

# KIC 009594804

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009594804-01 | OBS      | No   | 0.559834      | 131.986873   | 32.5        | 1.281            | 9.4 | 1.2 | 0.77                        | 5204            | 0.67                   | 2729.70                |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments                       |
|--------------|----------|------|-------|---|---|---|---|--------------------------------|
| 009594804-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT |

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

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

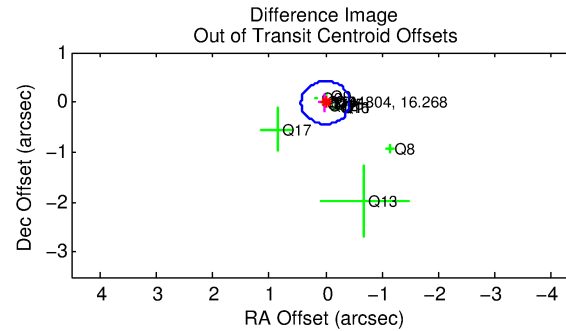
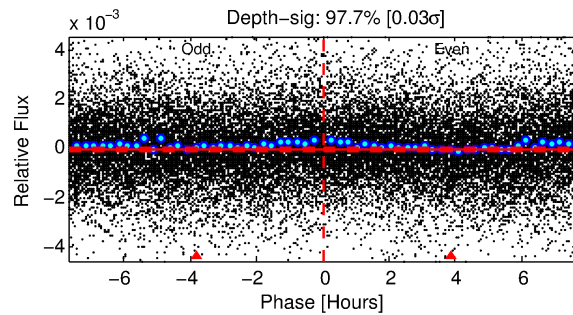
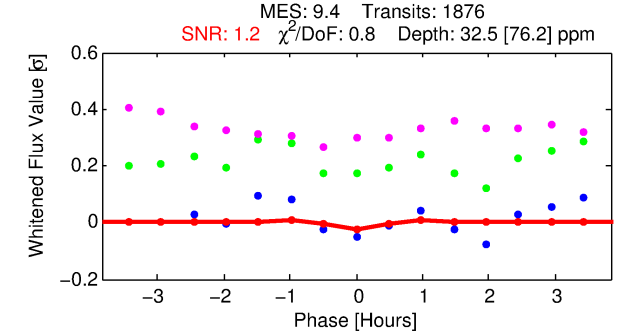
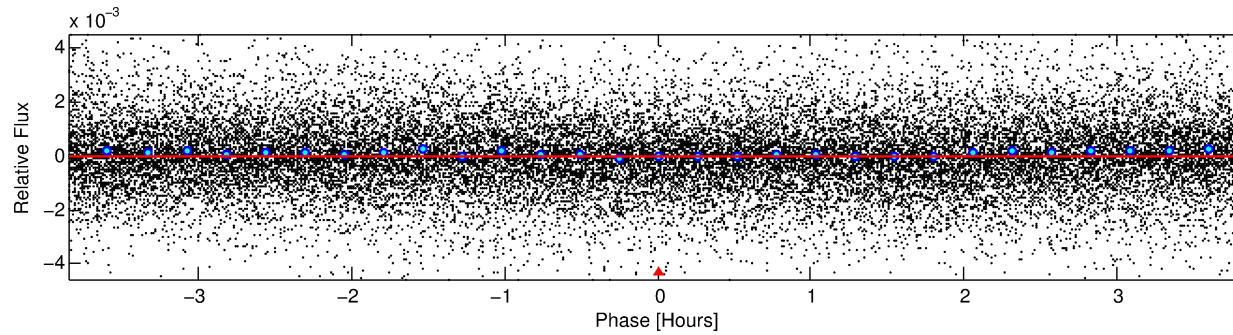
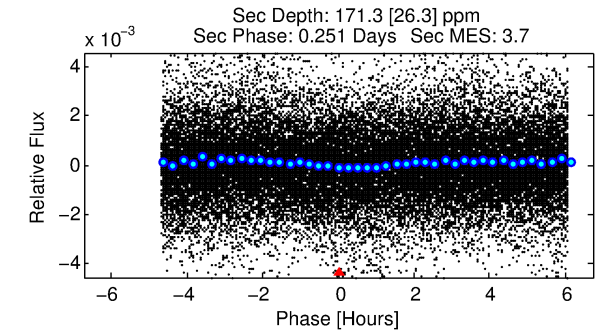
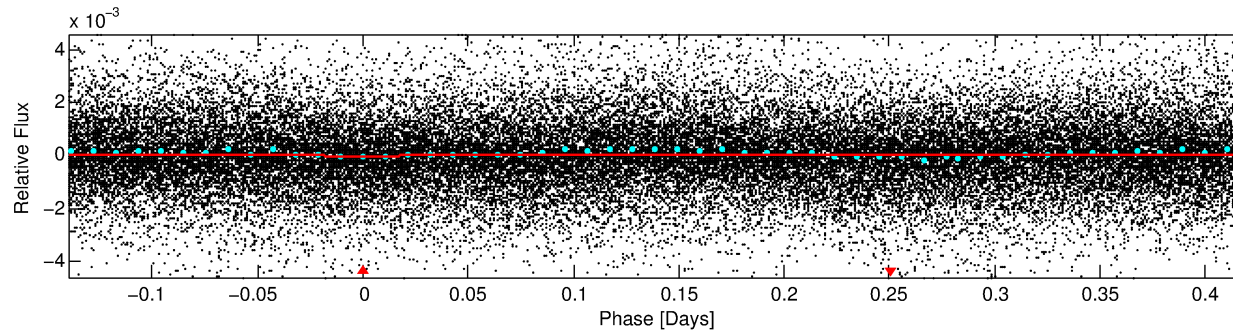
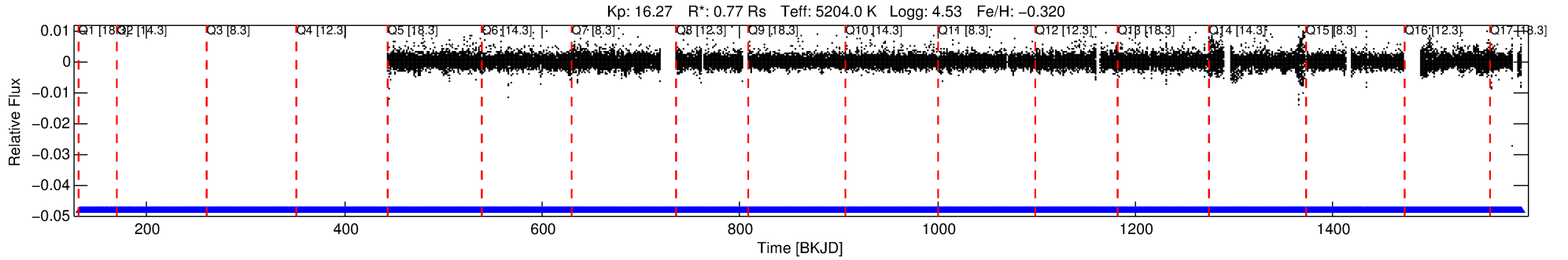
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009594804-01

No Significant Match Found

# DV One-Page Summary

KIC: 9594804 Candidate: 1 of 1 Period: 0.560 d



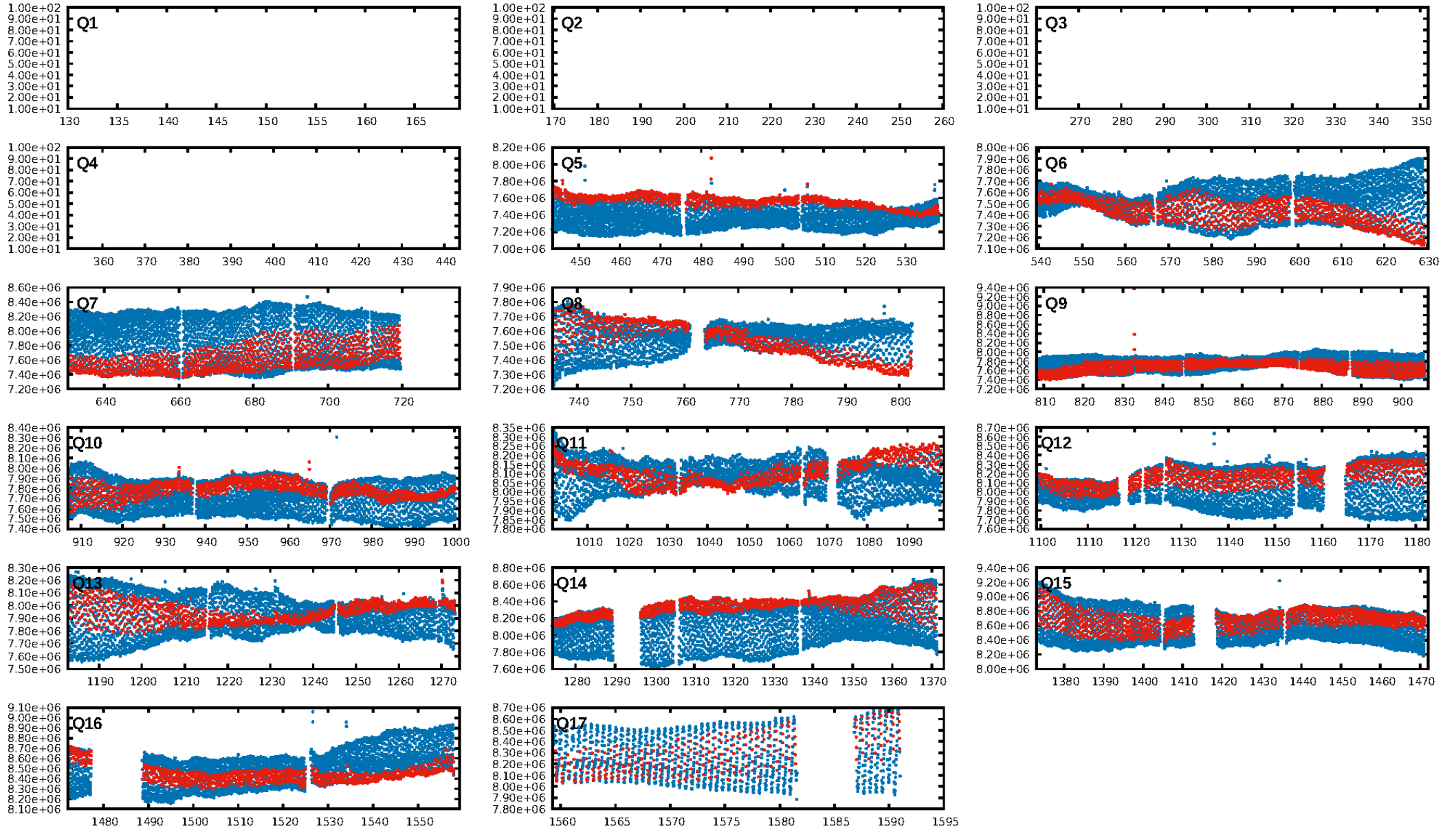
## DV Fit Results:

Period = 0.55983 [0.00008] d  
Epoch = 131.9869 [0.0106] BKJD  
Rp/R\* = 0.0080 [0.0143]  
a/R\* = 1.17 [1.35]  
b = 0.99 [0.09]  
Seff = 2729.70 [598.09]  
Teff = 1843 [101] K  
Rp = 0.67 [1.21] Re  
a = 0.0119 [0.0013] AU  
Ag = 30.05 [108.41] [0.27 $\sigma$ ]  
Teffp = 6672 [6018] K [0.80 $\sigma$ ]

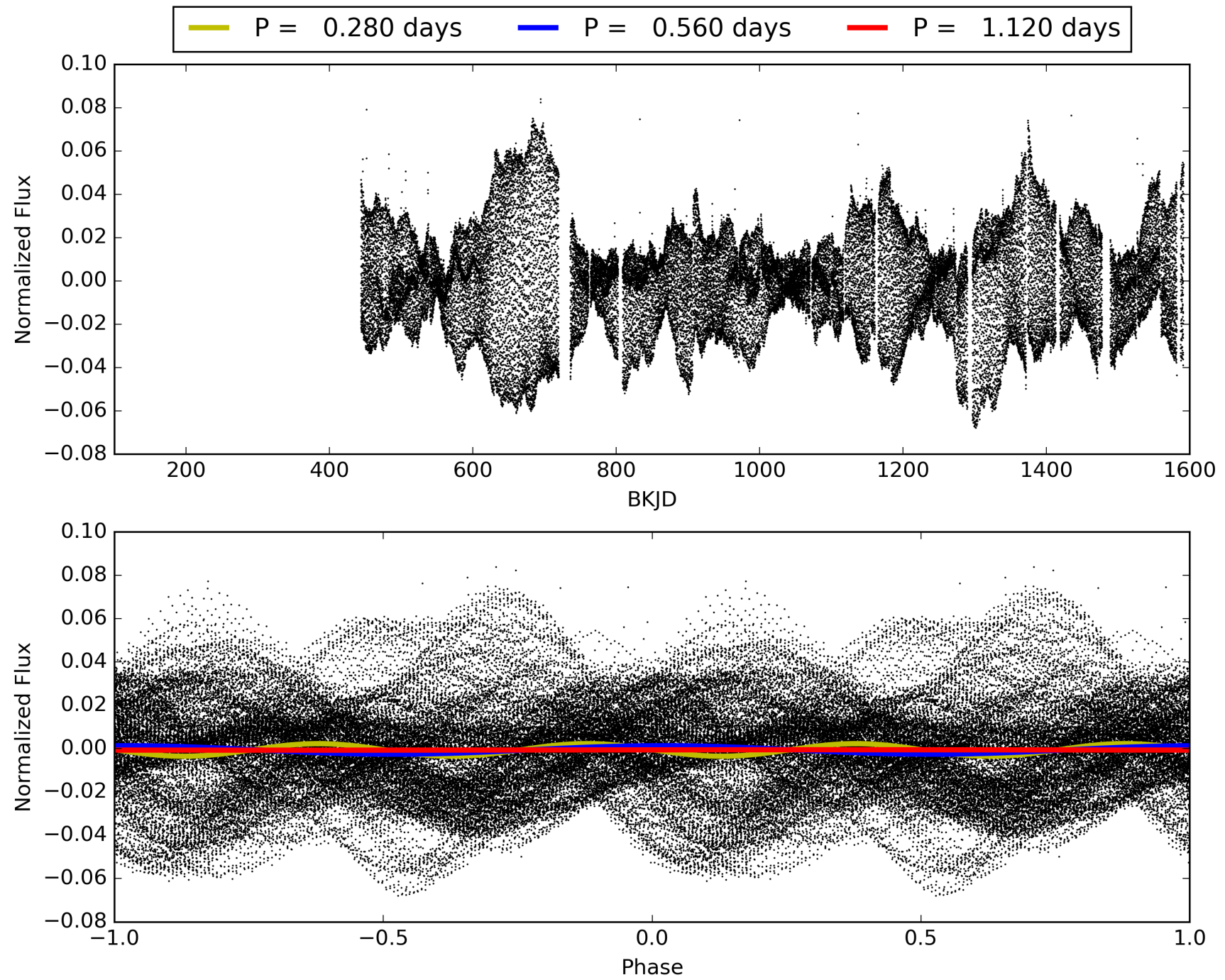
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.28e-20  
RollingBand-fgt: 1.00 [1828/1828]  
**GhostDiagnostic-chr: 0.611**  
Centroid-sig: 1.3%  
Centroid-so: 16.331 arcsec [2.25 $\sigma$ ]  
OotOffset-rm: 0.009 arcsec [0.06 $\sigma$ ]  
KicOffset-rm: 0.105 arcsec [0.59 $\sigma$ ]  
OotOffset-st: 3/3/3/4 [13]  
KicOffset-st: 3/3/3/4 [13]  
DiffImageQuality-fgm: 0.54 [7/13]  
DiffImageOverlap-fno: 1.00 [13/13]

# TCE 009594804-01, PDC Light Curves

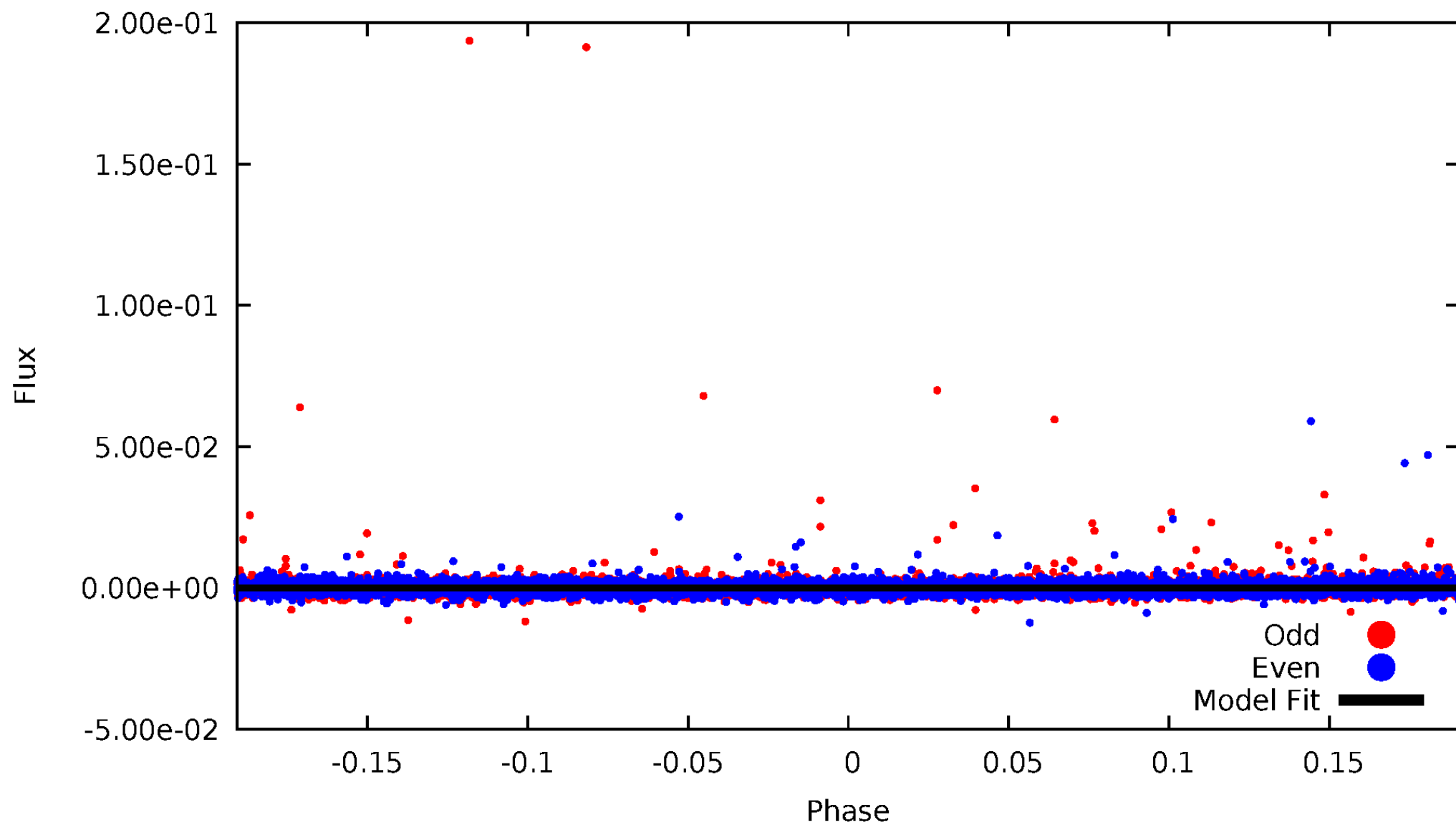


TCE 009594804-01



# DV Odd/Even

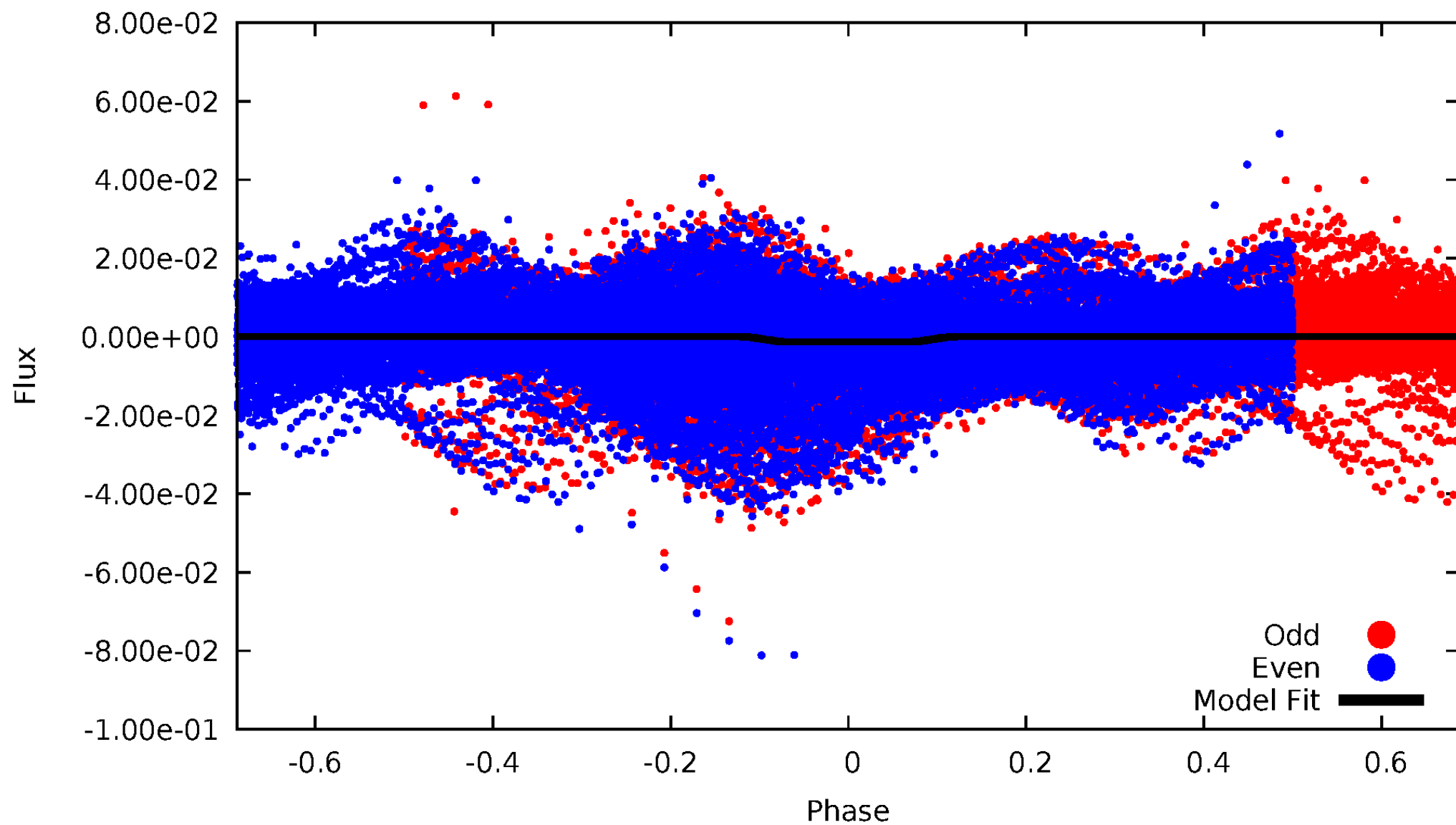
TCE 009594804-01





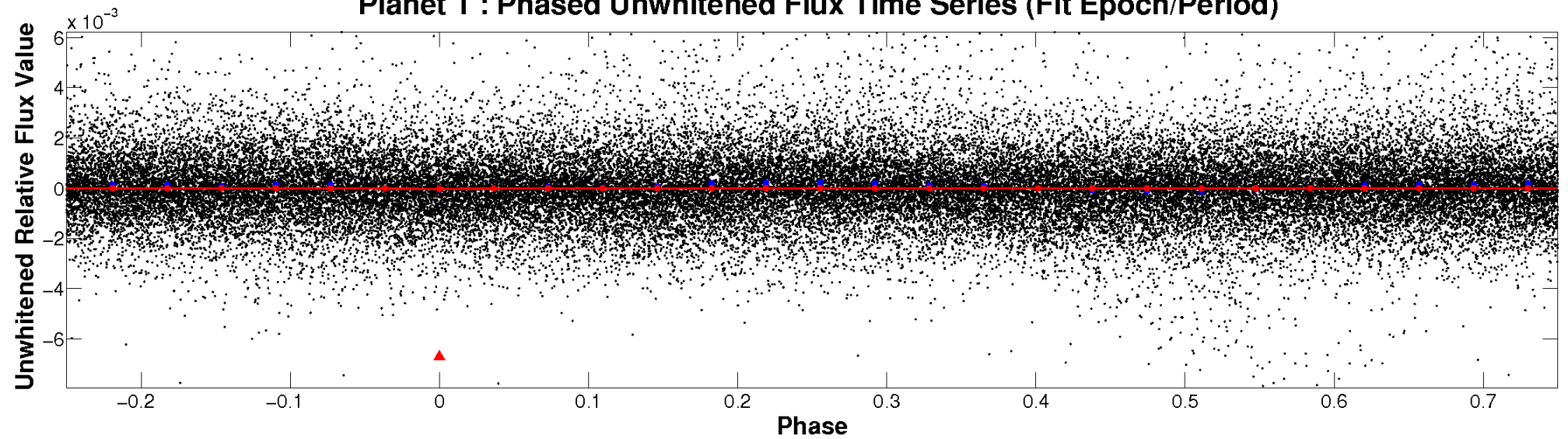
# ALT Odd/Even

TCE 009594804-01

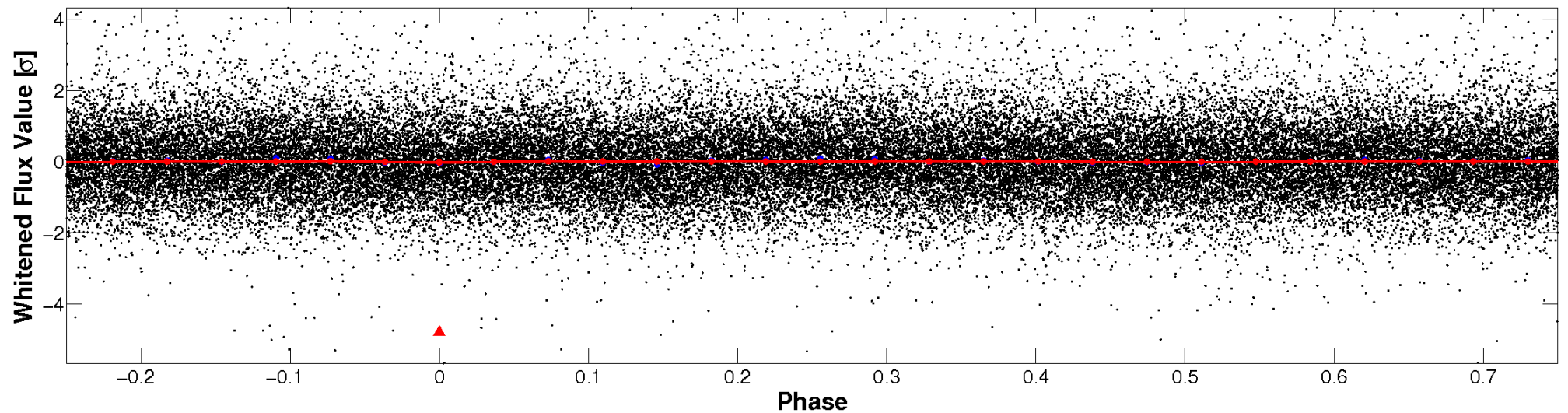


# Non-Whitened Vs. Whitened Light Curve

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

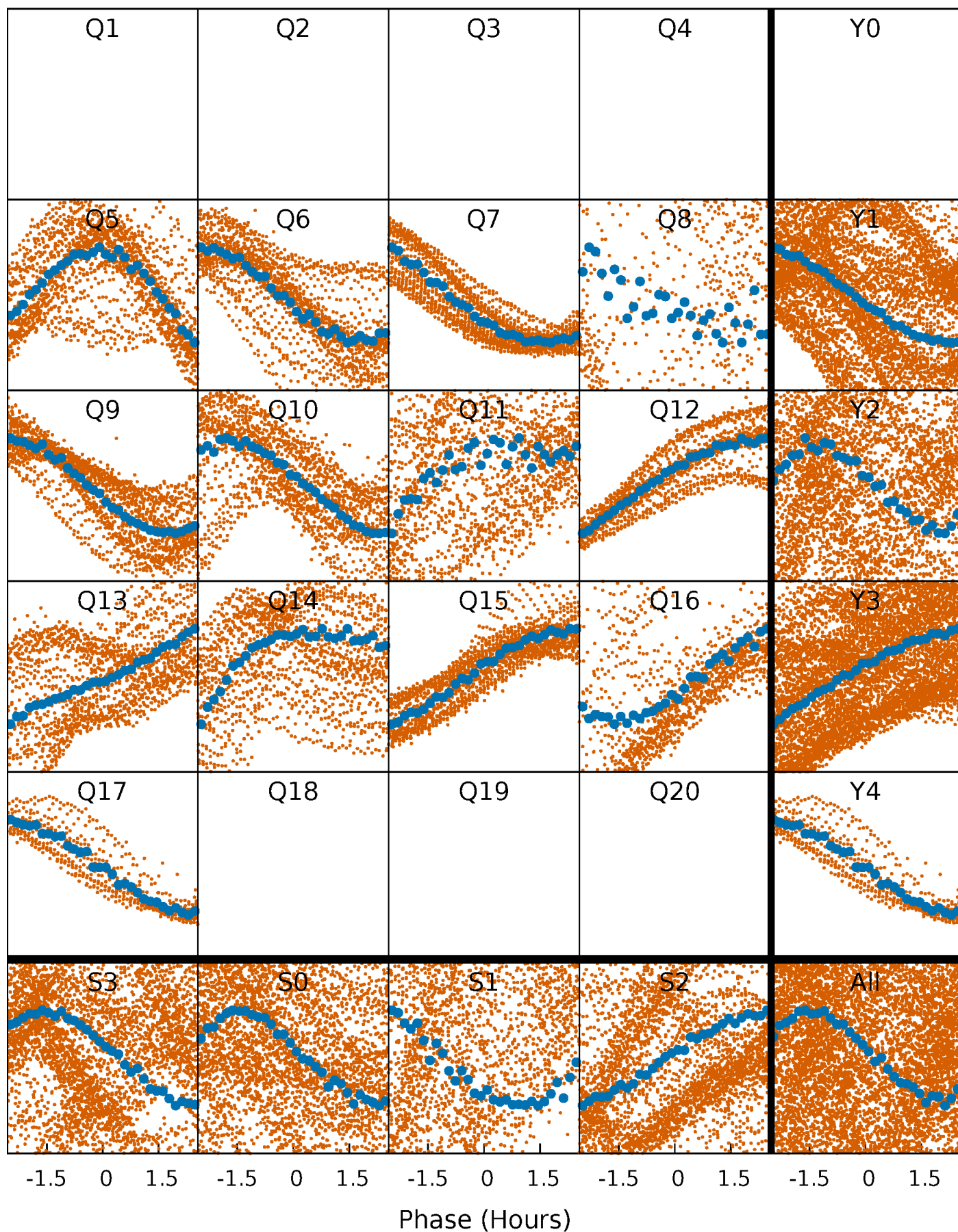


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

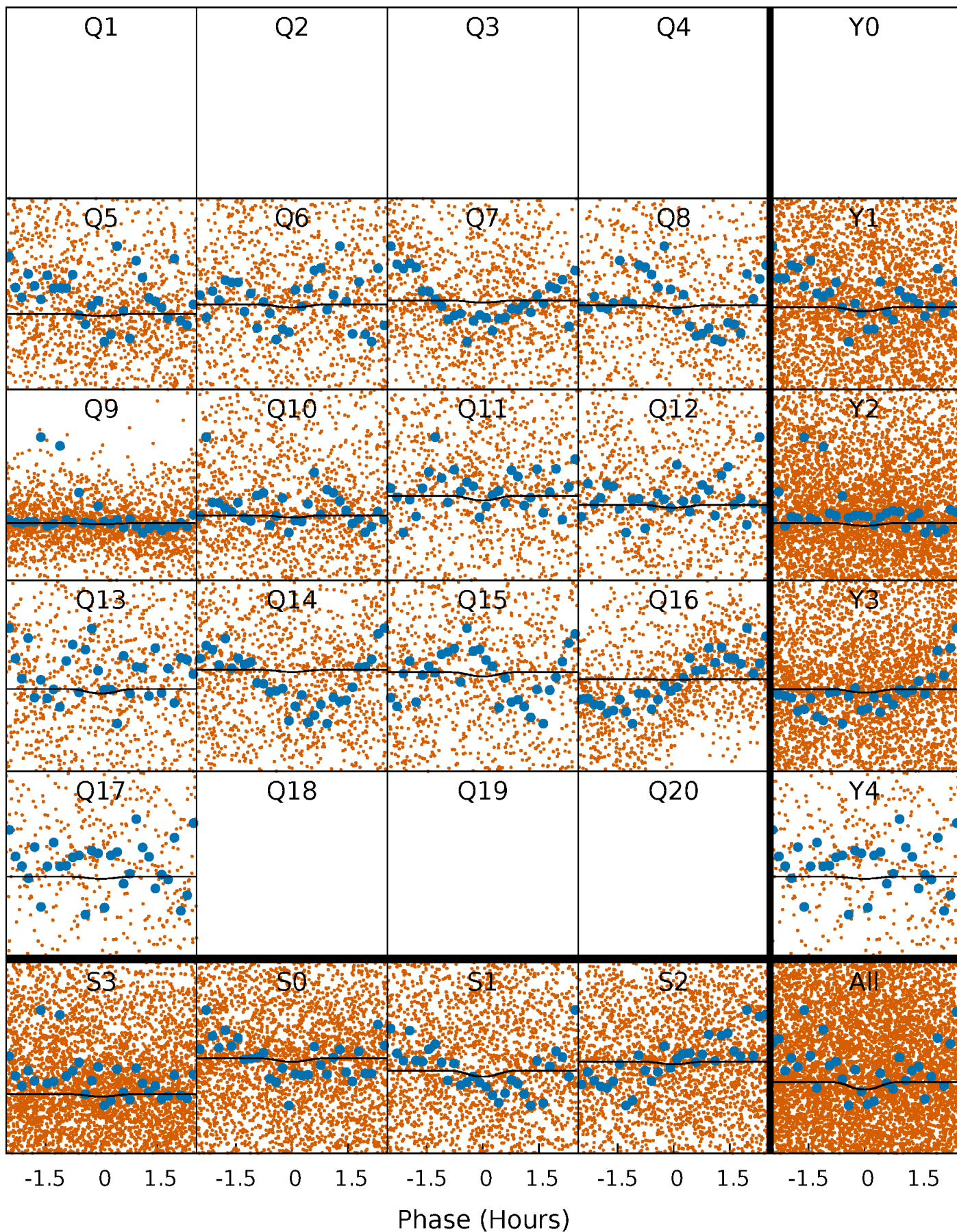
TCE 009594804-01   P= 0.559834 Days    $T_0=131.986873$  (BKJD)





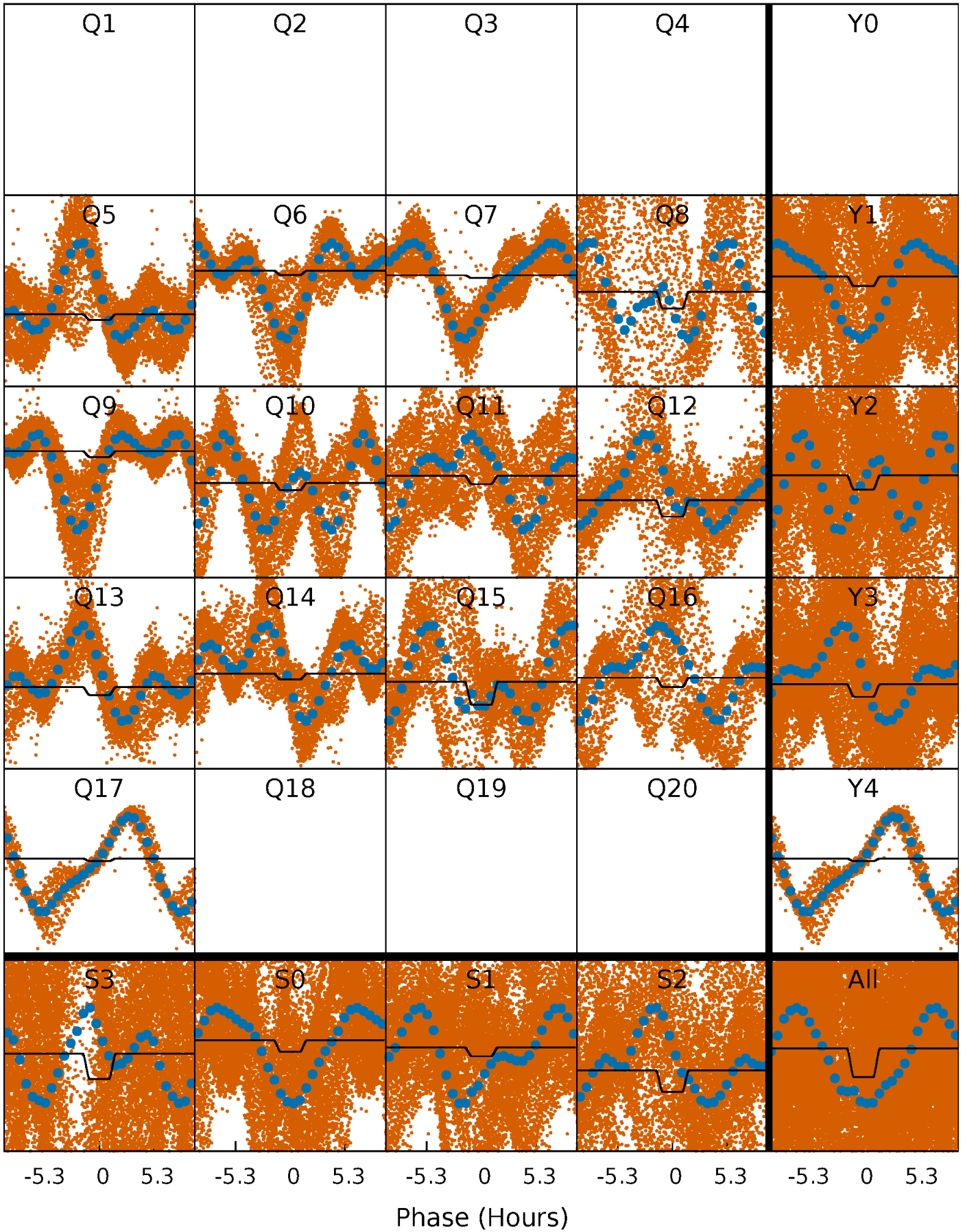
# DV Quarter-Phased Transit Curves

TCE 009594804-01   P= 0.559834 Days    $T_0=131.986873$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

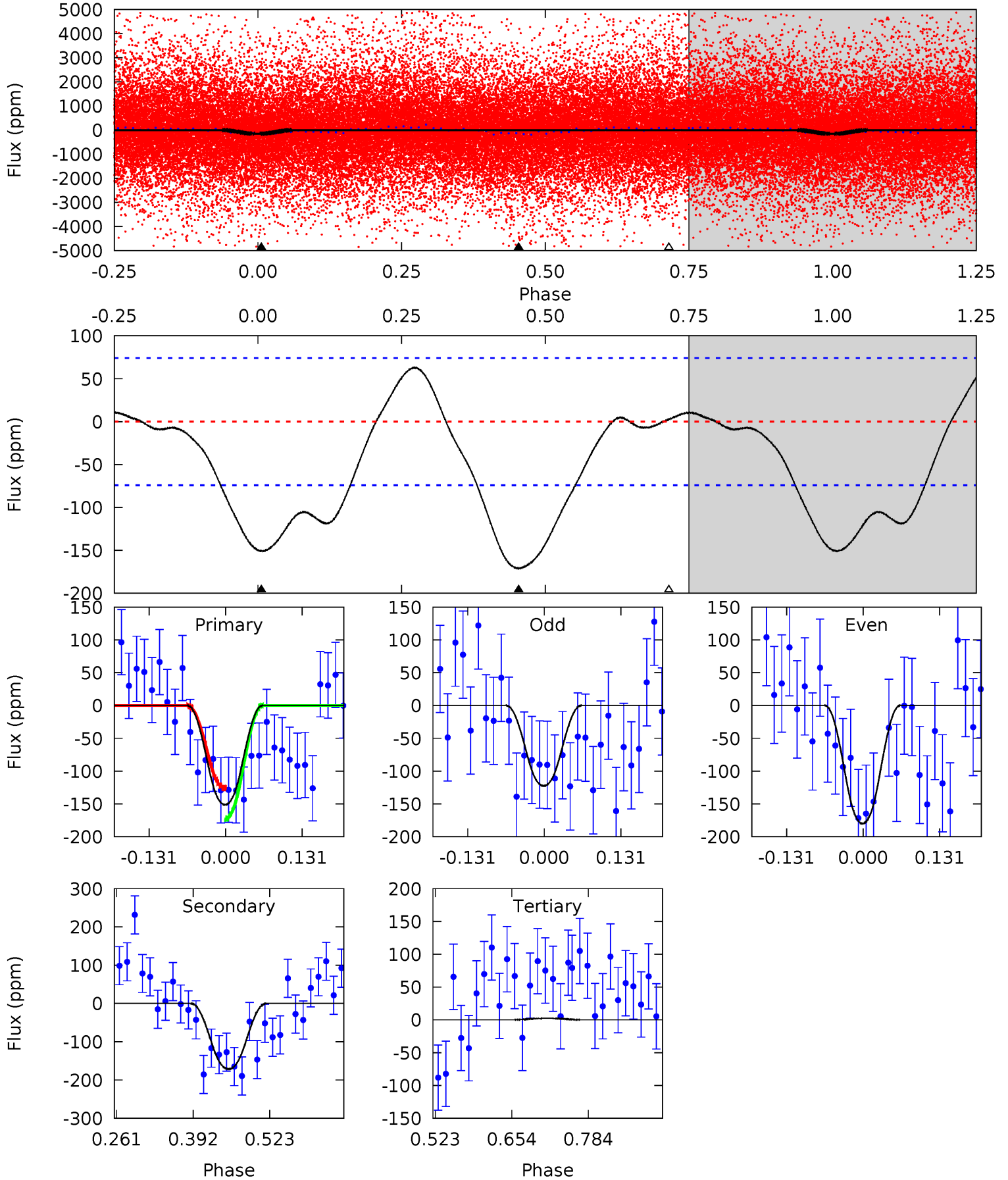
TCE 009594804-01     $P = 0.559967$  Days     $T_0 = 131.974102$  (BKJD)



# DV Model-Shift Uniqueness Test

009594804-01, P = 0.559834 Days, E = 131.986873 Days

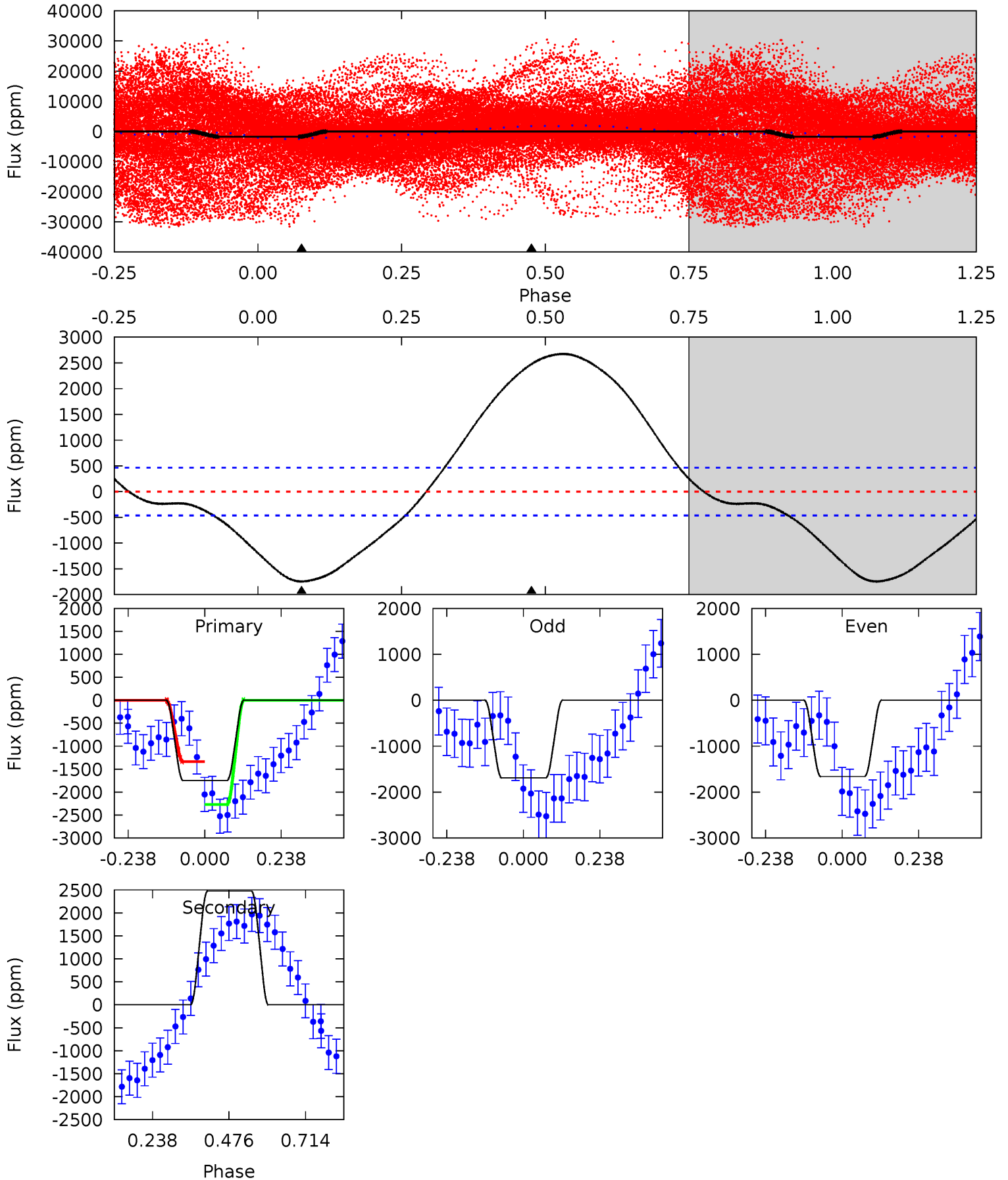
| Pri  | Sec  | Ter   | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|-------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.19 | 10.4 | -0.14 | 0   | 4.51            | 1.51            | 2.02             | 9.34    | 9.19    | 10.6    | 10.4    | 1.76    | 0.29 | 0.27  | 1.44 |



# Alt Model-Shift Uniqueness Test

009594804-01, P = 0.559967 Days, E = 131.974102 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  |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 16.5 | -23.4 | 0   | 0   | 4.38            | 1.18            | 2.80             | 16.5    | 16.5    | -23.4   | -23.4   | 0.15    | 12.8 | 0.60  | 5.54 |





### Stellar Parameters For KIC 009594804

|        | $T_{\text{eff}} (K)$ | $\log(g)$                 | $[\text{Fe}/\text{H}]$     | $R (R_{\odot})$           | $M (M_{\odot})$           | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|-------------------------------------------|
|        | $5204^{+196}_{-179}$ | $4.525^{+0.085}_{-0.085}$ | $-0.320^{+0.350}_{-0.300}$ | $0.769^{+0.105}_{-0.096}$ | $0.723^{+0.106}_{-0.049}$ | $2.241^{+0.857}_{-0.567}$                 |
|        | +4%/-3%              | +2%/-2%                   | +109%/-94%                 | +14%/-12%                 | +15%/-7%                  | +38%/-25%                                 |
| 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 009594804-01 / KOI

| Detrend | Depth (ppm)    | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$   | $A_{\text{obs}}$              |
|---------|----------------|------------------------|----------------------|------------------------|-------------------------------|
| DV      | $-171 \pm 16$  | $1.15^{+1.03}_{-0.76}$ | $2579^{+137}_{-116}$ | $5106^{+4173}_{-1172}$ | $10^{+82}_{-7}$               |
| Alt.    | $2474 \pm 106$ | $3.10^{+1.29}_{-1.29}$ | $2583^{+123}_{-129}$ | $-6045^{+905}_{-1942}$ | $-20.669^{+10.398}_{-38.573}$ |

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

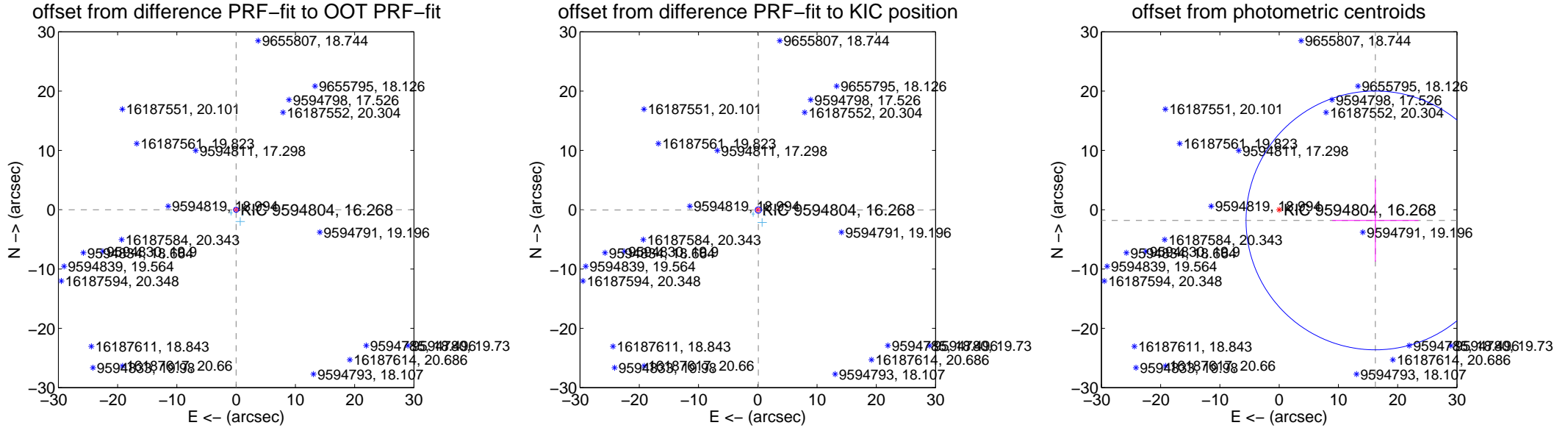
## DV Centroid Data

Supplemental centroid analysis for 009594804-01. Kepler magnitude: 16.27. Transit SNR 1.23

There are 7 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

|                                         | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|-----------------------------------------|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $0.009 \pm 0.143$  | 0.06                | $0.004 \pm 0.124$  | $-0.008 \pm 0.169$ |
| PRF-fit source offset from KIC position | $0.105 \pm 0.178$  | 0.59                | $-0.091 \pm 0.141$ | $-0.053 \pm 0.181$ |
| photometric centroid source offset      | $16.33 \pm 7.27$   | 2.25                | $-16.23 \pm 7.28$  | $-1.81 \pm 6.94$   |

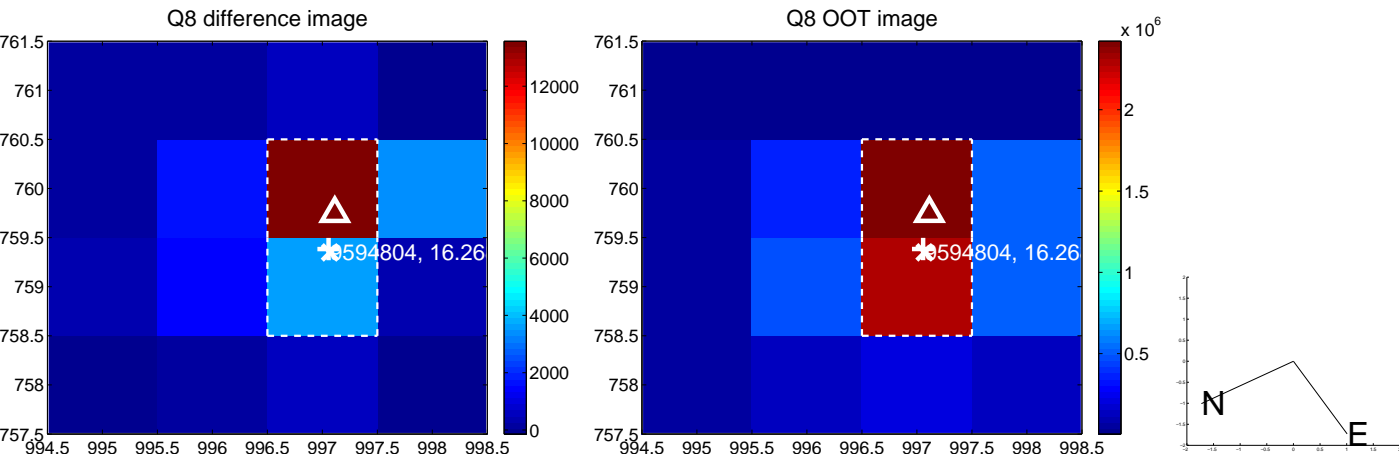
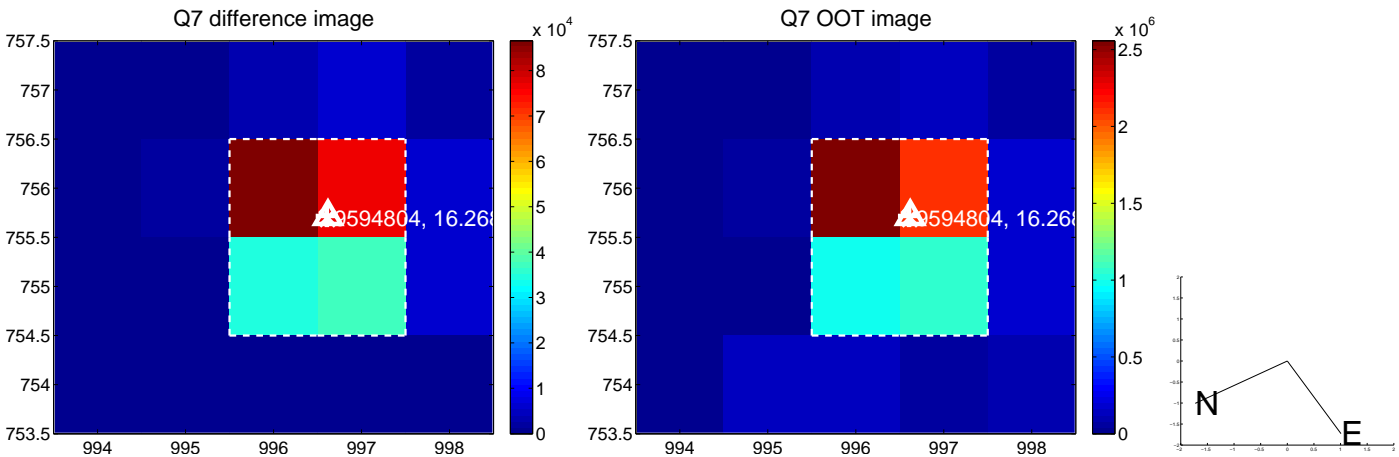
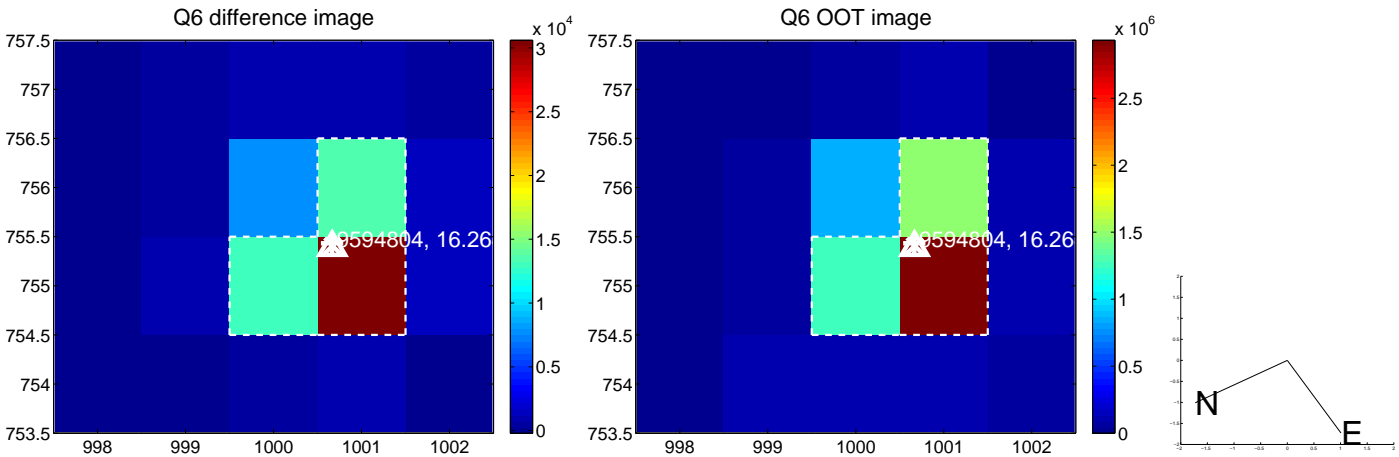
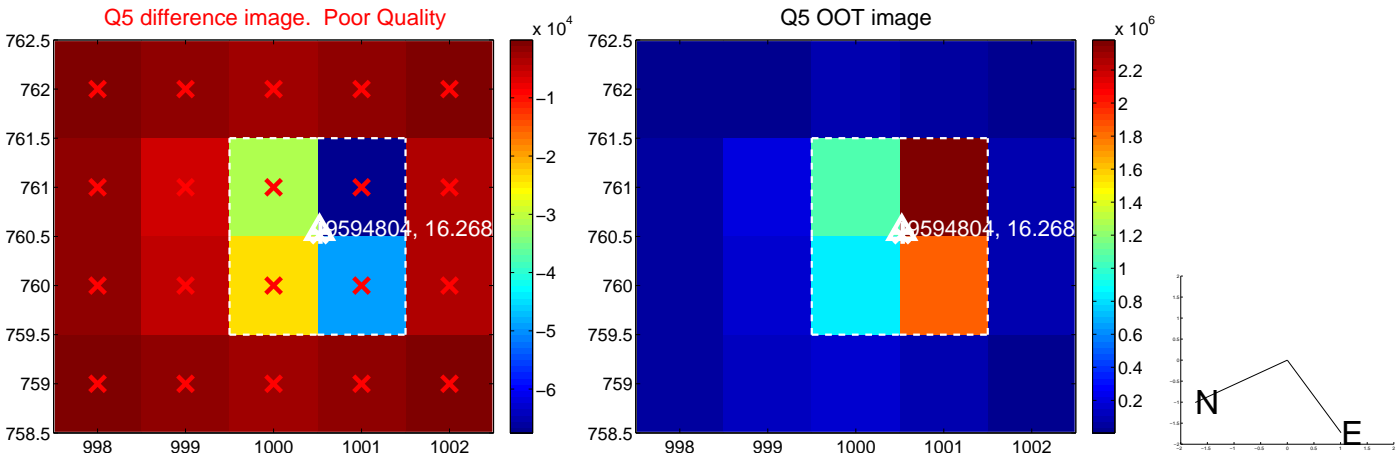


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

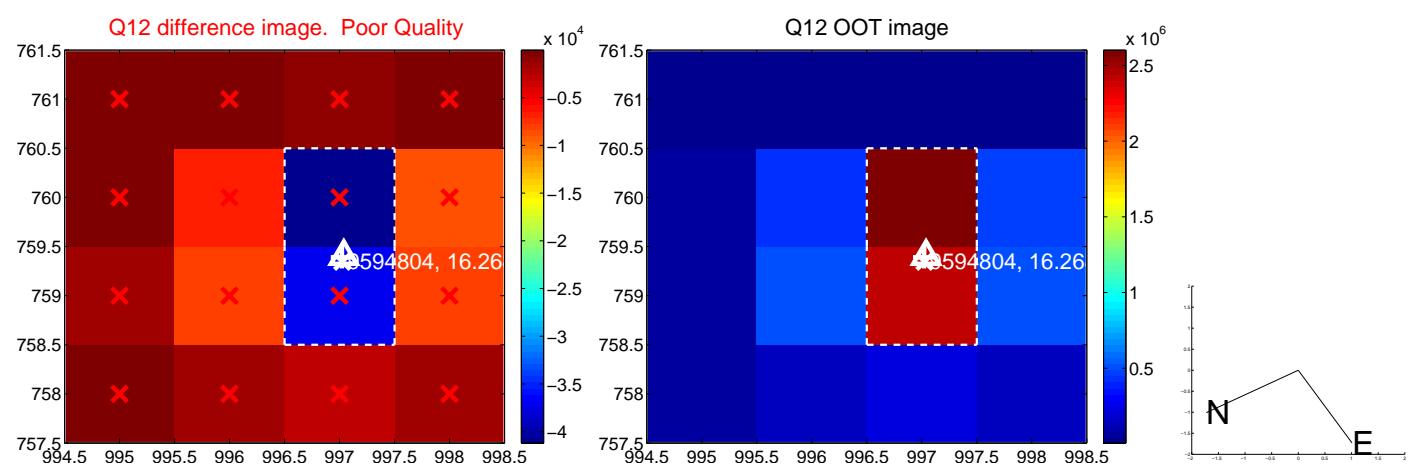
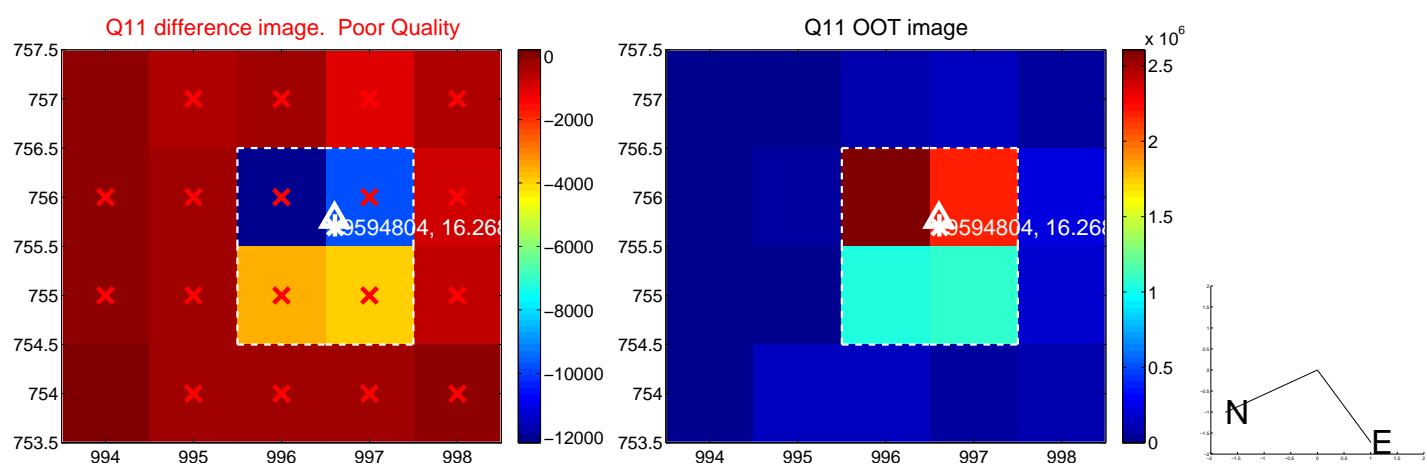
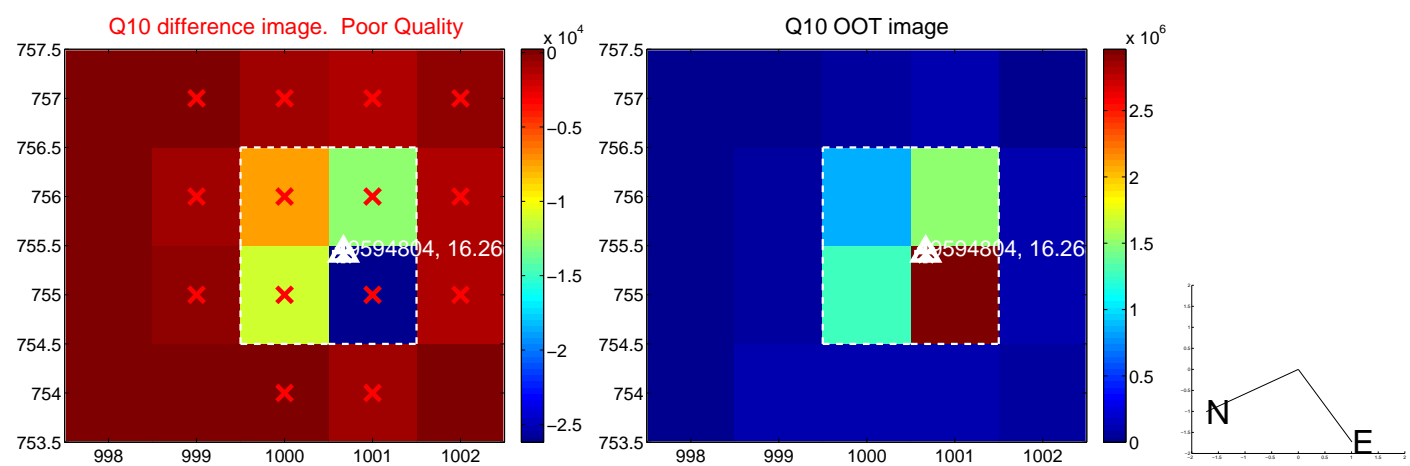
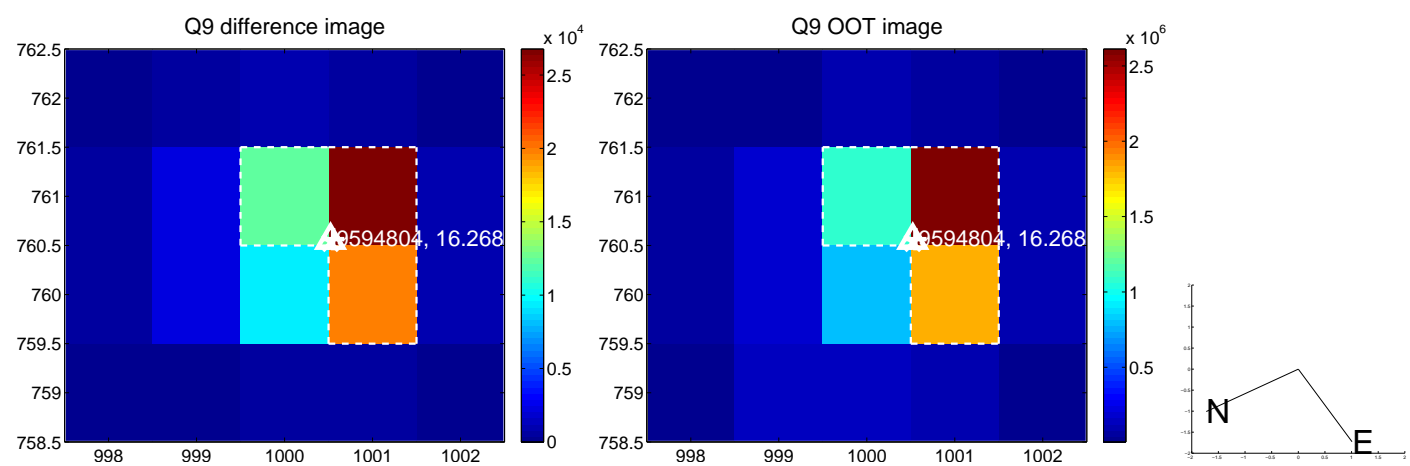


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

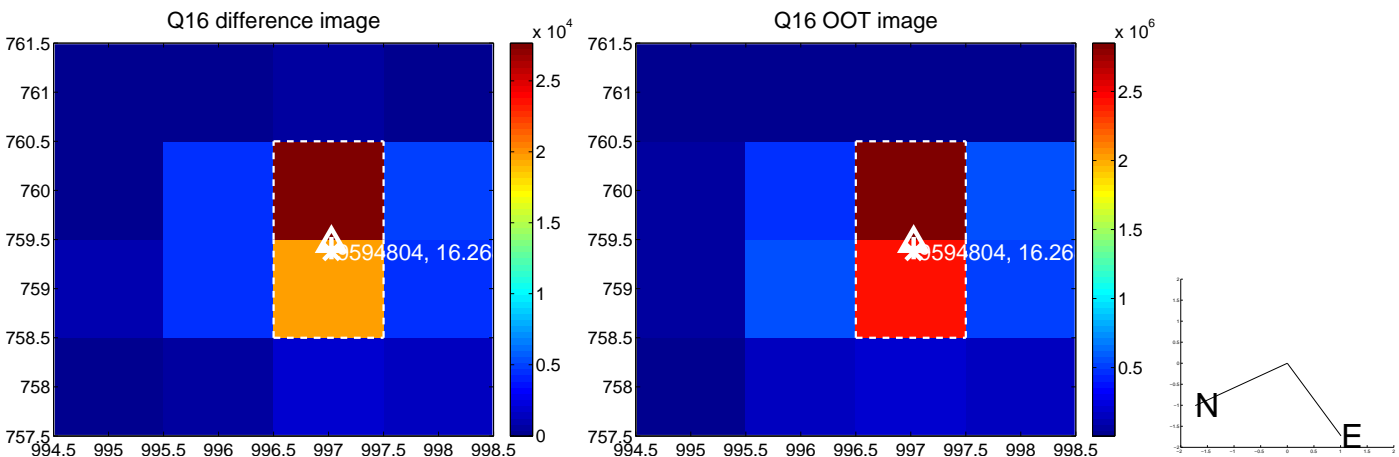
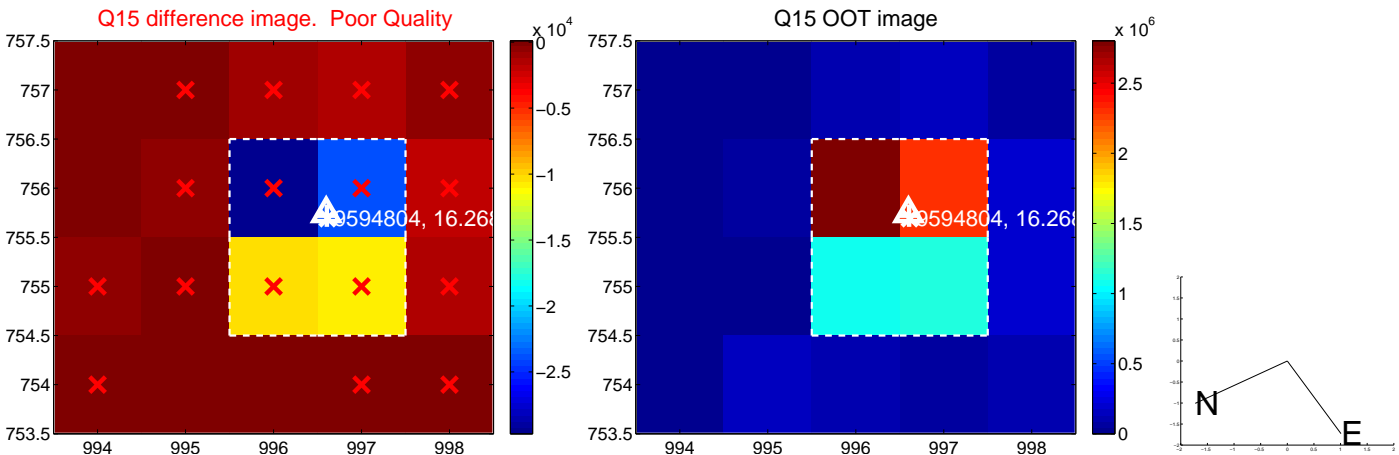
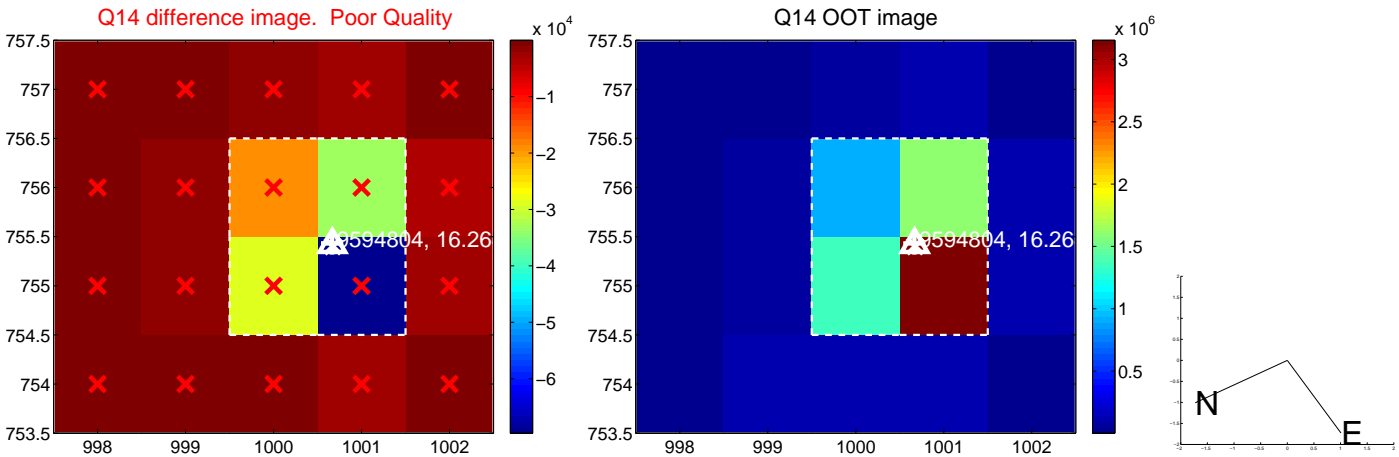
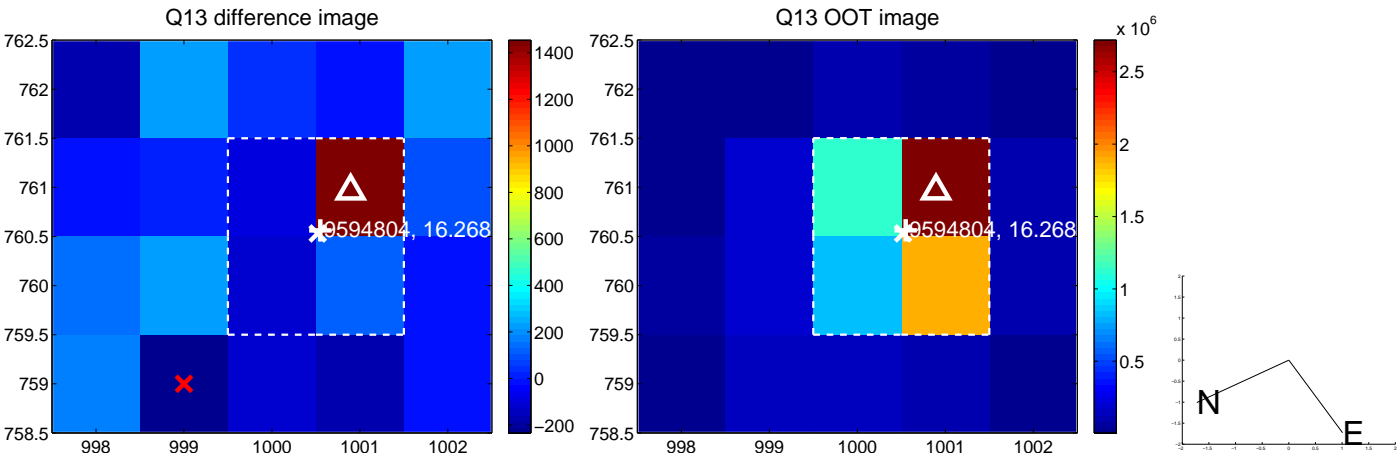




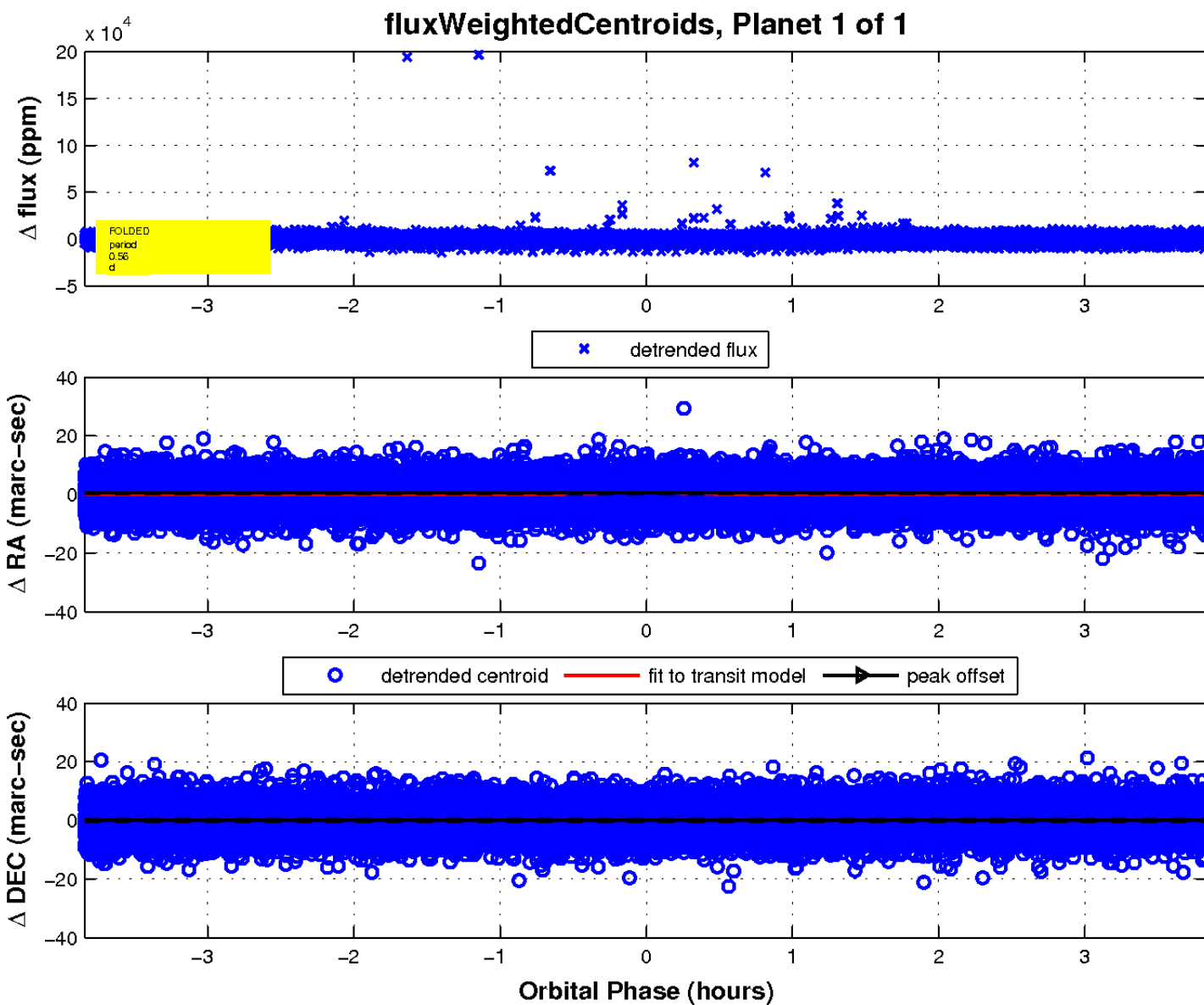
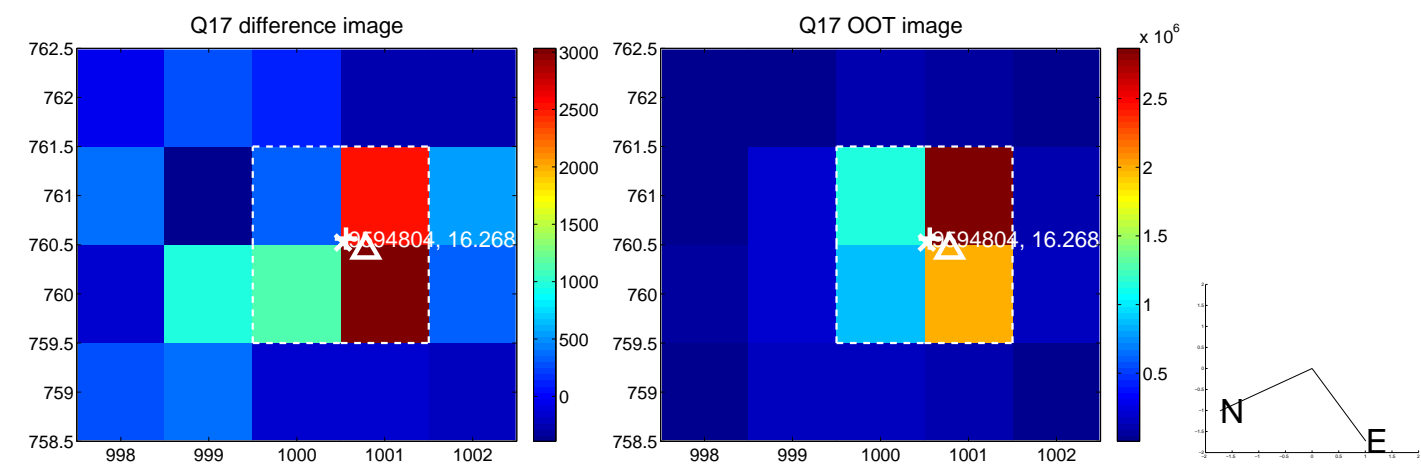
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

