

# KIC 008322861

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008322861-01 | OBS      | No   | 0.598340      | 131.950248   | 55.0        | 2.696            | 14.4 | 16.1 | 1.87                        | 7251            | 1.60                   | 37887.54               |
| 008322861-02 | OBS      | No   | 0.598357      | 131.646155   | 44.9        | 2.896            | 9.6  | 12.2 | 1.87                        | 7251            | 1.45                   | 37886.13               |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments                       |
|--------------|----------|------|-------|---|---|---|---|--------------------------------|
| 008322861-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT |
| 008322861-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—SAME_NTL_PERIOD         |

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

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

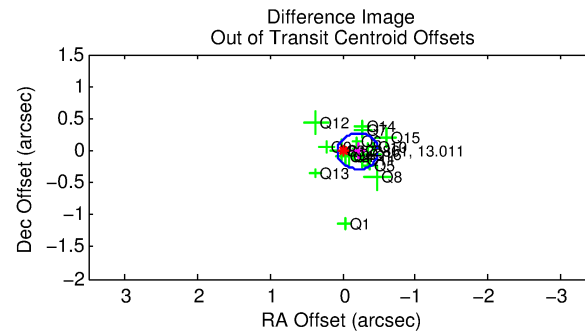
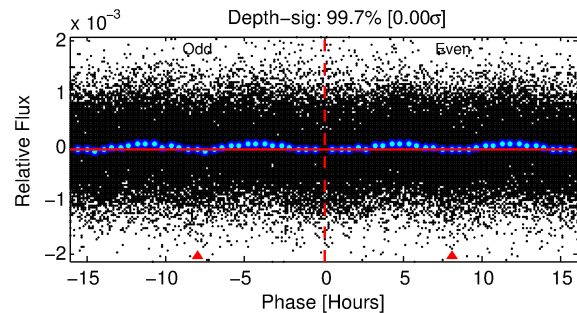
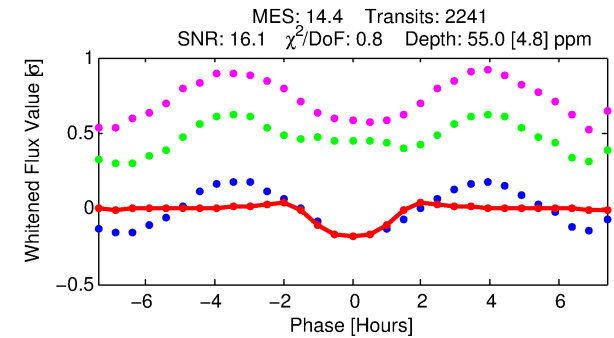
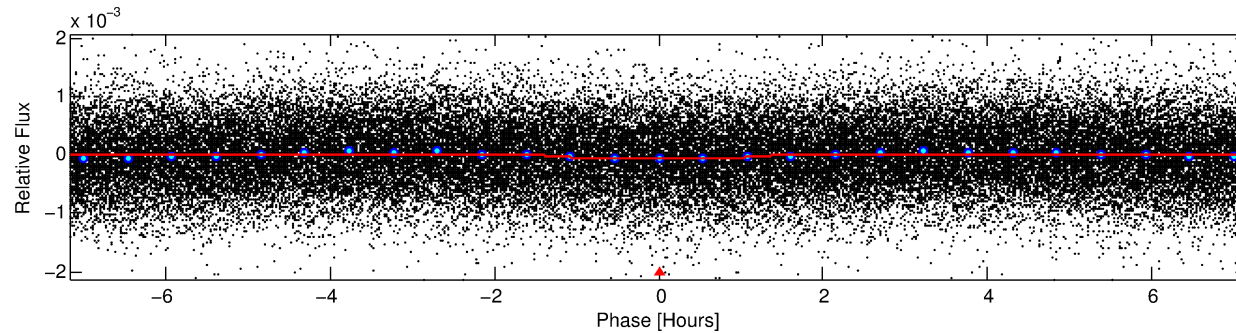
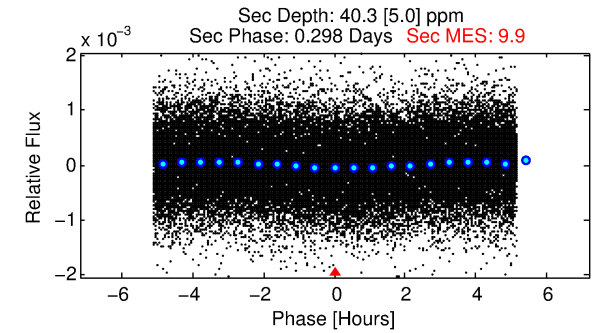
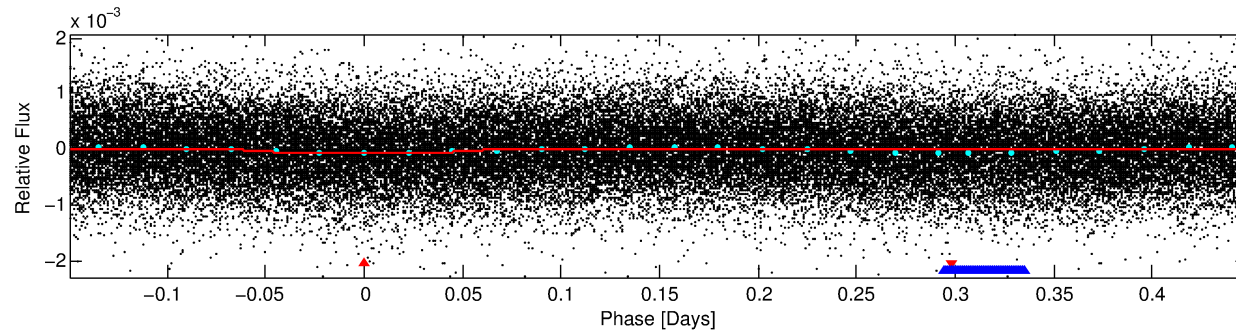
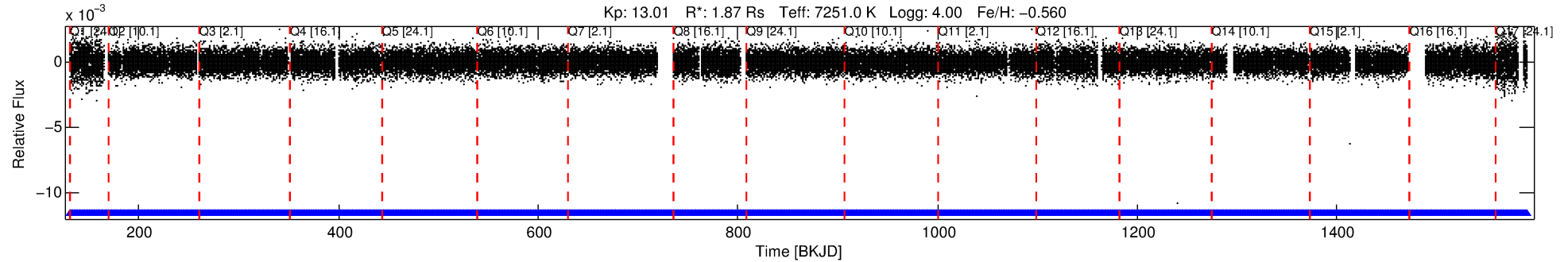
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008322861-01

No Significant Match Found

# DV One-Page Summary

KIC: 8322861 Candidate: 1 of 2 Period: 0.598 d



## DV Fit Results:

Period = 0.59834 [0.00001] d  
Epoch = 131.9502 [0.0022] BKJD  
Rp/R\* = 0.0079 [0.0040]  
a/R\* = 1.22 [1.25]  
b = 0.90 [0.69]  
Seff = 37887.54 [20704.45]  
Teq = 3558 [486] K  
Rp = 1.60 [0.96] Re  
a = 0.0151 [0.0048] AU  
Ag = 1.96 [2.24] [0.43σ]  
Teffp = 6511 [1673] K [1.70σ]

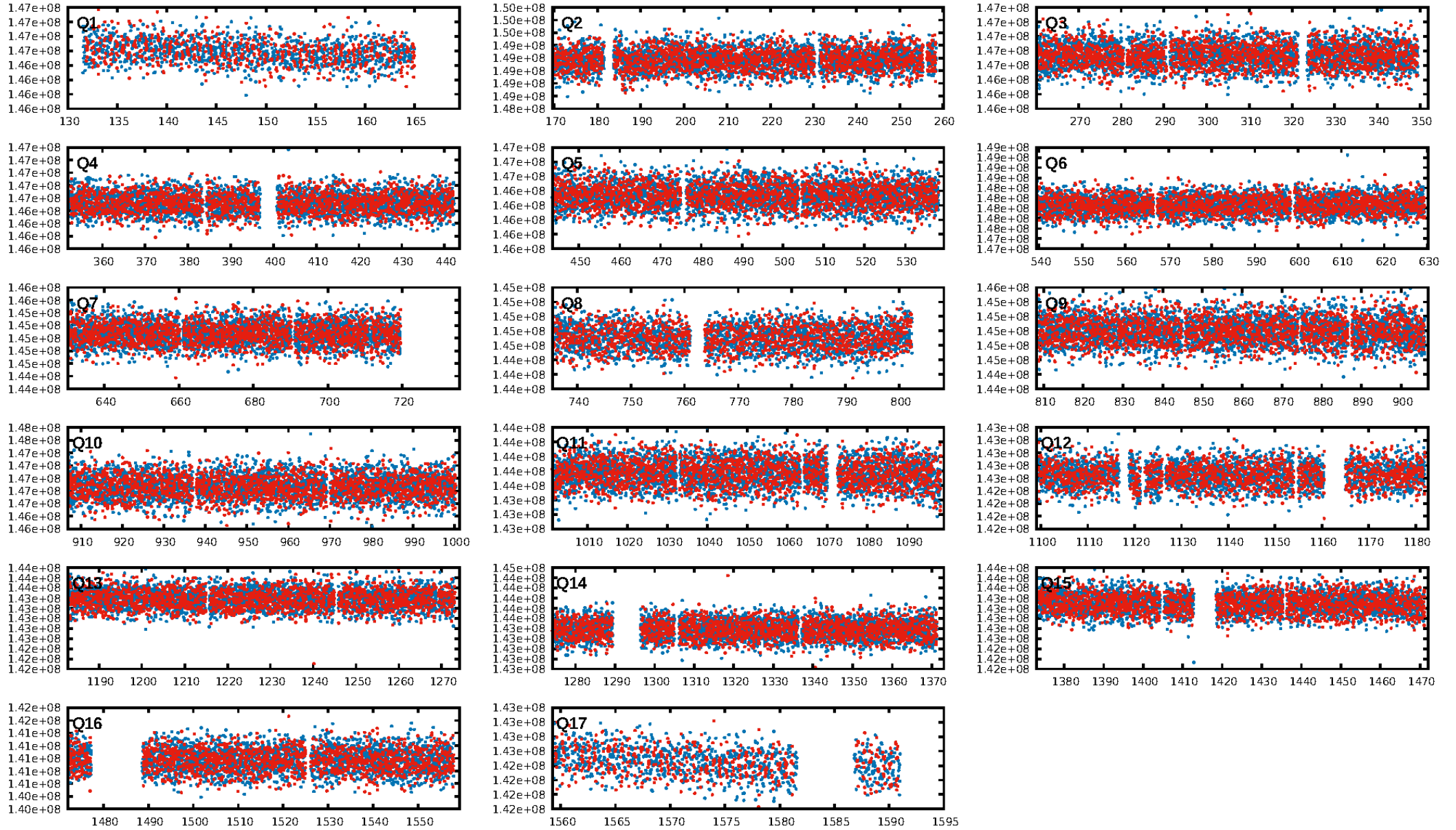
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGoF-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2141/2141]  
GhostDiagnostic-chr: 2.029  
Centroid-sig: 0.7%  
Centroid-so: 0.506 arcsec [1.47σ]  
OotOffset-rm: 0.210 arcsec [2.24σ]  
**KicOffset-rm: 0.309 arcsec [3.11σ]**  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:54:22 Z

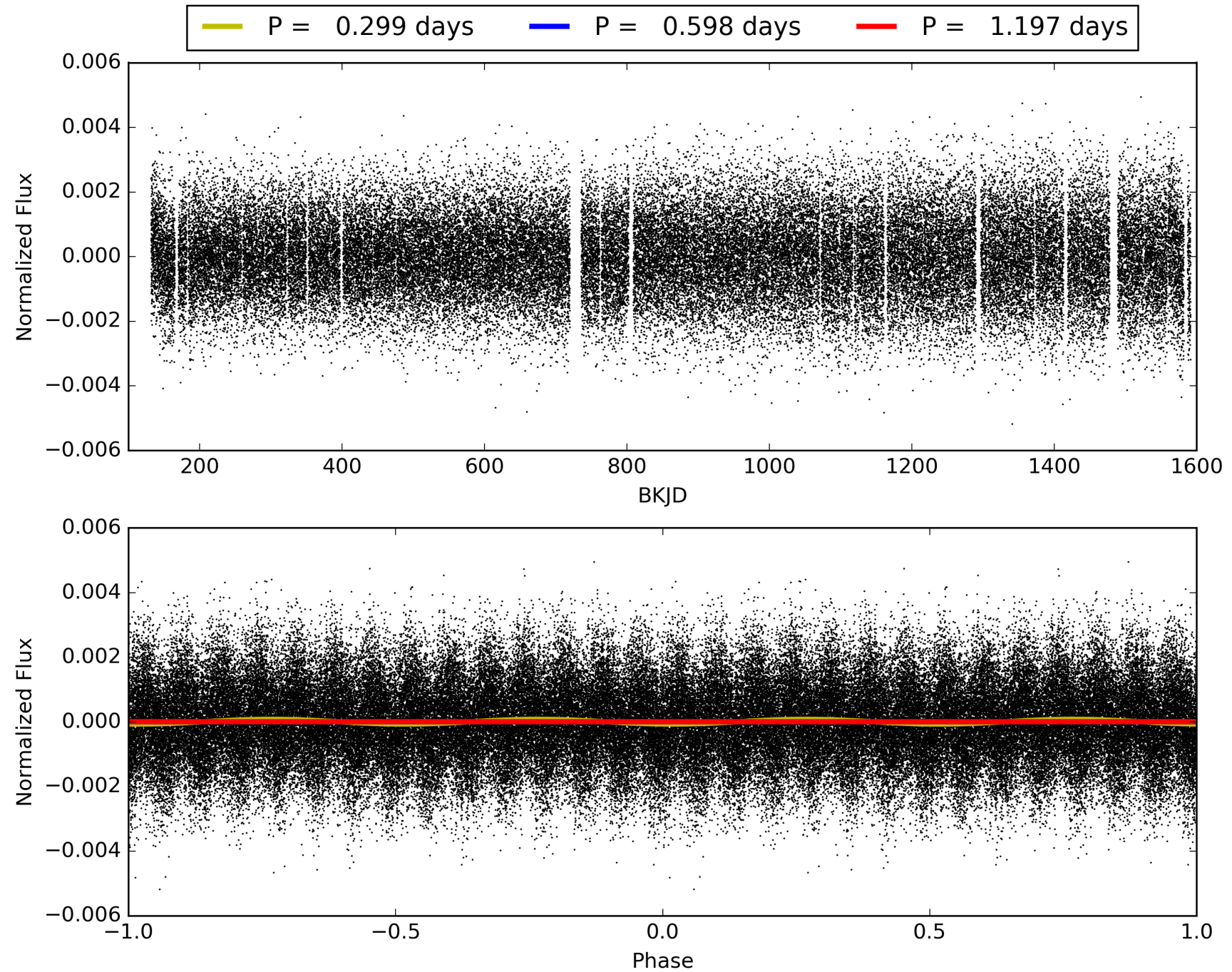
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008322861-01, PDC Light Curves



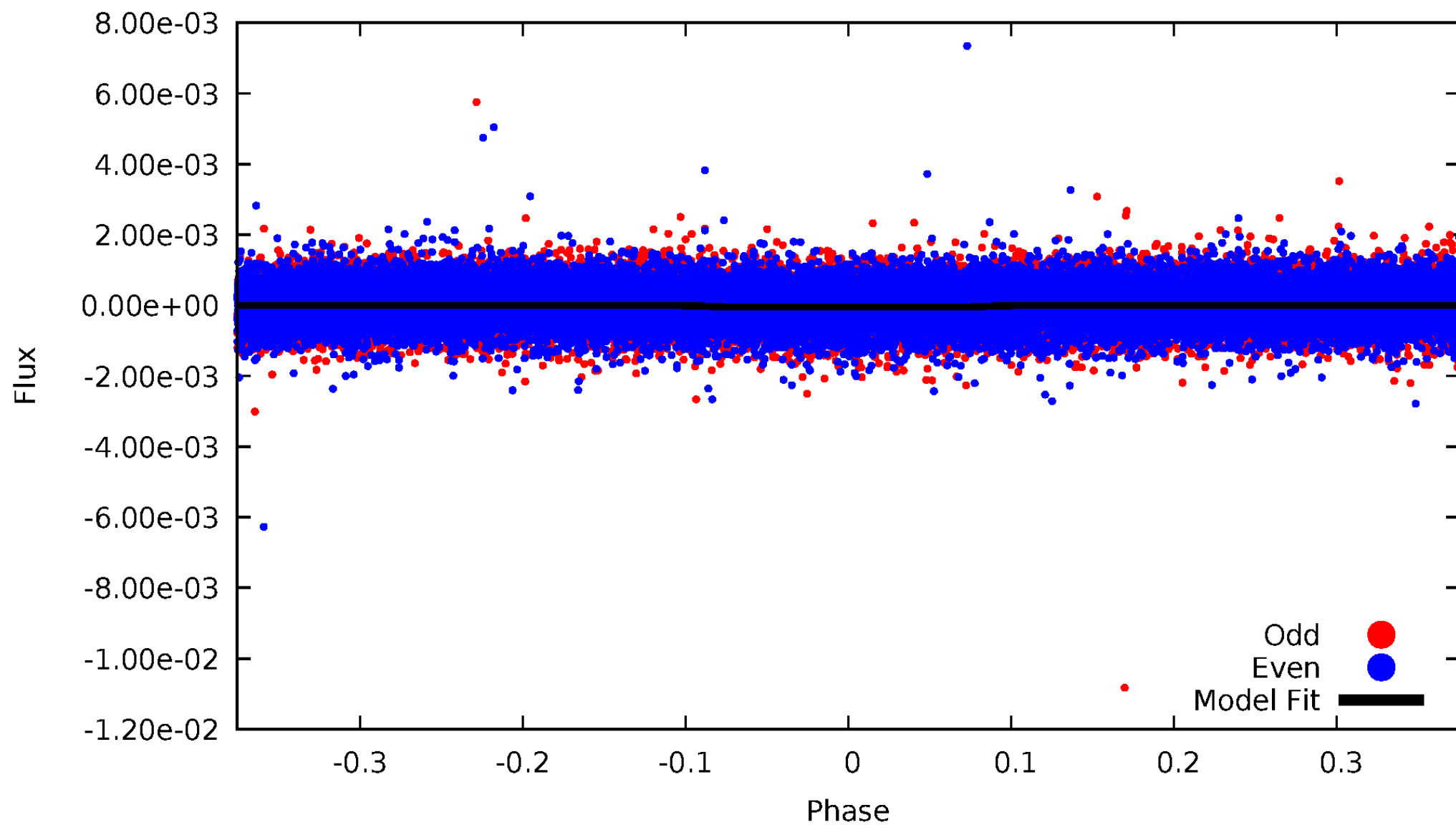


TCE 008322861-01



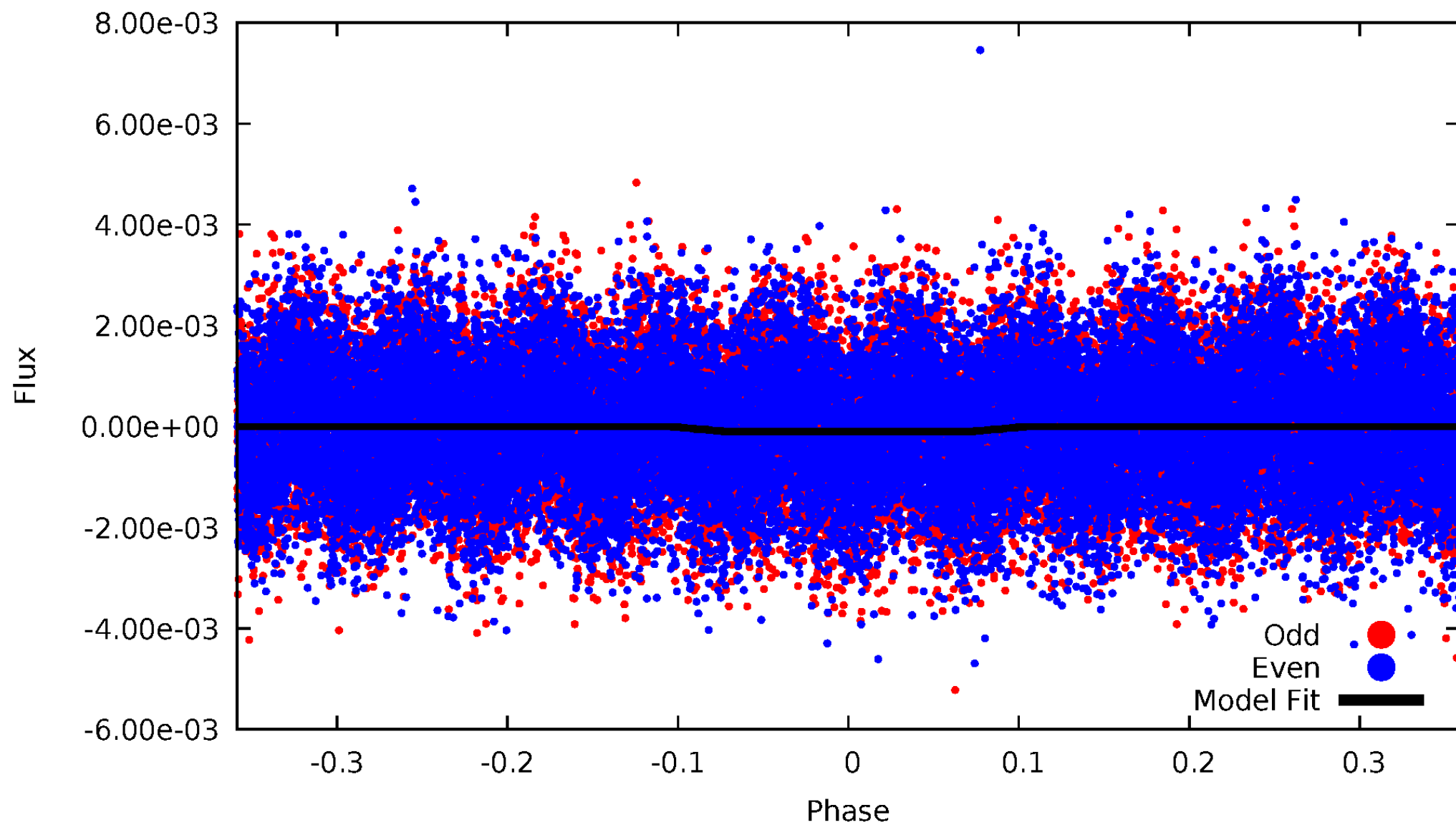
# DV Odd/Even

TCE 008322861-01



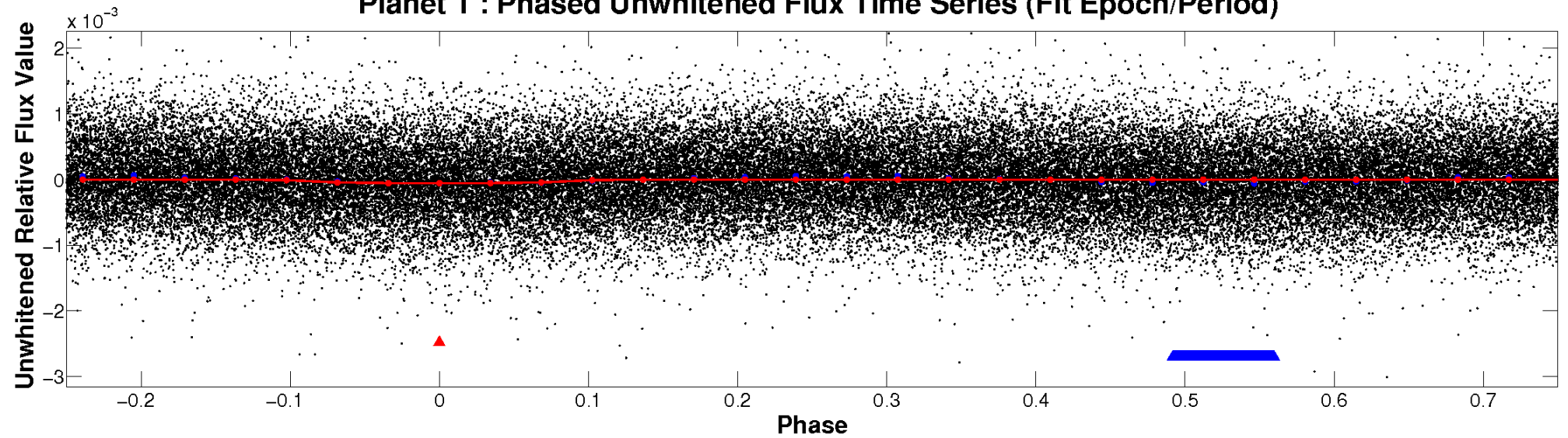
# ALT Odd/Even

TCE 008322861-01

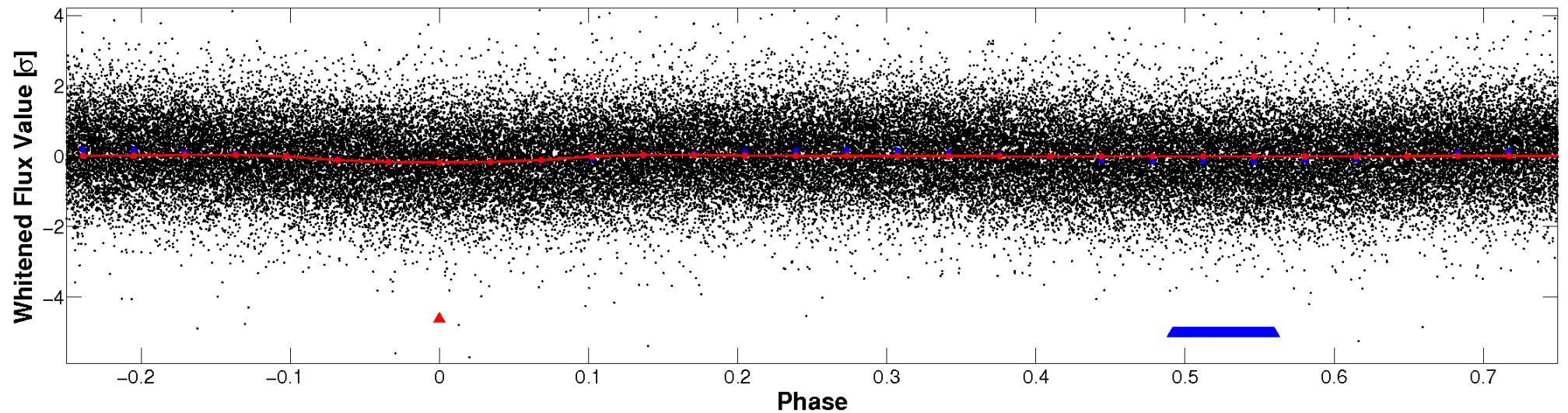


# Non-Whitened Vs. Whitened Light Curve

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



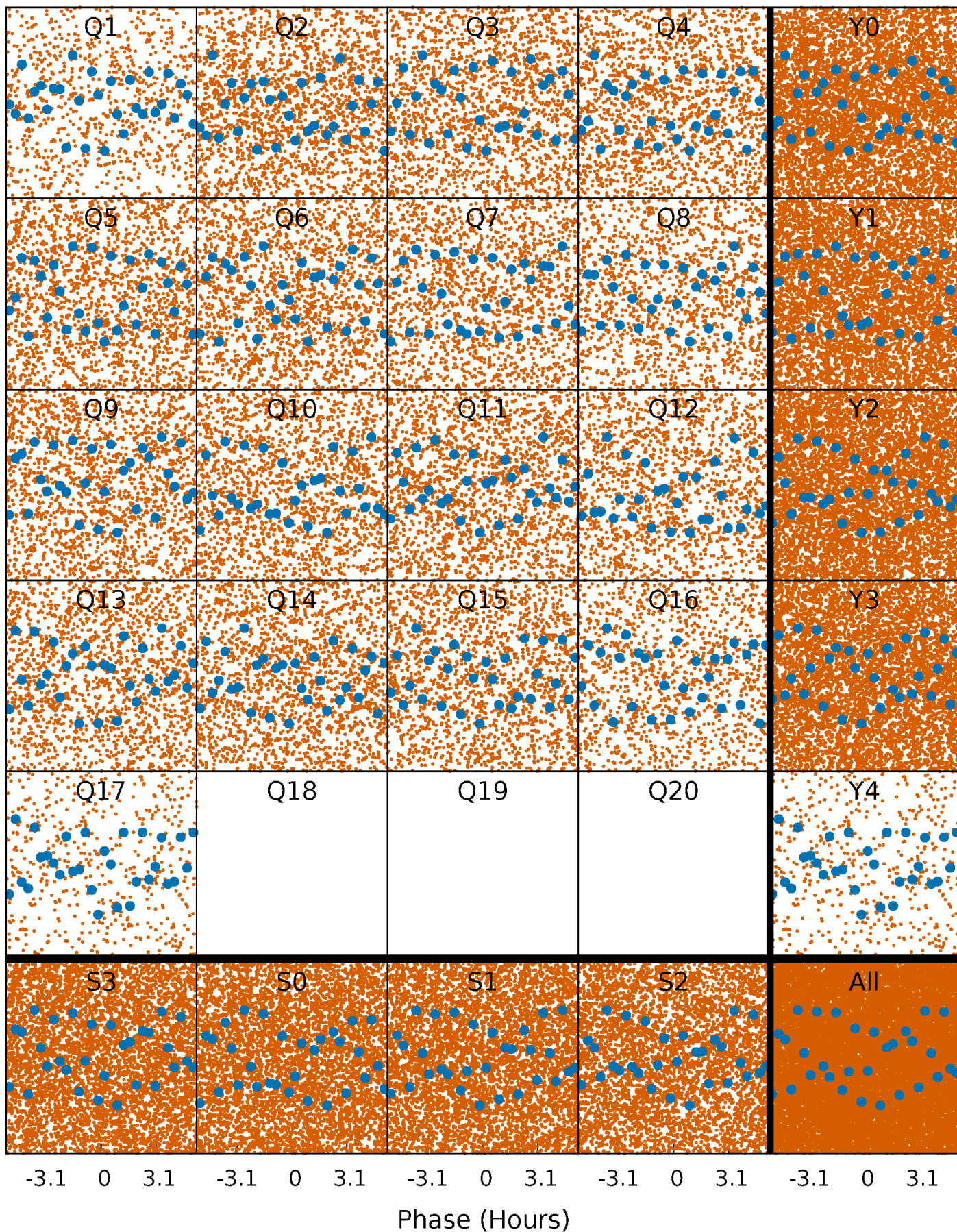
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

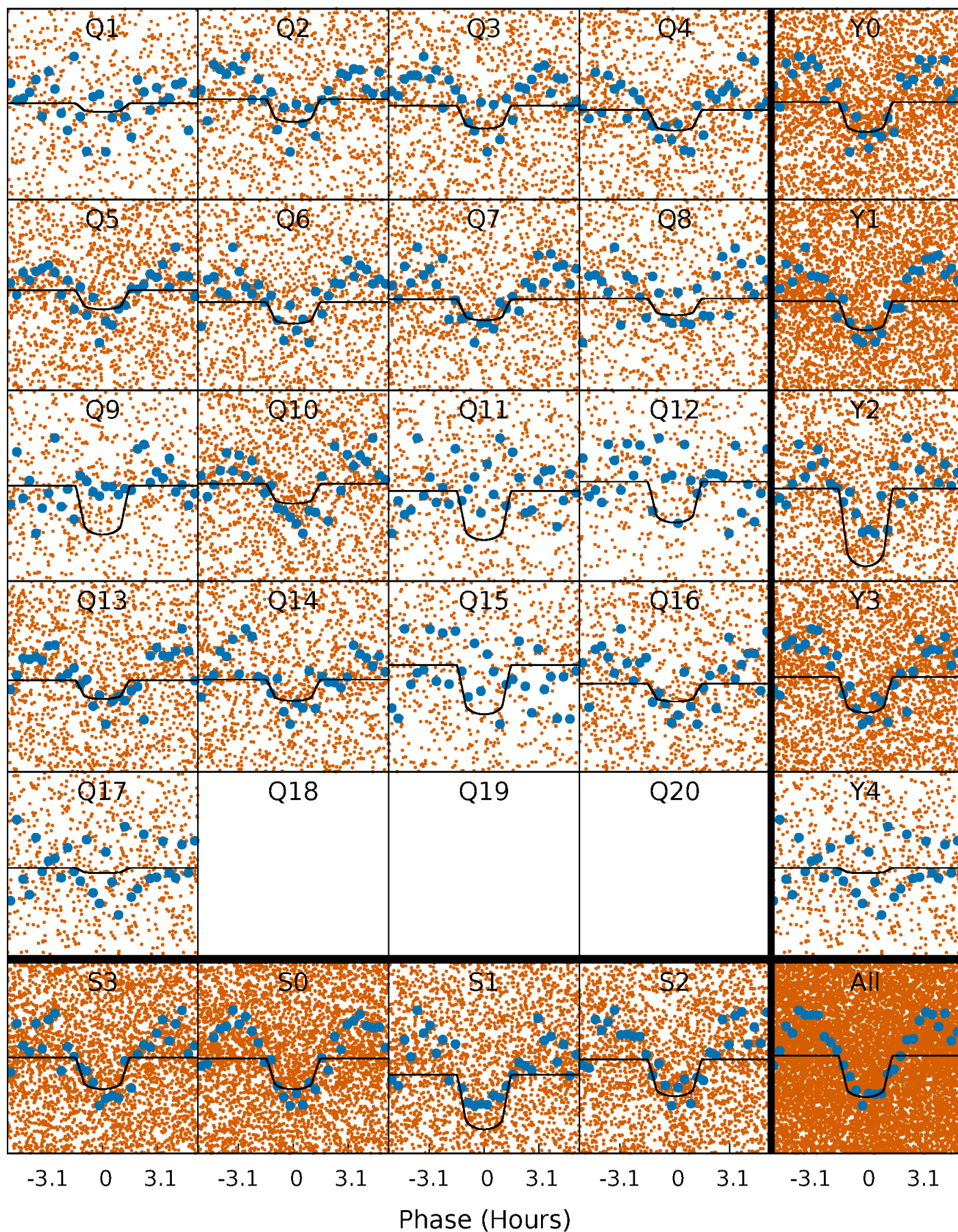
TCE 008322861-01 P= 0.598340 Days  $T_0=131.950248$  (BKJD)





# DV Quarter-Phased Transit Curves

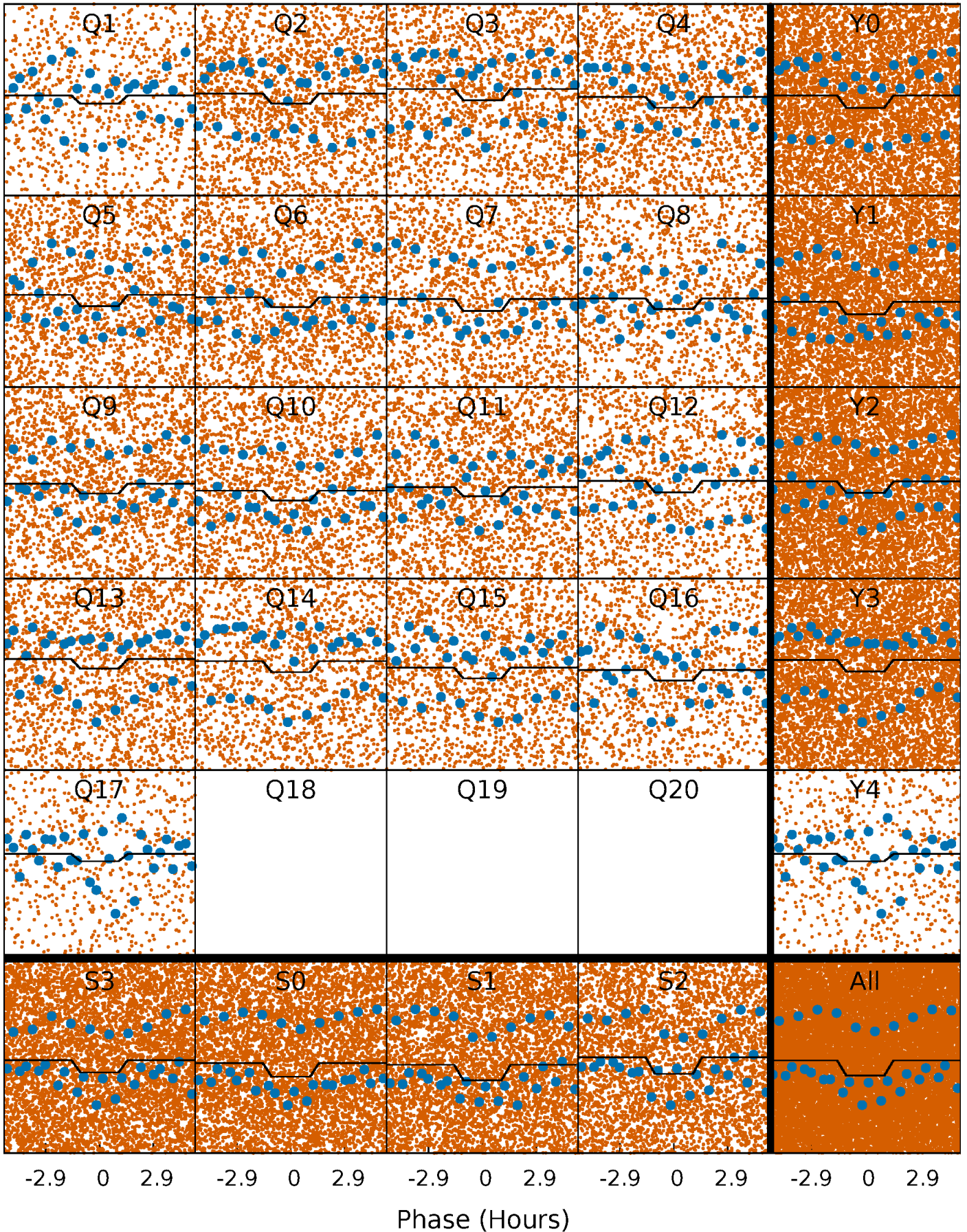
TCE 008322861-01 P= 0.598340 Days  $T_0=131.950248$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

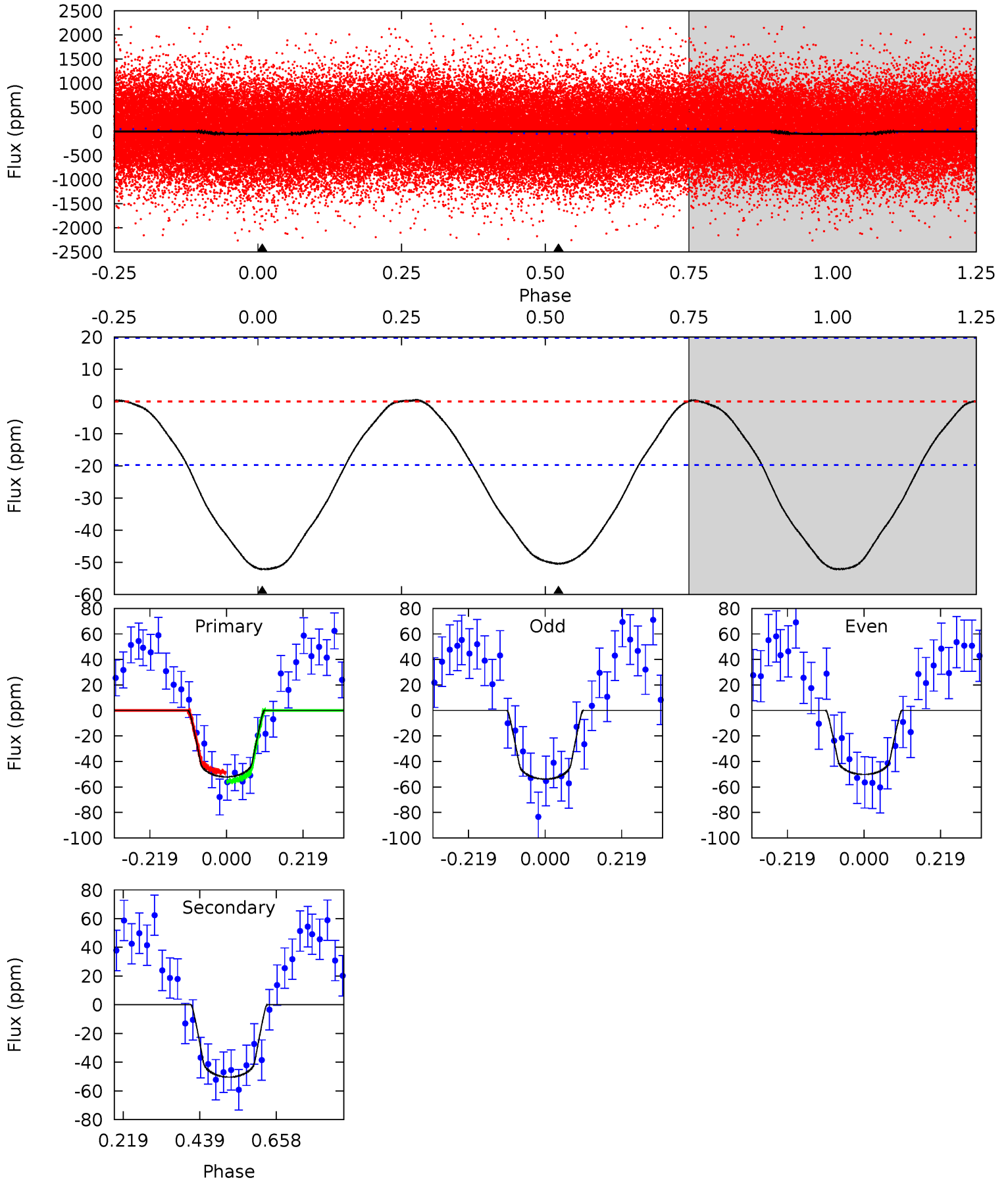
TCE 008322861-01   P= 0.598340 Days    $T_0=131.946865$  (BKJD)



# DV Model-Shift Uniqueness Test

008322861-01, P = 0.598340 Days, E = 131.351908 Days

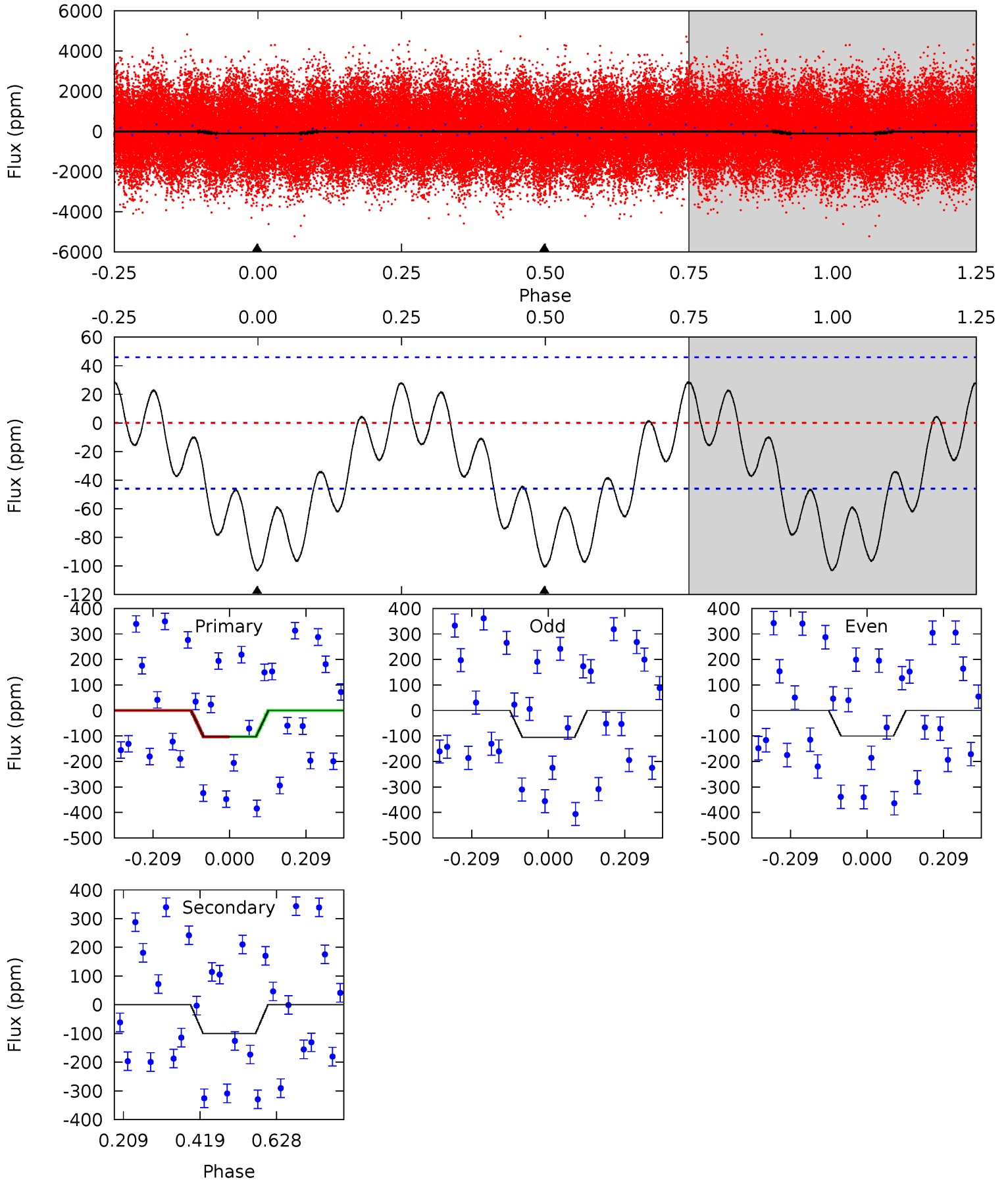
| Pri  | Sec  | Ter | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.6 | 11.2 | 0   | 0   | 4.40            | 1.23            | 0.13             | 11.6    | 11.6    | 11.2    | 11.2    | 0.41    | 1.07 | 0.01  | 0.79 |



# Alt Model-Shift Uniqueness Test

008322861-01, P = 0.598340 Days, E = 131.348525 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  |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.92 | 9.66 | 0   | 0   | 4.41            | 1.26            | 1.75             | 9.92    | 9.92    | 9.66    | 9.66    | 0.22    | 1.02 | 0.22  | 0.03 |





### Stellar Parameters For KIC 008322861

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M$ ( $M_{\odot}$ )       | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $7251^{+205}_{-307}$ | $4.003^{+0.308}_{-0.132}$ | $-0.560^{+0.250}_{-0.300}$ | $1.866^{+0.493}_{-0.603}$ | $1.277^{+0.202}_{-0.184}$ | $0.277^{+0.525}_{-0.119}$                     |
|        | +3%/-4%              | +8%/-3%                   | +45%/-54%                  | +26%/-32%                 | +16%/-14%                 | +190%/-43%                                    |
| 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 008322861-01 / KOI

| Detrend | Depth (ppm)   | $R_p$ ( $R_{\oplus}$ ) | $T_{max}$ (K)        | $T_{obs}$ (K)          | $A_{obs}$                 |
|---------|---------------|------------------------|----------------------|------------------------|---------------------------|
| DV      | $-50 \pm 4$   | $1.51^{+0.84}_{-0.73}$ | $4825^{+380}_{-413}$ | $6470^{+3517}_{-1313}$ | $2.693^{+7.660}_{-1.559}$ |
| Alt.    | $-101 \pm 10$ | $1.96^{+0.91}_{-0.83}$ | $4869^{+370}_{-432}$ | $7006^{+2766}_{-1311}$ | $3.197^{+6.515}_{-1.673}$ |

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

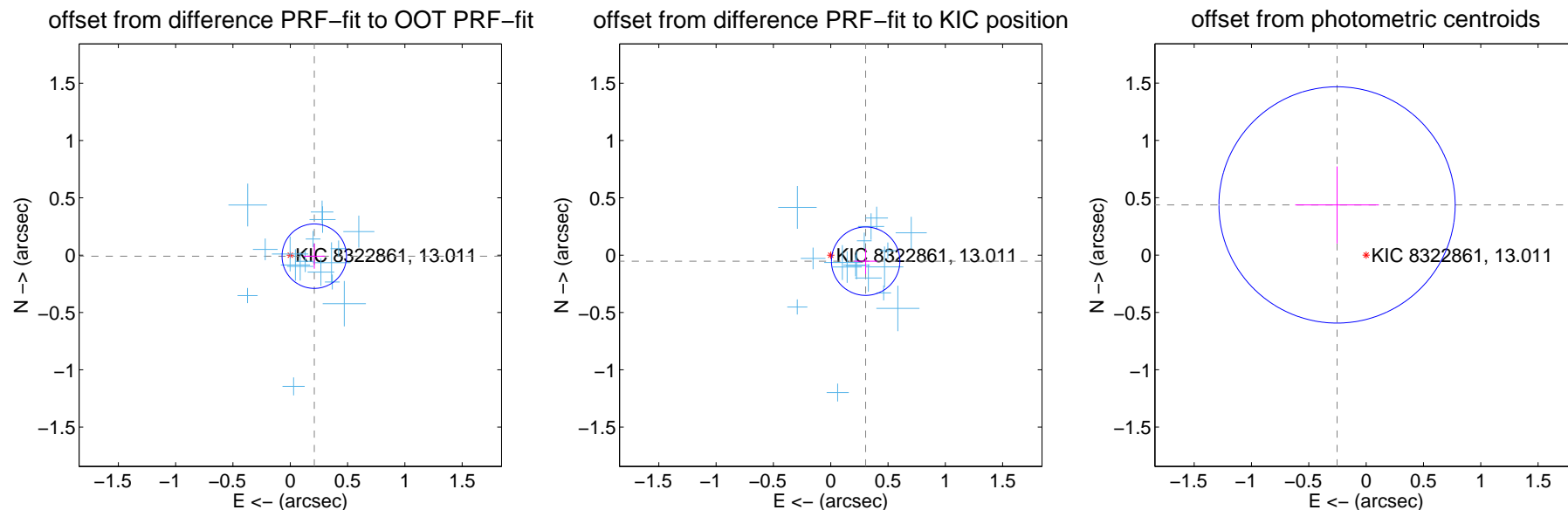
## DV Centroid Data

Supplemental centroid analysis for 008322861-01. Kepler magnitude: 13.01. Transit SNR 16.09

There are 17 quarters with good PRF difference image offsets

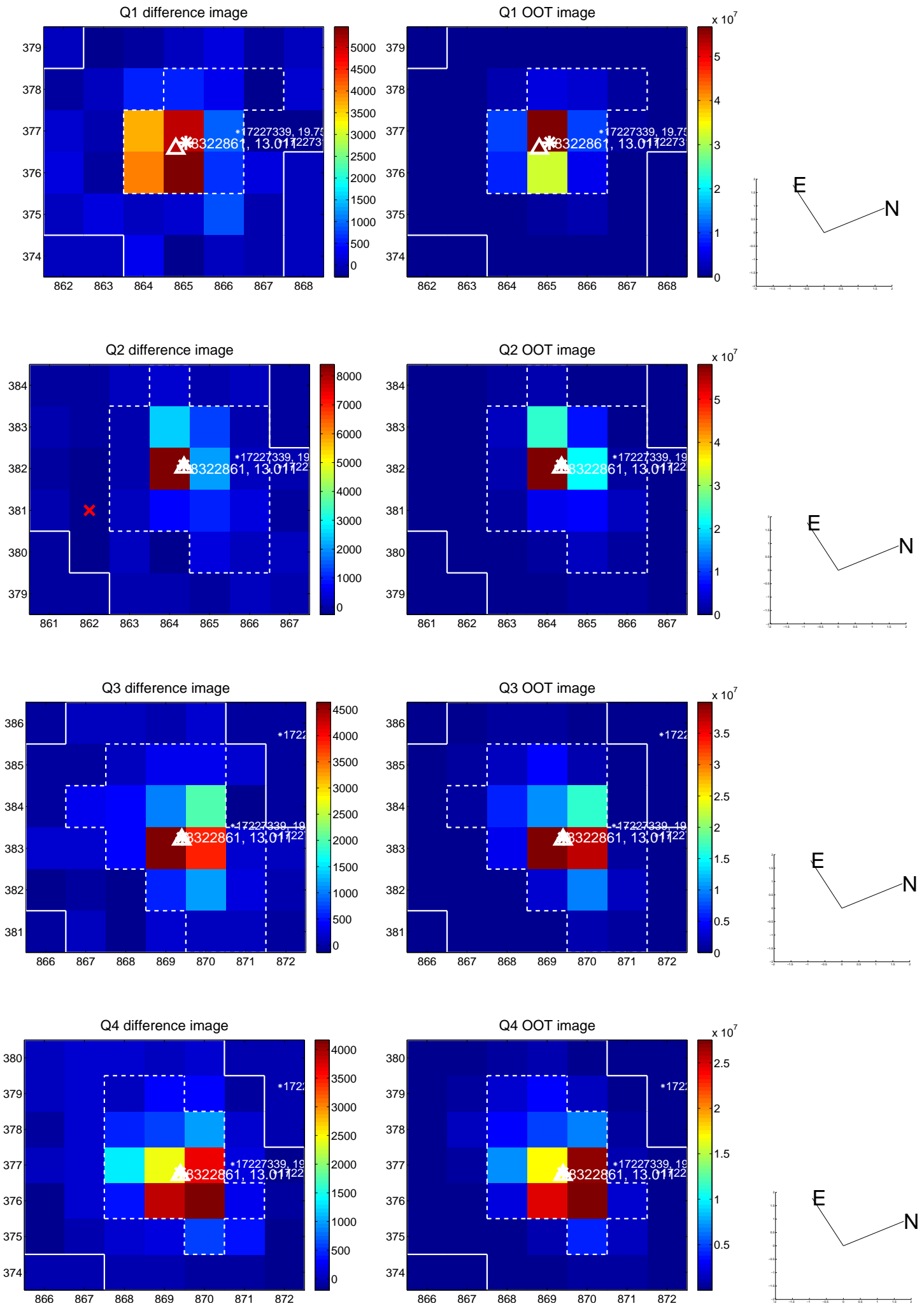
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

|   | Distance in arcsec                  | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|-------------------------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $0.210 \pm 0.094$                   | 2.24                | $-0.210 \pm 0.094$ | $-0.009 \pm 0.110$ |
| PRF-fit source offset from KIC position | <b><math>0.309 \pm 0.099</math></b> | <b>3.11</b>         | $-0.305 \pm 0.100$ | $-0.053 \pm 0.111$ |
| photometric centroid source offset      | $0.51 \pm 0.34$                     | 1.47                | $0.25 \pm 0.36$    | $0.44 \pm 0.34$    |

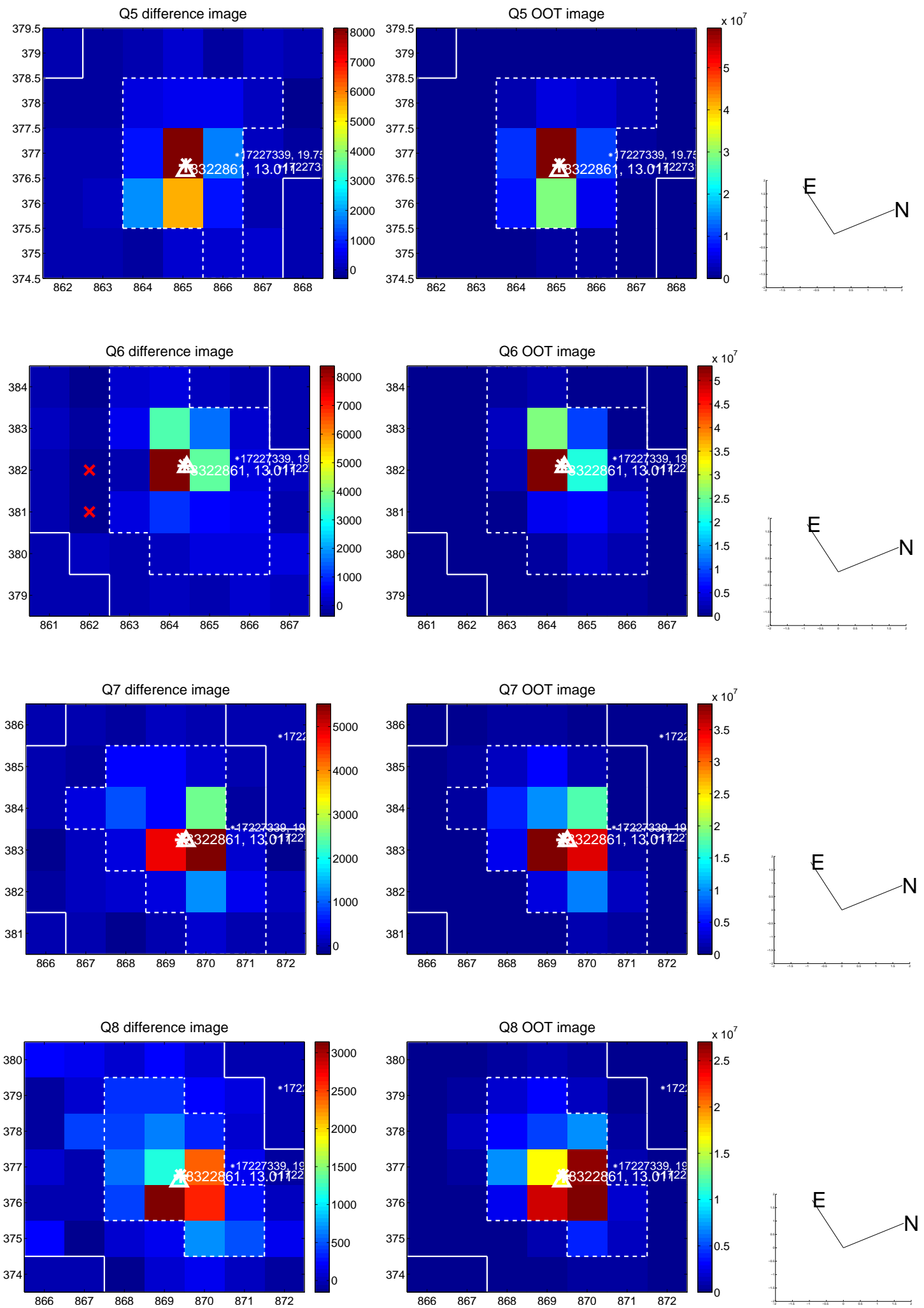


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

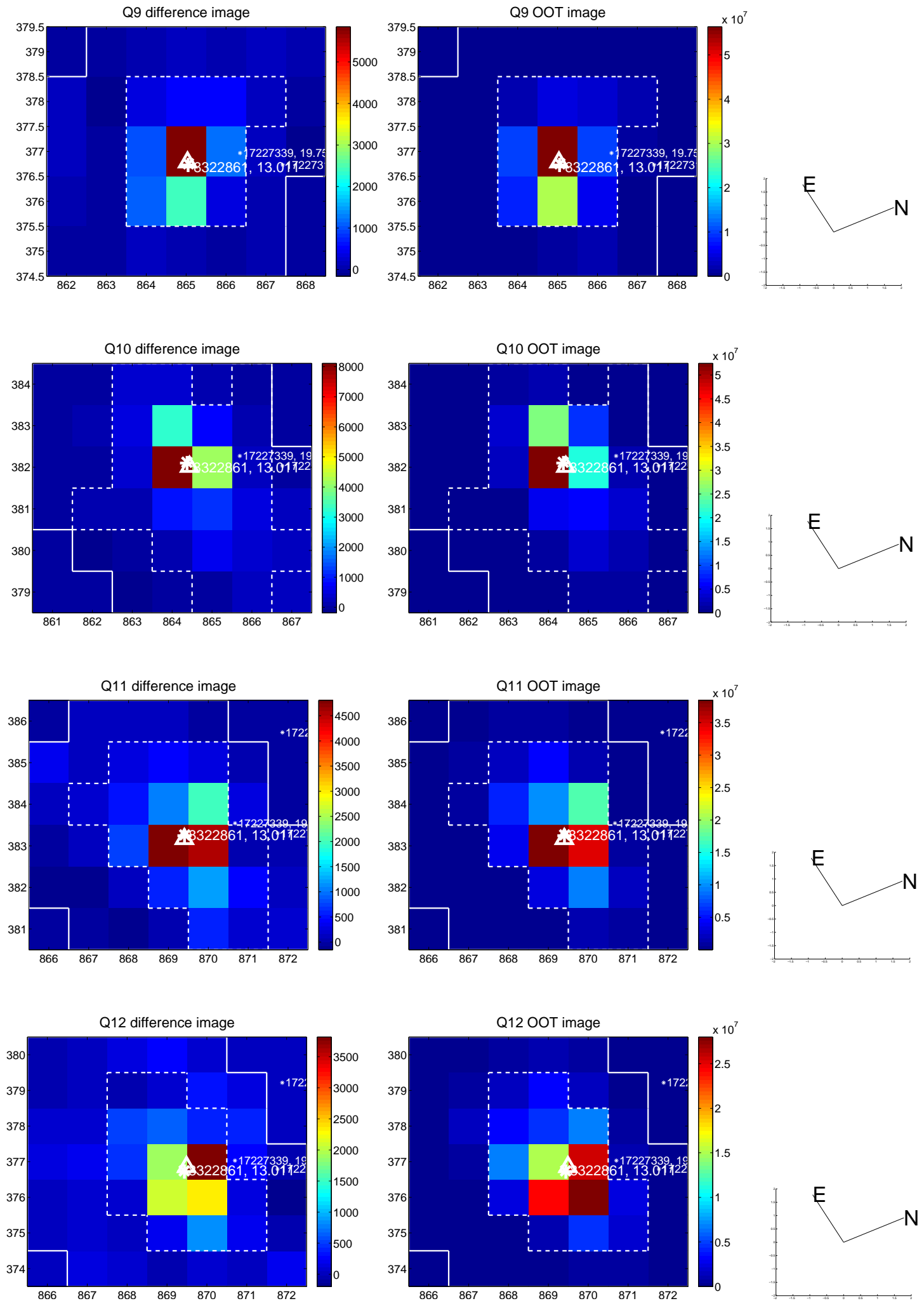


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

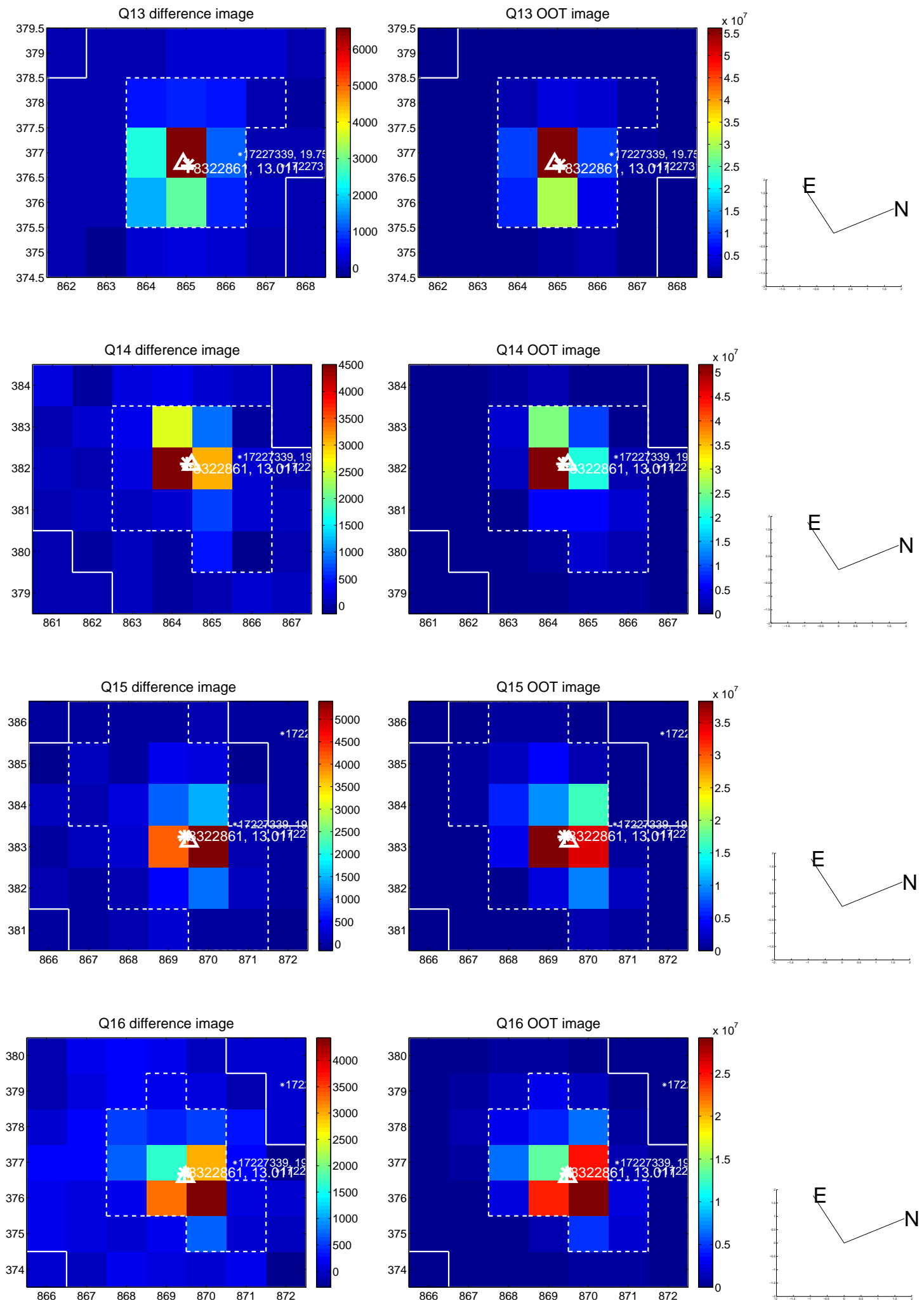




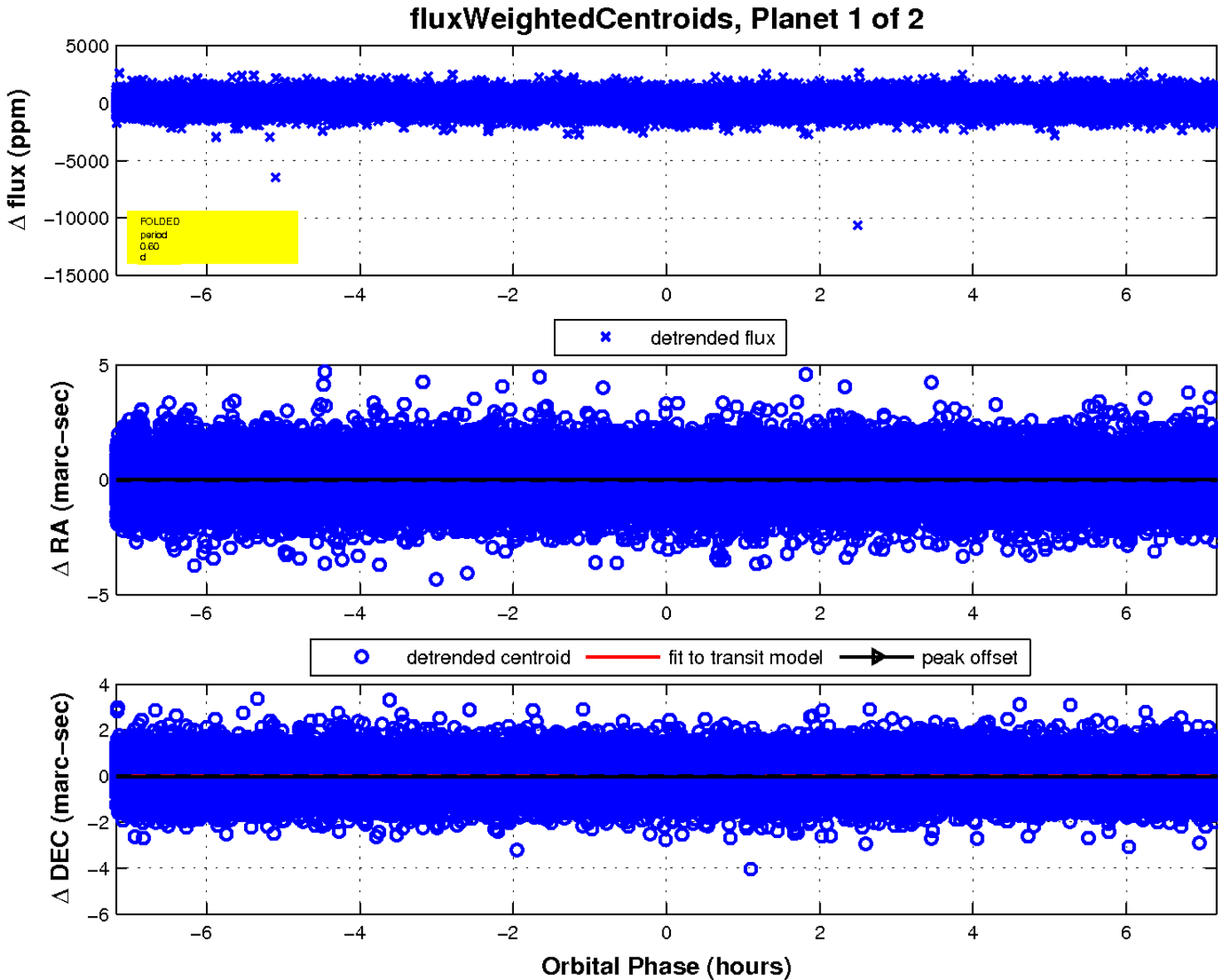
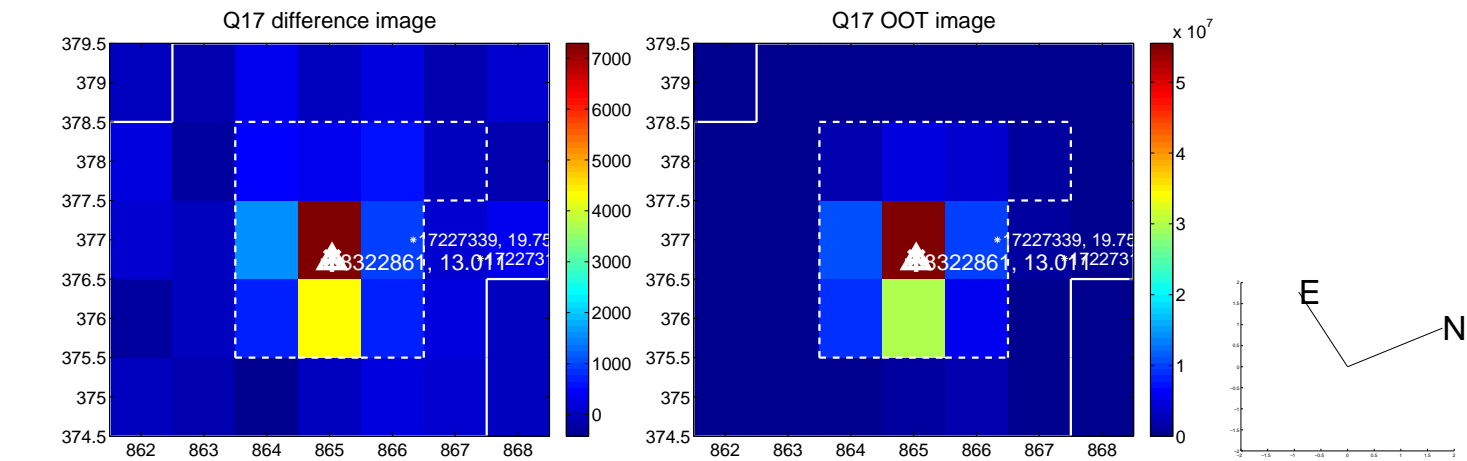
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

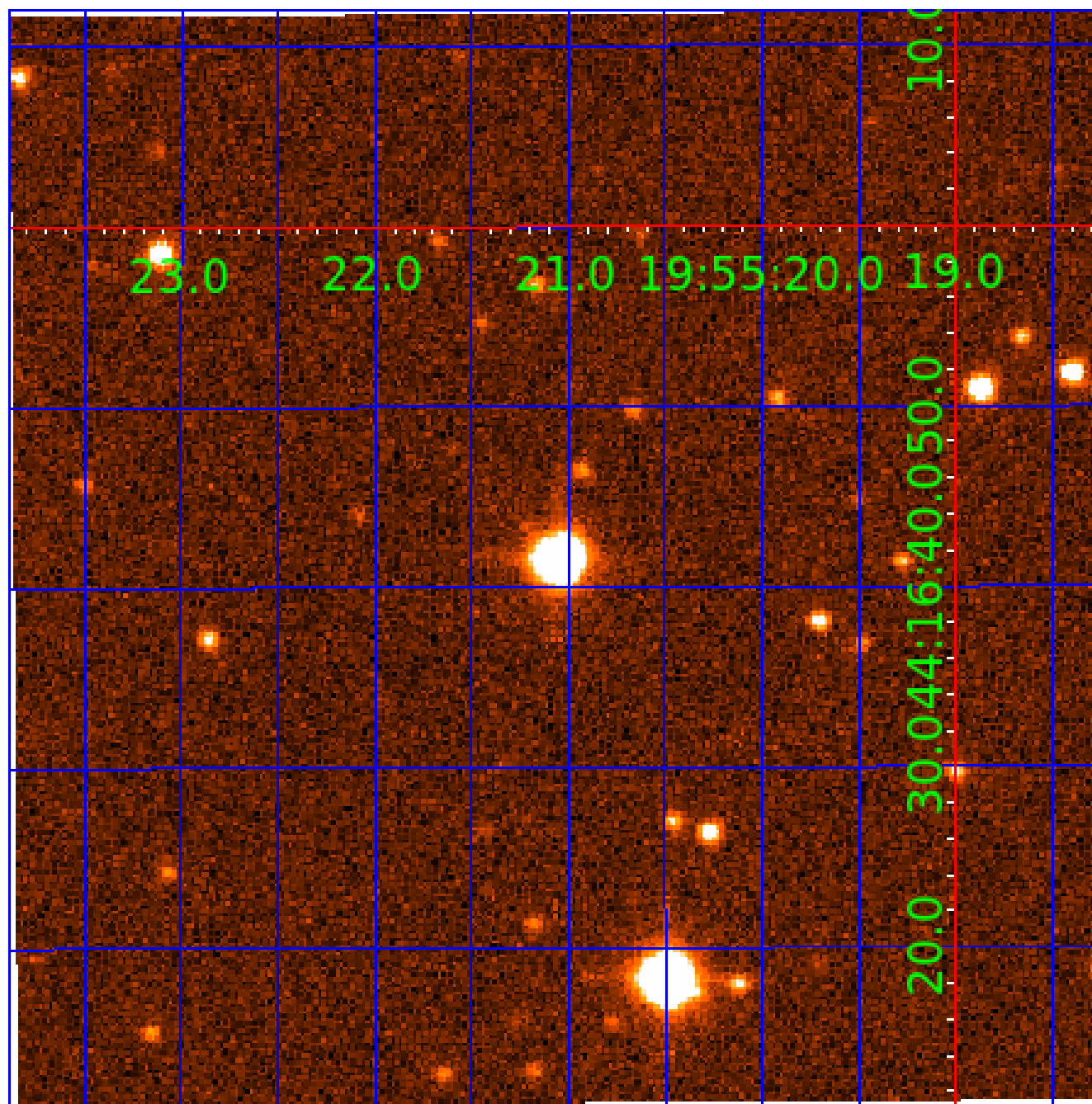


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008322861

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008322861-01 | OBS      | No   | 0.598340      | 131.950248   | 55.0        | 2.696            | 14.4 | 16.1 | 1.87                        | 7251            | 1.60                   | 37887.54               |
| 008322861-02 | OBS      | No   | 0.598357      | 131.646155   | 44.9        | 2.896            | 9.6  | 12.2 | 1.87                        | 7251            | 1.45                   | 37886.13               |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments                       |
|--------------|----------|------|-------|---|---|---|---|--------------------------------|
| 008322861-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT |
| 008322861-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—SAME_NTL_PERIOD         |

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

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

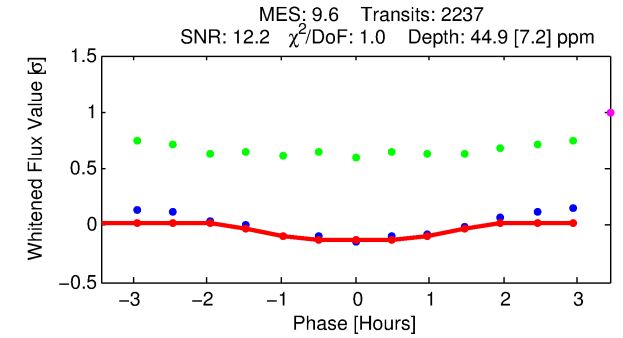
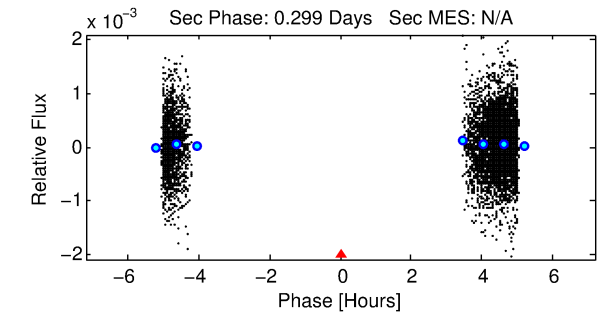
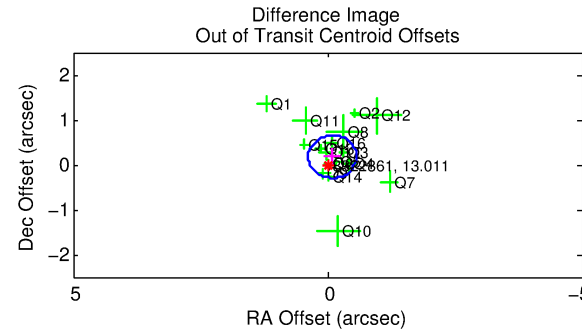
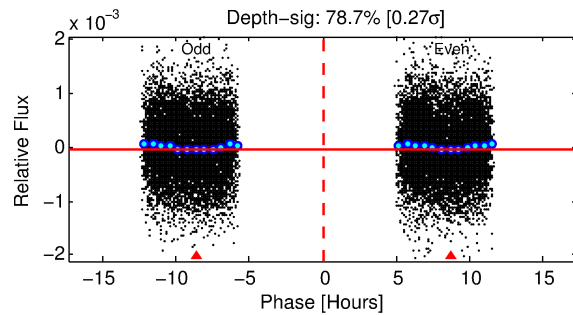
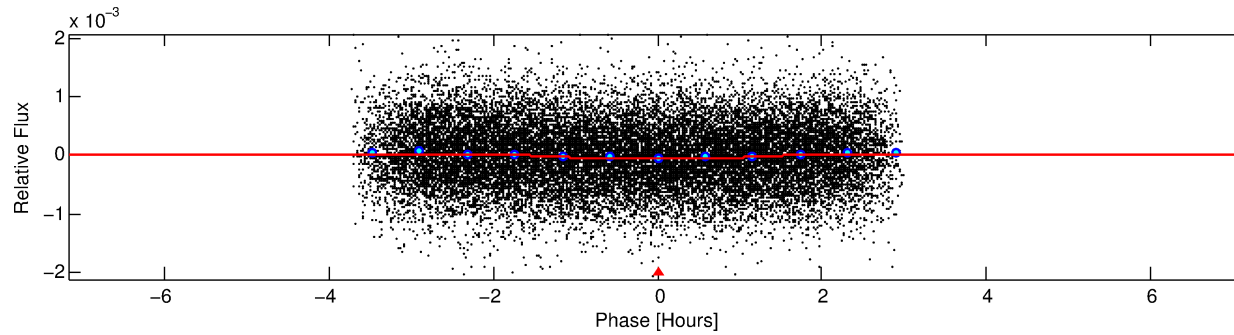
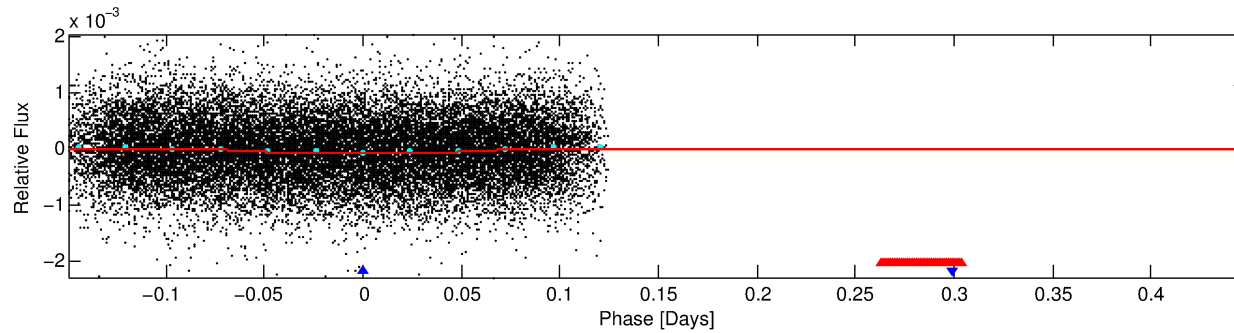
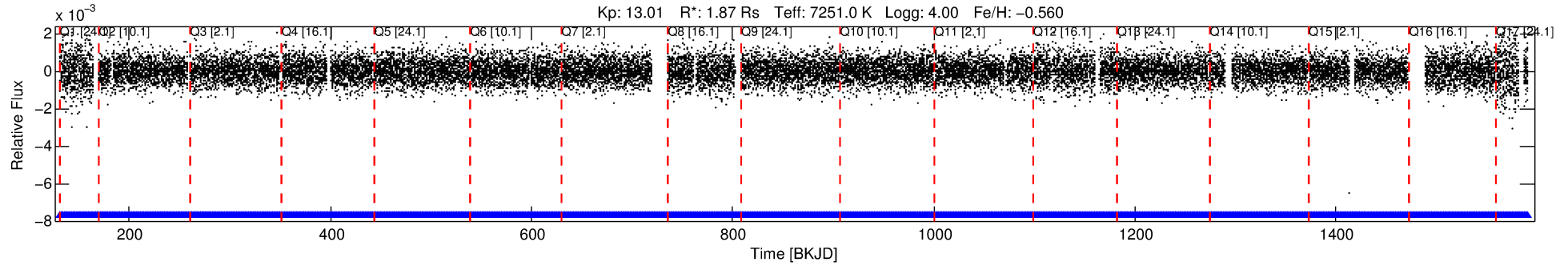
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008322861-02

No Significant Match Found

# DV One-Page Summary

KIC: 8322861 Candidate: 2 of 2 Period: 0.598 d



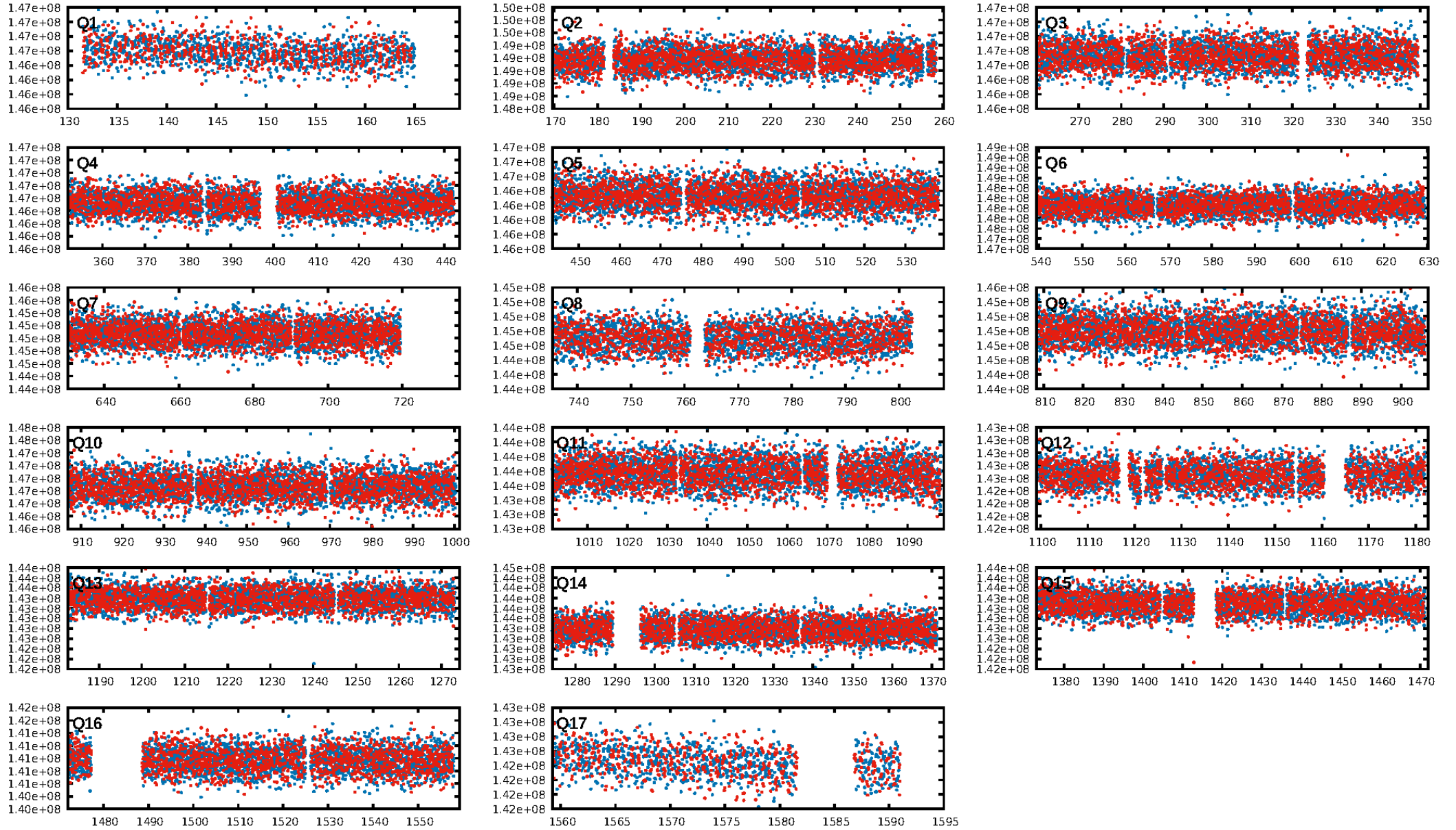
## DV Fit Results:

Period = 0.59836 [0.00001] d  
Epoch = 131.6462 [0.0035] BKJD  
Rp/R\* = 0.0071 [0.0051]  
a/R\* = 1.18 [1.53]  
b = 0.90 [0.99]  
Seff = 37886.13 [20703.68]  
Teq = 3558 [486] K  
Rp = 1.45 [1.13] Re  
a = 0.0151 [0.0048] AU

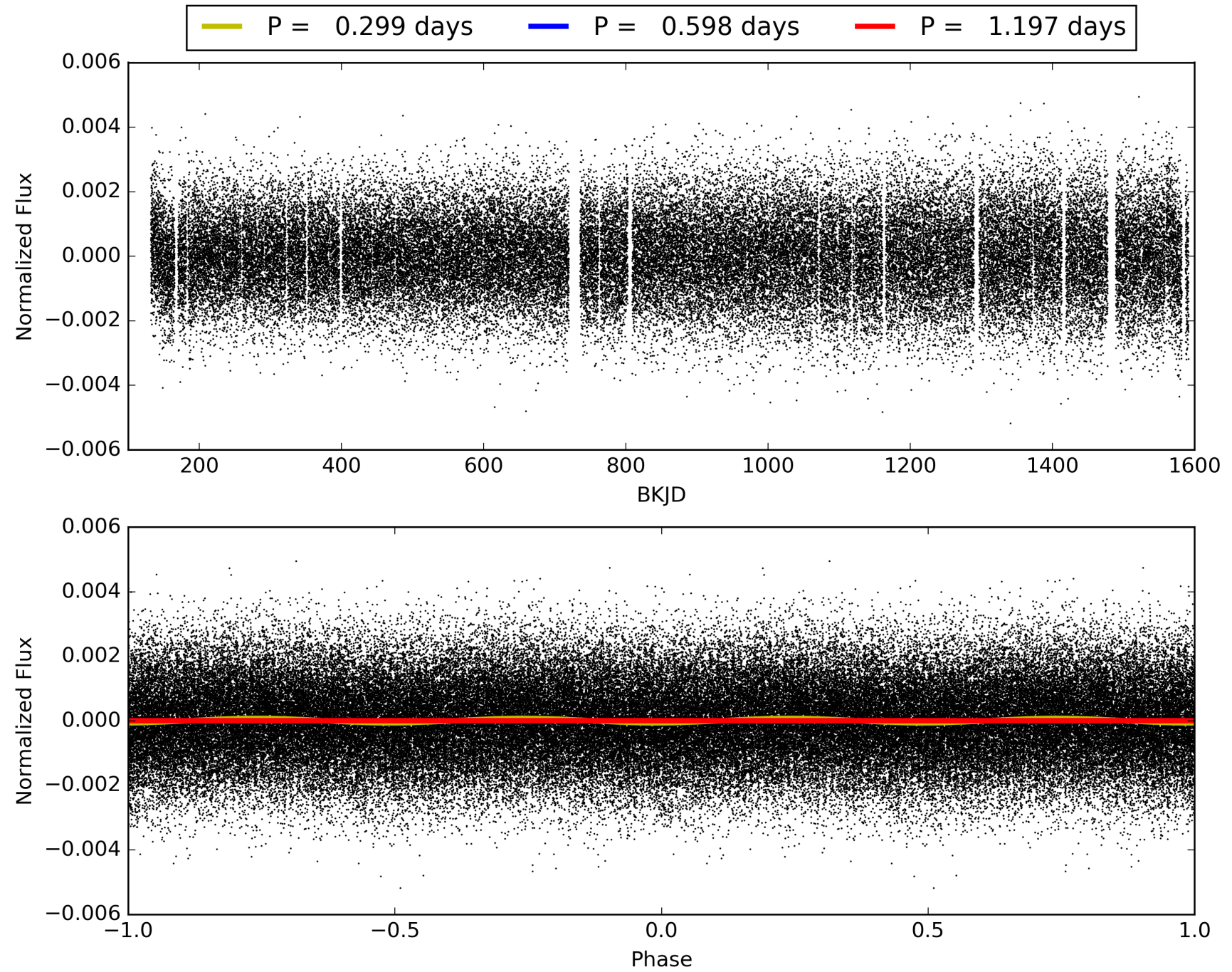
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2135/2135]  
GhostDiagnostic-chr: 3.477  
Centroid-sig: 65.1%  
Centroid-so: 0.219 arcsec [0.52 $\sigma$ ]  
OotOffset-rm: 0.200 arcsec [1.26 $\sigma$ ]  
KicOffset-rm: 0.236 arcsec [1.68 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.94 [16/17]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 008322861-02, PDC Light Curves



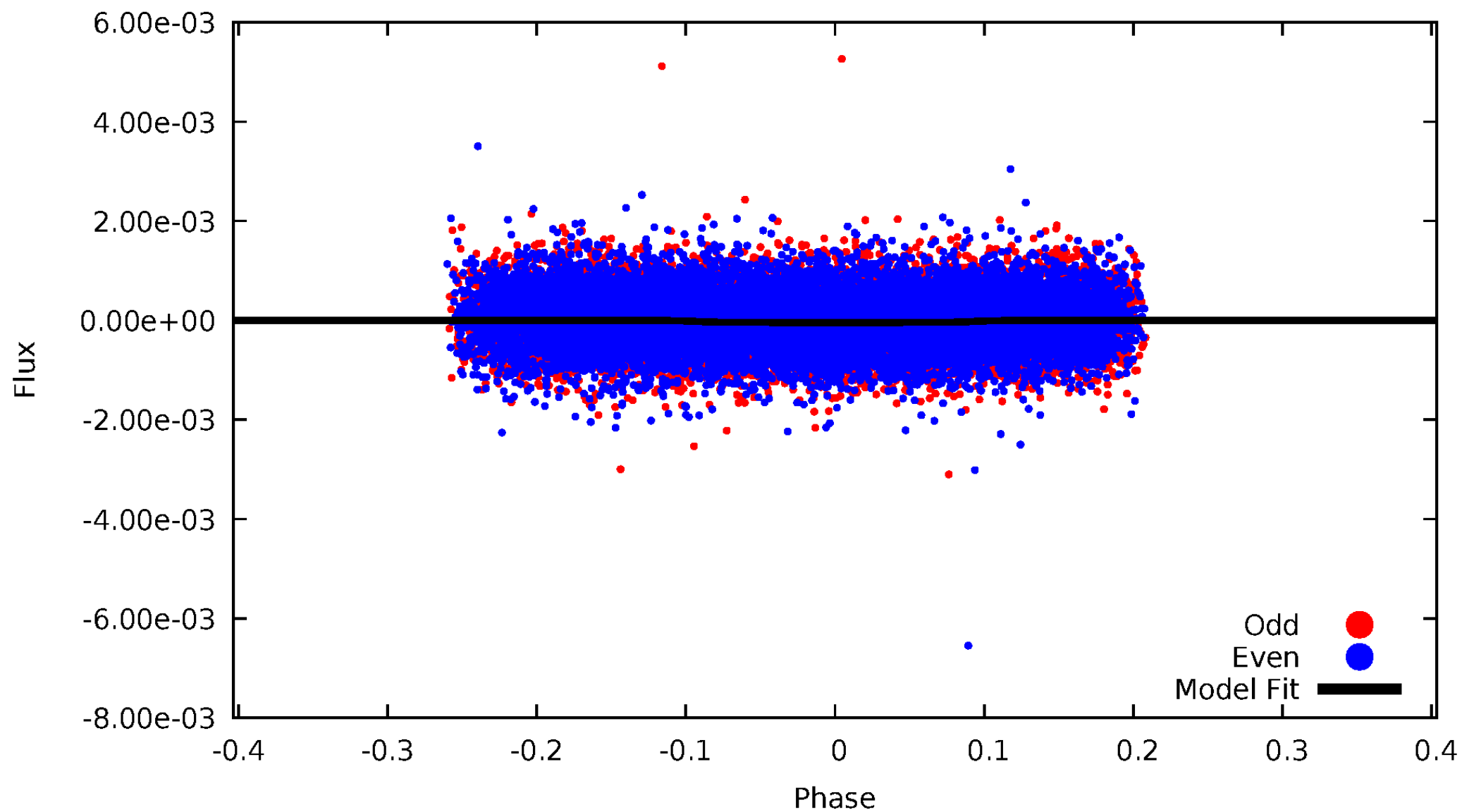
# TCE 008322861-02





DV Odd/Even

TCE 008322861-02



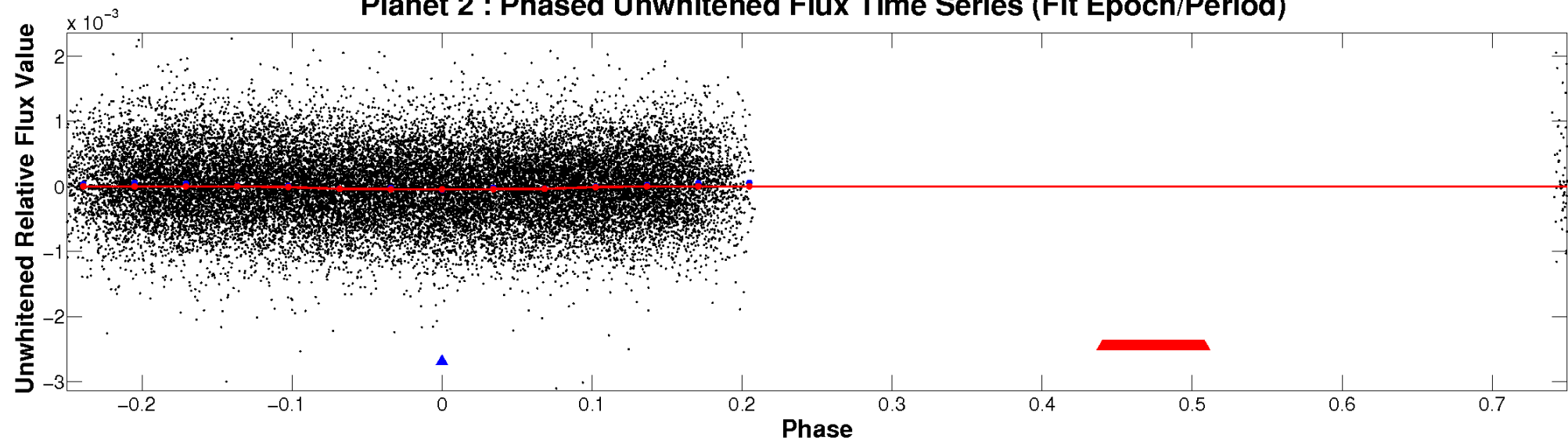


ALT Odd/Even

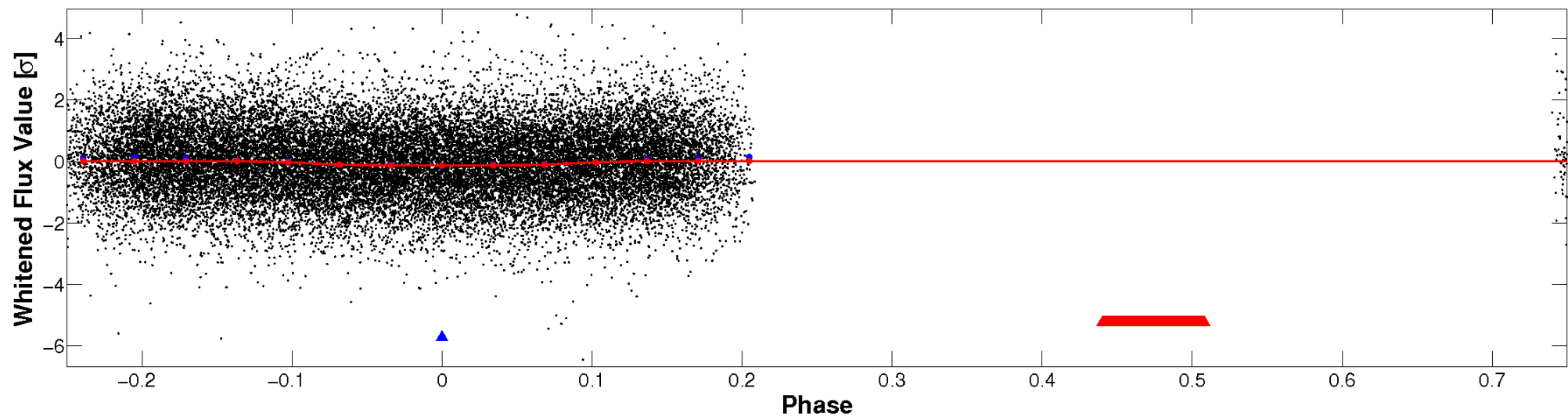
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

## Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

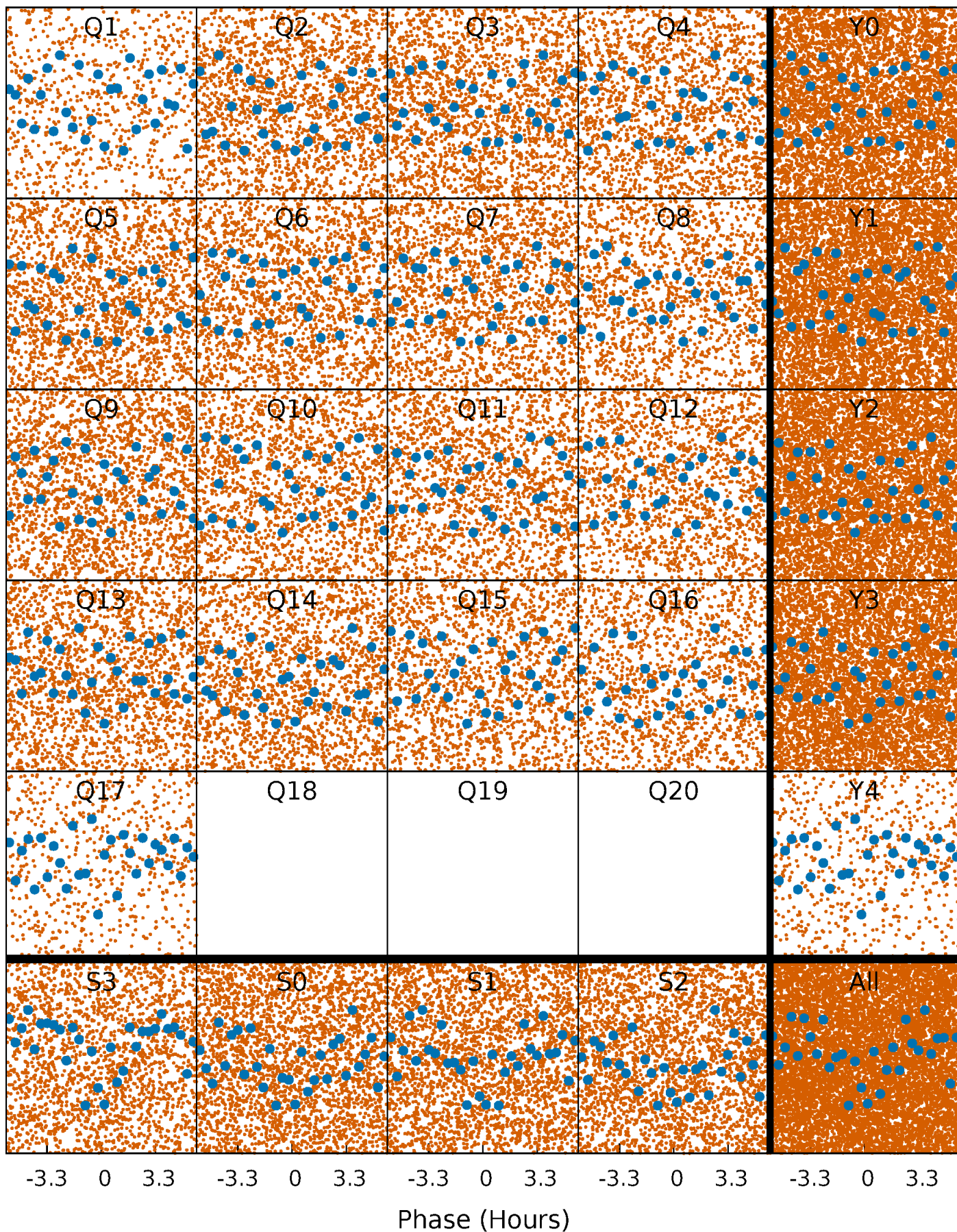


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

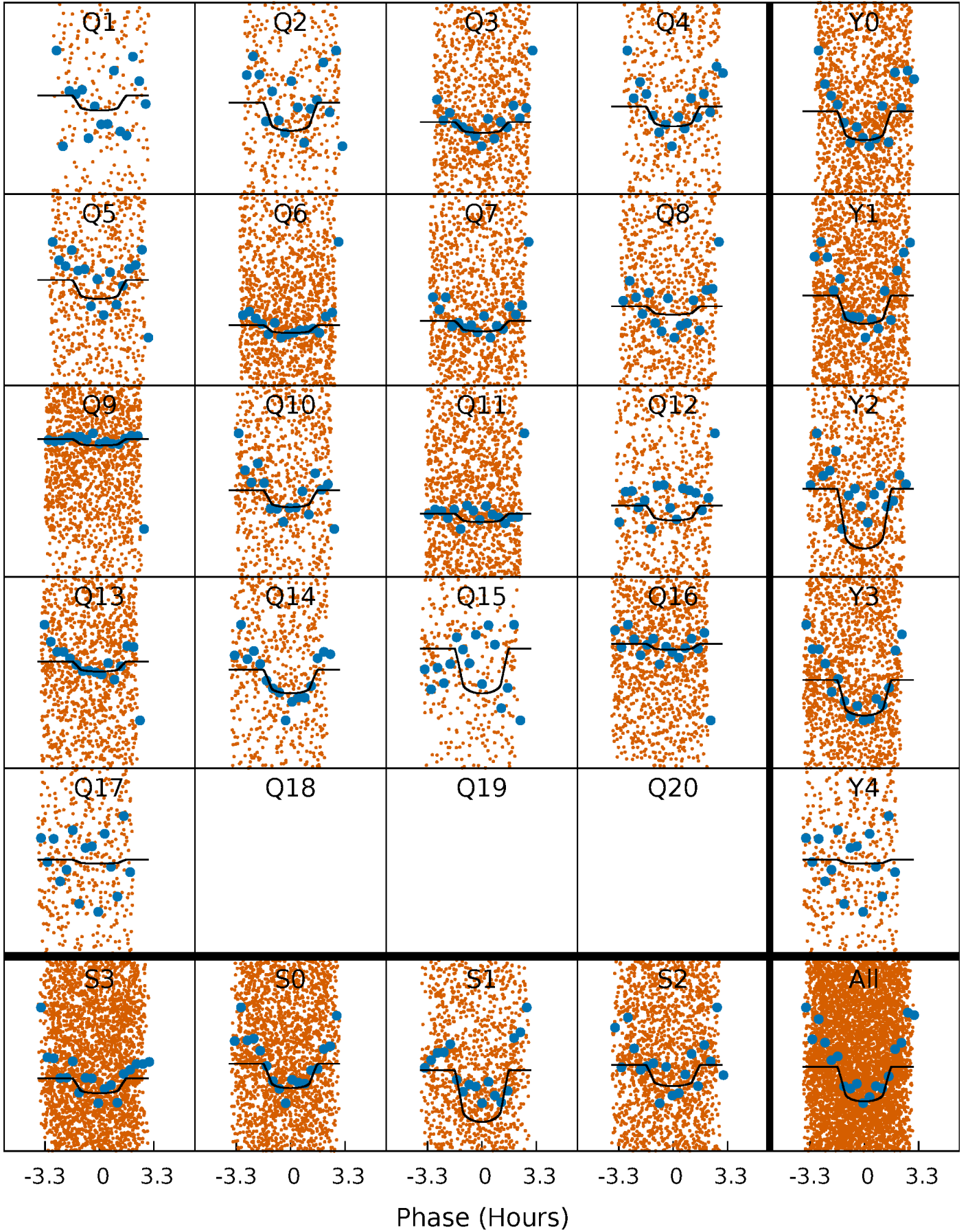
TCE 008322861-02 P= 0.598357 Days  $T_0=131.646155$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 008322861-02   P= 0.598357 Days    $T_0=131.646155$  (BKJD)



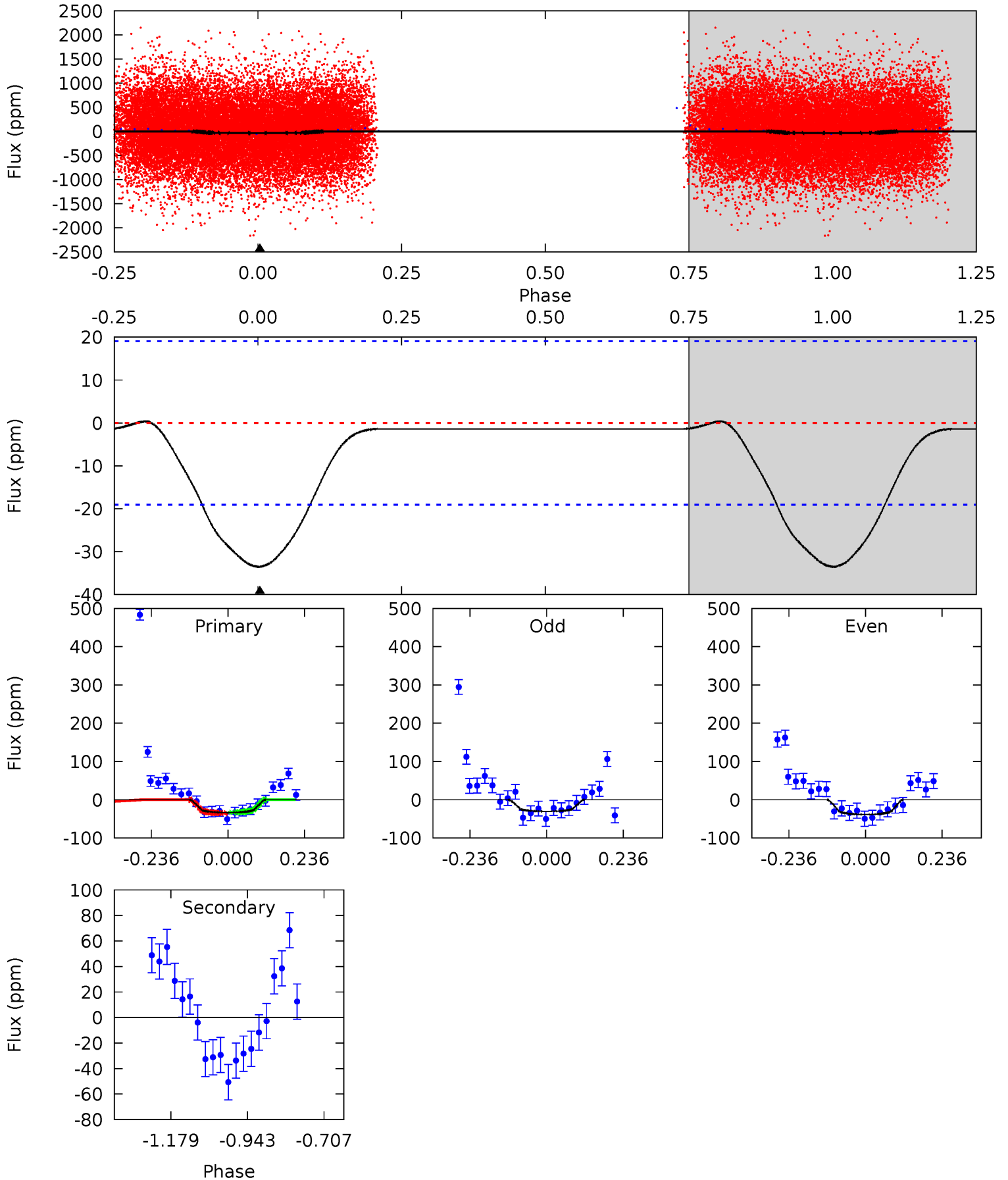


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

008322861-02, P = 0.598357 Days, E = 131.047798 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  |
|------|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.72 | 0   | 0   | 0   | 4.38            | 1.19            | 0.13             | 7.72    | 7.72    | 0       | 0       | 0.92    | 1.09 | 0.01  | 0.24 |



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 008322861

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M$ ( $M_{\odot}$ )       | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $7251^{+205}_{-307}$ | $4.003^{+0.308}_{-0.132}$ | $-0.560^{+0.250}_{-0.300}$ | $1.866^{+0.493}_{-0.603}$ | $1.277^{+0.202}_{-0.184}$ | $0.277^{+0.525}_{-0.119}$                     |
|        | +3%/-4%              | +8%/-3%                   | +45%/-54%                  | +26%/-32%                 | +16%/-14%                 | +190%/-43%                                    |
| 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 008322861-02 / KOI

| Detrend | Depth (ppm) | $R_p$ ( $R_{\oplus}$ ) | $T_{max}$ (K)        | $T_{obs}$ (K)          | $A_{obs}$                  |
|---------|-------------|------------------------|----------------------|------------------------|----------------------------|
| DV      | $0 \pm 4$   | $1.49^{+0.97}_{-0.89}$ | $4838^{+382}_{-459}$ | $-4177^{+7508}_{-716}$ | $-0.003^{+0.382}_{-0.342}$ |
| Alt.    | N/A         | N/A                    | N/A                  | N/A                    | N/A                        |

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

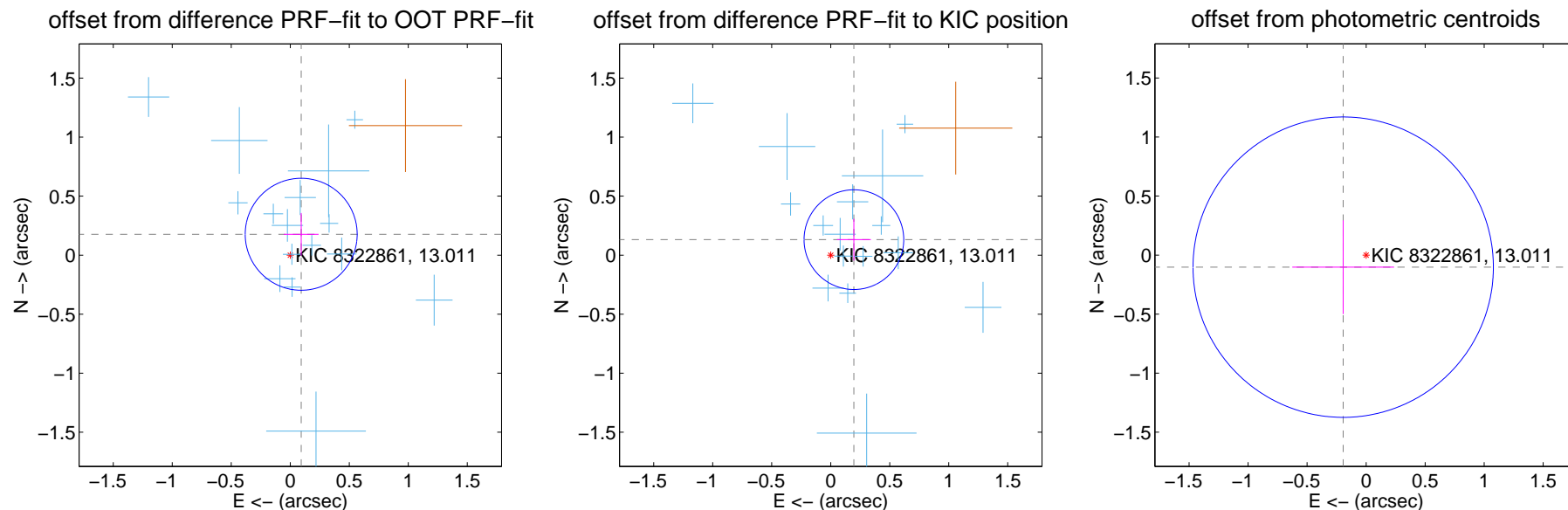
## DV Centroid Data

Supplemental centroid analysis for 008322861-02. Kepler magnitude: 13.01. Transit SNR 12.23

There are 16 quarters with good PRF difference image offsets

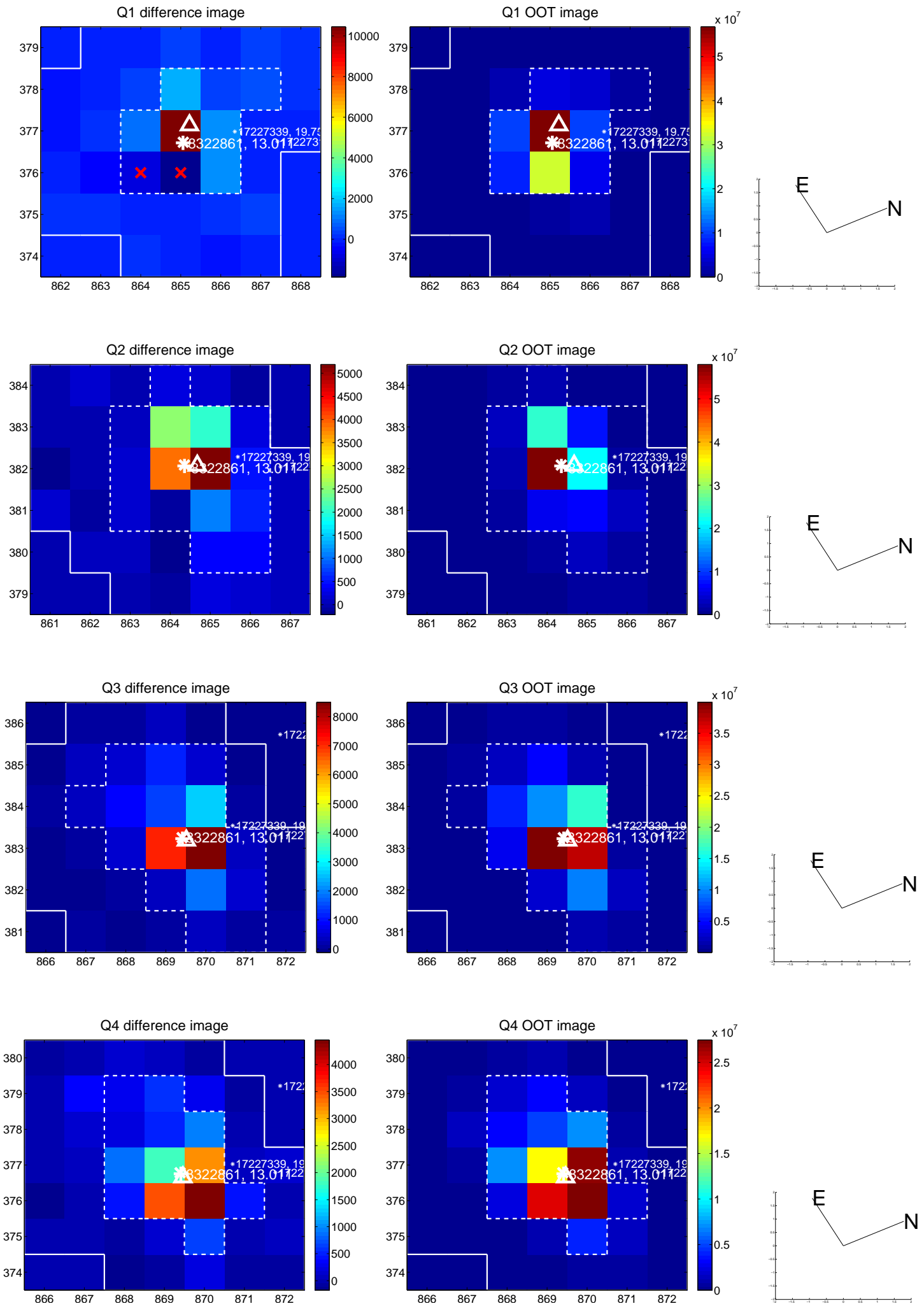
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | $0.200 \pm 0.158$  | 1.26                | $-0.093 \pm 0.148$ | $0.177 \pm 0.180$ |
| PRF-fit source offset from KIC position | $0.236 \pm 0.141$  | 1.68                | $-0.196 \pm 0.144$ | $0.131 \pm 0.177$ |
| photometric centroid source offset      | $0.22 \pm 0.42$    | 0.52                | $0.19 \pm 0.43$    | $-0.10 \pm 0.40$  |



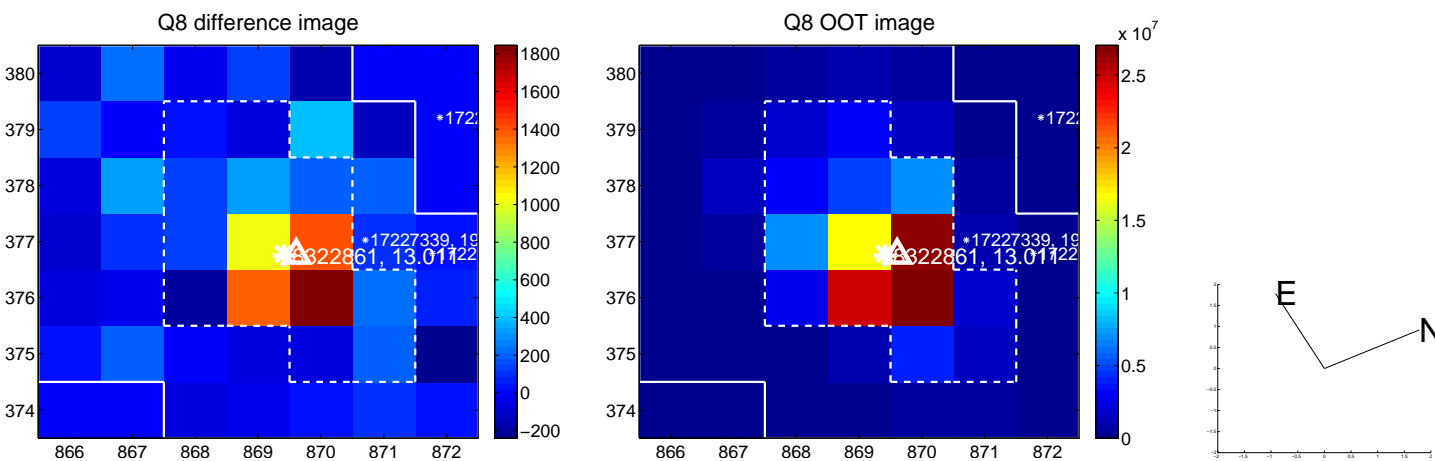
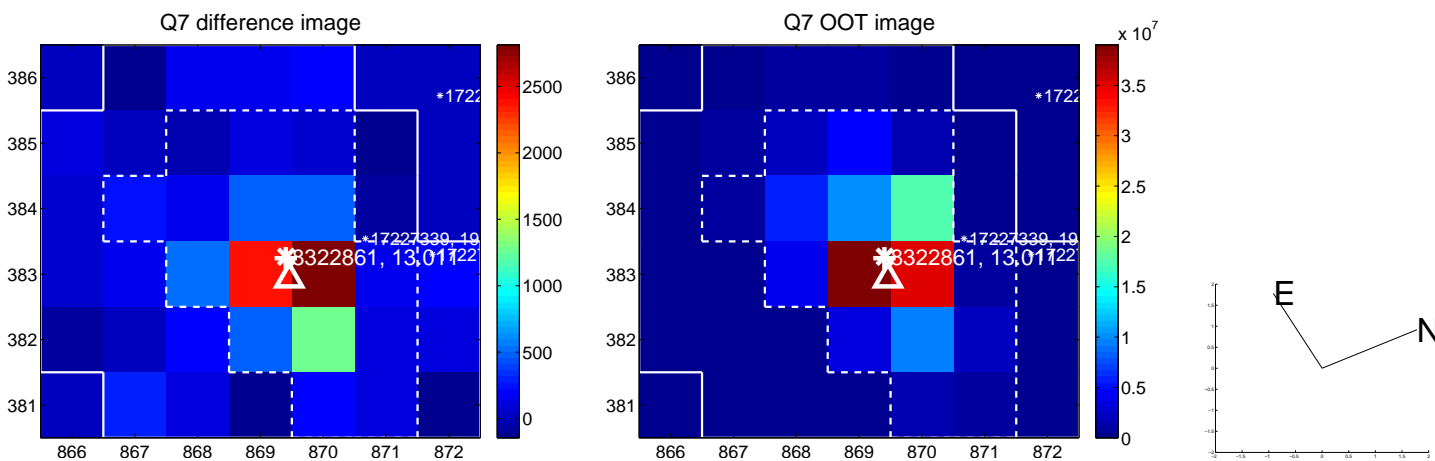
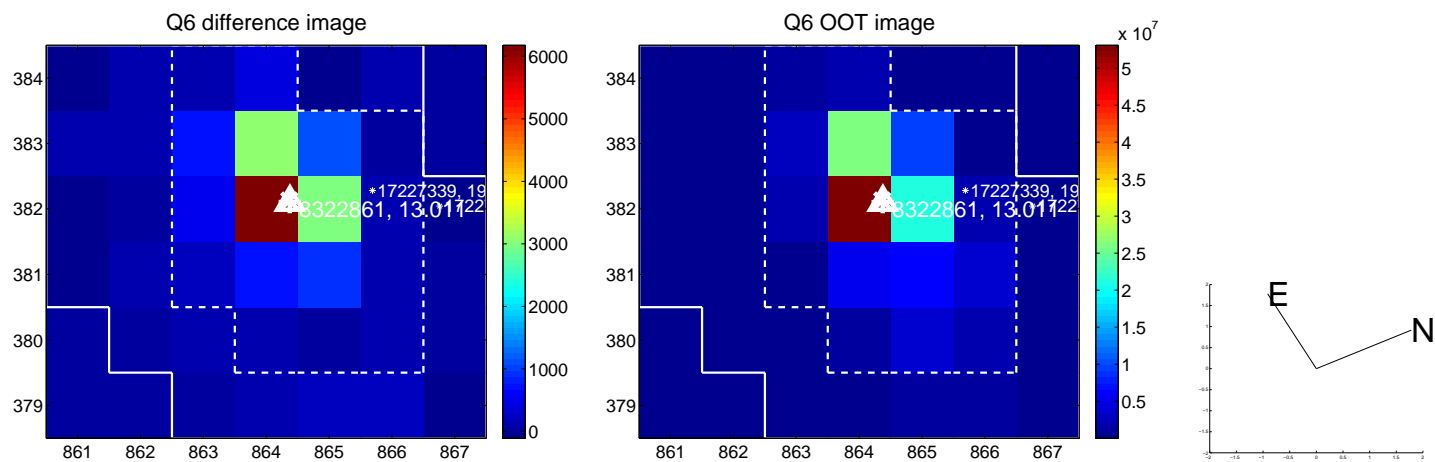
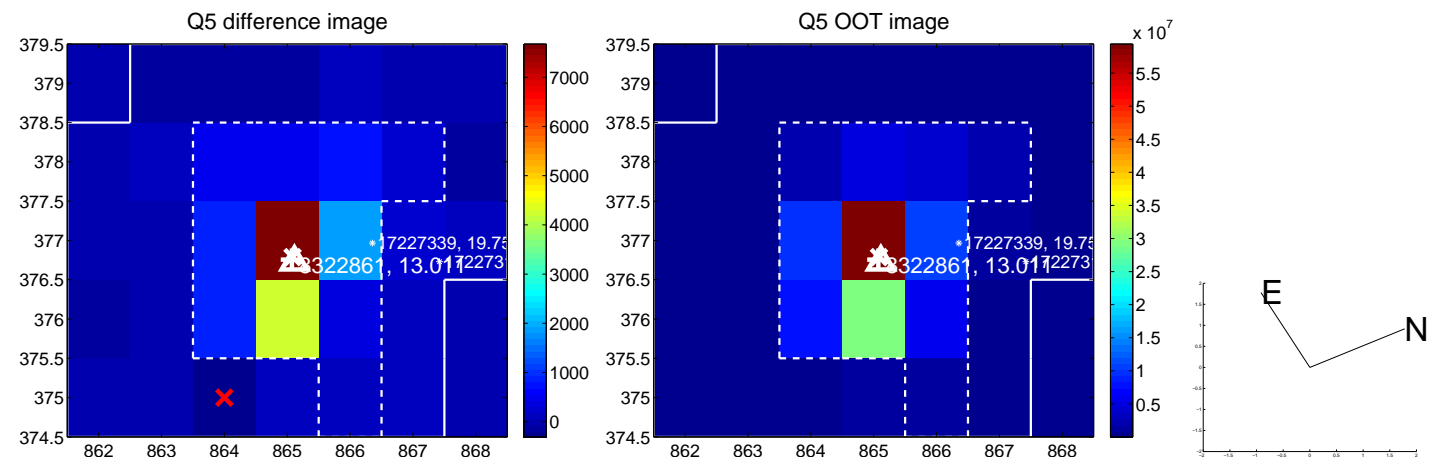
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

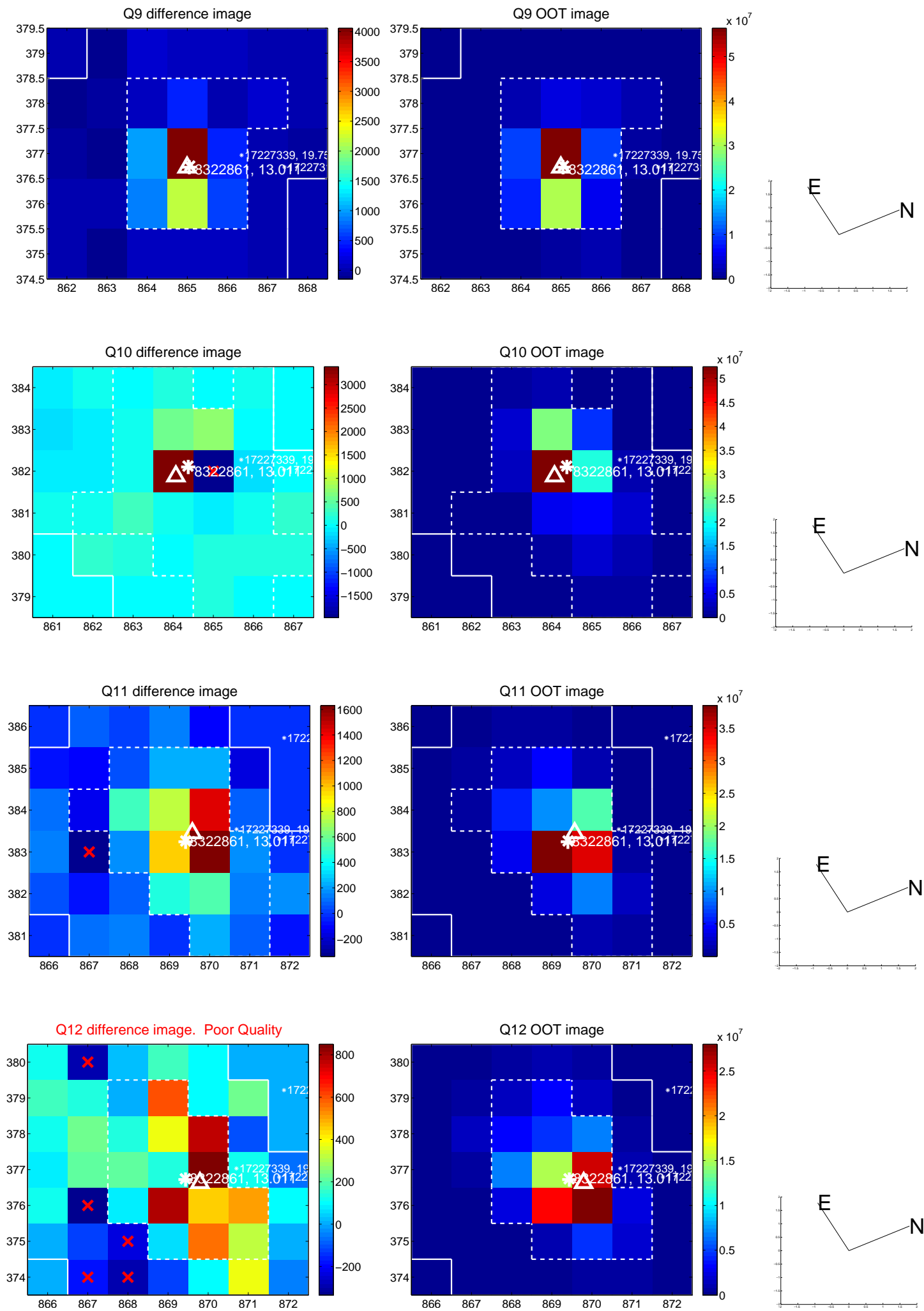




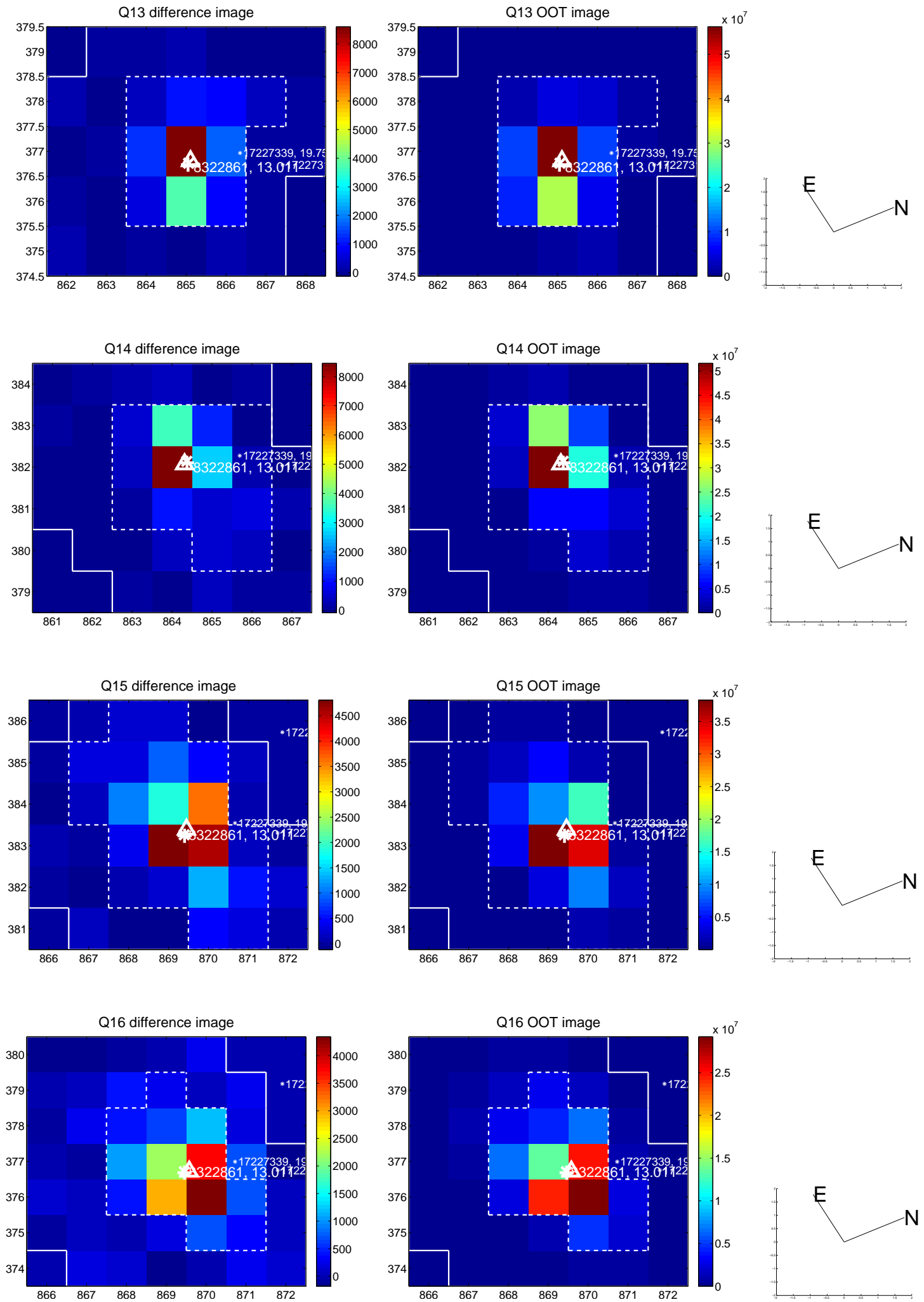
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



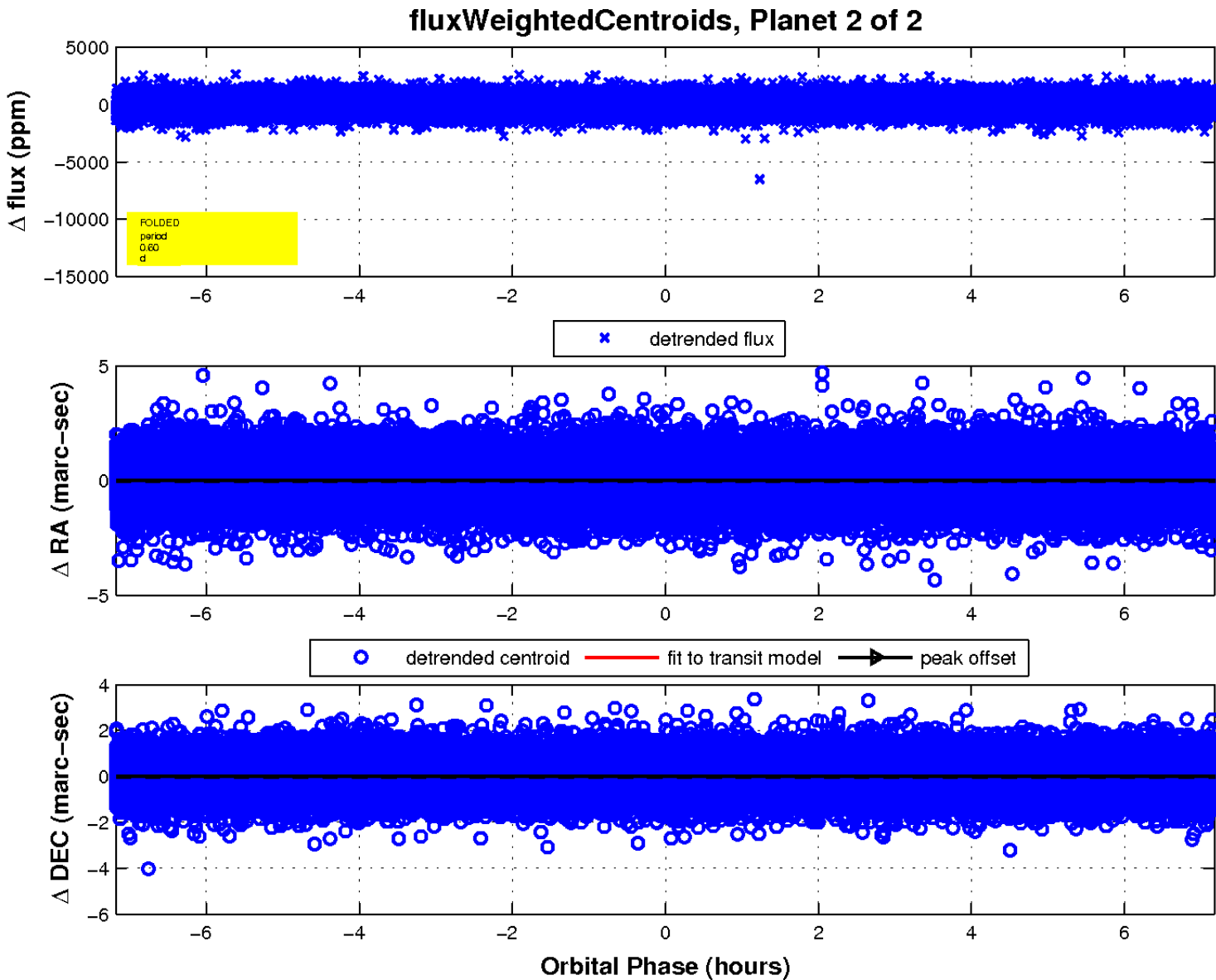
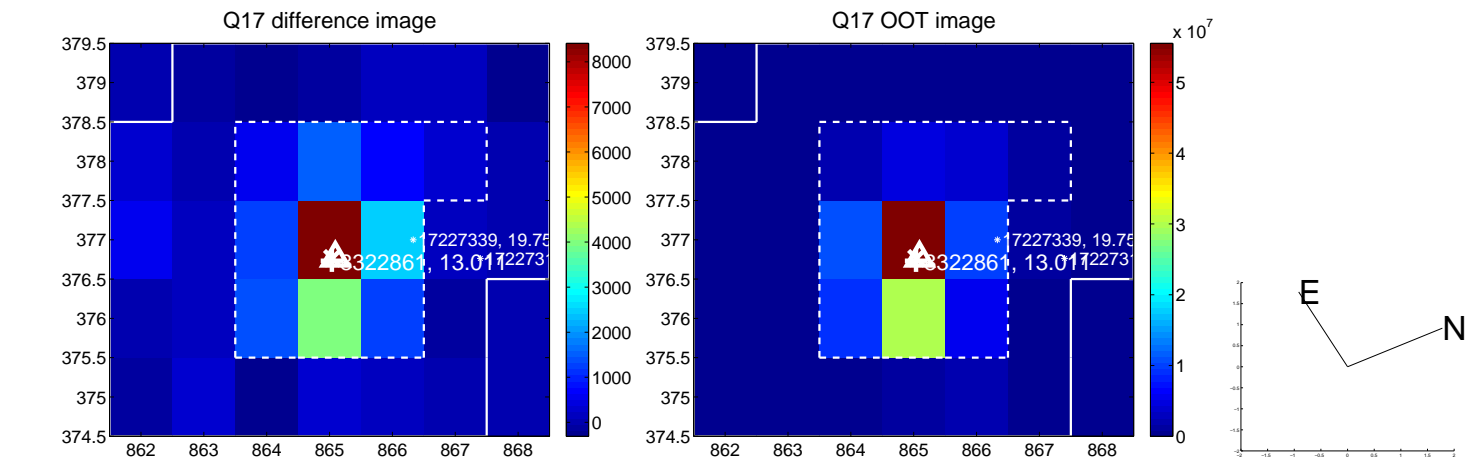
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

Declination

