

# KIC 005385750

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005385750-01 | OBS      | No   | 12.425398     | 141.307778   | 1154.8      | 12.835           | 10.2 | 14.2 | 49.28                       | 4067            | 356.04                 | 0.00                   |
| 005385750-02 | OBS      | No   | 12.431433     | 133.645653   | 503.4       | 10.861           | 8.9  | 9.0  | 49.28                       | 4067            | 143.33                 | 0.00                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005385750-01 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 1 | LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH            |
| 005385750-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 1 | LPP_DV—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH |

**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.

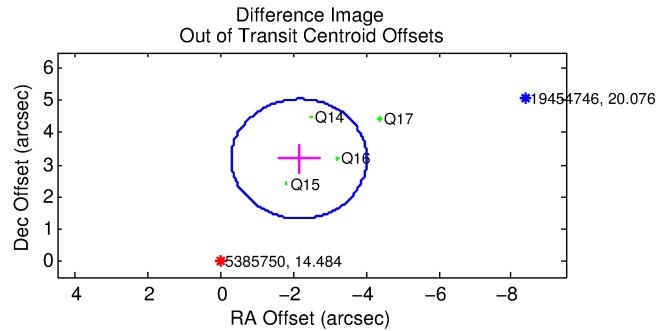
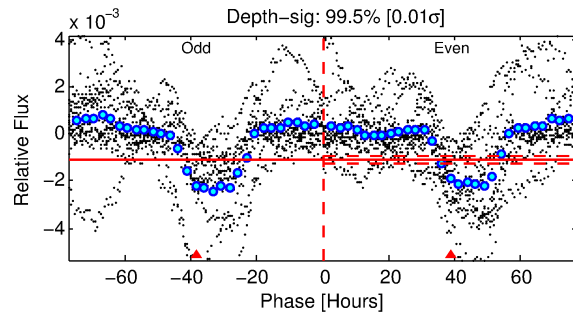
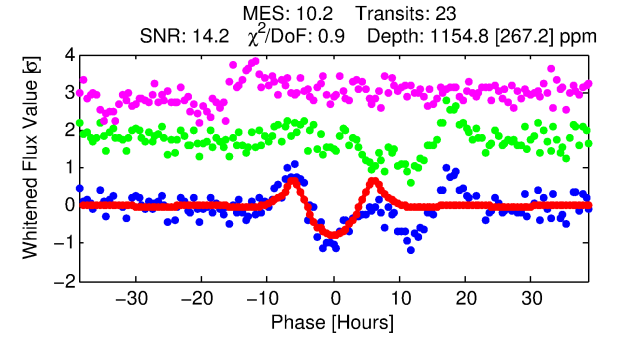
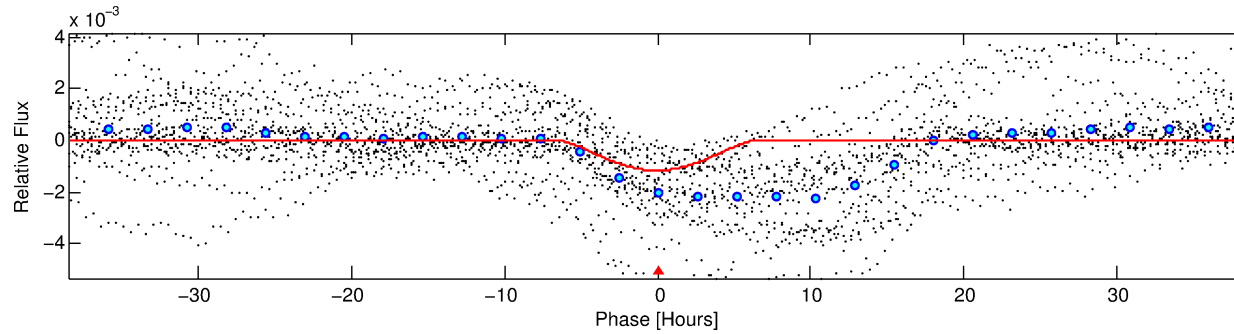
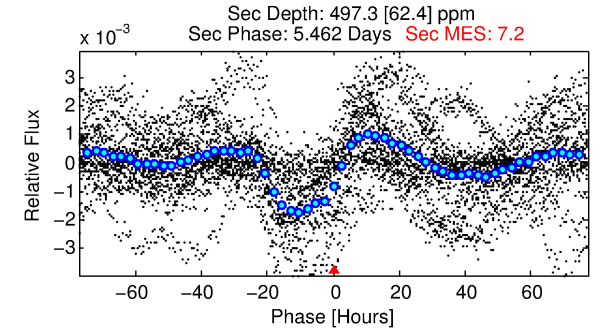
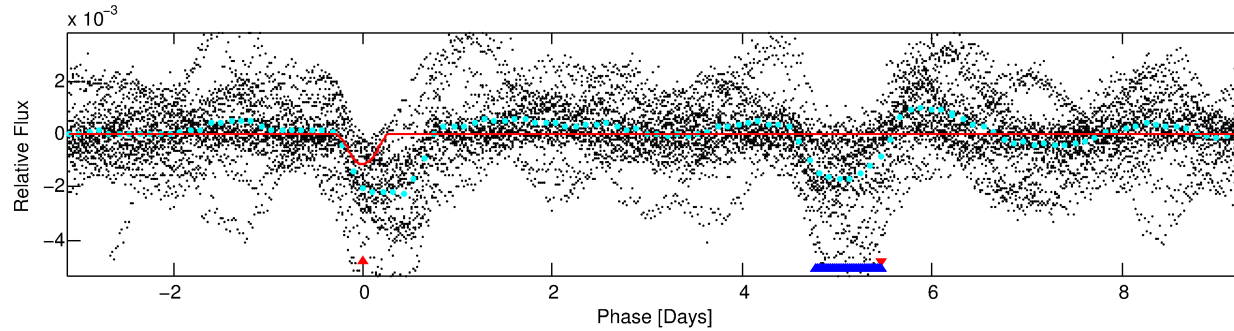
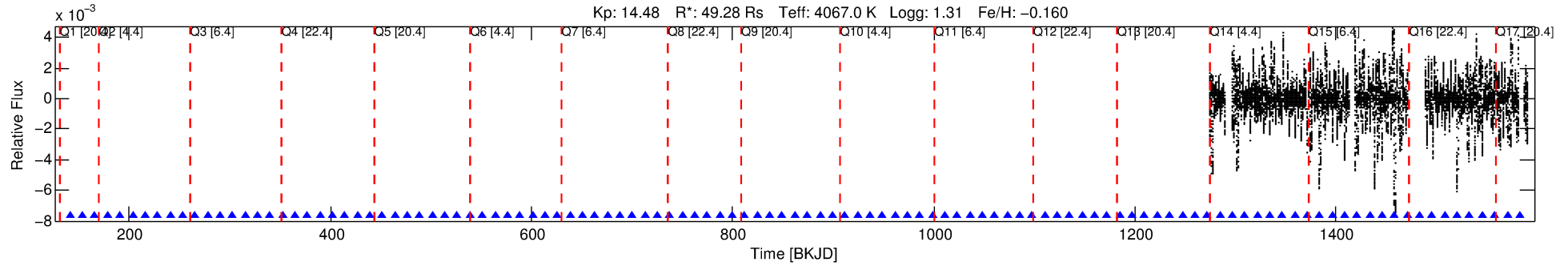
## Ephemeris Match Information For 005385750-01

| TCE (1)      | KIC     | Parent (2) | Parent KIC | $P_1:P_2$ | Dist ( $''$ ) | $\Delta$ Row | $\Delta$ Col | $m_2$ | $m_1$ | $D_2/D_1$ | Mechanism  | Flag | $\sigma_P$ | $\sigma_T$ |
|--------------|---------|------------|------------|-----------|---------------|--------------|--------------|-------|-------|-----------|------------|------|------------|------------|
| 005385750-01 | 5385750 | 6129.01    | 5385778    | 1:1       | 25.7          | -1           | -6           | 12.70 | 14.49 | 4.84      | Direct-PRF | 0    | 3.51       | 2.53       |

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 5385750 Candidate: 1 of 2 Period: 12.425 d



## DV Fit Results:

Period = 12.42540 [0.00067] d  
Epoch = 141.3078 [0.0692] BKJD  
Rp/R\* = 0.0662 [0.0645]  
a/R\* = 2.92 [0.51]  
b = 1.00 [0.10]  
Seff = N/A  
Teq = N/A  
**Rp = 356.04 [359.67] Re**  
a = N/A  
Ag = N/A  
Teffp = N/A

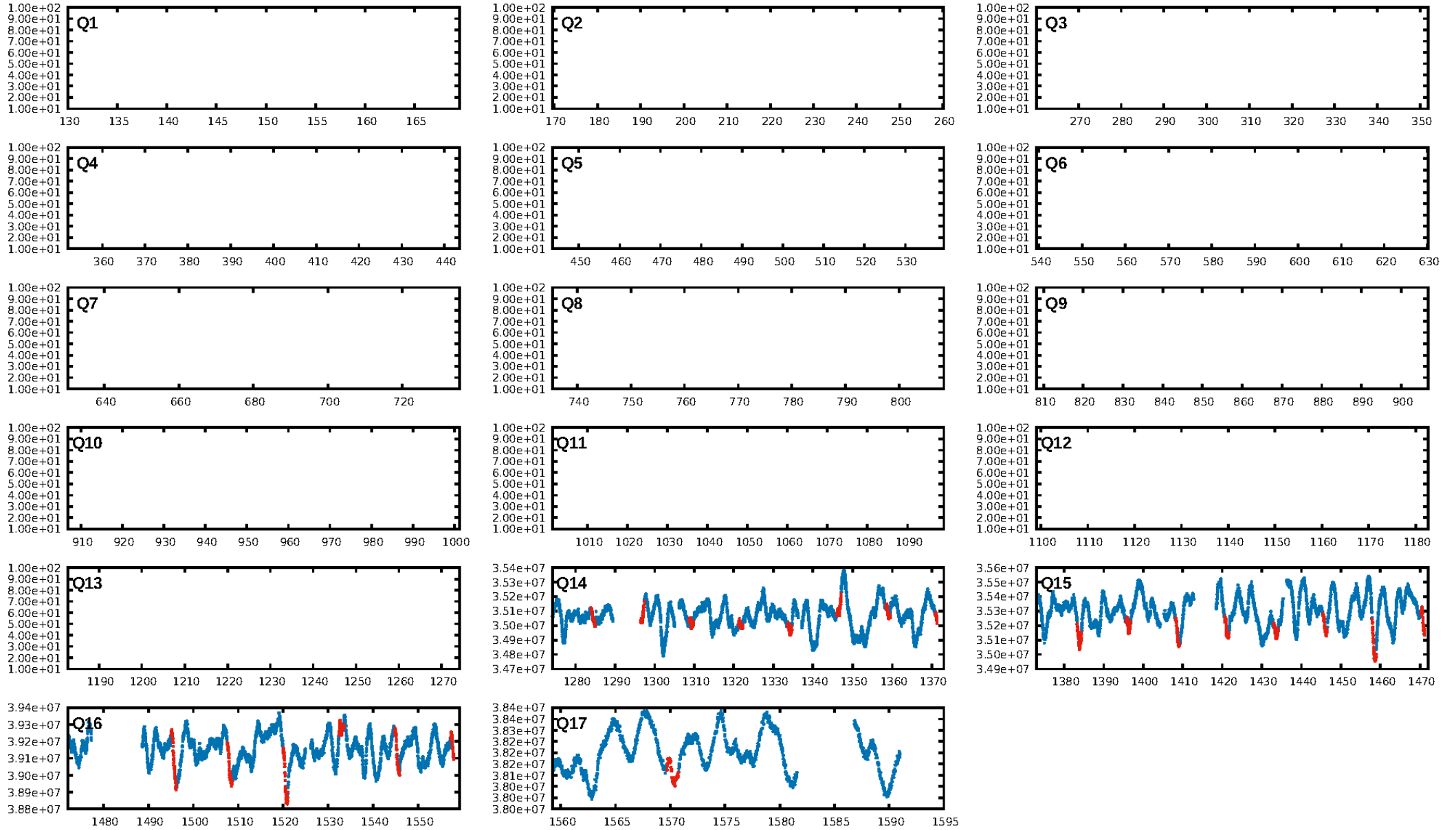
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.7% [0.01σ]  
ModelChiSquare2-sig: 96.5%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.55e-21  
RollingBand-fgt: 1.00 [22/22]  
**GhostDiagnostic-chr: 0.3074**  
Centroid-sig: 0.0%  
Centroid-so: 3.734 arcsec [6.73σ]  
OotOffset-rm: 3.844 arcsec [6.19σ]  
KicOffset-rm: 3.842 arcsec [7.02σ]  
OotOffset-st: 1/1/1/1 [4]  
KicOffset-st: 1/1/1/1 [4]  
DiffImageQuality-fgm: 0.00 [0/4]  
DiffImageOverlap-fno: 1.00 [4/4]

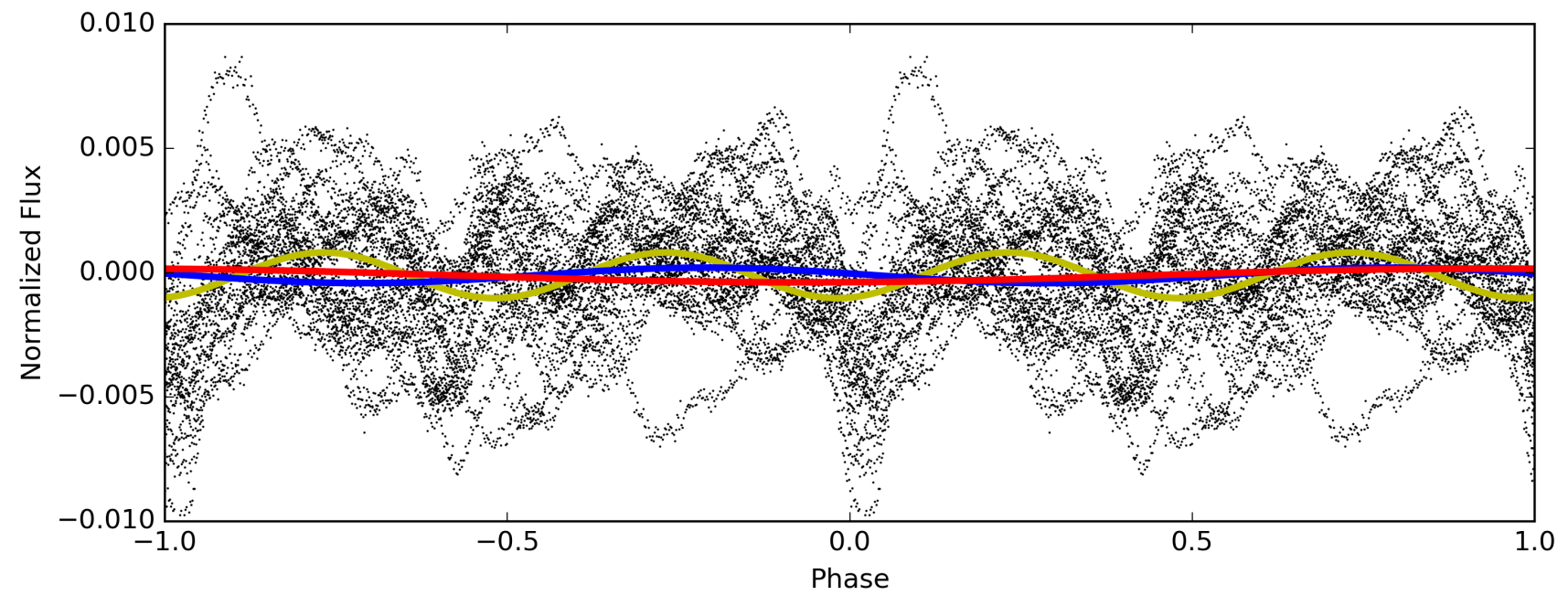
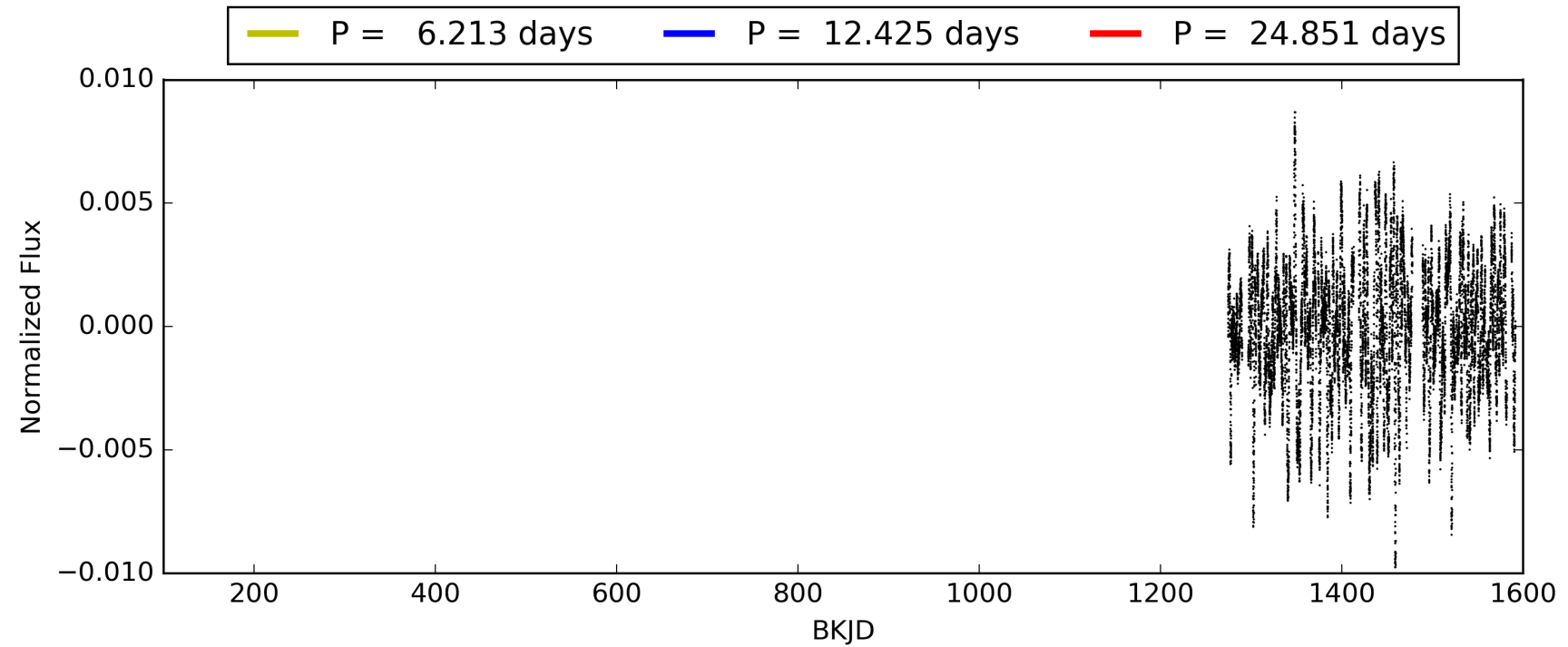
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:17:39 Z

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

# TCE 005385750-01, PDC Light Curves

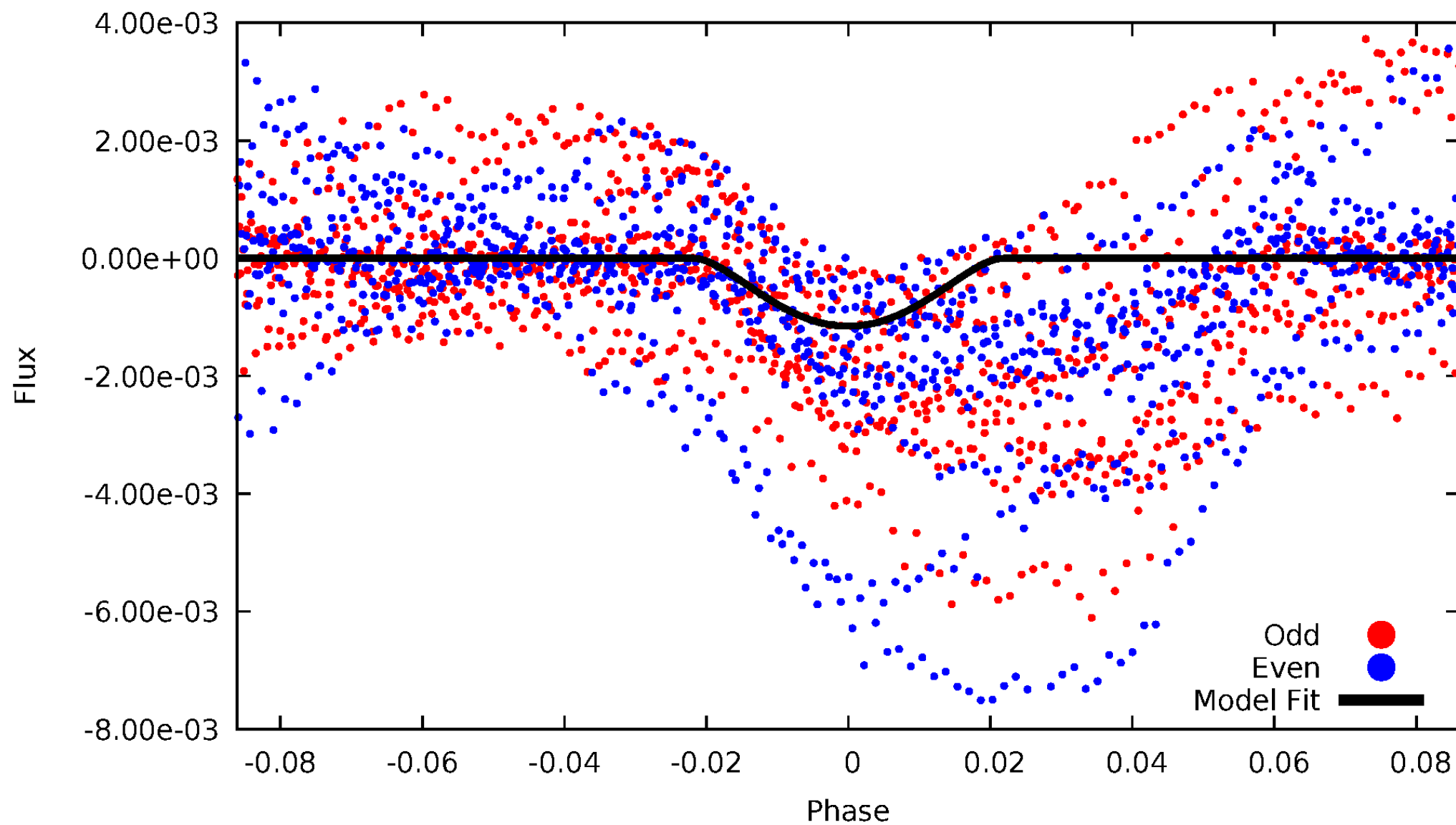


TCE 005385750-01



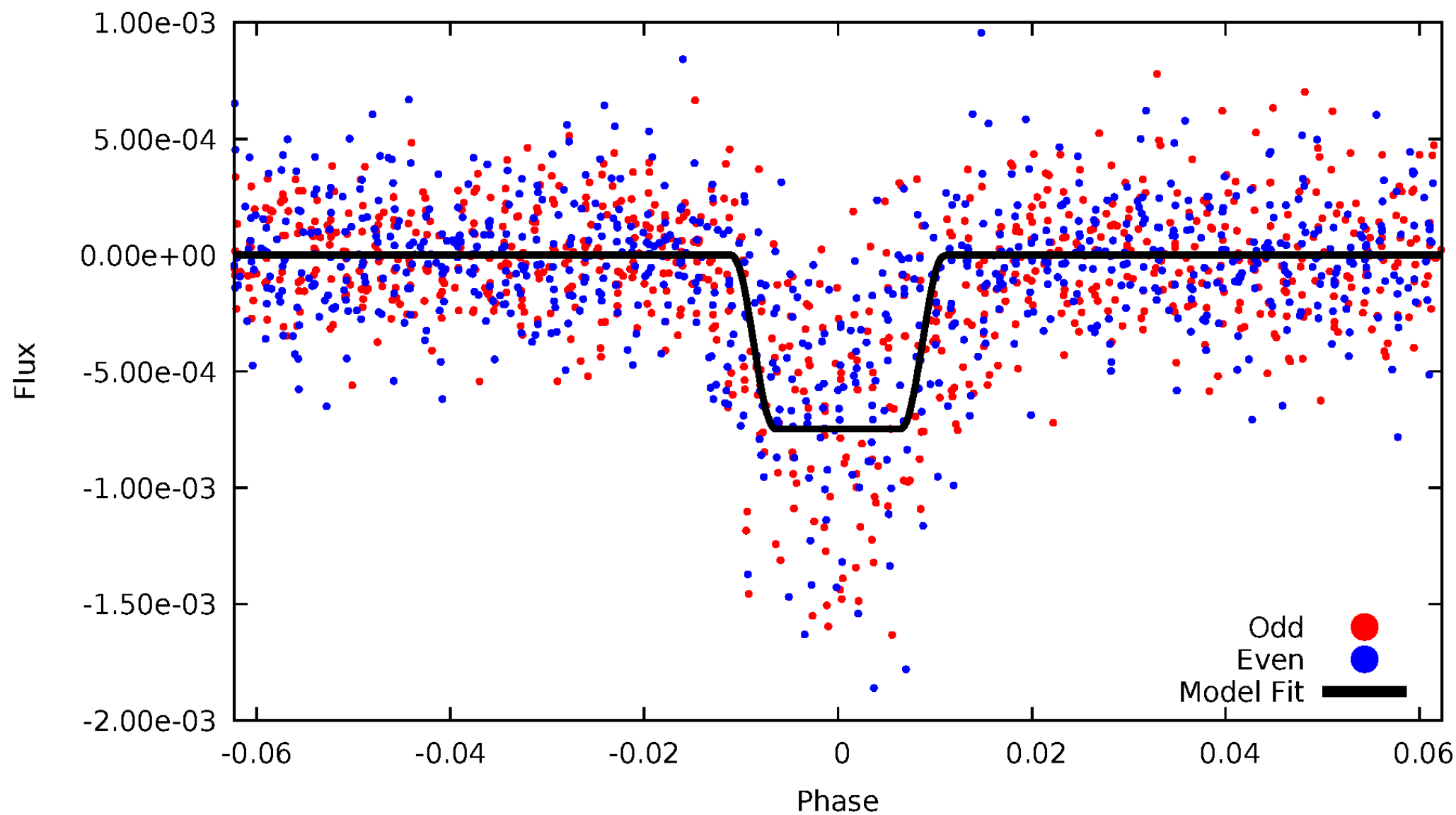
# DV Odd/Even

TCE 005385750-01



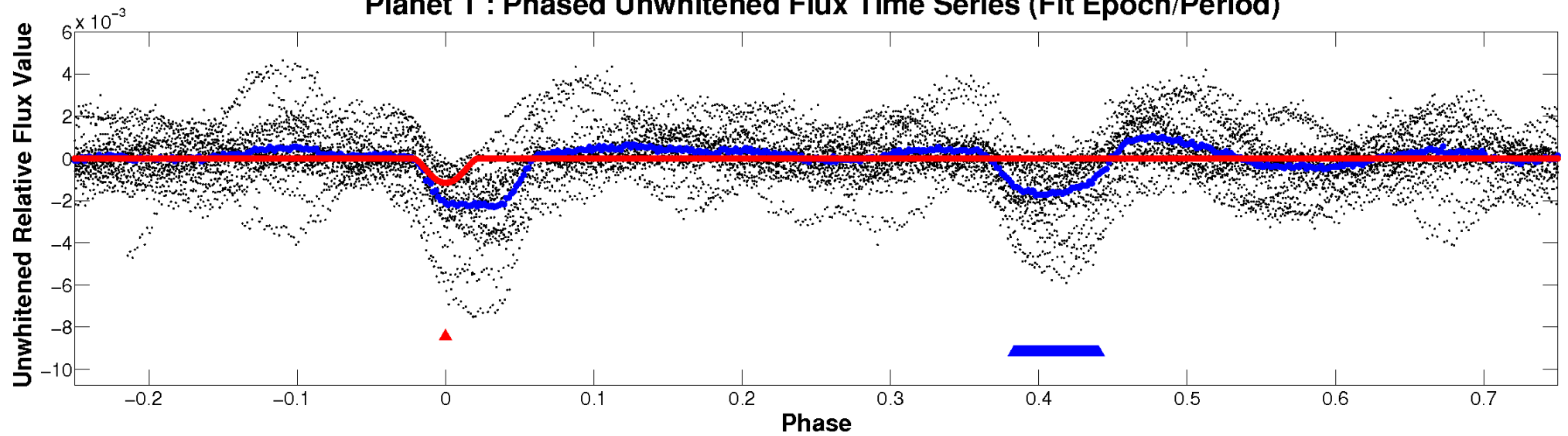
# ALT Odd/Even

TCE 005385750-01

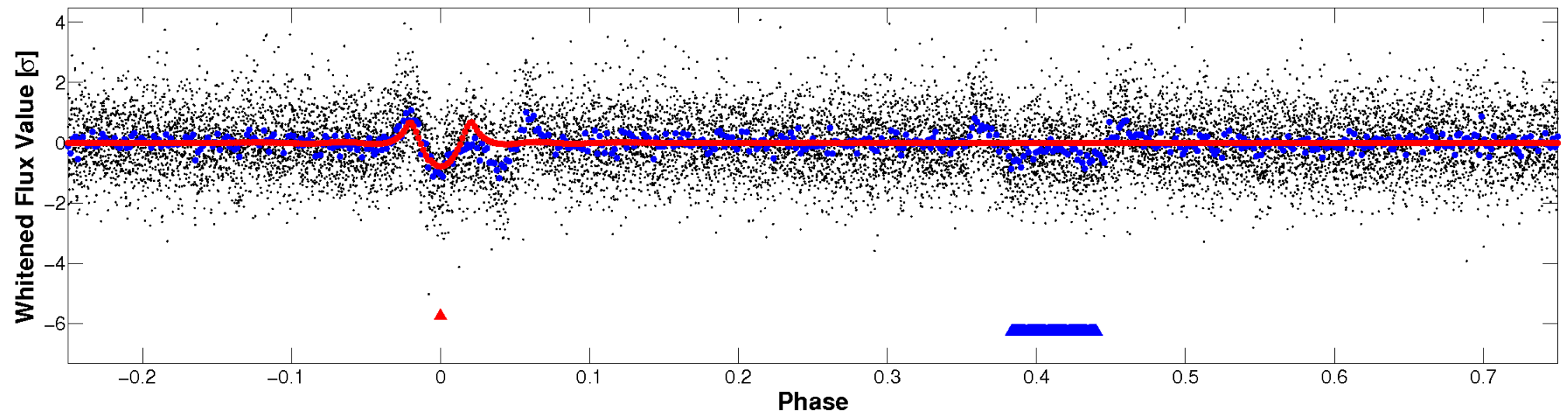


# Non-Whitened Vs. Whitened Light Curve

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



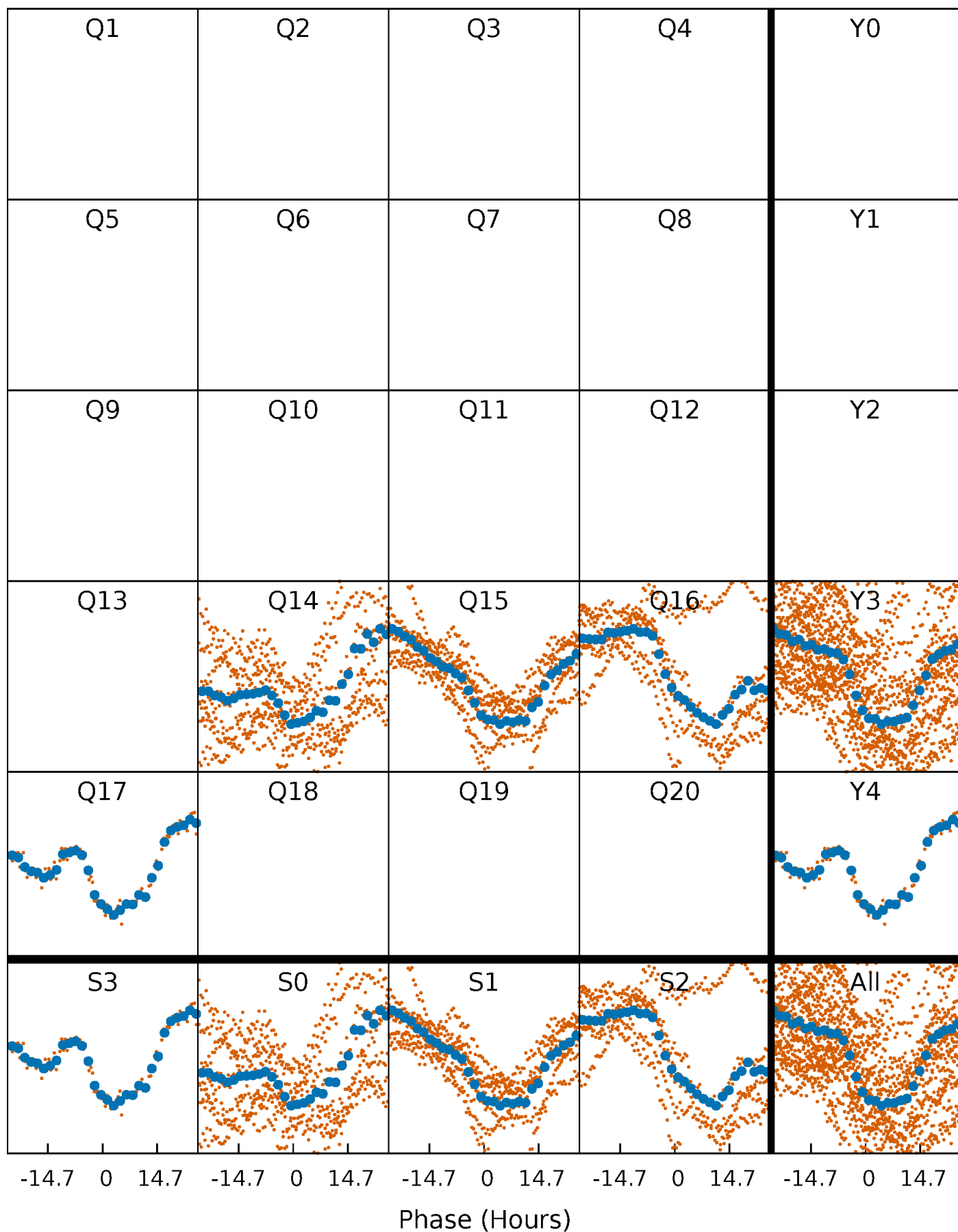
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

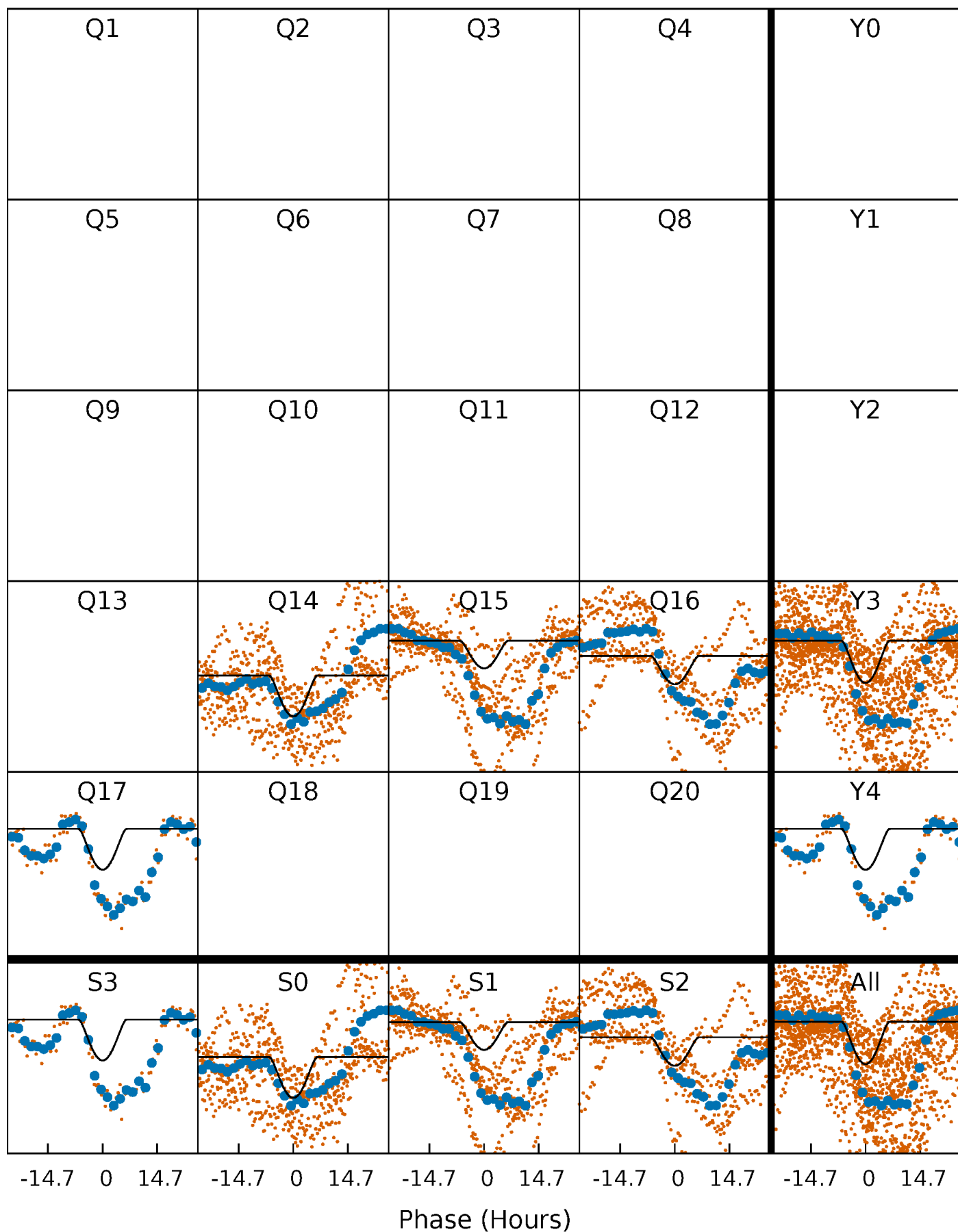
TCE 005385750-01   P= 12.425398 Days    $T_0=141.307778$  (BKJD)





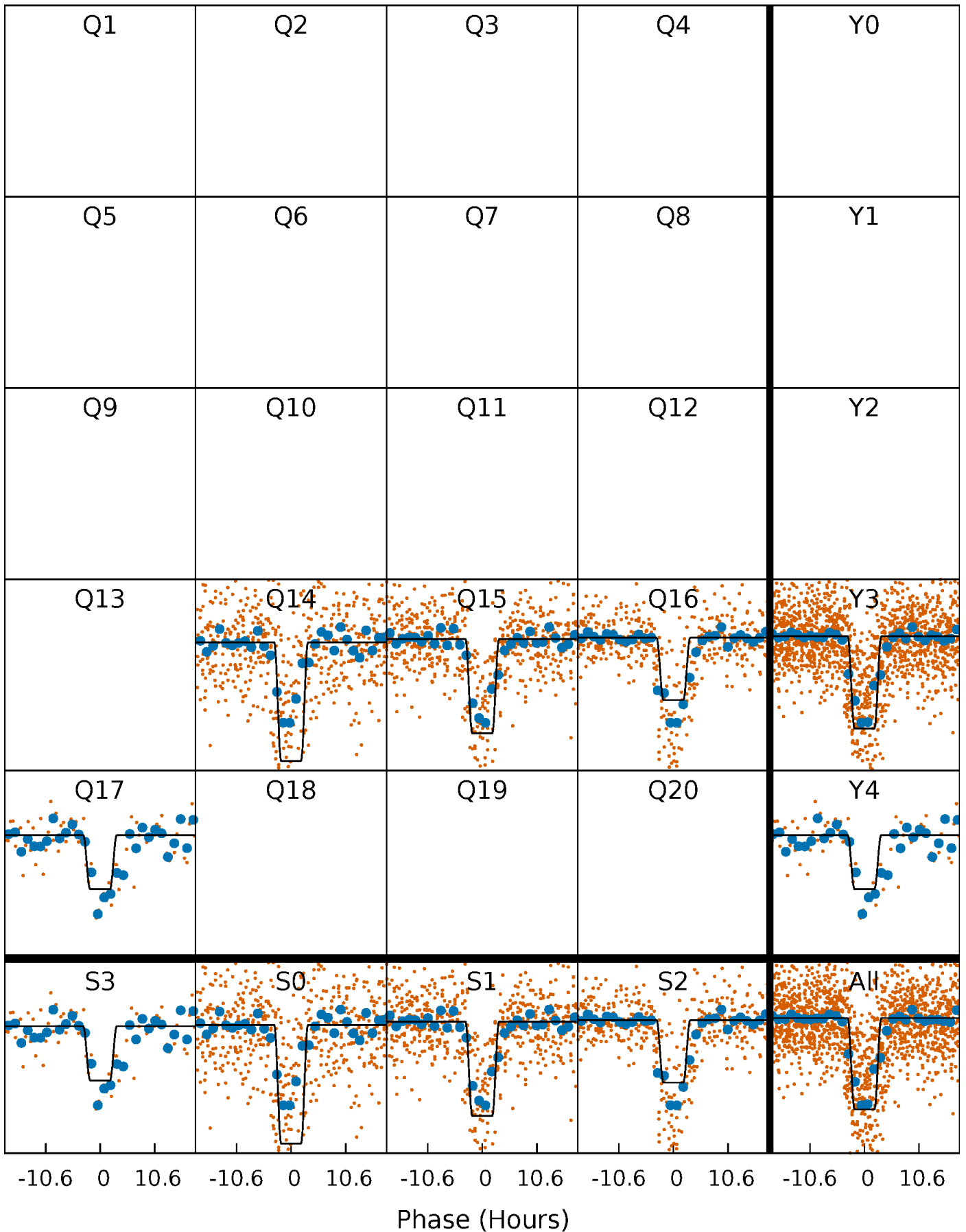
# DV Quarter-Phased Transit Curves

TCE 005385750-01   P= 12.425398 Days    $T_0=141.307778$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

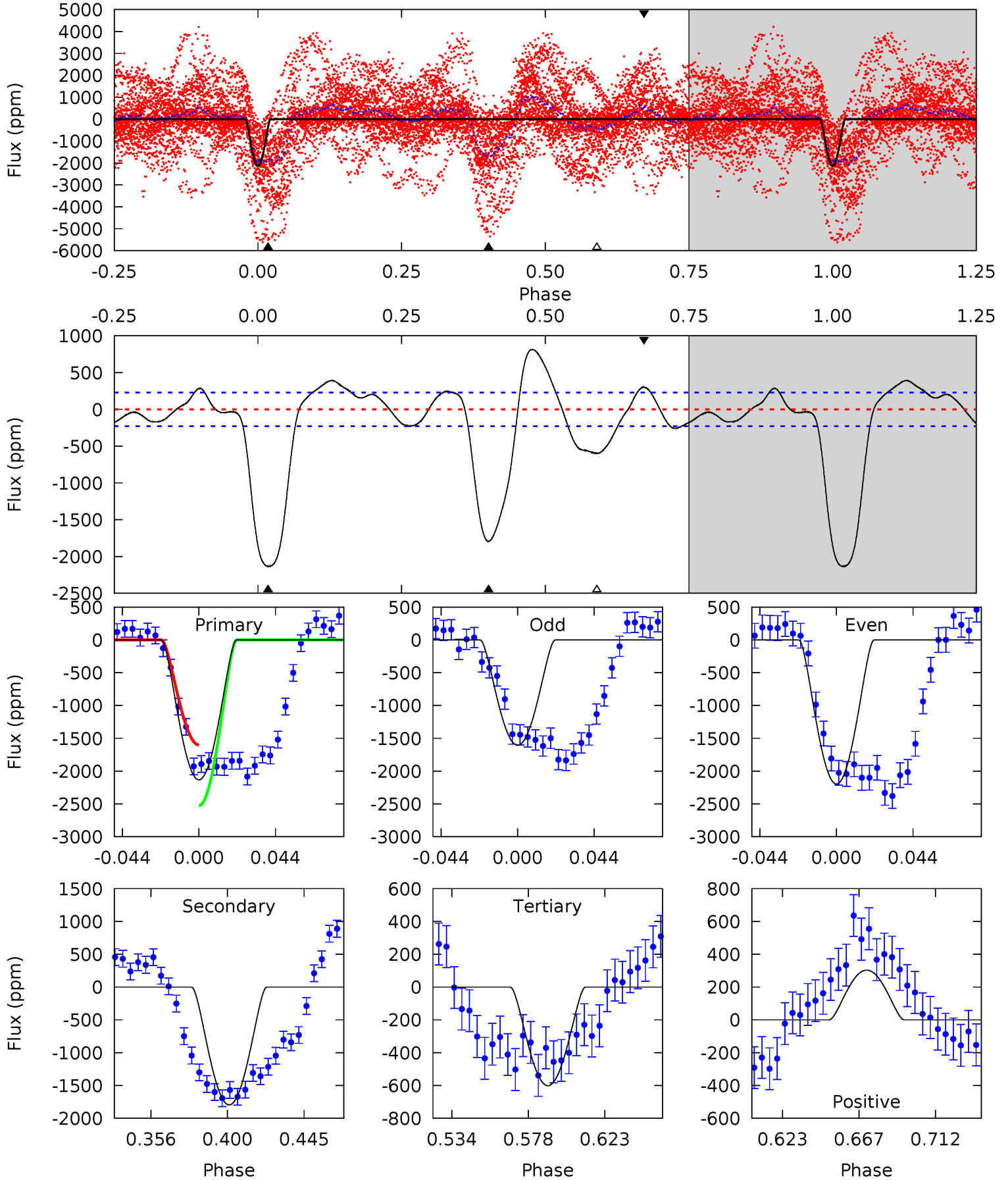
TCE 005385750-01   P= 12.422824 Days    $T_0=141.543183$  (BKJD)



# DV Model-Shift Uniqueness Test

005385750-01, P = 12.425398 Days, E = 141.307778 Days

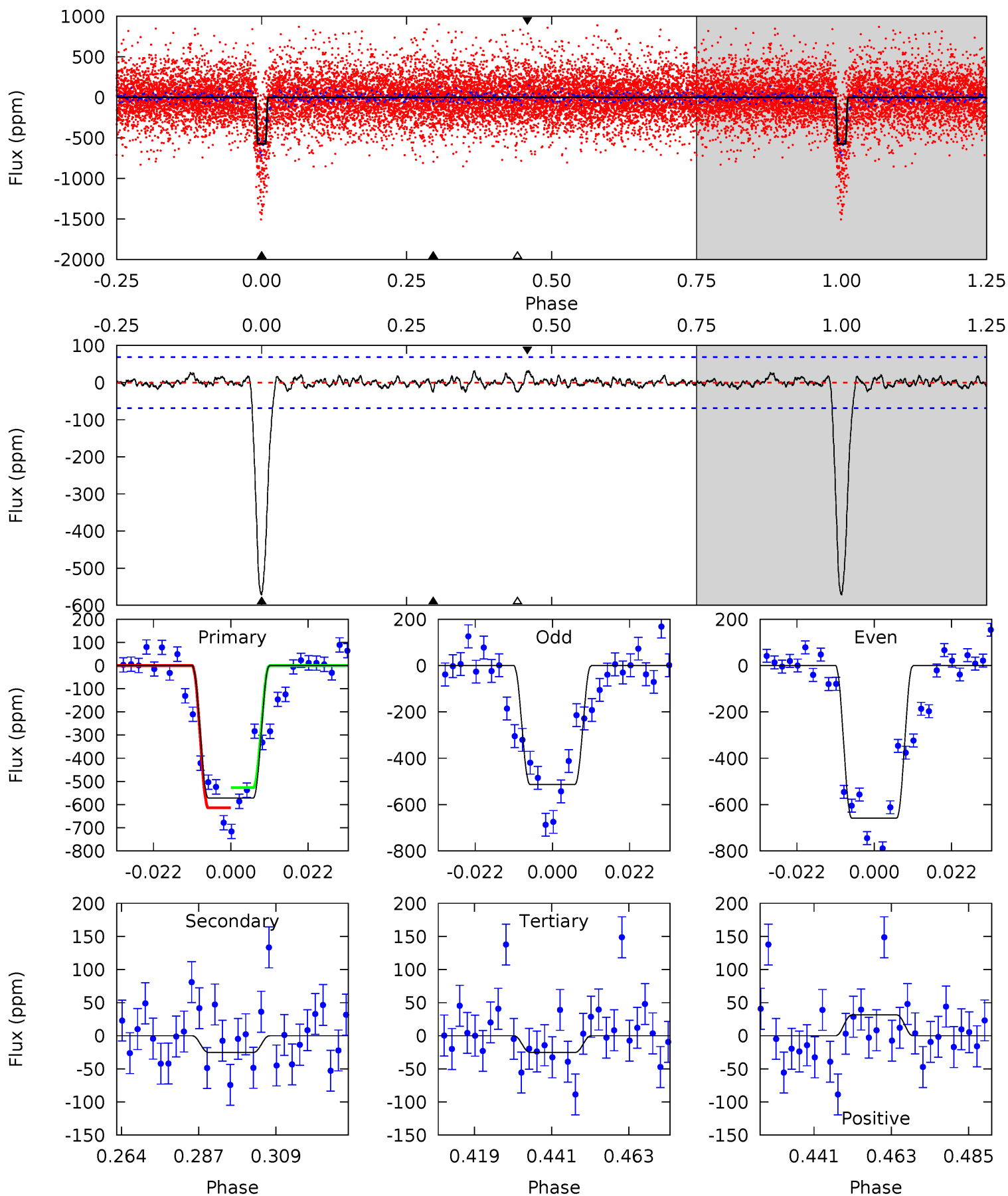
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 44.1 | 37.1 | 12.4 | 6.26 | 4.73            | 2.01            | 6.04             | 31.7    | 37.8    | 24.7    | 30.8    | 6.09    | 1.08 | 0.28  | 9.15 |



# Alt Model-Shift Uniqueness Test

005385750-01, P = 12.422824 Days, E = 141.543183 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 40.4 | 1.78 | 1.78 | 2.22 | 4.87            | 2.29            | 0.65             | 38.7    | 38.2    | 0.00    | -0.44   | 5.16    | 1.14 | 0.05  | 3.06 |



### Stellar Parameters For KIC 005385750

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )         | $M(M_{\odot})$            | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|---------------------|---------------------------|----------------------------|-----------------------------|---------------------------|---|
|        | $4067^{+65}_{-65}$  | $1.306^{+0.144}_{-0.096}$ | $-0.160^{+0.150}_{-0.150}$ | $49.278^{+5.318}_{-13.294}$ | $1.790^{+0.032}_{-0.612}$ | $0.000^{+0.000}_{-0.000}$                     |
|        | +2%/-2%             | +11%/-7%                  | +94%/-94%                  | +11%/-27%                   | +2%/-34%                  | +86%/-25%                                     |
| Source | SPE74               | SPE74                     | SPE74                      | DSEP                        |                           |   |

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

### Secondary Eclipse Parameters for KIC 005385750-01 / KOI

| Detrend | Depth (ppm)    | $R_p$ ( $R_{\oplus}$ )       | $T_{max}$ (K)        | $T_{obs}$ (K)          | $A_{obs}$                 |
|---------|----------------|------------------------------|----------------------|------------------------|---------------------------|
| DV      | $-1796 \pm 48$ | $403.12^{+355.93}_{-255.27}$ | $4940^{+189}_{-295}$ | $-3733^{+7905}_{-292}$ | $0.095^{+0.598}_{-0.068}$ |
| Alt.    | $-25 \pm 14$   | $288.51^{+286.09}_{-187.76}$ | $4929^{+198}_{-262}$ | $-4017^{+193}_{-138}$  | $0.002^{+0.017}_{-0.002}$ |

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

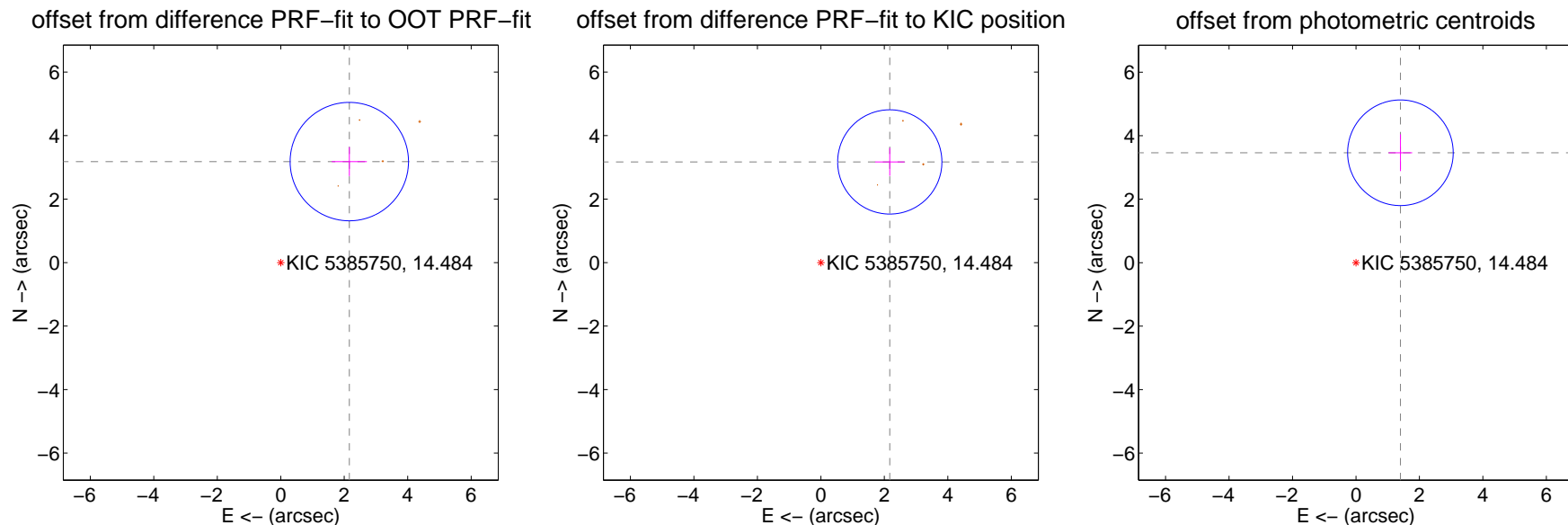
## DV Centroid Data

Supplemental centroid analysis for 005385750-01. Kepler magnitude: 14.48. Transit SNR 14.16

There are 0 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          | $3.844 \pm 0.621$  | 6.19                | $-2.160 \pm 0.552$ | $3.180 \pm 0.455$ |
| PRF-fit source offset from KIC position | $3.842 \pm 0.547$  | 7.02                | $-2.171 \pm 0.465$ | $3.170 \pm 0.440$ |
| photometric centroid source offset      | $3.73 \pm 0.55$    | 6.73                | $-1.40 \pm 0.37$   | $3.46 \pm 0.58$   |



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.





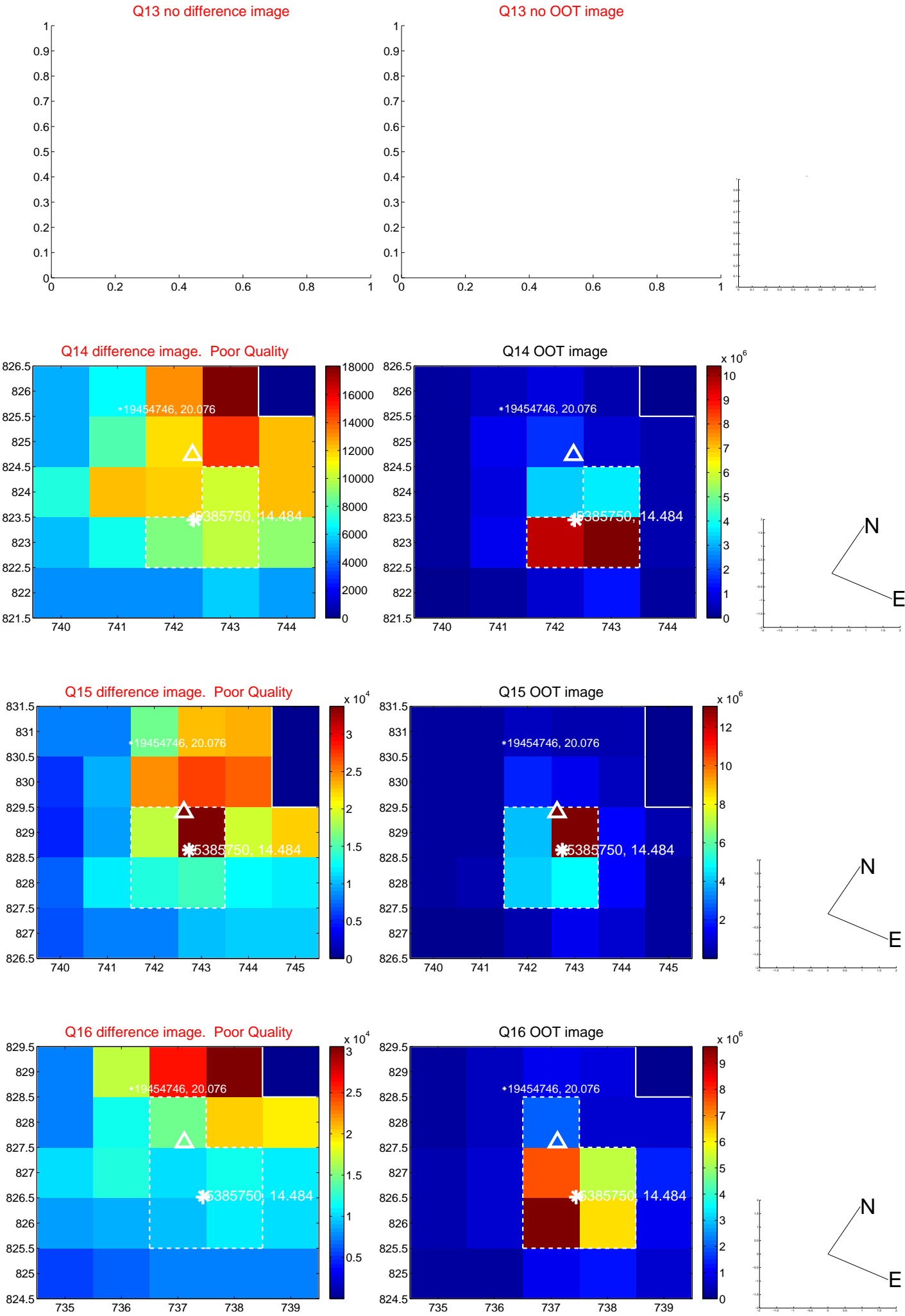
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



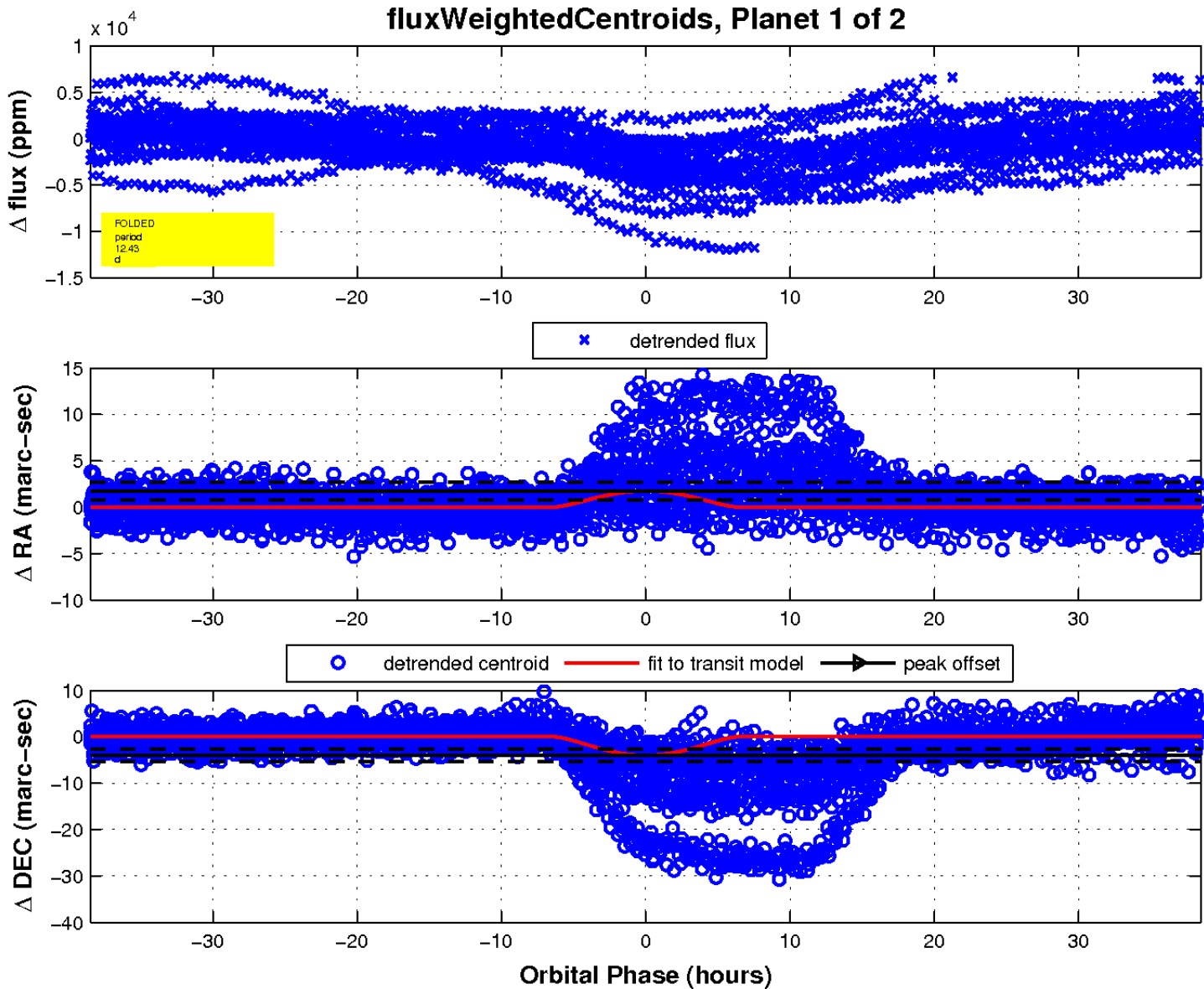
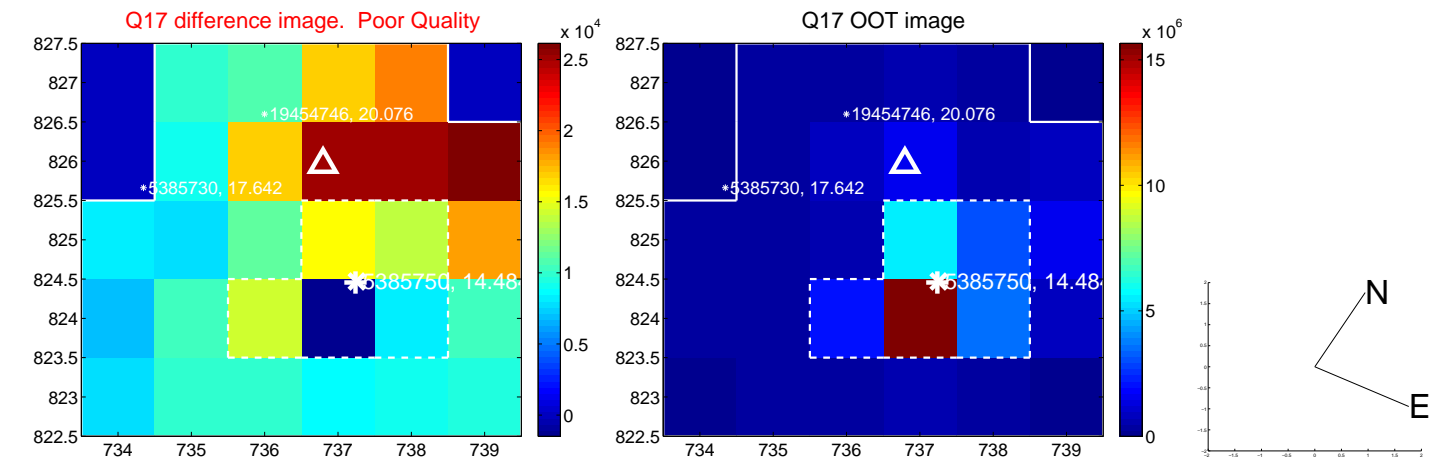
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



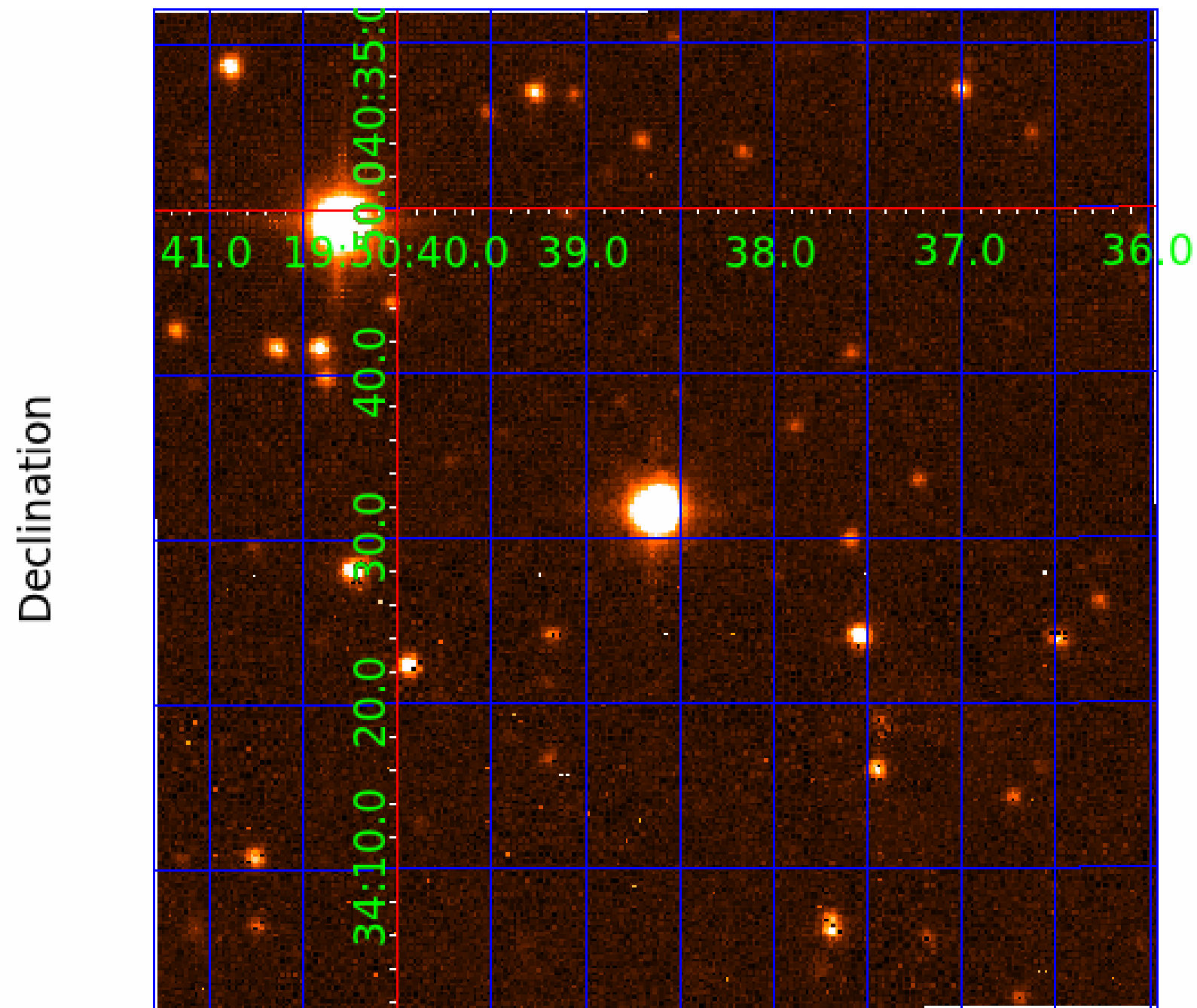
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005385750

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005385750-01 | OBS      | No   | 12.425398     | 141.307778   | 1154.8      | 12.835           | 10.2 | 14.2 | 49.28                       | 4067            | 356.04                 | 0.00                   |
| 005385750-02 | OBS      | No   | 12.431433     | 133.645653   | 503.4       | 10.861           | 8.9  | 9.0  | 49.28                       | 4067            | 143.33                 | 0.00                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005385750-01 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 1 | LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH            |
| 005385750-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 1 | LPP_DV—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH |

**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.

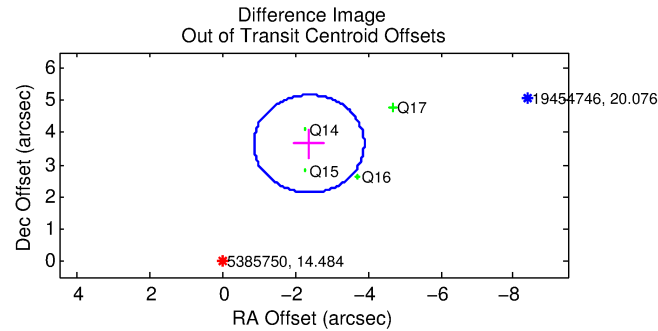
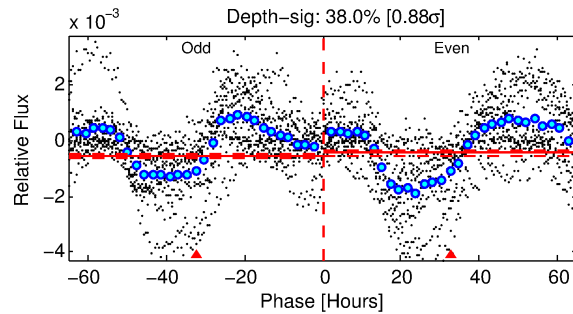
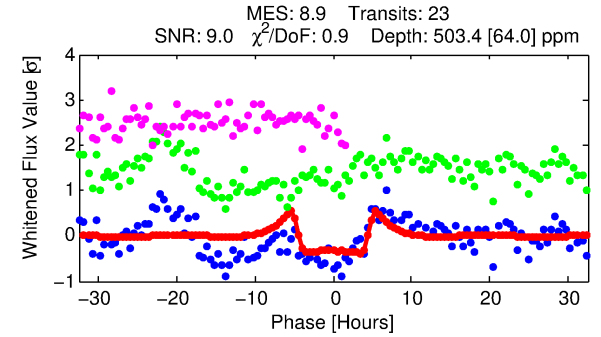
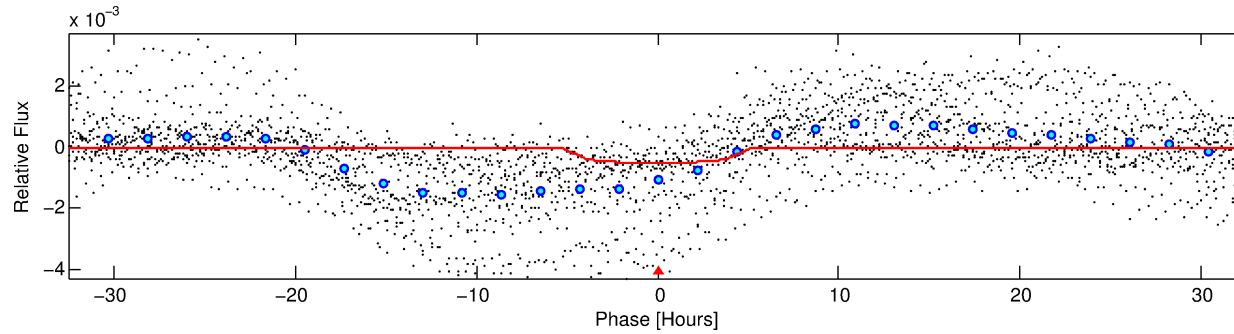
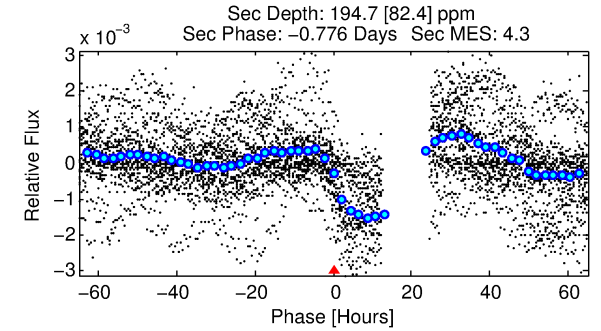
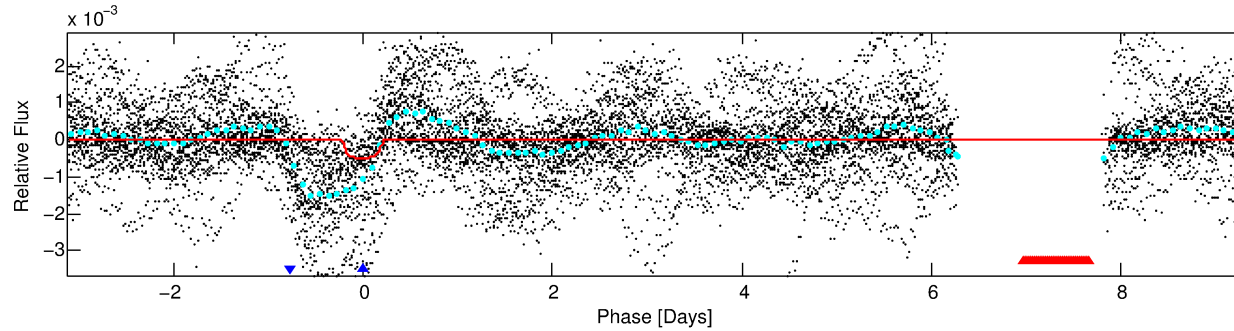
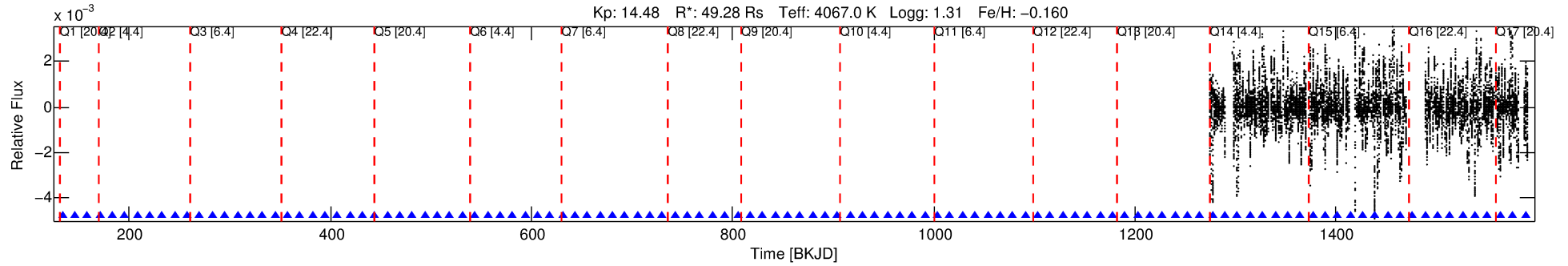
## Ephemeris Match Information For 005385750-02

| TCE (1)      | KIC     | Parent (2)   | Parent KIC | $P_1:P_2$ | Dist ( $''$ ) | $\Delta$ Row | $\Delta$ Col | $m_2$ | $m_1$ | $D_2/D_1$ | Mechanism  | Flag | $\sigma_P$ | $\sigma_T$ |
|--------------|---------|--------------|------------|-----------|---------------|--------------|--------------|-------|-------|-----------|------------|------|------------|------------|
| 005385750-02 | 5385750 | 005385838-03 | 5385838    | 3:1       | 89.4          | -6           | -22          | 12.97 | 14.49 | 0.09      | Direct-PRF | 1    | 1.42       | 2.87       |

**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 5385750 Candidate: 2 of 2 Period: 12.431 d



## DV Fit Results:

Period = 12.43143 [0.00056] d  
Epoch = 133.6457 [0.0580] BKJD  
Rp/R\* = 0.0267 [0.0026]  
a/R\* = 4.08 [0.99]  
b = 0.92 [0.04]  
Seff = N/A  
Teq = N/A  
Rp = 143.33 [41.07] Re  
a = N/A  
Ag = N/A  
Teff = N/A

## DV Diagnostic Results:

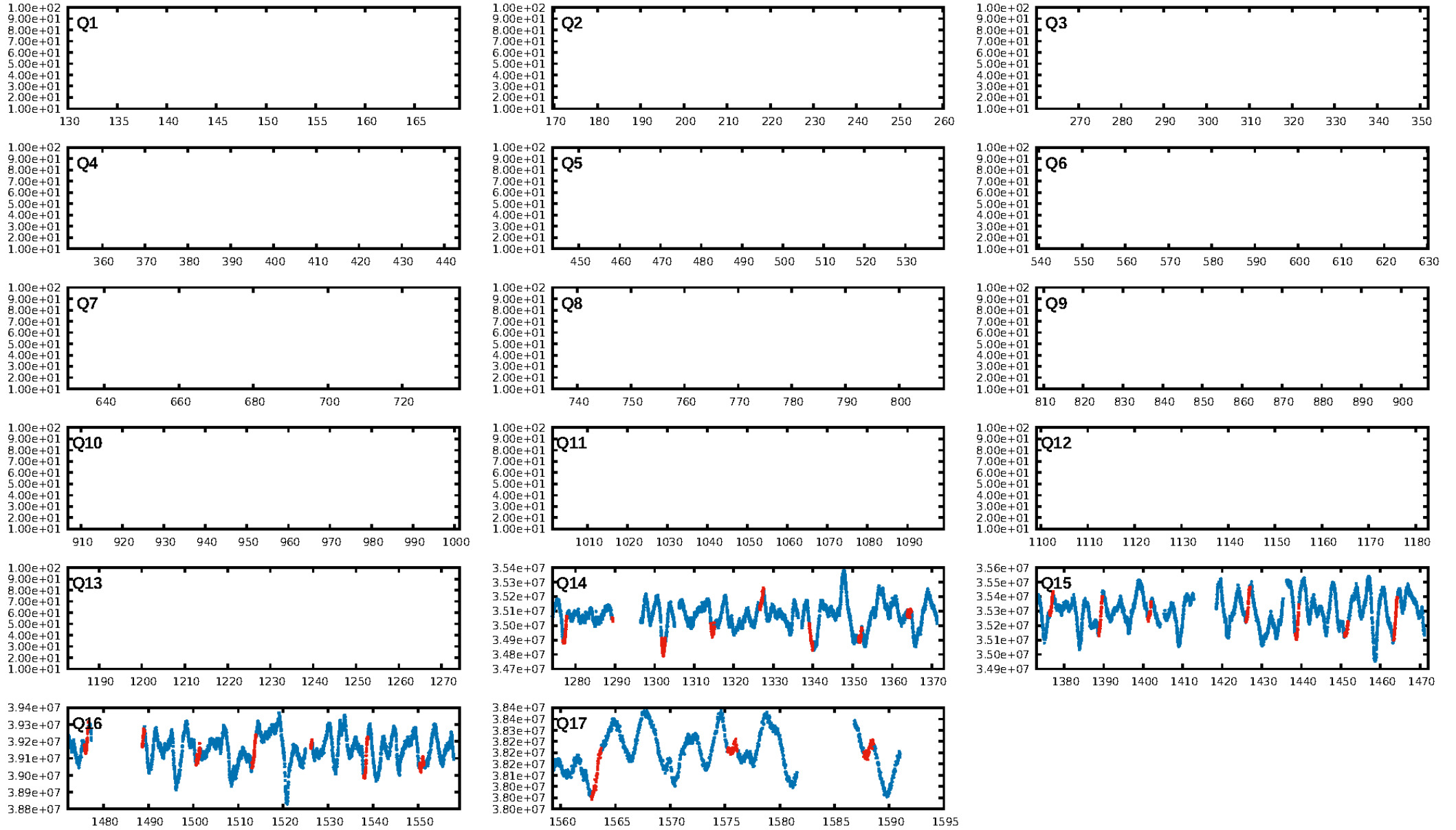
ShortPeriod-sig: 0.7% [0.01σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 95.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.93e-17  
RollingBand-fgt: 1.00 [20/20]  
GhostDiagnostic-chr: -0.1055  
Centroid-sig: 0.0%  
Centroid-so: 7.283 arcsec [6.66σ]  
OotOffset-rm: 4.354 arcsec [8.59σ]  
KicOffset-rm: 4.374 arcsec [7.53σ]  
OotOffset-st: 1/1/1/1 [4]  
KicOffset-st: 1/1/1/1 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 1.00 [4/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 10:17:48 Z

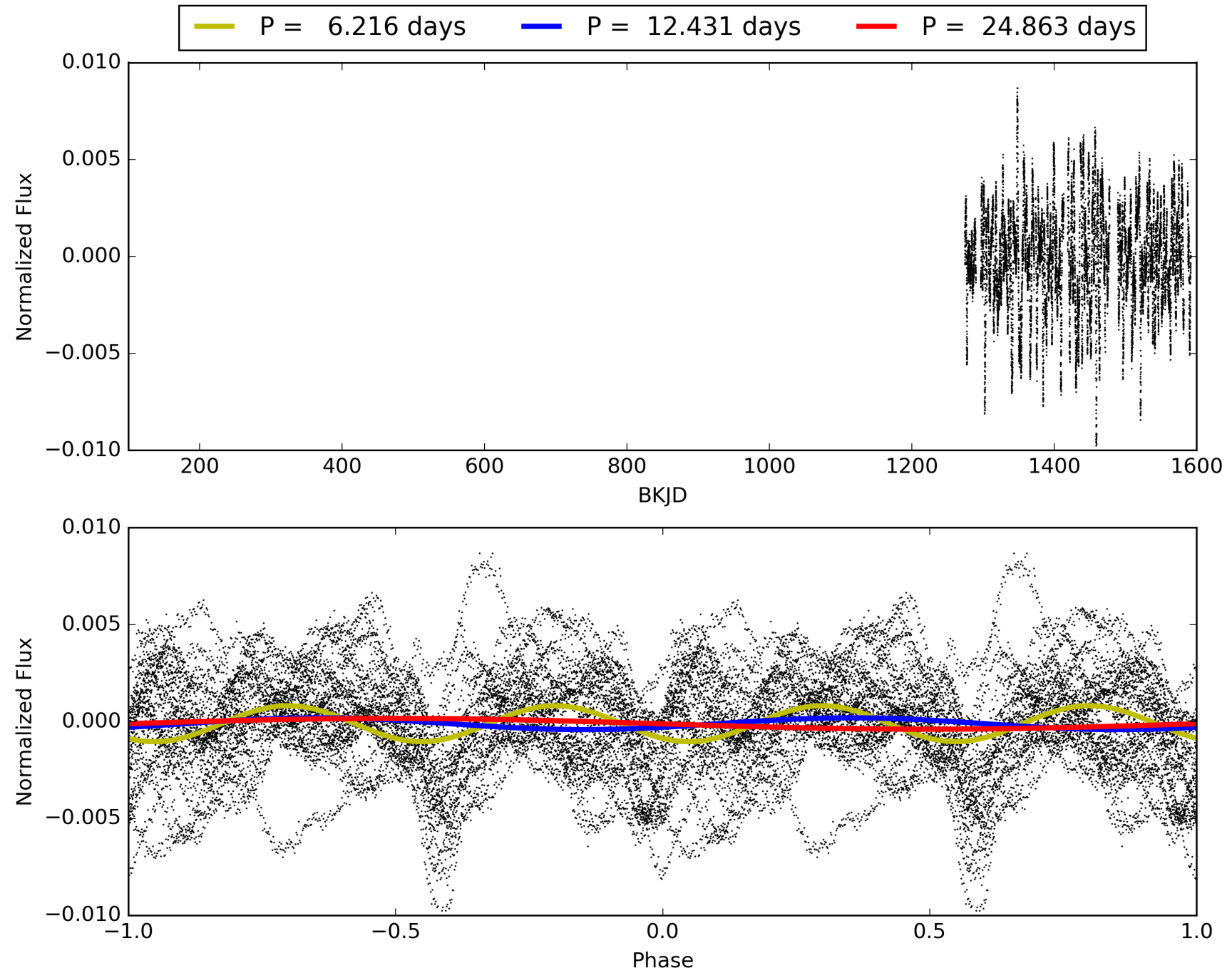
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 005385750-02, PDC Light Curves

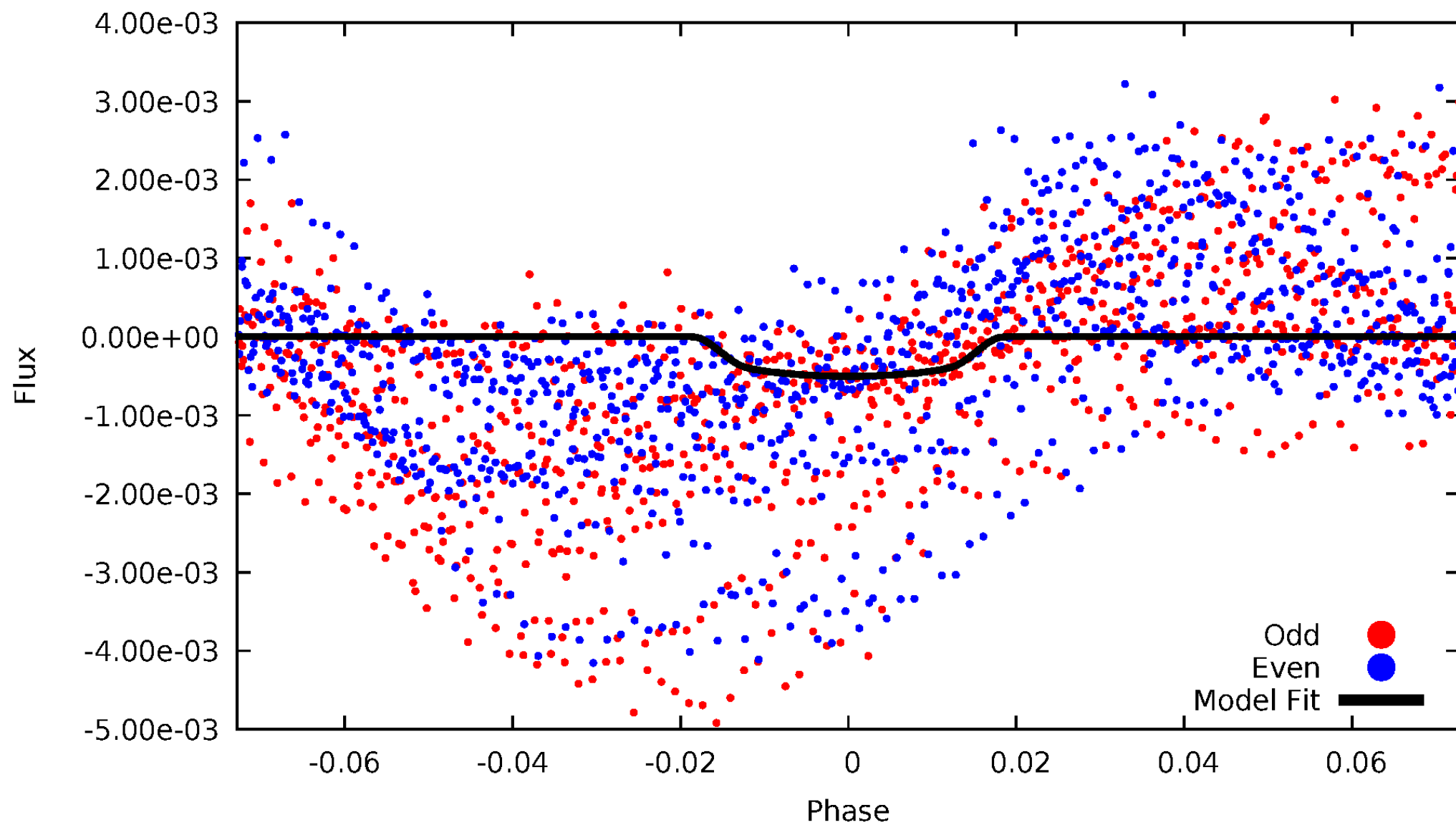


TCE 005385750-02



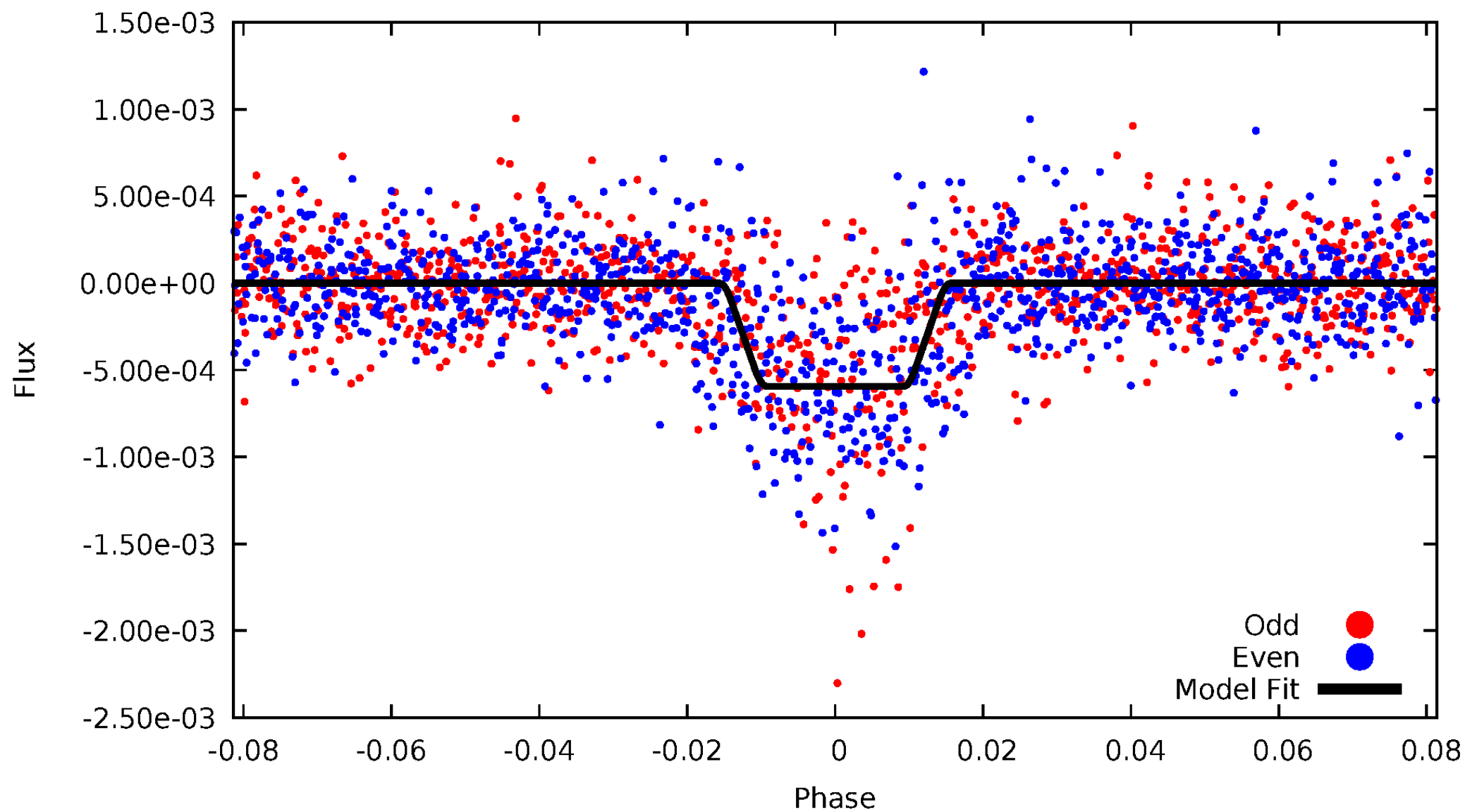
DV Odd/Even

TCE 005385750-02



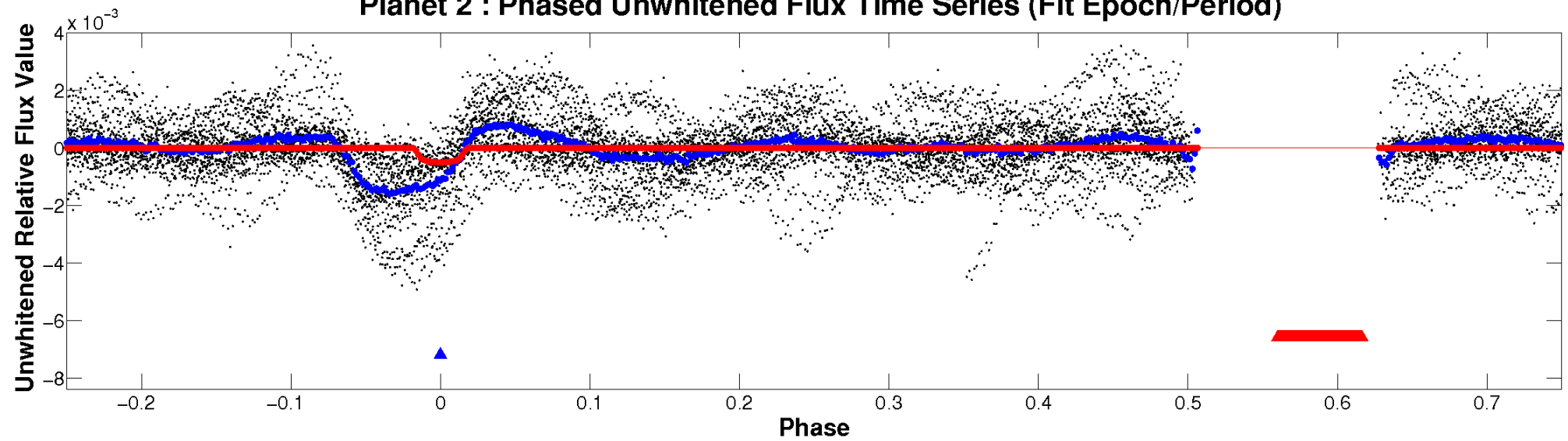
# ALT Odd/Even

TCE 005385750-02

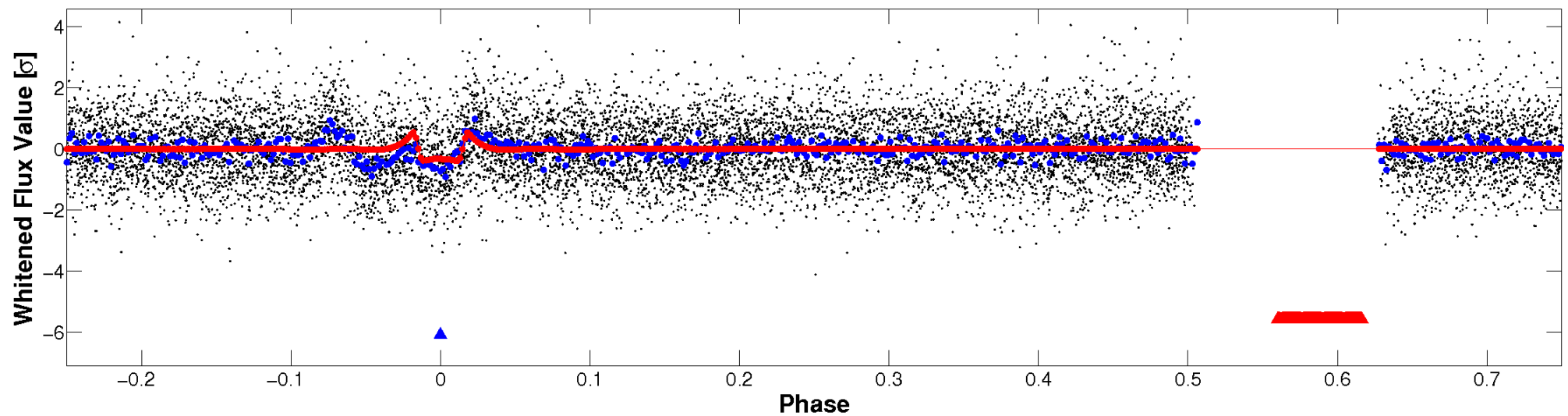


# Non-Whitened Vs. Whitened Light Curve

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

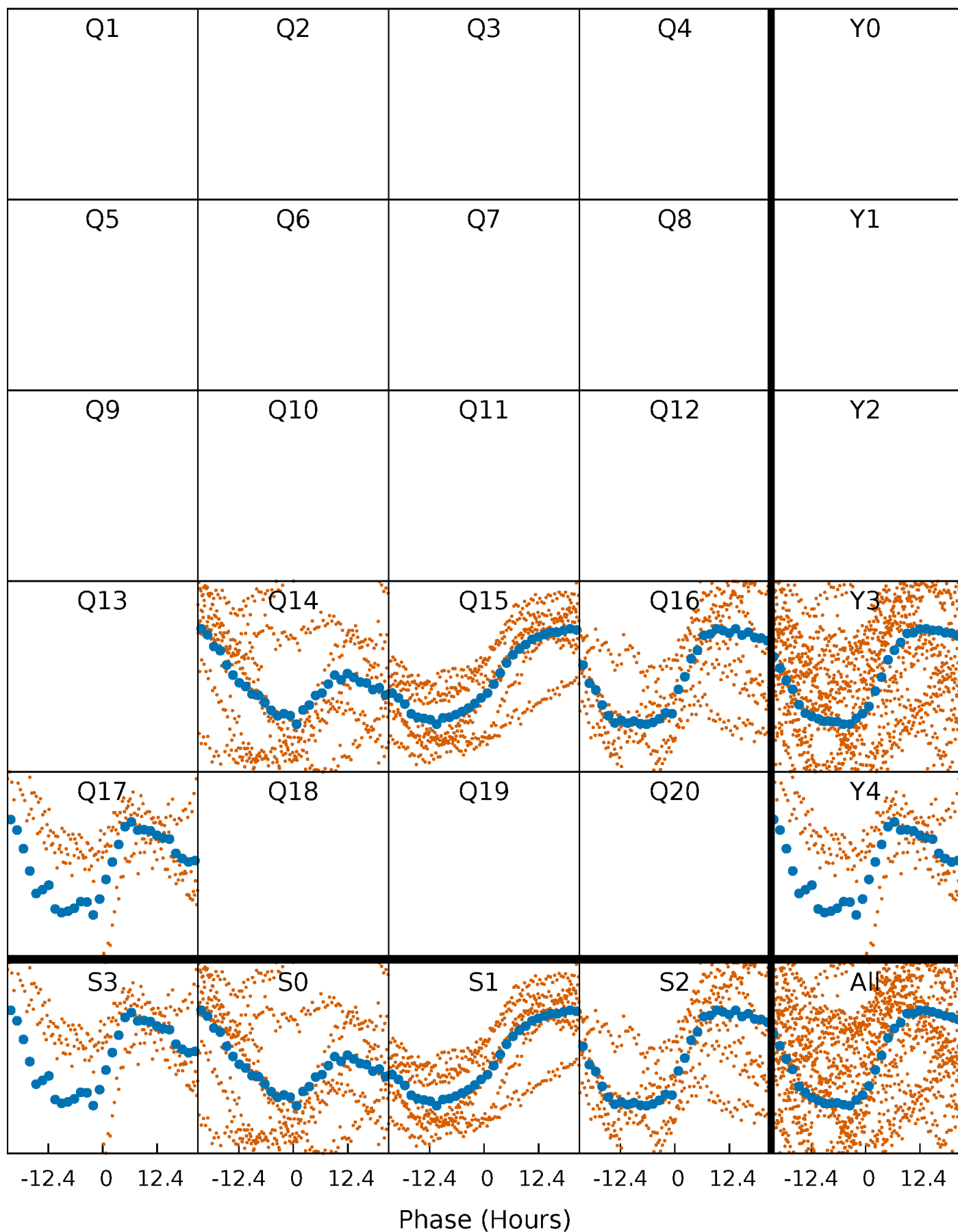


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



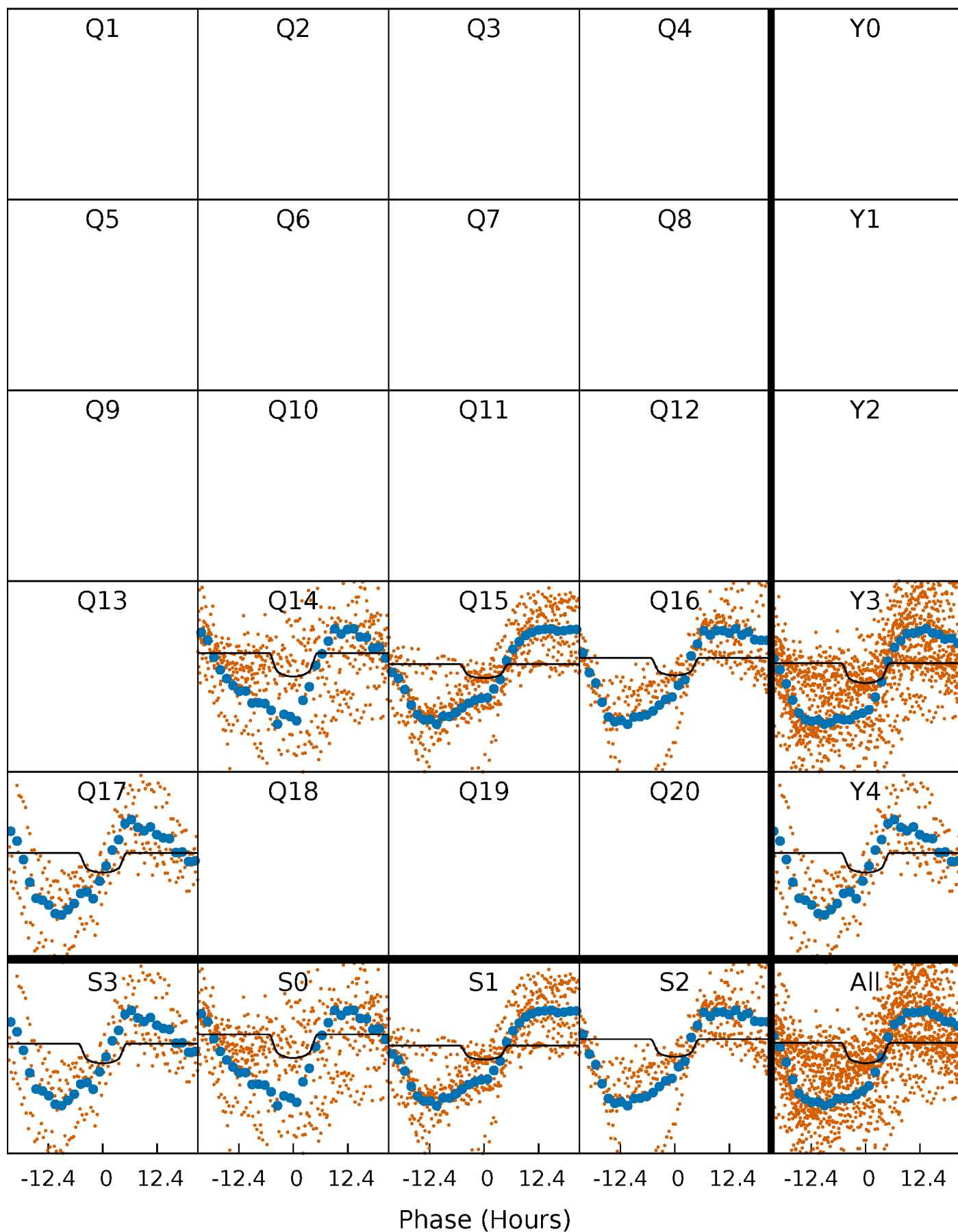
# PDC Quarter-Phased Transit Curves

TCE 005385750-02 P= 12.431433 Days  $T_0=133.645654$  (BKJD)



# DV Quarter-Phased Transit Curves

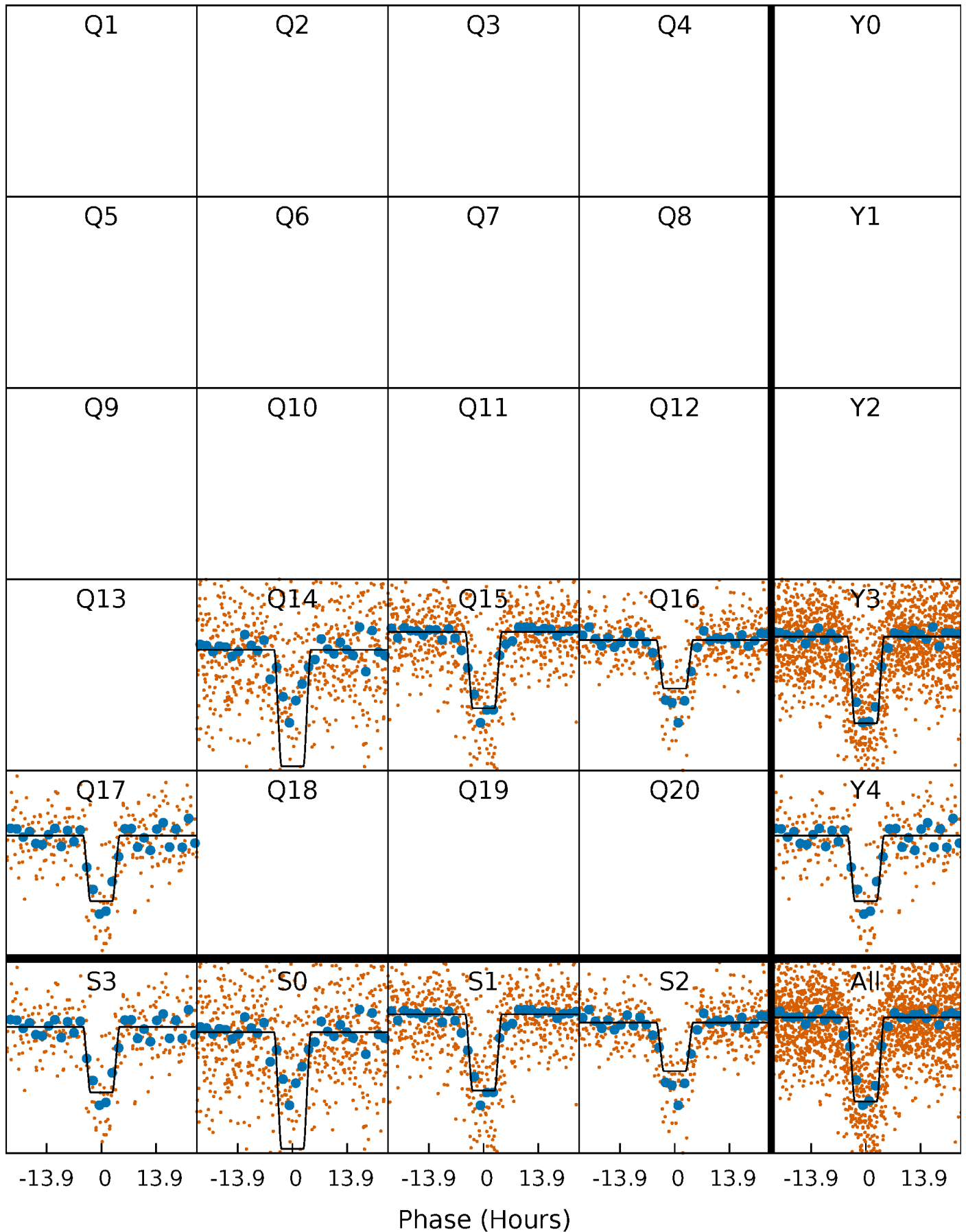
TCE 005385750-02   P= 12.431433 Days    $T_0=133.645654$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

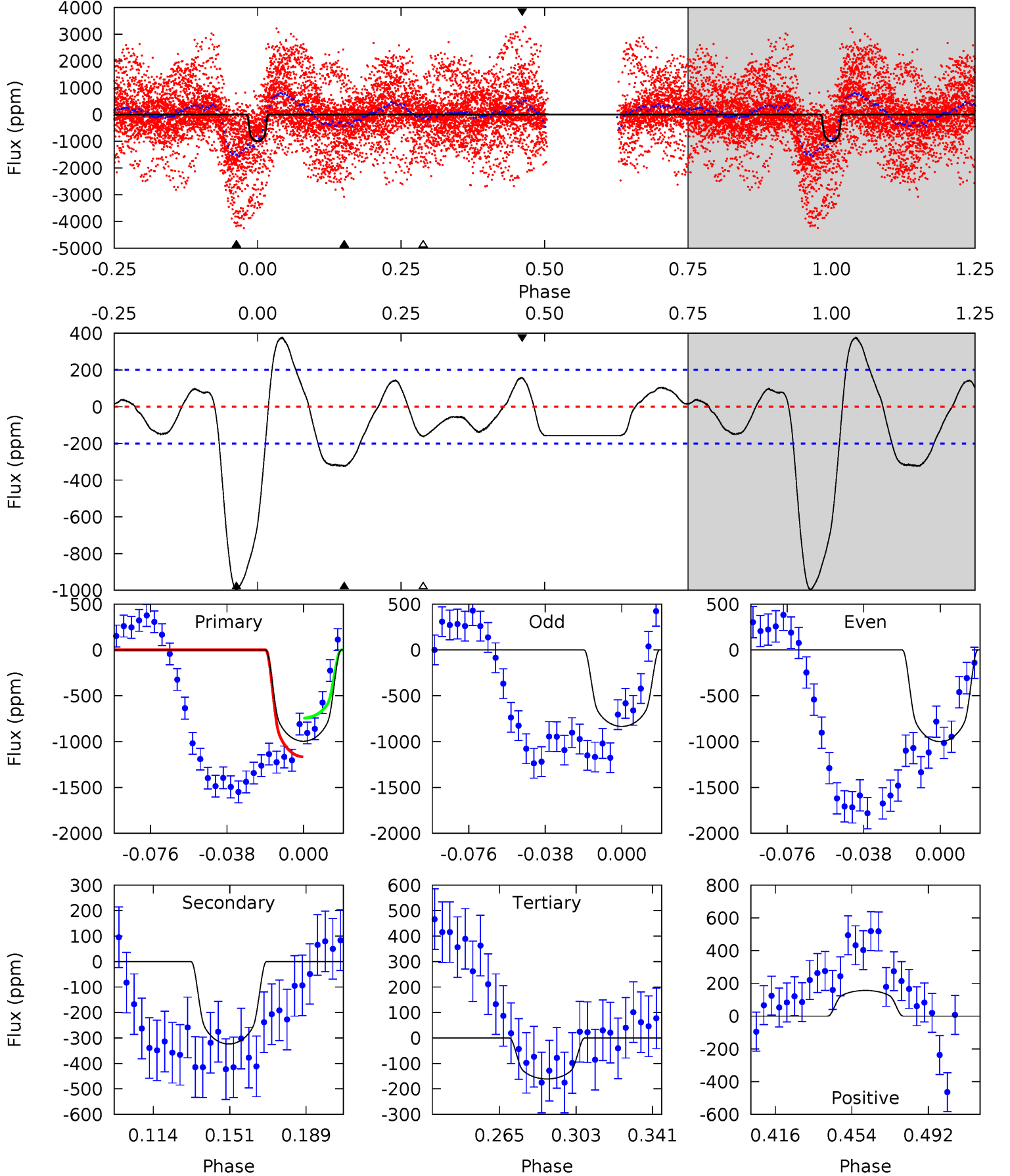
TCE 005385750-02 P= 12.426290 Days  $T_0=134.219014$  (BKJD)



# DV Model-Shift Uniqueness Test

005385750-02, P = 12.431433 Days, E = 133.645654 Days

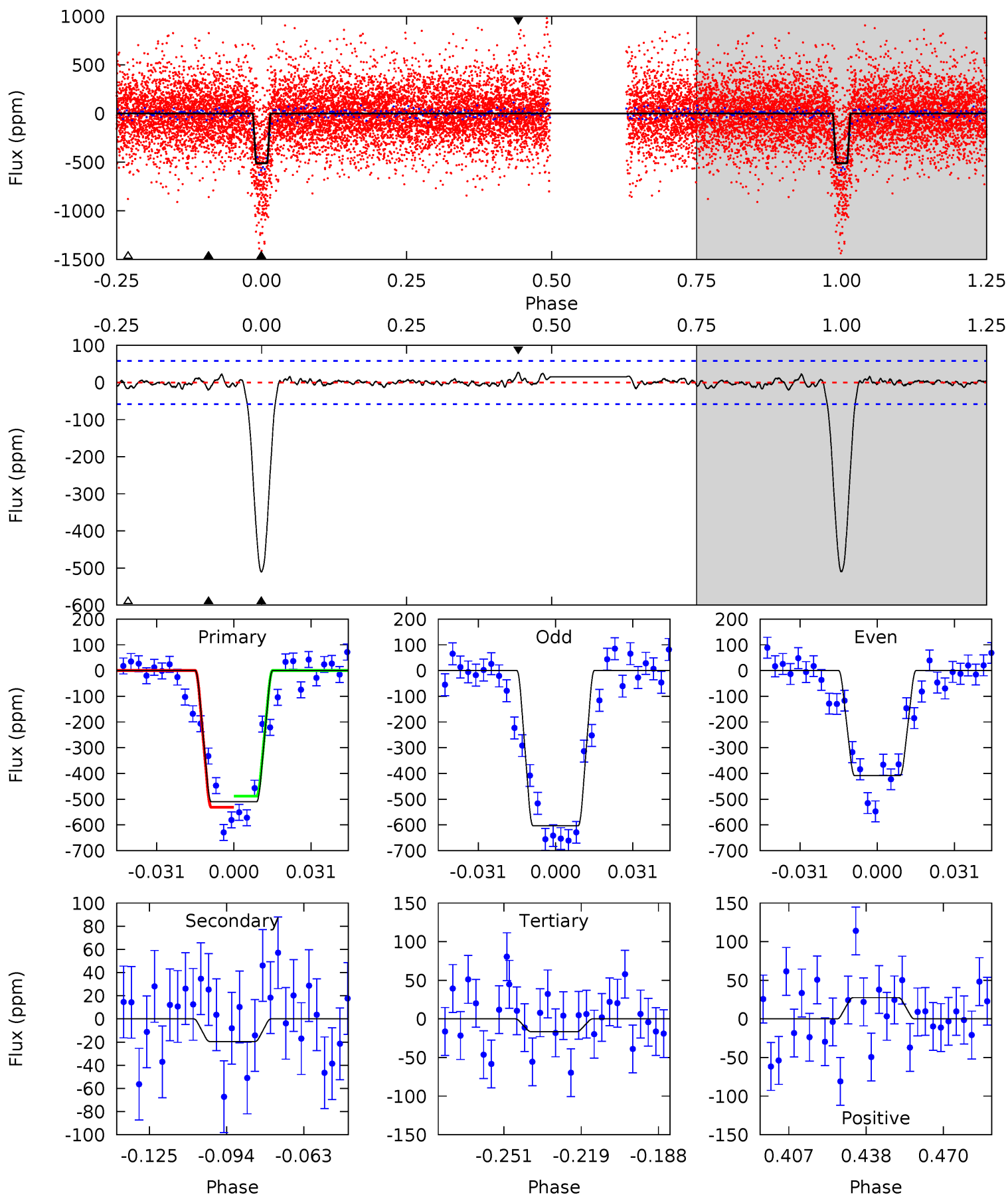
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 23.6 | 7.67 | 3.81 | 3.72 | 4.76            | 2.08            | 3.20             | 19.8    | 19.9    | 3.86    | 3.96    | 1.96    | 1.84 | 0.27  | 5.13 |



# Alt Model-Shift Uniqueness Test

005385750-02, P = 12.426290 Days, E = 134.219014 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 42.0 | 1.61 | 1.37 | 2.27 | 4.80            | 2.15            | 0.56             | 40.7    | 39.8    | 0.24    | -0.66   | 8.10    | 1.11 | 0.05  | 1.80 |



### Stellar Parameters For KIC 005385750

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )         | $M(M_{\odot})$            | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|---------------------|---------------------------|----------------------------|-----------------------------|---------------------------|---|
|        | $4067^{+65}_{-65}$  | $1.306^{+0.144}_{-0.096}$ | $-0.160^{+0.150}_{-0.150}$ | $49.278^{+5.318}_{-13.294}$ | $1.790^{+0.032}_{-0.612}$ | $0.000^{+0.000}_{-0.000}$                     |
|        | +2%/-2%             | +11%/-7%                  | +94%/-94%                  | +11%/-27%                   | +2%/-34%                  | +86%/-25%                                     |
| Source | SPE74               | SPE74                     | SPE74                      | DSEP                        |                           |   |

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

### Secondary Eclipse Parameters for KIC 005385750-02 / KOI

| Detrend | Depth (ppm)   | $R_p$ ( $R_{\oplus}$ )     | $T_{max}$ (K)        | $T_{obs}$ (K)         | $A_{obs}$                 |
|---------|---------------|----------------------------|----------------------|-----------------------|---------------------------|
| DV      | $-324 \pm 42$ | $139.19^{+21.08}_{-22.89}$ | $4933^{+190}_{-278}$ | $-3609^{+346}_{-208}$ | $0.144^{+0.059}_{-0.036}$ |
| Alt.    | $-20 \pm 12$  | $127.81^{+18.56}_{-21.13}$ | $4930^{+197}_{-263}$ | $-4019^{+169}_{-133}$ | $0.010^{+0.008}_{-0.006}$ |

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

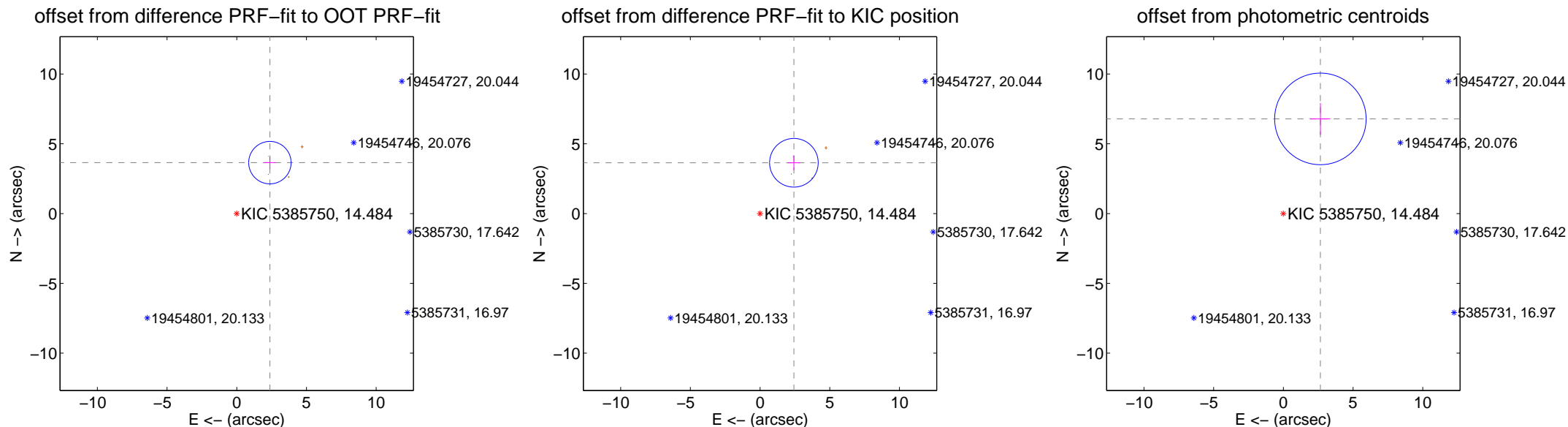
## DV Centroid Data

Supplemental centroid analysis for 005385750-02. Kepler magnitude: 14.48. Transit SNR 9.03

There are 1 quarters with good PRF difference image offsets

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

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | 4.354 $\pm$ 0.507  | 8.59                | -2.376 $\pm$ 0.418 | 3.649 $\pm$ 0.439 |
| PRF-fit source offset from KIC position | 4.374 $\pm$ 0.581  | 7.53                | -2.426 $\pm$ 0.443 | 3.639 $\pm$ 0.523 |
| photometric centroid source offset      | 7.28 $\pm$ 1.09    | 6.66                | -2.65 $\pm$ 0.72   | 6.78 $\pm$ 1.14   |

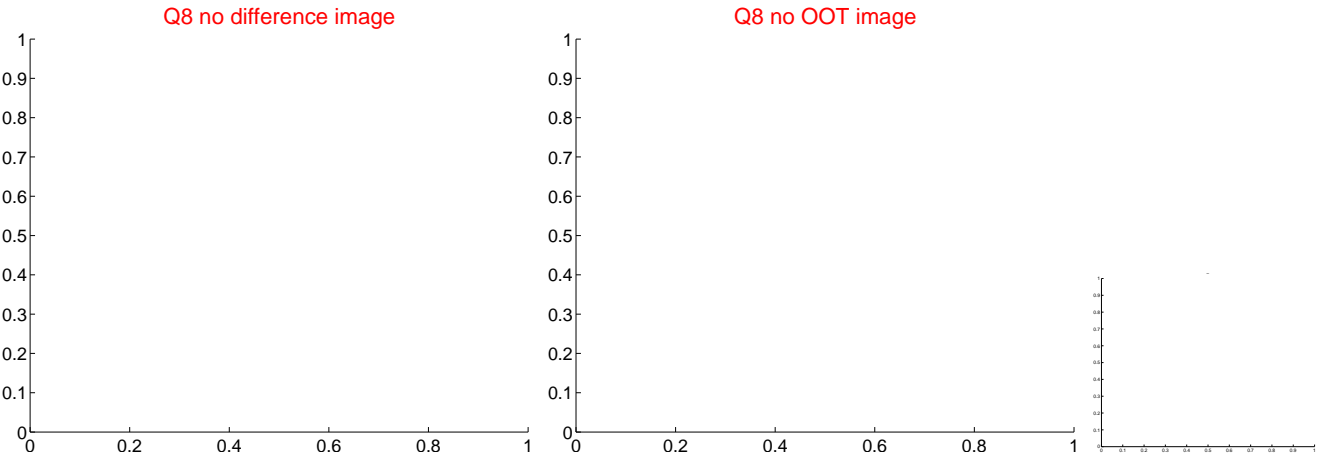
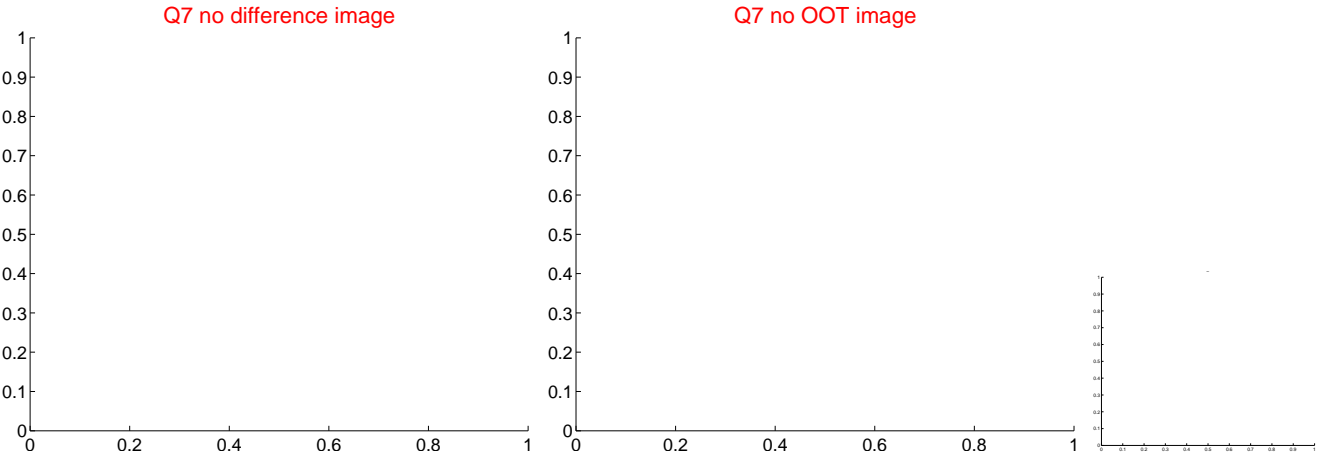
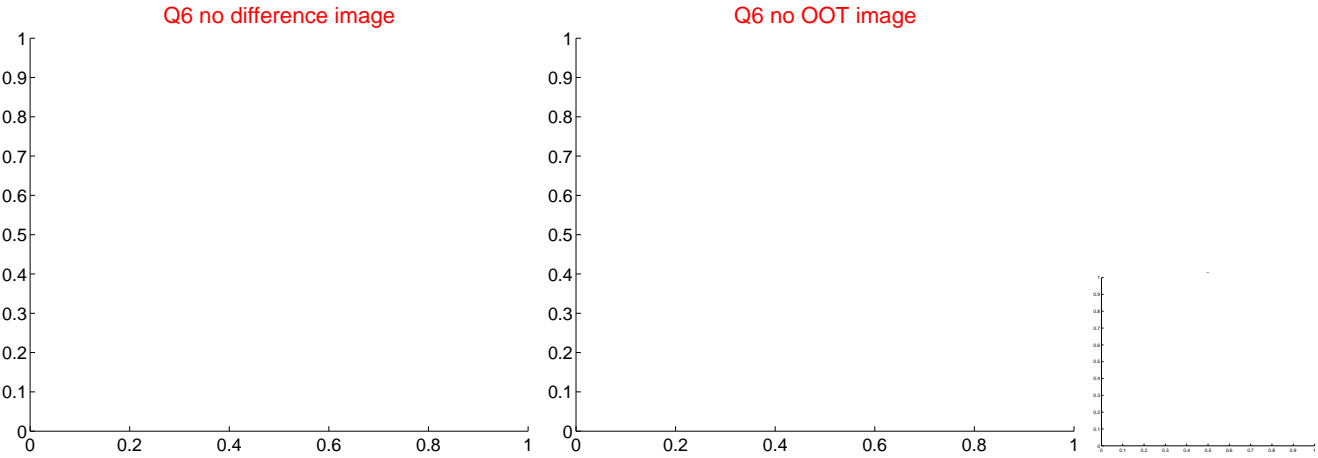
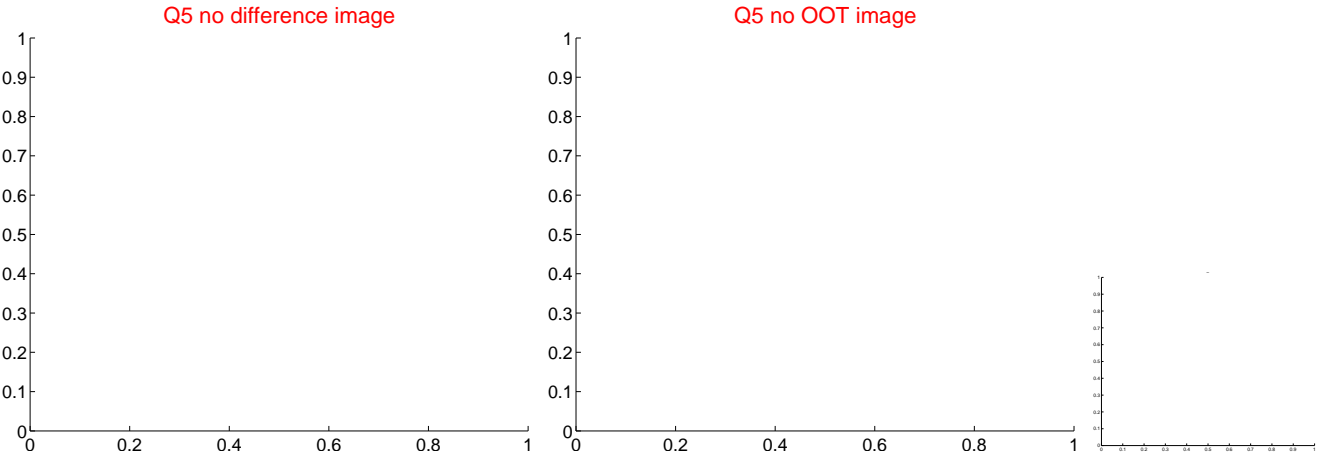


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

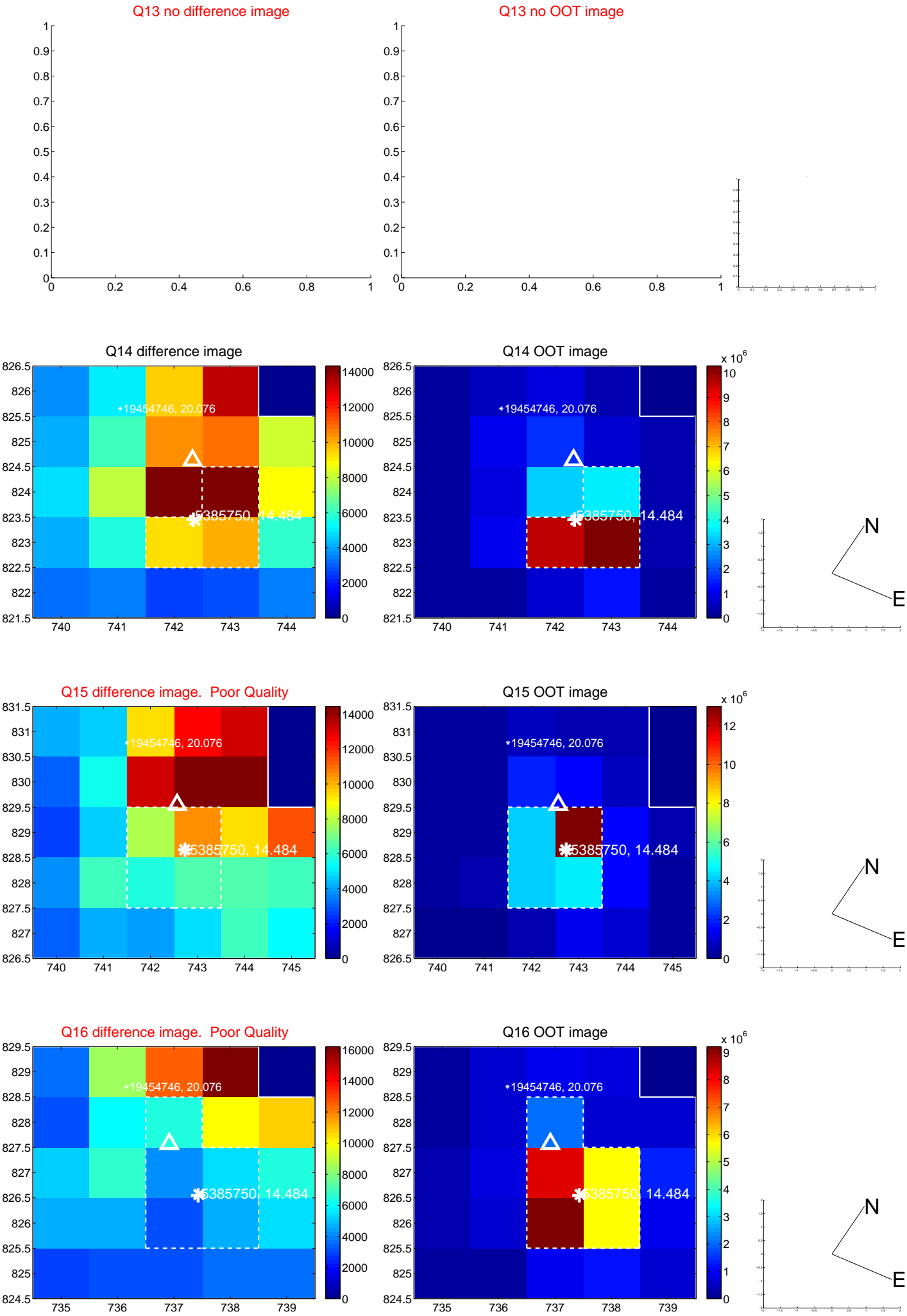




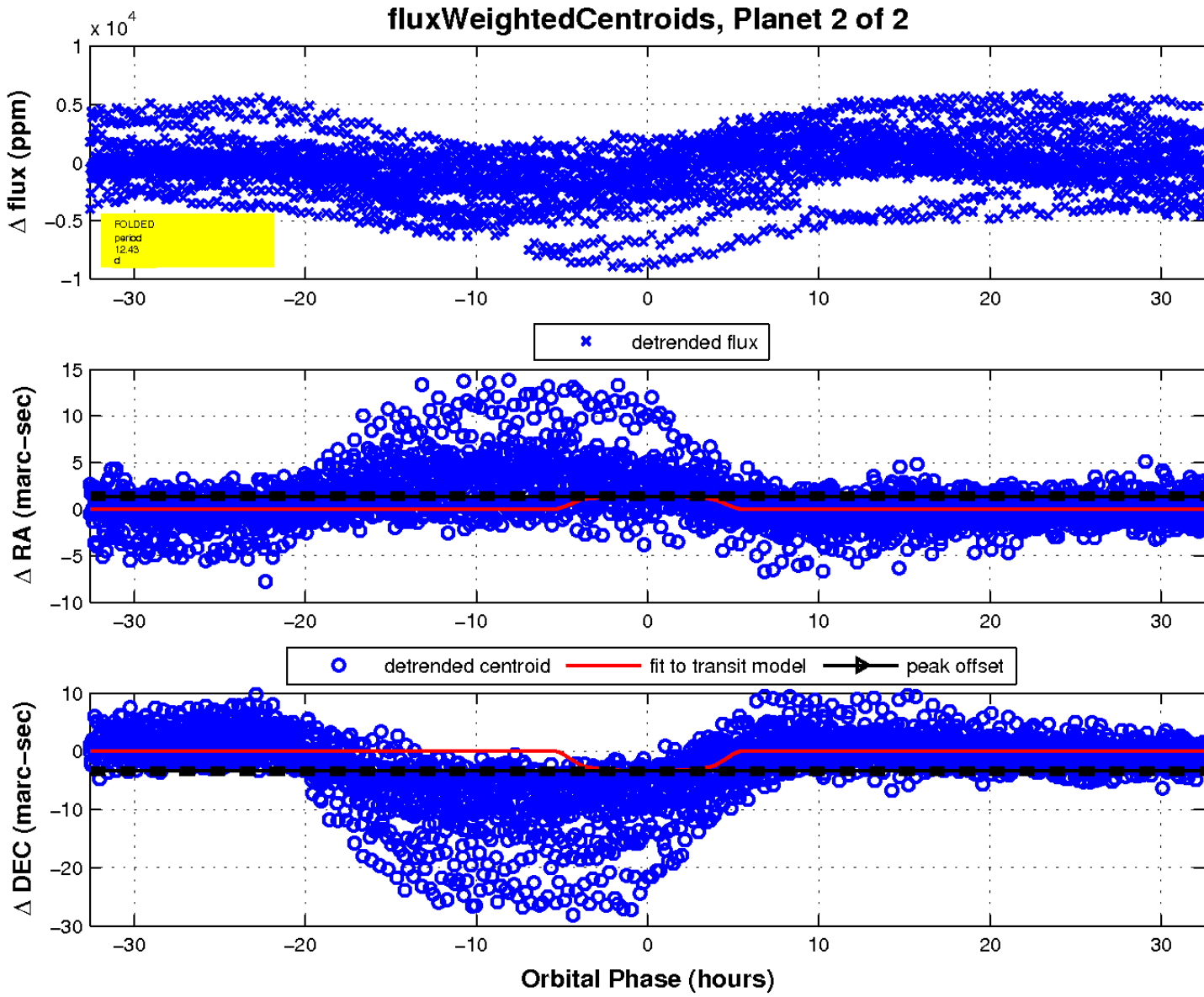
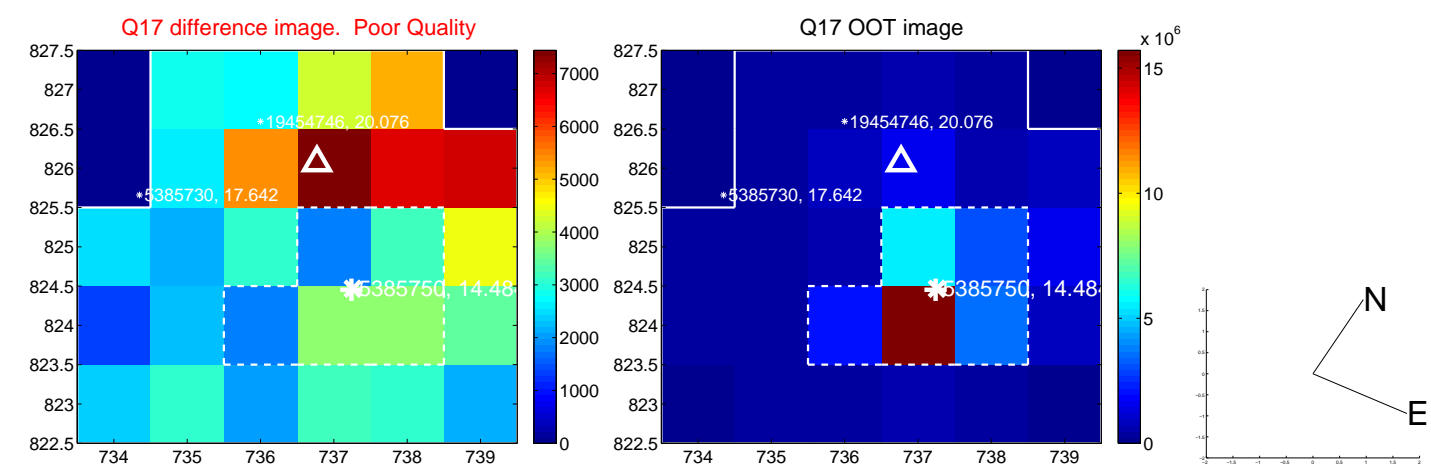
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

