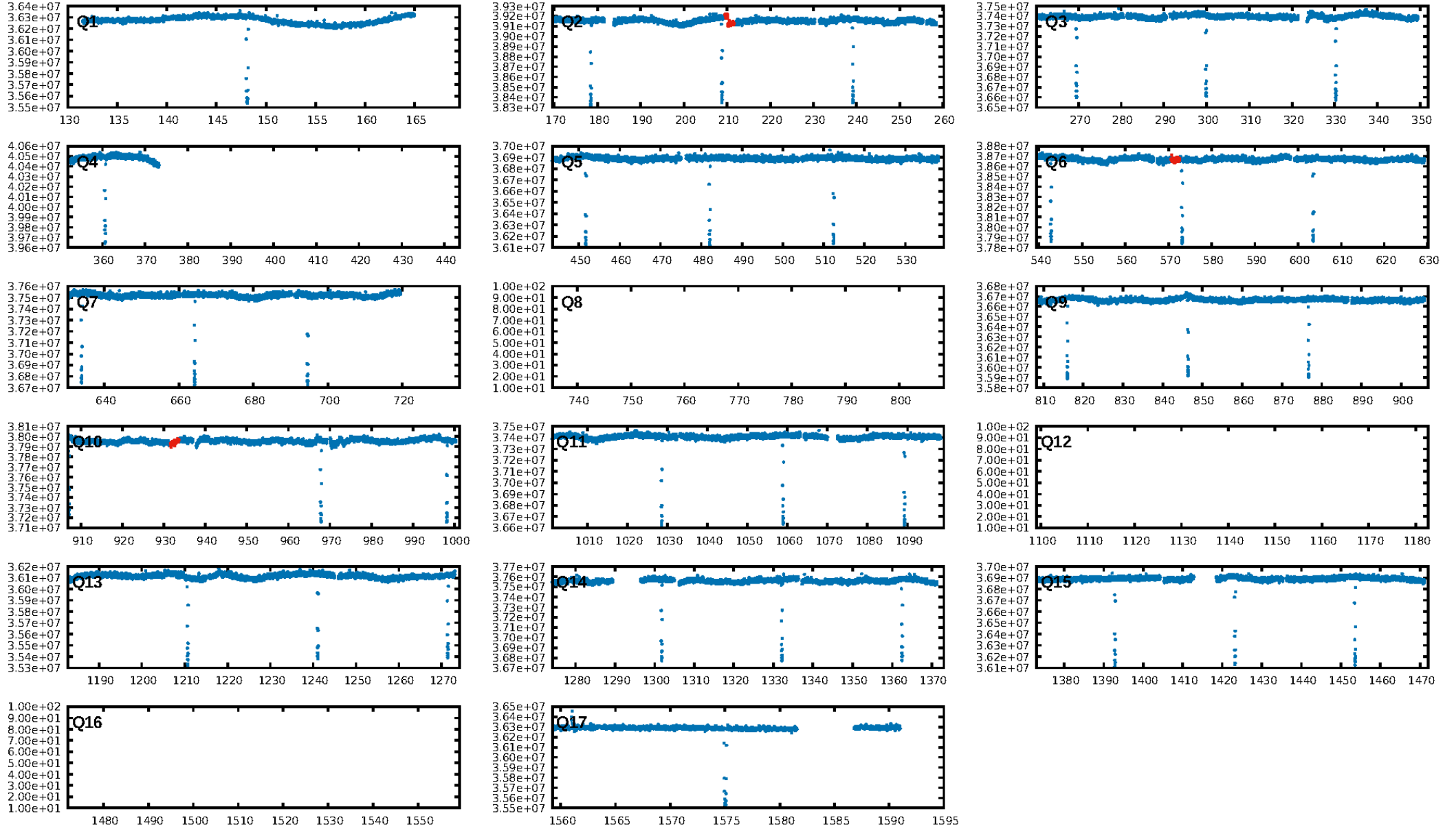
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [321.09σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 94.7%
Bootstrap-pfa: 4.19e-26
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.5397
Centroid-sig: 9.1%
Centroid-so: 2.013 arcsec [1.72σ]
OotOffset-rm: 0.769 arcsec [1.02σ]
OotOffset-st: 3/0/0/0 [3]
KicOffset-rm: 0.982 arcsec [1.21σ]
KicOffset-st: 3/0/0/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 0.33 [1/3]

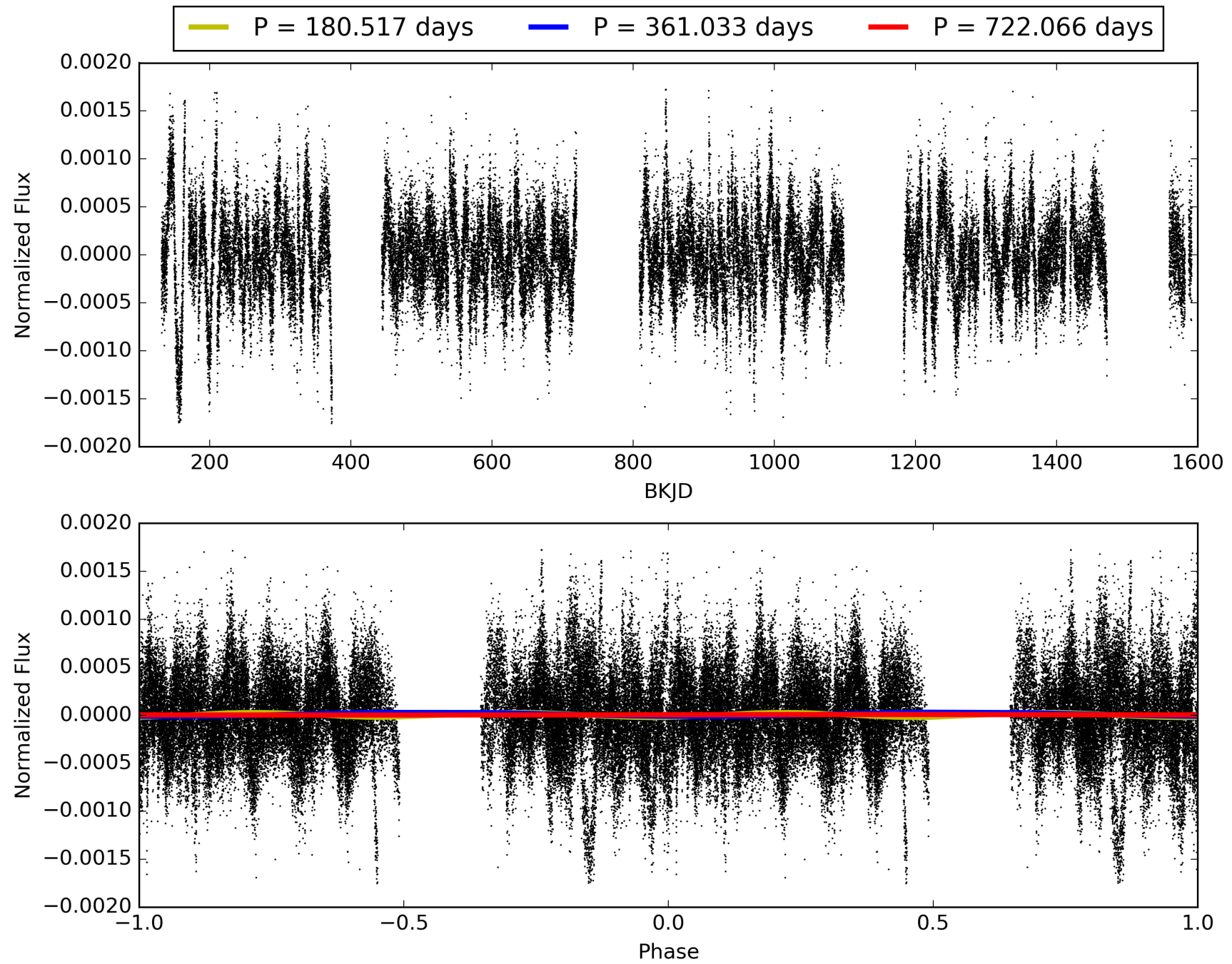
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 23:12:58 Z

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

TCE 011391018-02, PDC Light Curves

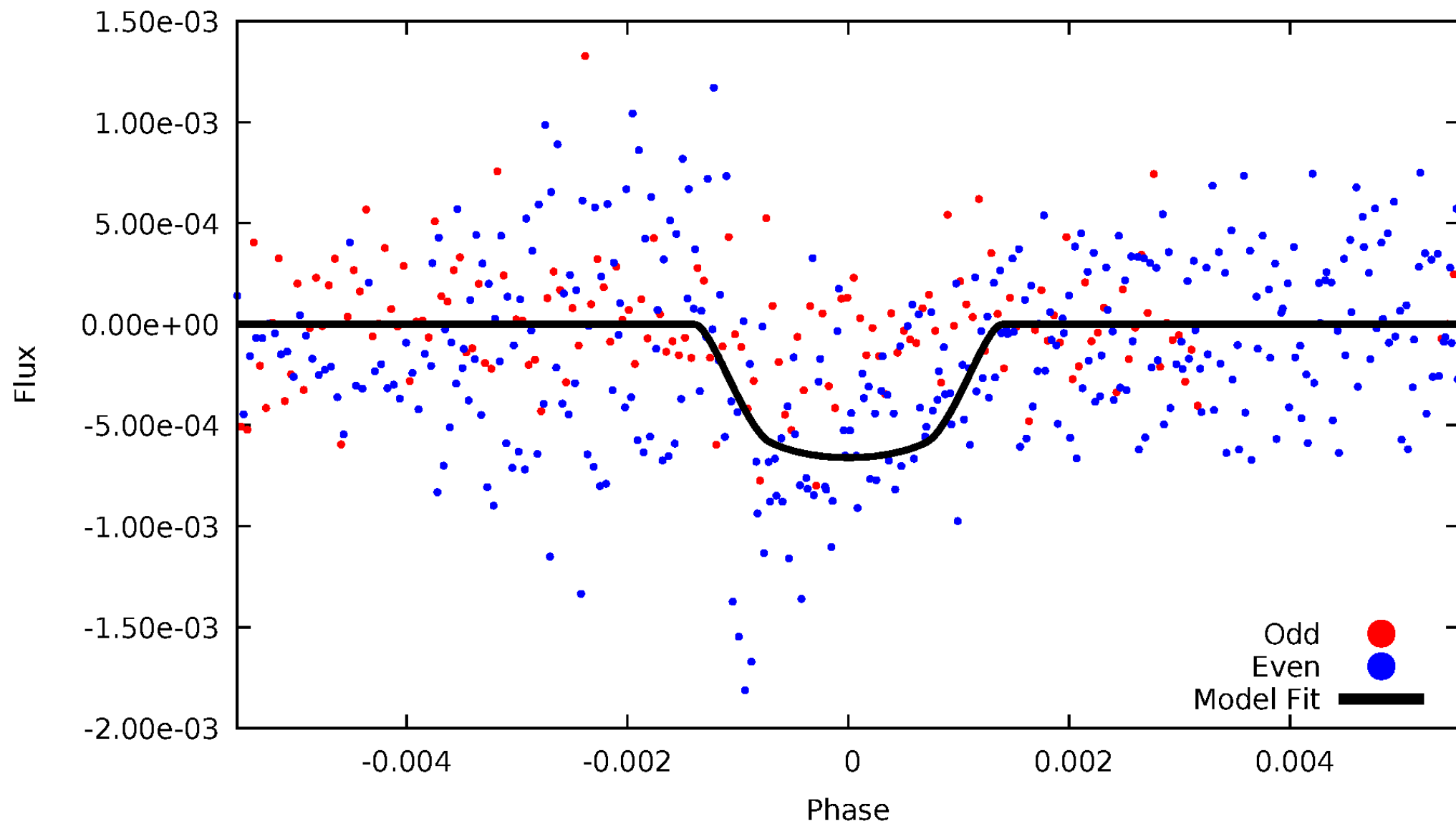


TCE 011391018-02



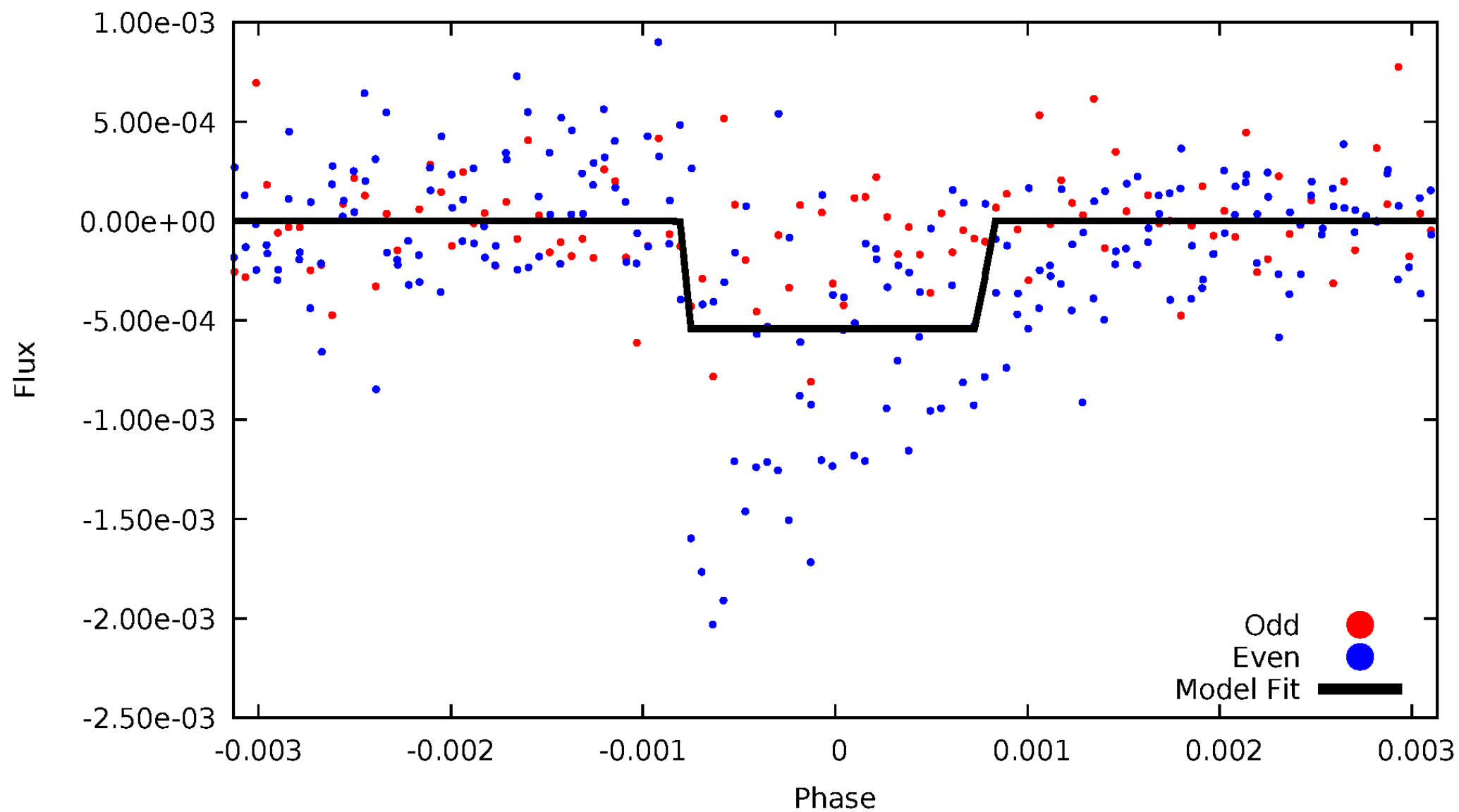
DV Odd/Even

TCE 011391018-02



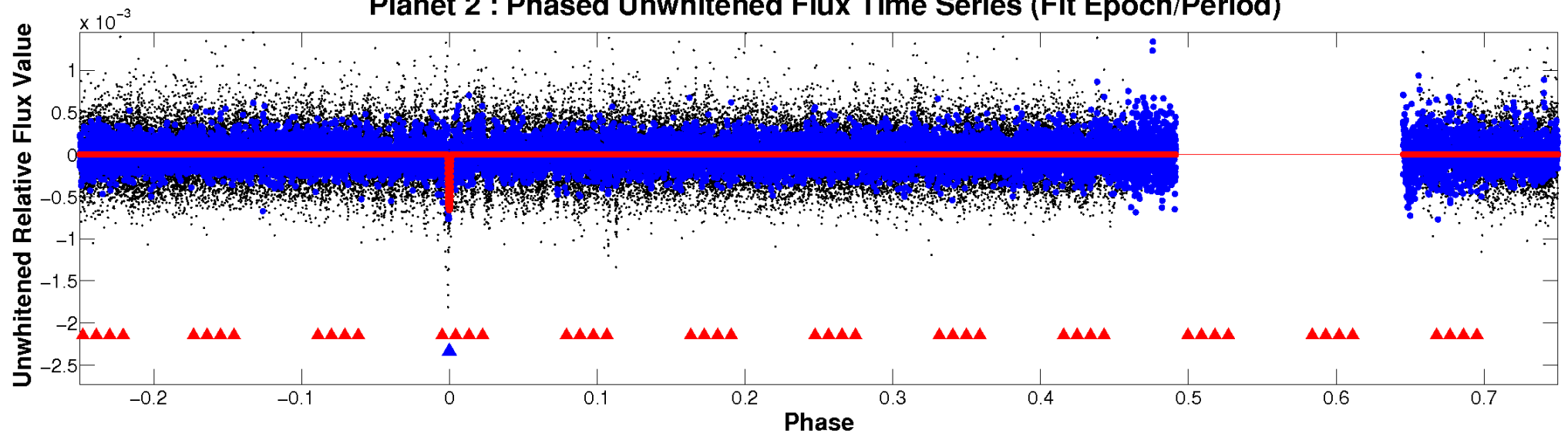
ALT Odd/Even

TCE 011391018-02

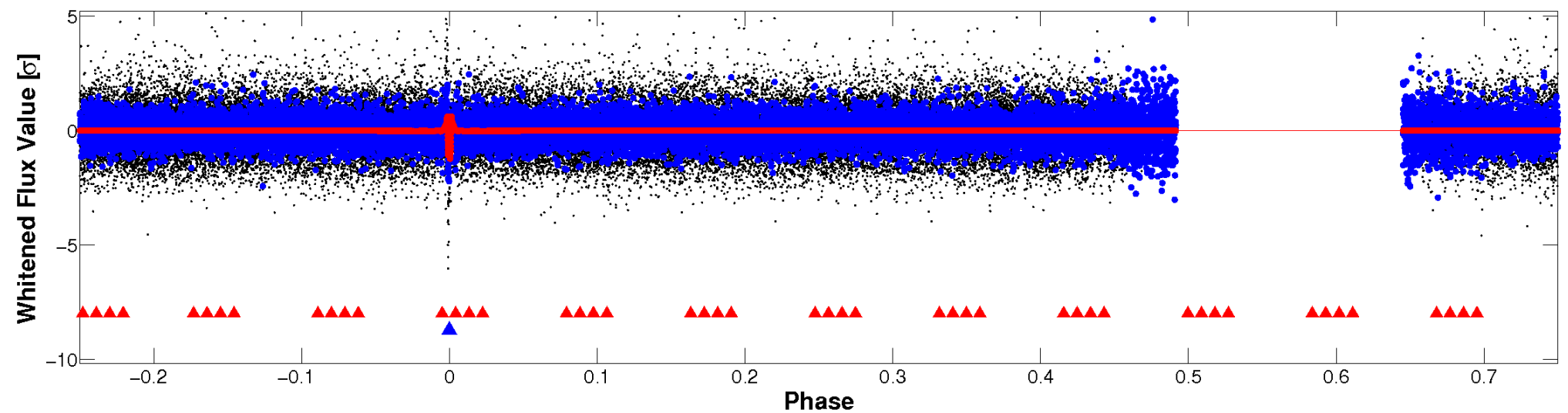


Non-Whitened Vs. Whitened Light Curve

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

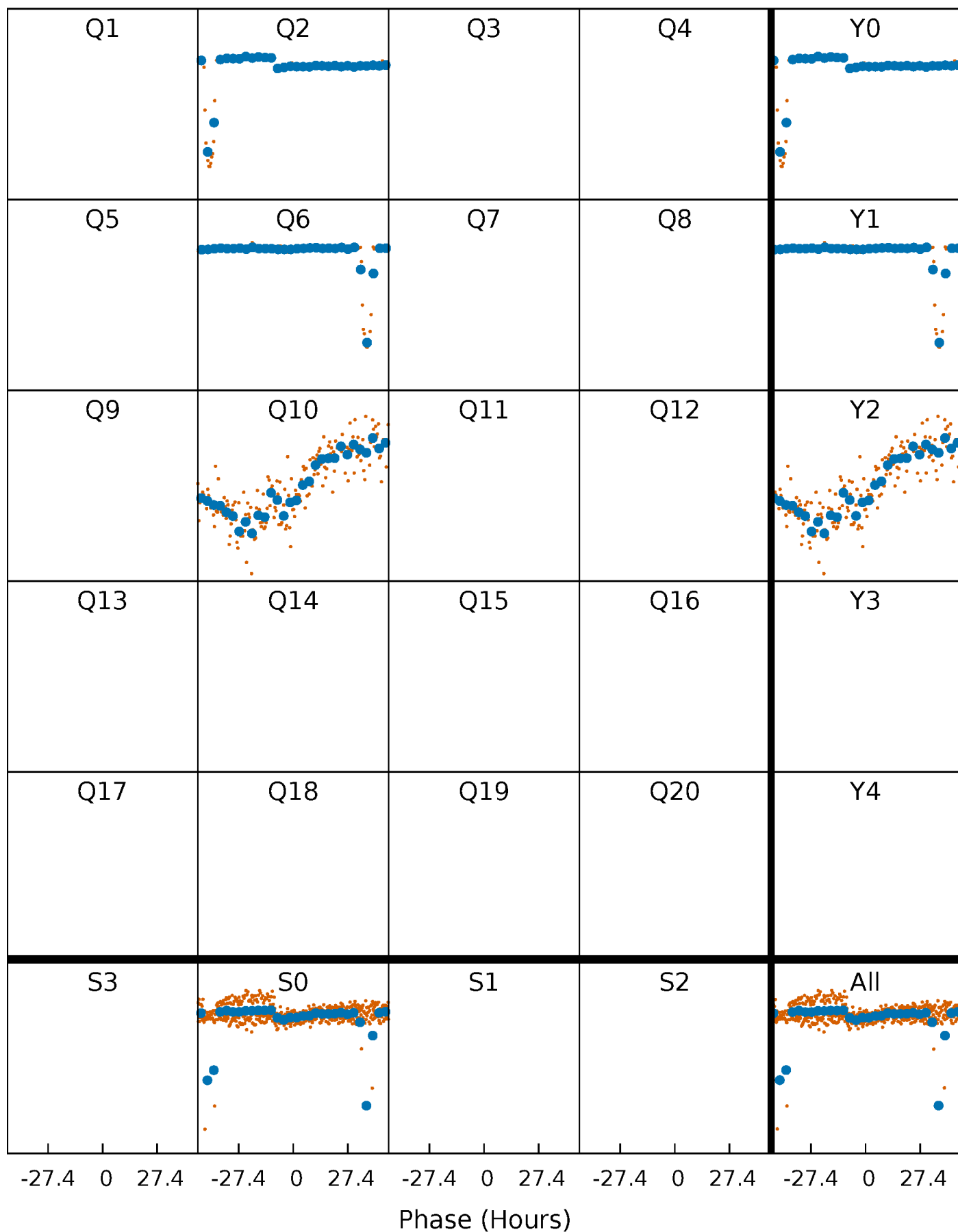


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



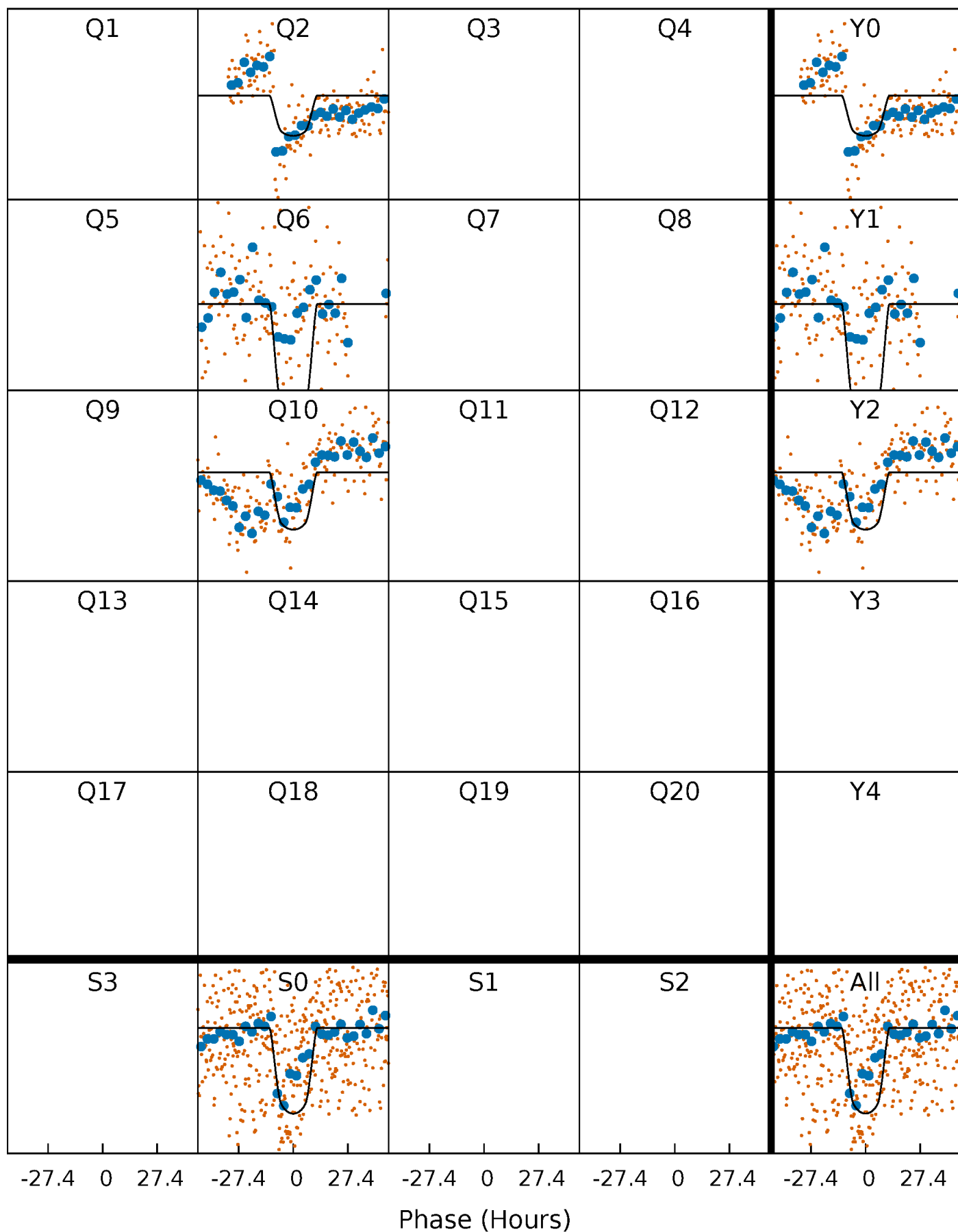
PDC Quarter-Phased Transit Curves

TCE 011391018-02 P=361.033229 Days $T_0=210.561388$ (BKJD)



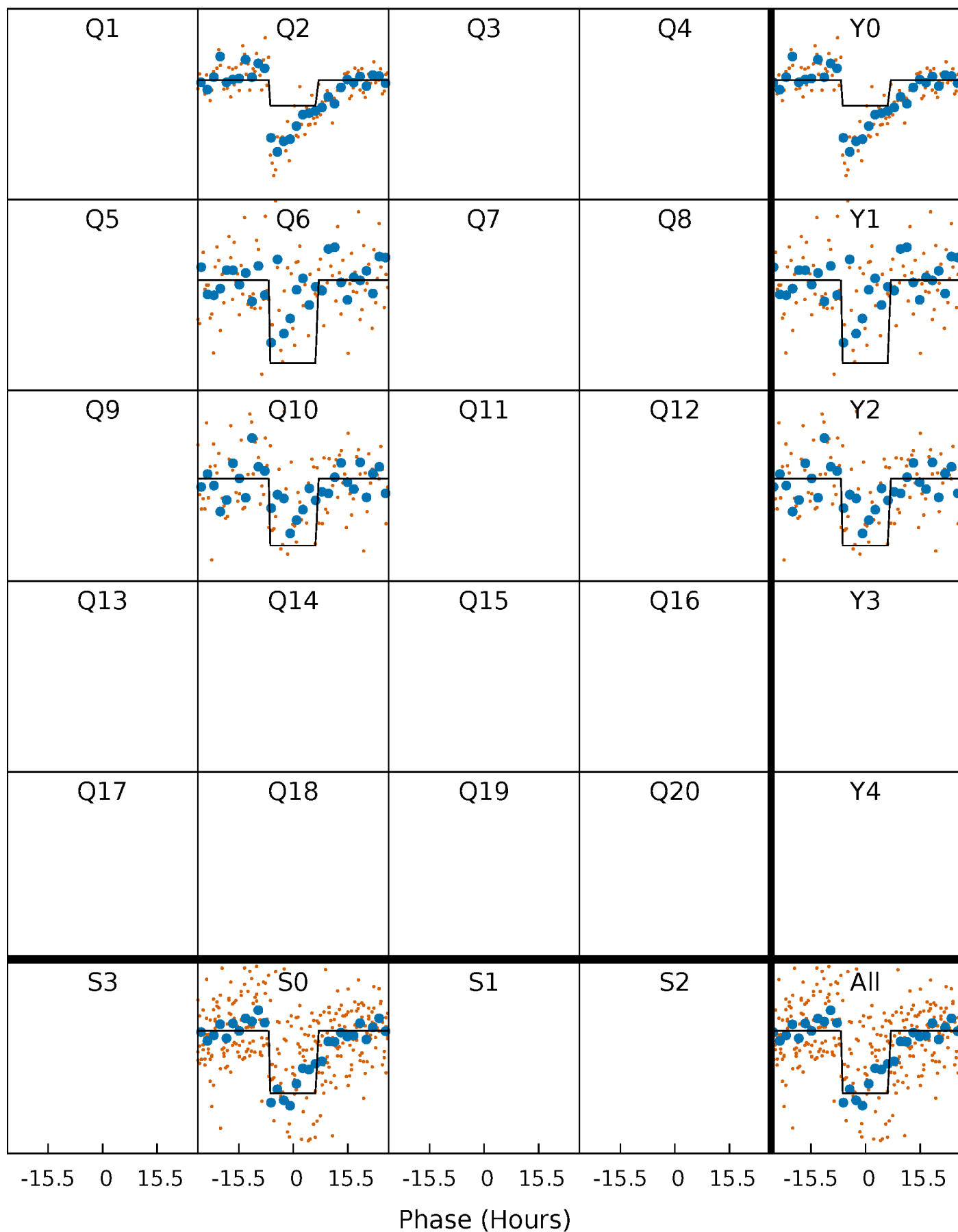
DV Quarter-Phased Transit Curves

TCE 011391018-02 P=361.033229 Days $T_0=210.561388$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

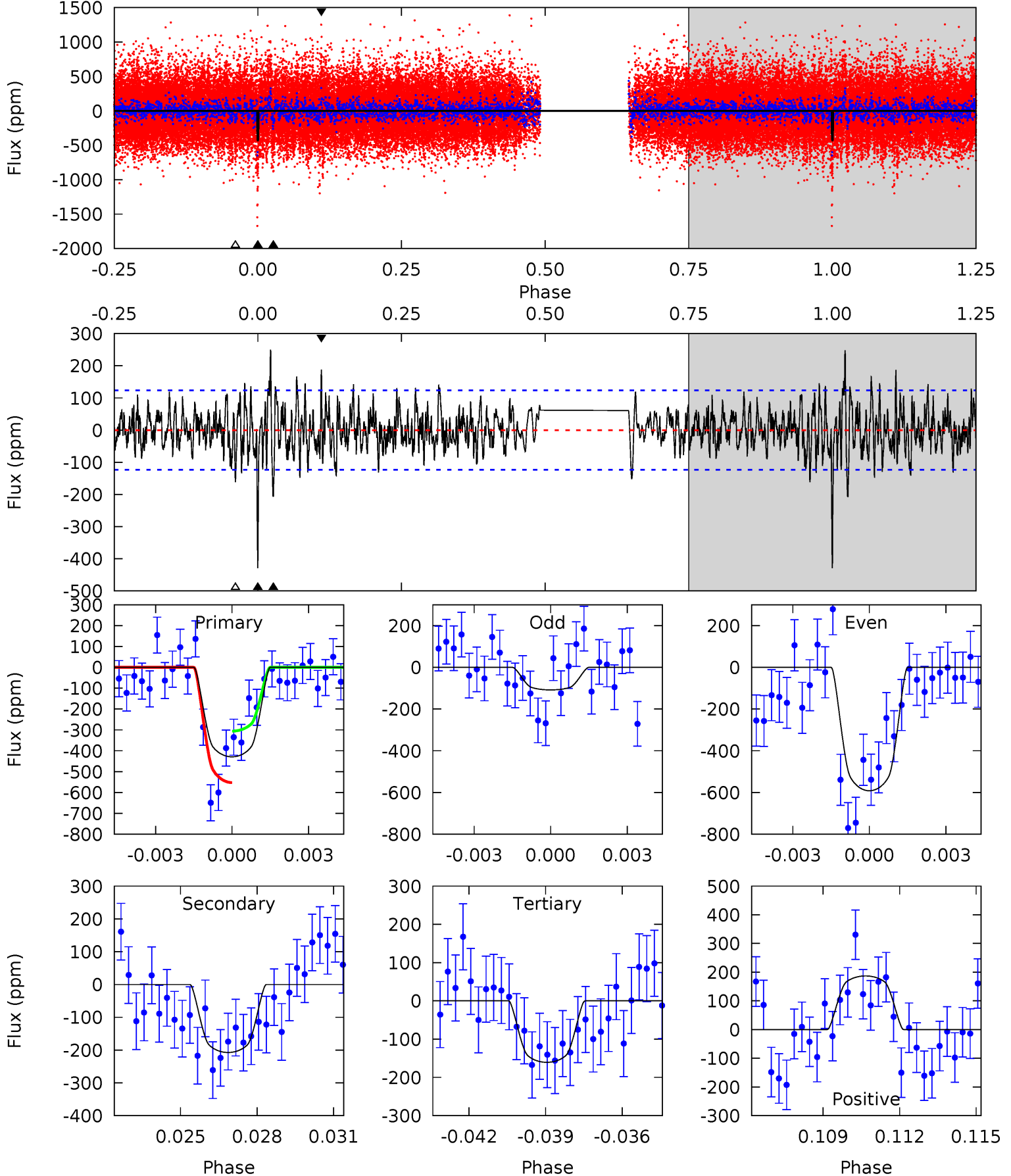
TCE 011391018-02 P=361.081439 Days $T_0=210.454220$ (BKJD)



DV Model-Shift Uniqueness Test

011391018-02, P = 361.033229 Days, E = 210.561388 Days

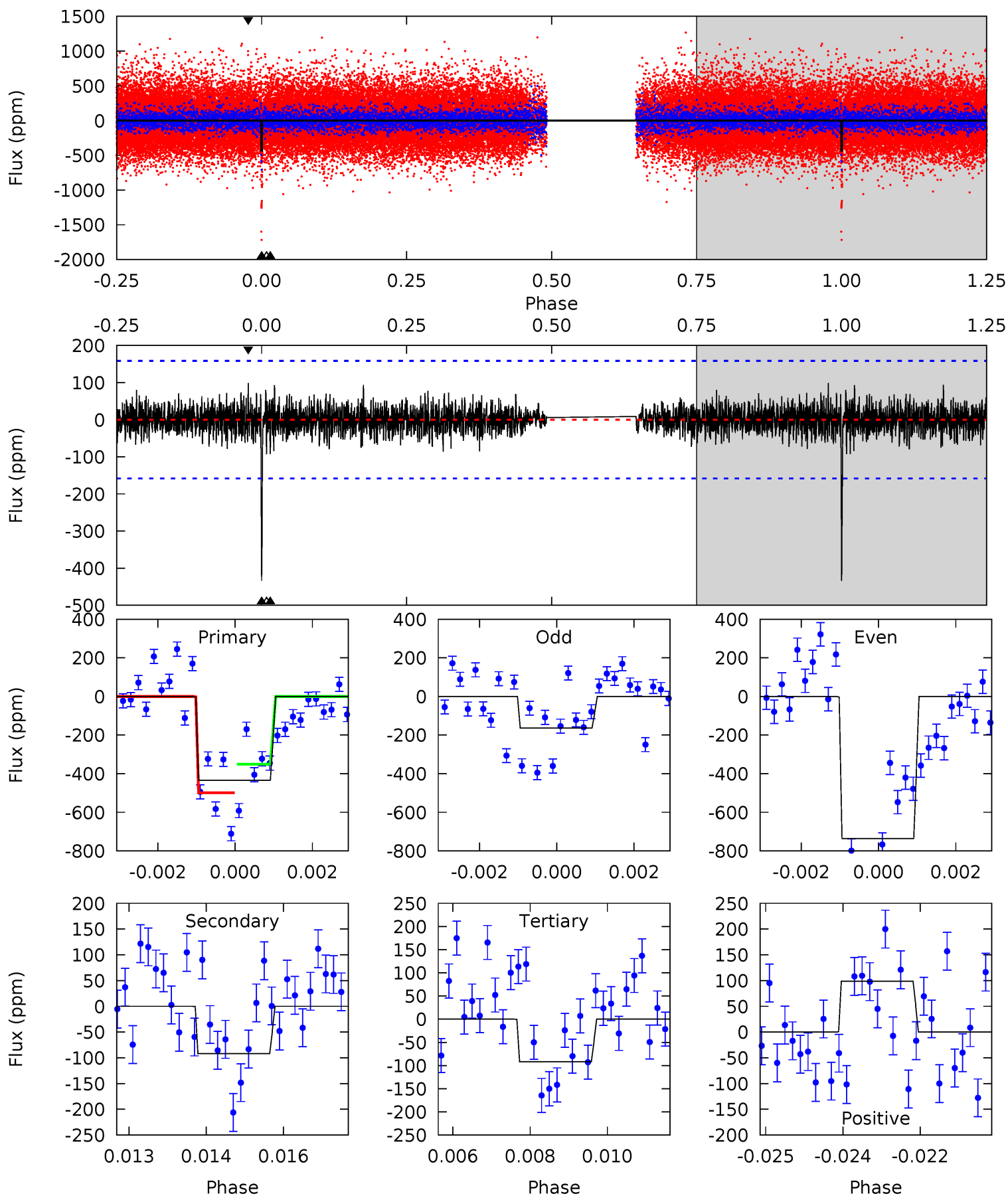
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 18.3 | 8.84 | 6.85 | 7.97 | 5.27 | 2.99 | 2.24 | 11.4 | 10.3 | 1.99 | 0.87 | 9.90 | 1.07 | 0.37 | 5.25 |



Alt Model-Shift Uniqueness Test

011391018-02, P = 361.081439 Days, E = 210.454220 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.7 | 3.12 | 3.12 | 3.34 | 5.37 | 3.16 | 0.84 | 11.6 | 11.4 | 0.01 | -0.22 | 9.50 | 2.22 | 0.18 | 2.48 |



Stellar Parameters For KIC 011391018

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 4939^{+148}_{-133} | $4.541^{+0.072}_{-0.044}$ | $-0.060^{+0.300}_{-0.300}$ | $0.765^{+0.063}_{-0.077}$ | $0.740^{+0.090}_{-0.055}$ | $2.332^{+0.662}_{-0.358}$ |
| | +3%/-3% | +2%/-1% | +500%/-500% | +8%/-10% | +12%/-7% | +28%/-15% |
| 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 011391018-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|----------------------|-------------------------|
| DV | -207 ± 23 | $2.55^{+0.24}_{-0.23}$ | 280^{+10}_{-10} | 3719^{+156}_{-143} | 14094^{+3659}_{-2699} |
| Alt. | -92 ± 30 | $1.92^{+0.24}_{-0.22}$ | 280^{+10}_{-10} | 3566^{+233}_{-232} | 11032^{+4787}_{-3993} |

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

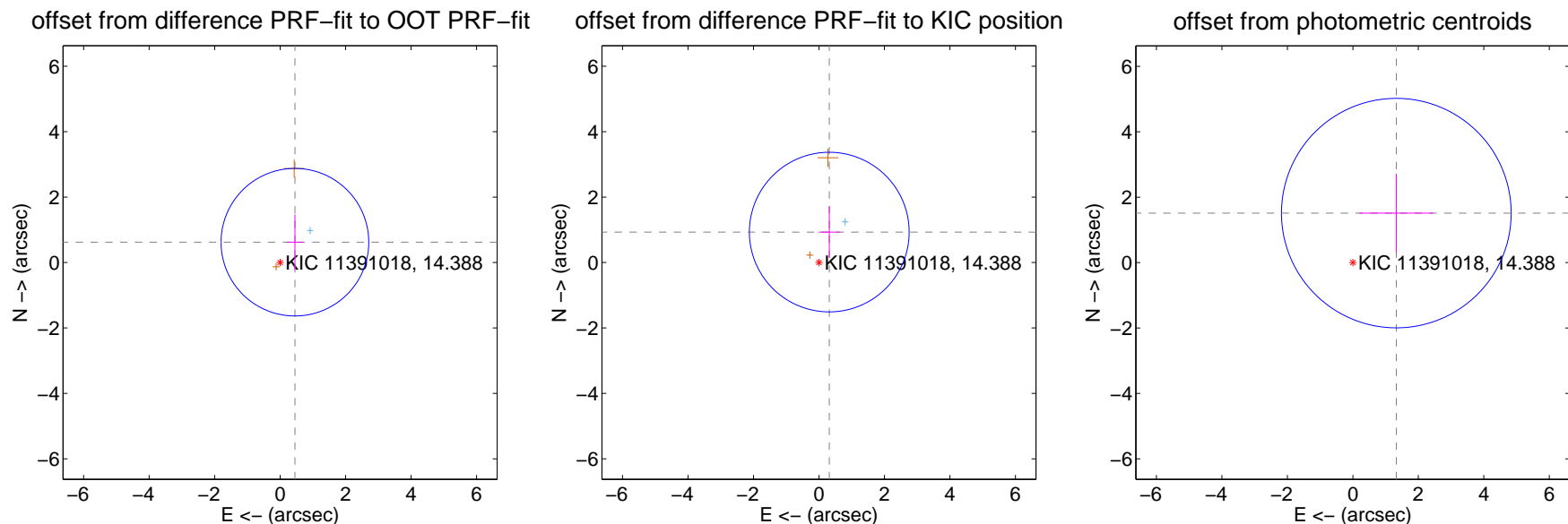
DV Centroid Data

Supplemental centroid analysis for 011391018-02. Kepler magnitude: 14.39. Transit SNR 11.28

There are 1 quarters with good PRF difference image offsets

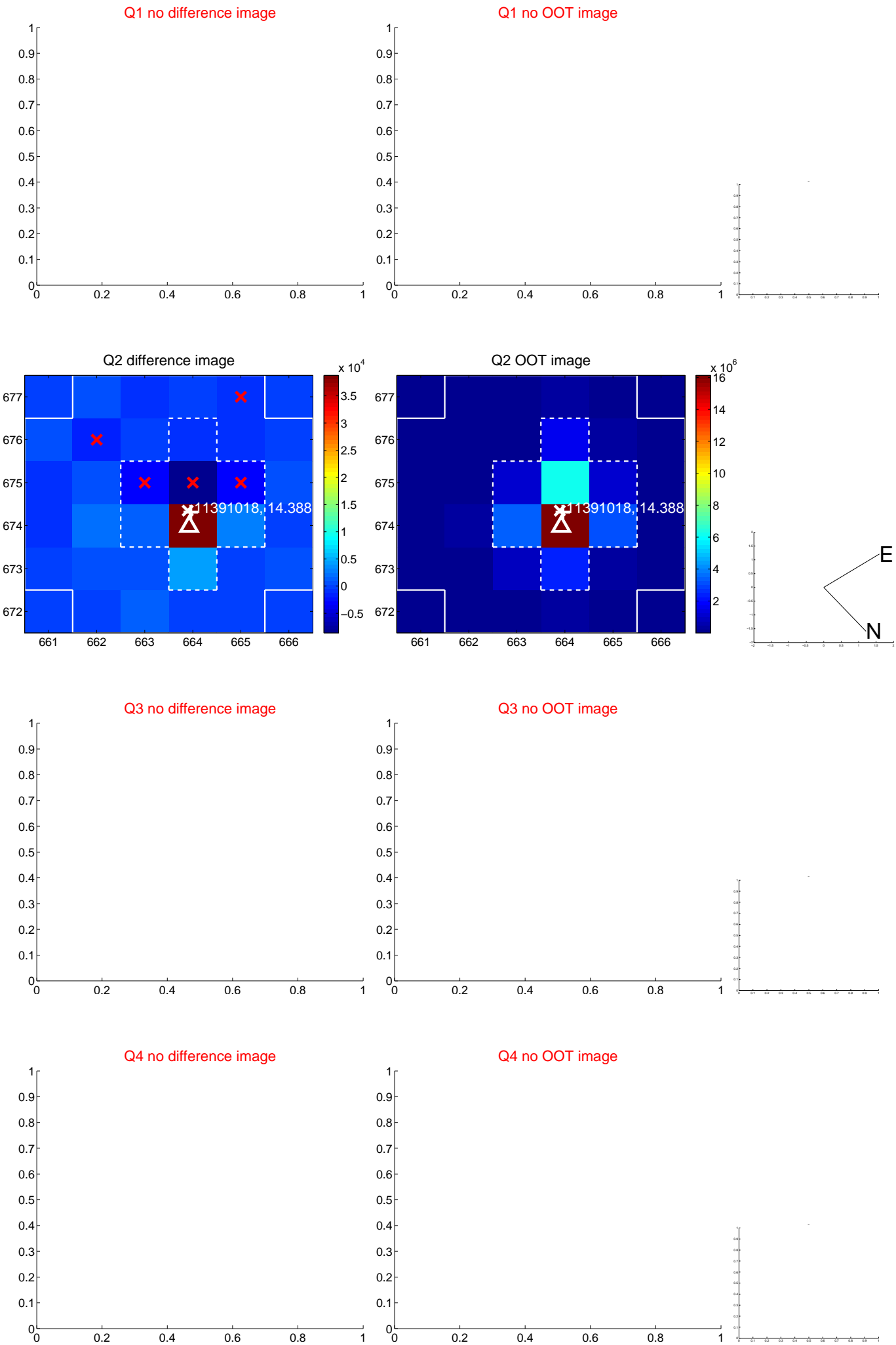
The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.769 ± 0.751 | 1.02 | -0.452 ± 0.250 | 0.622 ± 0.846 |
| PRF-fit source offset from KIC position | 0.982 ± 0.813 | 1.21 | -0.314 ± 0.319 | 0.931 ± 0.787 |
| photometric centroid source offset | 2.01 ± 1.17 | 1.72 | -1.33 ± 1.13 | 1.51 ± 1.20 |



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.

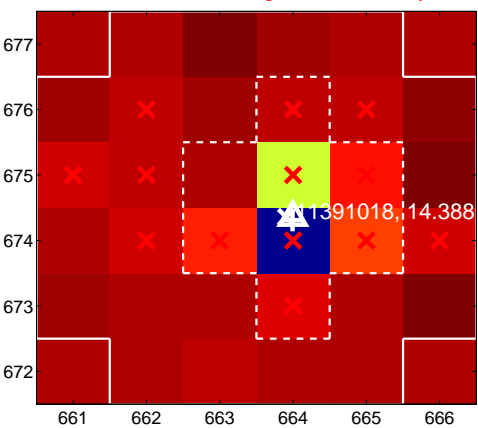
Q5 no difference image



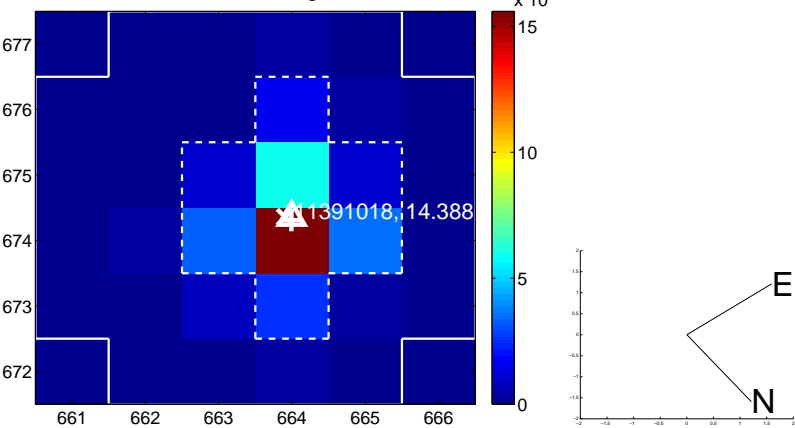
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



Q7 no difference image



Q7 no OOT image



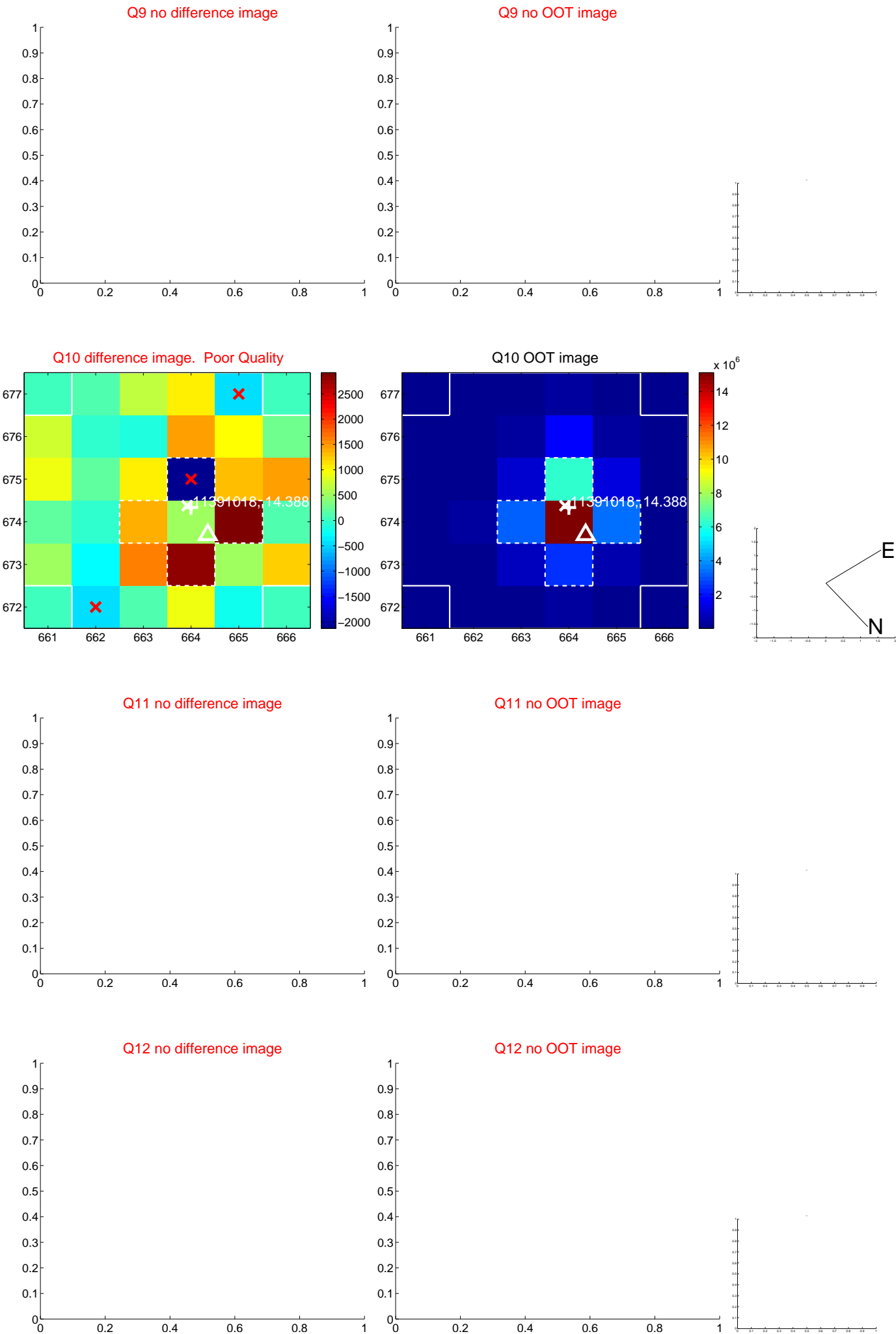
Q8 no difference image



Q8 no OOT image



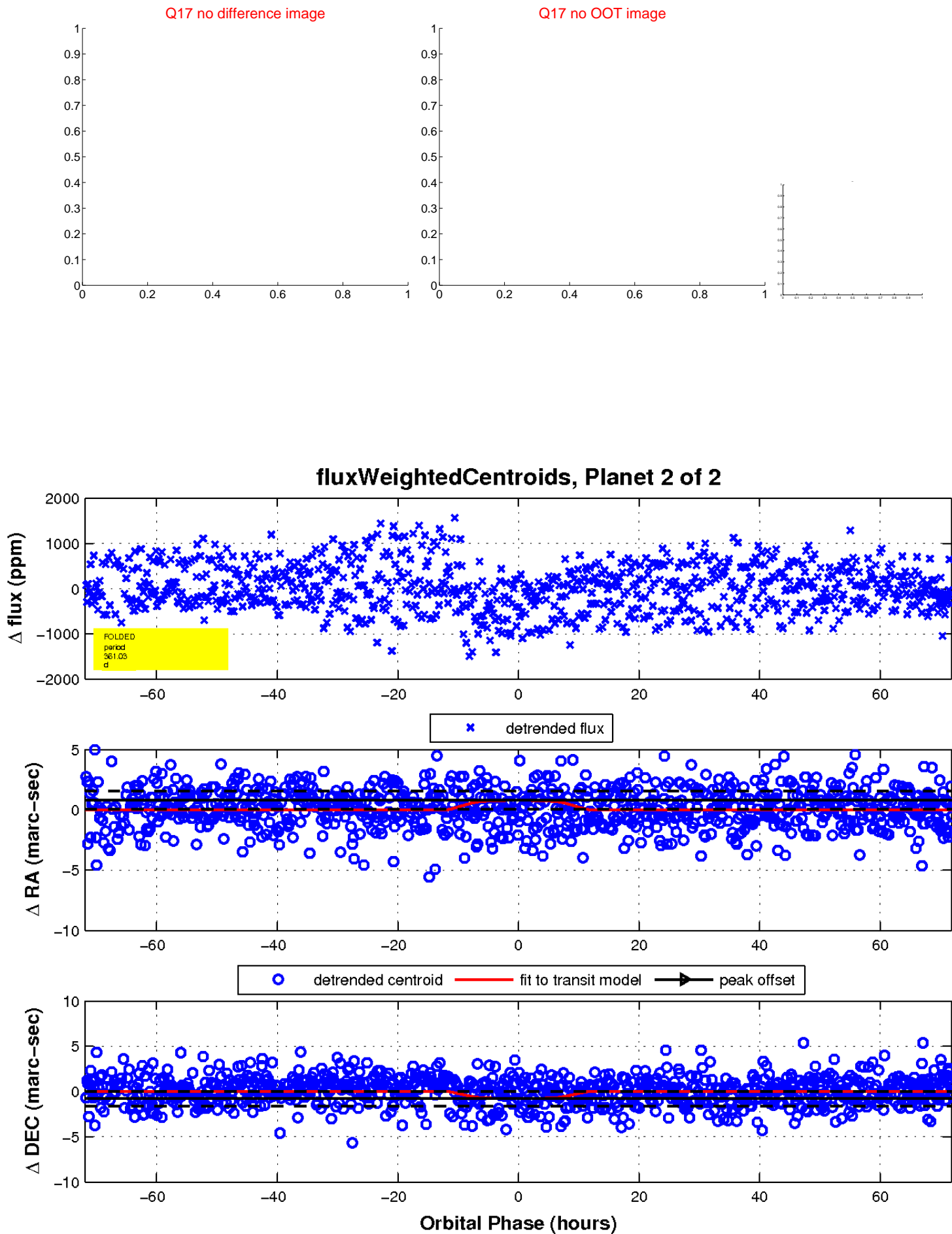
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

