

# KIC 005608002

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005608002-01 | OBS      | No   | 302.209519    | 171.181106   | 2127.8      | 4.936            | 13.6 | 6.2 | 0.18                        | 3223            | 0.81                   | 0.01                   |
| 005608002-02 | OBS      | No   | 330.344519    | 407.909197   | 2361.2      | 4.094            | 14.8 | 6.5 | 0.18                        | 3223            | 0.86                   | 0.01                   |
| 005608002-03 | OBS      | No   | 199.737602    | 324.308792   | 2348.0      | 6.649            | 11.8 | 7.4 | 0.18                        | 3223            | 0.89                   | 0.02                   |
| 005608002-04 | OBS      | No   | 511.172392    | 482.923424   | 2309.0      | 7.409            | 11.2 | 5.4 | 0.18                        | 3223            | 0.85                   | 0.01                   |
| 005608002-05 | OBS      | No   | 225.187164    | 132.001189   | 3320.5      | 4.313            | 11.0 | 8.1 | 0.18                        | 3223            | 1.87                   | 0.02                   |
| 005608002-06 | OBS      | No   | 276.834758    | 172.887603   | 2319.2      | 7.567            | 10.2 | 6.5 | 0.18                        | 3223            | 0.85                   | 0.01                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005608002-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS  |
| 005608002-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS           |
| 005608002-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 005608002-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV  |

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

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

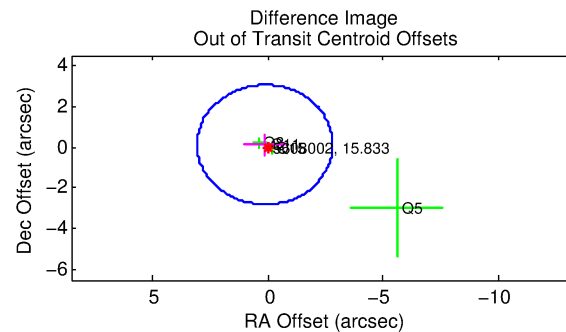
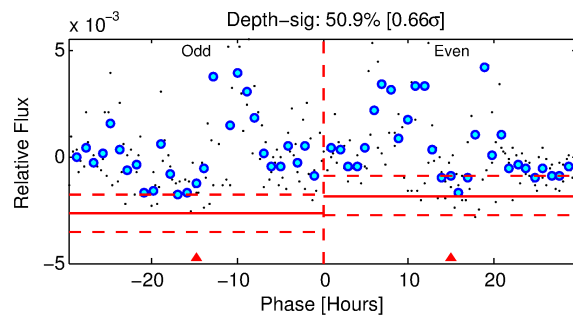
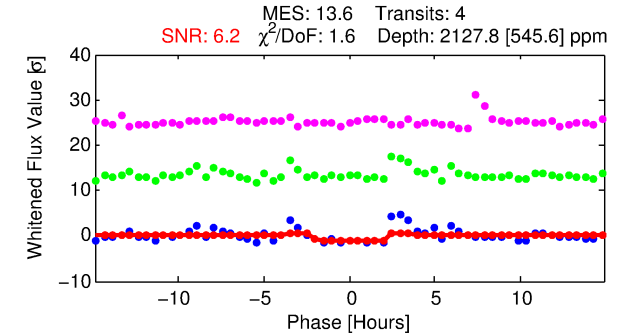
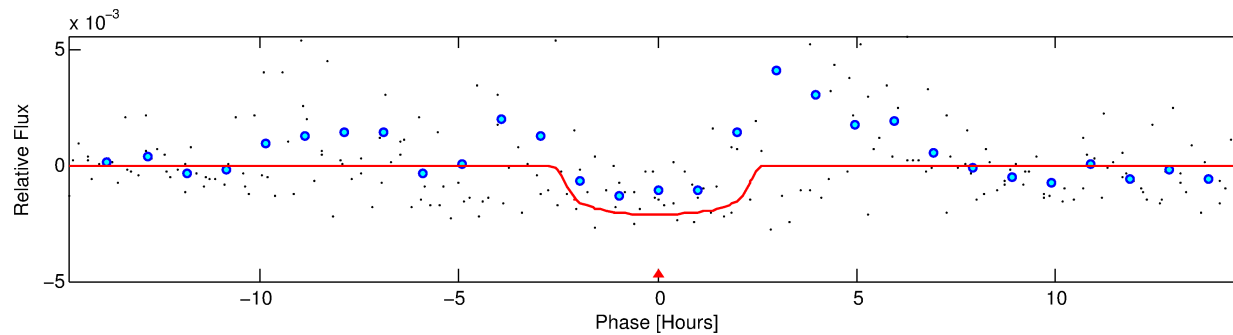
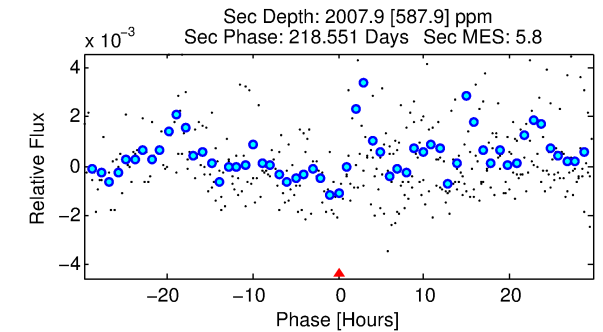
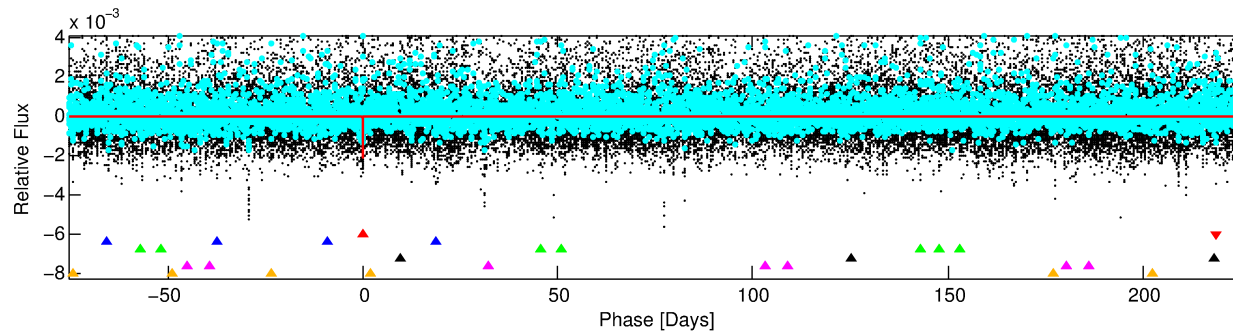
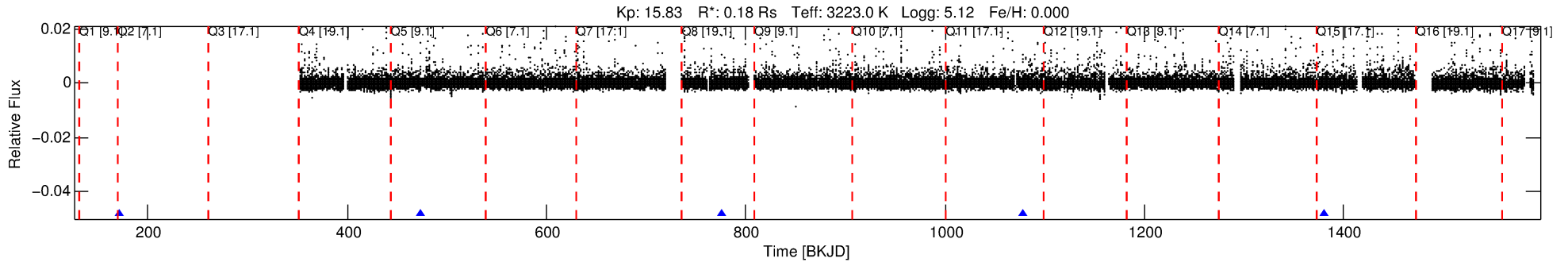
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005608002-01

No Significant Match Found

# DV One-Page Summary

KIC: 5608002 Candidate: 1 of 6 Period: 302.210 d



## DV Fit Results:

Period = 302.20952 [0.00673] d  
Epoch = 171.1811 [0.0185] BKJD  
Rp/R\* = 0.0417 [0.0751]  
a/R\* = 487.19 [3779.91]  
b = 0.02 [487.35]  
Seff = 0.01 [0.00]  
Teq = 87 [4] K  
Rp = 0.81 [1.48] Re  
a = 0.4744 [0.0735] AU  
Ag = 374682.13 [1355671.11] [0.28σ]  
Teffp = 3341 [3019] K [1.08σ]

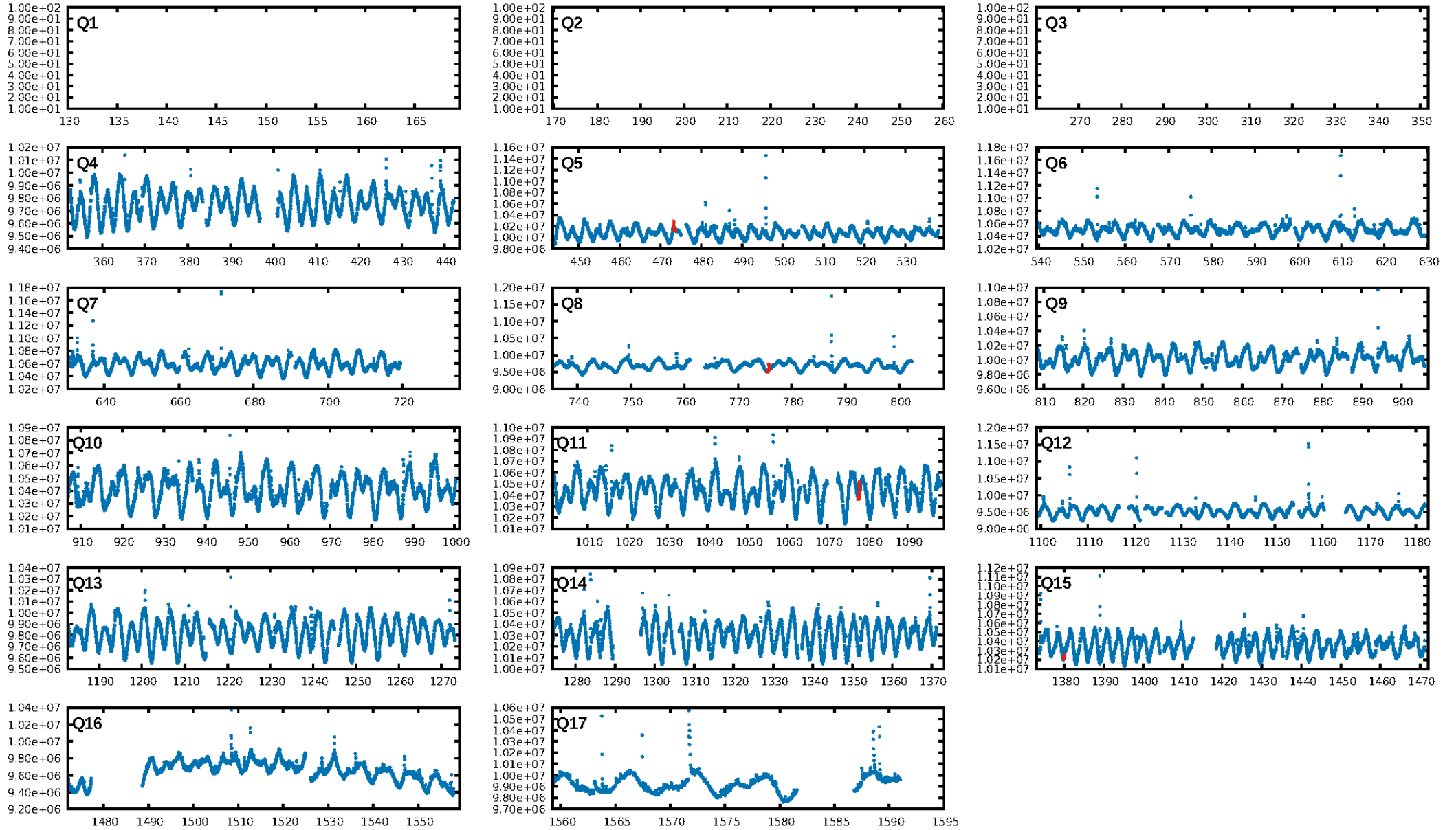
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [67.41σ]  
LongPeriod-sig: 100.0% [105.30σ]  
ModelChiSquare2-sig: 23.3%  
ModelChiSquareGof-sig: 86.9%  
Bootstrap-pfa: 5.04e-14  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 2.173  
Centroid-sig: 7.4%  
Centroid-so: 1.205 arcsec [1.42σ]  
OotOffset-rm: 0.177 arcsec [0.18σ]  
KicOffset-rm: 0.156 arcsec [0.21σ]  
OotOffset-st: 0/2/1/1 [4]  
KicOffset-st: 0/2/1/1 [4]  
DiffImageQuality-fgm: 0.75 [3/4]  
DiffImageOverlap-fno: 1.00 [4/4]

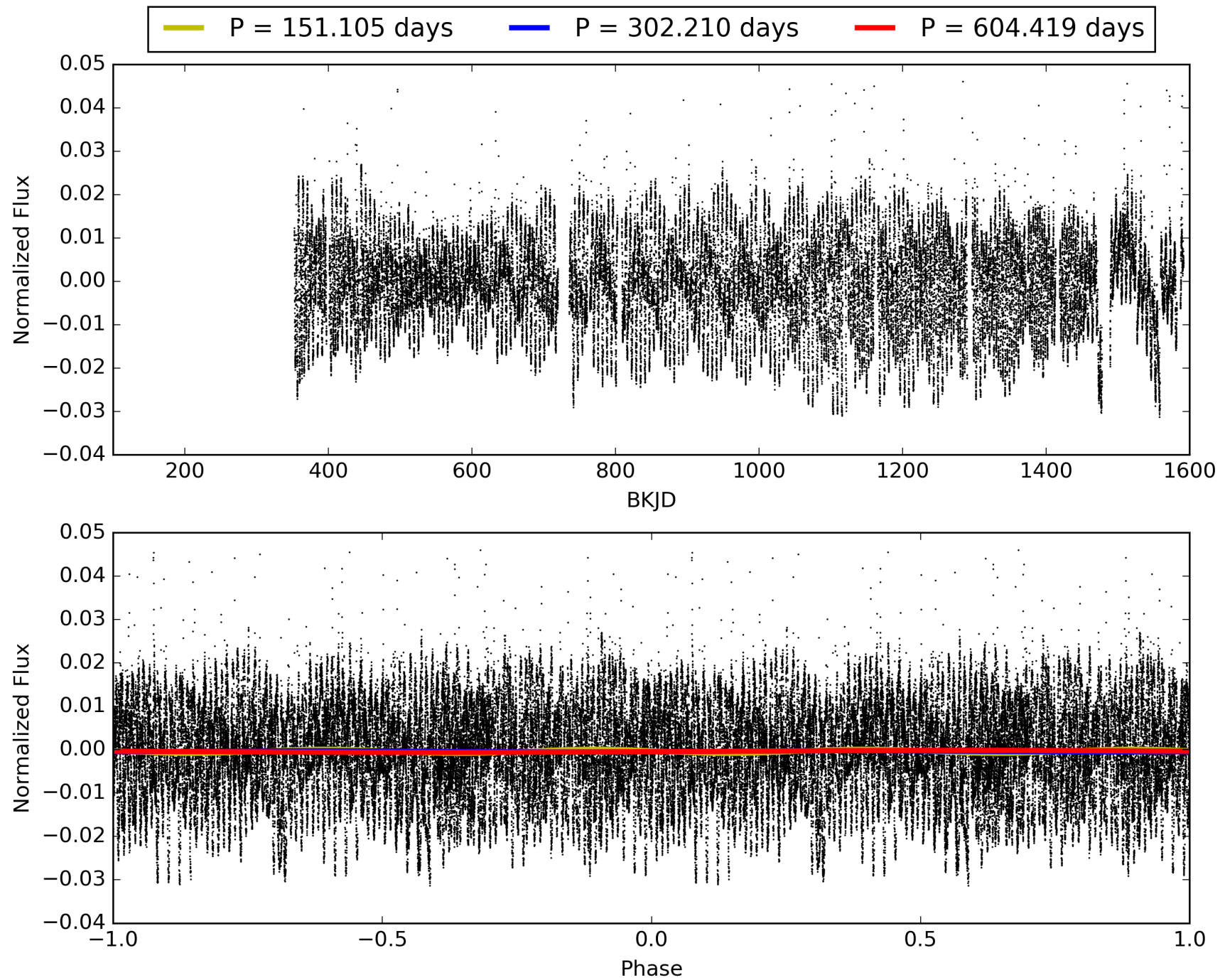
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 22:00:59 Z

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

# TCE 005608002-01, PDC Light Curves



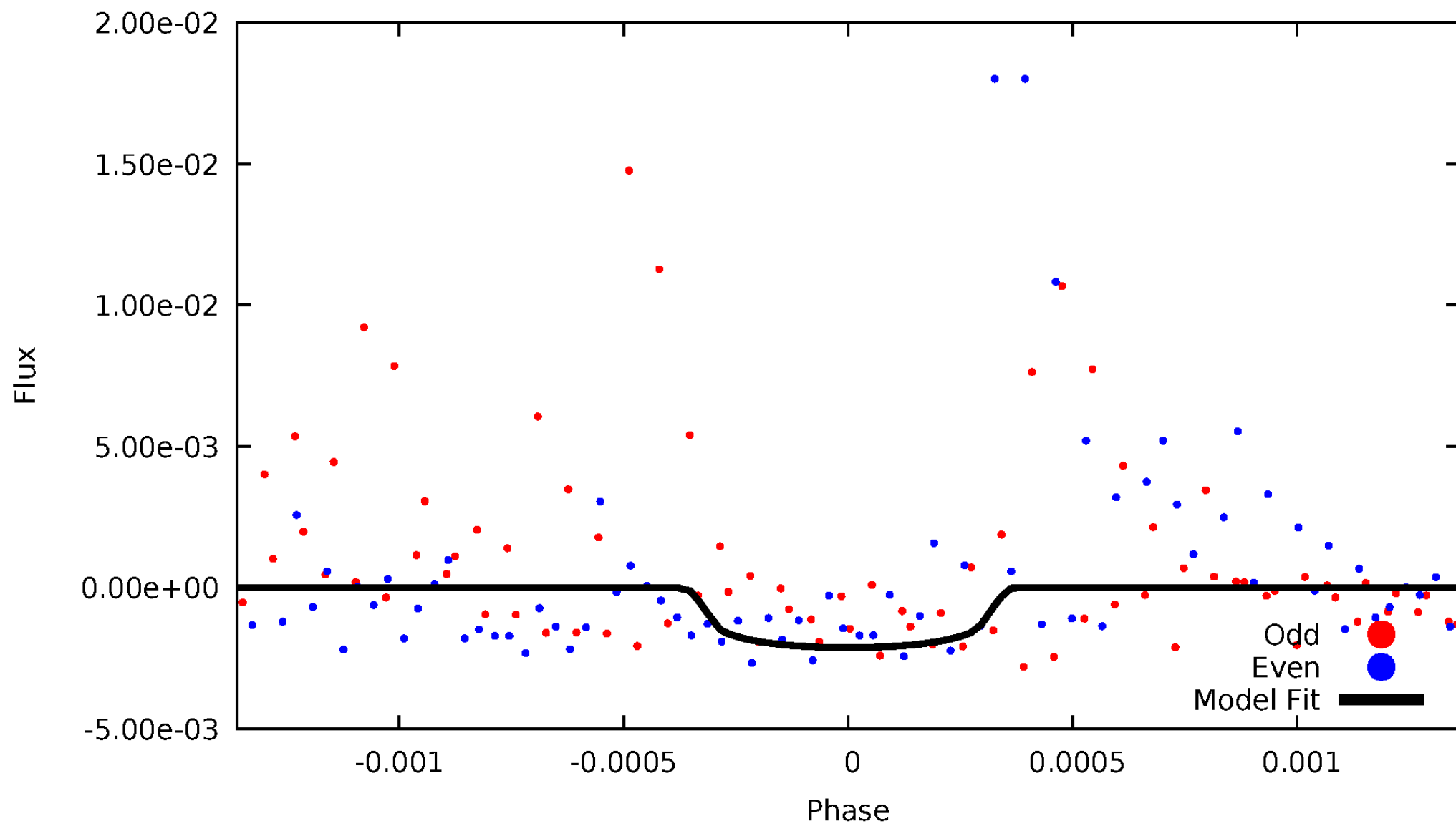
# TCE 005608002-01





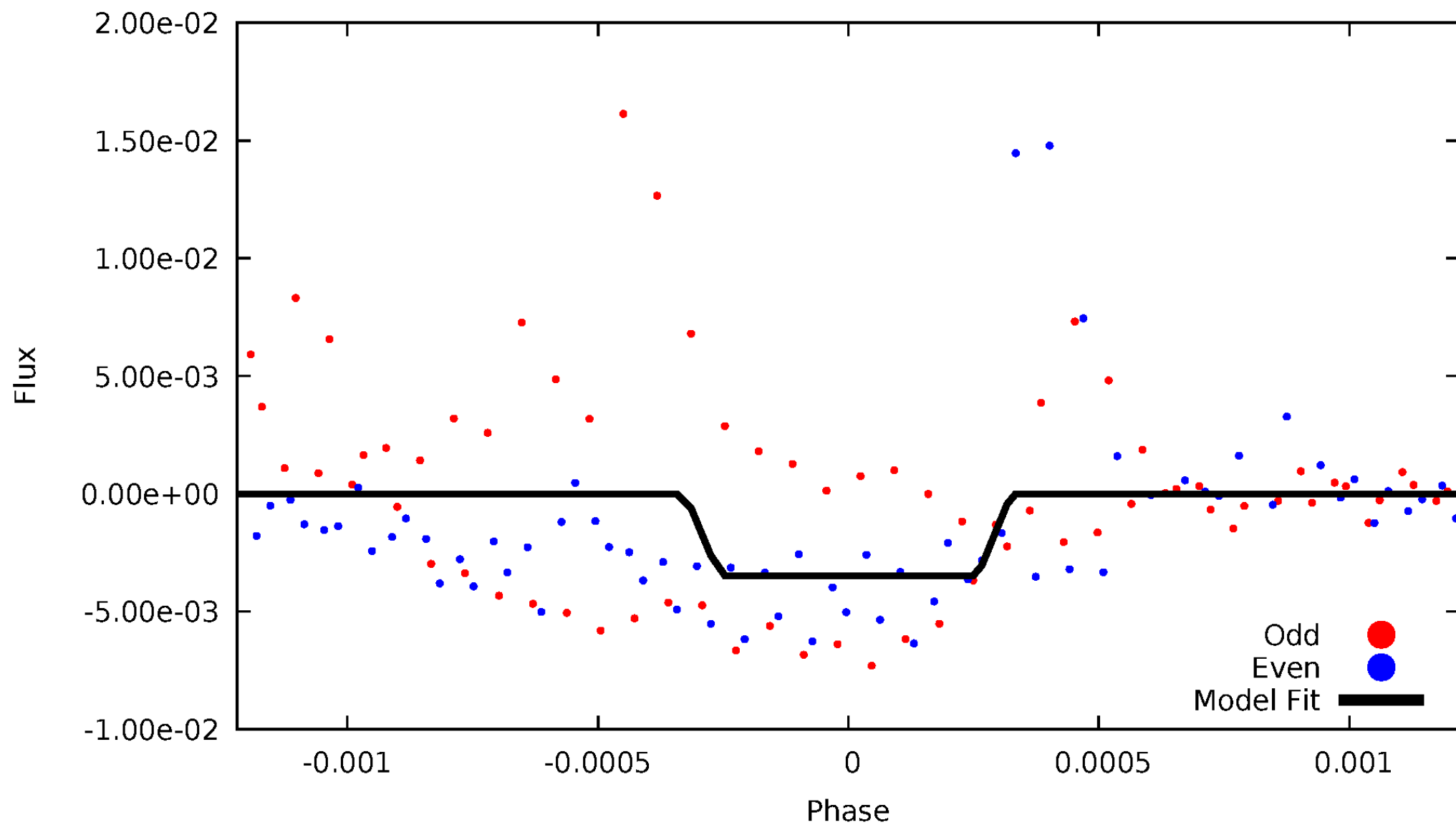
# DV Odd/Even

TCE 005608002-01



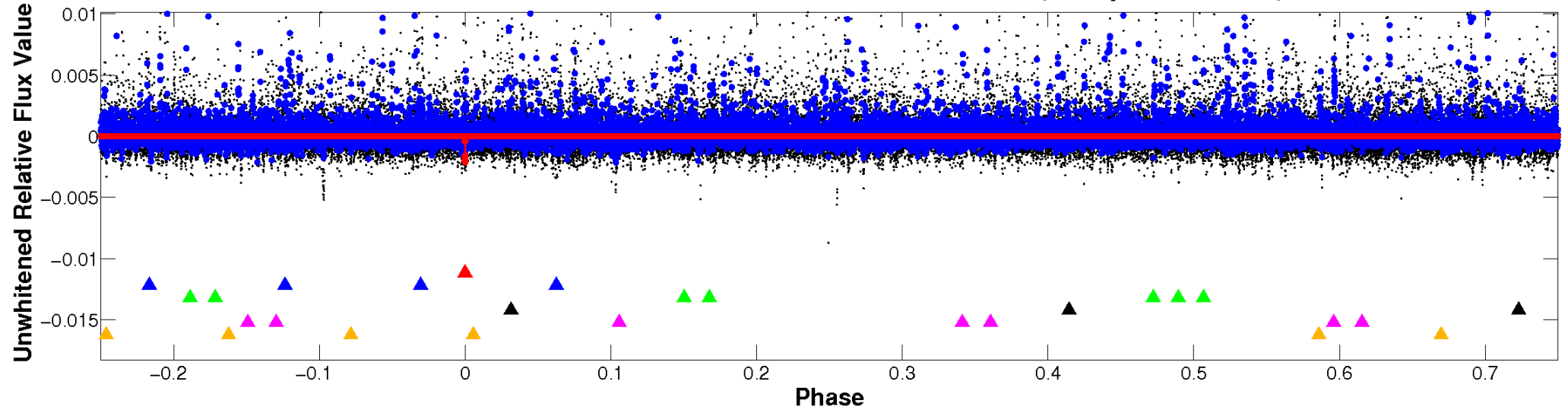
# ALT Odd/Even

TCE 005608002-01

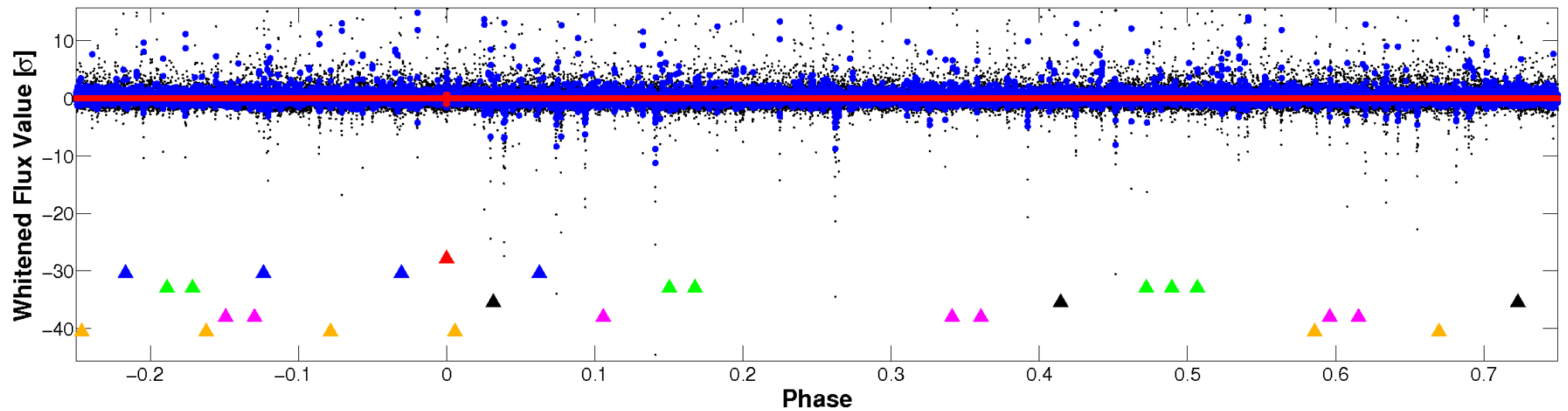


# Non-Whitened Vs. Whitened Light Curve

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

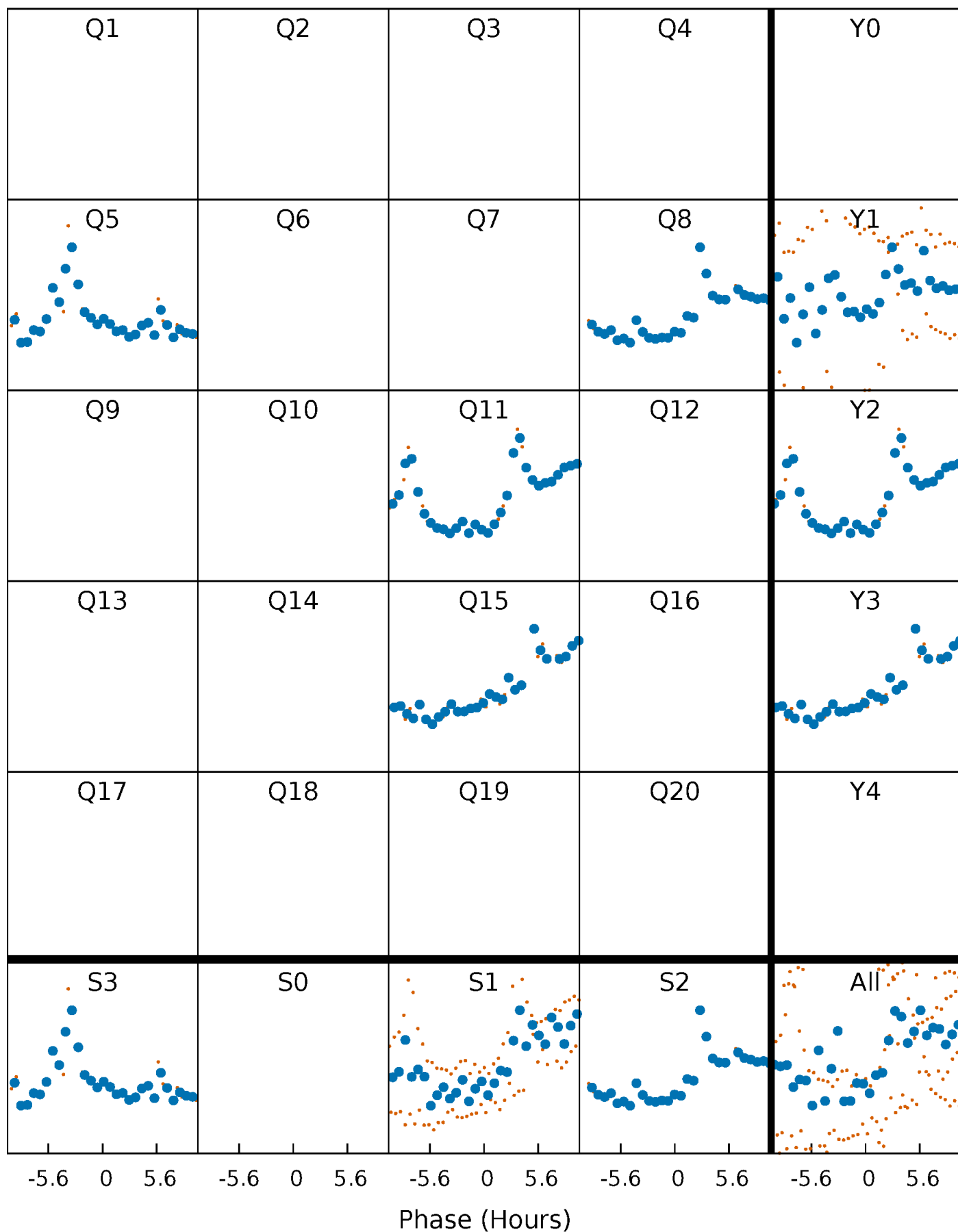


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



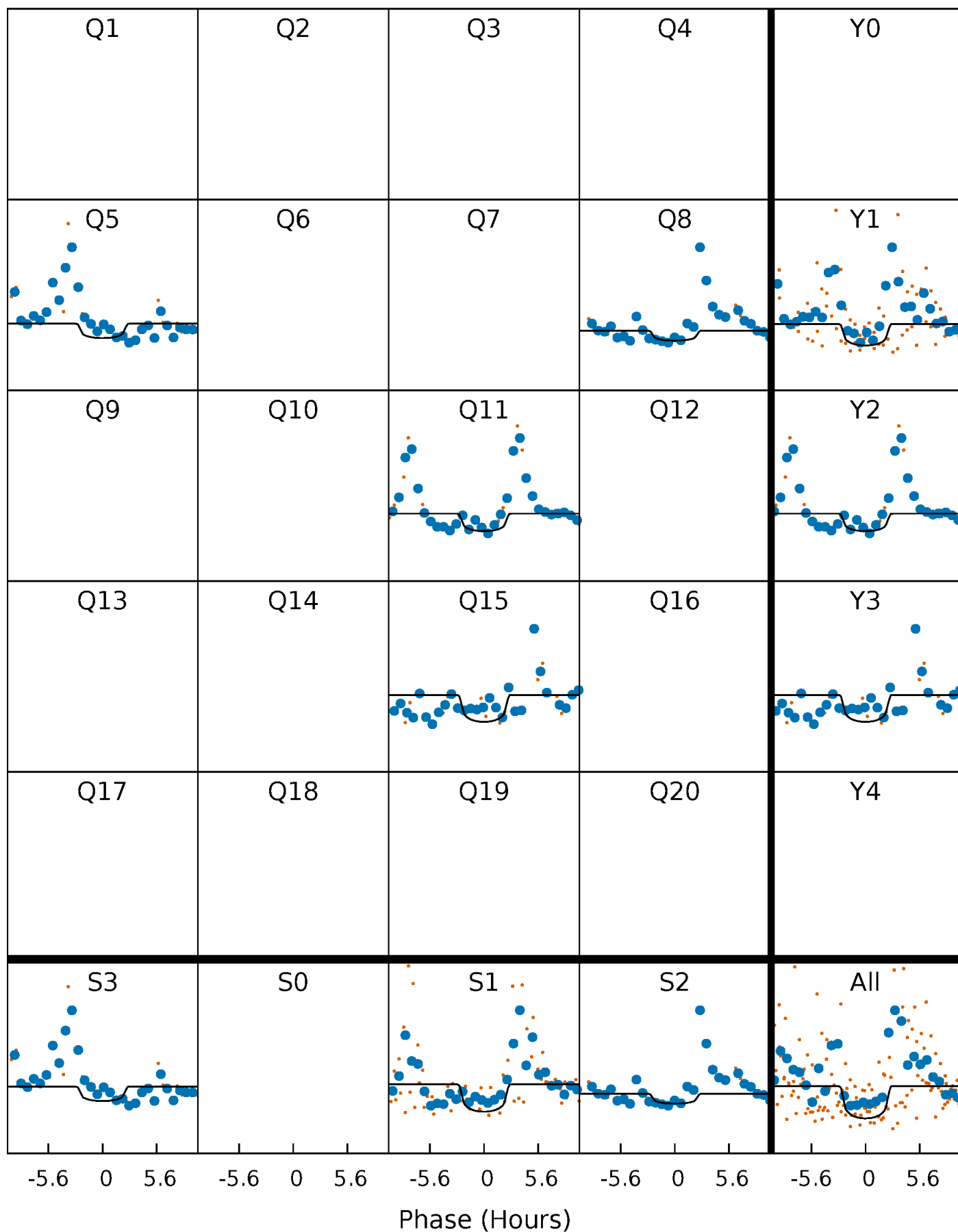
# PDC Quarter-Phased Transit Curves

TCE 005608002-01 P=302.209519 Days  $T_0=171.181106$  (BKJD)



# DV Quarter-Phased Transit Curves

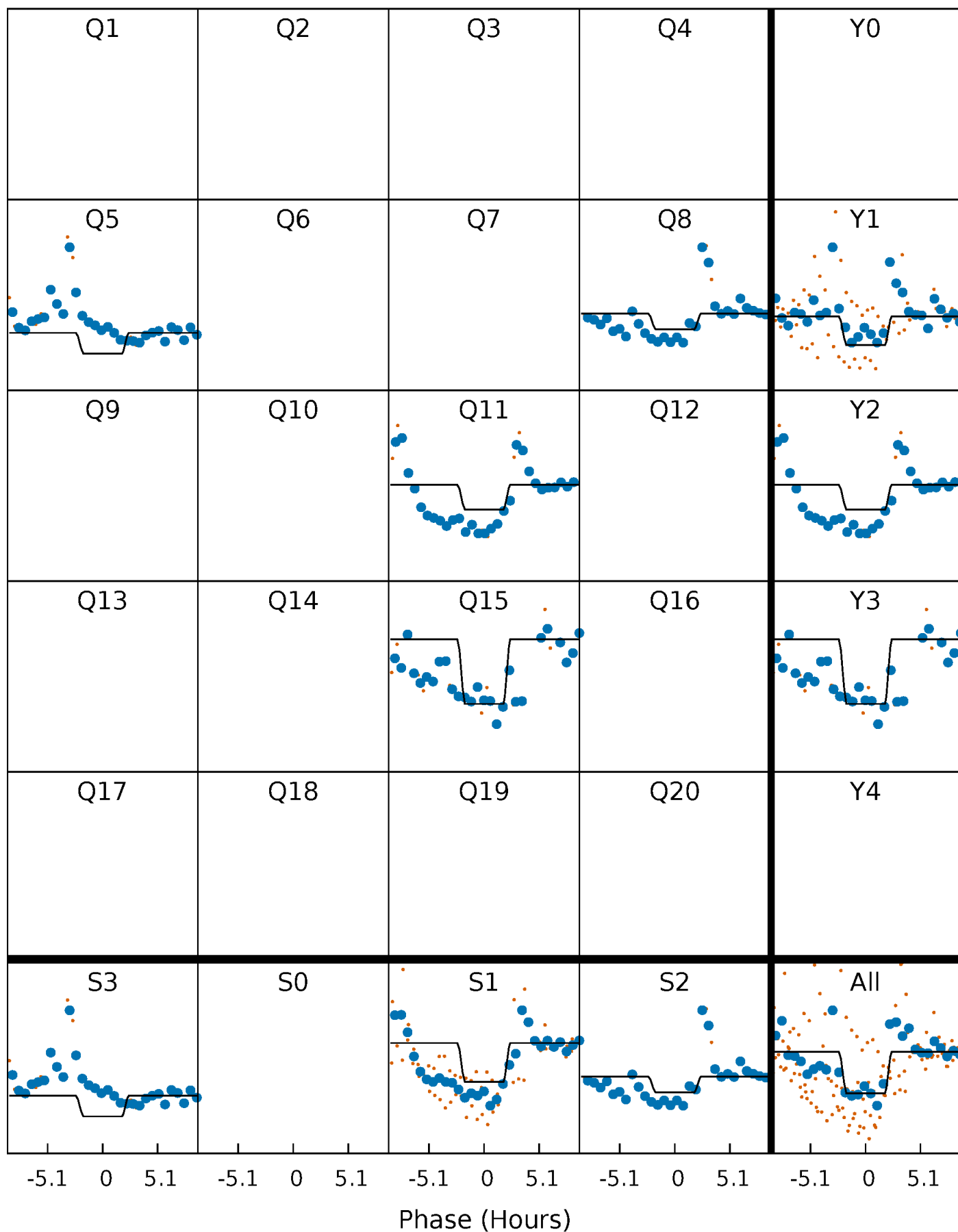
TCE 005608002-01 P=302.209519 Days  $T_0=171.181106$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

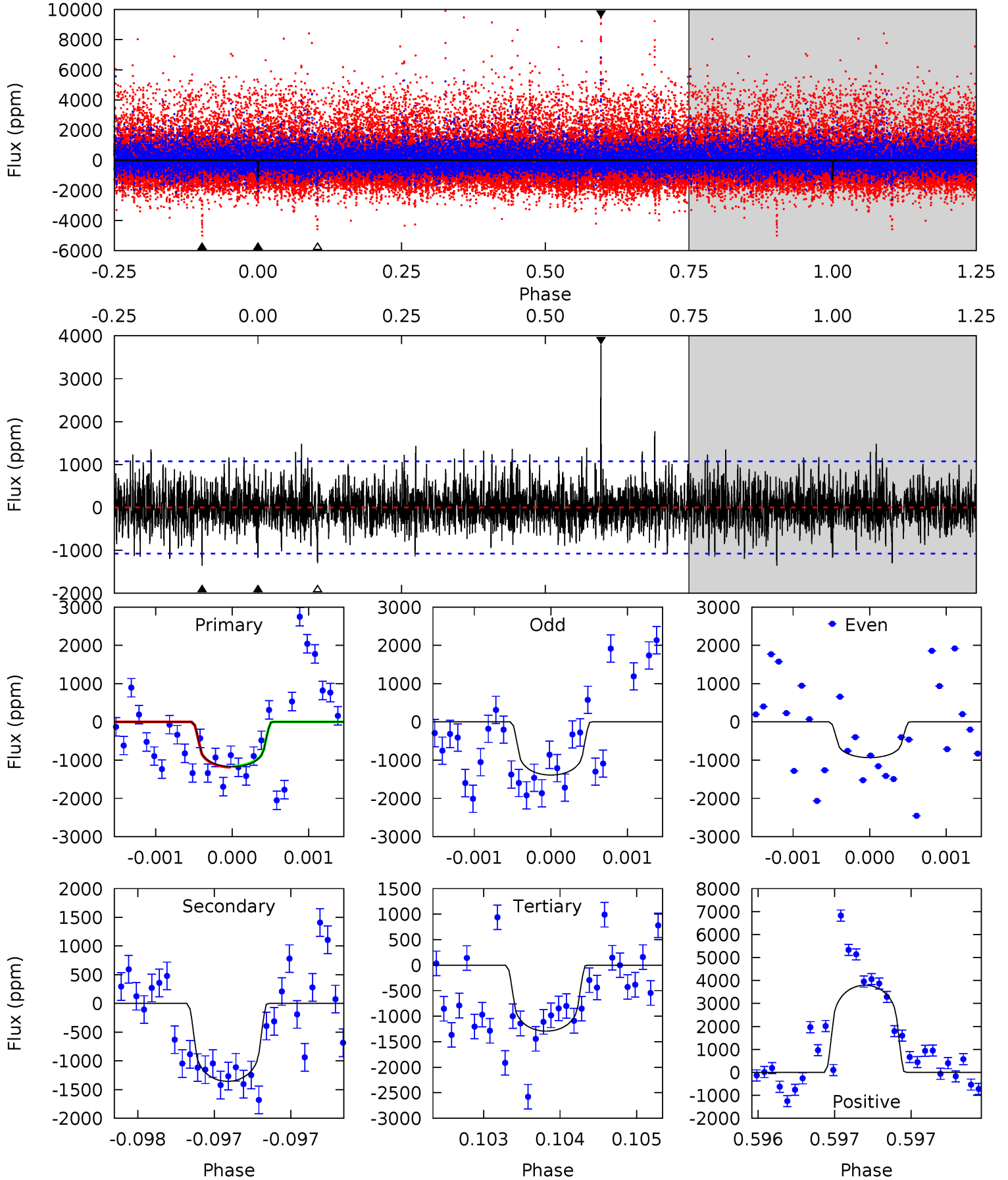
TCE 005608002-01 P=302.219164 Days  $T_0=171.159523$  (BKJD)



# DV Model-Shift Uniqueness Test

005608002-01, P = 302.209519 Days, E = 171.181106 Days

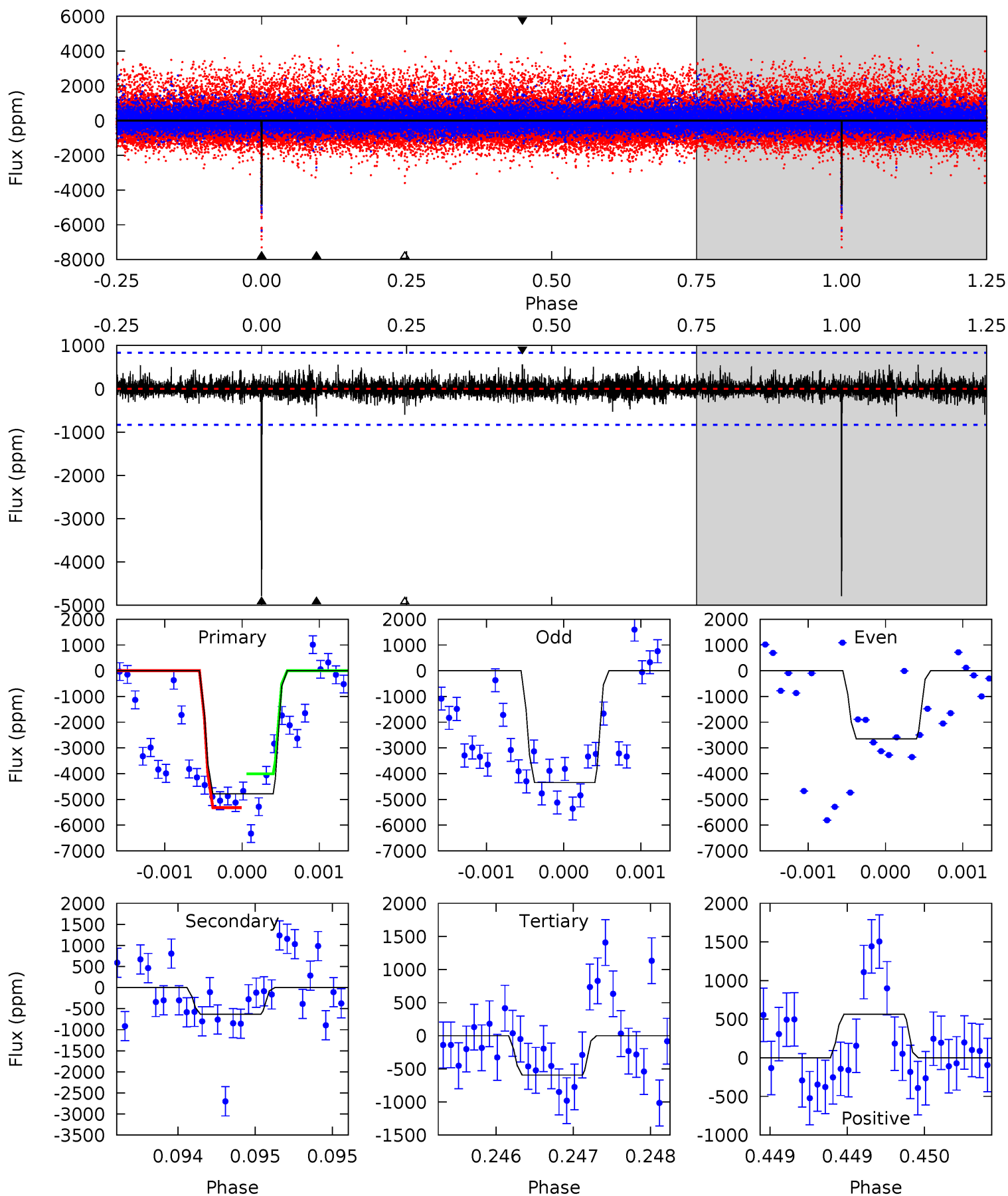
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.00 | 6.95 | 6.62 | 19.4 | 5.51            | 3.38            | 1.91             | -0.62   | -13.4   | 0.33    | -12.5   | 0.96    | 0.95 | 0.74  | 0.07 |



# Alt Model-Shift Uniqueness Test

005608002-01, P = 302.219164 Days, E = 171.159523 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 31.8 | 4.22 | 3.95 | 3.74 | 5.54            | 3.42            | 0.83             | 27.9    | 28.1    | 0.27    | 0.48    | 6.10    | 0.80 | 0.11  | 4.31 |



### Stellar Parameters For KIC 005608002

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3223^{+43}_{-24}$  | $5.125^{+0.063}_{-0.070}$ | $0.000^{+0.100}_{-0.100}$ | $0.179^{+0.039}_{-0.026}$ | $0.155^{+0.043}_{-0.023}$ | $38.370^{+13.470}_{-11.810}$              |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +22%/-15%                 | +28%/-15%                 | +35%/-31%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 005608002-01 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{max} (K)$   | $T_{obs} (K)$         | $A_{obs}$                  |
|---------|-----------------|------------------------|-----------------|-----------------------|----------------------------|
| DV      | $-1356 \pm 195$ | $1.39^{+1.24}_{-0.97}$ | $123^{+4}_{-4}$ | $2717^{+1065}_{-403}$ | $91124^{+806274}_{-66382}$ |
| Alt.    | $-635 \pm 150$  | $1.63^{+1.38}_{-1.07}$ | $122^{+4}_{-3}$ | $2370^{+728}_{-313}$  | $30381^{+201571}_{-21854}$ |

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

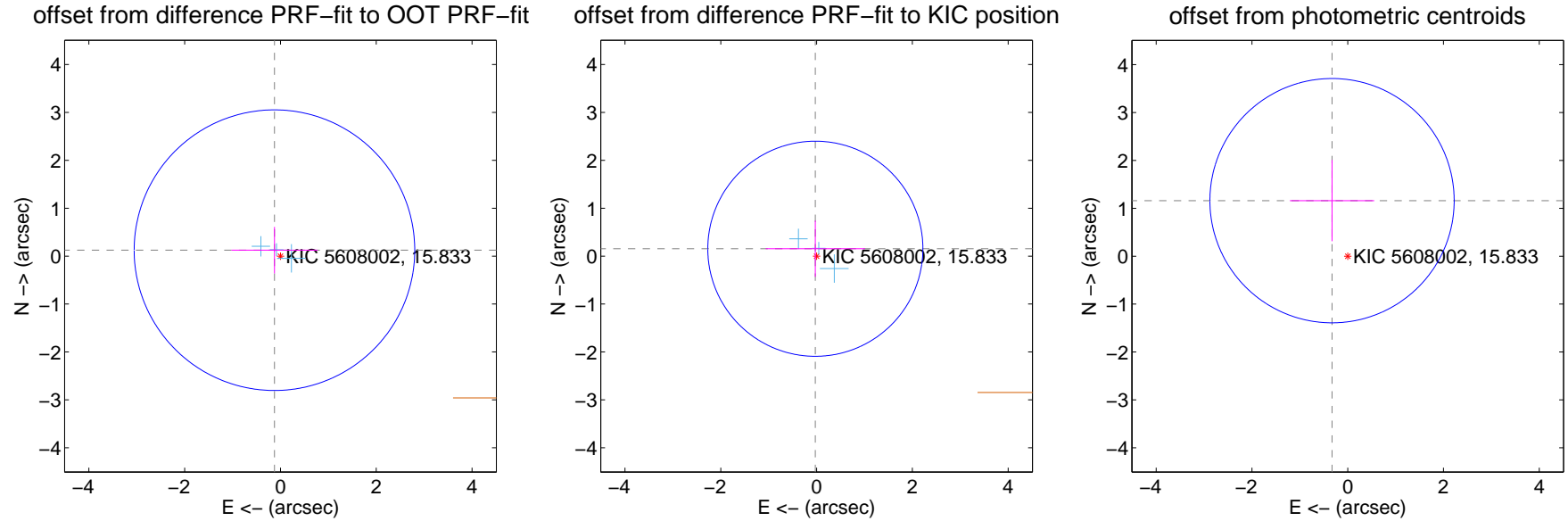
## DV Centroid Data

Supplemental centroid analysis for 005608002-01. Kepler magnitude: 15.83. Transit SNR 6.23

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $0.177 \pm 0.976$  | 0.18                | $0.125 \pm 0.897$ | $0.124 \pm 0.485$ |
| PRF-fit source offset from KIC position | $0.156 \pm 0.748$  | 0.21                | $0.026 \pm 1.036$ | $0.154 \pm 0.587$ |
| photometric centroid source offset      | $1.20 \pm 0.85$    | 1.42                | $0.33 \pm 0.88$   | $1.16 \pm 0.85$   |



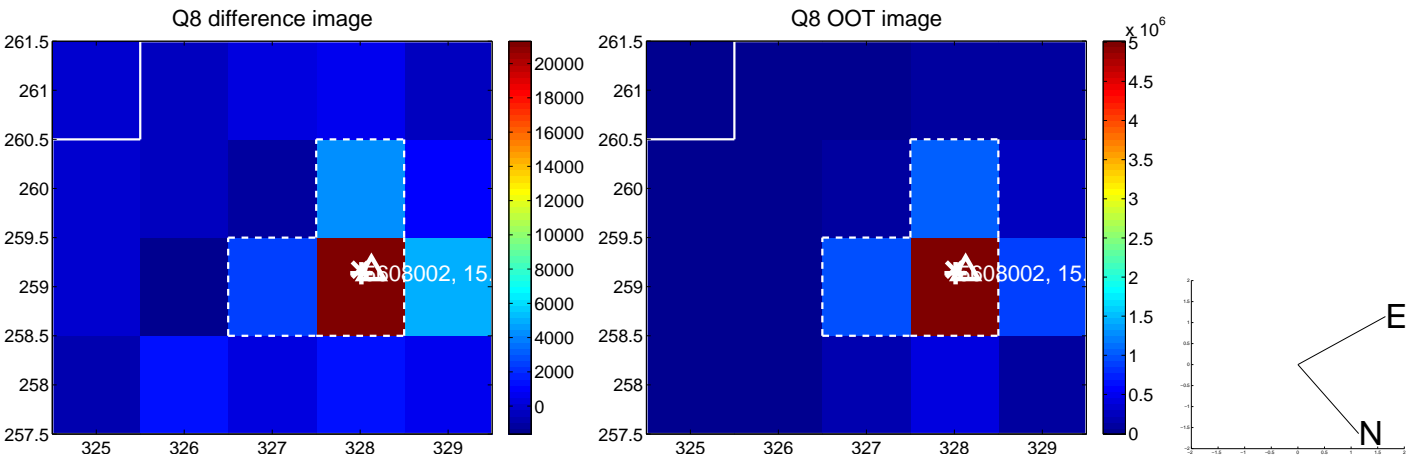
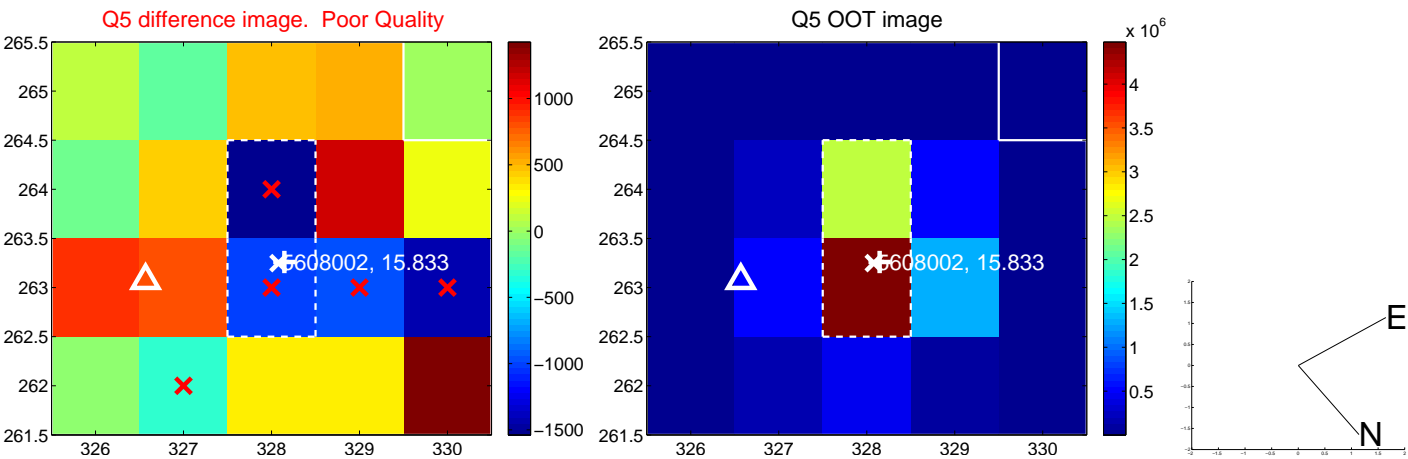
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



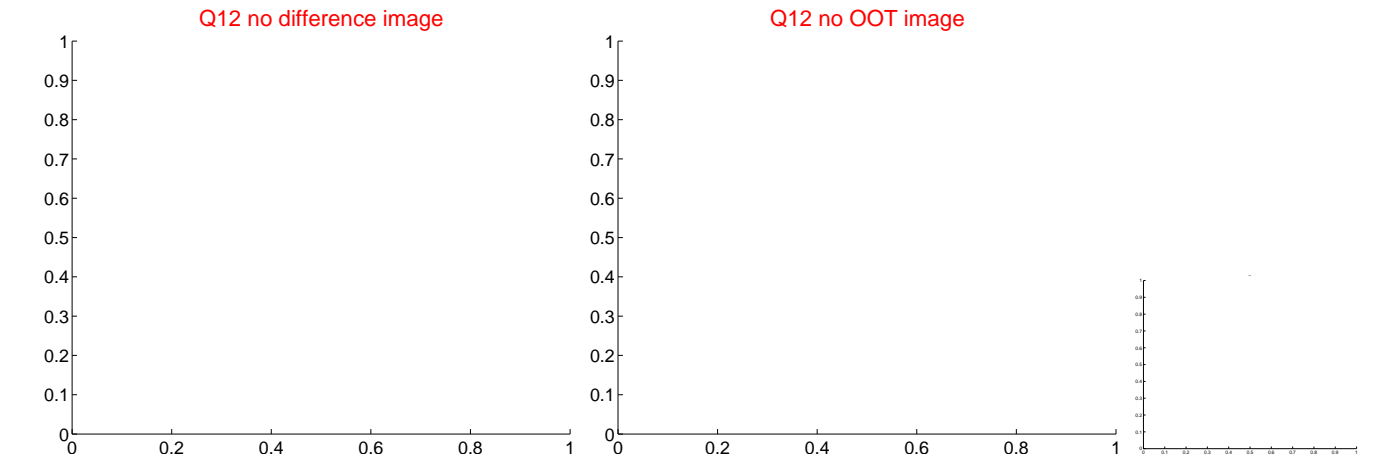
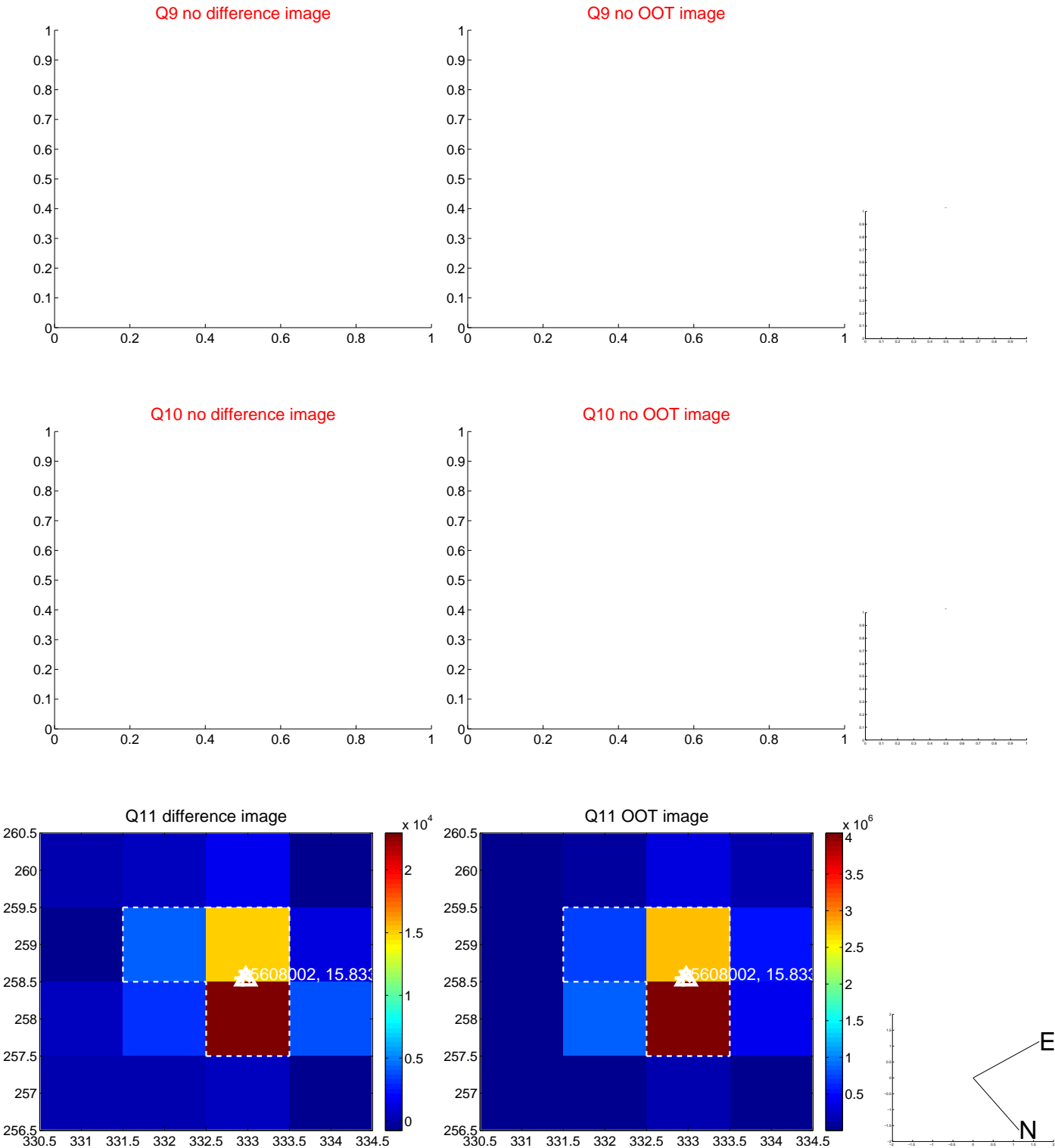
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



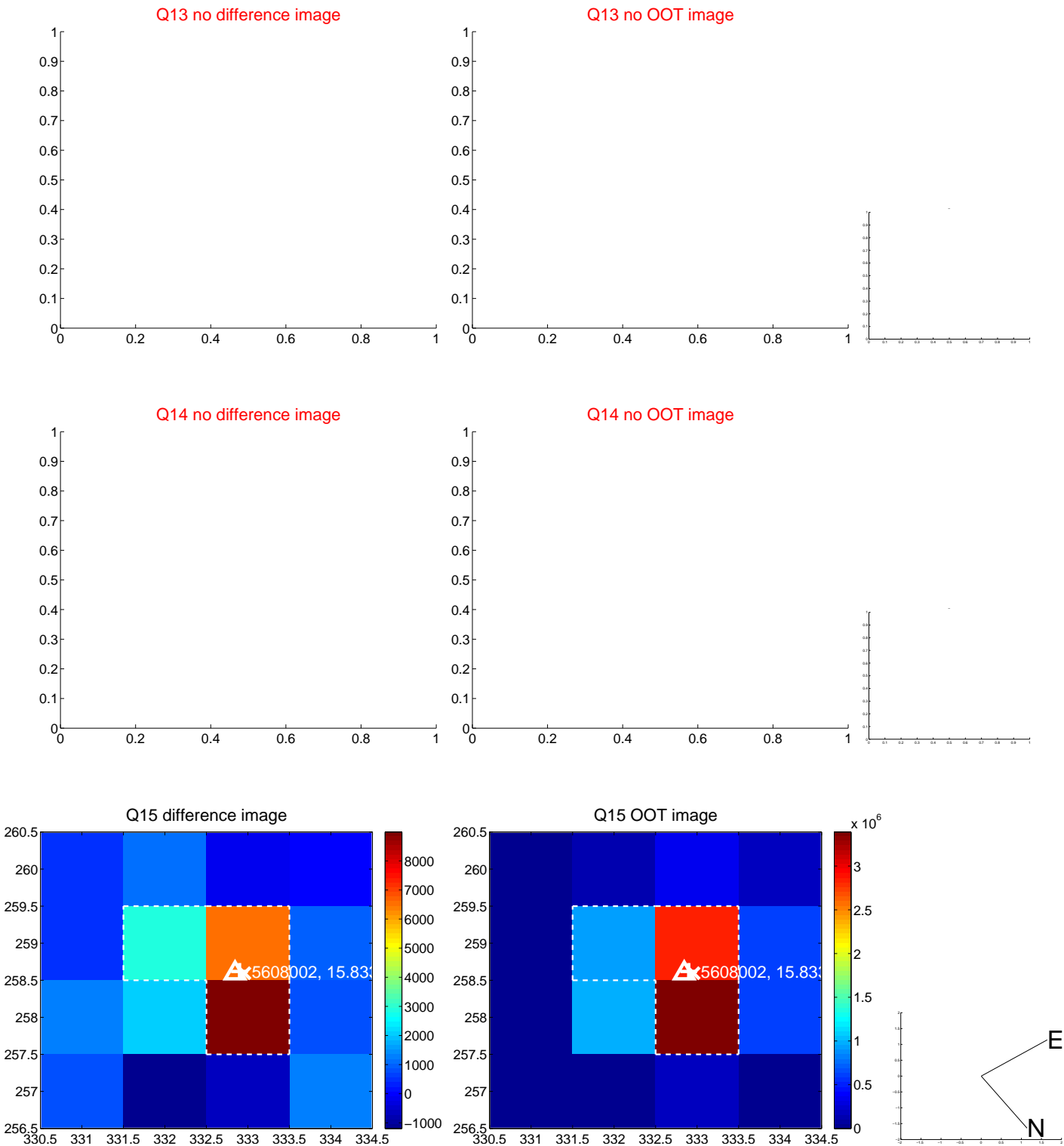
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



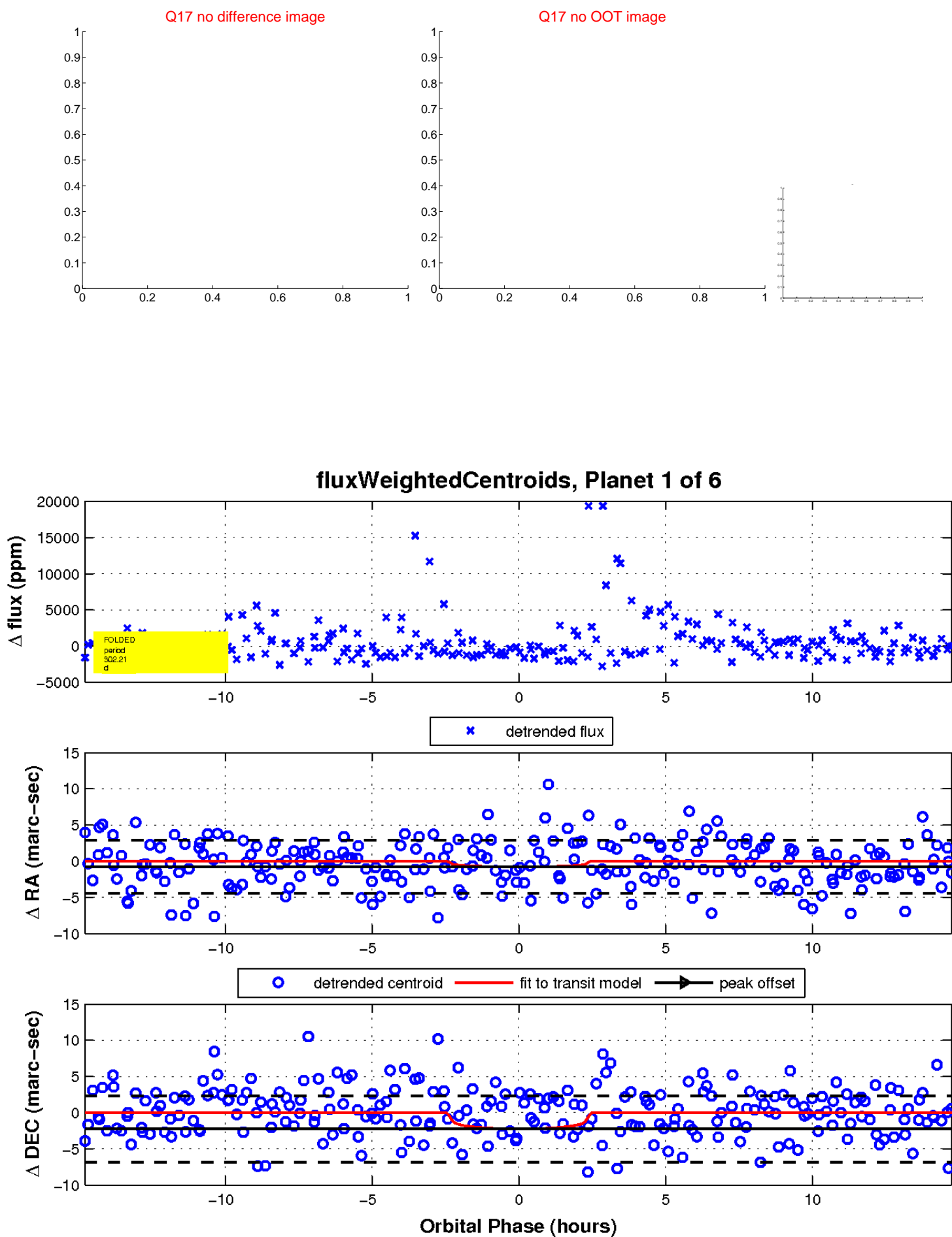
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

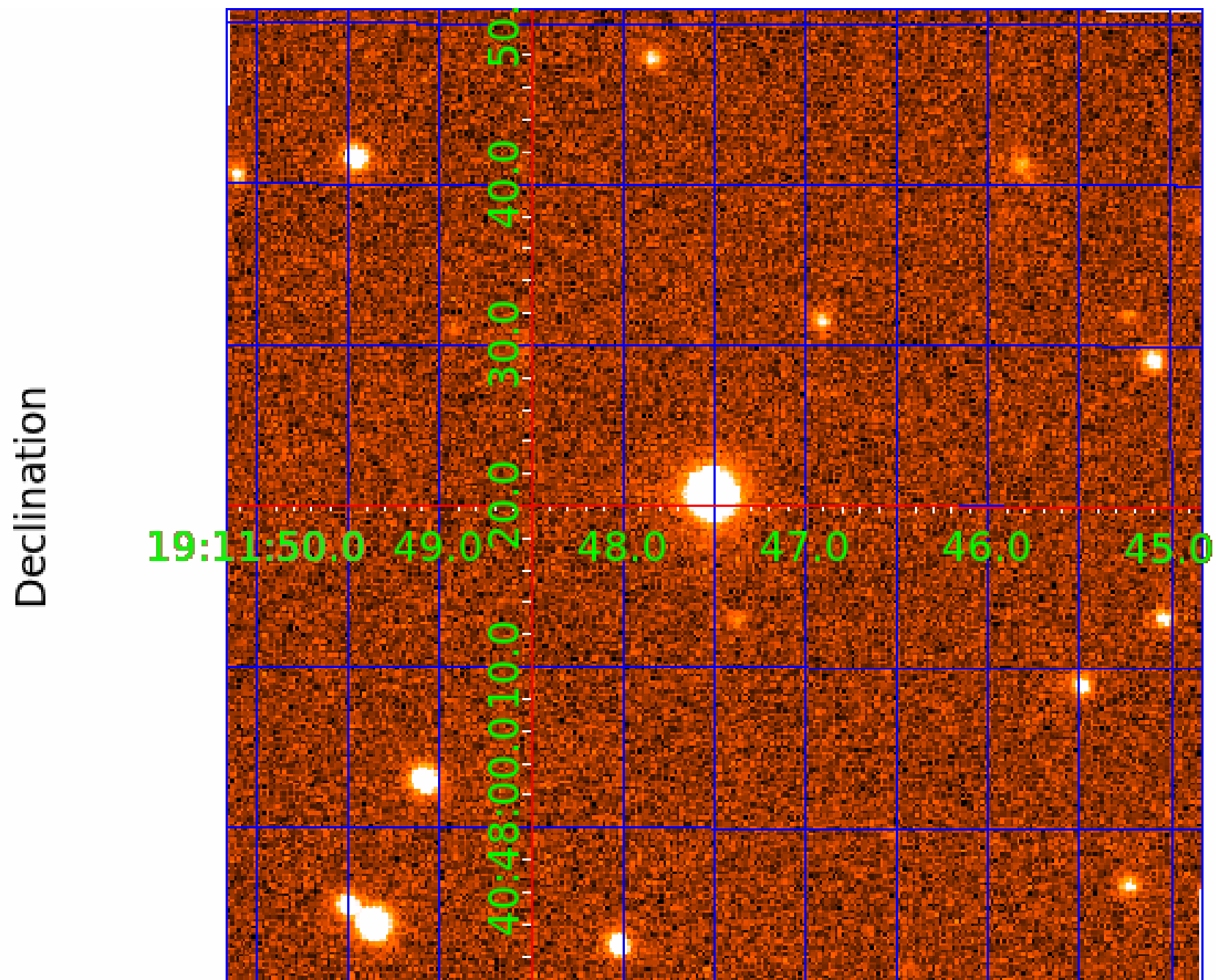


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image



# KIC 005608002

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005608002-01 | OBS      | No   | 302.209519    | 171.181106   | 2127.8      | 4.936            | 13.6 | 6.2 | 0.18                        | 3223            | 0.81                   | 0.01                   |
| 005608002-02 | OBS      | No   | 330.344519    | 407.909197   | 2361.2      | 4.094            | 14.8 | 6.5 | 0.18                        | 3223            | 0.86                   | 0.01                   |
| 005608002-03 | OBS      | No   | 199.737602    | 324.308792   | 2348.0      | 6.649            | 11.8 | 7.4 | 0.18                        | 3223            | 0.89                   | 0.02                   |
| 005608002-04 | OBS      | No   | 511.172392    | 482.923424   | 2309.0      | 7.409            | 11.2 | 5.4 | 0.18                        | 3223            | 0.85                   | 0.01                   |
| 005608002-05 | OBS      | No   | 225.187164    | 132.001189   | 3320.5      | 4.313            | 11.0 | 8.1 | 0.18                        | 3223            | 1.87                   | 0.02                   |
| 005608002-06 | OBS      | No   | 276.834758    | 172.887603   | 2319.2      | 7.567            | 10.2 | 6.5 | 0.18                        | 3223            | 0.85                   | 0.01                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005608002-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS  |
| 005608002-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS           |
| 005608002-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 005608002-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV  |

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

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

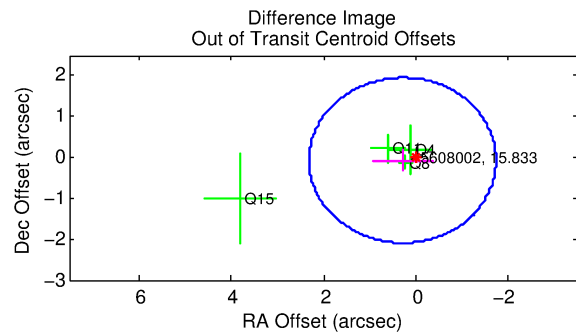
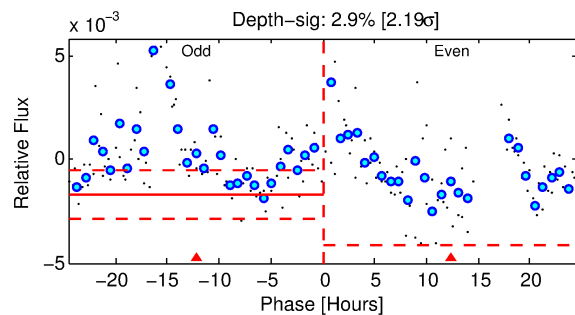
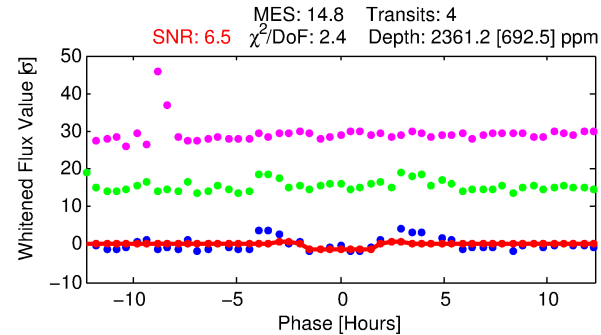
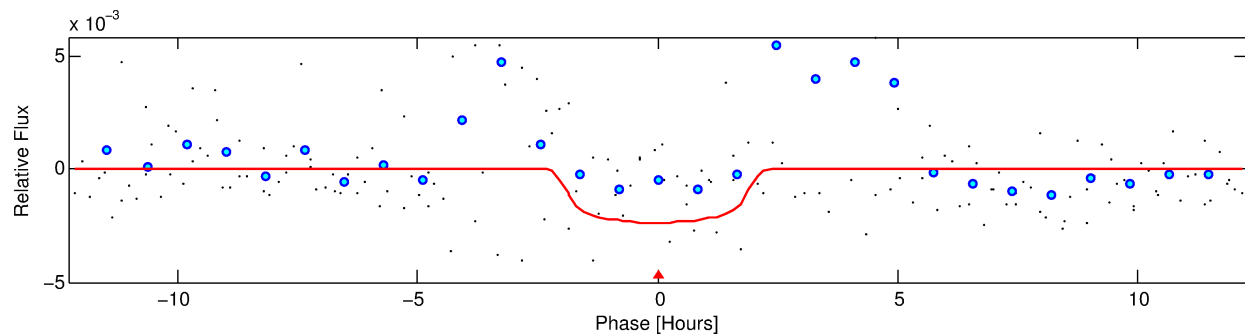
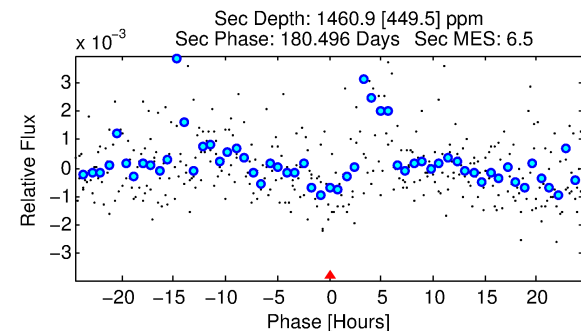
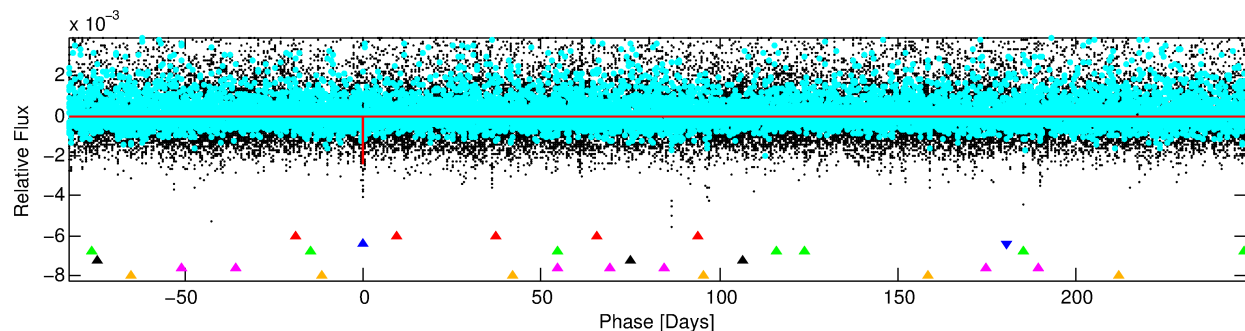
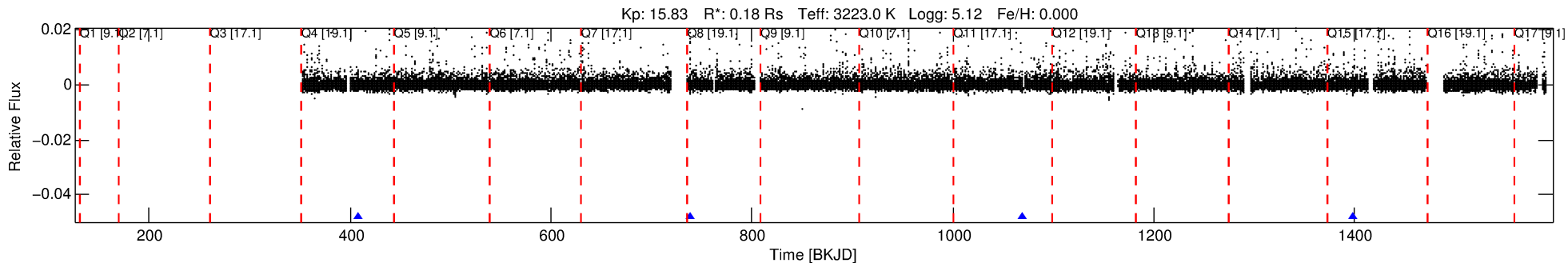
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005608002-02

No Significant Match Found

# DV One-Page Summary

KIC: 5608002 Candidate: 2 of 6 Period: 330.345 d



## DV Fit Results:

Period = 330.34452 [0.00746] d  
Epoch = 407.9092 [0.0146] BKJD  
Rp/R\* = 0.0443 [0.0673]  
a/R\* = 625.43 [4060.48]  
b = 0.25 [24.63]  
Seff = 0.01 [0.00]  
Teq = 85 [4] K  
Rp = 0.86 [1.33] Re  
a = 0.5034 [0.0780] AU  
Ag = 272541.77 [834183.82] [0.33σ]  
Teffp = 2995 [2288] K [1.27σ]

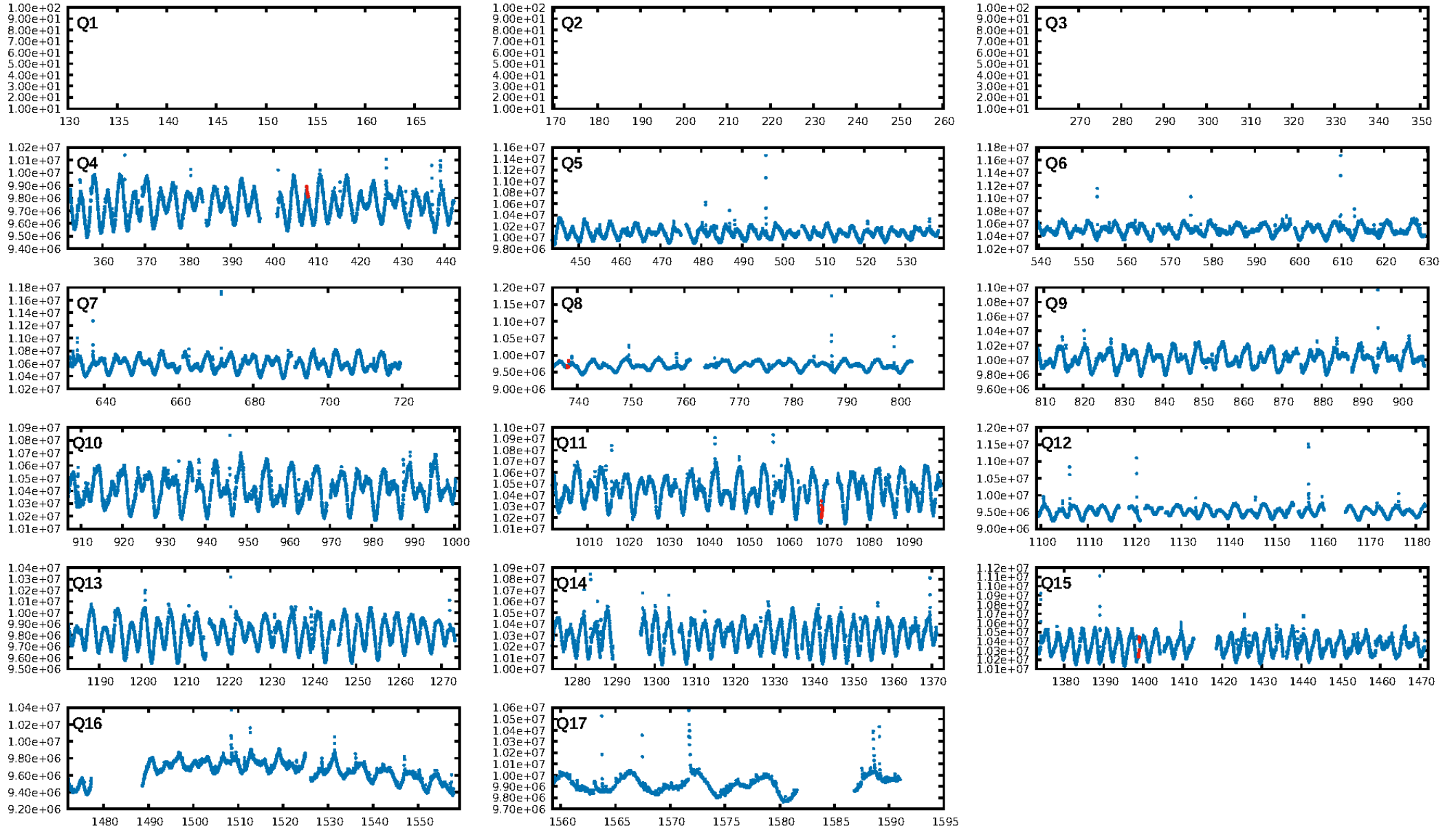
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [105.30σ]  
LongPeriod-sig: 100.0% [512.73σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 19.2%  
Bootstrap-pfa: 8.05e-15  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.9459  
Centroid-sig: 49.8%  
Centroid-so: 0.770 arcsec [0.83σ]  
OotOffset-rm: 0.302 arcsec [0.45σ]  
KicOffset-rm: 0.245 arcsec [0.44σ]  
OotOffset-st: 0/2/2/0 [4]  
KicOffset-st: 0/2/2/0 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 1.00 [4/4]

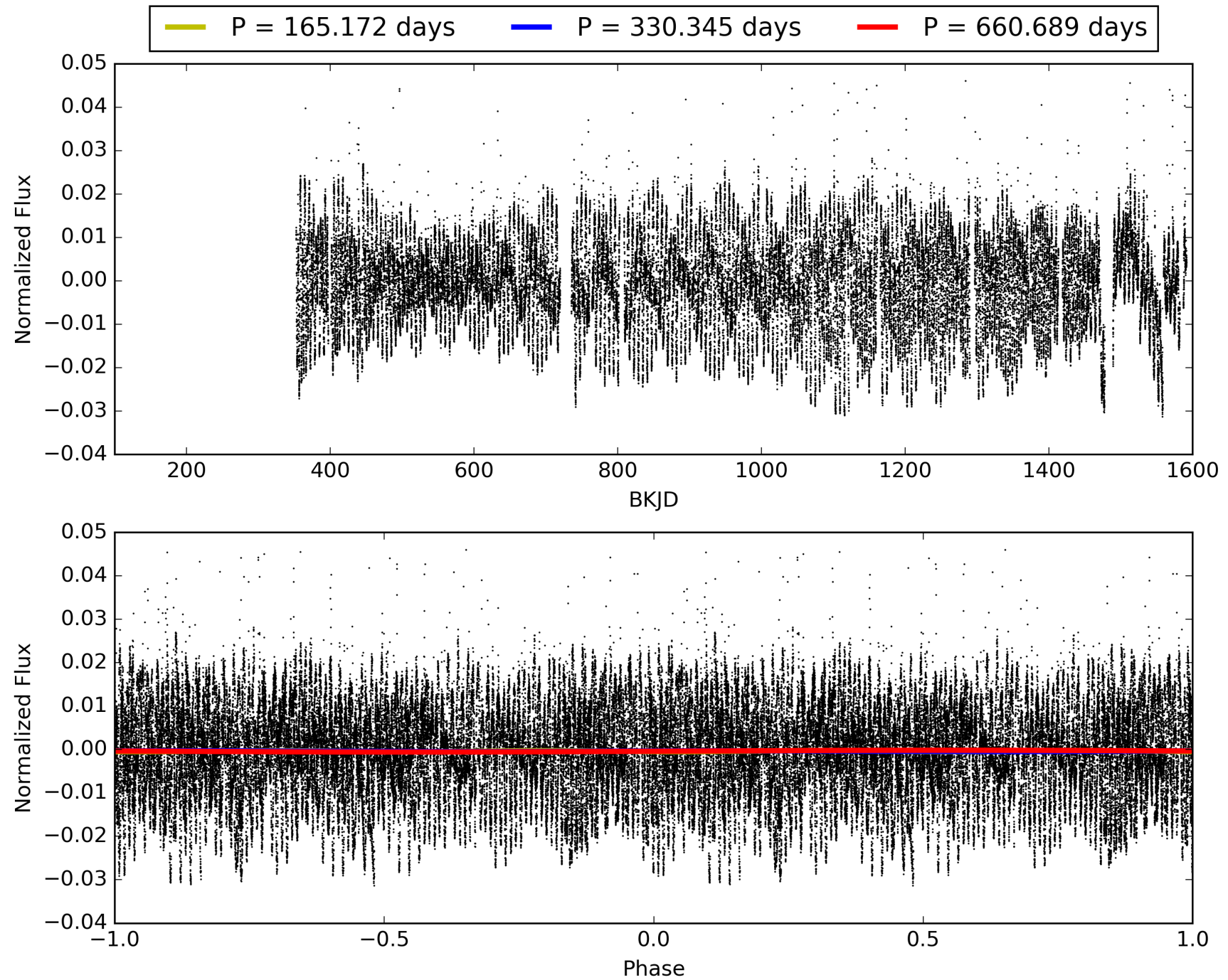
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 22:01:11 Z

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

# TCE 005608002-02, PDC Light Curves



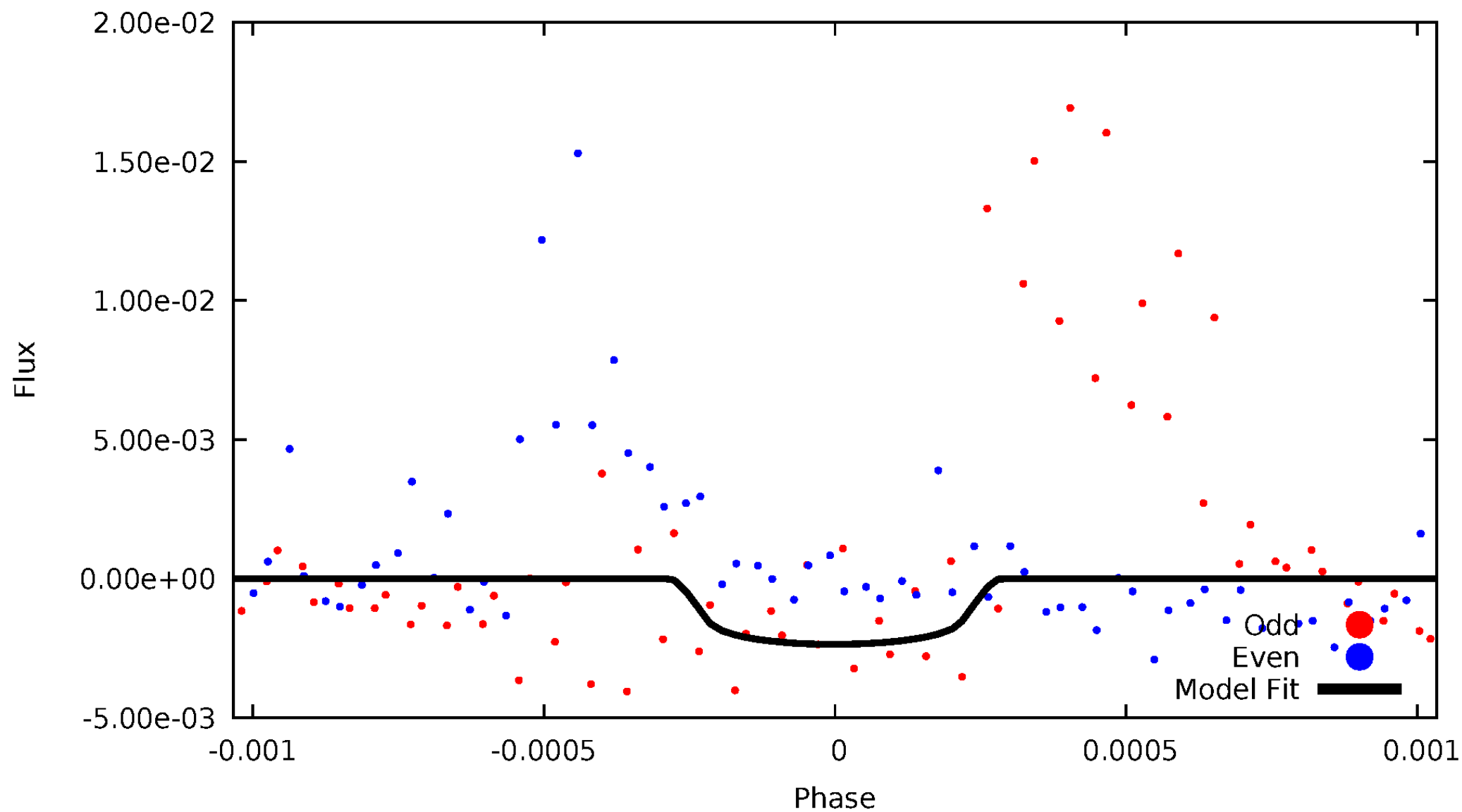
TCE 005608002-02





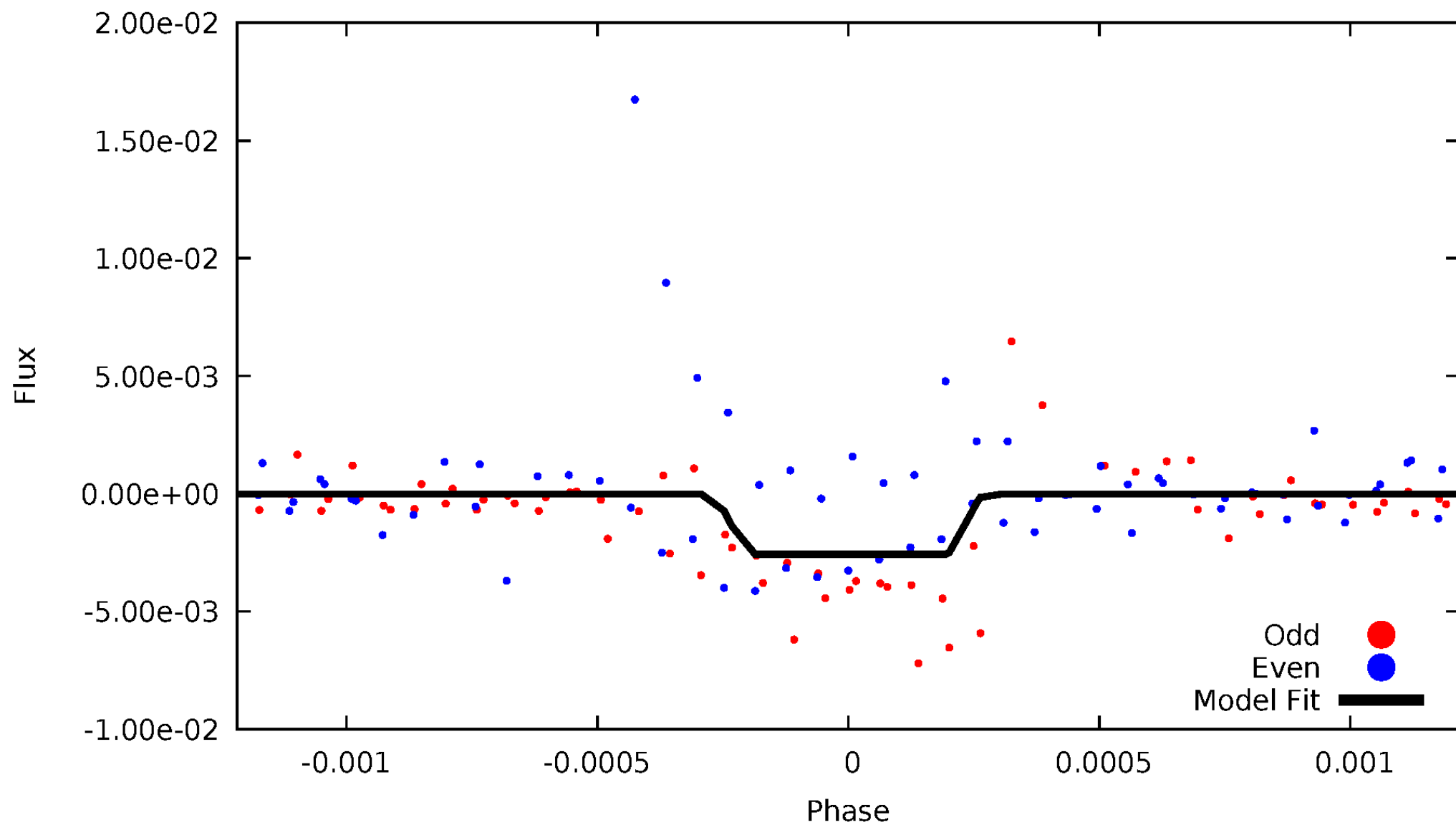
# DV Odd/Even

TCE 005608002-02



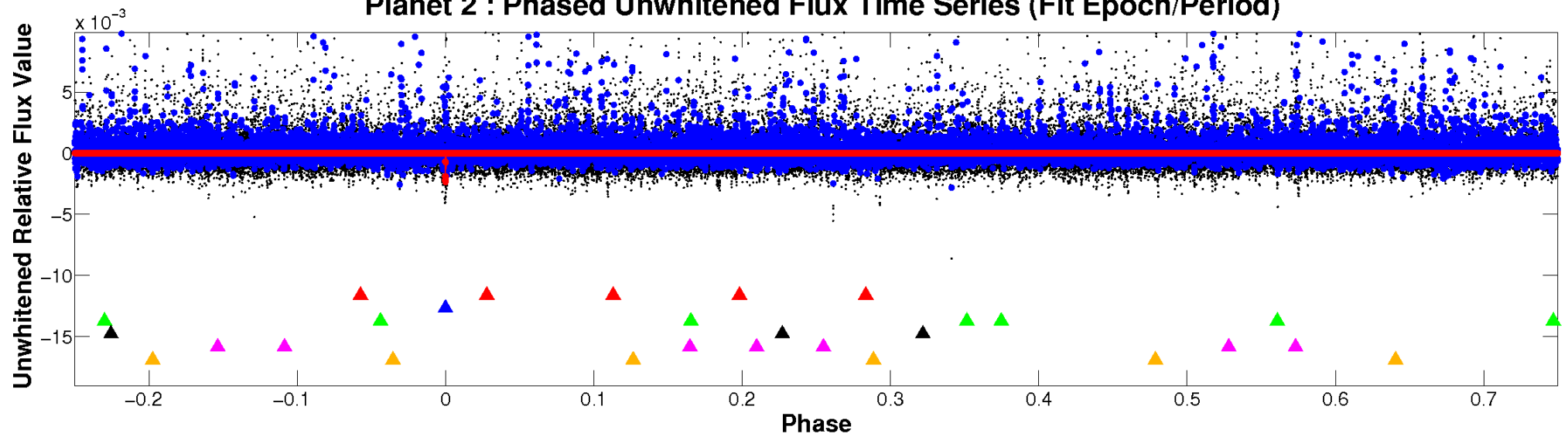
# ALT Odd/Even

TCE 005608002-02

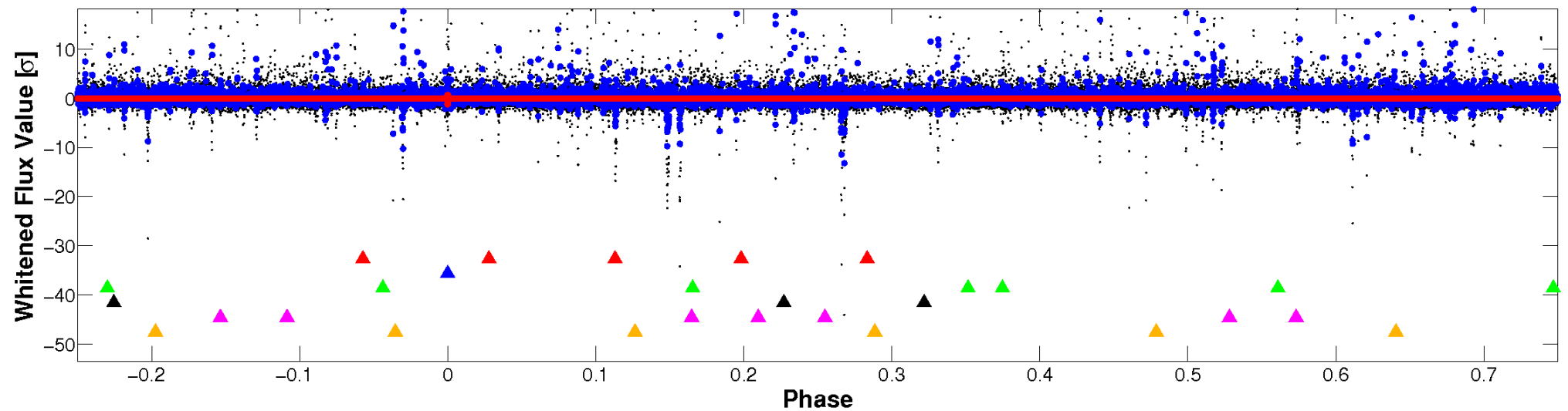


# Non-Whitened Vs. Whitened Light Curve

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

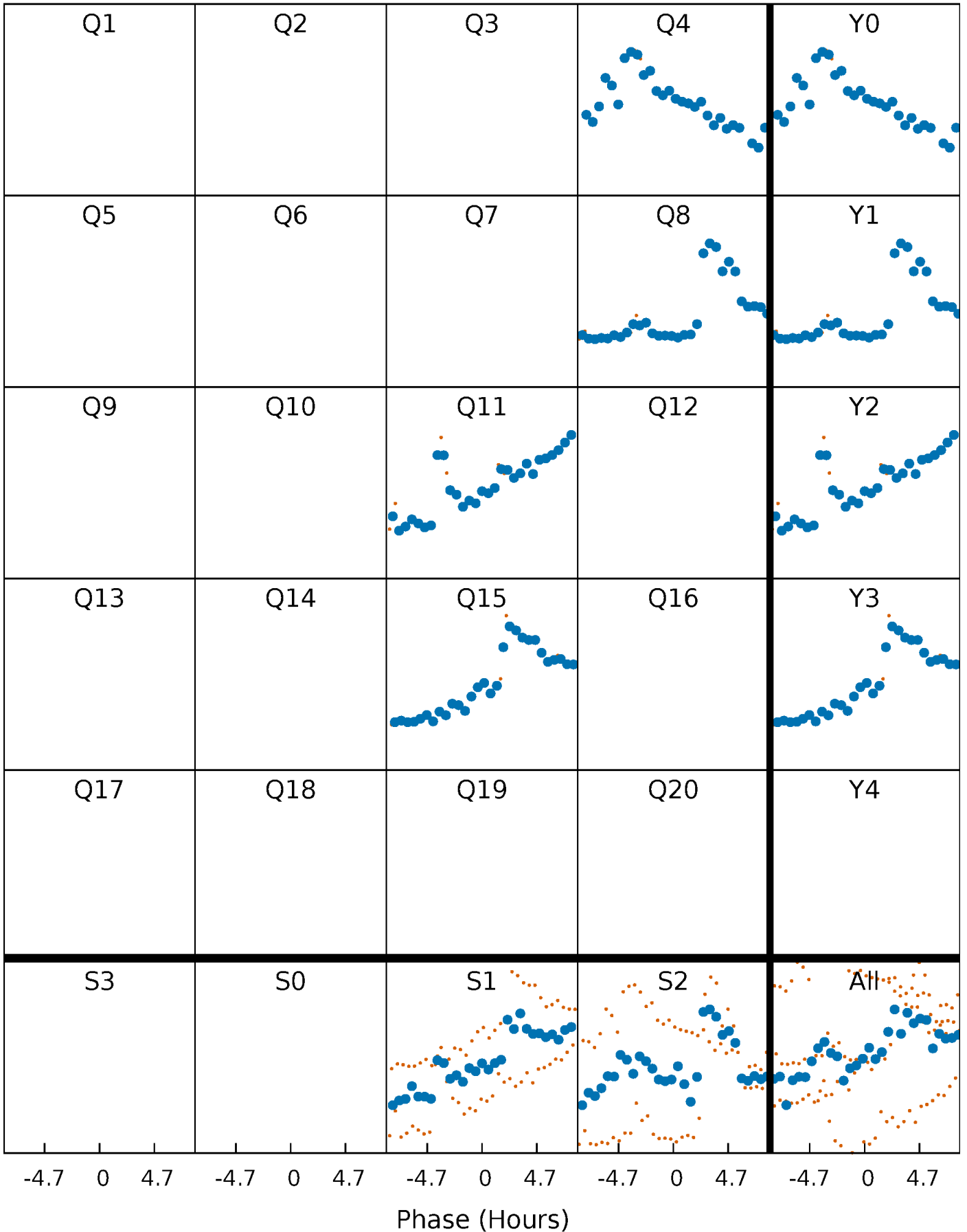


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



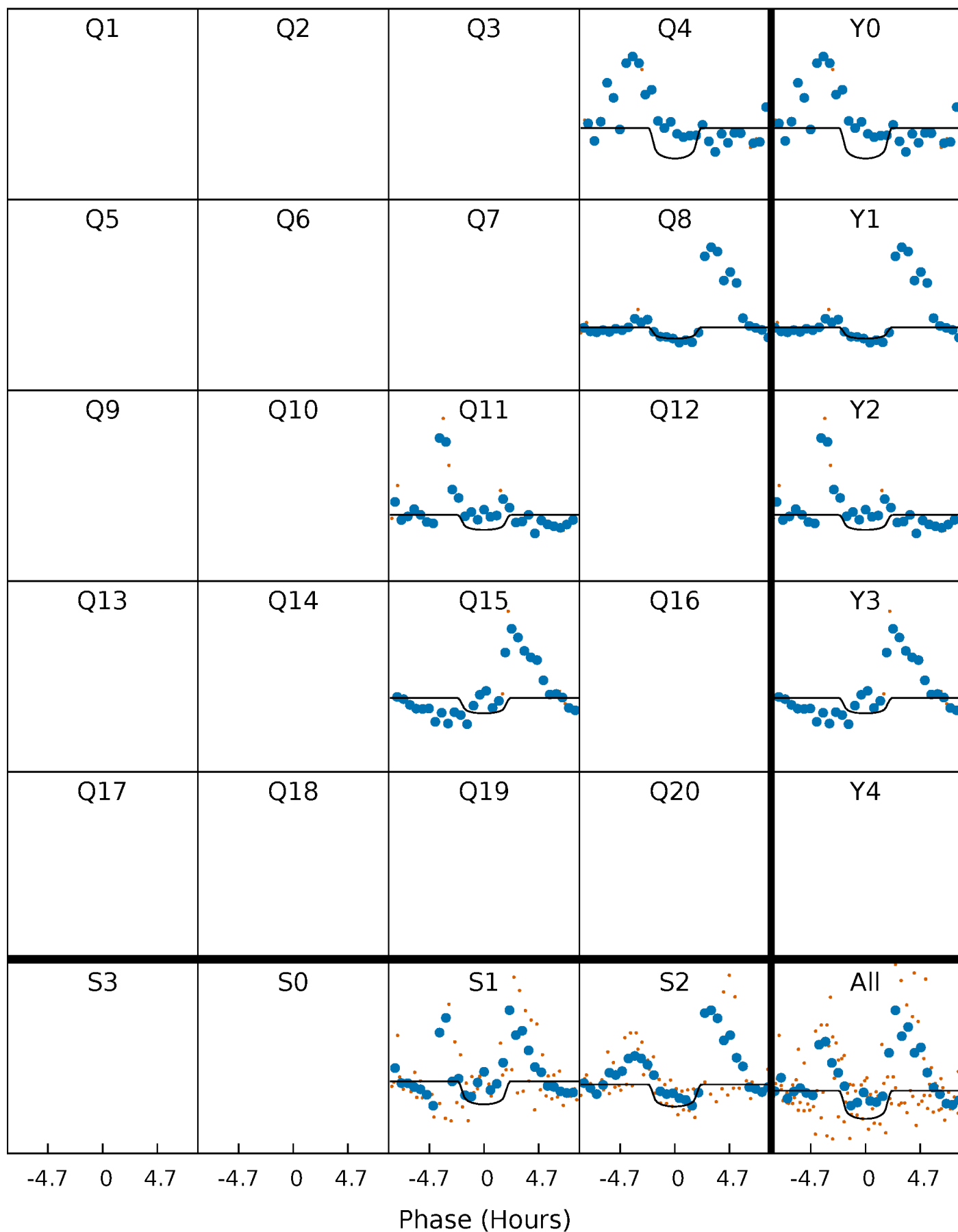
# PDC Quarter-Phased Transit Curves

TCE 005608002-02     $P=330.344518$  Days     $T_0=407.909197$  (BKJD)



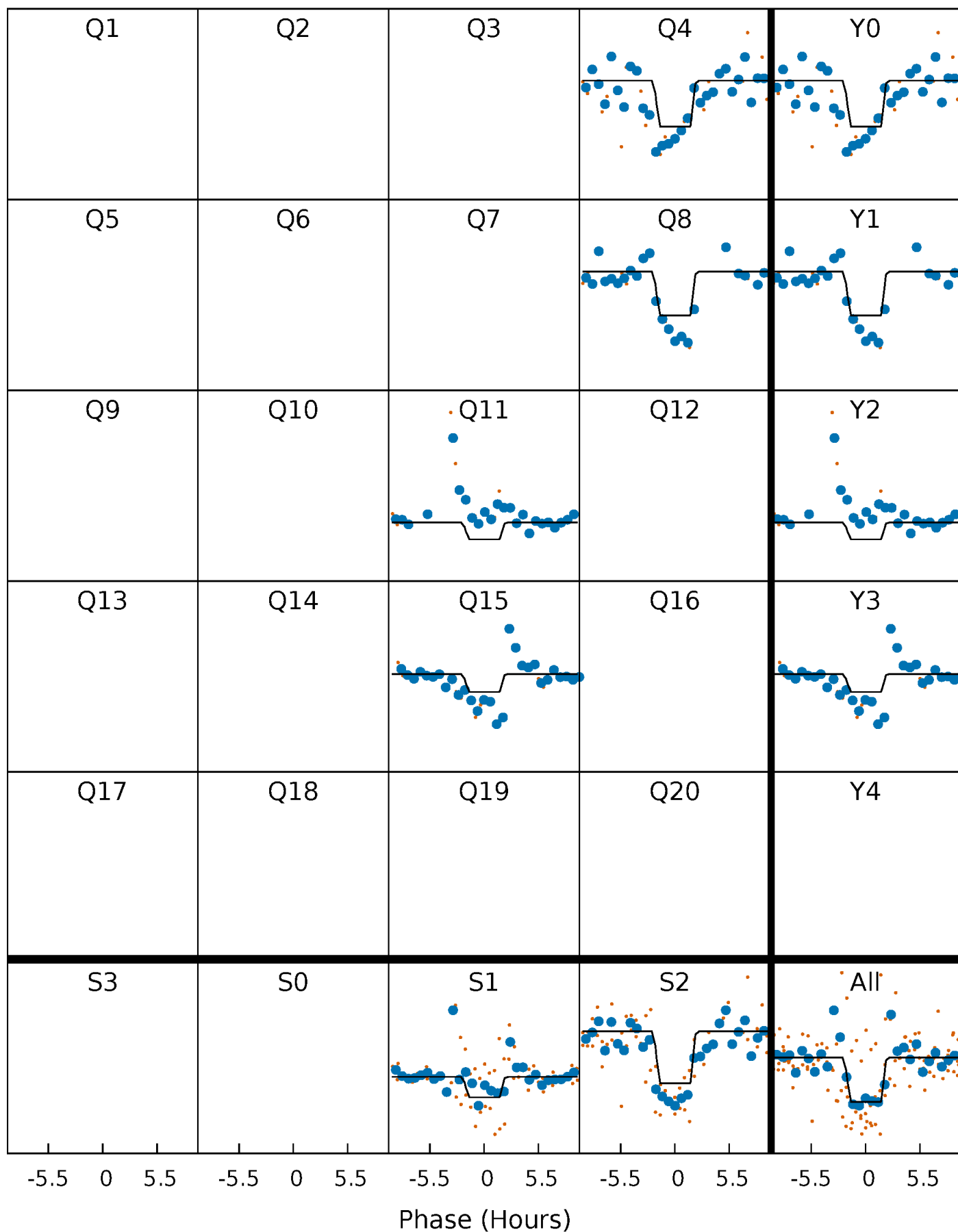
# DV Quarter-Phased Transit Curves

TCE 005608002-02     $P=330.344518$  Days     $T_0=407.909197$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

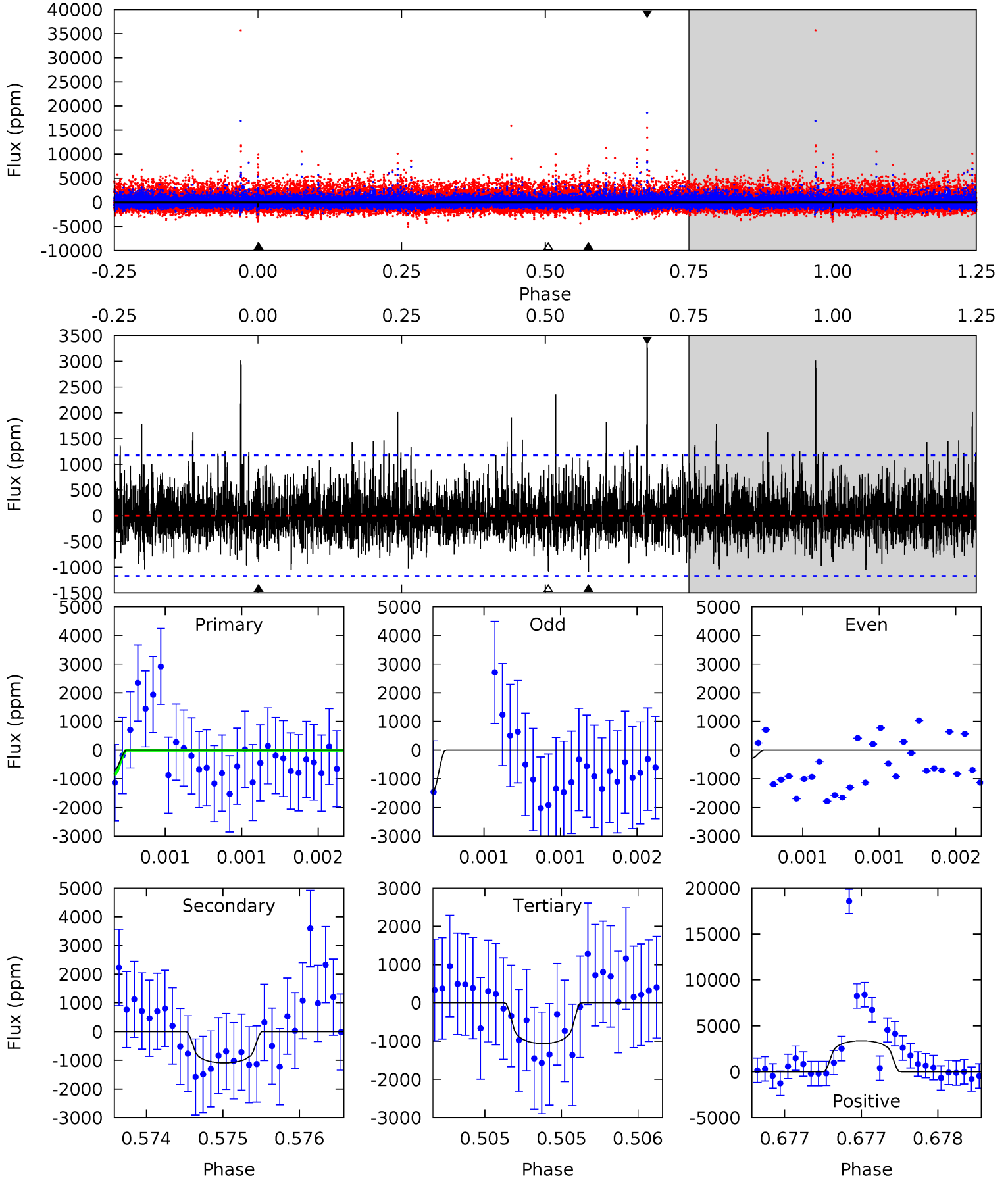
TCE 005608002-02     $P=330.328931$  Days     $T_0=407.934951$  (BKJD)



# DV Model-Shift Uniqueness Test

005608002-02, P = 330.344518 Days, E = 77.564679 Days

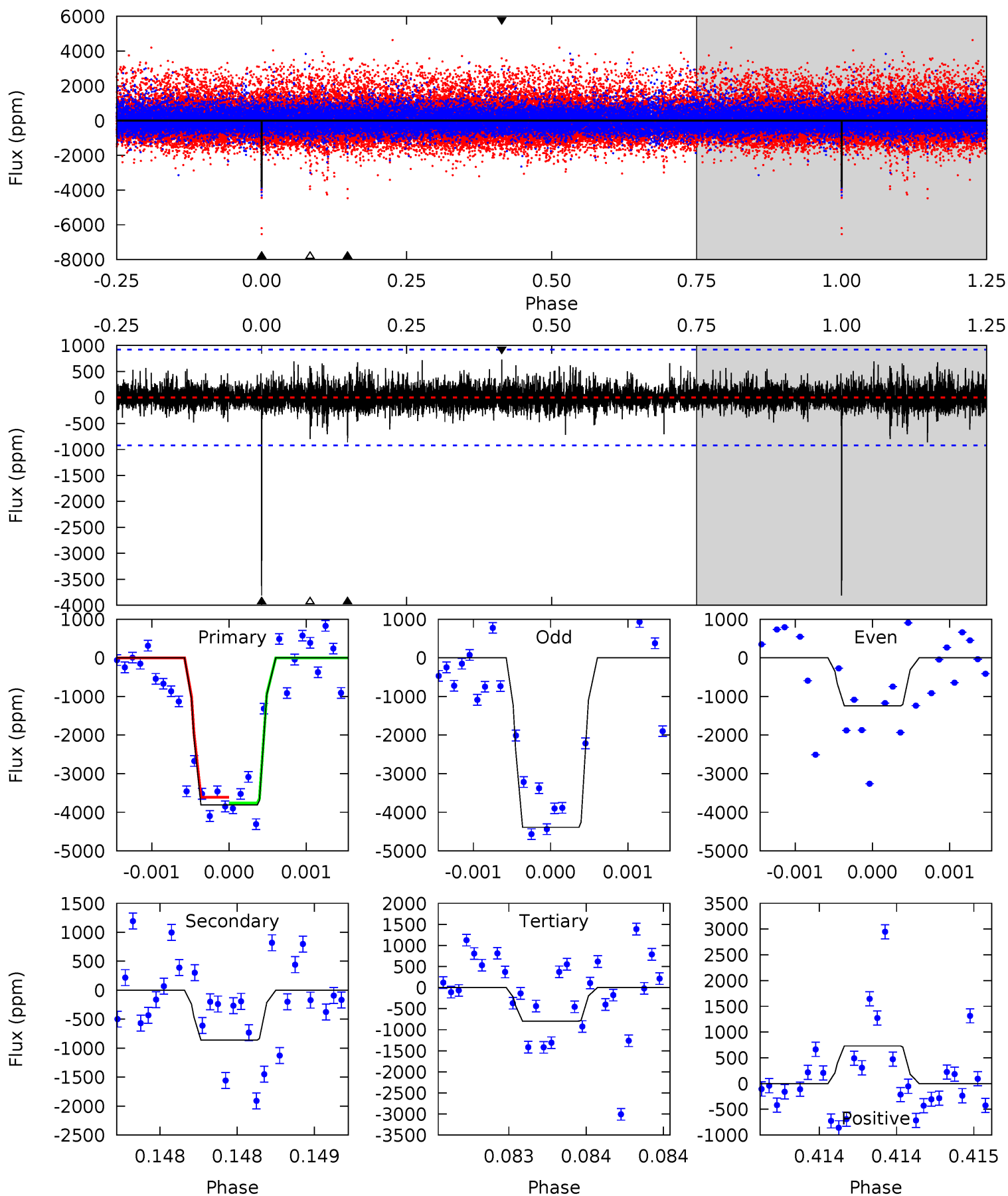
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 4.24 | 5.18 | 5.04 | 16.0 | 5.55            | 3.44            | 1.75             | -0.81   | -11.8   | 0.14    | -10.8   | 2.79    | 2.32 | 0.76  | 0.93 |



# Alt Model-Shift Uniqueness Test

005608002-02, P = 330.328931 Days, E = 77.606020 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 23.0 | 5.19 | 4.83 | 4.41 | 5.57            | 3.48            | 0.92             | 18.2    | 18.6    | 0.36    | 0.78    | 10.6    | 0.77 | 0.16  | 0.46 |





### Stellar Parameters For KIC 005608002

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3223^{+43}_{-24}$  | $5.125^{+0.063}_{-0.070}$ | $0.000^{+0.100}_{-0.100}$ | $0.179^{+0.039}_{-0.026}$ | $0.155^{+0.043}_{-0.023}$ | $38.370^{+13.470}_{-11.810}$              |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +22%/-15%                 | +28%/-15%                 | +35%/-31%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 005608002-02 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$           |
|---------|-----------------|------------------------|----------------------|----------------------|----------------------------|
| DV      | $-1092 \pm 211$ | $1.34^{+1.16}_{-0.88}$ | $119^{+4}_{-3}$      | $2633^{+980}_{-360}$ | $83328^{+673061}_{-59034}$ |
| Alt.    | $-859 \pm 166$  | $1.45^{+1.20}_{-0.95}$ | $119^{+4}_{-4}$      | $2526^{+813}_{-343}$ | $58568^{+398523}_{-41982}$ |

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

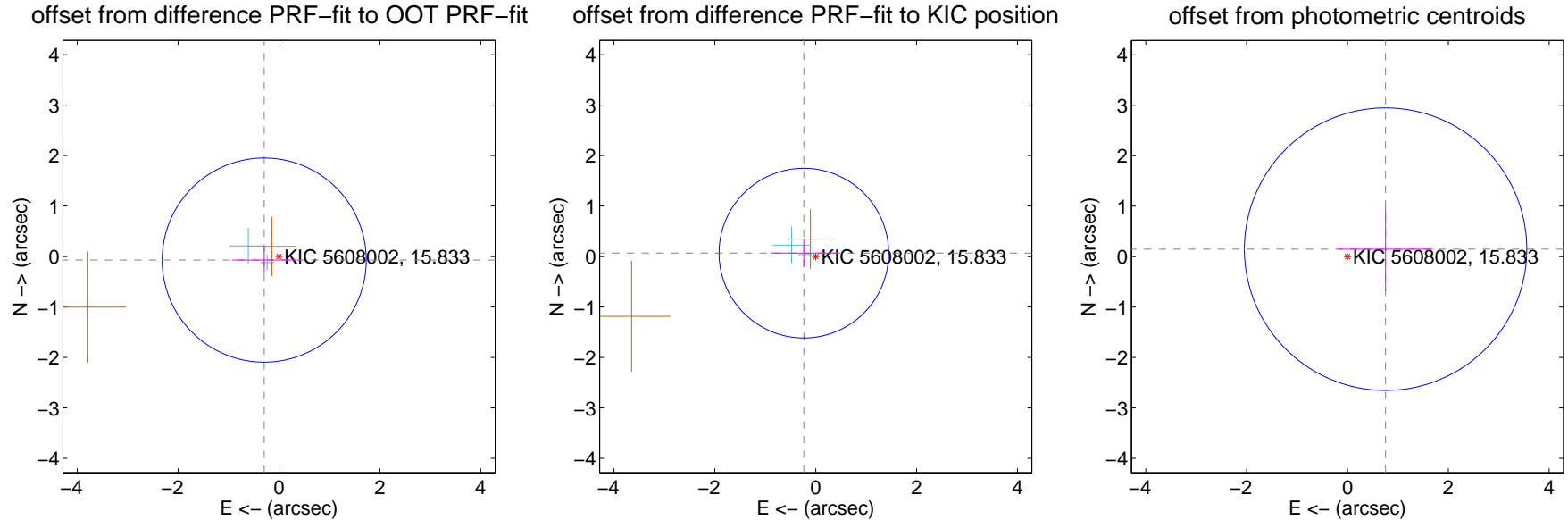
## DV Centroid Data

Supplemental centroid analysis for 005608002-02. Kepler magnitude: 15.83. Transit SNR 6.54

There are 2 quarters with good PRF difference image offsets

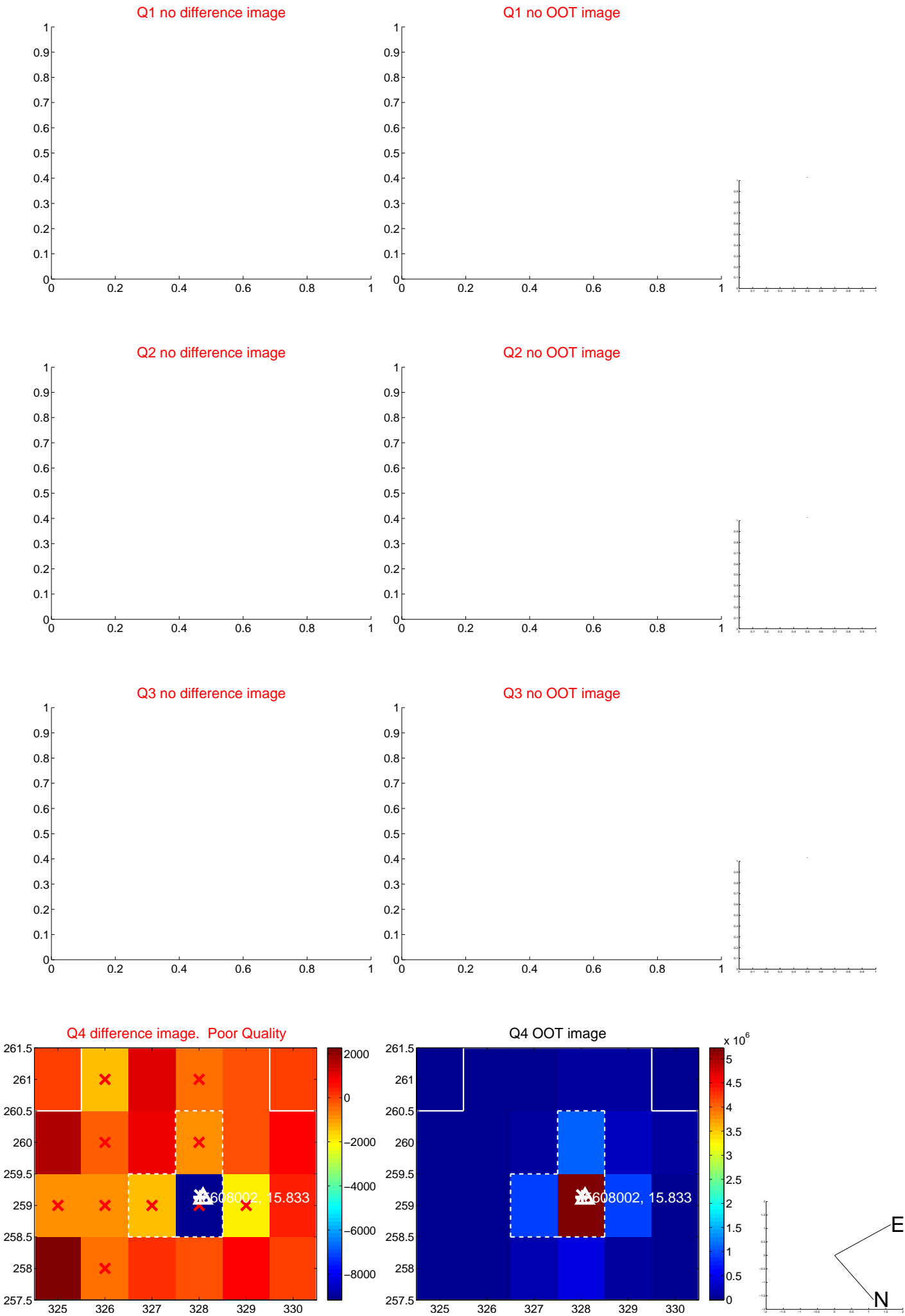
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.302 \pm 0.674$  | 0.45                | $0.293 \pm 0.639$ | $-0.071 \pm 0.250$ |
| PRF-fit source offset from KIC position | $0.245 \pm 0.560$  | 0.44                | $0.235 \pm 0.657$ | $0.067 \pm 0.279$  |
| photometric centroid source offset      | $0.77 \pm 0.93$    | 0.83                | $-0.76 \pm 0.94$  | $0.15 \pm 0.83$    |

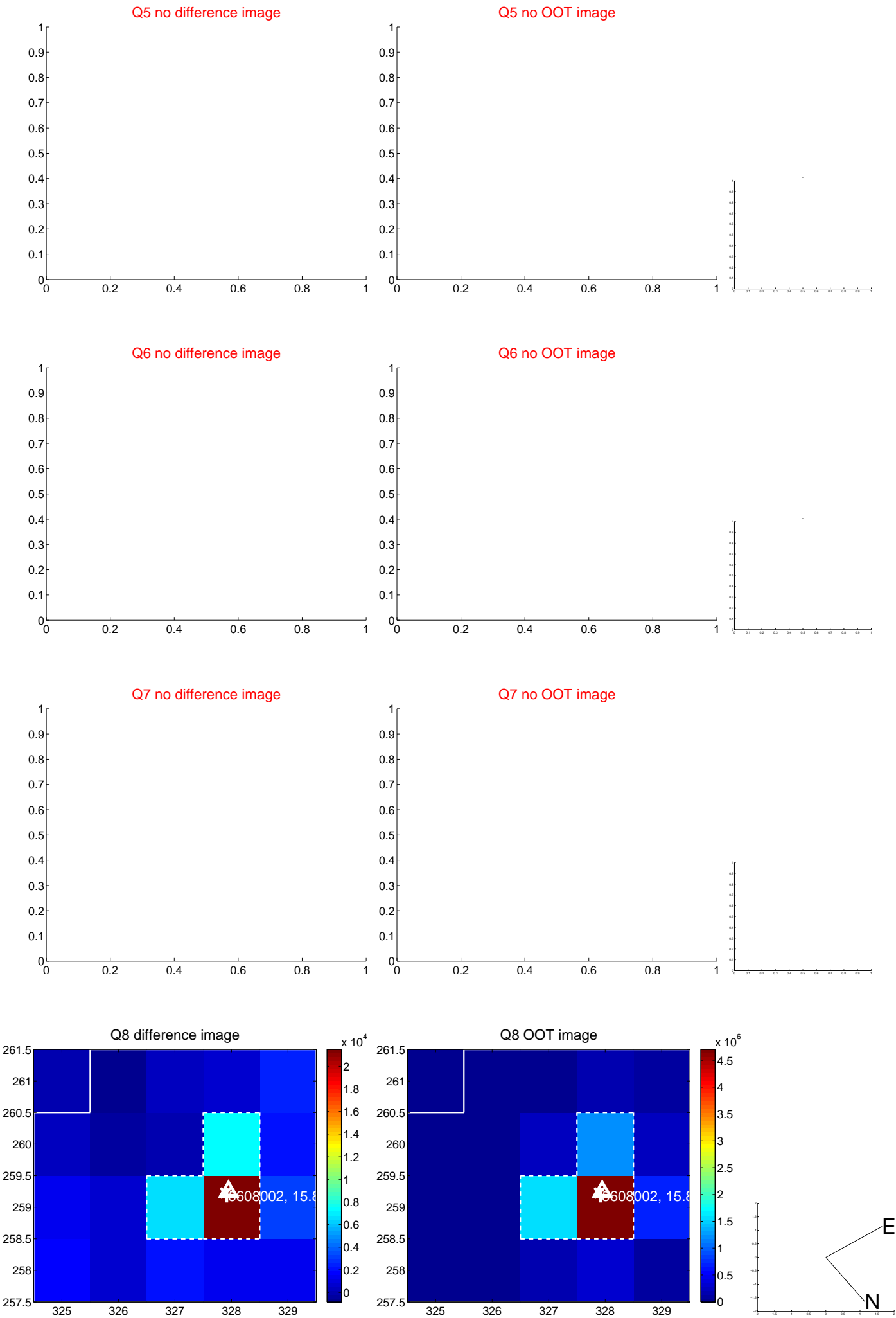


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

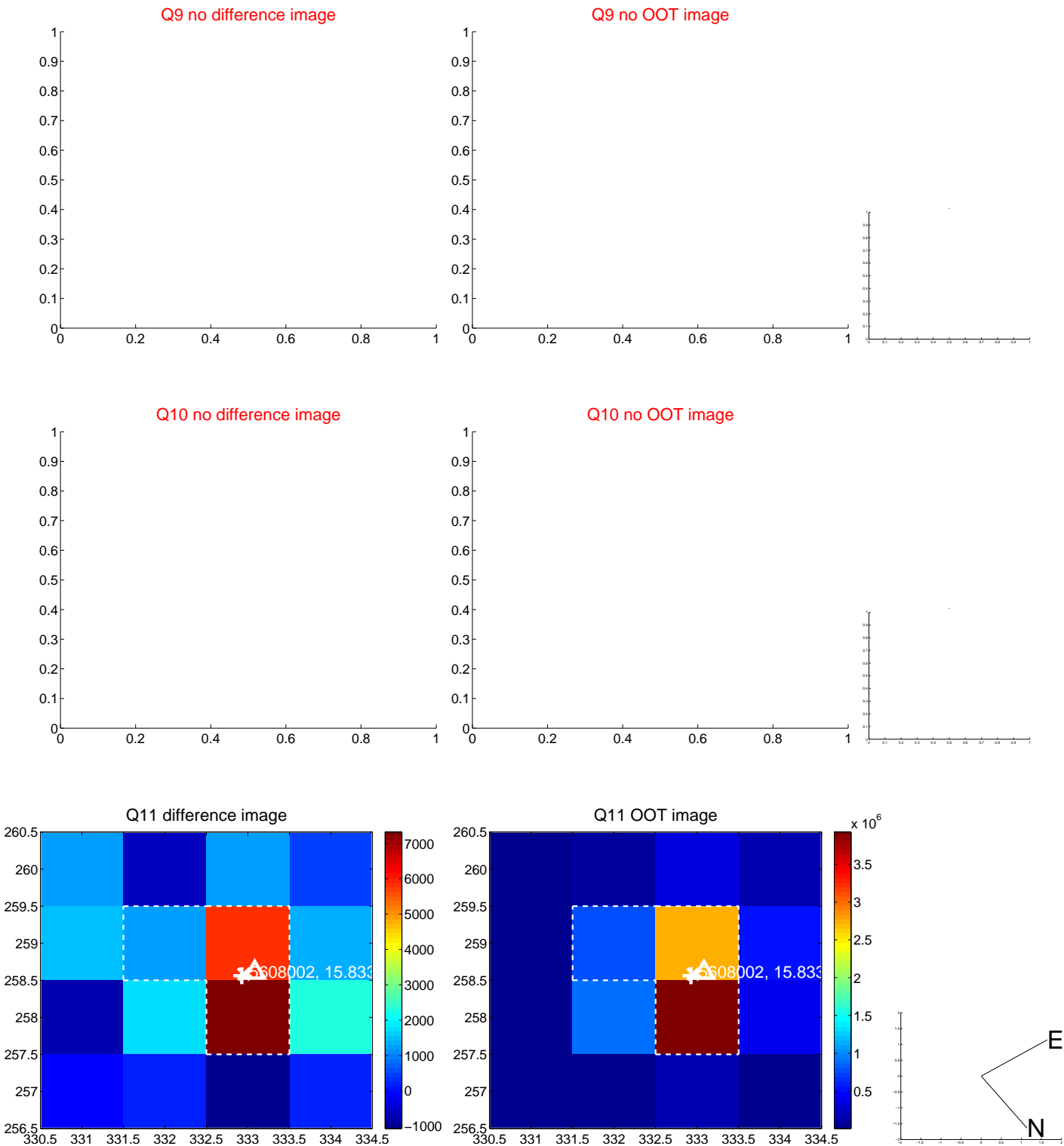
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



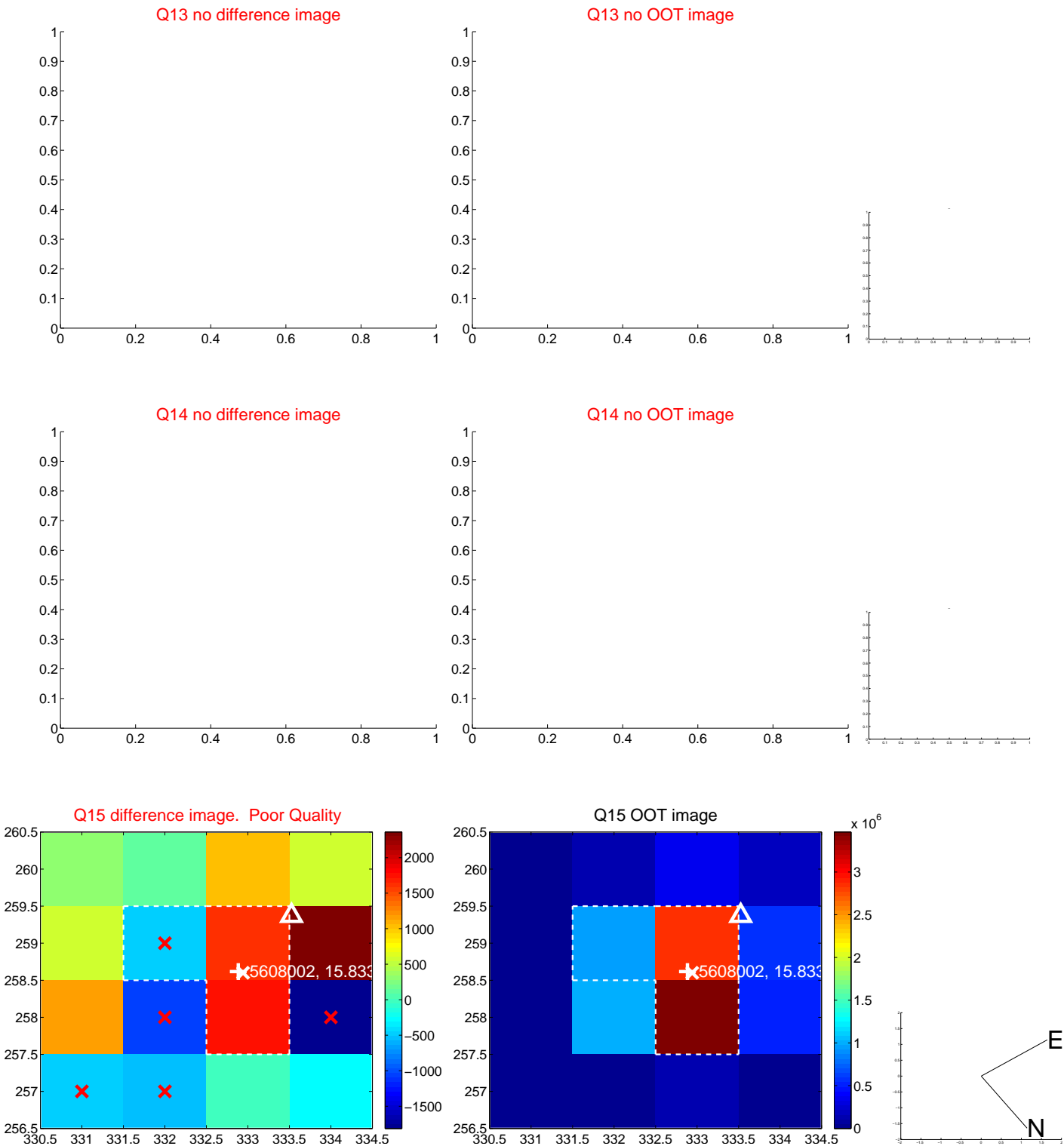
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



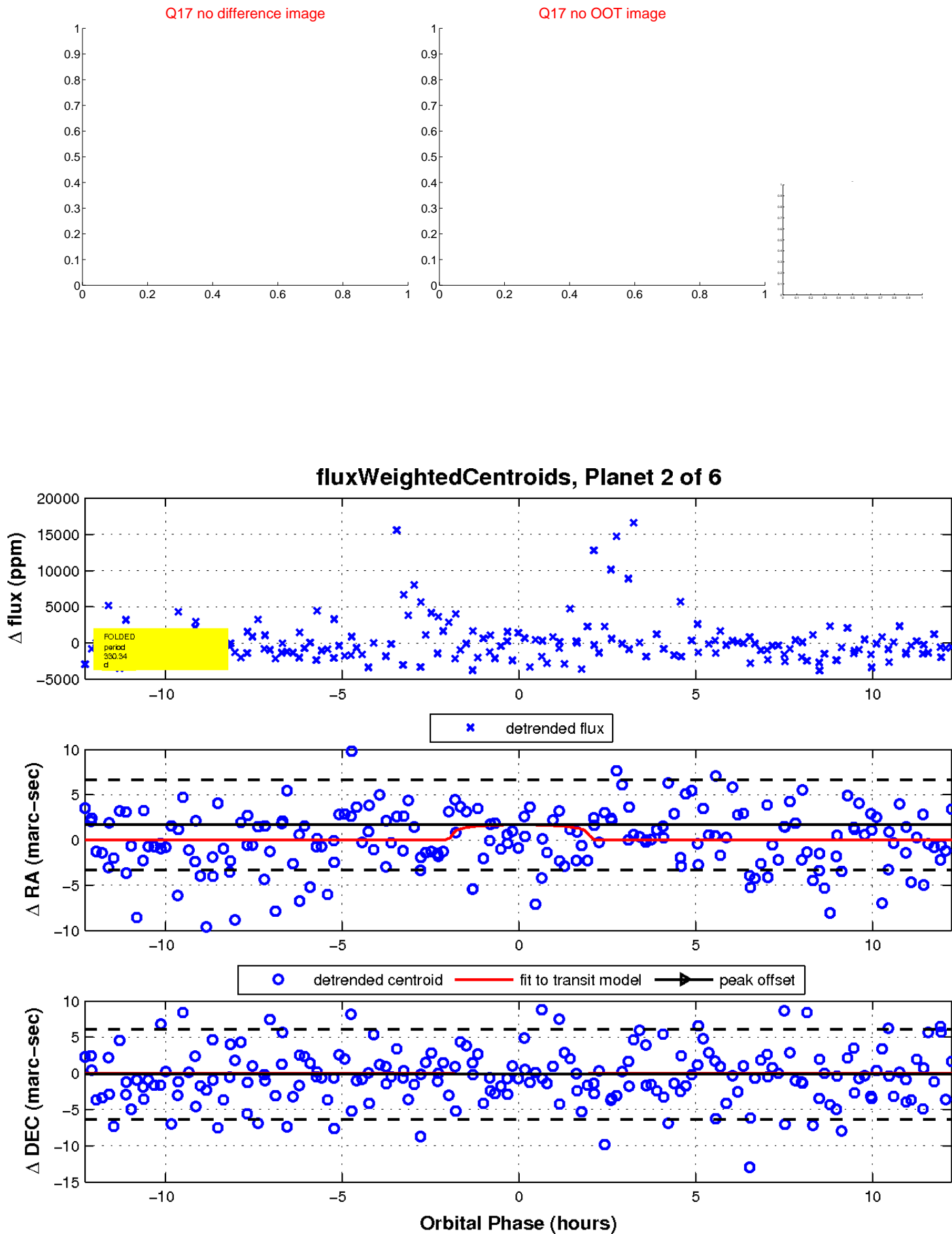
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



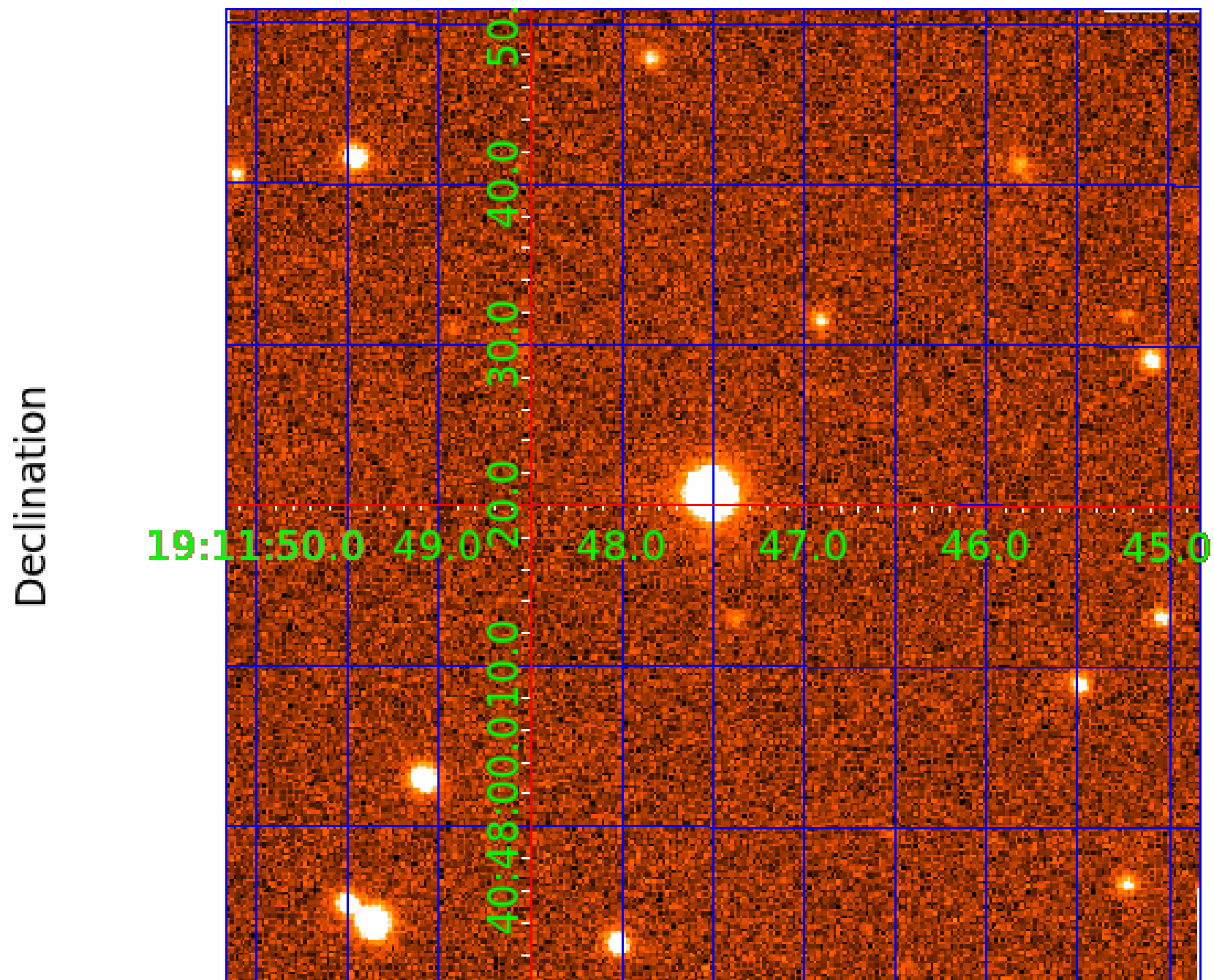
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



UKIRT Image





## KIC 005608002

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005608002-01 | OBS      | No   | 302.209519    | 171.181106   | 2127.8      | 4.936            | 13.6 | 6.2 | 0.18                        | 3223            | 0.81                   | 0.01                   |
| 005608002-02 | OBS      | No   | 330.344519    | 407.909197   | 2361.2      | 4.094            | 14.8 | 6.5 | 0.18                        | 3223            | 0.86                   | 0.01                   |
| 005608002-03 | OBS      | No   | 199.737602    | 324.308792   | 2348.0      | 6.649            | 11.8 | 7.4 | 0.18                        | 3223            | 0.89                   | 0.02                   |
| 005608002-04 | OBS      | No   | 511.172392    | 482.923424   | 2309.0      | 7.409            | 11.2 | 5.4 | 0.18                        | 3223            | 0.85                   | 0.01                   |
| 005608002-05 | OBS      | No   | 225.187164    | 132.001189   | 3320.5      | 4.313            | 11.0 | 8.1 | 0.18                        | 3223            | 1.87                   | 0.02                   |
| 005608002-06 | OBS      | No   | 276.834758    | 172.887603   | 2319.2      | 7.567            | 10.2 | 6.5 | 0.18                        | 3223            | 0.85                   | 0.01                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005608002-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS  |
| 005608002-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS           |
| 005608002-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 005608002-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV  |

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

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

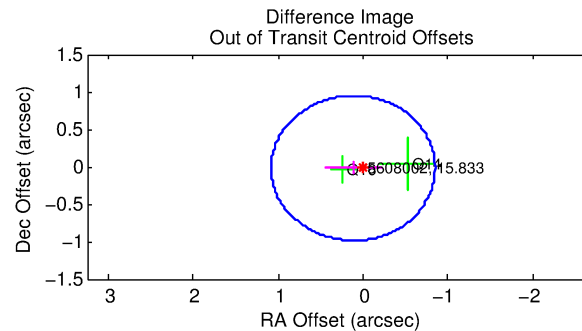
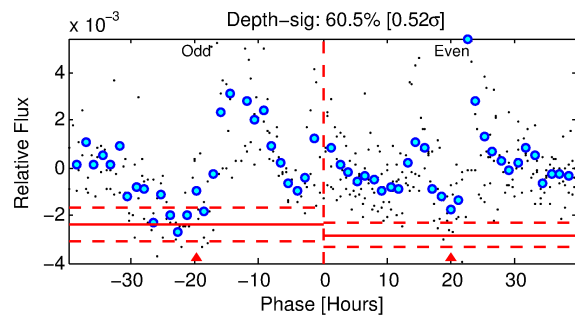
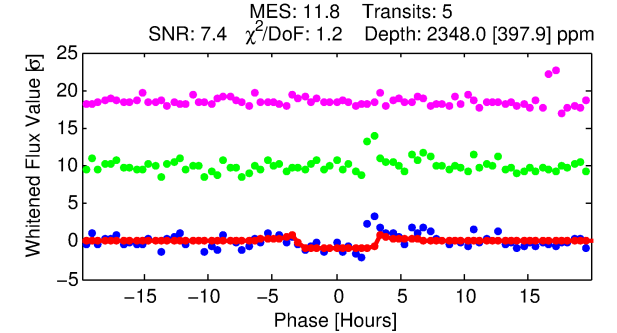
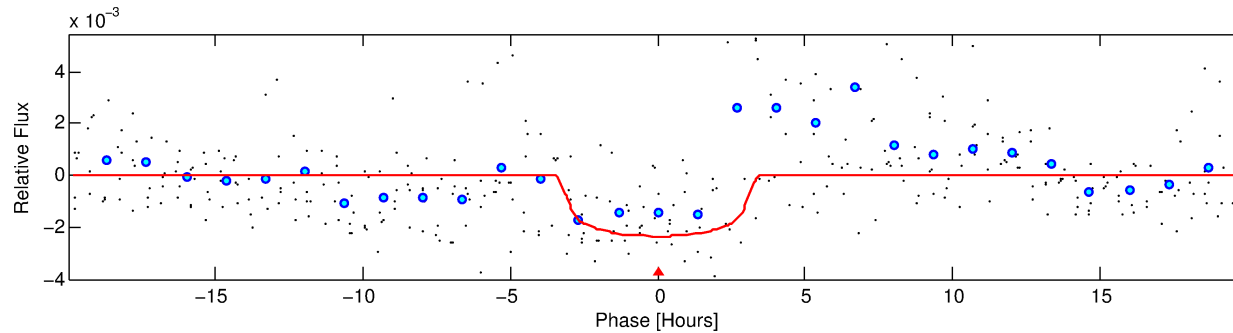
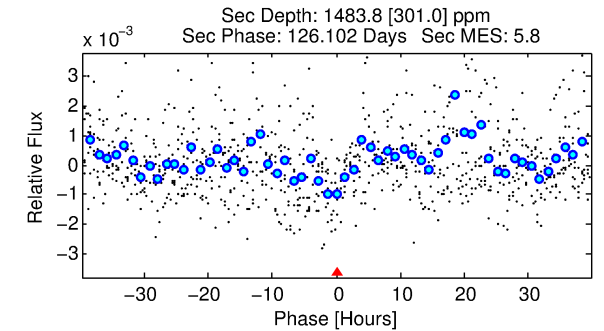
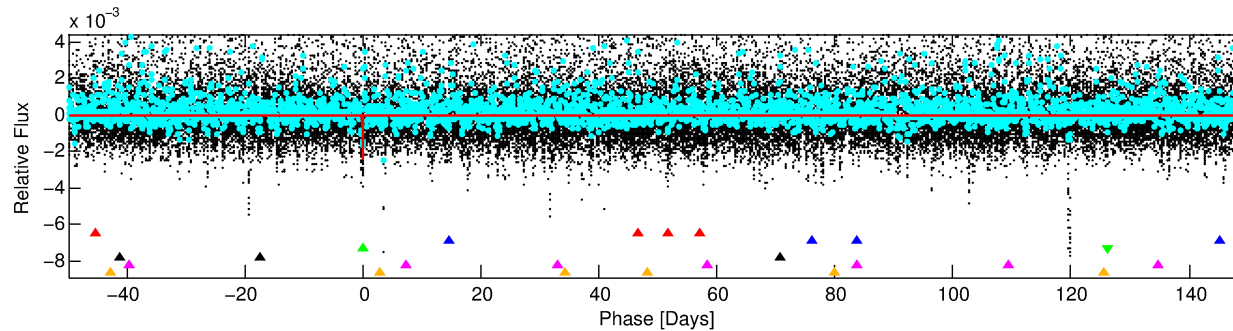
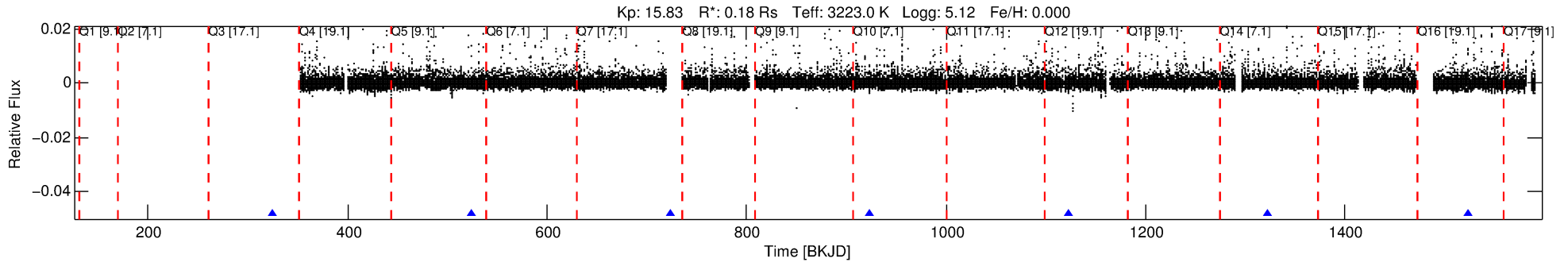
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005608002-03

No Significant Match Found

# DV One-Page Summary

KIC: 5608002 Candidate: 3 of 6 Period: 199.738 d



## DV Fit Results:

Period = 199.73760 [0.00370] d  
Epoch = 324.3088 [0.0139] BKJD  
Rp/R\* = 0.0454 [0.0176]  
a/R\* = 208.30 [325.75]  
b = 0.52 [2.20]  
Seff = 0.02 [0.00]  
Teq = 100 [5] K  
Rp = 0.89 [0.39] Re  
a = 0.3599 [0.0557] AU  
Ag = 134588.17 [110645.28] [1.22σ]  
Teffp = 2969 [597] K [4.81σ]

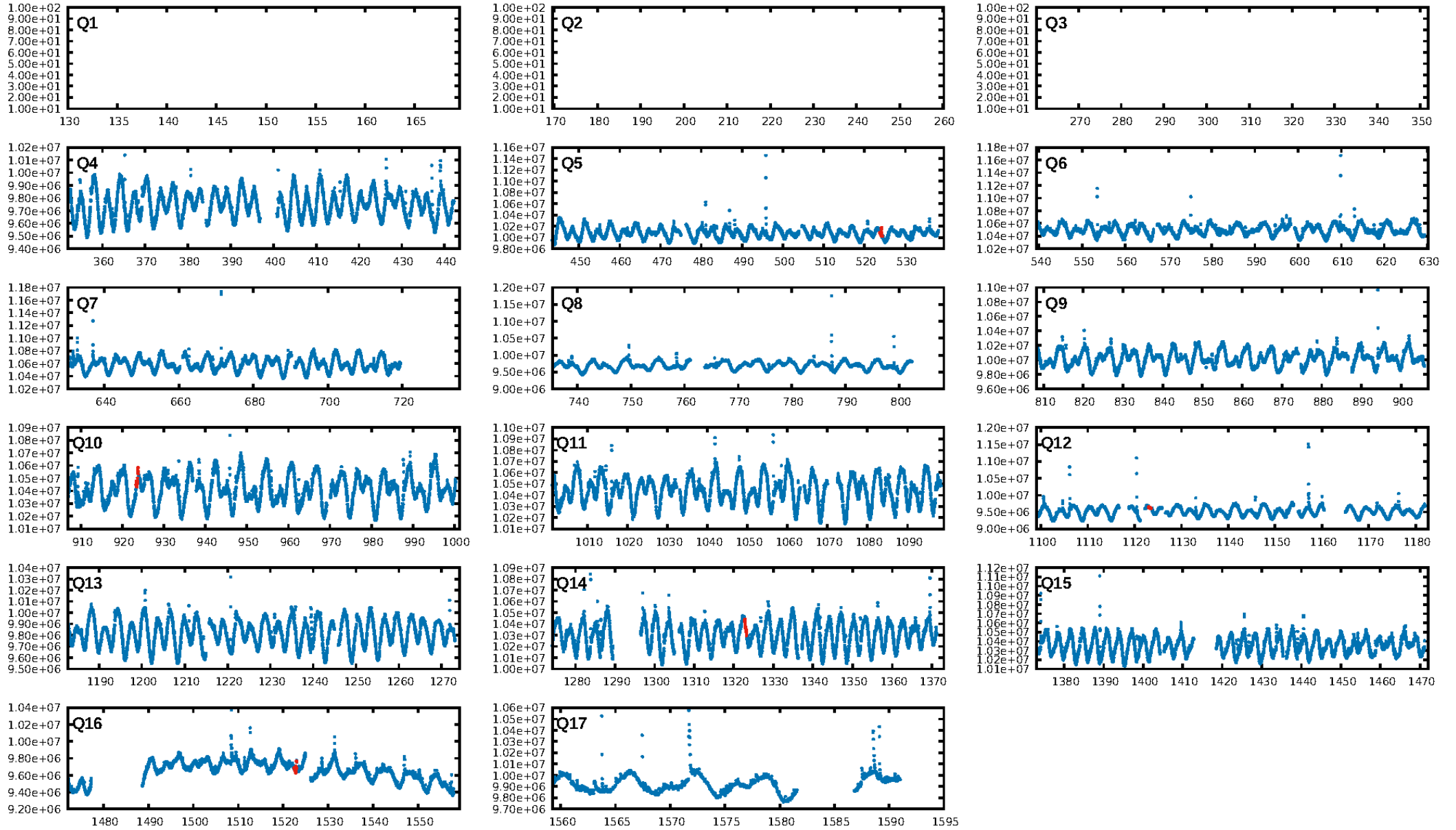
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [77.06σ]  
ModelChiSquare2-sig: 1.1%  
ModelChiSquareGof-sig: 95.8%  
**Bootstrap-pfa: 1.24e-11**  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 2.894  
Centroid-sig: 90.9%  
Centroid-so: 0.024 arcsec [0.04σ]  
OotOffset-rm: 0.115 arcsec [0.36σ]  
KicOffset-rm: 0.237 arcsec [1.16σ]  
OotOffset-st: 1/0/1/0 [2]  
KicOffset-st: 1/0/1/0 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [4/4]

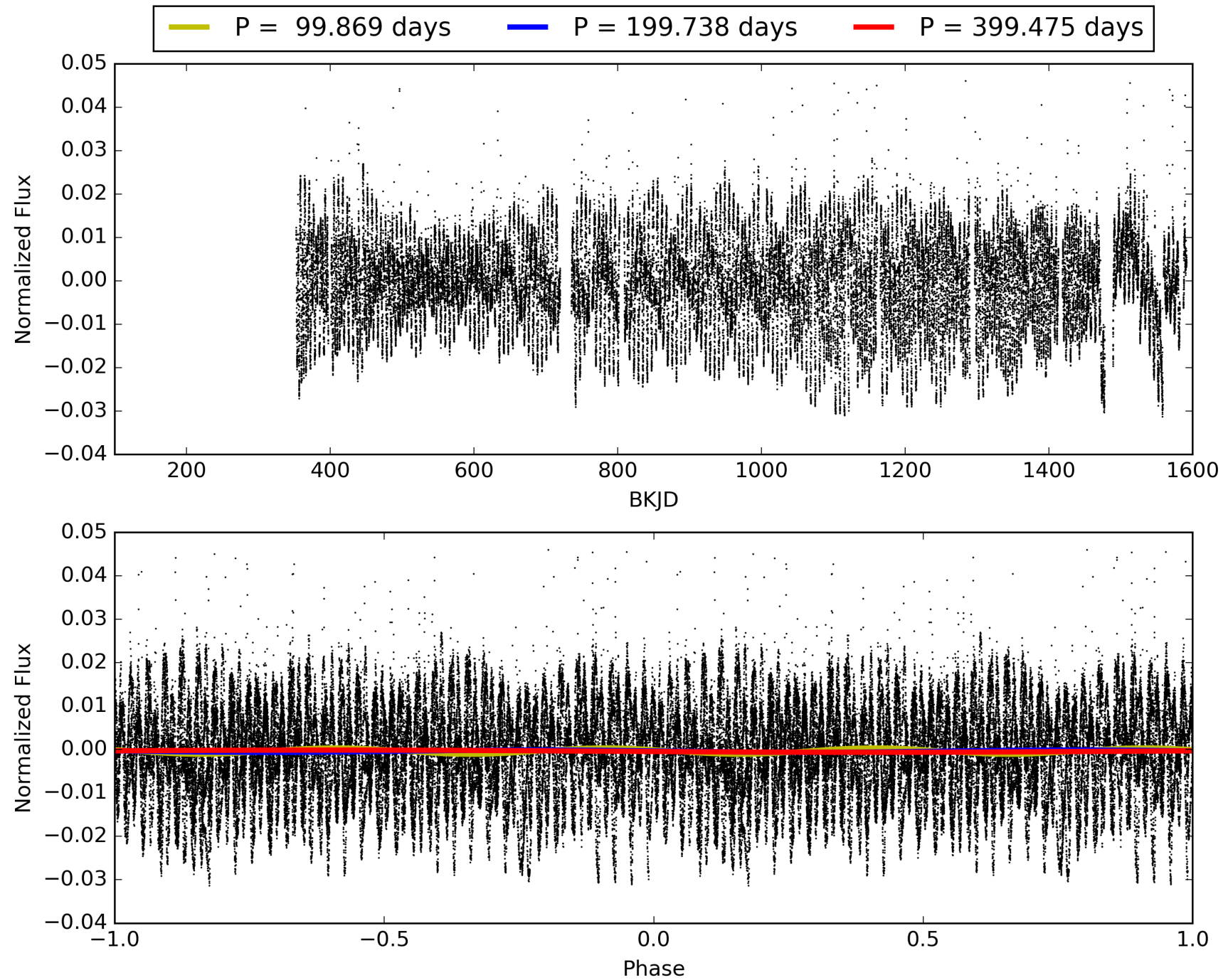
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 22:01:19 Z

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

# TCE 005608002-03, PDC Light Curves

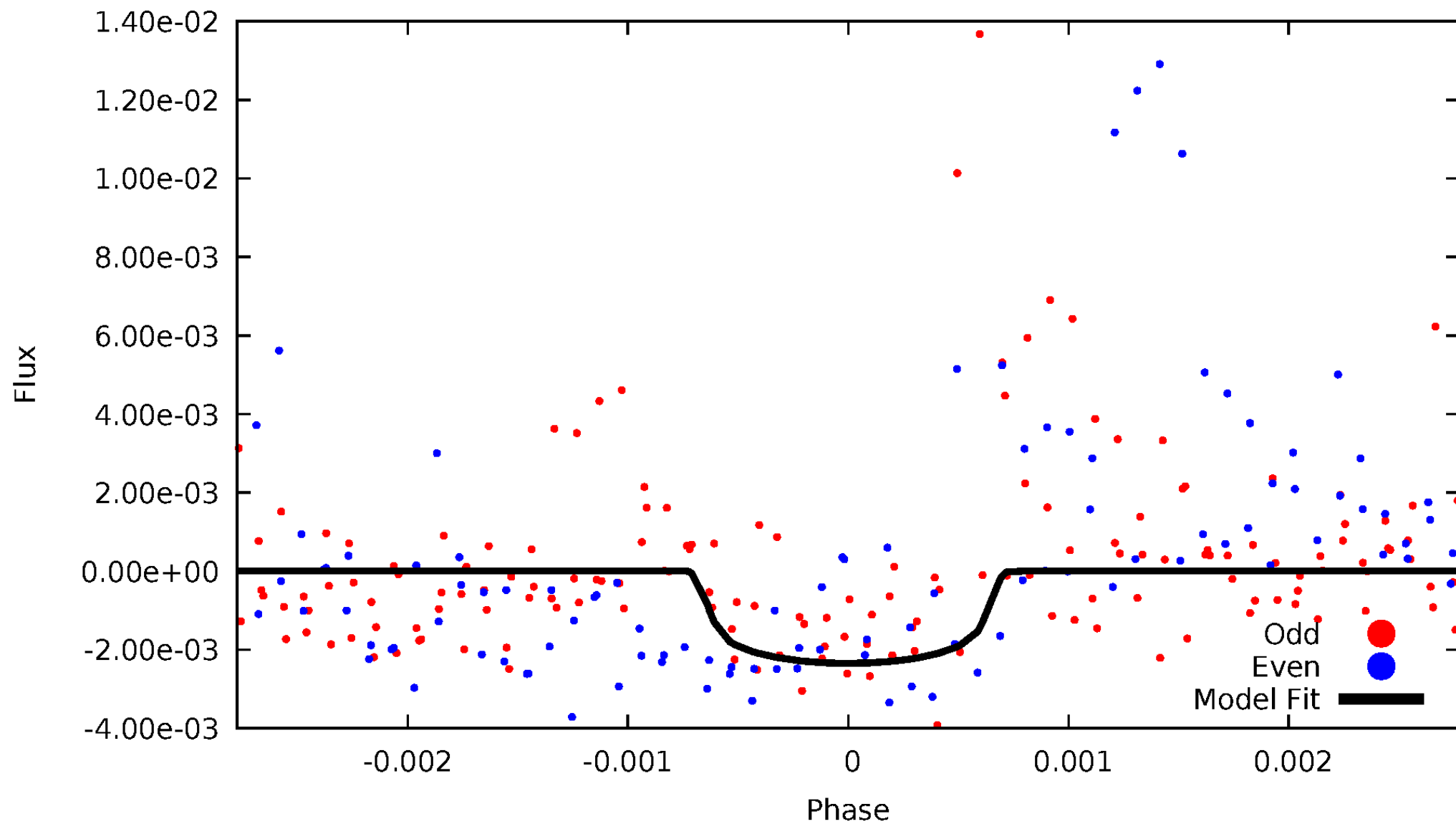


# TCE 005608002-03



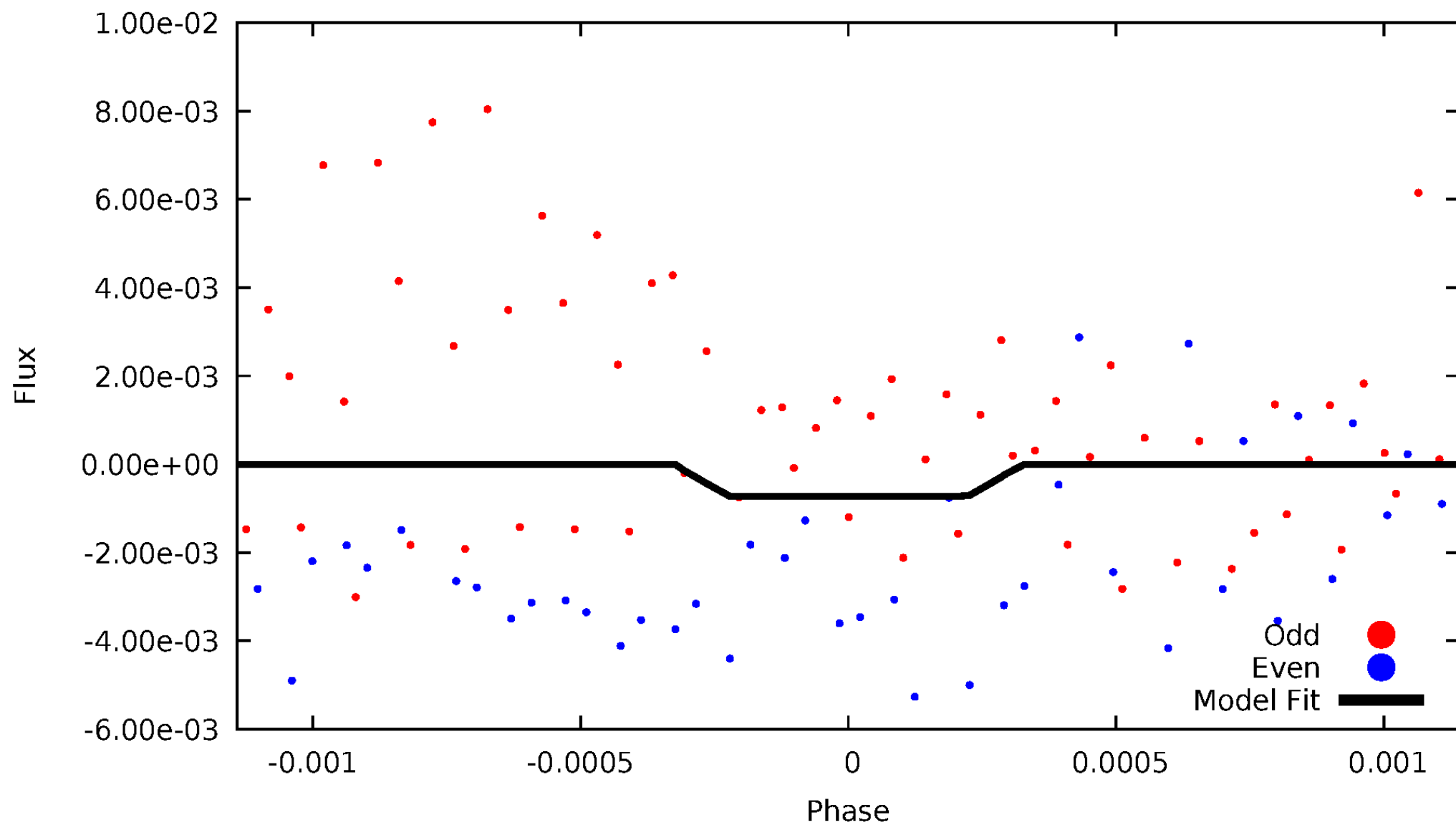
# DV Odd/Even

TCE 005608002-03



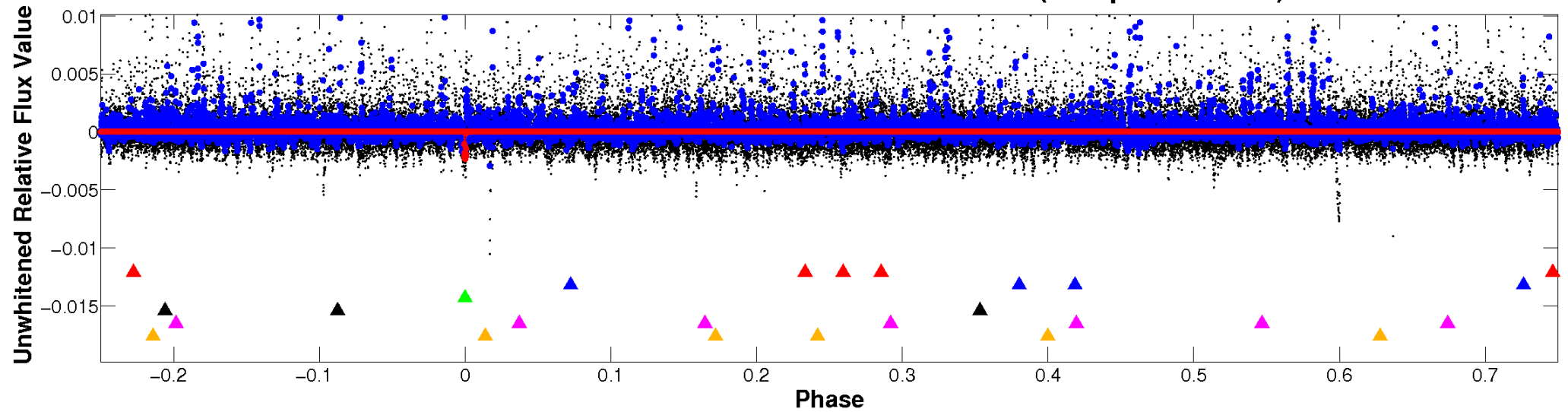
# ALT Odd/Even

TCE 005608002-03

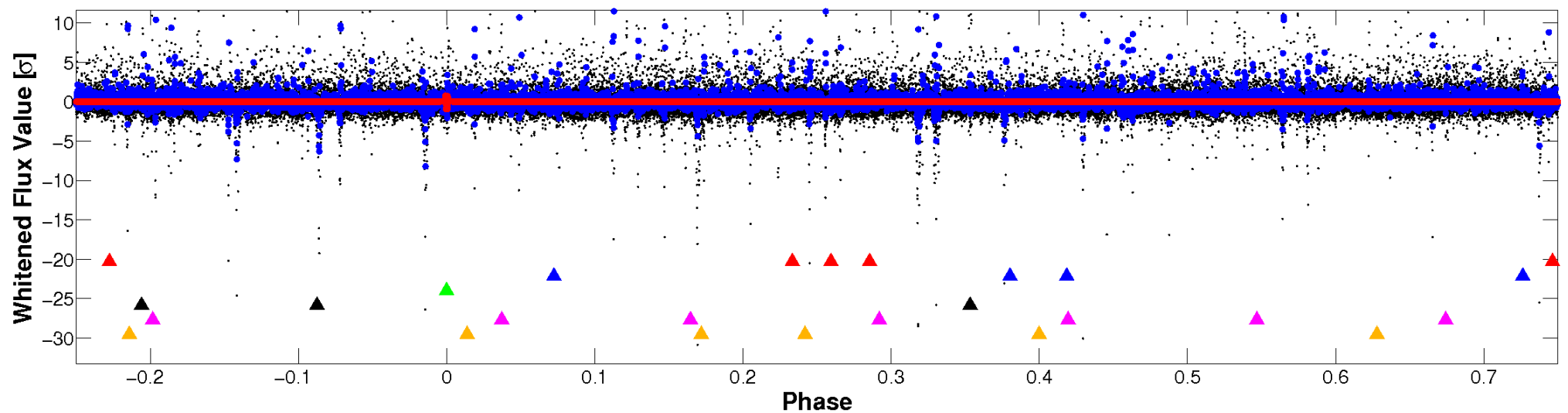


# Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

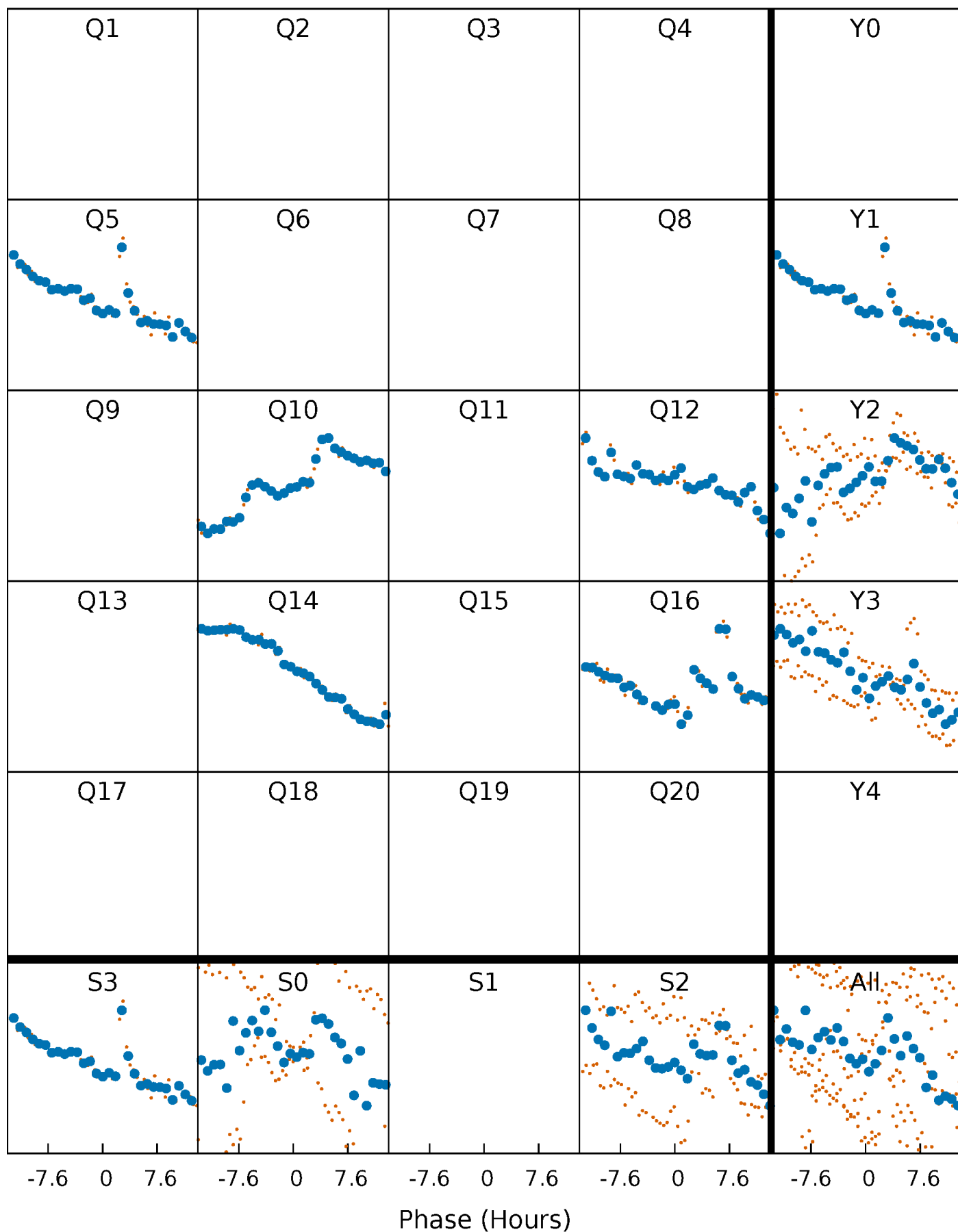


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

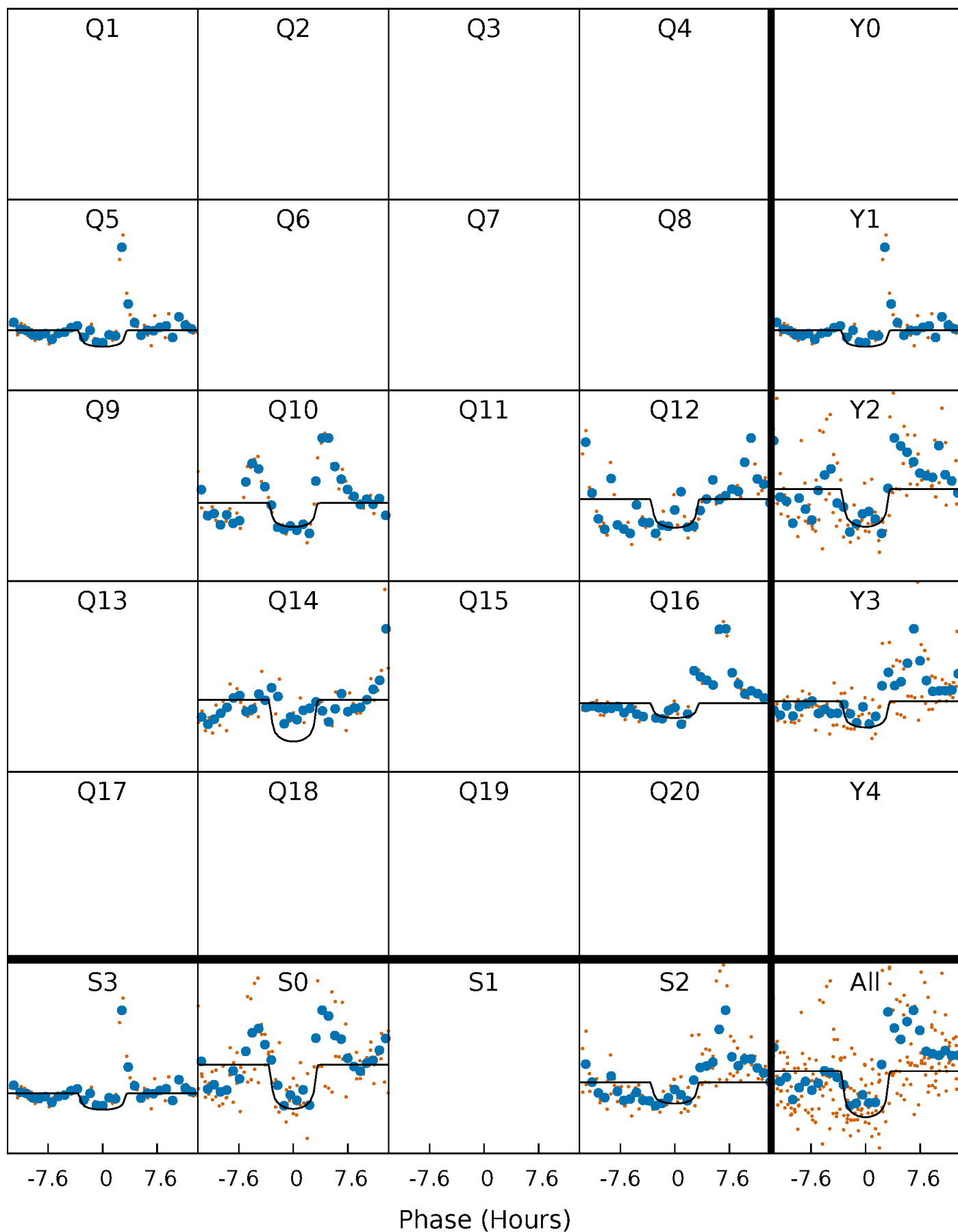
TCE 005608002-03 P=199.737602 Days  $T_0=324.308792$  (BKJD)





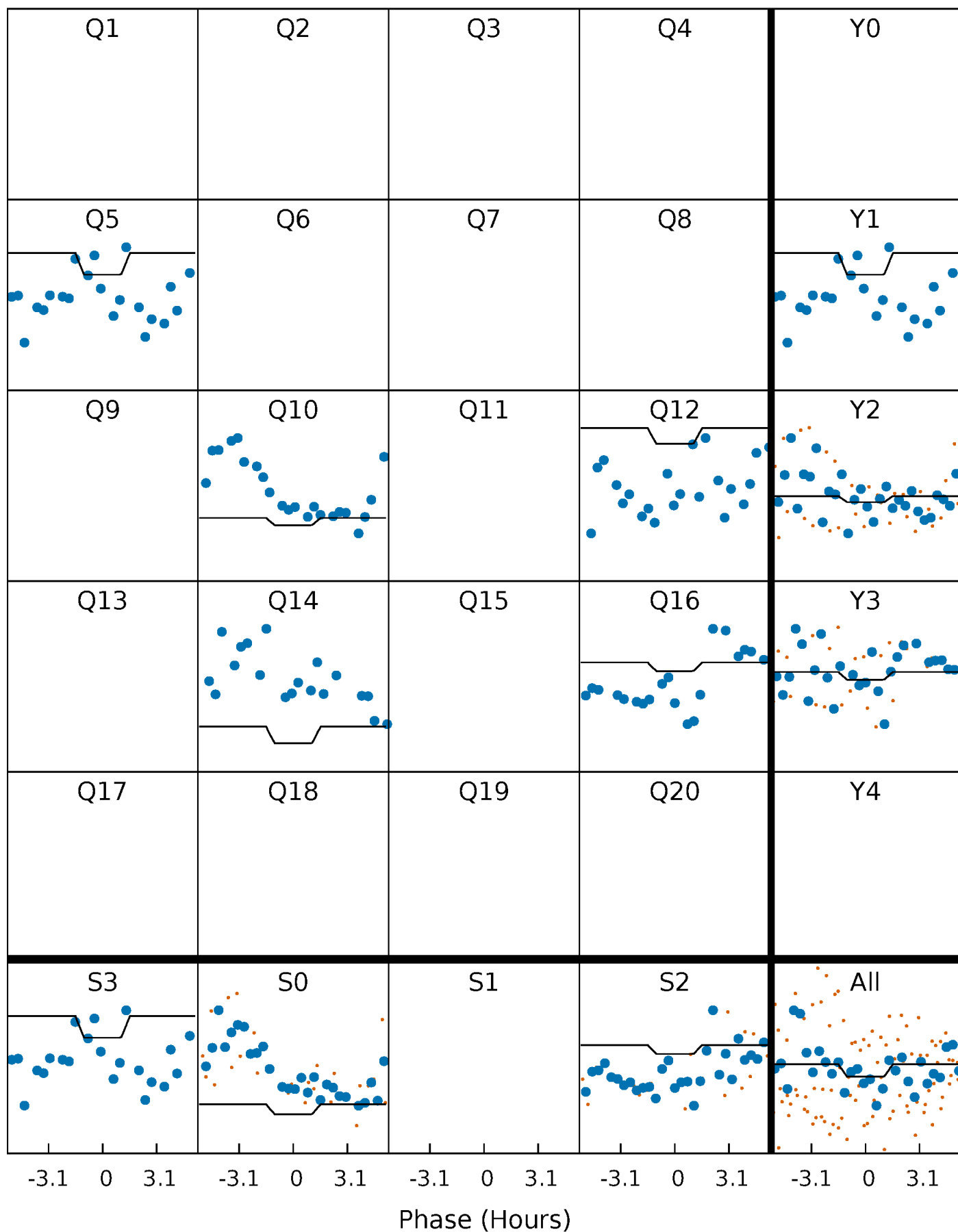
# DV Quarter-Phased Transit Curves

TCE 005608002-03     $P=199.737602$  Days     $T_0=324.308792$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

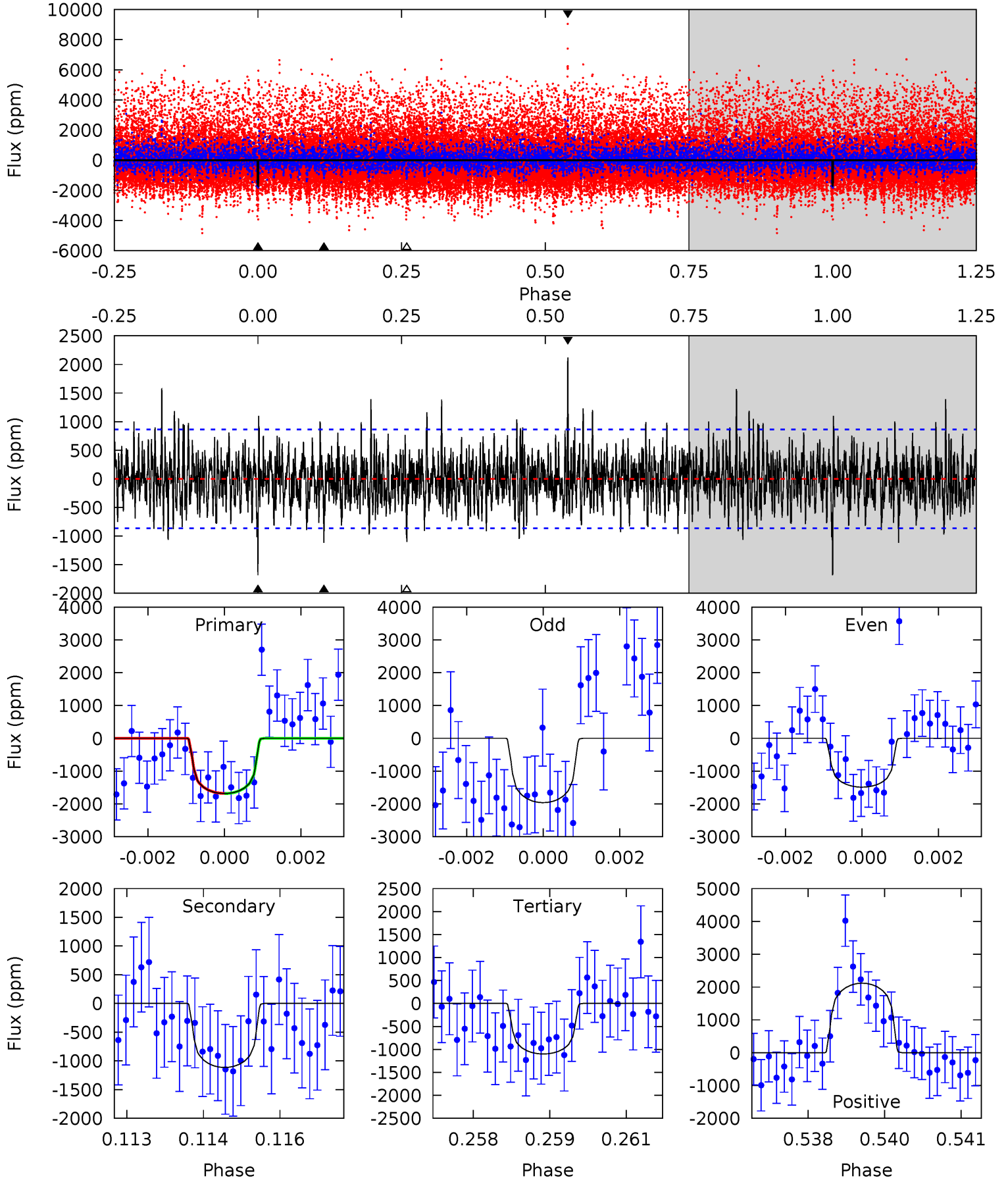
TCE 005608002-03 P=199.765294 Days  $T_0=324.155028$  (BKJD)



# DV Model-Shift Uniqueness Test

005608002-03, P = 199.737602 Days, E = 324.308792 Days

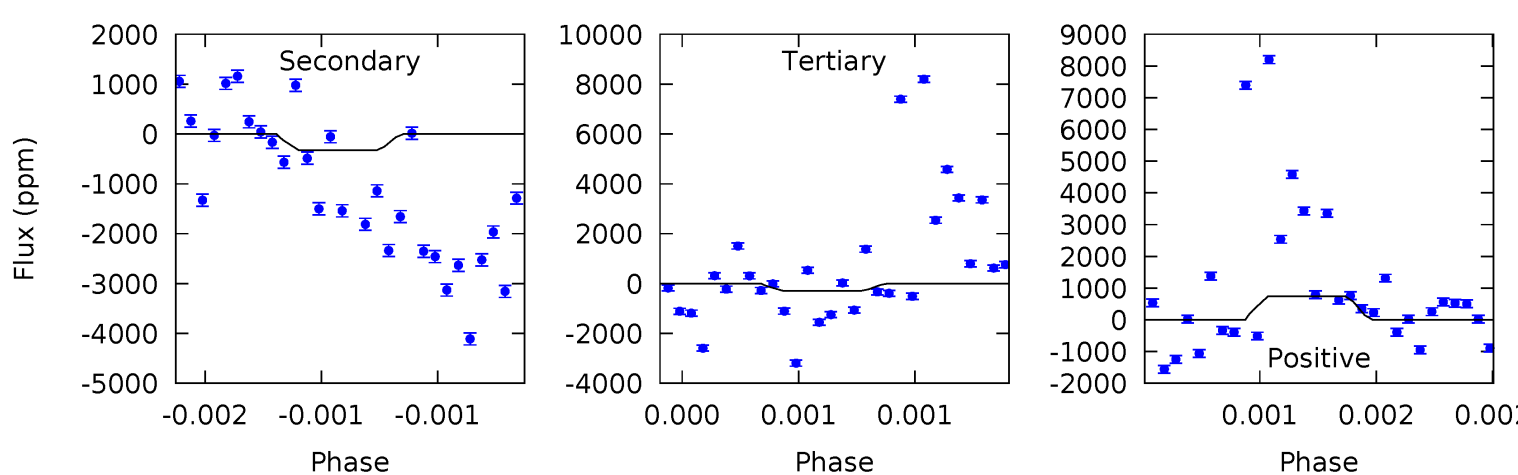
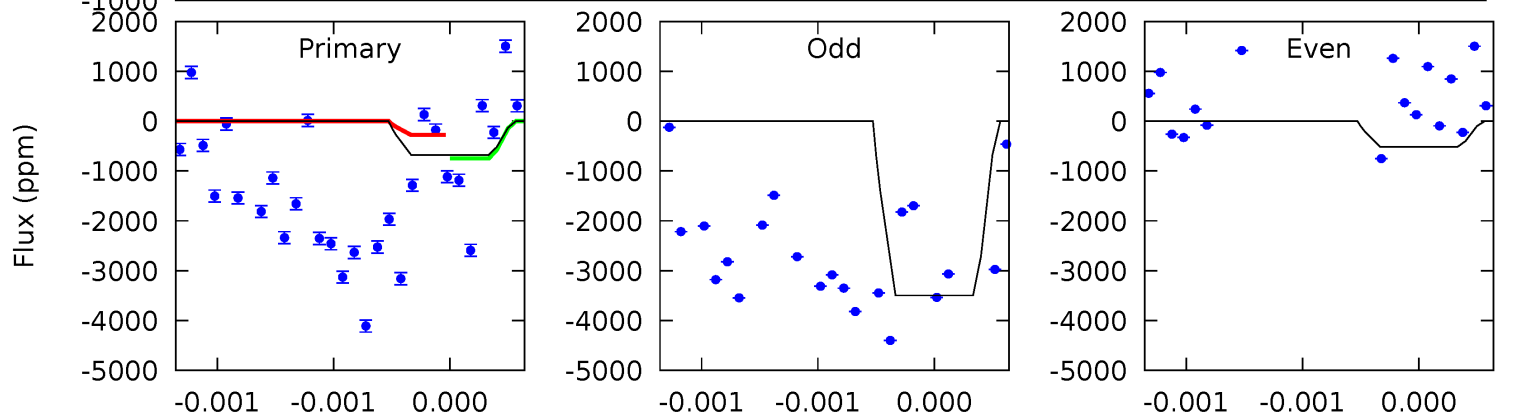
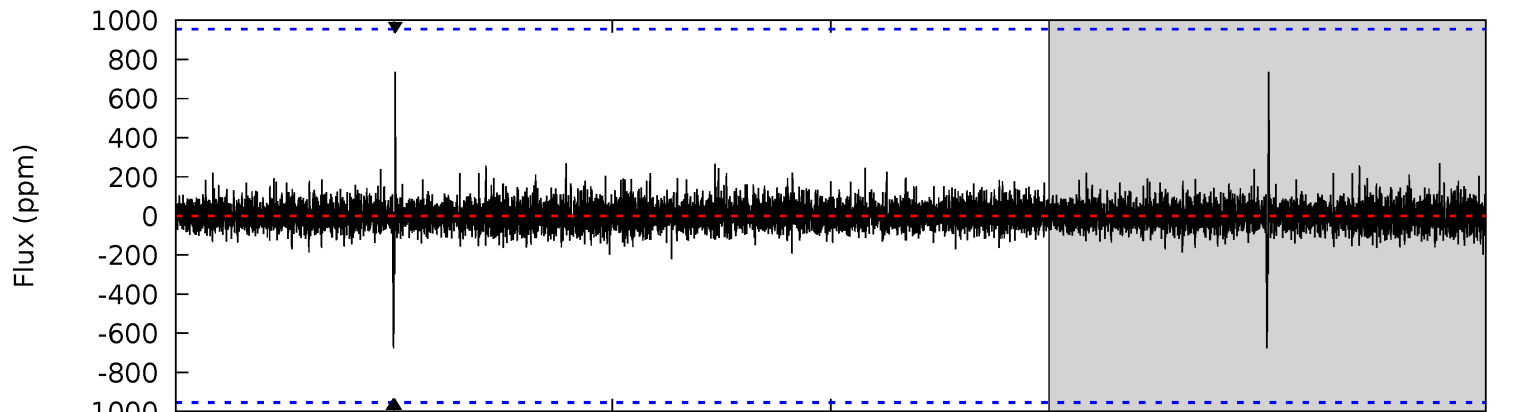
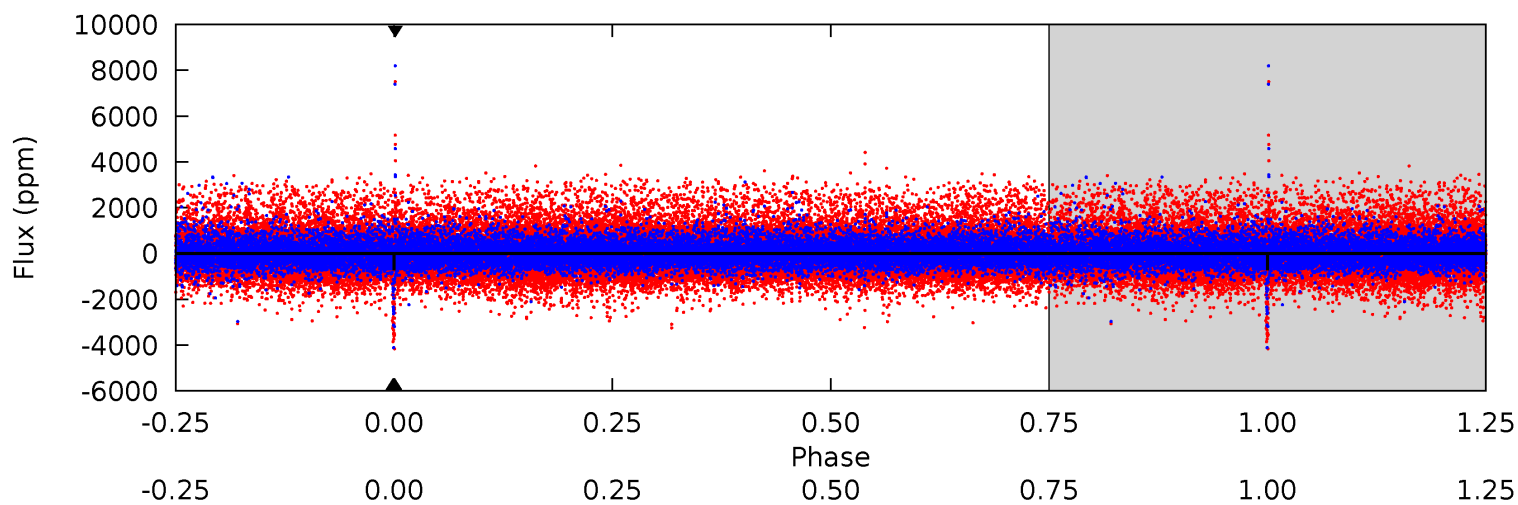
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.5 | 6.93 | 6.84 | 13.2 | 5.38            | 3.17            | 2.21             | 3.63    | -2.70   | 0.09    | -6.23   | 1.36    | 0.86 | 0.56  | 0.02 |



# Alt Model-Shift Uniqueness Test

005608002-03, P = 199.765294 Days, E = 324.155028 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 |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 3.92 | 1.91 | 1.72 | 4.27 | 5.54            | 3.43            | 0.32             | 2.20    | -0.34   | 0.19    | -2.36   | 9.11    | 0.83 | 0.52  | 0   |



### Stellar Parameters For KIC 005608002

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3223^{+43}_{-24}$  | $5.125^{+0.063}_{-0.070}$ | $0.000^{+0.100}_{-0.100}$ | $0.179^{+0.039}_{-0.026}$ | $0.155^{+0.043}_{-0.023}$ | $38.370^{+13.470}_{-11.810}$              |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +22%/-15%                 | +28%/-15%                 | +35%/-31%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 005608002-03 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$           |
|---------|-----------------|------------------------|----------------------|----------------------|----------------------------|
| DV      | $-1115 \pm 161$ | $0.90^{+0.36}_{-0.35}$ | $140^{+5}_{-4}$      | $2950^{+449}_{-260}$ | $99902^{+172783}_{-50344}$ |
| Alt.    | $-329 \pm 172$  | $0.55^{+0.36}_{-0.29}$ | $140^{+5}_{-4}$      | $2804^{+716}_{-376}$ | $69124^{+248626}_{-47514}$ |

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

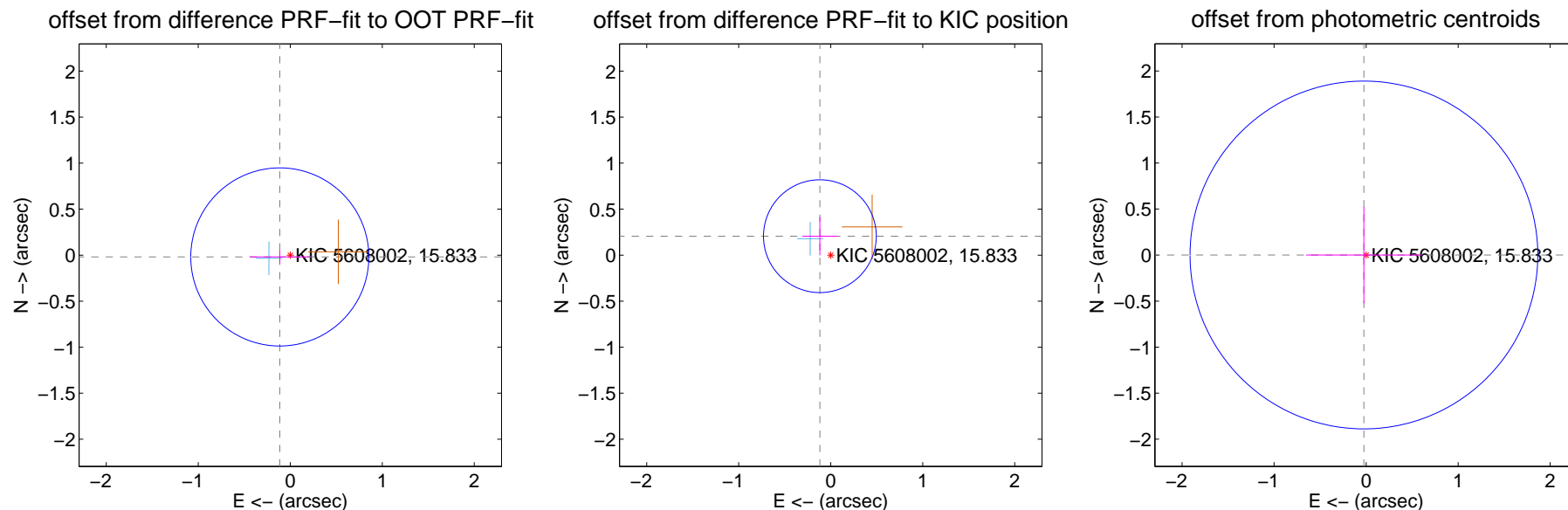
## DV Centroid Data

Supplemental centroid analysis for 005608002-03. Kepler magnitude: 15.83. Transit SNR 7.36

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          | $0.115 \pm 0.323$  | 0.36                | $0.114 \pm 0.327$ | $-0.020 \pm 0.075$ |
| PRF-fit source offset from KIC position | $0.237 \pm 0.204$  | 1.16                | $0.118 \pm 0.191$ | $0.206 \pm 0.208$  |
| photometric centroid source offset      | $0.02 \pm 0.63$    | 0.04                | $0.02 \pm 0.63$   | $0.00 \pm 0.52$    |

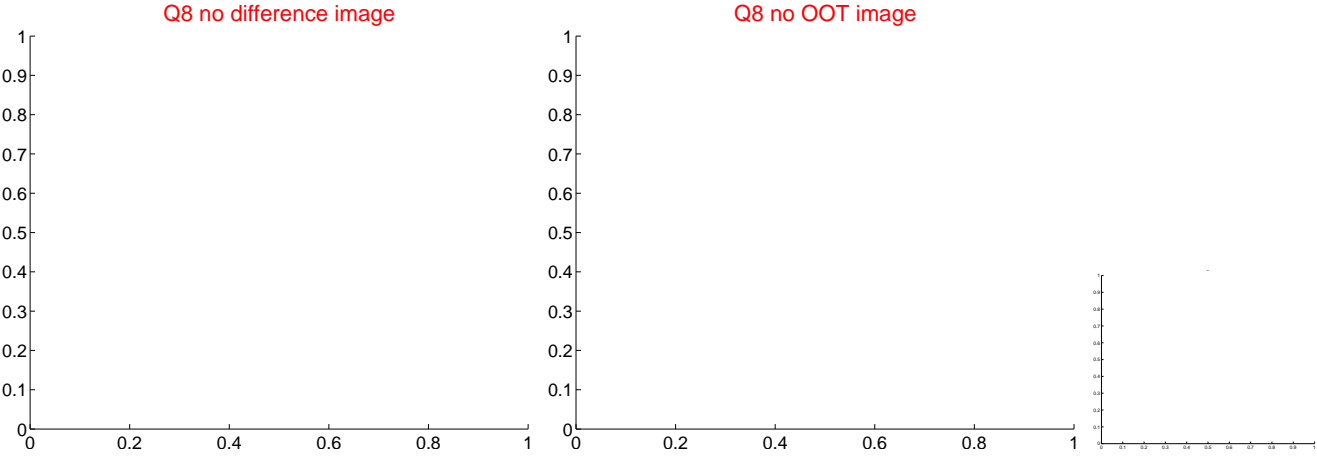
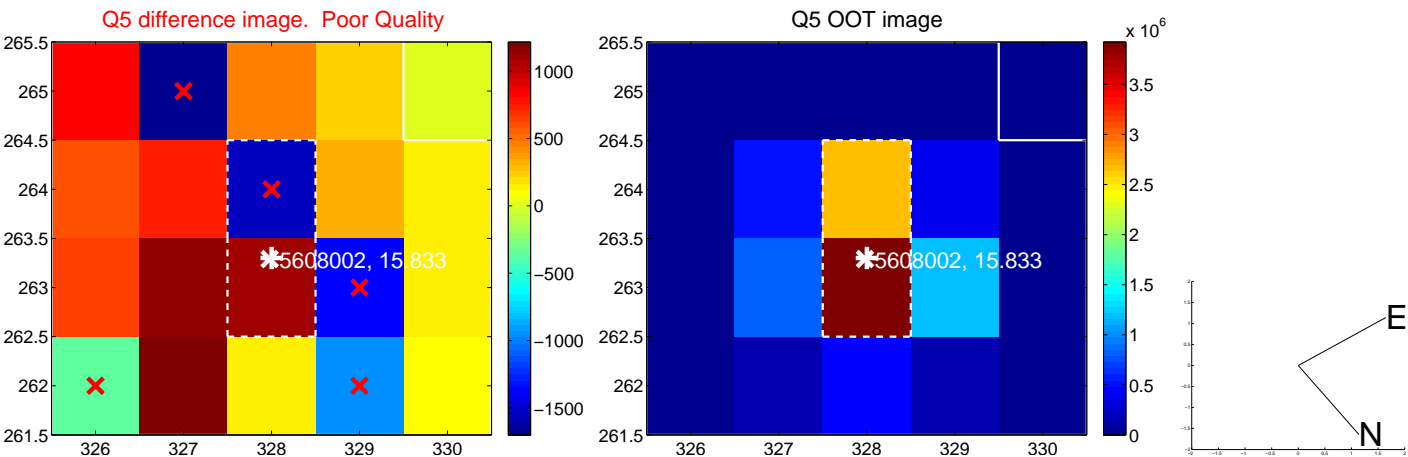


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

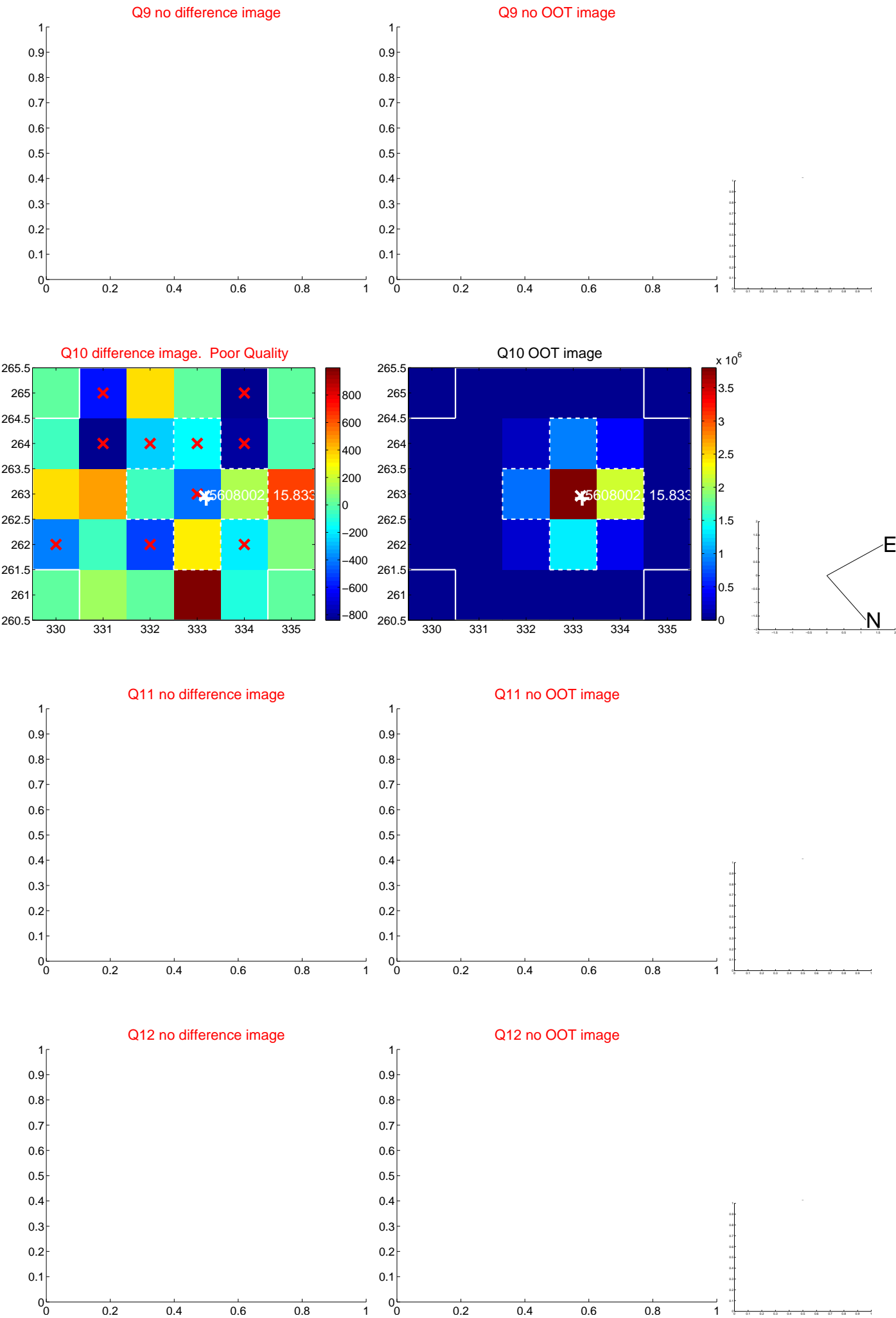


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

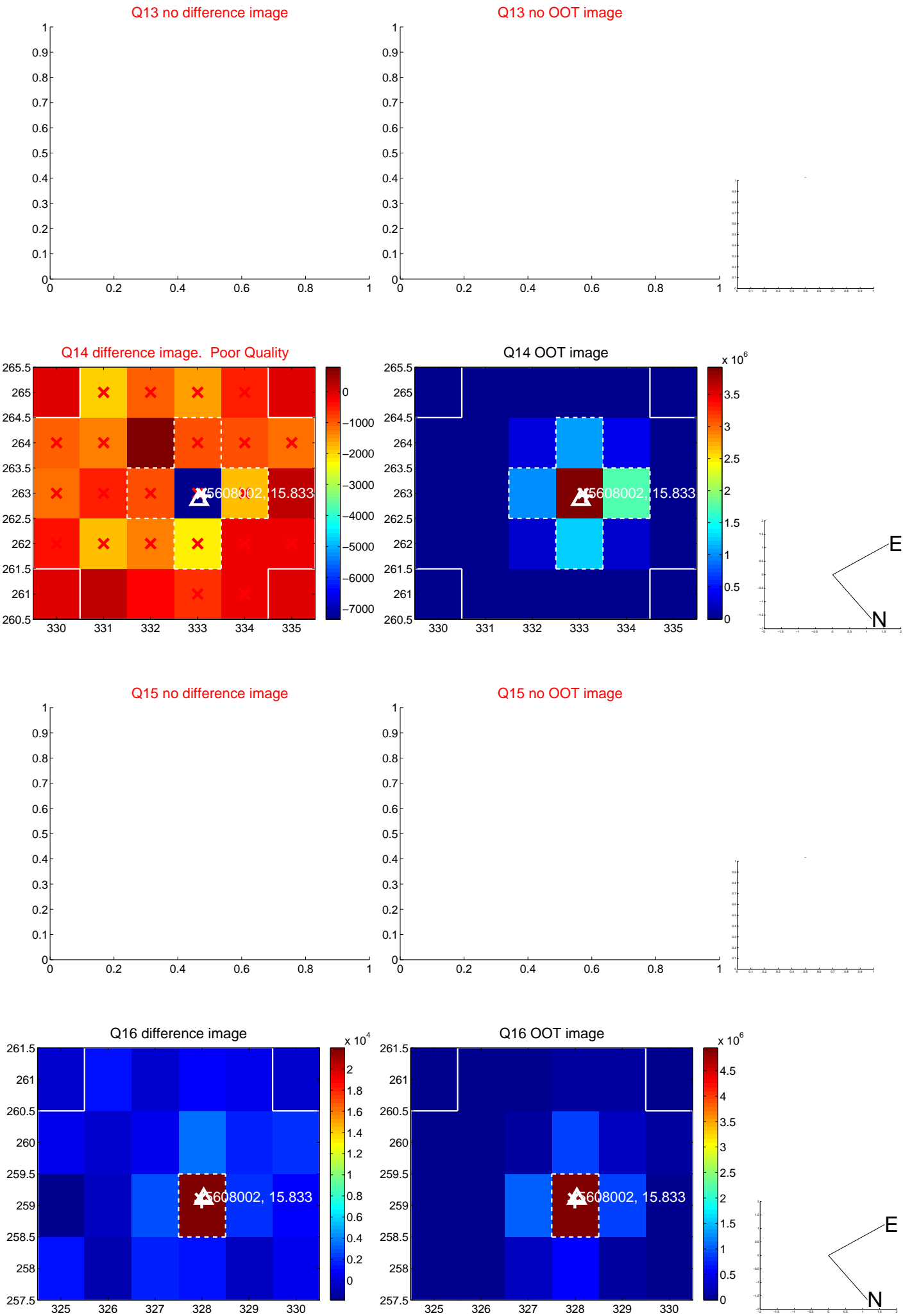




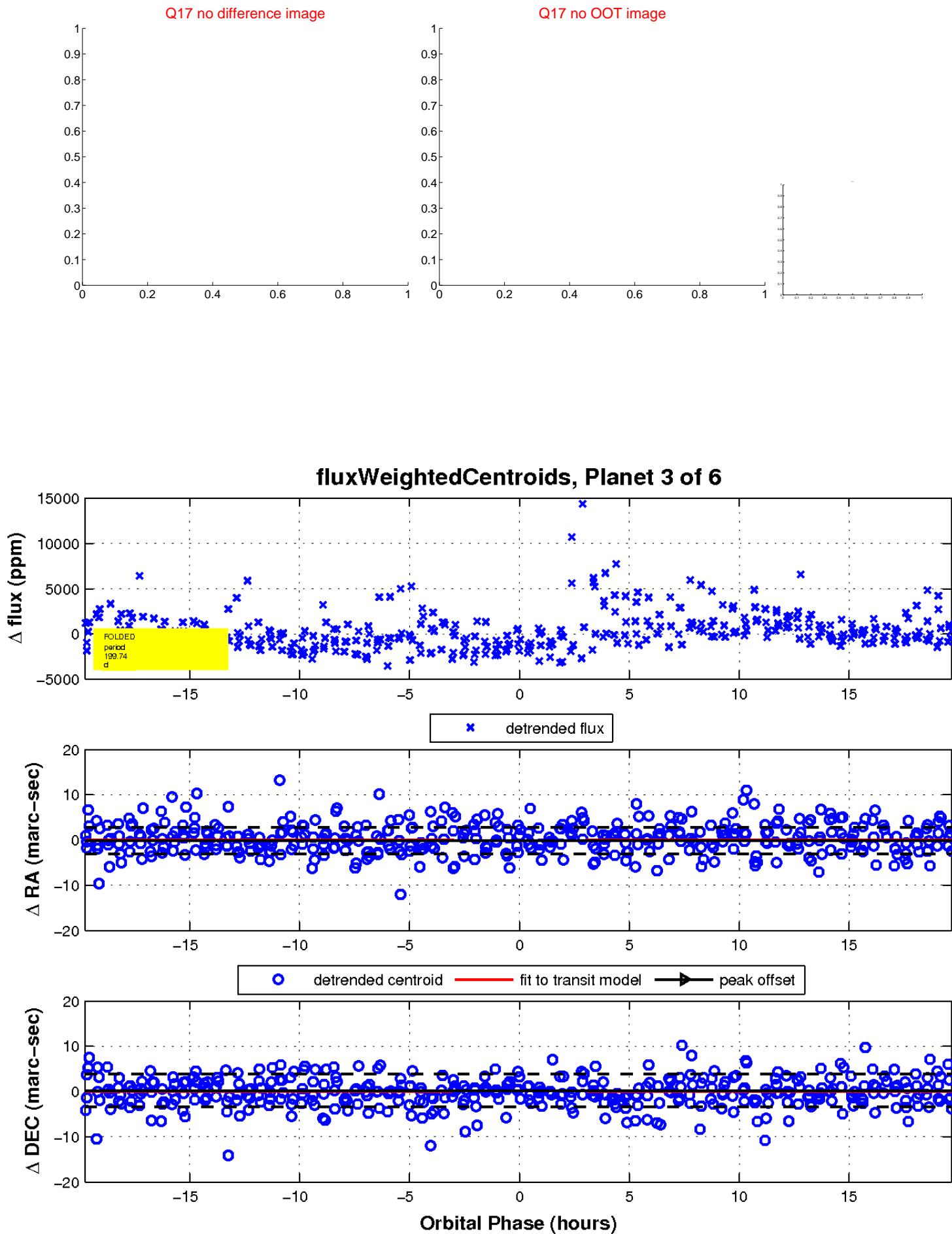
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



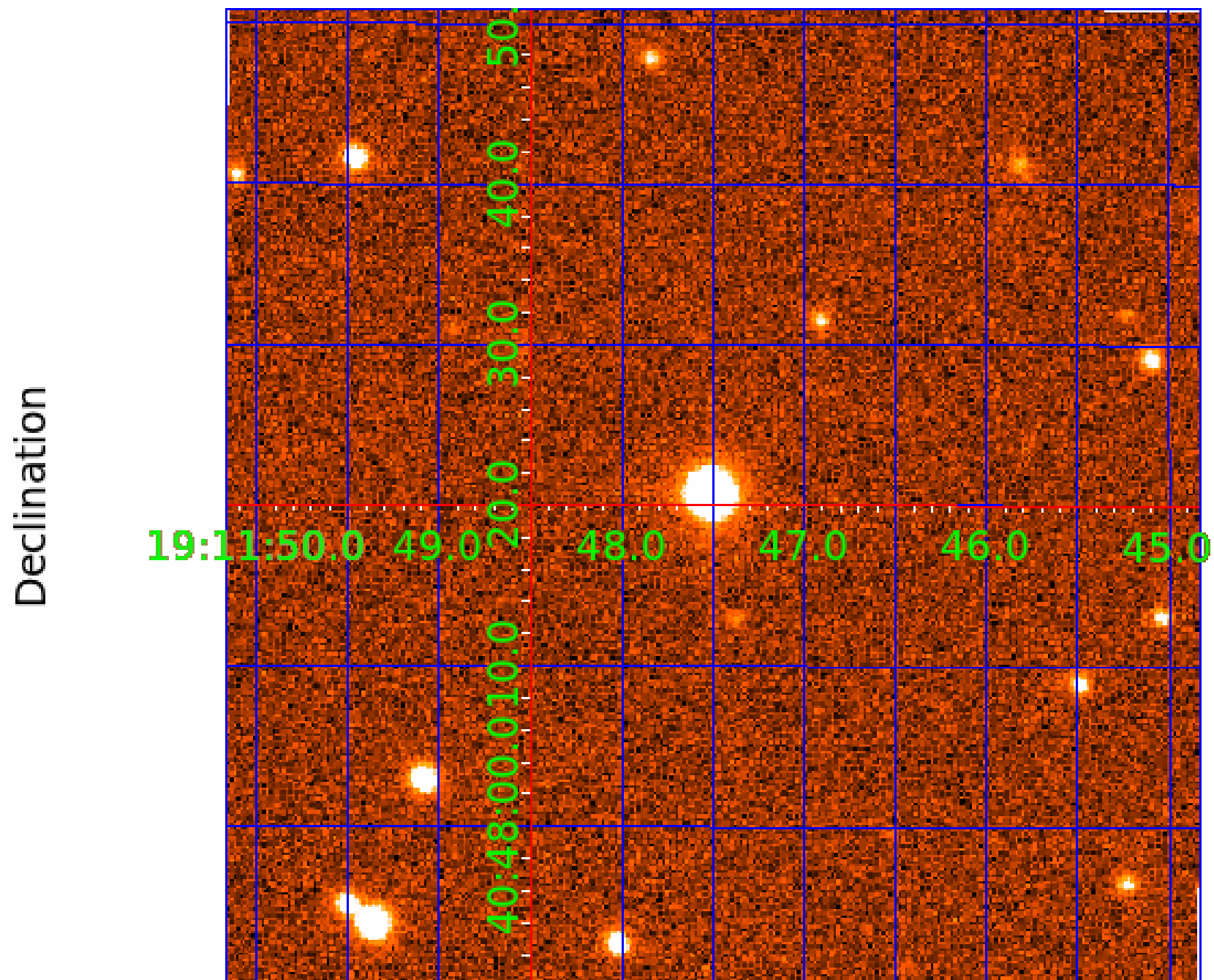
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 005608002

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005608002-01 | OBS      | No   | 302.209519    | 171.181106   | 2127.8      | 4.936            | 13.6 | 6.2 | 0.18                        | 3223            | 0.81                   | 0.01                   |
| 005608002-02 | OBS      | No   | 330.344519    | 407.909197   | 2361.2      | 4.094            | 14.8 | 6.5 | 0.18                        | 3223            | 0.86                   | 0.01                   |
| 005608002-03 | OBS      | No   | 199.737602    | 324.308792   | 2348.0      | 6.649            | 11.8 | 7.4 | 0.18                        | 3223            | 0.89                   | 0.02                   |
| 005608002-04 | OBS      | No   | 511.172392    | 482.923424   | 2309.0      | 7.409            | 11.2 | 5.4 | 0.18                        | 3223            | 0.85                   | 0.01                   |
| 005608002-05 | OBS      | No   | 225.187164    | 132.001189   | 3320.5      | 4.313            | 11.0 | 8.1 | 0.18                        | 3223            | 1.87                   | 0.02                   |
| 005608002-06 | OBS      | No   | 276.834758    | 172.887603   | 2319.2      | 7.567            | 10.2 | 6.5 | 0.18                        | 3223            | 0.85                   | 0.01                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005608002-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS  |
| 005608002-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS           |
| 005608002-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 005608002-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV  |

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

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

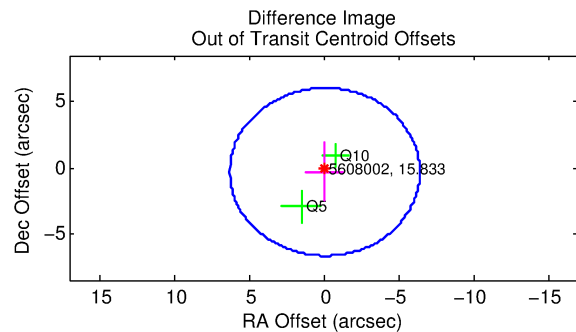
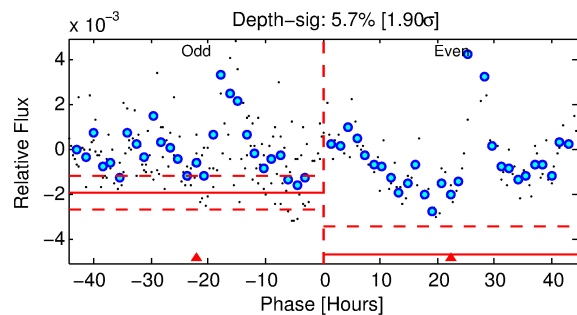
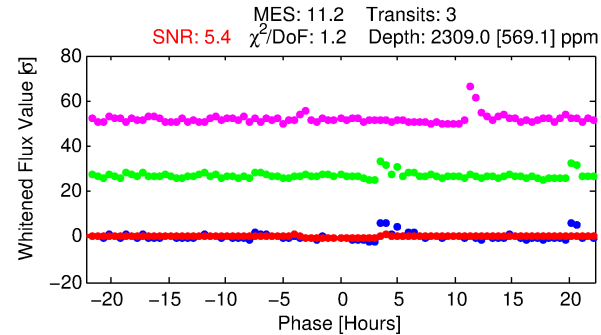
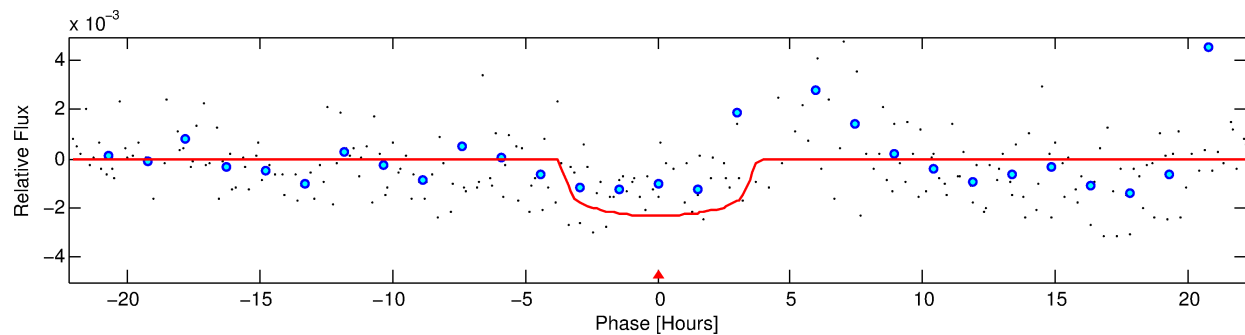
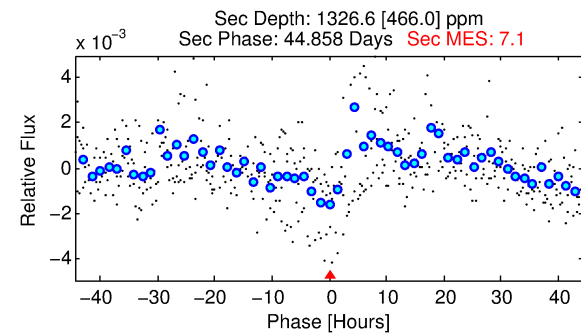
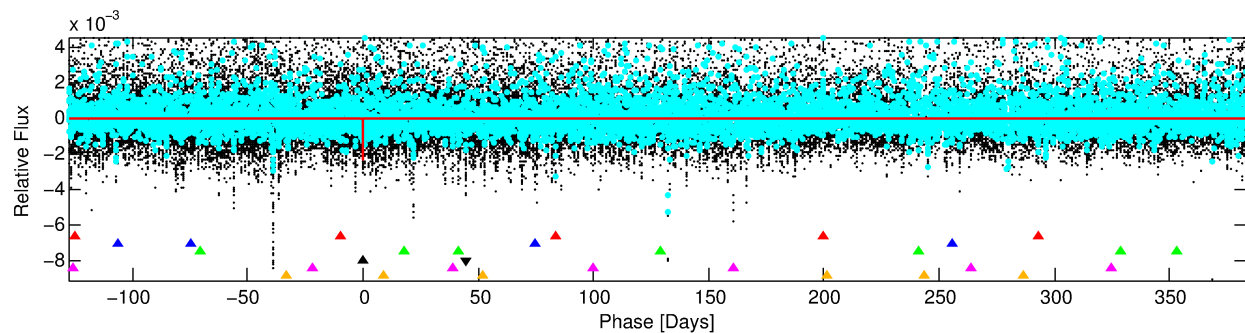
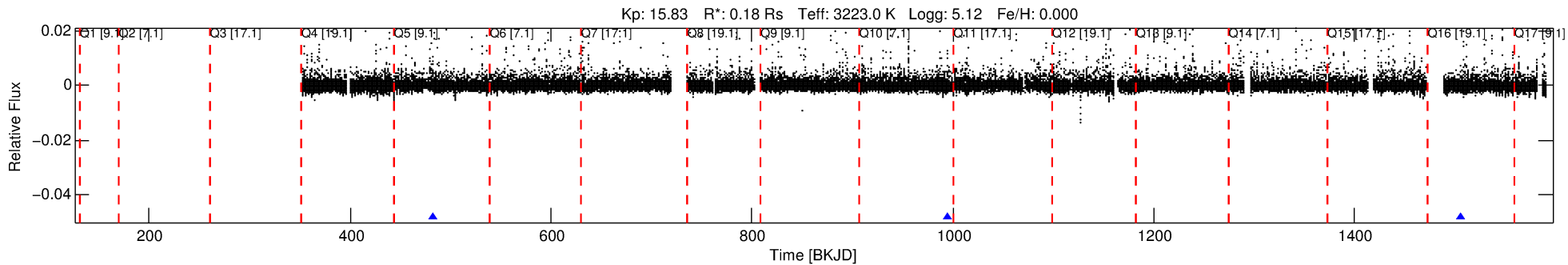
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005608002-04

No Significant Match Found

# DV One-Page Summary

KIC: 5608002 Candidate: 4 of 6 Period: 511.172 d



## DV Fit Results:

Period = 511.17239 [0.01064] d  
Epoch = 482.9234 [0.0132] BKJD  
Rp/R\* = 0.0434 [0.0405]  
a/R\* = 549.92 [2158.47]  
b = 0.02 [220.50]  
Seff = 0.01 [0.00]  
Teq = 73 [3] K  
Rp = 0.85 [0.81] Re  
a = 0.6735 [0.1043] AU  
Ag = 459930.59 [876734.69] [0.52σ]  
Teffp = 2952 [1401] K [2.05σ]

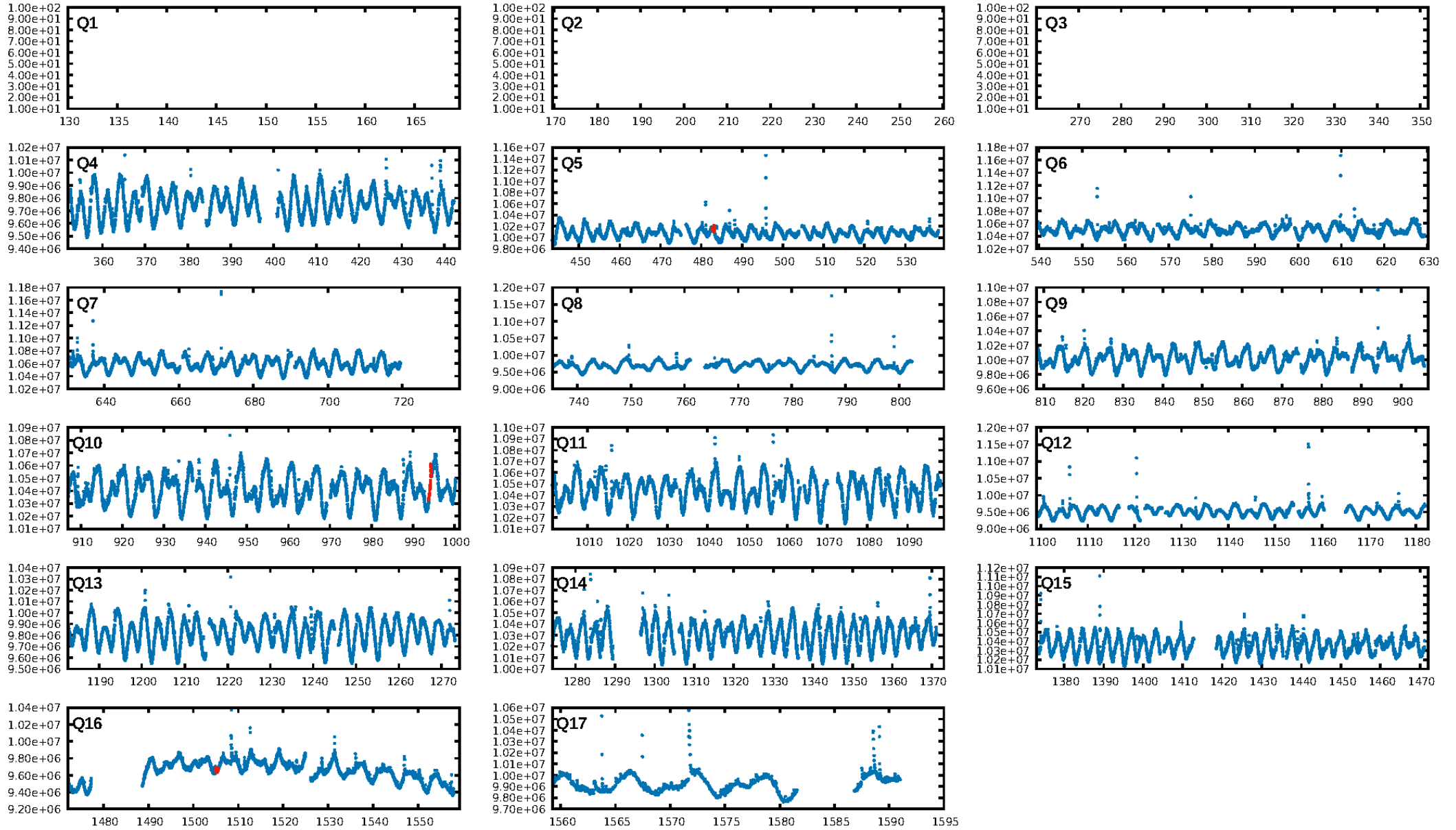
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [512.73σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 20.1%  
ModelChiSquareGof-sig: 96.3%  
**Bootstrap-pfa: 1.76e-09**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 2.031  
Centroid-sig: 47.9%  
Centroid-so: 0.271 arcsec [0.44σ]  
OotOffset-rm: 0.330 arcsec [0.16σ]  
KicOffset-rm: 0.325 arcsec [0.17σ]  
OotOffset-st: 1/0/0/1 [2]  
KicOffset-st: 1/0/0/1 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [2/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 22:01:30 Z

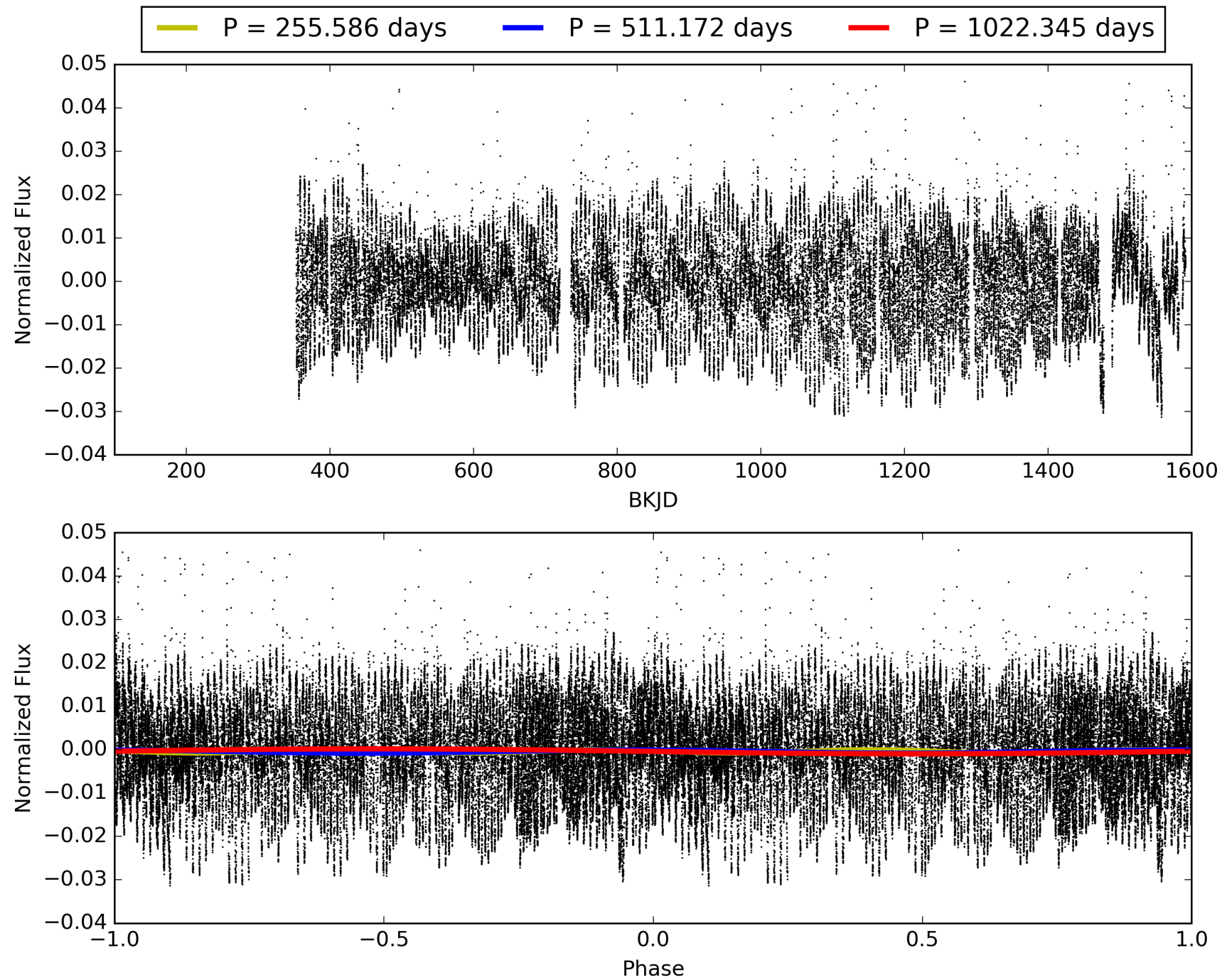
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005608002-04, PDC Light Curves





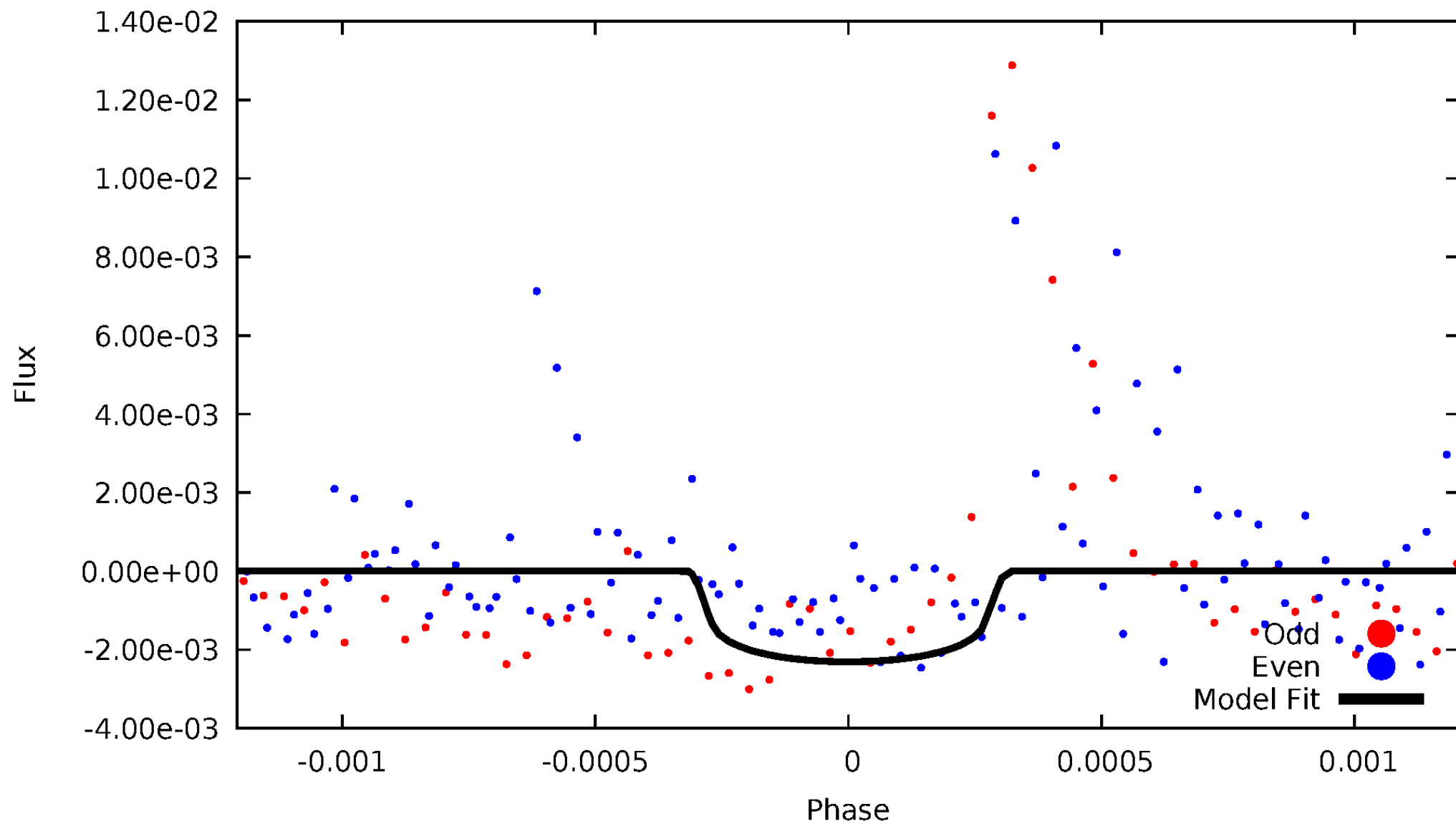
# TCE 005608002-04





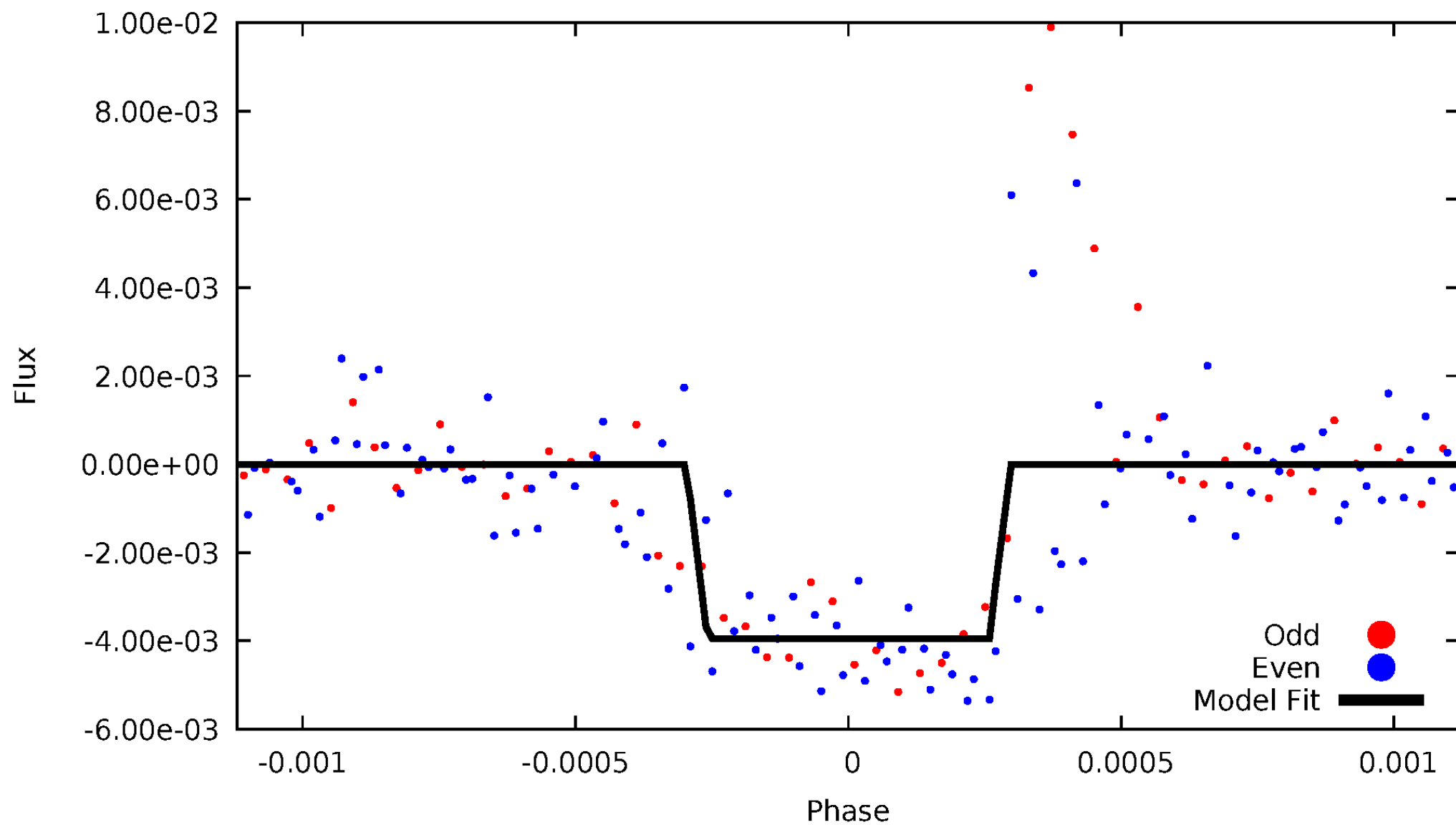
# DV Odd/Even

TCE 005608002-04



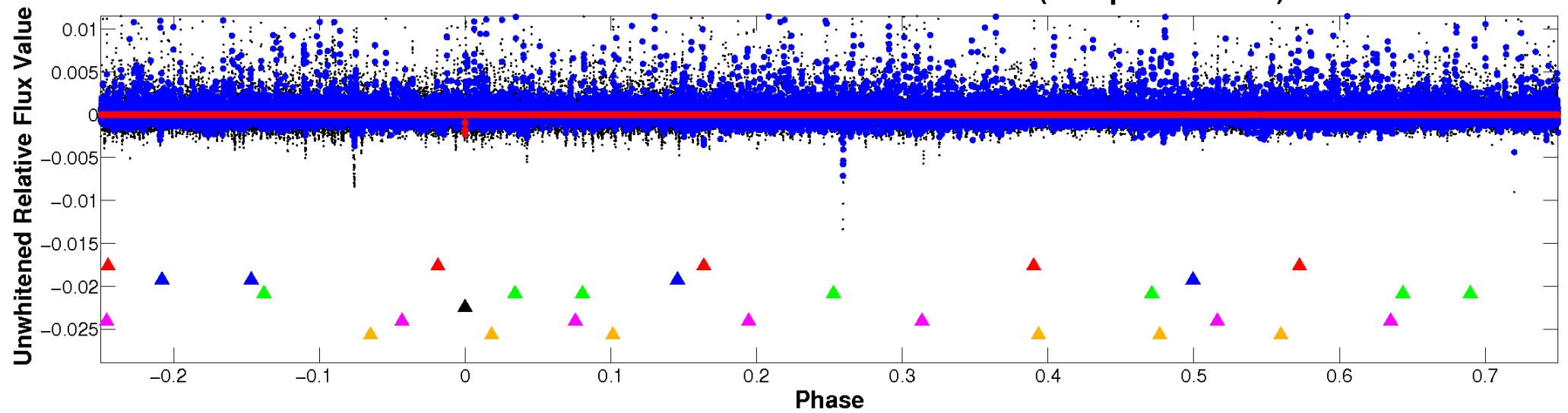
# ALT Odd/Even

TCE 005608002-04

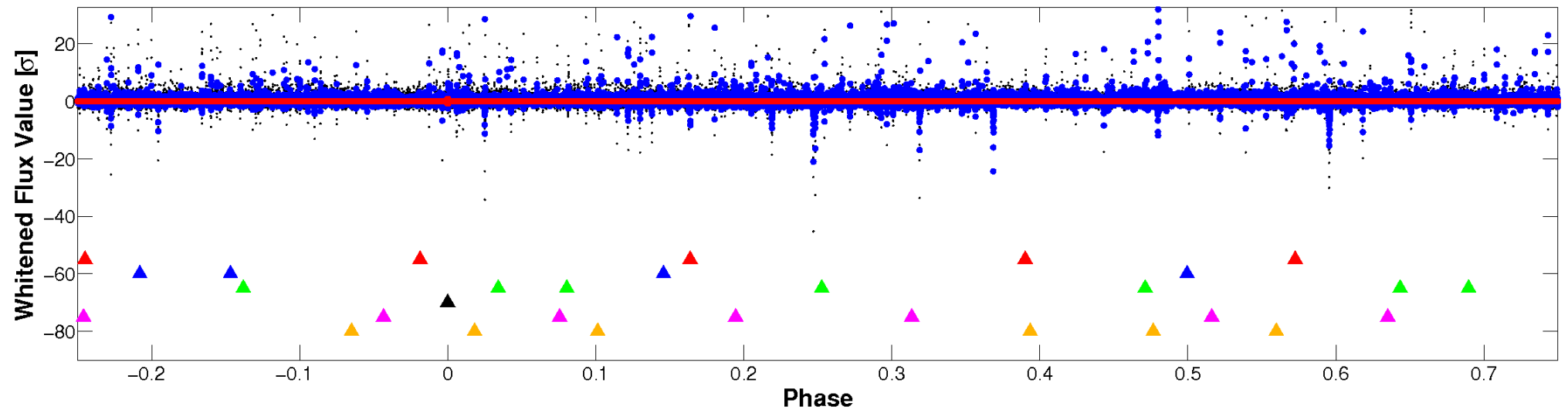


# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

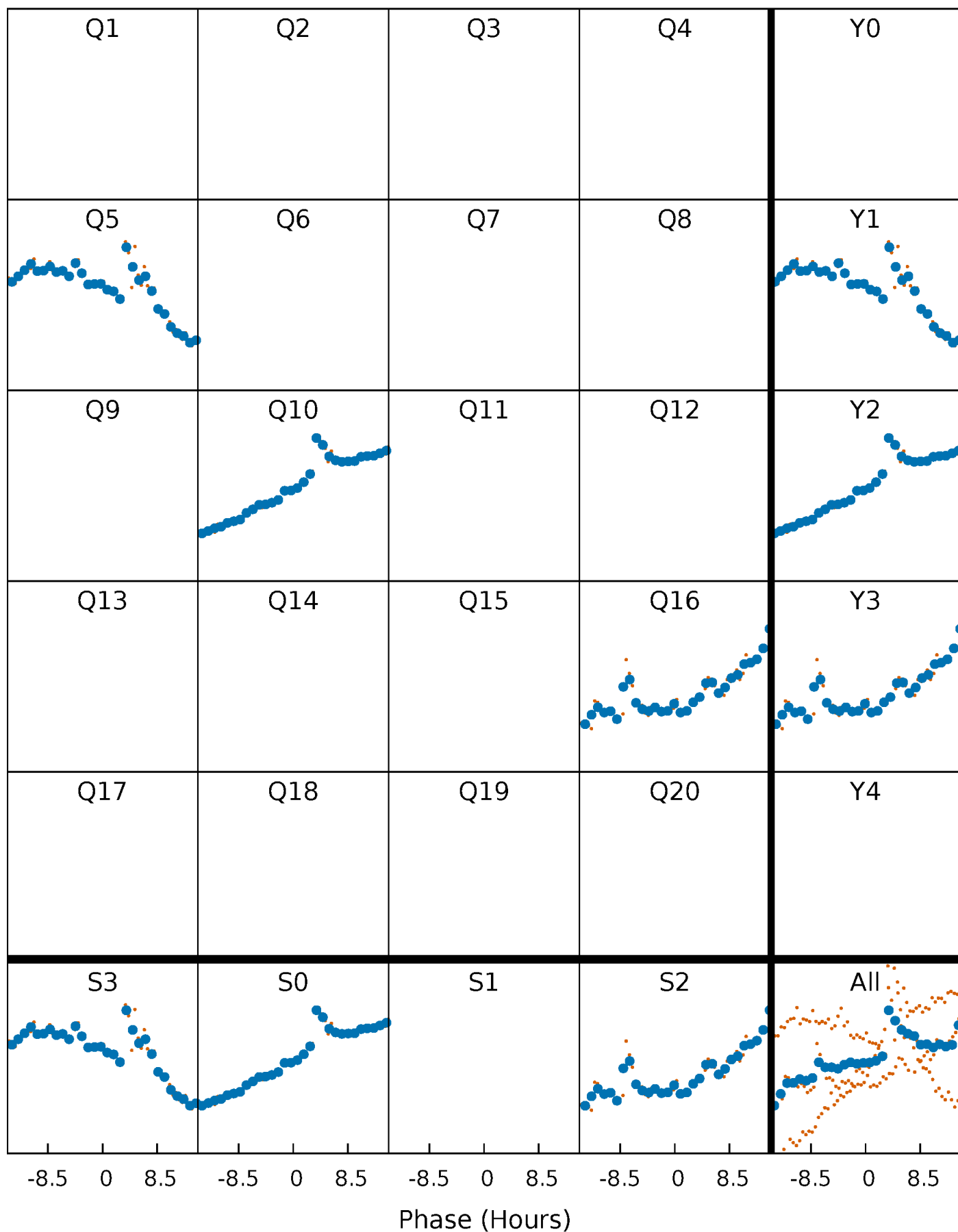


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



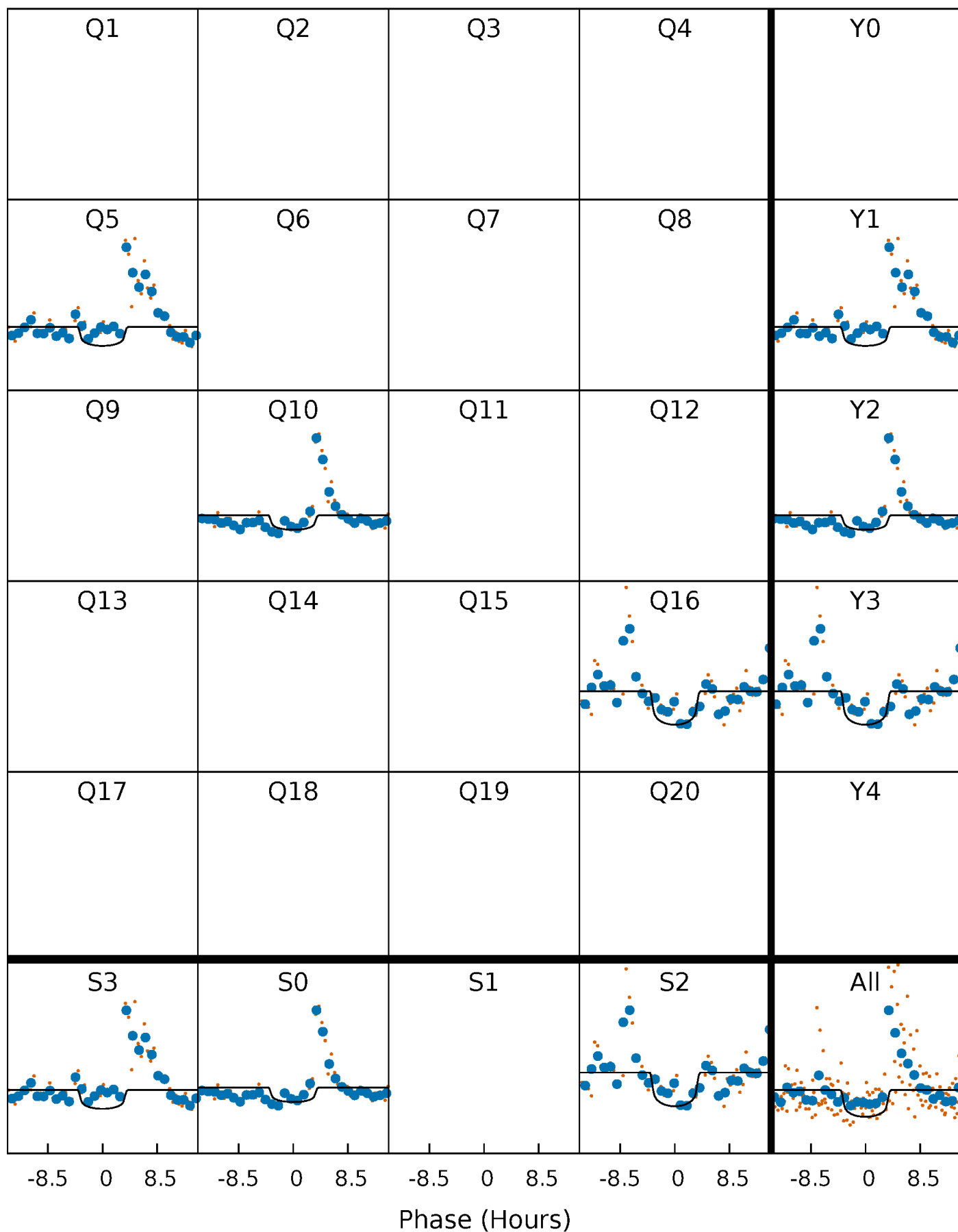
# PDC Quarter-Phased Transit Curves

TCE 005608002-04     $P=511.172392$  Days     $T_0=482.923424$  (BKJD)



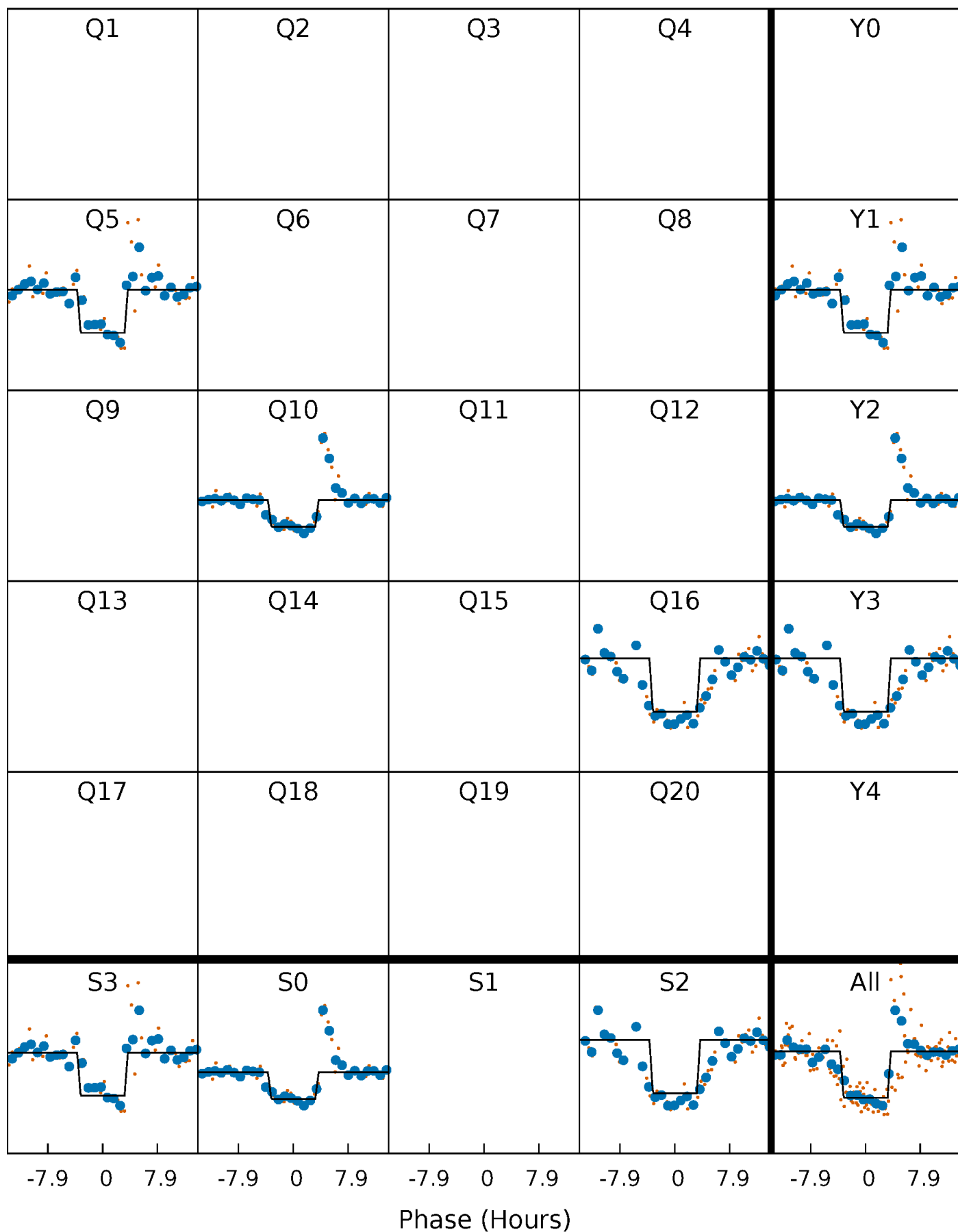
# DV Quarter-Phased Transit Curves

TCE 005608002-04 P=511.172392 Days  $T_0=482.923424$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

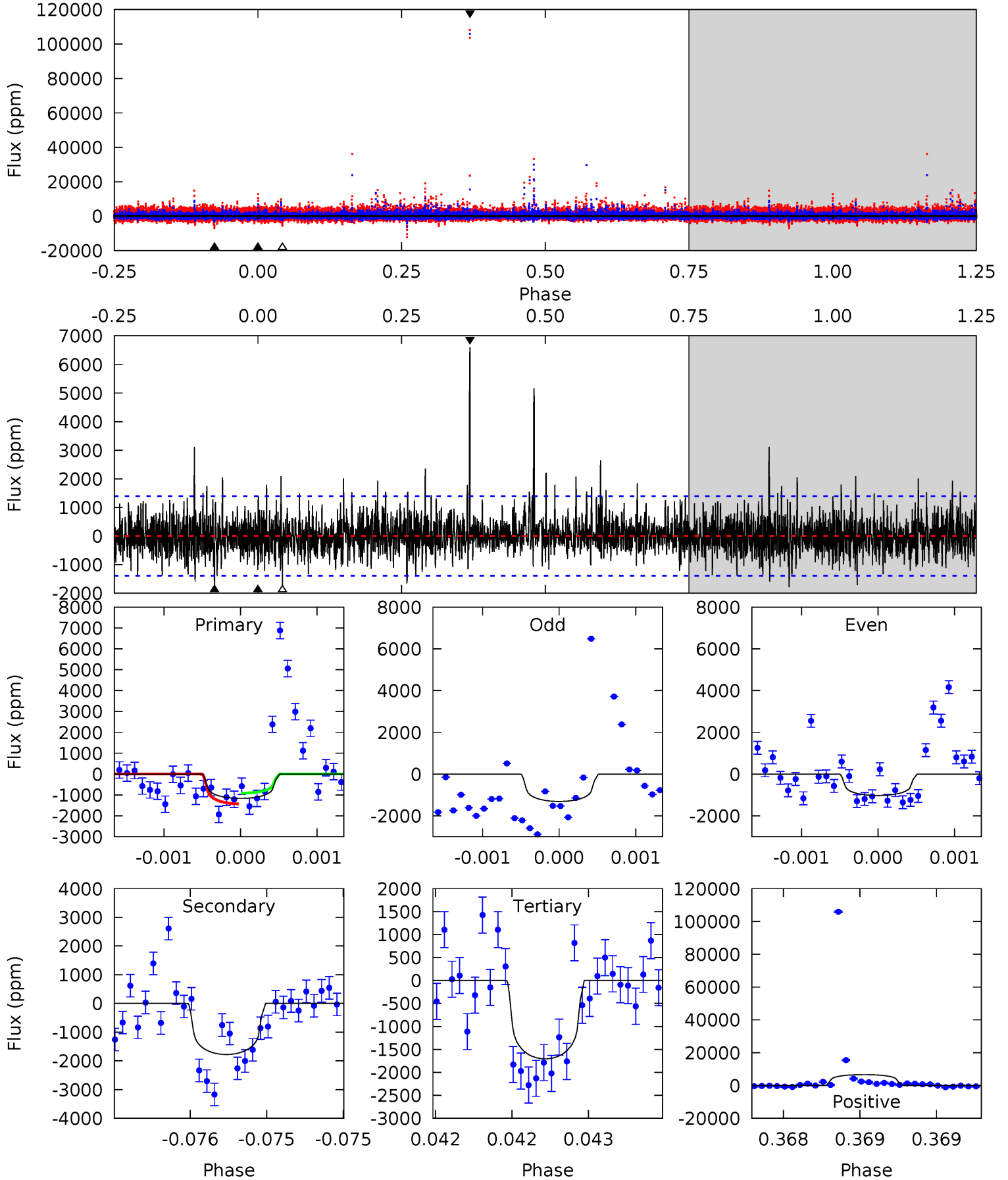
TCE 005608002-04 P=511.152315 Days  $T_0=482.919285$  (BKJD)



# DV Model-Shift Uniqueness Test

005608002-04, P = 511.172392 Days, E = 482.923424 Days

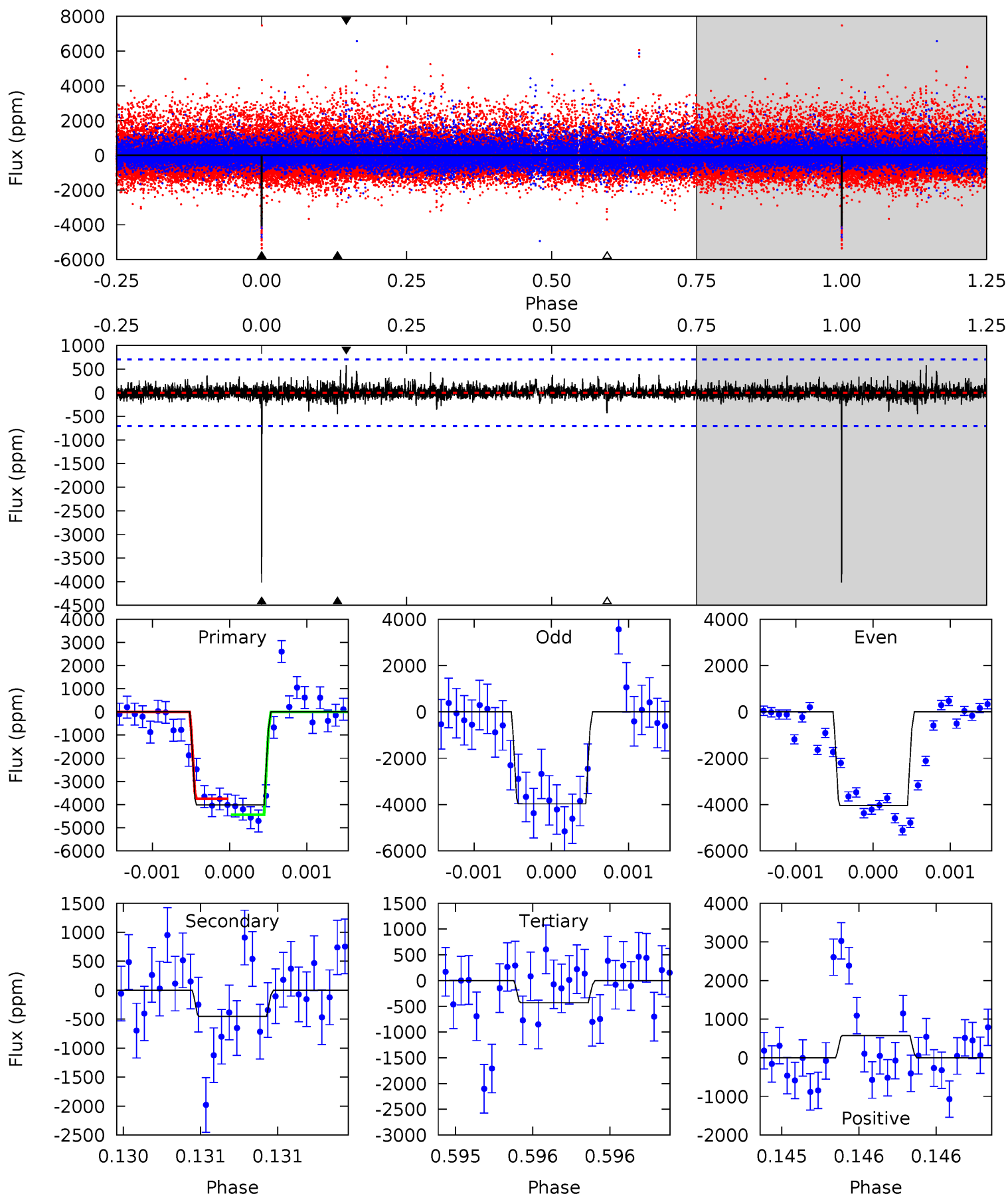
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 4.63 | 7.05 | 6.77 | 26.2 | 5.53            | 3.42            | 2.09             | -2.14   | -21.6   | 0.28    | -19.1   | 0.32    | 0.79 | 0.79  | 1.02 |



# Alt Model-Shift Uniqueness Test

005608002-04, P = 511.152315 Days, E = 482.919285 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 31.5 | 3.55 | 3.37 | 4.52 | 5.55            | 3.44            | 0.63             | 28.2    | 27.0    | 0.18    | -0.97   | 0.24    | 1.01 | 0.13  | 2.65 |





### Stellar Parameters For KIC 005608002

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3223^{+43}_{-24}$  | $5.125^{+0.063}_{-0.070}$ | $0.000^{+0.100}_{-0.100}$ | $0.179^{+0.039}_{-0.026}$ | $0.155^{+0.043}_{-0.023}$ | $38.370^{+13.470}_{-11.810}$              |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +22%/-15%                 | +28%/-15%                 | +35%/-31%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 005608002-04 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{max} (K)$   | $T_{obs} (K)$         | $A_{obs}$                     |
|---------|-----------------|------------------------|-----------------|-----------------------|-------------------------------|
| DV      | $-1777 \pm 252$ | $0.99^{+0.78}_{-0.58}$ | $103^{+3}_{-3}$ | $3066^{+1010}_{-434}$ | $453126^{+2281973}_{-312488}$ |
| Alt.    | $-453 \pm 127$  | $1.33^{+0.72}_{-0.79}$ | $103^{+4}_{-3}$ | $2375^{+612}_{-238}$  | $63999^{+323837}_{-39312}$    |

$T_{max}$  = 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

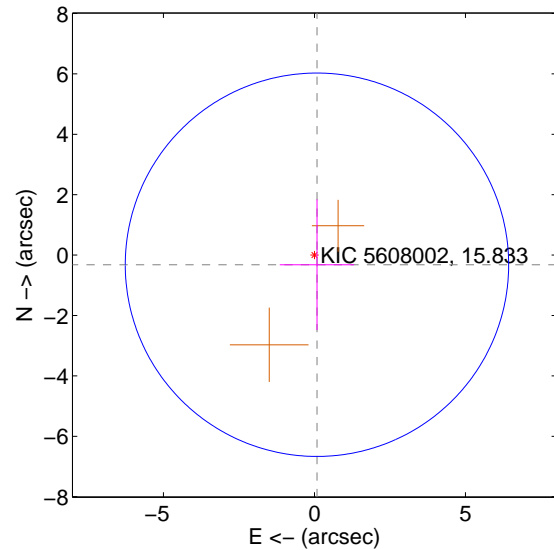
Supplemental centroid analysis for 005608002-04. Kepler magnitude: 15.83. Transit SNR 5.40

There are 0 quarters with good PRF difference image offsets

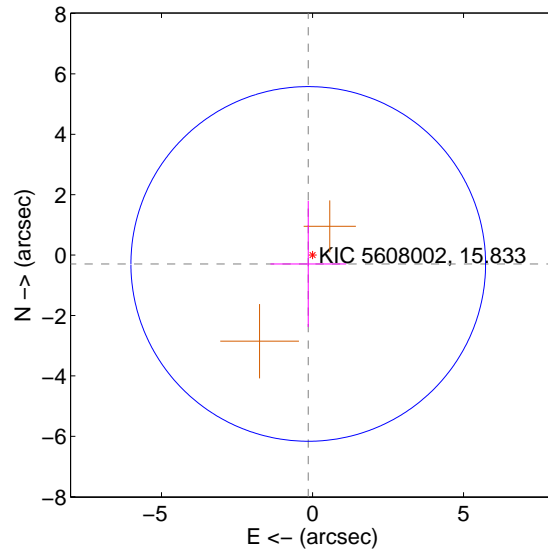
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $0.330 \pm 2.116$  | 0.16                | $-0.084 \pm 1.229$ | $-0.320 \pm 2.163$ |
| PRF-fit source offset from KIC position | $0.325 \pm 1.957$  | 0.17                | $0.141 \pm 1.253$  | $-0.293 \pm 2.088$ |
| photometric centroid source offset      | $0.27 \pm 0.62$    | 0.44                | $0.12 \pm 0.70$    | $-0.24 \pm 0.59$   |

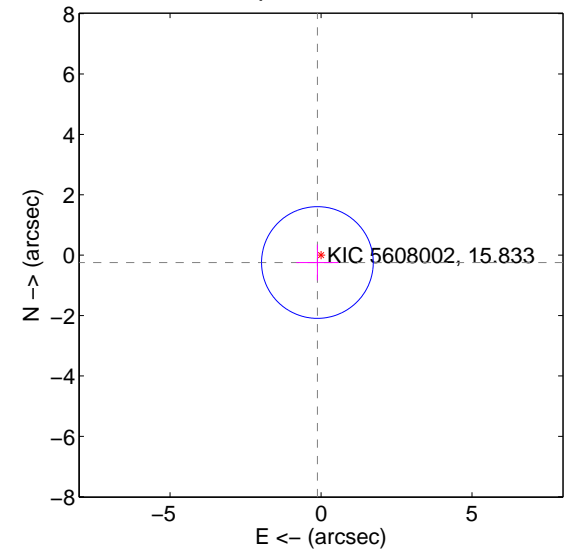
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

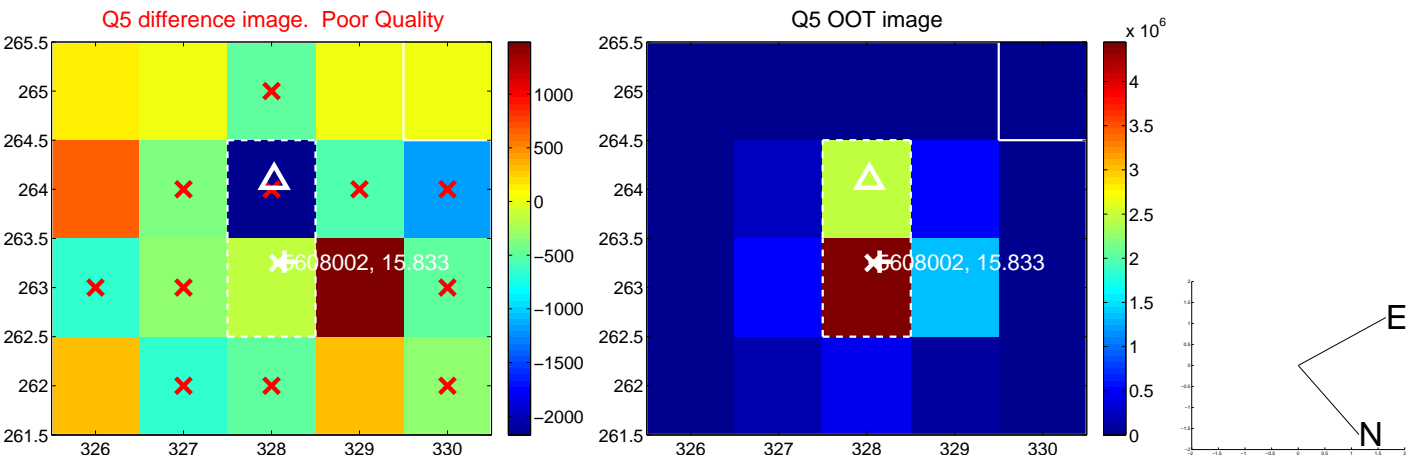


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

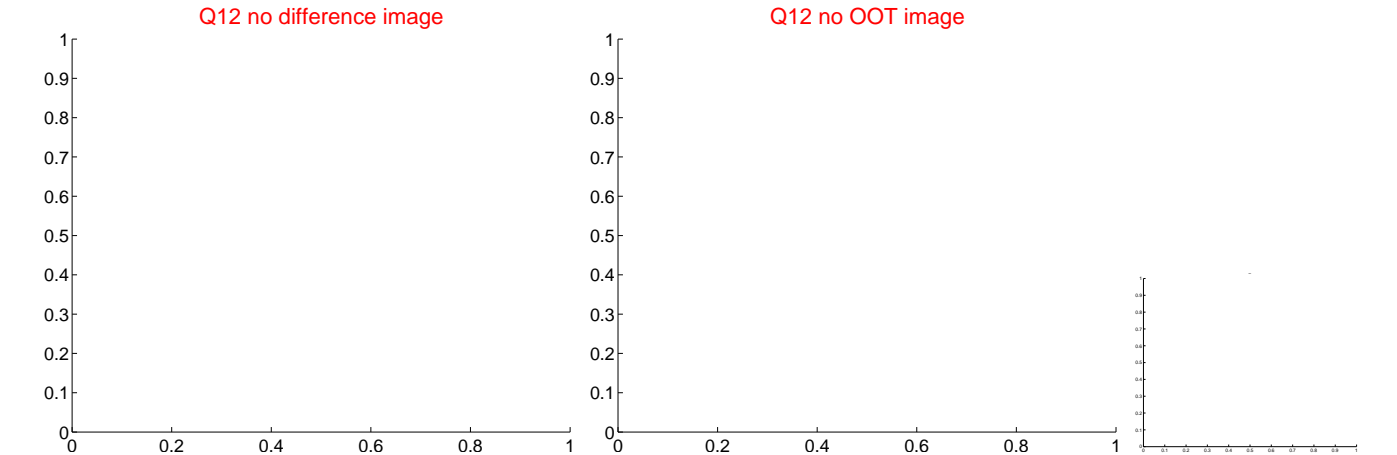
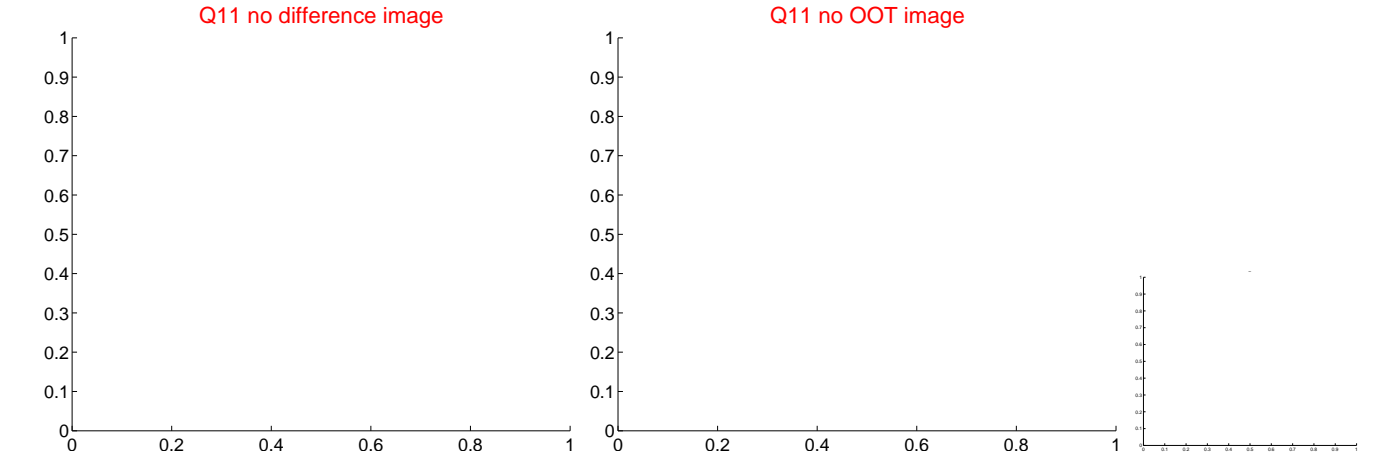
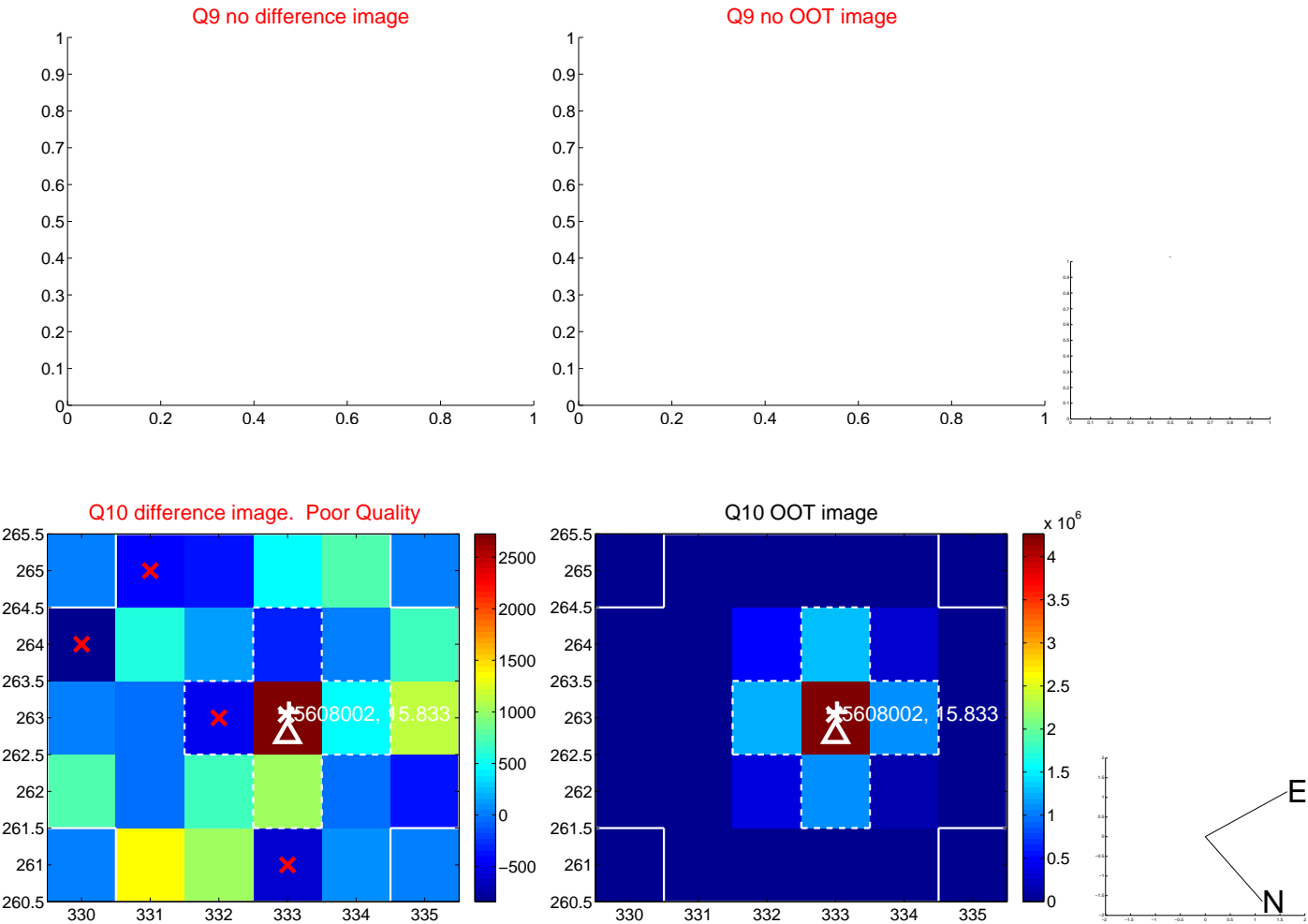
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



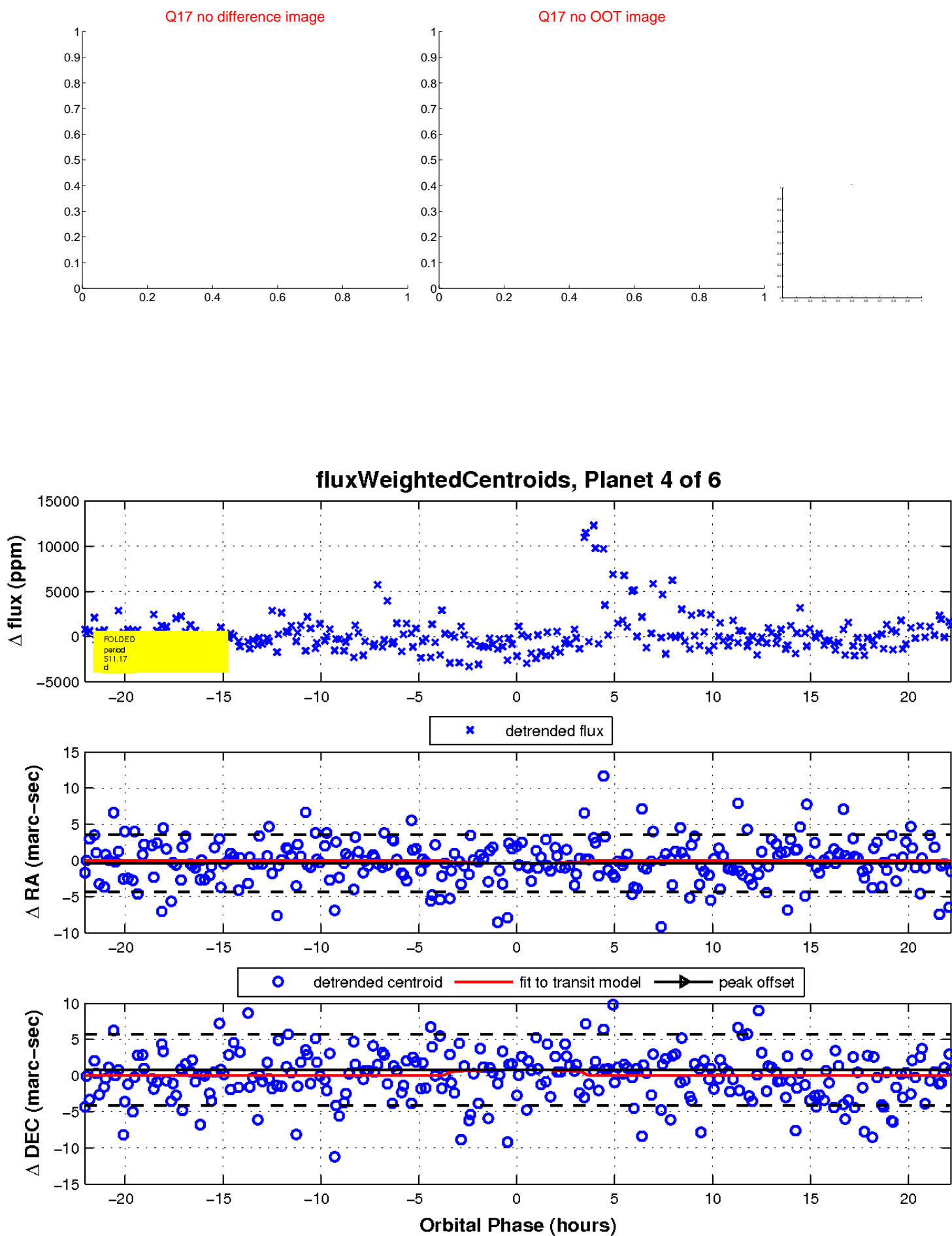
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



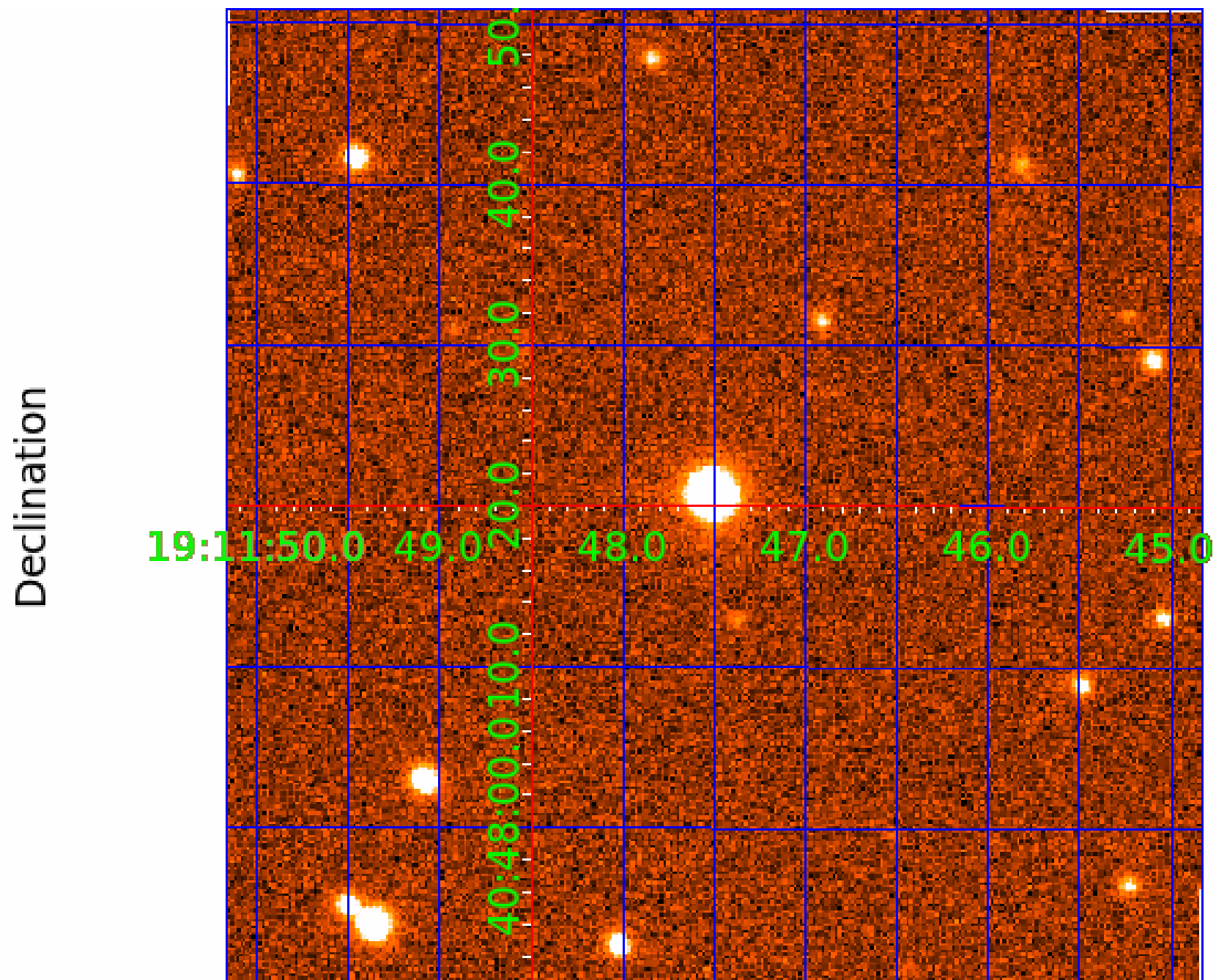
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





## KIC 005608002

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005608002-01 | OBS      | No   | 302.209519    | 171.181106   | 2127.8      | 4.936            | 13.6 | 6.2 | 0.18                        | 3223            | 0.81                   | 0.01                   |
| 005608002-02 | OBS      | No   | 330.344519    | 407.909197   | 2361.2      | 4.094            | 14.8 | 6.5 | 0.18                        | 3223            | 0.86                   | 0.01                   |
| 005608002-03 | OBS      | No   | 199.737602    | 324.308792   | 2348.0      | 6.649            | 11.8 | 7.4 | 0.18                        | 3223            | 0.89                   | 0.02                   |
| 005608002-04 | OBS      | No   | 511.172392    | 482.923424   | 2309.0      | 7.409            | 11.2 | 5.4 | 0.18                        | 3223            | 0.85                   | 0.01                   |
| 005608002-05 | OBS      | No   | 225.187164    | 132.001189   | 3320.5      | 4.313            | 11.0 | 8.1 | 0.18                        | 3223            | 1.87                   | 0.02                   |
| 005608002-06 | OBS      | No   | 276.834758    | 172.887603   | 2319.2      | 7.567            | 10.2 | 6.5 | 0.18                        | 3223            | 0.85                   | 0.01                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005608002-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS  |
| 005608002-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS           |
| 005608002-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 005608002-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV  |

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

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

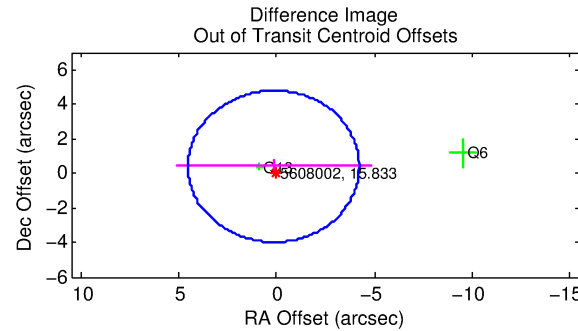
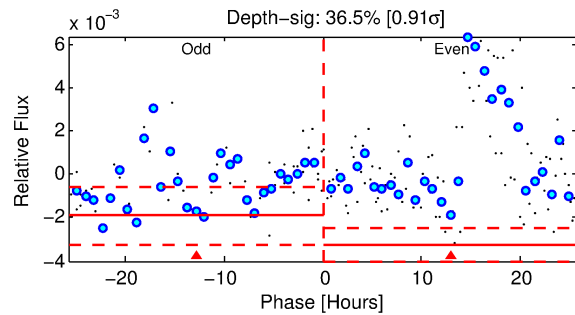
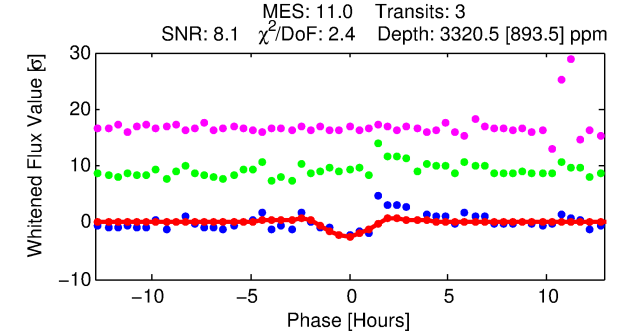
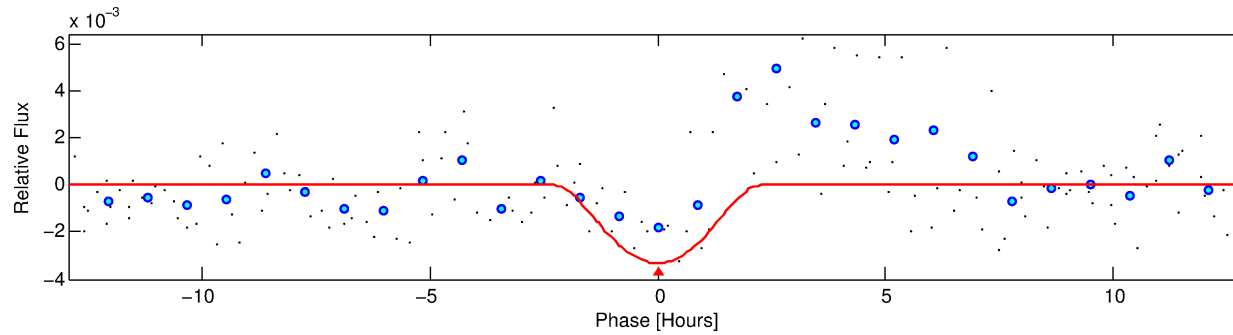
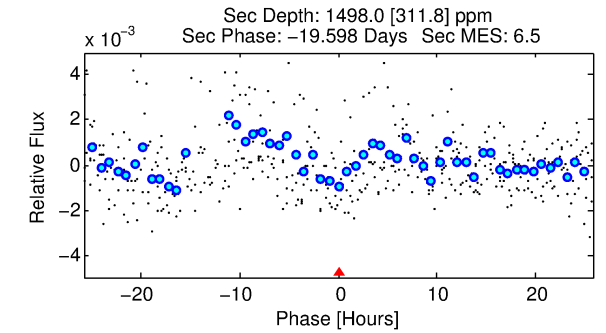
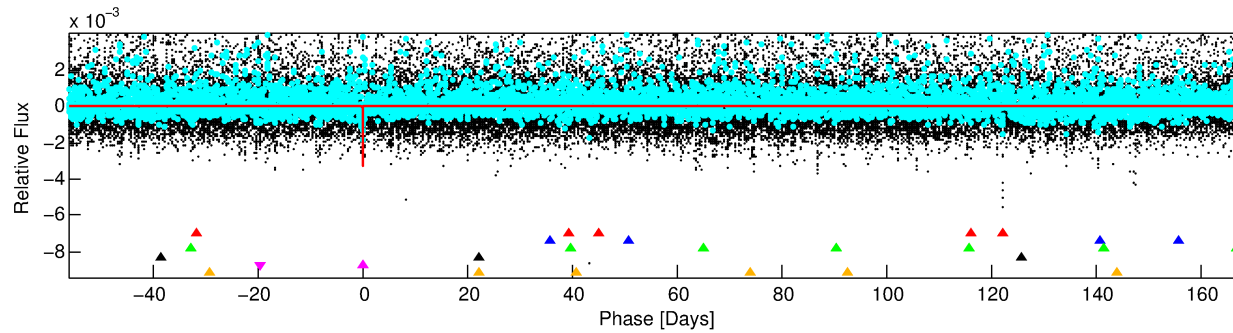
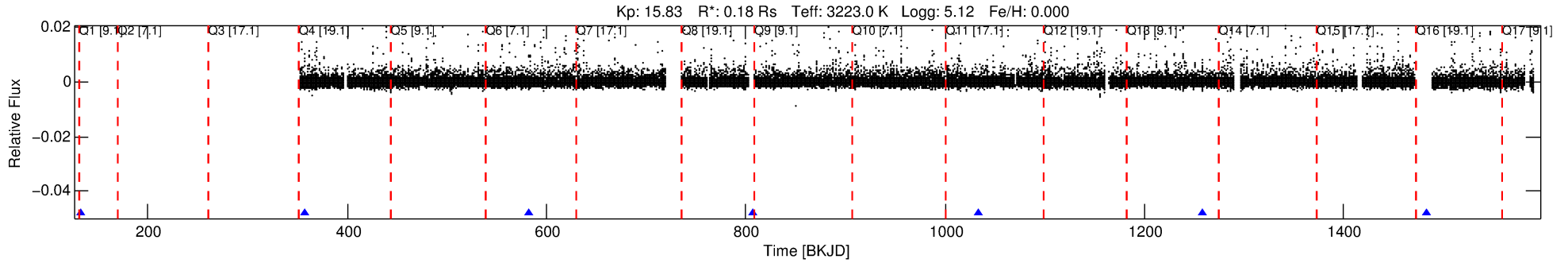
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005608002-05

No Significant Match Found

# DV One-Page Summary

KIC: 5608002 Candidate: 5 of 6 Period: 225.187 d



## DV Fit Results:

Period = 225.18716 [0.00475] d  
Epoch = 132.0012 [0.0175] BKJD  
Rp/R\* = 0.0959 [0.5614]  
a/R\* = 185.10 [223.55]  
b = 0.99 [0.83]  
Seff = 0.02 [0.00]  
Teq = 96 [5] K  
Rp = 1.87 [10.97] Re  
a = 0.3899 [0.0604] AU  
Ag = 35694.26 [417958.83] [0.09σ]  
Teffp = 2047 [5993] K [0.33σ]

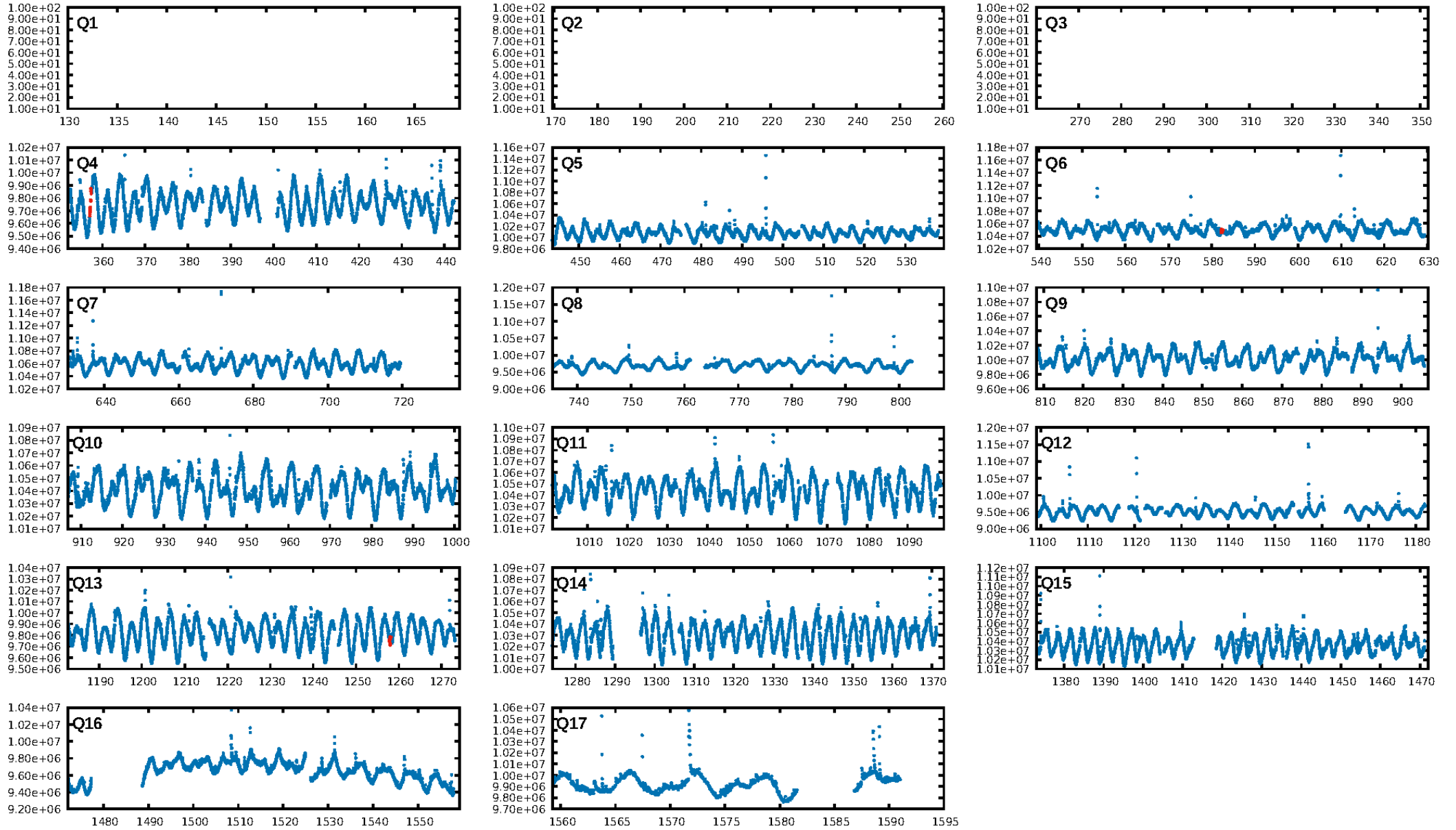
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [77.06σ]  
LongPeriod-sig: 100.0% [142.32σ]  
ModelChiSquare2-sig: 16.3%  
ModelChiSquareGof-sig: 17.8%  
**Bootstrap-pfa: 8.76e-11**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.9578**  
Centroid-sig: 62.9%  
Centroid-so: 0.356 arcsec [0.41σ]  
OotOffset-rm: 0.428 arcsec [0.29σ]  
KicOffset-rm: 0.493 arcsec [0.33σ]  
OotOffset-st: 1/0/0/1 [2]  
KicOffset-st: 1/0/0/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 1.00 [3/3]

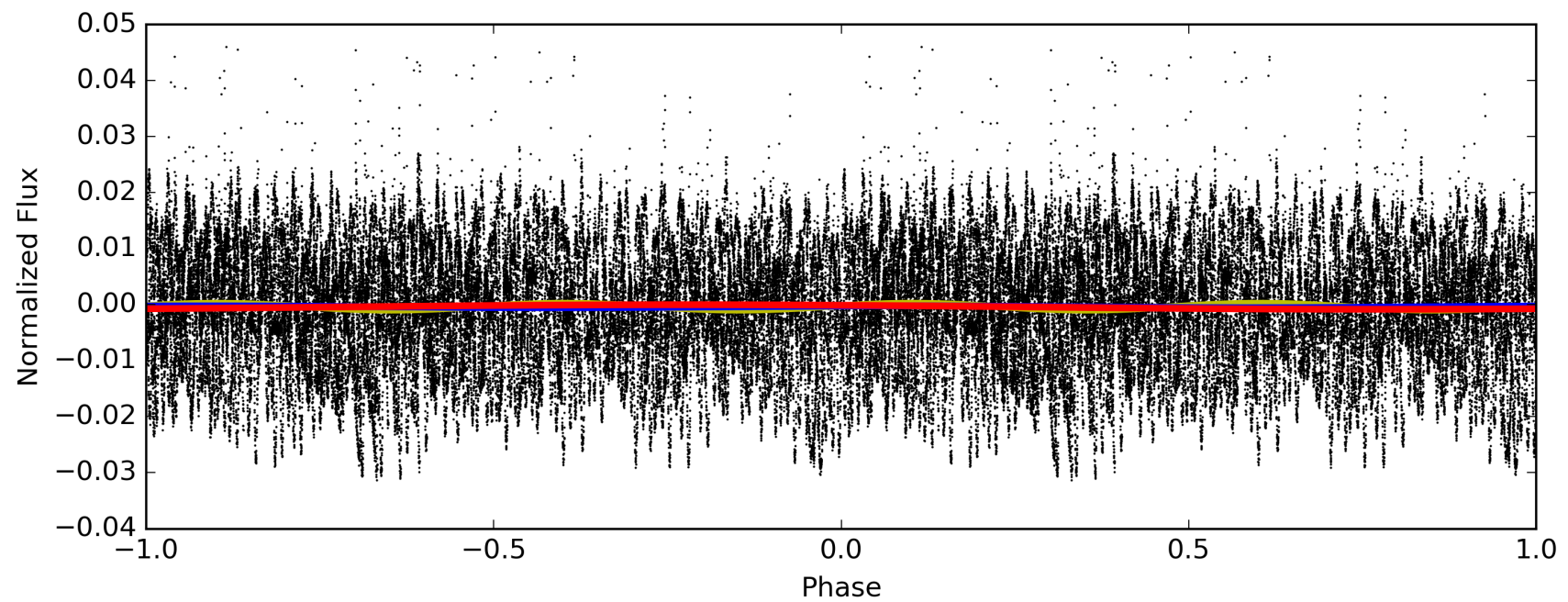
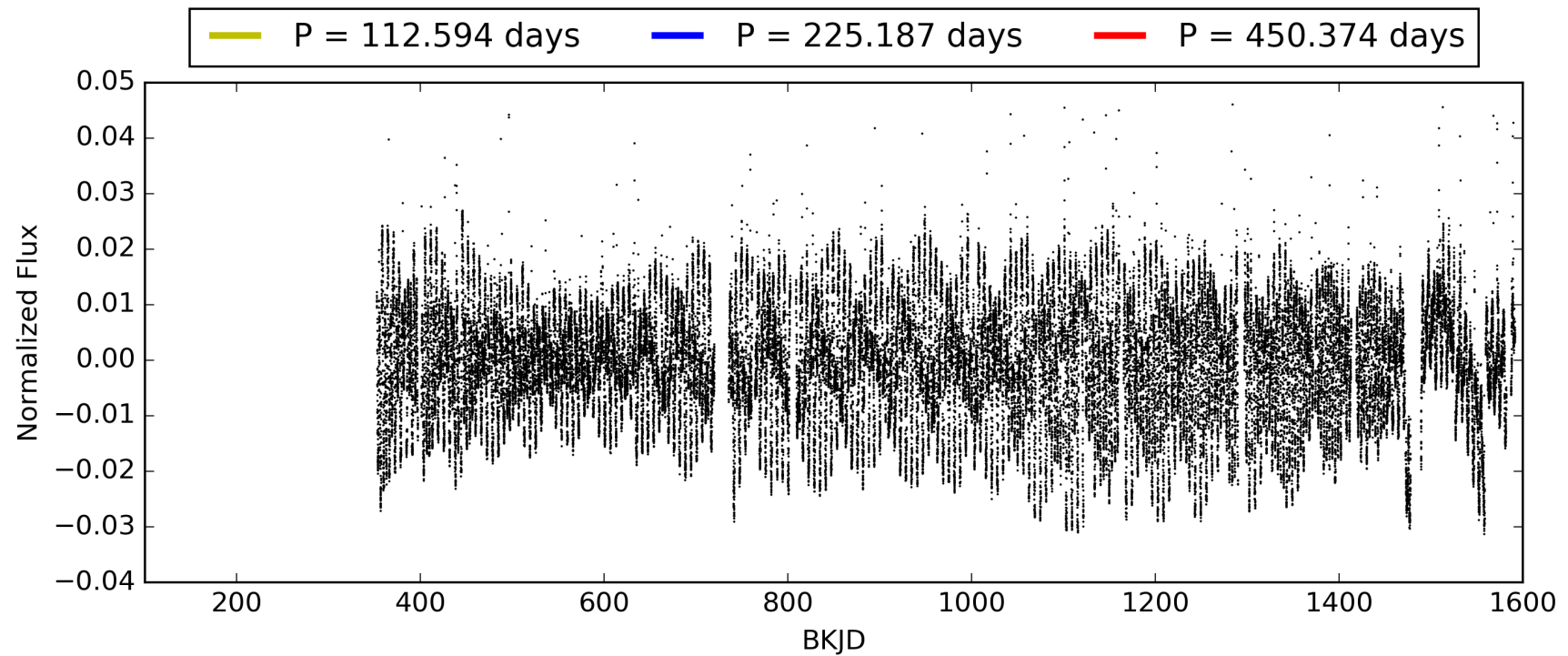
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 22:01:40 Z

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

# TCE 005608002-05, PDC Light Curves

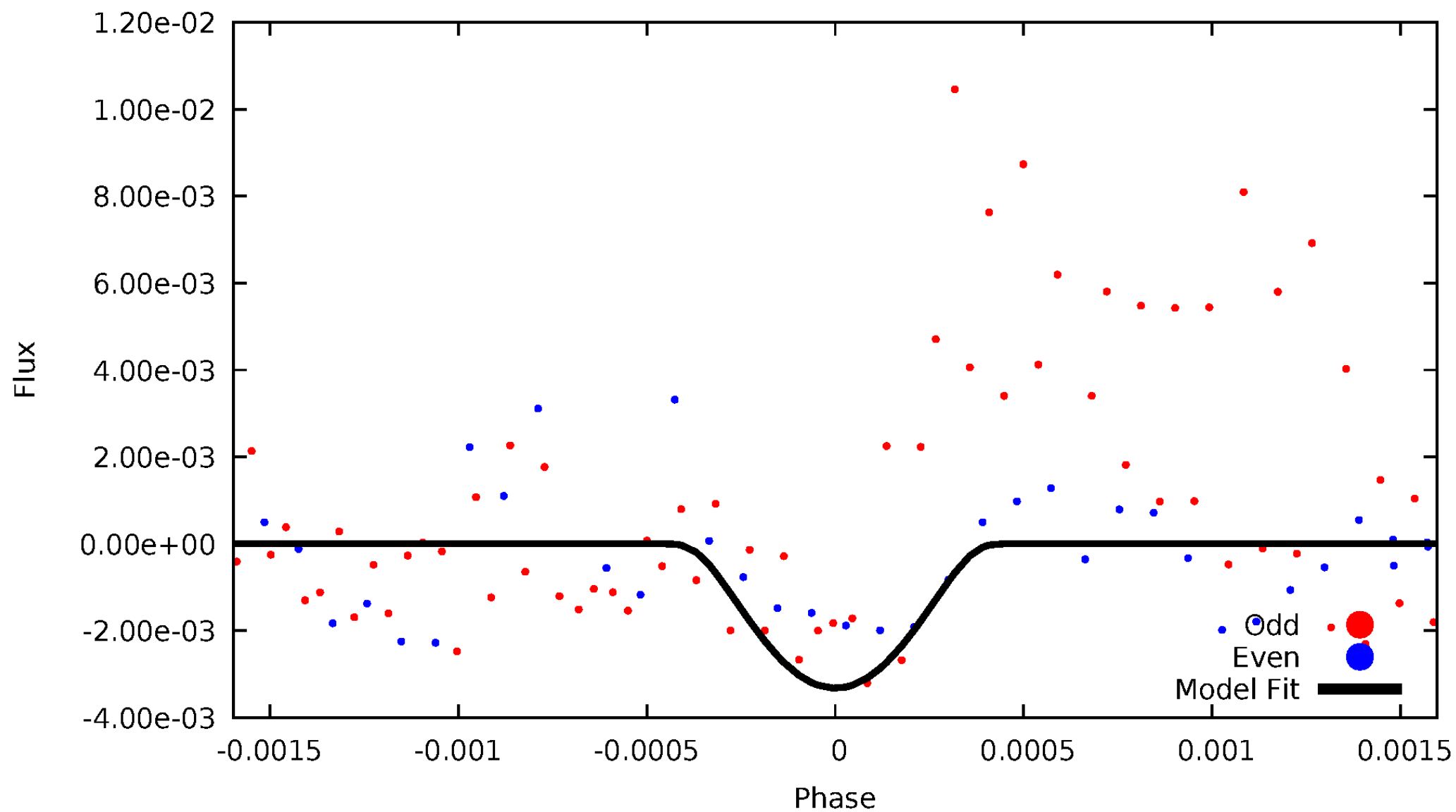


TCE 005608002-05



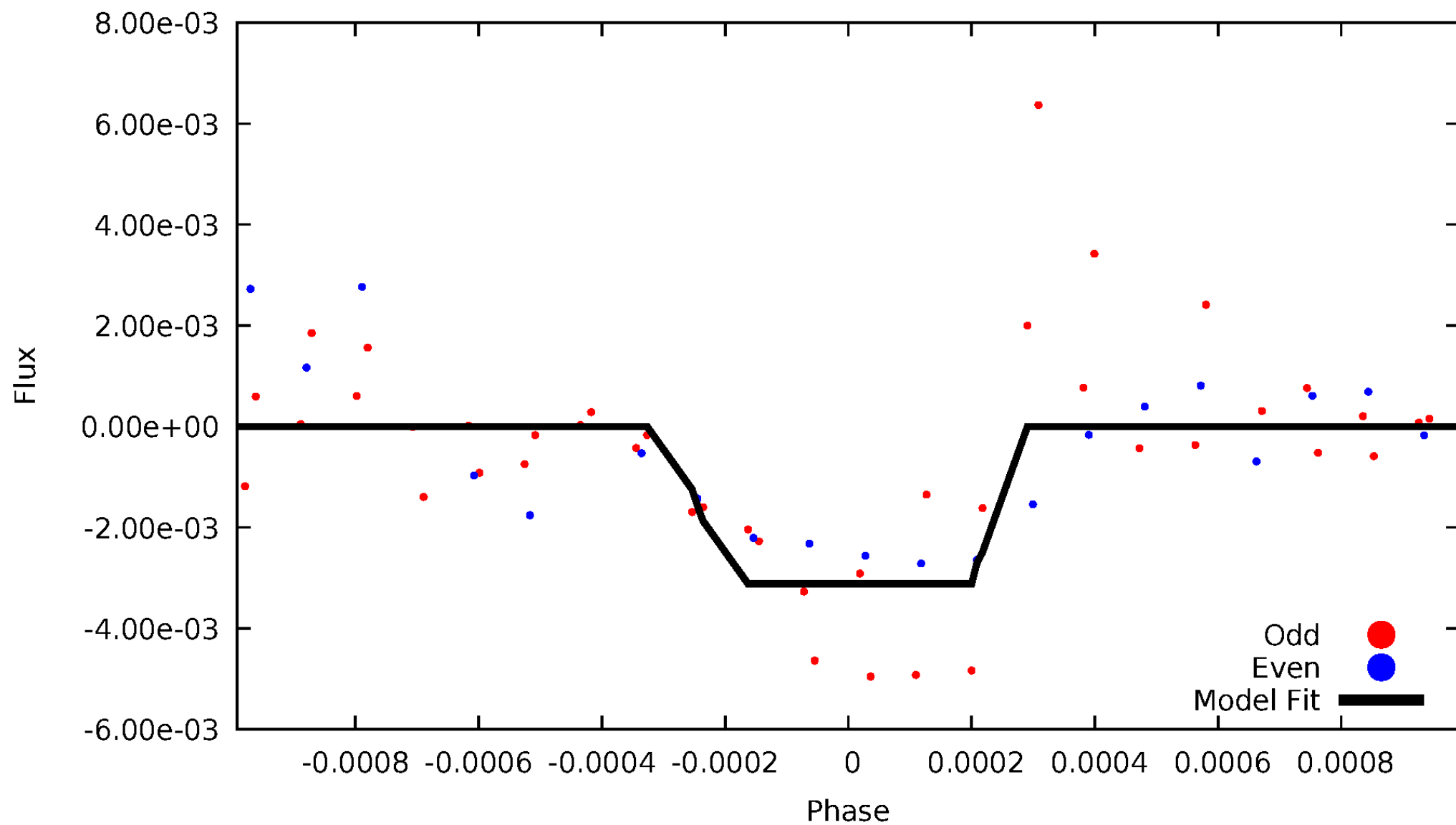
# DV Odd/Even

TCE 005608002-05

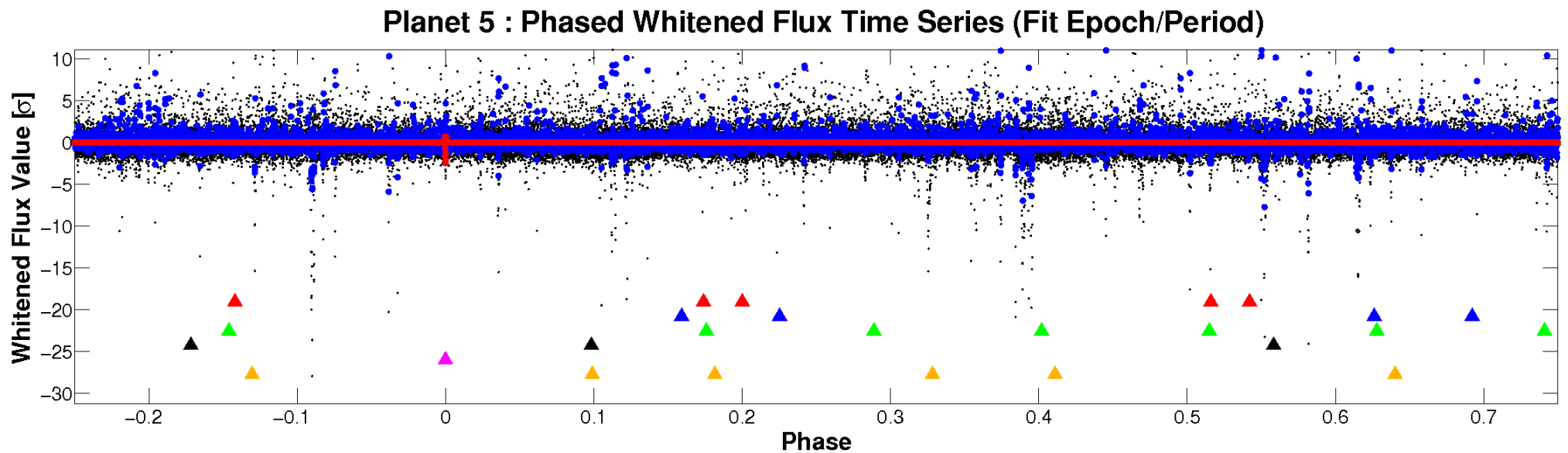
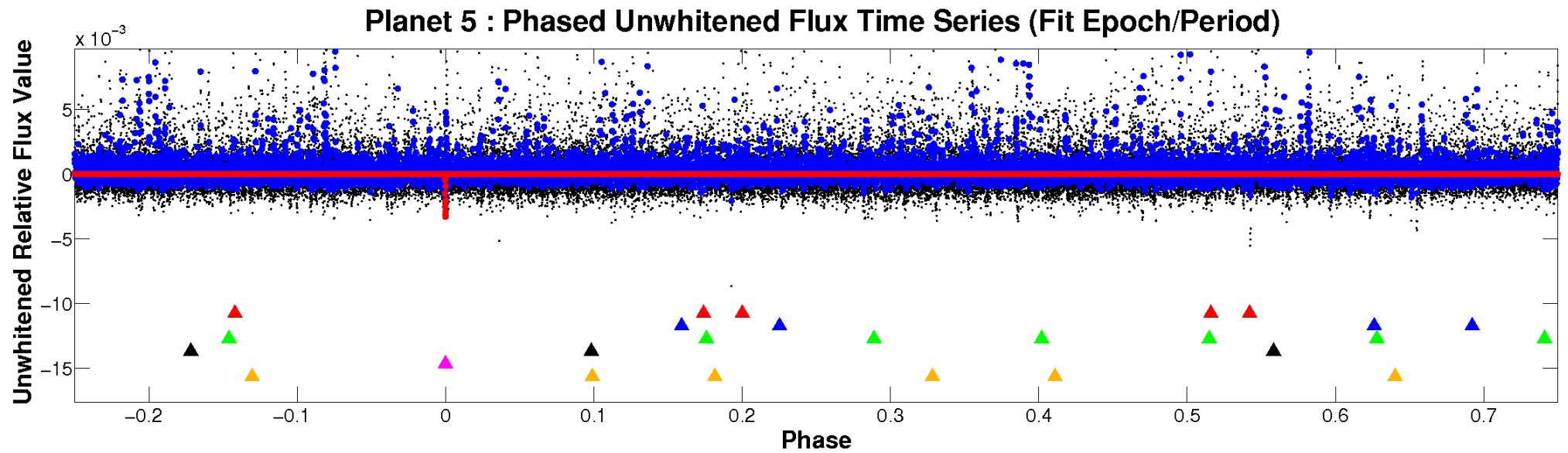


# ALT Odd/Even

TCE 005608002-05

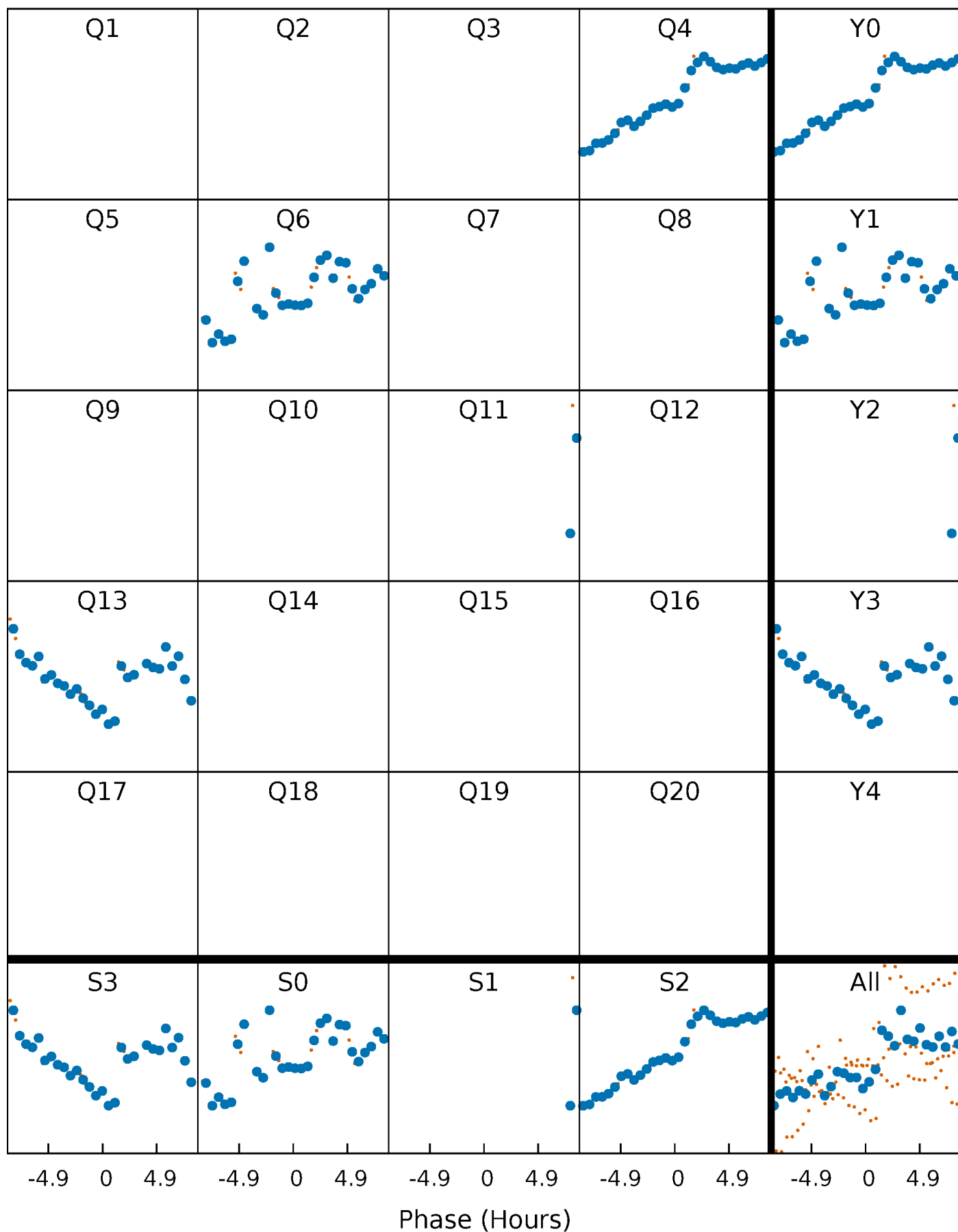


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

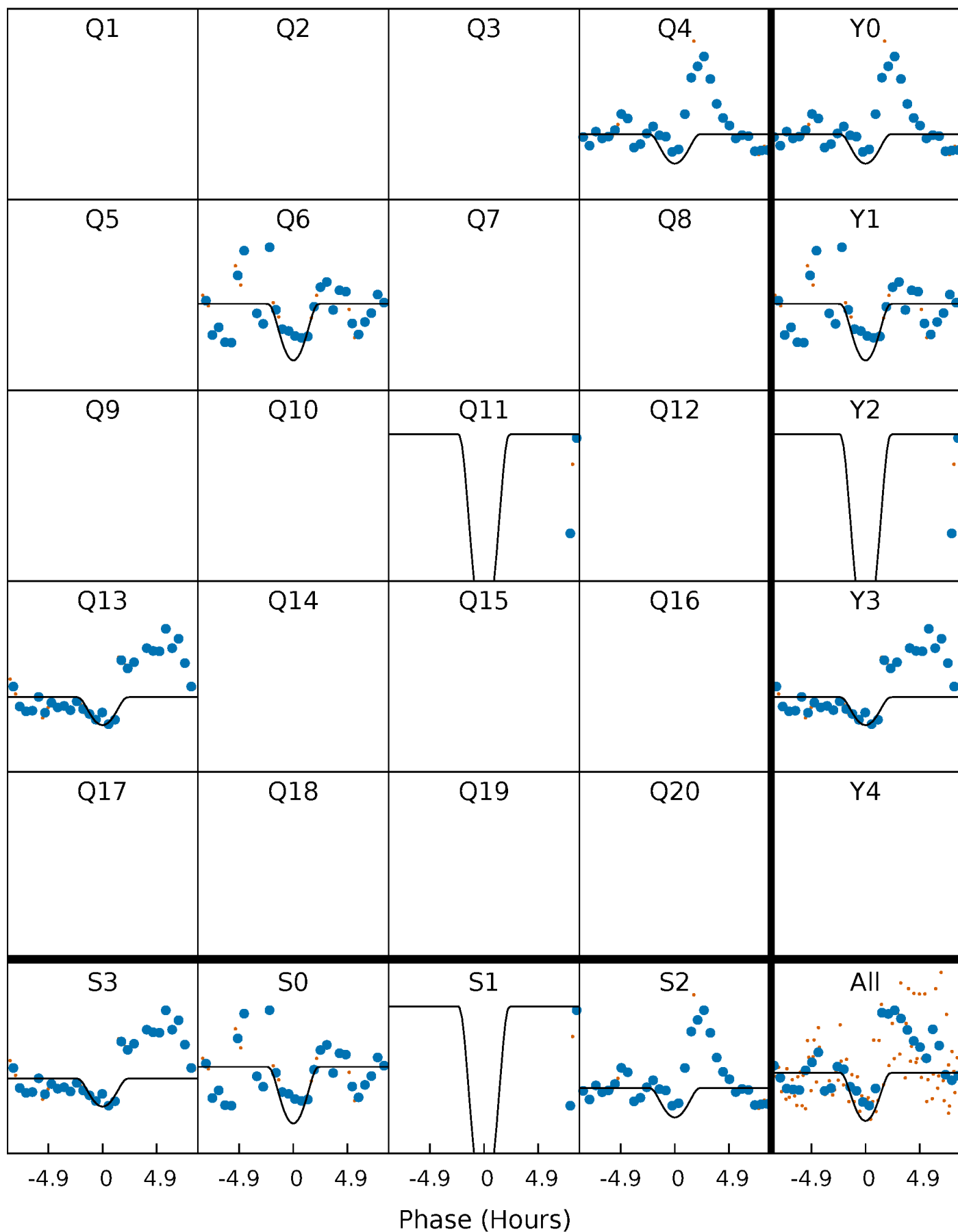
TCE 005608002-05     $P=225.187164$  Days     $T_0=132.001189$  (BKJD)





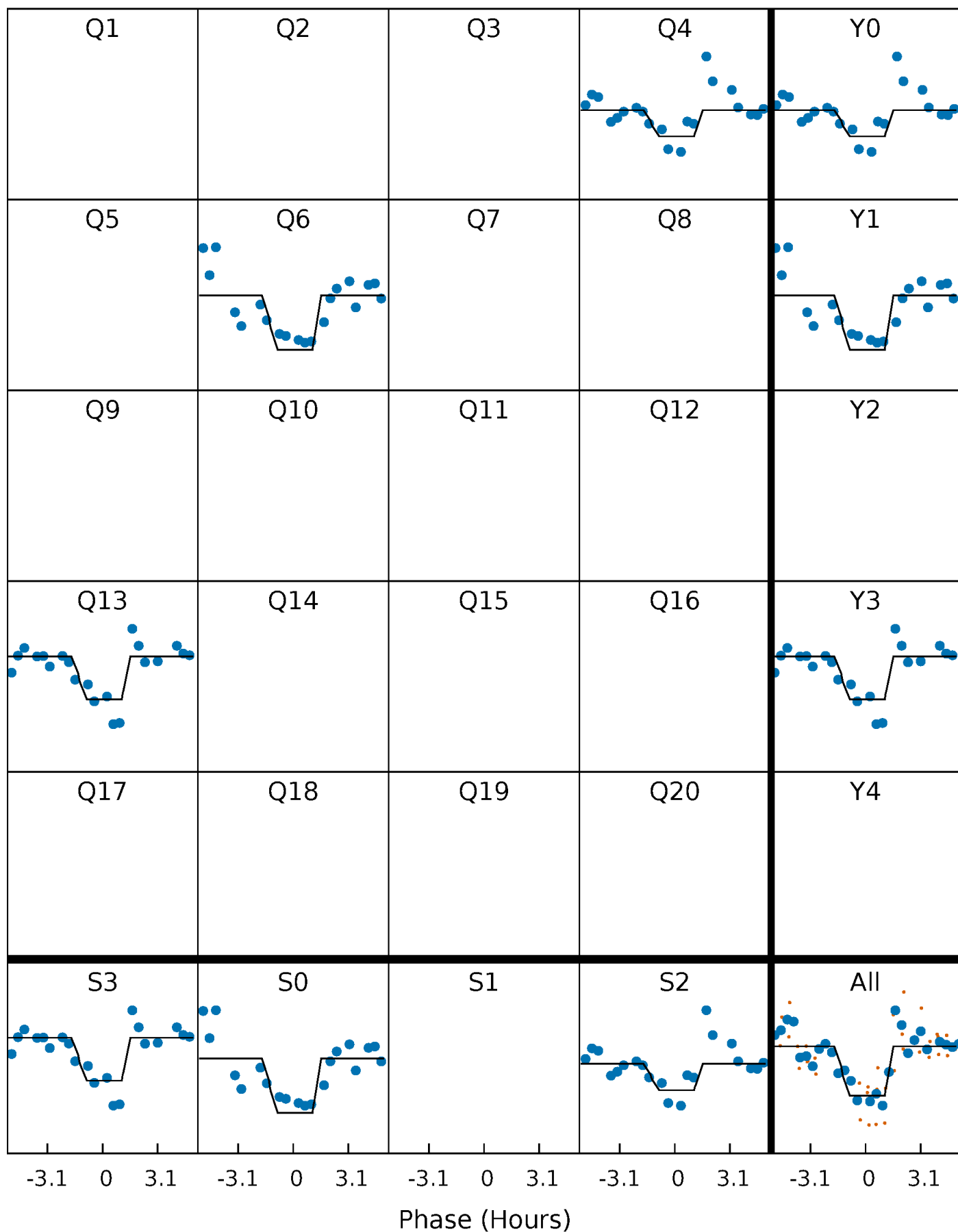
# DV Quarter-Phased Transit Curves

TCE 005608002-05     $P=225.187164$  Days     $T_0=132.001189$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

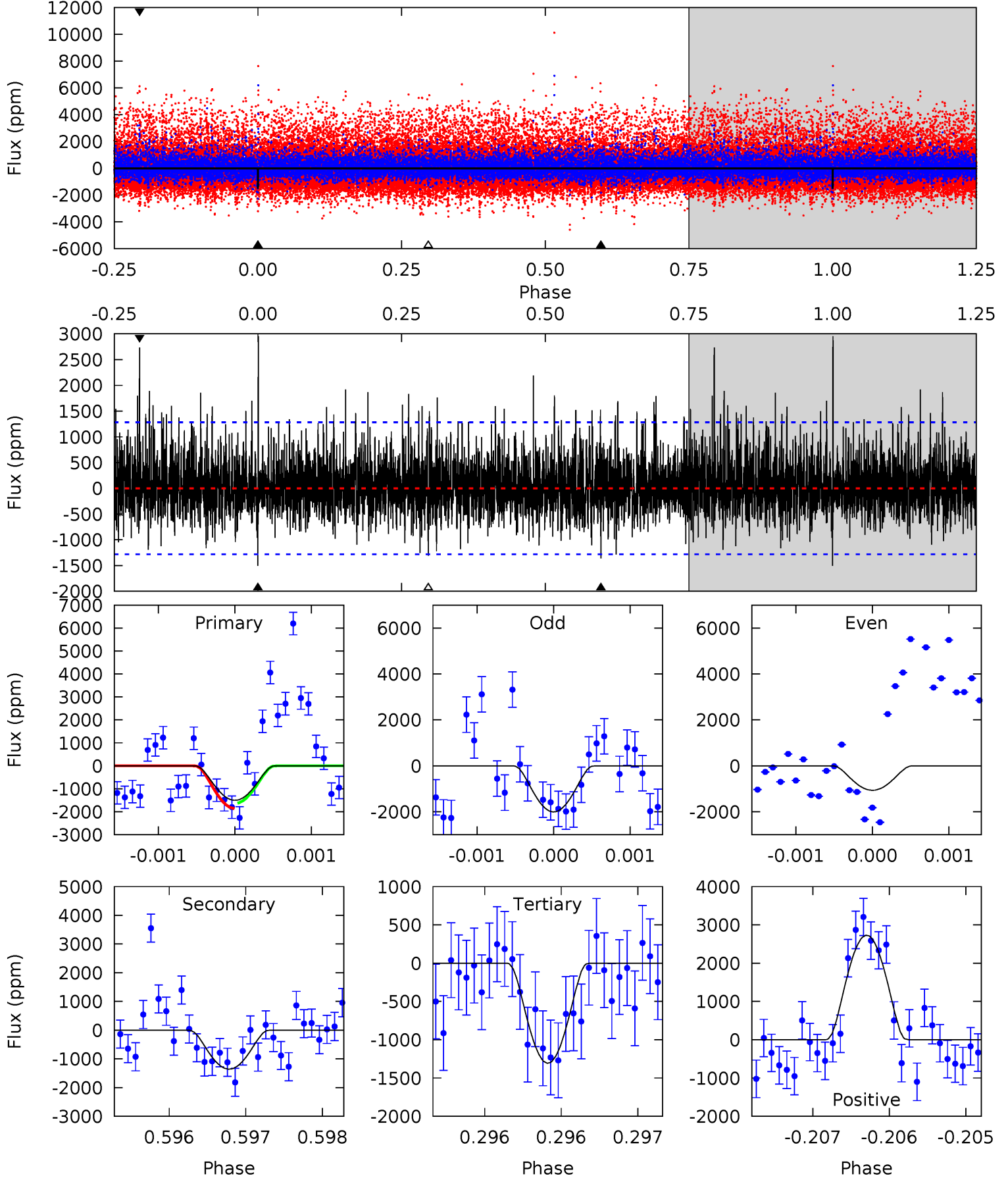
TCE 005608002-05     $P=225.185296$  Days     $T_0=132.005093$  (BKJD)



# DV Model-Shift Uniqueness Test

005608002-05, P = 225.187164 Days, E = 132.001189 Days

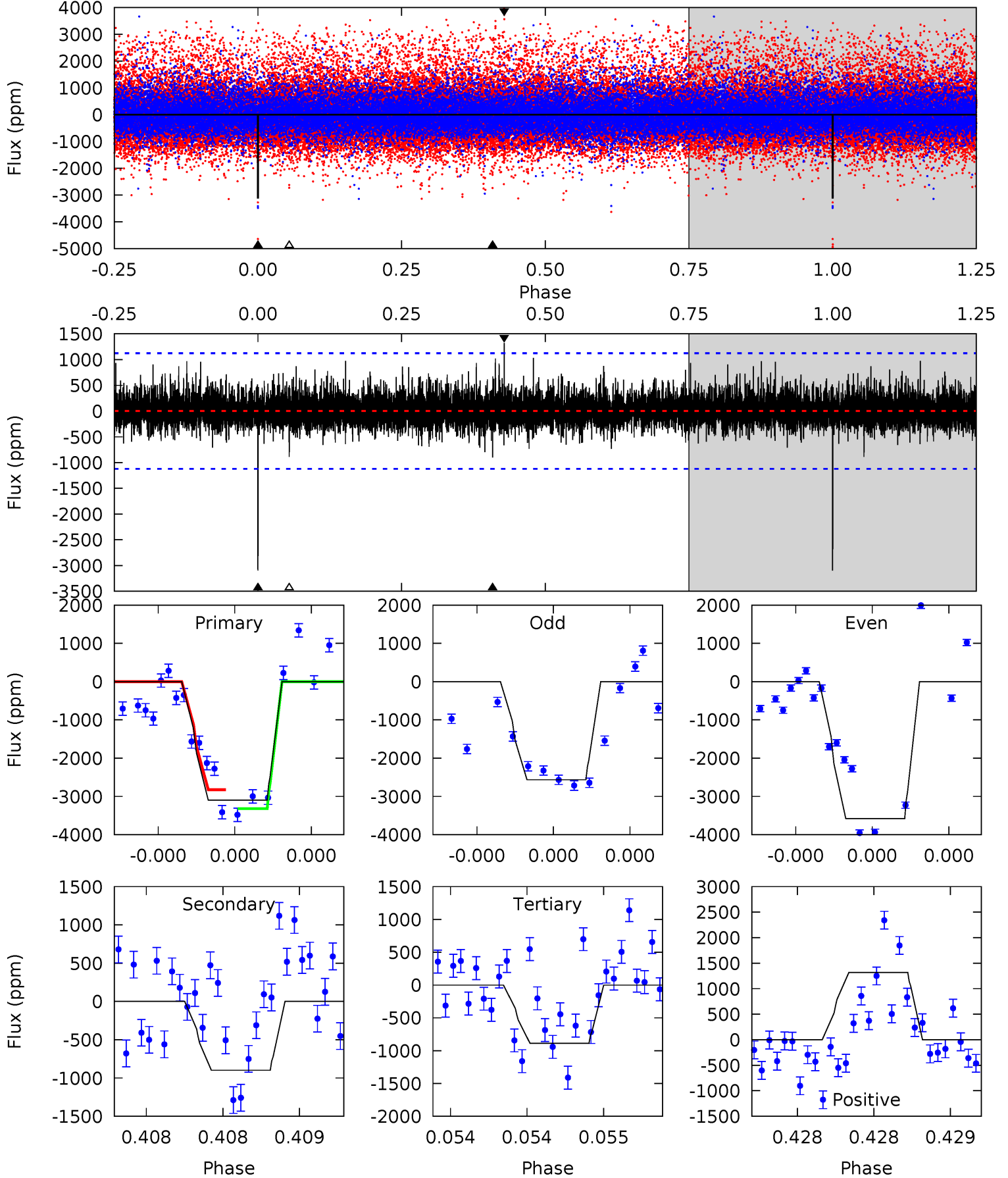
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.43 | 5.81 | 5.60 | 11.7 | 5.49            | 3.35            | 1.88             | 0.84    | -5.26   | 0.22    | -5.87   | 1.76    | 0.65 | 0.66  | 0.49 |



# Alt Model-Shift Uniqueness Test

005608002-05, P = 225.185296 Days, E = 132.005093 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 15.4 | 4.46 | 4.41 | 6.54 | 5.58            | 3.50            | 1.07             | 11.0    | 8.85    | 0.05    | -2.08   | 2.41    | 1.00 | 0.30  | 1.24 |



### Stellar Parameters For KIC 005608002

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3223^{+43}_{-24}$  | $5.125^{+0.063}_{-0.070}$ | $0.000^{+0.100}_{-0.100}$ | $0.179^{+0.039}_{-0.026}$ | $0.155^{+0.043}_{-0.023}$ | $38.370^{+13.470}_{-11.810}$              |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +22%/-15%                 | +28%/-15%                 | +35%/-31%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 005608002-05 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{max} (K)$   | $T_{obs} (K)$        | $A_{obs}$               |
|---------|-----------------|------------------------|-----------------|----------------------|-------------------------|
| DV      | $-1358 \pm 234$ | $8.16^{+8.05}_{-5.86}$ | $135^{+4}_{-4}$ | $1820^{+549}_{-216}$ | $1644^{+19813}_{-1228}$ |
| Alt.    | $-898 \pm 201$  | $8.24^{+8.01}_{-5.78}$ | $135^{+5}_{-4}$ | $1757^{+469}_{-209}$ | $1096^{+10705}_{-833}$  |

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

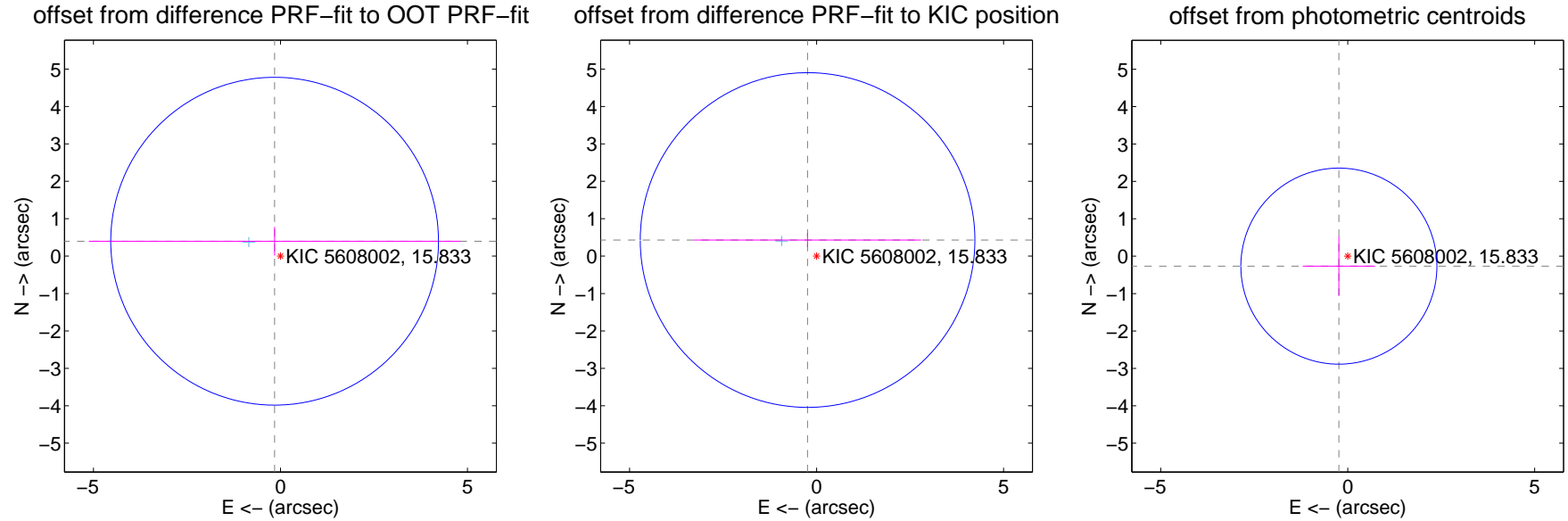
## DV Centroid Data

Supplemental centroid analysis for 005608002-05. Kepler magnitude: 15.83. Transit SNR 8.08

There are 1 quarters with good PRF difference image offsets

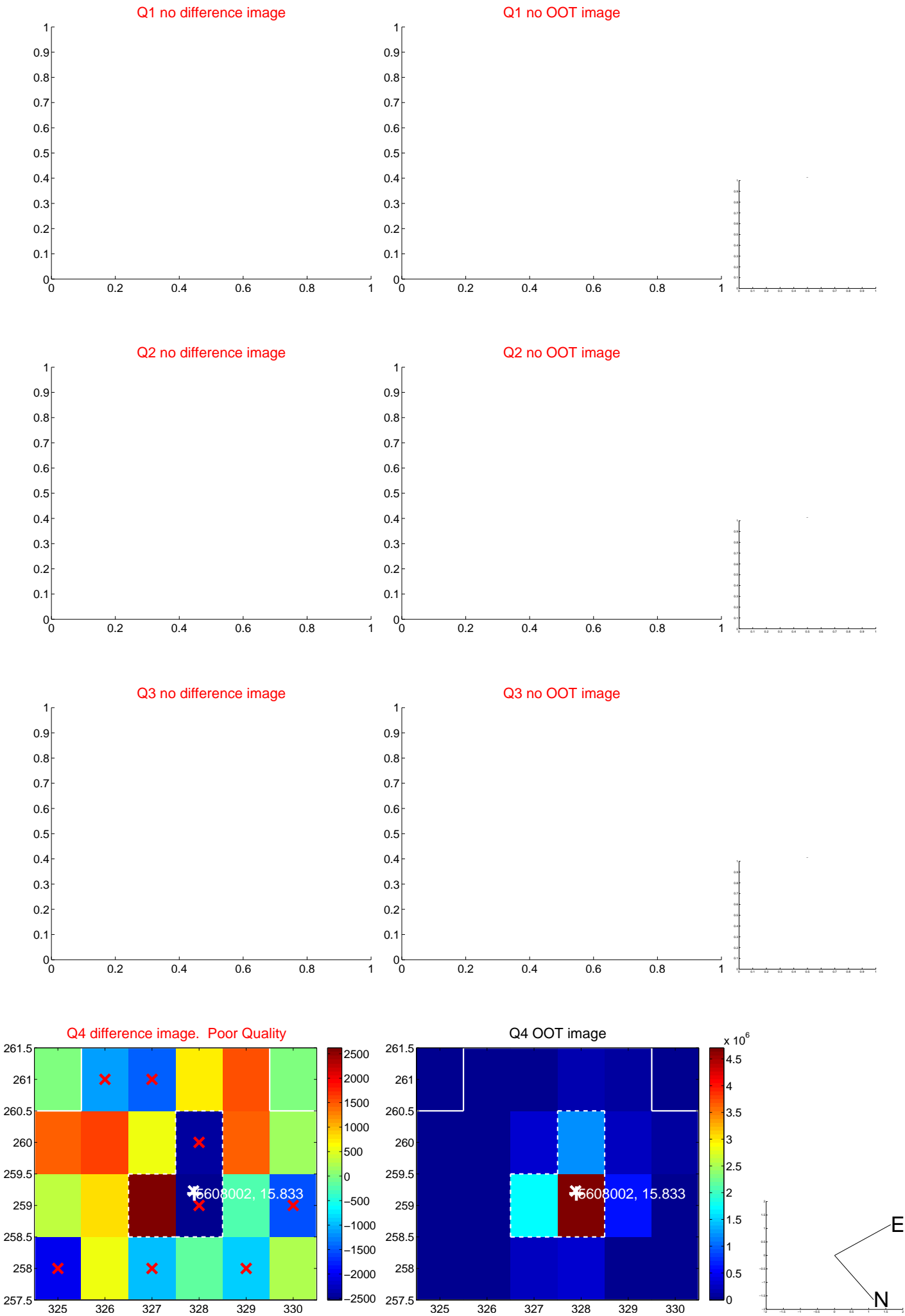
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $0.428 \pm 1.461$  | 0.29                | $0.156 \pm 4.971$ | $0.399 \pm 0.384$ |
| PRF-fit source offset from KIC position | $0.493 \pm 1.491$  | 0.33                | $0.241 \pm 3.034$ | $0.430 \pm 0.191$ |
| photometric centroid source offset      | $0.36 \pm 0.87$    | 0.41                | $0.24 \pm 0.97$   | $-0.27 \pm 0.79$  |

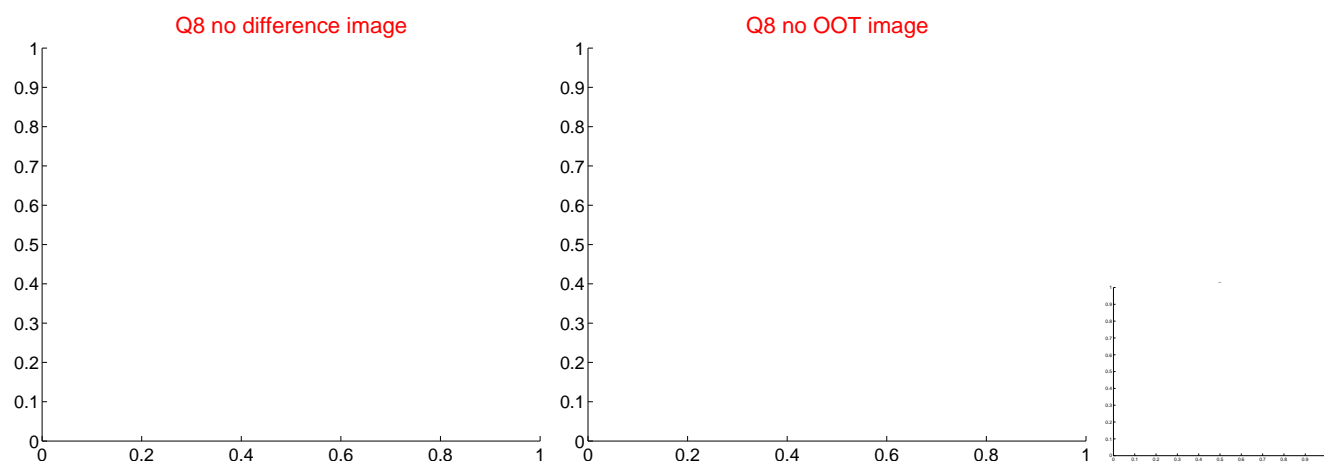
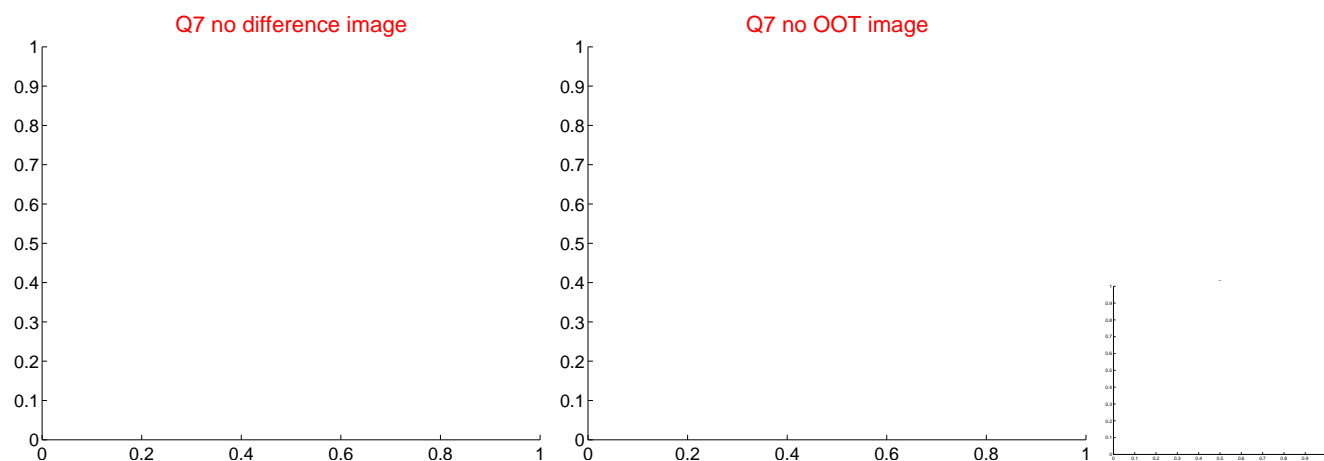
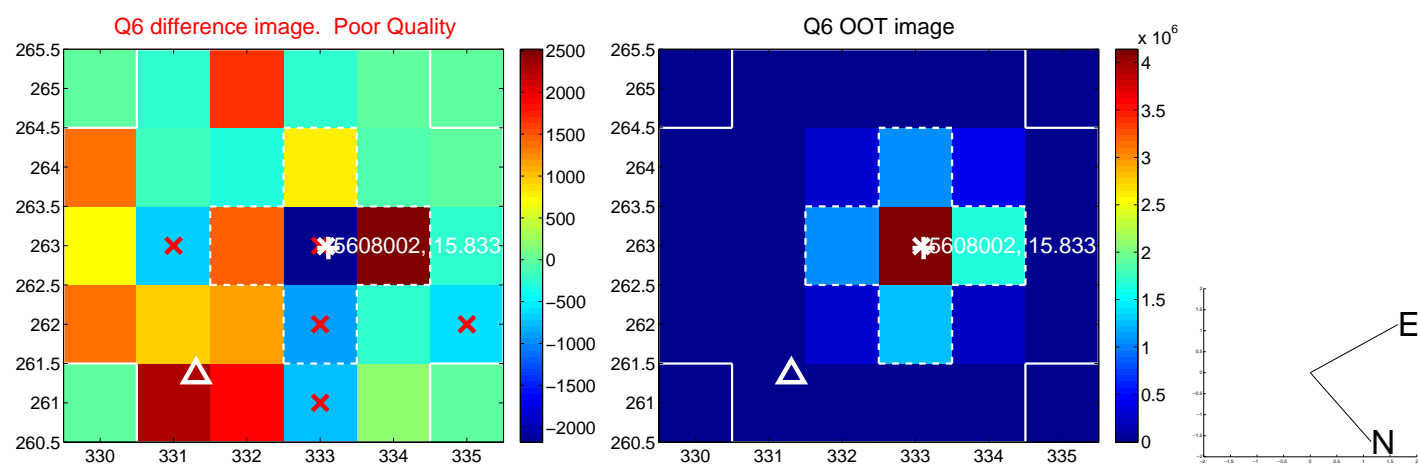
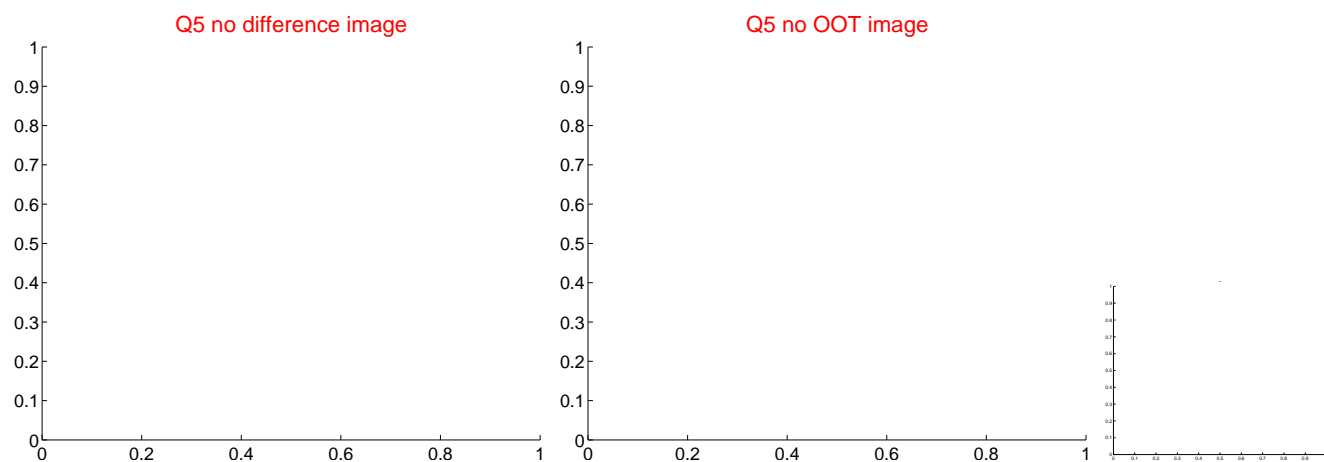


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

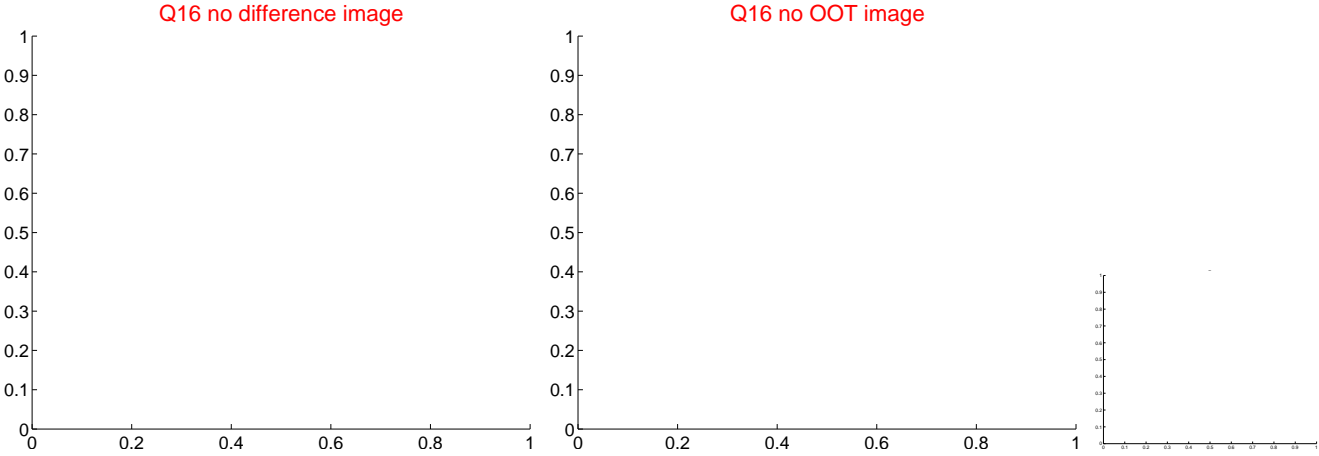
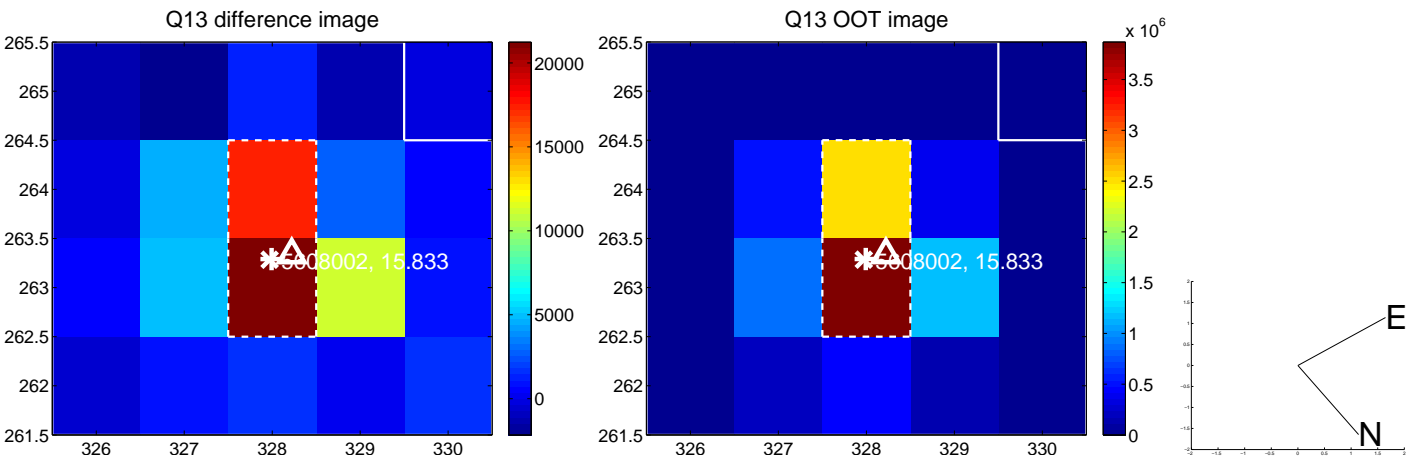




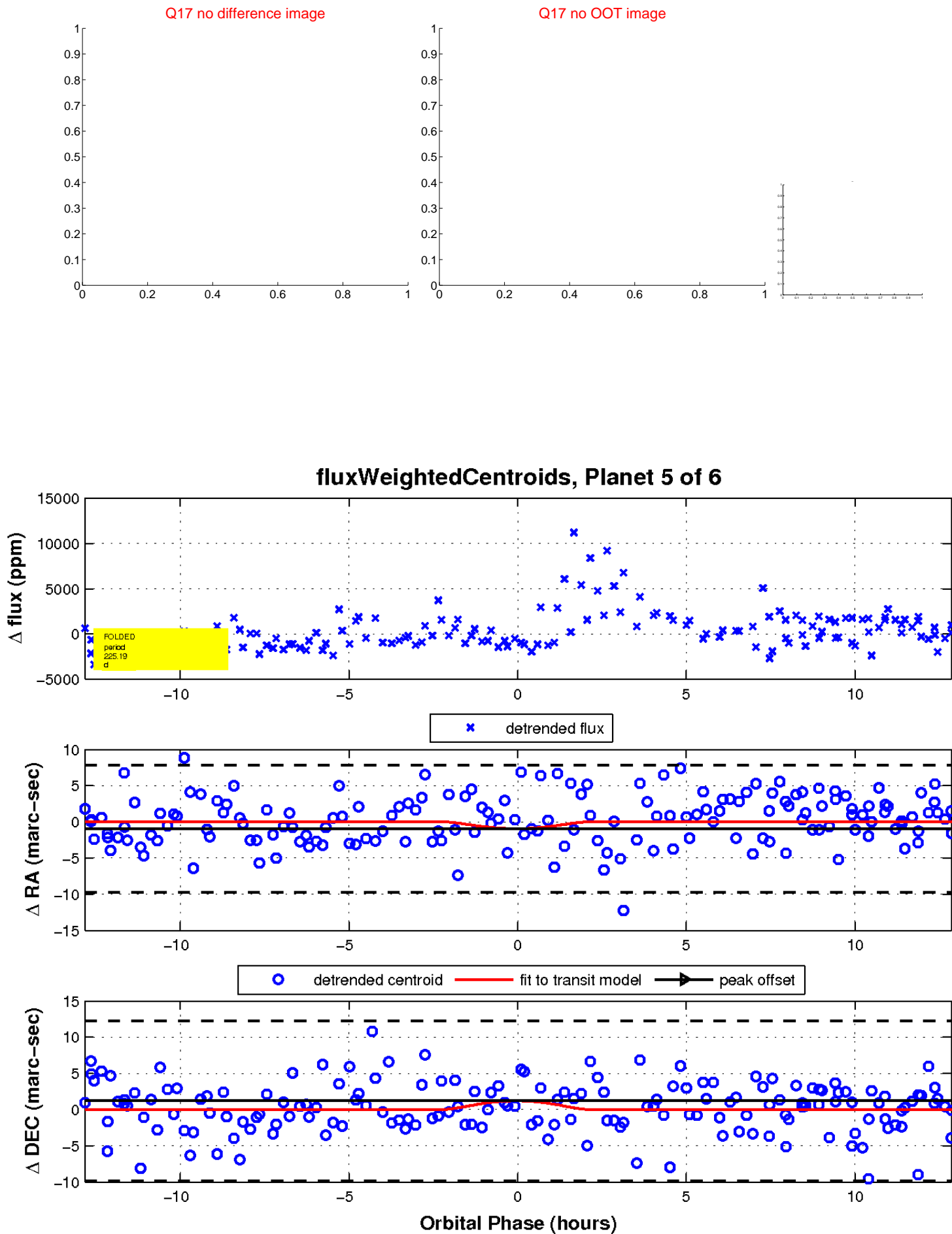
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



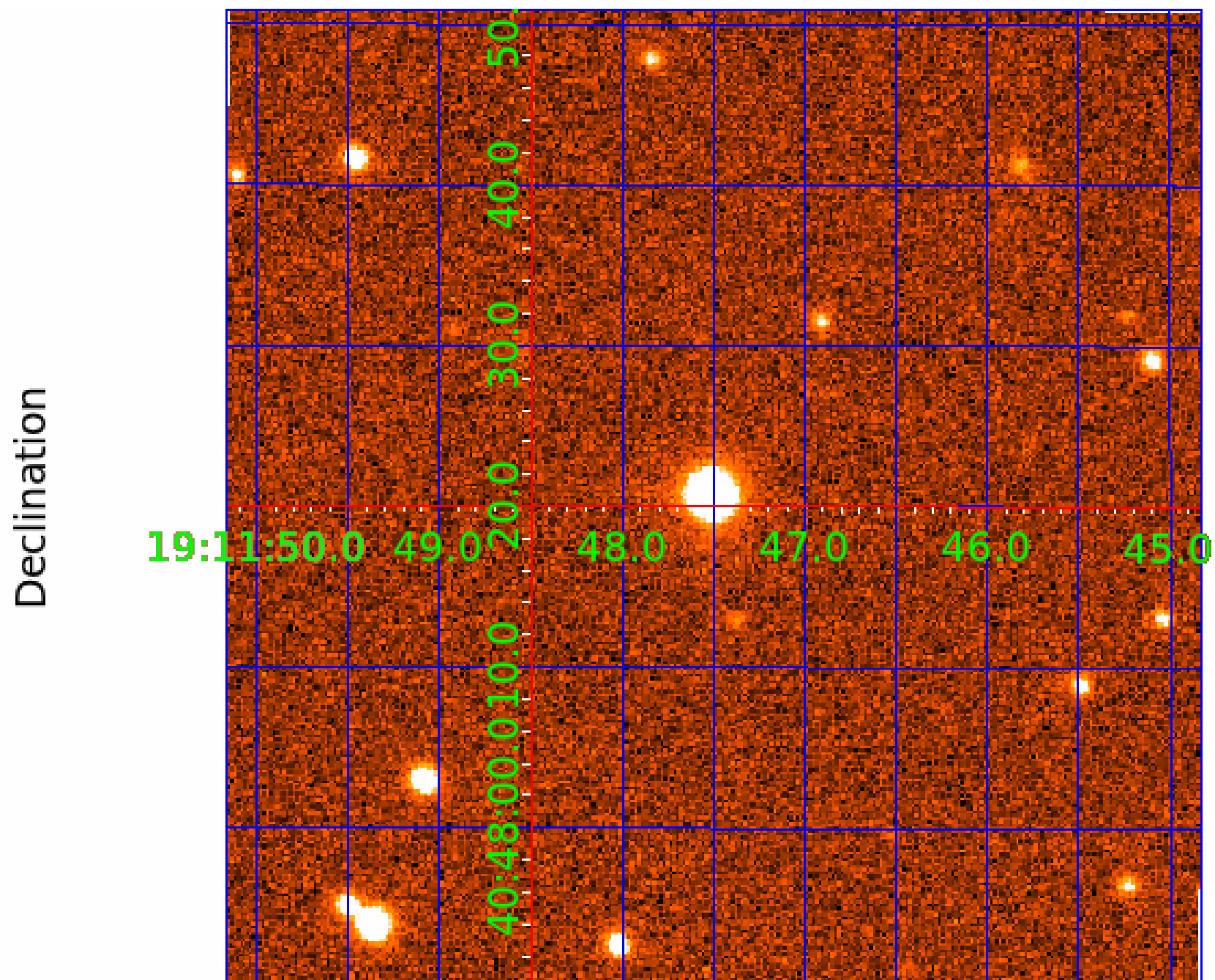
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



UKIRT Image



# KIC 005608002

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 005608002-01 | OBS      | No   | 302.209519    | 171.181106   | 2127.8      | 4.936            | 13.6 | 6.2 | 0.18                        | 3223            | 0.81                   | 0.01                   |
| 005608002-02 | OBS      | No   | 330.344519    | 407.909197   | 2361.2      | 4.094            | 14.8 | 6.5 | 0.18                        | 3223            | 0.86                   | 0.01                   |
| 005608002-03 | OBS      | No   | 199.737602    | 324.308792   | 2348.0      | 6.649            | 11.8 | 7.4 | 0.18                        | 3223            | 0.89                   | 0.02                   |
| 005608002-04 | OBS      | No   | 511.172392    | 482.923424   | 2309.0      | 7.409            | 11.2 | 5.4 | 0.18                        | 3223            | 0.85                   | 0.01                   |
| 005608002-05 | OBS      | No   | 225.187164    | 132.001189   | 3320.5      | 4.313            | 11.0 | 8.1 | 0.18                        | 3223            | 1.87                   | 0.02                   |
| 005608002-06 | OBS      | No   | 276.834758    | 172.887603   | 2319.2      | 7.567            | 10.2 | 6.5 | 0.18                        | 3223            | 0.85                   | 0.01                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 005608002-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS  |
| 005608002-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS           |
| 005608002-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS                   |
| 005608002-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS |
| 005608002-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV  |

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

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

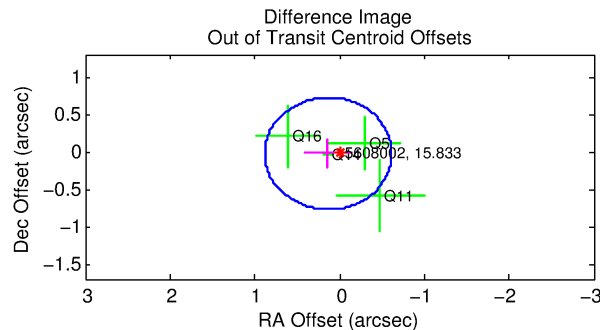
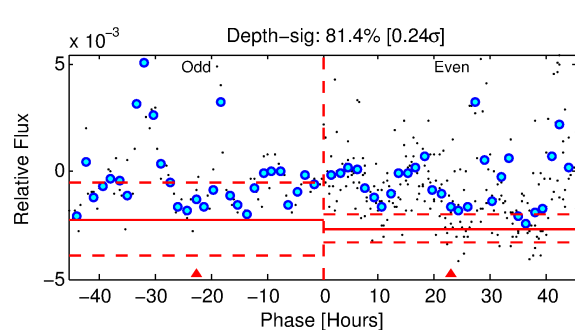
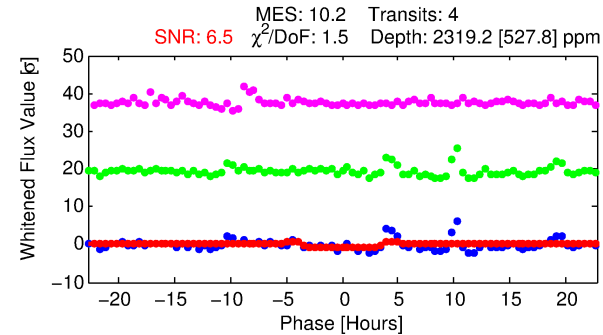
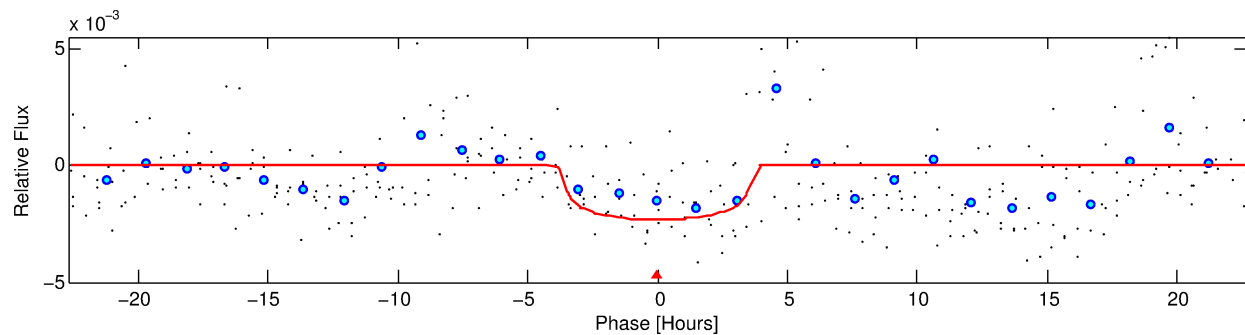
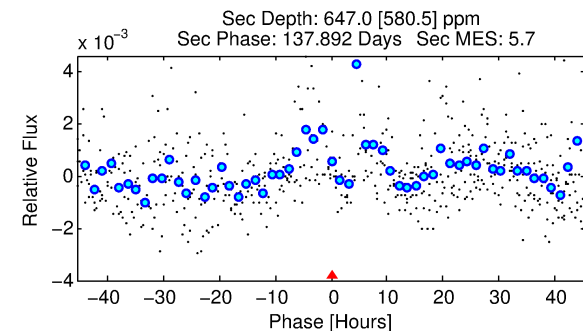
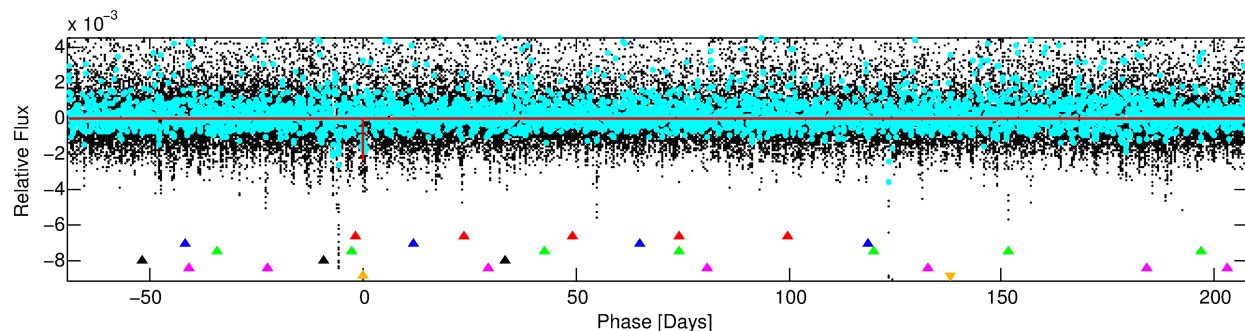
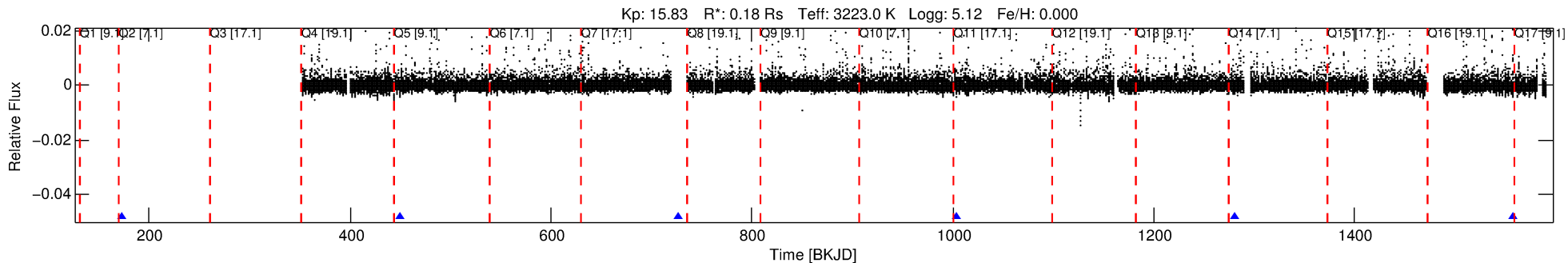
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005608002-06

No Significant Match Found

# DV One-Page Summary

KIC: 5608002 Candidate: 6 of 6 Period: 276.835 d



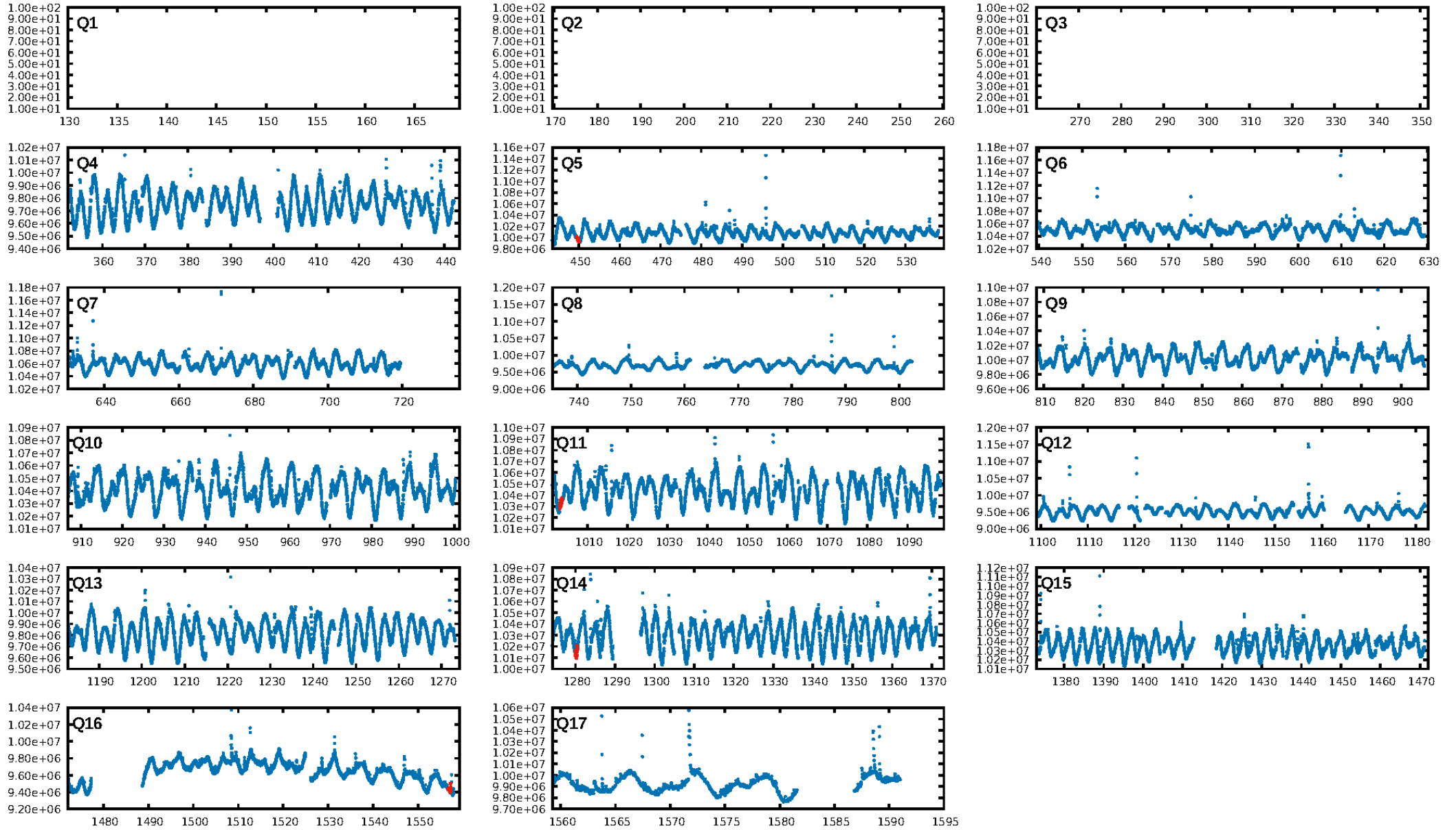
## DV Fit Results:

Period = 276.83476 [0.00493] d  
Epoch = 172.8876 [0.0186] BKJD  
Rp/R\* = 0.0435 [0.0302]  
a/R\* = 291.36 [841.10]  
b = 0.05 [61.26]  
Seff = 0.02 [0.00]  
Teq = 90 [4] K  
Rp = 0.85 [0.62] Re  
a = 0.4475 [0.0693] AU  
Ag = 98541.82 [163965.22] [0.60σ]  
Teffp = 2464 [1019] K [2.33σ]

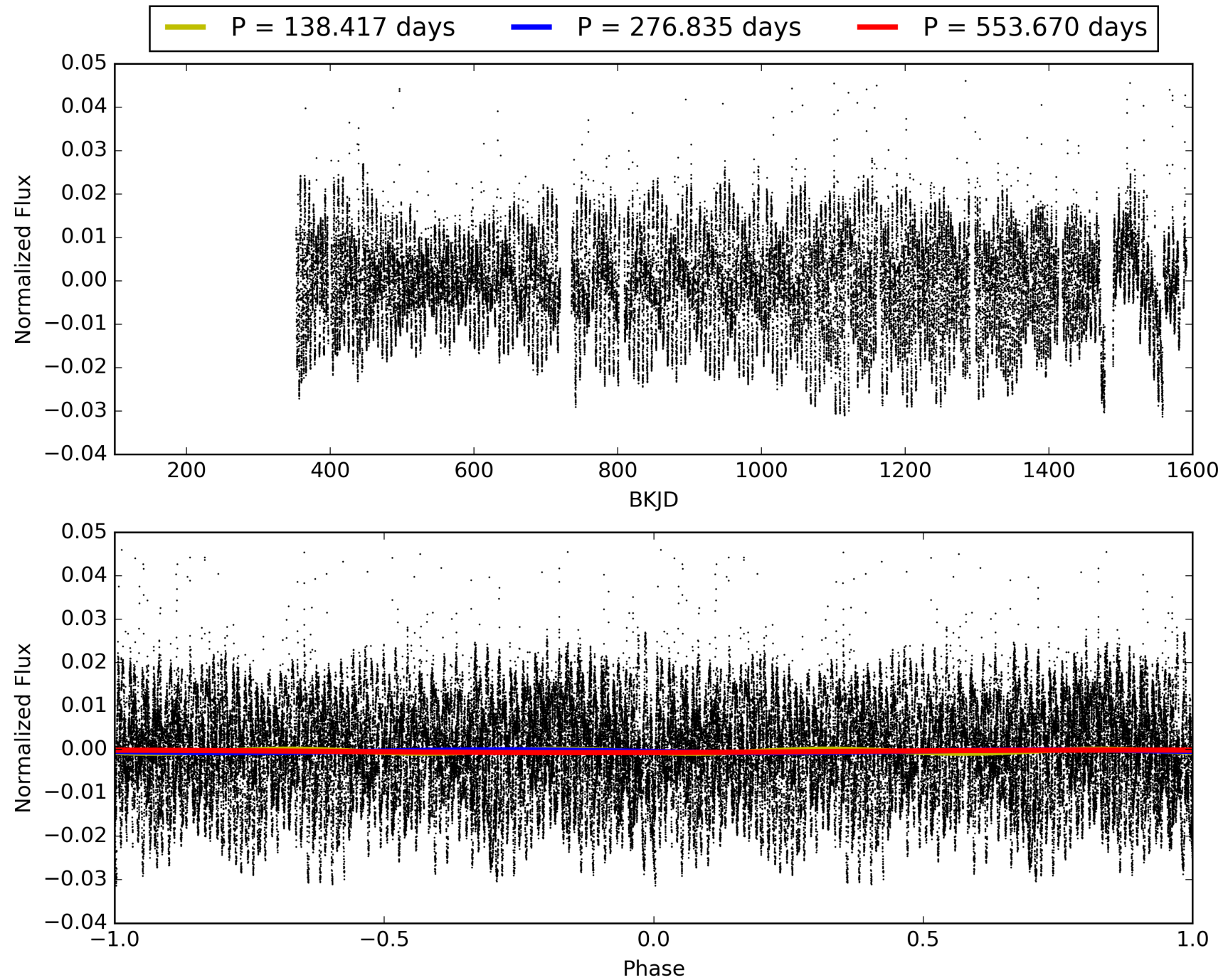
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [142.32σ]  
LongPeriod-sig: 100.0% [67.41σ]  
ModelChiSquare2-sig: 80.5%  
ModelChiSquareGof-sig: 72.0%  
**Bootstrap-pfa: 1.57e-09**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -4.319  
Centroid-sig: 67.8%  
Centroid-so: 0.369 arcsec [0.59σ]  
OotOffset-rm: 0.136 arcsec [0.54σ]  
KicOffset-rm: 0.308 arcsec [1.05σ]  
OotOffset-st: 1/1/1/1 [4]  
KicOffset-st: 1/1/1/1 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 1.00 [4/4]

# TCE 005608002-06, PDC Light Curves



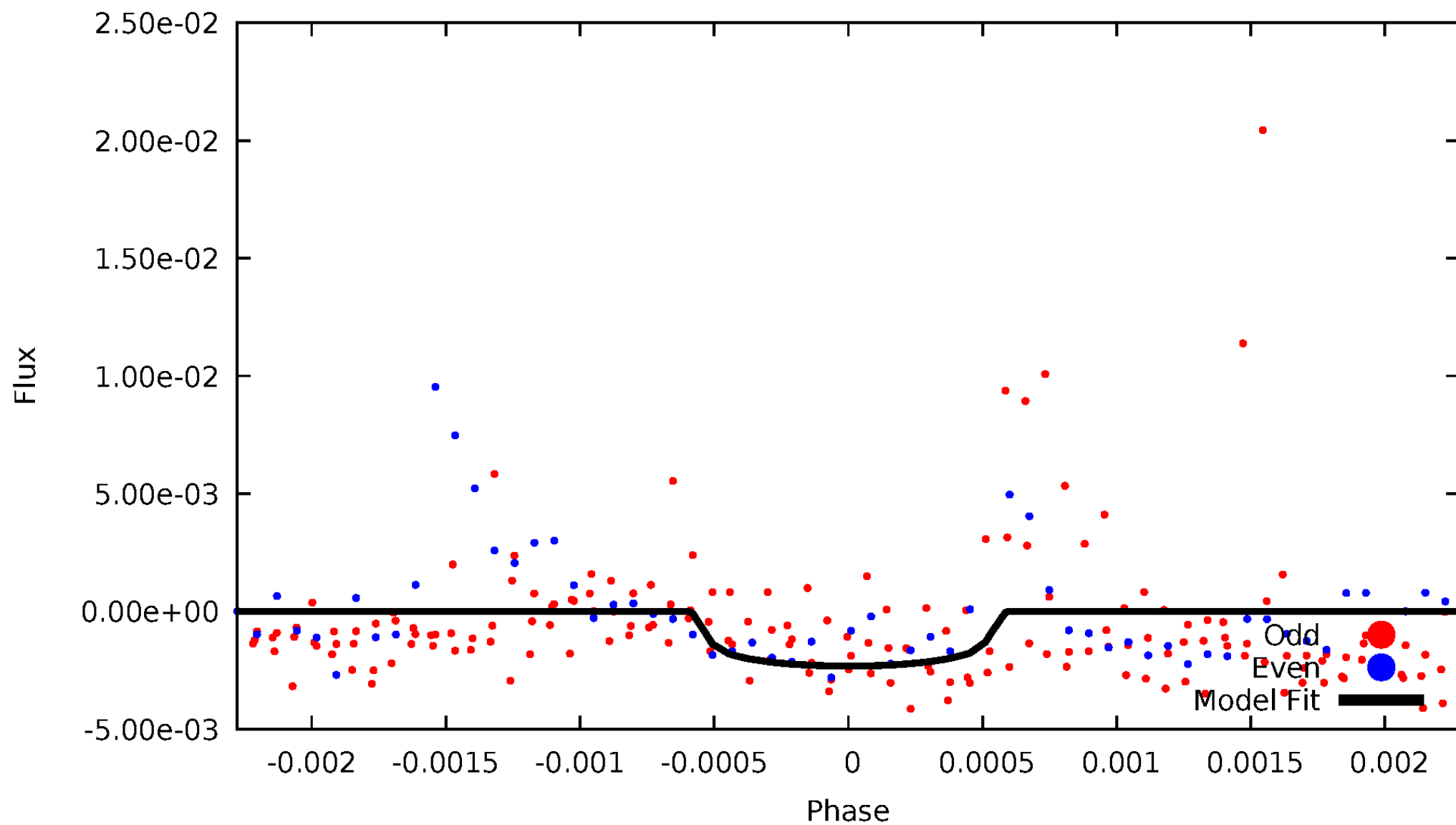
# TCE 005608002-06





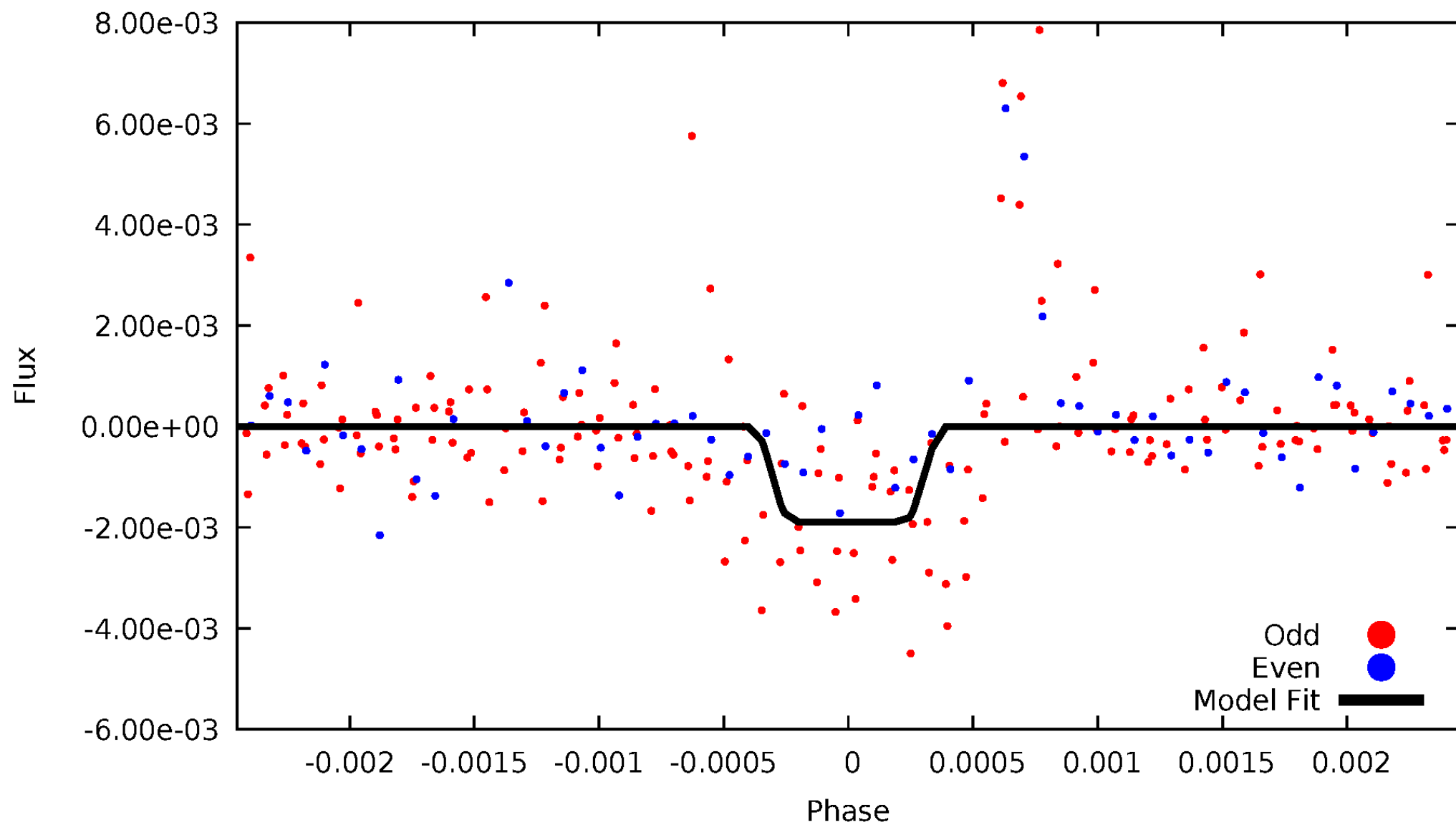
# DV Odd/Even

TCE 005608002-06



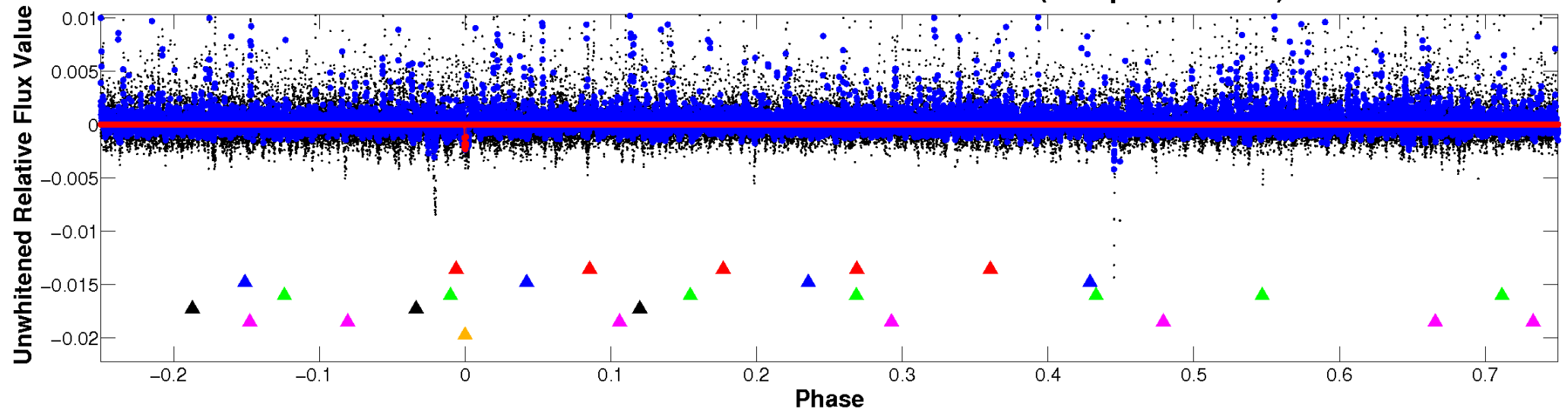
# ALT Odd/Even

TCE 005608002-06

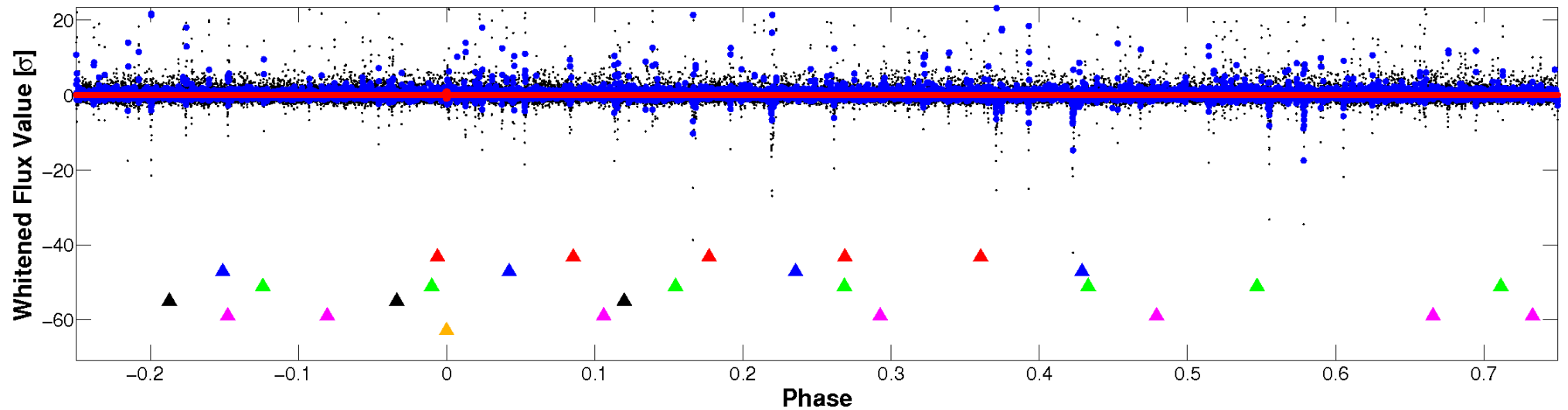


# Non-Whitened Vs. Whitened Light Curve

**Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

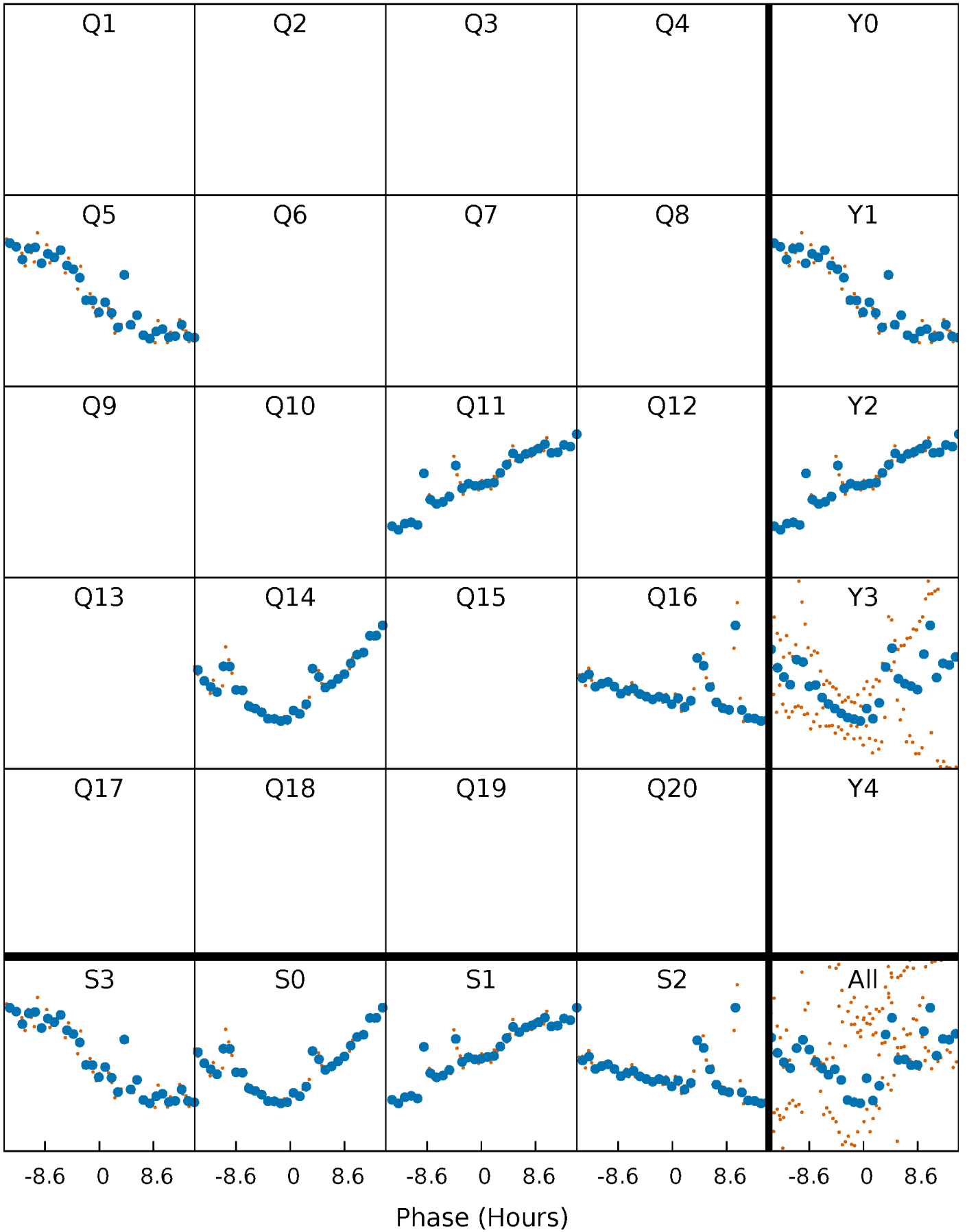


**Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



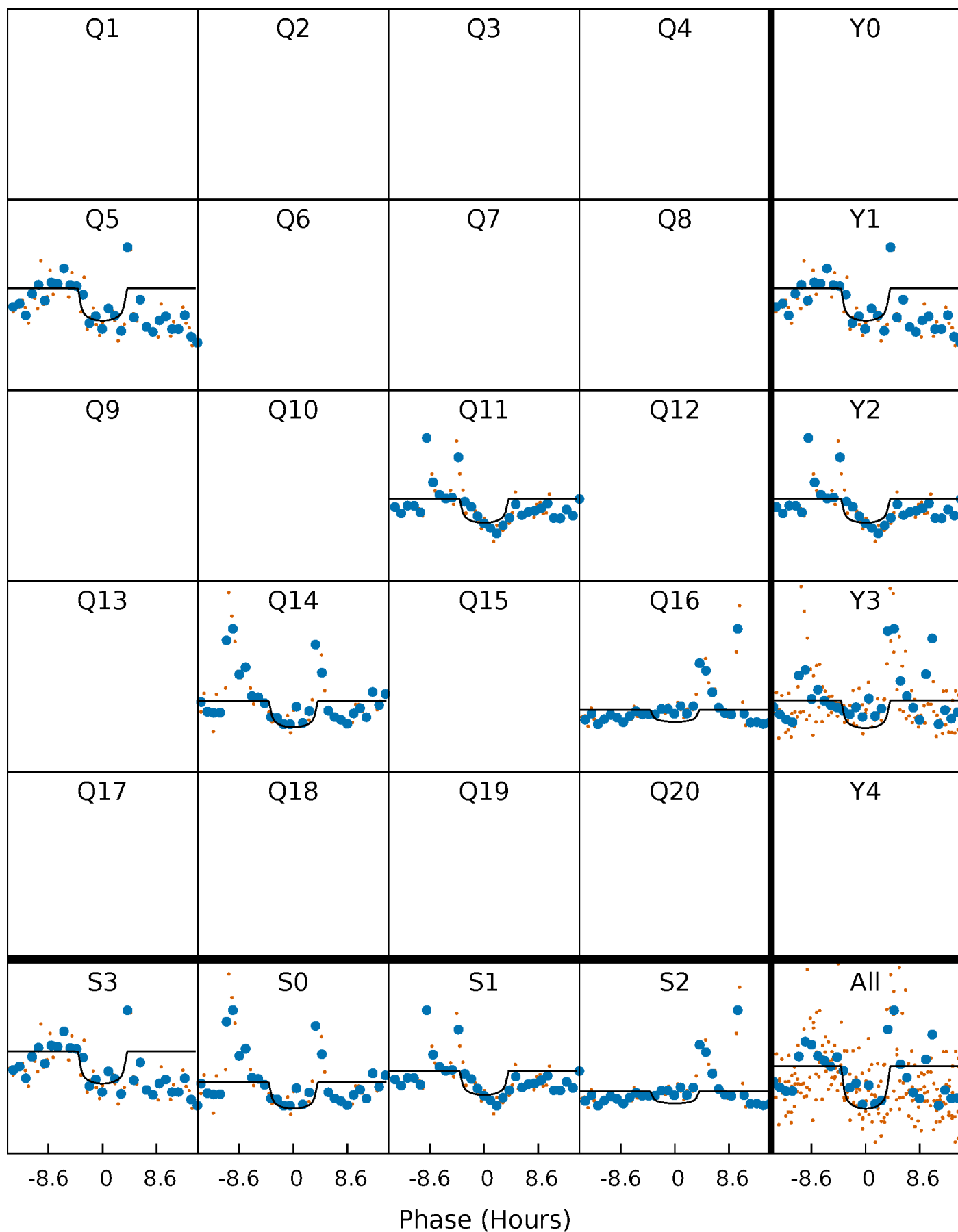
# PDC Quarter-Phased Transit Curves

TCE 005608002-06     $P=276.834758$  Days     $T_0=172.887603$  (BKJD)



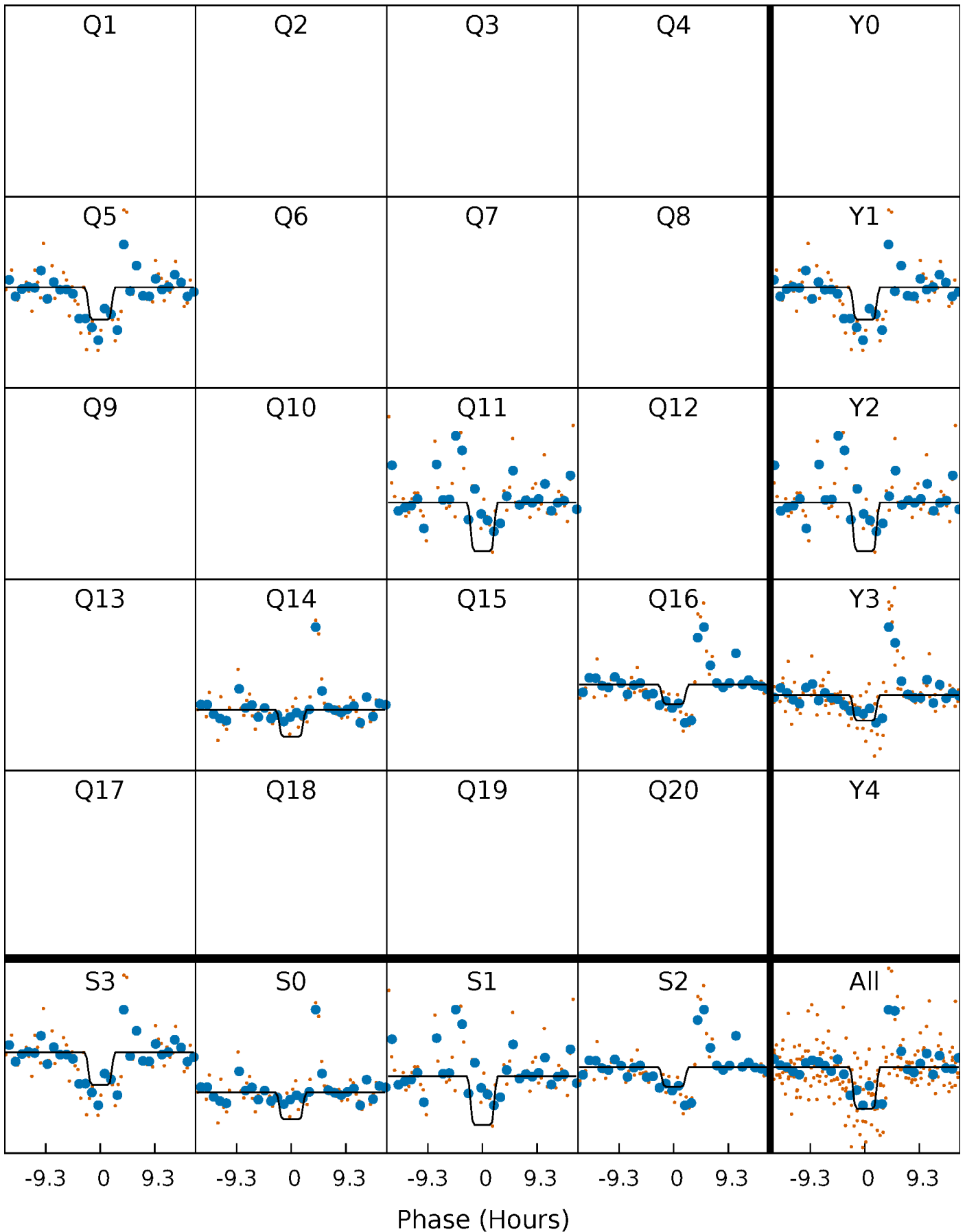
# DV Quarter-Phased Transit Curves

TCE 005608002-06     $P=276.834758$  Days     $T_0=172.887603$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

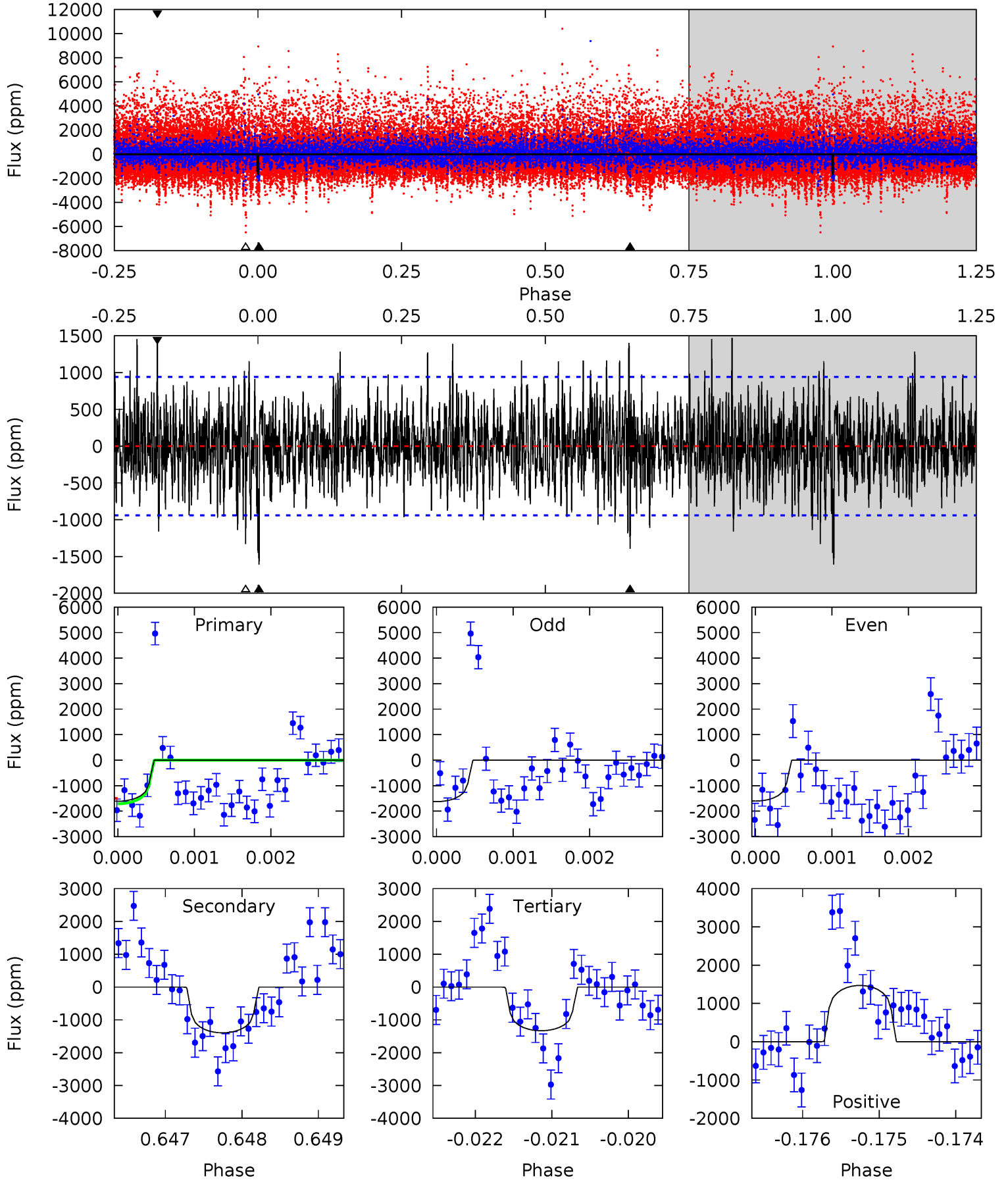
TCE 005608002-06     $P=276.833871$  Days     $T_0=172.882904$  (BKJD)



# DV Model-Shift Uniqueness Test

005608002-06, P = 276.834758 Days, E = 172.887603 Days

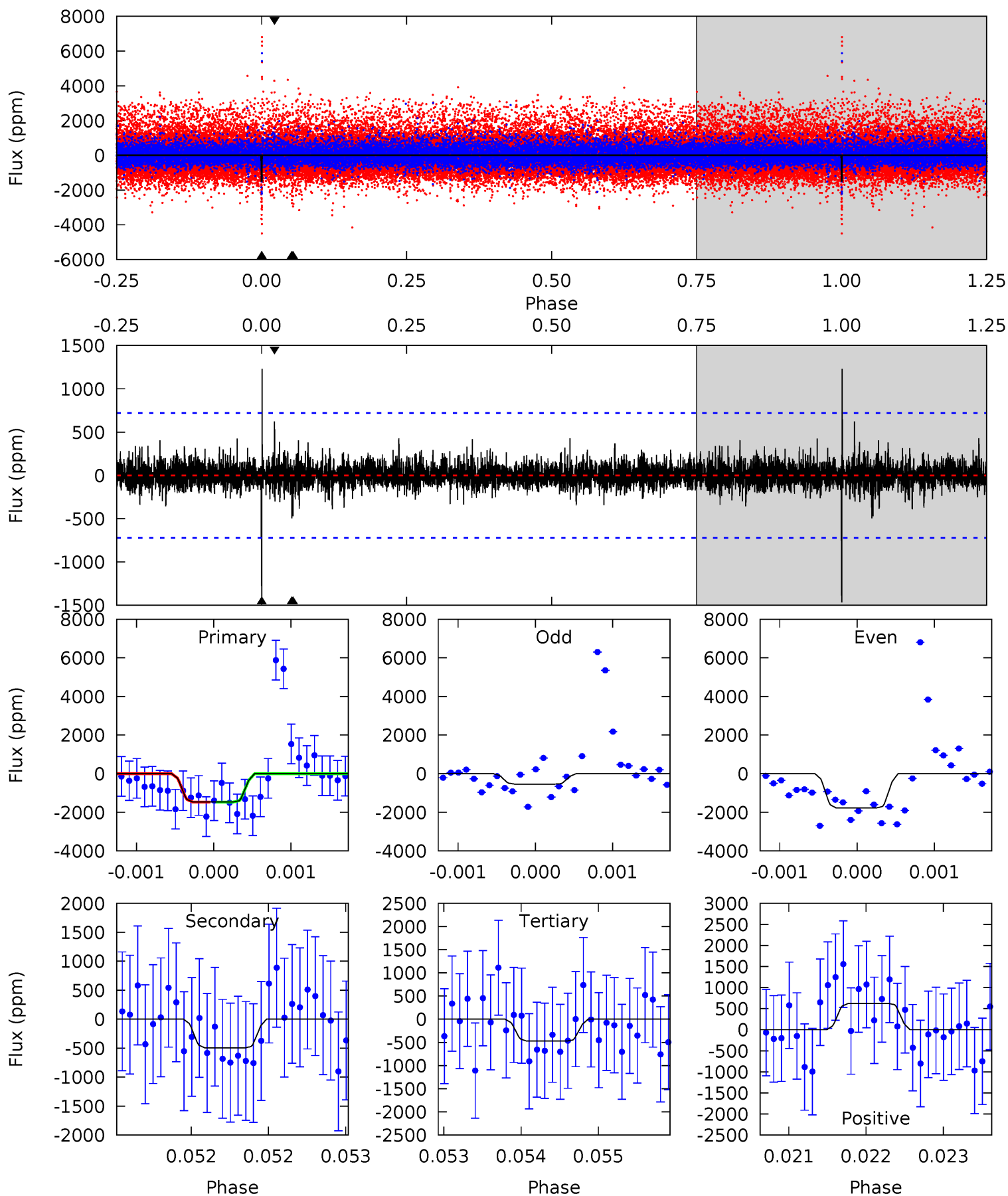
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.26 | 8.02 | 7.66 | 8.46 | 5.41            | 3.23            | 2.21             | 1.60    | 0.80    | 0.37    | -0.44   | 0.04    | 0.81 | 0.48  | 0.61 |



# Alt Model-Shift Uniqueness Test

005608002-06, P = 276.833871 Days, E = 172.882904 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 | 3.77 | 3.60 | 4.74 | 5.51            | 3.38            | 0.75             | 7.59    | 6.44    | 0.17    | -0.97   | 3.98    | 1.00 | 0.46  | 0.00 |





### Stellar Parameters For KIC 005608002

|        | $T_{\text{eff}}(K)$ | $\log(g)$                 | [Fe/H]                    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $3223^{+43}_{-24}$  | $5.125^{+0.063}_{-0.070}$ | $0.000^{+0.100}_{-0.100}$ | $0.179^{+0.039}_{-0.026}$ | $0.155^{+0.043}_{-0.023}$ | $38.370^{+13.470}_{-11.810}$              |
|        | +1%/-1%             | +1%/-1%                   | +inf%/-inf%               | +22%/-15%                 | +28%/-15%                 | +35%/-31%                                 |
| Source | PHO2                | PHO2                      | PHO2                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 005608002-06 / KOI

| Detrend | Depth (ppm)     | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$             |
|---------|-----------------|------------------------|----------------------|----------------------|------------------------------|
| DV      | $-1394 \pm 174$ | $0.91^{+0.62}_{-0.51}$ | $126^{+4}_{-4}$      | $3027^{+870}_{-366}$ | $182782^{+784799}_{-113938}$ |
| Alt.    | $-494 \pm 131$  | $0.90^{+0.58}_{-0.55}$ | $126^{+4}_{-4}$      | $2639^{+871}_{-317}$ | $66331^{+416584}_{-43224}$   |

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

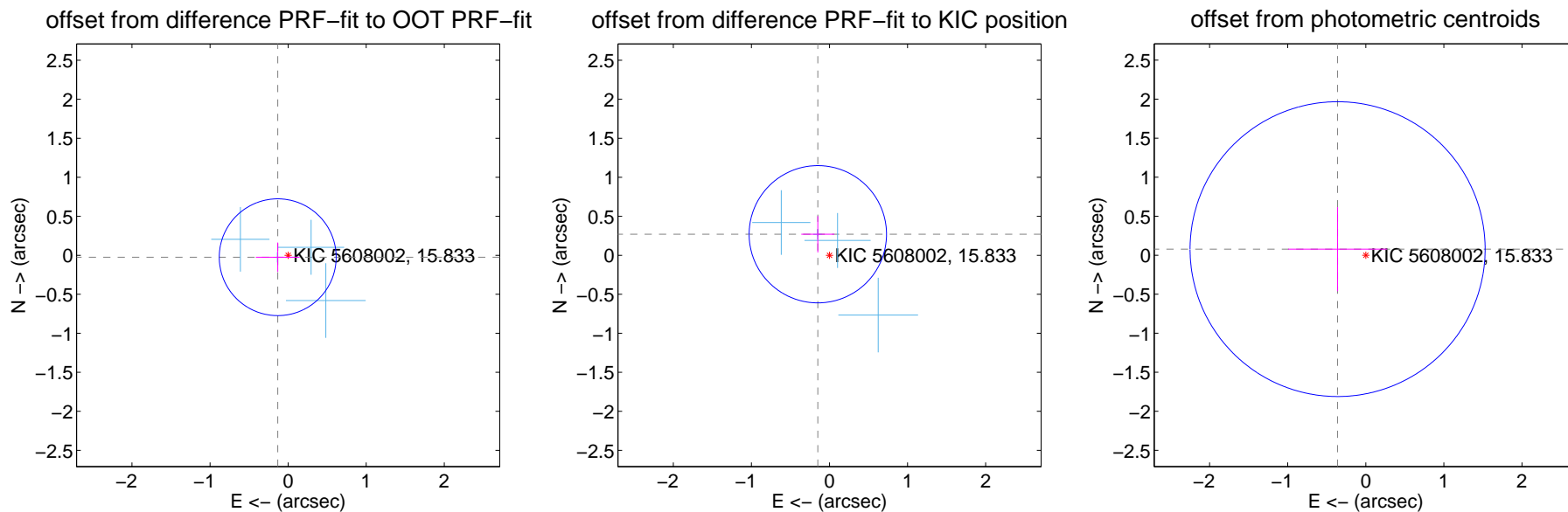
## DV Centroid Data

Supplemental centroid analysis for 005608002-06. Kepler magnitude: 15.83. Transit SNR 6.54

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.136 \pm 0.250$  | 0.54                | $0.133 \pm 0.280$ | $-0.025 \pm 0.188$ |
| PRF-fit source offset from KIC position | $0.308 \pm 0.293$  | 1.05                | $0.149 \pm 0.211$ | $0.270 \pm 0.233$  |
| photometric centroid source offset      | $0.37 \pm 0.63$    | 0.59                | $0.36 \pm 0.63$   | $0.08 \pm 0.54$    |

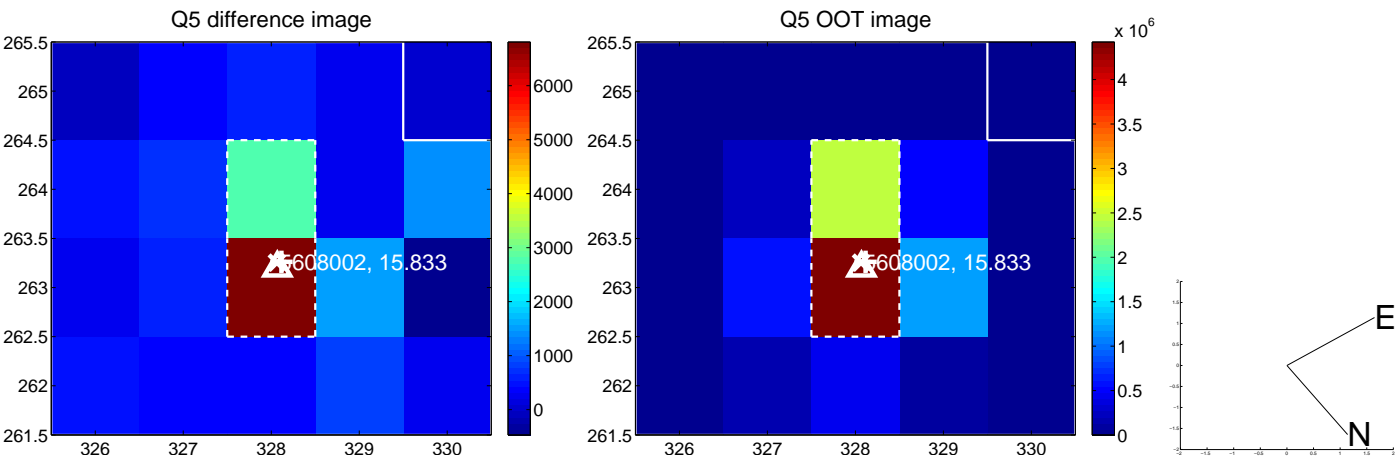


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

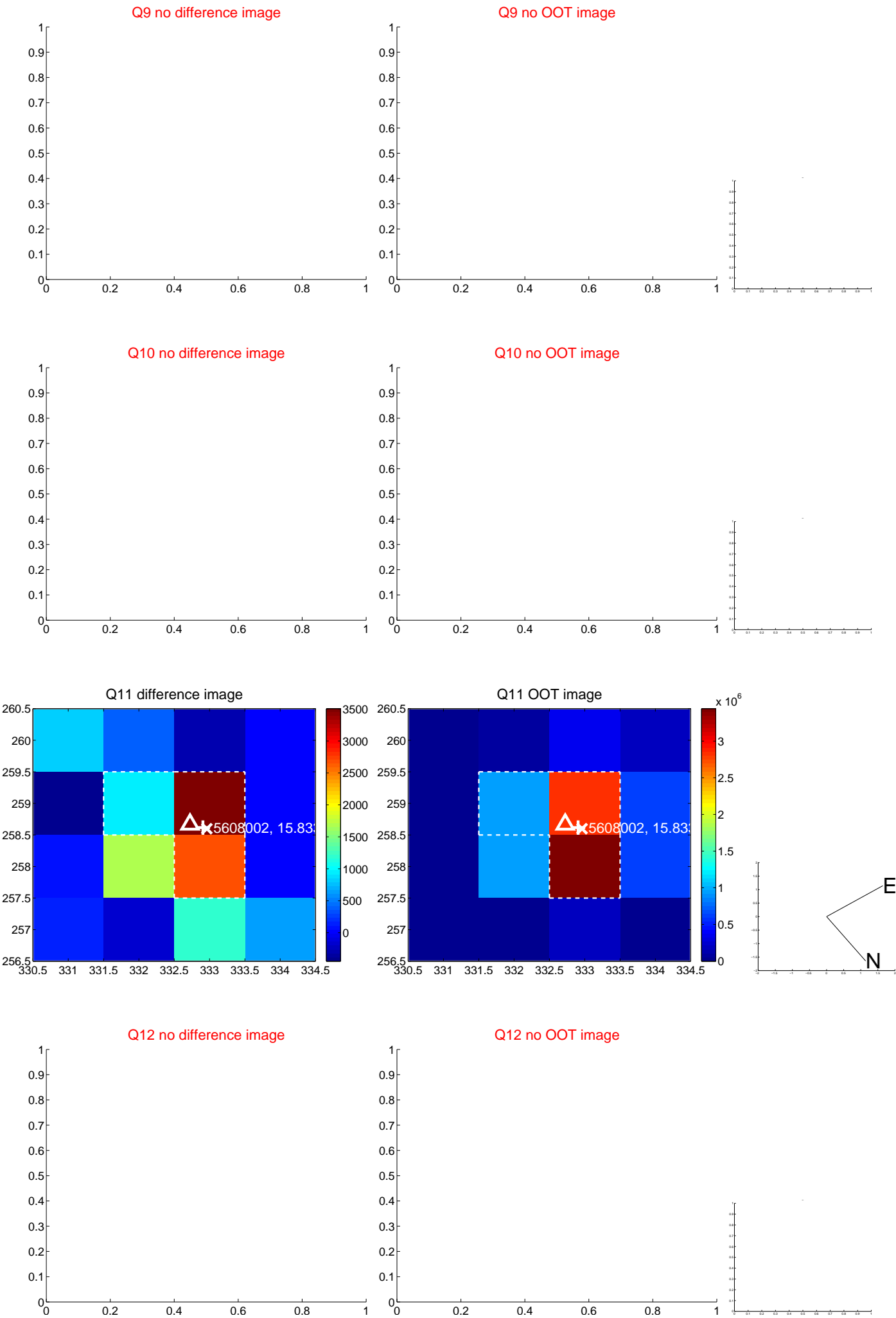
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



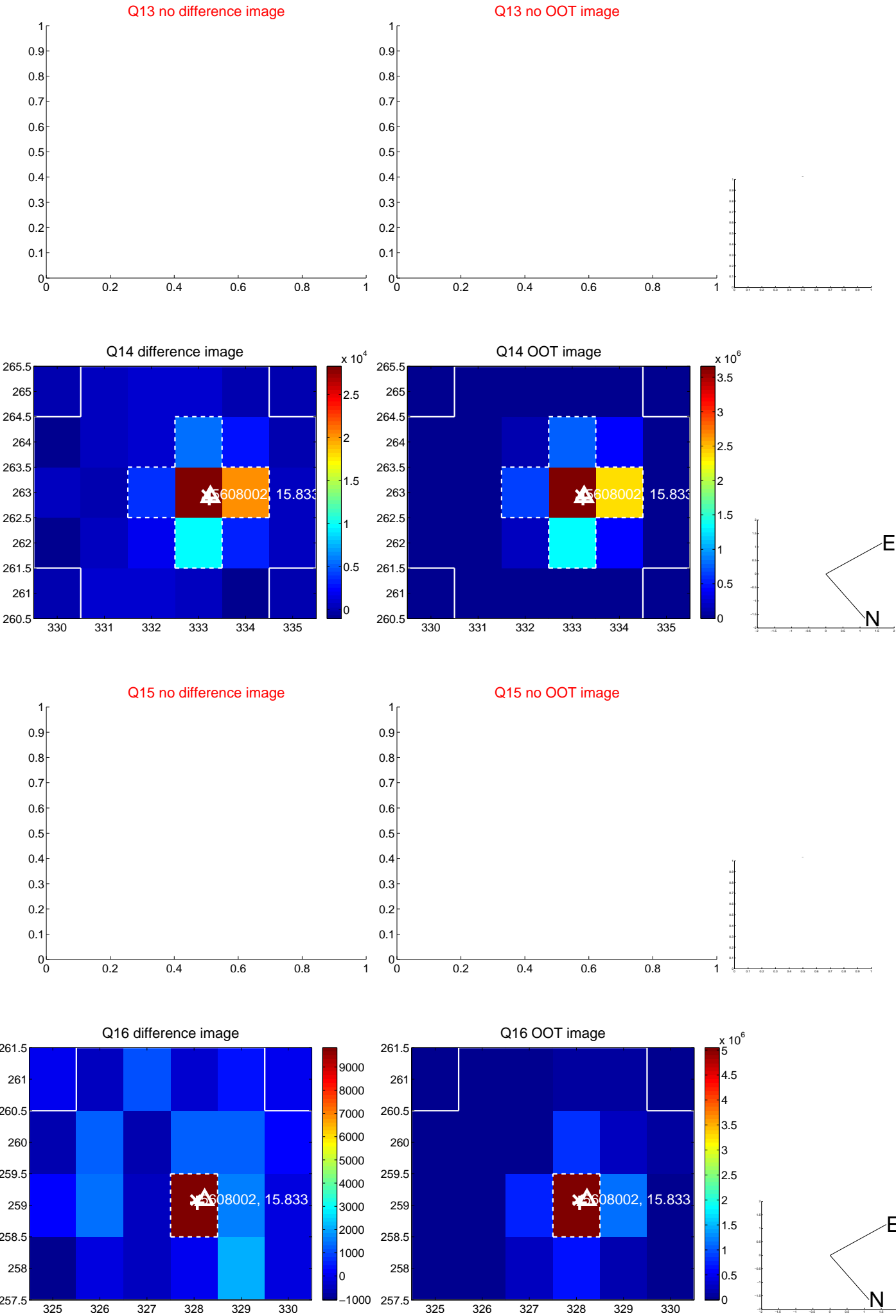
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



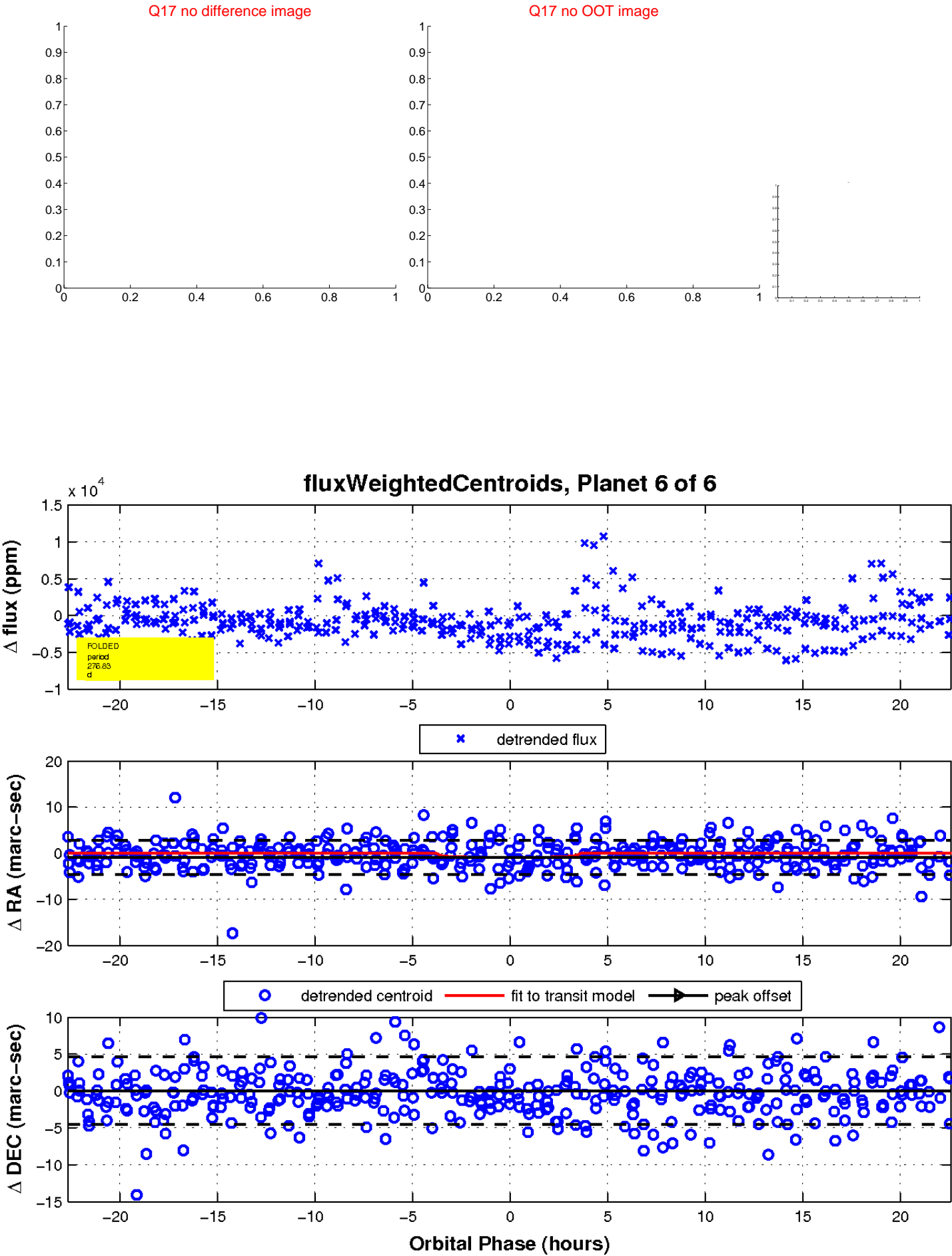
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

