

KIC 011710139

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 011710139-01 | OBS | No | 447.823302 | 430.911523 | 60772.4 | 0.631 | 43.0 | 27.0 | 0.90 | 5708 | 28.07 | 0.63 |
| 011710139-02 | OBS | No | 337.780032 | 200.197157 | 10391.8 | 3.831 | 27.0 | 12.9 | 0.90 | 5708 | 10.54 | 0.92 |
| 011710139-03 | OBS | No | 410.402014 | 349.354172 | 20272.9 | 3.136 | 21.2 | 17.7 | 0.90 | 5708 | 22.80 | 0.71 |
| 011710139-04 | OBS | No | 276.223441 | 383.185770 | 16327.2 | 3.418 | 14.4 | 22.7 | 0.90 | 5708 | 11.56 | 1.20 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 011710139-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

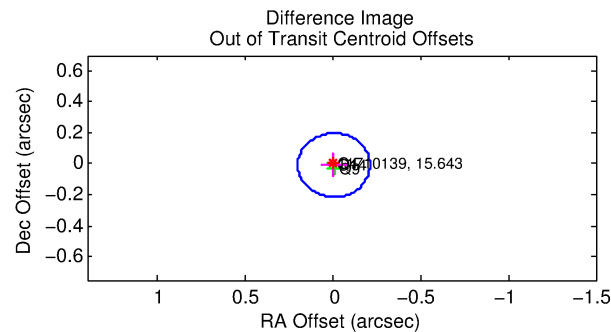
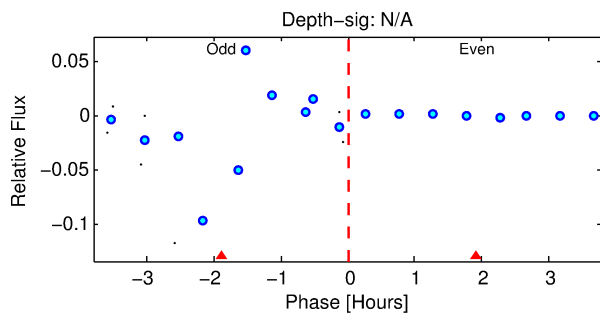
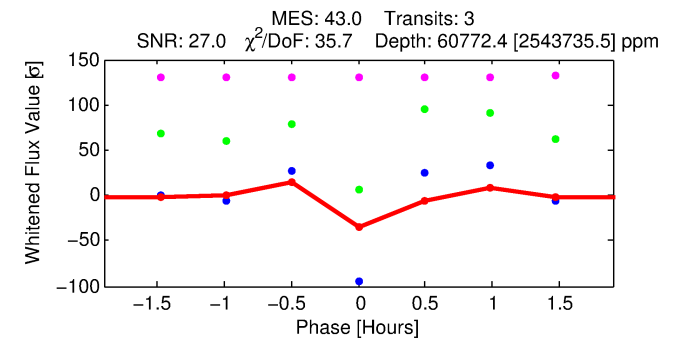
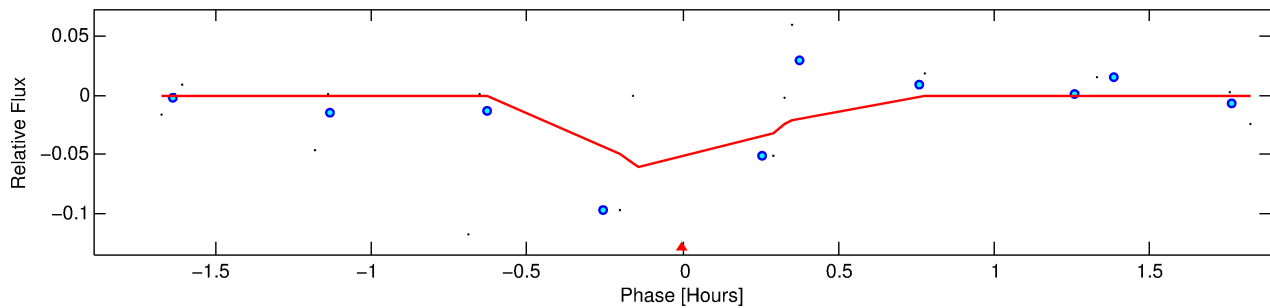
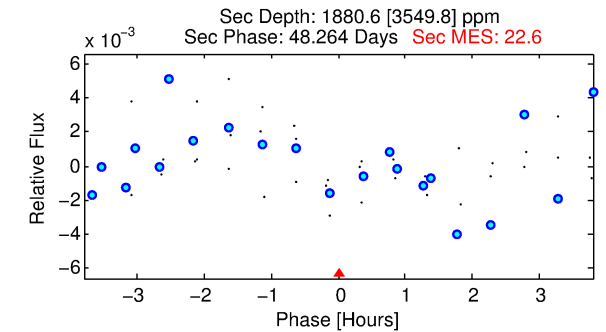
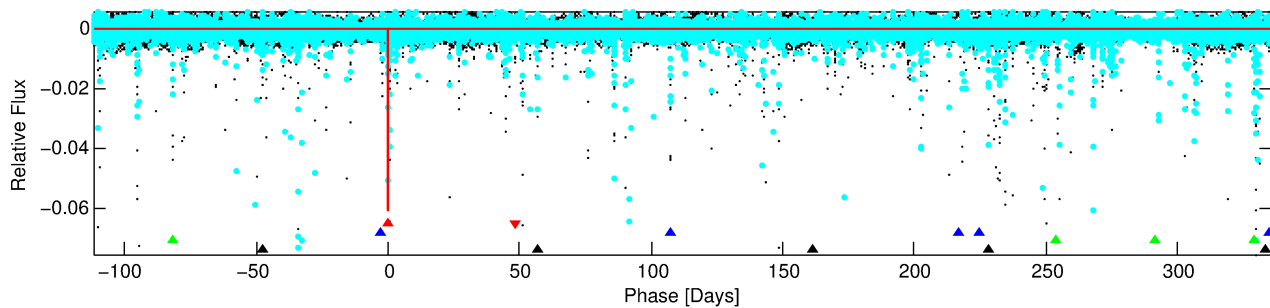
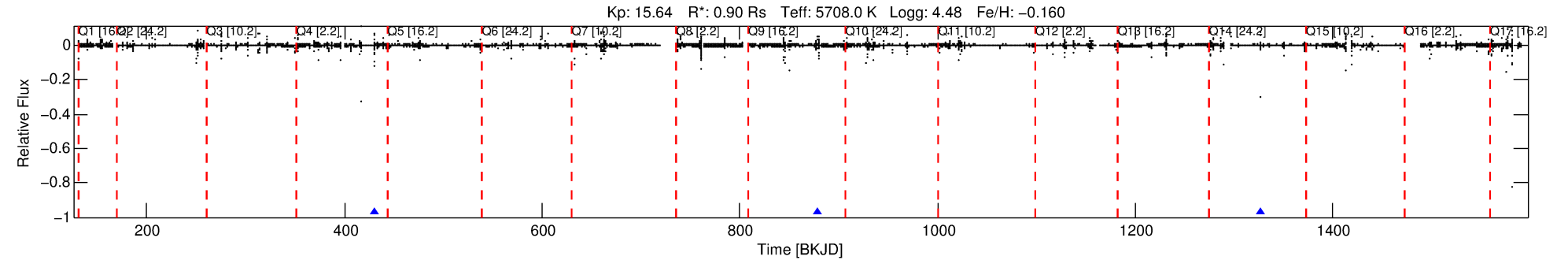
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 011710139-01

No Significant Match Found

DV One-Page Summary

KIC: 11710139 Candidate: 1 of 4 Period: 447.823 d



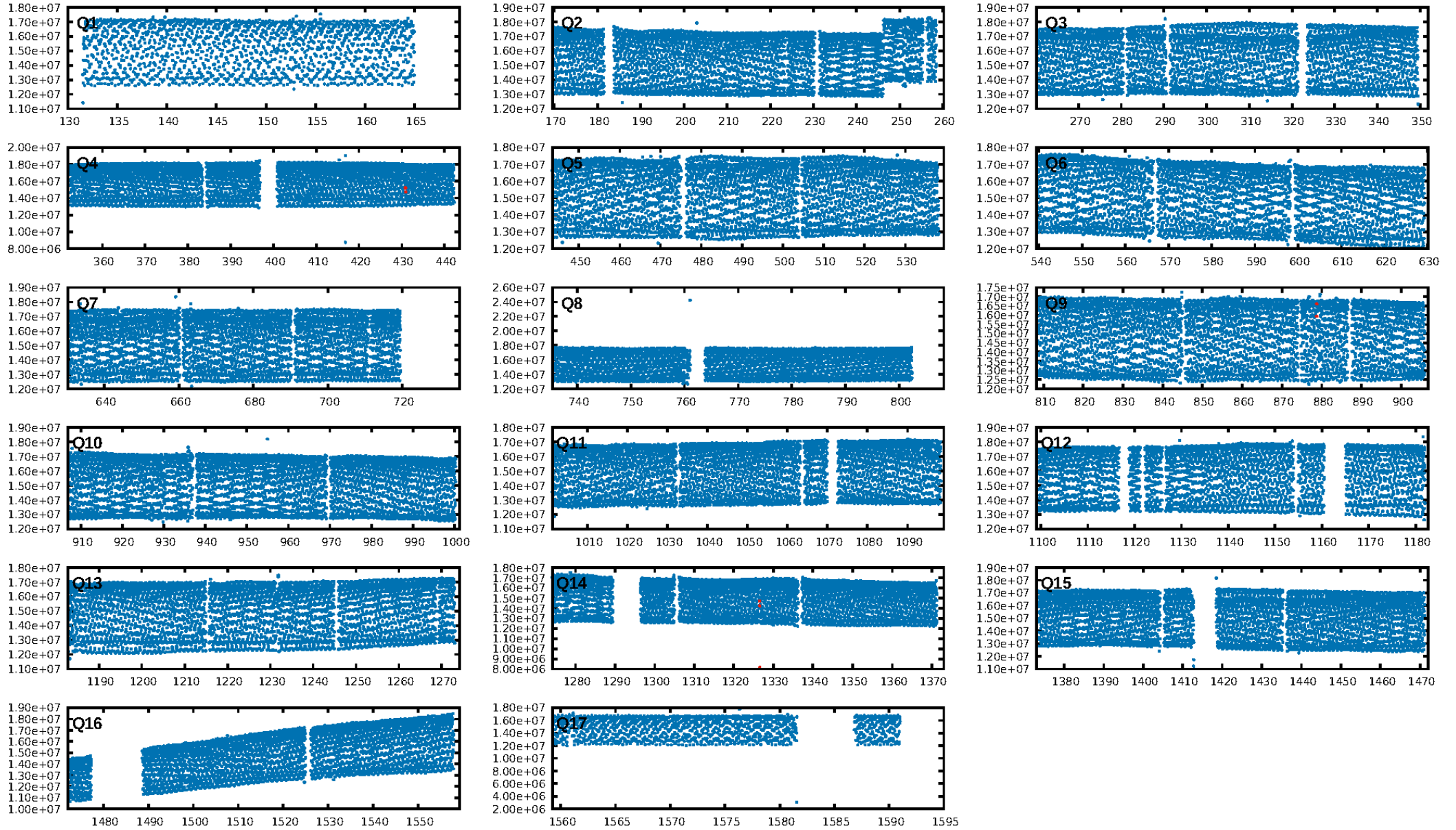
DV Fit Results:

Period = 447.82330 [0.04662] d
Epoch = 430.9115 [0.0591] BKJD
Rp/R* = 0.2852 [4.5149]
a/R* = 6682.96 [281201.02]
b = 0.36 [45.52]
Seff = 0.63 [0.23]
Teq = 227 [21] K
Rp = 28.07 [444.46] Re
a = 1.1064 [0.2543] AU
Ag = 1607.43 [50991.88] [0.03σ]
Teffp = 2226 [17652] K [0.1σ]

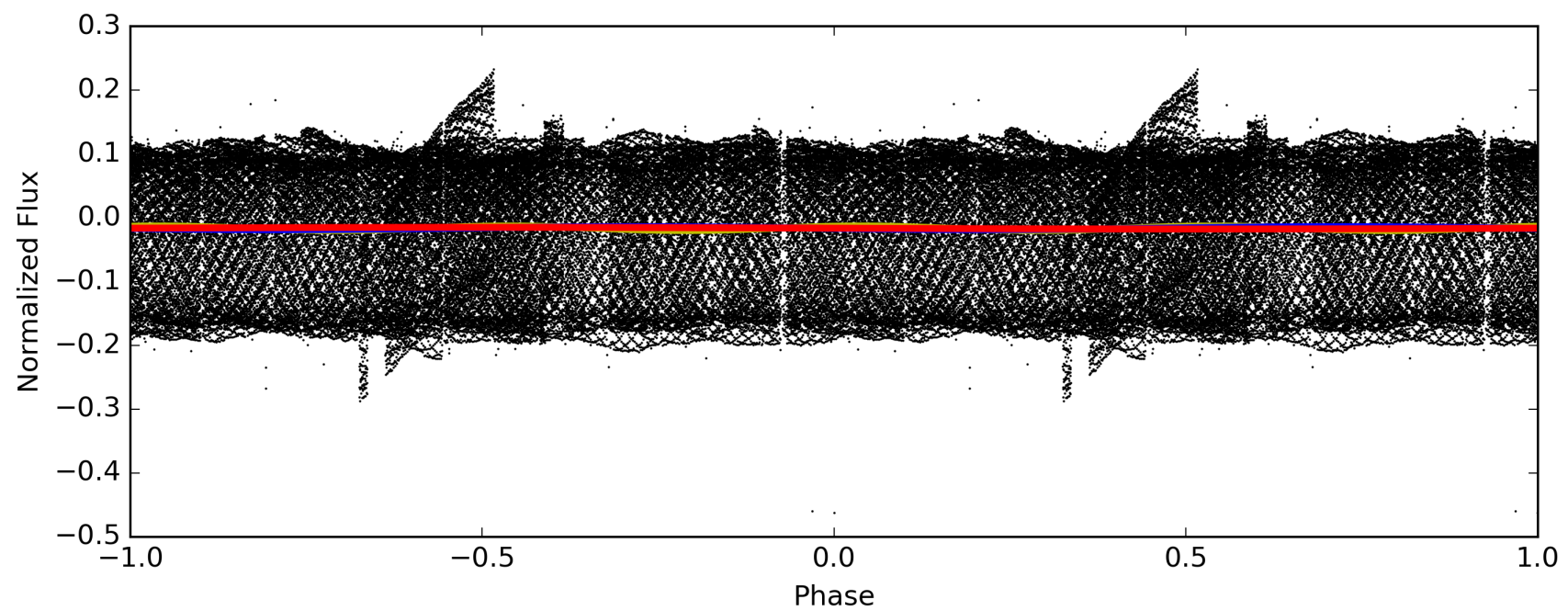
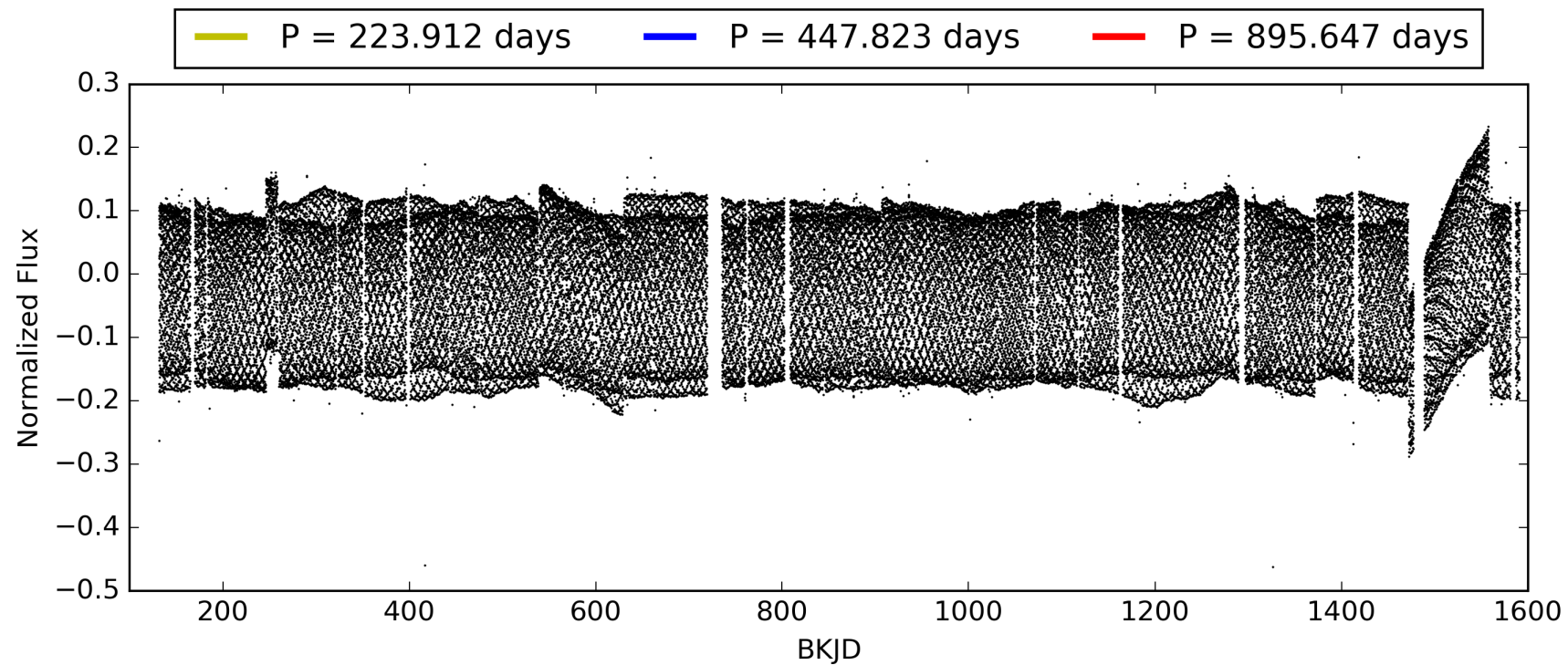
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [280.77σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 25.1%
ModelChiSquareGof-sig: 7.6%
Bootstrap-pfa: 5.54e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.079
Centroid-sig: 19.9%
Centroid-so: 0.153 arcsec [2.16σ]
OotOffset-rm: 0.010 arcsec [0.15σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-rm: 0.136 arcsec [1.43σ]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 011710139-01, PDC Light Curves

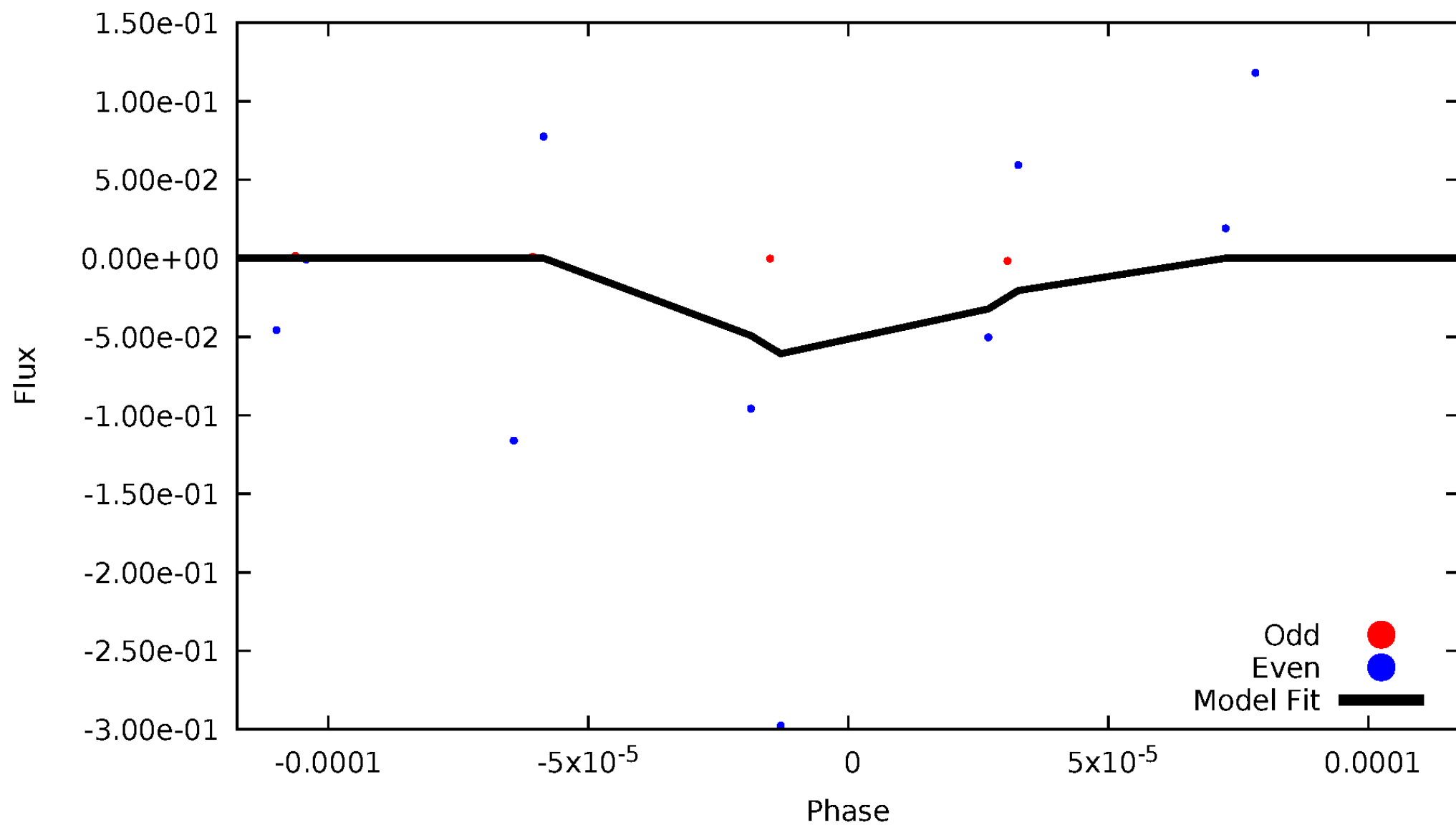


TCE 011710139-01



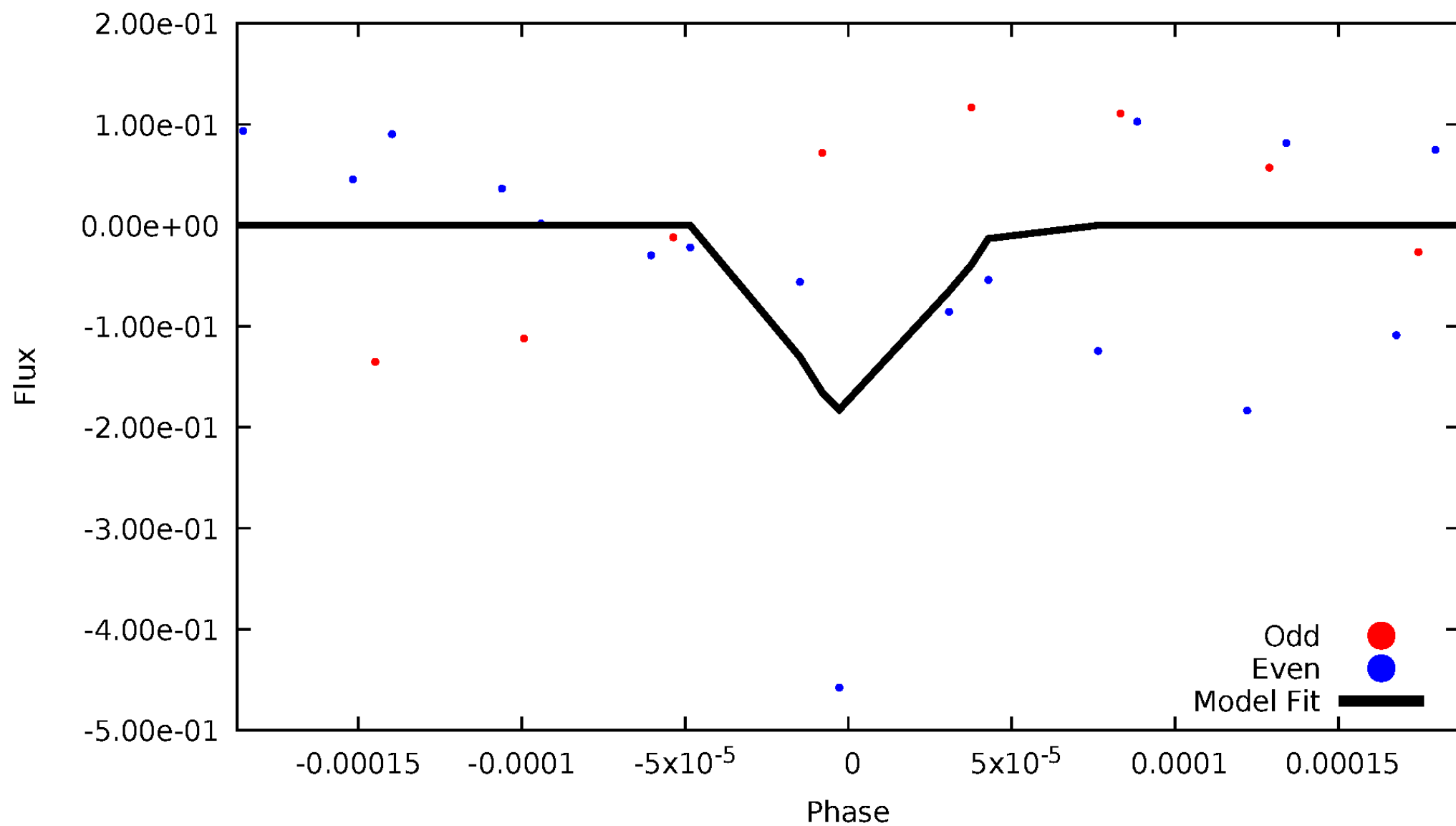
DV Odd/Even

TCE 011710139-01



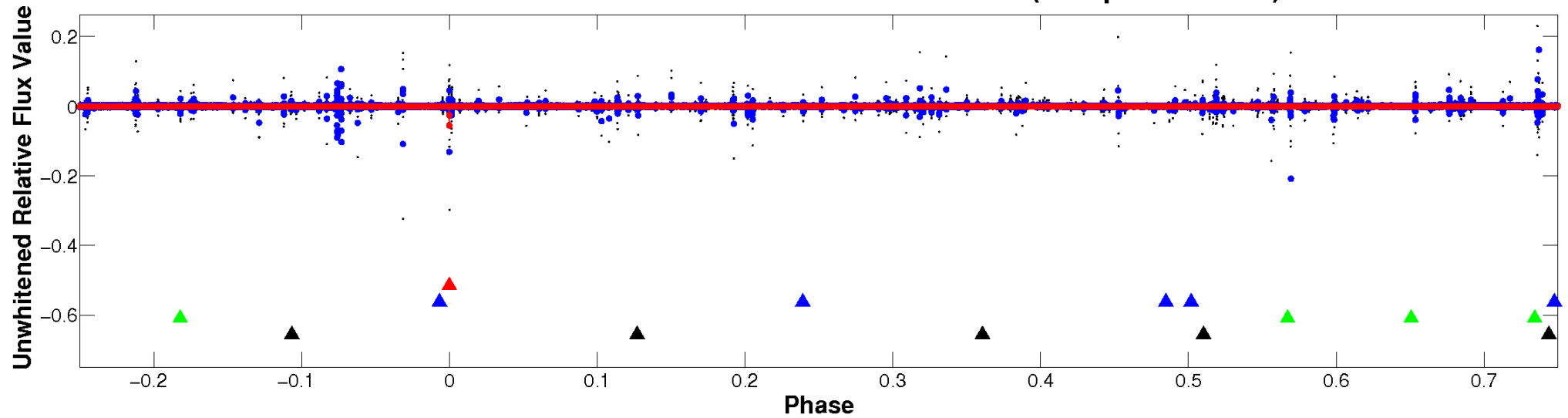
ALT Odd/Even

TCE 011710139-01

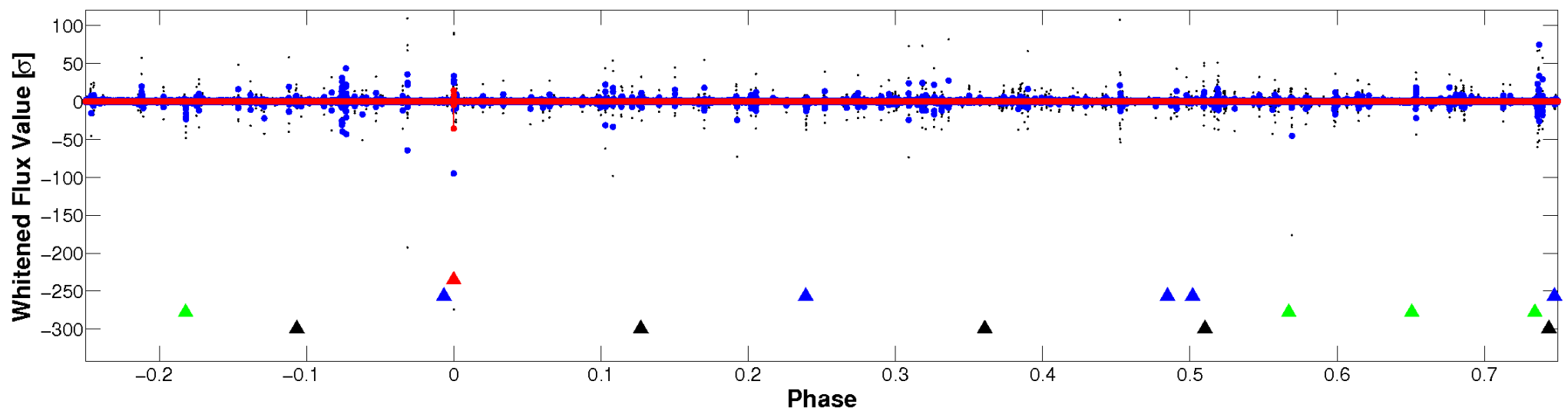


Non-Whitened Vs. Whitened Light Curve

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

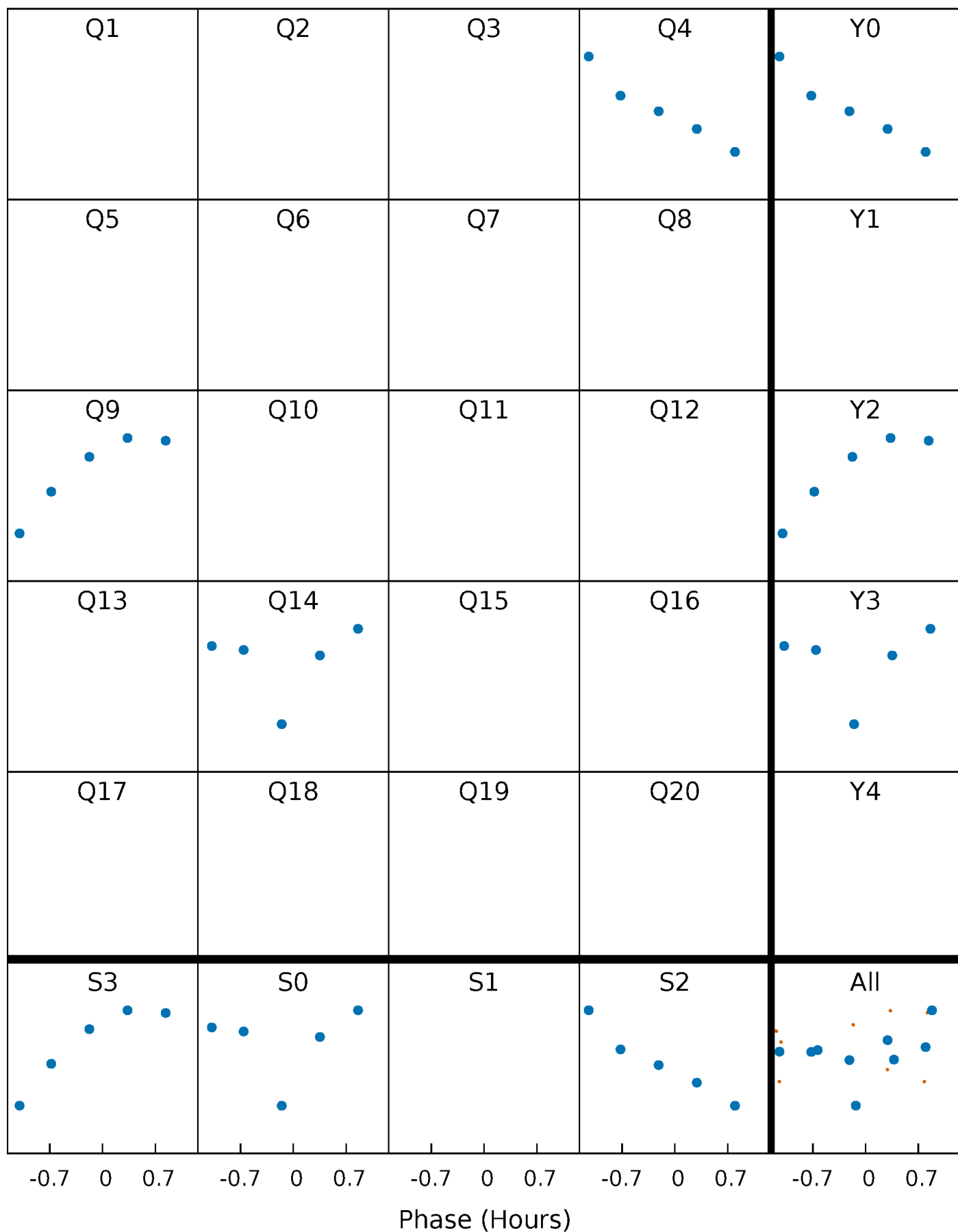


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



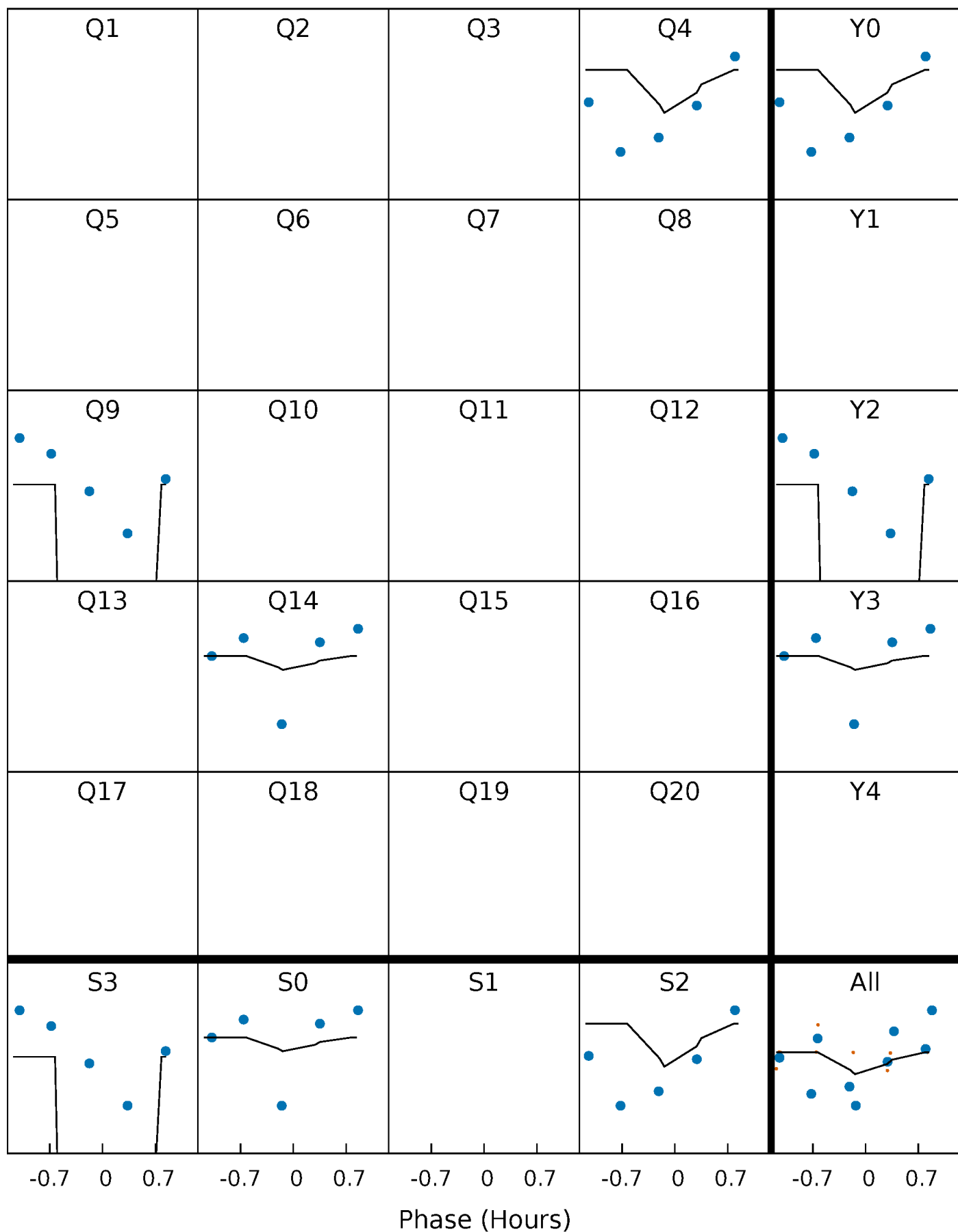
PDC Quarter-Phased Transit Curves

TCE 011710139-01 P=447.823302 Days $T_0=430.911523$ (BKJD)



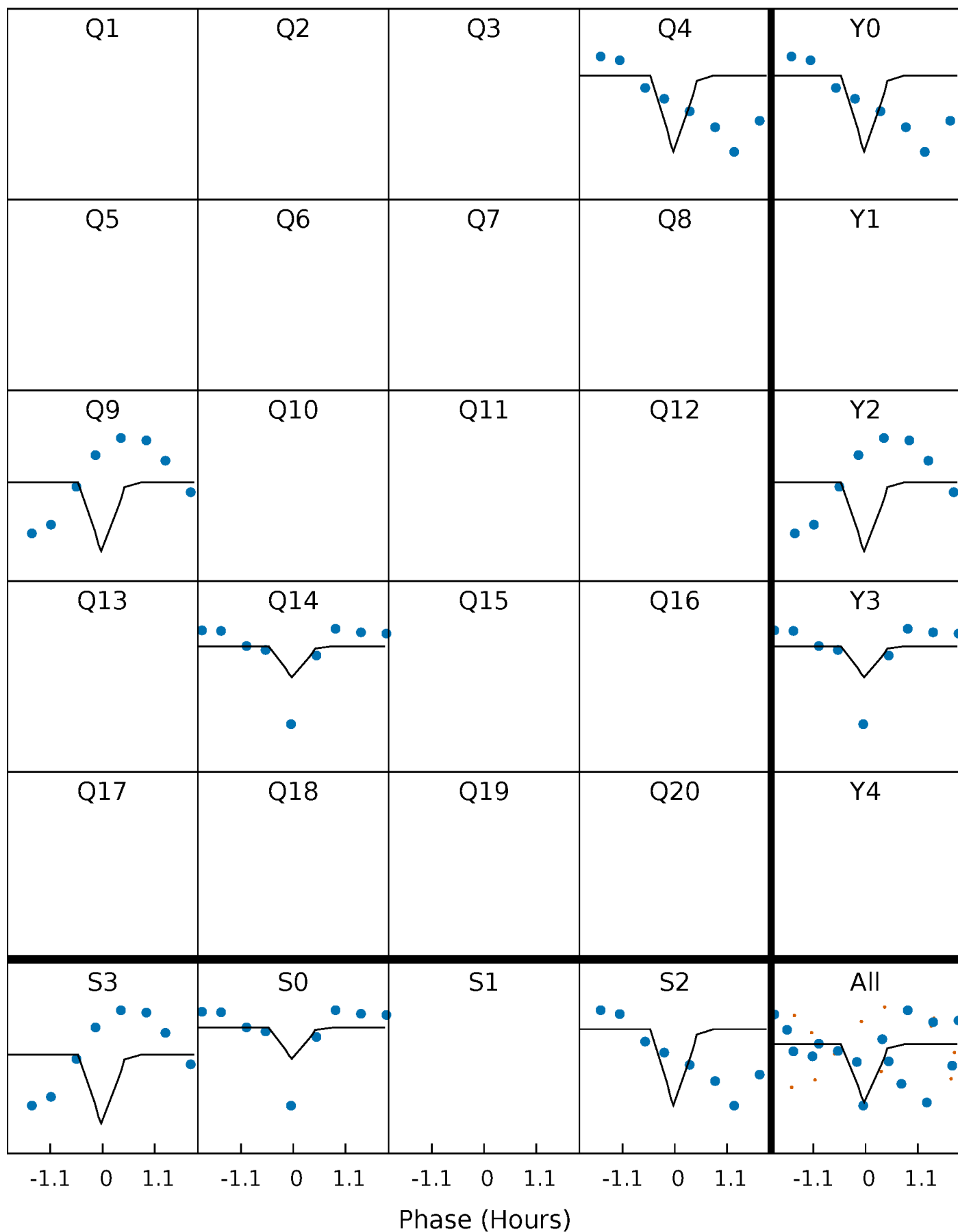
DV Quarter-Phased Transit Curves

TCE 011710139-01 P=447.823302 Days $T_0=430.911523$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

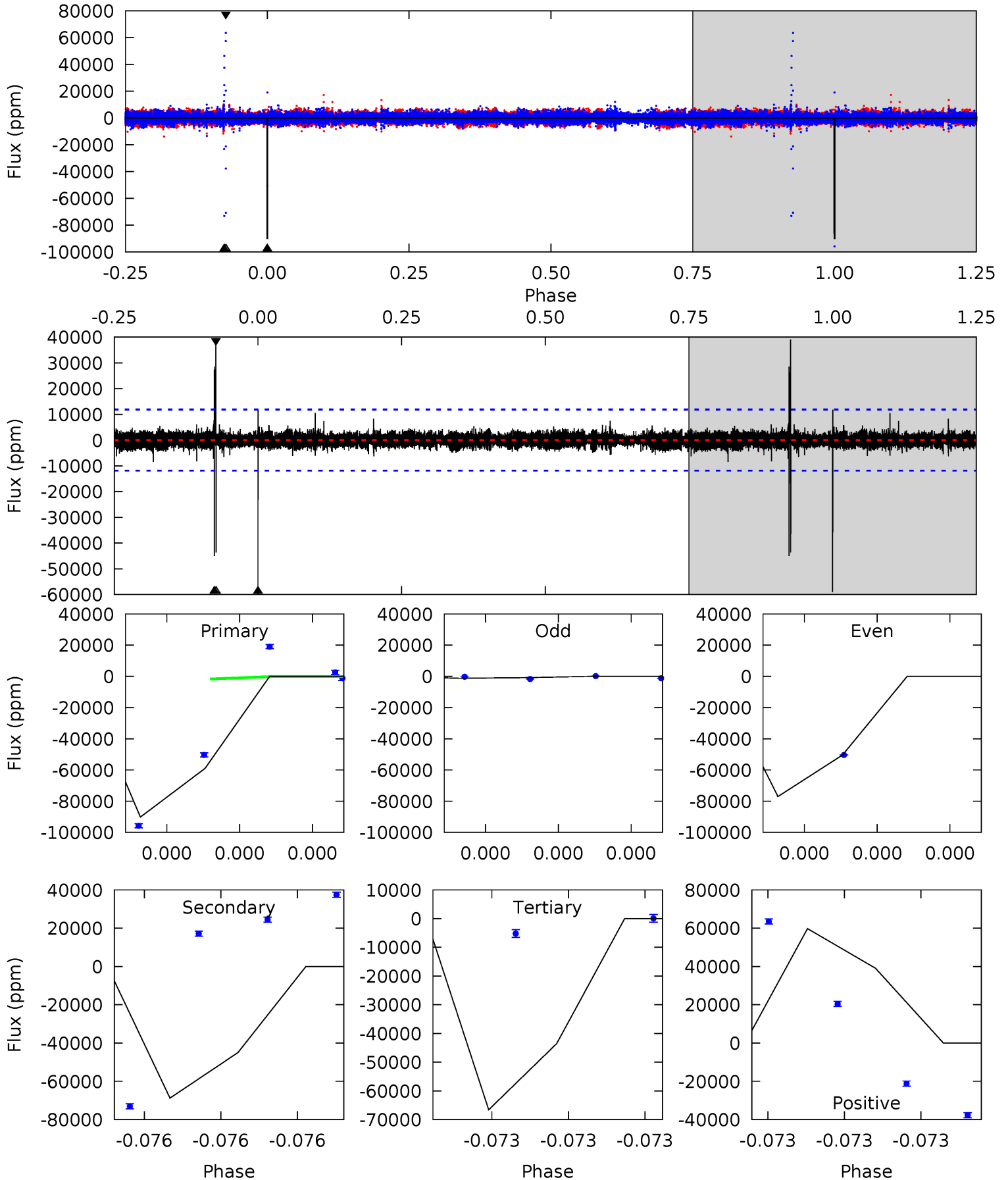
TCE 011710139-01 P=447.821901 Days $T_0=430.909766$ (BKJD)



DV Model-Shift Uniqueness Test

011710139-01, P = 447.823302 Days, E = 430.911523 Days

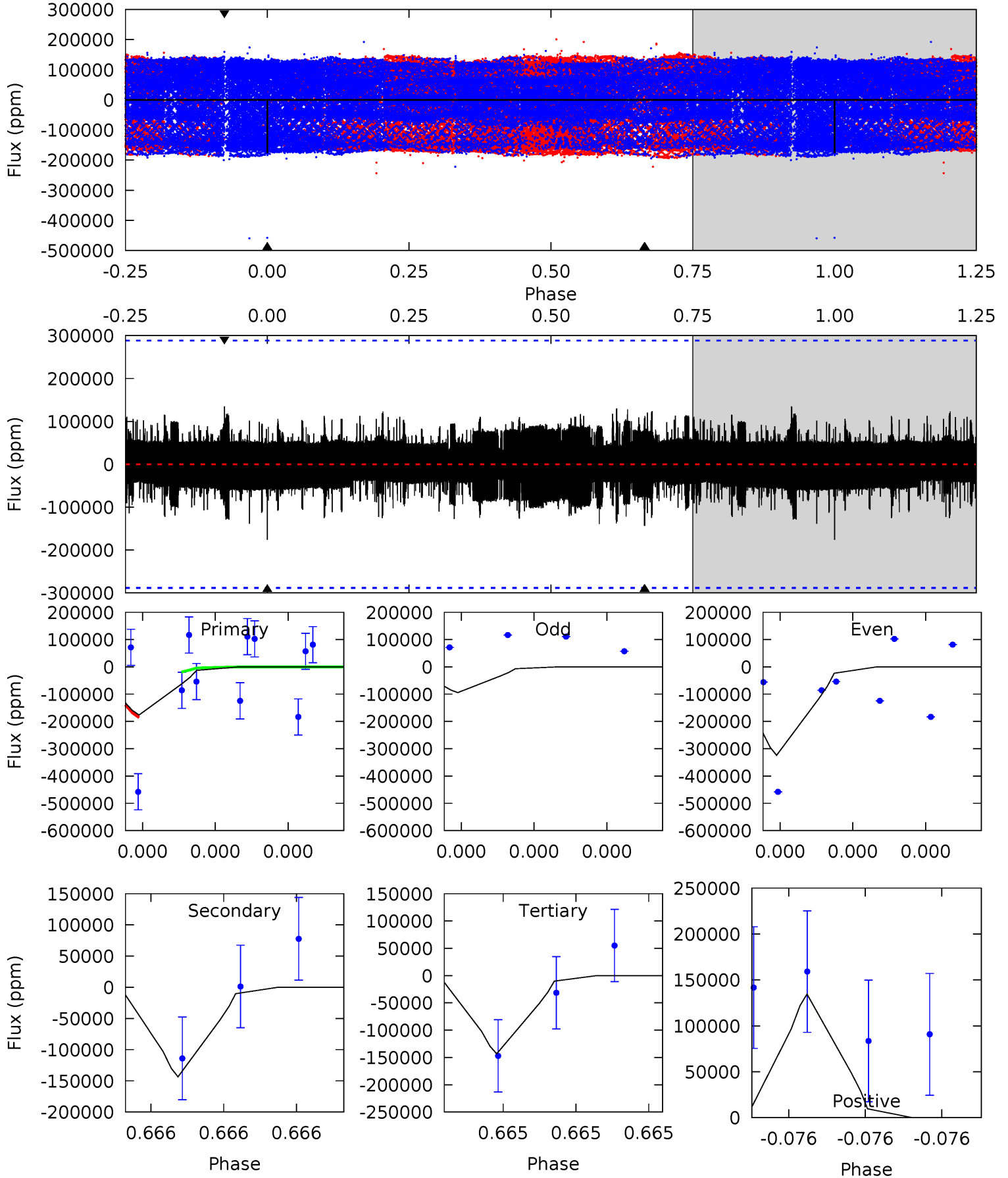
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 29.5 | 22.5 | 21.8 | 19.6 | 5.96 | 4.05 | 0.61 | 7.72 | 9.95 | 0.72 | 2.95 | 16.4 | 1.08 | 0.40 | 0 |



Alt Model-Shift Uniqueness Test

011710139-01, P = 447.821901 Days, E = 430.909766 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 3.63 | 2.96 | 2.95 | 2.77 | 5.94 | 4.02 | 0.70 | 0.68 | 0.86 | 0.01 | 0.19 | 2.60 | 1.40 | 0.43 | 1.72 |



Stellar Parameters For KIC 011710139

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5708^{+169}_{-186} | $4.482^{+0.075}_{-0.188}$ | $-0.160^{+0.300}_{-0.300}$ | $0.902^{+0.242}_{-0.104}$ | $0.902^{+0.115}_{-0.094}$ | $1.729^{+0.593}_{-0.867}$ |
| | +3%/-3% | +2%/-4% | +188%/-188% | +27%/-12% | +13%/-10% | +34%/-50% |
| 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 011710139-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------------|------------------------------|-------------------|-----------------------|------------------------|
| DV | -44988 ± 1999 | $336.01^{+335.79}_{-229.41}$ | 322^{+21}_{-16} | 2376^{+814}_{-348} | 287^{+2525}_{-218} |
| Alt. | -143543 ± 48566 | $330.68^{+330.77}_{-243.88}$ | 321^{+22}_{-16} | 2757^{+1514}_{-465} | 1000^{+14302}_{-789} |

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 $A_{obs} \gg 1.0$

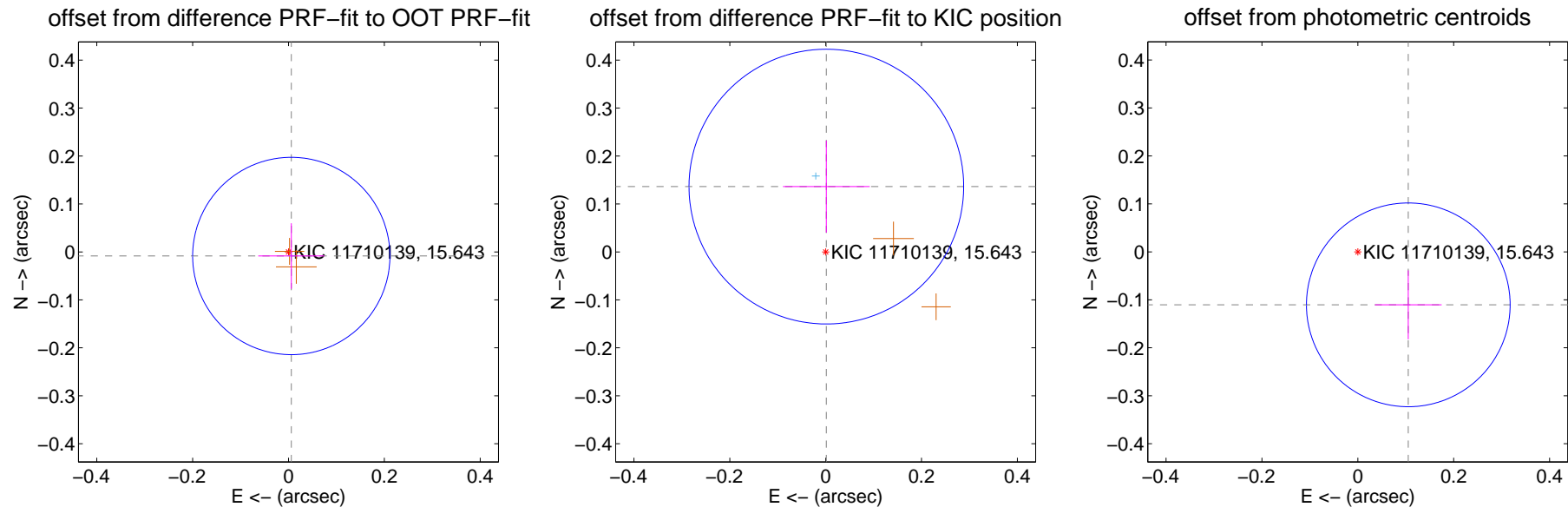
DV Centroid Data

Supplemental centroid analysis for 011710139-01. Kepler magnitude: 15.64. Transit SNR 27.00

There are 1 quarters with good PRF difference image offsets

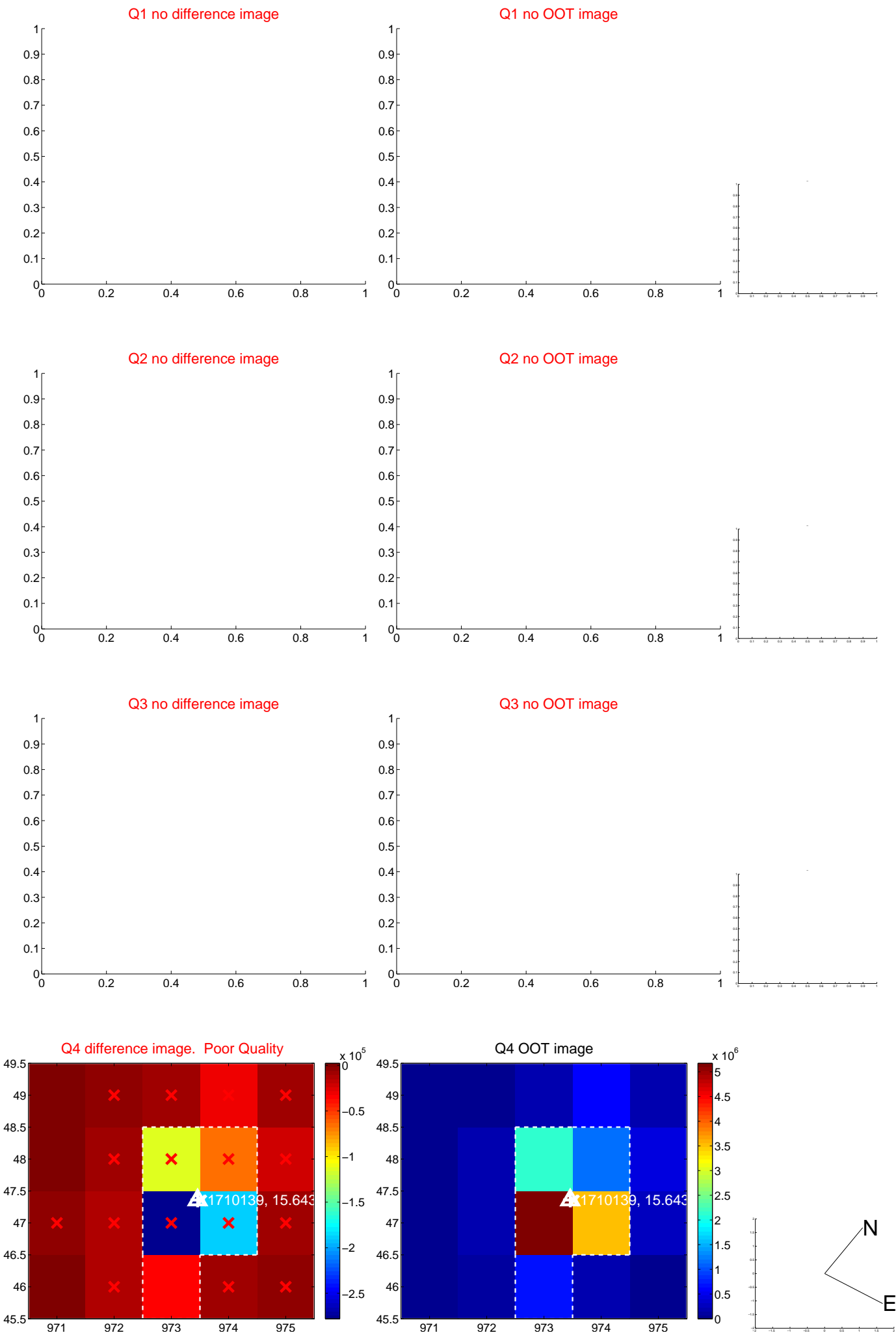
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.010 ± 0.069 | 0.15 | -0.006 ± 0.069 | -0.008 ± 0.068 |
| PRF-fit source offset from KIC position | 0.136 ± 0.096 | 1.43 | -0.001 ± 0.091 | 0.136 ± 0.096 |
| photometric centroid source offset | 0.15 ± 0.07 | 2.16 | -0.11 ± 0.07 | -0.11 ± 0.07 |



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.

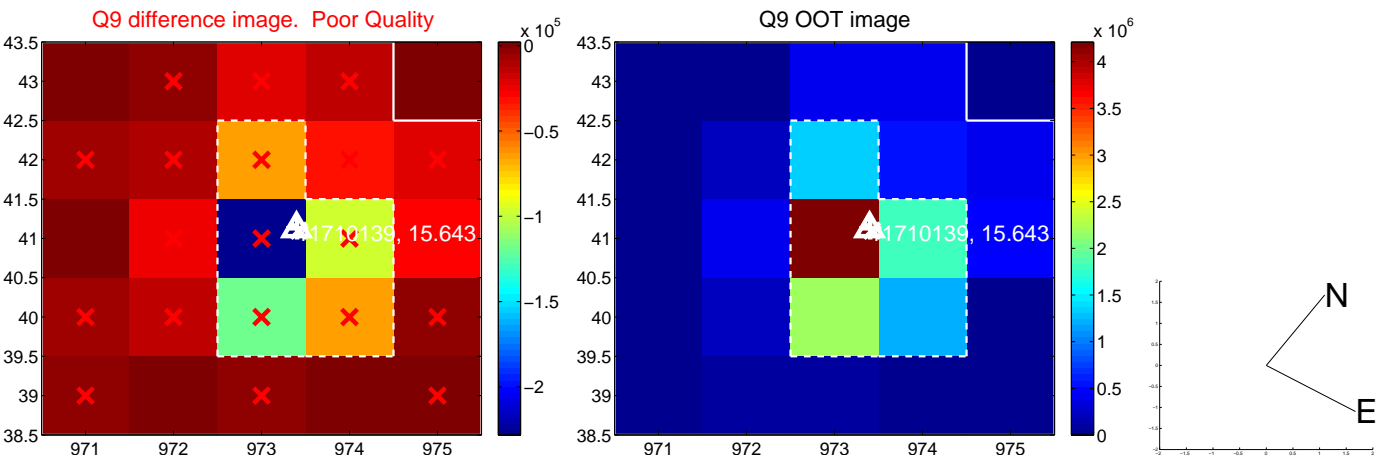
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



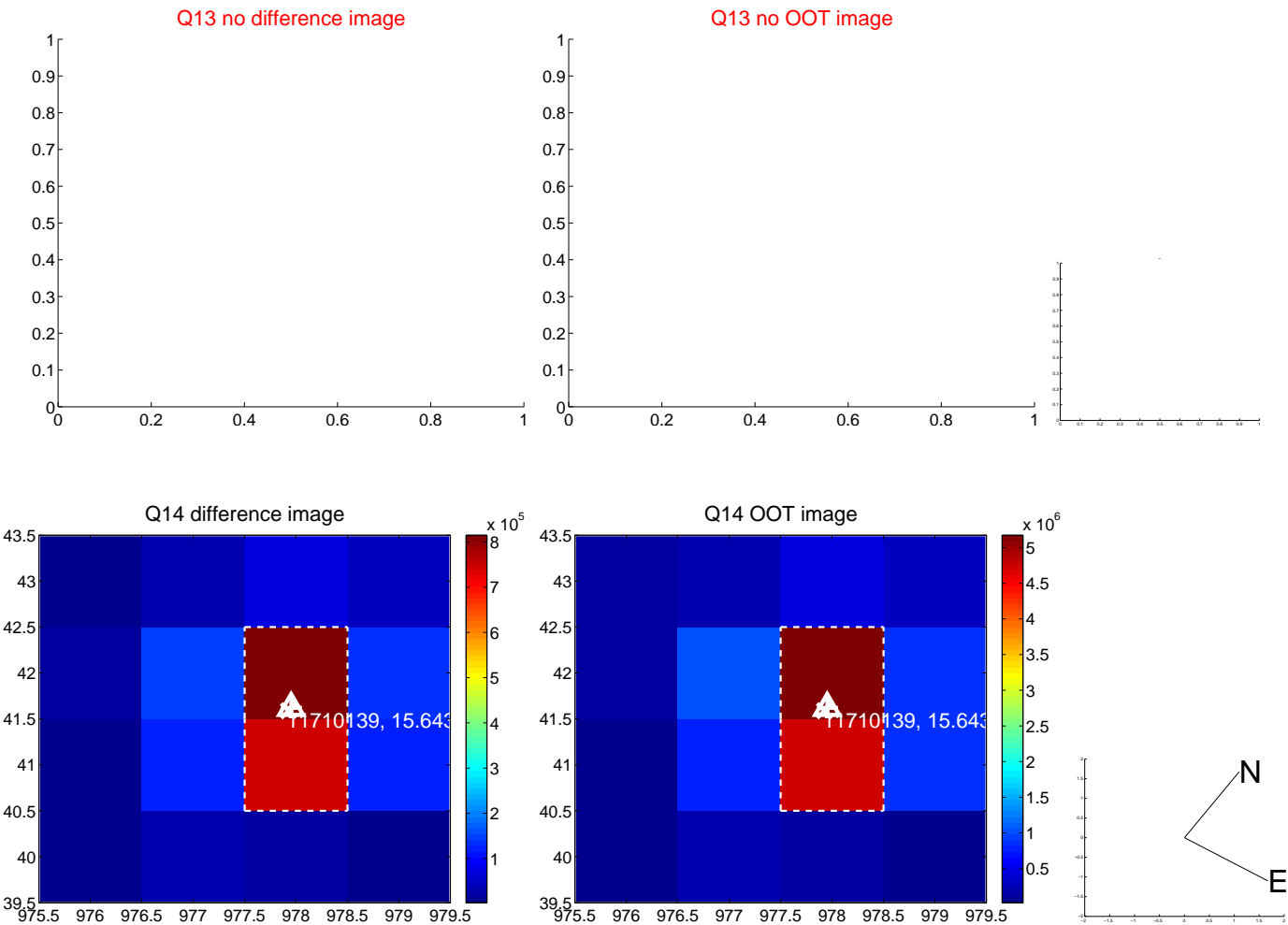
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



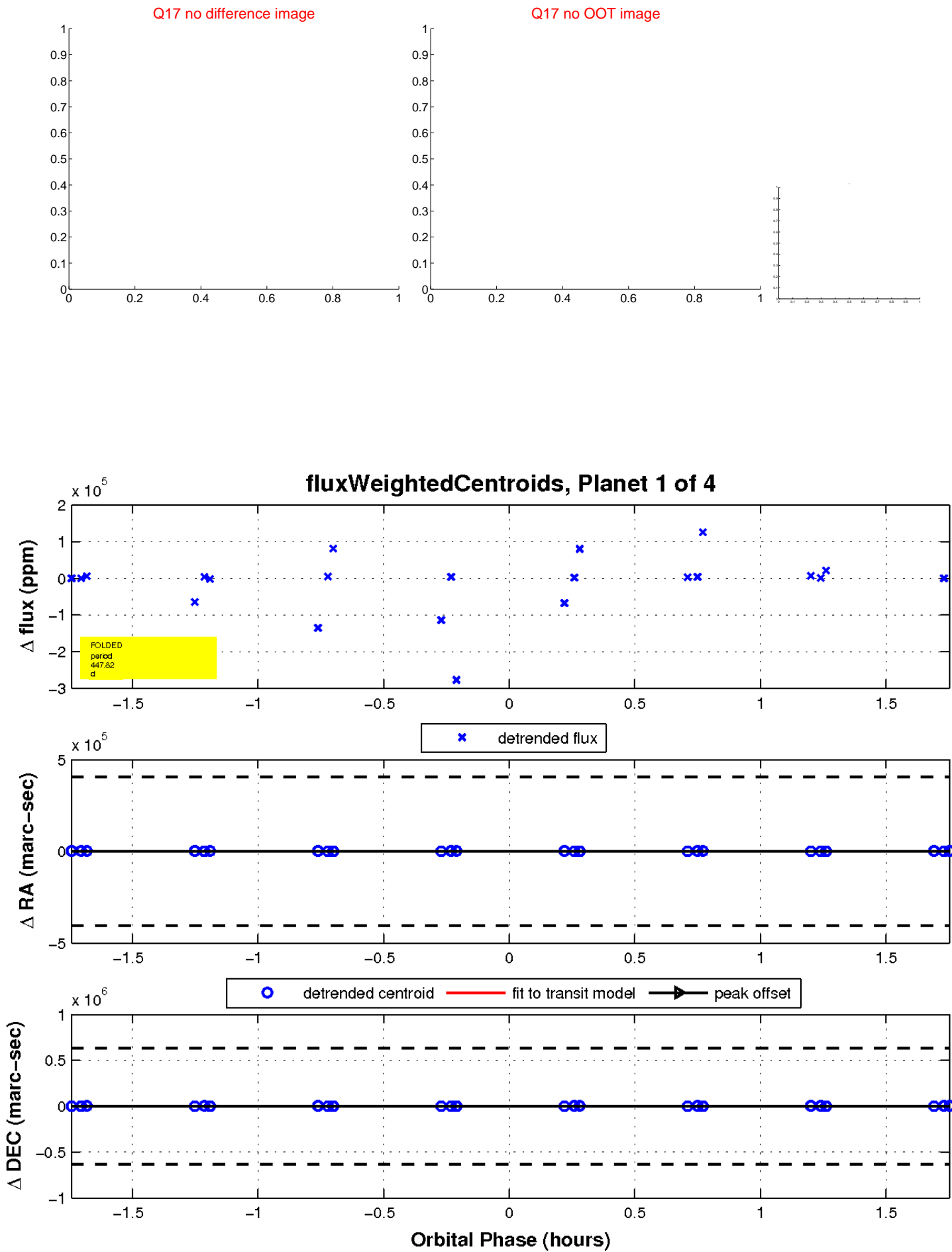
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

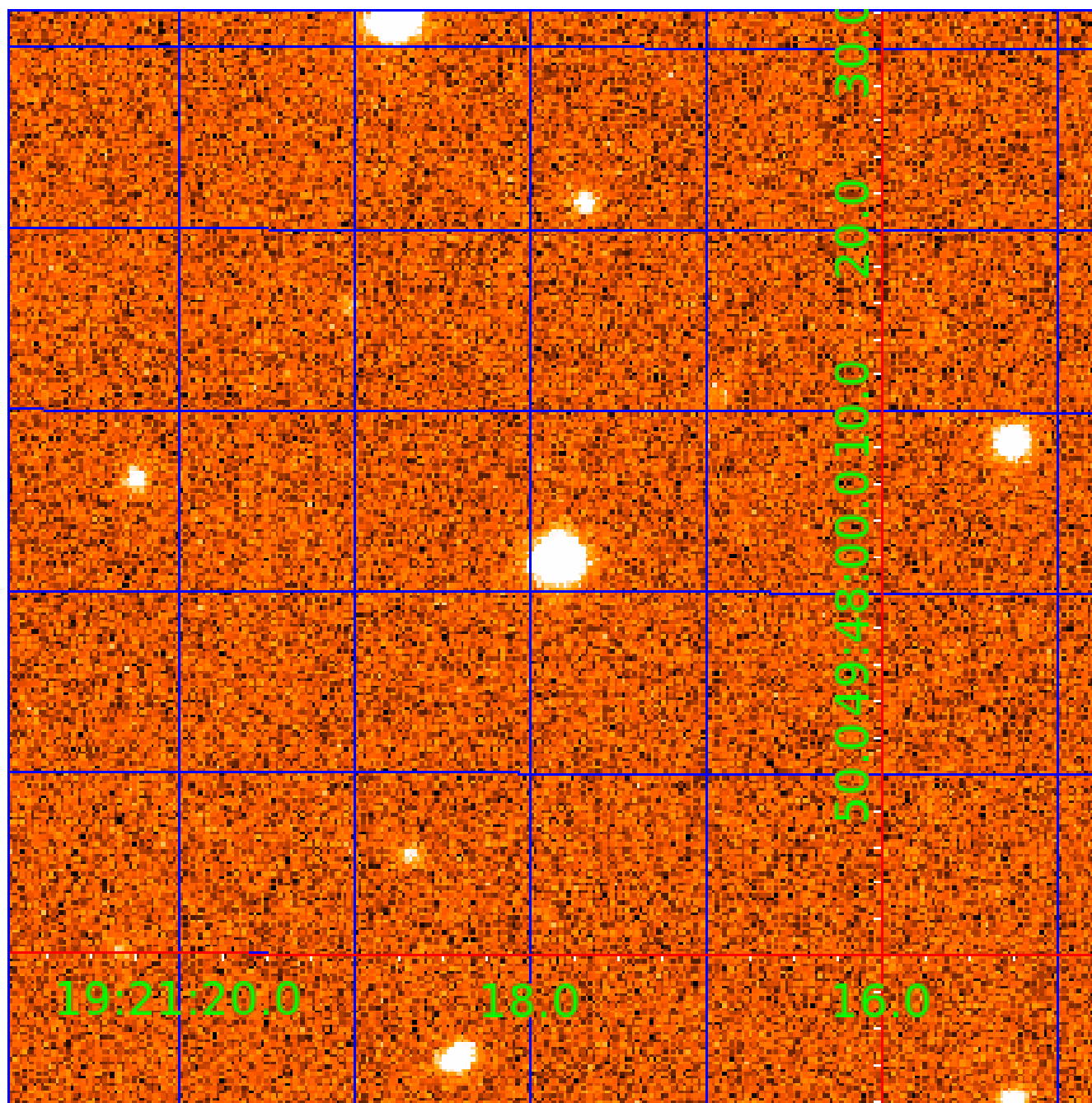


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 011710139

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 011710139-01 | OBS | No | 447.823302 | 430.911523 | 60772.4 | 0.631 | 43.0 | 27.0 | 0.90 | 5708 | 28.07 | 0.63 |
| 011710139-02 | OBS | No | 337.780032 | 200.197157 | 10391.8 | 3.831 | 27.0 | 12.9 | 0.90 | 5708 | 10.54 | 0.92 |
| 011710139-03 | OBS | No | 410.402014 | 349.354172 | 20272.9 | 3.136 | 21.2 | 17.7 | 0.90 | 5708 | 22.80 | 0.71 |
| 011710139-04 | OBS | No | 276.223441 | 383.185770 | 16327.2 | 3.418 | 14.4 | 22.7 | 0.90 | 5708 | 11.56 | 1.20 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 011710139-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

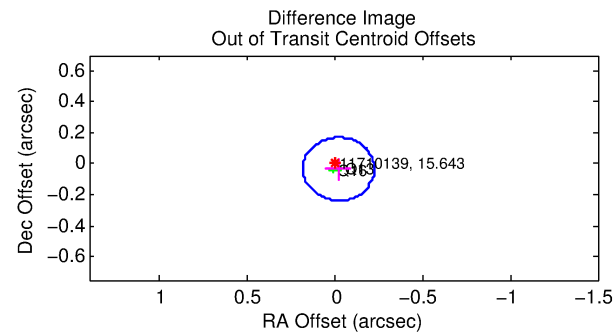
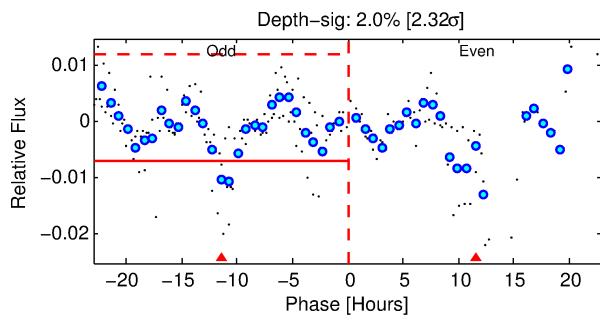
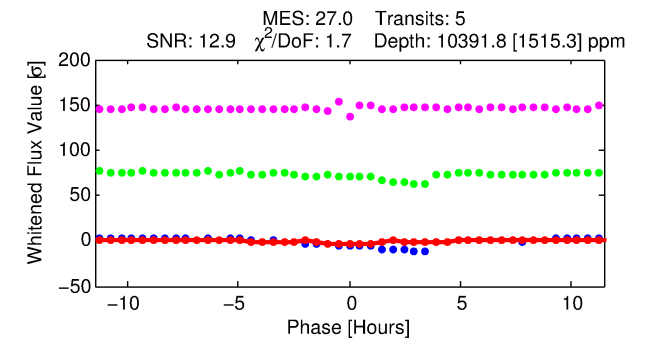
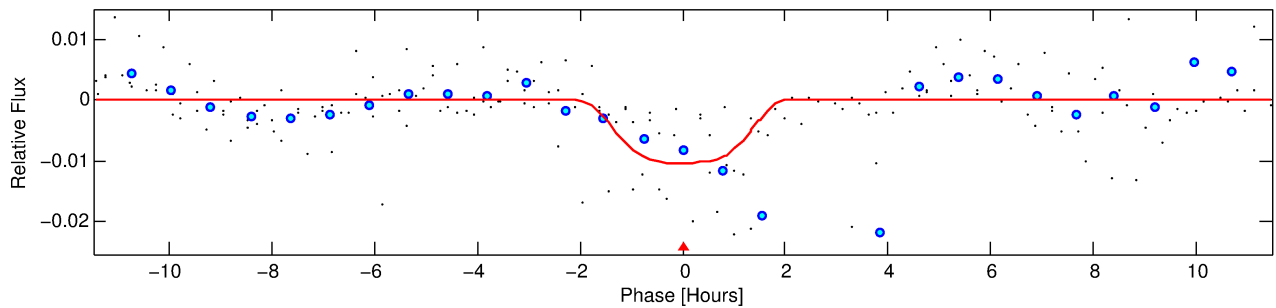
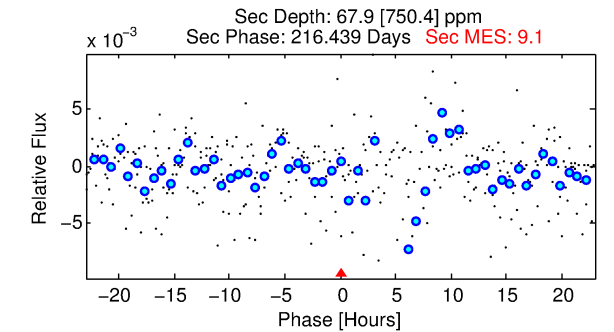
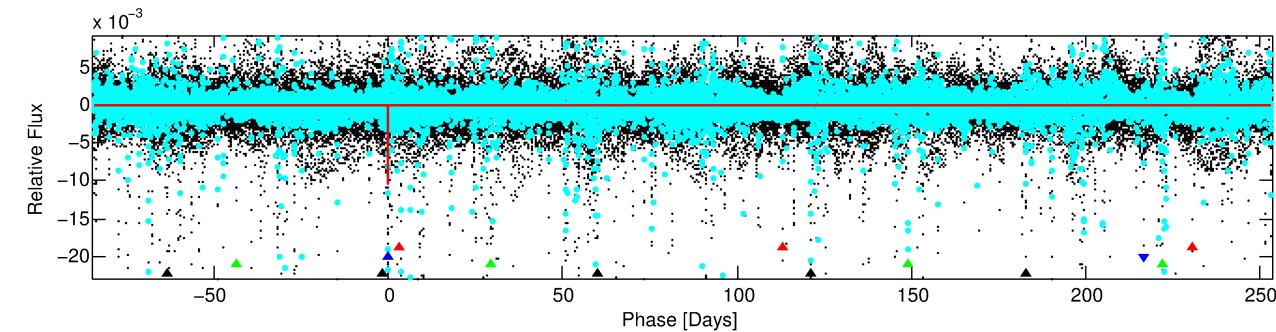
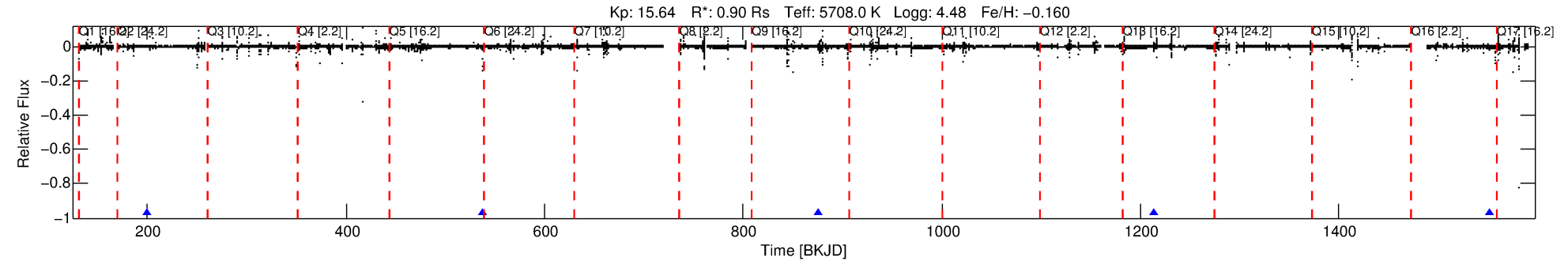
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 011710139-02

No Significant Match Found

DV One-Page Summary

KIC: 11710139 Candidate: 2 of 4 Period: 337.780 d



DV Fit Results:

Period = 337.78003 [0.00382] d
Epoch = 200.1972 [0.0088] BKJD
Rp/R* = 0.1071 [0.0115]
a/R* = 481.65 [103.03]
b = 0.85 [0.08]
Seff = 0.92 [0.33]
Teq = 250 [23] K
Rp = 10.54 [3.05] Re
a = 0.9168 [0.2107] AU
Ag = 282.66 [3124.71] [0.09 σ]
Teffp = 1583 [4375] K [0.30 σ]

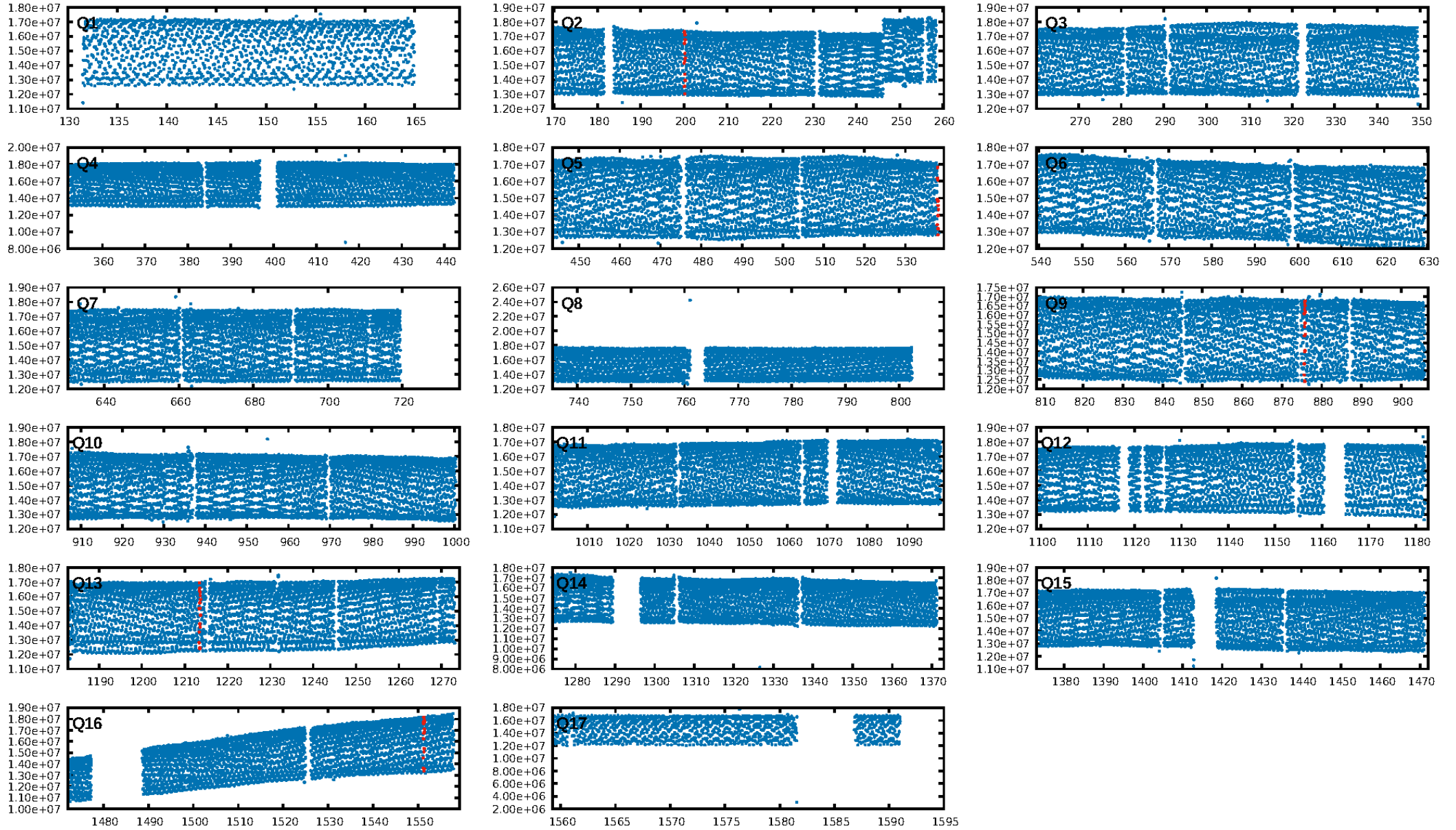
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [287.75 σ]
LongPeriod-sig: 100.0% [352.04 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 2.6%
Bootstrap-pfa: 3.38e-07
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 0.8632
Centroid-sig: 44.5%
Centroid-so: 0.335 arcsec [1.97 σ]
OotOffset-rm: 0.040 arcsec [0.58 σ]
KicOffset-rm: 0.219 arcsec [3.24 σ]
OotOffset-st: 0/0/1/1 [2]
KicOffset-st: 0/0/1/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

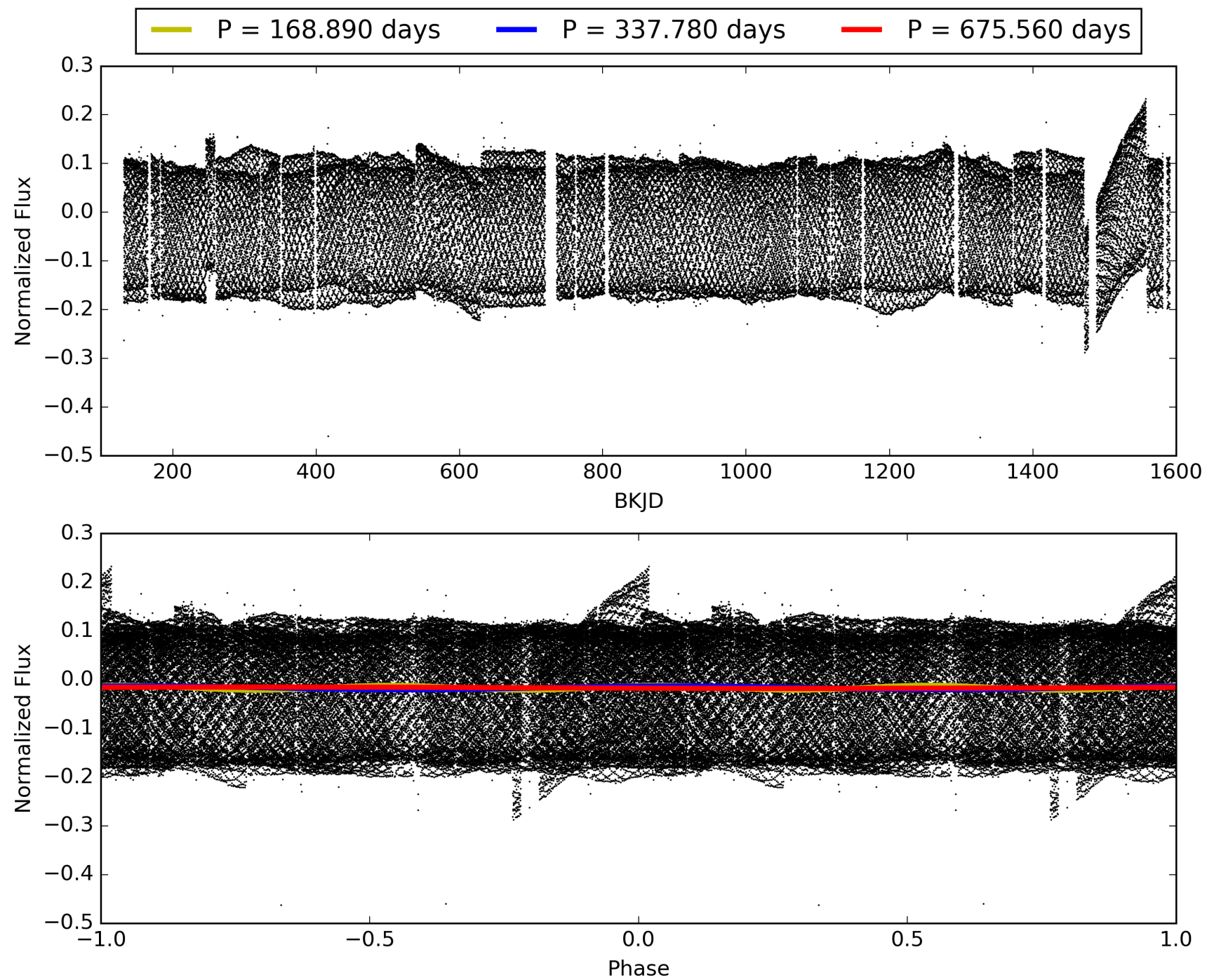
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:17:09 Z

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

TCE 011710139-02, PDC Light Curves

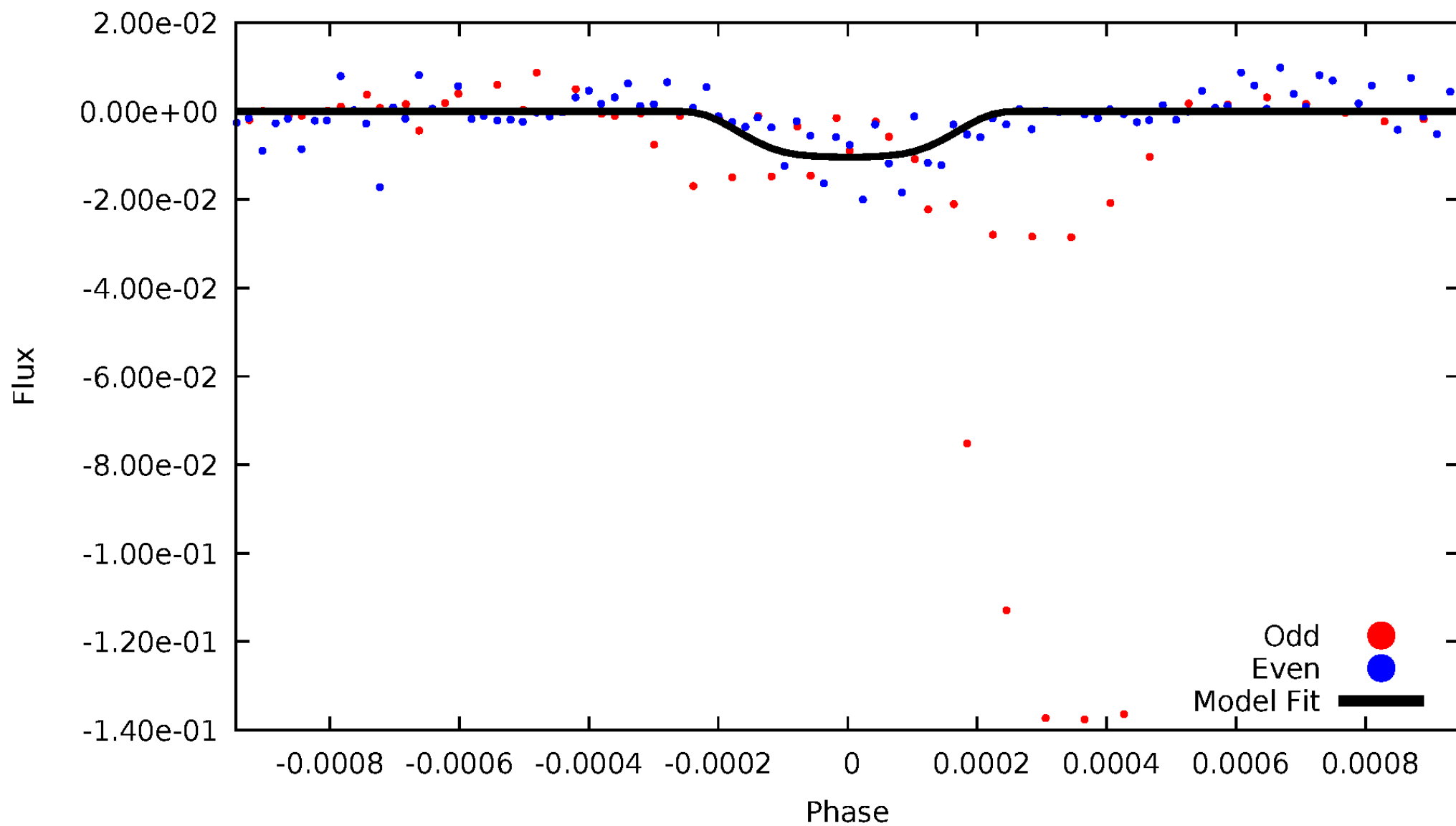


TCE 011710139-02



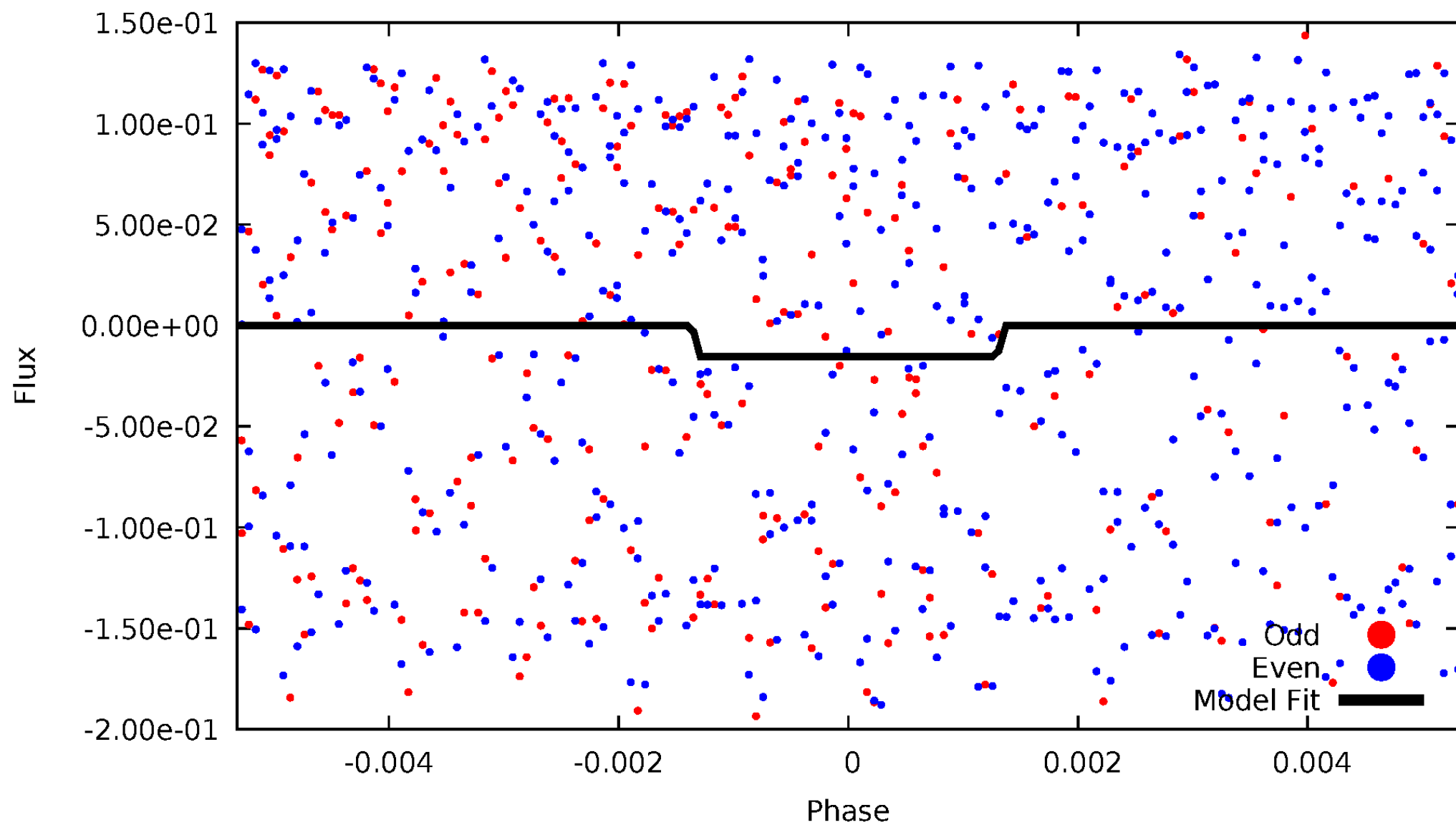
DV Odd/Even

TCE 011710139-02



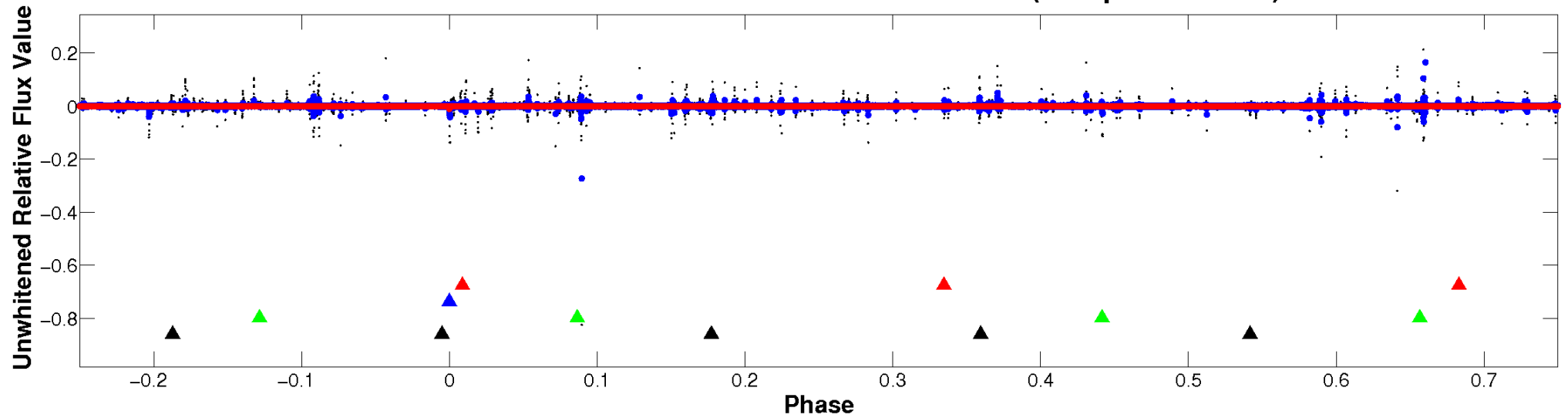
ALT Odd/Even

TCE 011710139-02

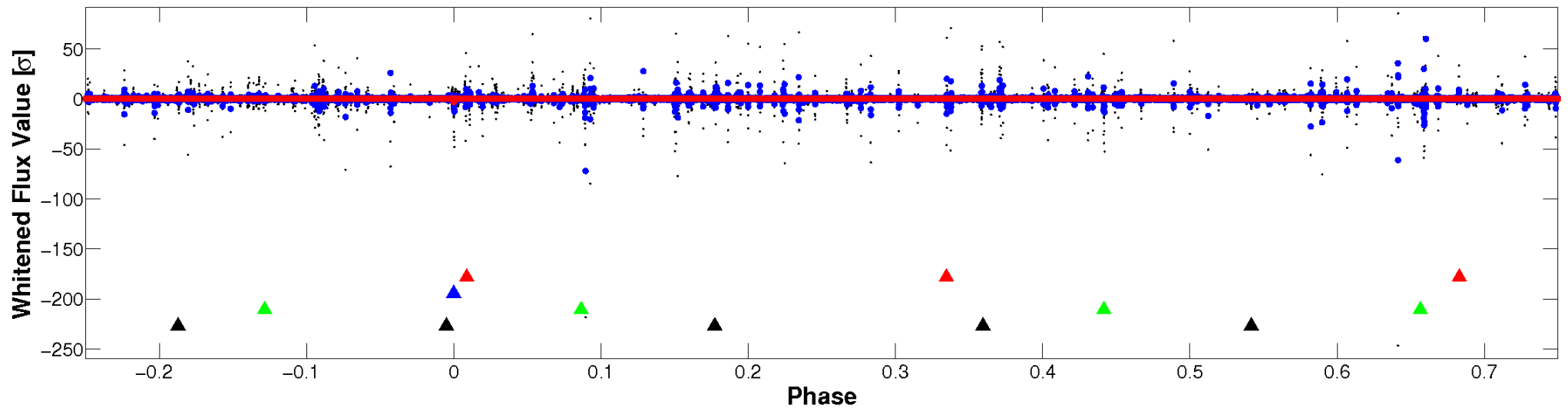


Non-Whitened Vs. Whitened Light Curve

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

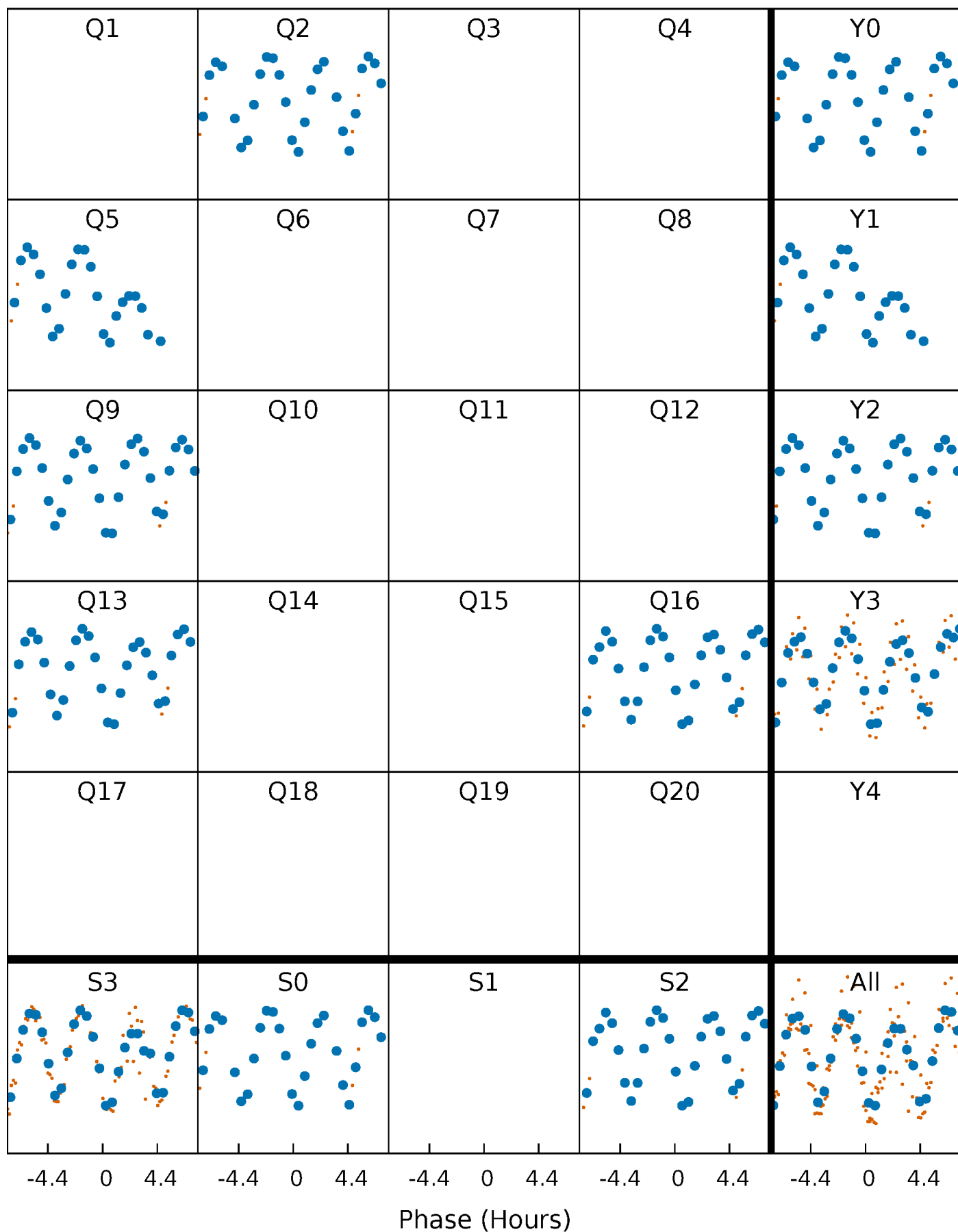


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



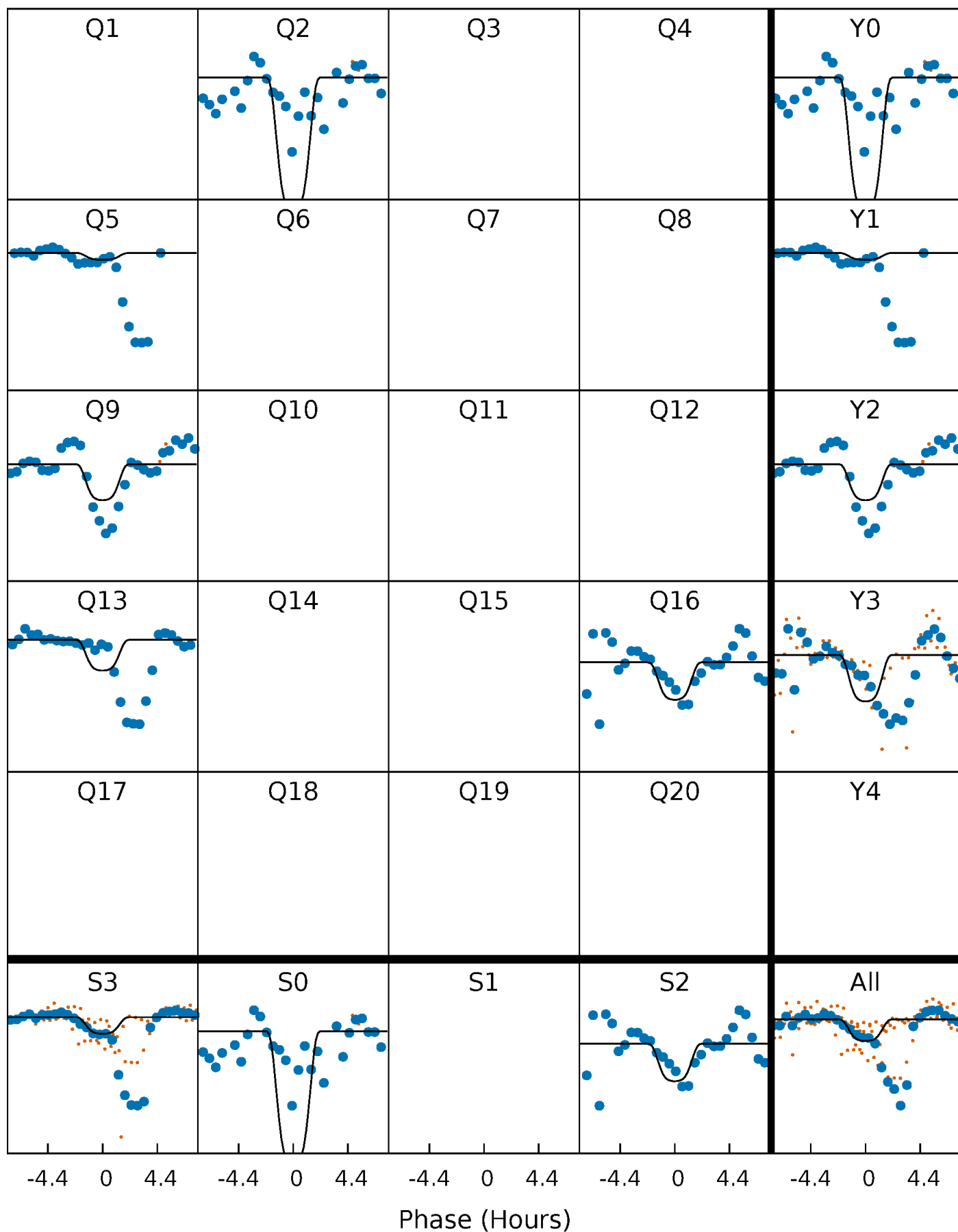
PDC Quarter-Phased Transit Curves

TCE 011710139-02 $P=337.780032$ Days $T_0=200.197157$ (BKJD)



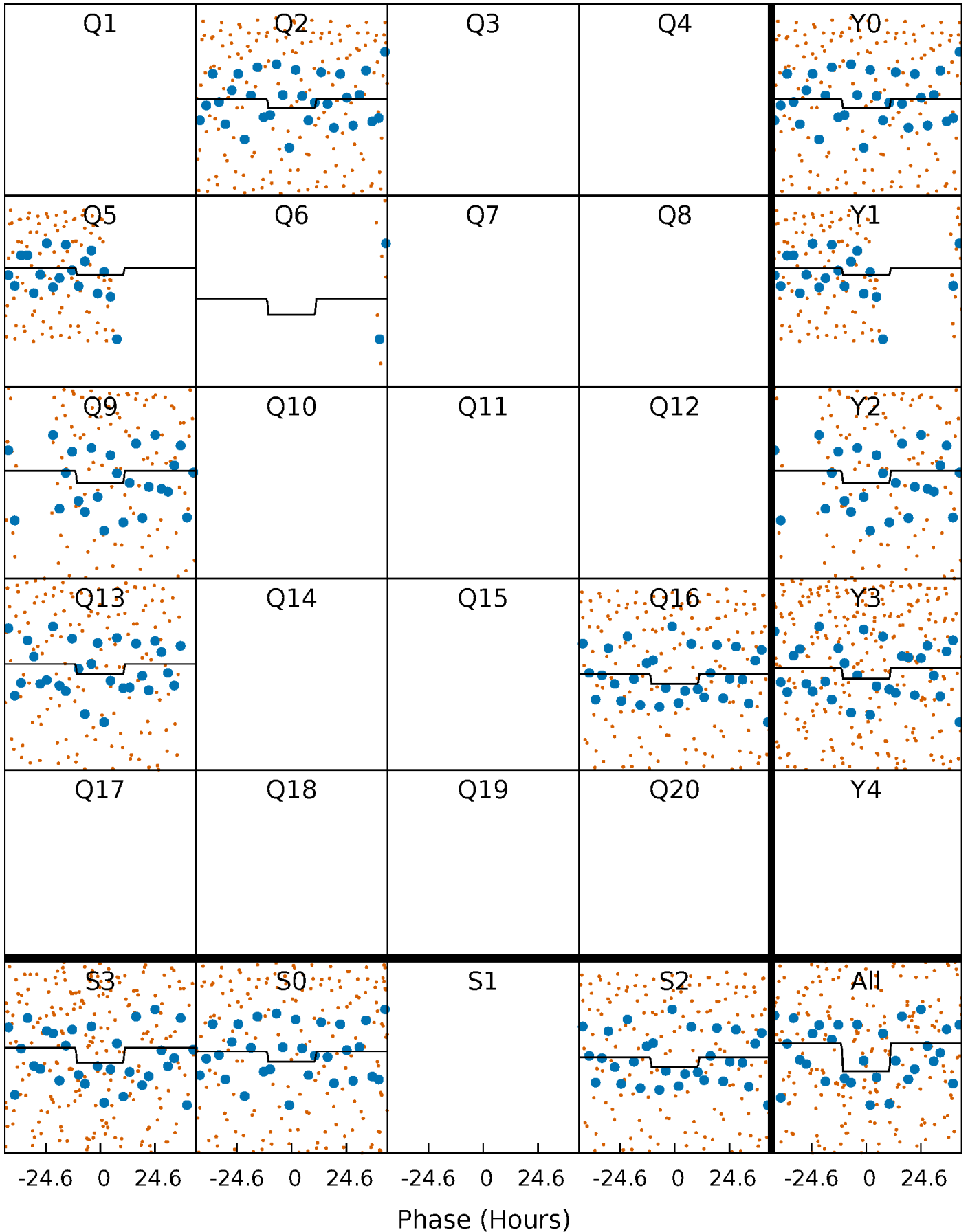
DV Quarter-Phased Transit Curves

TCE 011710139-02 P=337.780032 Days $T_0=200.197157$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

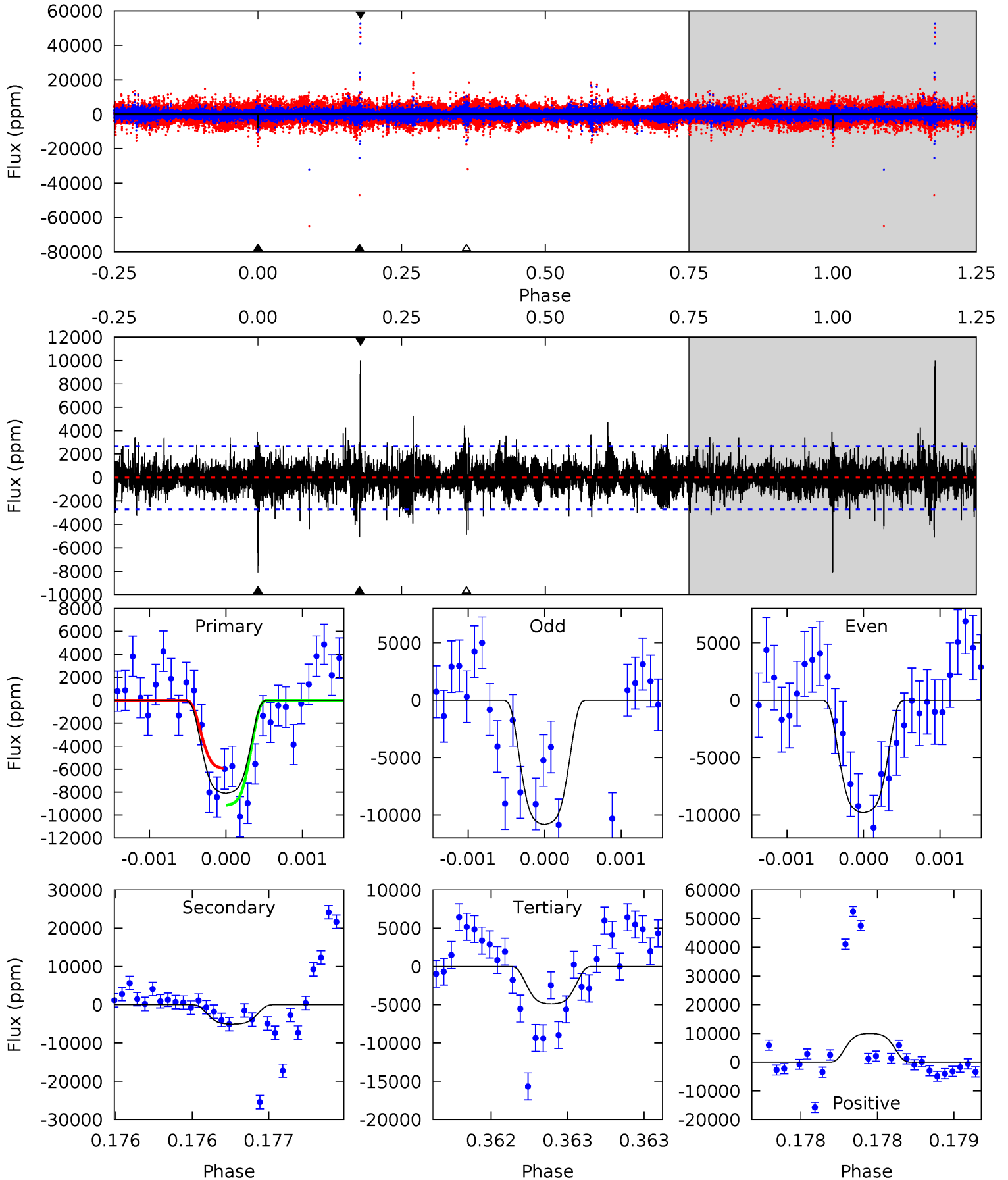
TCE 011710139-02 P=337.807614 Days $T_0=200.073655$ (BKJD)



DV Model-Shift Uniqueness Test

011710139-02, P = 337.780032 Days, E = 200.197157 Days

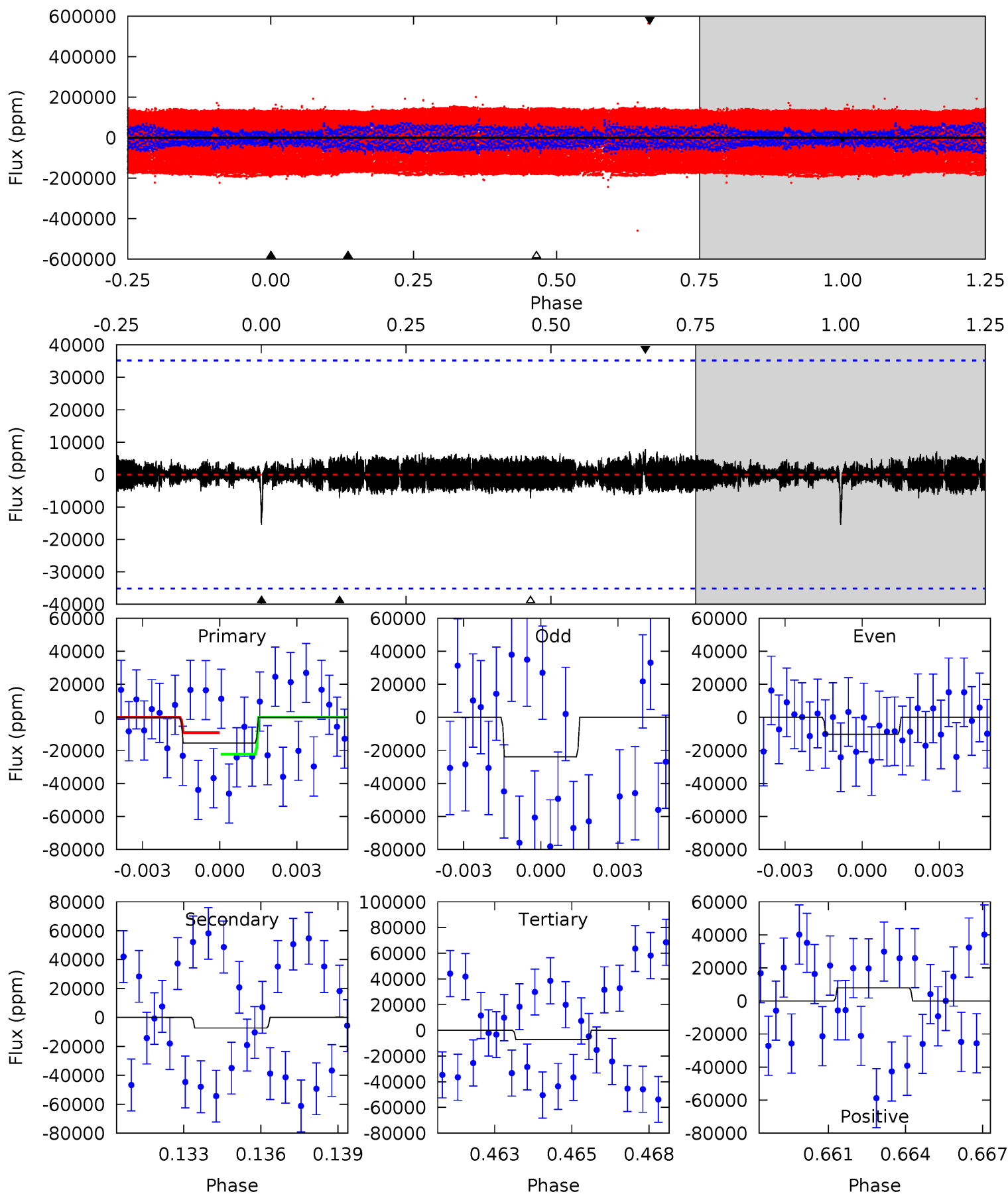
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 16.7 | 10.4 | 10.1 | 20.6 | 5.57 | 3.48 | 2.02 | 6.63 | -3.93 | 0.37 | -10.2 | 0.96 | 1.26 | 0.55 | 3.27 |



Alt Model-Shift Uniqueness Test

011710139-02, P = 337.807614 Days, E = 200.073655 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 2.32 | 1.09 | 1.08 | 1.19 | 5.27 | 3.00 | 0.36 | 1.24 | 1.13 | 0.01 | -0.10 | 0.99 | 0.66 | 0.34 | 0.98 |



Stellar Parameters For KIC 011710139

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5708^{+169}_{-186} | $4.482^{+0.075}_{-0.188}$ | $-0.160^{+0.300}_{-0.300}$ | $0.902^{+0.242}_{-0.104}$ | $0.902^{+0.115}_{-0.094}$ | $1.729^{+0.593}_{-0.867}$ |
| | +3%/-3% | +2%/-4% | +188%/-188% | +27%/-12% | +13%/-10% | +34%/-50% |
| 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 011710139-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|------------------|-------------------------|-------------------|-----------------------|---------------------------|
| DV | -5067 ± 485 | $10.77^{+2.00}_{-1.43}$ | 355^{+24}_{-18} | 4786^{+293}_{-246} | 19905^{+6596}_{-5707} |
| Alt. | -7278 ± 6673 | $12.66^{+1.98}_{-1.61}$ | 355^{+23}_{-18} | 4790^{+860}_{-2336} | 19478^{+21526}_{-19149} |

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 $A_{obs} \gg 1.0$

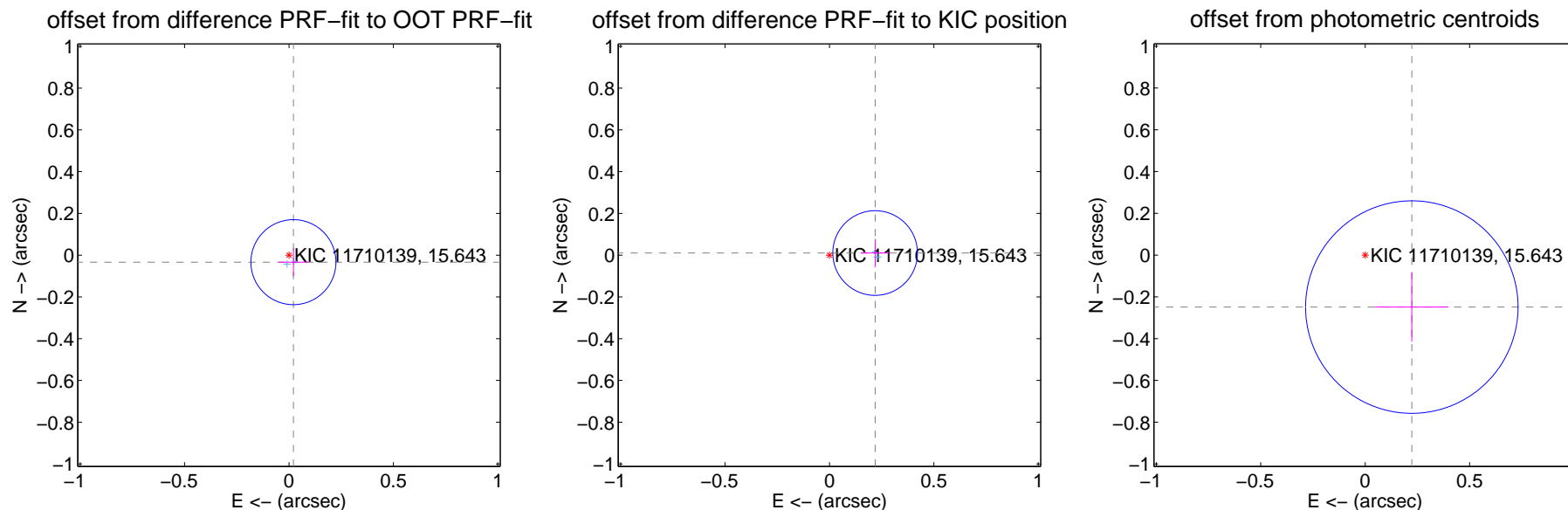
DV Centroid Data

Supplemental centroid analysis for 011710139-02. Kepler magnitude: 15.64. Transit SNR 12.93

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.040 ± 0.068 | 0.58 | -0.021 ± 0.070 | -0.034 ± 0.067 |
| PRF-fit source offset from KIC position | 0.219 ± 0.068 | 3.24 | -0.219 ± 0.068 | 0.010 ± 0.067 |
| photometric centroid source offset | 0.33 ± 0.17 | 1.97 | -0.22 ± 0.18 | -0.25 ± 0.16 |



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.

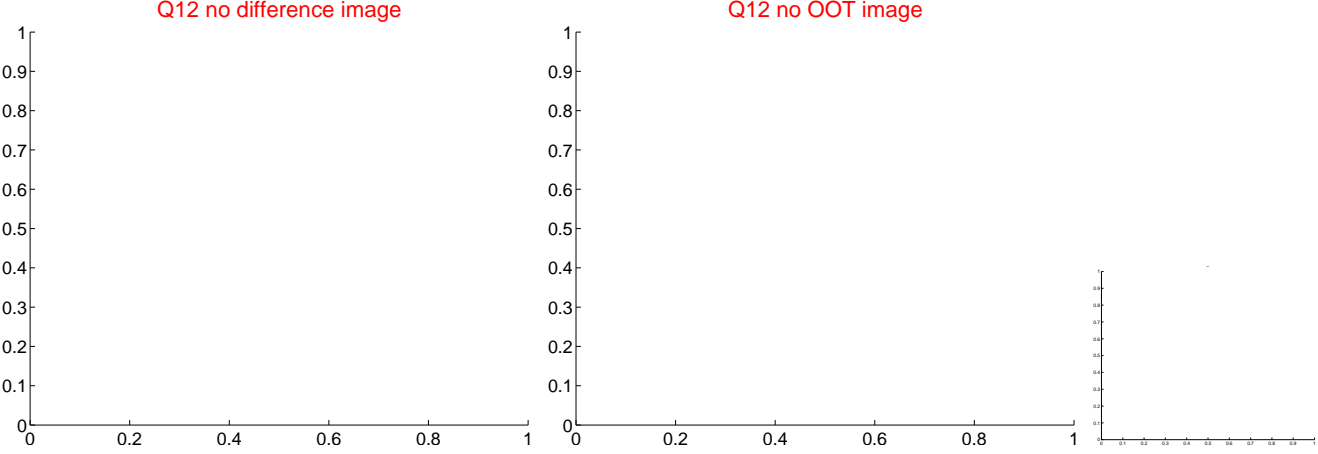
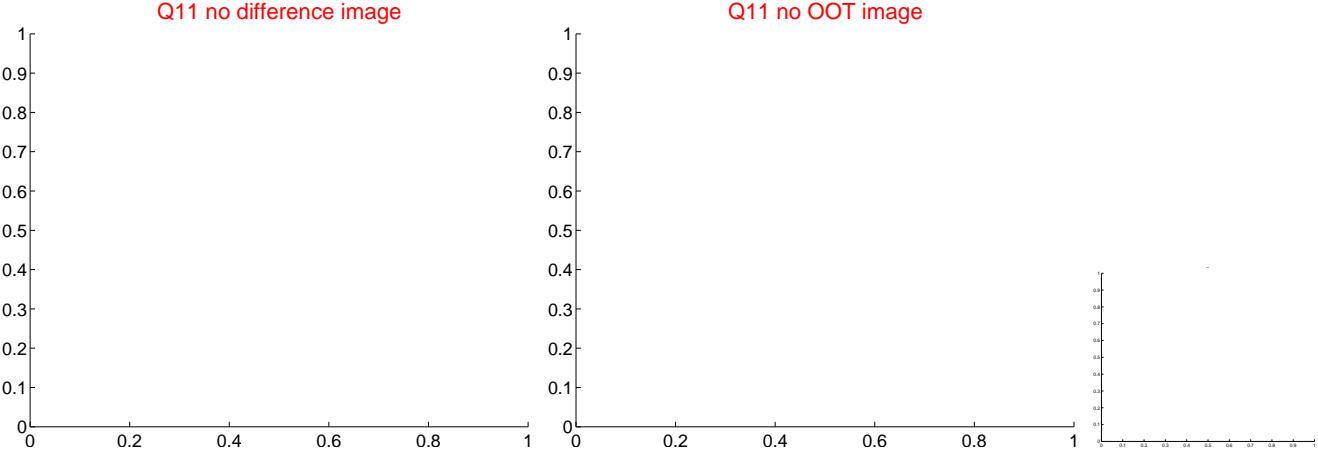
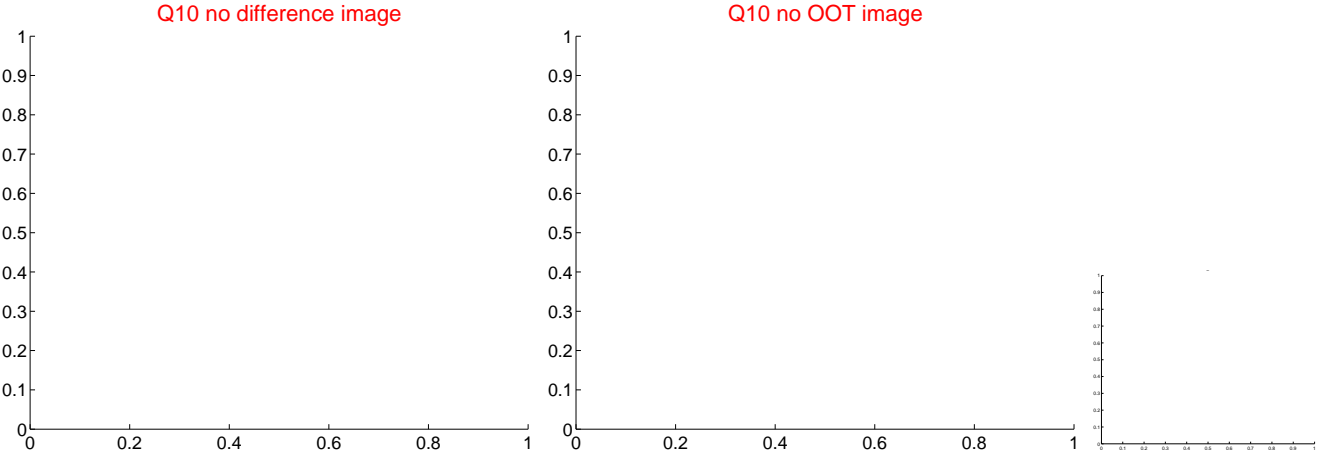
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



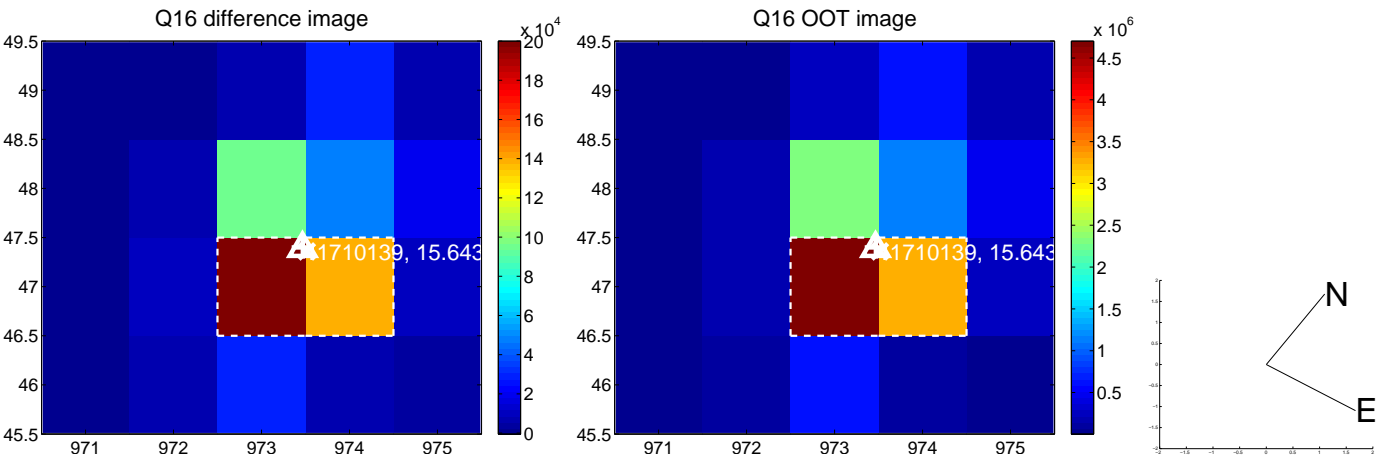
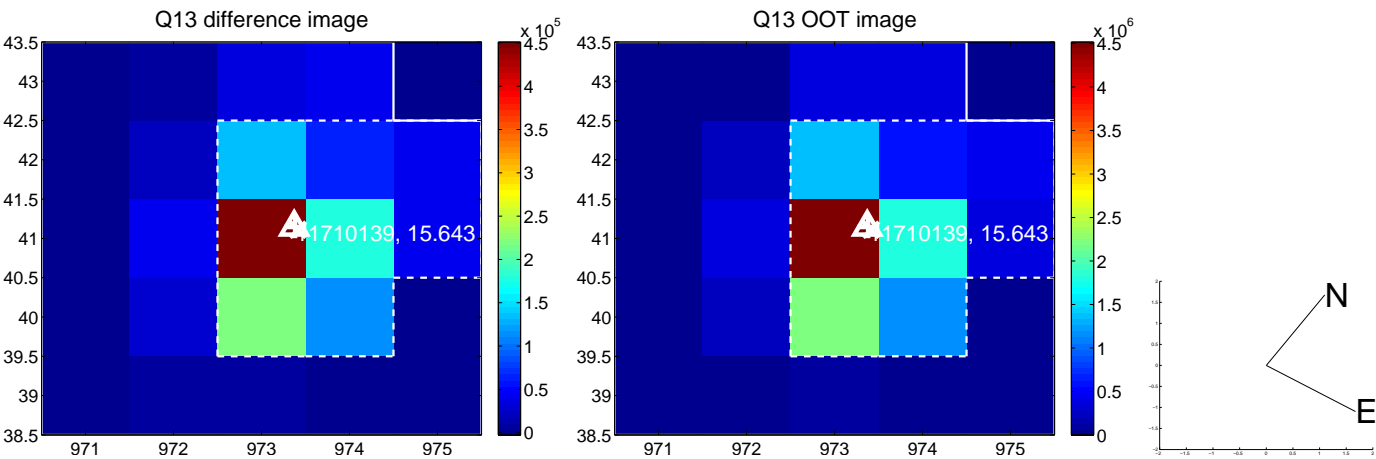
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



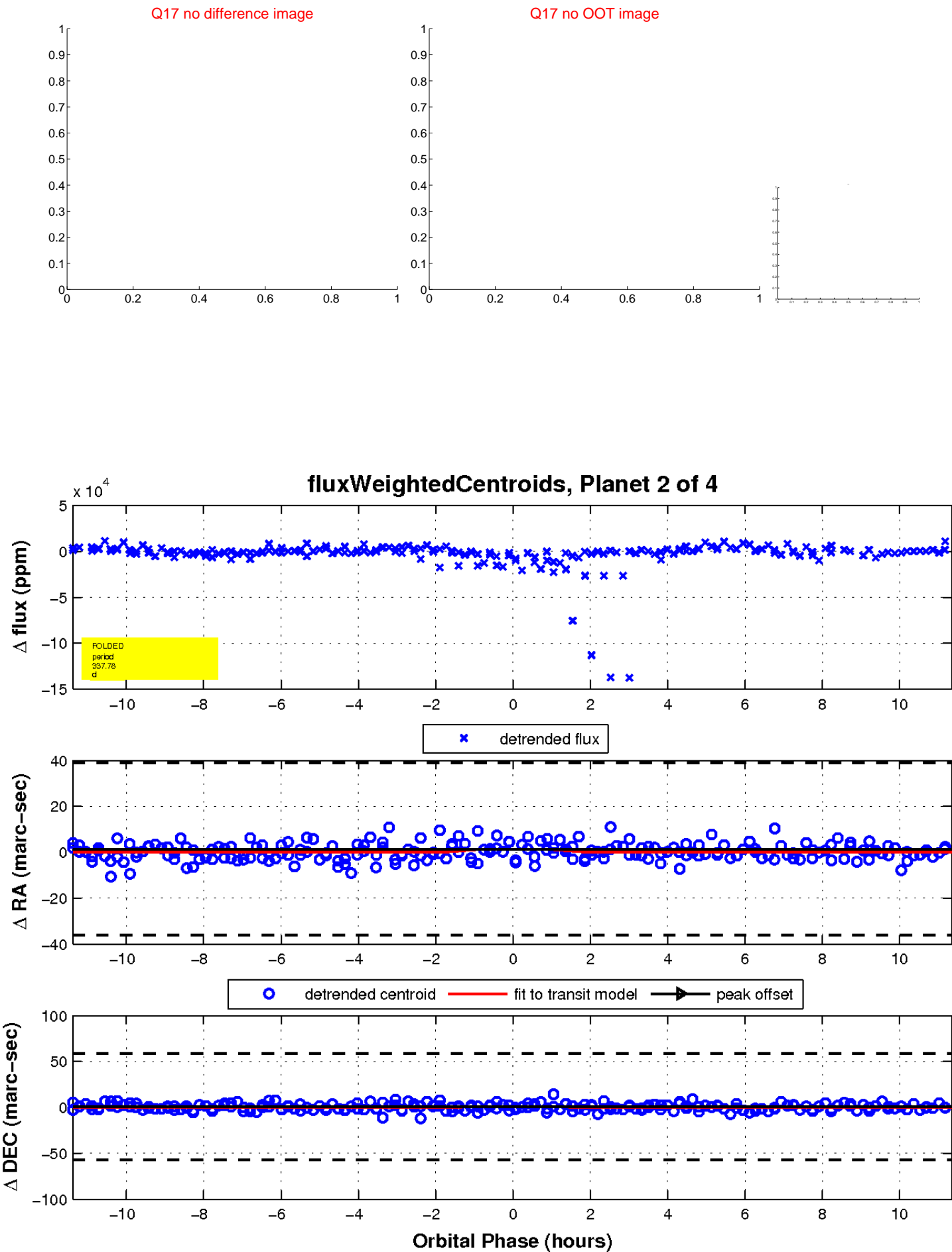
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

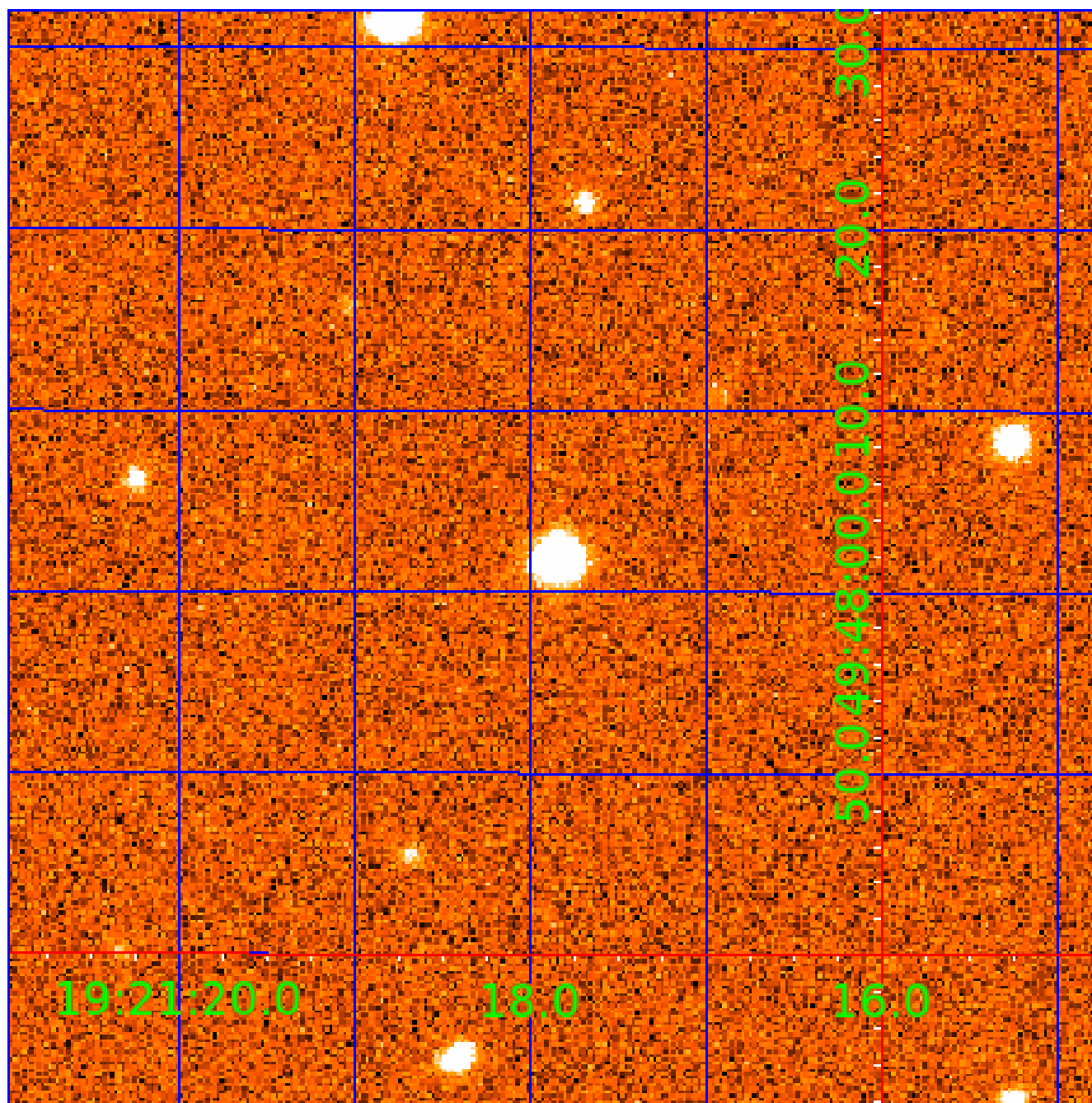


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 011710139

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 011710139-01 | OBS | No | 447.823302 | 430.911523 | 60772.4 | 0.631 | 43.0 | 27.0 | 0.90 | 5708 | 28.07 | 0.63 |
| 011710139-02 | OBS | No | 337.780032 | 200.197157 | 10391.8 | 3.831 | 27.0 | 12.9 | 0.90 | 5708 | 10.54 | 0.92 |
| 011710139-03 | OBS | No | 410.402014 | 349.354172 | 20272.9 | 3.136 | 21.2 | 17.7 | 0.90 | 5708 | 22.80 | 0.71 |
| 011710139-04 | OBS | No | 276.223441 | 383.185770 | 16327.2 | 3.418 | 14.4 | 22.7 | 0.90 | 5708 | 11.56 | 1.20 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 011710139-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

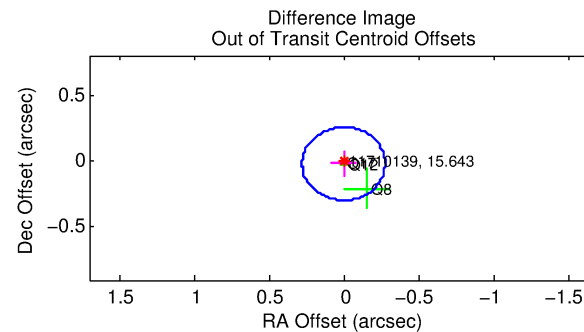
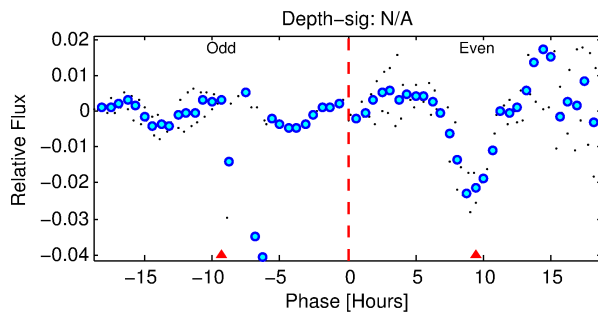
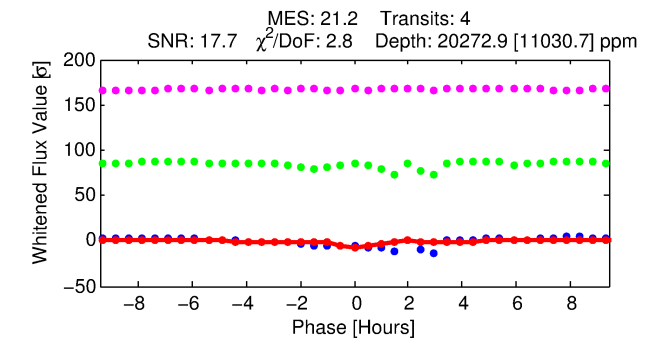
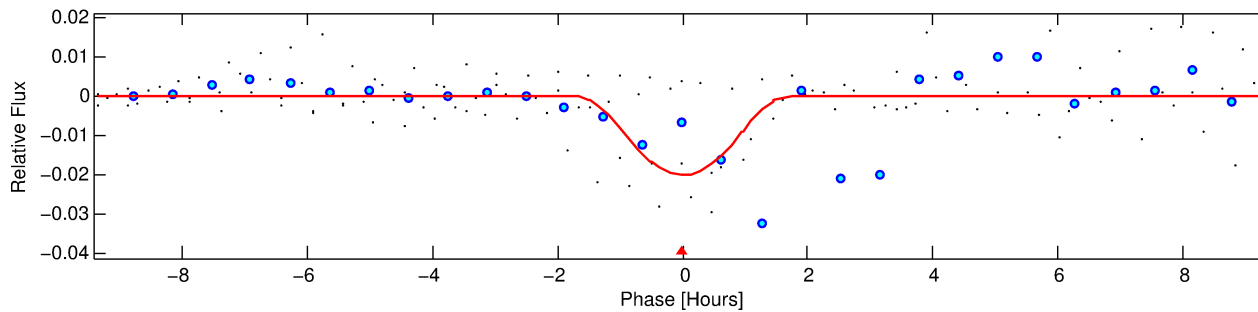
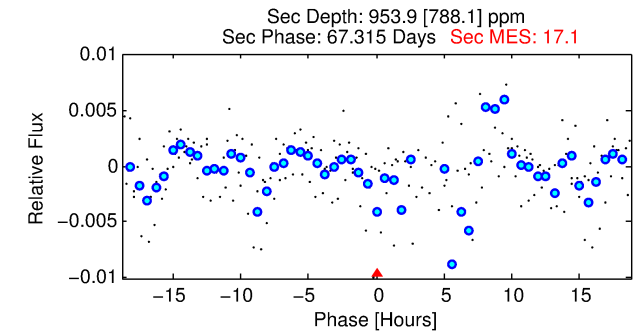
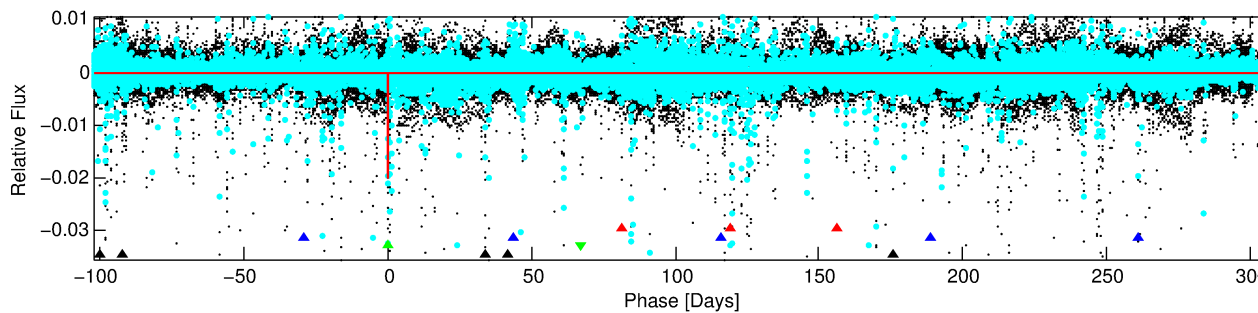
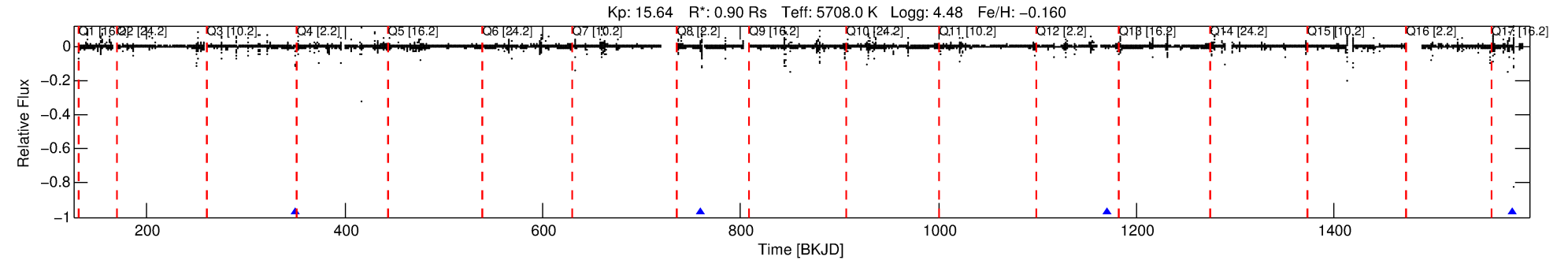
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 011710139-03

No Significant Match Found

DV One-Page Summary

KIC: 11710139 Candidate: 3 of 4 Period: 410.402 d



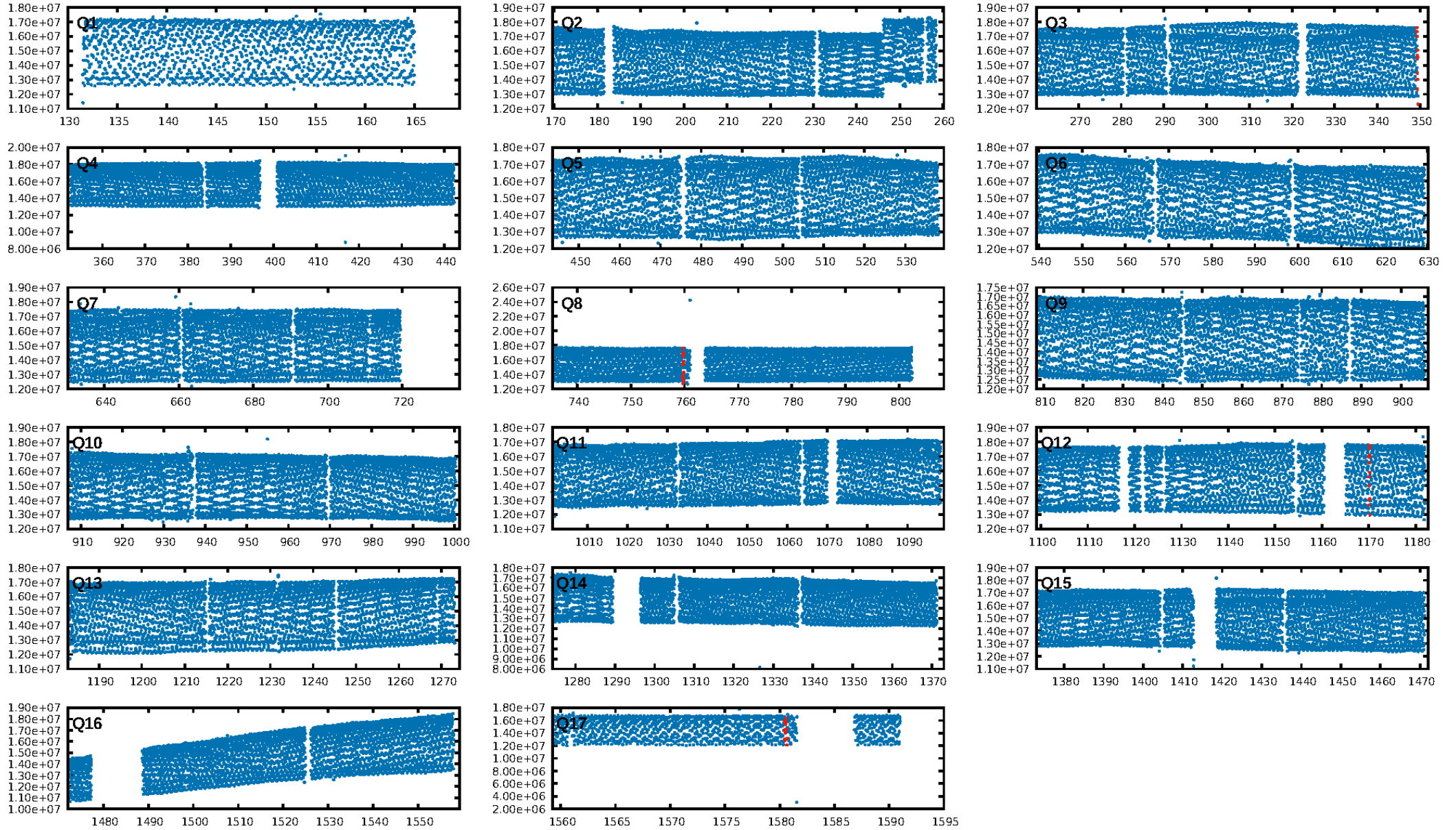
DV Fit Results:

Period = 410.40201 [0.00540] d
Epoch = 349.3542 [0.0102] BKJD
Rp/R* = 0.2317 [1.1604]
a/R* = 719.05 [342.44]
b = 1.00 [1.51]
Seff = 0.71 [0.26]
Teq = 234 [21] K
Rp = 22.80 [114.38] Re
a = 1.0439 [0.2399] AU
Ag = 1099.58 [11057.90] [0.10σ]
Teffp = 2084 [5237] K [0.35σ]

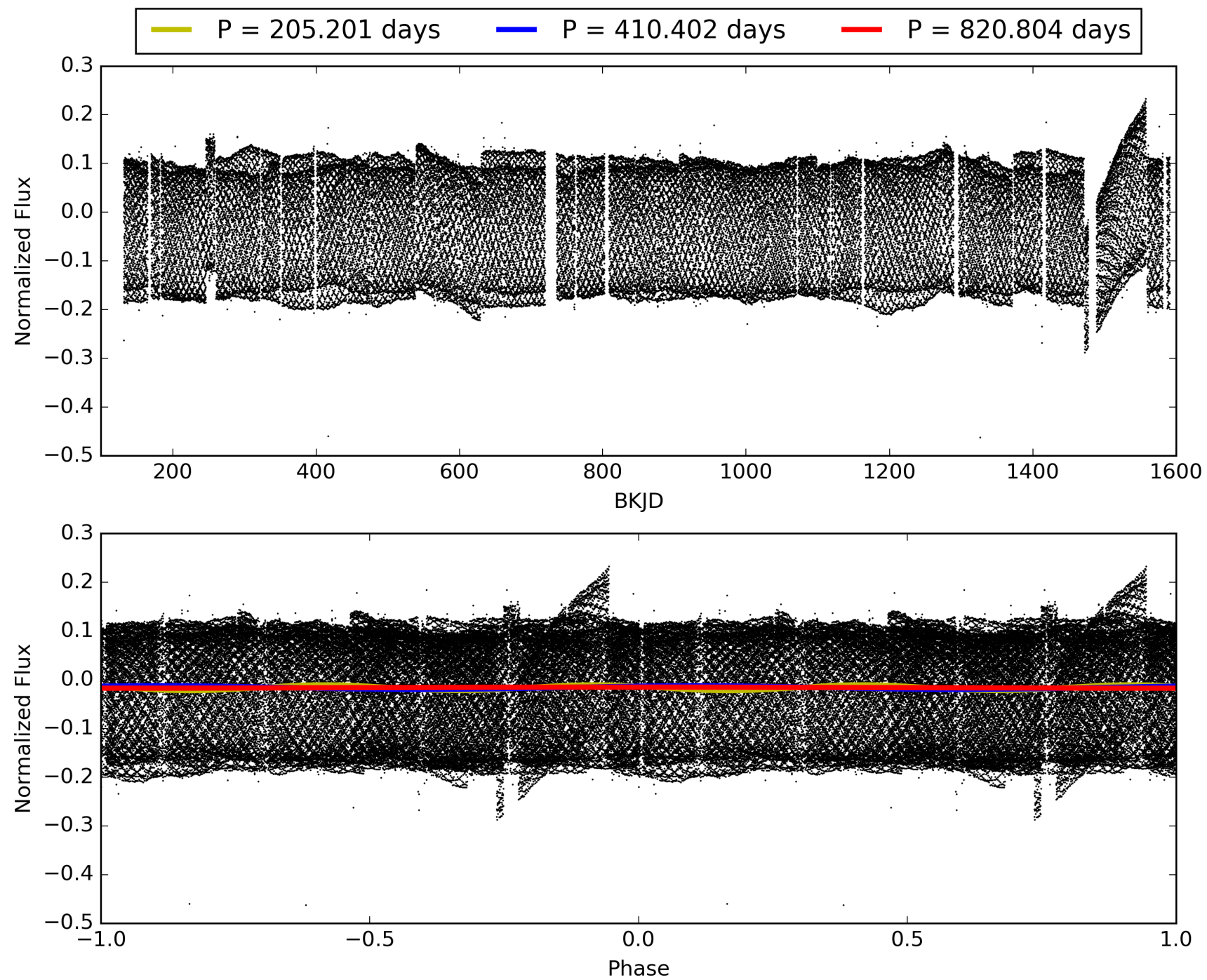
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [352.04σ]
LongPeriod-sig: 100.0% [280.77σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.3%
Bootstrap-pfa: 4.84e-05
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.734
Centroid-sig: 71.6%
Centroid-so: 0.232 arcsec [1.88σ]
OotOffset-rm: 0.020 arcsec [0.22σ]
KicOffset-rm: 0.192 arcsec [2.28σ]
OotOffset-st: 0/0/2/1 [3]
KicOffset-st: 0/0/2/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 011710139-03, PDC Light Curves

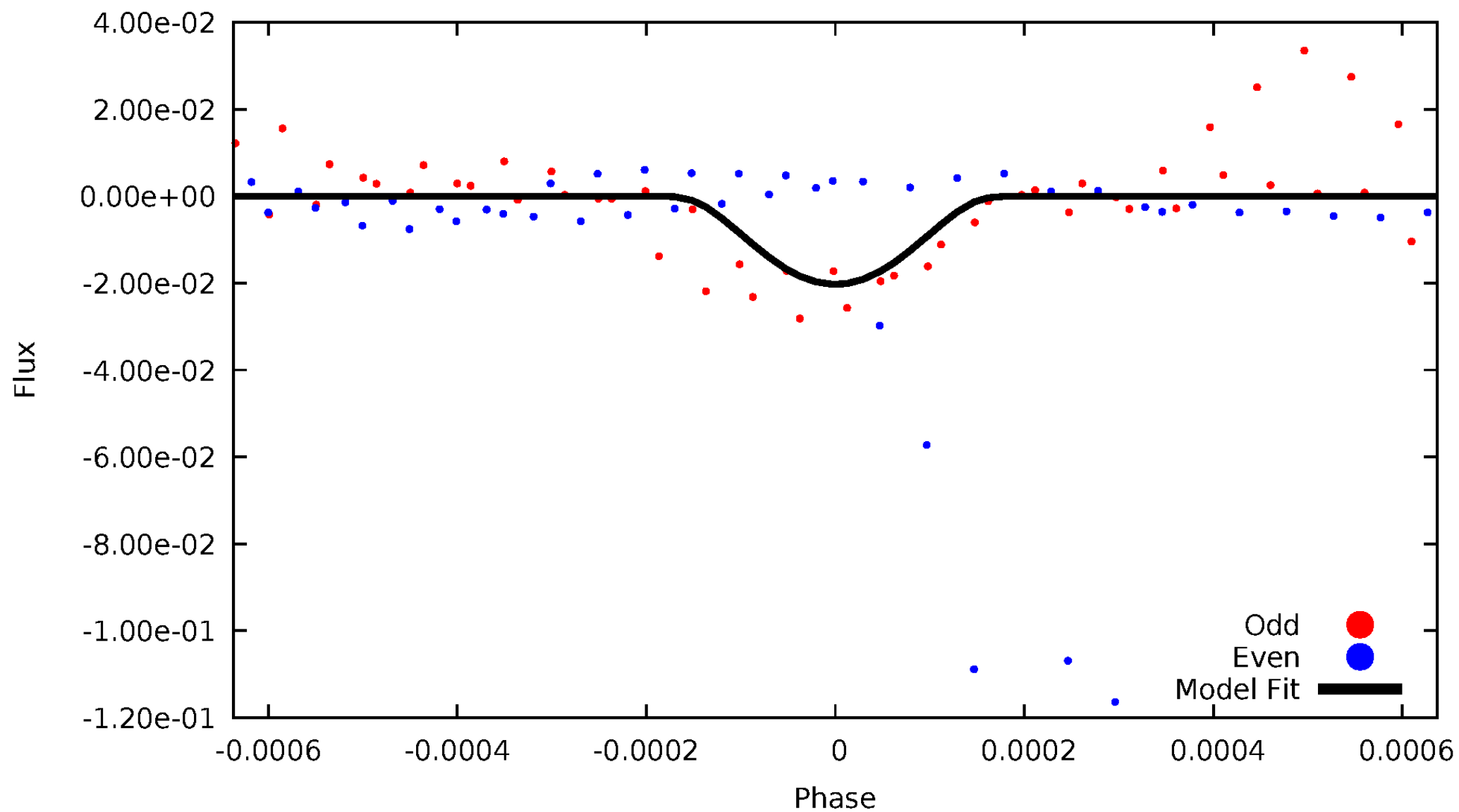


TCE 011710139-03



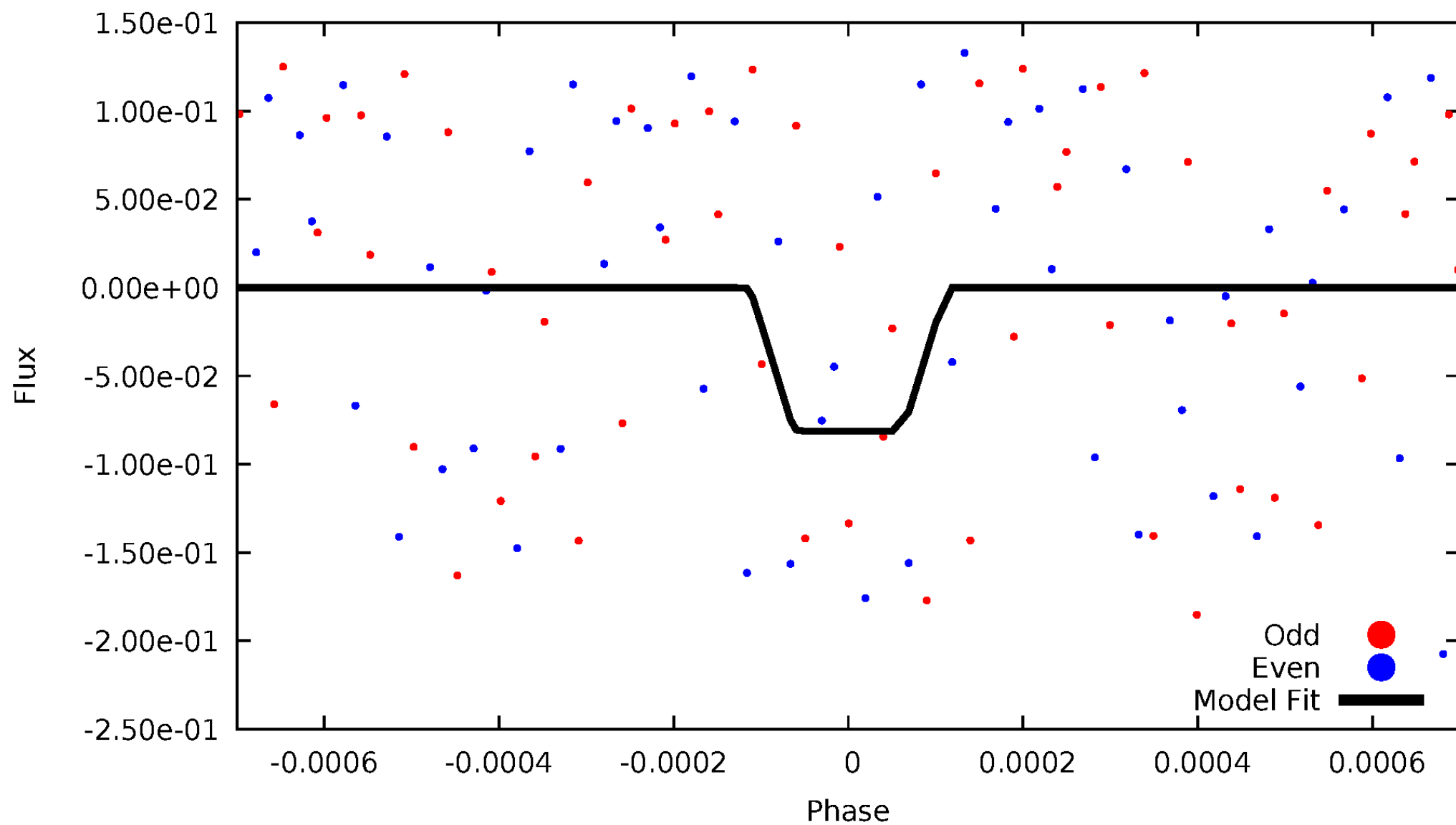
DV Odd/Even

TCE 011710139-03



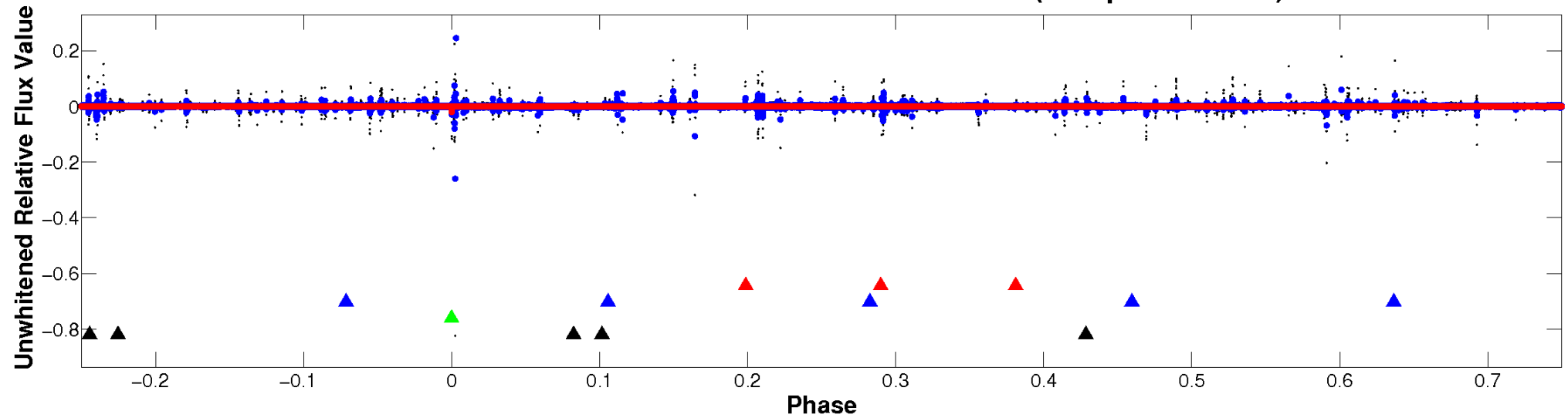
ALT Odd/Even

TCE 011710139-03

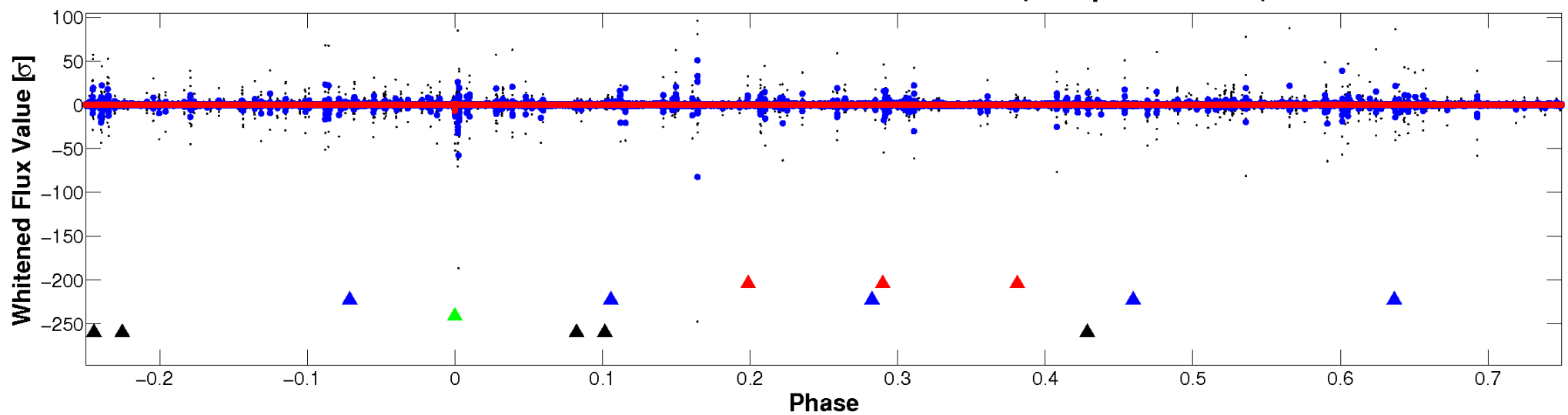


Non-Whitened Vs. Whitened Light Curve

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

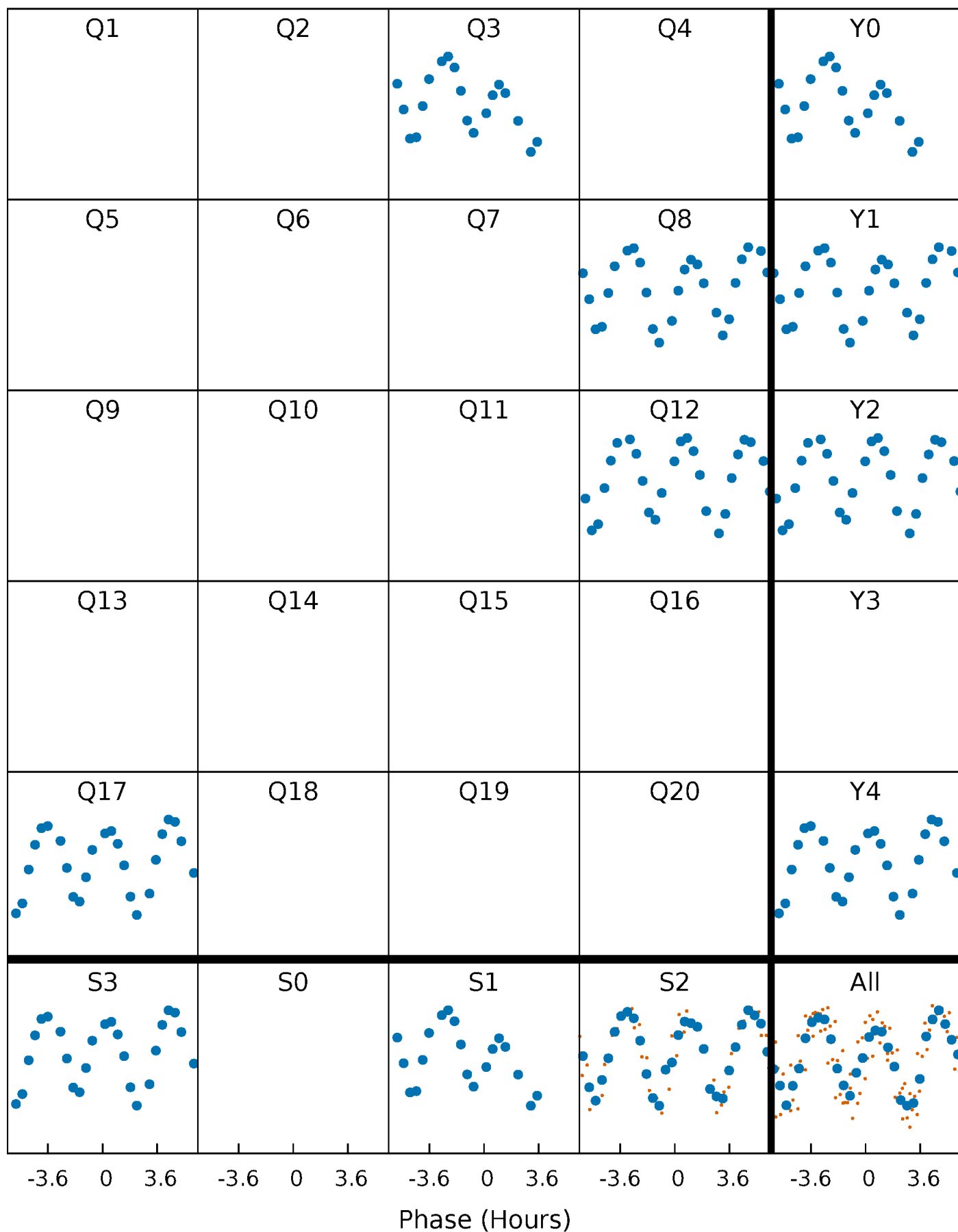


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



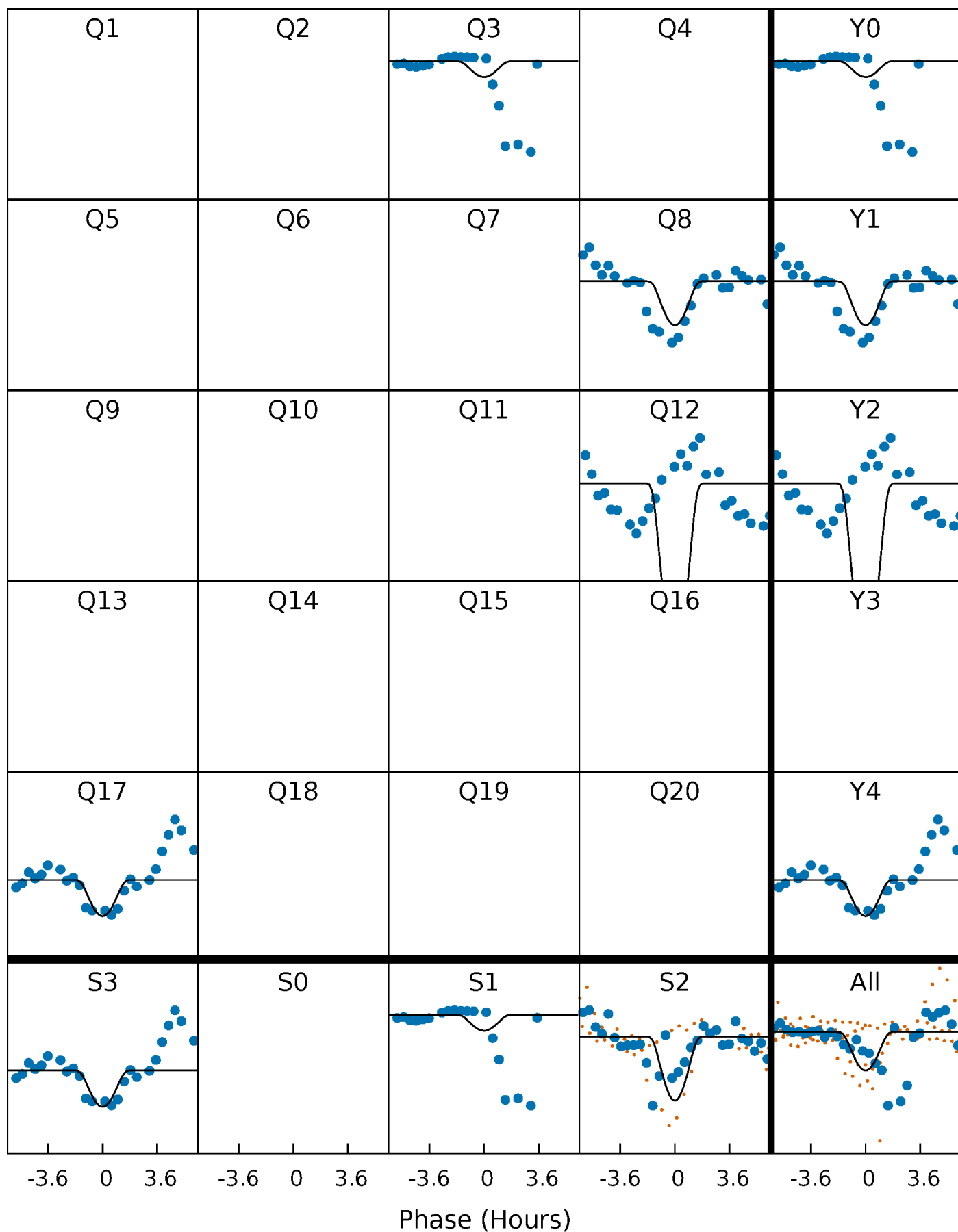
PDC Quarter-Phased Transit Curves

TCE 011710139-03 P=410.402014 Days $T_0=349.354172$ (BKJD)



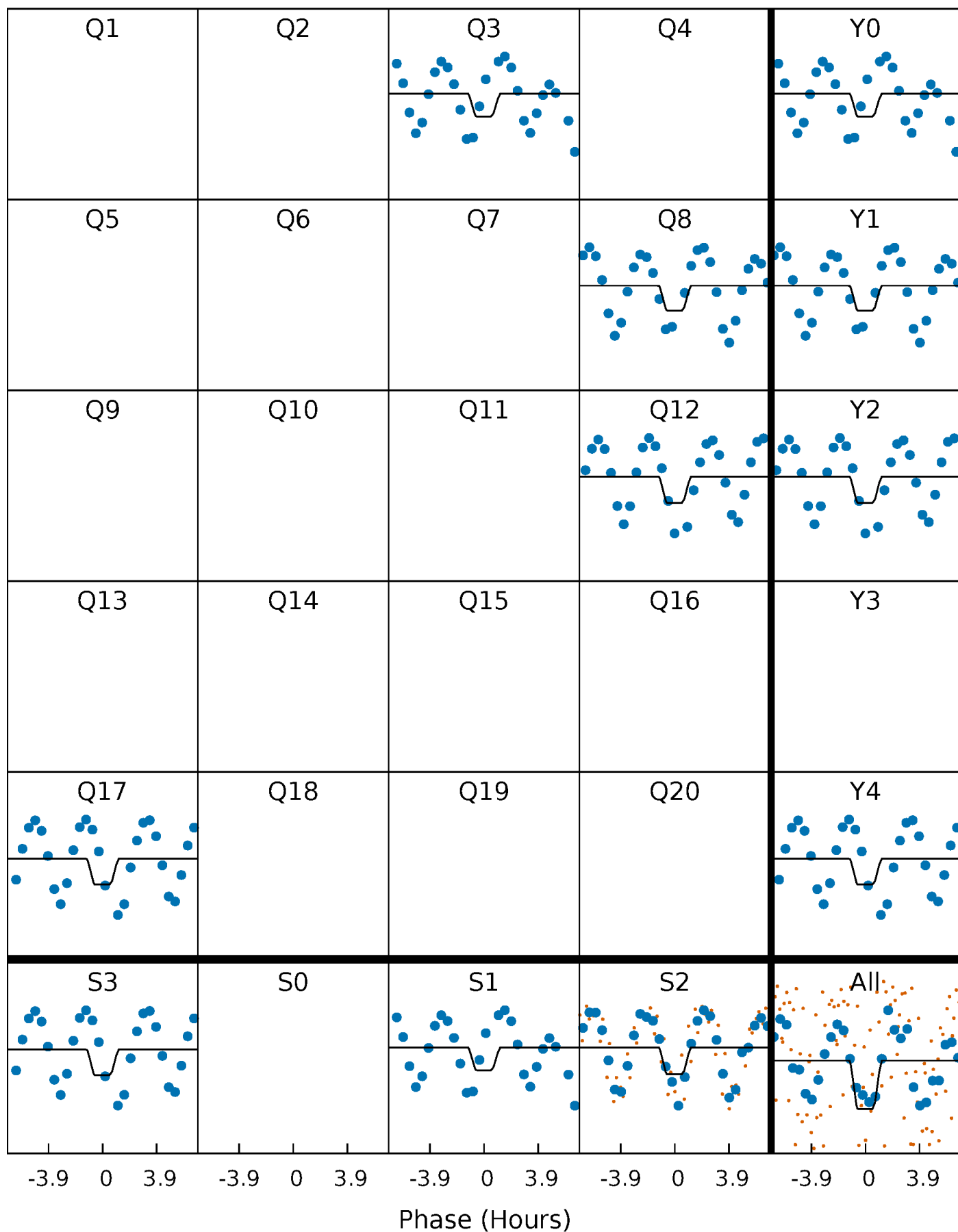
DV Quarter-Phased Transit Curves

TCE 011710139-03 P=410.402014 Days $T_0=349.354172$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

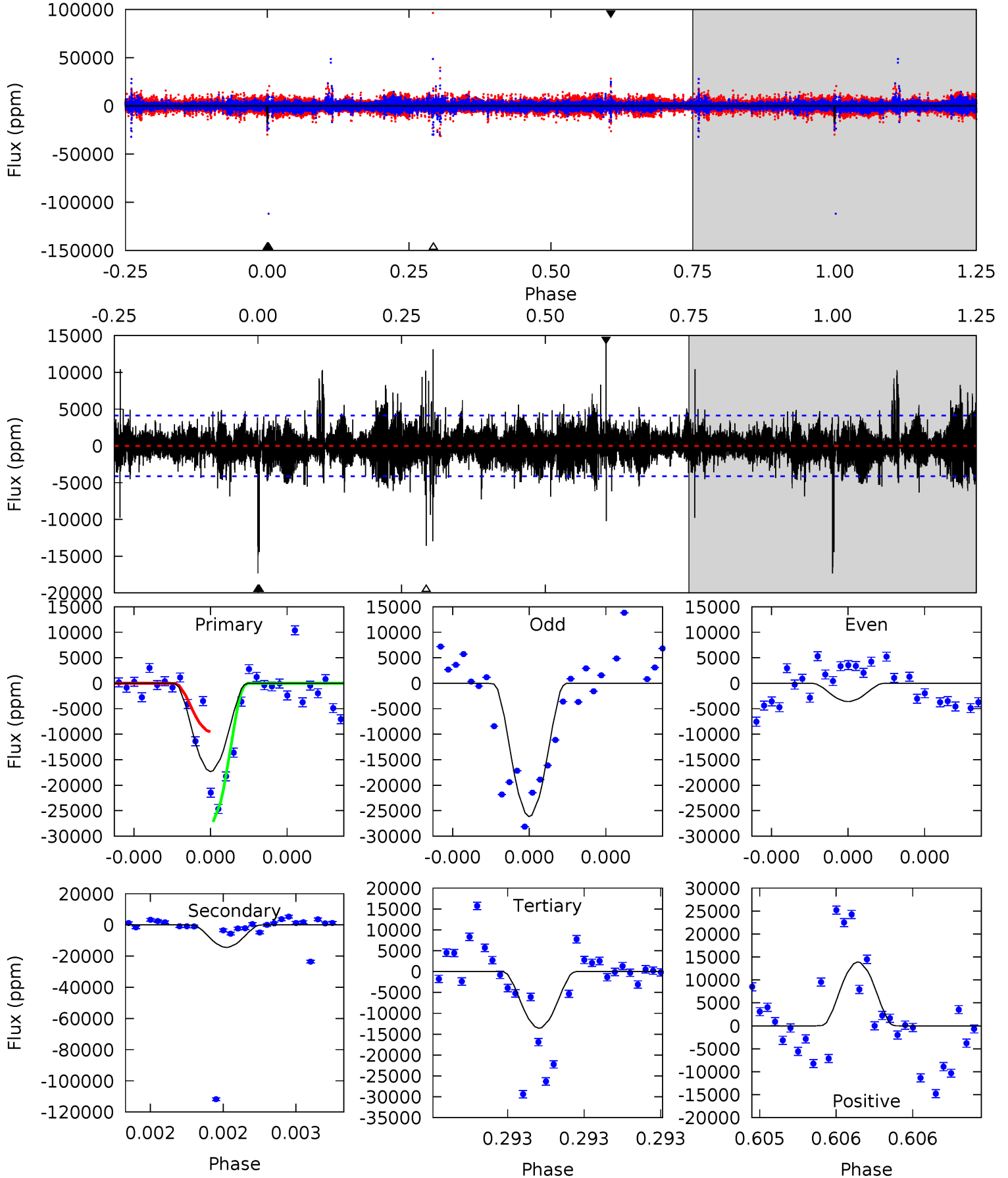
TCE 011710139-03 P=410.360374 Days $T_0=349.196343$ (BKJD)



DV Model-Shift Uniqueness Test

011710139-03, P = 410.402014 Days, E = 349.354172 Days

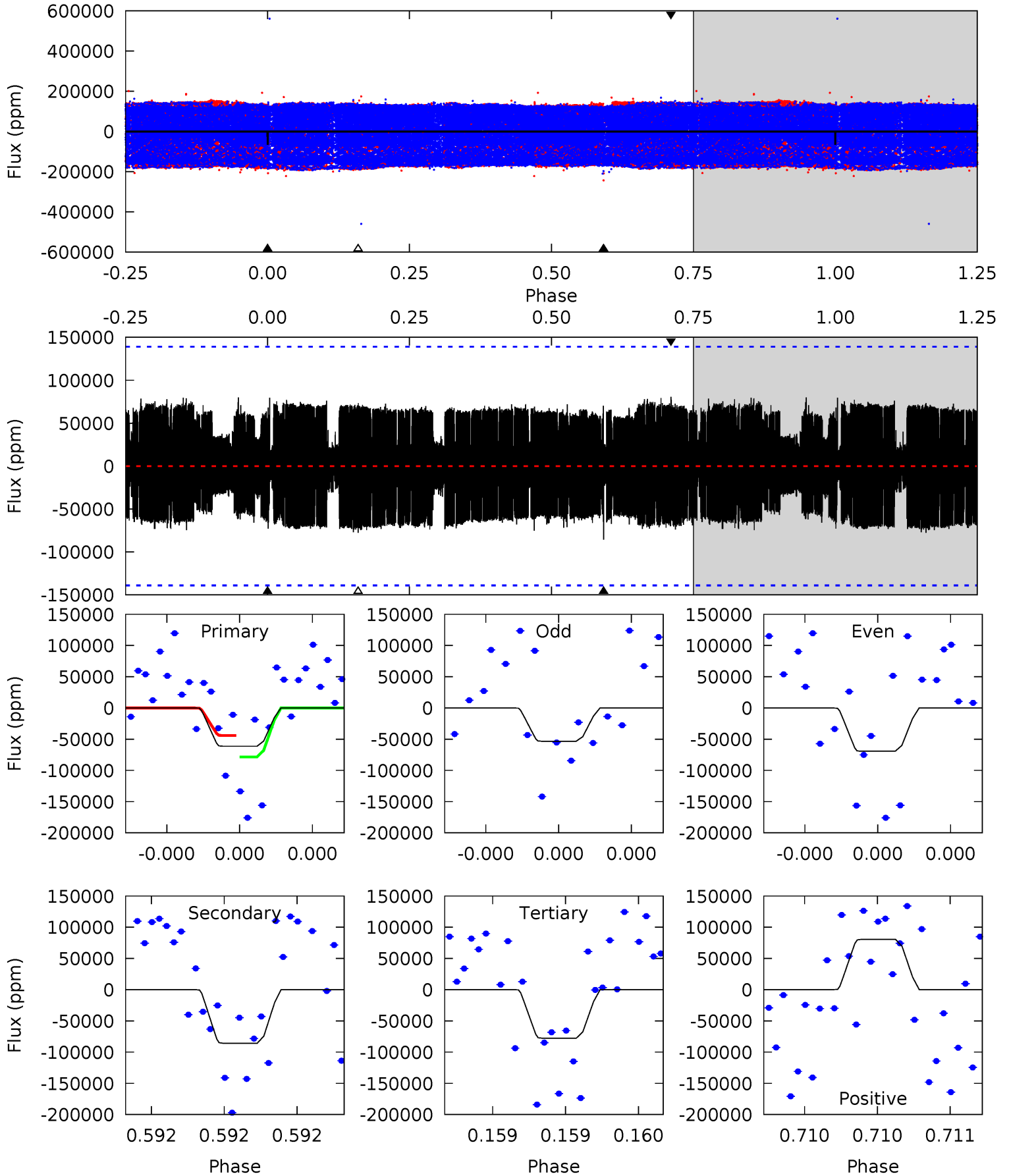
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 23.6 | 19.6 | 18.5 | 18.9 | 5.63 | 3.56 | 2.36 | 5.10 | 4.65 | 1.15 | 0.70 | 13.5 | 0.84 | 0.45 | 12.2 |



Alt Model-Shift Uniqueness Test

011710139-03, P = 410.360374 Days, E = 349.196343 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 2.52 | 3.53 | 3.19 | 3.31 | 5.72 | 3.71 | 1.62 | -0.67 | -0.79 | 0.33 | 0.22 | 0.33 | 1.06 | 0.48 | 0.70 |



Stellar Parameters For KIC 011710139

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5708^{+169}_{-186} | $4.482^{+0.075}_{-0.188}$ | $-0.160^{+0.300}_{-0.300}$ | $0.902^{+0.242}_{-0.104}$ | $0.902^{+0.115}_{-0.094}$ | $1.729^{+0.593}_{-0.867}$ |
| | +3%/-3% | +2%/-4% | +188%/-188% | +27%/-12% | +13%/-10% | +34%/-50% |
| 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 011710139-03 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|--------------------|---------------------------|-------------------|-----------------------|-------------------------|
| DV | -14426 ± 734 | $85.86^{+92.47}_{-56.86}$ | 331^{+21}_{-17} | 2863^{+1195}_{-469} | 1174^{+9124}_{-899} |
| Alt. | -85687 ± 24287 | $94.02^{+93.25}_{-61.64}$ | 333^{+22}_{-18} | 3710^{+1799}_{-747} | 5928^{+41575}_{-4467} |

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 $A_{obs} \gg 1.0$

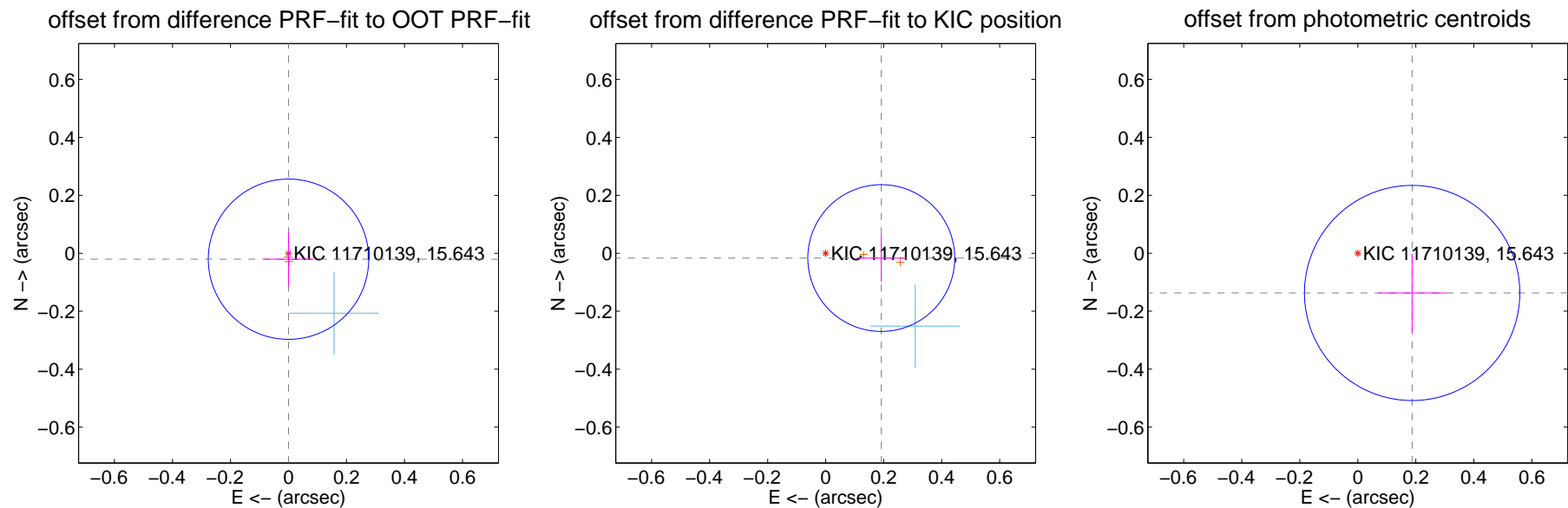
DV Centroid Data

Supplemental centroid analysis for 011710139-03. Kepler magnitude: 15.64. Transit SNR 17.70

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.020 ± 0.092 | 0.22 | -0.000 ± 0.085 | -0.020 ± 0.092 |
| PRF-fit source offset from KIC position | 0.192 ± 0.084 | 2.28 | -0.192 ± 0.084 | -0.016 ± 0.082 |
| photometric centroid source offset | 0.23 ± 0.12 | 1.88 | -0.19 ± 0.12 | -0.14 ± 0.14 |

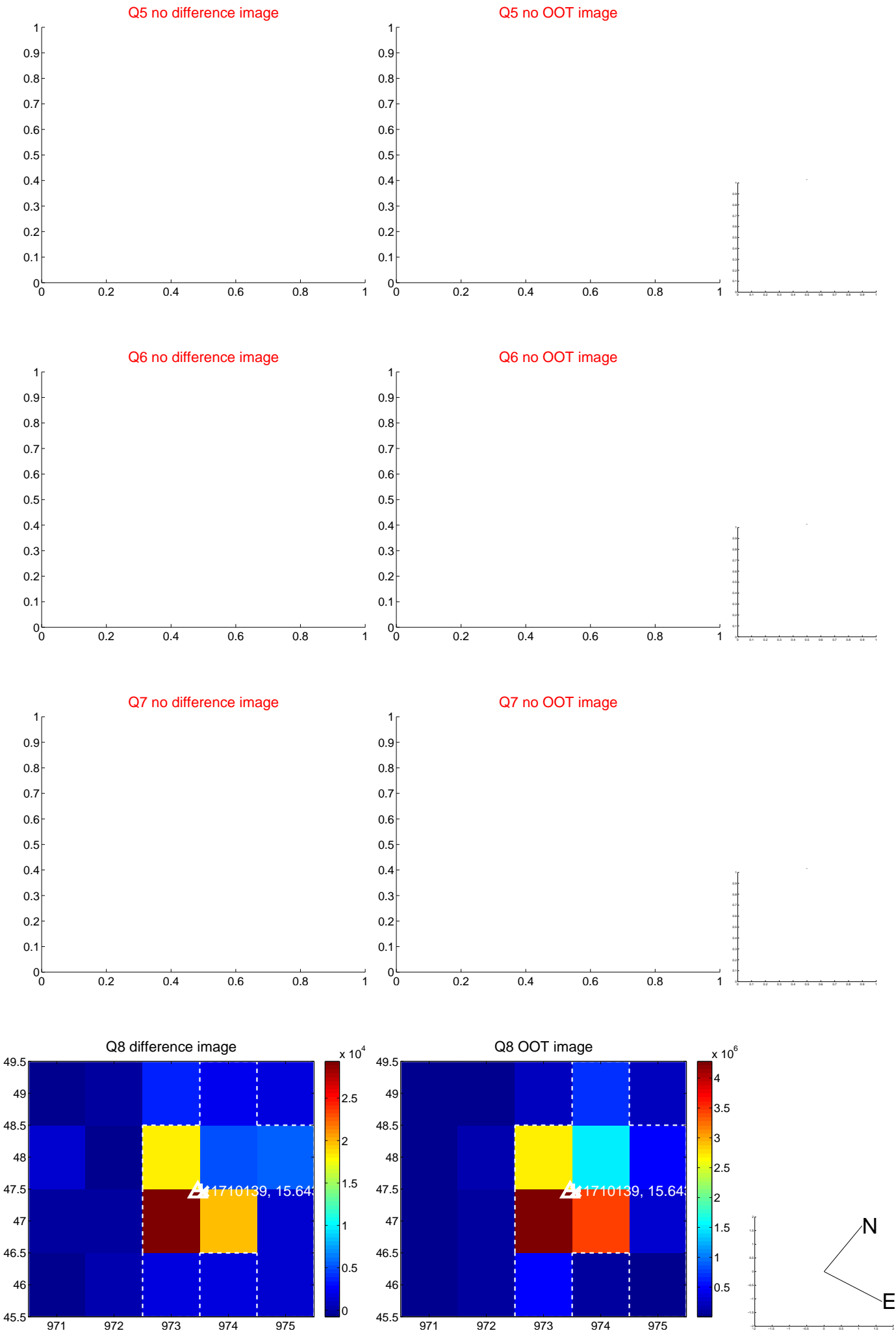


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

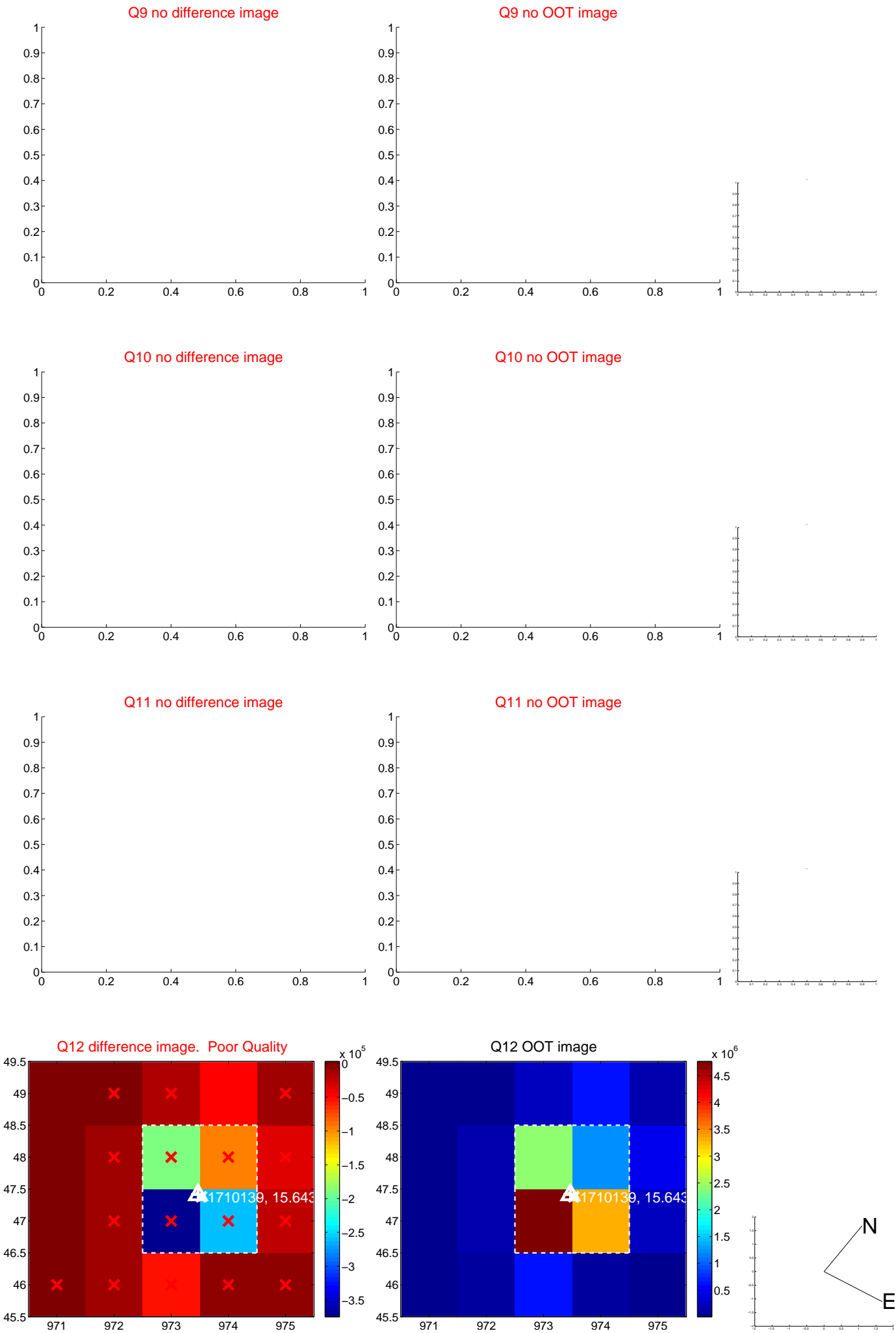
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



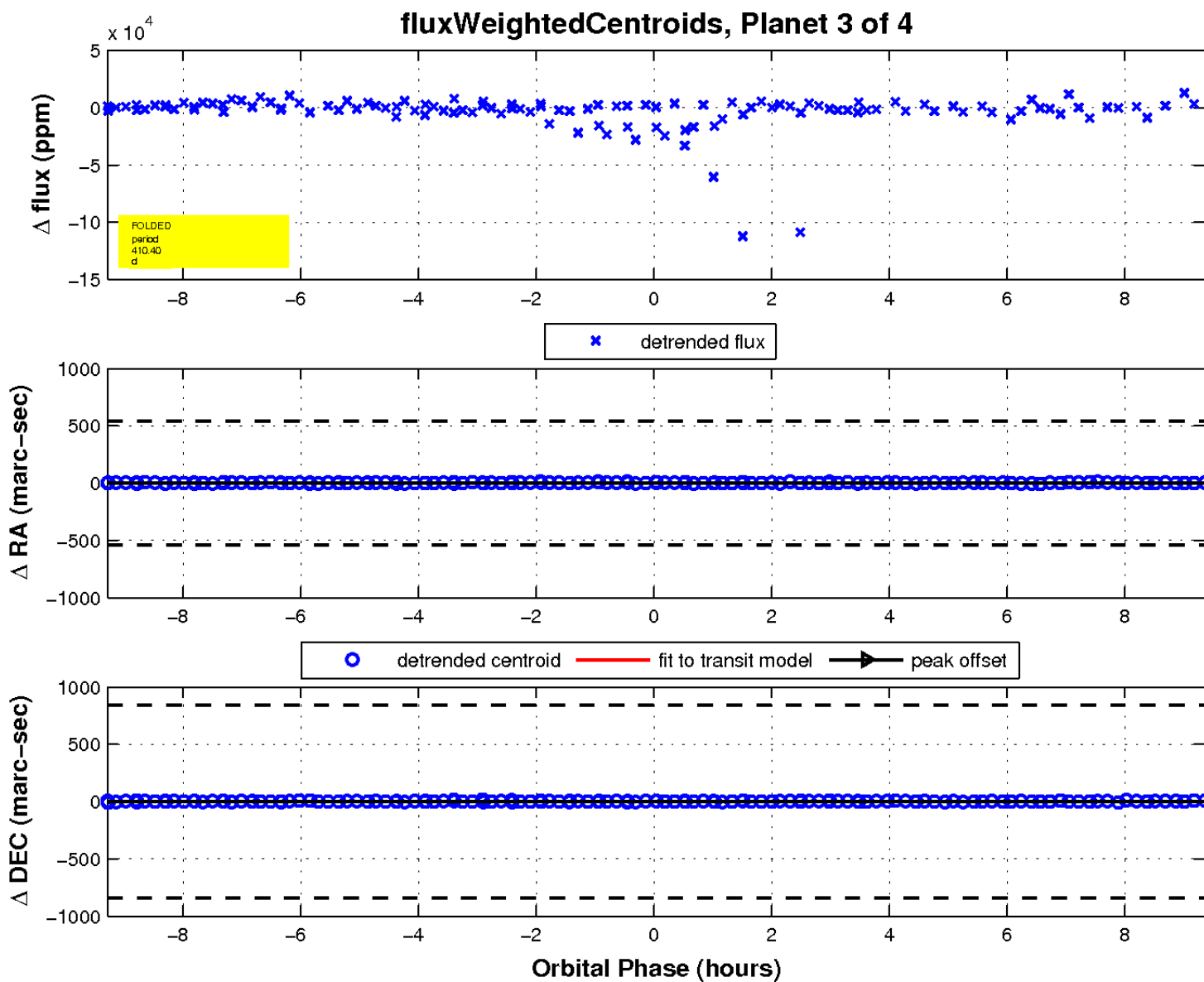
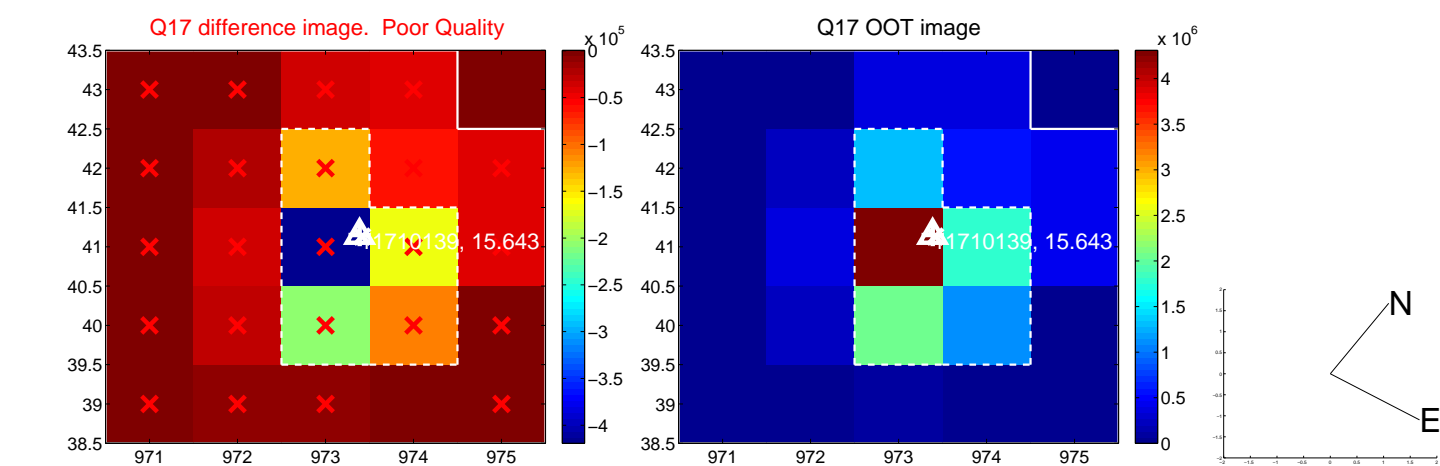
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

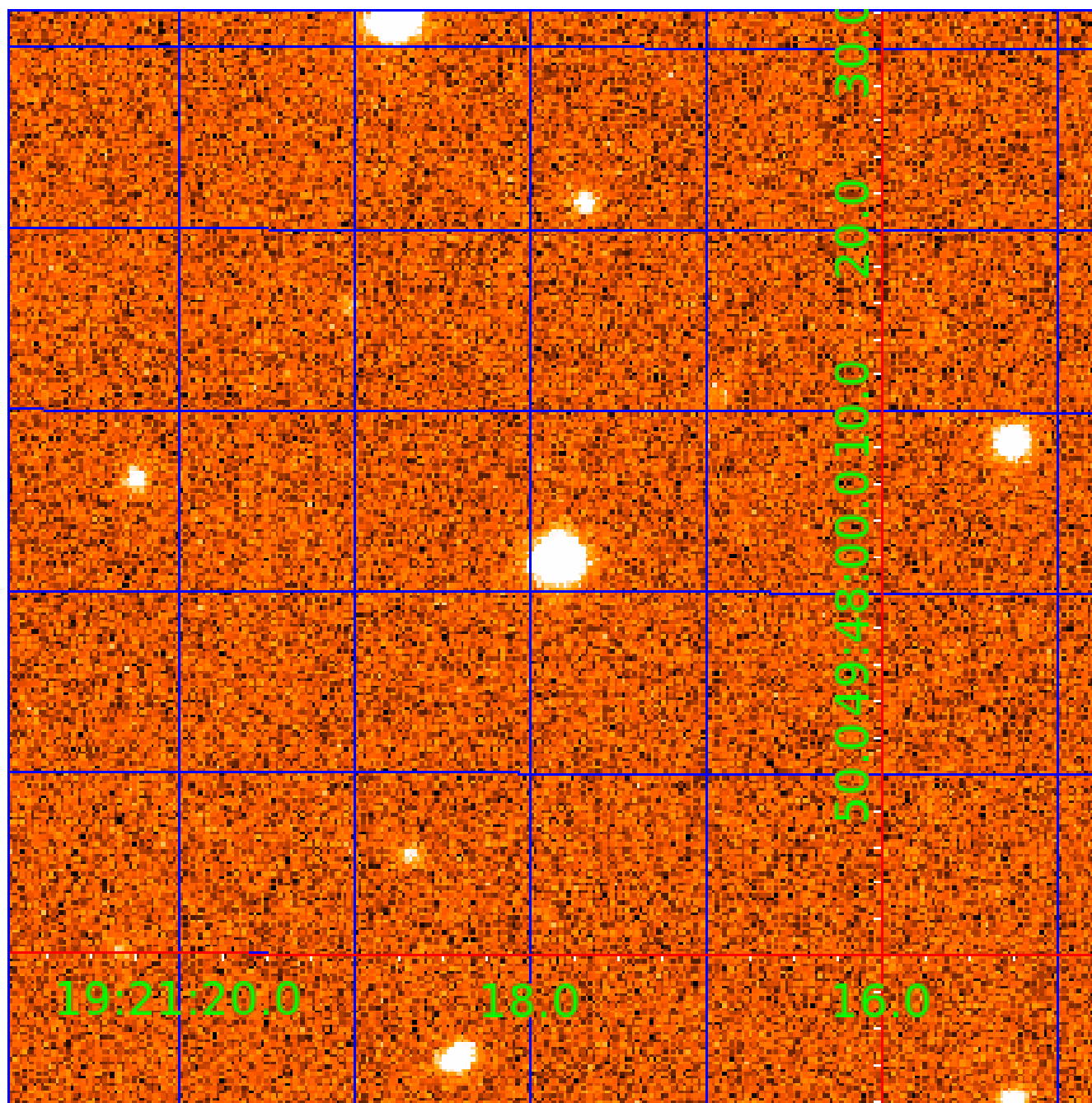


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 011710139

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 011710139-01 | OBS | No | 447.823302 | 430.911523 | 60772.4 | 0.631 | 43.0 | 27.0 | 0.90 | 5708 | 28.07 | 0.63 |
| 011710139-02 | OBS | No | 337.780032 | 200.197157 | 10391.8 | 3.831 | 27.0 | 12.9 | 0.90 | 5708 | 10.54 | 0.92 |
| 011710139-03 | OBS | No | 410.402014 | 349.354172 | 20272.9 | 3.136 | 21.2 | 17.7 | 0.90 | 5708 | 22.80 | 0.71 |
| 011710139-04 | OBS | No | 276.223441 | 383.185770 | 16327.2 | 3.418 | 14.4 | 22.7 | 0.90 | 5708 | 11.56 | 1.20 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 011710139-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 011710139-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

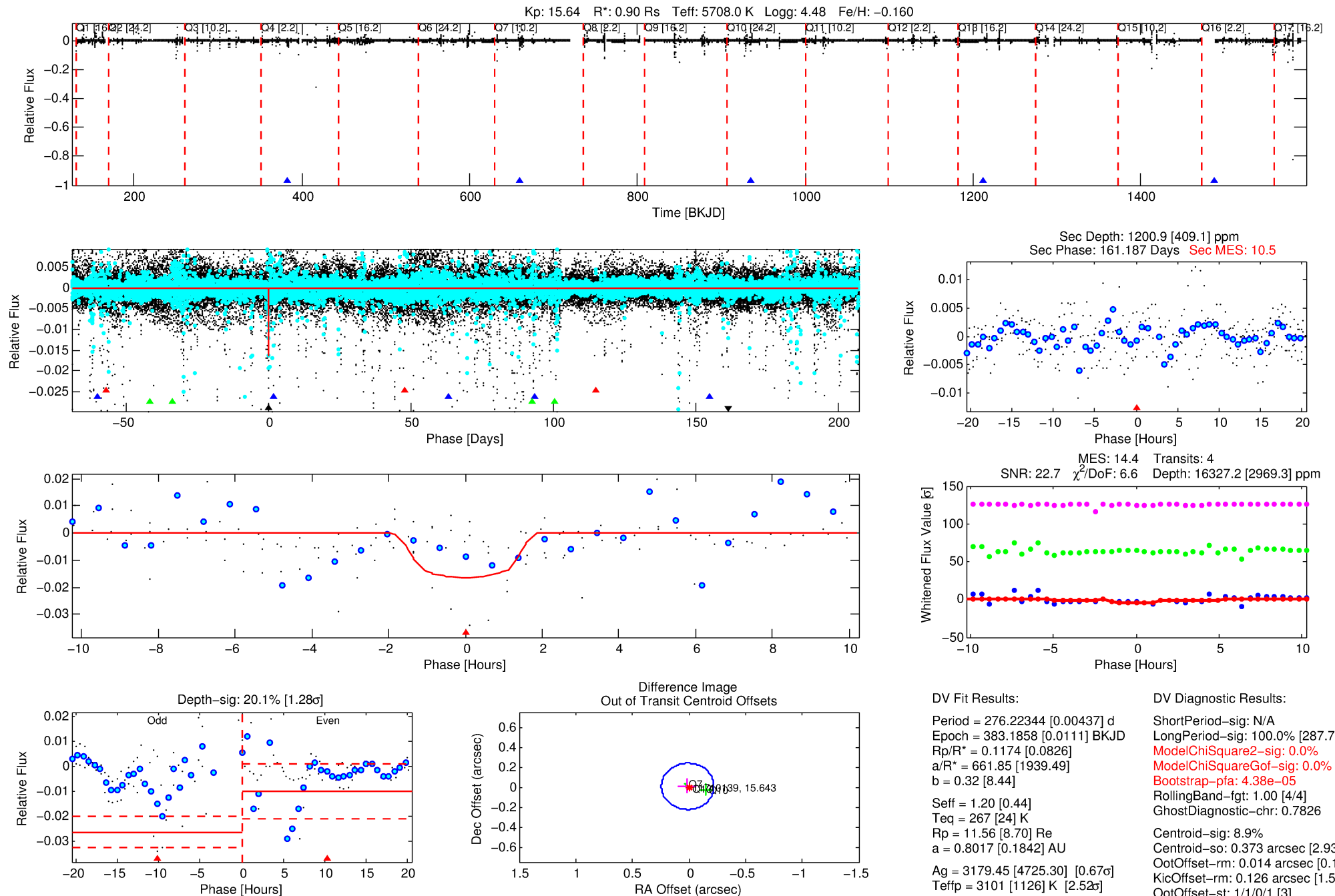
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 011710139-04

No Significant Match Found

DV One-Page Summary

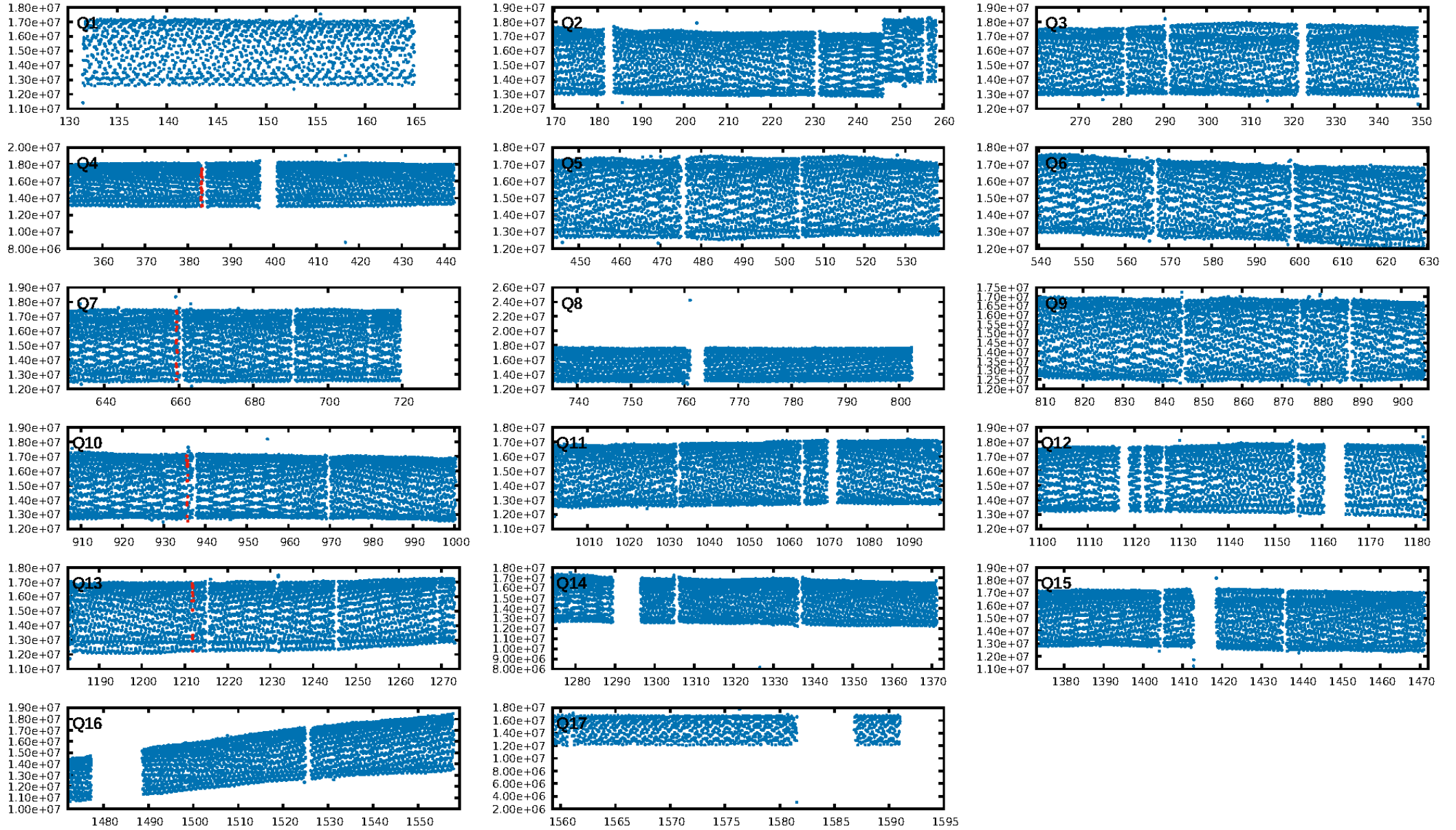
KIC: 11710139 Candidate: 4 of 4 Period: 276.223 d



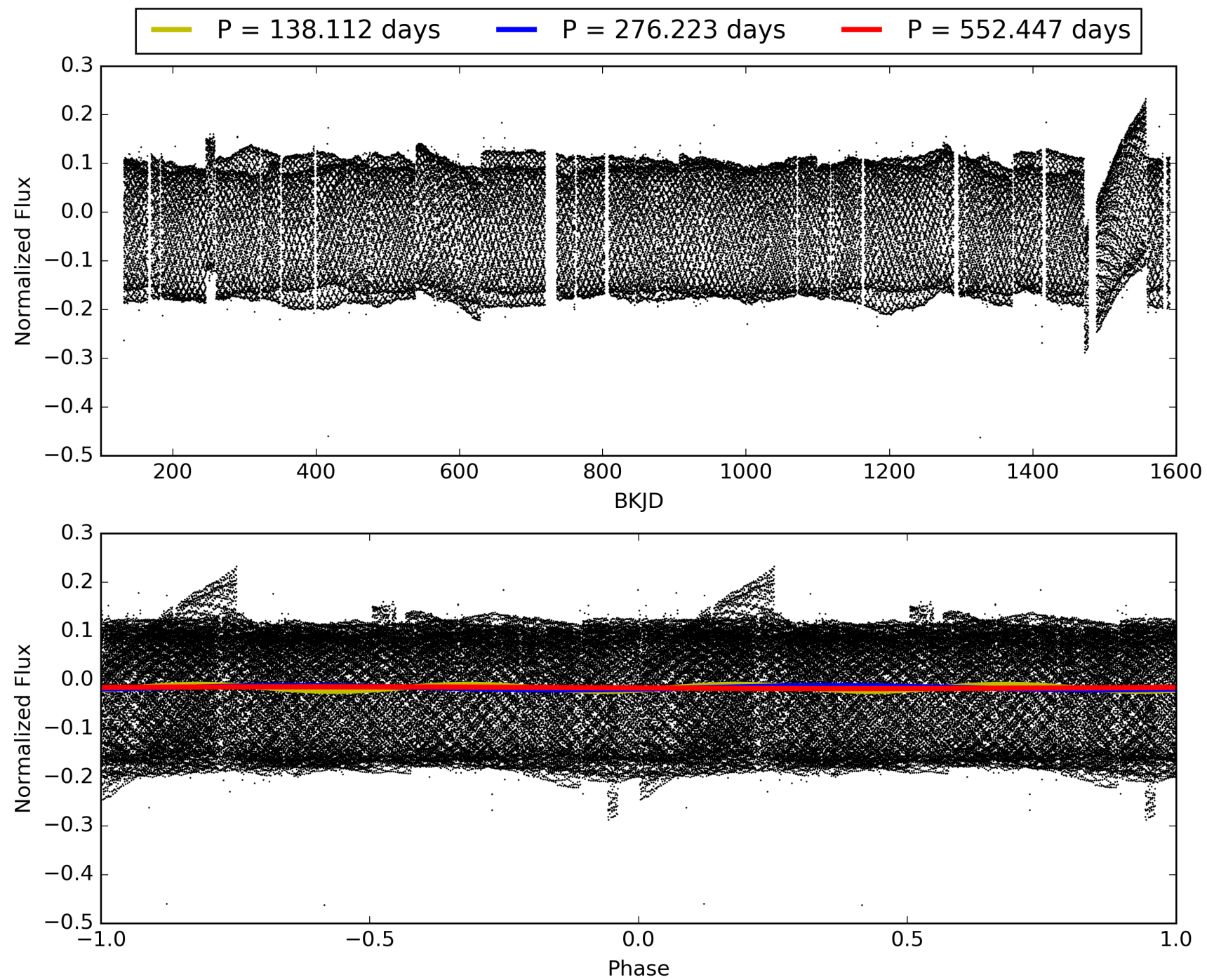
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:17:40 Z

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

TCE 011710139-04, PDC Light Curves

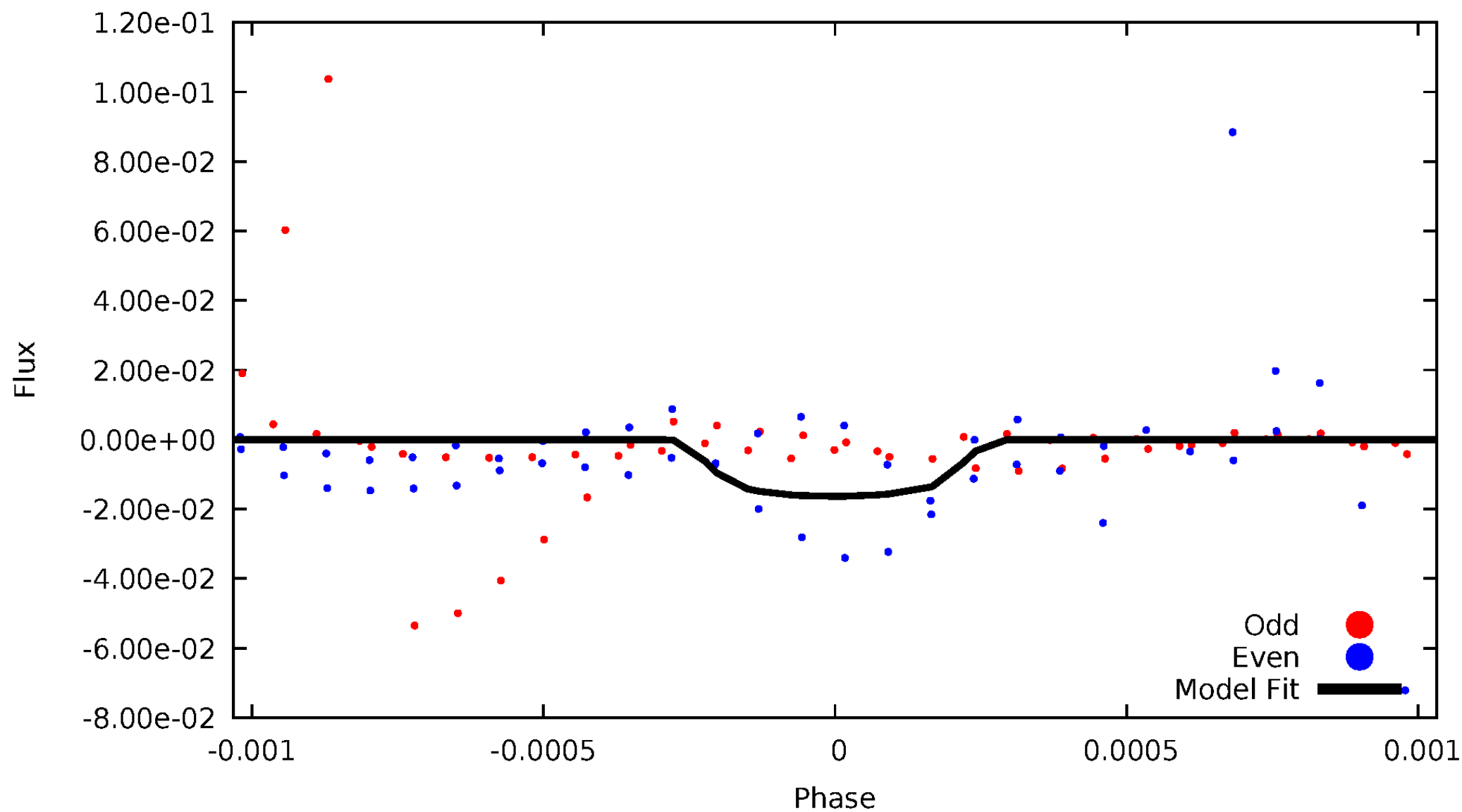


TCE 011710139-04



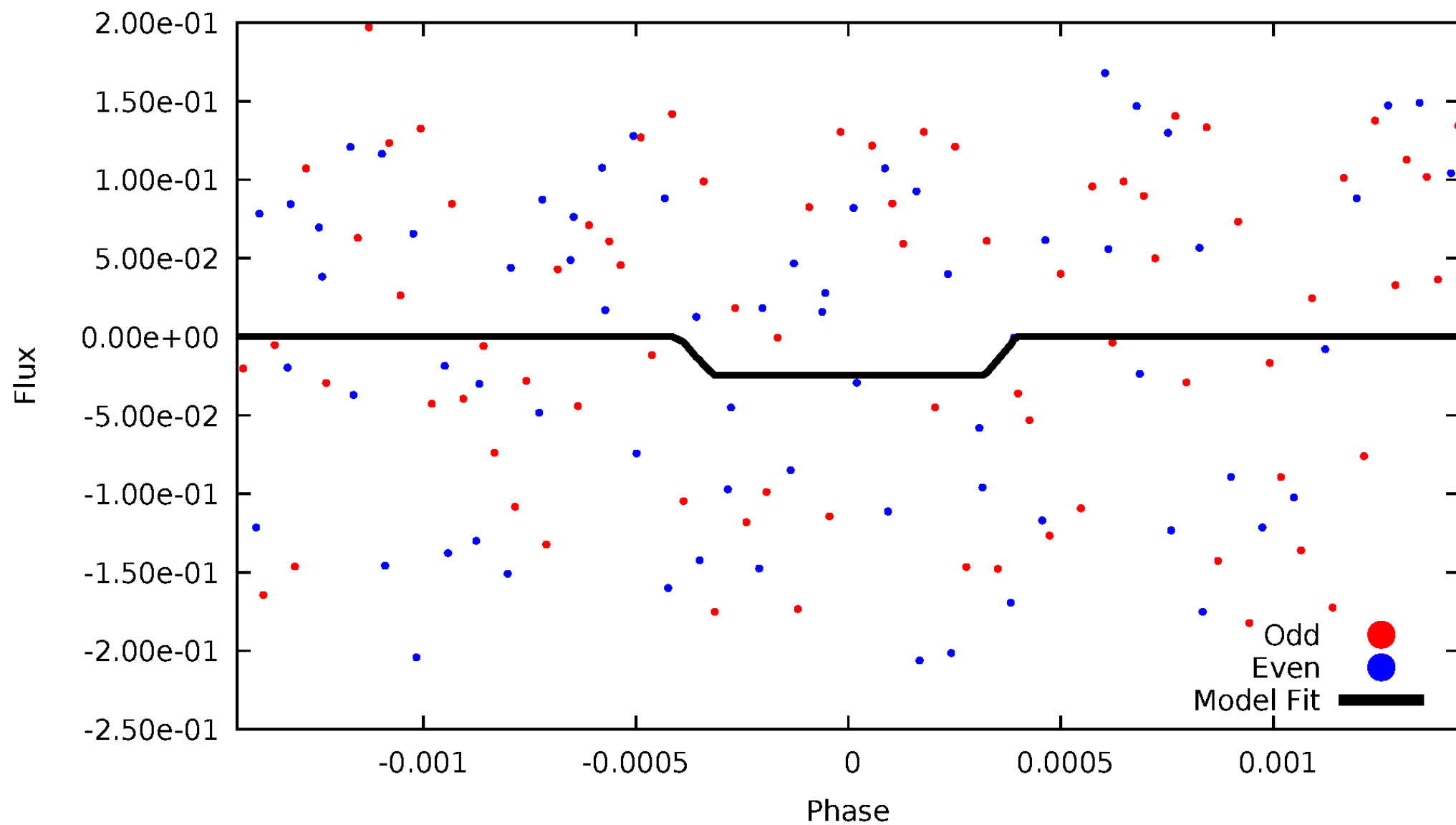
DV Odd/Even

TCE 011710139-04



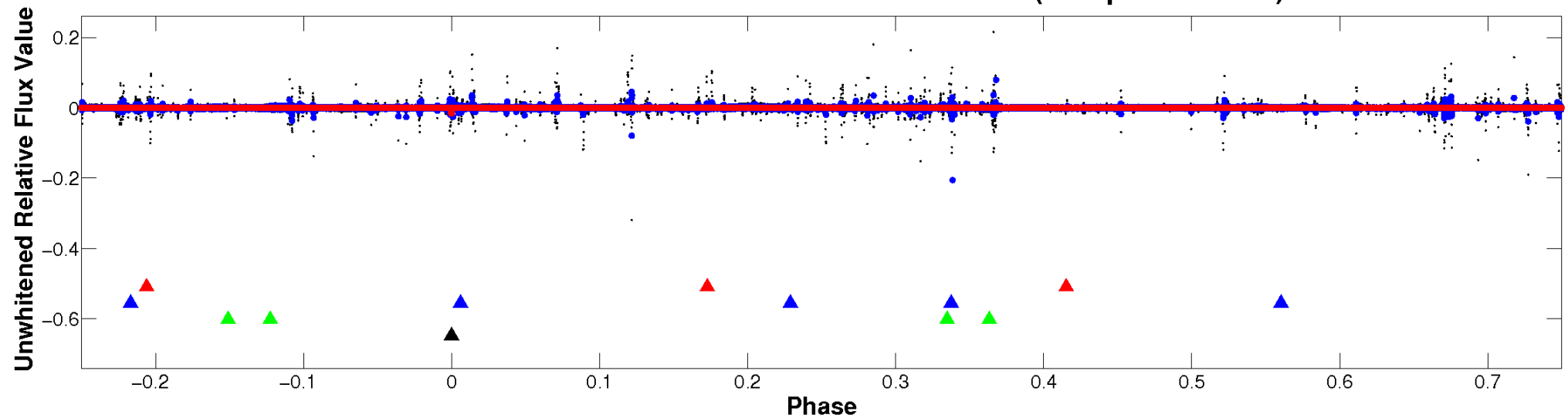
ALT Odd/Even

TCE 011710139-04

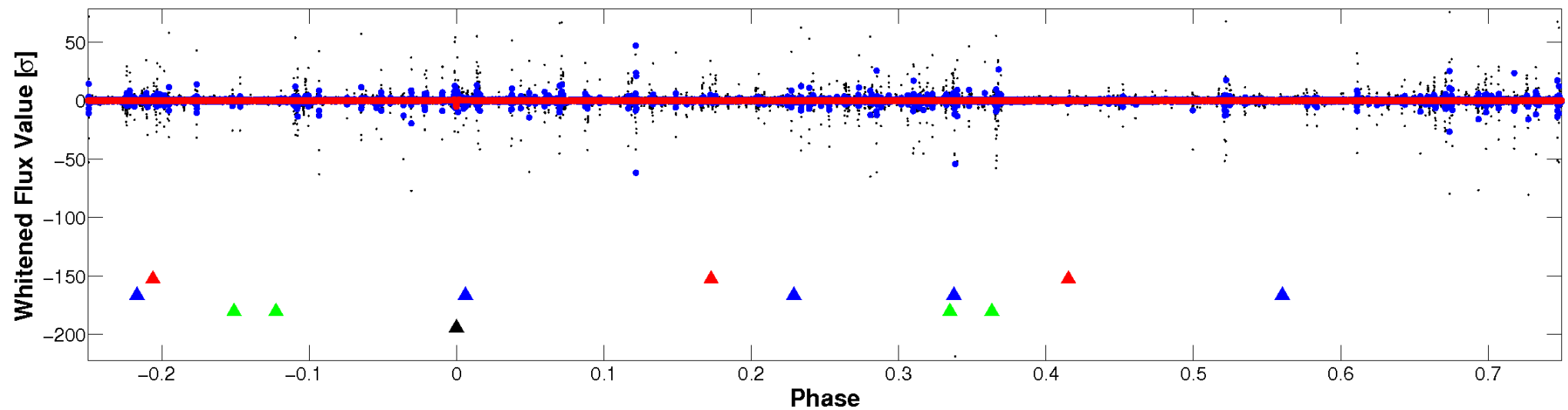


Non-Whitened Vs. Whitened Light Curve

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

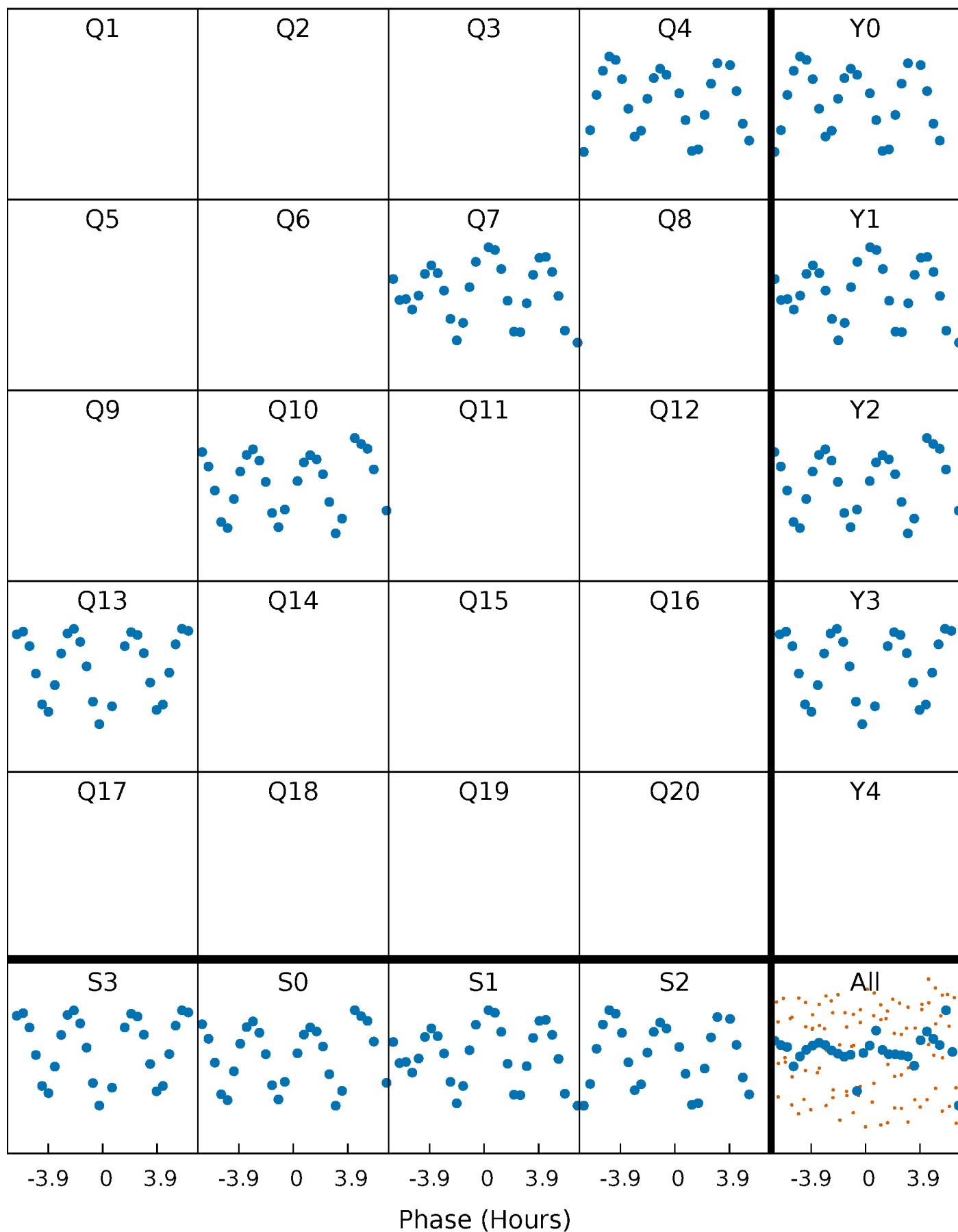


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



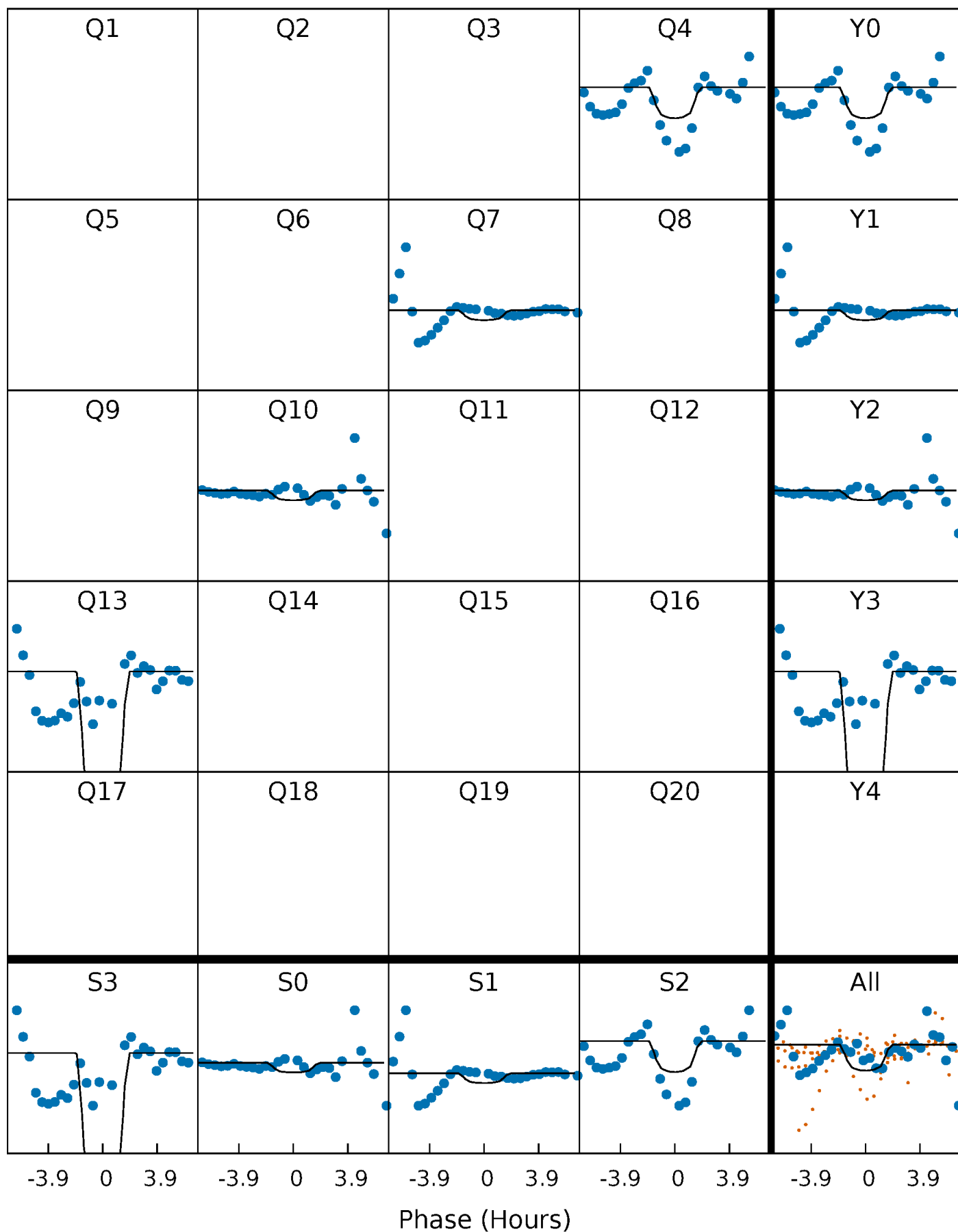
PDC Quarter-Phased Transit Curves

TCE 011710139-04 P=276.223441 Days $T_0=383.185770$ (BKJD)



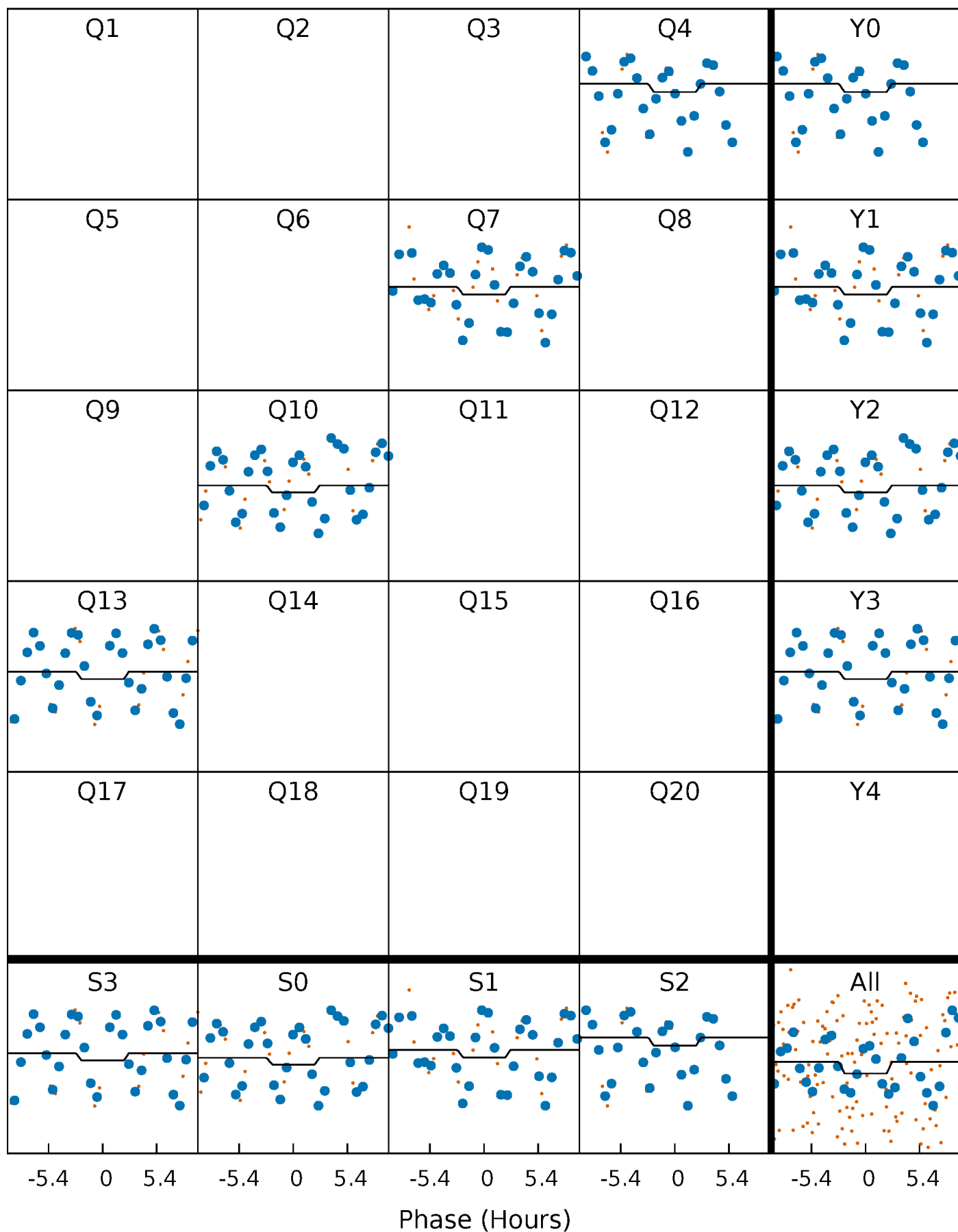
DV Quarter-Phased Transit Curves

TCE 011710139-04 P=276.223441 Days $T_0=383.185770$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

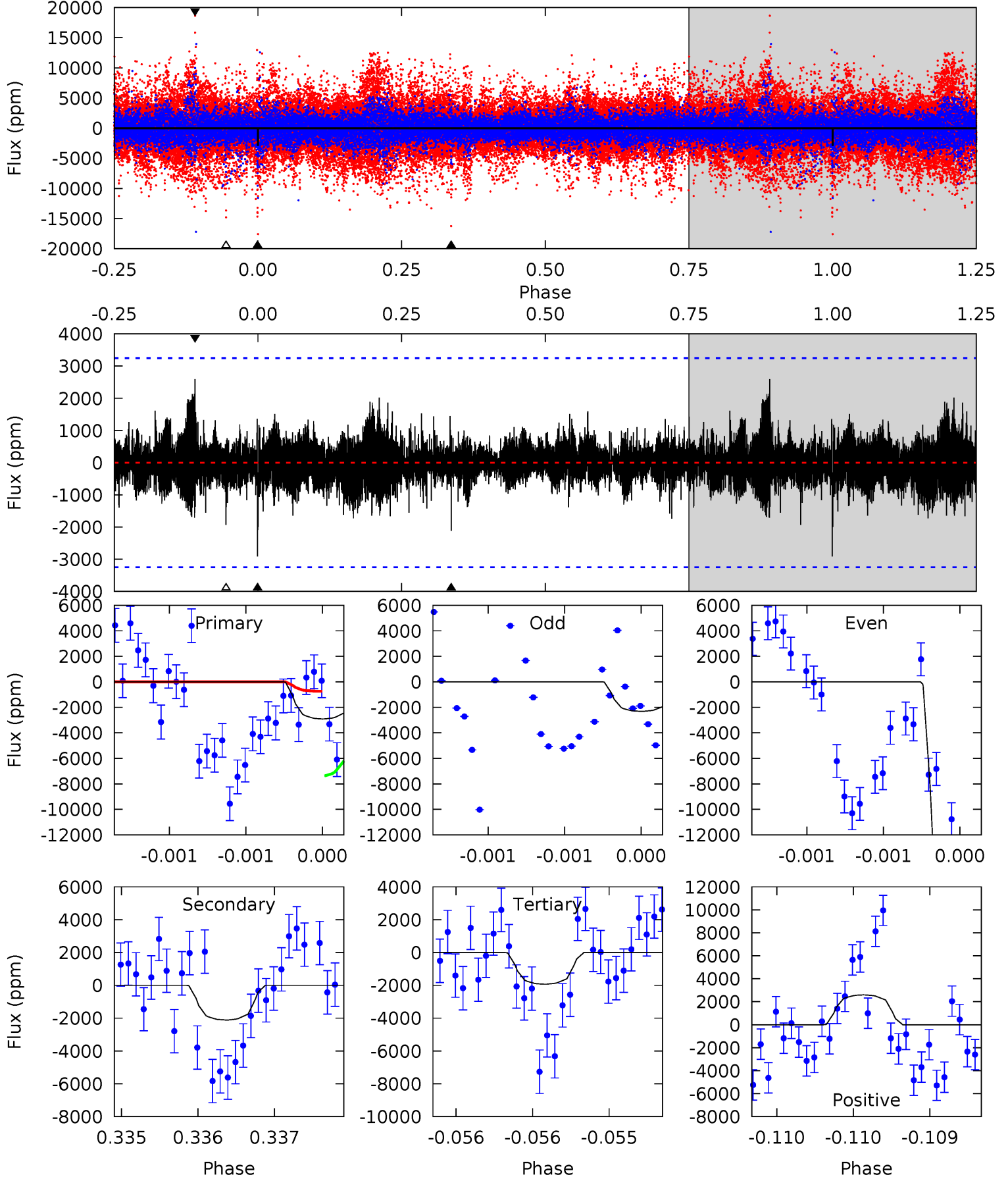
TCE 011710139-04 $P=276.234486$ Days $T_0=383.185045$ (BKJD)



DV Model-Shift Uniqueness Test

011710139-04, P = 276.223441 Days, E = 106.962329 Days

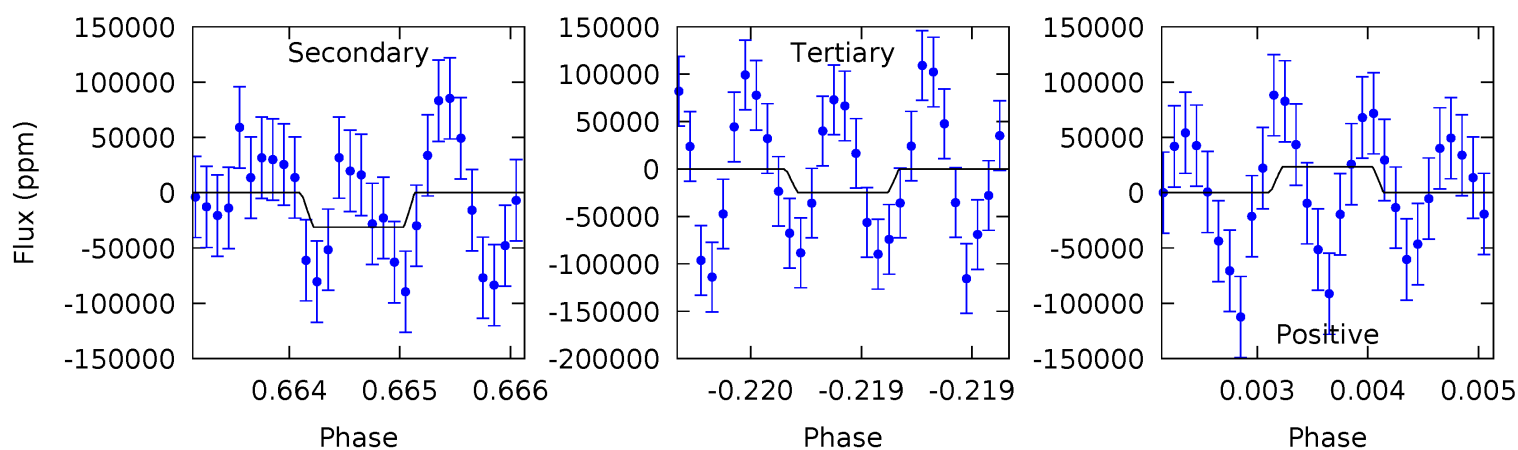
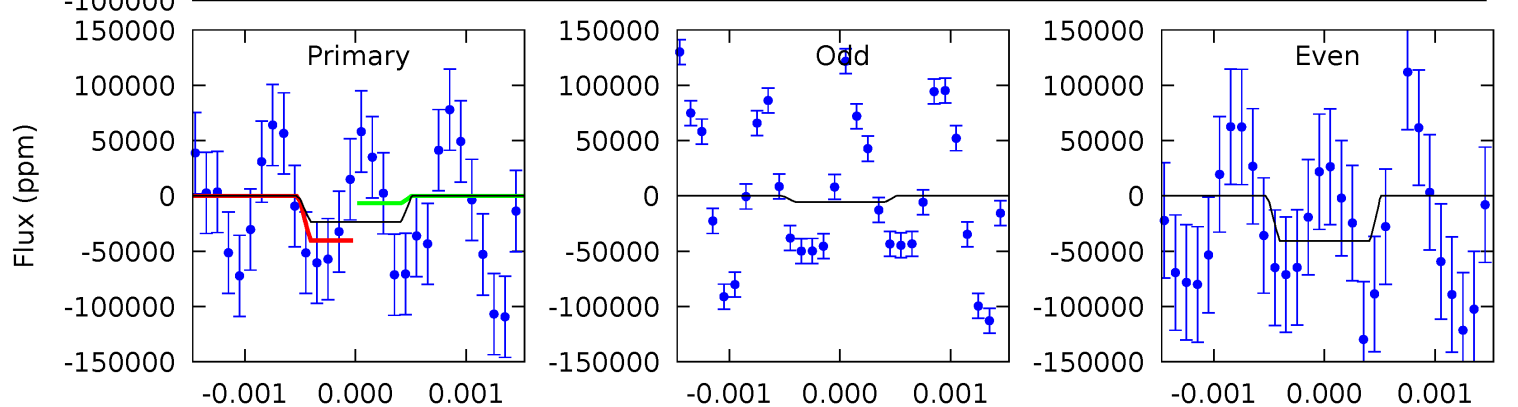
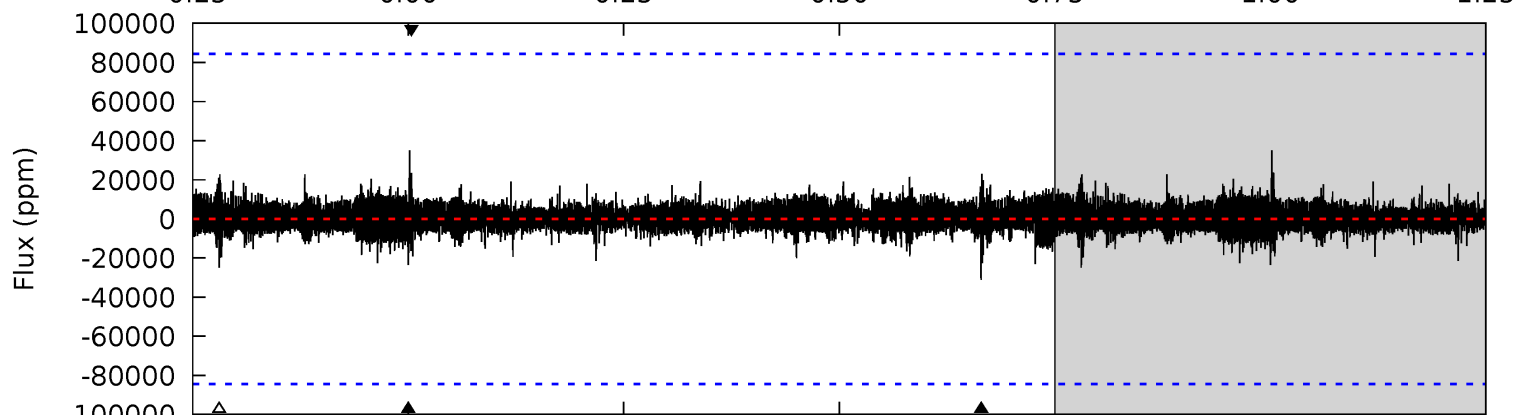
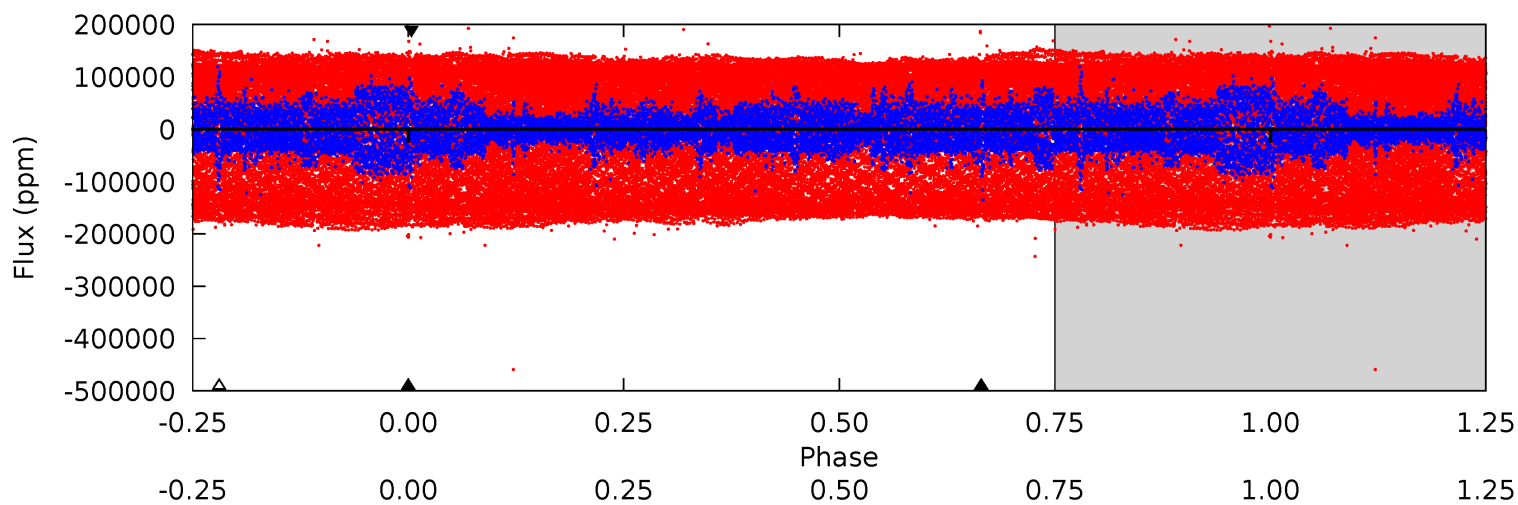
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 4.98 | 3.61 | 3.30 | 4.43 | 5.55 | 3.44 | 0.84 | 1.67 | 0.54 | 0.31 | -0.82 | 15.2 | 2.57 | 0.47 | 5.83 |



Alt Model-Shift Uniqueness Test

011710139-04, P = 276.234486 Days, E = 106.950559 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 1.53 | 2.03 | 1.62 | 1.53 | 5.50 | 3.36 | 0.33 | -0.09 | -0.00 | 0.41 | 0.50 | 1.16 | 1.56 | 0.53 | 1.10 |



Stellar Parameters For KIC 011710139

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5708^{+169}_{-186} | $4.482^{+0.075}_{-0.188}$ | $-0.160^{+0.300}_{-0.300}$ | $0.902^{+0.242}_{-0.104}$ | $0.902^{+0.115}_{-0.094}$ | $1.729^{+0.593}_{-0.867}$ |
| | +3%/-3% | +2%/-4% | +188%/-188% | +27%/-12% | +13%/-10% | +34%/-50% |
| 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 011710139-04 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|--------------------|-------------------------|-------------------|------------------------|----------------------------|
| DV | -2115 ± 585 | $12.45^{+8.34}_{-6.81}$ | 377^{+26}_{-18} | 3851^{+1350}_{-604} | 4845^{+18573}_{-3224} |
| Alt. | -31151 ± 15357 | $16.24^{+8.55}_{-8.05}$ | 379^{+27}_{-19} | 5955^{+3031}_{-1232} | $41339^{+132719}_{-27378}$ |

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 $A_{obs} \gg 1.0$

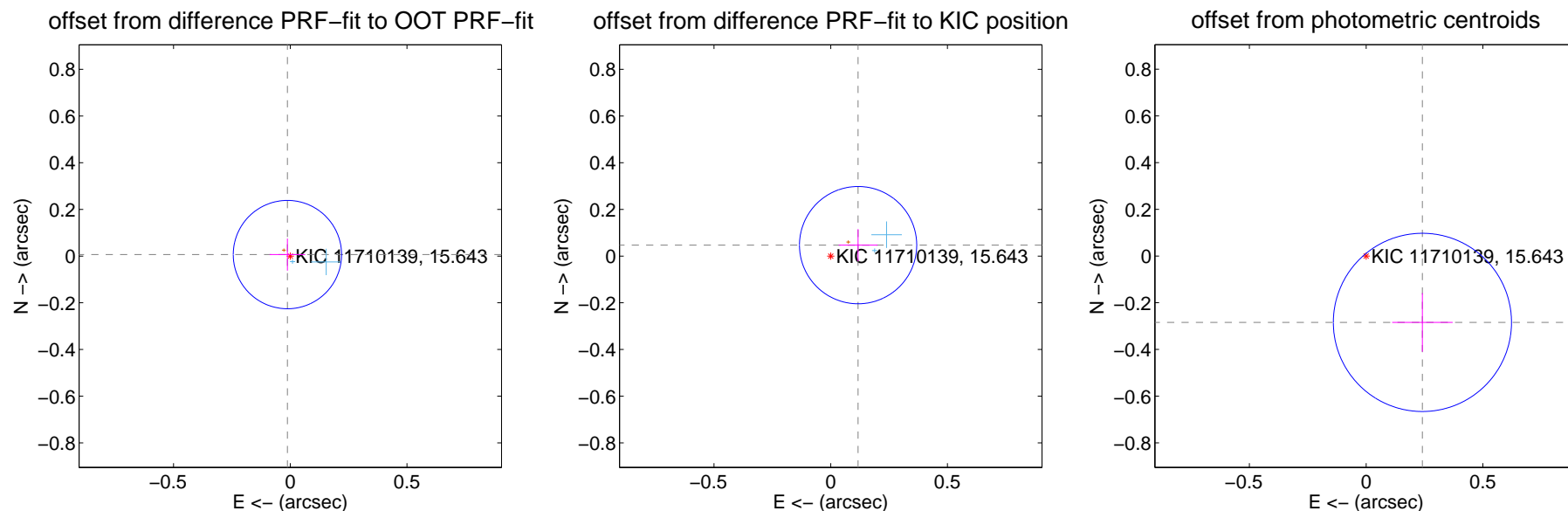
DV Centroid Data

Supplemental centroid analysis for 011710139-04. Kepler magnitude: 15.64. Transit SNR 22.72

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.014 ± 0.077 | 0.18 | 0.012 ± 0.076 | 0.006 ± 0.069 |
| PRF-fit source offset from KIC position | 0.126 ± 0.084 | 1.51 | -0.117 ± 0.083 | 0.047 ± 0.068 |
| photometric centroid source offset | 0.37 ± 0.13 | 2.93 | -0.24 ± 0.13 | -0.28 ± 0.13 |

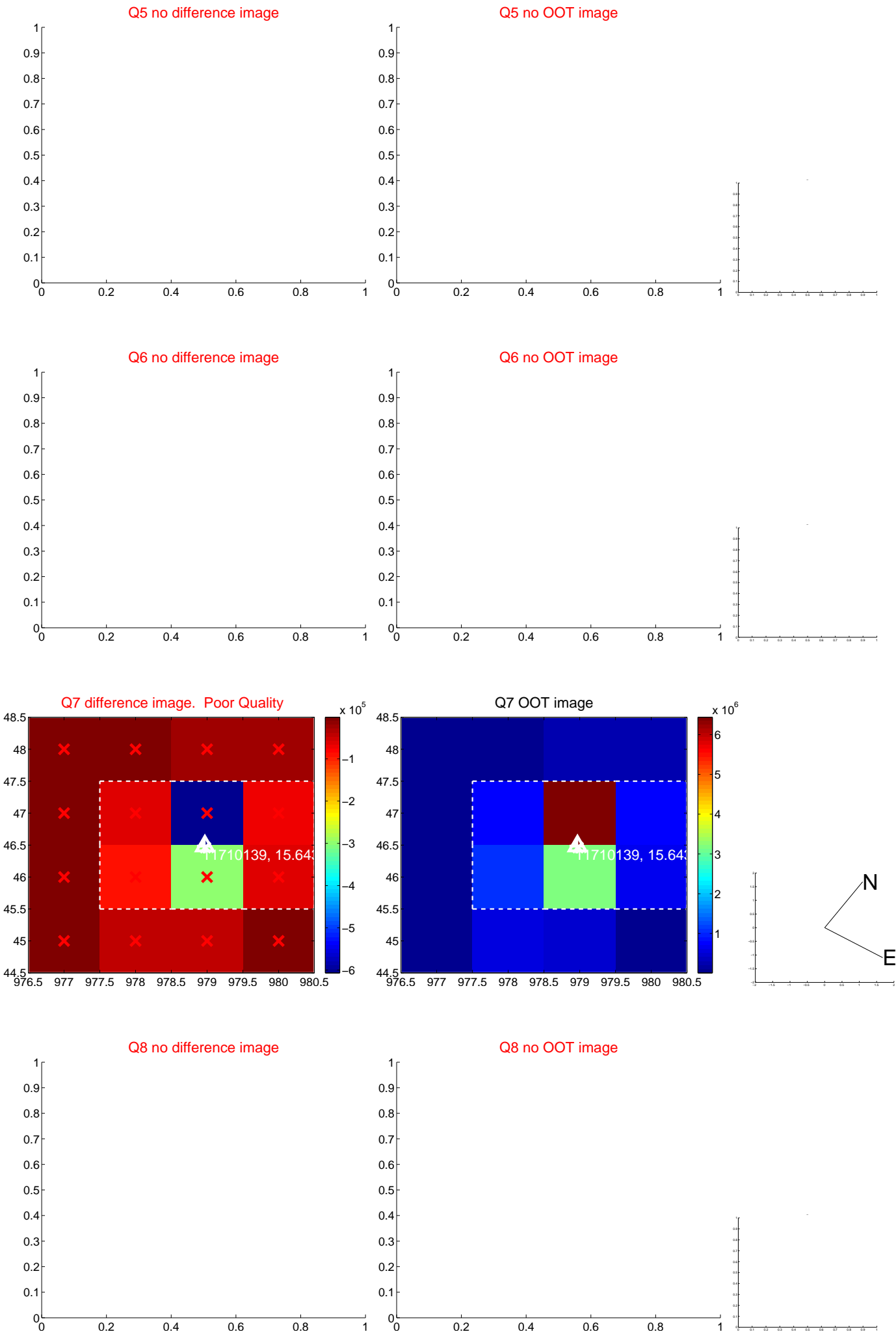


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

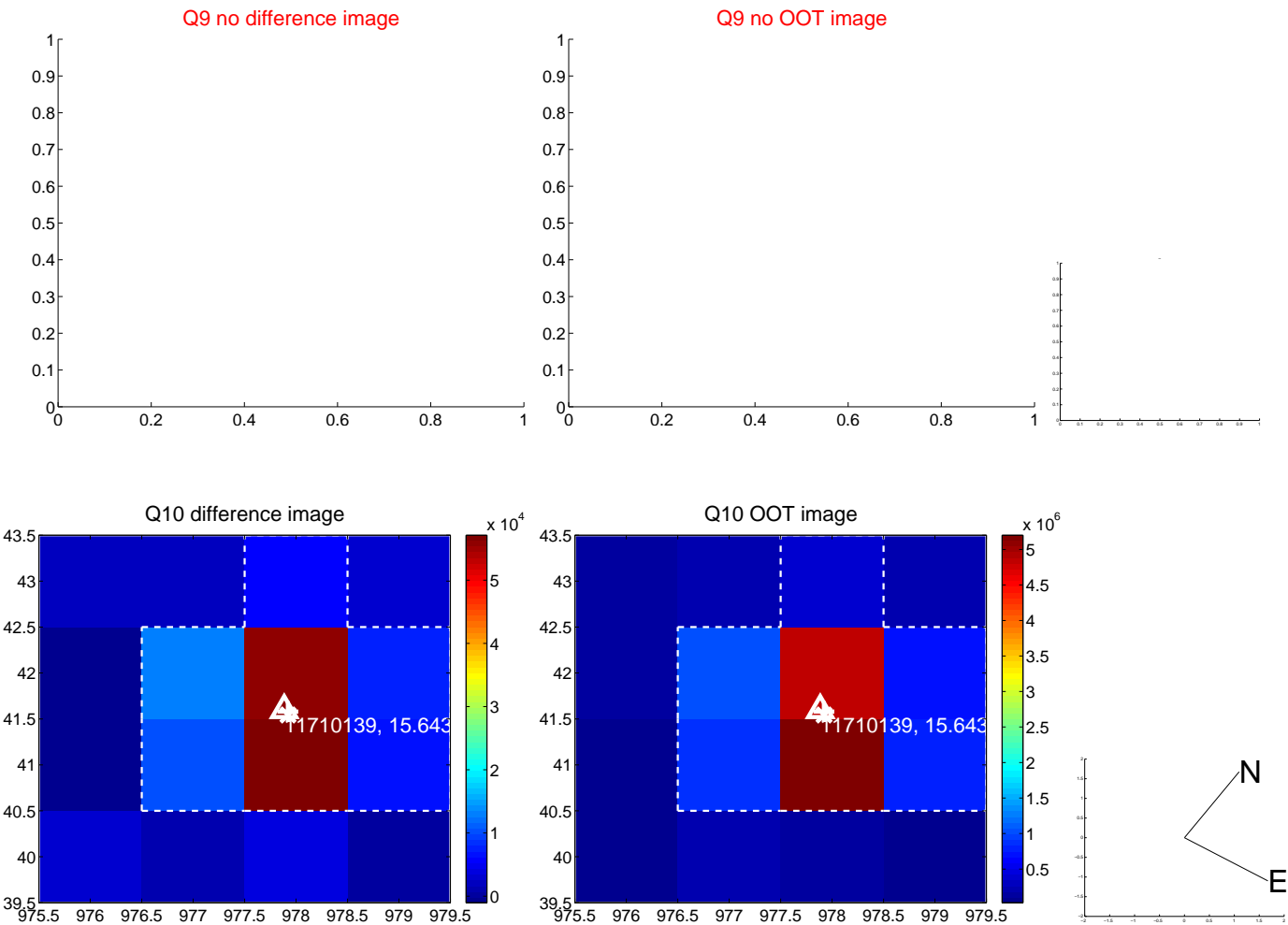
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



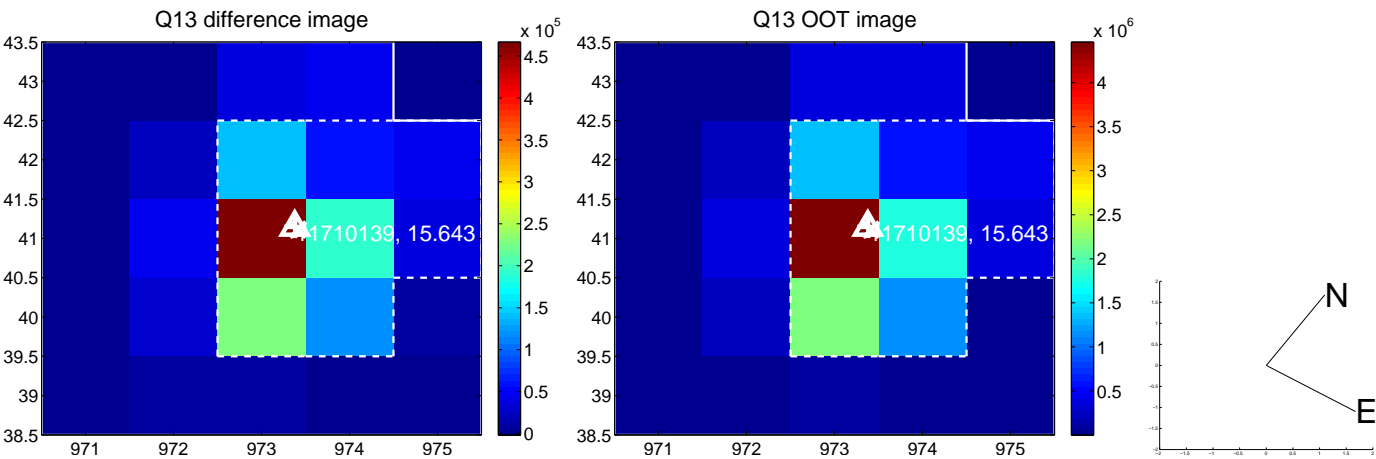
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



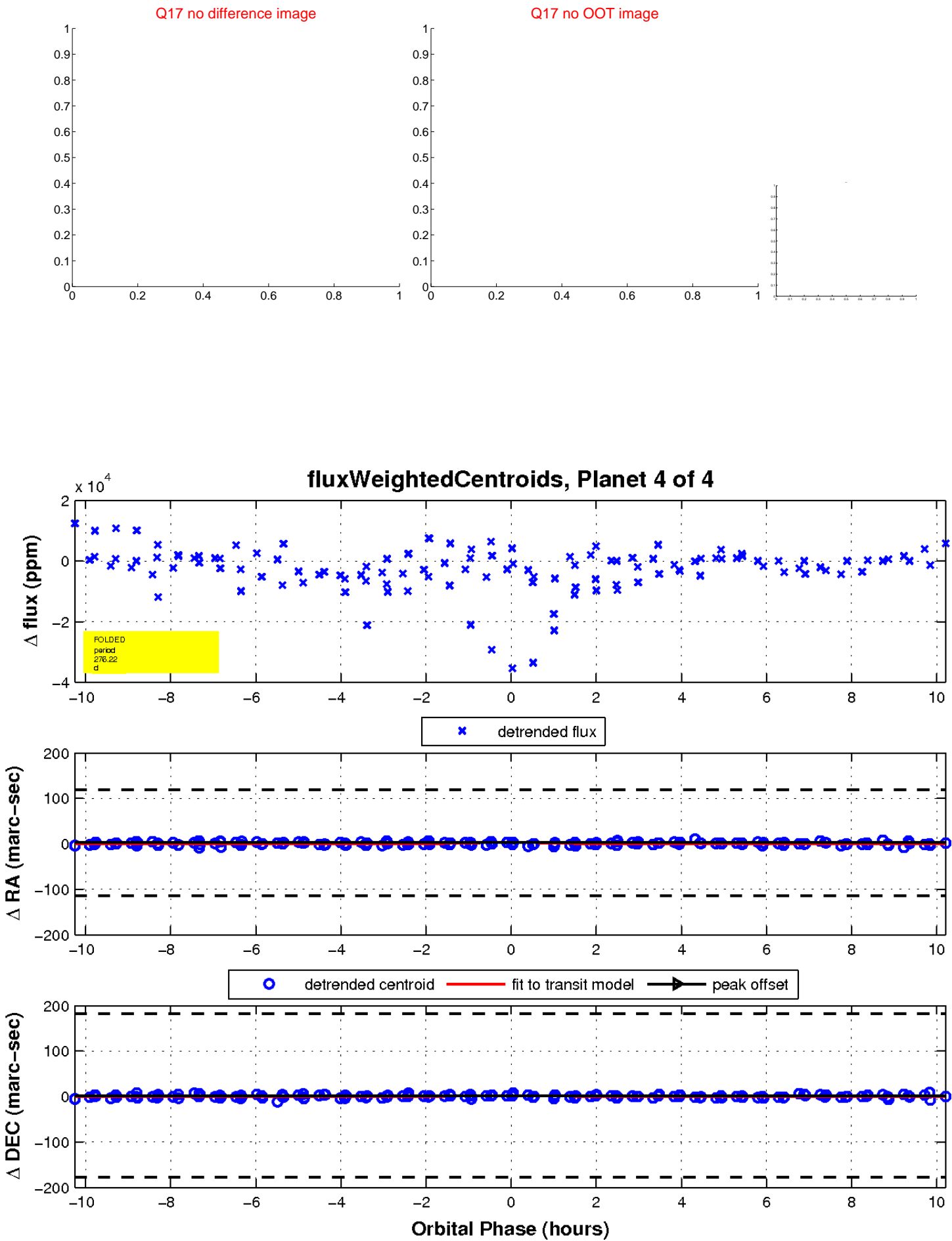
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

