

# KIC 005563507

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005563507-01 | OBS      | No   | 3.080043      | 132.050185   | 45.9        | 13.286           | 10.0 | 10.7 | 1.22                        | 6263            | 0.84                   | 1008.14                |
| 005563507-02 | OBS      | No   | 3.079453      | 134.047594   | 52.4        | 8.508            | 9.4  | 12.1 | 1.22                        | 6263            | 1.02                   | 1008.40                |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005563507-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV   |
| 005563507-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD |

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

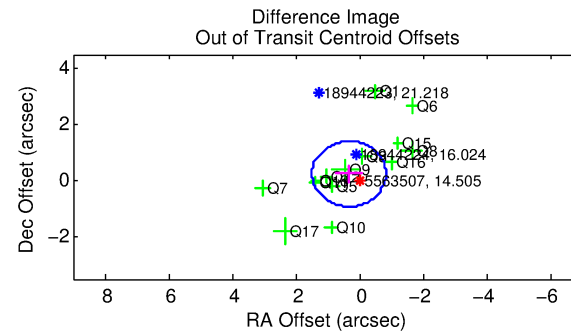
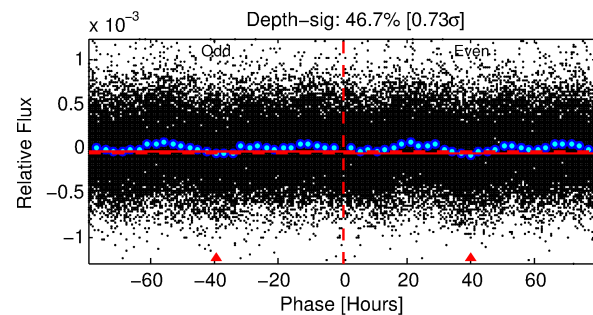
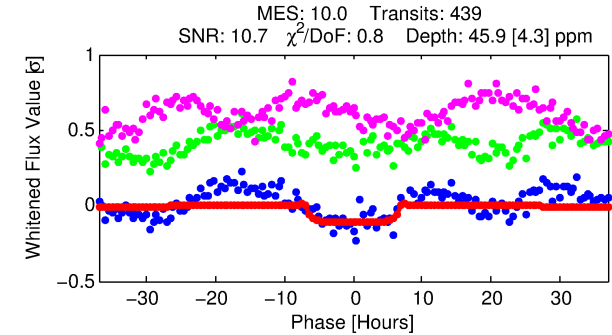
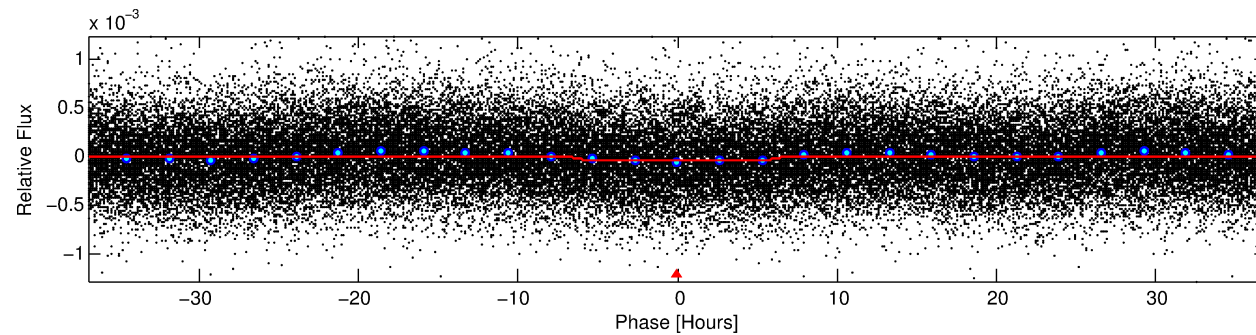
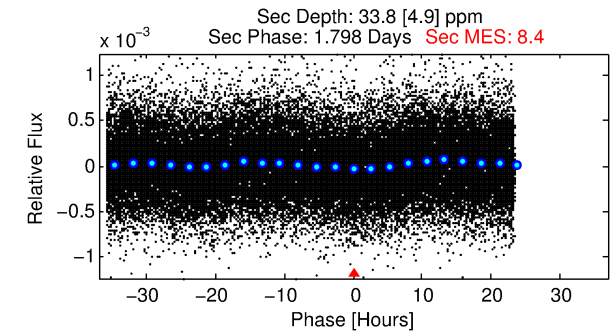
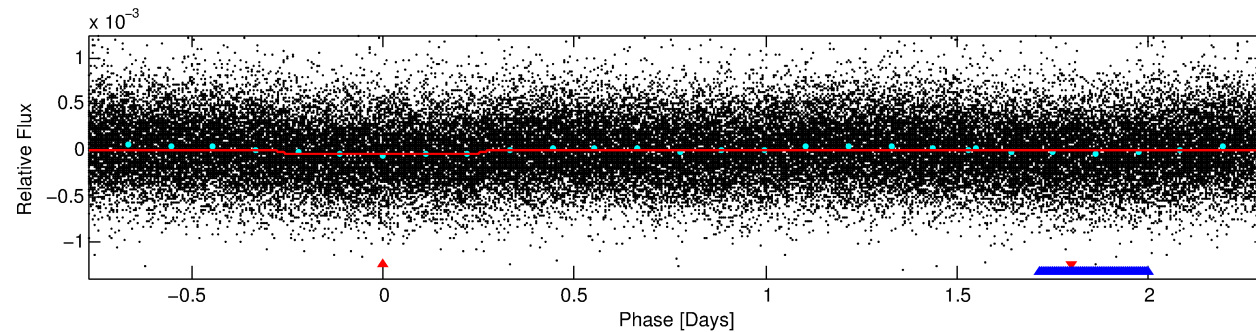
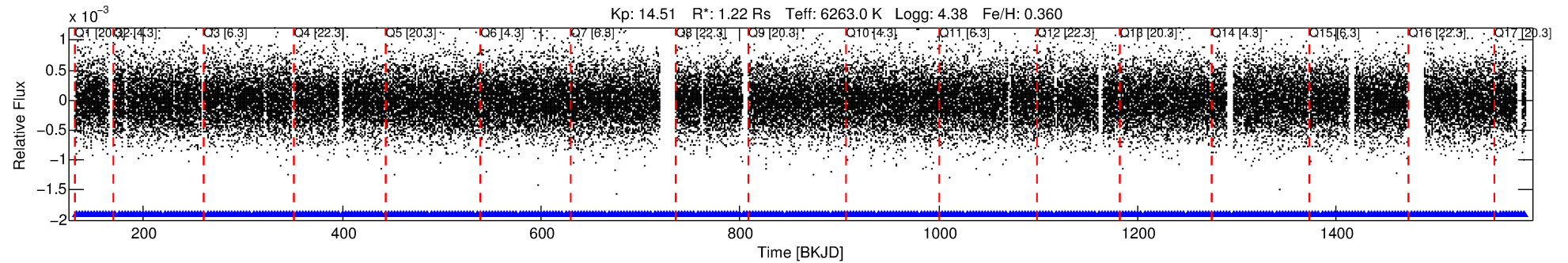
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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 005563507-01

No Significant Match Found

KIC: 5563507    Candidate: 1 of 2    Period: 3.080 d



DV Fit Results:

Period = 3.08004 [0.00005] d  
Epoch = 132.0502 [0.0106] BKJD  
Rp/R\* = 0.0063 [0.0051]  
a/R\* = 1.78 [4.74]  
b = 0.38 [8.77]  
Seff = 1008.14 [353.55]  
Teq = 1437 [126] K  
Rp = 0.84 [0.71] Re  
a = 0.0451 [0.0096] AU  
Ag = 54.04 [89.09] [0.60σ]  
Teffp = 6023 [2452] K [1.87σ]

DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00s]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.53e-27  
RollingBand-fgt: 1.00 [420/420]  
GhostDiagnostic-chr: 3.512

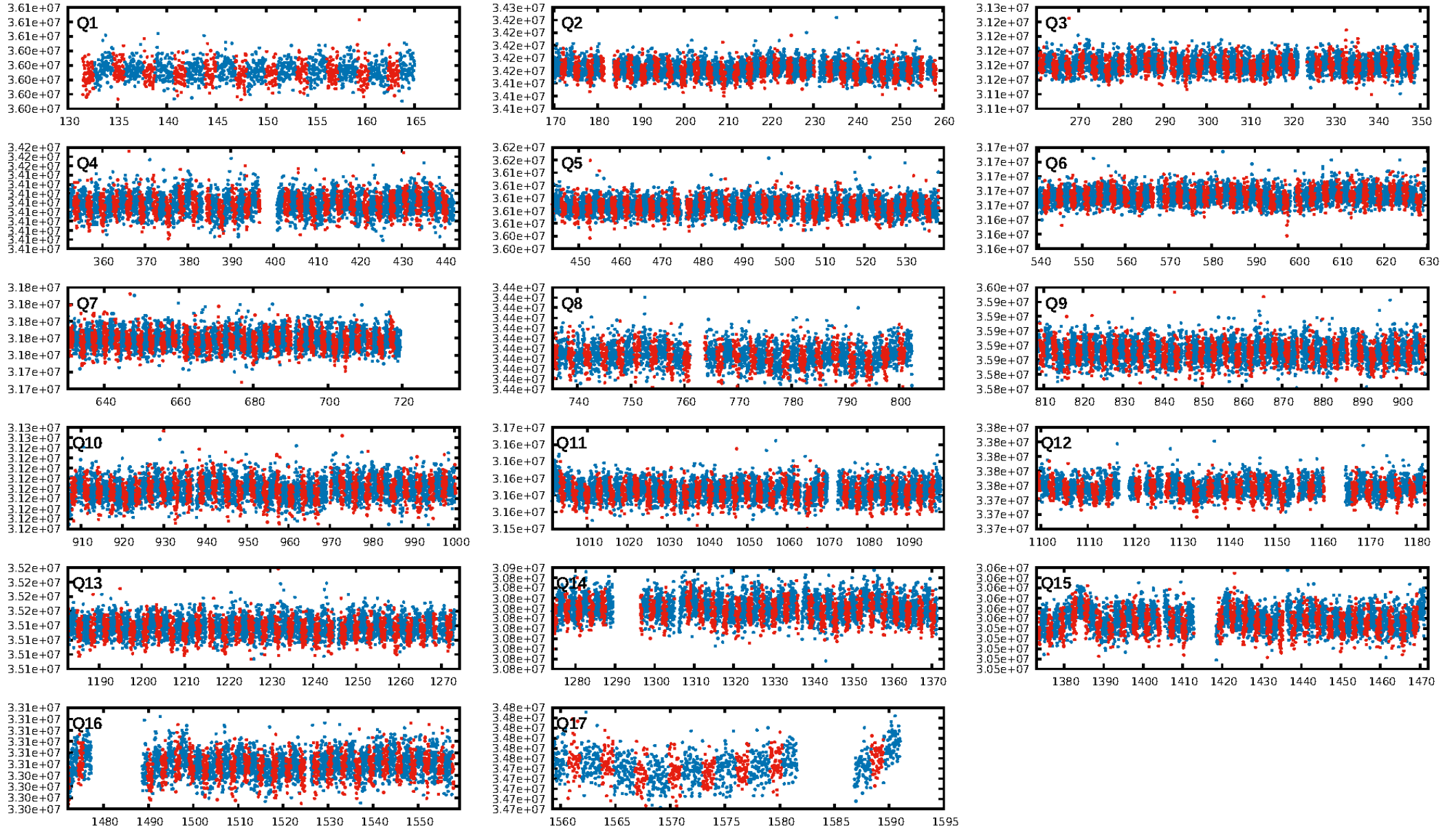
Centroid-sig: 0.0%

Centroid-so: 2.466 arcsec [2.25s]  
OotOffset-rm: 0.404 arcsec [1.04s]  
KicOffset-rm: 0.379 arcsec [1.05s]  
OotOffset-st: 2/4/3/5 [14]  
KicOffset-st: 2/4/3/5 [14]  
DiffImageQuality-fgm: 0.86 [12/14]  
DiffImageOverlap-fno: 0.82 [14/17]

**Software Revision:** svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- **Date Generated:** 29-Jan-2016 11:59:42 Z

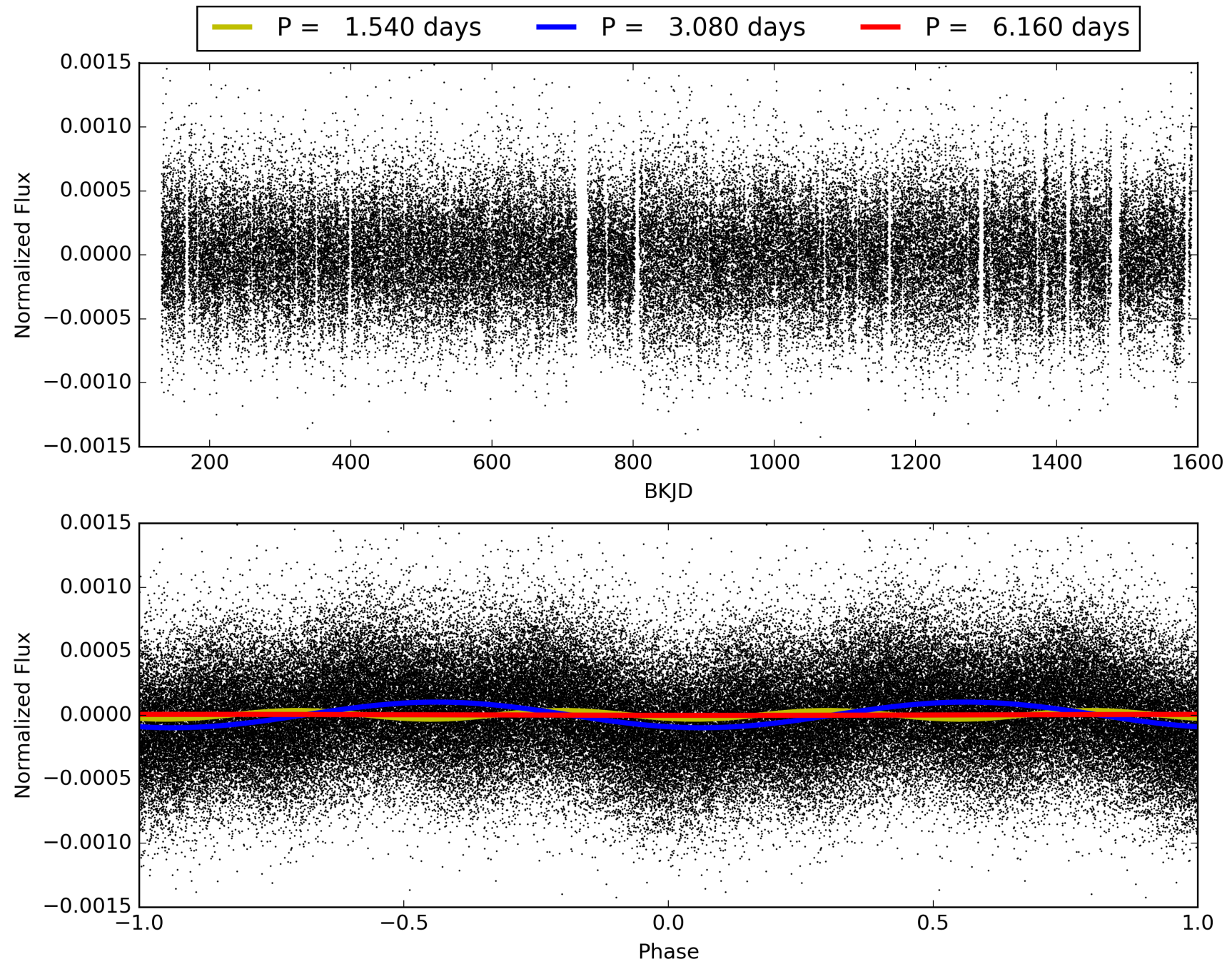
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005563507-01, PDC Light Curves



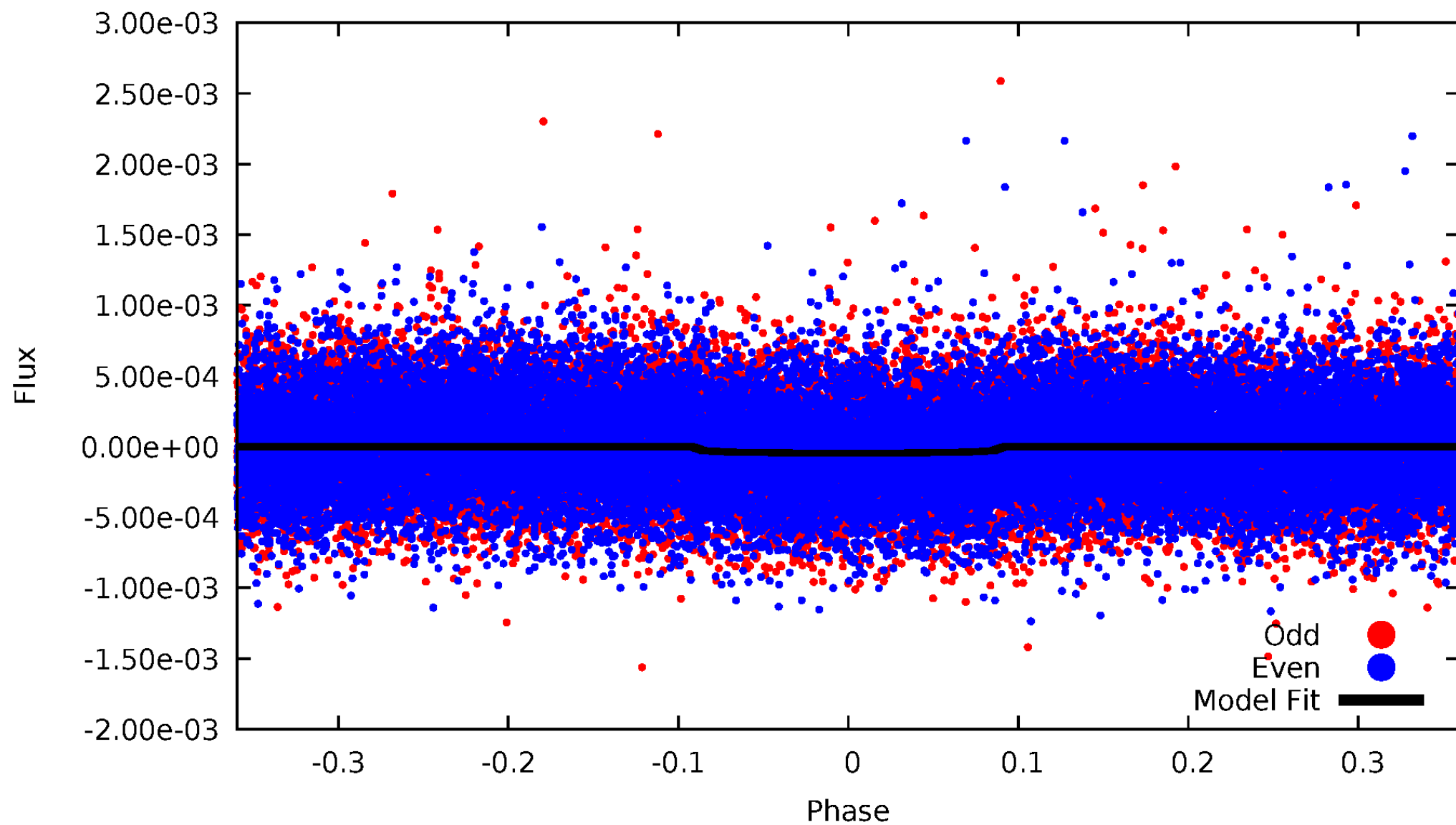


TCE 005563507-01



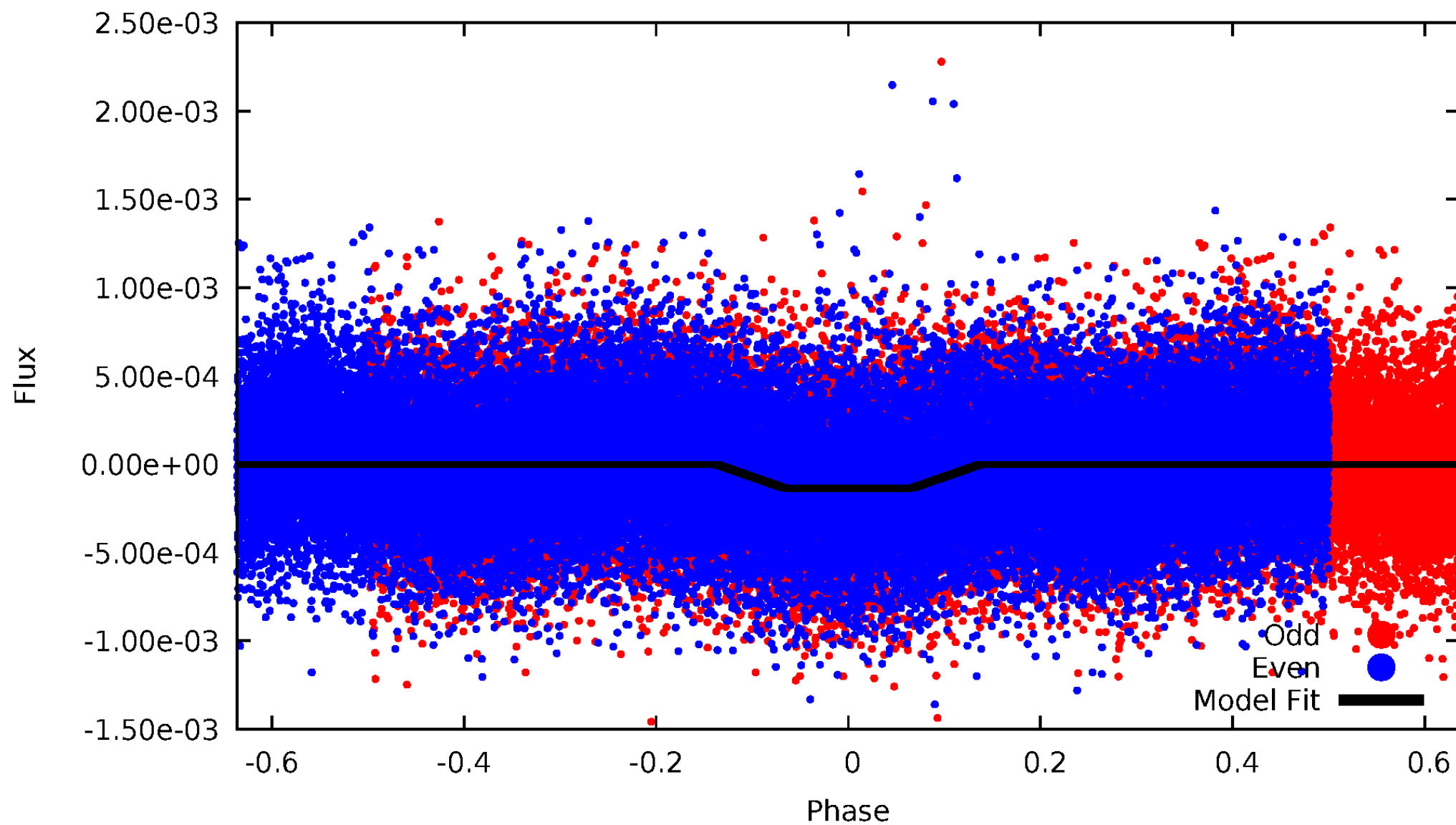
# DV Odd/Even

TCE 005563507-01



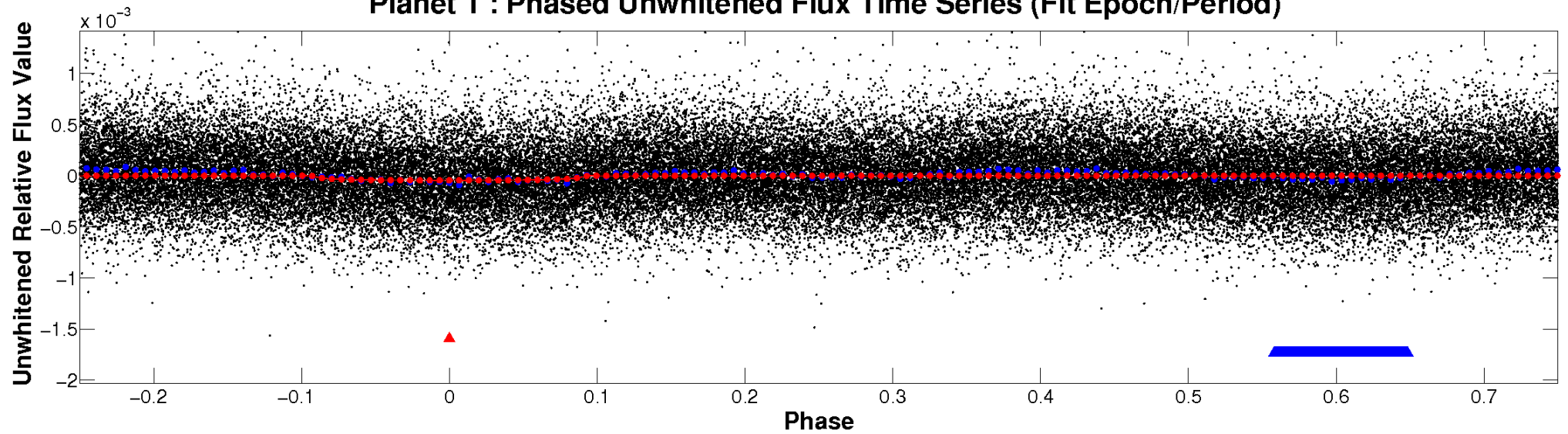
# ALT Odd/Even

TCE 005563507-01

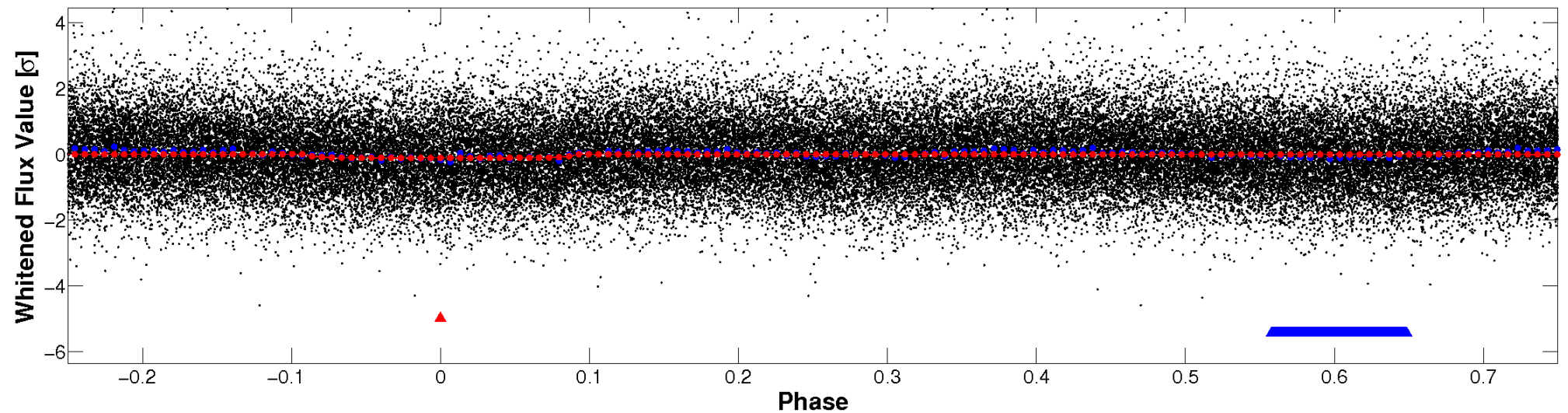


# Non-Whitened Vs. Whitened Light Curve

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



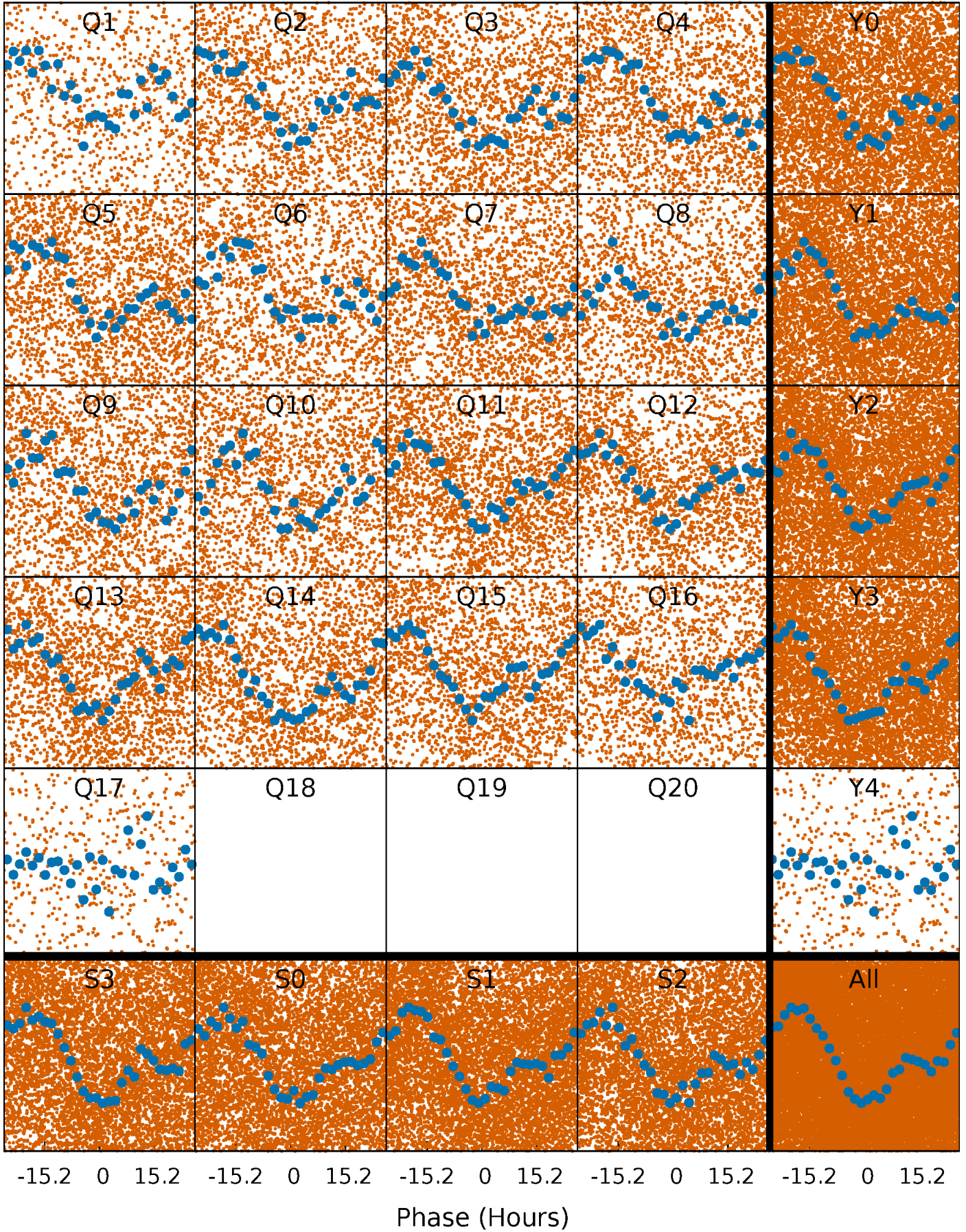
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

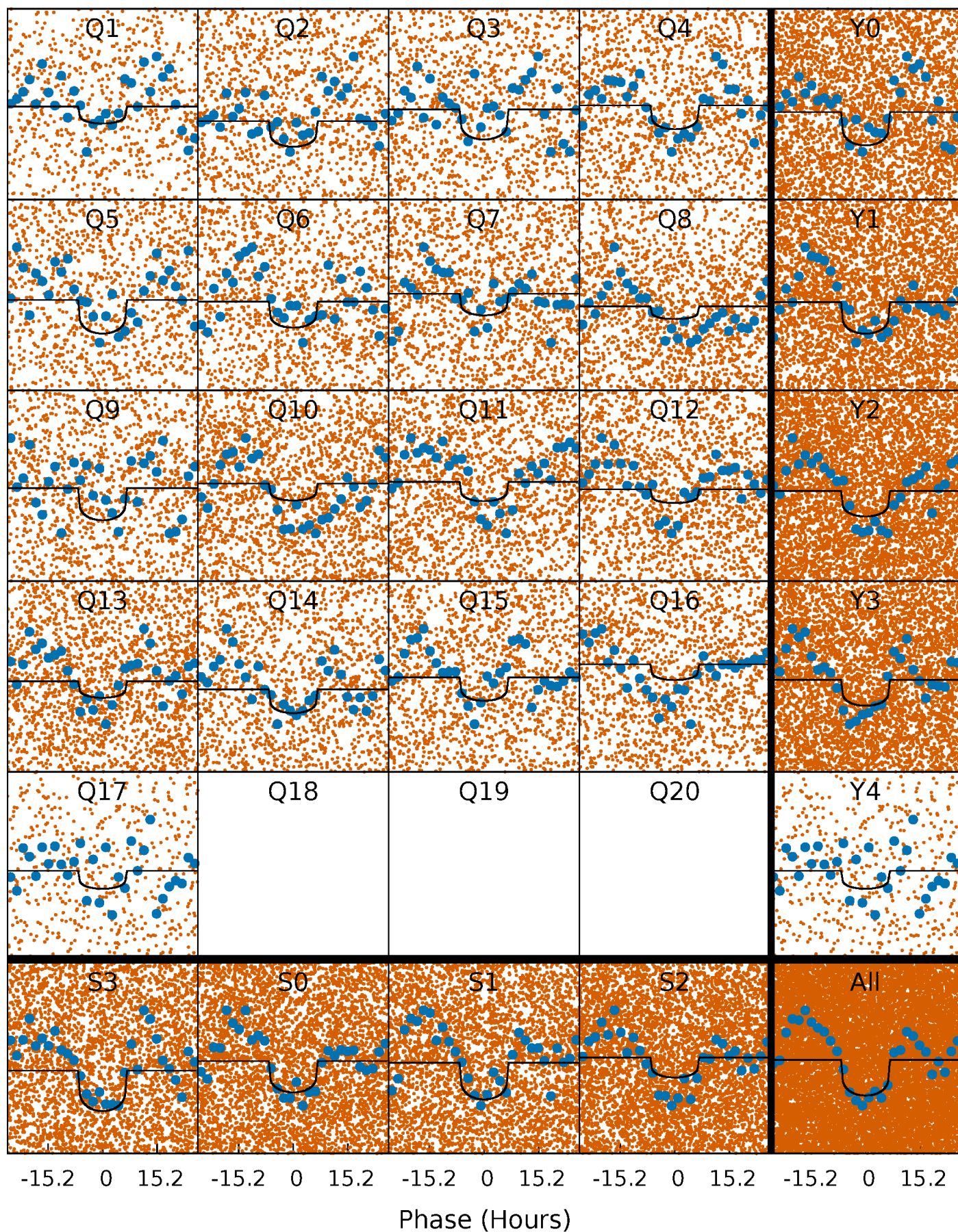
TCE 005563507-01 P= 3.080043 Days  $T_0=132.050185$  (BKJD)





# DV Quarter-Phased Transit Curves

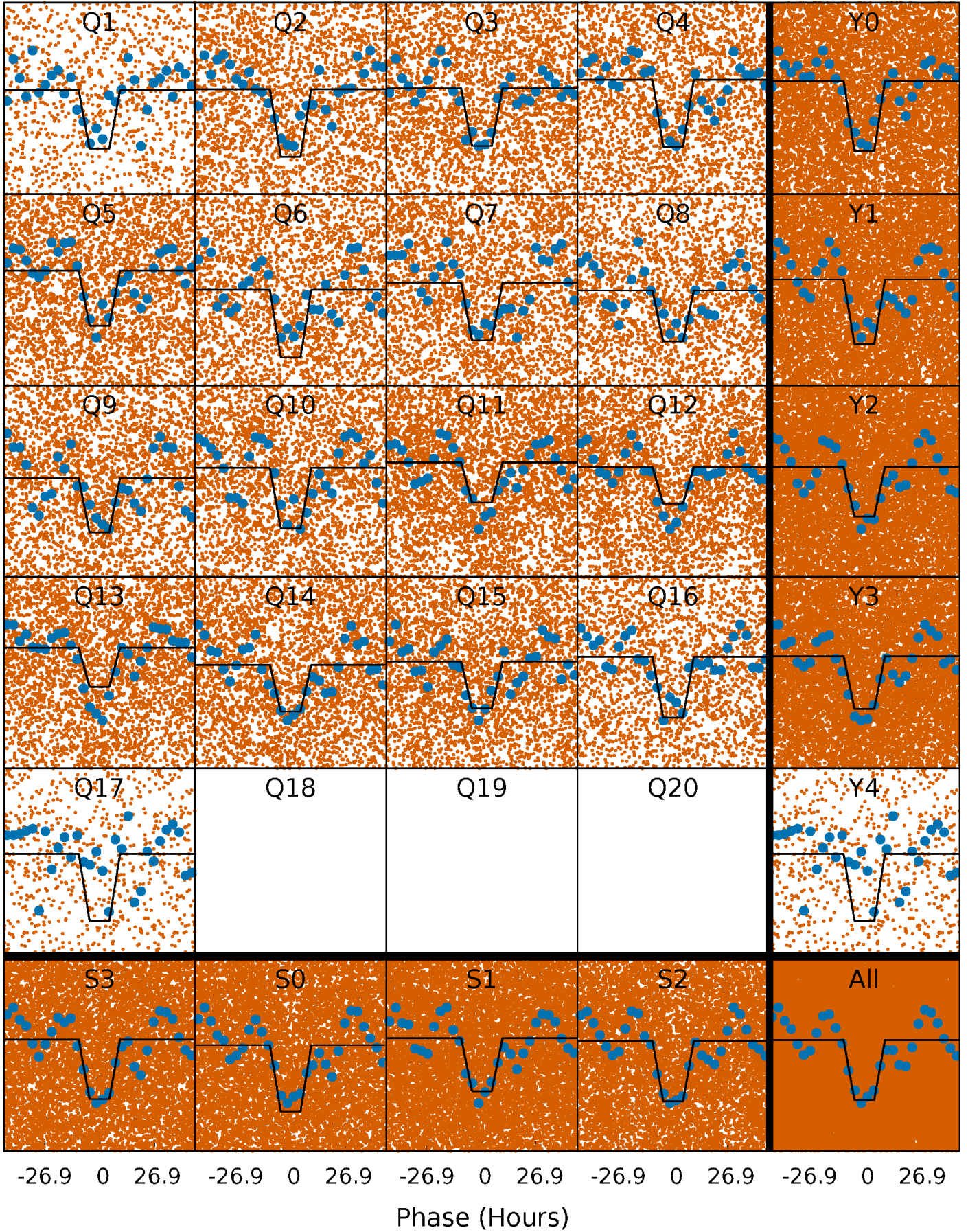
TCE 005563507-01 P= 3.080043 Days  $T_0=132.050185$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

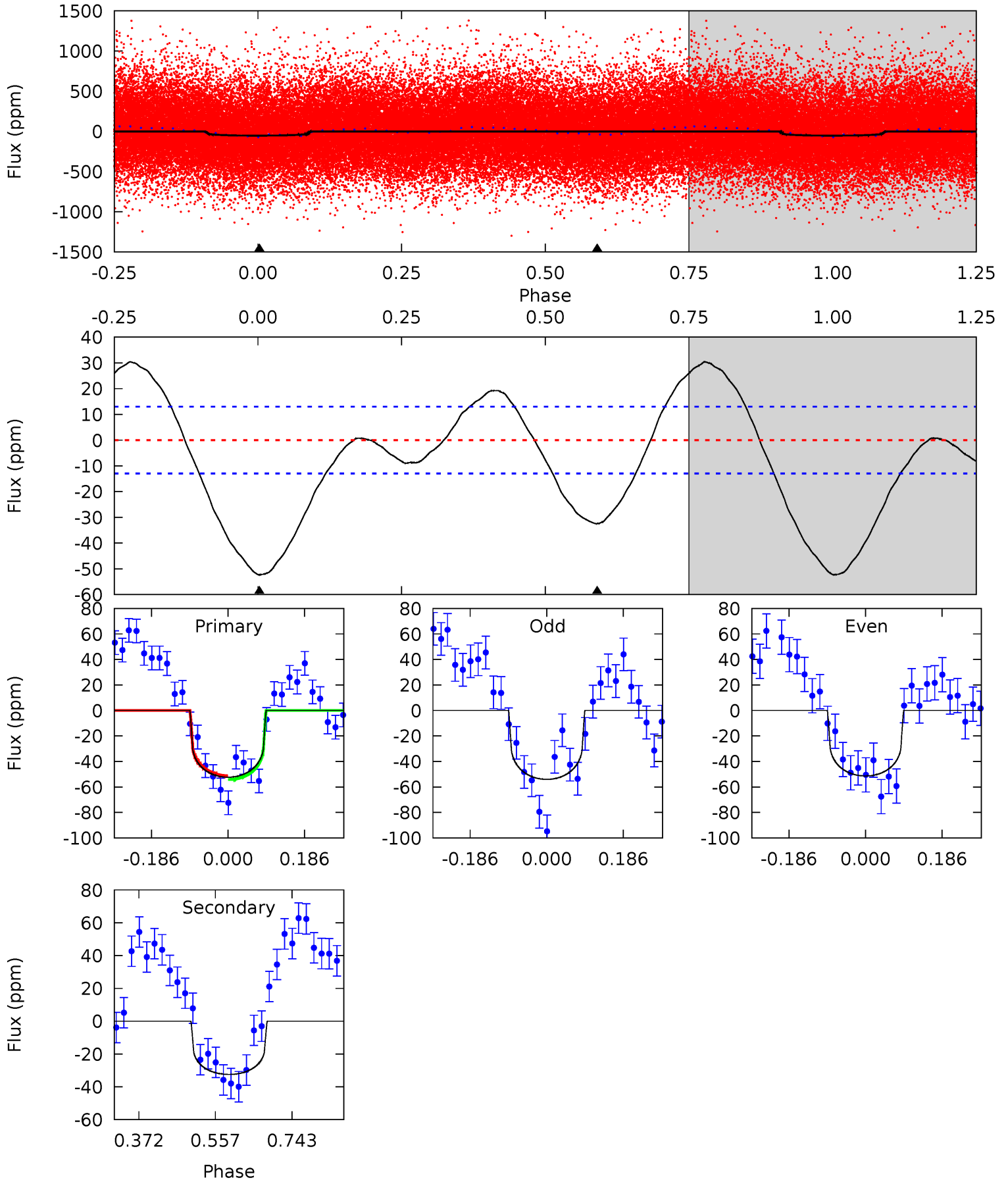
TCE 005563507-01 P= 3.079739 Days  $T_0=132.135896$  (BKJD)



# DV Model-Shift Uniqueness Test

005563507-01, P = 3.080043 Days, E = 128.970142 Days

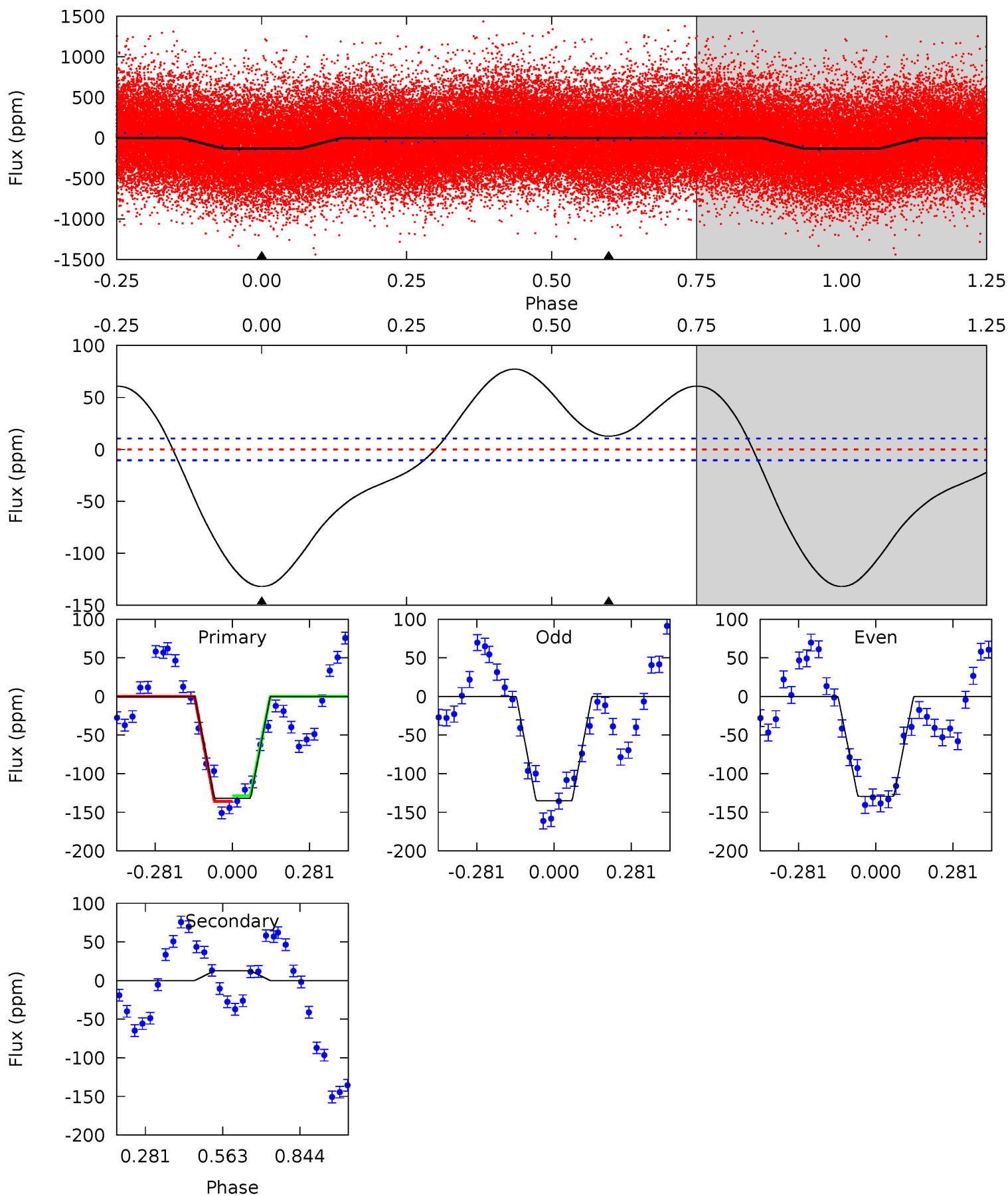
| Pri  | Sec  | Ter | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 17.9 | 11.1 | 0   | 0   | 4.43            | 1.32            | 4.38             | 17.9    | 17.9    | 11.1    | 11.1    | 0.46    | 1.17 | 0.37  | 0.50 |



# Alt Model-Shift Uniqueness Test

005563507-01, P = 3.079739 Days, E = 129.056157 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  |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 54.6 | -5.27 | 0   | 0   | 4.34            | 1.08            | 7.38             | 54.6    | 54.6    | -5.27   | -5.27   | 1.15    | 1.04 | 0.37  | 1.46 |





### Stellar Parameters For KIC 005563507

|        | $T_{\text{eff}} (K)$ | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M (M_{\odot})$           | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $6263^{+174}_{-261}$ | $4.376^{+0.060}_{-0.168}$ | $0.360^{+0.100}_{-0.350}$ | $1.220^{+0.310}_{-0.143}$ | $1.290^{+0.125}_{-0.188}$ | $1.000^{+0.302}_{-0.461}$                 |
|        | +3%/-4%              | +1%/-4%                   | +28%/-97%                 | +25%/-12%                 | +10%/-15%                 | +30%/-46%                                 |
| 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 005563507-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{max} (K)$        | $T_{obs} (K)$          | $A_{obs}$                   |
|---------|-------------|------------------------|----------------------|------------------------|-----------------------------|
| DV      | $-32 \pm 3$ | $0.96^{+0.67}_{-0.57}$ | $2037^{+130}_{-107}$ | $5676^{+3629}_{-1128}$ | $40^{+193}_{-26}$           |
| Alt.    | $13 \pm 2$  | $1.71^{+0.69}_{-0.77}$ | $2038^{+122}_{-109}$ | $-3768^{+359}_{-856}$  | $-4.739^{+2.452}_{-10.748}$ |

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

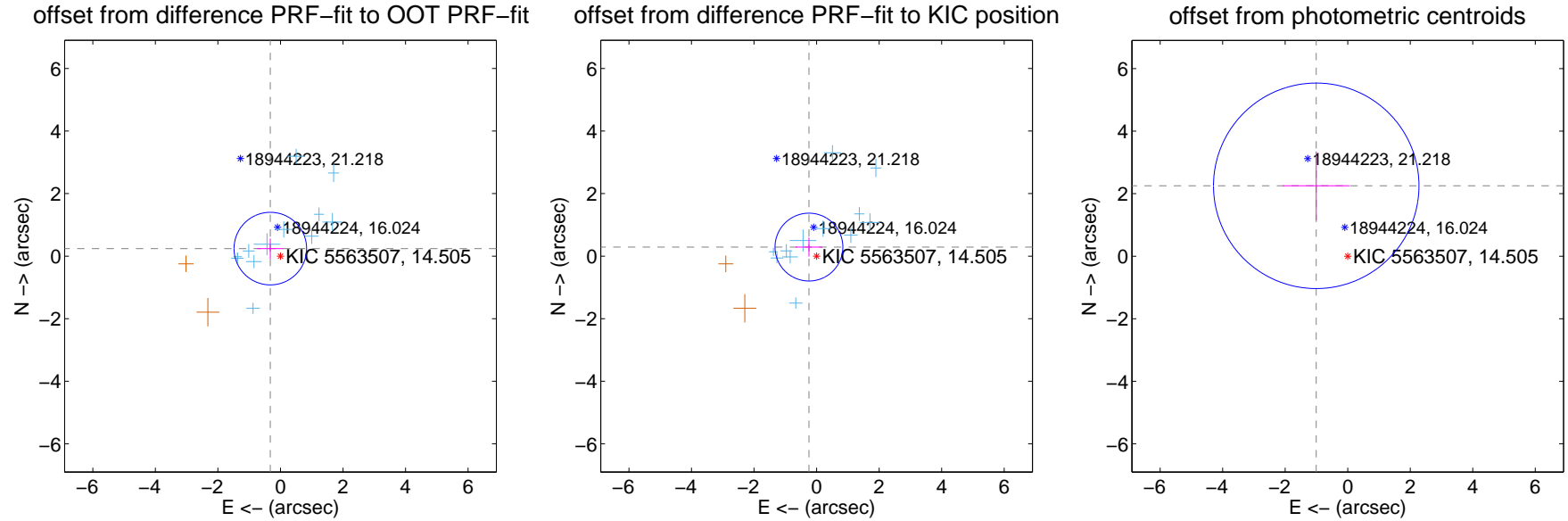
## DV Centroid Data

Supplemental centroid analysis for 005563507-01. Kepler magnitude: 14.51. Transit SNR 10.67

There are 12 quarters with good PRF difference image offsets

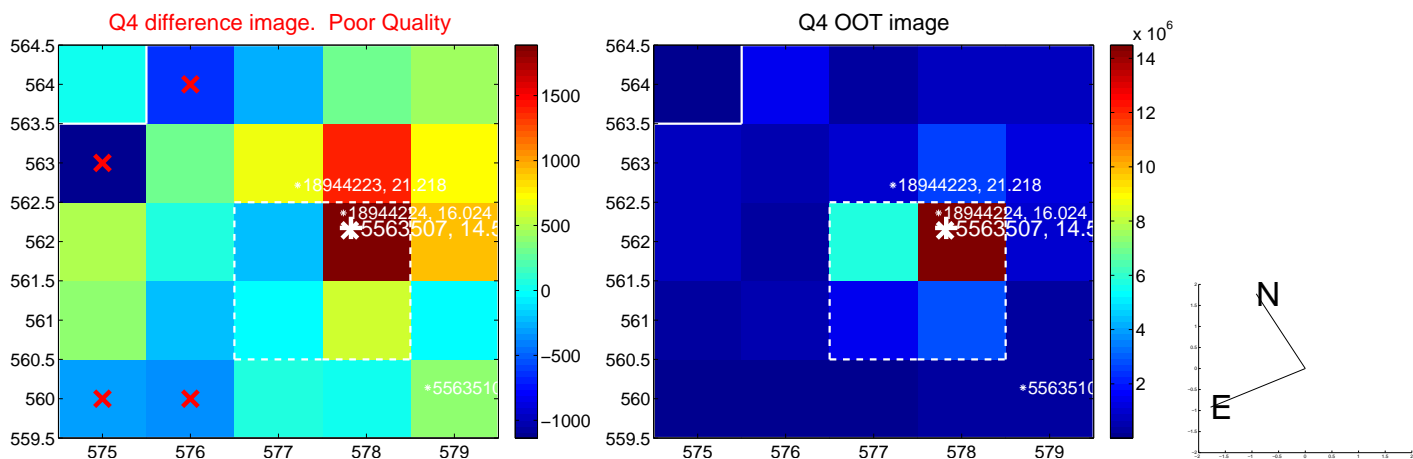
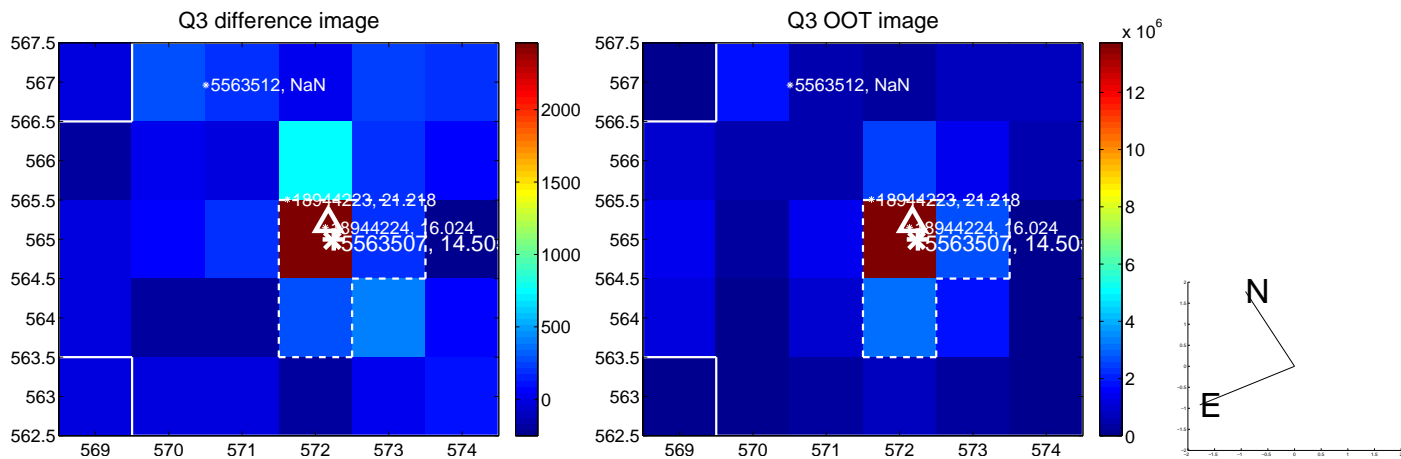
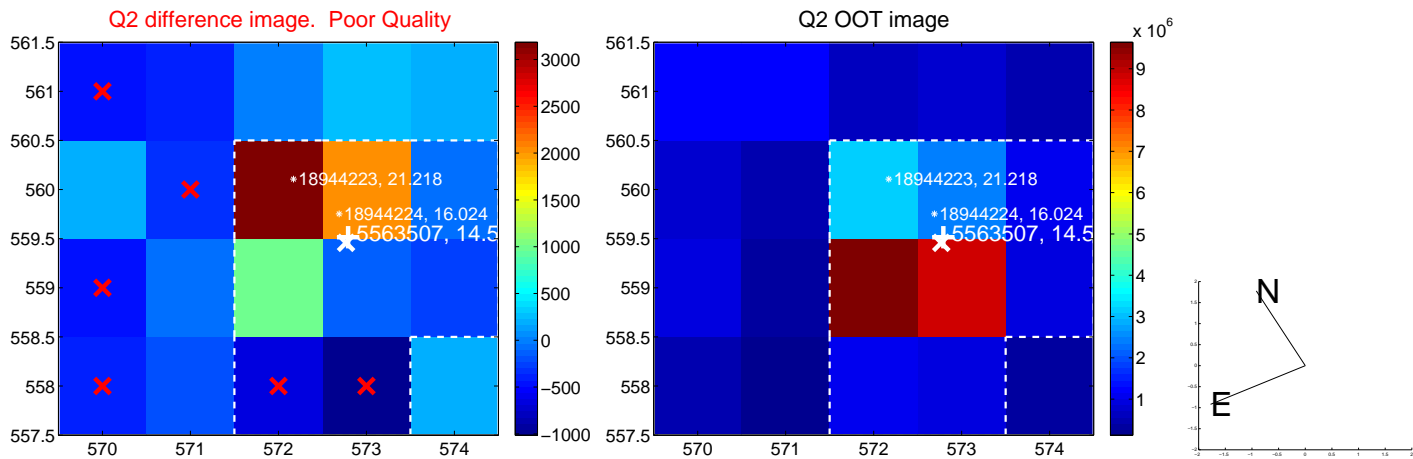
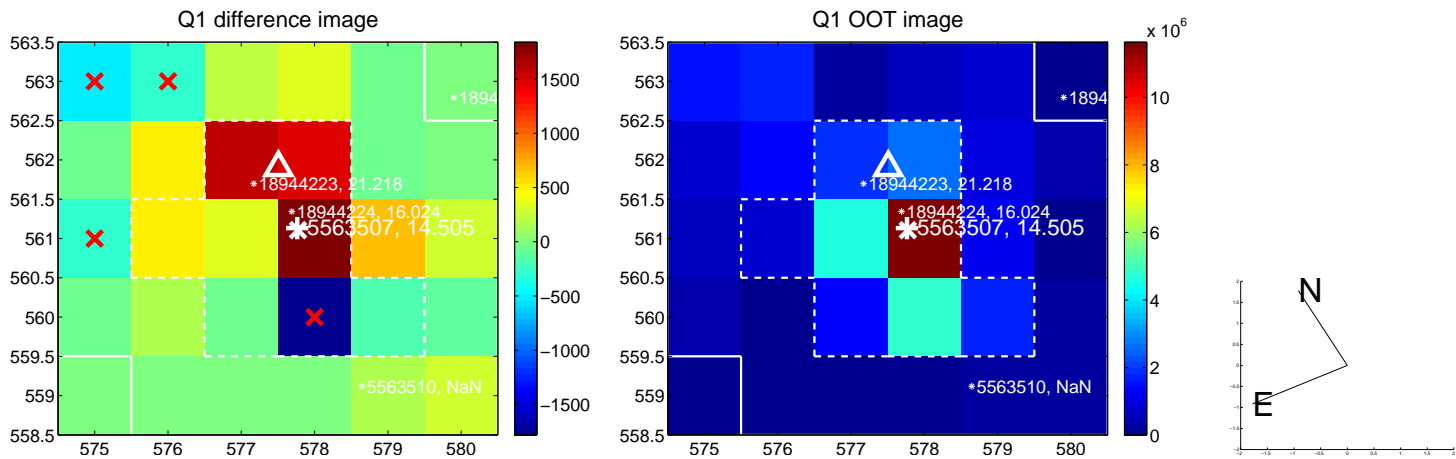
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $0.404 \pm 0.387$  | 1.04                | $0.324 \pm 0.419$ | $0.241 \pm 0.320$ |
| PRF-fit source offset from KIC position | $0.379 \pm 0.361$  | 1.05                | $0.244 \pm 0.429$ | $0.289 \pm 0.304$ |
| photometric centroid source offset      | $2.47 \pm 1.10$    | 2.25                | $1.01 \pm 1.07$   | $2.25 \pm 1.10$   |

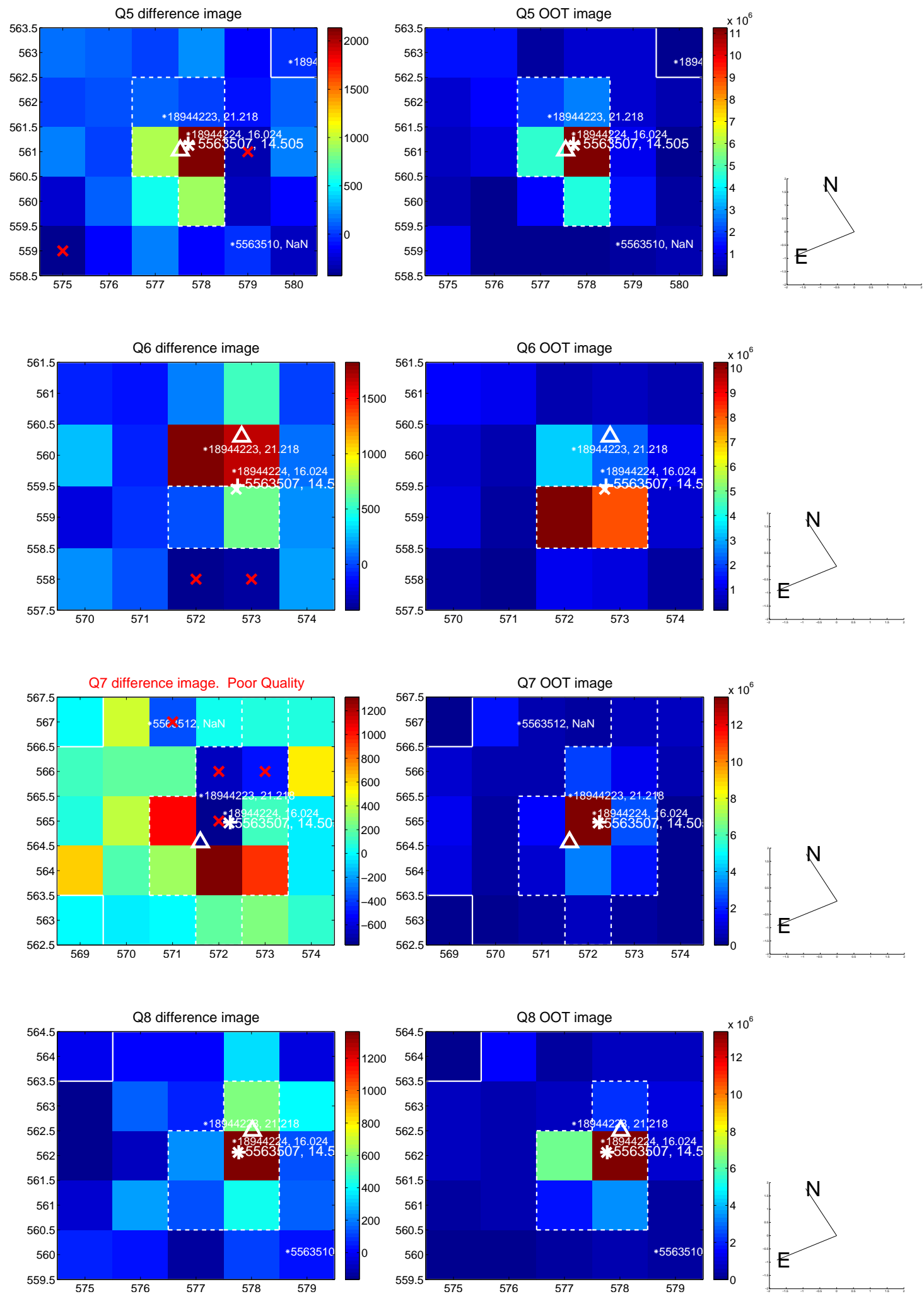


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

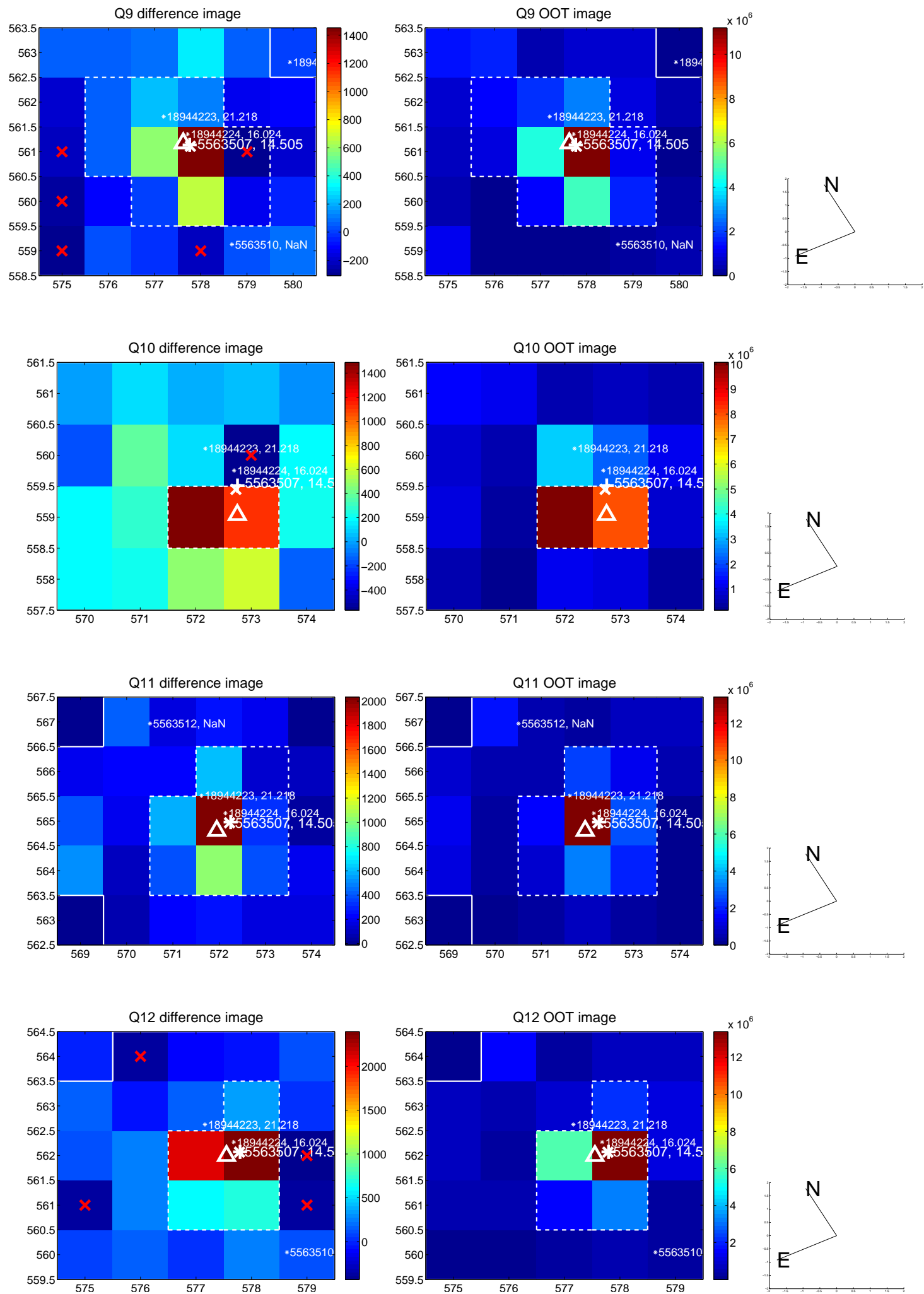


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

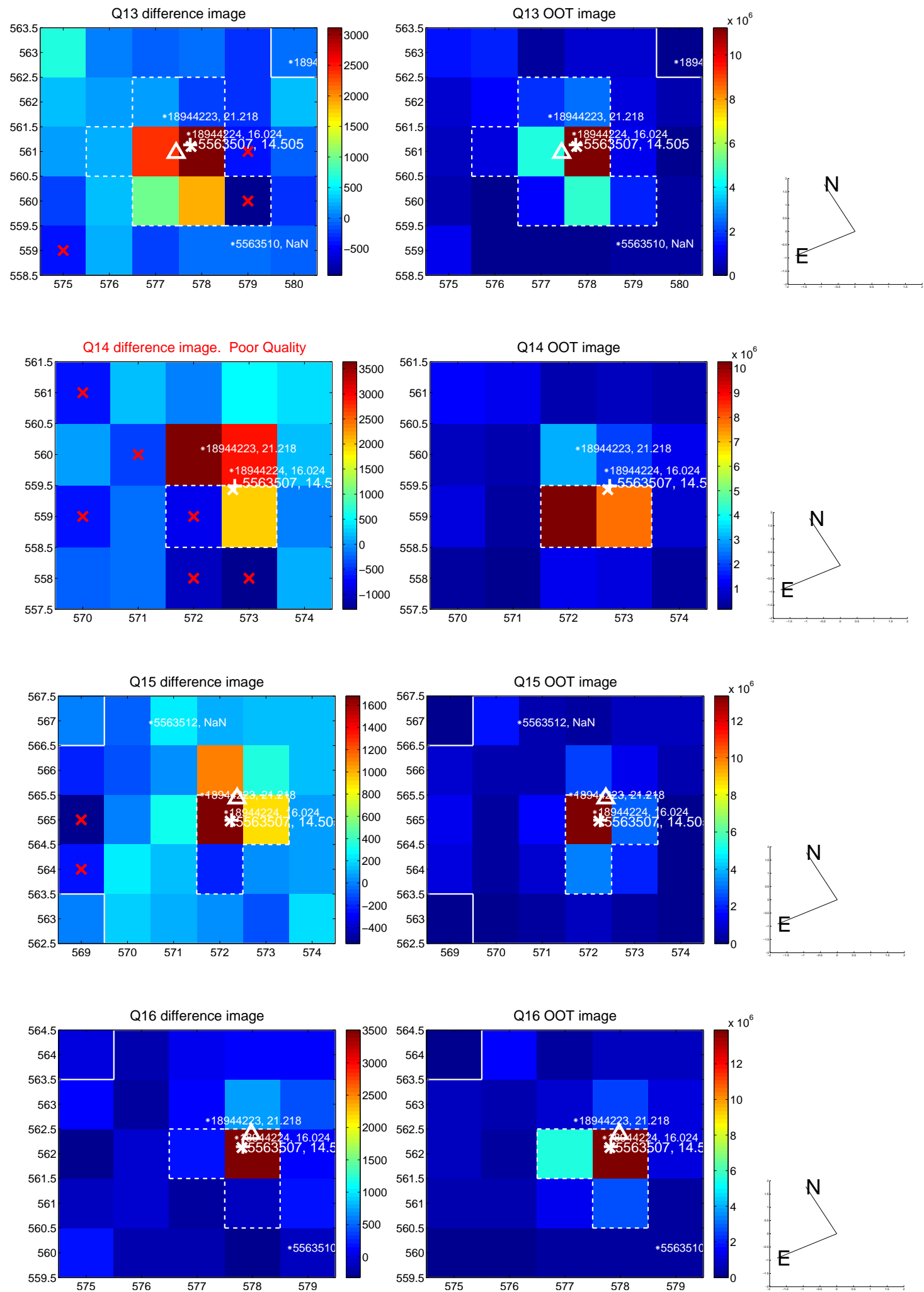




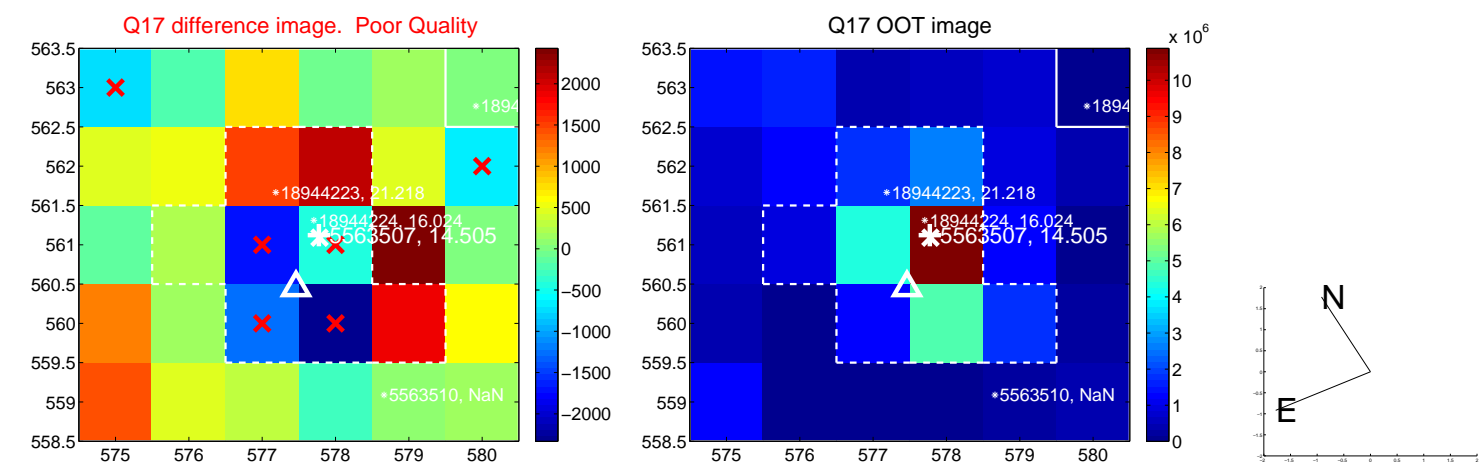
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



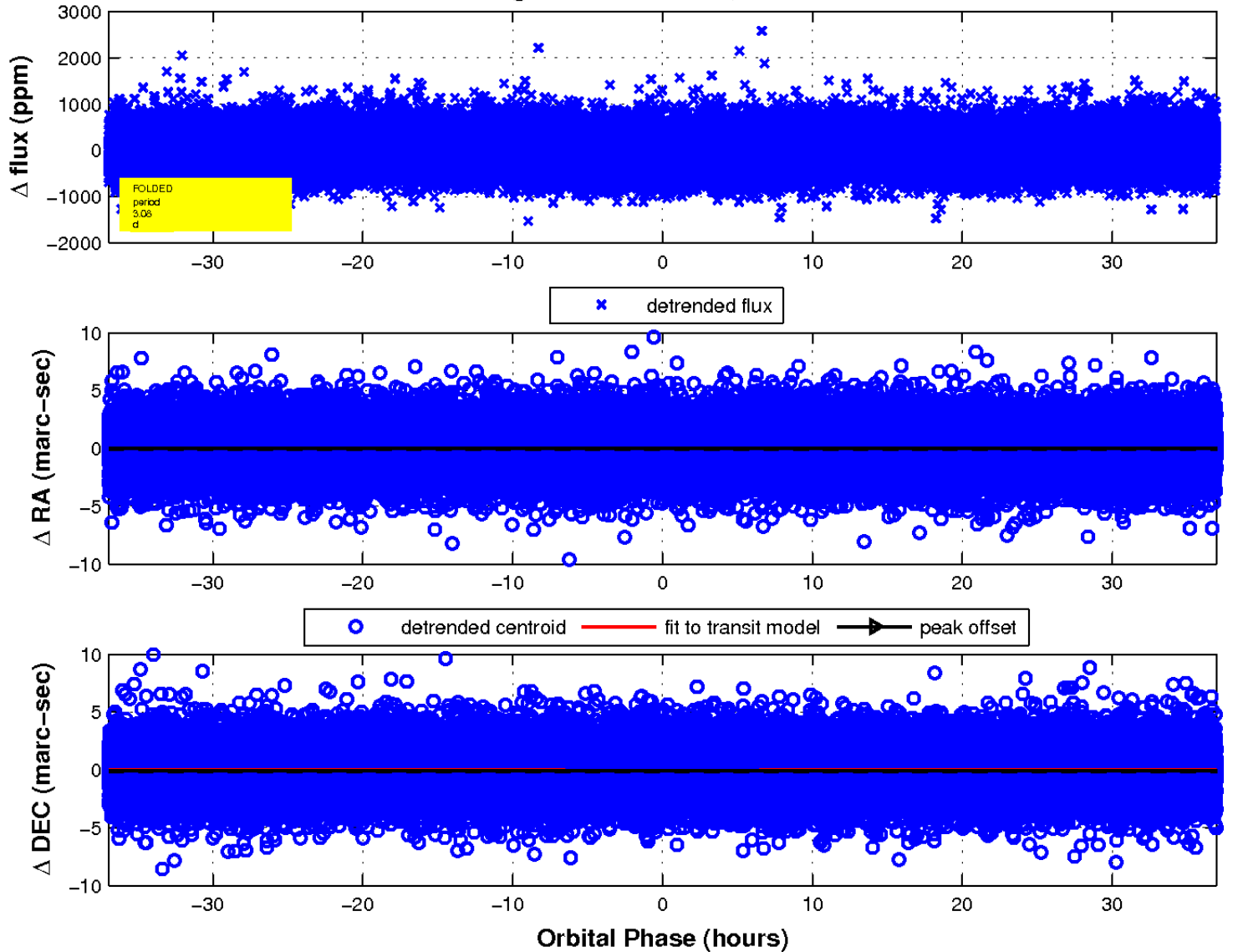
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

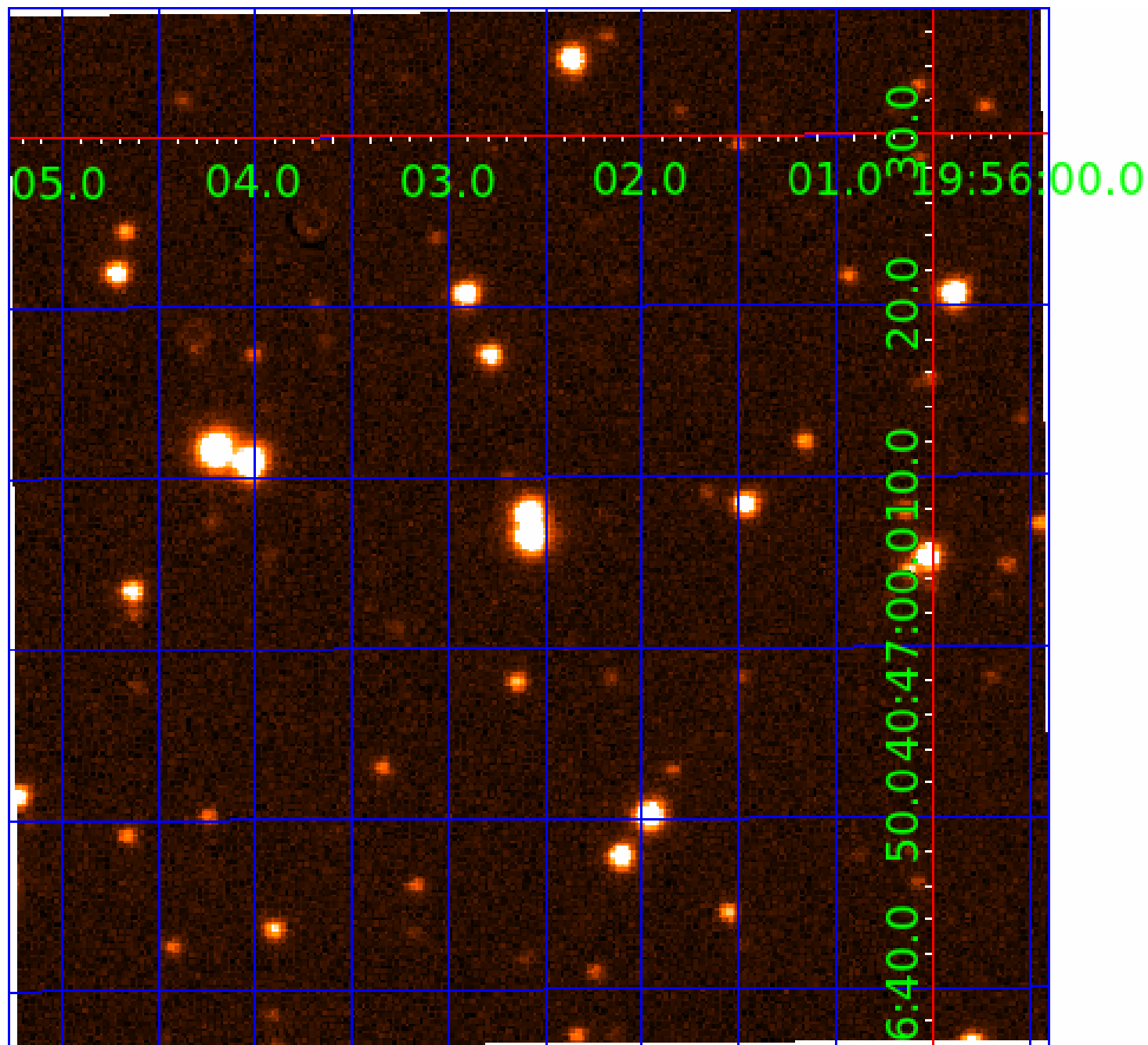


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 005563507

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005563507-01 | OBS      | No   | 3.080043      | 132.050185   | 45.9        | 13.286           | 10.0 | 10.7 | 1.22                        | 6263            | 0.84                   | 1008.14                |
| 005563507-02 | OBS      | No   | 3.079453      | 134.047594   | 52.4        | 8.508            | 9.4  | 12.1 | 1.22                        | 6263            | 1.02                   | 1008.40                |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005563507-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV   |
| 005563507-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—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.

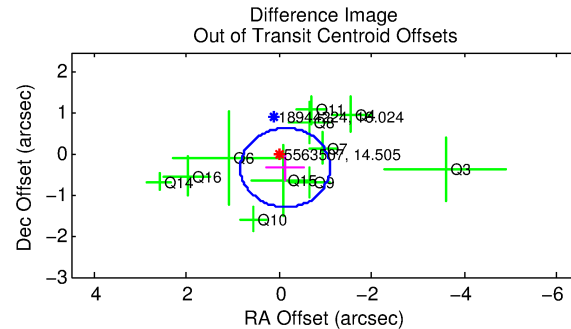
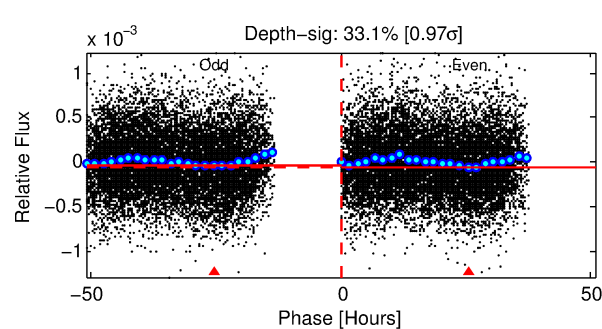
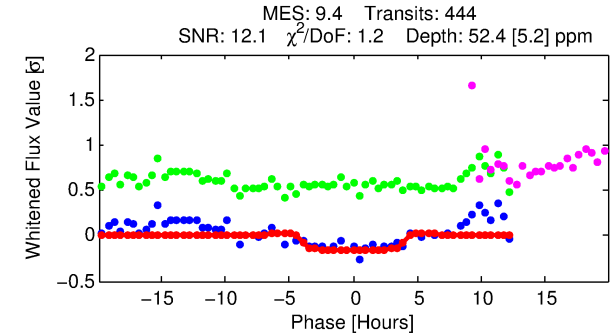
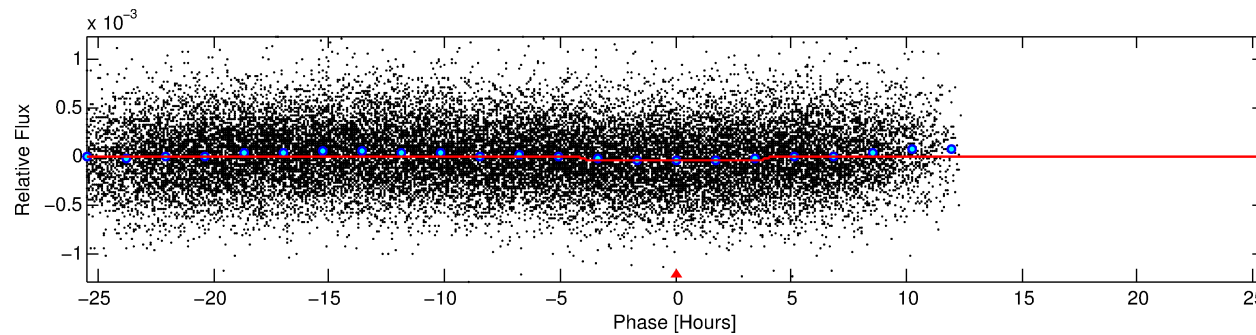
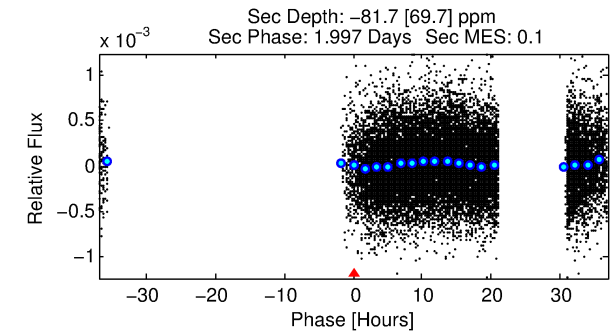
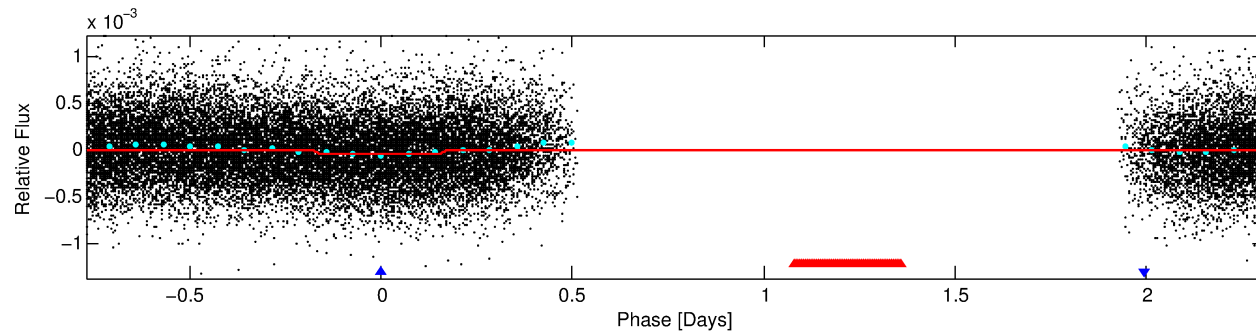
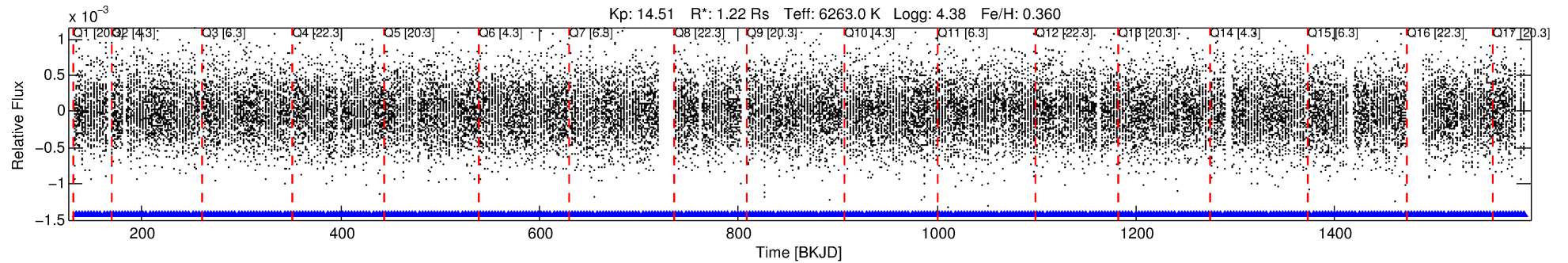
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005563507-02

No Significant Match Found

# DV One-Page Summary

KIC: 5563507 Candidate: 2 of 2 Period: 3.079 d



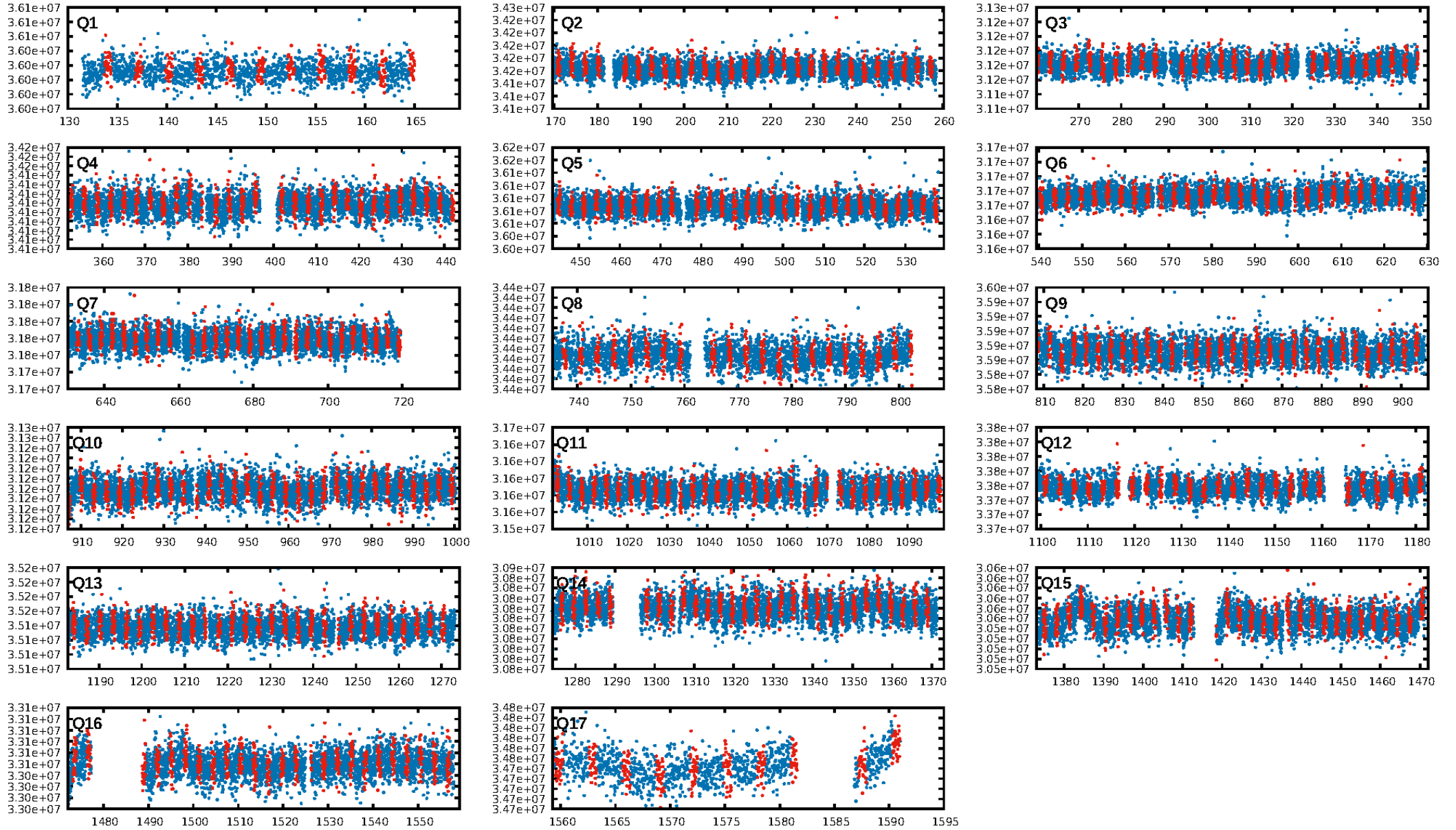
## DV Fit Results:

Period = 3.07945 [0.00004] d  
Epoch = 134.0476 [0.0084] BKJD  
Rp/R\* = 0.0077 [0.0026]  
a/R\* = 1.64 [1.75]  
b = 0.88 [0.44]  
Seff = 1008.40 [353.64]  
Teff = 1437 [126] K  
Rp = 1.03 [0.43] Re  
a = 0.0451 [0.0096] AU  
Ag = N/A  
Teffp = N/A

## DV Diagnostic Results:

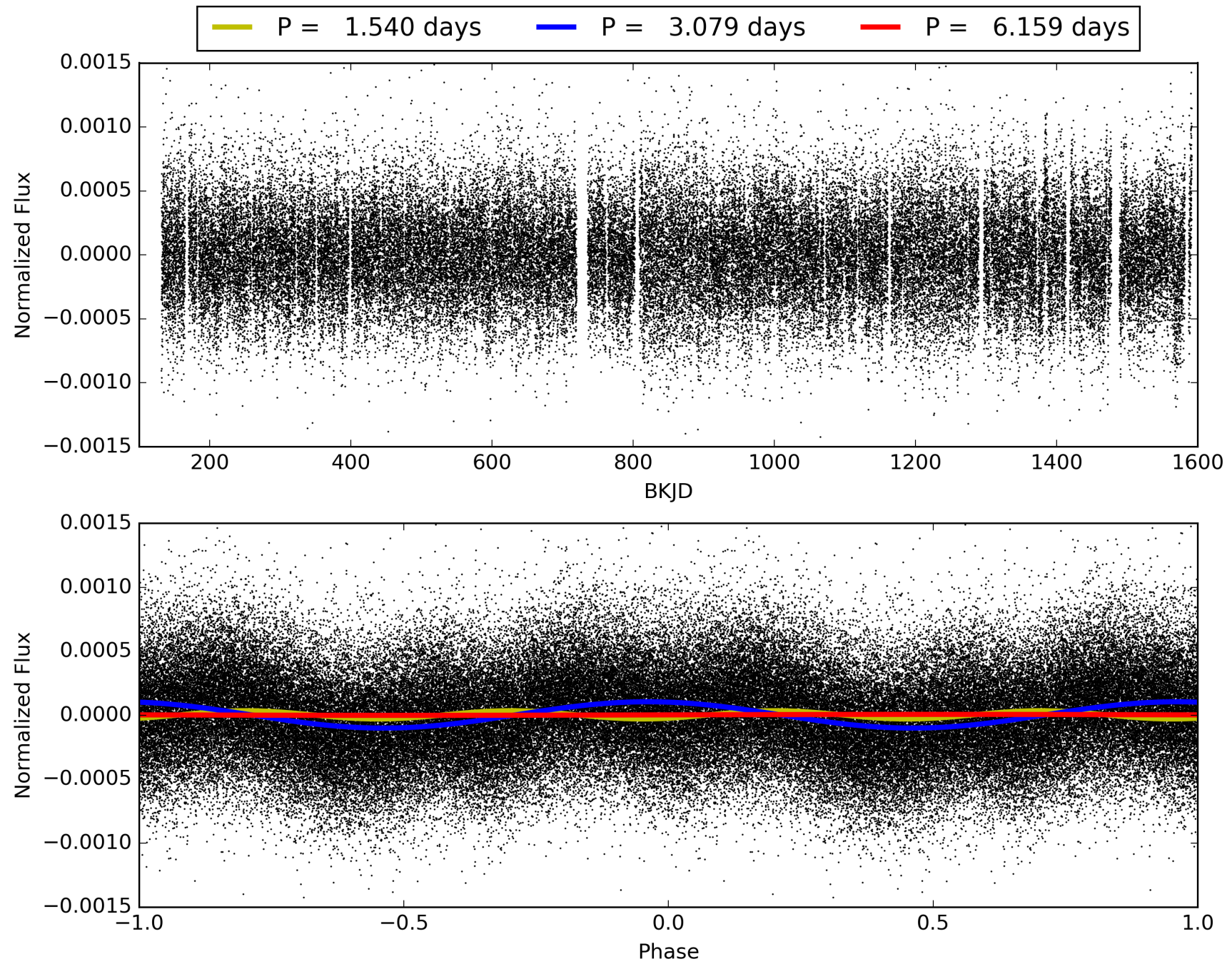
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 9.21e-25  
RollingBand-fgt: 1.00 [423/423]  
GhostDiagnostic-chr: 2.453  
Centroid-sig: 0.0%  
Centroid-so: 2.742 arcsec [2.40σ]  
OotOffset-rm: 0.348 arcsec [1.08σ]  
KicOffset-rm: 0.372 arcsec [1.06σ]  
OotOffset-st: 3/4/3/1 [11]  
KicOffset-st: 3/4/3/1 [11]  
DiffImageQuality-fgm: 0.73 [8/11]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 005563507-02, PDC Light Curves





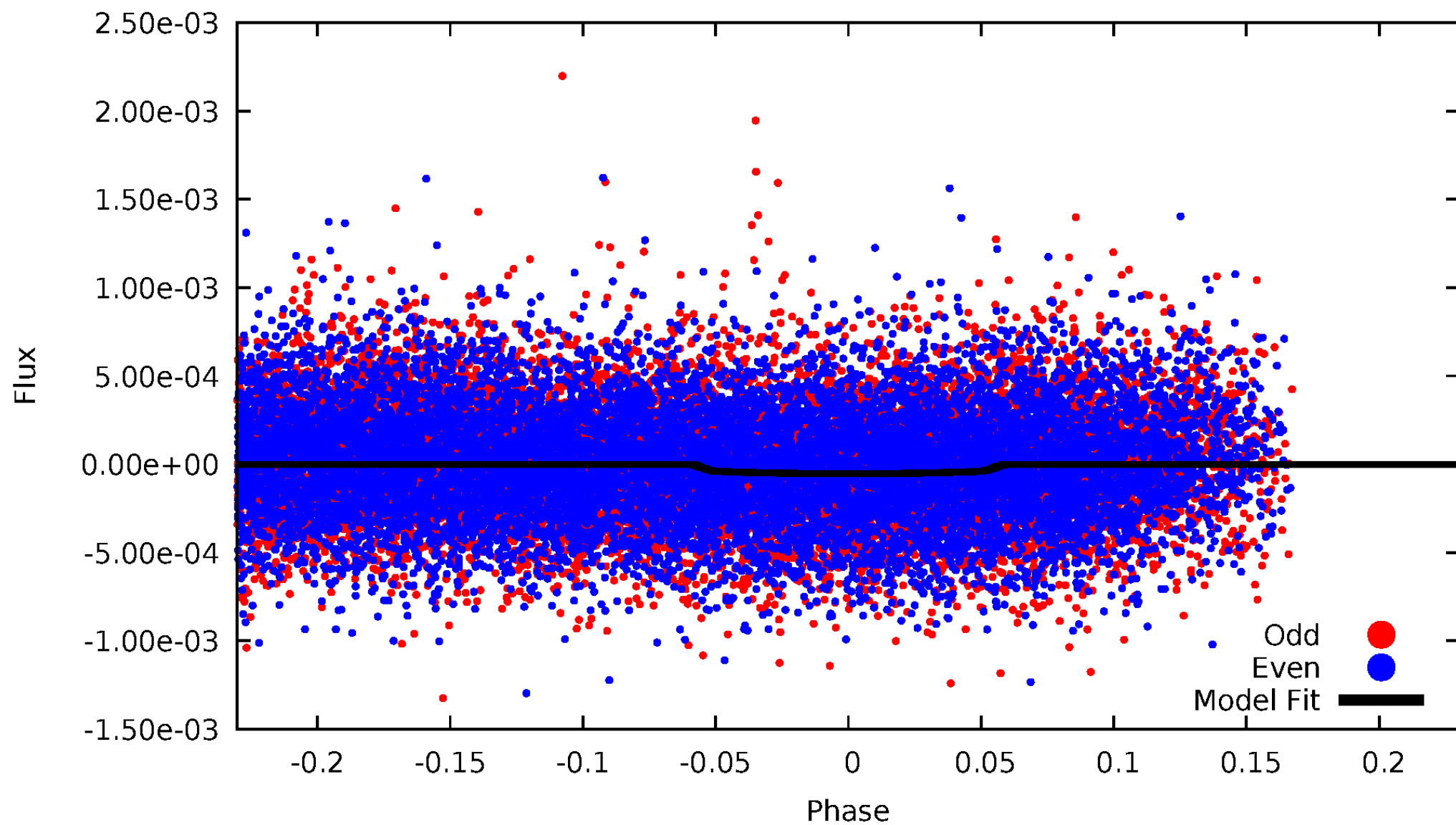
TCE 005563507-02





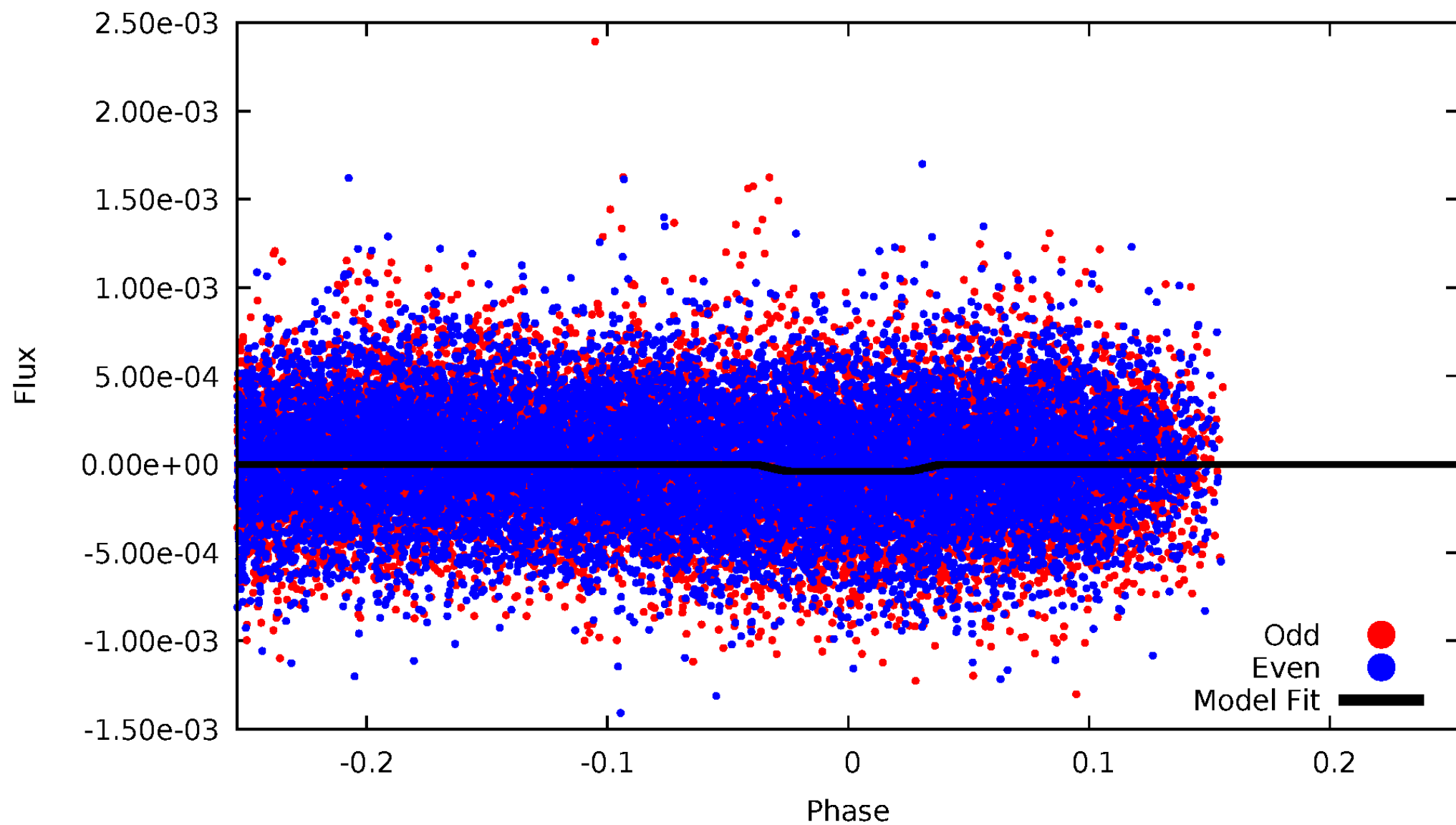
# DV Odd/Even

TCE 005563507-02



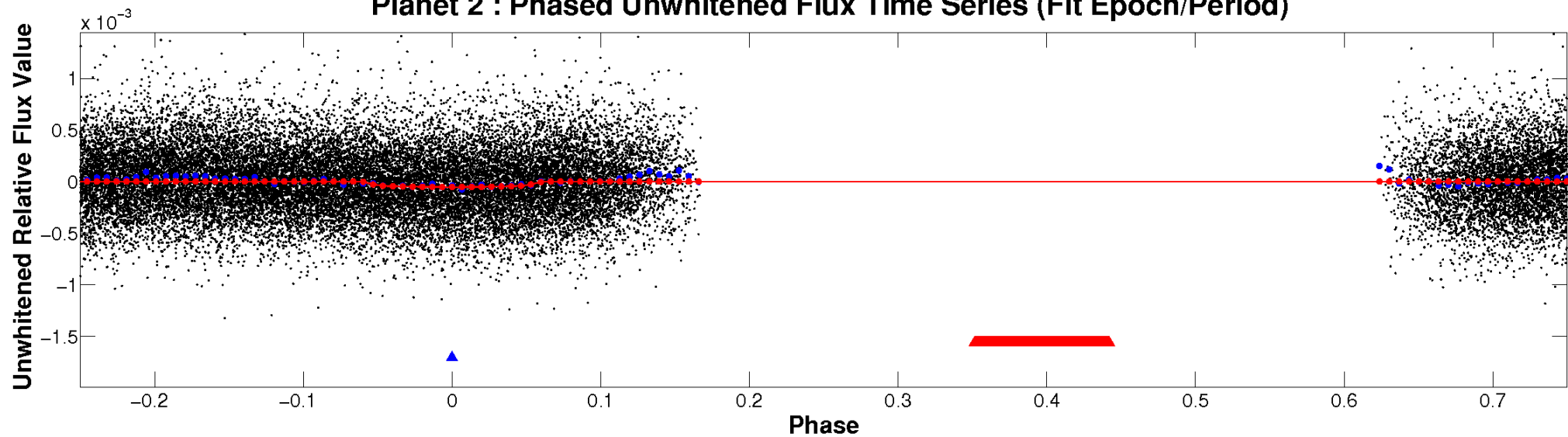
# ALT Odd/Even

TCE 005563507-02

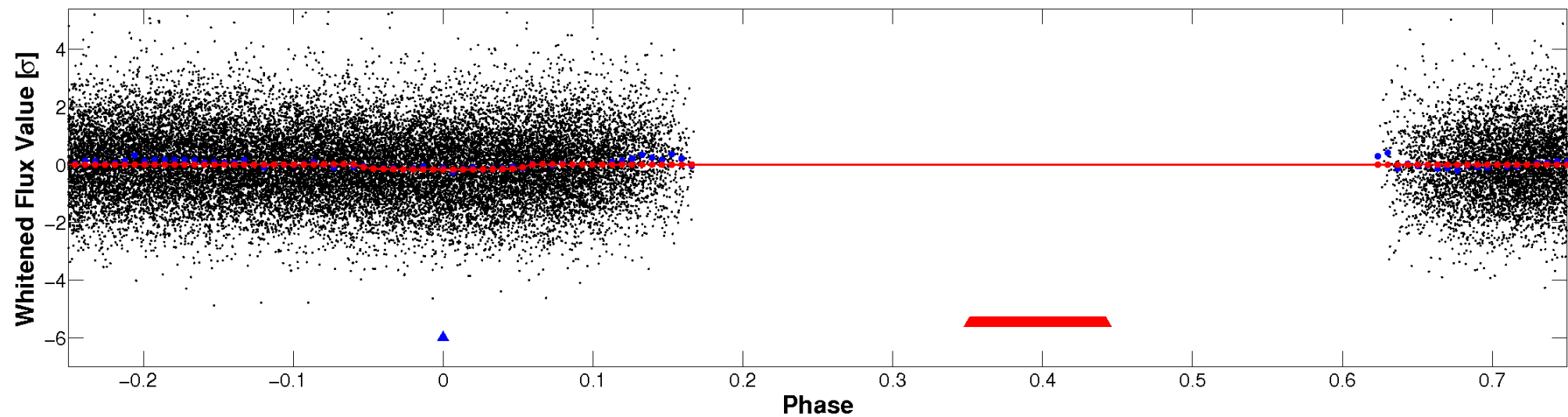


# Non-Whitened Vs. Whitened Light Curve

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

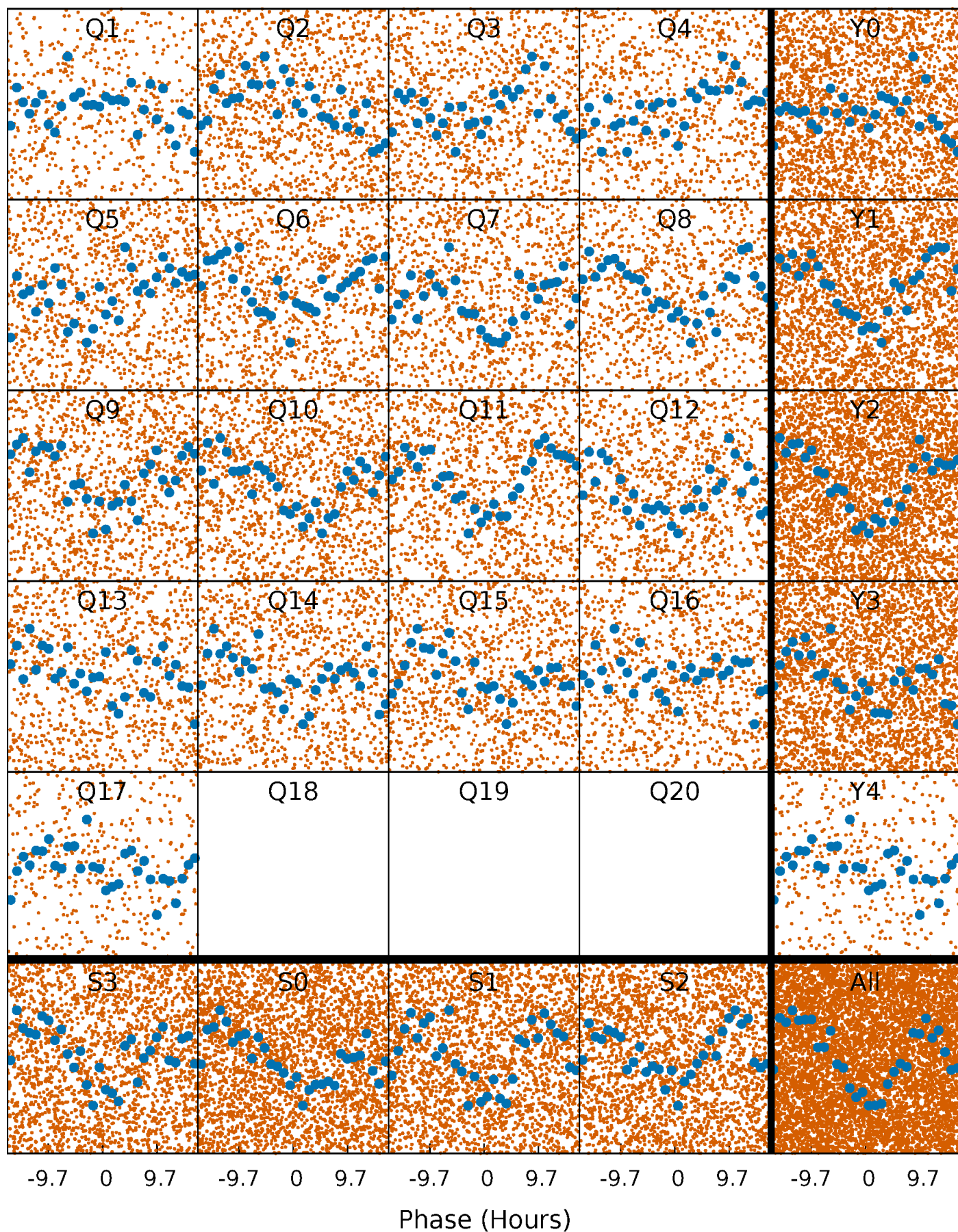


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

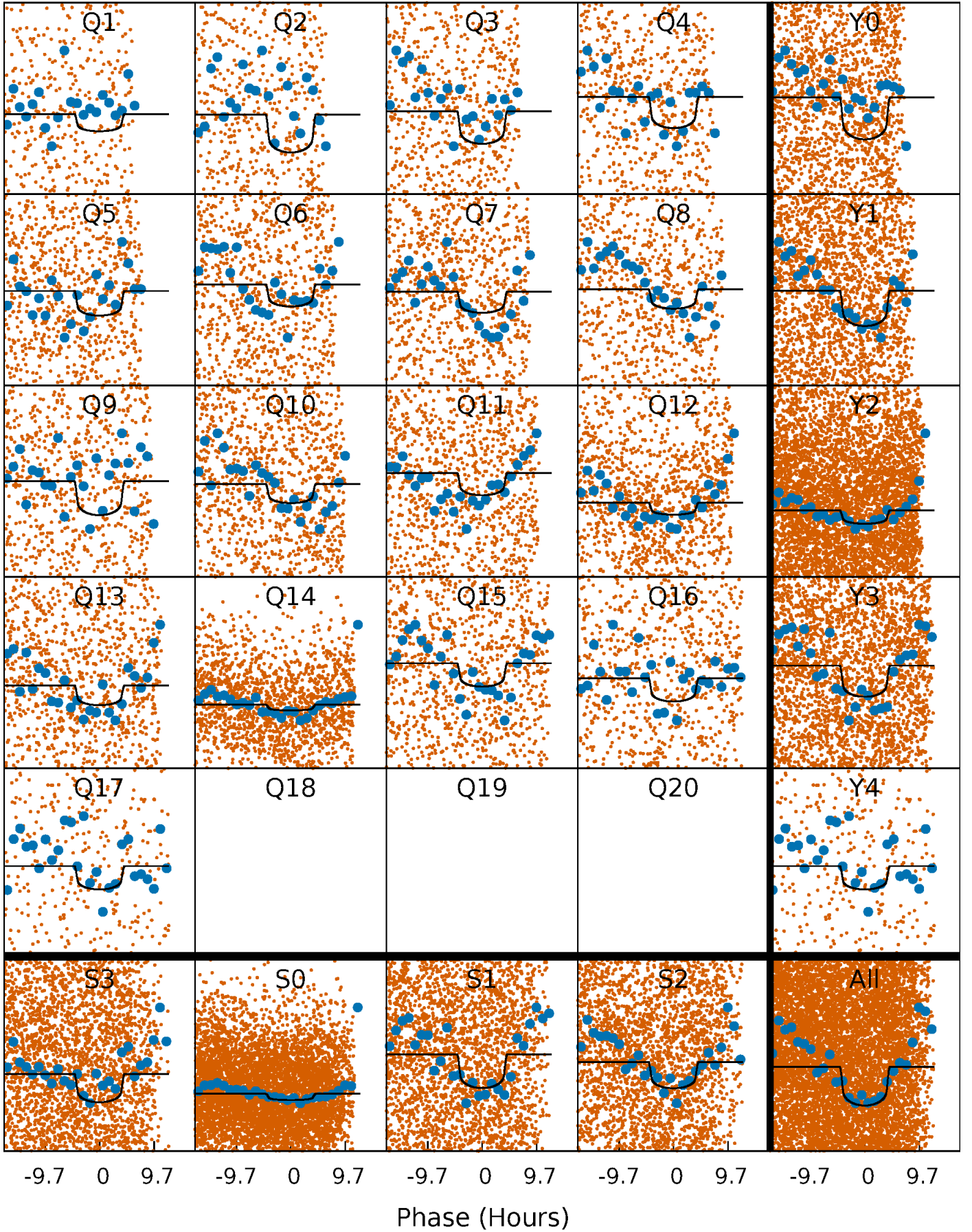
TCE 005563507-02 P= 3.079453 Days  $T_0=134.047594$  (BKJD)





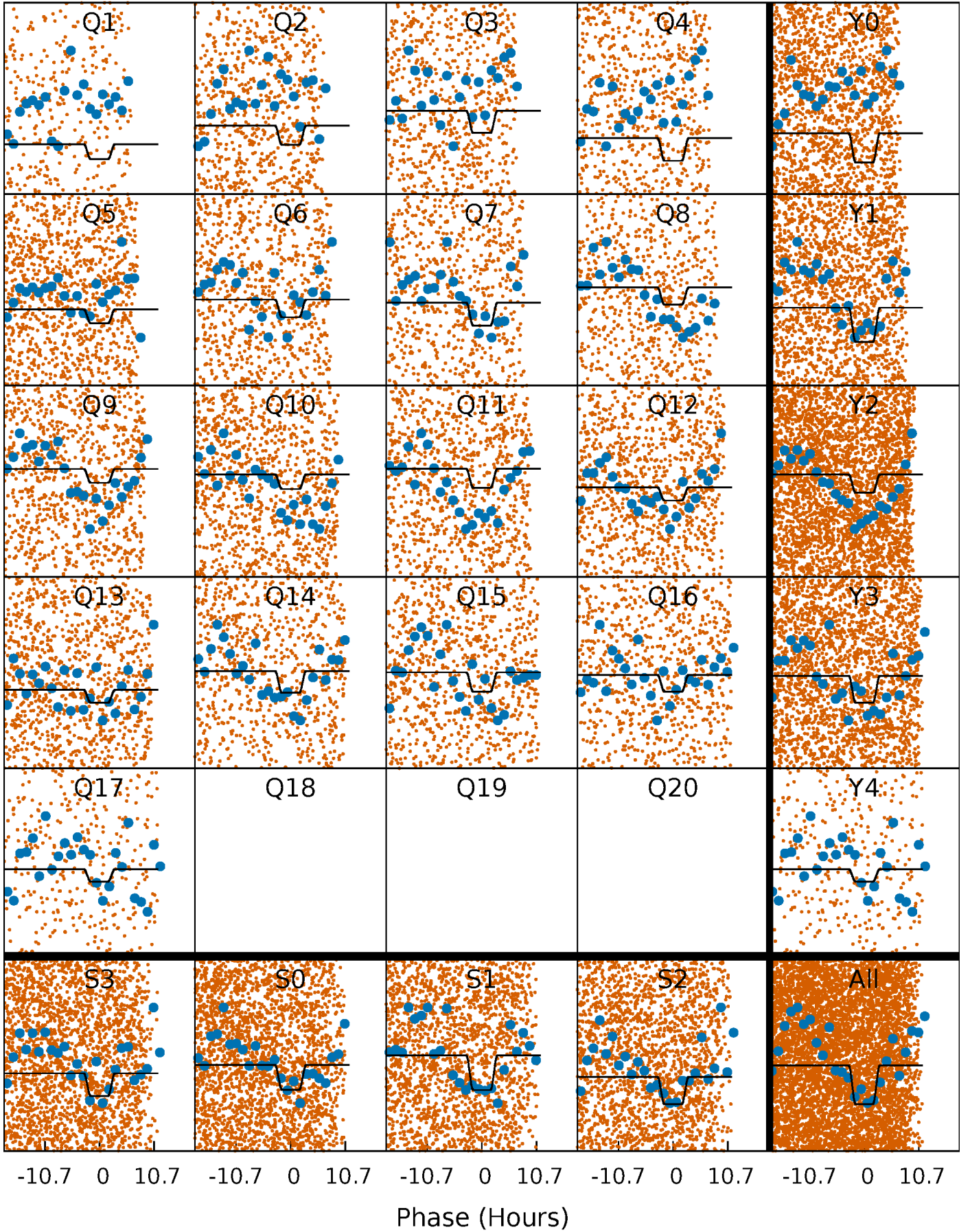
# DV Quarter-Phased Transit Curves

TCE 005563507-02   P= 3.079453 Days    $T_0=134.047594$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005563507-02     $P = 3.079554$  Days     $T_0 = 134.036586$  (BKJD)

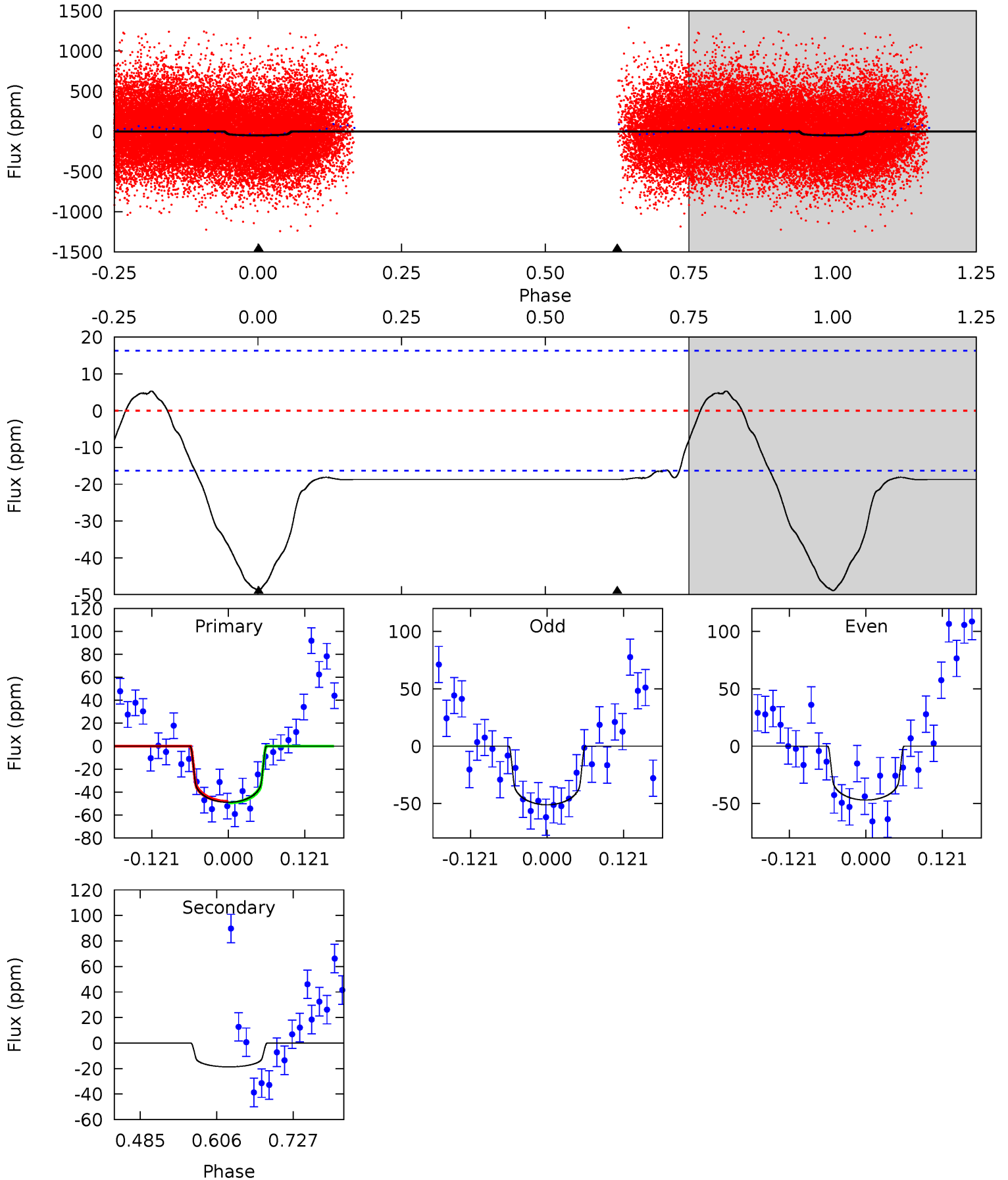




# DV Model-Shift Uniqueness Test

005563507-02, P = 3.079453 Days, E = 130.968141 Days

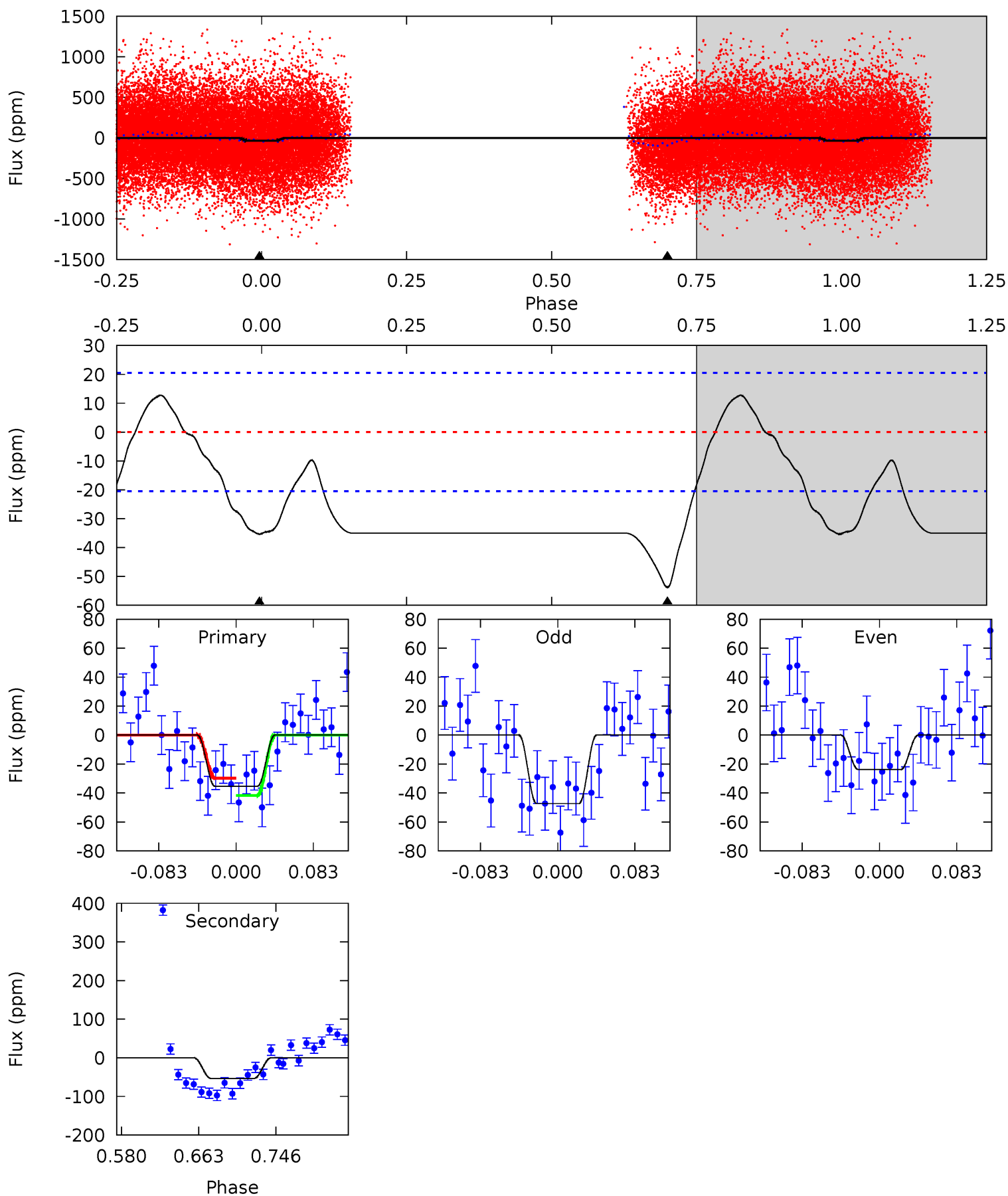
| Pri  | Sec  | Ter | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.6 | 5.19 | 0   | 0   | 4.52            | 1.55            | 1.93             | 13.6    | 13.6    | 5.19    | 5.19    | 0.57    | 1.08 | 0.10  | 0.17 |



# Alt Model-Shift Uniqueness Test

005563507-02, P = 3.079554 Days, E = 130.957032 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  |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.94 | 12.1 | 0   | 0   | 4.60            | 1.73            | 2.72             | 7.94    | 7.94    | 12.1    | 12.1    | 2.64    | 0.99 | 0.19  | 1.35 |



### Stellar Parameters For KIC 005563507

|        | $T_{\text{eff}} (K)$ | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M (M_{\odot})$           | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $6263^{+174}_{-261}$ | $4.376^{+0.060}_{-0.168}$ | $0.360^{+0.100}_{-0.350}$ | $1.220^{+0.310}_{-0.143}$ | $1.290^{+0.125}_{-0.188}$ | $1.000^{+0.302}_{-0.461}$                 |
|        | +3%/-4%              | +1%/-4%                   | +28%/-97%                 | +25%/-12%                 | +10%/-15%                 | +30%/-46%                                 |
| 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 005563507-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$   | $A_{\text{obs}}$  |
|---------|-------------|------------------------|----------------------|------------------------|-------------------|
| DV      | $-19 \pm 4$ | $1.07^{+0.37}_{-0.35}$ | $2039^{+121}_{-105}$ | $4722^{+966}_{-526}$   | $17^{+23}_{-8}$   |
| Alt.    | $-54 \pm 4$ | $0.87^{+0.39}_{-0.35}$ | $2035^{+116}_{-100}$ | $6677^{+2498}_{-1107}$ | $76^{+132}_{-40}$ |

$T_{\text{max}}$  = 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

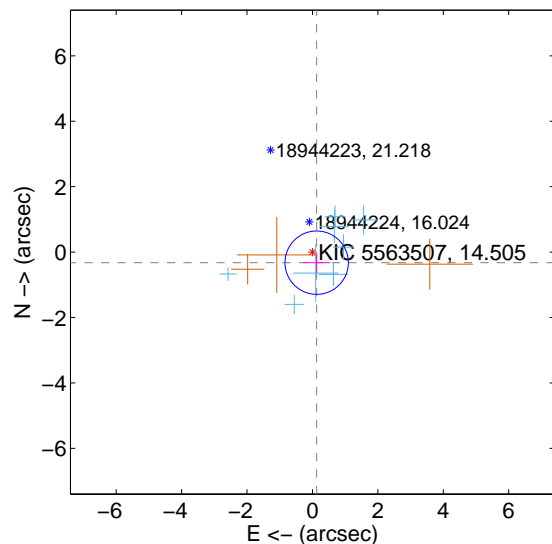
Supplemental centroid analysis for 005563507-02. Kepler magnitude: 14.51. Transit SNR 12.12

There are 8 quarters with good PRF difference image offsets

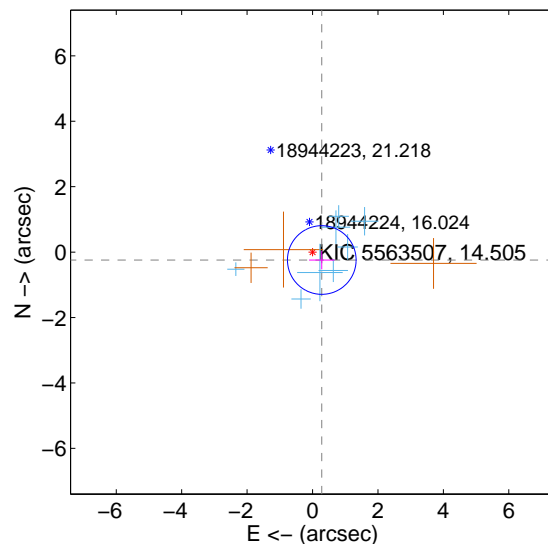
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $0.348 \pm 0.323$  | 1.08                | $-0.129 \pm 0.413$ | $-0.324 \pm 0.306$ |
| PRF-fit source offset from KIC position | $0.372 \pm 0.350$  | 1.06                | $-0.283 \pm 0.391$ | $-0.242 \pm 0.284$ |
| photometric centroid source offset      | $2.74 \pm 1.14$    | 2.40                | $0.96 \pm 1.11$    | $-2.57 \pm 1.15$   |

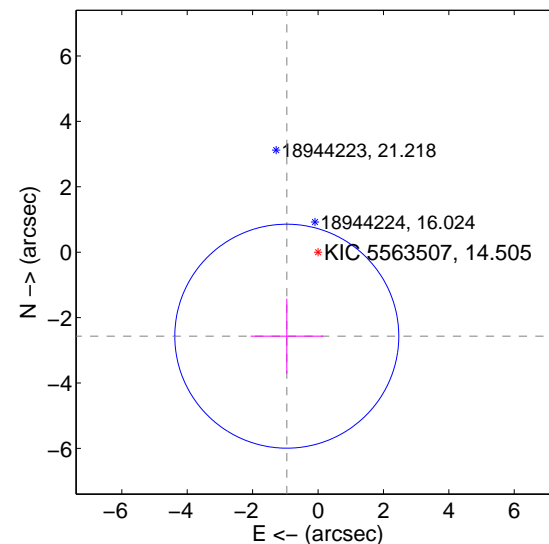
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

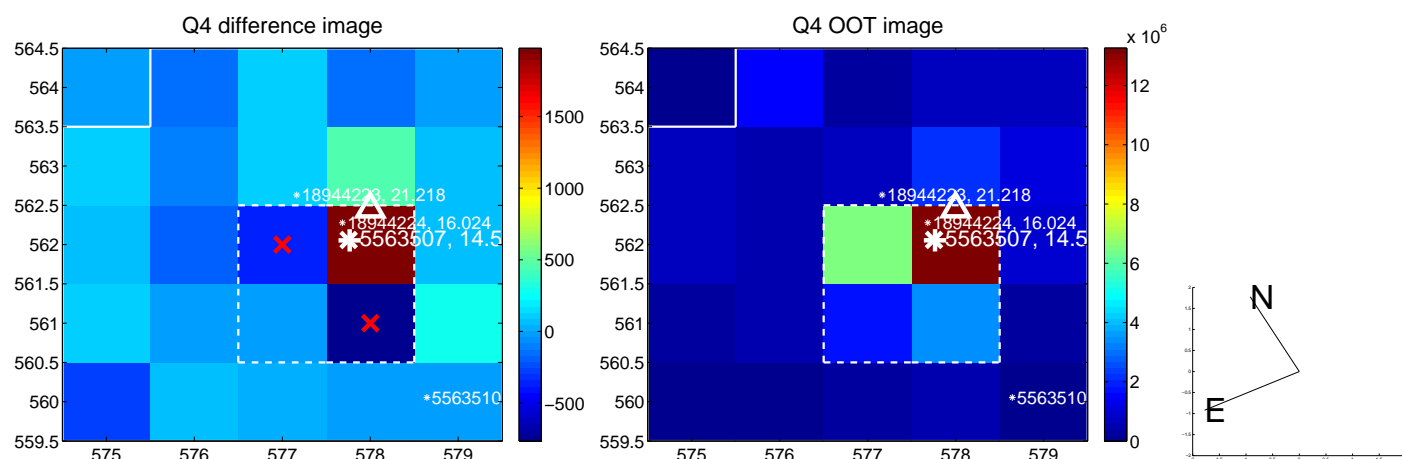
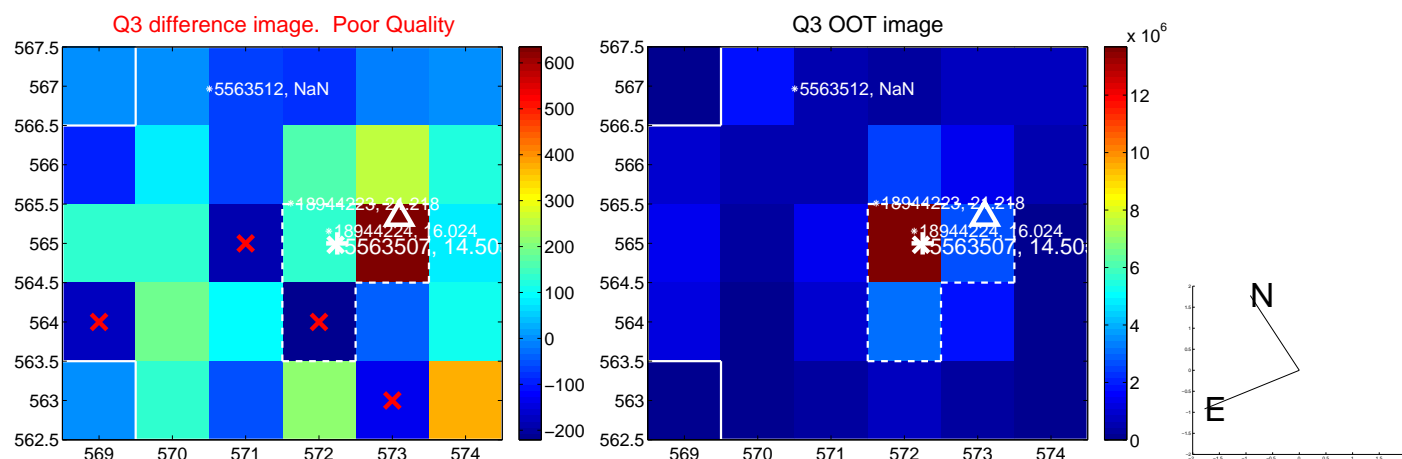
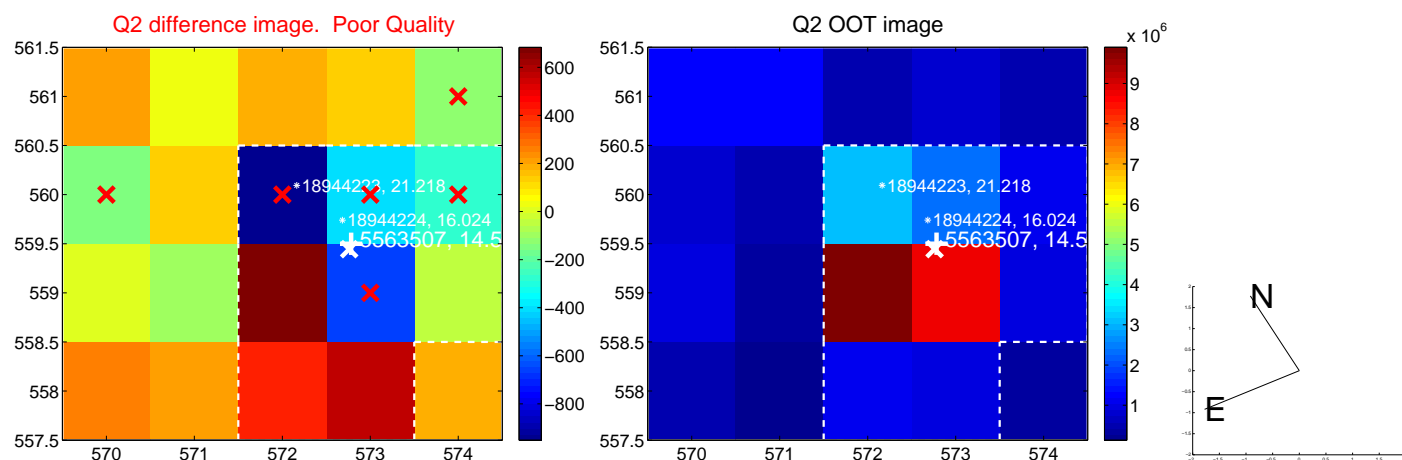
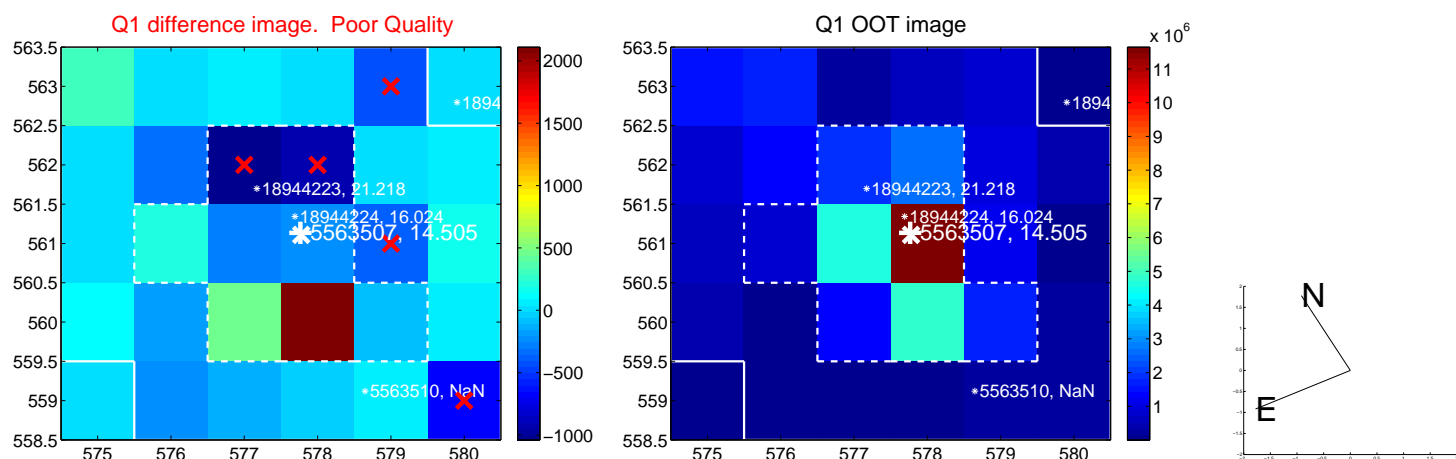


offset from photometric centroids

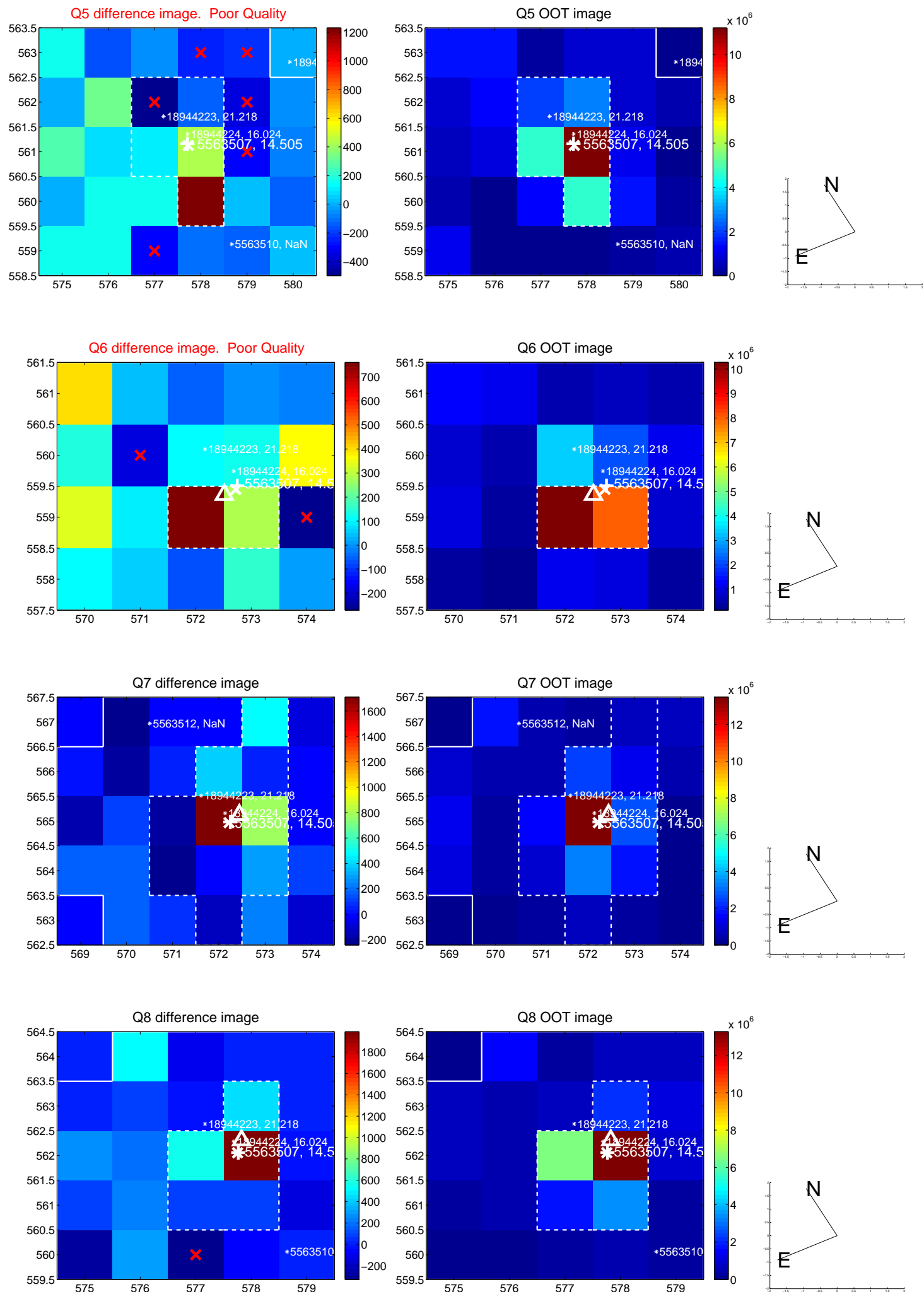


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

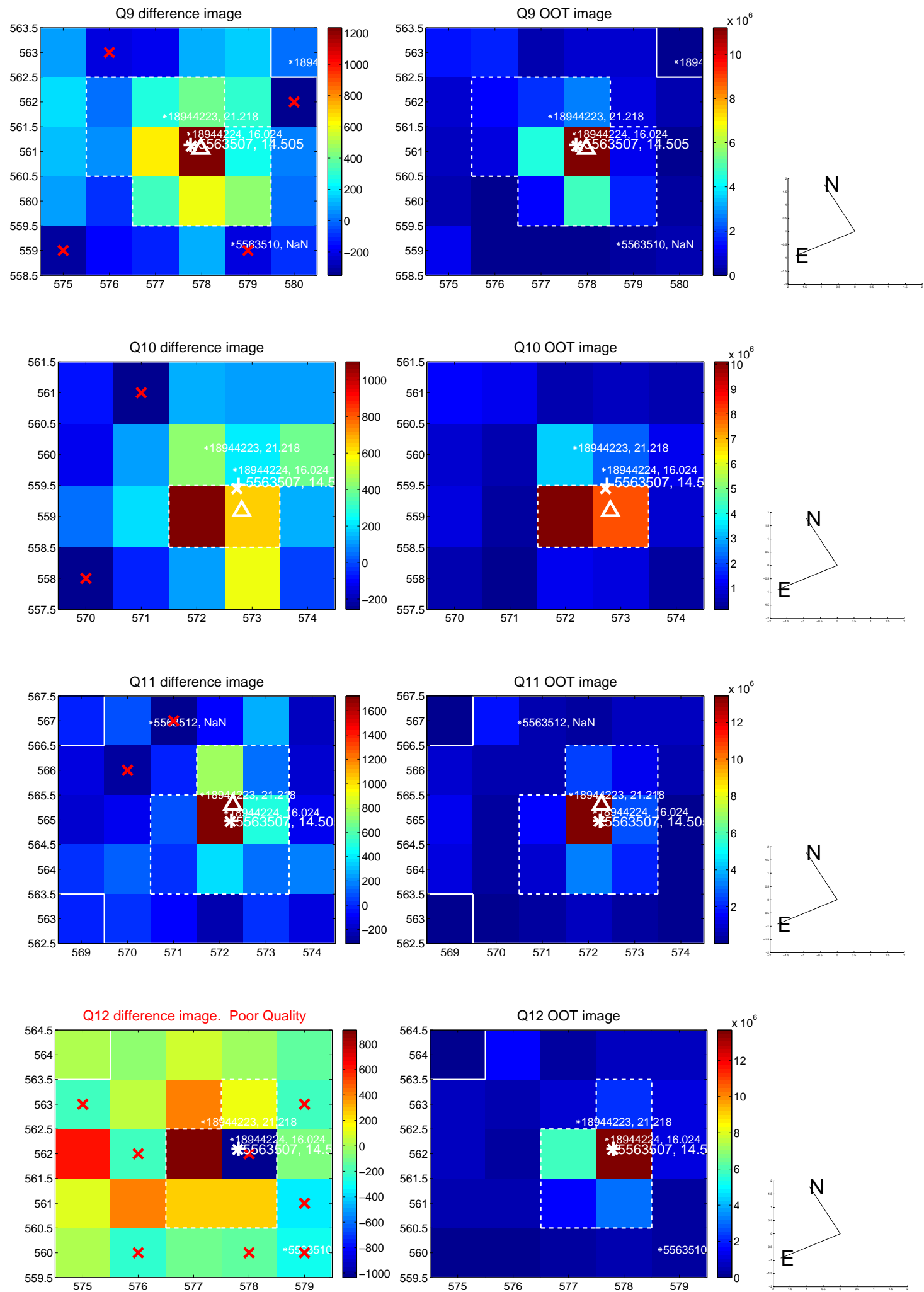


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

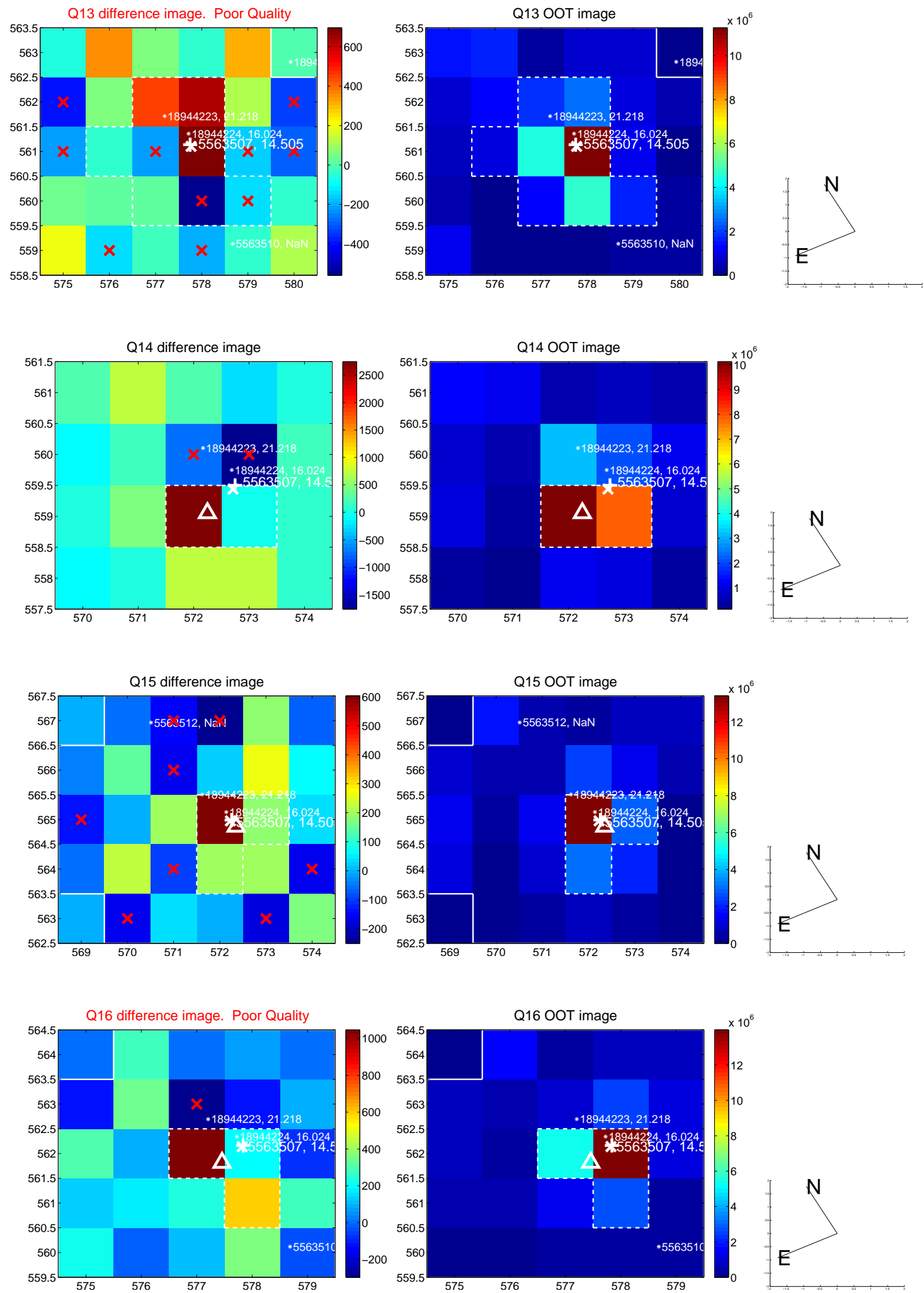




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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





UKIRT Image

Declination

