

# KIC 006580131

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|------|-----------------------------|-----------------|------------------------|------------------------|
| 006580131-01 | OBS      | No   | 6.876035      | 138.141940   | 138.9       | 2.465            | 9.3 | 2.6  | 86.04                       | 3952            | 110.88                 | 0.00                   |
| 006580131-02 | OBS      | No   | 10.733153     | 135.653045   | 390.4       | 1.276            | 8.3 | 13.6 | 86.04                       | 3952            | 232.60                 | 0.00                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 006580131-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_SATURATED           |
| 006580131-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_ZUMA_TRACKER—LPP_DV—MOD_TER_DV—CENT_SATURATED |

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

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

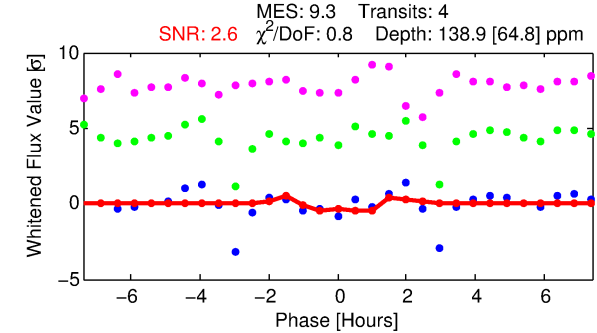
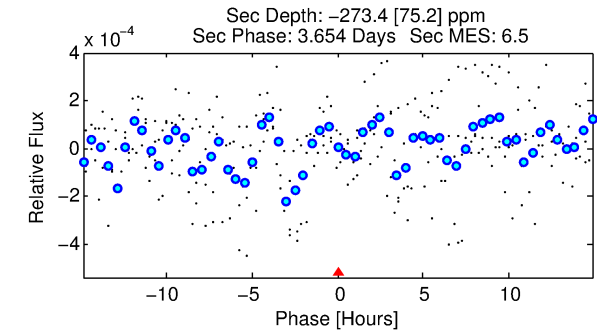
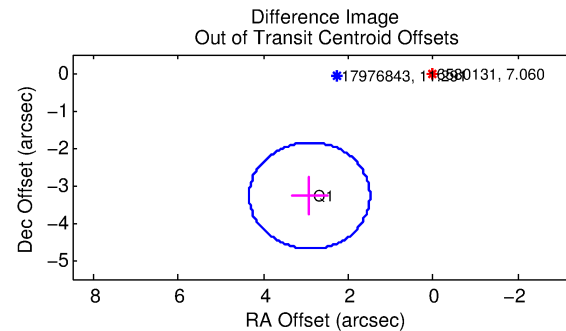
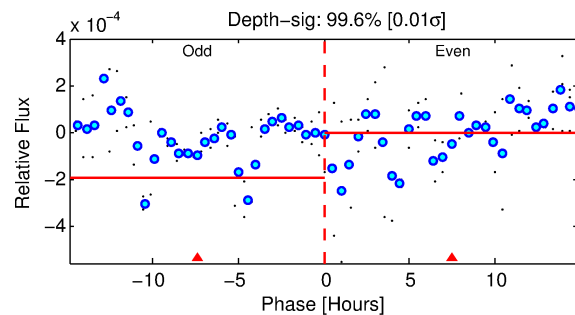
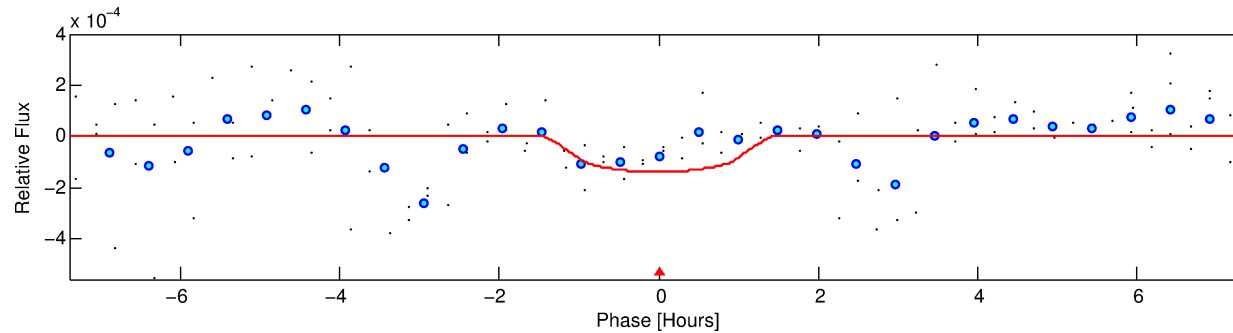
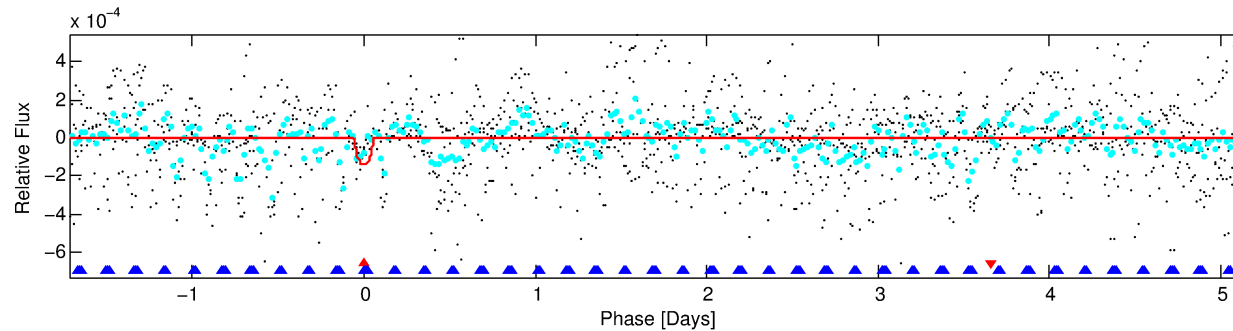
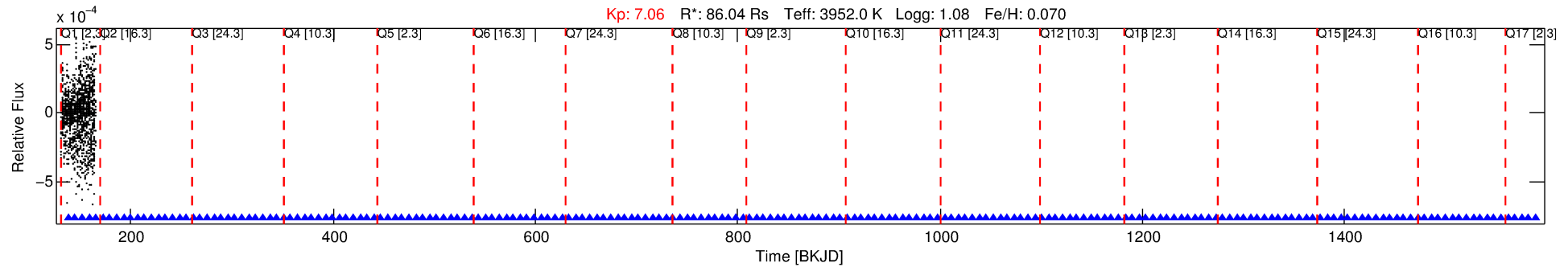
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006580131-01

No Significant Match Found

# DV One-Page Summary

KIC: 6580131 Candidate: 1 of 2 Period: 6.876 d



## DV Fit Results:

Period = 6.87604 [0.00676] d  
Epoch = 138.1419 [0.0079] BKJD  
Rp/R\* = 0.0118 [0.0153]  
a/R\* = 14.73 [52.35]  
b = 0.74 [2.28]  
Seff = N/A  
Teq = N/A  
Rp = 110.88 [157.52] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

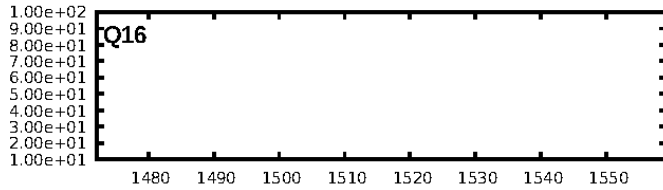
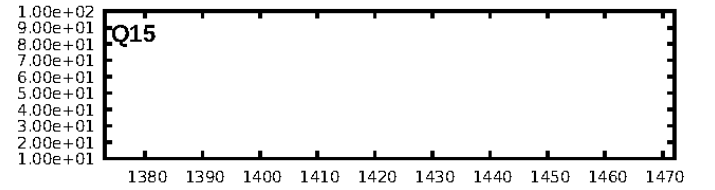
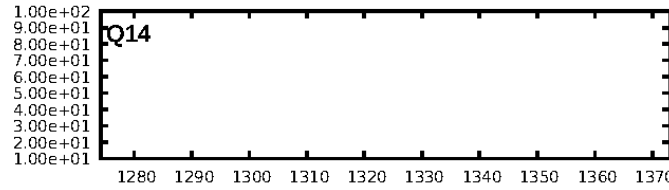
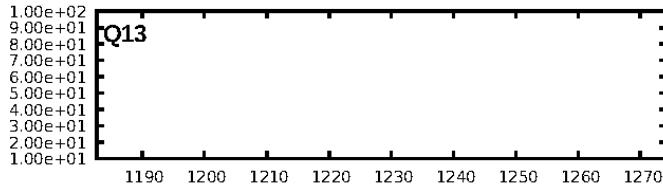
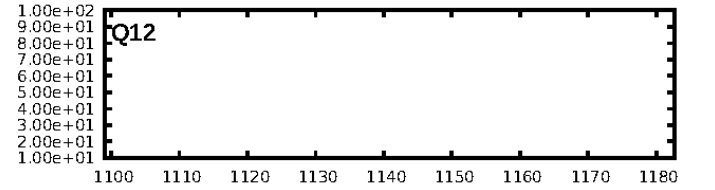
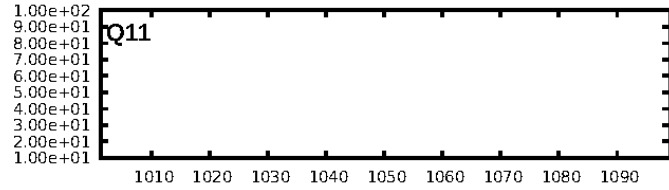
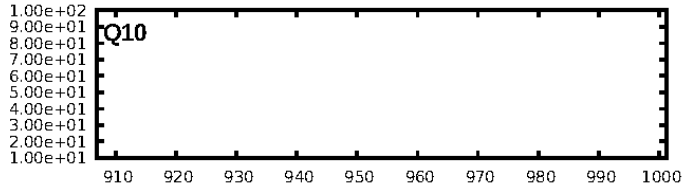
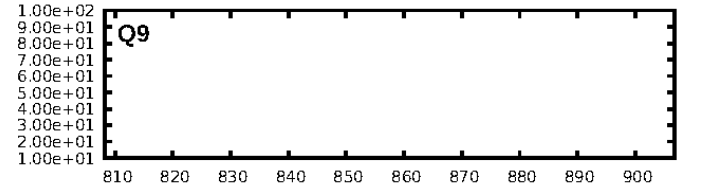
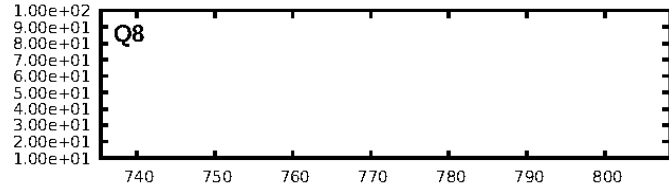
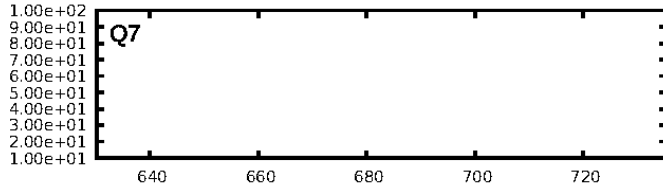
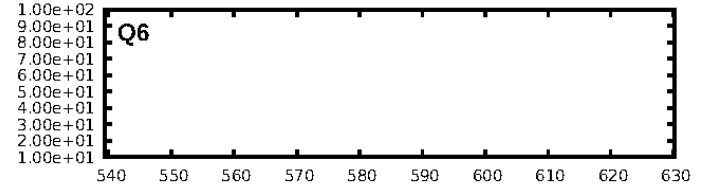
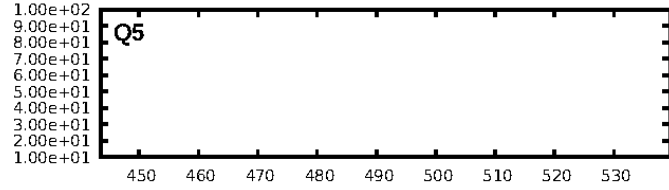
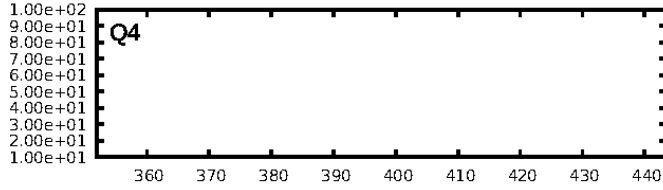
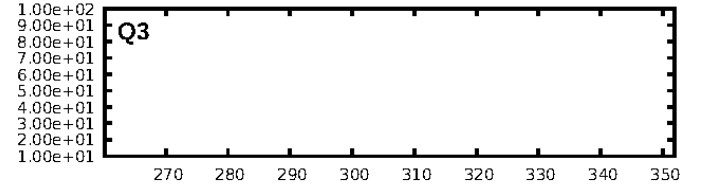
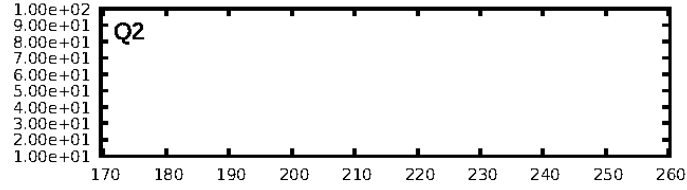
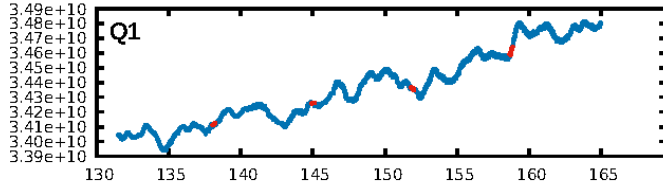
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [33.36 $\sigma$ ]  
ModelChiSquare2-sig: 58.3%  
ModelChiSquareGof-sig: 99.7%  
Bootstrap-pfa: 1.97e-10  
RollingBand-fgt: N/A  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: 6.772 arcsec [1.84 $\sigma$ ]  
OotOffset-rm: 4.377 arcsec [9.23 $\sigma$ ]  
KicOffset-rm: 6.909 arcsec [15.67 $\sigma$ ]  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [1/1]

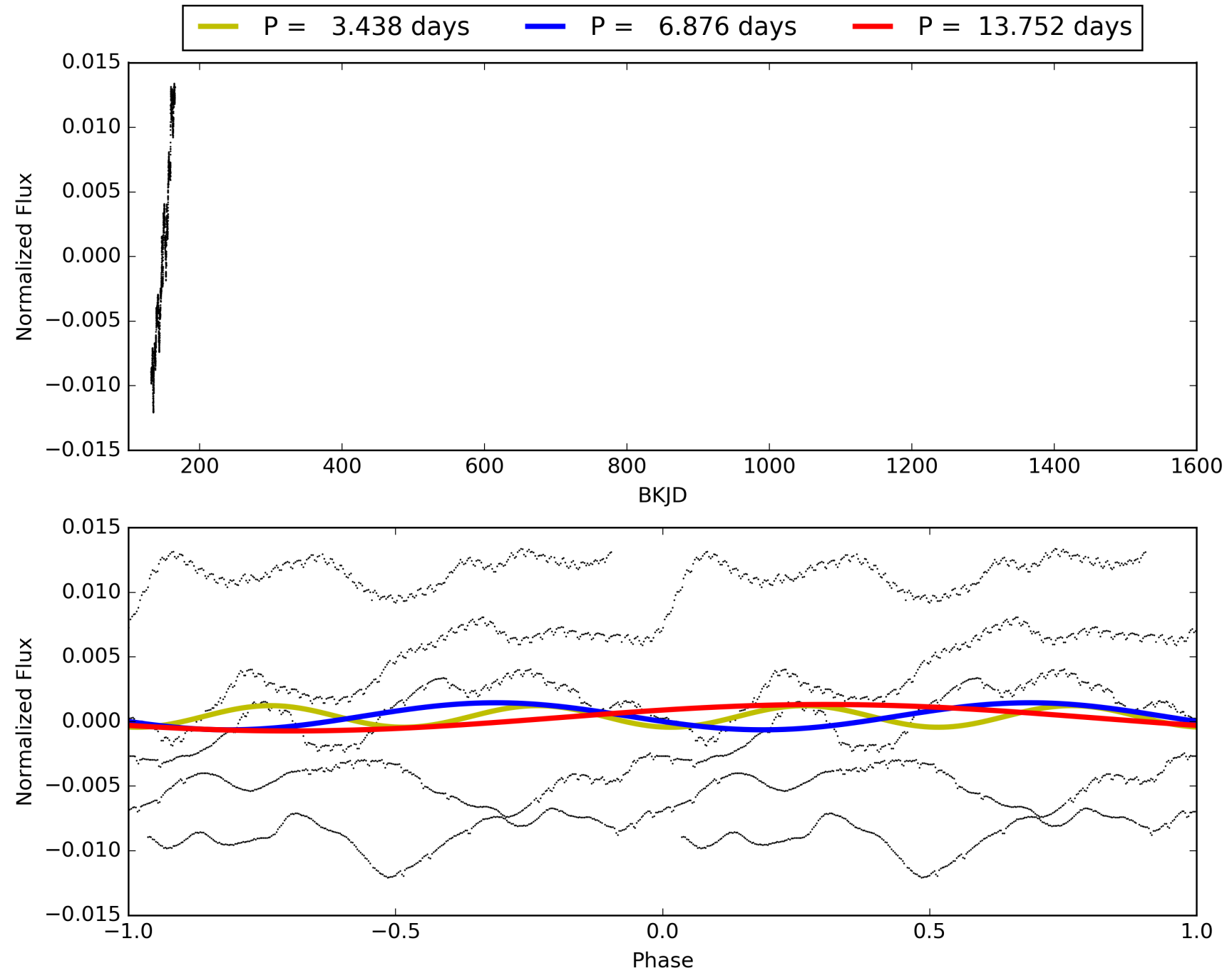
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 23:14:56 Z

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

# TCE 006580131-01, PDC Light Curves

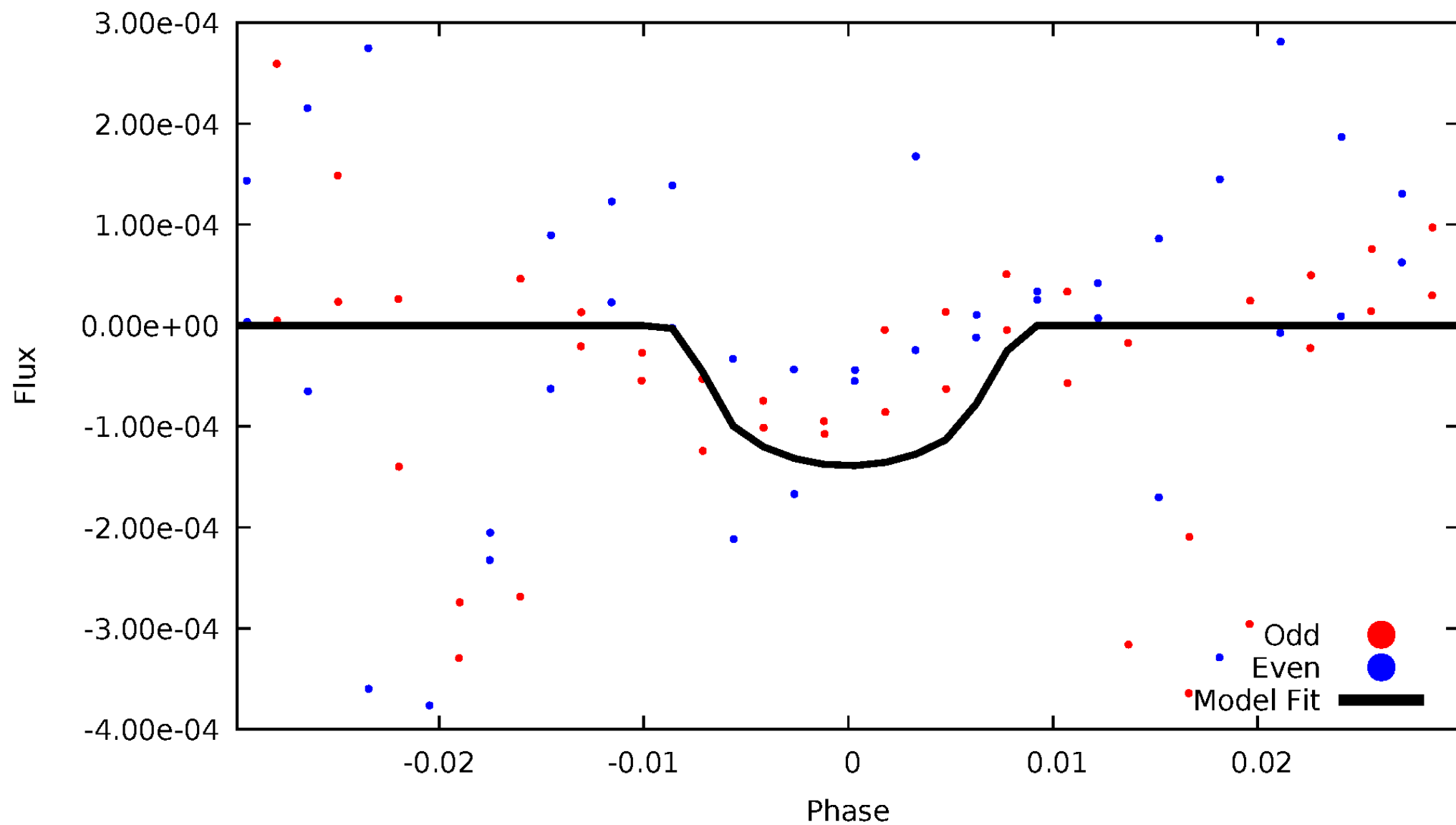


# TCE 006580131-01



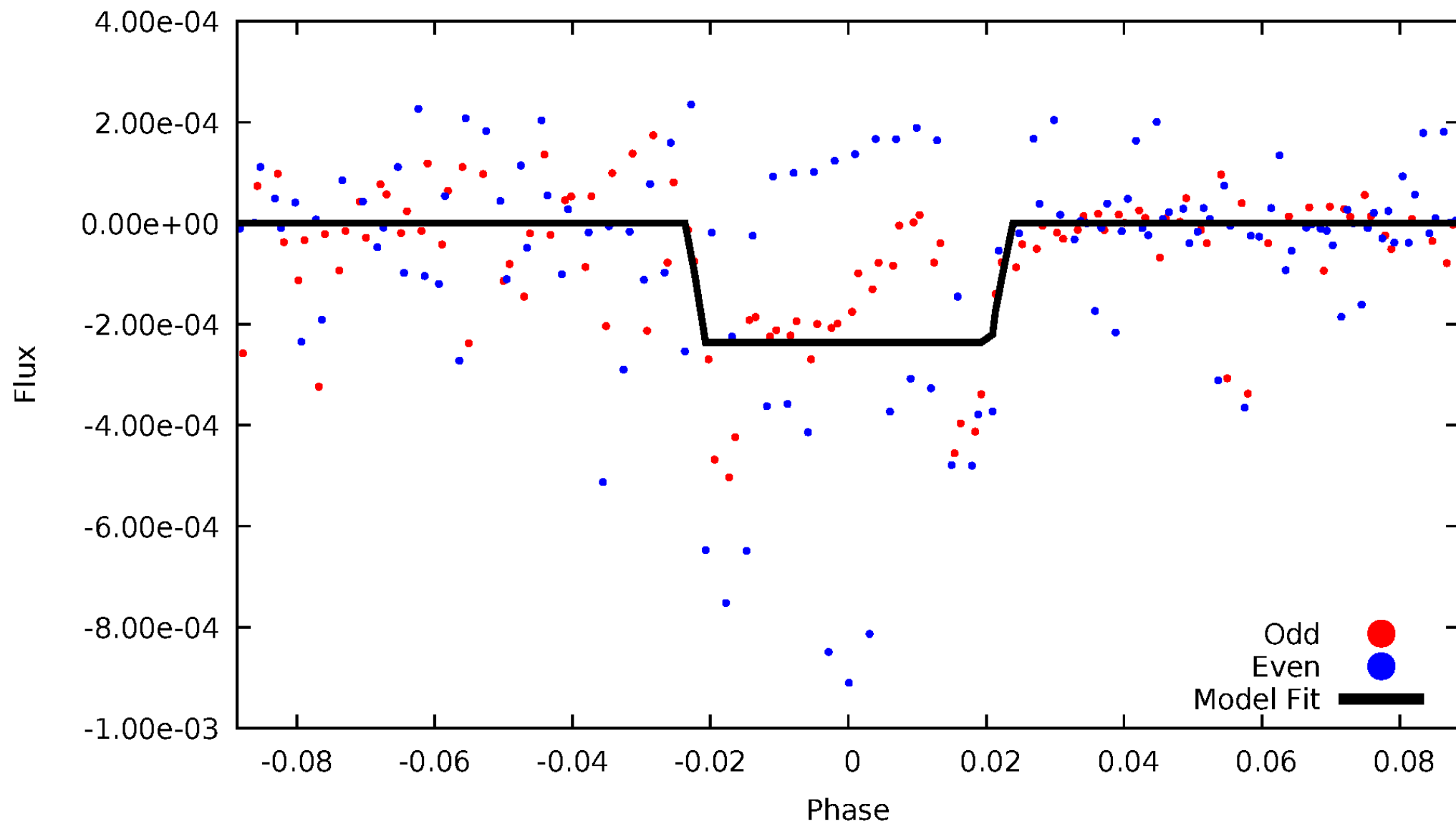
# DV Odd/Even

TCE 006580131-01

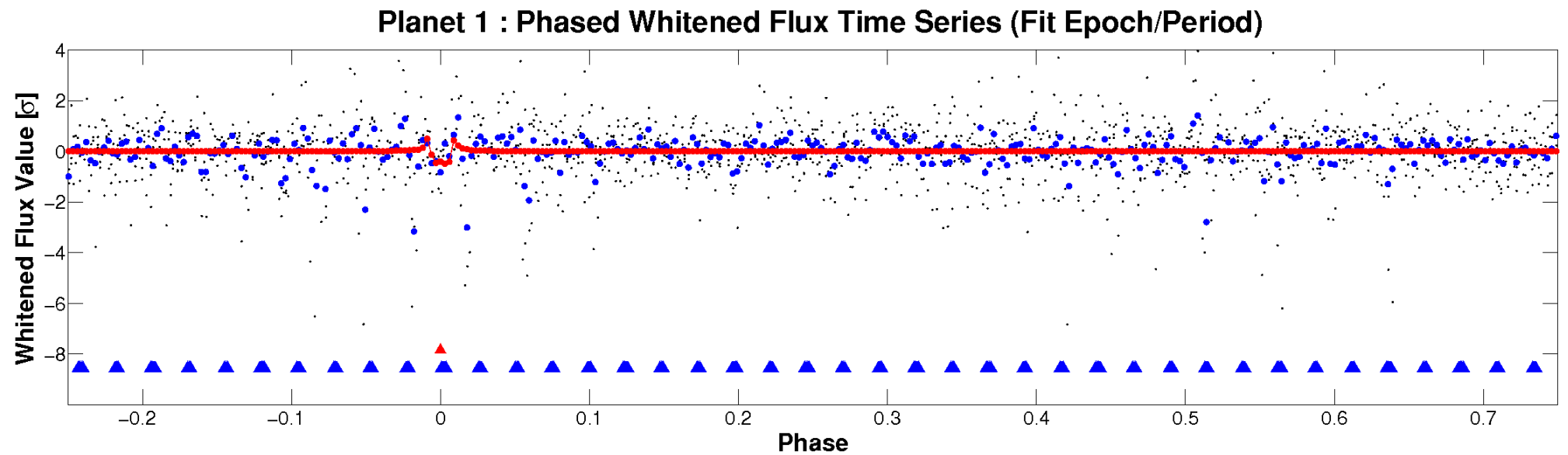
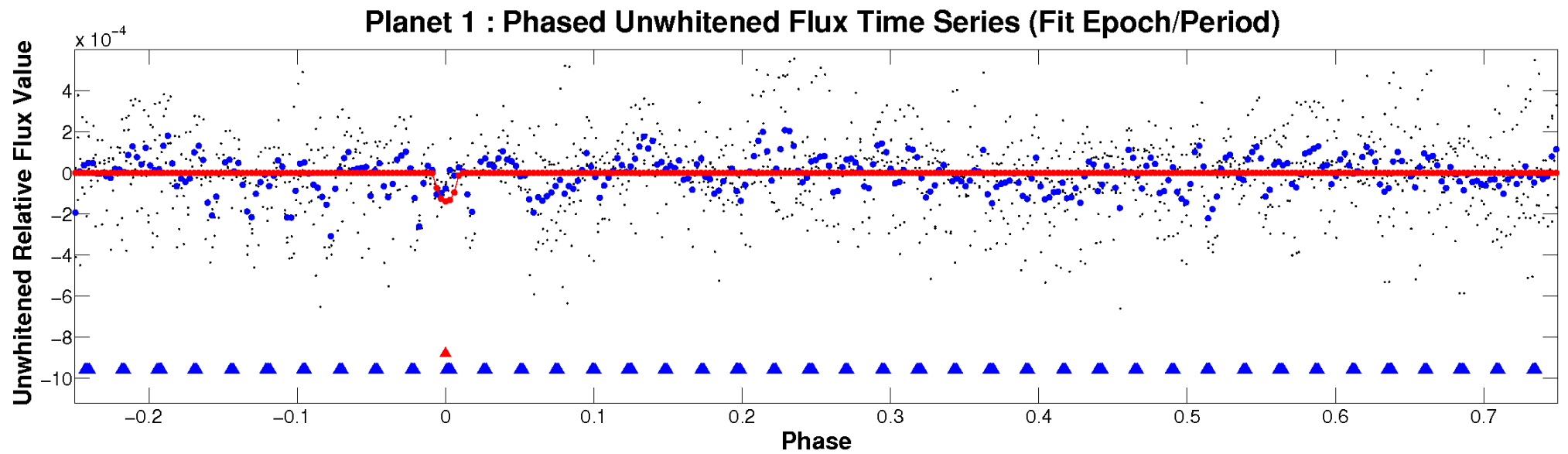


# ALT Odd/Even

TCE 006580131-01

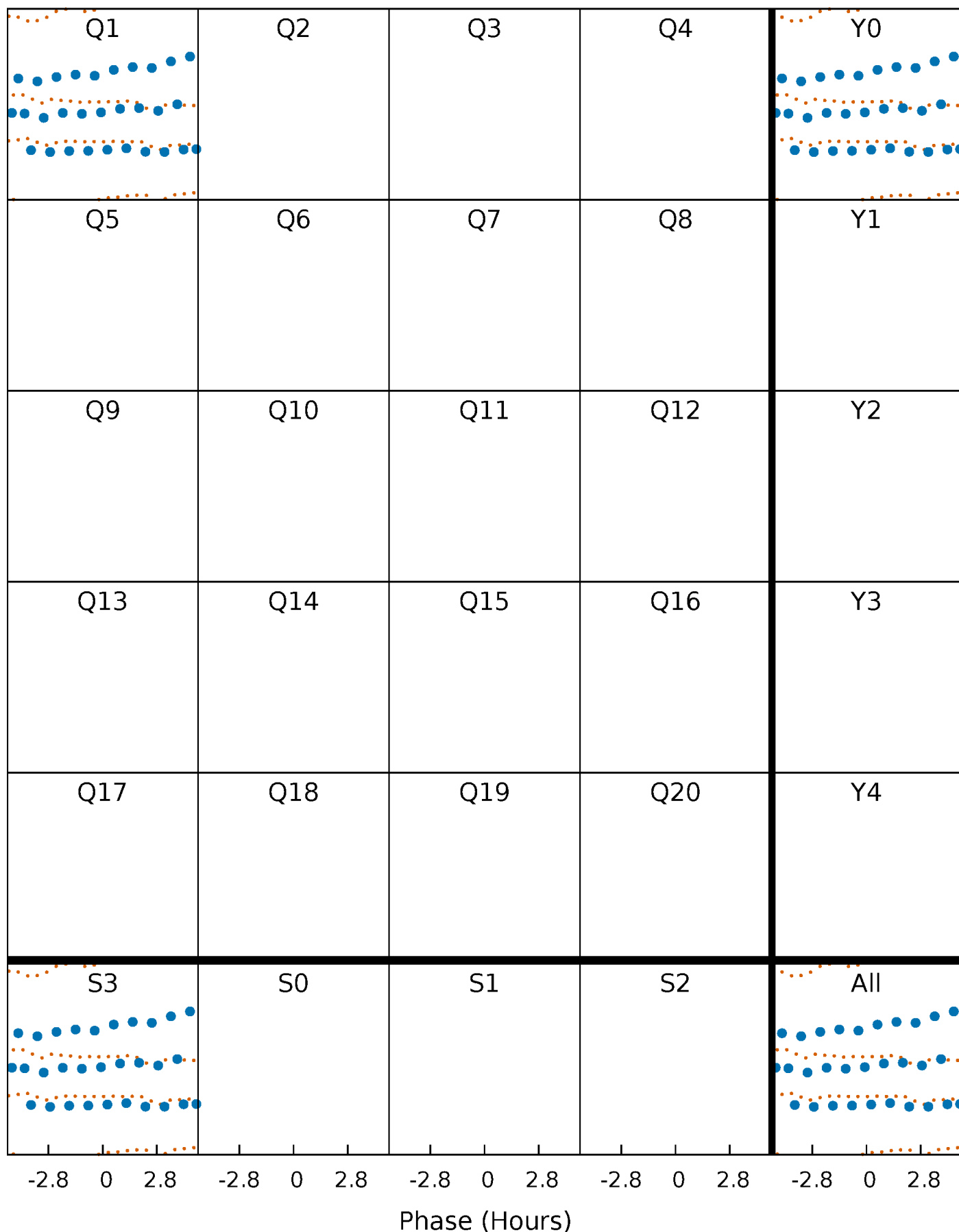


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

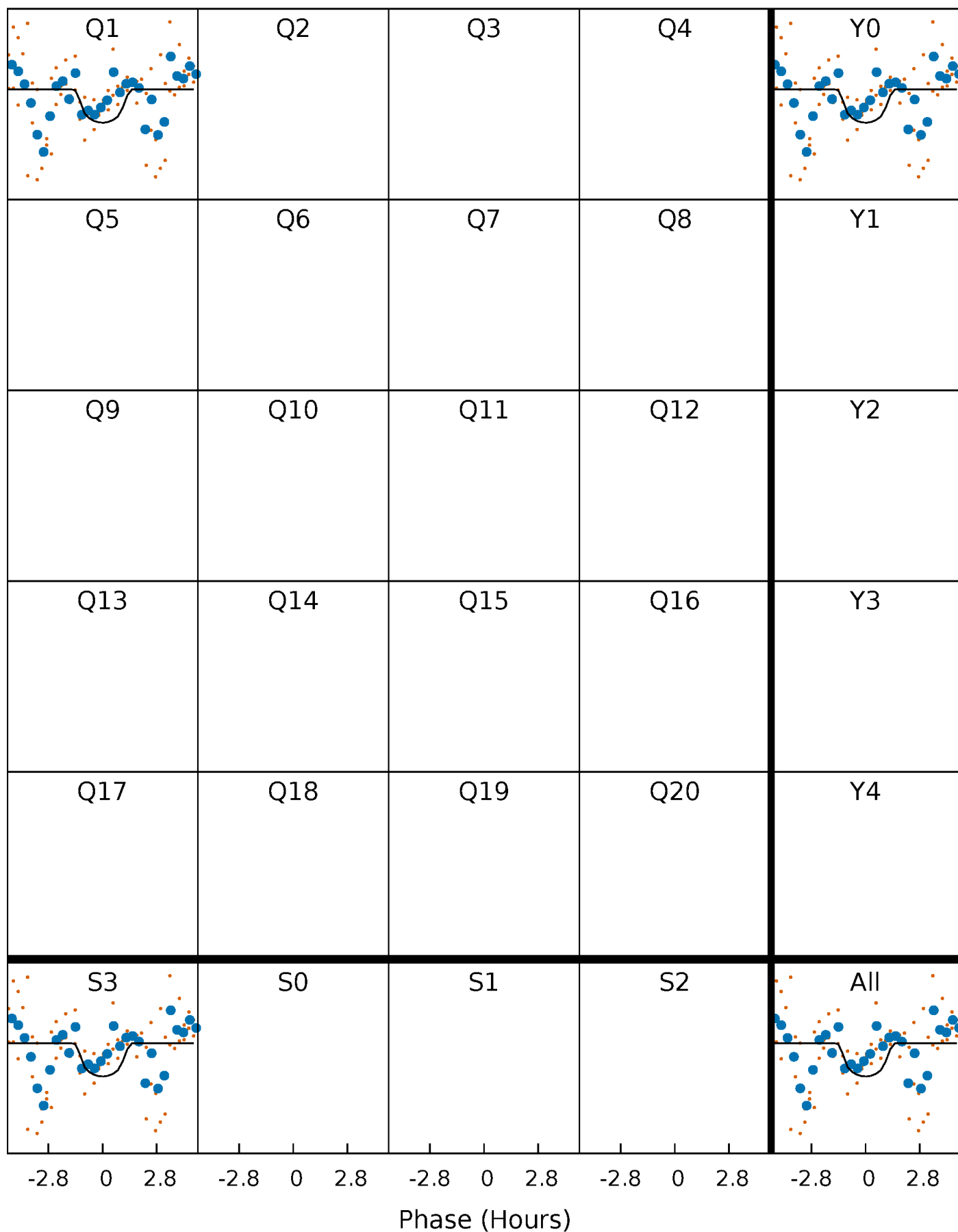
TCE 006580131-01   P= 6.876035 Days    $T_0=138.141940$  (BKJD)





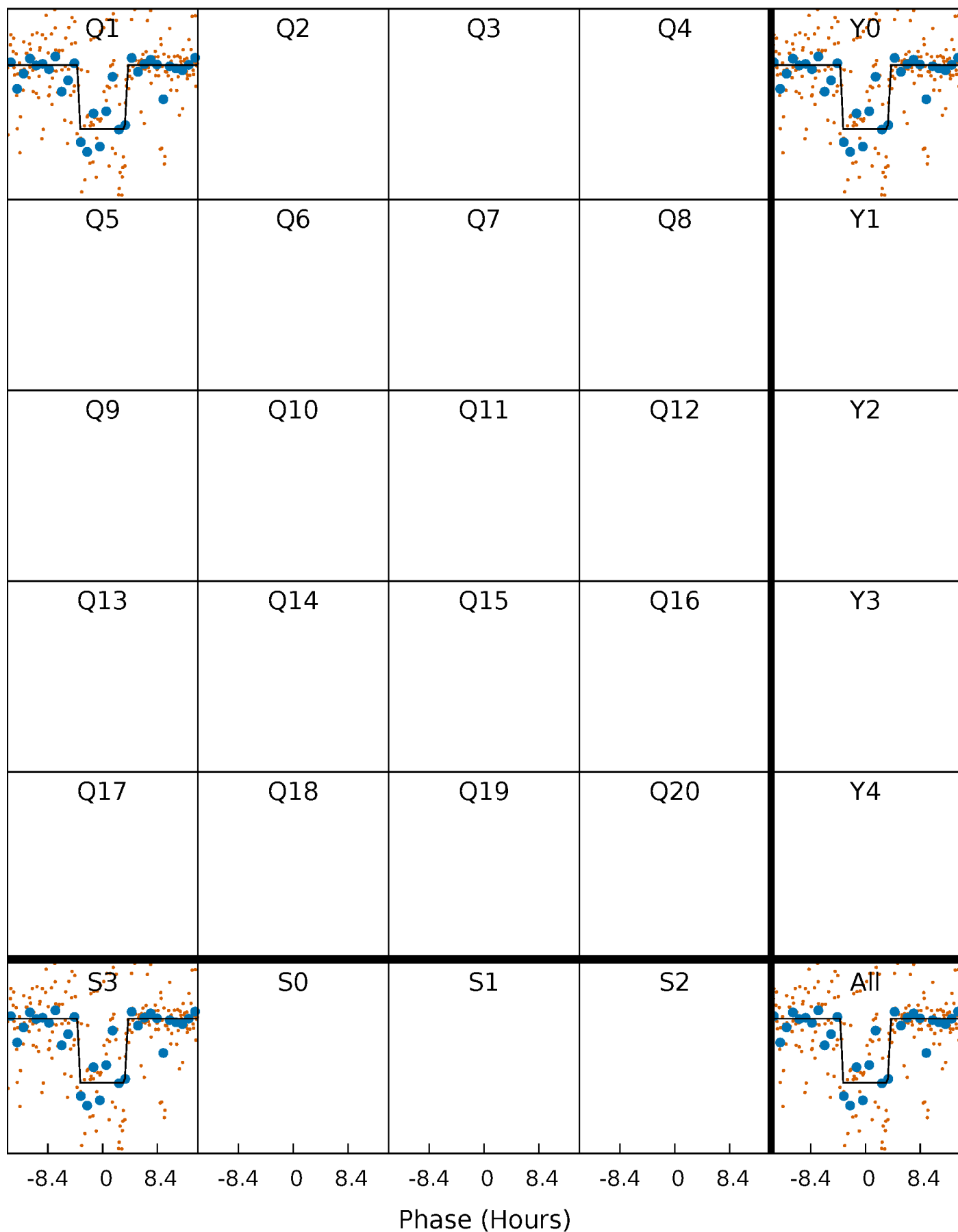
# DV Quarter-Phased Transit Curves

TCE 006580131-01   P= 6.876035 Days    $T_0=138.141940$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

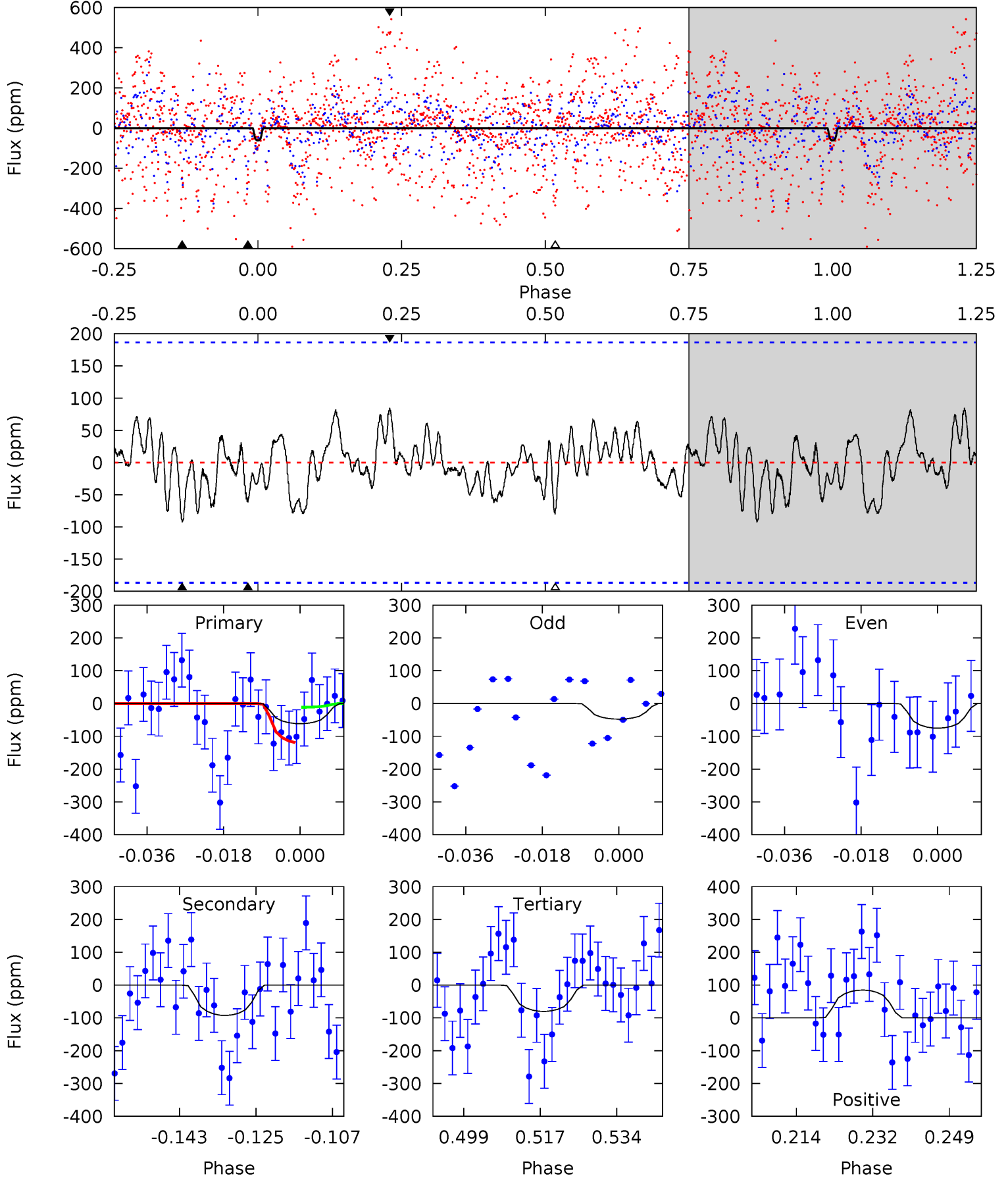
TCE 006580131-01 P= 6.868927 Days  $T_0=138.144396$  (BKJD)



# DV Model-Shift Uniqueness Test

006580131-01, P = 6.876035 Days, E = 131.265905 Days

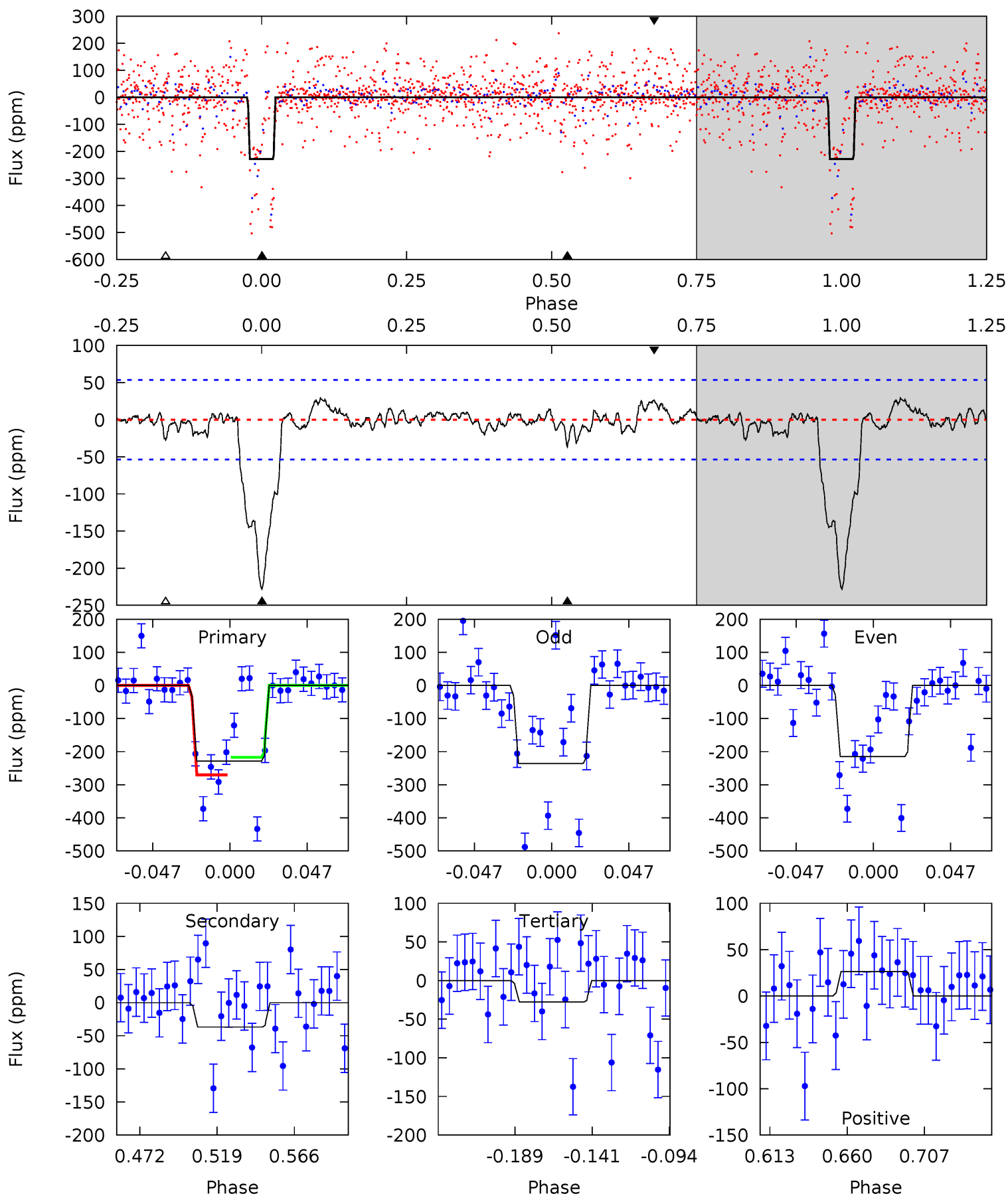
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 1.62 | 2.44 | 2.12 | 2.23 | 4.91            | 2.37            | 0.91             | -0.49   | -0.61   | 0.32    | 0.20    | 0.36    | 1.25 | 0.48  | 1.42 |



# Alt Model-Shift Uniqueness Test

006580131-01, P = 6.868927 Days, E = 131.275469 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 20.1 | 3.24 | 2.42 | 2.33 | 4.72            | 1.98            | 0.89             | 17.7    | 17.8    | 0.82    | 0.92    | 0.98    | 1.09 | 0.11  | 2.21 |



### Stellar Parameters For KIC 006580131

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$             | $M(M_{\odot})$            | $p_{\star} (g \cdot \text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|-----------------------------|---------------------------|--------------------------------------|
|        | $3952^{+71}_{-79}$  | $1.084^{+0.375}_{-0.125}$ | $0.070^{+0.200}_{-0.300}$ | $86.041^{+8.838}_{-50.083}$ | $3.273^{+0.236}_{-2.126}$ | $0.000^{+0.000}_{-0.000}$            |
|        | +2%/-2%             | +35%/-12%                 | +286%/-429%               | +10%/-58%                   | +7%/-65%                  | +399%/-33%                           |
| Source | SPE14               | PHO54                     | PHO54                     | DSEP                        |                           |                                      |

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

### Secondary Eclipse Parameters for KIC 006580131-01 / KOI

| Detrend | Depth (ppm)  | $R_p (R_{\oplus})$           | $T_{max} (K)$        | $T_{obs} (K)$          | $A_{obs}$                 |
|---------|--------------|------------------------------|----------------------|------------------------|---------------------------|
| DV      | $-93 \pm 38$ | $137.01^{+132.42}_{-95.35}$  | $6945^{+319}_{-763}$ | $-5017^{+2137}_{-356}$ | $0.027^{+0.261}_{-0.021}$ |
| Alt.    | $-37 \pm 11$ | $162.96^{+133.10}_{-104.48}$ | $6944^{+317}_{-733}$ | $-5152^{+669}_{-276}$  | $0.008^{+0.050}_{-0.006}$ |

$T_{max}$  = 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

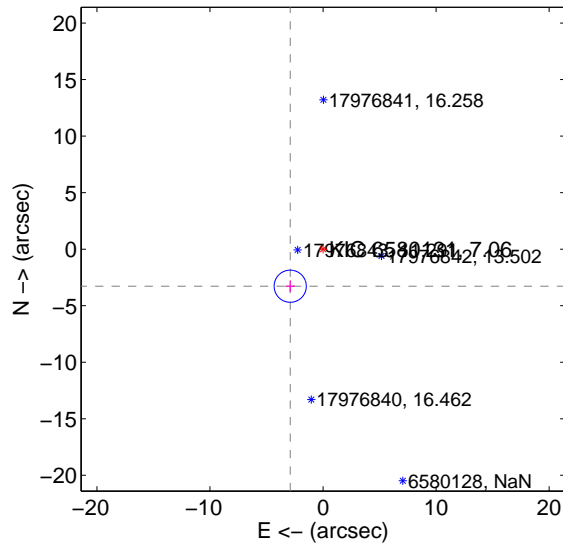
Supplemental centroid analysis for 006580131-01. **Kepler magnitude: 7.06.** Transit SNR 2.64

There are 0 quarters with good PRF difference image offsets

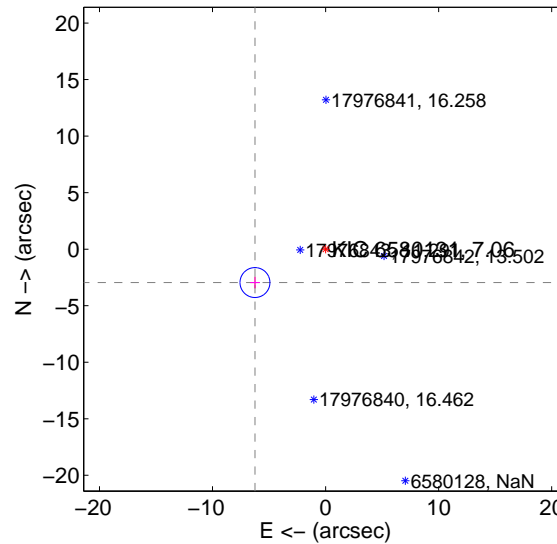
The OOT PRF centroid is offset from the target star catalog position by about 3.36 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

|   | Distance in arcsec                  | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|-------------------------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | <b>4.377 <math>\pm</math> 0.474</b> | <b>9.23</b>         | 2.903 $\pm$ 0.424 | -3.276 $\pm$ 0.510 |
| PRF-fit source offset from KIC position | <b>6.909 <math>\pm</math> 0.441</b> | <b>15.67</b>        | 6.246 $\pm$ 0.424 | -2.952 $\pm$ 0.510 |
| photometric centroid source offset      | 6.77 $\pm$ 3.69                     | 1.84                | 6.70 $\pm$ 3.69   | 0.97 $\pm$ 3.40    |

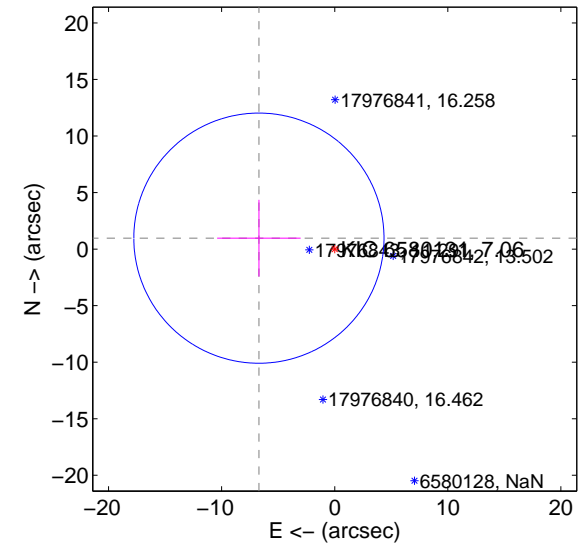
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

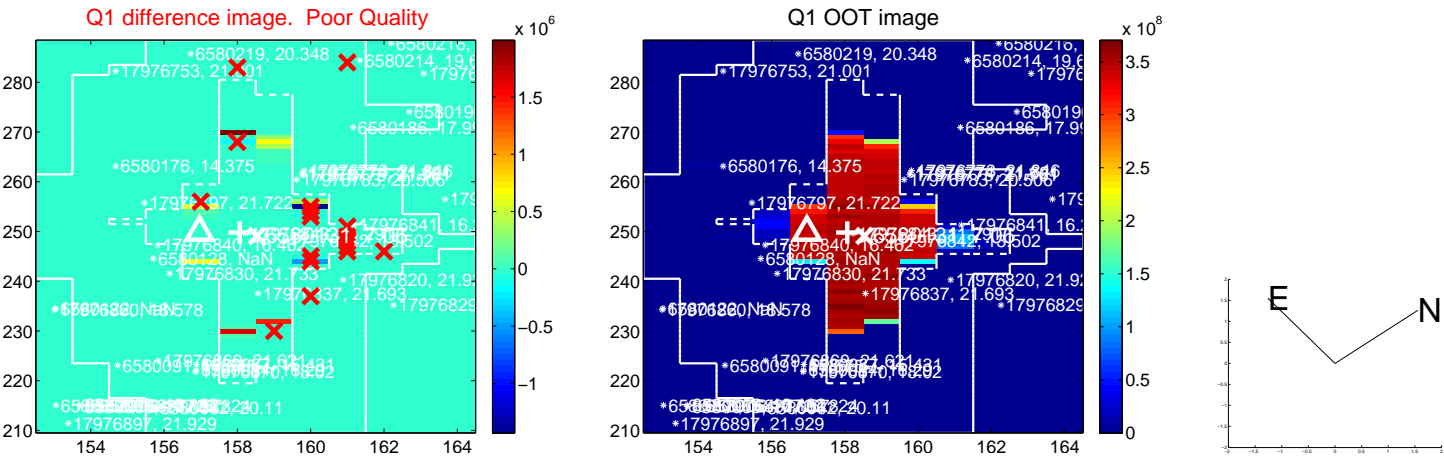


offset from photometric centroids

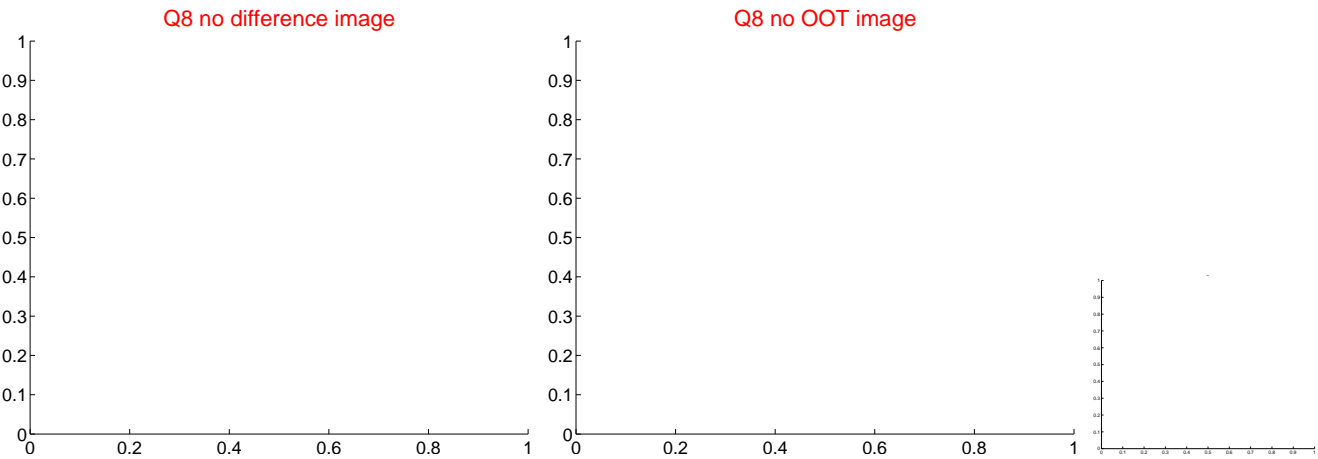
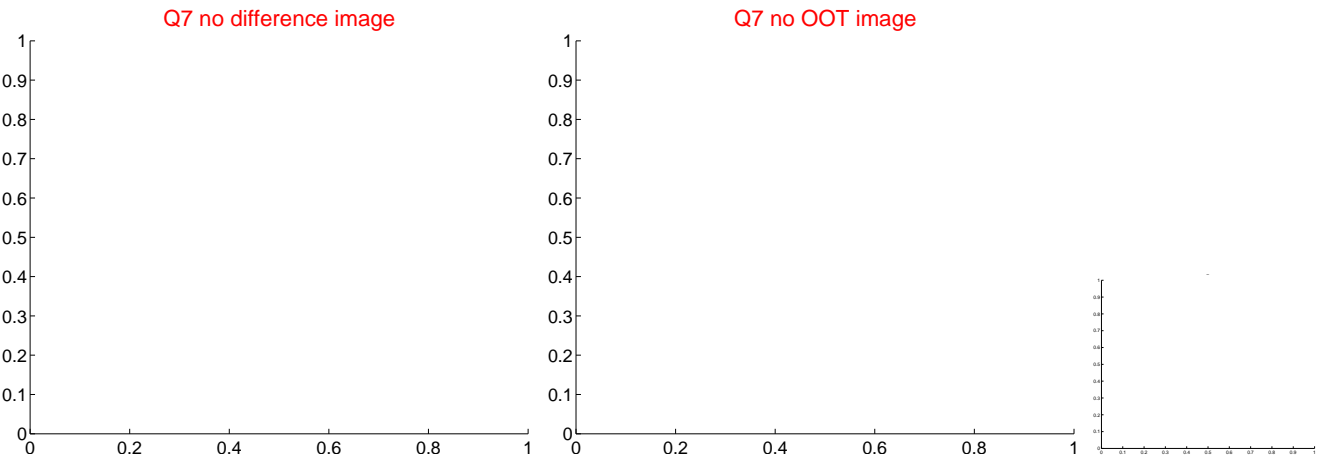
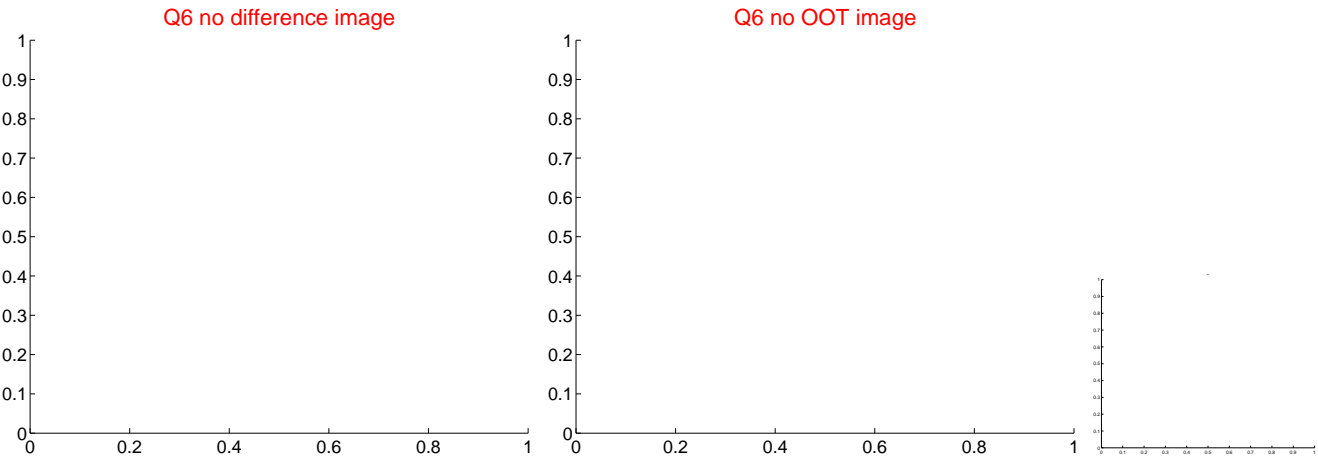
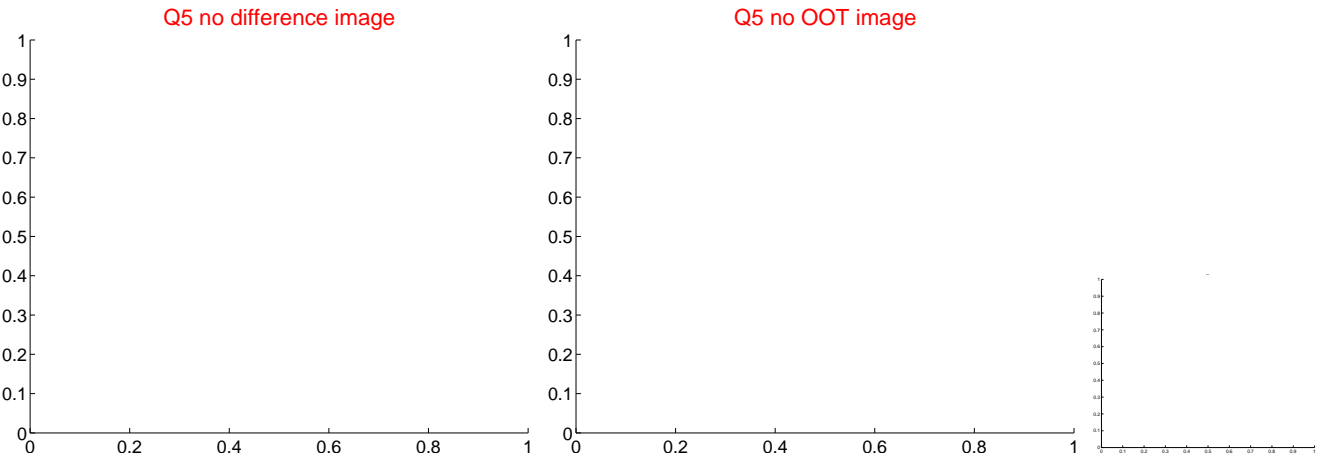


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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





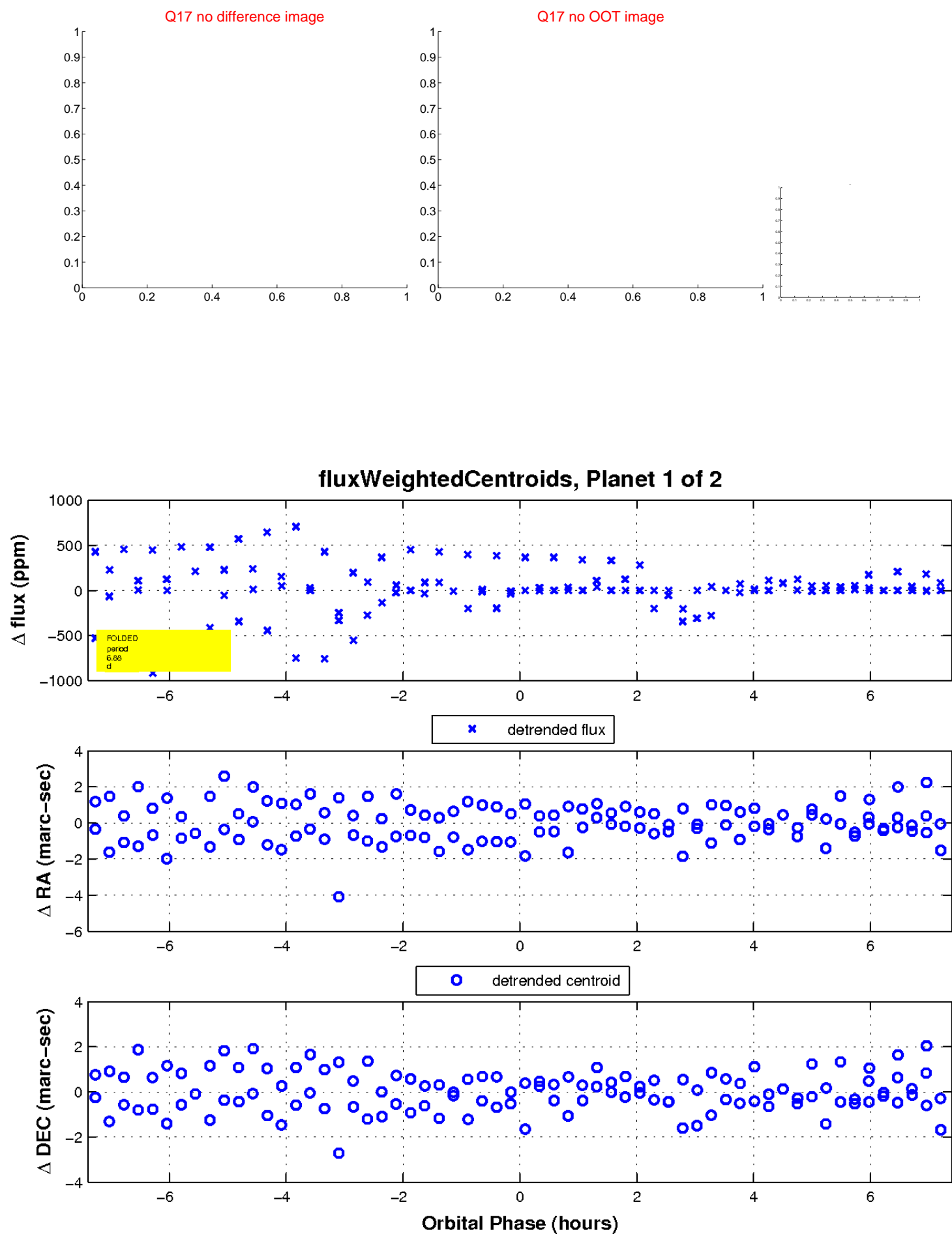
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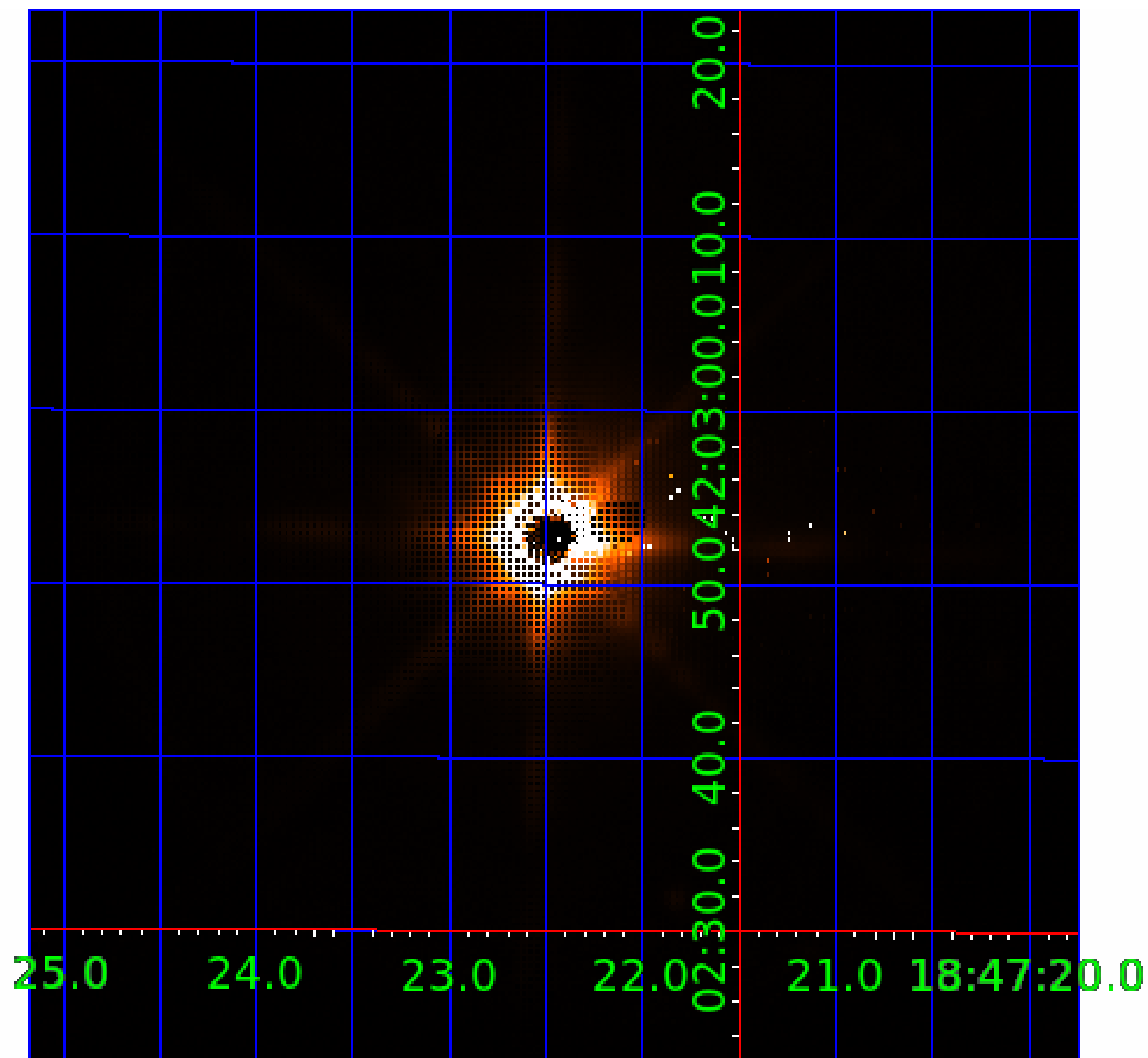


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006580131

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|------|-----------------------------|-----------------|------------------------|------------------------|
| 006580131-01 | OBS      | No   | 6.876035      | 138.141940   | 138.9       | 2.465            | 9.3 | 2.6  | 86.04                       | 3952            | 110.88                 | 0.00                   |
| 006580131-02 | OBS      | No   | 10.733153     | 135.653045   | 390.4       | 1.276            | 8.3 | 13.6 | 86.04                       | 3952            | 232.60                 | 0.00                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 006580131-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_SATURATED           |
| 006580131-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_ZUMA_TRACKER—LPP_DV—MOD_TER_DV—CENT_SATURATED |

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

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

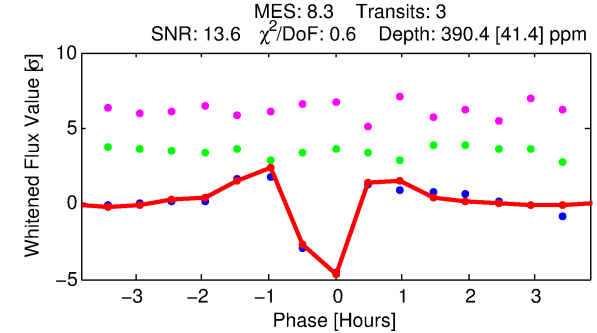
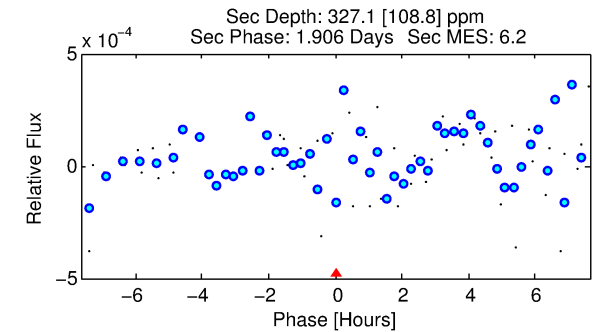
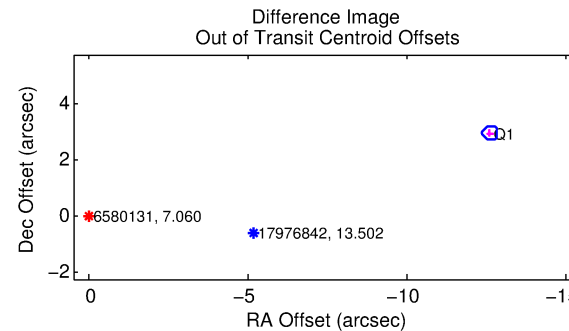
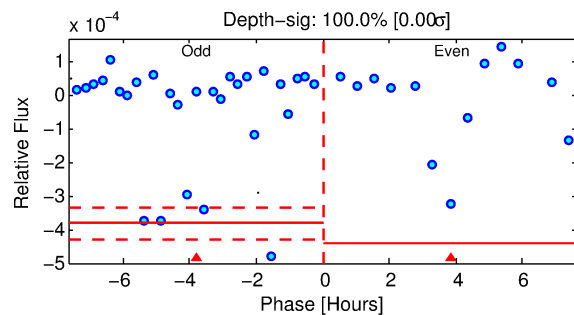
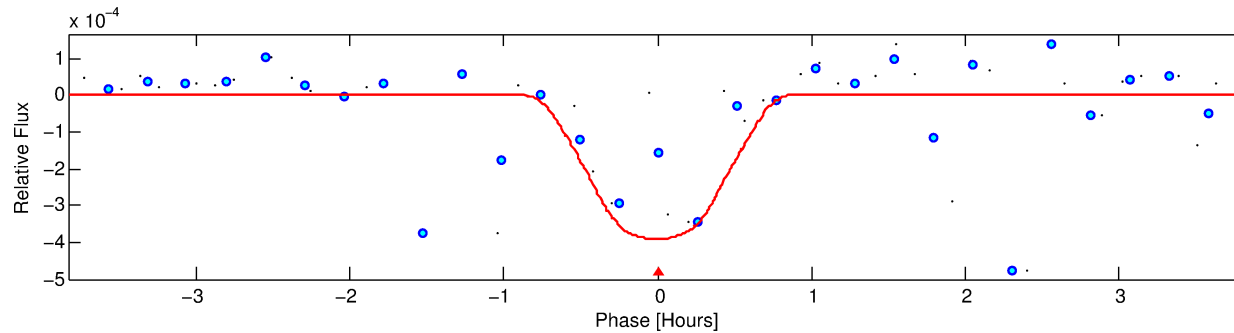
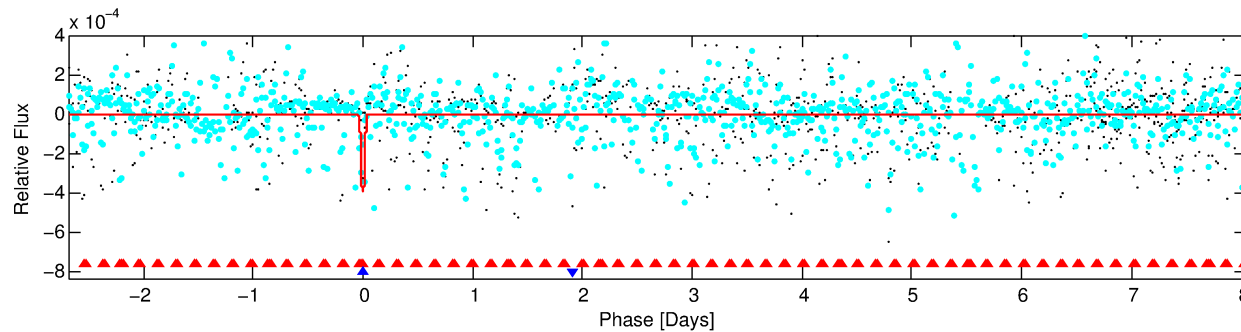
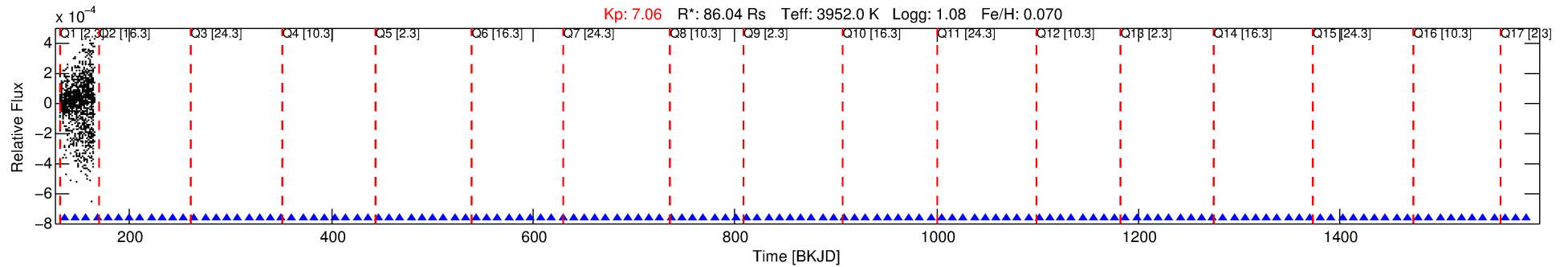
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006580131-02

No Significant Match Found

# DV One-Page Summary

KIC: 6580131 Candidate: 2 of 2 Period: 10.733 d



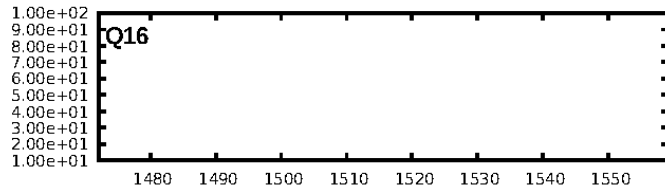
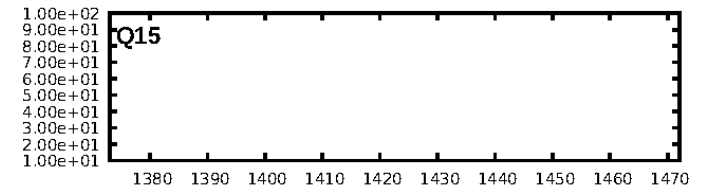
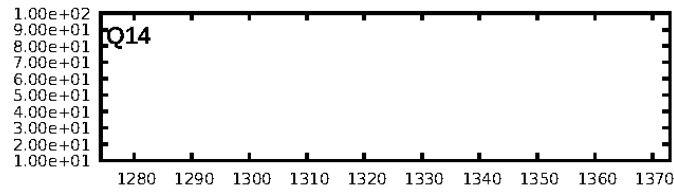
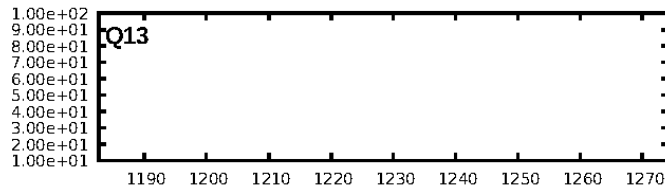
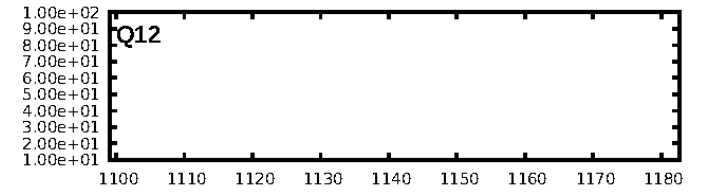
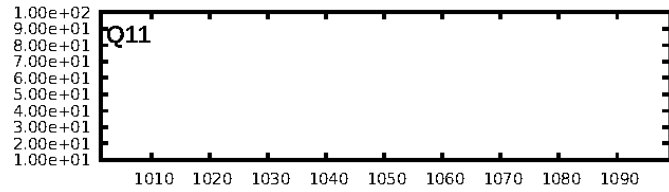
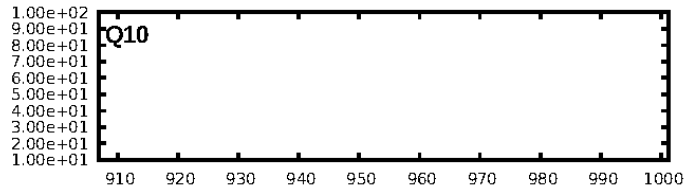
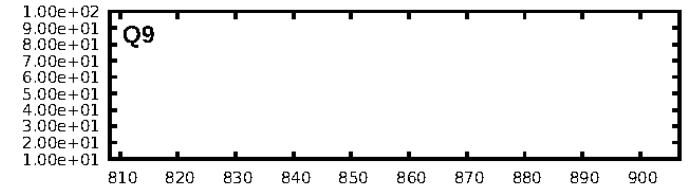
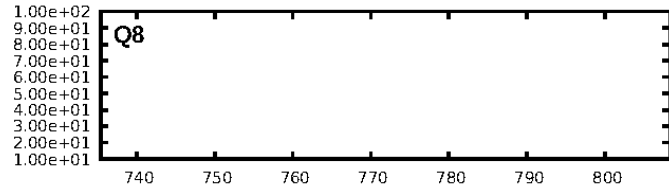
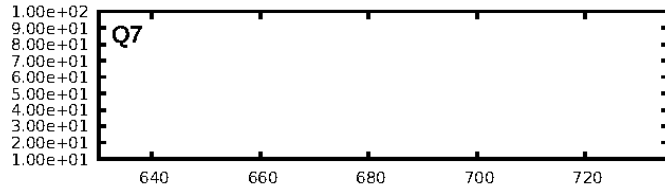
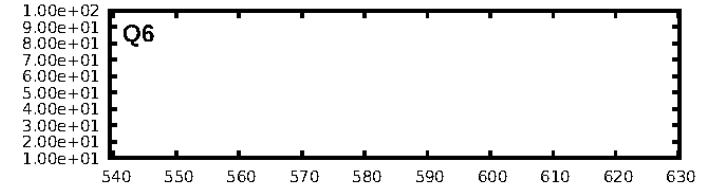
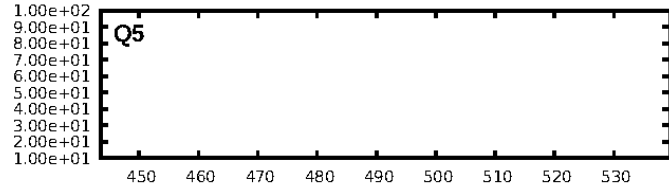
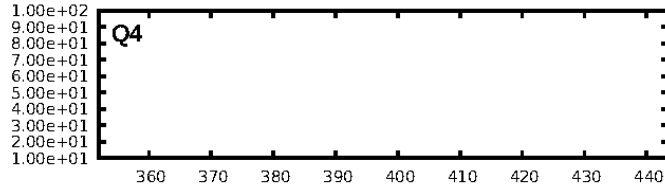
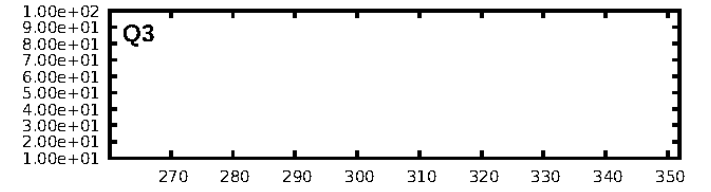
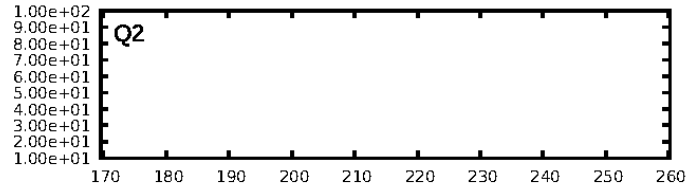
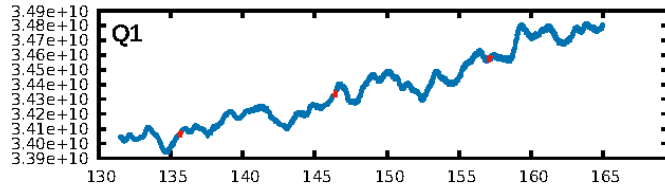
## DV Fit Results:

Period = 10.73315 [0.00179] d  
Epoch = 135.6530 [0.0013] BKJD  
Rp/R\* = 0.0248 [0.0079]  
a/R\* = 26.41 [26.65]  
b = 0.94 [0.13]  
Seff = N/A  
Teq = N/A  
**Rp = 232.60 [154.18] Re**  
a = N/A  
Ag = N/A  
Teffp = N/A

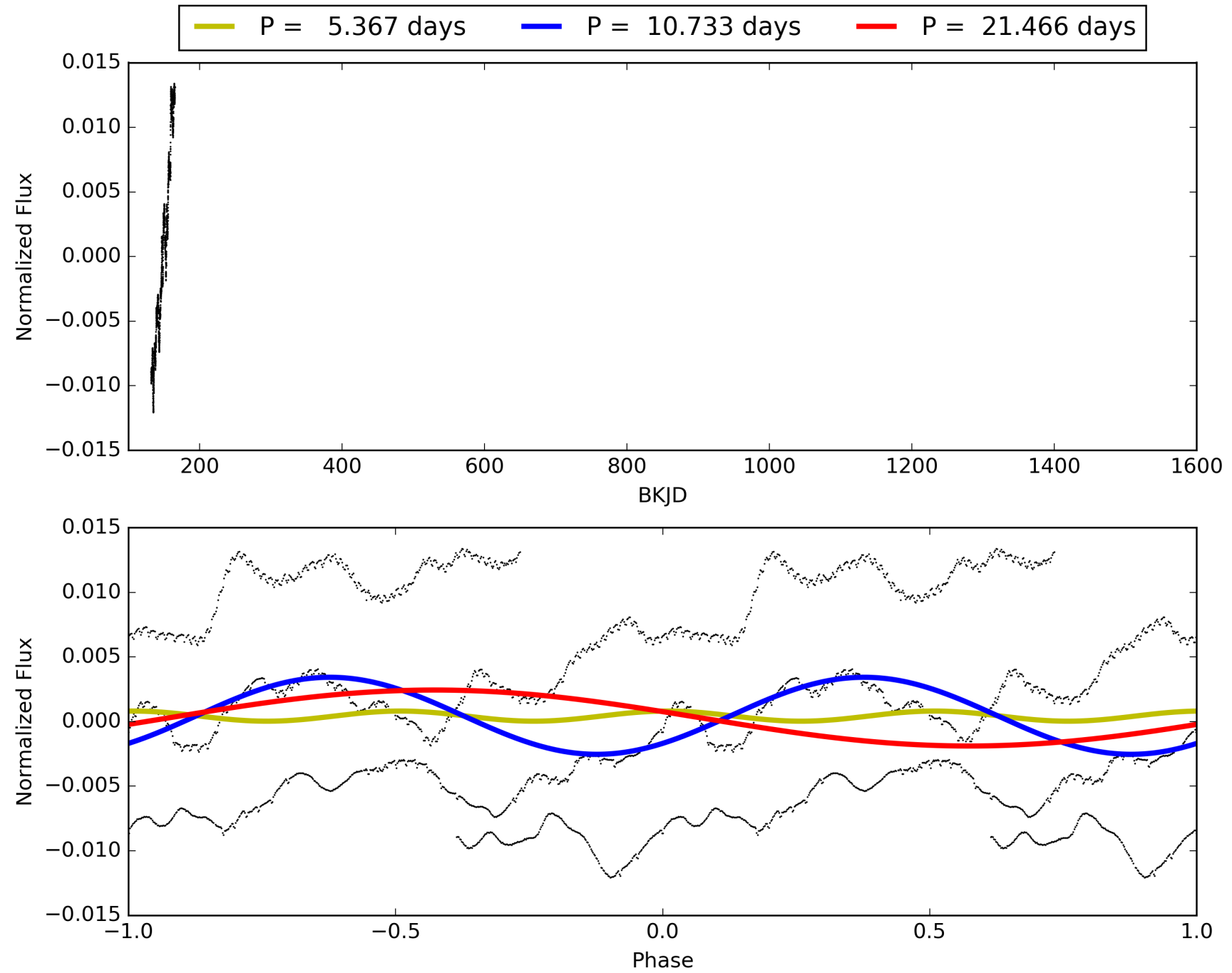
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [33.36 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 37.0%  
ModelChiSquareGof-sig: 96.8%  
Bootstrap-pfa: 2.54e-13  
RollingBand-fgt: N/A  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: 3.245 arcsec [2.30 $\sigma$ ]  
**OotOffset-rm: 12.941 arcsec [155.77 $\sigma$ ]**  
**KicOffset-rm: 9.860 arcsec [118.83 $\sigma$ ]**  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [1/1]

# TCE 006580131-02, PDC Light Curves



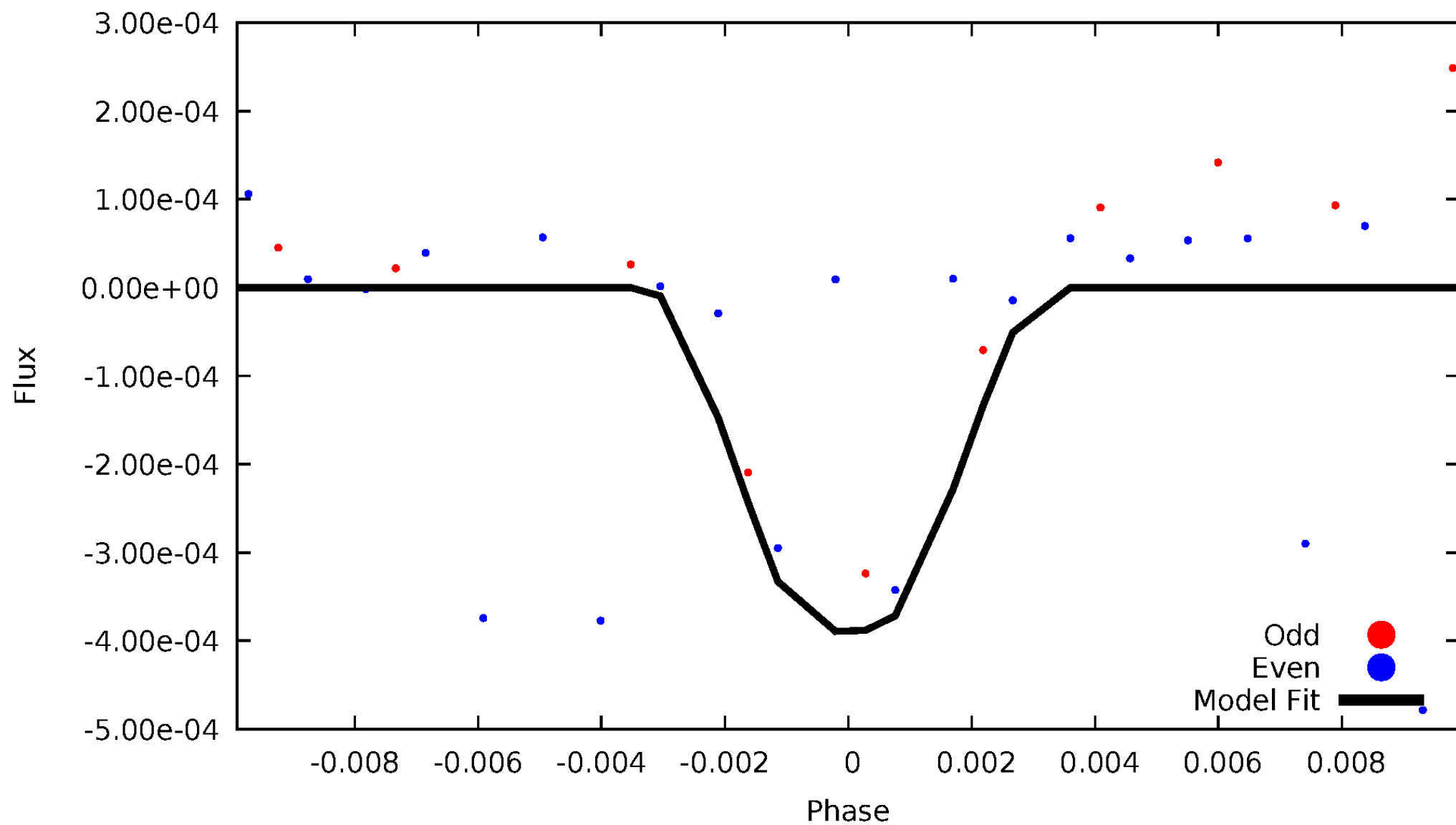
# TCE 006580131-02





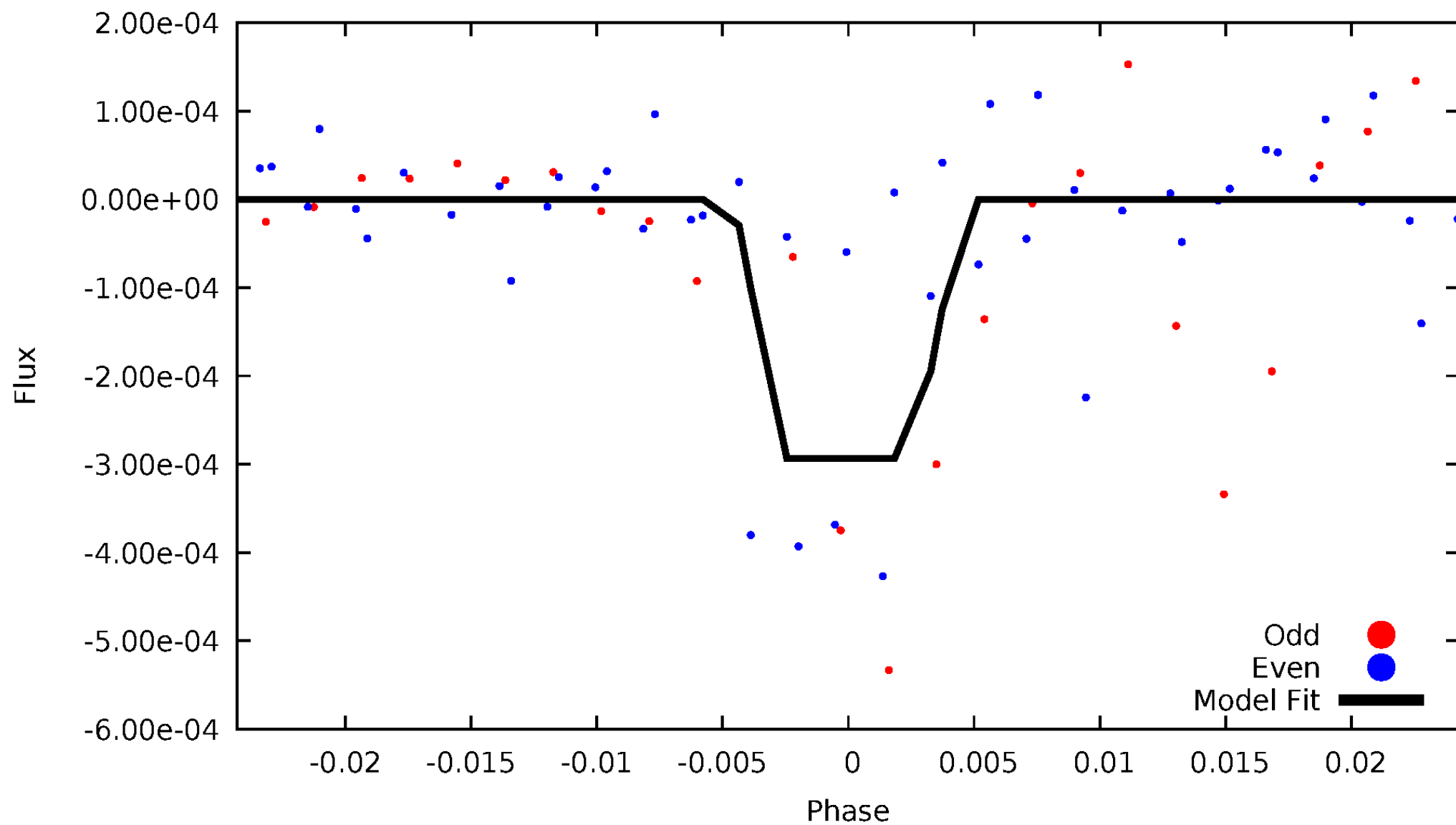
# DV Odd/Even

TCE 006580131-02



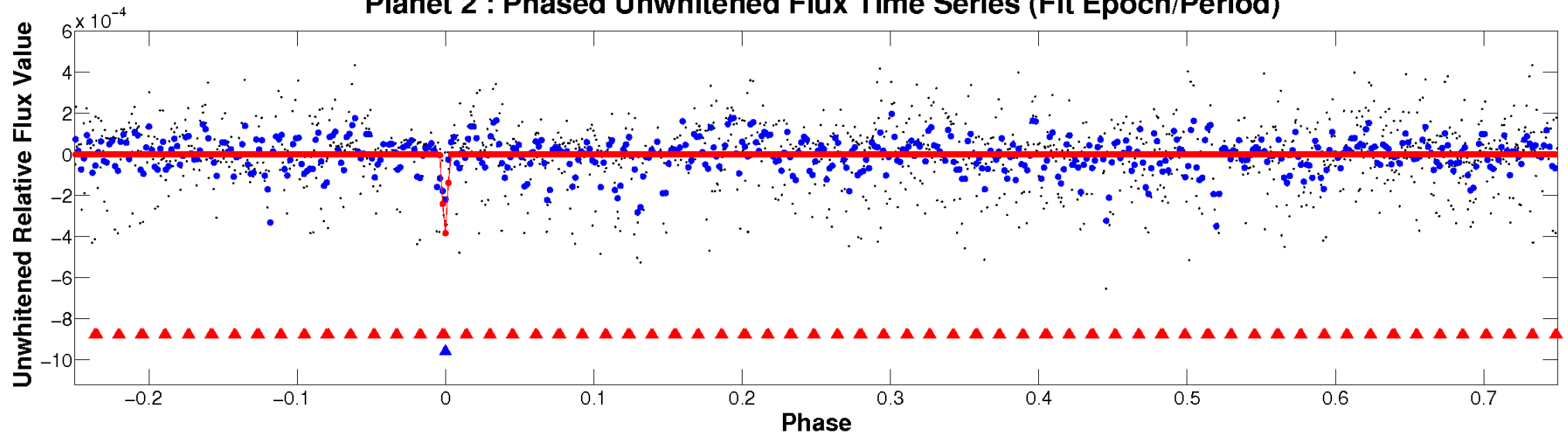
# ALT Odd/Even

TCE 006580131-02

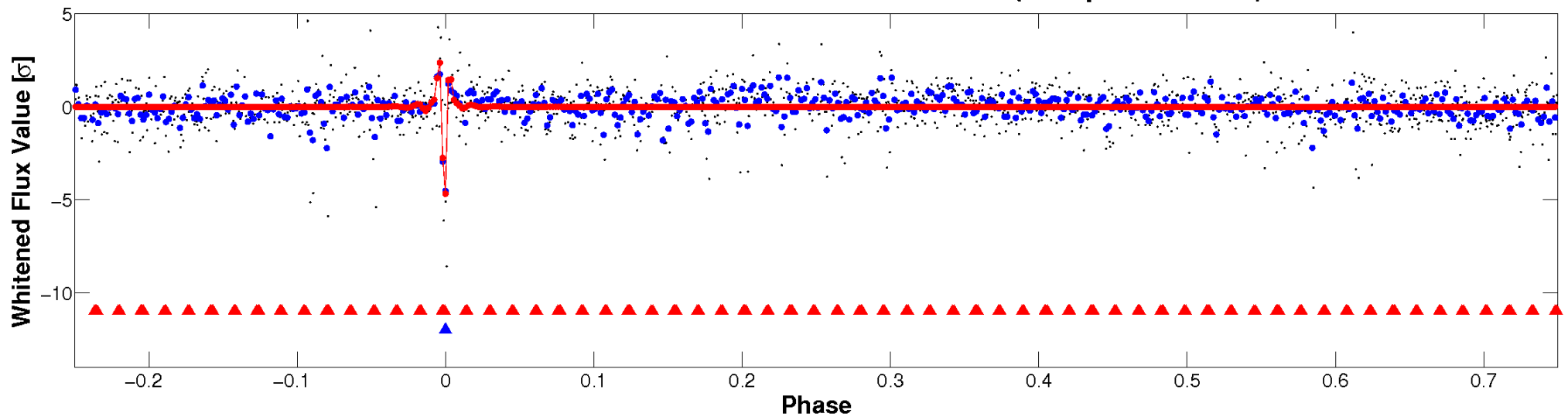


# Non-Whitened Vs. Whitened Light Curve

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

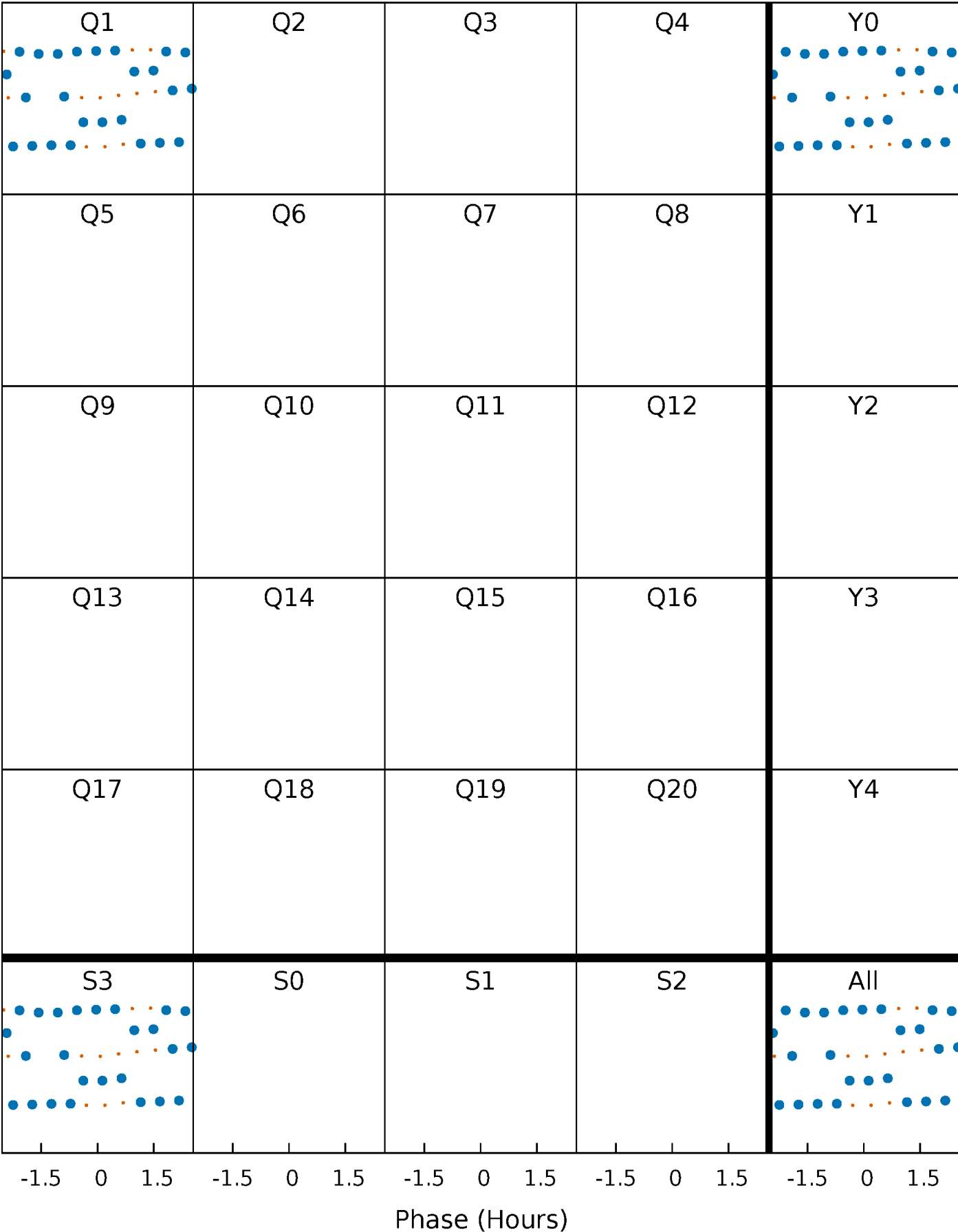


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



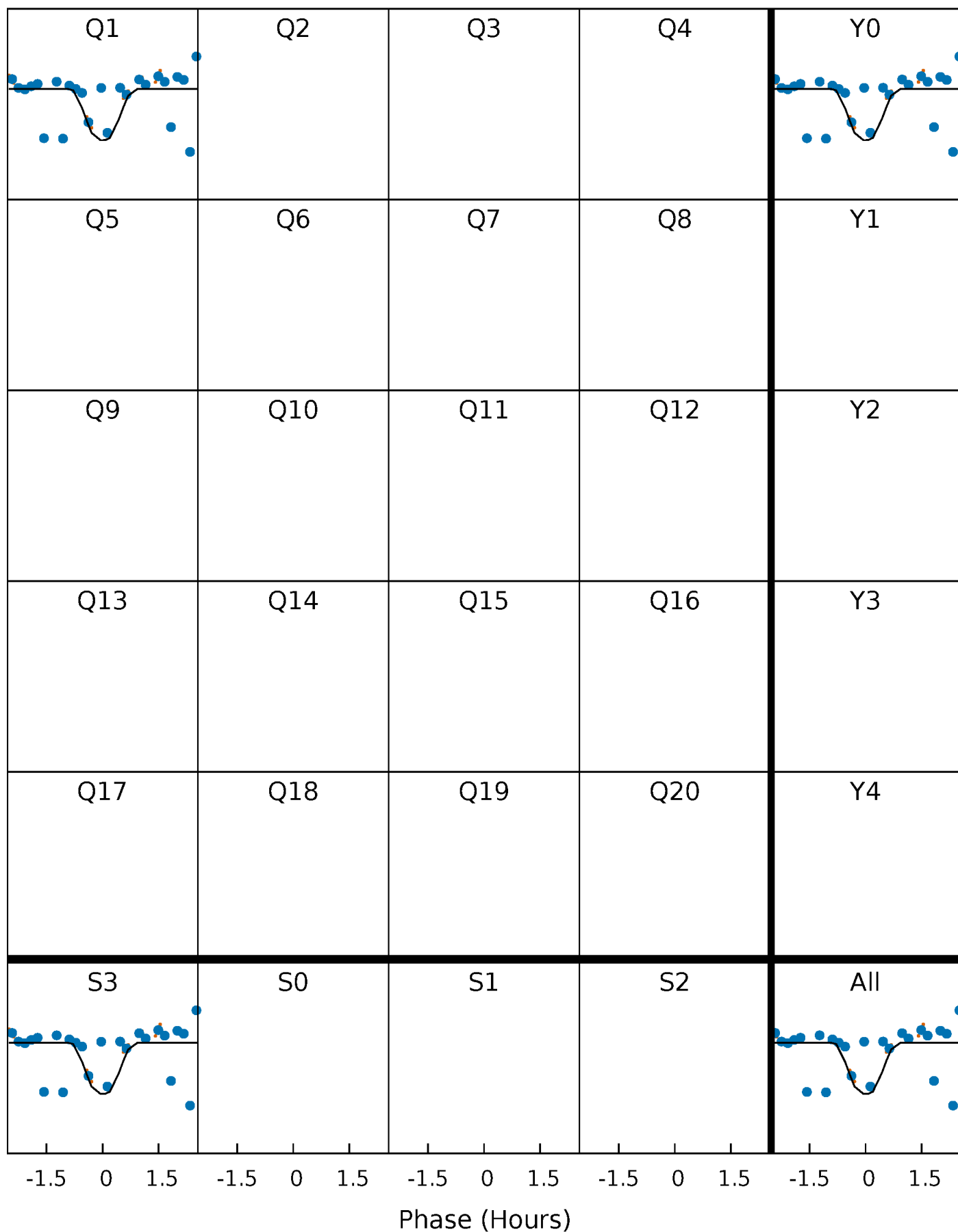
PDC Quarter-Phased Transit Curves

TCE 006580131-02    P= 10.733153 Days    T<sub>0</sub>=135.653045 (BKJD)



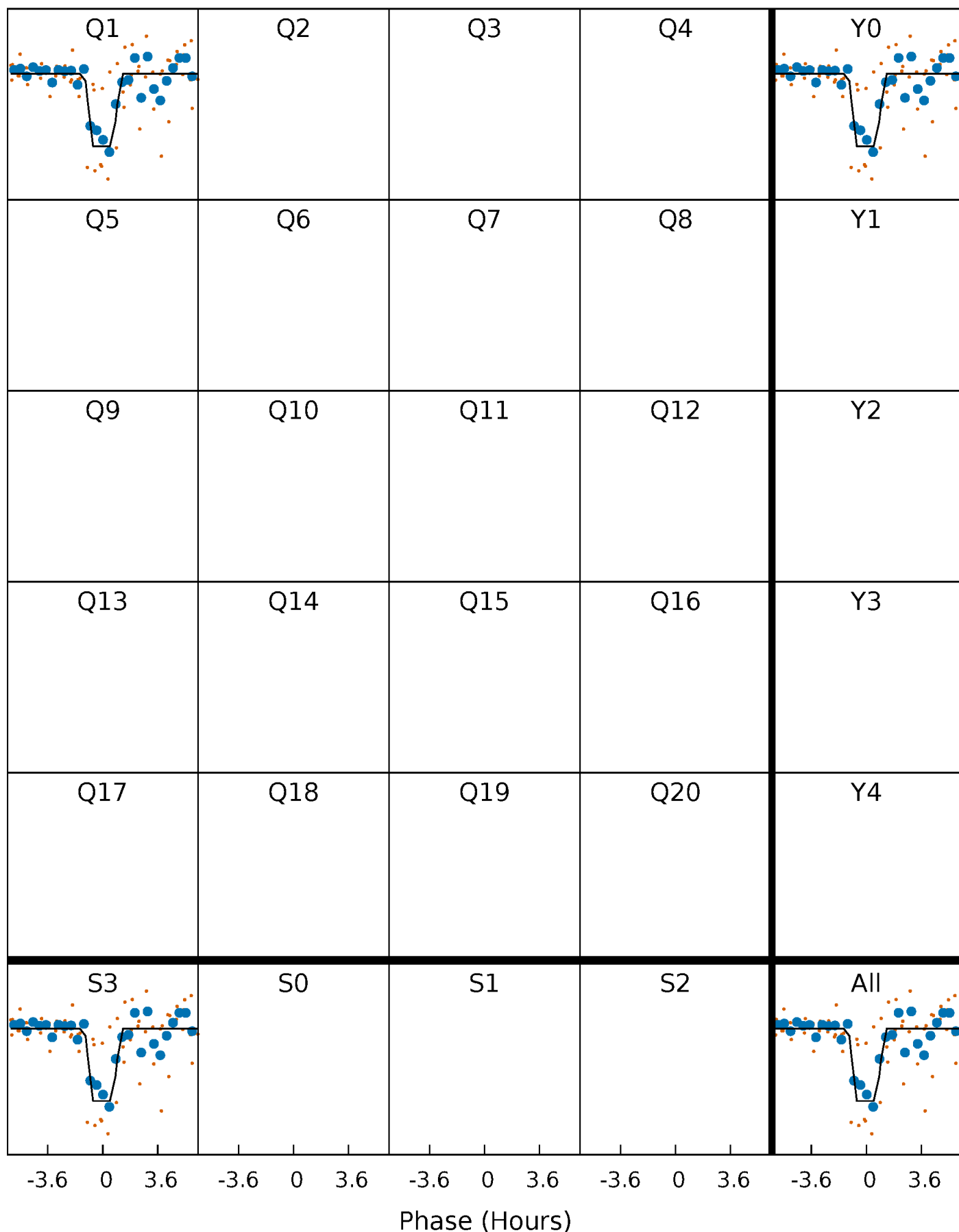
# DV Quarter-Phased Transit Curves

TCE 006580131-02 P= 10.733153 Days  $T_0=135.653045$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

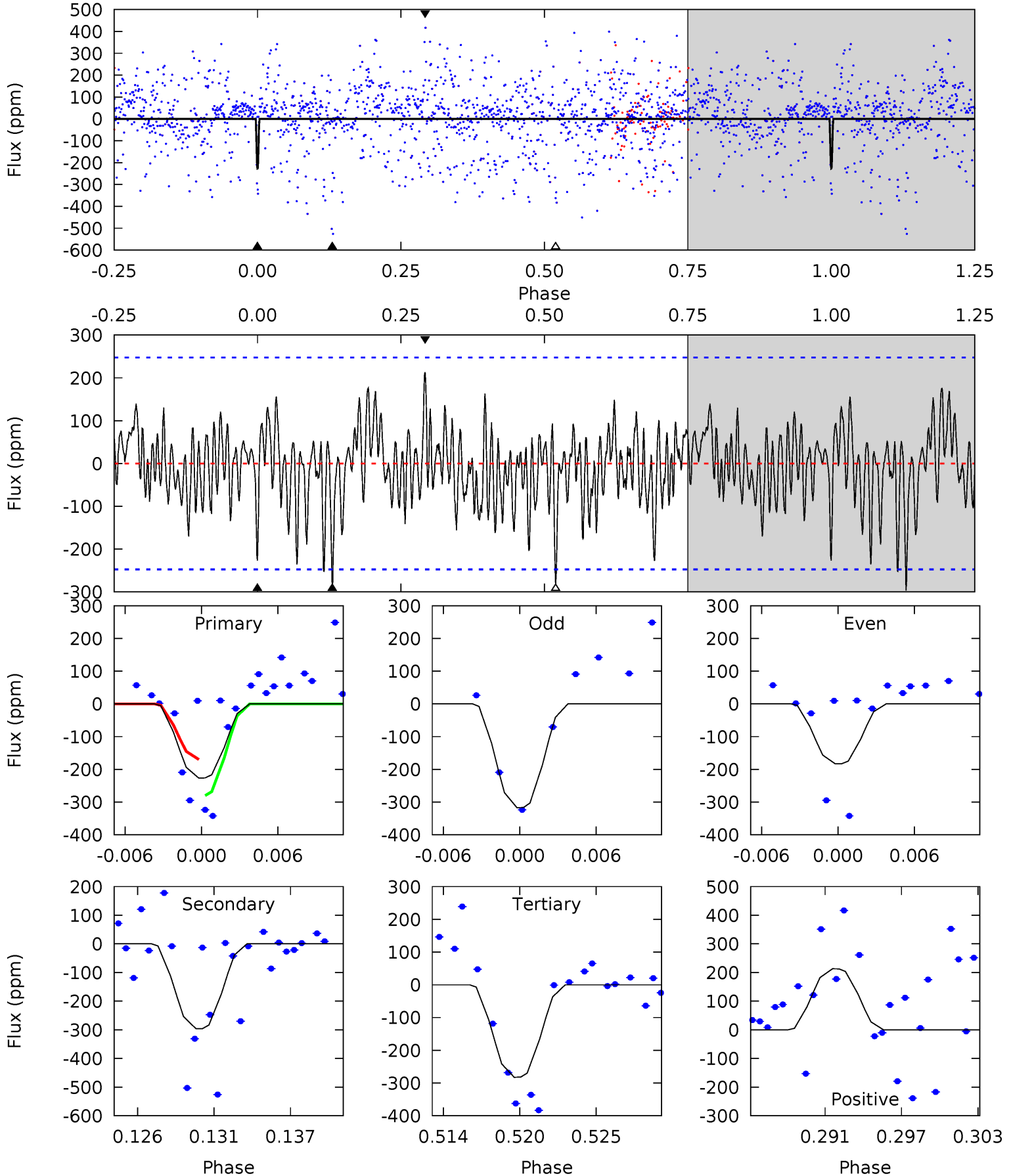
TCE 006580131-02   P= 10.725487 Days    $T_0=135.646518$  (BKJD)



# DV Model-Shift Uniqueness Test

006580131-02, P = 10.733153 Days, E = 124.919892 Days

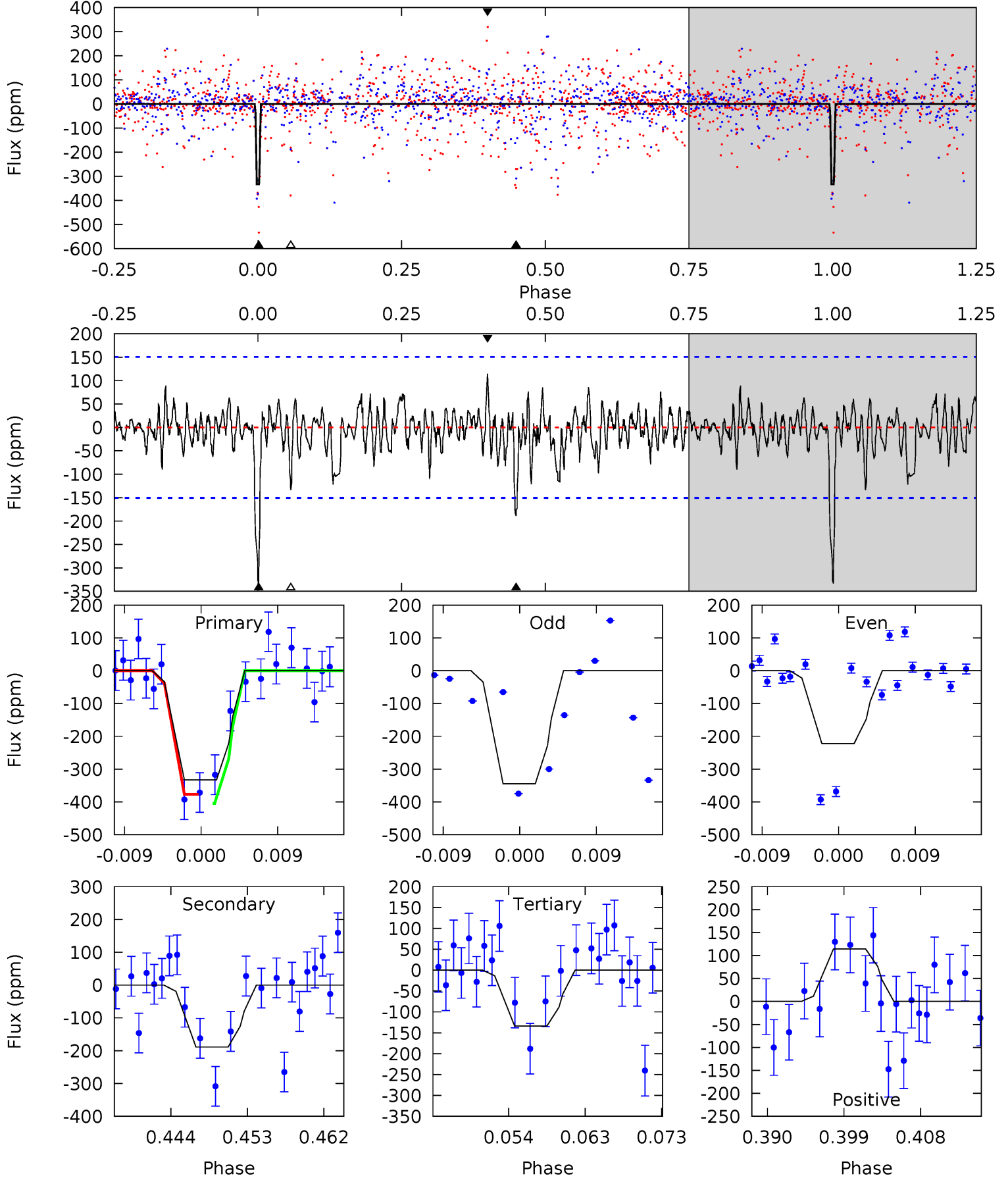
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 4.71 | 6.15 | 5.87 | 4.42 | 5.13            | 2.76            | 1.53             | -1.16   | 0.28    | 0.29    | 1.73    | 1.27    | 0.70 | 0.42  | 1.15 |



# Alt Model-Shift Uniqueness Test

006580131-02,  $P = 10.725487$  Days,  $E = 124.921031$  Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 11.2 | 6.32 | 4.49 | 3.83 | 5.05            | 2.61            | 1.18             | 6.67    | 7.32    | 1.84    | 2.49    | 1.78    | 0.98 | 0.26  | 0   |





### Stellar Parameters For KIC 006580131

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$             | $M(M_{\odot})$            | $p_{\star} (g \cdot \text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|-----------------------------|---------------------------|--------------------------------------|
|        | $3952^{+71}_{-79}$  | $1.084^{+0.375}_{-0.125}$ | $0.070^{+0.200}_{-0.300}$ | $86.041^{+8.838}_{-50.083}$ | $3.273^{+0.236}_{-2.126}$ | $0.000^{+0.000}_{-0.000}$            |
|        | +2%/-2%             | +35%/-12%                 | +286%/-429%               | +10%/-58%                   | +7%/-65%                  | +399%/-33%                           |
| Source | SPE14               | PHO54                     | PHO54                     | DSEP                        |                           |                                      |

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

### Secondary Eclipse Parameters for KIC 006580131-02 / KOI

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$         | $T_{max} (K)$        | $T_{obs} (K)$          | $A_{obs}$                 |
|---------|---------------|----------------------------|----------------------|------------------------|---------------------------|
| DV      | $-297 \pm 48$ | $221.22^{+87.80}_{-79.26}$ | $5977^{+263}_{-618}$ | $-4370^{+647}_{-266}$  | $0.063^{+0.088}_{-0.030}$ |
| Alt.    | $-189 \pm 30$ | $150.12^{+80.09}_{-71.57}$ | $6004^{+269}_{-639}$ | $-4271^{+7064}_{-323}$ | $0.087^{+0.231}_{-0.048}$ |

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

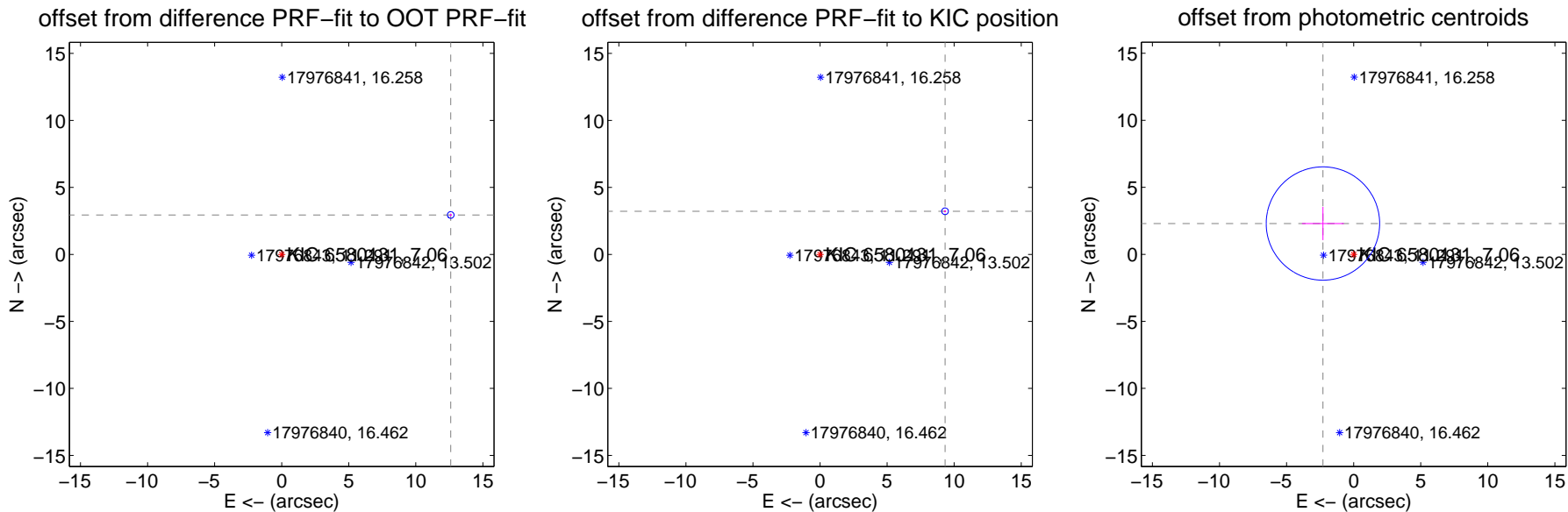
## DV Centroid Data

Supplemental centroid analysis for 006580131-02. **Kepler magnitude: 7.06.** Transit SNR 13.62

There are 0 quarters with good PRF difference image offsets

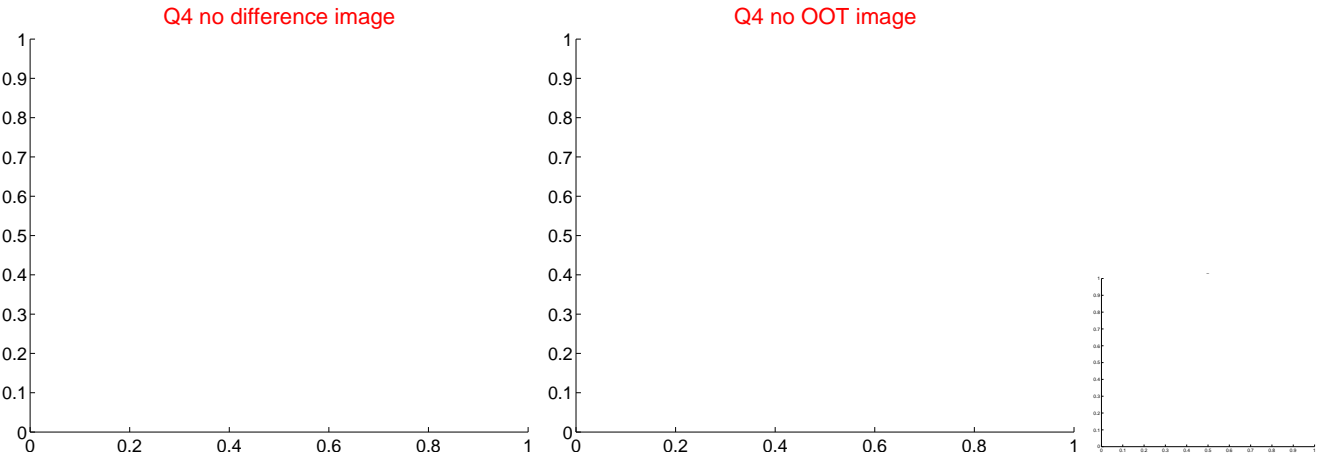
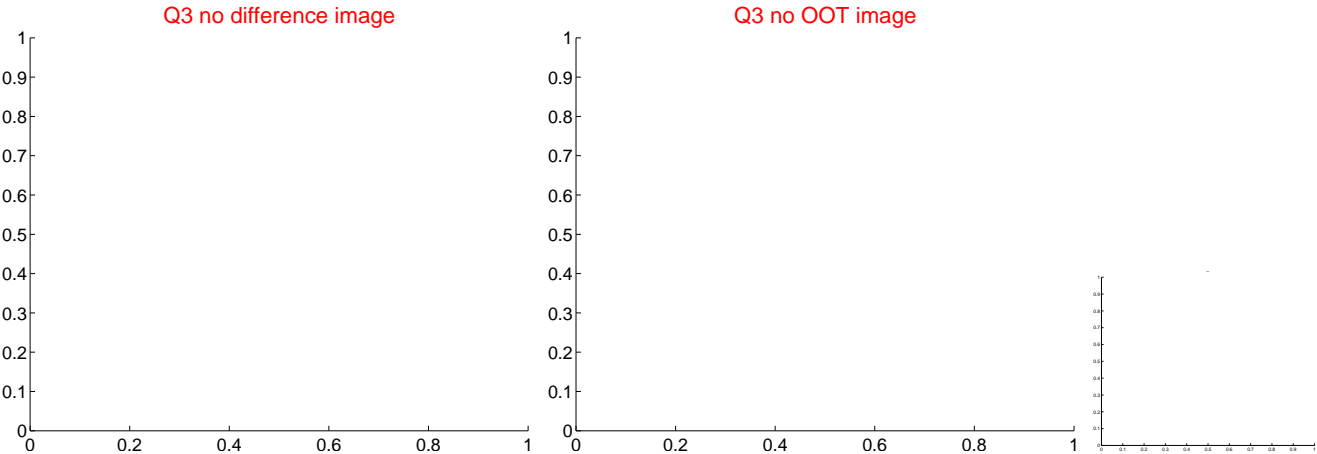
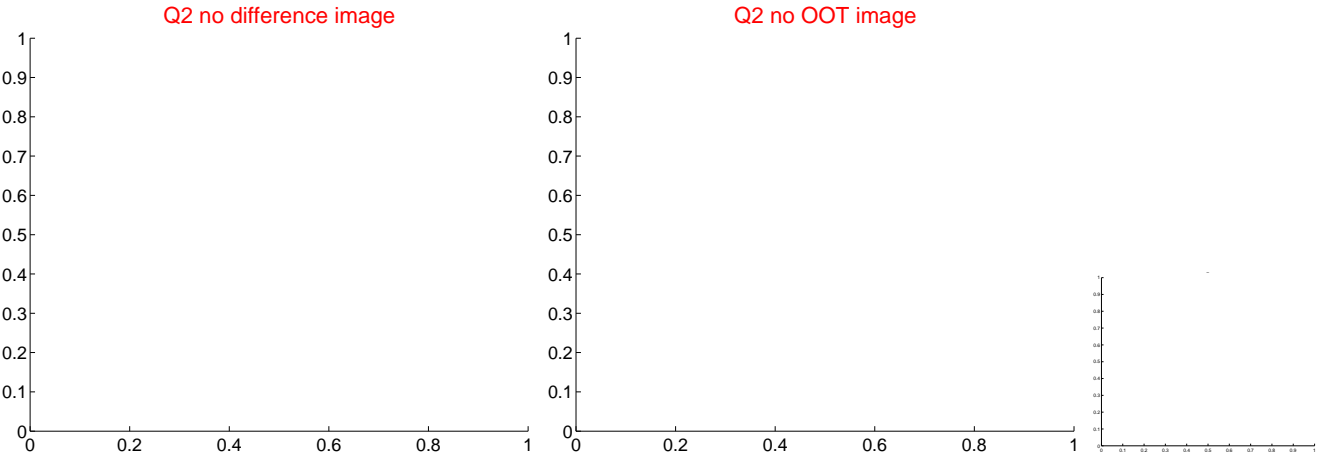
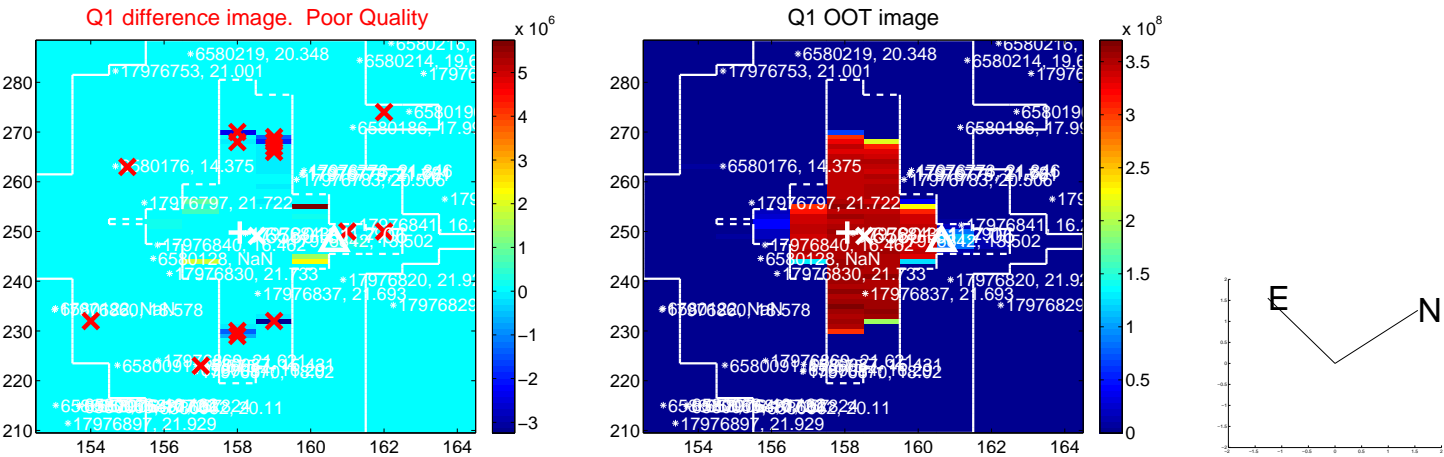
The OOT PRF centroid is offset from the target star catalog position by about 3.29 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

|   | Distance in arcsec                   | Distance / $\sigma$ | $\Delta$ RA         | $\Delta$ Dec      |
|---|--------------------------------------|---------------------|---------------------|-------------------|
| PRF-fit source offset from OOT          | <b>12.941 <math>\pm</math> 0.083</b> | <b>155.77</b>       | -12.602 $\pm$ 0.083 | 2.942 $\pm$ 0.082 |
| PRF-fit source offset from KIC position | <b>9.860 <math>\pm</math> 0.083</b>  | <b>118.83</b>       | -9.320 $\pm$ 0.083  | 3.220 $\pm$ 0.082 |
| photometric centroid source offset      | 3.25 $\pm$ 1.41                      | 2.30                | 2.29 $\pm$ 1.56     | 2.30 $\pm$ 1.24   |

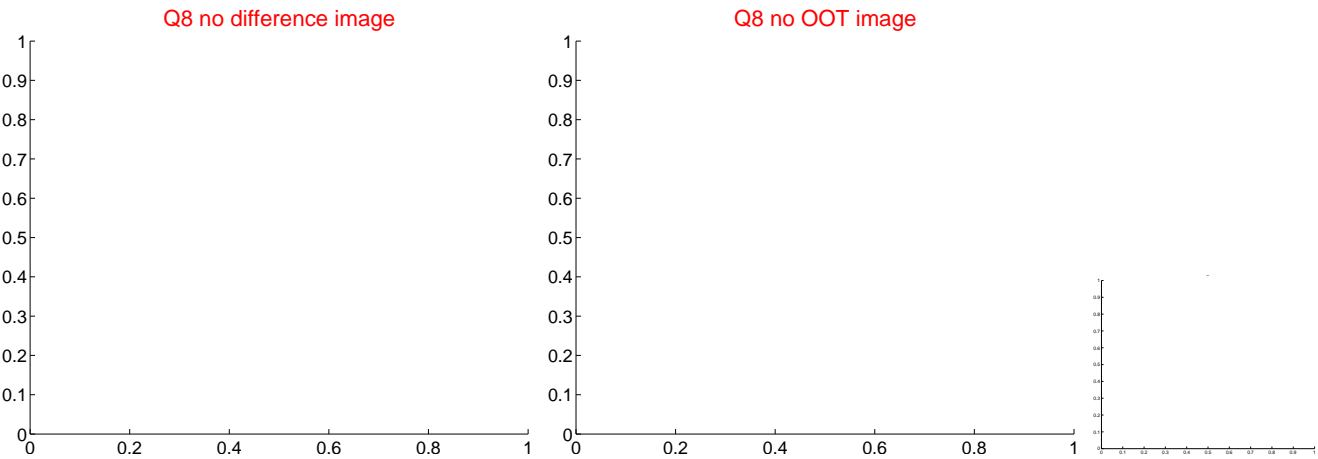
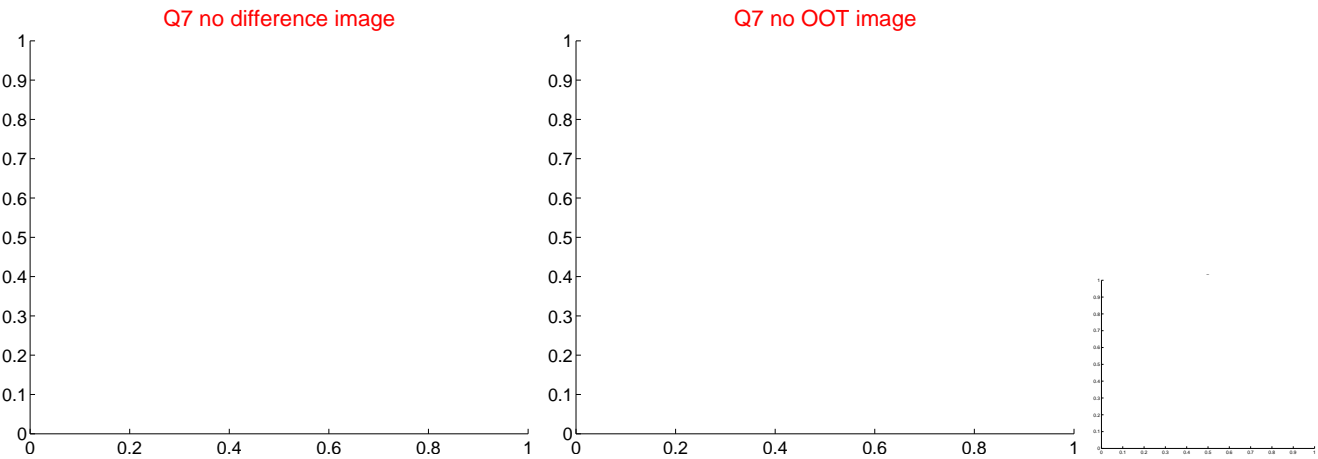
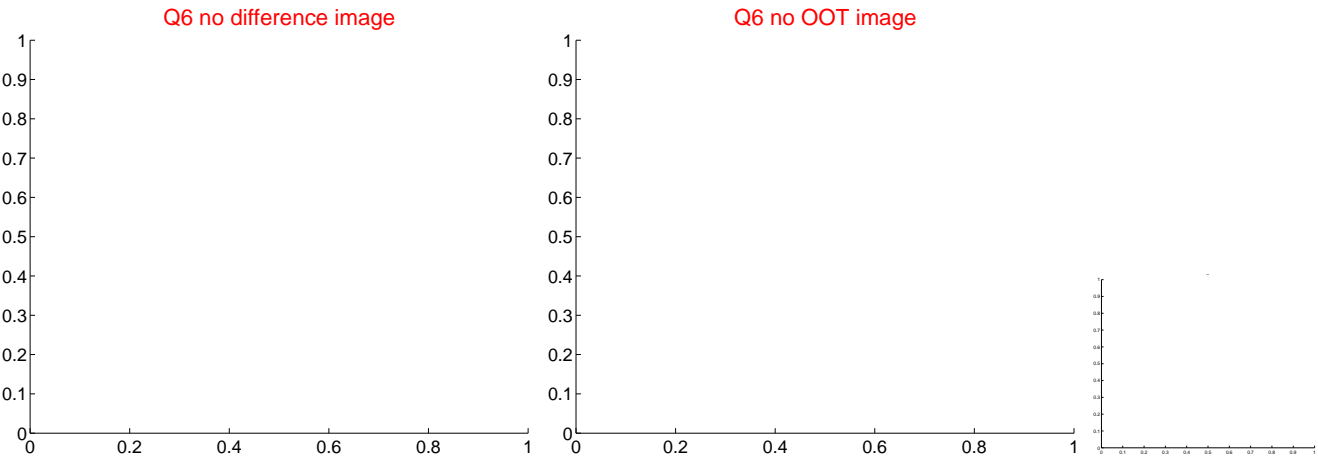
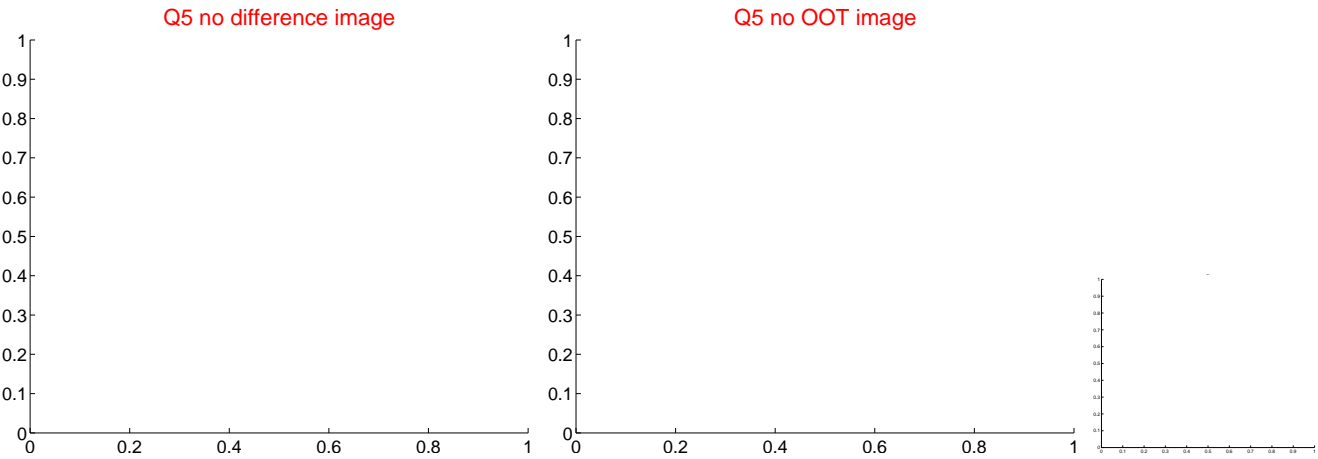


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



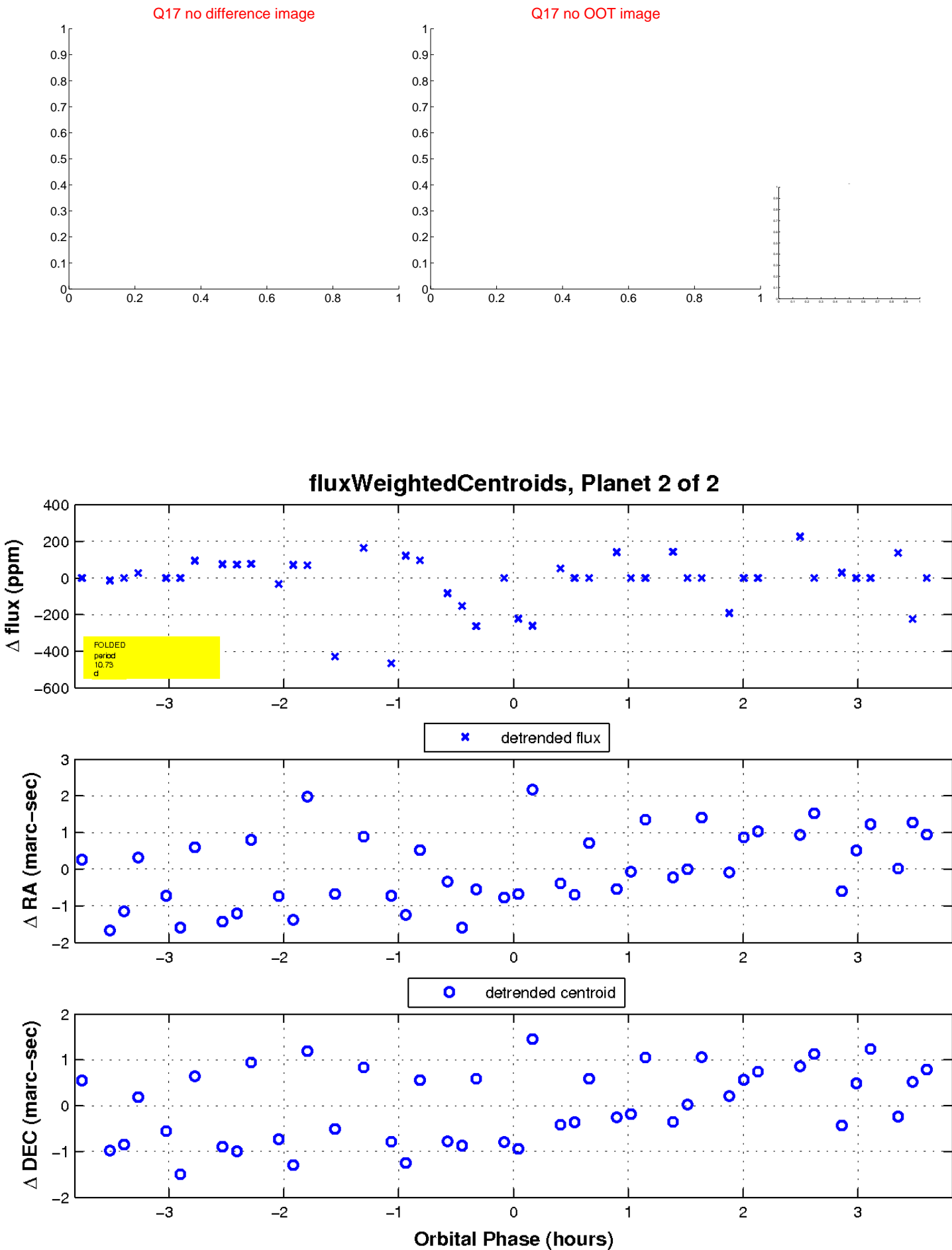
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

