

# KIC 005023948

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|--------|-----------------------------|-----------------|------------------------|------------------------|
| 005023948-01 | OBS      | 3570.01 | 1.824667      | 132.876915   | 179971.7    | 4.235            | 8903.3 | 4855.6 | 0.94                        | 6413            | 47.63                  | 1884.90                |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005023948-01 | OBS      | FP   | 0.00  | 0 | 1 | 0 | 0 | DEPTH_ODDEVEN_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—DEEP_V_SHAPED |

**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.

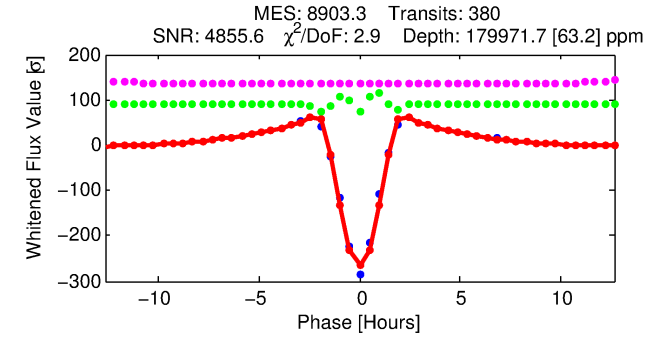
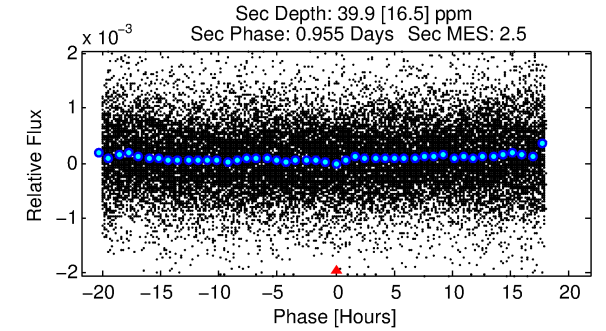
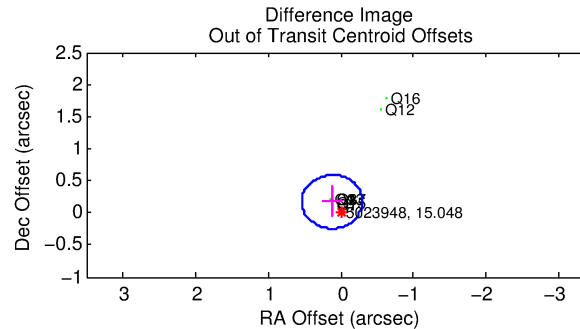
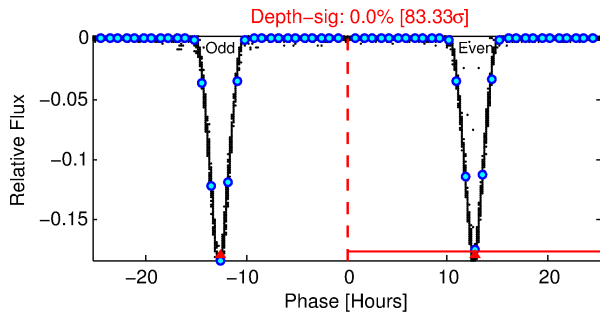
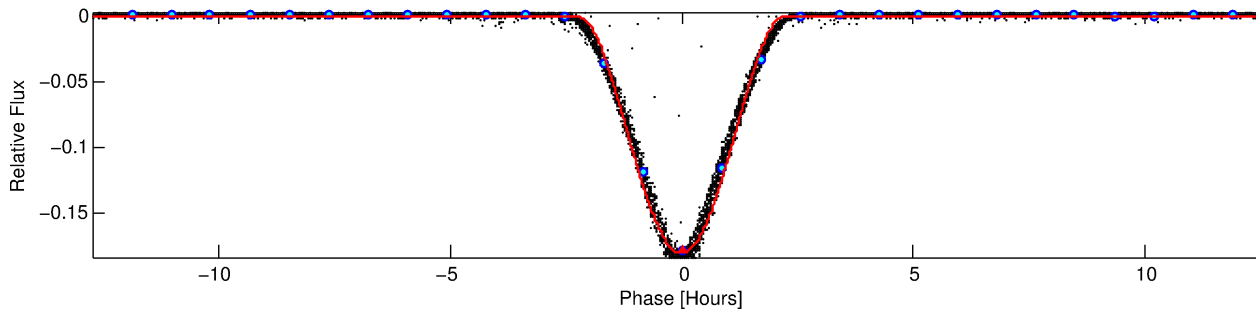
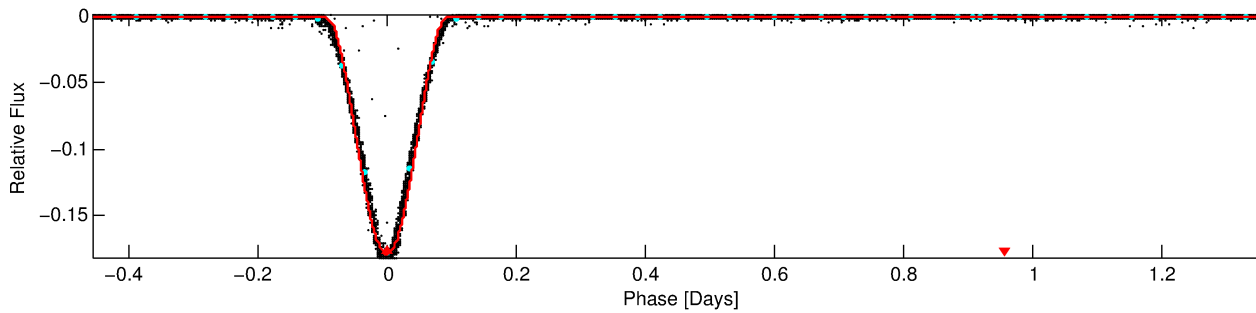
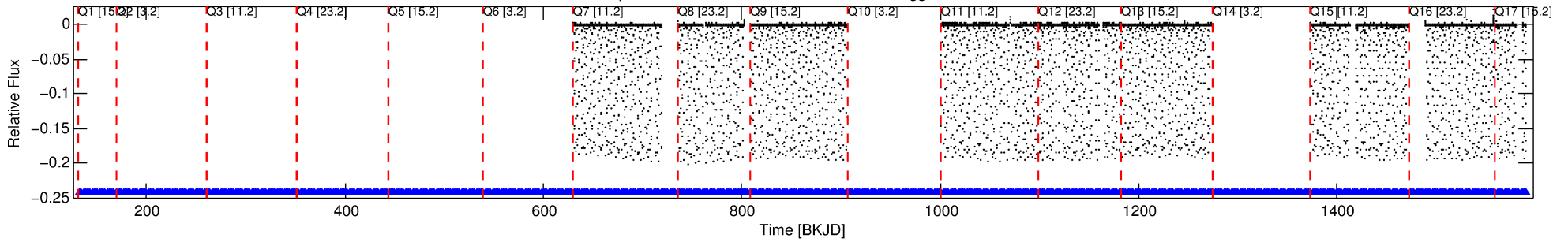
## Ephemeris Match Information For 005023948-01

No Significant Match Found

# DV One-Page Summary

KIC: 5023948 Candidate: 1 of 1 Period: 1.825 d  
KOI: K03570.01 Corr: 0.983

Kp: 15.05 R\*: 0.94 Rs Teff: 6413.0 K Logg: 4.37 Fe/H: -1.540



## DV Fit Results:

Period = 1.82467 [0.00000] d  
Epoch = 132.8769 [0.0000] BKJD  
Rp/R\* = 0.4638 [0.0020]  
a/R\* = 4.34 [0.00]  
b = 0.71 [0.00]  
Seff = 1884.90 [679.37]  
Teff = 1680 [151] K  
Rp = 47.63 [10.07] Re  
a = 0.0267 [0.0055] AU  
Ag = 0.01 [0.00] [-270.39σ]  
Teffp = 749 [81] K [-5.42σ]

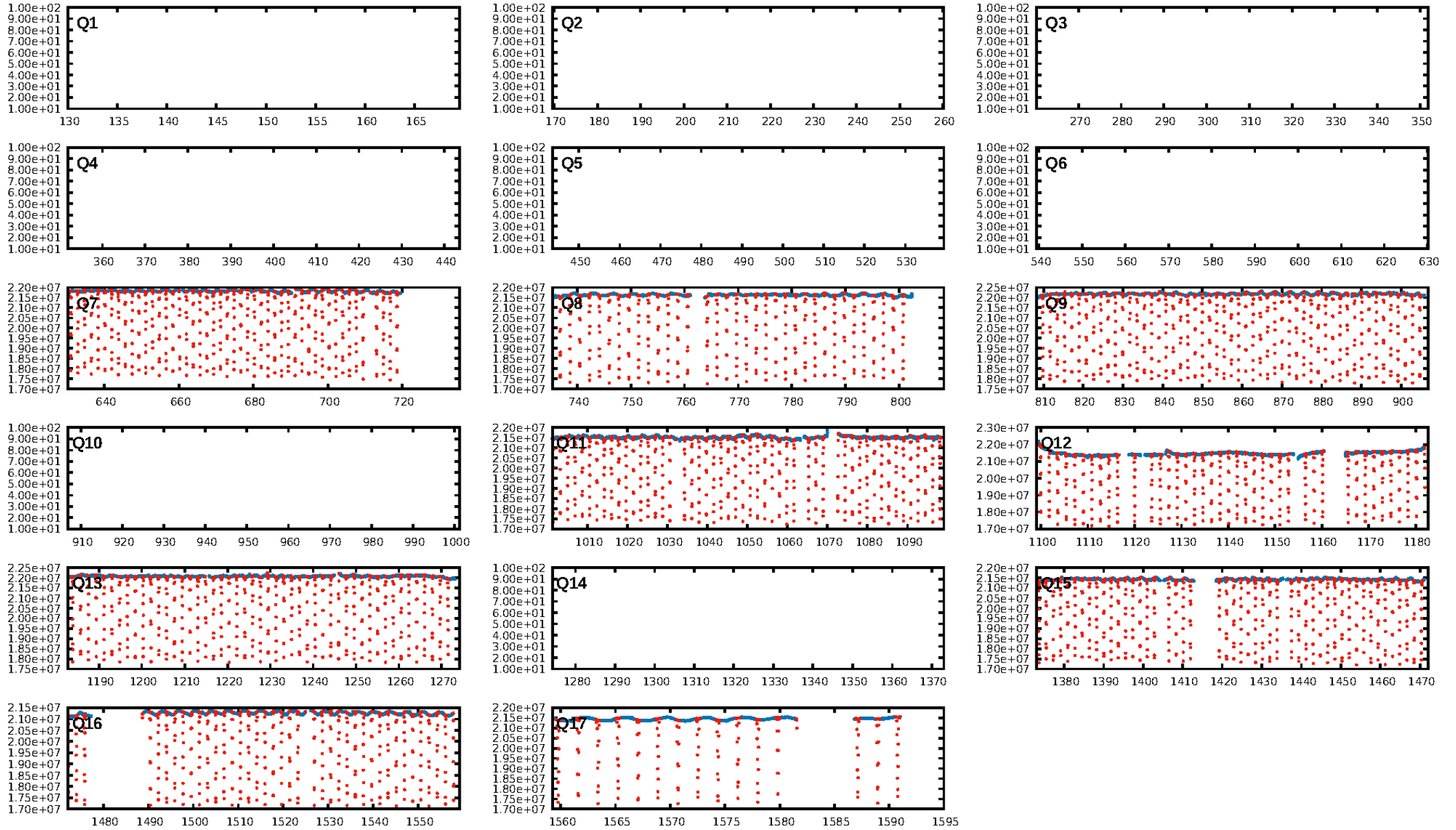
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-figt: 1.00 [364/364]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: 1.221 arcsec [1178.35σ]  
OotOffset-rm: 0.210 arcsec [1.51σ]  
KicOffset-rm: 0.134 arcsec [1.97σ]  
OotOffset-st: 0/3/3 [9]  
KicOffset-st: 0/3/3 [9]  
DiffImageQuality-fgm: 1.00 [9/9]  
DiffImageOverlap-fno: 1.00 [9/9]

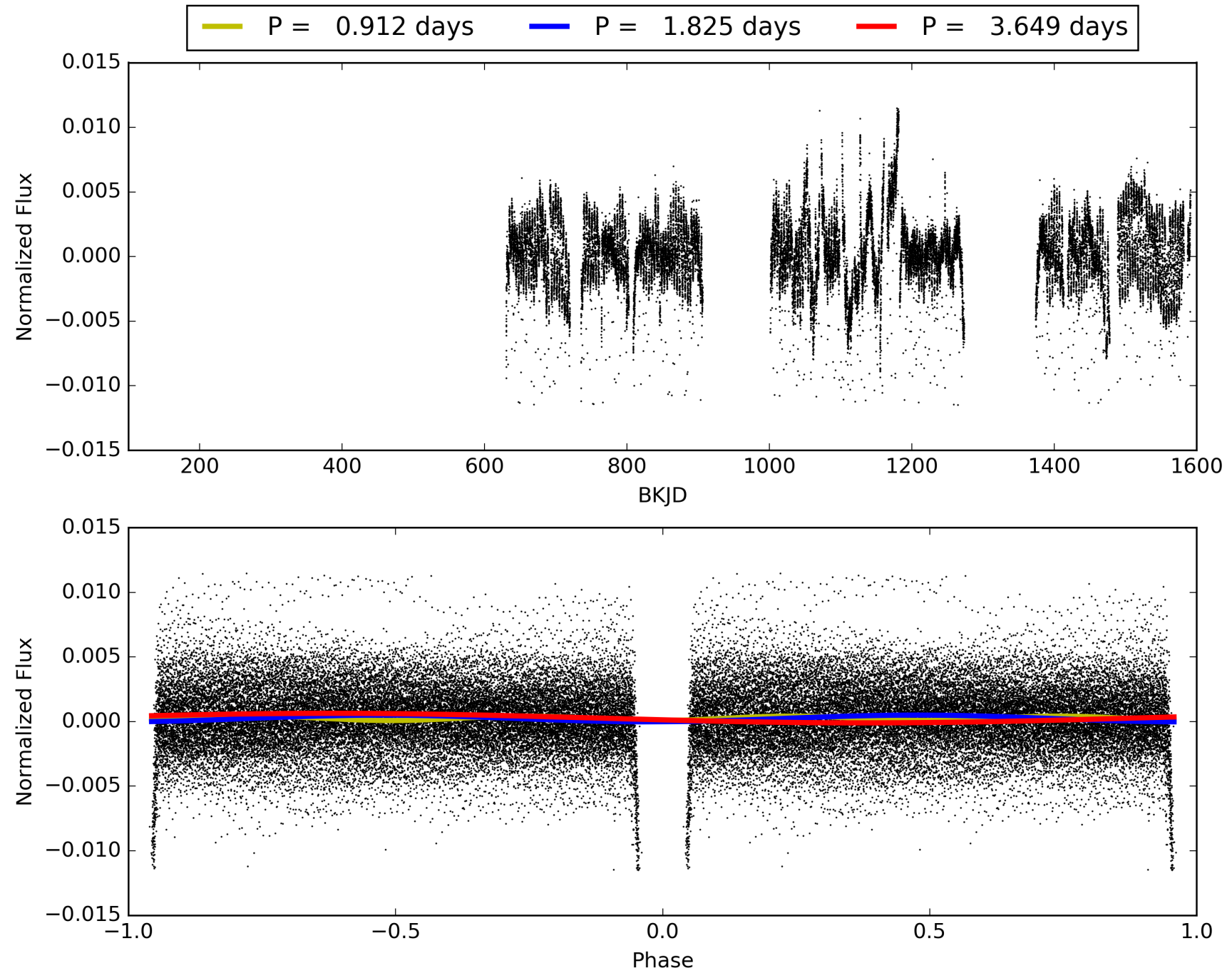
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:39:31 Z

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

# TCE 005023948-01, PDC Light Curves

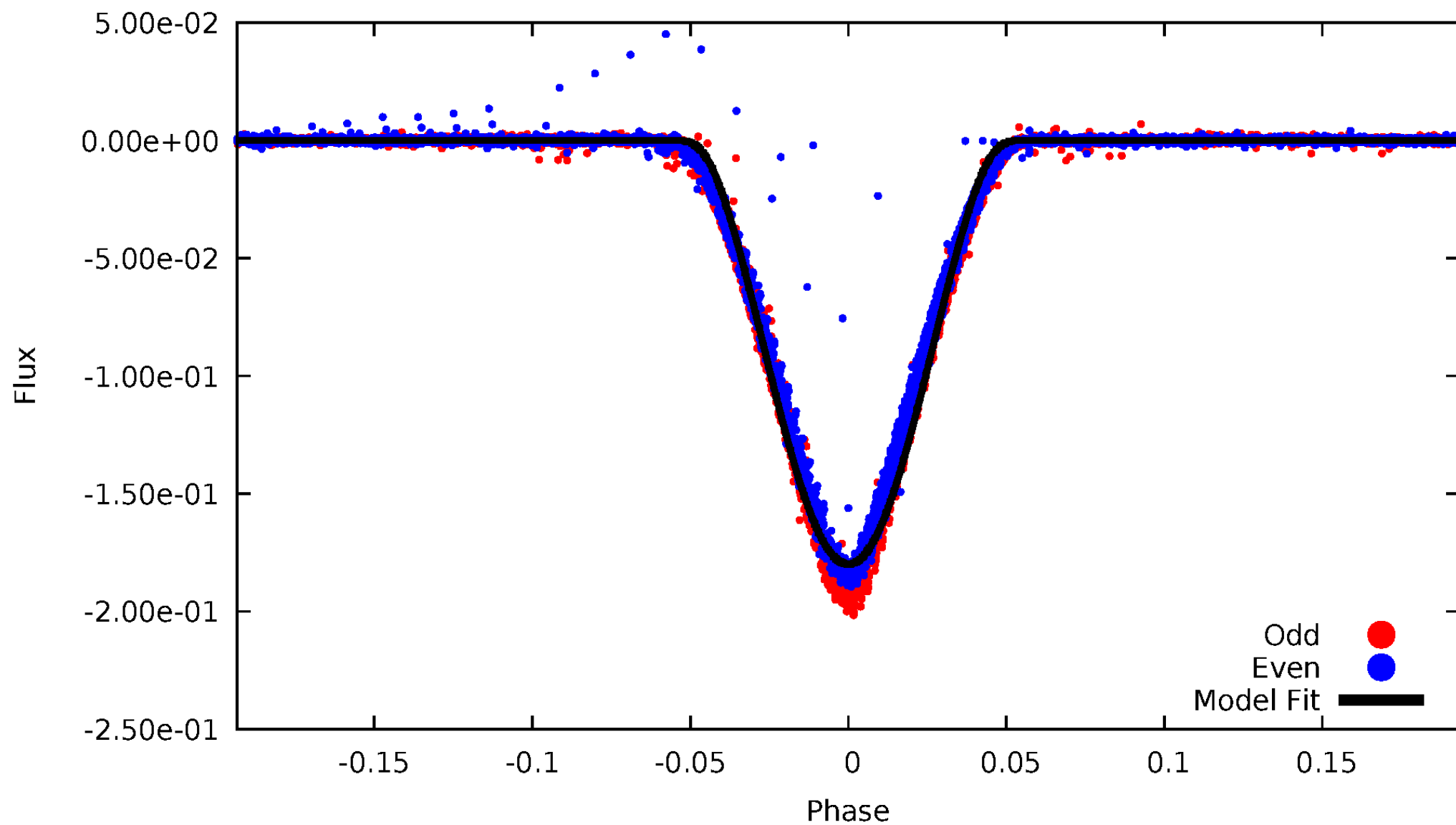


TCE 005023948-01



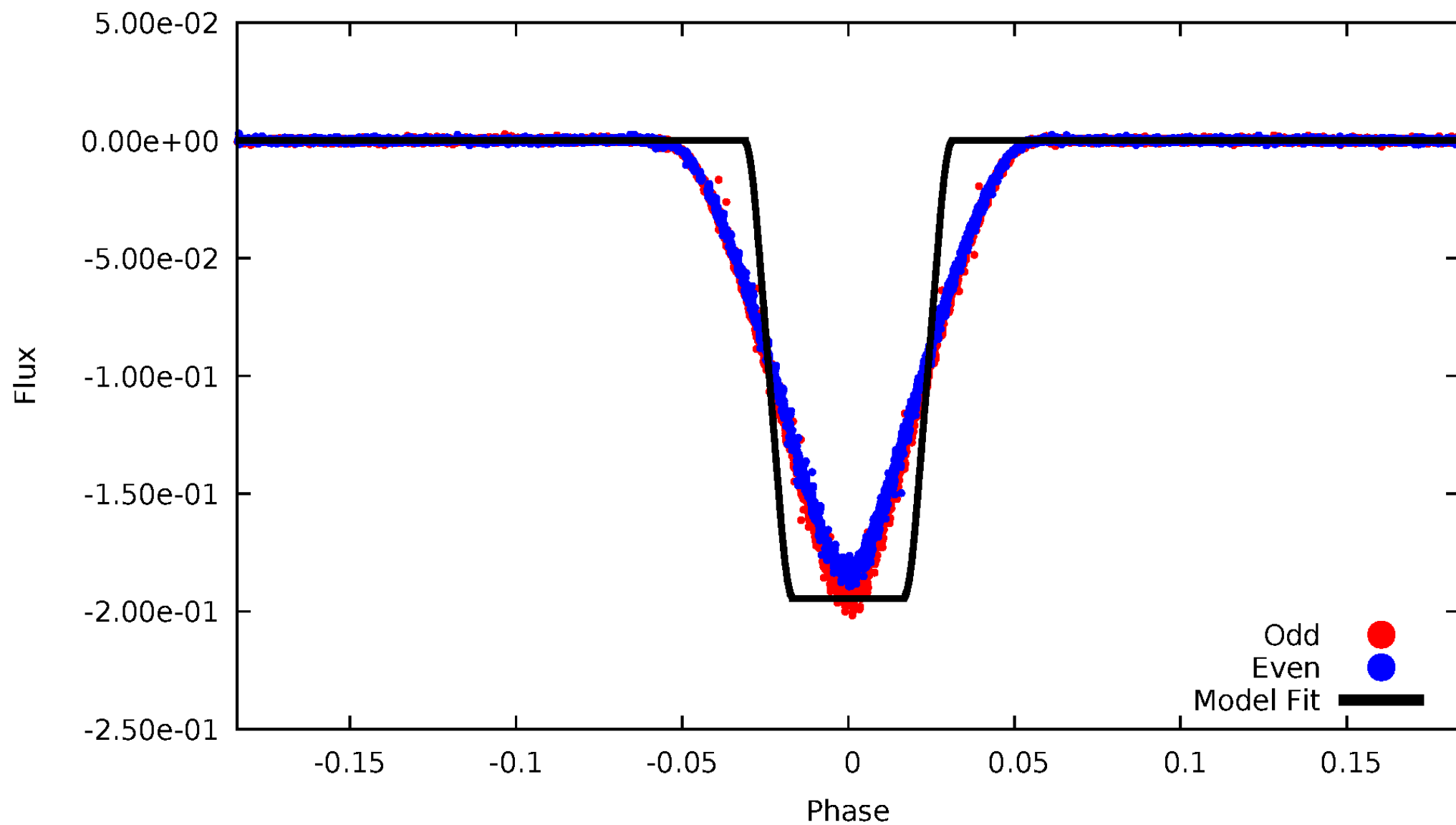
# DV Odd/Even

TCE 005023948-01



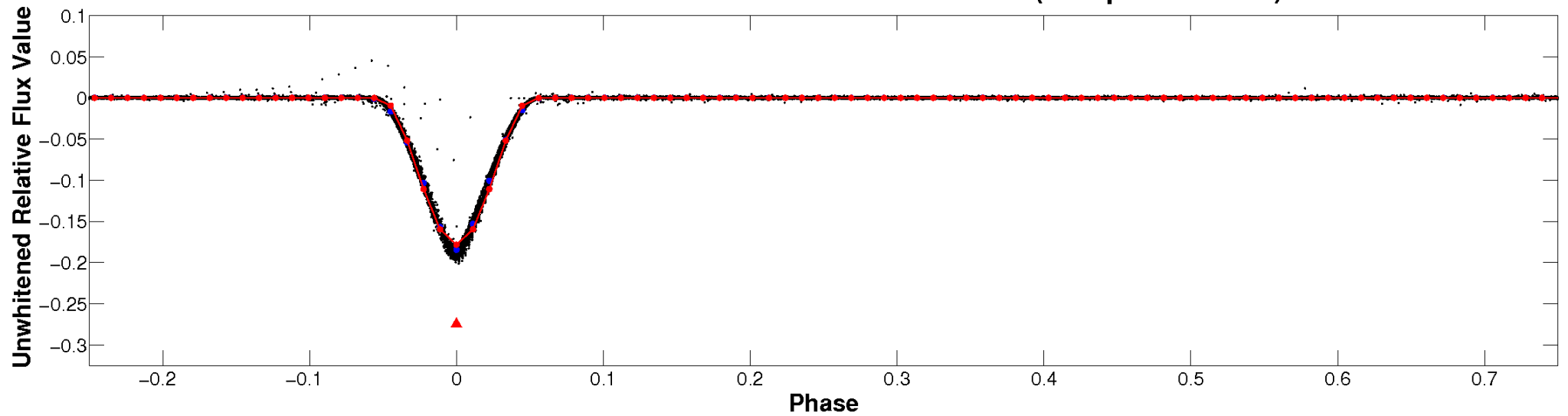
# ALT Odd/Even

TCE 005023948-01

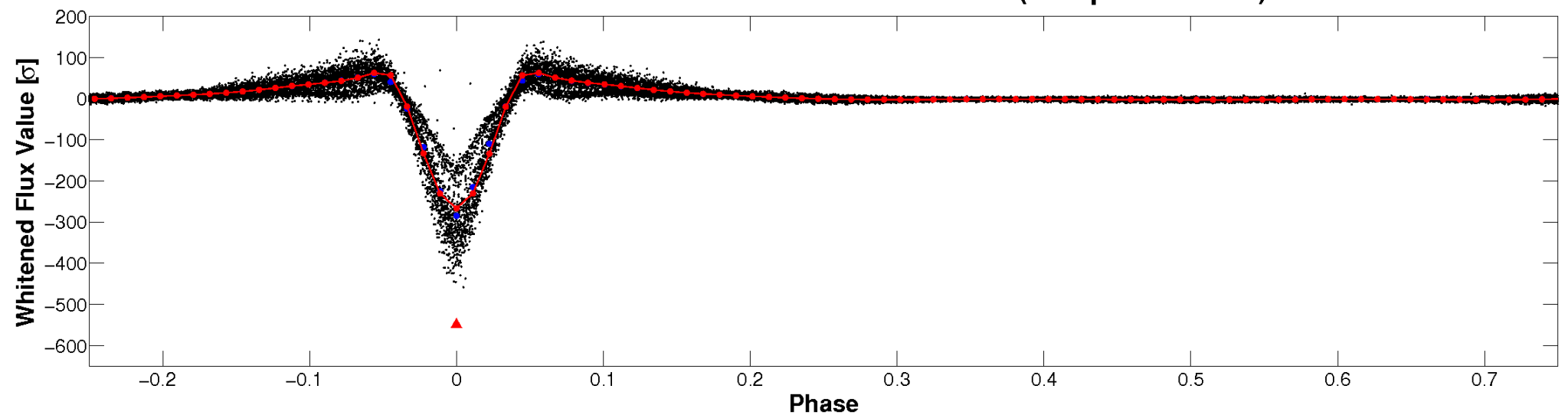


# Non-Whitened Vs. Whitened Light Curve

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

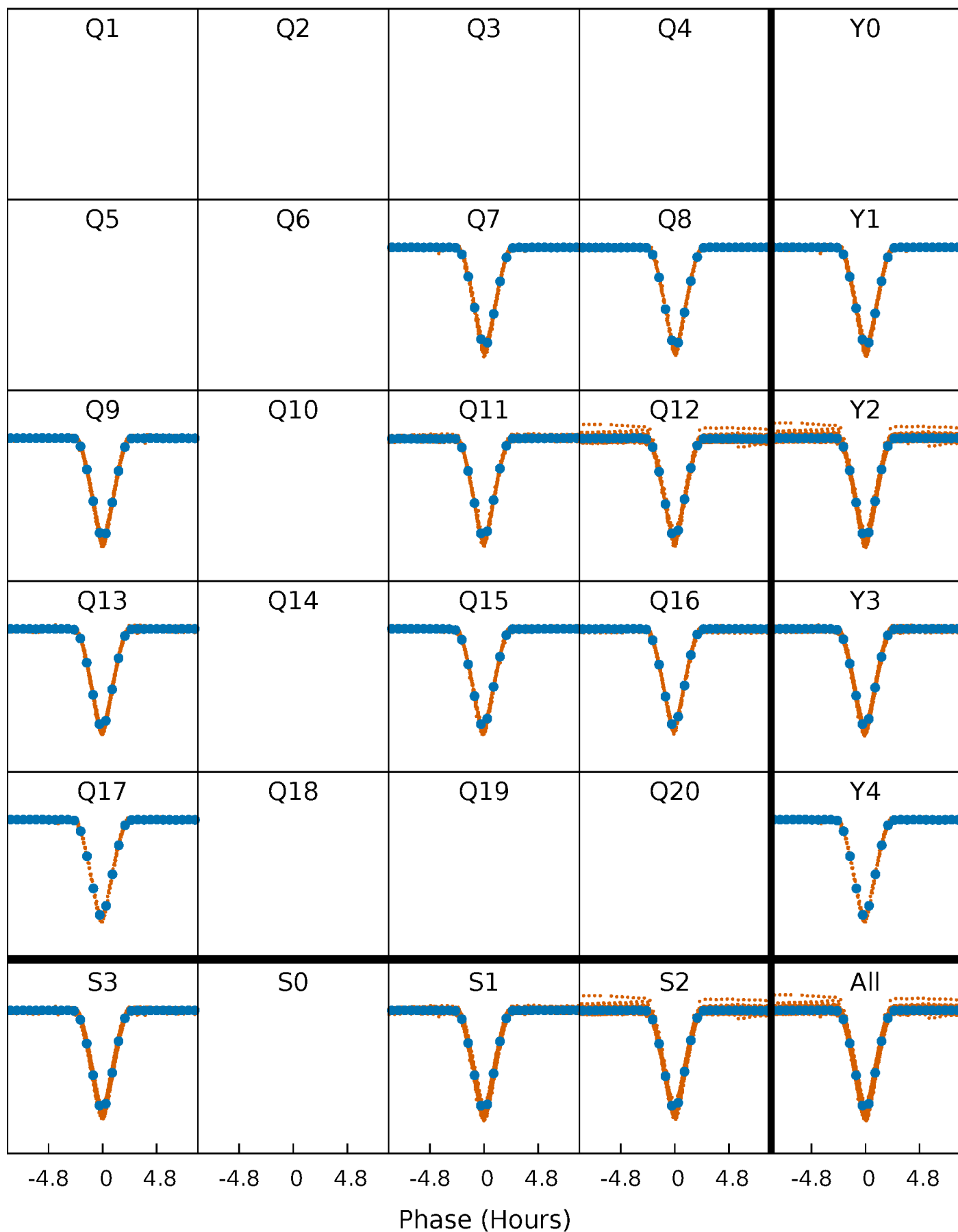


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

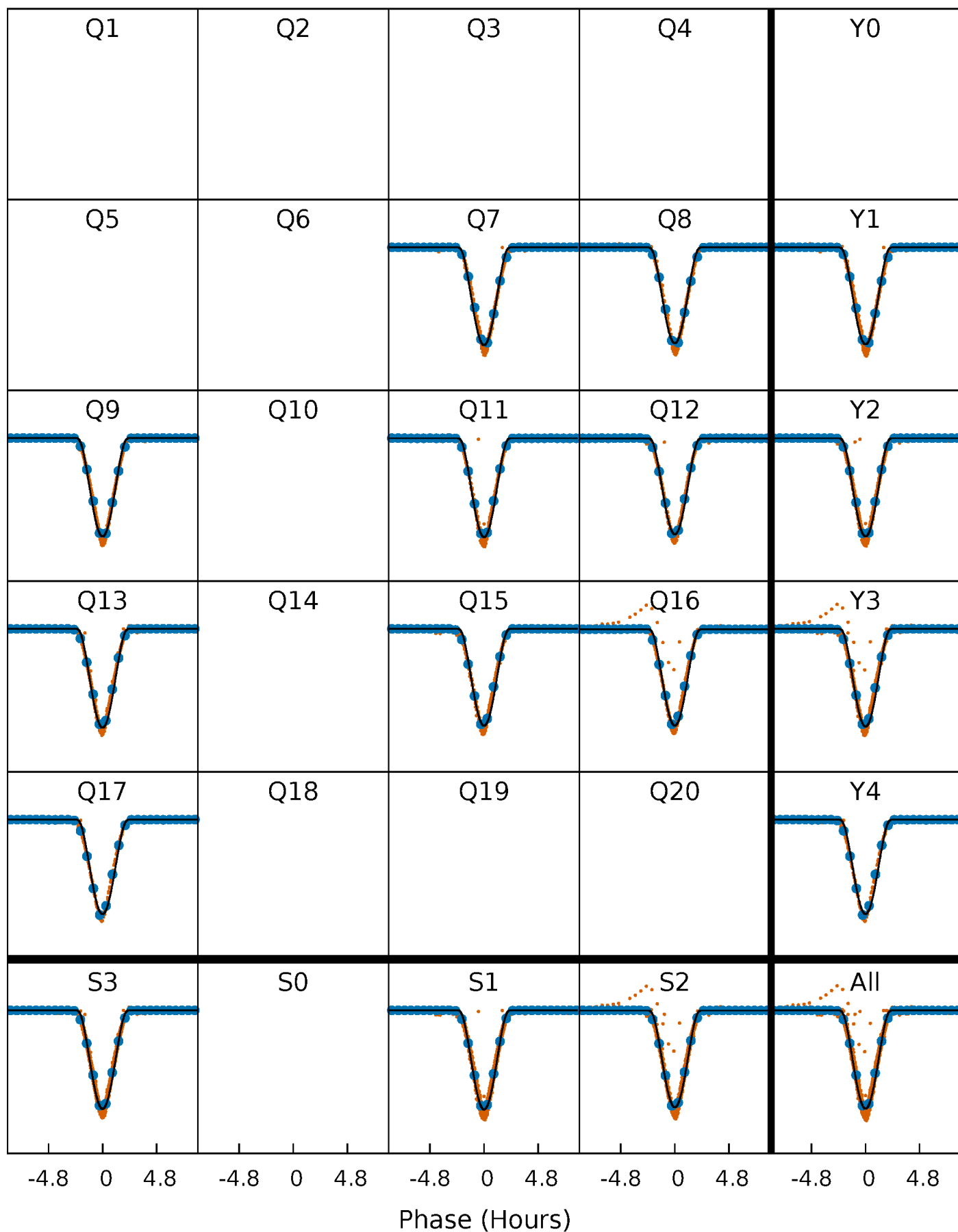
TCE 005023948-01 P= 1.824667 Days  $T_0=132.876915$  (BKJD)





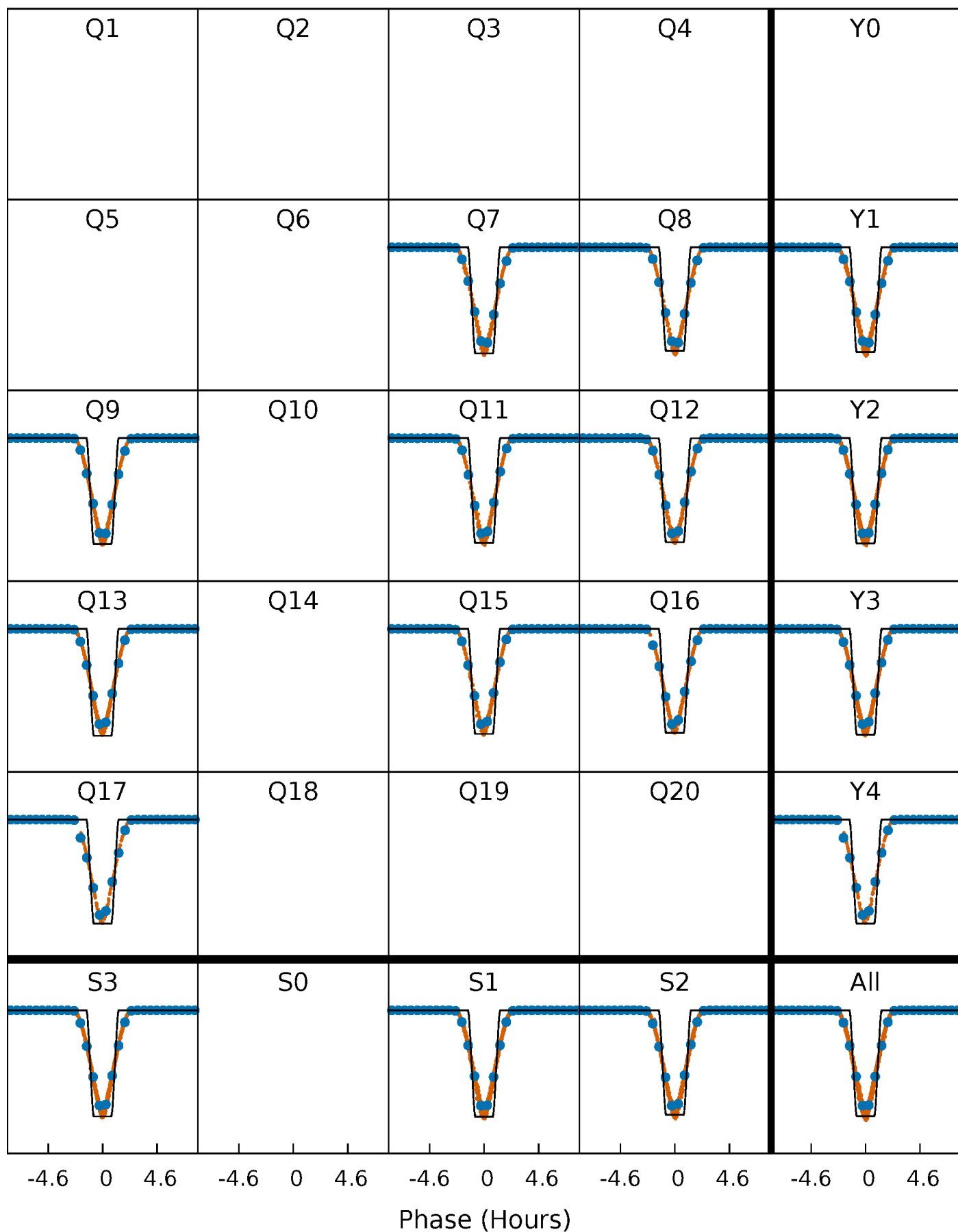
# DV Quarter-Phased Transit Curves

TCE 005023948-01   P= 1.824667 Days    $T_0=132.876915$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

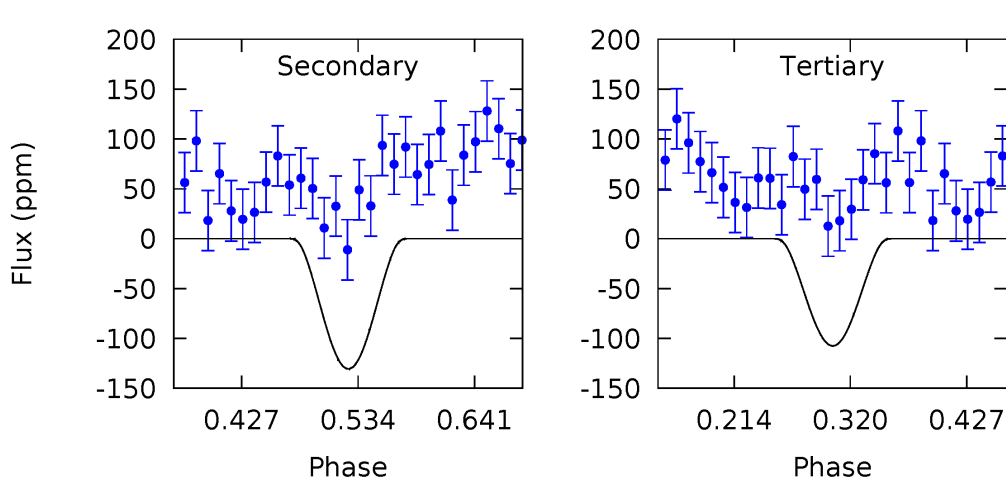
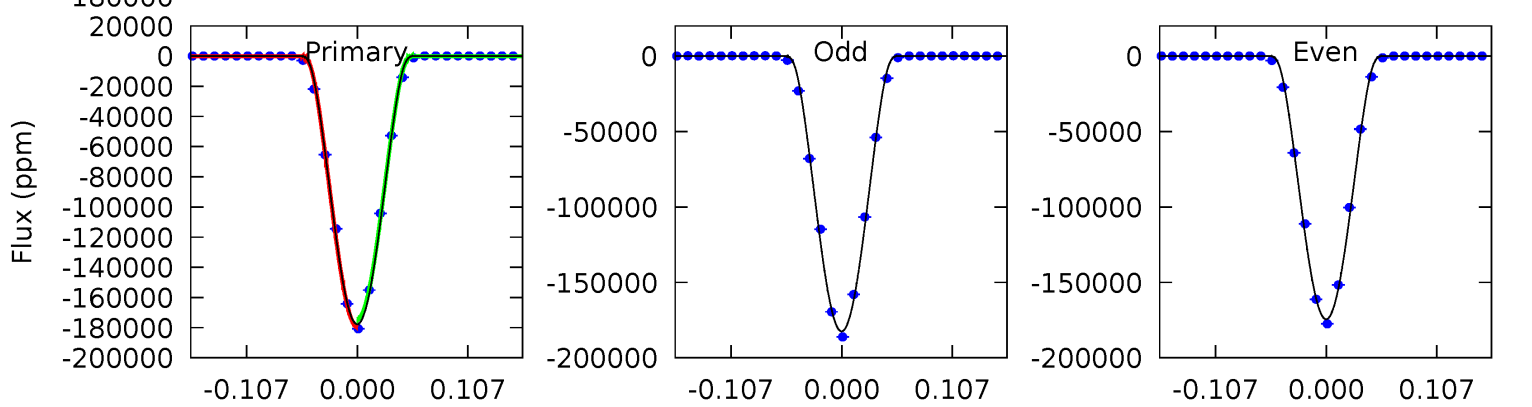
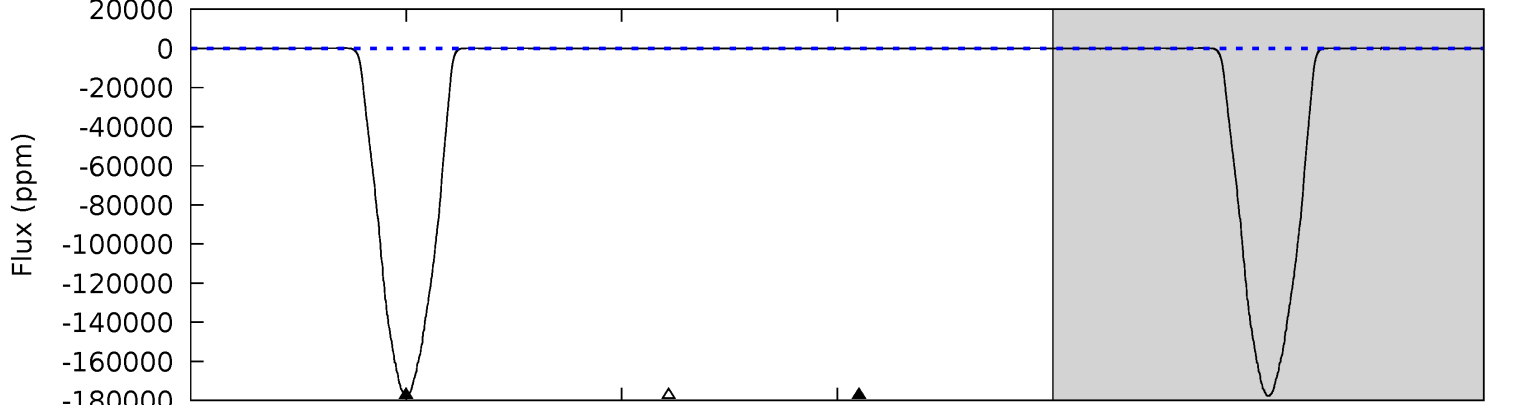
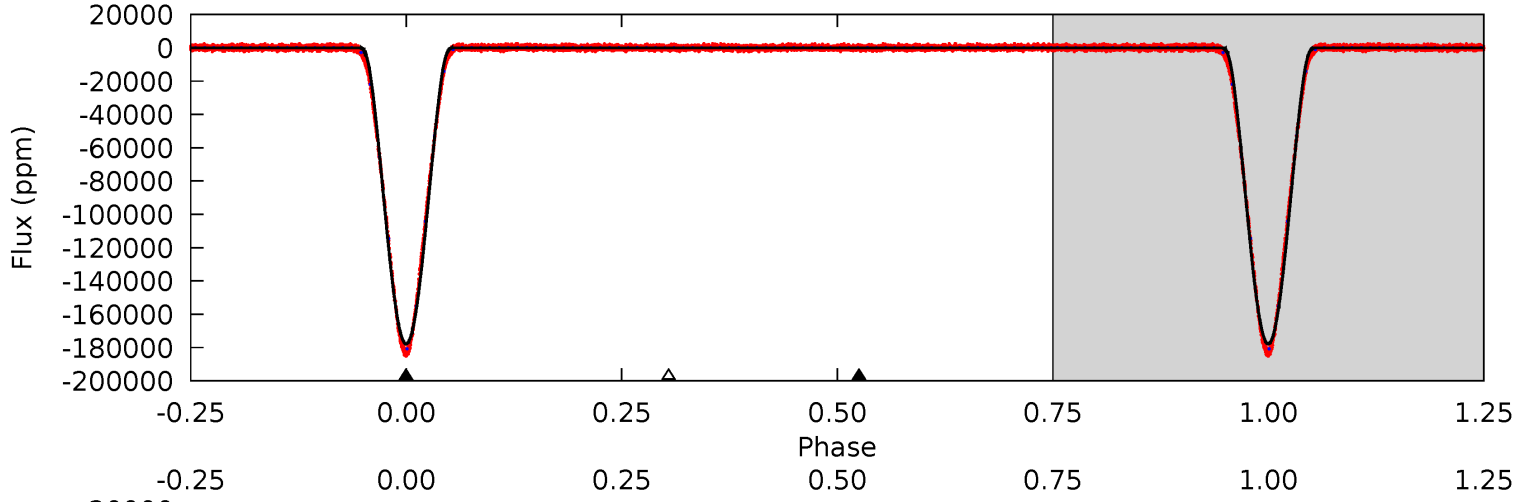
TCE 005023948-01   P= 1.824659 Days    $T_0=132.880226$  (BKJD)



# DV Model-Shift Uniqueness Test

005023948-01, P = 1.824667 Days, E = 132.876915 Days

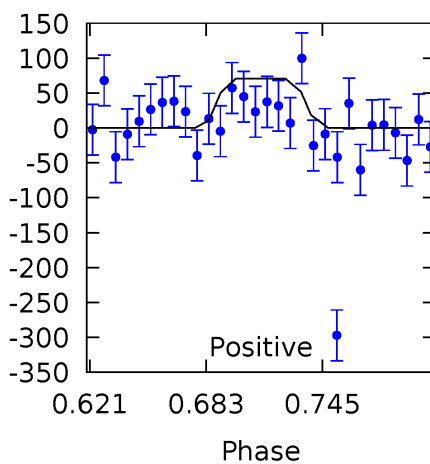
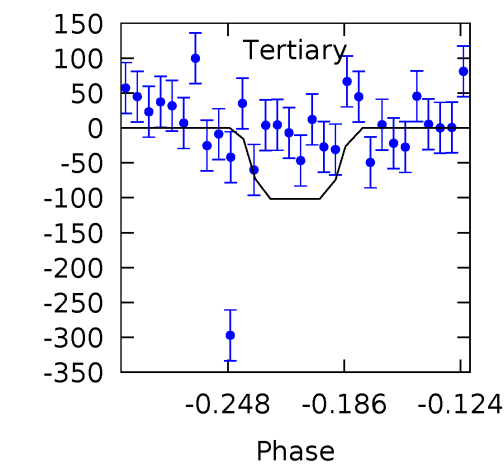
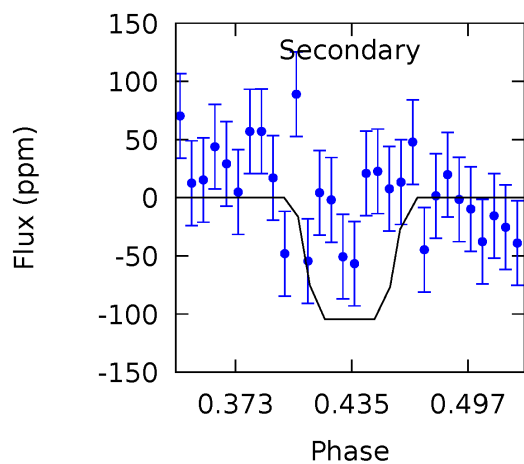
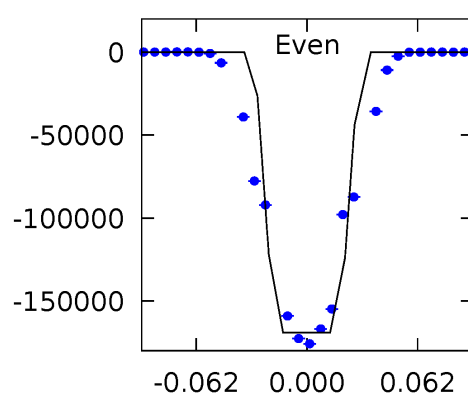
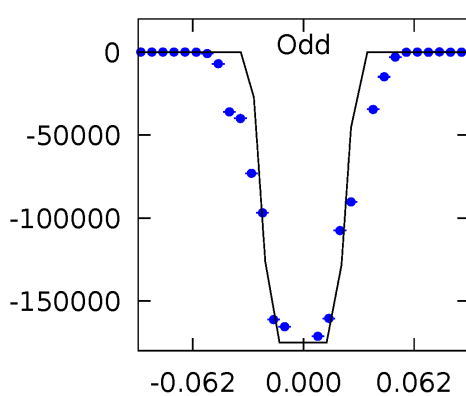
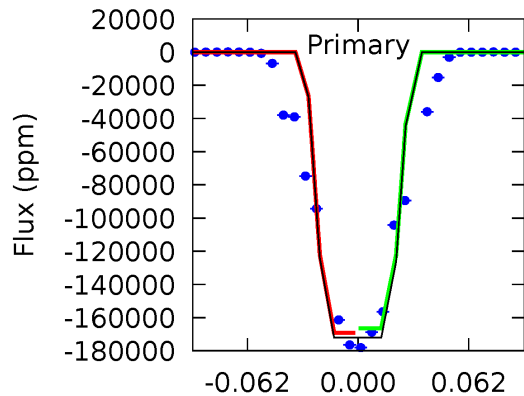
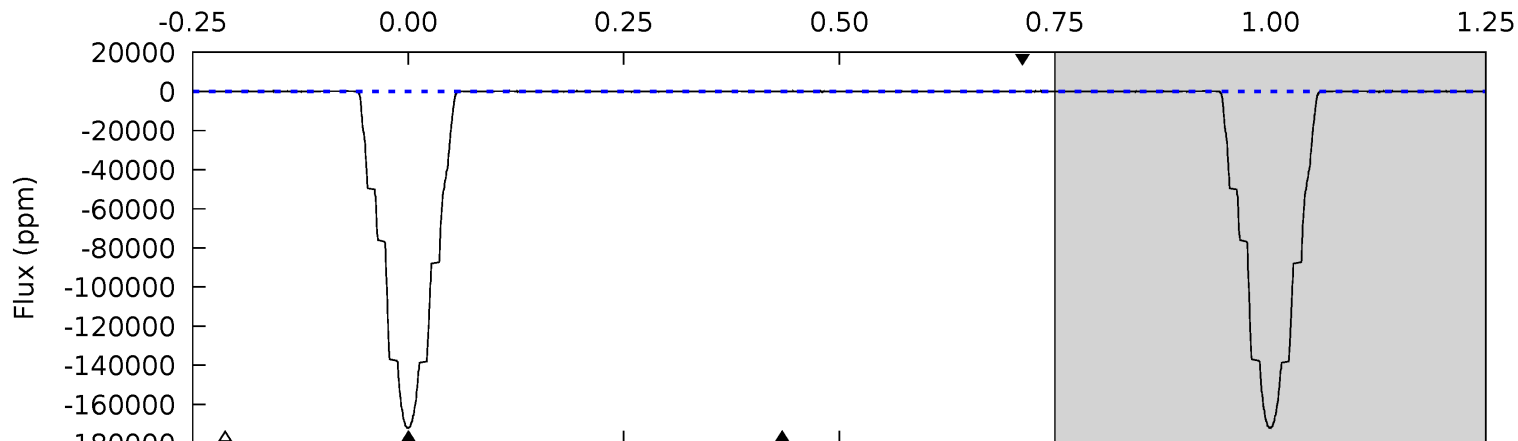
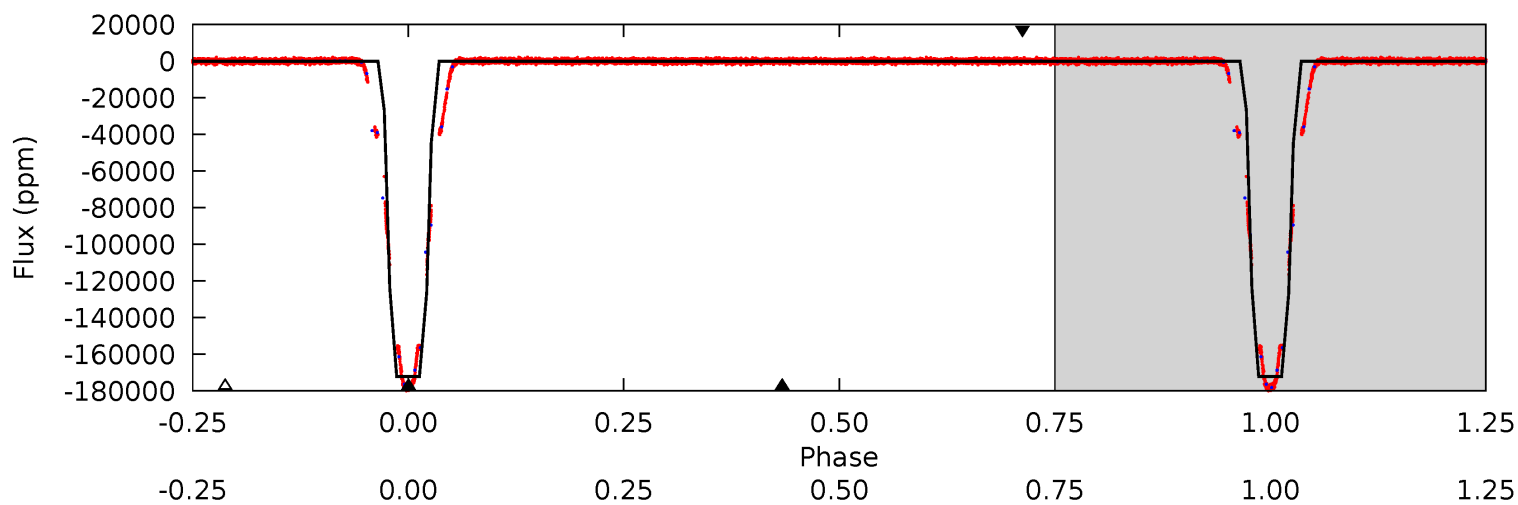
| Pri   | Sec  | Ter  | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT   |
|-------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-------|
| 10745 | 7.90 | 6.50 | 0   | 4.55            | 1.61            | 2.98             | 10738   | 10745   | 1.39    | 7.90    | 247.7   | 1.00 | 0.00  | 149.2 |



# Alt Model-Shift Uniqueness Test

005023948-01, P = 1.824659 Days, E = 132.880226 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 |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 6507 | 3.95 | 3.83 | 2.67 | 4.66            | 1.87            | 1.59             | 6503    | 6504    | 0.12    | 1.28    | 121.8   | 1.00 | 0.00  | 0   |



### Stellar Parameters For KIC 005023948

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6413^{+194}_{-213}$ | $4.372^{+0.198}_{-0.162}$ | $-1.540^{+0.300}_{-0.250}$ | $0.941^{+0.199}_{-0.163}$ | $0.760^{+0.079}_{-0.034}$ | $1.284^{+1.215}_{-0.537}$                 |
|        | +3%/-3%              | +5%/-4%                   | +19%/-16%                  | +21%/-17%                 | +10%/-4%                  | +95%/-42%                                 |
| Source | KIC0                 | KIC0                      | KIC0                       | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 005023948-01 / KOI 3570.01

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$      | $T_{max} (K)$        | $T_{obs} (K)$        | $A_{obs}$                 |
|---------|---------------|-------------------------|----------------------|----------------------|---------------------------|
| DV      | $-131 \pm 17$ | $47.45^{+5.95}_{-5.10}$ | $2337^{+147}_{-159}$ | $-2671^{+99}_{-92}$  | $0.023^{+0.007}_{-0.005}$ |
| Alt.    | $-104 \pm 26$ | $45.09^{+5.53}_{-4.87}$ | $2337^{+153}_{-163}$ | $-2674^{+100}_{-96}$ | $0.020^{+0.007}_{-0.006}$ |

$T_{max}$  = 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

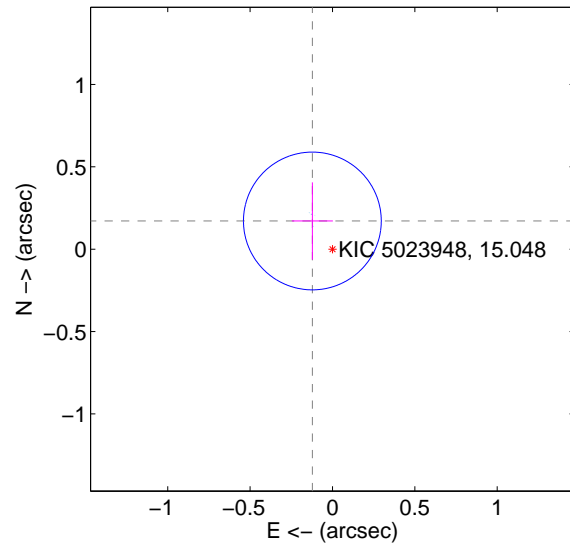
Supplemental centroid analysis for 005023948-01. Kepler magnitude: 15.05. Transit SNR 4855.60

There are 9 quarters with good PRF difference image offsets

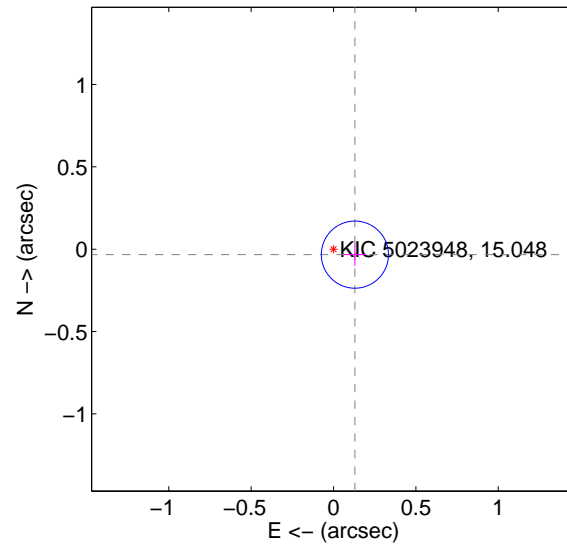
The direct PRF centroid is offset from the target star catalog position by about 0.39 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $0.210 \pm 0.139$  | 1.51                | $0.122 \pm 0.125$  | $0.171 \pm 0.235$  |
| PRF-fit source offset from KIC position | $0.134 \pm 0.068$  | 1.97                | $-0.130 \pm 0.067$ | $-0.033 \pm 0.069$ |
| photometric centroid source offset      | $1.22 \pm 0.00$    | 1178.35             | $0.08 \pm 0.00$    | $-1.22 \pm 0.00$   |

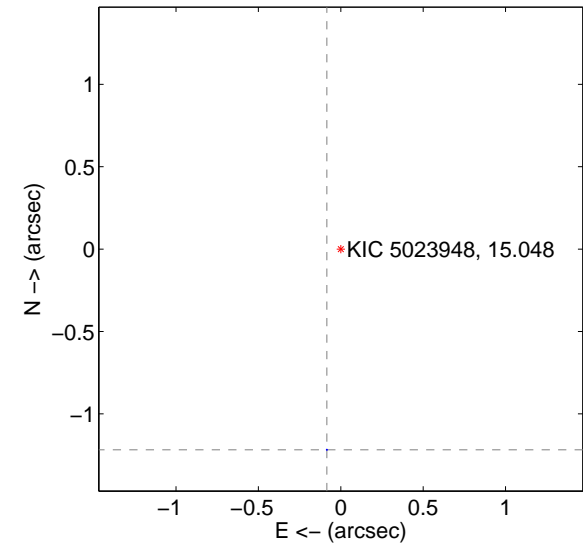
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

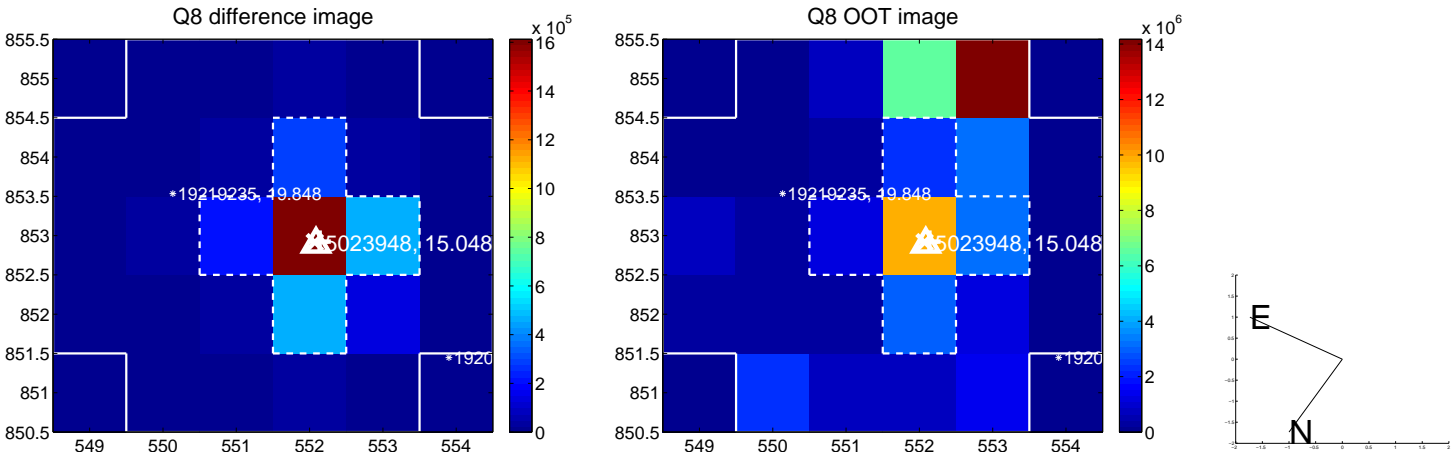
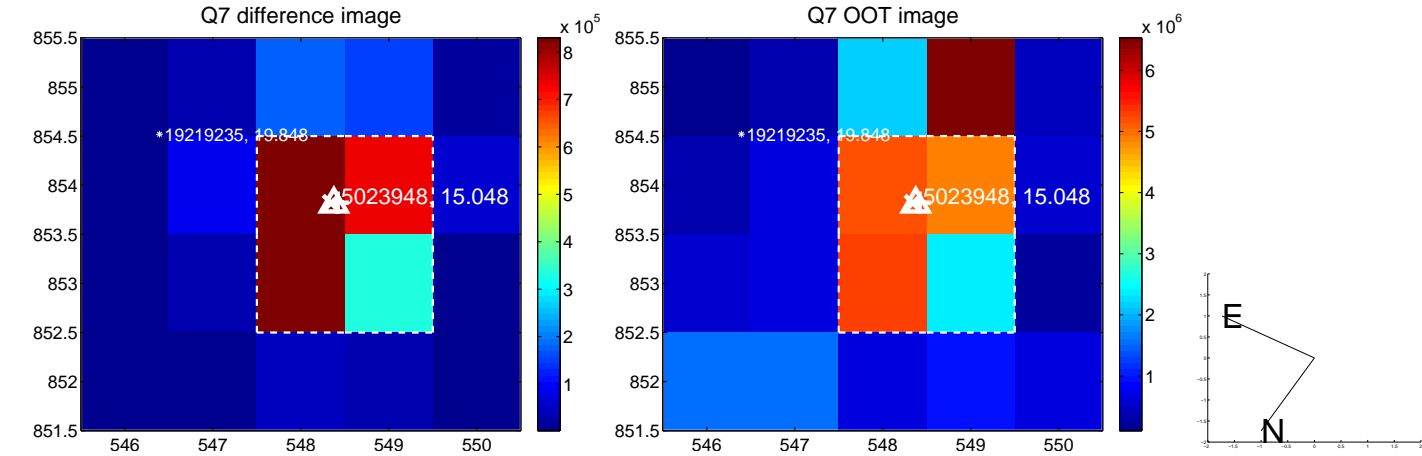


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

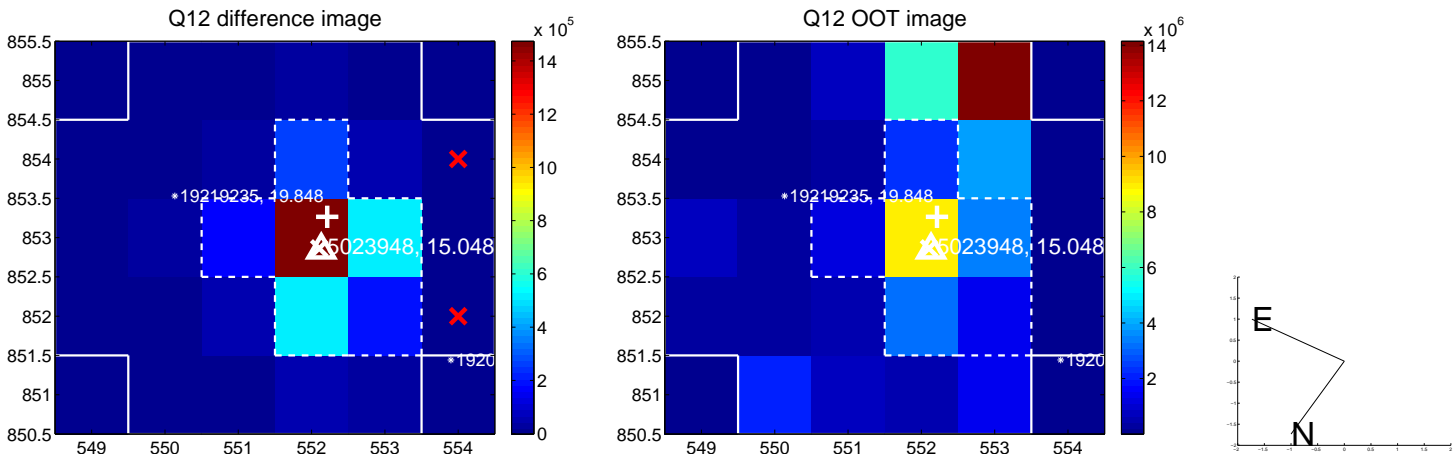
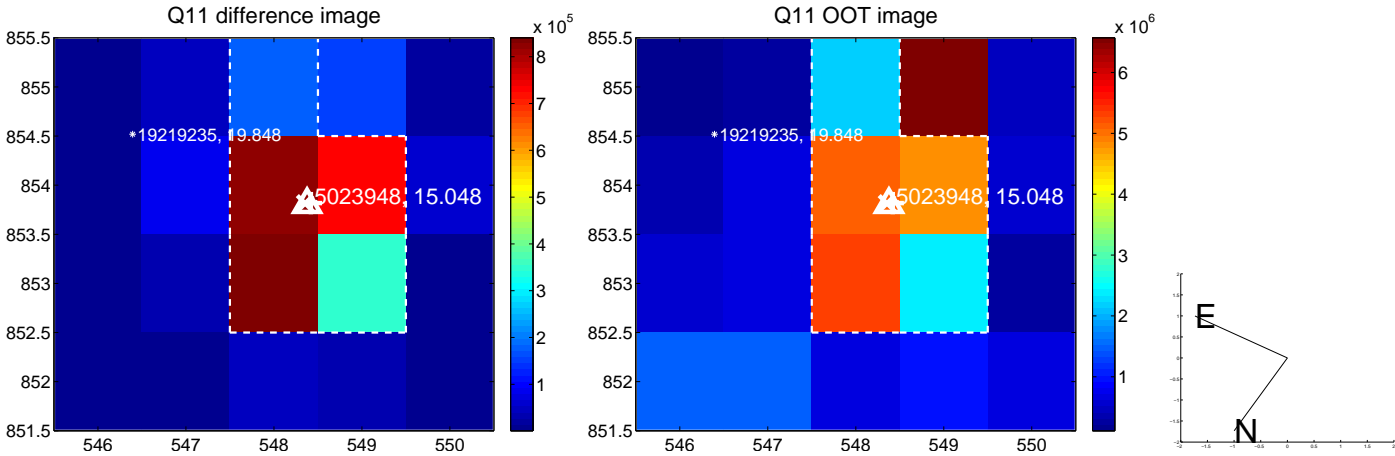
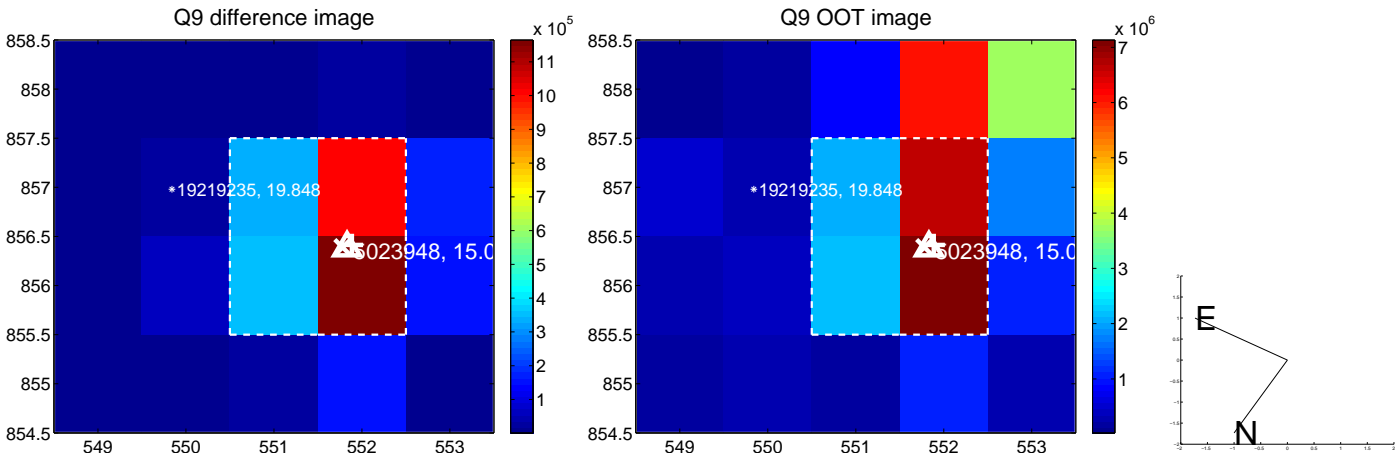


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

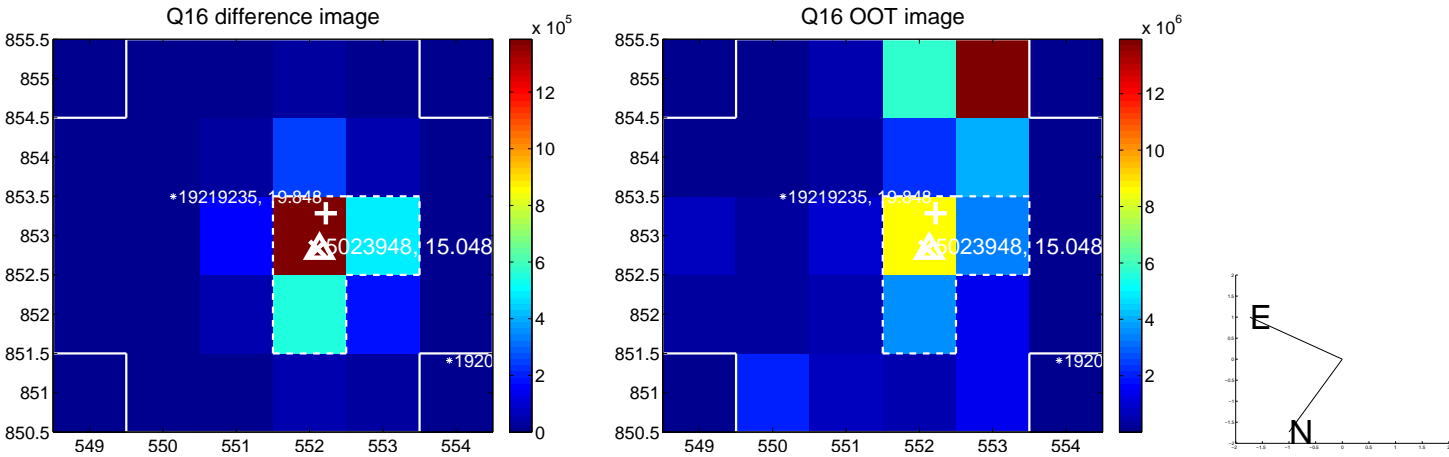
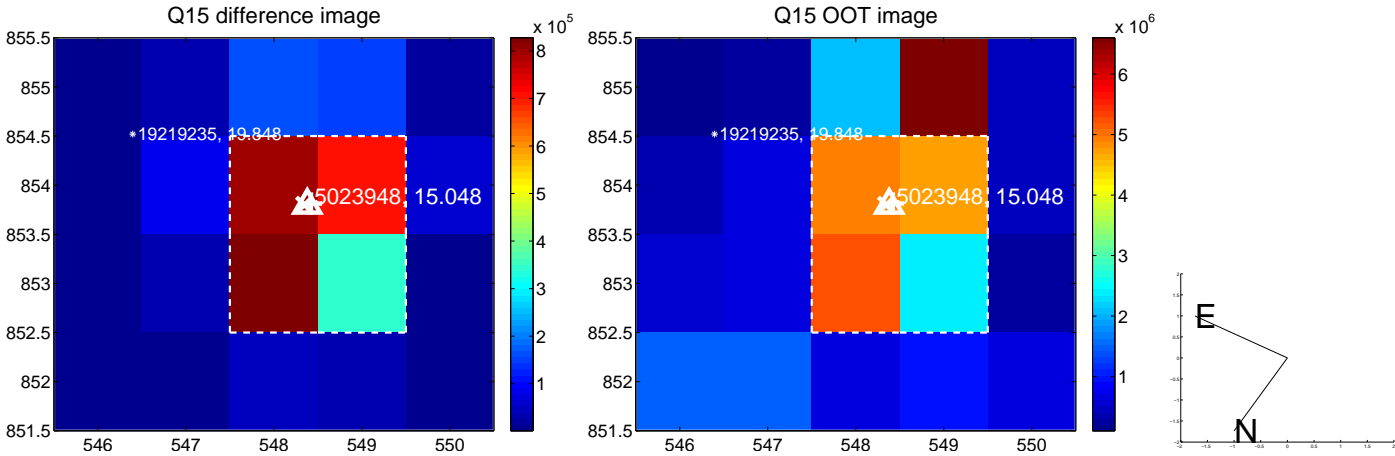
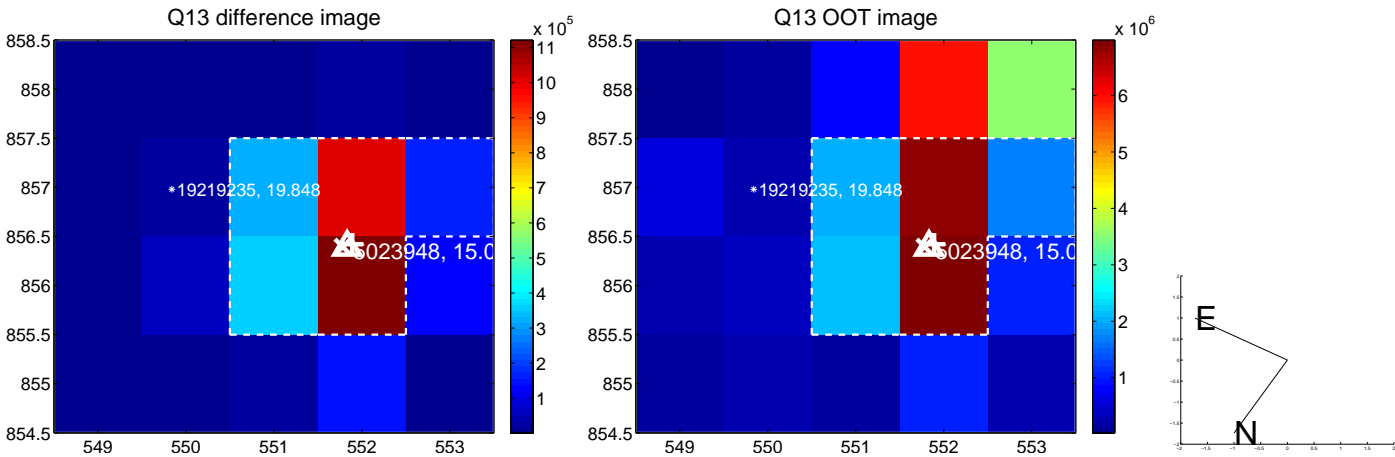




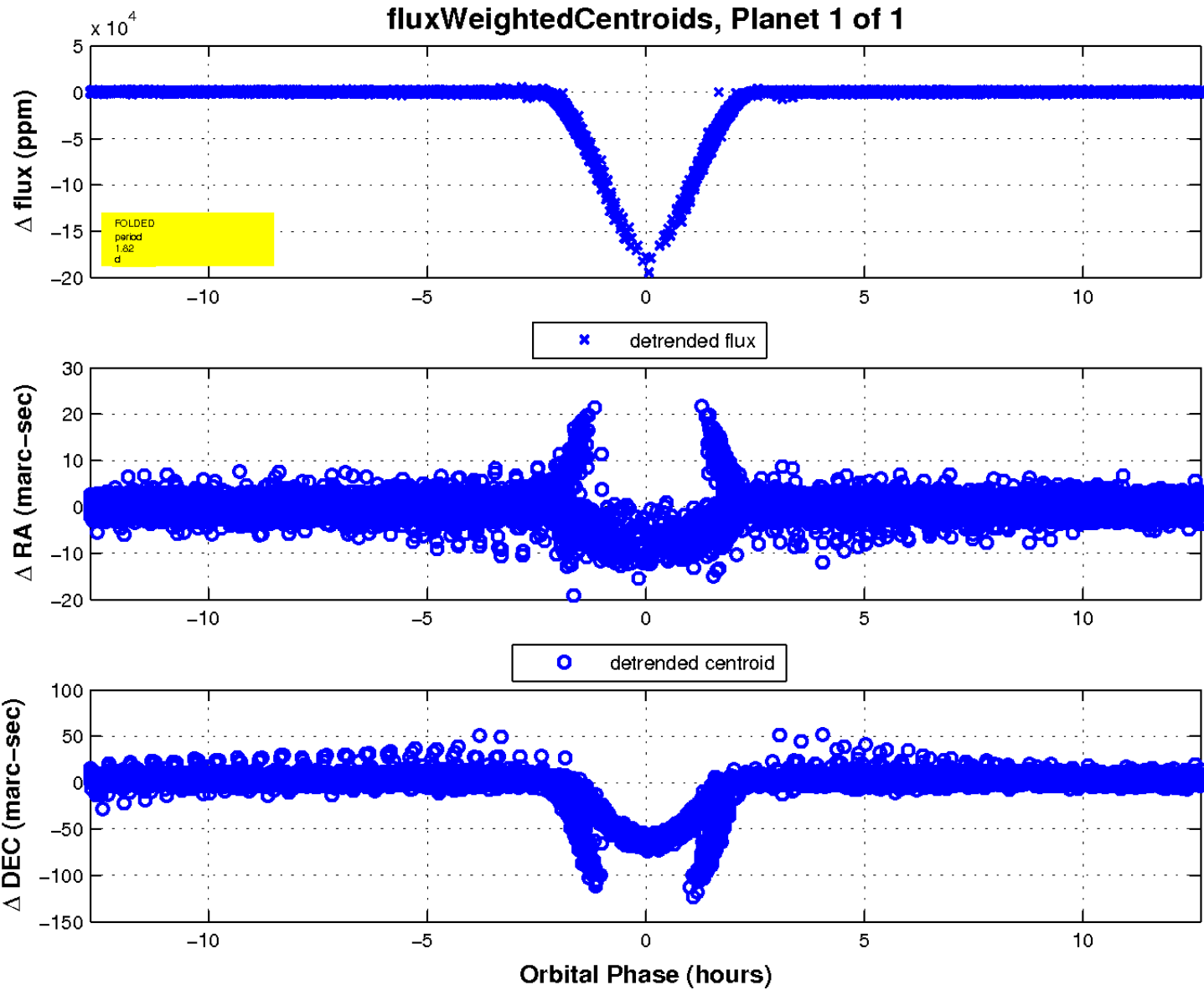
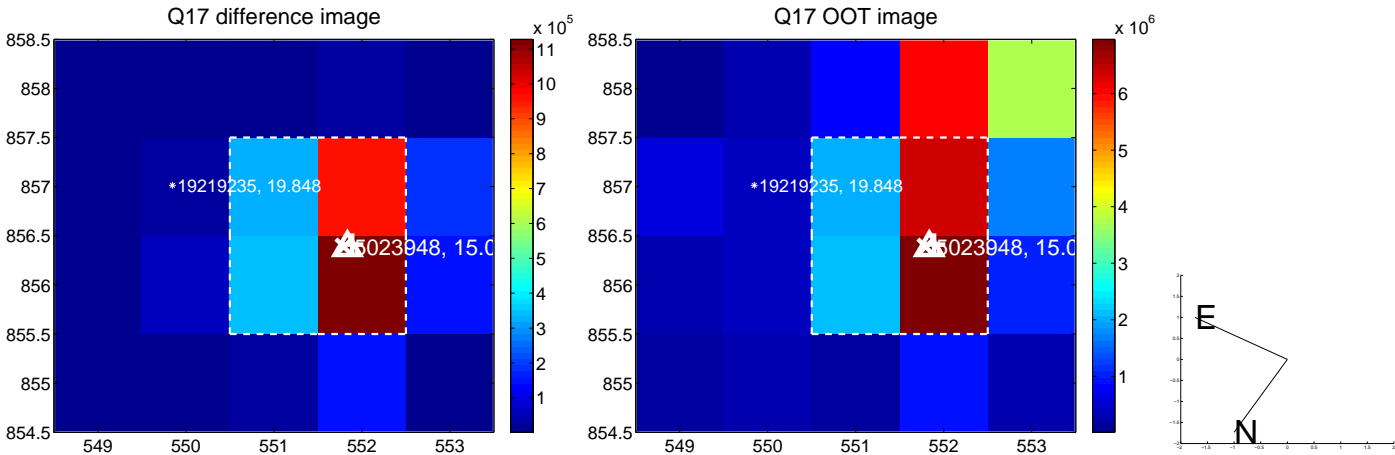
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

