

# KIC 011099109

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 011099109-01 | OBS      | 8219.01 | 115.288280    | 219.575610   | 448.4       | 11.730           | 10.0 | 9.8 | 1.00                        | 5780            | 2.23                   | 4.65                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments                          |
|--------------|----------|------|-------|---|---|---|---|-----------------------------------|
| 011099109-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INCONSISTENT_TRANS—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.

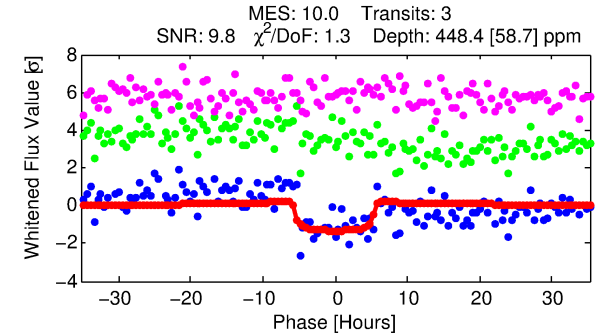
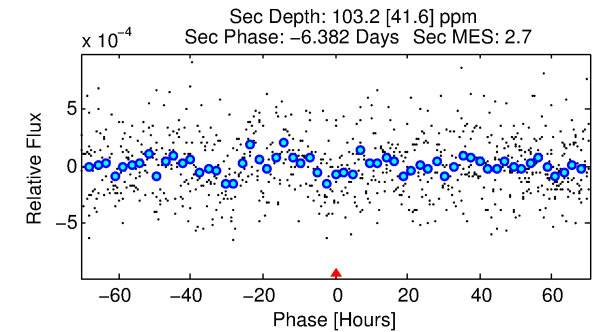
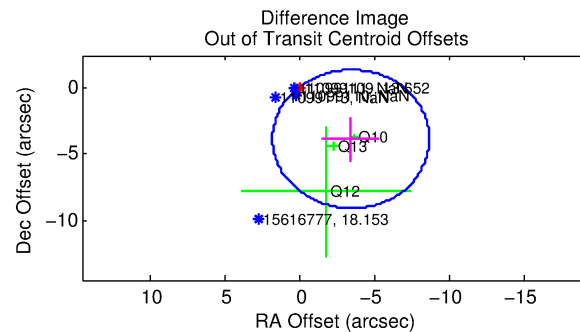
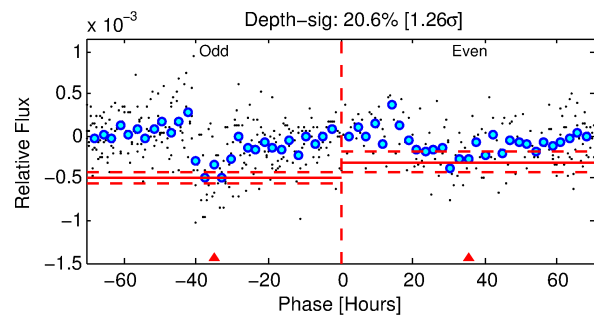
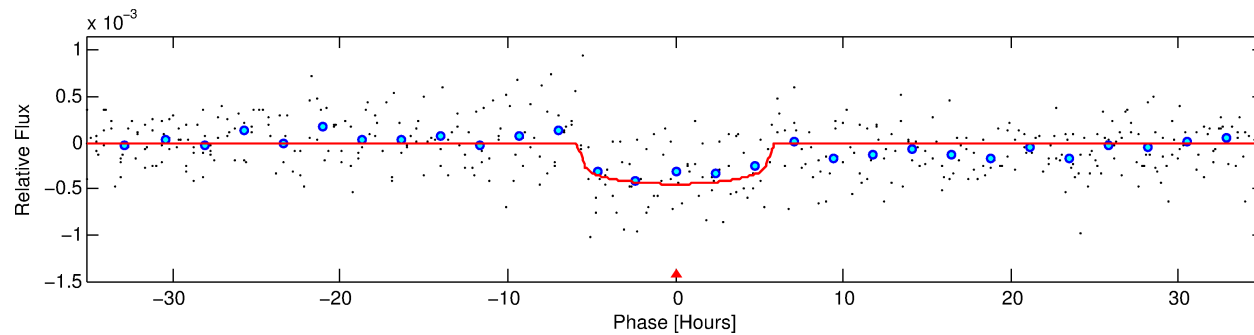
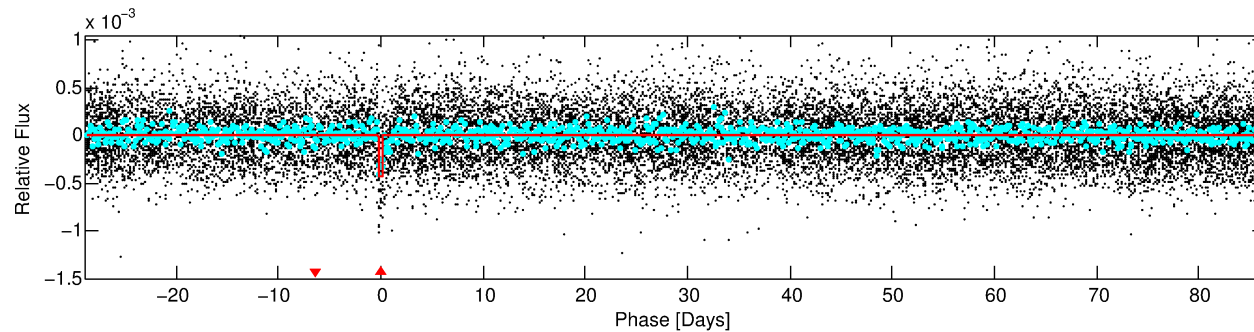
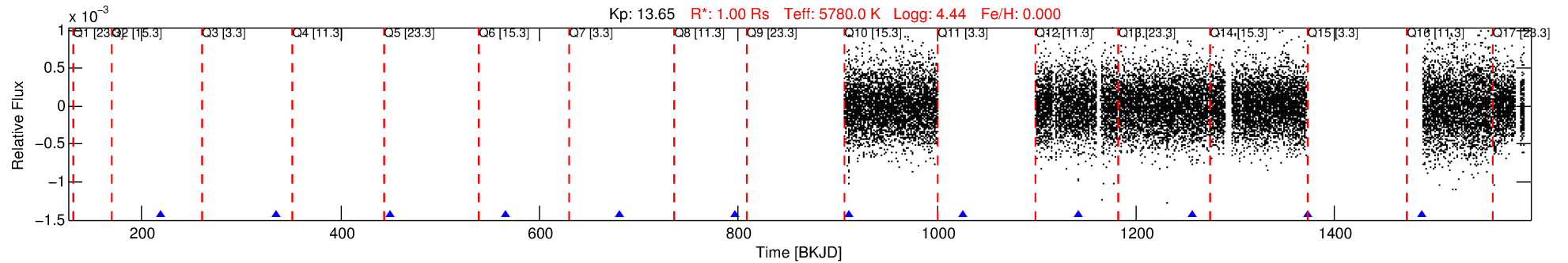
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011099109-01

No Significant Match Found

# DV One-Page Summary

KIC: 11099109 Candidate: 1 of 1 Period: 115.288 d



## DV Fit Results:

Period = 115.28828 [0.00773] d  
Epoch = 219.5756 [0.0624] BKJD  
Rp/R\* = 0.0204 [0.0288]  
a/R\* = 58.90 [367.64]  
b = 0.65 [5.54]  
Seff = 4.65 [0.00]  
Teq = 374 [0] K  
Rp = 2.23 [3.14] Re  
a = 0.4637 [0.0000] AU  
Ag = 2455.13 [6985.01] [0.35σ]  
Teff = 4075 [2899] K [1.28σ]

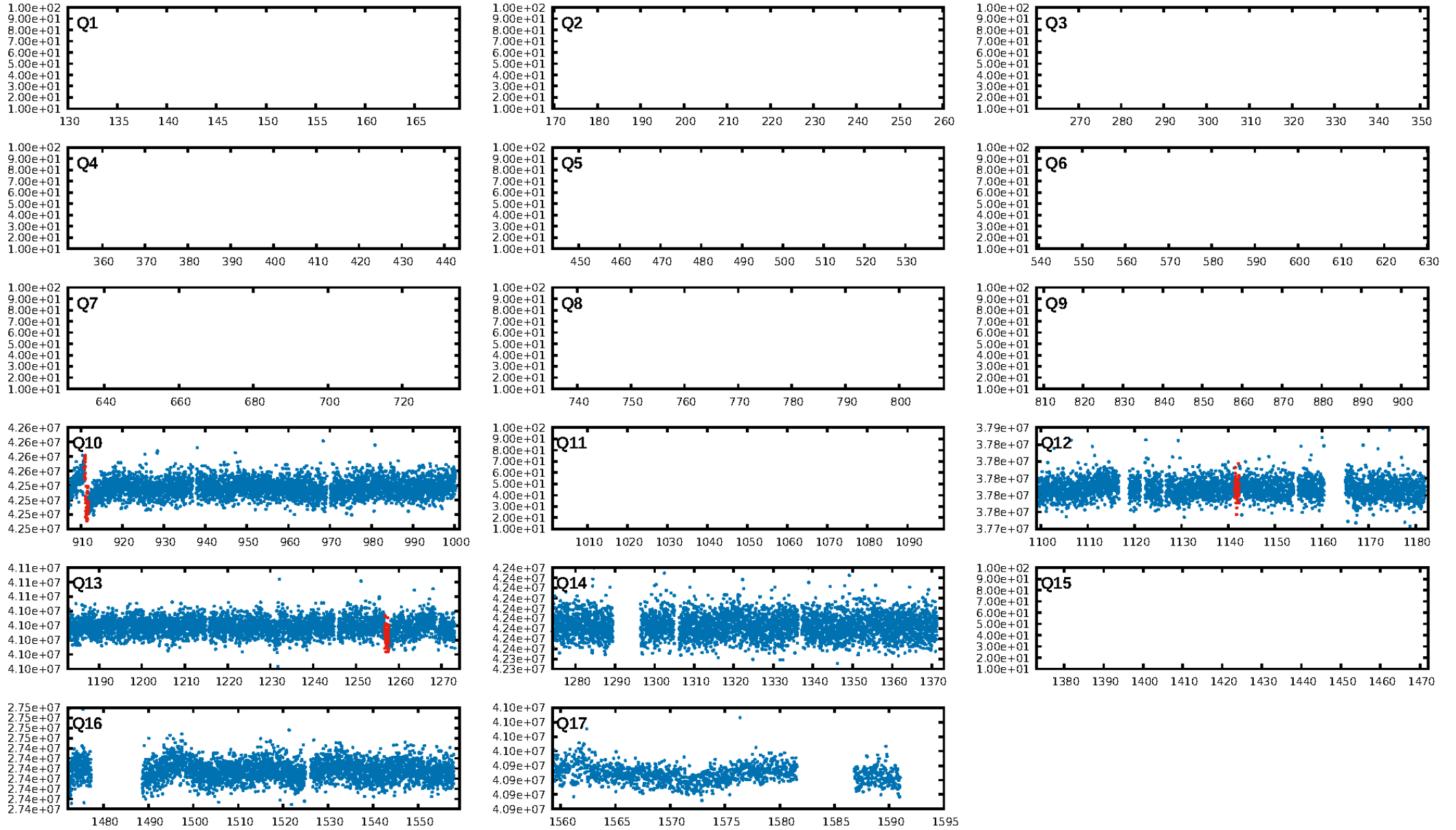
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 54.1%  
Bootstrap-pfa: 3.15e-19  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 10.72  
Centroid-sig: 0.9%  
Centroid-so: 2.202 arcsec [1.66σ]  
OotOffset-rm: 5.171 arcsec [2.96σ]  
KicOffset-rm: 4.591 arcsec [2.58σ]  
OotOffset-st: 1/0/1/1 [3]  
KicOffset-st: 1/0/1/1 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 1.00 [3/3]

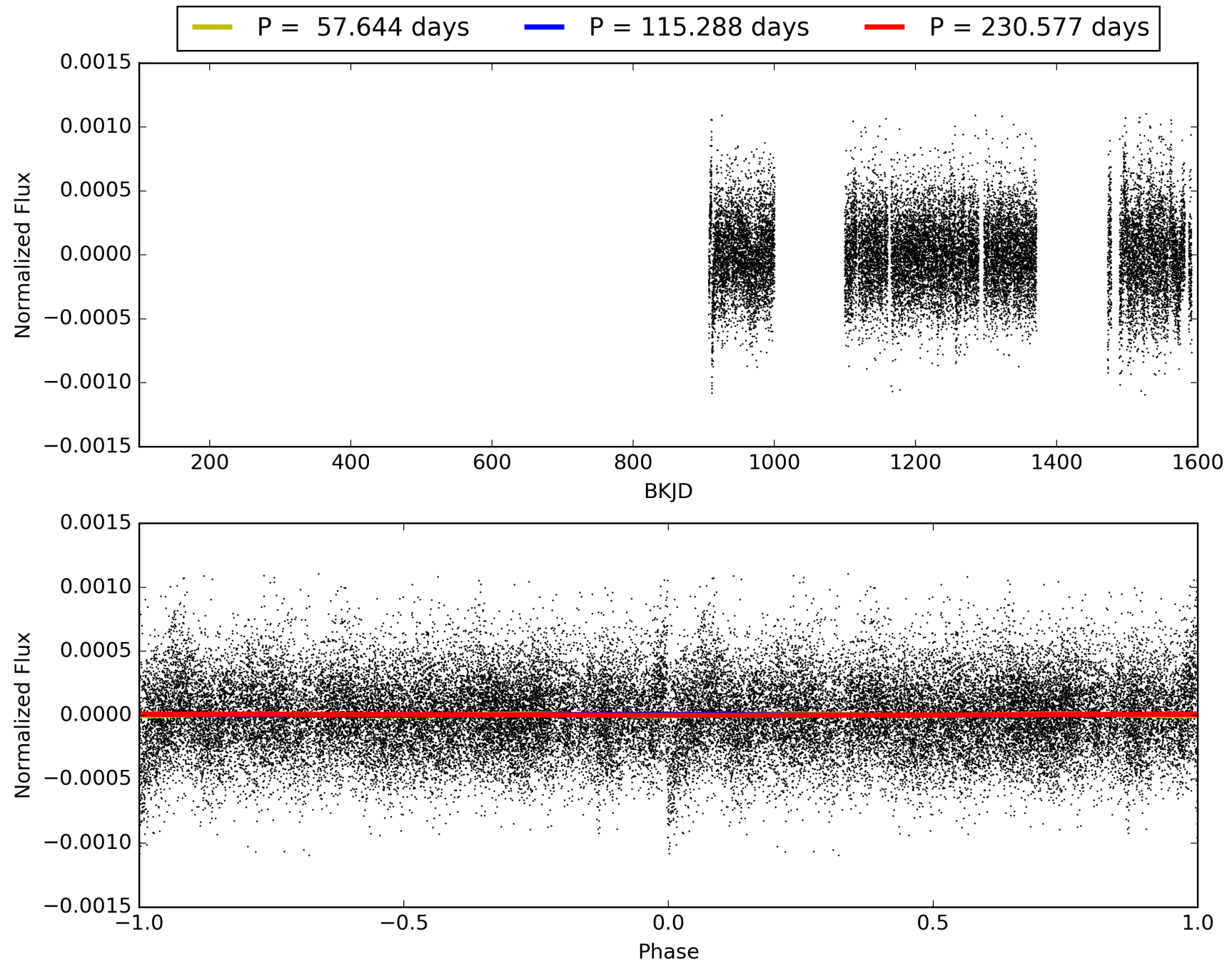
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:10:59 Z

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

# TCE 011099109-01, PDC Light Curves

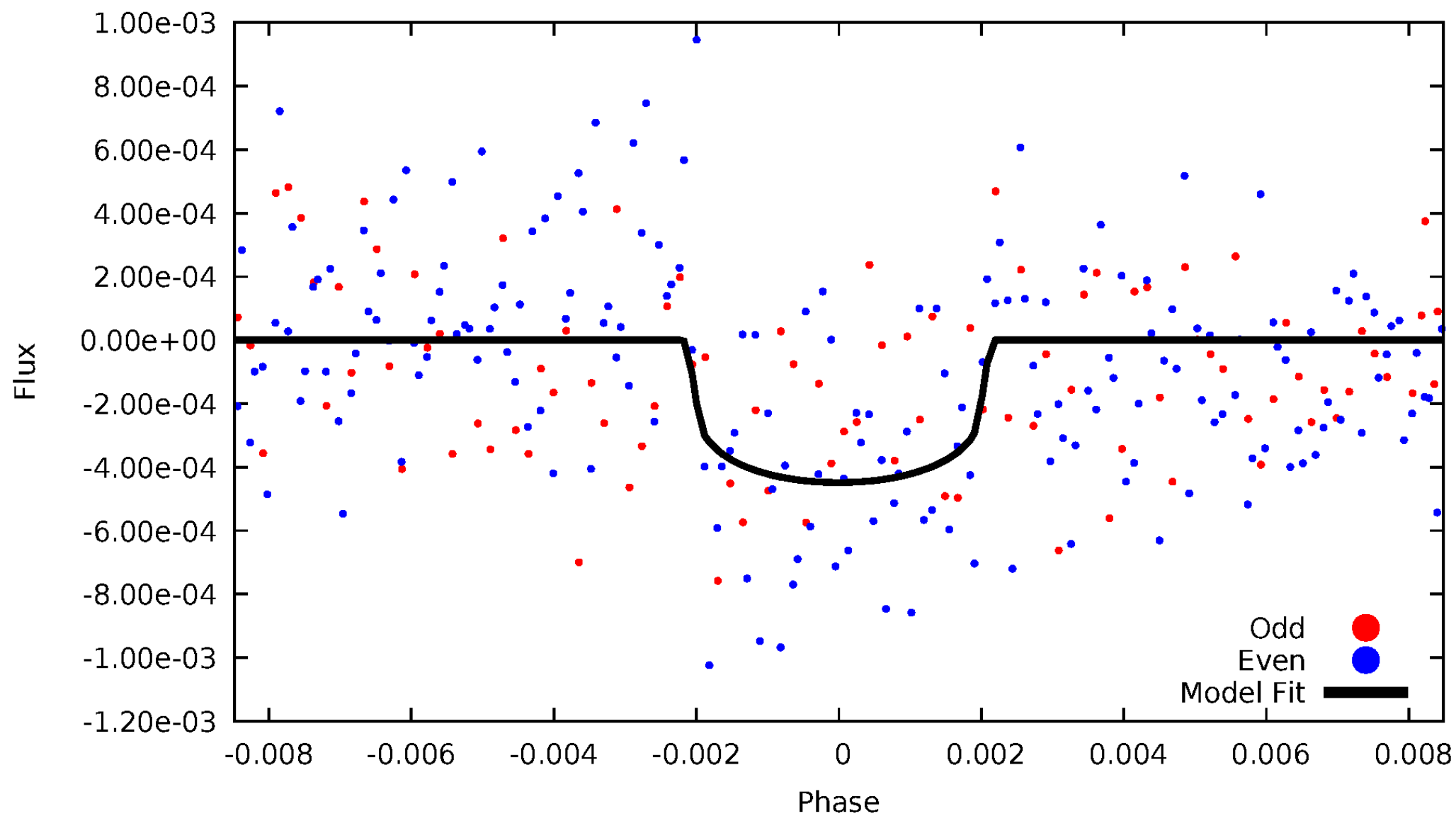


# TCE 011099109-01



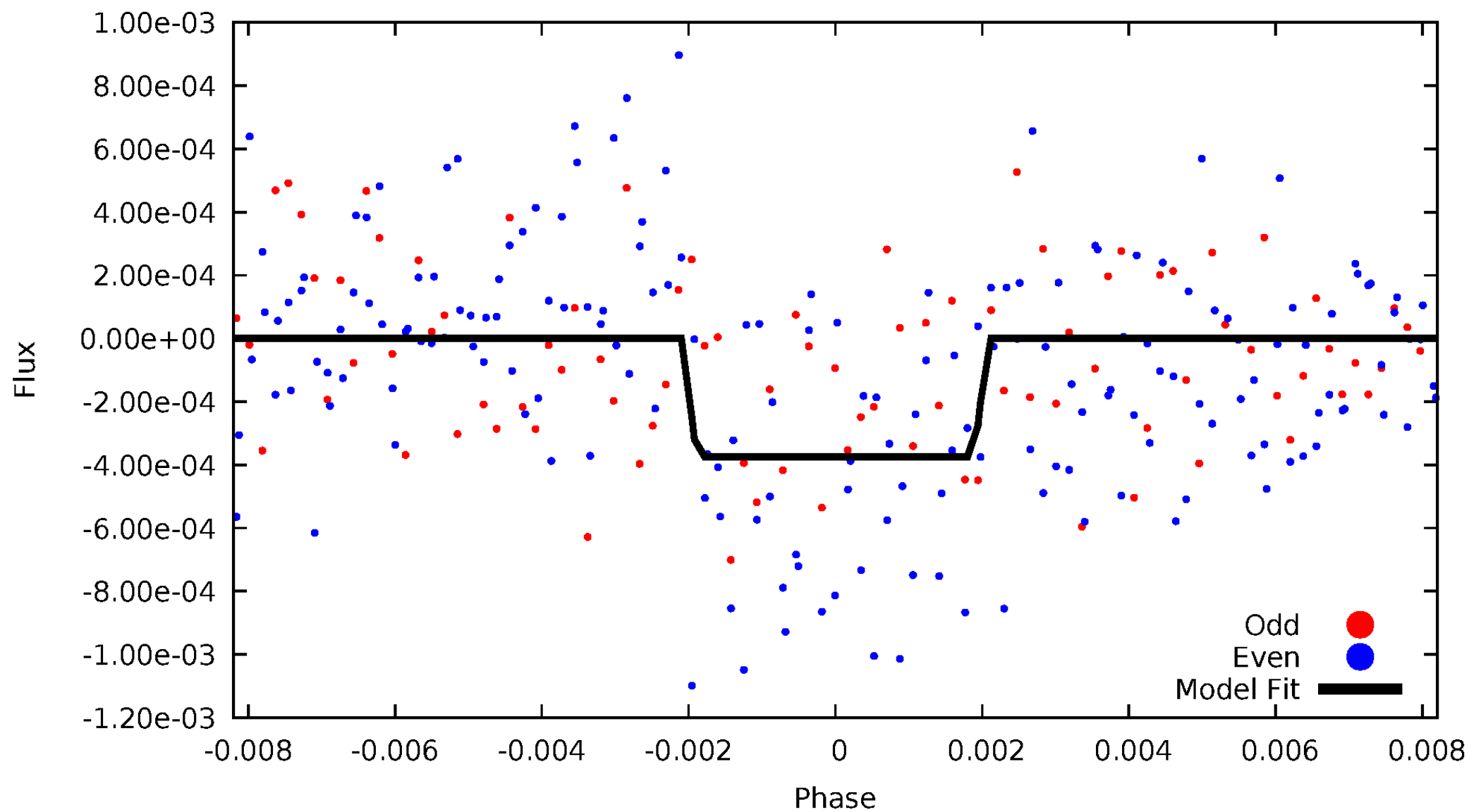
# DV Odd/Even

TCE 011099109-01



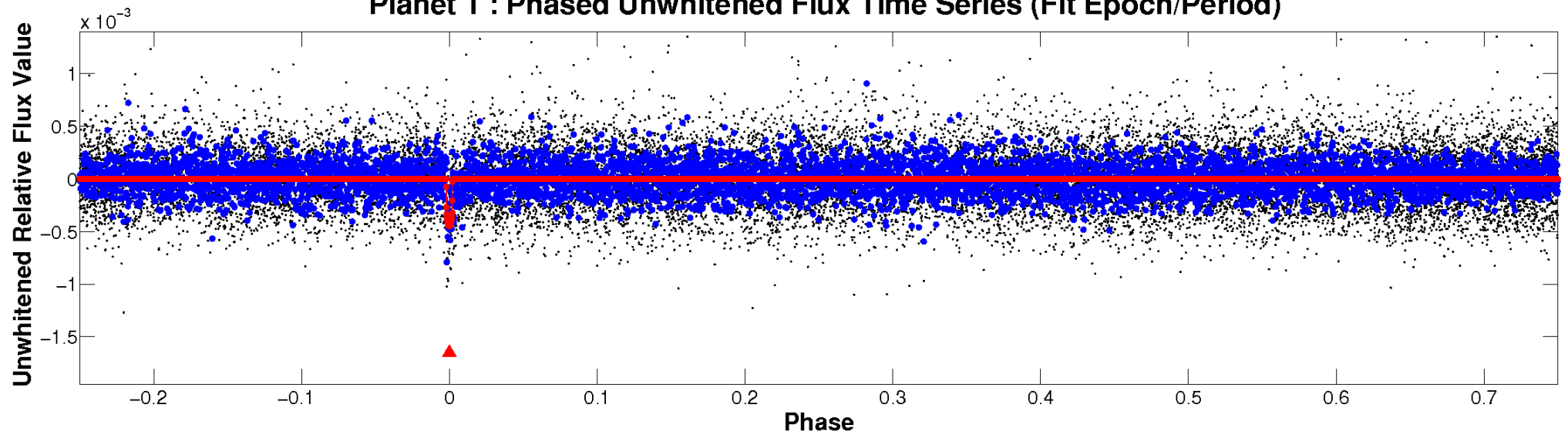
# ALT Odd/Even

TCE 011099109-01

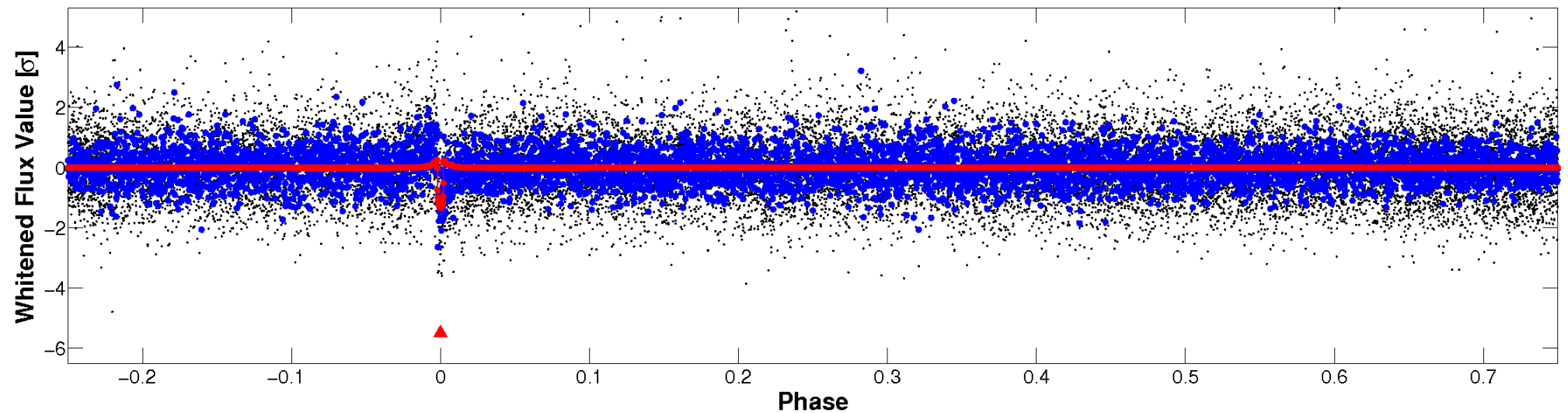


# Non-Whitened Vs. Whitened Light Curve

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

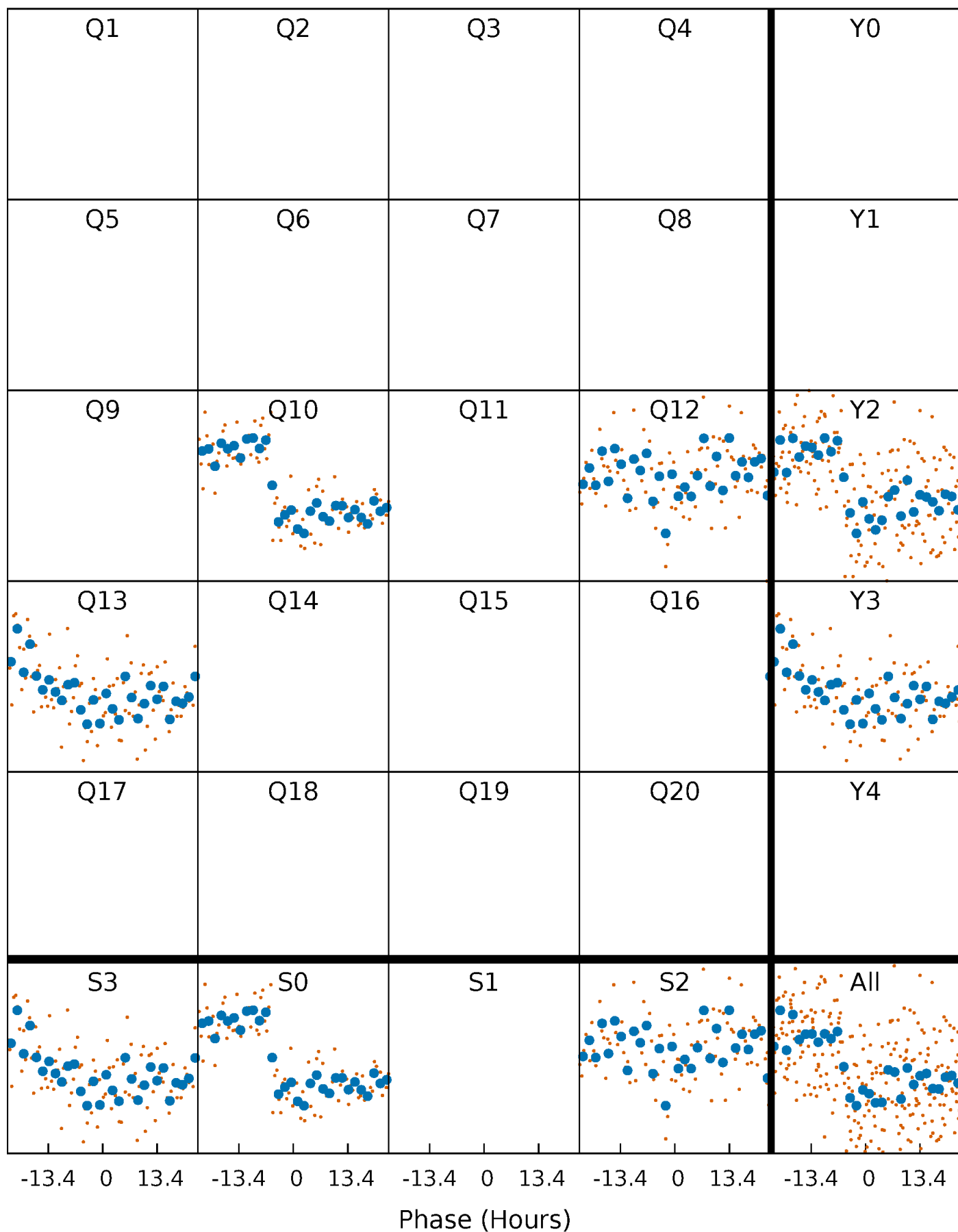


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

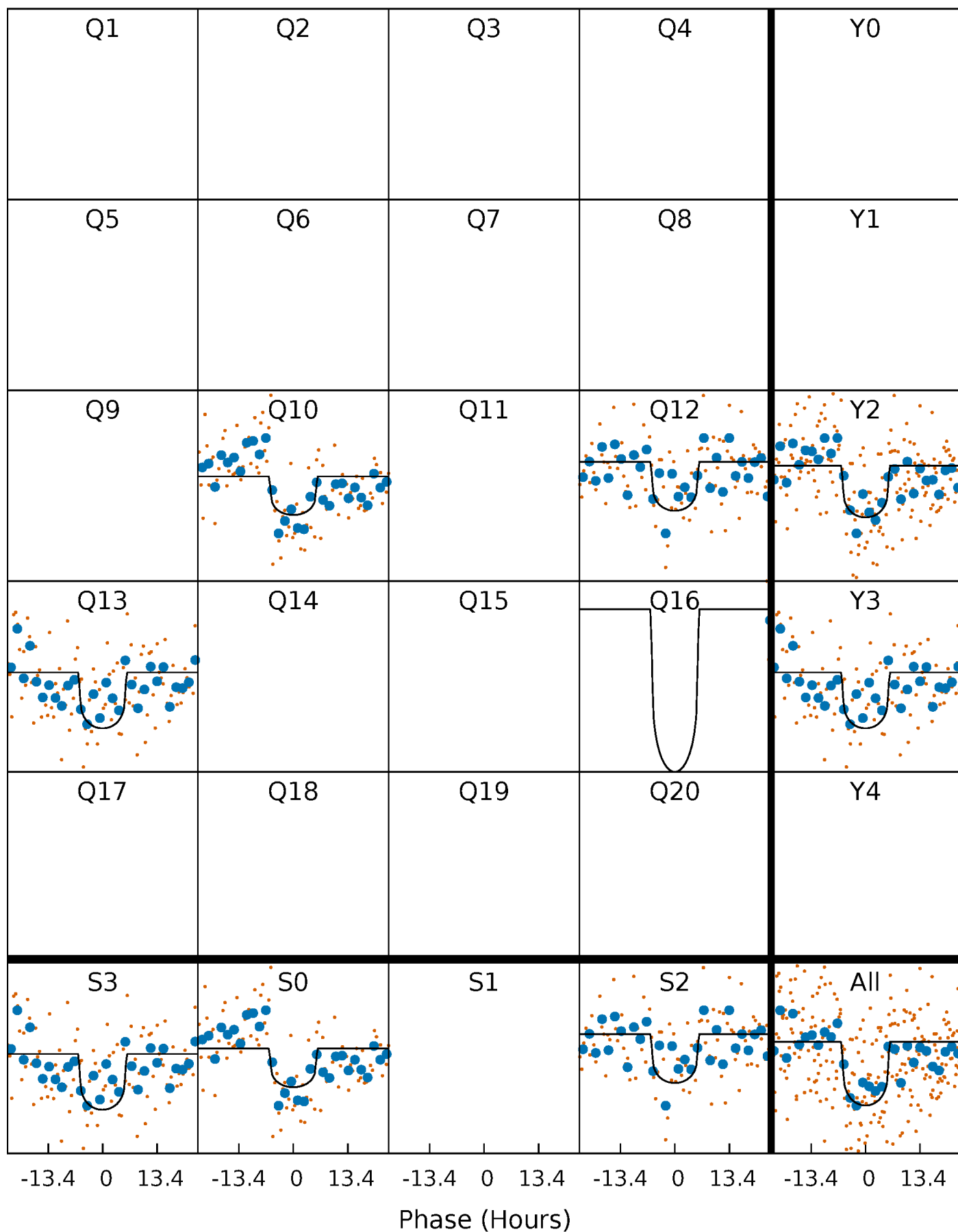
TCE 011099109-01 P=115.288280 Days  $T_0=219.575610$  (BKJD)





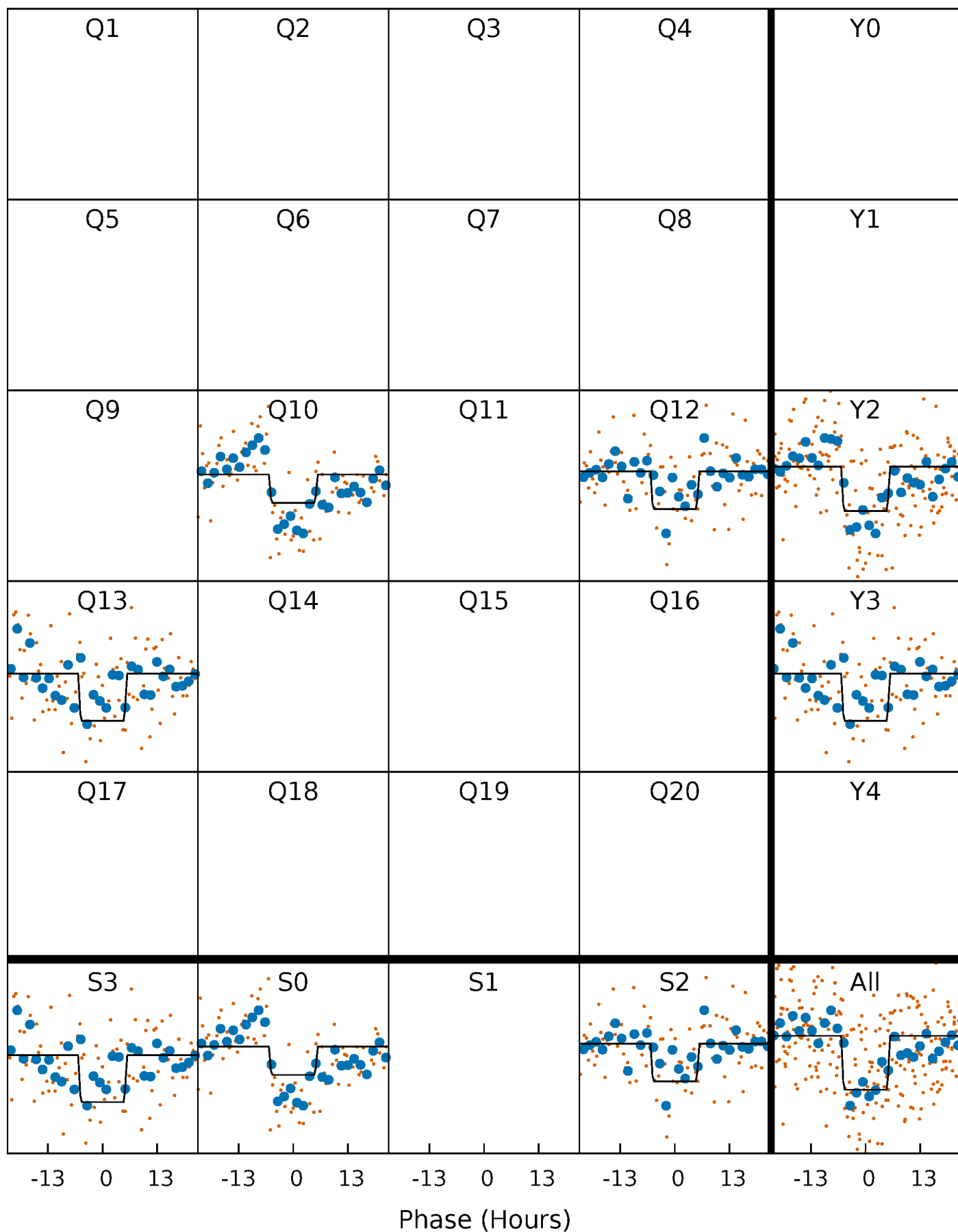
# DV Quarter-Phased Transit Curves

TCE 011099109-01 P=115.288280 Days  $T_0=219.575610$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

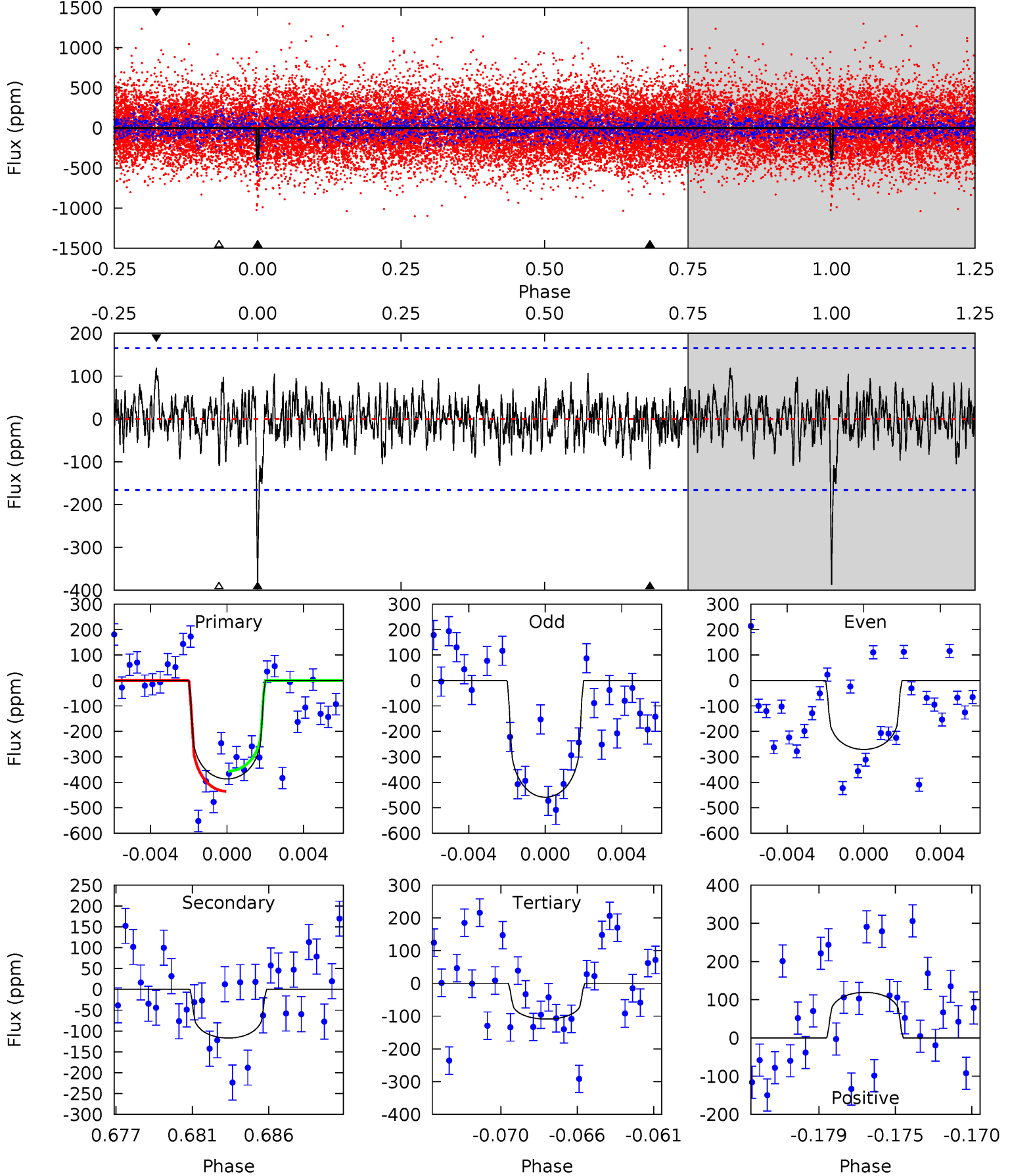
TCE 011099109-01 P=115.272523 Days  $T_0=219.685845$  (BKJD)



# DV Model-Shift Uniqueness Test

011099109-01, P = 115.288280 Days, E = 219.575610 Days

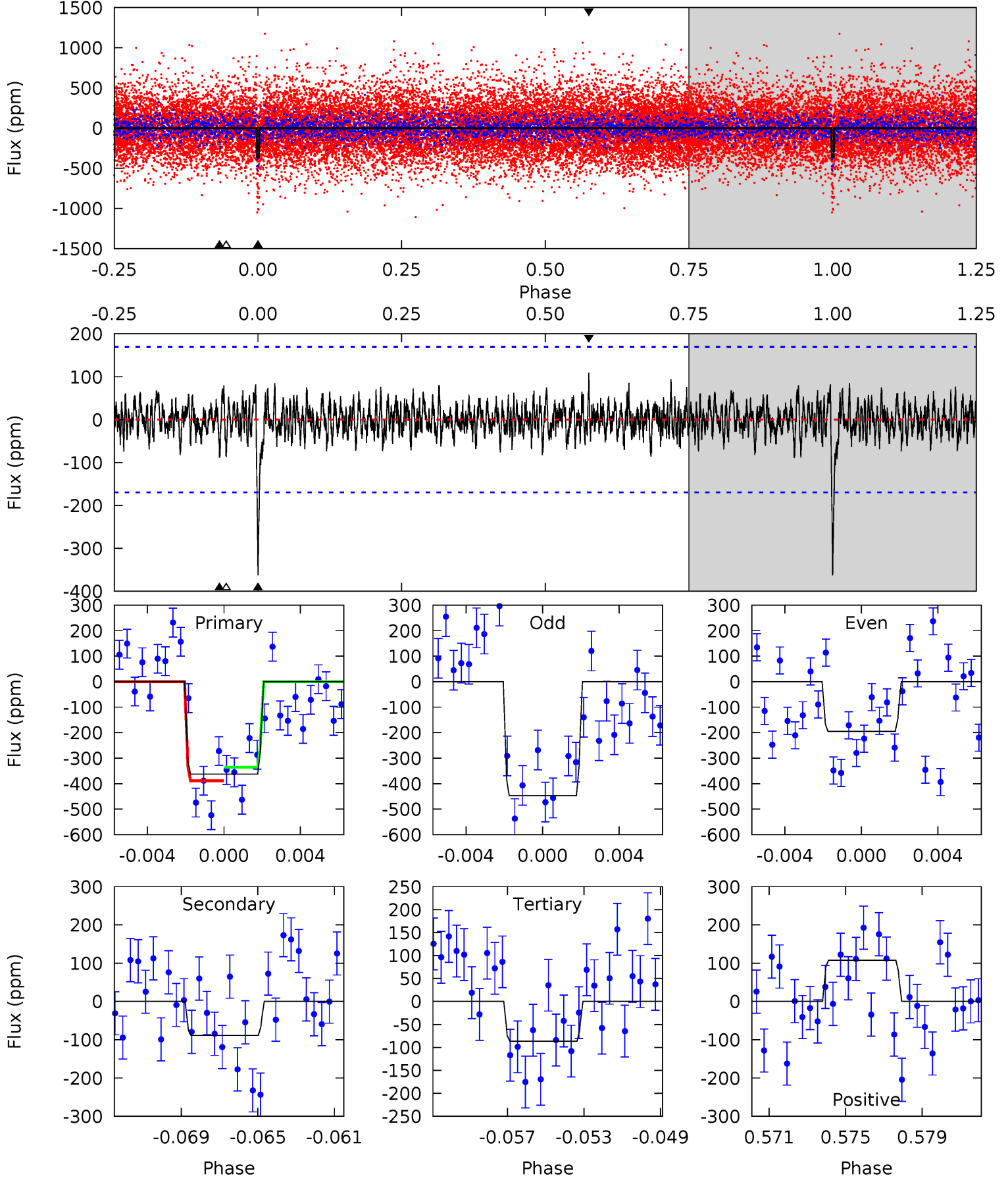
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.1 | 3.65 | 3.41 | 3.73 | 5.18            | 2.85            | 1.16             | 8.68    | 8.37    | 0.24    | -0.08   | 2.73    | 1.13 | 0.24  | 1.23 |



# Alt Model-Shift Uniqueness Test

011099109-01, P = 115.272523 Days, E = 219.685845 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.1 | 2.72 | 2.65 | 3.30 | 5.20            | 2.87            | 0.88             | 8.46    | 7.80    | 0.07    | -0.58   | 3.64    | 1.39 | 0.23  | 0.81 |



### Stellar Parameters For KIC 011099109

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$             | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|----------------------------|---|
|        | $5780^{+1}_{-1}$    | $4.438^{+1.000}_{-1.000}$ | $0.000^{+1.000}_{-1.000}$ | $1.000^{+1.000}_{-1.000}$ | $-1.000^{+1.000}_{-1.000}$ | $-1.000^{+1.000}_{-1.000}$                |
|        | +0%/-0%             | +23%/-23%                 | +inf%/-inf%               | +100%/-100%               | +100%/-100%                | +100%/-100%                               |
| Source | Solar               | Solar                     | Solar                     | Solar                     |                            |   |

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

### Secondary Eclipse Parameters for KIC 011099109-01 / KOI 8219.01

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$     | $T_{max} (K)$     | $T_{obs} (K)$         | $A_{obs}$              |
|---------|---------------|------------------------|-------------------|-----------------------|------------------------|
| DV      | $-117 \pm 32$ | $3.18^{+2.72}_{-2.13}$ | $523^{+26}_{-24}$ | $3864^{+2191}_{-708}$ | $1303^{+11770}_{-928}$ |
| Alt.    | $-89 \pm 33$  | $3.13^{+2.84}_{-2.02}$ | $525^{+24}_{-24}$ | $3684^{+1872}_{-712}$ | $1010^{+7672}_{-761}$  |

$T_{max}$  = 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

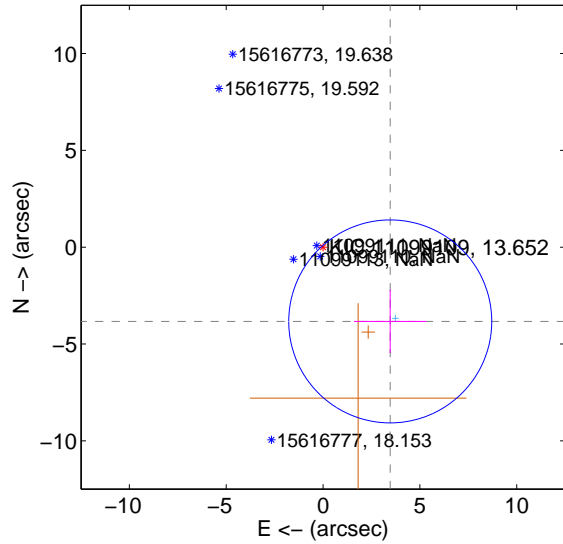
Supplemental centroid analysis for 011099109-01. Kepler magnitude: 13.65. Transit SNR 9.81

There are 1 quarters with good PRF difference image offsets

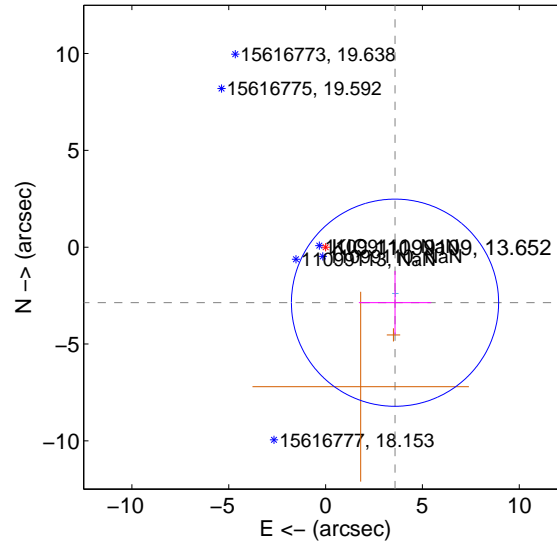
The direct PRF centroid is offset from the target star catalog position by about 1.18 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $5.171 \pm 1.747$  | 2.96                | $-3.470 \pm 1.869$ | $-3.834 \pm 1.640$ |
| PRF-fit source offset from KIC position | $4.591 \pm 1.783$  | 2.58                | $-3.586 \pm 1.869$ | $-2.868 \pm 1.640$ |
| photometric centroid source offset      | $2.20 \pm 1.32$    | 1.66                | $-0.38 \pm 1.63$   | $-2.17 \pm 1.31$   |

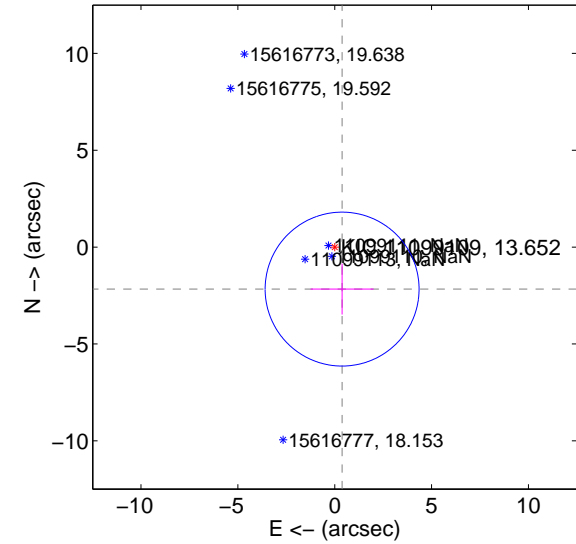
offset from difference PRF-fit to OOT PRF-fit



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.

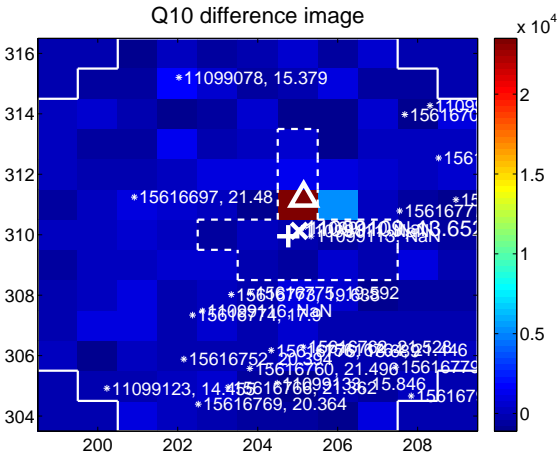
Q9 no difference image



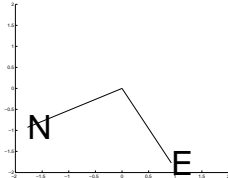
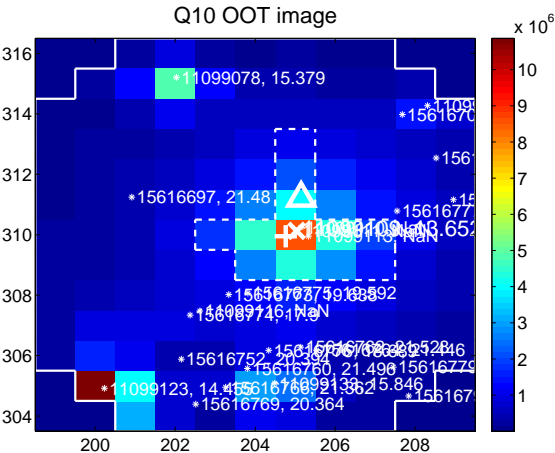
Q9 no OOT image



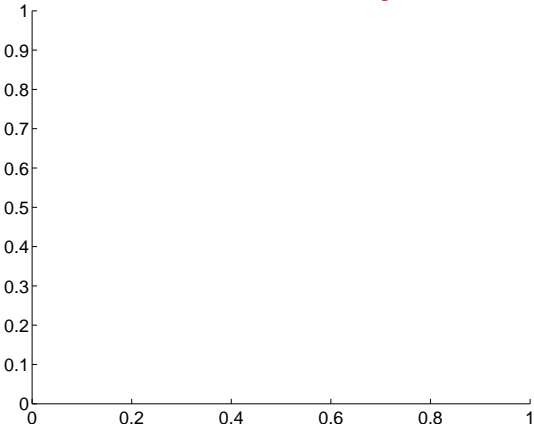
Q10 difference image



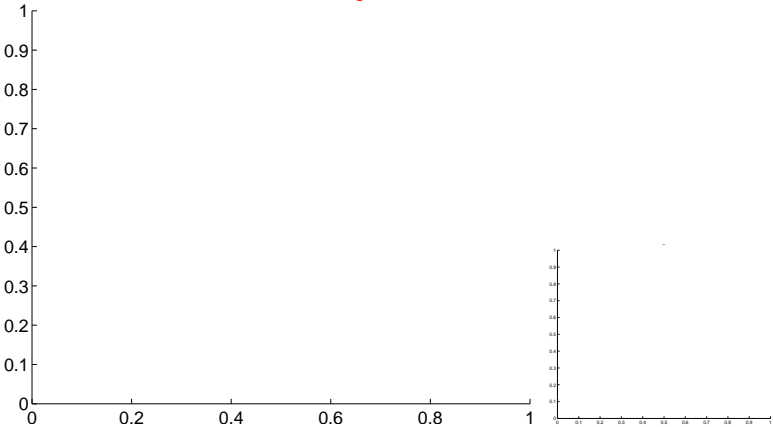
Q10 OOT image



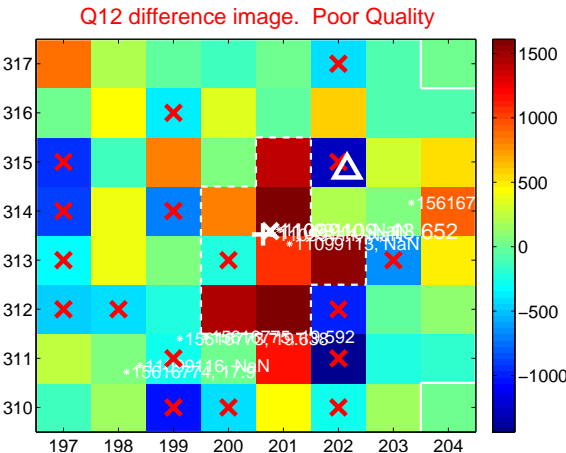
Q11 no difference image



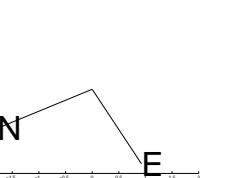
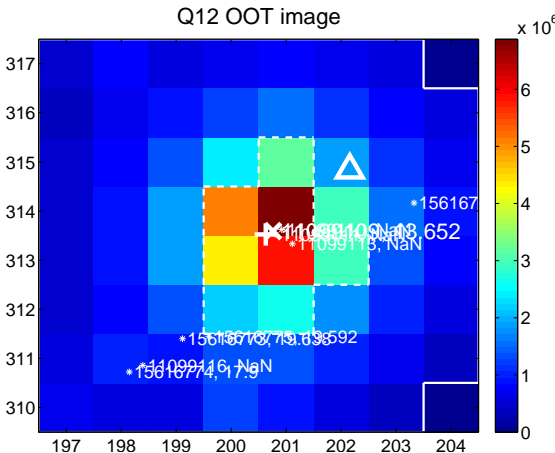
Q11 no OOT image



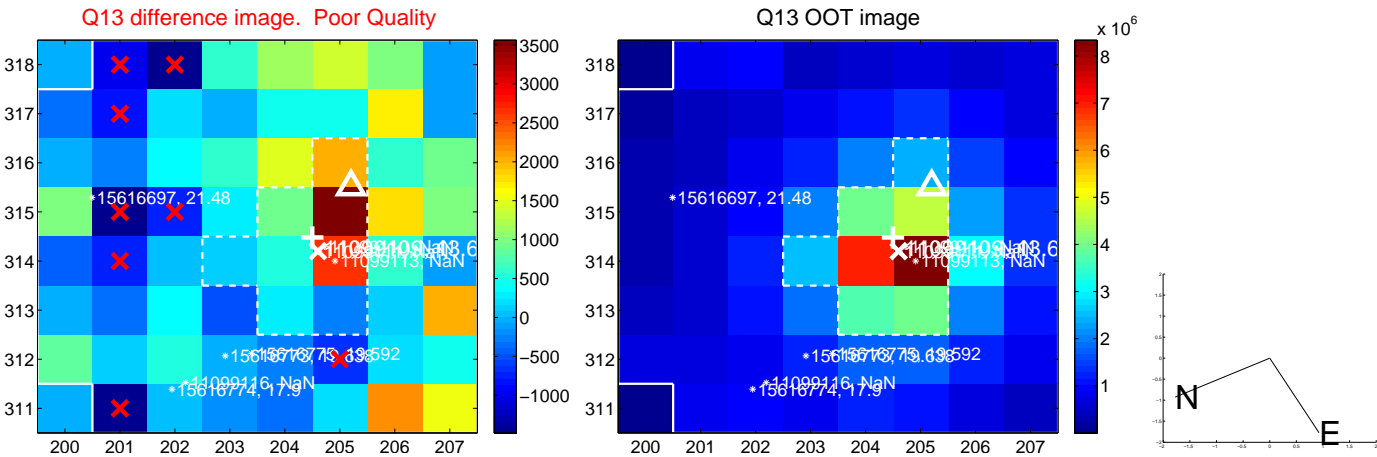
Q12 difference image. Poor Quality



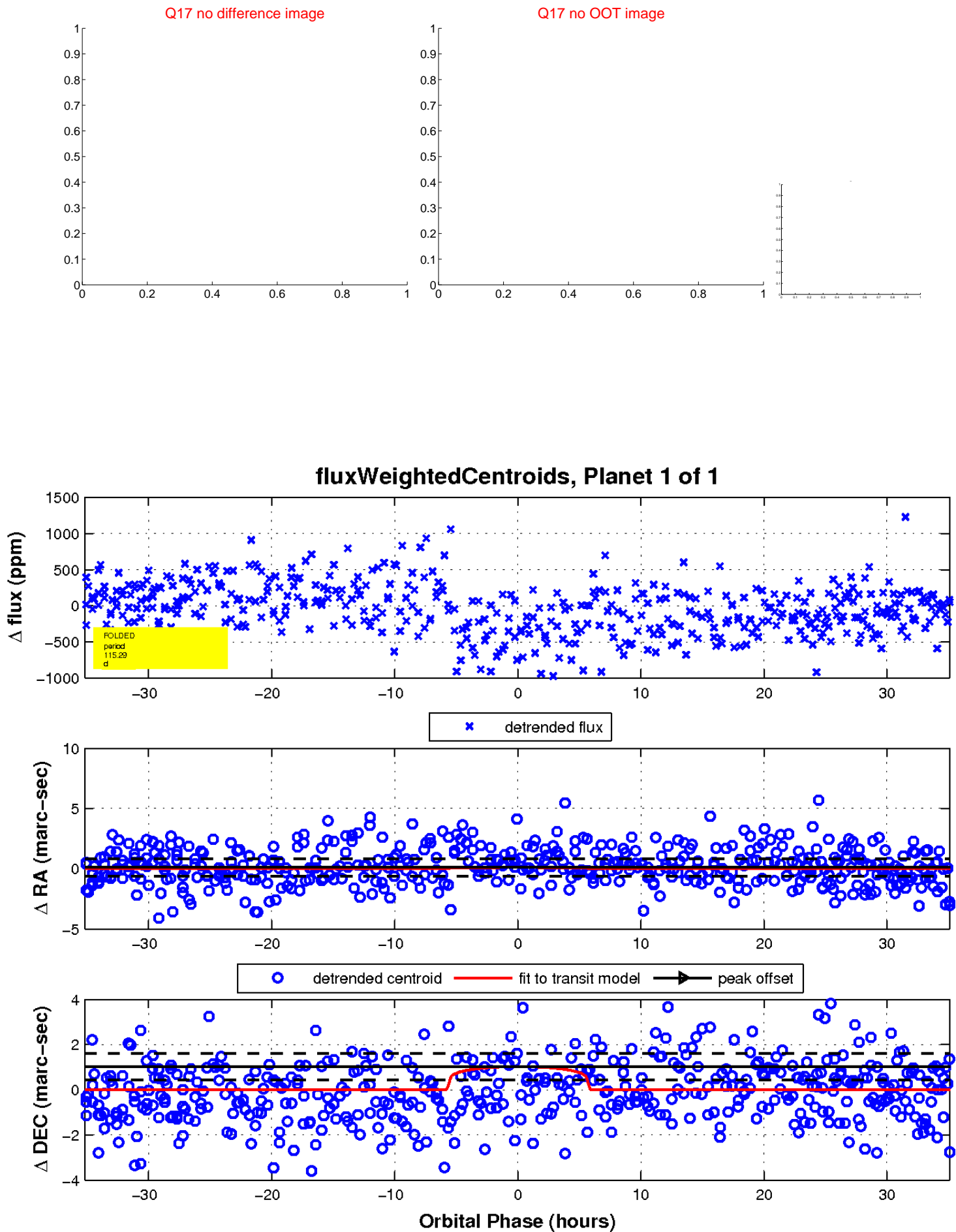
Q12 OOT image



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.



UKIRT Image

Declination

