

# KIC 008030148

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 008030148-01 | OBS      | 0155.01 | 5.660670      | 131.755310   | 733.4       | 4.781            | 178.7 | 182.9 | 1.17                        | 5746            | 3.51                   | 365.93                 |
| 008030148-02 | OBS      | No      | 285.549561    | 153.279423   | 215.0       | 12.534           | 7.9   | 7.8   | 1.17                        | 5746            | 1.87                   | 1.96                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008030148-01 | OBS      | PC   | 1.00  | 0 | 0 | 0 | 0 | NO_COMMENT  |
| 008030148-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_FEW_DIFFS |

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

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

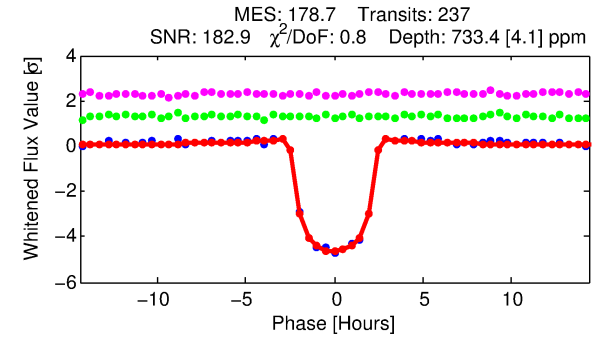
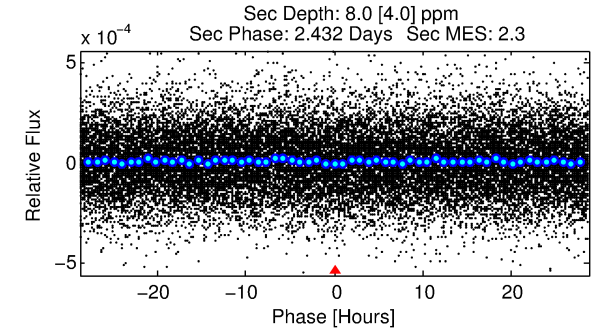
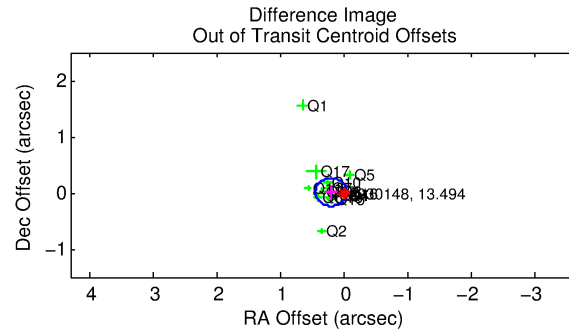
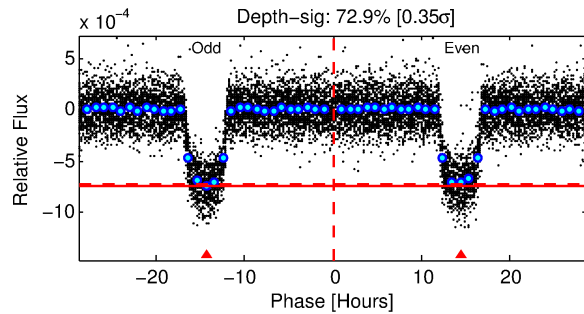
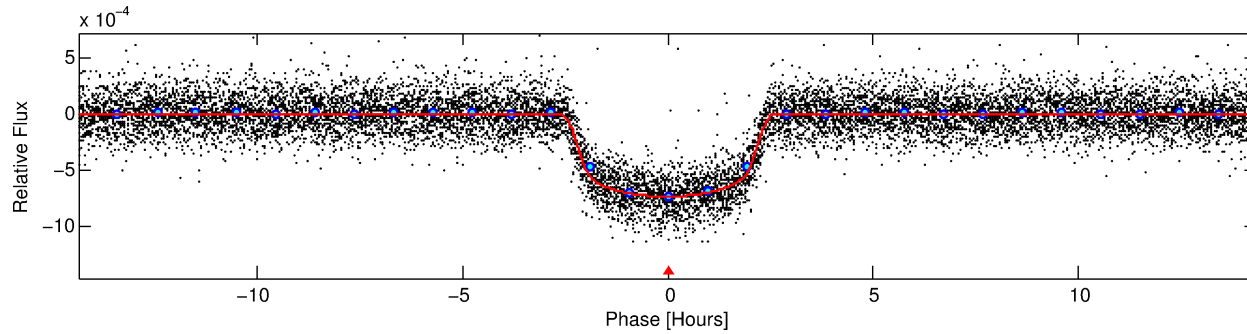
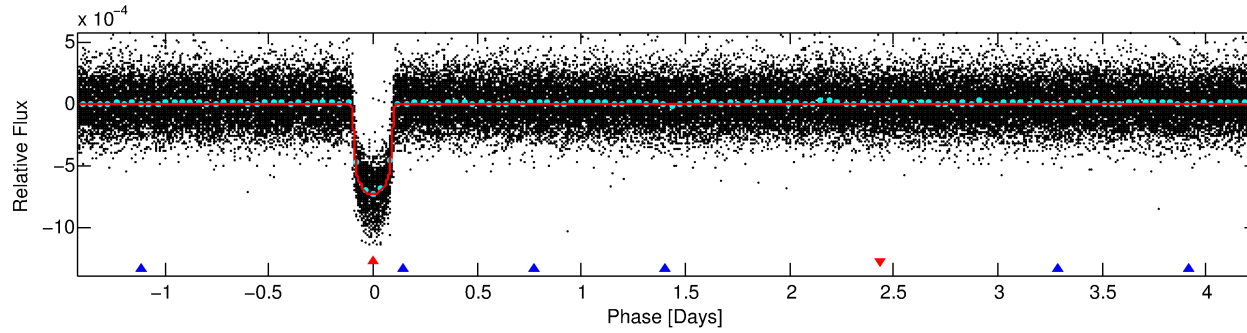
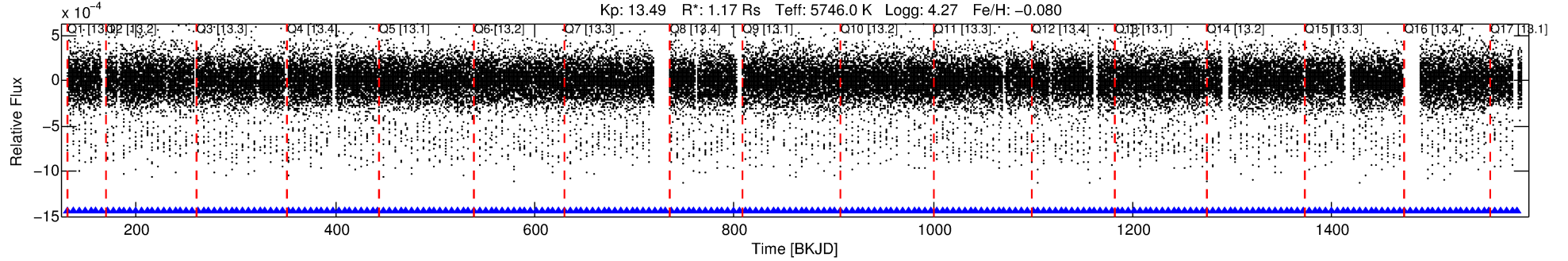
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008030148-01

No Significant Match Found

# DV One-Page Summary

KIC: 8030148 Candidate: 1 of 2 Period: 5.661 d  
KOI: K00155.01 Corr: 0.989



## DV Fit Results:

Period = 5.66067 [0.00000] d  
Epoch = 131.7553 [0.0004] BKJD  
Rp/R\* = 0.0274 [0.0008]  
a/R\* = 6.00 [0.74]  
b = 0.79 [0.06]  
Seff = 365.93 [104.09]  
Teff = 1115 [79] K  
Rp = 3.51 [0.60] Re  
a = 0.0606 [0.0102] AU  
Ag = 1.32 [0.75] [0.42 $\sigma$ ]  
Teffp = 1848 [234] K [2.96 $\sigma$ ]

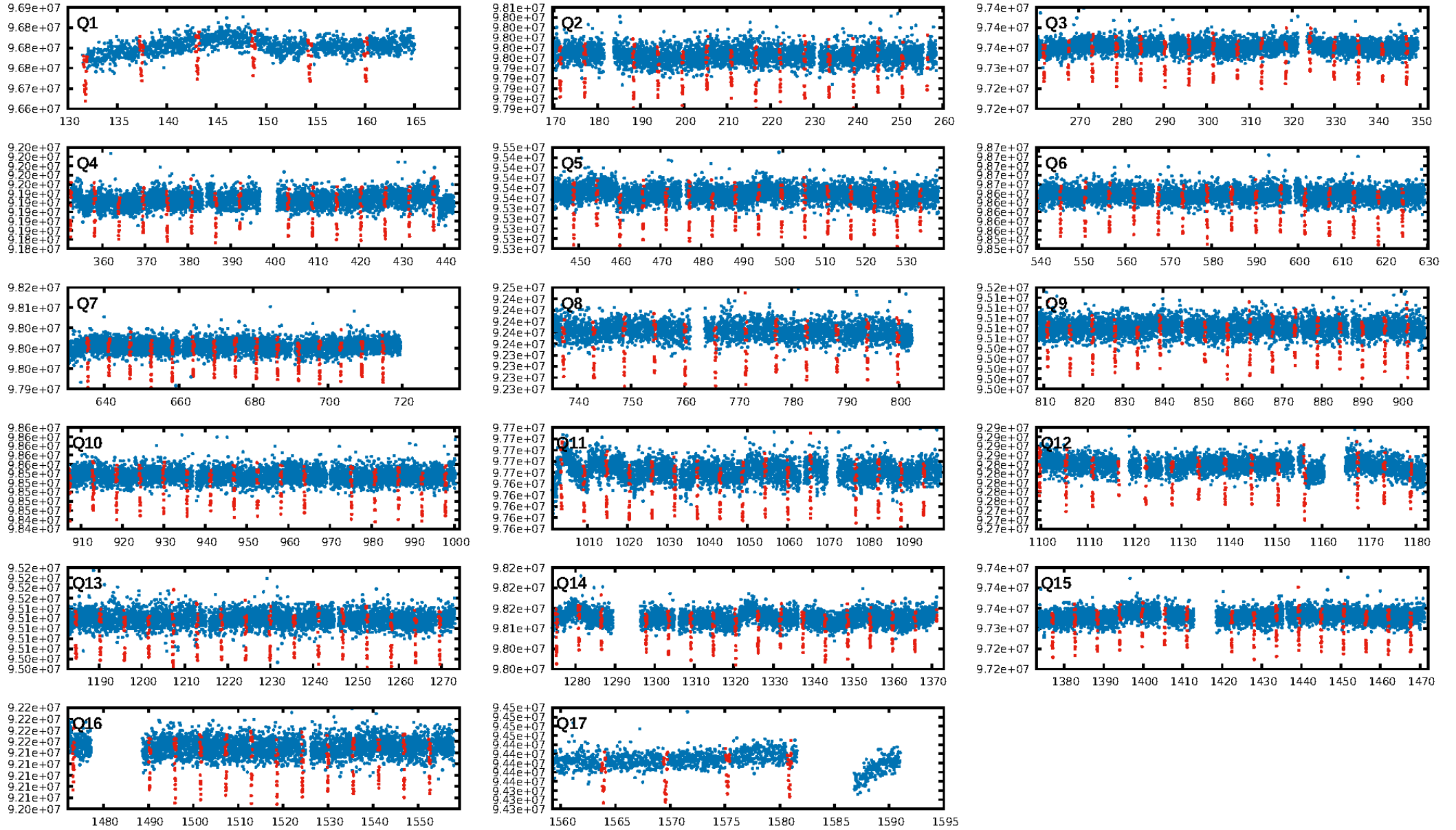
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [500.74 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [227/227]  
GhostDiagnostic-chr: 6.236  
Centroid-sig: 0.0%  
Centroid-so: 0.275 arcsec [3.98 $\sigma$ ]  
OotOffset-rm: 0.204 arcsec [2.47 $\sigma$ ]  
KicOffset-rm: 0.238 arcsec [2.37 $\sigma$ ]  
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]

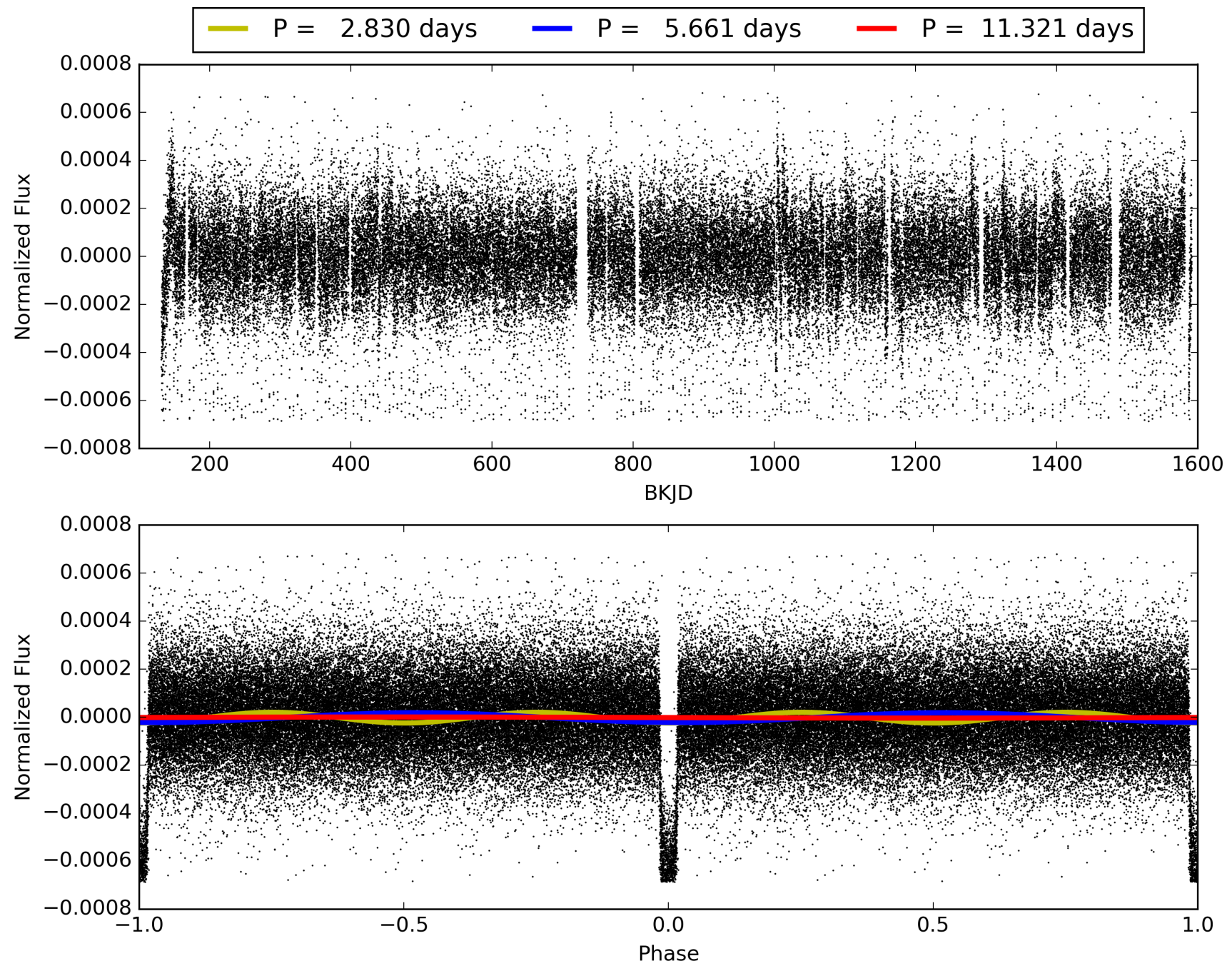
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:18:34 Z

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

# TCE 008030148-01, PDC Light Curves



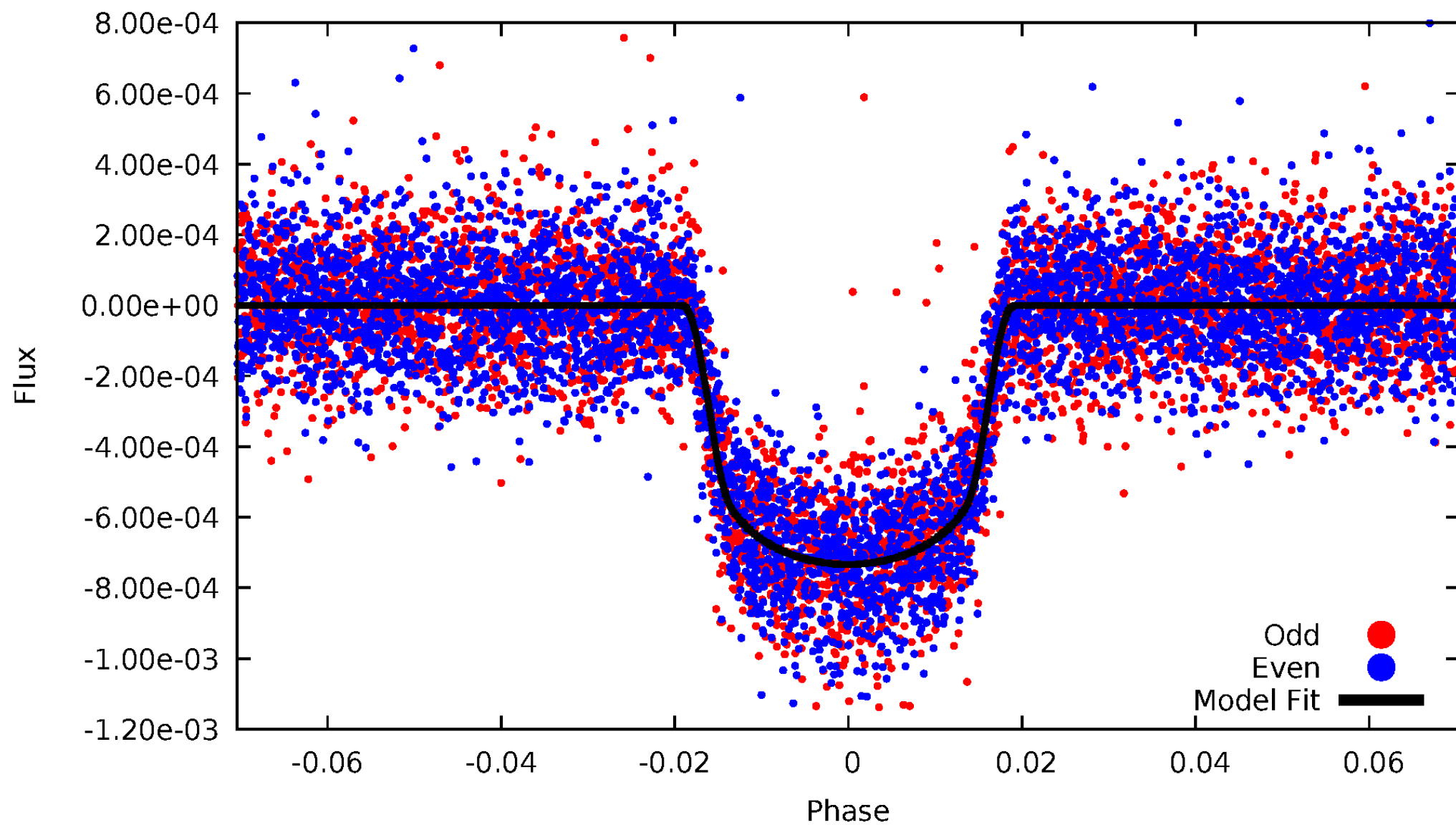
TCE 008030148-01





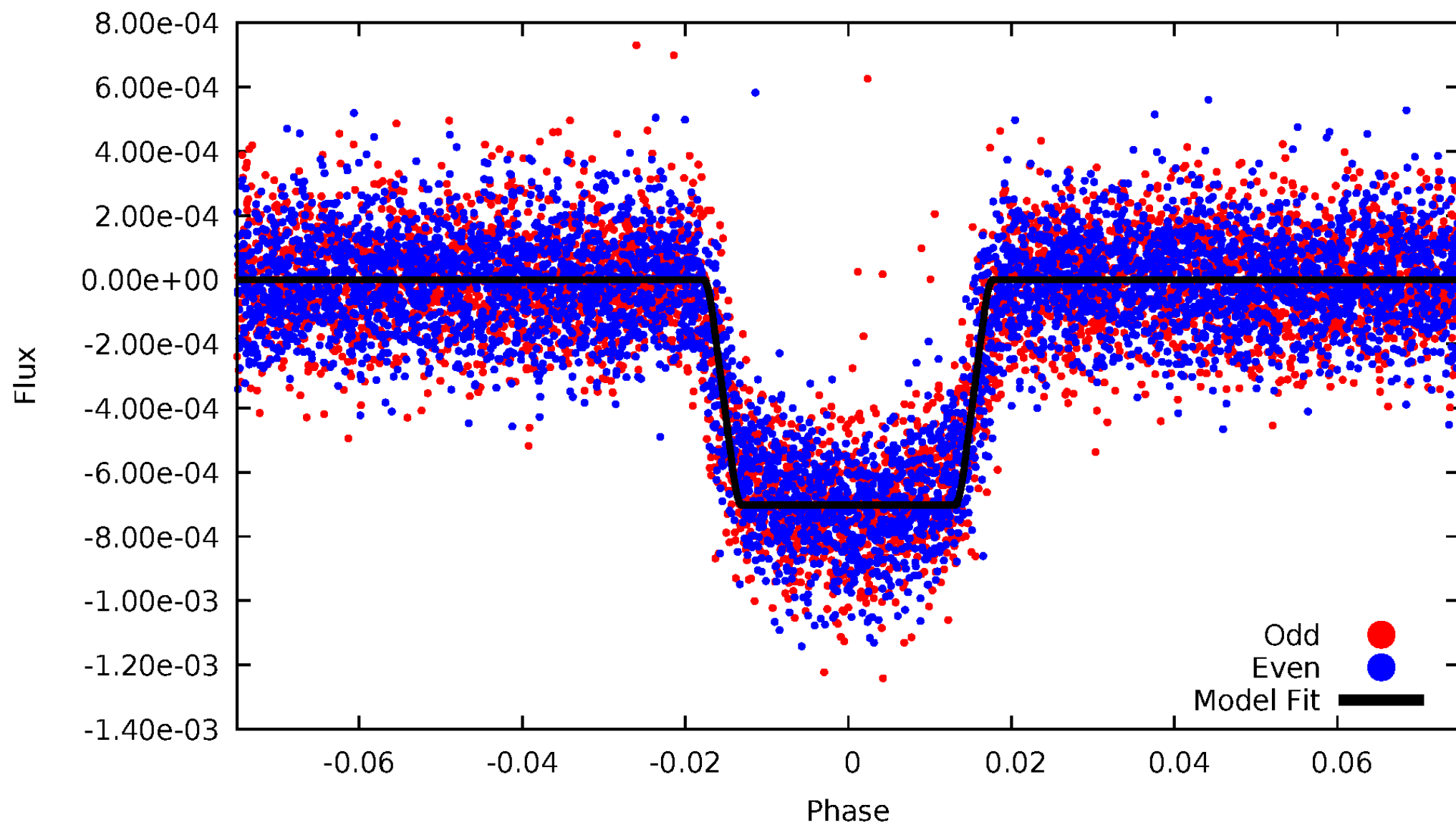
# DV Odd/Even

TCE 008030148-01



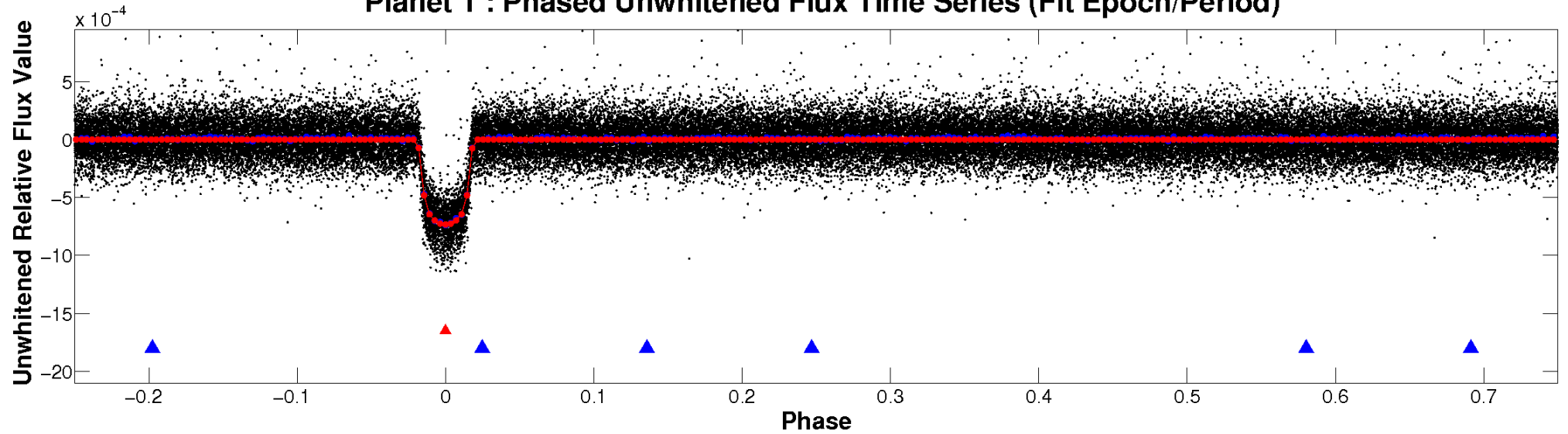
# ALT Odd/Even

TCE 008030148-01

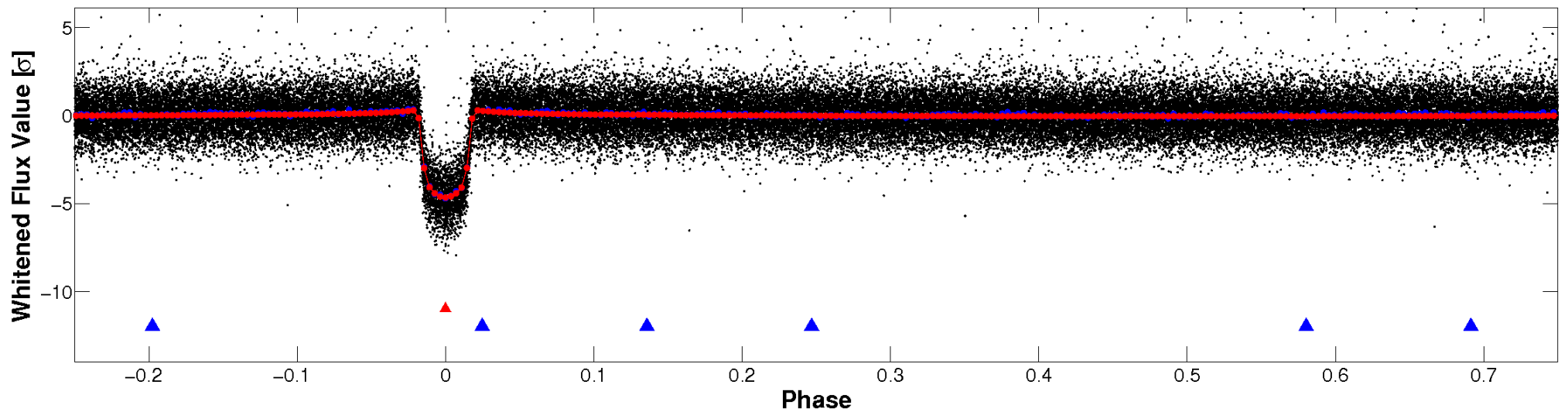


# Non-Whitened Vs. Whitened Light Curve

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

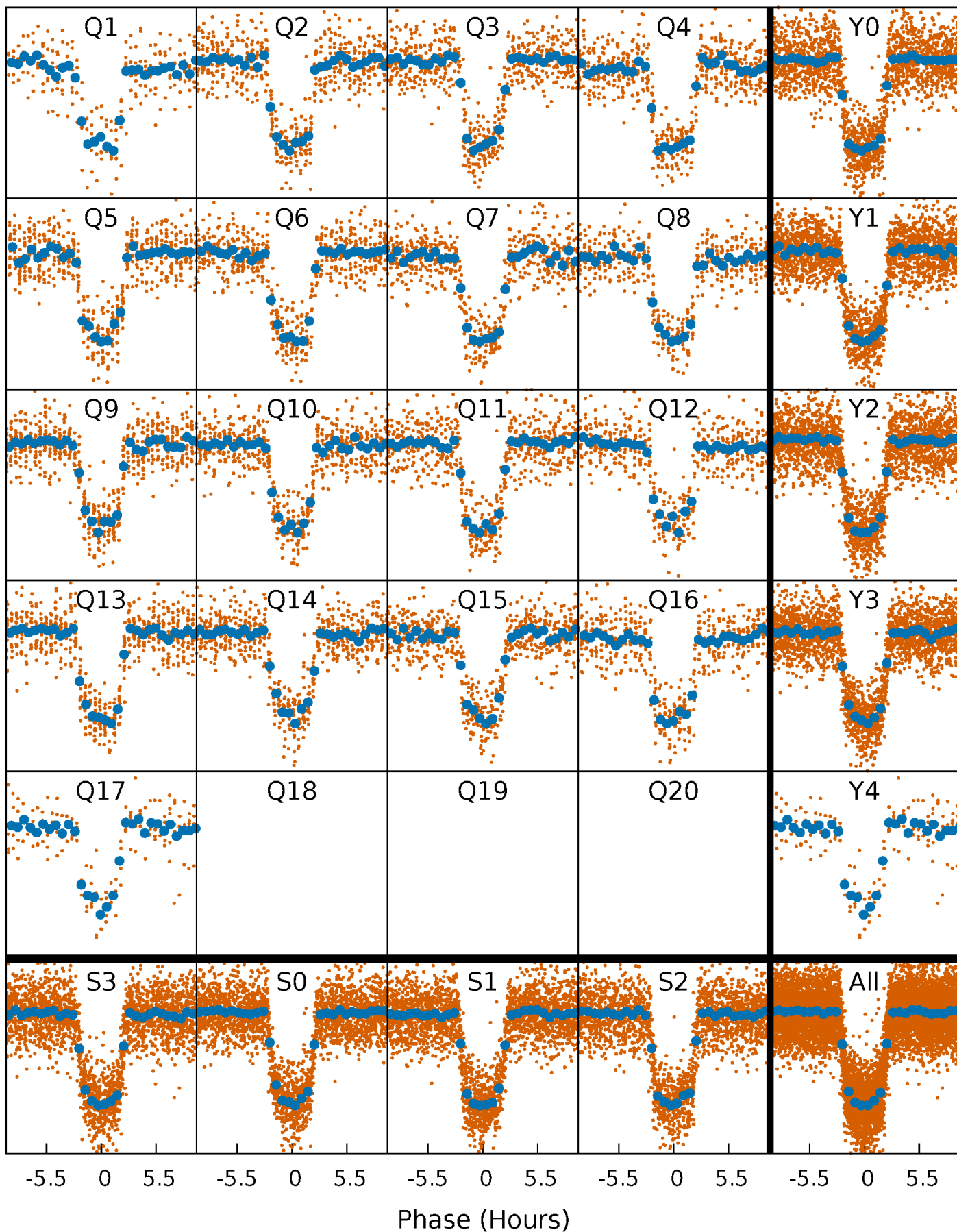


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

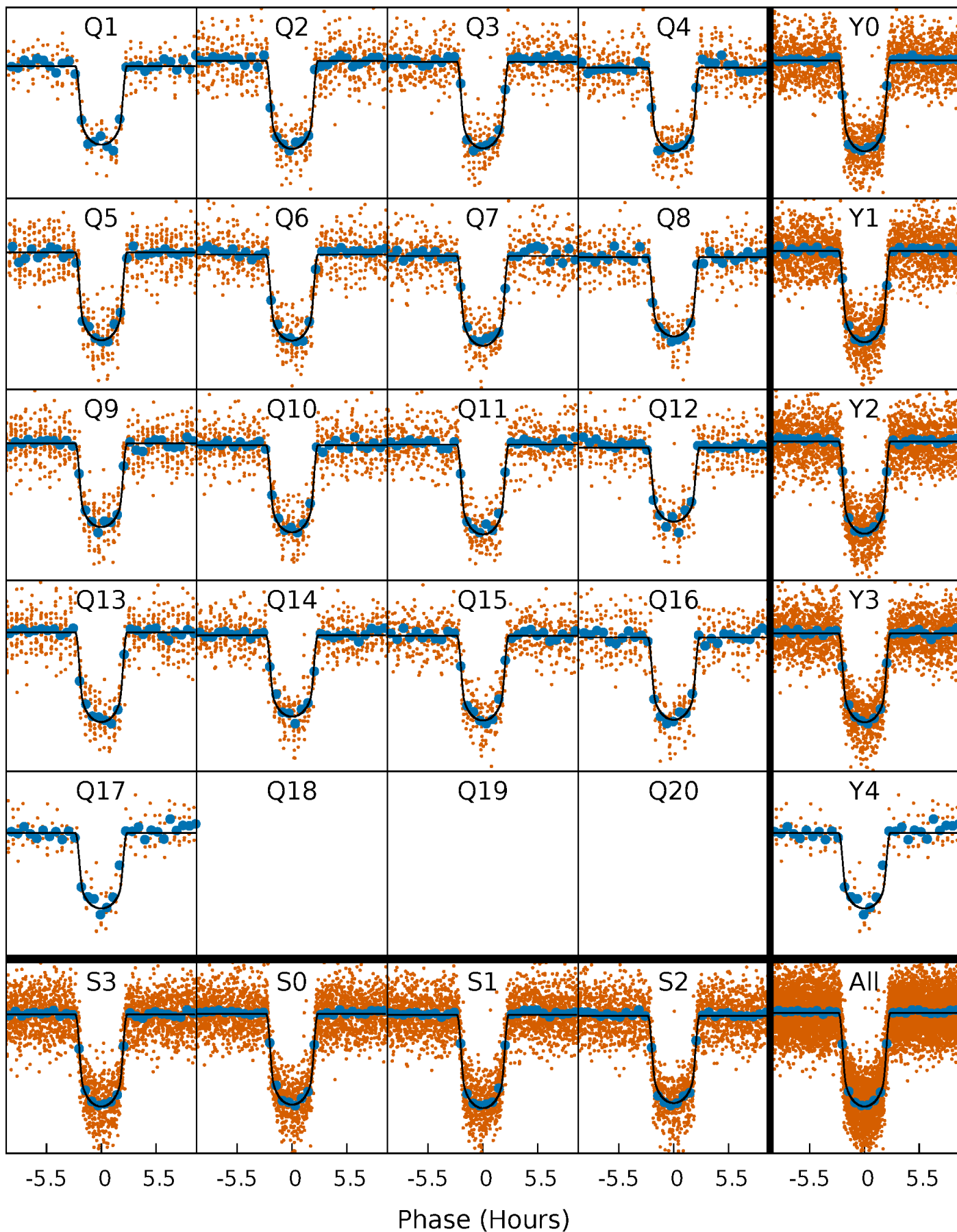
TCE 008030148-01 P= 5.660670 Days  $T_0=131.755310$  (BKJD)





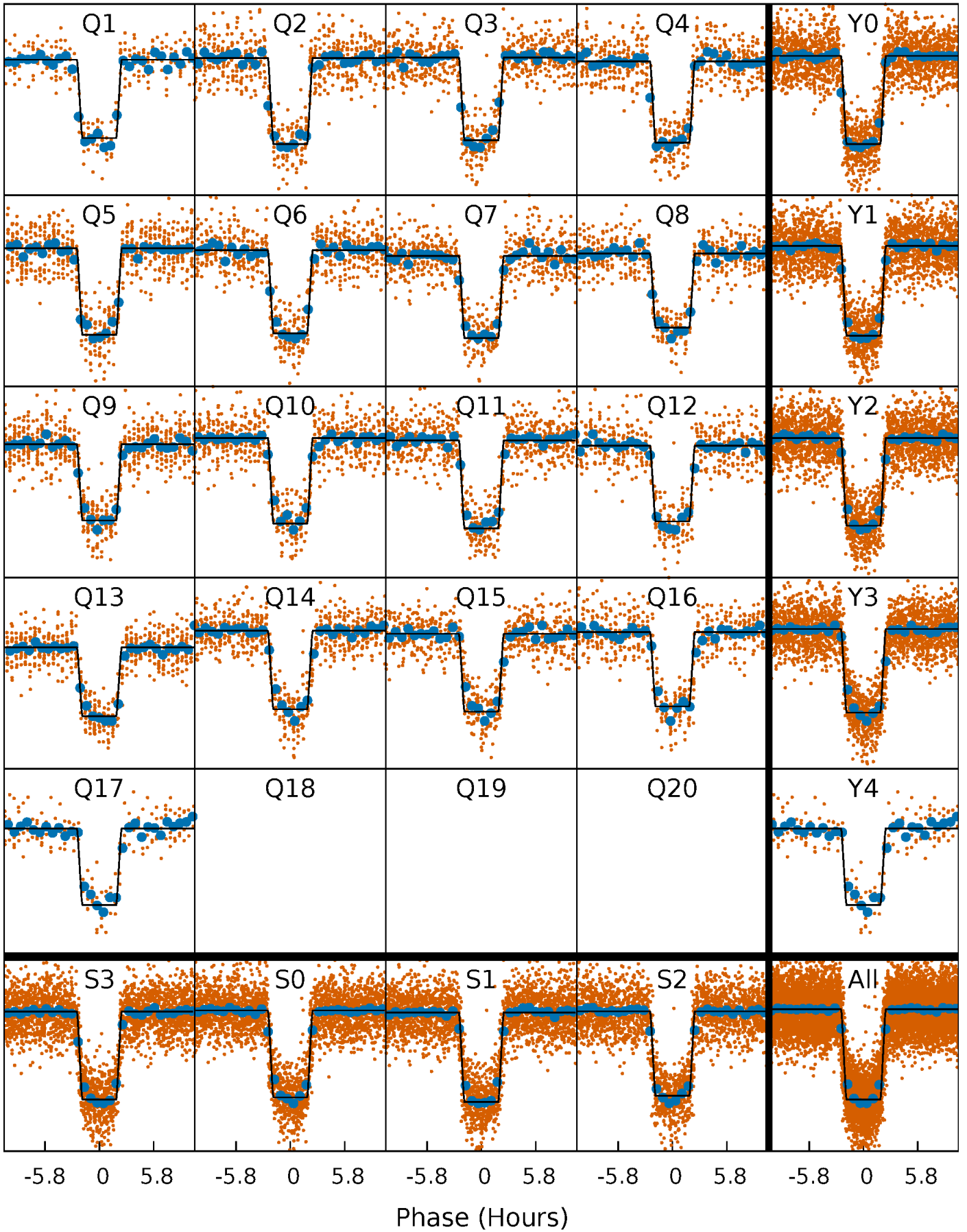
# DV Quarter-Phased Transit Curves

TCE 008030148-01 P= 5.660670 Days  $T_0=131.755310$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

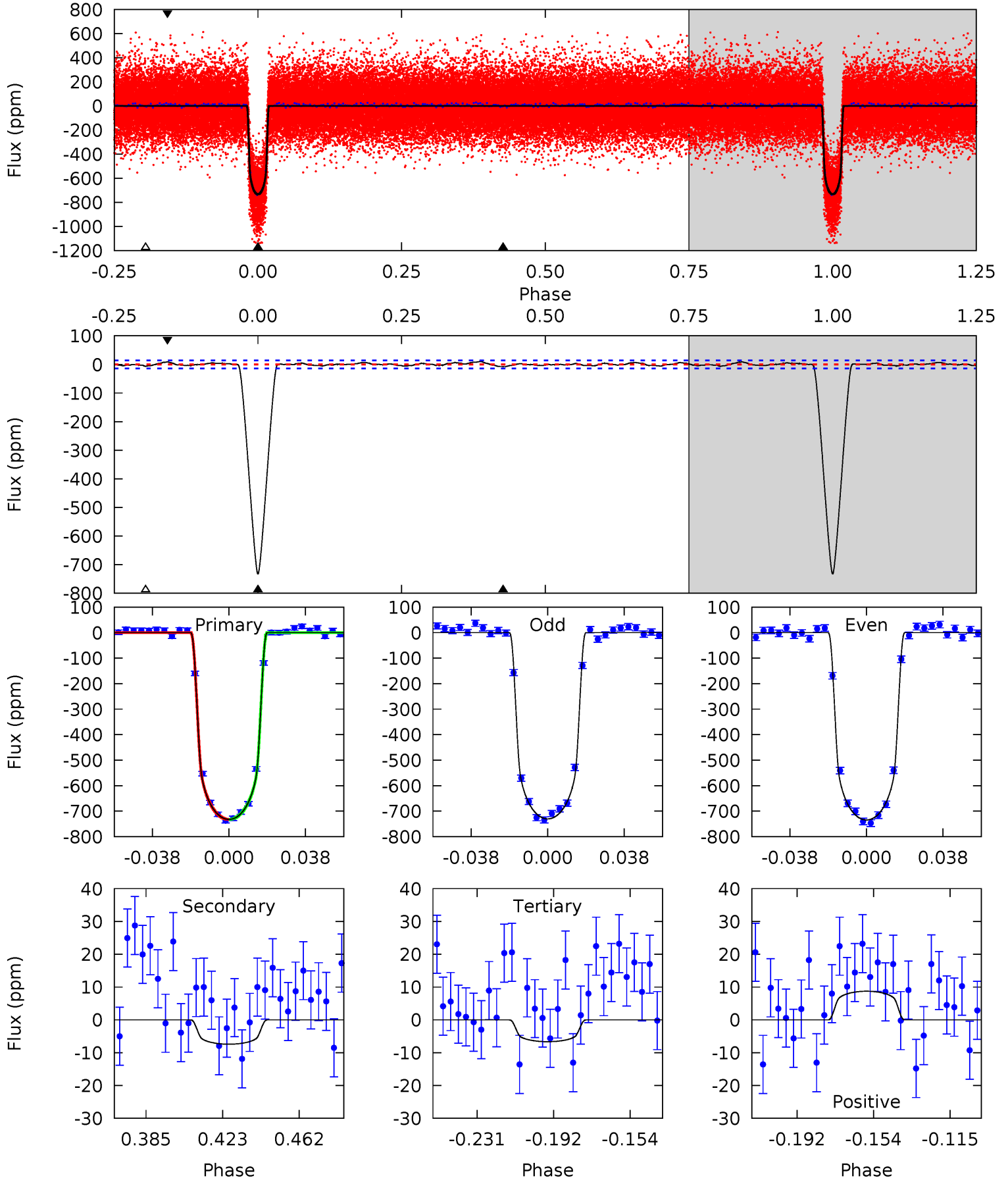
TCE 008030148-01   P= 5.660596 Days    $T_0=131.764590$  (BKJD)



# DV Model-Shift Uniqueness Test

008030148-01, P = 5.660670 Days, E = 126.094640 Days

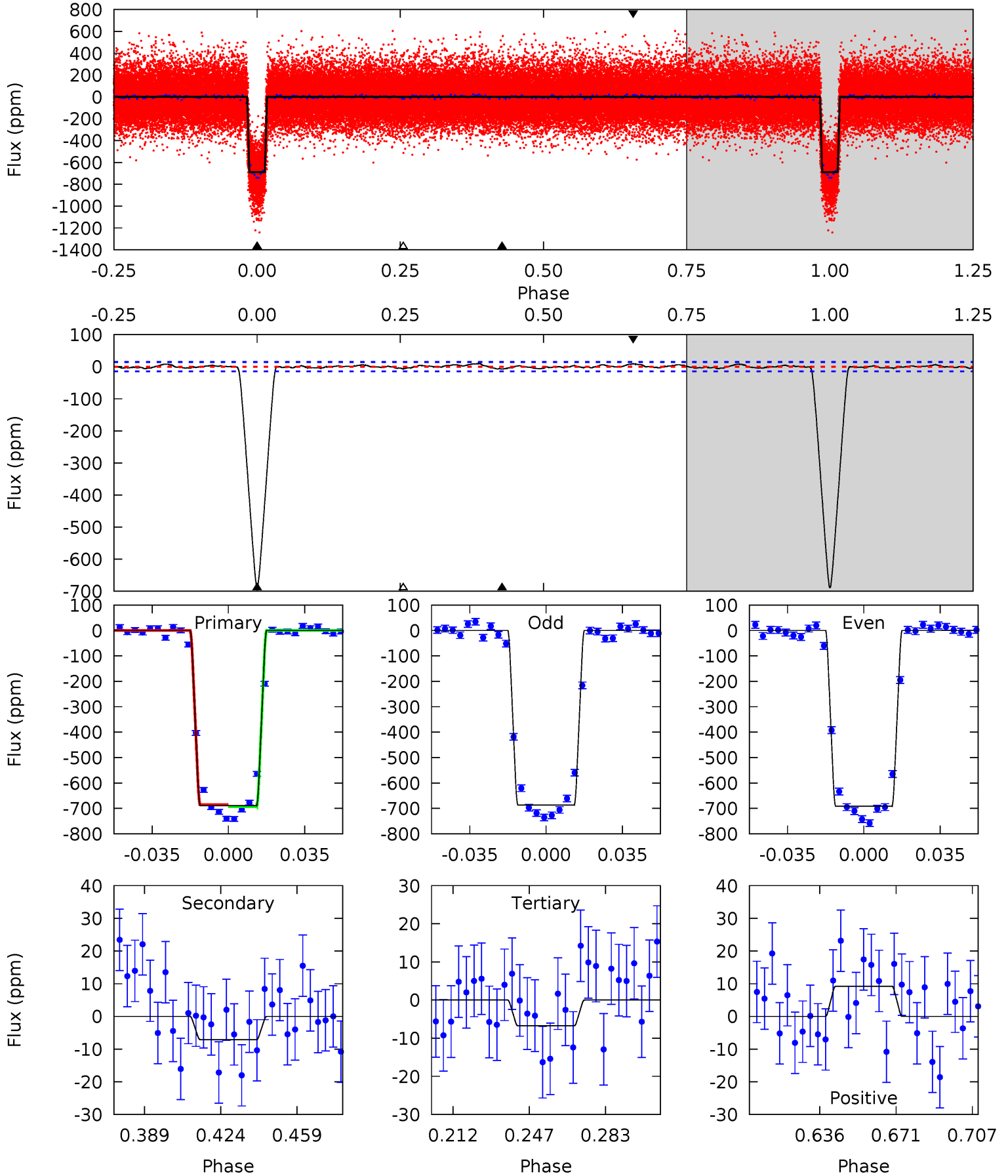
| Pri   | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 247.8 | 2.51 | 2.25 | 2.95 | 4.76            | 2.07            | 1.16             | 245.5   | 244.8   | 0.26    | -0.44   | 0.71    | 1.00 | 0.01  | 0.01 |



# Alt Model-Shift Uniqueness Test

008030148-01, P = 5.660596 Days, E = 126.103994 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  |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 224.6 | 2.33 | 2.21 | 3.01 | 4.78            | 2.10            | 1.14             | 222.4   | 221.6   | 0.12    | -0.68   | 0.80    | 1.00 | 0.01  | 1.14 |



### Stellar Parameters For KIC 008030148

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $5746^{+115}_{-103}$ | $4.266^{+0.162}_{-0.108}$ | $-0.080^{+0.150}_{-0.150}$ | $1.173^{+0.178}_{-0.198}$ | $0.927^{+0.078}_{-0.052}$ | $0.808^{+0.648}_{-0.264}$                 |
|        | +2%/-2%              | +4%/-3%                   | +188%/-188%                | +15%/-17%                 | +8%/-6%                   | +80%/-33%                                 |
| Source | SPE59                | SPE59                     | SPE59                      | DSEP                      |                           |   |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008030148-01 / KOI 0155.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$          |
|---------|-------------|------------------------|----------------------|----------------------|---------------------------|
| DV      | $-7 \pm 3$  | $3.50^{+0.33}_{-0.36}$ | $1554^{+74}_{-83}$   | $2533^{+143}_{-194}$ | $1.252^{+0.569}_{-0.501}$ |
| Alt.    | $-7 \pm 3$  | $3.38^{+0.33}_{-0.36}$ | $1553^{+74}_{-91}$   | $2543^{+154}_{-259}$ | $1.274^{+0.684}_{-0.590}$ |

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



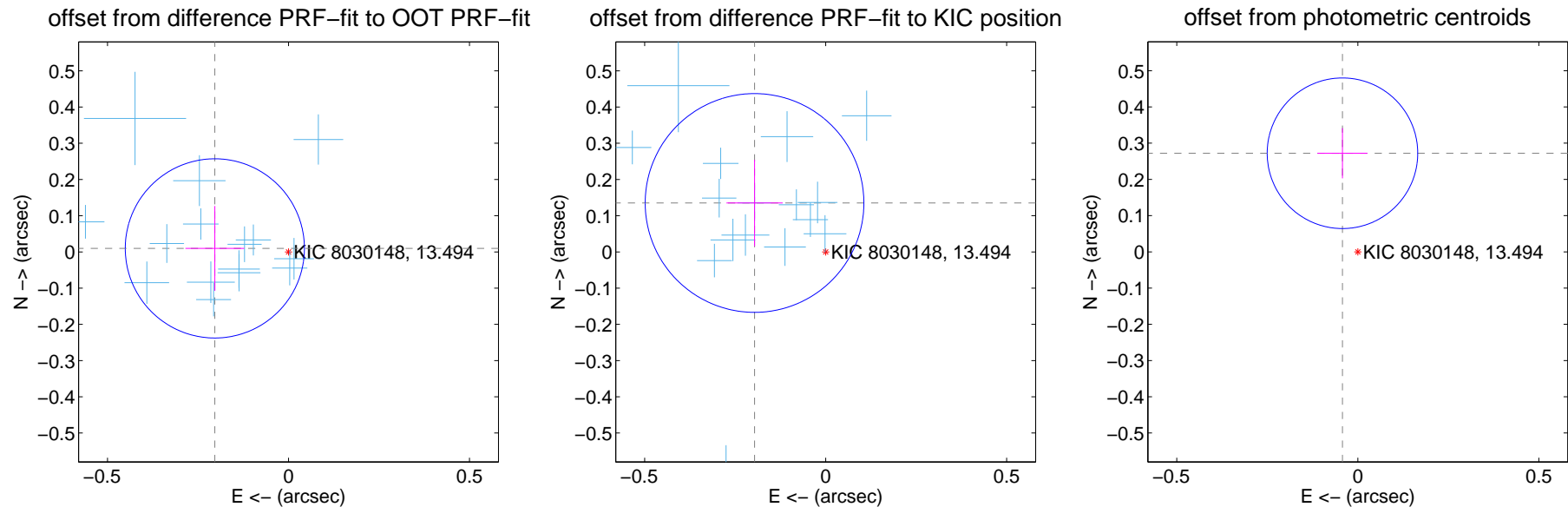
## DV Centroid Data

Supplemental centroid analysis for 008030148-01. Kepler magnitude: 13.49. Transit SNR 182.88

There are 17 quarters with good PRF difference image offsets

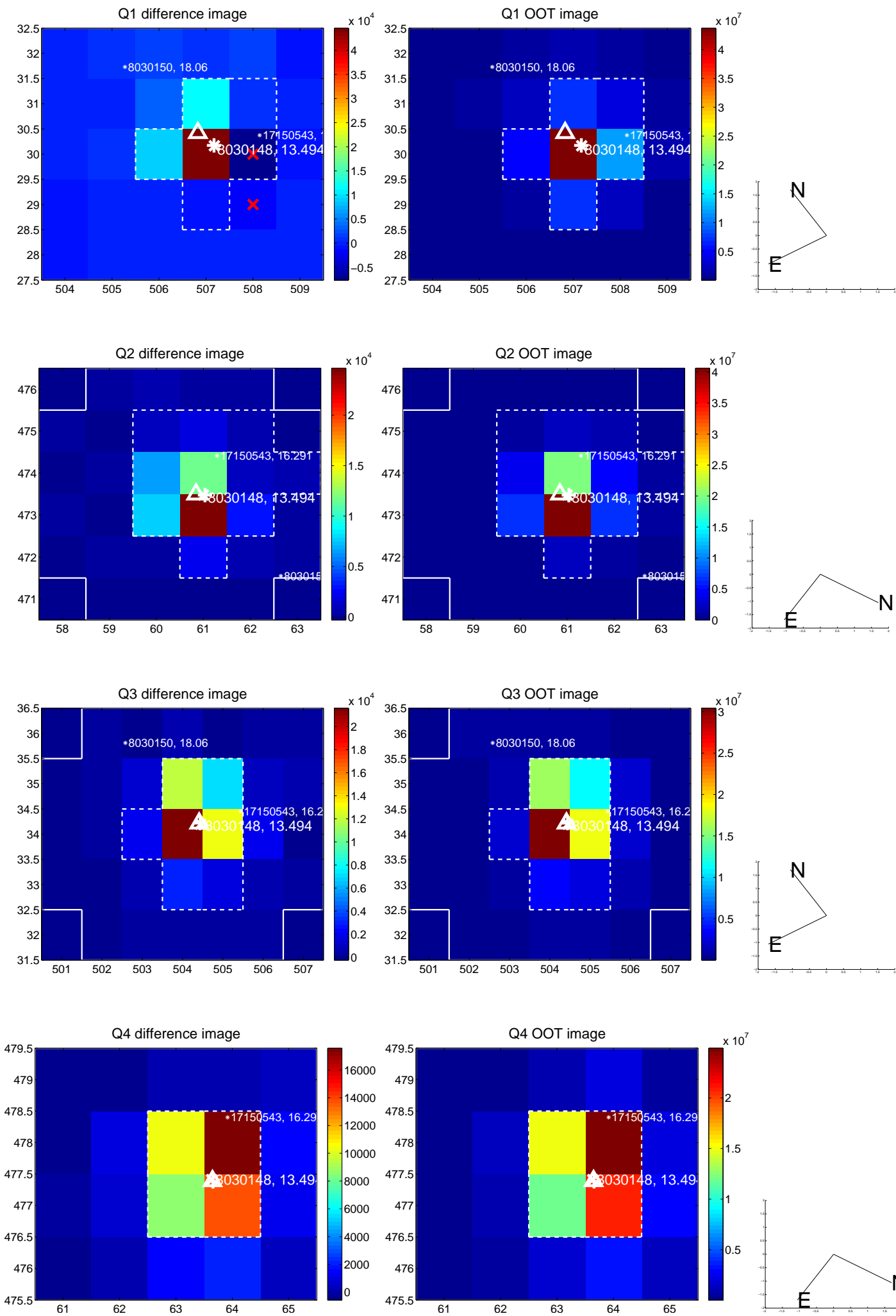
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $0.204 \pm 0.082$  | 2.47                | $0.203 \pm 0.081$ | $0.010 \pm 0.117$ |
| PRF-fit source offset from KIC position | $0.238 \pm 0.101$  | 2.37                | $0.196 \pm 0.078$ | $0.135 \pm 0.119$ |
| photometric centroid source offset      | $0.28 \pm 0.07$    | 3.98                | $0.04 \pm 0.07$   | $0.27 \pm 0.07$   |

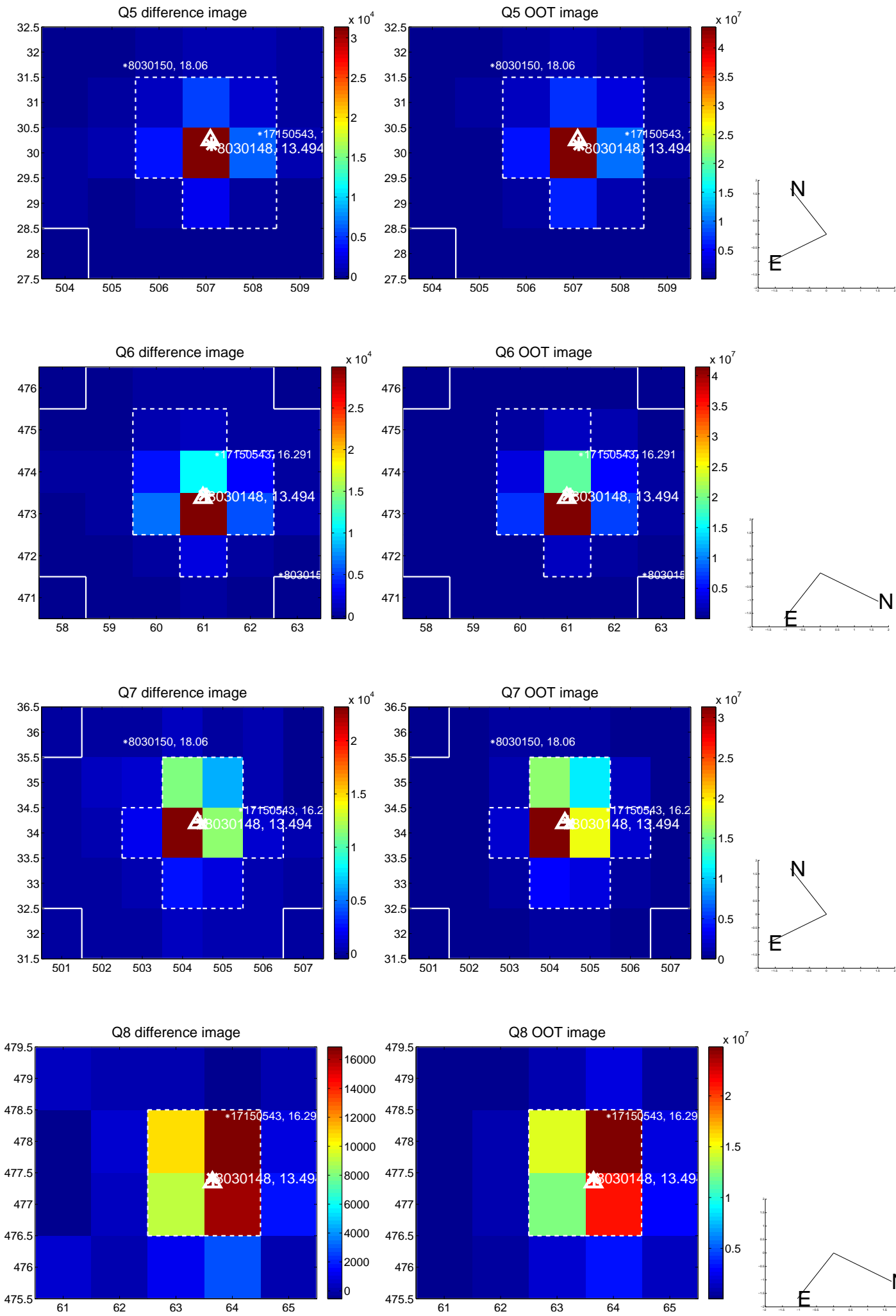


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

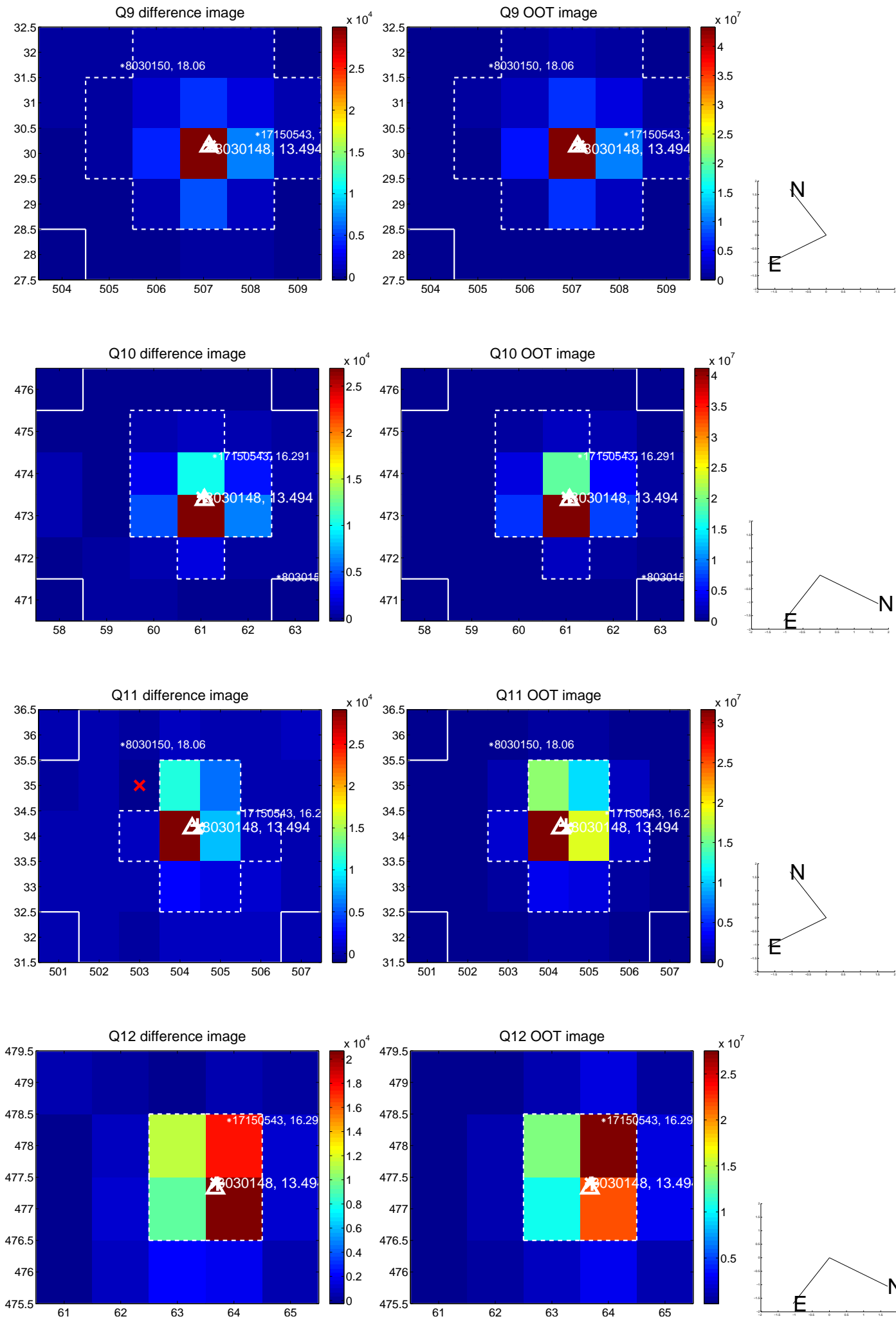
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



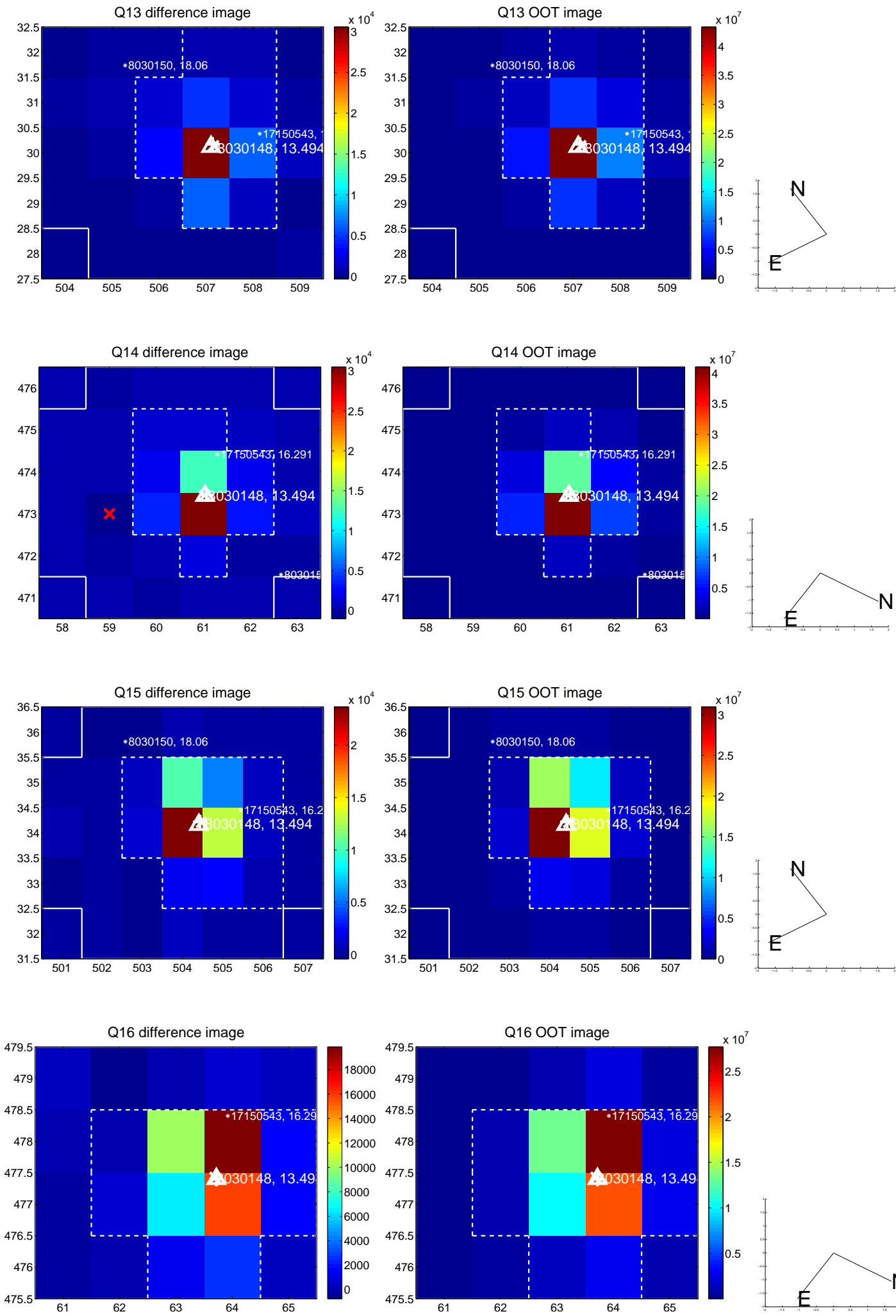
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

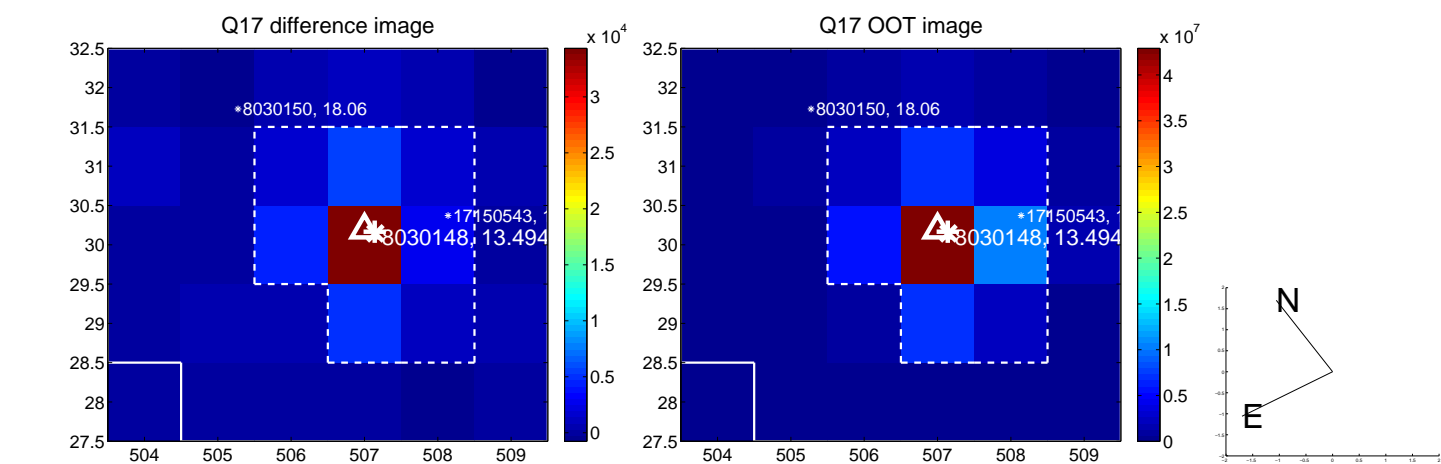


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

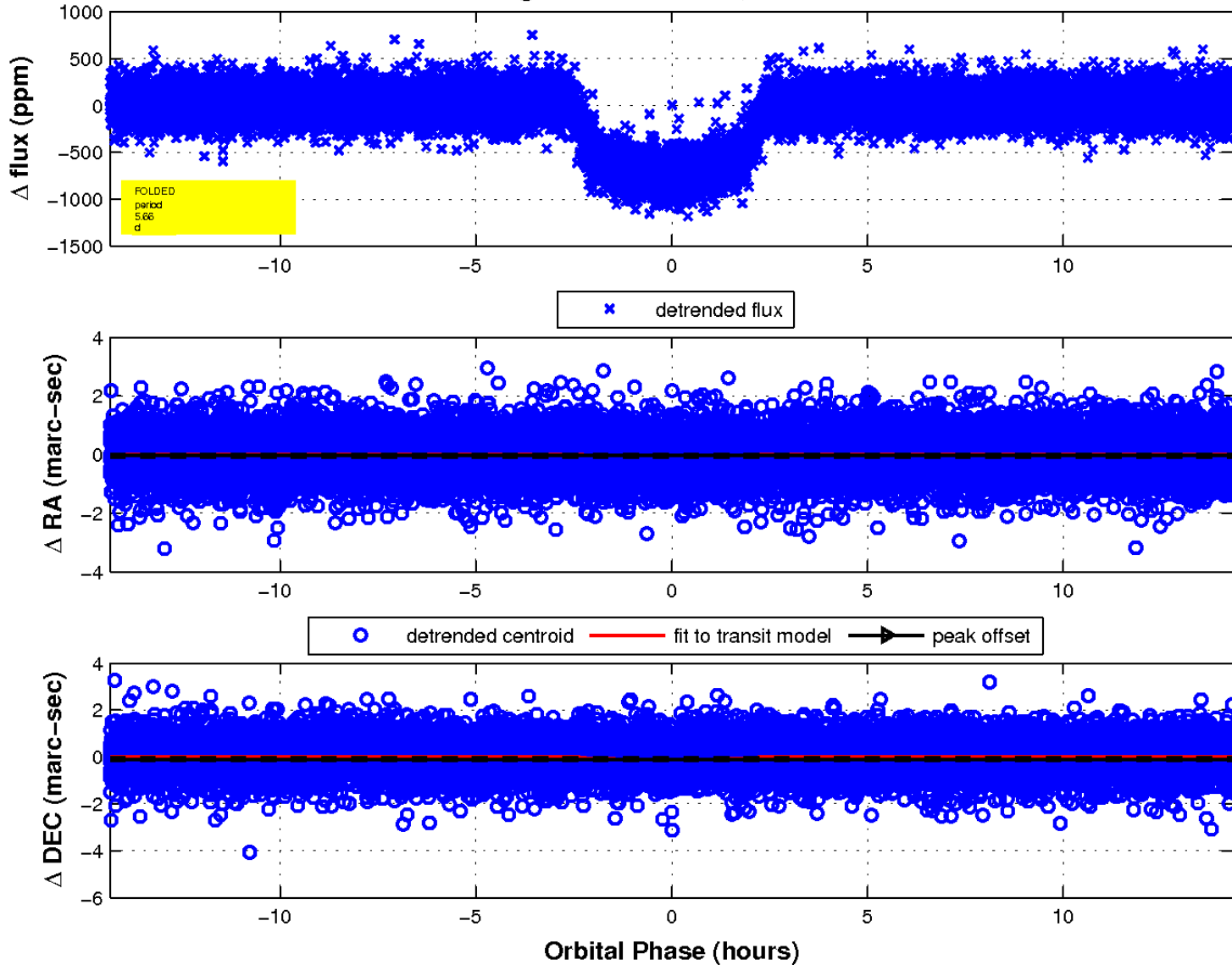




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



Declination

# KIC 008030148

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 008030148-01 | OBS      | 0155.01 | 5.660670      | 131.755310   | 733.4       | 4.781            | 178.7 | 182.9 | 1.17                        | 5746            | 3.51                   | 365.93                 |
| 008030148-02 | OBS      | No      | 285.549561    | 153.279423   | 215.0       | 12.534           | 7.9   | 7.8   | 1.17                        | 5746            | 1.87                   | 1.96                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008030148-01 | OBS      | PC   | 1.00  | 0 | 0 | 0 | 0 | NO_COMMENT  |
| 008030148-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—CENT_FEW_DIFFS |

**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.

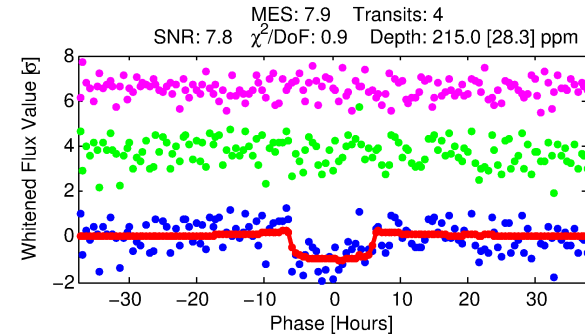
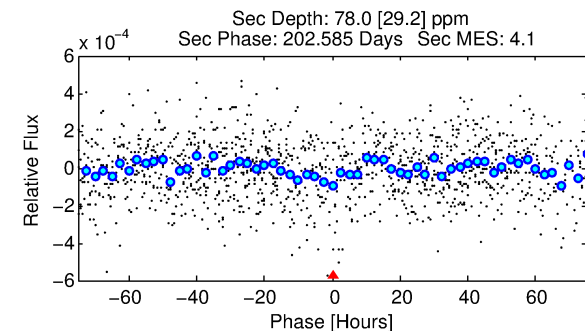
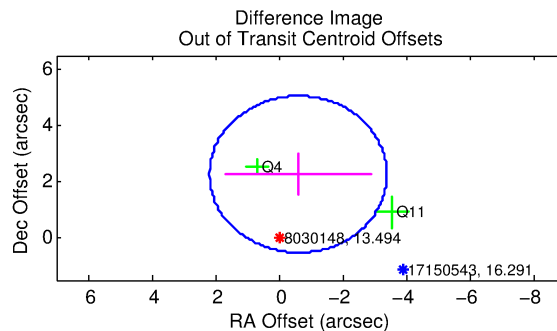
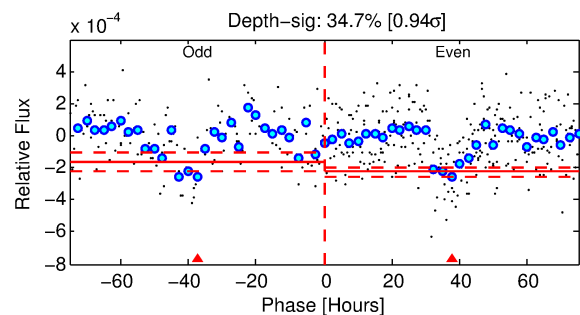
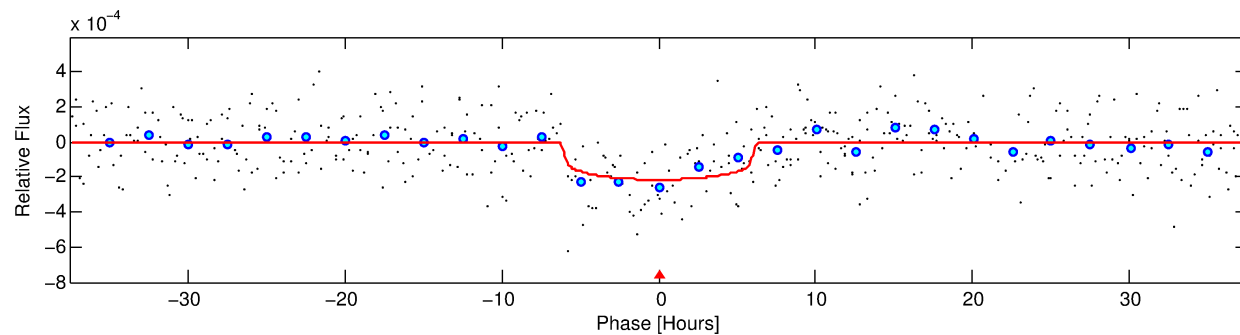
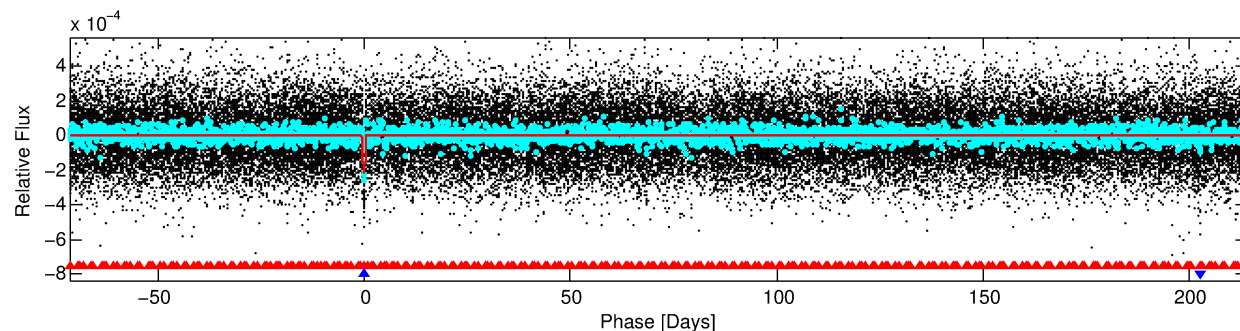
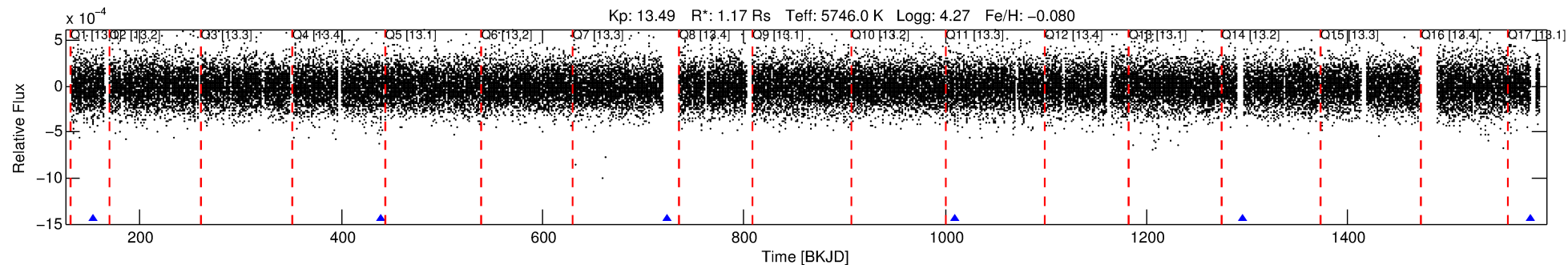
## Ephemeris Match Information For 008030148-02

No Significant Match Found

# DV One-Page Summary

KIC: 8030148 Candidate: 2 of 2 Period: 285.550 d  
KOI: K00155 Corr: No Ephemeris Match

Kp: 13.49 R\*: 1.17 Rs Teff: 5746.0 K Logg: 4.27 Fe/H: -0.080



## DV Fit Results:

Period = 285.54956 [0.00625] d  
Epoch = 153.2794 [0.0155] BKJD  
Rp/R\* = 0.0146 [0.0068]  
a/R\* = 117.97 [246.37]  
b = 0.76 [1.20]  
Seff = 1.96 [0.56]  
Teq = 302 [21] K  
Rp = 1.87 [0.93] Re  
a = 0.8273 [0.1387] AU  
Ag = 8390.98 [8732.13] [0.96σ]  
Teffp = 4466 [1125] K [3.70σ]

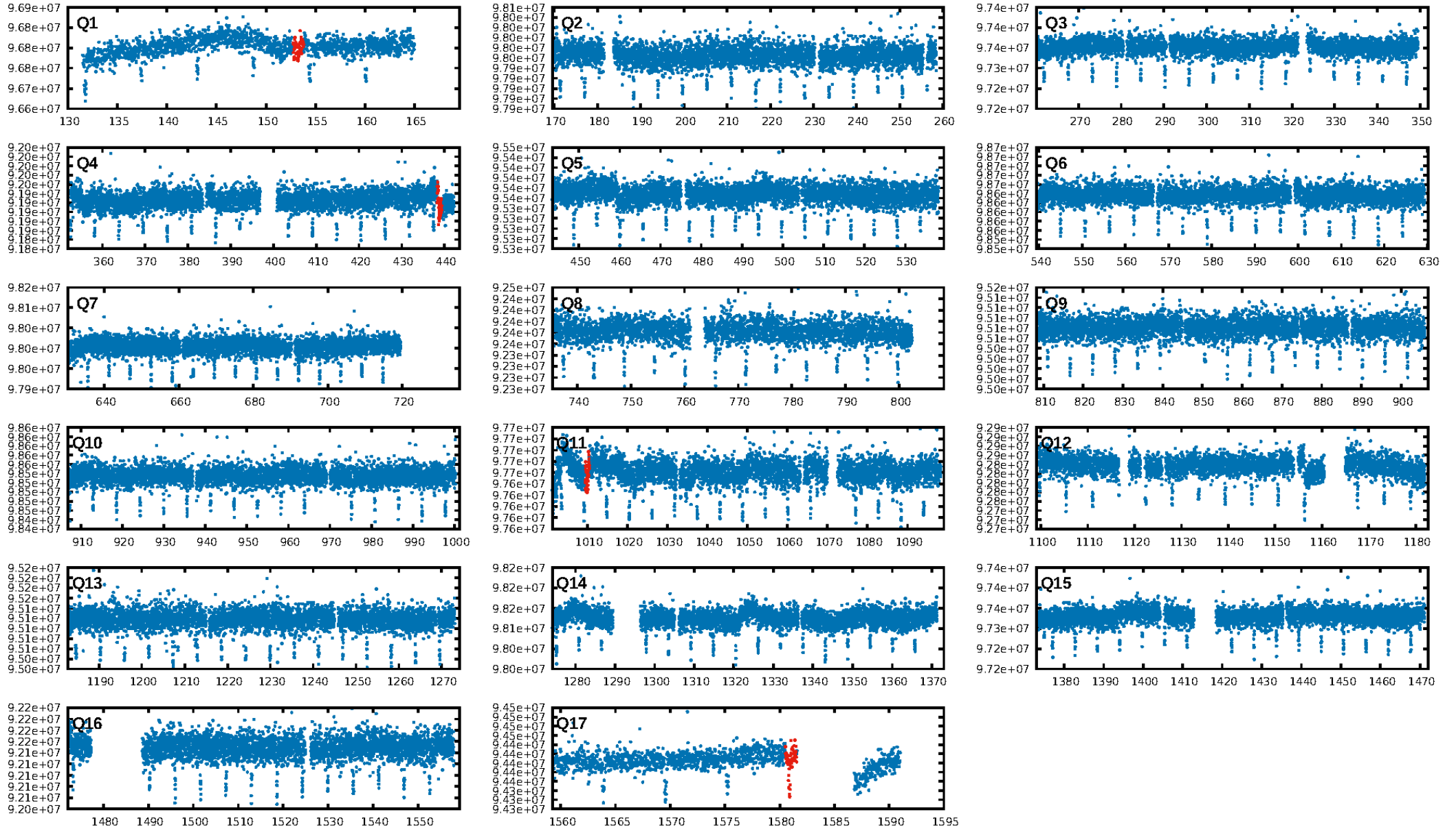
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [500.74σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 41.0%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.48e-12**  
RollingBand-fgt: 1.00 [2/2]  
**GhostDiagnostic-chr: -1.524**  
Centroid-sig: 16.3%  
Centroid-so: 0.929 arcsec [0.88σ]  
OotOffset-rm: 2.342 arcsec [2.52σ]  
OotOffset-st: 0/1/1/0 [2]  
KicOffset-rm: 2.479 arcsec [2.81σ]  
KicOffset-st: 0/1/1/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.67 [2/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:18:43 Z

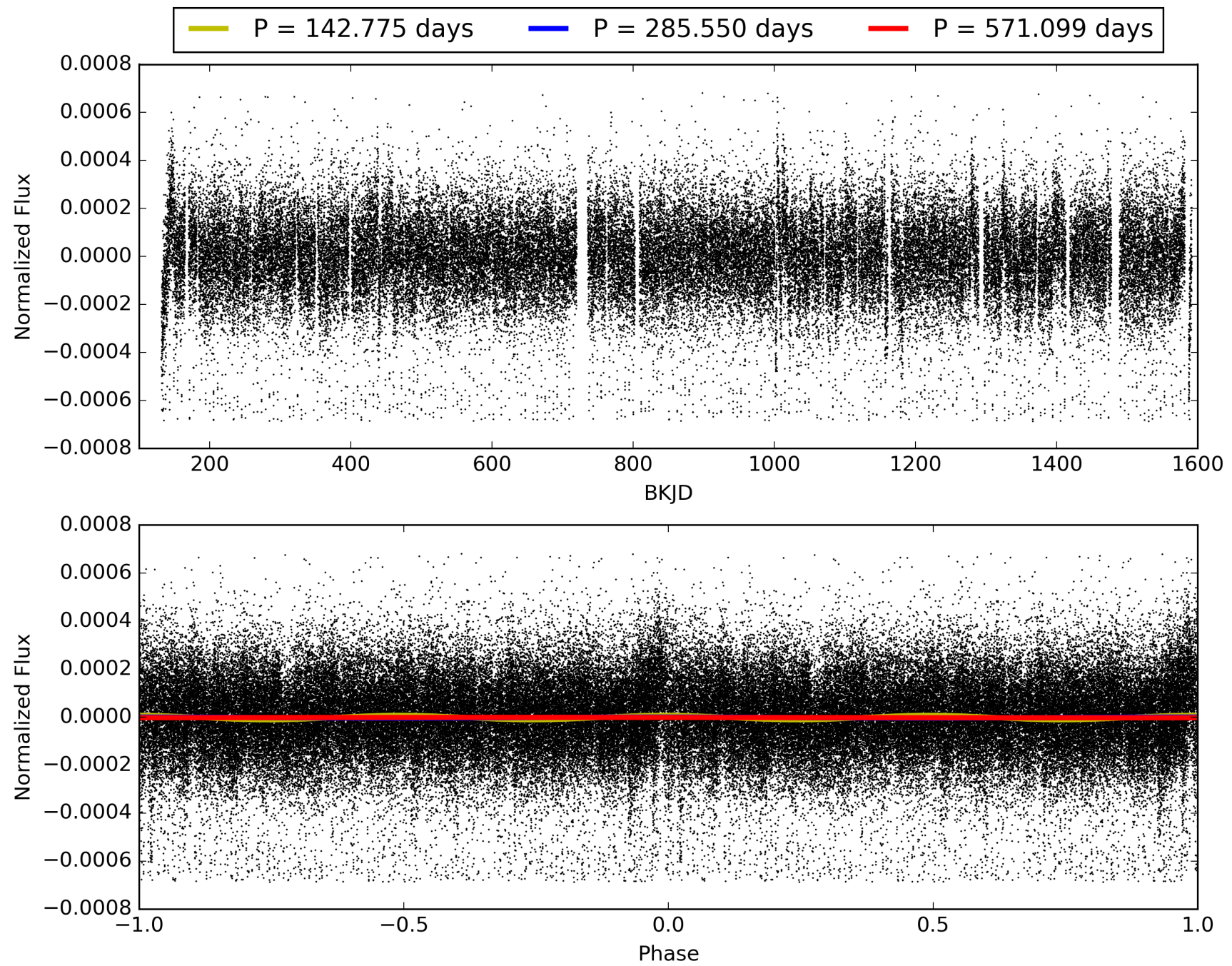
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008030148-02, PDC Light Curves



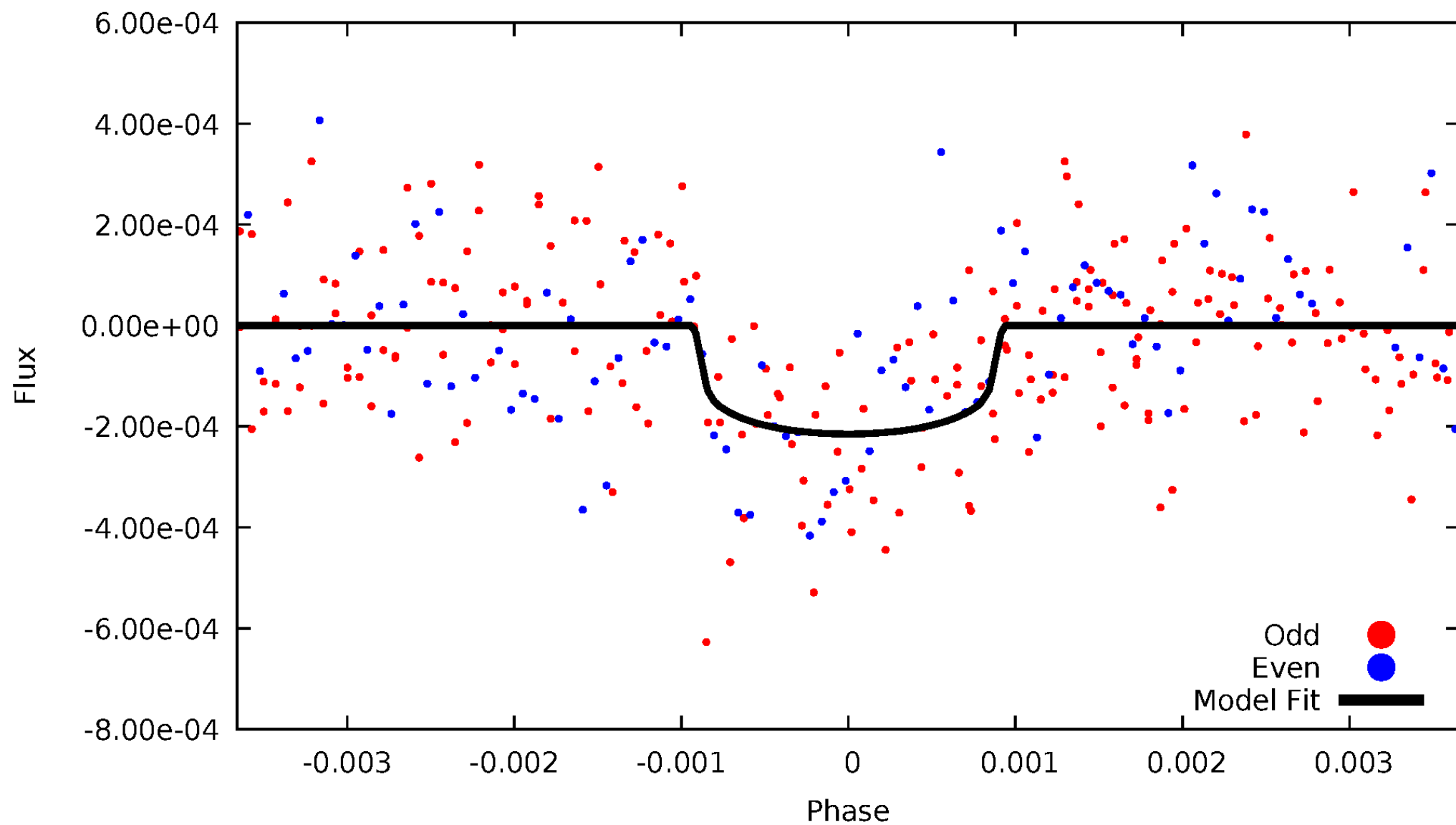


TCE 008030148-02



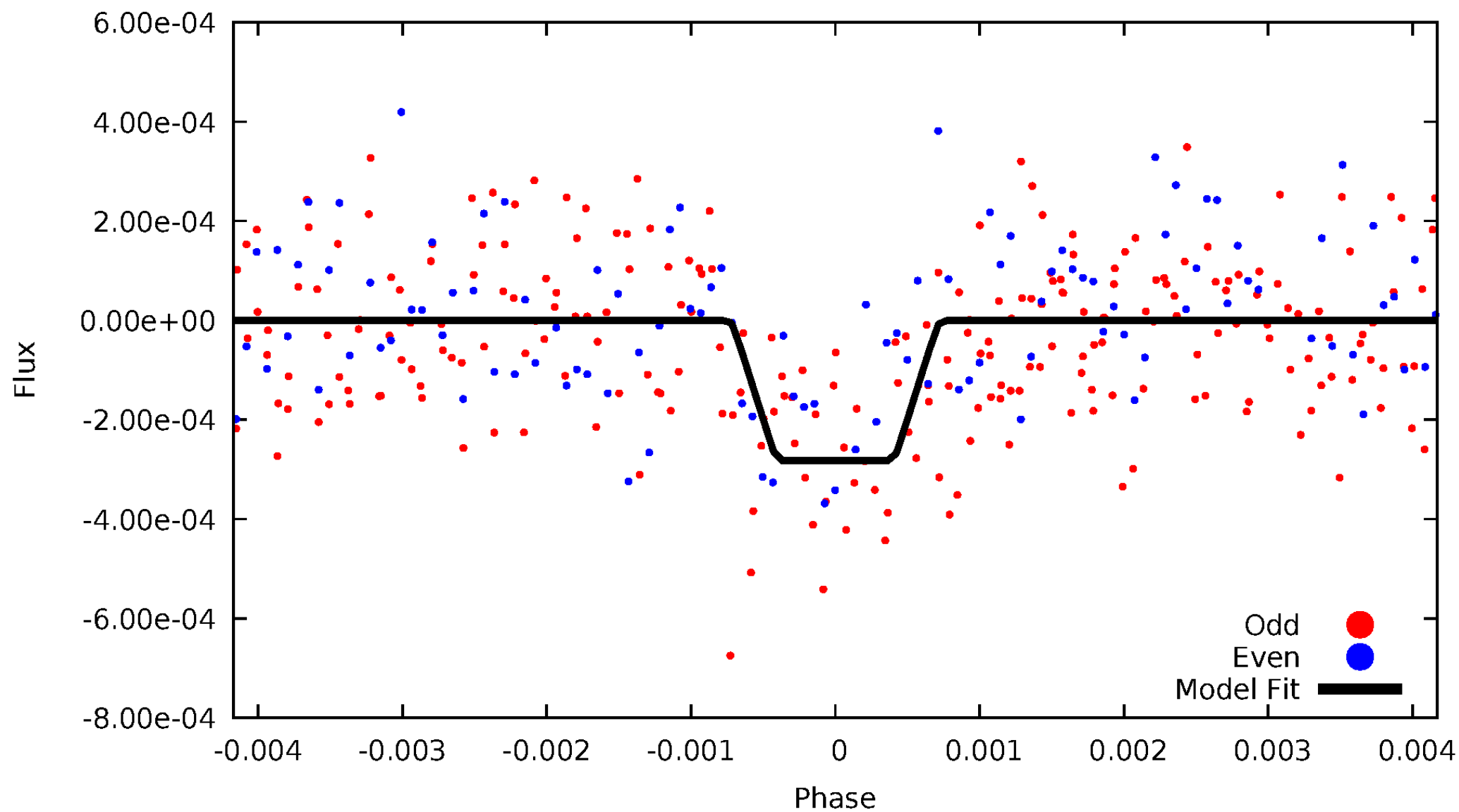
# DV Odd/Even

TCE 008030148-02



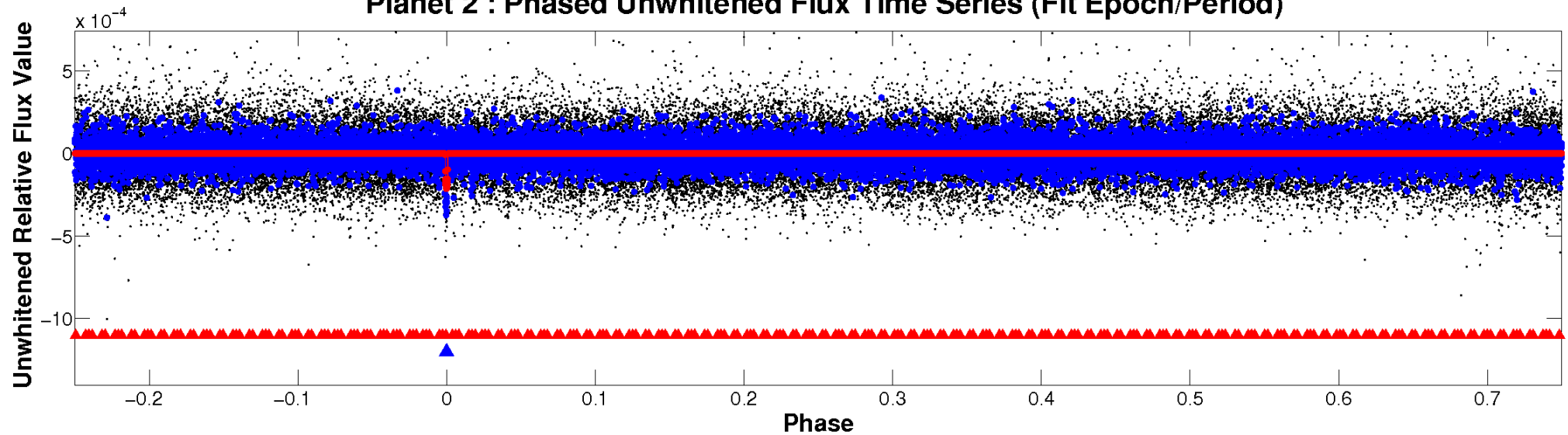
# ALT Odd/Even

TCE 008030148-02

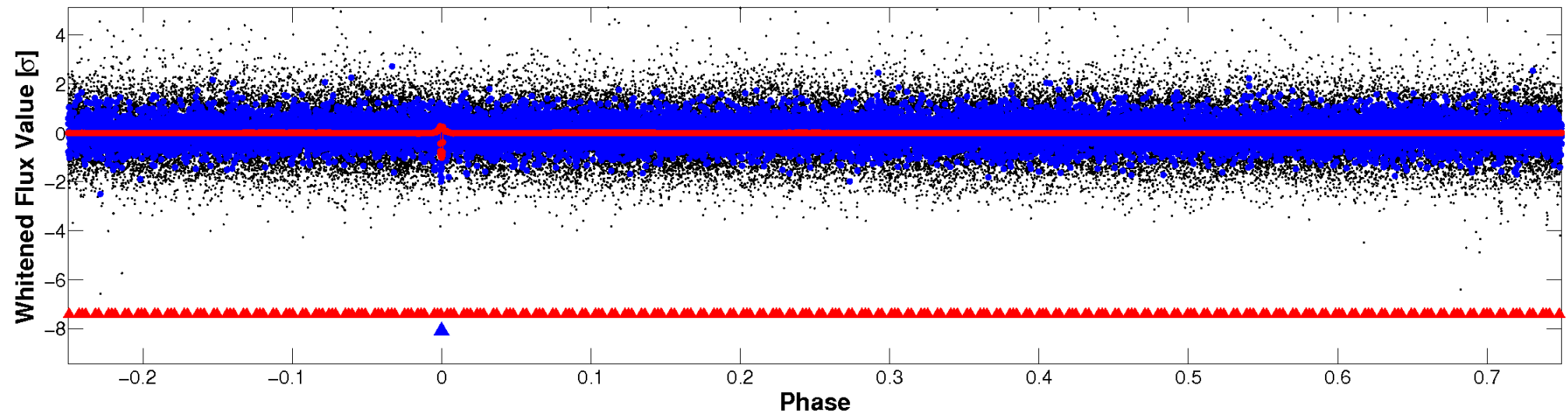


# Non-Whitened Vs. Whitened Light Curve

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

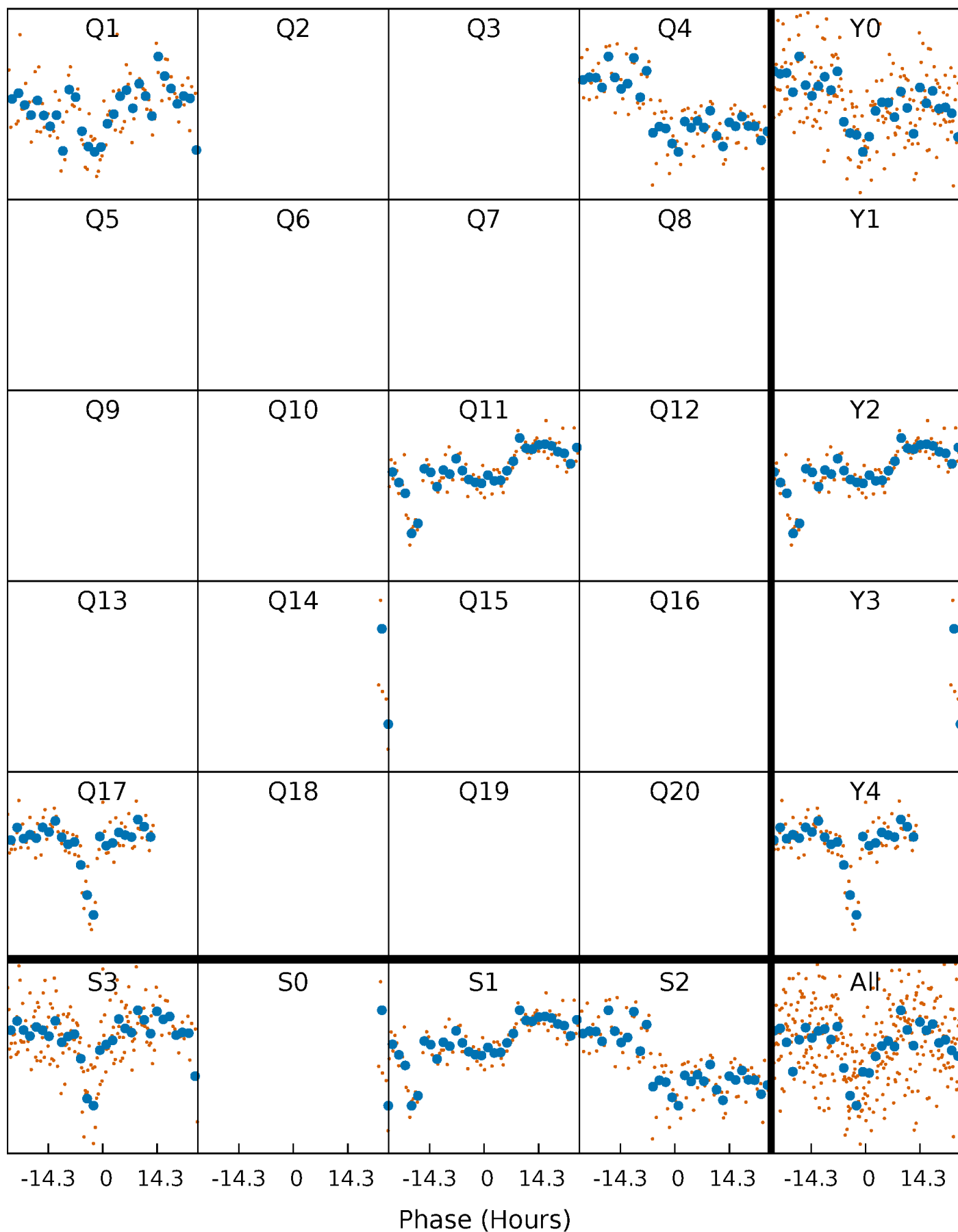


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

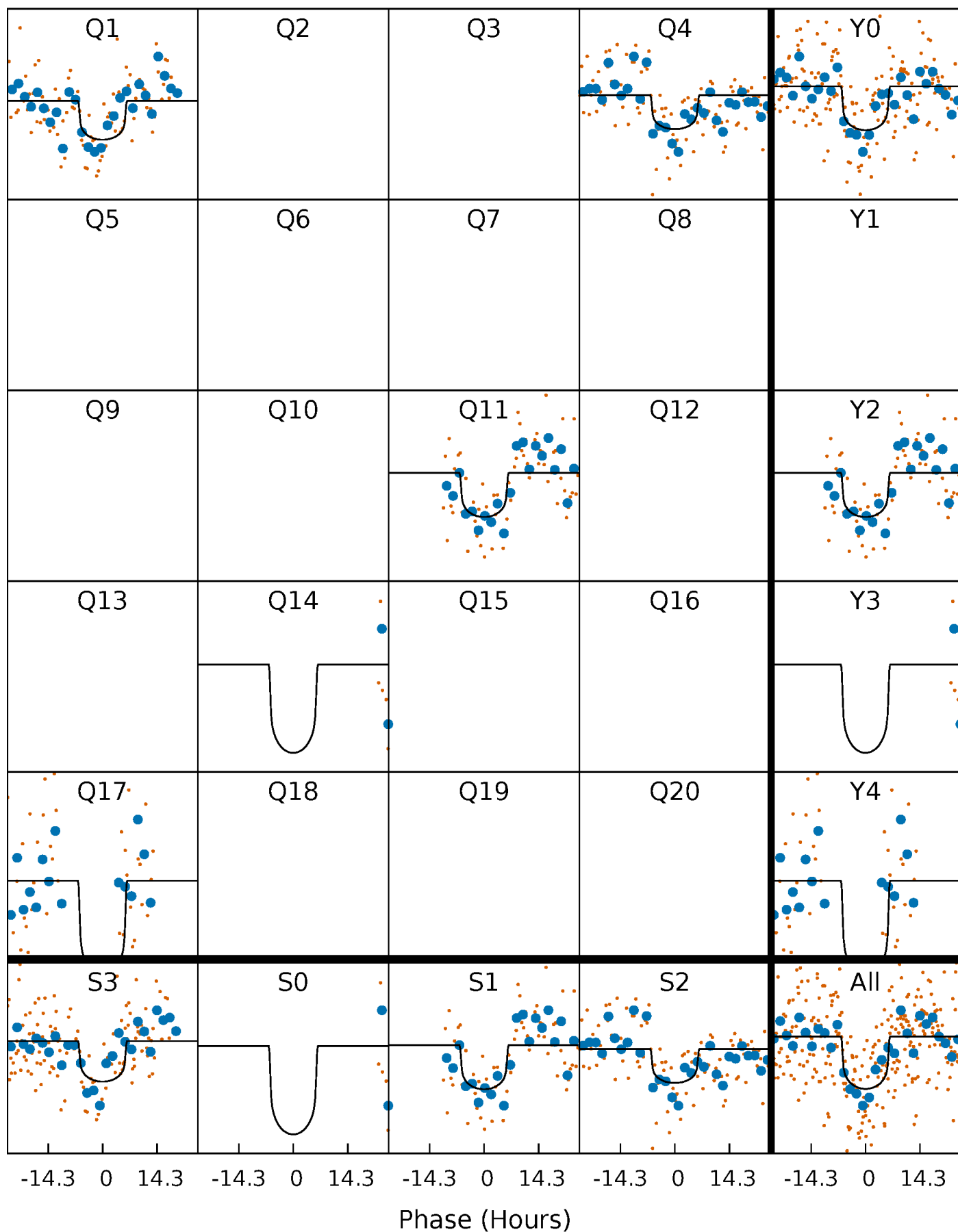
TCE 008030148-02 P=285.549561 Days  $T_0=153.279423$  (BKJD)





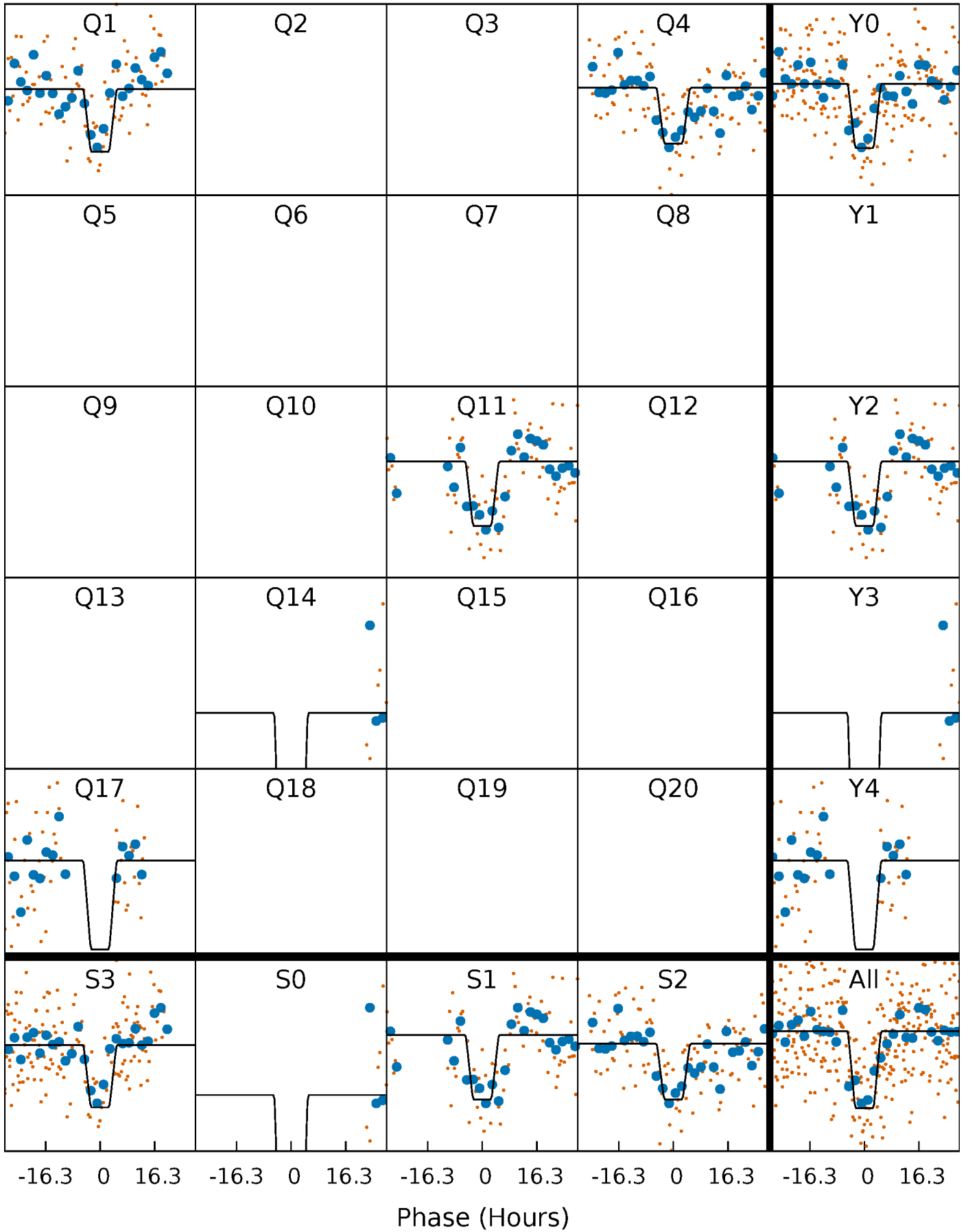
# DV Quarter-Phased Transit Curves

TCE 008030148-02 P=285.549561 Days  $T_0=153.279423$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

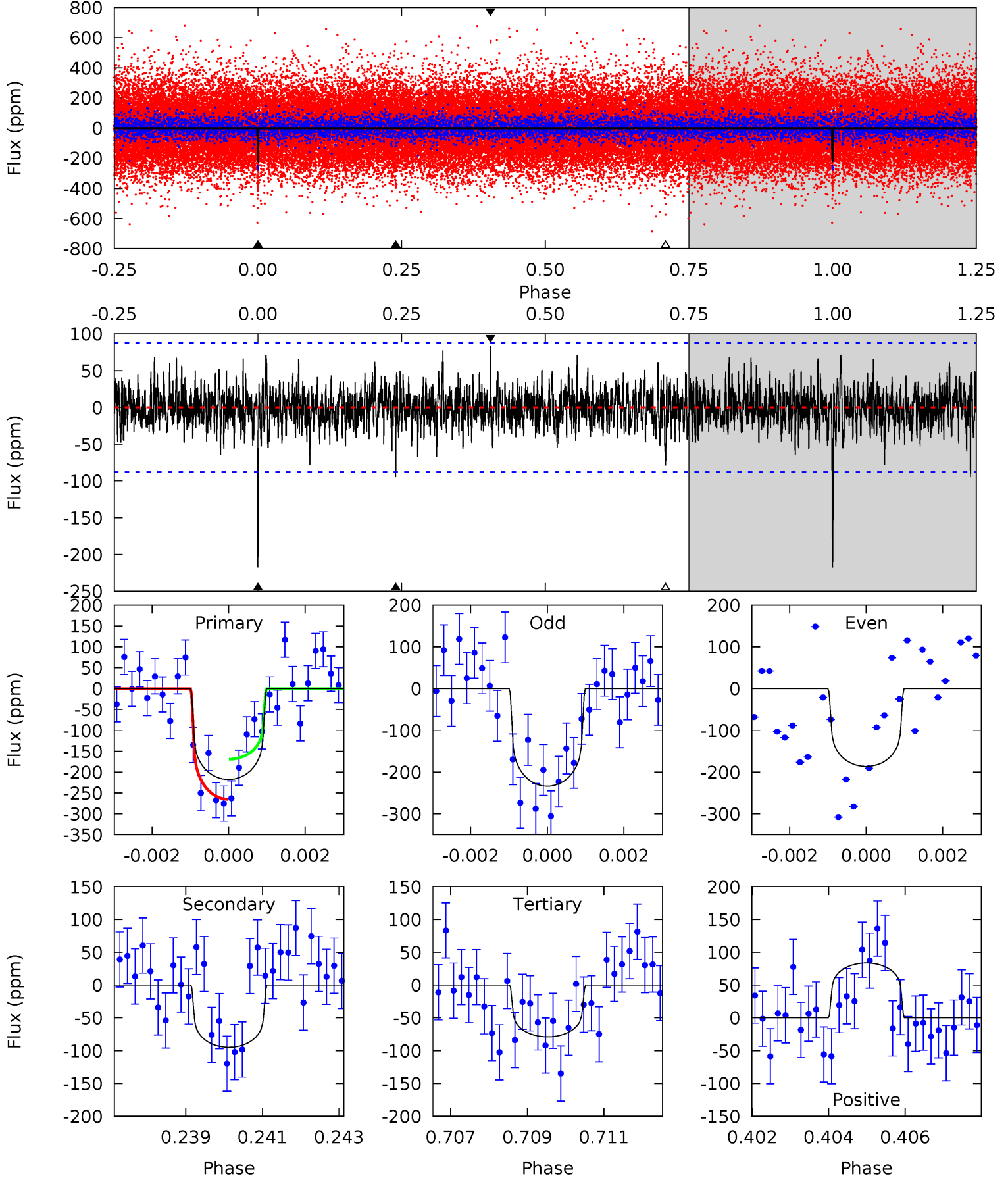
TCE 008030148-02 P=285.559001 Days  $T_0=153.234592$  (BKJD)



# DV Model-Shift Uniqueness Test

008030148-02, P = 285.549561 Days, E = 153.279423 Days

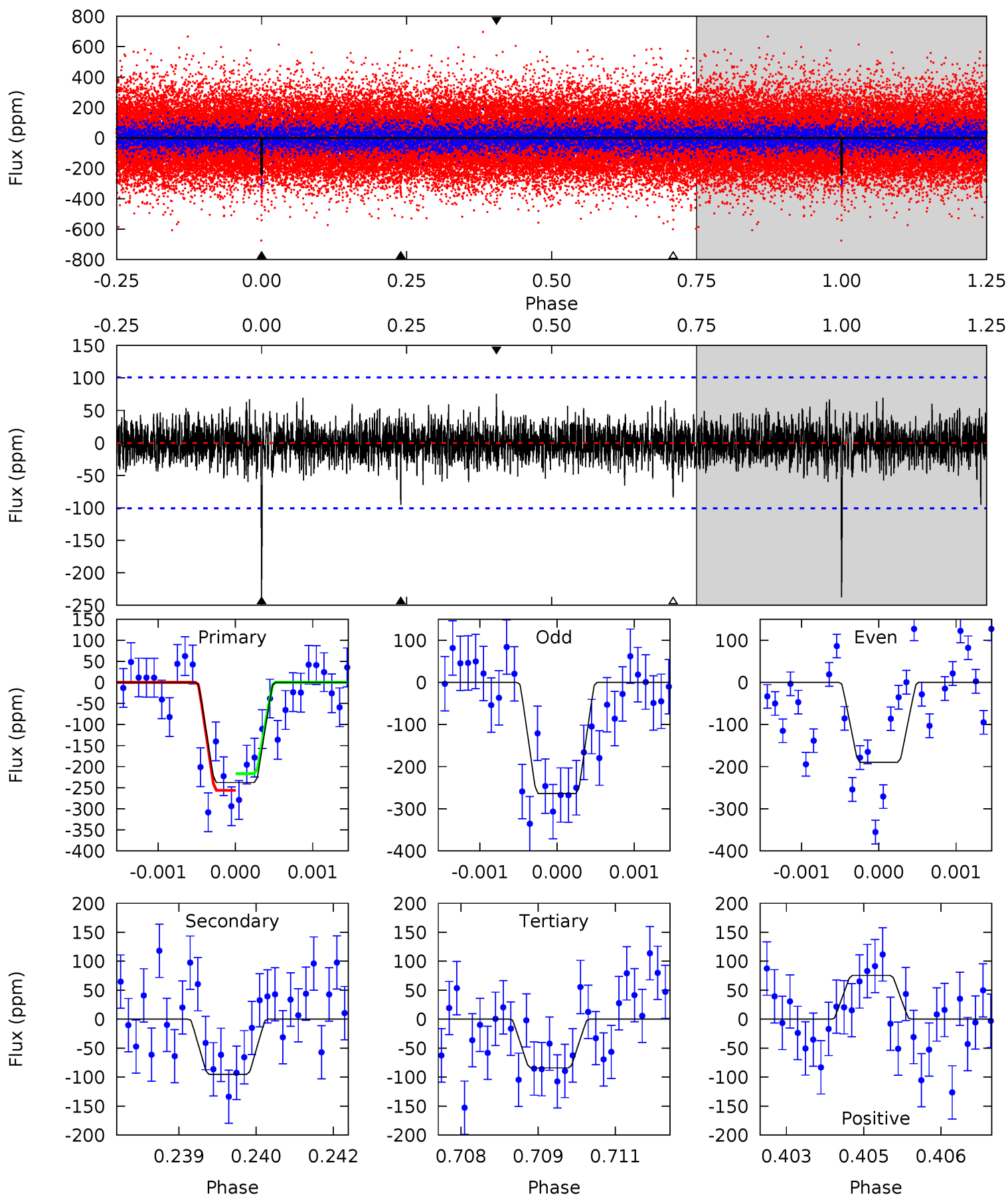
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.2 | 5.76 | 4.79 | 5.08 | 5.34            | 3.11            | 1.26             | 8.43    | 8.14    | 0.97    | 0.68    | 1.36    | 0.83 | 0.28  | 2.91 |



# Alt Model-Shift Uniqueness Test

008030148-02, P = 285.559001 Days, E = 153.234592 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.7 | 5.08 | 4.49 | 4.04 | 5.38            | 3.18            | 1.05             | 8.21    | 8.66    | 0.59    | 1.04    | 1.87    | 1.14 | 0.24  | 1.06 |



### Stellar Parameters For KIC 008030148

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $5746^{+115}_{-103}$ | $4.266^{+0.162}_{-0.108}$ | $-0.080^{+0.150}_{-0.150}$ | $1.173^{+0.178}_{-0.198}$ | $0.927^{+0.078}_{-0.052}$ | $0.808^{+0.648}_{-0.264}$                 |
|        | +2%/-2%              | +4%/-3%                   | +188%/-188%                | +15%/-17%                 | +8%/-6%                   | +80%/-33%                                 |
| Source | SPE59                | SPE59                     | SPE59                      | DSEP                      |                           |   |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008030148-02 / KOI

| Detrend | Depth (ppm)  | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$  | $A_{\text{obs}}$         |
|---------|--------------|------------------------|----------------------|-----------------------|--------------------------|
| DV      | $-95 \pm 16$ | $1.88^{+0.83}_{-0.87}$ | $420^{+20}_{-22}$    | $4762^{+1588}_{-607}$ | $10215^{+24714}_{-5413}$ |
| Alt.    | $-95 \pm 19$ | $2.17^{+0.94}_{-0.86}$ | $421^{+19}_{-21}$    | $4520^{+1118}_{-602}$ | $7657^{+13779}_{-4089}$  |

$T_{\text{max}}$  = 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

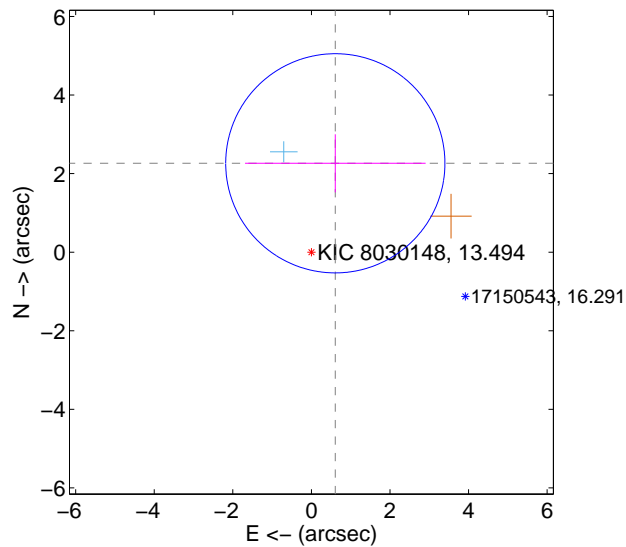
Supplemental centroid analysis for 008030148-02. Kepler magnitude: 13.49. Transit SNR 7.78

There are 1 quarters with good PRF difference image offsets

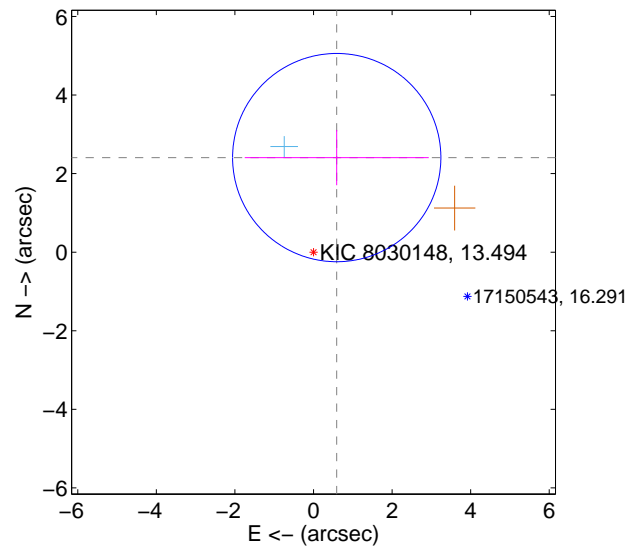
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | $2.342 \pm 0.930$  | 2.52                | $-0.609 \pm 2.298$ | $2.262 \pm 0.738$ |
| PRF-fit source offset from KIC position | $2.479 \pm 0.883$  | 2.81                | $-0.591 \pm 2.341$ | $2.407 \pm 0.705$ |
| photometric centroid source offset      | $0.93 \pm 1.06$    | 0.88                | $-0.22 \pm 1.08$   | $-0.90 \pm 1.05$  |

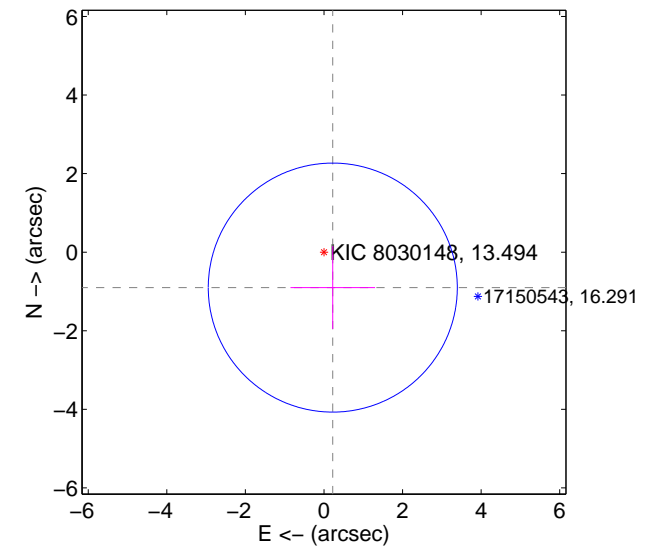
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

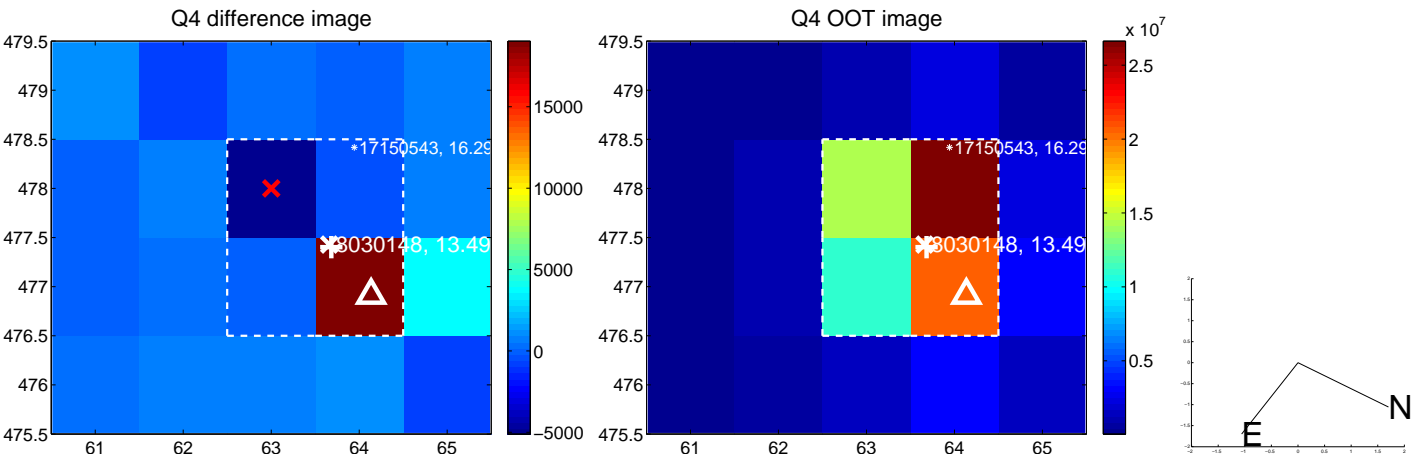
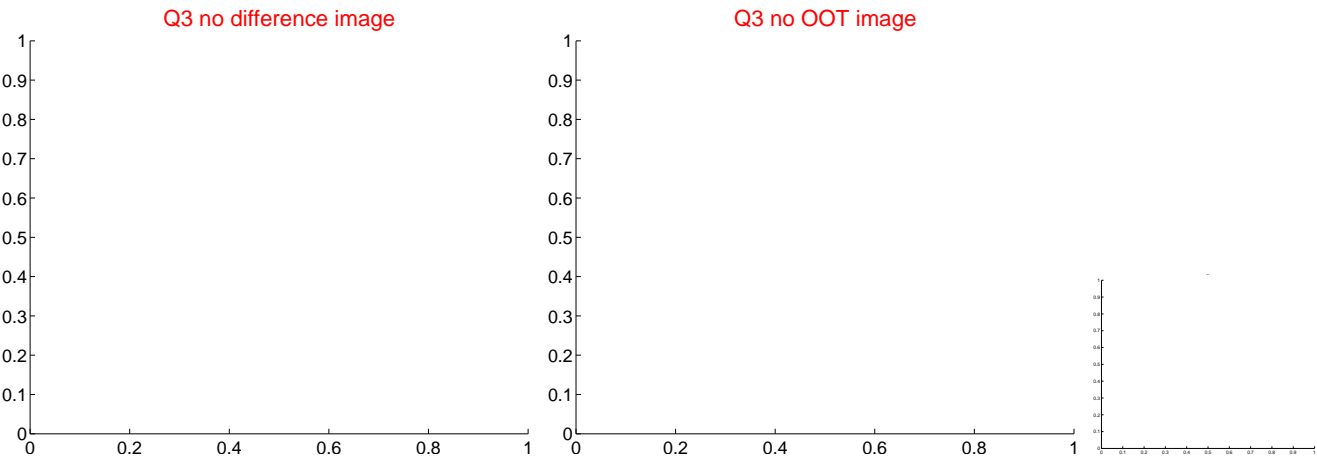
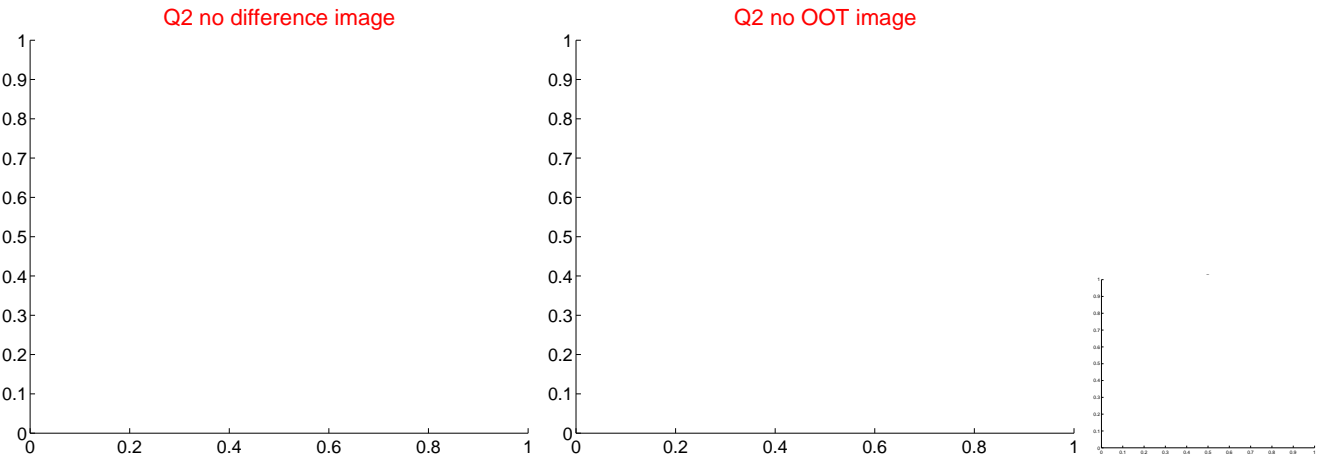
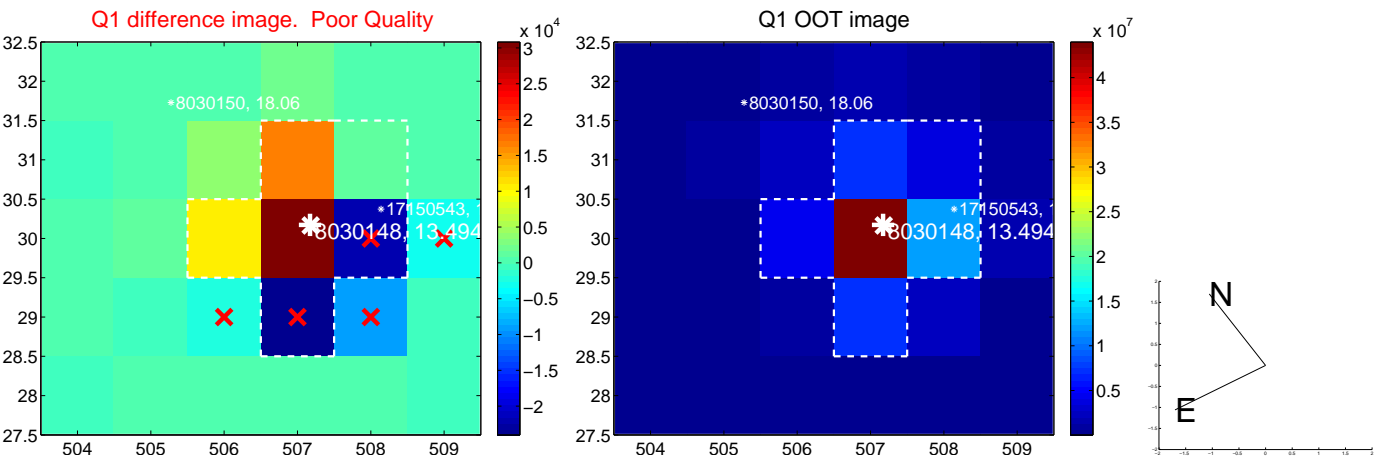


offset from photometric centroids



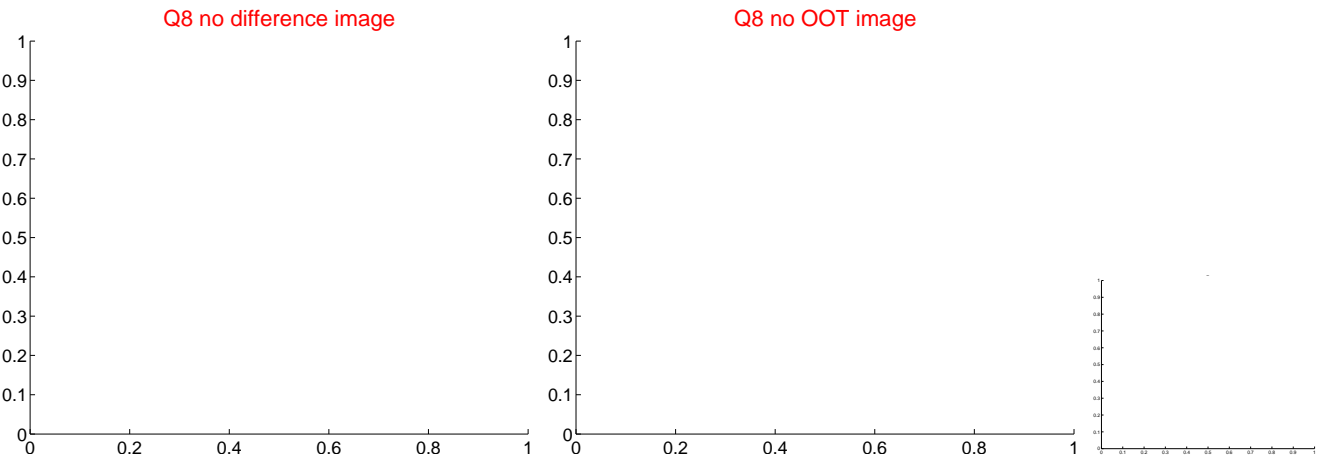
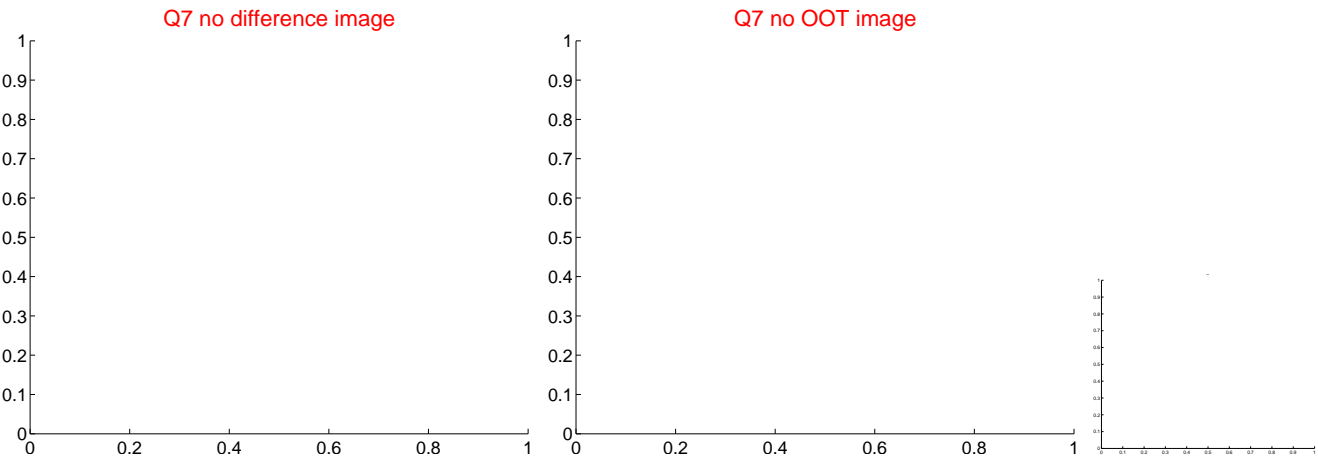
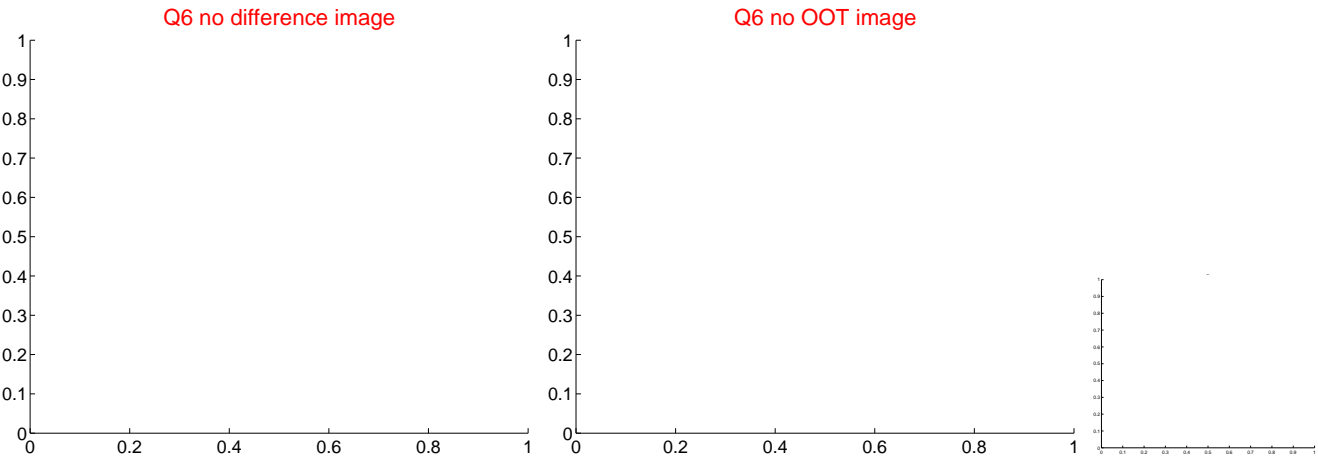
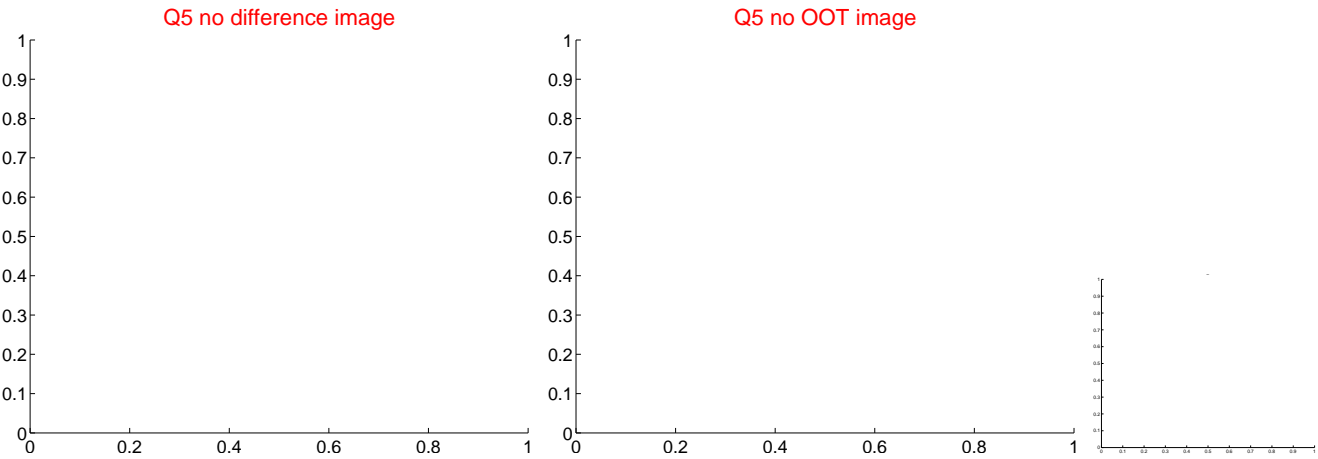
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



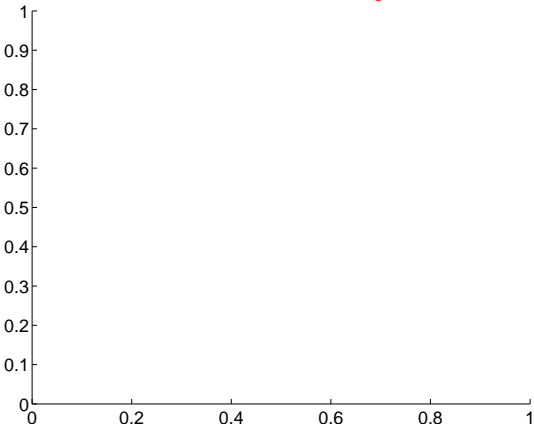


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

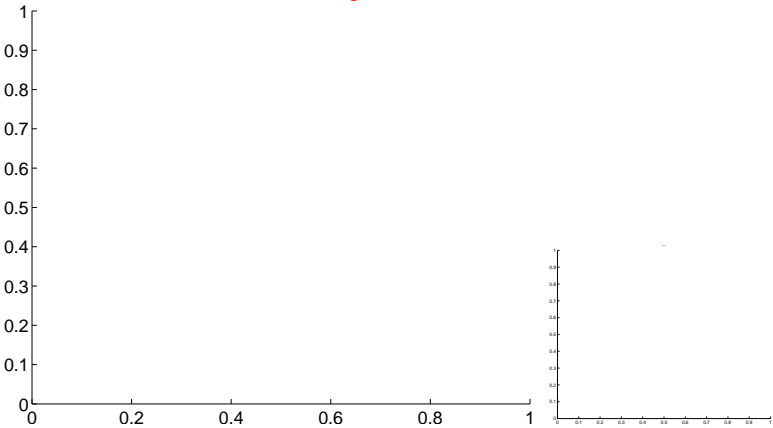


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

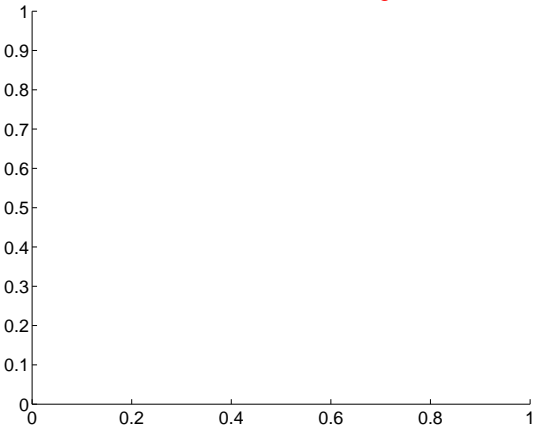
Q9 no difference image



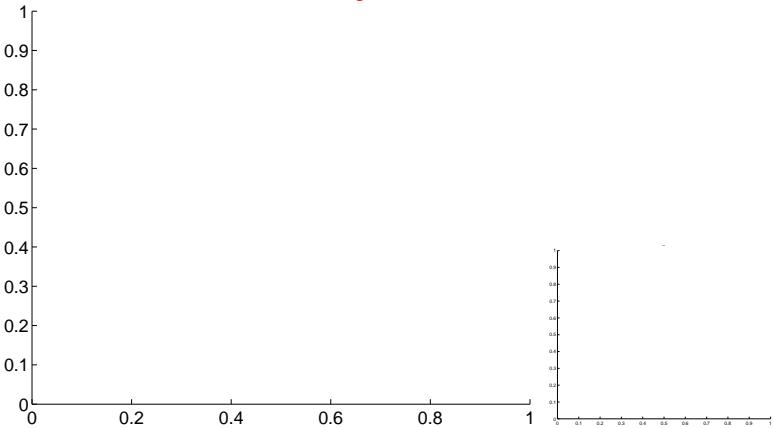
Q9 no OOT image



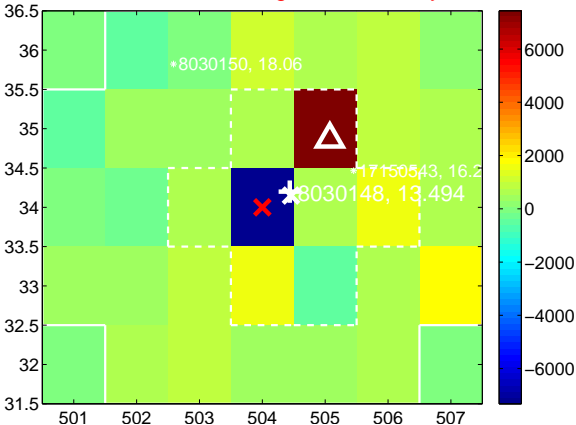
Q10 no difference image



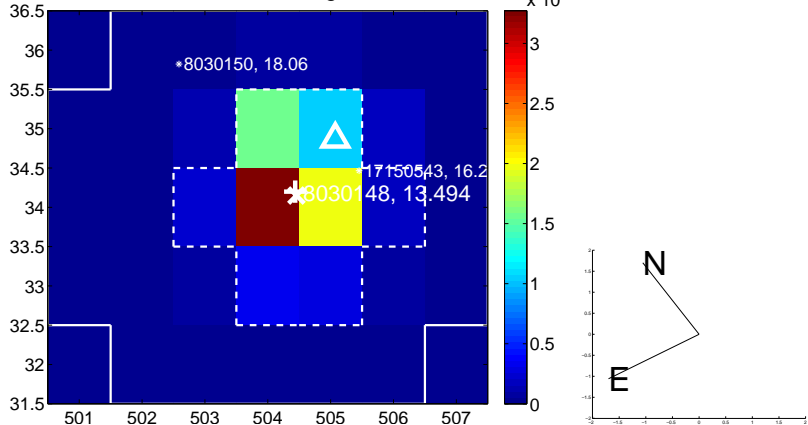
Q10 no OOT image



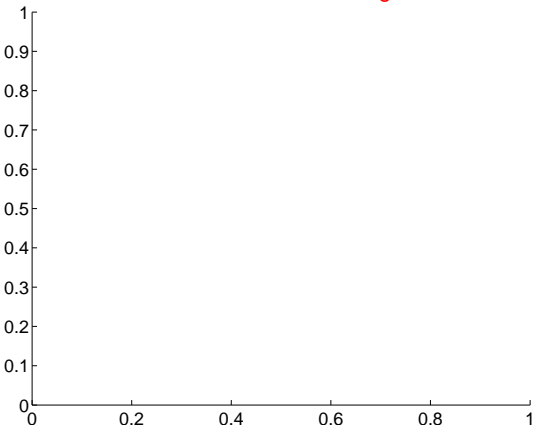
Q11 difference image. Poor Quality



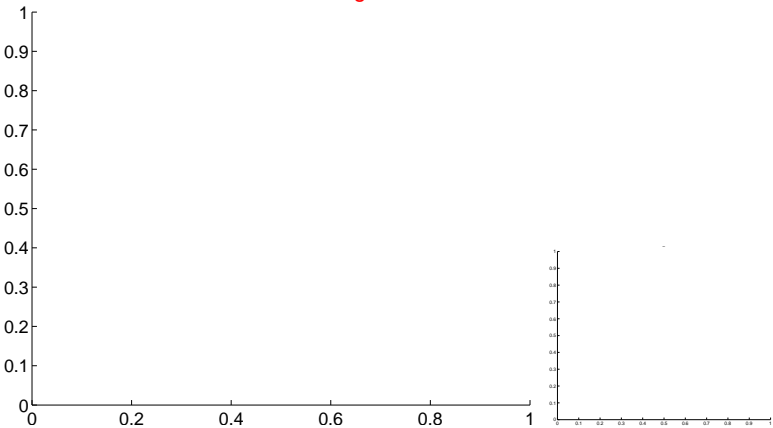
Q11 OOT image



Q12 no difference image



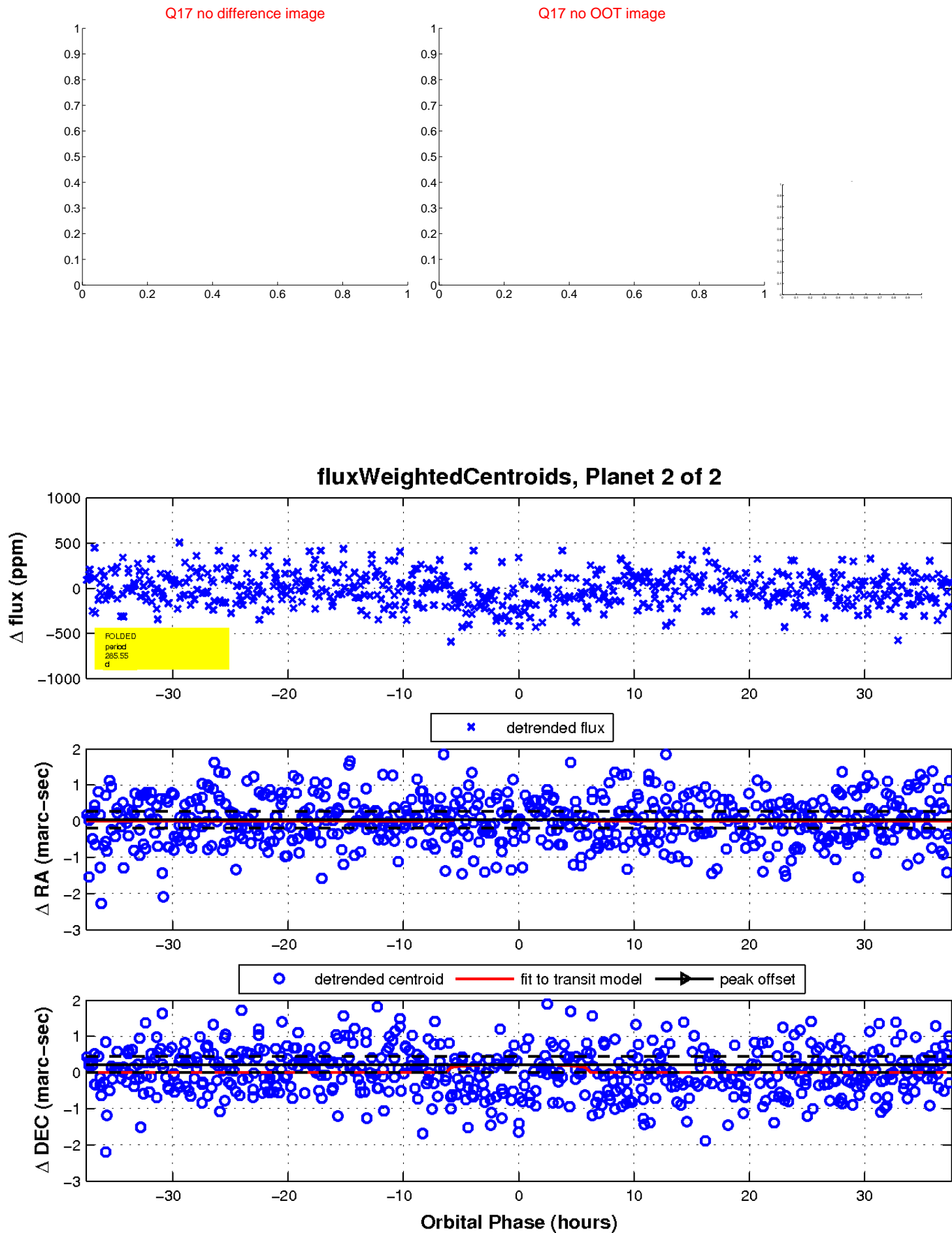
Q12 no OOT image



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

