

# KIC 010019854

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 010019854-01 | OBS      | 7272.01 | 14.101659     | 133.457325   | 98.0        | 4.445            | 7.9 | 7.3 | 1.20                        | 6534            | 1.39                   | 157.93                 |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|------------|
| 010019854-01 | OBS      | PC   | 0.76  | 0 | 0 | 0 | 0 | NO_COMMENT |

**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.

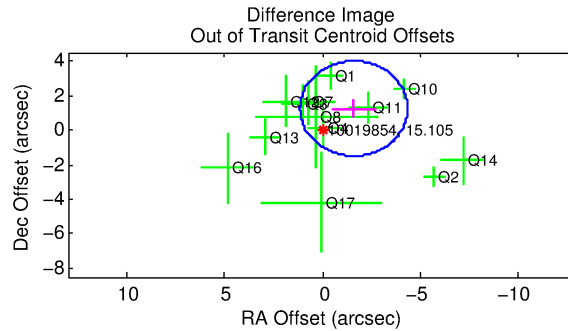
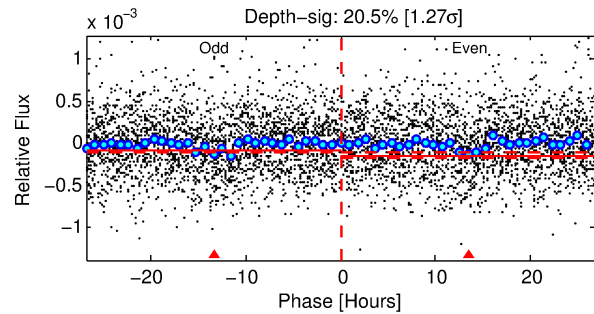
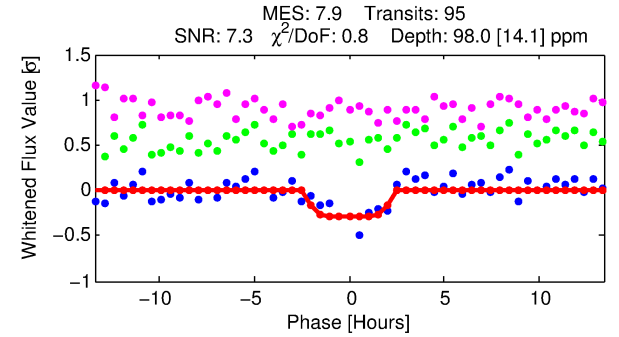
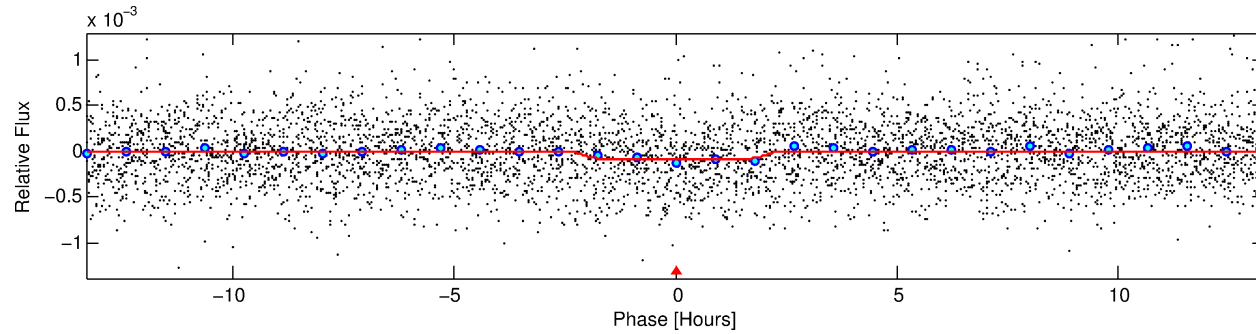
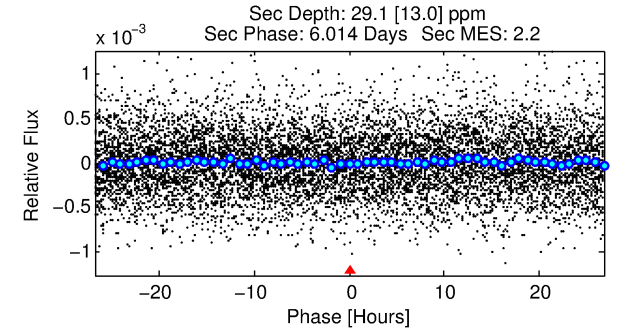
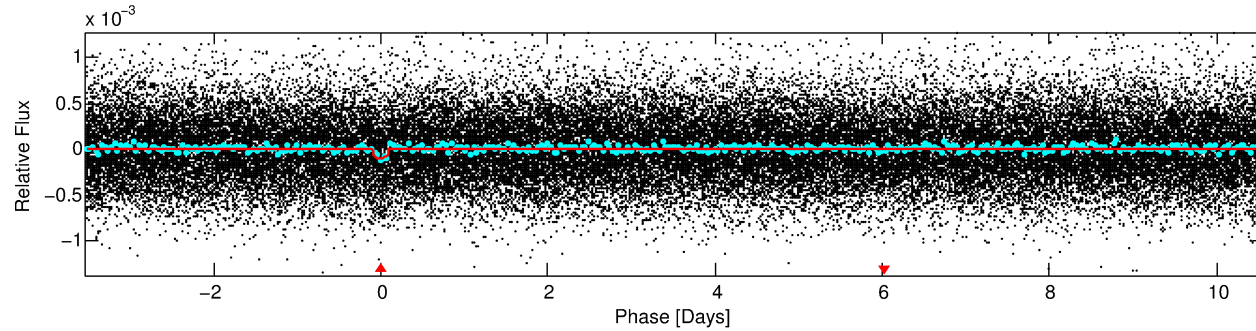
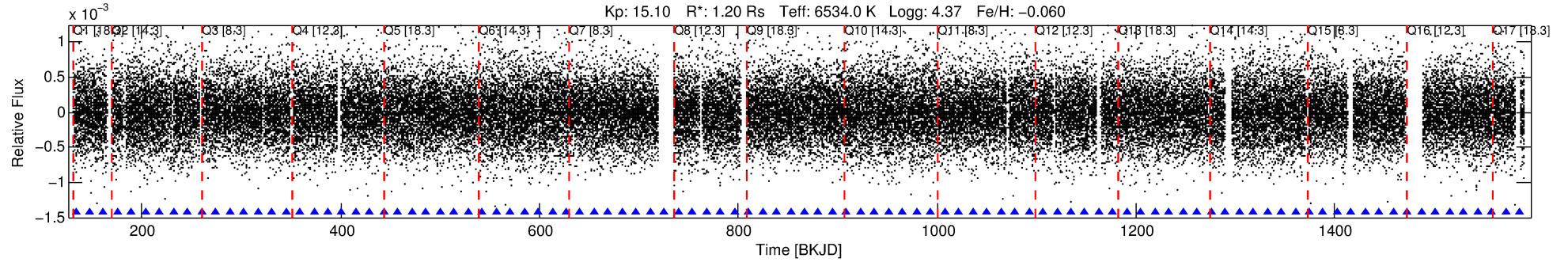
## Ephemeris Match Information For 010019854-01

No Significant Match Found

# DV One-Page Summary

KIC: 10019854 Candidate: 1 of 1 Period: 14.102 d

KOI: K07272.01 Corr: 0.949



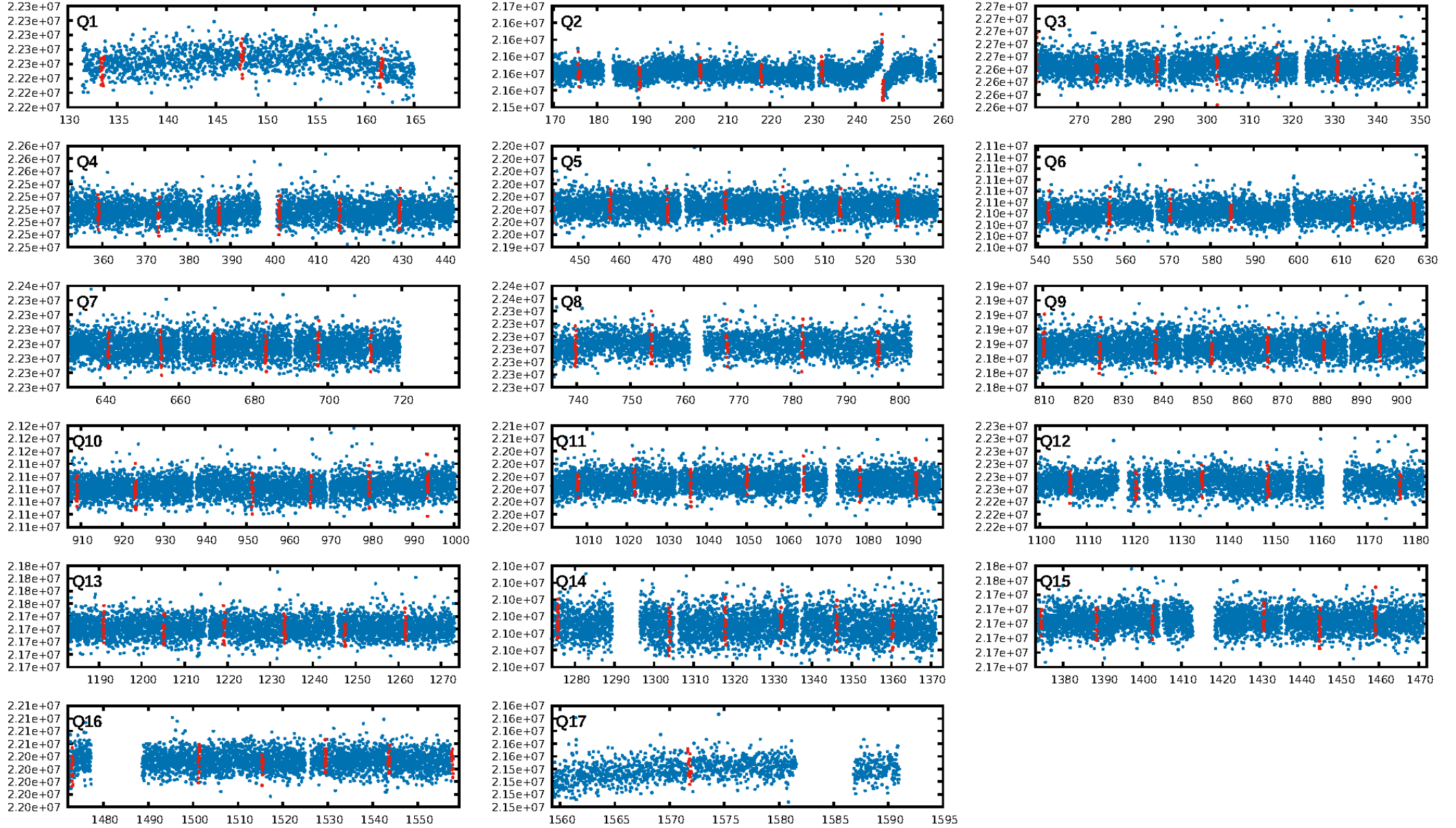
## DV Fit Results:

Period = 14.10166 [0.00022] d  
Epoch = 133.4573 [0.0128] BKJD  
Rp/R\* = 0.0106 [0.0063]  
a/R\* = 11.18 [37.80]  
b = 0.90 [0.73]  
Seff = 157.93 [62.80]  
Teq = 904 [90] K  
Rp = 1.39 [0.93] Re  
a = 0.1219 [0.0316] AU  
Ag = 123.87 [163.86] [0.75σ]  
Teffp = 4663 [1488] K [2.52σ]

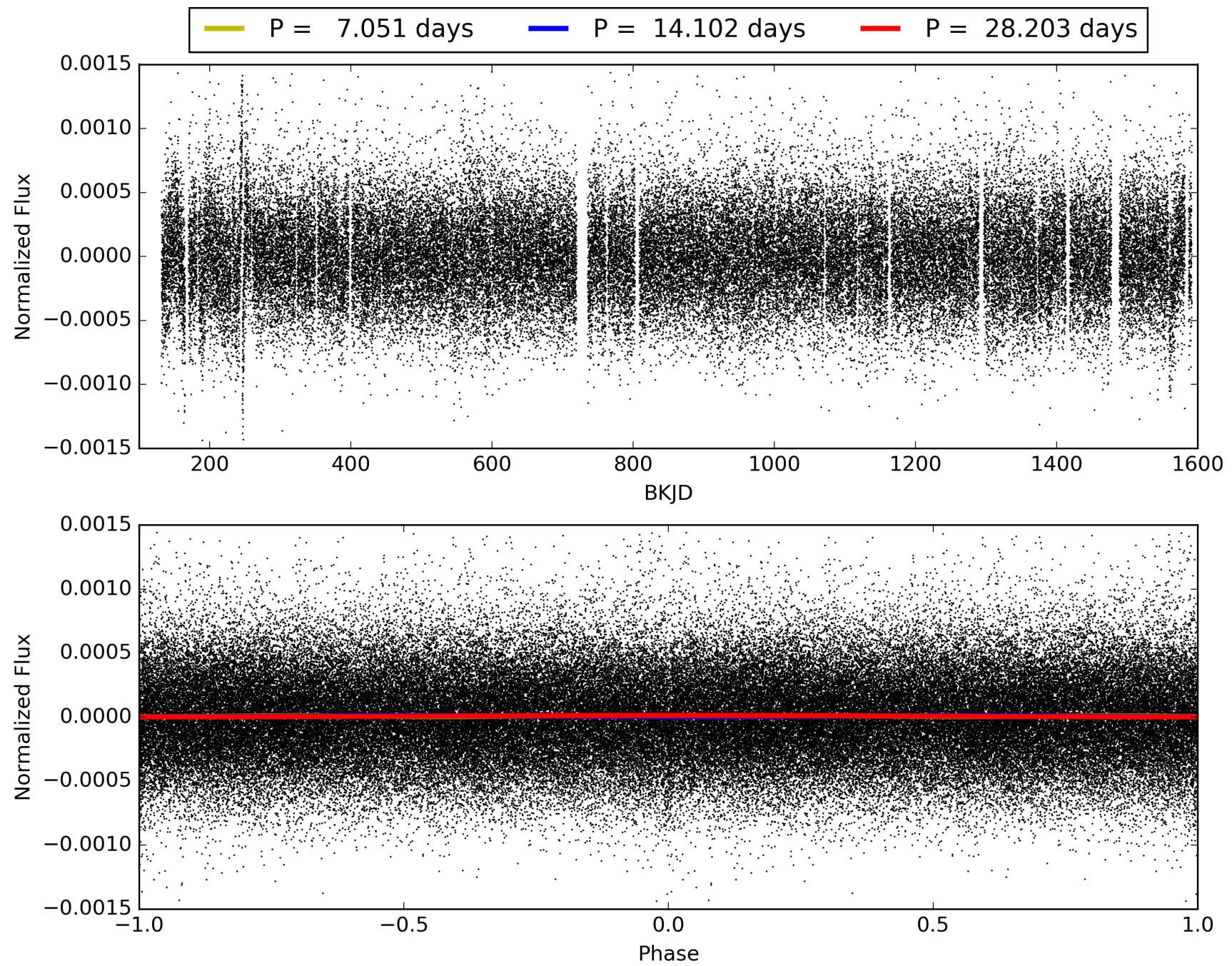
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 97.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.65e-15  
RollingBand-fgt: 1.00 [91/91]  
GhostDiagnostic-chr: 10.91  
Centroid-sig: 31.5%  
Centroid-so: 2.223 arcsec [1.18σ]  
OotOffset-rm: 2.028 arcsec [2.22σ]  
KicOffset-rm: 2.104 arcsec [2.39σ]  
OotOffset-st: 3/3/4/3 [13]  
KicOffset-st: 3/3/4/3 [13]  
DiffImageQuality-fgm: 0.31 [4/13]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 010019854-01, PDC Light Curves



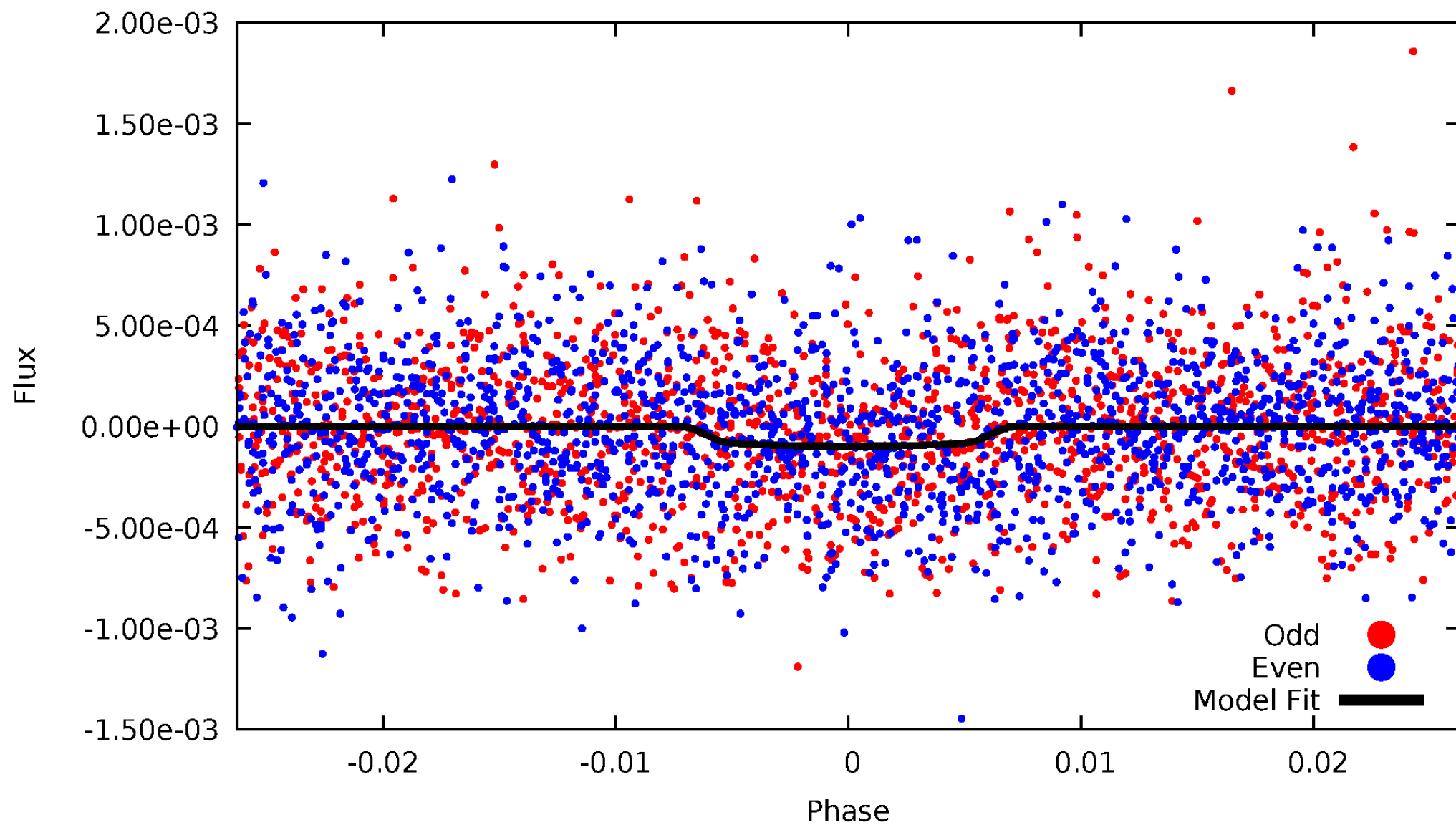
TCE 010019854-01





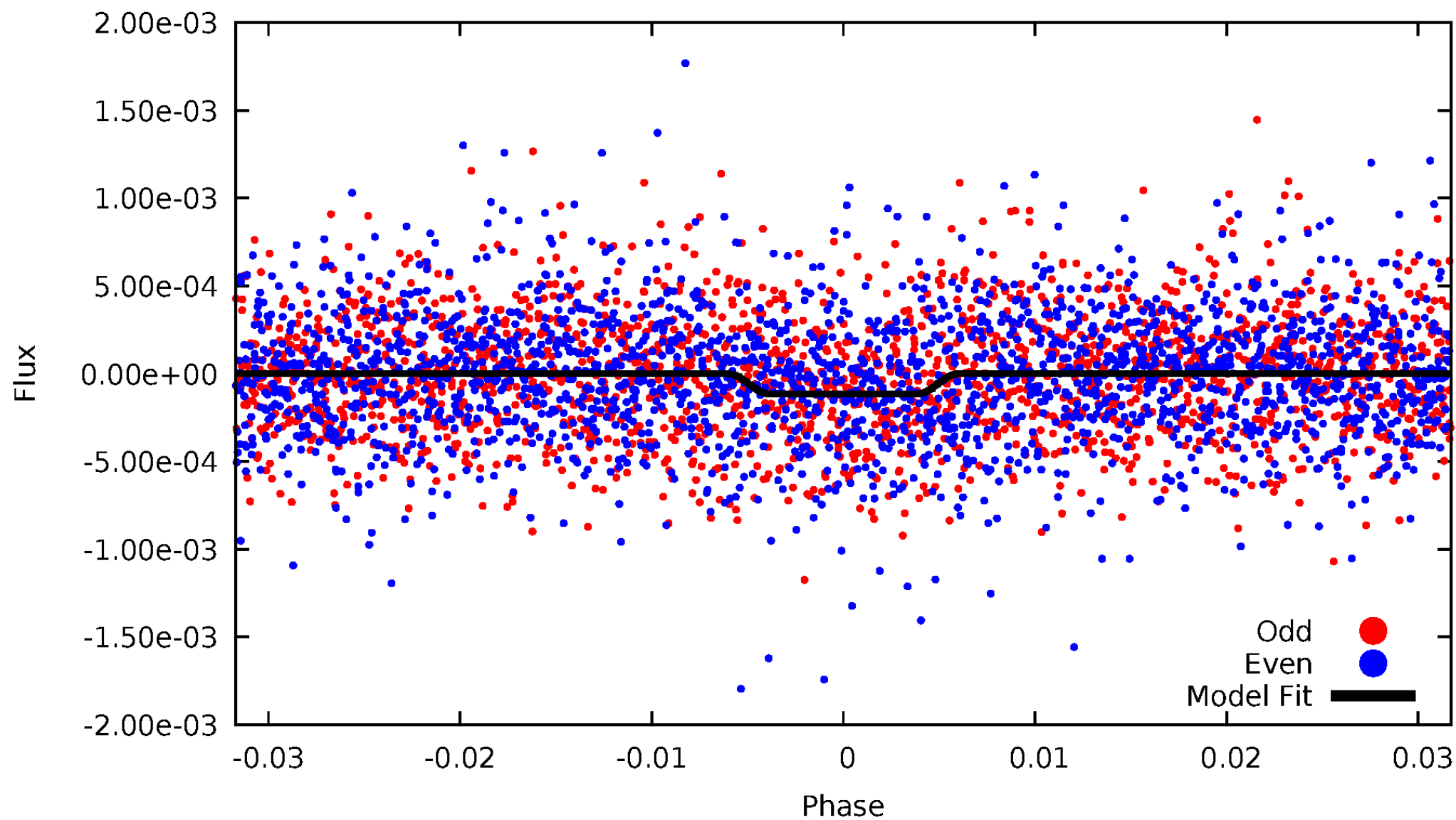
# DV Odd/Even

TCE 010019854-01



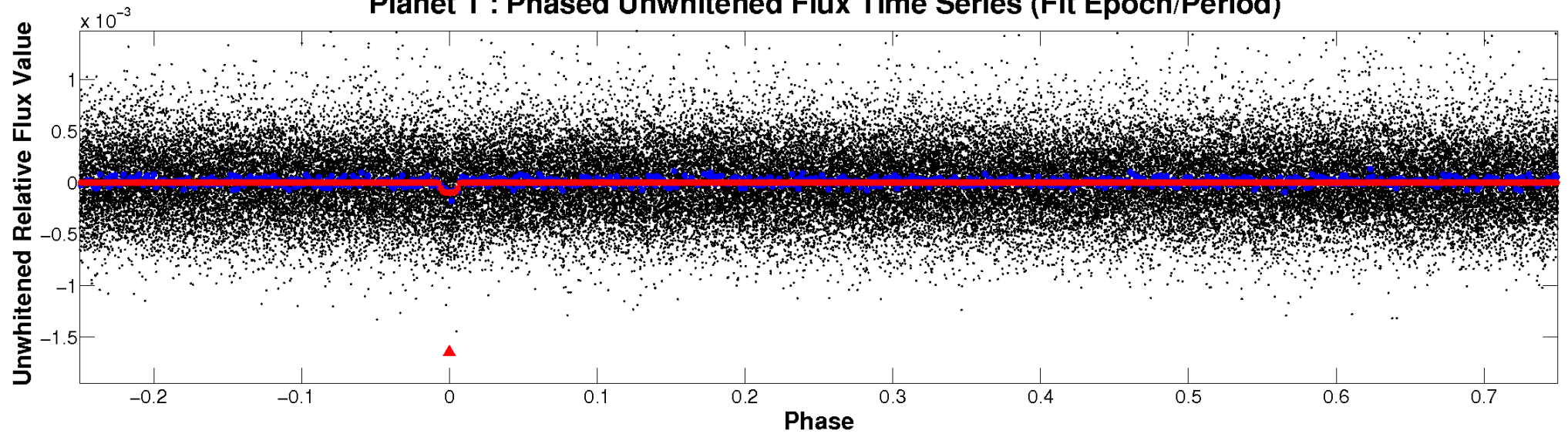
# ALT Odd/Even

TCE 010019854-01

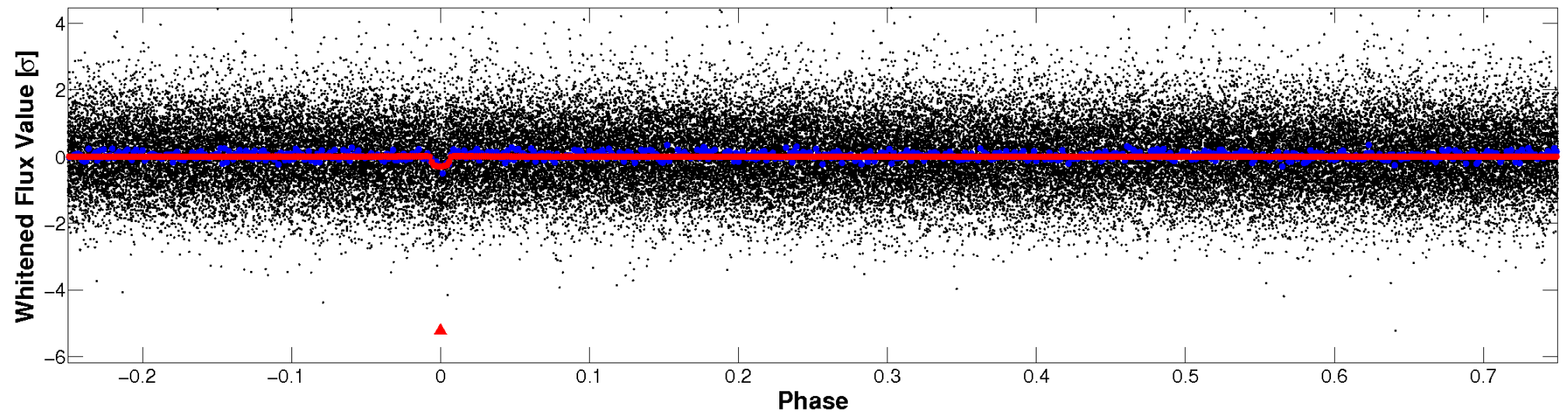


# Non-Whitened Vs. Whitened Light Curve

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

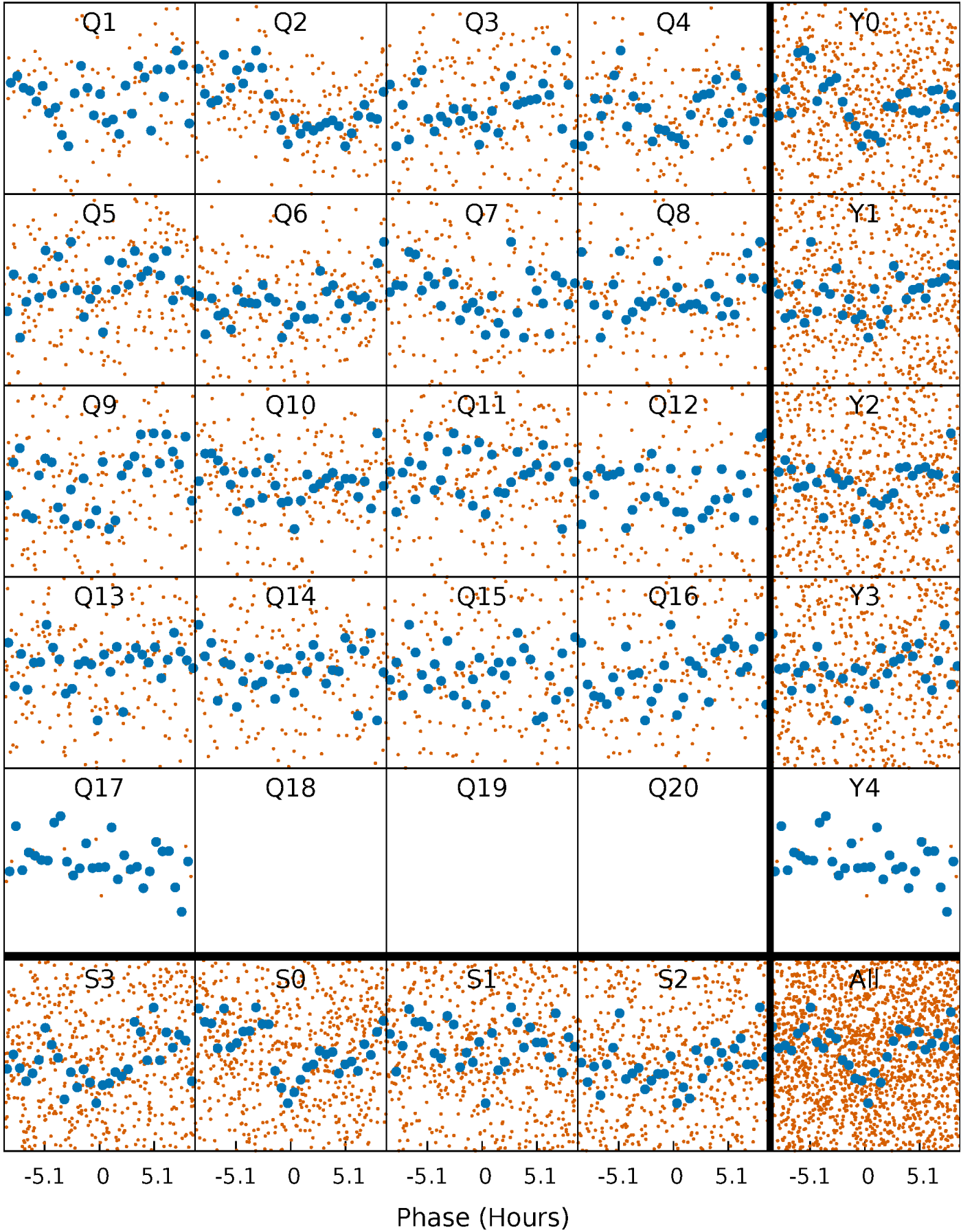


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

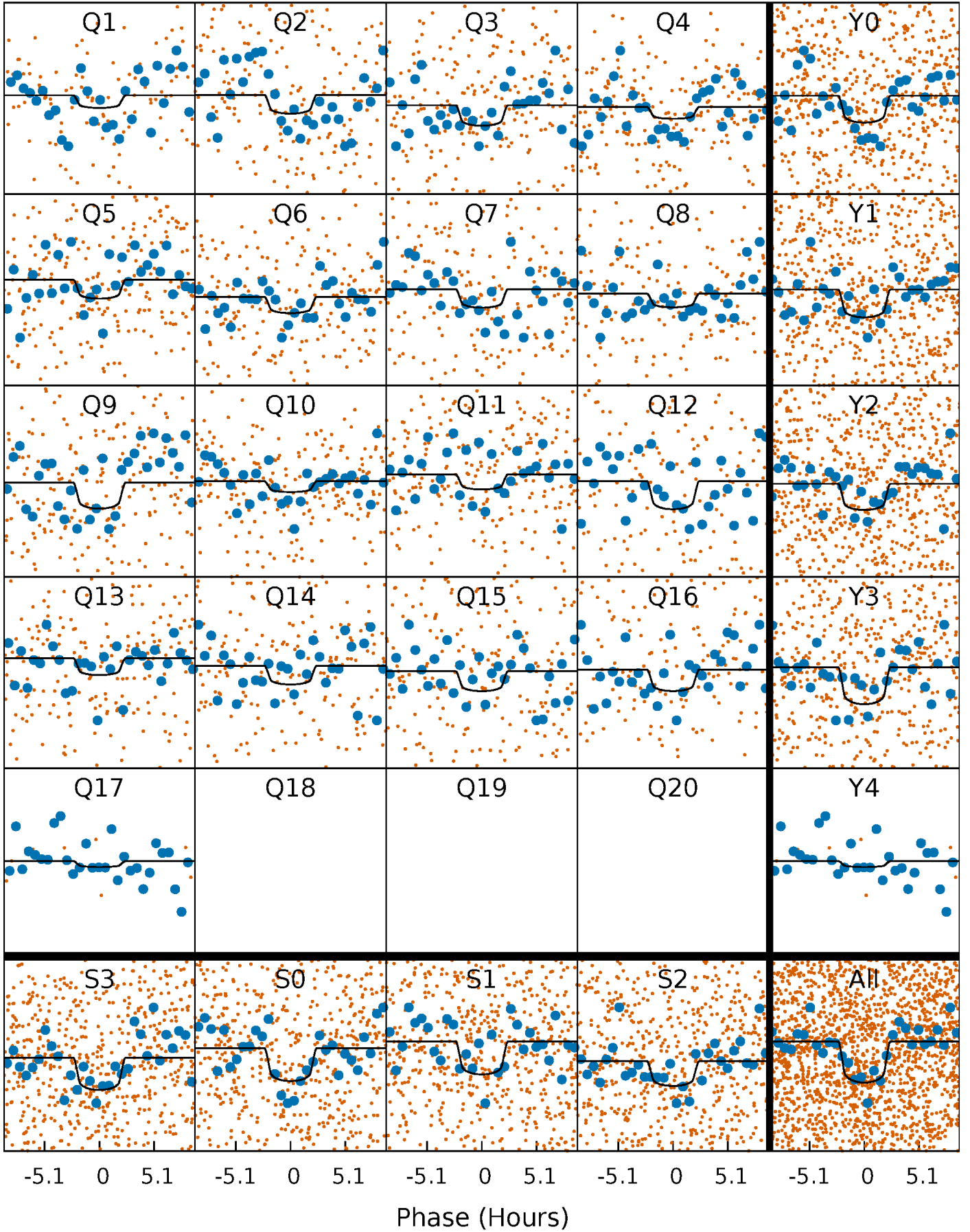
TCE 010019854-01   P= 14.101659 Days    $T_0=133.457325$  (BKJD)





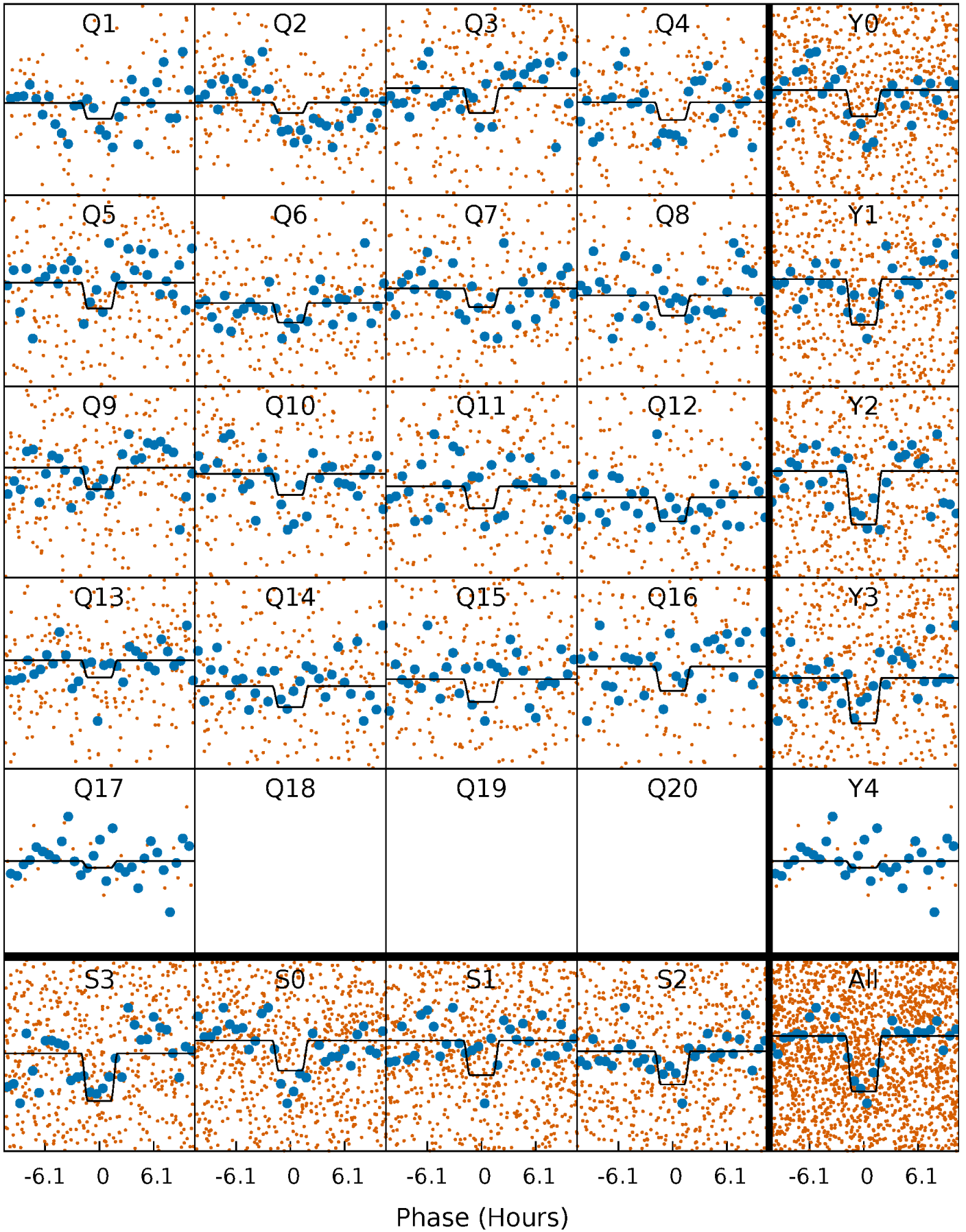
# DV Quarter-Phased Transit Curves

TCE 010019854-01 P= 14.101659 Days  $T_0=133.457325$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

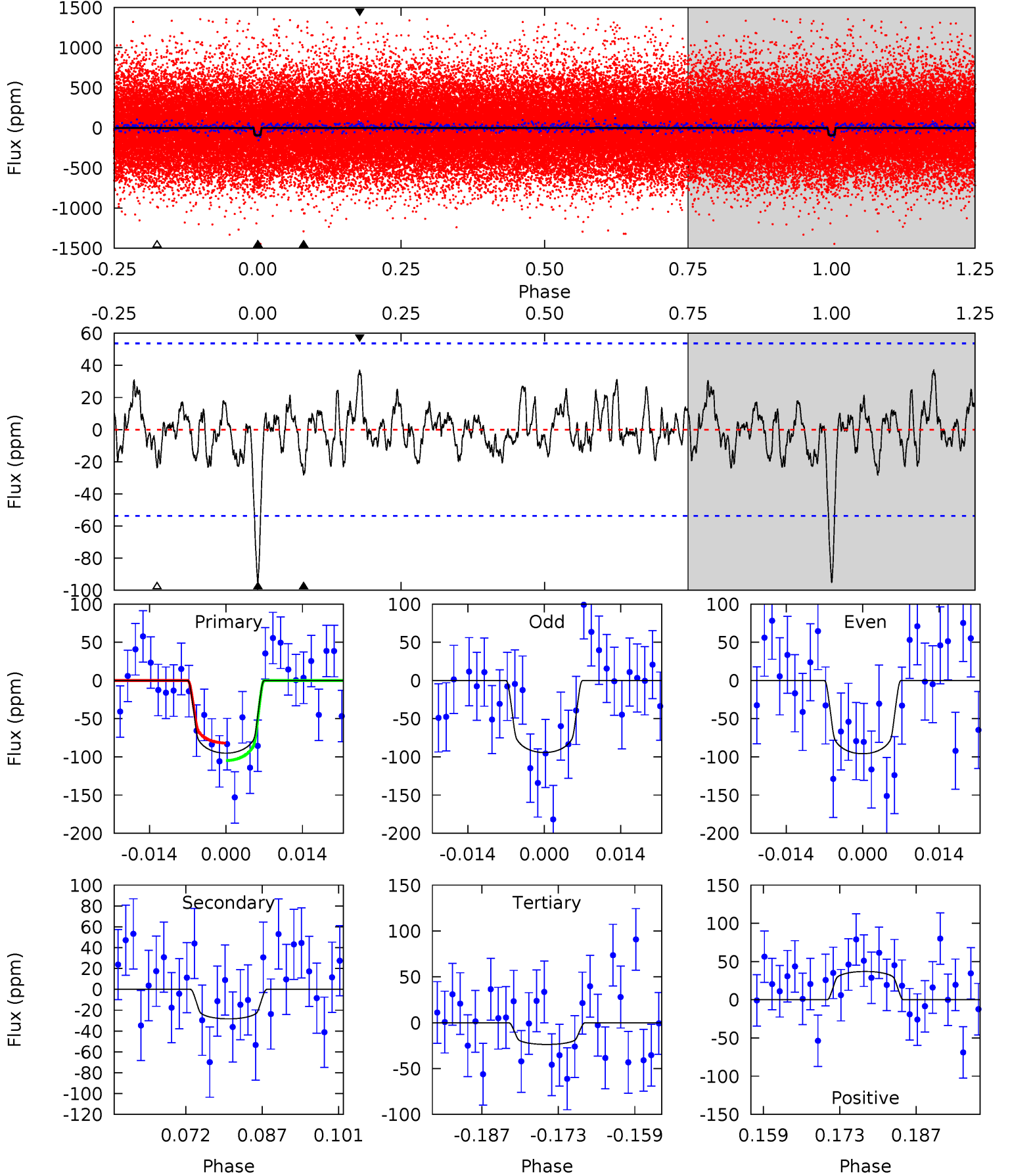
TCE 010019854-01 P= 14.101383 Days  $T_0=133.472092$  (BKJD)



# DV Model-Shift Uniqueness Test

010019854-01,  $P = 14.101659$  Days,  $E = 119.355666$  Days

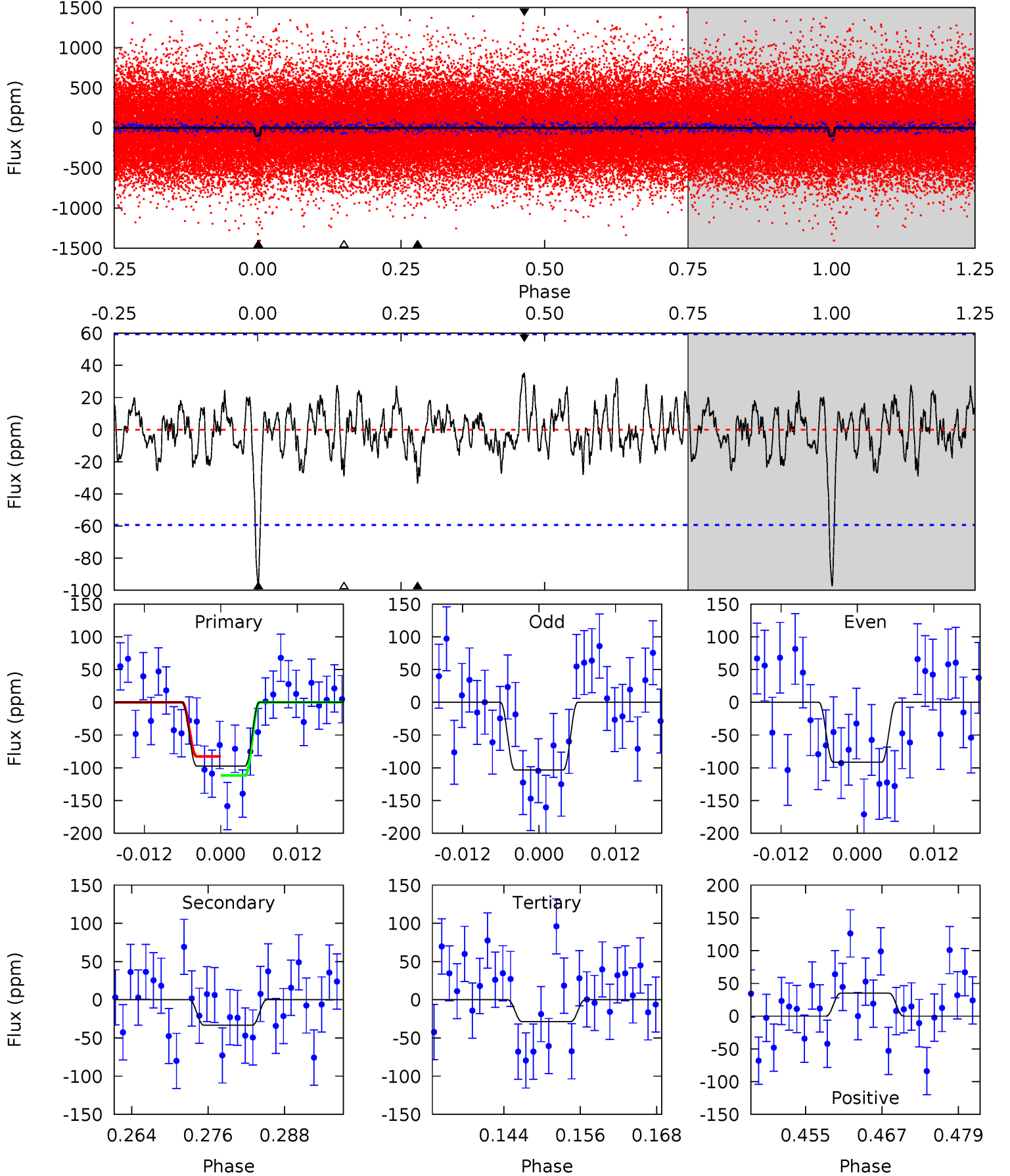
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.77 | 2.61 | 2.19 | 3.41 | 4.96            | 2.45            | 1.05             | 6.59    | 5.36    | 0.42    | -0.80   | 0.07    | 0.94 | 0.28  | 1.06 |



# Alt Model-Shift Uniqueness Test

010019854-01,  $P = 14.101383$  Days,  $E = 119.370709$  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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.19 | 2.80 | 2.42 | 2.95 | 4.99            | 2.51            | 0.98             | 5.77    | 5.24    | 0.38    | -0.15   | 0.49    | 1.24 | 0.26  | 1.23 |





### Stellar Parameters For KIC 010019854

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6534^{+158}_{-225}$ | $4.365^{+0.067}_{-0.202}$ | $-0.060^{+0.250}_{-0.300}$ | $1.199^{+0.373}_{-0.133}$ | $1.219^{+0.176}_{-0.176}$ | $0.996^{+0.356}_{-0.534}$                 |
|        | +2%/-3%              | +2%/-5%                   | +417%/-500%                | +31%/-11%                 | +14%/-14%                 | +36%/-54%                                 |
| 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 010019854-01 / KOI 7272.01

| Detrend | Depth (ppm)  | $R_p (R_{\oplus})$     | $T_{max} (K)$      | $T_{obs} (K)$         | $A_{obs}$          |
|---------|--------------|------------------------|--------------------|-----------------------|--------------------|
| DV      | $-28 \pm 11$ | $1.47^{+0.90}_{-0.75}$ | $1283^{+89}_{-66}$ | $4630^{+1791}_{-810}$ | $100^{+326}_{-67}$ |
| Alt.    | $-33 \pm 12$ | $1.51^{+0.86}_{-0.73}$ | $1285^{+87}_{-67}$ | $4808^{+1826}_{-856}$ | $114^{+378}_{-74}$ |

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

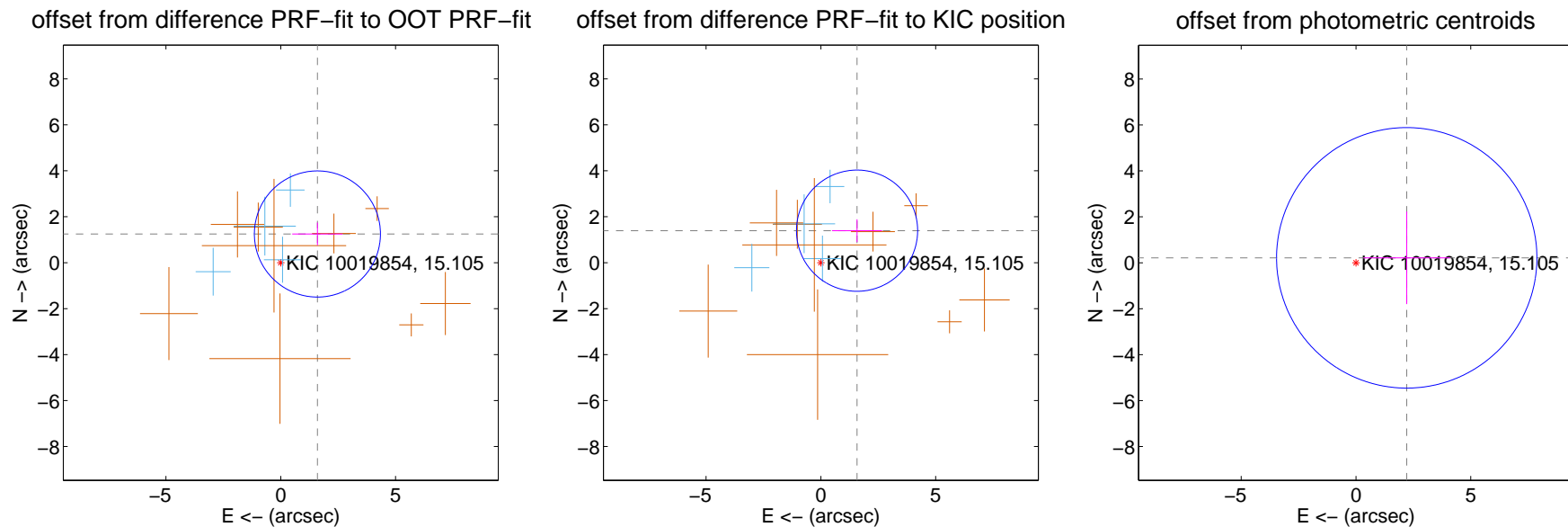
## DV Centroid Data

Supplemental centroid analysis for 010019854-01. Kepler magnitude: 15.11. Transit SNR 7.30

There are 4 quarters with good PRF difference image offsets

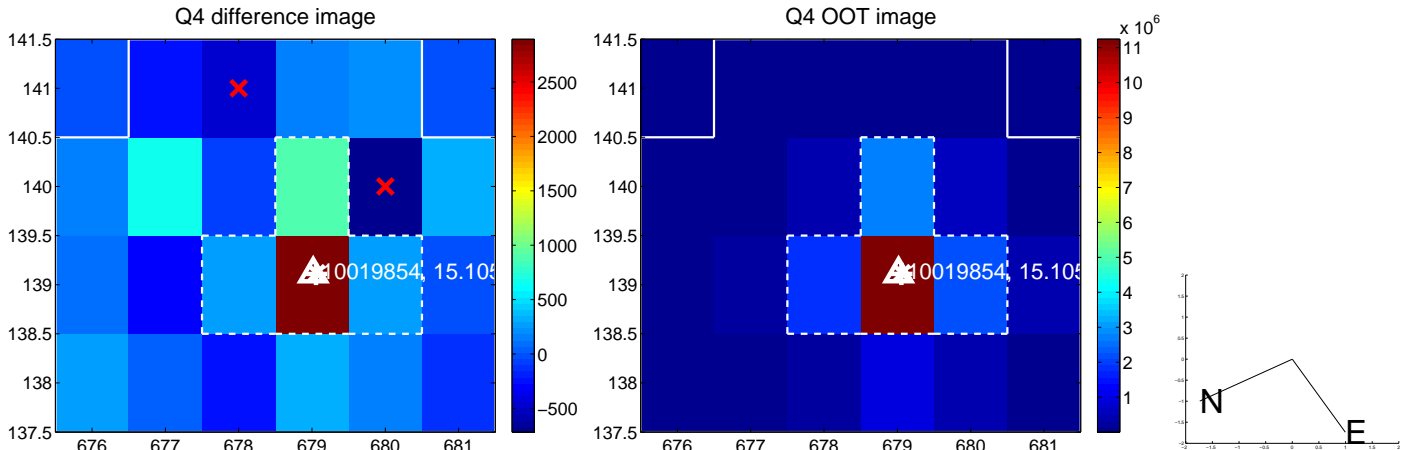
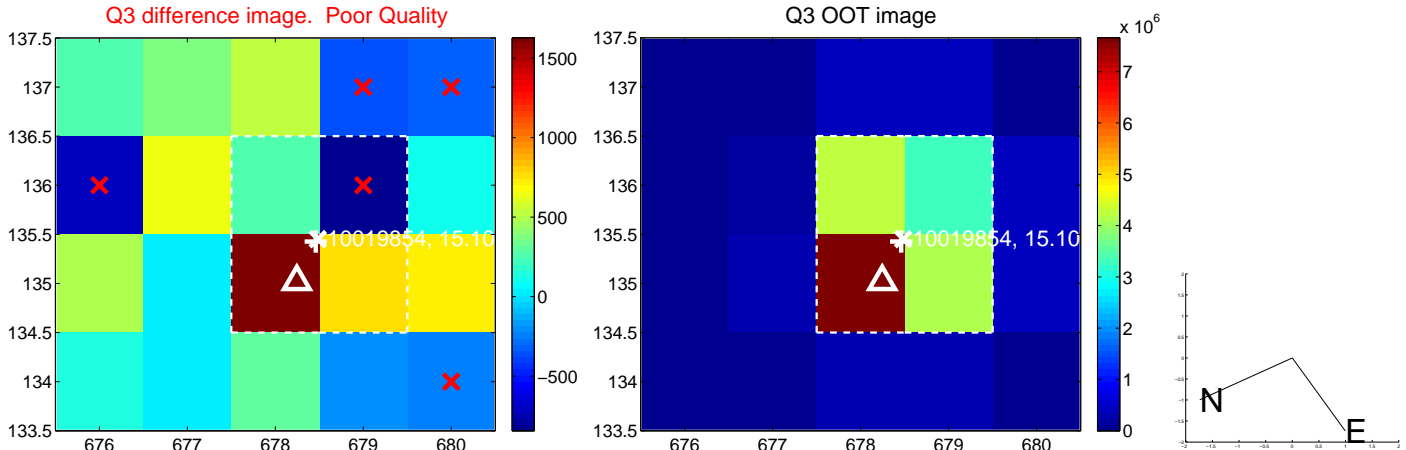
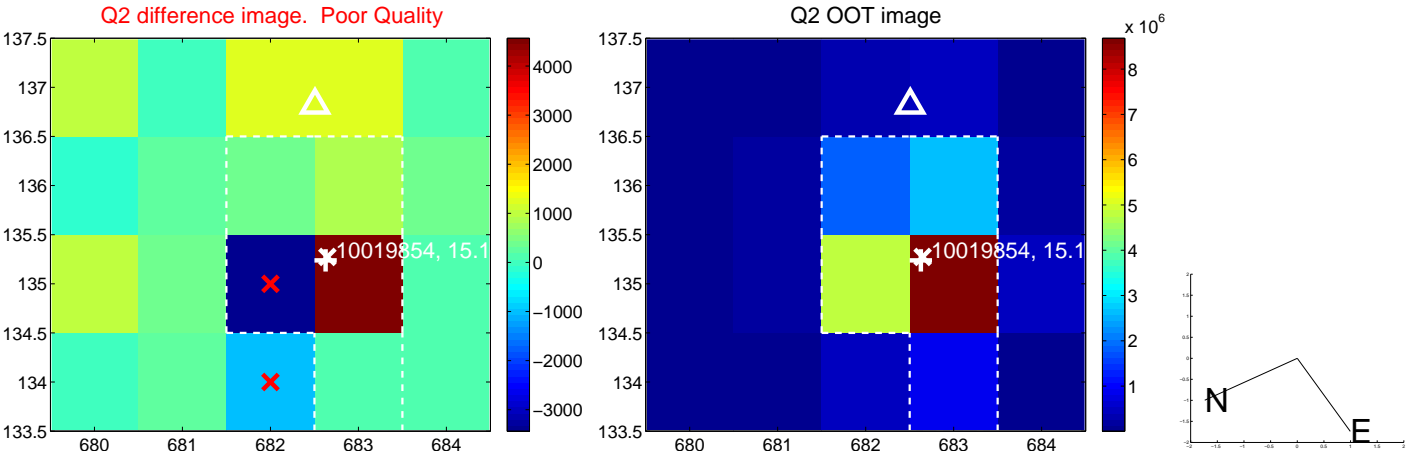
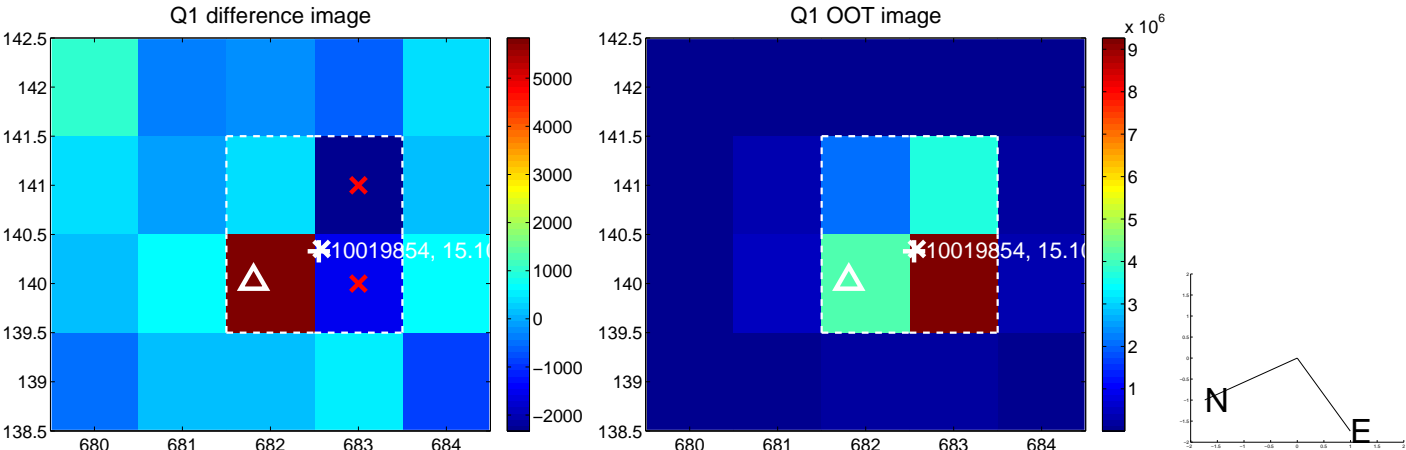
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | $2.028 \pm 0.915$  | 2.22                | $-1.597 \pm 1.095$ | $1.250 \pm 0.496$ |
| PRF-fit source offset from KIC position | $2.104 \pm 0.880$  | 2.39                | $-1.577 \pm 1.090$ | $1.394 \pm 0.494$ |
| photometric centroid source offset      | $2.22 \pm 1.89$    | 1.18                | $-2.21 \pm 1.89$   | $0.21 \pm 2.02$   |

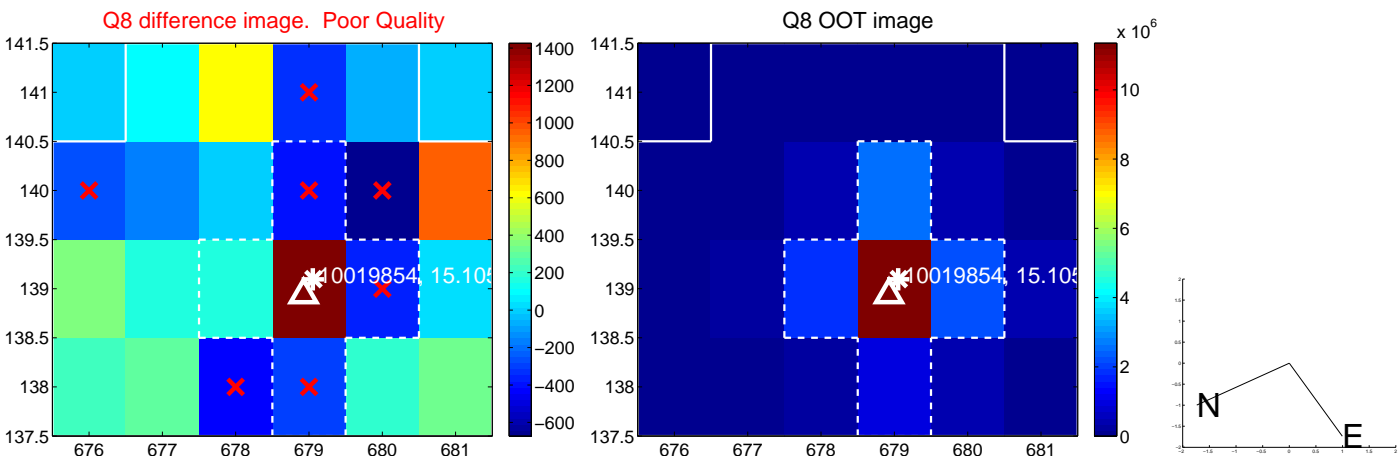
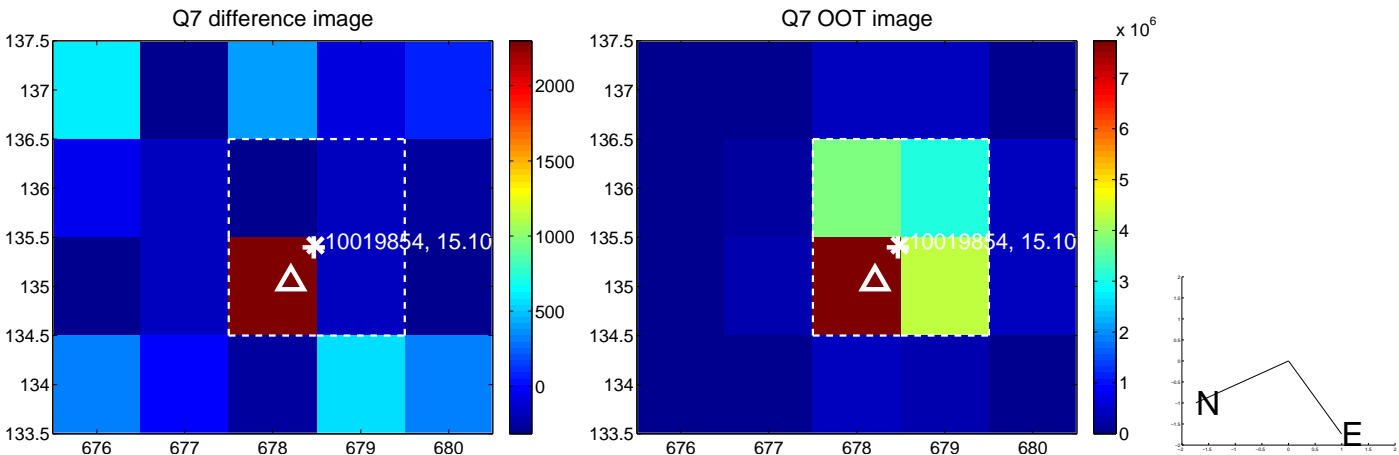
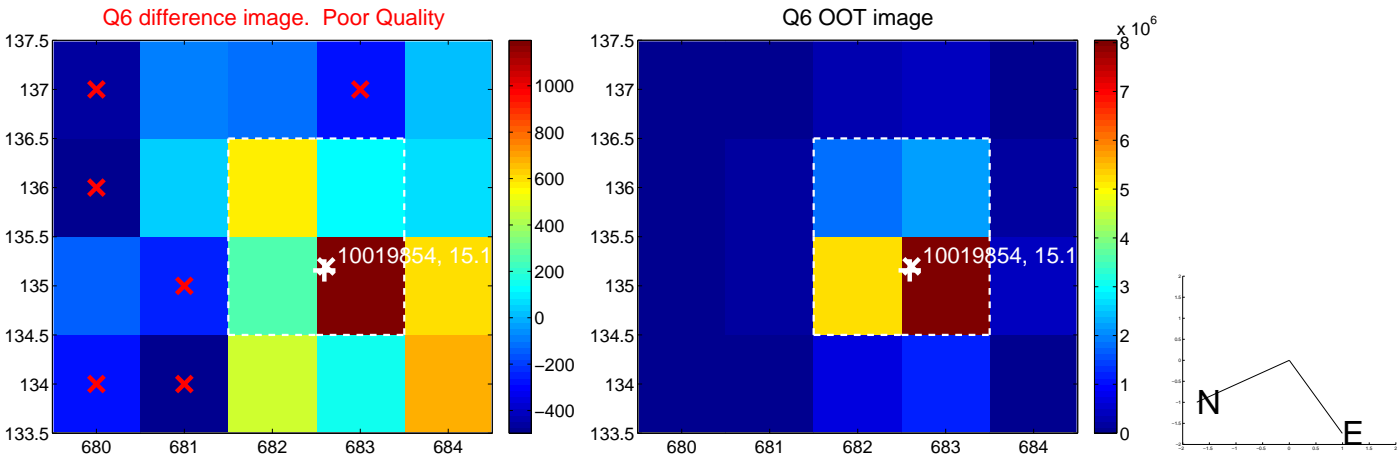
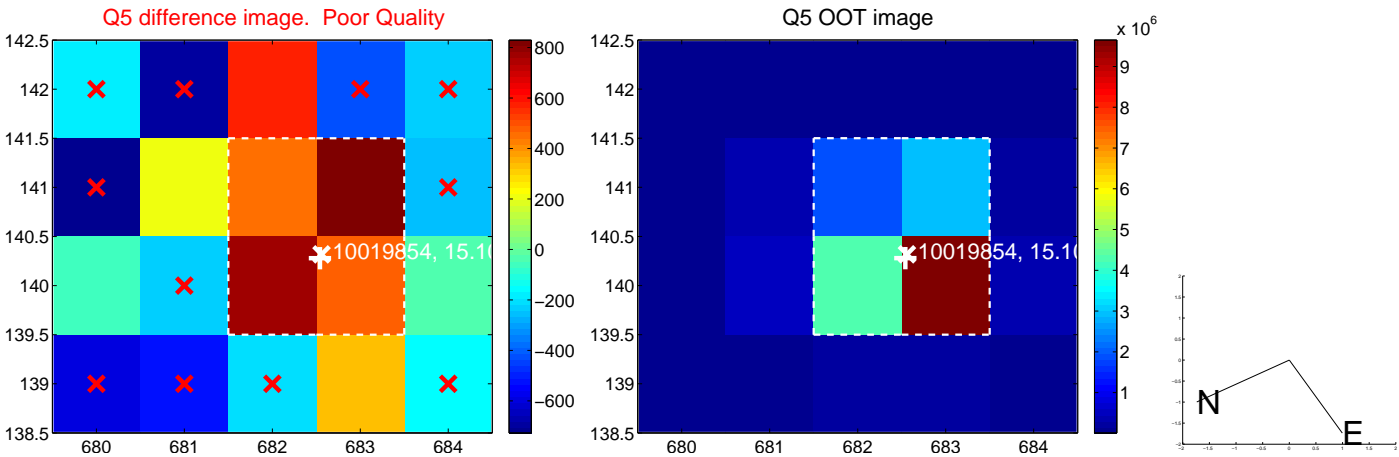


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

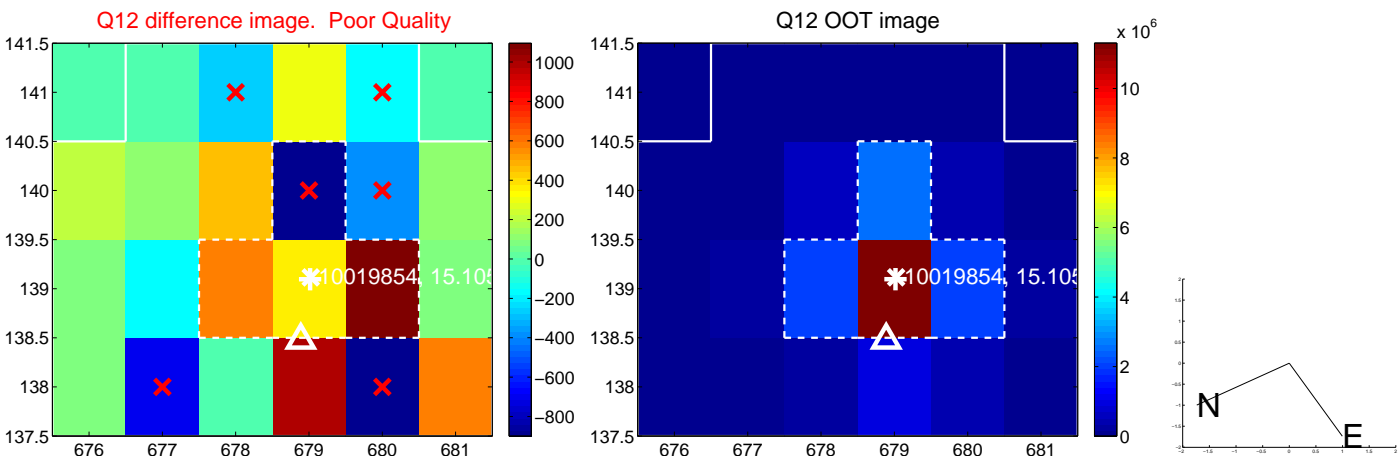
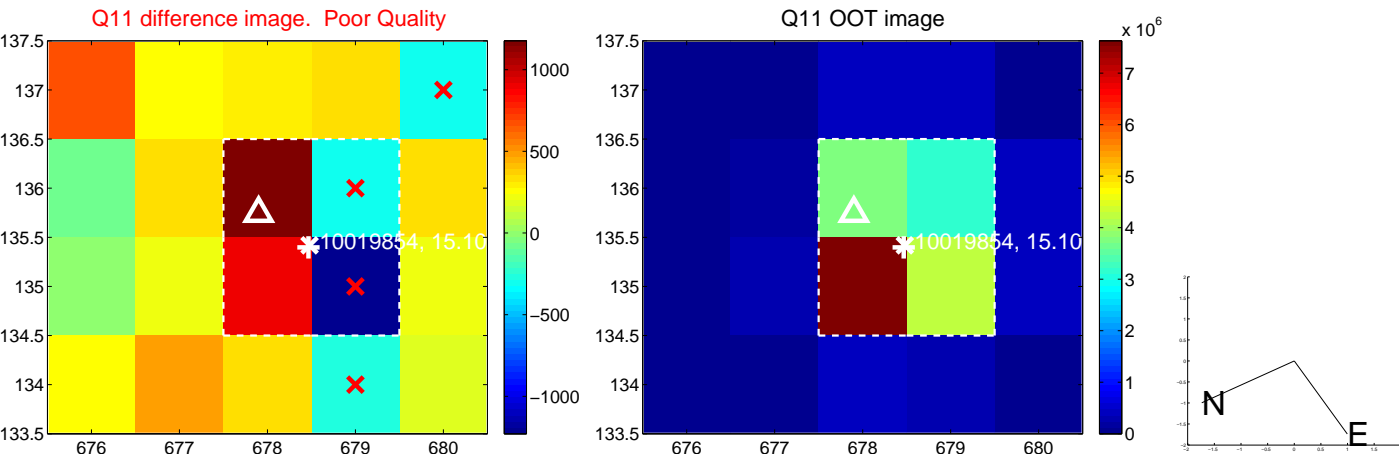
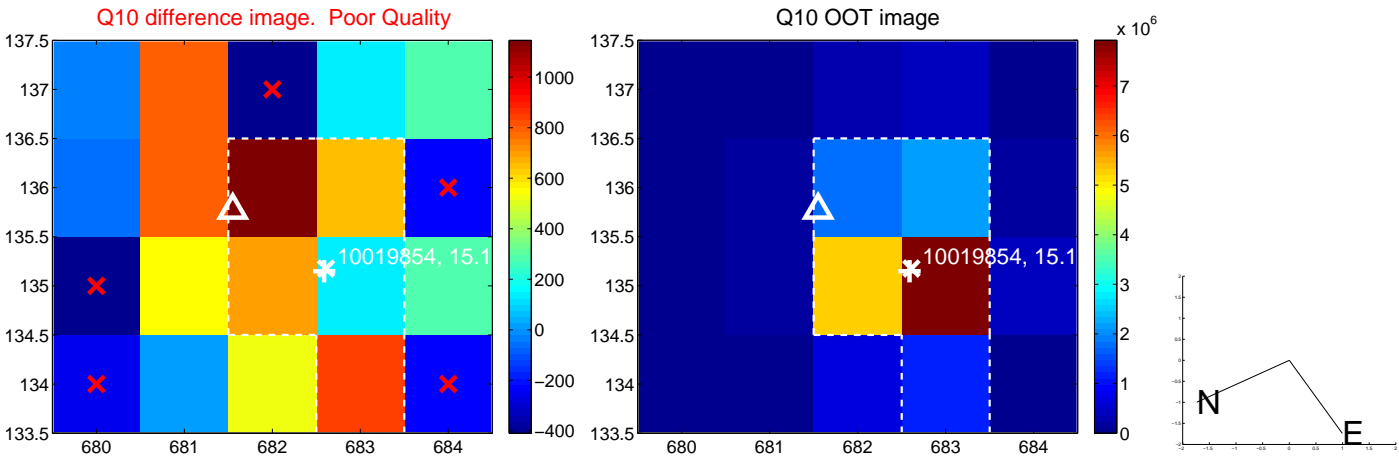
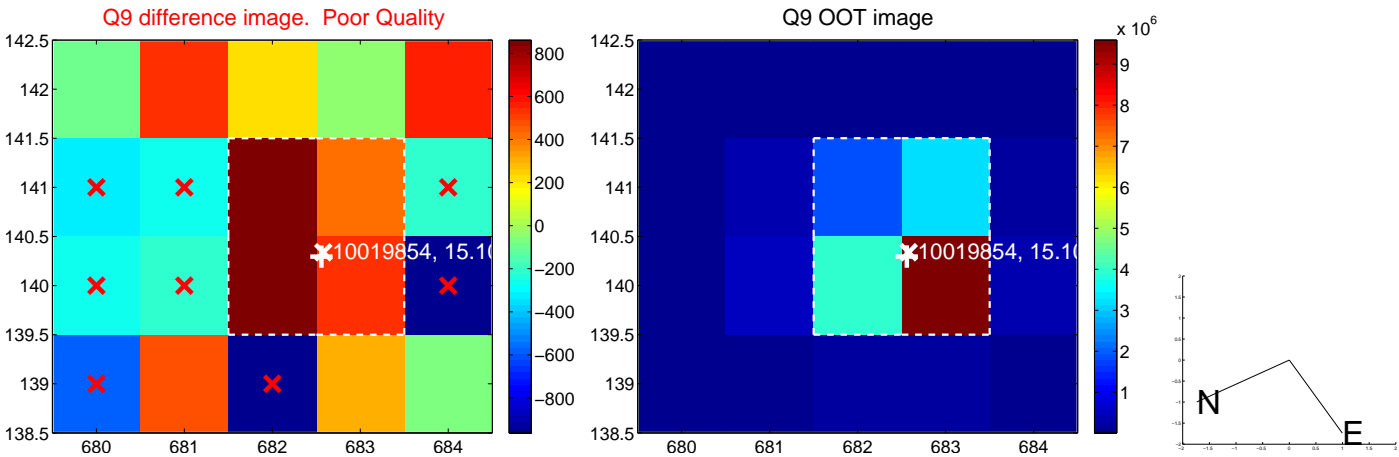


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

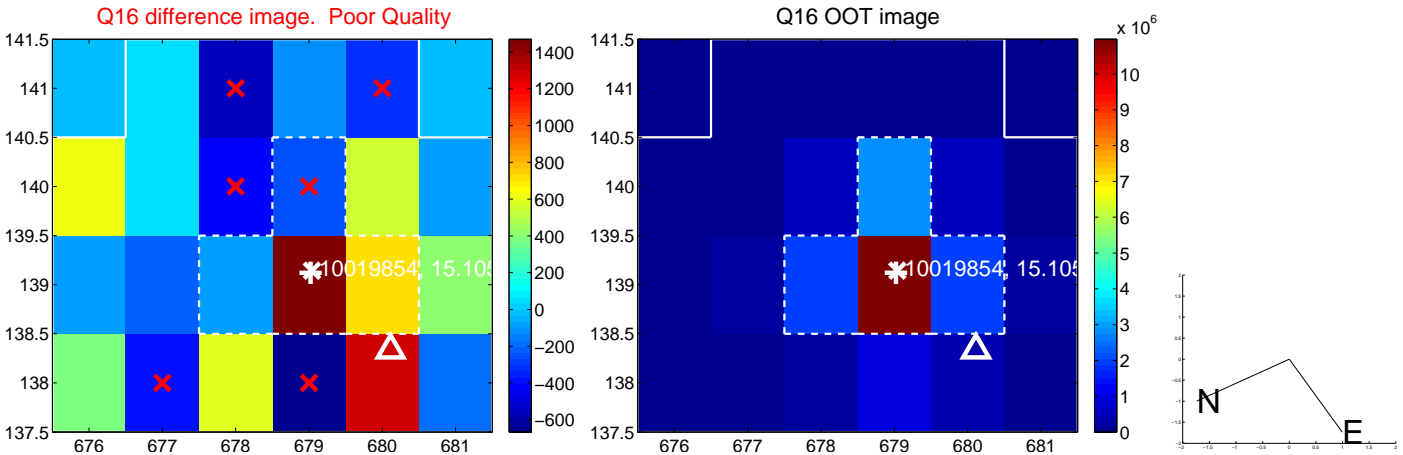
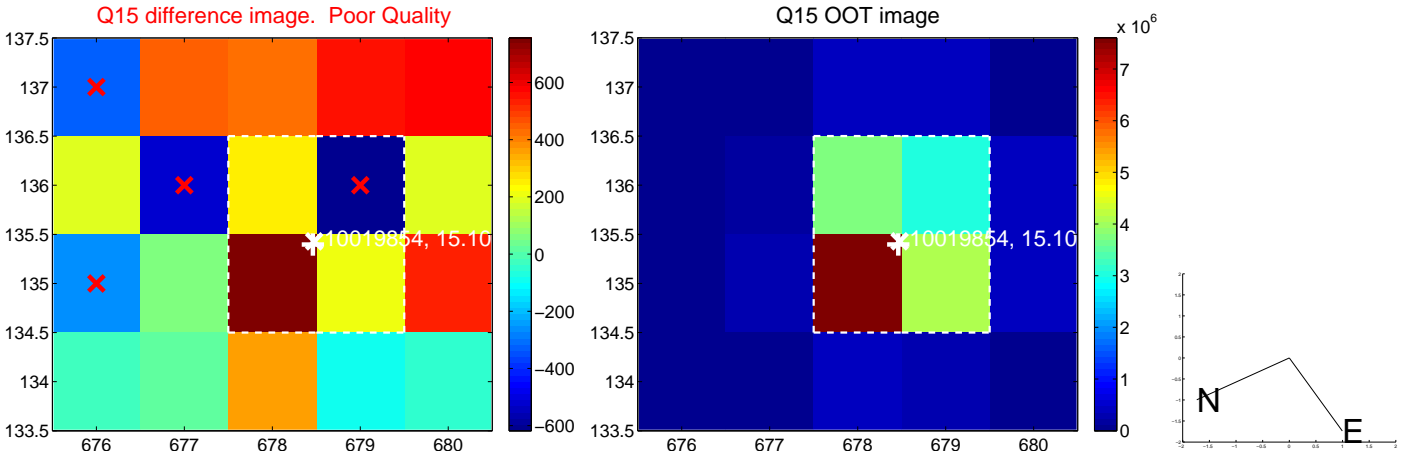
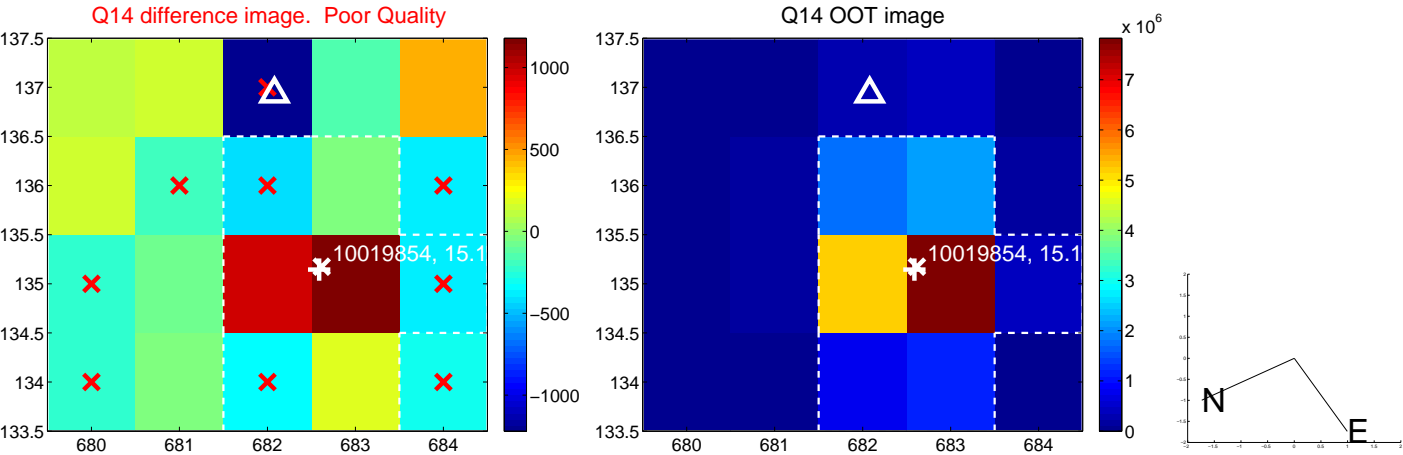
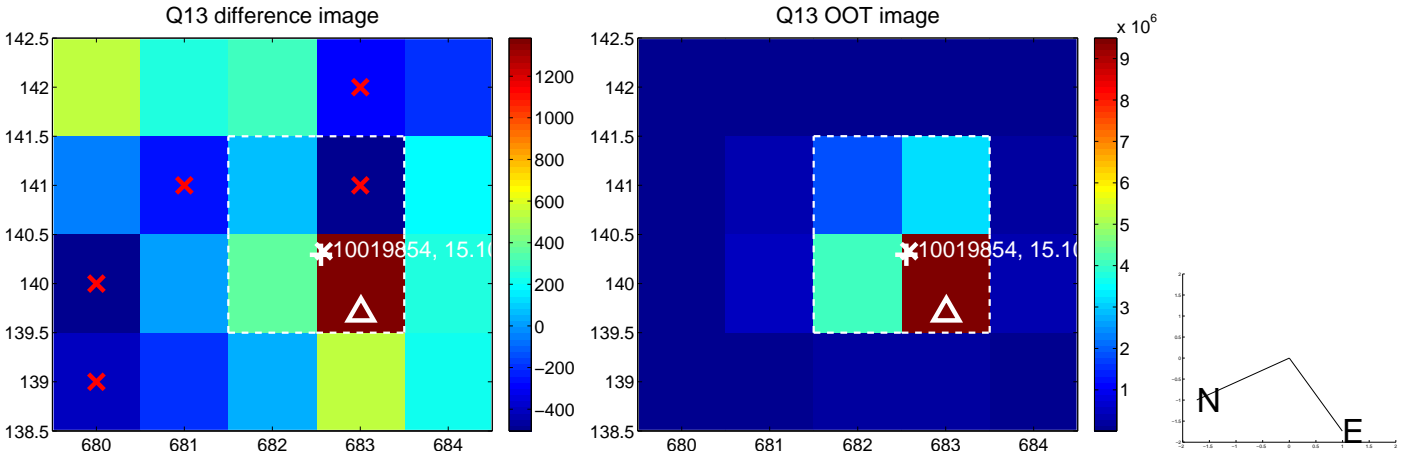




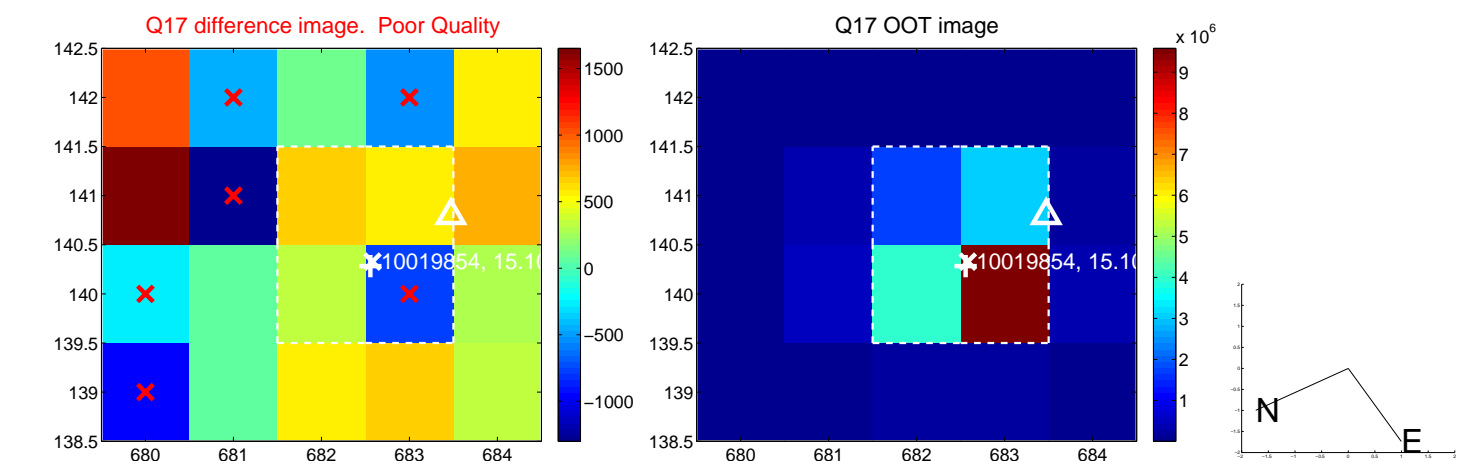
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



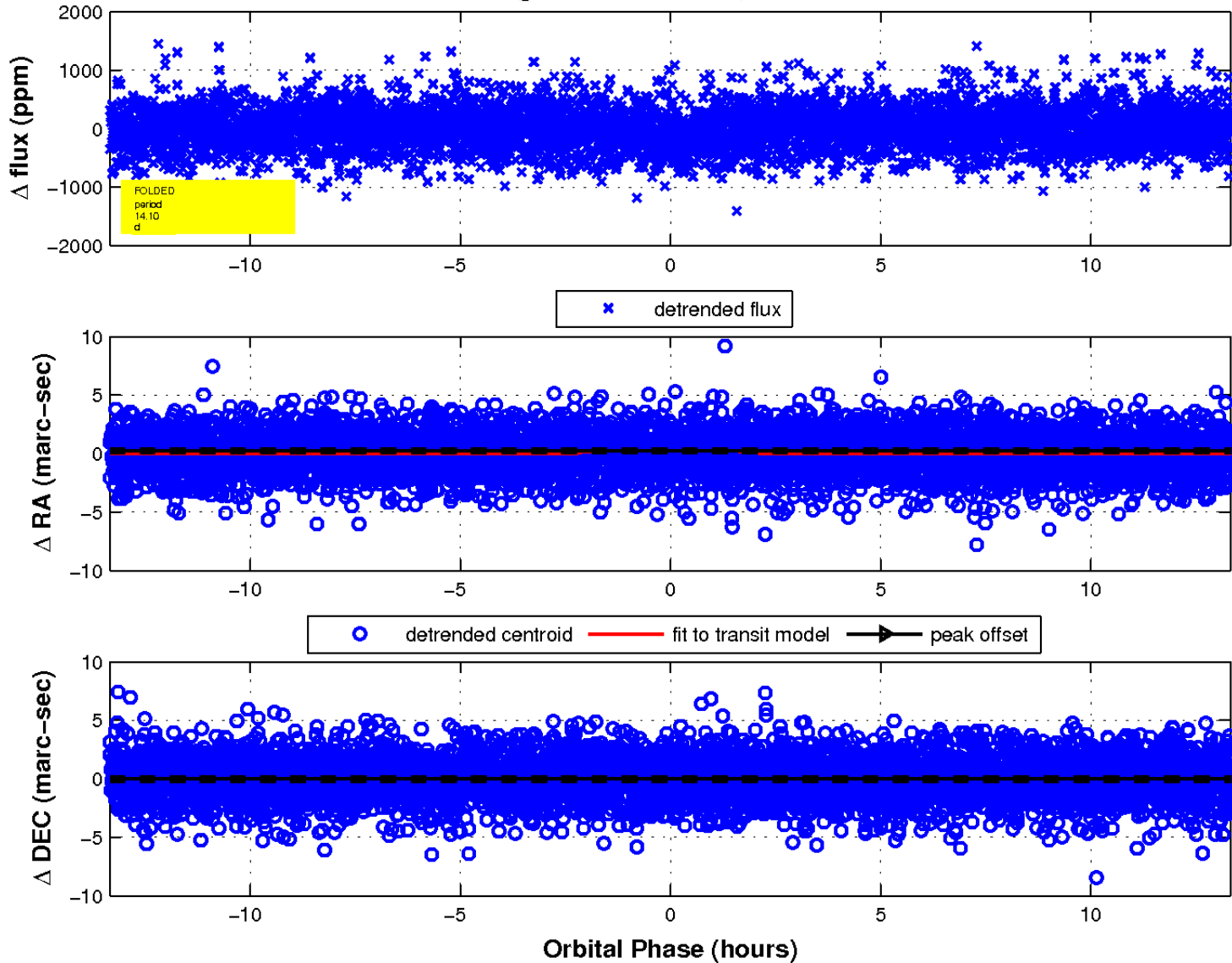
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



# UKIRT Image

Declination

