

KIC 008105398

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008105398-01 | OBS | 5475.01 | 224.150759 | 341.028533 | 379.3 | 12.861 | 20.5 | 20.6 | 1.29 | 6072 | 2.74 | 4.41 |
| 008105398-02 | OBS | 5475.02 | 5.683207 | 134.882091 | 39.5 | 1.767 | 7.2 | 7.9 | 1.29 | 6072 | 0.95 | 591.91 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|------------|
| 008105398-01 | OBS | PC | 1.00 | 0 | 0 | 0 | 0 | NO_COMMENT |
| 008105398-02 | OBS | PC | 0.98 | 0 | 0 | 0 | 0 | NO_COMMENT |

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.

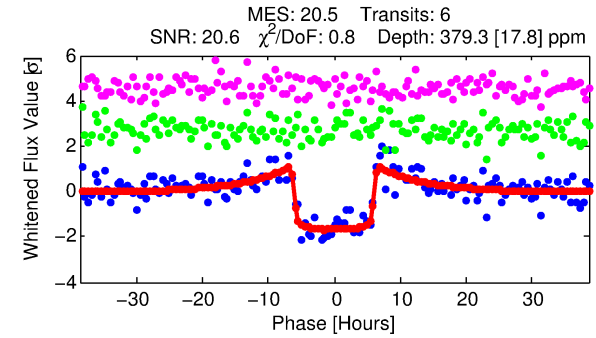
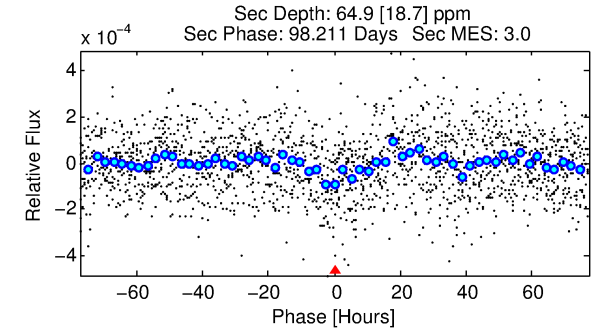
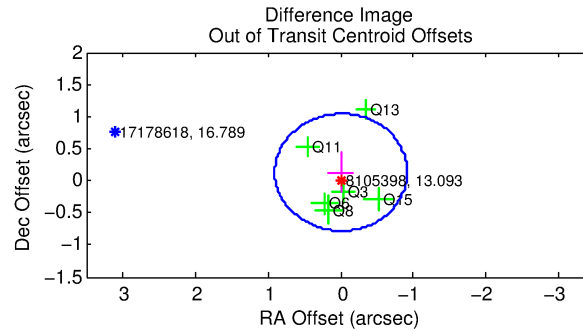
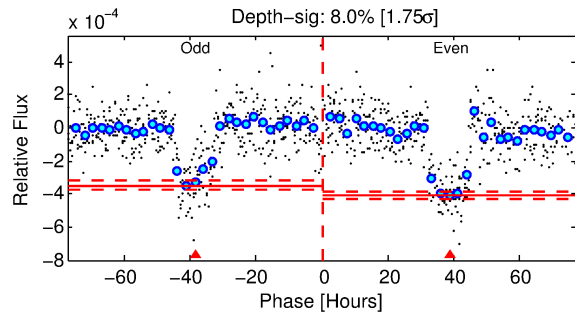
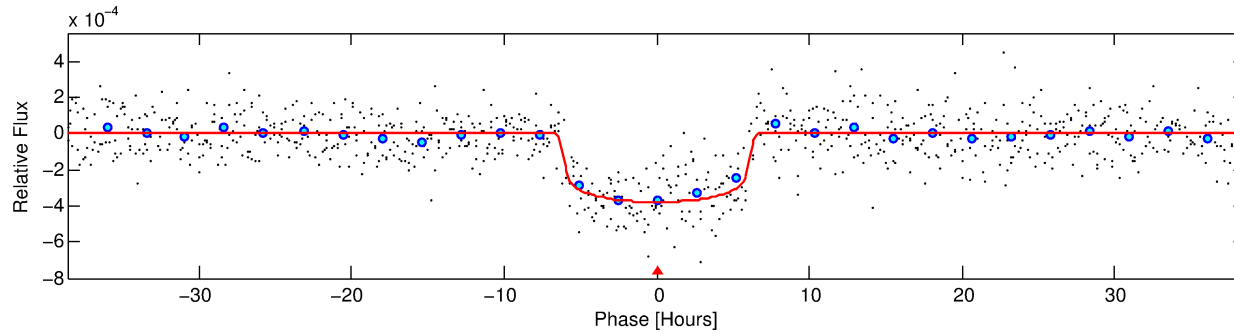
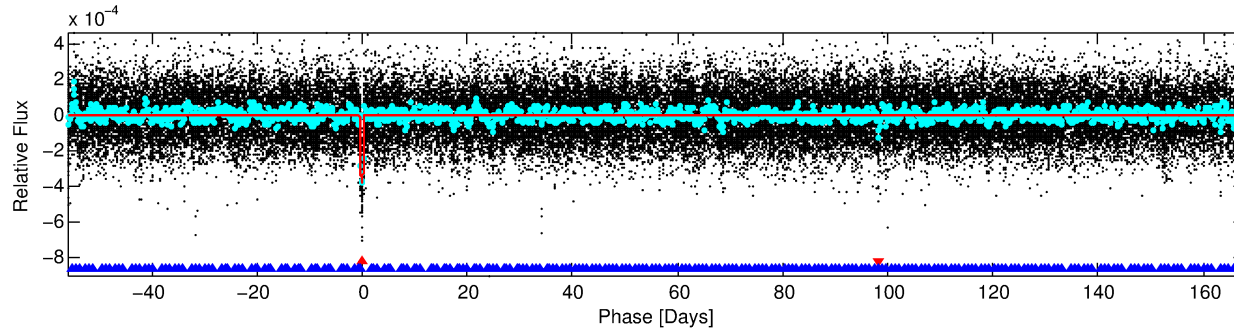
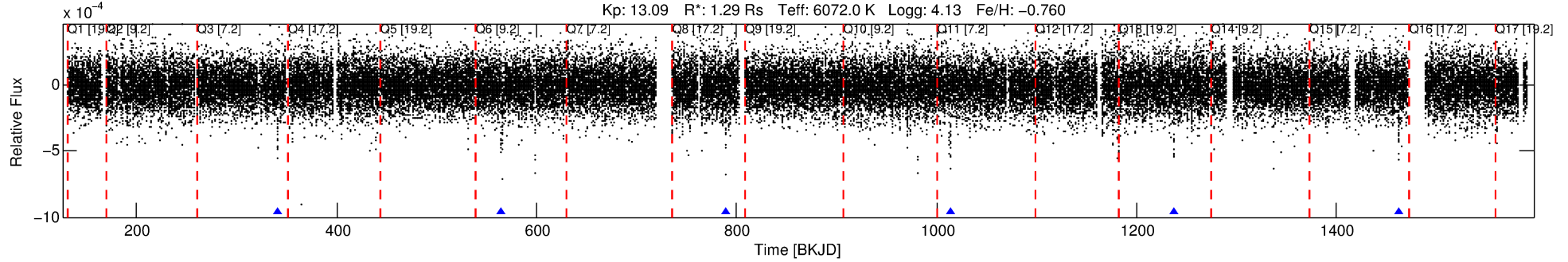
Ephemeris Match Information For 008105398-01

No Significant Match Found

DV One-Page Summary

KIC: 8105398 Candidate: 1 of 2 Period: 224.151 d
KOI: K05475 Corr: No Ephemeris Match

Kp: 13.09 R*: 1.29 Rs Teff: 6072.0 K Logg: 4.13 Fe/H: -0.760



DV Fit Results:

Period = 224.15076 [0.00180] d
Epoch = 341.0285 [0.0056] BKJD
Rp/R* = 0.0195 [0.0016]
a/R* = 88.81 [36.46]
b = 0.77 [0.22]
Seff = 4.41 [2.27]
Teq = 369 [48] K
Rp = 2.74 [0.85] Re
a = 0.6759 [0.2059] AU
Ag = 2178.69 [1312.25] [1.66 σ]
Teffp = 3903 [341] K [10.27 σ]

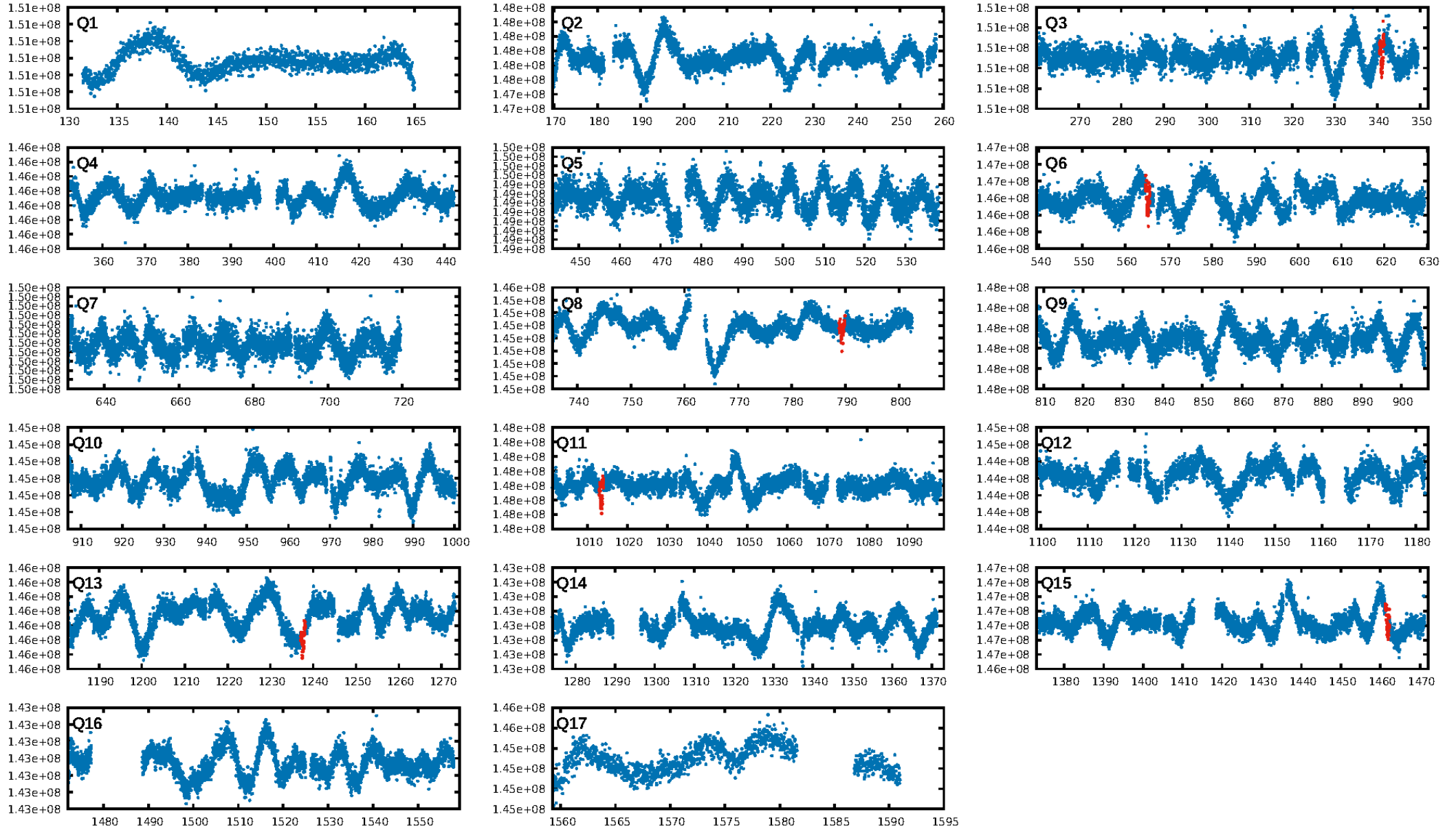
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [403.90 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 14.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.34e-57
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 2.95
Centroid-sig: 2.0%
Centroid-so: 0.886 arcsec [2.07 σ]
OotOffset-rm: 0.131 arcsec [0.43 σ]
KicOffset-rm: 0.102 arcsec [0.54 σ]
OotOffset-st: 1/3/1/1 [6]
KicOffset-st: 1/3/1/1 [6]
DiffImageQuality-fgm: 1.00 [6/6]
DiffImageOverlap-fno: 0.67 [4/6]

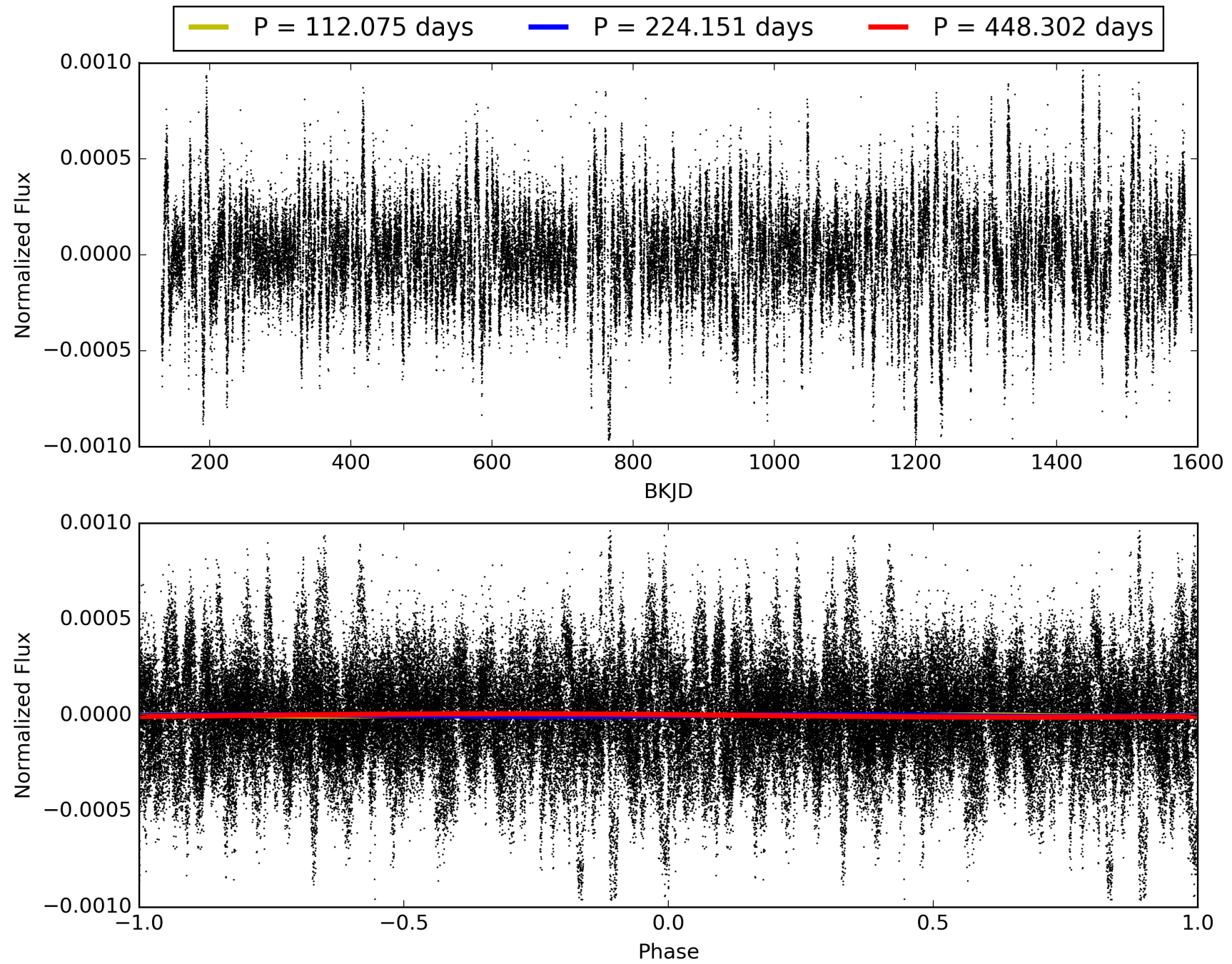
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 06:27:24 Z

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

TCE 008105398-01, PDC Light Curves

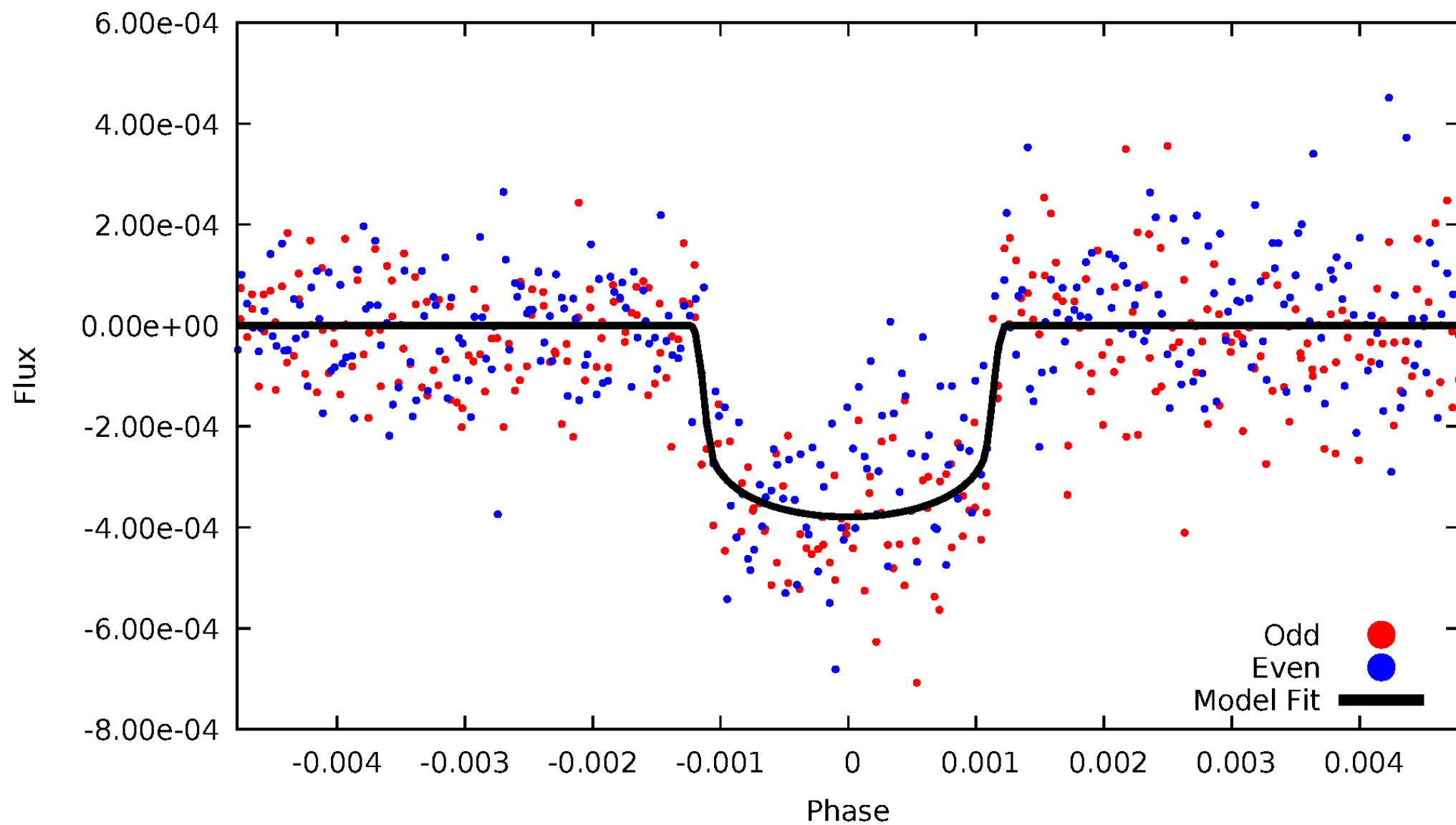


TCE 008105398-01



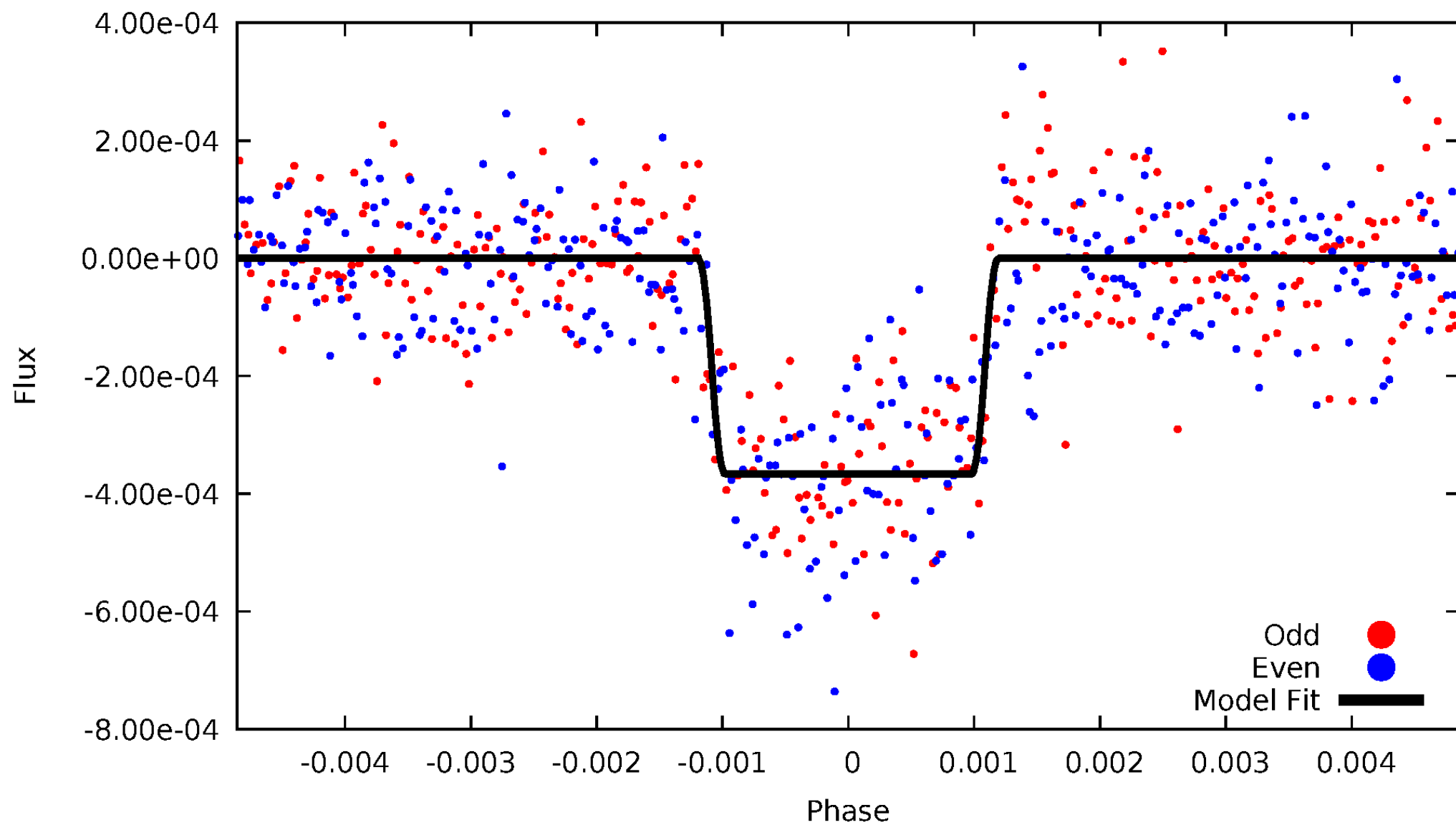
DV Odd/Even

TCE 008105398-01

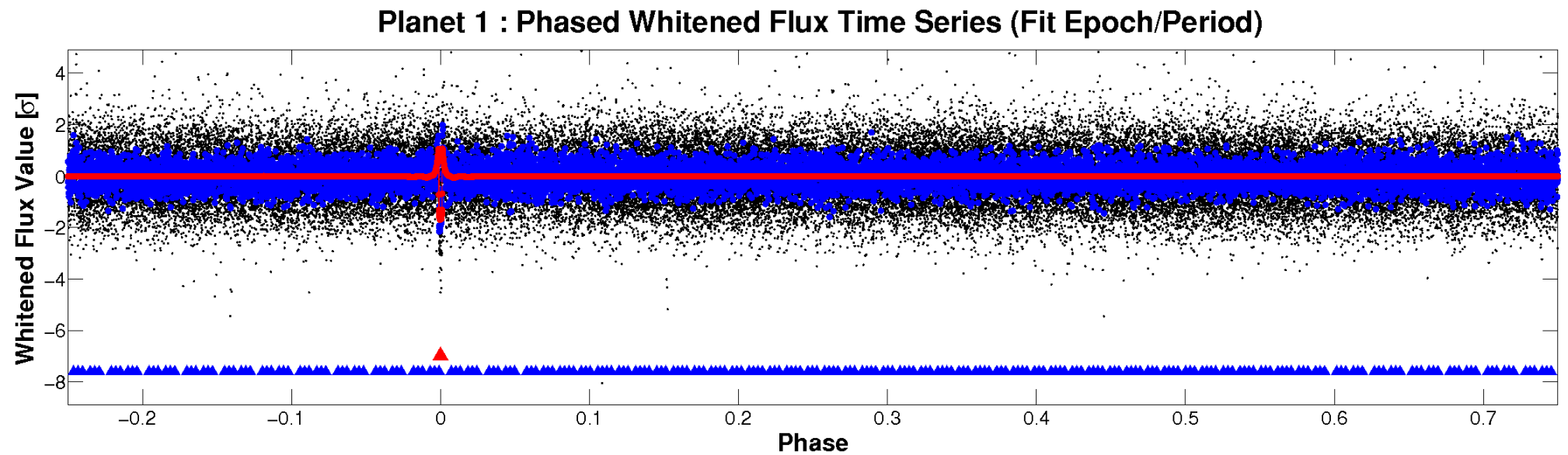
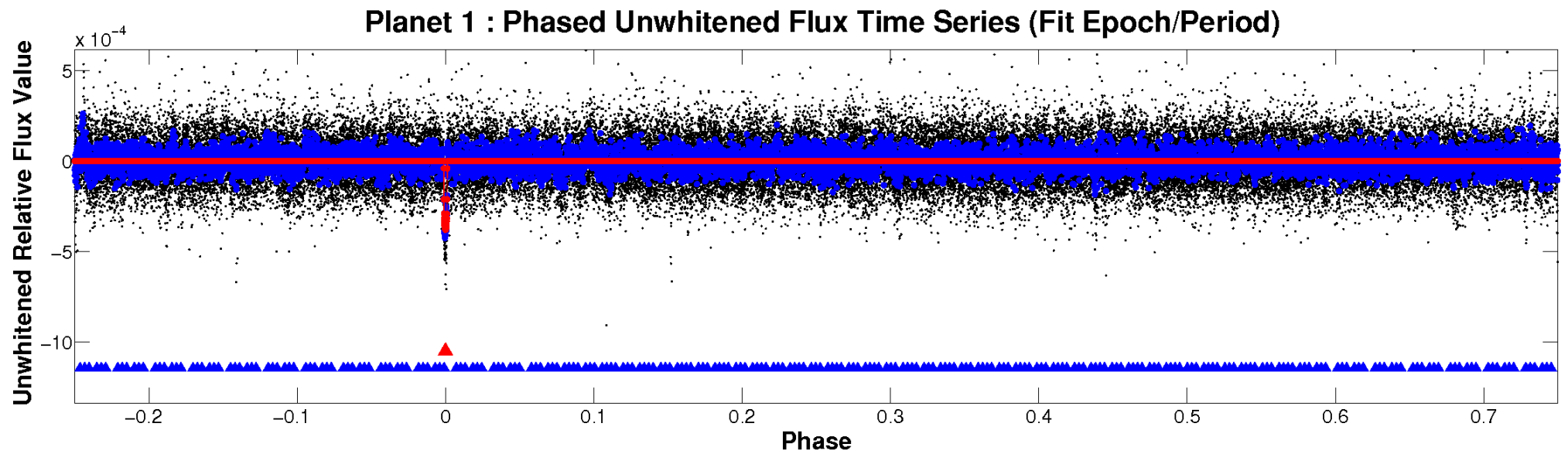


ALT Odd/Even

TCE 008105398-01

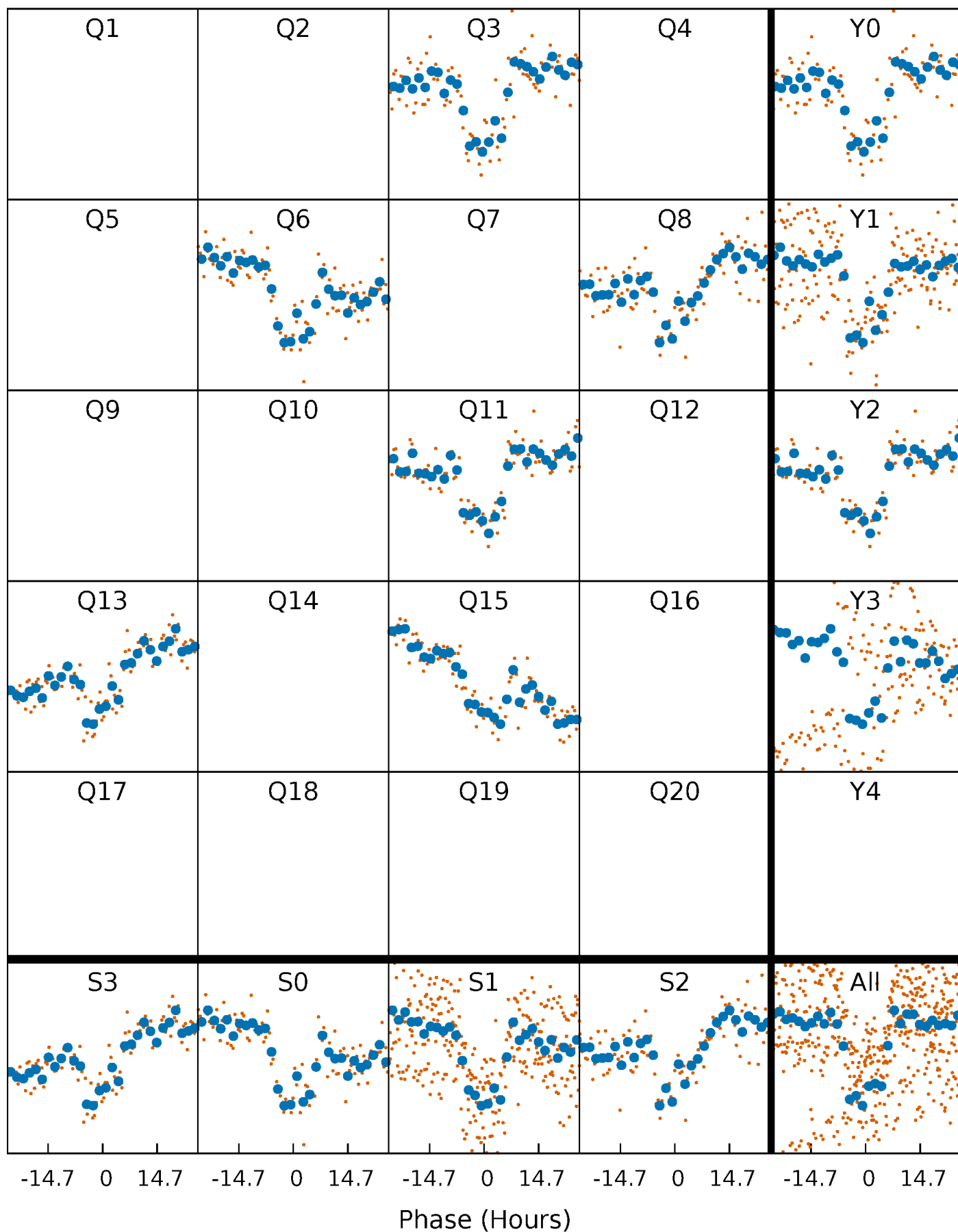


Non-Whitened Vs. Whitened Light Curve



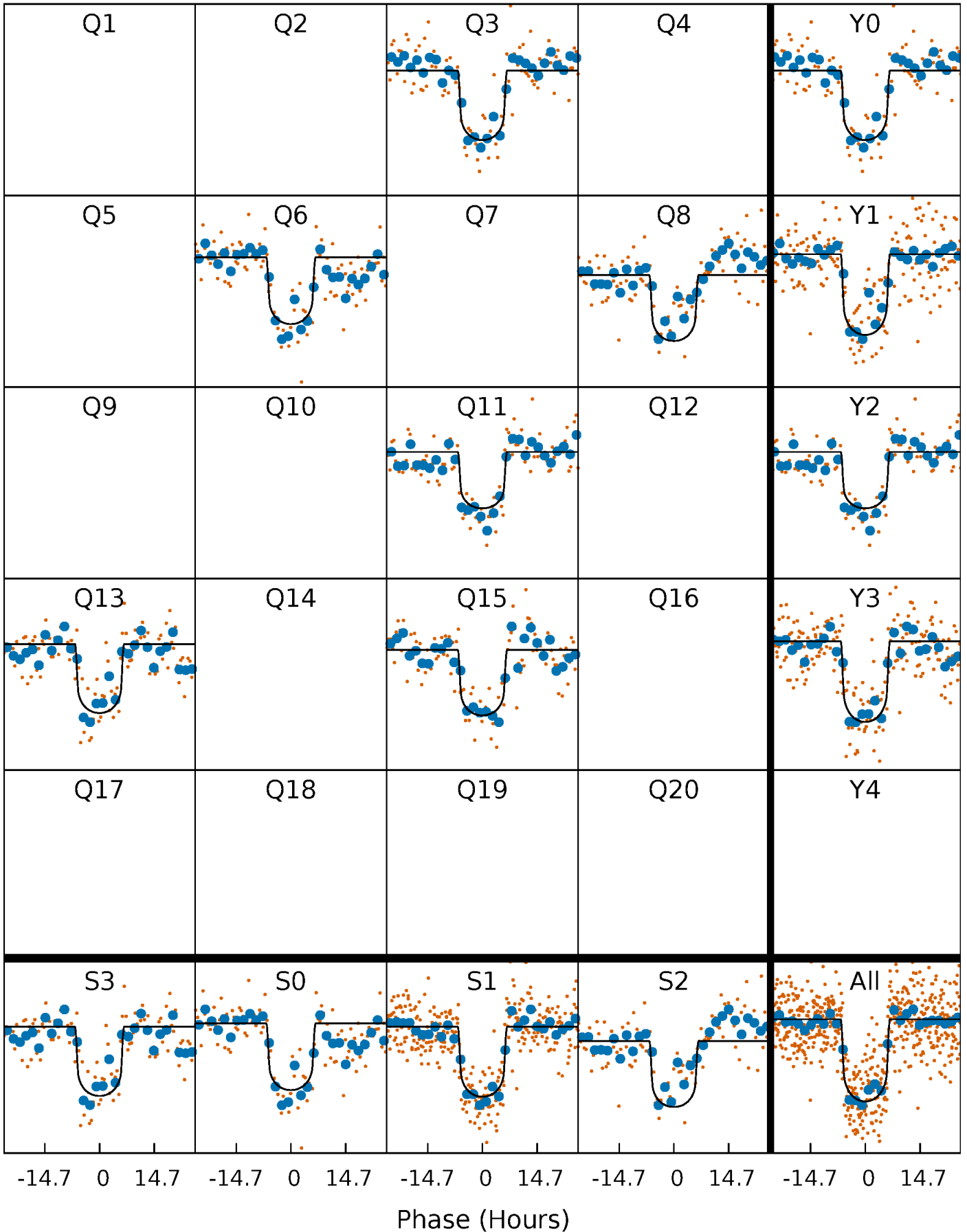
PDC Quarter-Phased Transit Curves

TCE 008105398-01 $P=224.150759$ Days $T_0=341.028533$ (BKJD)



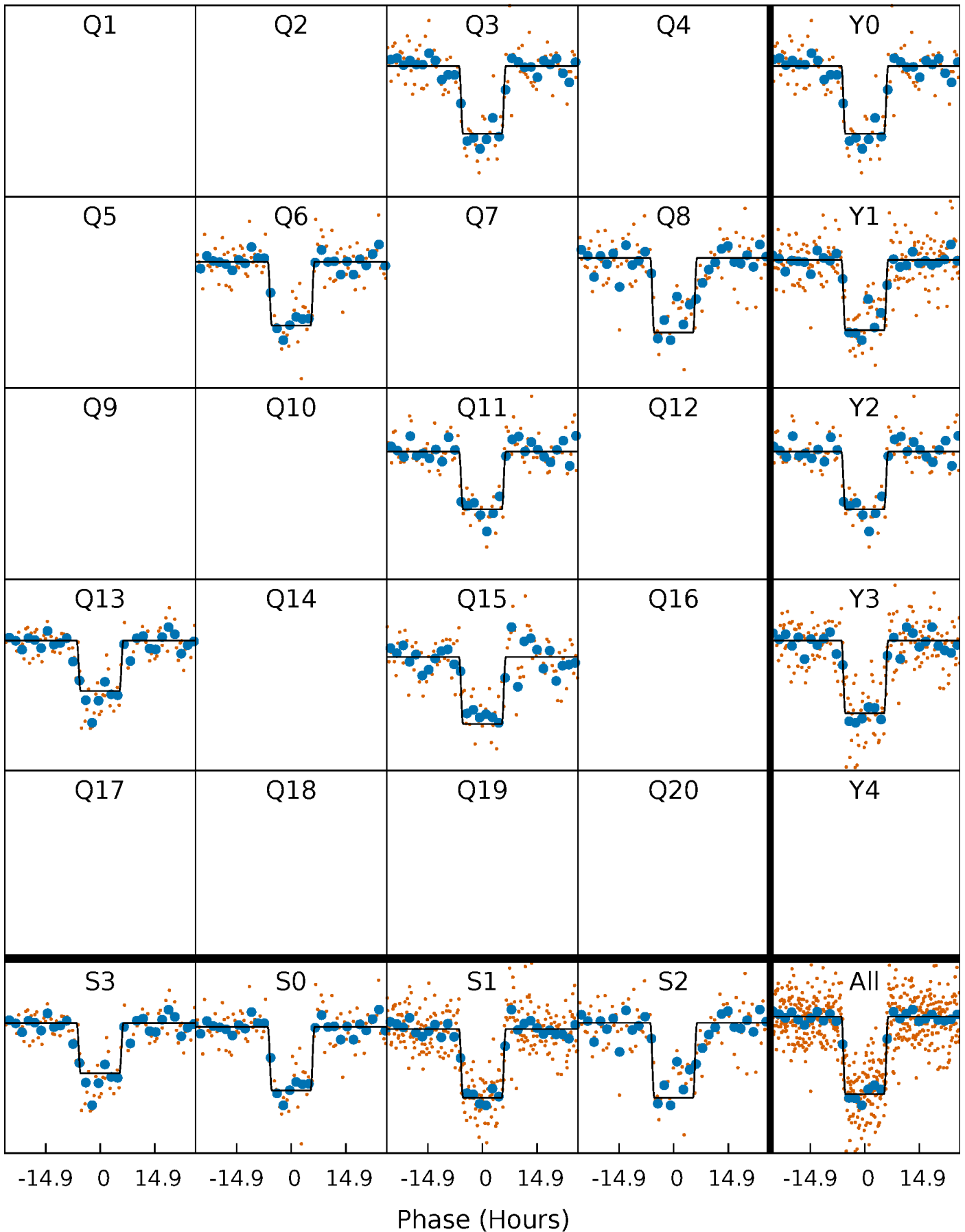
DV Quarter-Phased Transit Curves

TCE 008105398-01 $P=224.150759$ Days $T_0=341.028533$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

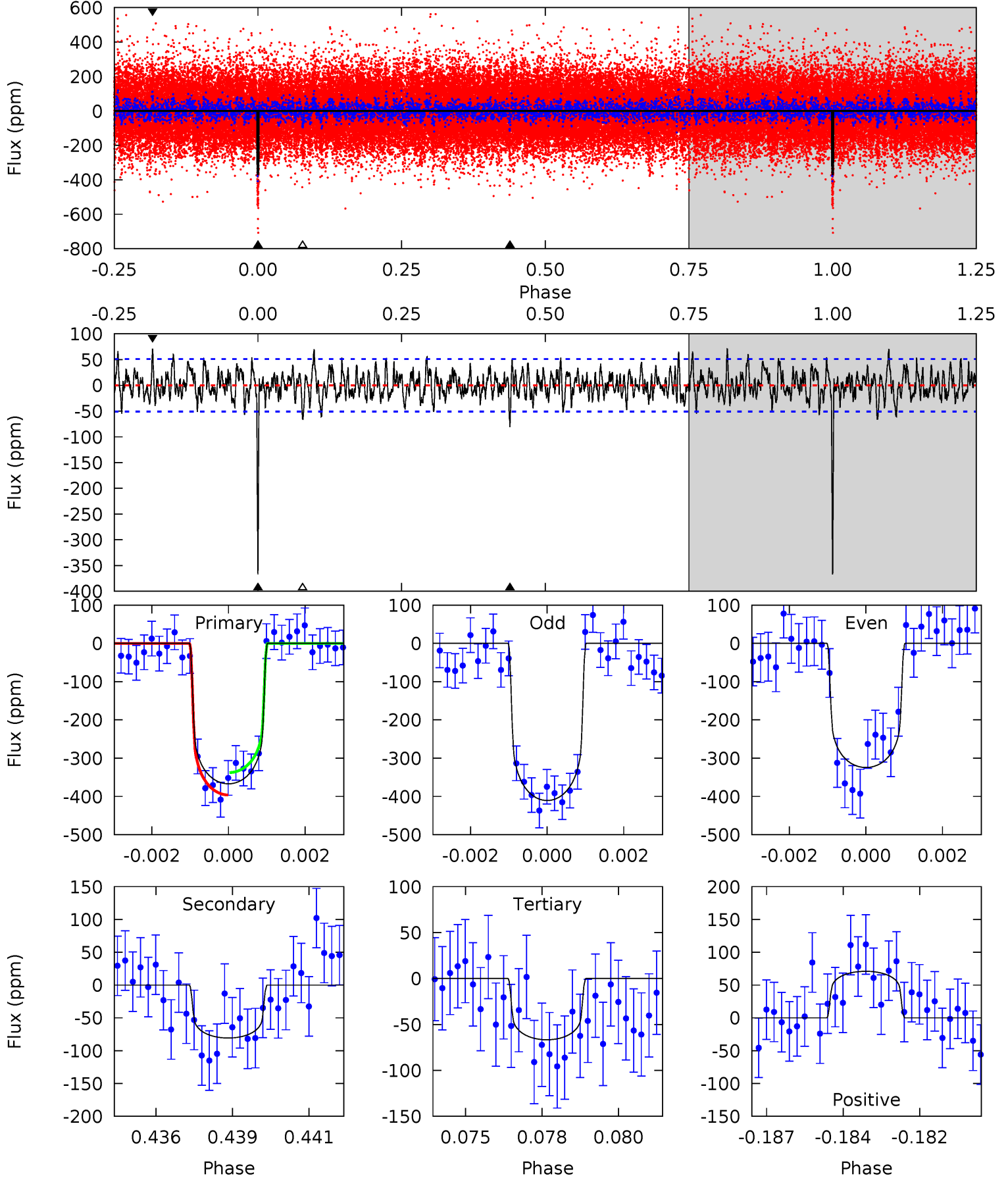
TCE 008105398-01 P=224.149342 Days $T_0=341.033167$ (BKJD)



DV Model-Shift Uniqueness Test

008105398-01, P = 224.150759 Days, E = 116.877774 Days

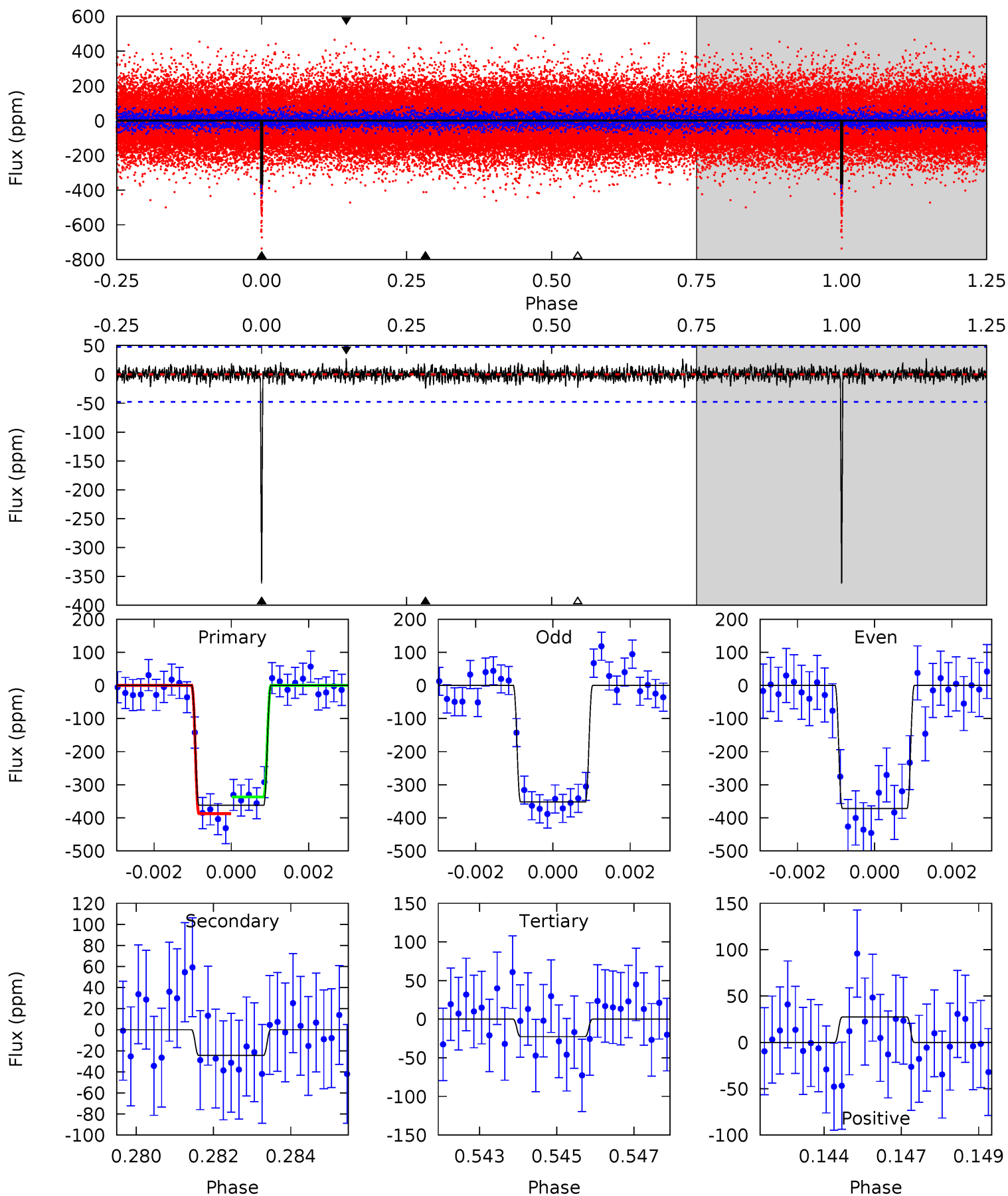
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 38.0 | 8.36 | 6.91 | 7.35 | 5.29 | 3.03 | 2.16 | 31.1 | 30.7 | 1.45 | 1.01 | 4.45 | 0.97 | 0.16 | 3.02 |



Alt Model-Shift Uniqueness Test

008105398-01, P = 224.149342 Days, E = 116.883825 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 40.3 | 2.72 | 2.52 | 3.04 | 5.30 | 3.04 | 0.71 | 37.8 | 37.3 | 0.20 | -0.32 | 1.09 | 0.98 | 0.07 | 2.82 |



Stellar Parameters For KIC 008105398

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|-------------------------------------------|
| | 6072^{+167}_{-137} | $4.133^{+0.301}_{-0.129}$ | $-0.760^{+0.300}_{-0.200}$ | $1.286^{+0.255}_{-0.383}$ | $0.818^{+0.106}_{-0.049}$ | $0.542^{+0.994}_{-0.219}$ |
| | +3%/-2% | +7%/-3% | +39%/-26% | +20%/-30% | +13%/-6% | +183%/-40% |
| Source | PHO1 | FLK73 | 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 008105398-01 / KOI 5475.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|--------------|------------------------|----------------------|----------------------|-----------------------|
| DV | -81 ± 10 | $2.69^{+0.41}_{-0.46}$ | 511^{+33}_{-43} | 4349^{+202}_{-166} | 2882^{+1290}_{-780} |
| Alt. | -24 ± 9 | $2.64^{+0.45}_{-0.44}$ | 511^{+32}_{-42} | 3556^{+219}_{-274} | 907^{+543}_{-395} |

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

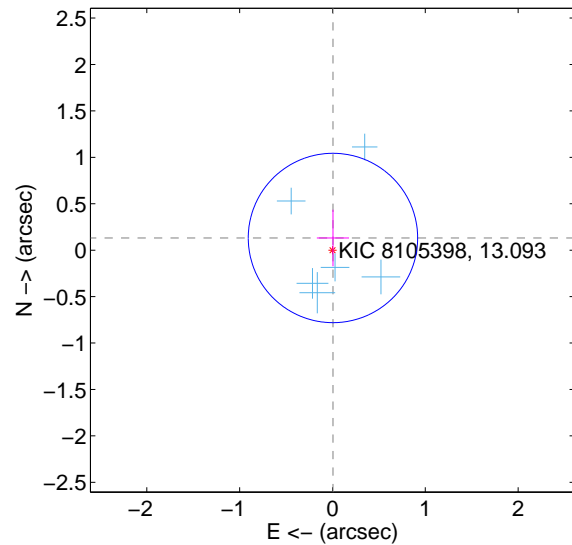
Supplemental centroid analysis for 008105398-01. Kepler magnitude: 13.09. Transit SNR 20.56

There are 6 quarters with good PRF difference image offsets

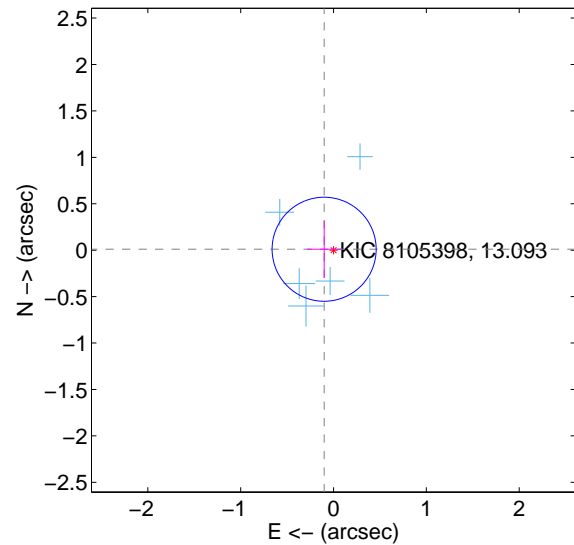
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|-----------------------------------------|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.131 ± 0.304 | 0.43 | -0.005 ± 0.173 | 0.131 ± 0.304 |
| PRF-fit source offset from KIC position | 0.102 ± 0.187 | 0.54 | 0.101 ± 0.185 | 0.010 ± 0.307 |
| photometric centroid source offset | 0.89 ± 0.43 | 2.07 | 0.47 ± 0.41 | -0.75 ± 0.44 |

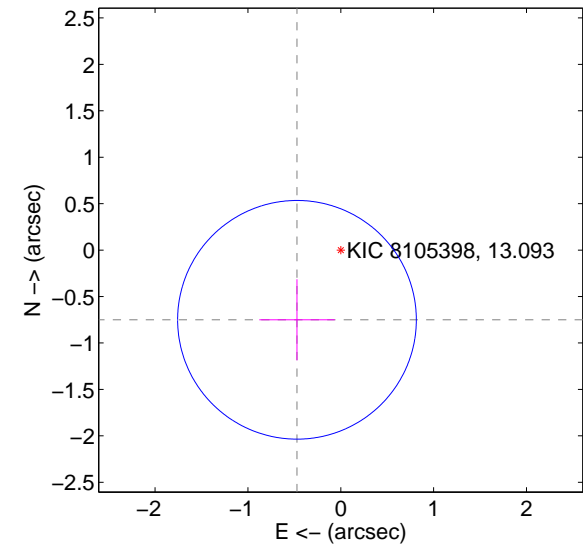
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

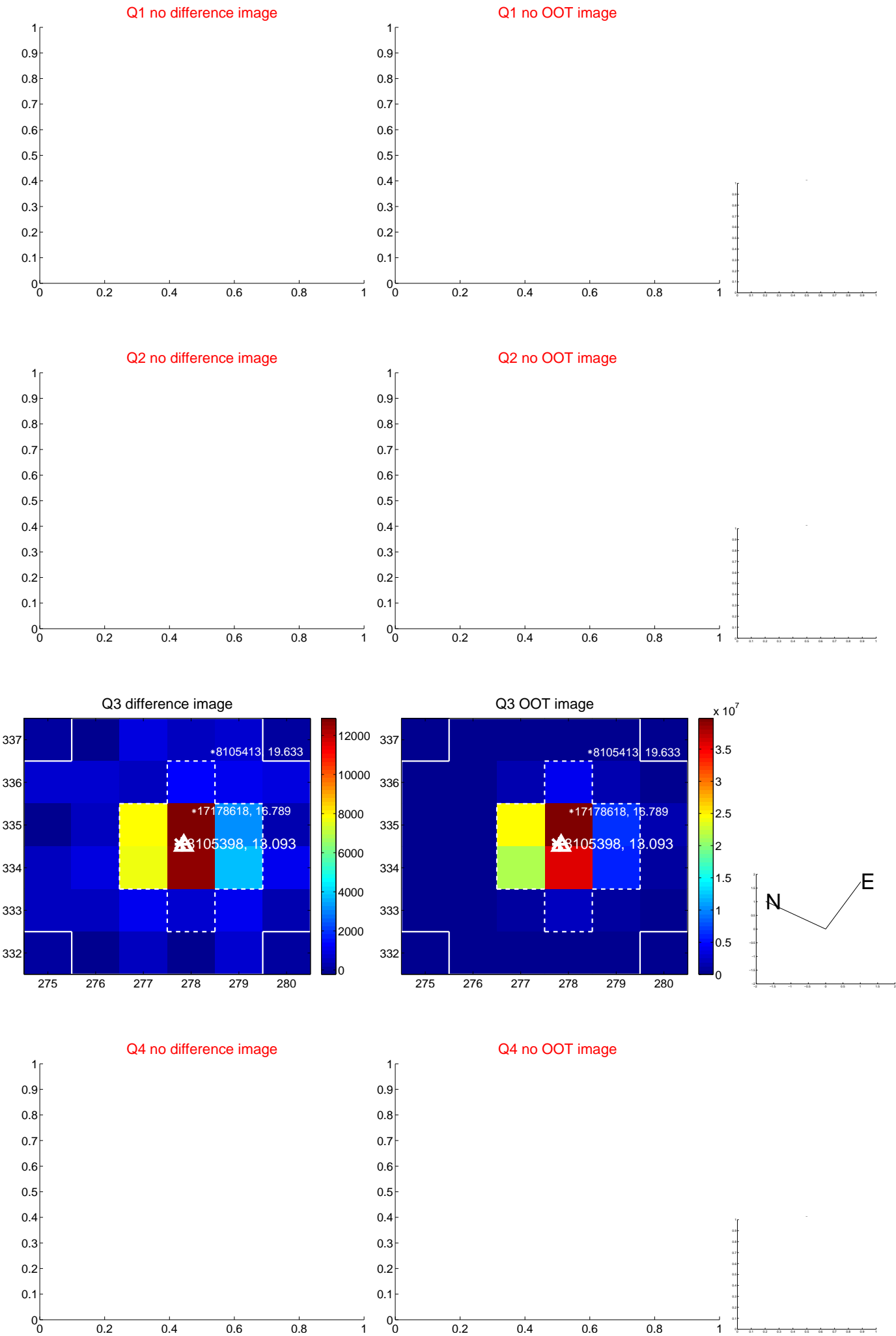


offset from photometric centroids



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.

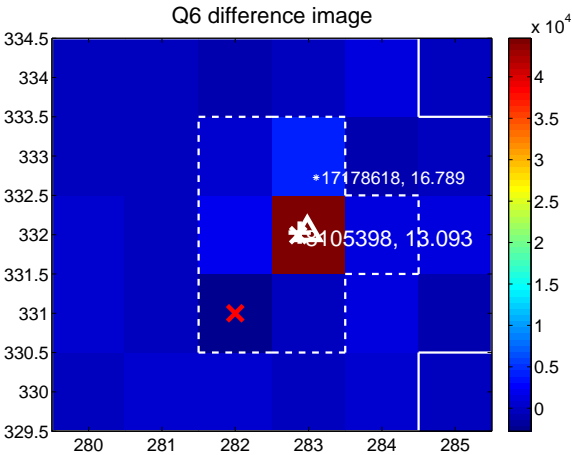
Q5 no difference image



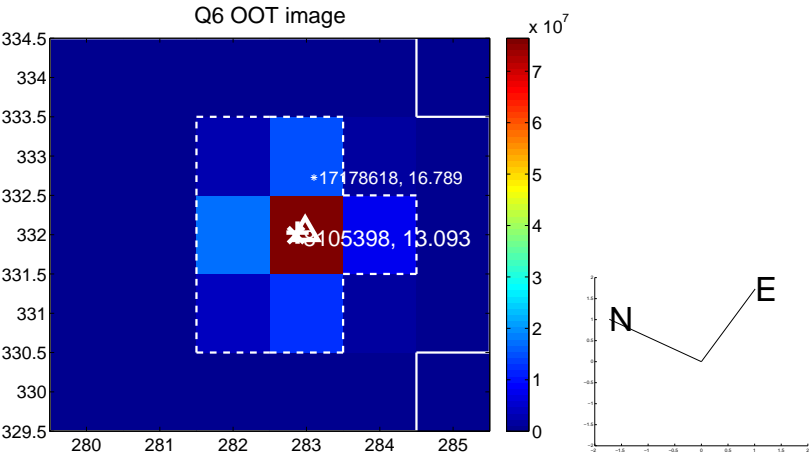
Q5 no OOT image



Q6 difference image



Q6 OOT image



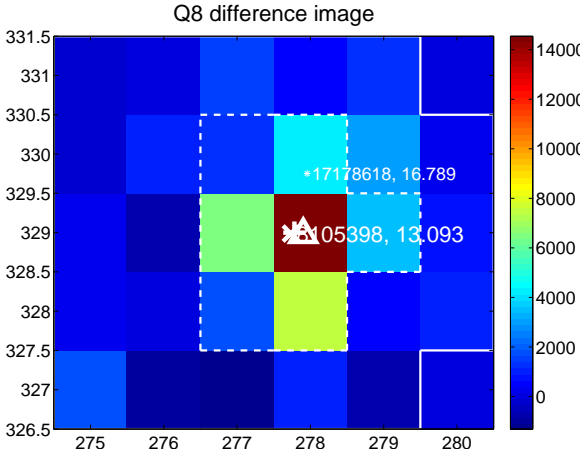
Q7 no difference image



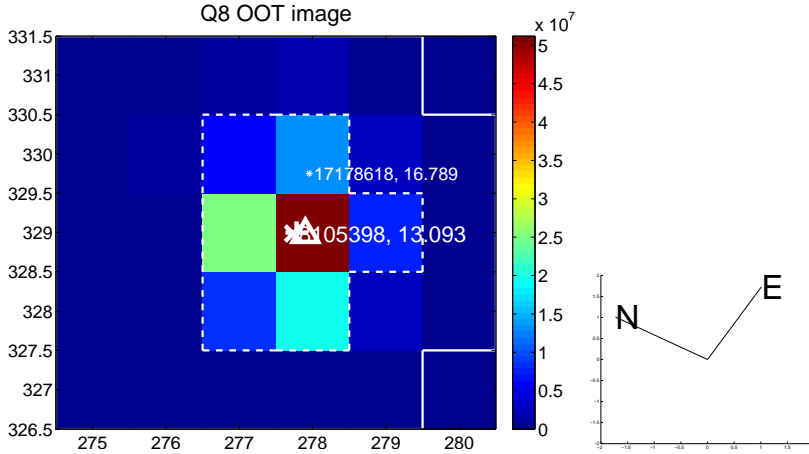
Q7 no OOT image



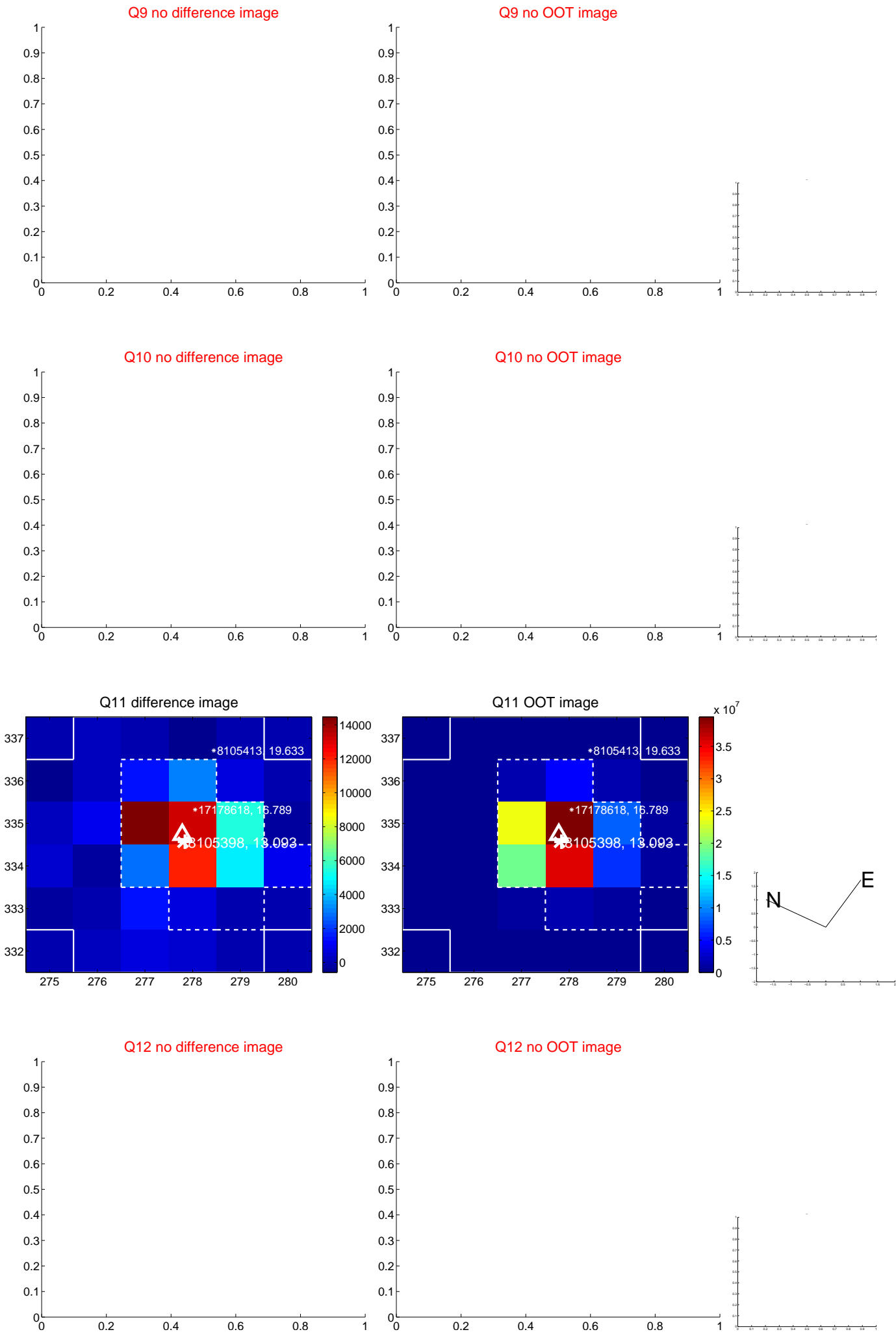
Q8 difference image



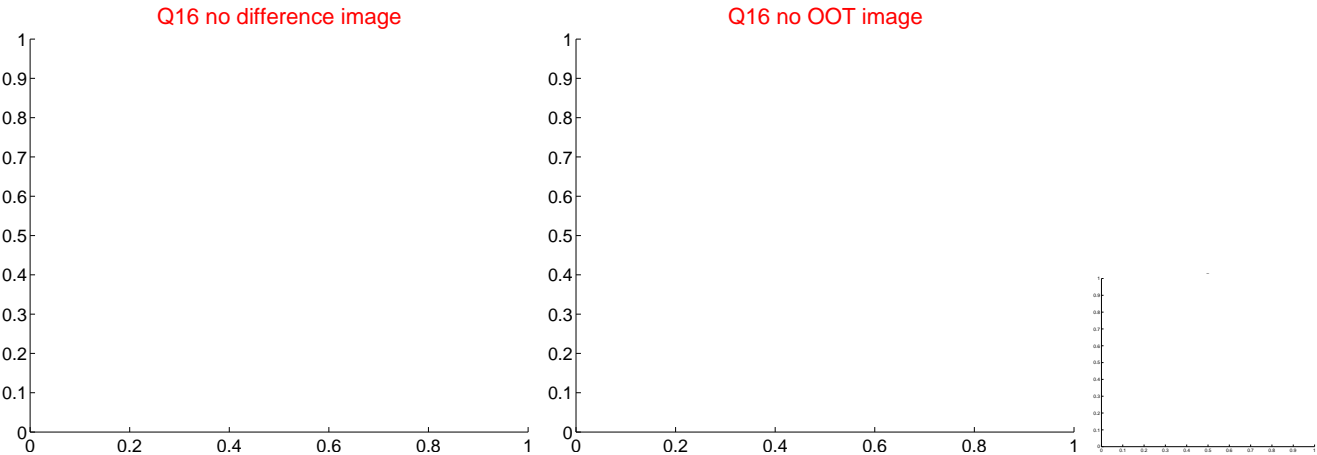
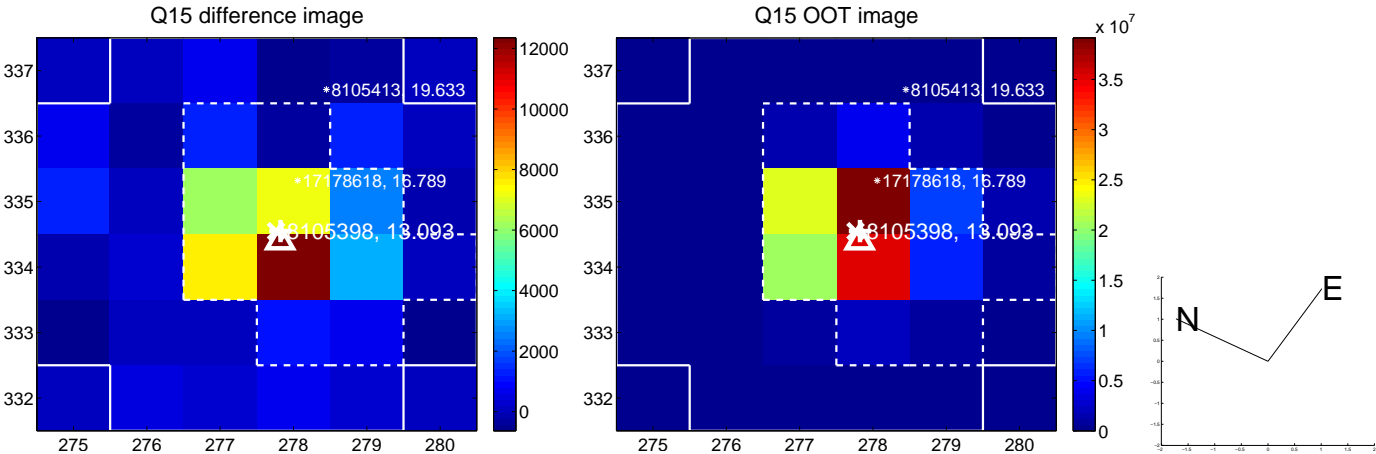
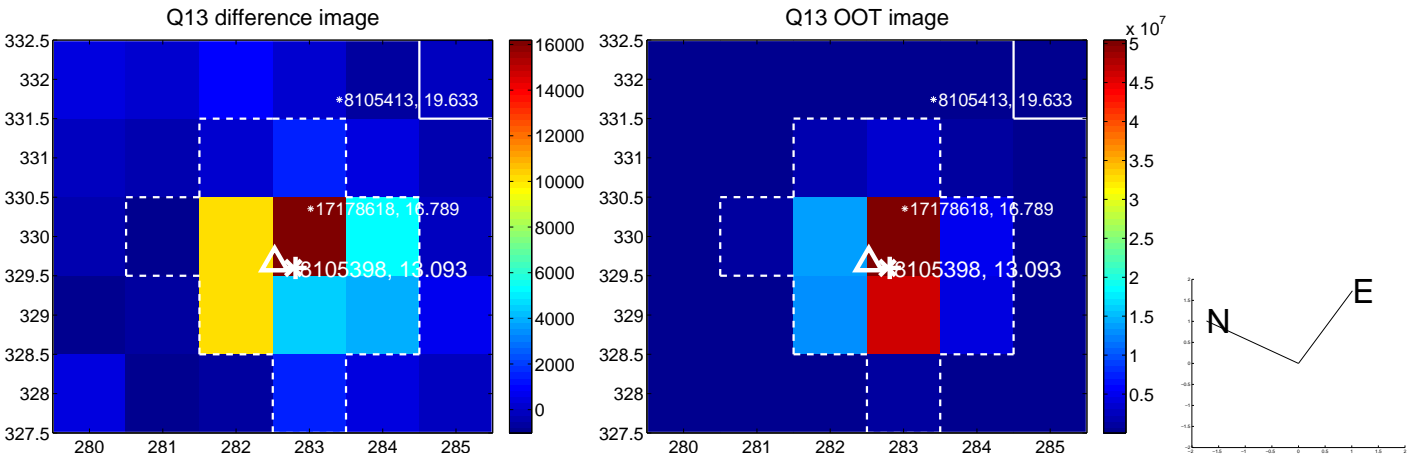
Q8 OOT image



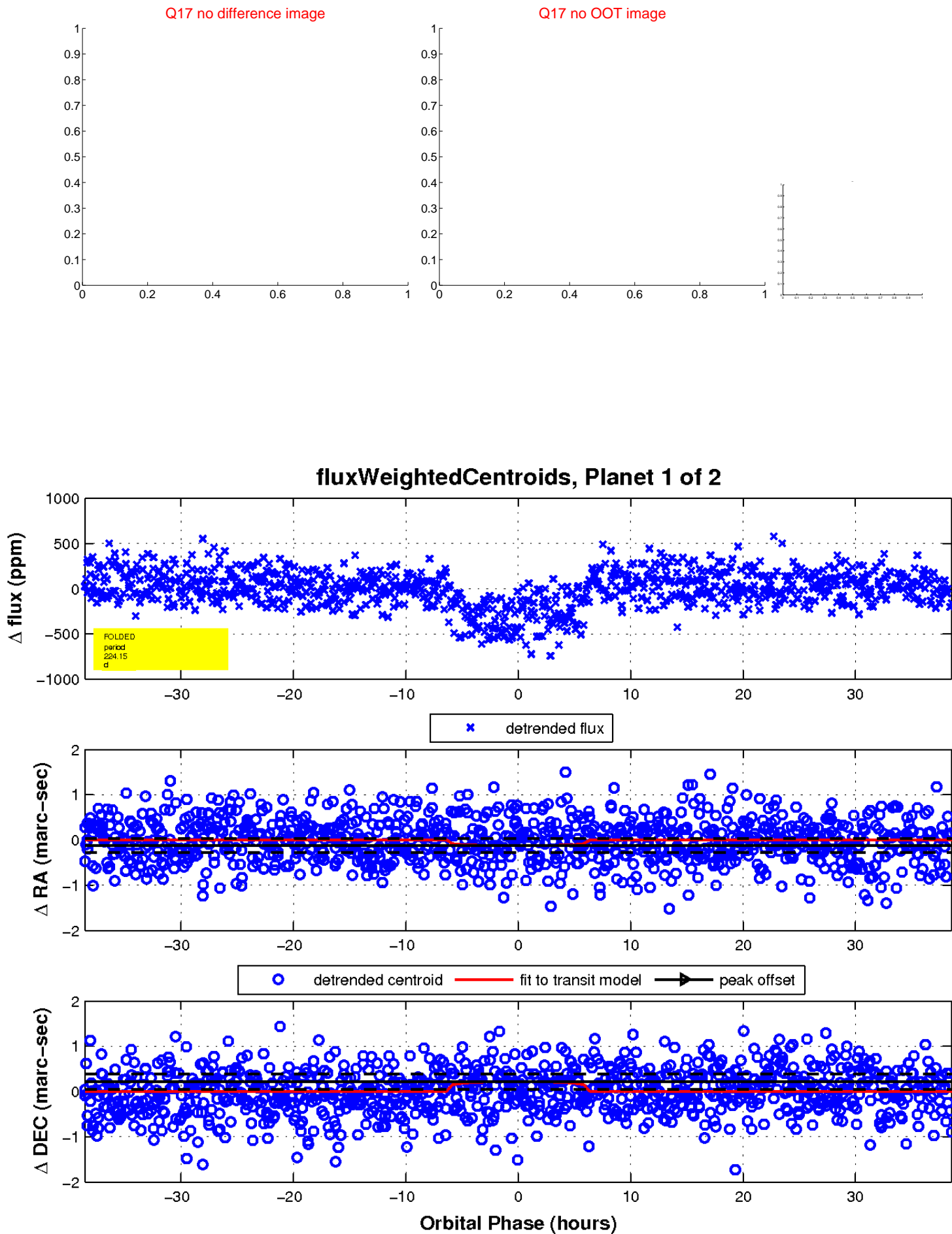
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

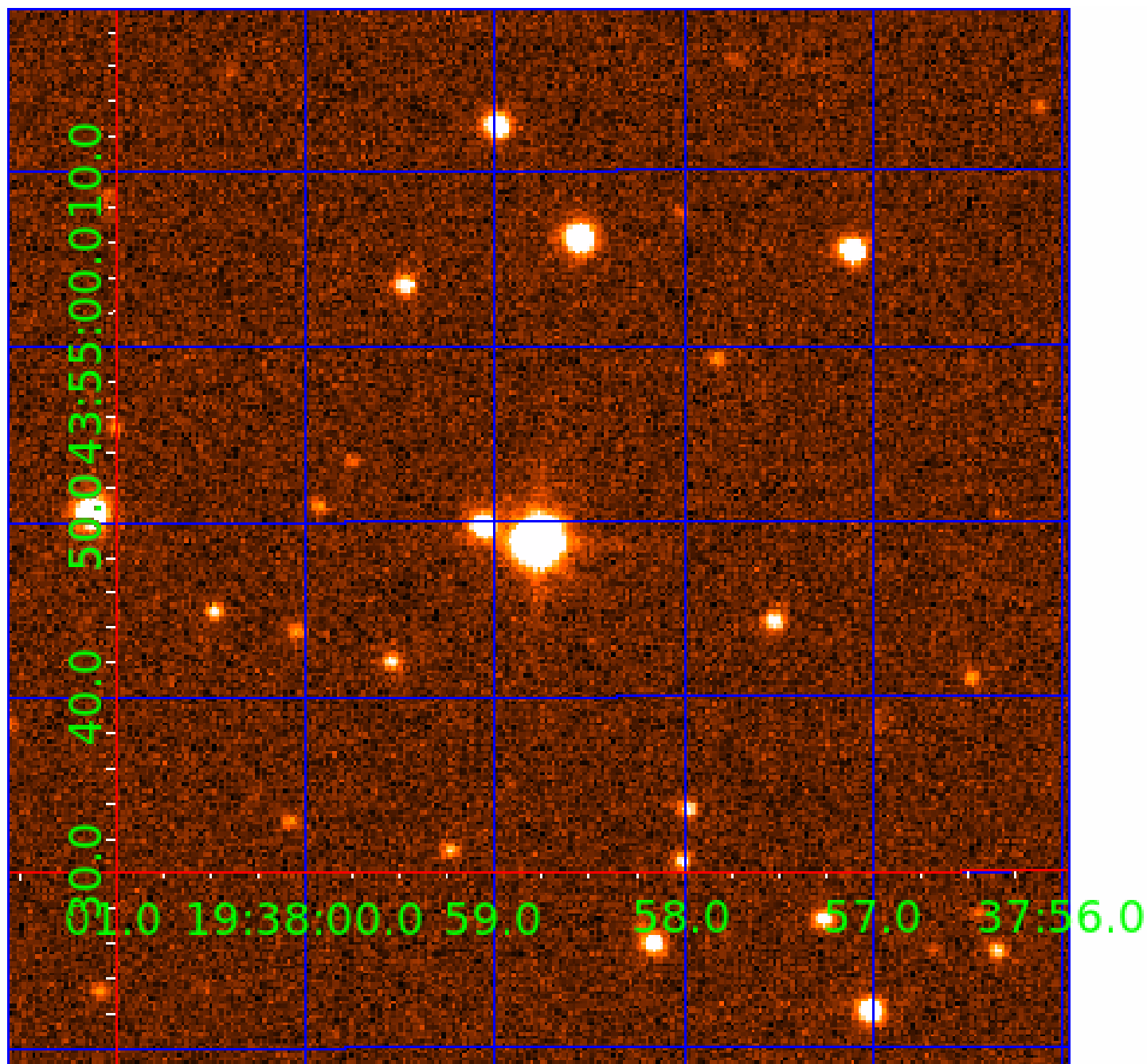


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008105398

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008105398-01 | OBS | 5475.01 | 224.150759 | 341.028533 | 379.3 | 12.861 | 20.5 | 20.6 | 1.29 | 6072 | 2.74 | 4.41 |
| 008105398-02 | OBS | 5475.02 | 5.683207 | 134.882091 | 39.5 | 1.767 | 7.2 | 7.9 | 1.29 | 6072 | 0.95 | 591.91 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|------------|
| 008105398-01 | OBS | PC | 1.00 | 0 | 0 | 0 | 0 | NO_COMMENT |
| 008105398-02 | OBS | PC | 0.98 | 0 | 0 | 0 | 0 | NO_COMMENT |

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

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

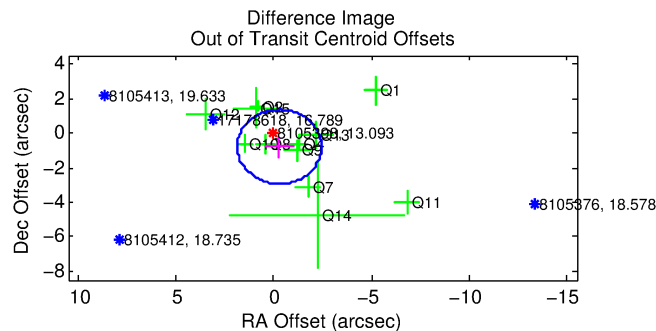
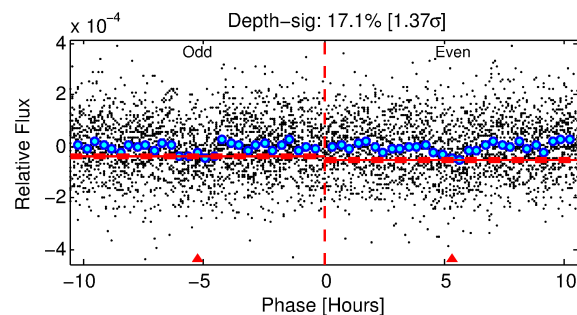
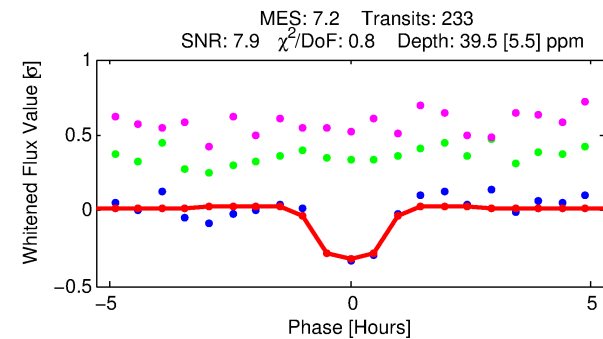
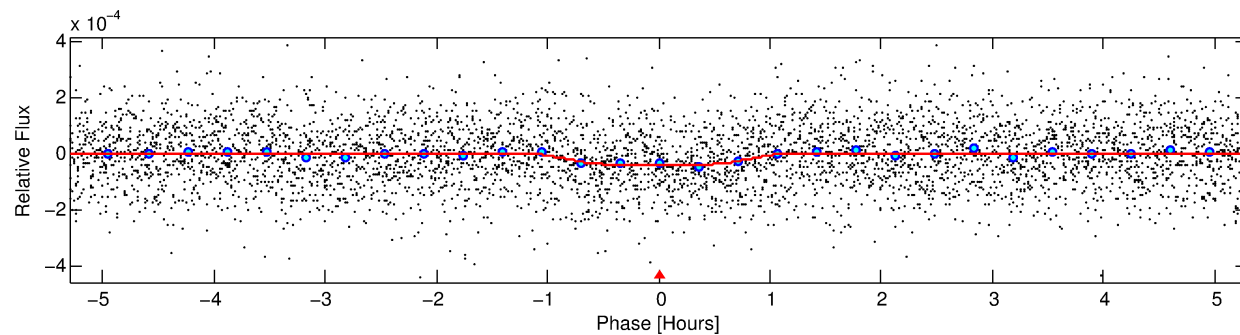
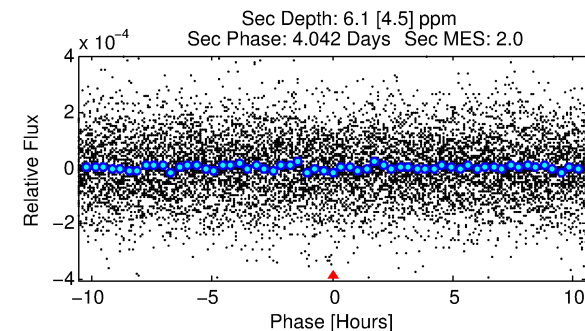
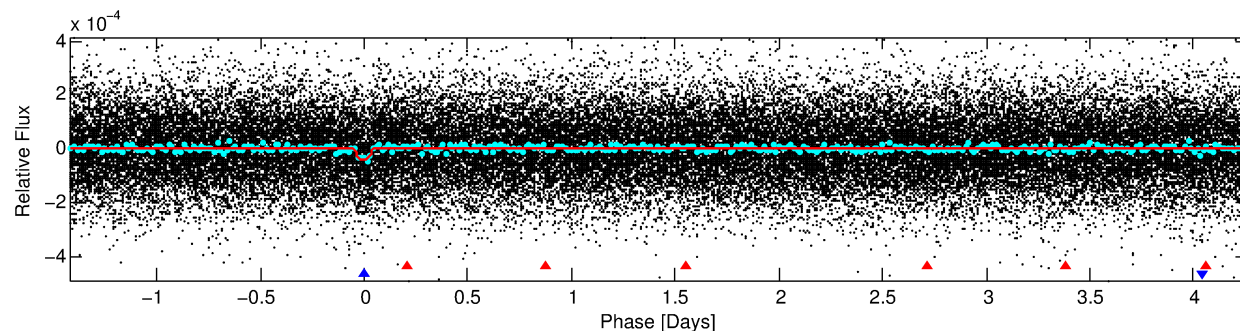
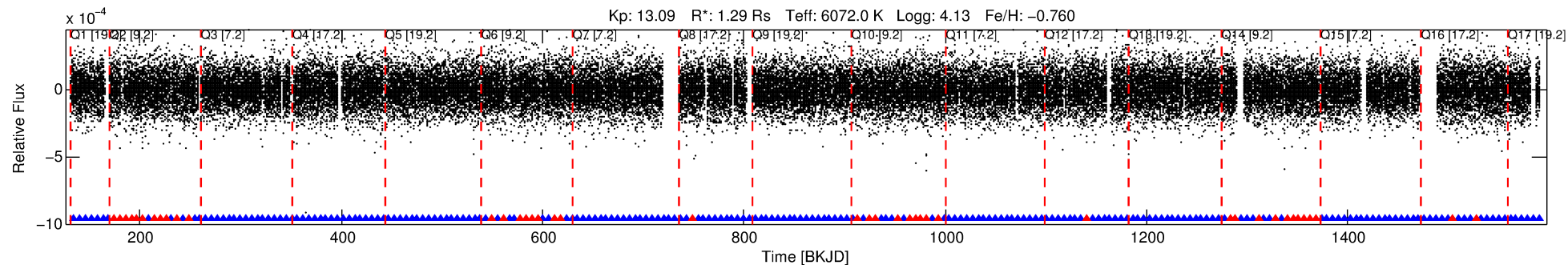
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008105398-02

No Significant Match Found

DV One-Page Summary

KIC: 8105398 Candidate: 2 of 2 Period: 5.683 d
KOI: K05475.02 Corr: 0.961



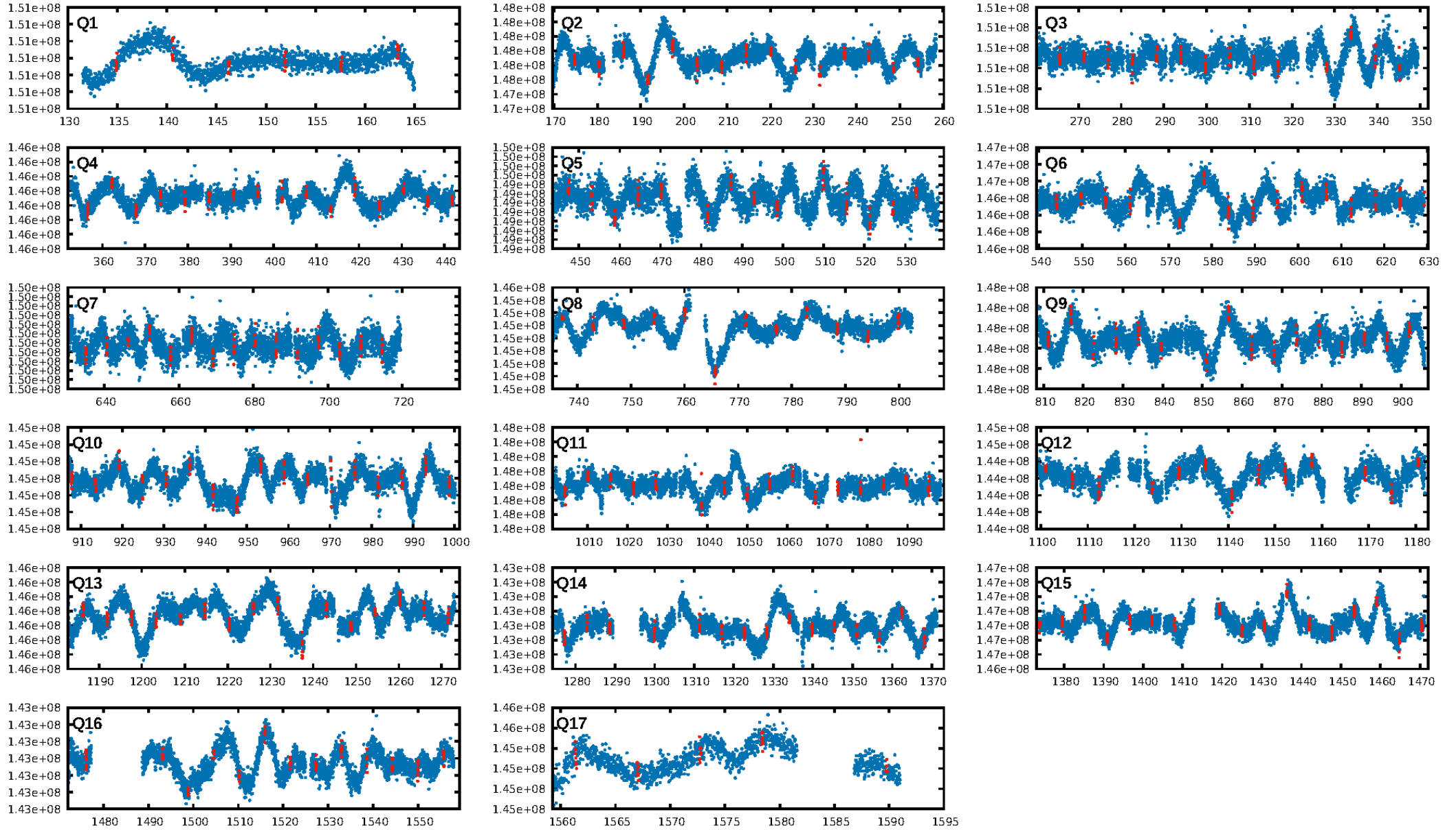
DV Fit Results:

Period = 5.68321 [0.00004] d
Epoch = 134.8821 [0.0045] BKJD
Rp/R* = 0.0068 [0.0041]
a/R* = 11.16 [37.57]
b = 0.90 [0.73]
Seff = 591.91 [304.72]
Teff = 1258 [162] K
Rp = 0.95 [0.64] Re
a = 0.0583 [0.0178] AU
Ag = 12.63 [19.07] [0.61σ]
Teffp = 3666 [1309] K [1.83σ]

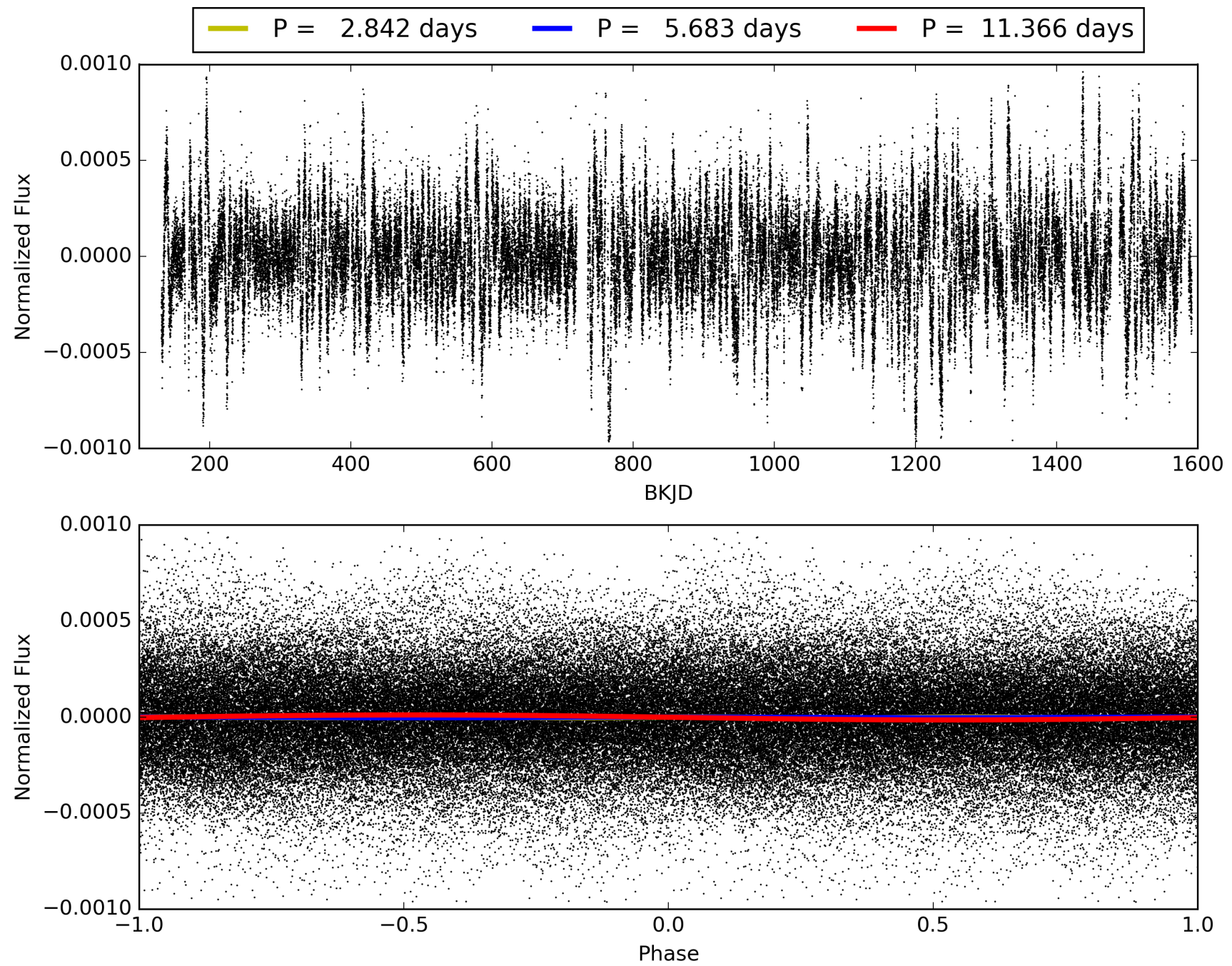
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [403.90σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.86e-12
RollingBand-fgt: 0.81 [180/222]
GhostDiagnostic-chr: -6.631
Centroid-sig: 29.7%
Centroid-so: 1.528 arcsec [0.98σ]
OotOffset-rm: 0.843 arcsec [1.18σ]
KicOffset-rm: 0.909 arcsec [1.50σ]
OotOffset-st: 3/3/3/3 [12]
KicOffset-st: 3/3/3/3 [12]
DiffImageQuality-fgm: 0.67 [8/12]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 008105398-02, PDC Light Curves

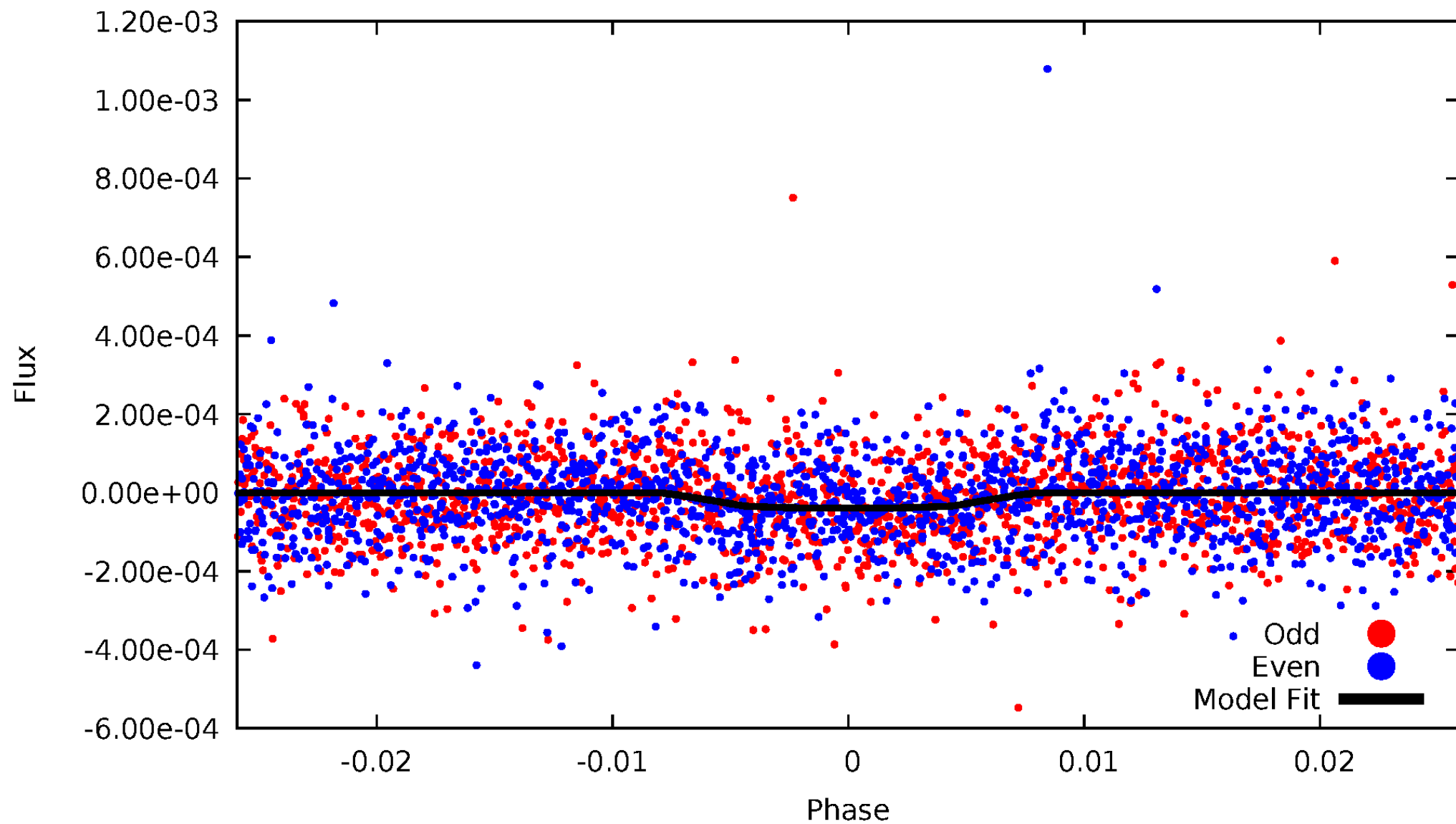


TCE 008105398-02



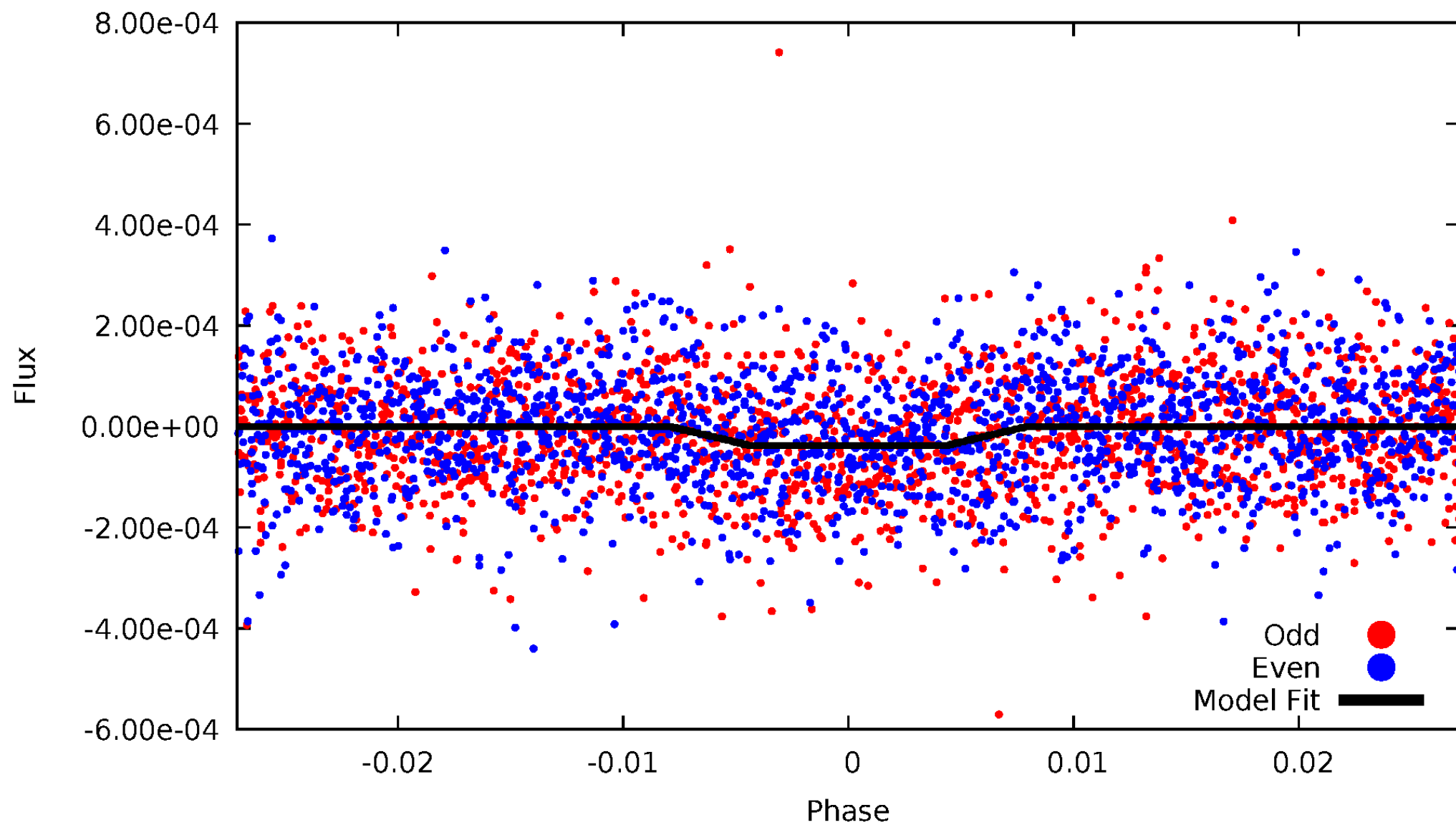
DV Odd/Even

TCE 008105398-02



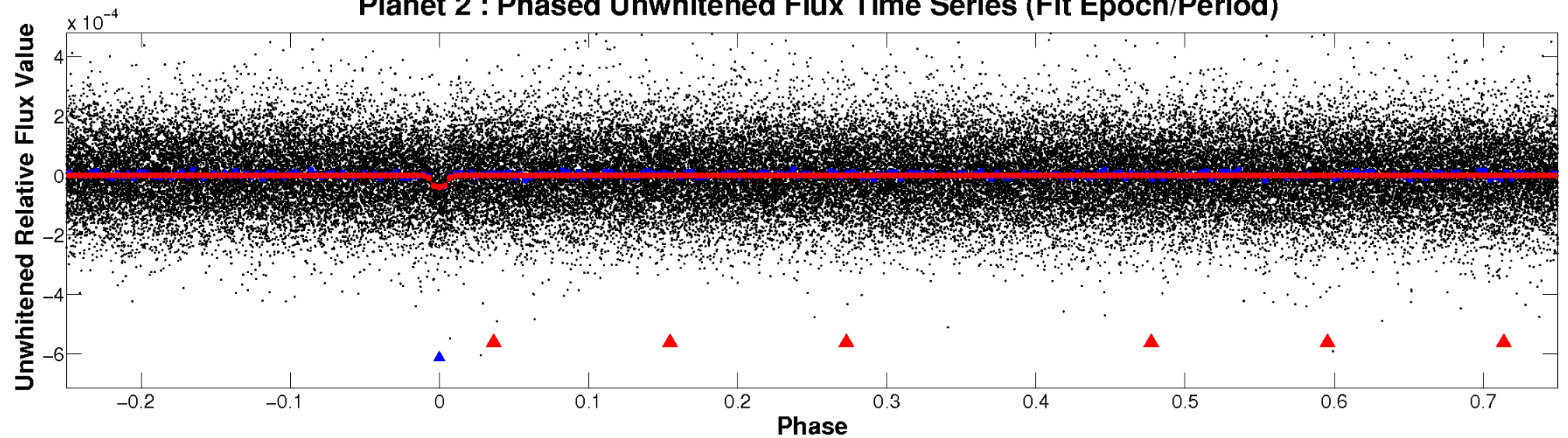
ALT Odd/Even

TCE 008105398-02

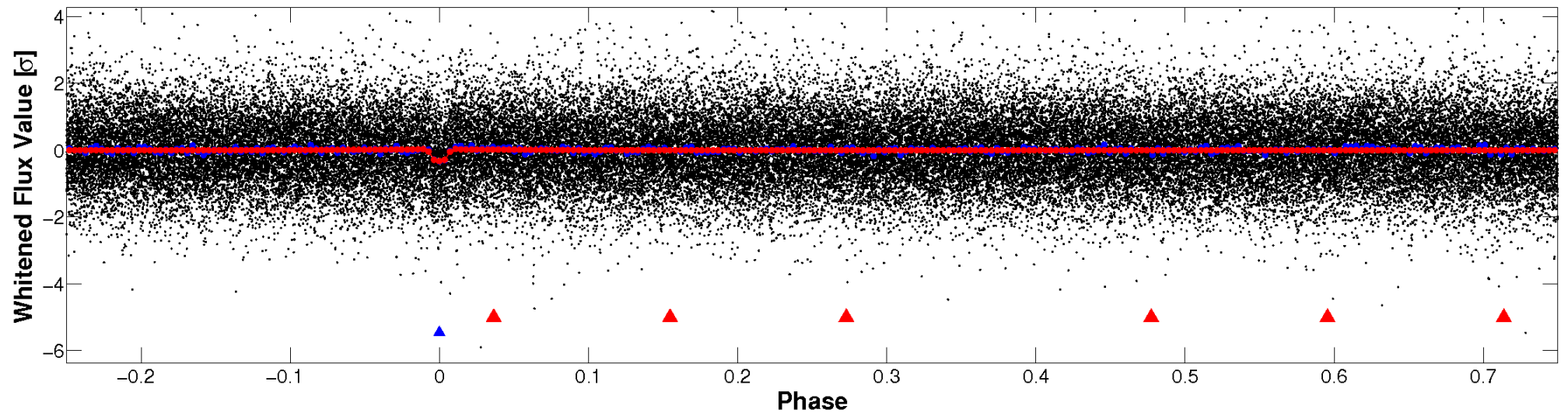


Non-Whitened Vs. Whitened Light Curve

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

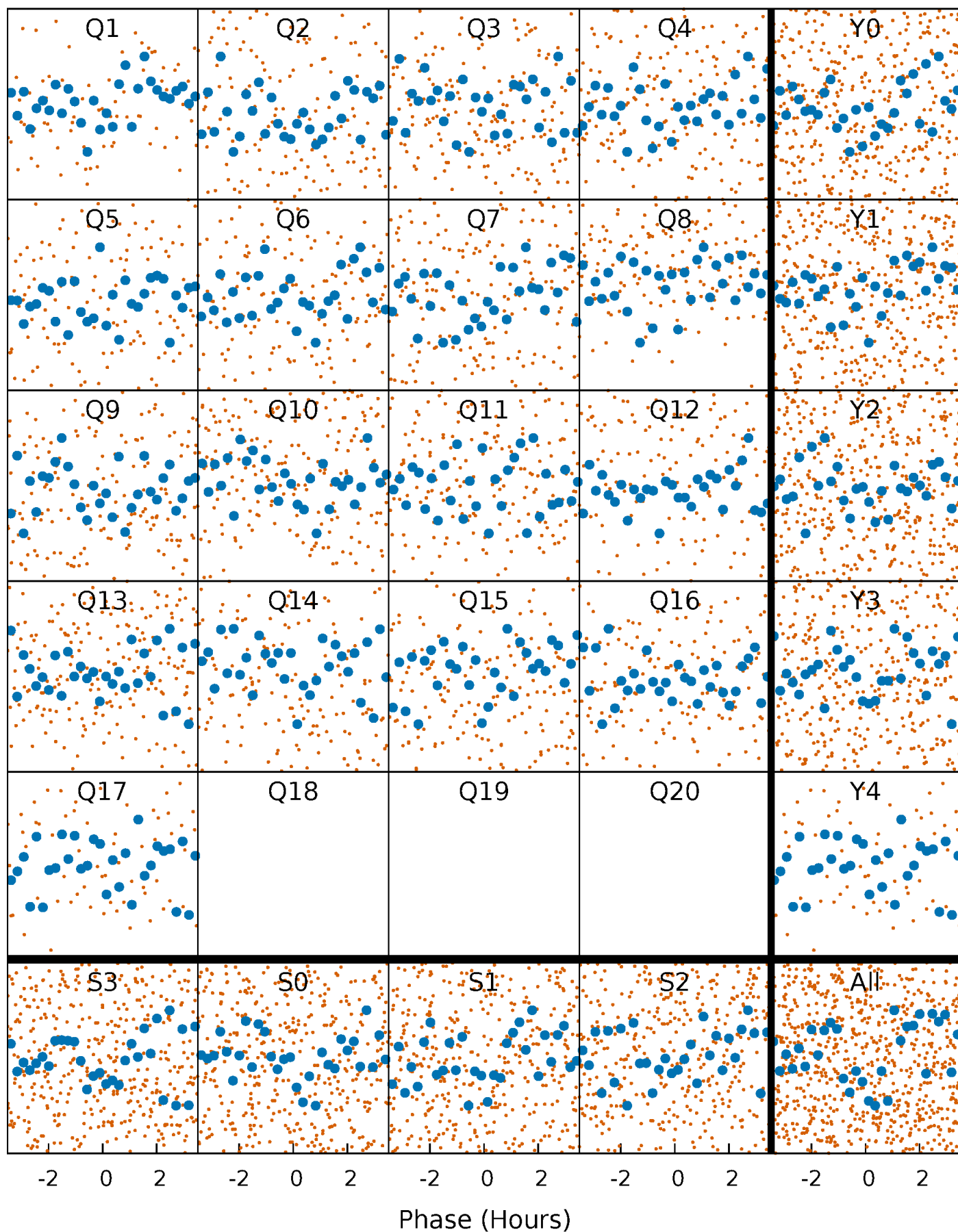


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



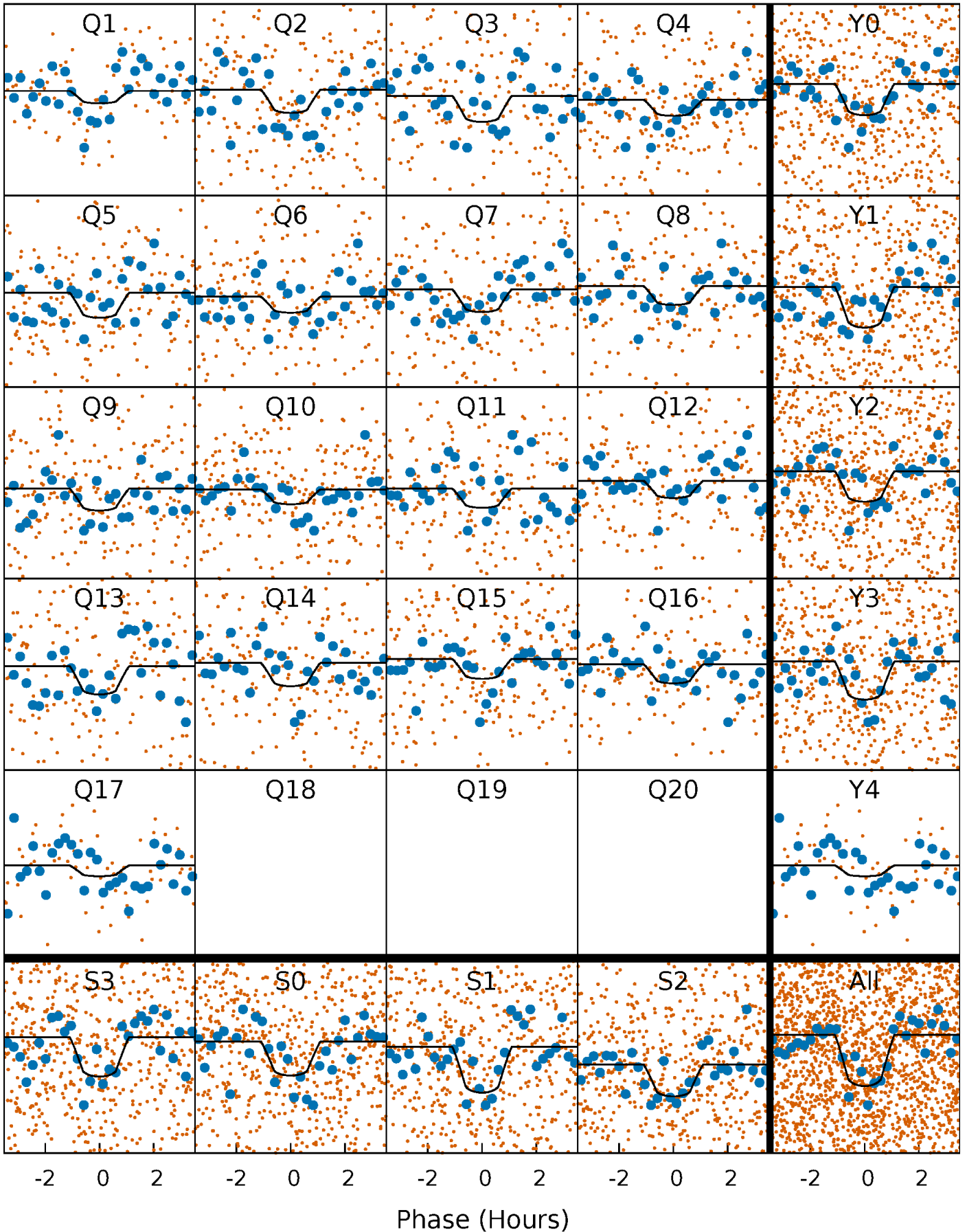
PDC Quarter-Phased Transit Curves

TCE 008105398-02 P= 5.683207 Days $T_0=134.882091$ (BKJD)



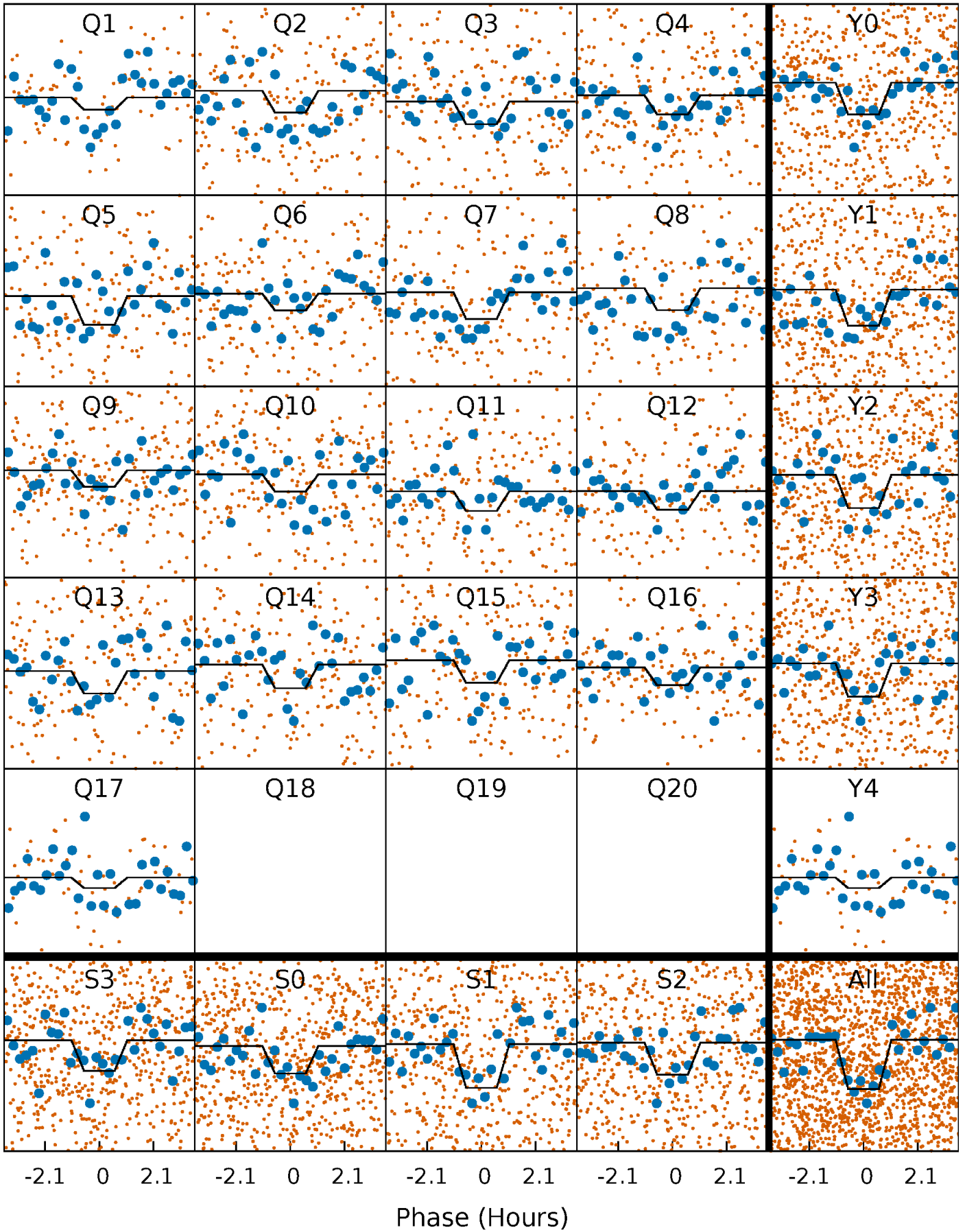
DV Quarter-Phased Transit Curves

TCE 008105398-02 P= 5.683207 Days $T_0=134.882091$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

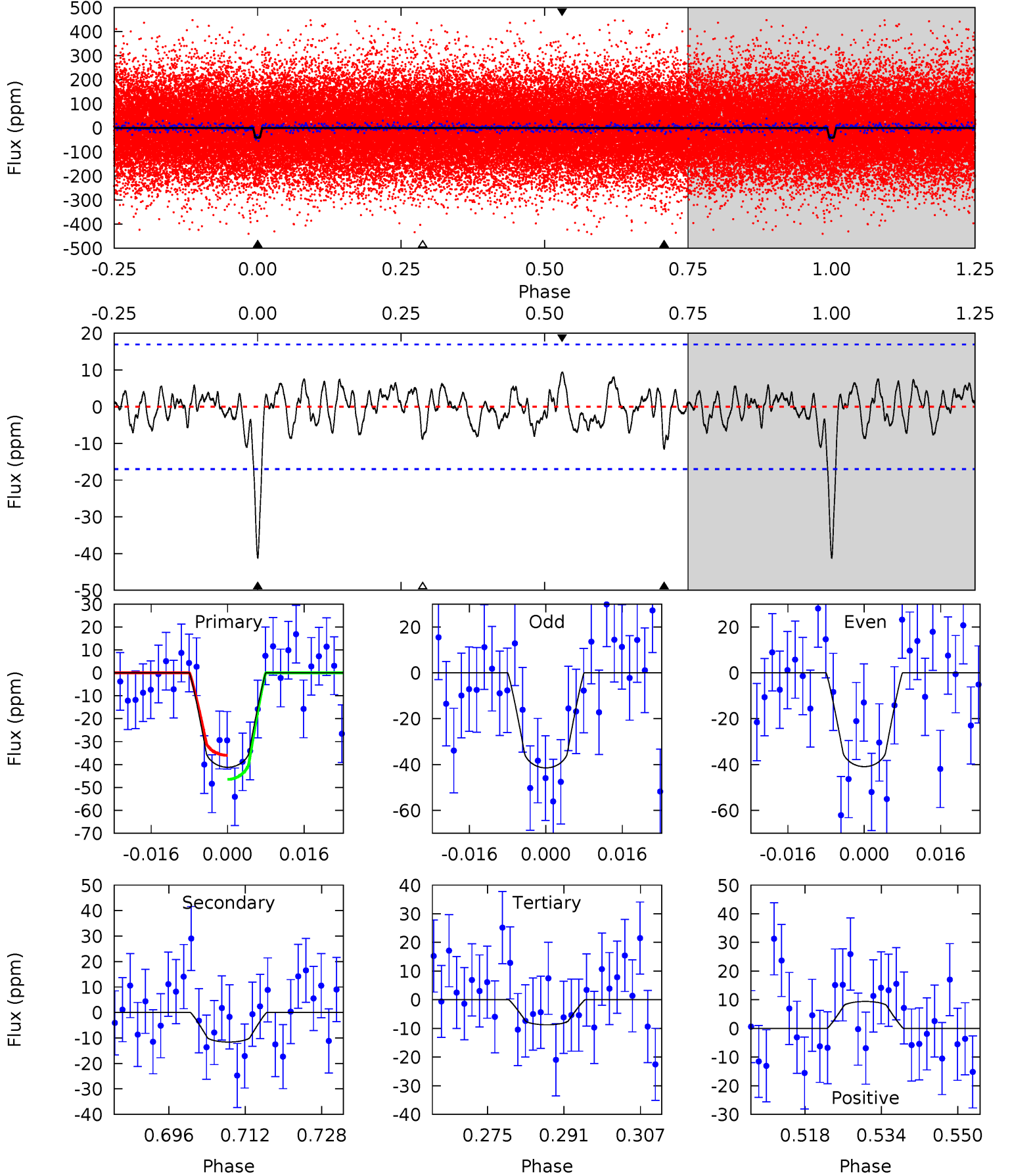
TCE 008105398-02 P= 5.683304 Days $T_0=134.870785$ (BKJD)



DV Model-Shift Uniqueness Test

008105398-02, P = 5.683207 Days, E = 129.198884 Days

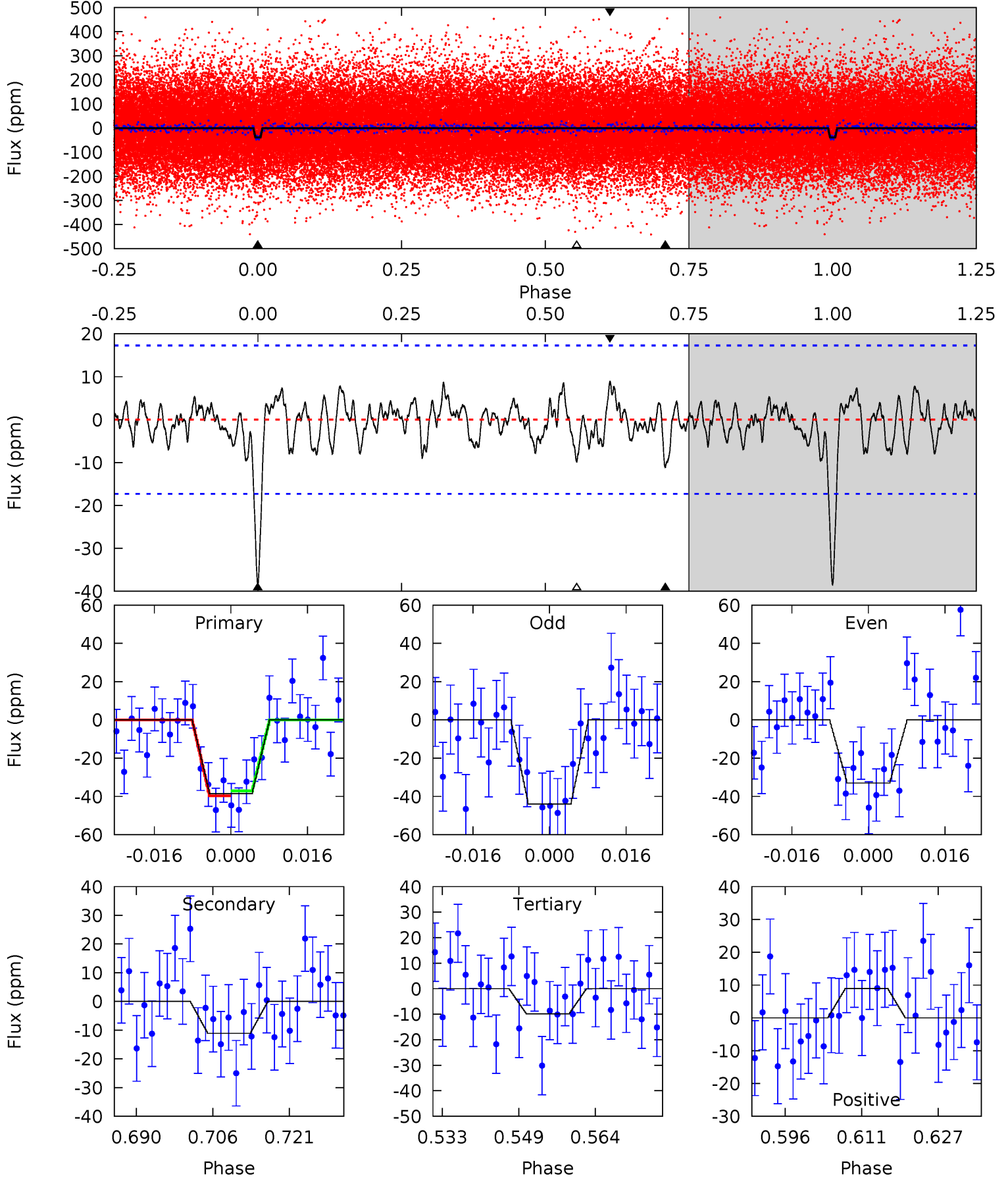
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.0 | 3.37 | 2.54 | 2.73 | 4.93 | 2.40 | 1.10 | 9.44 | 9.24 | 0.83 | 0.64 | 0.08 | 0.98 | 0.19 | 1.53 |



Alt Model-Shift Uniqueness Test

008105398-02, P = 5.683304 Days, E = 129.187481 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.0 | 3.18 | 2.83 | 2.55 | 4.94 | 2.42 | 1.05 | 8.16 | 8.45 | 0.35 | 0.63 | 1.57 | 0.98 | 0.19 | 0.37 |



Stellar Parameters For KIC 008105398

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|-------------------------------------------|
| | 6072^{+167}_{-137} | $4.133^{+0.301}_{-0.129}$ | $-0.760^{+0.300}_{-0.200}$ | $1.286^{+0.255}_{-0.383}$ | $0.818^{+0.106}_{-0.049}$ | $0.542^{+0.994}_{-0.219}$ |
| | +3%/-2% | +7%/-3% | +39%/-26% | +20%/-30% | +13%/-6% | +183%/-40% |
| Source | PHO1 | FLK73 | 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 008105398-02 / KOI 5475.02

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|-----------------------|-------------------|
| DV | -12 ± 3 | $0.91^{+0.58}_{-0.50}$ | 1730^{+113}_{-151} | 4486^{+1760}_{-802} | 28^{+102}_{-19} |
| Alt. | -11 ± 3 | $0.89^{+0.56}_{-0.50}$ | 1747^{+109}_{-154} | 4471^{+2068}_{-751} | 26^{+129}_{-17} |

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

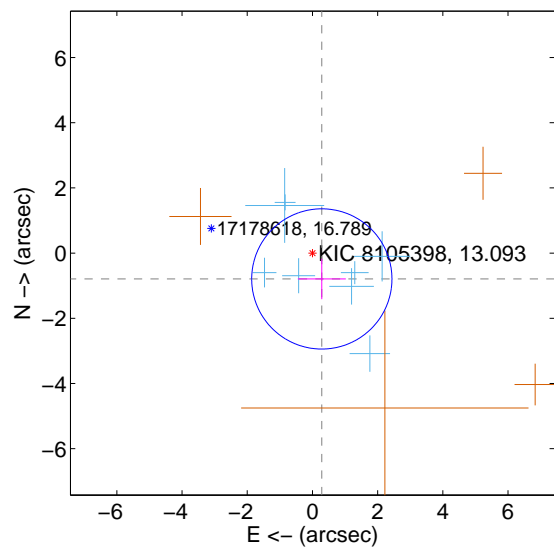
Supplemental centroid analysis for 008105398-02. Kepler magnitude: 13.09. Transit SNR 7.92

There are 8 quarters with good PRF difference image offsets

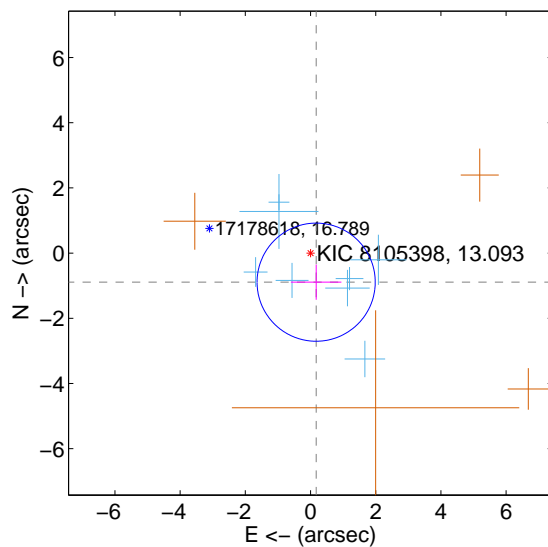
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|-----------------------------------------|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.843 ± 0.717 | 1.18 | -0.288 ± 0.736 | -0.793 ± 0.620 |
| PRF-fit source offset from KIC position | 0.909 ± 0.604 | 1.50 | -0.173 ± 0.774 | -0.892 ± 0.540 |
| photometric centroid source offset | 1.53 ± 1.55 | 0.98 | -1.00 ± 1.47 | -1.16 ± 1.61 |

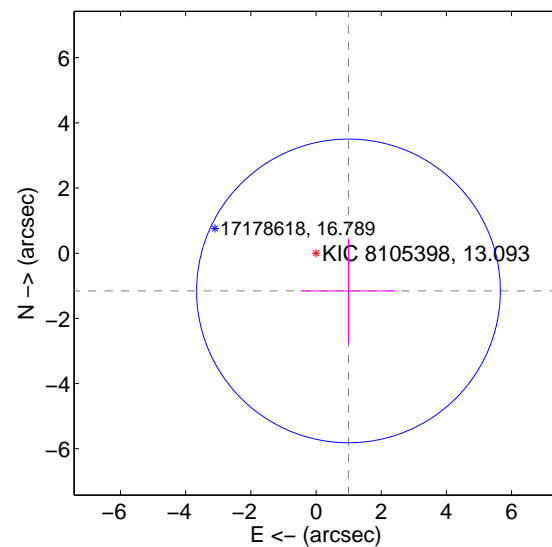
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

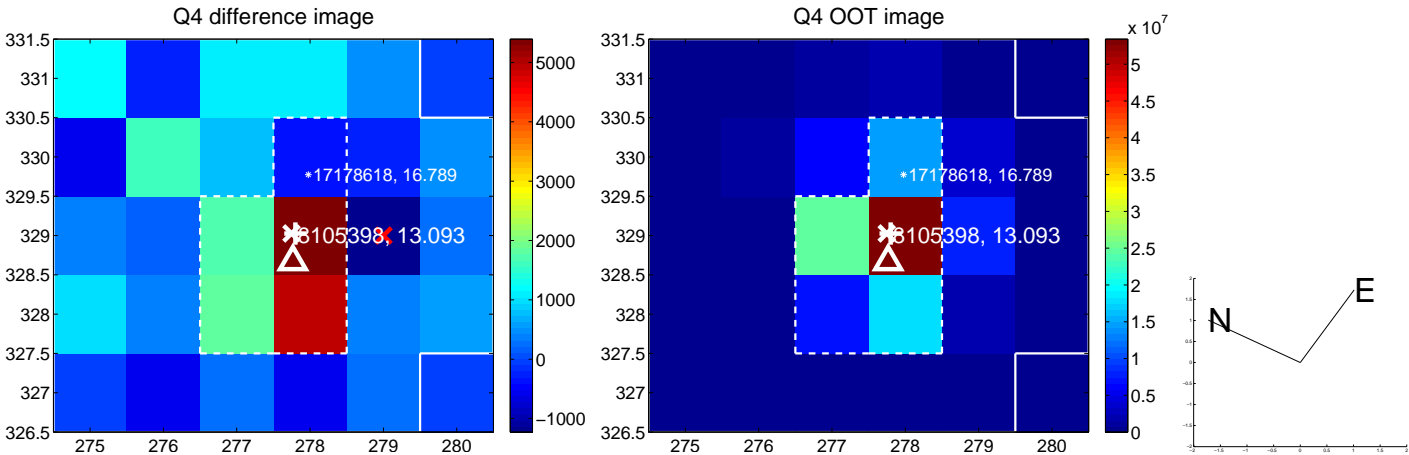
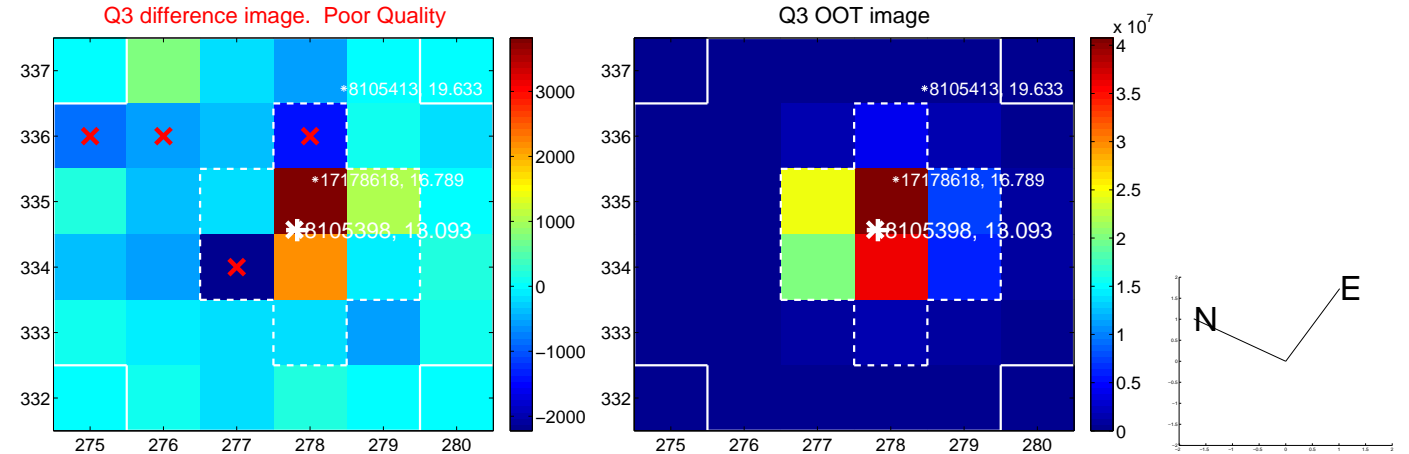
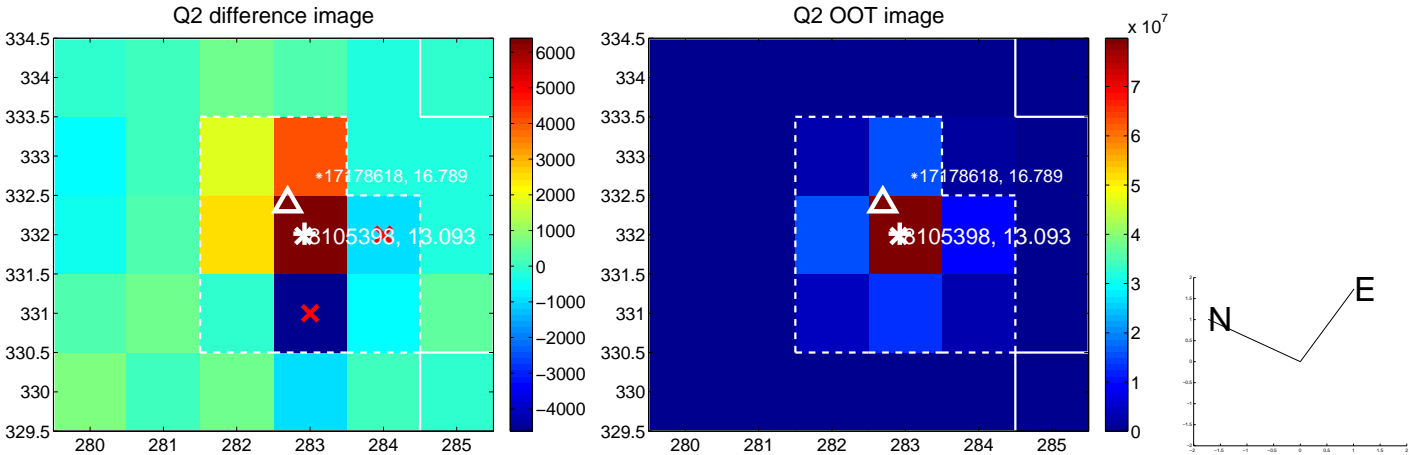
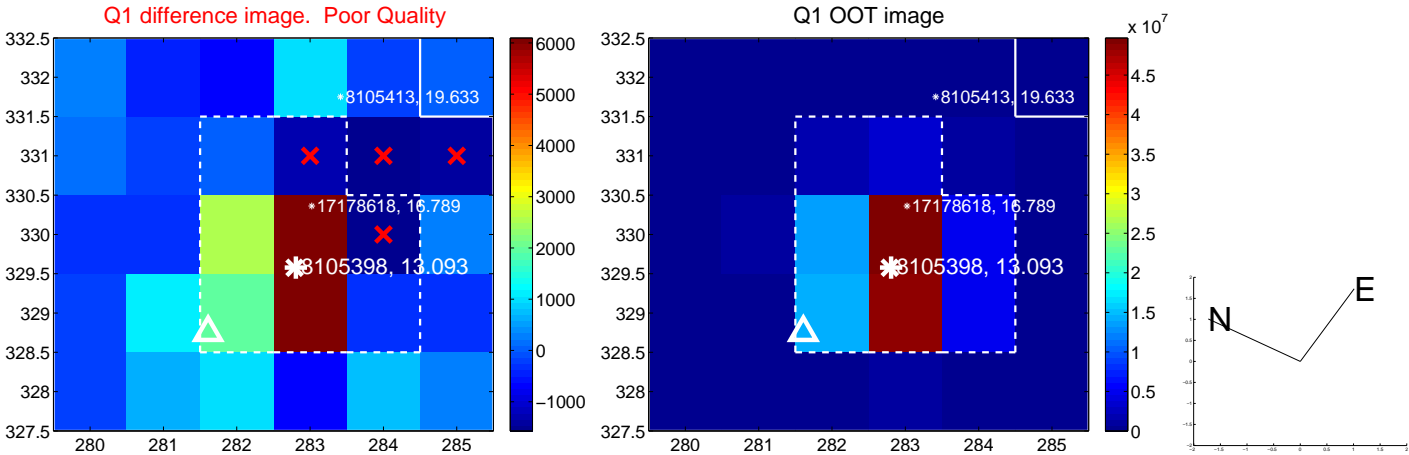


offset from photometric centroids

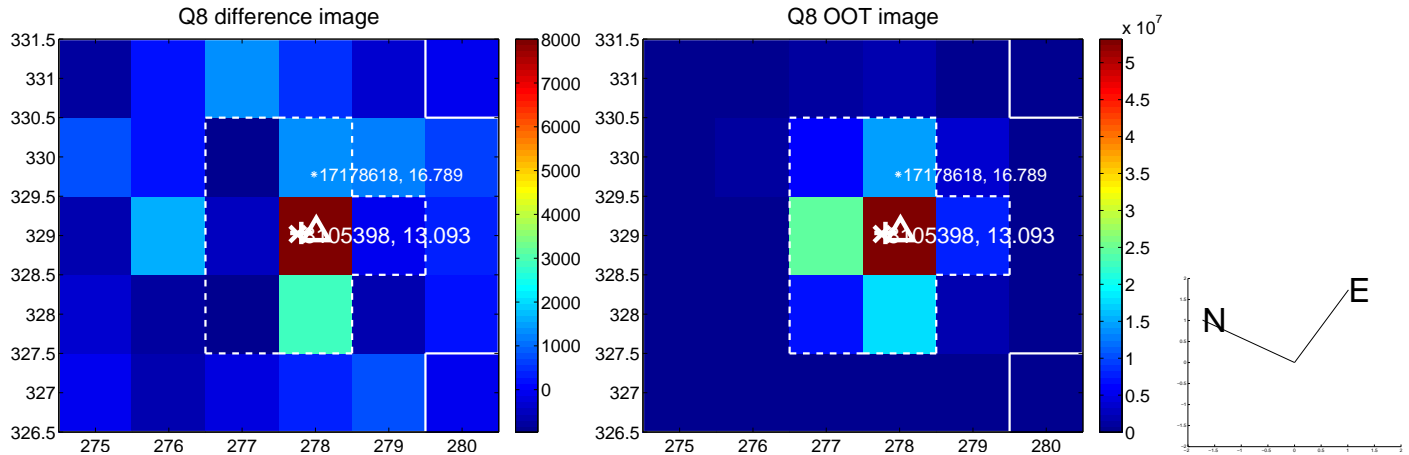
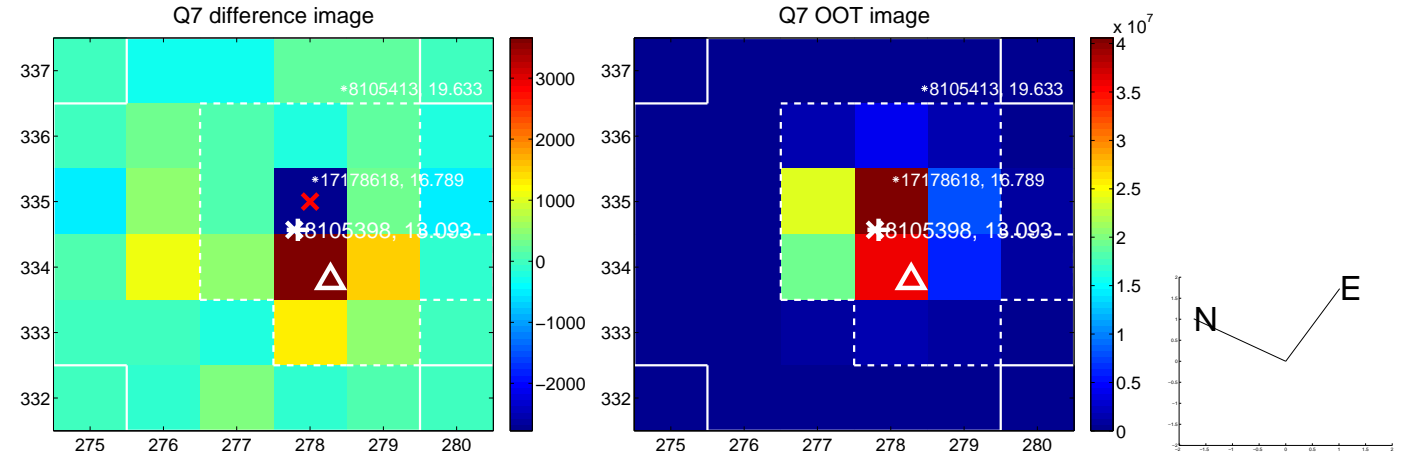
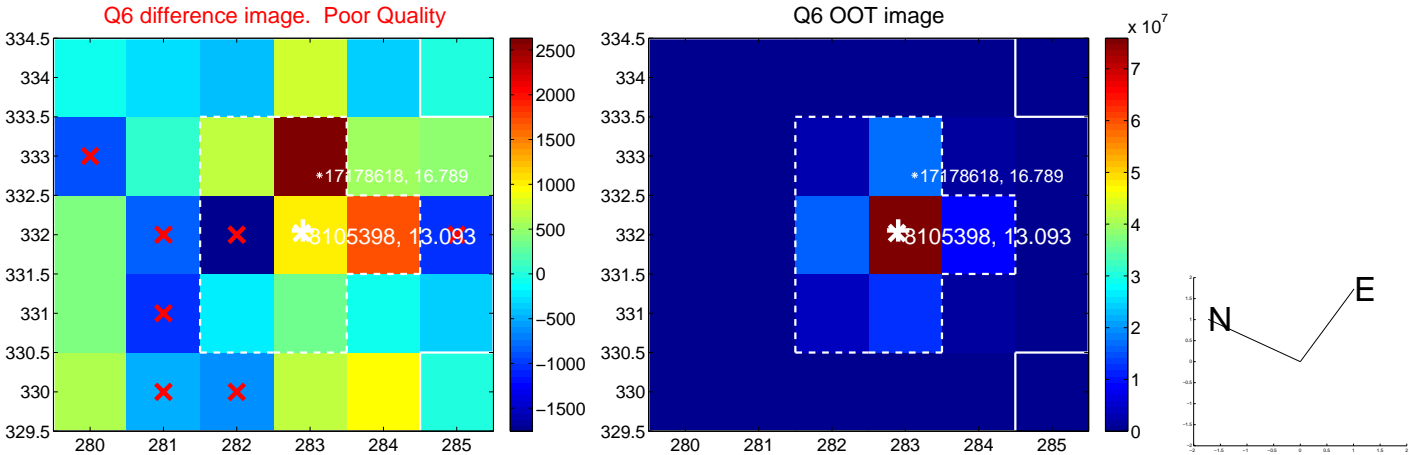
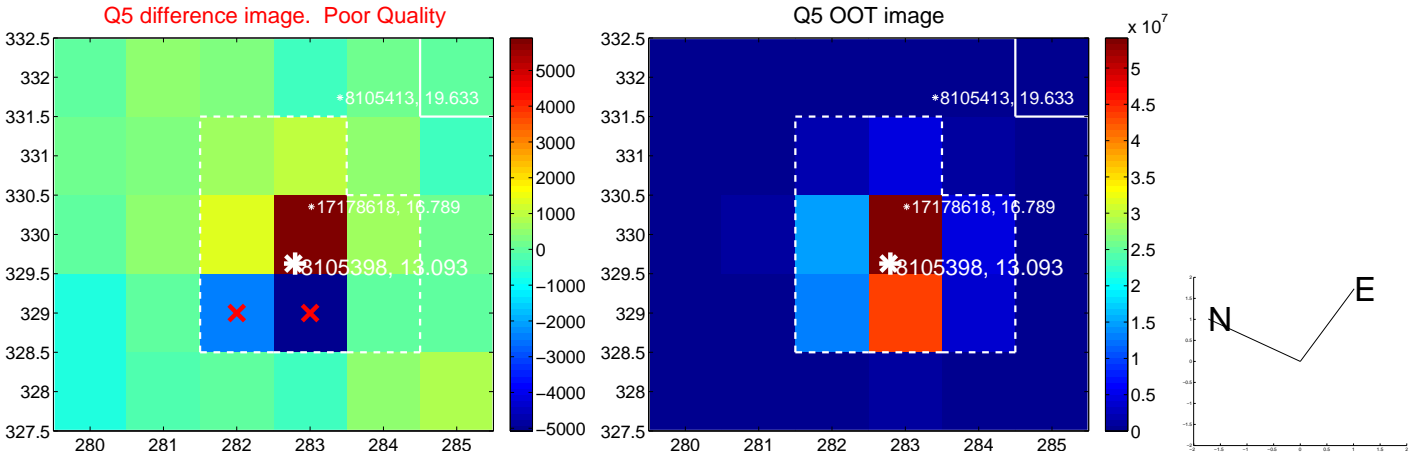


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

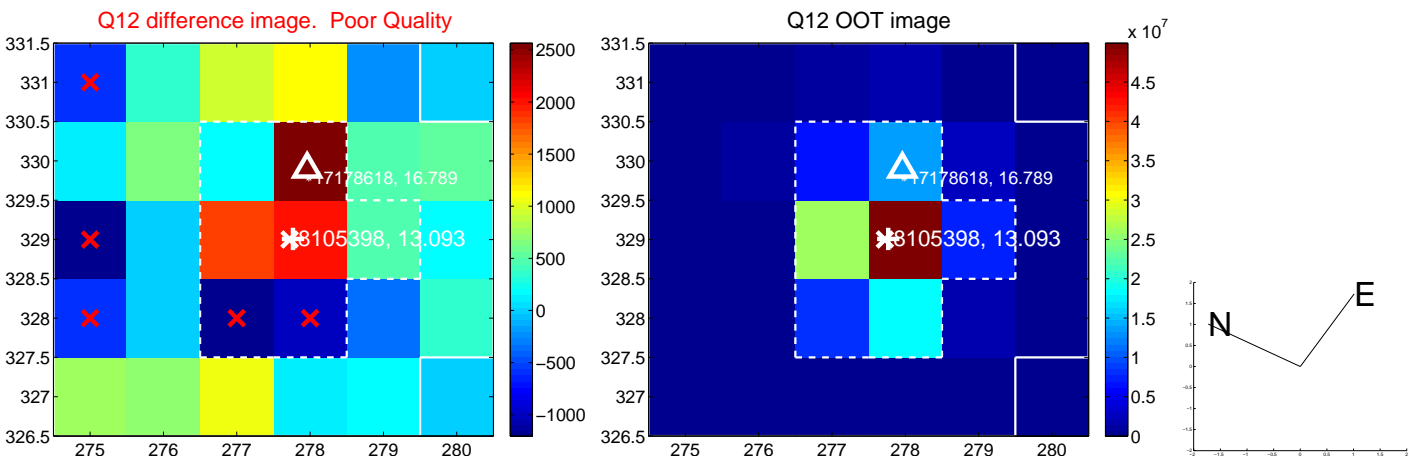
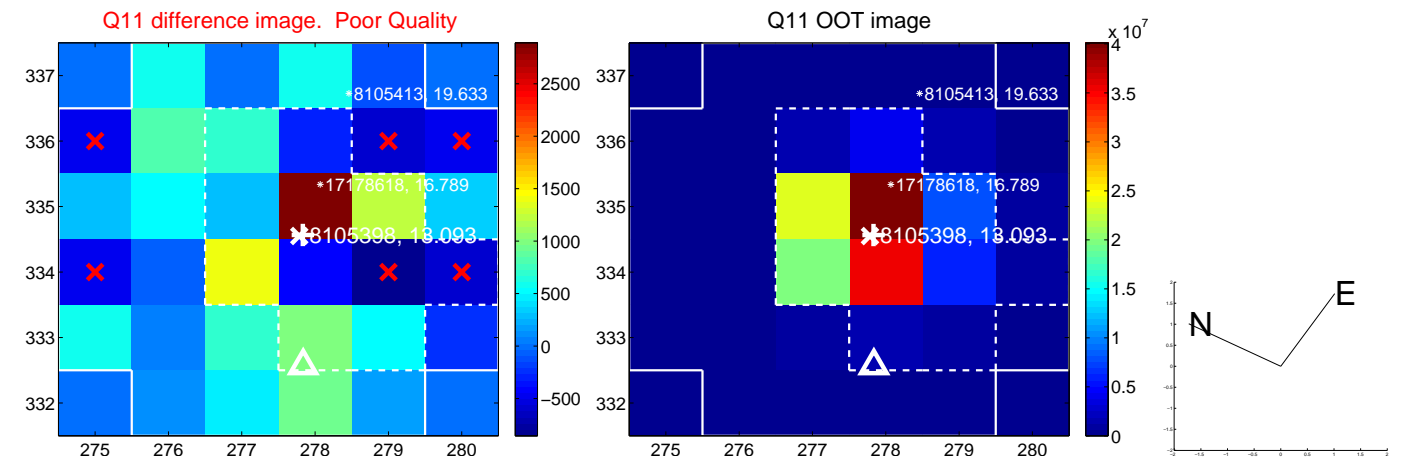
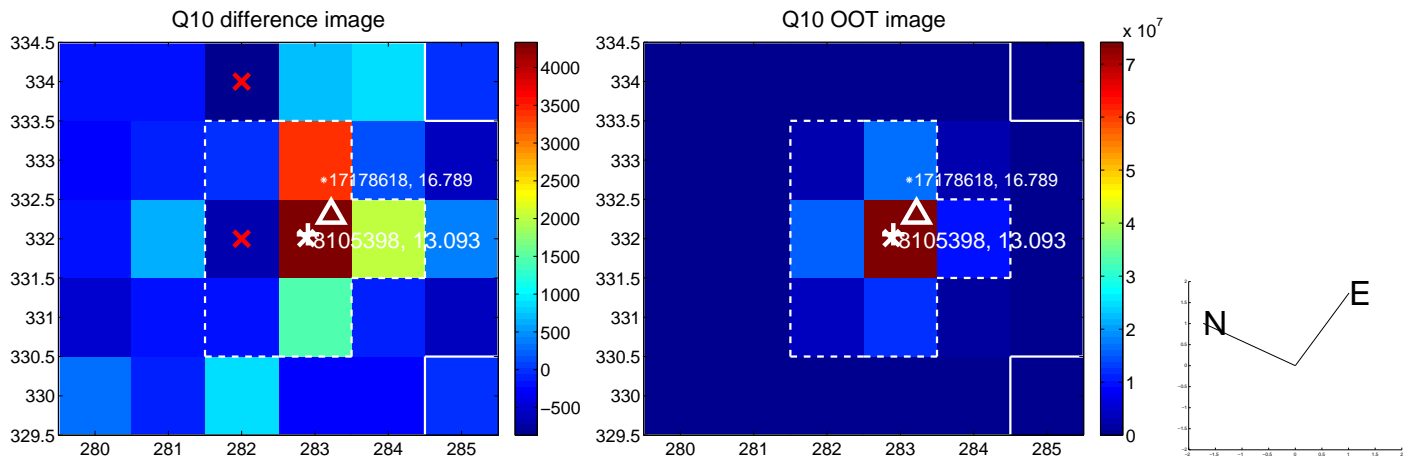
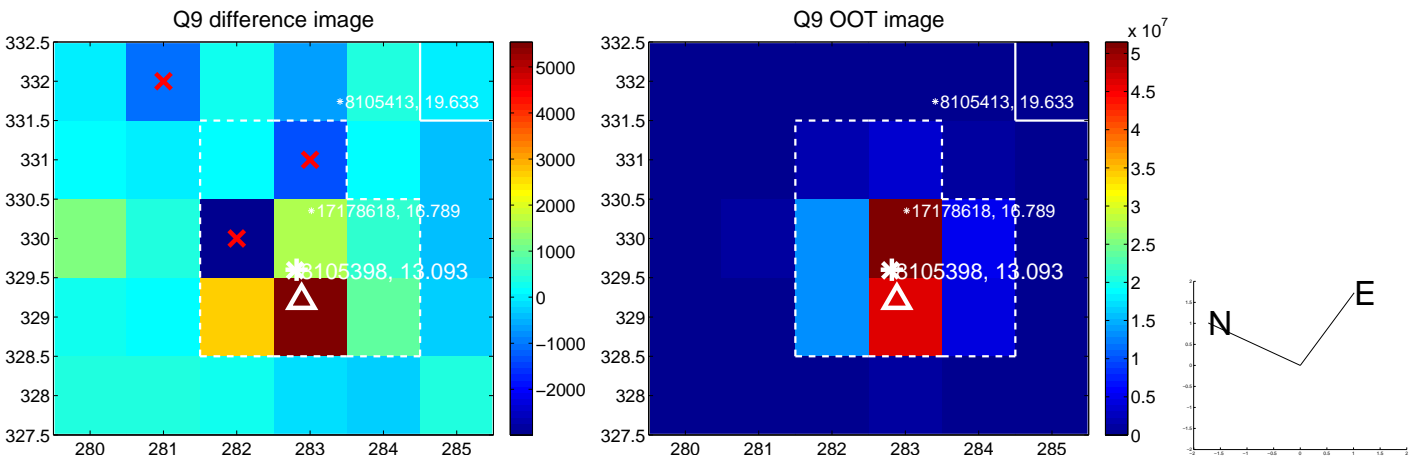
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



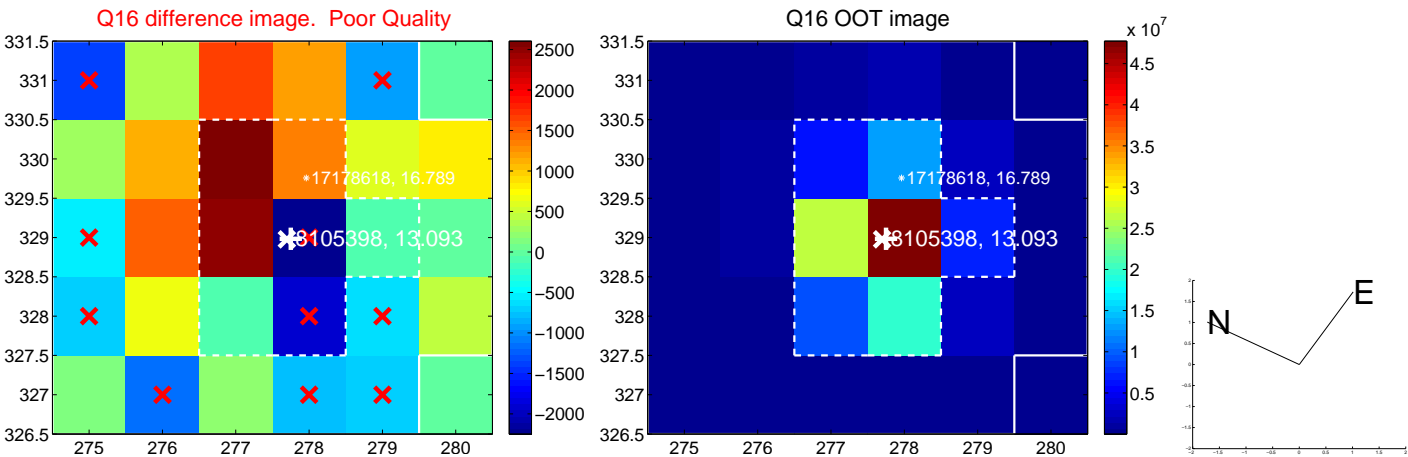
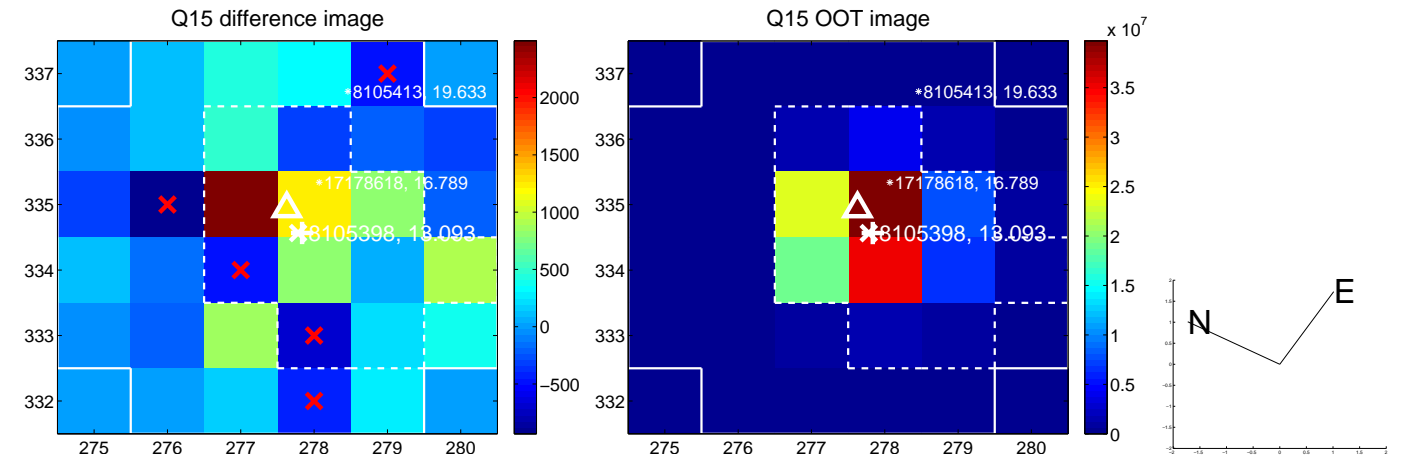
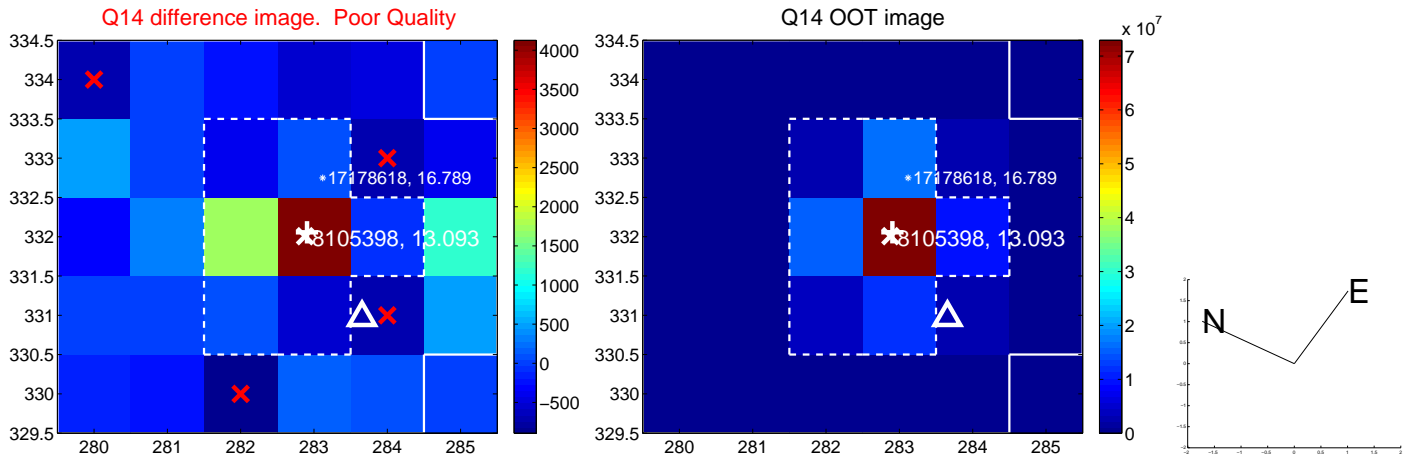
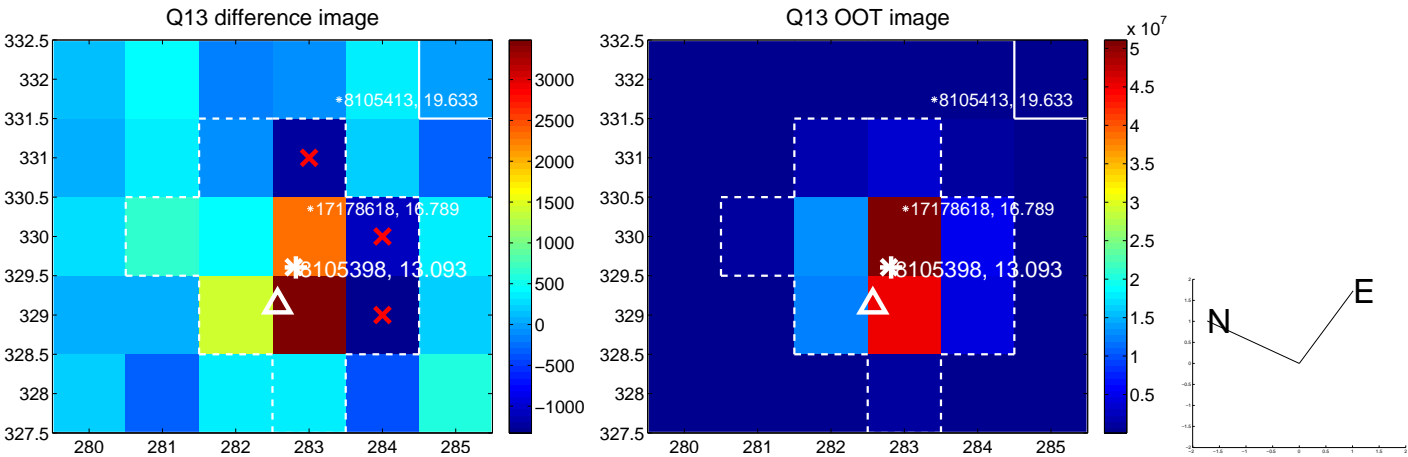
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



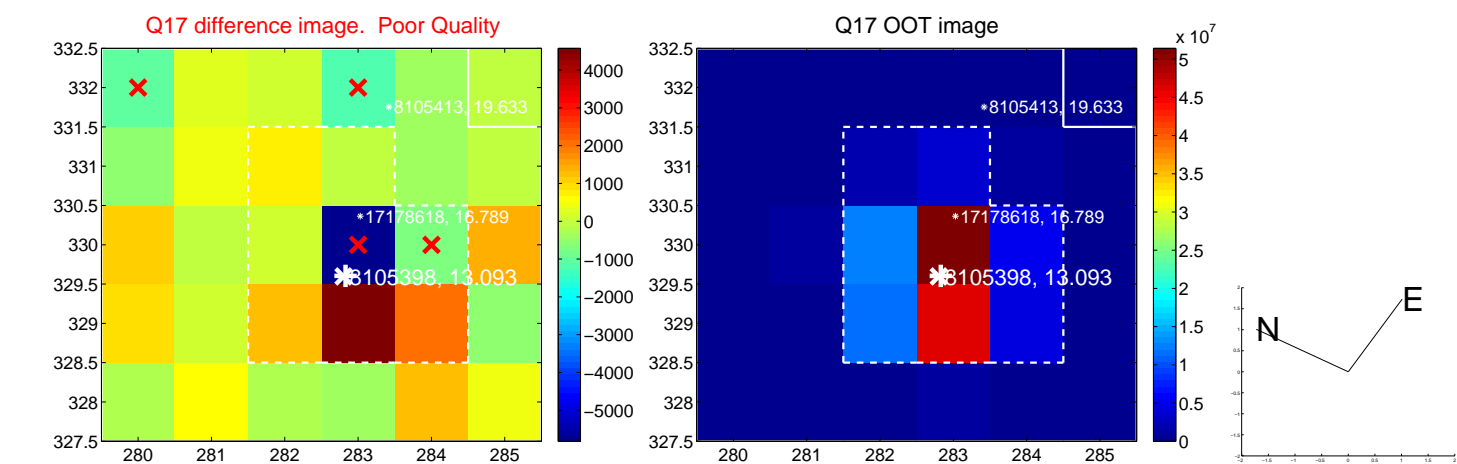
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



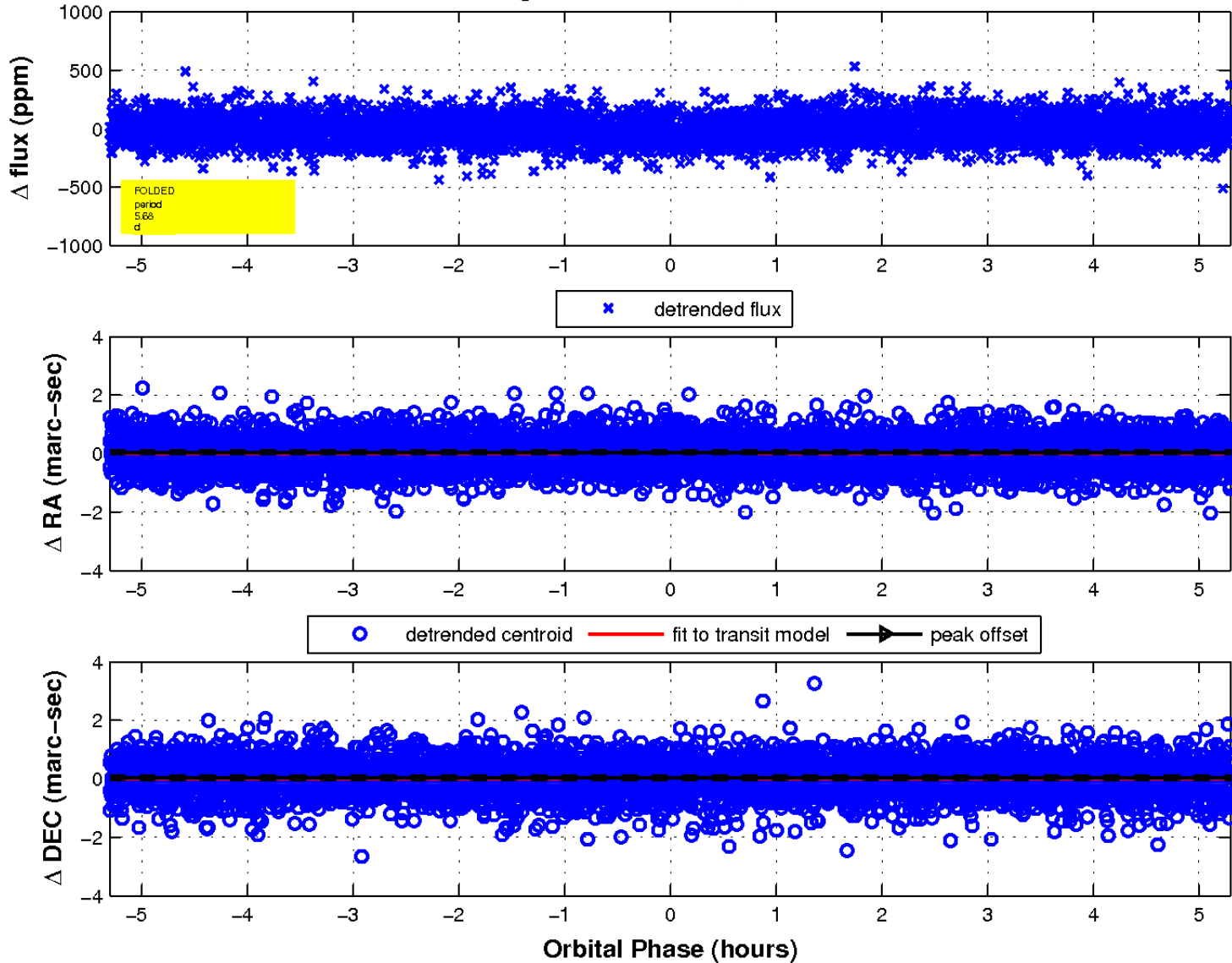
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

