

# KIC 010532771

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 010532771-01 | OBS      | No   | 1.102272      | 131.739079   | 252.6       | 5.369            | 12.9 | 12.8 | 3.40                        | 8014            | 7.06                   | 59986.76               |
| 010532771-02 | OBS      | No   | 1.102275      | 132.279935   | 263.2       | 4.345            | 13.2 | 15.5 | 3.40                        | 8014            | 5.58                   | 59986.58               |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments                       |
|--------------|----------|------|-------|---|---|---|---|--------------------------------|
| 010532771-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT |
| 010532771-02 | 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.

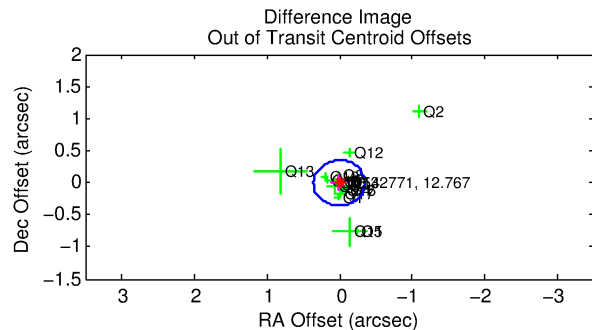
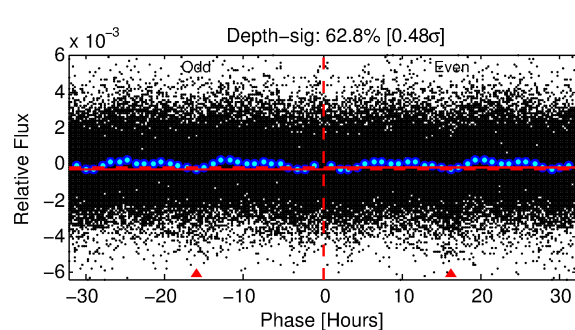
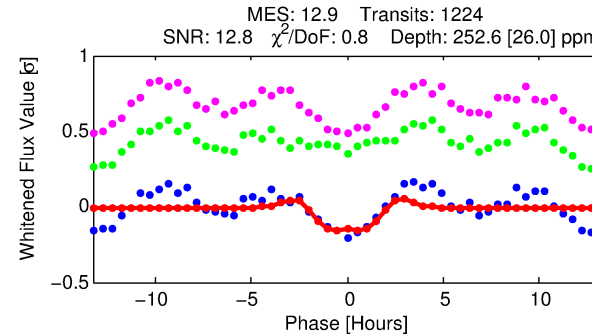
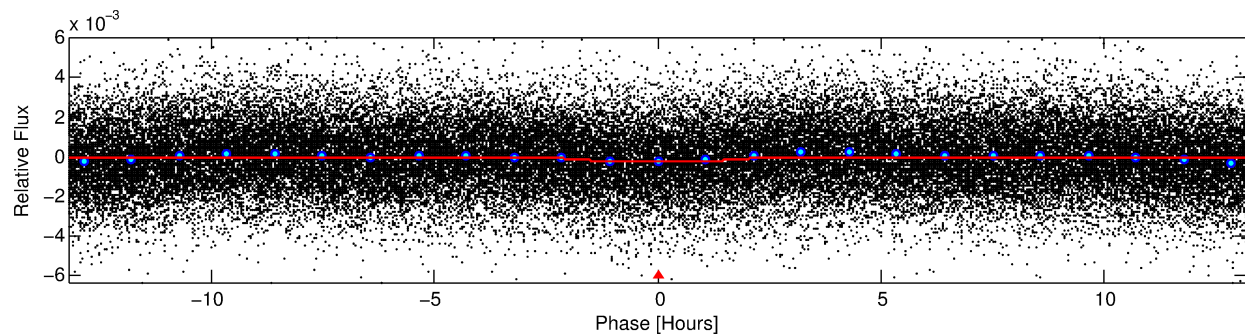
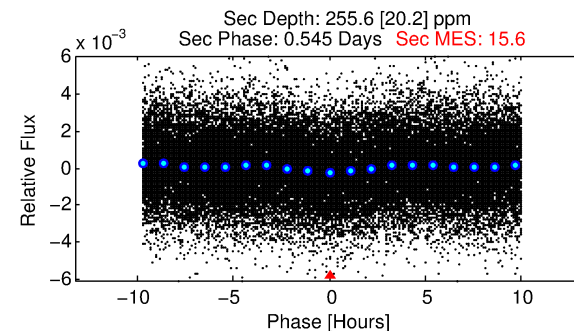
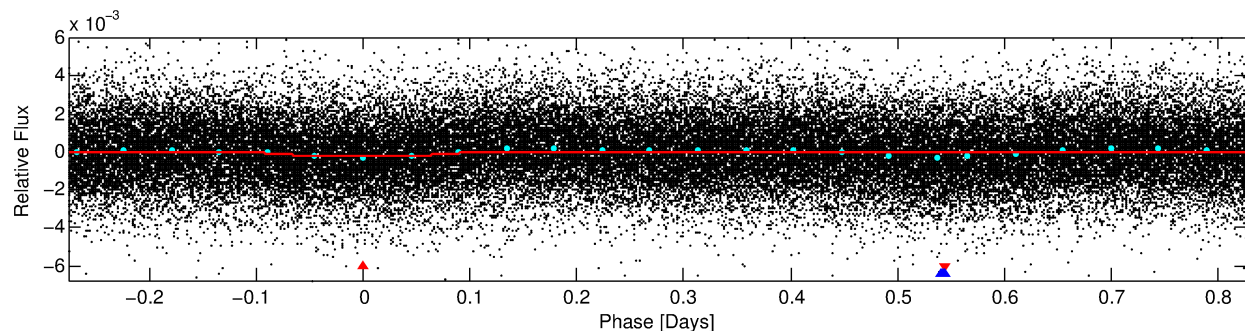
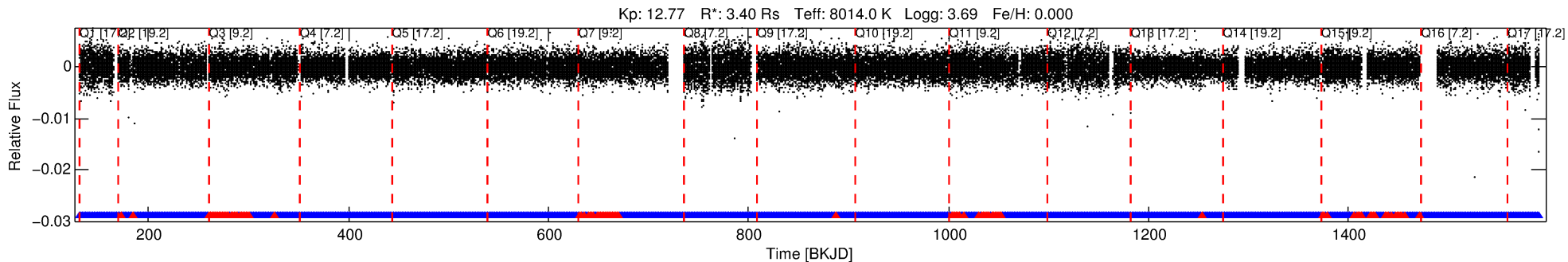
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010532771-01

No Significant Match Found

# DV One-Page Summary

KIC: 10532771 Candidate: 1 of 2 Period: 1.102 d



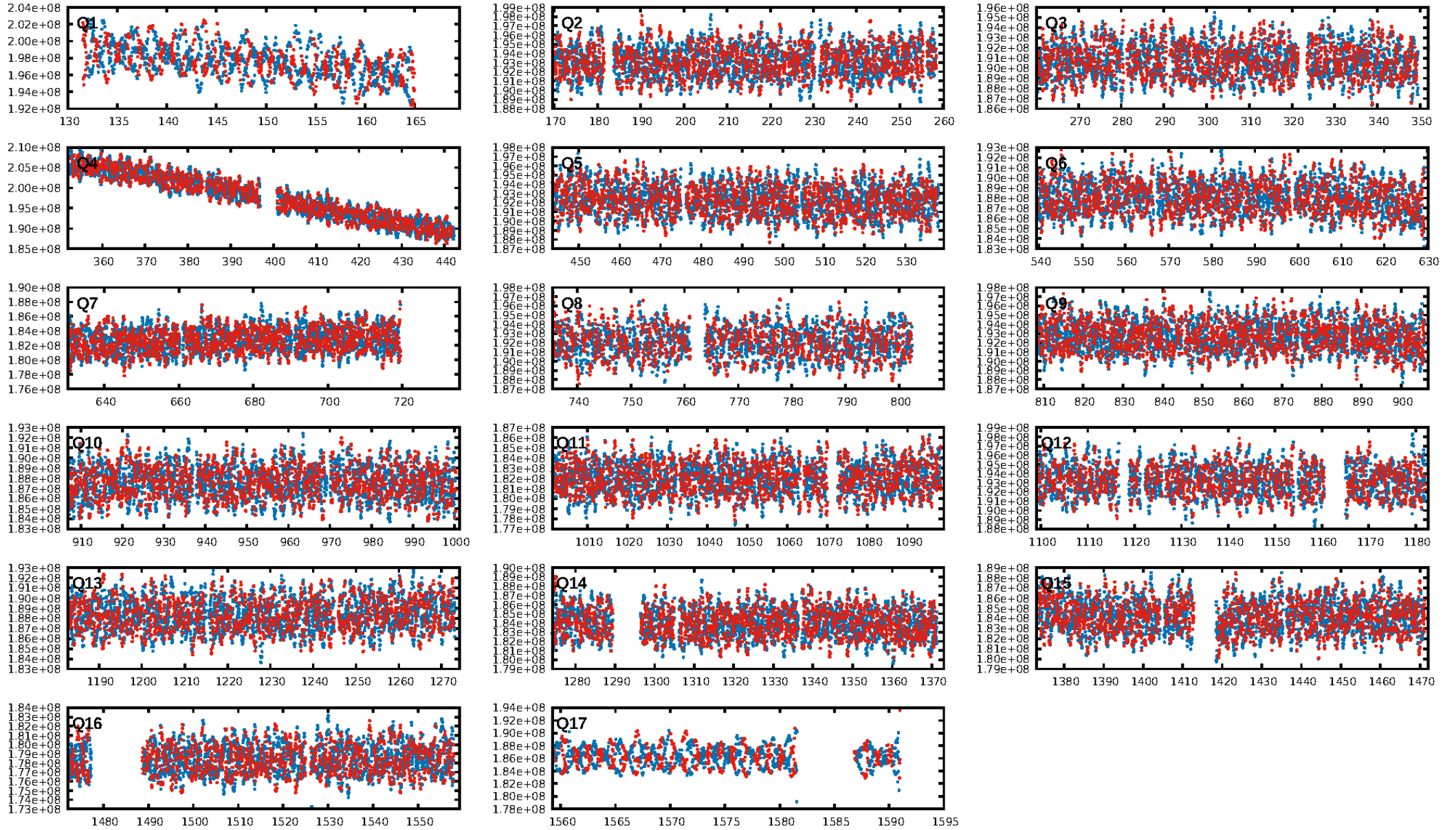
## DV Fit Results:

Period = 1.10227 [0.00001] d  
Epoch = 131.7391 [0.0041] BKJD  
Rp/R\* = 0.0190 [0.0011]  
a/R\* = 1.09 [0.02]  
b = 0.98 [0.00]  
Seff = 59986.76 [46485.91]  
Teff = 3991 [773] K  
Rp = 7.06 [3.29] Re  
a = 0.0267 [0.0123] AU  
Ag = 2.01 [1.54] [0.65σ]  
**Teffp = 7345 [421] K [3.81σ]**

## DV Diagnostic Results:

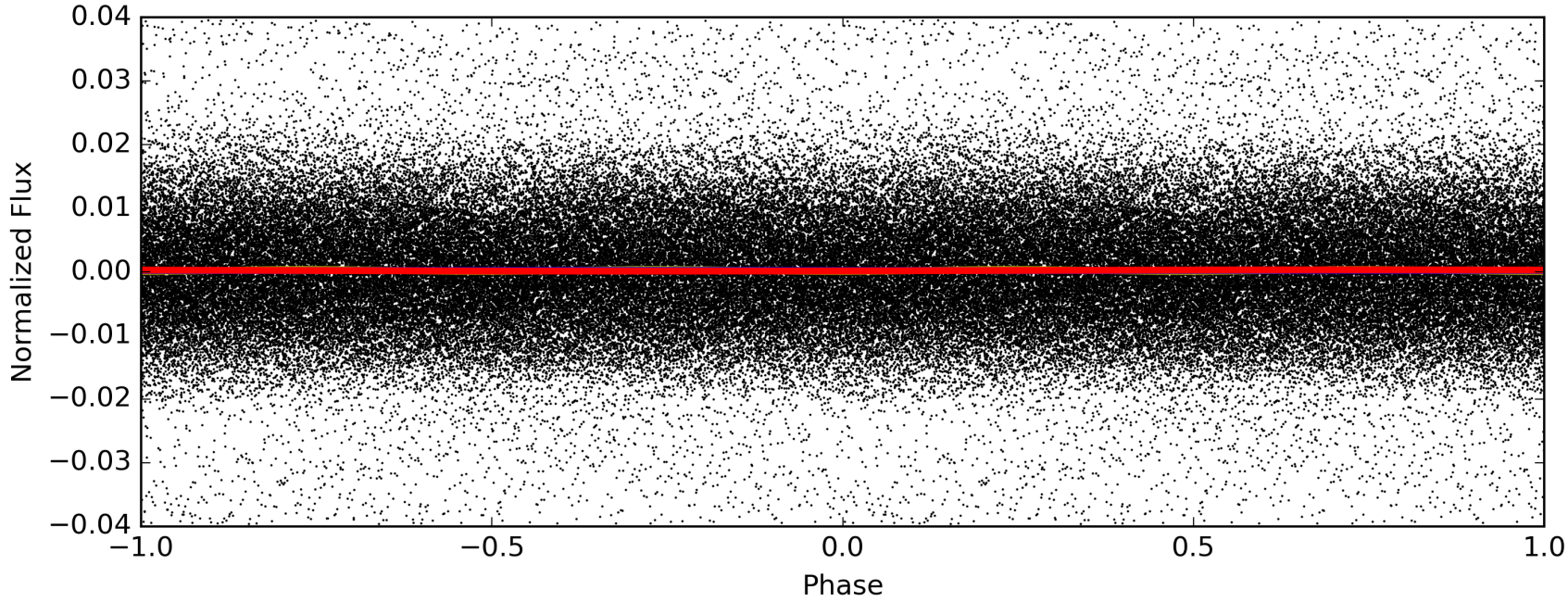
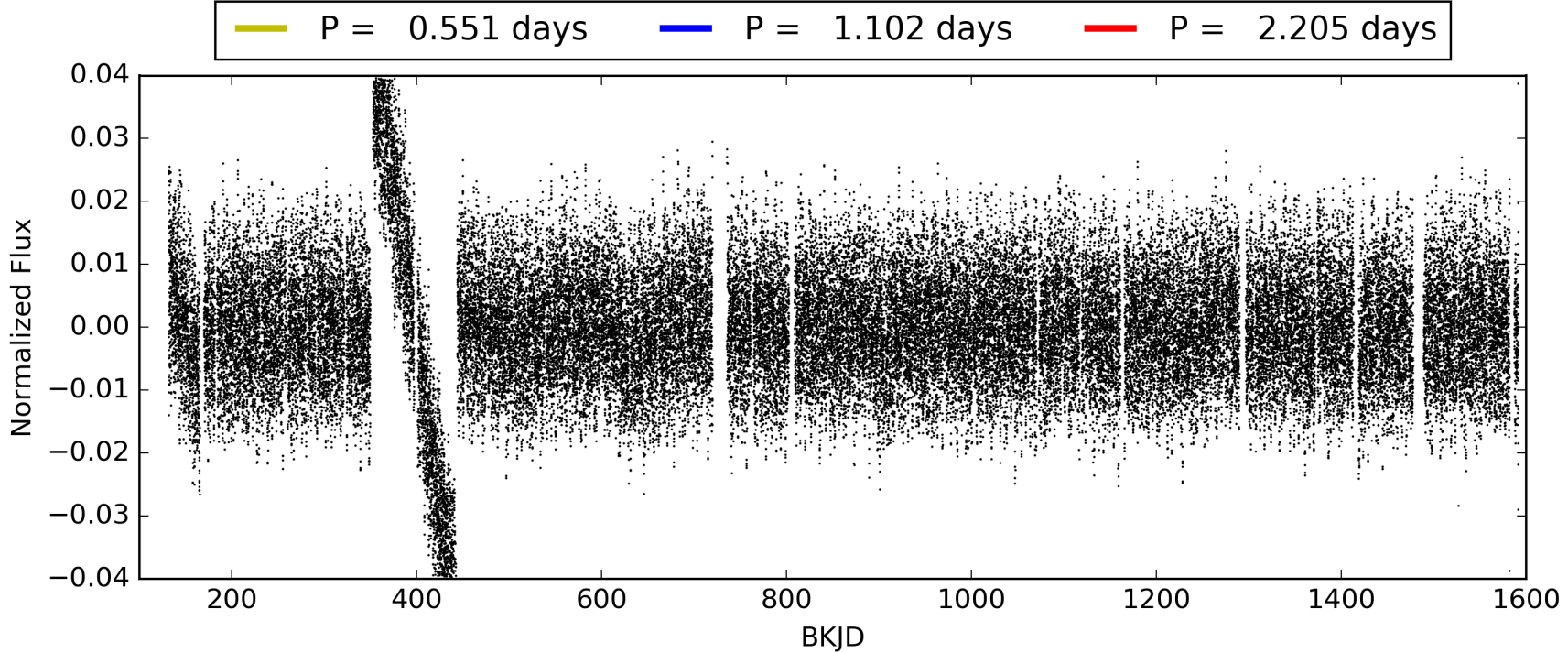
ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.90 [1047/1168]  
**GhostDiagnostic-chr: 0.9901**  
Centroid-sig: 15.2%  
**Centroid-so: 0.212 arcsec [3.62σ]**  
OotOffset-rm: 0.008 arcsec [0.07σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 0.214 arcsec [1.80σ]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.94 [16/17]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 010532771-01, PDC Light Curves



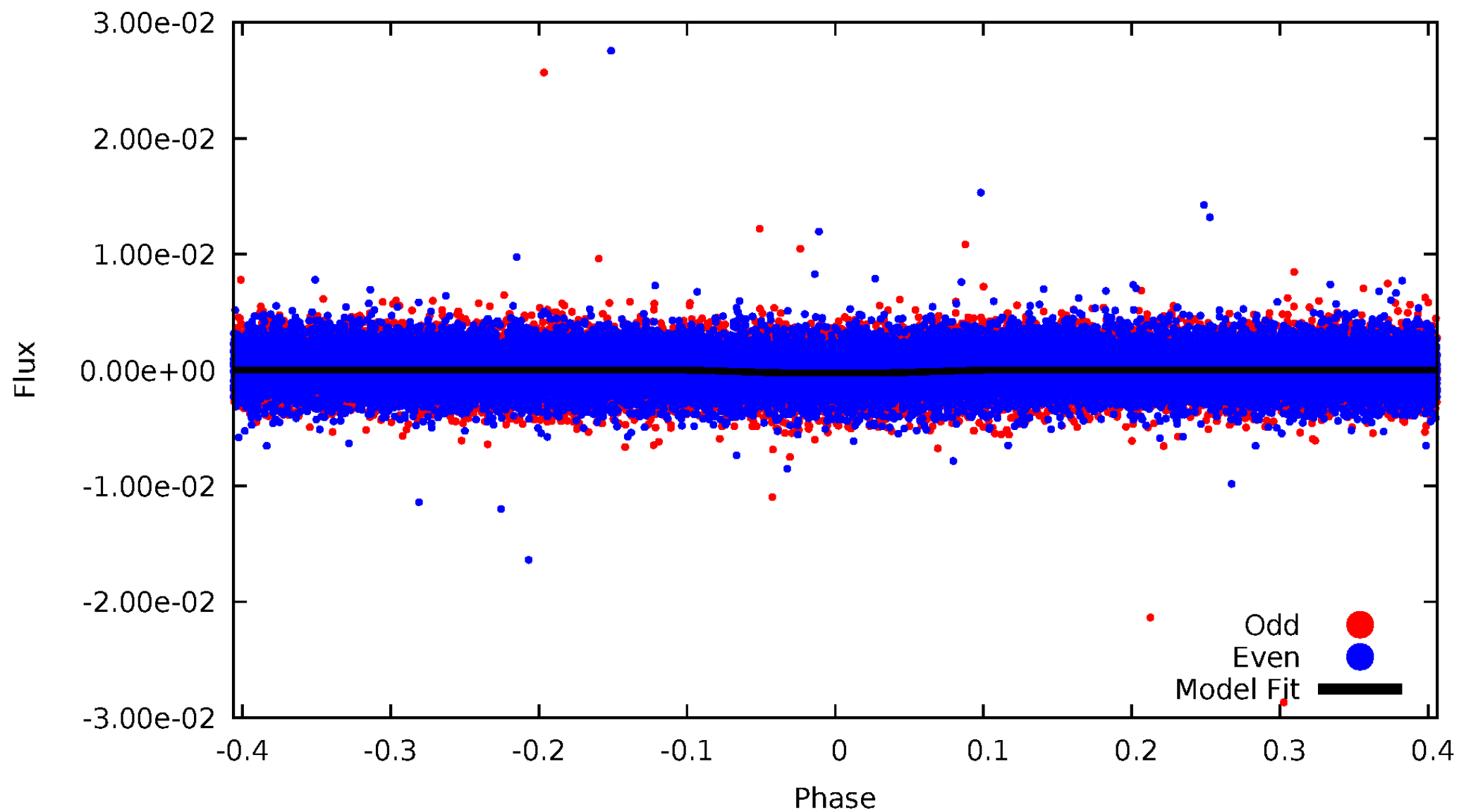


TCE 010532771-01



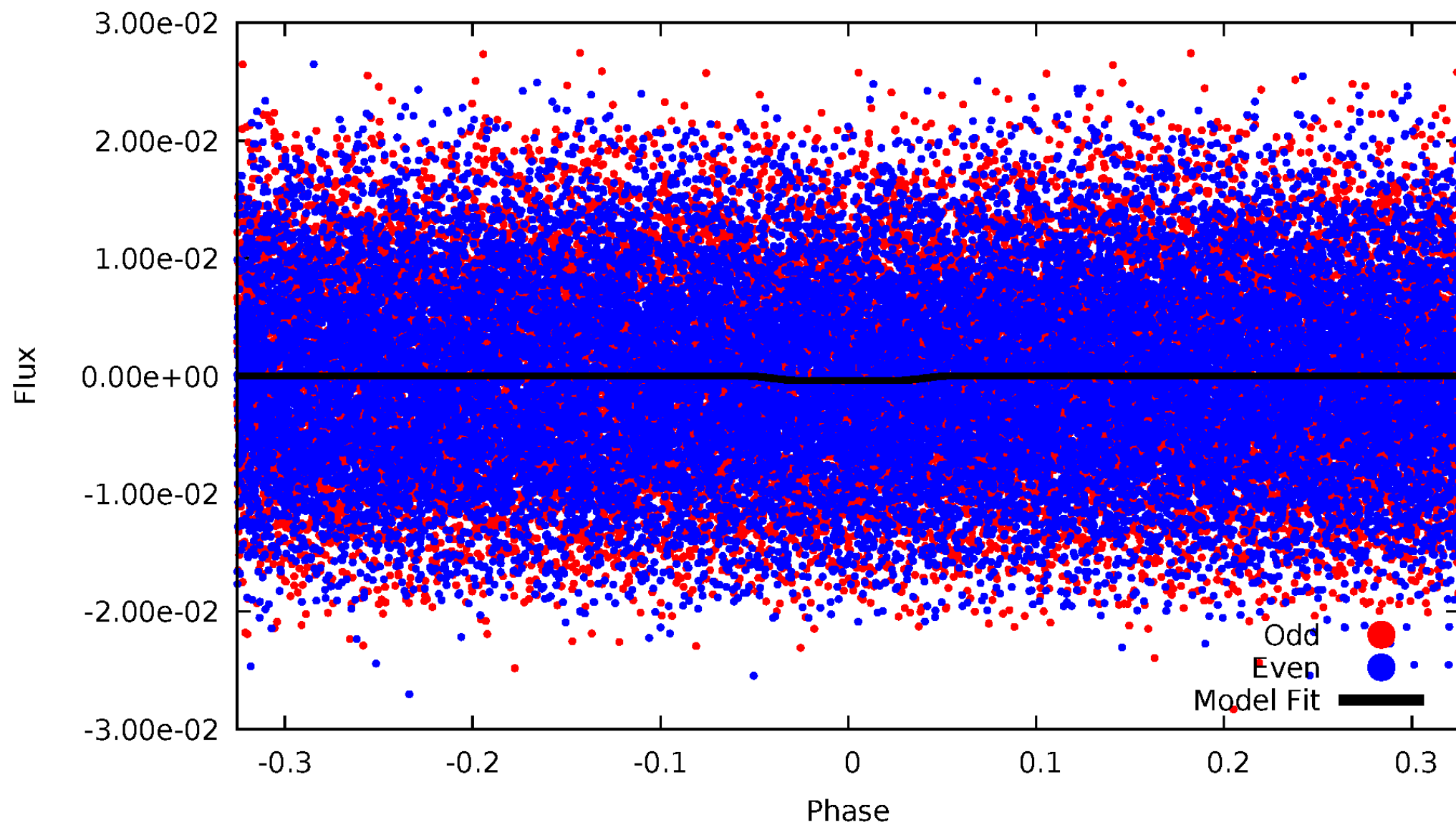
# DV Odd/Even

TCE 010532771-01



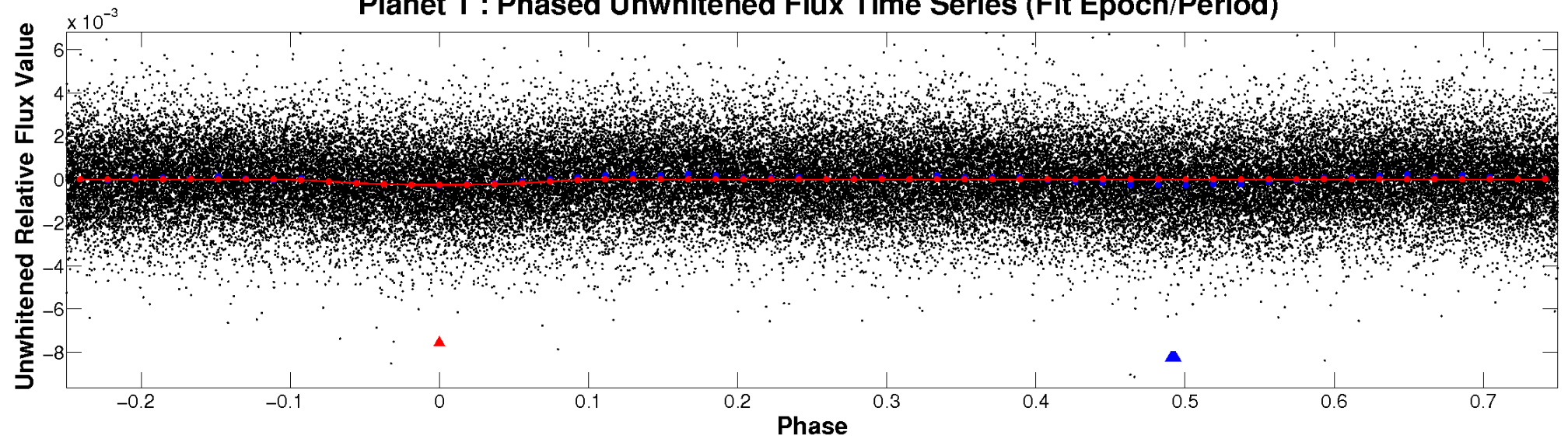
# ALT Odd/Even

TCE 010532771-01

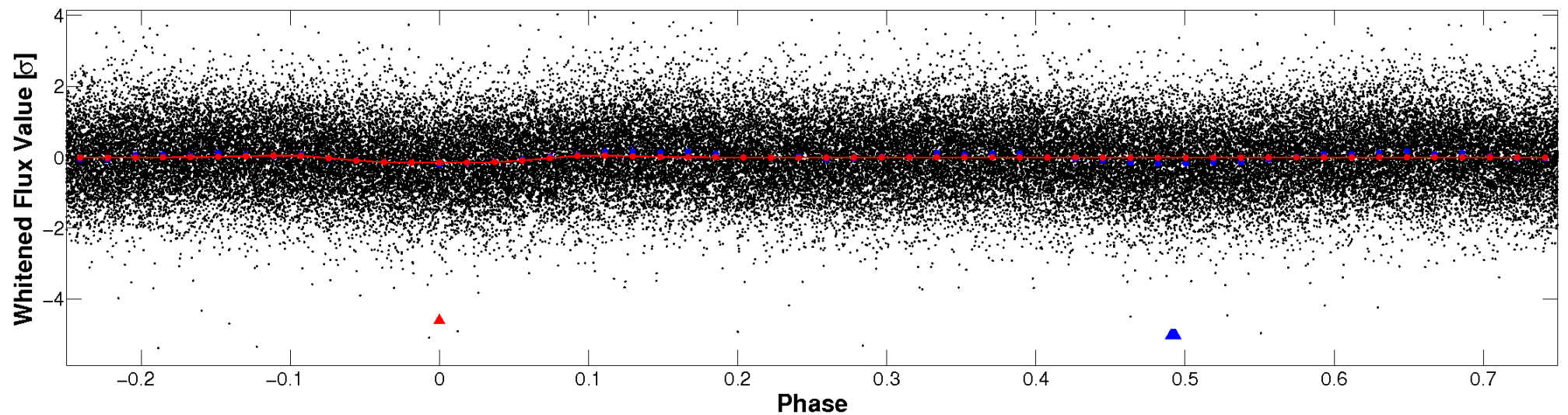


# Non-Whitened Vs. Whitened Light Curve

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



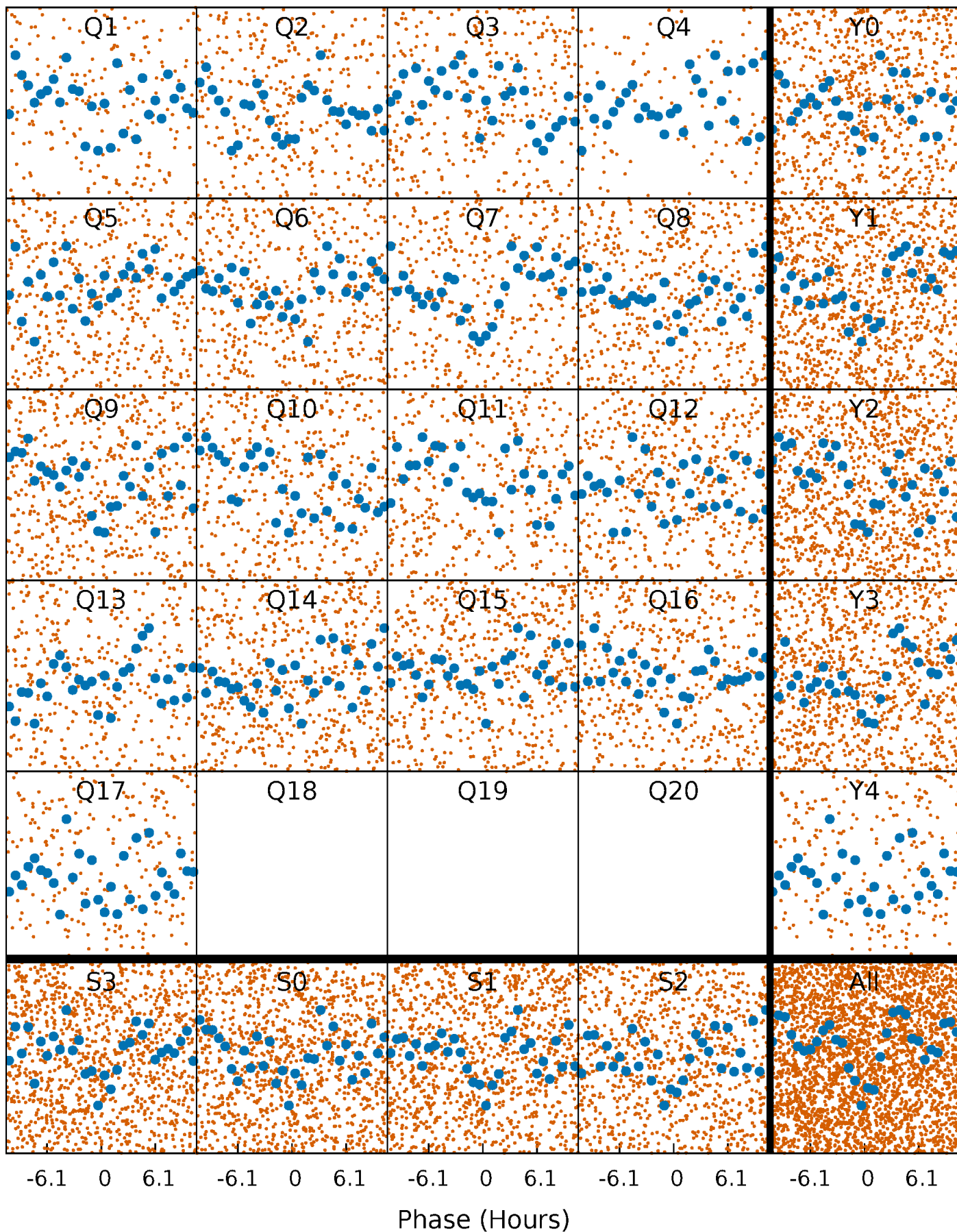
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

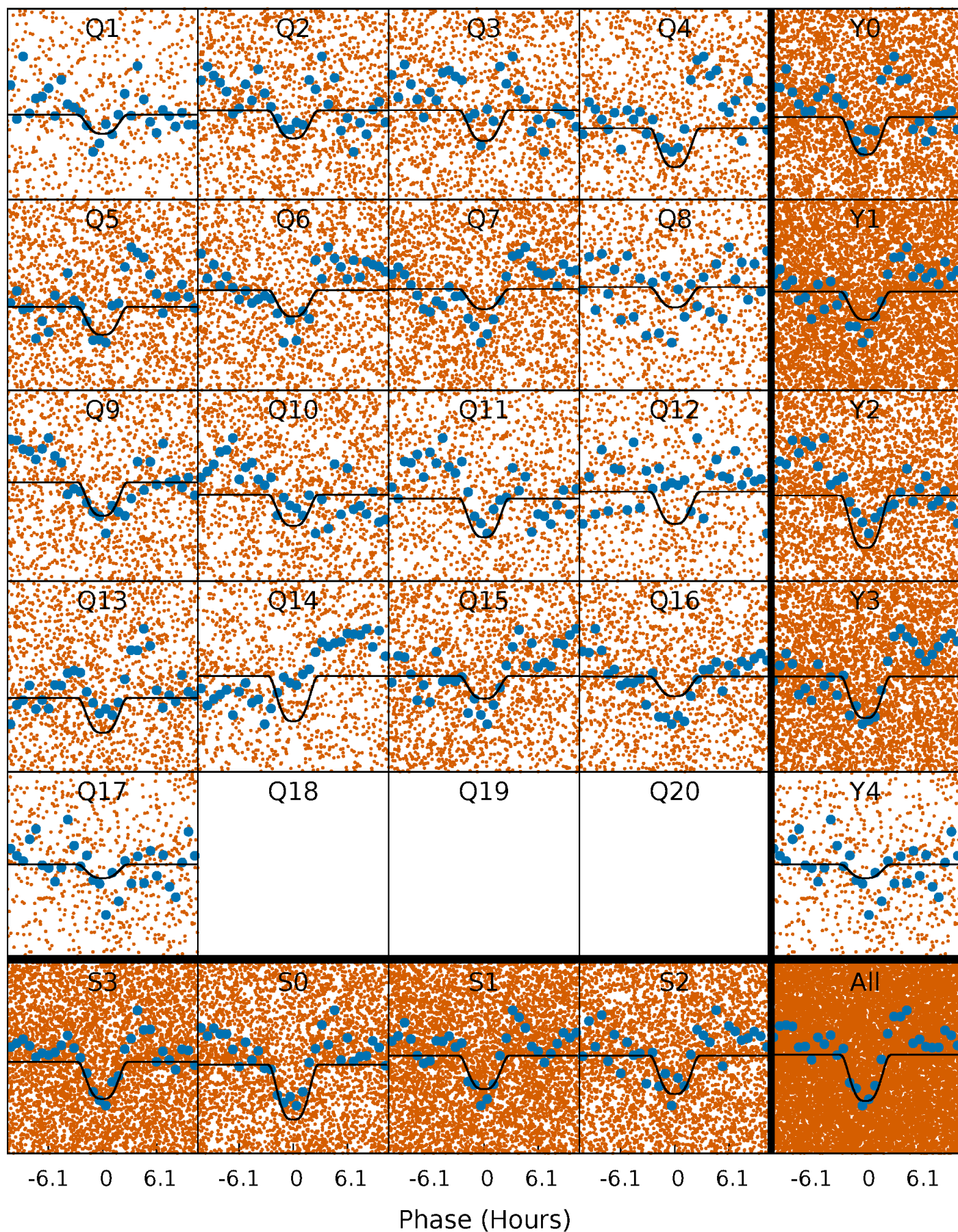
TCE 010532771-01 P= 1.102272 Days  $T_0=131.739079$  (BKJD)





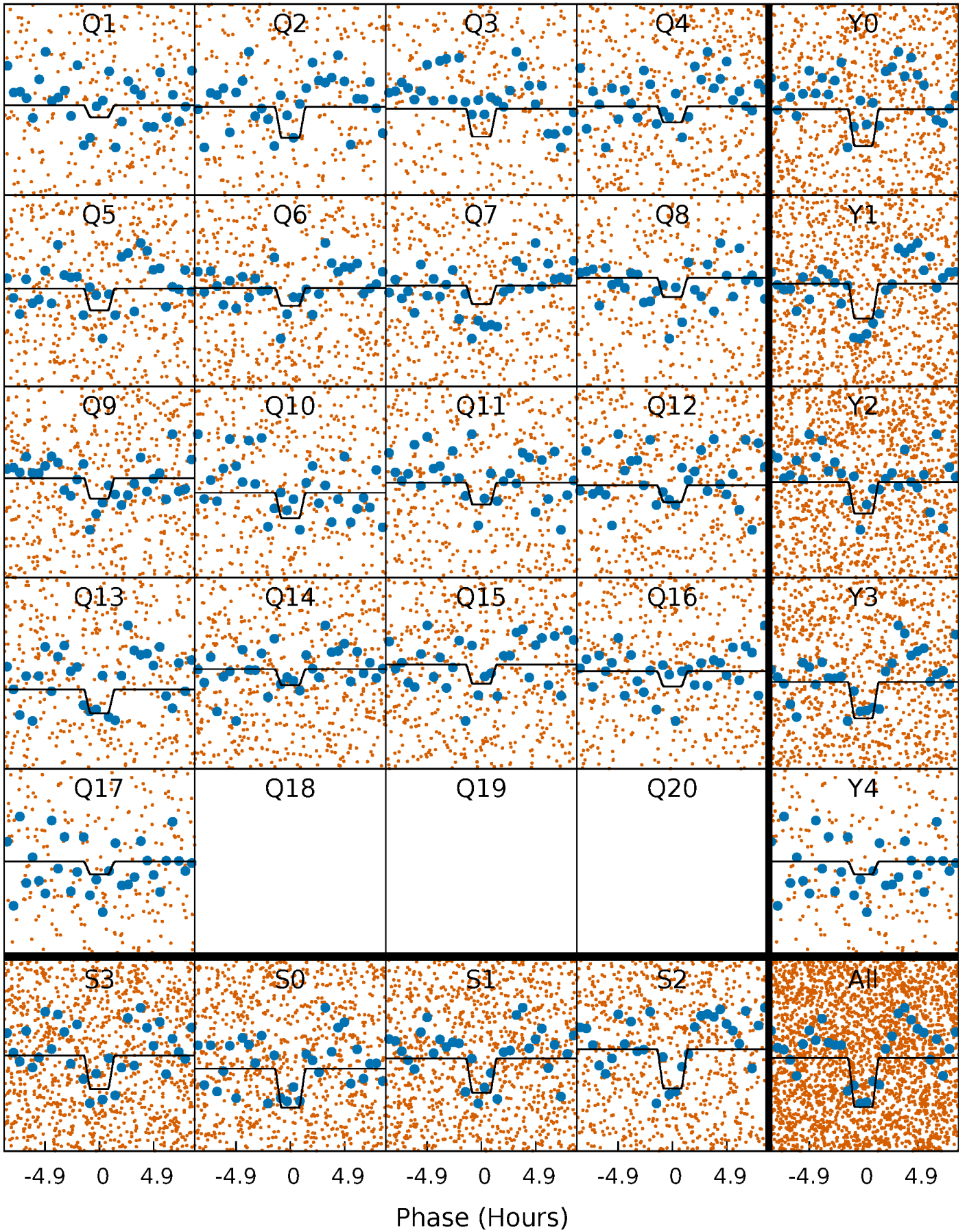
# DV Quarter-Phased Transit Curves

TCE 010532771-01 P= 1.102272 Days  $T_0=131.739079$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

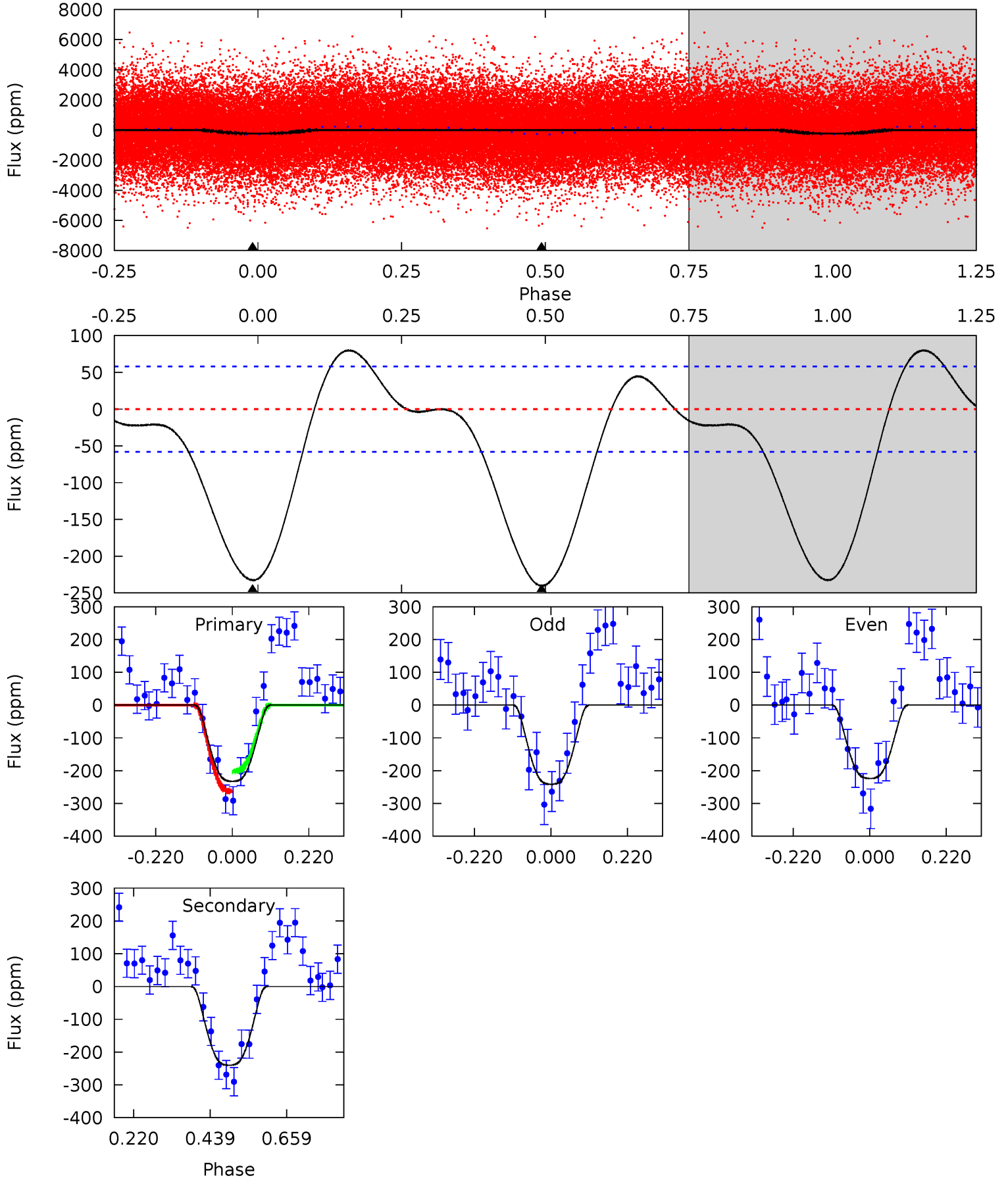
TCE 010532771-01 P= 1.102290 Days  $T_0=131.724525$  (BKJD)



# DV Model-Shift Uniqueness Test

010532771-01, P = 1.102272 Days, E = 130.636807 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  |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 17.6 | 18.2 | 0   | 0   | 4.40            | 1.23            | 1.22             | 17.6    | 17.6    | 18.2    | 18.2    | 0.68    | 0.96 | 0.25  | 2.30 |

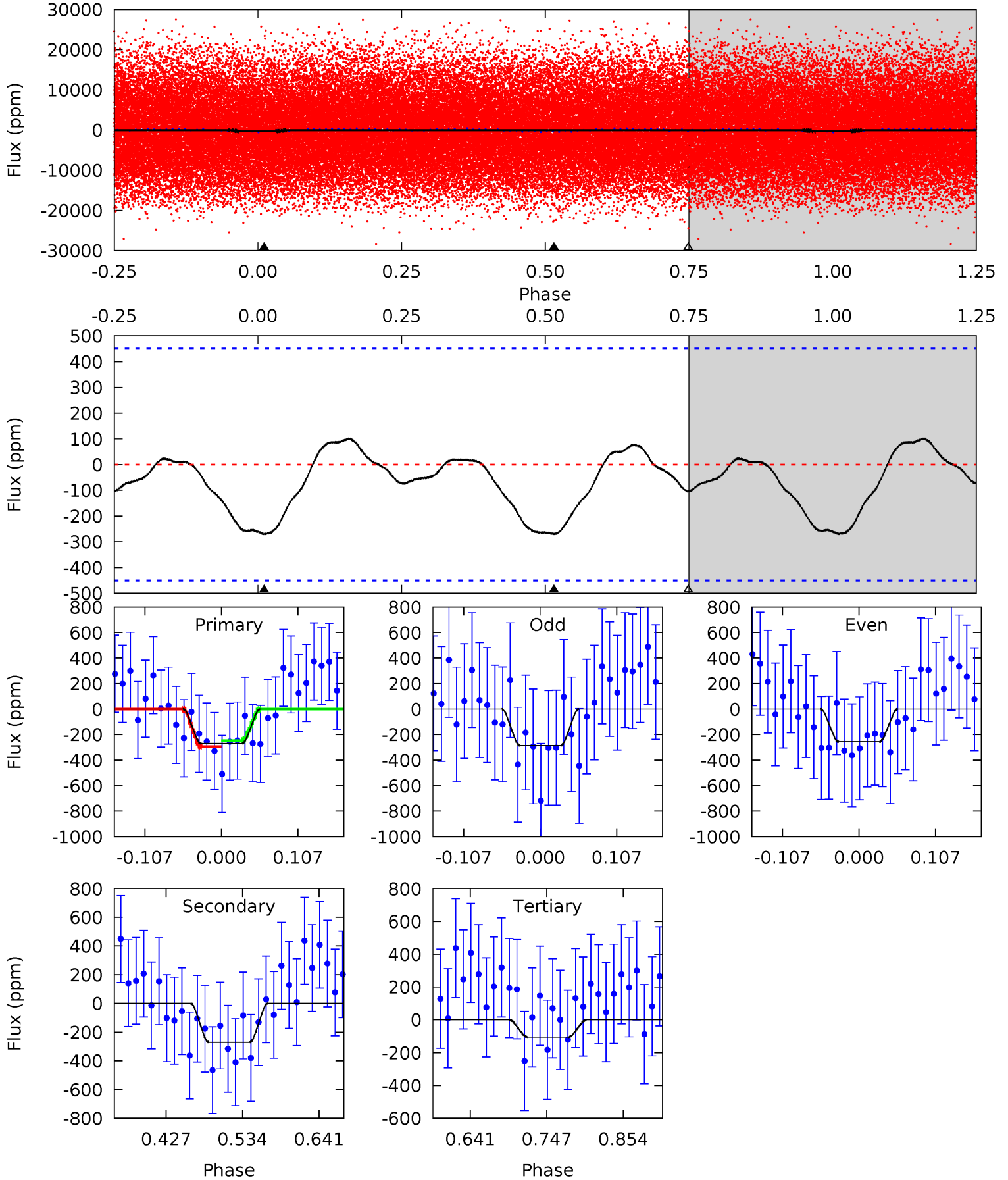




# Alt Model-Shift Uniqueness Test

010532771-01, P = 1.102290 Days, E = 130.622235 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  |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 2.73 | 2.74 | 1.06 | 0   | 4.55            | 1.61            | 0.53             | 1.67    | 2.73    | 1.68    | 2.74    | 0.15    | 1.38 | 0.27  | 0.23 |





### Stellar Parameters For KIC 010532771

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                    | $R$ ( $R_{\odot}$ )       | $M$ ( $M_{\odot}$ )       | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $8014^{+194}_{-361}$ | $3.694^{+0.448}_{-0.112}$ | $0.000^{+0.200}_{-0.400}$ | $3.398^{+0.846}_{-1.572}$ | $2.081^{+0.337}_{-0.506}$ | $0.075^{+0.299}_{-0.031}$                     |
|        | +2%/-5%              | +12%/-3%                  | +inf%/-inf%               | +25%/-46%                 | +16%/-24%                 | +400%/-42%                                    |
| 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 010532771-01 / KOI

| Detrend | Depth (ppm)   | $R_p$ ( $R_{\oplus}$ ) | $T_{\text{max}}$ (K) | $T_{\text{obs}}$ (K) | $A_{\text{obs}}$          |
|---------|---------------|------------------------|----------------------|----------------------|---------------------------|
| DV      | $-240 \pm 13$ | $6.62^{+1.21}_{-1.62}$ | $5338^{+443}_{-666}$ | $6784^{+364}_{-382}$ | $2.192^{+1.444}_{-0.621}$ |
| Alt.    | $-271 \pm 99$ | $6.54^{+1.29}_{-1.74}$ | $5324^{+482}_{-708}$ | $7032^{+905}_{-954}$ | $2.558^{+2.109}_{-1.135}$ |

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

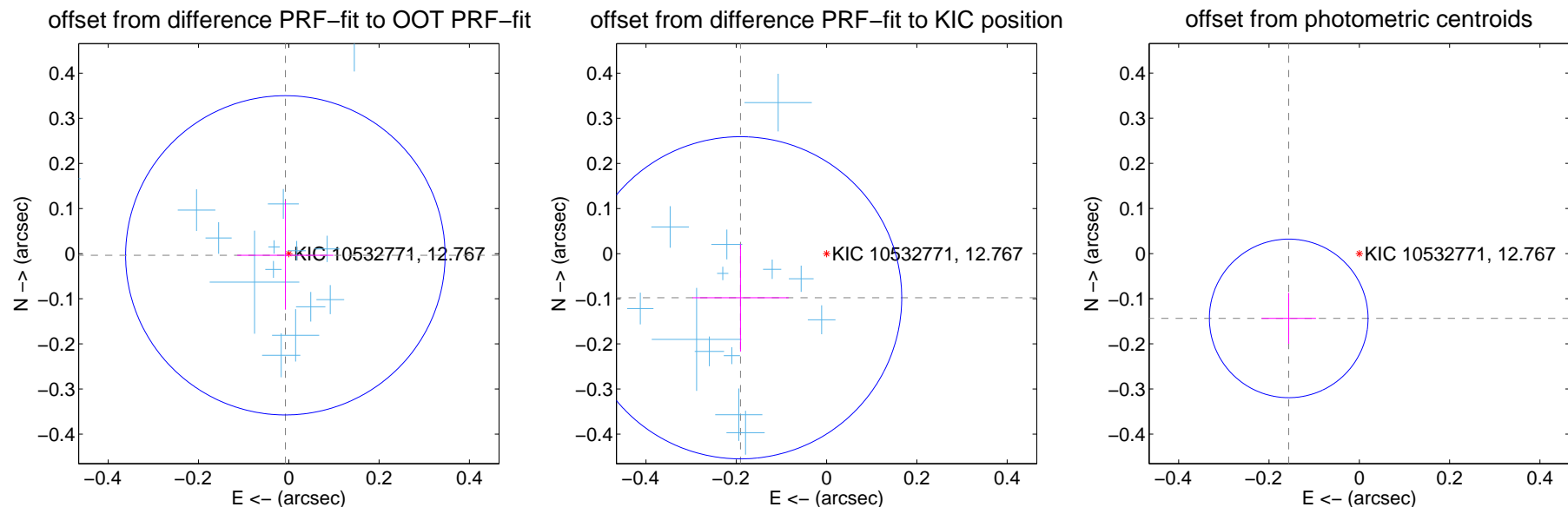
## DV Centroid Data

Supplemental centroid analysis for 010532771-01. Kepler magnitude: 12.77. Transit SNR 12.76

There are 16 quarters with good PRF difference image offsets

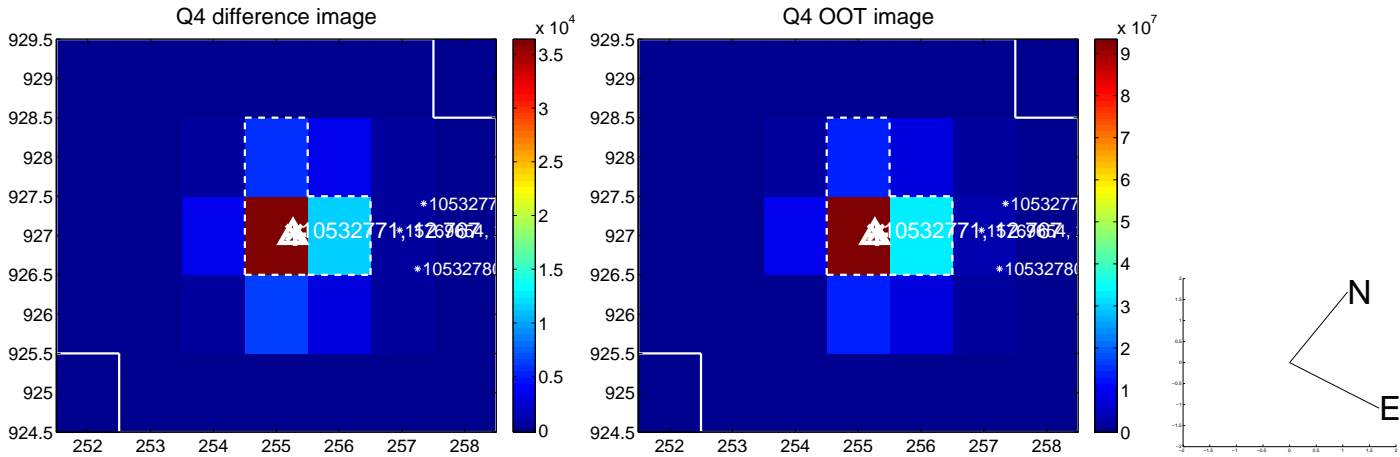
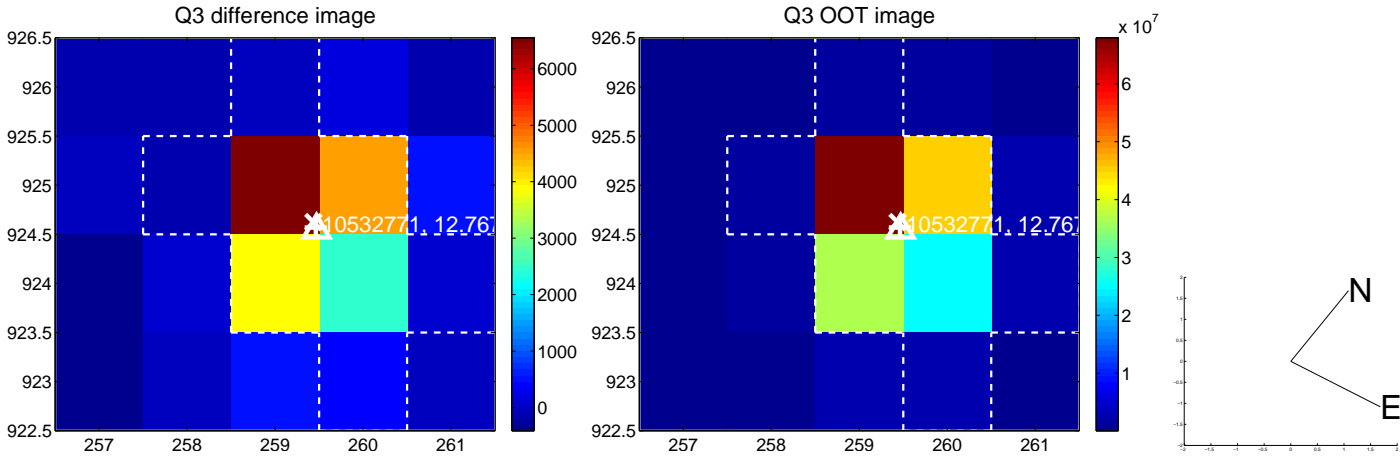
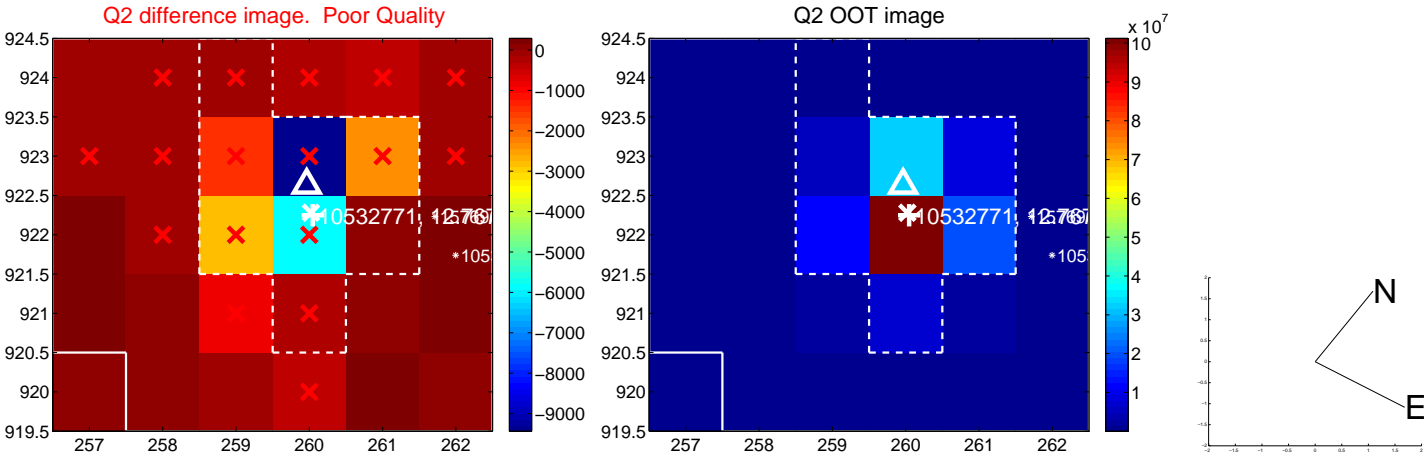
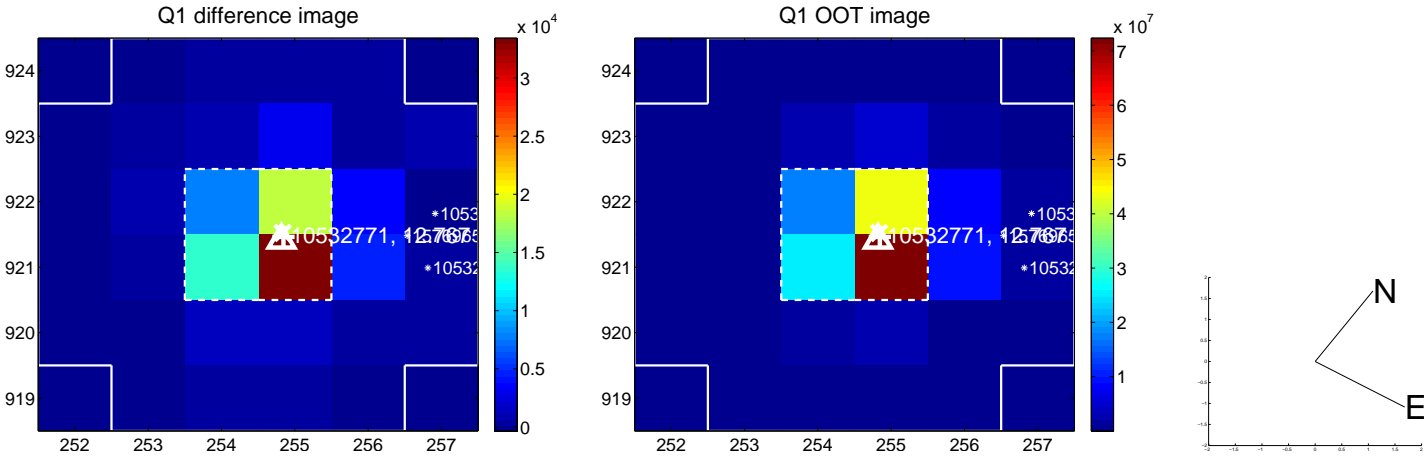
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.008 \pm 0.118$  | 0.07                | $0.008 \pm 0.107$ | $-0.004 \pm 0.121$ |
| PRF-fit source offset from KIC position | $0.214 \pm 0.119$  | 1.80                | $0.191 \pm 0.107$ | $-0.098 \pm 0.119$ |
| photometric centroid source offset      | $0.21 \pm 0.06$    | 3.62                | $0.16 \pm 0.06$   | $-0.14 \pm 0.06$   |

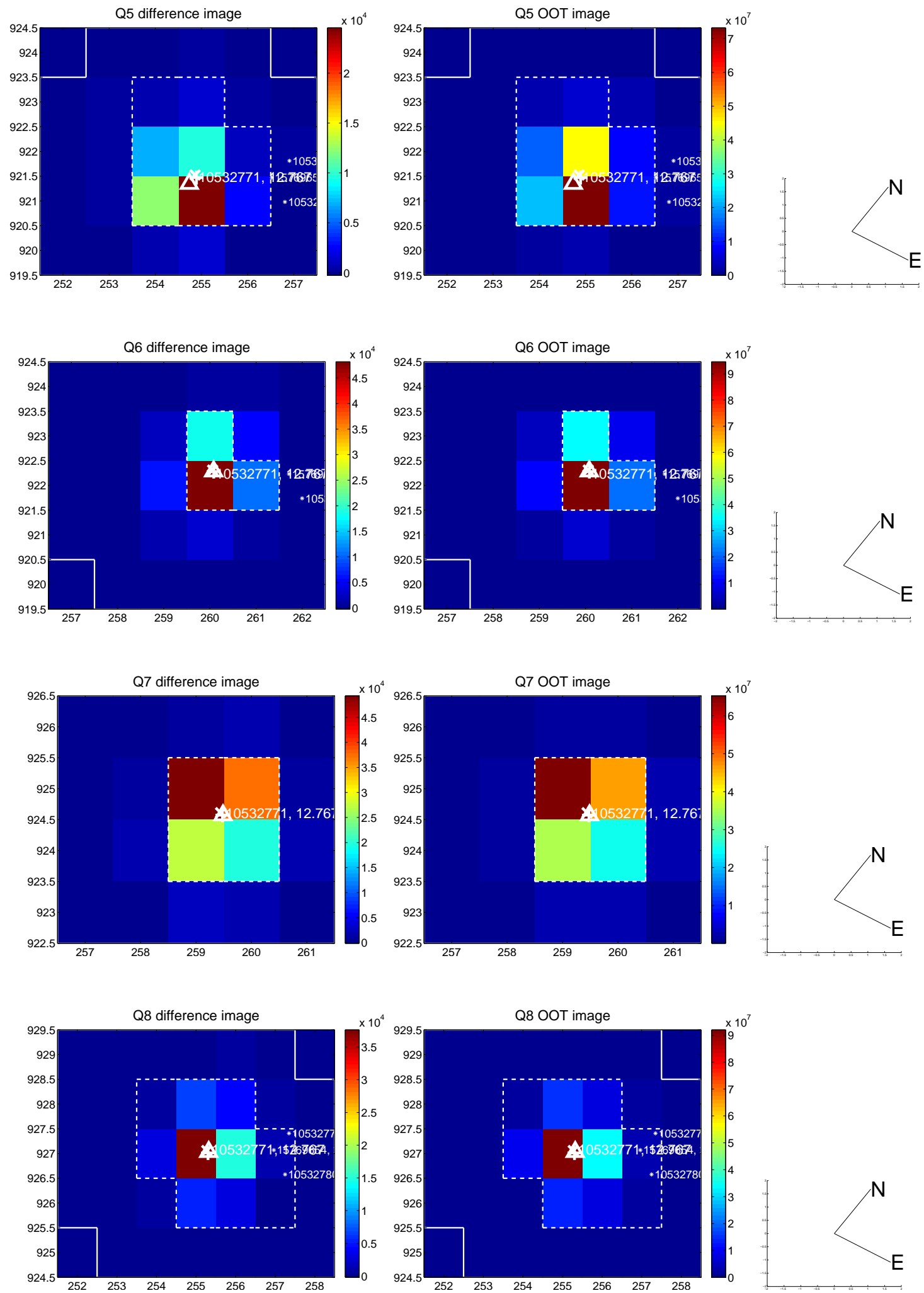


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

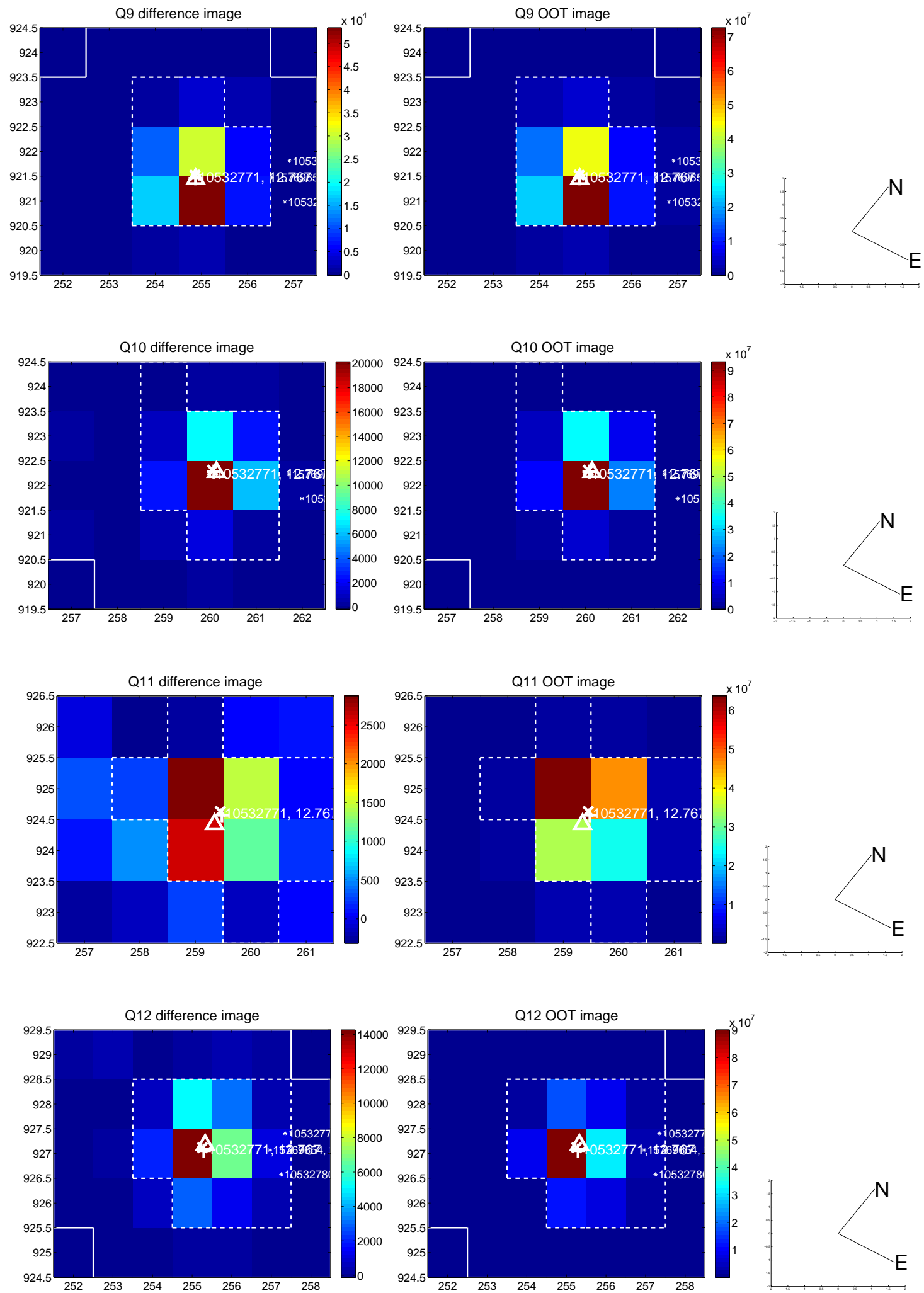


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

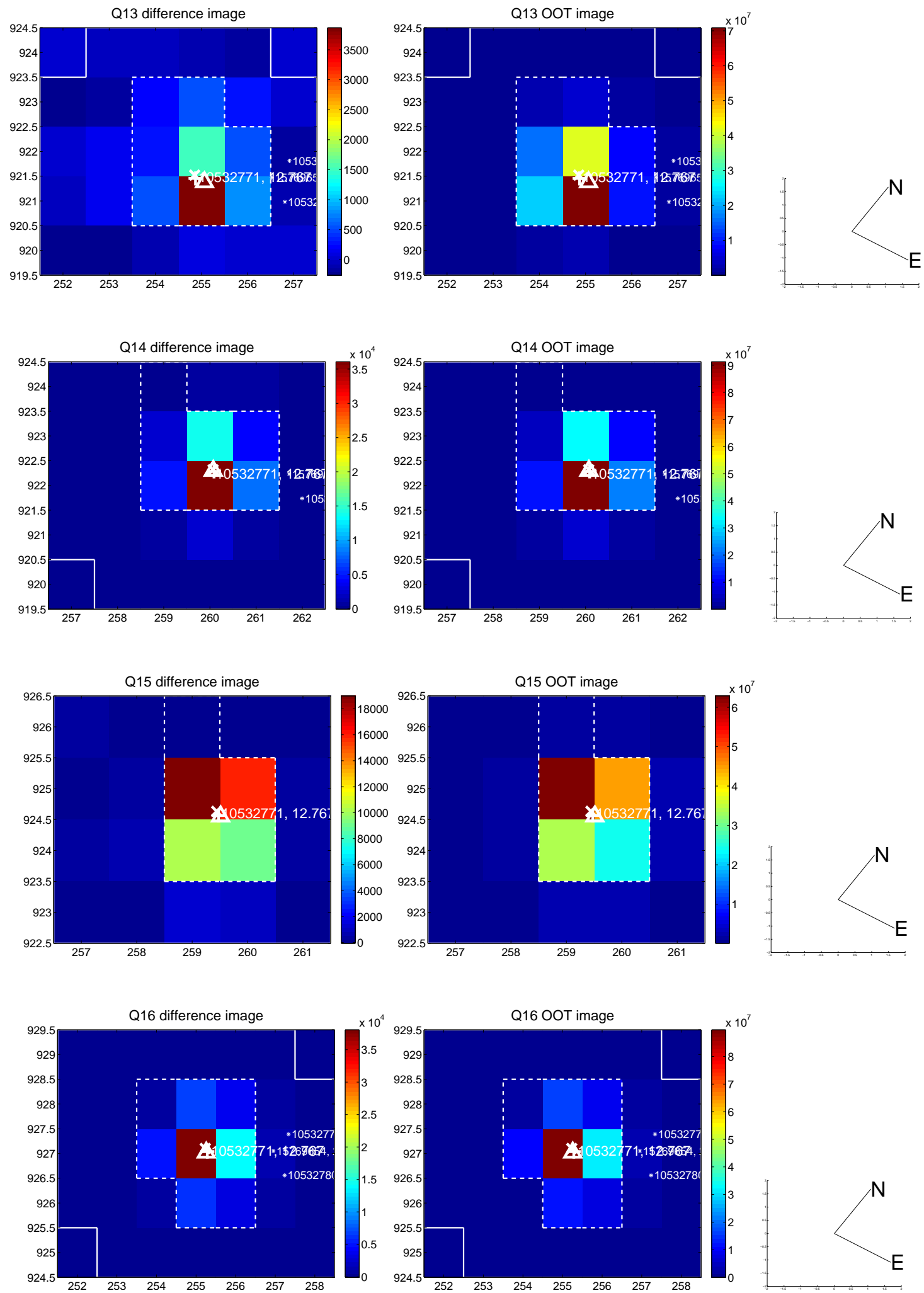




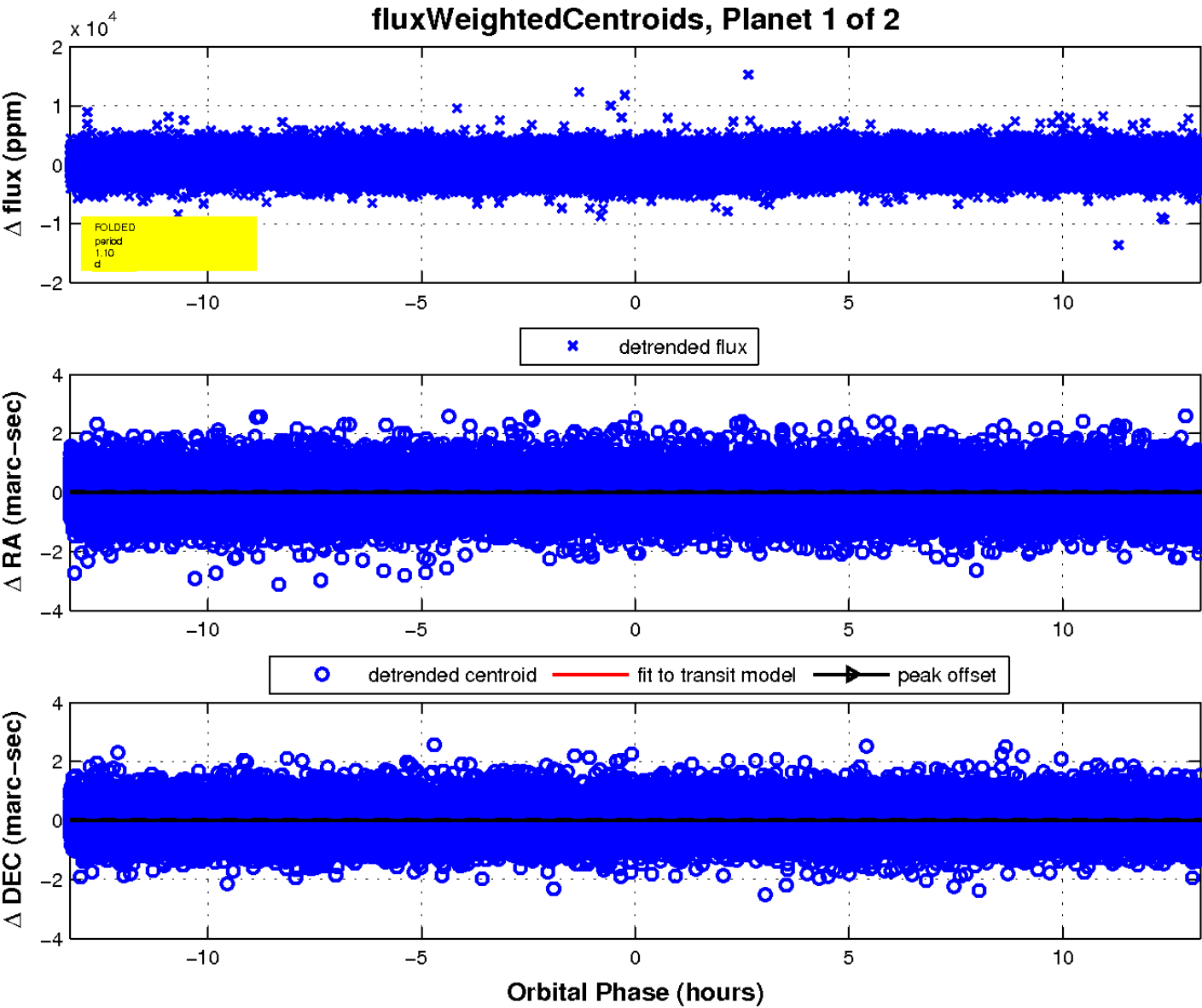
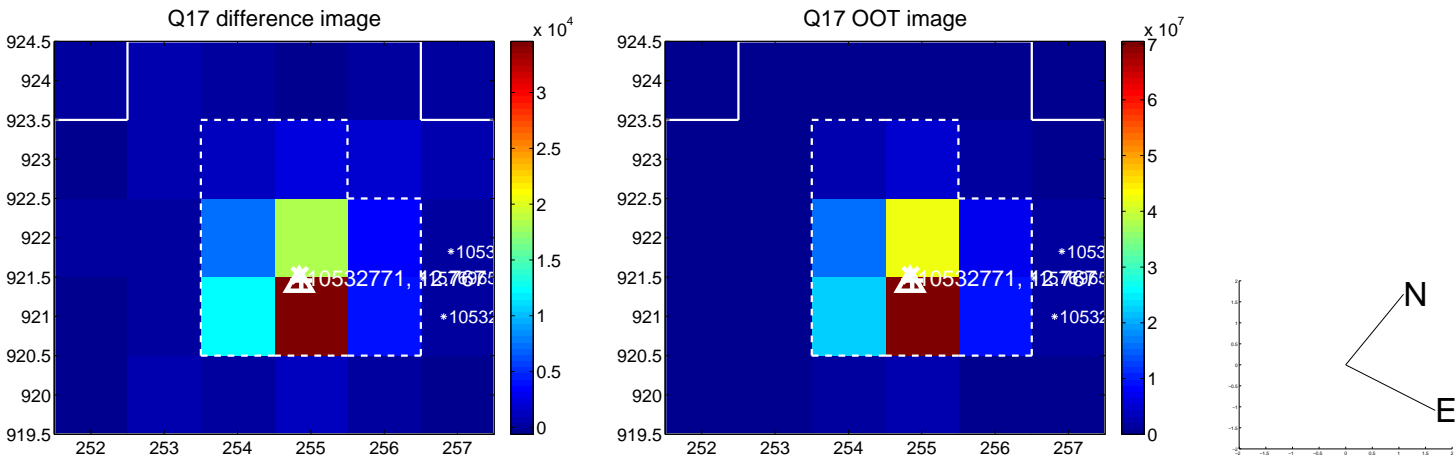
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

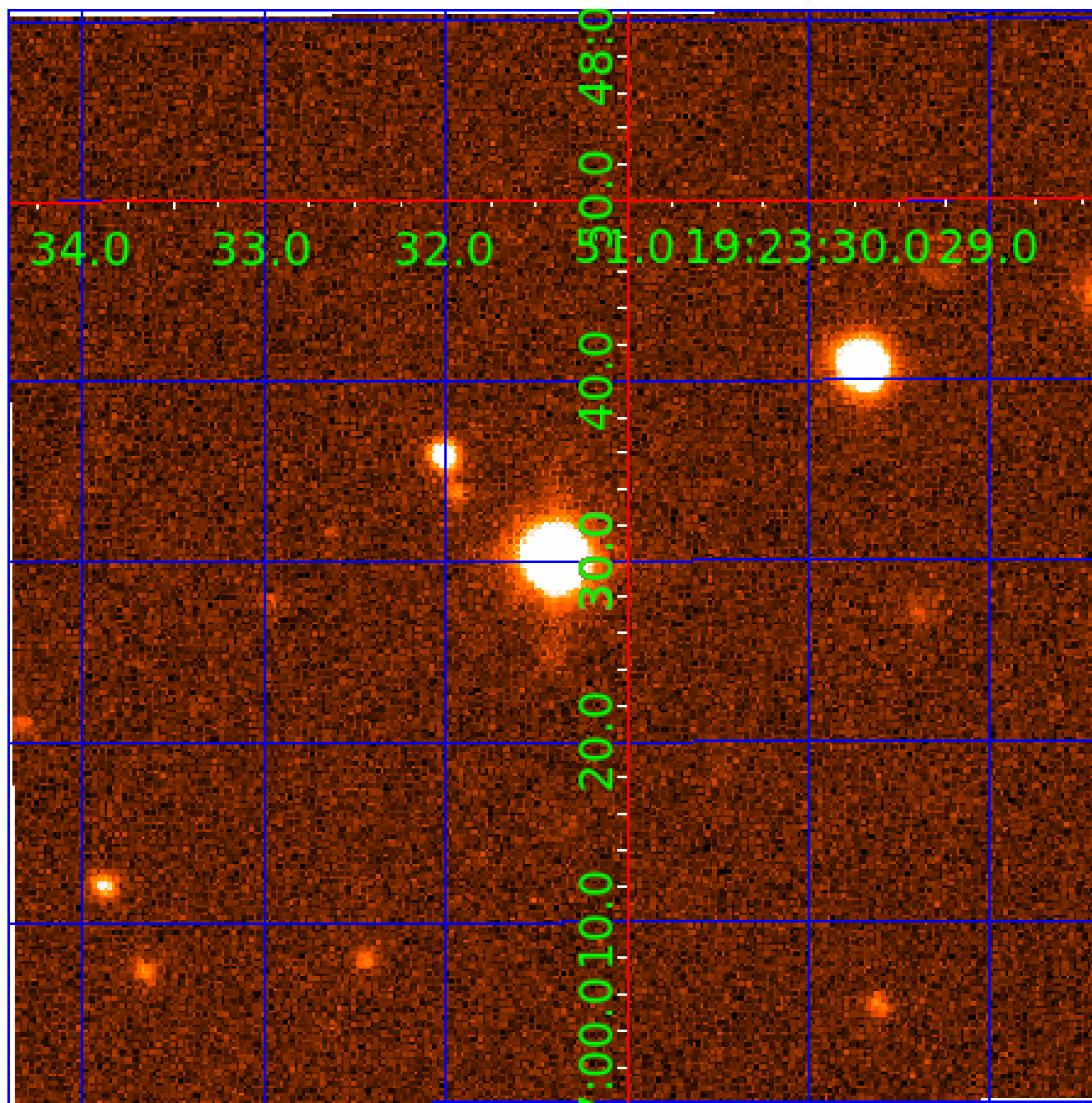


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 010532771

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 010532771-01 | OBS      | No   | 1.102272      | 131.739079   | 252.6       | 5.369            | 12.9 | 12.8 | 3.40                        | 8014            | 7.06                   | 59986.76               |
| 010532771-02 | OBS      | No   | 1.102275      | 132.279935   | 263.2       | 4.345            | 13.2 | 15.5 | 3.40                        | 8014            | 5.58                   | 59986.58               |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments                       |
|--------------|----------|------|-------|---|---|---|---|--------------------------------|
| 010532771-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT |
| 010532771-02 | 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.

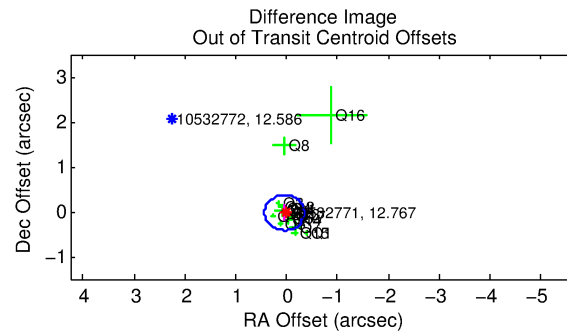
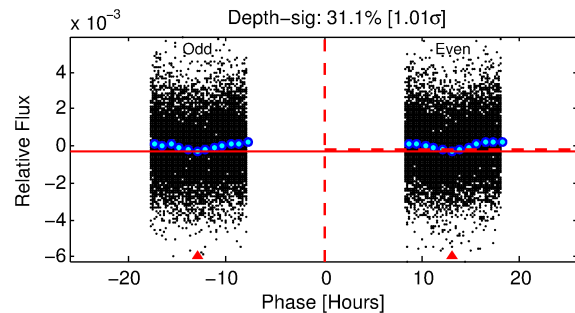
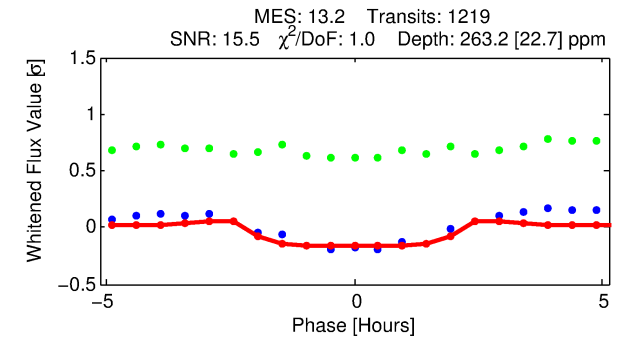
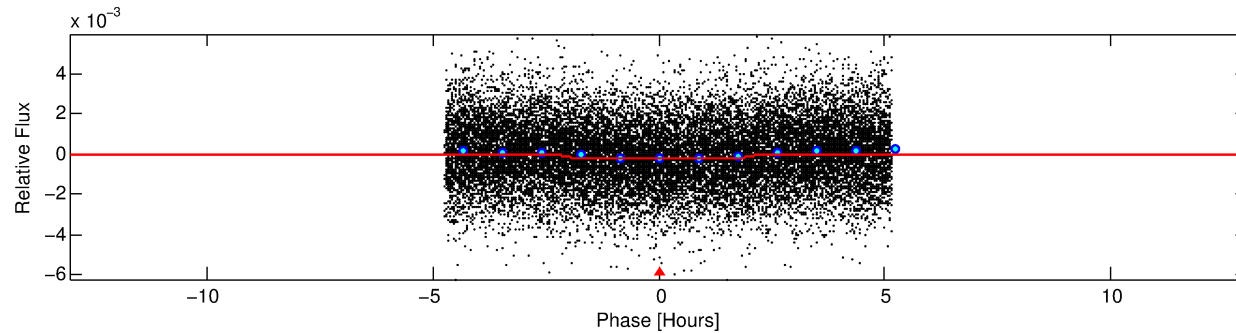
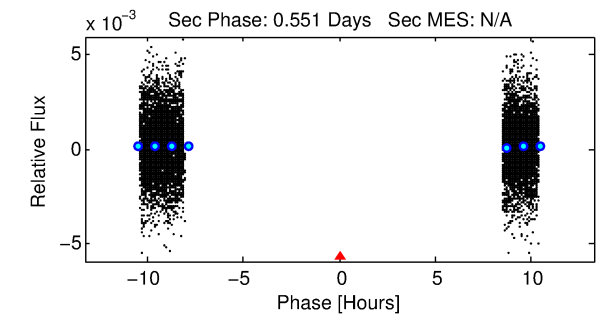
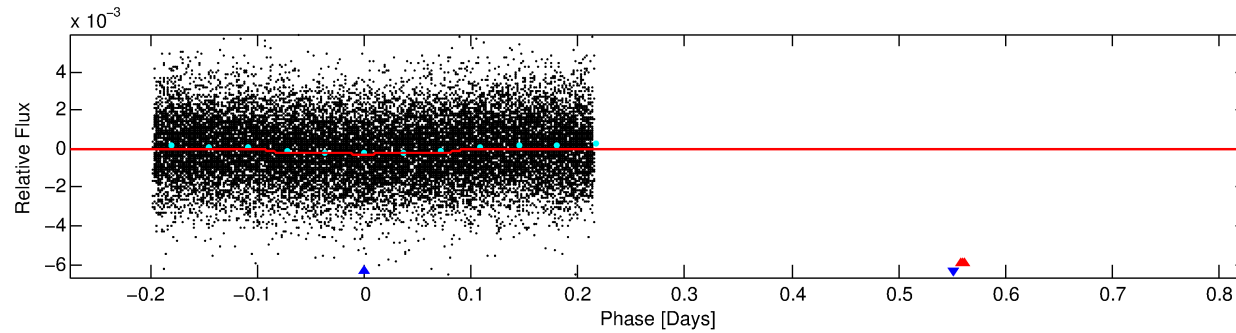
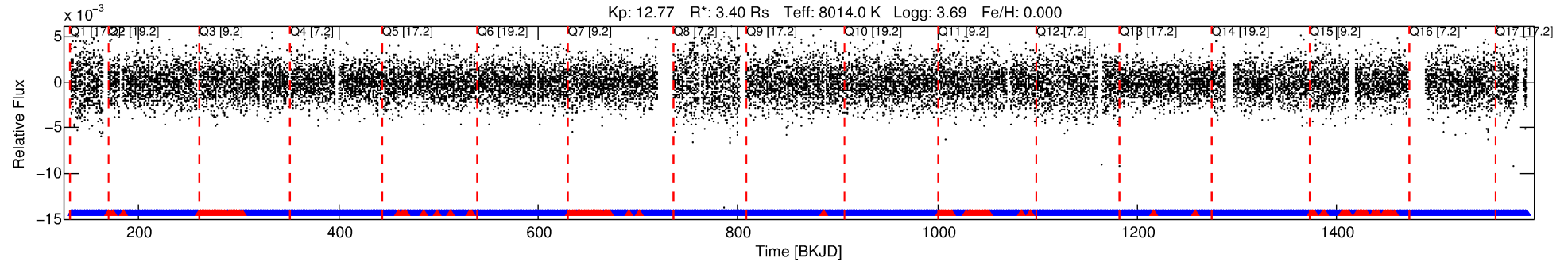
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010532771-02

No Significant Match Found

# DV One-Page Summary

KIC: 10532771 Candidate: 2 of 2 Period: 1.102 d



## DV Fit Results:

Period = 1.10227 [0.00001] d  
Epoch = 132.2799 [0.0030] BKJD  
Rp/R\* = 0.0150 [0.0211]  
a/R\* = 2.03 [12.07]  
b = 0.18 [42.52]  
Seff = 59986.58 [46485.78]  
Teff = 3991 [773] K  
Rp = 5.58 [8.23] Re  
a = 0.0267 [0.0123] AU

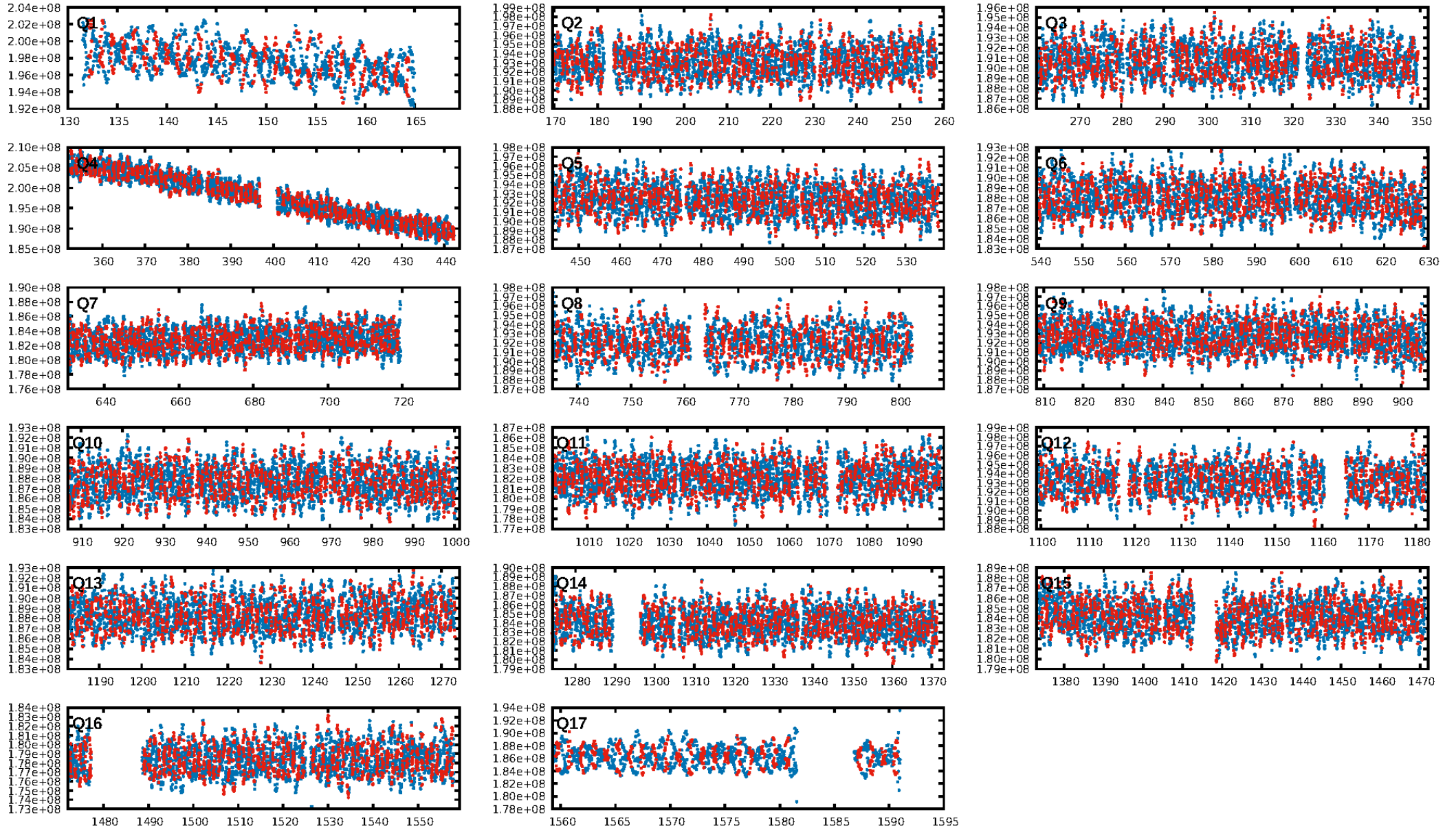
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.87 [1017/1165]  
GhostDiagnostic-chr: 1.006  
Centroid-sig: 0.0%  
Centroid-so: 0.245 arcsec [4.87σ]  
OotOffset-rm: 0.049 arcsec [0.37σ]  
KicOffset-rm: 0.262 arcsec [2.23σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:12:37 Z

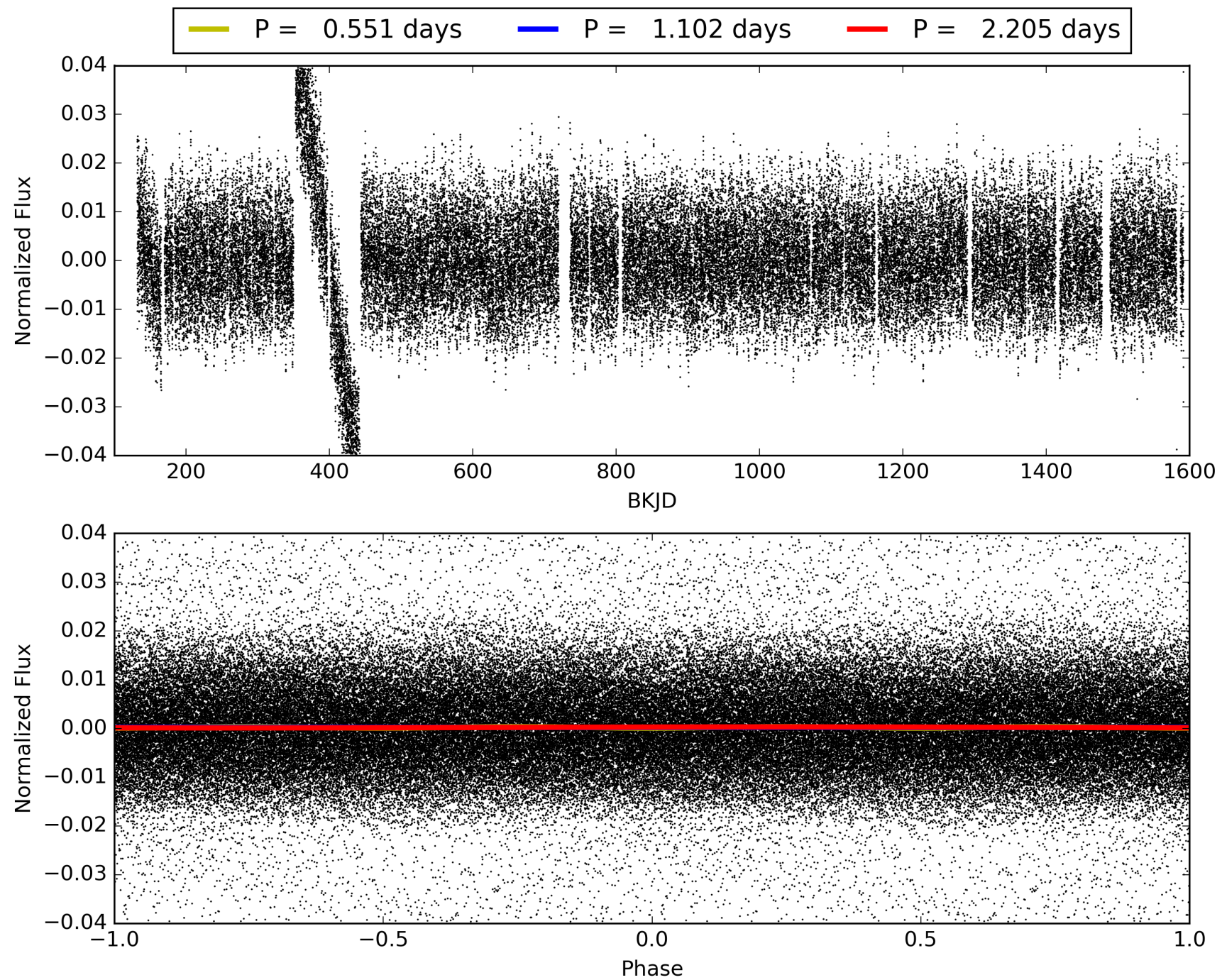
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010532771-02, PDC Light Curves





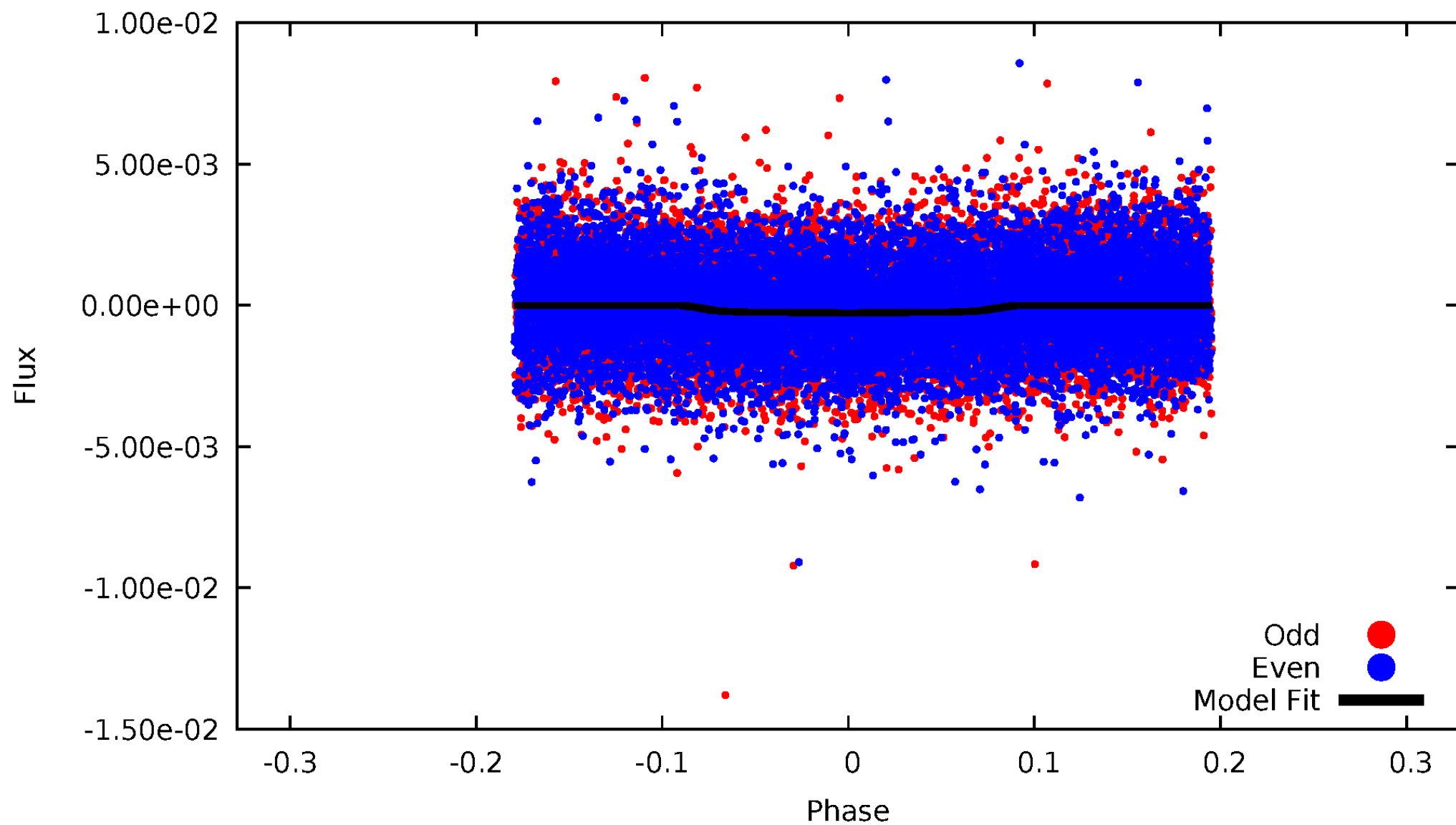
TCE 010532771-02





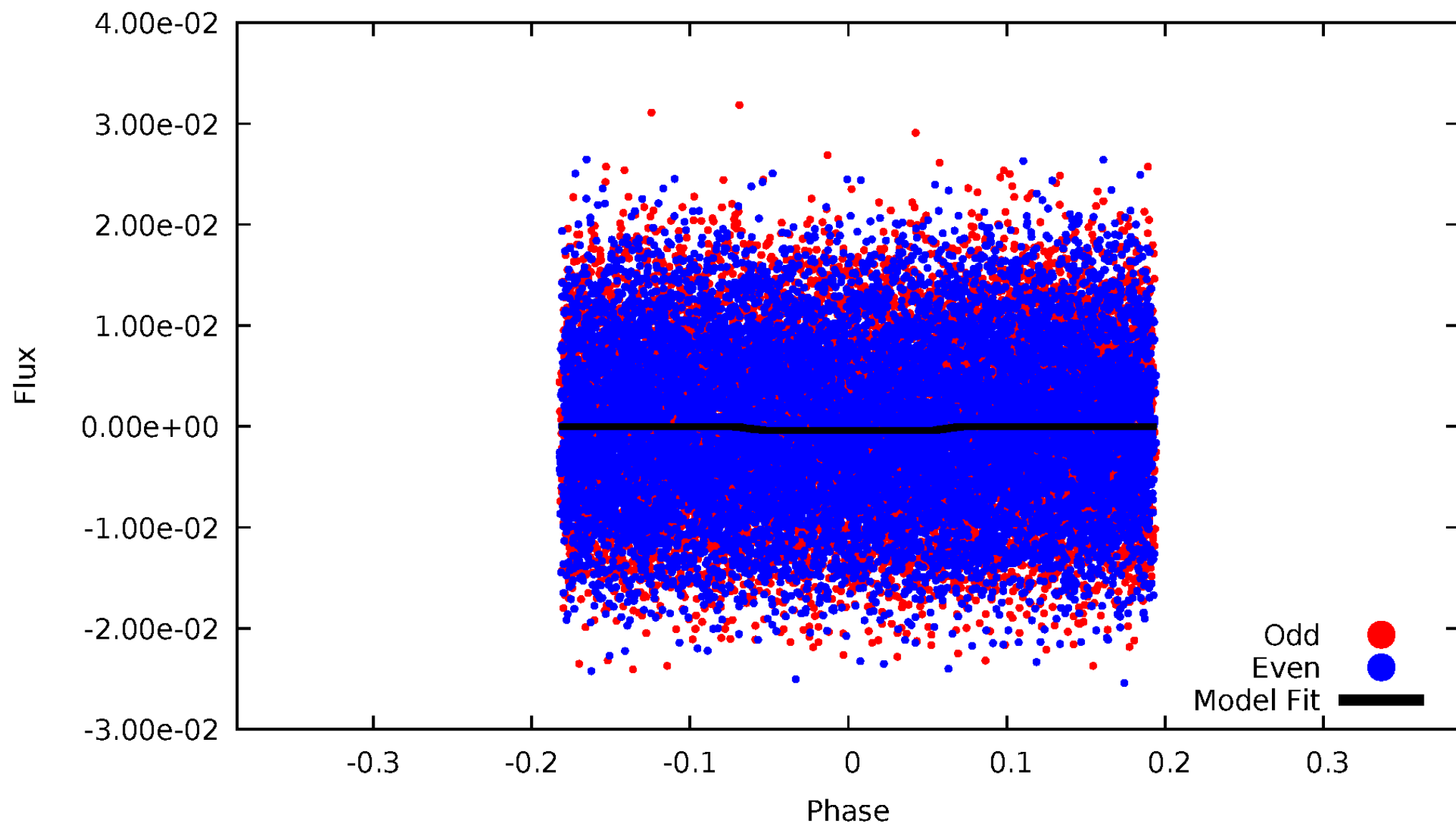
# DV Odd/Even

TCE 010532771-02



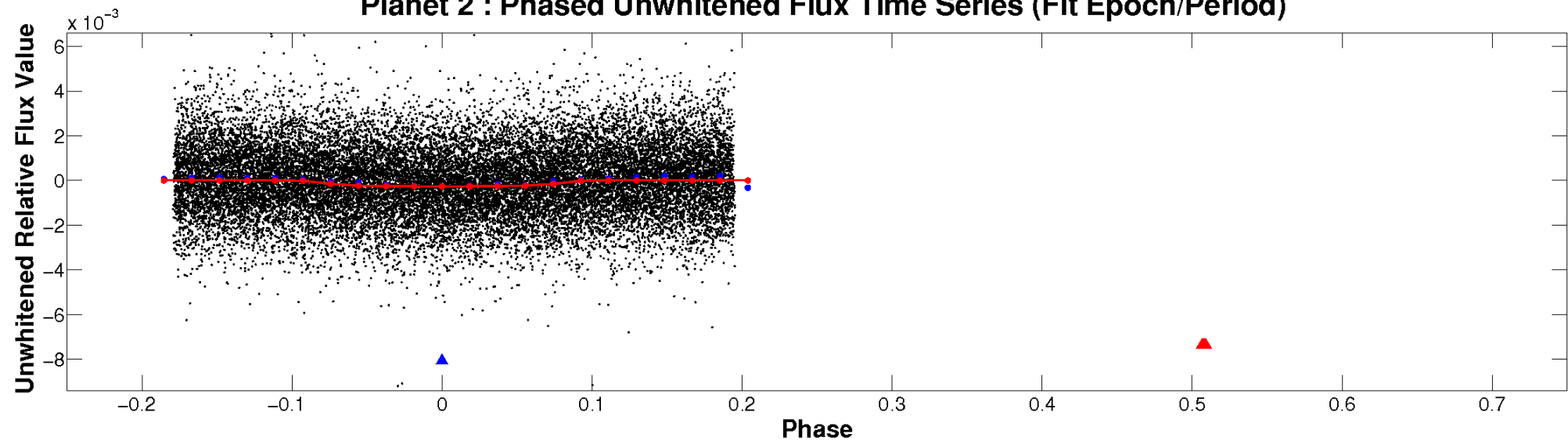
ALT Odd/Even

TCE 010532771-02

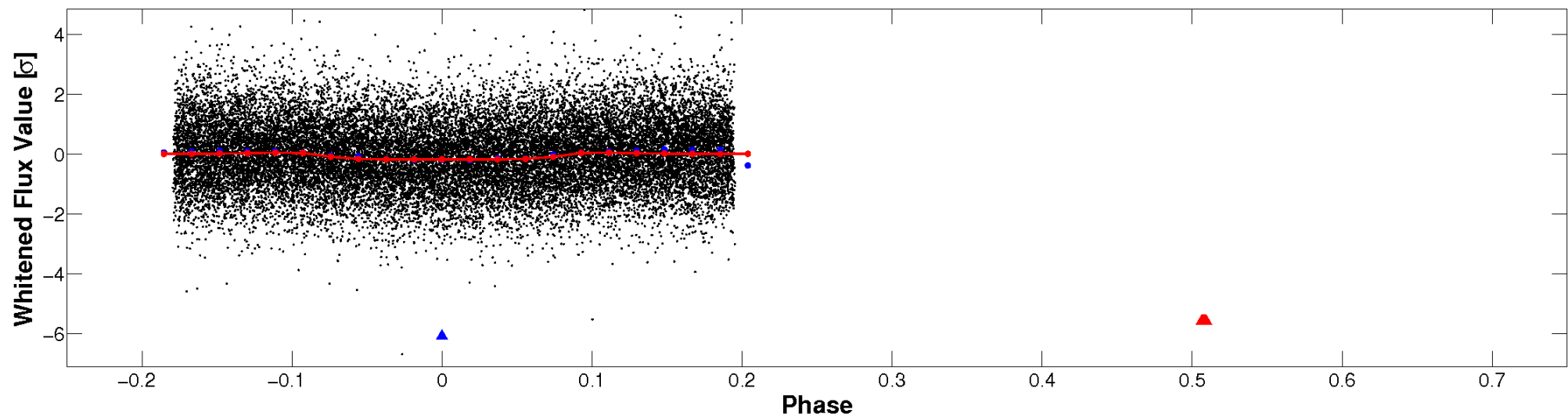


# Non-Whitened Vs. Whitened Light Curve

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

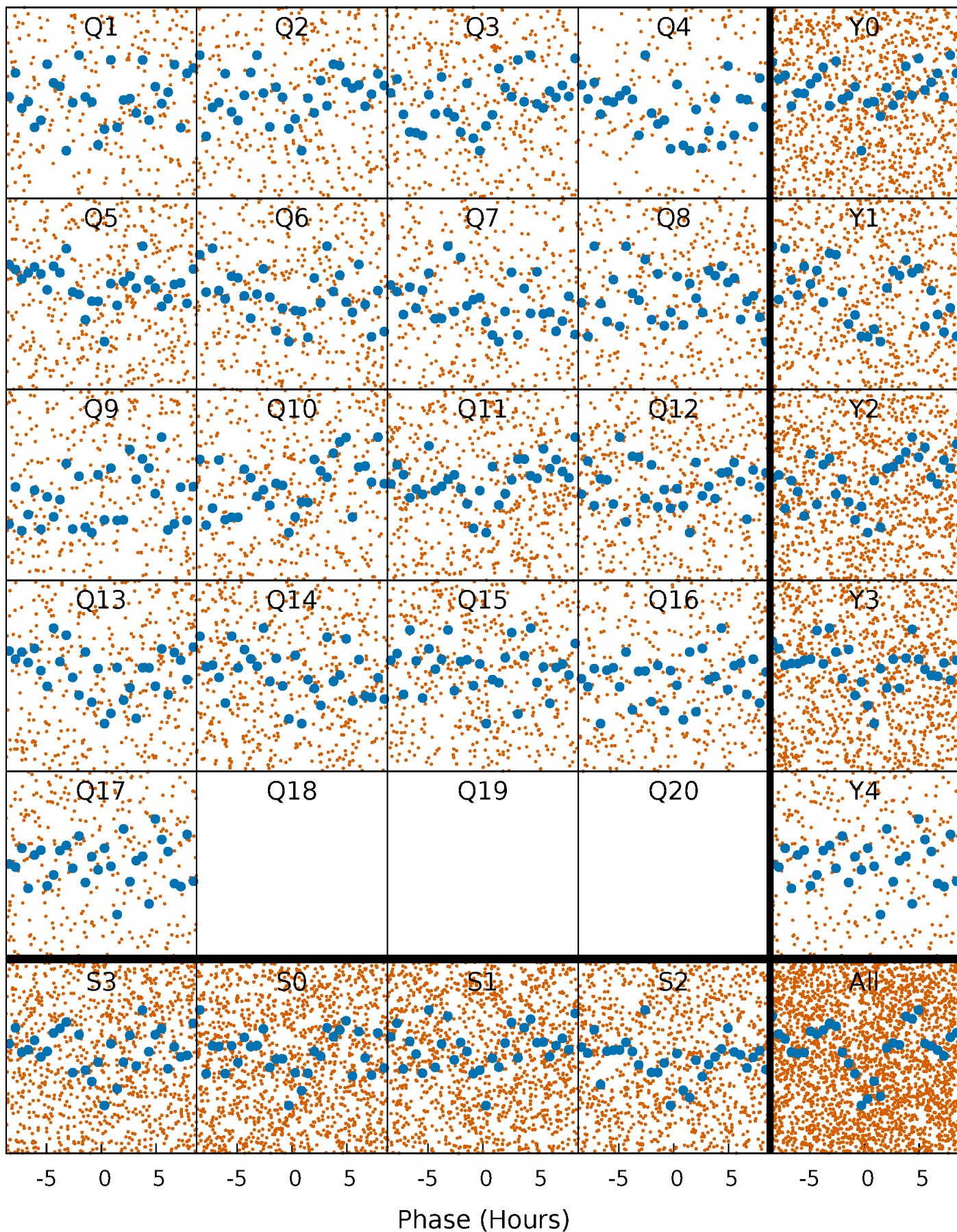


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



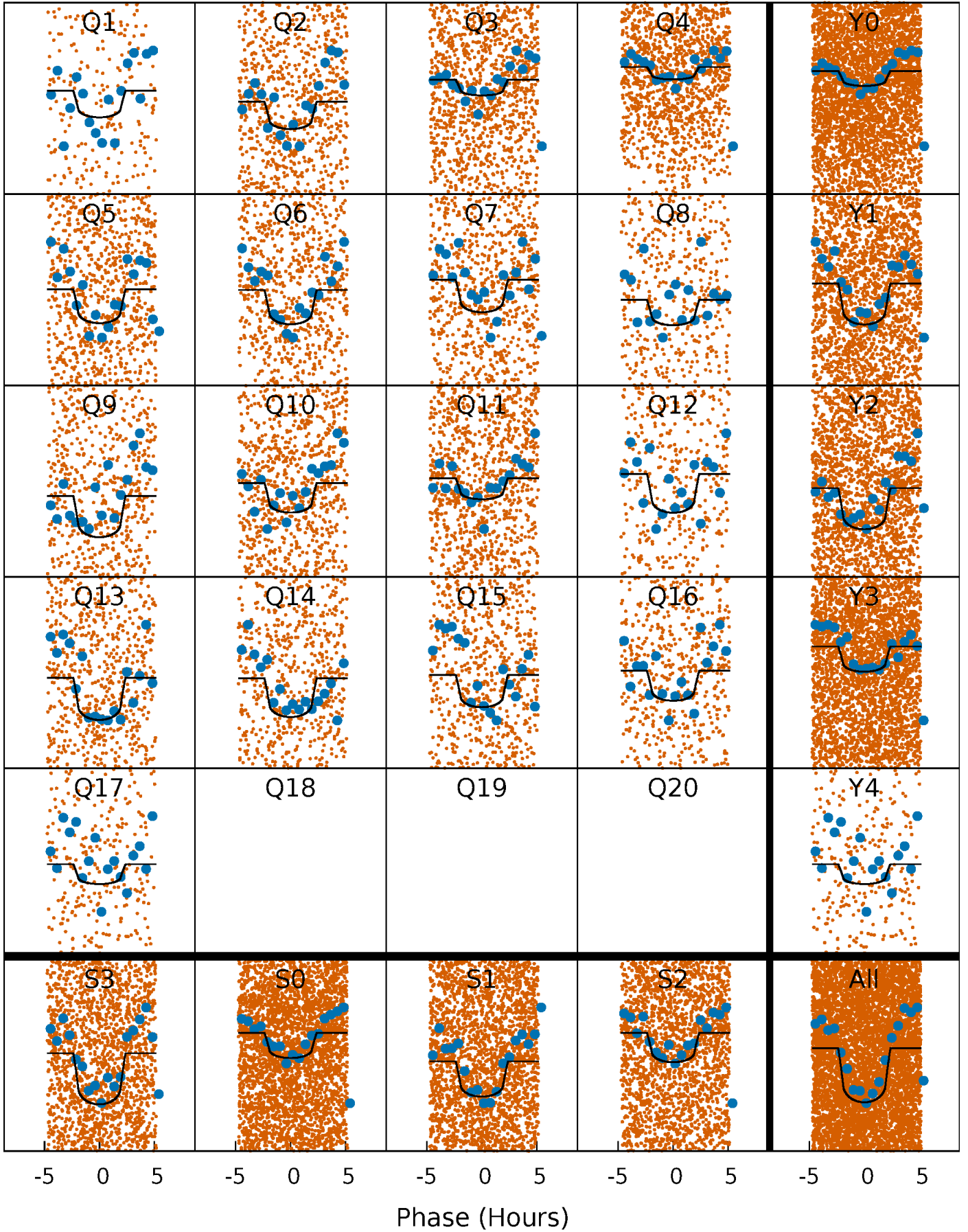
# PDC Quarter-Phased Transit Curves

TCE 010532771-02   P= 1.102275 Days    $T_0=132.279935$  (BKJD)



# DV Quarter-Phased Transit Curves

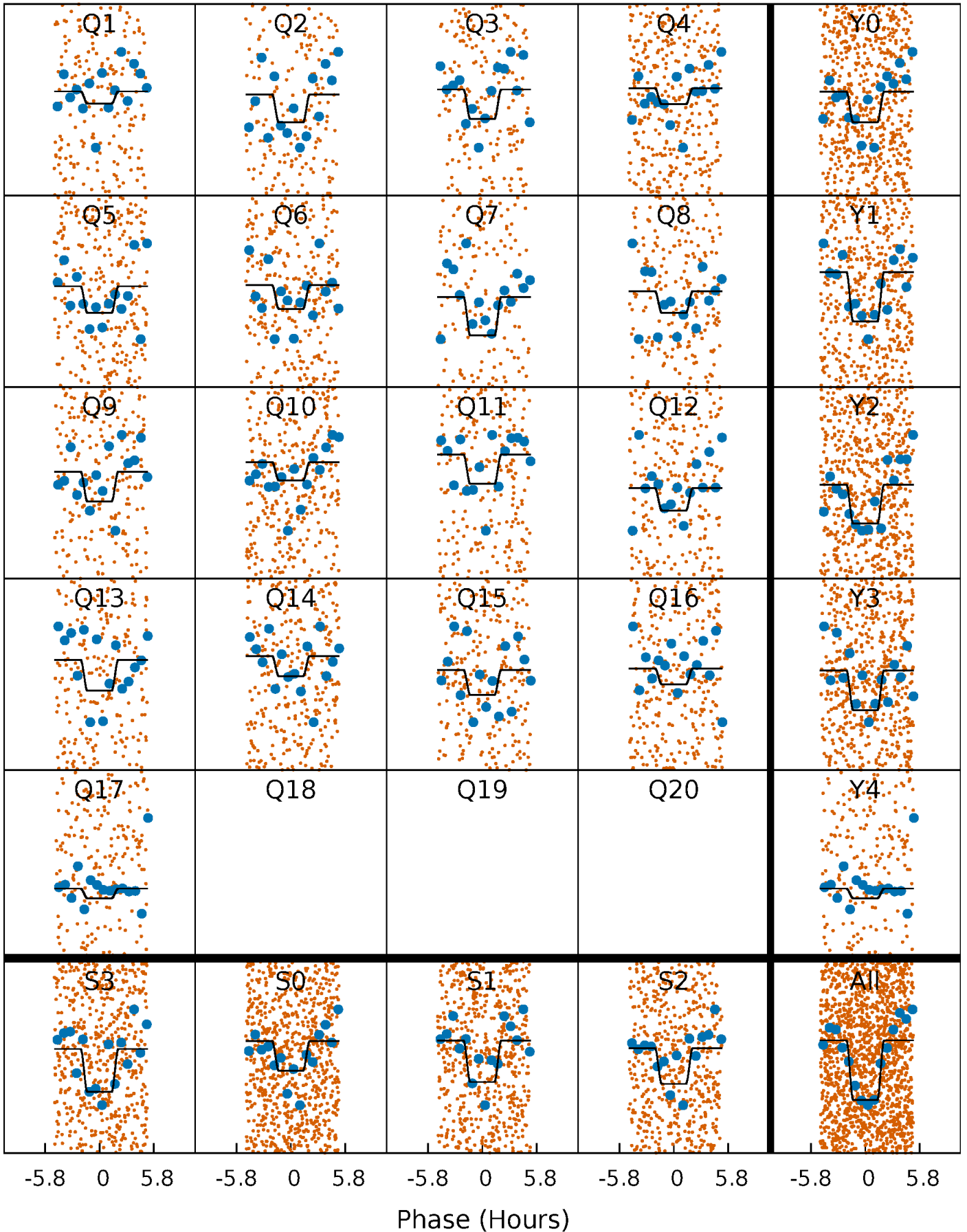
TCE 010532771-02   P= 1.102275 Days    $T_0=132.279935$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 010532771-02     $P = 1.102268$  Days     $T_0 = 132.286250$  (BKJD)

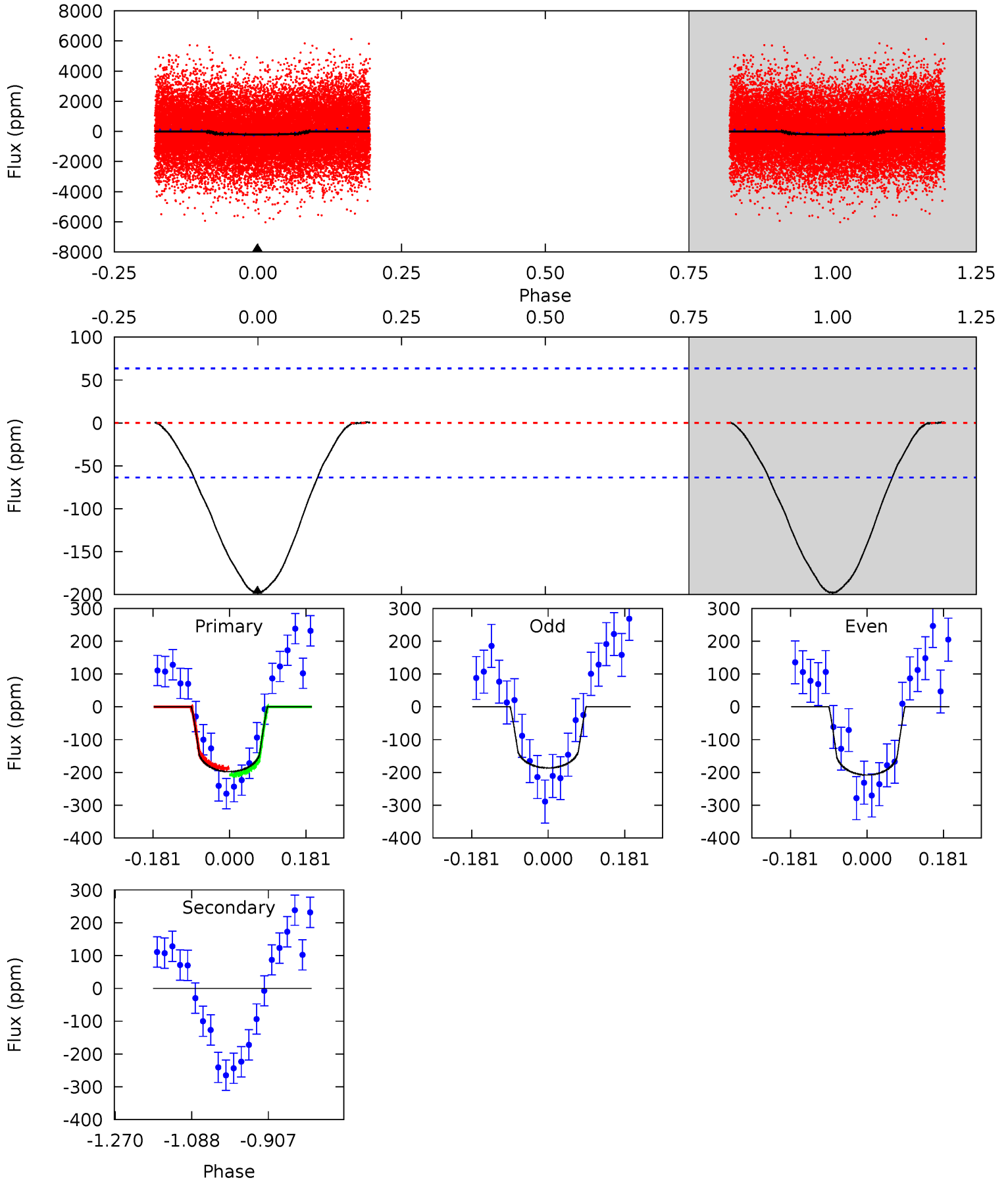




# DV Model-Shift Uniqueness Test

010532771-02, P = 1.102275 Days, E = 131.177660 Days

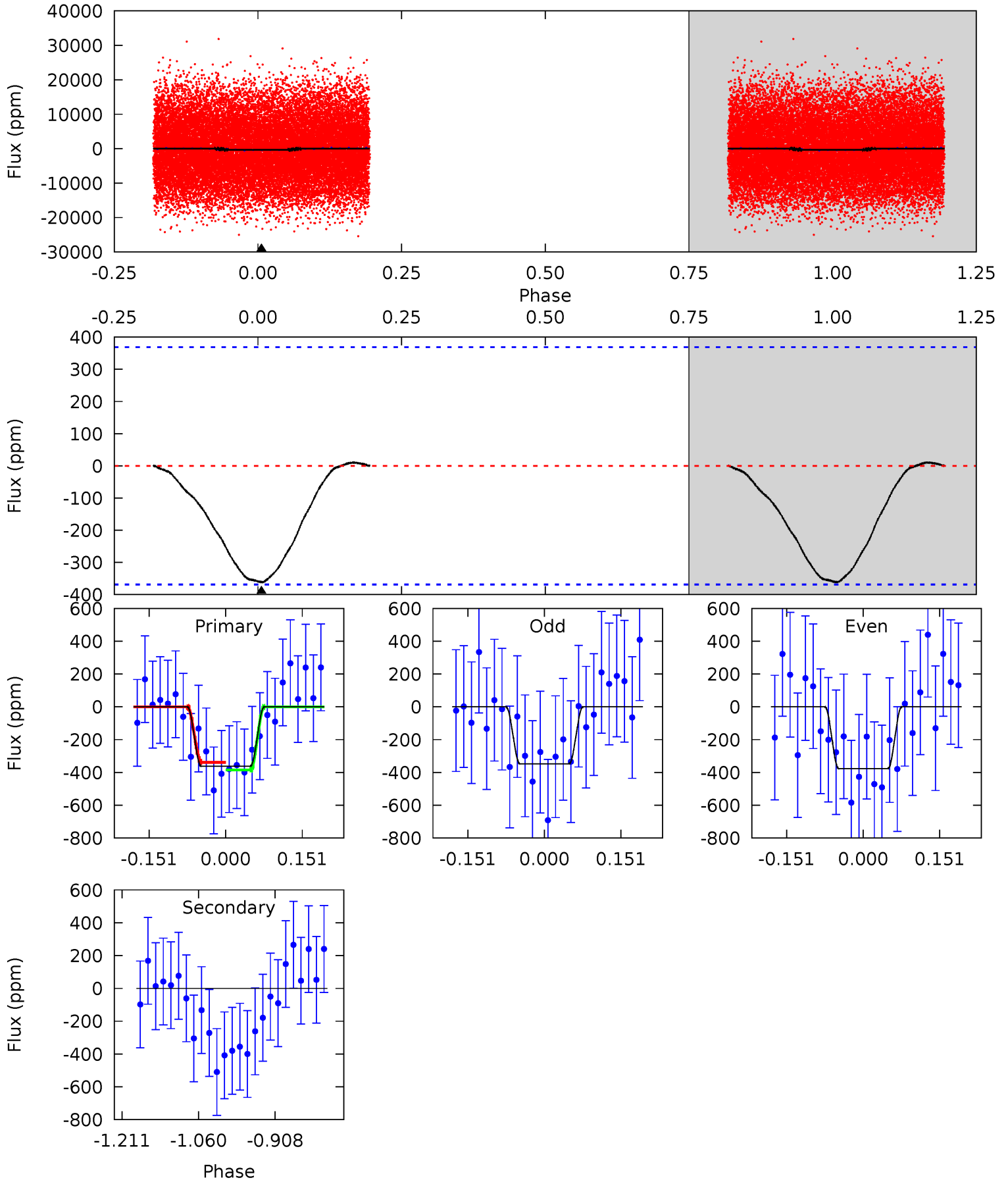
| Pri  | Sec | Ter | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.8 | 0   | 0   | 0   | 4.44            | 1.34            | 0.07             | 13.8    | 13.8    | 0       | 0       | 0.75    | 1.07 | 0.00  | 0.72 |



# Alt Model-Shift Uniqueness Test

010532771-02, P = 1.102268 Days, E = 131.183982 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  |
|------|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 4.39 | 0   | 0   | 0   | 4.48            | 1.43            | 0.16             | 4.39    | 4.39    | 0       | 0       | 0.18    | 1.01 | 0.03  | 0.28 |



### Stellar Parameters For KIC 010532771

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $8014^{+194}_{-361}$ | $3.694^{+0.448}_{-0.112}$ | $0.000^{+0.200}_{-0.400}$ | $3.398^{+0.846}_{-1.572}$ | $2.081^{+0.337}_{-0.506}$ | $0.075^{+0.299}_{-0.031}$                 |
|        | +2%/-5%              | +12%/-3%                  | +inf%/-inf%               | +25%/-46%                 | +16%/-24%                 | +400%/-42%                                |
| 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 010532771-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$    | $A_{\text{obs}}$           |
|---------|-------------|------------------------|----------------------|-------------------------|----------------------------|
| DV      | $0 \pm 14$  | $6.89^{+6.74}_{-4.70}$ | $5316^{+489}_{-625}$ | $-4444^{+1017}_{-523}$  | $-0.003^{+0.197}_{-0.197}$ |
| Alt.    | $0 \pm 82$  | $8.00^{+7.11}_{-5.08}$ | $5347^{+447}_{-678}$ | $-4412^{+9195}_{-1401}$ | $0.006^{+0.773}_{-0.850}$  |

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

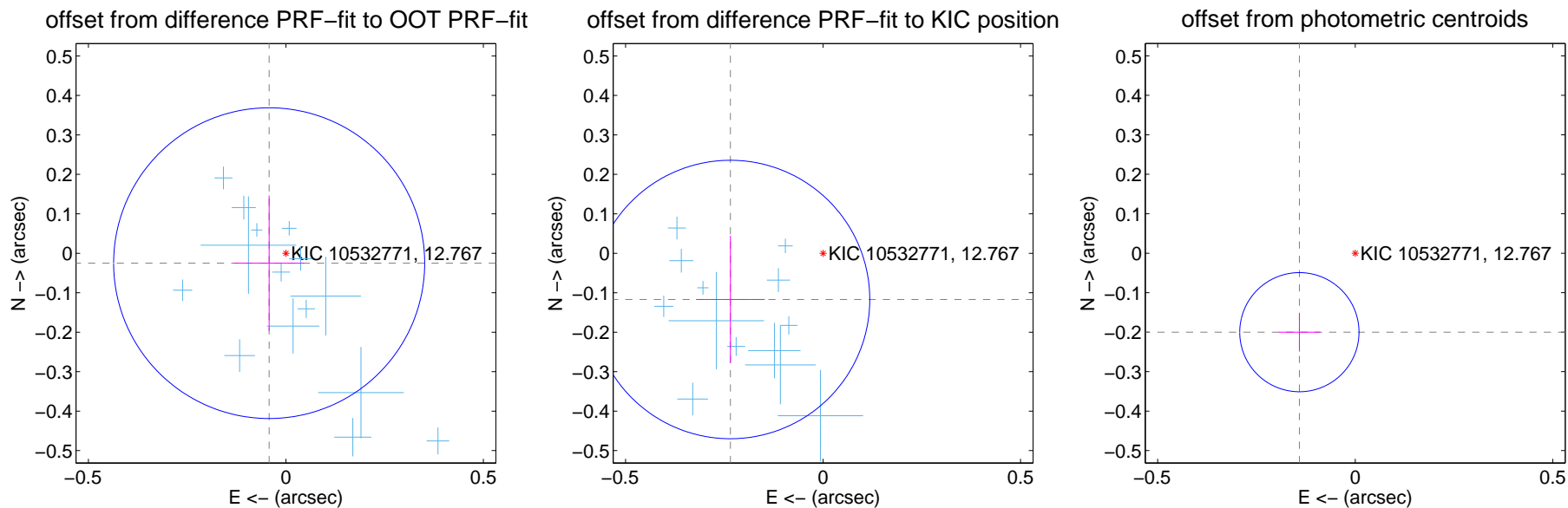
## DV Centroid Data

Supplemental centroid analysis for 010532771-02. Kepler magnitude: 12.77. Transit SNR 15.48

There are 17 quarters with good PRF difference image offsets

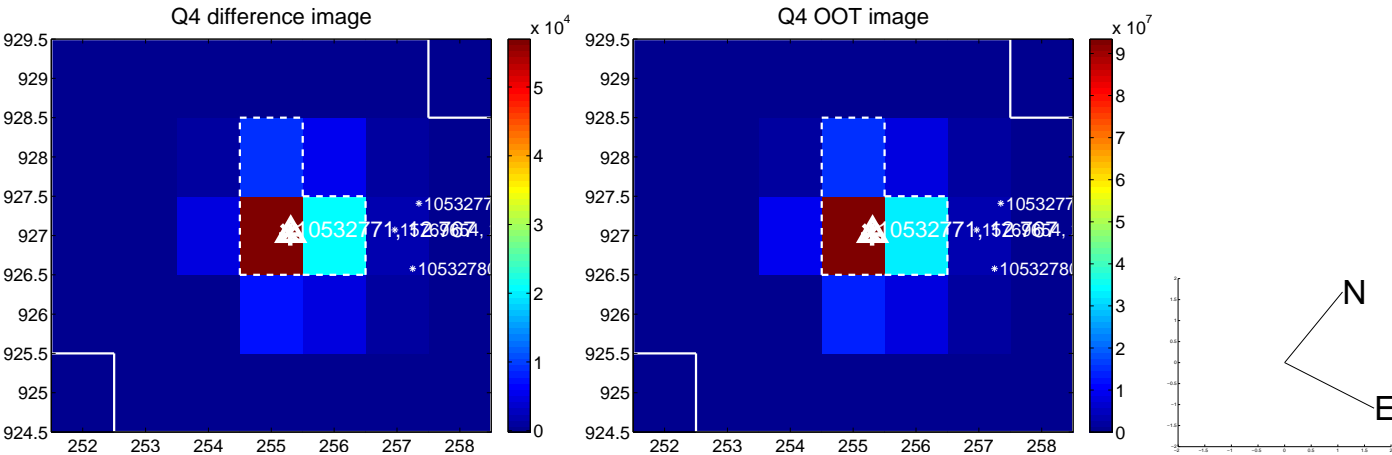
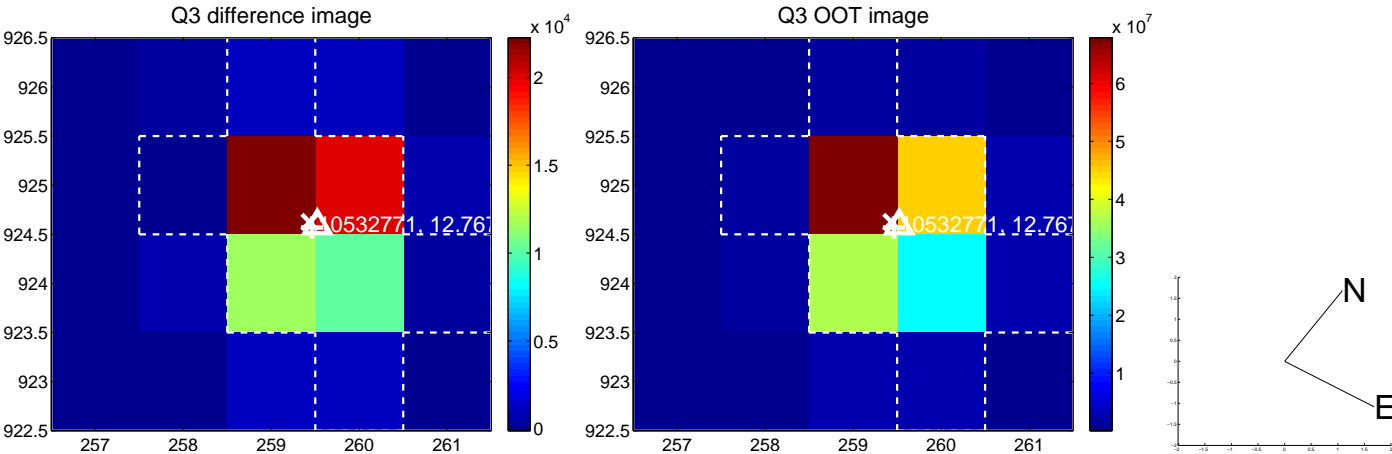
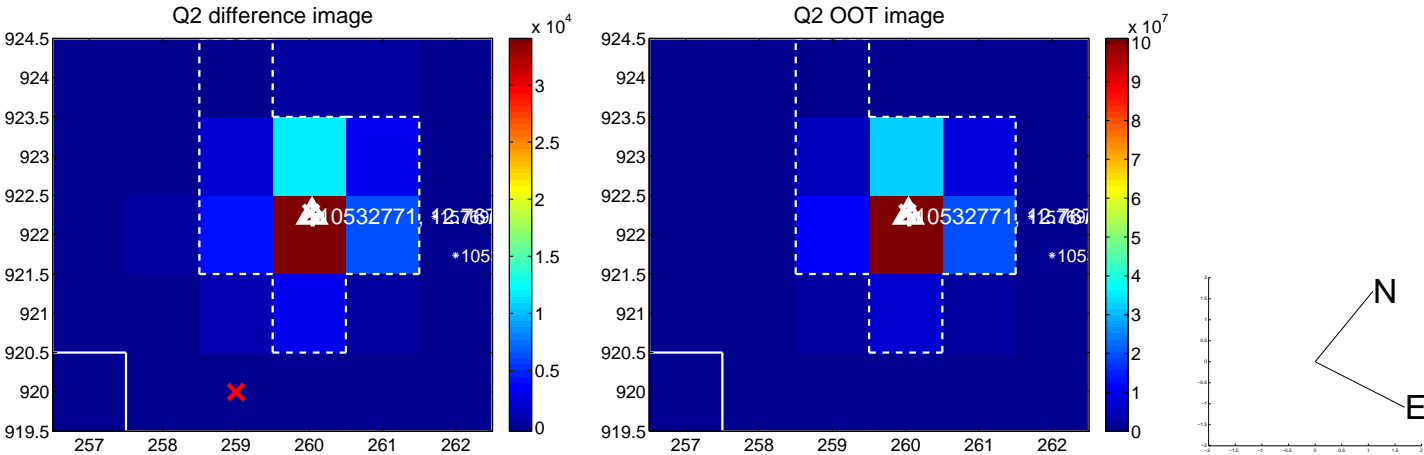
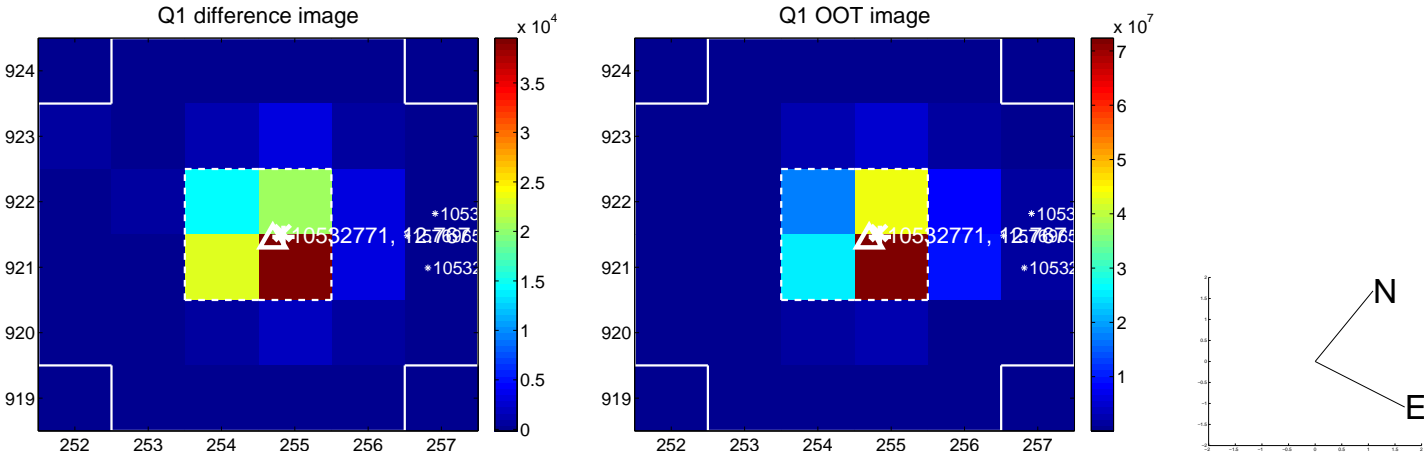
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.049 \pm 0.131$  | 0.37                | $0.042 \pm 0.089$ | $-0.025 \pm 0.172$ |
| PRF-fit source offset from KIC position | $0.262 \pm 0.118$  | 2.23                | $0.235 \pm 0.087$ | $-0.117 \pm 0.161$ |
| photometric centroid source offset      | $0.24 \pm 0.05$    | 4.87                | $0.14 \pm 0.05$   | $-0.20 \pm 0.05$   |

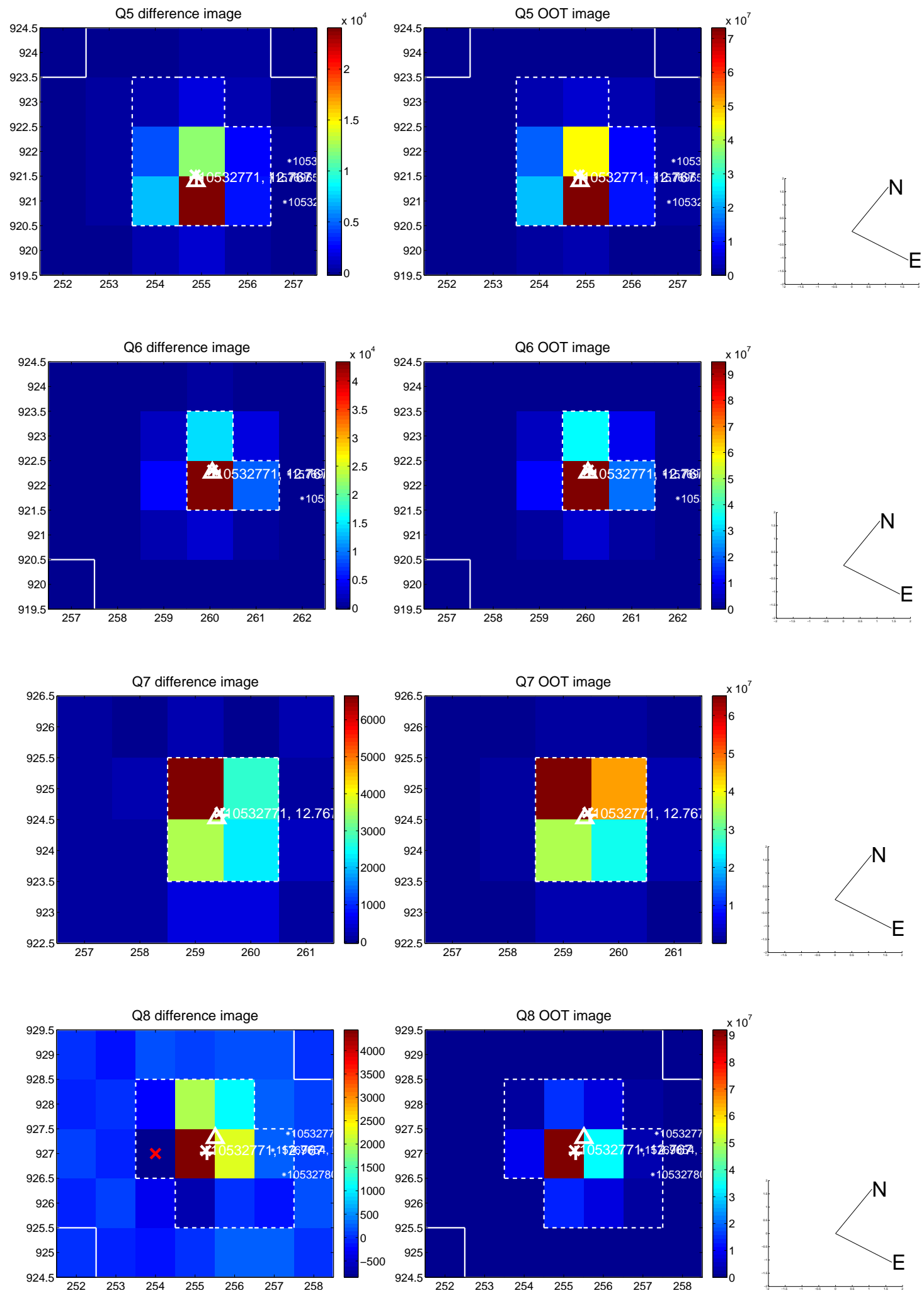


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

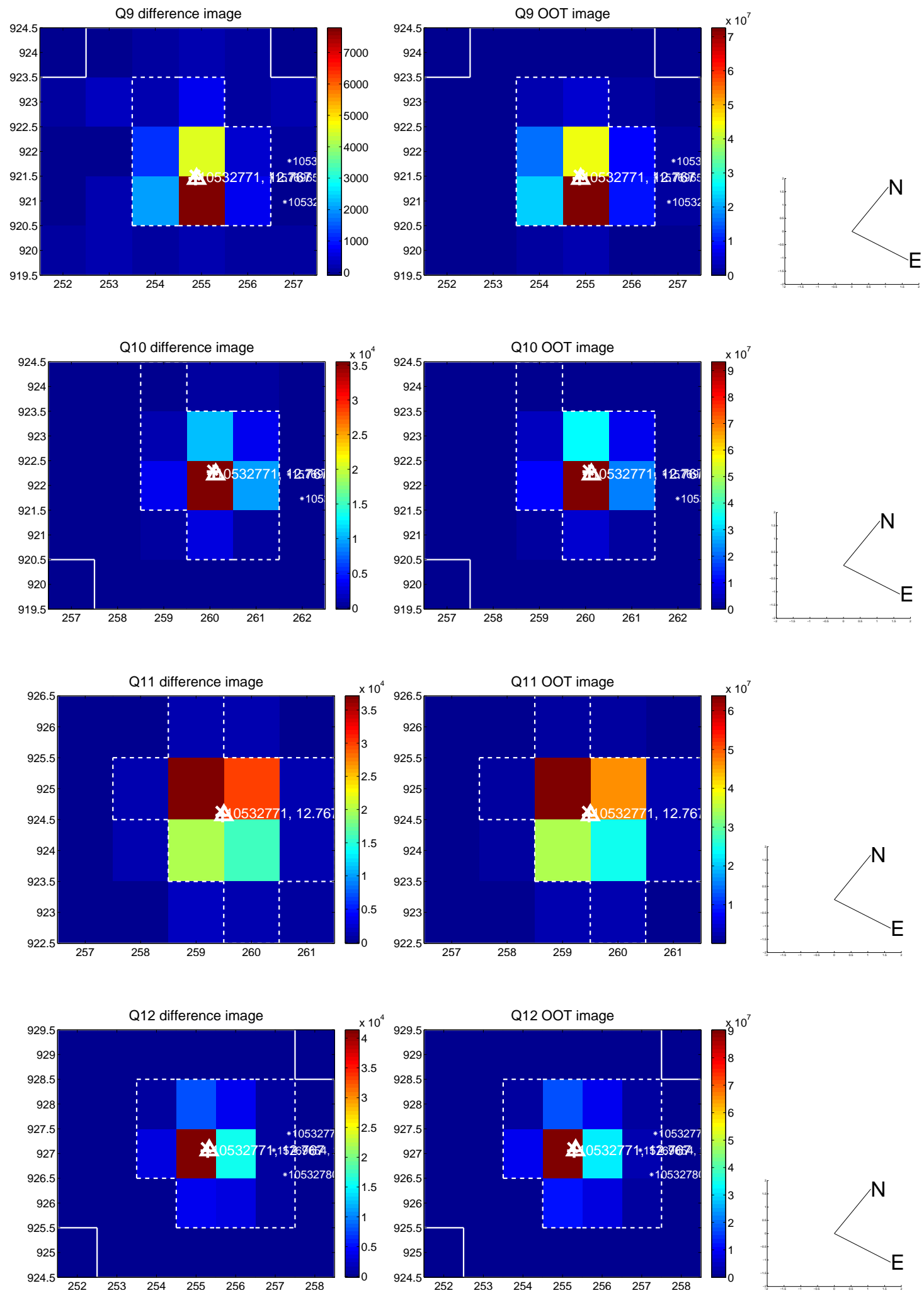


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

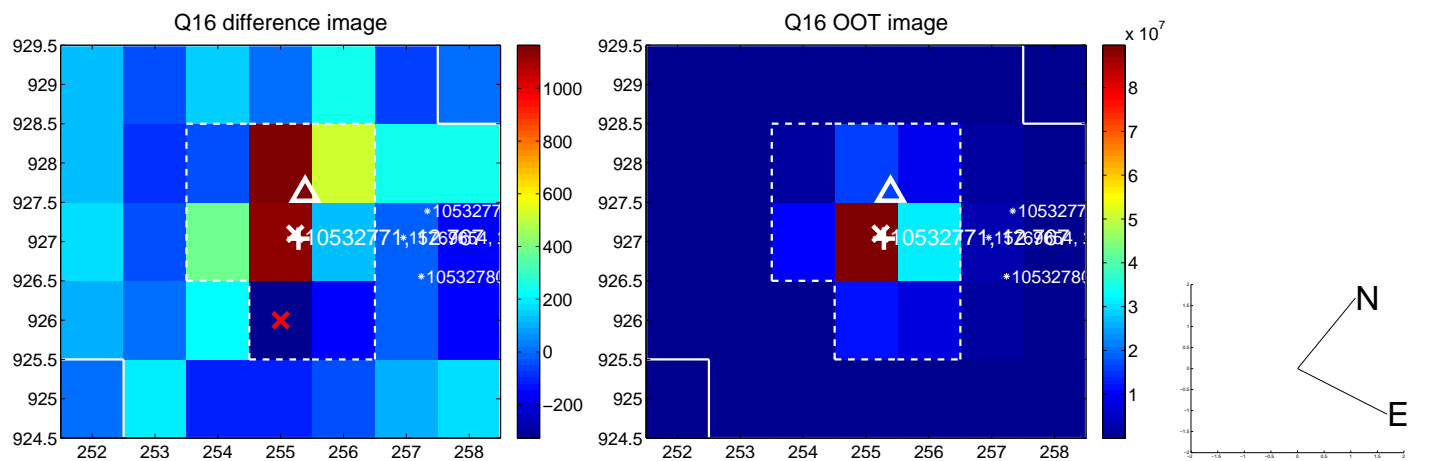
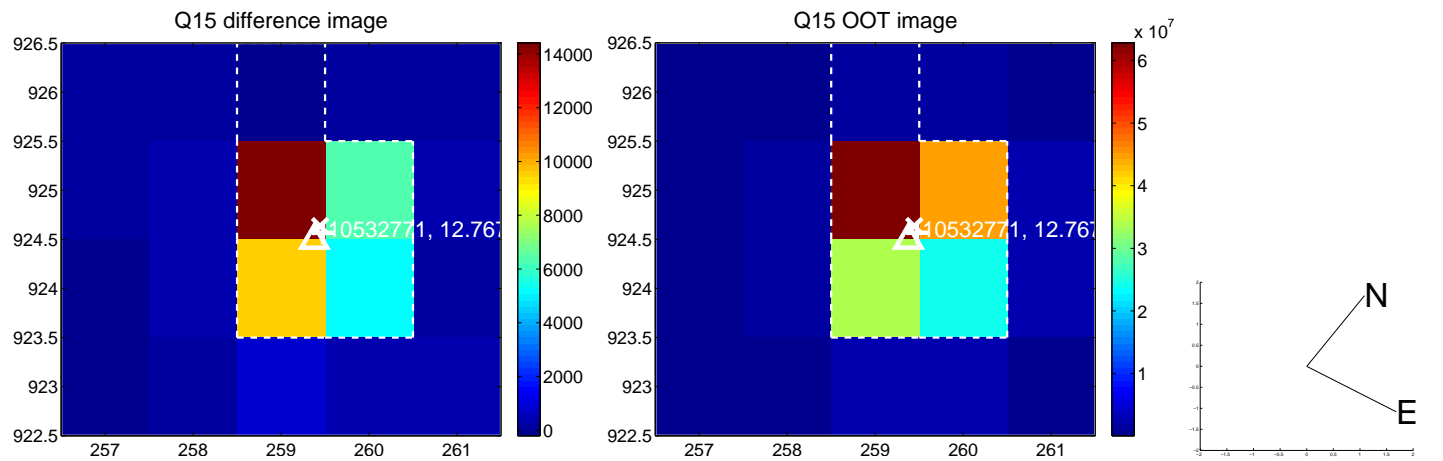
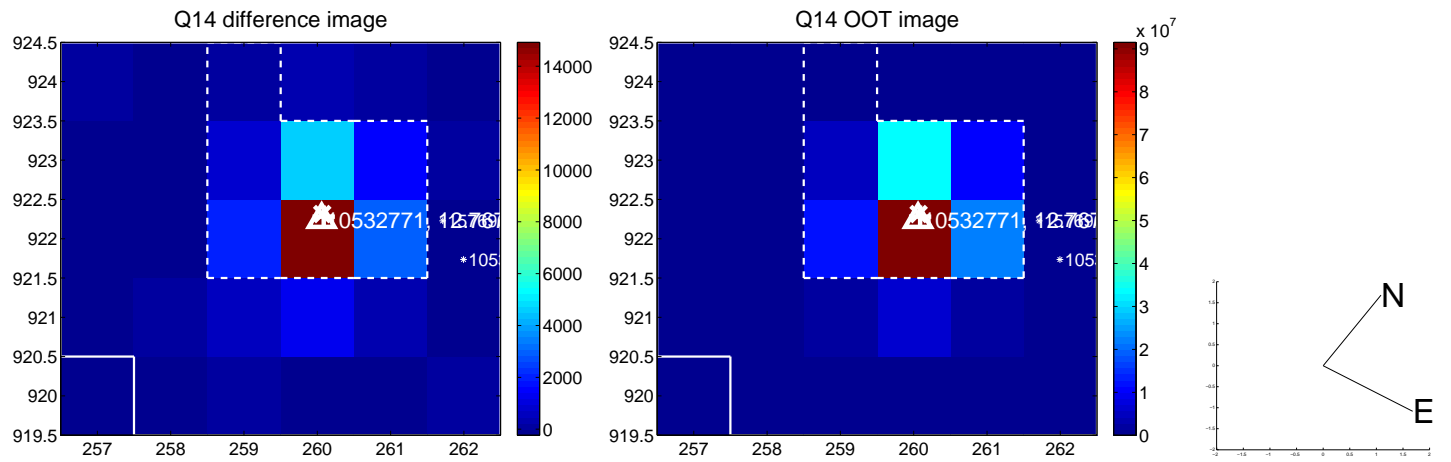
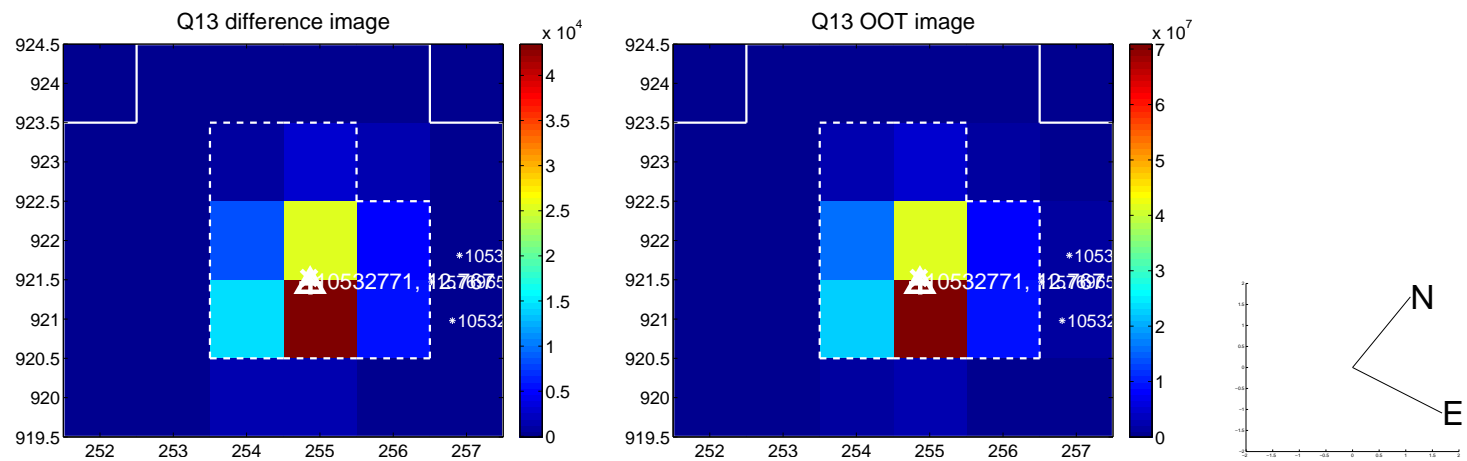




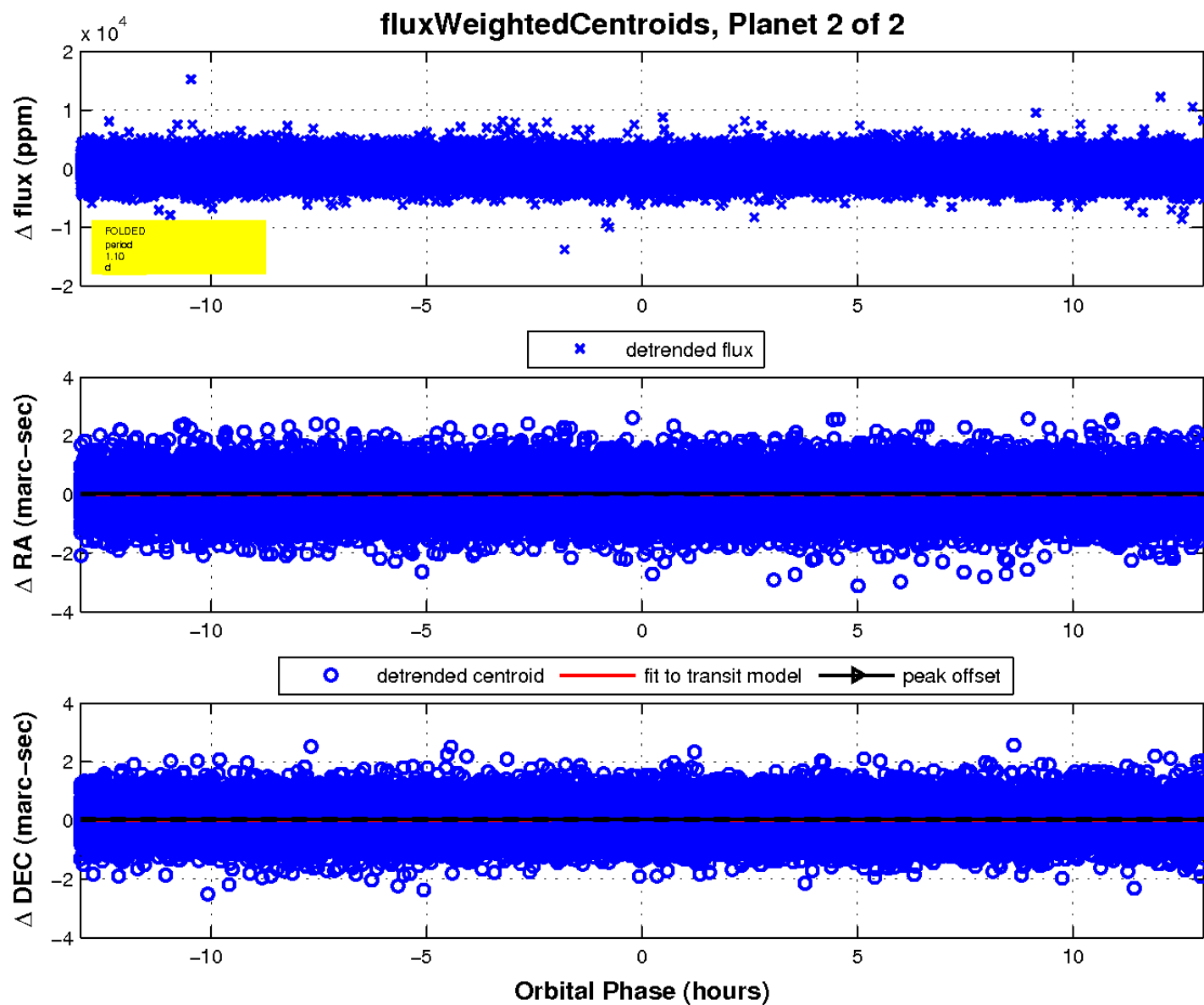
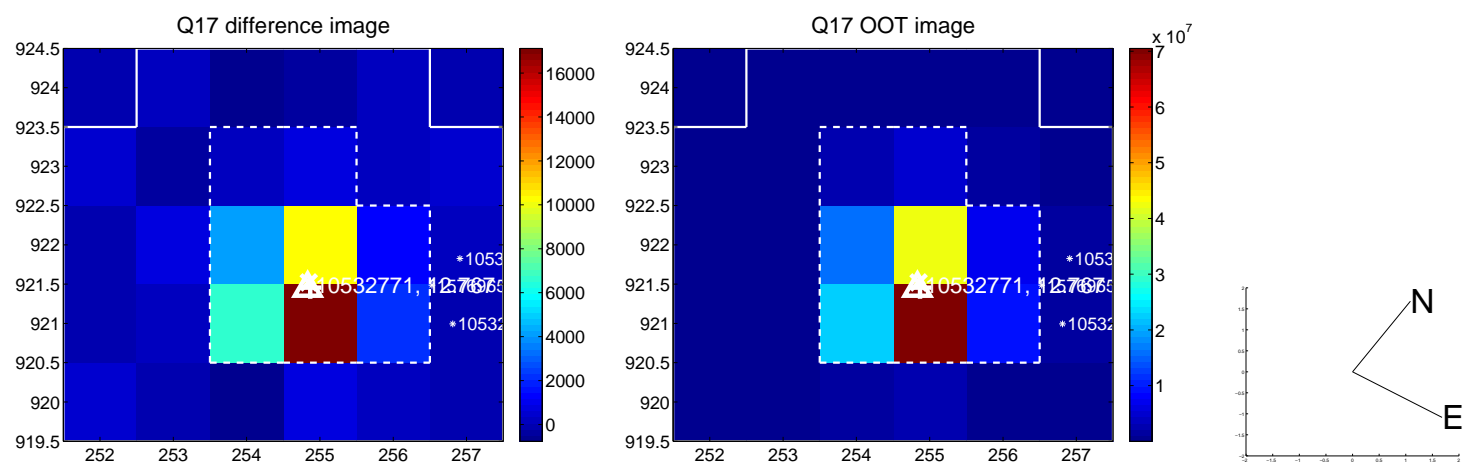
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

