

# KIC 005893123

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005893123-01 | OBS      | 0653.01 | 1.125953      | 132.480001   | 113.1       | 1.649            | 29.7 | 34.3 | 1.12                        | 6225            | 1.40                   | 3702.84                |
| 005893123-02 | OBS      | No      | 1.125910      | 131.937998   | 22.3        | 1.775            | 8.8  | 7.3  | 1.12                        | 6225            | 0.64                   | 3703.02                |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 005893123-01 | OBS      | FP   | 0.00  | 0 | 1 | 1 | 0 | MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET |
| 005893123-02 | OBS      | FP   | 0.00  | 1 | 1 | 1 | 0 | IS_SEC_TCE—CENT_RESOLVED_OFFSET                         |

**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](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

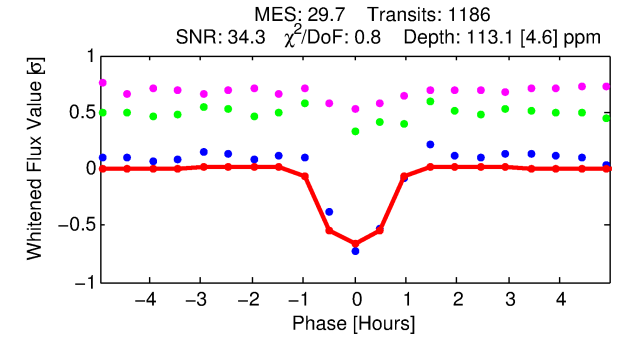
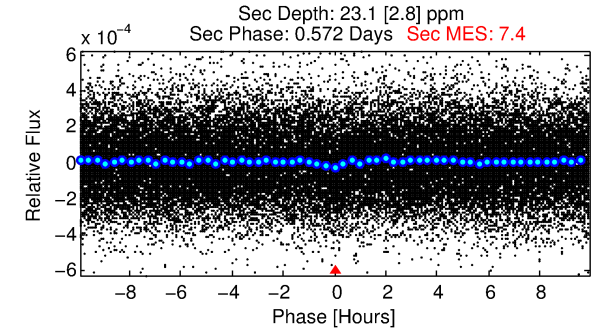
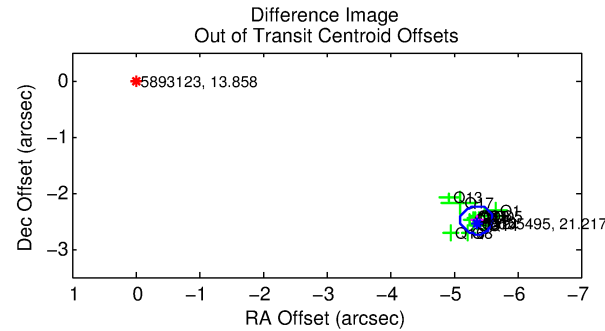
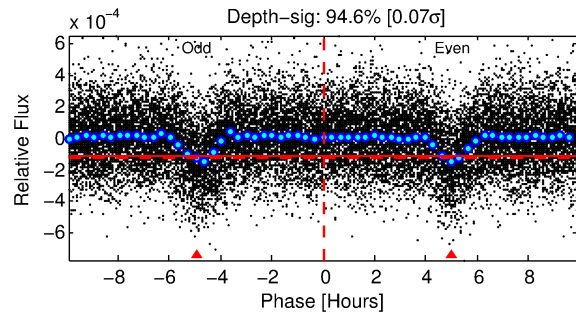
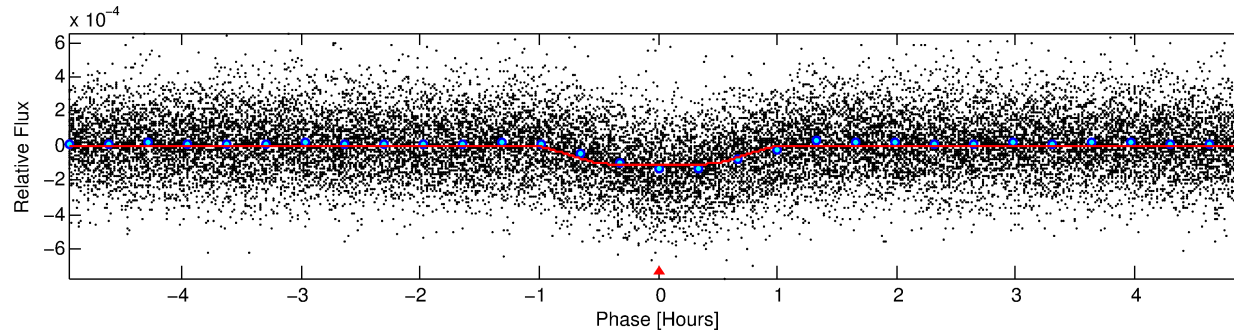
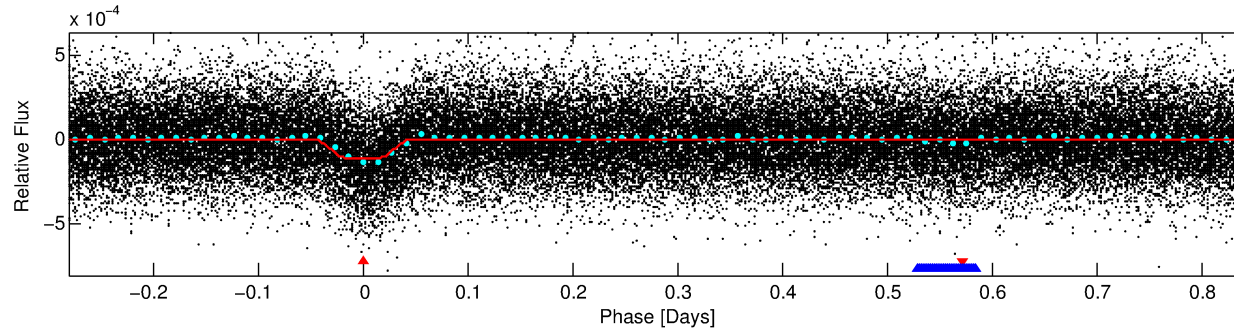
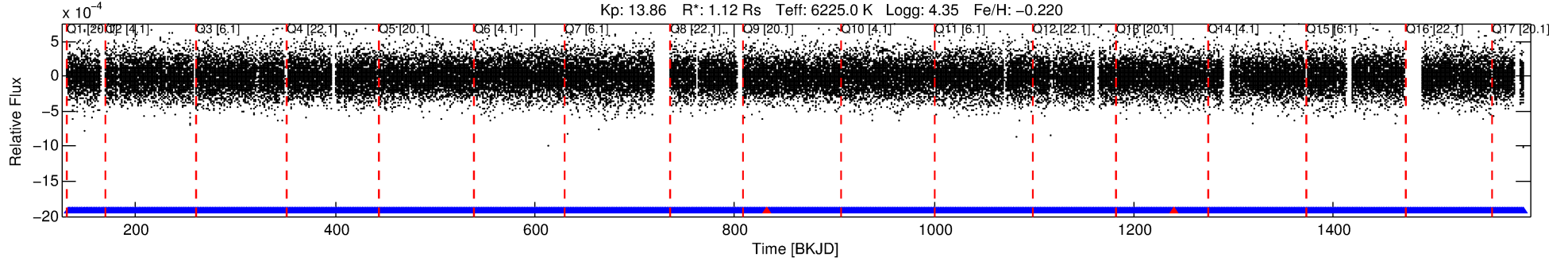
## Ephemeris Match Information For 005893123-01

No Significant Match Found

# DV One-Page Summary

KIC: 5893123 Candidate: 1 of 2 Period: 1.126 d  
KOI: K00653.01 Corr: 0.910

Kp: 13.86 R\*: 1.12 Rs Teff: 6225.0 K Logg: 4.35 Fe/H: -0.220



## DV Fit Results:

Period = 1.12595 [0.00000] d  
Epoch = 132.4800 [0.0007] BKJD  
Rp/R\* = 0.0115 [0.0024]  
a/R\* = 2.55 [2.43]  
b = 0.90 [0.23]  
Seff = 3702.83 [855.81]  
Teq = 1989 [115] K  
Rp = 1.40 [0.37] Re  
a = 0.0213 [0.0032] AU  
Ag = 2.93 [1.42] [1.36σ]  
Teffp = 4024 [436] K [4.51σ]

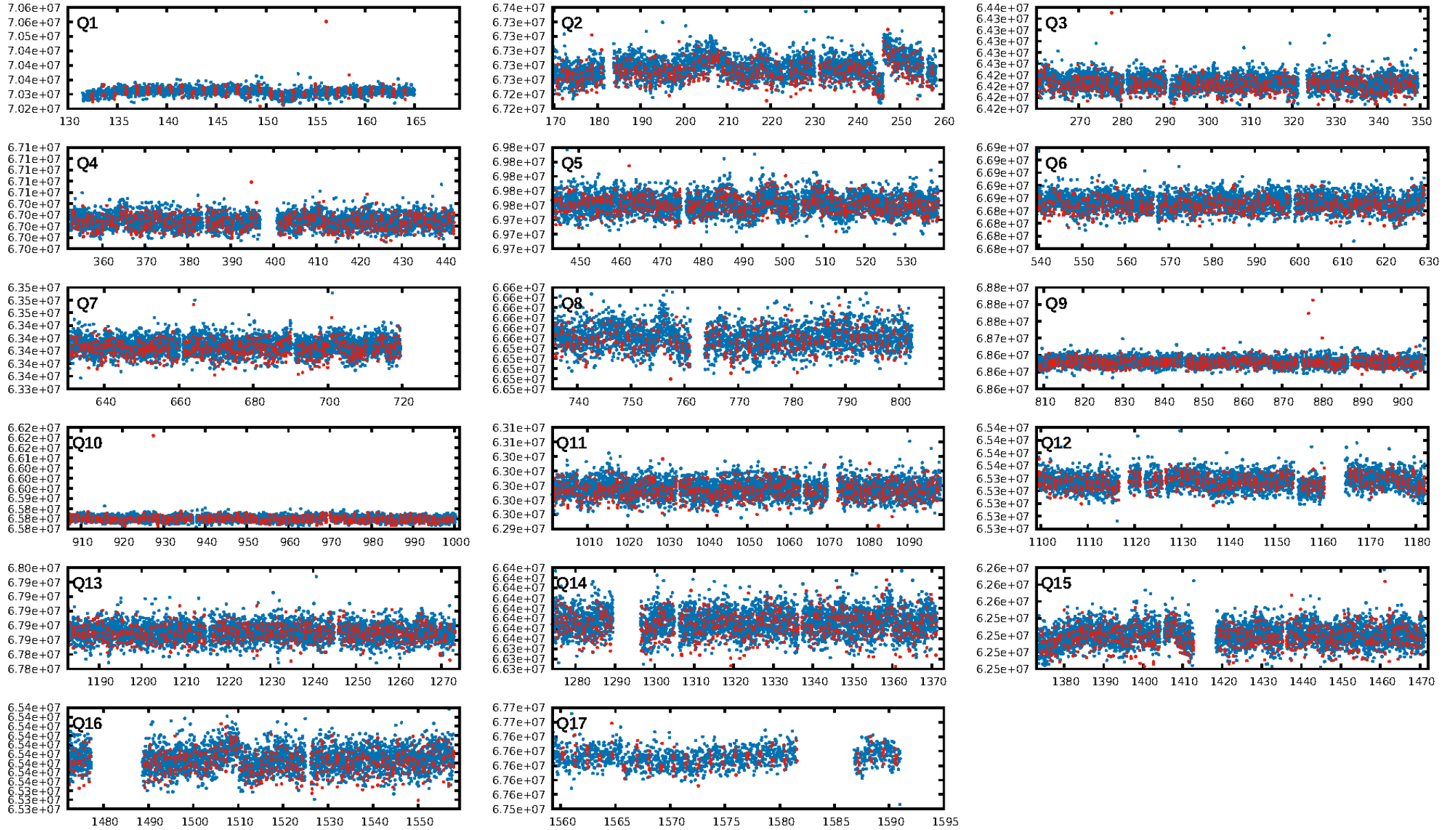
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.07e-184  
RollingBand-fgt: 1.00 [1131/1133]  
GhostDiagnostic-chr: 0.4769  
Centroid-sig: 0.0%  
Centroid-so: 8.850 arcsec [21.27σ]  
OotOffset-rm: 5.909 arcsec [70.93σ]  
KicOffset-rm: 5.923 arcsec [74.05σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.94 [16/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:00:26 Z

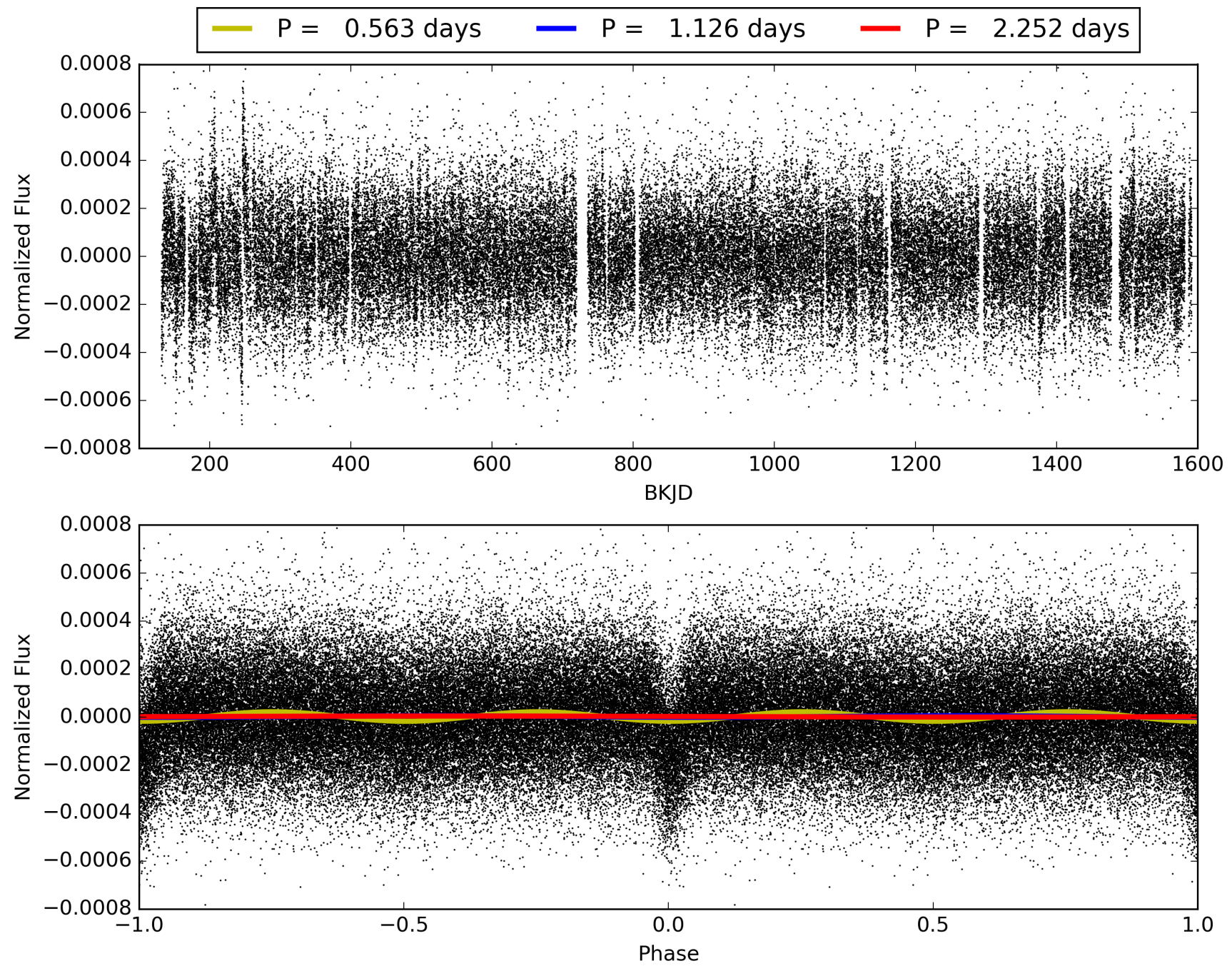
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005893123-01, PDC Light Curves



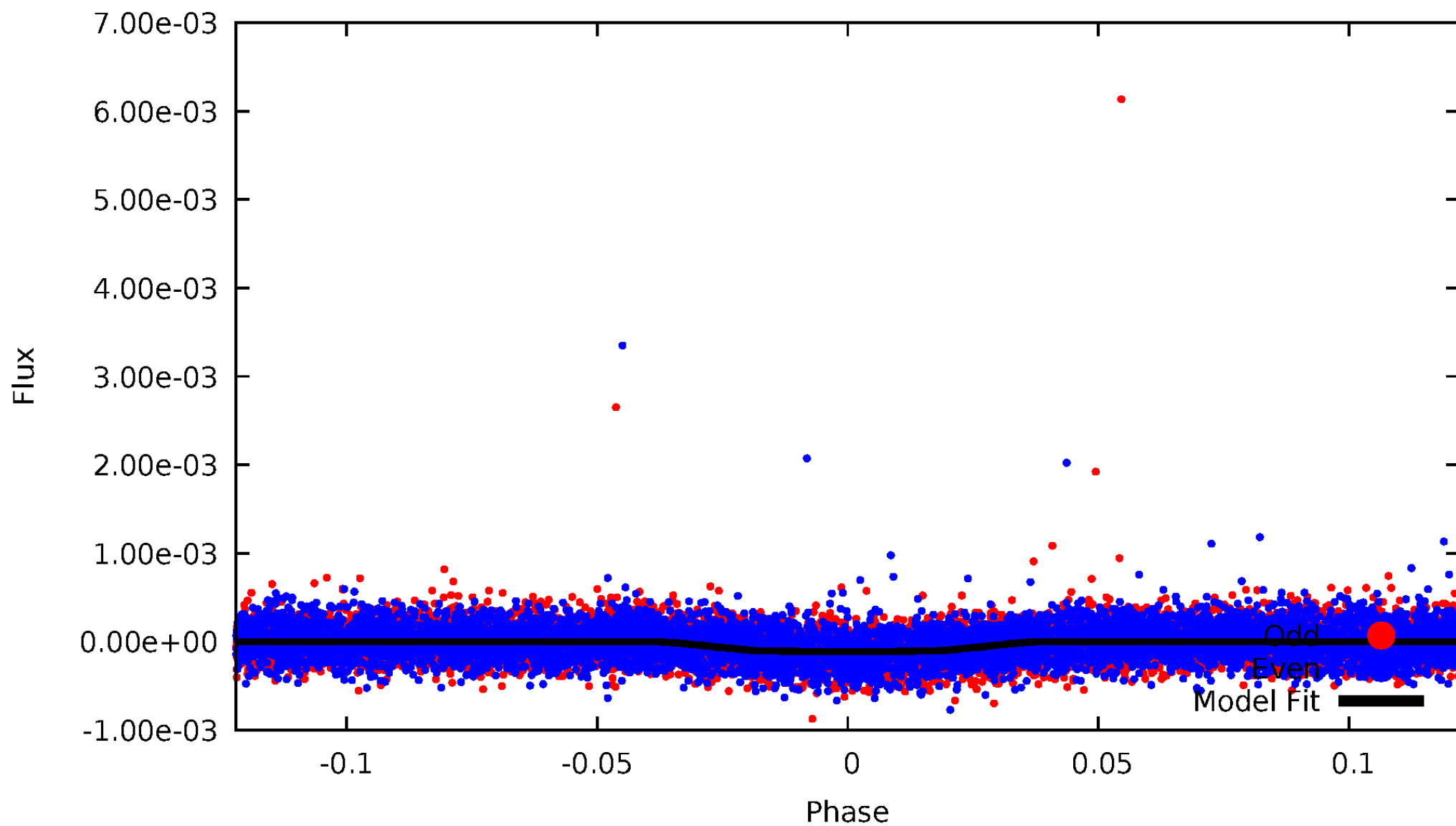


TCE 005893123-01



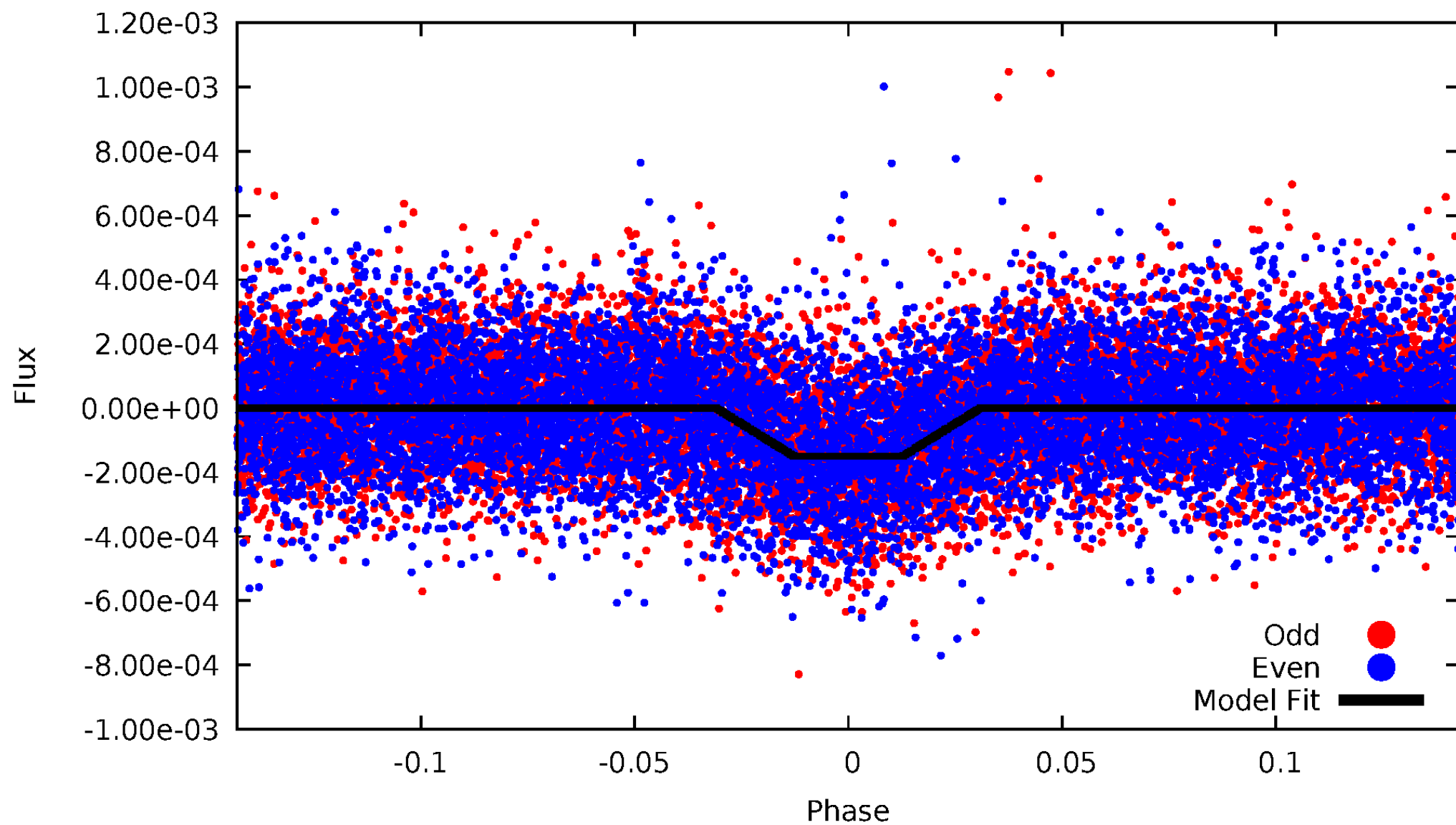
# DV Odd/Even

TCE 005893123-01



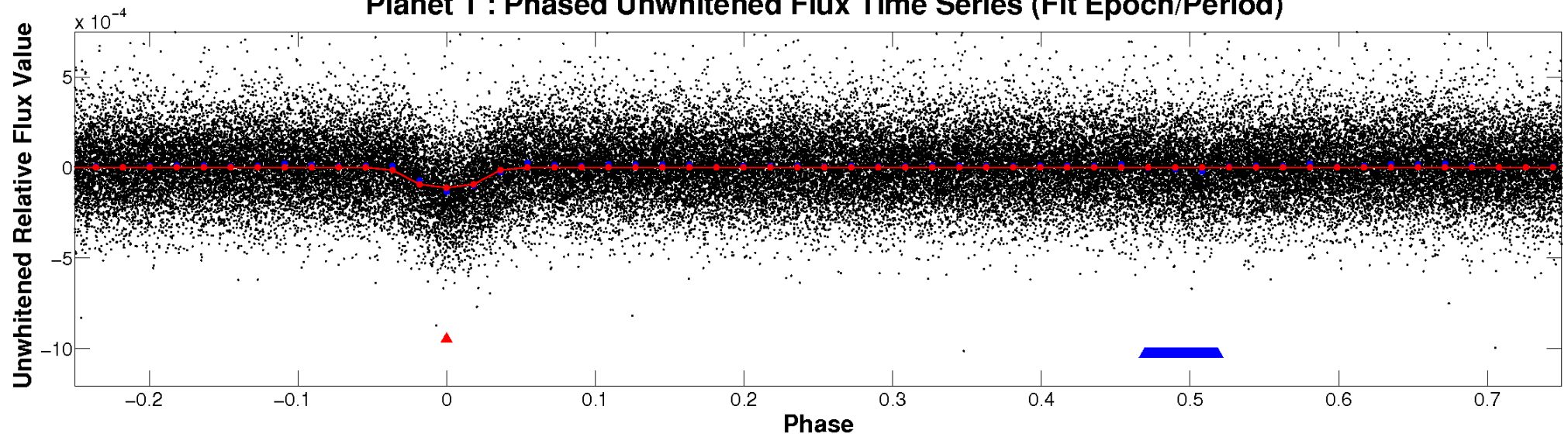
# ALT Odd/Even

TCE 005893123-01

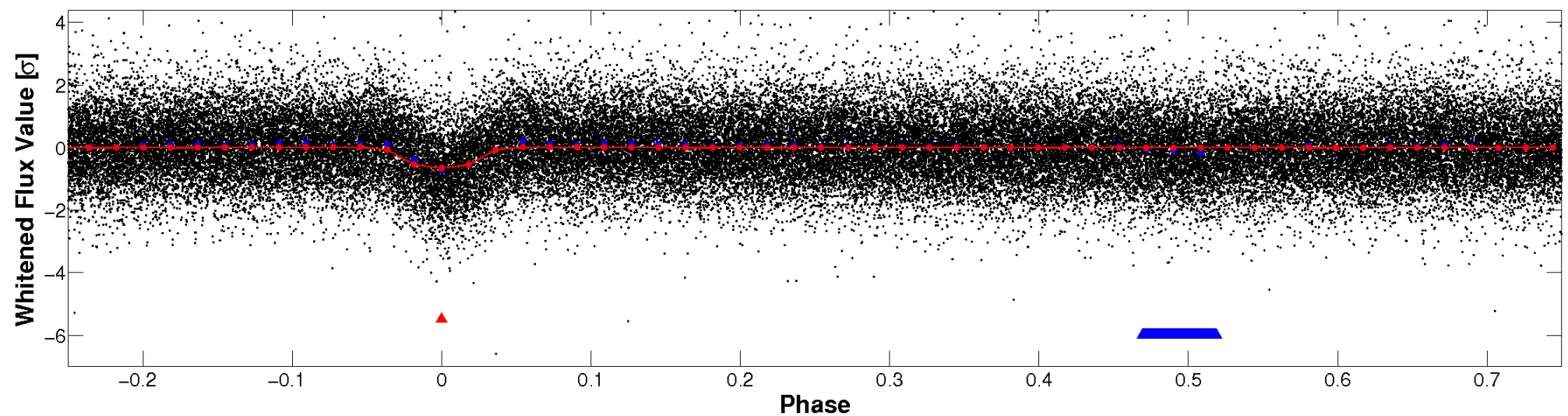


# Non-Whitened Vs. Whitened Light Curve

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



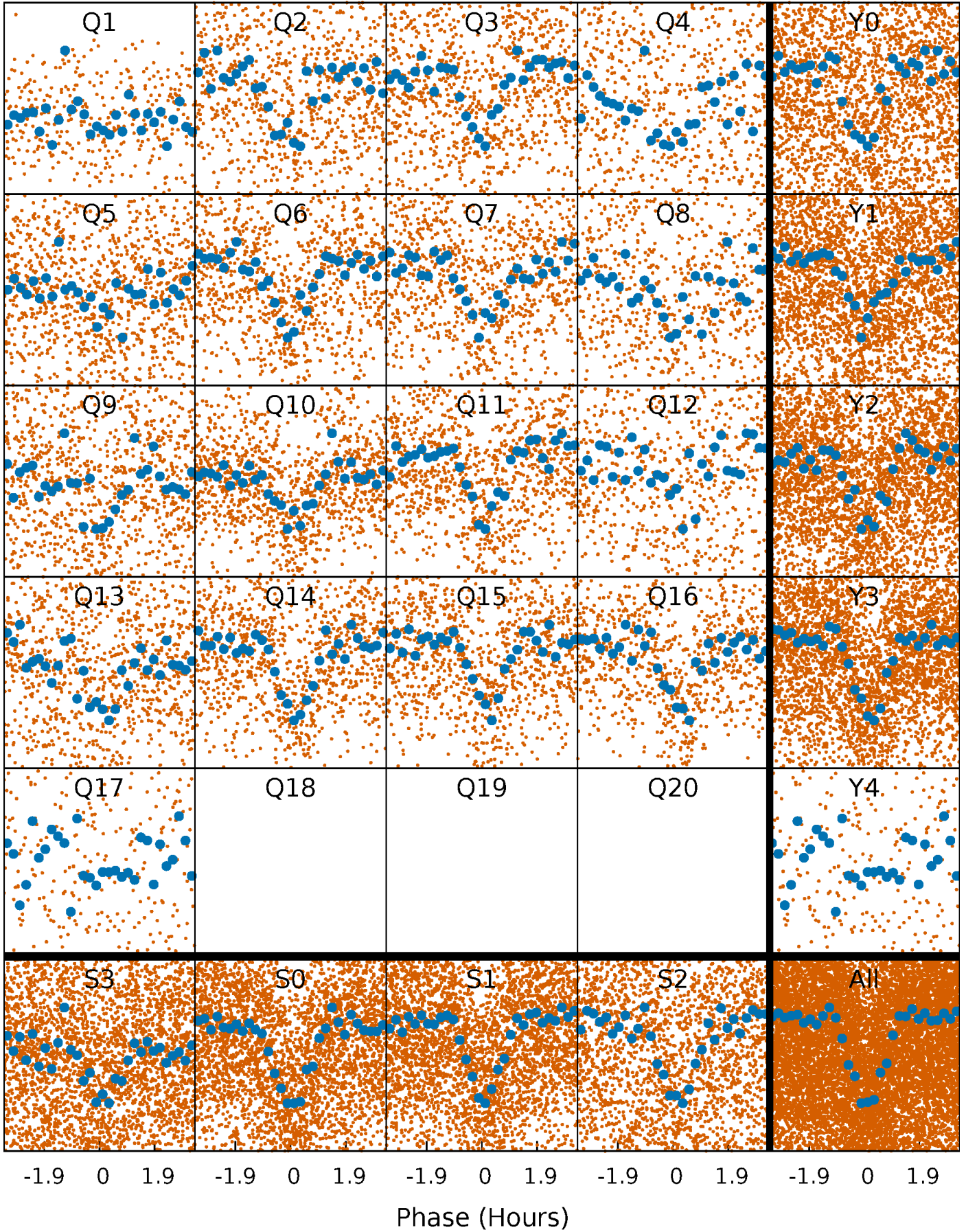
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

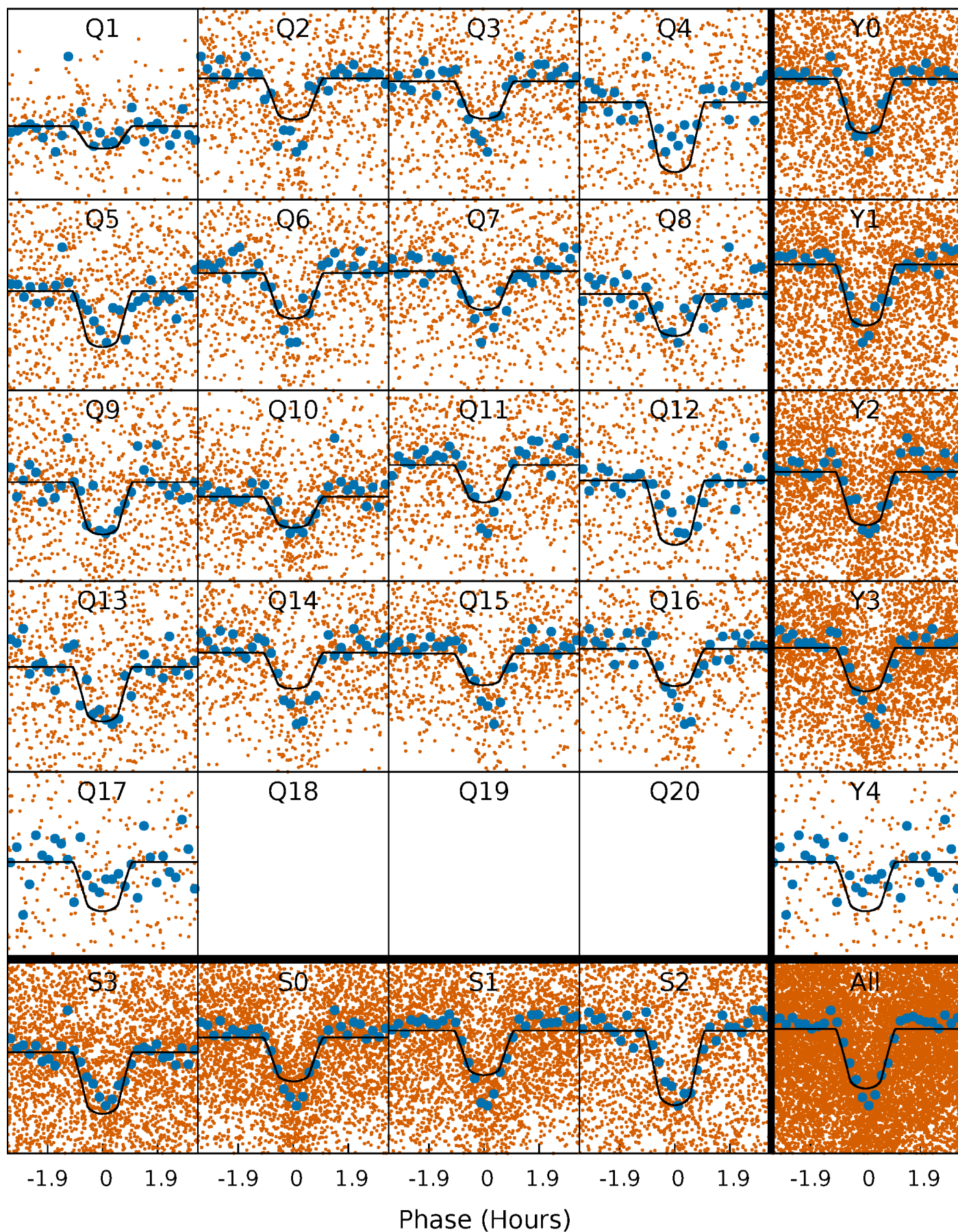
TCE 005893123-01 P= 1.125953 Days  $T_0=132.480001$  (BKJD)





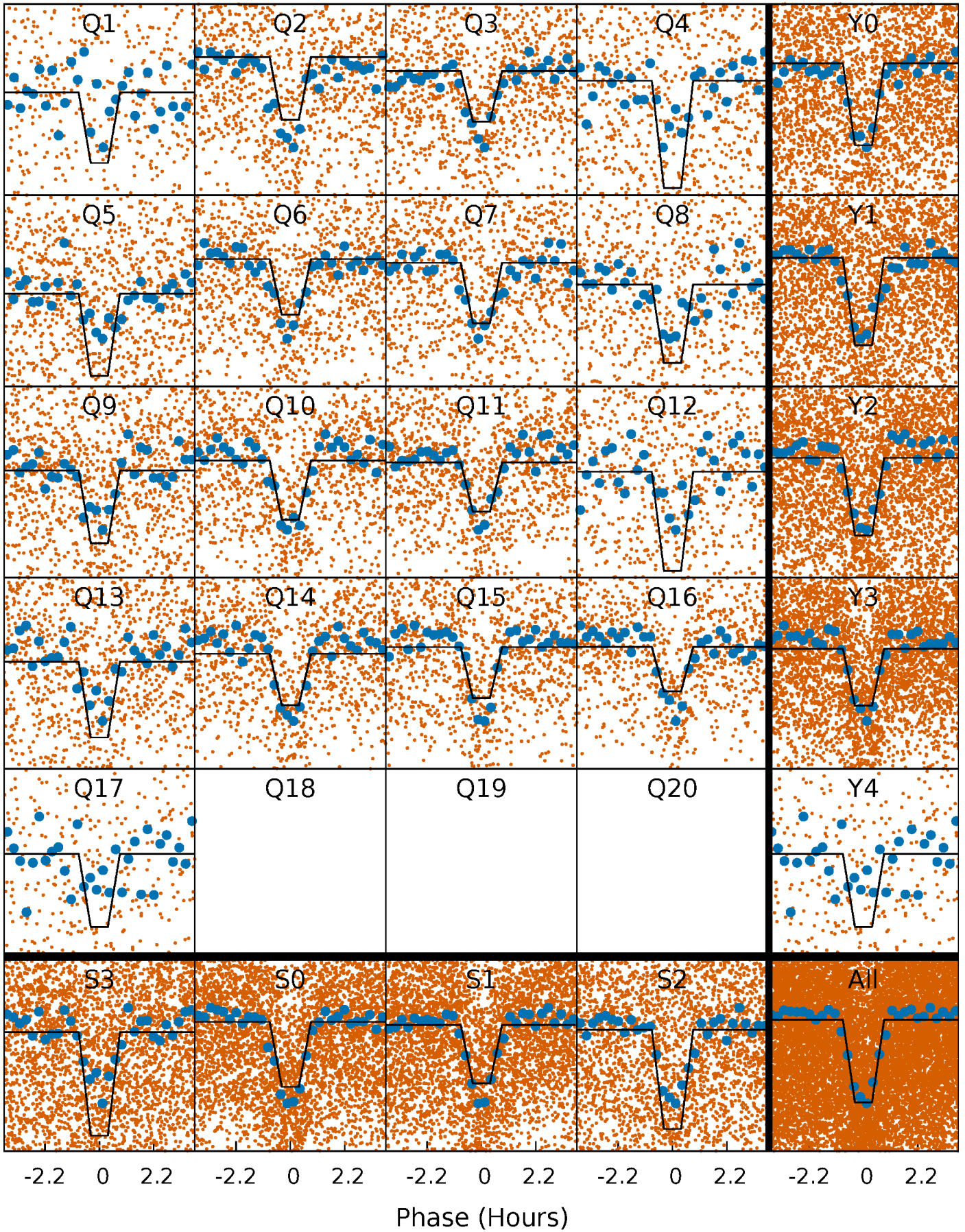
# DV Quarter-Phased Transit Curves

TCE 005893123-01 P= 1.125953 Days  $T_0=132.480001$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005893123-01 P= 1.125961 Days  $T_0=132.478555$  (BKJD)

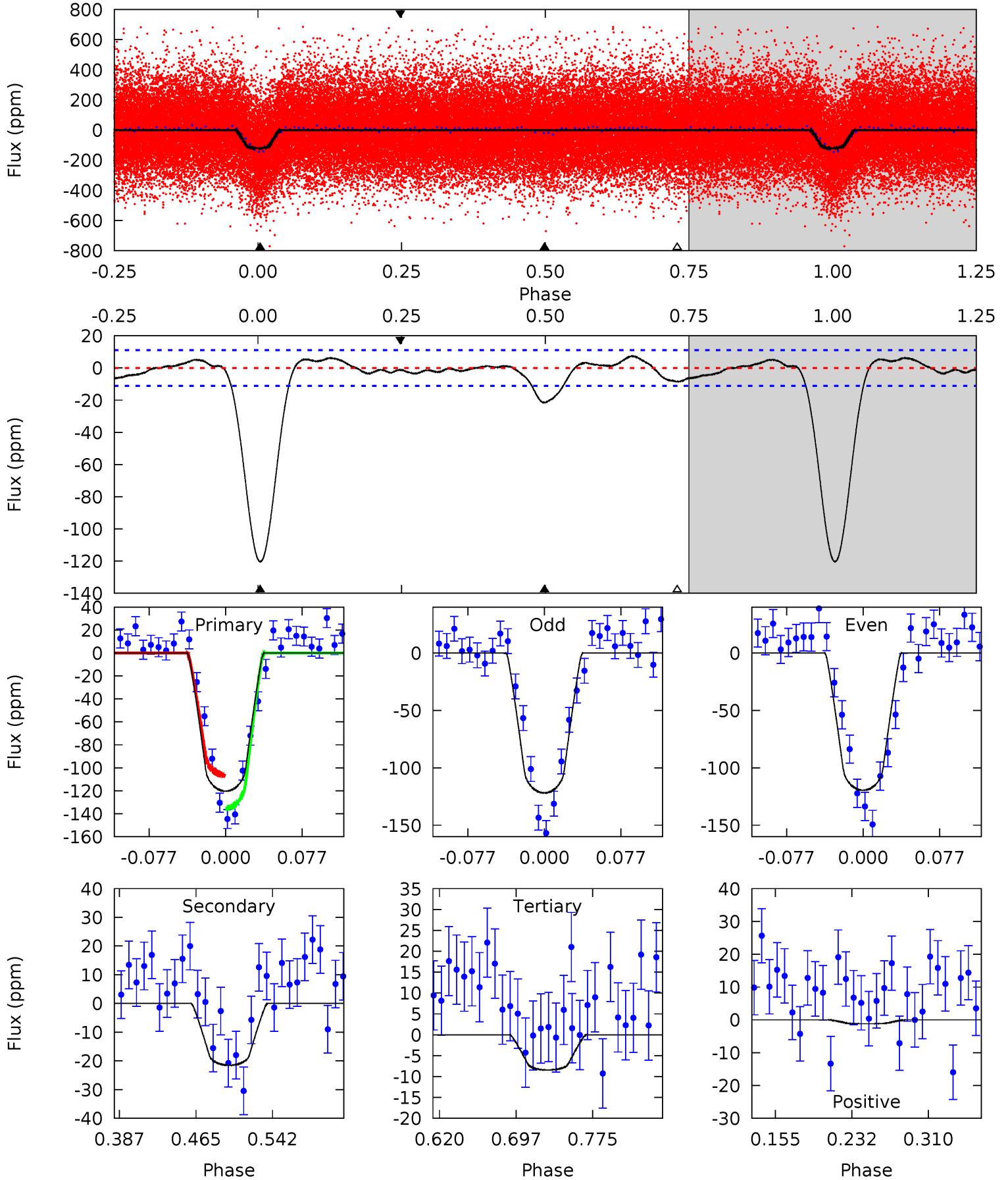




# DV Model-Shift Uniqueness Test

005893123-01, P = 1.125953 Days, E = 131.354048 Days

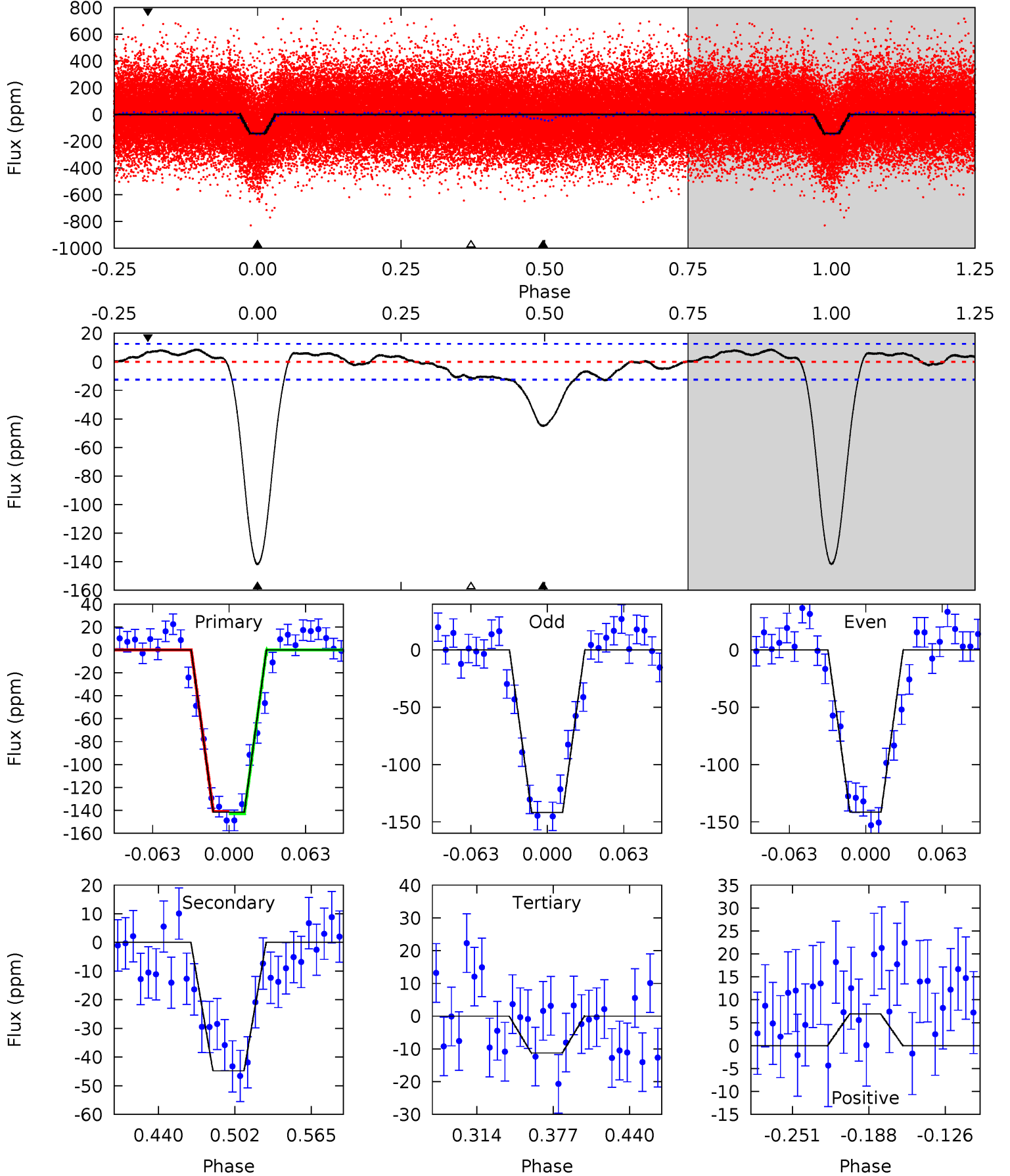
| Pri  | Sec  | Ter  | Pos   | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|-------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 50.1 | 8.97 | 3.51 | -0.49 | 4.62            | 1.77            | 1.56             | 46.6    | 50.6    | 5.46    | 9.47    | 0.49    | 0.98 | 0.06  | 6.00 |



# Alt Model-Shift Uniqueness Test

005893123-01, P = 1.125961 Days, E = 131.352594 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 52.7 | 16.7 | 4.19 | 2.57 | 4.66            | 1.86            | 2.27             | 48.5    | 50.1    | 12.5    | 14.1    | 0.04    | 0.98 | 0.06  | 0.35 |





### Stellar Parameters For KIC 005893123

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M(M_{\odot})$            | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|---------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6225^{+80}_{-87}$  | $4.348^{+0.095}_{-0.126}$ | $-0.220^{+0.150}_{-0.150}$ | $1.116^{+0.190}_{-0.117}$ | $1.011^{+0.087}_{-0.051}$ | $1.023^{+0.363}_{-0.374}$                     |
|        | +1%/-1%             | +2%/-3%                   | +68%/-68%                  | +17%/-10%                 | +9%/-5%                   | +36%/-37%                                     |
| Source | SPE68               | SPE68                     | SPE68                      | DSEP                      |                           |   |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 005893123-01 / KOI 0653.01

| Detrend | Depth (ppm) | $R_p$ ( $R_{\oplus}$ ) | $T_{\text{max}}$ (K) | $T_{\text{obs}}$ (K) | $A_{\text{obs}}$          |
|---------|-------------|------------------------|----------------------|----------------------|---------------------------|
| DV      | $-22 \pm 2$ | $1.42^{+0.32}_{-0.32}$ | $2790^{+118}_{-102}$ | $4115^{+437}_{-326}$ | $2.694^{+1.723}_{-0.947}$ |
| Alt.    | $-45 \pm 3$ | $1.51^{+0.33}_{-0.29}$ | $2785^{+121}_{-93}$  | $4665^{+443}_{-349}$ | $4.897^{+2.565}_{-1.610}$ |

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

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

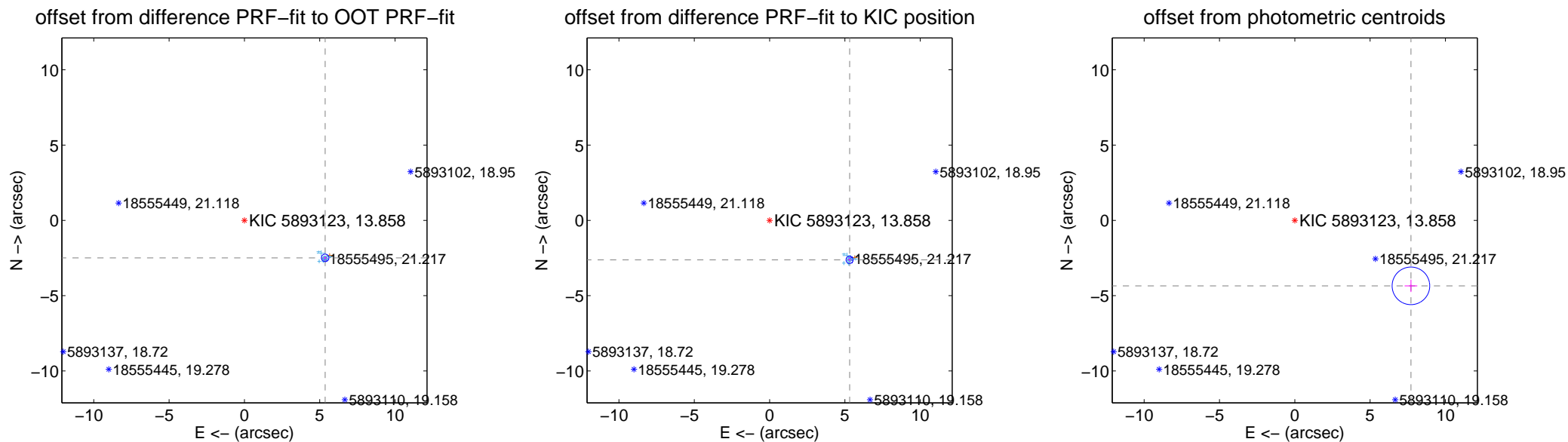
## DV Centroid Data

Supplemental centroid analysis for 005893123-01. Kepler magnitude: 13.86. Transit SNR 34.27

There are 16 quarters with good PRF difference image offsets

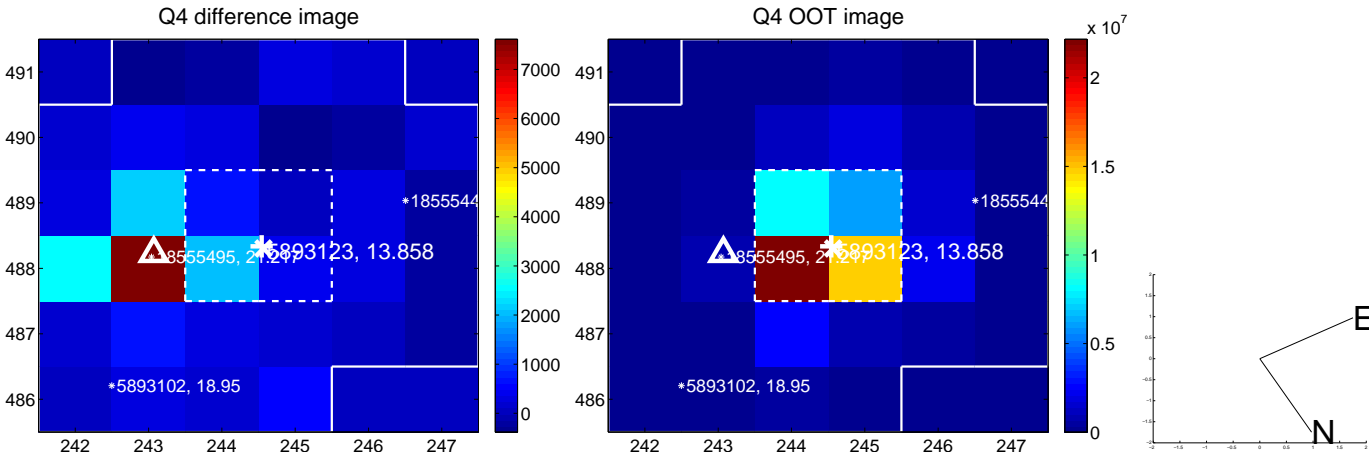
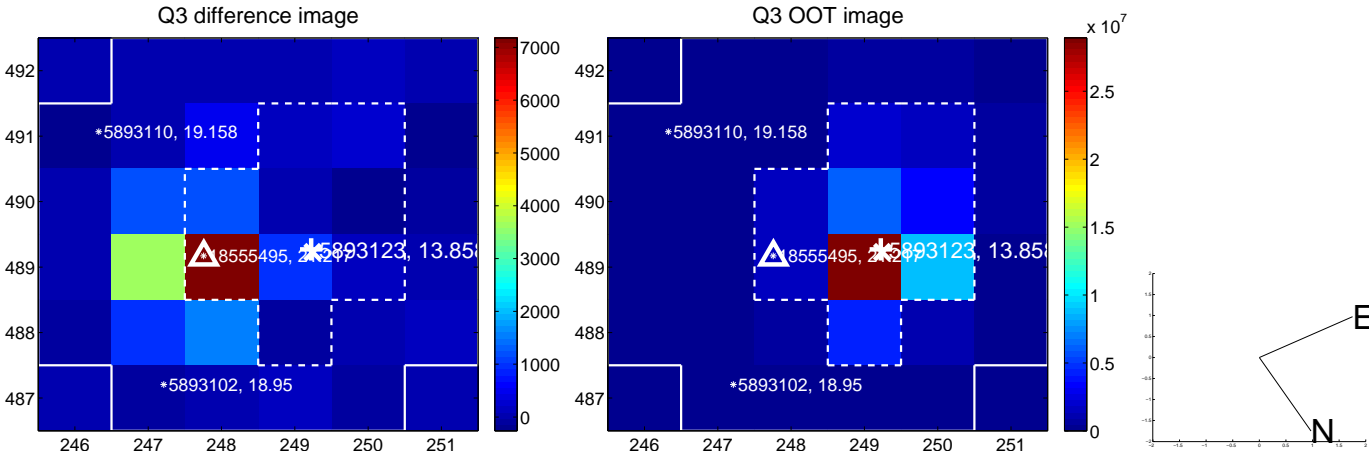
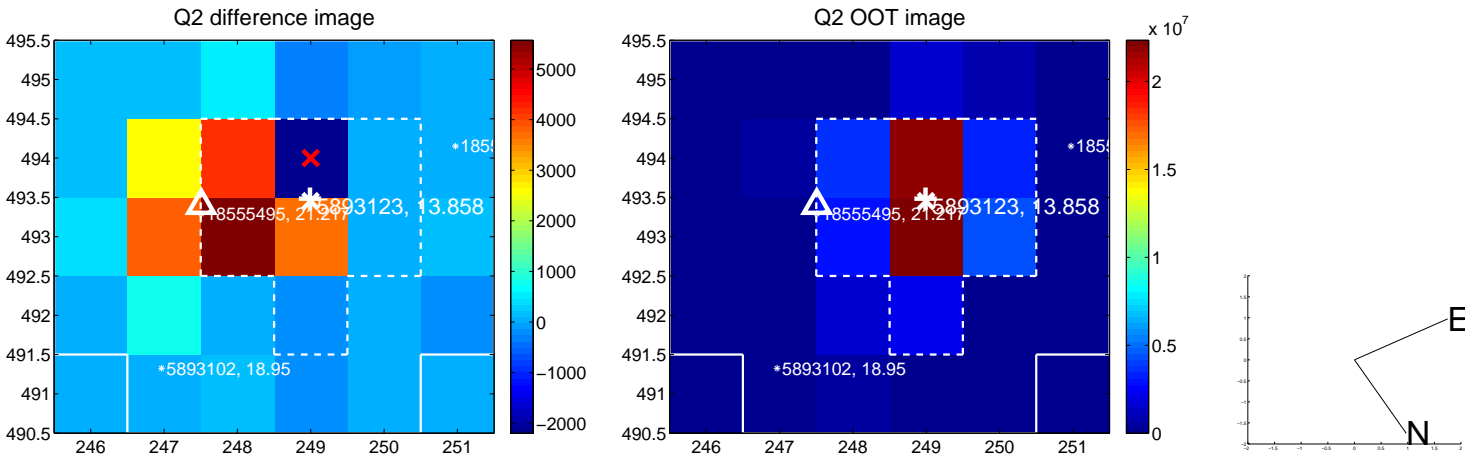
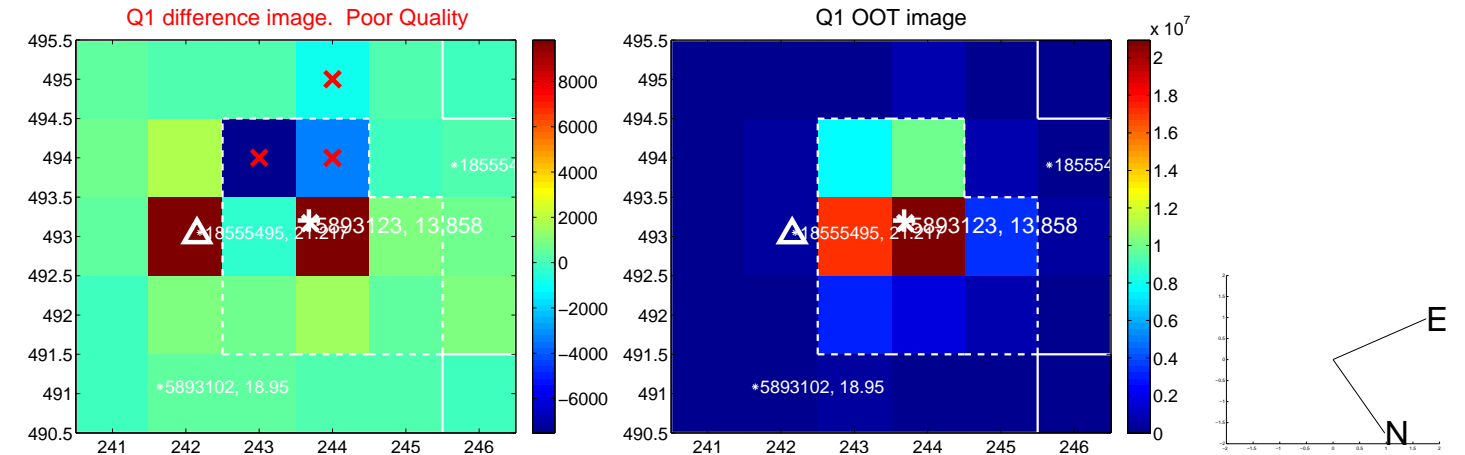
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $5.909 \pm 0.083$  | 70.93               | $-5.359 \pm 0.084$ | $-2.490 \pm 0.077$ |
| PRF-fit source offset from KIC position | $5.923 \pm 0.080$  | 74.05               | $-5.311 \pm 0.081$ | $-2.621 \pm 0.076$ |
| photometric centroid source offset      | $8.85 \pm 0.42$    | 21.27               | $-7.71 \pm 0.42$   | $-4.35 \pm 0.41$   |

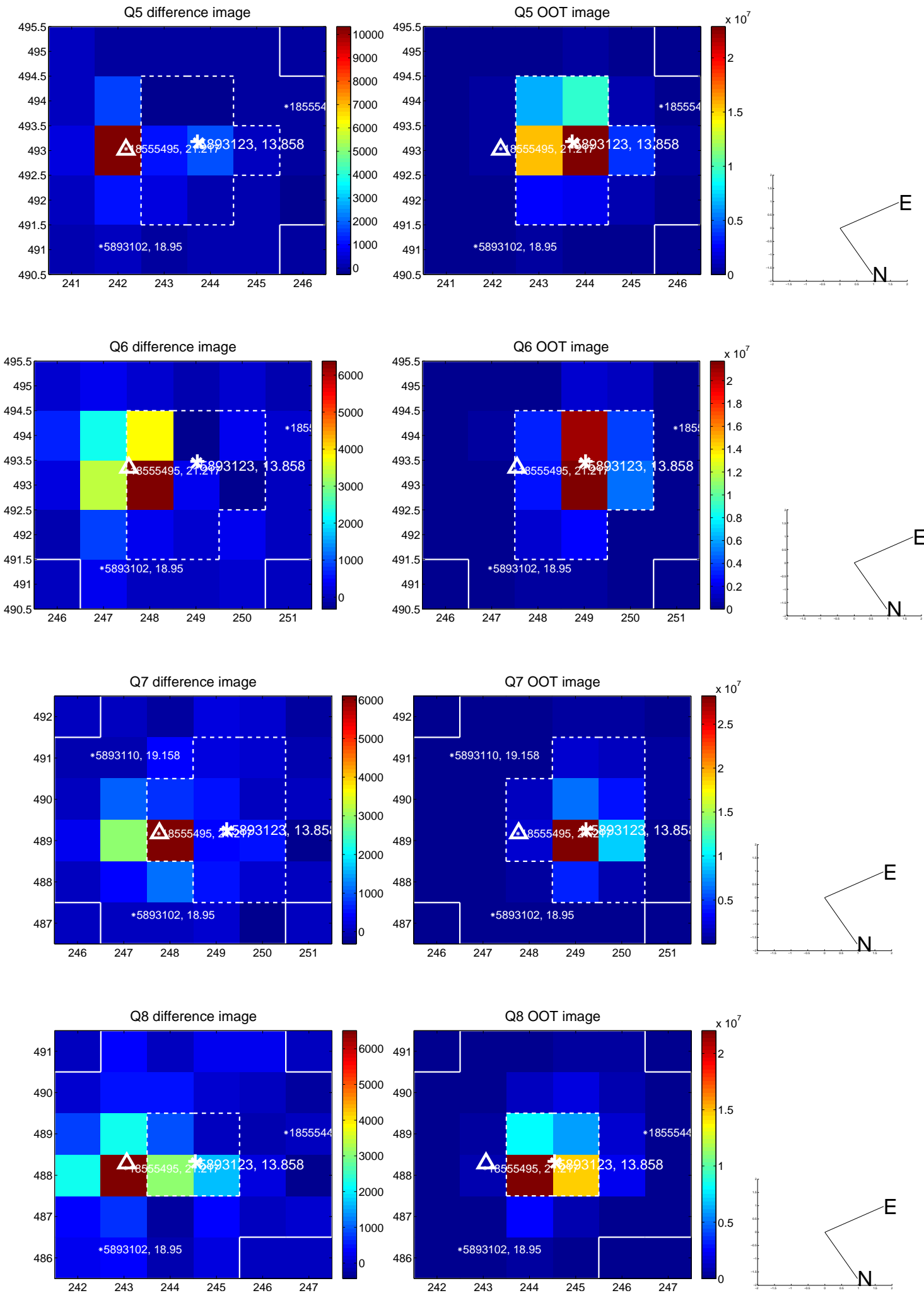


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

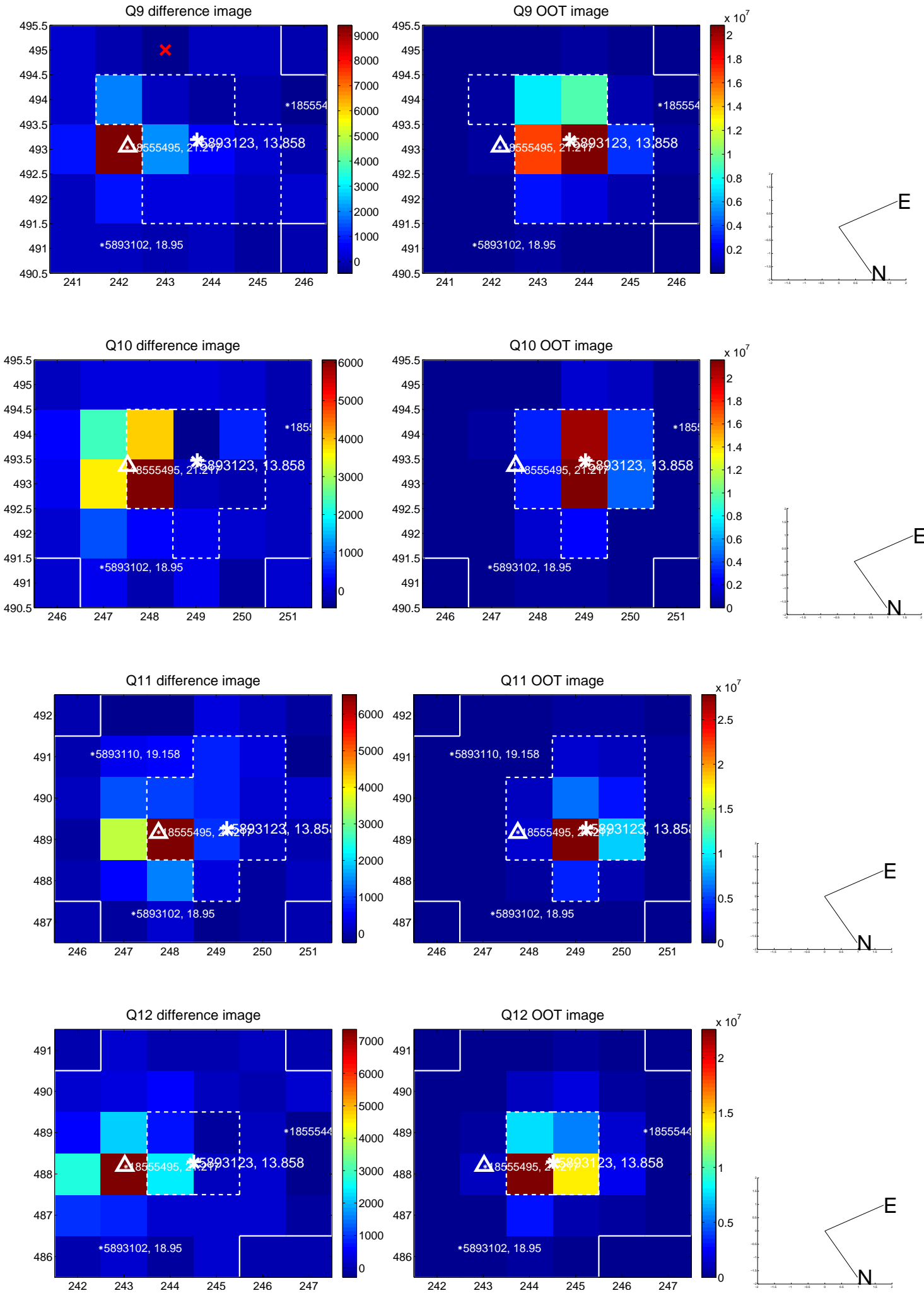


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

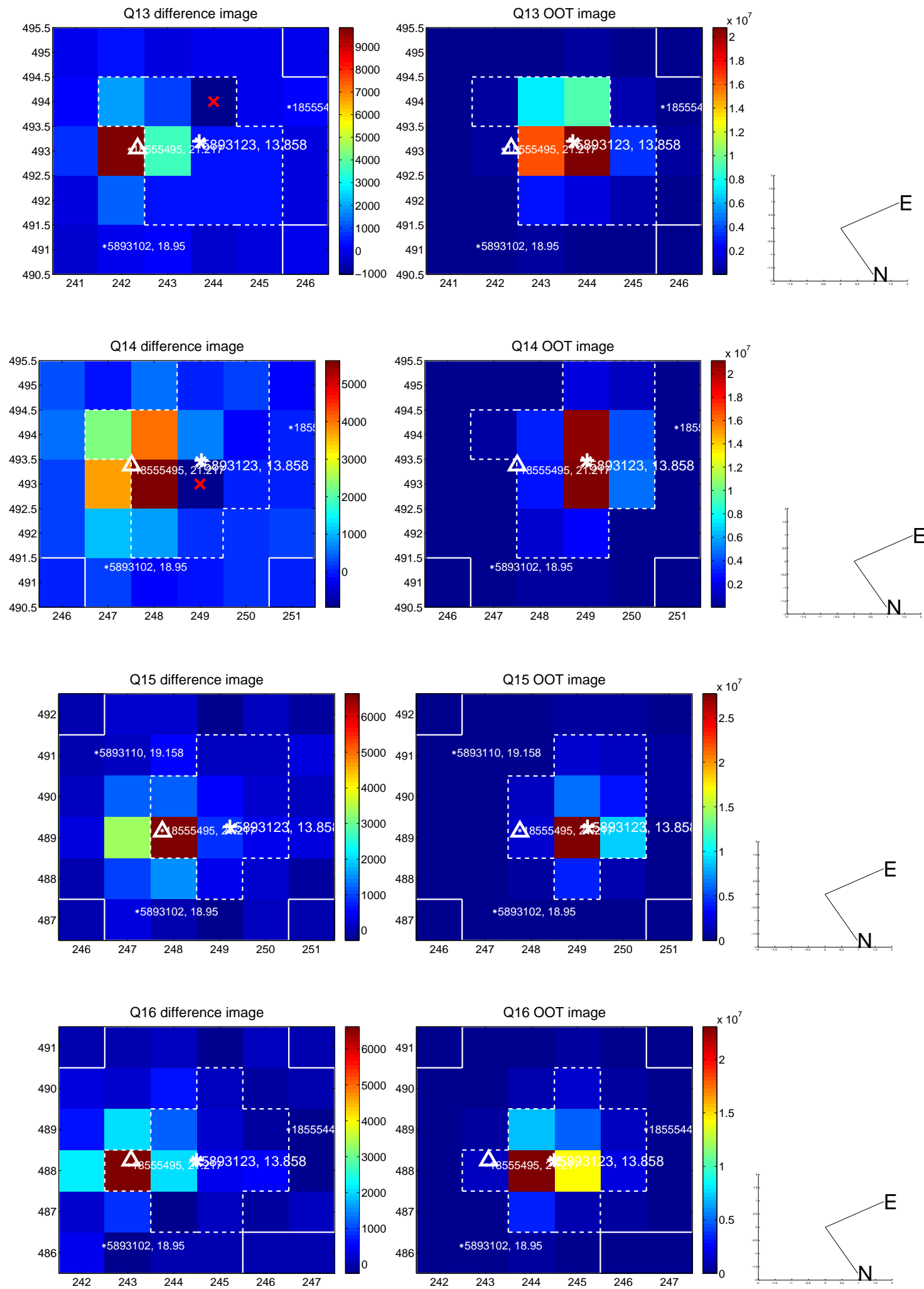




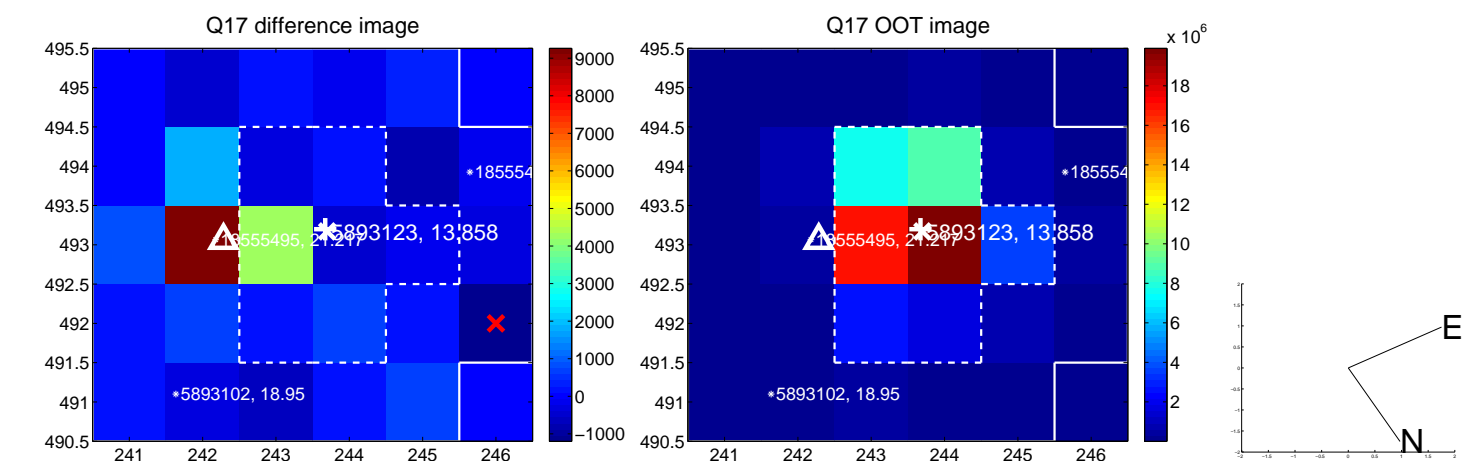
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



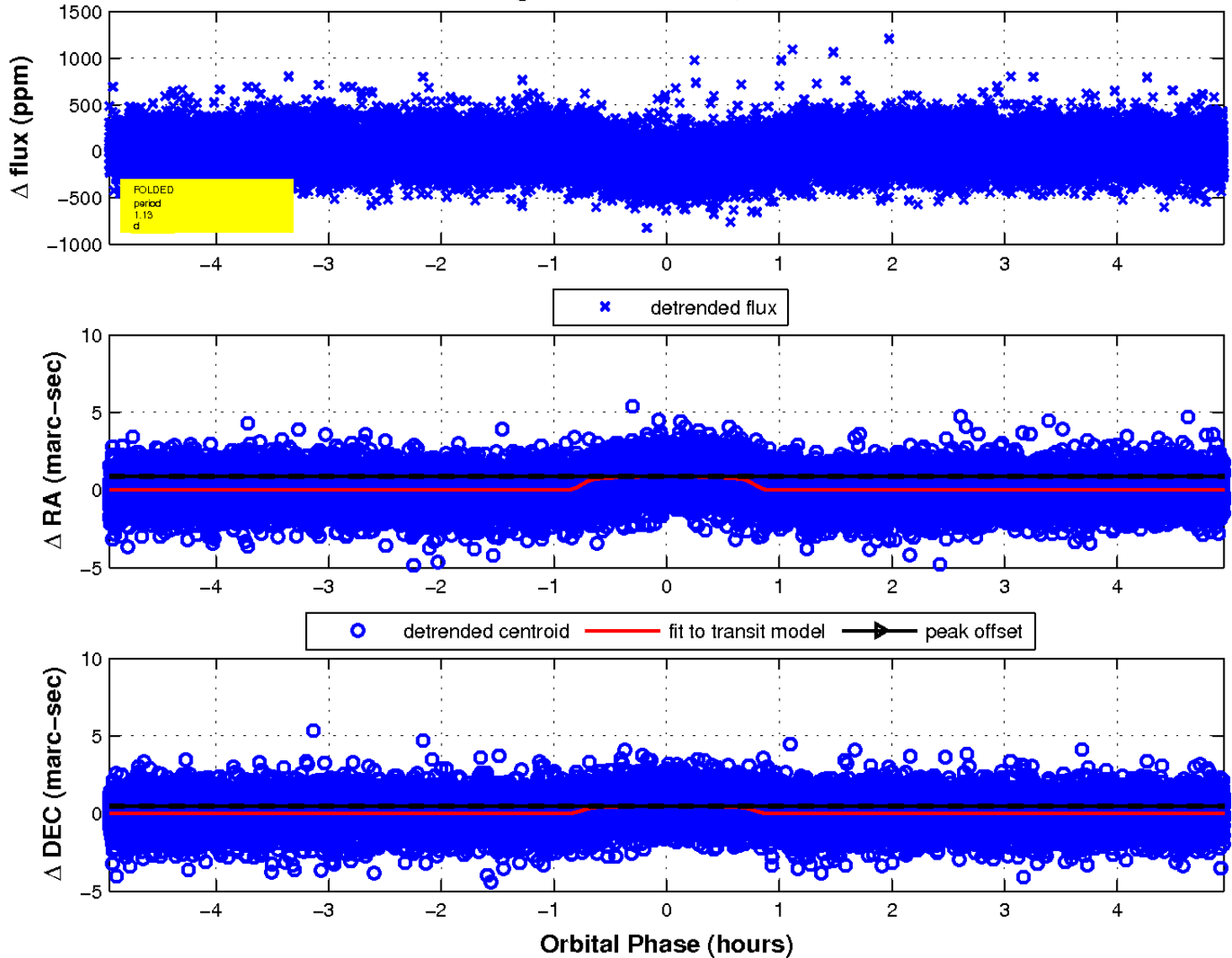
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

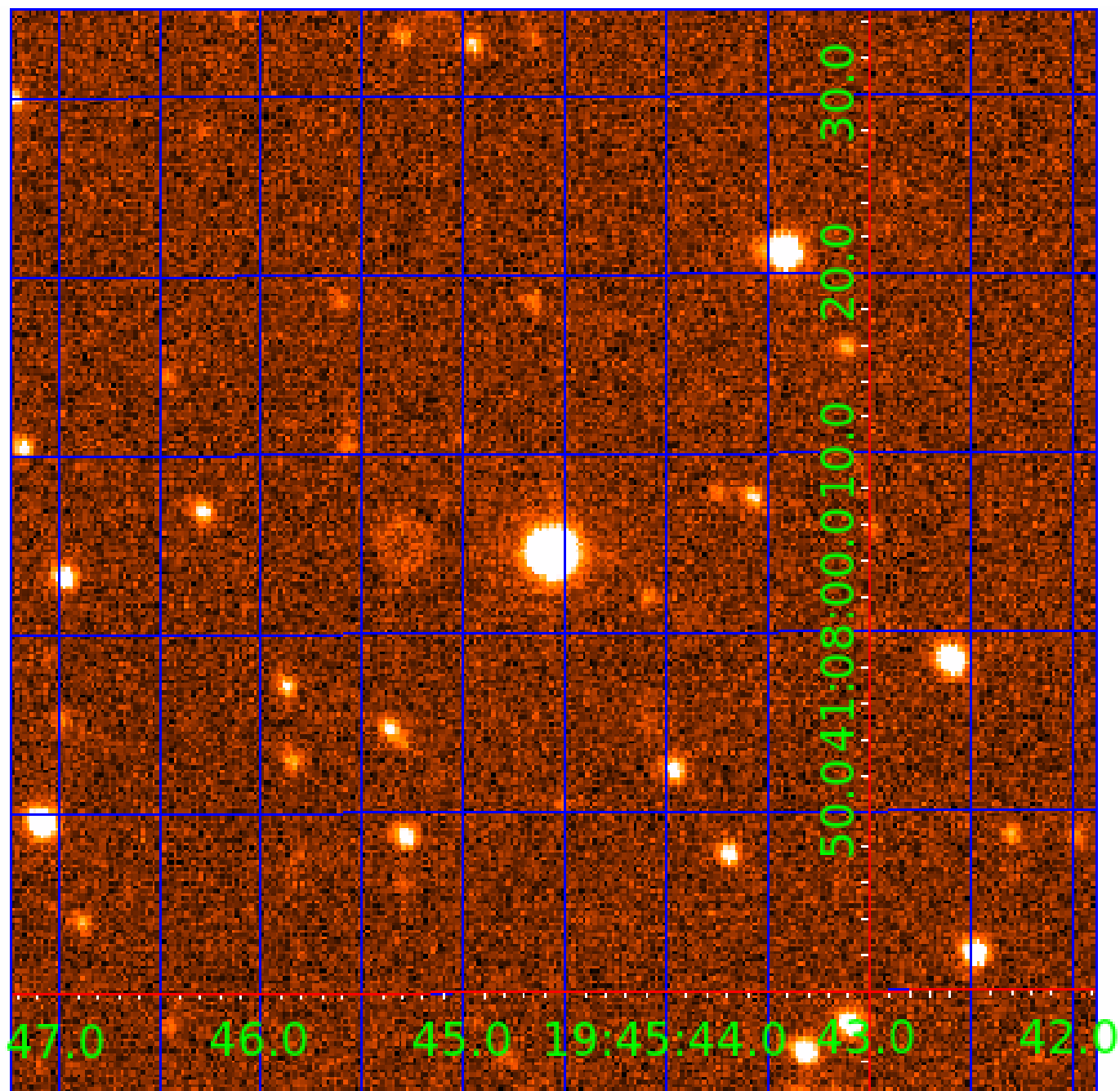


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 005893123

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005893123-01 | OBS      | 0653.01 | 1.125953      | 132.480001   | 113.1       | 1.649            | 29.7 | 34.3 | 1.12                        | 6225            | 1.40                   | 3702.84                |
| 005893123-02 | OBS      | No      | 1.125910      | 131.937998   | 22.3        | 1.775            | 8.8  | 7.3  | 1.12                        | 6225            | 0.64                   | 3703.02                |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 005893123-01 | OBS      | FP   | 0.00  | 0 | 1 | 1 | 0 | MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET |
| 005893123-02 | OBS      | FP   | 0.00  | 1 | 1 | 1 | 0 | IS_SEC_TCE—CENT_RESOLVED_OFFSET                         |

**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](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

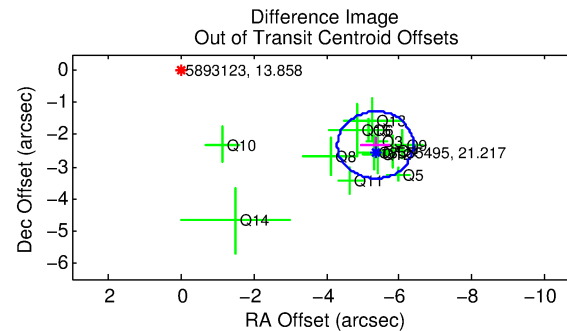
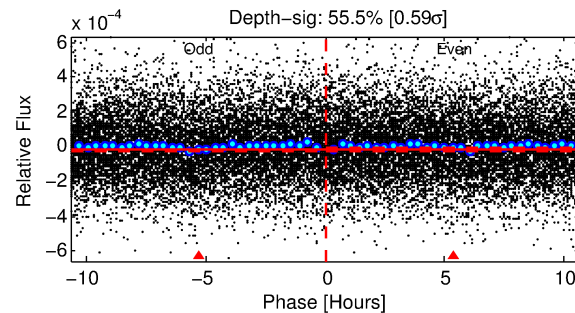
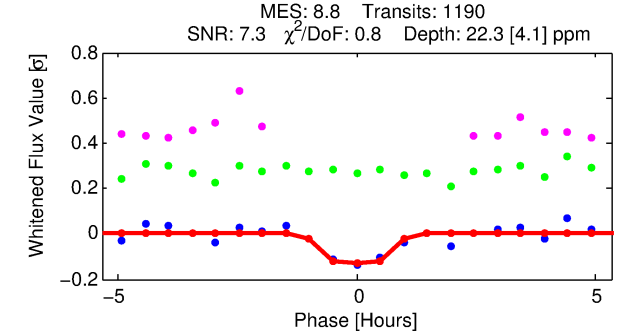
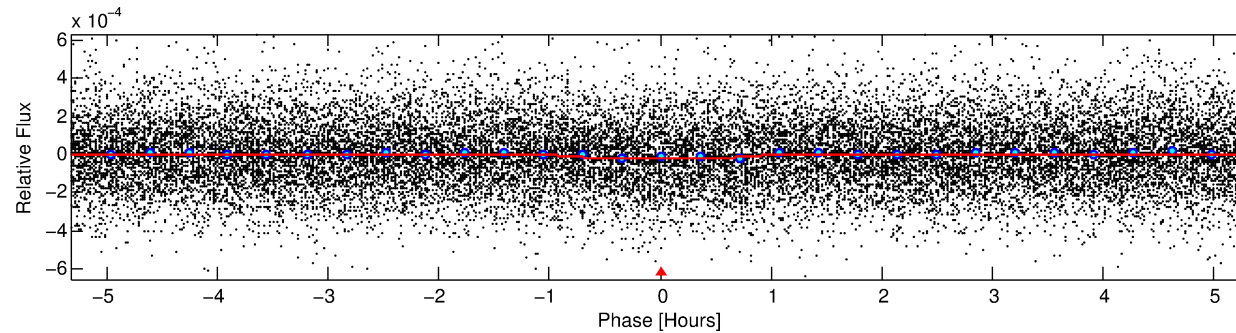
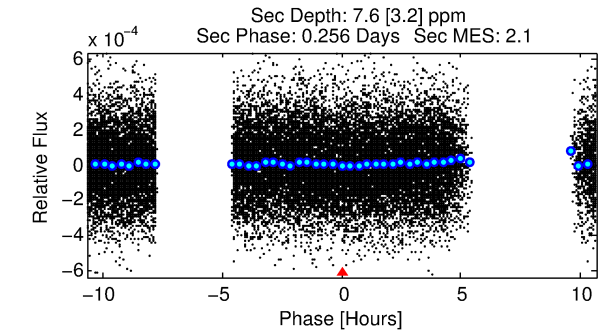
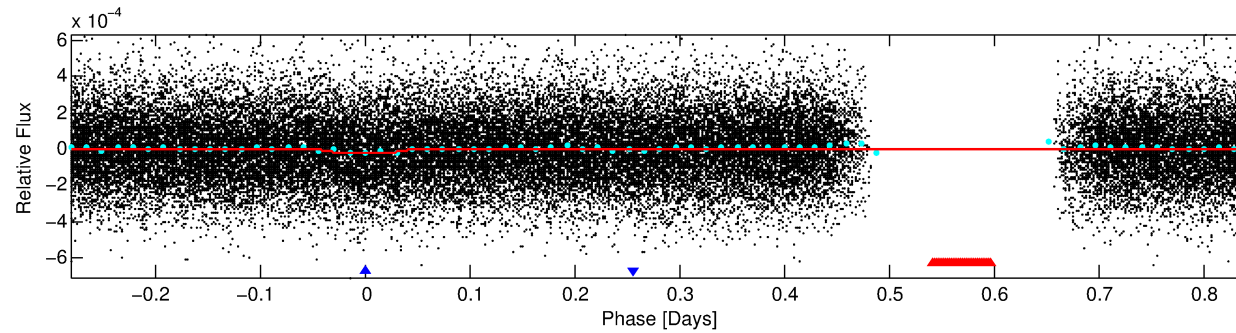
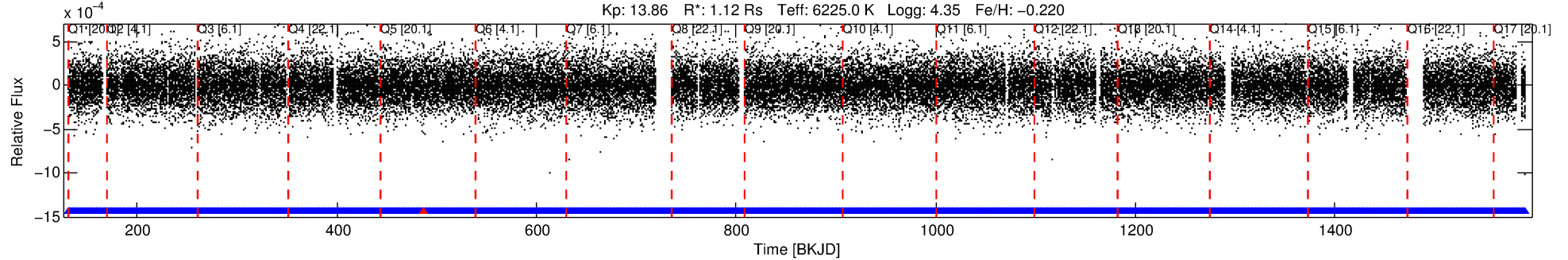
## Ephemeris Match Information For 005893123-02

No Significant Match Found

# DV One-Page Summary

KIC: 5893123 Candidate: 2 of 2 Period: 1.126 d  
KOI: K00653 Corr: No Ephemeris Match

Kp: 13.86 R\*: 1.12 Rs Teff: 6225.0 K Logg: 4.35 Fe/H: -0.220



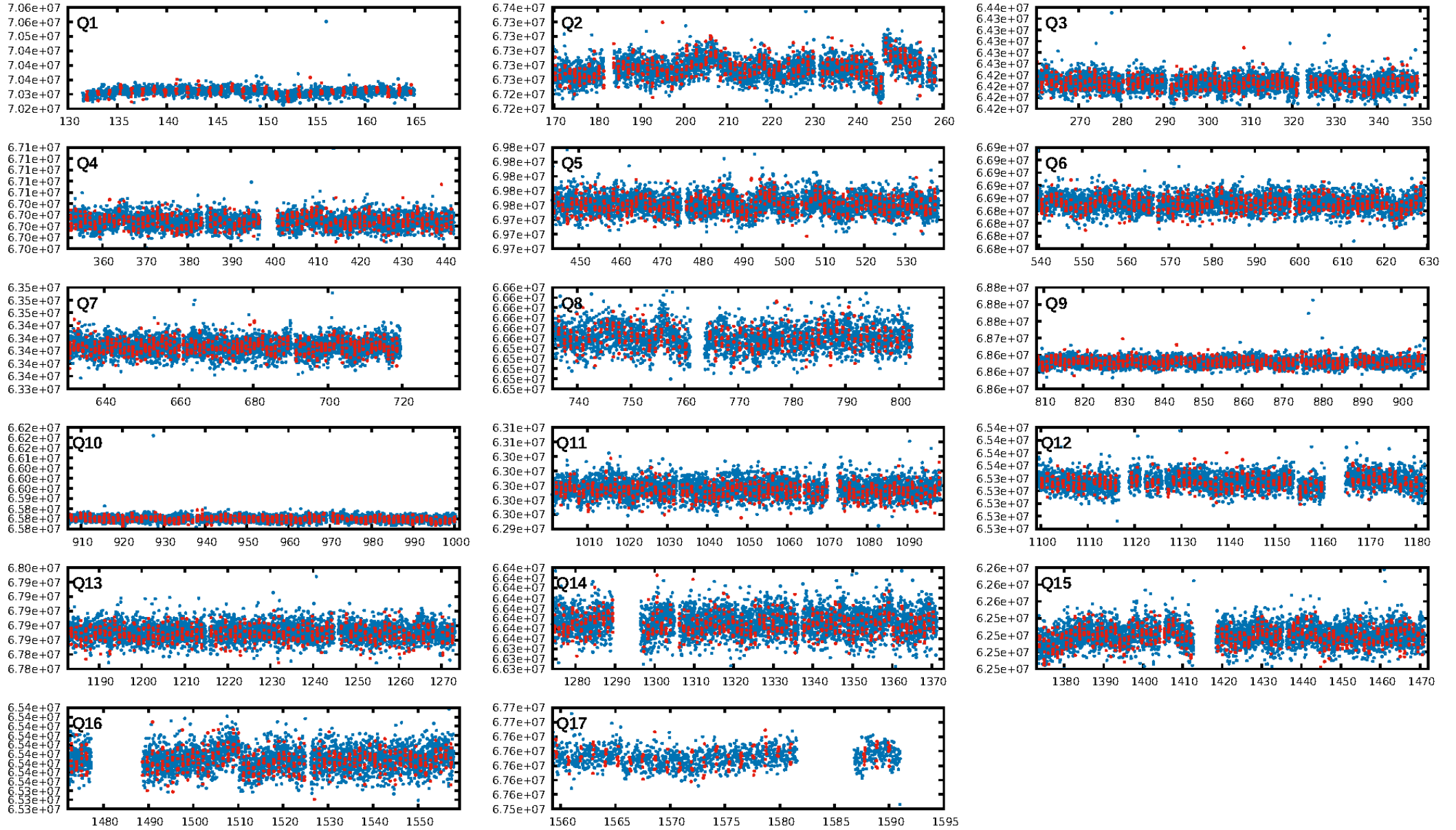
## DV Fit Results:

Period = 1.12591 [0.00001] d  
Epoch = 131.9380 [0.0036] BKJD  
Rp/R\* = 0.0052 [0.0033]  
a/R\* = 2.08 [5.59]  
b = 0.93 [0.51]  
Seff = 3703.02 [855.85]  
Teq = 1989 [115] K  
Rp = 0.64 [0.41] Re  
a = 0.0213 [0.0032] AU  
Ag = 4.67 [6.20] [0.59σ]  
Teffp = 4521 [1481] K [1.70σ]

## DV Diagnostic Results:

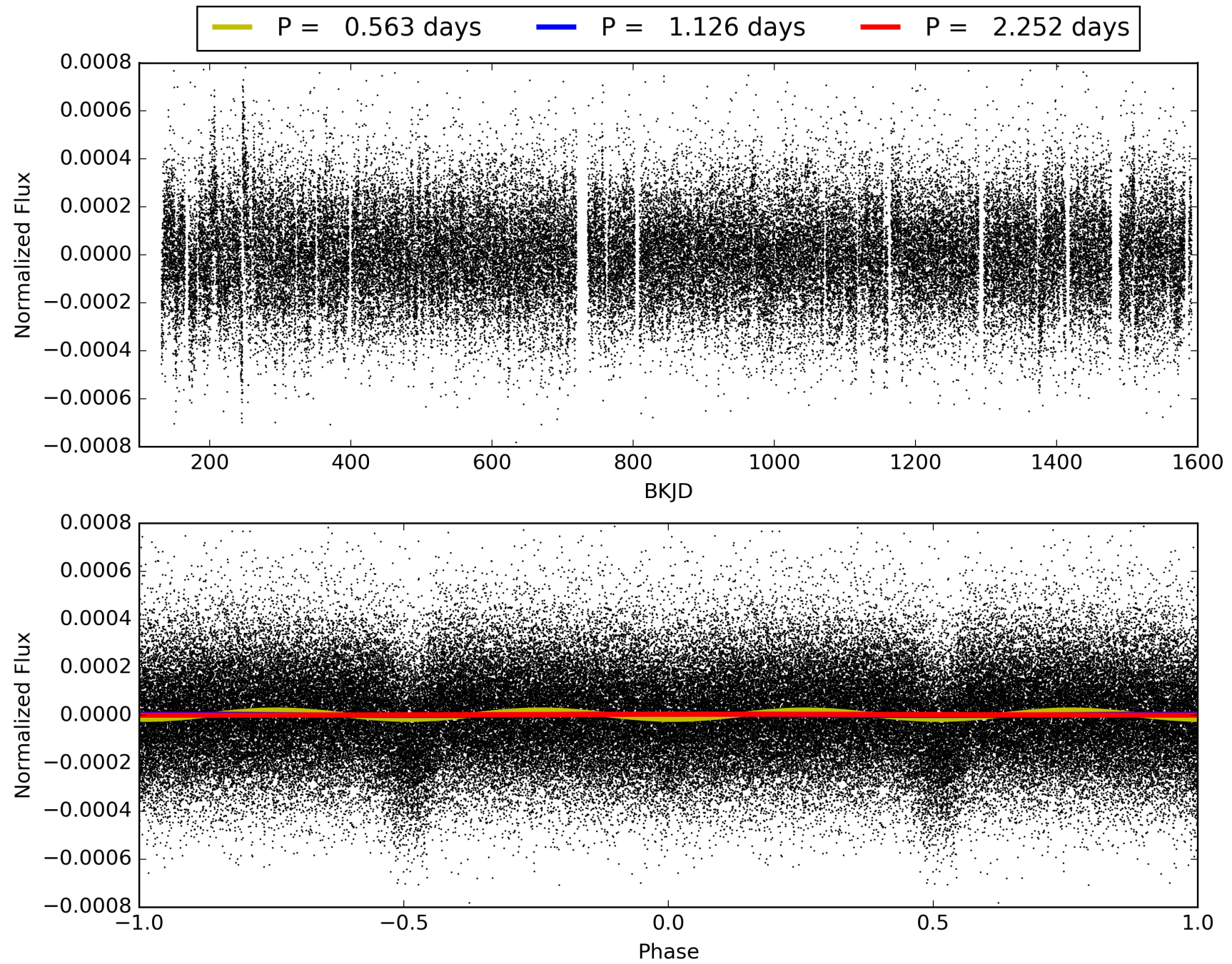
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.52e-19  
RollingBand-fgt: 1.00 [1136/1137]  
GhostDiagnostic-chr: 0.7321  
Centroid-sig: 0.0%  
Centroid-so: 8.583 arcsec [4.36σ]  
OotOffset-rm: 5.829 arcsec [16.77σ]  
KicOffset-rm: 5.871 arcsec [16.13σ]  
OotOffset-st: 3/3/4/3 [13]  
KicOffset-st: 3/3/4/3 [13]  
DiffImageQuality-fgm: 0.69 [9/13]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 005893123-02, PDC Light Curves





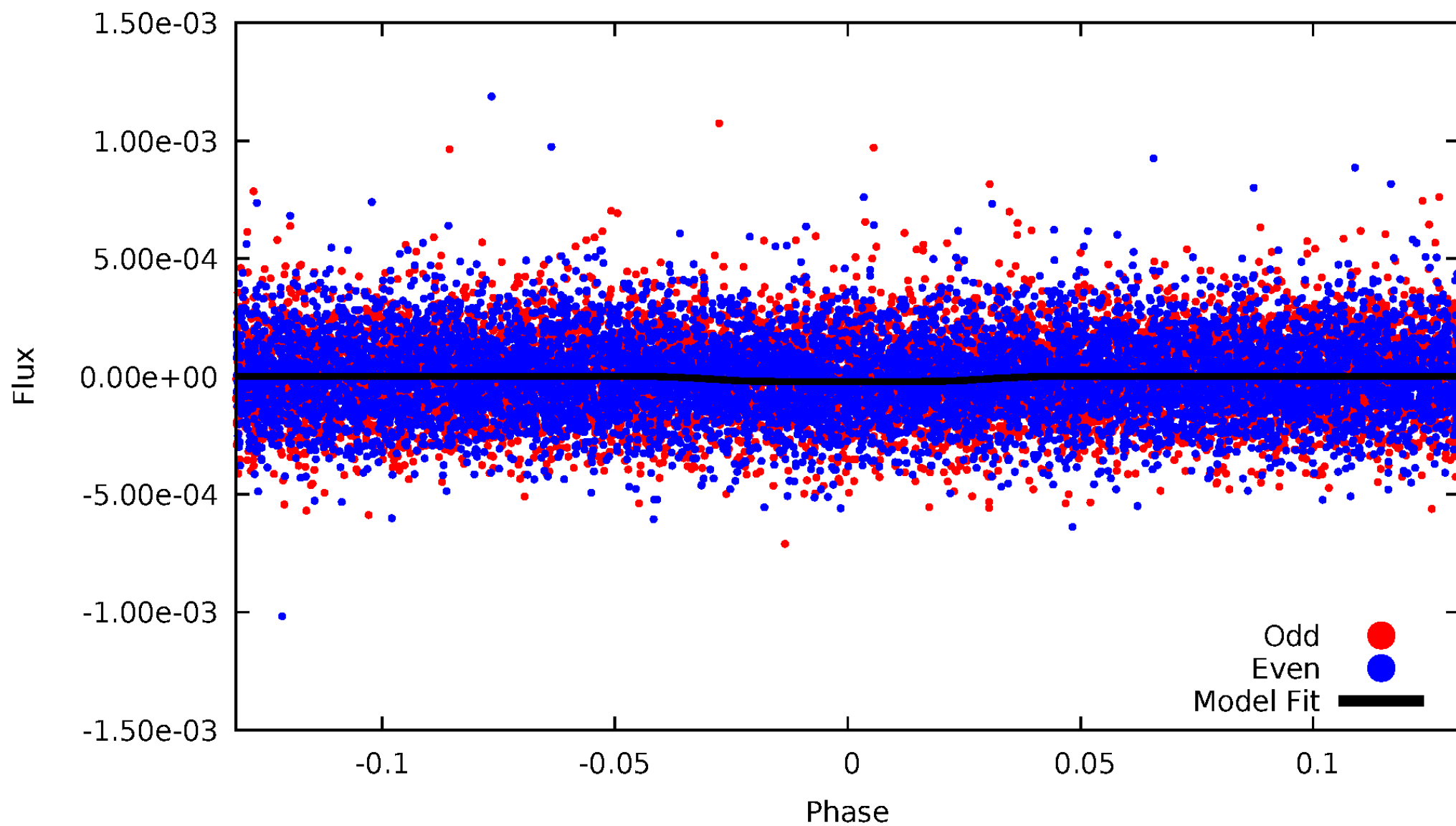
TCE 005893123-02





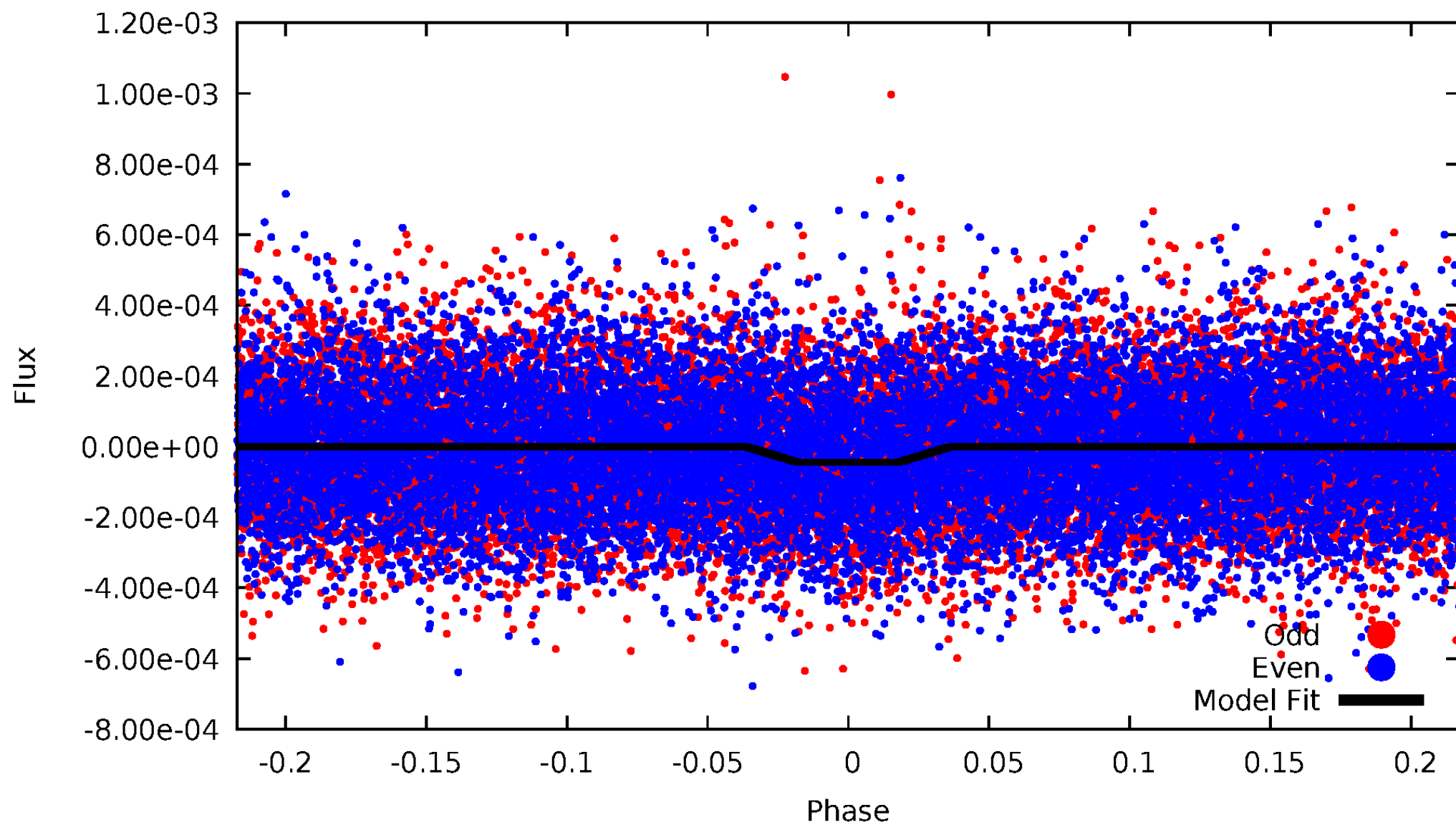
# DV Odd/Even

TCE 005893123-02



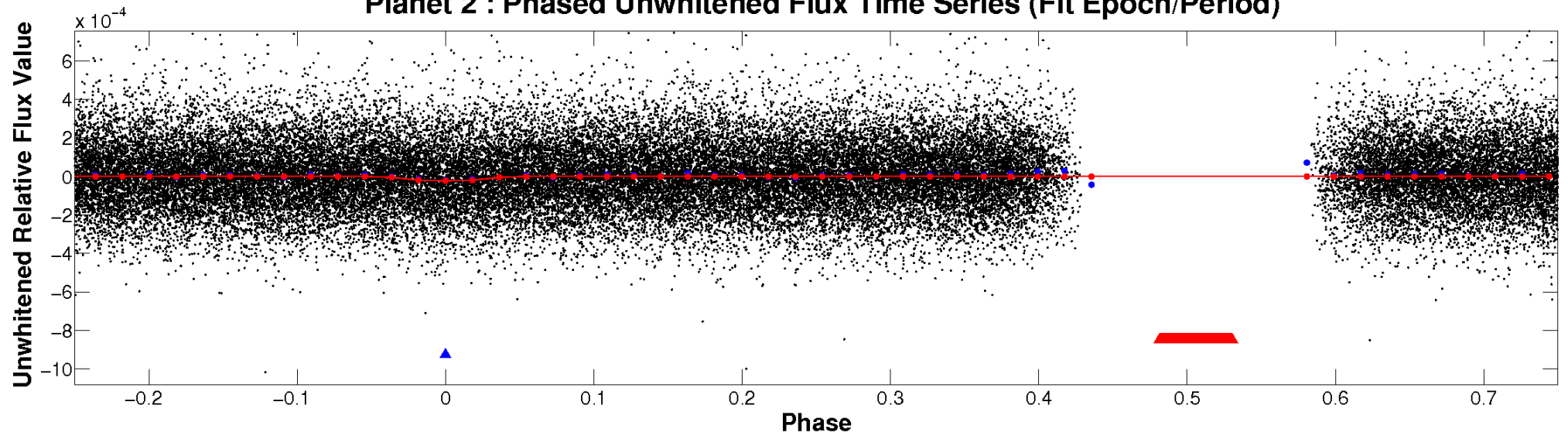
# ALT Odd/Even

TCE 005893123-02

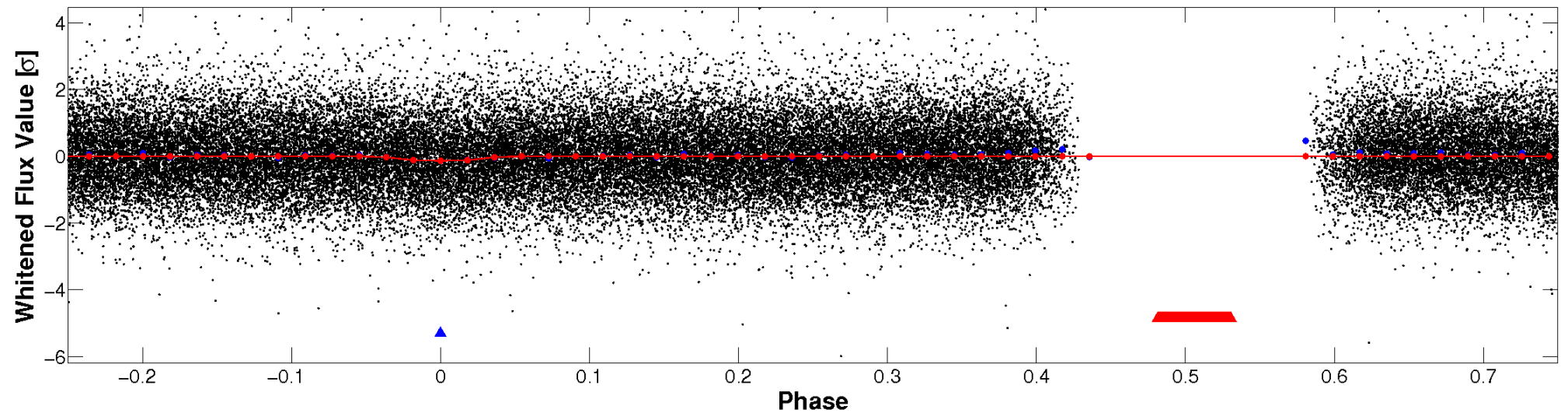


# Non-Whitened Vs. Whitened Light Curve

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

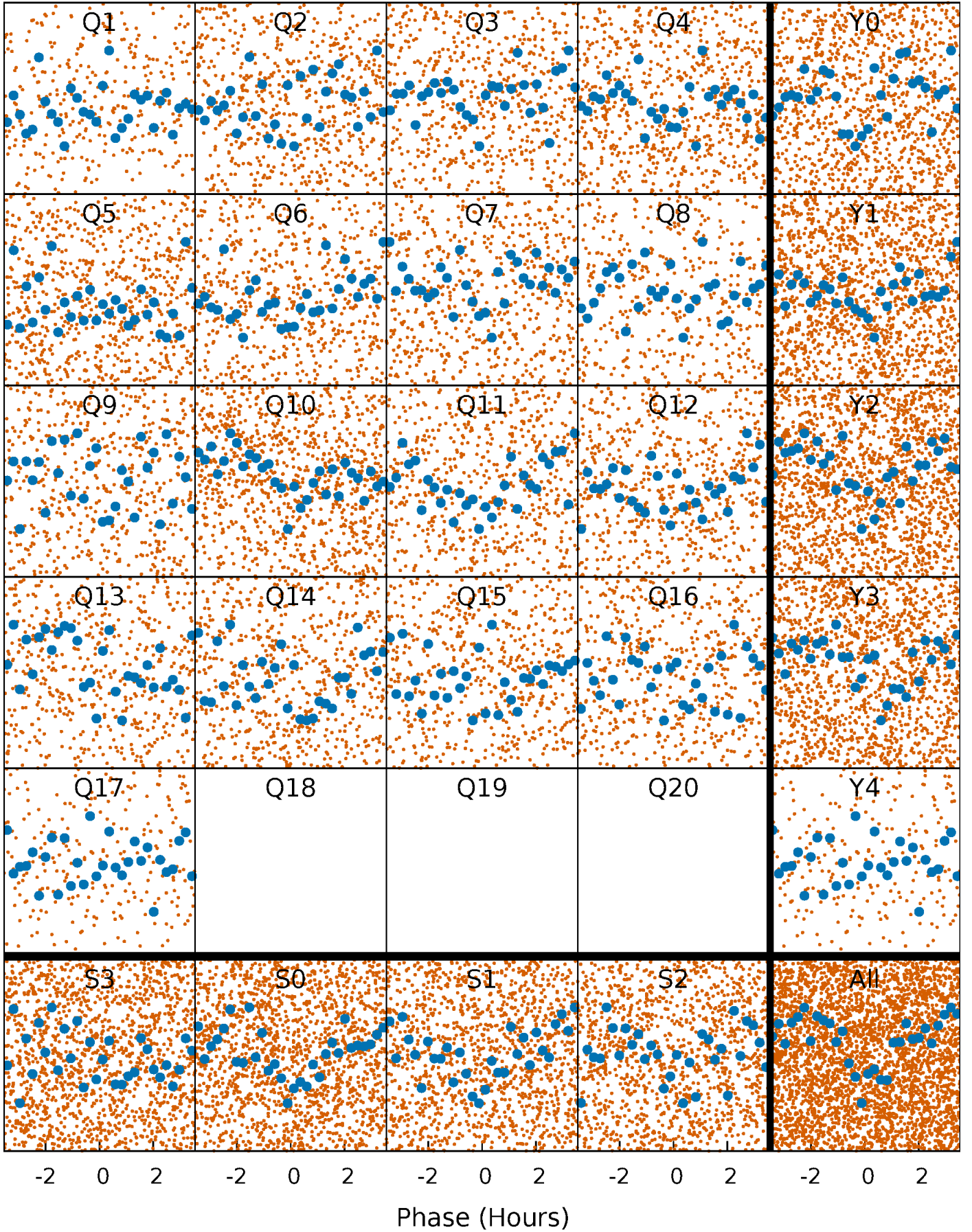


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

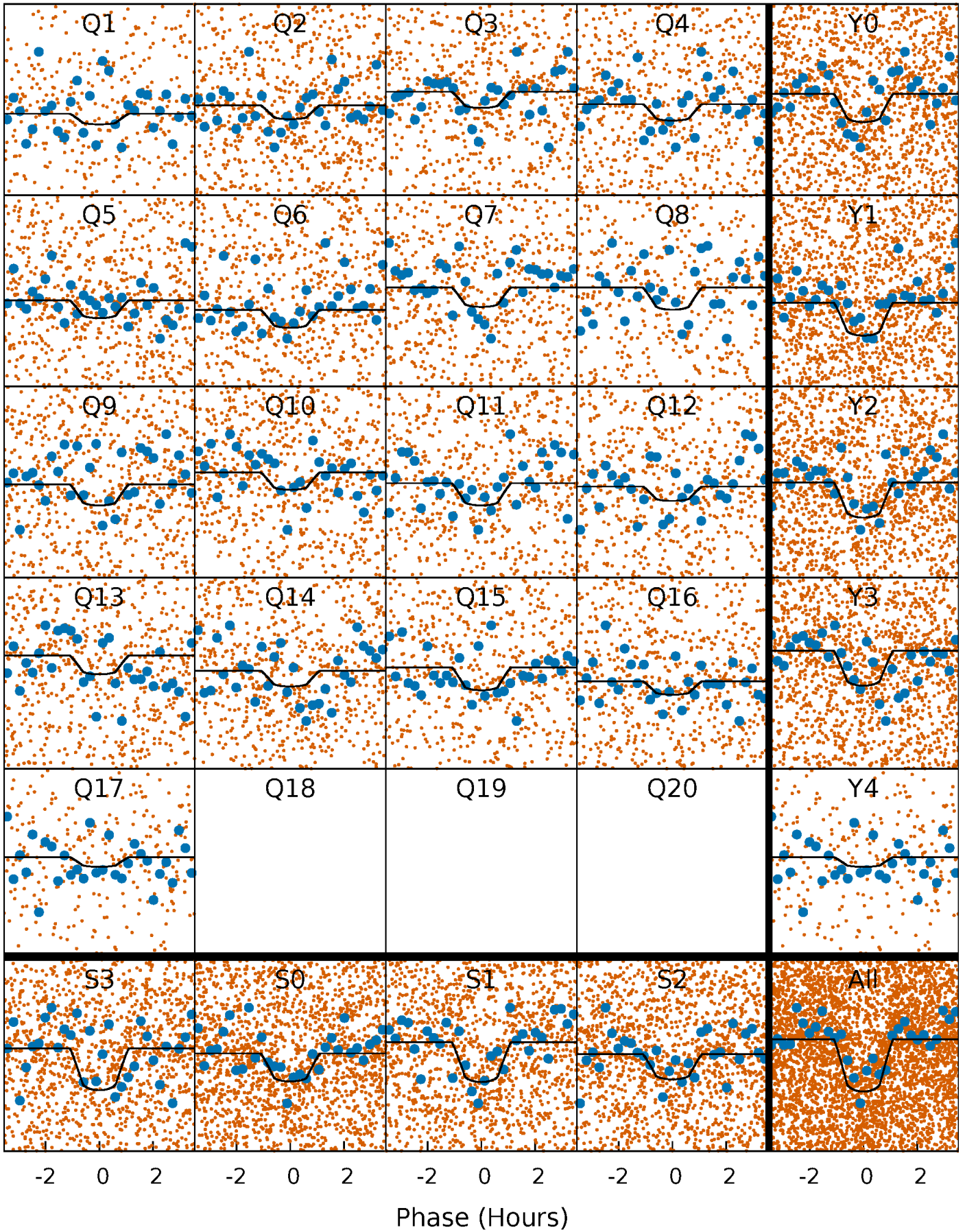
TCE 005893123-02   P= 1.125910 Days    $T_0=131.937998$  (BKJD)





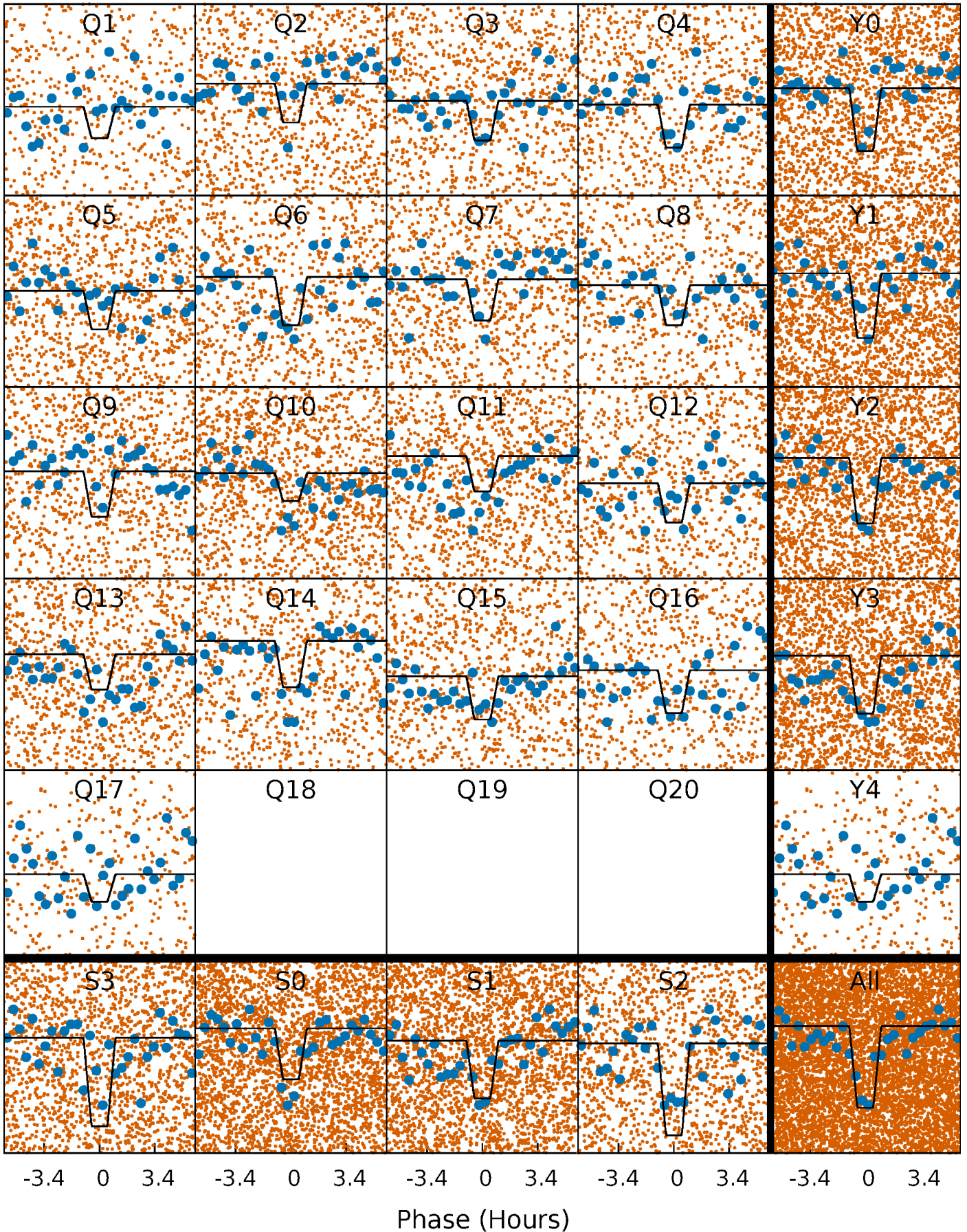
# DV Quarter-Phased Transit Curves

TCE 005893123-02 P= 1.125910 Days  $T_0=131.937998$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005893123-02 P= 1.125954 Days  $T_0=131.920121$  (BKJD)

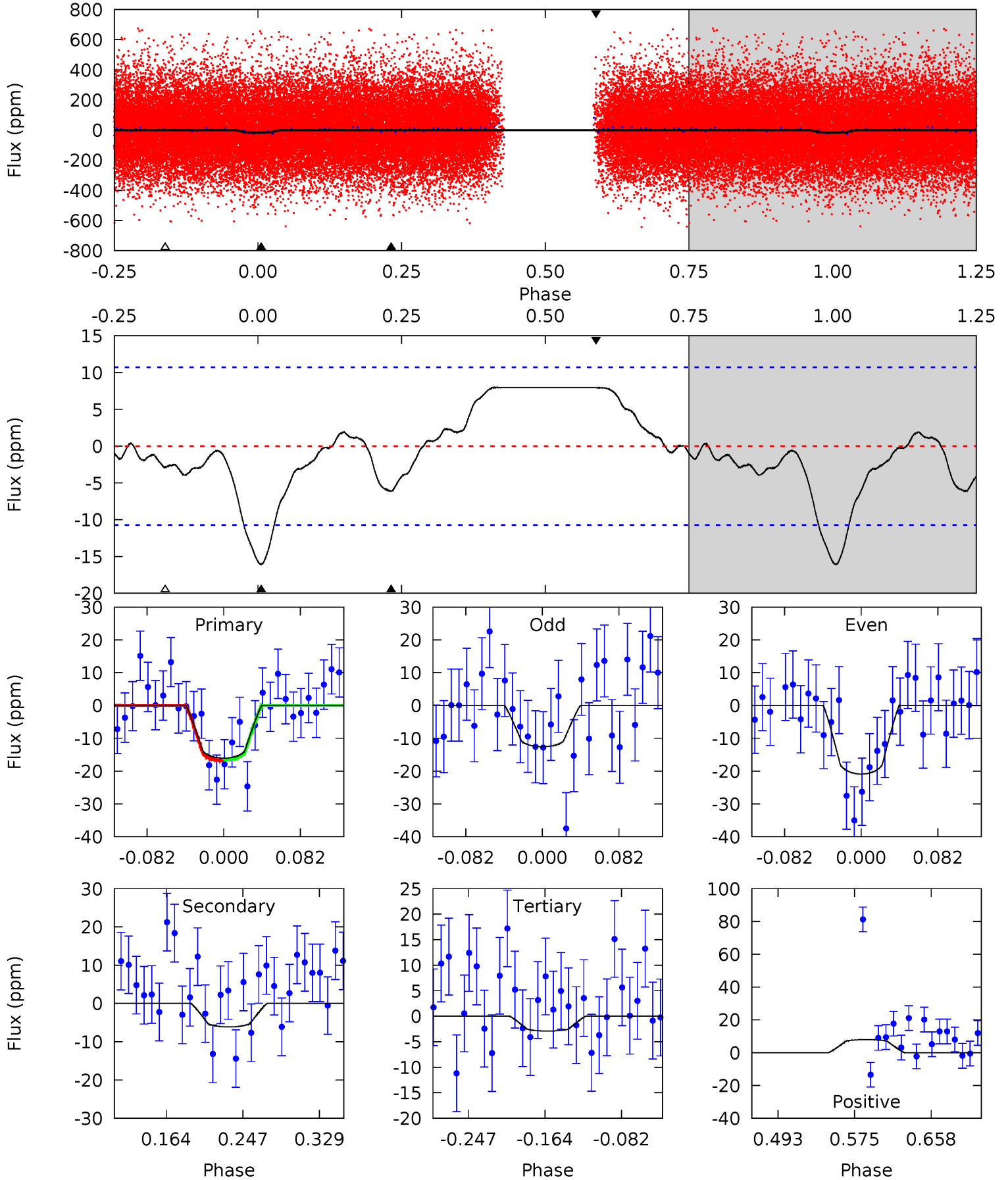




# DV Model-Shift Uniqueness Test

005893123-02, P = 1.125910 Days, E = 130.812088 Days

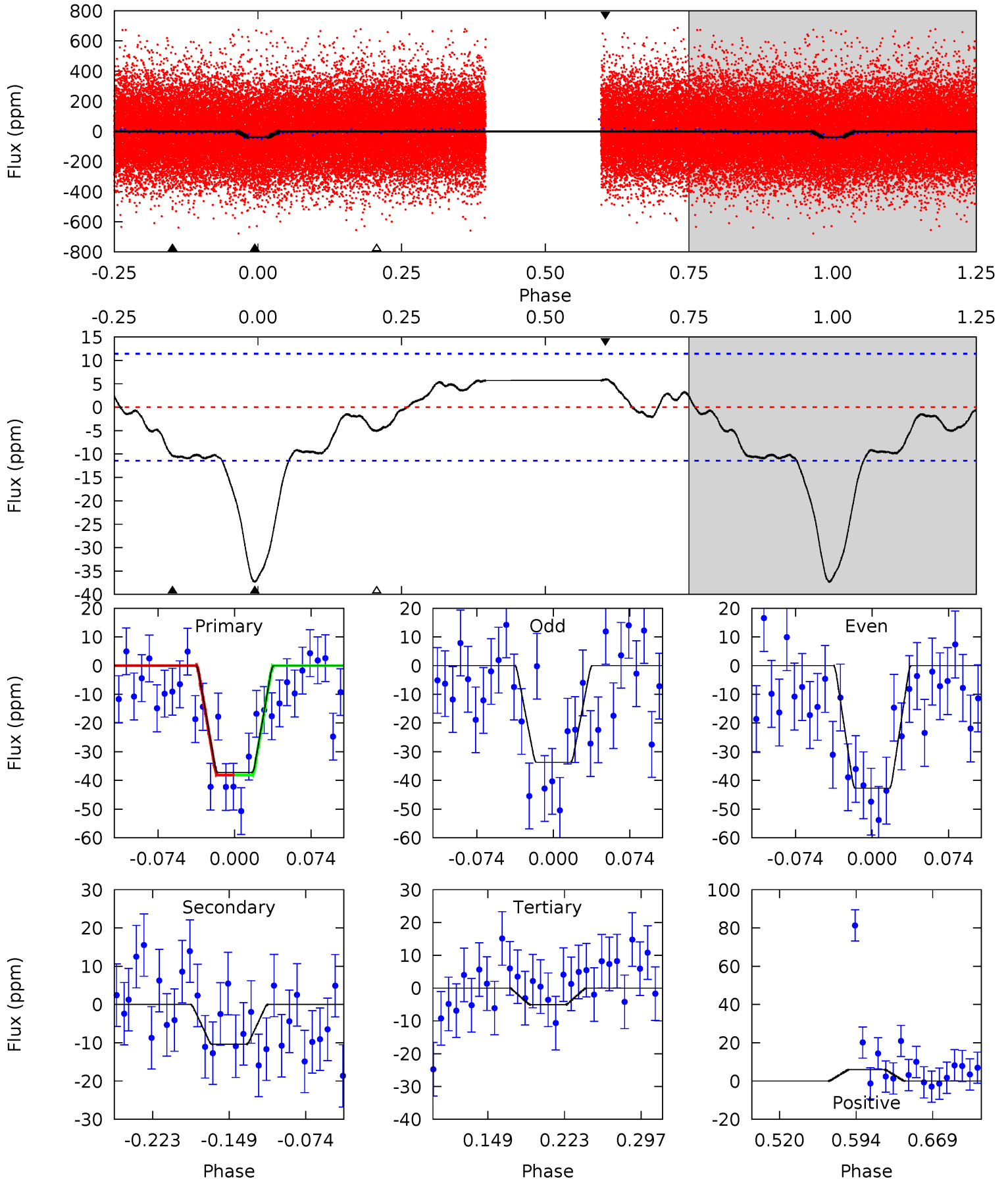
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.90 | 2.63 | 1.25 | 3.42 | 4.61            | 1.74            | 1.38             | 5.66    | 3.48    | 1.38    | -0.79   | 1.79    | 0.84 | 0.33  | 0.05 |



# Alt Model-Shift Uniqueness Test

005893123-02, P = 1.125954 Days, E = 130.794167 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 15.1 | 4.20 | 2.06 | 2.42 | 4.63            | 1.78            | 1.82             | 13.0    | 12.7    | 2.14    | 1.78    | 1.83    | 0.94 | 0.14  | 0.01 |



### Stellar Parameters For KIC 005893123

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M(M_{\odot})$            | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|---------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6225^{+80}_{-87}$  | $4.348^{+0.095}_{-0.126}$ | $-0.220^{+0.150}_{-0.150}$ | $1.116^{+0.190}_{-0.117}$ | $1.011^{+0.087}_{-0.051}$ | $1.023^{+0.363}_{-0.374}$                     |
|        | +1%/-1%             | +2%/-3%                   | +68%/-68%                  | +17%/-10%                 | +9%/-5%                   | +36%/-37%                                     |
| Source | SPE68               | SPE68                     | SPE68                      | DSEP                      |                           |   |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 005893123-02 / KOI

| Detrend | Depth (ppm) | $R_p$ ( $R_{\oplus}$ ) | $T_{max}$ (K)       | $T_{obs}$ (K)         | $A_{obs}$                  |
|---------|-------------|------------------------|---------------------|-----------------------|----------------------------|
| DV      | $-6\pm 2$   | $0.67^{+0.37}_{-0.35}$ | $2786^{+125}_{-95}$ | $4319^{+1594}_{-800}$ | $3.269^{+9.943}_{-2.057}$  |
| Alt.    | $-10\pm 2$  | $0.84^{+0.39}_{-0.40}$ | $2779^{+133}_{-94}$ | $4395^{+1527}_{-674}$ | $3.812^{+10.179}_{-2.203}$ |

$T_{max}$  = 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  $A_{obs} \gg 1.0$

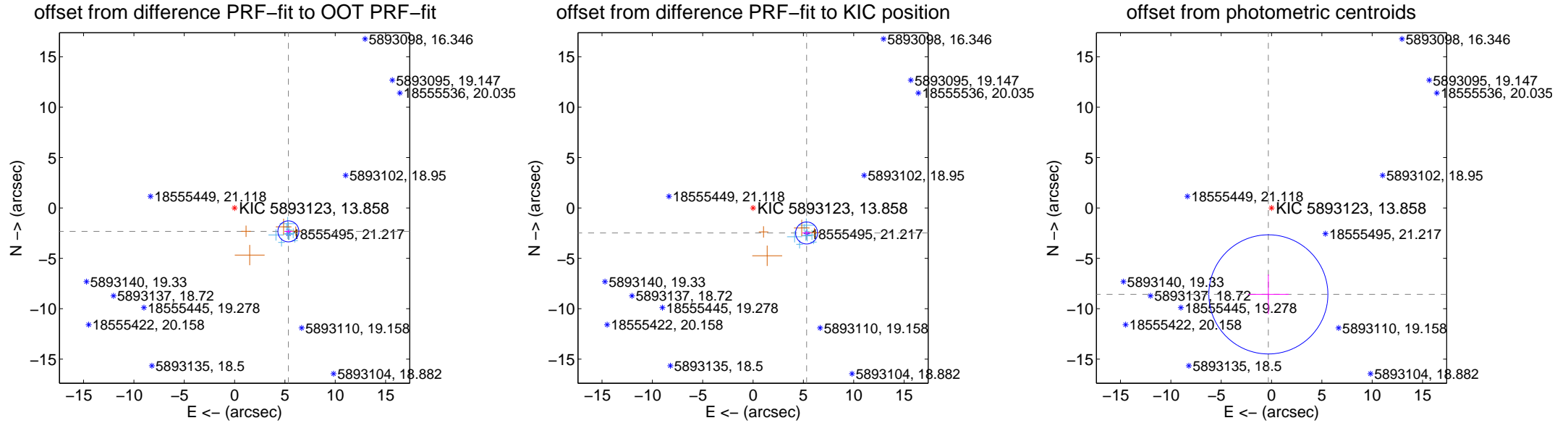
## DV Centroid Data

Supplemental centroid analysis for 005893123-02. Kepler magnitude: 13.86. Transit SNR 7.32

There are 9 quarters with good PRF difference image offsets

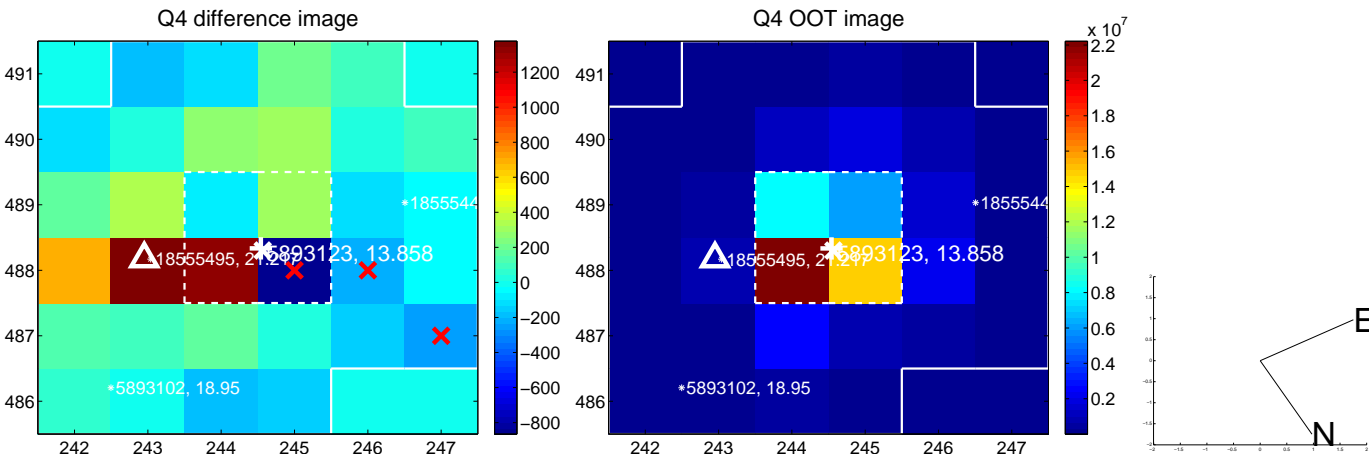
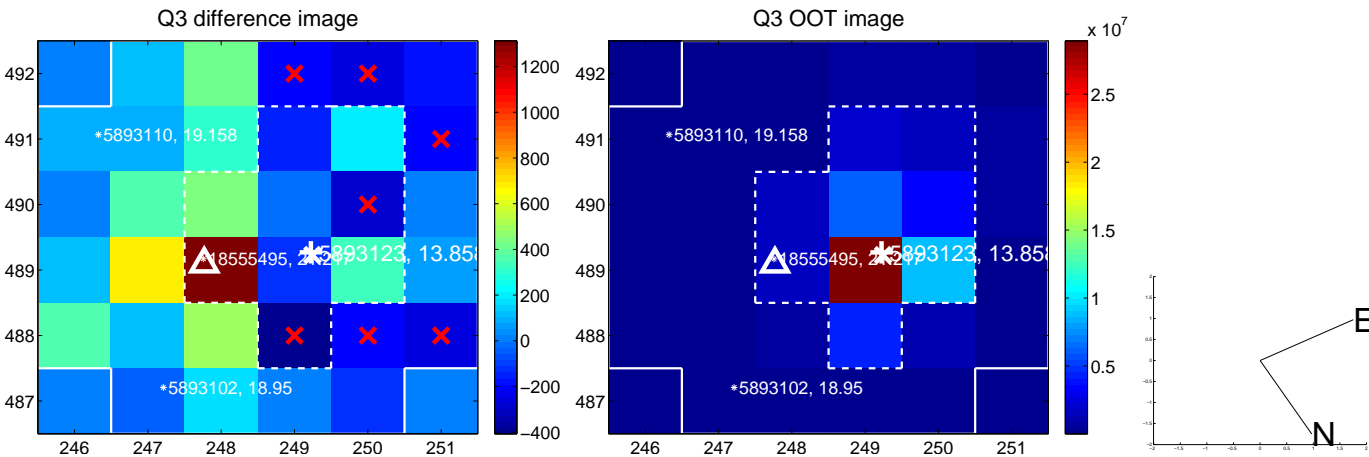
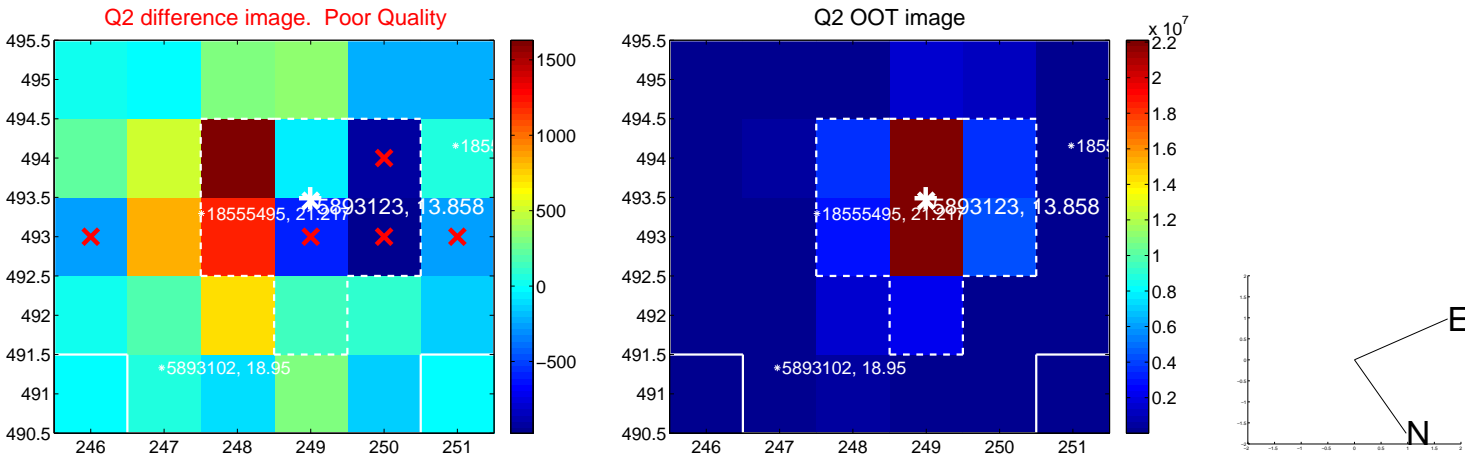
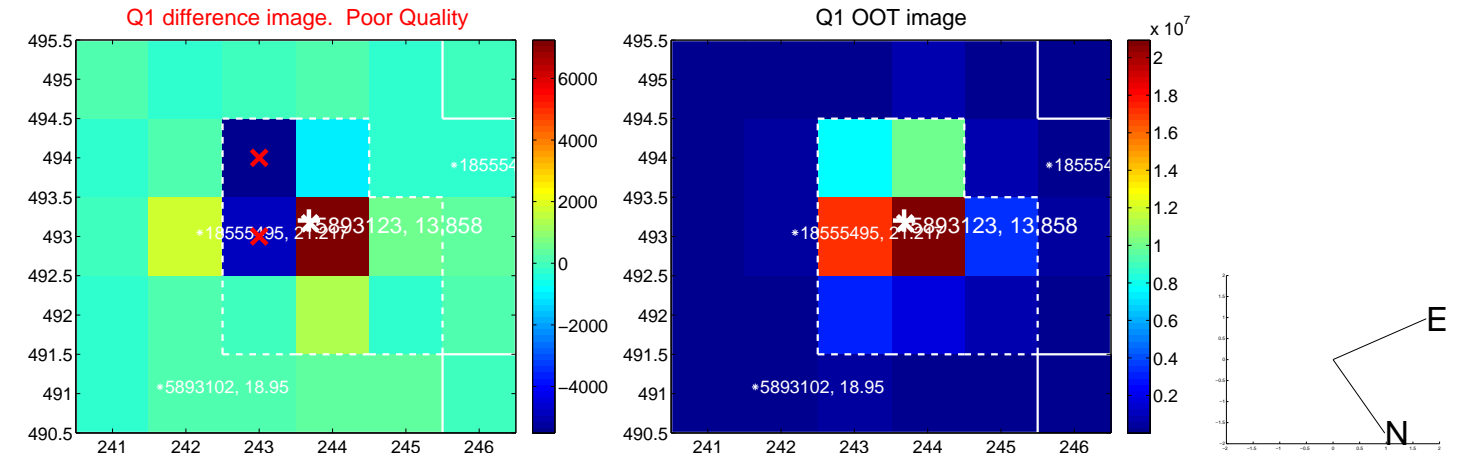
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $5.829 \pm 0.348$  | 16.77               | $-5.345 \pm 0.396$ | $-2.325 \pm 0.208$ |
| PRF-fit source offset from KIC position | $5.871 \pm 0.364$  | 16.13               | $-5.319 \pm 0.431$ | $-2.484 \pm 0.210$ |
| photometric centroid source offset      | $8.58 \pm 1.97$    | 4.36                | $0.31 \pm 2.02$    | $-8.58 \pm 1.97$   |

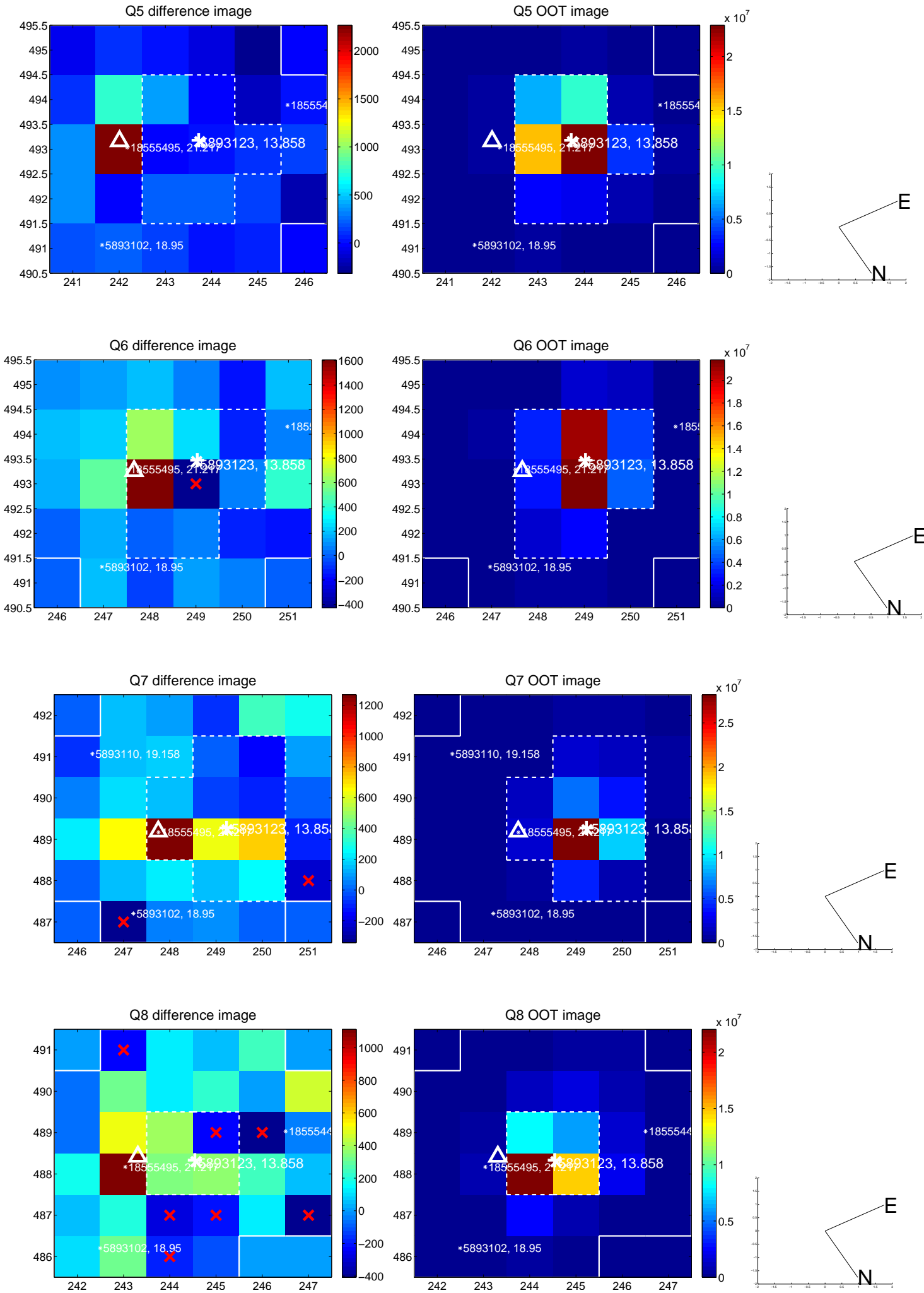


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

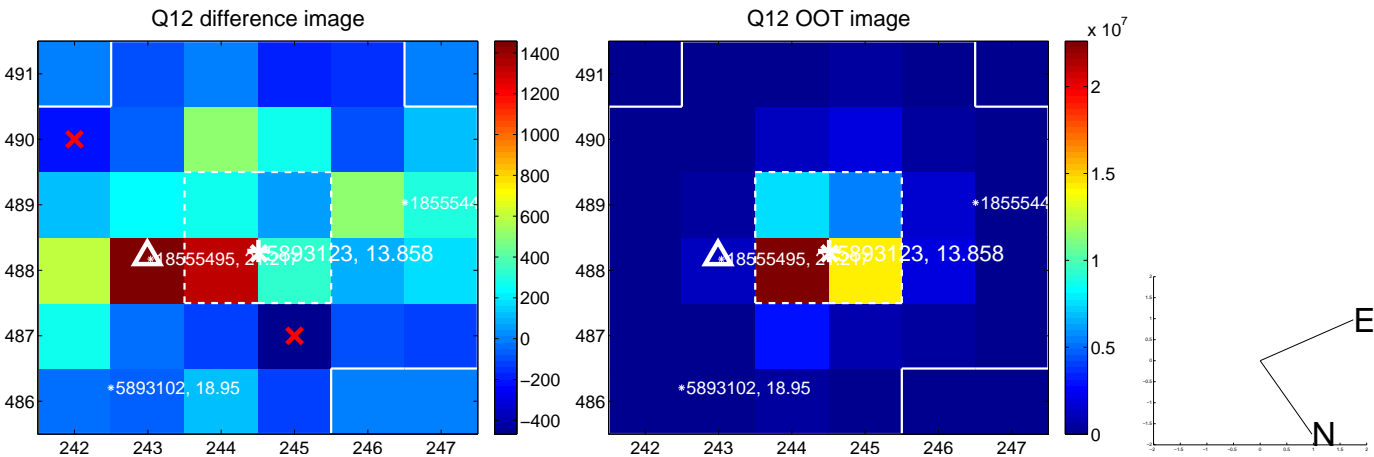
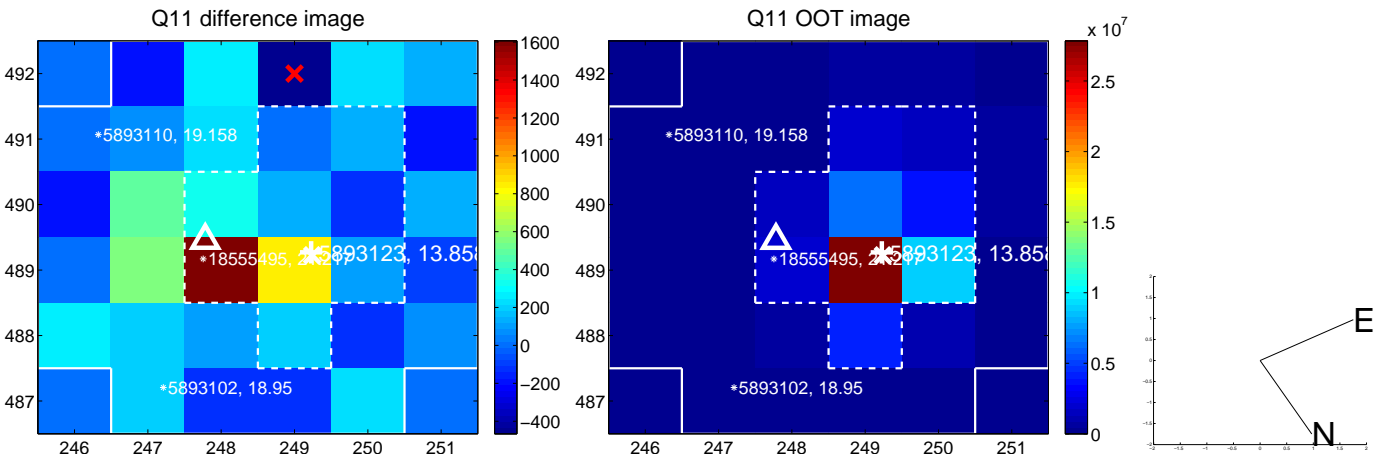
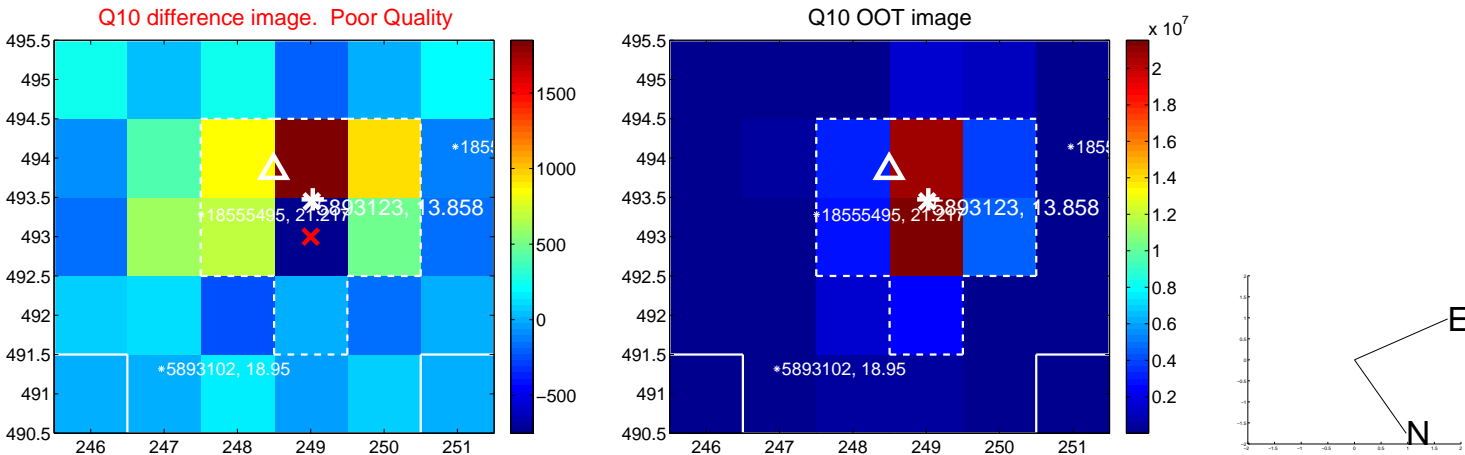
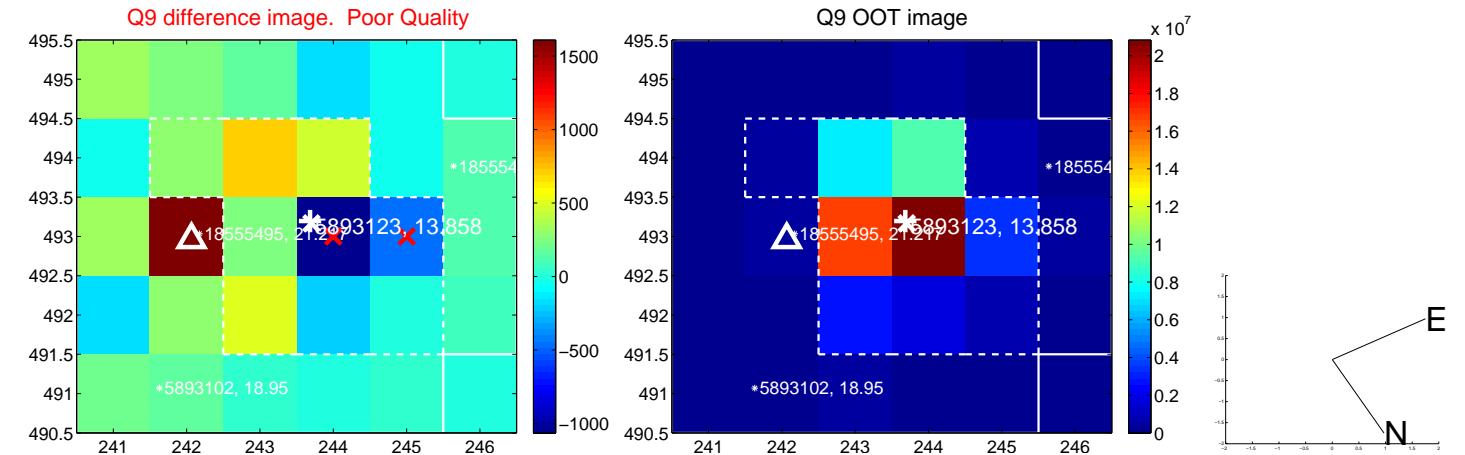


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

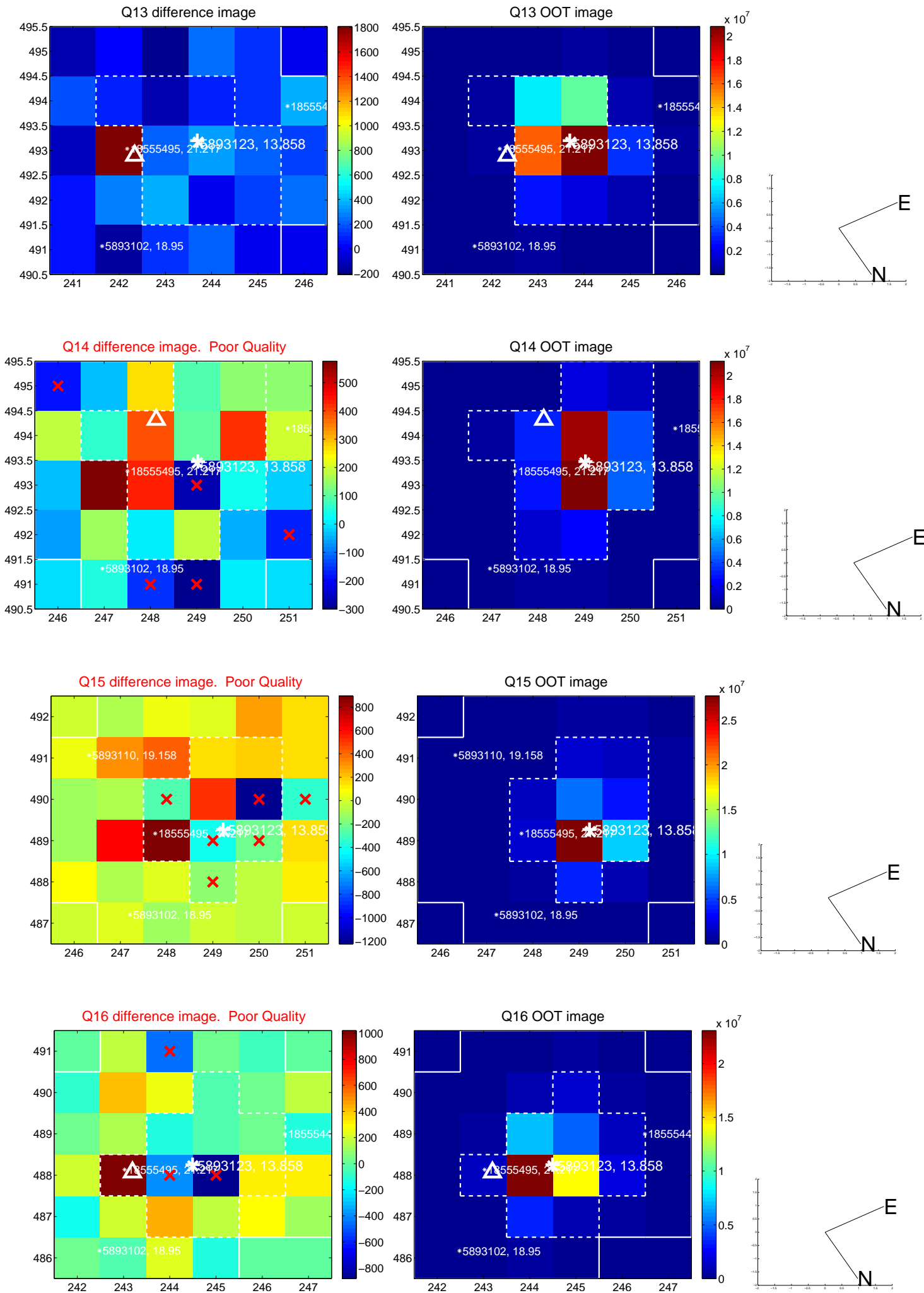




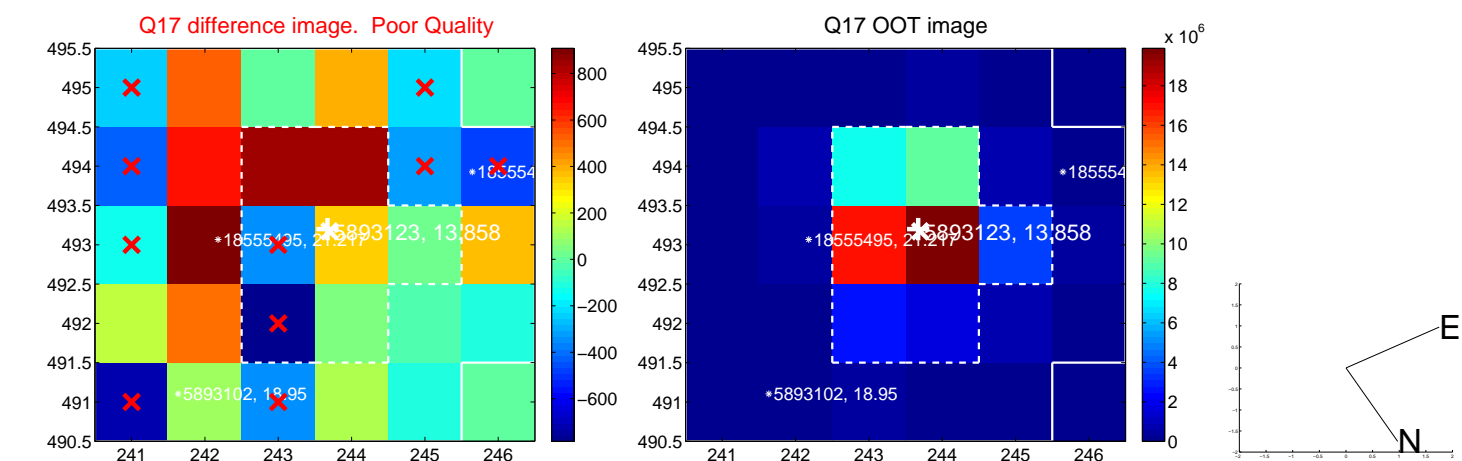
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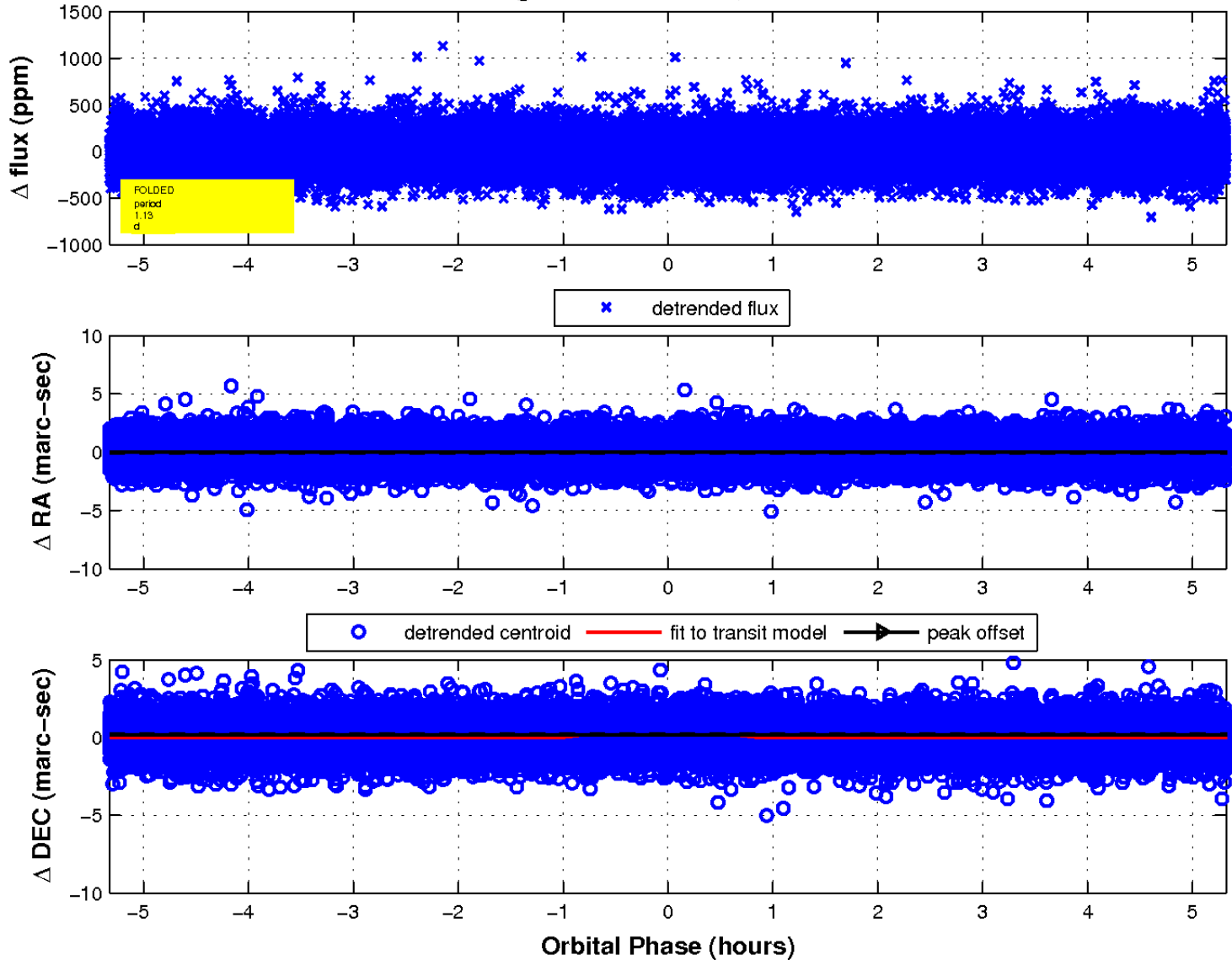
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

