

# KIC 008307354

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-----|------|-----------------------------|-----------------|------------------------|------------------------|
| 008307354-01 | OBS      | No      | 370.815956    | 230.929618   | 2284.8      | 14.864           | 8.5 | 8.1  | 0.81                        | 5546            | 4.66                   | 0.58                   |
| 008307354-02 | OBS      | 8155.01 | 320.602556    | 279.504458   | 543.9       | 15.000           | 7.2 | -1.0 | 0.81                        | 5546            | 1.86                   | 0.71                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008307354-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 008307354-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_NOFITS                               |

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

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

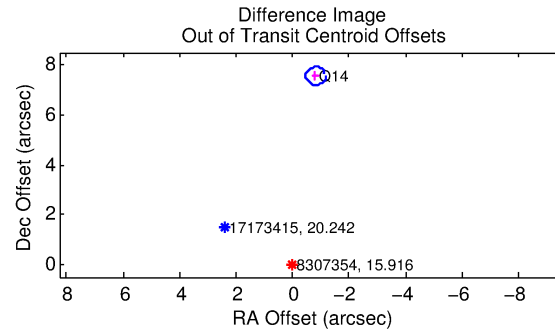
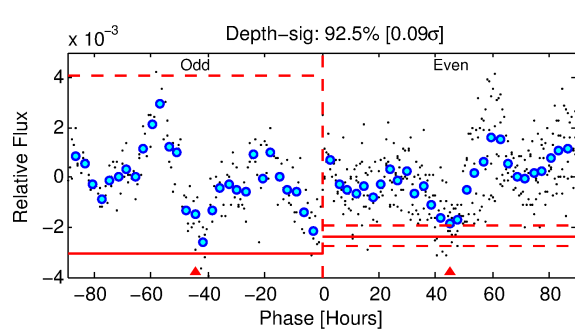
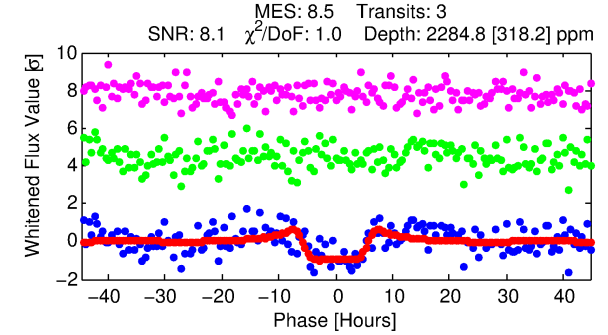
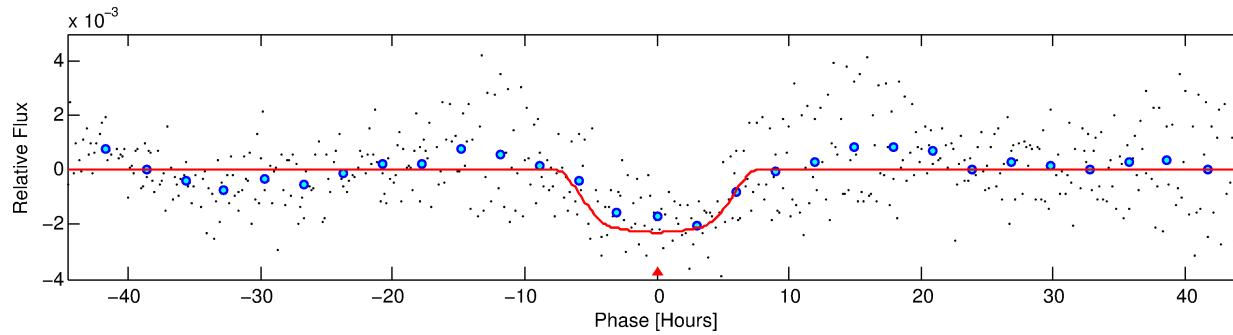
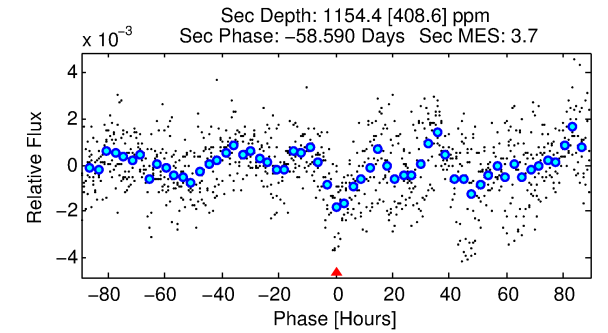
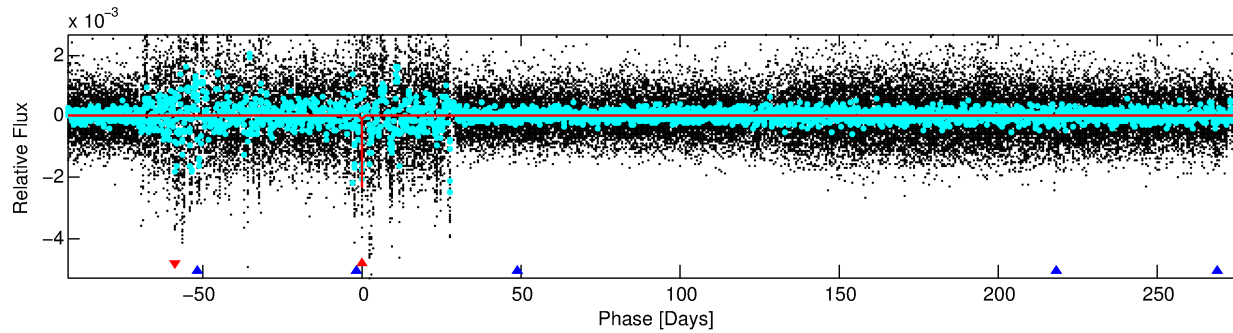
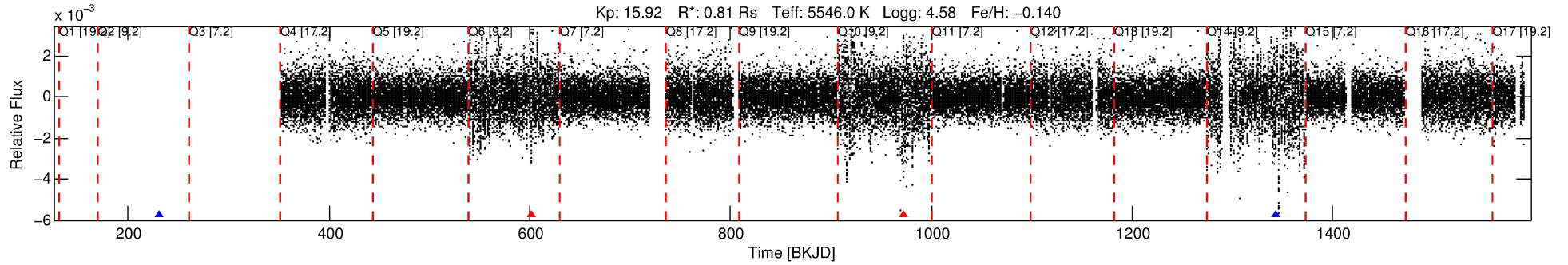
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008307354-01

No Significant Match Found

# DV One-Page Summary

KIC: 8307354 Candidate: 1 of 2 Period: 370.816 d



## DV Fit Results:

Period = 370.81596 [0.01622] d  
Epoch = 230.9296 [0.0325] BKJD  
Rp/R\* = 0.0527 [0.0046]  
a/R\* = 102.79 [17.64]  
b = 0.90 [0.04]  
Seff = 0.58 [0.19]  
Teq = 223 [18] K  
Rp = 4.66 [1.15] Re  
a = 0.9753 [0.1920] AU  
Ag = 27860.36 [13652.45] [2.04σ]  
Teff = 4454 [464] K [9.12σ]

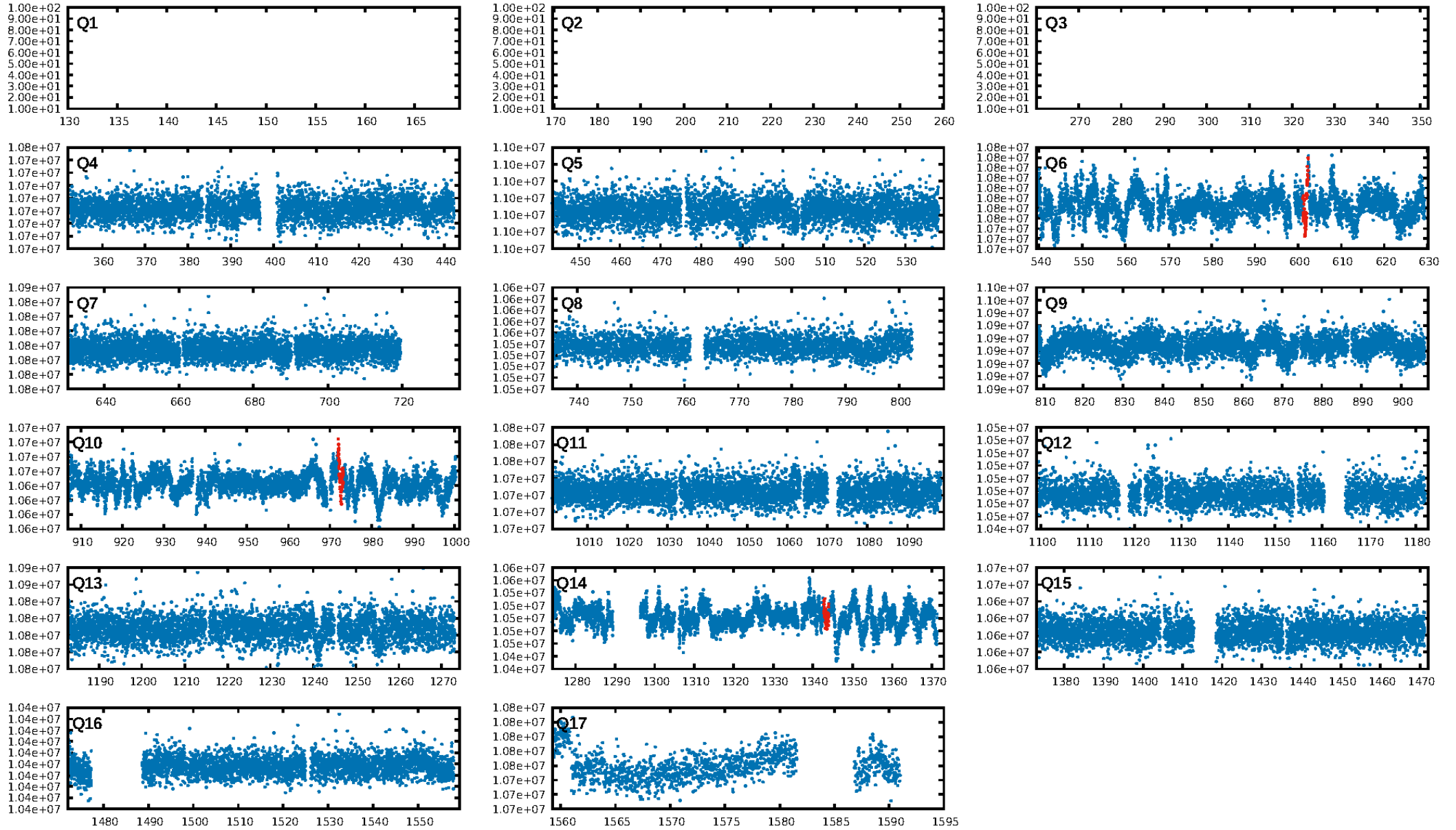
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [57.07σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 9.0%  
ModelChiSquareGoF-sig: 99.3%  
Bootstrap-pfa: 6.72e-11  
RollingBand-fgt: 0.33 [1/3]  
GhostDiagnostic-chr: -11.87  
Centroid-sig: 51.5%  
Centroid-so: 1.971 arcsec [0.56σ]  
OotOffset-rm: 7.601 arcsec [64.16σ]  
KicOffset-rm: 7.412 arcsec [62.57σ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.67 [2/3]

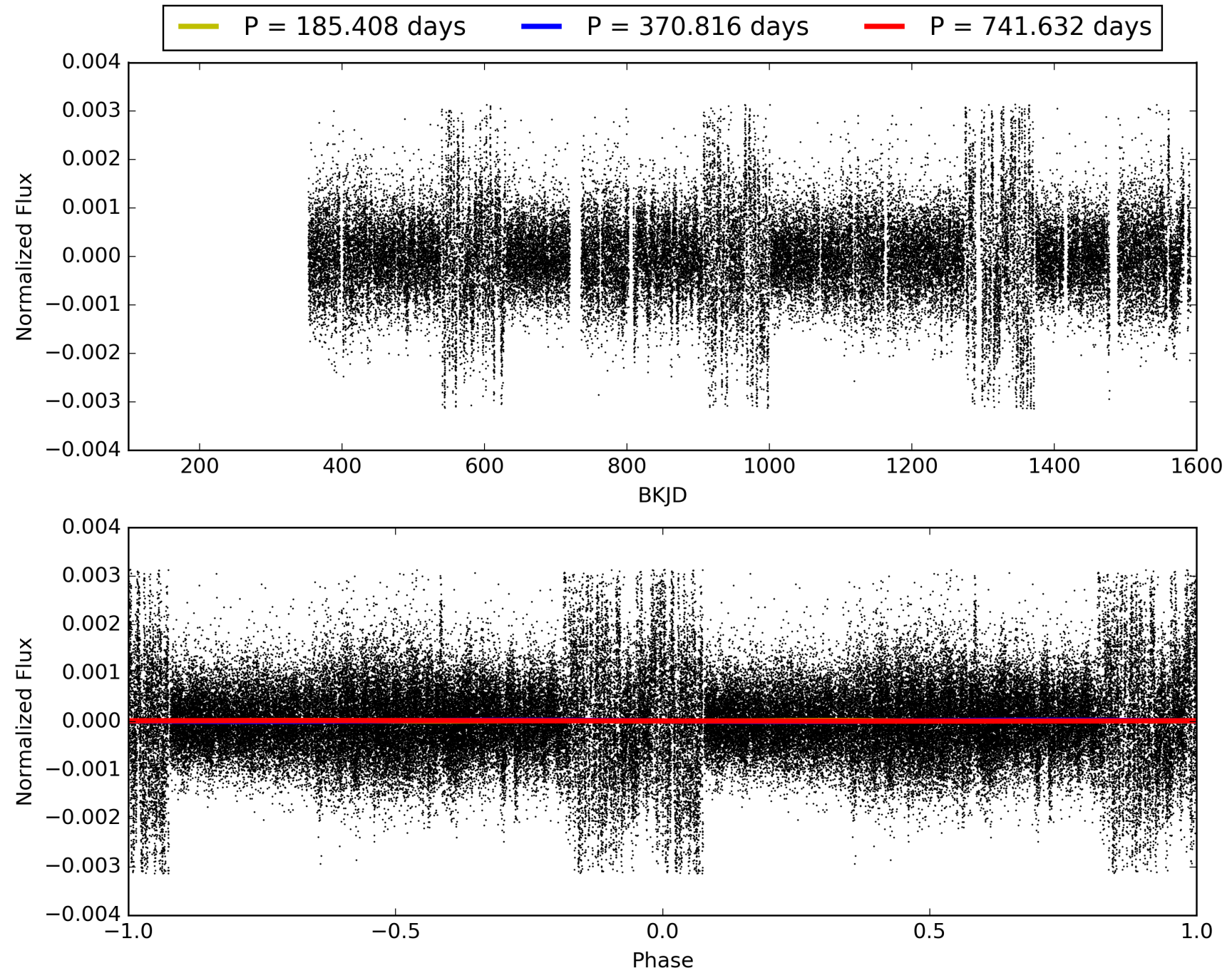
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:41:41 Z

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

# TCE 008307354-01, PDC Light Curves

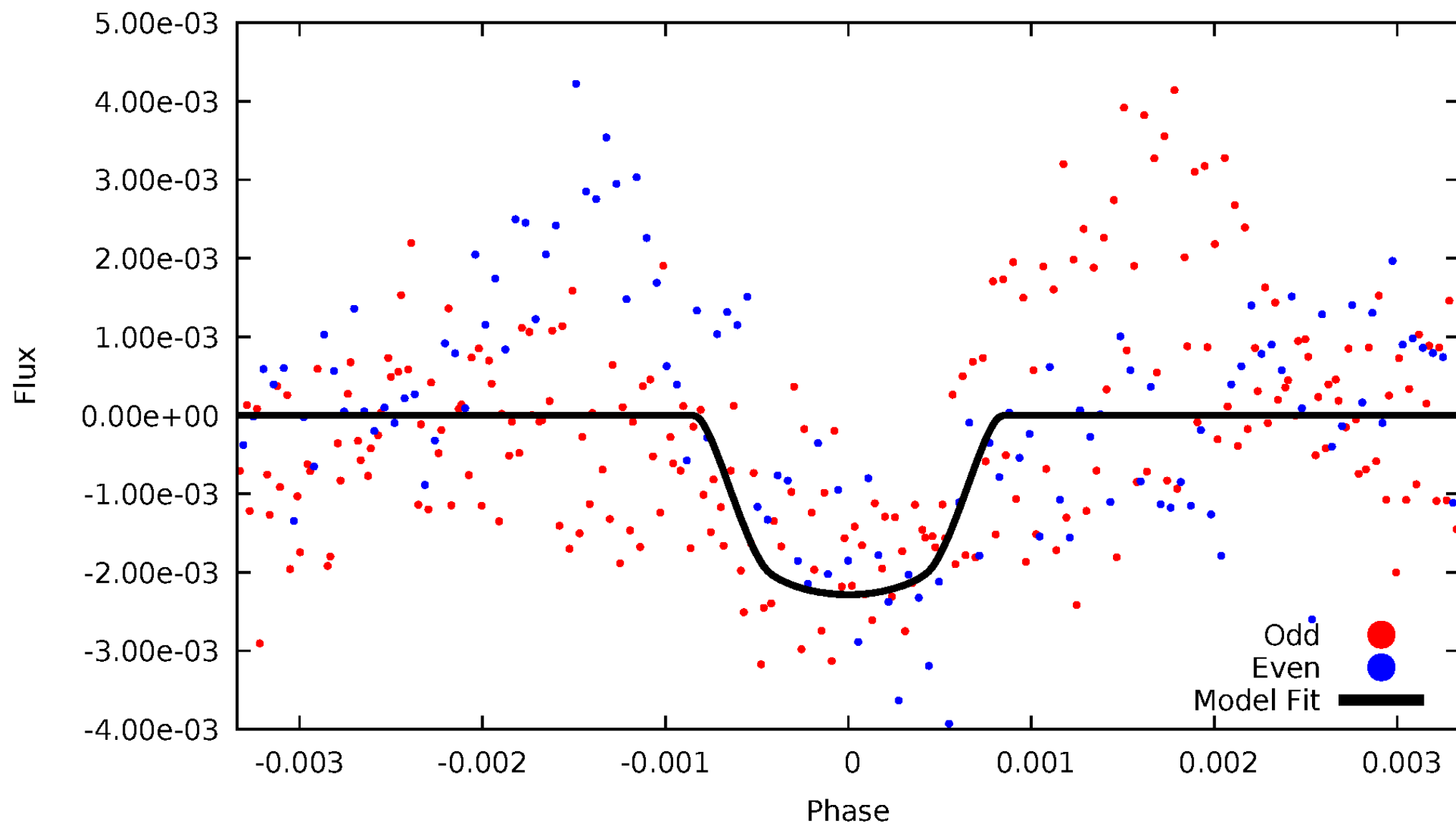


TCE 008307354-01



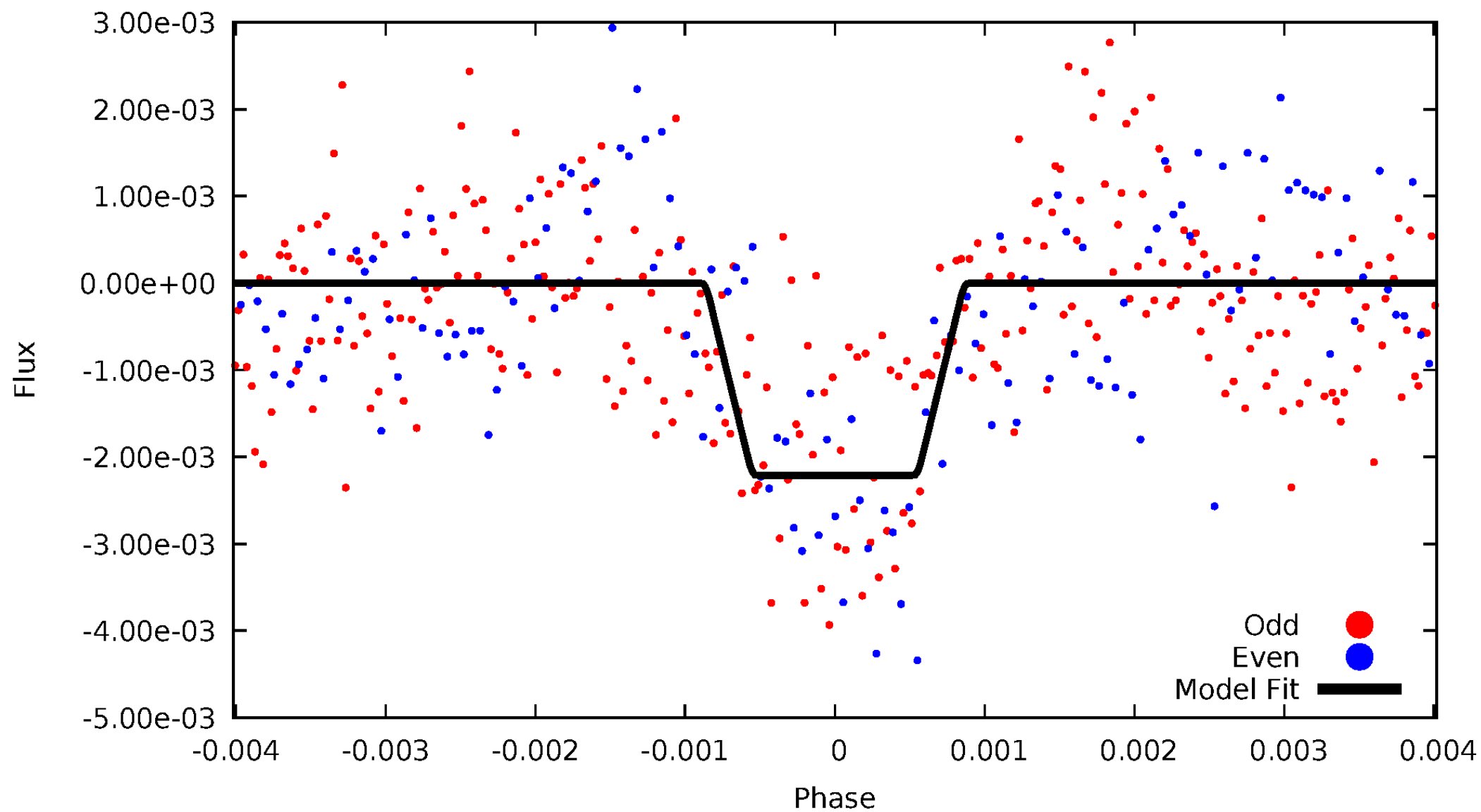
# DV Odd/Even

TCE 008307354-01



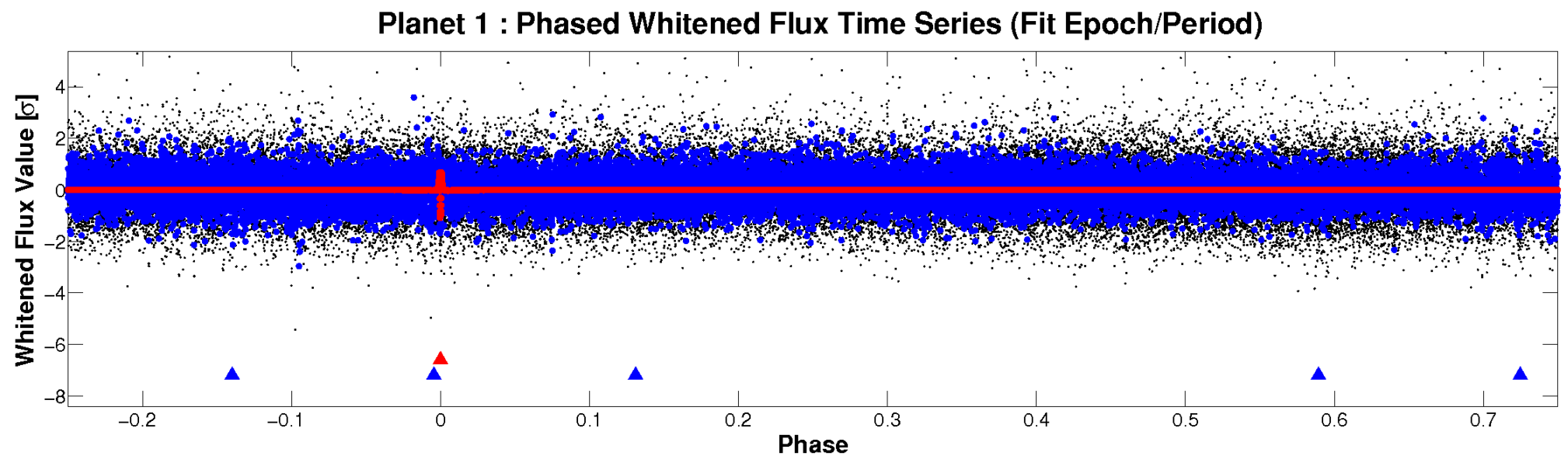
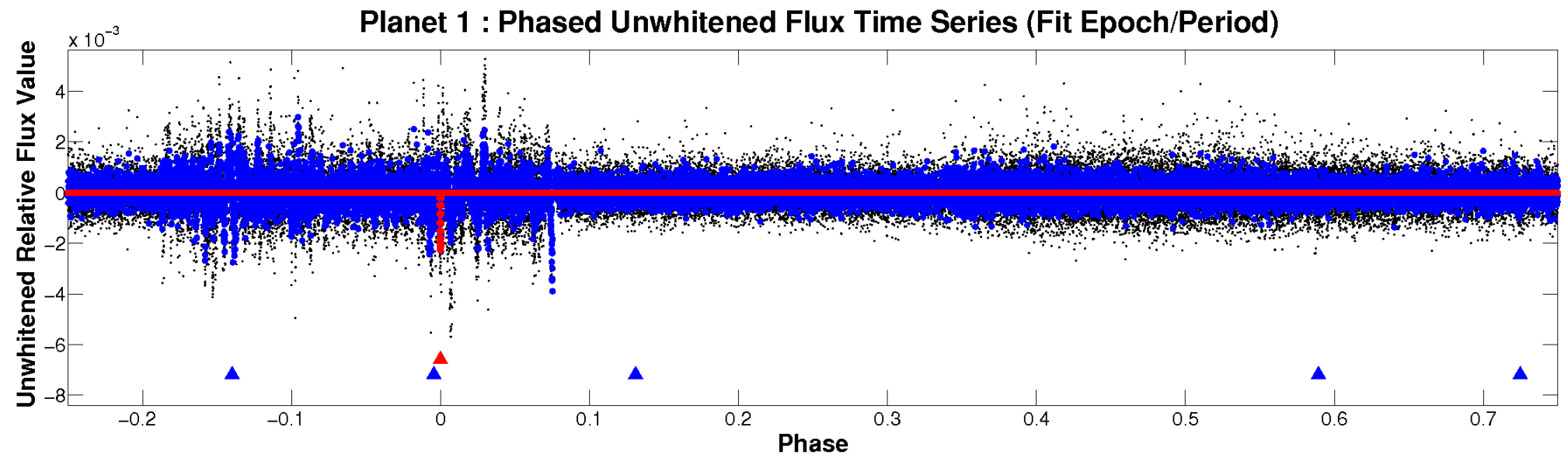
# ALT Odd/Even

TCE 008307354-01



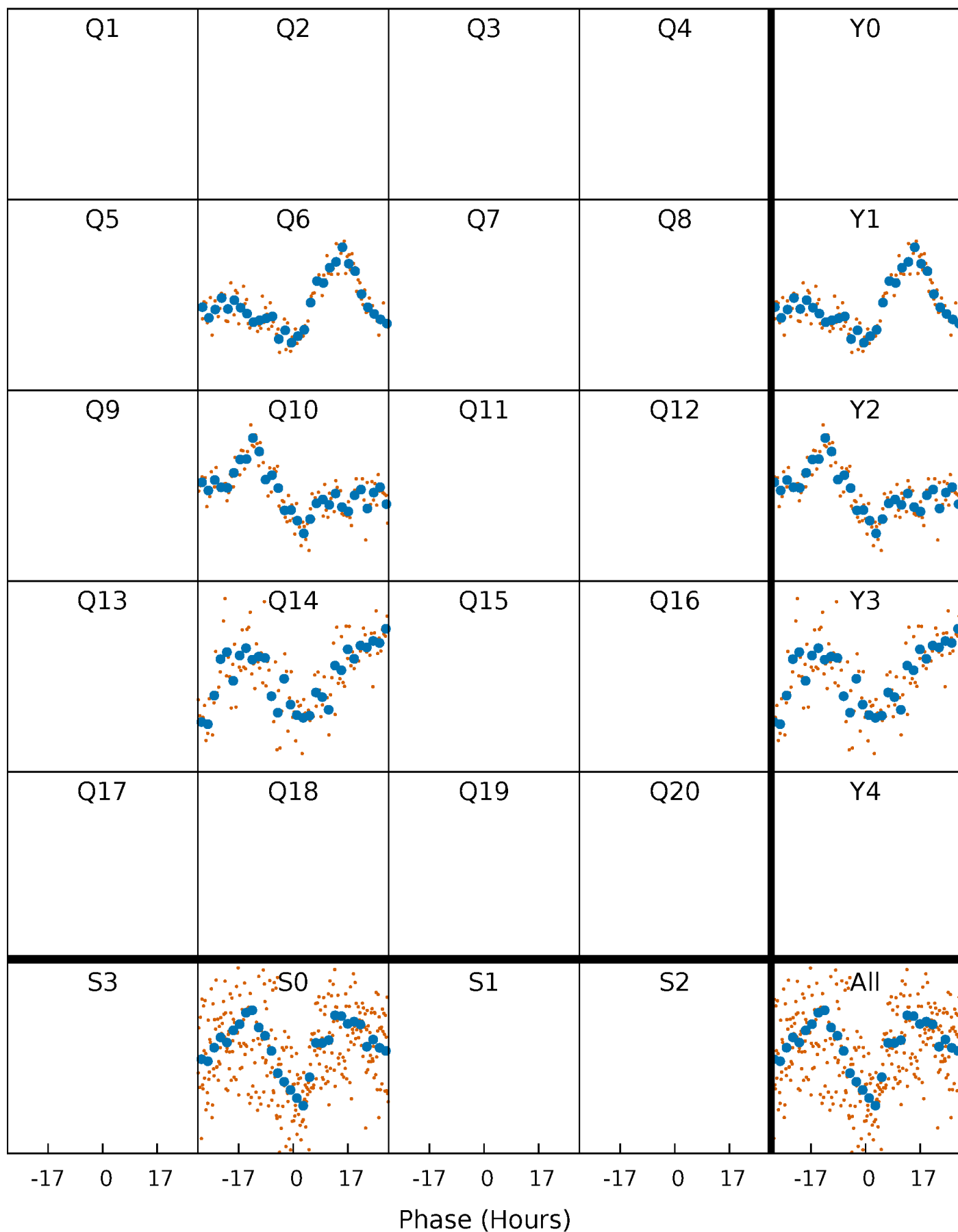


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

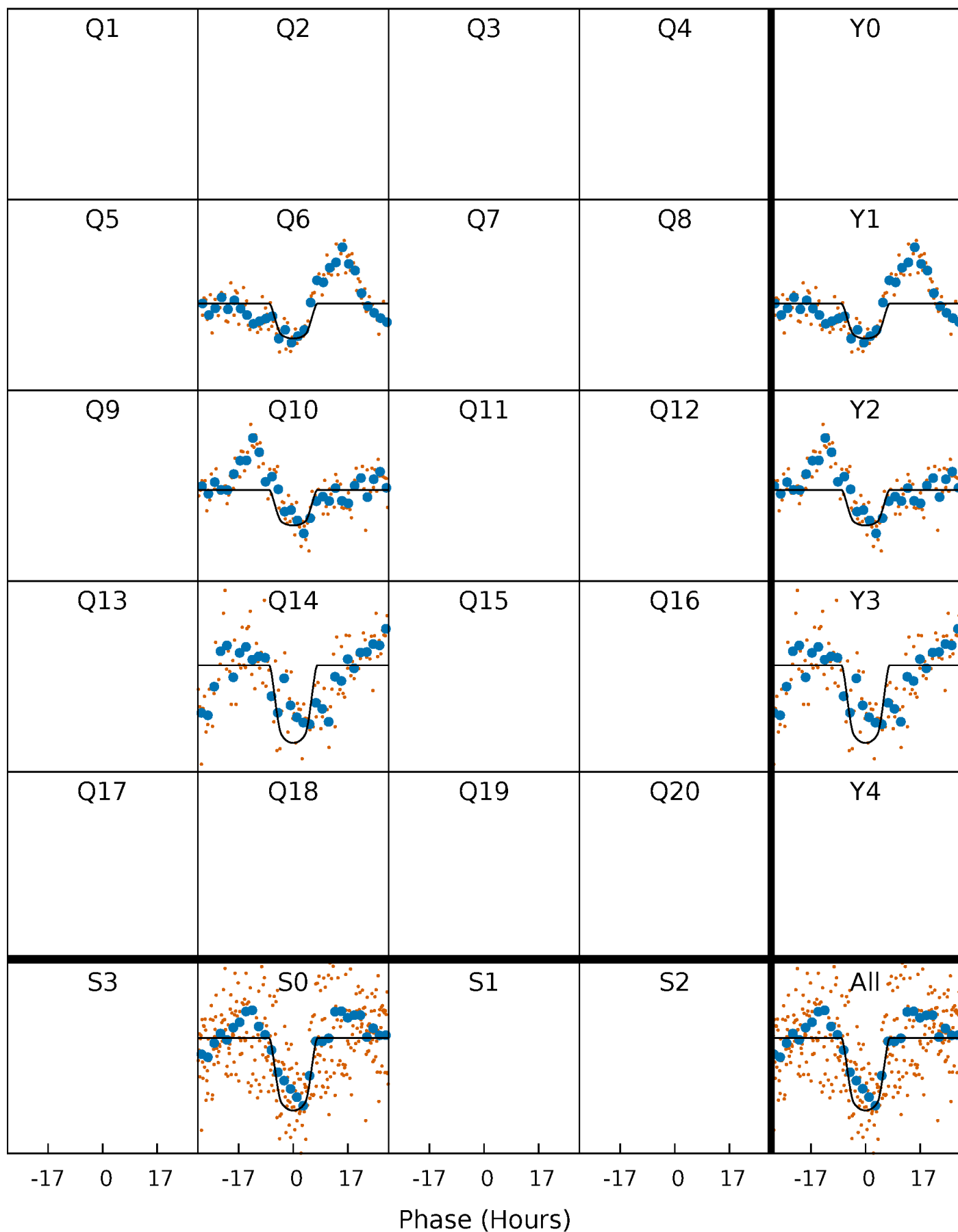
TCE 008307354-01 P=370.815956 Days  $T_0=230.929618$  (BKJD)





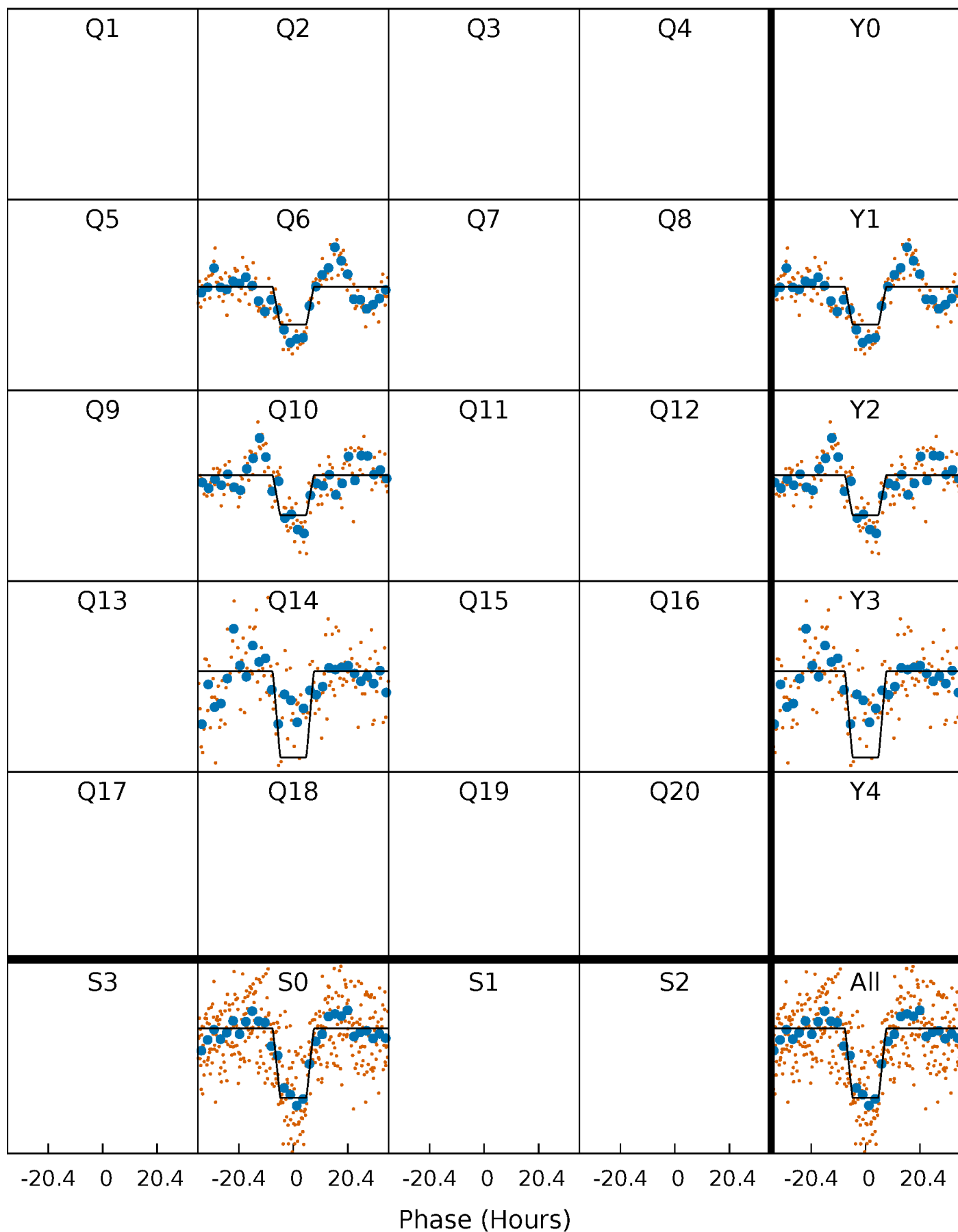
# DV Quarter-Phased Transit Curves

TCE 008307354-01 P=370.815956 Days  $T_0=230.929618$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

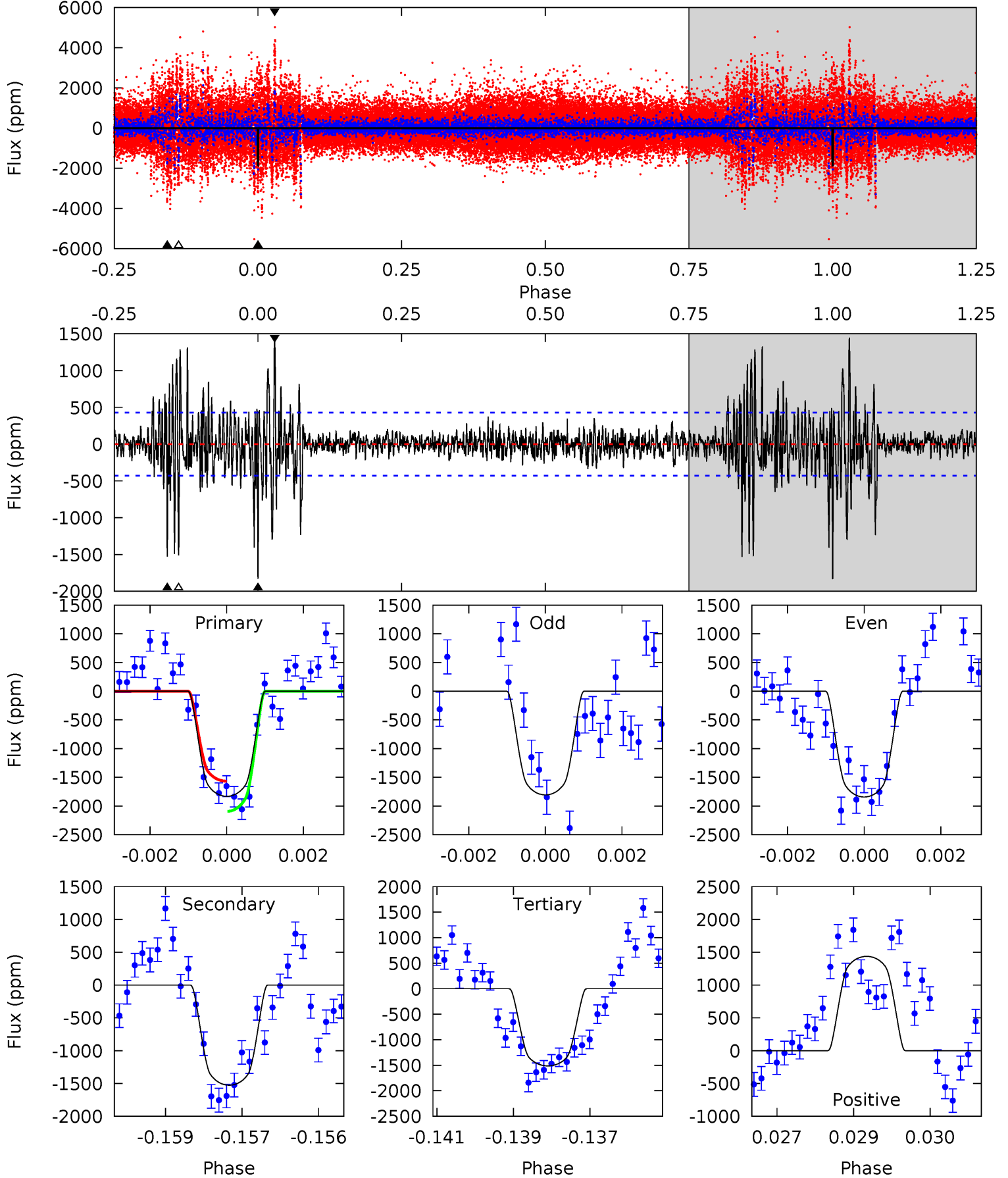
TCE 008307354-01 P=370.835058 Days  $T_0=230.890871$  (BKJD)



# DV Model-Shift Uniqueness Test

008307354-01, P = 370.815956 Days, E = 230.929618 Days

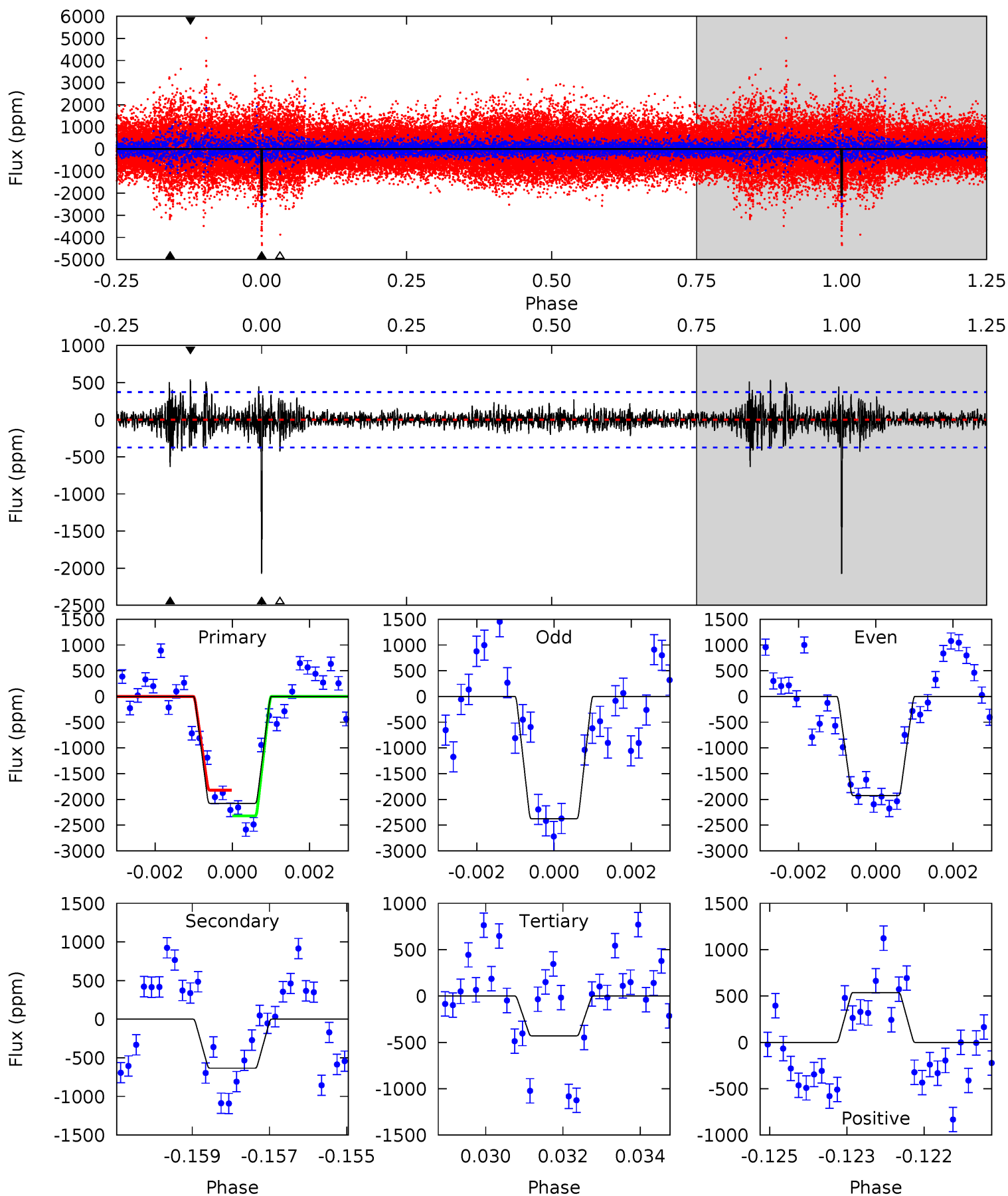
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 22.9 | 19.1 | 18.9 | 17.9 | 5.36            | 3.14            | 2.88             | 3.98    | 4.92    | 0.17    | 1.11    | 0.21    | 1.01 | 0.44  | 3.29 |



# Alt Model-Shift Uniqueness Test

008307354-01, P = 370.835058 Days, E = 230.890871 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 29.8 | 9.09 | 6.16 | 7.70 | 5.35            | 3.13            | 1.25             | 23.6    | 22.1    | 2.94    | 1.39    | 3.03    | 0.87 | 0.21  | 3.58 |



### Stellar Parameters For KIC 008307354

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M$ ( $M_{\odot}$ )       | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $5546^{+182}_{-182}$ | $4.575^{+0.040}_{-0.160}$ | $-0.140^{+0.300}_{-0.300}$ | $0.810^{+0.187}_{-0.067}$ | $0.907^{+0.091}_{-0.102}$ | $2.404^{+0.499}_{-1.037}$                     |
|        | +3%/-3%              | +1%/-3%                   | +214%/-214%                | +23%/-8%                  | +10%/-11%                 | +21%/-43%                                     |
| Source | KIC0                 | KIC0                      | KIC0                       | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 008307354-01 / KOI

| Detrend | Depth (ppm)    | $R_p$ ( $R_{\oplus}$ ) | $T_{\text{max}}$ (K) | $T_{\text{obs}}$ (K) | $A_{\text{obs}}$        |
|---------|----------------|------------------------|----------------------|----------------------|-------------------------|
| DV      | $-1526 \pm 80$ | $4.80^{+0.68}_{-0.57}$ | $317^{+18}_{-14}$    | $4873^{+256}_{-222}$ | $34413^{+9627}_{-7664}$ |
| Alt.    | $-634 \pm 70$  | $4.32^{+0.65}_{-0.54}$ | $317^{+19}_{-14}$    | $4272^{+215}_{-195}$ | $17622^{+5438}_{-4292}$ |

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

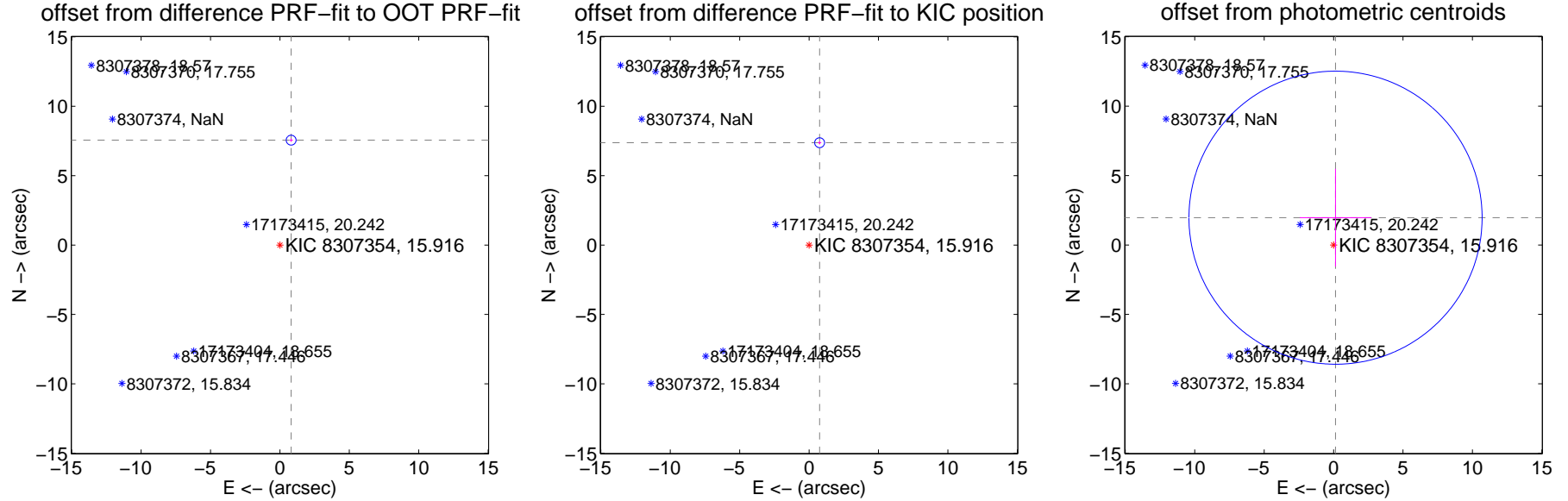
## DV Centroid Data

Supplemental centroid analysis for 008307354-01. Kepler magnitude: 15.92. Transit SNR 8.15

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | 7.601 $\pm$ 0.118  | 64.16               | -0.809 $\pm$ 0.119 | 7.558 $\pm$ 0.118 |
| PRF-fit source offset from KIC position | 7.412 $\pm$ 0.118  | 62.57               | -0.757 $\pm$ 0.119 | 7.374 $\pm$ 0.118 |
| photometric centroid source offset      | 1.97 $\pm$ 3.52    | 0.56                | -0.14 $\pm$ 2.58   | 1.97 $\pm$ 3.52   |



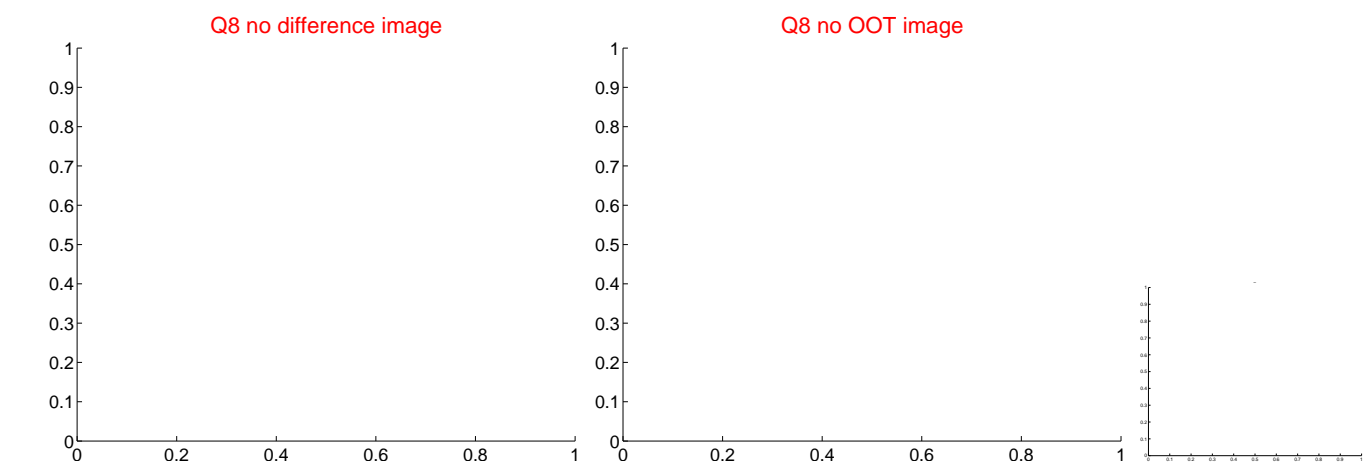
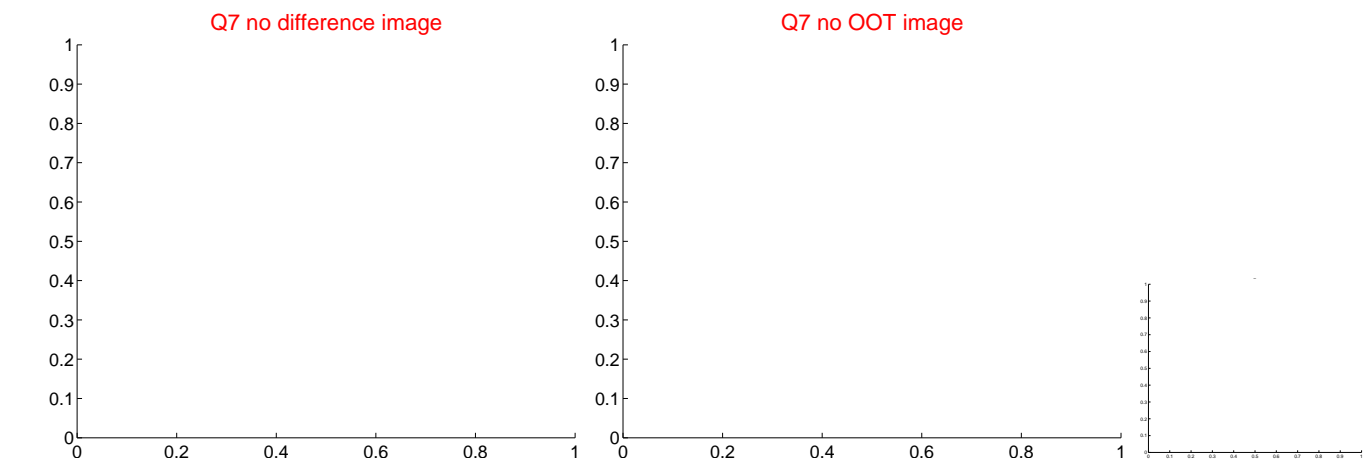
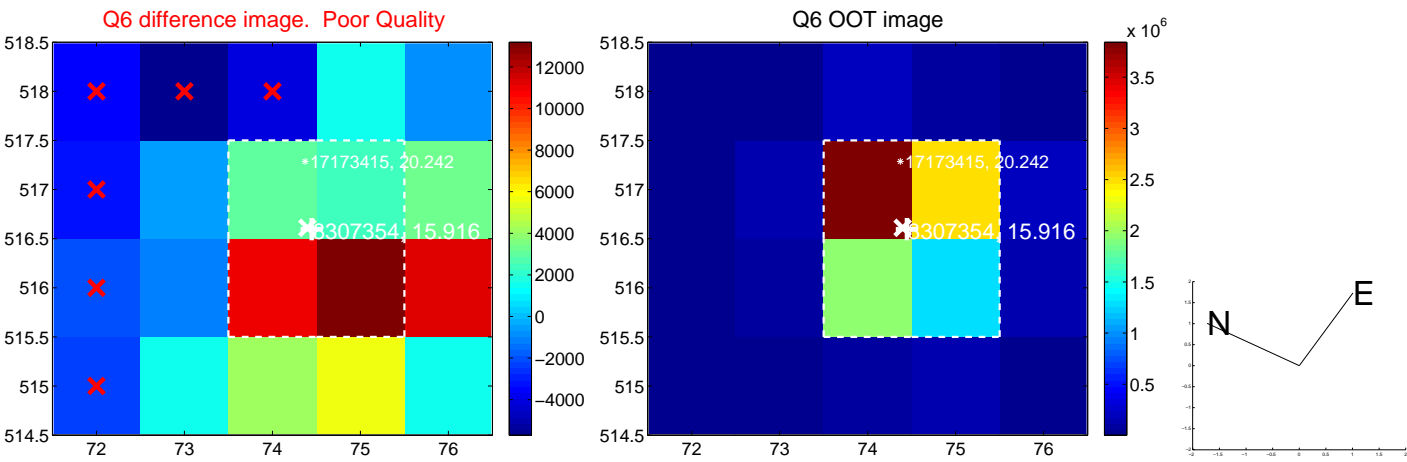
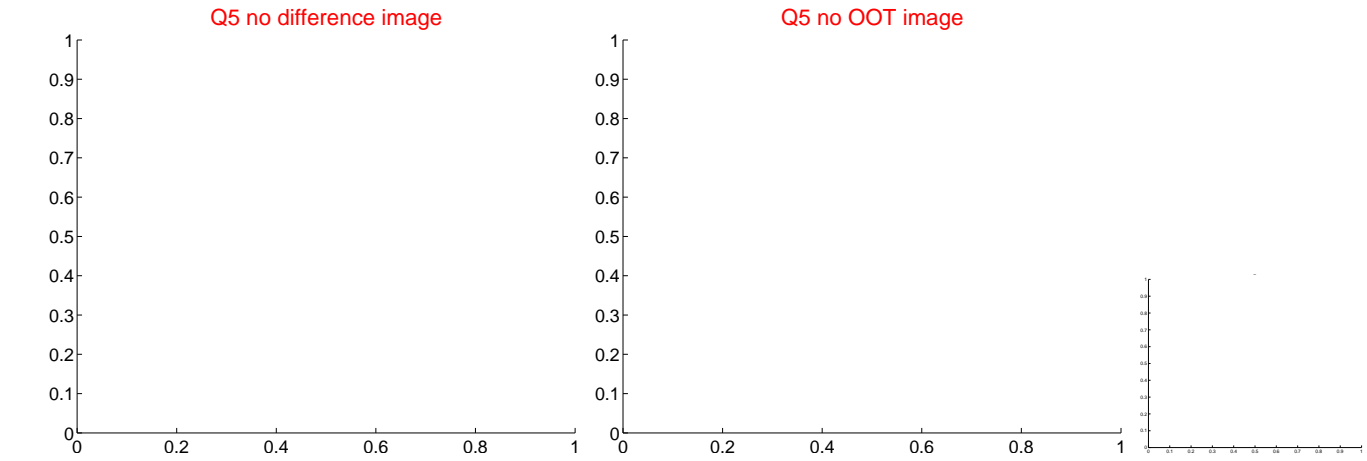
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

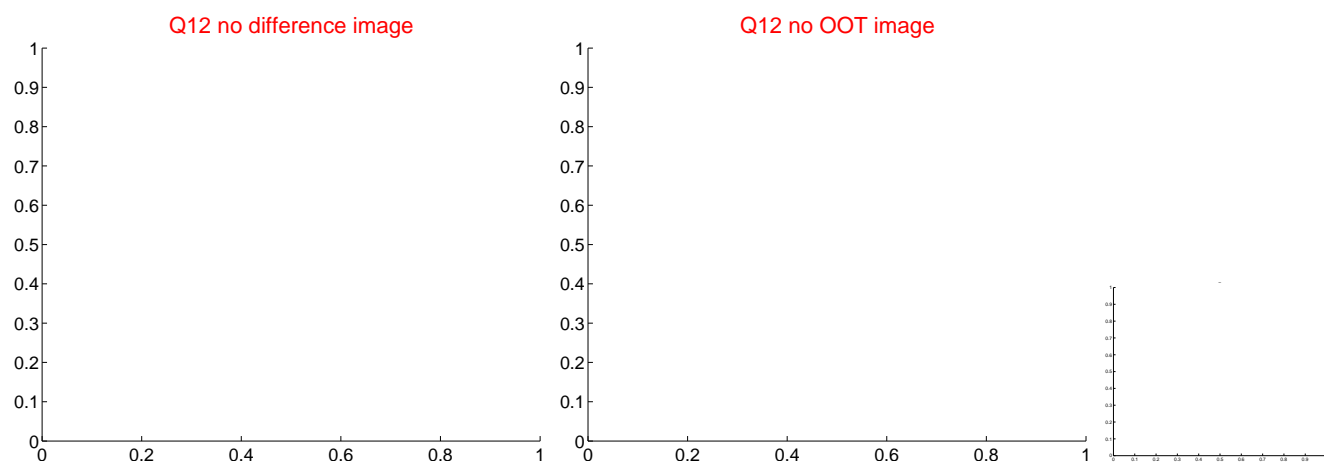
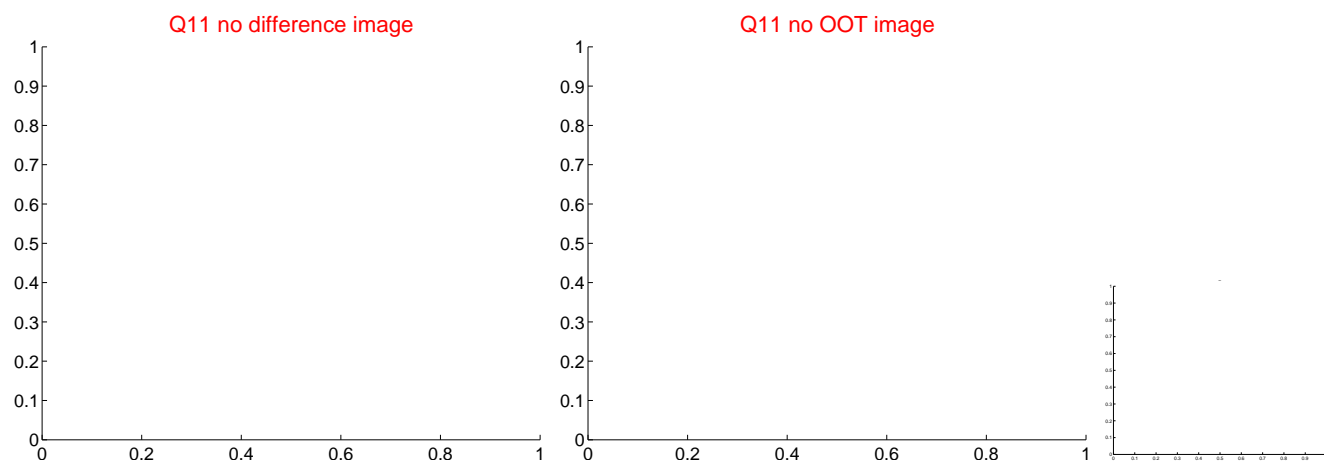
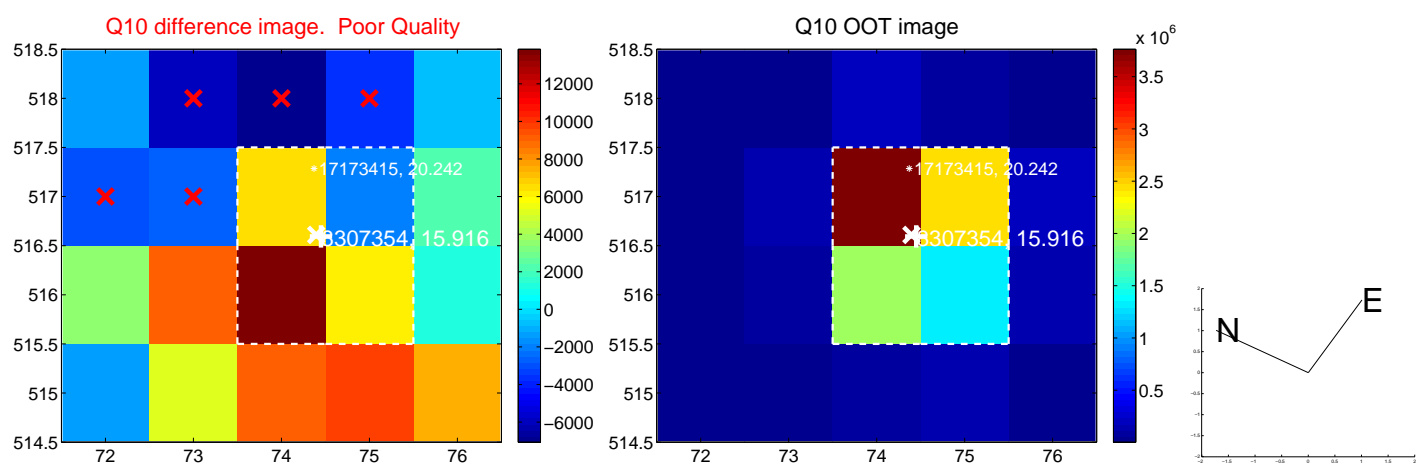
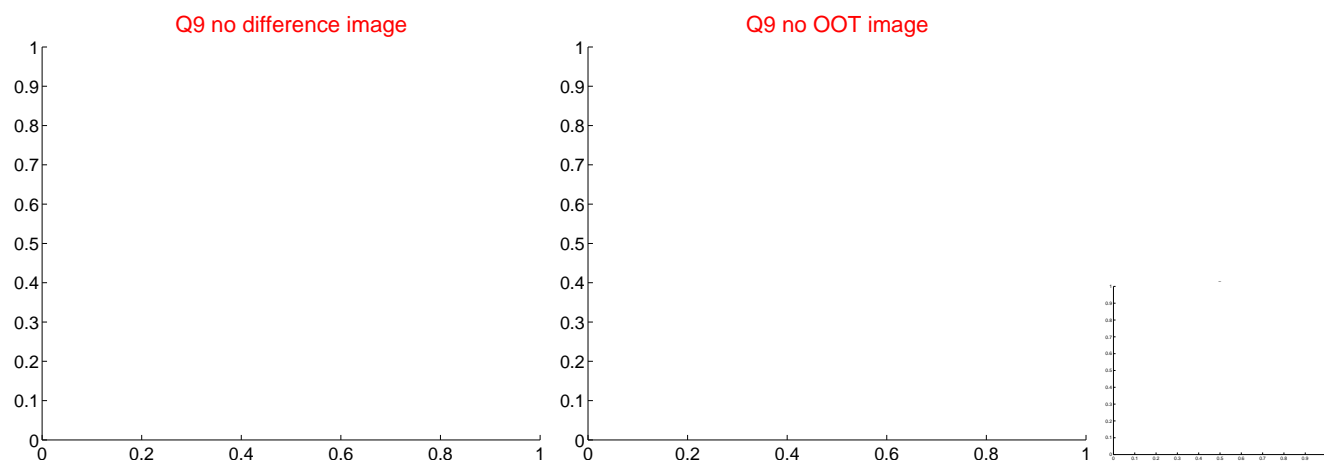




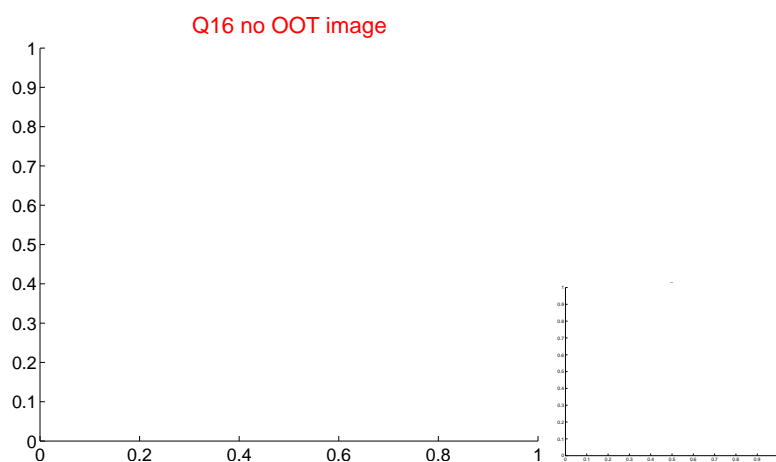
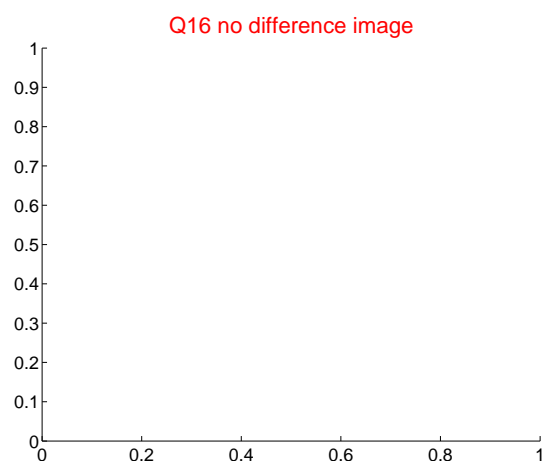
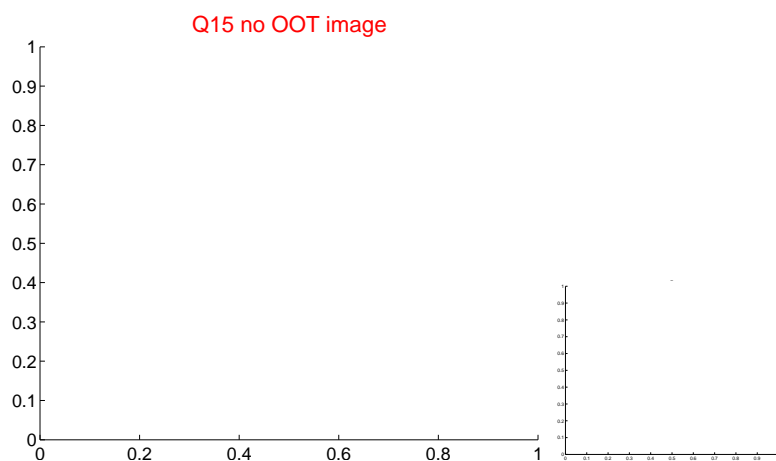
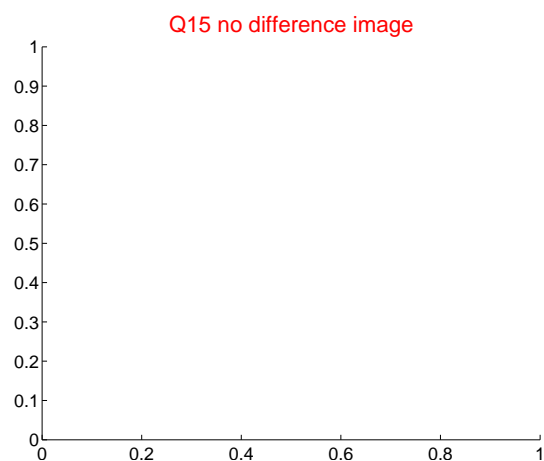
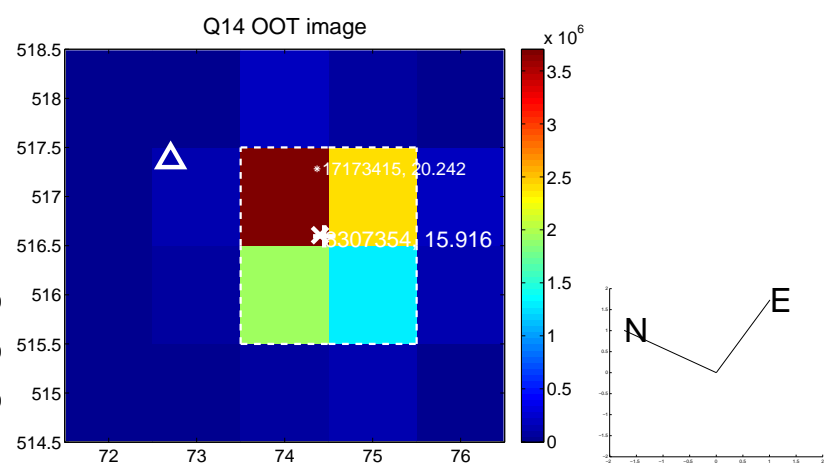
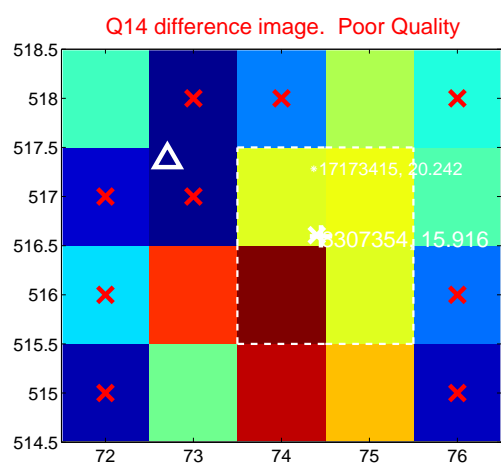
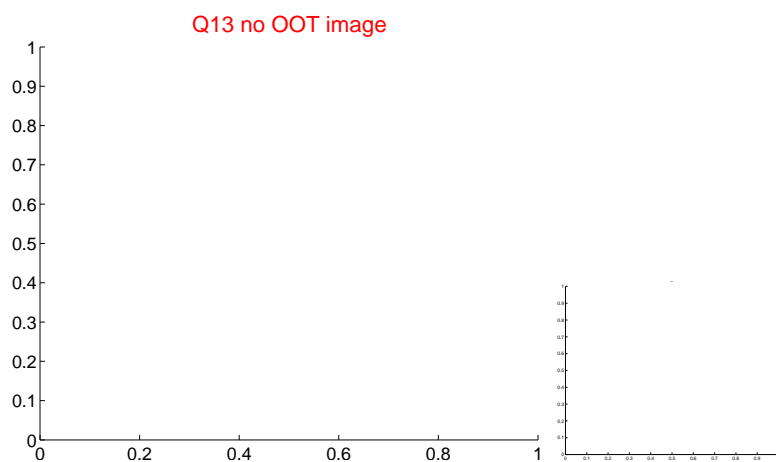
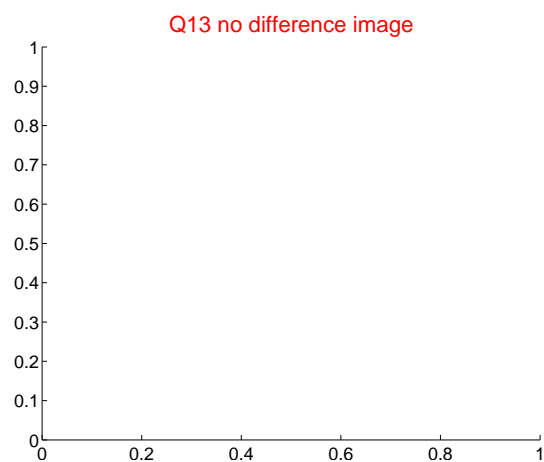
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



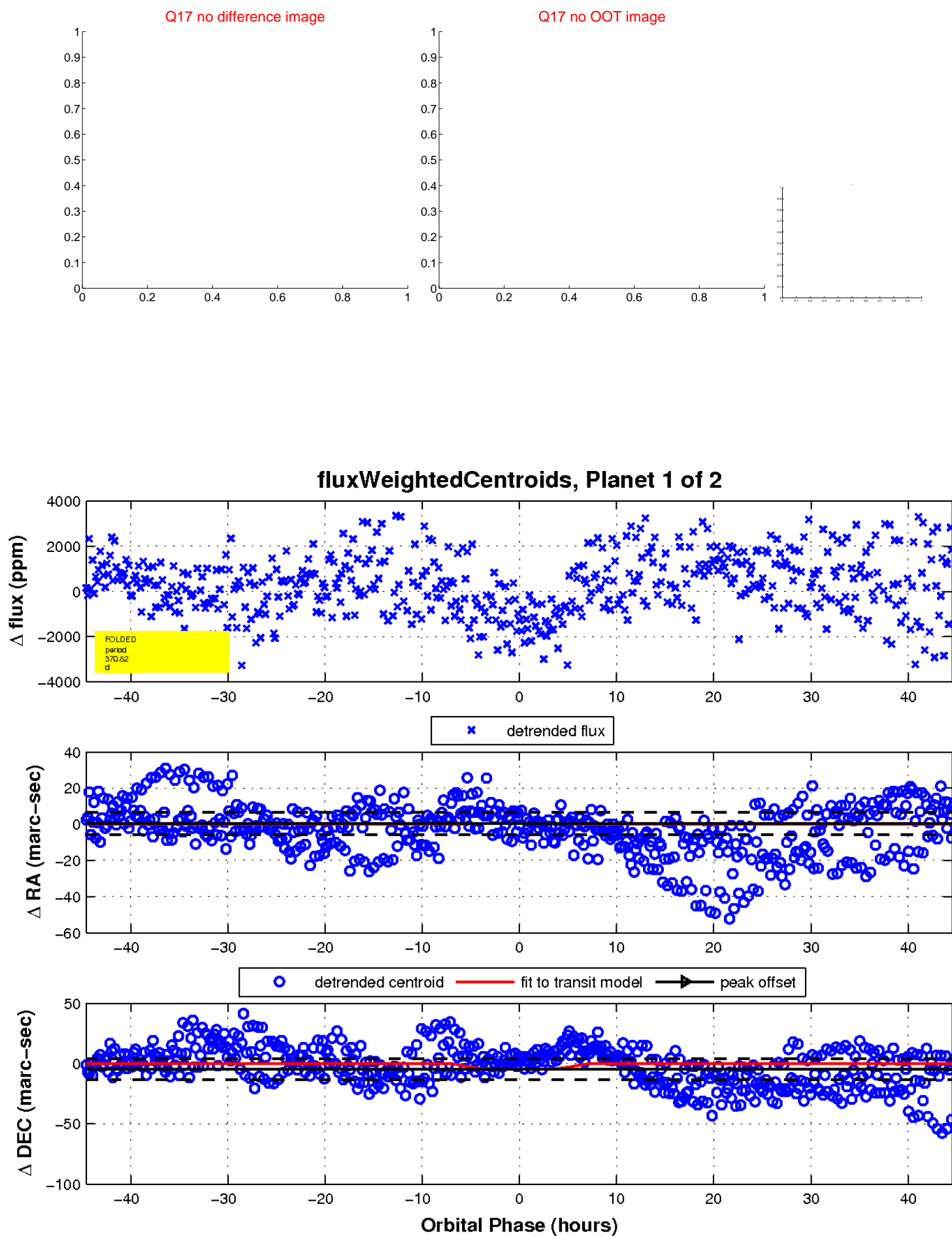
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

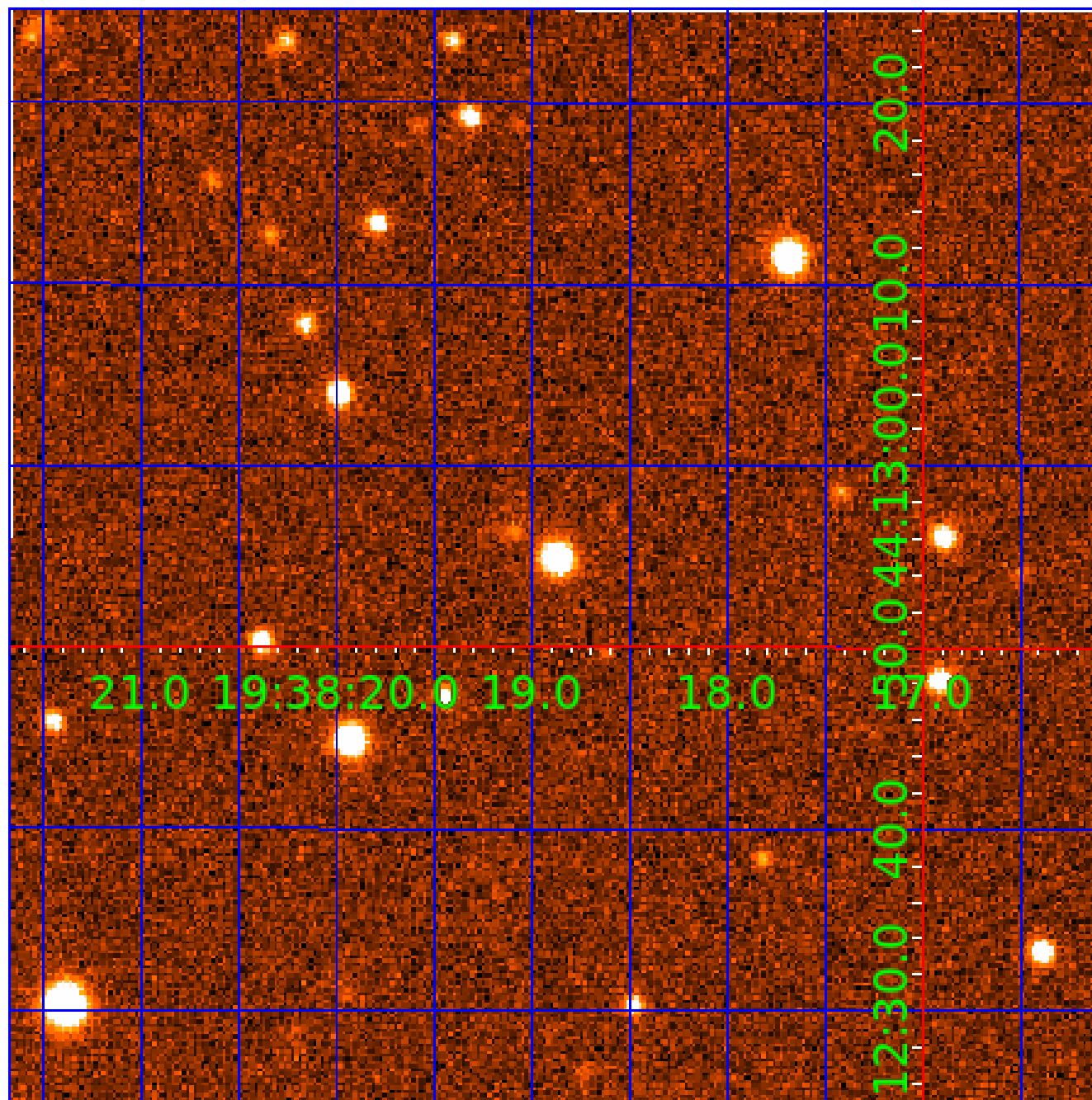


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008307354

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-----|------|-----------------------------|-----------------|------------------------|------------------------|
| 008307354-01 | OBS      | No      | 370.815956    | 230.929618   | 2284.8      | 14.864           | 8.5 | 8.1  | 0.81                        | 5546            | 4.66                   | 0.58                   |
| 008307354-02 | OBS      | 8155.01 | 320.602556    | 279.504458   | 543.9       | 15.000           | 7.2 | -1.0 | 0.81                        | 5546            | 1.86                   | 0.71                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 008307354-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 008307354-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_NOFITS                               |

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

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

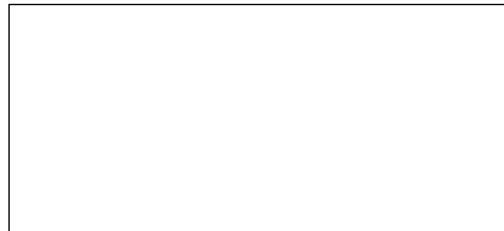
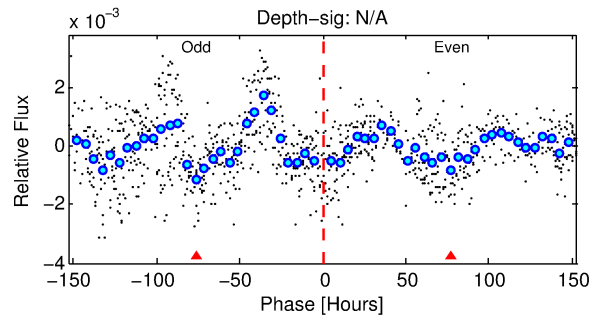
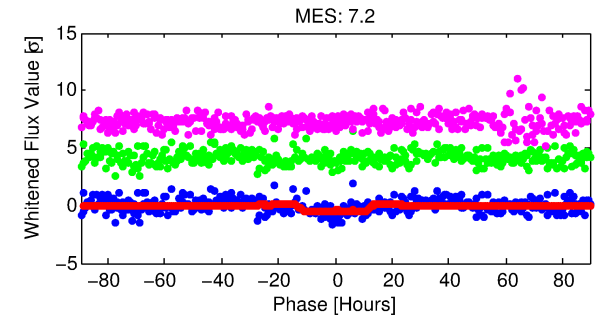
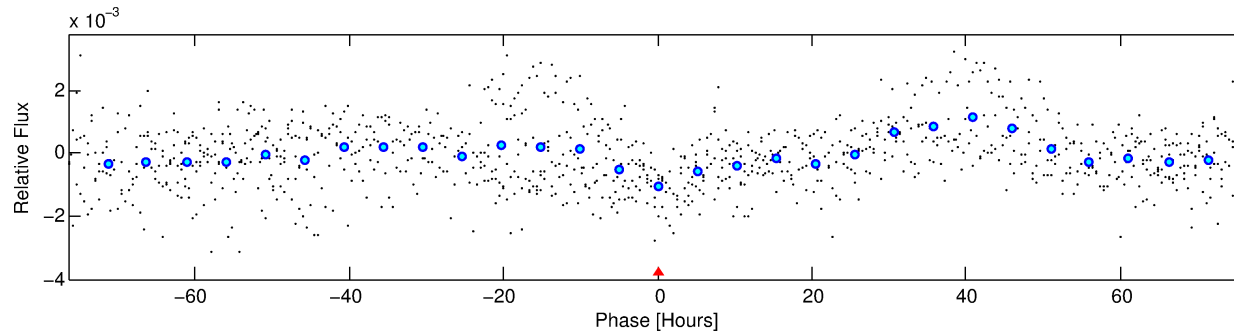
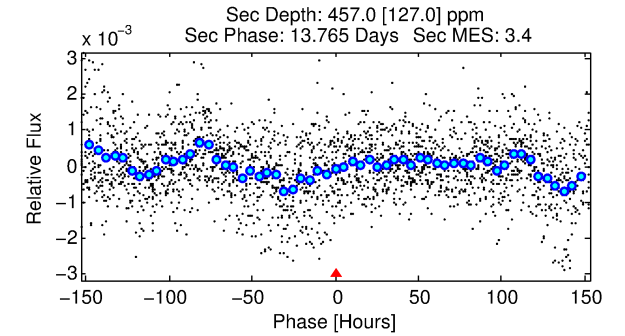
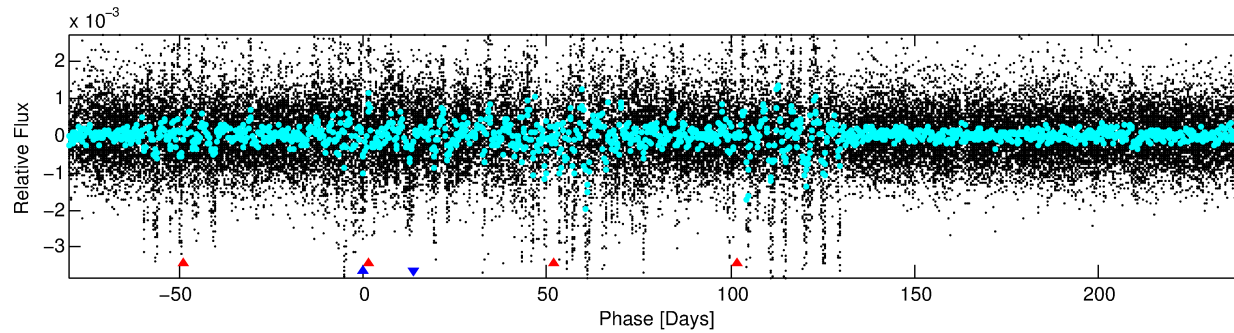
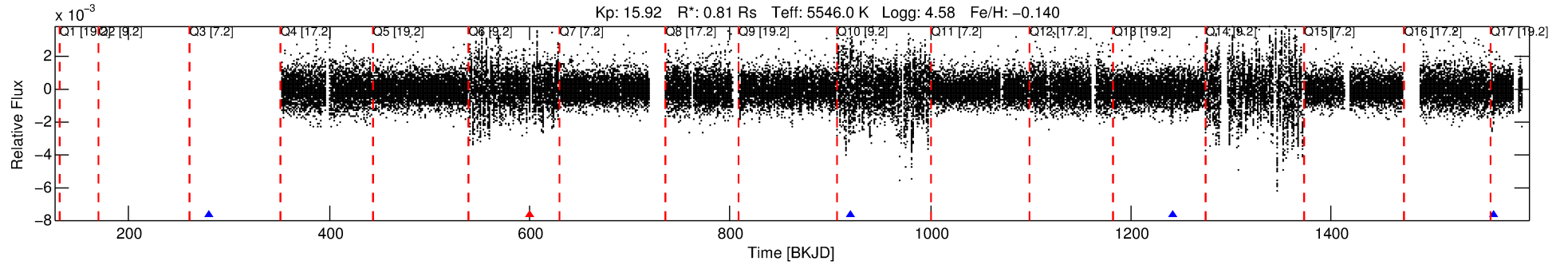
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 008307354-02

No Significant Match Found

# DV One-Page Summary

KIC: 8307354 Candidate: 2 of 2 Period: 320.603 d



## TPS TCE Results:

Period = 320.60256 d  
Epoch = 279.5045 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

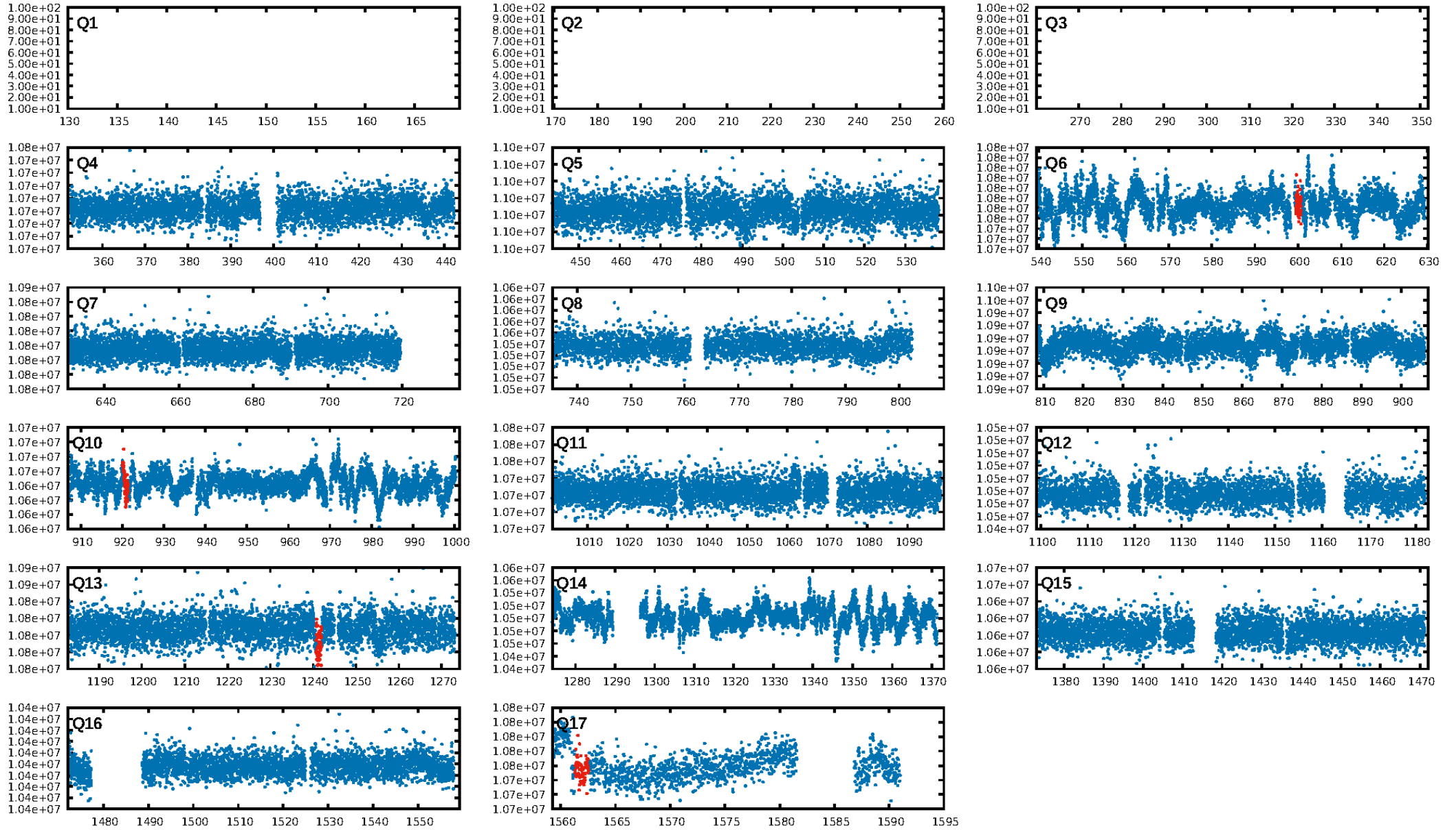
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [57.07σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.33e-10  
RollingBand-fgt: 0.67 [2/3]  
GhostDiagnostic-chr: 1.102  
Centroid-sig: 2.2%  
Centroid-so: 5.204 arcsec [1.72σ]  
OotOffset-rm: N/A  
KicOffset-rm: N/A  
OotOffset-st: 0/0/0 [0]  
KicOffset-st: 0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 1.00 [1/1]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:41:48 Z

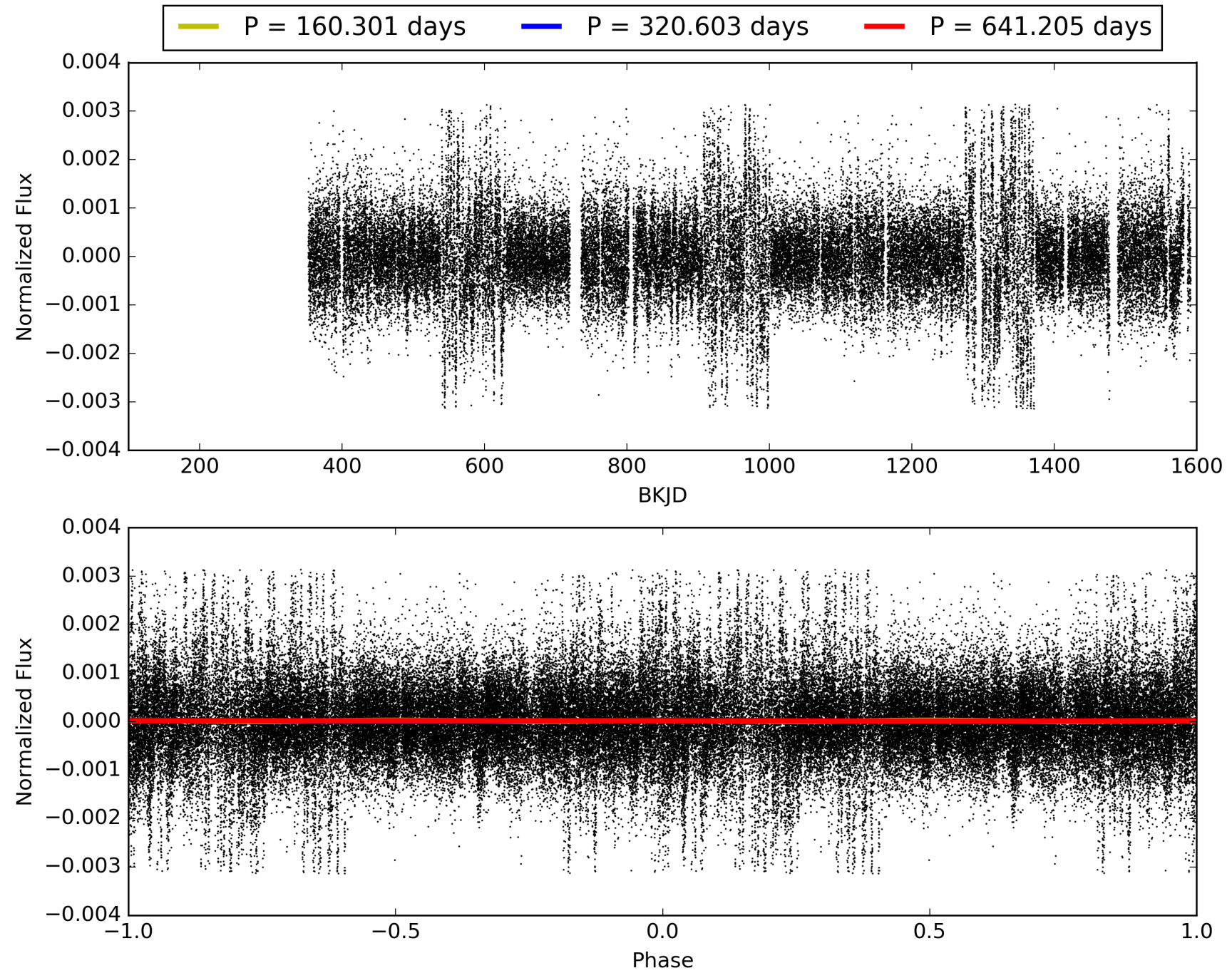
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 008307354-02, PDC Light Curves

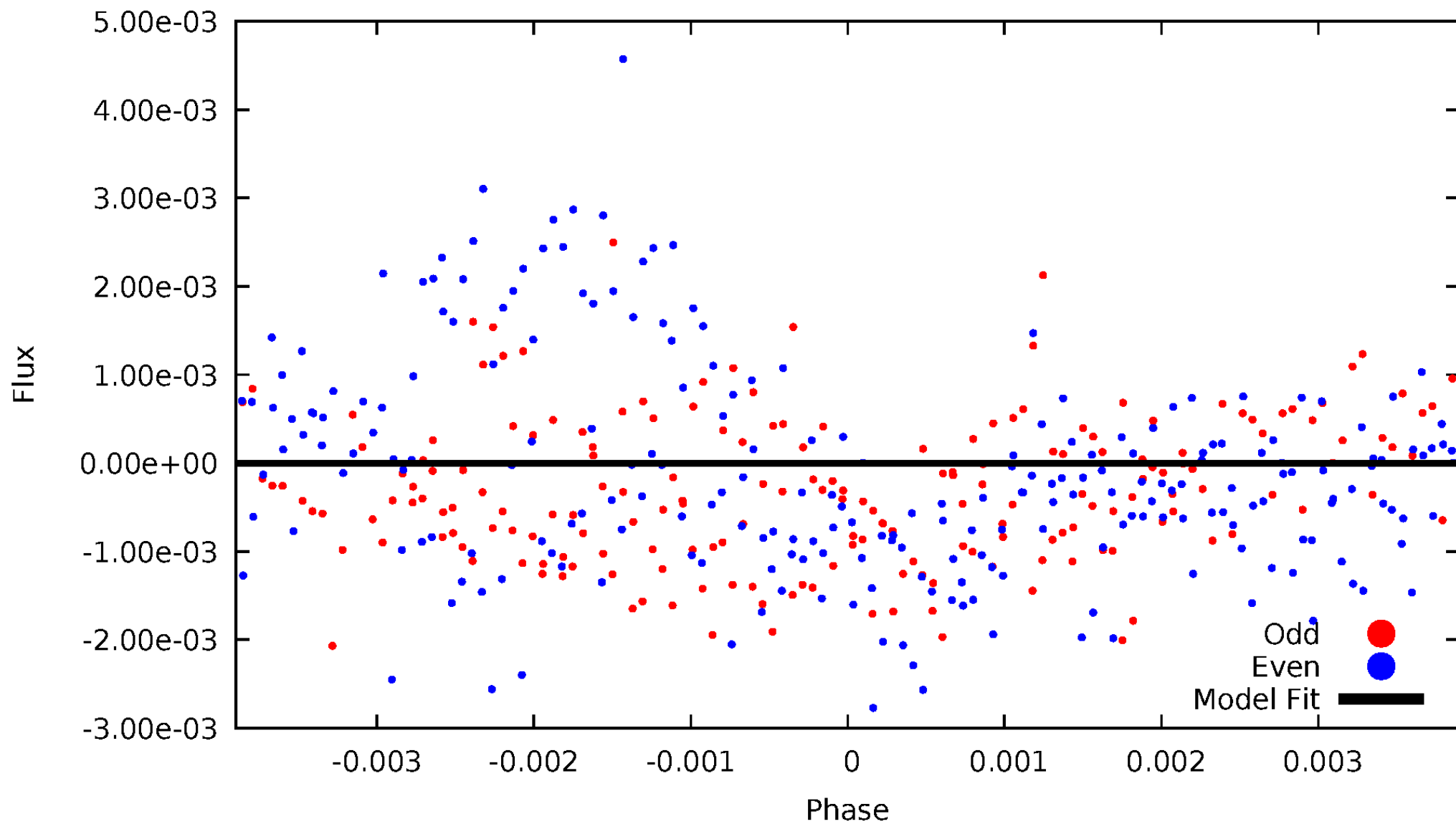


TCE 008307354-02



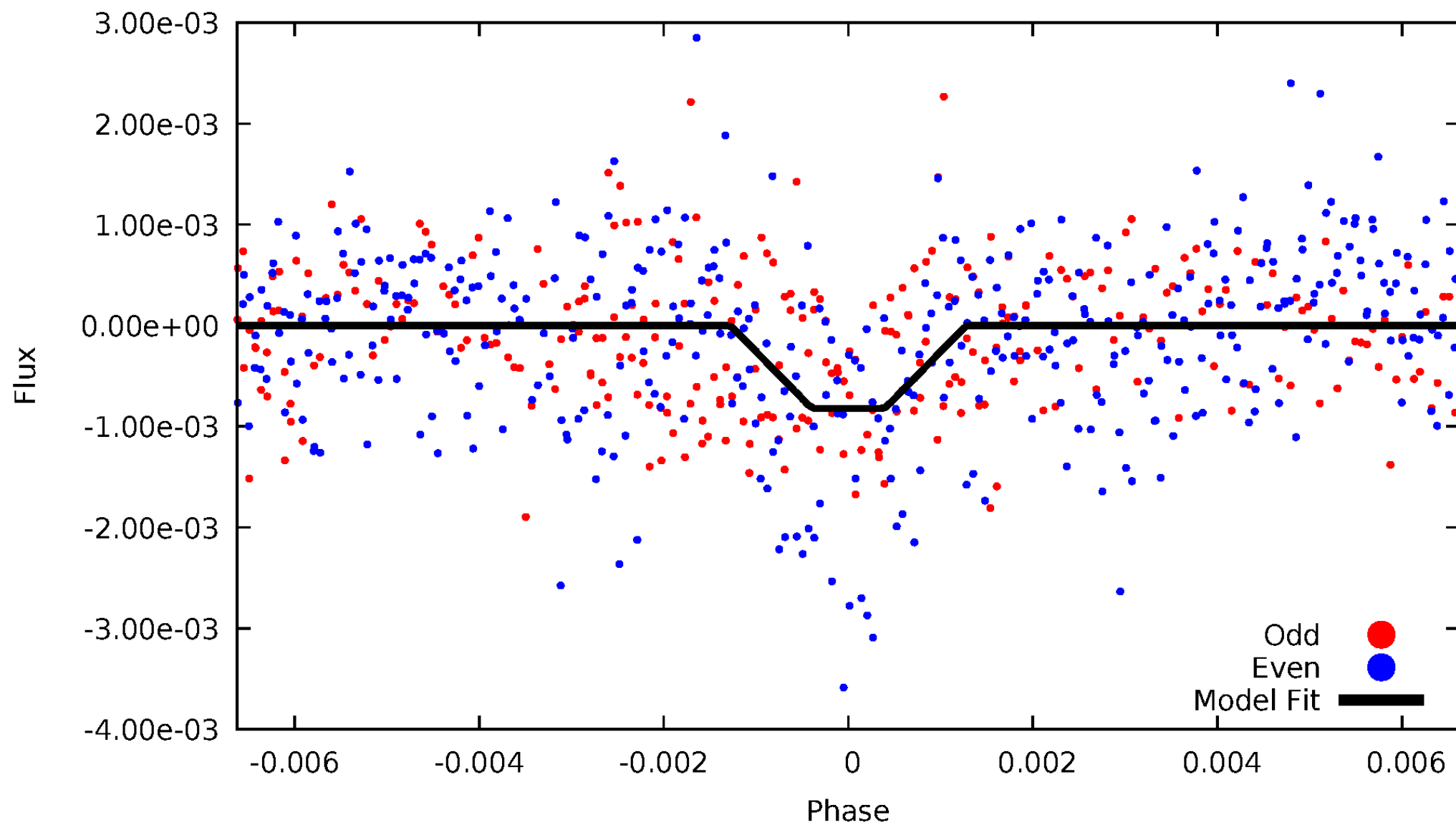
# DV Odd/Even

TCE 008307354-02



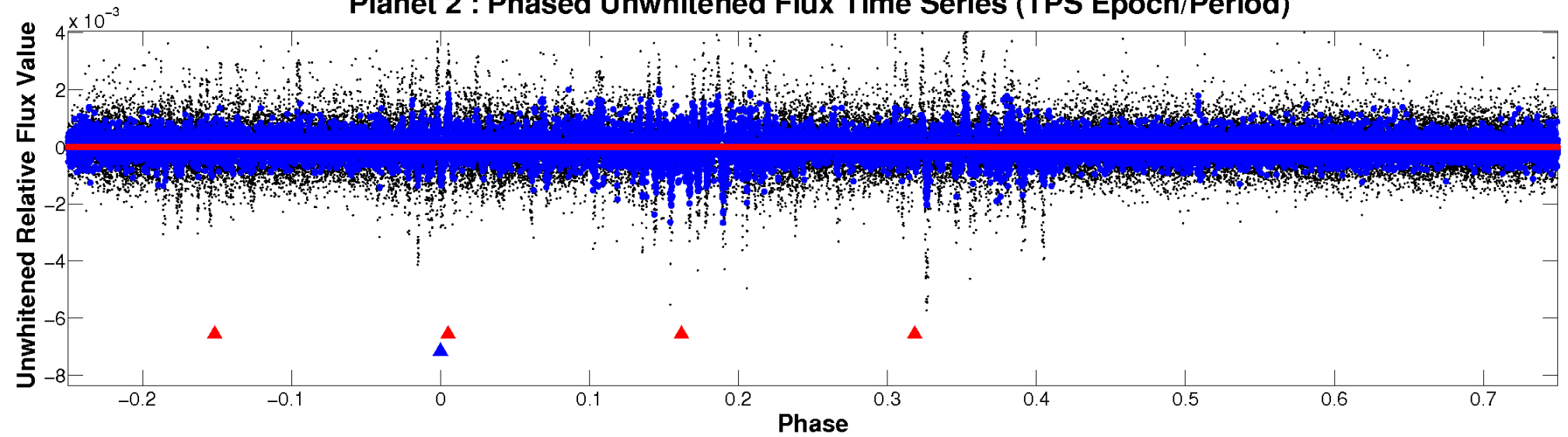
# ALT Odd/Even

TCE 008307354-02

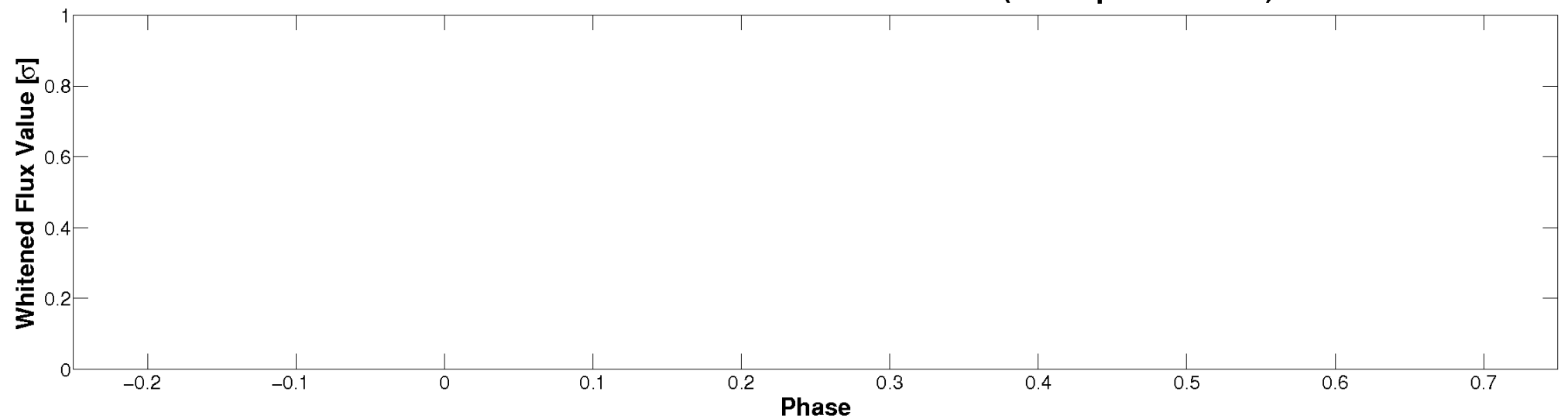


# Non-Whitened Vs. Whitened Light Curve

**Planet 2 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

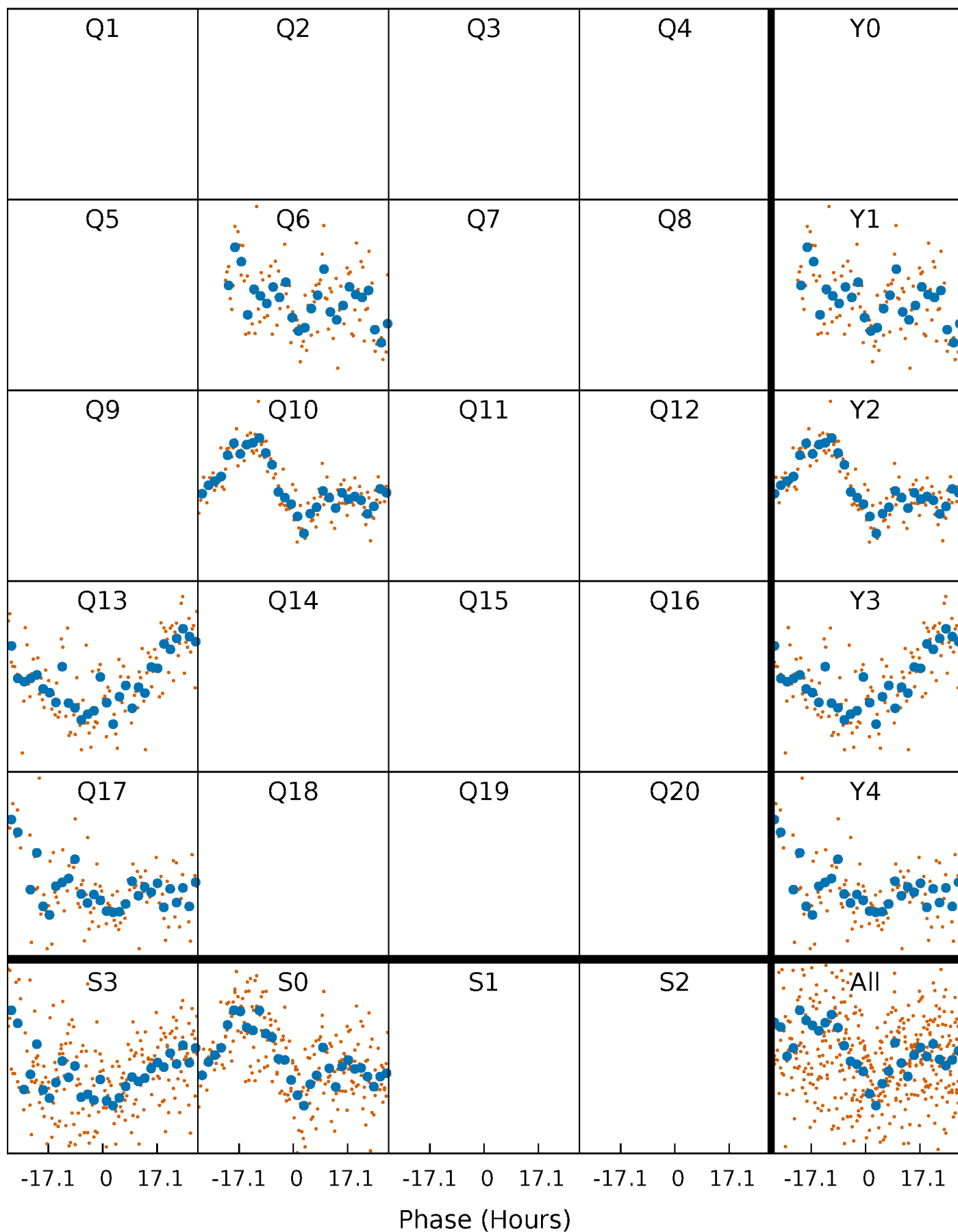


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



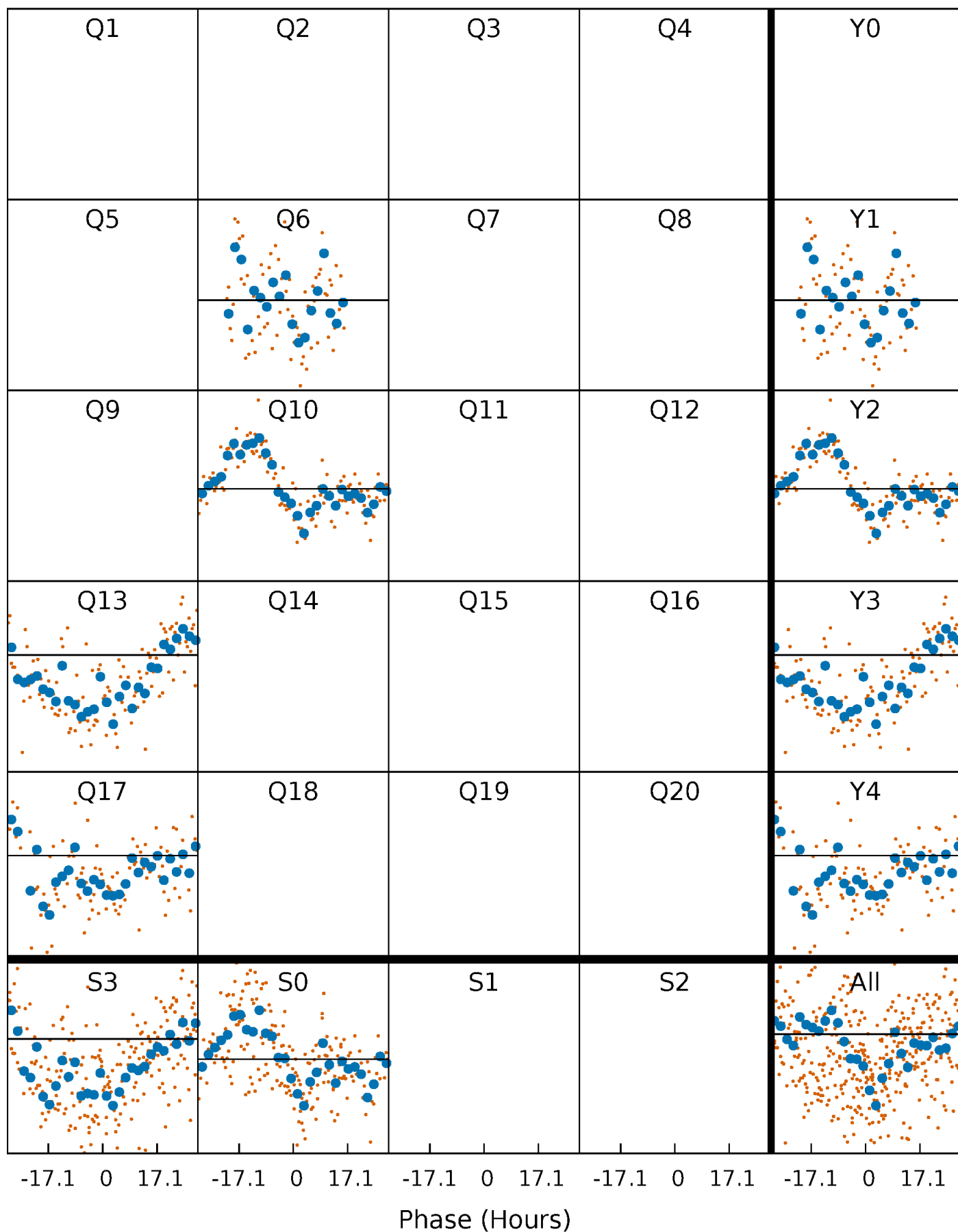
# PDC Quarter-Phased Transit Curves

TCE 008307354-02 P=320.602556 Days  $T_0=279.504458$  (BKJD)



# DV Quarter-Phased Transit Curves

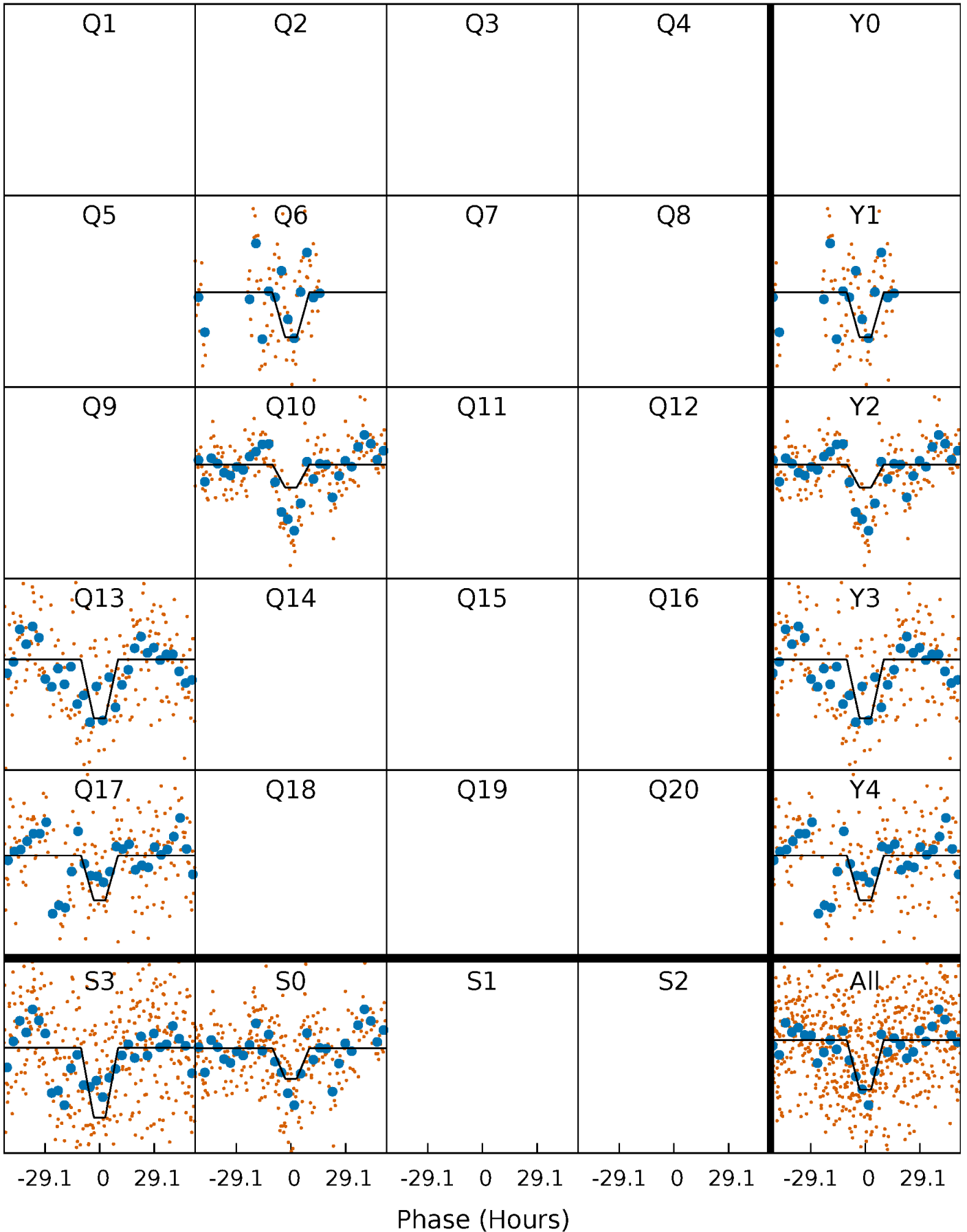
TCE 008307354-02 P=320.602556 Days  $T_0=279.504458$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

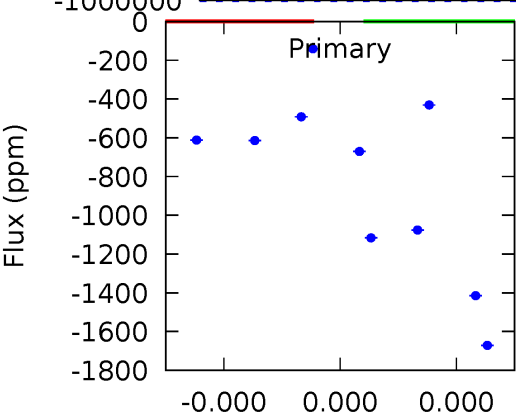
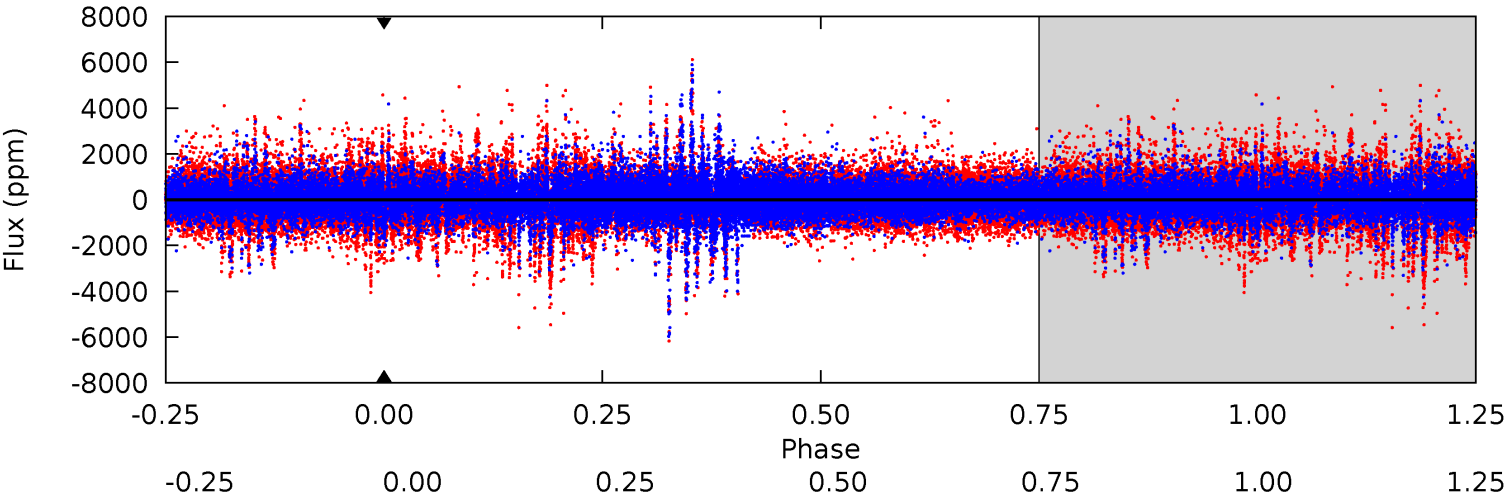
TCE 008307354-02     $P=320.602556$  Days     $T_0=279.572242$  (BKJD)



# DV Model-Shift Uniqueness Test

008307354-02, P = 320.602556 Days, E = 279.504458 Days

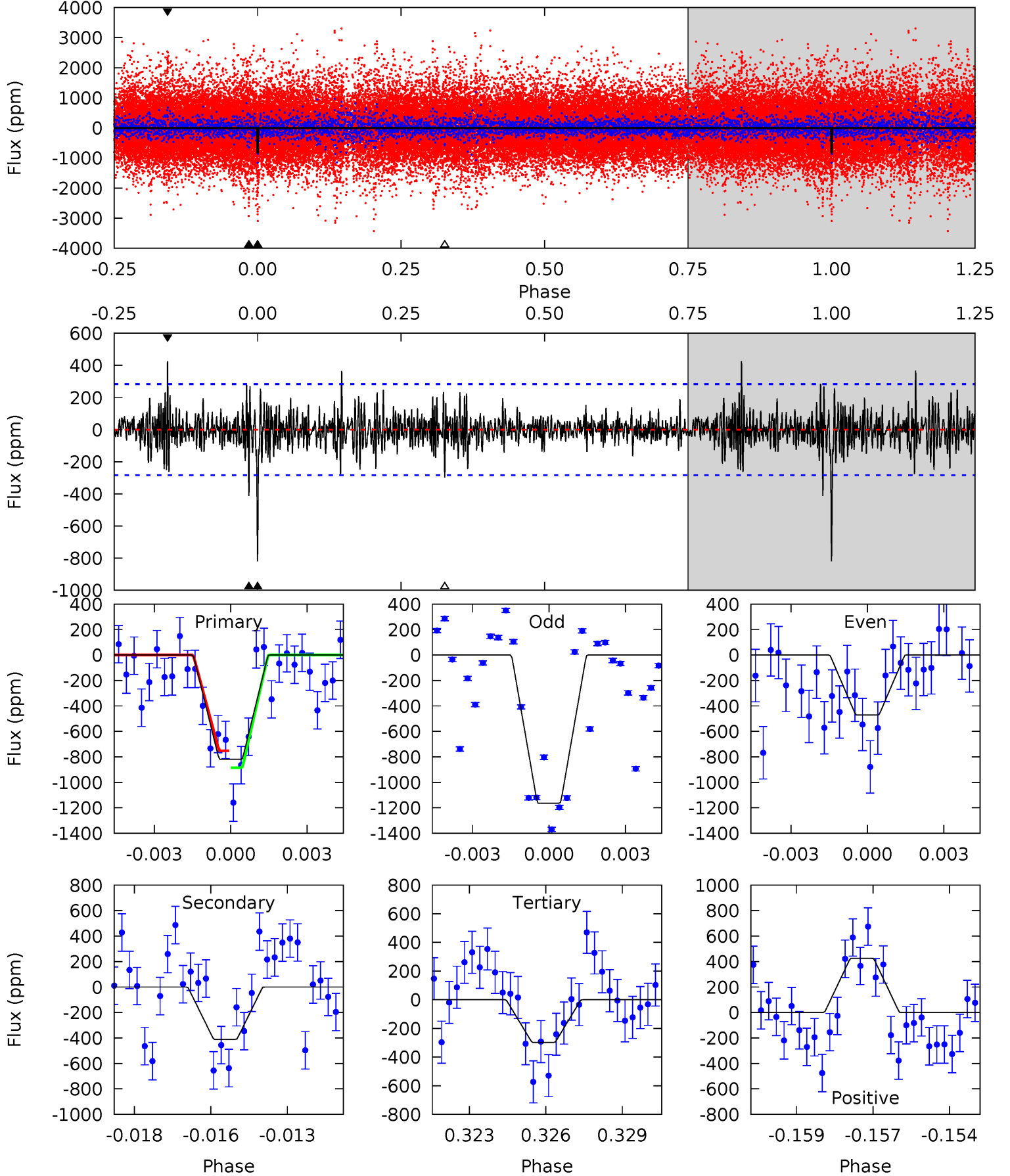
| Pri | Sec | Ter | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-----|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-----|-------|-----|
| 0   | 0   | 0   | 0   | 1.00            | 1.00            | 1.00             | 0       | 0       | 0       | 0       | 0       | 0   | 0     | 0   |



# Alt Model-Shift Uniqueness Test

008307354-02,  $P = 320.602556$  Days,  $E = 279.572242$  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 |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 15.2 | 7.65 | 5.53 | 7.93 | 5.28            | 3.01            | 1.37             | 9.70    | 7.30    | 2.12    | -0.28   | 6.44    | 1.63 | 0.34  | 0   |



### Stellar Parameters For KIC 008307354

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M$ ( $M_{\odot}$ )       | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $5546^{+182}_{-182}$ | $4.575^{+0.040}_{-0.160}$ | $-0.140^{+0.300}_{-0.300}$ | $0.810^{+0.187}_{-0.067}$ | $0.907^{+0.091}_{-0.102}$ | $2.404^{+0.499}_{-1.037}$                     |
|        | +3%/-3%              | +1%/-3%                   | +214%/-214%                | +23%/-8%                  | +10%/-11%                 | +21%/-43%                                     |
| Source | KIC0                 | KIC0                      | KIC0                       | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 008307354-02 / KOI 8155.01

| Detrend | Depth (ppm)     | $R_p$ ( $R_{\oplus}$ ) | $T_{max}$ (K)     | $T_{obs}$ (K)            | $A_{obs}$                     |
|---------|-----------------|------------------------|-------------------|--------------------------|-------------------------------|
| DV      | $0 \pm 1000000$ | $6.71^{+7.53}_{-4.41}$ | $333^{+19}_{-15}$ | $4114^{+15248}_{-23246}$ | $12418^{+1609396}_{-1691911}$ |
| Alt.    | $-411 \pm 54$   | $7.50^{+6.95}_{-5.07}$ | $332^{+18}_{-15}$ | $3304^{+1572}_{-554}$    | $2993^{+25168}_{-2163}$       |

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

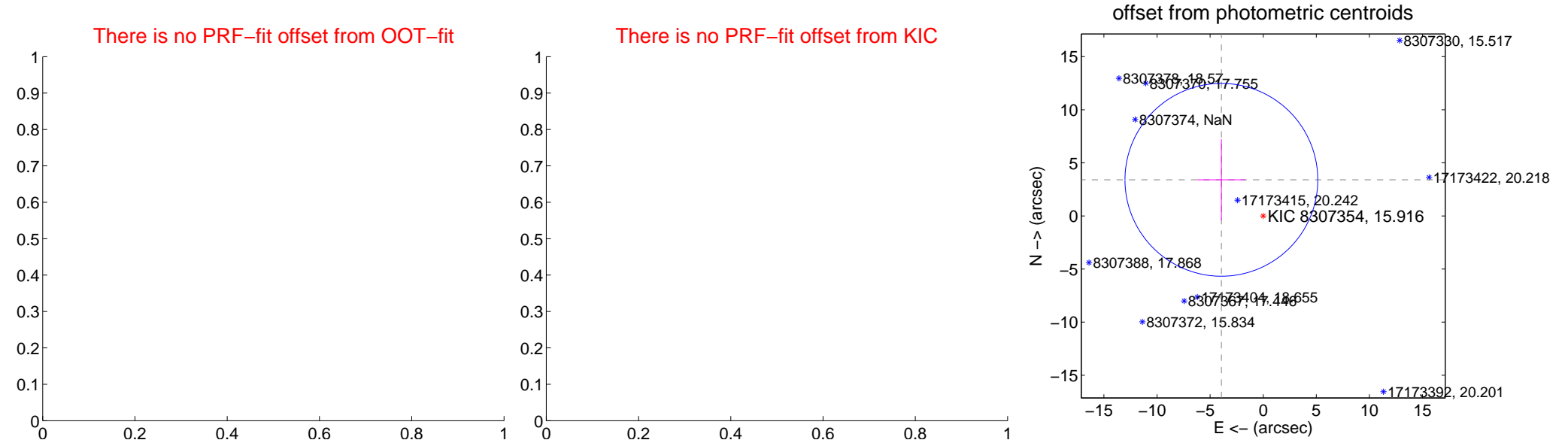
## DV Centroid Data

Supplemental centroid analysis for 008307354-02. Kepler magnitude: 15.92. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

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

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA     | $\Delta$ Dec    |
|---|--------------------|---------------------|-----------------|-----------------|
| PRF-fit source offset from OOT          | —                  | —                   | —               | —               |
| PRF-fit source offset from KIC position | —                  | —                   | —               | —               |
| photometric centroid source offset      | $5.20 \pm 3.03$    | 1.72                | $3.94 \pm 2.26$ | $3.40 \pm 3.82$ |

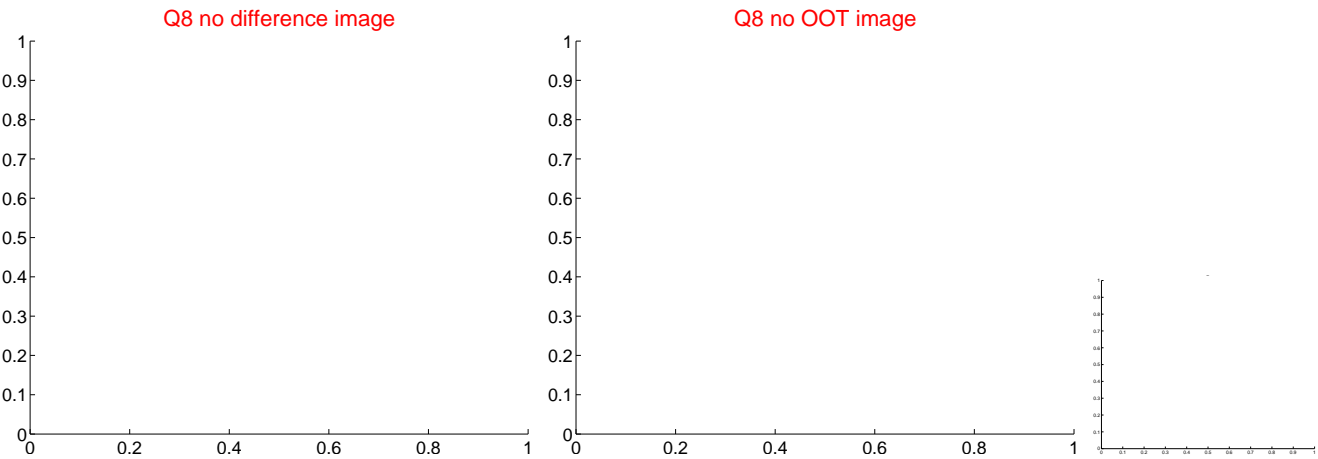
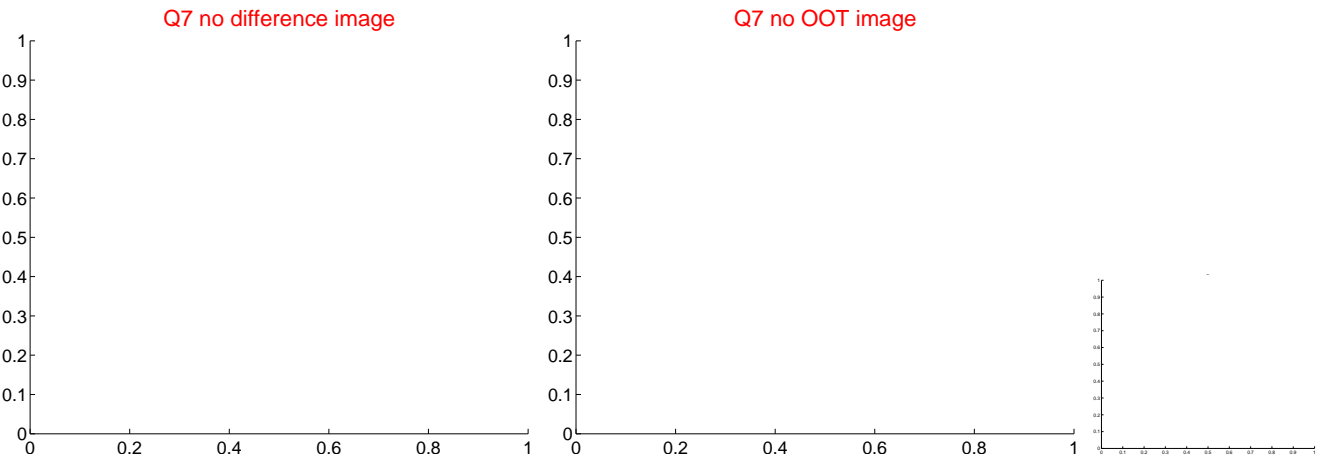
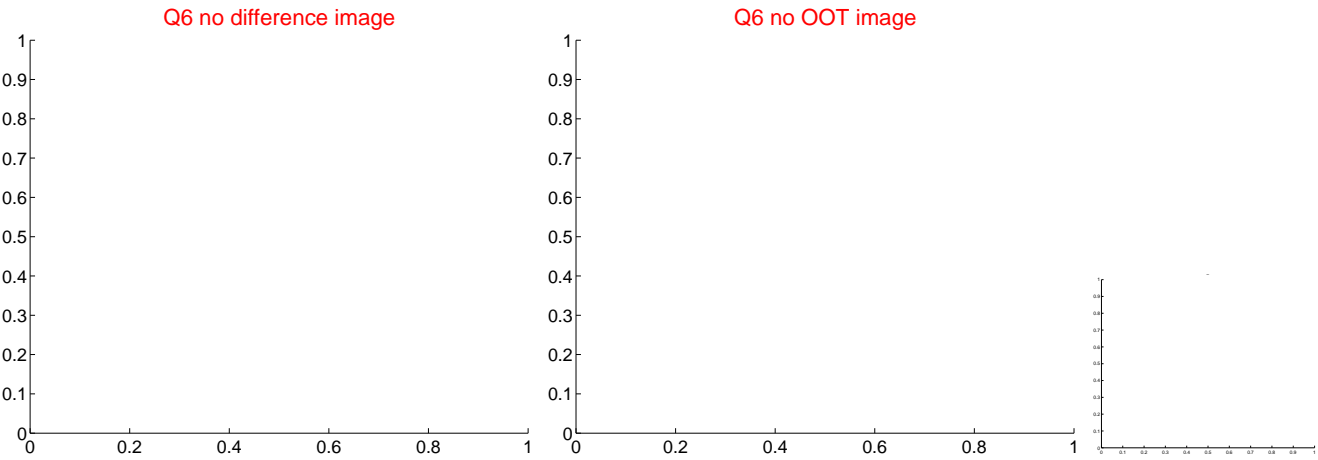
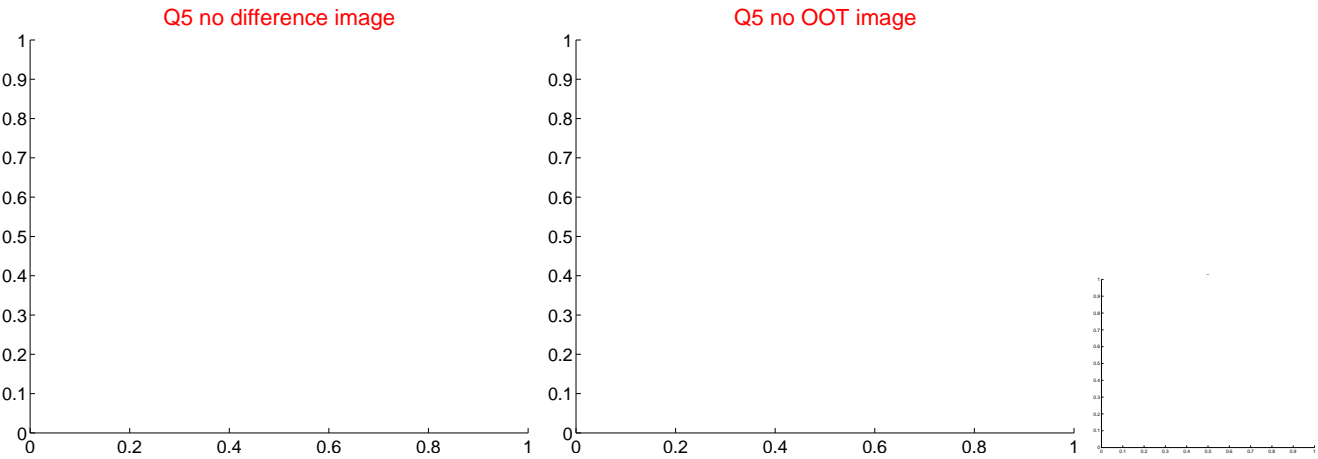


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

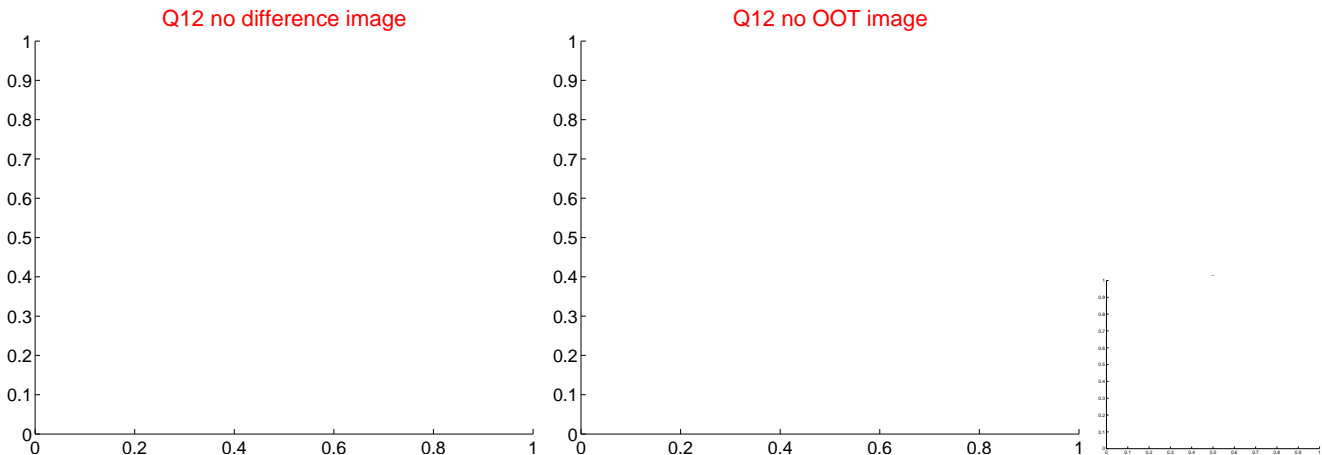
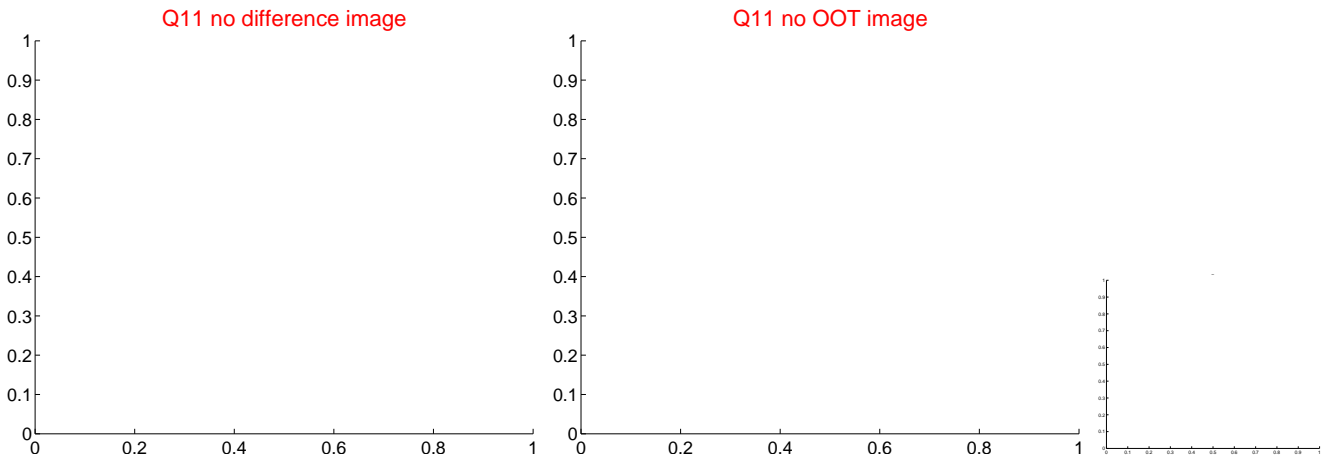
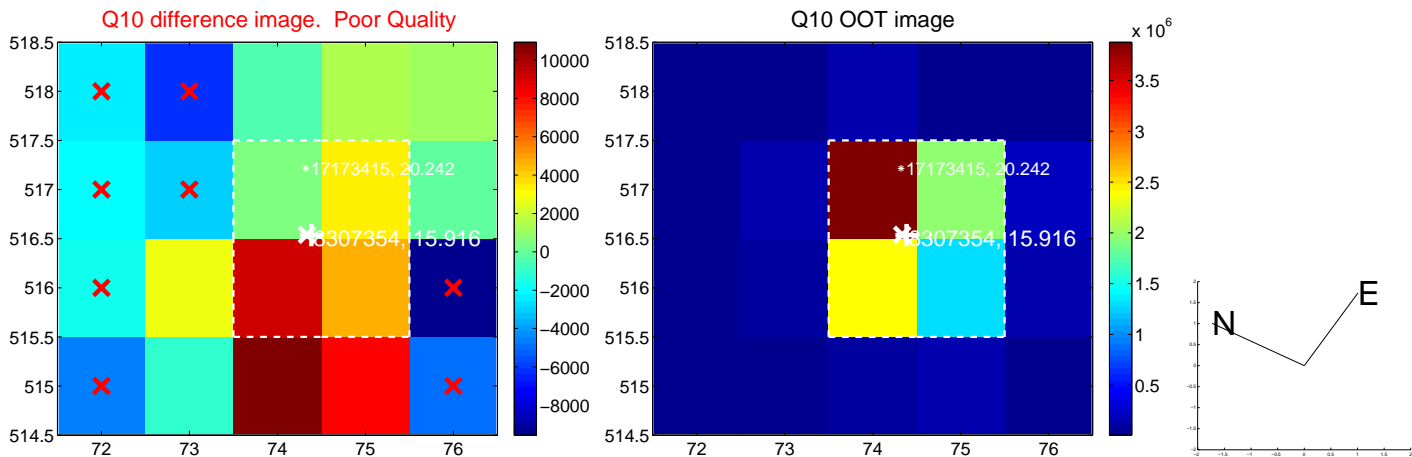
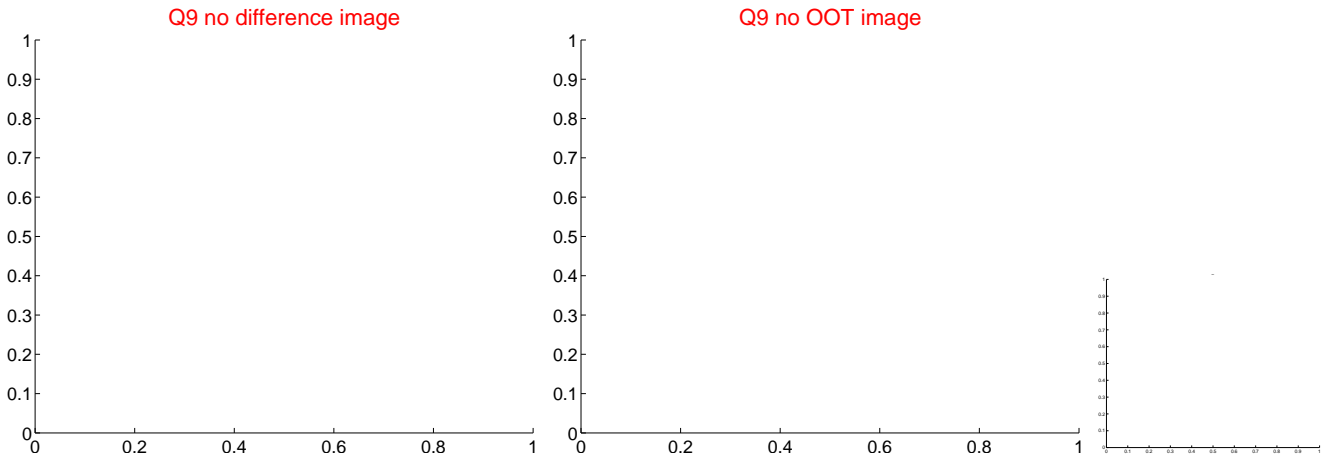


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





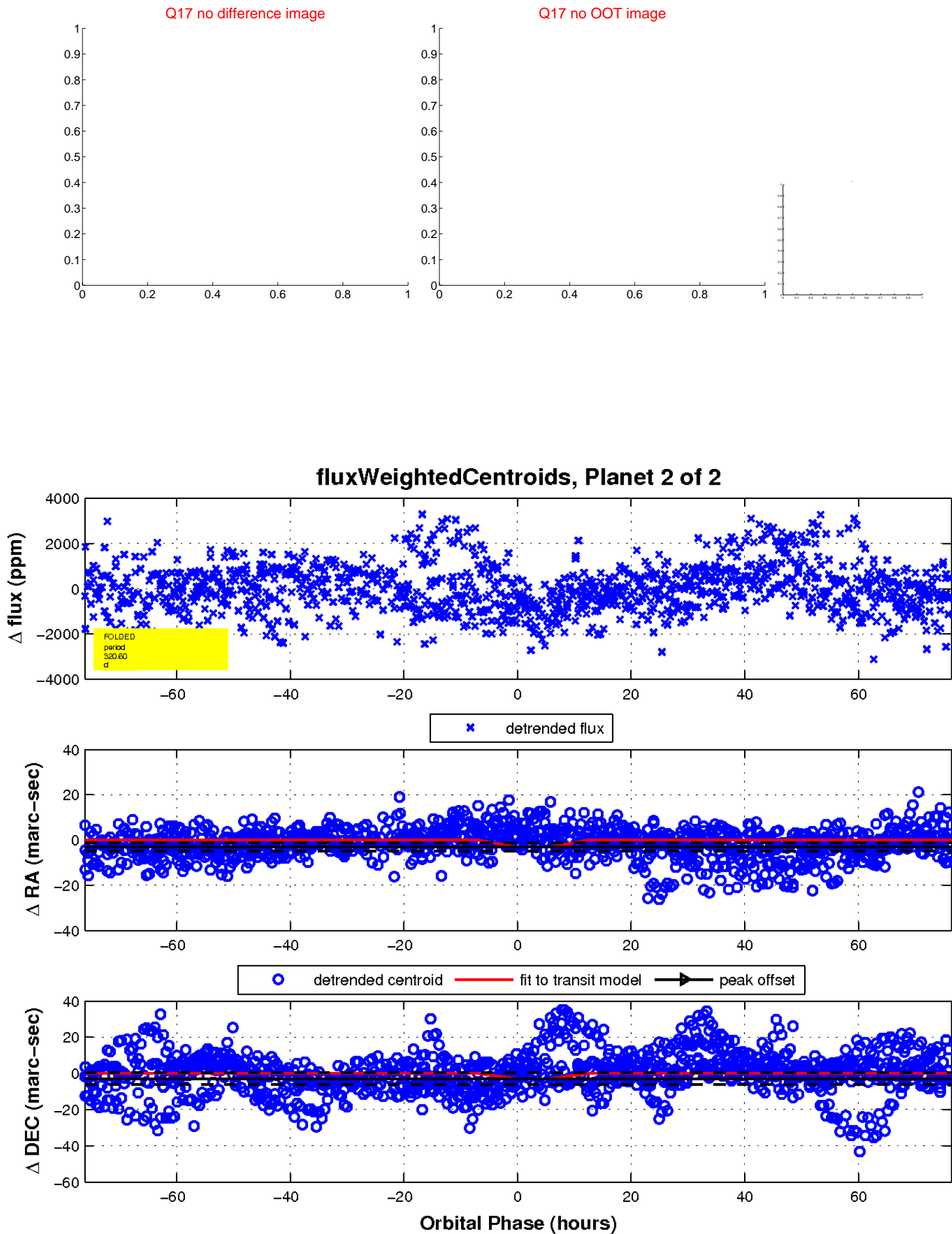
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

