

# KIC 008440305

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 008440305-01 | OBS      | No   | 377.449805    | 374.756775   | 2079.7      | 17.067           | 10.7 | 9.2 | 0.88                        | 5649            | 3.97                   | 0.74                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008440305-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—CENT_FEW_DIFFS |

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

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

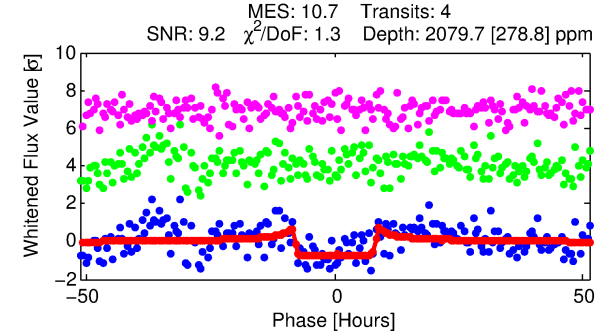
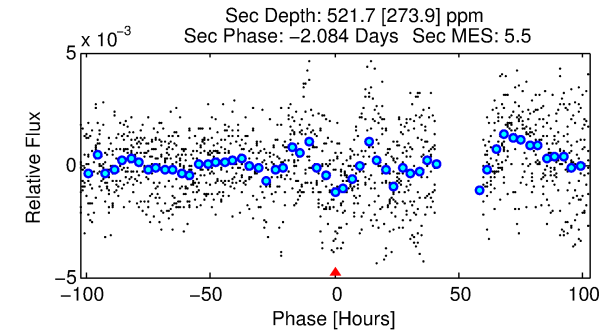
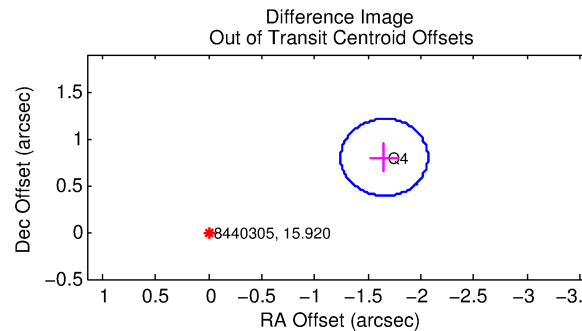
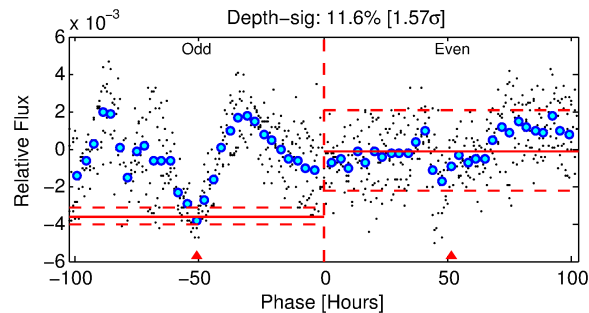
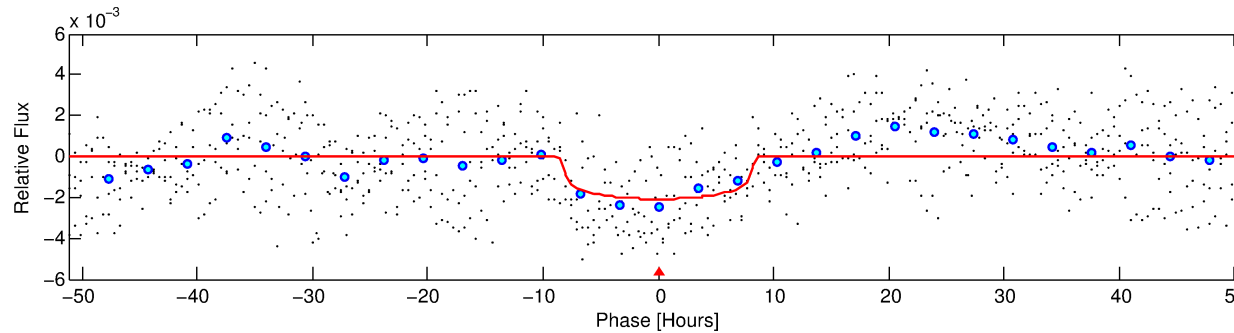
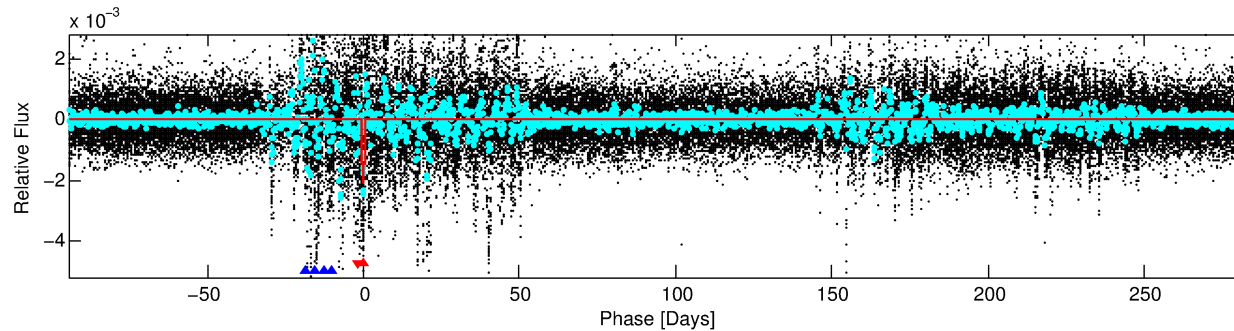
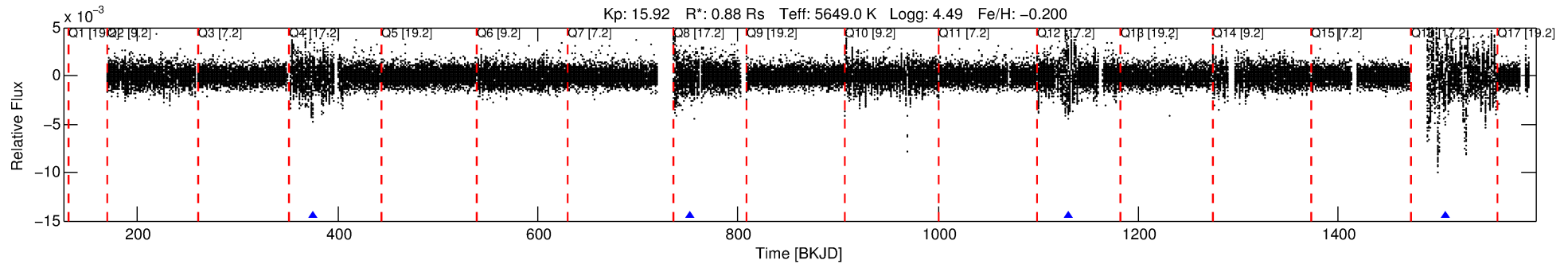
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008440305-01

No Significant Match Found

# DV One-Page Summary

KIC: 8440305 Candidate: 1 of 2 Period: 377.450 d



## DV Fit Results:

Period = 377.44980 [0.00824] d  
Epoch = 374.7568 [0.0150] BKJD  
Rp/R\* = 0.0414 [0.0136]  
a/R\* = 174.30 [236.88]  
b = 0.14 [9.41]  
Seff = 0.74 [0.24]  
Teq = 237 [19] K  
Rp = 3.97 [1.65] Re  
a = 0.9763 [0.2060] AU  
Ag = 17317.97 [15460.84] [1.12 $\sigma$ ]  
Teffp = 4196 [890] K [4.45 $\sigma$ ]

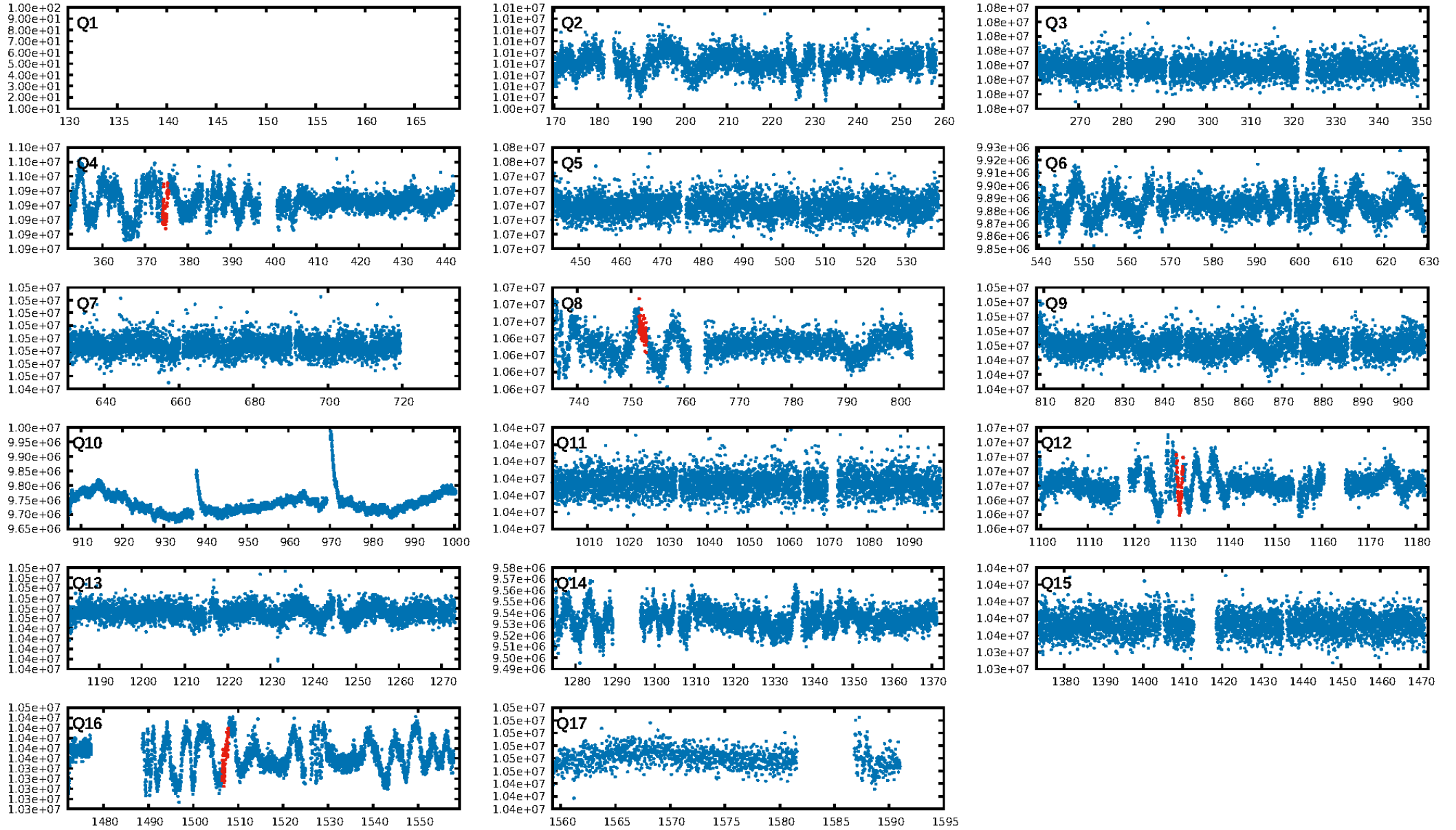
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 99.8% [3.15 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 88.2%  
Bootstrap-pfa: 2.49e-08  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -1.387  
Centroid-sig: 3.4%  
Centroid-so: 3.528 arcsec [1.83 $\sigma$ ]  
OotOffset-rm: 1.837 arcsec [13.40 $\sigma$ ]  
KicOffset-rm: 1.916 arcsec [13.83 $\sigma$ ]  
OotOffset-st: 0/0/1/0 [1]  
KicOffset-st: 0/0/1/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [3/3]

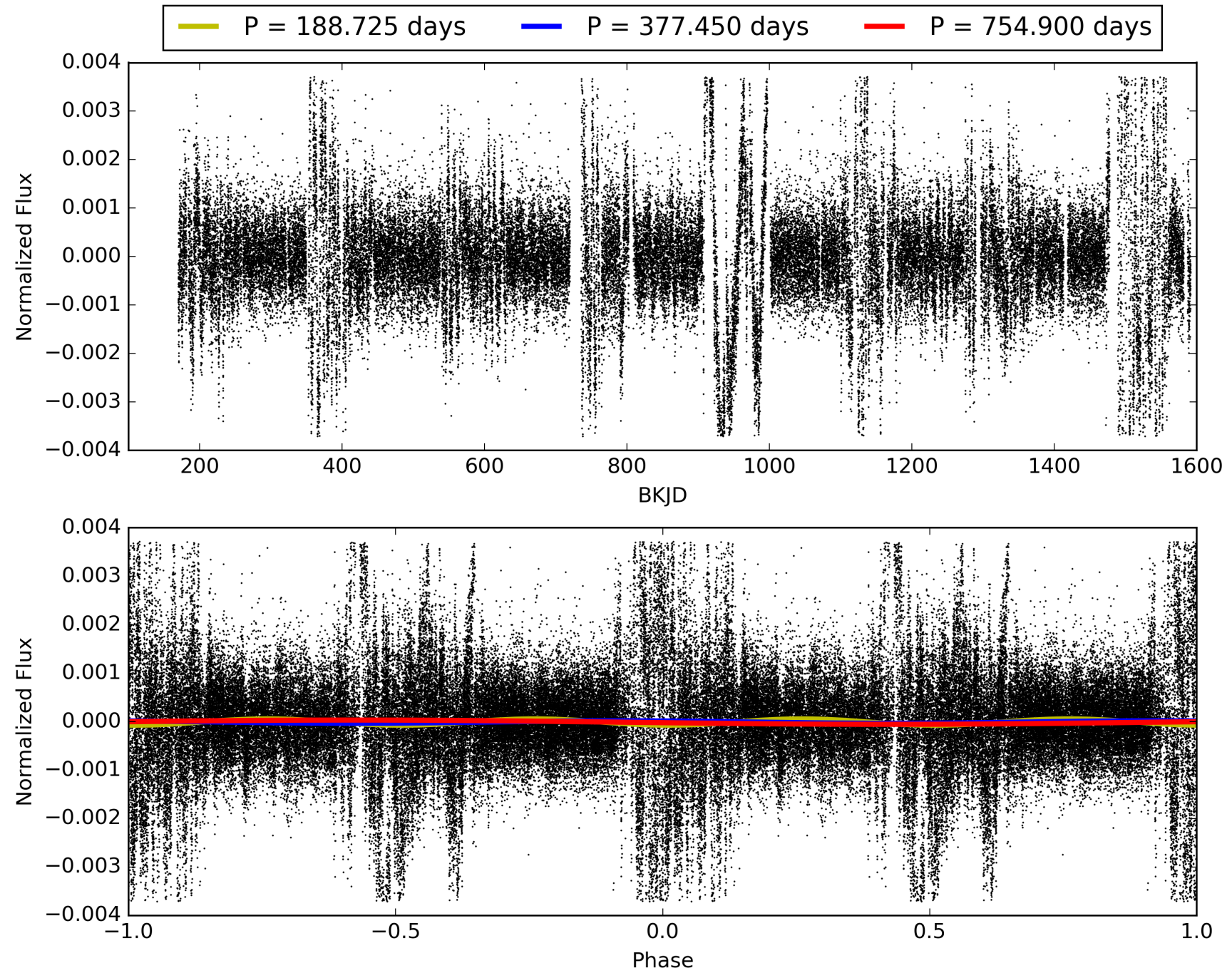
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 07:12:26 Z

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

# TCE 008440305-01, PDC Light Curves

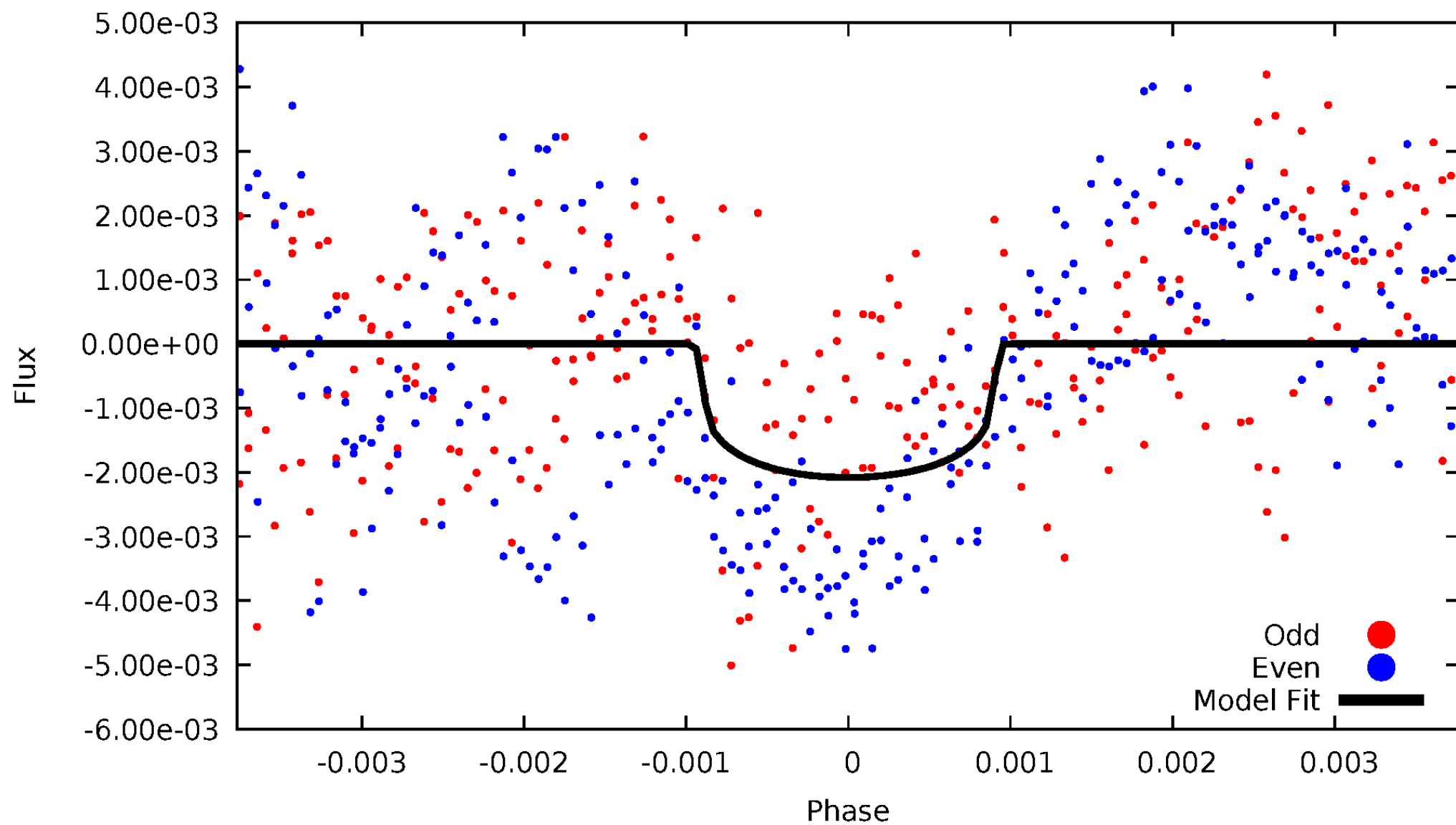


TCE 008440305-01



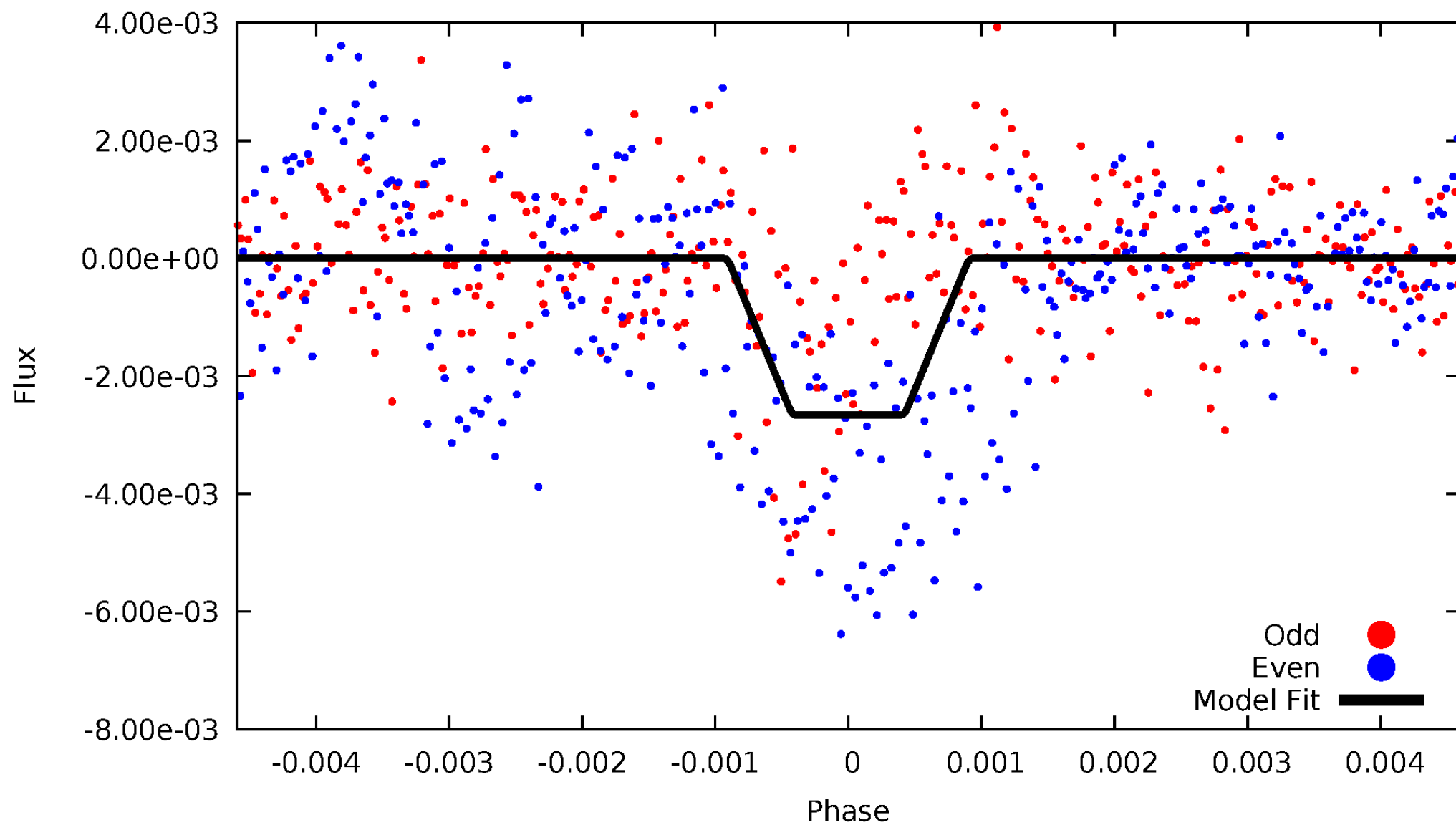
# DV Odd/Even

TCE 008440305-01



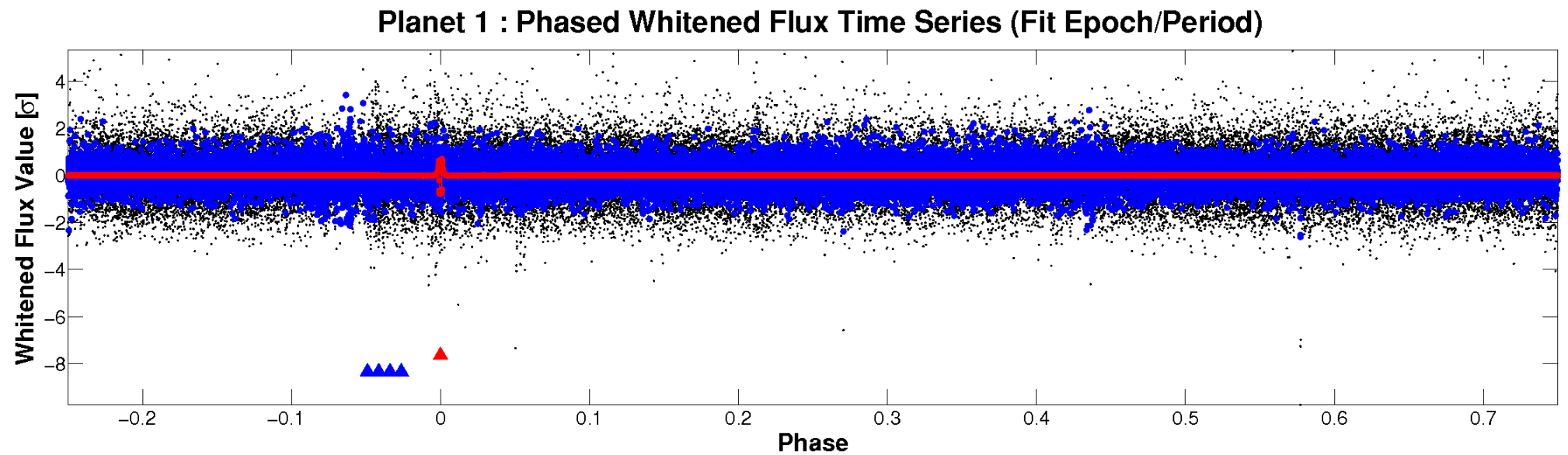
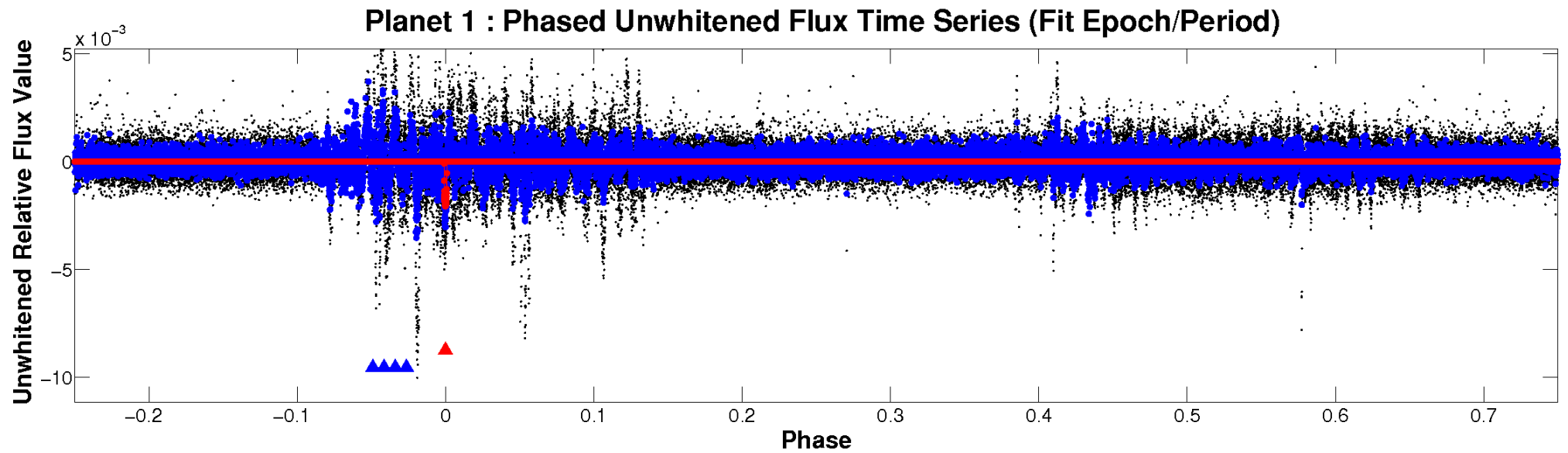
# ALT Odd/Even

TCE 008440305-01





# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

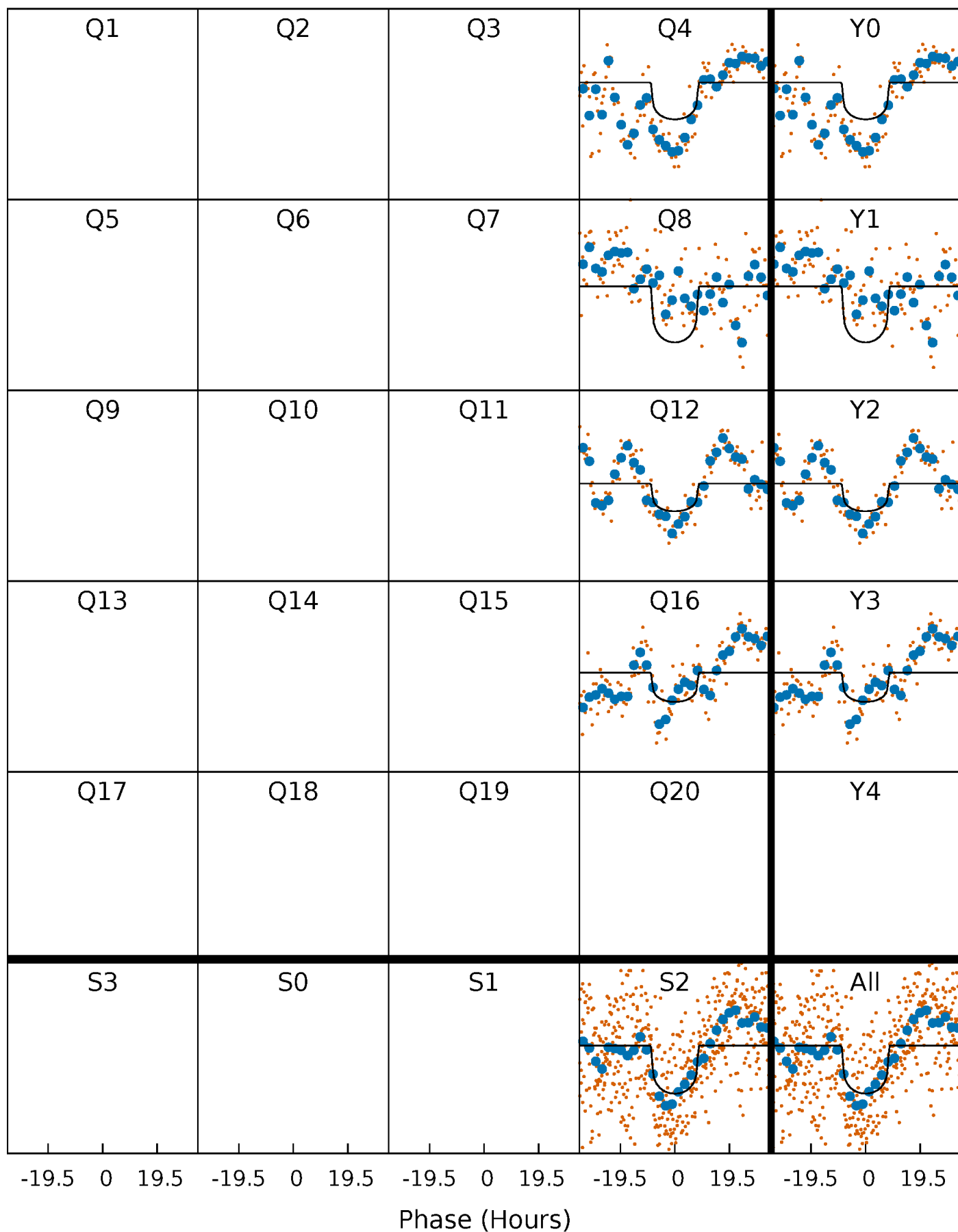
TCE 008440305-01 P=377.449805 Days  $T_0=374.756775$  (BKJD)





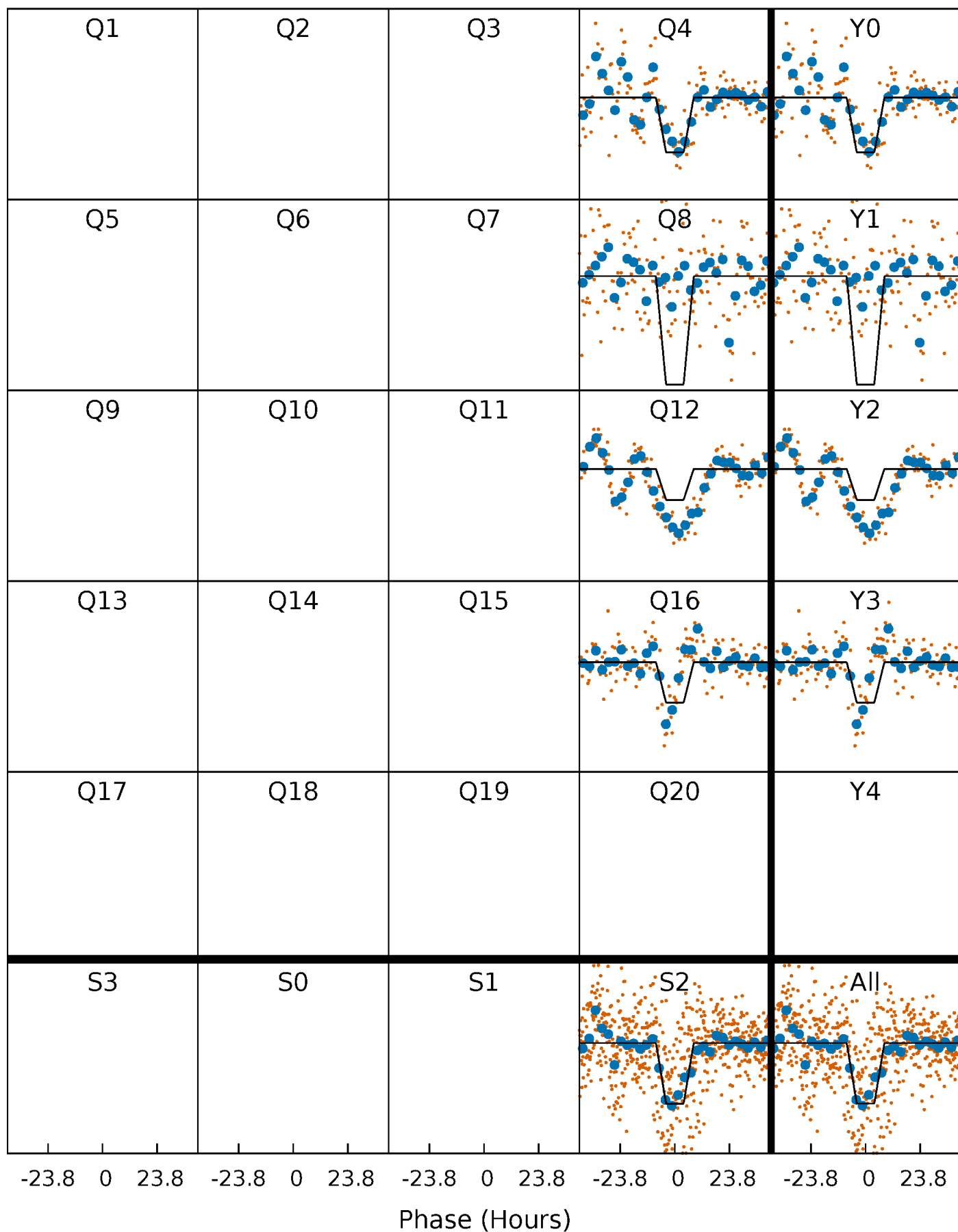
# DV Quarter-Phased Transit Curves

TCE 008440305-01     $P=377.449805$  Days     $T_0=374.756775$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

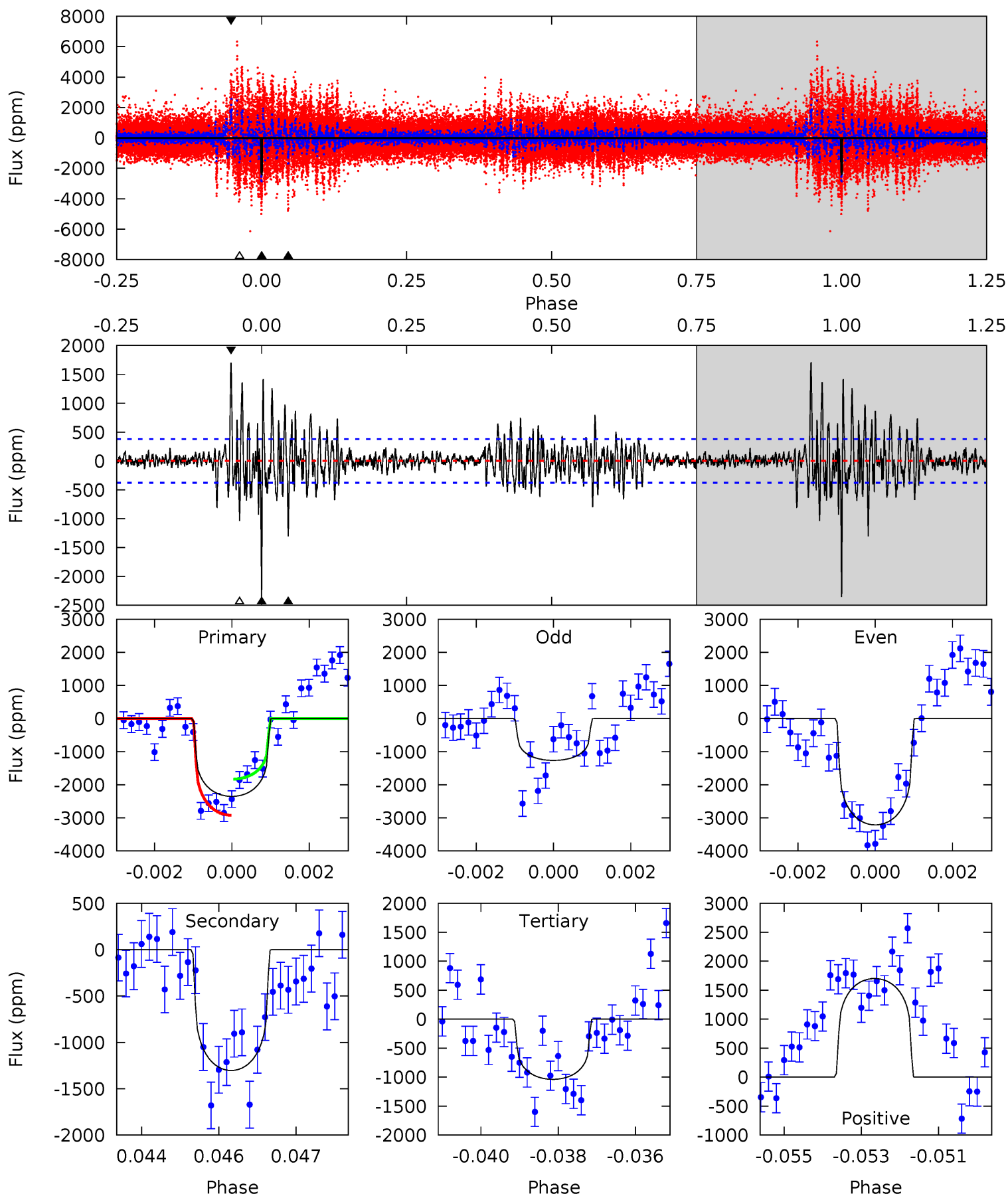
TCE 008440305-01 P=377.435098 Days  $T_0=374.718784$  (BKJD)



# DV Model-Shift Uniqueness Test

008440305-01, P = 377.449805 Days, E = 374.756775 Days

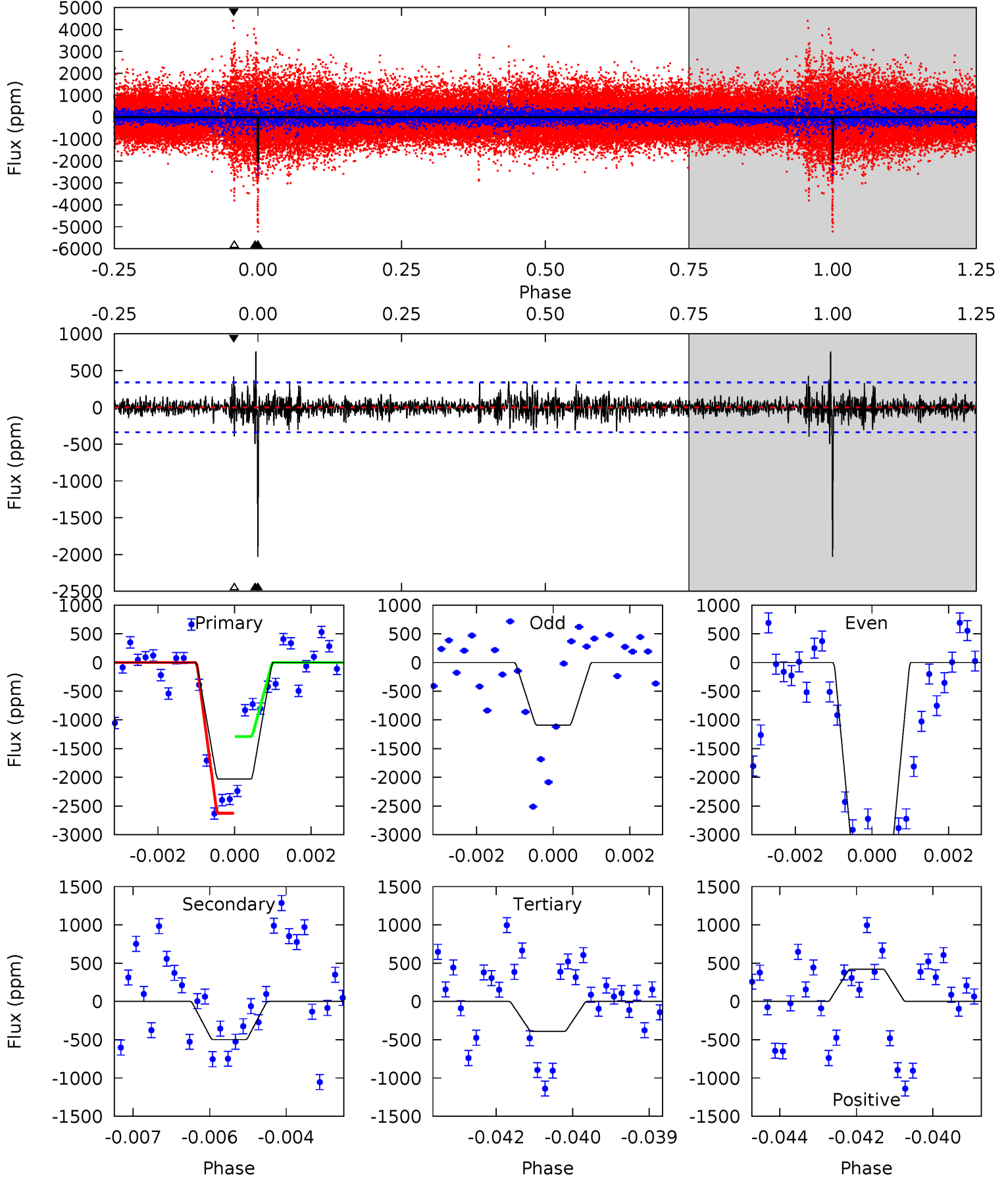
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 33.2 | 18.4 | 14.6 | 24.0 | 5.34            | 3.11            | 3.55             | 18.5    | 9.19    | 3.74    | -5.61   | 12.9    | 0.90 | 0.42  | 7.66 |



# Alt Model-Shift Uniqueness Test

008440305-01, P = 377.435098 Days, E = 374.718784 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 |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 32.0 | 7.85 | 6.17 | 6.62 | 5.34            | 3.11            | 1.27             | 25.8    | 25.4    | 1.67    | 1.23    | 22.6    | 1.17 | 0.27  | 0   |



### Stellar Parameters For KIC 008440305

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $5649^{+169}_{-169}$ | $4.489^{+0.075}_{-0.162}$ | $-0.200^{+0.300}_{-0.300}$ | $0.880^{+0.225}_{-0.113}$ | $0.871^{+0.112}_{-0.082}$ | $1.803^{+0.664}_{-0.839}$                 |
|        | +3%/-3%              | +2%/-4%                   | +150%/-150%                | +26%/-13%                 | +13%/-9%                  | +37%/-47%                                 |
| Source | PHO1                 | 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 008440305-01 / KOI

| Detrend | Depth (ppm)    | $R_p (R_{\oplus})$     | $T_{max} (K)$     | $T_{obs} (K)$        | $A_{obs}$                 |
|---------|----------------|------------------------|-------------------|----------------------|---------------------------|
| DV      | $-1303 \pm 71$ | $4.13^{+1.50}_{-1.28}$ | $334^{+23}_{-17}$ | $5274^{+960}_{-569}$ | $39871^{+42685}_{-18252}$ |
| Alt.    | $-498 \pm 63$  | $5.11^{+1.47}_{-1.41}$ | $335^{+19}_{-16}$ | $4008^{+496}_{-313}$ | $9896^{+8682}_{-4145}$    |

$T_{max}$  = 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

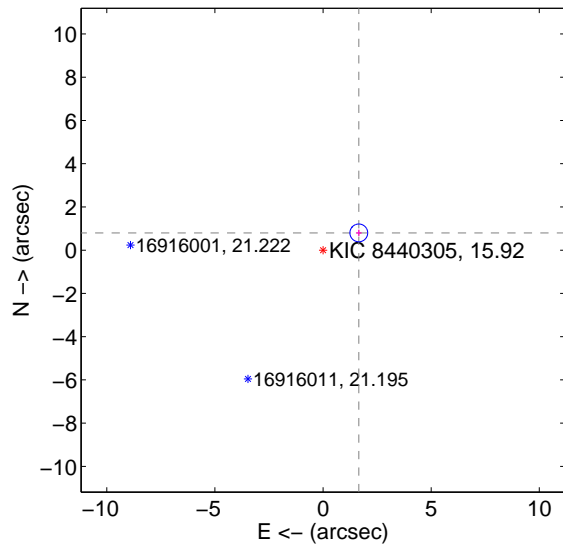
Supplemental centroid analysis for 008440305-01. Kepler magnitude: 15.92. Transit SNR 9.24

There are 0 quarters with good PRF difference image offsets

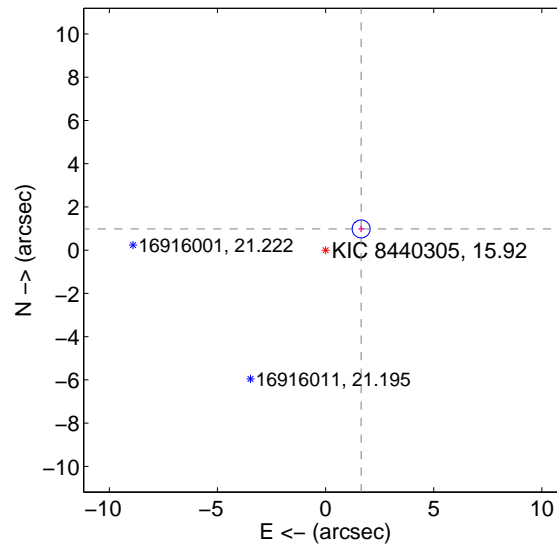
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | $1.837 \pm 0.137$  | 13.40               | $-1.654 \pm 0.134$ | $0.799 \pm 0.152$ |
| PRF-fit source offset from KIC position | $1.916 \pm 0.139$  | 13.83               | $-1.644 \pm 0.134$ | $0.983 \pm 0.152$ |
| photometric centroid source offset      | $3.53 \pm 1.93$    | 1.83                | $3.11 \pm 1.84$    | $1.66 \pm 2.23$   |

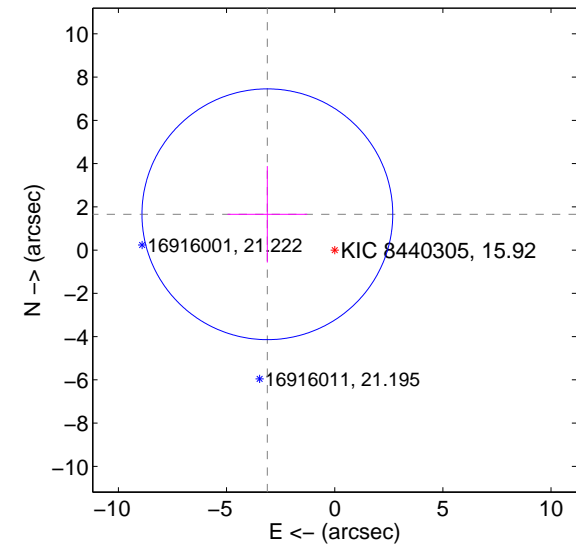
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

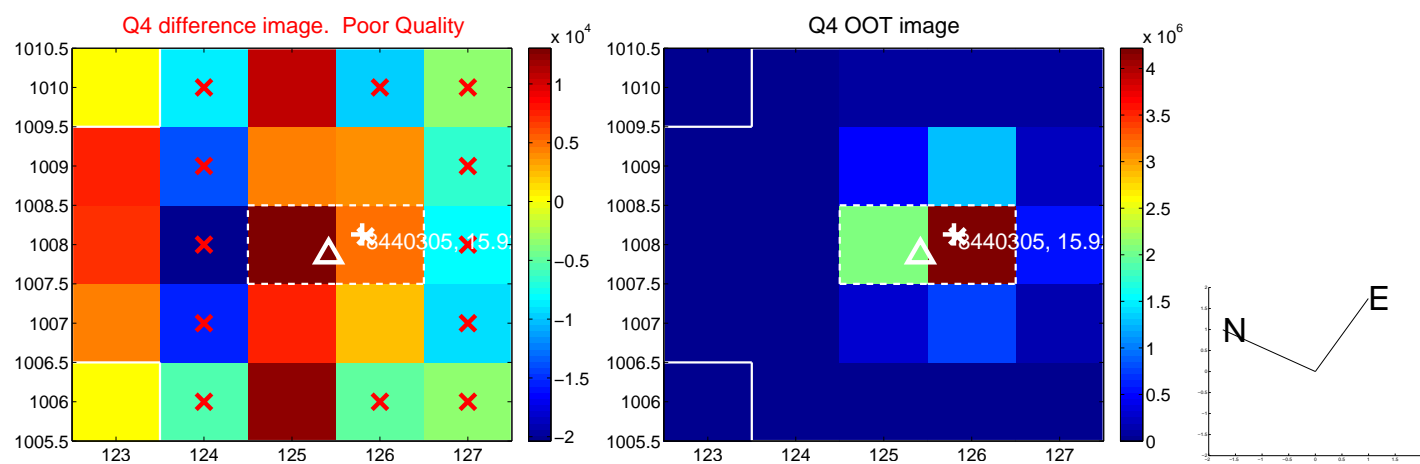


offset from photometric centroids



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.

Q5 no difference image



Q5 no OOT image



Q6 no difference image



Q6 no OOT image



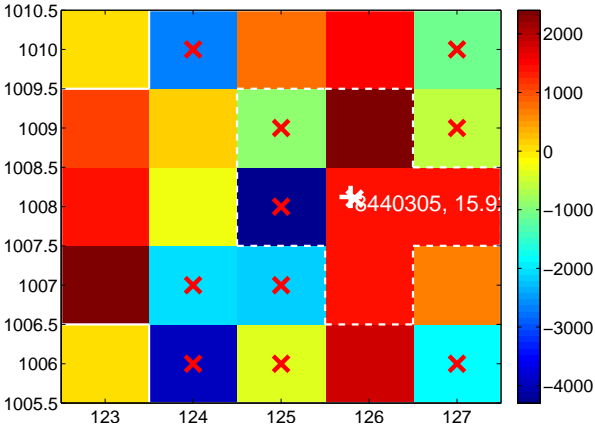
Q7 no difference image



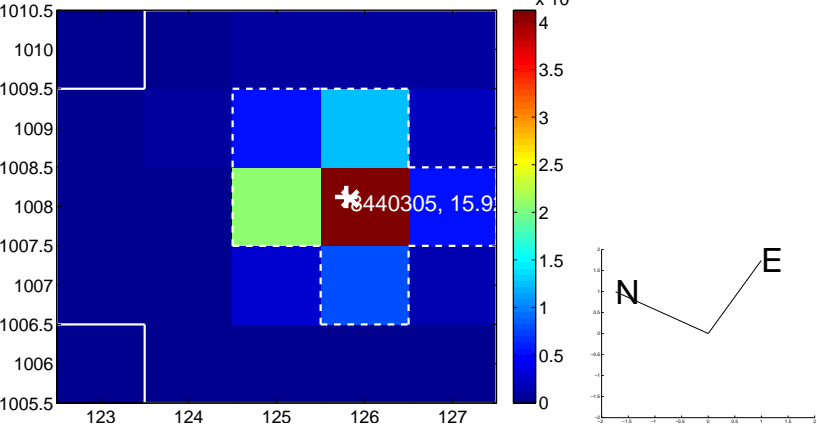
Q7 no OOT image



Q8 difference image. Poor Quality



Q8 OOT image

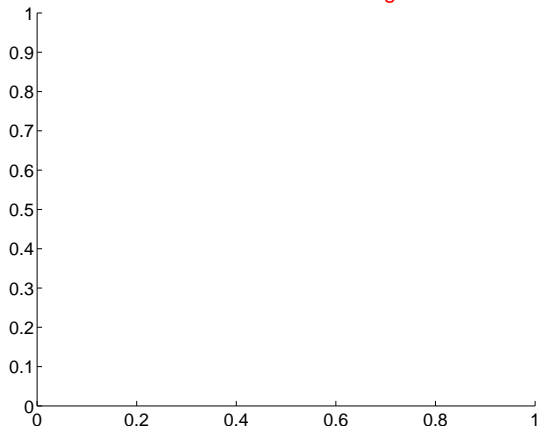


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

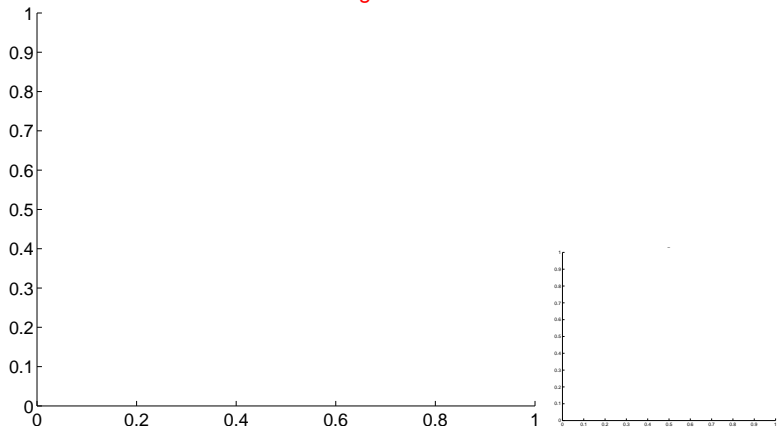


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

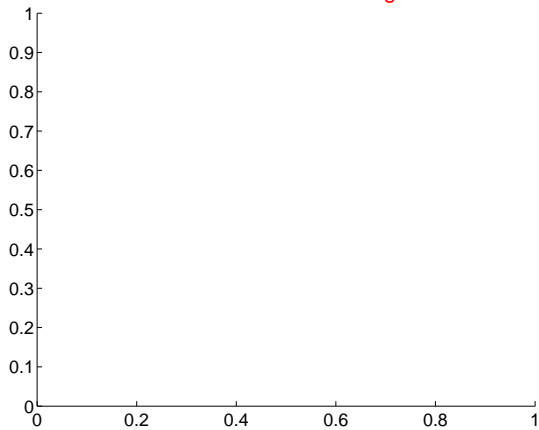
Q13 no difference image



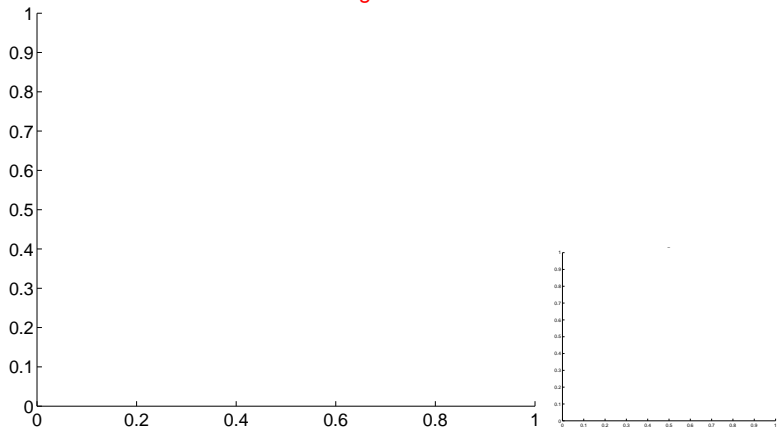
Q13 no OOT image



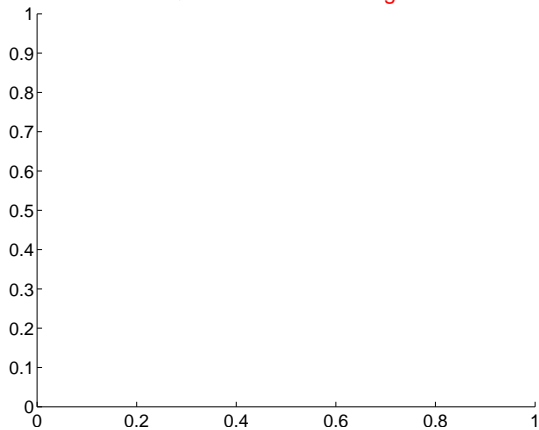
Q14 no difference image



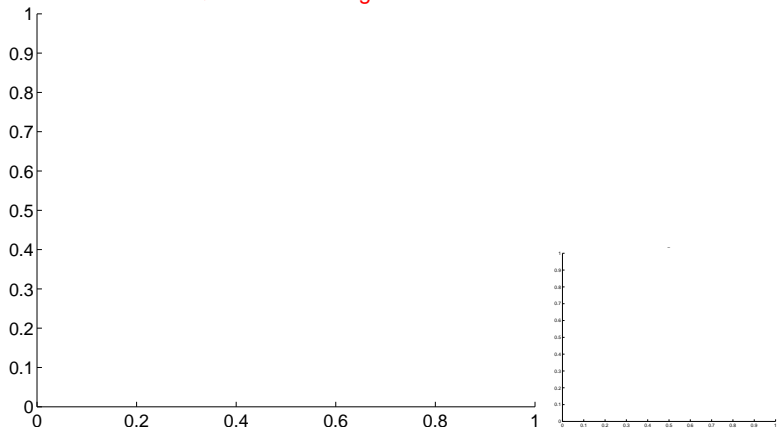
Q14 no OOT image



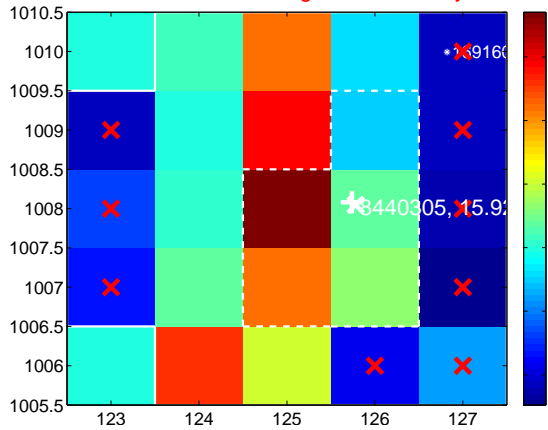
Q15 no difference image



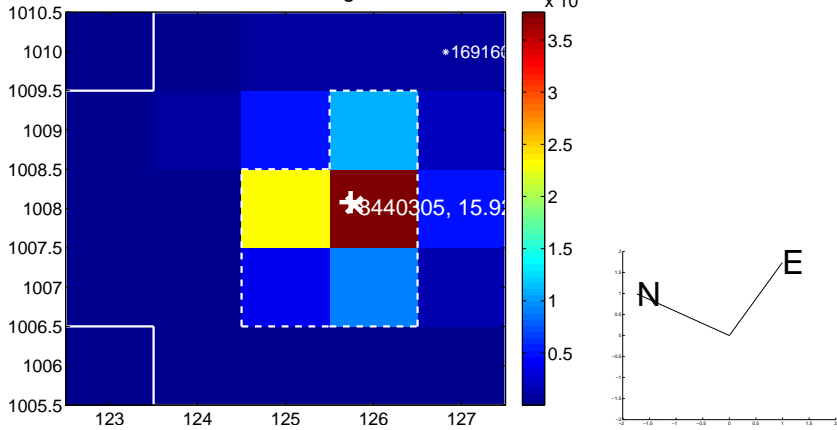
Q15 no OOT image



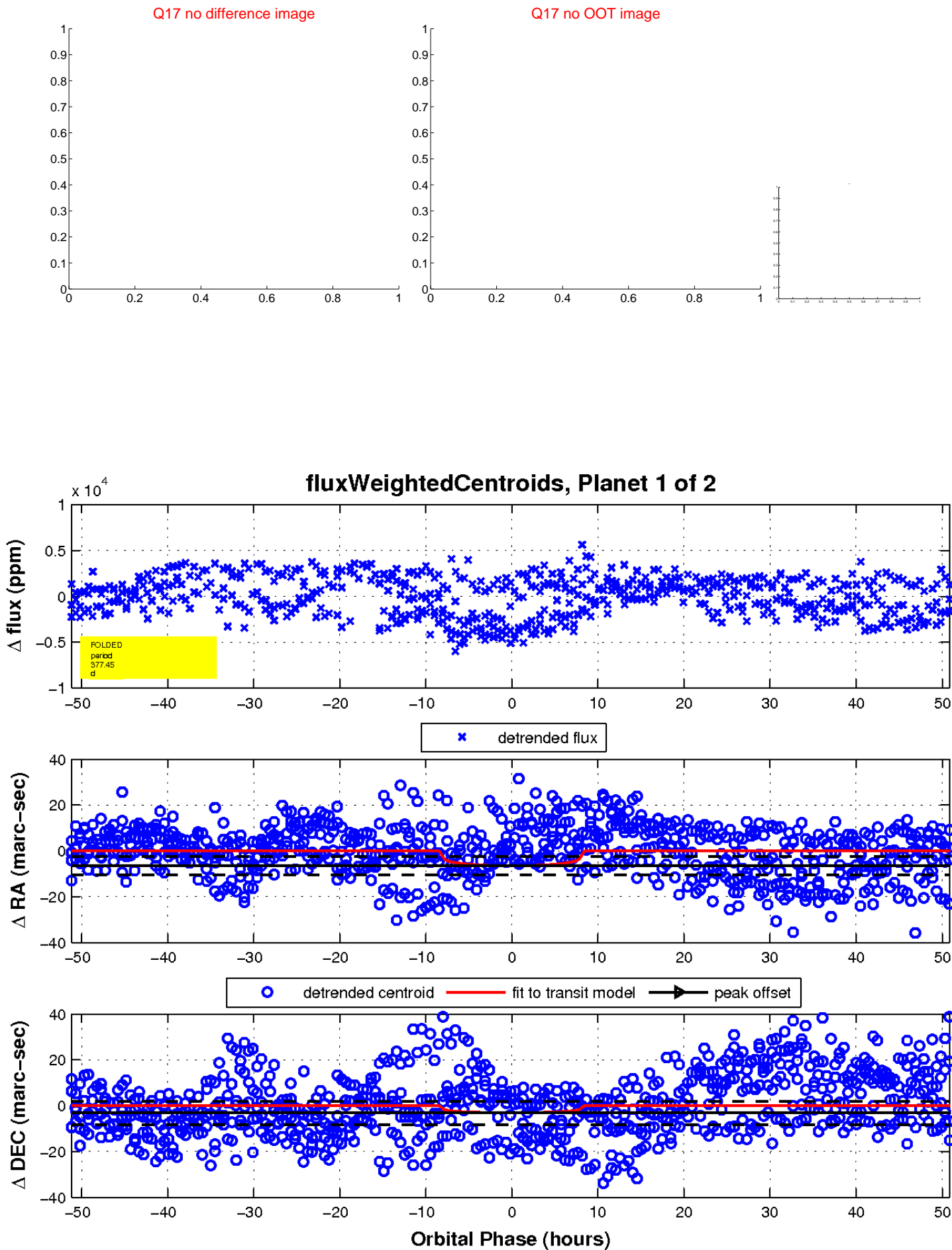
Q16 difference image. Poor Quality



Q16 OOT image



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



UKIRT Image

