

# KIC 005709906

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005709906-01 | OBS      | 4744.01 | 3.391597      | 134.124798   | 29.2        | 3.536            | 7.4 | 7.6 | 0.91                        | 5896            | 0.61                   | 463.32                 |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|------------|
| 005709906-01 | OBS      | PC   | 0.82  | 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.

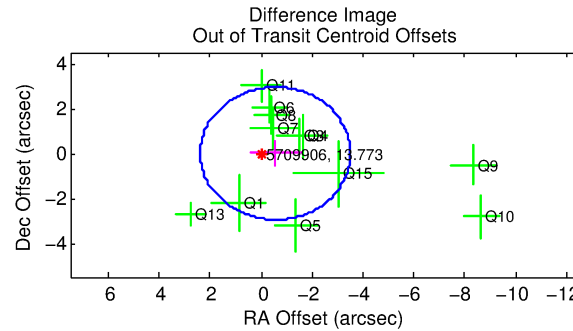
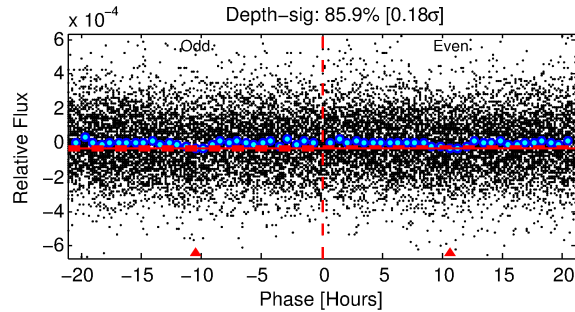
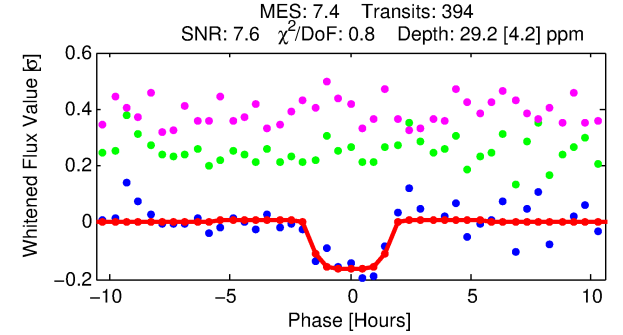
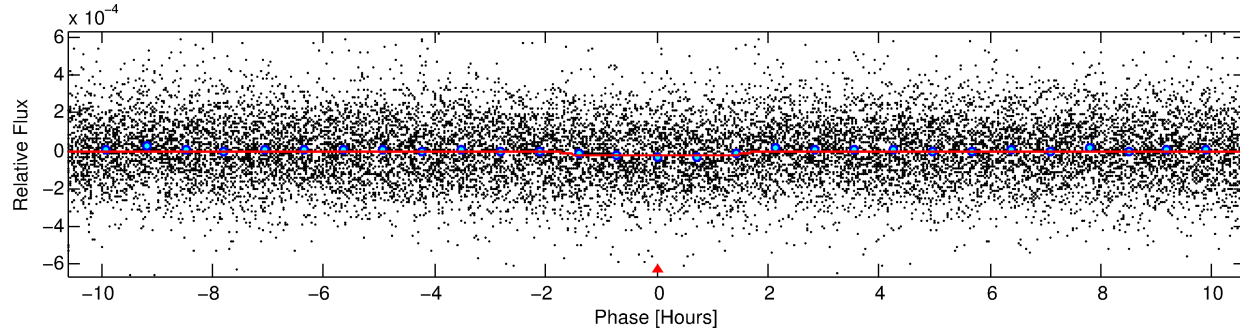
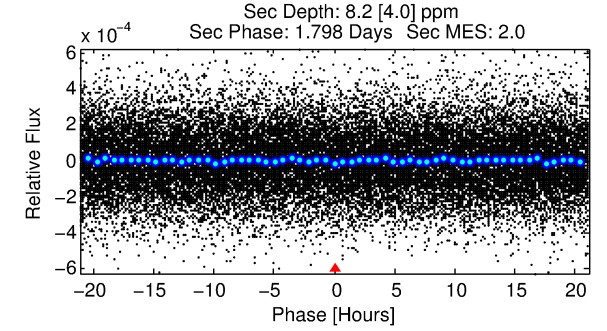
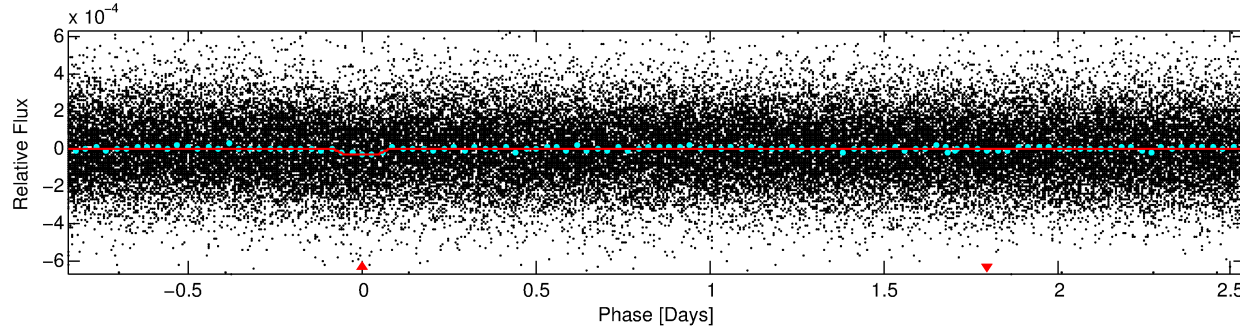
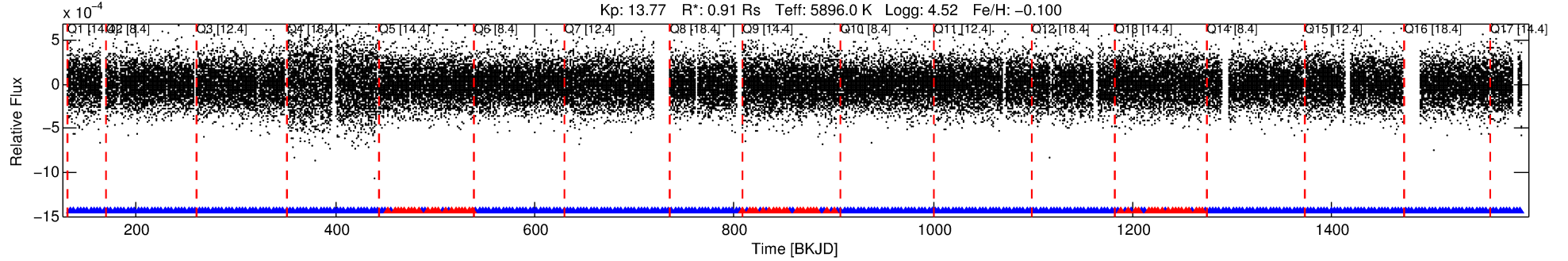
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005709906-01

No Significant Match Found

# DV One-Page Summary

KIC: 5709906 Candidate: 1 of 1 Period: 3.392 d  
KOI: K04744.01 Corr: 0.911



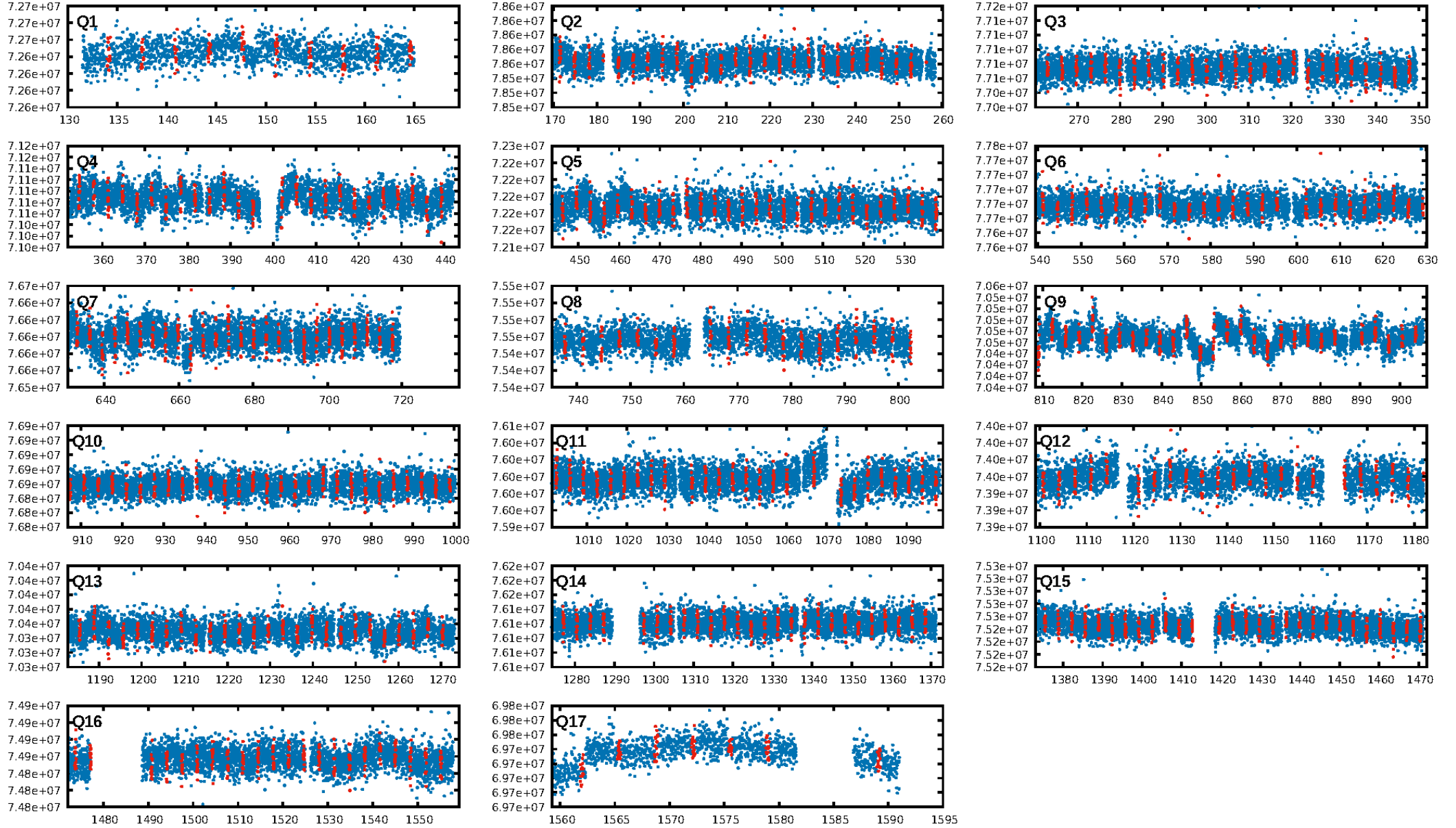
## DV Fit Results:

Period = 3.39160 [0.00004] d  
Epoch = 134.1248 [0.0069] BKJD  
Rp/R\* = 0.0061 [0.0034]  
a/R\* = 2.85 [7.35]  
b = 0.94 [0.39]  
Seff = 463.32 [183.08]  
Teq = 1183 [117] K  
Rp = 0.61 [0.38] Re  
a = 0.0442 [0.0113] AU  
Ag = 23.60 [29.84] [0.76σ]  
Teffp = 4031 [1223] K [2.32σ]

## DV Diagnostic Results:

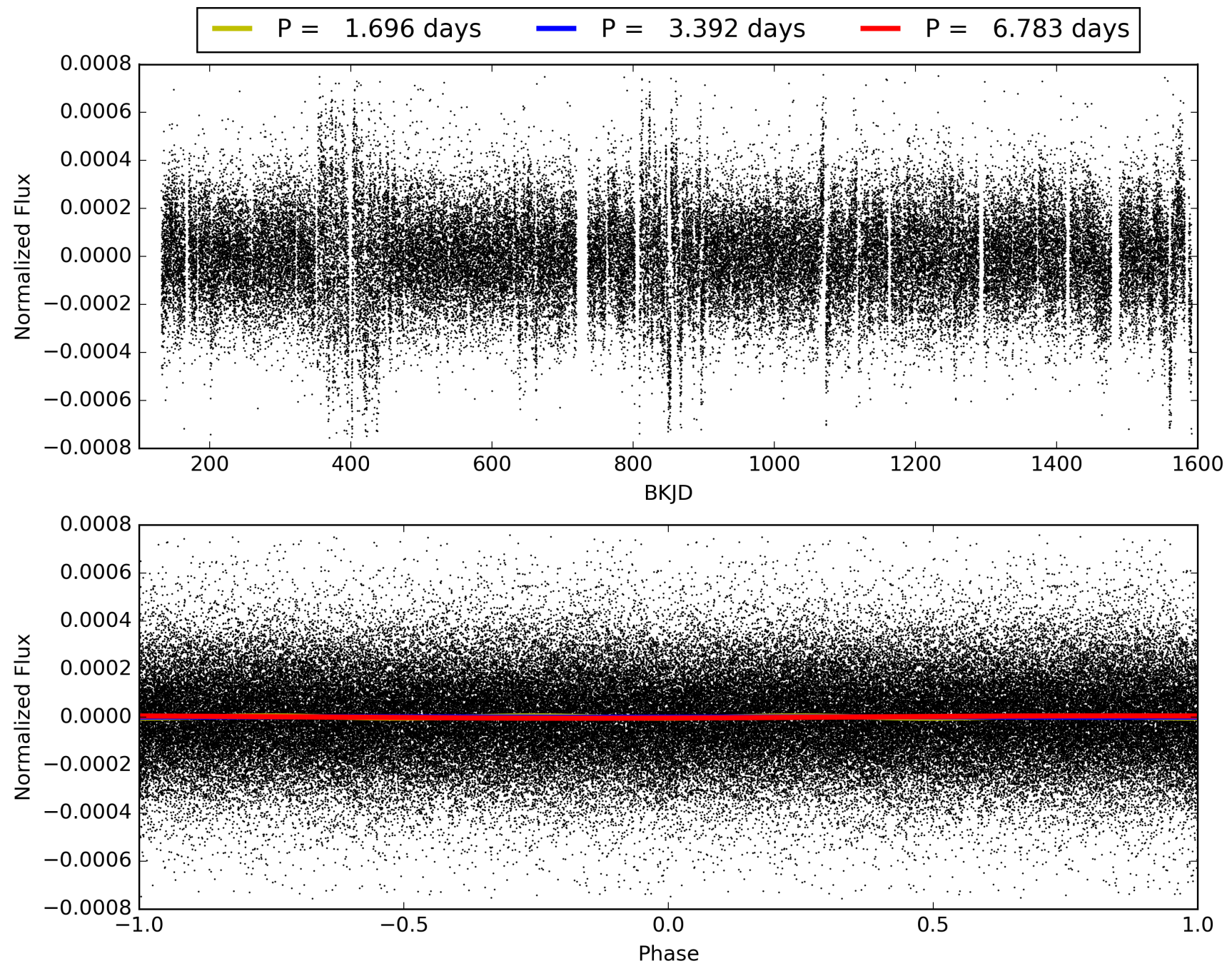
ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 6.55e-14  
RollingBand-fgt: 0.84 [317/377]  
GhostDiagnostic-chr: 2.51  
Centroid-sig: 0.0%  
Centroid-so: 3.772 arcsec [2.38σ]  
OotOffset-rm: 0.562 arcsec [0.57σ]  
KicOffset-rm: 0.448 arcsec [0.47σ]  
OotOffset-st: 2/4/2/4 [12]  
KicOffset-st: 2/4/2/4 [12]  
DiffImageQuality-fgm: 0.42 [5/12]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 005709906-01, PDC Light Curves



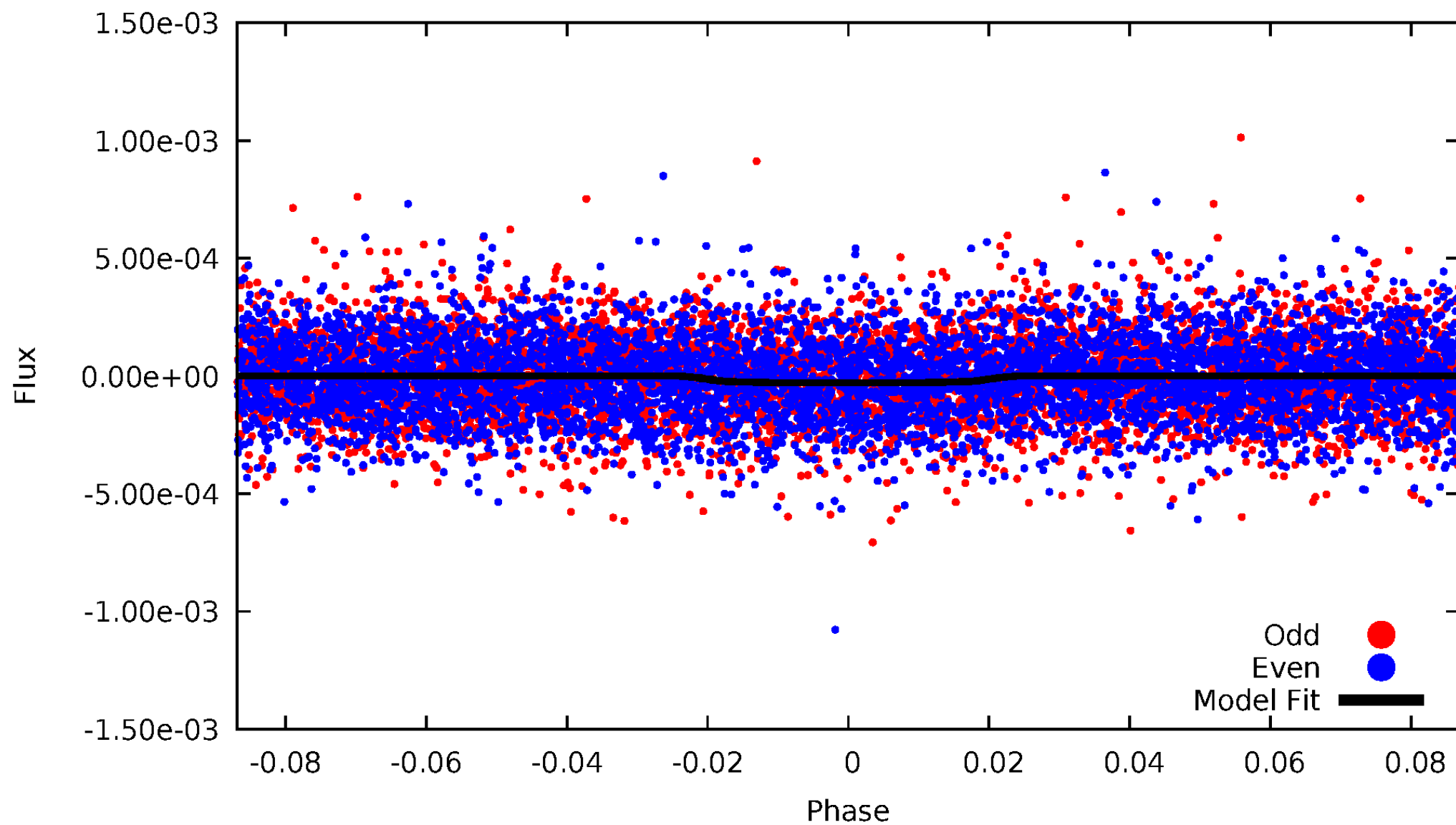


TCE 005709906-01



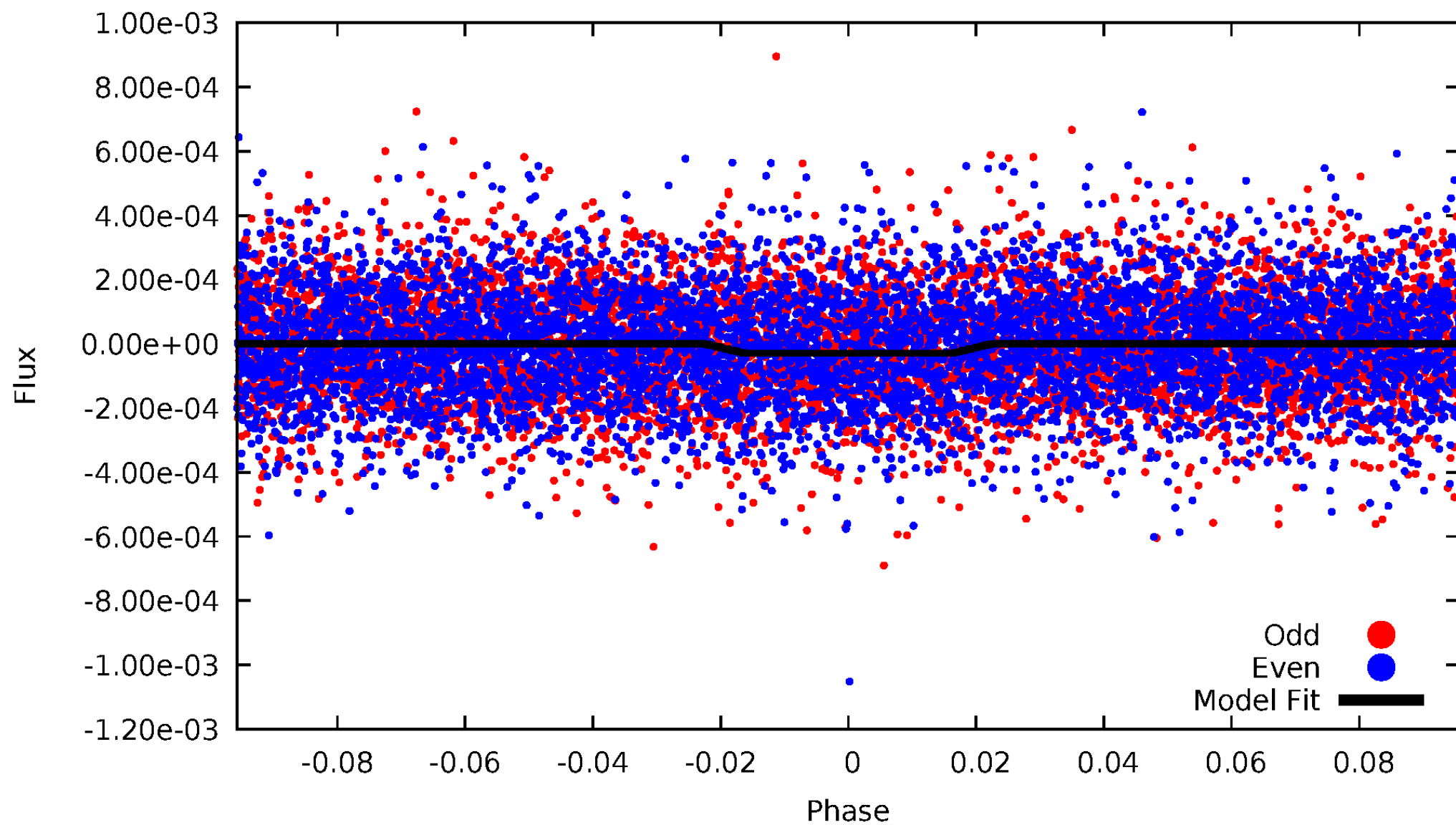
# DV Odd/Even

TCE 005709906-01



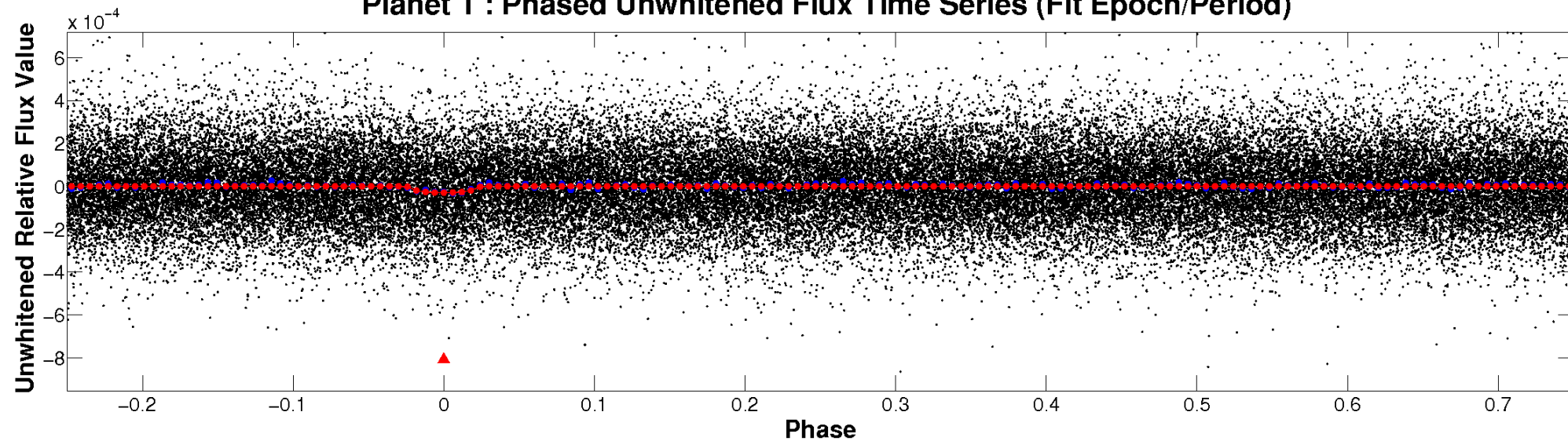
# ALT Odd/Even

TCE 005709906-01

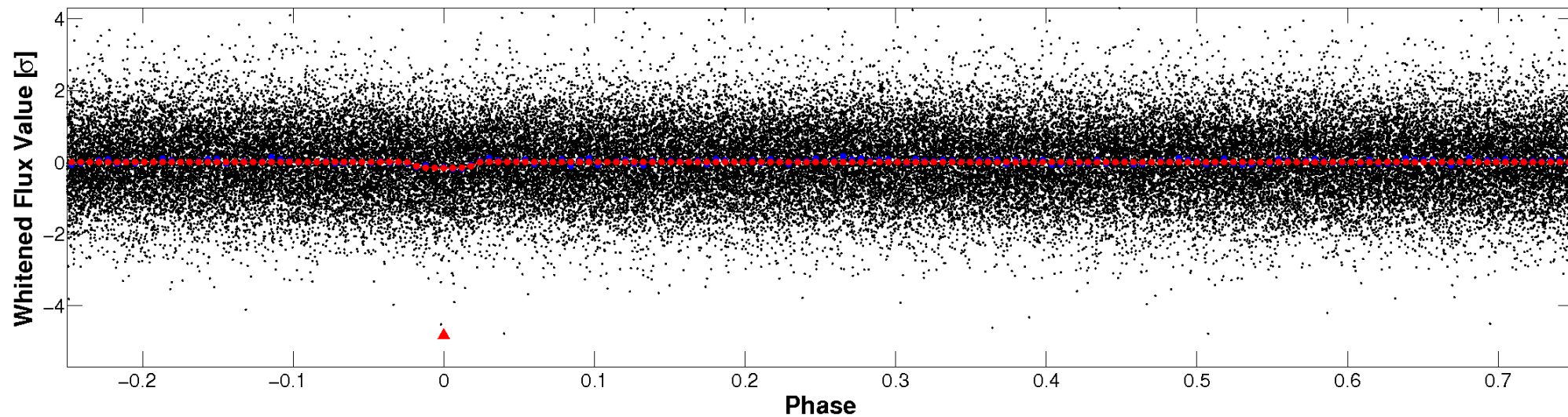


# Non-Whitened Vs. Whitened Light Curve

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



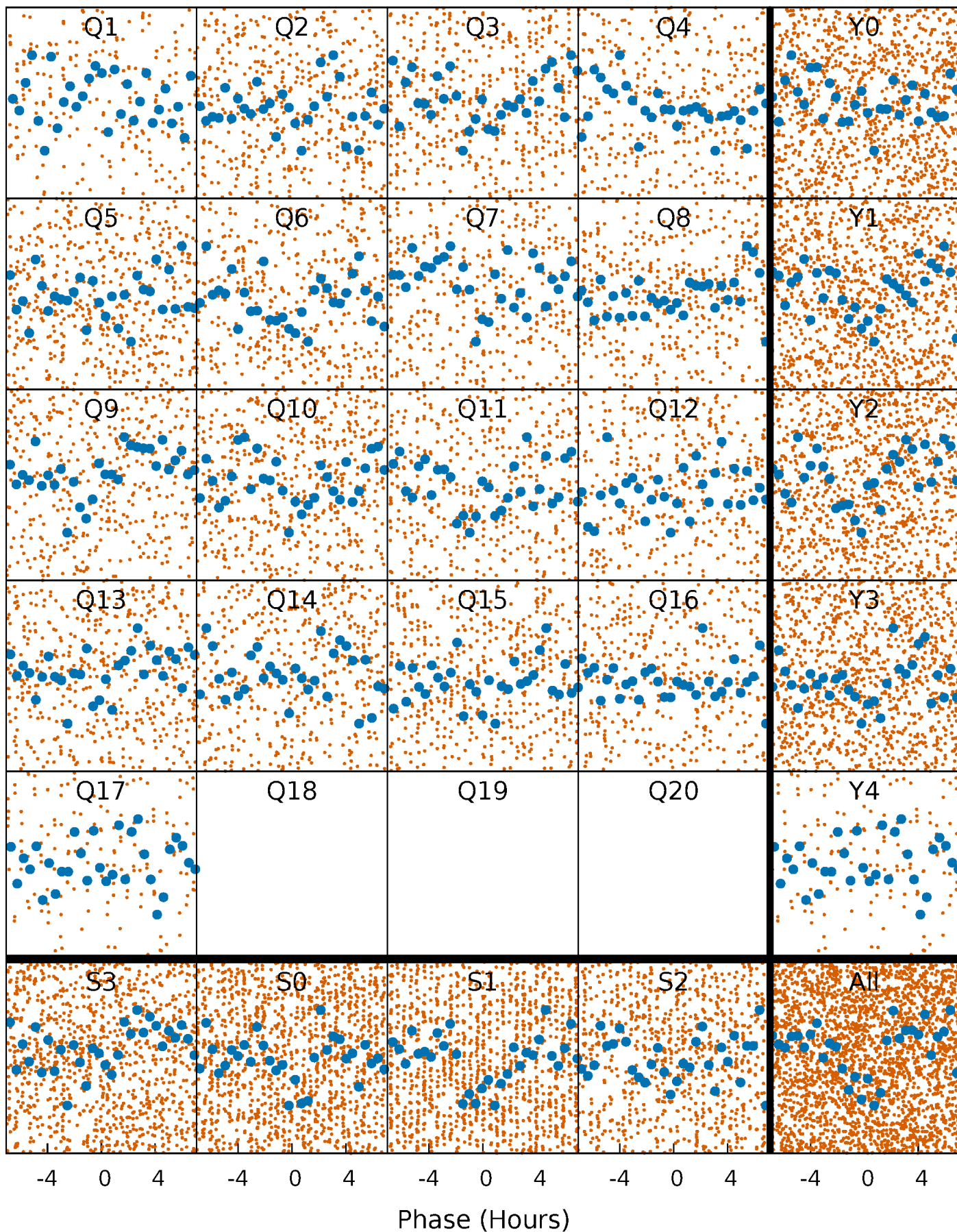
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

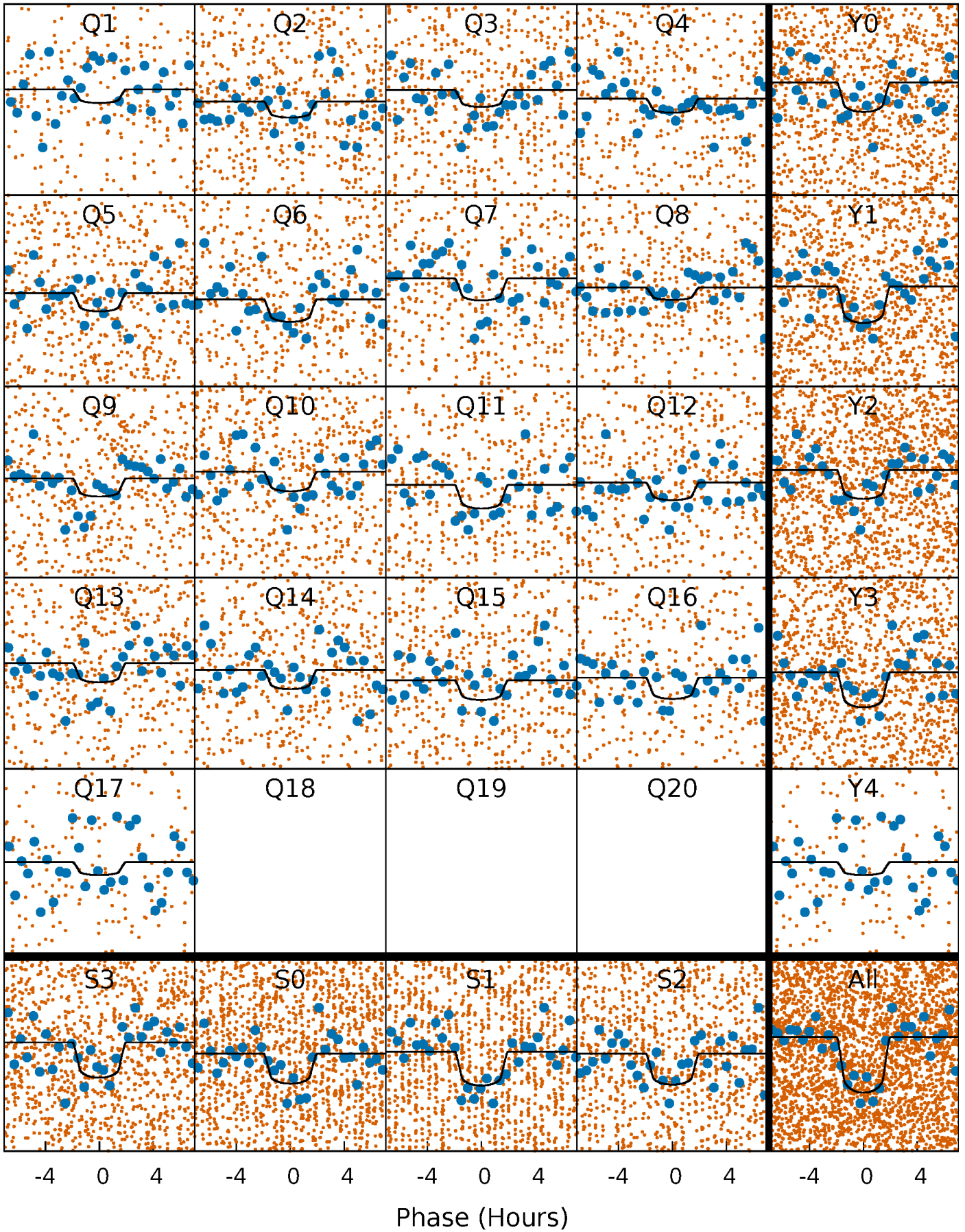
TCE 005709906-01   P= 3.391597 Days    $T_0=134.124798$  (BKJD)





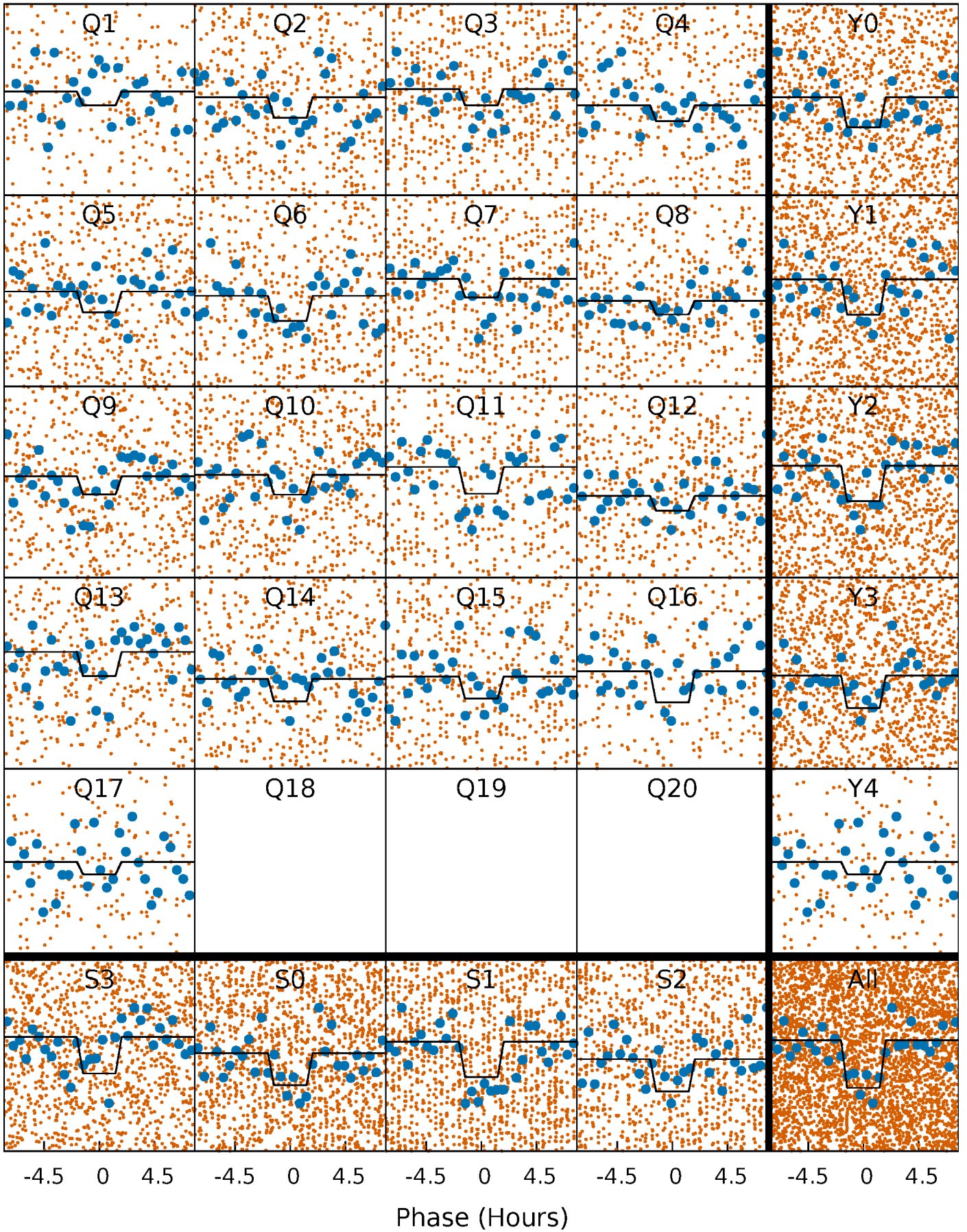
# DV Quarter-Phased Transit Curves

TCE 005709906-01 P= 3.391597 Days  $T_0=134.124798$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

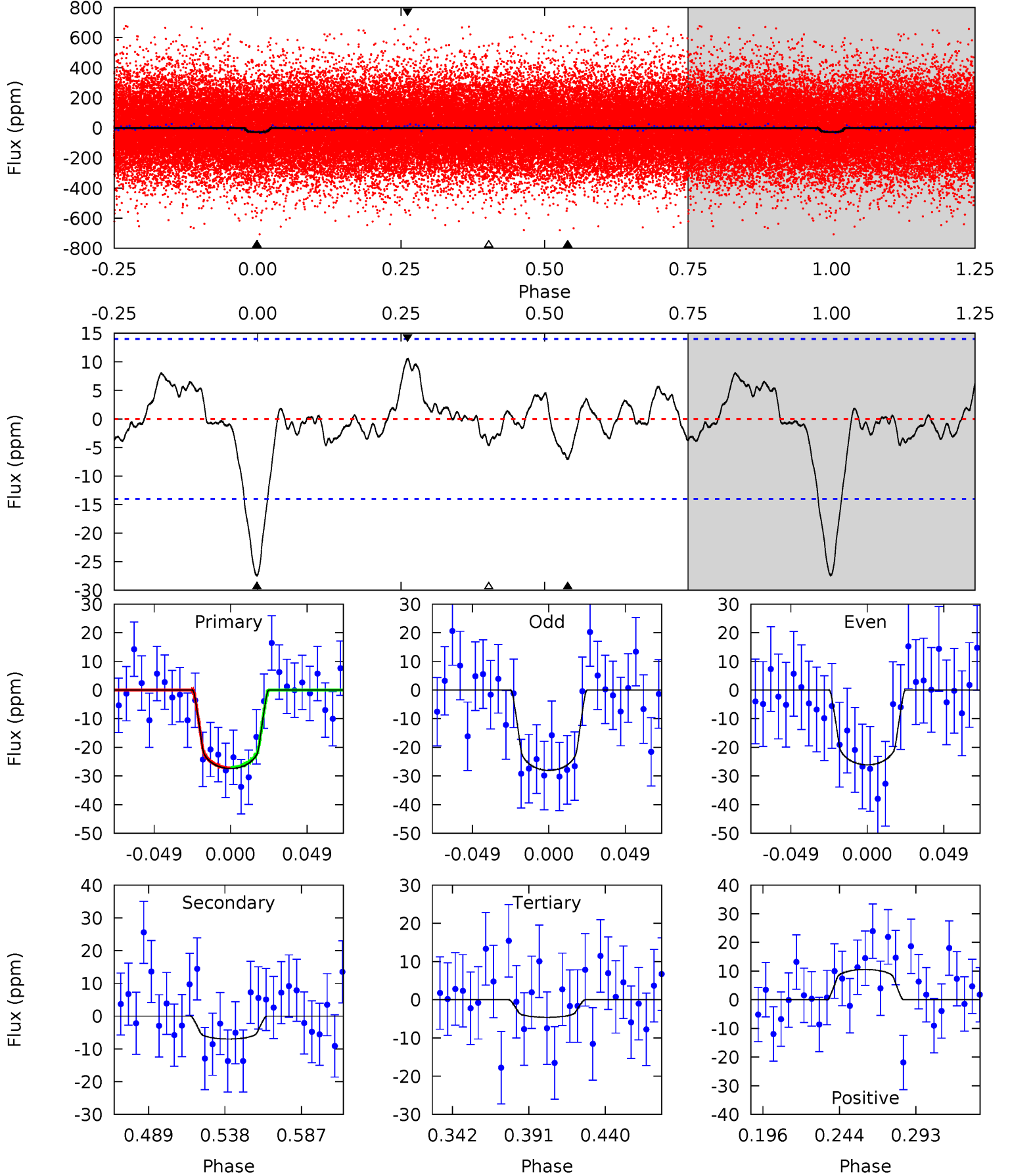
TCE 005709906-01 P= 3.391619 Days  $T_0=134.115827$  (BKJD)



# DV Model-Shift Uniqueness Test

005709906-01, P = 3.391597 Days, E = 130.733201 Days

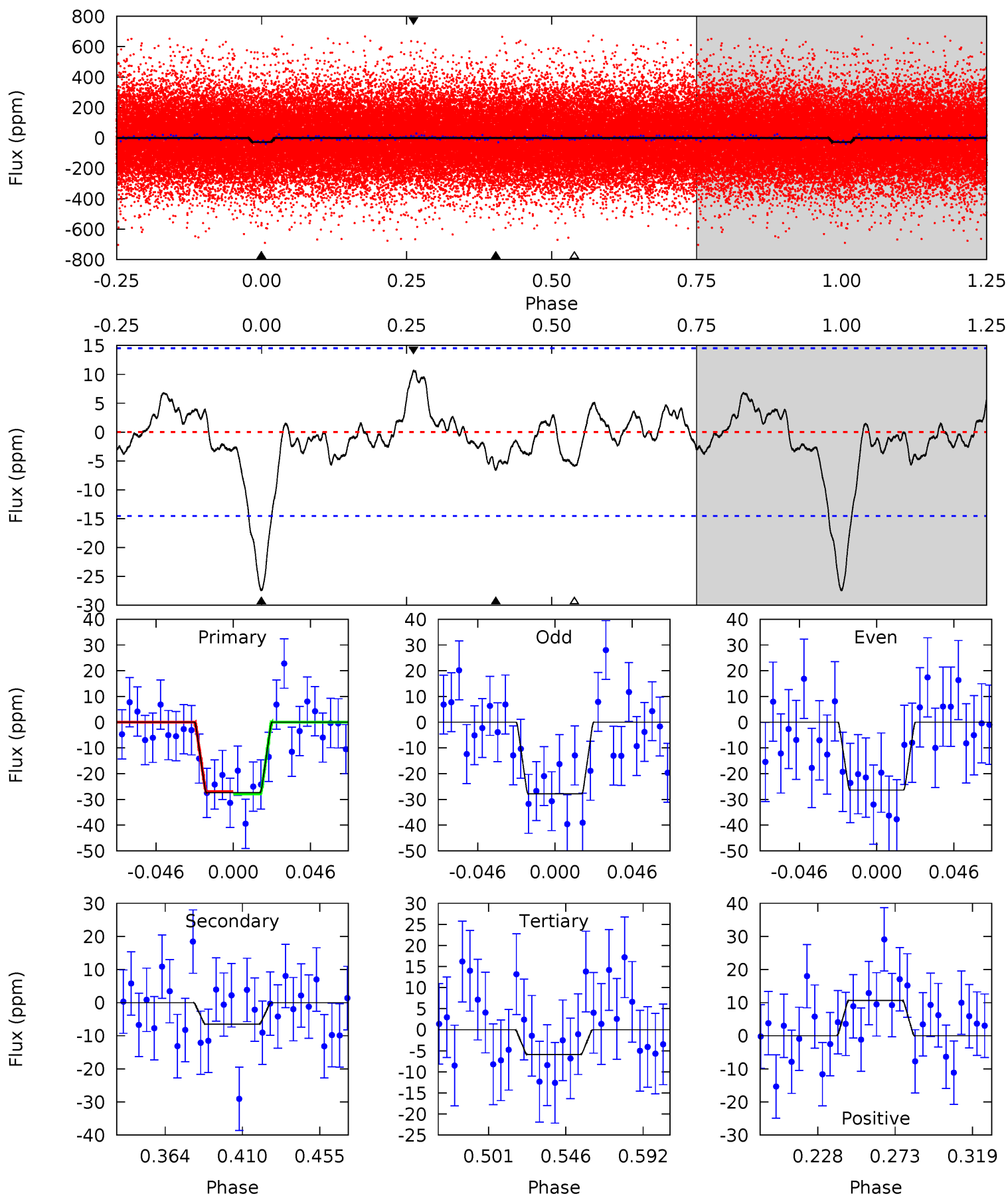
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.22 | 2.35 | 1.55 | 3.55 | 4.71            | 1.97            | 1.11             | 7.68    | 5.67    | 0.81    | -1.20   | 0.33    | 1.14 | 0.28  | 0.03 |



# Alt Model-Shift Uniqueness Test

005709906-01, P = 3.391619 Days, E = 130.724208 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.91 | 2.13 | 1.91 | 3.48 | 4.73            | 2.00            | 1.07             | 7.00    | 5.44    | 0.22    | -1.35   | 0.24    | 1.16 | 0.28  | 0.15 |





### Stellar Parameters For KIC 005709906

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $5896^{+159}_{-176}$ | $4.516^{+0.052}_{-0.208}$ | $-0.100^{+0.300}_{-0.300}$ | $0.914^{+0.274}_{-0.091}$ | $1.000^{+0.120}_{-0.132}$ | $1.846^{+0.376}_{-0.958}$                 |
|        | +3%/-3%              | +1%/-5%                   | +300%/-300%                | +30%/-10%                 | +12%/-13%                 | +20%/-52%                                 |
| 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 005709906-01 / KOI 4744.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{max} (K)$       | $T_{obs} (K)$         | $A_{obs}$        |
|---------|-------------|------------------------|---------------------|-----------------------|------------------|
| DV      | $-7 \pm 3$  | $0.67^{+0.36}_{-0.34}$ | $1684^{+122}_{-75}$ | $4061^{+1384}_{-679}$ | $16^{+53}_{-11}$ |
| Alt.    | $-7 \pm 3$  | $0.60^{+0.34}_{-0.32}$ | $1688^{+128}_{-77}$ | $4173^{+1438}_{-714}$ | $19^{+61}_{-13}$ |

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

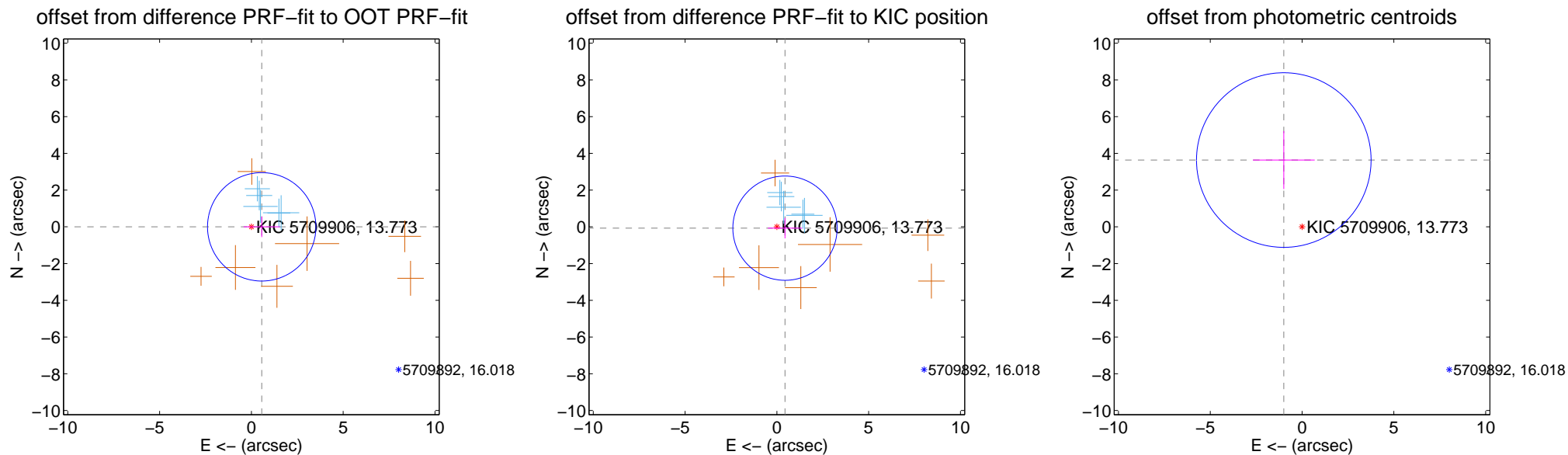
## DV Centroid Data

Supplemental centroid analysis for 005709906-01. Kepler magnitude: 13.77. Transit SNR 7.59

There are 5 quarters with good PRF difference image offsets

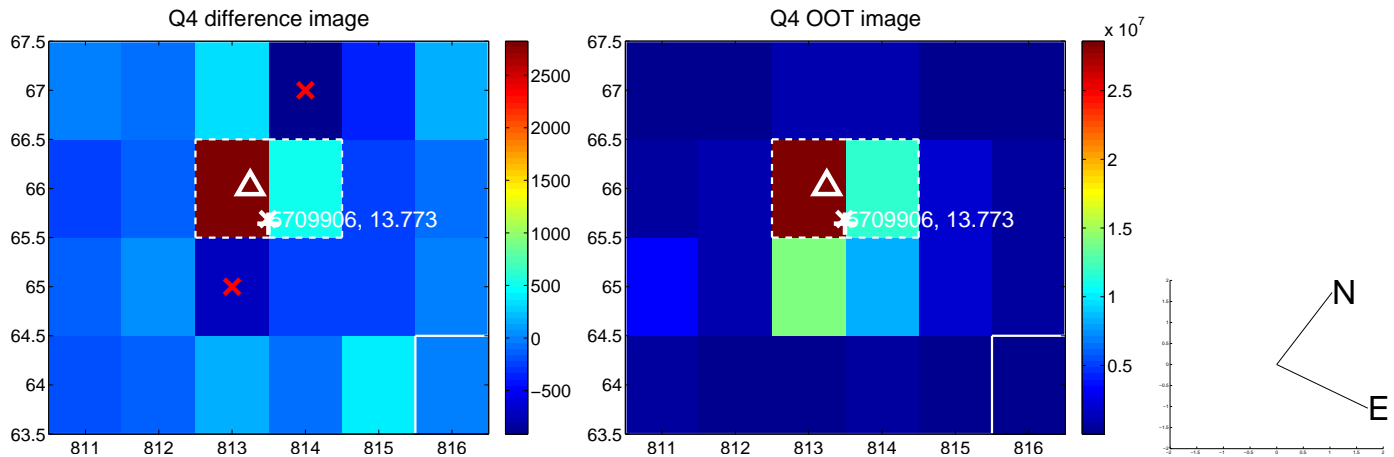
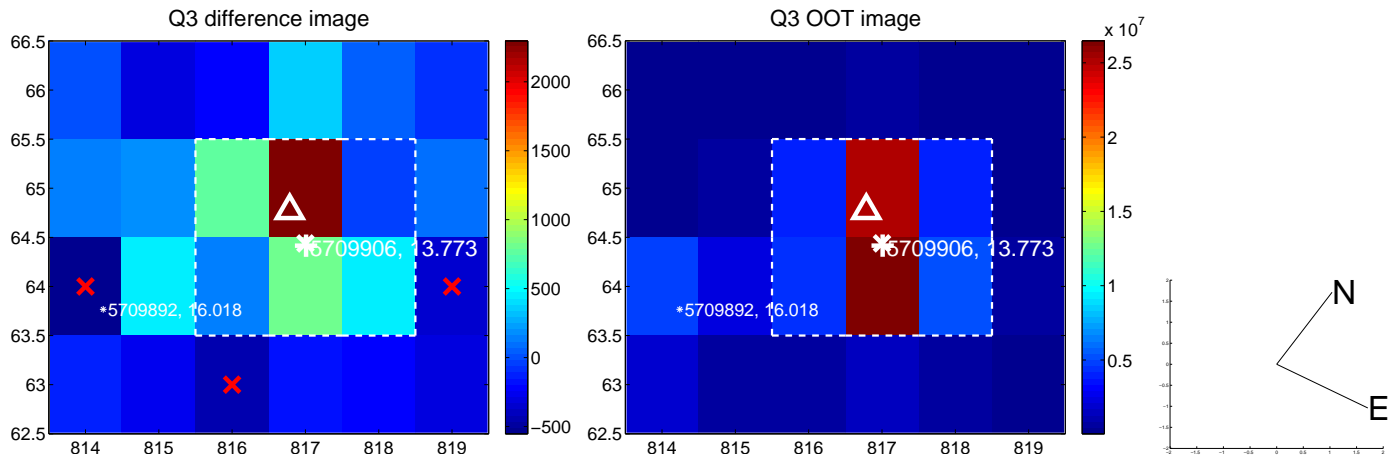
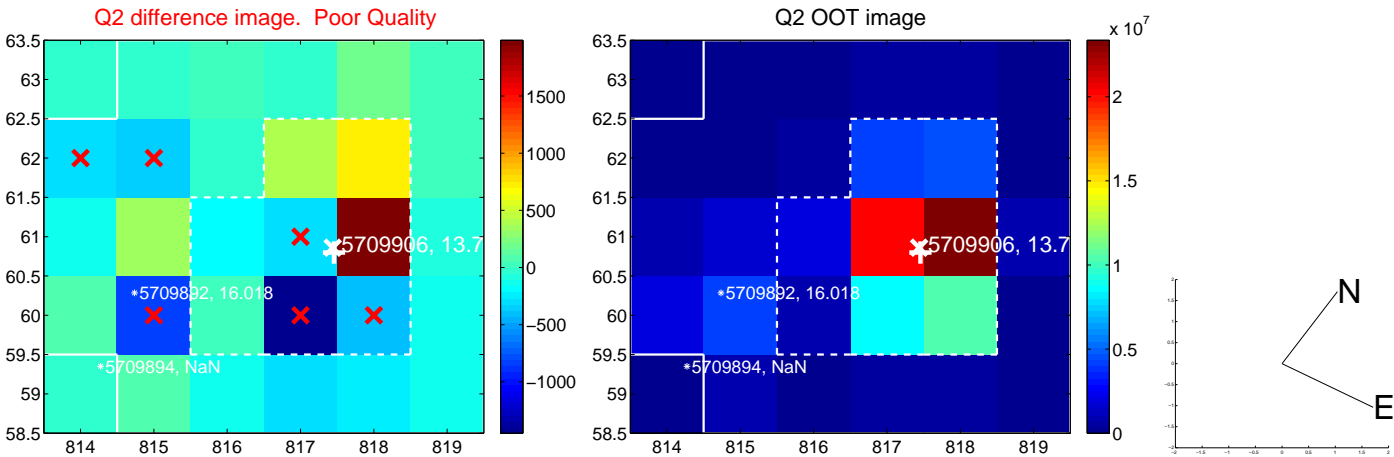
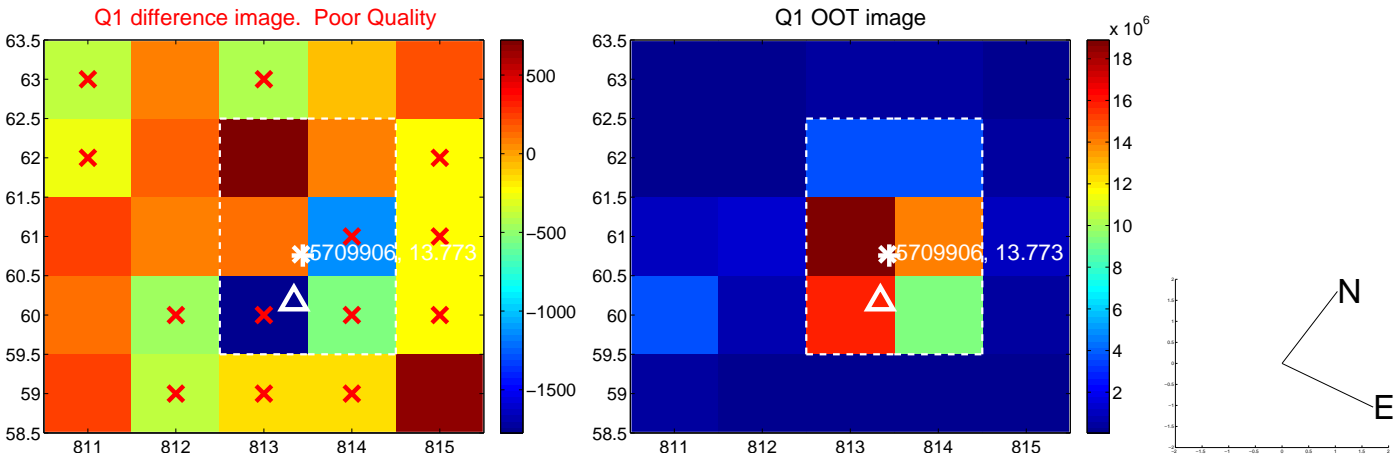
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $0.562 \pm 0.984$  | 0.57                | $-0.562 \pm 0.984$ | $0.001 \pm 0.559$  |
| PRF-fit source offset from KIC position | $0.448 \pm 0.947$  | 0.47                | $-0.442 \pm 0.930$ | $-0.071 \pm 0.555$ |
| photometric centroid source offset      | $3.77 \pm 1.58$    | 2.38                | $1.00 \pm 1.68$    | $3.64 \pm 1.58$    |

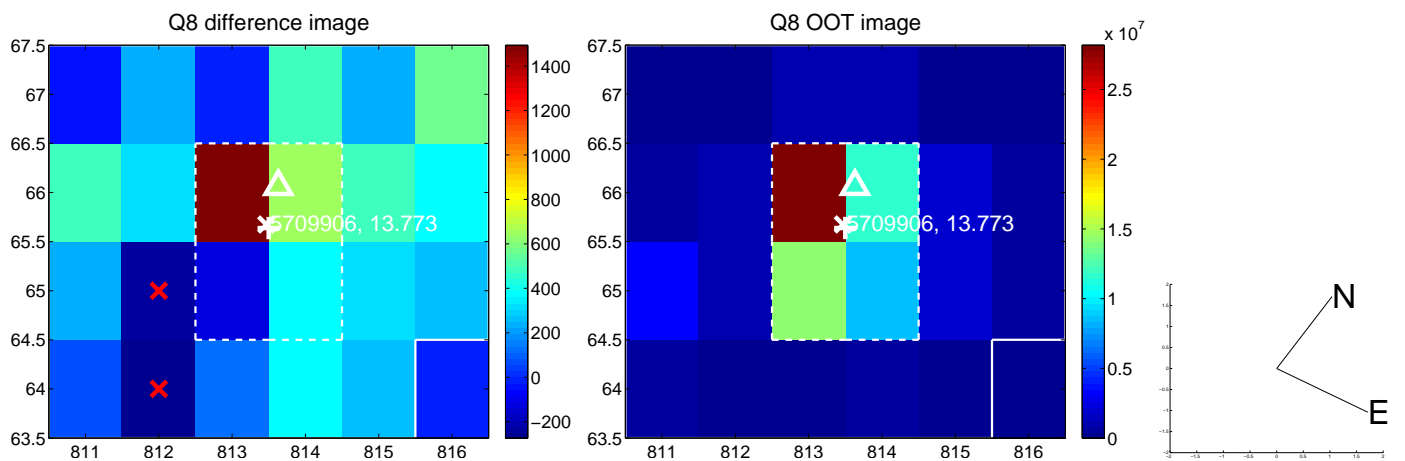
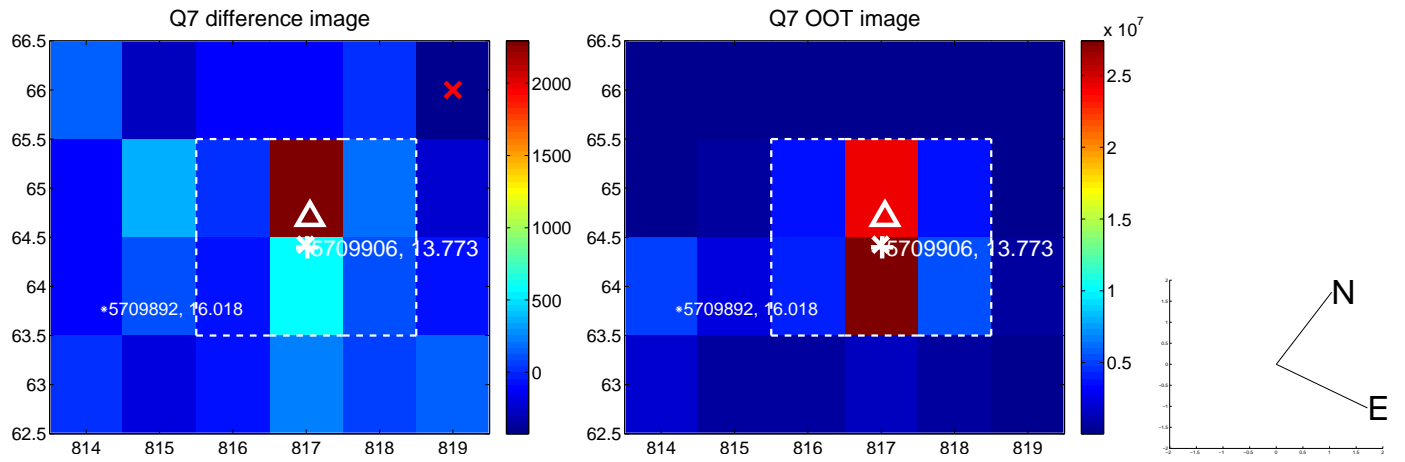
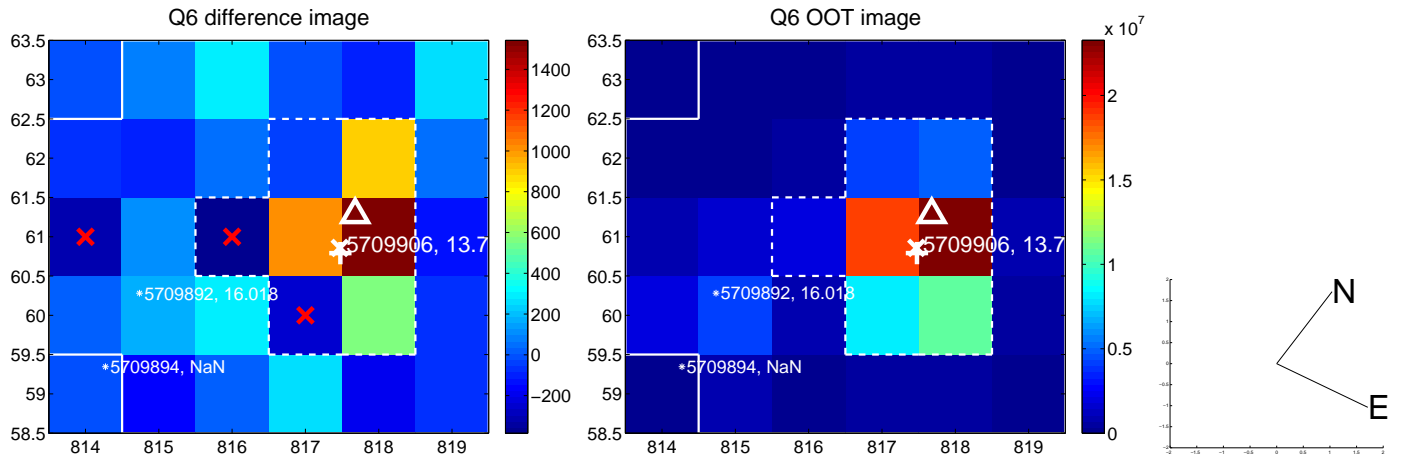
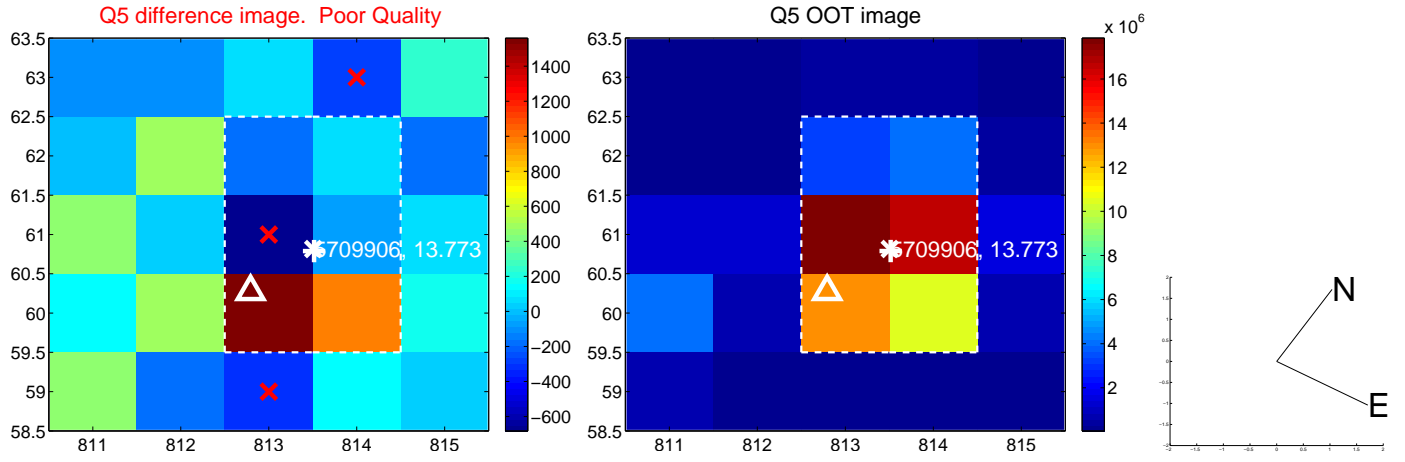


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

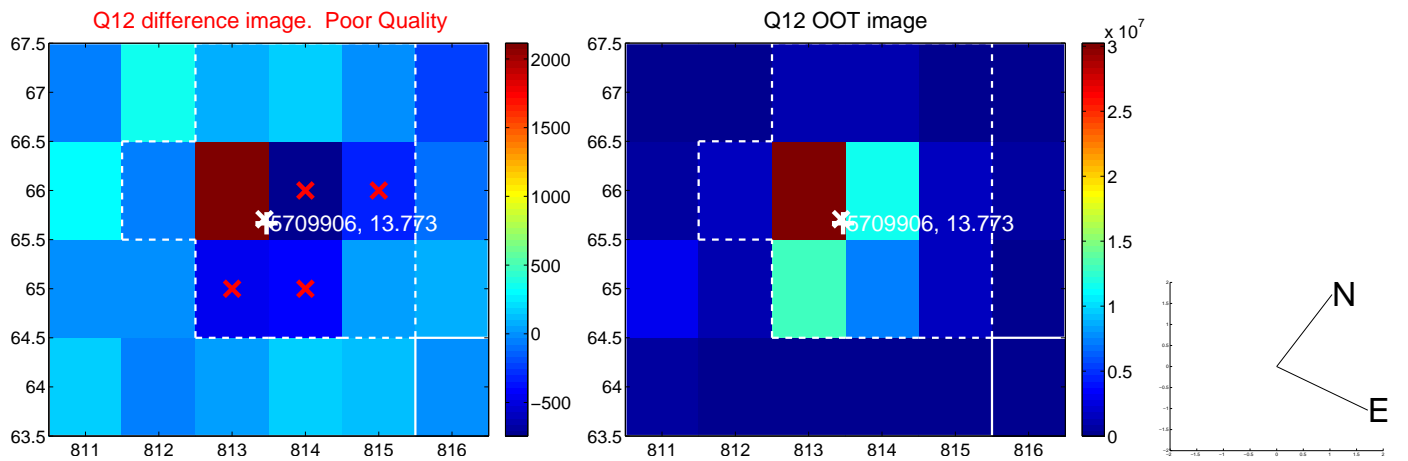
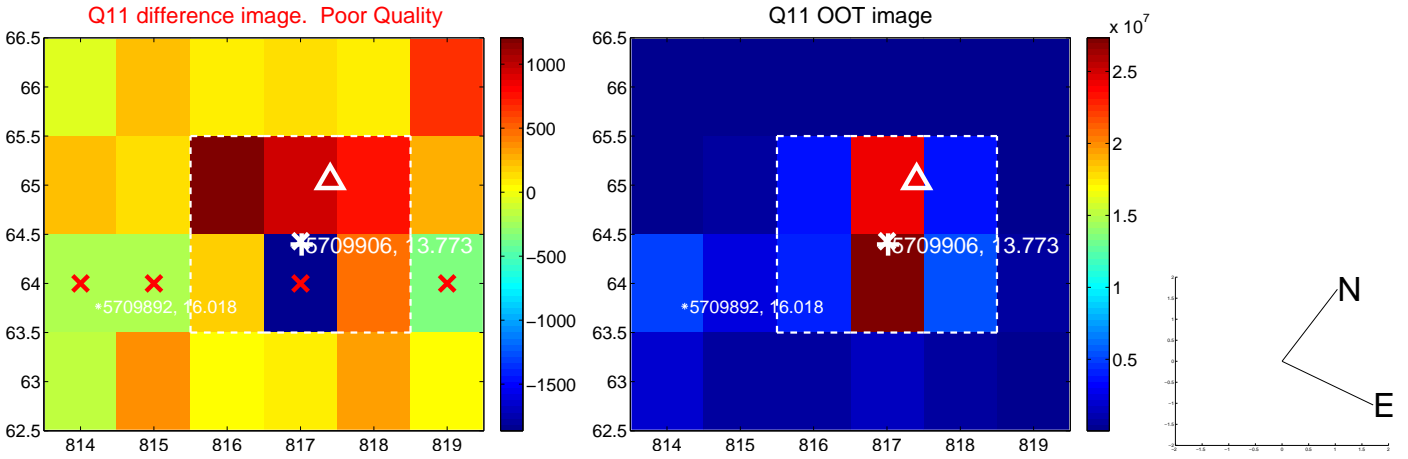
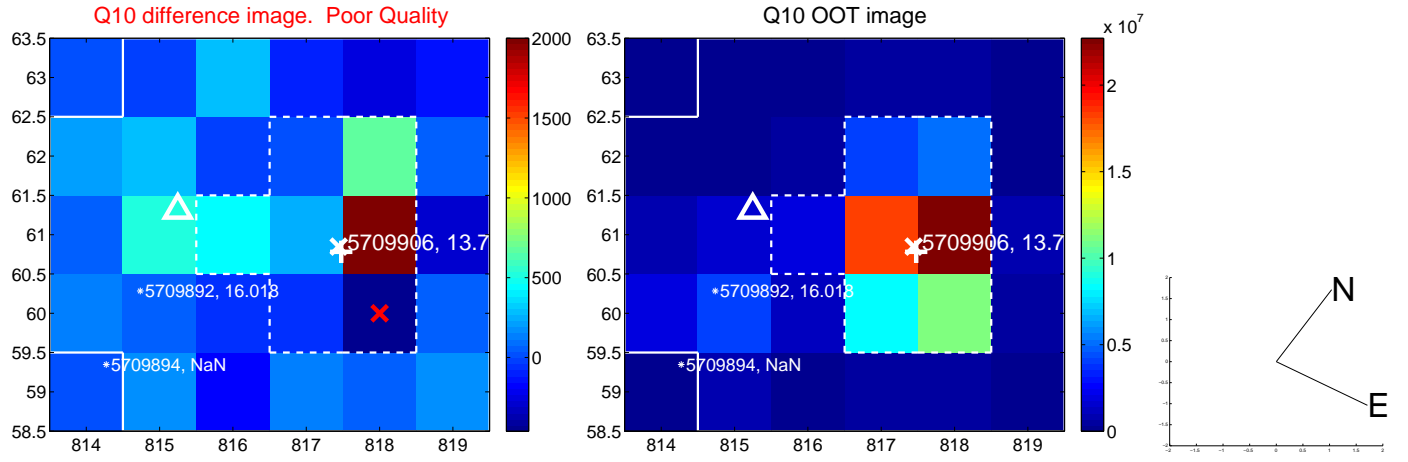
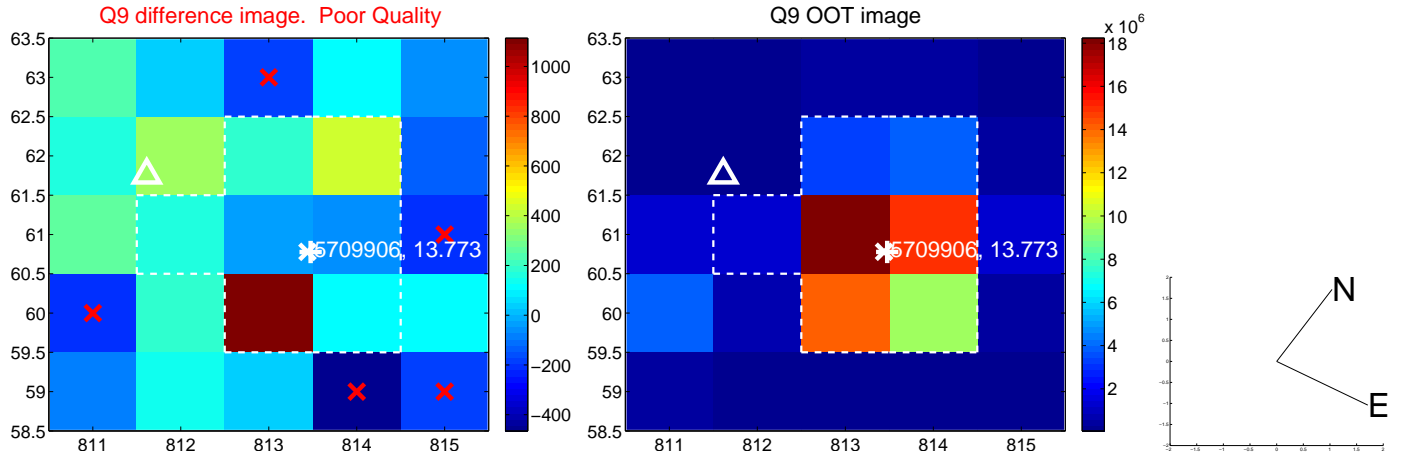


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

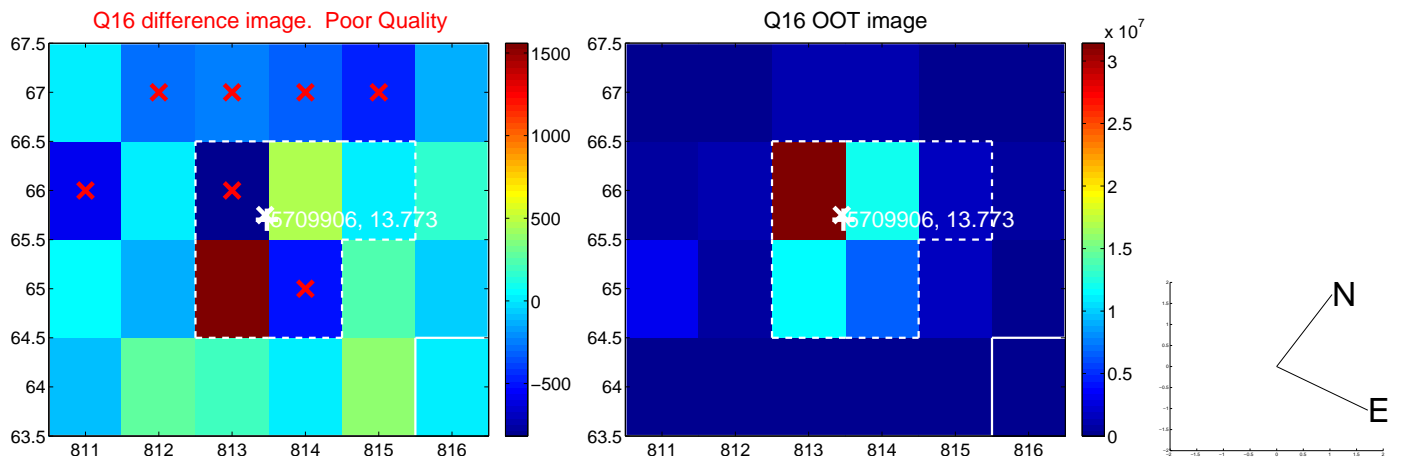
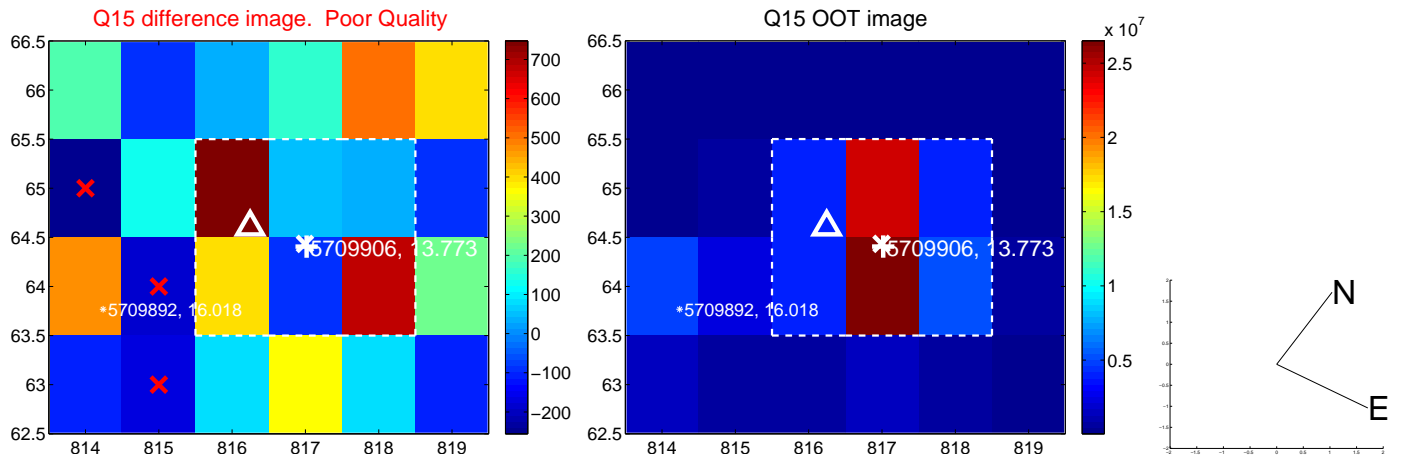
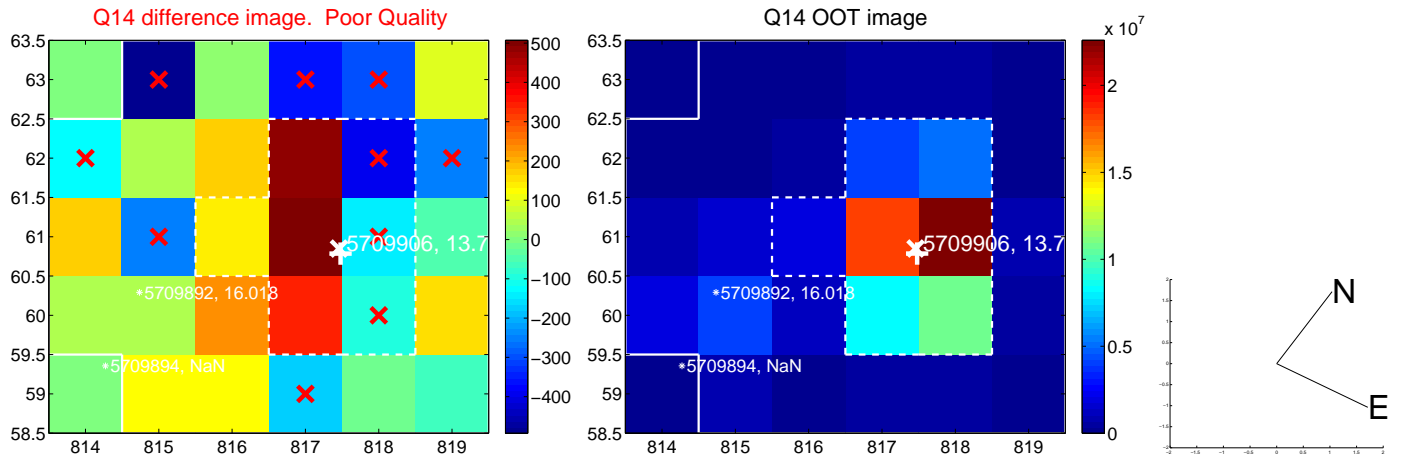
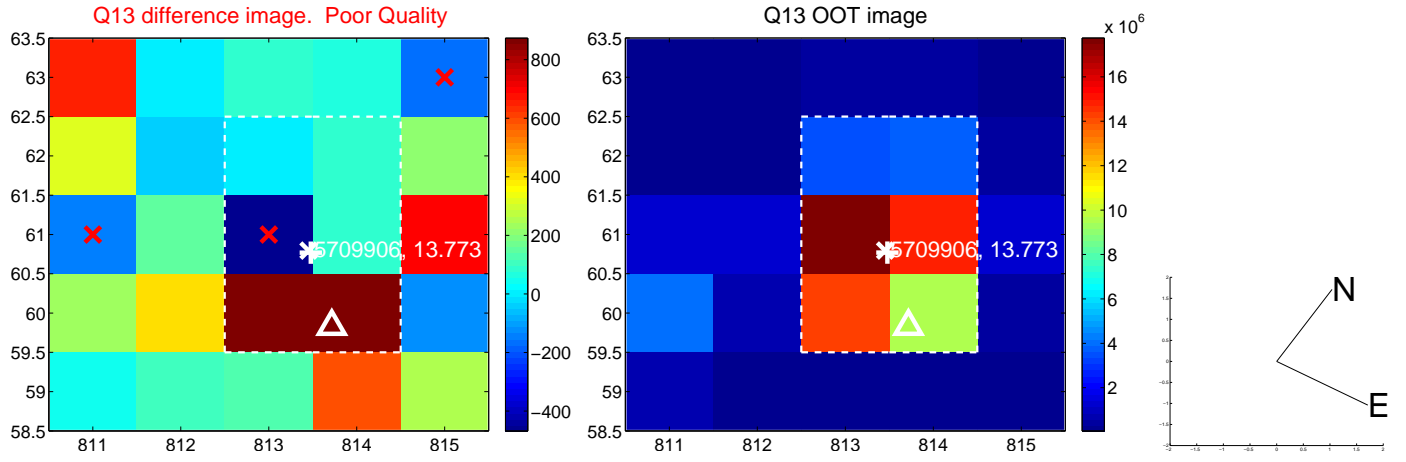




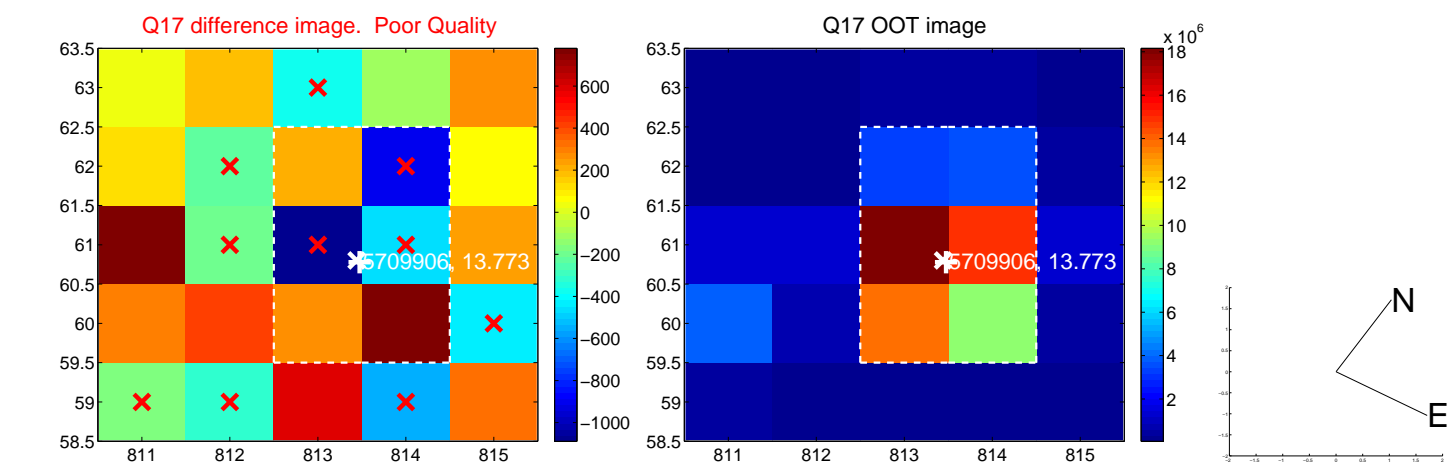
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



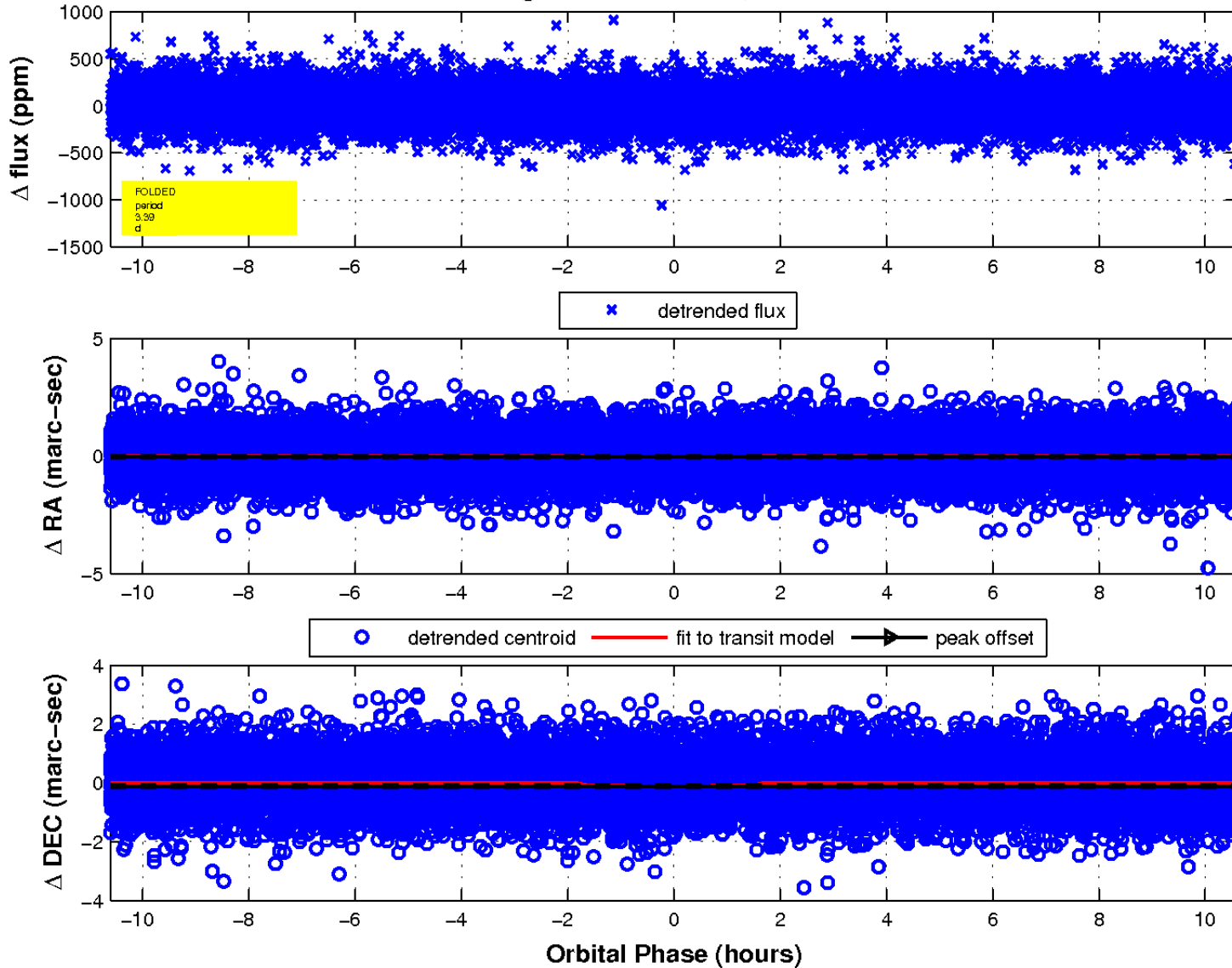
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 1 of 1



UKIRT Image

Declination

