

# KIC 005462901

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|--------|-----------------------------|-----------------|------------------------|------------------------|
| 005462901-01 | OBS      | 6581.01 | 5.270730      | 136.181163   | 296014.3    | 2.775            | 3169.2 | 1830.4 | 0.68                        | 4348            | 59.17                  | 54.75                  |
| 005462901-02 | OBS      | No      | 5.270727      | 133.546351   | 81677.4     | 2.738            | 930.0  | 713.7  | 0.68                        | 4348            | 28.88                  | 54.75                  |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005462901-01 | OBS      | FP   | 0.00  | 0 | 1 | 0 | 0 | MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS |
| 005462901-02 | OBS      | FP   | 0.00  | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_KIC_POS  |

**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.

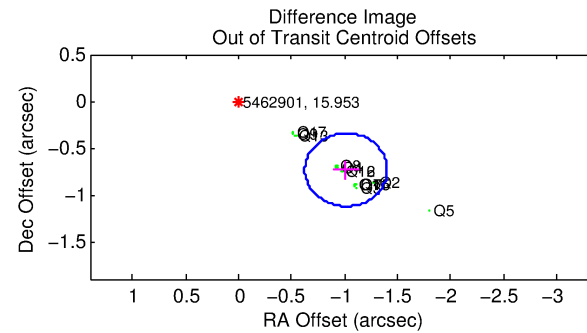
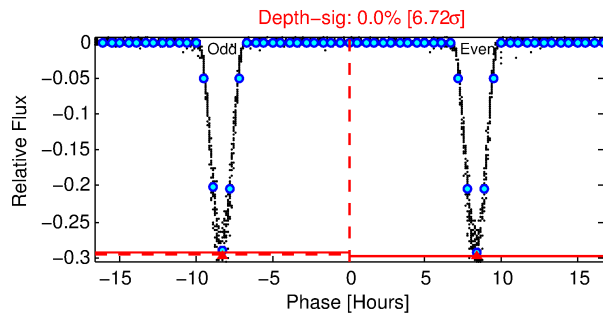
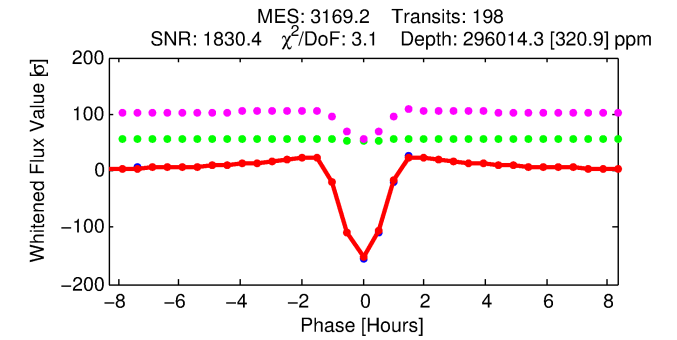
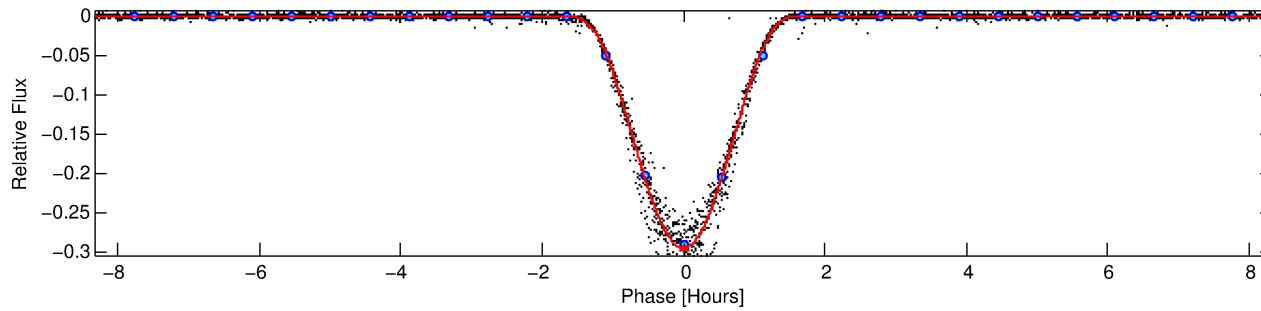
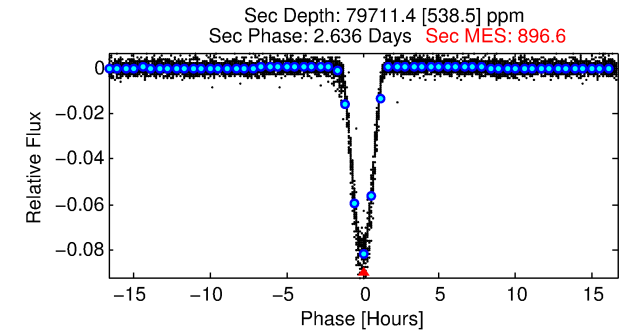
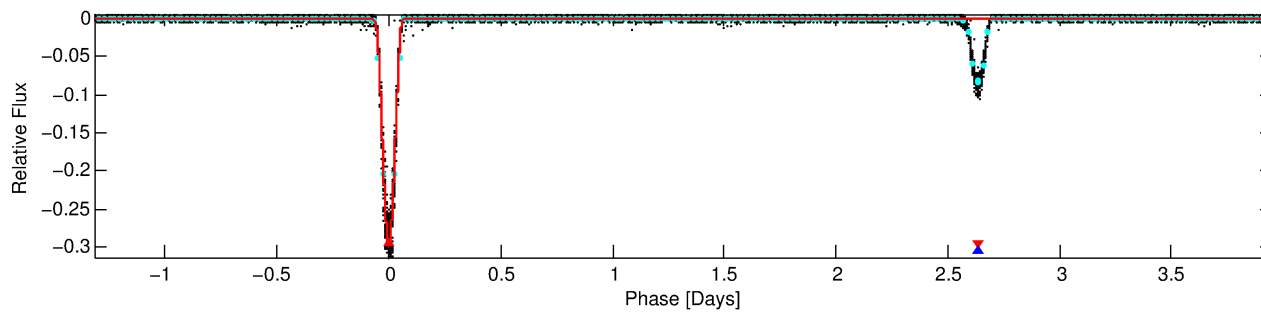
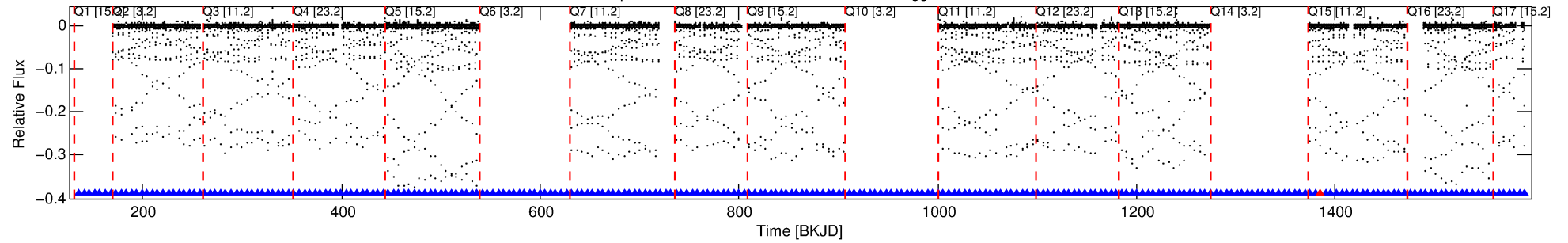
## Ephemeris Match Information For 005462901-01

No Significant Match Found

# DV One-Page Summary

KIC: 5462901 Candidate: 1 of 2 Period: 5.271 d  
KOI: K06581.01 Corr: 0.998

Kp: 15.95 R\*: 0.68 Rs Teff: 4348.0 K Logg: 4.60 Fe/H: 0.070



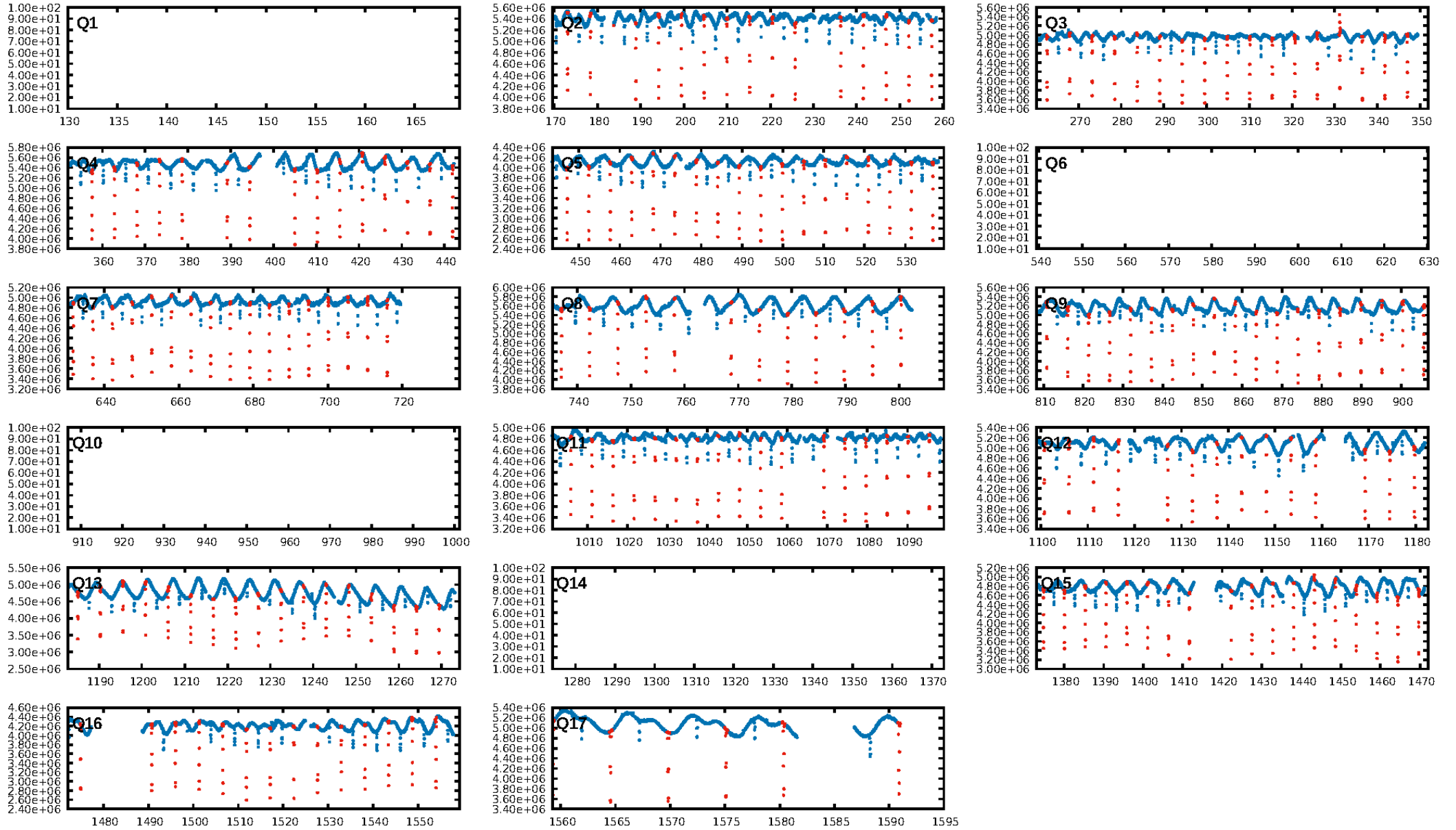
## DV Fit Results:

Period = 5.27073 [0.00000] d  
Epoch = 136.1812 [0.0000] BKJD  
Rp/R\* = 0.7997 [0.0224]  
a/R\* = 22.47 [0.17]  
b = 0.92 [0.03]  
Seff = 54.75 [10.04]  
Teff = 694 [32] K  
Rp = 59.17 [5.66] Re  
a = 0.0519 [0.0038] AU  
Ag = 33.68 [3.92] [8.34σ]  
Teffp = 2583 [105] K [17.20σ]

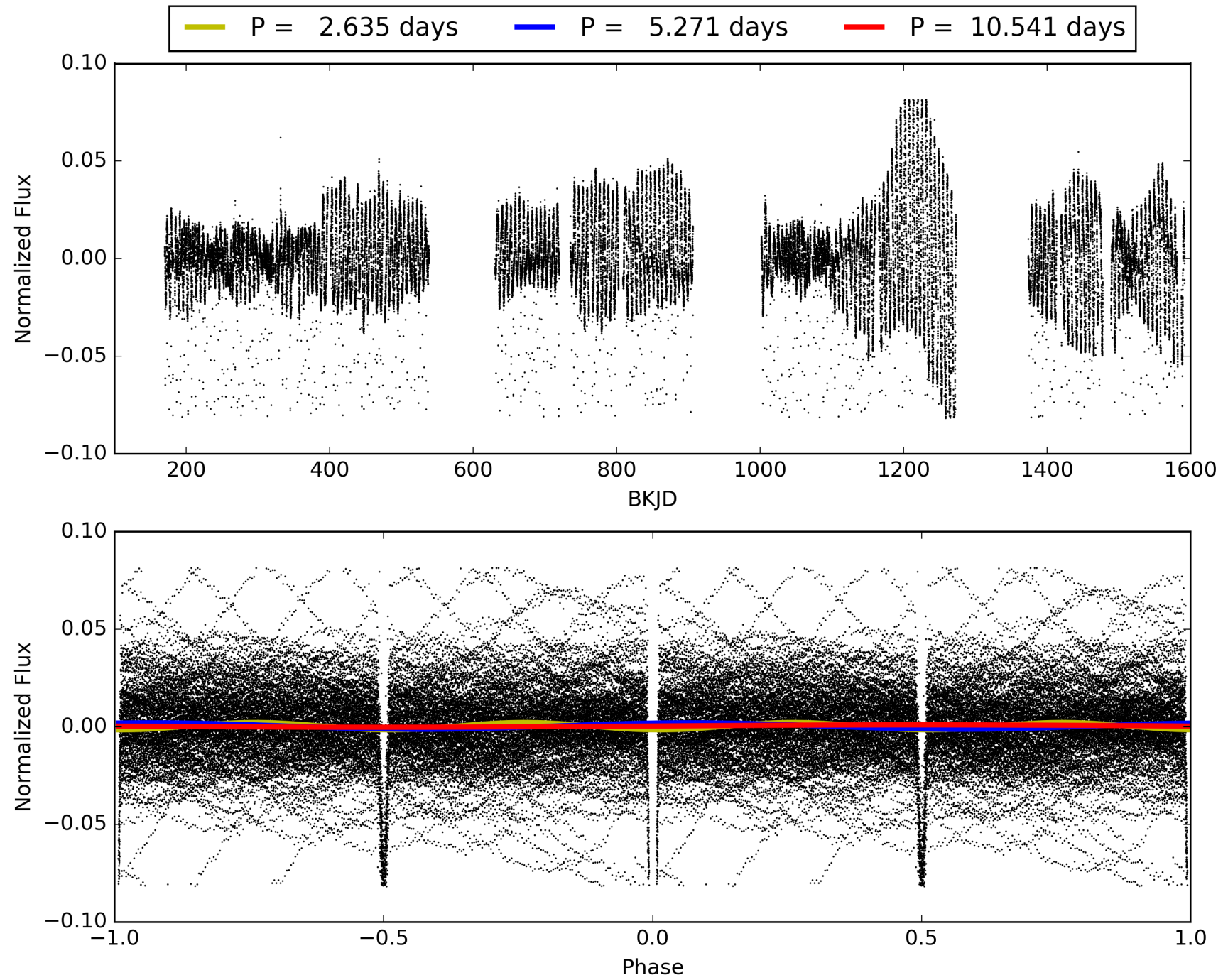
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.99 [191/192]  
GhostDiagnostic-chr: 2.387  
Centroid-sig: 0.0%  
Centroid-so: 0.935 arcsec [660.60σ]  
OotOffset-rm: 1.254 arcsec [9.66σ]  
KicOffset-rm: 0.244 arcsec [3.60σ]  
OotOffset-st: 1/4/4/4 [13]  
KicOffset-st: 1/4/4/4 [13]  
DiffImageQuality-fgm: 1.00 [13/13]  
DiffImageOverlap-fno: 1.00 [13/13]

# TCE 005462901-01, PDC Light Curves

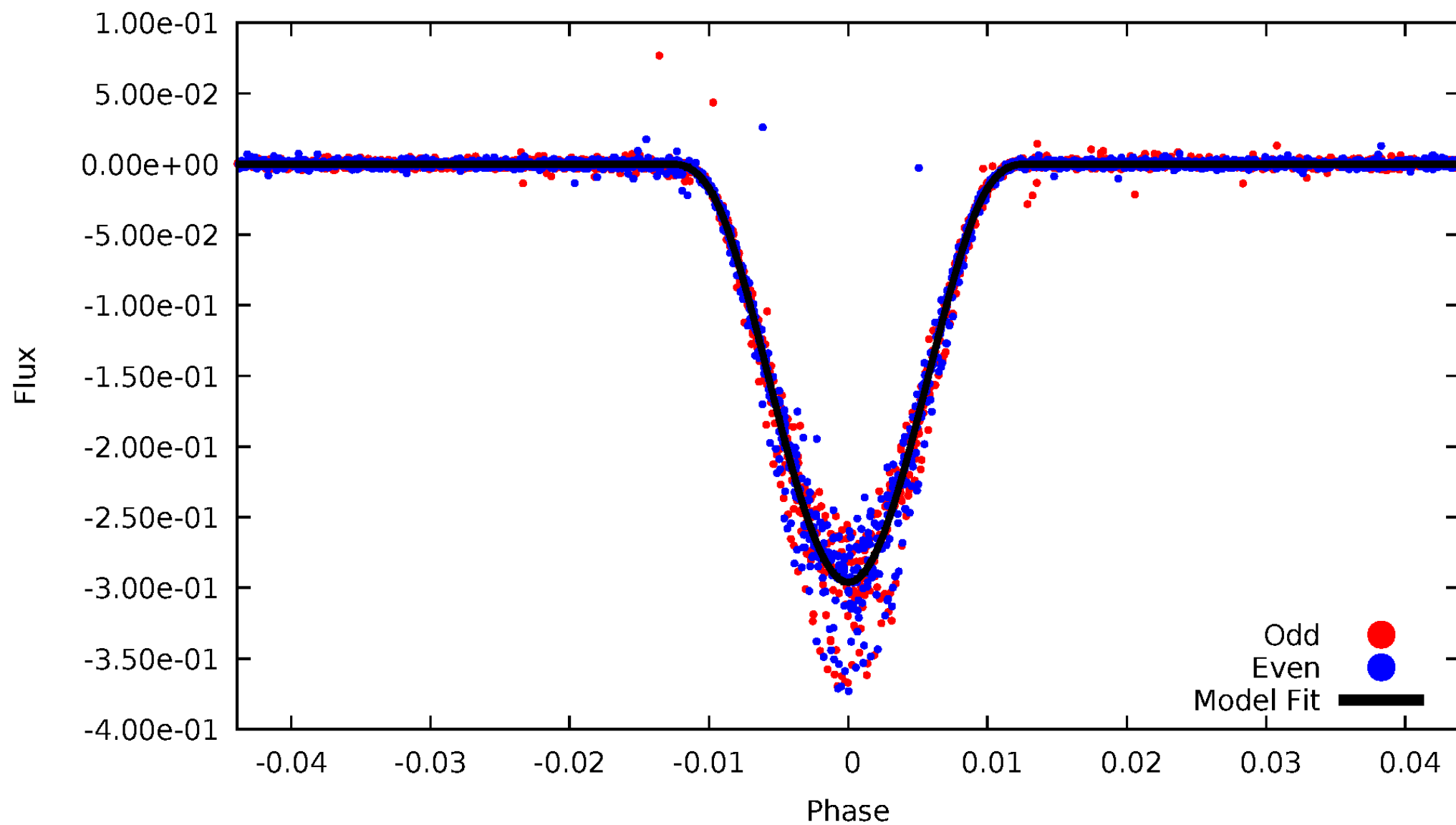


TCE 005462901-01



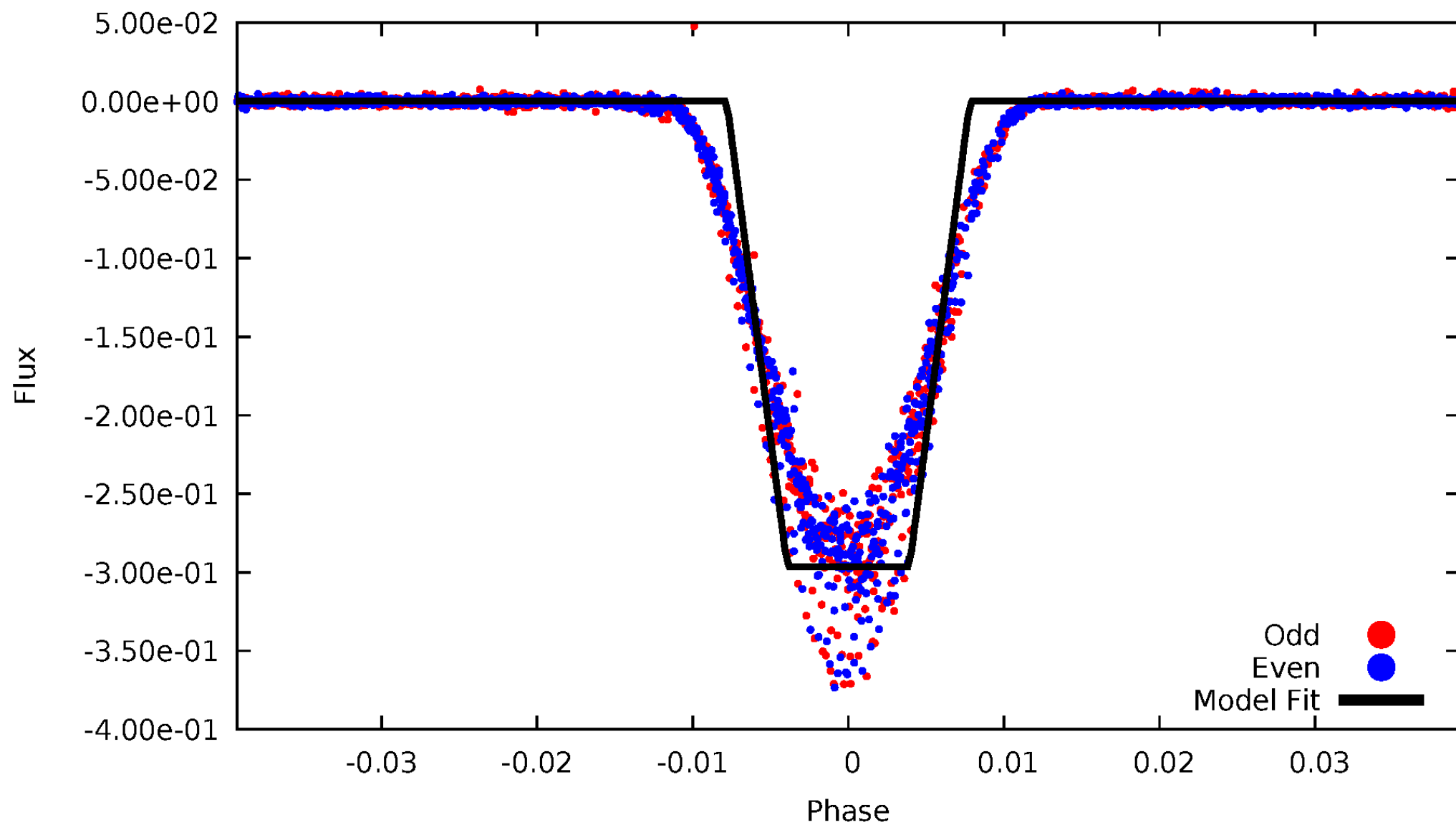
# DV Odd/Even

TCE 005462901-01



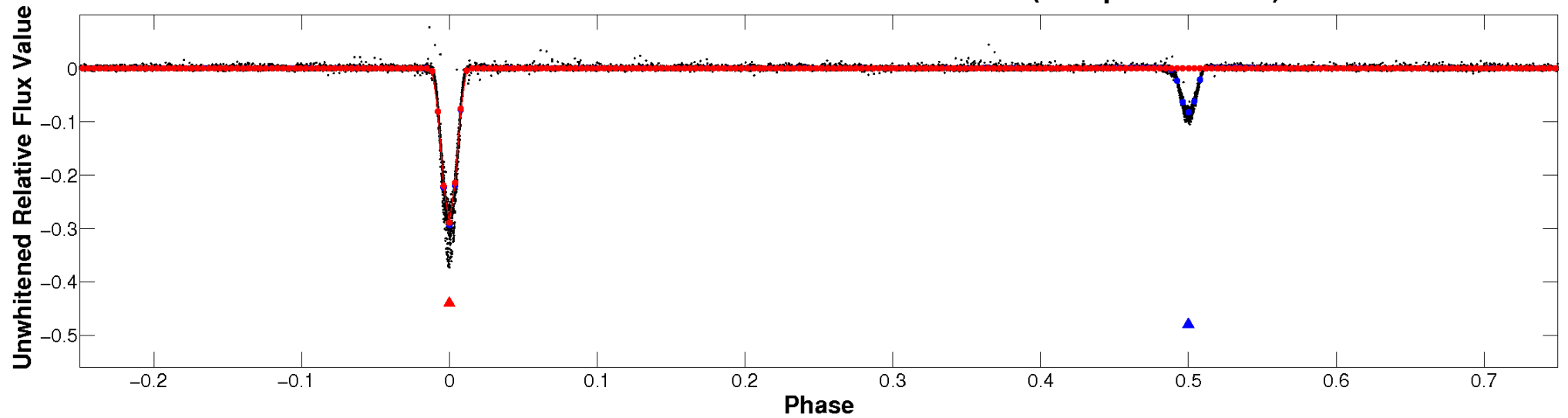
# ALT Odd/Even

TCE 005462901-01

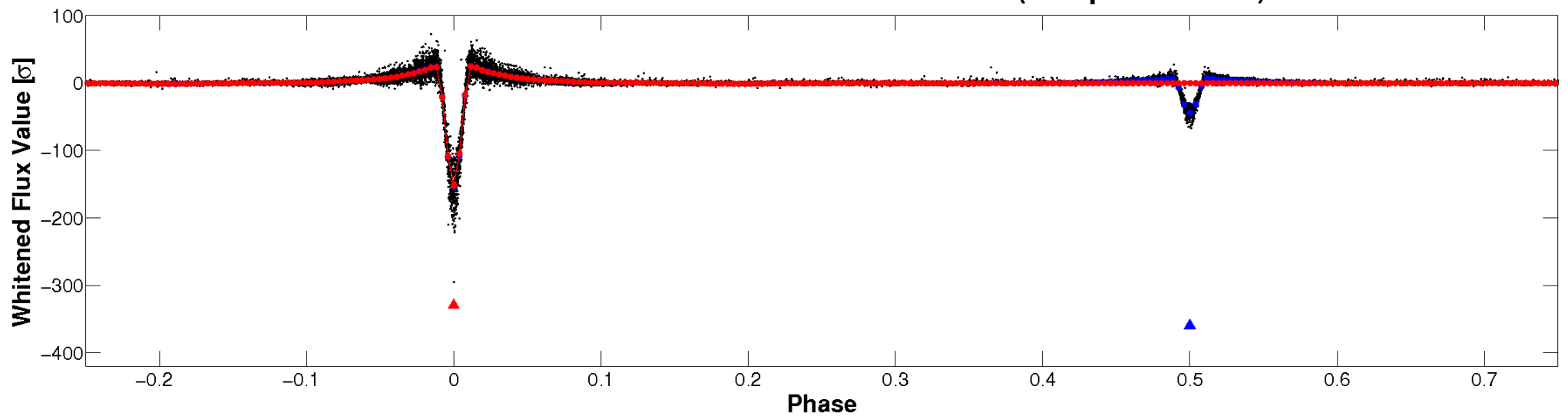


# Non-Whitened Vs. Whitened Light Curve

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

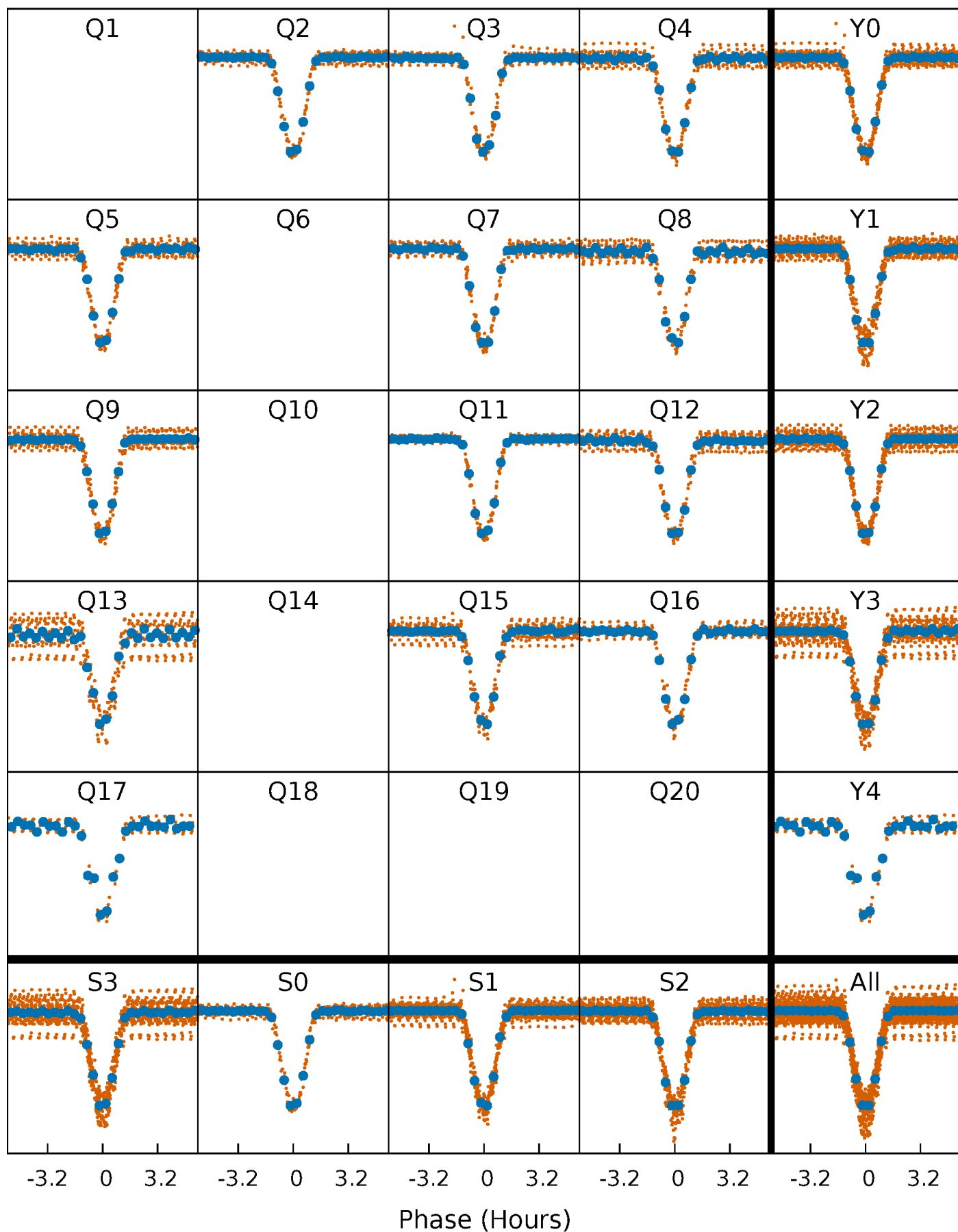


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

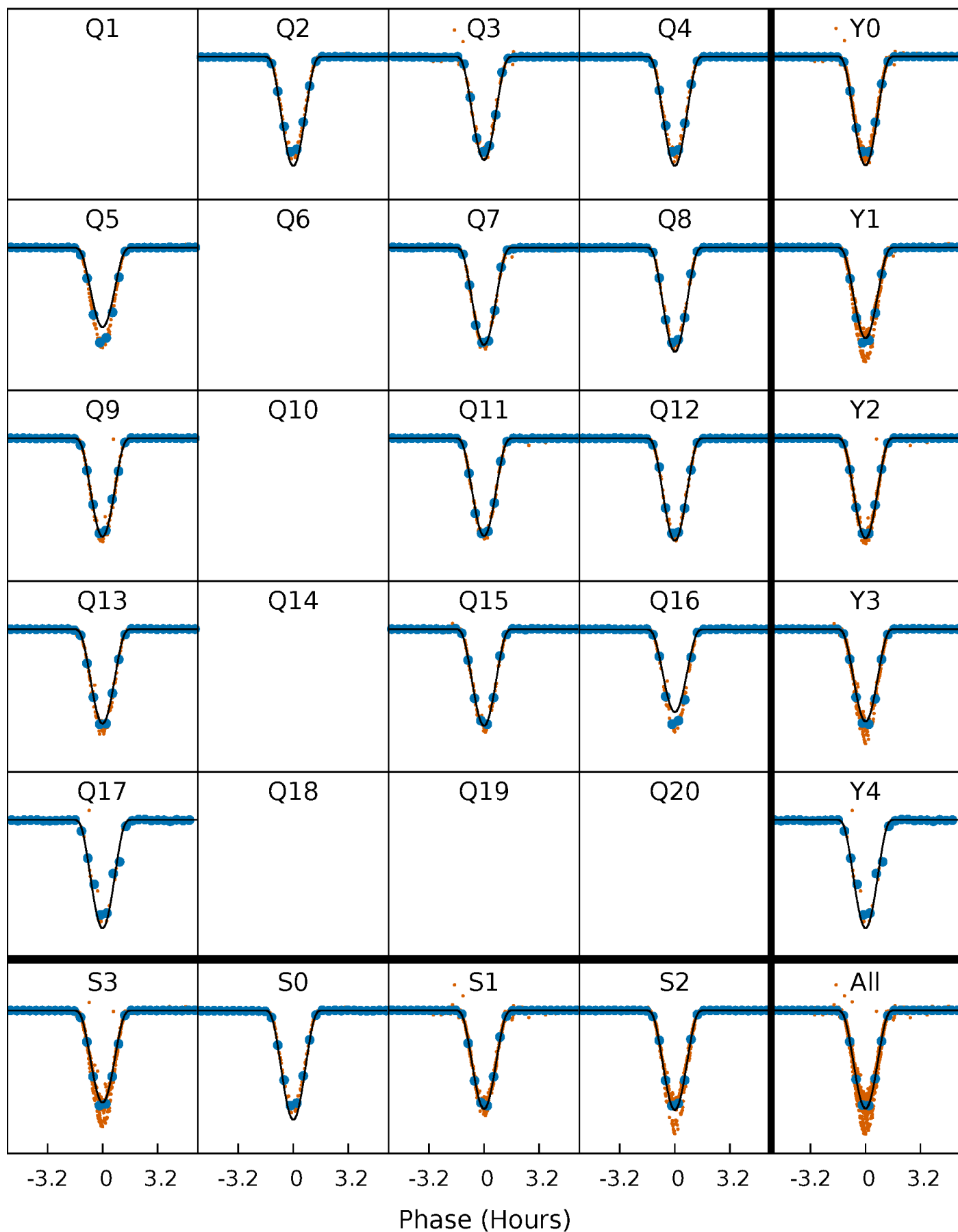
TCE 005462901-01 P= 5.270730 Days  $T_0=136.181163$  (BKJD)





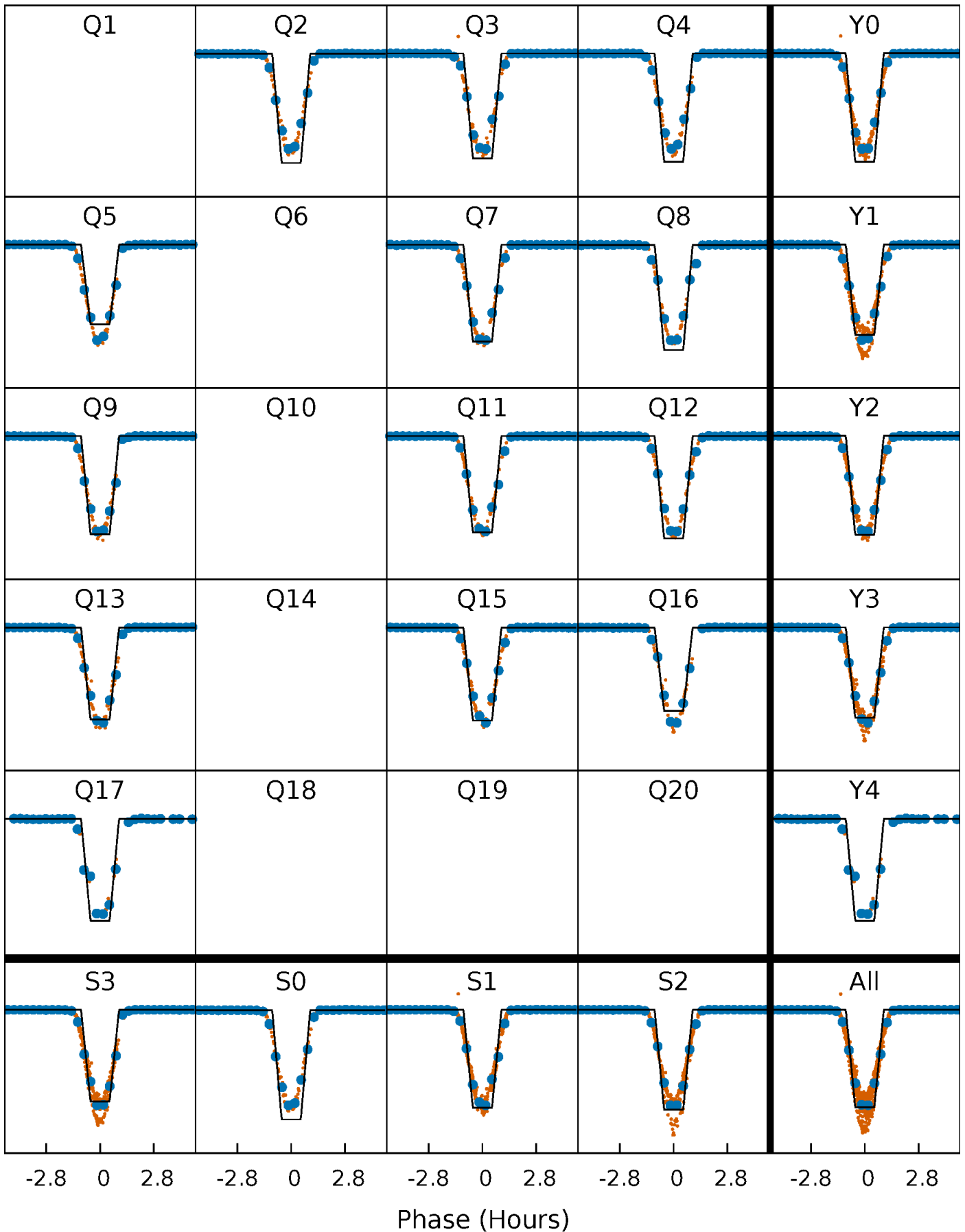
# DV Quarter-Phased Transit Curves

TCE 005462901-01 P= 5.270730 Days  $T_0=136.181163$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

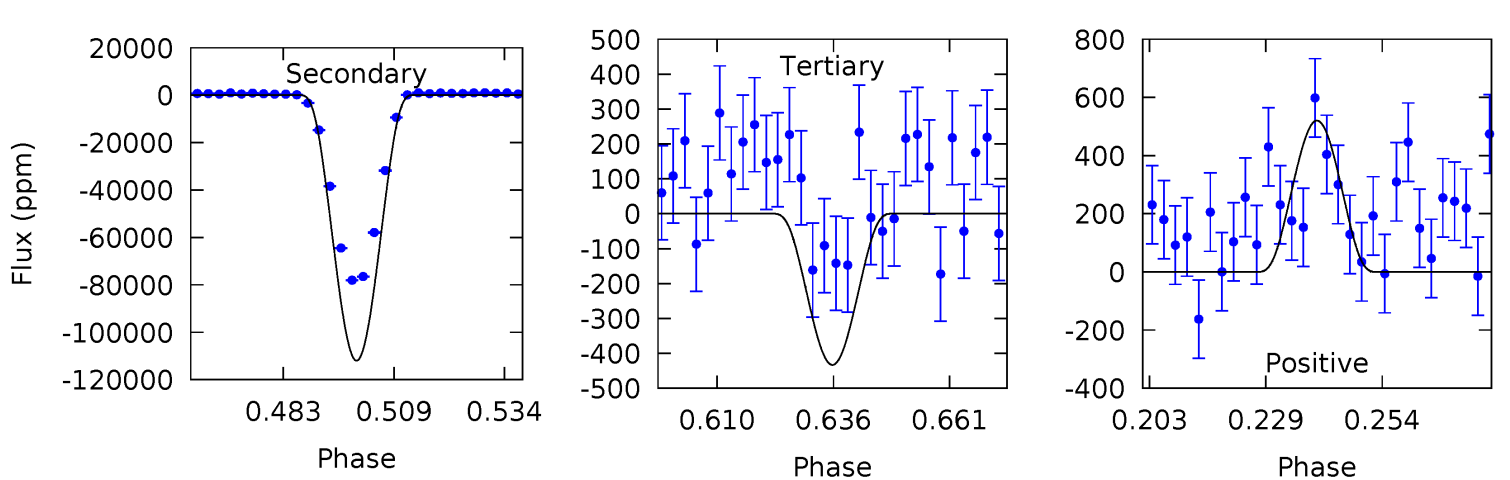
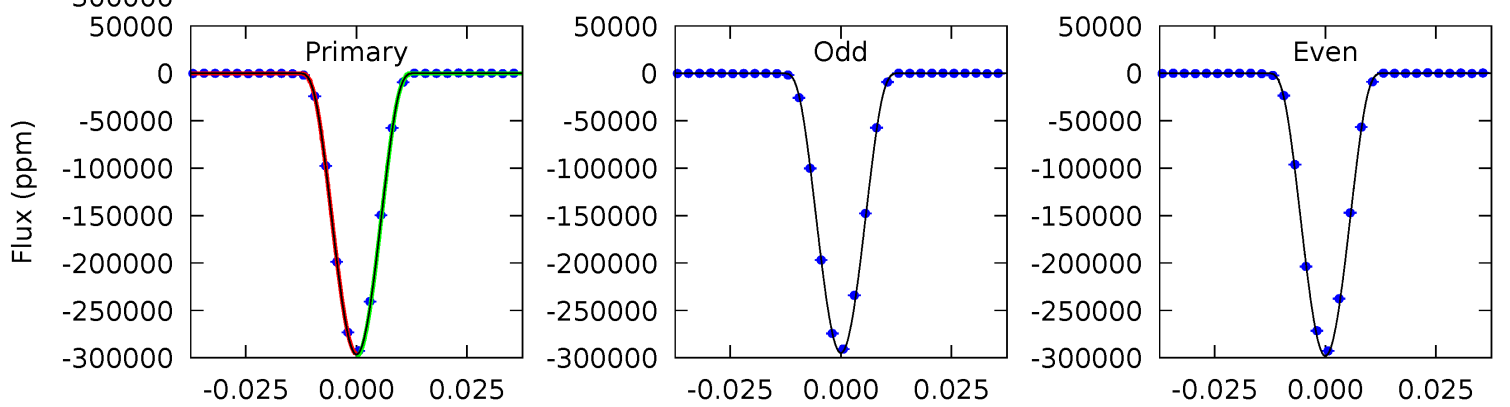
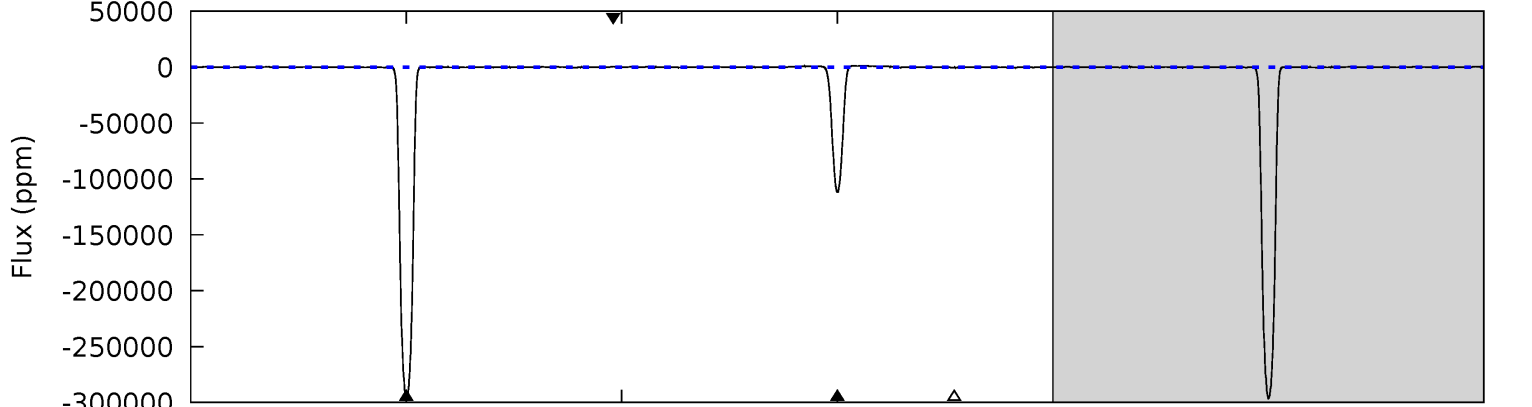
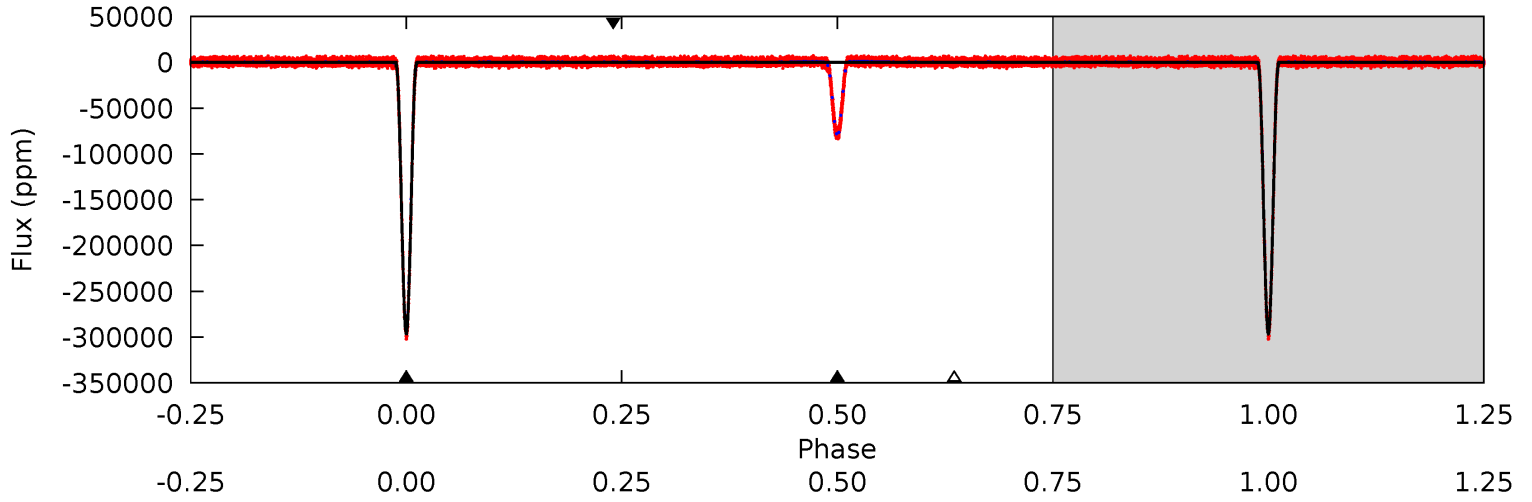
TCE 005462901-01 P= 5.270721 Days  $T_0=136.182595$  (BKJD)



# DV Model-Shift Uniqueness Test

005462901-01, P = 5.270730 Days, E = 136.181163 Days

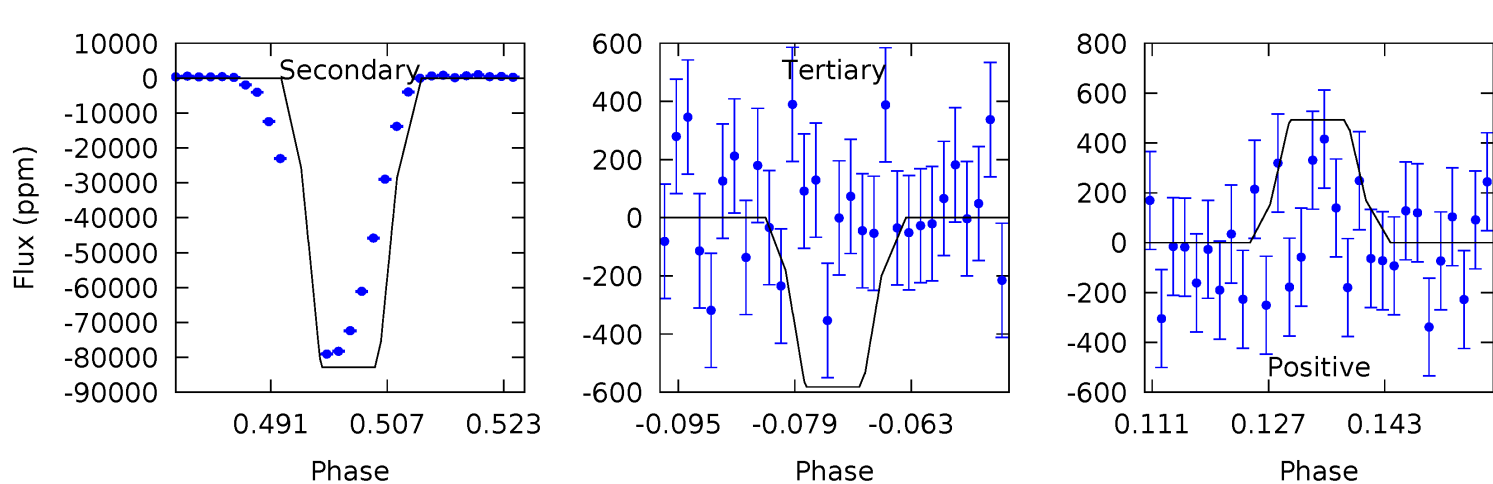
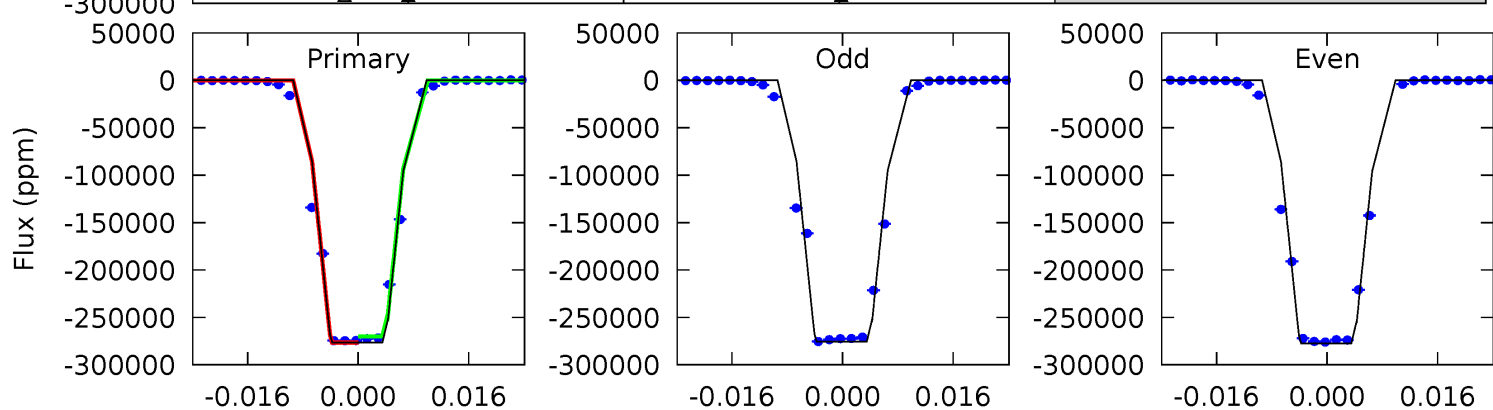
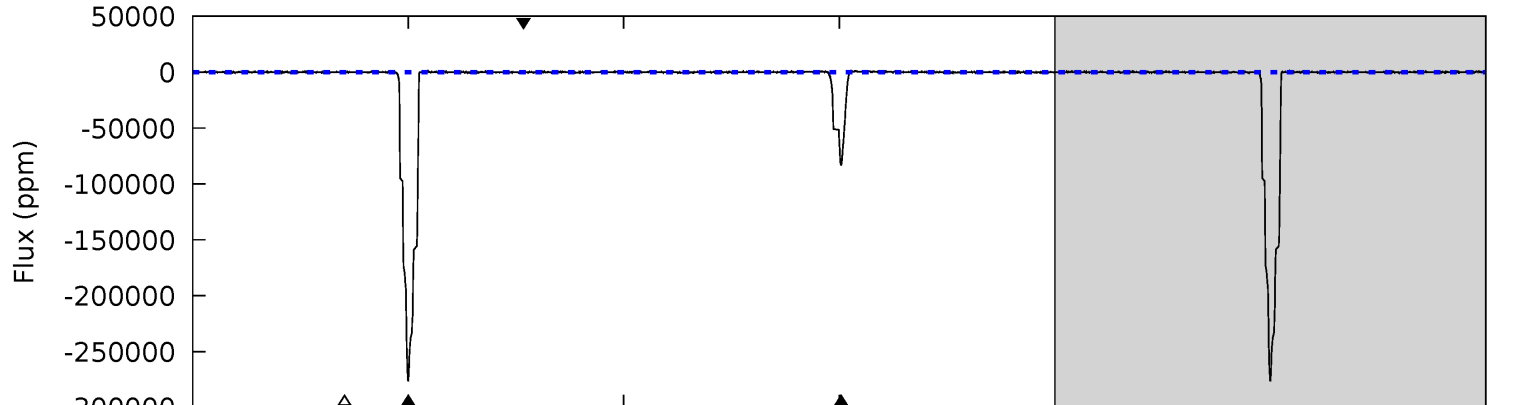
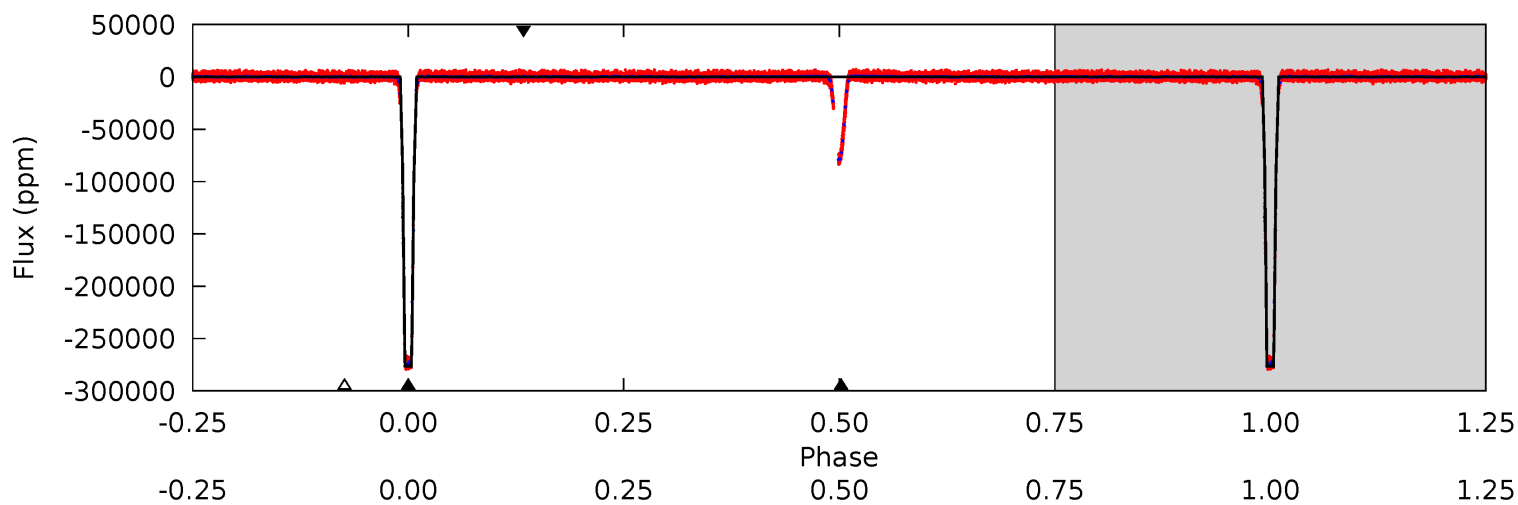
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 4819 | 1820 | 7.04 | 8.46 | 4.84            | 2.23            | 4.34             | 4812    | 4811    | 1813    | 1812    | 25.8    | 1.02 | 0.00  | 0   |



# Alt Model-Shift Uniqueness Test

005462901-01, P = 5.270721 Days, E = 136.182595 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  |
|------|-------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 1911 | 572.6 | 4.02 | 3.41 | 4.94            | 2.41            | 1.48             | 1907    | 1907    | 568.6   | 569.2   | 7.07    | 1.02 | 0.00  | 22.0 |



### Stellar Parameters For KIC 005462901

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $4348^{+151}_{-166}$ | $4.601^{+0.053}_{-0.021}$ | $0.070^{+0.250}_{-0.300}$ | $0.678^{+0.036}_{-0.062}$ | $0.669^{+0.057}_{-0.057}$ | $3.020^{+0.764}_{-0.278}$                 |
|        | +3%/-4%              | +1%/-0%                   | +357%/-429%               | +5%/-9%                   | +9%/-9%                   | +25%/-9%                                  |
| 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 005462901-01 / KOI 6581.01

| Detrend | Depth (ppm)      | $R_p (R_{\oplus})$      | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$ |
|---------|------------------|-------------------------|----------------------|----------------------|------------------|
| DV      | $-111977 \pm 62$ | $58.67^{+2.76}_{-3.32}$ | $962^{+39}_{-38}$    | $3306^{+97}_{-109}$  | $55^{+5}_{-4}$   |
| Alt.    | $-82869 \pm 145$ | $39.92^{+2.16}_{-2.55}$ | $963^{+32}_{-39}$    | $3540^{+110}_{-119}$ | $85^{+10}_{-8}$  |

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

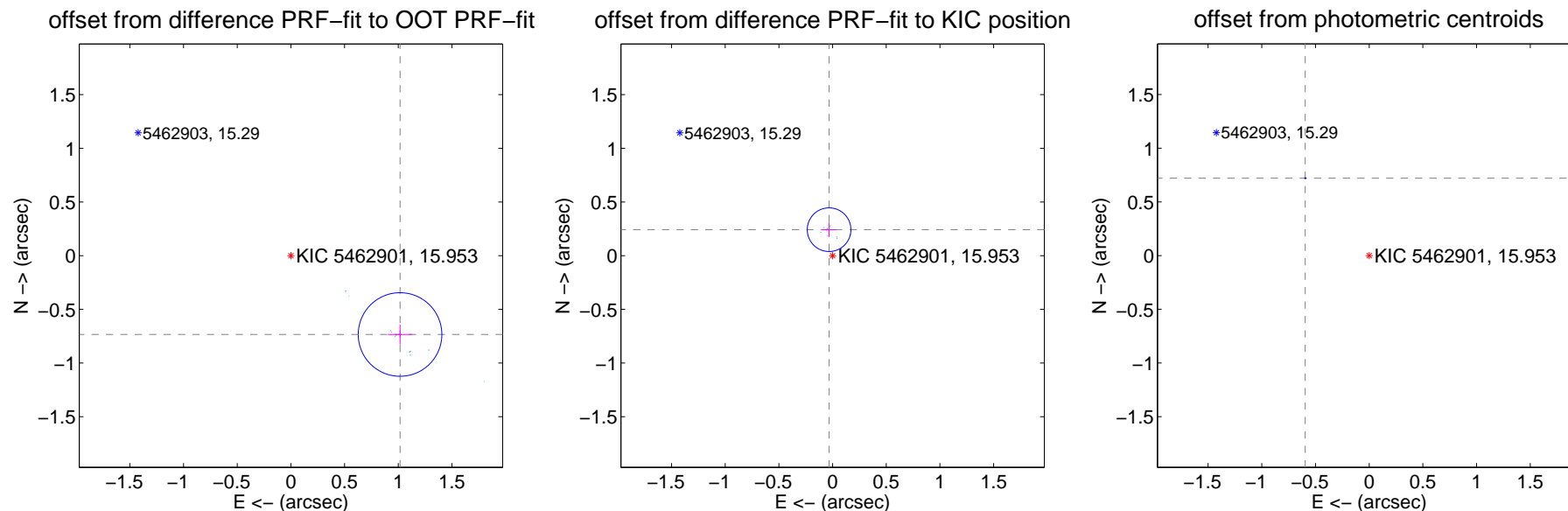
## DV Centroid Data

Supplemental centroid analysis for 005462901-01. Kepler magnitude: 15.95. Transit SNR 1830.37

There are 13 quarters with good PRF difference image offsets

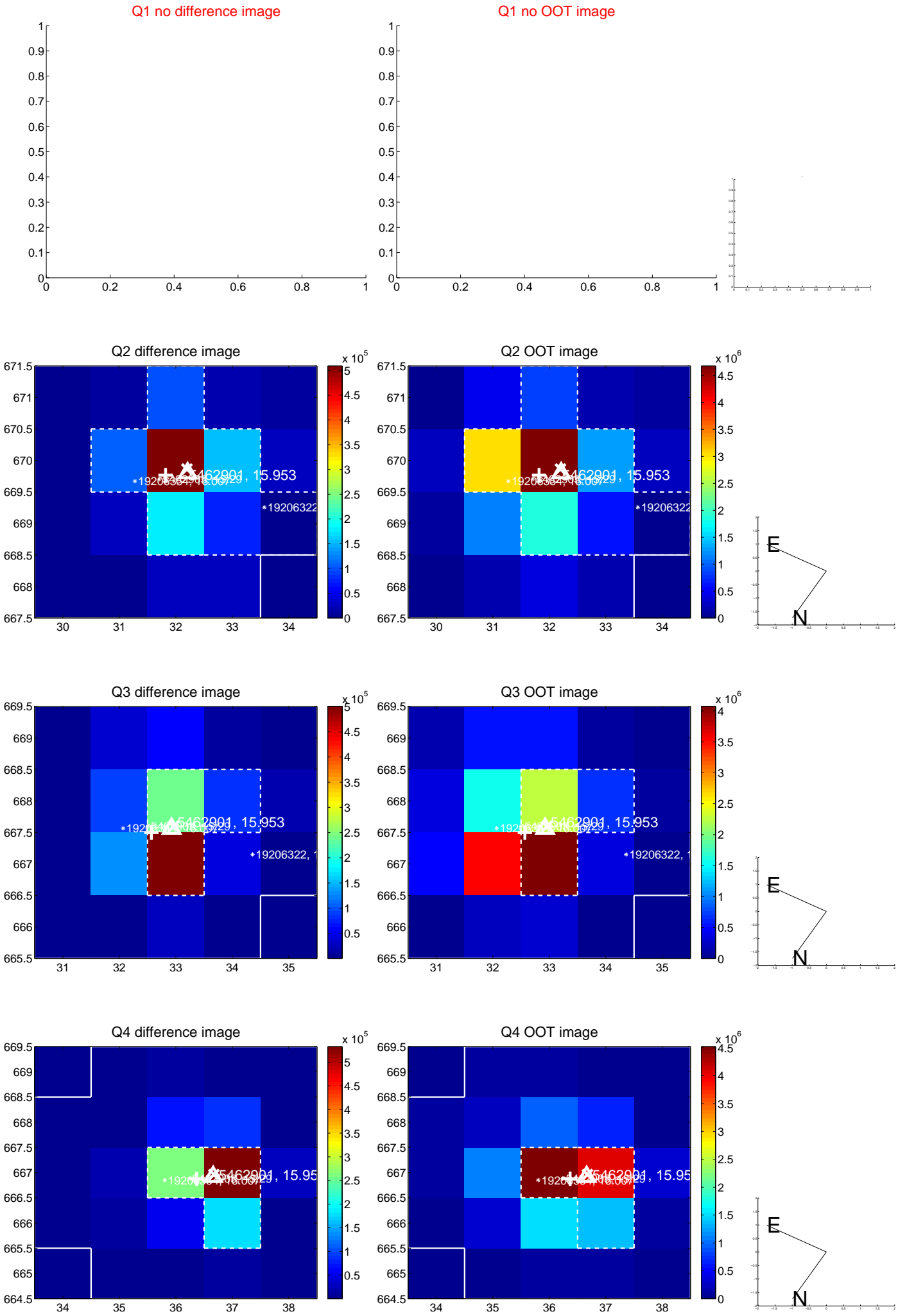
The direct PRF centroid is offset from the target star catalog position by about 0.81 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $1.254 \pm 0.130$  | 9.66                | $-1.016 \pm 0.113$ | $-0.734 \pm 0.093$ |
| PRF-fit source offset from KIC position | $0.244 \pm 0.068$  | 3.60                | $0.033 \pm 0.068$  | $0.242 \pm 0.068$  |
| photometric centroid source offset      | $0.94 \pm 0.00$    | 660.60              | $0.60 \pm 0.00$    | $0.72 \pm 0.00$    |

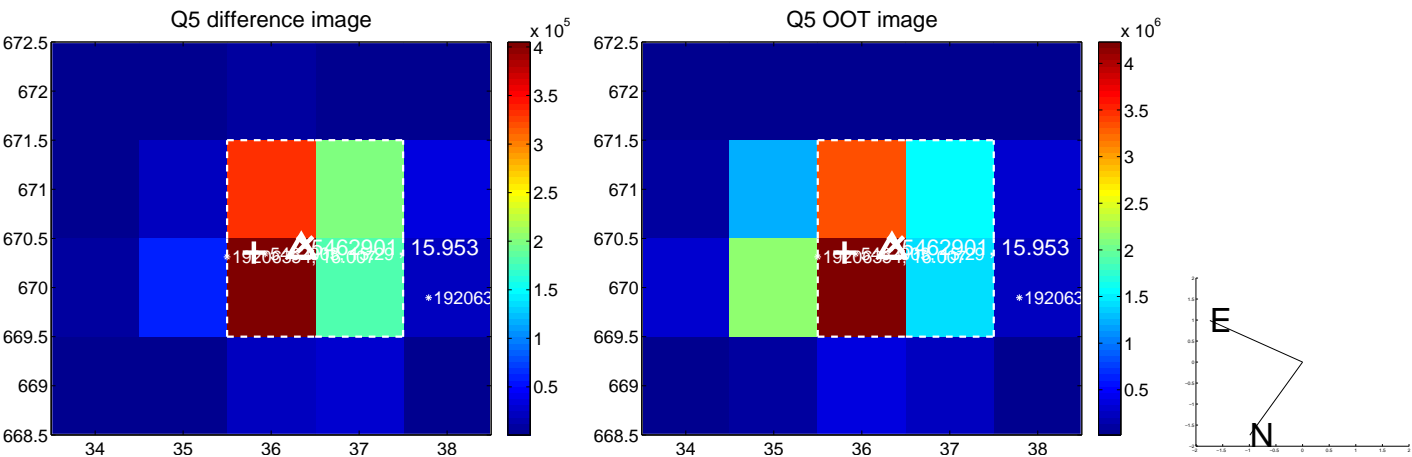


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

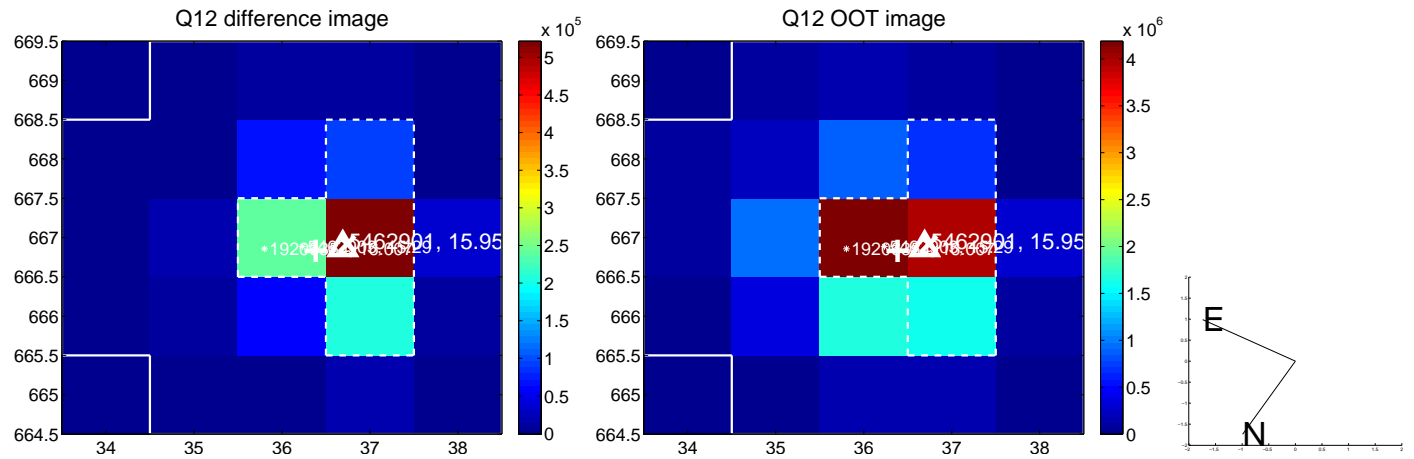
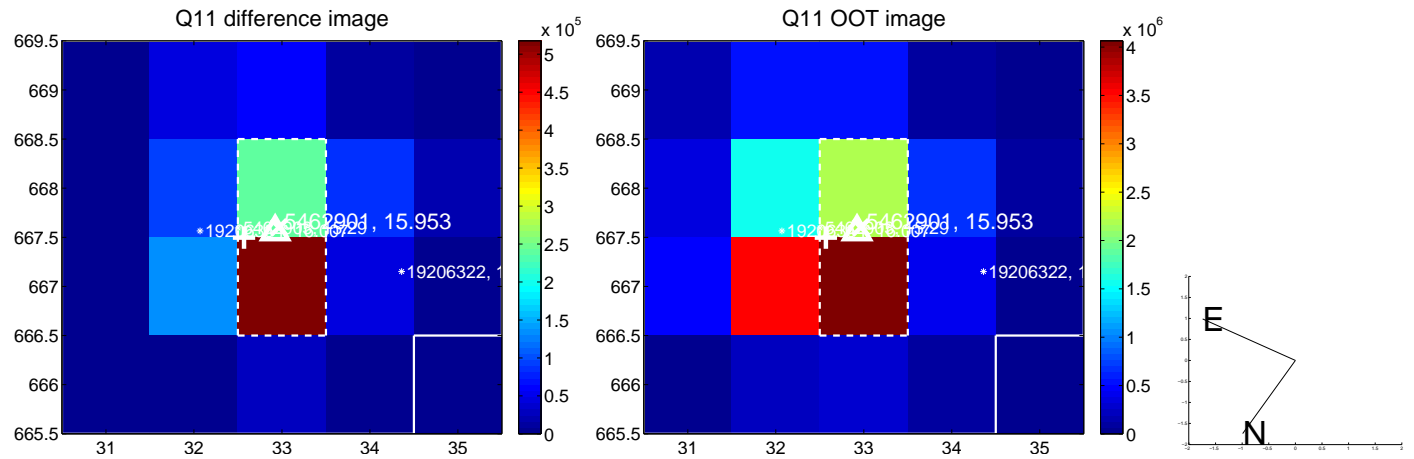
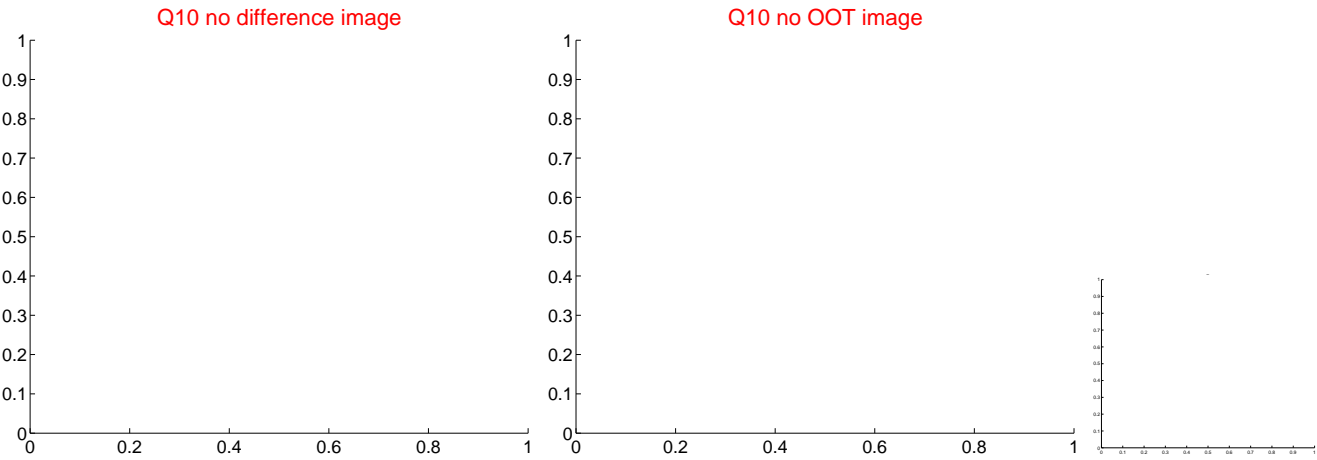
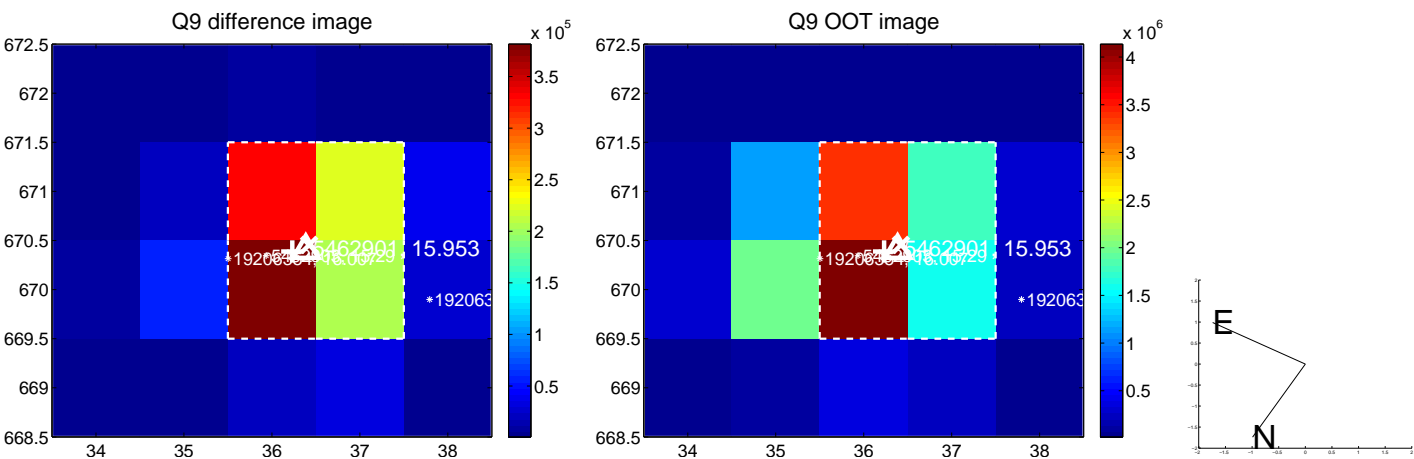


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

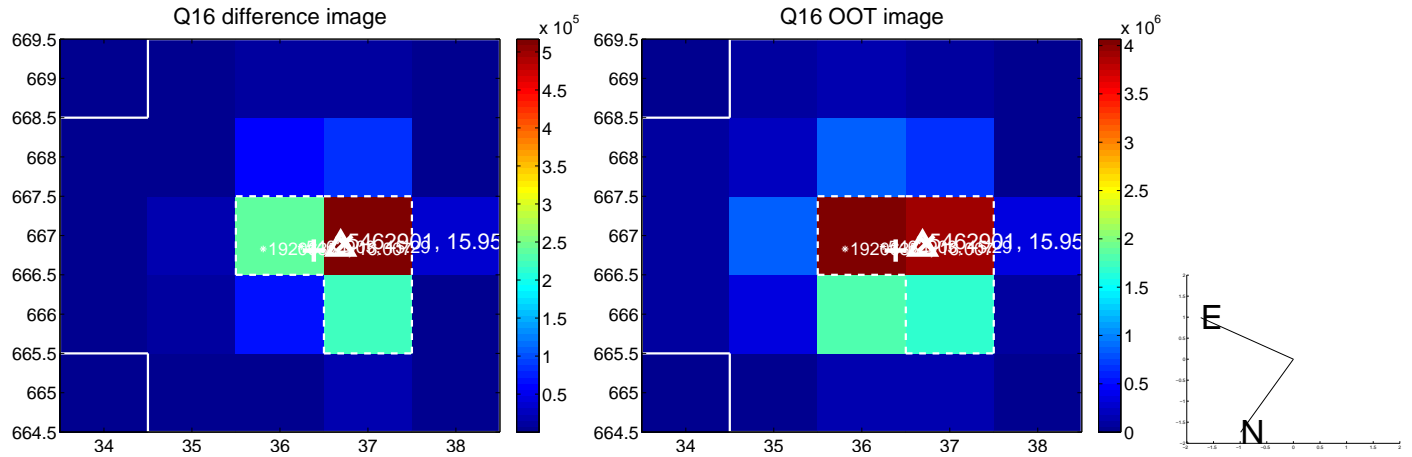
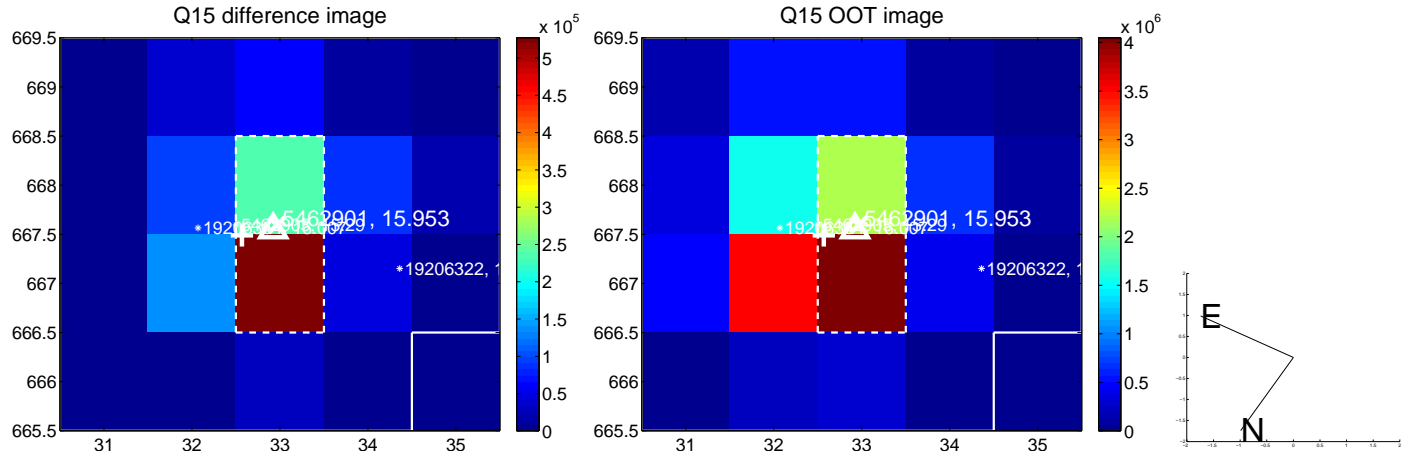
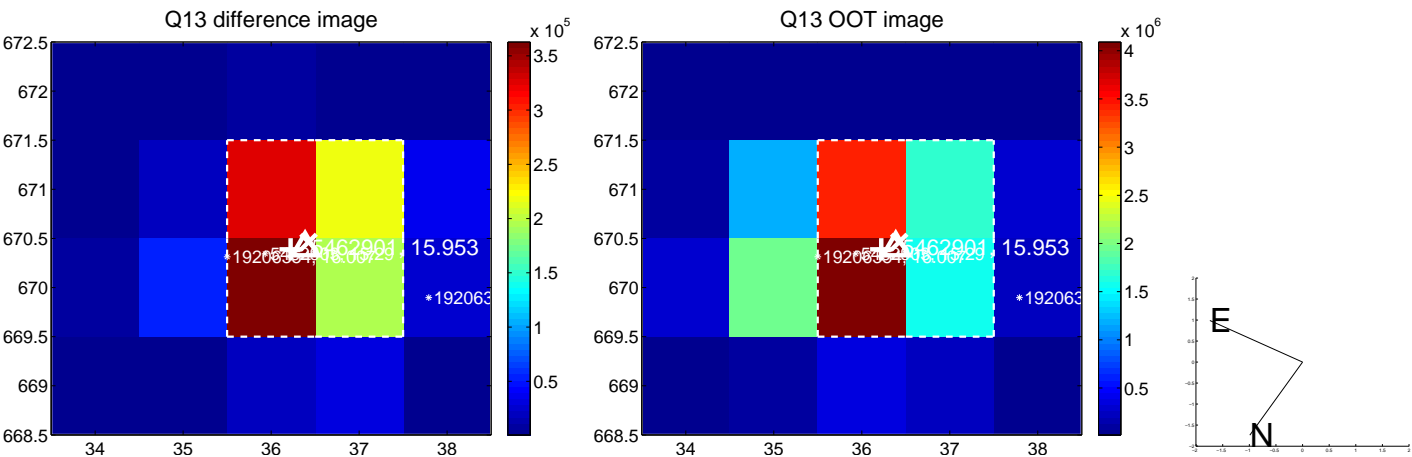




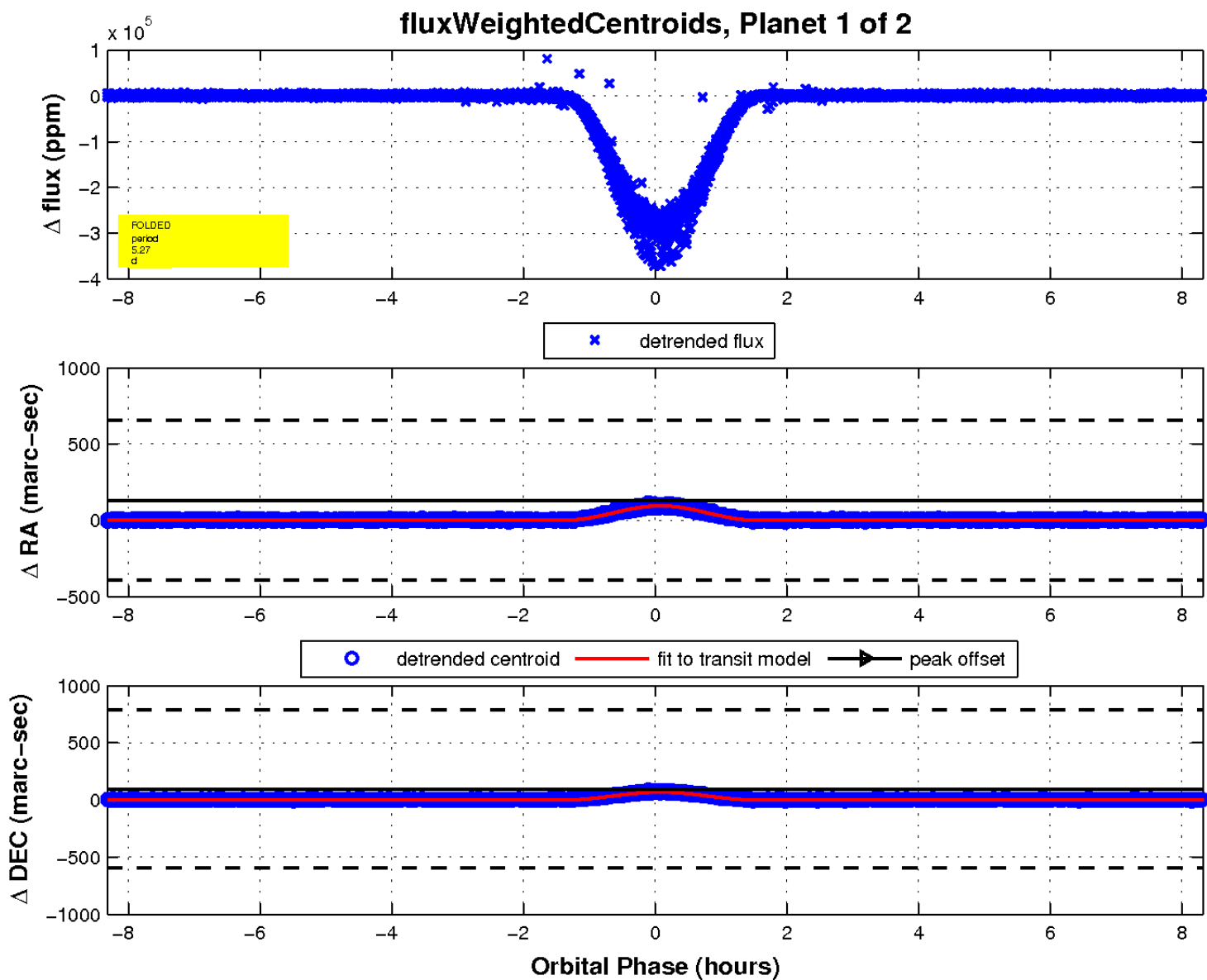
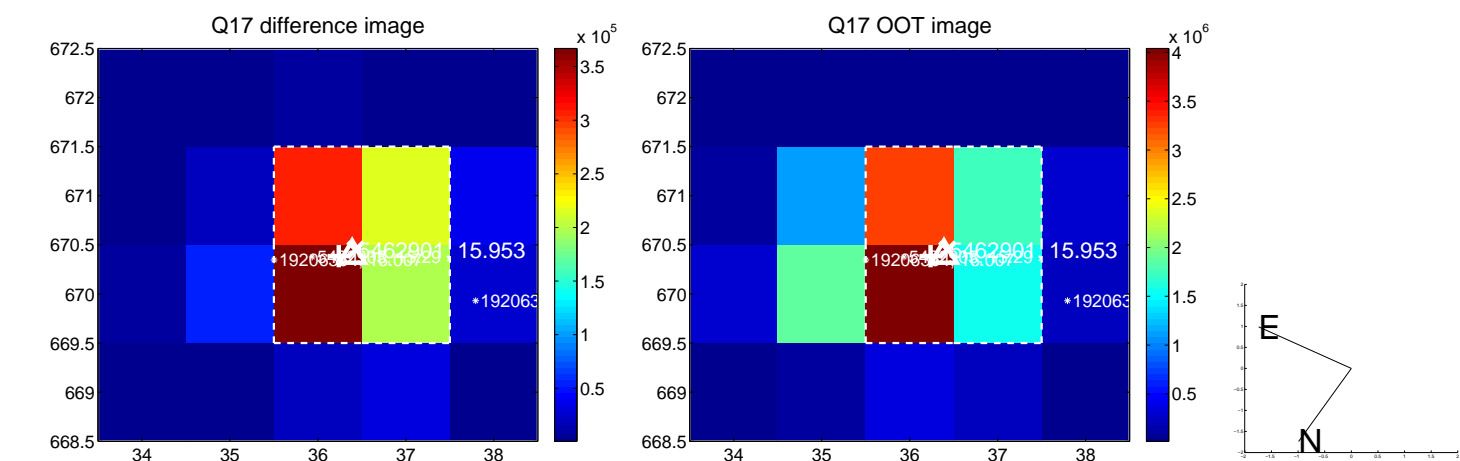
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

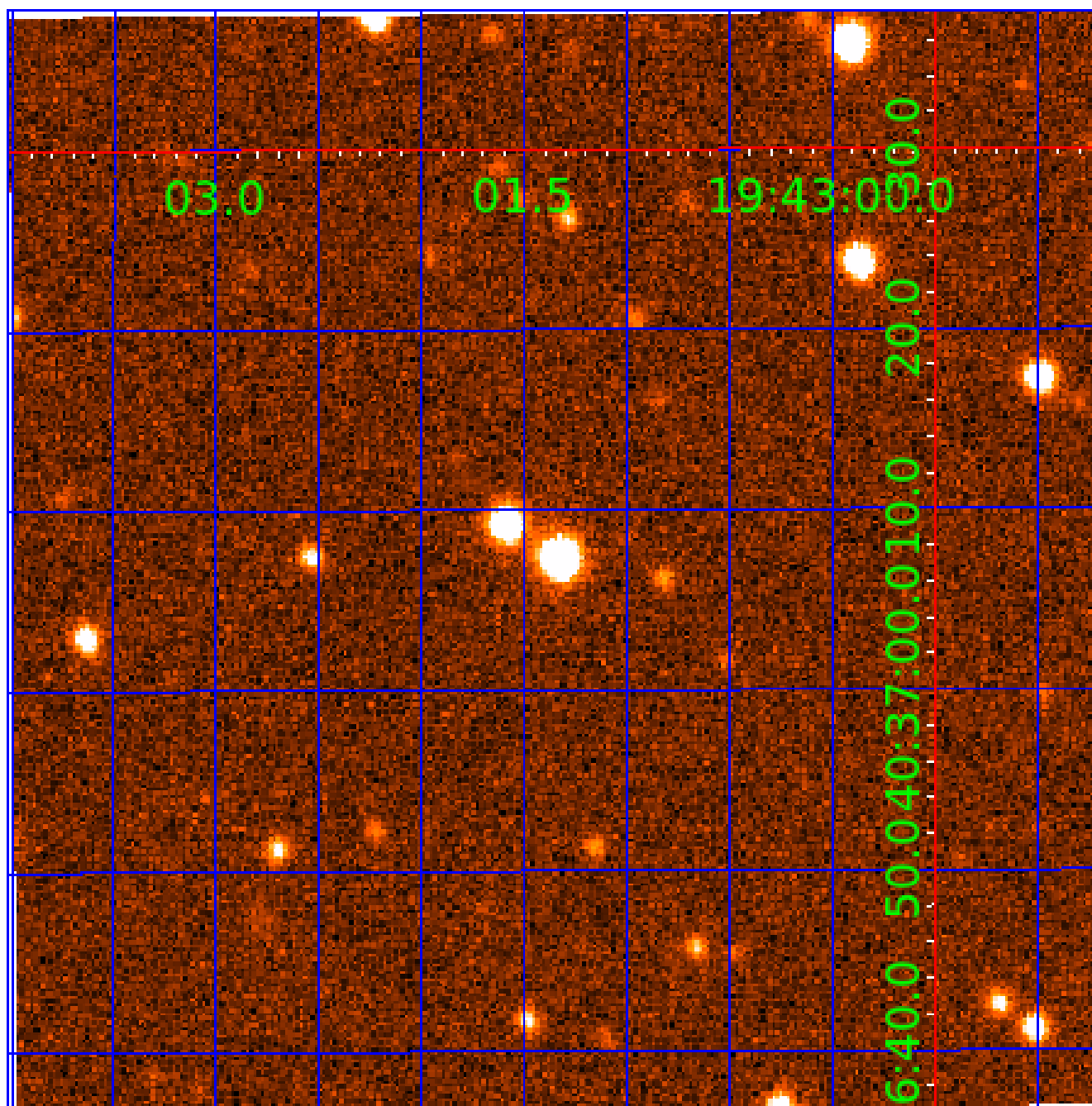


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 005462901

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|--------|--------|-----------------------------|-----------------|------------------------|------------------------|
| 005462901-01 | OBS      | 6581.01 | 5.270730      | 136.181163   | 296014.3    | 2.775            | 3169.2 | 1830.4 | 0.68                        | 4348            | 59.17                  | 54.75                  |
| 005462901-02 | OBS      | No      | 5.270727      | 133.546351   | 81677.4     | 2.738            | 930.0  | 713.7  | 0.68                        | 4348            | 28.88                  | 54.75                  |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005462901-01 | OBS      | FP   | 0.00  | 0 | 1 | 0 | 0 | MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—DEEP_V_SHAPED—HAS_SEC_TCE—CENT_KIC_POS |
| 005462901-02 | OBS      | FP   | 0.00  | 1 | 1 | 0 | 0 | IS_SEC_TCE—CENT_KIC_POS  |

**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.

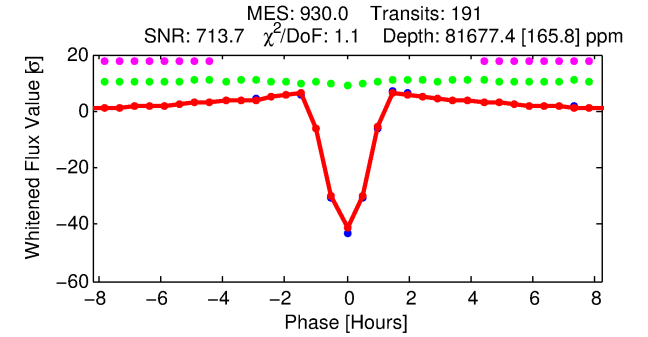
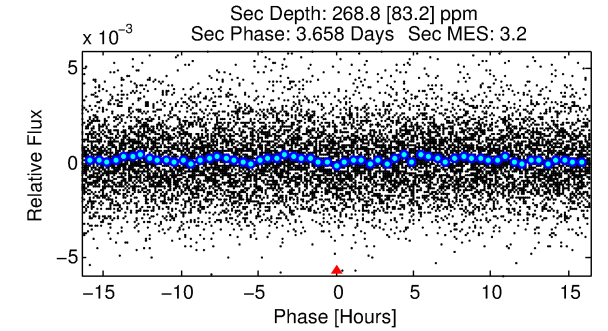
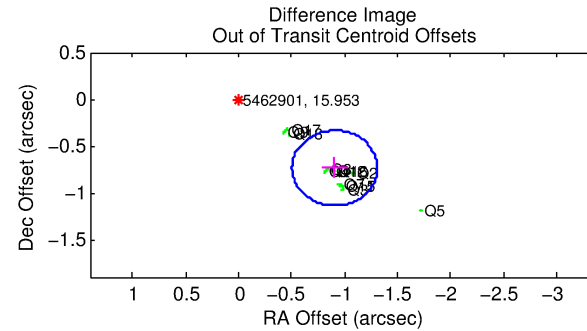
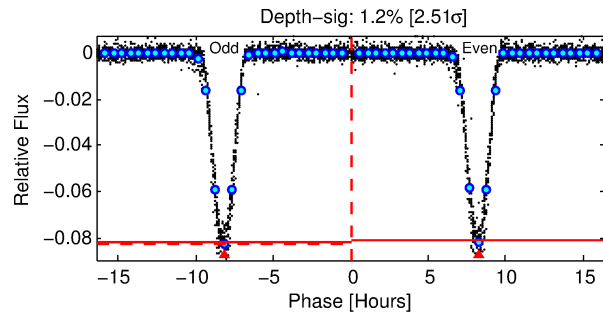
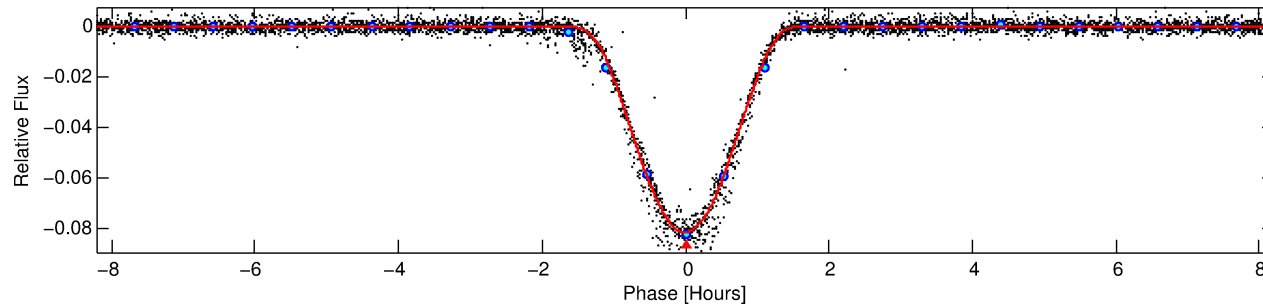
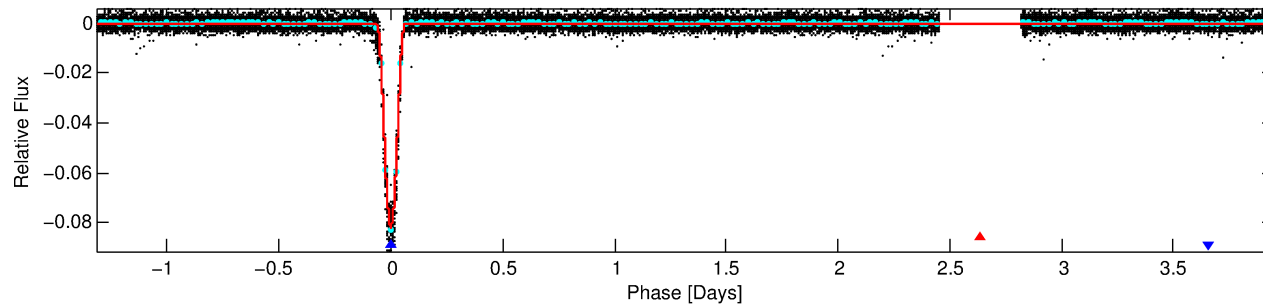
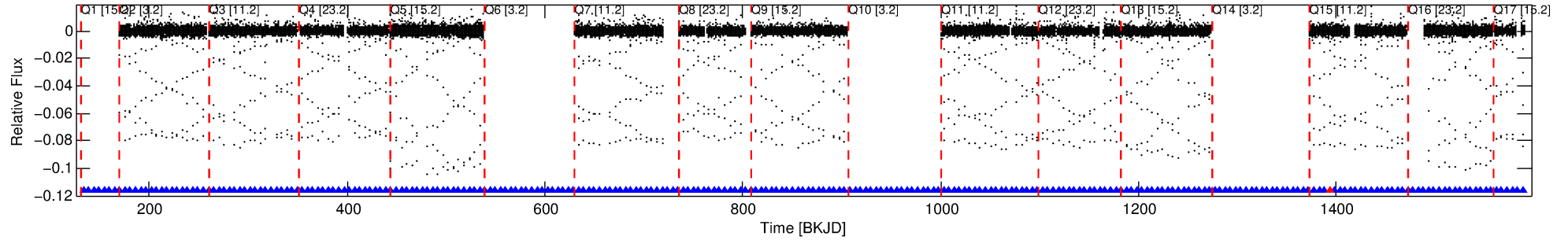
## Ephemeris Match Information For 005462901-02

No Significant Match Found

# DV One-Page Summary

KIC: 5462901 Candidate: 2 of 2 Period: 5.271 d  
KOI: K06581 Corr: No Ephemeris Match

Kp: 15.95 R\*: 0.68 Rs Teff: 4348.0 K Logg: 4.60 Fe/H: 0.070



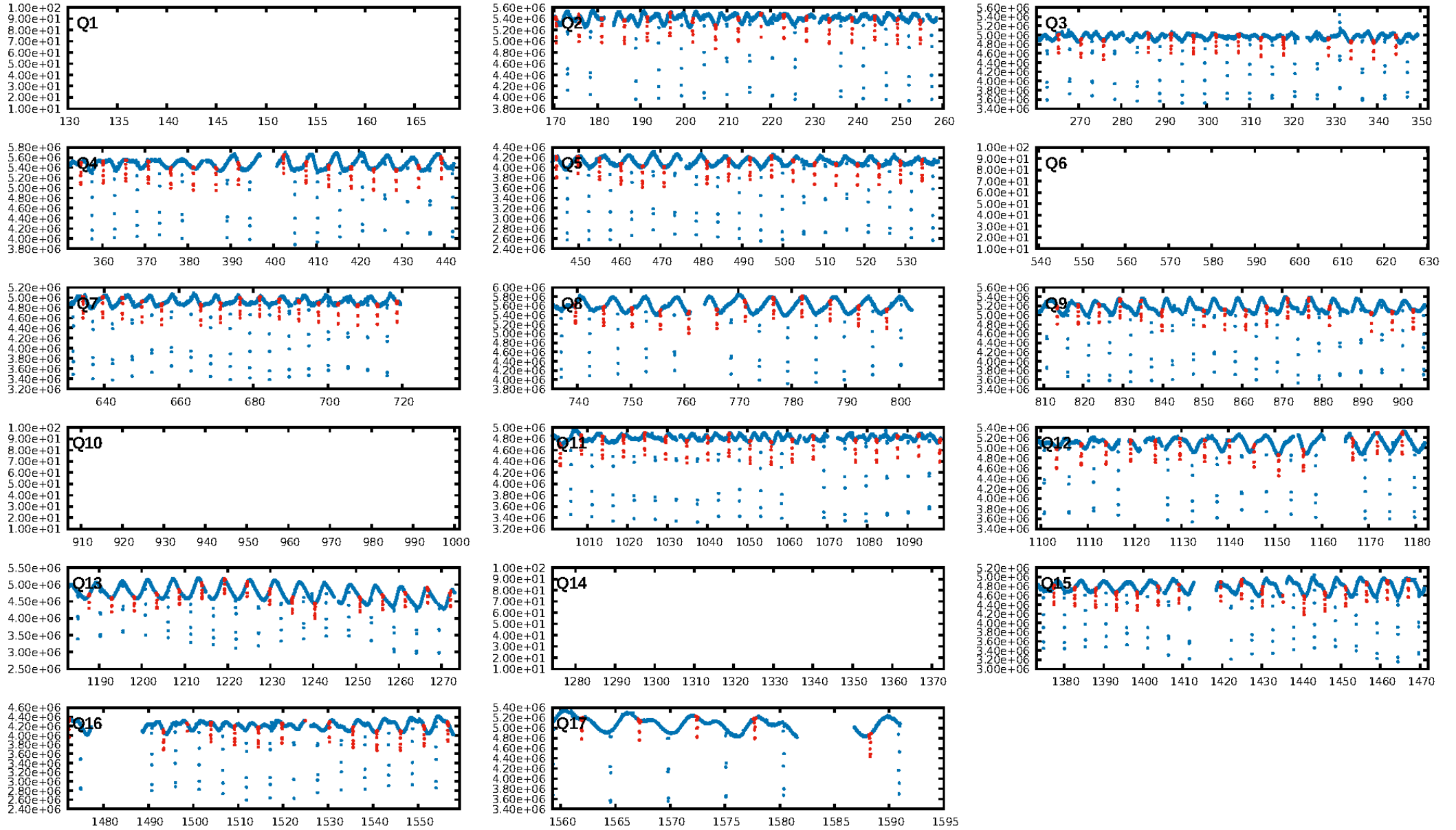
## DV Fit Results:

Period = 5.27073 [0.00000] d  
Epoch = 133.5464 [0.0001] BKJD  
Rp/R\* = 0.3903 [0.0542]  
a/R\* = 15.56 [0.04]  
b = 0.90 [0.08]  
Seff = 54.75 [10.04]  
Teff = 694 [32] K  
Rp = 28.88 [4.80] Re  
a = 0.0519 [0.0038] AU  
Ag = 0.48 [0.20] [-2.56σ]  
Teffp = 891 [99] K [1.90σ]

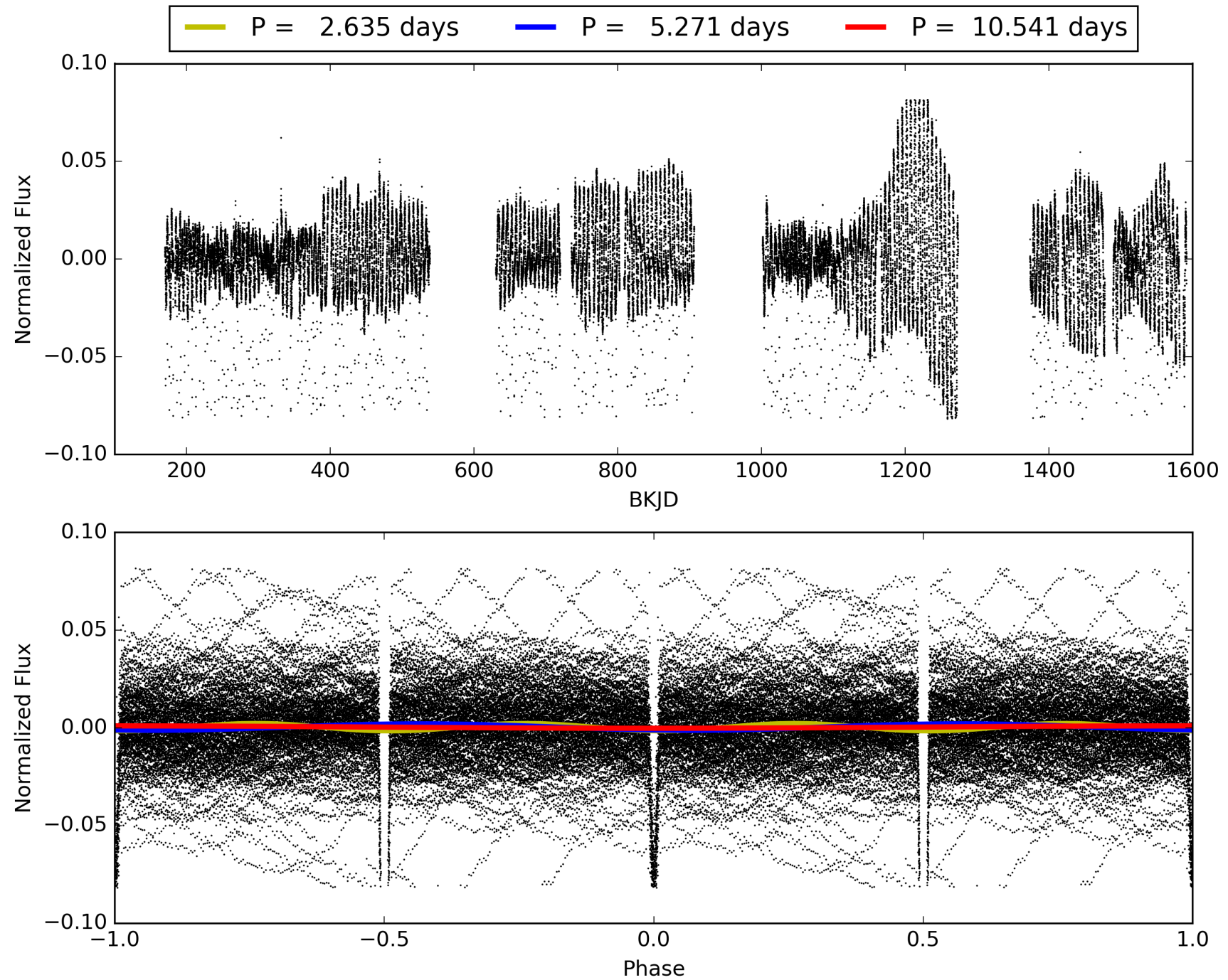
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 0.99 [185/186]  
GhostDiagnostic-chr: 2.072  
Centroid-sig: 0.0%  
Centroid-so: 0.940 arcsec [194.98σ]  
OotOffset-rm: 1.169 arcsec [8.73σ]  
KicOffset-rm: 0.253 arcsec [3.68σ]  
OotOffset-st: 1/4/4/4 [13]  
KicOffset-st: 1/4/4/4 [13]  
DiffImageQuality-fgm: 1.00 [13/13]  
DiffImageOverlap-fno: 1.00 [13/13]

# TCE 005462901-02, PDC Light Curves



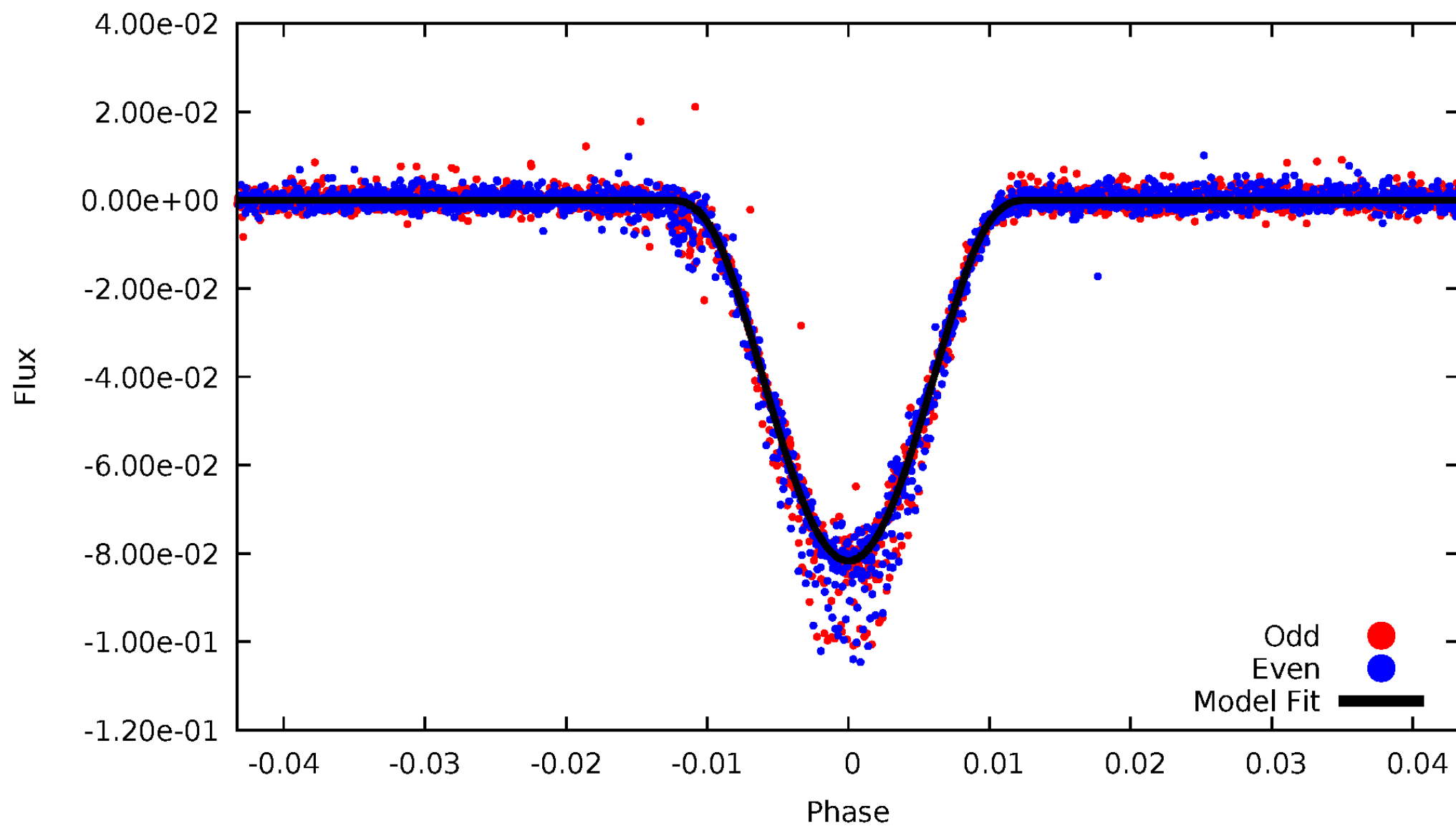
TCE 005462901-02





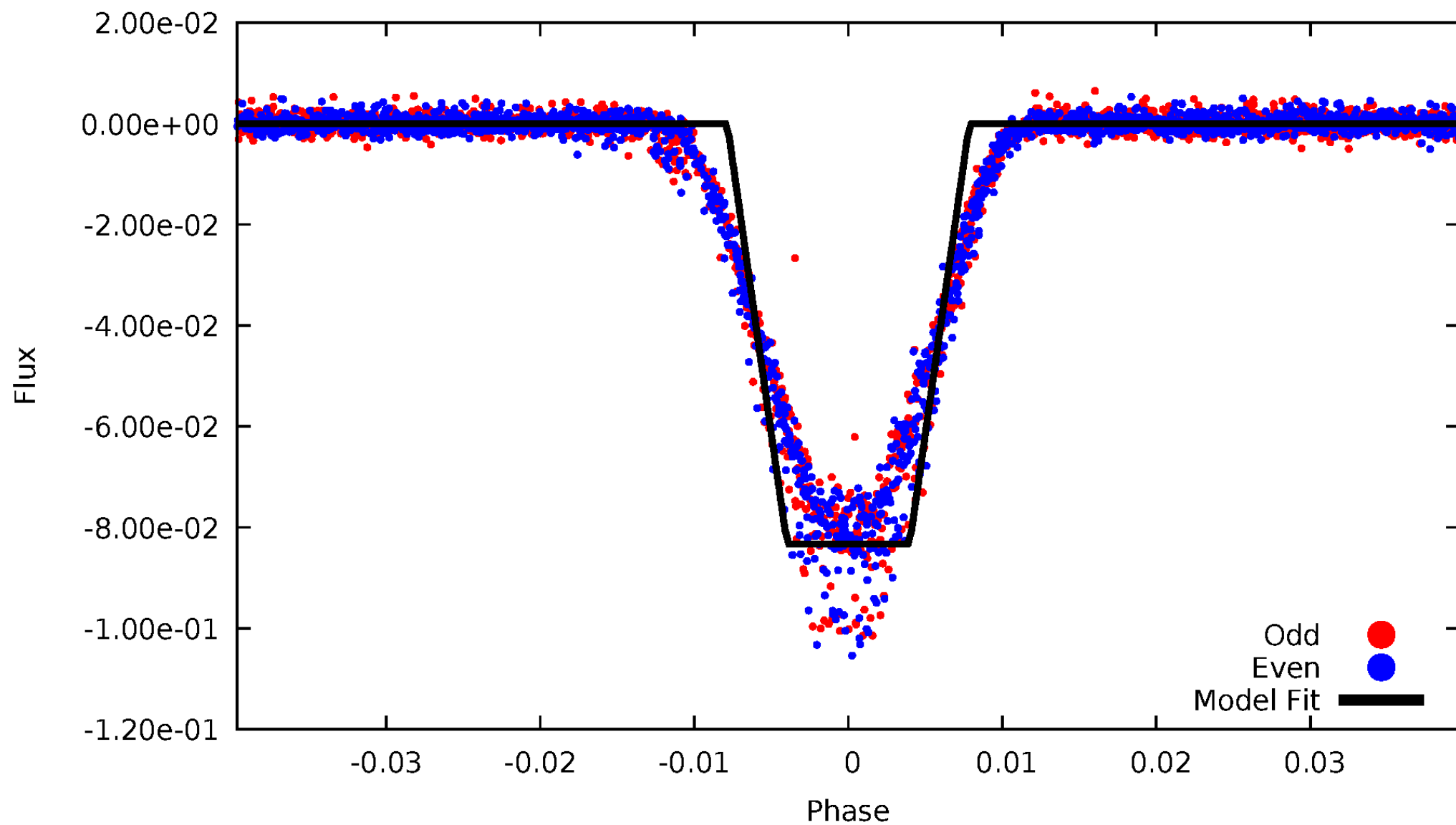
# DV Odd/Even

TCE 005462901-02



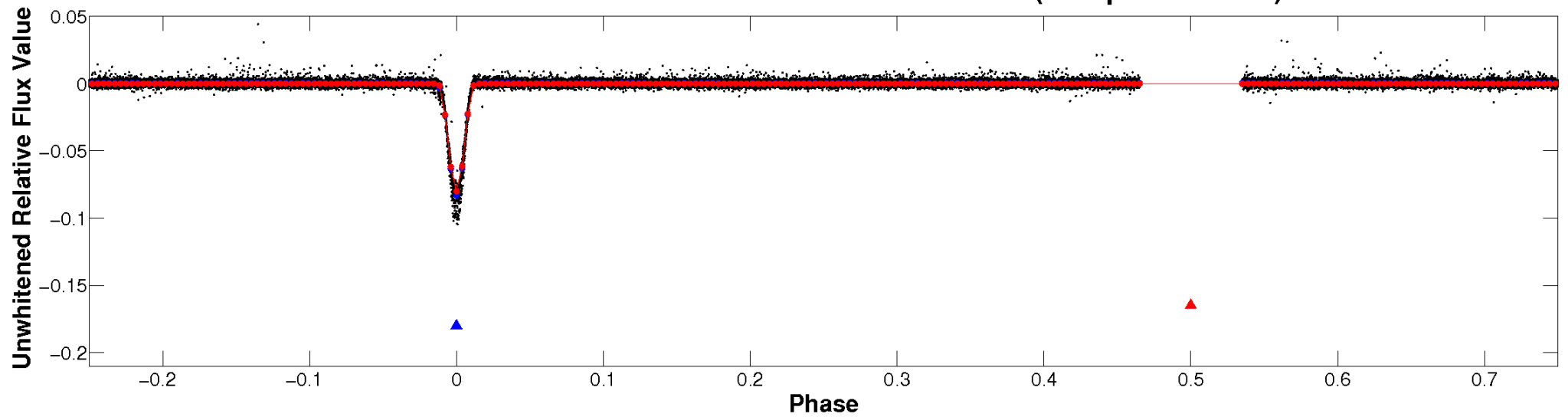
# ALT Odd/Even

TCE 005462901-02

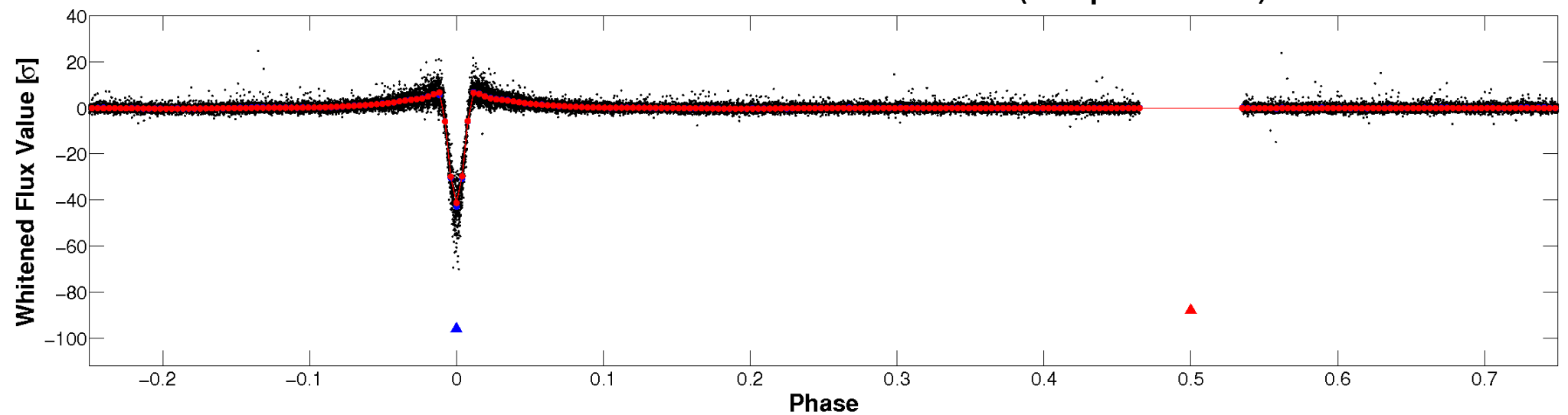


# Non-Whitened Vs. Whitened Light Curve

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

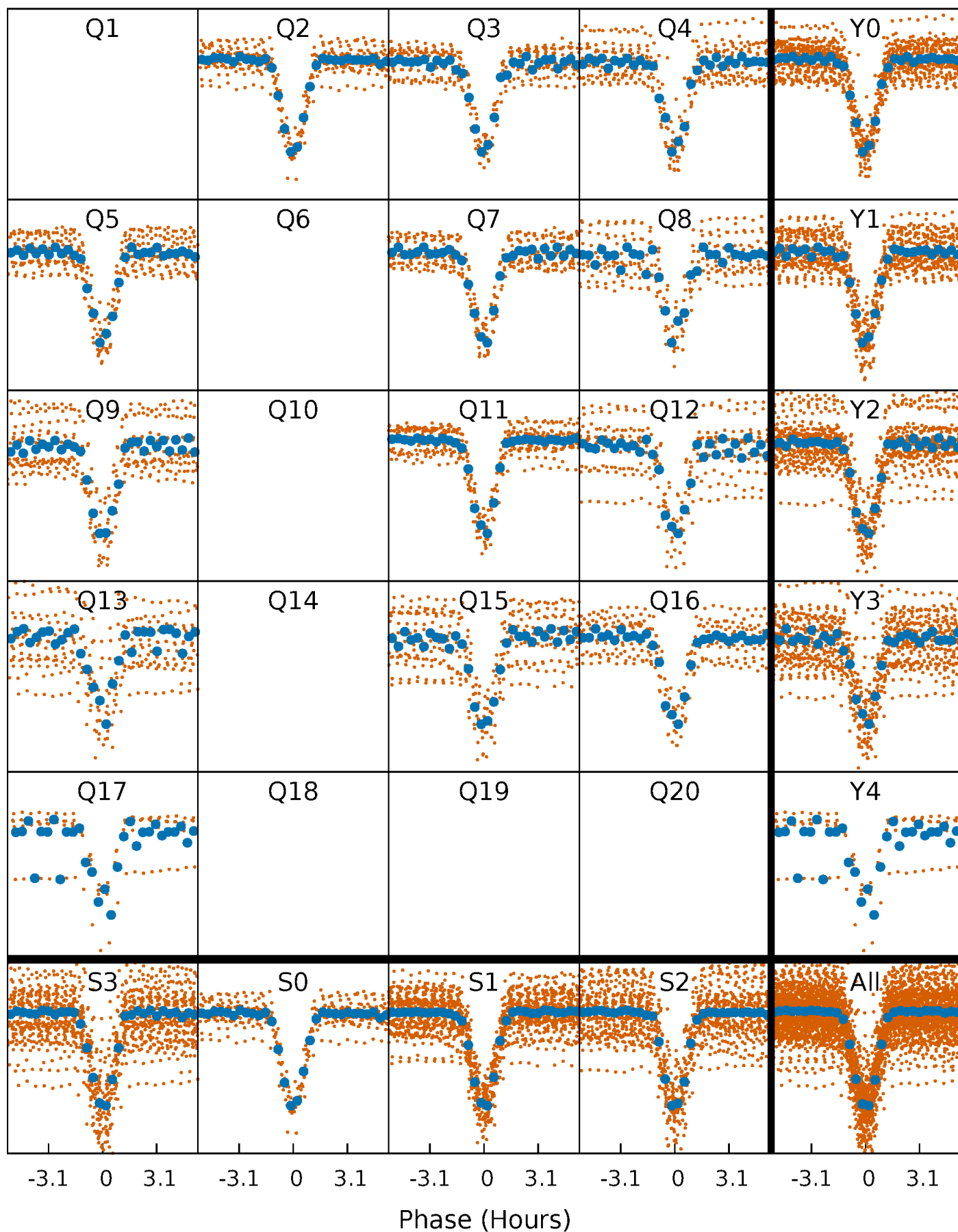


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



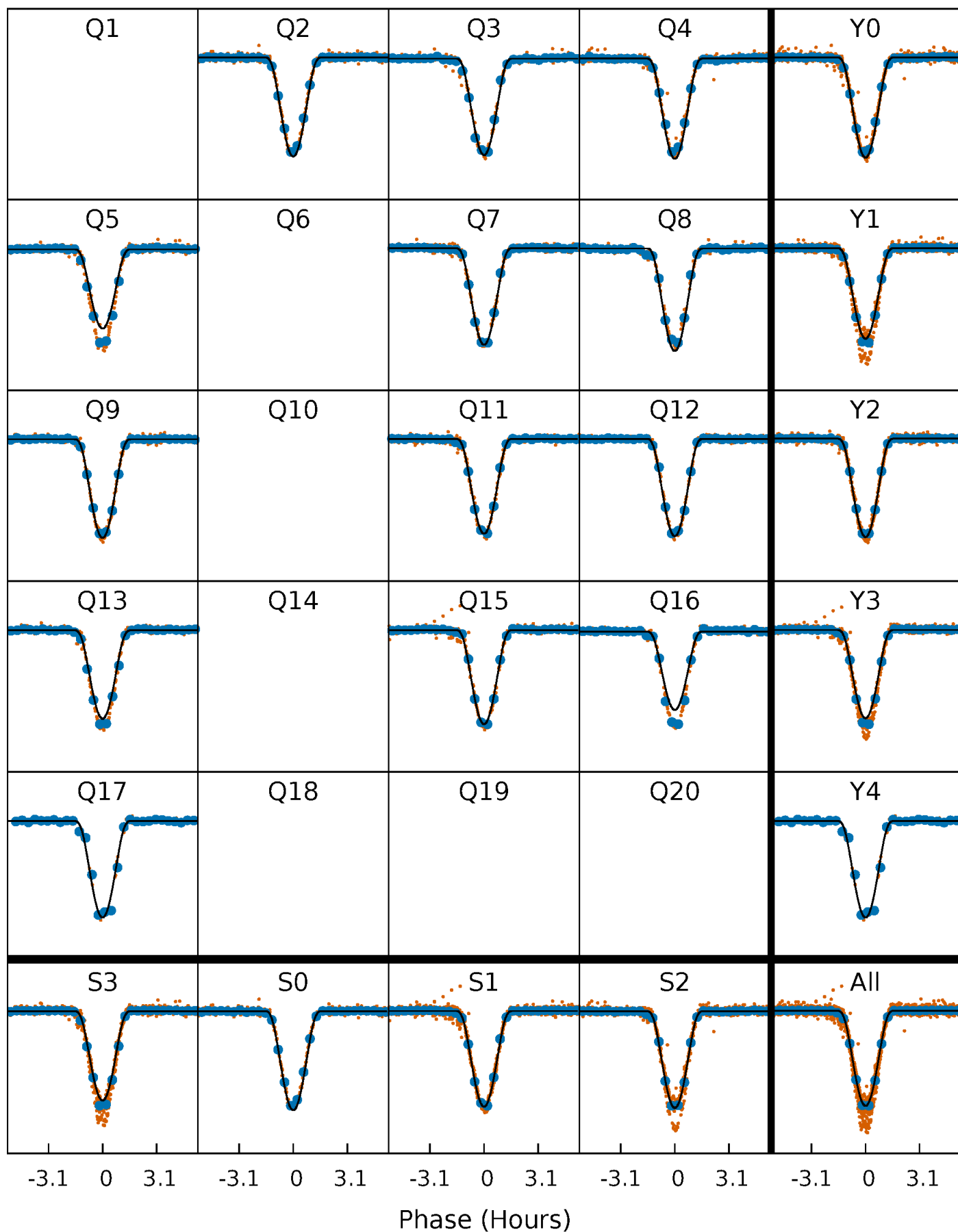
# PDC Quarter-Phased Transit Curves

TCE 005462901-02     $P = 5.270727$  Days     $T_0 = 133.546351$  (BKJD)



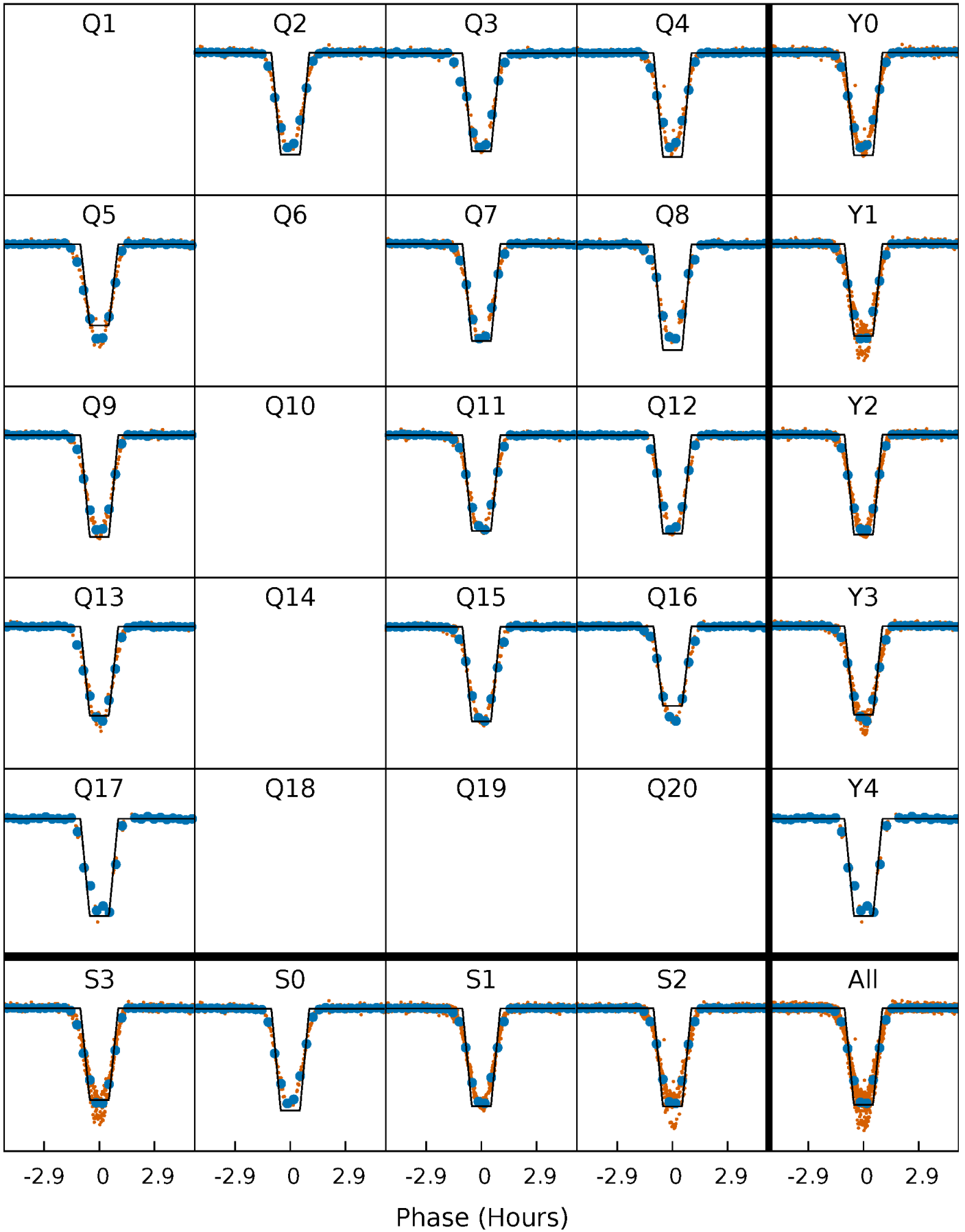
# DV Quarter-Phased Transit Curves

TCE 005462901-02   P= 5.270727 Days    $T_0=133.546351$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

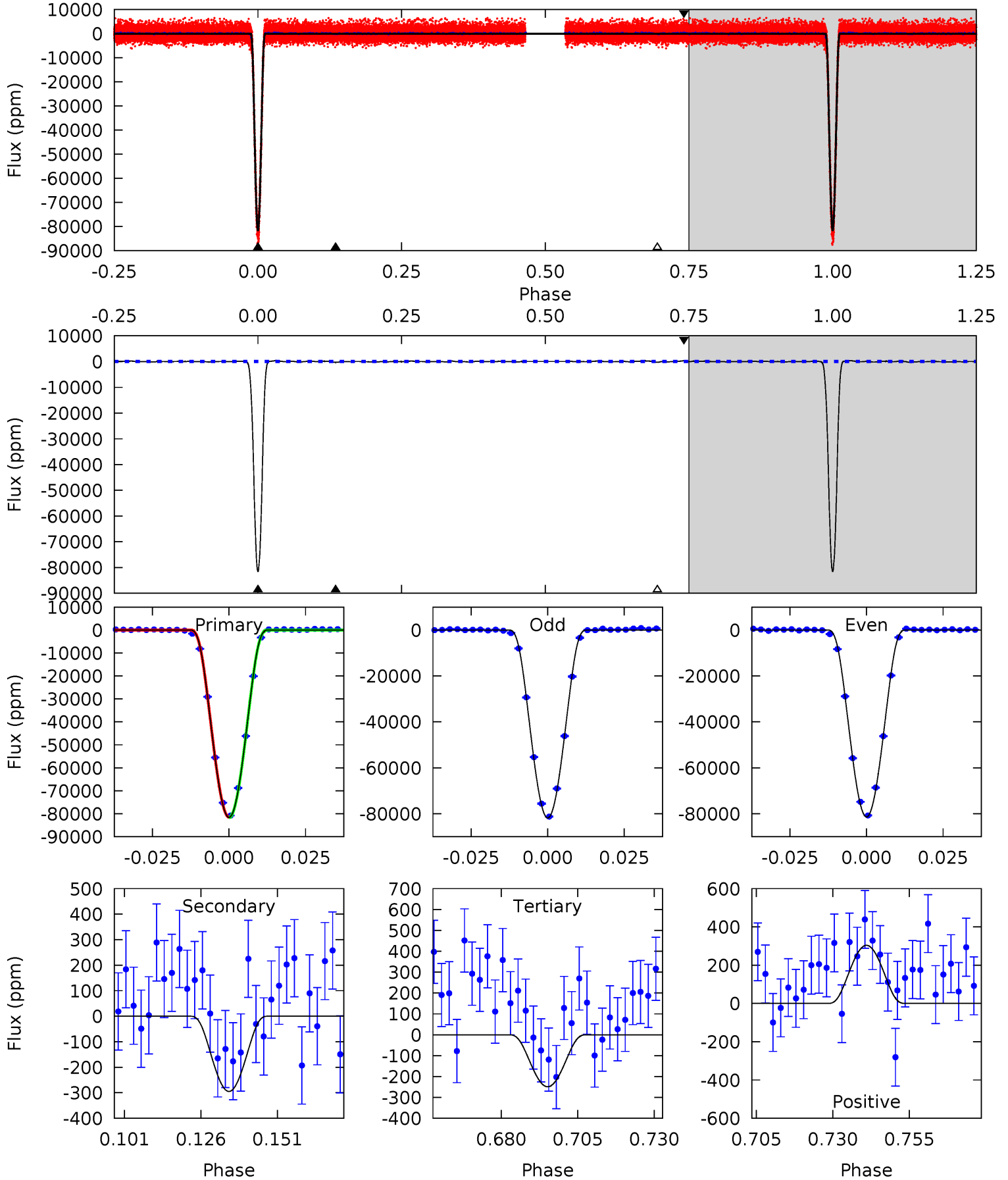
TCE 005462901-02   P= 5.270721 Days    $T_0=133.547274$  (BKJD)



# DV Model-Shift Uniqueness Test

005462901-02, P = 5.270727 Days, E = 133.546351 Days

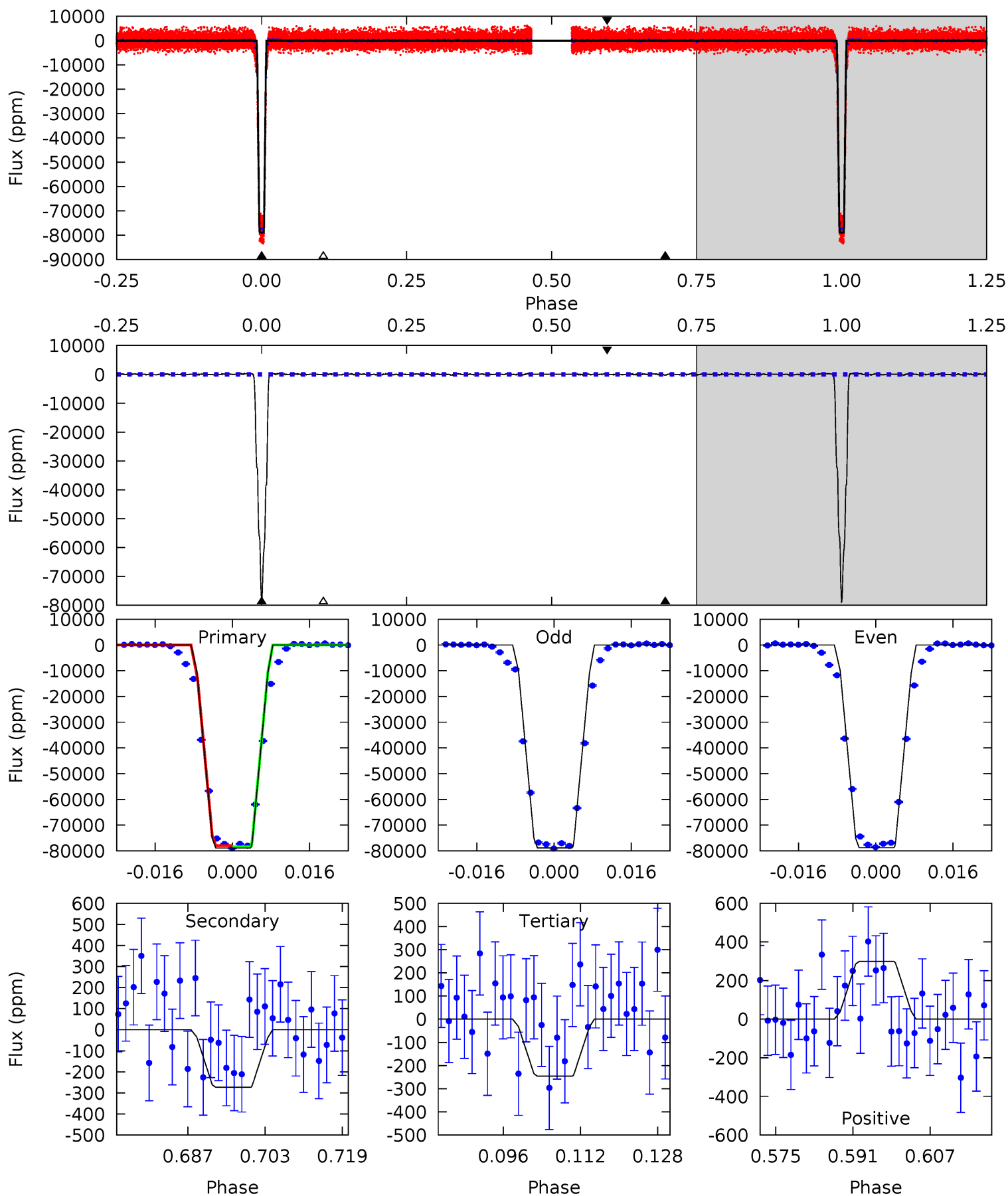
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 1607 | 5.81 | 4.90 | 5.98 | 4.85            | 2.24            | 1.98             | 1602    | 1601    | 0.90    | -0.18   | 4.60    | 1.02 | 0.00  | 1.87 |



# Alt Model-Shift Uniqueness Test

005462901-02, P = 5.270721 Days, E = 133.547274 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  |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 956.8 | 3.32 | 2.99 | 3.63 | 4.94            | 2.41            | 1.20             | 953.8   | 953.2   | 0.33    | -0.31   | 0.13    | 1.03 | 0.00  | 2.87 |





### Stellar Parameters For KIC 005462901

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $4348^{+151}_{-166}$ | $4.601^{+0.053}_{-0.021}$ | $0.070^{+0.250}_{-0.300}$ | $0.678^{+0.036}_{-0.062}$ | $0.669^{+0.057}_{-0.057}$ | $3.020^{+0.764}_{-0.278}$                 |
|        | +3%/-4%              | +1%/-0%                   | +357%/-429%               | +5%/-9%                   | +9%/-9%                   | +25%/-9%                                  |
| 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 005462901-02 / KOI

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$      | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$          |
|---------|---------------|-------------------------|----------------------|----------------------|---------------------------|
| DV      | $-295 \pm 51$ | $28.64^{+4.15}_{-3.68}$ | $965^{+34}_{-40}$    | $1744^{+112}_{-144}$ | $0.530^{+0.216}_{-0.148}$ |
| Alt.    | $-274 \pm 82$ | $21.23^{+3.81}_{-4.11}$ | $964^{+39}_{-44}$    | $1909^{+143}_{-150}$ | $0.897^{+0.577}_{-0.337}$ |

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

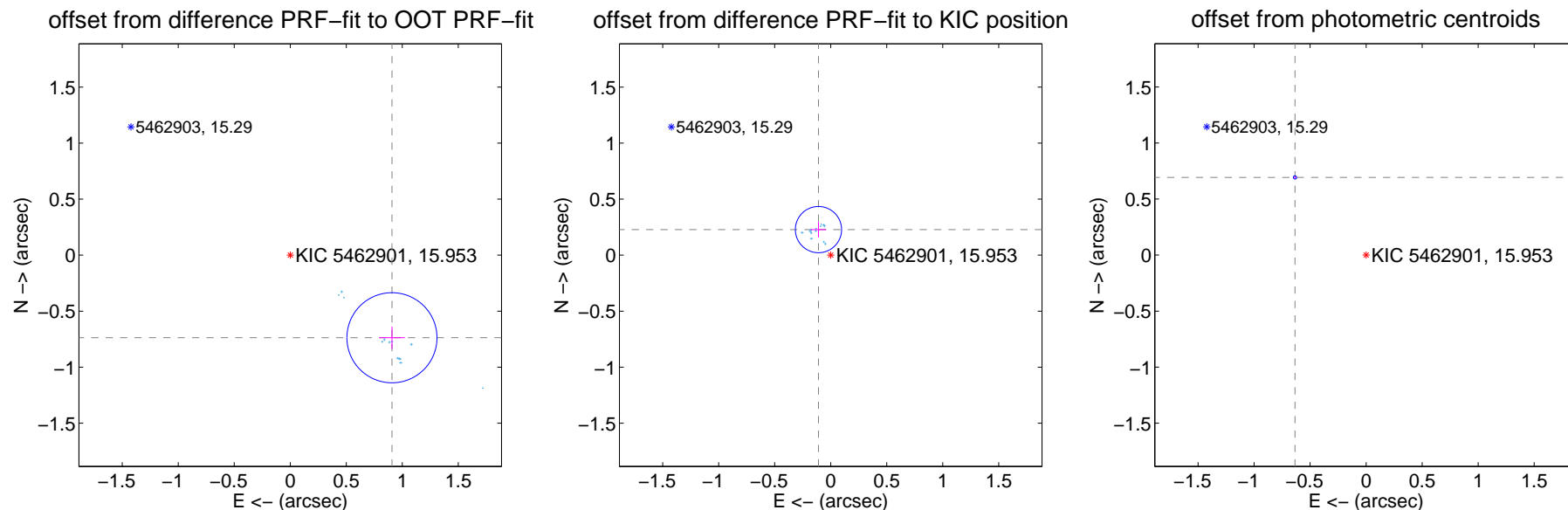
## DV Centroid Data

Supplemental centroid analysis for 005462901-02. Kepler magnitude: 15.95. Transit SNR 713.69

There are 13 quarters with good PRF difference image offsets

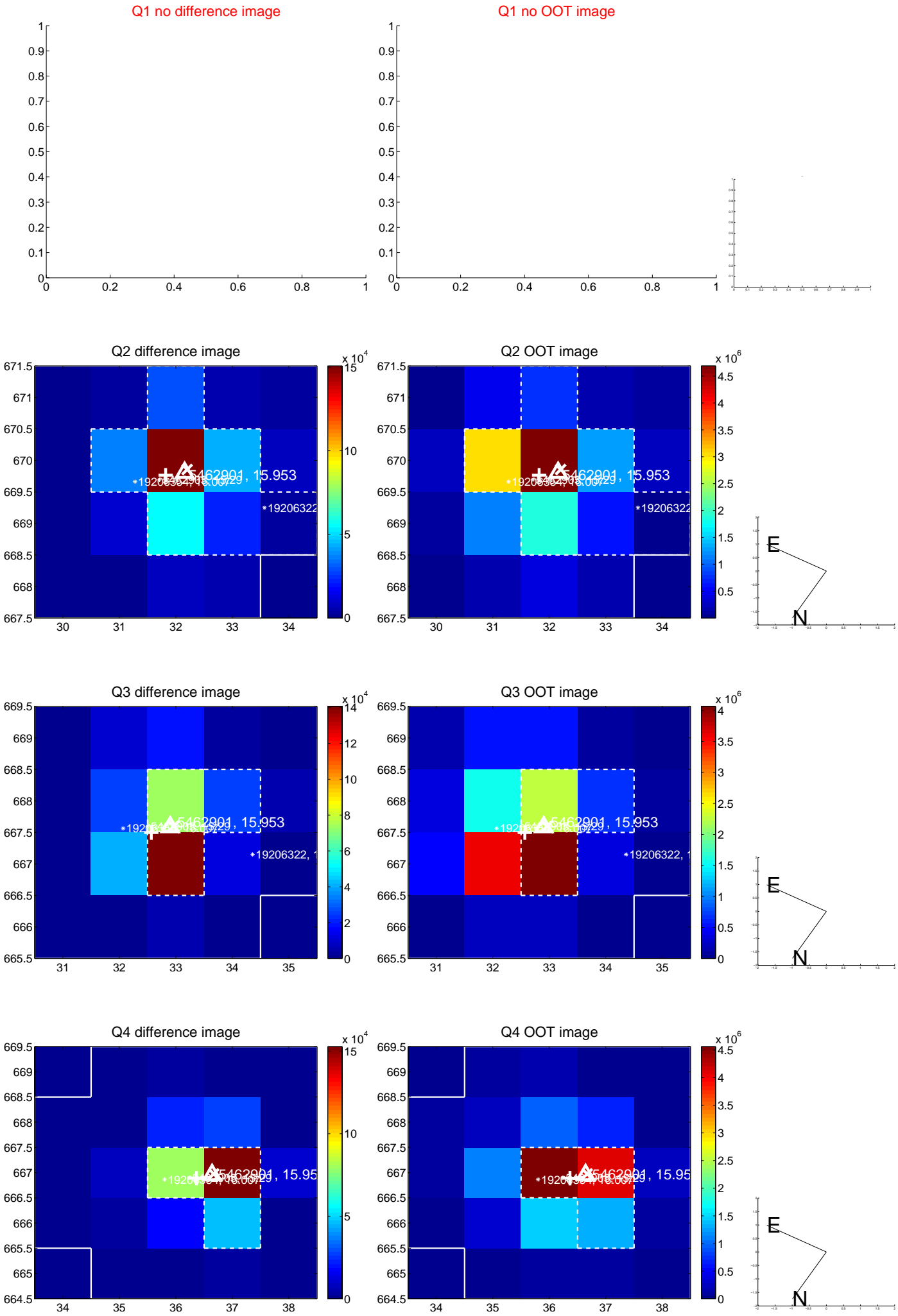
The direct PRF centroid is offset from the target star catalog position by about 0.79 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $1.169 \pm 0.134$  | 8.73                | $-0.908 \pm 0.114$ | $-0.737 \pm 0.099$ |
| PRF-fit source offset from KIC position | $0.253 \pm 0.069$  | 3.68                | $0.109 \pm 0.069$  | $0.228 \pm 0.069$  |
| photometric centroid source offset      | $0.94 \pm 0.00$    | 194.98              | $0.63 \pm 0.01$    | $0.69 \pm 0.00$    |

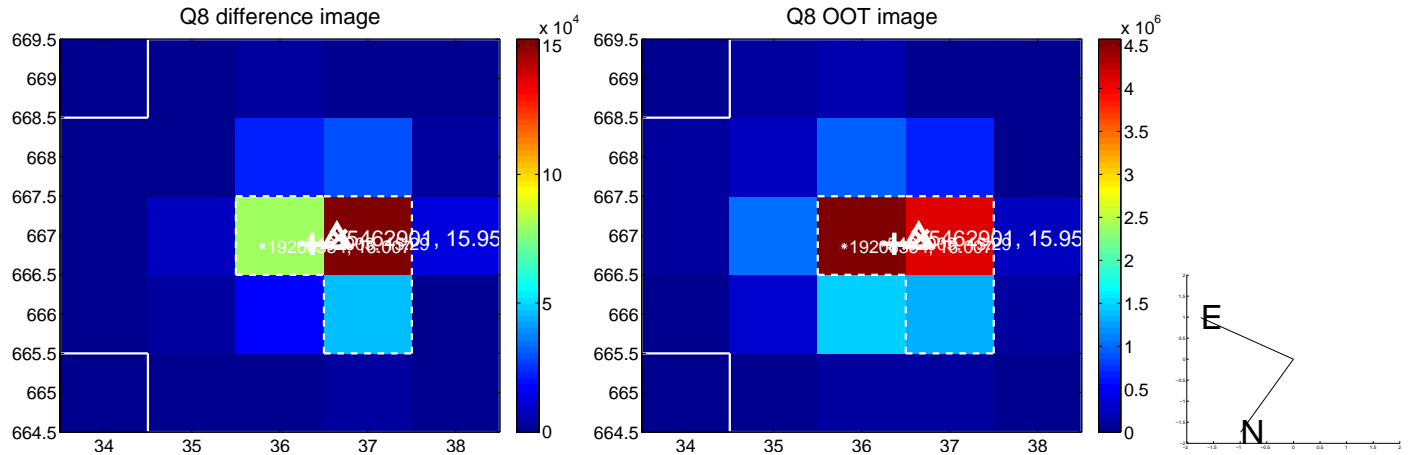
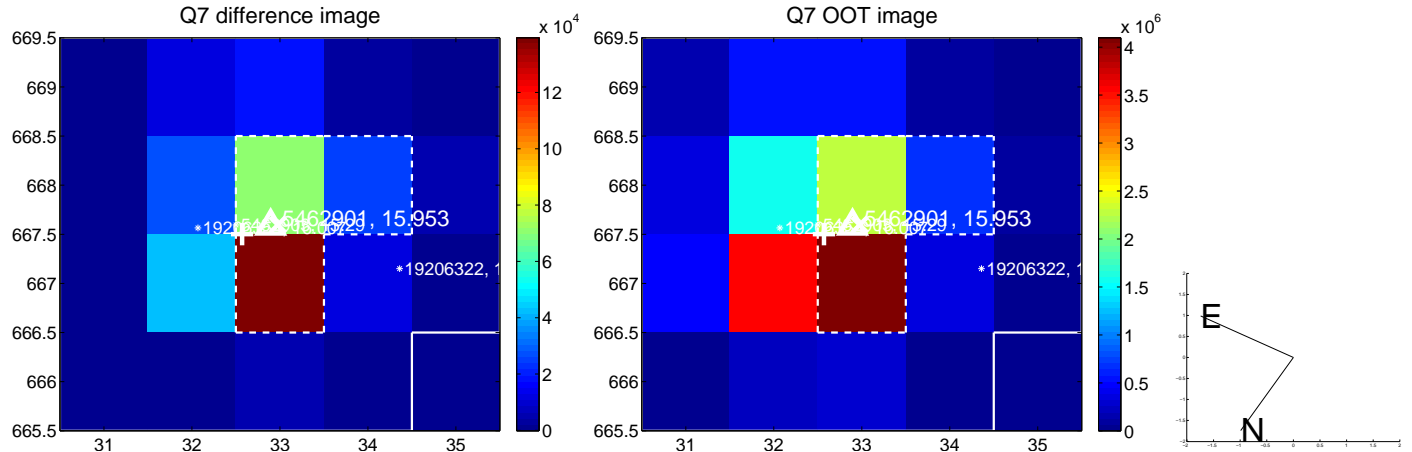
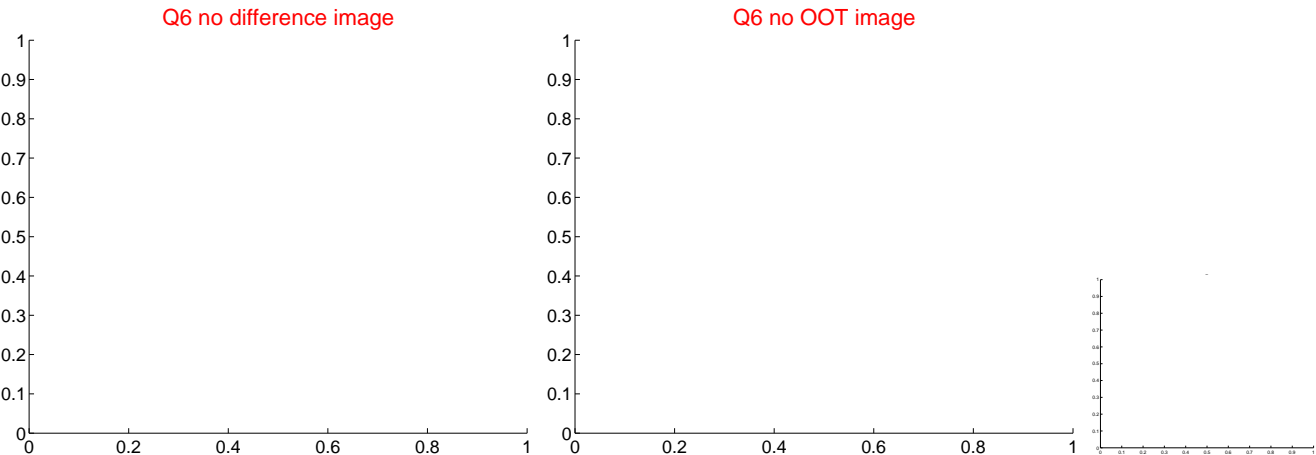
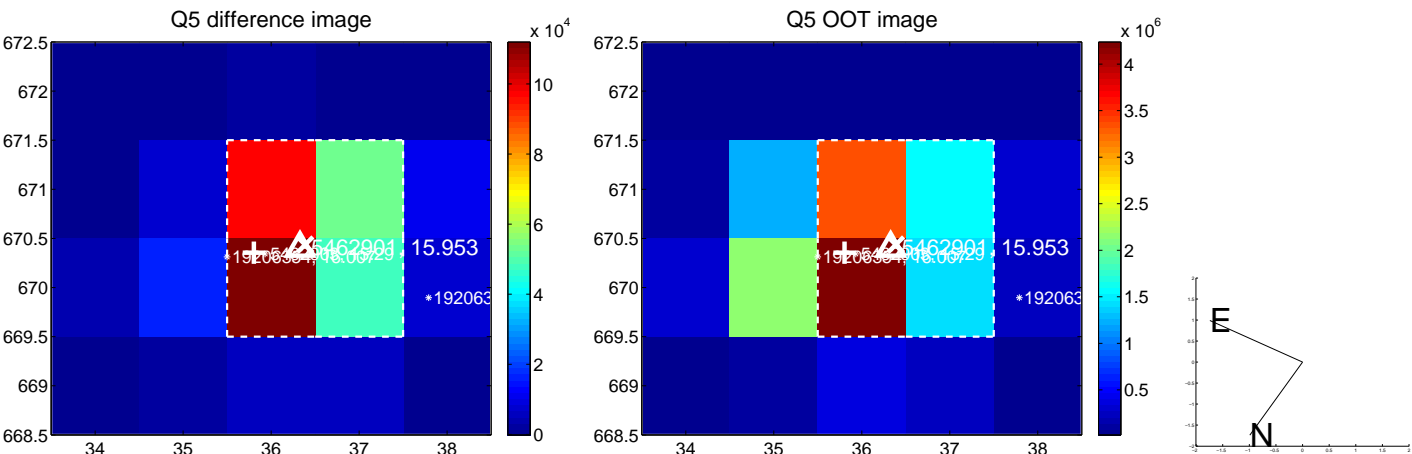


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

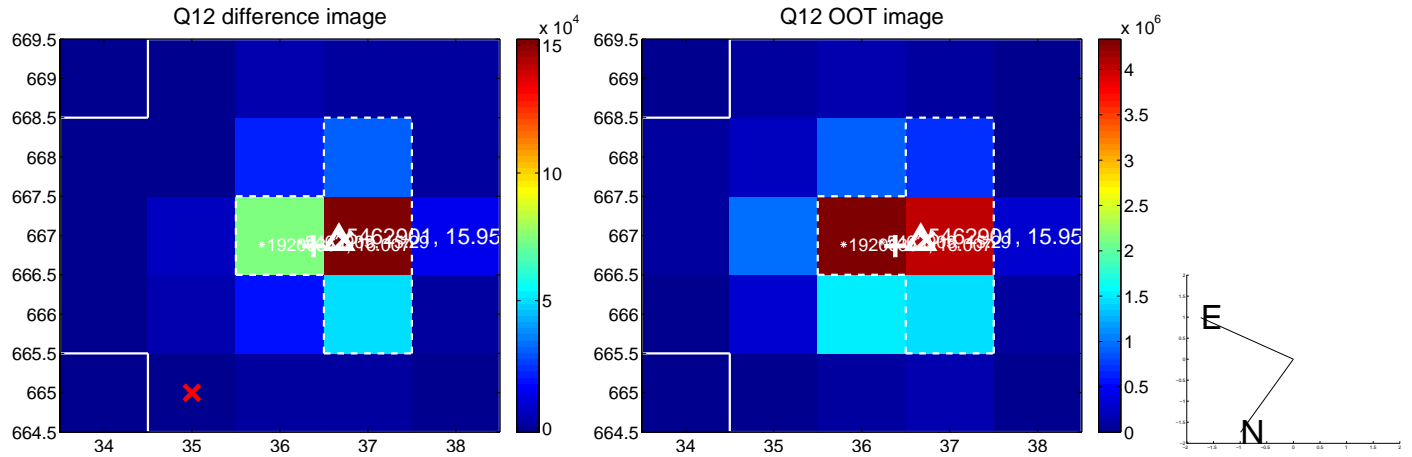
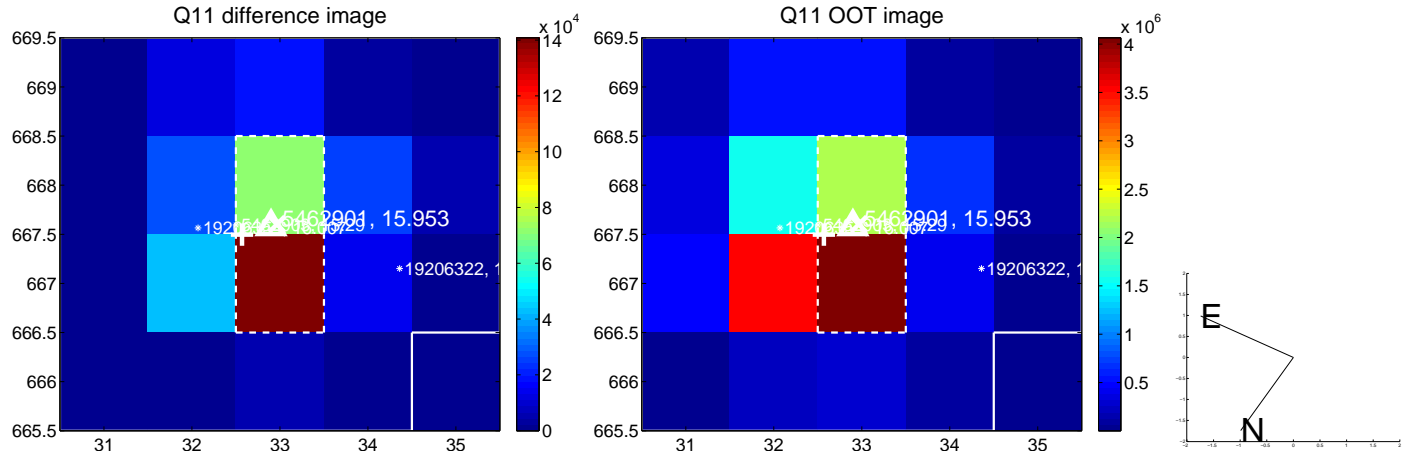
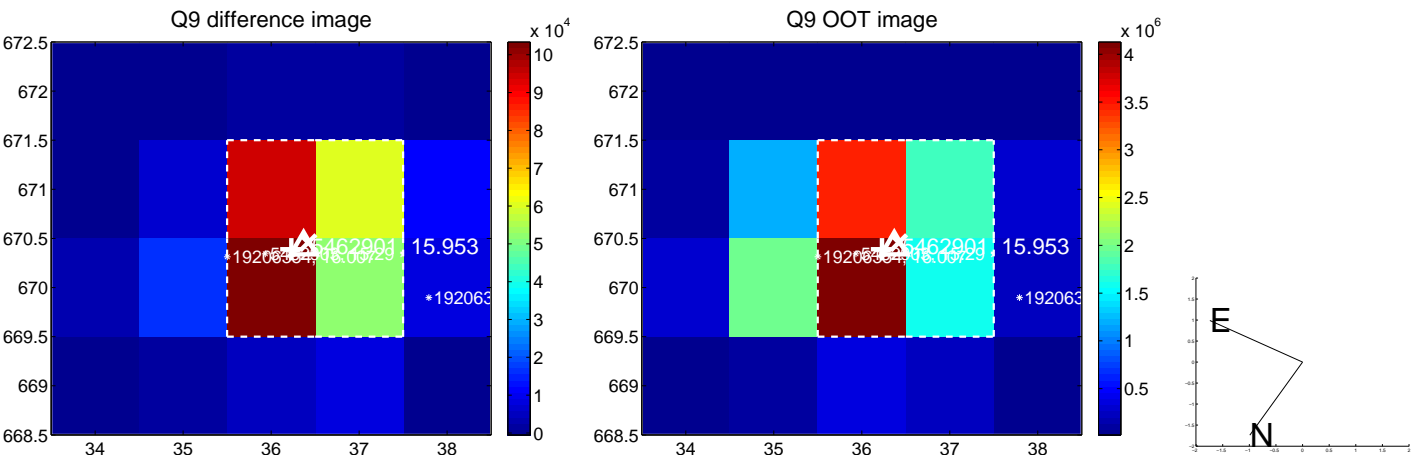
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



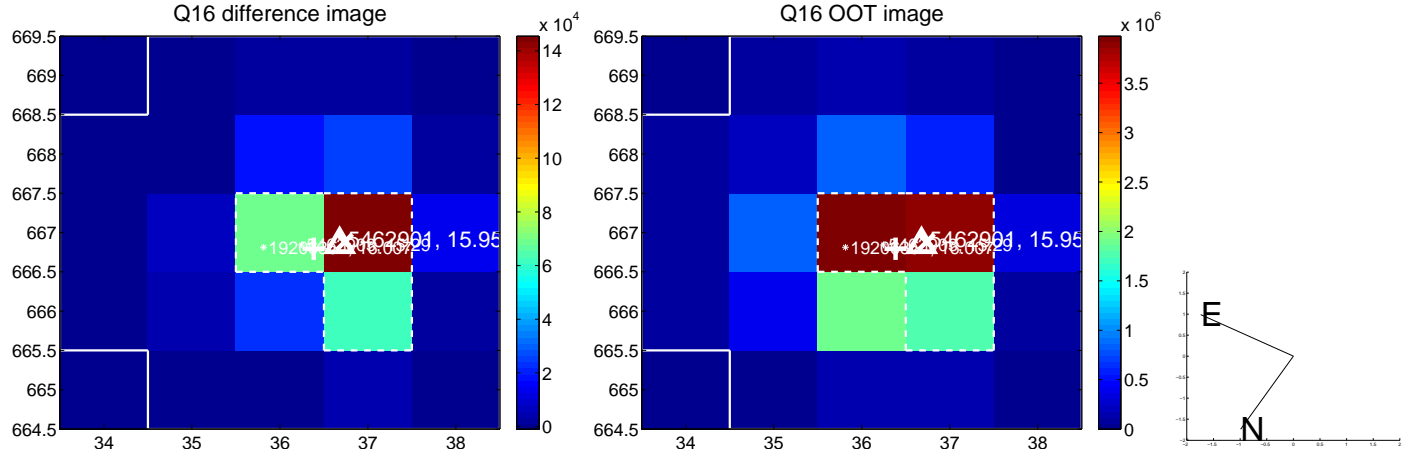
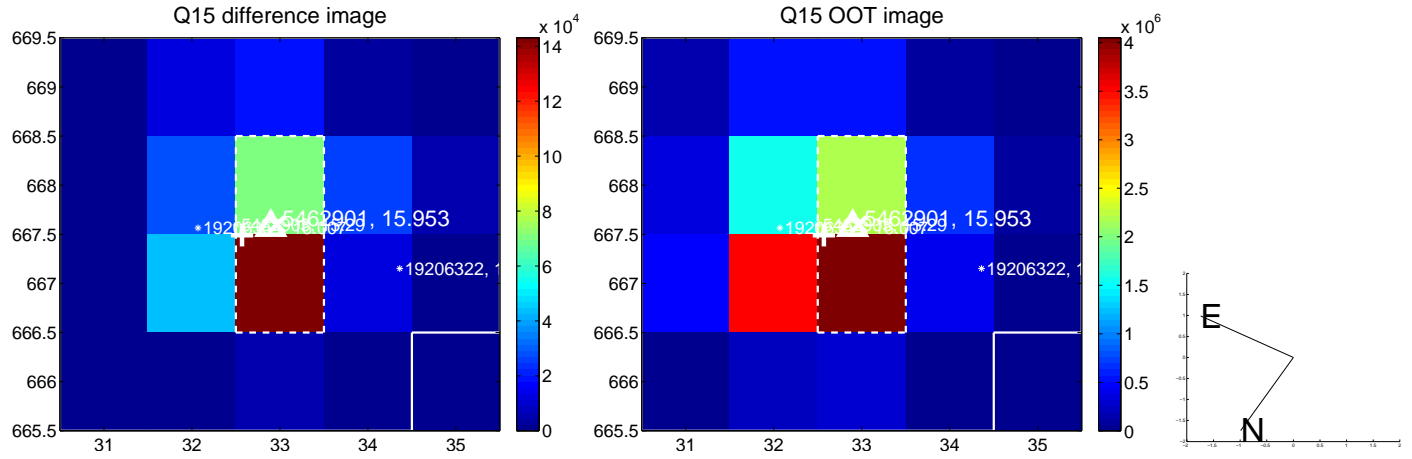
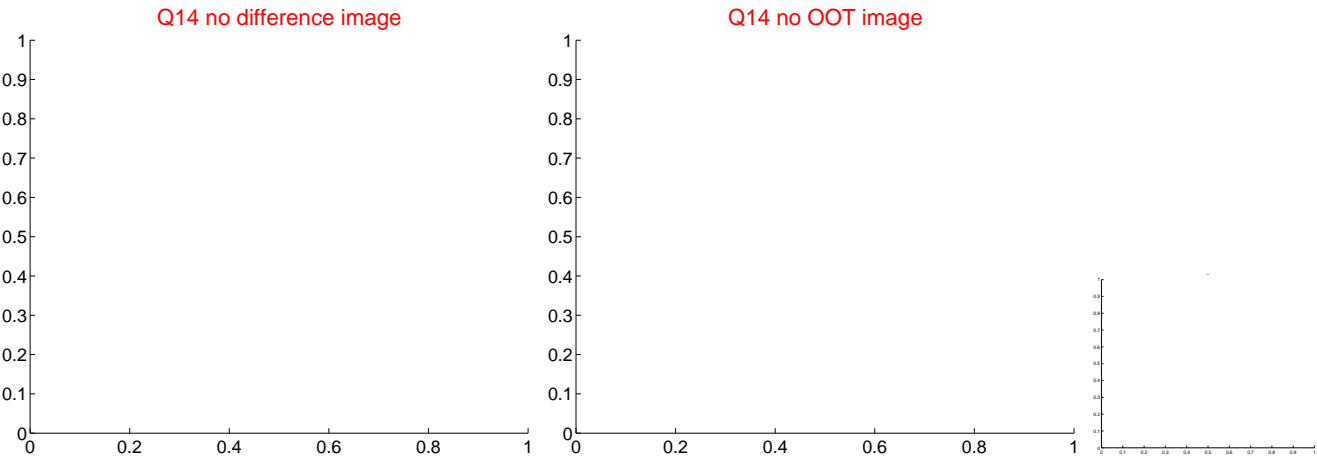
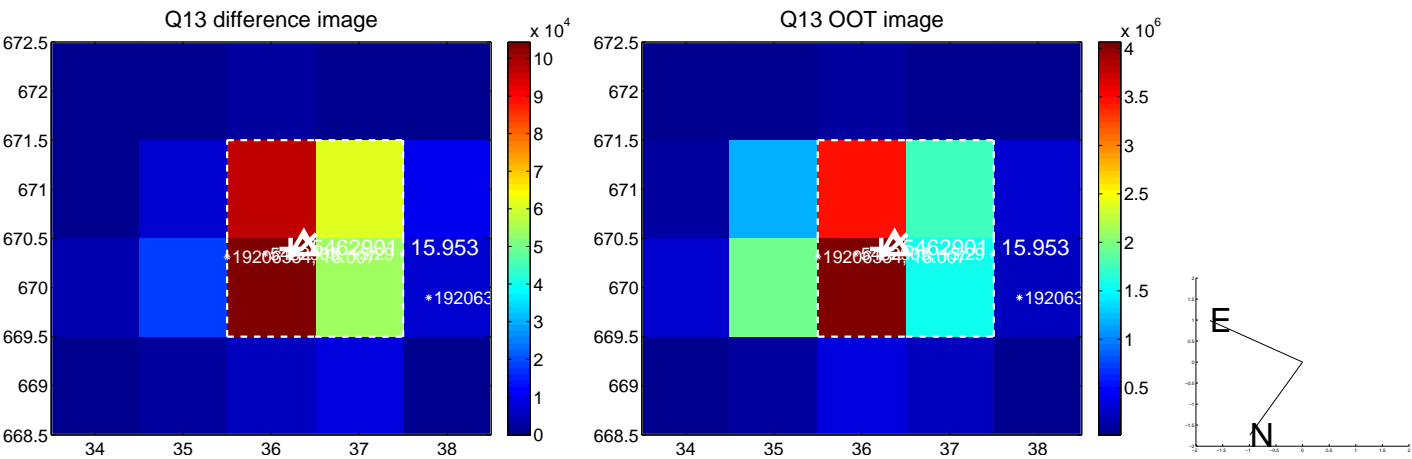
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



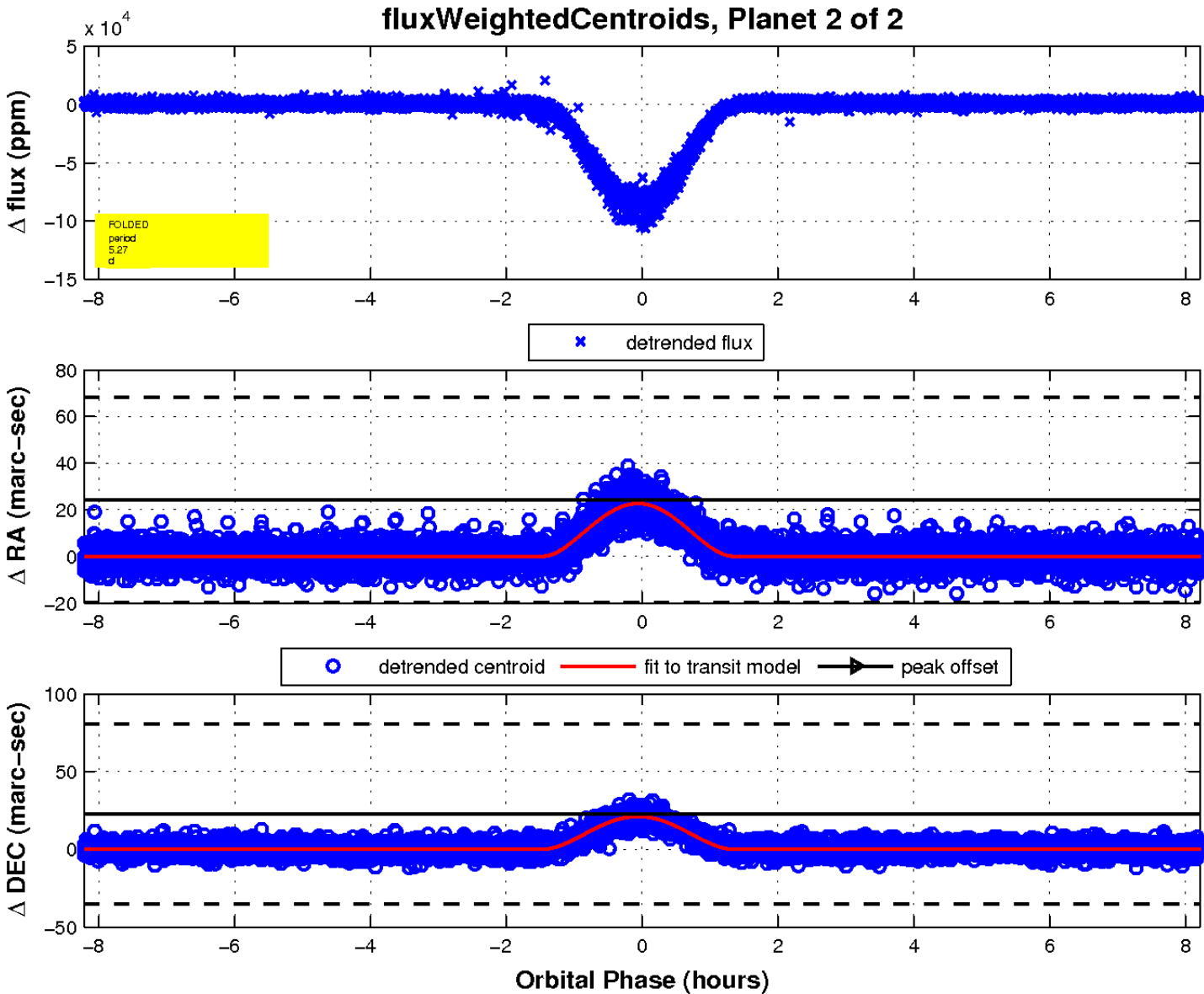
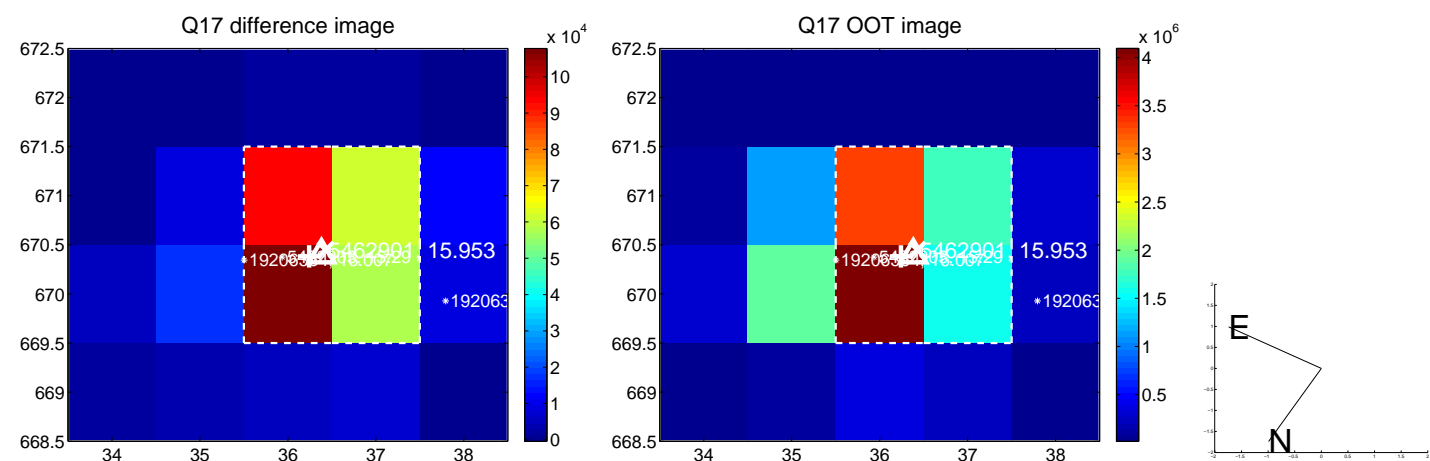
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

