

# KIC 005894825

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005894825-01 | OBS      | 6633.01 | 1.362994      | 132.716941   | 28.1        | 5.247            | 9.5 | 8.8 | 2.11                        | 6831            | 1.37                   | 11336.49               |
| 005894825-02 | OBS      | No      | 159.312723    | 238.540998   | 148.4       | 24.128           | 8.3 | 5.3 | 2.11                        | 6831            | 2.79                   | 19.84                  |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005894825-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—MOD_NONUNIQ_ALT   |
| 005894825-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS |

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

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

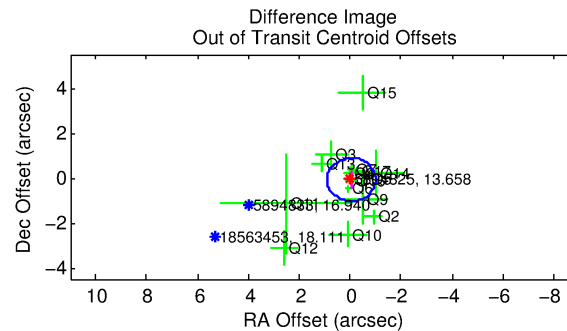
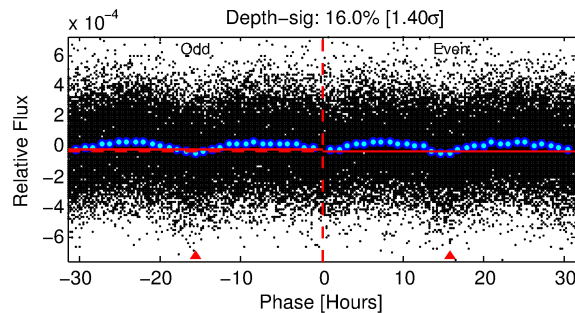
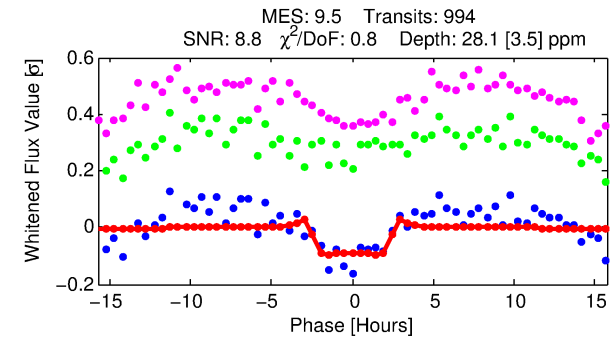
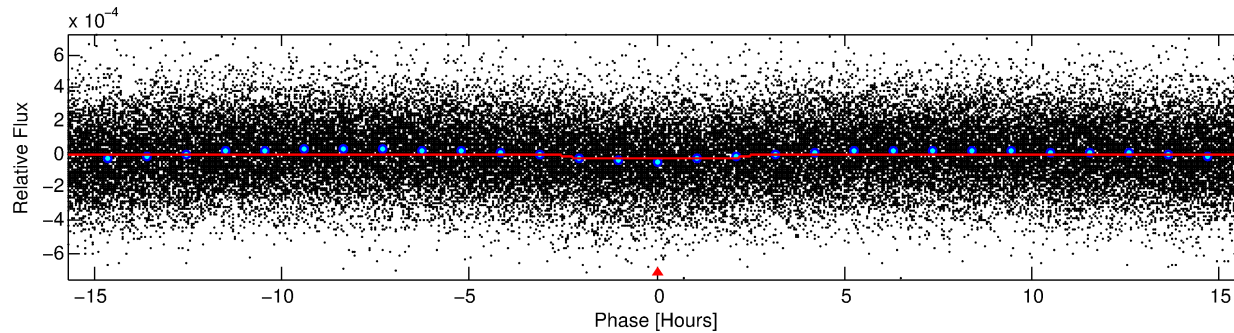
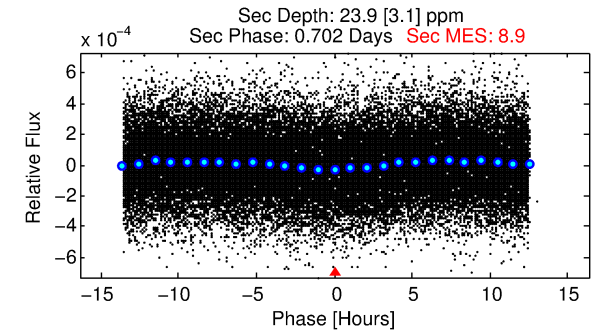
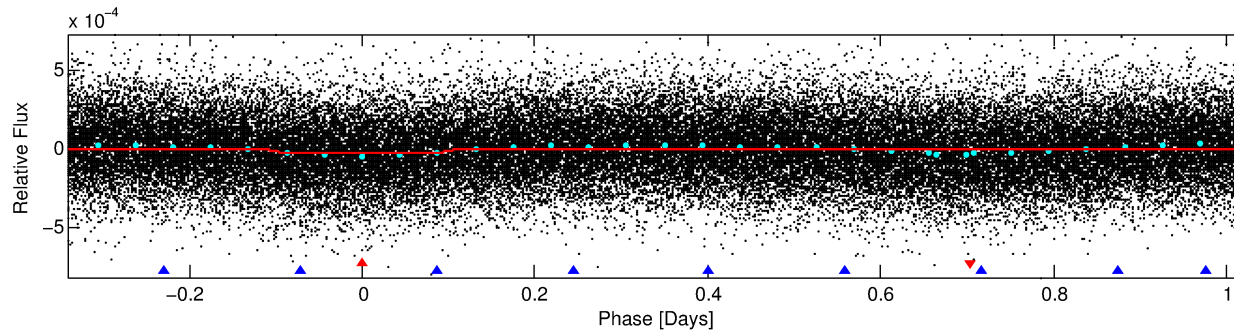
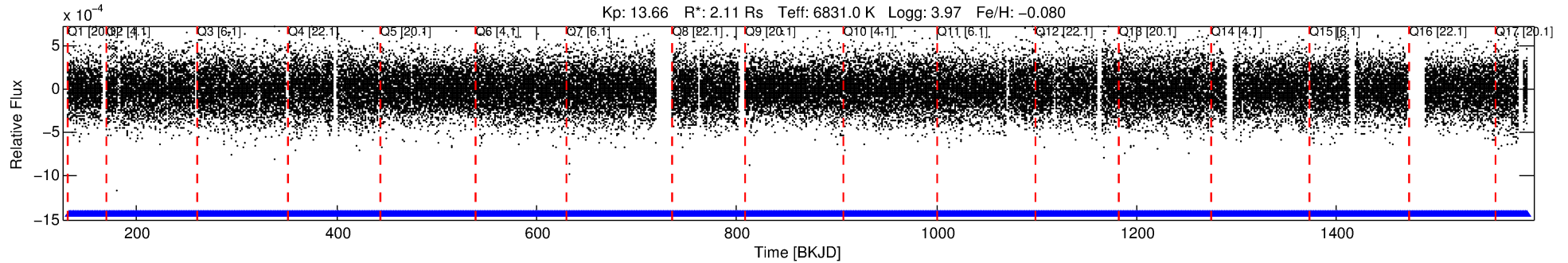
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005894825-01

No Significant Match Found

# DV One-Page Summary

KIC: 5894825 Candidate: 1 of 2 Period: 1.363 d  
KOI: K06633 Corr: No Ephemeris Match



## DV Fit Results:

Period = 1.36299 [0.00002] d  
Epoch = 132.7169 [0.0044] BKJD  
Rp/R\* = 0.0059 [0.0011]  
a/R\* = 1.17 [0.36]  
b = 0.95 [0.12]  
Seff = 11336.49 [6021.64]  
Teq = 2631 [349] K  
Rp = 1.37 [0.53] Re  
a = 0.0276 [0.0088] AU  
Ag = 5.36 [3.45] [1.26σ]  
Teffp = 6190 [671] K [4.70σ]

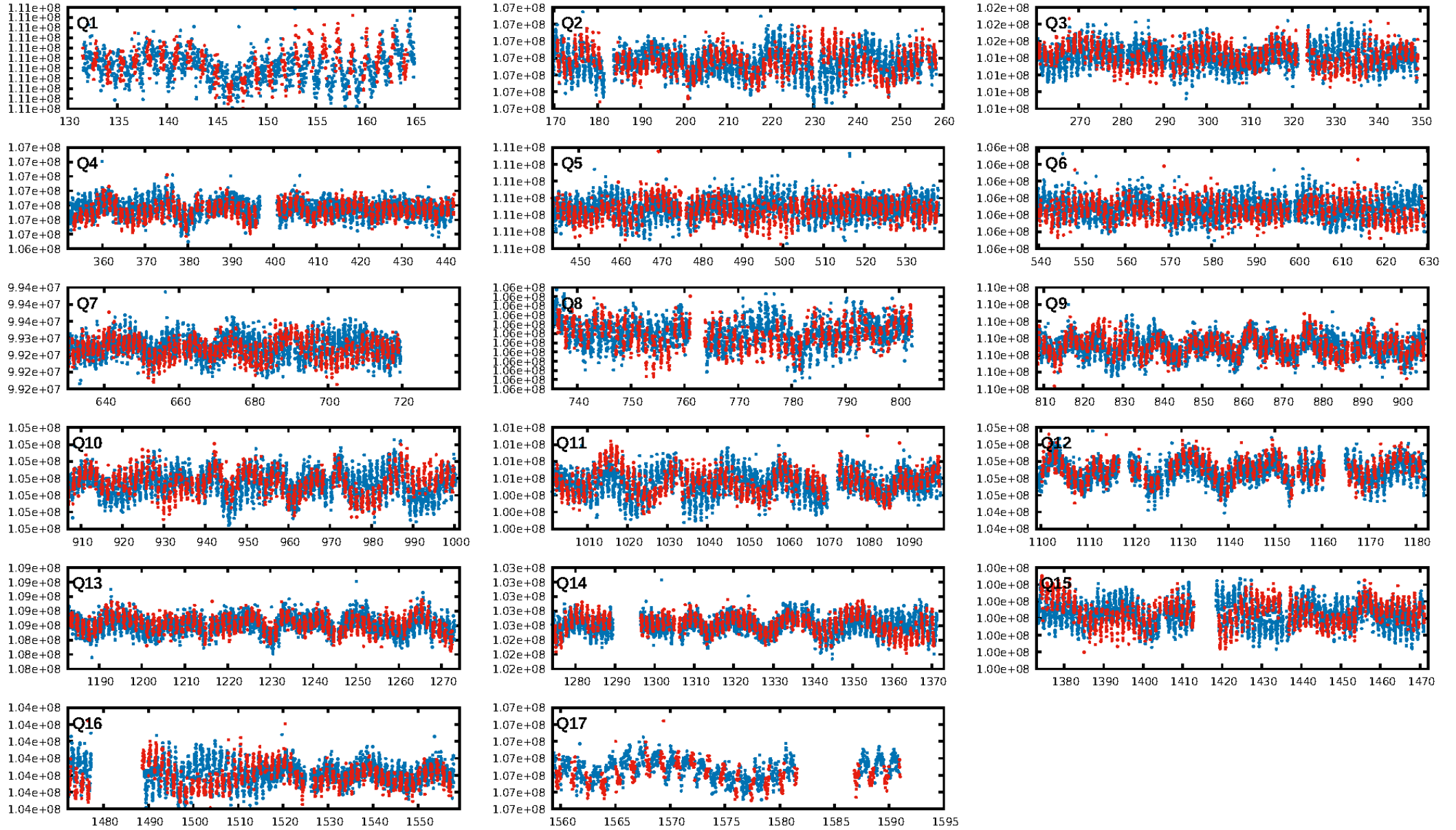
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [153.52σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.38e-15  
RollingBand-fgt: 1.00 [949/949]  
GhostDiagnostic-chr: 1.329  
Centroid-sig: 58.2%  
Centroid-so: 0.233 arcsec [0.37σ]  
OotOffset-rm: 0.091 arcsec [0.29σ]  
KicOffset-rm: 0.149 arcsec [0.42σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.69 [11/16]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:28:02 Z

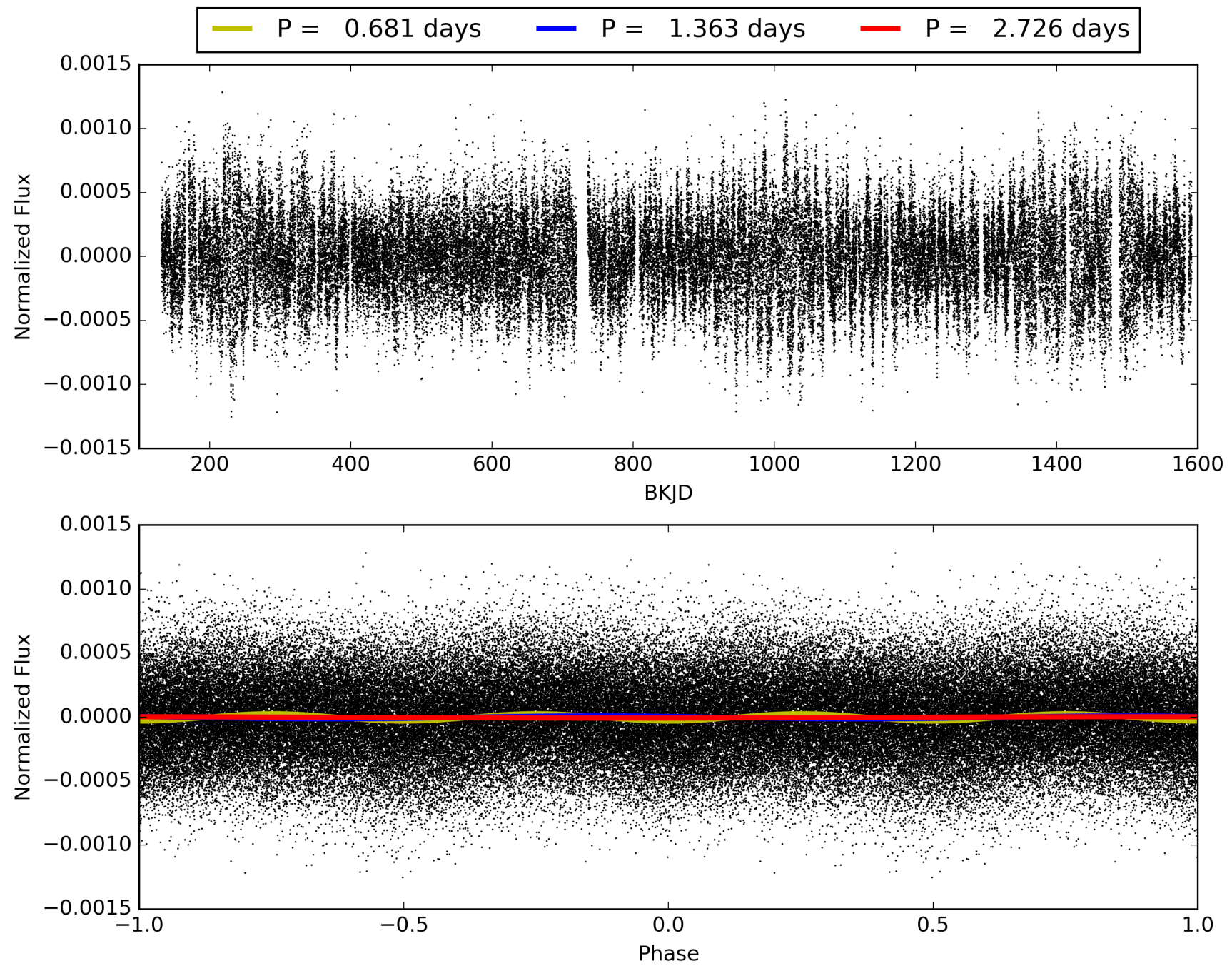
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005894825-01, PDC Light Curves



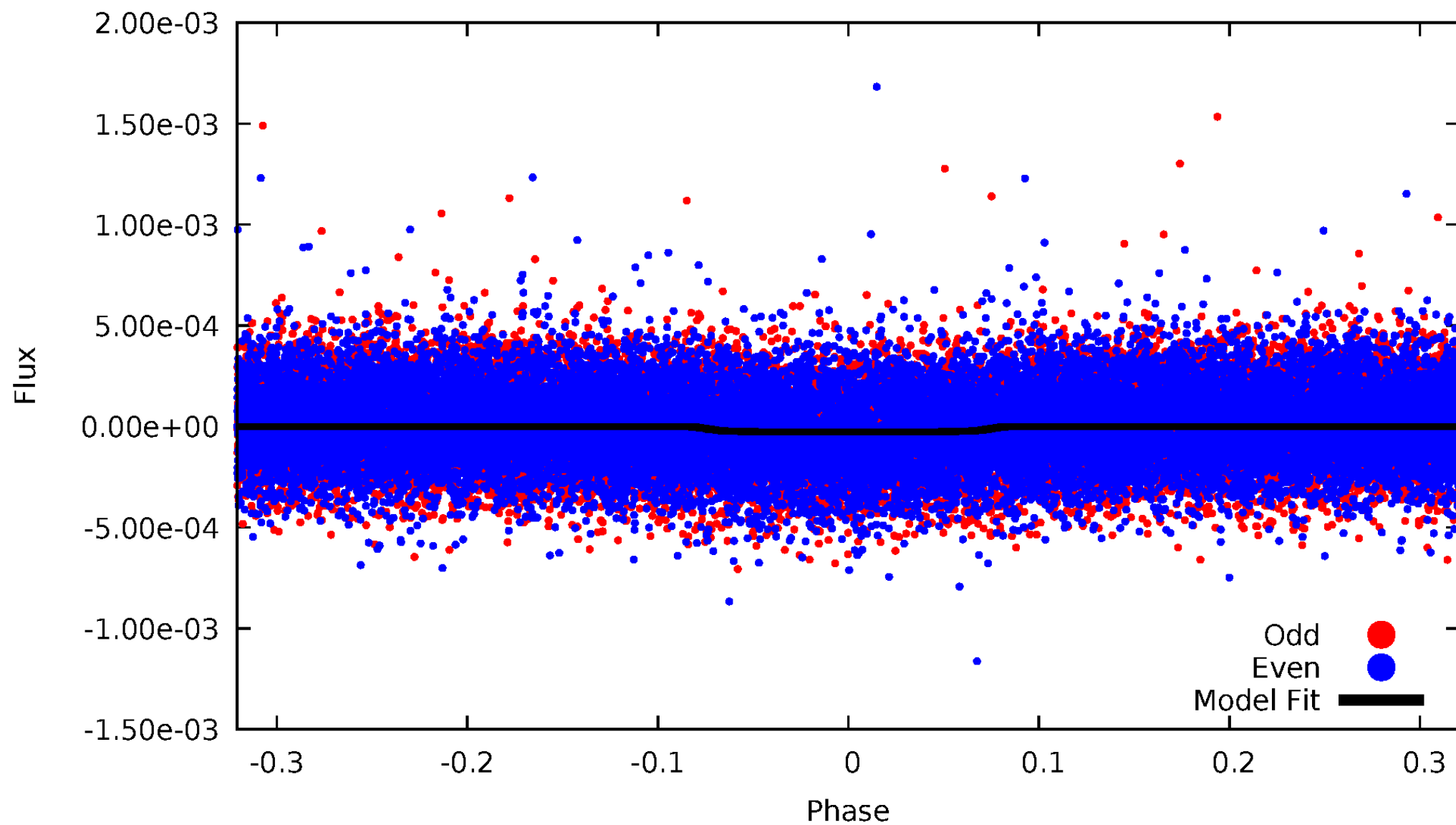


TCE 005894825-01



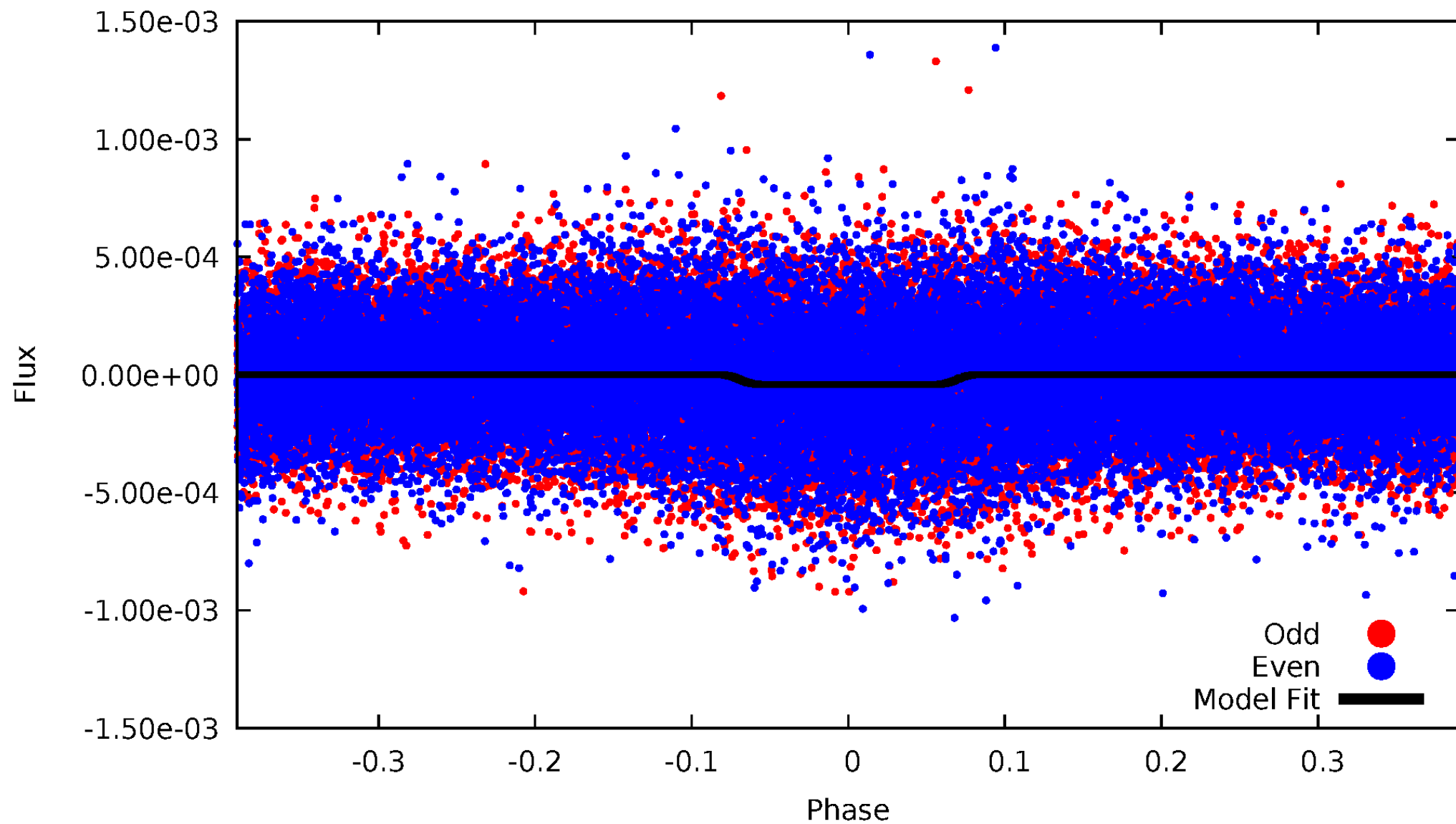
# DV Odd/Even

TCE 005894825-01

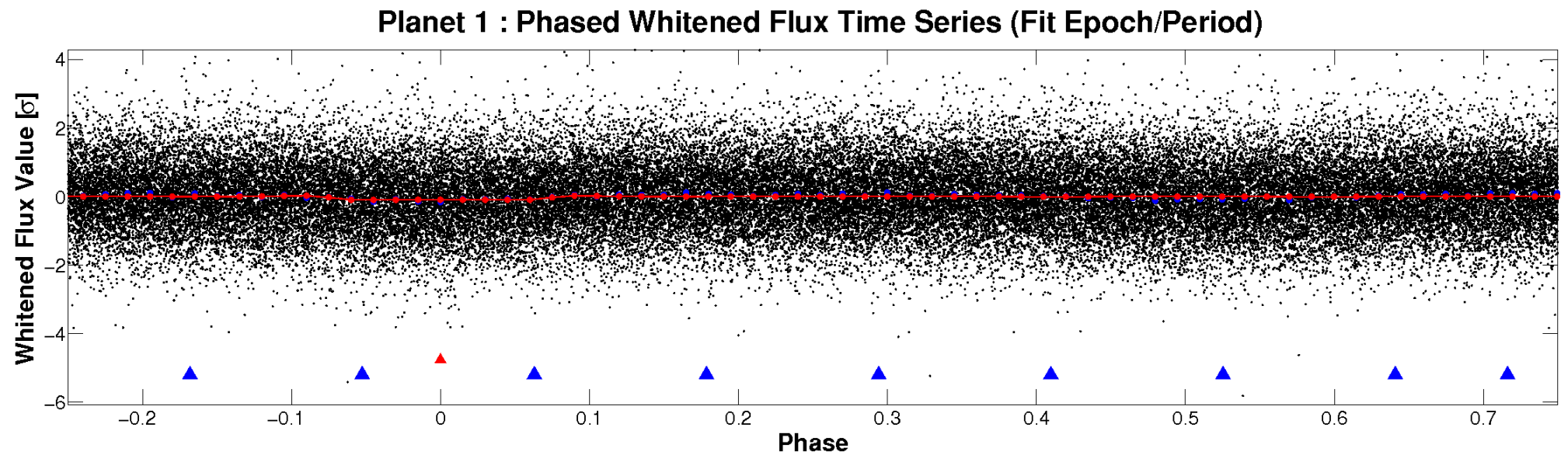
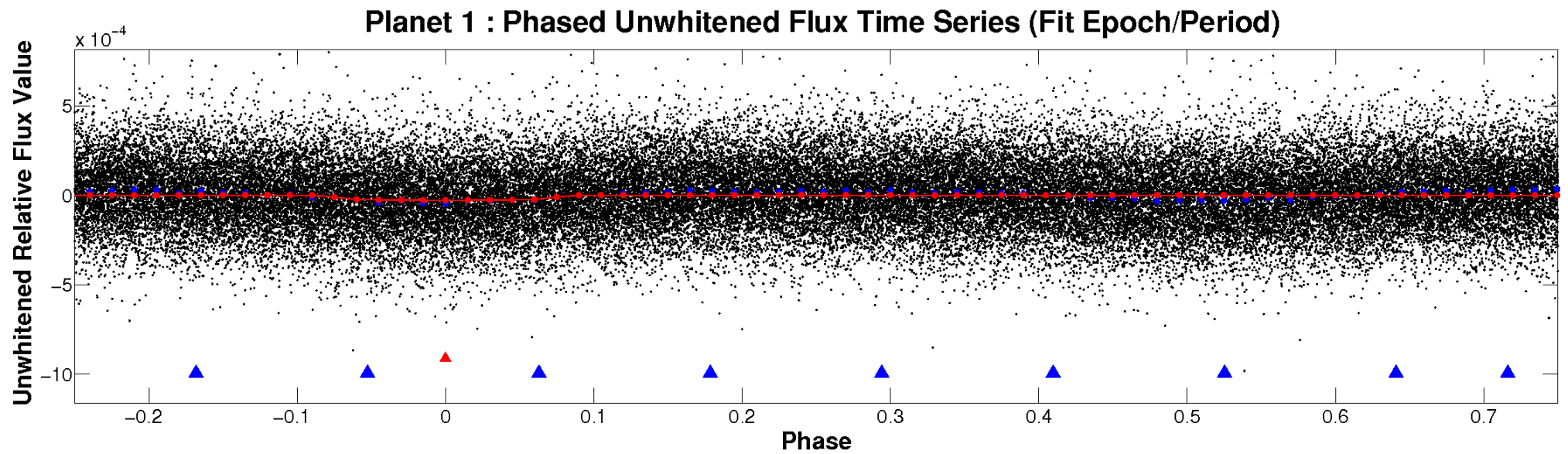


# ALT Odd/Even

TCE 005894825-01



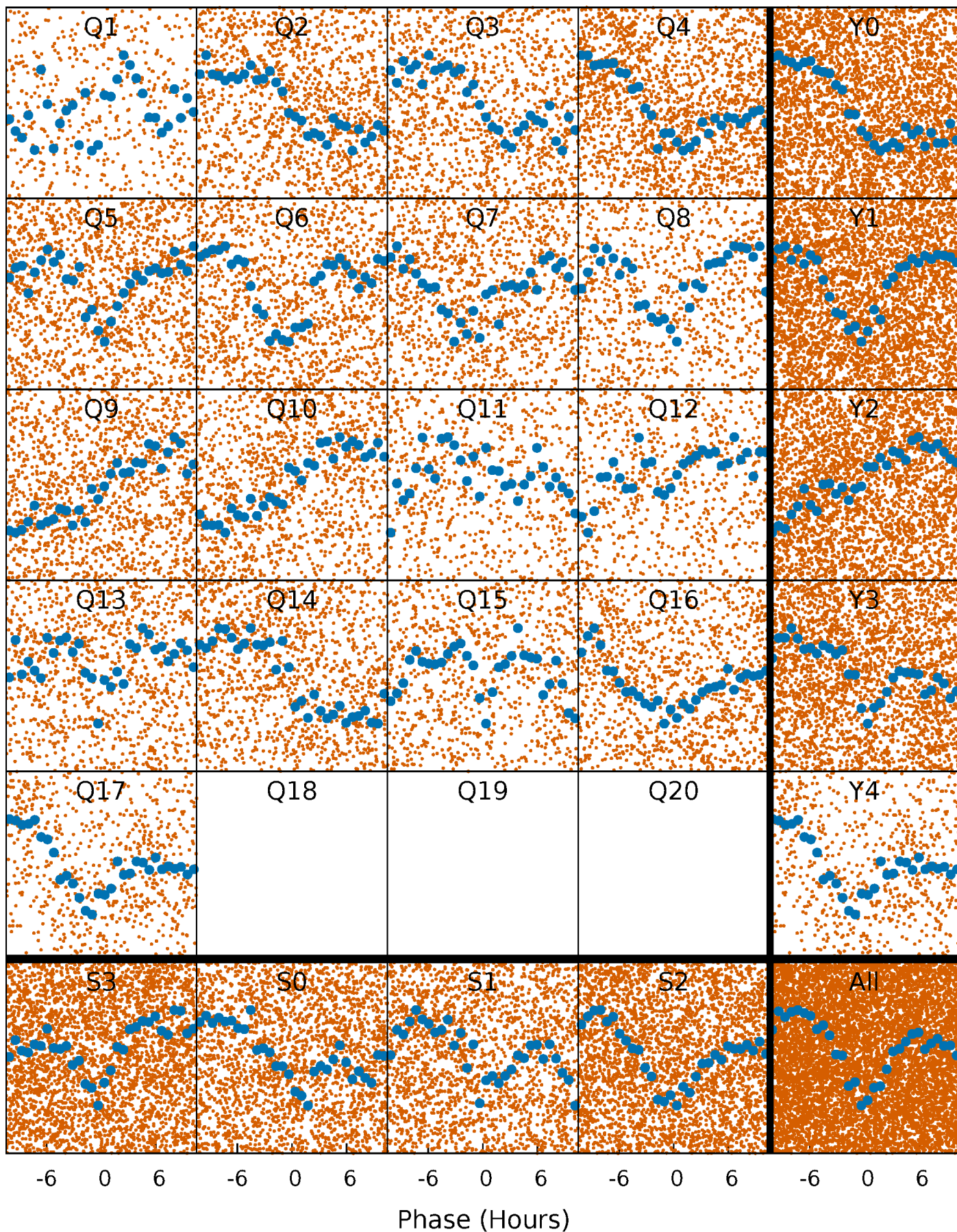
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

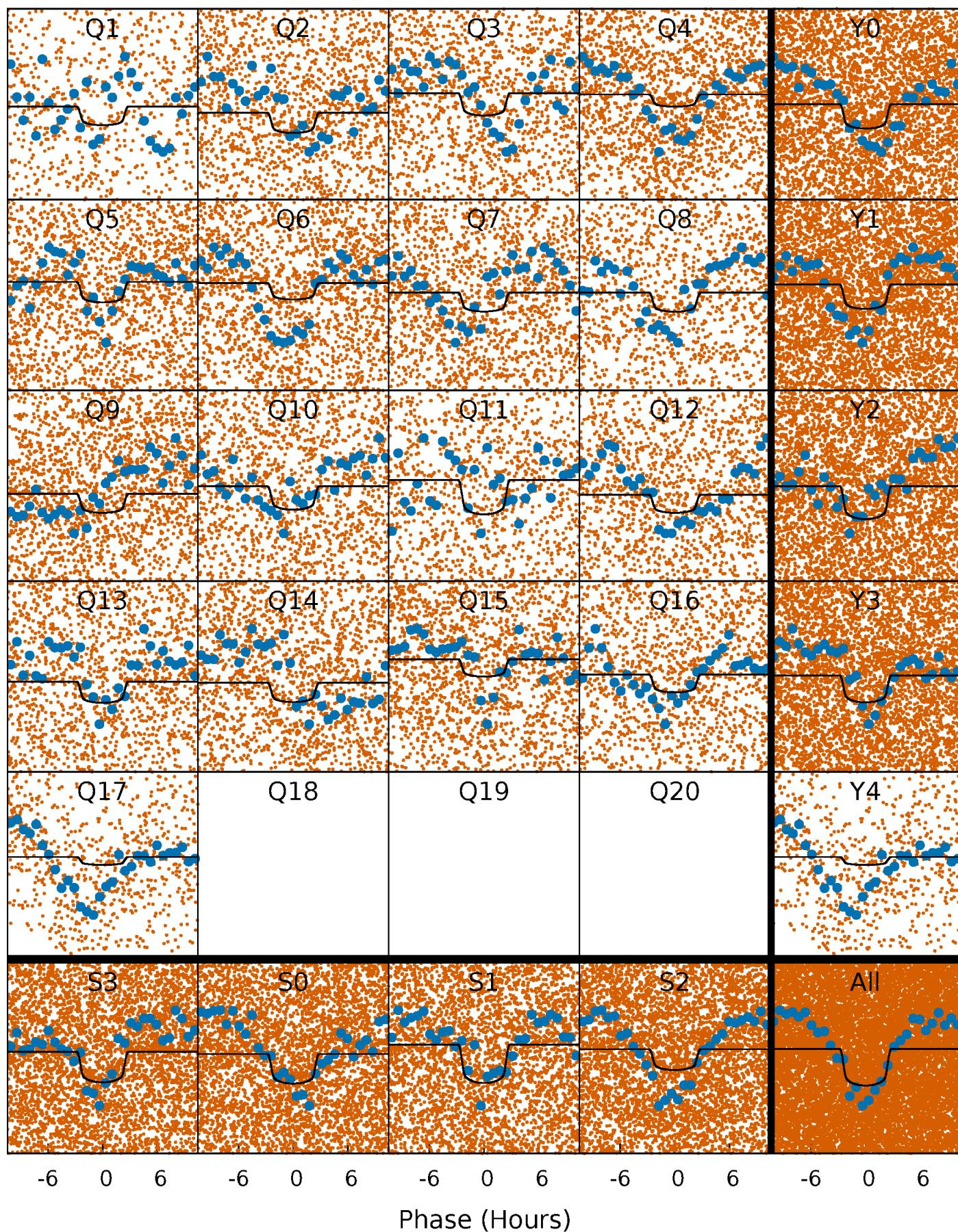
TCE 005894825-01 P= 1.362994 Days  $T_0=132.716941$  (BKJD)





# DV Quarter-Phased Transit Curves

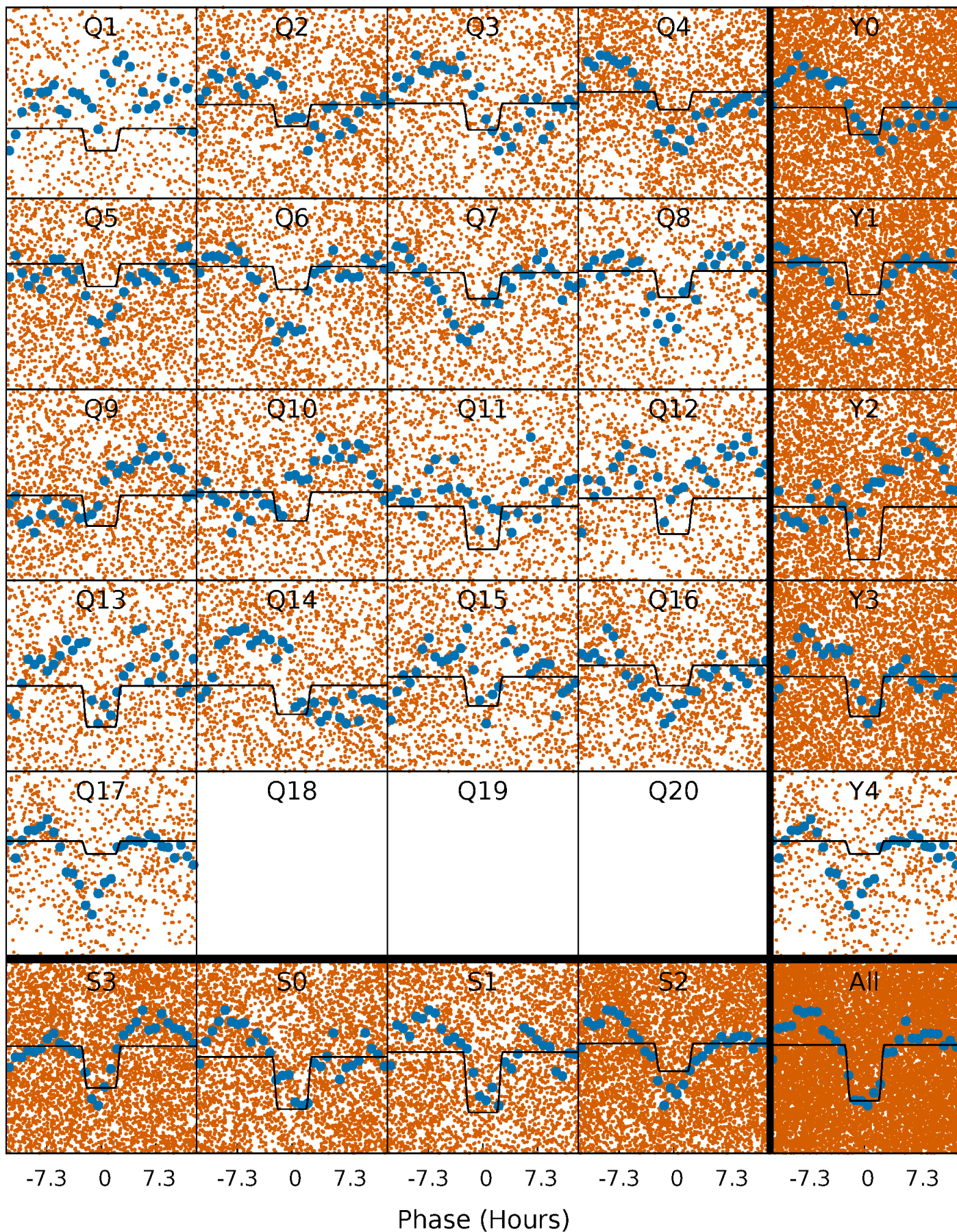
TCE 005894825-01 P= 1.362994 Days  $T_0=132.716941$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

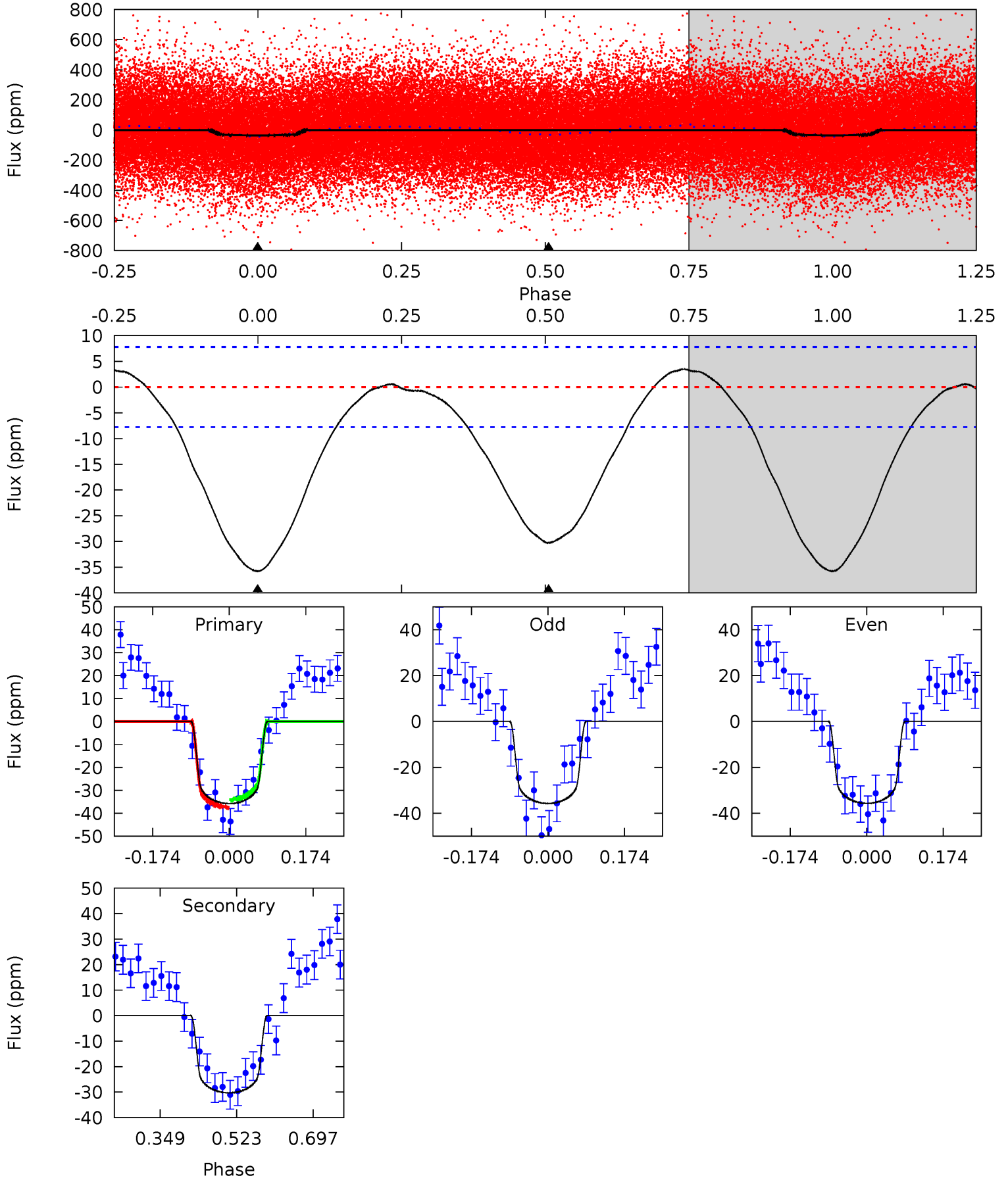
TCE 005894825-01 P= 1.362987 Days  $T_0=132.716773$  (BKJD)



# DV Model-Shift Uniqueness Test

005894825-01, P = 1.362994 Days, E = 131.353947 Days

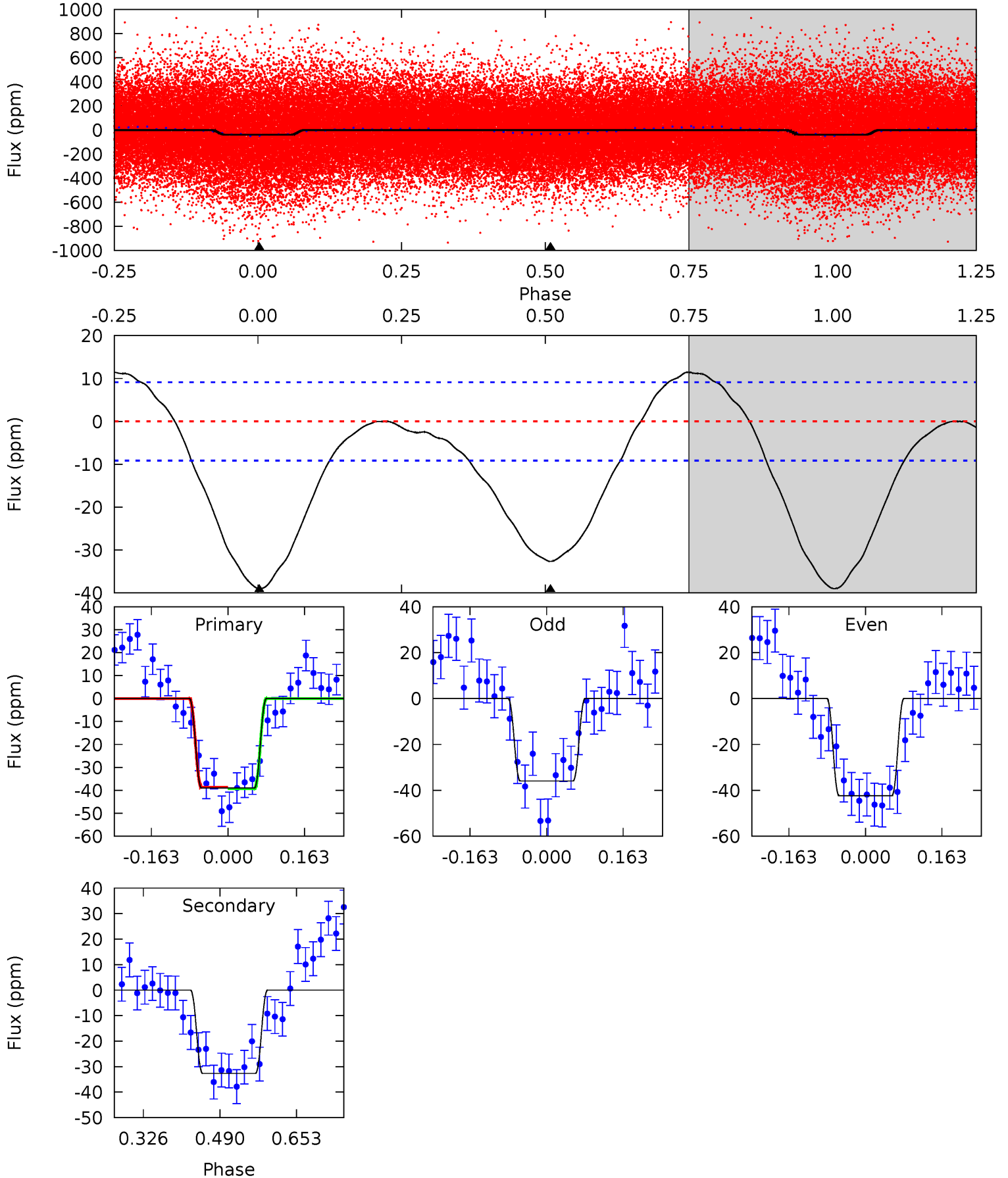
| Pri  | Sec  | Ter | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 20.4 | 17.3 | 0   | 0   | 4.45            | 1.36            | 1.06             | 20.4    | 20.4    | 17.3    | 17.3    | 0.01    | 1.16 | 0.09  | 0.93 |



# Alt Model-Shift Uniqueness Test

005894825-01, P = 1.362987 Days, E = 131.353786 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  |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 19.0 | 15.9 | 0   | 0   | 4.46            | 1.39            | 2.78             | 19.0    | 19.0    | 15.9    | 15.9    | 1.57    | 1.13 | 0.23  | 0.16 |





### Stellar Parameters For KIC 005894825

|        | $T_{\text{eff}} (K)$ | $\log(g)$                 | $[\text{Fe}/\text{H}]$     | $R (R_{\odot})$           | $M (M_{\odot})$           | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6831^{+190}_{-286}$ | $3.971^{+0.293}_{-0.158}$ | $-0.080^{+0.250}_{-0.350}$ | $2.106^{+0.588}_{-0.719}$ | $1.511^{+0.217}_{-0.326}$ | $0.228^{+0.447}_{-0.099}$                 |
|        | +3%/-4%              | +7%/-4%                   | +312%/-438%                | +28%/-34%                 | +14%/-22%                 | +196%/-44%                                |
| Source | PHO54                | PHO54                     | PHO54                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 005894825-01 / KOI 6633.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$          |
|---------|-------------|------------------------|----------------------|----------------------|---------------------------|
| DV      | $-30 \pm 2$ | $1.30^{+0.38}_{-0.33}$ | $3602^{+313}_{-349}$ | $6420^{+931}_{-567}$ | $7.386^{+5.926}_{-2.888}$ |
| Alt.    | $-33 \pm 2$ | $1.41^{+0.36}_{-0.37}$ | $3612^{+290}_{-358}$ | $6352^{+781}_{-610}$ | $6.900^{+5.220}_{-2.597}$ |

$T_{\text{max}}$  = 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

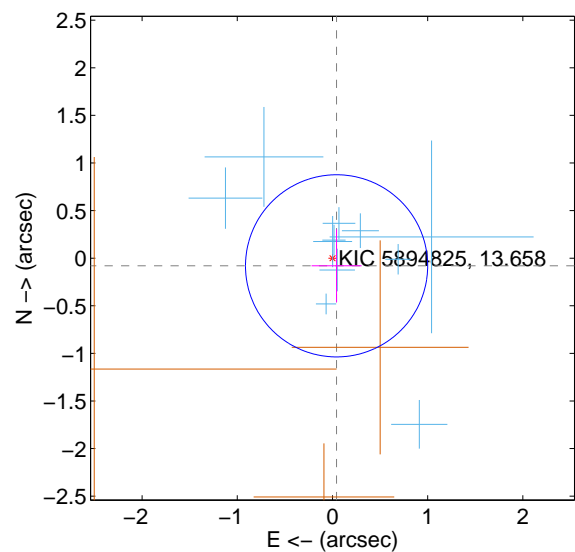
Supplemental centroid analysis for 005894825-01. Kepler magnitude: 13.66. Transit SNR 8.84

There are 11 quarters with good PRF difference image offsets

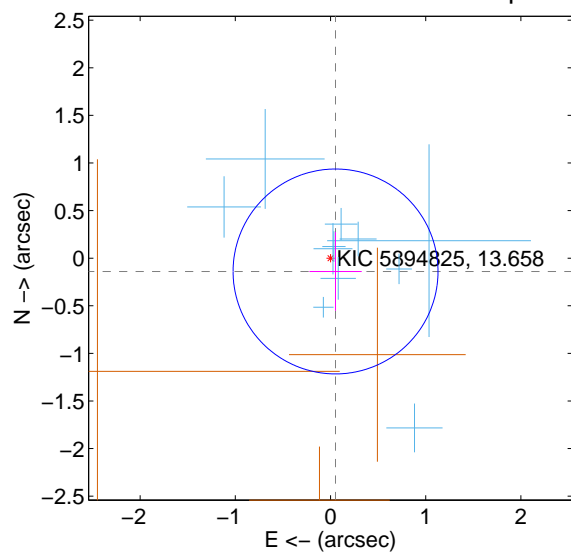
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $0.091 \pm 0.319$  | 0.29                | $-0.043 \pm 0.263$ | $-0.080 \pm 0.383$ |
| PRF-fit source offset from KIC position | $0.149 \pm 0.359$  | 0.42                | $-0.053 \pm 0.275$ | $-0.140 \pm 0.413$ |
| photometric centroid source offset      | $0.23 \pm 0.63$    | 0.37                | $0.16 \pm 0.64$    | $0.17 \pm 0.62$    |

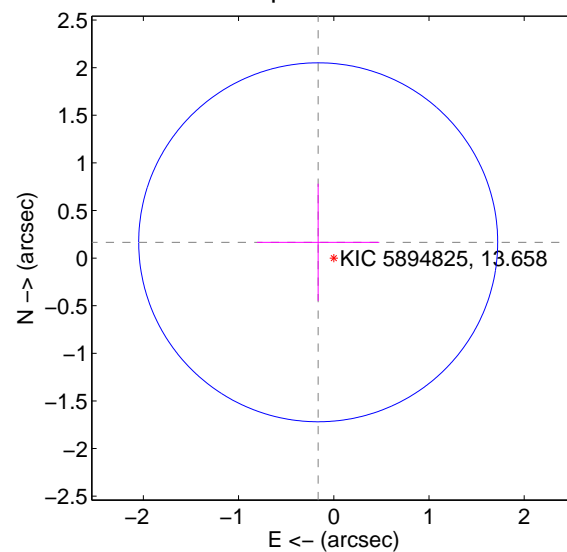
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

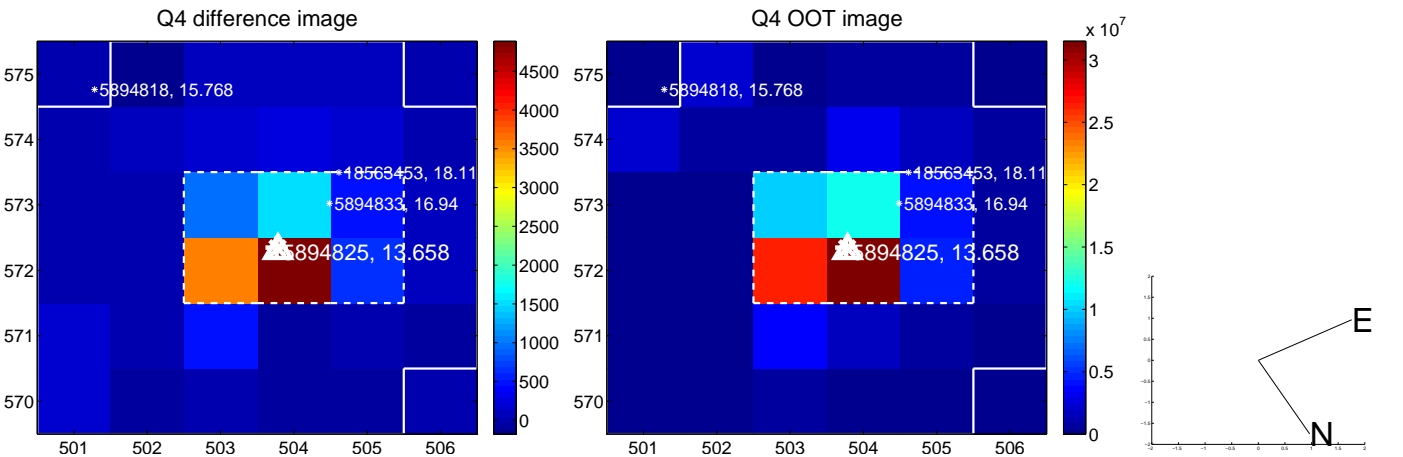
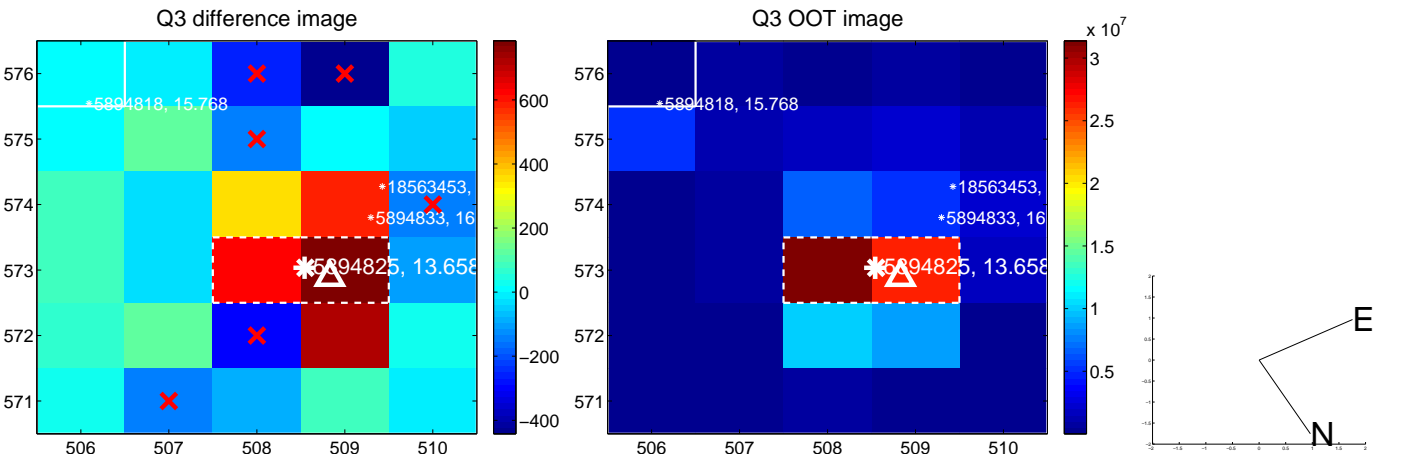
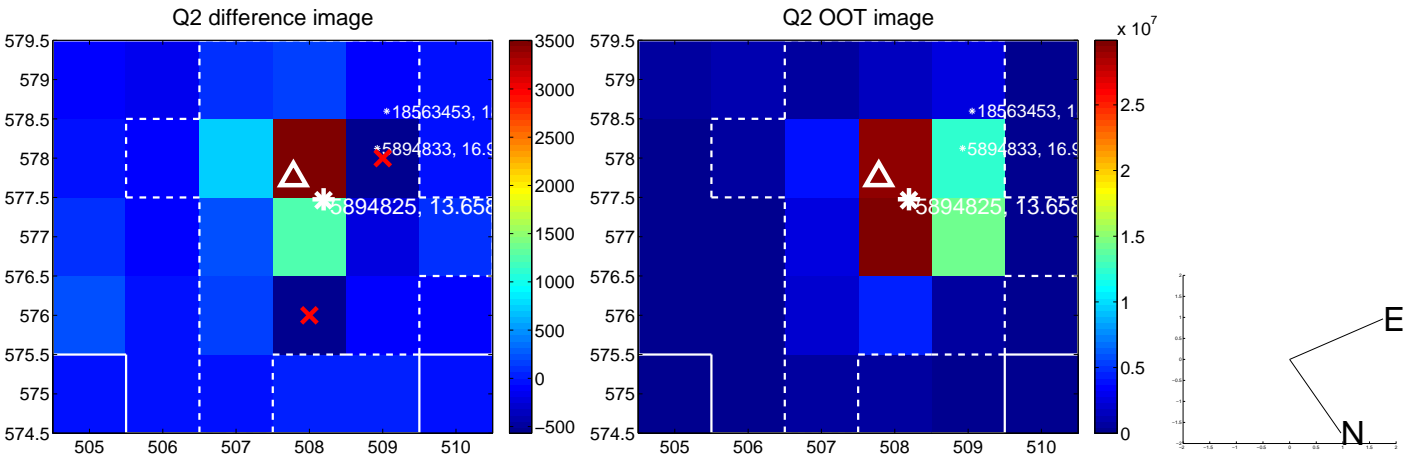
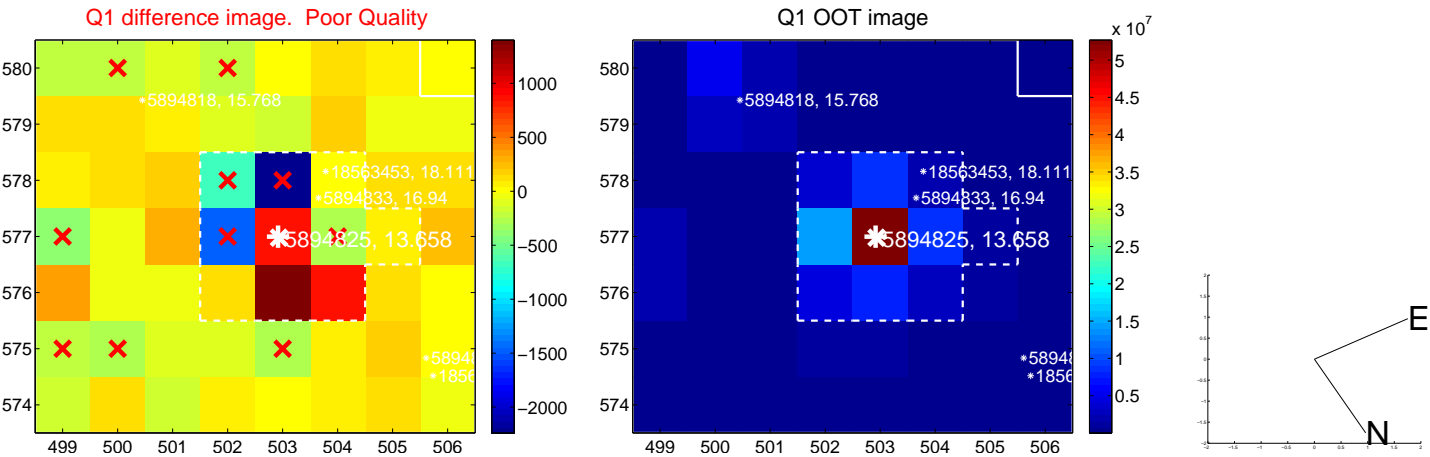


offset from photometric centroids



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- $\sigma$  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.

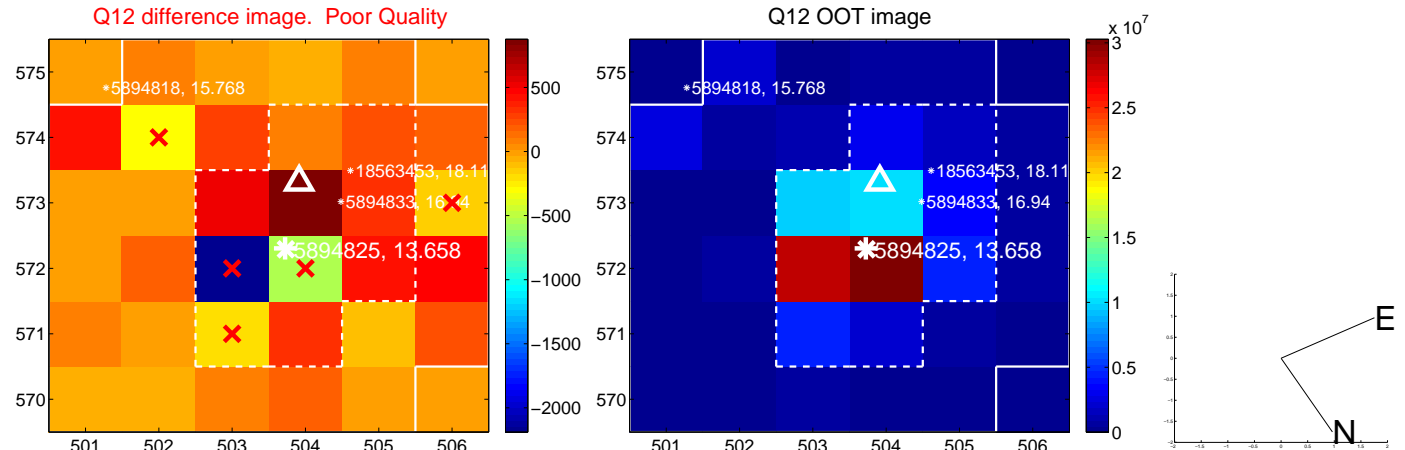
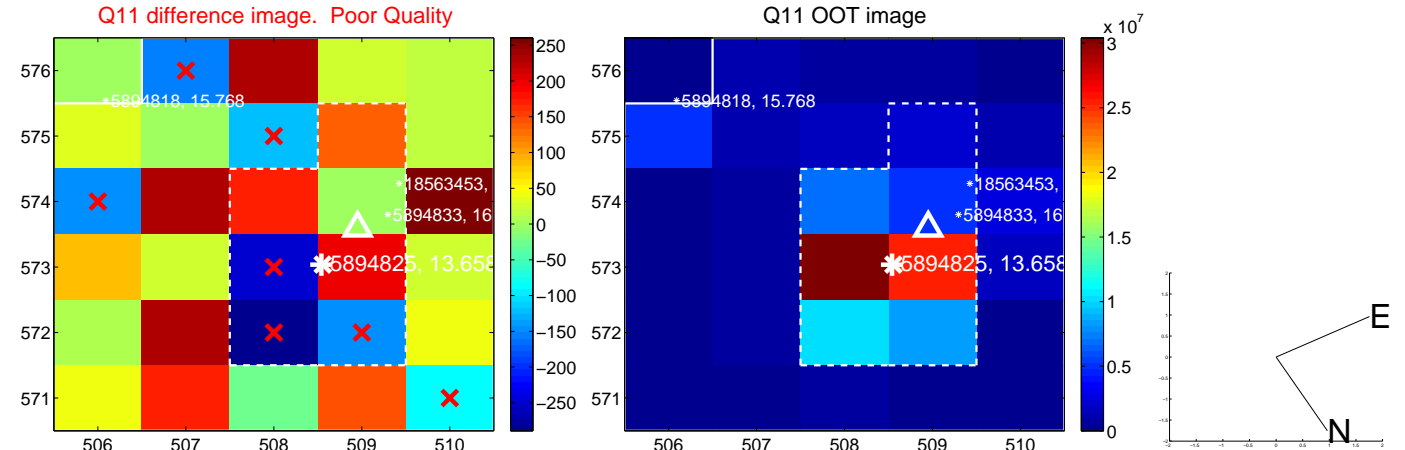
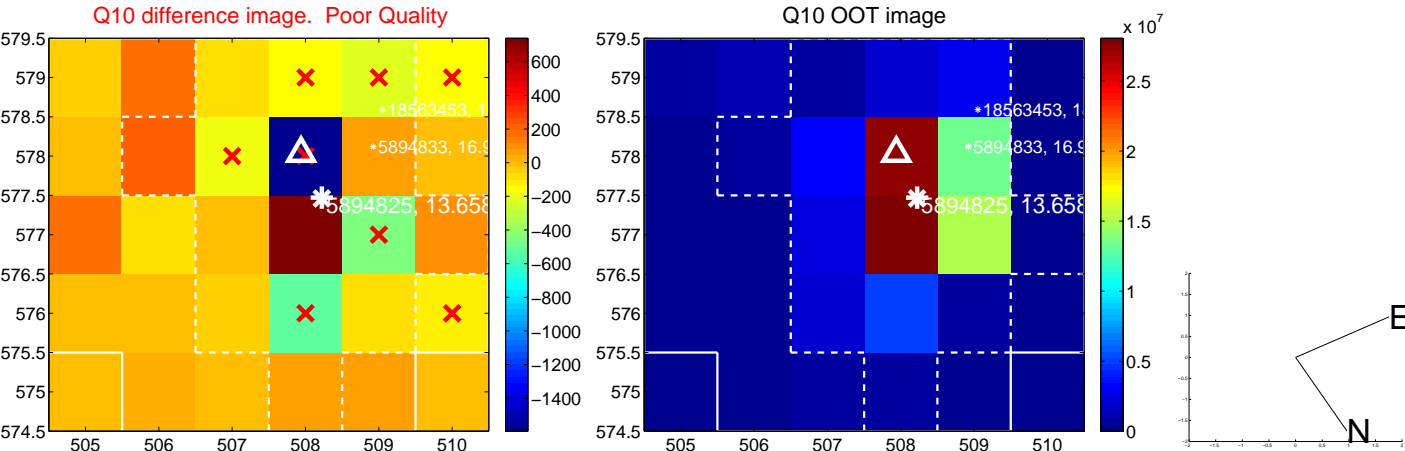
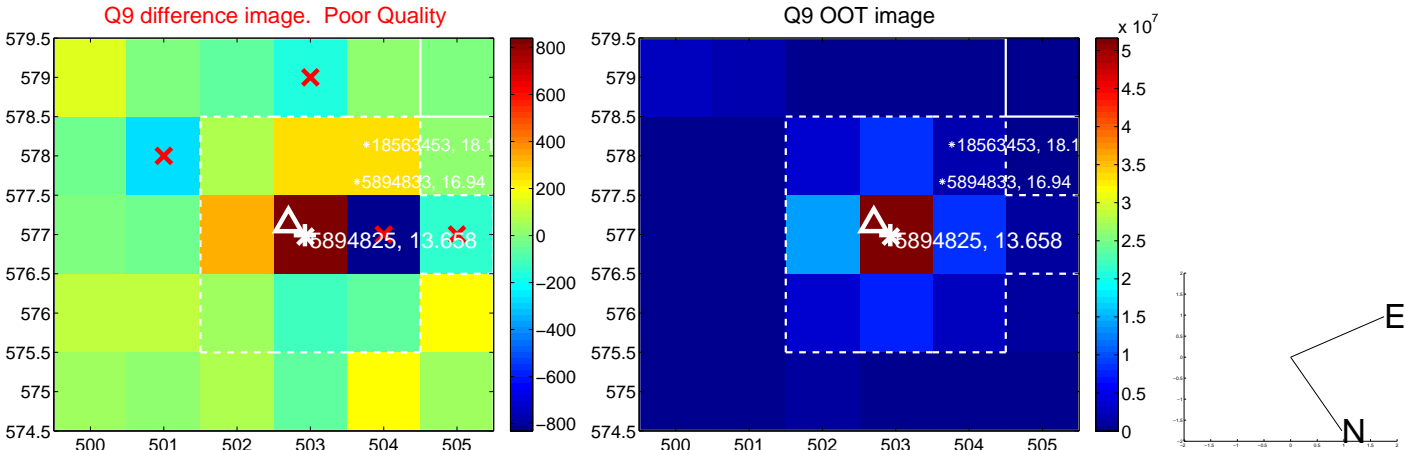
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





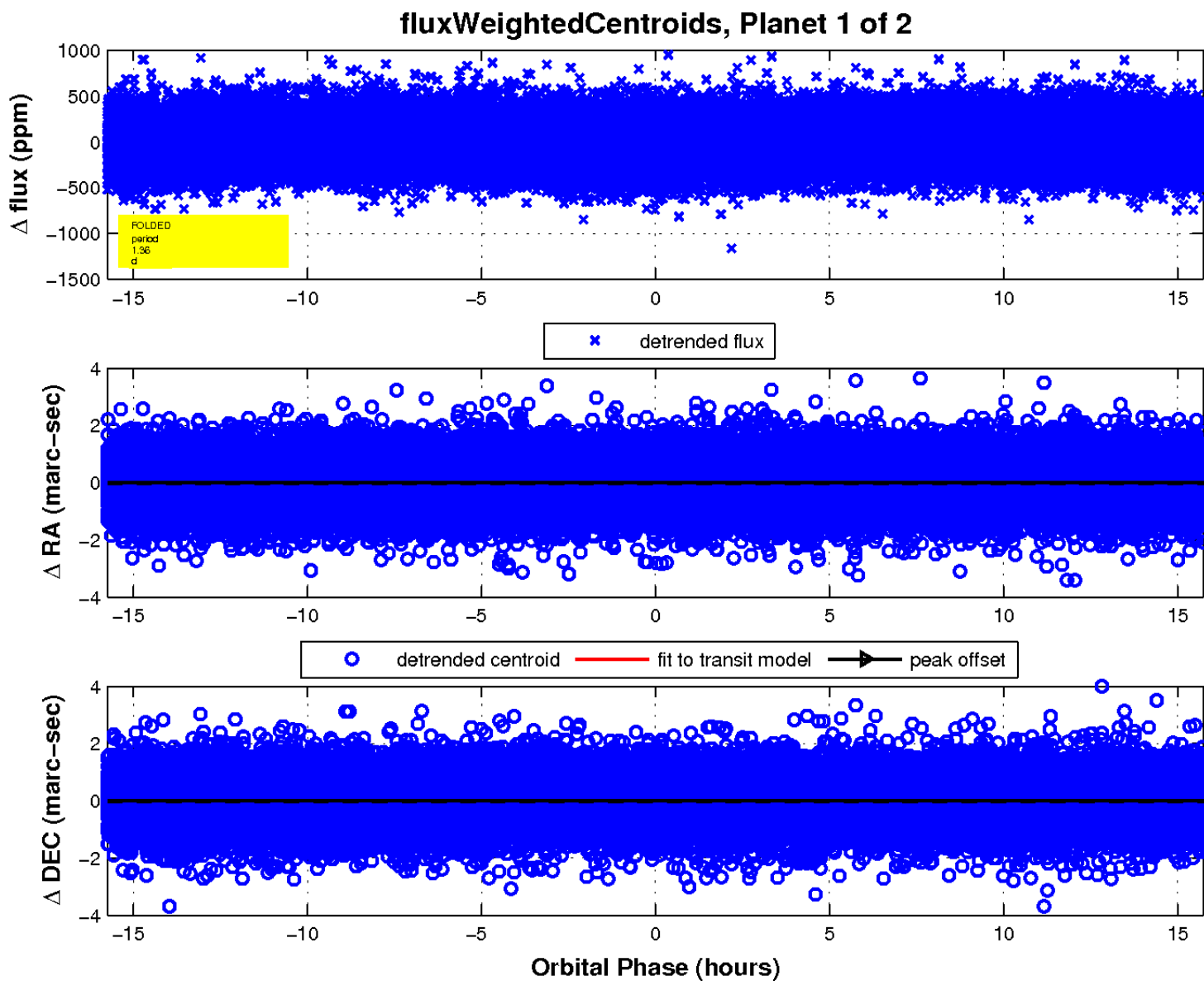
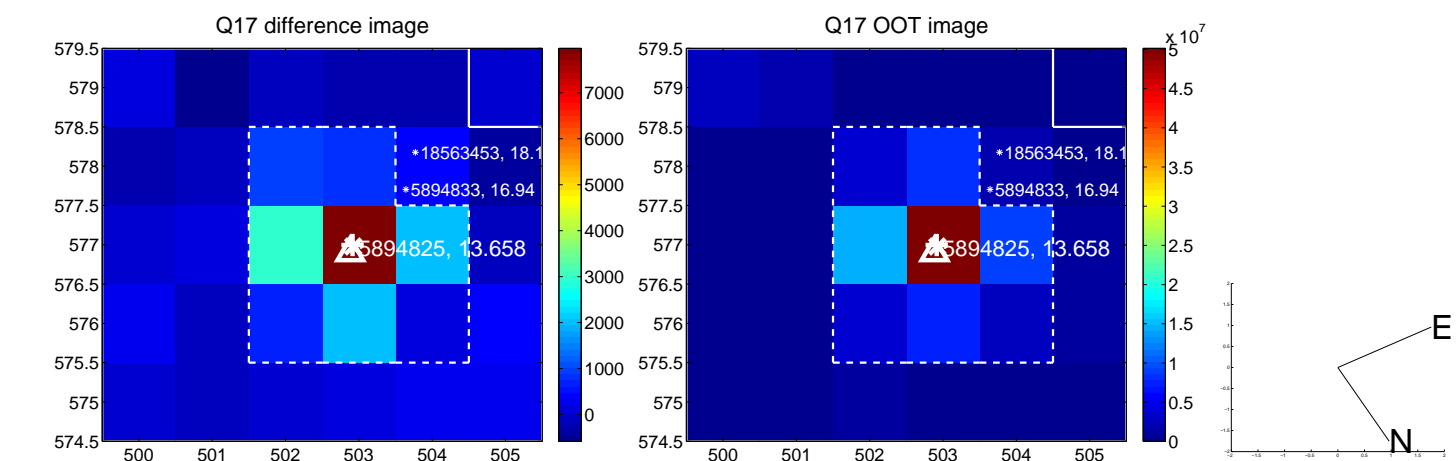


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



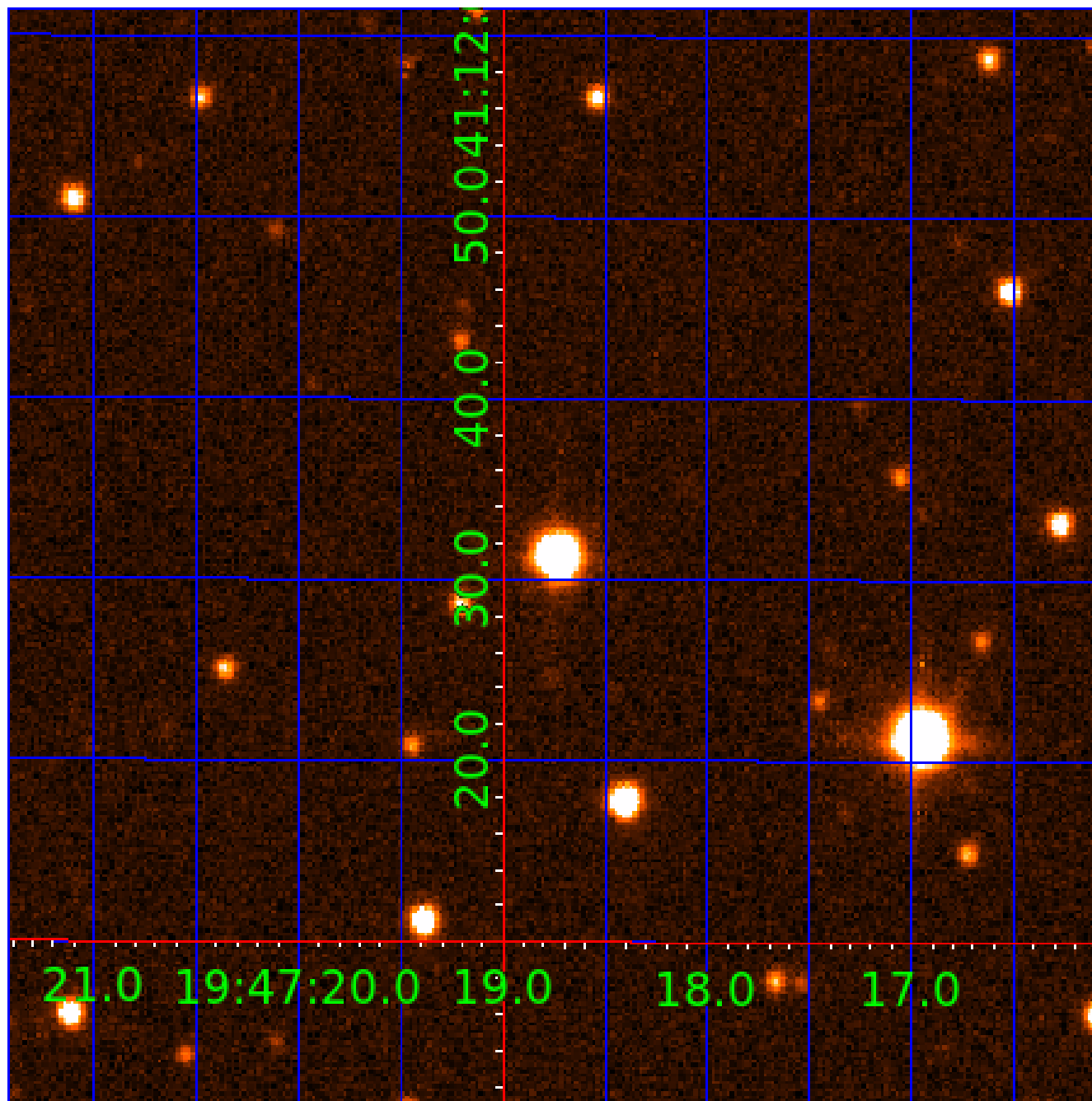


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 005894825

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005894825-01 | OBS      | 6633.01 | 1.362994      | 132.716941   | 28.1        | 5.247            | 9.5 | 8.8 | 2.11                        | 6831            | 1.37                   | 11336.49               |
| 005894825-02 | OBS      | No      | 159.312723    | 238.540998   | 148.4       | 24.128           | 8.3 | 5.3 | 2.11                        | 6831            | 2.79                   | 19.84                  |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005894825-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—MOD_NONUNIQ_ALT   |
| 005894825-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS |

**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.

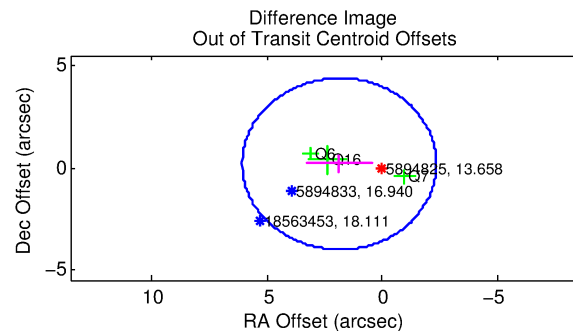
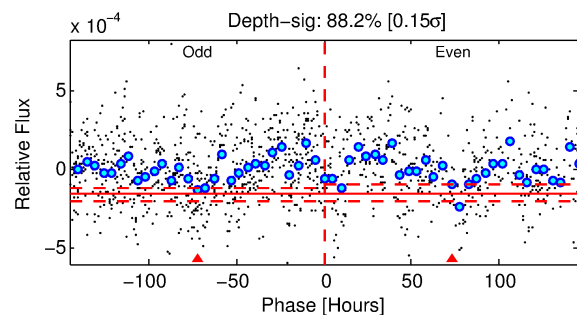
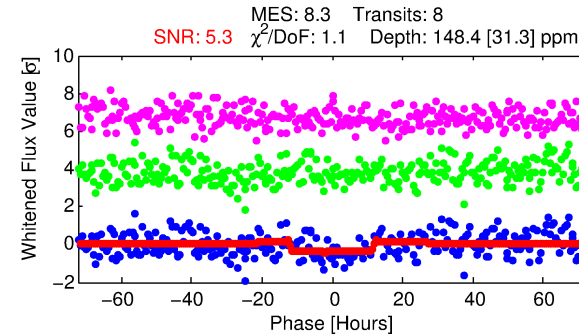
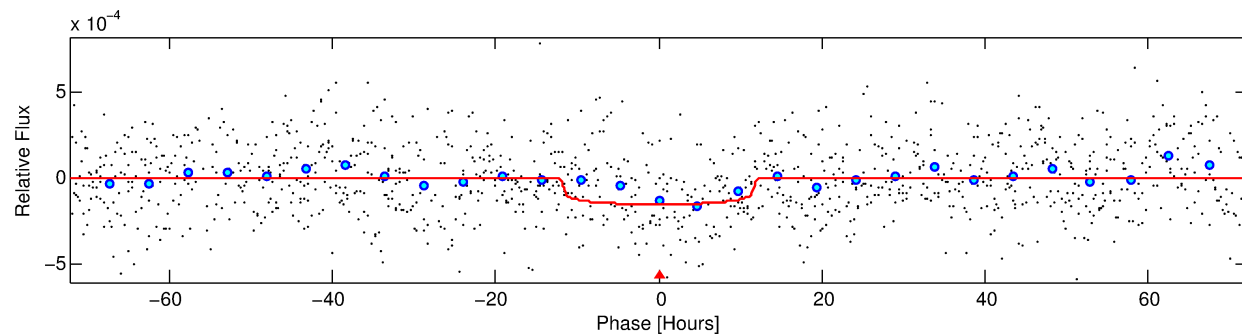
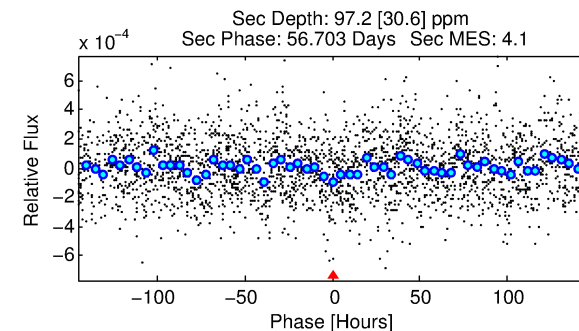
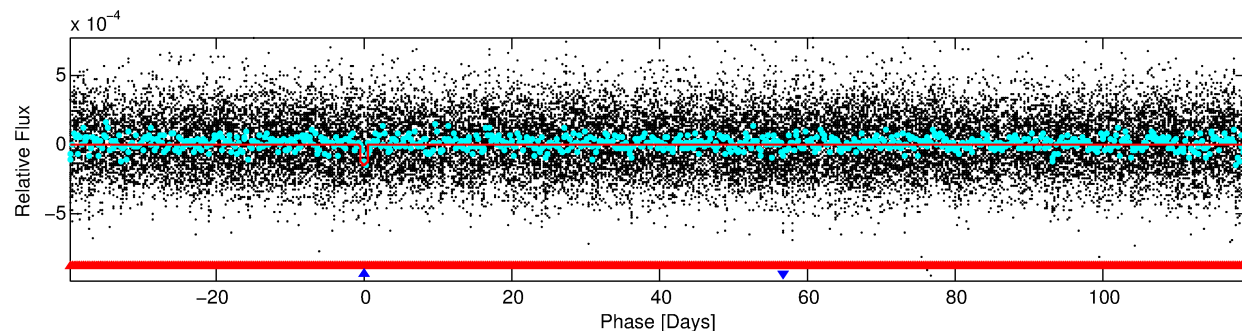
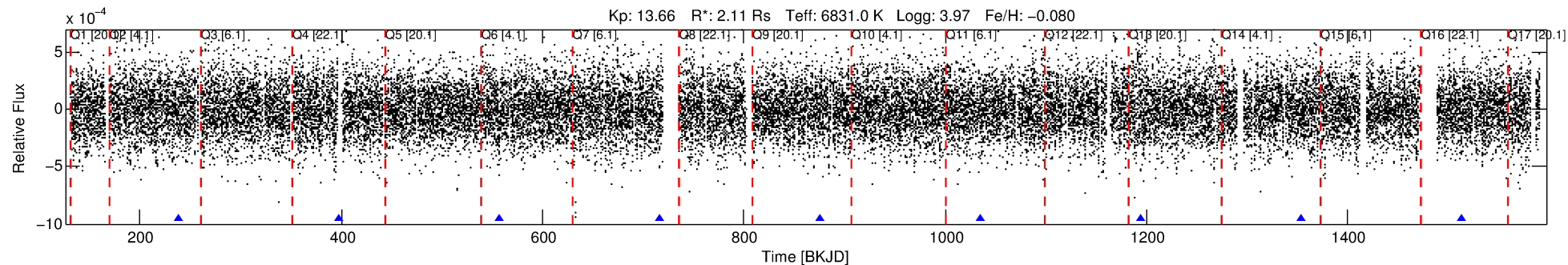
## Ephemeris Match Information For 005894825-02

No Significant Match Found

# DV One-Page Summary

KIC: 5894825 Candidate: 2 of 2 Period: 159.313 d  
KOI: K06633 Corr: No Ephemeris Match

Kp: 13.66 R\*: 2.11 Rs Teff: 6831.0 K Logg: 3.97 Fe/H: -0.080



## DV Fit Results:

Period = 159.31272 [0.00793] d  
Epoch = 238.5410 [0.0433] BKJD  
Rp/R\* = 0.0121 [0.0031]  
a/R\* = 33.83 [44.28]  
b = 0.76 [0.74]  
Seff = 19.84 [10.54]  
Teq = 538 [71] K  
Rp = 2.79 [1.19] Re  
a = 0.6604 [0.2113] AU  
Ag = 2995.23 [2344.26] [1.28σ]  
Teffp = 6155 [957] K [5.85σ]

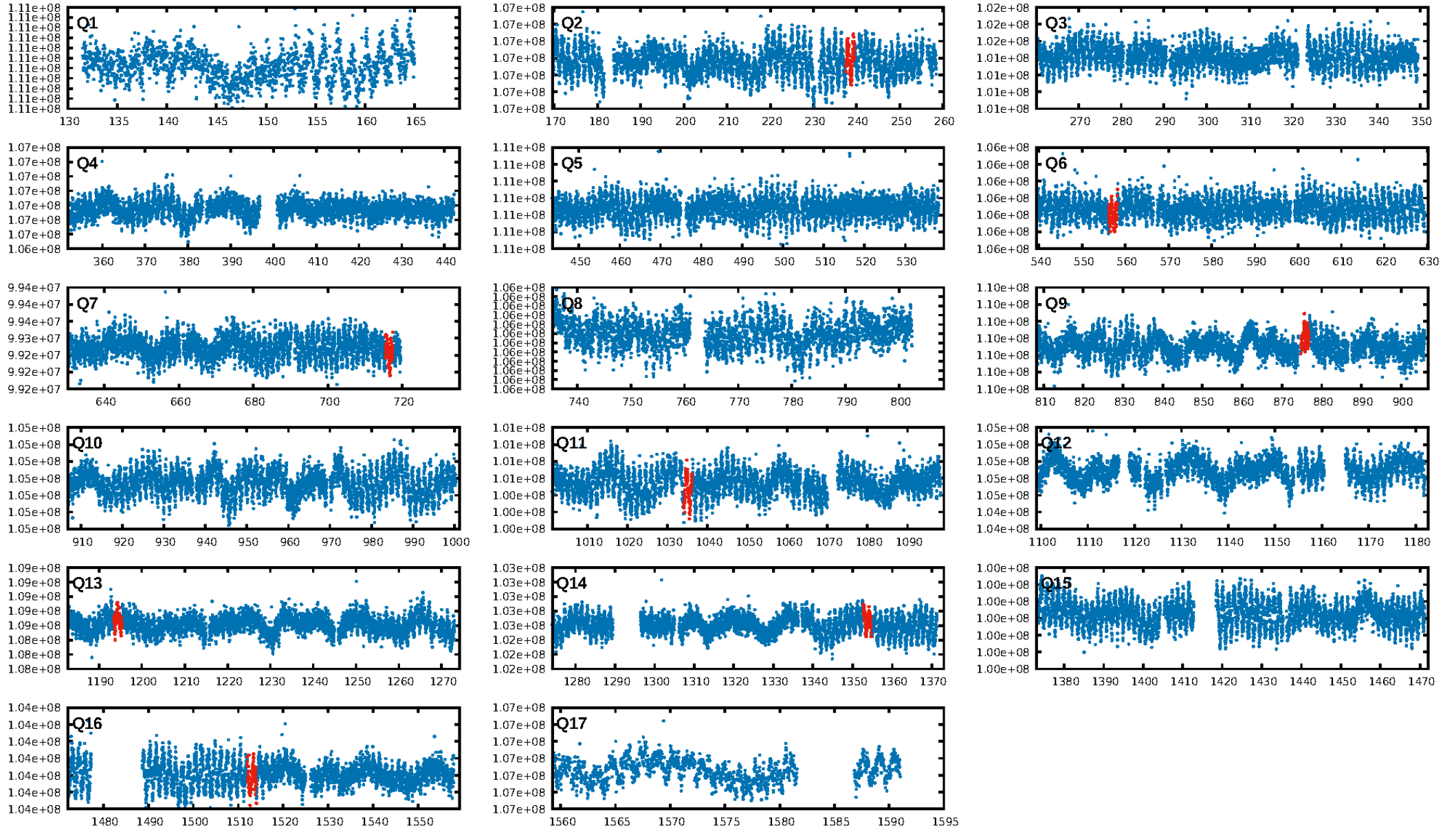
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [153.52σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 5.07e-11**  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: 16.24  
Centroid-sig: 91.1%  
Centroid-so: 0.443 arcsec [0.51σ]  
OotOffset-rm: 1.874 arcsec [1.34σ]  
KicOffset-rm: 1.886 arcsec [1.31σ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.00 [0/5]

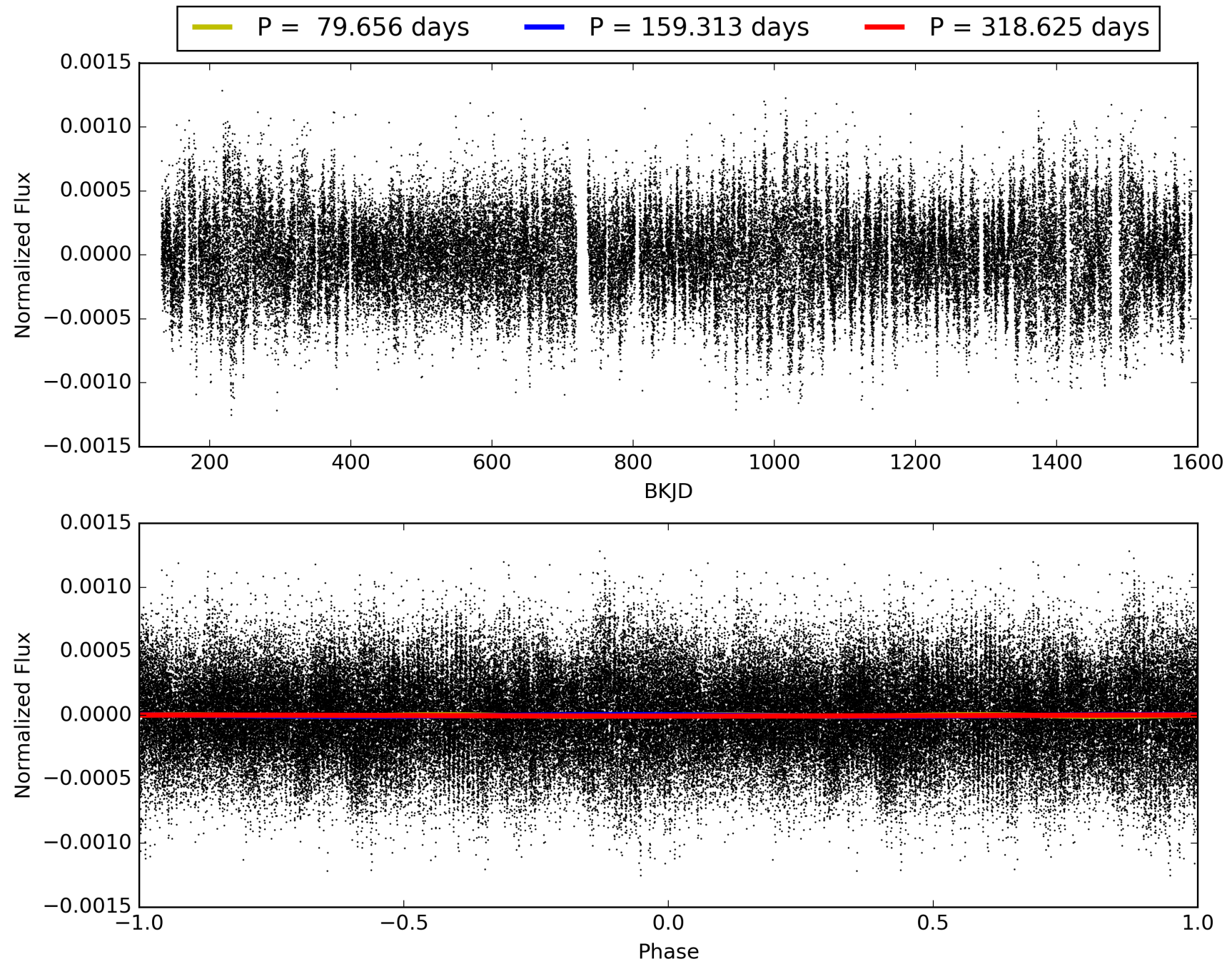
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:28:13 Z

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

# TCE 005894825-02, PDC Light Curves



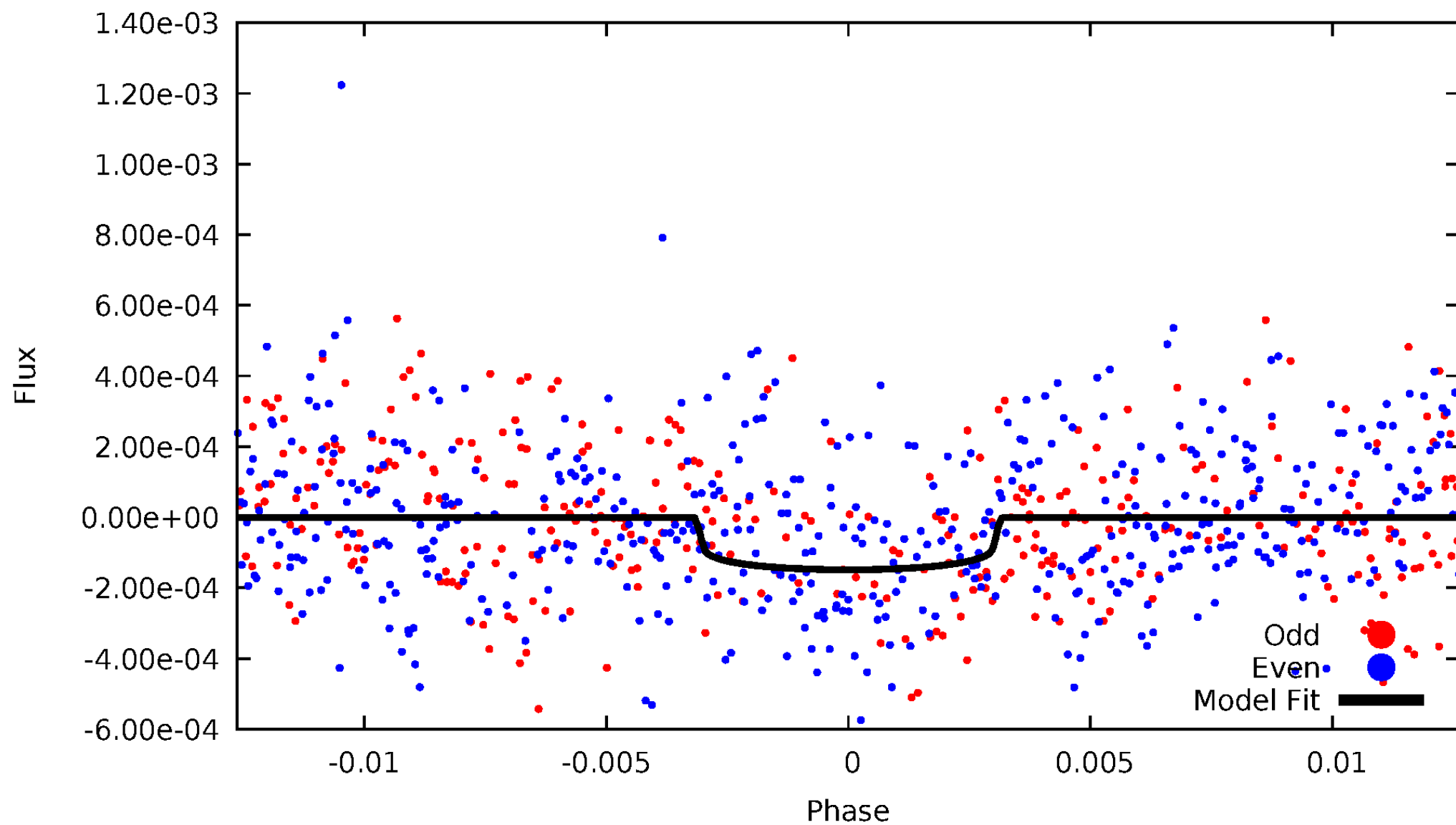
TCE 005894825-02





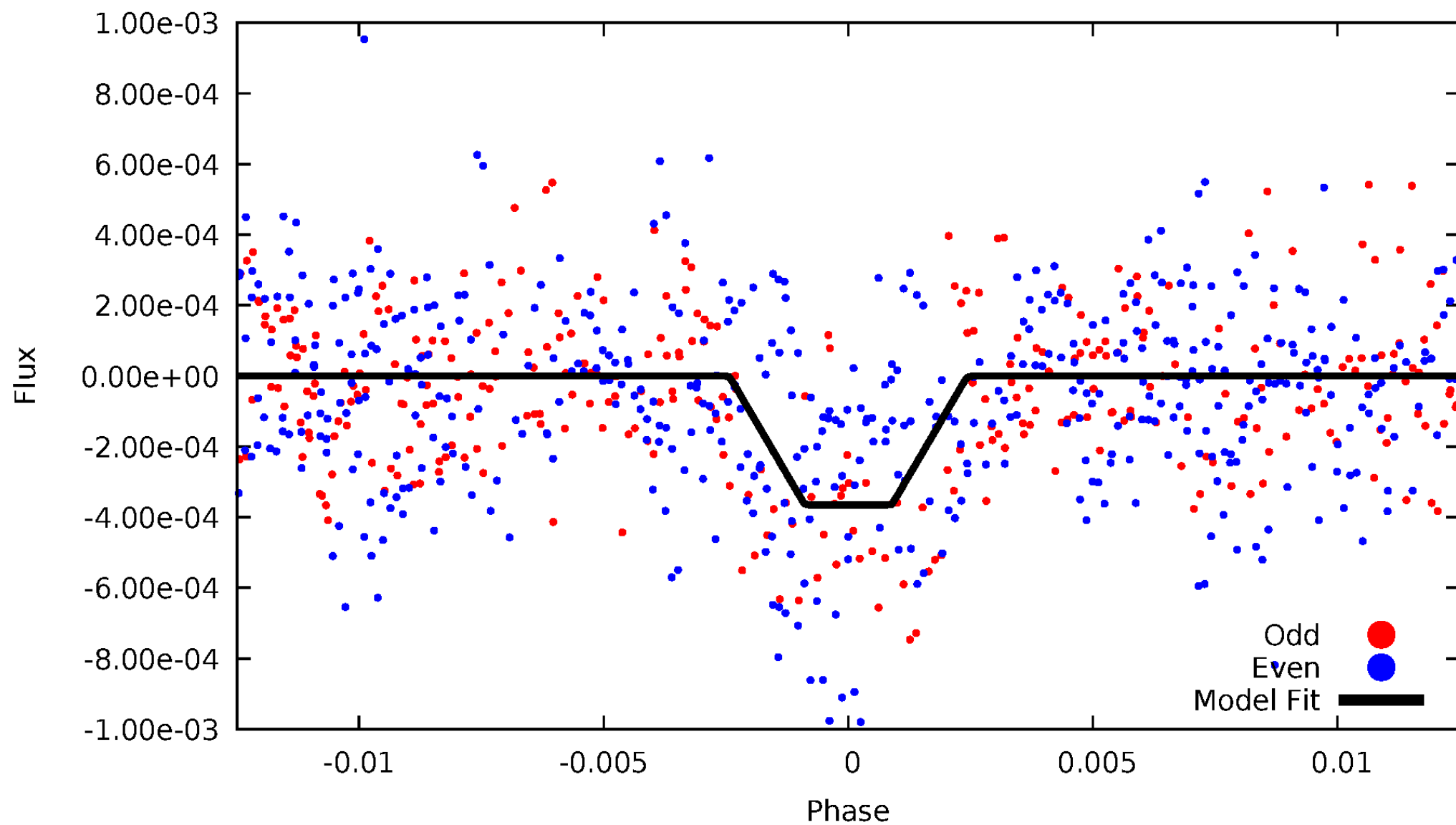
# DV Odd/Even

TCE 005894825-02



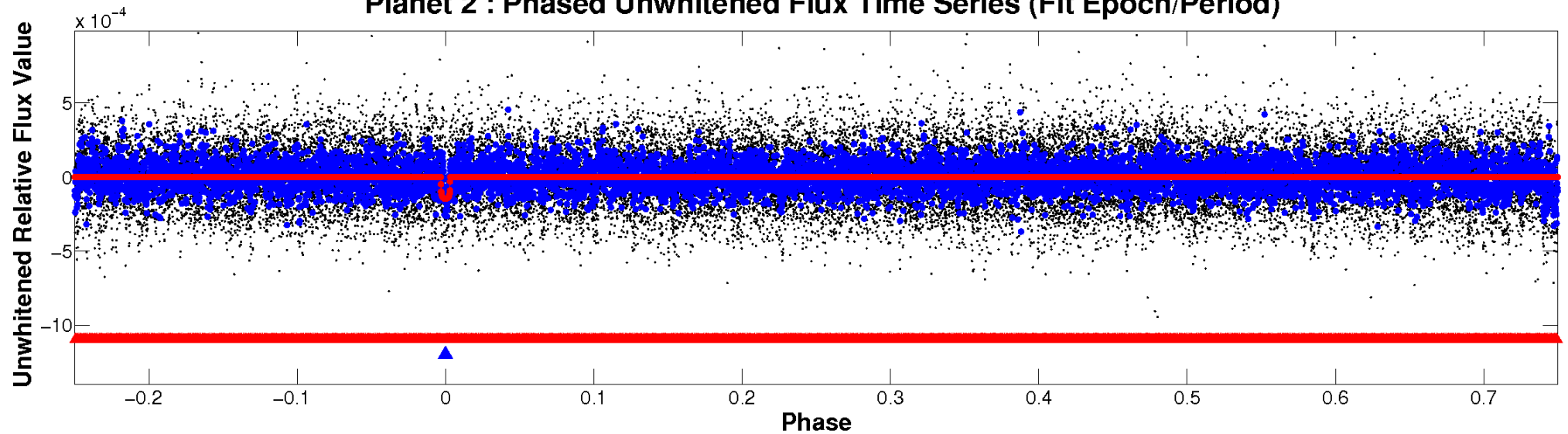
# ALT Odd/Even

TCE 005894825-02

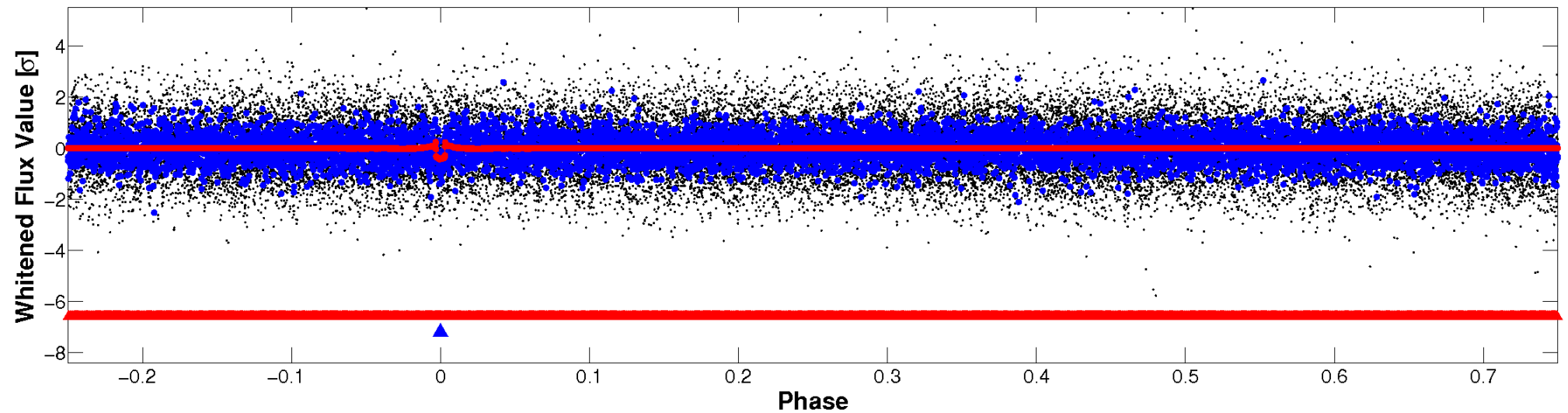


# Non-Whitened Vs. Whitened Light Curve

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

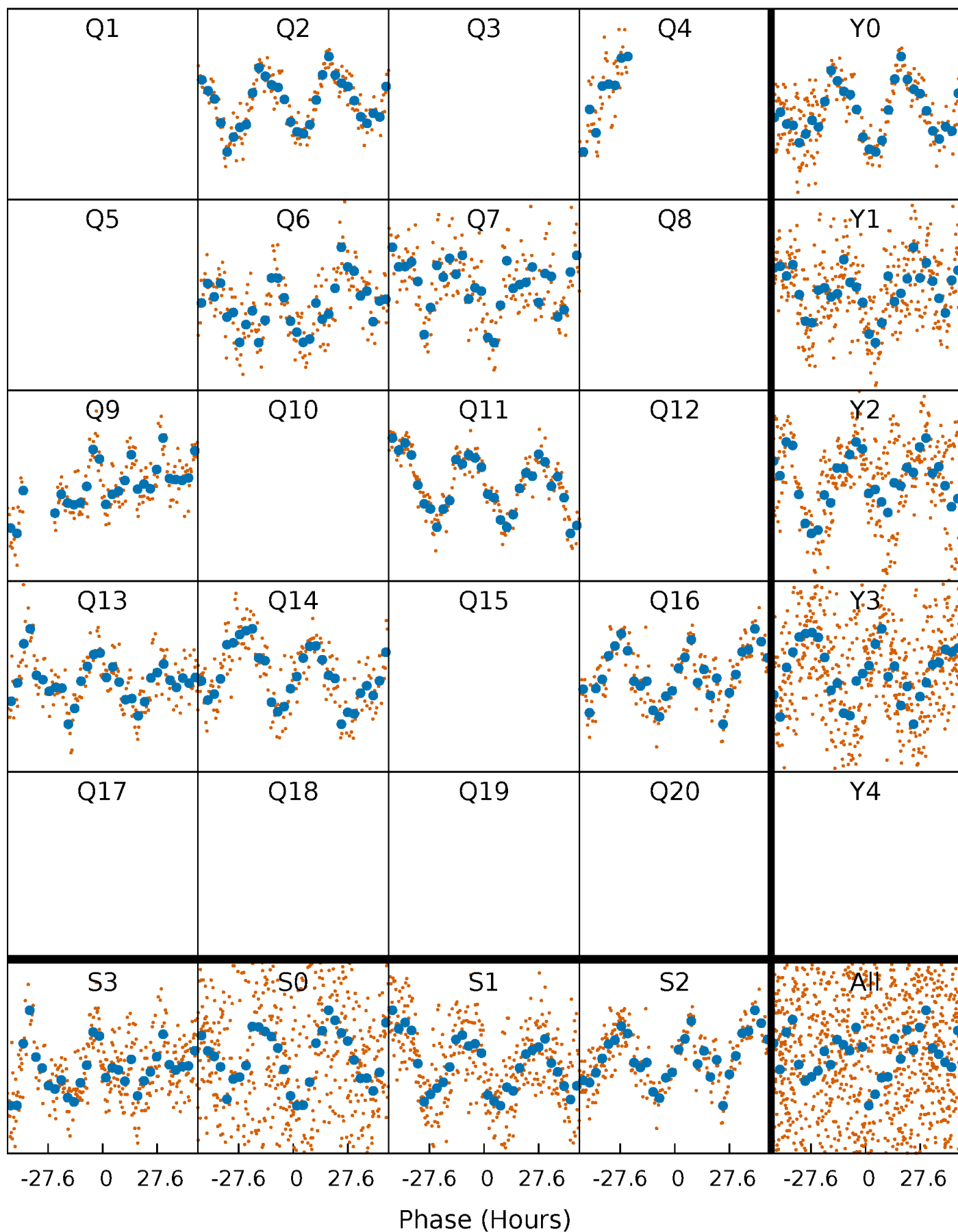


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



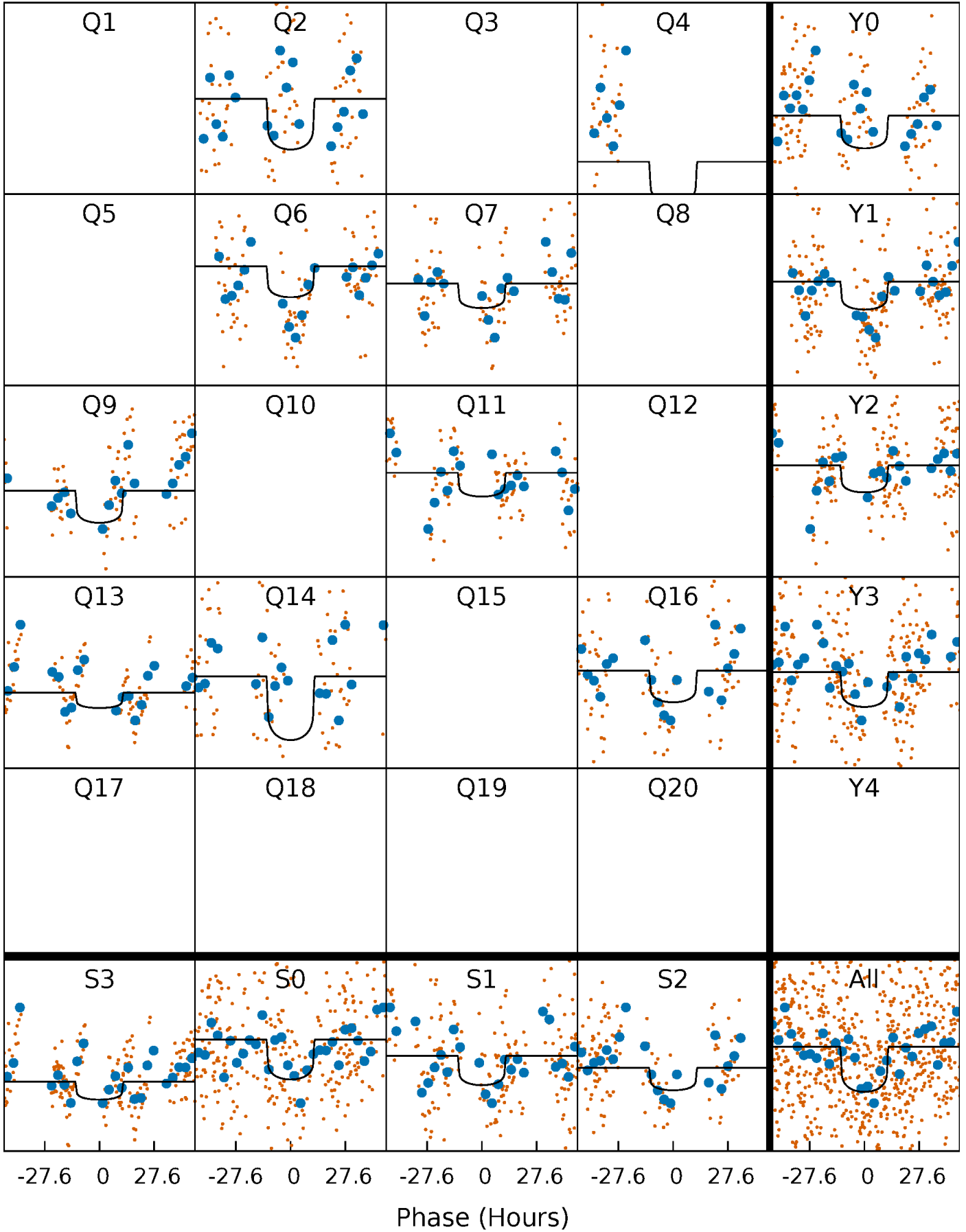
# PDC Quarter-Phased Transit Curves

TCE 005894825-02 P=159.312723 Days  $T_0=238.540998$  (BKJD)



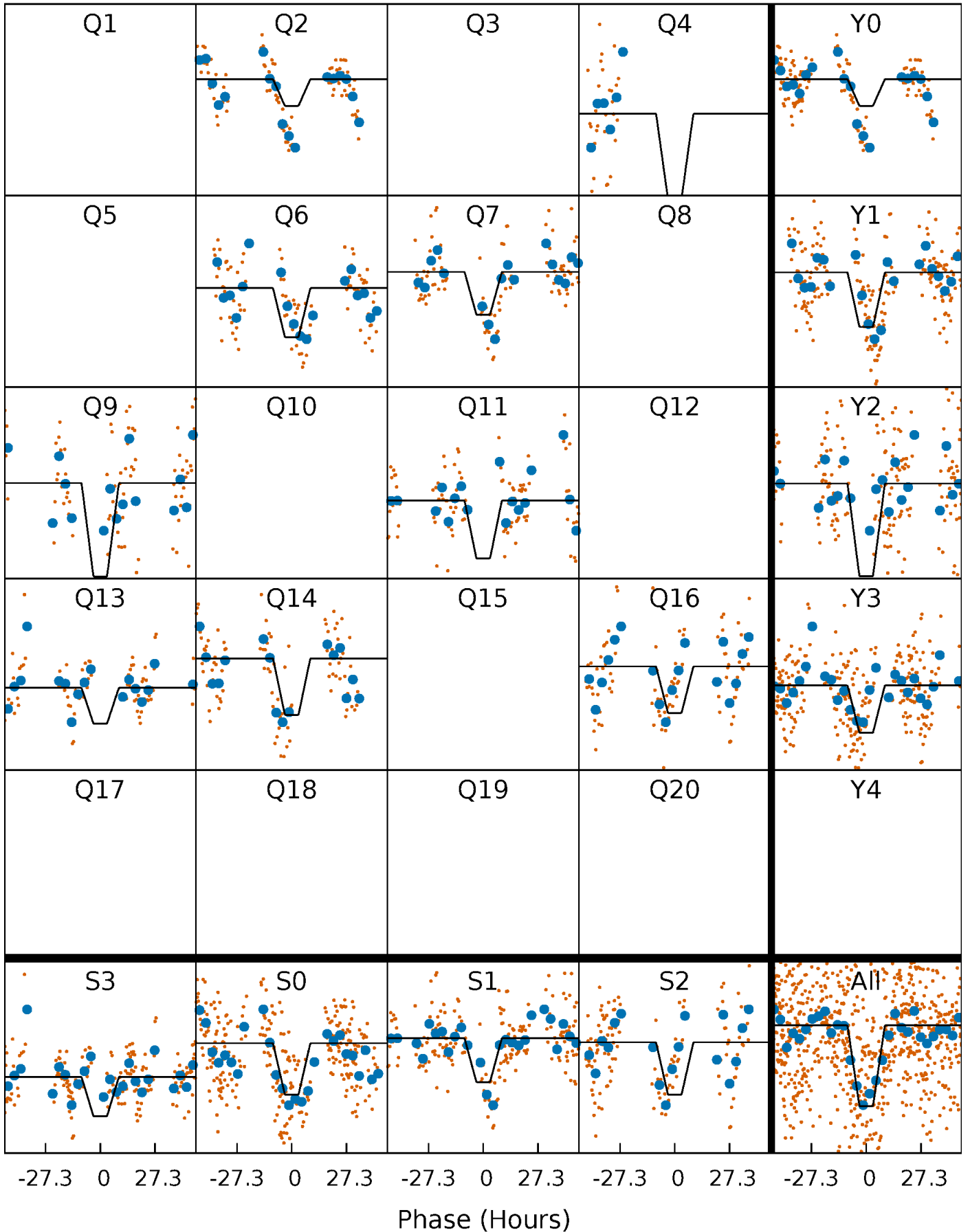
# DV Quarter-Phased Transit Curves

TCE 005894825-02 P=159.312723 Days  $T_0=238.540998$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005894825-02 P=159.279600 Days  $T_0=238.648227$  (BKJD)

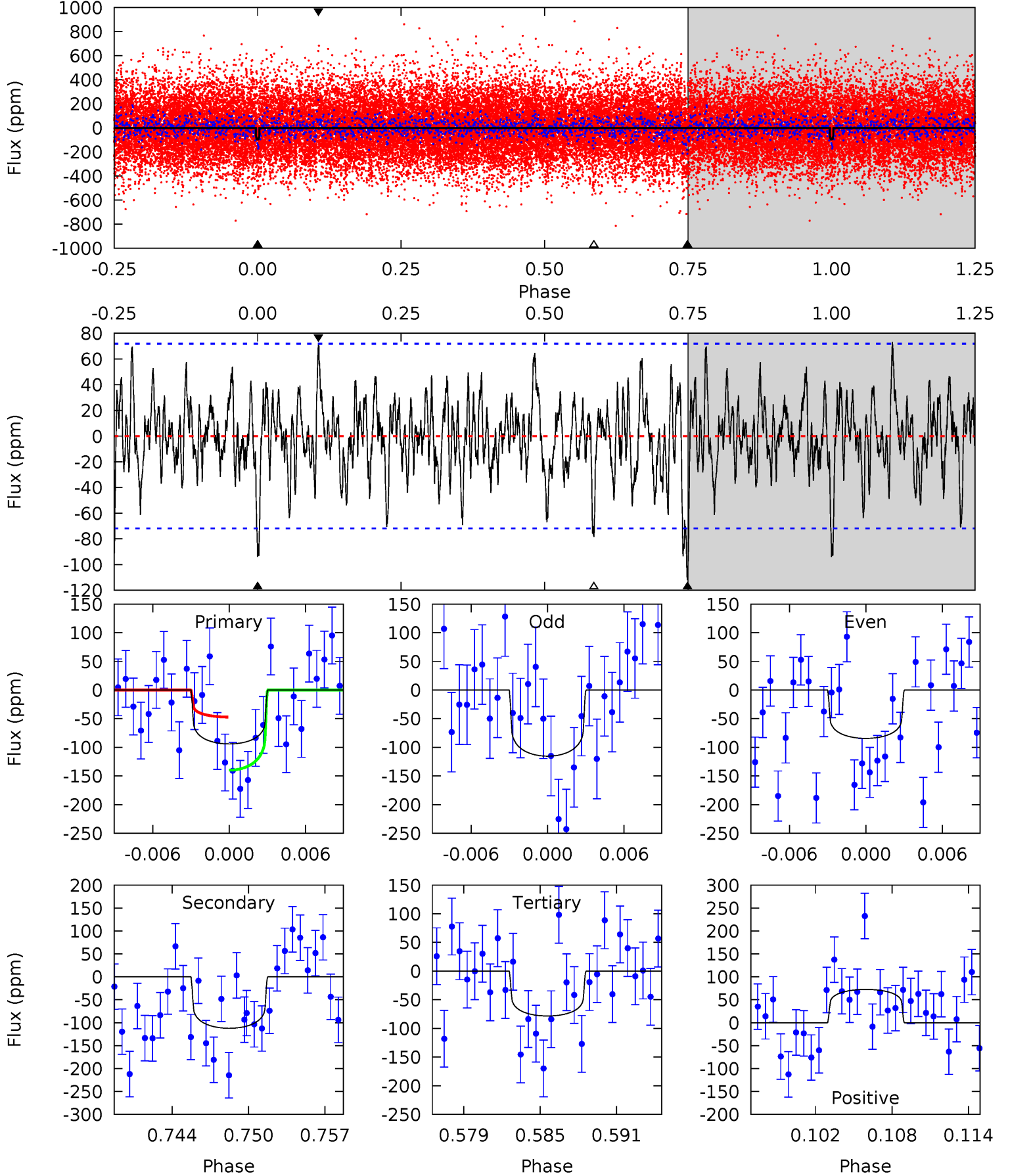




# DV Model-Shift Uniqueness Test

005894825-02, P = 159.312723 Days, E = 79.228275 Days

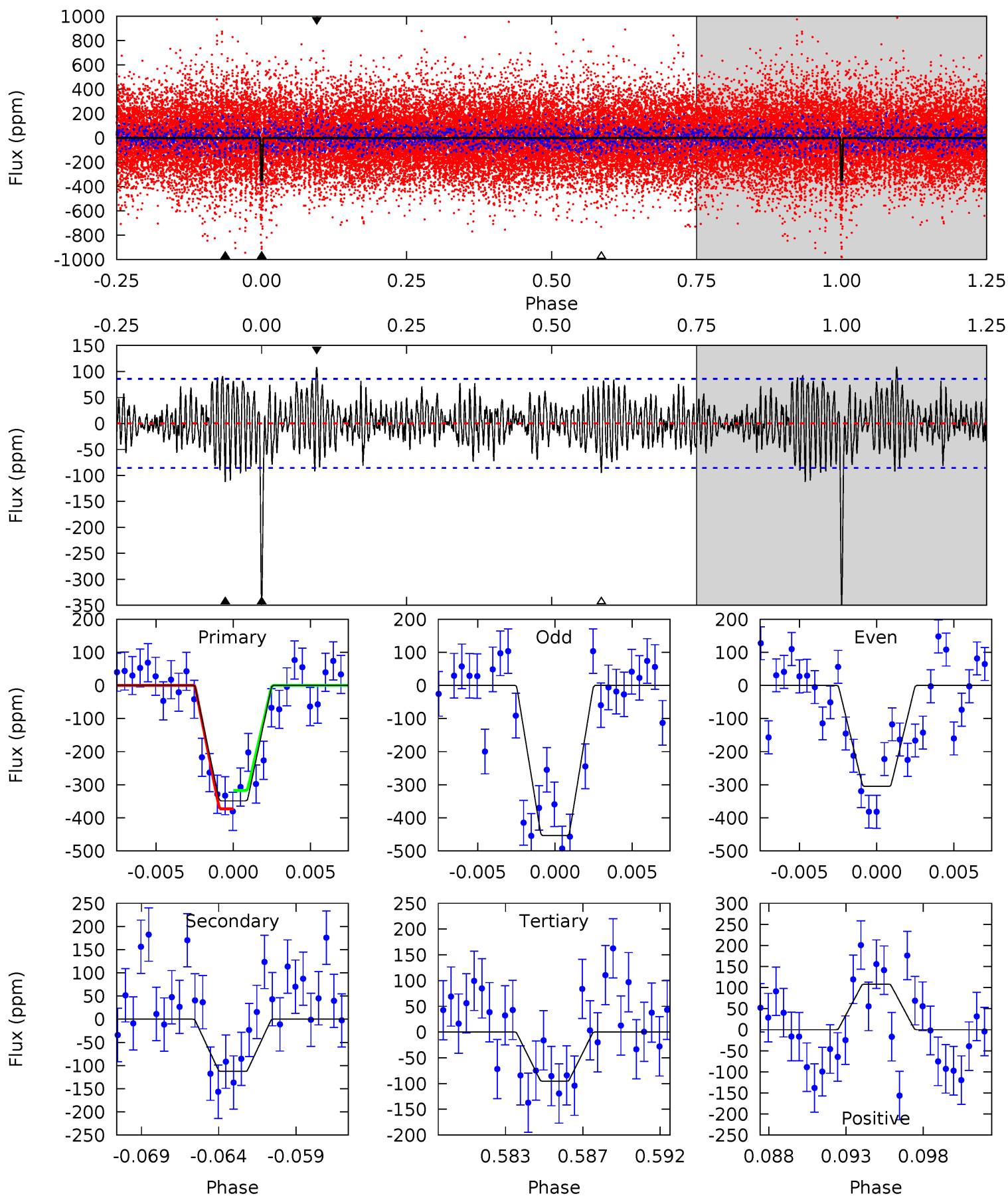
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.69 | 7.99 | 5.57 | 5.16 | 5.11            | 2.73            | 1.78             | 1.12    | 1.54    | 2.41    | 2.83    | 1.04    | 0.91 | 0.39  | 3.30 |



# Alt Model-Shift Uniqueness Test

005894825-02, P = 159.279600 Days, E = 79.368627 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 21.0 | 6.80 | 5.75 | 6.52 | 5.16            | 2.81            | 2.06             | 15.3    | 14.5    | 1.05    | 0.28    | 4.25    | 0.25 | 0.24  | 1.67 |



### Stellar Parameters For KIC 005894825

|        | $T_{\text{eff}} (K)$ | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M (M_{\odot})$           | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6831^{+190}_{-286}$ | $3.971^{+0.293}_{-0.158}$ | $-0.080^{+0.250}_{-0.350}$ | $2.106^{+0.588}_{-0.719}$ | $1.511^{+0.217}_{-0.326}$ | $0.228^{+0.447}_{-0.099}$                 |
|        | +3%/-4%              | +7%/-4%                   | +312%/-438%                | +28%/-34%                 | +14%/-22%                 | +196%/-44%                                |
| Source | PHO54                | PHO54                     | PHO54                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 005894825-02 / KOI

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$     | $T_{max} (K)$     | $T_{obs} (K)$         | $A_{obs}$              |
|---------|---------------|------------------------|-------------------|-----------------------|------------------------|
| DV      | $-112 \pm 14$ | $2.64^{+0.91}_{-0.78}$ | $741^{+62}_{-76}$ | $6365^{+1111}_{-784}$ | $3762^{+3678}_{-1721}$ |
| Alt.    | $-113 \pm 17$ | $4.23^{+1.13}_{-0.95}$ | $738^{+61}_{-68}$ | $5117^{+485}_{-373}$  | $1484^{+1020}_{-531}$  |

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

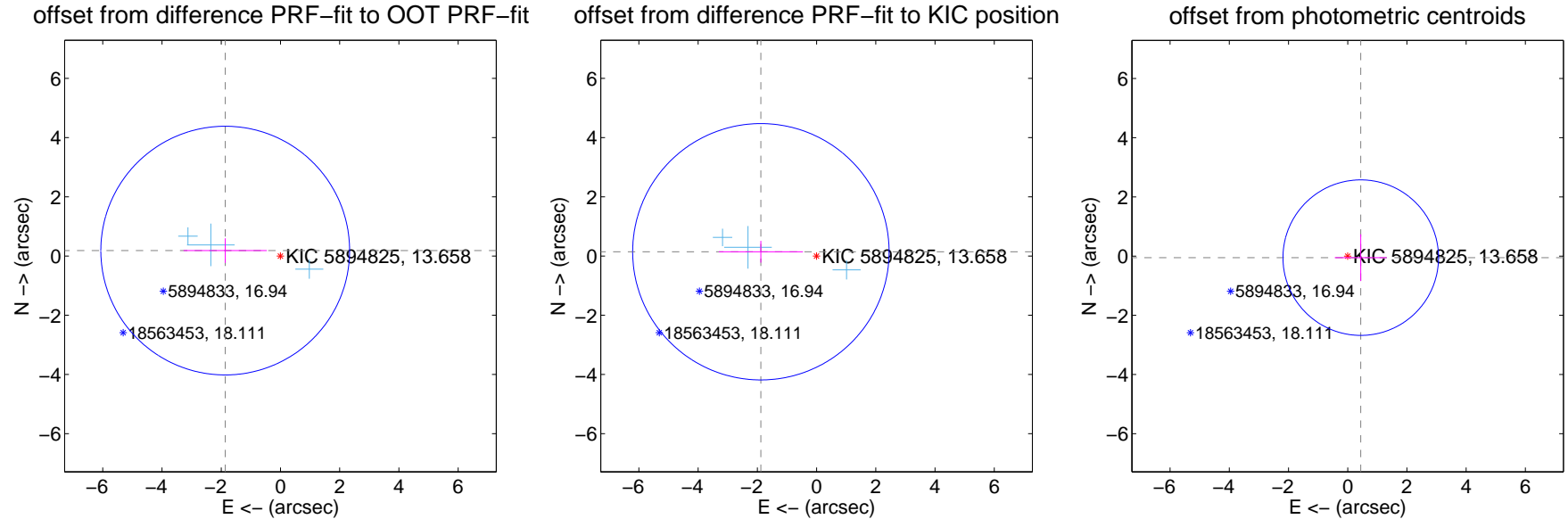
## DV Centroid Data

Supplemental centroid analysis for 005894825-02. Kepler magnitude: 13.66. Transit SNR 5.29

There are 3 quarters with good PRF difference image offsets

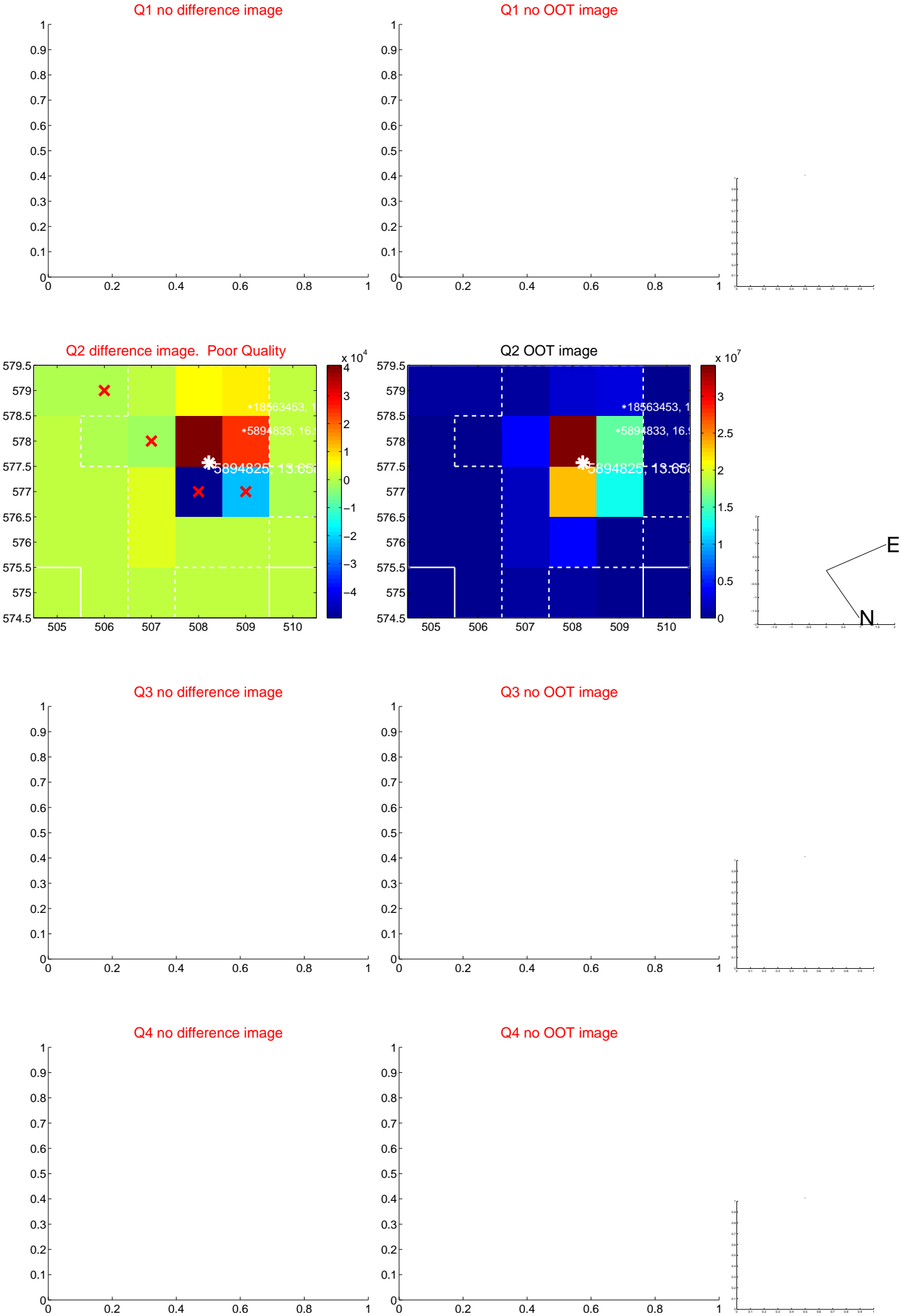
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $1.874 \pm 1.400$  | 1.34                | $1.865 \pm 1.406$ | $0.184 \pm 0.415$ |
| PRF-fit source offset from KIC position | $1.886 \pm 1.443$  | 1.31                | $1.880 \pm 1.419$ | $0.144 \pm 0.368$ |
| photometric centroid source offset      | $0.44 \pm 0.88$    | 0.51                | $-0.44 \pm 0.88$  | $-0.05 \pm 0.79$  |



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.

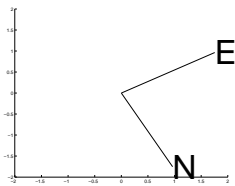
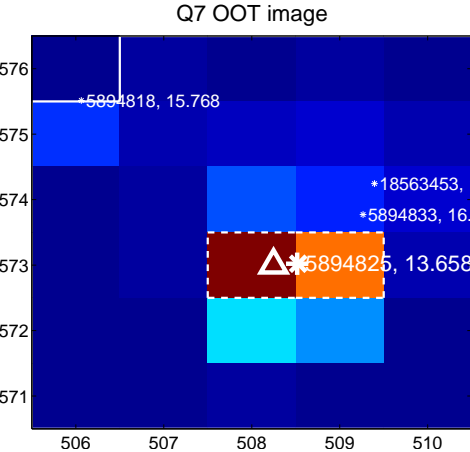
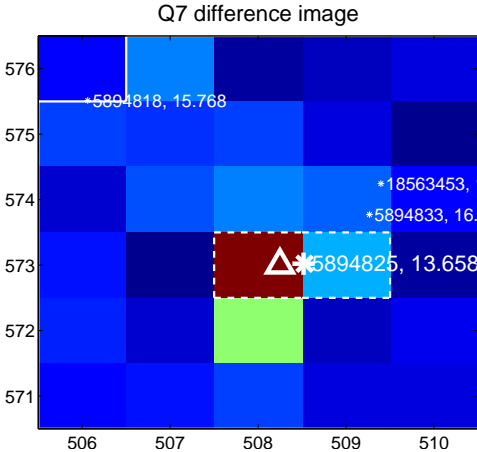
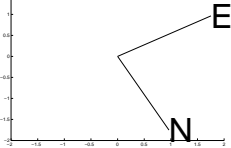
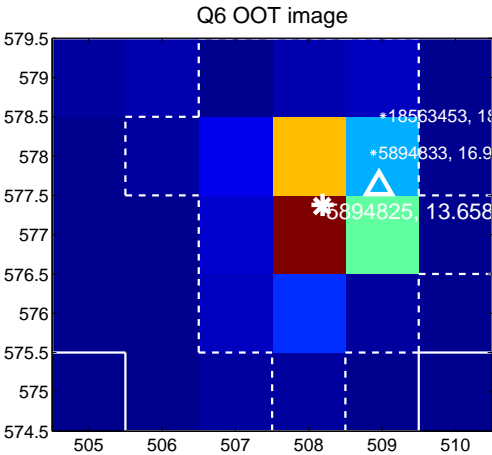
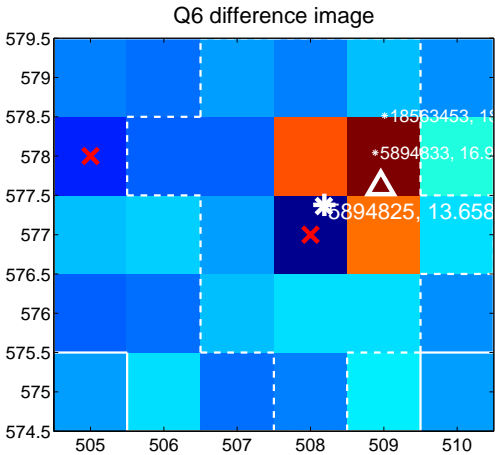


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

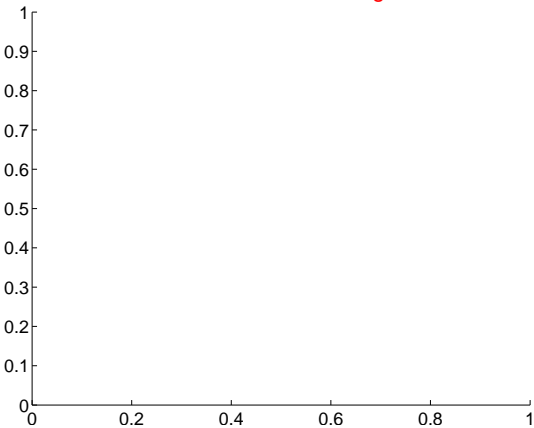
Q5 no difference image



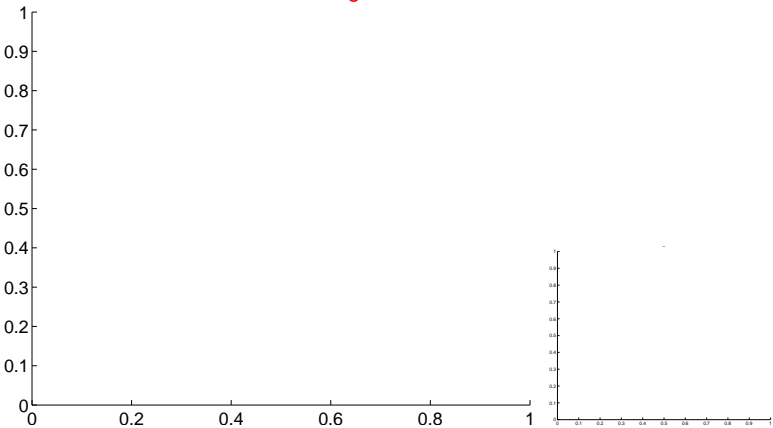
Q5 no OOT image



Q8 no difference image



Q8 no OOT image

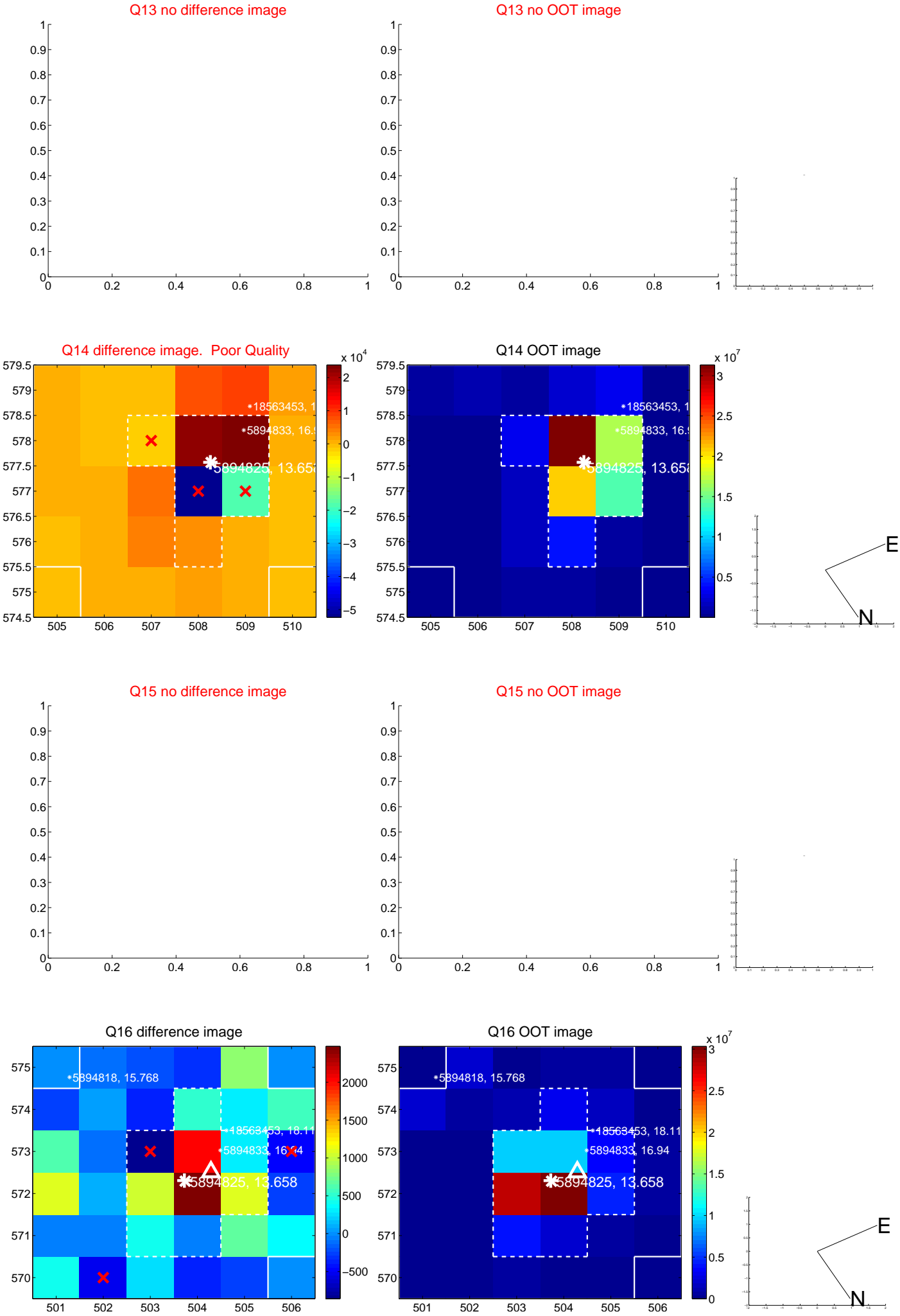




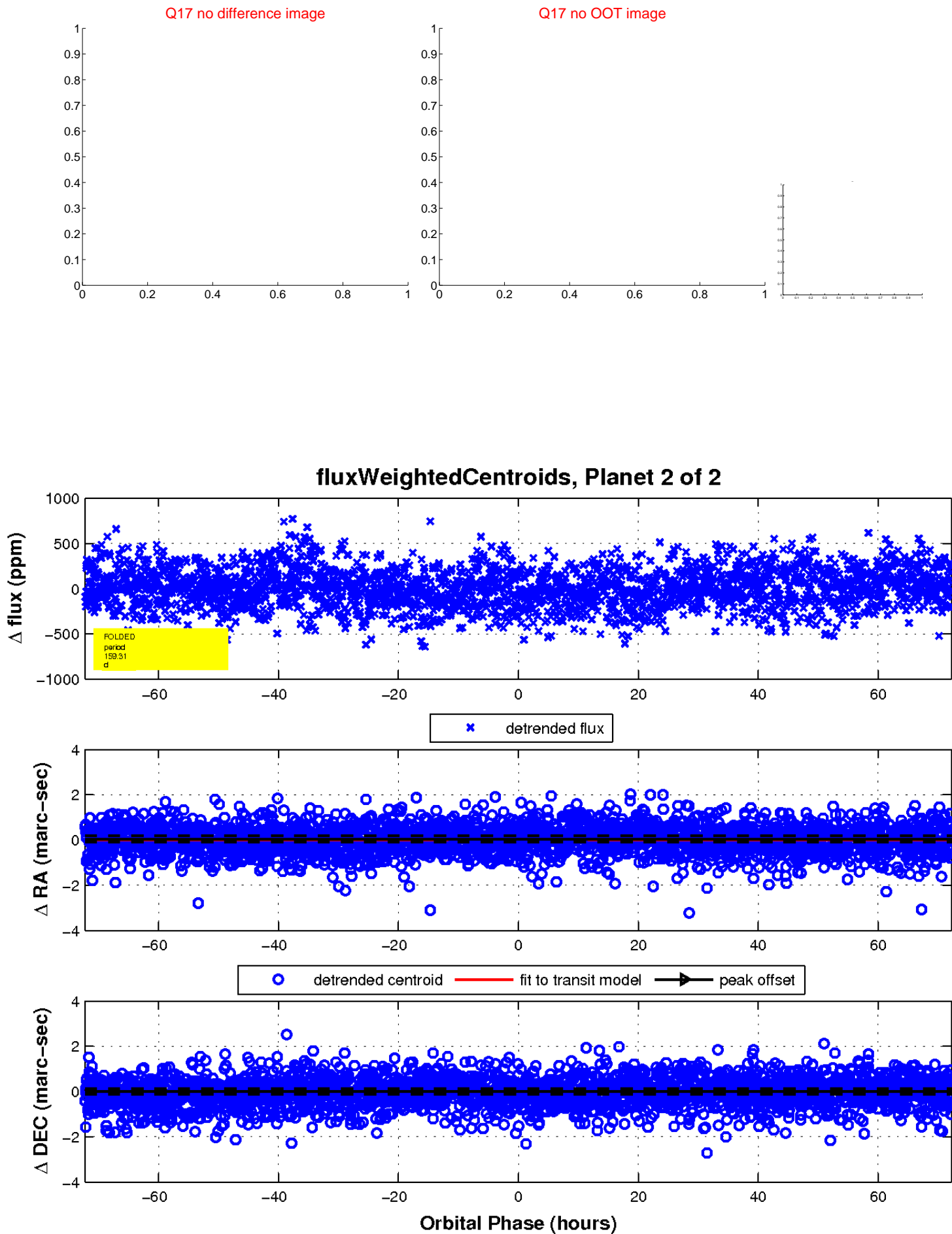
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

