

# KIC 008767669

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008767669-01 | OBS      | No   | 1.027454      | 131.866368   | 56.6        | 4.168            | 10.1 | 13.5 | 0.71                        | 4338            | 0.53                   | 505.98                 |
| 008767669-02 | OBS      | No   | 259.258227    | 237.523756   | 656.2       | 15.309           | 16.0 | 6.7  | 0.71                        | 4338            | 2.24                   | 0.32                   |
| 008767669-04 | OBS      | No   | 77.391894     | 168.038322   | 264.6       | 5.687            | 10.5 | 4.7  | 0.71                        | 4338            | 1.30                   | 1.59                   |
| 008767669-05 | OBS      | No   | 79.392159     | 186.894962   | 178.4       | 5.210            | 10.3 | 3.3  | 0.71                        | 4338            | 1.06                   | 1.54                   |
| 008767669-06 | OBS      | No   | 137.506101    | 148.977257   | 209.7       | 4.835            | 9.0  | 3.9  | 0.71                        | 4338            | 1.12                   | 0.74                   |
| 008767669-07 | OBS      | No   | 66.132688     | 149.768808   | 94.2        | 11.290           | 9.9  | 1.9  | 0.71                        | 4338            | 0.79                   | 1.96                   |
| 008767669-08 | OBS      | No   | 99.591749     | 151.043130   | 315.0       | 5.022            | 9.5  | 6.6  | 0.71                        | 4338            | 1.31                   | 1.14                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 008767669-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST           |
| 008767669-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT   |
| 008767669-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008767669-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 008767669-07 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-08 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT   |

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

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

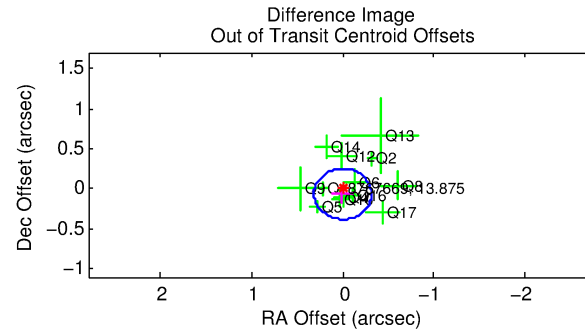
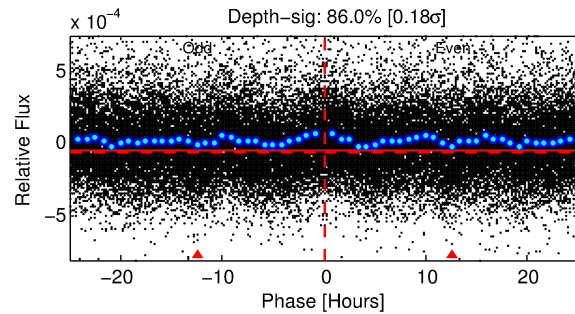
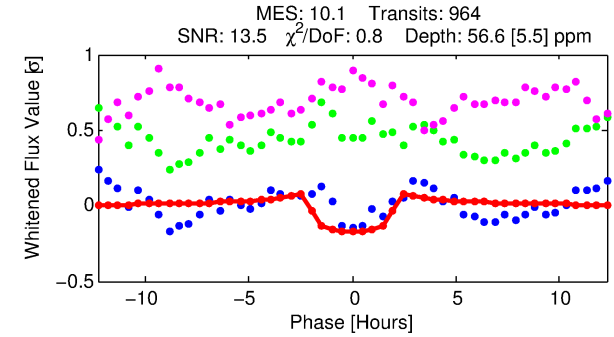
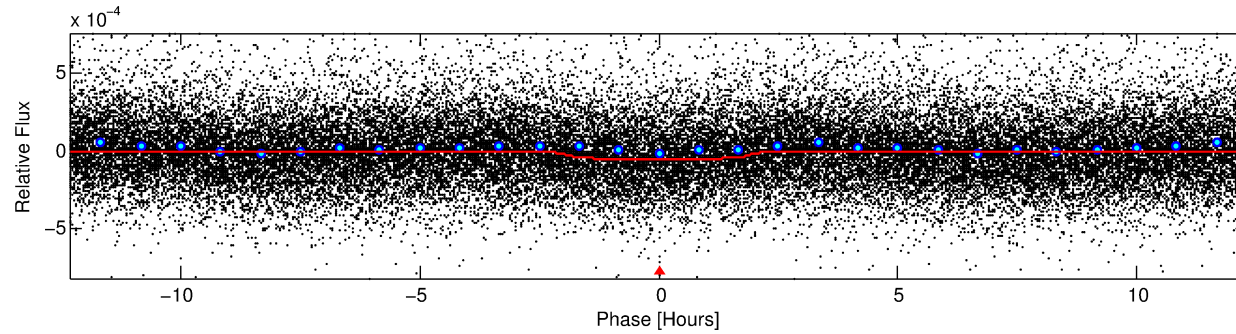
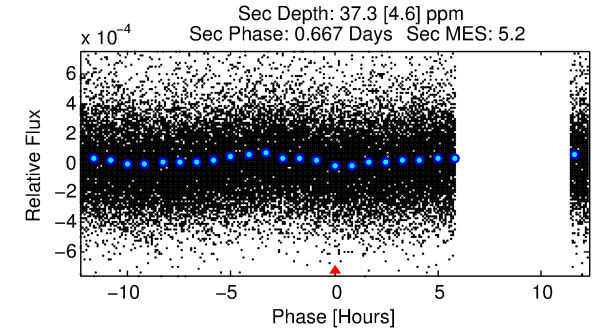
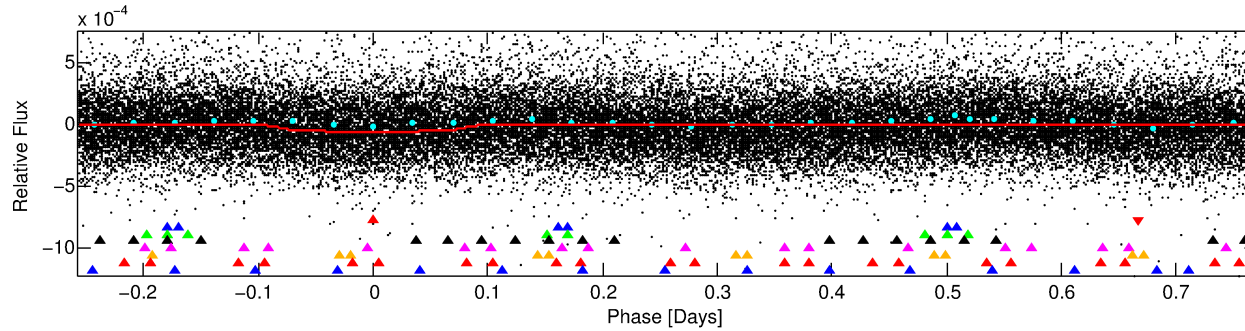
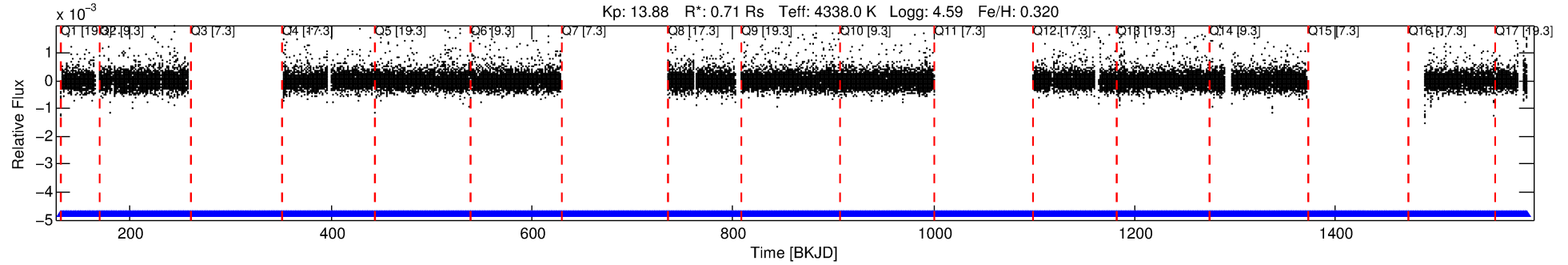
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008767669-01

No Significant Match Found

# DV One-Page Summary

KIC: 8767669 Candidate: 1 of 8 Period: 1.027 d



## DV Fit Results:

Period = 1.02745 [0.00001] d  
Epoch = 131.8664 [0.0028] BKJD  
Rp/R\* = 0.0069 [0.0026]  
a/R\* = 1.81 [1.35]  
b = 0.49 [1.74]  
Seff = 505.98 [83.76]  
Teff = 1209 [50] K  
Rp = 0.53 [0.21] Re  
a = 0.0178 [0.0012] AU  
Ag = 22.95 [18.03] [1.22σ]  
Teffp = 4092 [808] K [3.56σ]

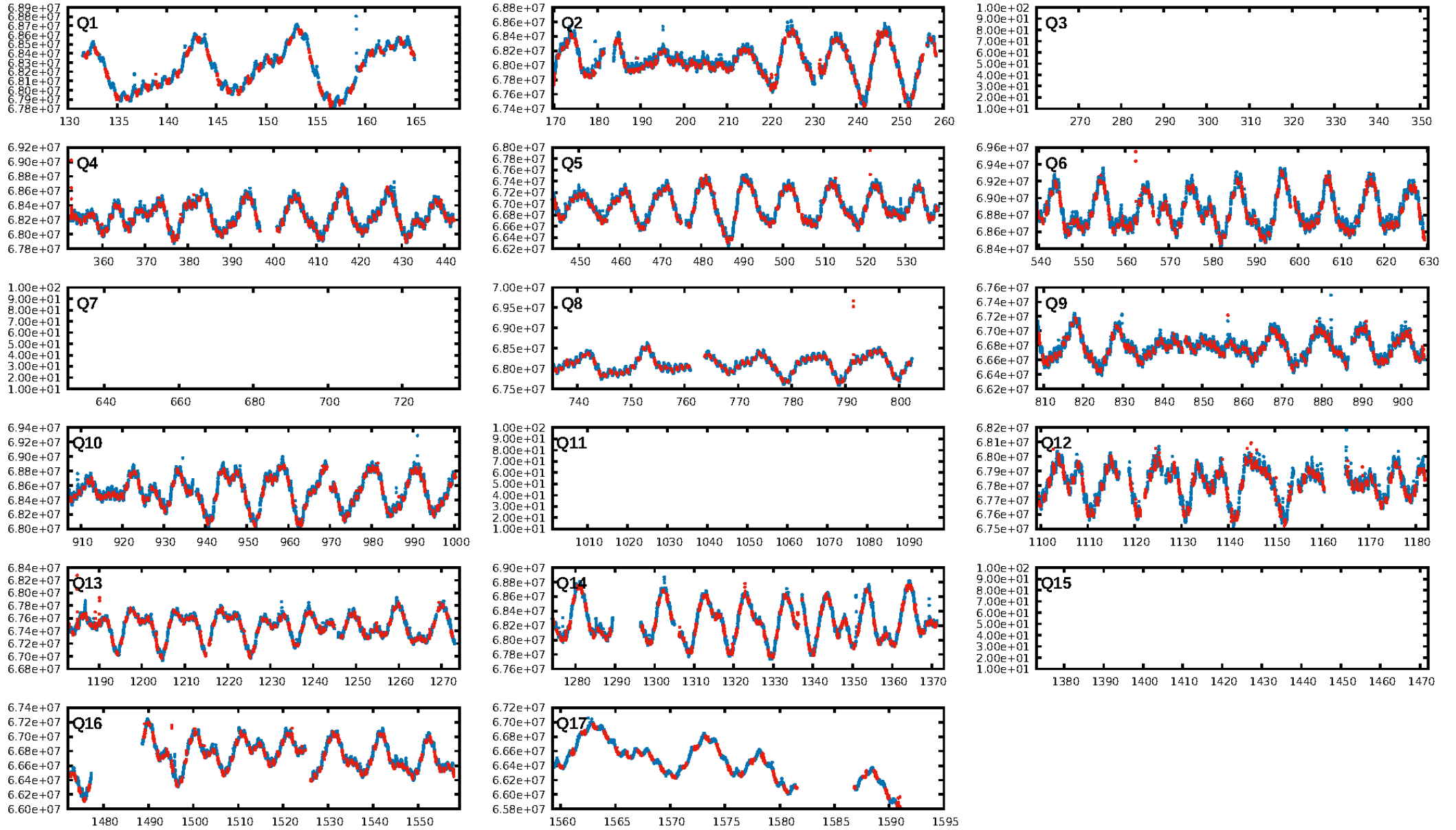
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [129.84σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.85e-20  
RollingBand-fgt: 1.00 [904/904]  
GhostDiagnostic-chr: 1.389  
Centroid-sig: 0.0%  
Centroid-so: 1.371 arcsec [2.57σ]  
OotOffset-rm: 0.064 arcsec [0.61σ]  
KicOffset-rm: 0.073 arcsec [0.67σ]  
OotOffset-st: 4/0/4/5 [13]  
KicOffset-st: 4/0/4/5 [13]  
DiffImageQuality-fgm: 0.92 [12/13]  
DiffImageOverlap-fno: 1.00 [13/13]

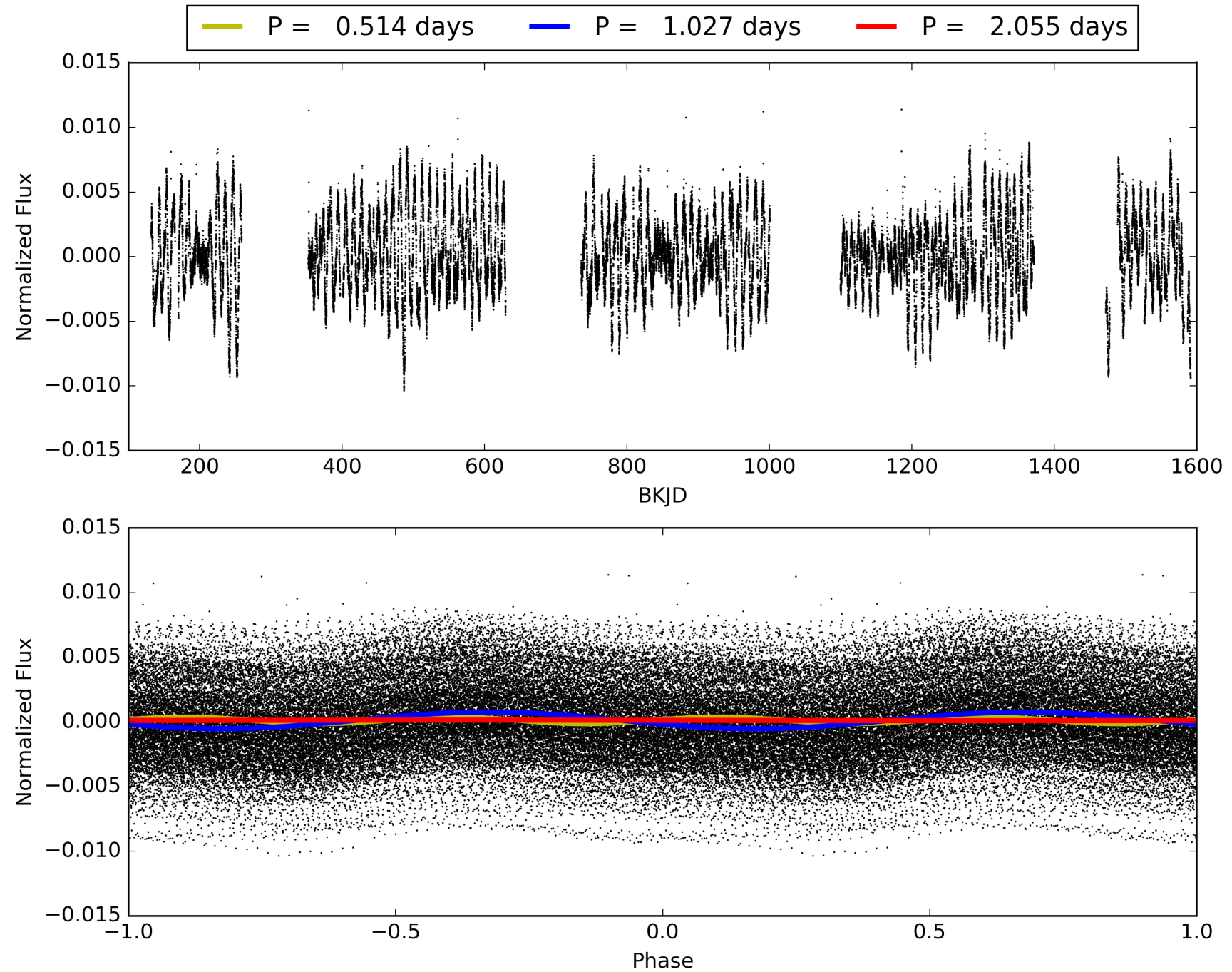
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:56:28 Z

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

# TCE 008767669-01, PDC Light Curves



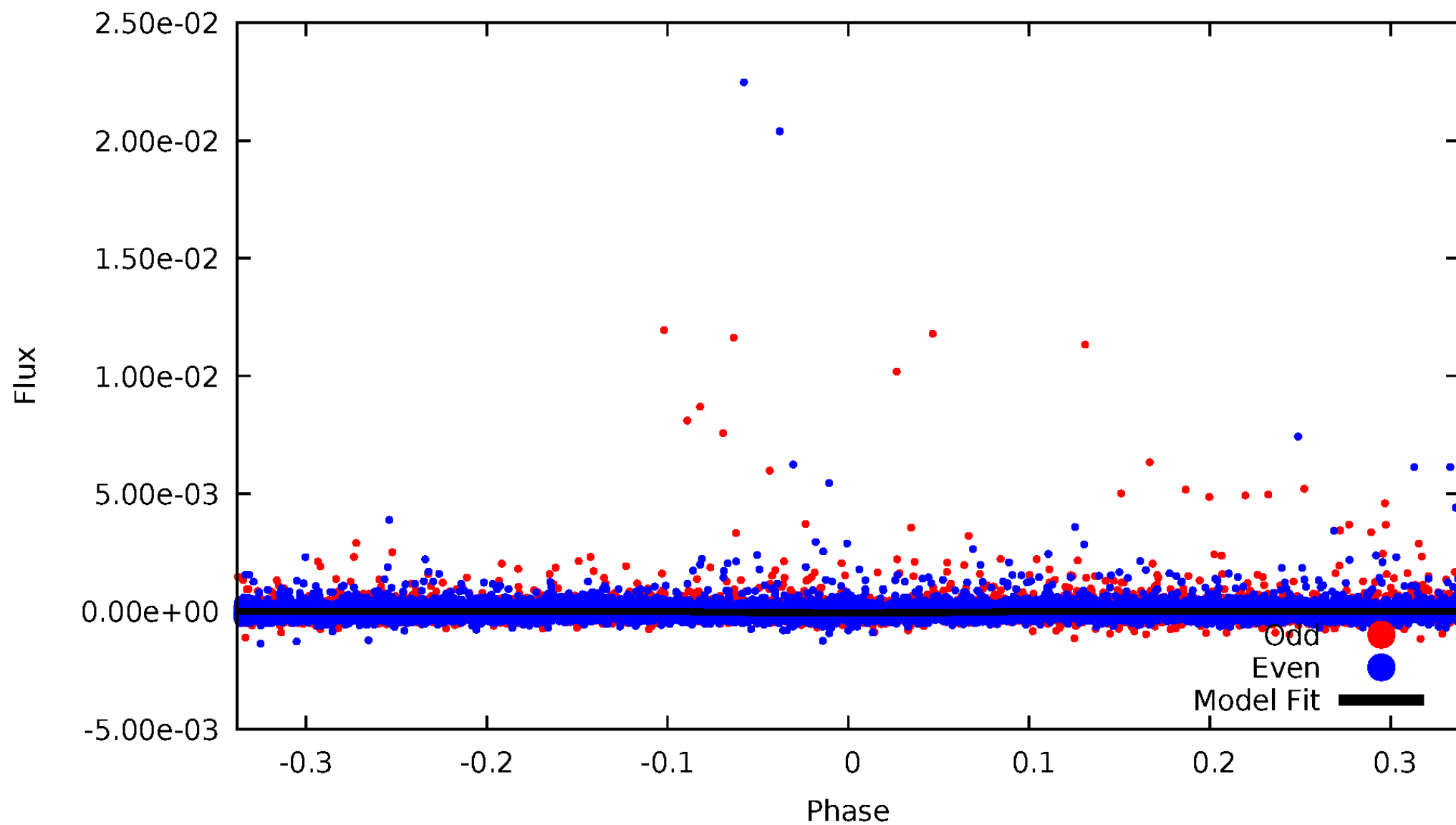
TCE 008767669-01





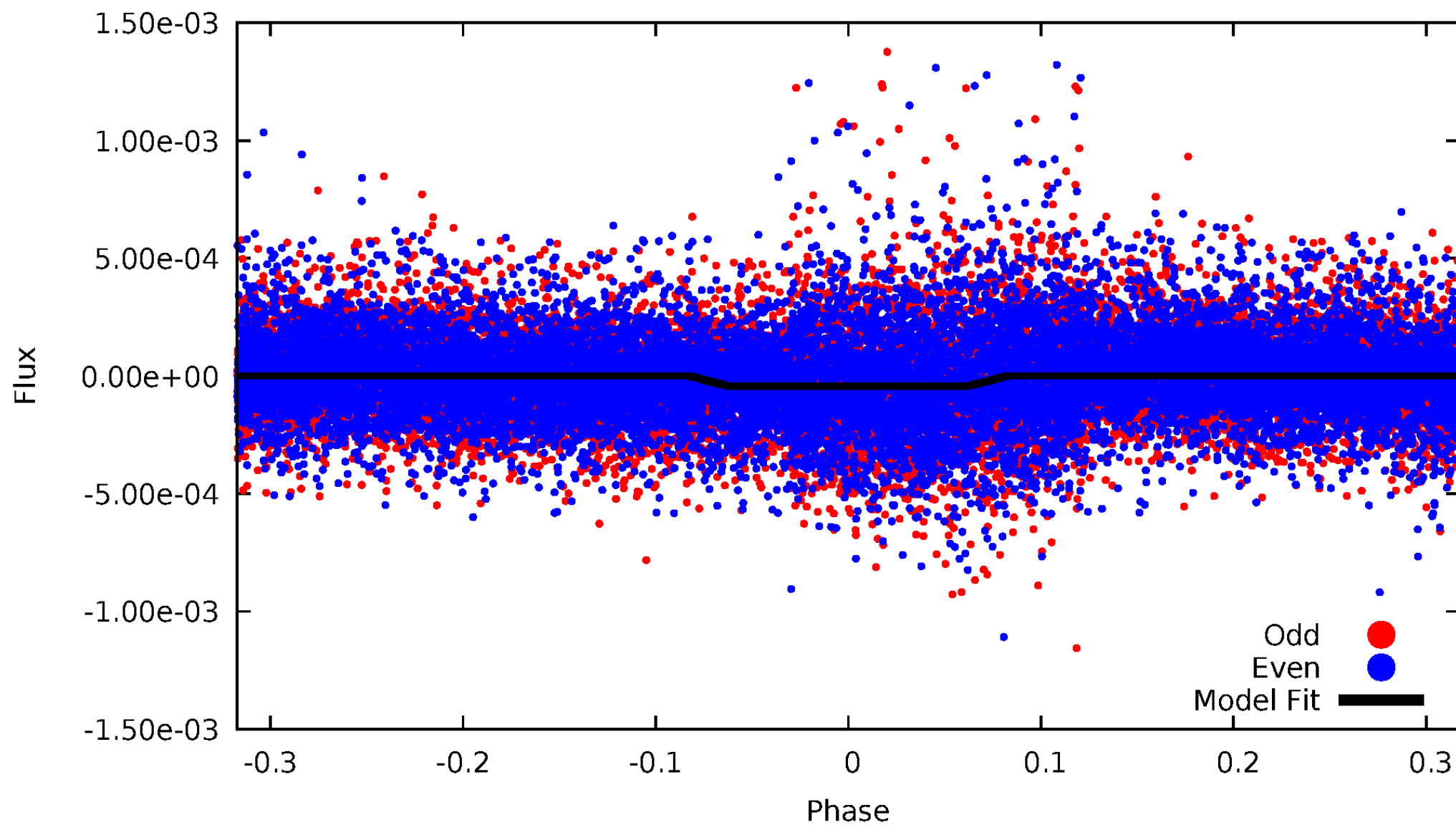
# DV Odd/Even

TCE 008767669-01



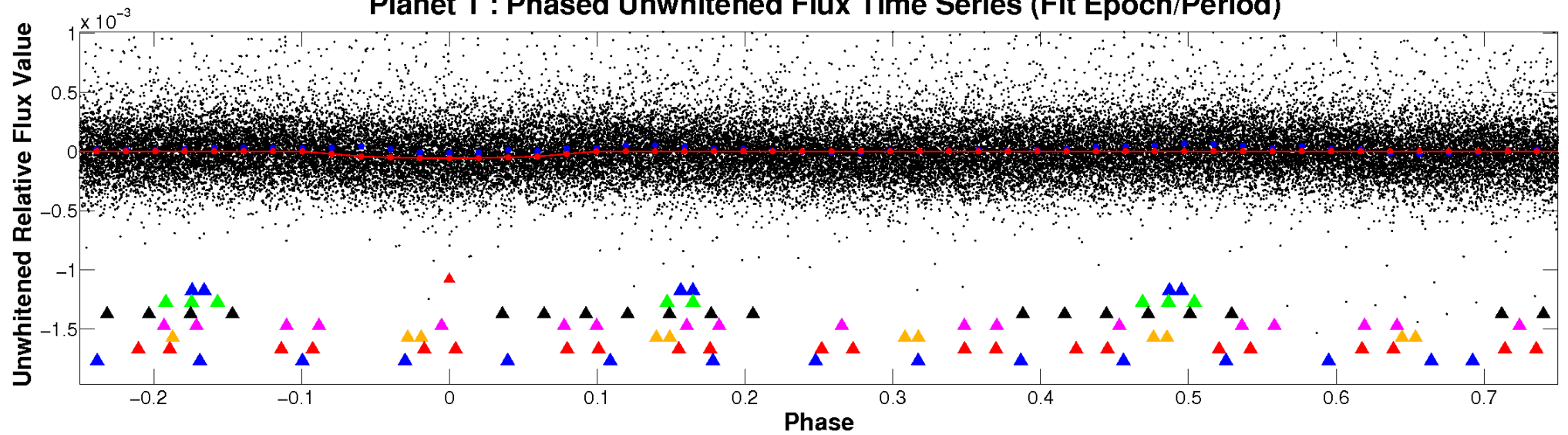
# ALT Odd/Even

TCE 008767669-01

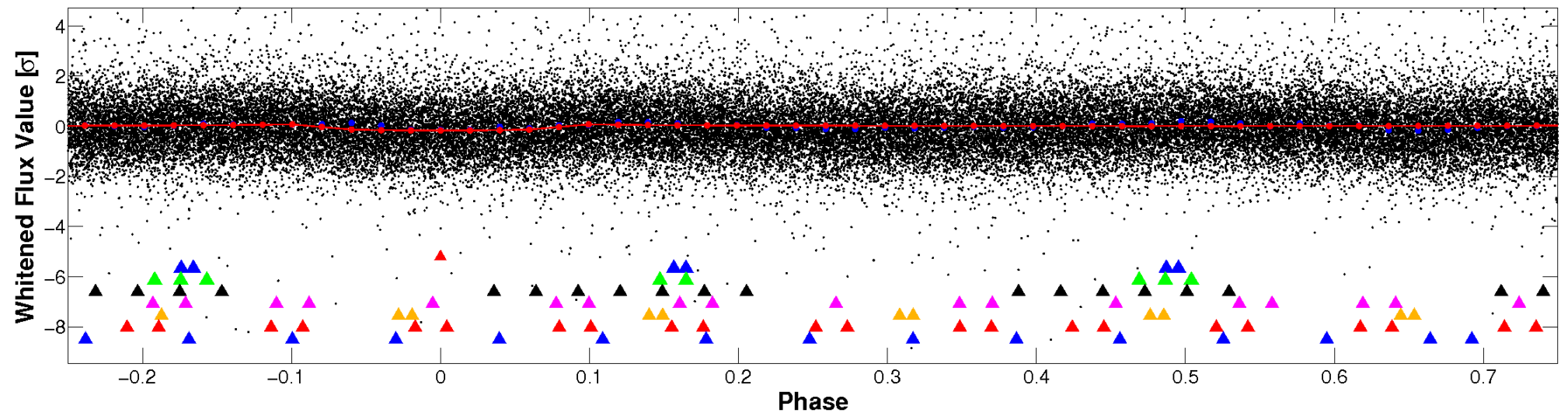


# Non-Whitened Vs. Whitened Light Curve

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

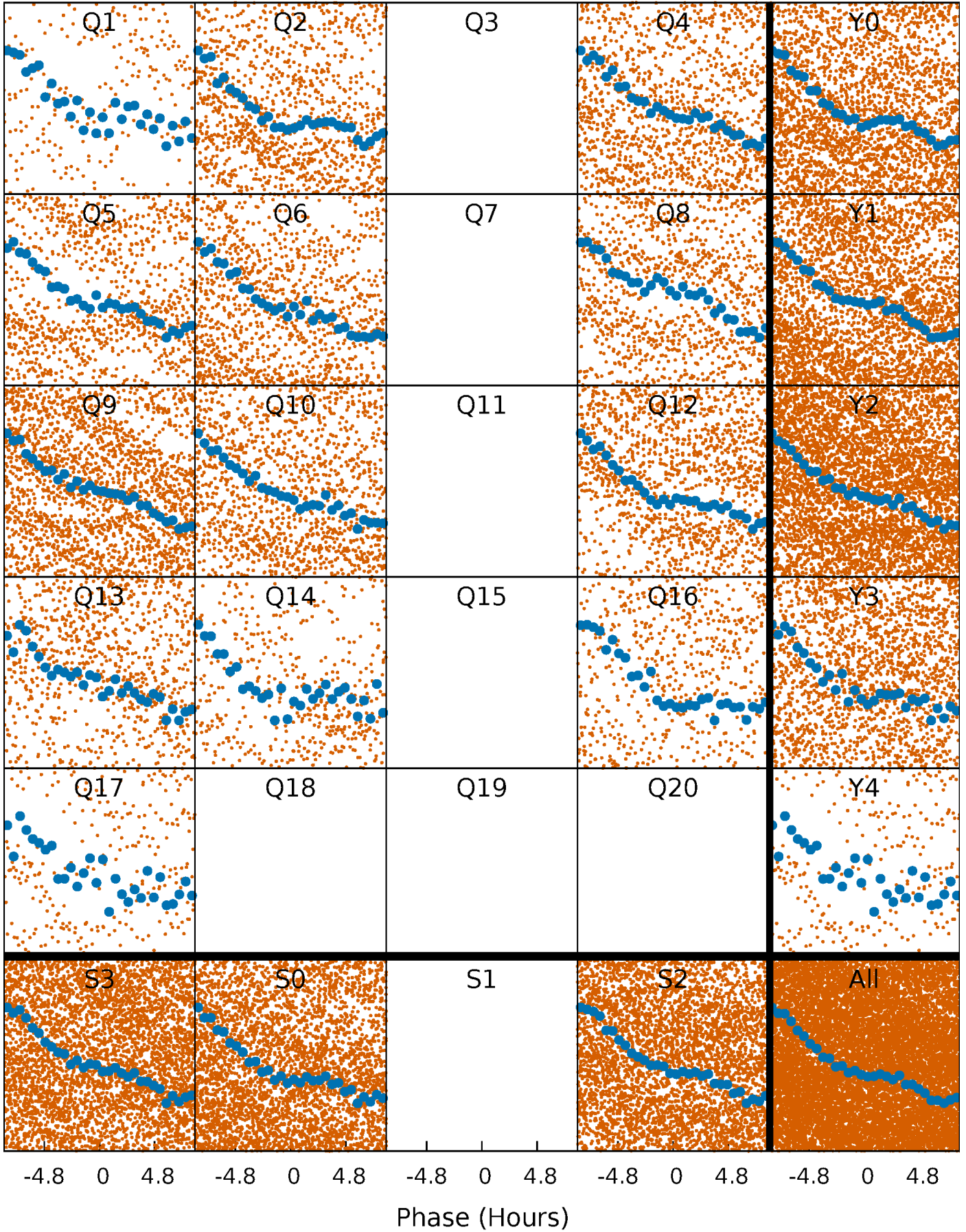


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

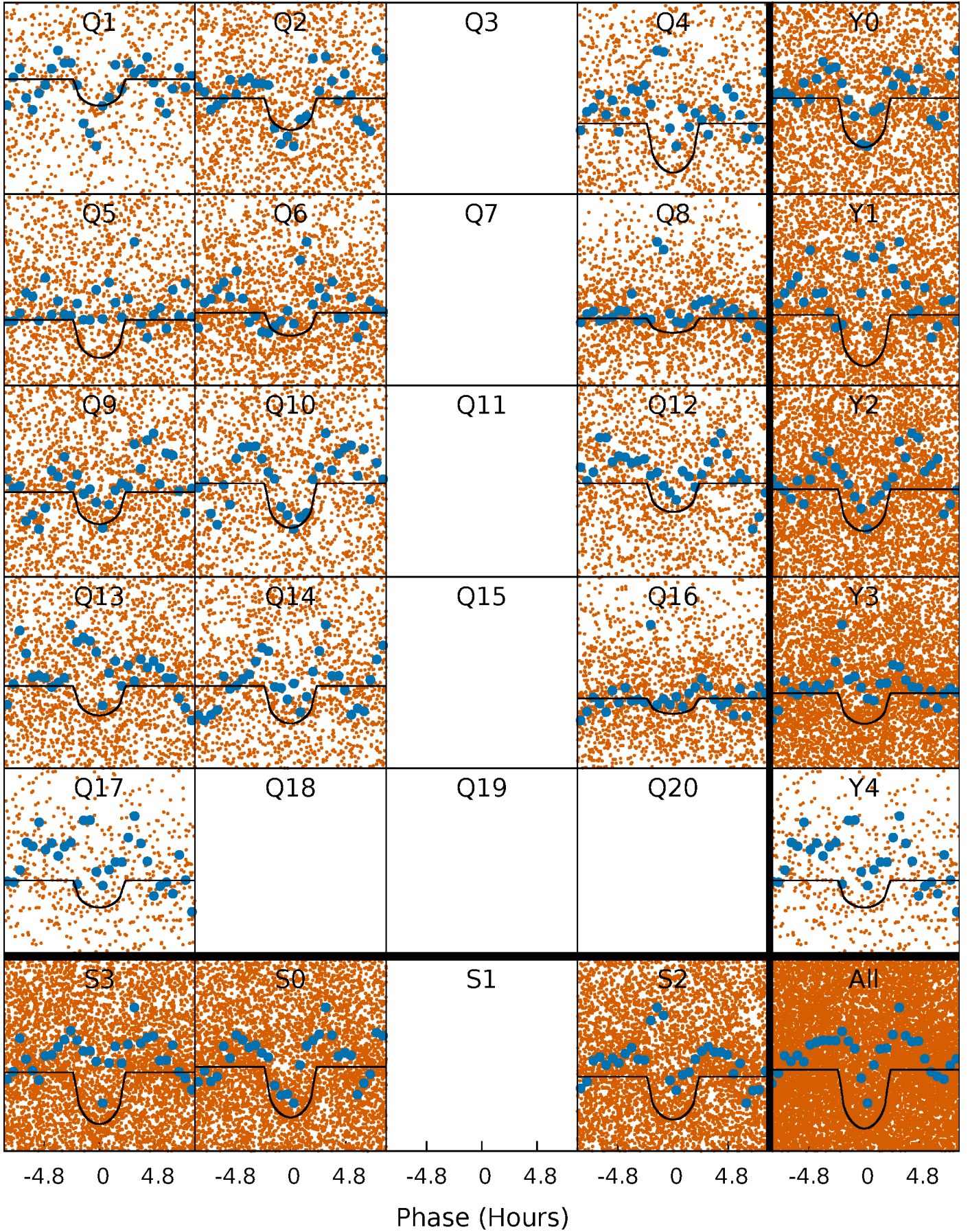
TCE 008767669-01 P= 1.027454 Days  $T_0=131.866368$  (BKJD)





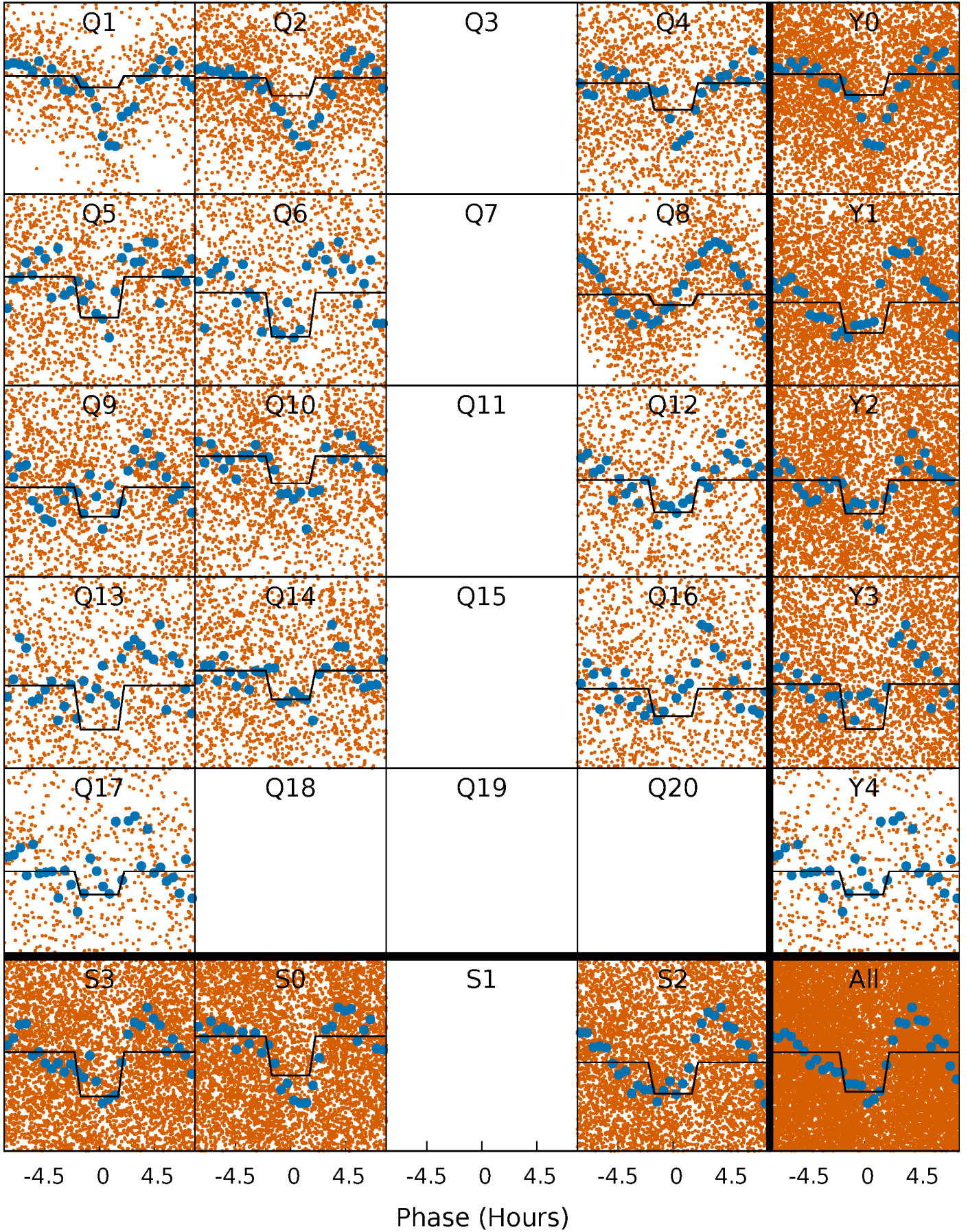
# DV Quarter-Phased Transit Curves

TCE 008767669-01 P= 1.027454 Days  $T_0=131.866368$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 008767669-01 P= 1.027504 Days  $T_0=131.791865$  (BKJD)

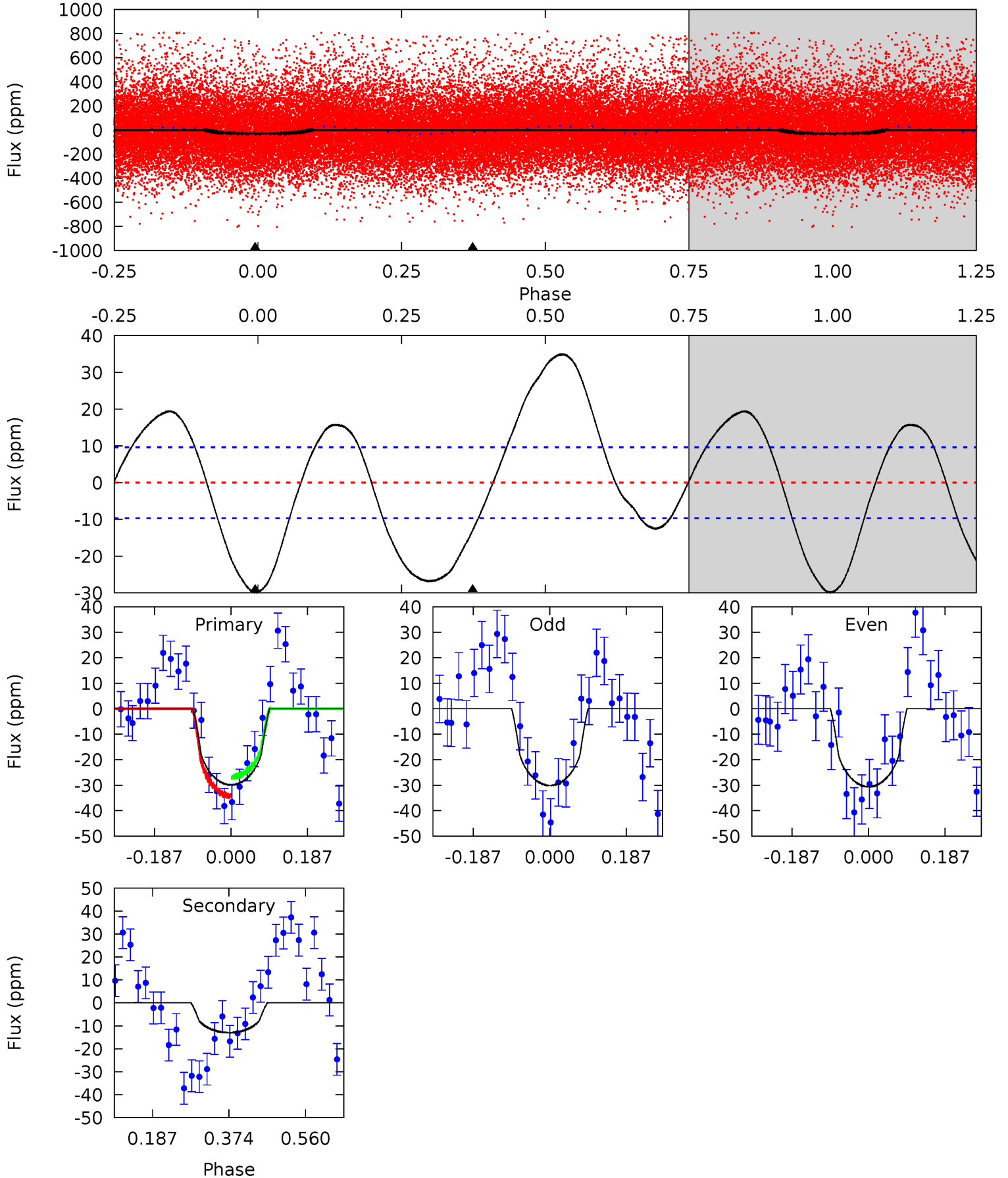




# DV Model-Shift Uniqueness Test

008767669-01, P = 1.027454 Days, E = 130.838914 Days

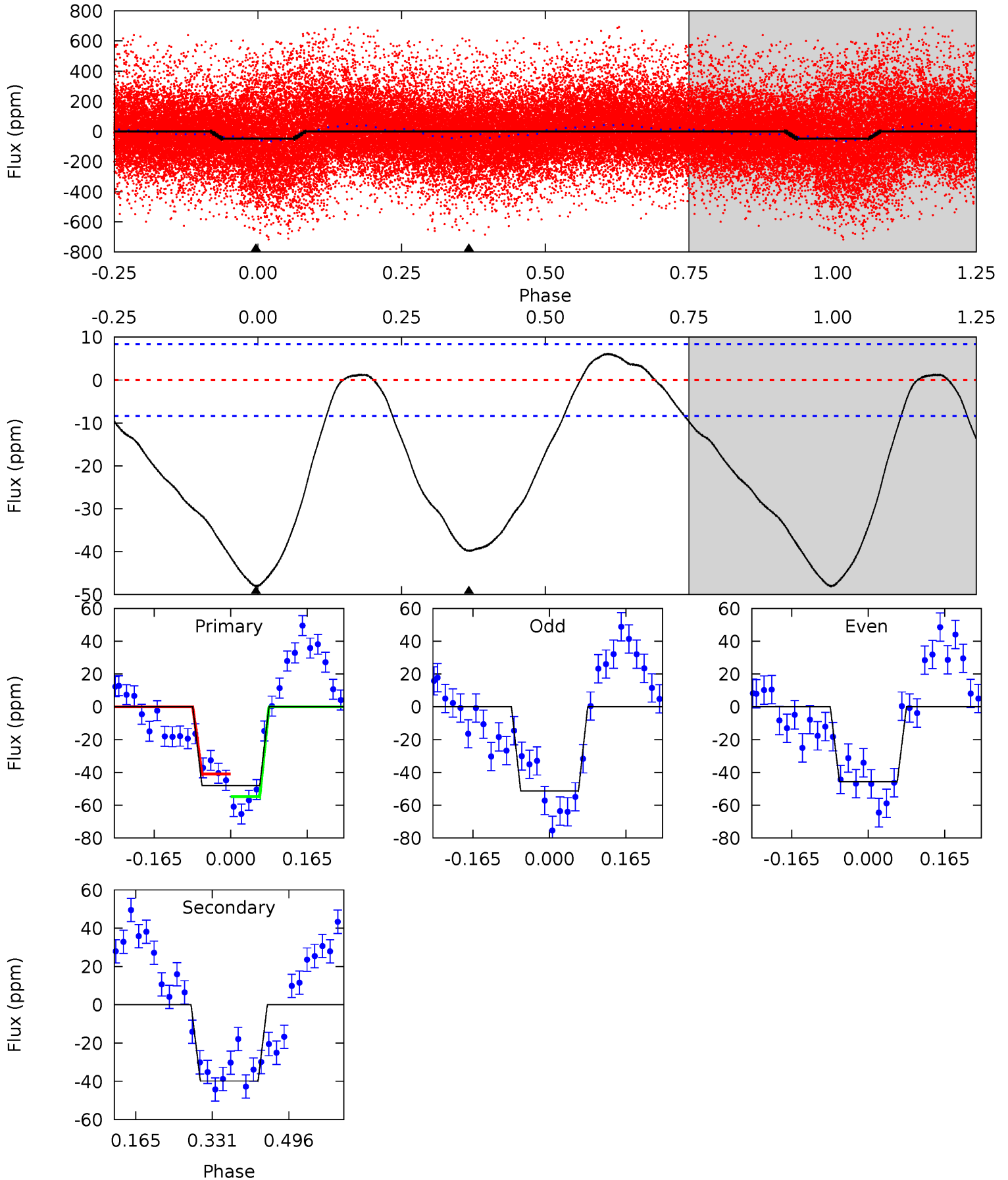
| Pri  | Sec  | Ter | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM   | Shape | TAT  |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-------|-------|------|
| 13.7 | 5.96 | 0   | 0   | 4.43            | 1.32            | 5.16             | 13.7    | 13.7    | 5.96    | 5.96    | 0.12    | -0.28 | 0.54  | 1.75 |



# Alt Model-Shift Uniqueness Test

008767669-01, P = 1.027504 Days, E = 130.764361 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 |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 25.5 | 21.2 | 0   | 0   | 4.46            | 1.39            | 4.25             | 25.5    | 25.5    | 21.2    | 21.2    | 1.53    | 1.02 | 0.11  | 0   |





### Stellar Parameters For KIC 008767669

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $4338^{+129}_{-142}$ | $4.586^{+0.056}_{-0.017}$ | $0.320^{+0.150}_{-0.300}$ | $0.709^{+0.024}_{-0.057}$ | $0.708^{+0.036}_{-0.049}$ | $2.794^{+0.652}_{-0.202}$                 |
|        | +3%/-3%              | +1%/-0%                   | +47%/-94%                 | +3%/-8%                   | +5%/-7%                   | +23%/-7%                                  |
| Source | PHO1                 | KIC0                      | KIC0                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 008767669-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$           |
|---------|-------------|------------------------|----------------------|----------------------|----------------------------|
| DV      | $-13 \pm 2$ | $0.52^{+0.20}_{-0.18}$ | $1680^{+53}_{-57}$   | $3463^{+561}_{-360}$ | $8.463^{+11.803}_{-4.136}$ |
| Alt.    | $-40 \pm 2$ | $0.50^{+0.19}_{-0.19}$ | $1678^{+57}_{-61}$   | $4248^{+893}_{-467}$ | $28^{+40}_{-14}$           |

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

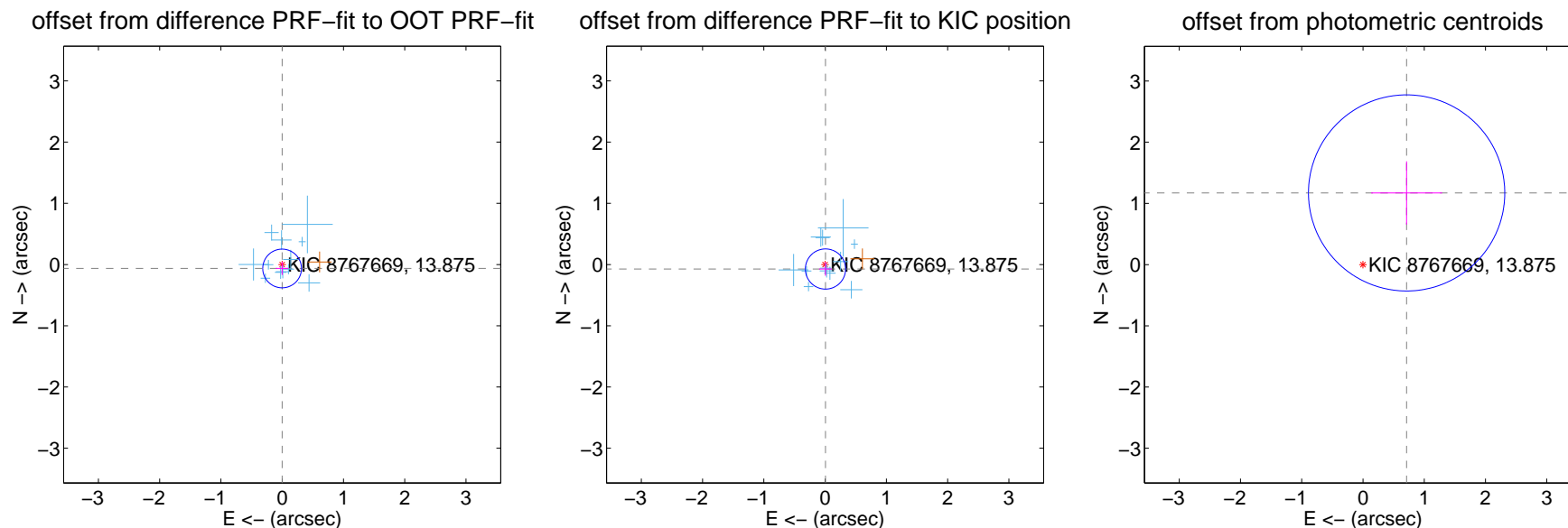
## DV Centroid Data

Supplemental centroid analysis for 008767669-01. Kepler magnitude: 13.88. Transit SNR 13.54

There are 12 quarters with good PRF difference image offsets

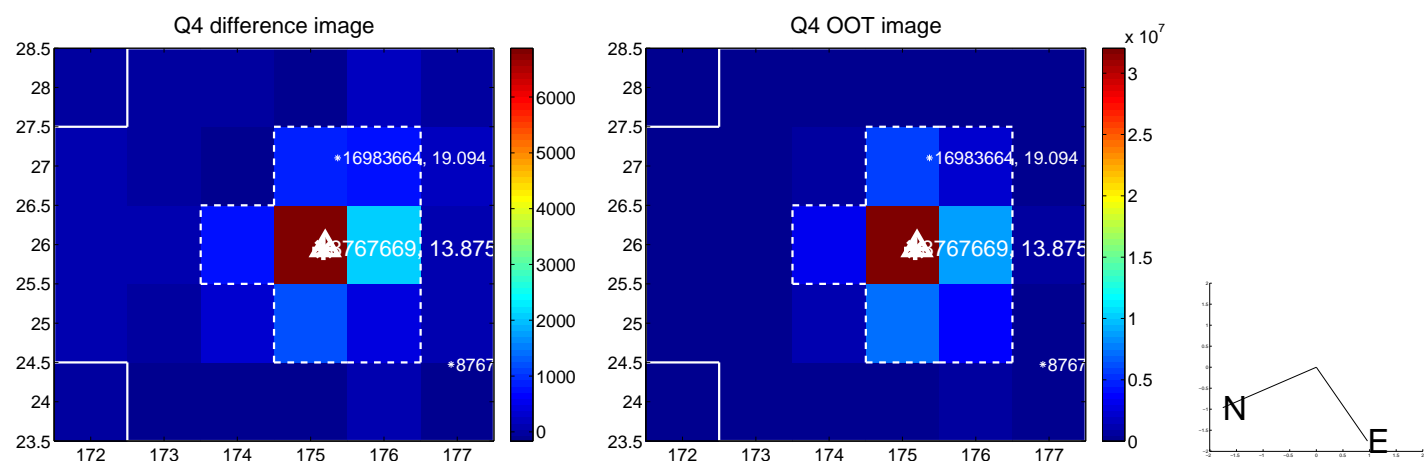
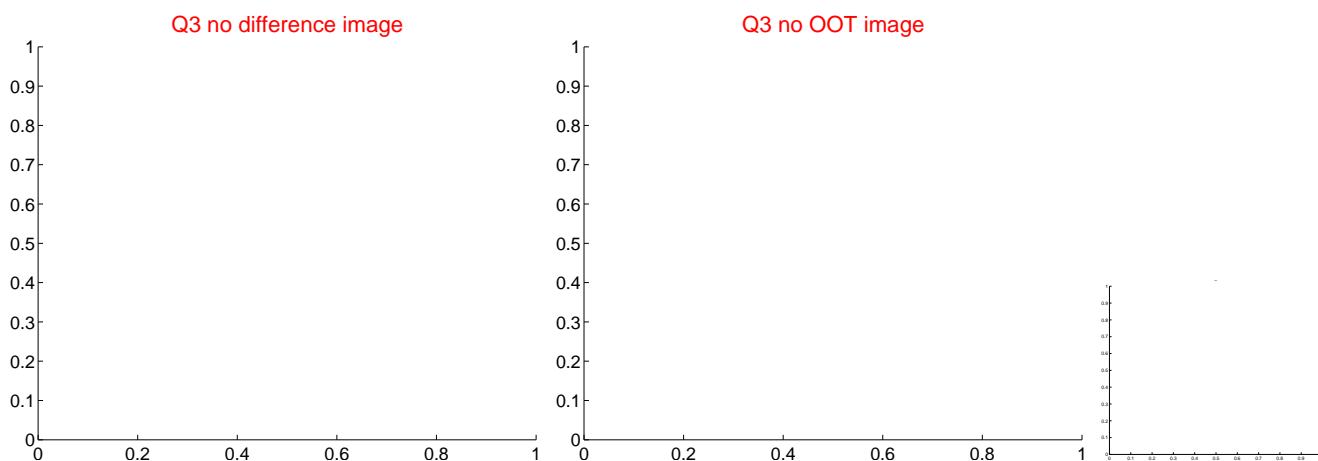
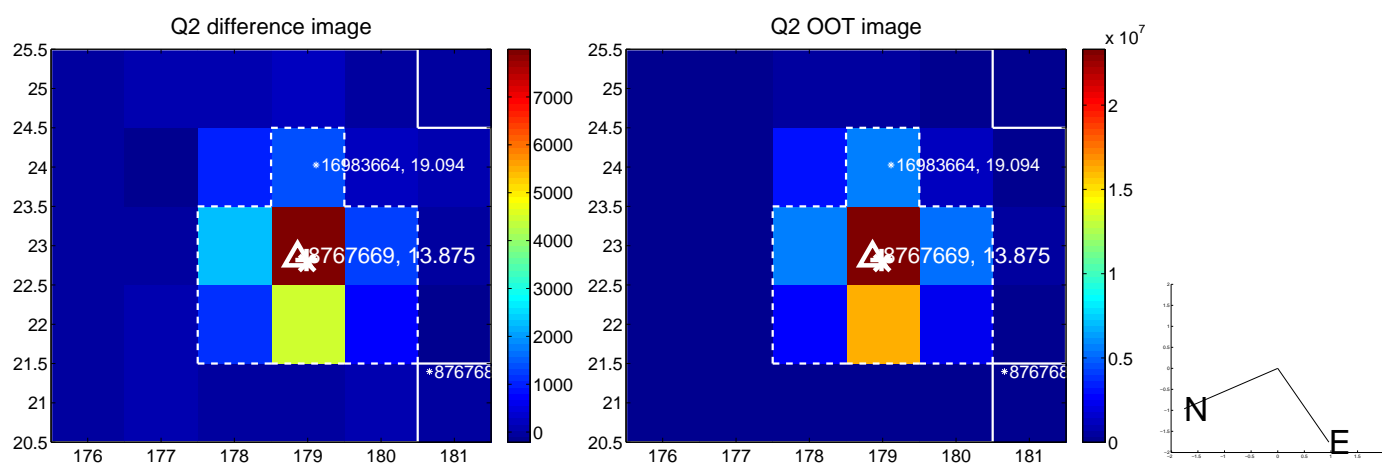
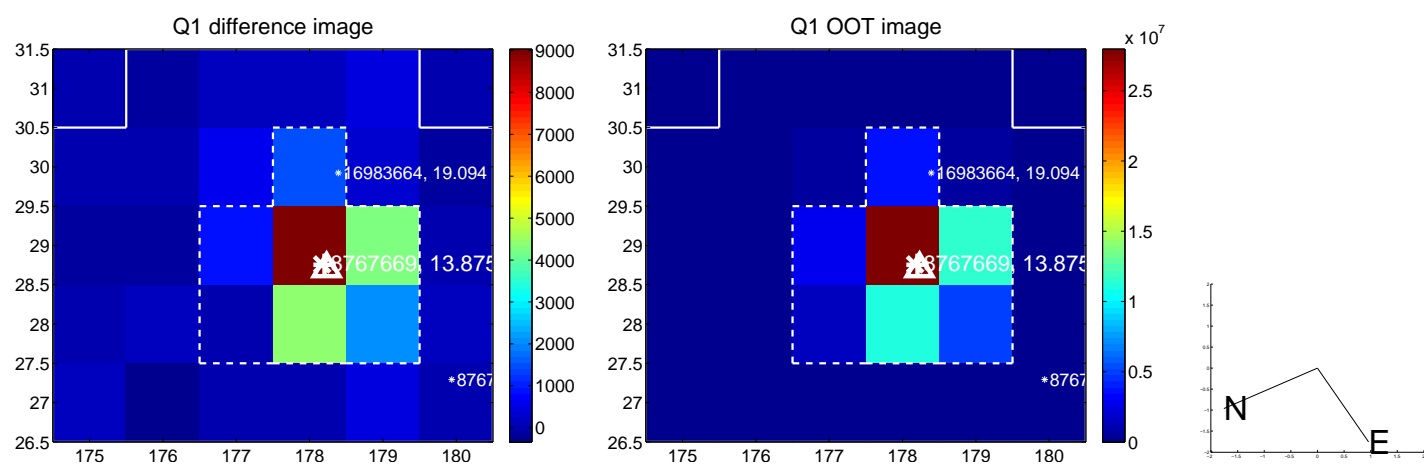
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $0.064 \pm 0.105$  | 0.61                | $0.001 \pm 0.104$  | $-0.064 \pm 0.105$ |
| PRF-fit source offset from KIC position | $0.073 \pm 0.109$  | 0.67                | $-0.006 \pm 0.104$ | $-0.073 \pm 0.109$ |
| photometric centroid source offset      | $1.37 \pm 0.53$    | 2.57                | $-0.71 \pm 0.58$   | $1.17 \pm 0.52$    |

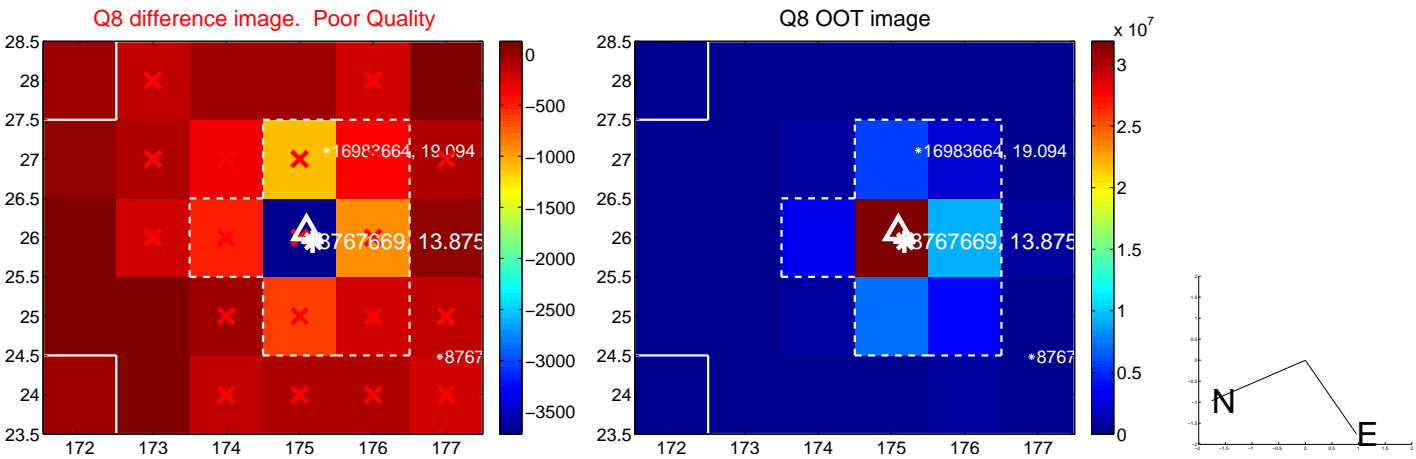
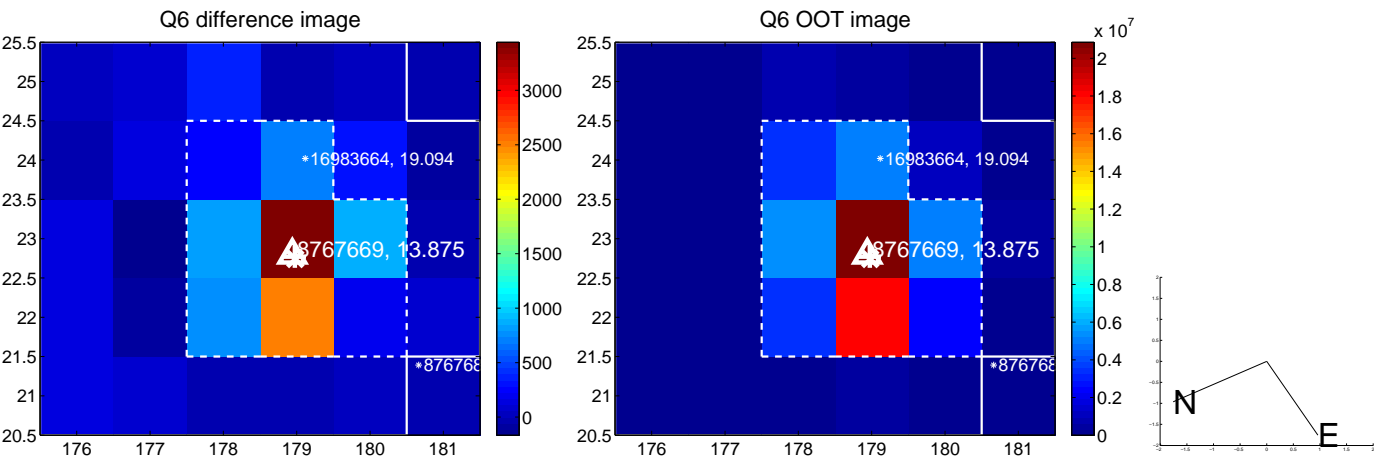
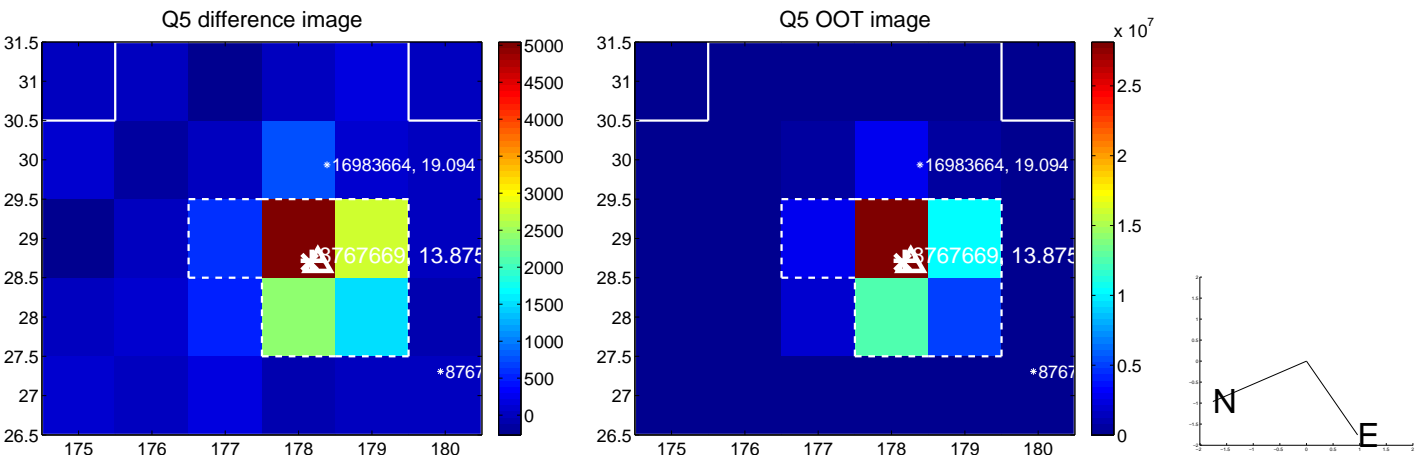


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

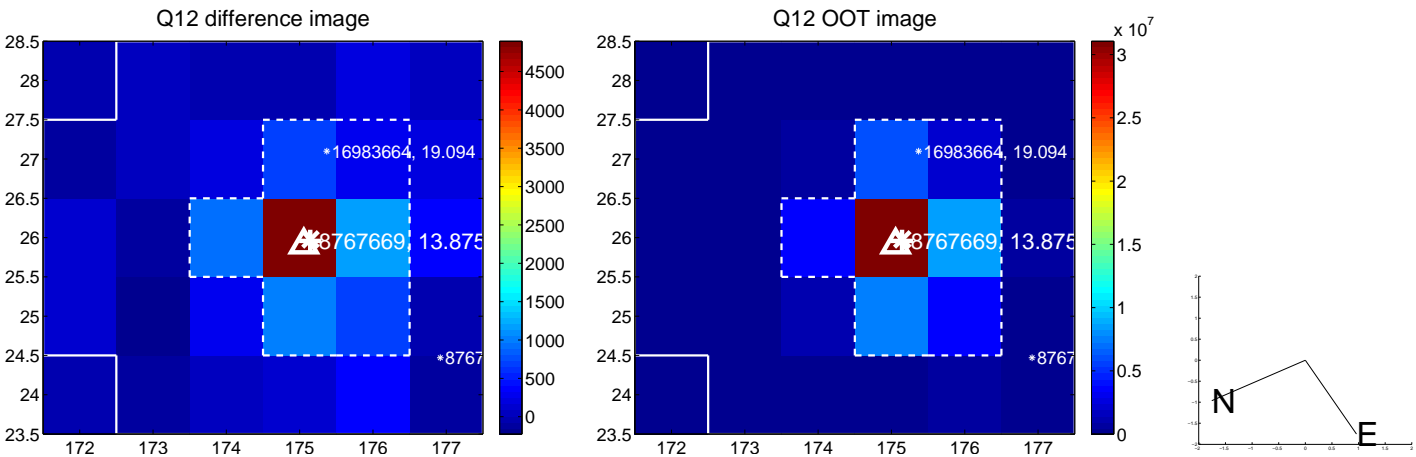
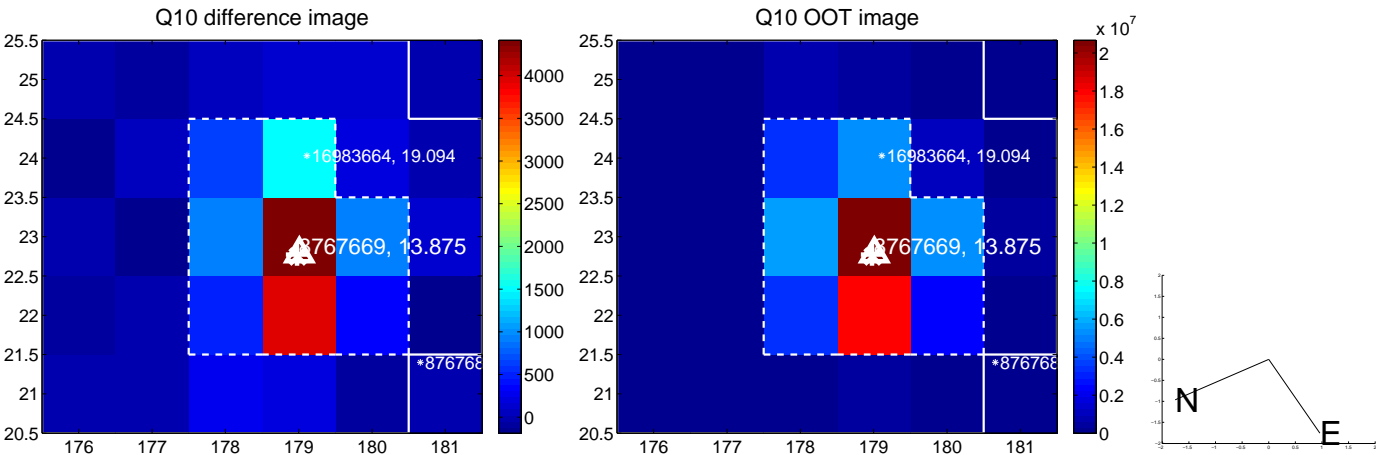
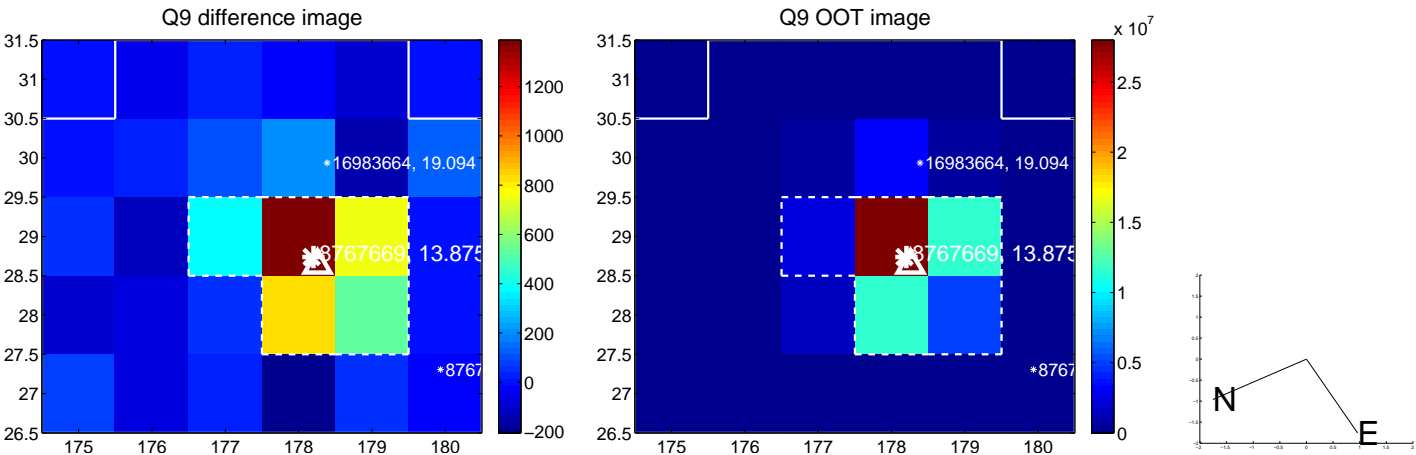


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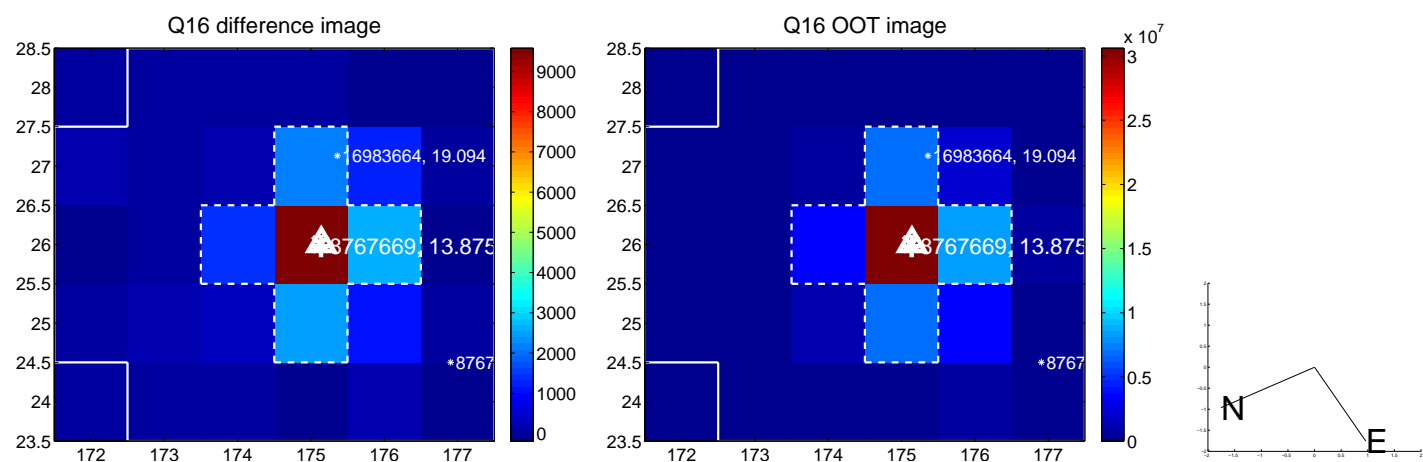
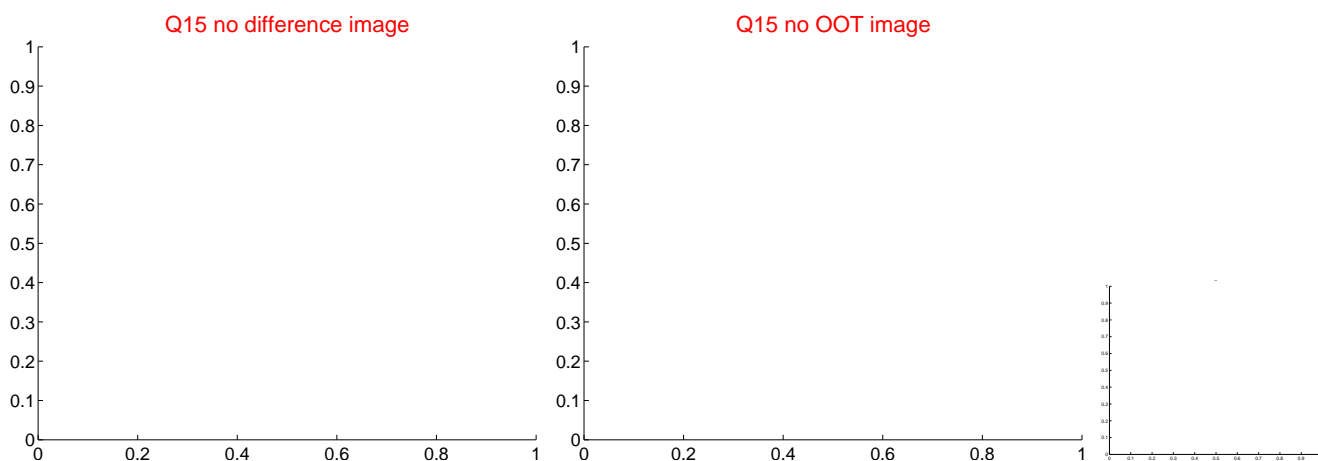
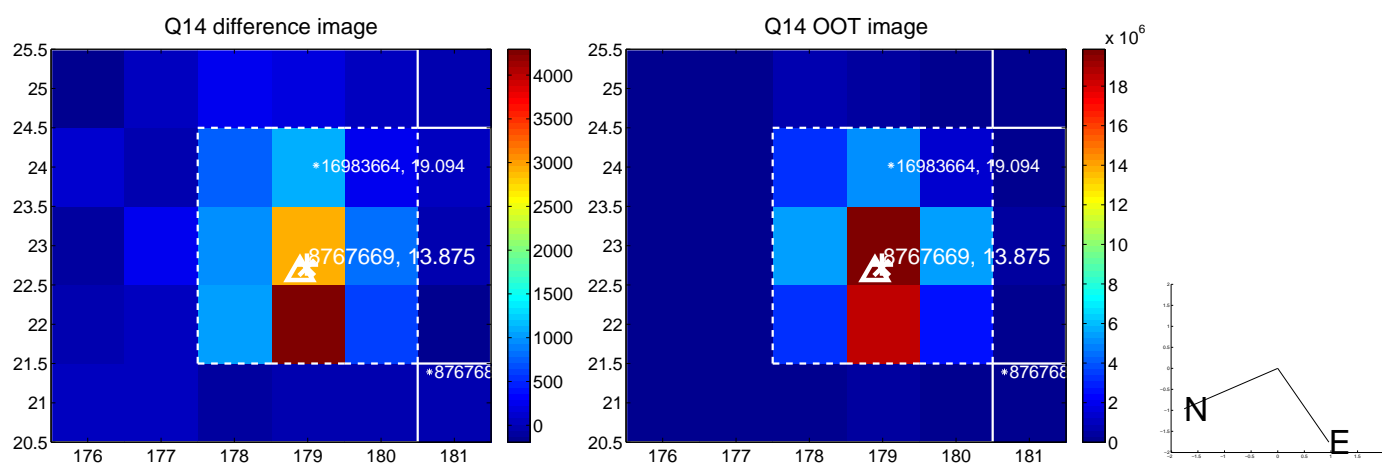
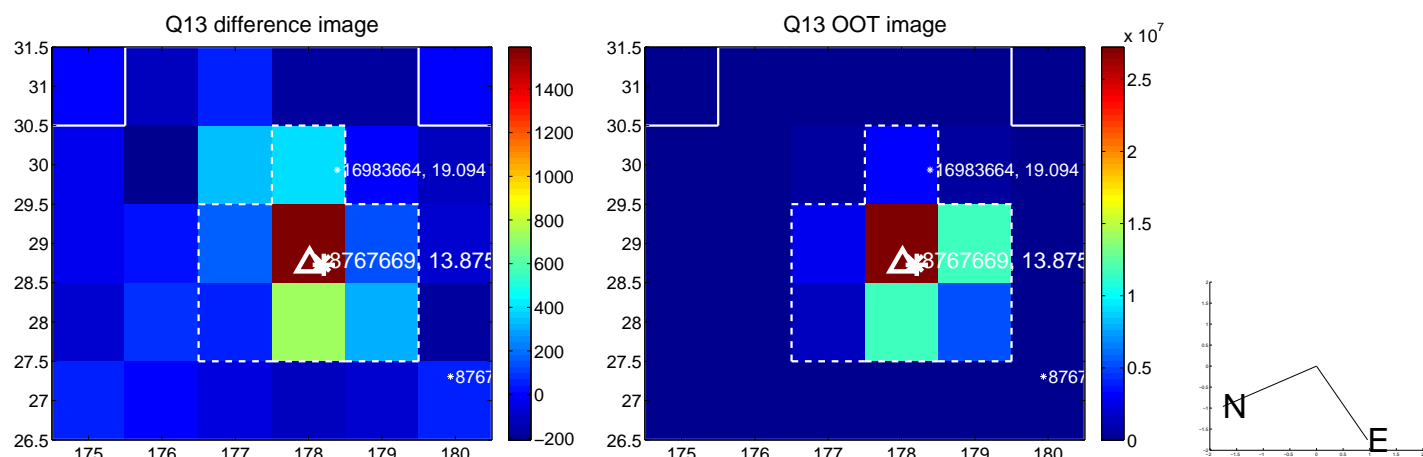




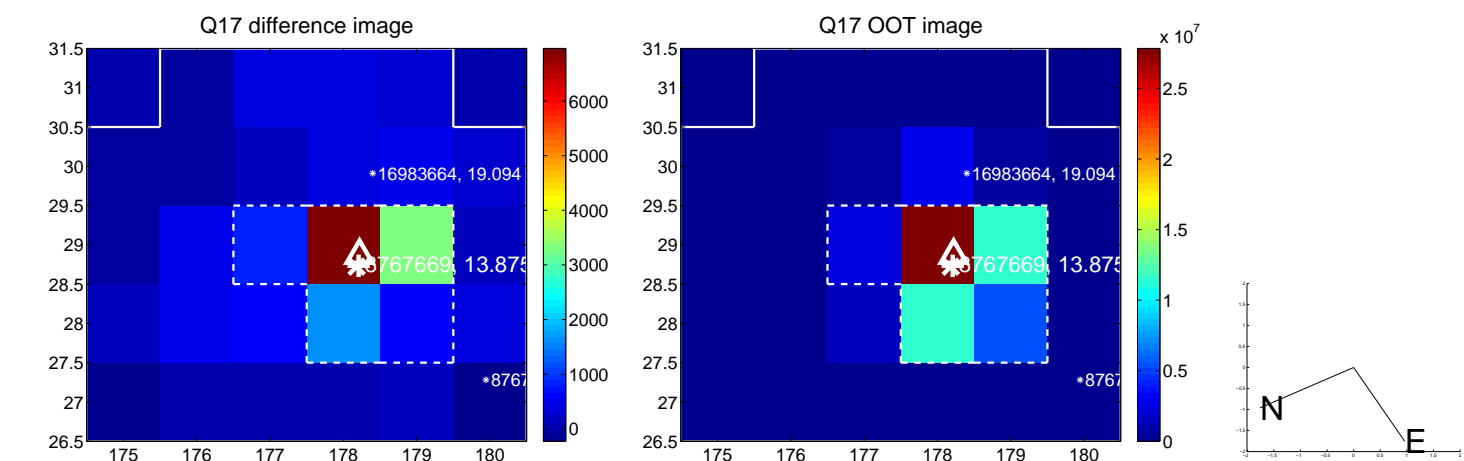
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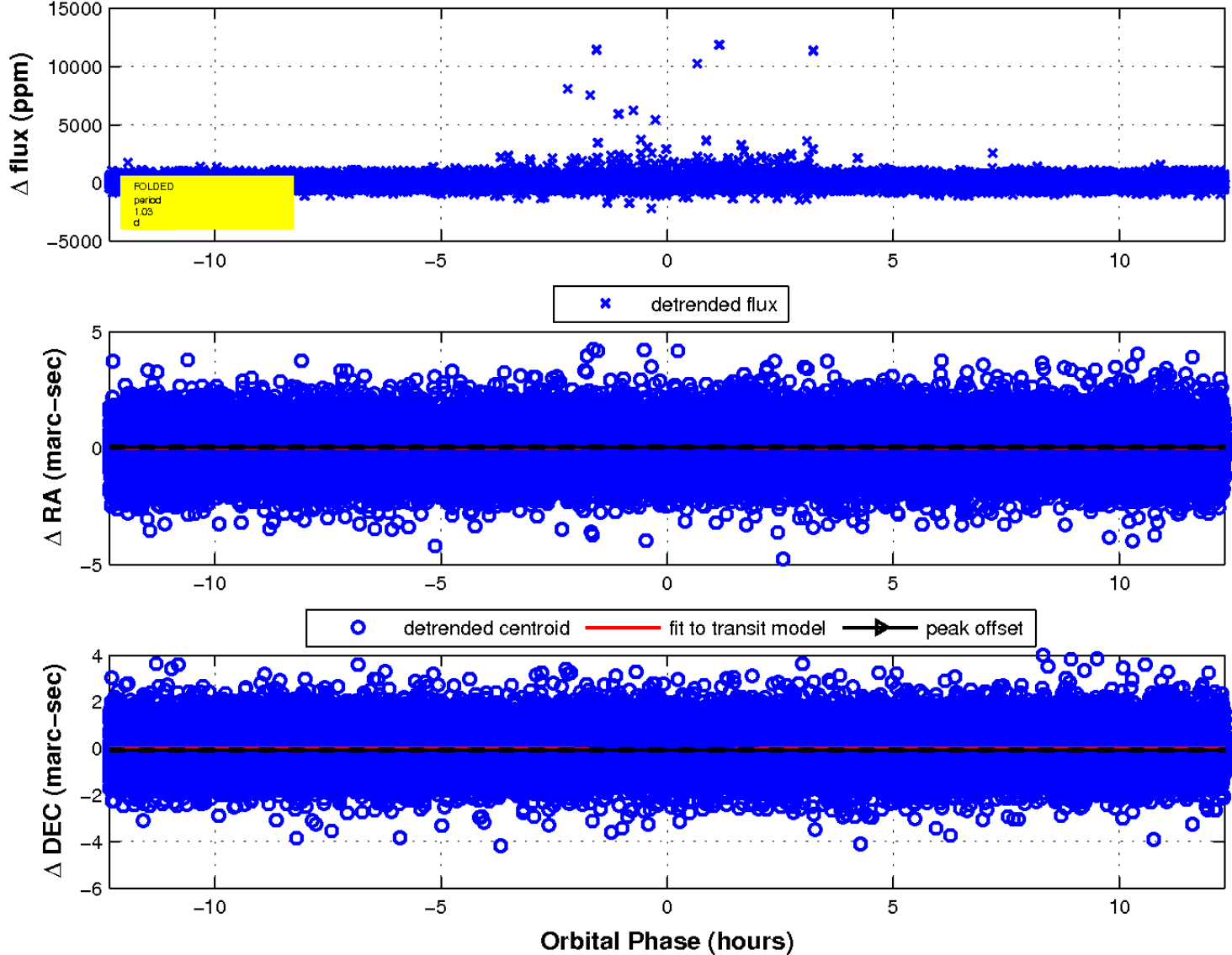
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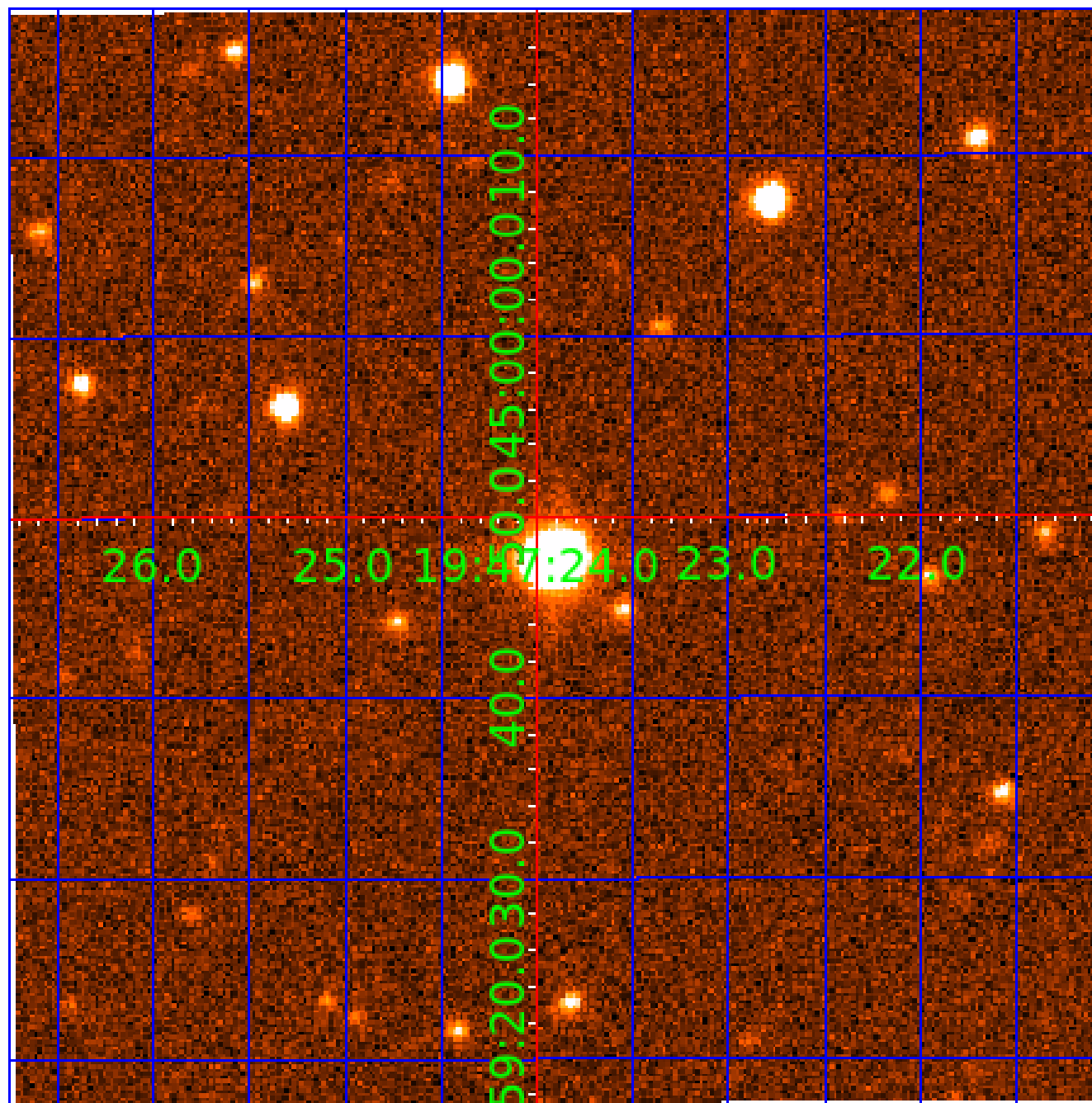


fluxWeightedCentroids, Planet 1 of 8



UKIRT Image

Declination





# KIC 008767669

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
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## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 008767669-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST           |
| 008767669-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT   |
| 008767669-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008767669-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 008767669-07 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-08 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT   |

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

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

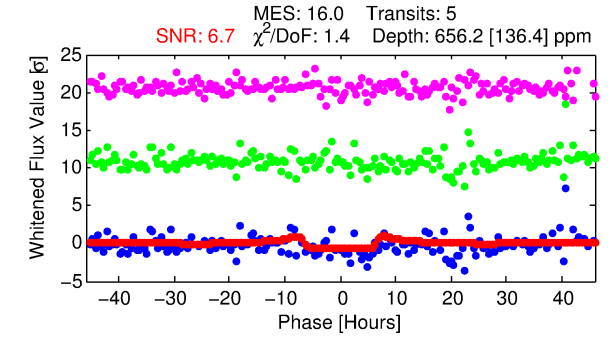
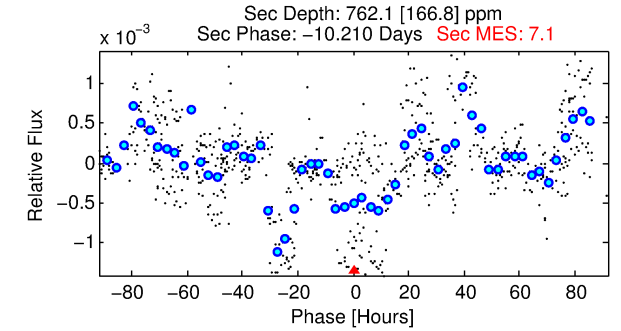
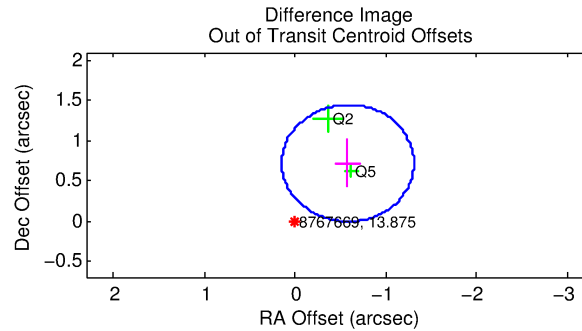
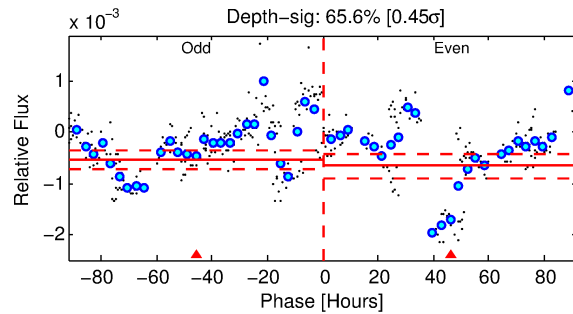
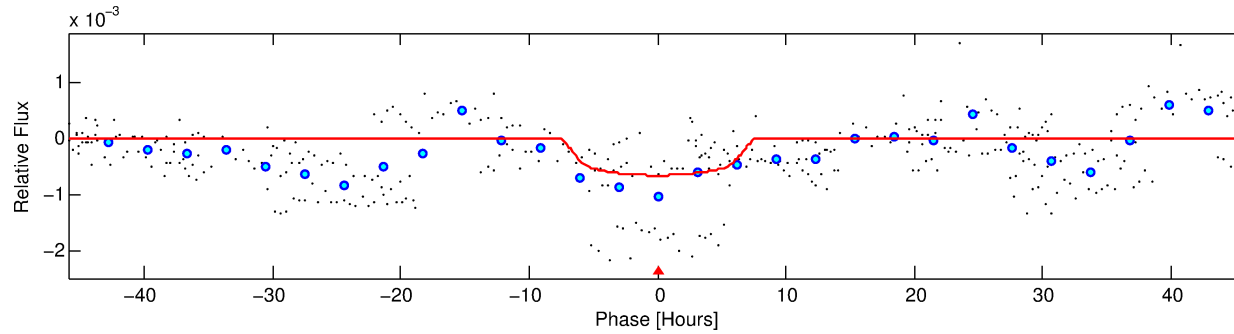
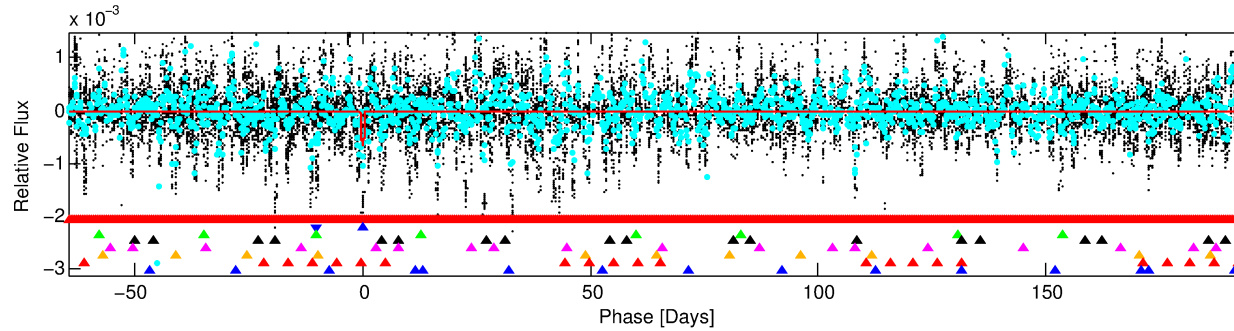
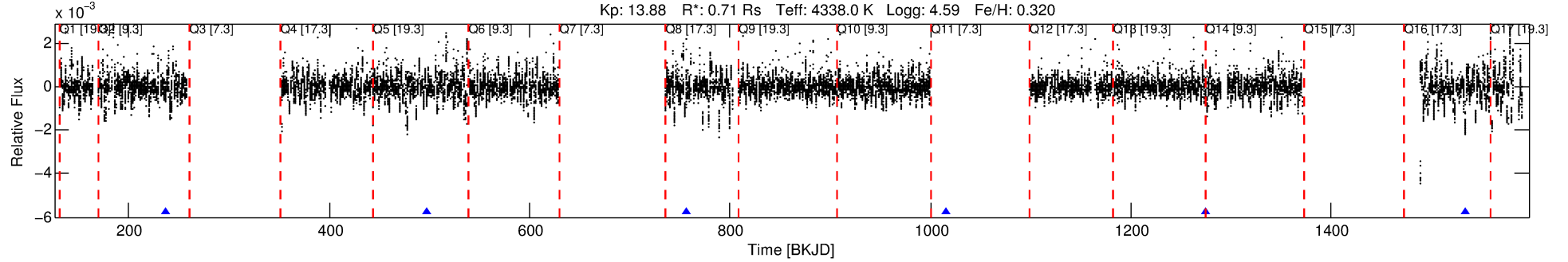
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008767669-02

No Significant Match Found

# DV One-Page Summary

KIC: 8767669 Candidate: 2 of 8 Period: 259.258 d



## DV Fit Results:

Period = 259.25823 [0.01473] d  
Epoch = 237.5238 [0.0241] BKJD  
Rp/R\* = 0.0290 [0.0043]  
a/R\* = 65.62 [24.02]  
b = 0.90 [0.08]  
Seff = 0.32 [0.05]  
Teq = 191 [8] K  
Rp = 2.24 [0.38] Re  
a = 0.7090 [0.0487] AU  
Ag = 41883.36 [16064.47] [2.61 $\sigma$ ]  
Teffp = 4233 [415] K [9.73 $\sigma$ ]

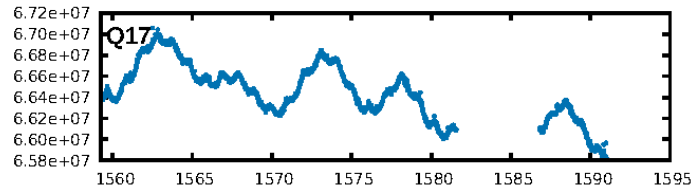
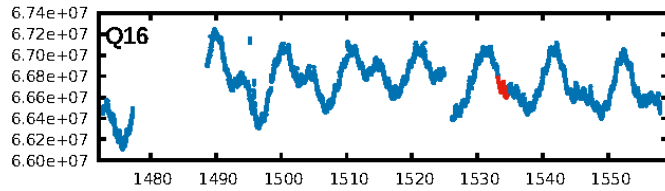
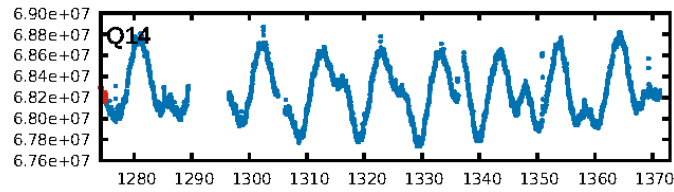
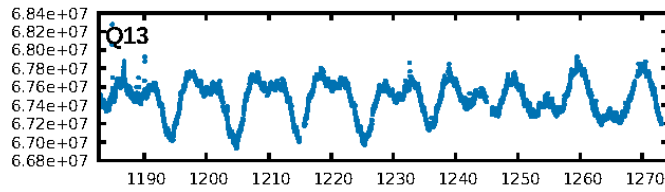
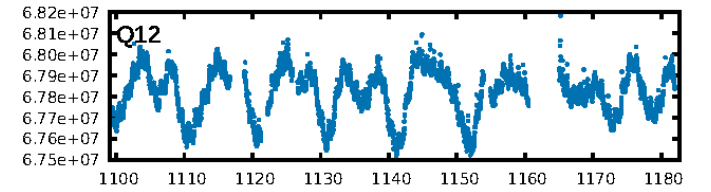
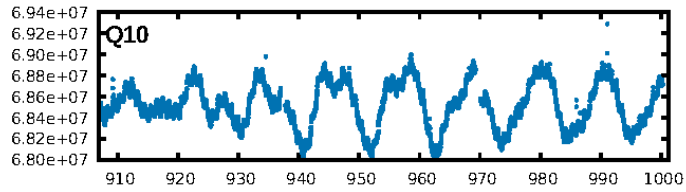
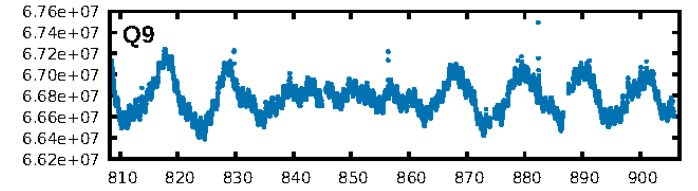
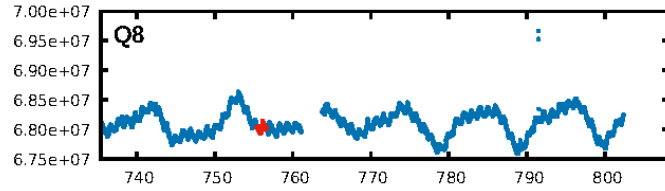
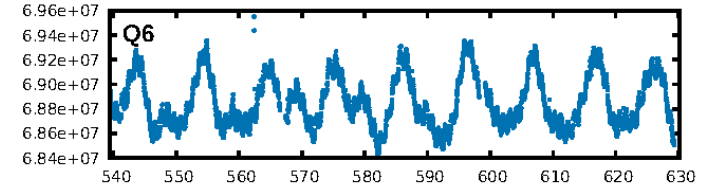
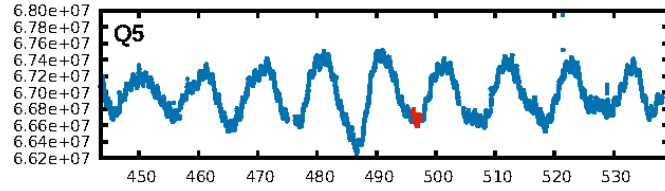
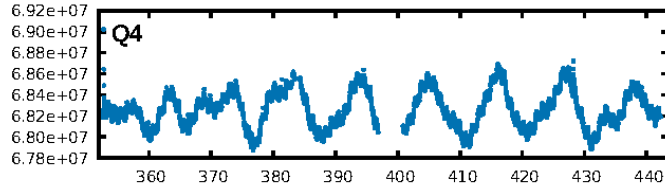
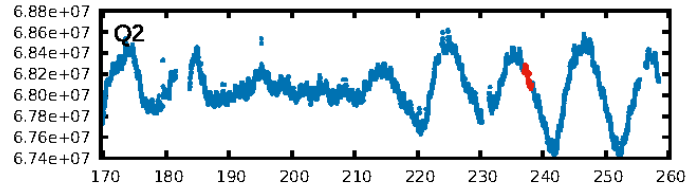
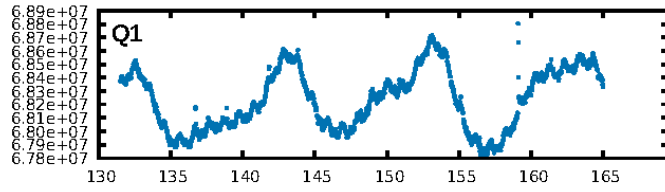
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [72.48 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.24e-24  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -0.1465  
Centroid-sig: 18.7%  
Centroid-so: 0.394 arcsec [0.82 $\sigma$ ]  
OotOffset-rm: 0.924 arcsec [3.81 $\sigma$ ]  
KicOffset-rm: 0.845 arcsec [3.80 $\sigma$ ]  
OotOffset-st: 1/0/0/1 [2]  
KicOffset-st: 1/0/0/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.00 [0/3]

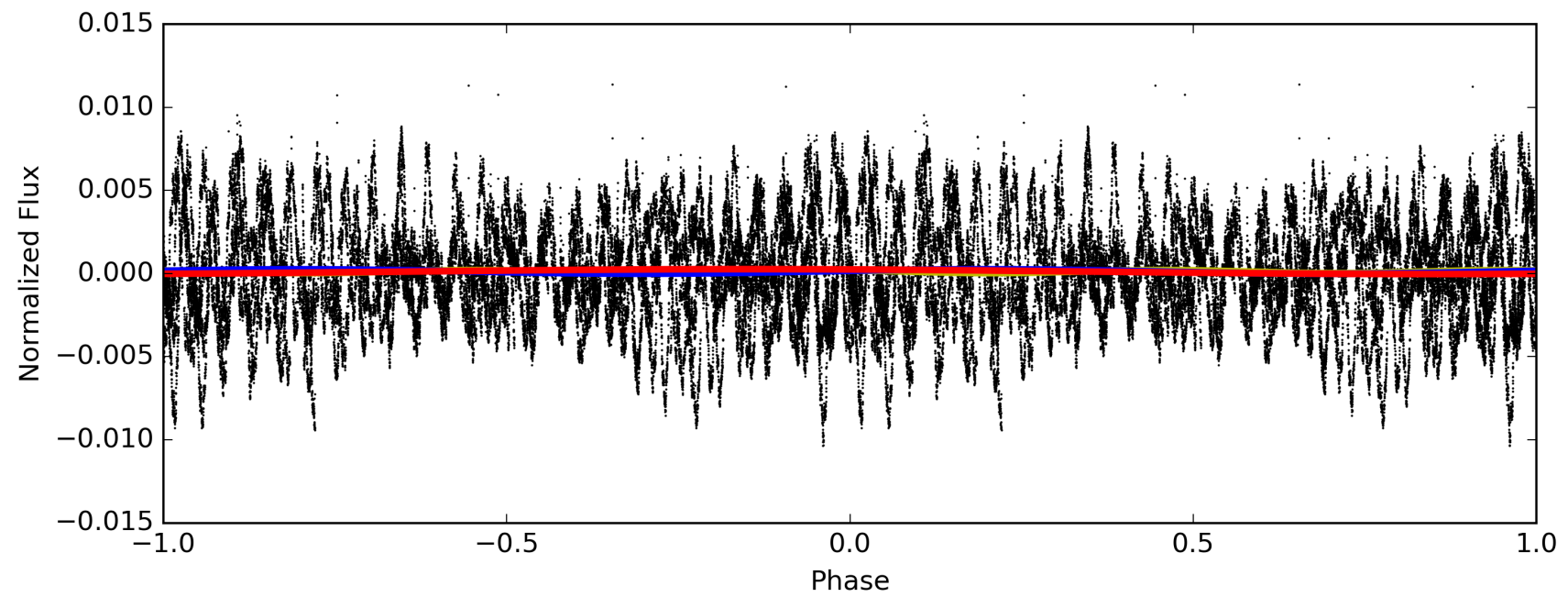
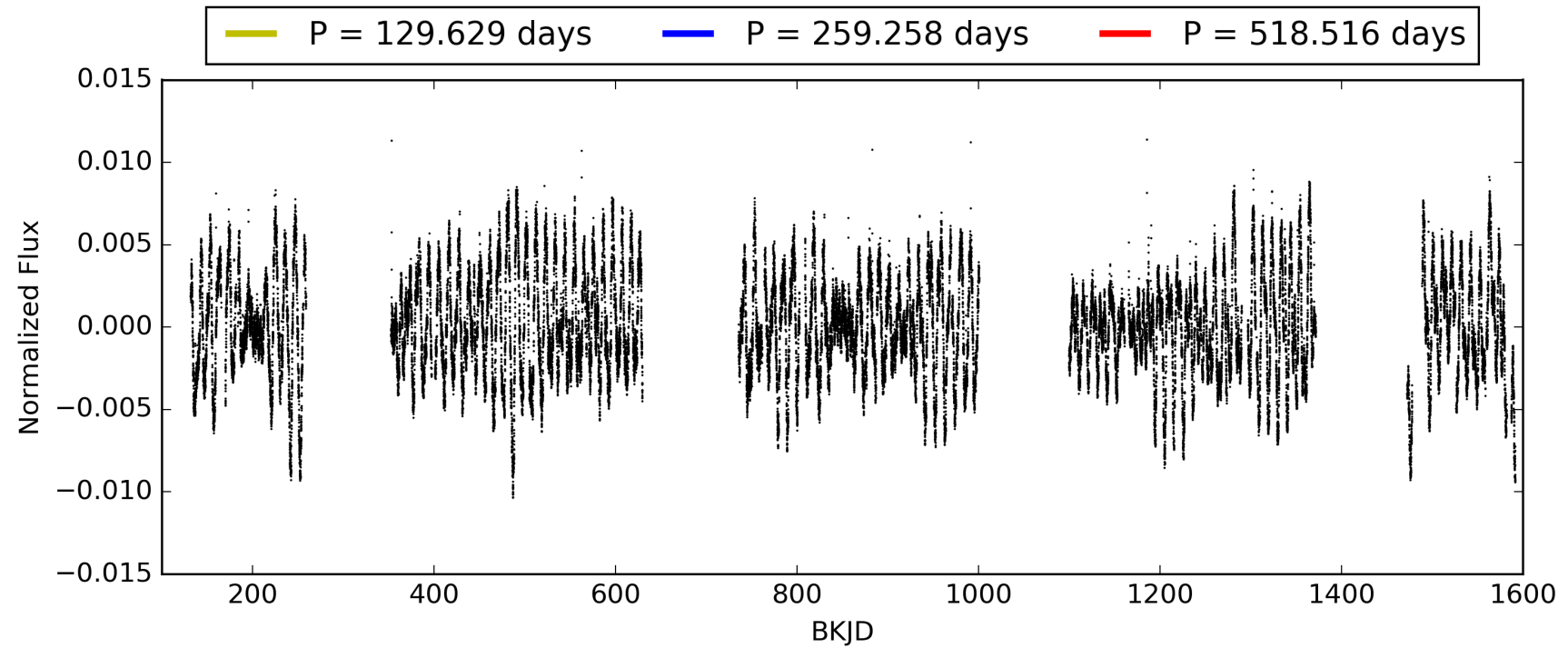
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:56:37 Z

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

# TCE 008767669-02, PDC Light Curves

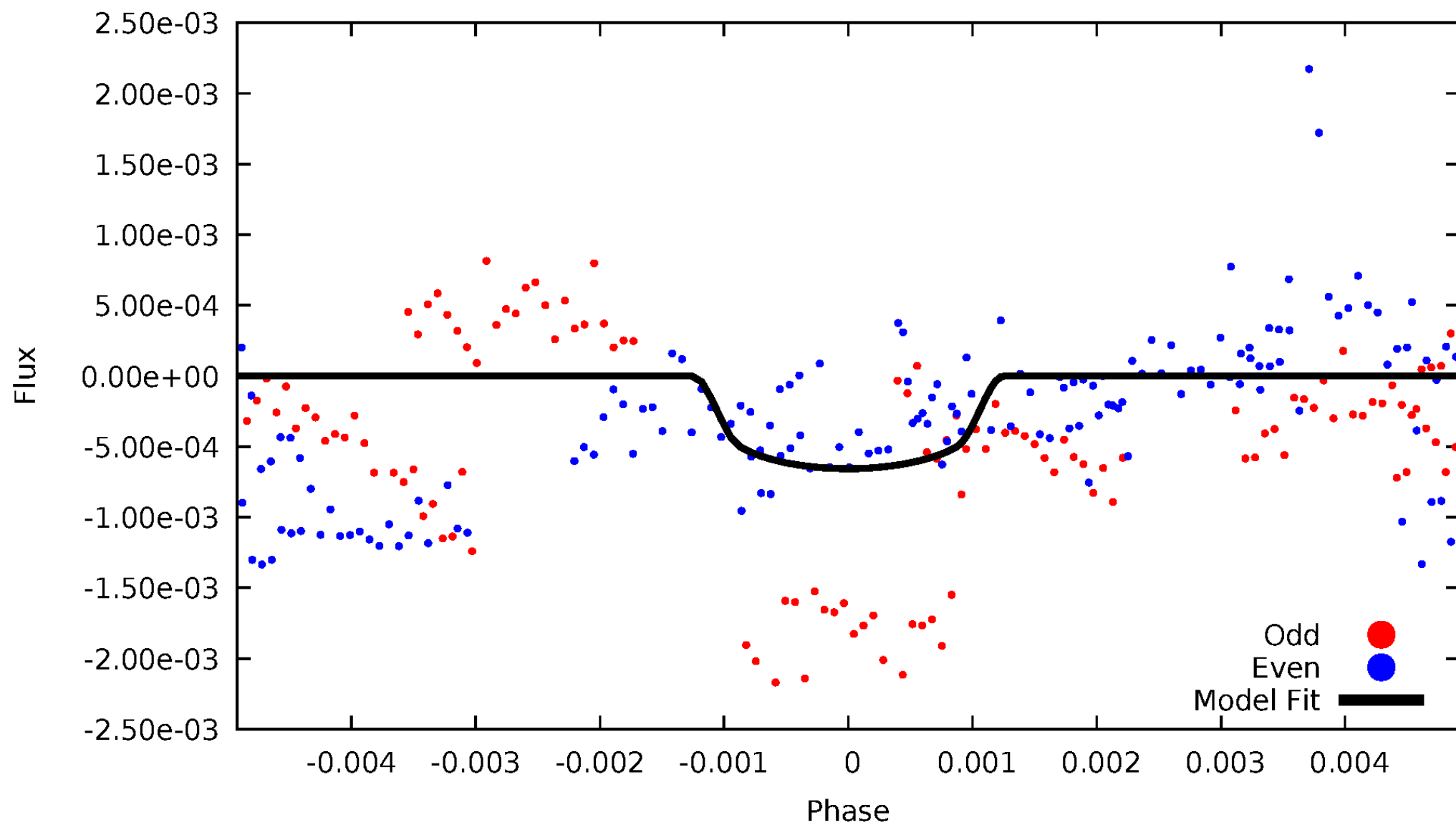


TCE 008767669-02



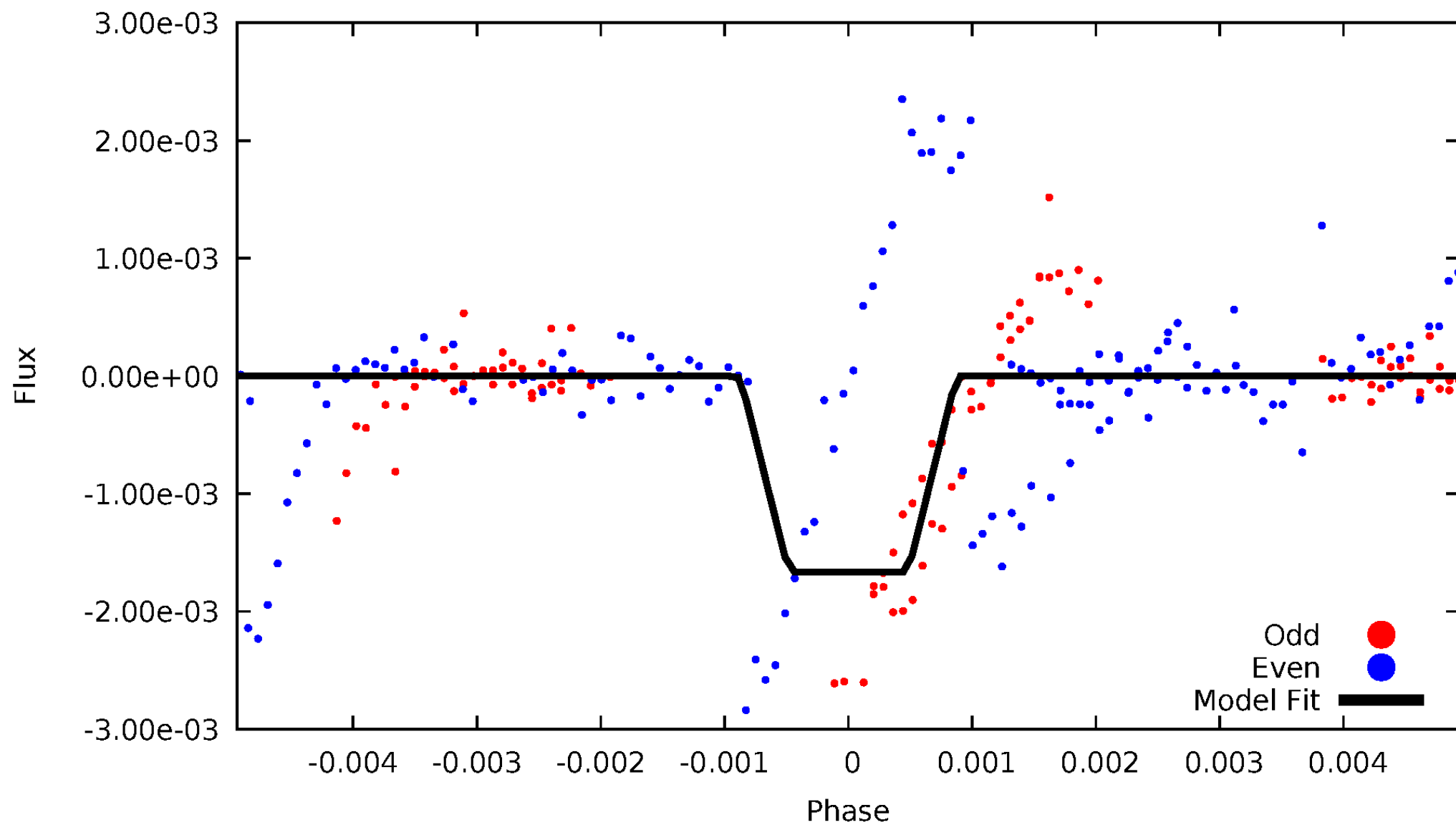
# DV Odd/Even

TCE 008767669-02



# ALT Odd/Even

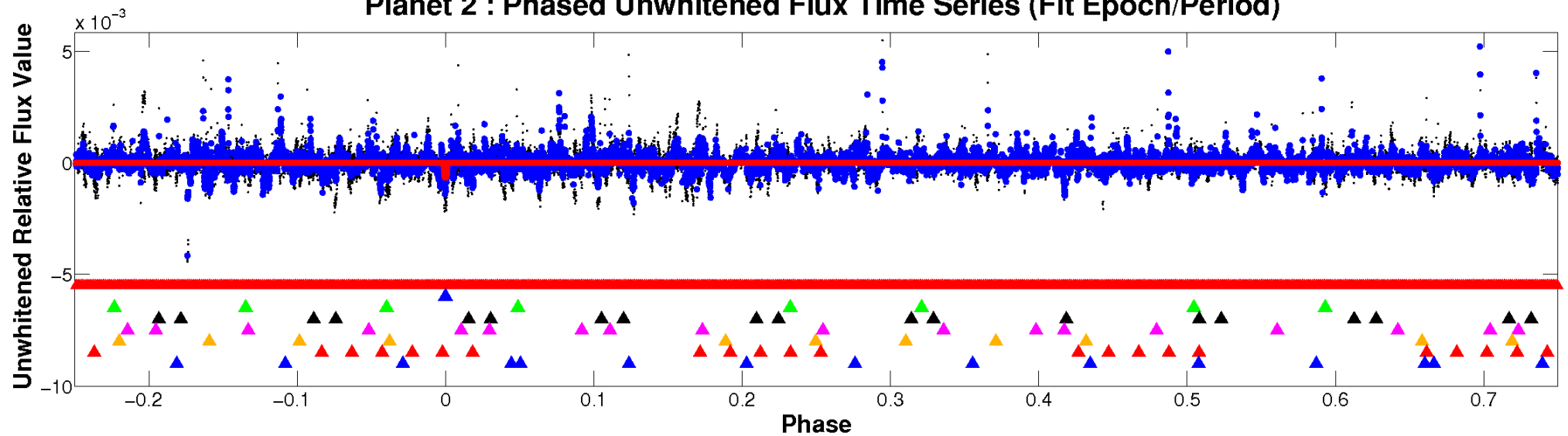
TCE 008767669-02



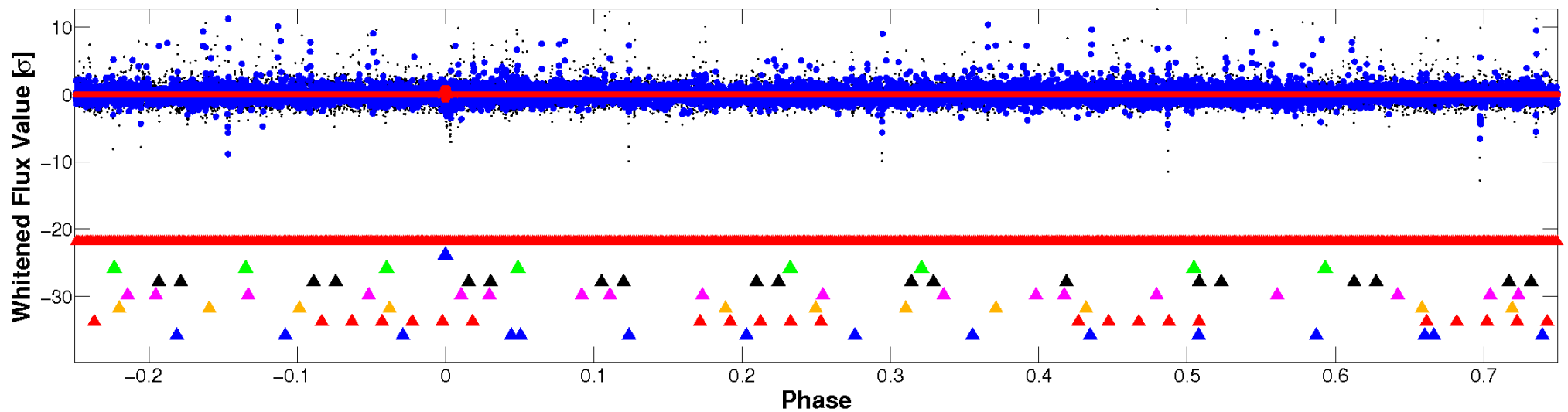


# Non-Whitened Vs. Whitened Light Curve

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

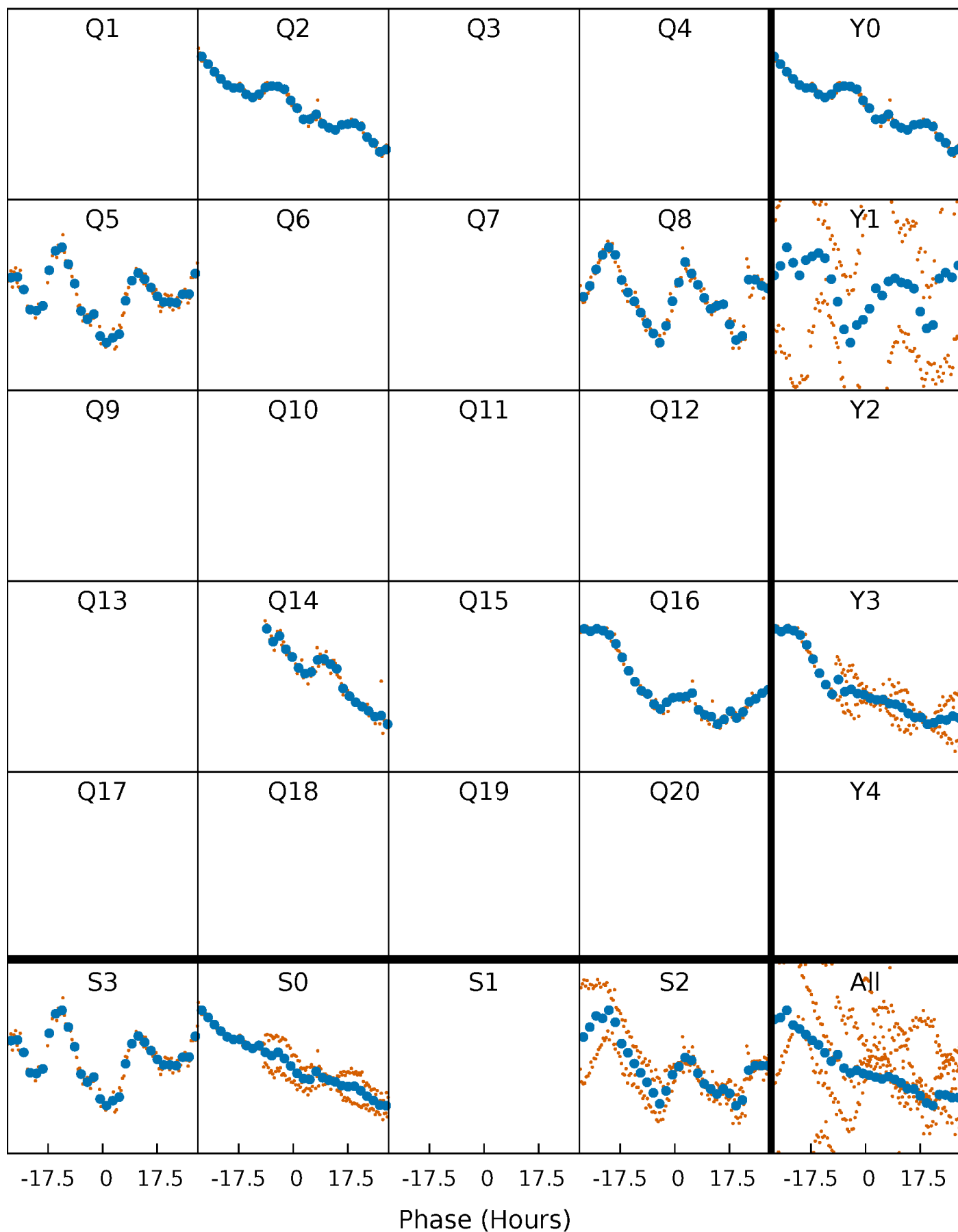


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



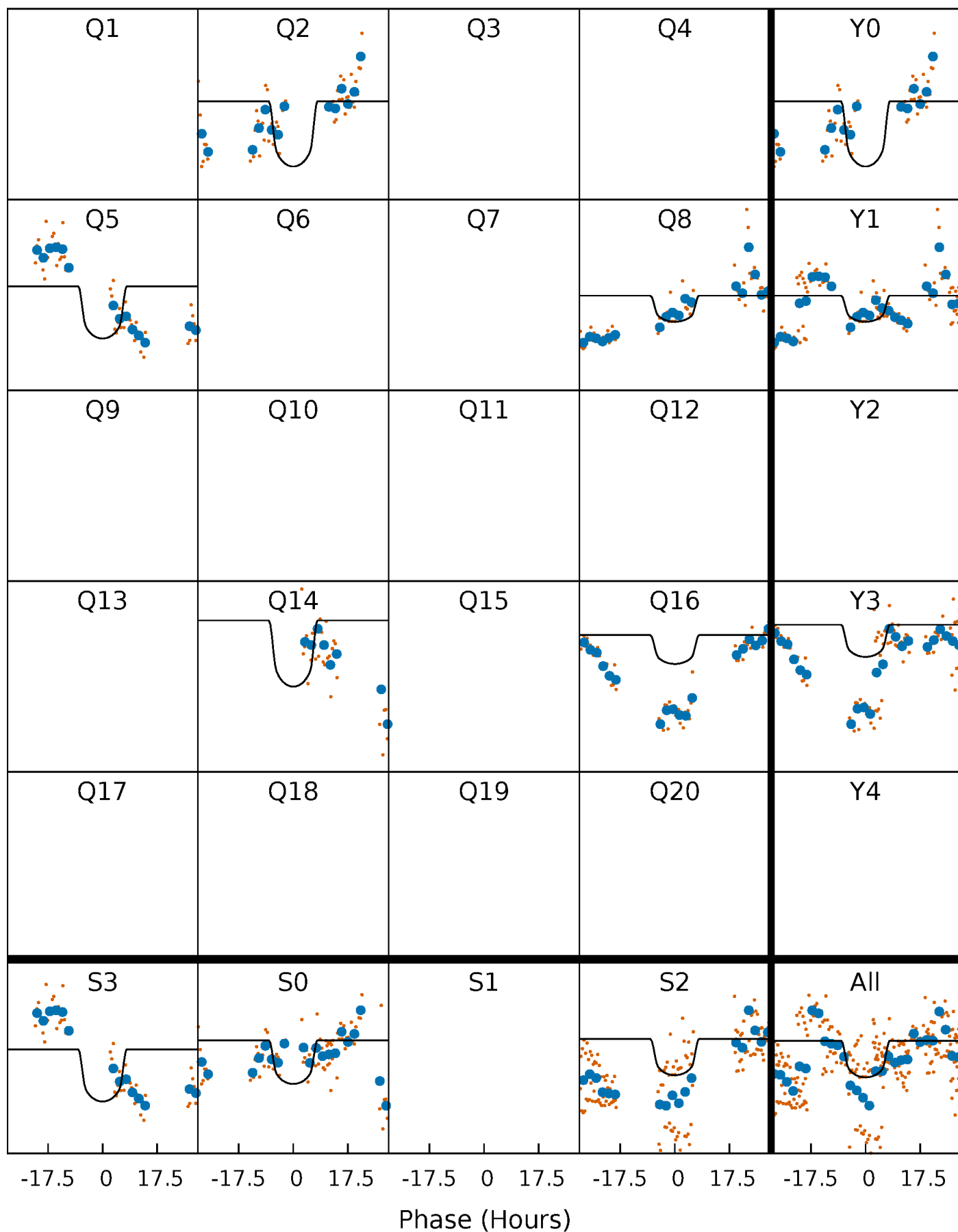
# PDC Quarter-Phased Transit Curves

TCE 008767669-02 P=259.258227 Days  $T_0=237.523756$  (BKJD)



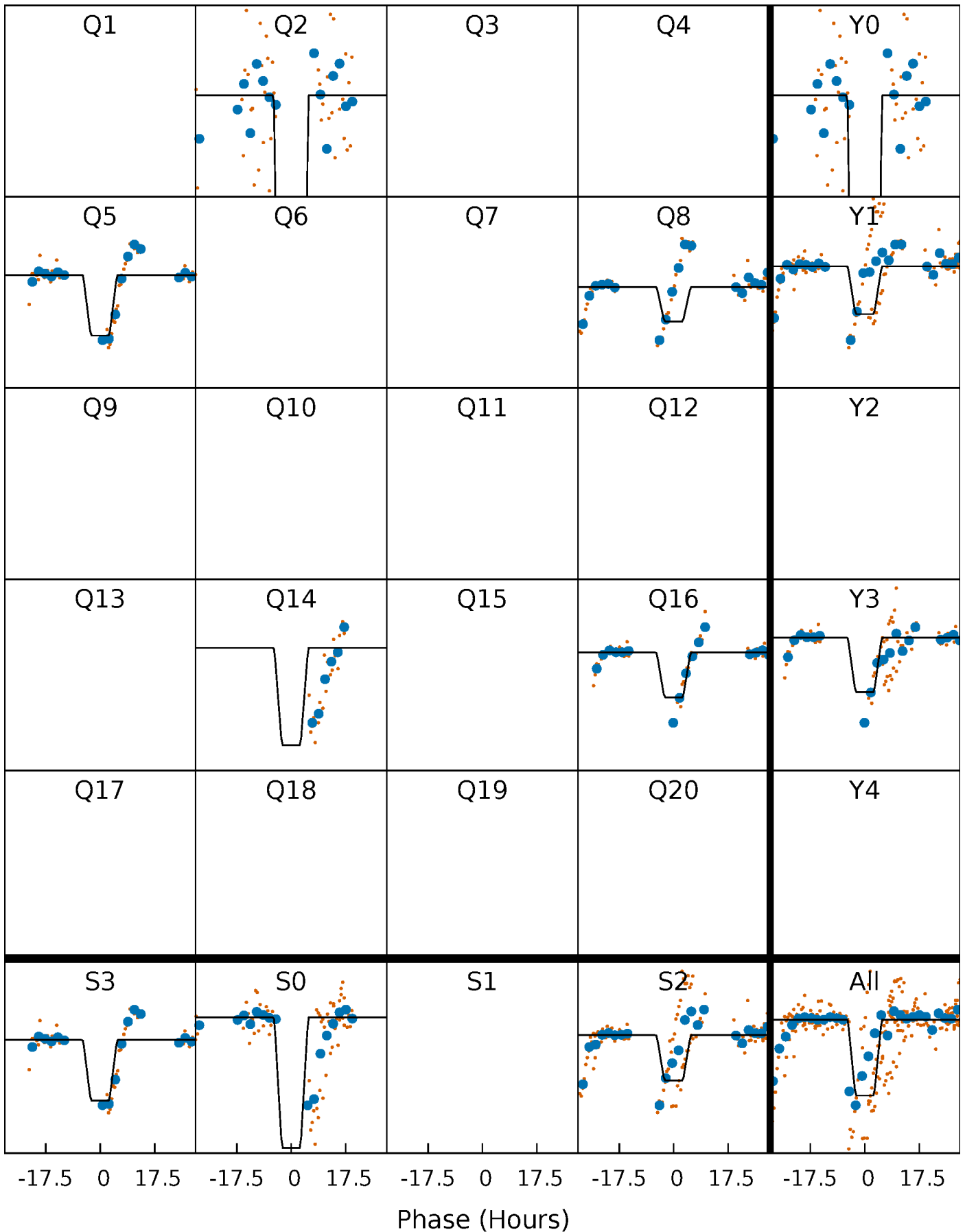
# DV Quarter-Phased Transit Curves

TCE 008767669-02     $P=259.258227$  Days     $T_0=237.523756$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

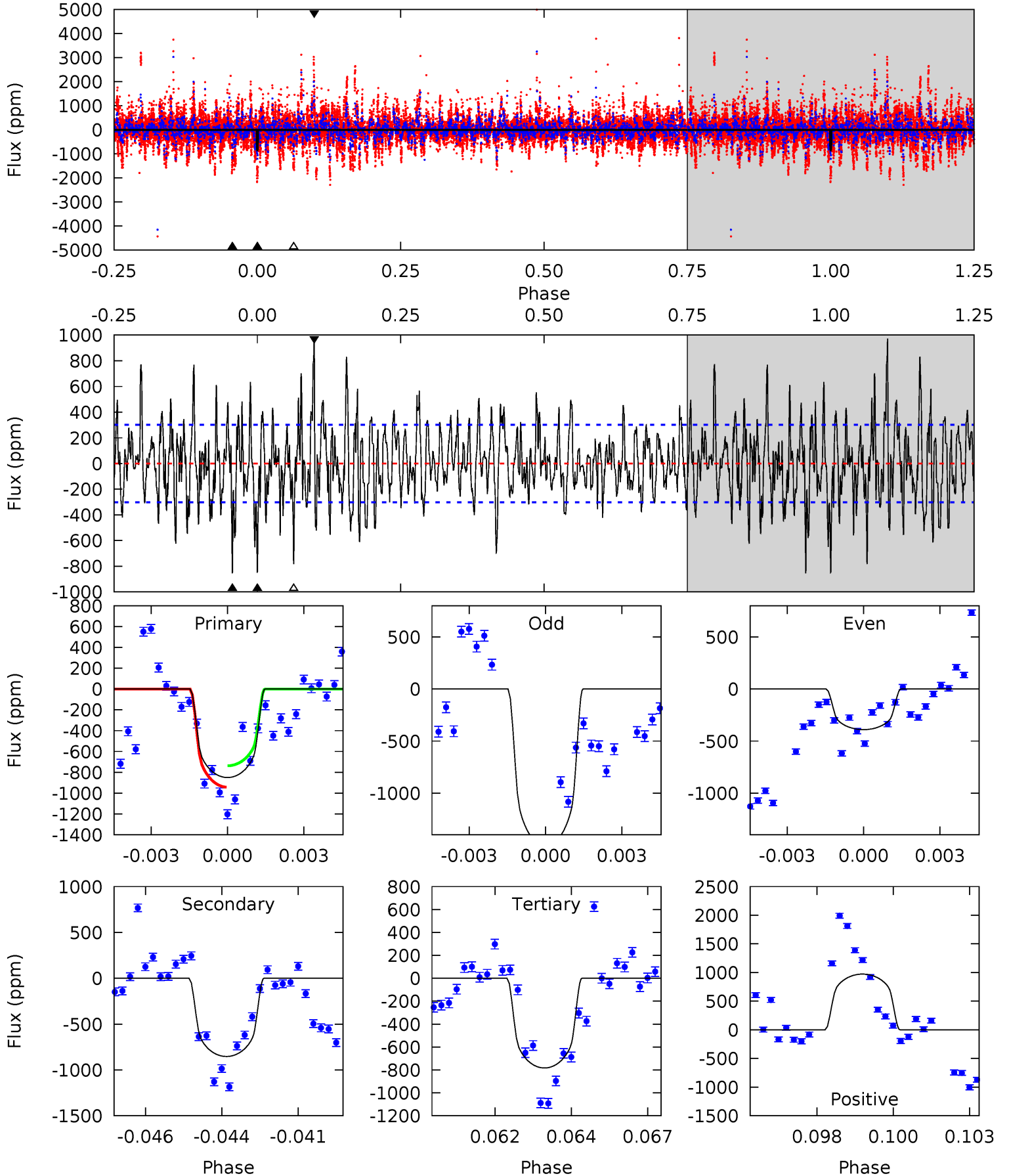
TCE 008767669-02 P=259.199709 Days  $T_0=237.631997$  (BKJD)



# DV Model-Shift Uniqueness Test

008767669-02, P = 259.258227 Days, E = 237.523756 Days

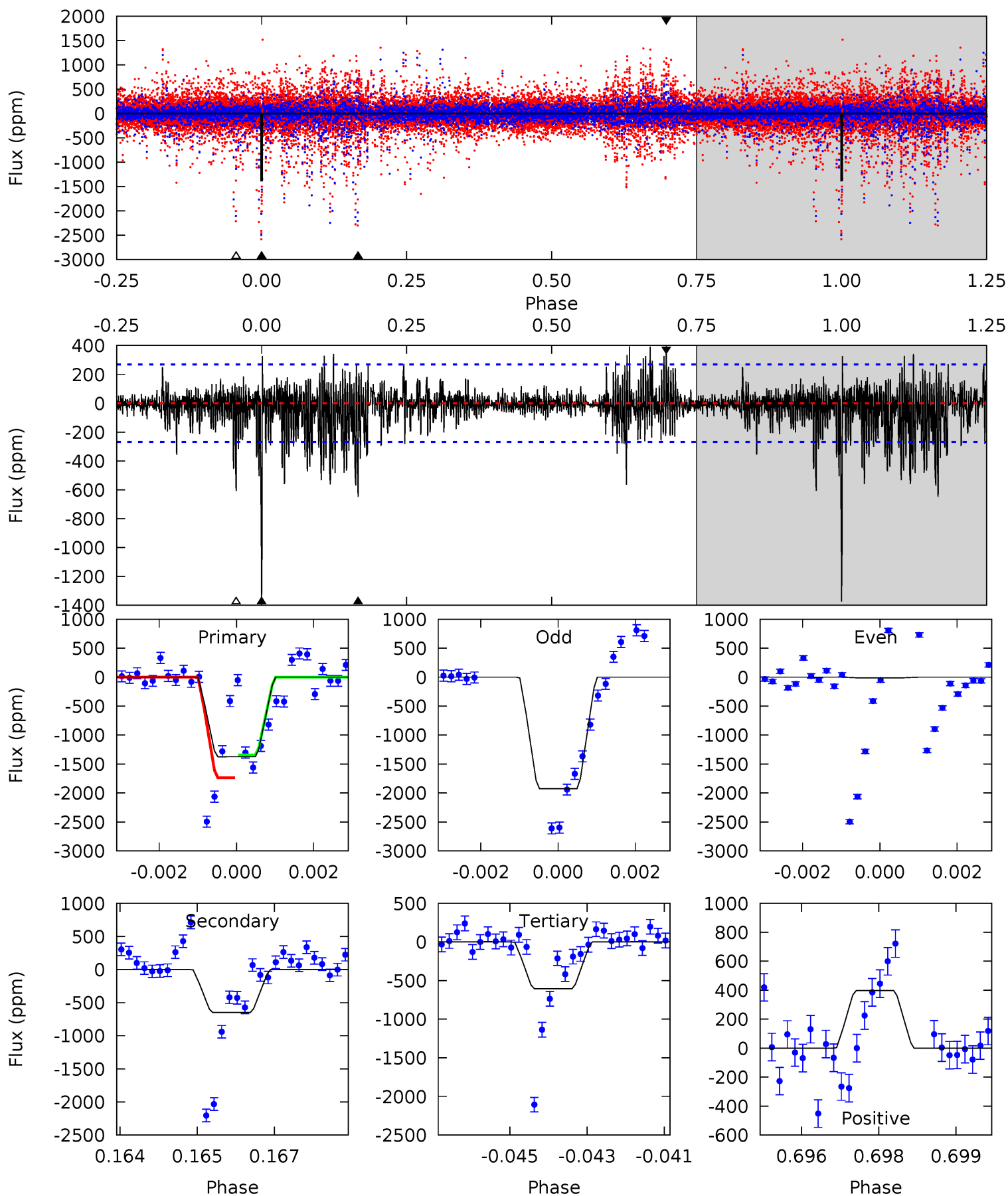
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.9 | 14.9 | 13.7 | 17.0 | 5.28            | 3.02            | 4.19             | 1.18    | -2.15   | 1.23    | -2.09   | 9.19    | 1.76 | 0.53  | 1.78 |



# Alt Model-Shift Uniqueness Test

008767669-02, P = 259.199709 Days, E = 237.631997 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 27.4 | 12.9 | 12.1 | 7.93 | 5.35            | 3.12            | 2.05             | 15.3    | 19.5    | 0.85    | 5.01    | 21.7    | 0.94 | 0.22  | 3.84 |





### Stellar Parameters For KIC 008767669

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $4338^{+129}_{-142}$ | $4.586^{+0.056}_{-0.017}$ | $0.320^{+0.150}_{-0.300}$ | $0.709^{+0.024}_{-0.057}$ | $0.708^{+0.036}_{-0.049}$ | $2.794^{+0.652}_{-0.202}$                 |
|        | +3%/-3%              | +1%/-0%                   | +47%/-94%                 | +3%/-8%                   | +5%/-7%                   | +23%/-7%                                  |
| Source | PHO1                 | KIC0                      | KIC0                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 008767669-02 / KOI

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$          |
|---------|---------------|------------------------|----------------------|----------------------|---------------------------|
| DV      | $-853 \pm 57$ | $2.22^{+0.35}_{-0.33}$ | $266^{+8}_{-10}$     | $4343^{+331}_{-254}$ | $48224^{+18687}_{-12504}$ |
| Alt.    | $-649 \pm 50$ | $3.14^{+0.36}_{-0.36}$ | $265^{+9}_{-9}$      | $3659^{+181}_{-163}$ | $18235^{+5543}_{-3593}$   |

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

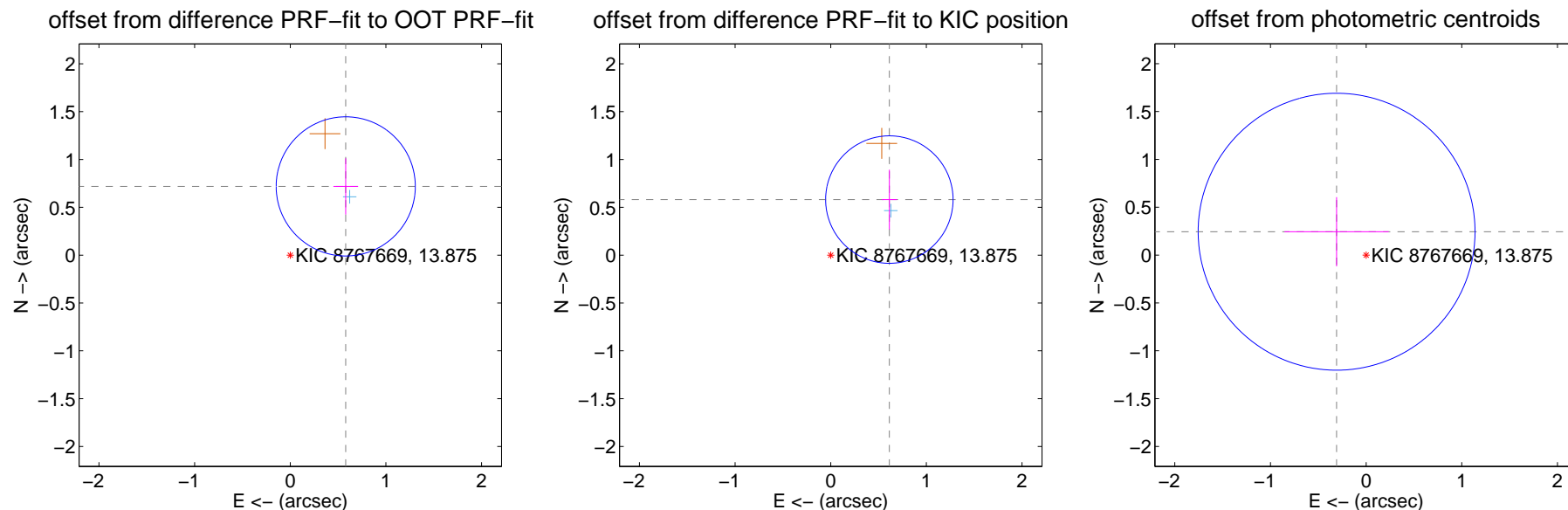
## DV Centroid Data

Supplemental centroid analysis for 008767669-02. Kepler magnitude: 13.88. Transit SNR 6.67

There are 1 quarters with good PRF difference image offsets

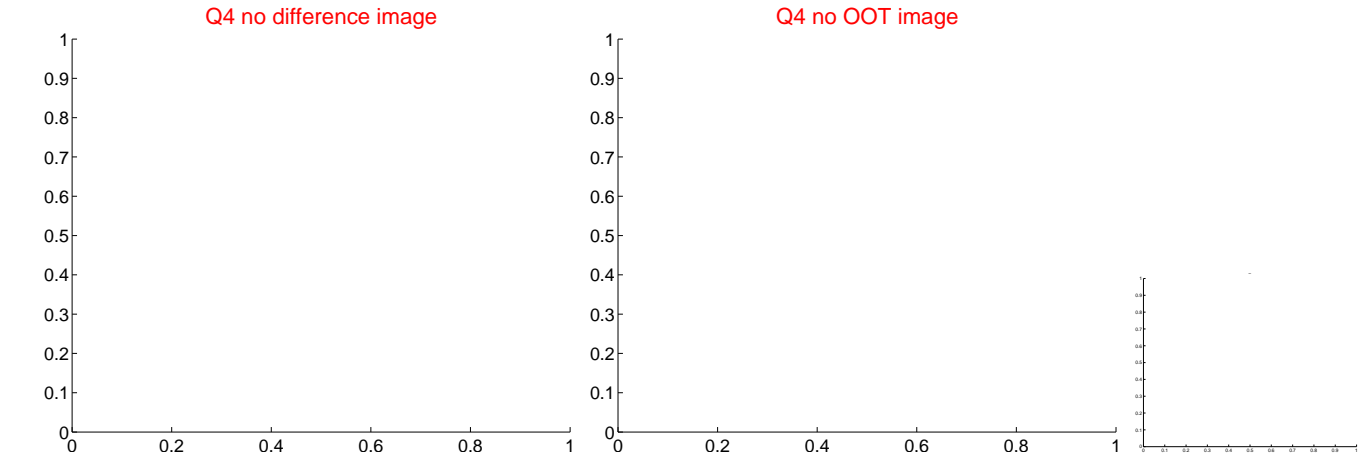
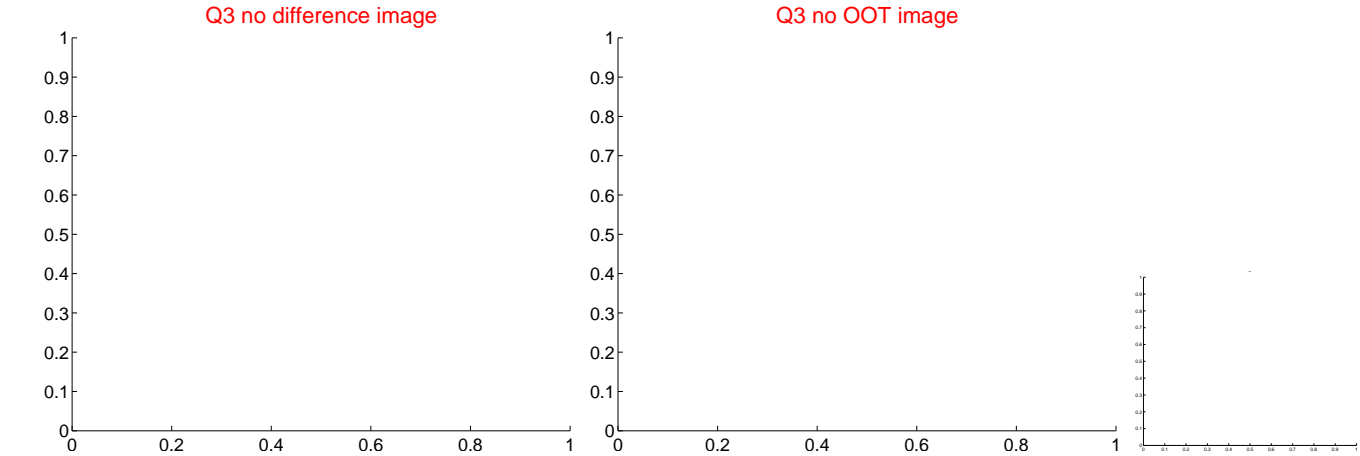
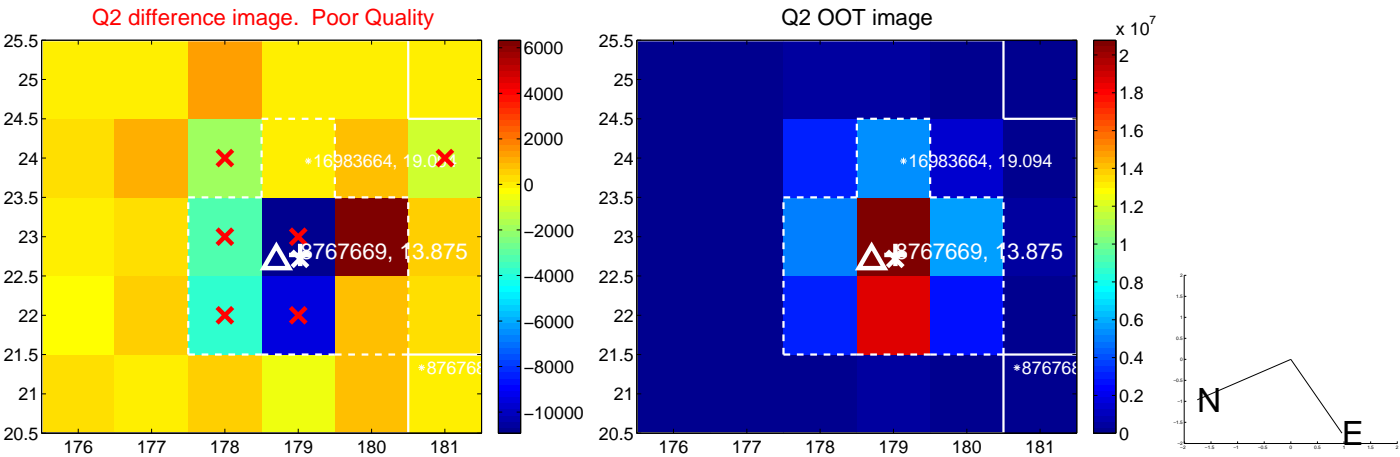
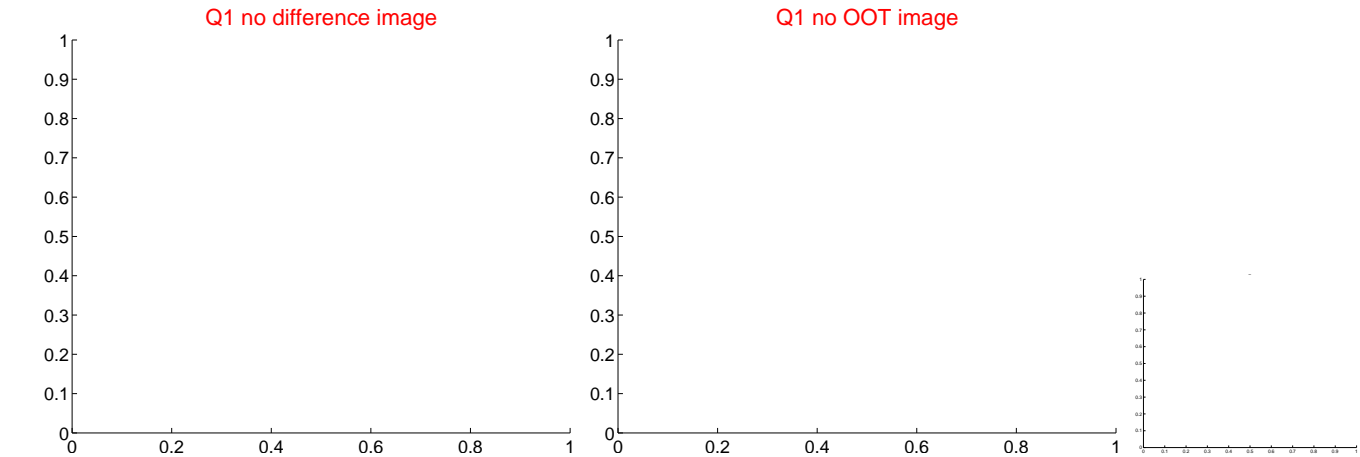
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | $0.924 \pm 0.242$  | 3.81                | $-0.580 \pm 0.129$ | $0.719 \pm 0.294$ |
| PRF-fit source offset from KIC position | $0.845 \pm 0.222$  | 3.80                | $-0.613 \pm 0.078$ | $0.581 \pm 0.312$ |
| photometric centroid source offset      | $0.39 \pm 0.48$    | 0.82                | $0.31 \pm 0.54$    | $0.24 \pm 0.36$   |

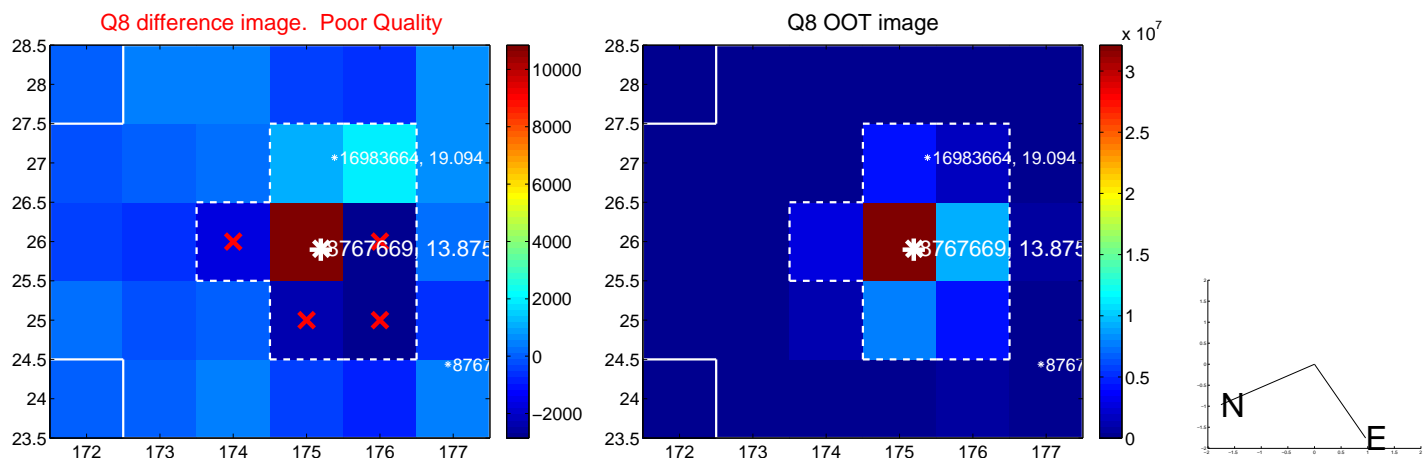
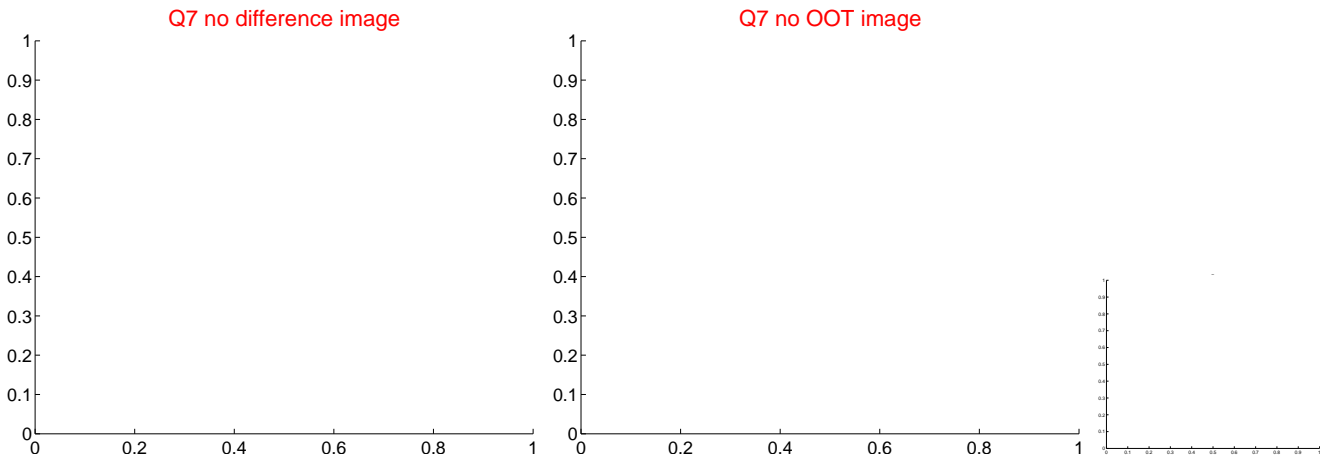
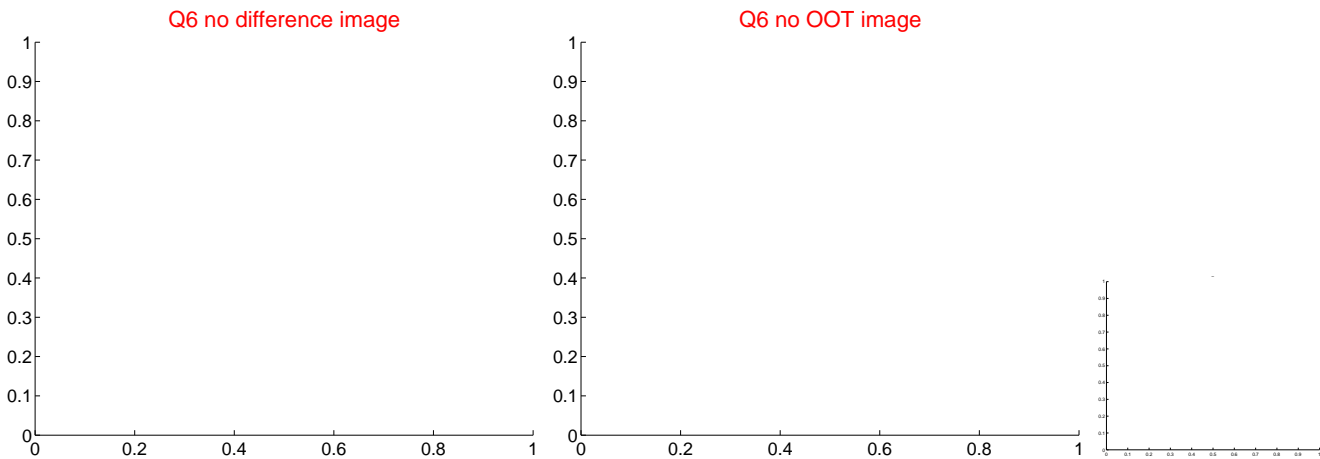
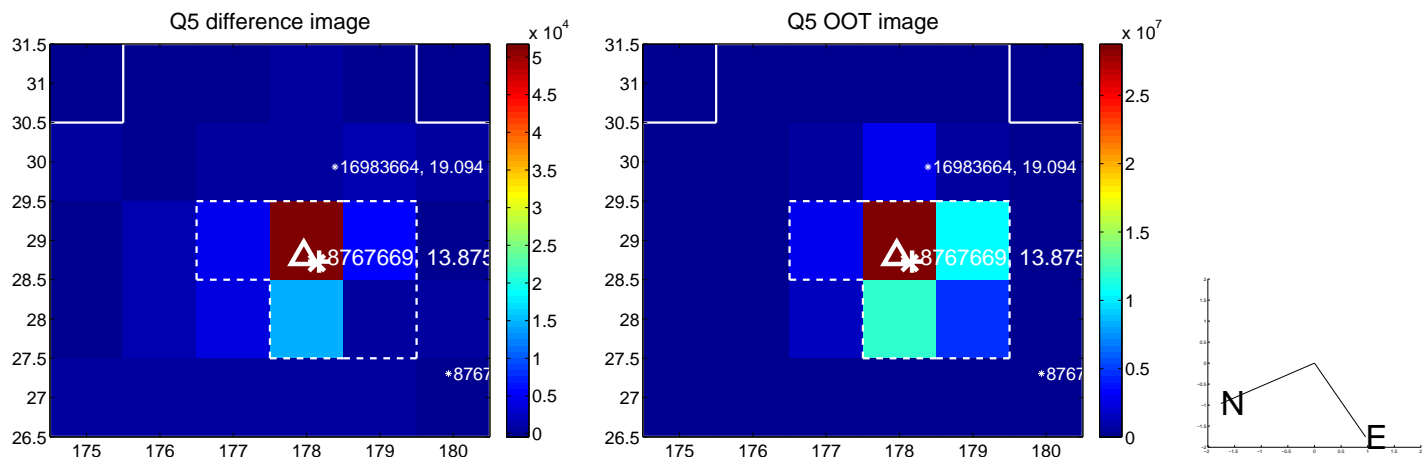


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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



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



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

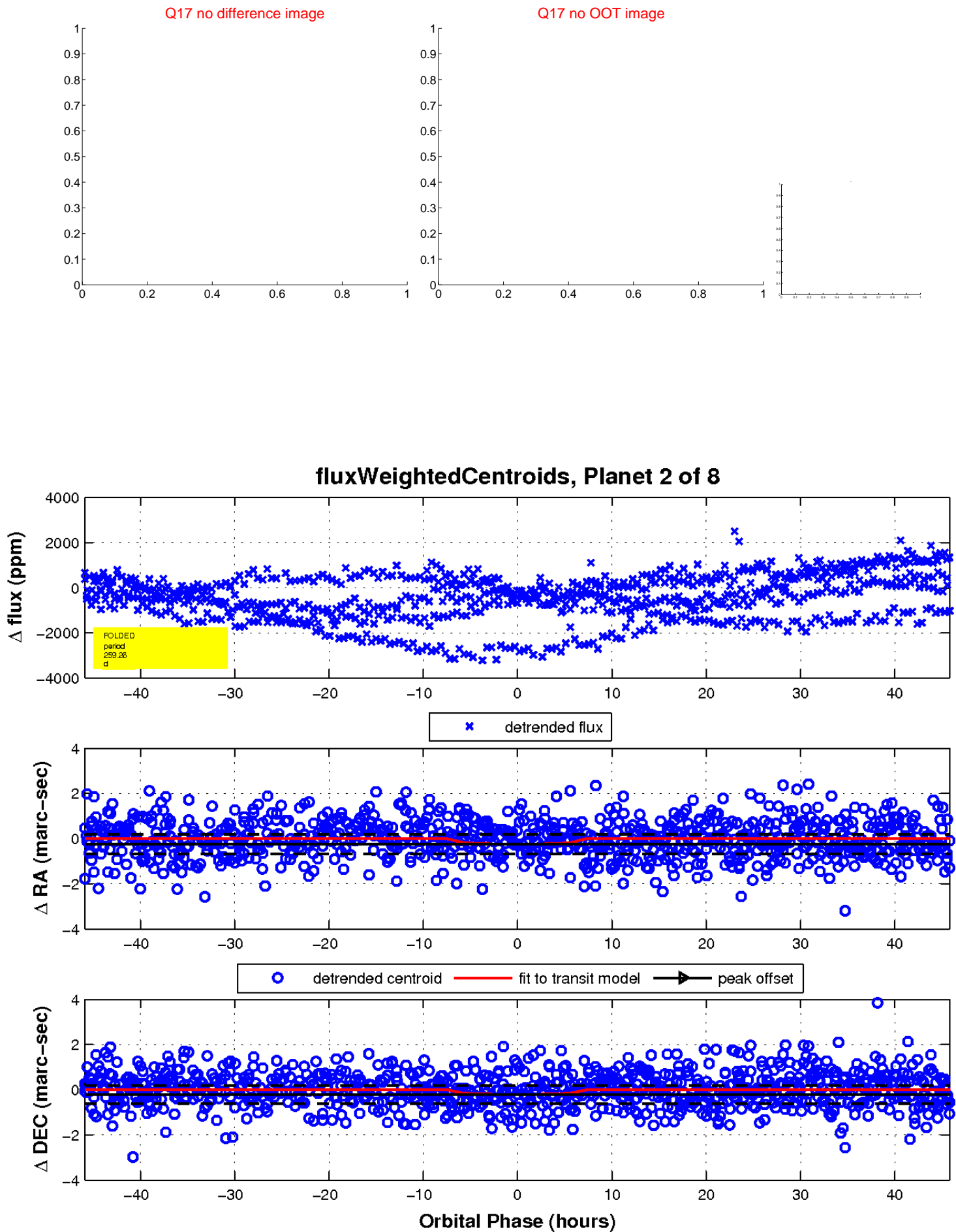


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



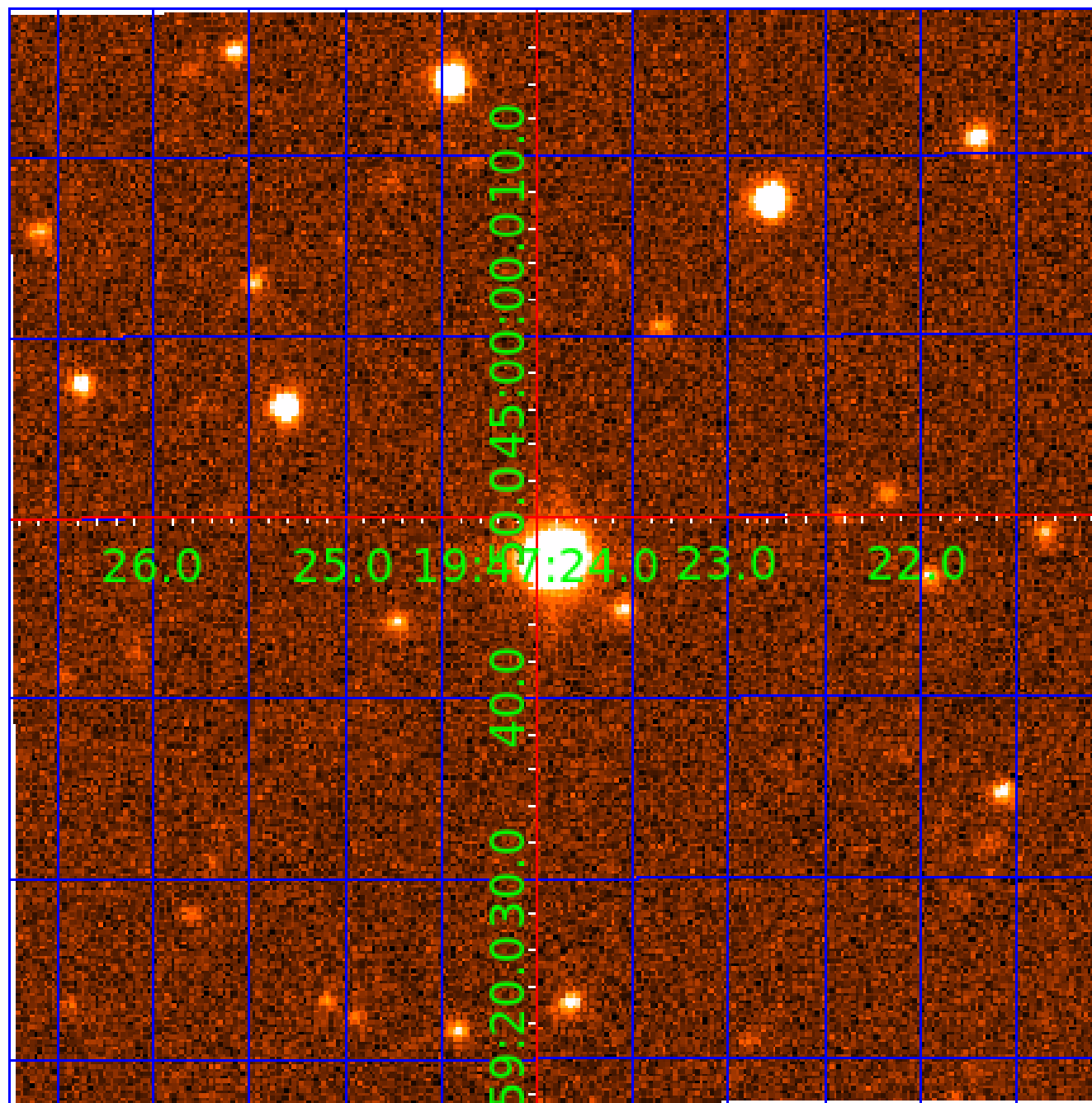


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008767669

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008767669-01 | OBS      | No   | 1.027454      | 131.866368   | 56.6        | 4.168            | 10.1 | 13.5 | 0.71                        | 4338            | 0.53                   | 505.98                 |
| 008767669-02 | OBS      | No   | 259.258227    | 237.523756   | 656.2       | 15.309           | 16.0 | 6.7  | 0.71                        | 4338            | 2.24                   | 0.32                   |
| 008767669-04 | OBS      | No   | 77.391894     | 168.038322   | 264.6       | 5.687            | 10.5 | 4.7  | 0.71                        | 4338            | 1.30                   | 1.59                   |
| 008767669-05 | OBS      | No   | 79.392159     | 186.894962   | 178.4       | 5.210            | 10.3 | 3.3  | 0.71                        | 4338            | 1.06                   | 1.54                   |
| 008767669-06 | OBS      | No   | 137.506101    | 148.977257   | 209.7       | 4.835            | 9.0  | 3.9  | 0.71                        | 4338            | 1.12                   | 0.74                   |
| 008767669-07 | OBS      | No   | 66.132688     | 149.768808   | 94.2        | 11.290           | 9.9  | 1.9  | 0.71                        | 4338            | 0.79                   | 1.96                   |
| 008767669-08 | OBS      | No   | 99.591749     | 151.043130   | 315.0       | 5.022            | 9.5  | 6.6  | 0.71                        | 4338            | 1.31                   | 1.14                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 008767669-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST           |
| 008767669-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT   |
| 008767669-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008767669-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 008767669-07 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-08 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT   |

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

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

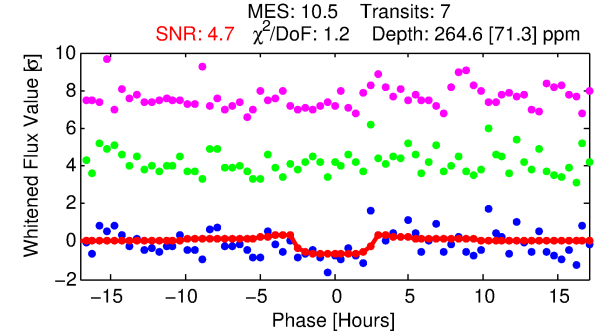
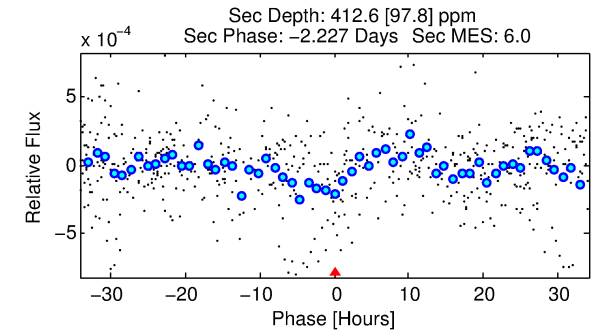
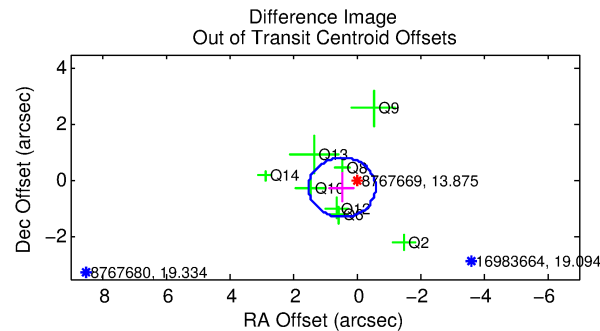
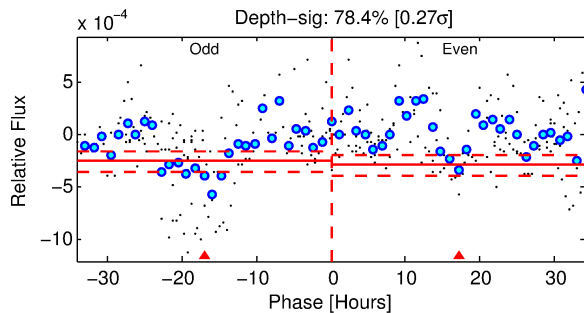
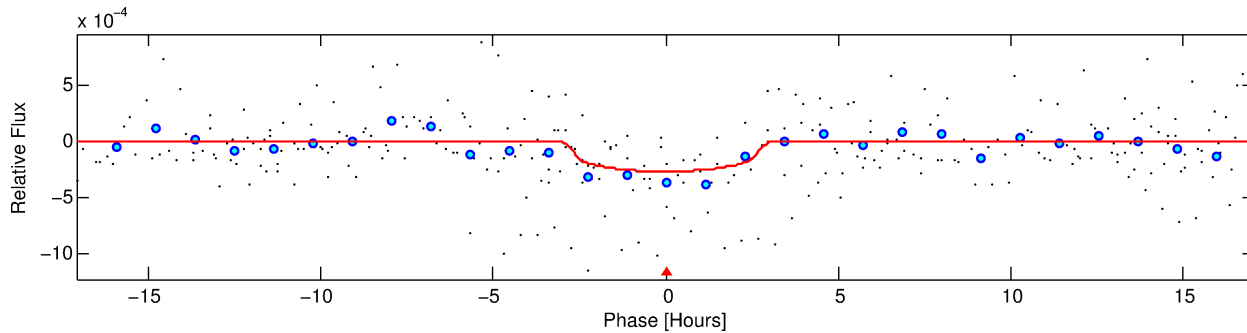
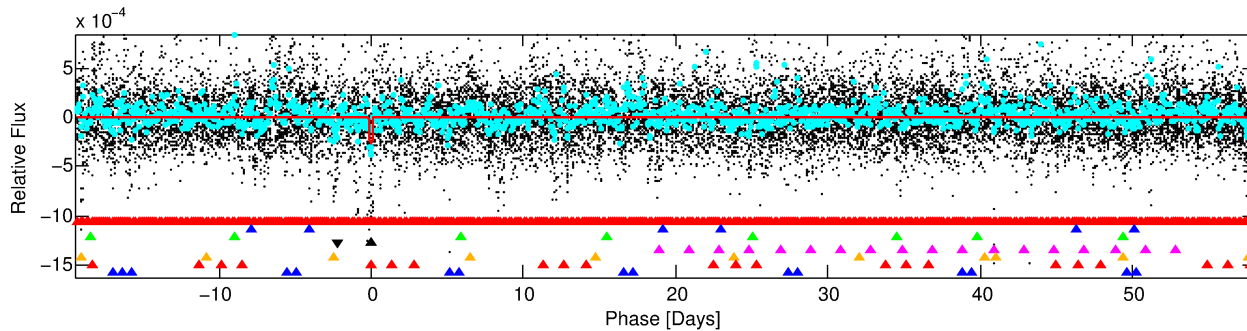
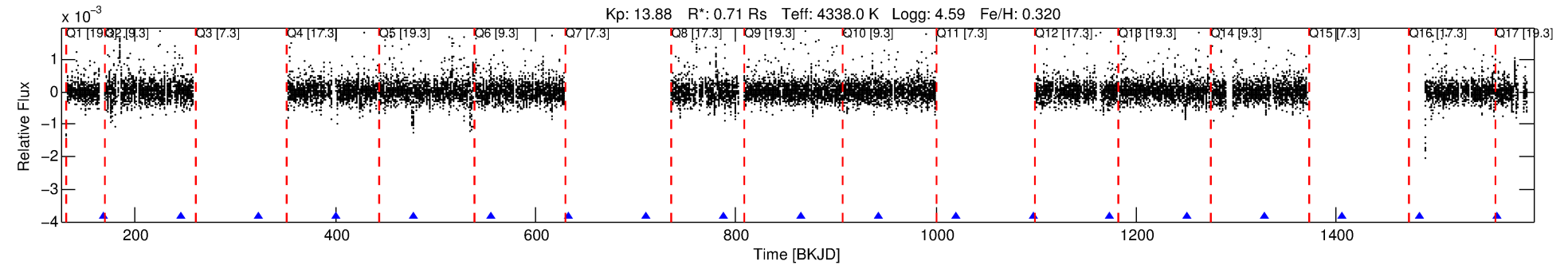
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008767669-04

No Significant Match Found

# DV One-Page Summary

KIC: 8767669 Candidate: 4 of 8 Period: 77.392 d



## DV Fit Results:

Period = 77.39189 [0.00221] d  
Epoch = 168.0383 [0.0197] BKJD  
Rp/R\* = 0.0168 [0.0192]  
a/R\* = 66.23 [239.46]  
b = 0.79 [1.75]  
Seff = 1.59 [0.26]  
Teq = 286 [12] K  
Rp = 1.30 [1.49] Re  
a = 0.3167 [0.0218] AU  
Ag = 13546.80 [31295.42] [0.43 $\sigma$ ]  
Teffp = 4777 [2760] K [1.63 $\sigma$ ]

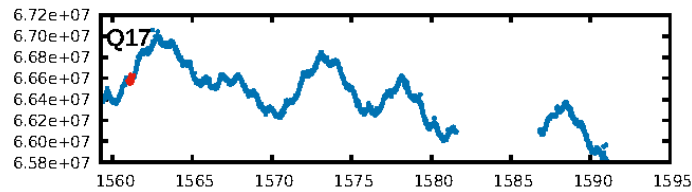
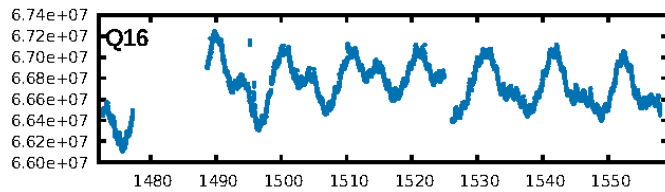
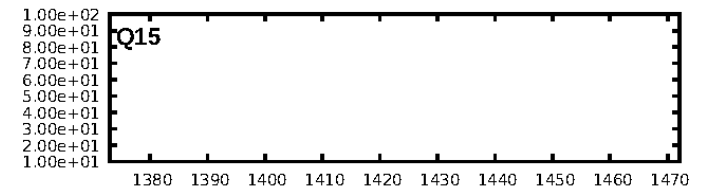
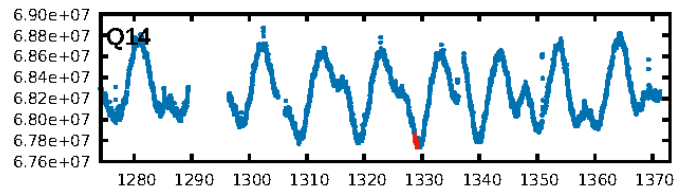
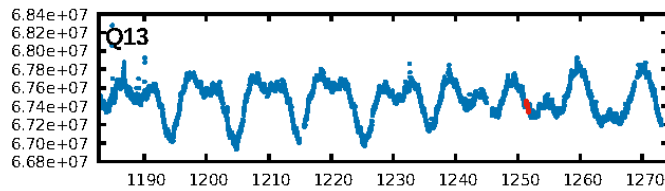
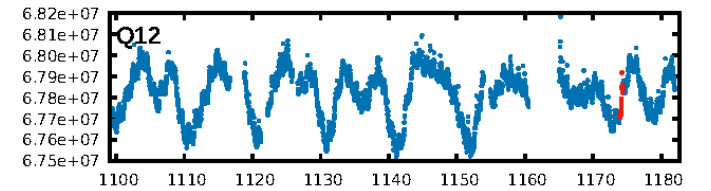
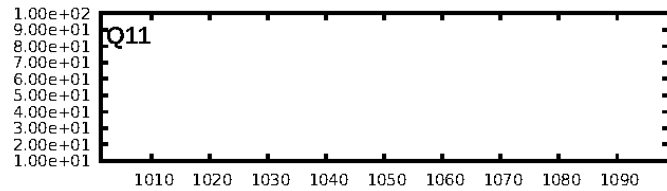
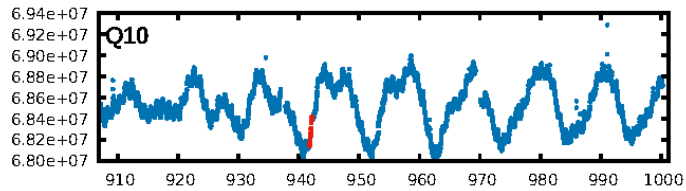
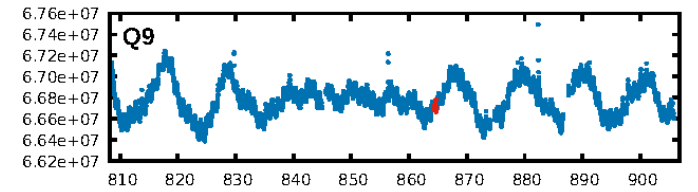
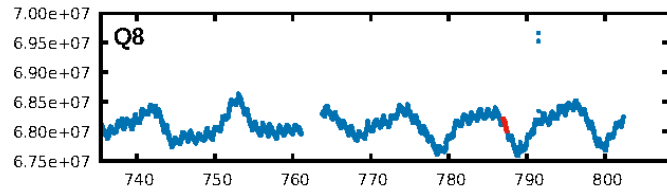
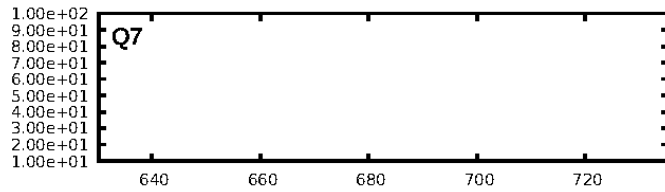
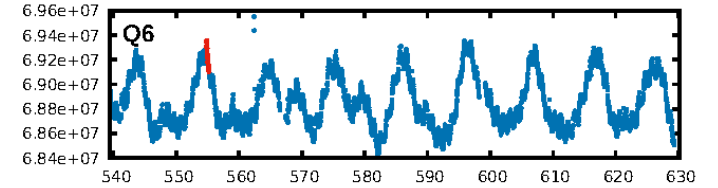
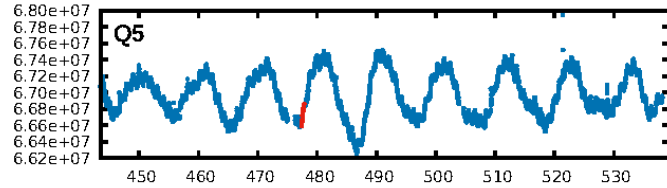
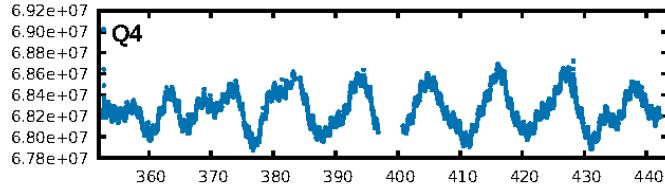
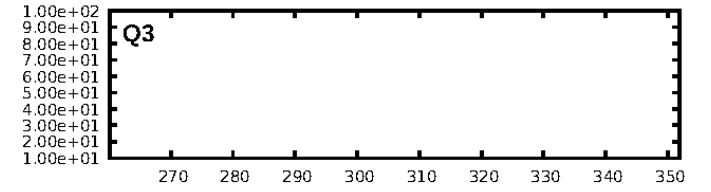
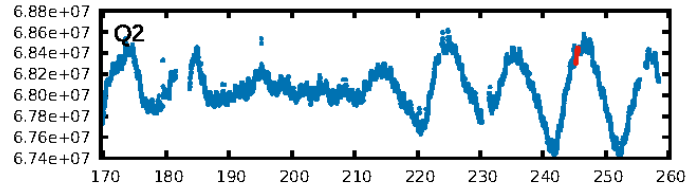
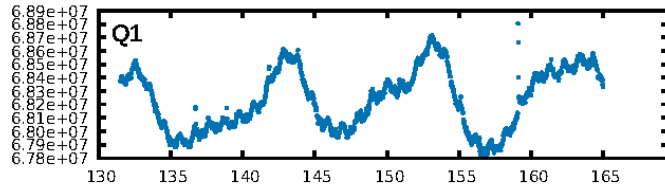
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [21.38 $\sigma$ ]  
LongPeriod-sig: 100.0% [6.22 $\sigma$ ]  
ModelChiSquare2-sig: 59.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.02e-16  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: -0.4876  
Centroid-sig: 60.4%  
Centroid-so: 0.741 arcsec [0.68 $\sigma$ ]  
OotOffset-rm: 0.516 arcsec [1.46 $\sigma$ ]  
OotOffset-st: 4/0/2/2 [8]  
KicOffset-rm: 0.503 arcsec [1.25 $\sigma$ ]  
KicOffset-st: 4/0/2/2 [8]  
DiffImageQuality-fgm: 0.25 [2/8]  
DiffImageOverlap-fno: 0.00 [0/8]

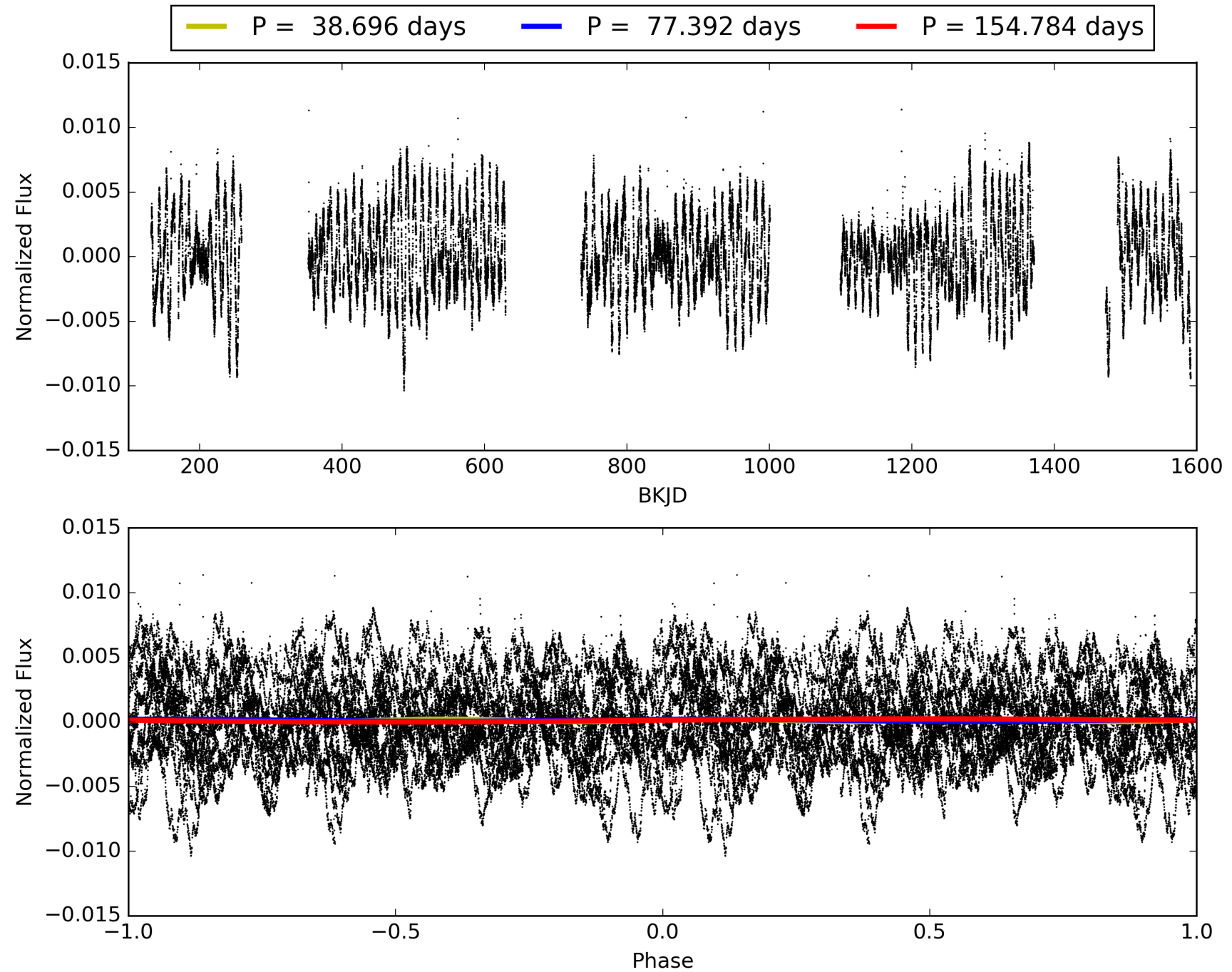
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:56:46 Z

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

# TCE 008767669-04, PDC Light Curves



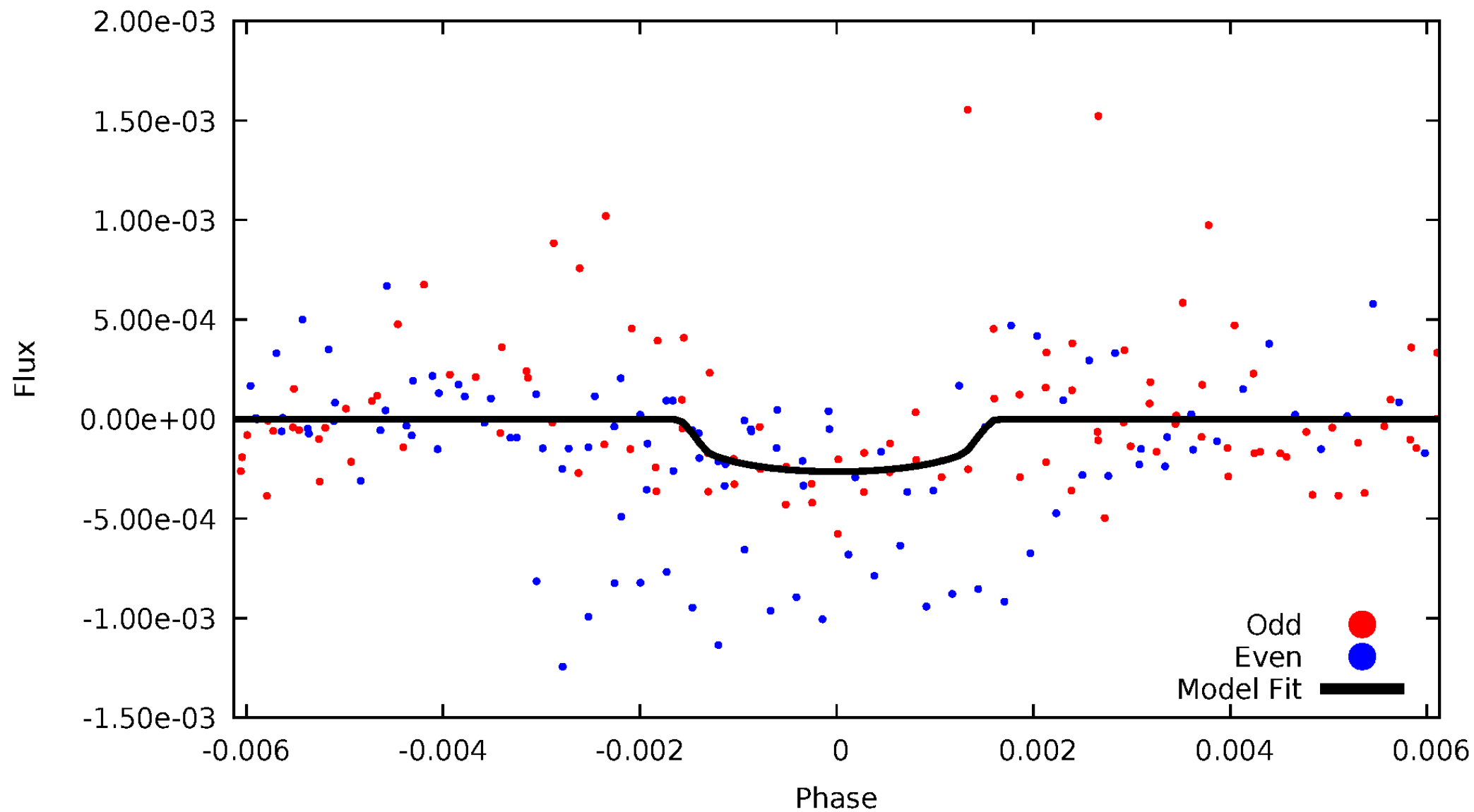
# TCE 008767669-04





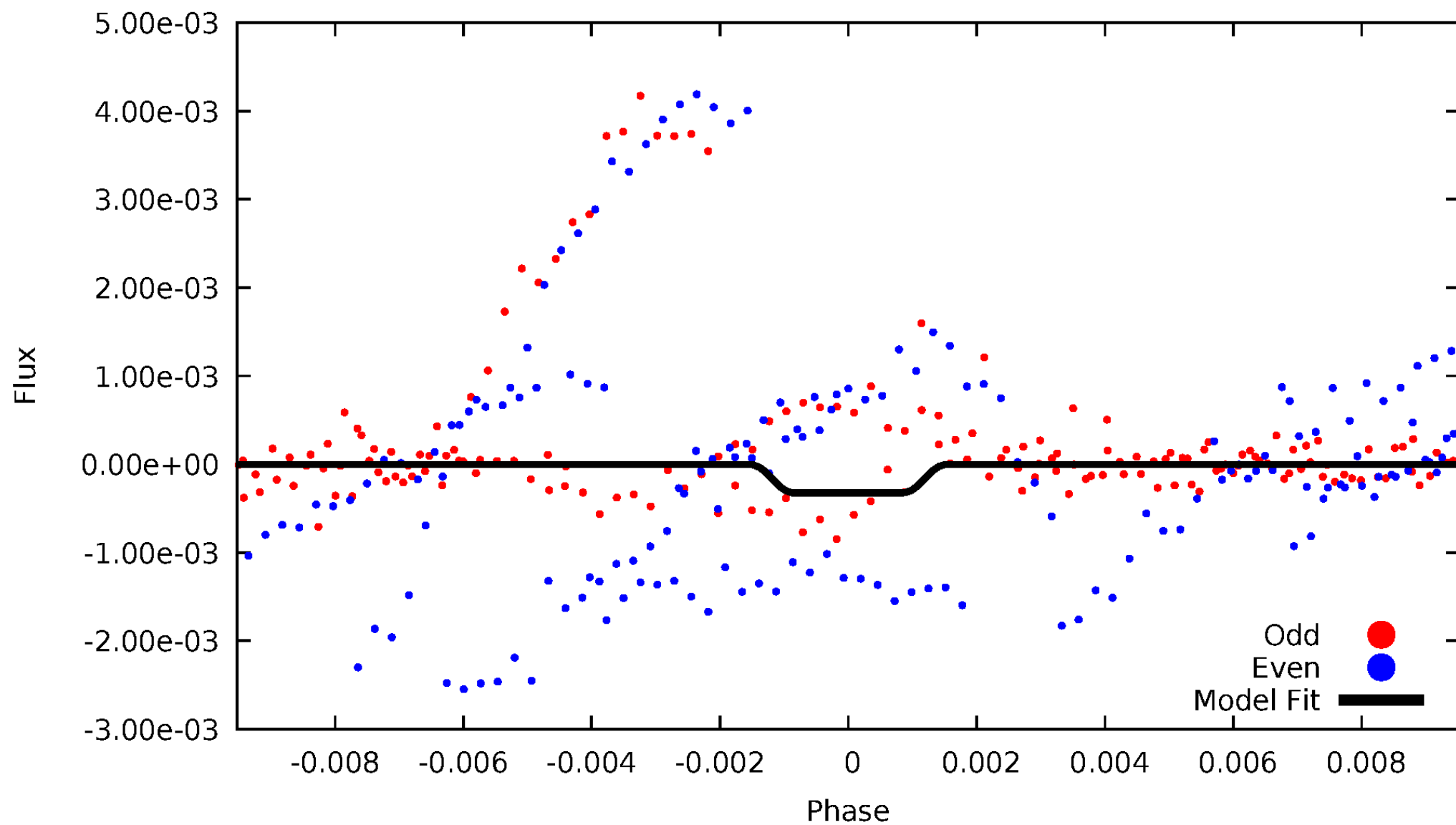
# DV Odd/Even

TCE 008767669-04



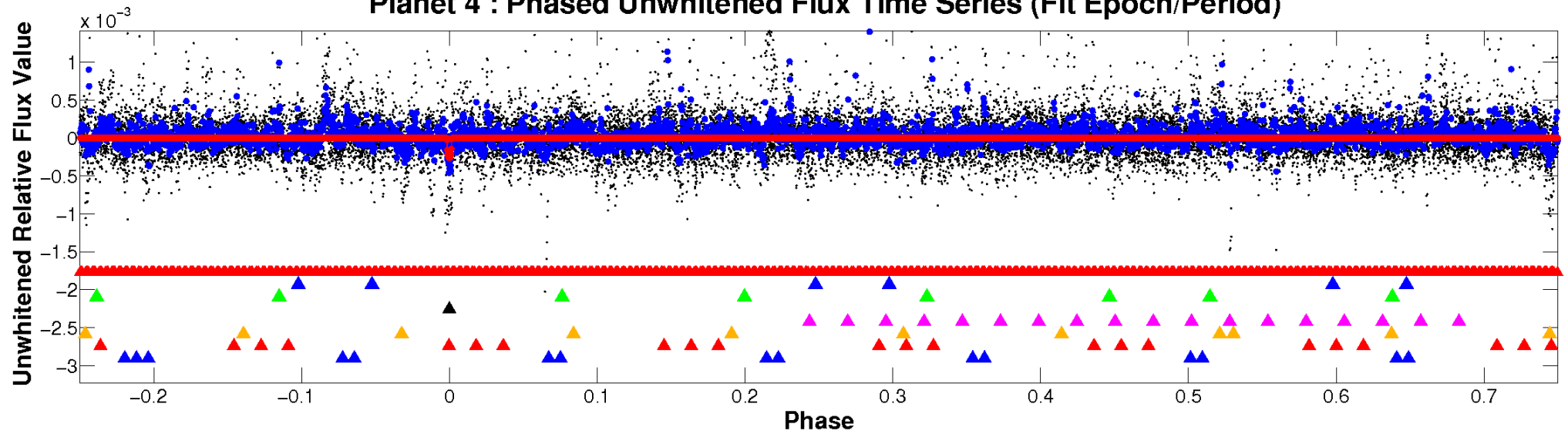
# ALT Odd/Even

TCE 008767669-04

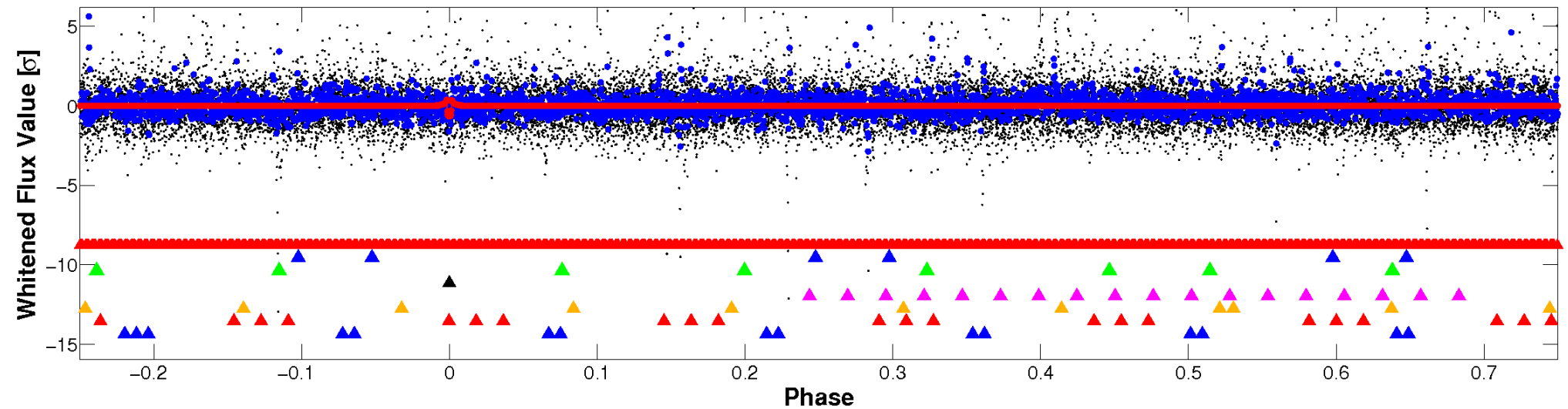


# Non-Whitened Vs. Whitened Light Curve

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

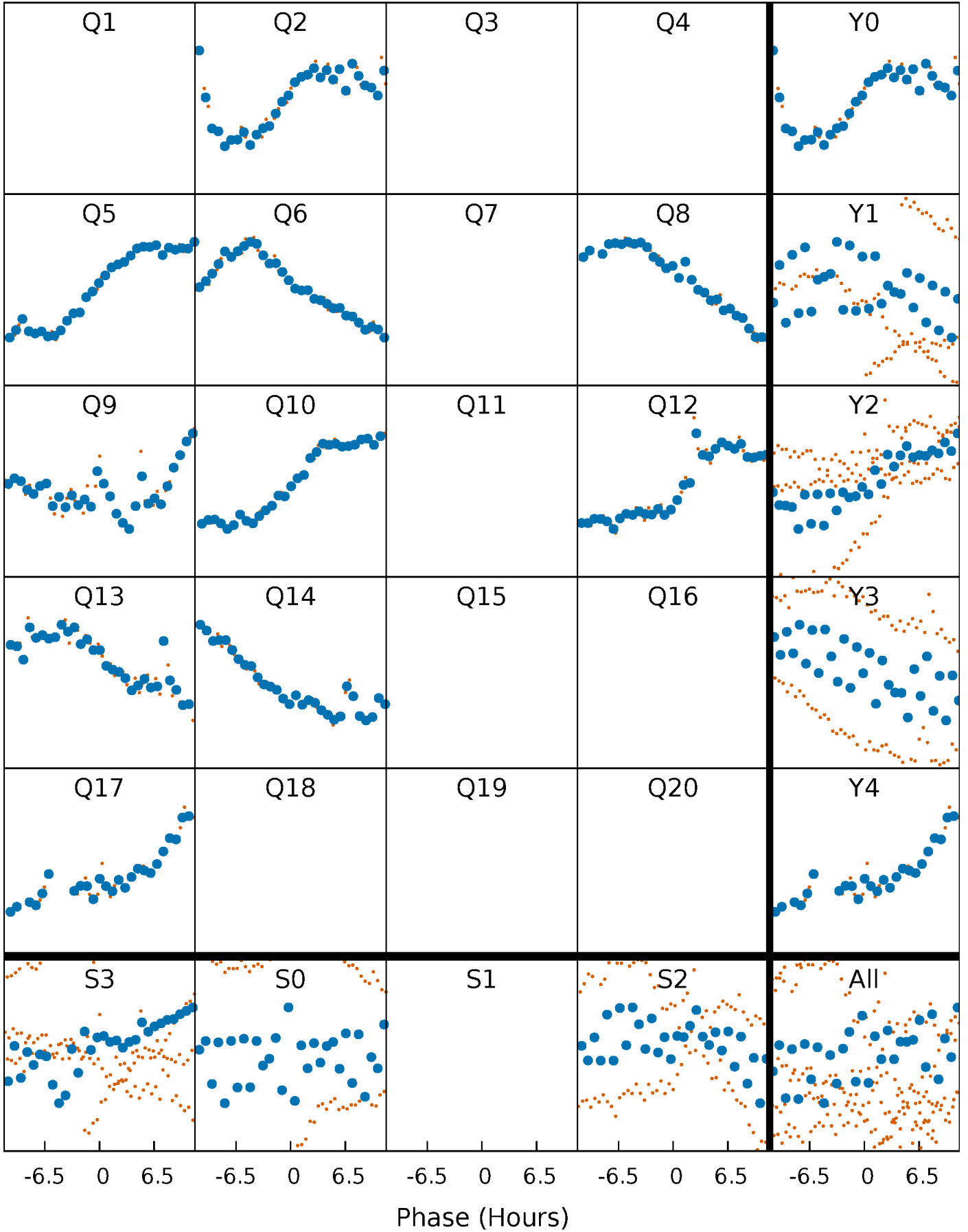


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



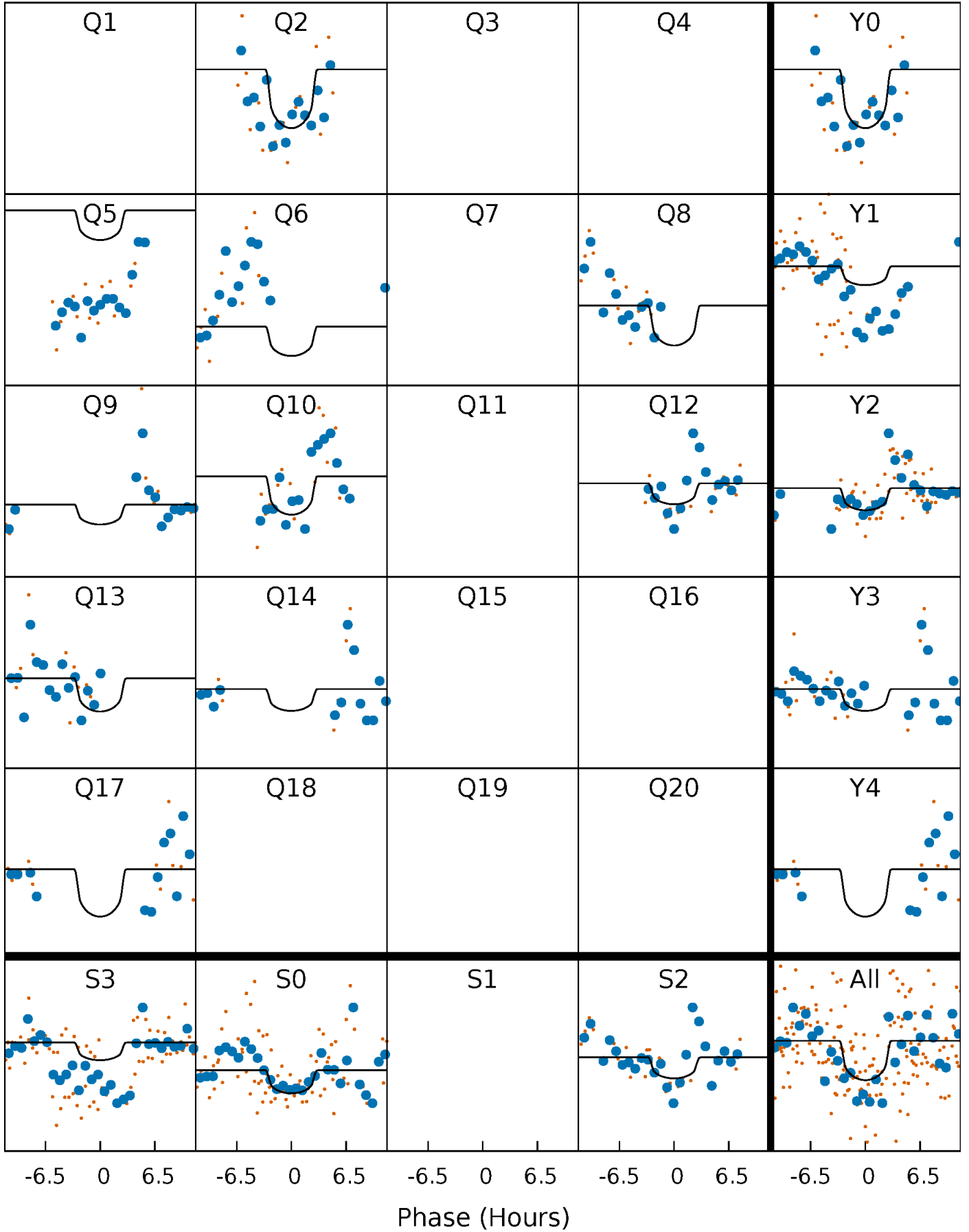
# PDC Quarter-Phased Transit Curves

TCE 008767669-04   P= 77.391894 Days    $T_0=168.038322$  (BKJD)



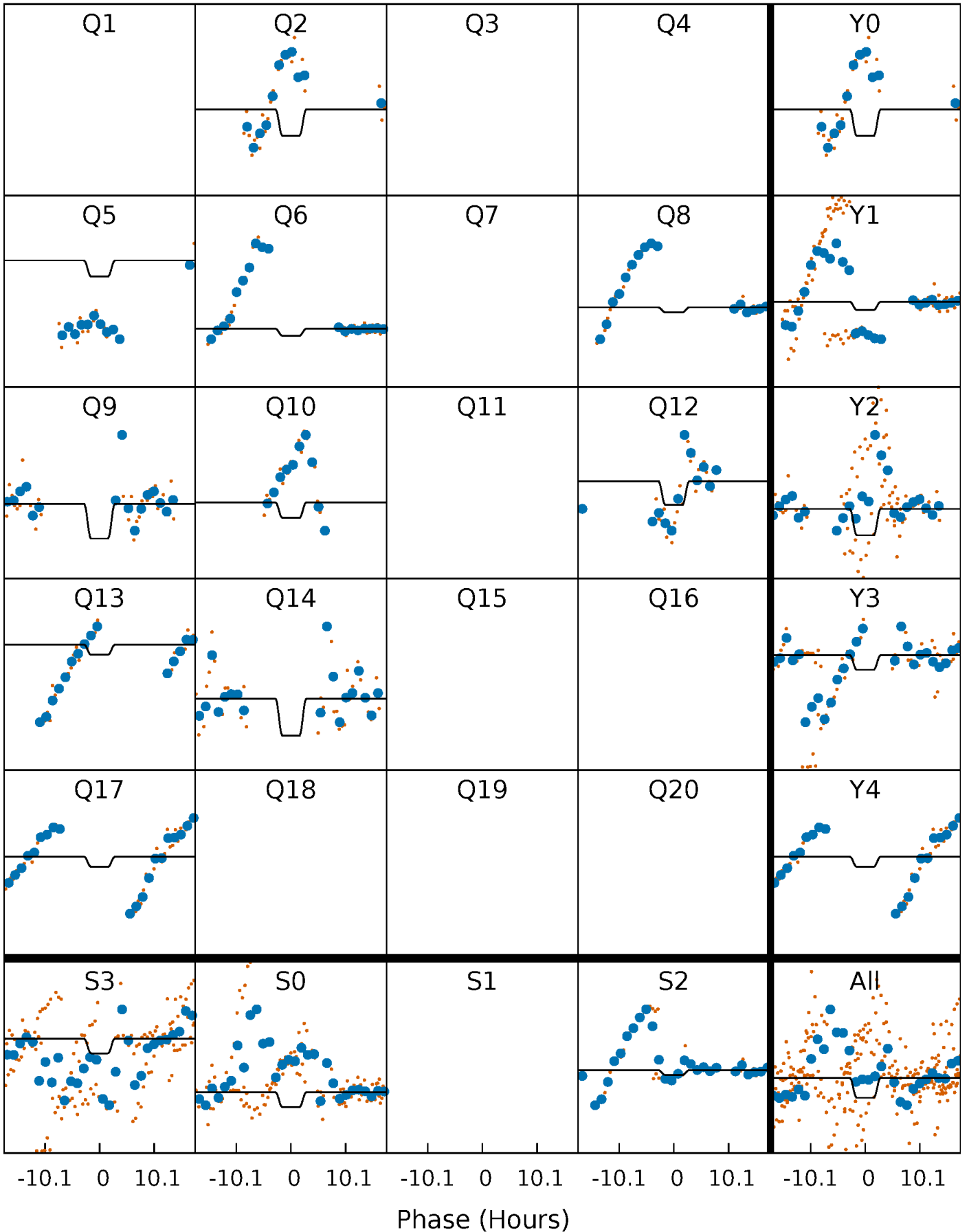
# DV Quarter-Phased Transit Curves

TCE 008767669-04   P= 77.391894 Days    $T_0=168.038322$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

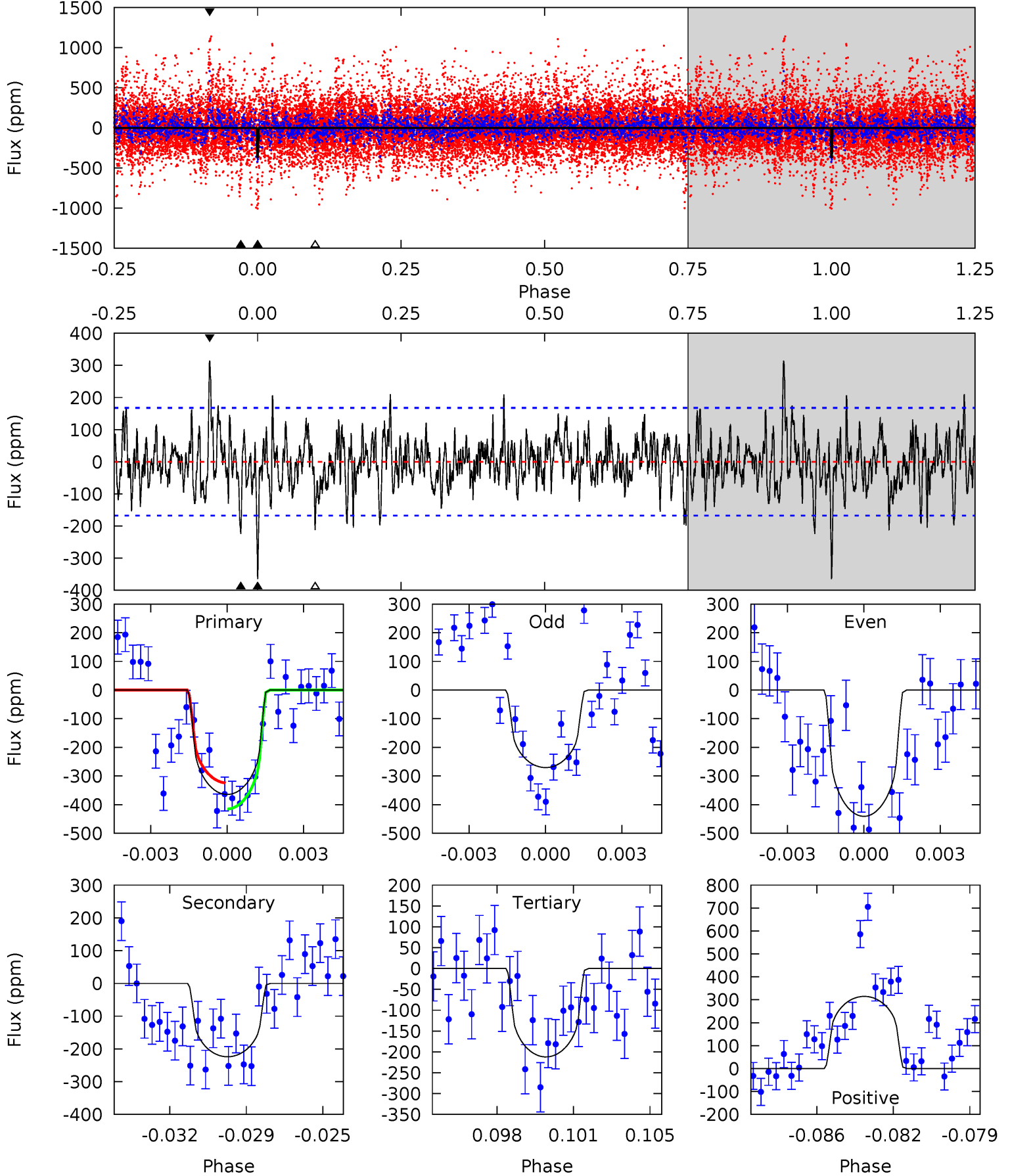
TCE 008767669-04     $P = 77.385074$  Days     $T_0 = 168.141722$  (BKJD)



# DV Model-Shift Uniqueness Test

008767669-04, P = 77.391894 Days, E = 90.646428 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.4 | 7.00 | 6.63 | 9.84 | 5.24            | 2.95            | 1.97             | 4.77    | 1.56    | 0.37    | -2.83   | 2.58    | 1.19 | 0.46  | 1.42 |

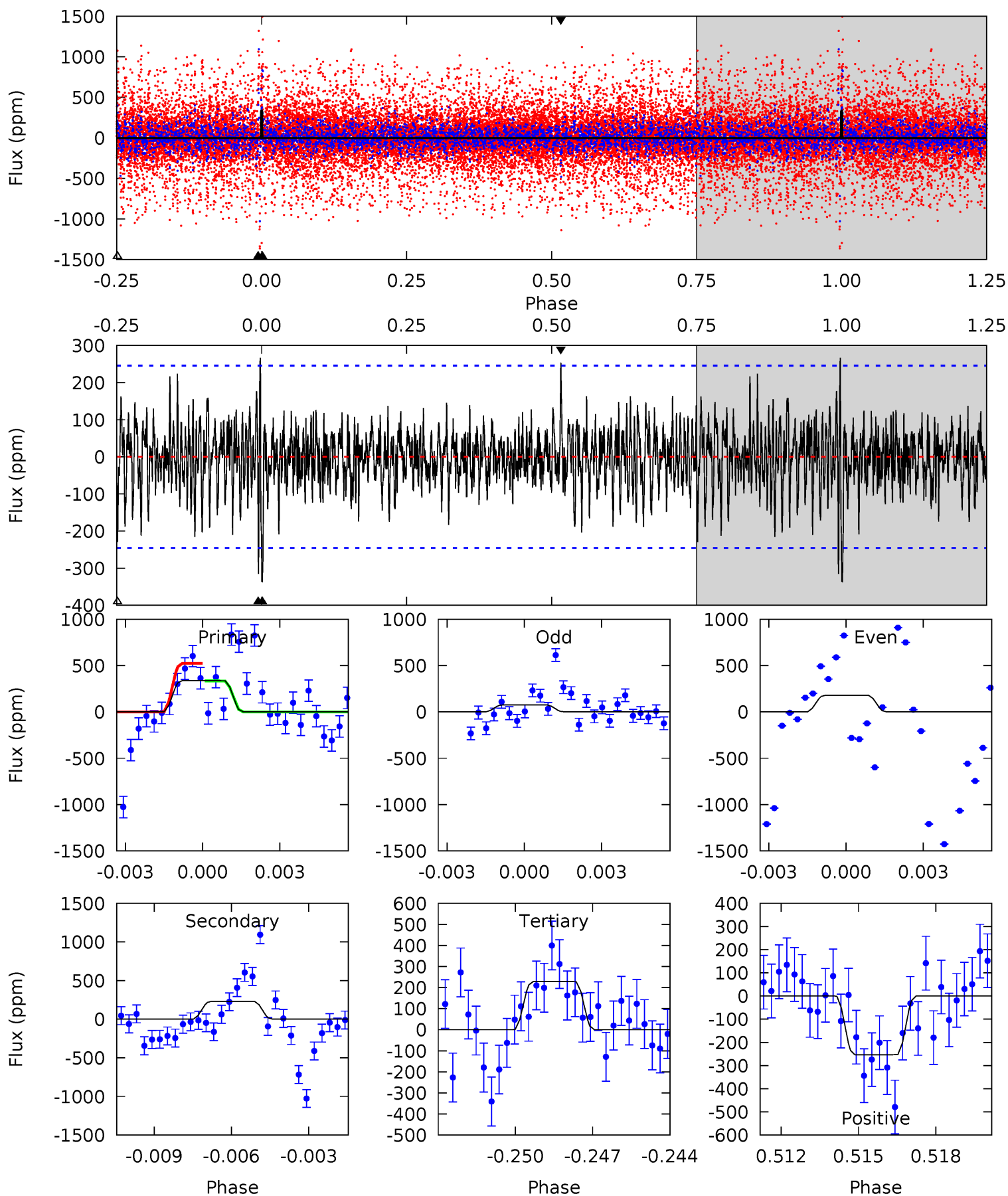




# Alt Model-Shift Uniqueness Test

008767669-04, P = 77.385074 Days, E = 90.756648 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.22 | 4.97 | 4.90 | 5.42 | 5.25            | 2.97            | 1.41             | 2.32    | 1.80    | 0.08    | -0.45   | 1.14    | 0.08 | 0.44  | 1.96 |



### Stellar Parameters For KIC 008767669

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $4338^{+129}_{-142}$ | $4.586^{+0.056}_{-0.017}$ | $0.320^{+0.150}_{-0.300}$ | $0.709^{+0.024}_{-0.057}$ | $0.708^{+0.036}_{-0.049}$ | $2.794^{+0.652}_{-0.202}$                 |
|        | +3%/-3%              | +1%/-0%                   | +47%/-94%                 | +3%/-8%                   | +5%/-7%                   | +23%/-7%                                  |
| Source | PHO1                 | KIC0                      | KIC0                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 008767669-04 / KOI

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$  | $A_{\text{obs}}$        |
|---------|---------------|------------------------|----------------------|-----------------------|-------------------------|
| DV      | $-224 \pm 32$ | $1.72^{+1.31}_{-1.07}$ | $398^{+12}_{-15}$    | $3710^{+1807}_{-569}$ | $4081^{+24573}_{-2701}$ |
| Alt.    | $-233 \pm 47$ | $1.72^{+1.23}_{-1.06}$ | $397^{+14}_{-14}$    | $3781^{+1658}_{-621}$ | $4449^{+24501}_{-2994}$ |

$T_{\text{max}}$  = 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

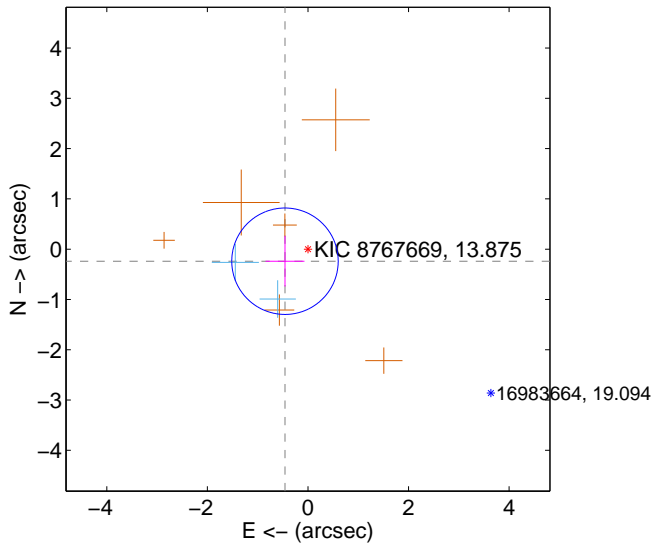
Supplemental centroid analysis for 008767669-04. Kepler magnitude: 13.88. Transit SNR 4.70

There are 2 quarters with good PRF difference image offsets

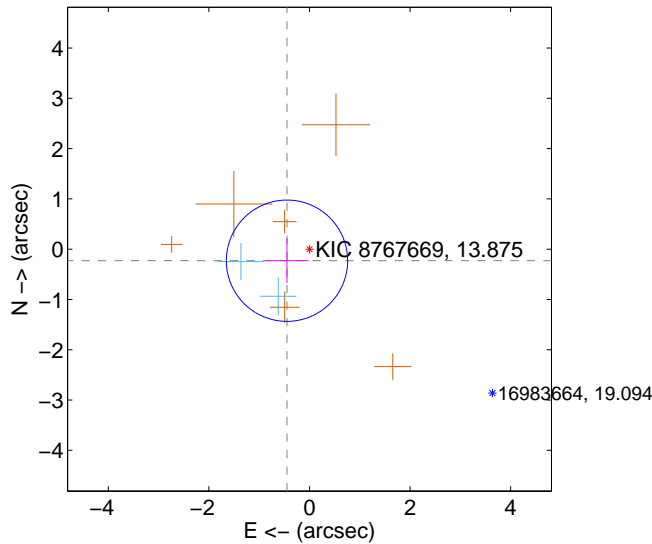
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.516 \pm 0.353$  | 1.46                | $0.457 \pm 0.387$ | $-0.240 \pm 0.504$ |
| PRF-fit source offset from KIC position | $0.503 \pm 0.402$  | 1.25                | $0.447 \pm 0.428$ | $-0.230 \pm 0.445$ |
| photometric centroid source offset      | $0.74 \pm 1.09$    | 0.68                | $-0.68 \pm 1.11$  | $0.29 \pm 0.94$    |

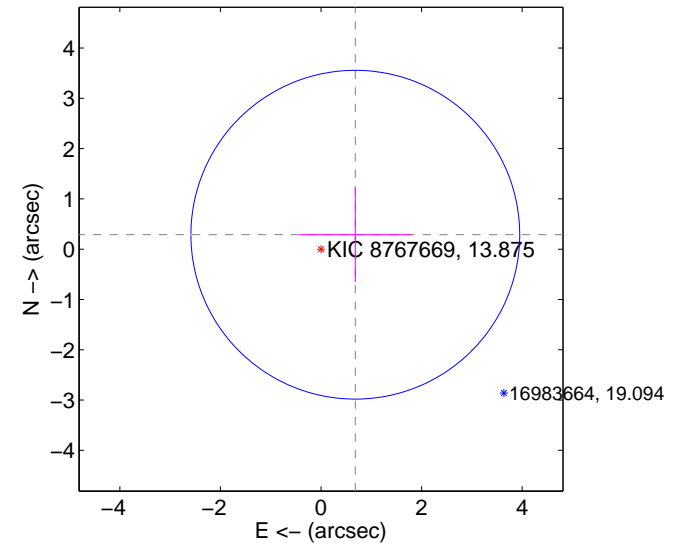
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

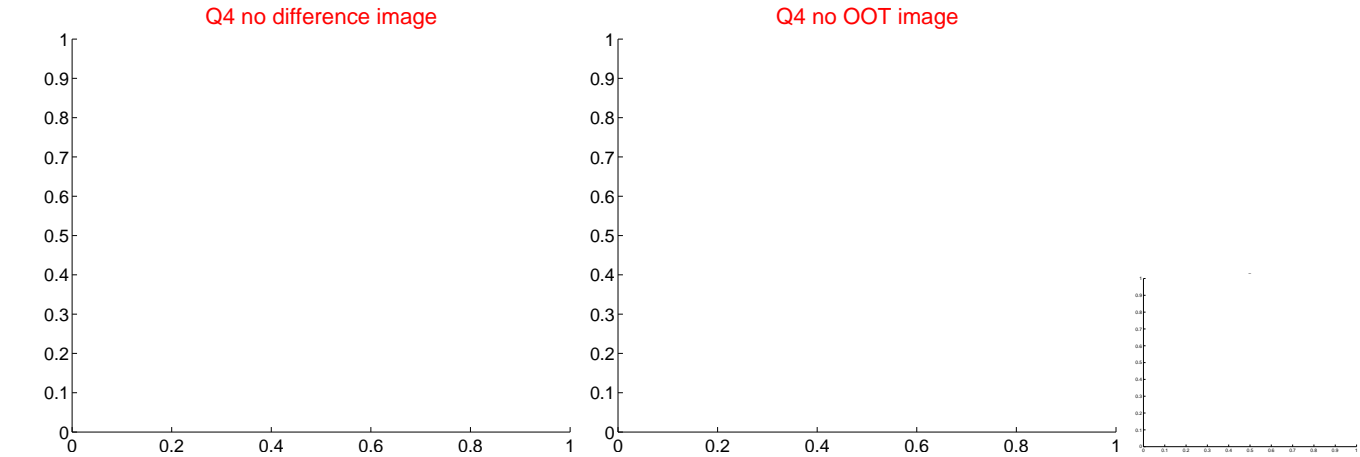
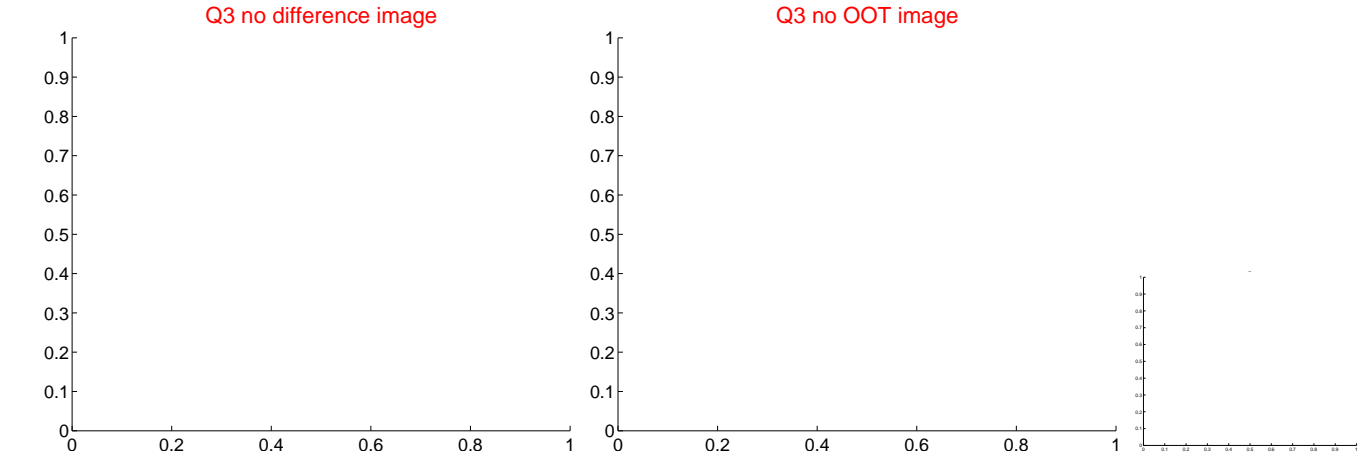
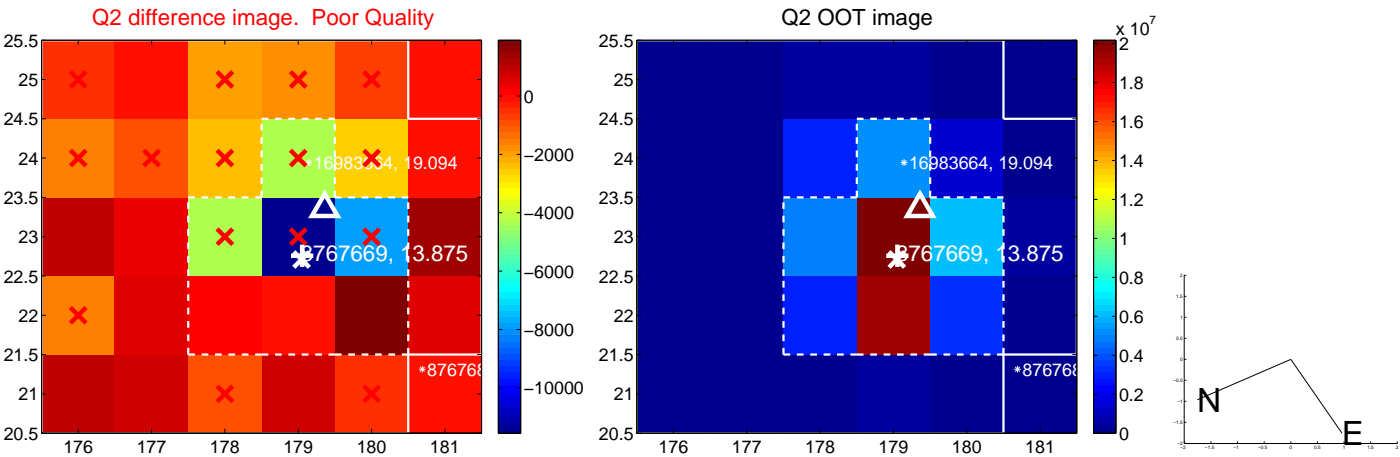
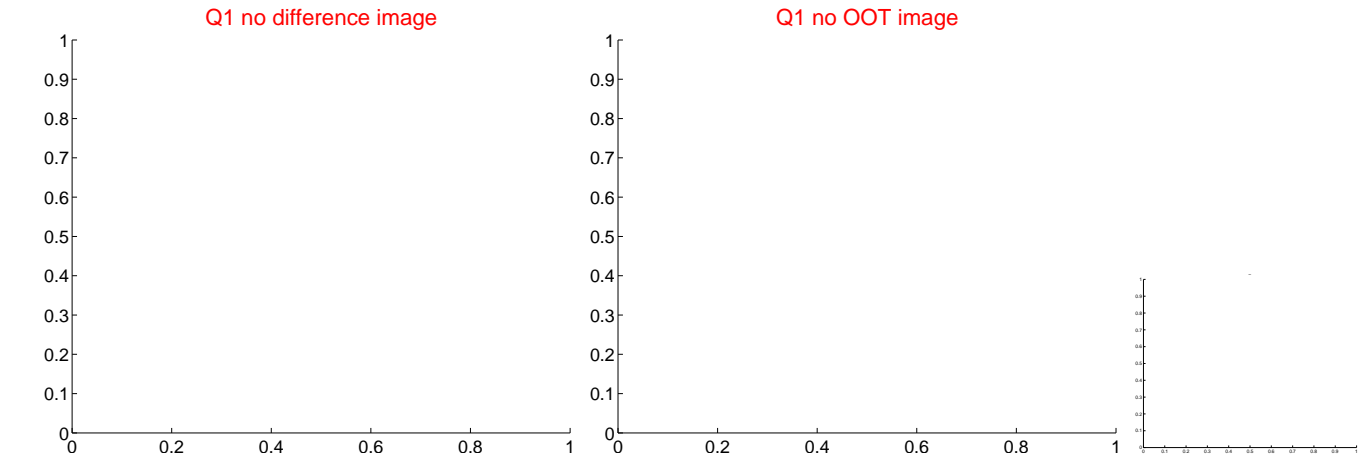


offset from photometric centroids

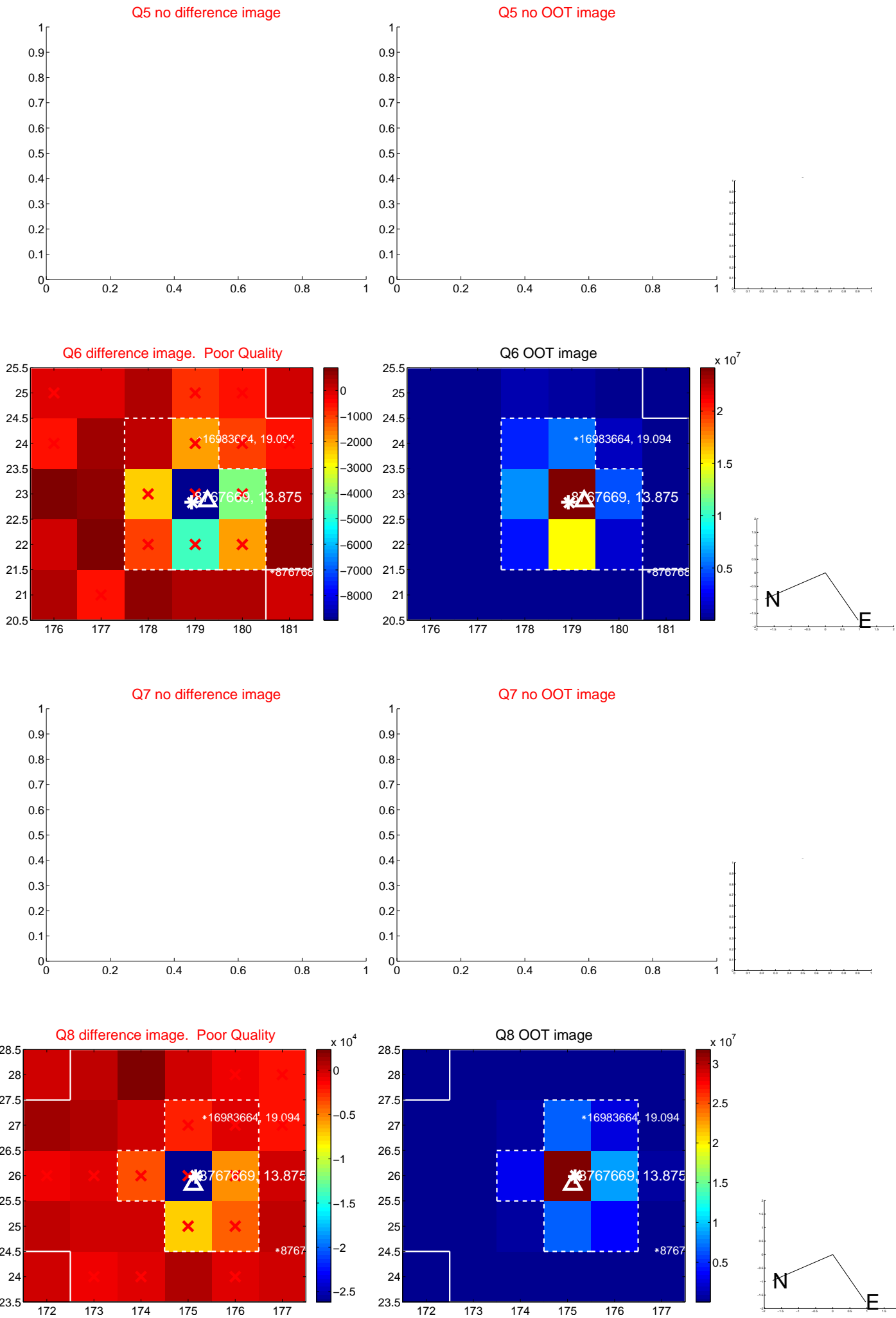


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

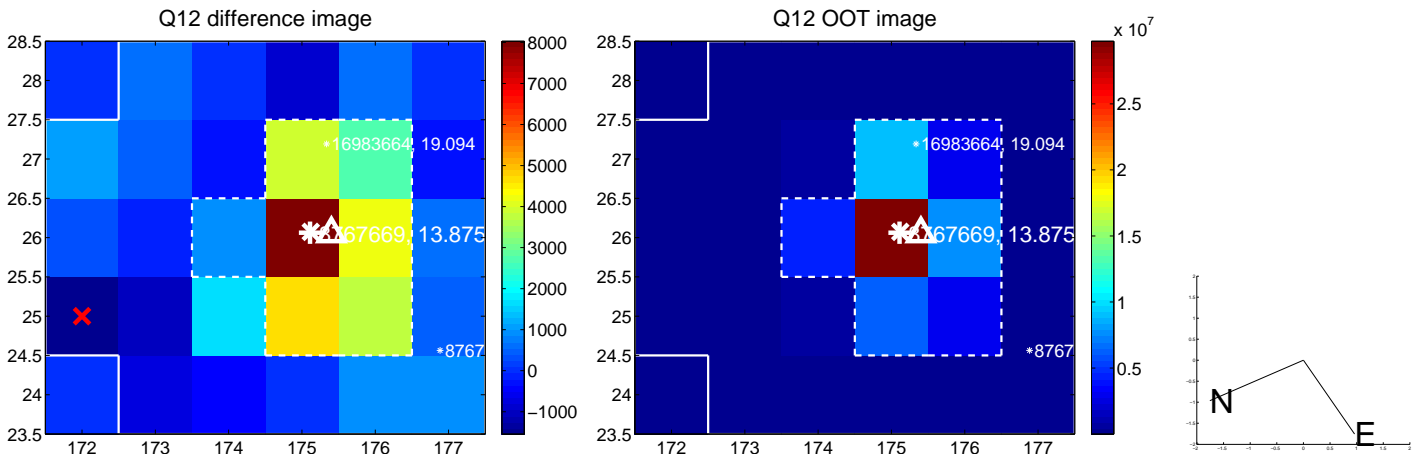
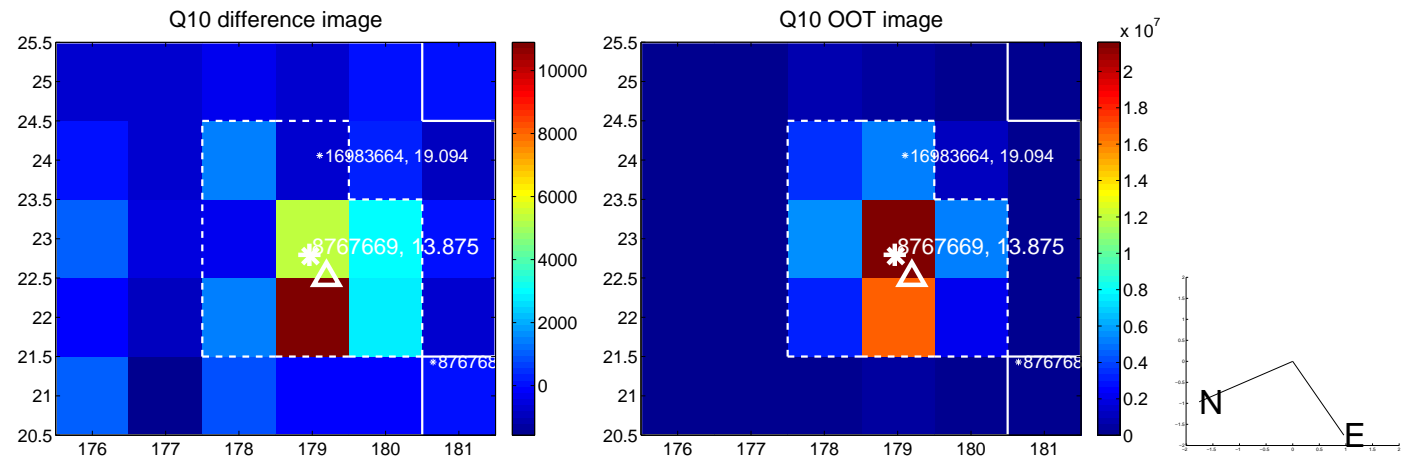
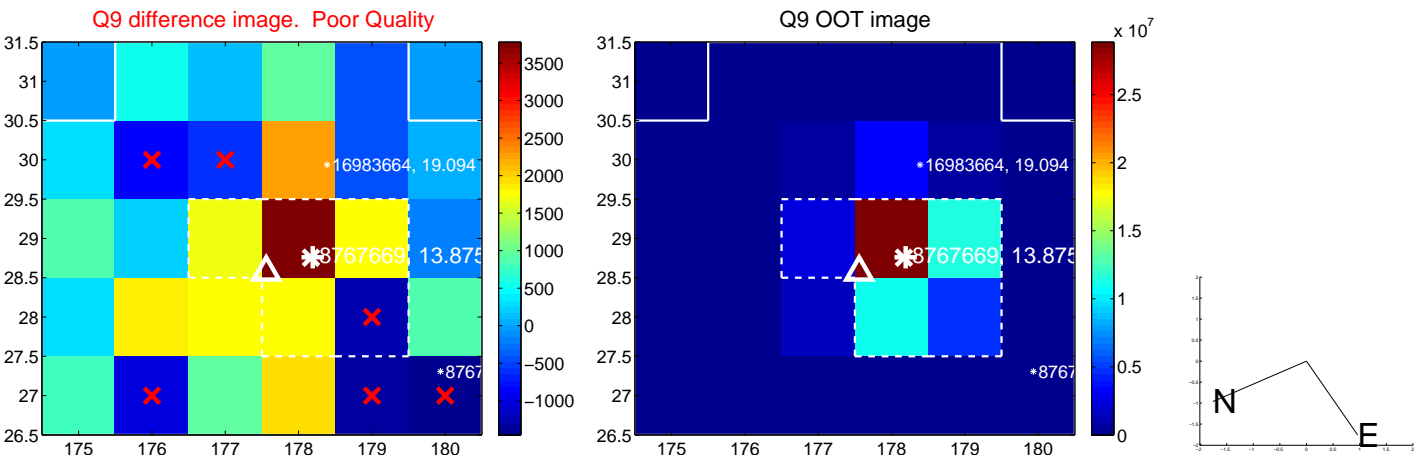
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



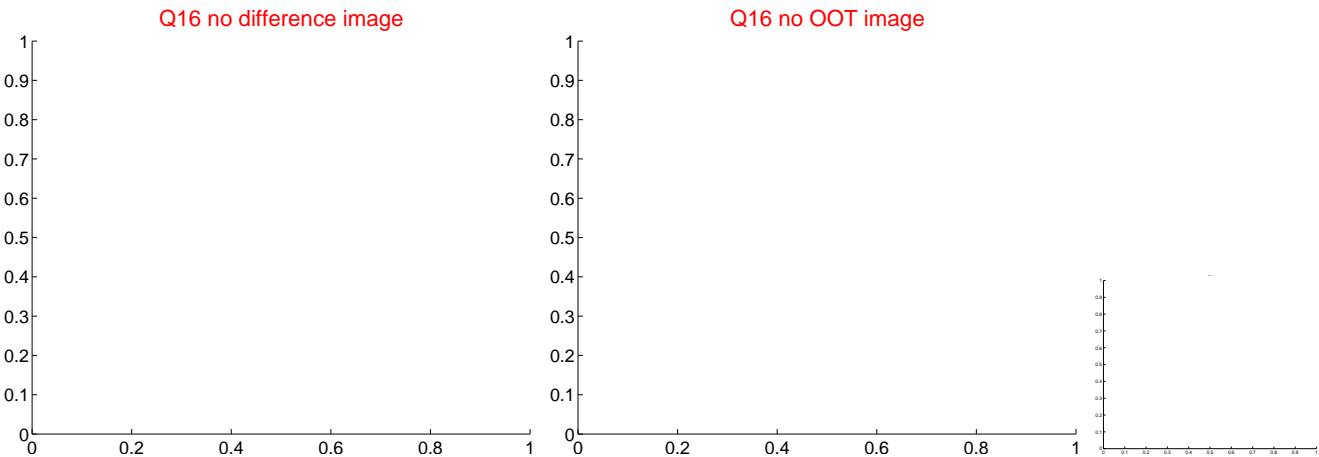
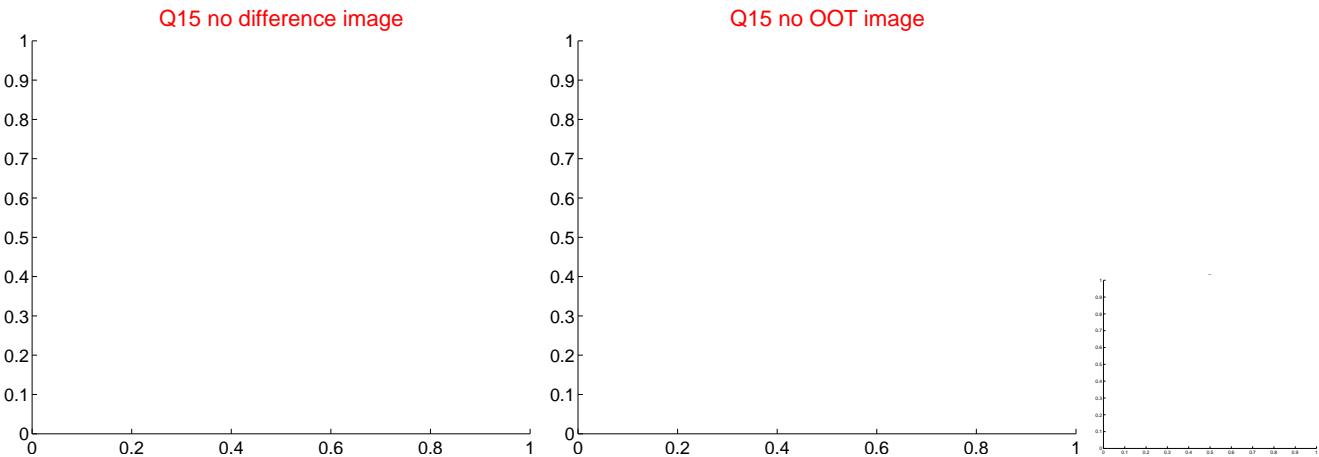
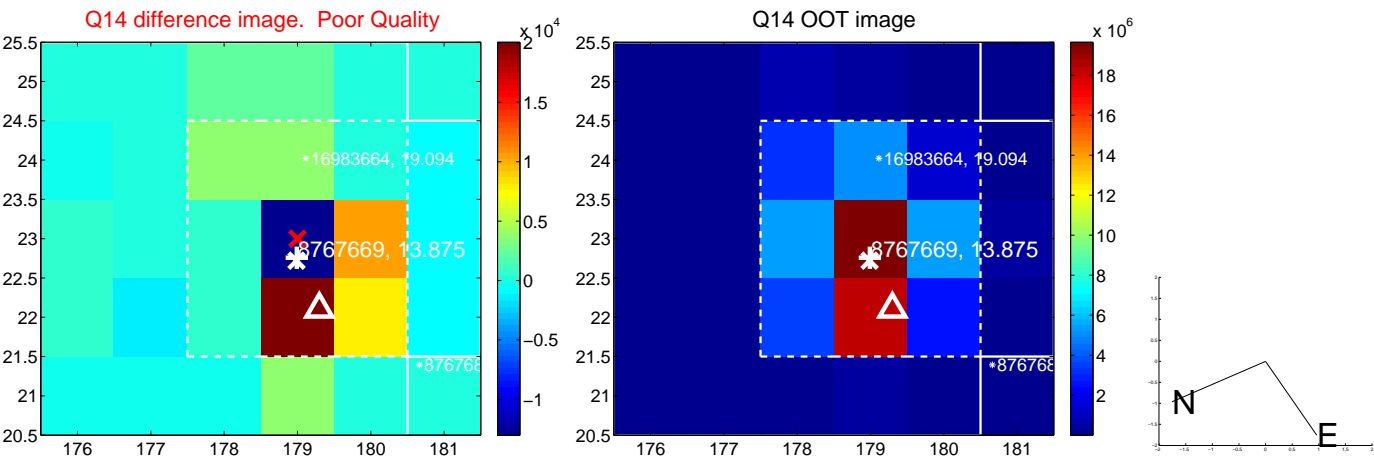
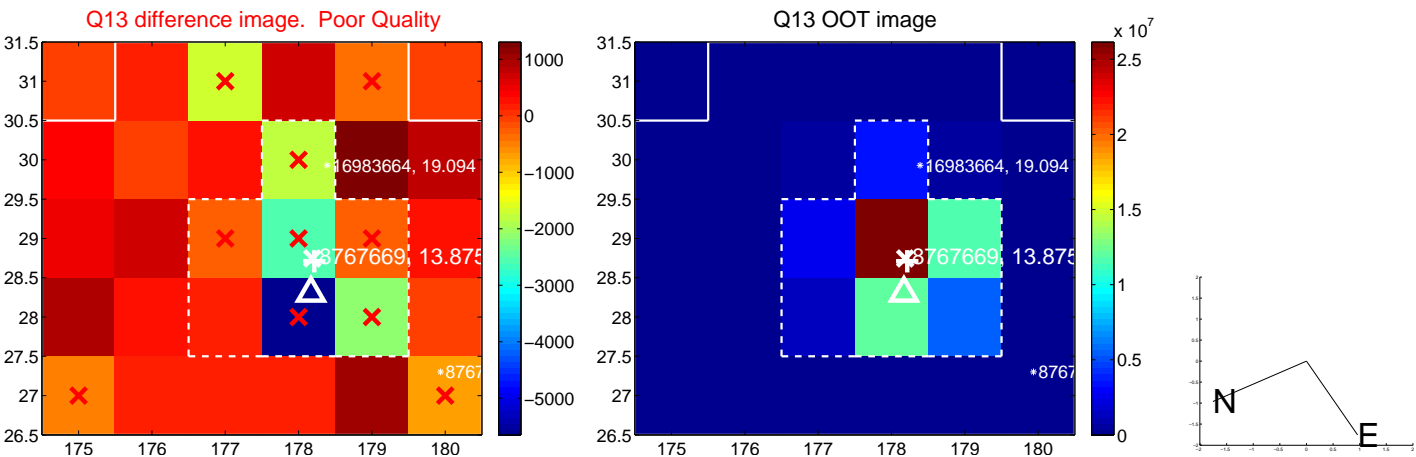
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

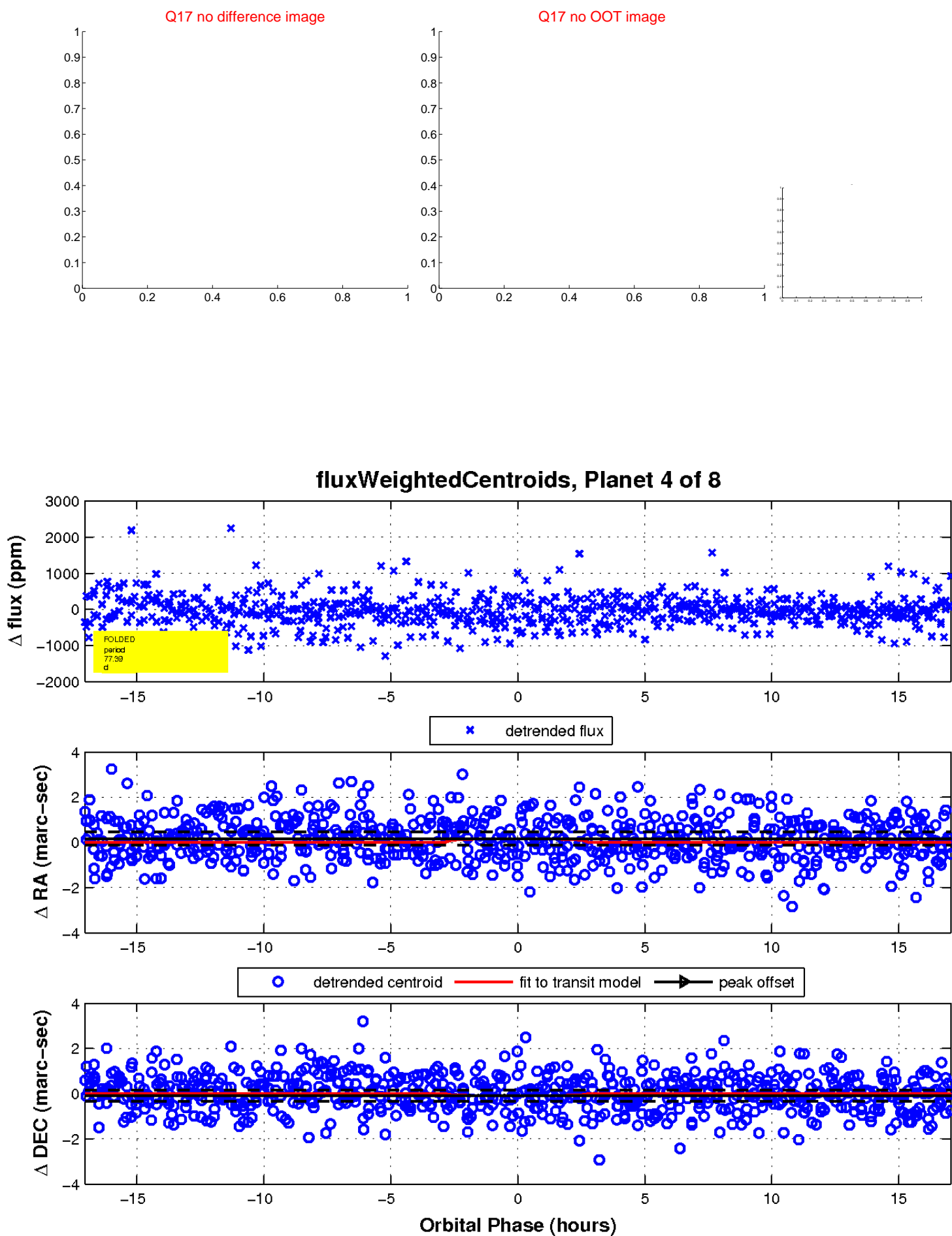


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



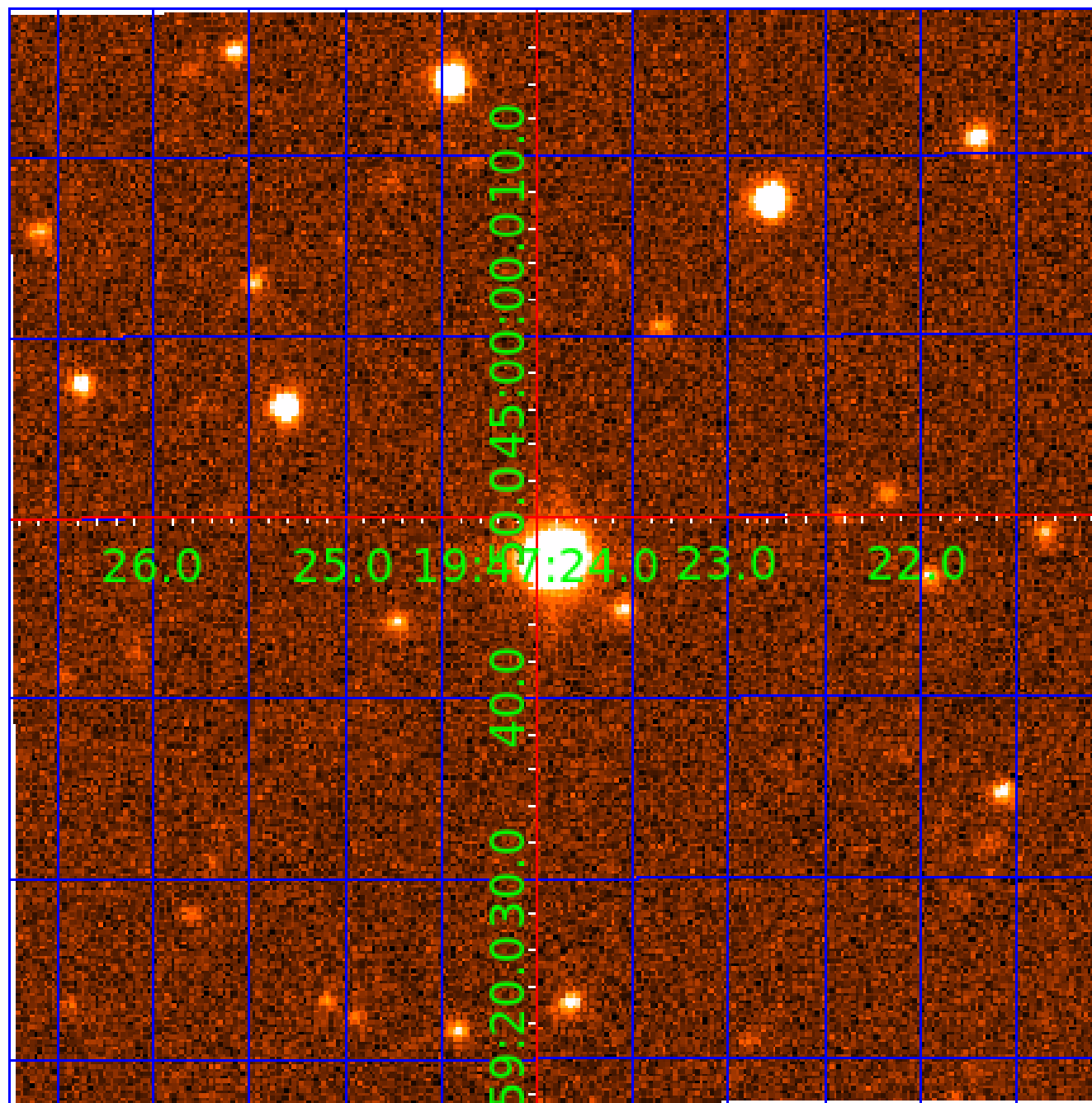


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008767669

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008767669-01 | OBS      | No   | 1.027454      | 131.866368   | 56.6        | 4.168            | 10.1 | 13.5 | 0.71                        | 4338            | 0.53                   | 505.98                 |
| 008767669-02 | OBS      | No   | 259.258227    | 237.523756   | 656.2       | 15.309           | 16.0 | 6.7  | 0.71                        | 4338            | 2.24                   | 0.32                   |
| 008767669-04 | OBS      | No   | 77.391894     | 168.038322   | 264.6       | 5.687            | 10.5 | 4.7  | 0.71                        | 4338            | 1.30                   | 1.59                   |
| 008767669-05 | OBS      | No   | 79.392159     | 186.894962   | 178.4       | 5.210            | 10.3 | 3.3  | 0.71                        | 4338            | 1.06                   | 1.54                   |
| 008767669-06 | OBS      | No   | 137.506101    | 148.977257   | 209.7       | 4.835            | 9.0  | 3.9  | 0.71                        | 4338            | 1.12                   | 0.74                   |
| 008767669-07 | OBS      | No   | 66.132688     | 149.768808   | 94.2        | 11.290           | 9.9  | 1.9  | 0.71                        | 4338            | 0.79                   | 1.96                   |
| 008767669-08 | OBS      | No   | 99.591749     | 151.043130   | 315.0       | 5.022            | 9.5  | 6.6  | 0.71                        | 4338            | 1.31                   | 1.14                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 008767669-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST           |
| 008767669-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT   |
| 008767669-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008767669-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 008767669-07 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-08 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT   |

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

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

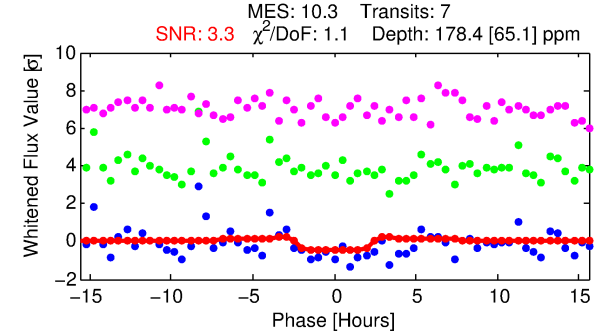
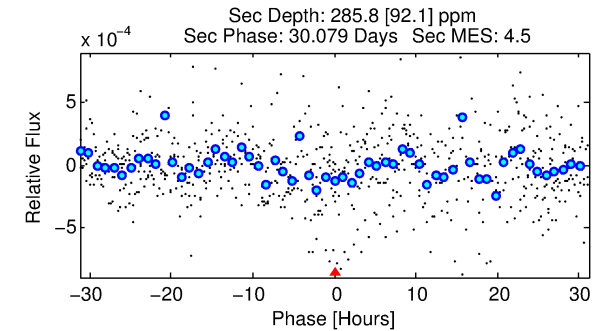
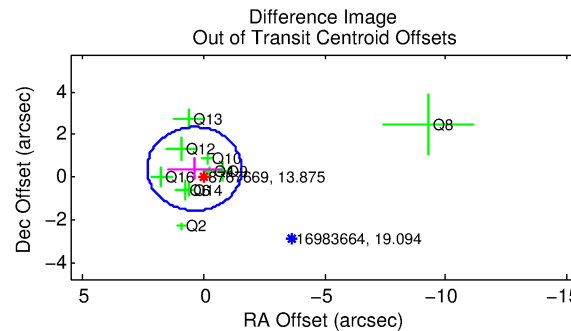
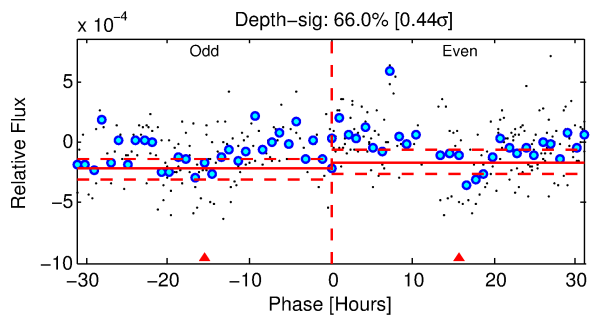
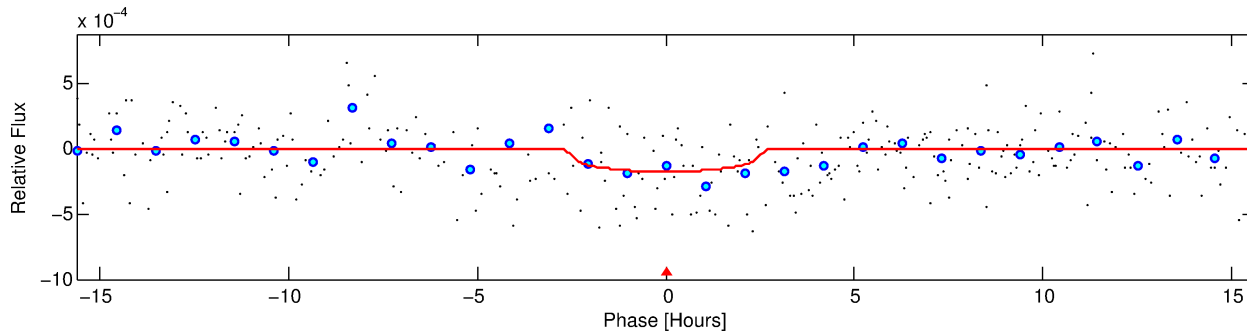
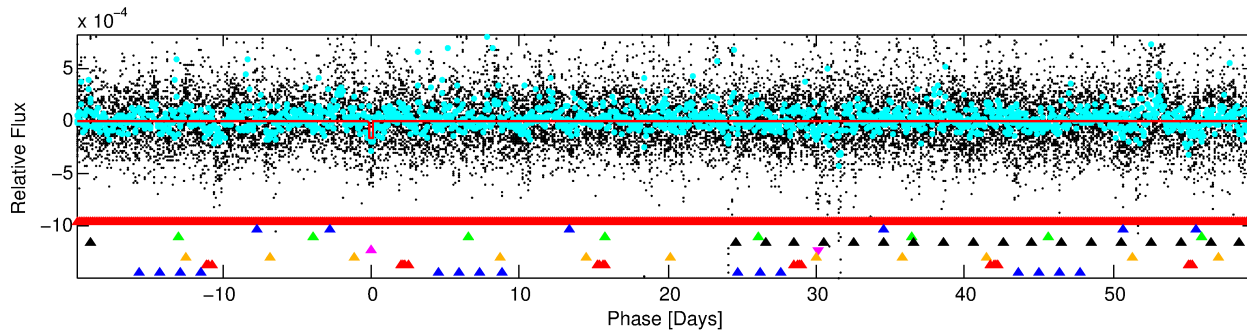
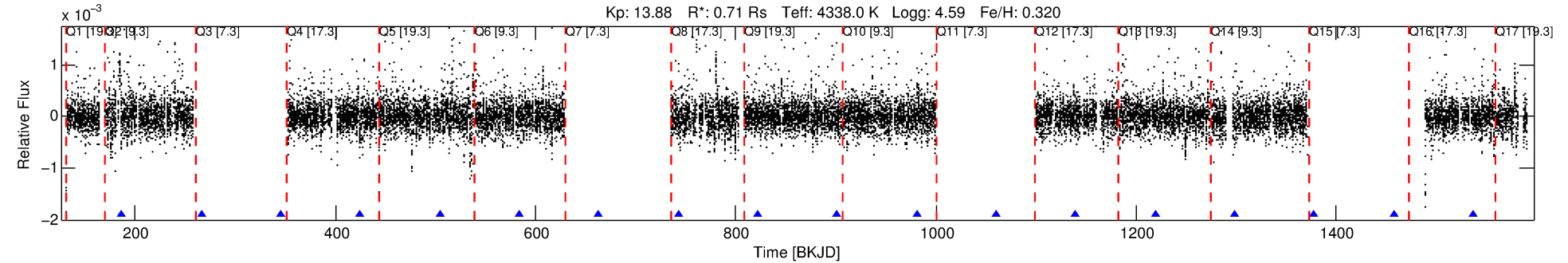
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008767669-05

No Significant Match Found

# DV One-Page Summary

KIC: 8767669 Candidate: 5 of 8 Period: 79.392 d



## DV Fit Results:

Period = 79.39216 [0.00317] d  
Epoch = 186.8950 [0.0254] BKJD  
Rp/R\* = 0.0137 [0.0267]  
a/R\* = 74.36 [457.45]  
b = 0.79 [3.06]  
Seff = 1.54 [0.25]  
Teff = 284 [12] K  
Rp = 1.06 [2.07] Re  
a = 0.3221 [0.0221] AU  
Ag = 14499.44 [56680.25] [0.26 $\sigma$ ]  
Teffp = 4817 [4709] K [0.96 $\sigma$ ]

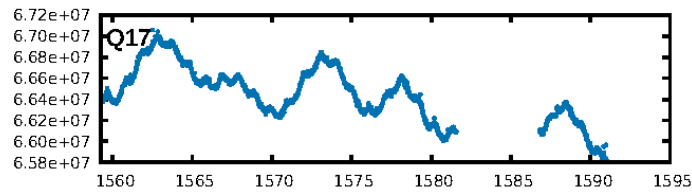
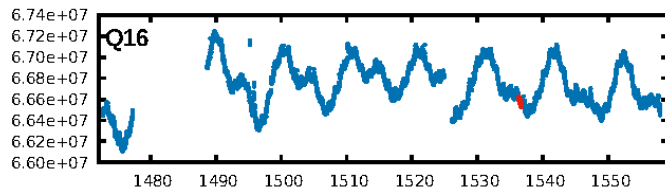
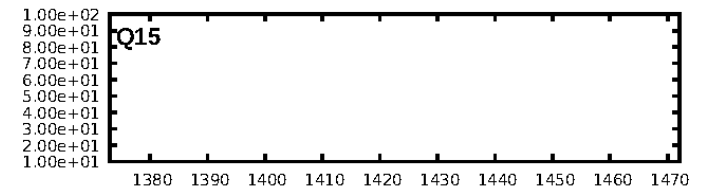
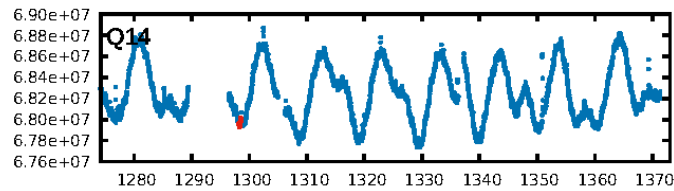
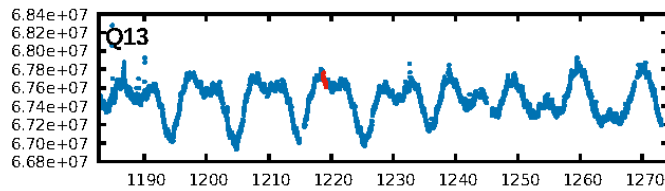
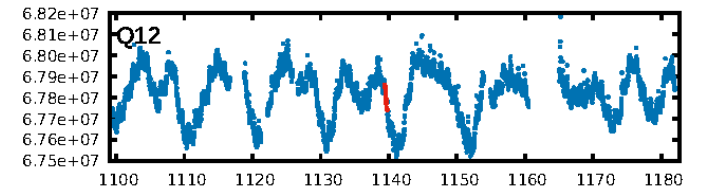
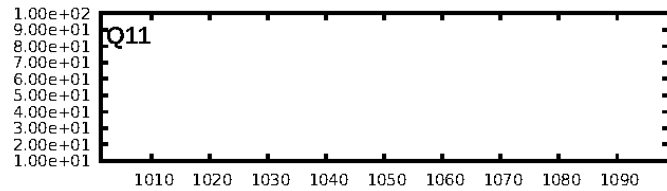
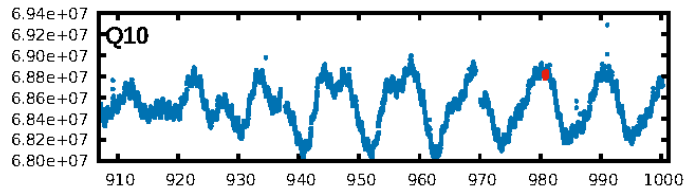
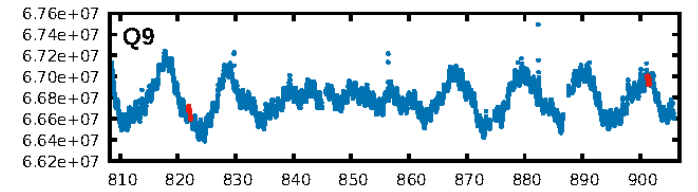
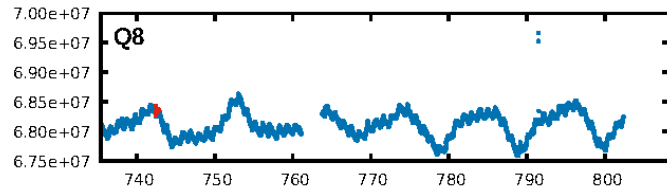
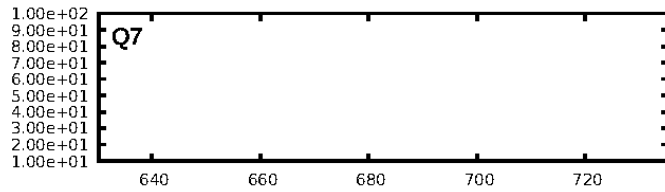
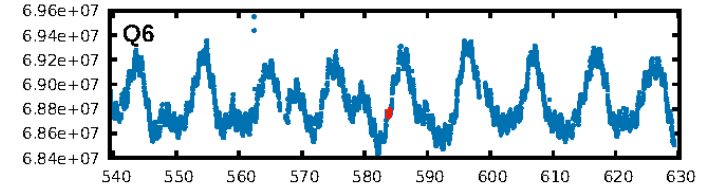
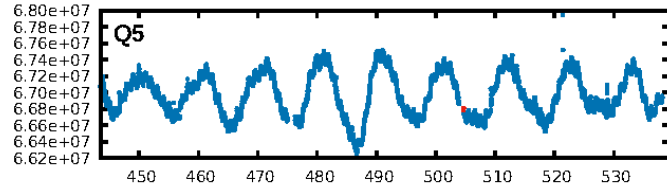
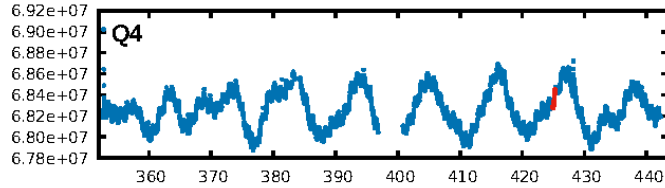
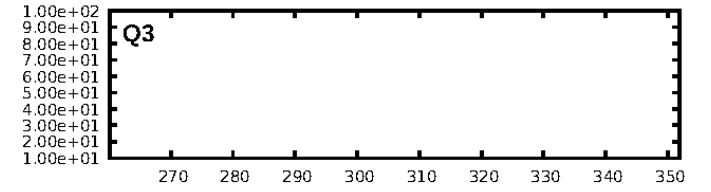
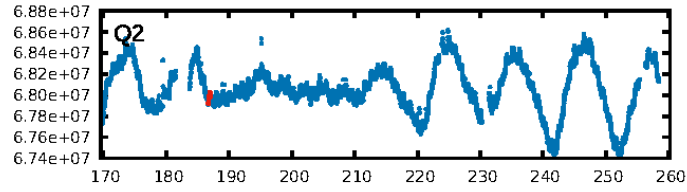
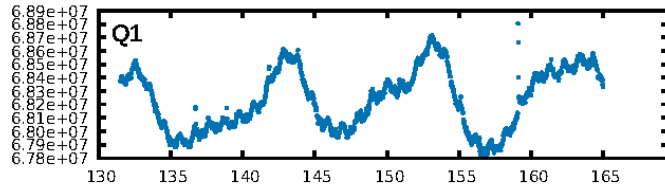
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [6.22 $\sigma$ ]  
LongPeriod-sig: 100.0% [66.99 $\sigma$ ]  
ModelChiSquare2-sig: 2.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.01e-15  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: -1.032  
Centroid-sig: 2.2%  
Centroid-so: 2.244 arcsec [1.61 $\sigma$ ]  
OotOffset-rm: 0.545 arcsec [0.84 $\sigma$ ]  
OotOffset-st: 4/0/4/2 [10]  
KicOffset-rm: 0.497 arcsec [0.94 $\sigma$ ]  
KicOffset-st: 4/0/4/2 [10]  
DiffImageQuality-fgm: 0.60 [6/10]  
DiffImageOverlap-fno: 0.00 [0/10]

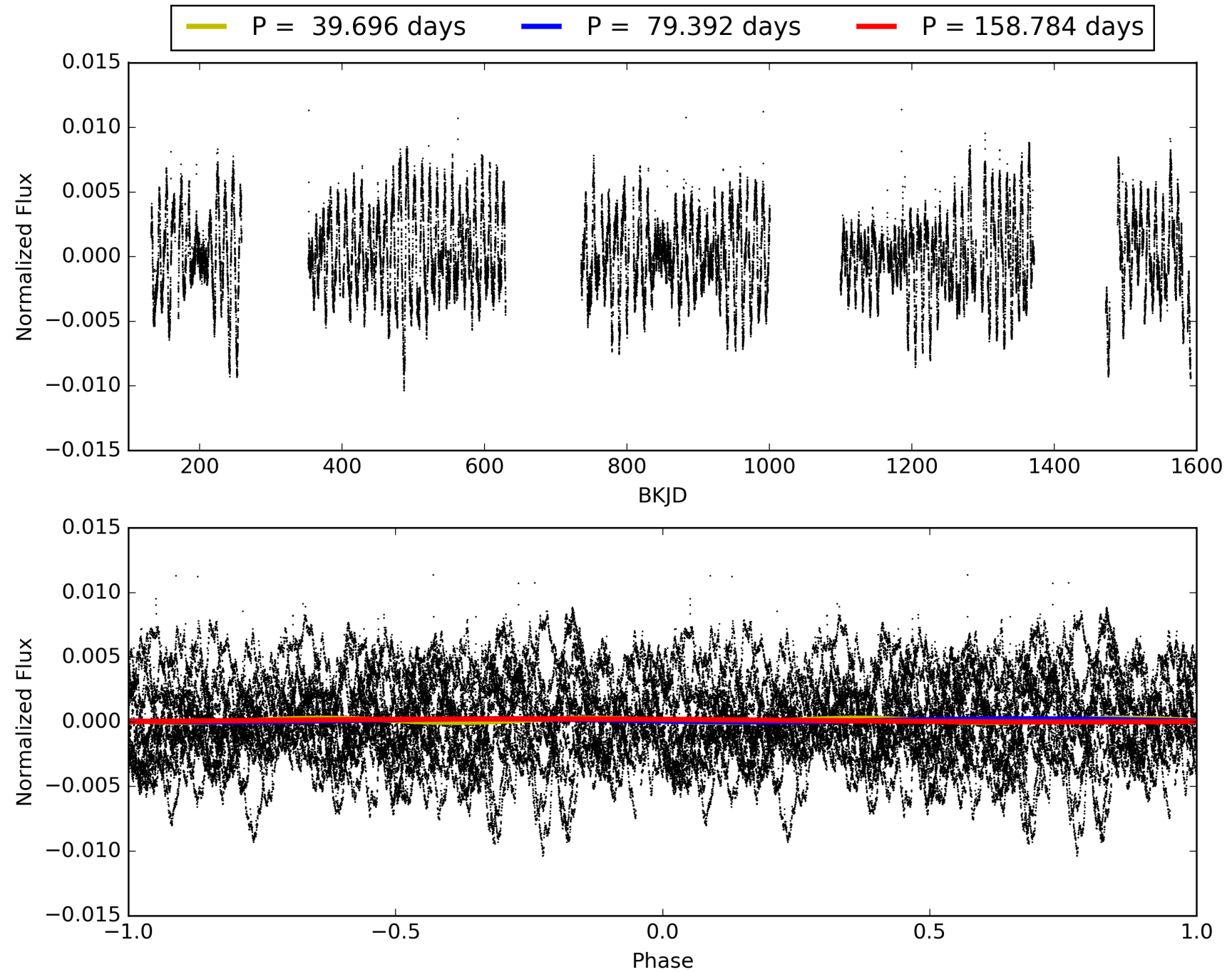
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:56:51 Z

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

# TCE 008767669-05, PDC Light Curves

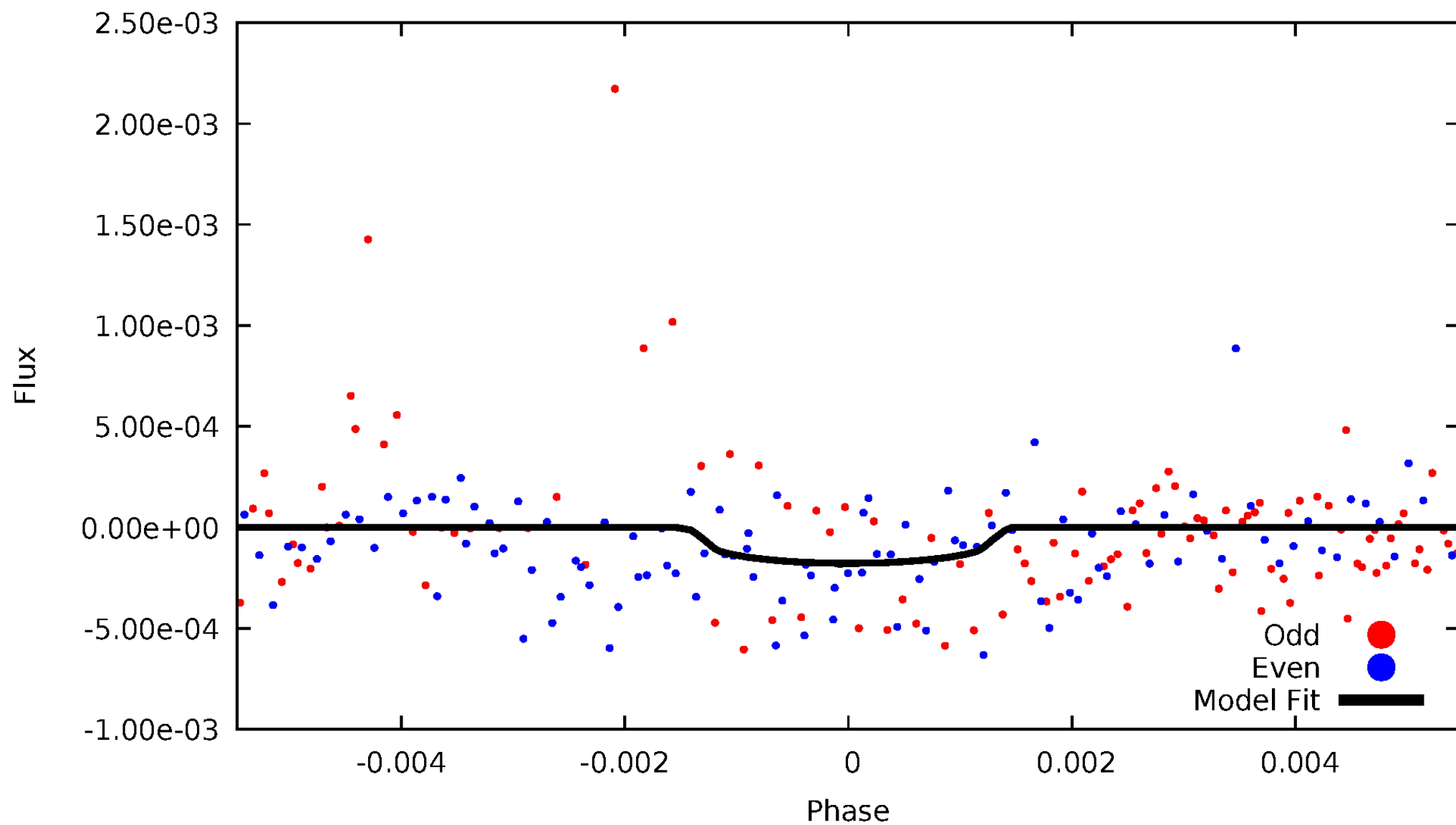


# TCE 008767669-05



# DV Odd/Even

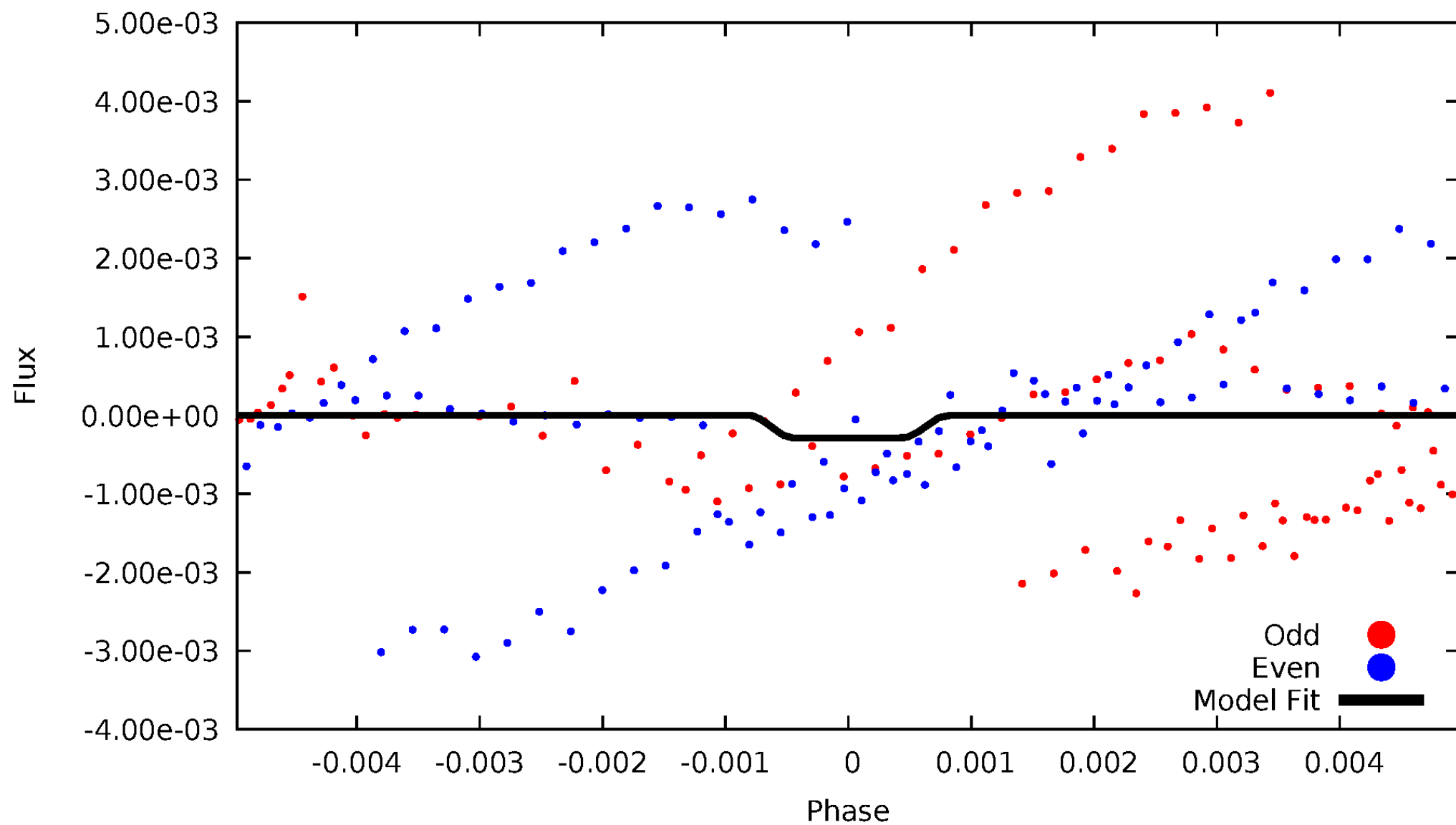
TCE 008767669-05





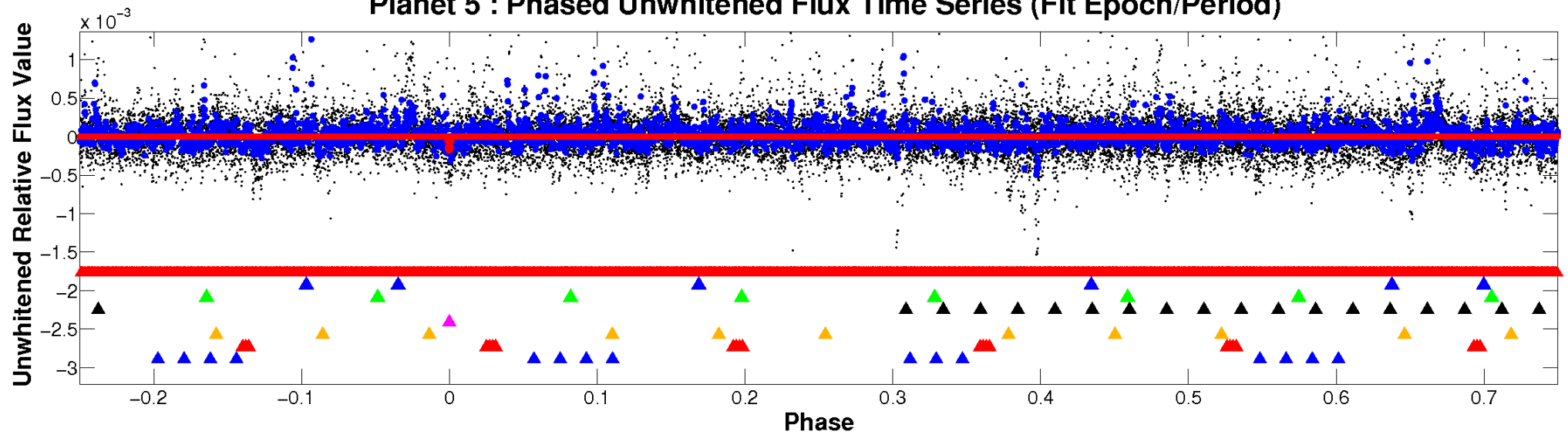
# ALT Odd/Even

TCE 008767669-05

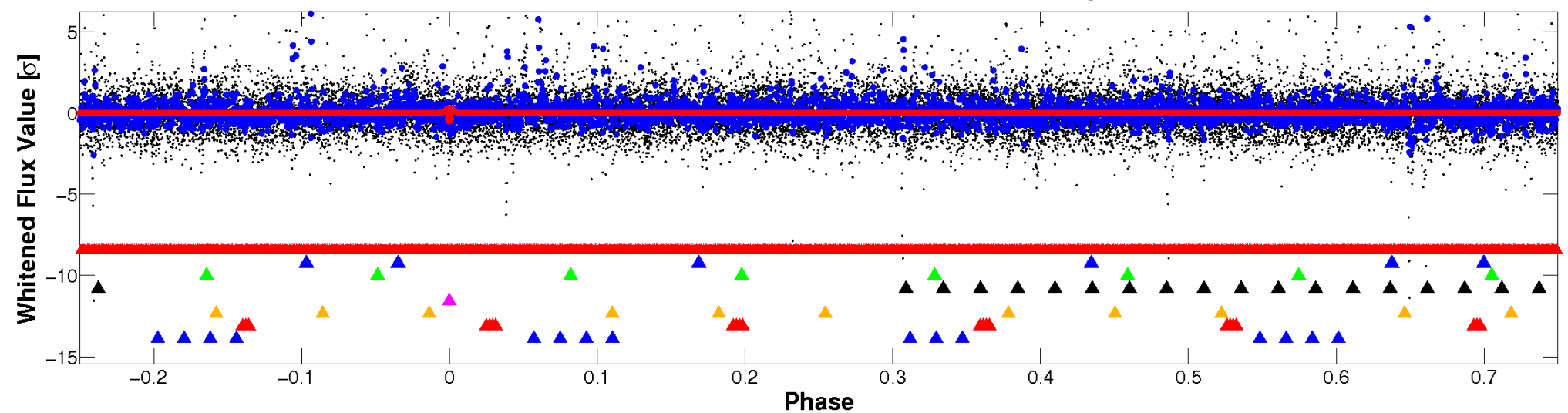


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

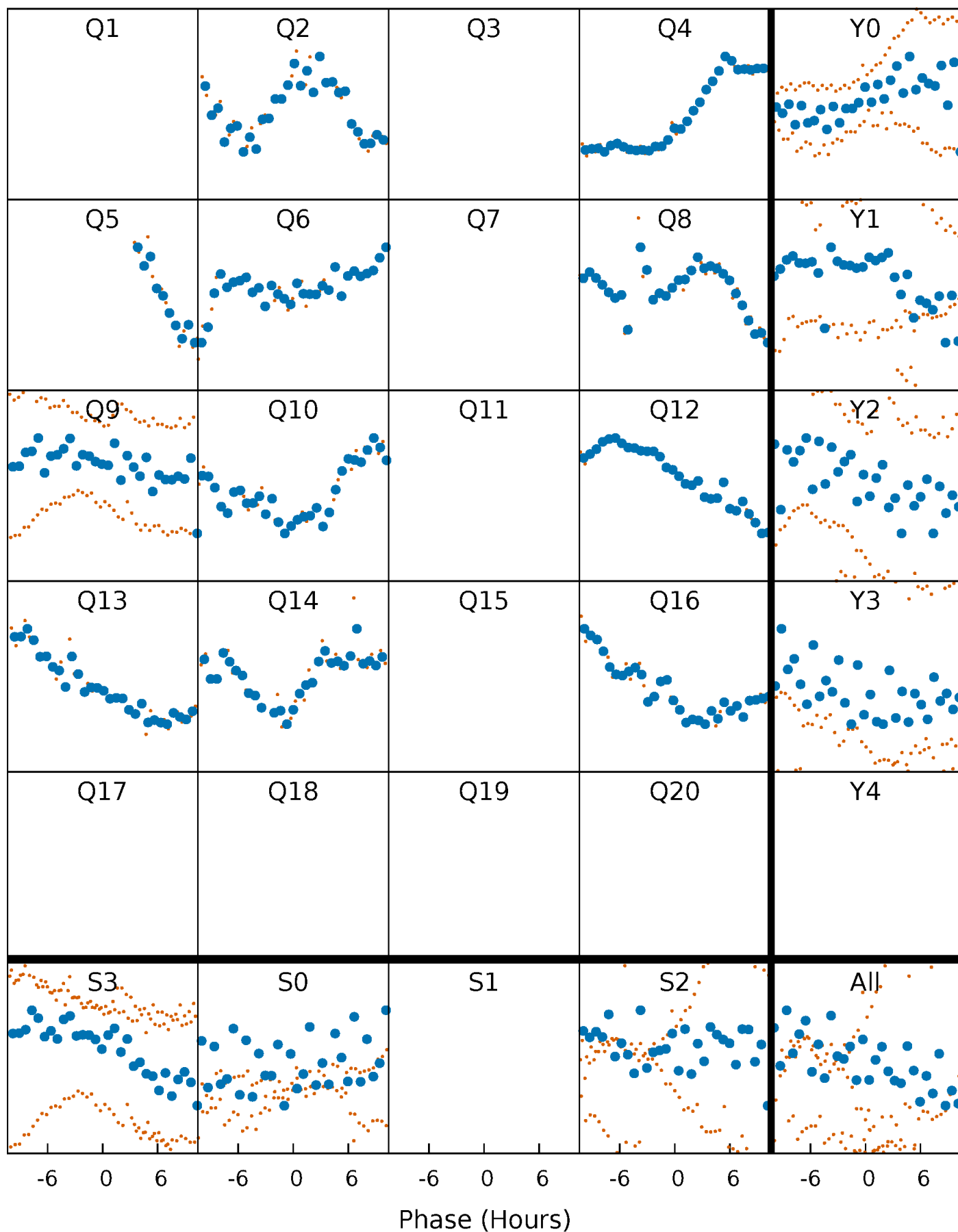


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



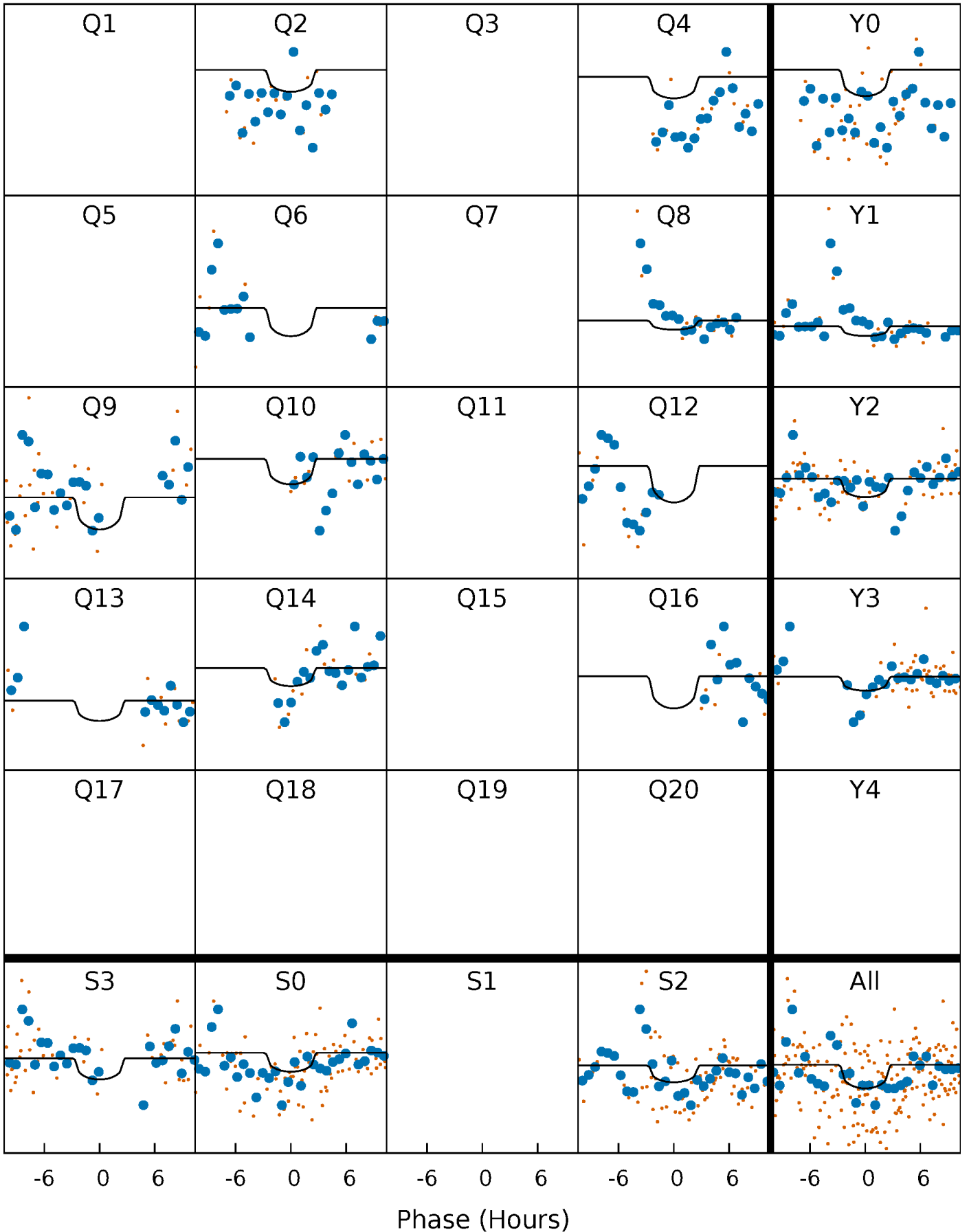
# PDC Quarter-Phased Transit Curves

TCE 008767669-05     $P = 79.392159$  Days     $T_0 = 186.894962$  (BKJD)



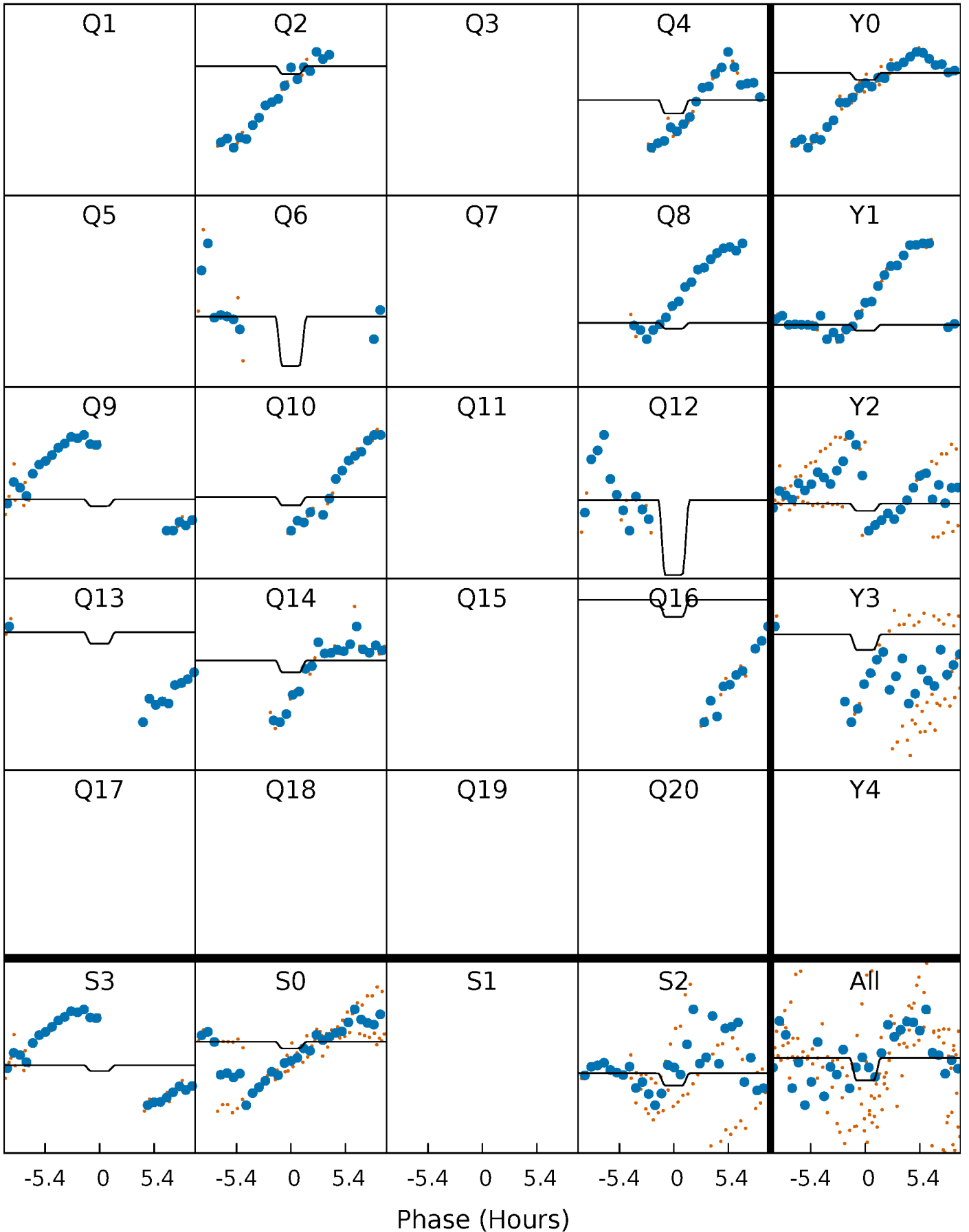
# DV Quarter-Phased Transit Curves

TCE 008767669-05     $P = 79.392159$  Days     $T_0 = 186.894962$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

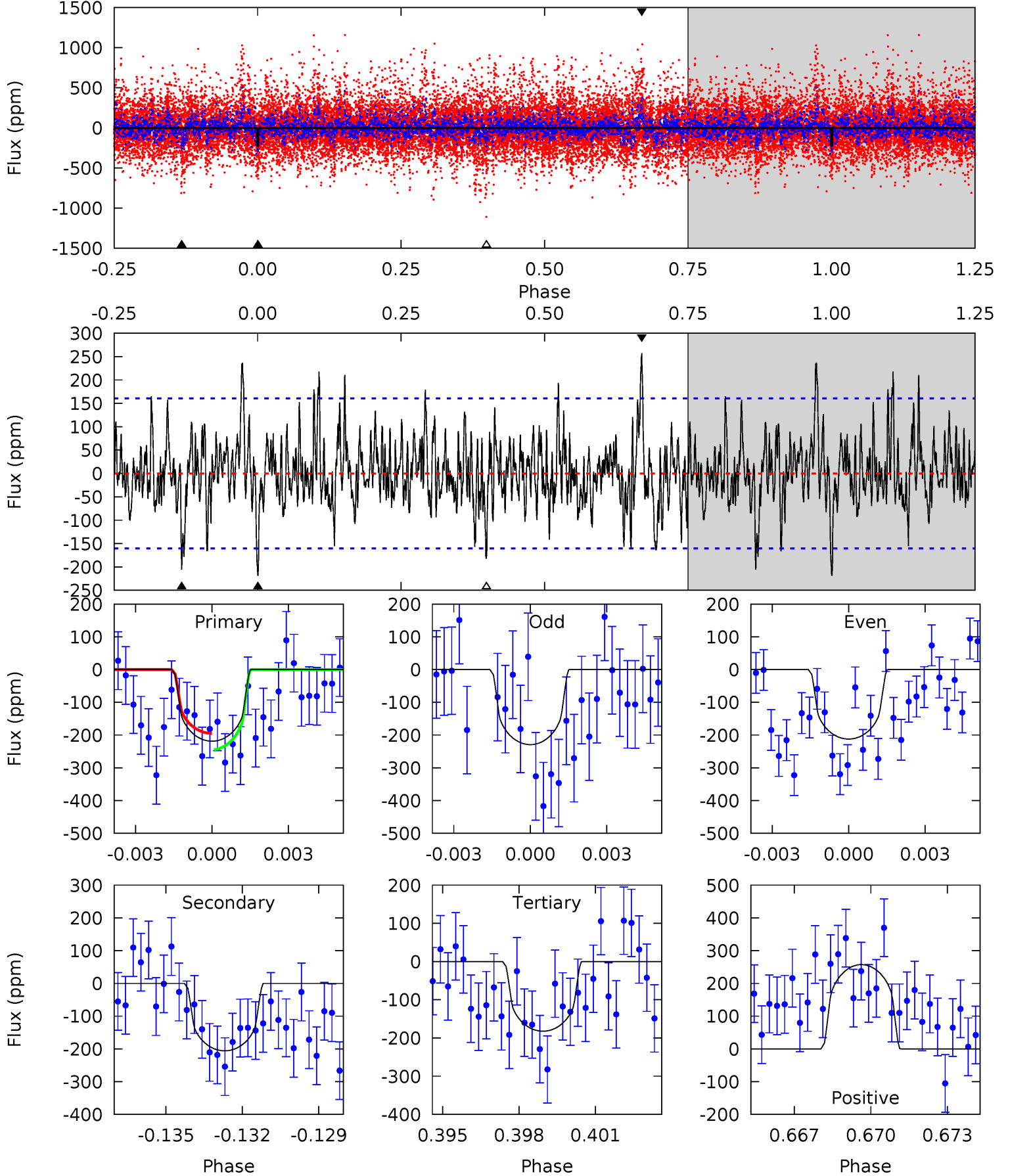
TCE 008767669-05     $P = 79.392346$  Days     $T_0 = 186.904794$  (BKJD)



# DV Model-Shift Uniqueness Test

008767669-05, P = 79.392159 Days, E = 107.502803 Days

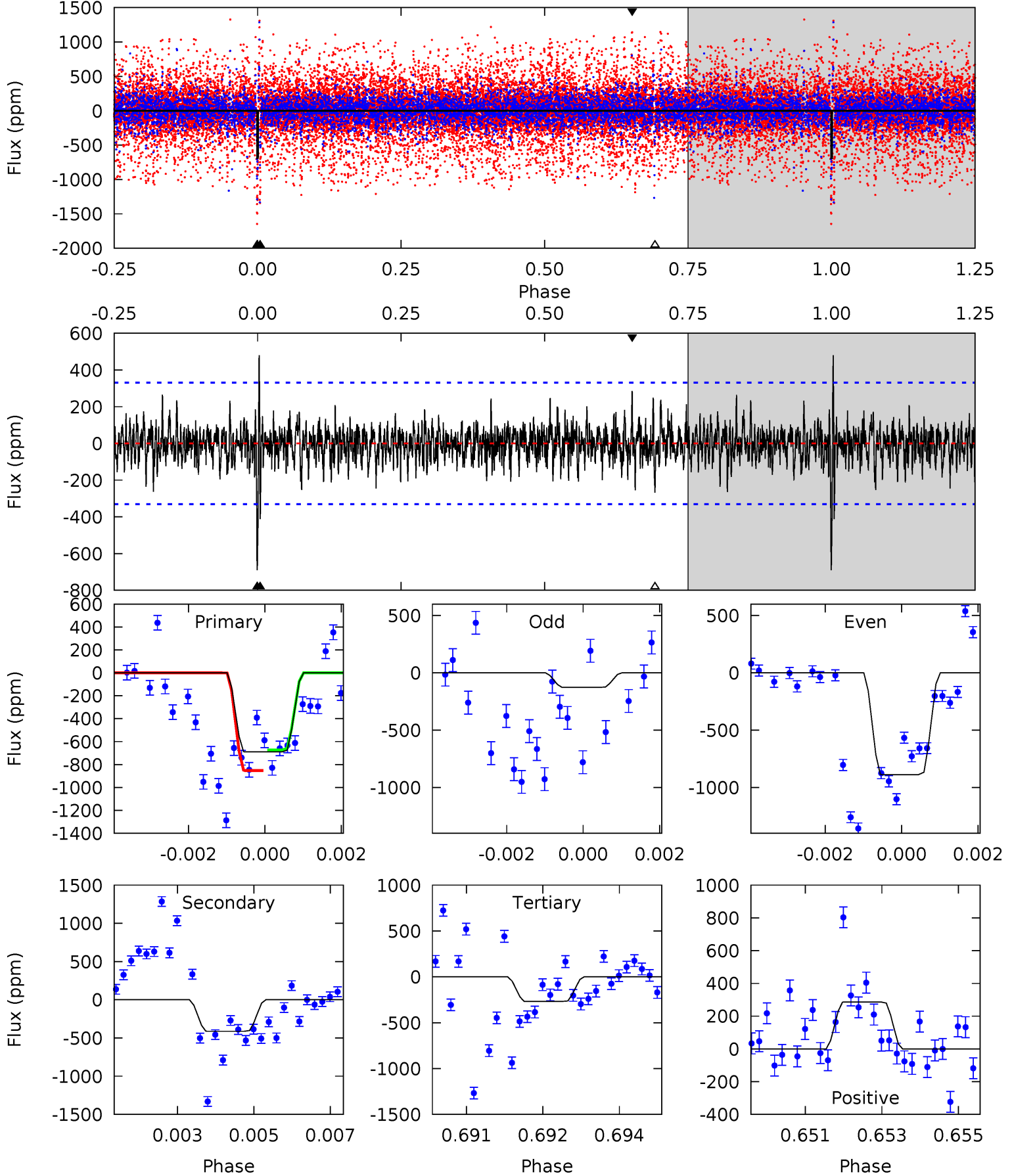
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.17 | 6.75 | 5.98 | 8.43 | 5.26            | 2.98            | 2.03             | 1.19    | -1.26   | 0.77    | -1.69   | 0.26    | 0.94 | 0.54  | 0.82 |



# Alt Model-Shift Uniqueness Test

008767669-05, P = 79.392346 Days, E = 107.512448 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 11.2 | 6.69 | 4.35 | 4.64 | 5.36            | 3.15            | 1.19             | 6.85    | 6.55    | 2.34    | 2.05    | 5.85    | 0.00 | 0.41  | 0   |





### Stellar Parameters For KIC 008767669

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $4338^{+129}_{-142}$ | $4.586^{+0.056}_{-0.017}$ | $0.320^{+0.150}_{-0.300}$ | $0.709^{+0.024}_{-0.057}$ | $0.708^{+0.036}_{-0.049}$ | $2.794^{+0.652}_{-0.202}$                 |
|        | +3%/-3%              | +1%/-0%                   | +47%/-94%                 | +3%/-8%                   | +5%/-7%                   | +23%/-7%                                  |
| Source | PHO1                 | KIC0                      | KIC0                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 008767669-05 / KOI

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$     | $T_{max} (K)$     | $T_{obs} (K)$         | $A_{obs}$               |
|---------|---------------|------------------------|-------------------|-----------------------|-------------------------|
| DV      | $-206 \pm 31$ | $1.88^{+1.66}_{-1.29}$ | $393^{+13}_{-14}$ | $3583^{+1959}_{-622}$ | $3279^{+27968}_{-2346}$ |
| Alt.    | $-413 \pm 62$ | $2.06^{+1.68}_{-1.32}$ | $394^{+14}_{-14}$ | $3897^{+2084}_{-677}$ | $5503^{+39038}_{-3817}$ |

$T_{max}$  = 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

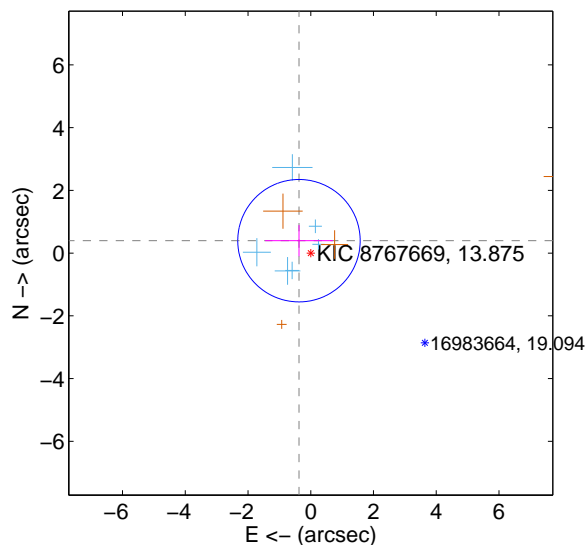
Supplemental centroid analysis for 008767669-05. Kepler magnitude: 13.88. Transit SNR 3.35

There are 6 quarters with good PRF difference image offsets

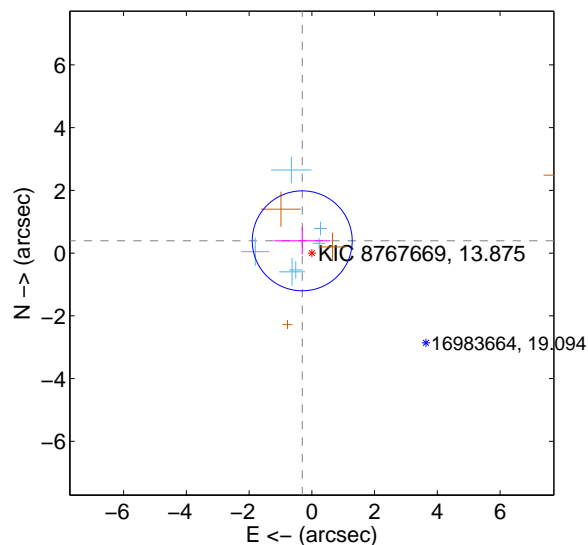
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $0.545 \pm 0.650$  | 0.84                | $0.375 \pm 1.081$ | $0.396 \pm 0.498$ |
| PRF-fit source offset from KIC position | $0.497 \pm 0.531$  | 0.94                | $0.306 \pm 0.894$ | $0.391 \pm 0.436$ |
| photometric centroid source offset      | $2.24 \pm 1.40$    | 1.61                | $0.44 \pm 1.67$   | $2.20 \pm 1.38$   |

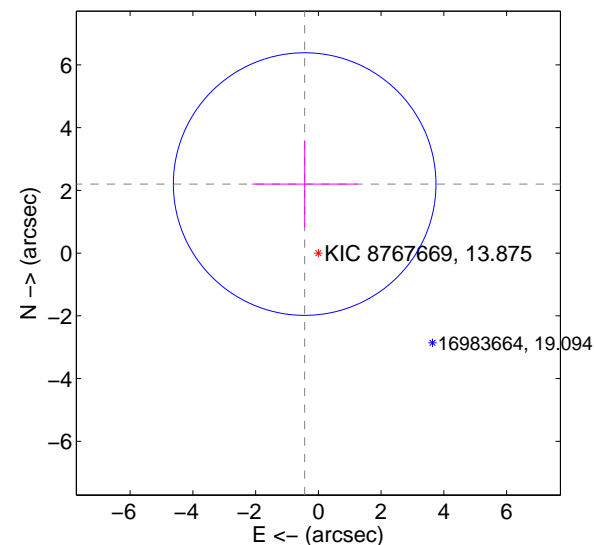
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

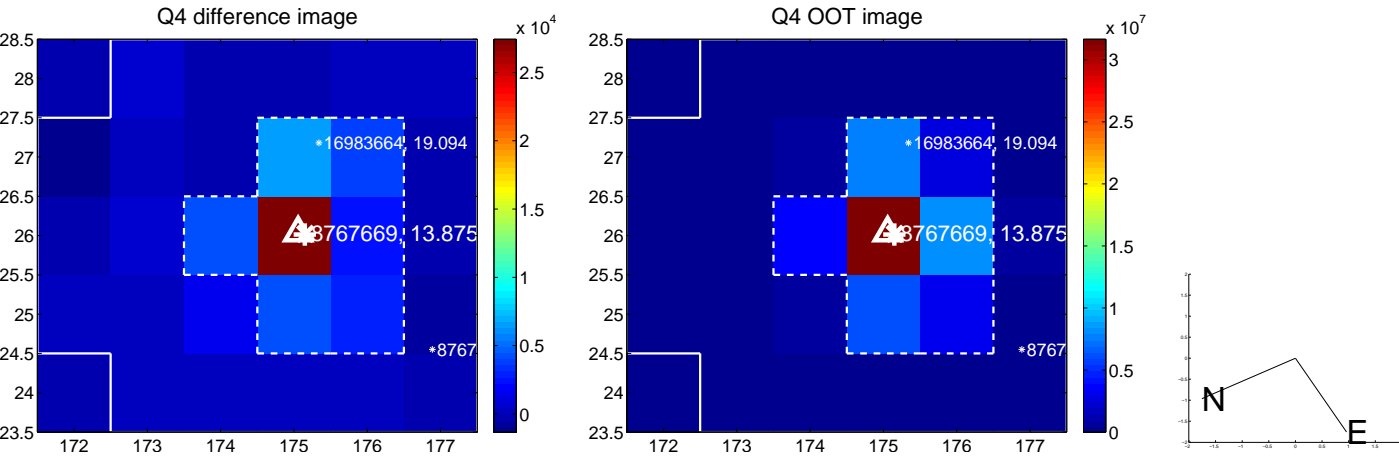
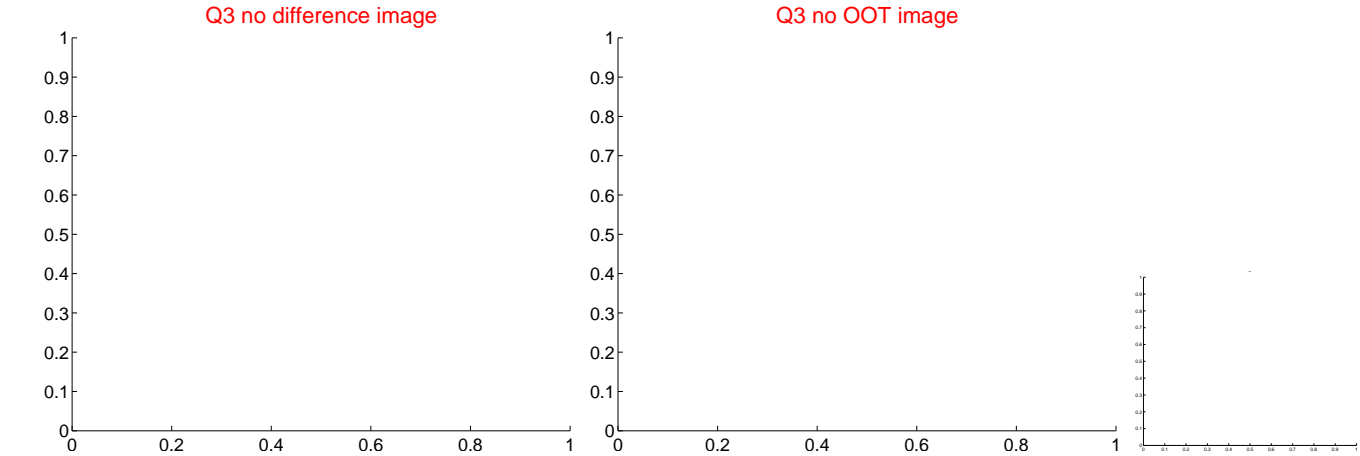
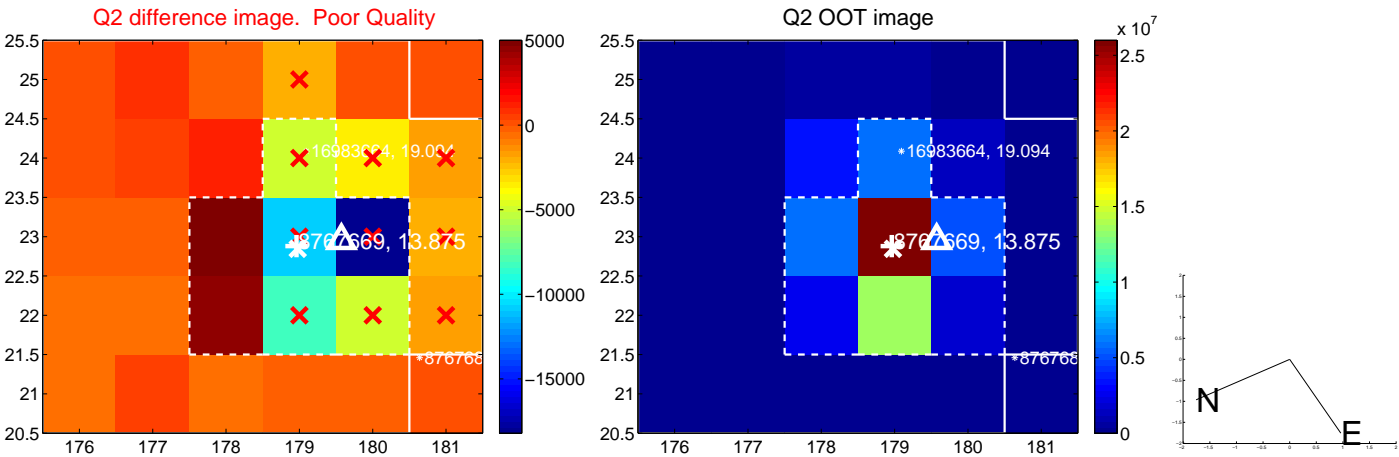
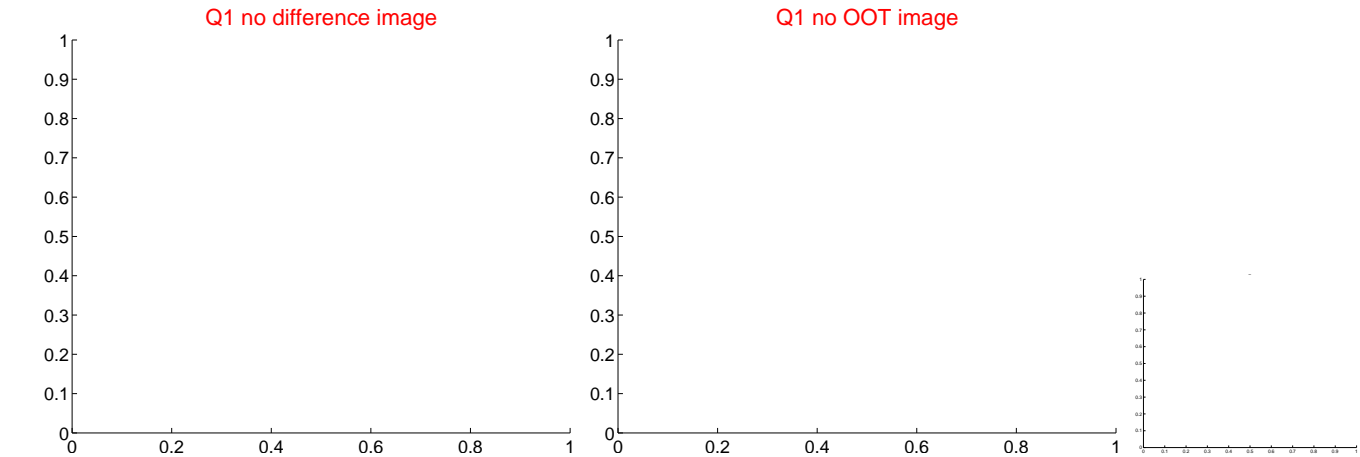


offset from photometric centroids

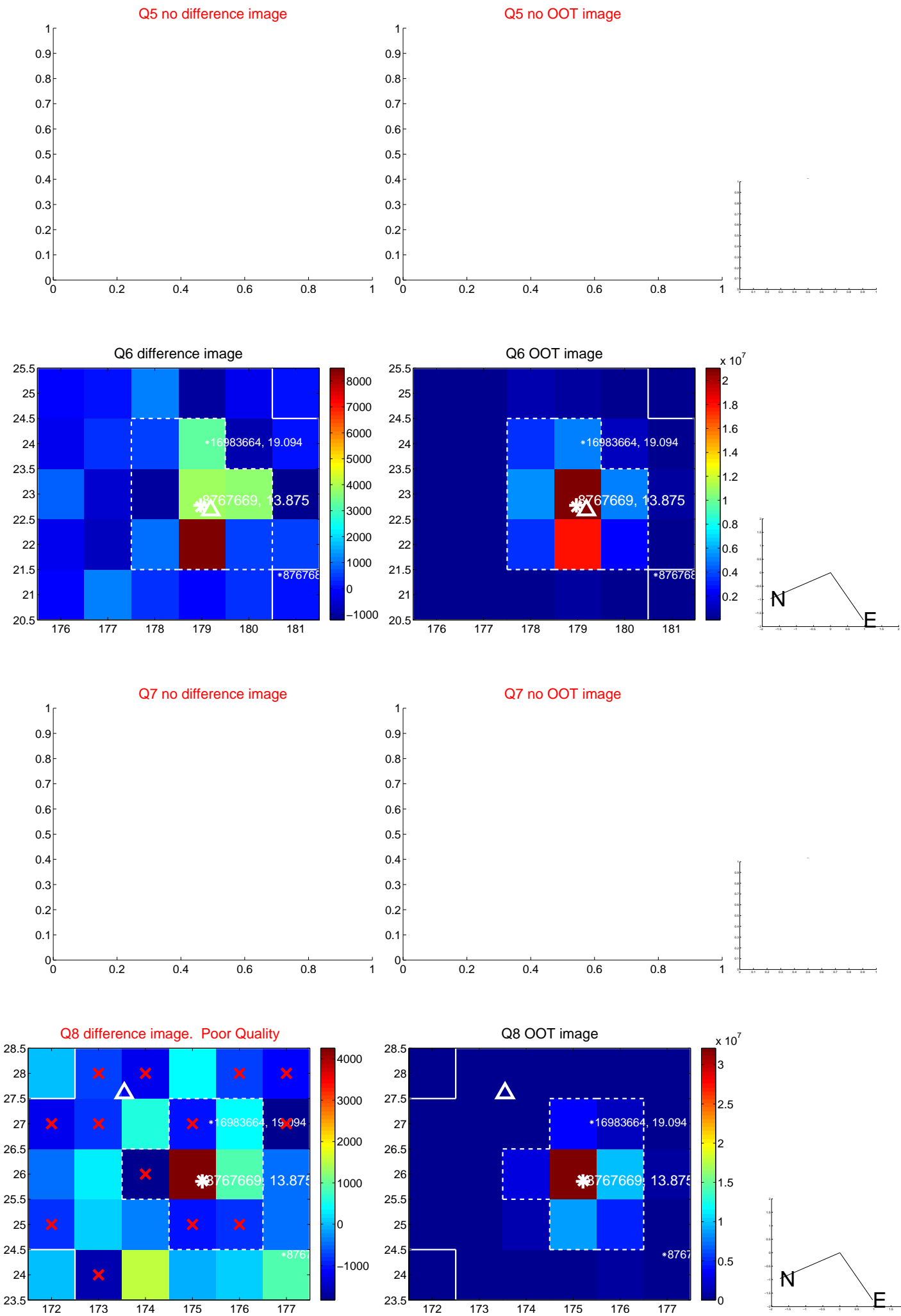


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

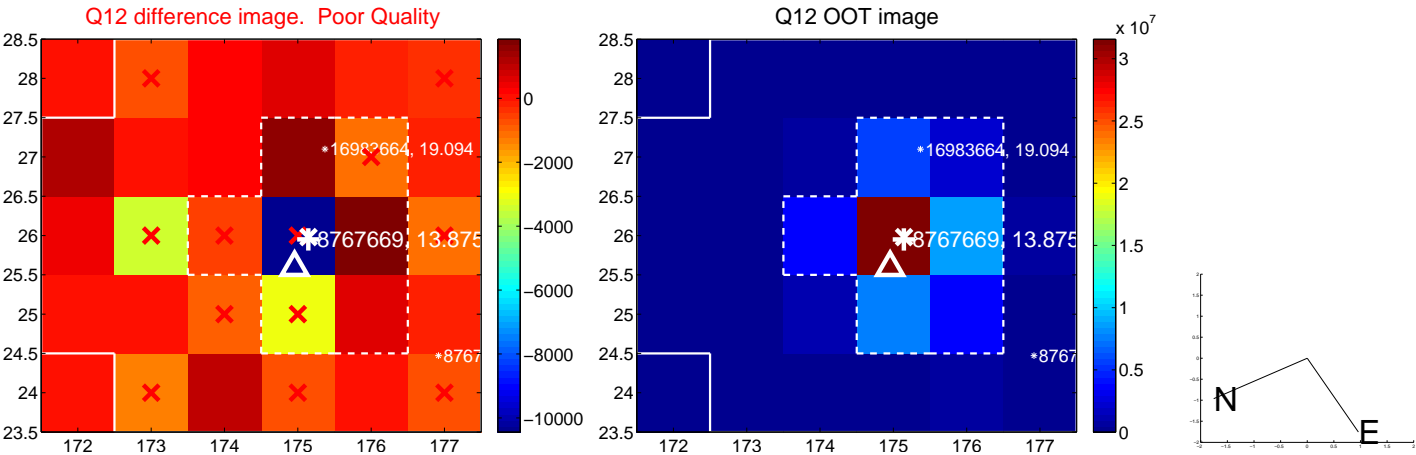
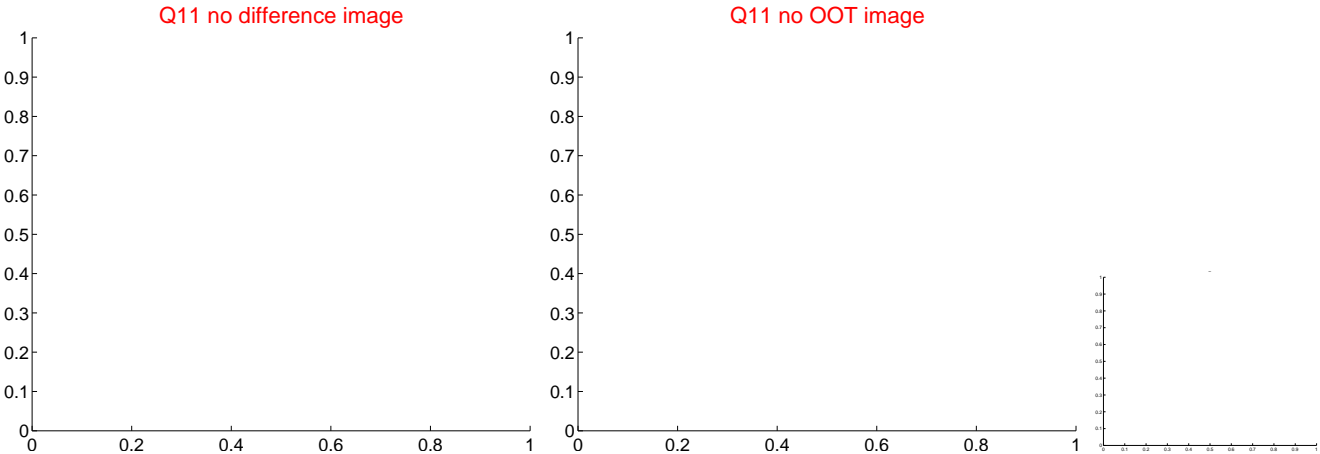
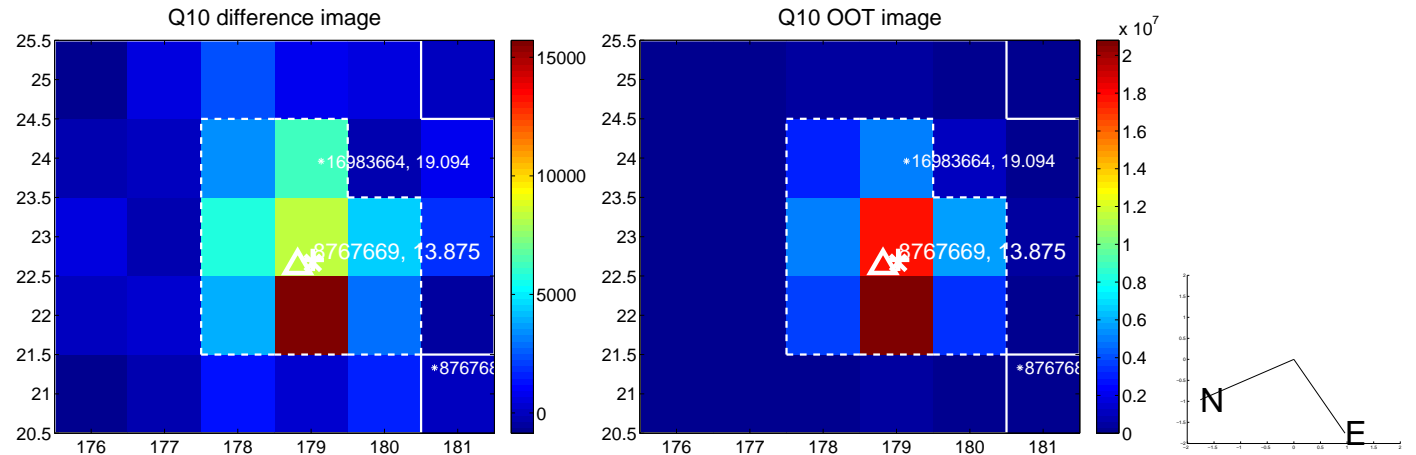
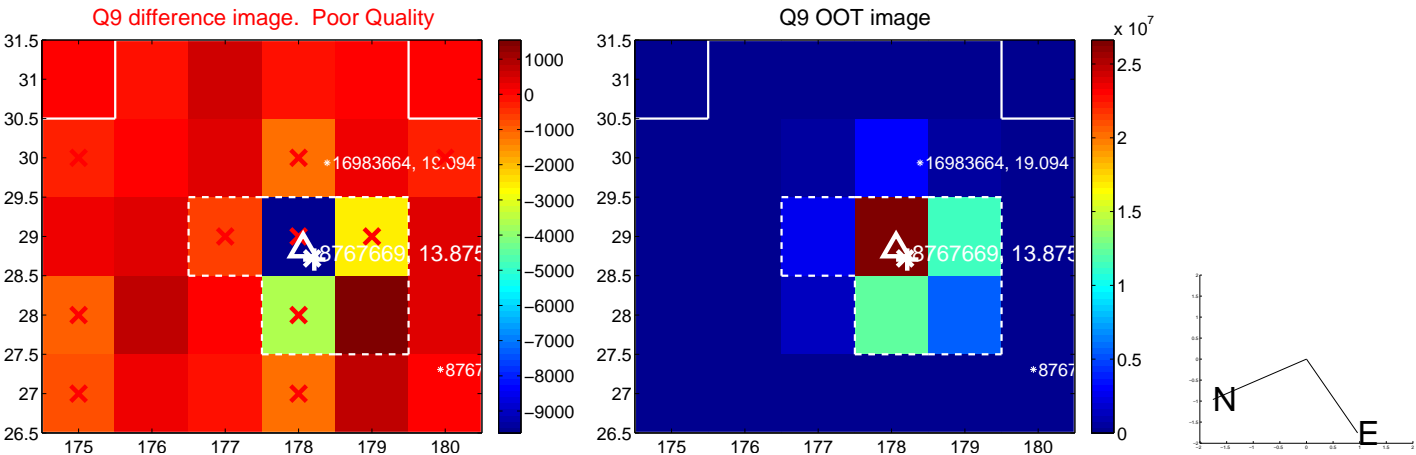
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



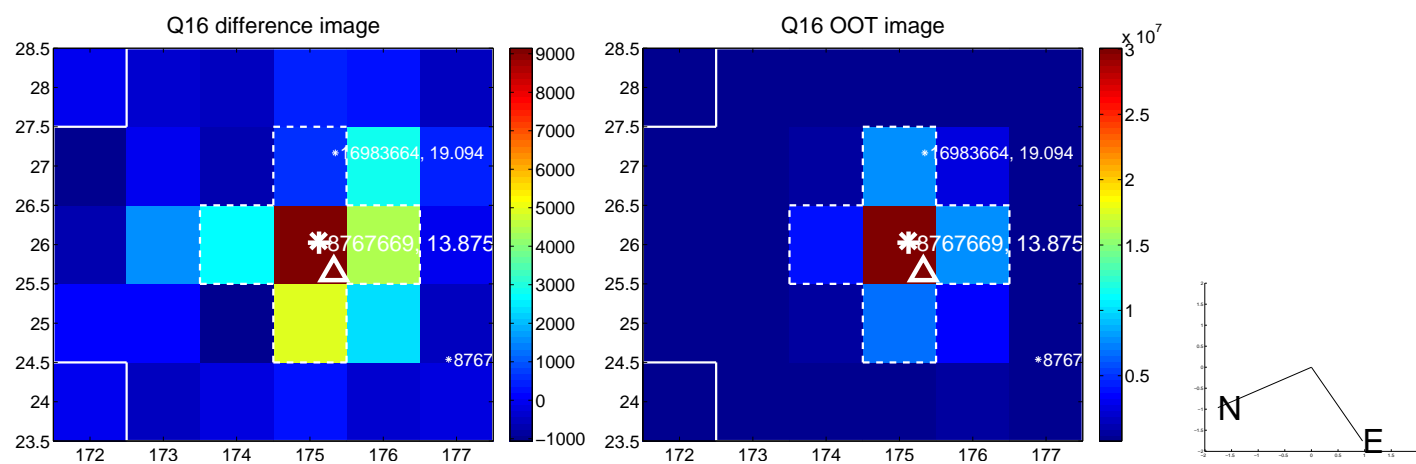
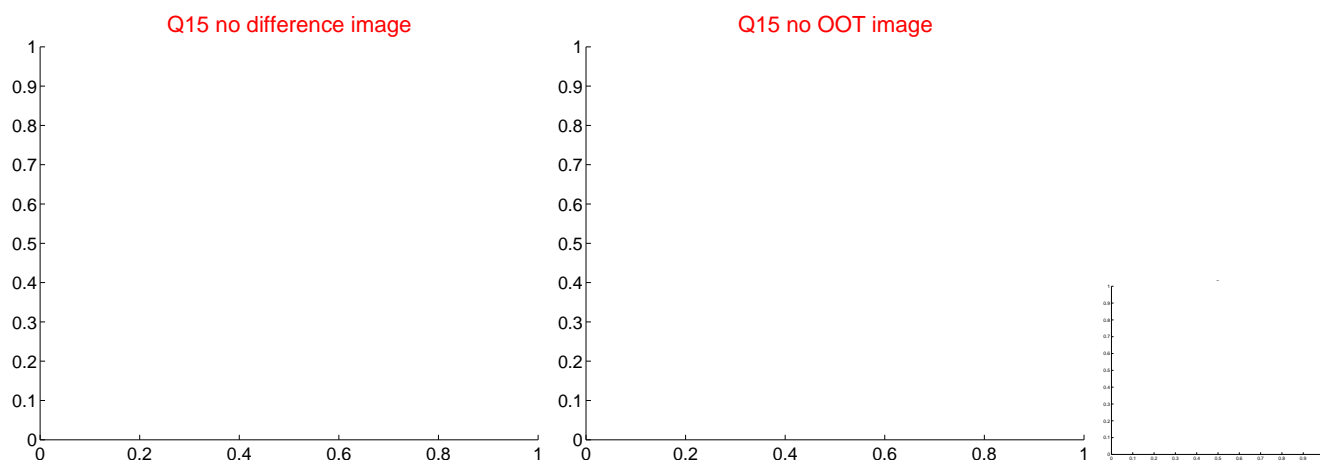
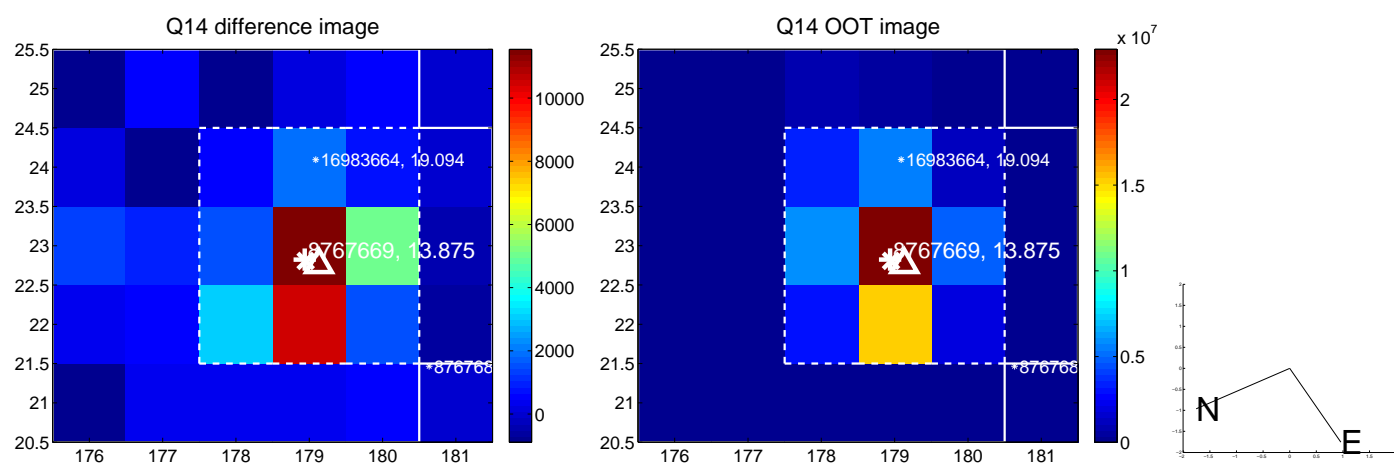
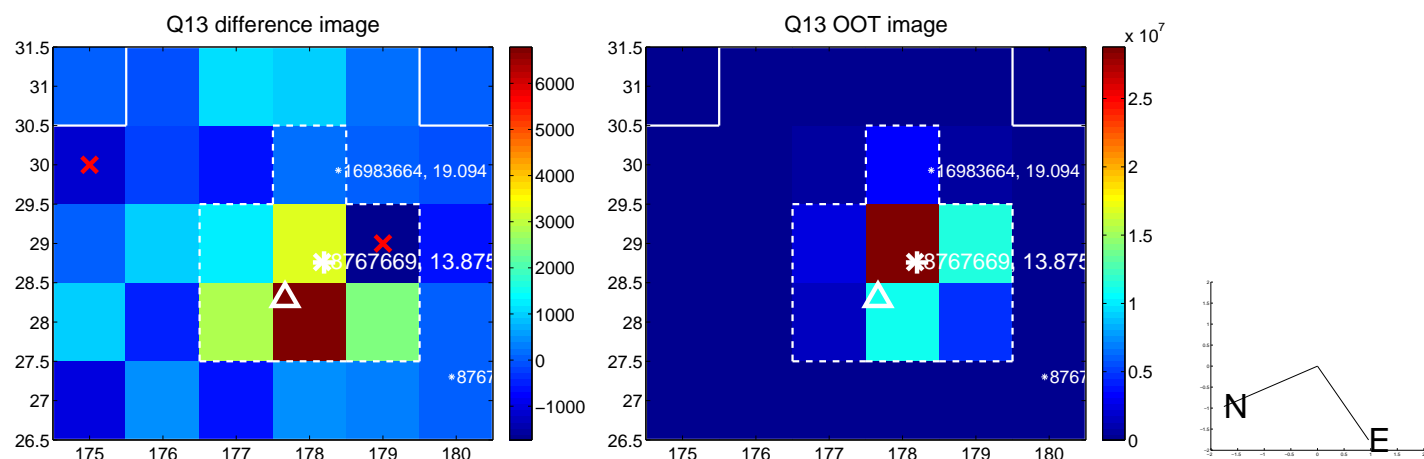
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



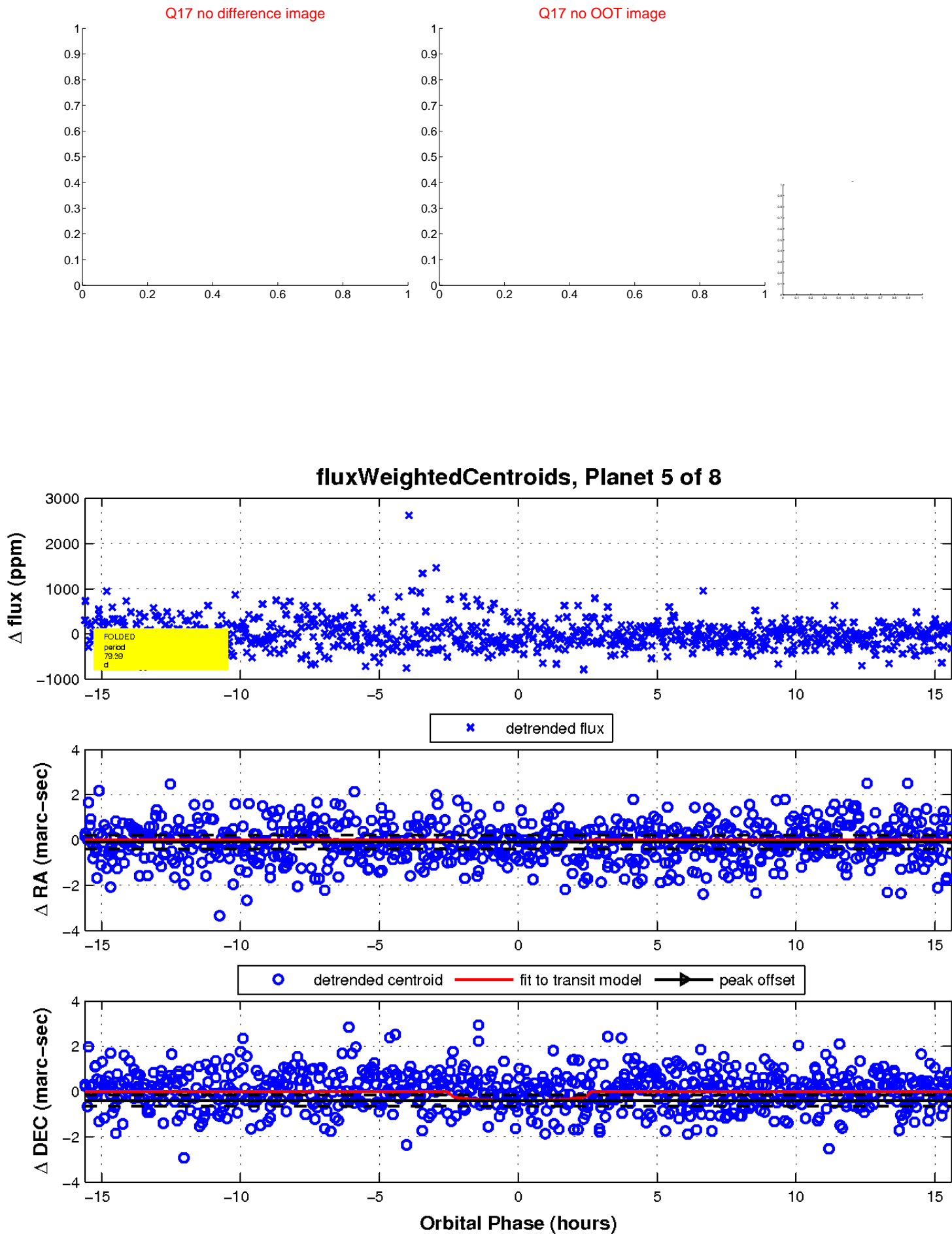
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

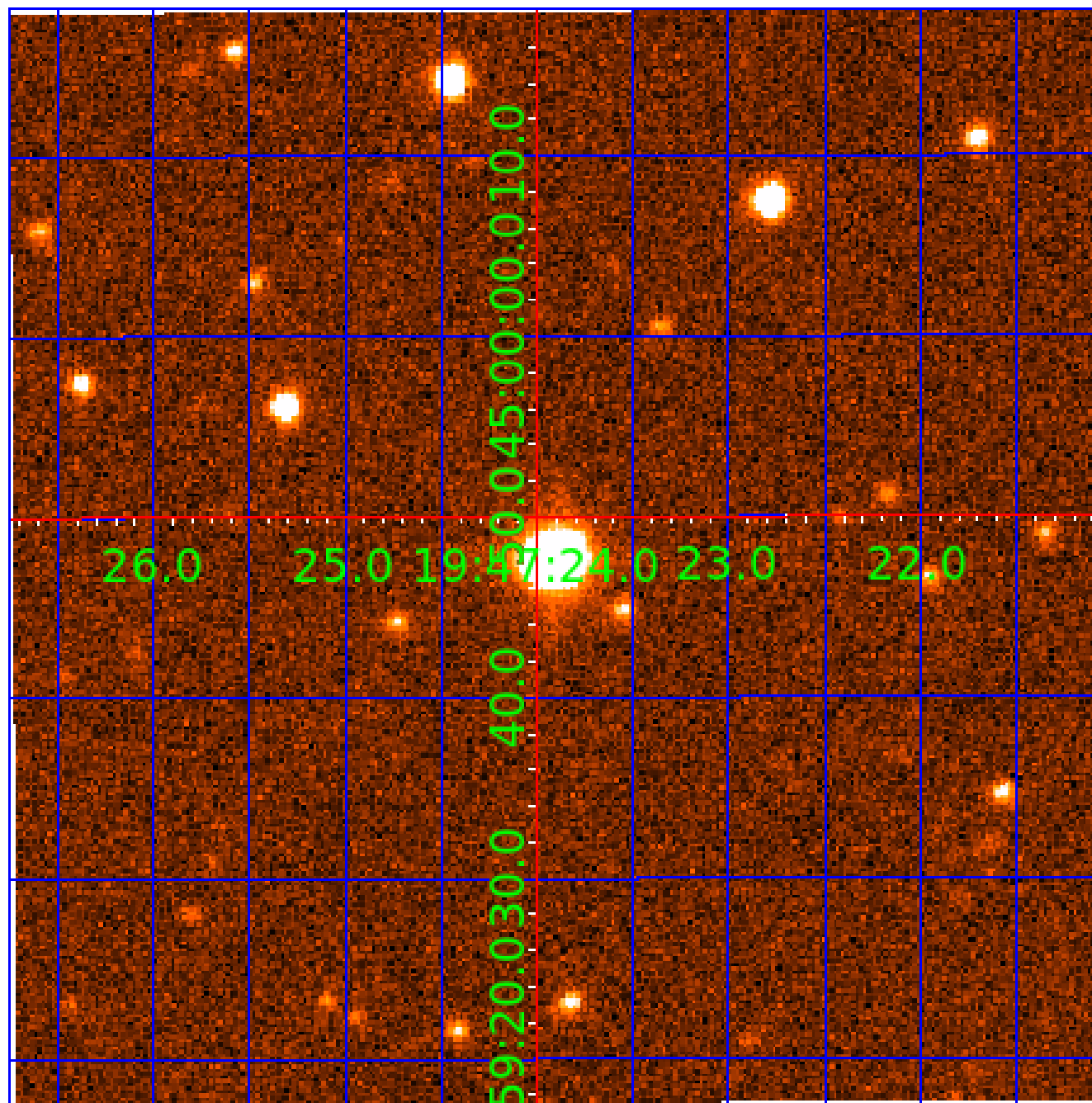


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008767669

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008767669-01 | OBS      | No   | 1.027454      | 131.866368   | 56.6        | 4.168            | 10.1 | 13.5 | 0.71                        | 4338            | 0.53                   | 505.98                 |
| 008767669-02 | OBS      | No   | 259.258227    | 237.523756   | 656.2       | 15.309           | 16.0 | 6.7  | 0.71                        | 4338            | 2.24                   | 0.32                   |
| 008767669-04 | OBS      | No   | 77.391894     | 168.038322   | 264.6       | 5.687            | 10.5 | 4.7  | 0.71                        | 4338            | 1.30                   | 1.59                   |
| 008767669-05 | OBS      | No   | 79.392159     | 186.894962   | 178.4       | 5.210            | 10.3 | 3.3  | 0.71                        | 4338            | 1.06                   | 1.54                   |
| 008767669-06 | OBS      | No   | 137.506101    | 148.977257   | 209.7       | 4.835            | 9.0  | 3.9  | 0.71                        | 4338            | 1.12                   | 0.74                   |
| 008767669-07 | OBS      | No   | 66.132688     | 149.768808   | 94.2        | 11.290           | 9.9  | 1.9  | 0.71                        | 4338            | 0.79                   | 1.96                   |
| 008767669-08 | OBS      | No   | 99.591749     | 151.043130   | 315.0       | 5.022            | 9.5  | 6.6  | 0.71                        | 4338            | 1.31                   | 1.14                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 008767669-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST           |
| 008767669-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT   |
| 008767669-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008767669-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 008767669-07 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-08 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT   |

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

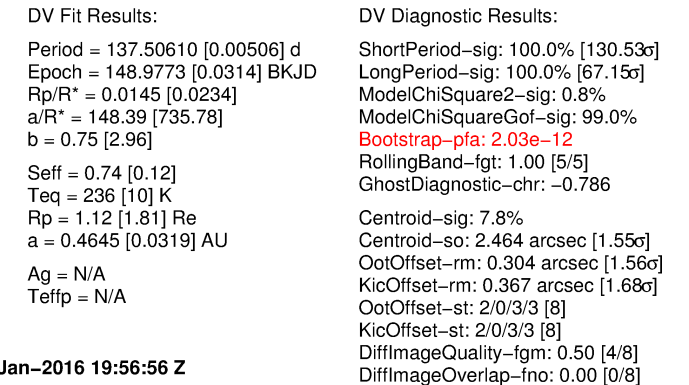
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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 008767669-06

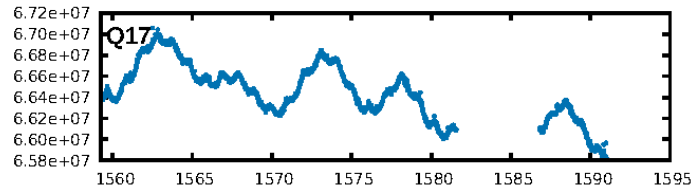
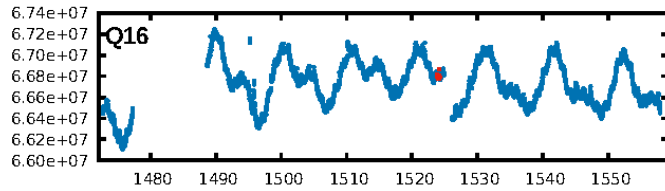
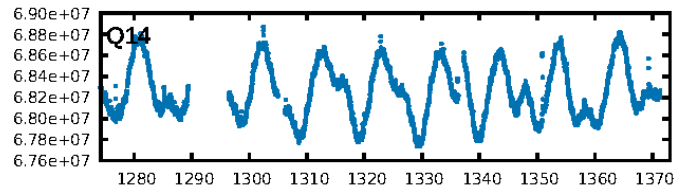
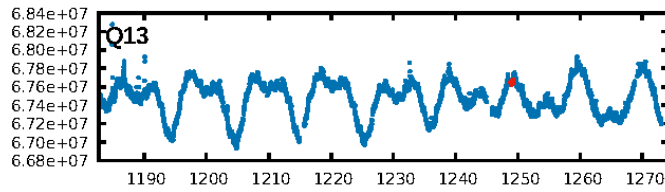
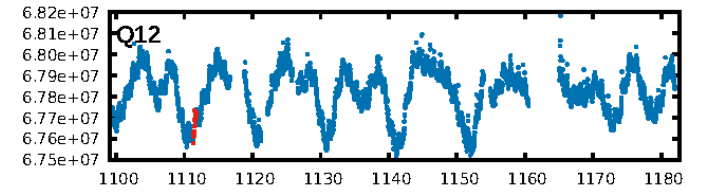
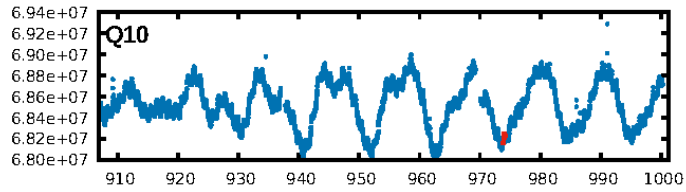
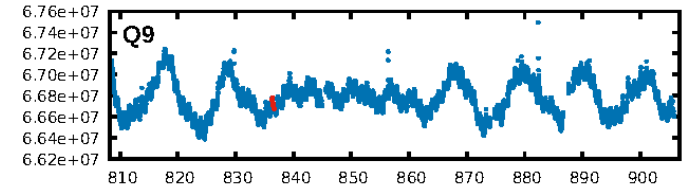
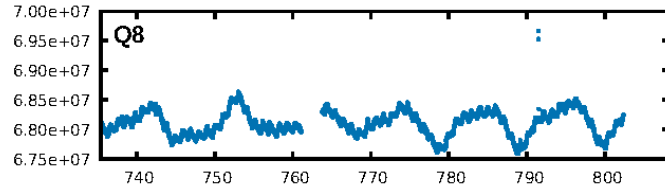
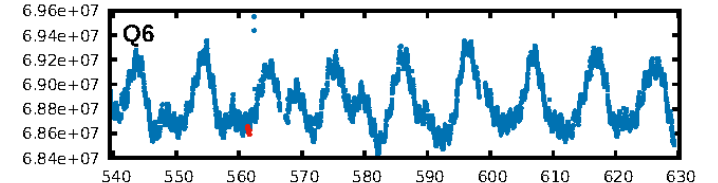
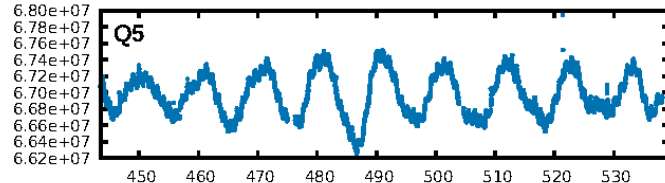
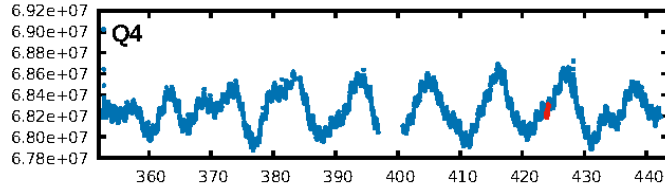
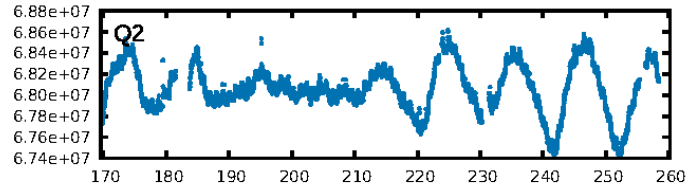
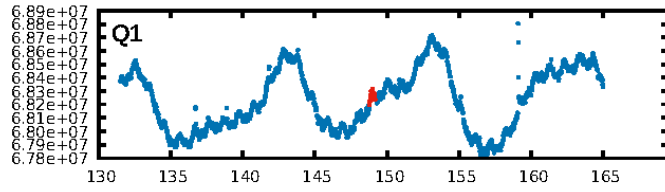
No Significant Match Found

## KIC: 8767669    Candidate: 6 of 8    Period: 137.506 d

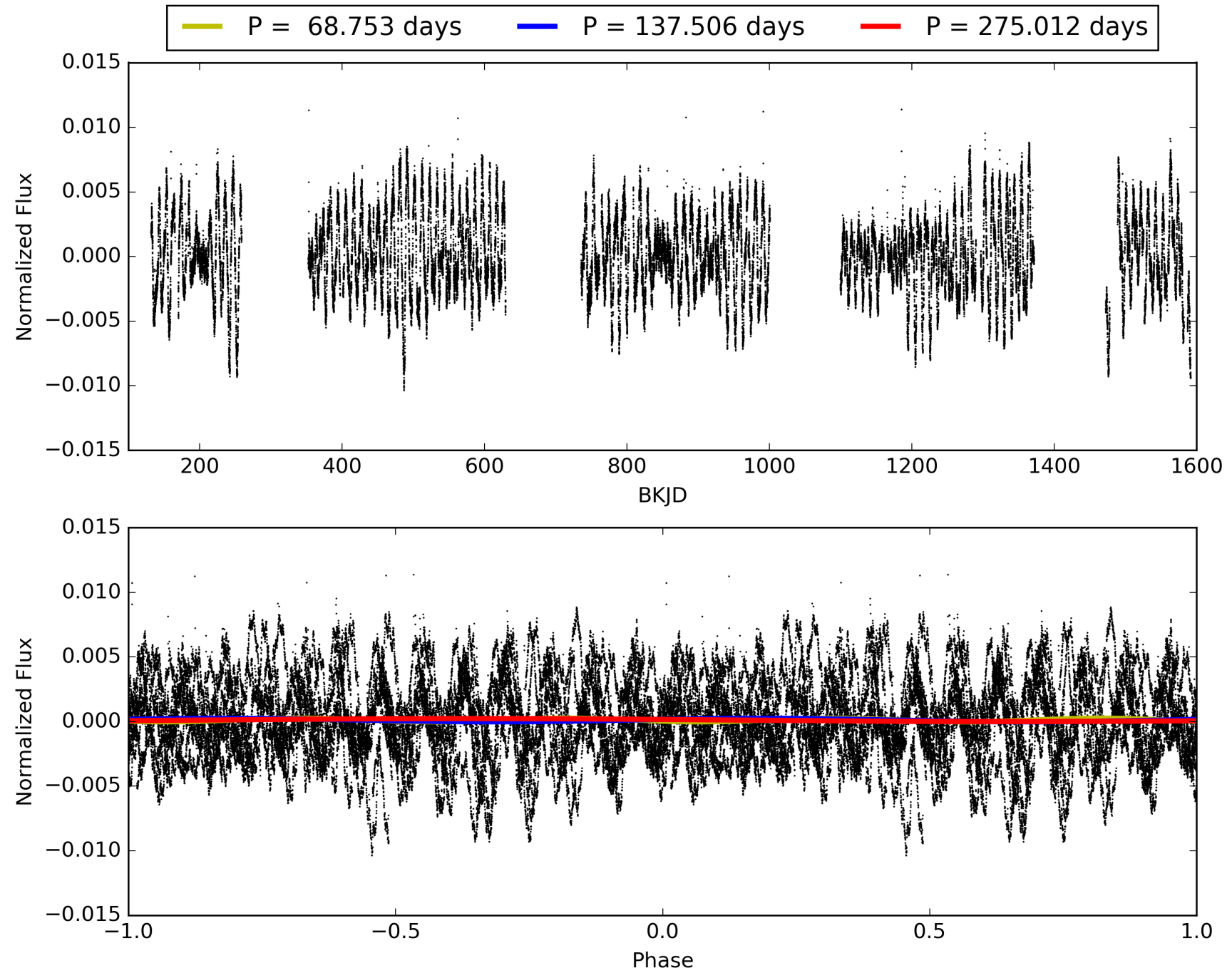
Software Revision: [svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958](https://murzim/repo/soc/tags/release/9.3.42@60958) -- Date Generated: 31-Jan-2016 19:56:56 Z

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

# TCE 008767669-06, PDC Light Curves

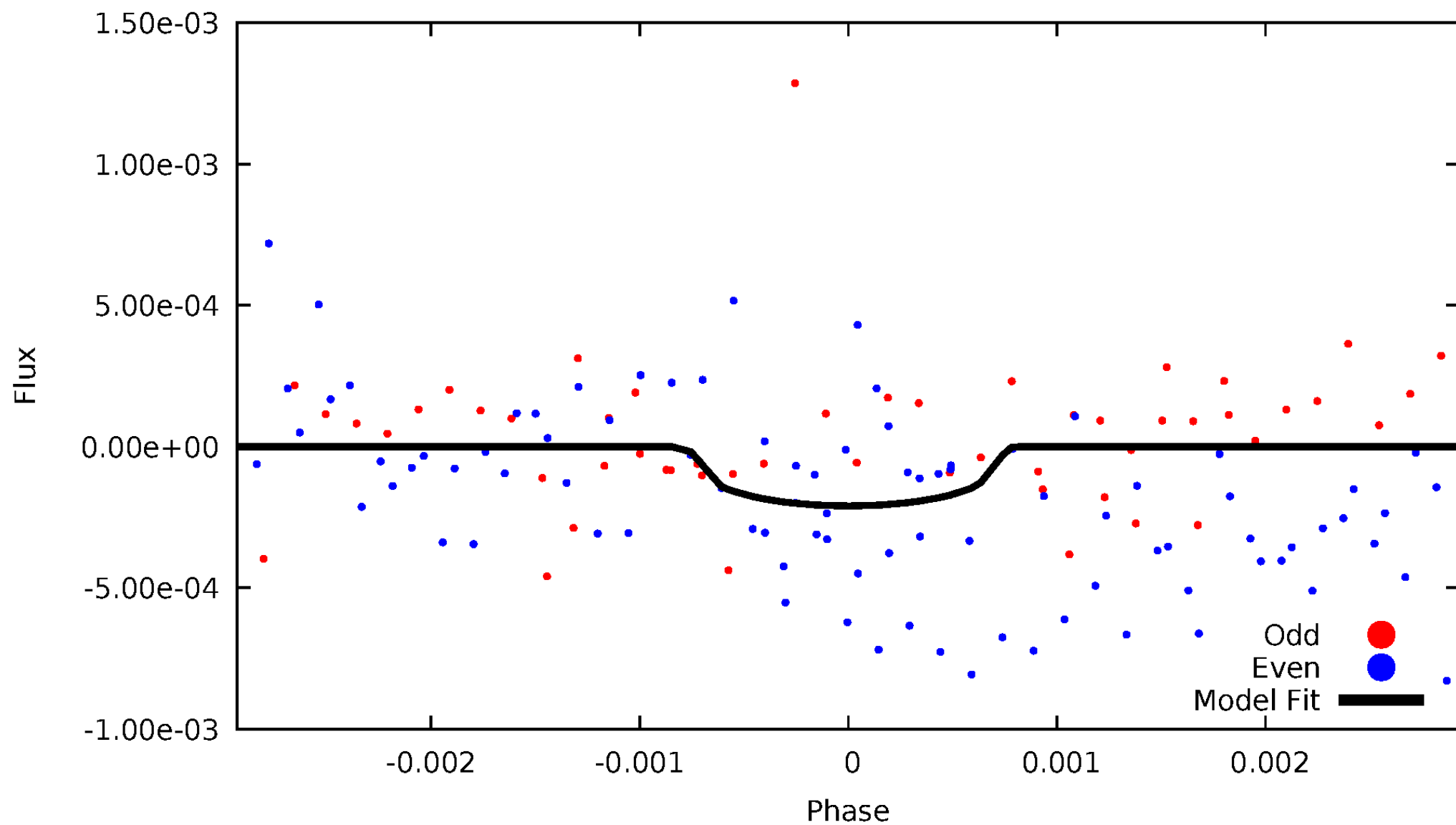


# TCE 008767669-06



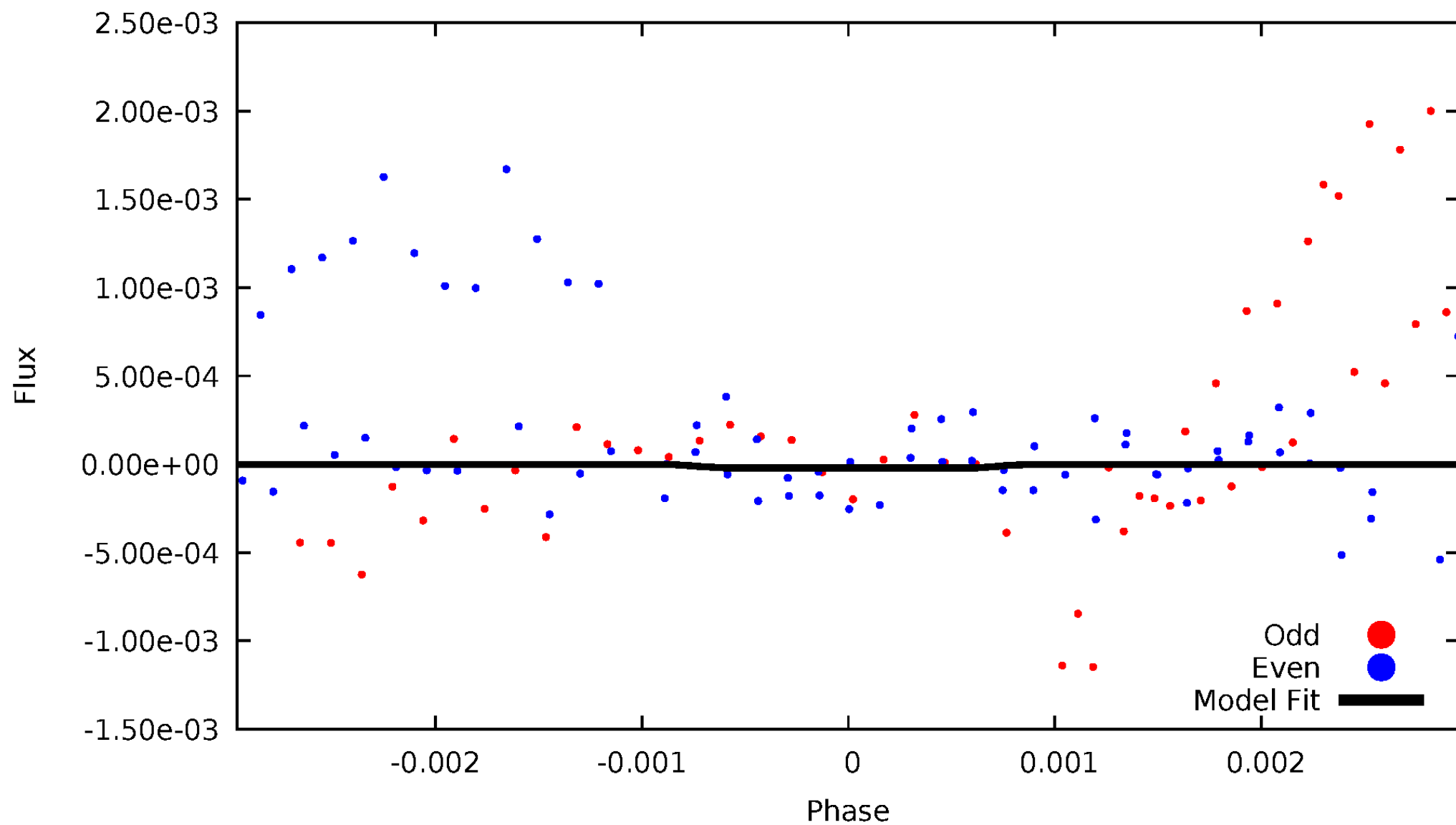
# DV Odd/Even

TCE 008767669-06



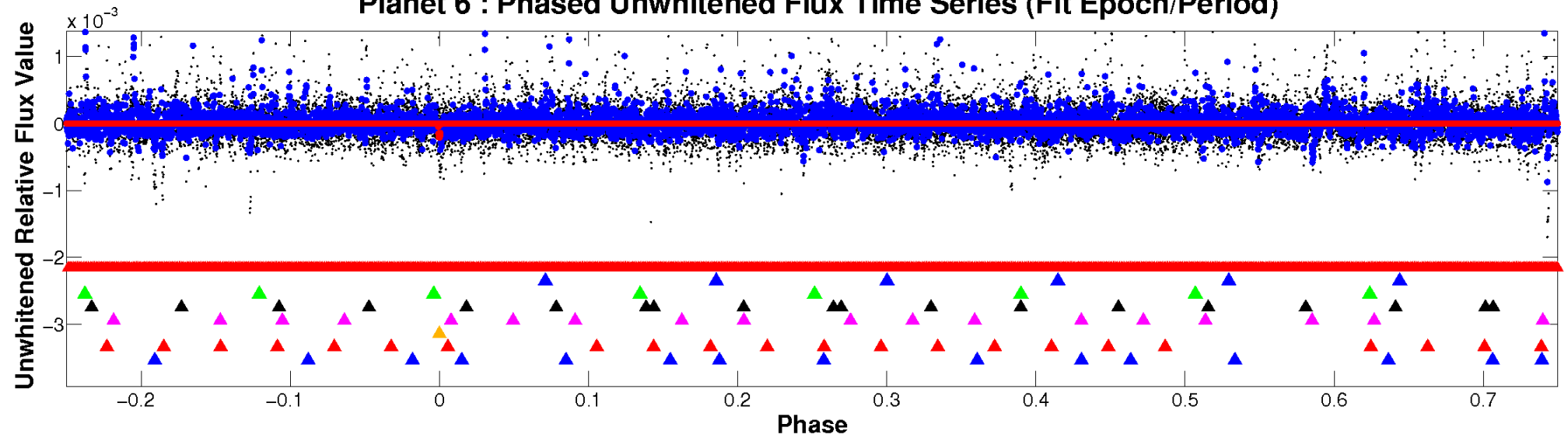
# ALT Odd/Even

TCE 008767669-06

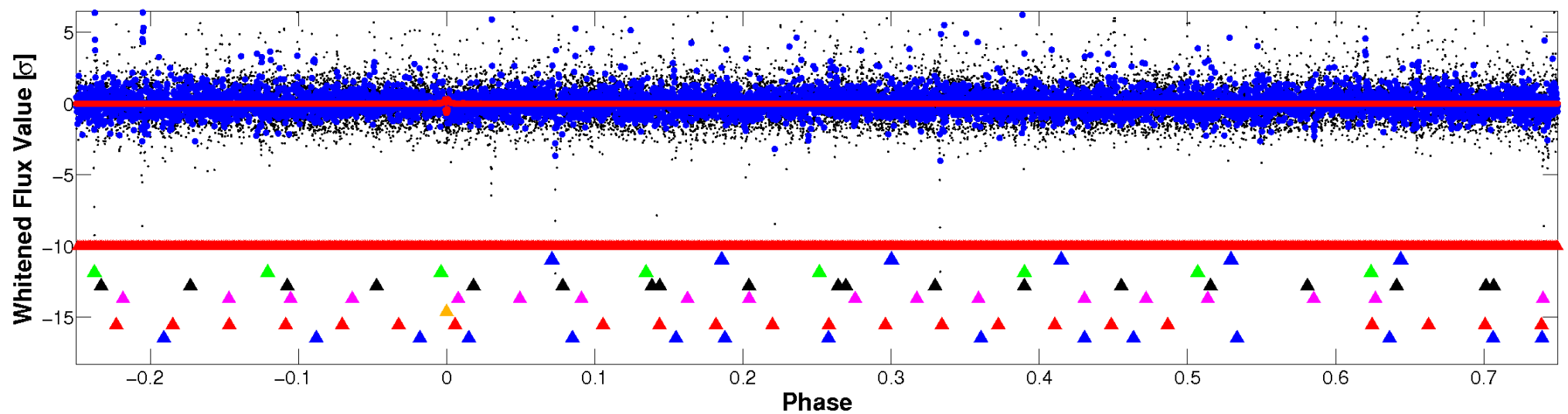


# Non-Whitened Vs. Whitened Light Curve

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

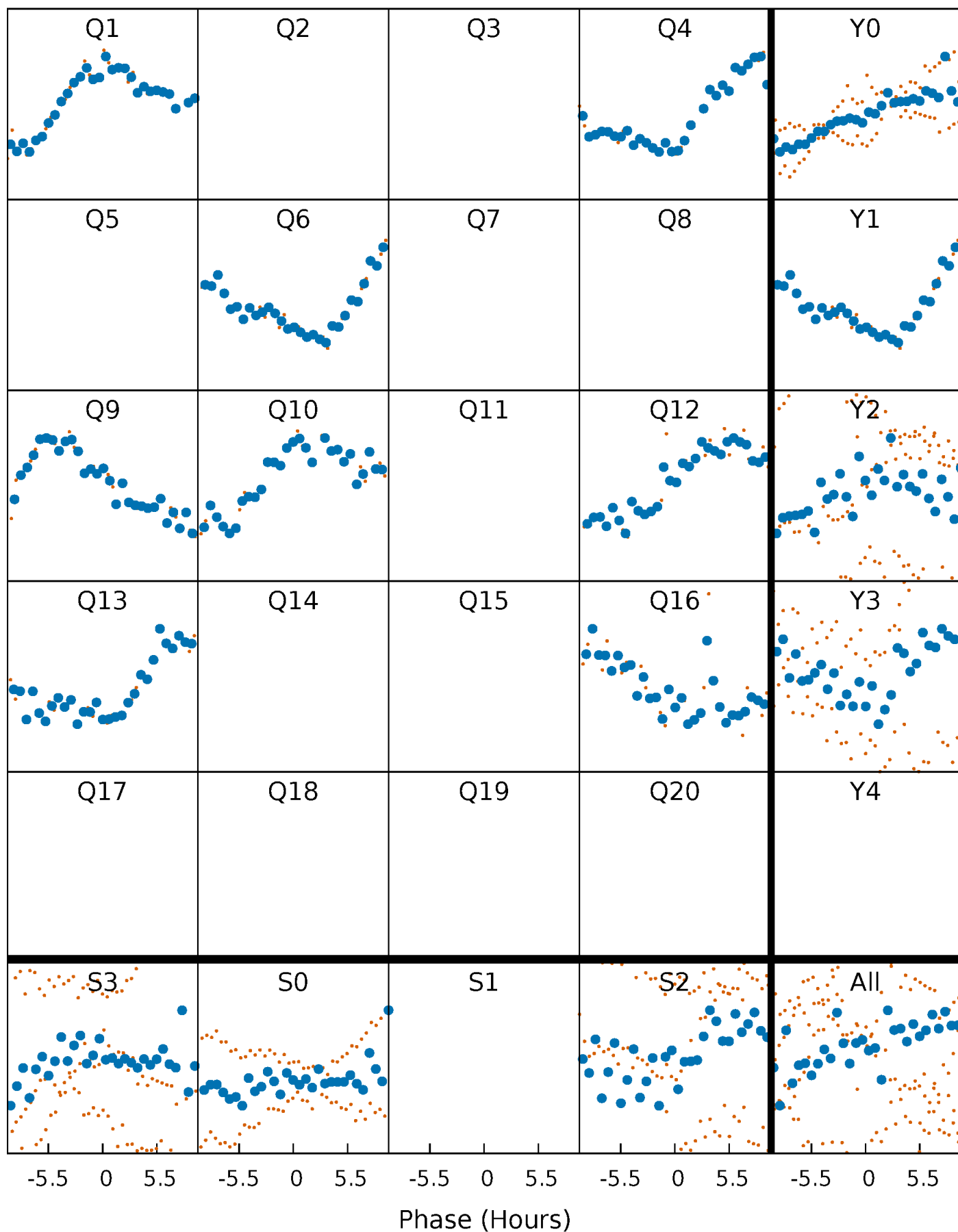


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

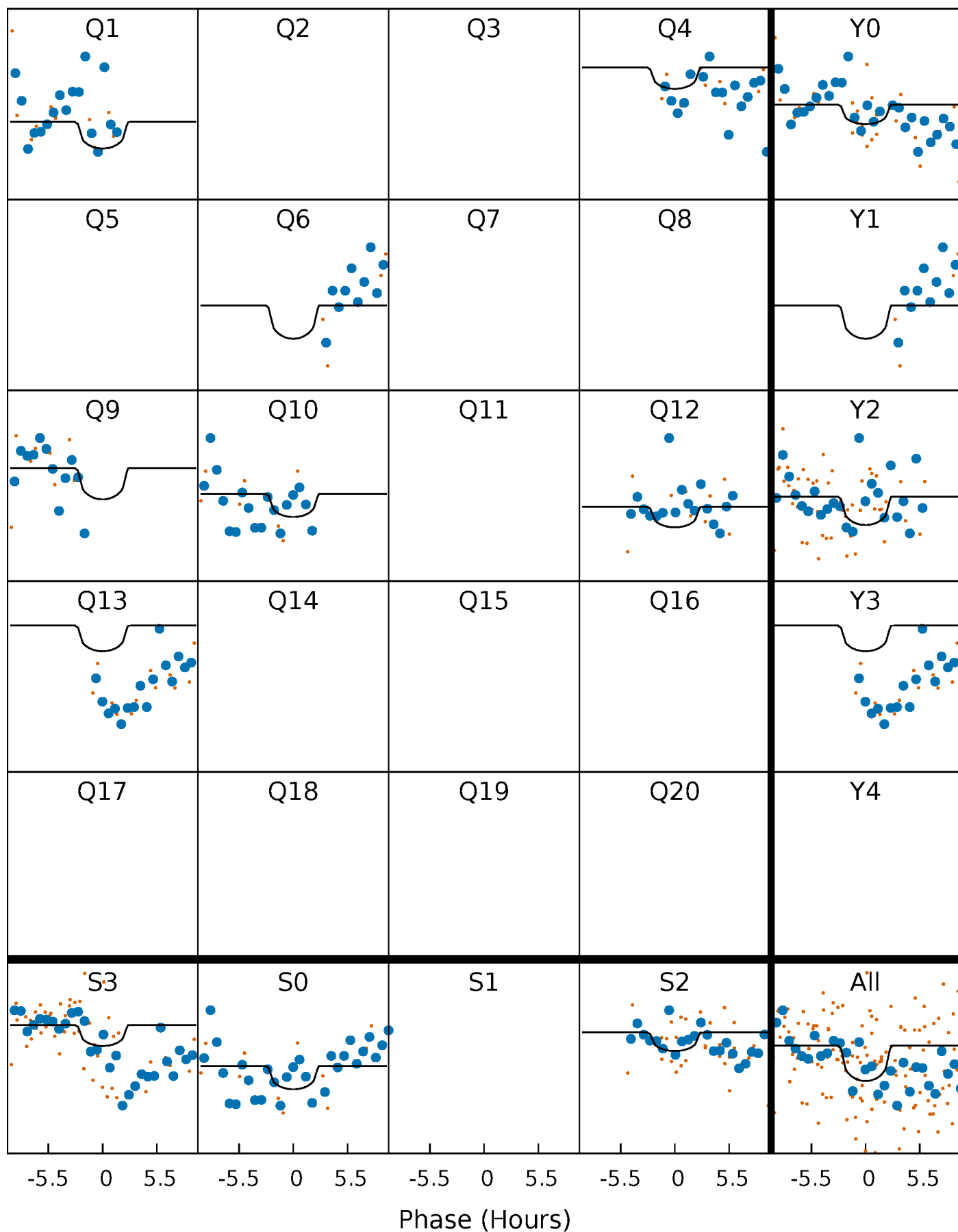
TCE 008767669-06 P=137.506101 Days  $T_0=148.977258$  (BKJD)





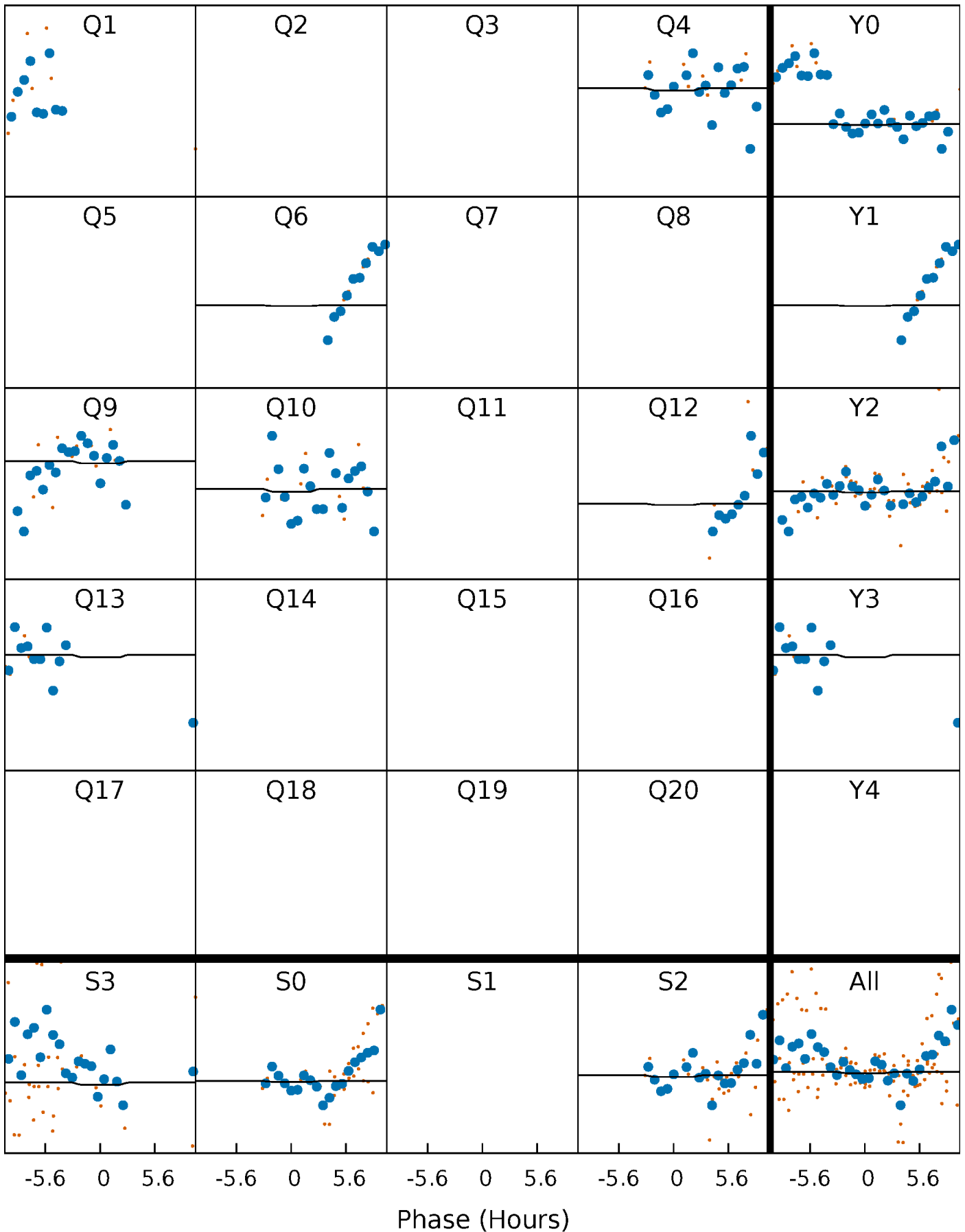
# DV Quarter-Phased Transit Curves

TCE 008767669-06 P=137.506101 Days  $T_0=148.977258$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

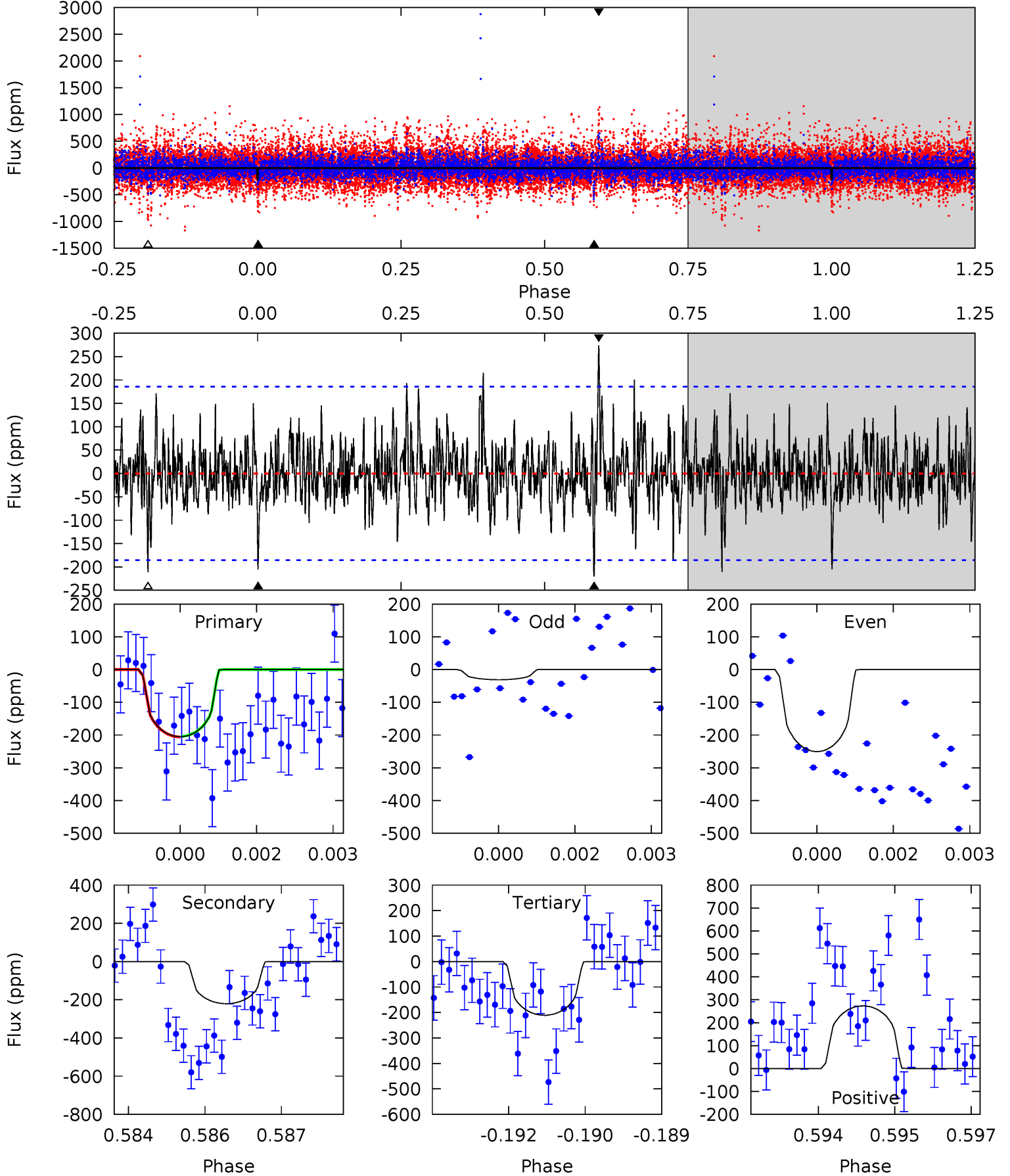
TCE 008767669-06 P=137.422502 Days  $T_0=149.210897$  (BKJD)



# DV Model-Shift Uniqueness Test

008767669-06, P = 137.506101 Days, E = 11.471157 Days

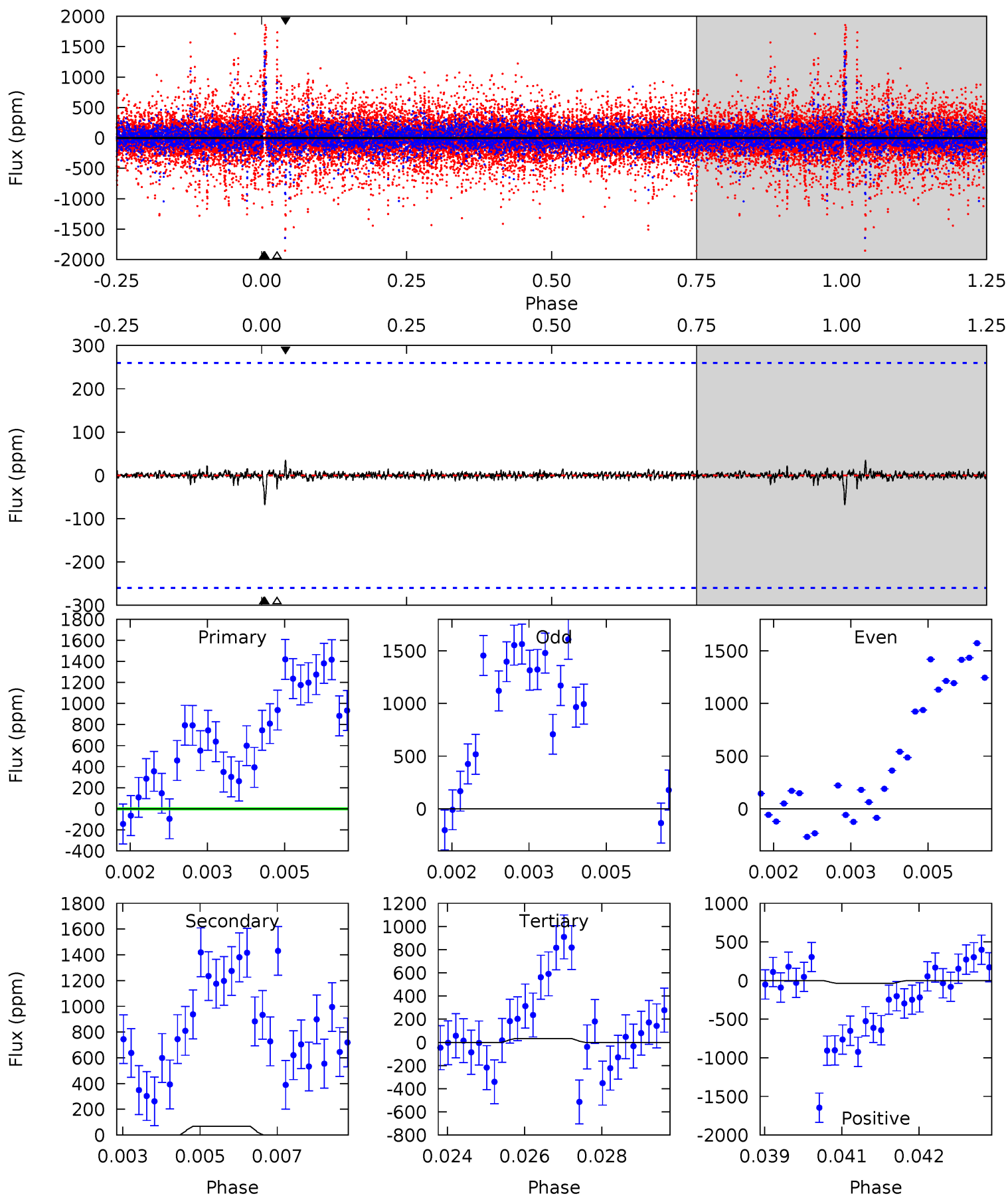
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 5.94 | 6.39 | 6.11 | 7.91 | 5.37            | 3.17            | 1.58             | -0.17   | -1.98   | 0.28    | -1.53   | 2.59    | 1.09 | 0.55  | 0.03 |



# Alt Model-Shift Uniqueness Test

008767669-06,  $P = 137.422502$  Days,  $E = 11.788395$  Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 0.57 | 1.41 | 0.66 | 0.74 | 5.36            | 3.15            | 0.10             | -0.09   | -0.17   | 0.75    | 0.67    | 0.36    | 1.26 | 0.34  | 0.22 |



### Stellar Parameters For KIC 008767669

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $4338^{+129}_{-142}$ | $4.586^{+0.056}_{-0.017}$ | $0.320^{+0.150}_{-0.300}$ | $0.709^{+0.024}_{-0.057}$ | $0.708^{+0.036}_{-0.049}$ | $2.794^{+0.652}_{-0.202}$                 |
|        | +3%/-3%              | +1%/-0%                   | +47%/-94%                 | +3%/-8%                   | +5%/-7%                   | +23%/-7%                                  |
| Source | PHO1                 | KIC0                      | KIC0                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 008767669-06 / KOI

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$     | $T_{max} (K)$     | $T_{obs} (K)$         | $A_{obs}$               |
|---------|---------------|------------------------|-------------------|-----------------------|-------------------------|
| DV      | $-221 \pm 35$ | $1.78^{+1.51}_{-1.18}$ | $328^{+11}_{-12}$ | $3709^{+2032}_{-656}$ | $8528^{+63351}_{-6120}$ |
| Alt.    | $-68 \pm 48$  | $1.36^{+1.52}_{-0.93}$ | $327^{+11}_{-11}$ | $3208^{+1636}_{-780}$ | $3332^{+35240}_{-2948}$ |

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

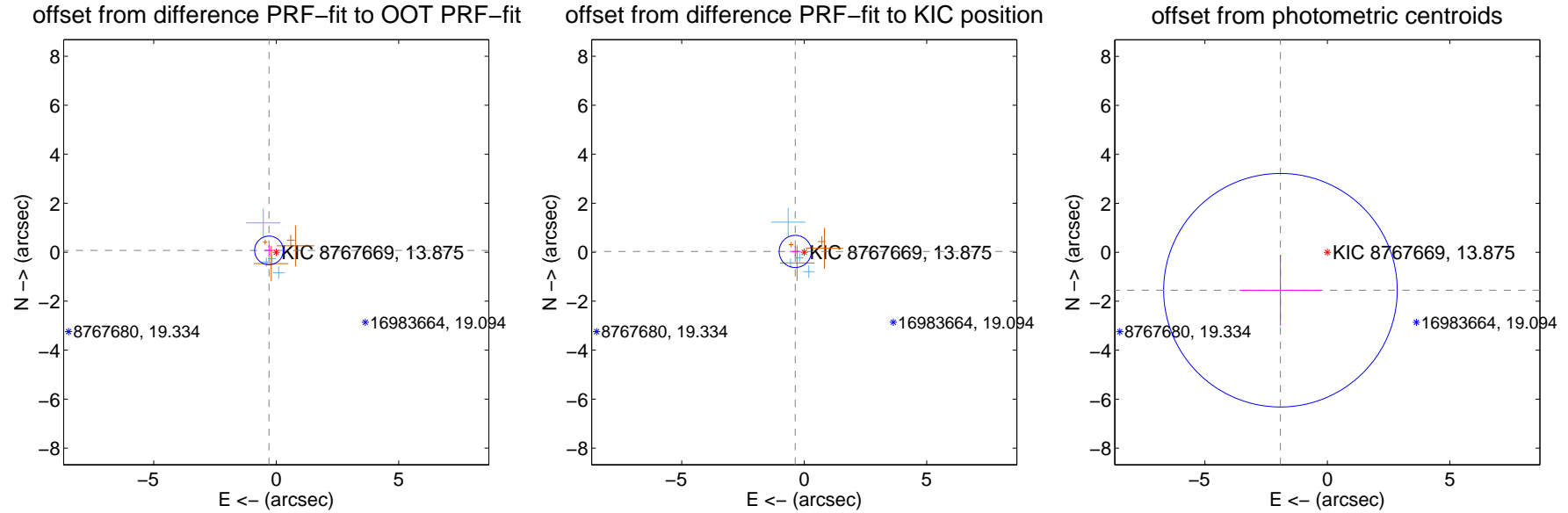
## DV Centroid Data

Supplemental centroid analysis for 008767669-06. Kepler magnitude: 13.88. Transit SNR 3.89

There are 4 quarters with good PRF difference image offsets

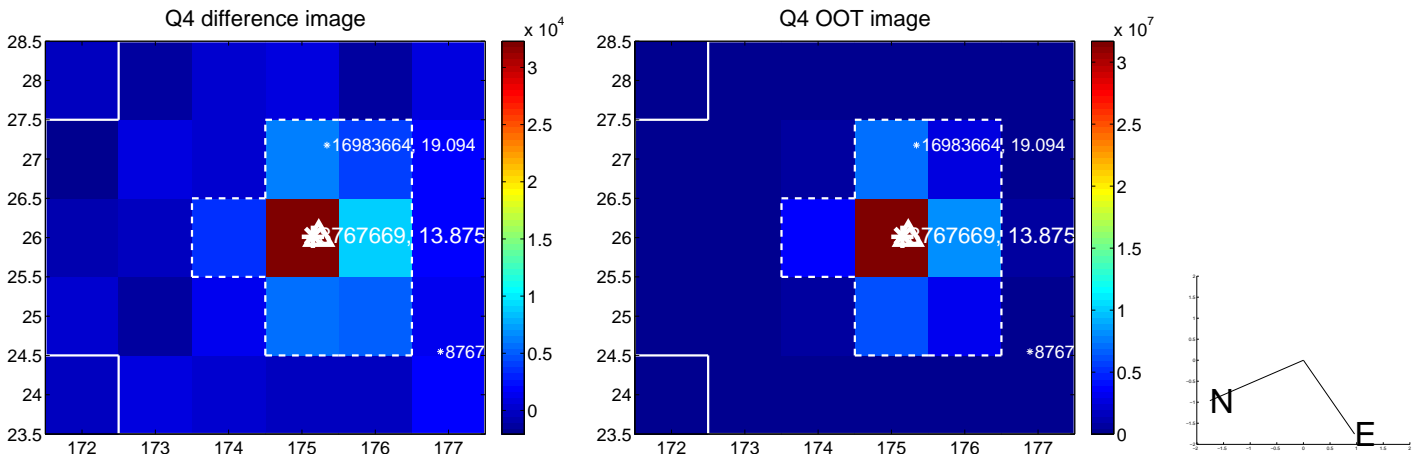
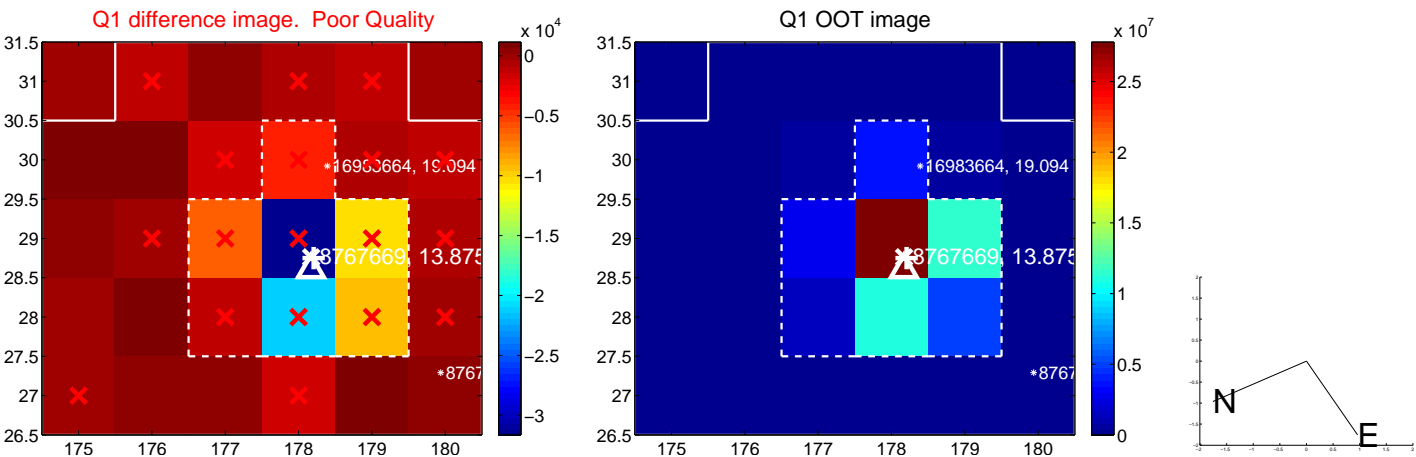
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $0.304 \pm 0.195$  | 1.56                | $0.295 \pm 0.187$ | $0.073 \pm 0.211$ |
| PRF-fit source offset from KIC position | $0.367 \pm 0.219$  | 1.68                | $0.366 \pm 0.220$ | $0.032 \pm 0.214$ |
| photometric centroid source offset      | $2.46 \pm 1.59$    | 1.55                | $1.92 \pm 1.68$   | $-1.55 \pm 1.45$  |



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.

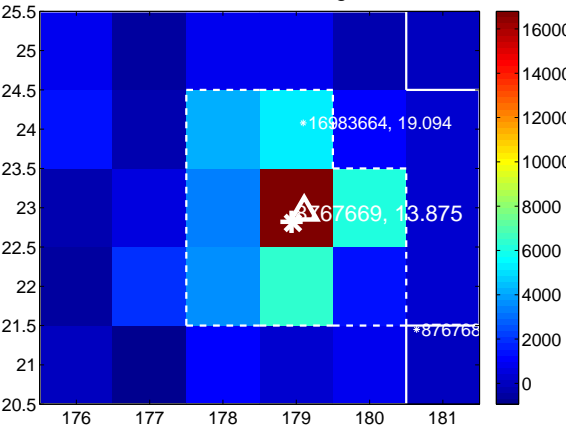
Q5 no difference image



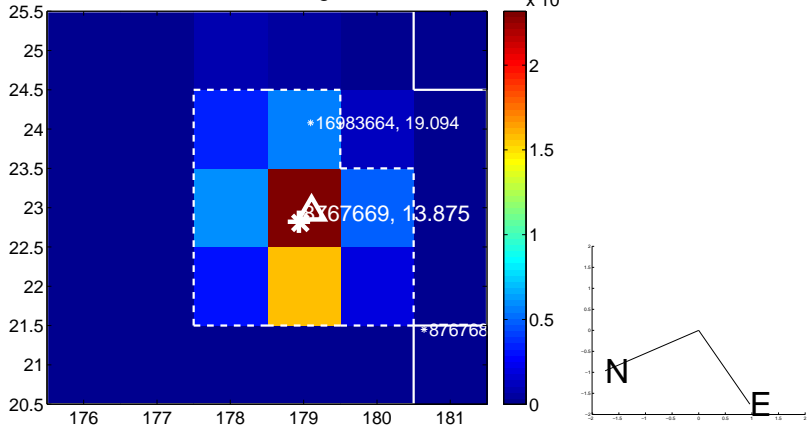
Q5 no OOT image



Q6 difference image



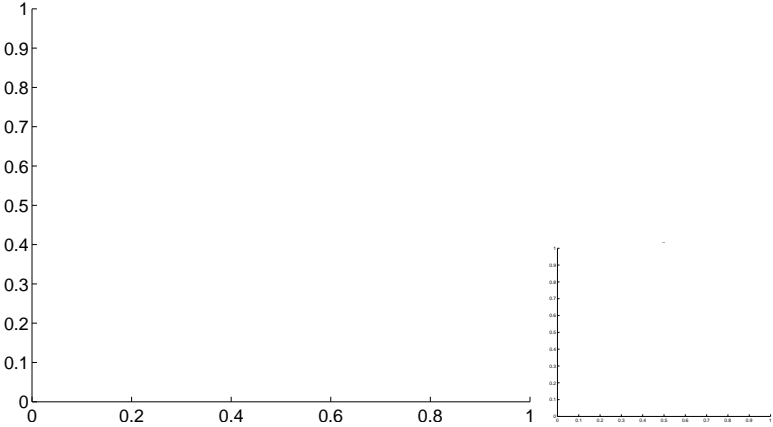
Q6 OOT image



Q7 no difference image



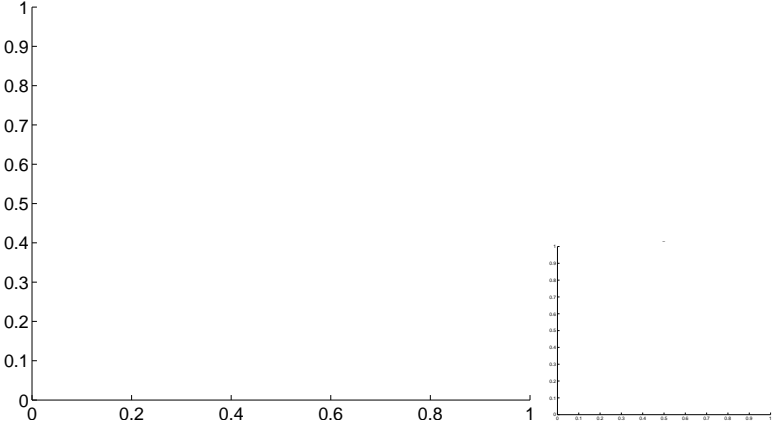
Q7 no OOT image



Q8 no difference image

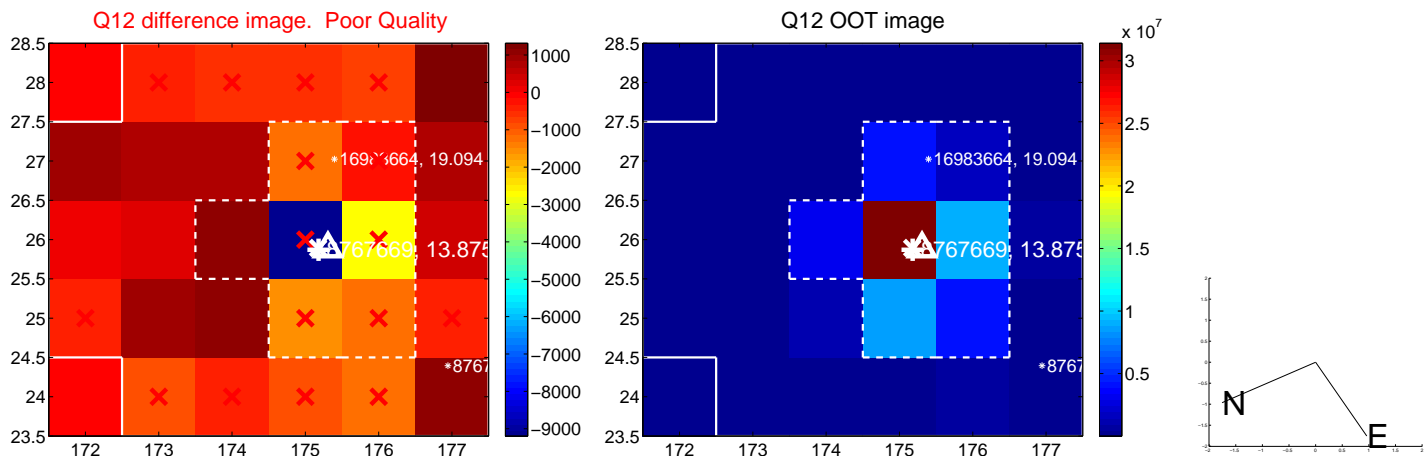
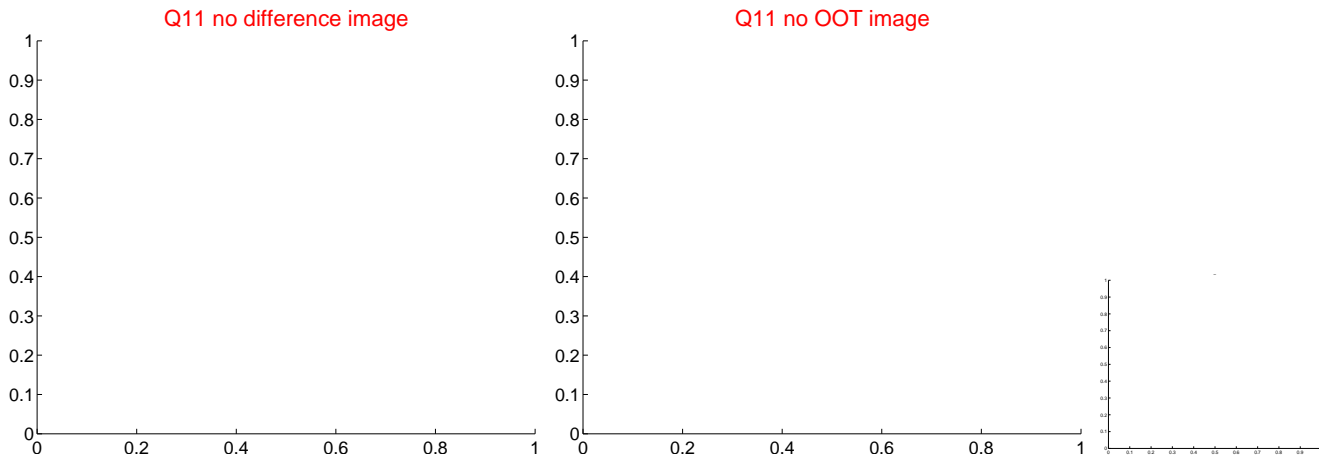
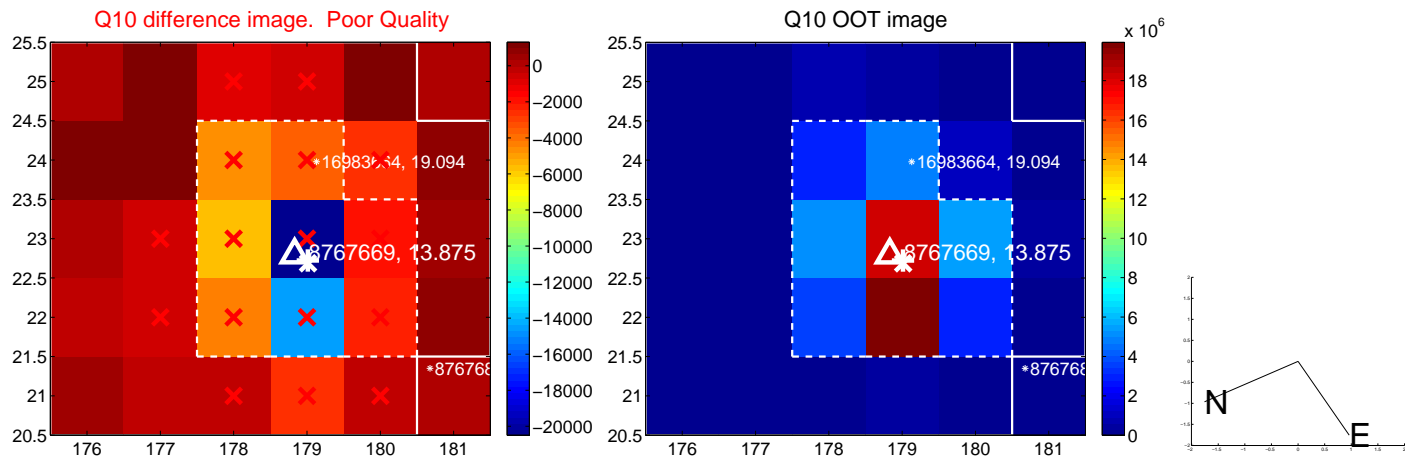
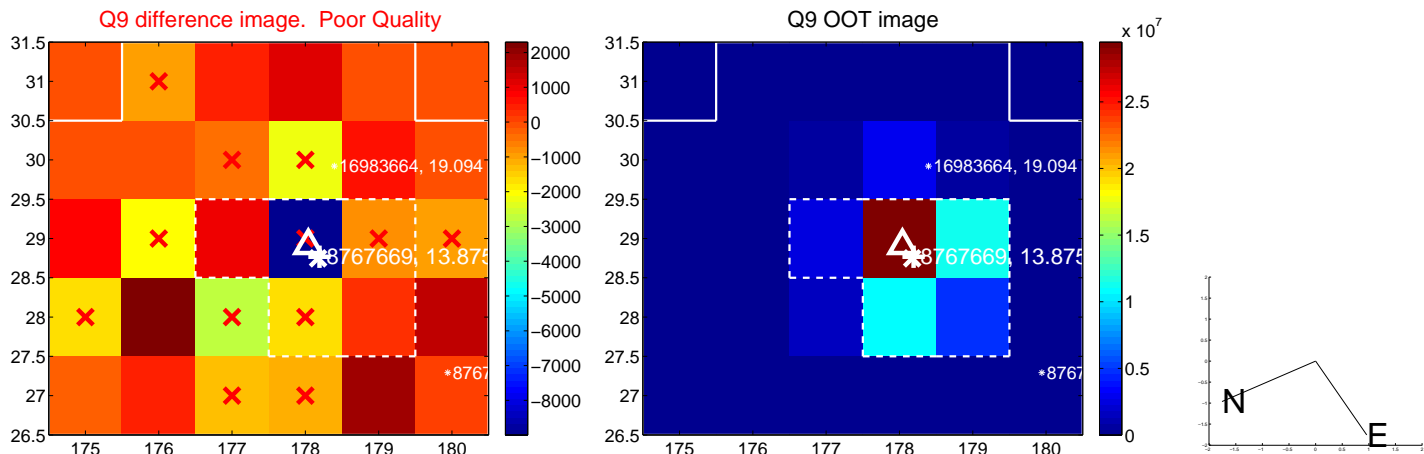


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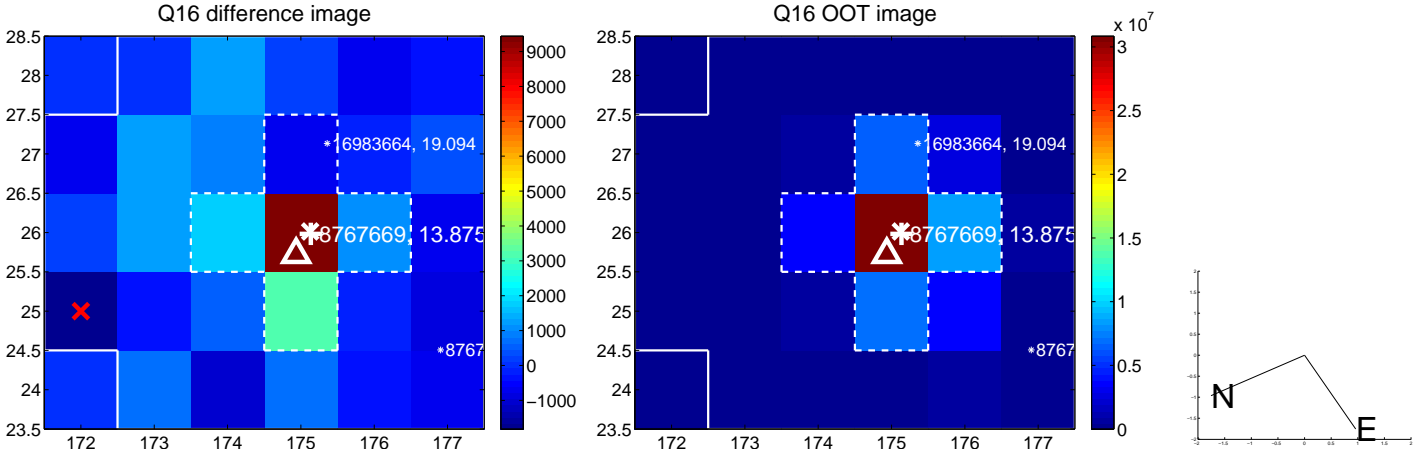
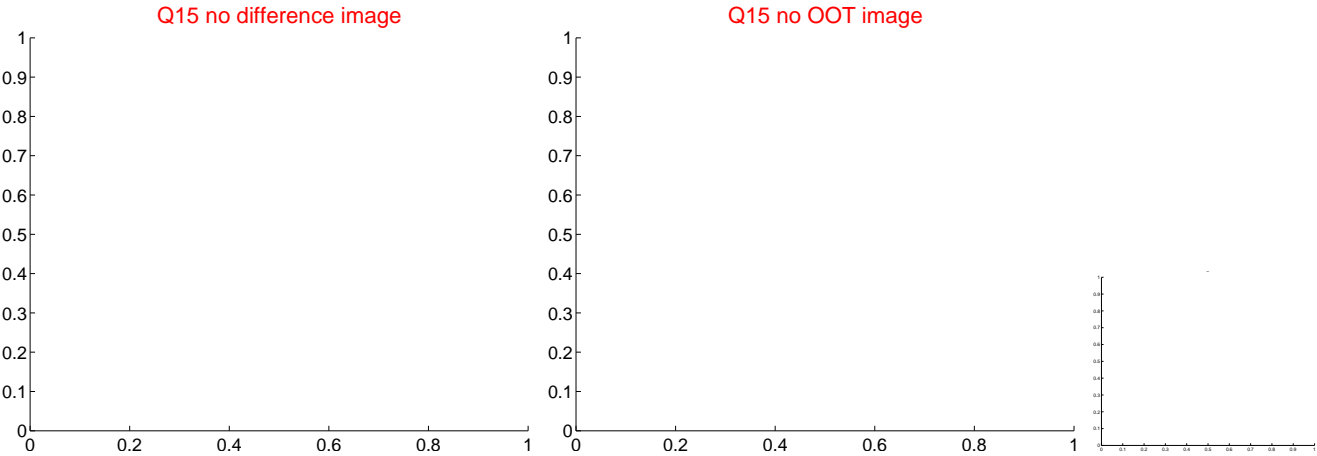
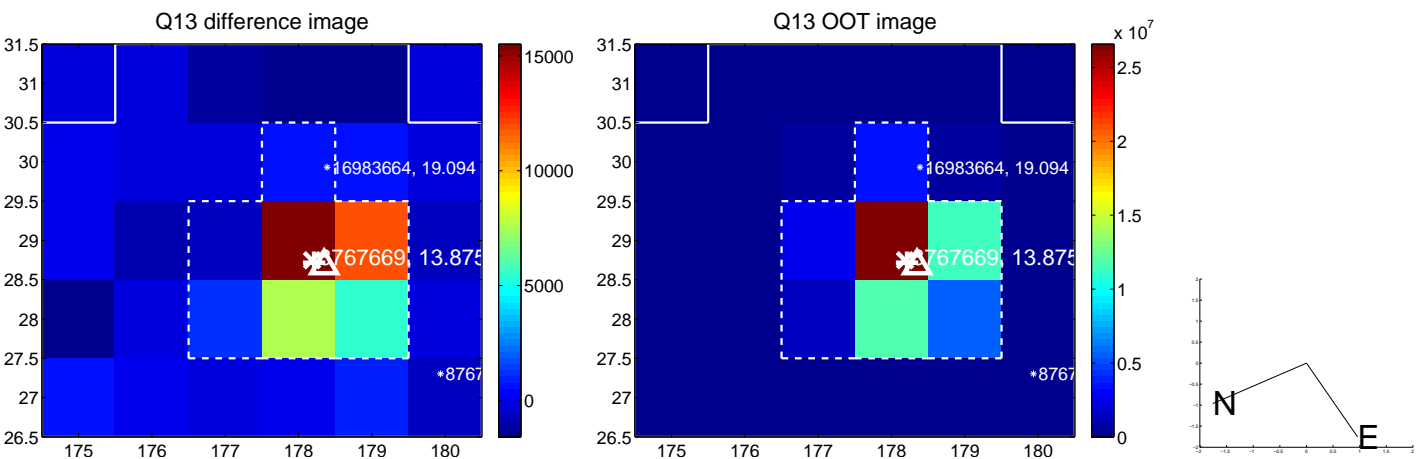




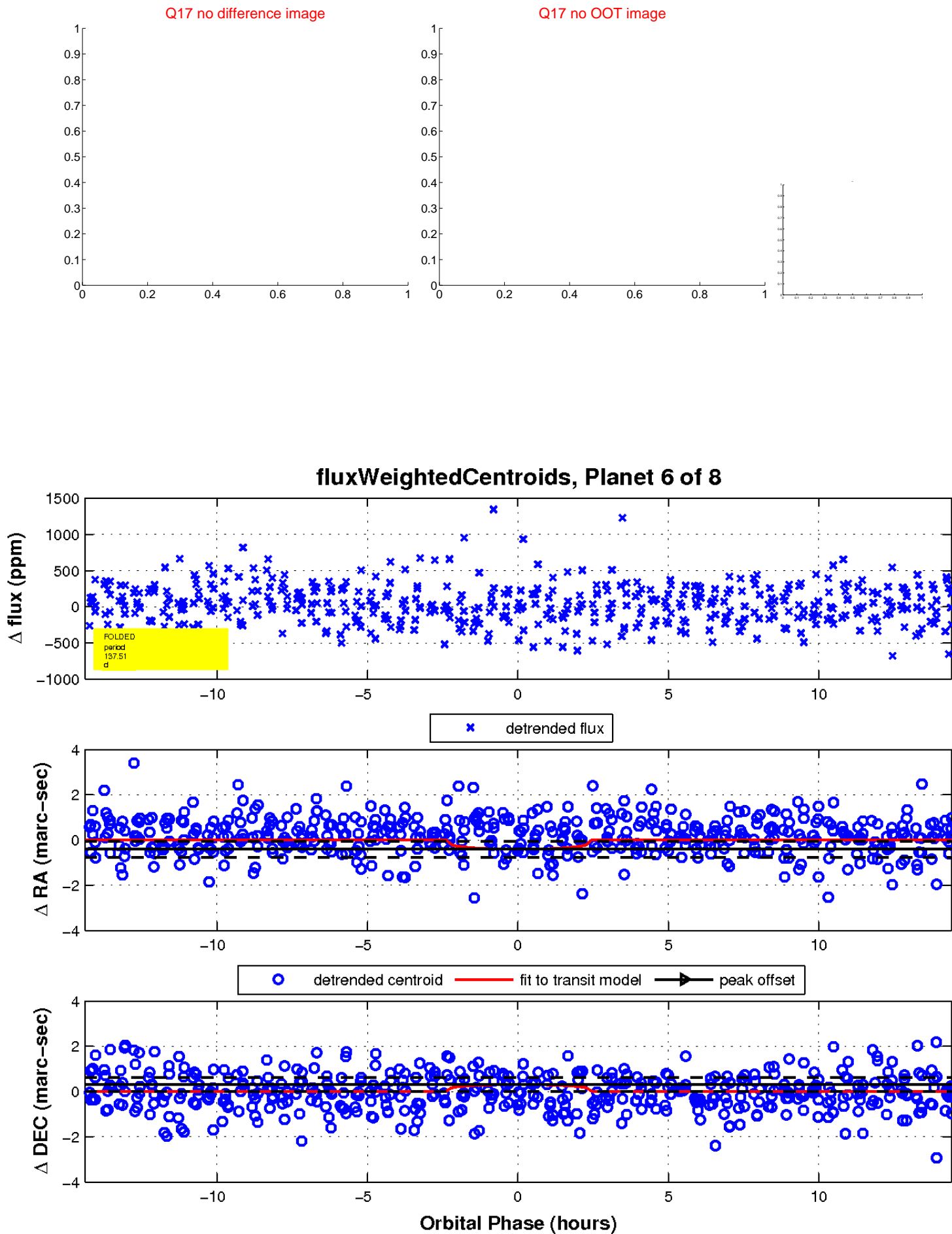
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

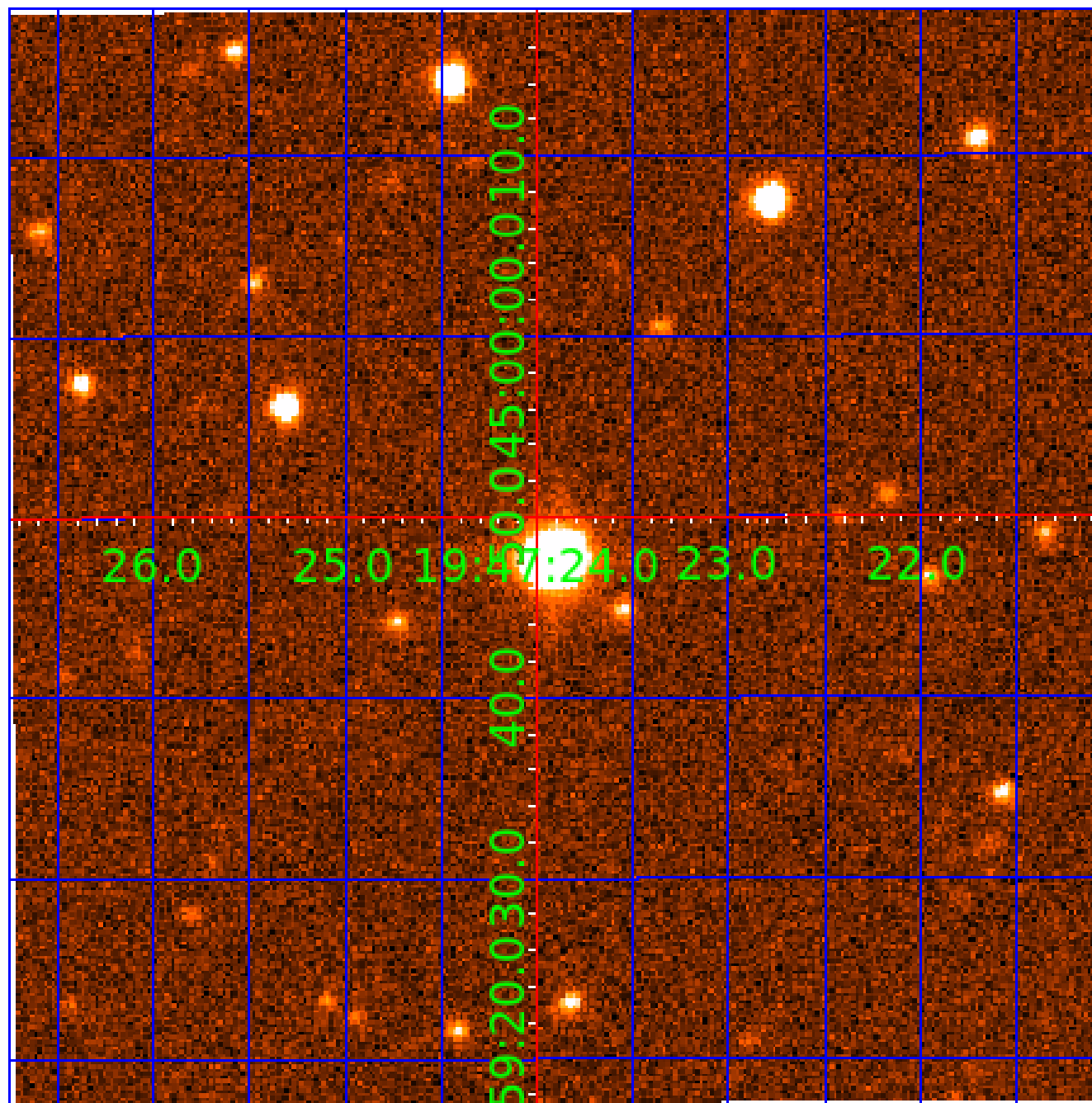


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008767669

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008767669-01 | OBS      | No   | 1.027454      | 131.866368   | 56.6        | 4.168            | 10.1 | 13.5 | 0.71                        | 4338            | 0.53                   | 505.98                 |
| 008767669-02 | OBS      | No   | 259.258227    | 237.523756   | 656.2       | 15.309           | 16.0 | 6.7  | 0.71                        | 4338            | 2.24                   | 0.32                   |
| 008767669-04 | OBS      | No   | 77.391894     | 168.038322   | 264.6       | 5.687            | 10.5 | 4.7  | 0.71                        | 4338            | 1.30                   | 1.59                   |
| 008767669-05 | OBS      | No   | 79.392159     | 186.894962   | 178.4       | 5.210            | 10.3 | 3.3  | 0.71                        | 4338            | 1.06                   | 1.54                   |
| 008767669-06 | OBS      | No   | 137.506101    | 148.977257   | 209.7       | 4.835            | 9.0  | 3.9  | 0.71                        | 4338            | 1.12                   | 0.74                   |
| 008767669-07 | OBS      | No   | 66.132688     | 149.768808   | 94.2        | 11.290           | 9.9  | 1.9  | 0.71                        | 4338            | 0.79                   | 1.96                   |
| 008767669-08 | OBS      | No   | 99.591749     | 151.043130   | 315.0       | 5.022            | 9.5  | 6.6  | 0.71                        | 4338            | 1.31                   | 1.14                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 008767669-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST           |
| 008767669-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT   |
| 008767669-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008767669-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 008767669-07 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-08 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT   |

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

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

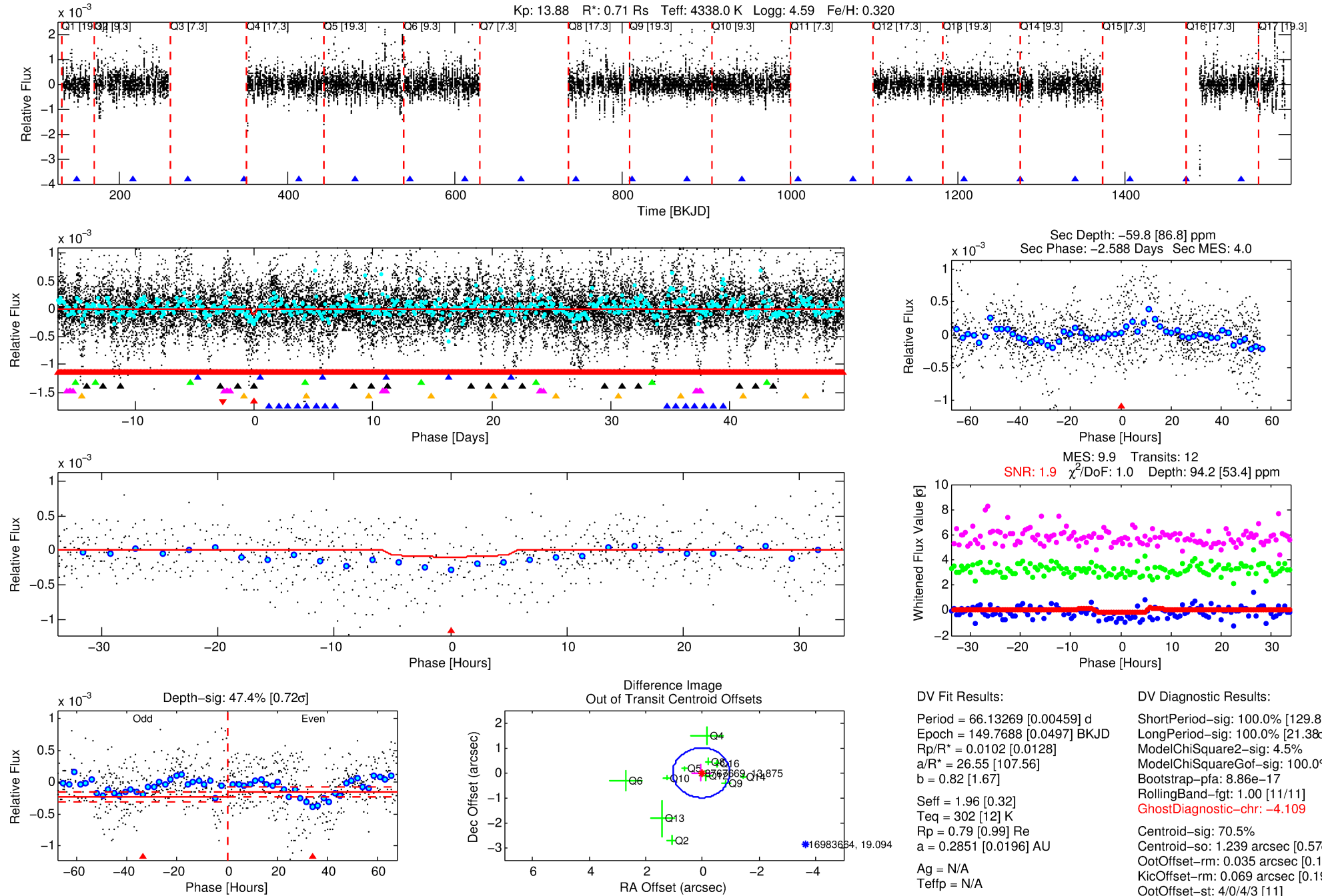
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008767669-07

No Significant Match Found

# DV One-Page Summary

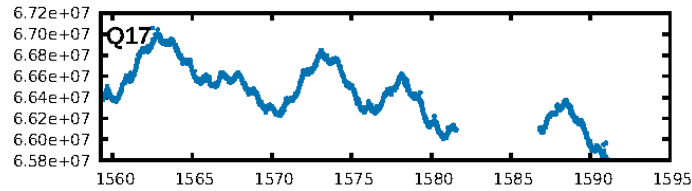
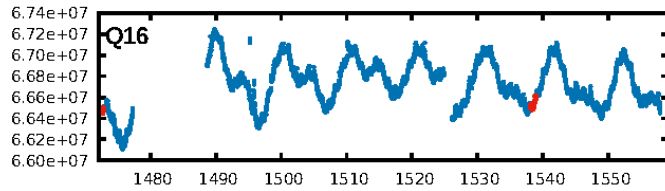
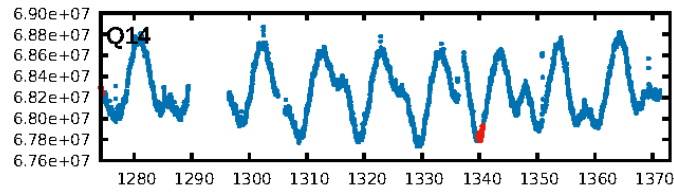
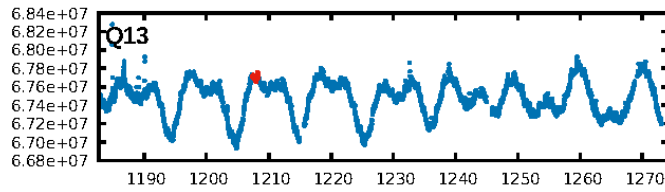
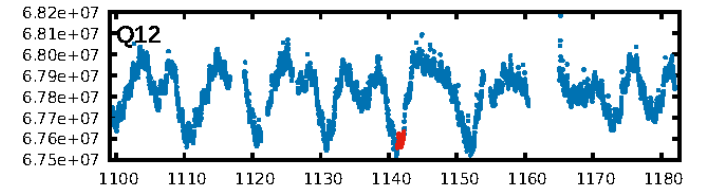
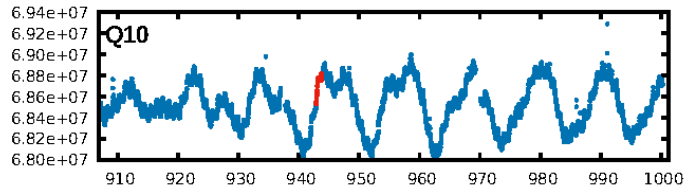
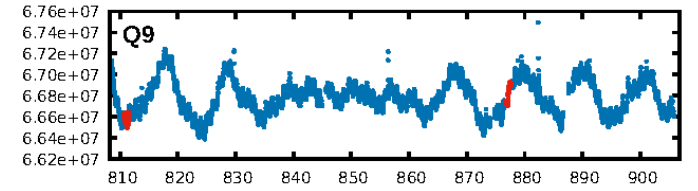
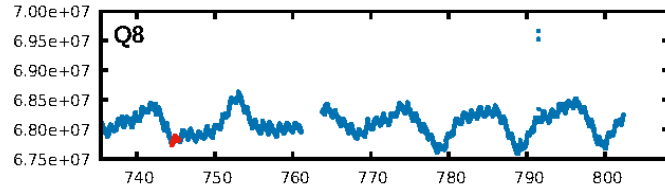
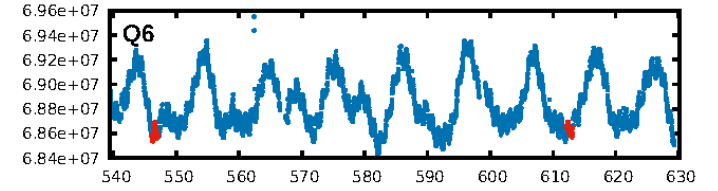
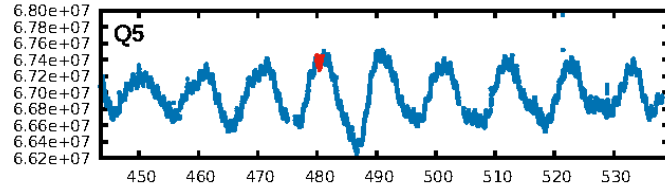
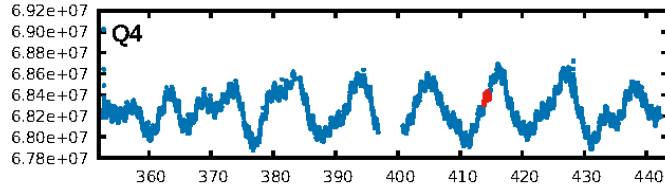
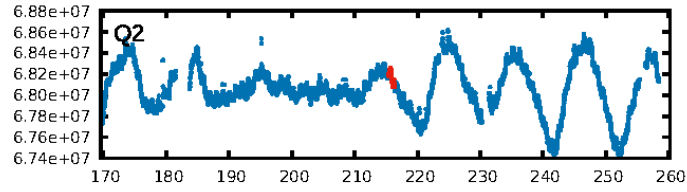
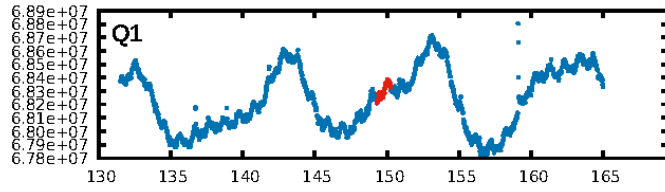
KIC: 8767669 Candidate: 7 of 8 Period: 66.133 d



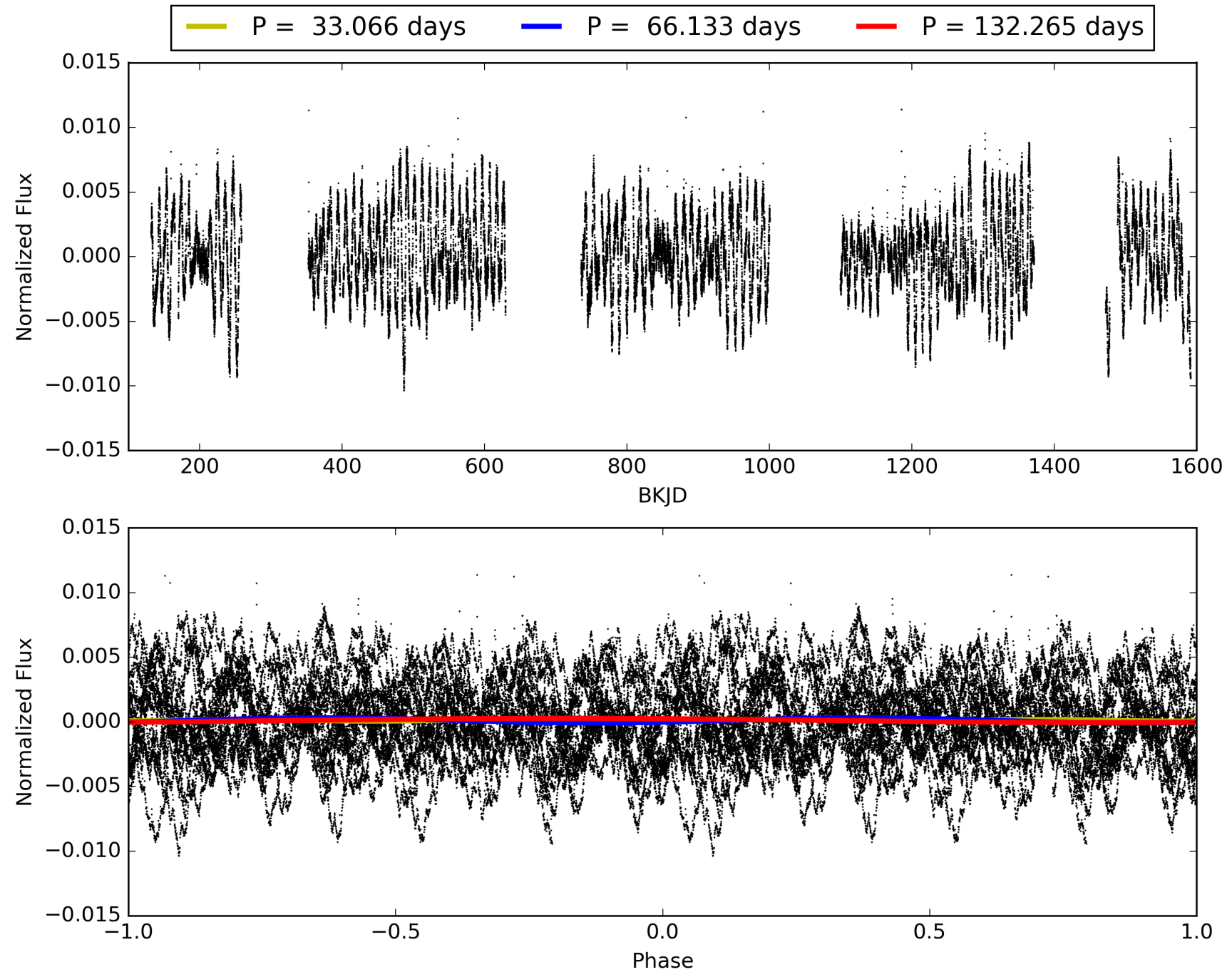
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008767669-07, PDC Light Curves



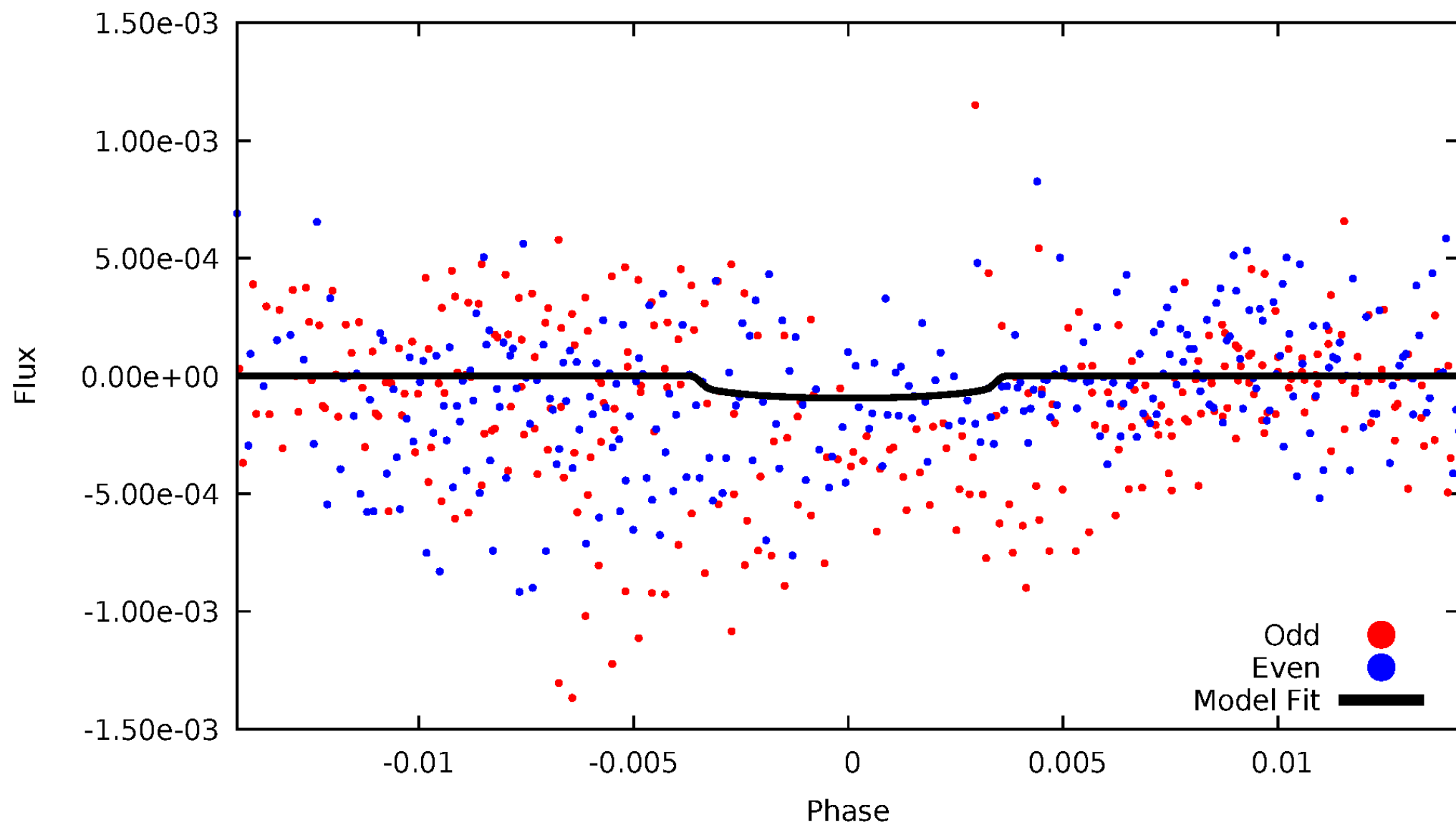
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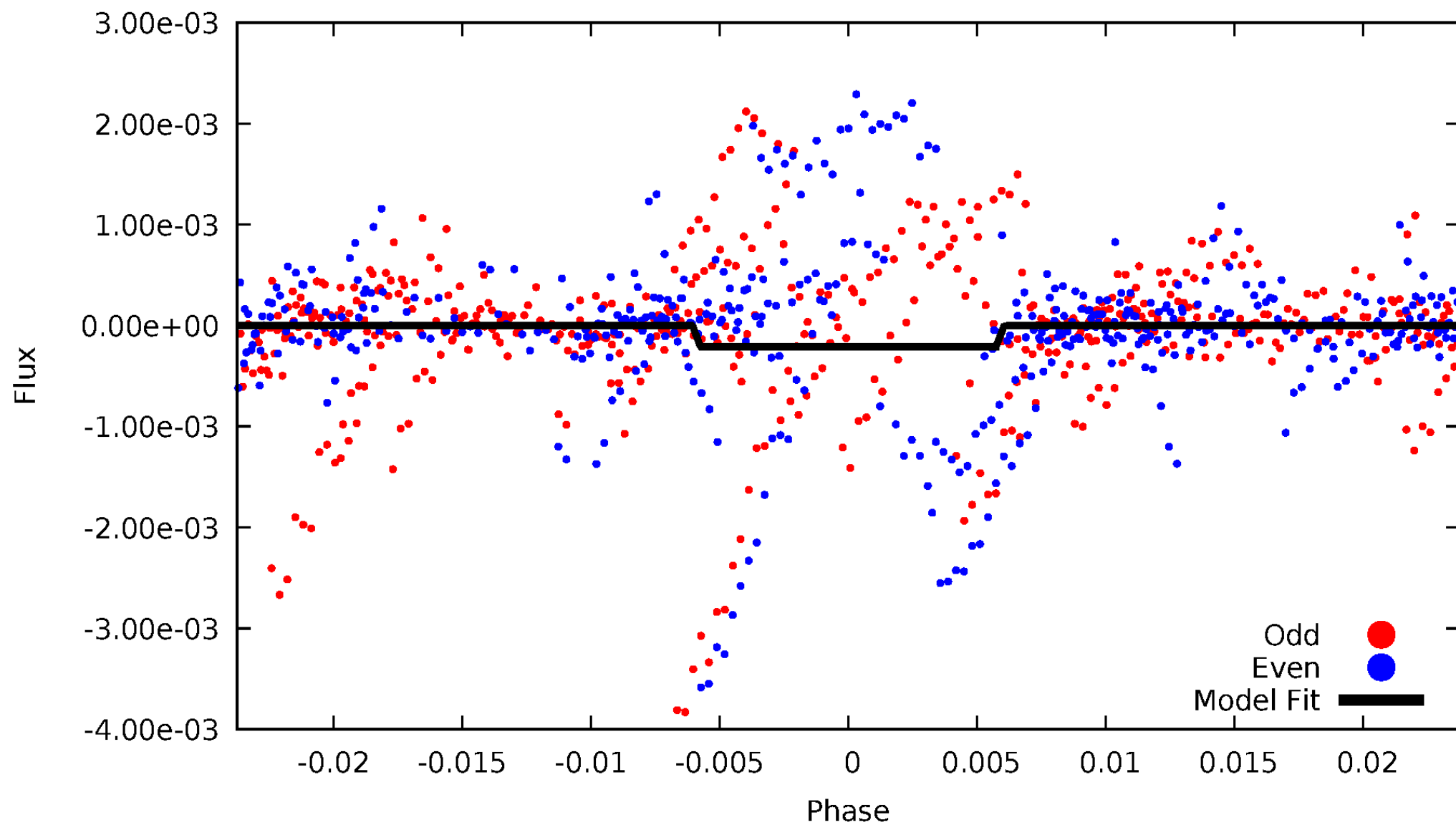
# DV Odd/Even

TCE 008767669-07



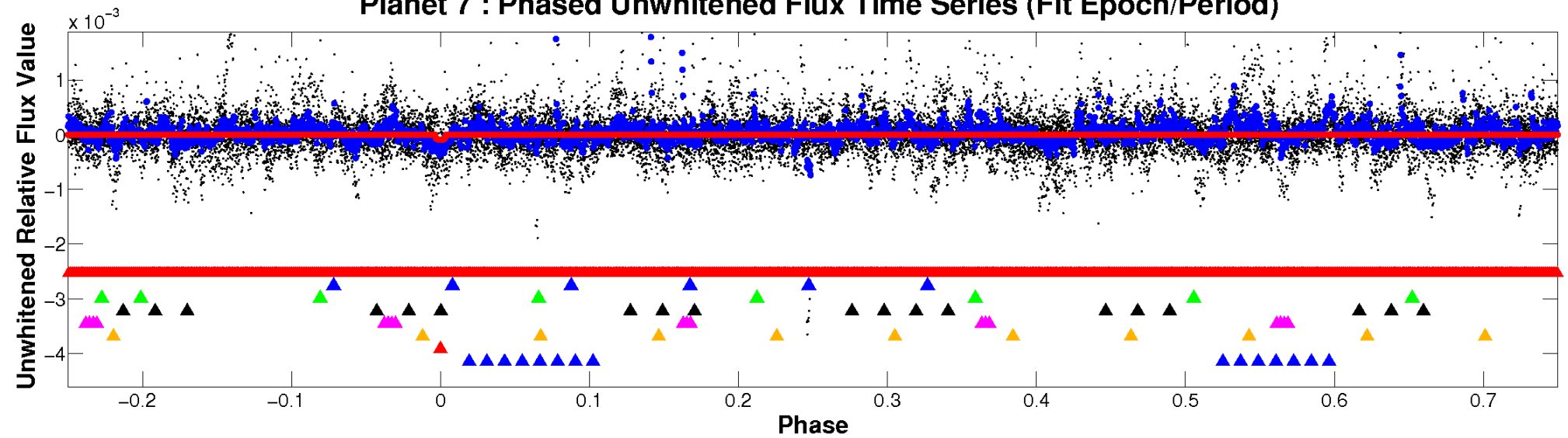
# ALT Odd/Even

TCE 008767669-07

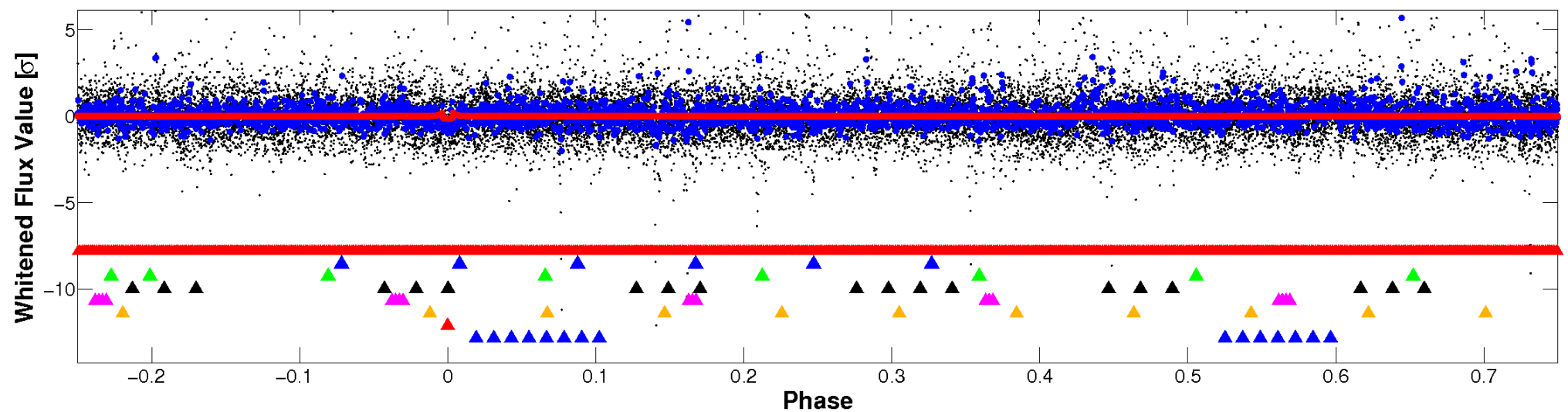


# Non-Whitened Vs. Whitened Light Curve

## Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

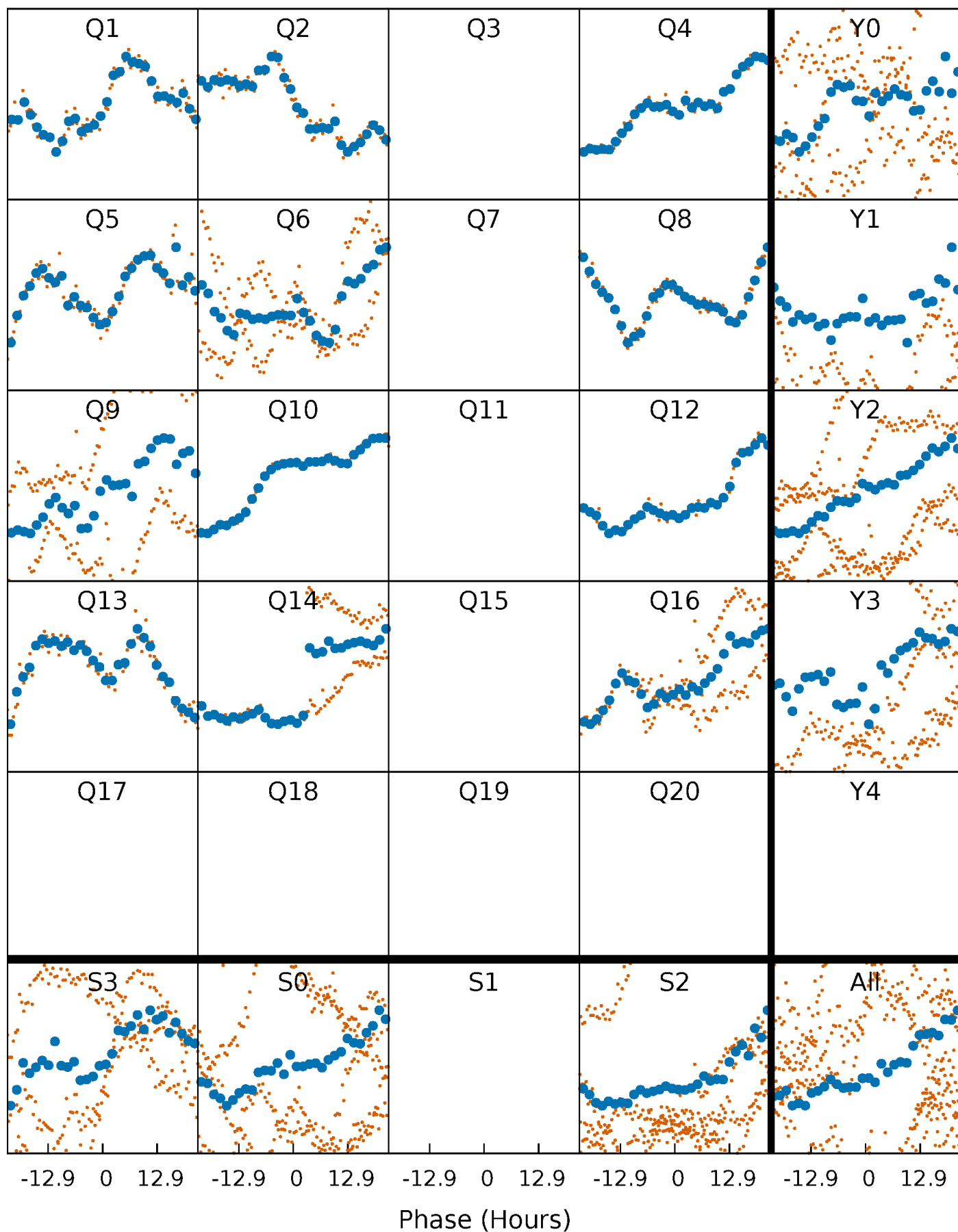


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



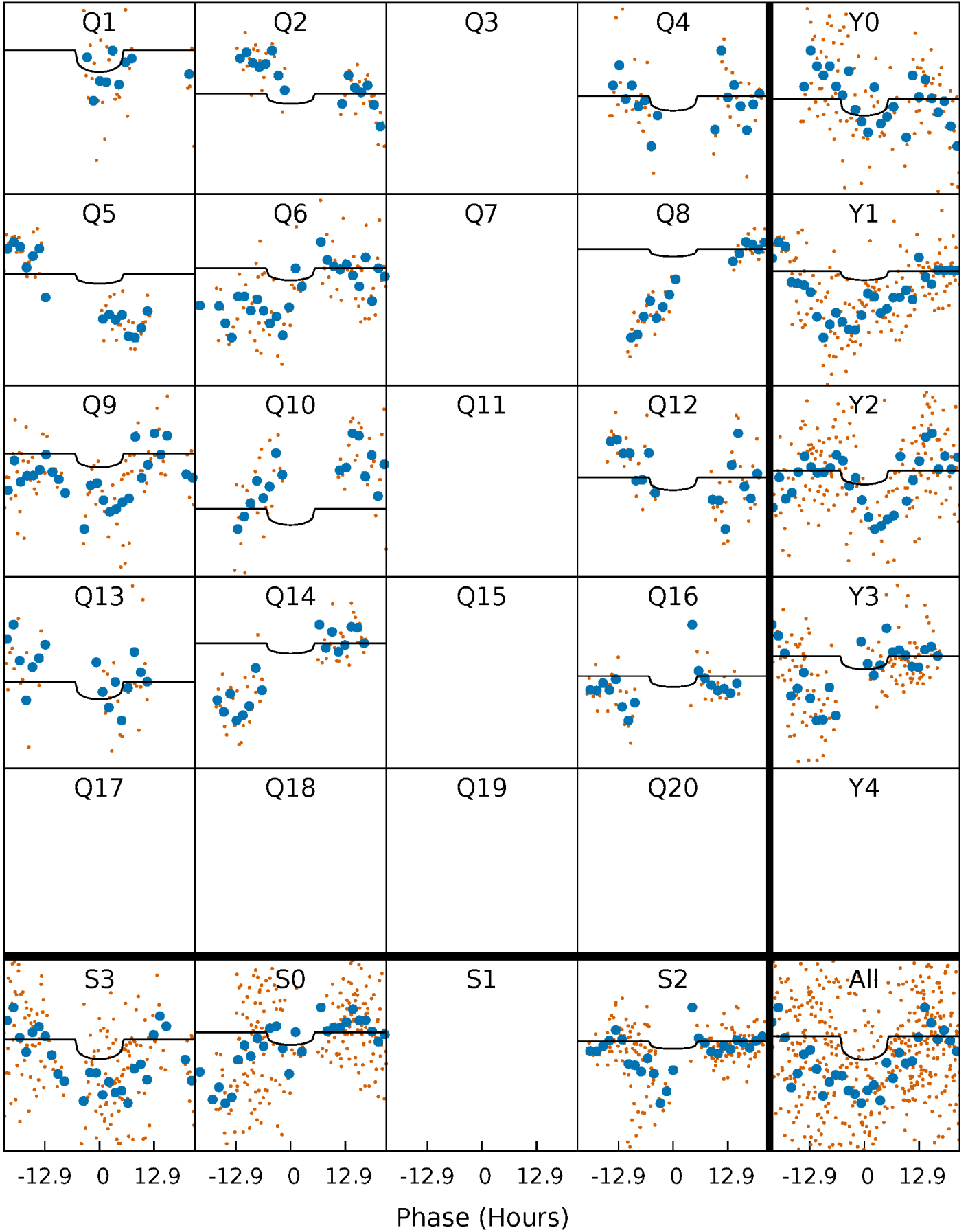
# PDC Quarter-Phased Transit Curves

TCE 008767669-07     $P = 66.132688$  Days     $T_0 = 149.768808$  (BKJD)



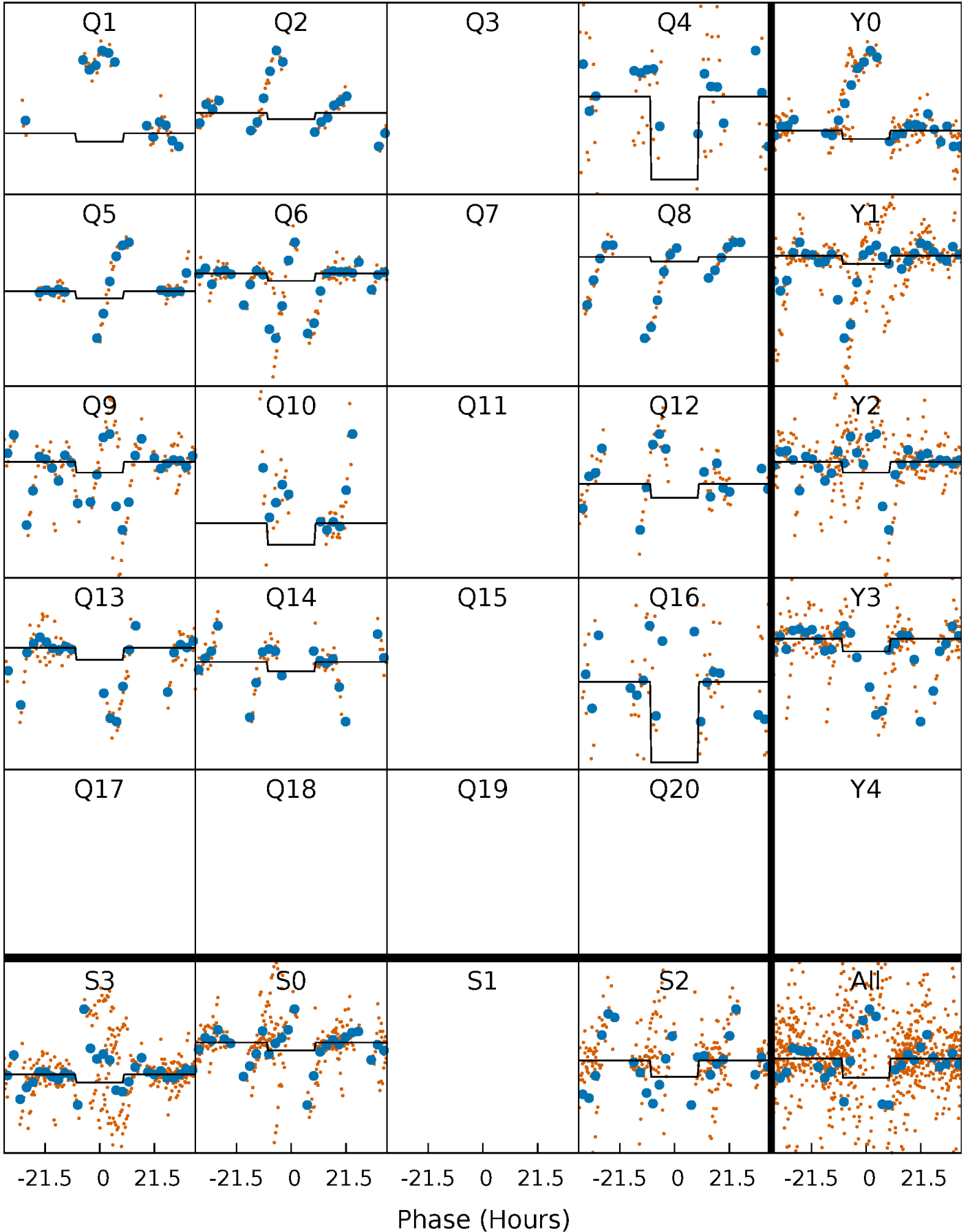
# DV Quarter-Phased Transit Curves

TCE 008767669-07    P= 66.132688 Days     $T_0=149.768808$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

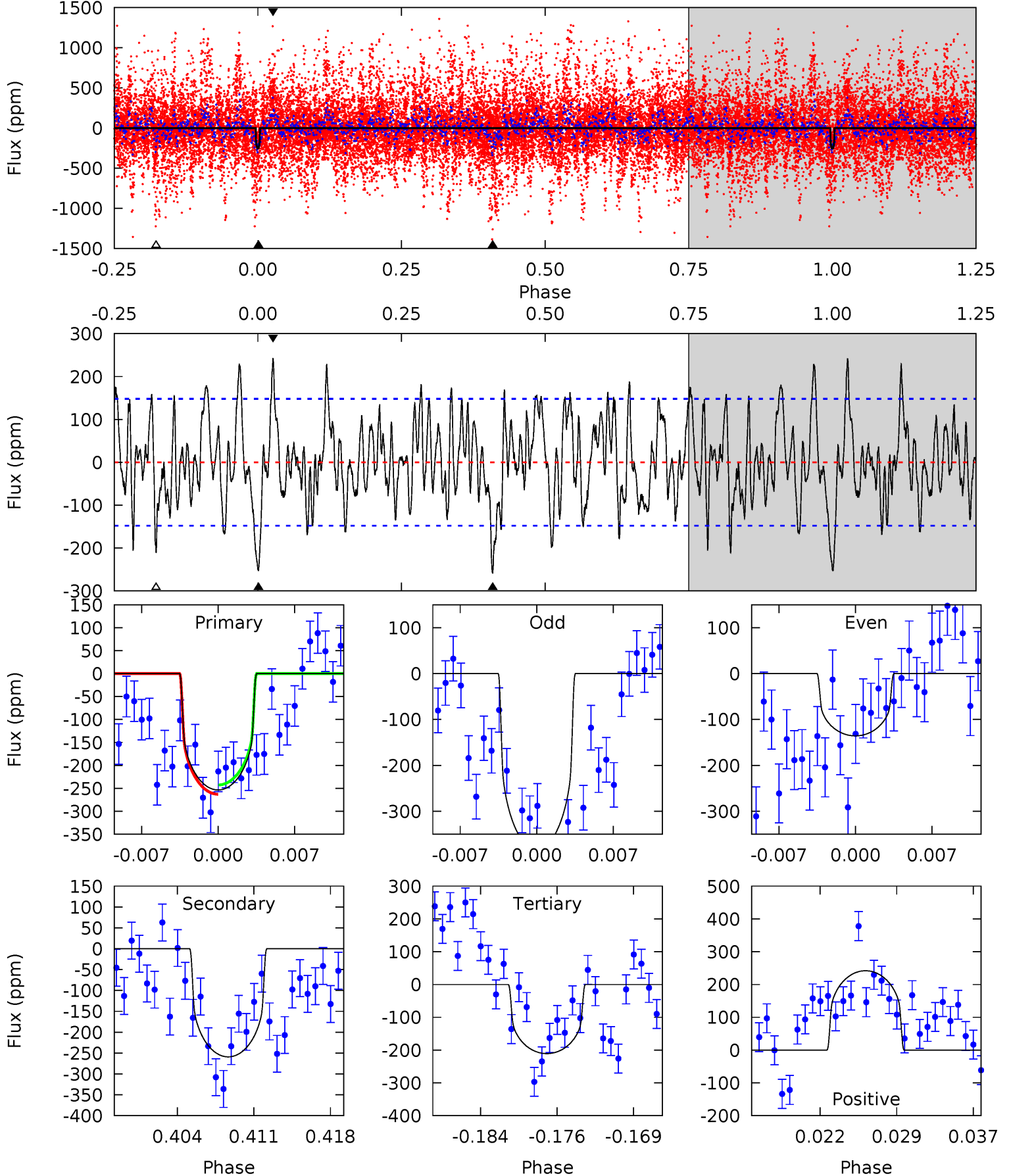
TCE 008767669-07     $P = 66.121741$  Days     $T_0 = 149.861694$  (BKJD)



# DV Model-Shift Uniqueness Test

008767669-07, P = 66.132688 Days, E = 83.636120 Days

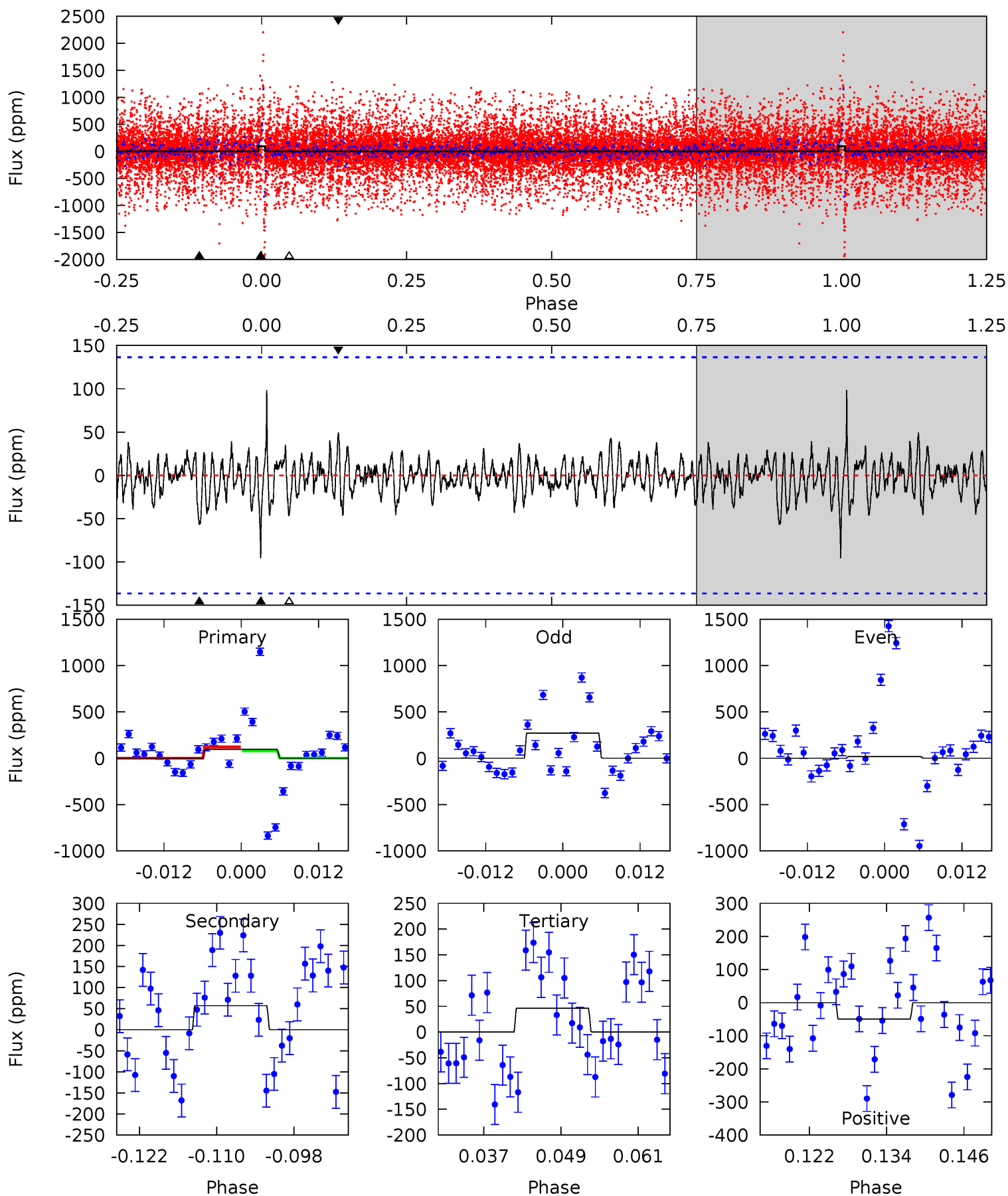
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.73 | 8.92 | 7.26 | 8.33 | 5.09            | 2.68            | 2.89             | 1.47    | 0.40    | 1.66    | 0.59    | 4.14    | 0.74 | 0.48  | 0.35 |



# Alt Model-Shift Uniqueness Test

008767669-07, P = 66.121741 Days, E = 83.739953 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-------|-------|------|
| 3.49 | 2.08 | 1.69 | 1.81 | 4.99            | 2.51            | 0.60             | 1.81    | 1.68    | 0.40    | 0.27    | 4.90    | -0.73 | 0.51  | 0.74 |





### Stellar Parameters For KIC 008767669

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $4338^{+129}_{-142}$ | $4.586^{+0.056}_{-0.017}$ | $0.320^{+0.150}_{-0.300}$ | $0.709^{+0.024}_{-0.057}$ | $0.708^{+0.036}_{-0.049}$ | $2.794^{+0.652}_{-0.202}$                 |
|        | +3%/-3%              | +1%/-0%                   | +47%/-94%                 | +3%/-8%                   | +5%/-7%                   | +23%/-7%                                  |
| Source | PHO1                 | KIC0                      | KIC0                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 008767669-07 / KOI

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$  | $A_{\text{obs}}$         |
|---------|---------------|------------------------|----------------------|-----------------------|--------------------------|
| DV      | $-259 \pm 29$ | $1.01^{+0.85}_{-0.68}$ | $418^{+14}_{-14}$    | $4661^{+3545}_{-914}$ | $11480^{+95147}_{-8172}$ |
| Alt.    | $-57 \pm 27$  | $1.25^{+0.91}_{-0.77}$ | $418^{+13}_{-16}$    | $3315^{+1316}_{-561}$ | $1558^{+9106}_{-1112}$   |

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

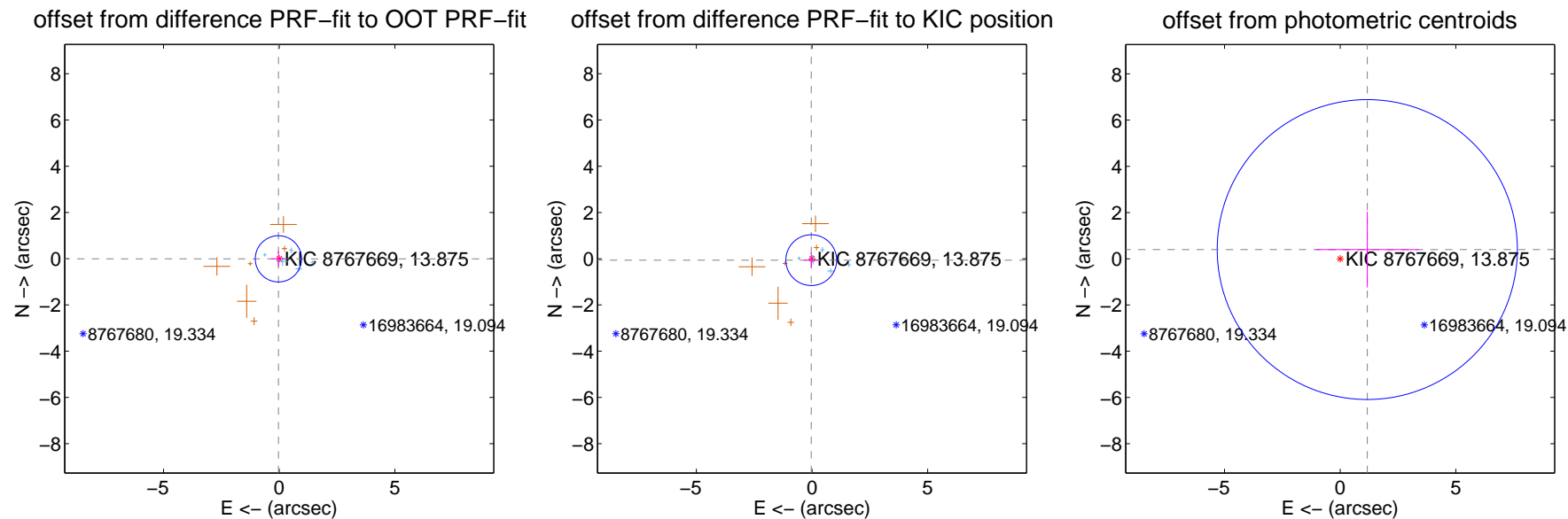
## DV Centroid Data

Supplemental centroid analysis for 008767669-07. Kepler magnitude: 13.88. Transit SNR 1.93

There are 5 quarters with good PRF difference image offsets

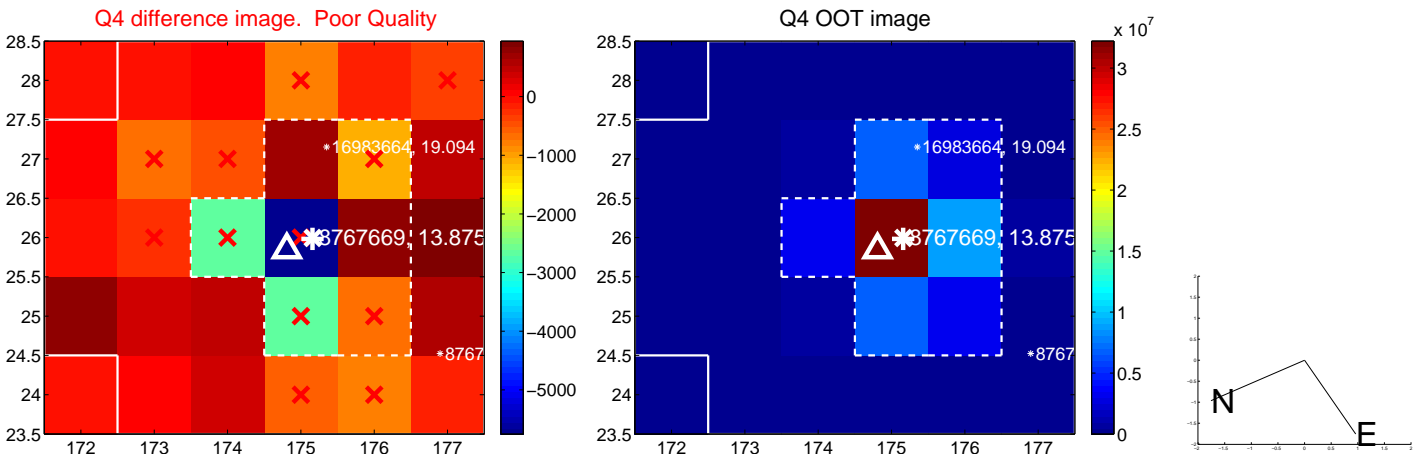
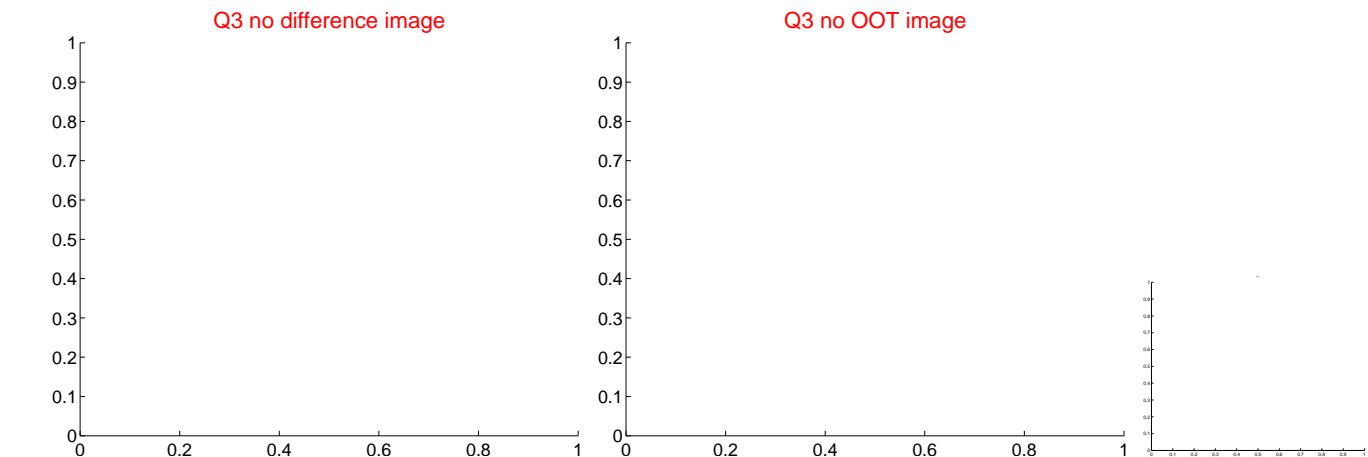
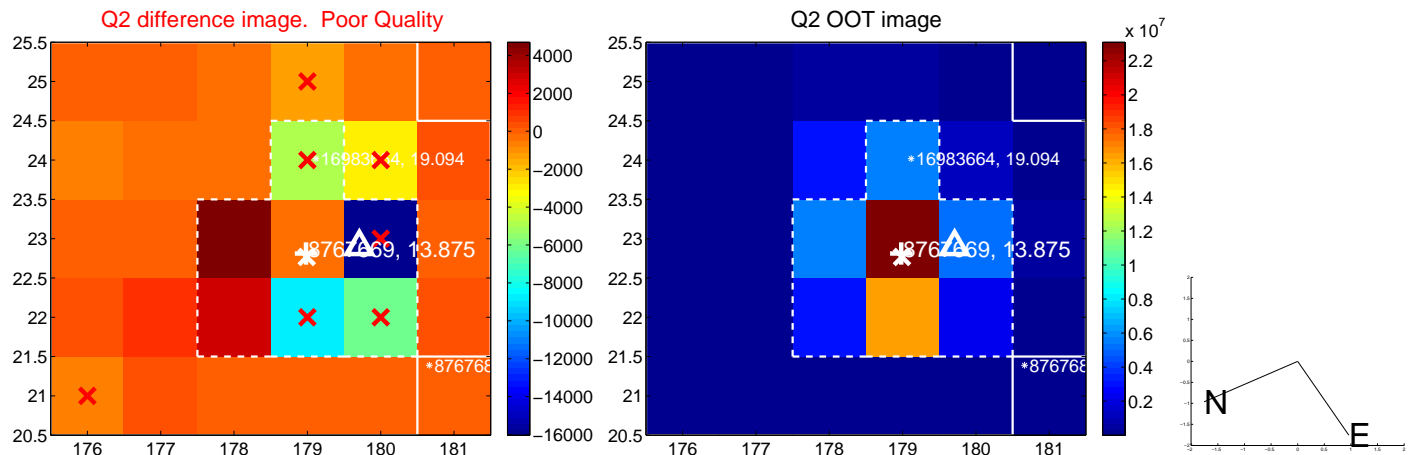
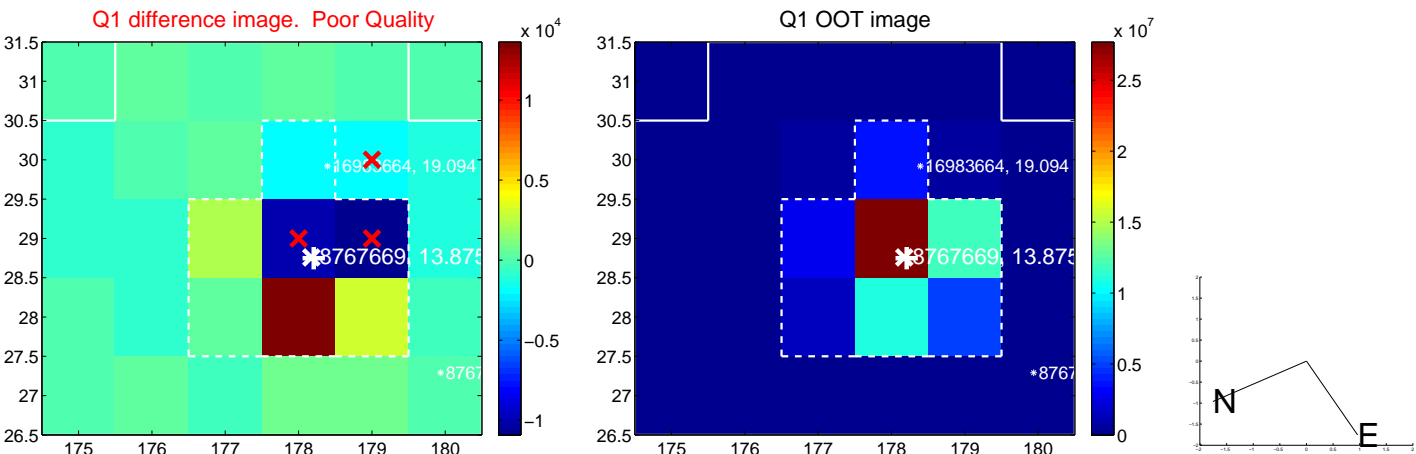
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $0.035 \pm 0.333$  | 0.11                | $0.035 \pm 0.320$ | $-0.005 \pm 0.335$ |
| PRF-fit source offset from KIC position | $0.069 \pm 0.366$  | 0.19                | $0.032 \pm 0.318$ | $-0.062 \pm 0.326$ |
| photometric centroid source offset      | $1.24 \pm 2.16$    | 0.57                | $-1.17 \pm 2.22$  | $0.40 \pm 1.64$    |

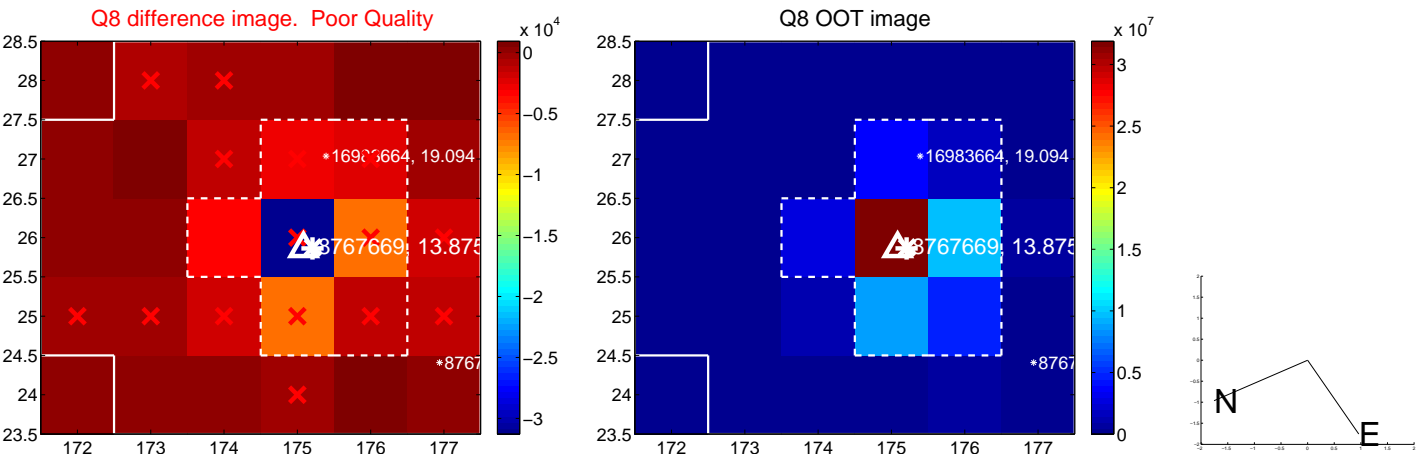
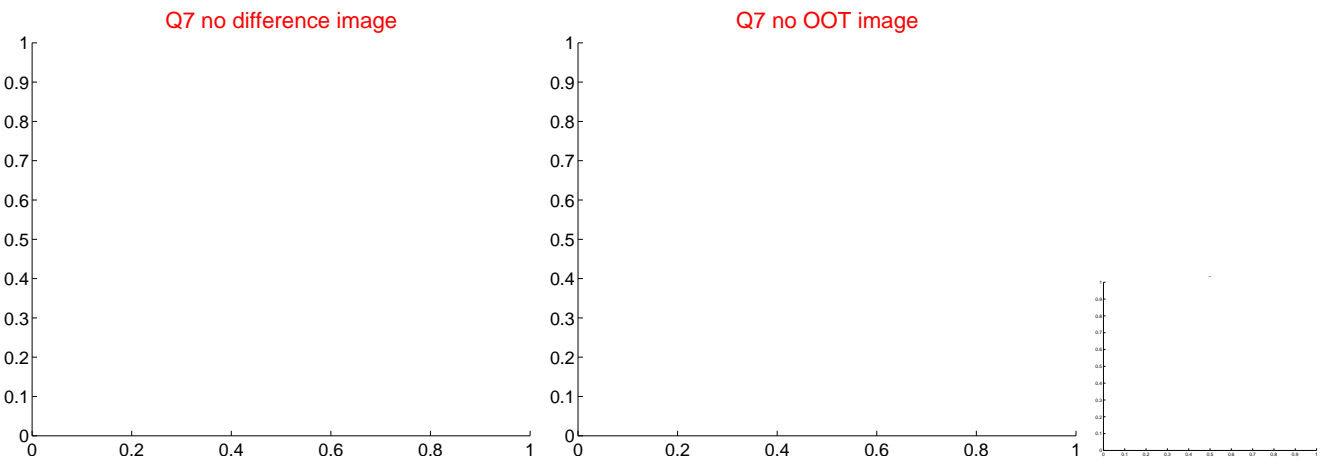
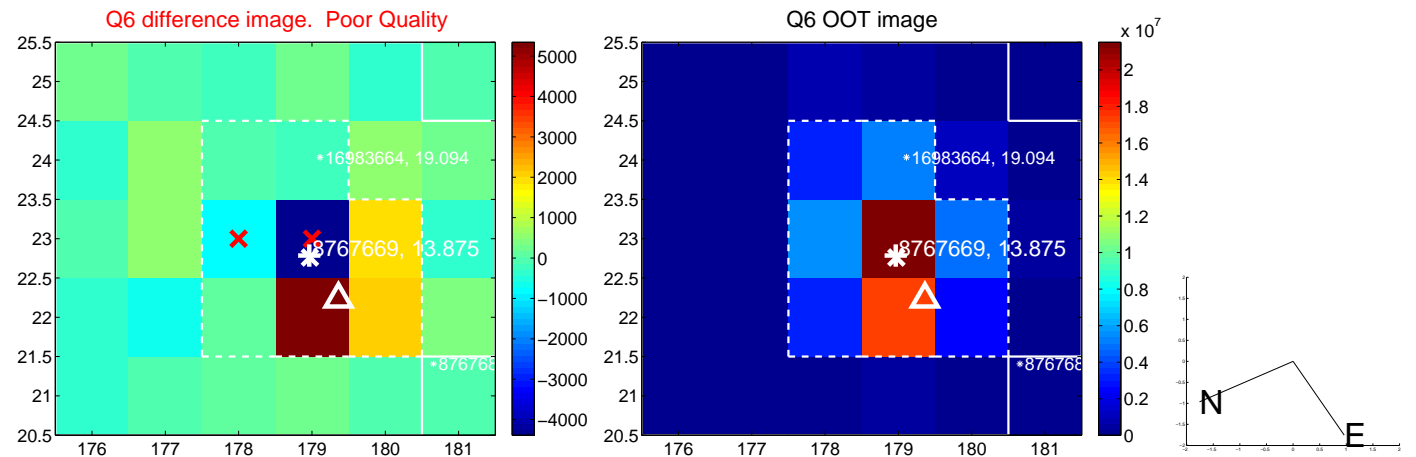
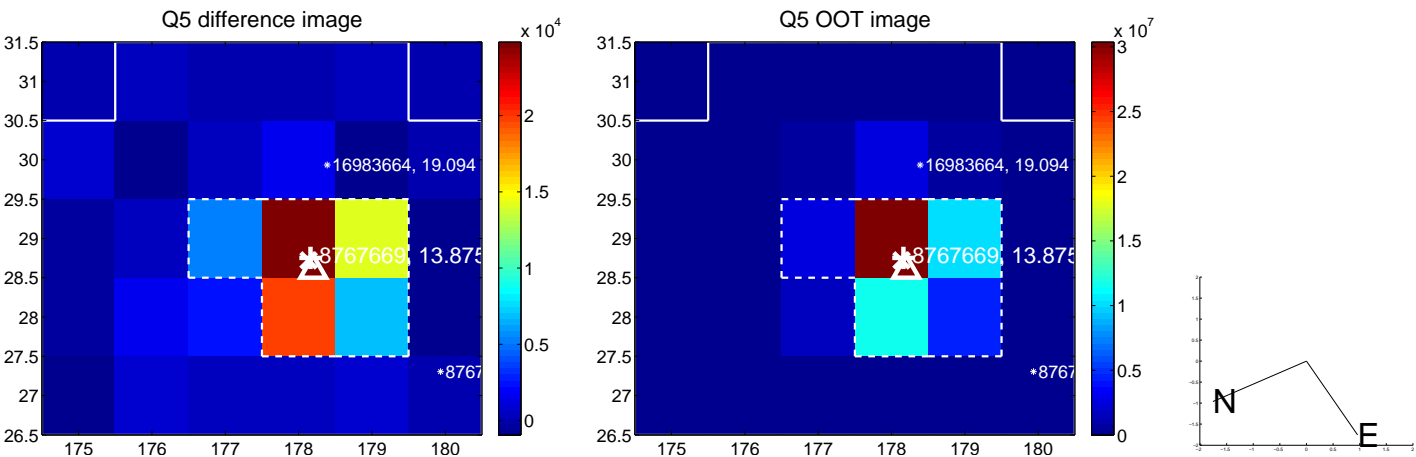


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

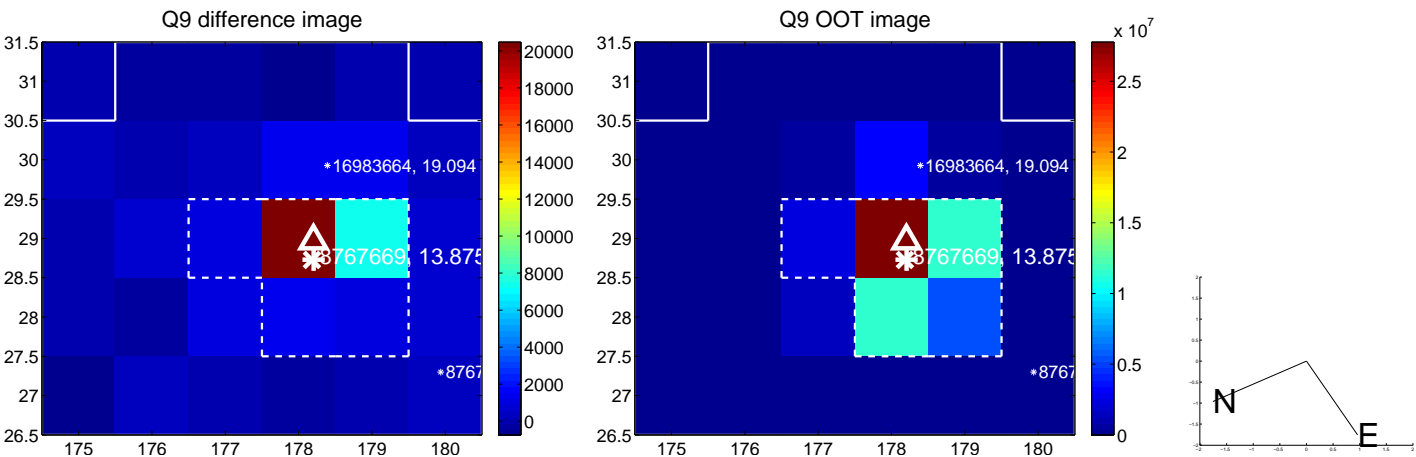
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



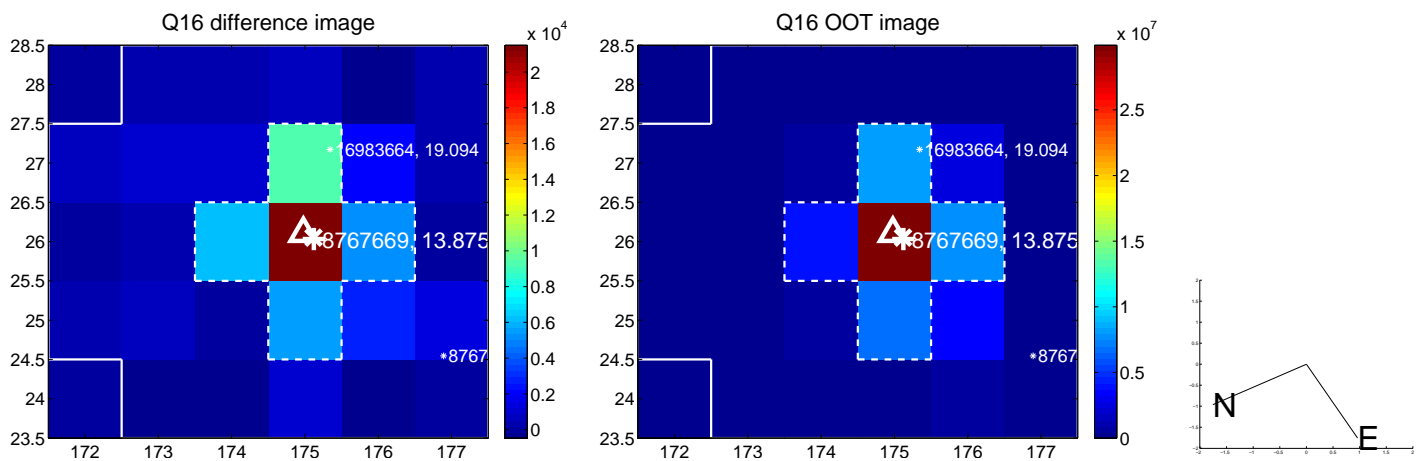
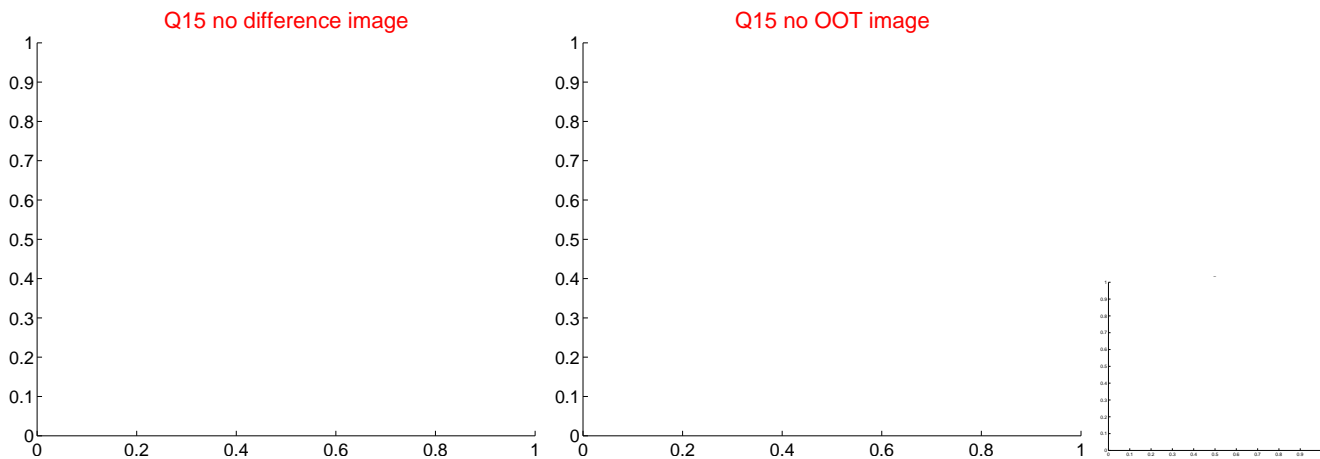
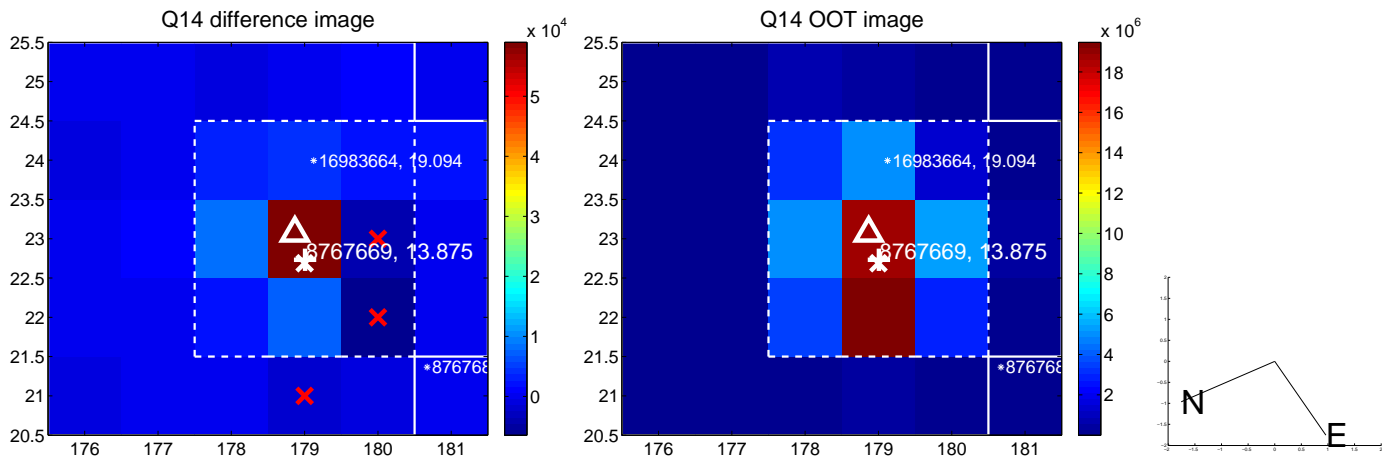
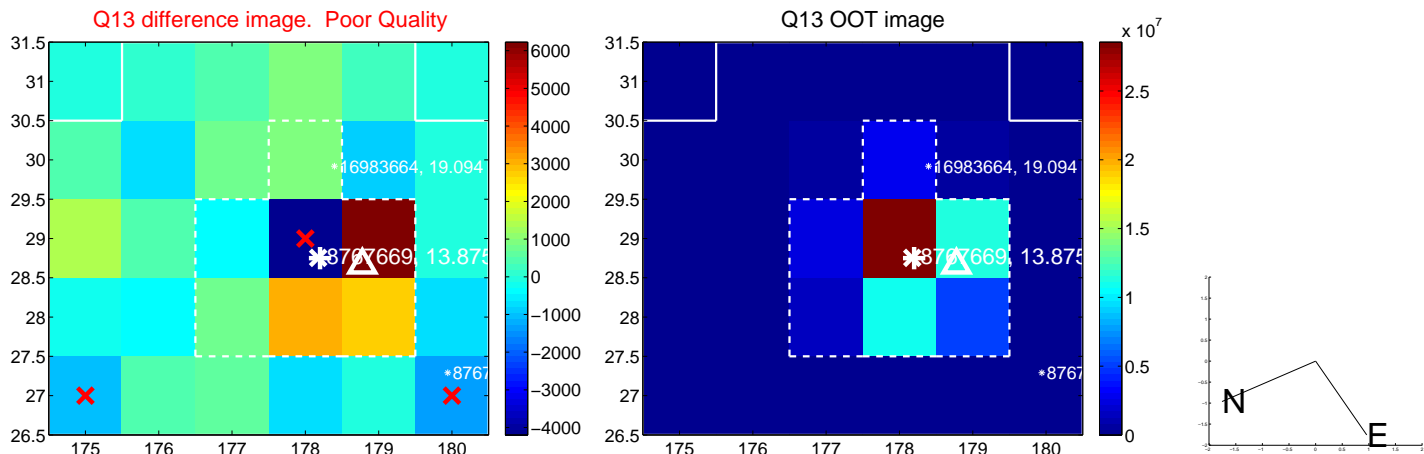
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



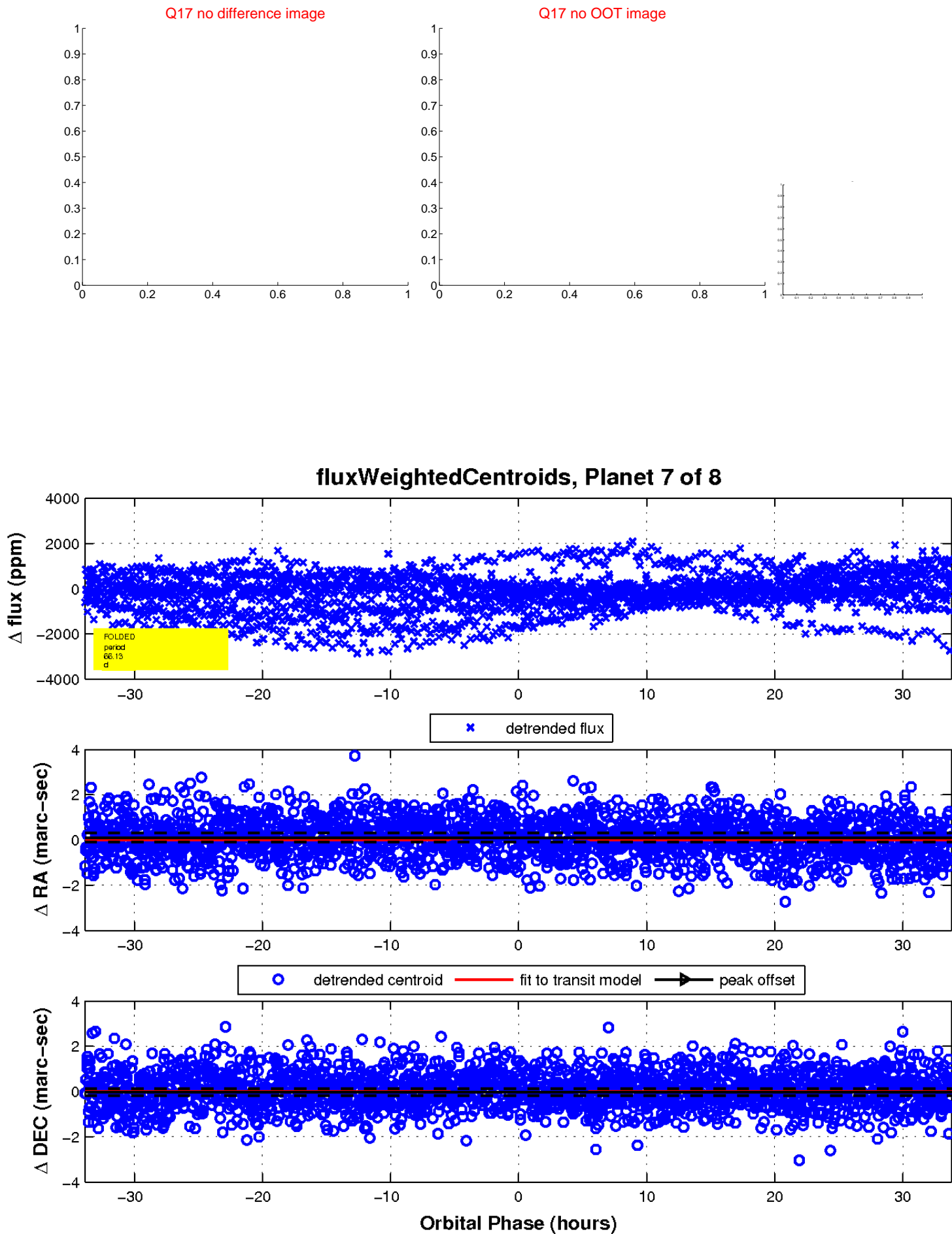
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

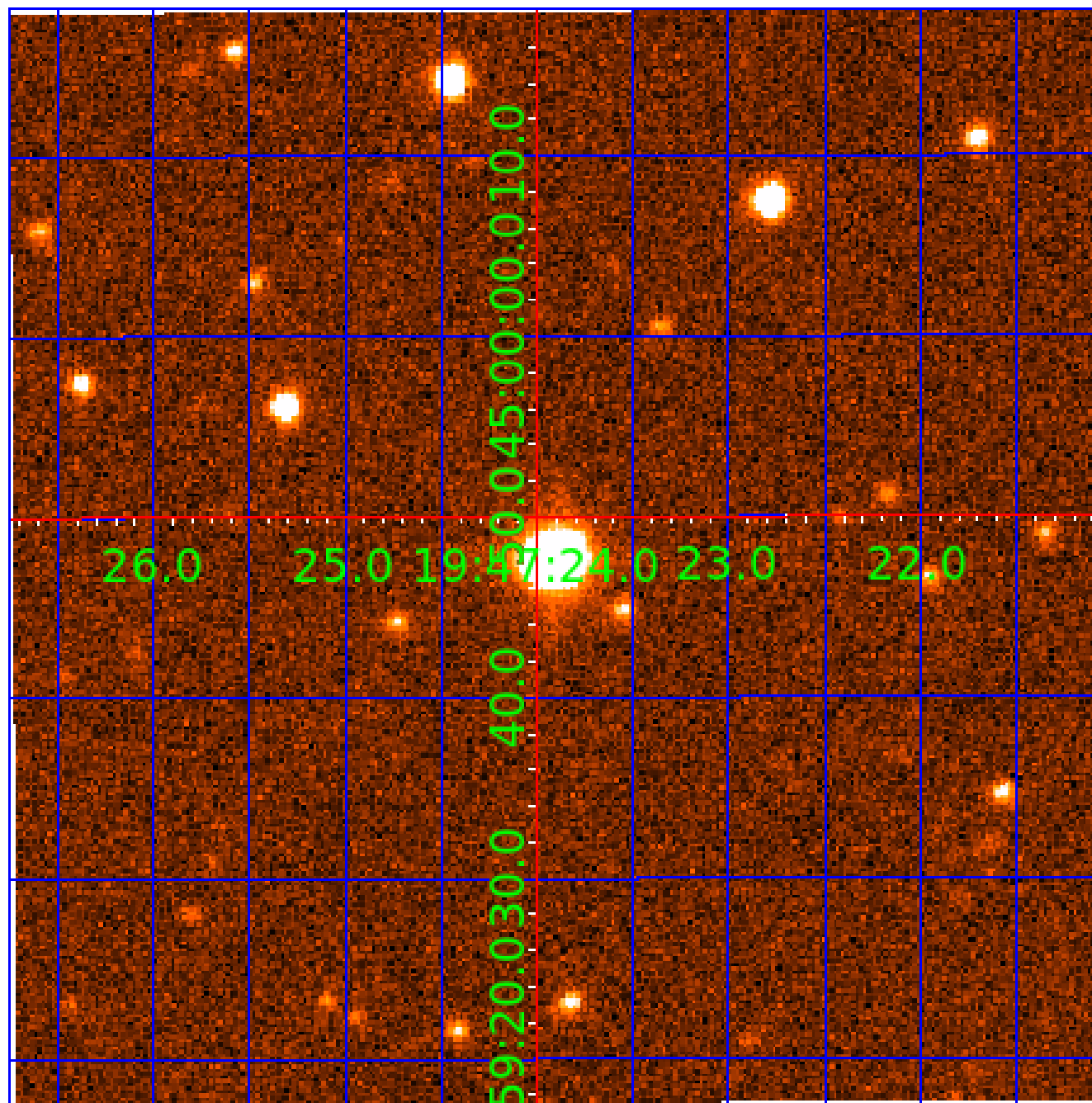


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008767669

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 008767669-01 | OBS      | No   | 1.027454      | 131.866368   | 56.6        | 4.168            | 10.1 | 13.5 | 0.71                        | 4338            | 0.53                   | 505.98                 |
| 008767669-02 | OBS      | No   | 259.258227    | 237.523756   | 656.2       | 15.309           | 16.0 | 6.7  | 0.71                        | 4338            | 2.24                   | 0.32                   |
| 008767669-04 | OBS      | No   | 77.391894     | 168.038322   | 264.6       | 5.687            | 10.5 | 4.7  | 0.71                        | 4338            | 1.30                   | 1.59                   |
| 008767669-05 | OBS      | No   | 79.392159     | 186.894962   | 178.4       | 5.210            | 10.3 | 3.3  | 0.71                        | 4338            | 1.06                   | 1.54                   |
| 008767669-06 | OBS      | No   | 137.506101    | 148.977257   | 209.7       | 4.835            | 9.0  | 3.9  | 0.71                        | 4338            | 1.12                   | 0.74                   |
| 008767669-07 | OBS      | No   | 66.132688     | 149.768808   | 94.2        | 11.290           | 9.9  | 1.9  | 0.71                        | 4338            | 0.79                   | 1.96                   |
| 008767669-08 | OBS      | No   | 99.591749     | 151.043130   | 315.0       | 5.022            | 9.5  | 6.6  | 0.71                        | 4338            | 1.31                   | 1.14                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments   |
|--------------|----------|------|-------|---|---|---|---|--|
| 008767669-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST           |
| 008767669-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT   |
| 008767669-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT   |
| 008767669-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 008767669-07 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT  |
| 008767669-08 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT   |

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

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

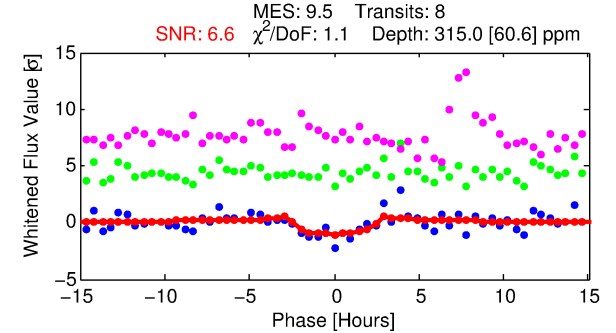
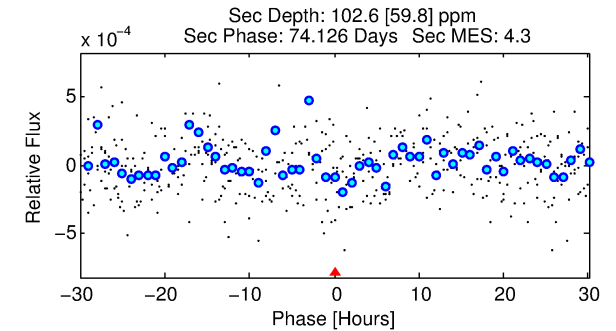
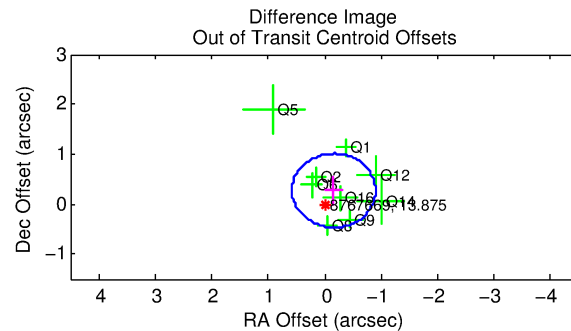
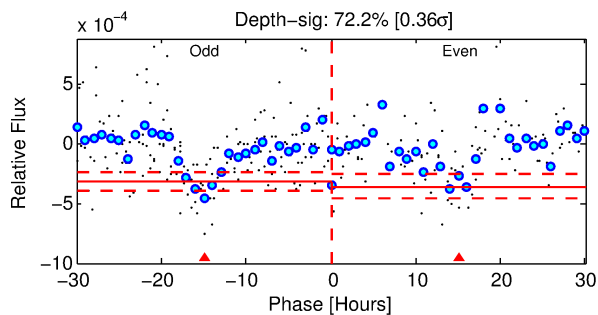
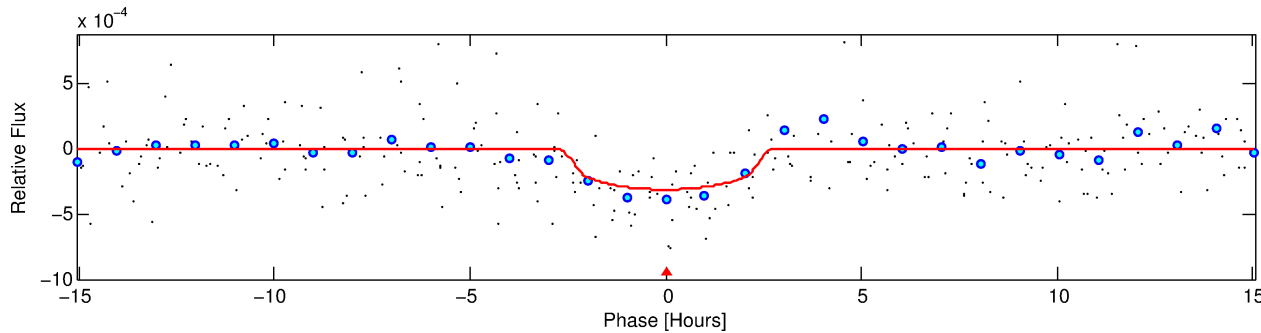
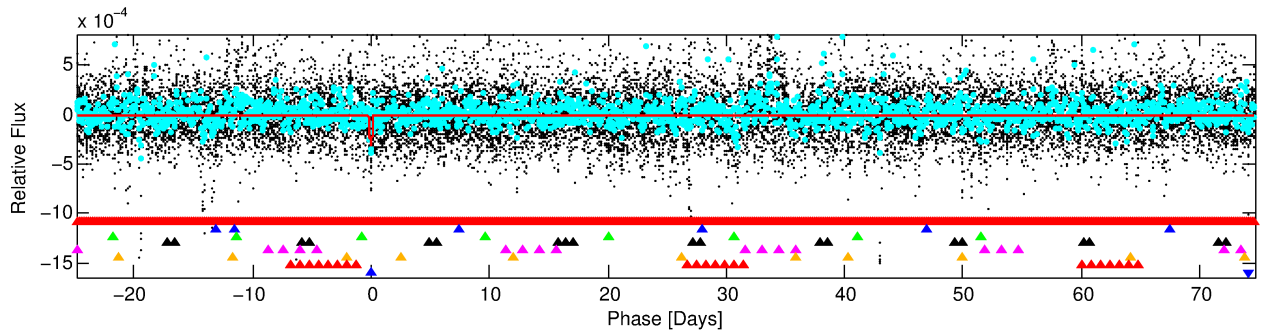
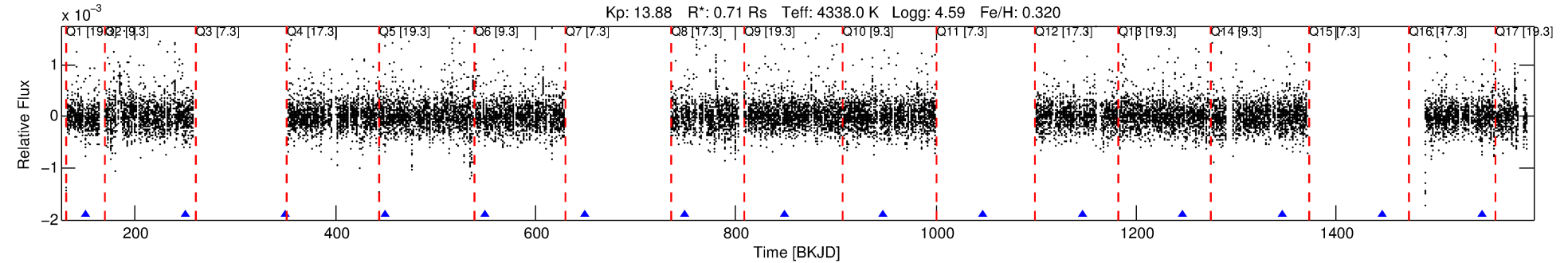
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008767669-08

No Significant Match Found

# DV One-Page Summary

KIC: 8767669 Candidate: 8 of 8 Period: 99.592 d



## DV Fit Results:

Period = 99.59175 [0.00158] d  
Epoch = 151.0431 [0.0106] BKJD  
Rp/R\* = 0.0170 [0.0225]  
a/R\* = 119.12 [457.15]  
b = 0.64 [3.58]  
Seff = 1.14 [0.19]  
Teq = 263 [11] K  
Rp = 1.31 [1.74] Re  
a = 0.3746 [0.0257] AU  
Ag = 4599.14 [12500.06] [0.37 $\sigma$ ]  
Teffp = 3352 [2279] K [1.36 $\sigma$ ]

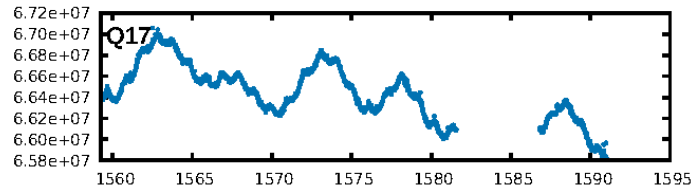
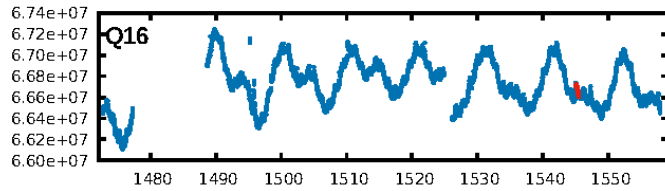
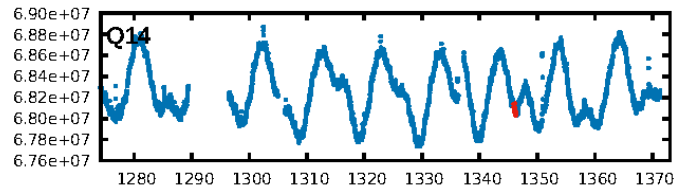
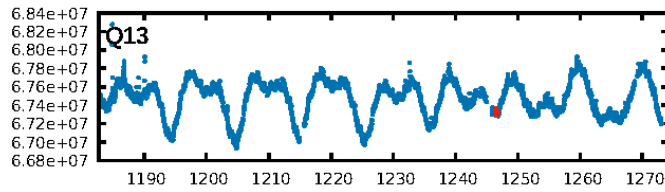
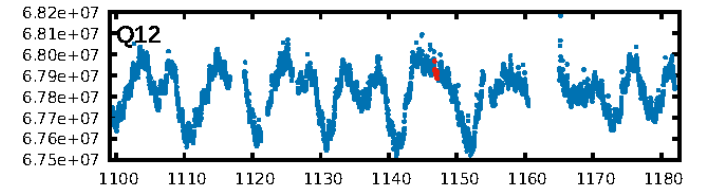
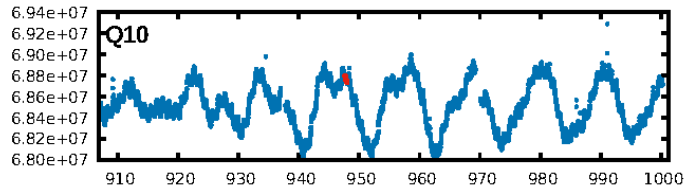
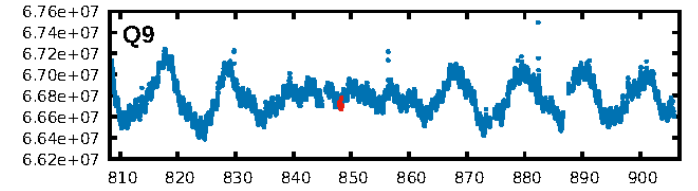
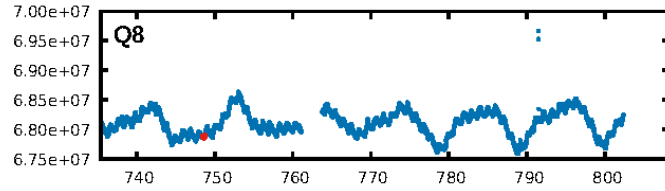
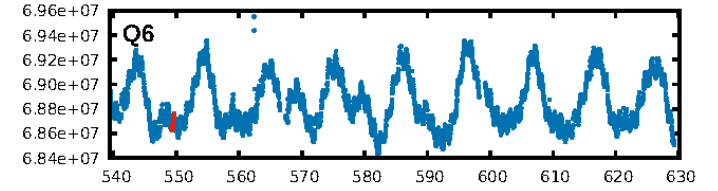
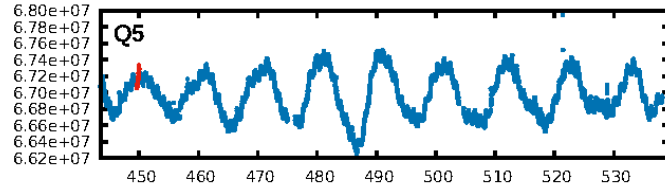
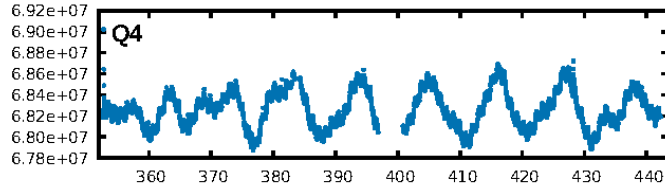
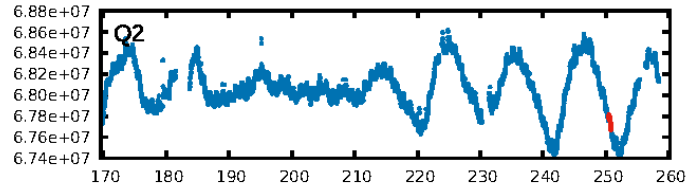
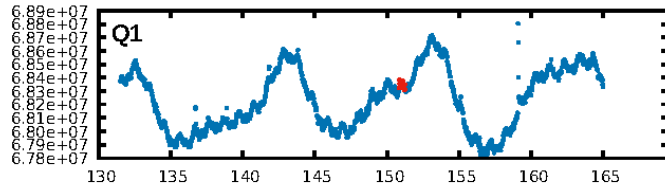
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [66.99 $\sigma$ ]  
LongPeriod-sig: 100.0% [130.53 $\sigma$ ]  
ModelChiSquare2-sig: 33.8%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.47e-12**  
RollingBand-fgt: 1.00 [7/7]  
**GhostDiagnostic-chr: -0.3444**  
Centroid-sig: 60.4%  
Centroid-so: 0.526 arcsec [0.56 $\sigma$ ]  
OotOffset-rm: 0.316 arcsec [1.28 $\sigma$ ]  
OotOffset-st: 3/0/3/3 [9]  
KicOffset-rm: 0.321 arcsec [1.15 $\sigma$ ]  
KicOffset-st: 3/0/3/3 [9]  
DiffImageQuality-fgm: 0.67 [6/9]  
DiffImageOverlap-fno: 0.00 [0/10]

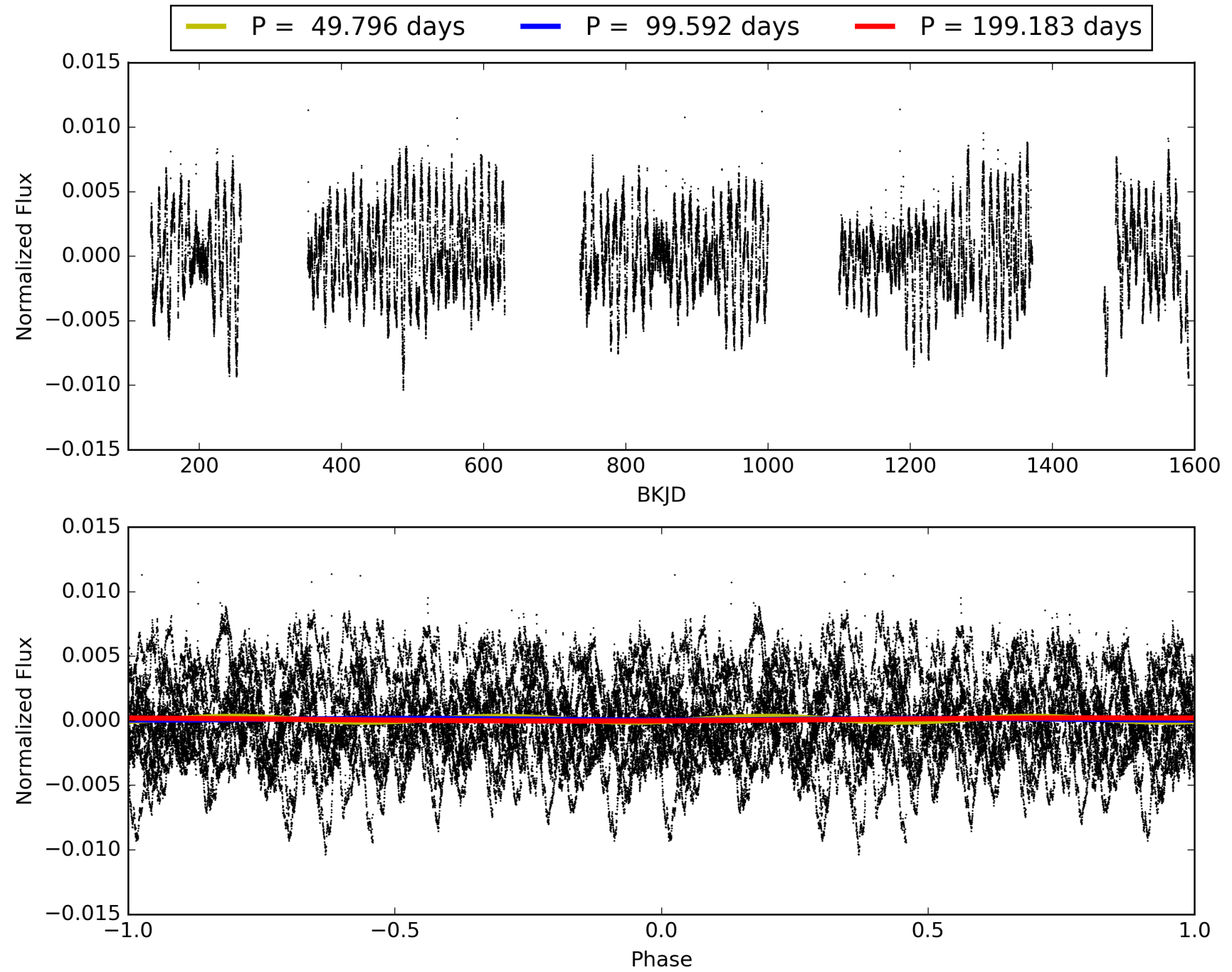
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:57:06 Z

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

# TCE 008767669-08, PDC Light Curves

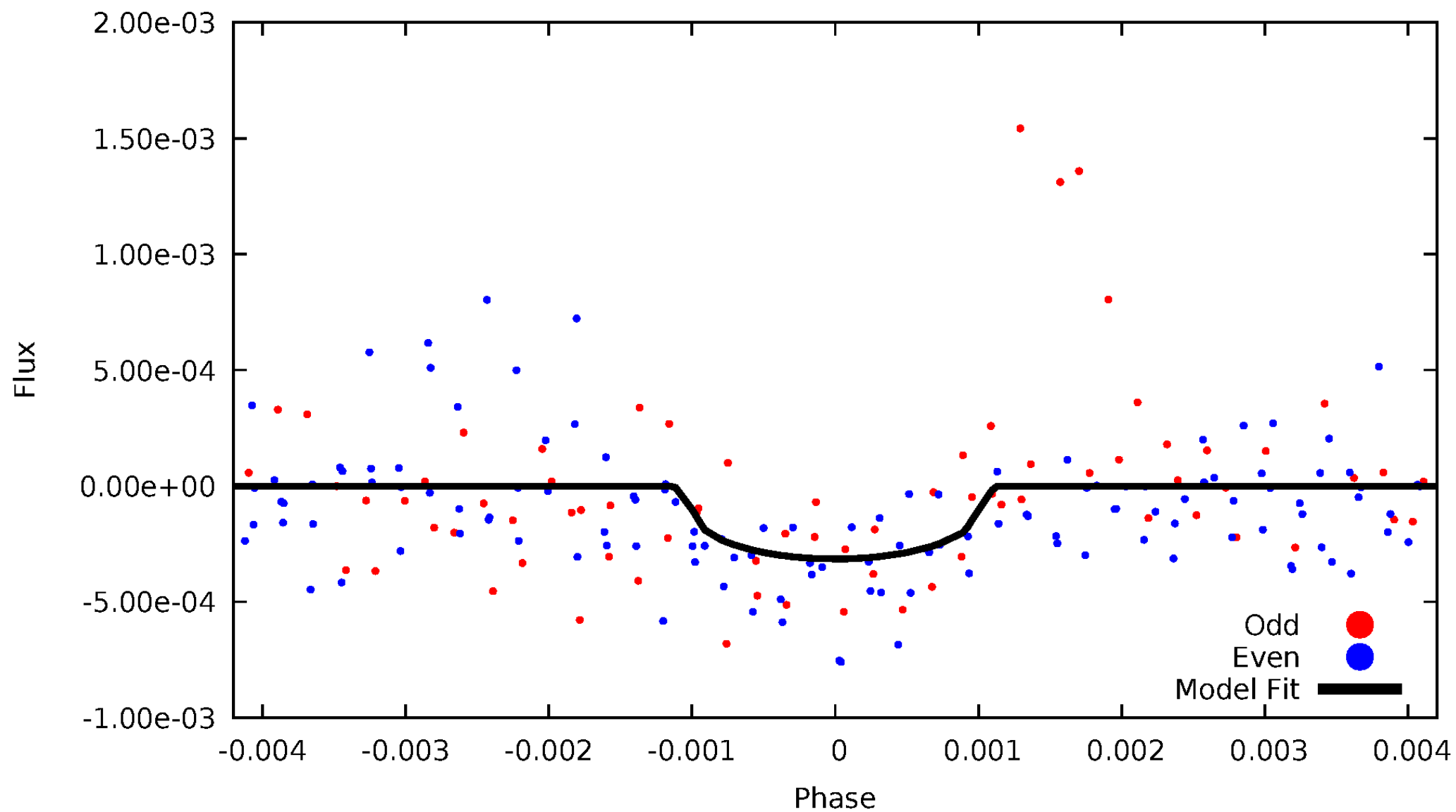


# TCE 008767669-08



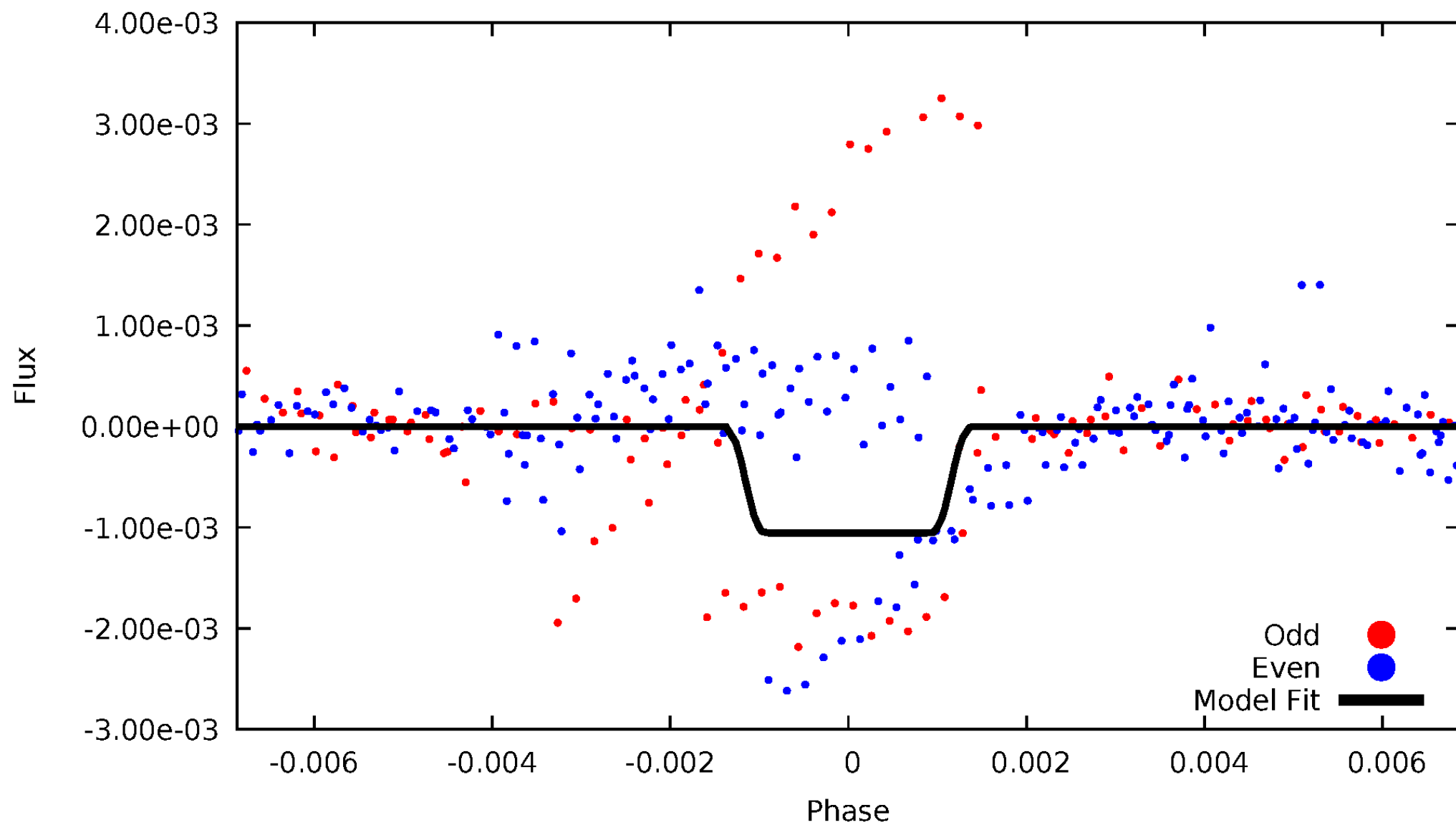
# DV Odd/Even

TCE 008767669-08



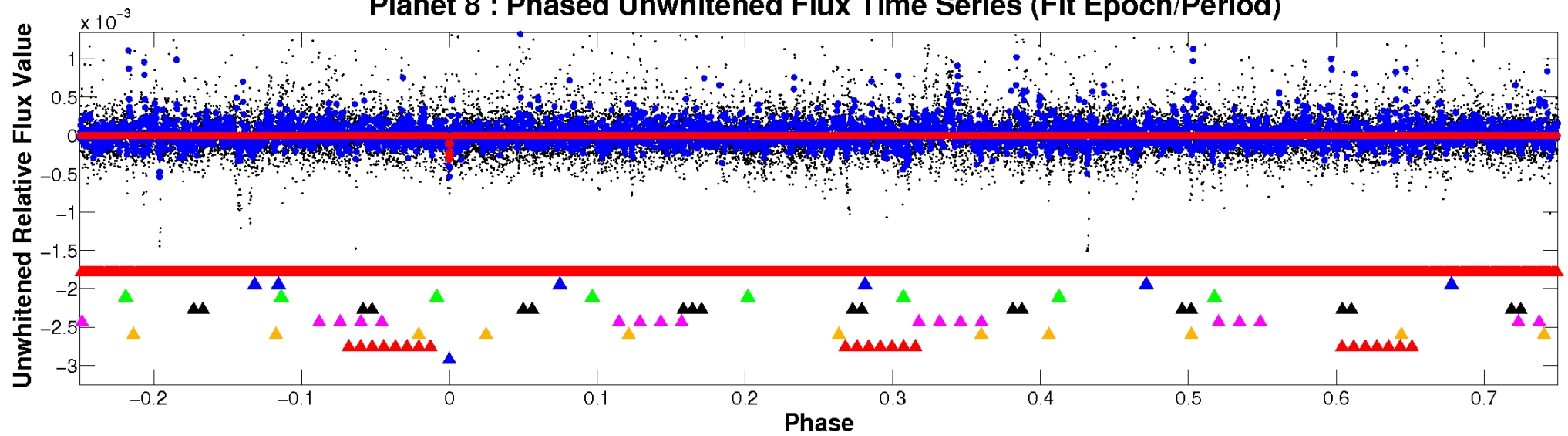
# ALT Odd/Even

TCE 008767669-08

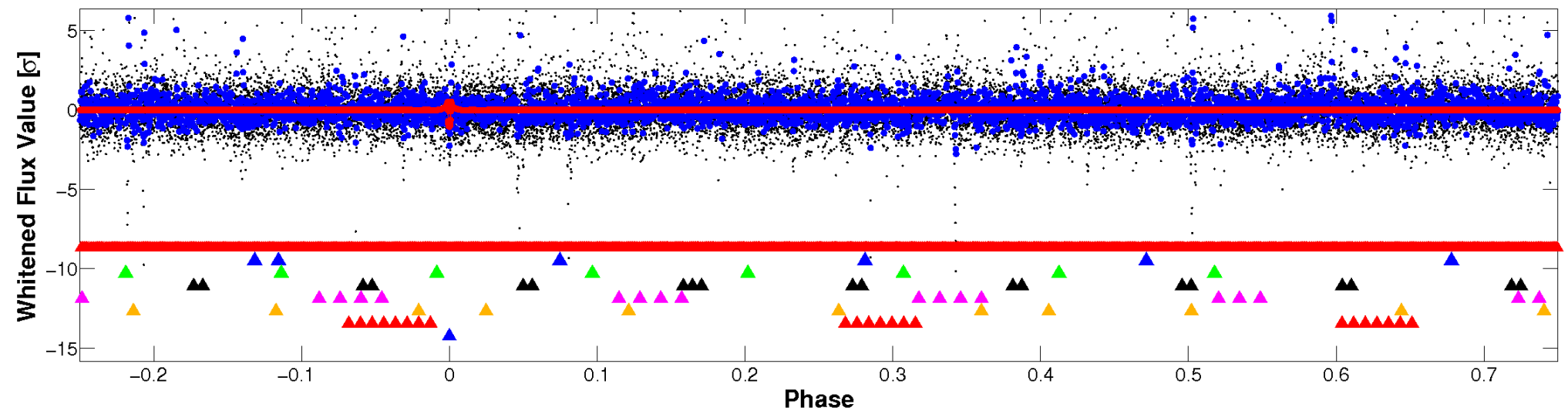


# Non-Whitened Vs. Whitened Light Curve

## Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

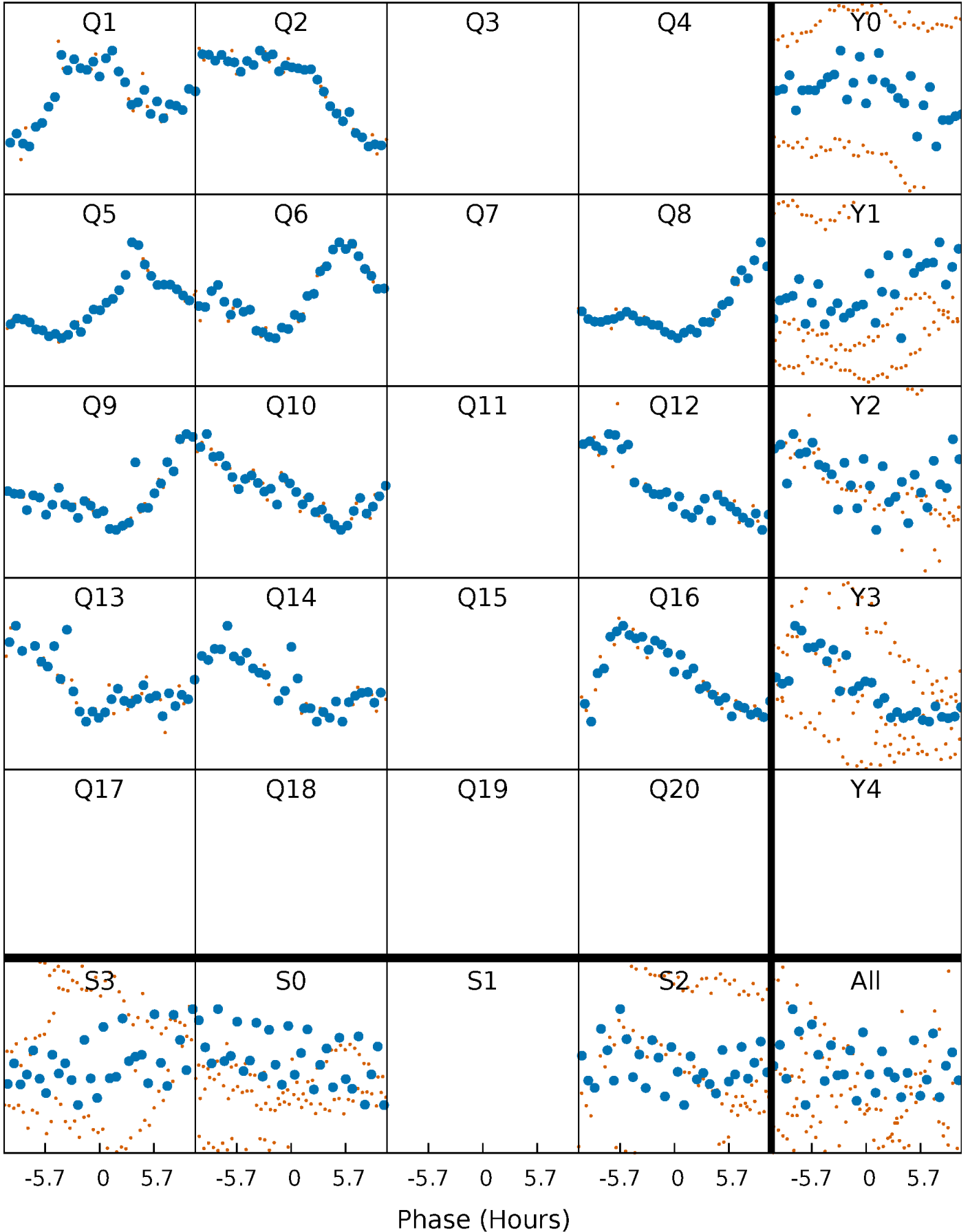


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

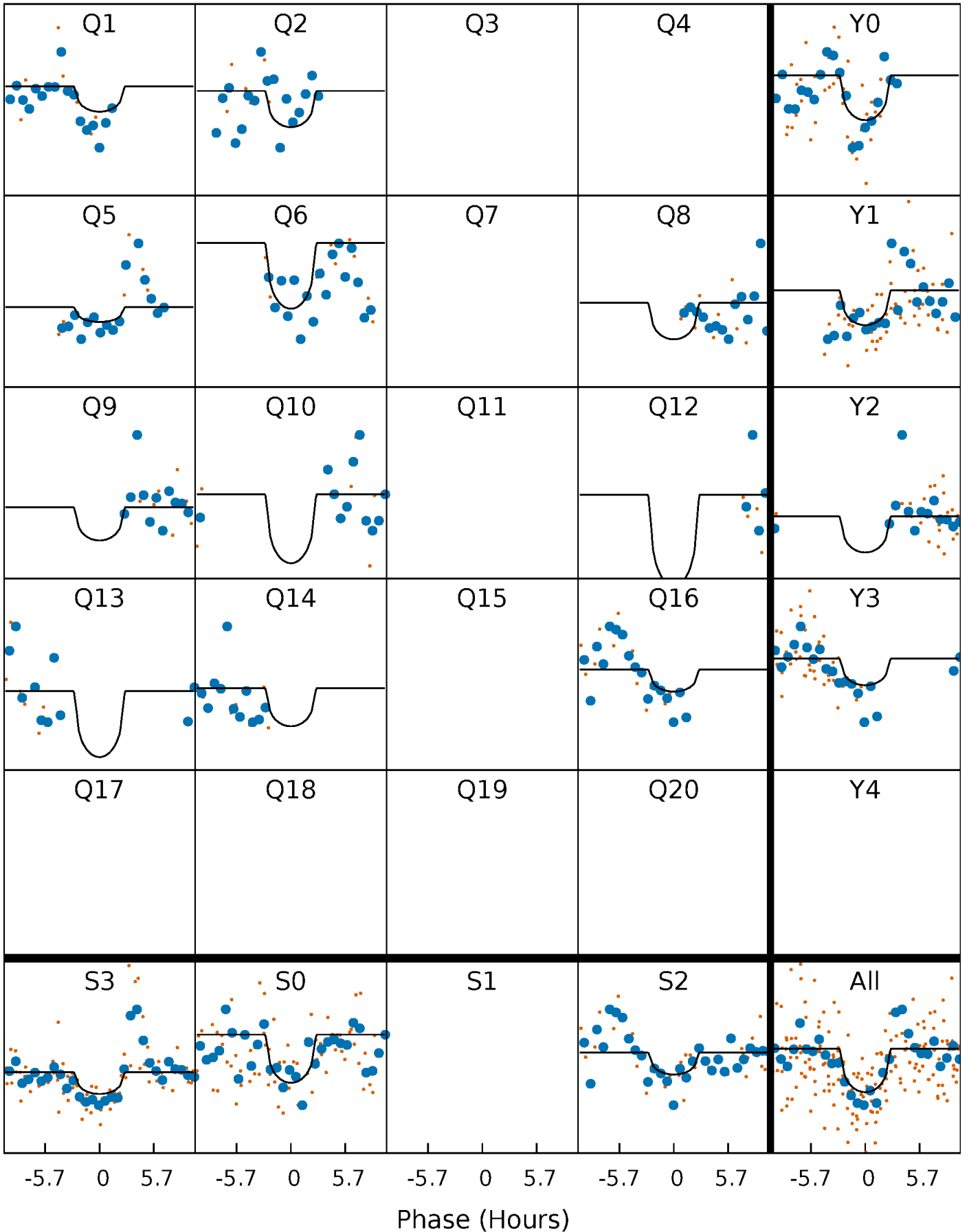
TCE 008767669-08 P= 99.591749 Days  $T_0=151.043130$  (BKJD)





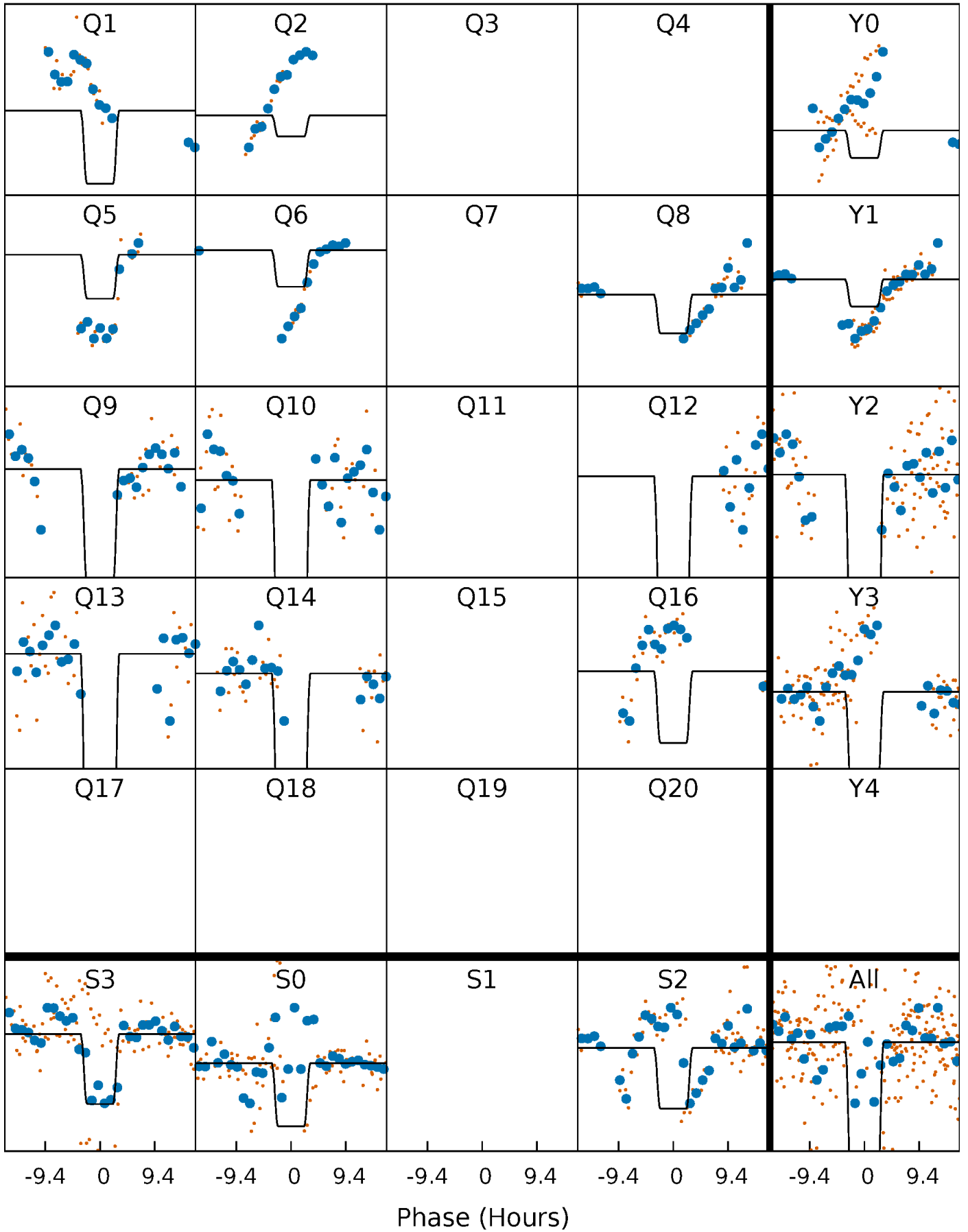
# DV Quarter-Phased Transit Curves

TCE 008767669-08 P= 99.591749 Days  $T_0=151.043130$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

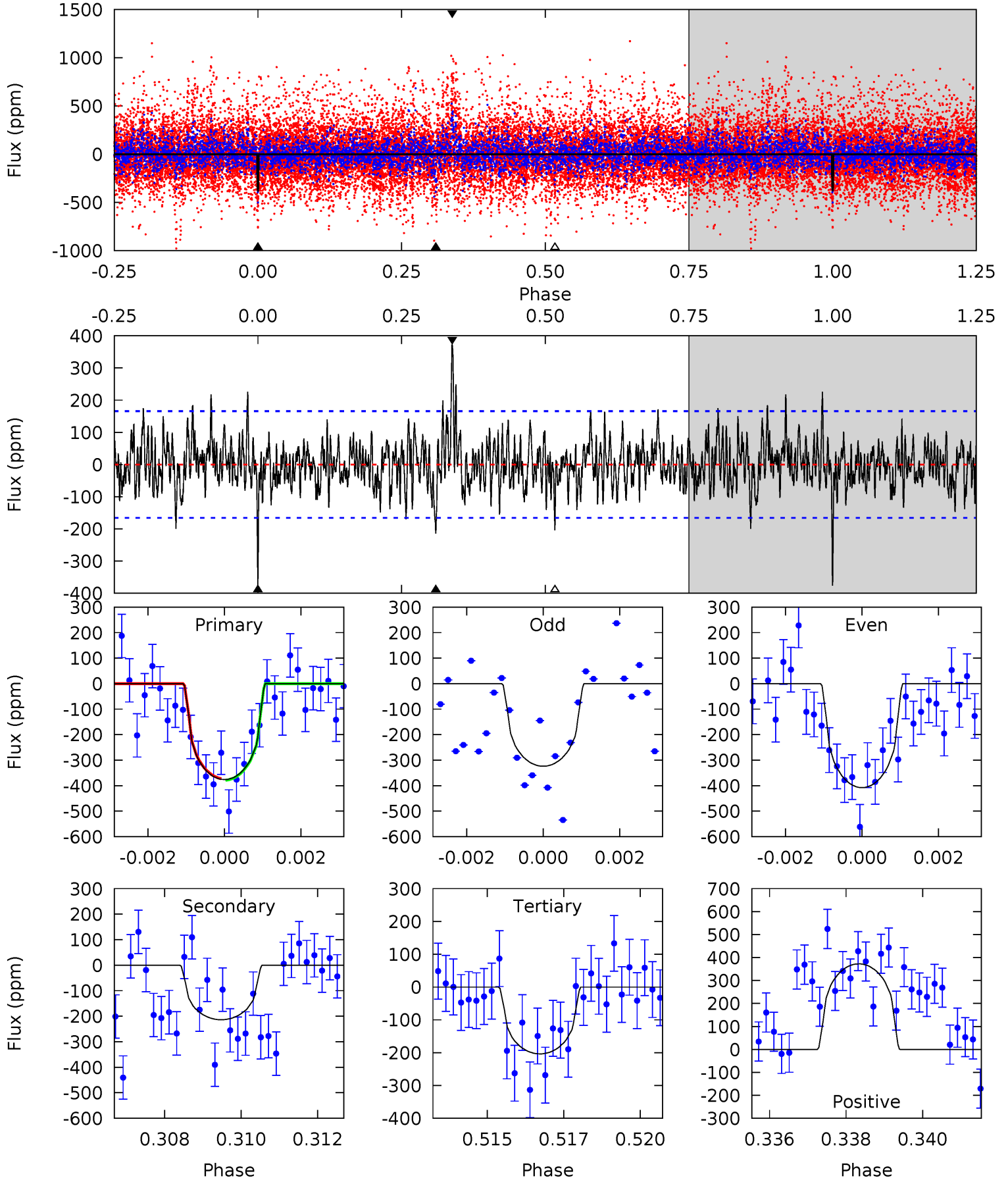
TCE 008767669-08 P= 99.589522 Days  $T_0=151.030083$  (BKJD)



# DV Model-Shift Uniqueness Test

008767669-08, P = 99.591749 Days, E = 51.451381 Days

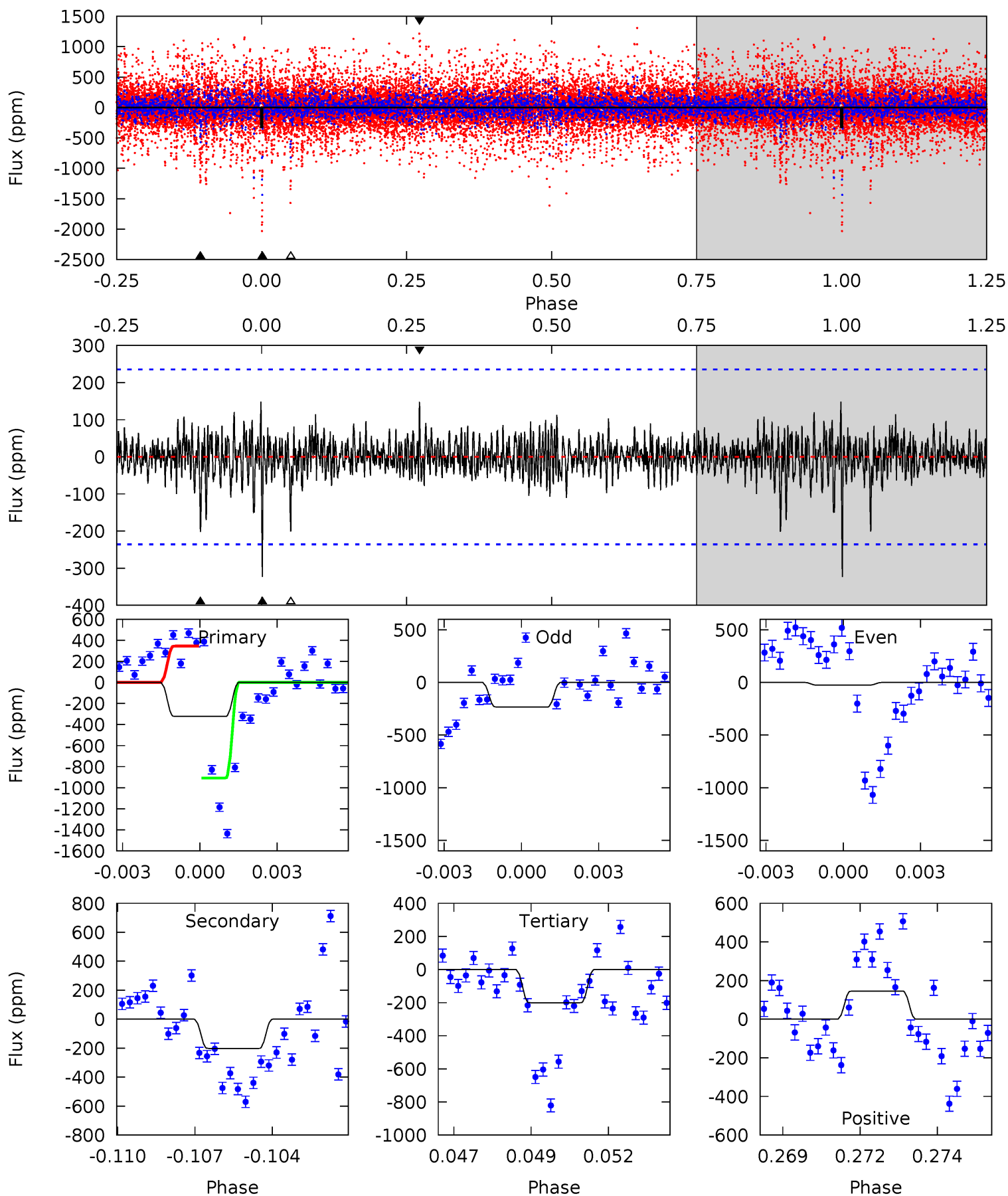
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.1 | 6.87 | 6.54 | 12.0 | 5.31            | 3.07            | 2.04             | 5.54    | 0.12    | 0.33    | -5.09   | 1.26    | 0.90 | 0.50  | 0.10 |



# Alt Model-Shift Uniqueness Test

008767669-08, P = 99.589522 Days, E = 51.440561 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.22 | 4.52 | 4.49 | 3.26 | 5.27            | 3.00            | 0.86             | 2.73    | 3.97    | 0.03    | 1.26    | 2.45    | 3.00 | 0.31  | 6.38 |



### Stellar Parameters For KIC 008767669

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | $[\text{Fe}/\text{H}]$    | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
|        | $4338^{+129}_{-142}$ | $4.586^{+0.056}_{-0.017}$ | $0.320^{+0.150}_{-0.300}$ | $0.709^{+0.024}_{-0.057}$ | $0.708^{+0.036}_{-0.049}$ | $2.794^{+0.652}_{-0.202}$                 |
|        | +3%/-3%              | +1%/-0%                   | +47%/-94%                 | +3%/-8%                   | +5%/-7%                   | +23%/-7%                                  |
| Source | PHO1                 | KIC0                      | KIC0                      | DSEP                      |                           |   |

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

### Secondary Eclipse Parameters for KIC 008767669-08 / KOI

| Detrend | Depth (ppm)   | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$  | $A_{\text{obs}}$        |
|---------|---------------|------------------------|----------------------|-----------------------|-------------------------|
| DV      | $-214 \pm 31$ | $1.78^{+1.60}_{-1.12}$ | $365^{+12}_{-13}$    | $3675^{+1798}_{-653}$ | $5267^{+35297}_{-3804}$ |
| Alt.    | $-202 \pm 45$ | $2.75^{+1.50}_{-1.49}$ | $365^{+13}_{-14}$    | $3175^{+941}_{-386}$  | $2059^{+8068}_{-1213}$  |

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

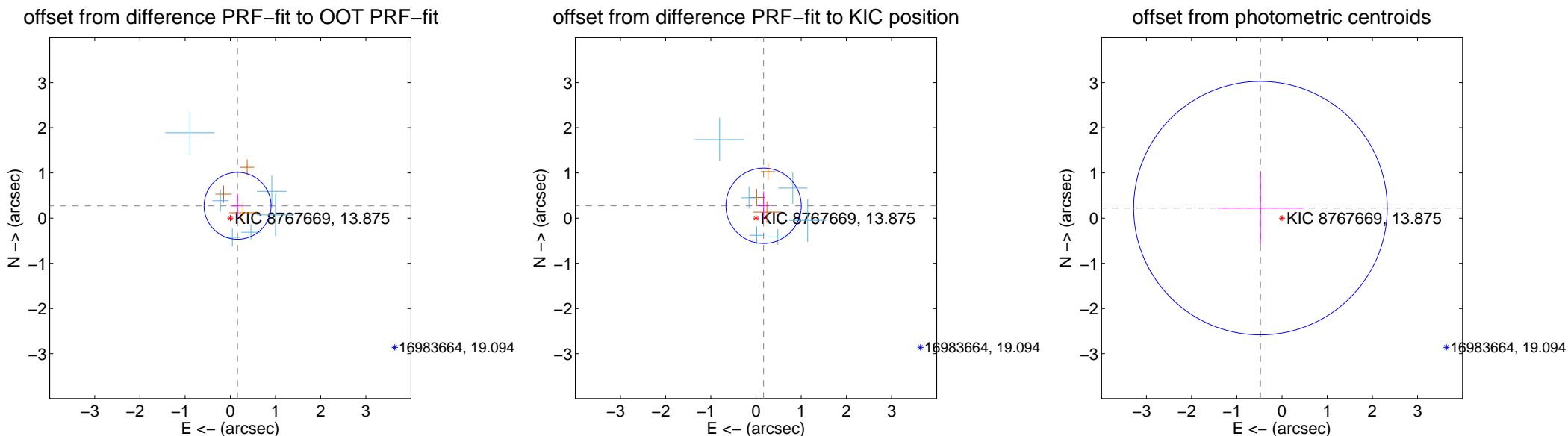
## DV Centroid Data

Supplemental centroid analysis for 008767669-08. Kepler magnitude: 13.88. Transit SNR 6.59

There are 6 quarters with good PRF difference image offsets

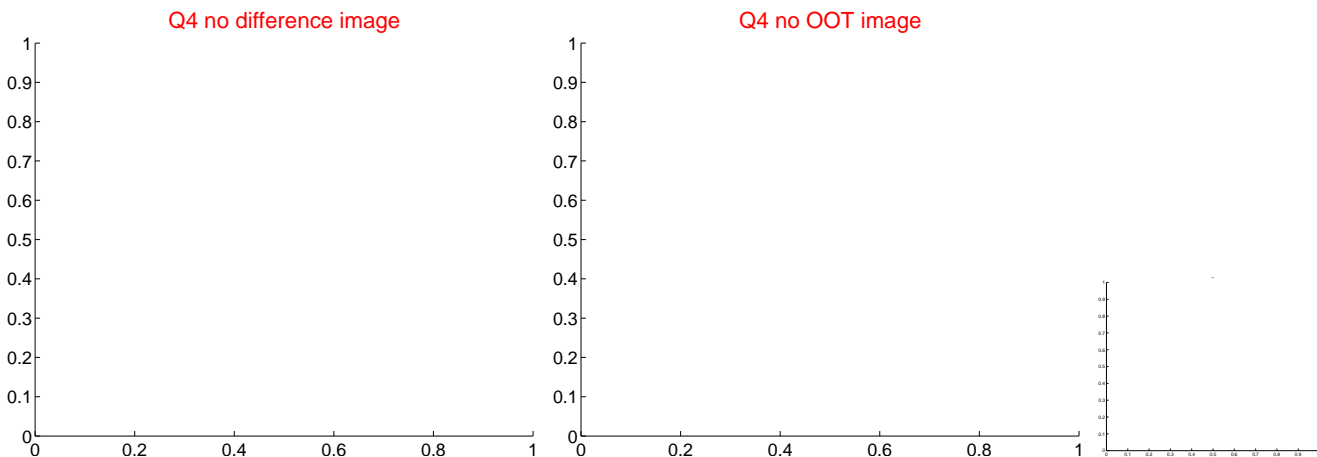
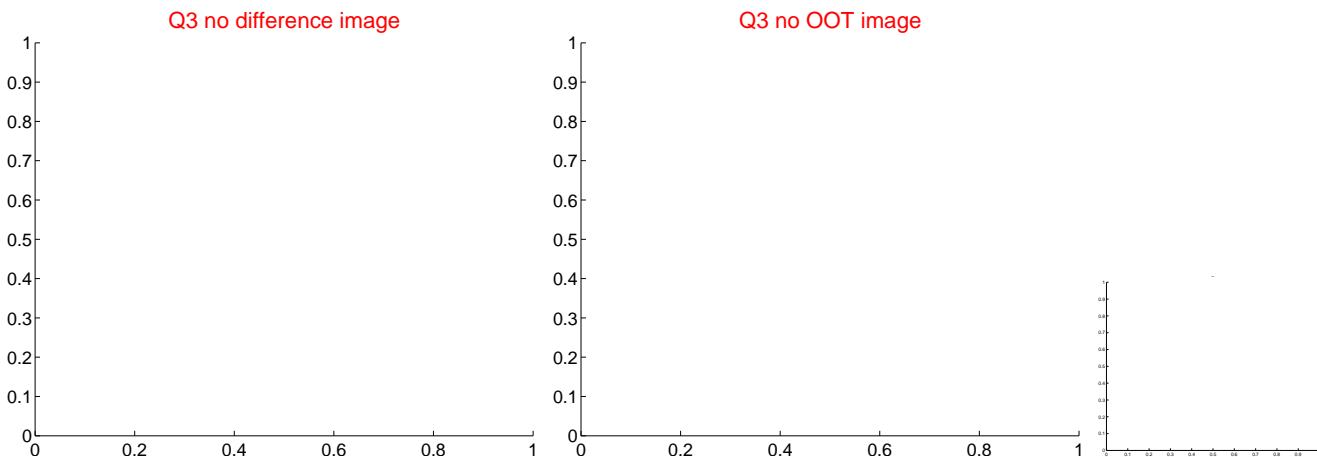
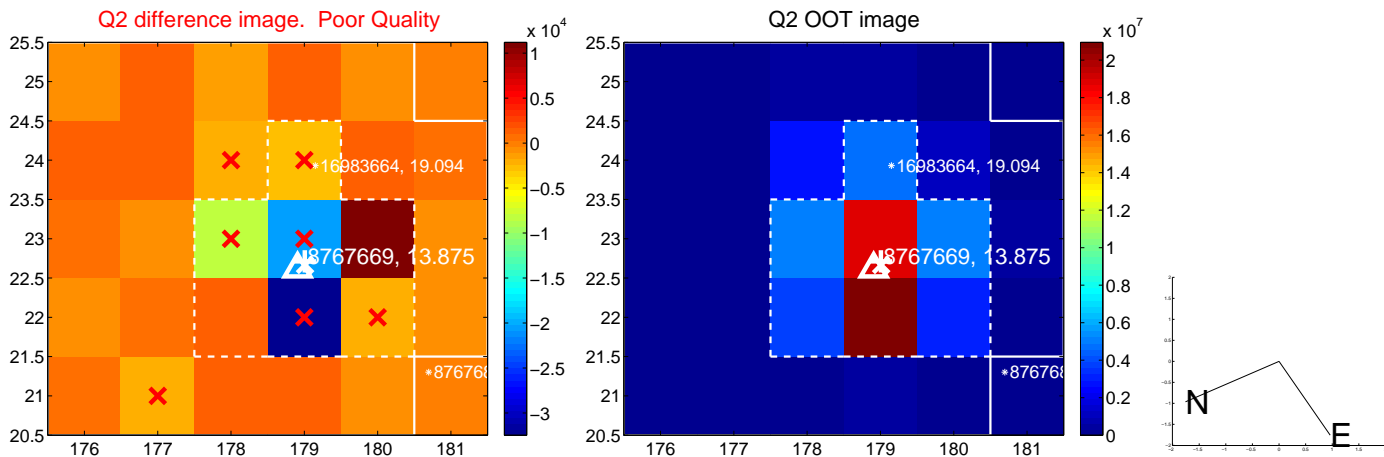
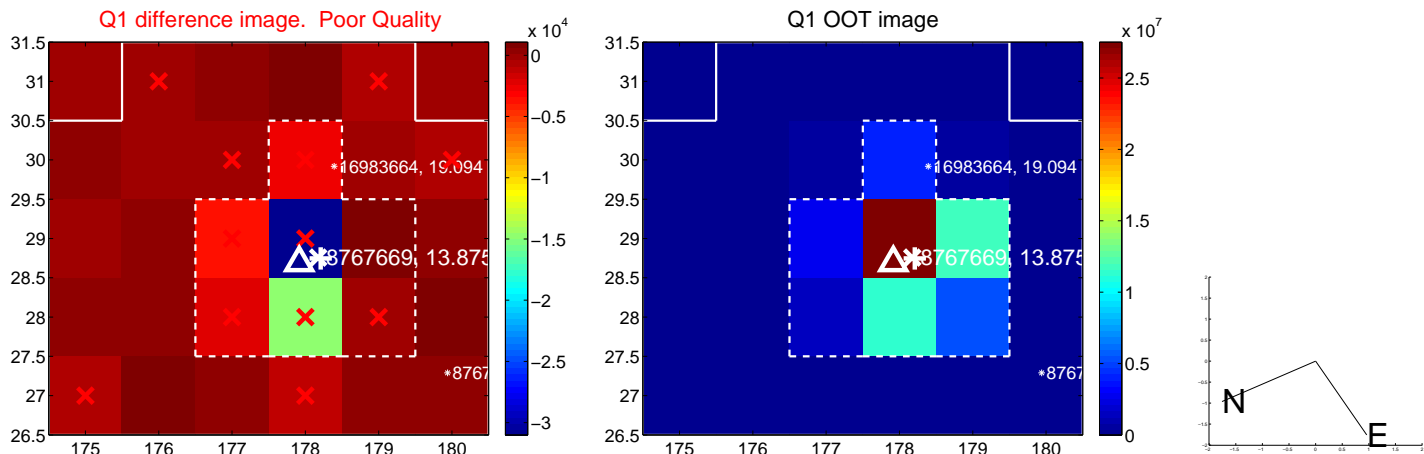
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | $0.316 \pm 0.247$  | 1.28                | $-0.161 \pm 0.154$ | $0.272 \pm 0.272$ |
| PRF-fit source offset from KIC position | $0.321 \pm 0.278$  | 1.15                | $-0.168 \pm 0.141$ | $0.273 \pm 0.314$ |
| photometric centroid source offset      | $0.53 \pm 0.94$    | 0.56                | $0.48 \pm 0.96$    | $0.22 \pm 0.81$   |

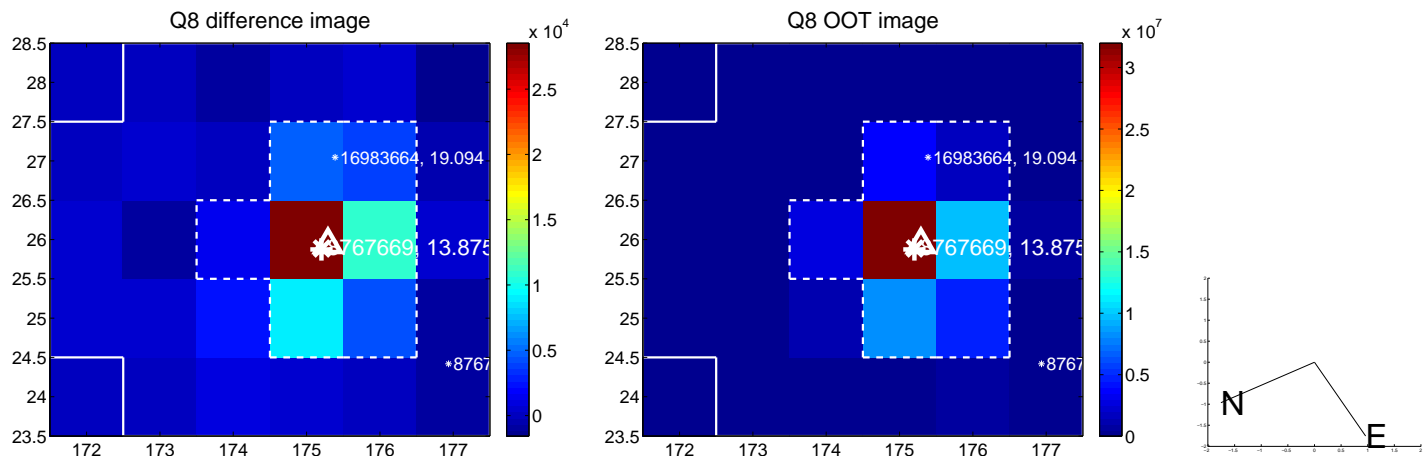
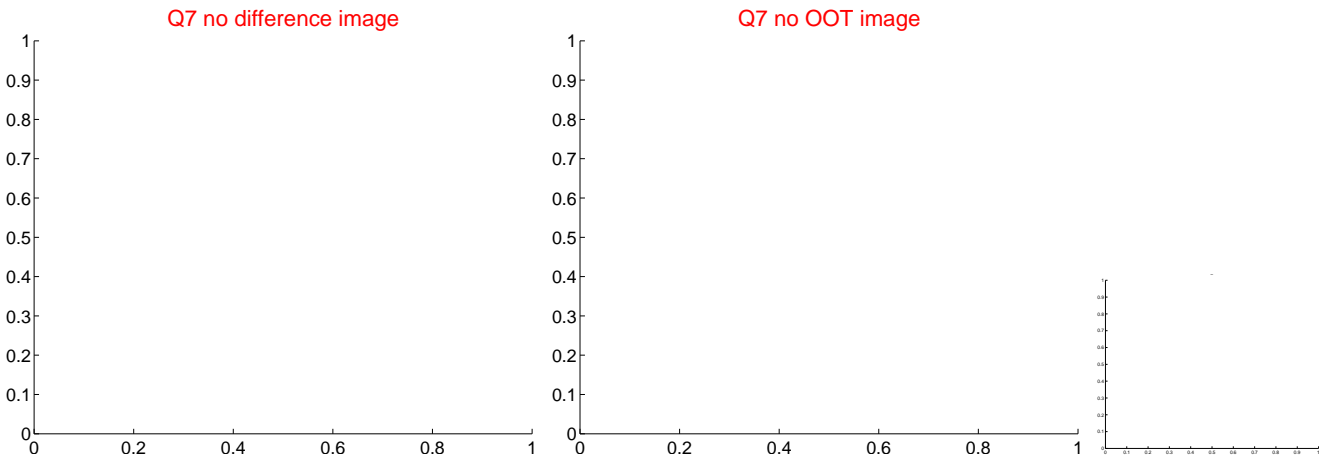
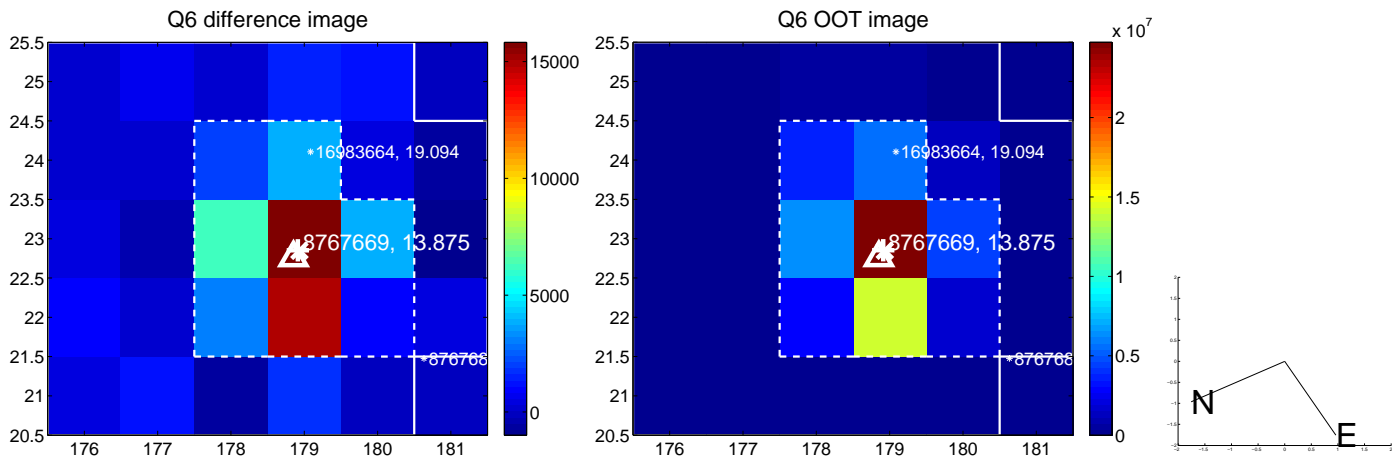
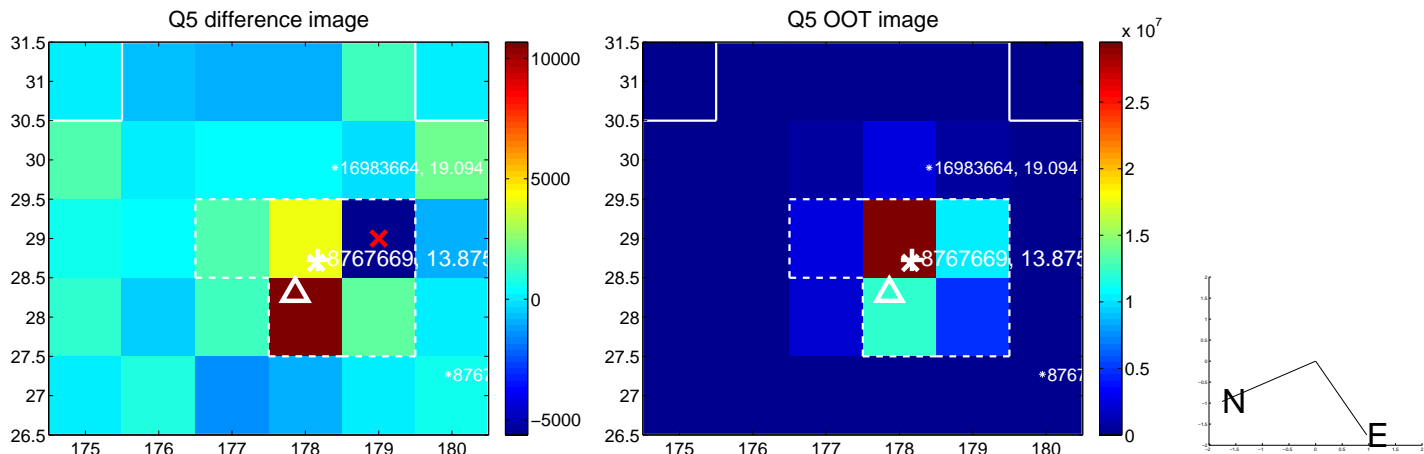


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

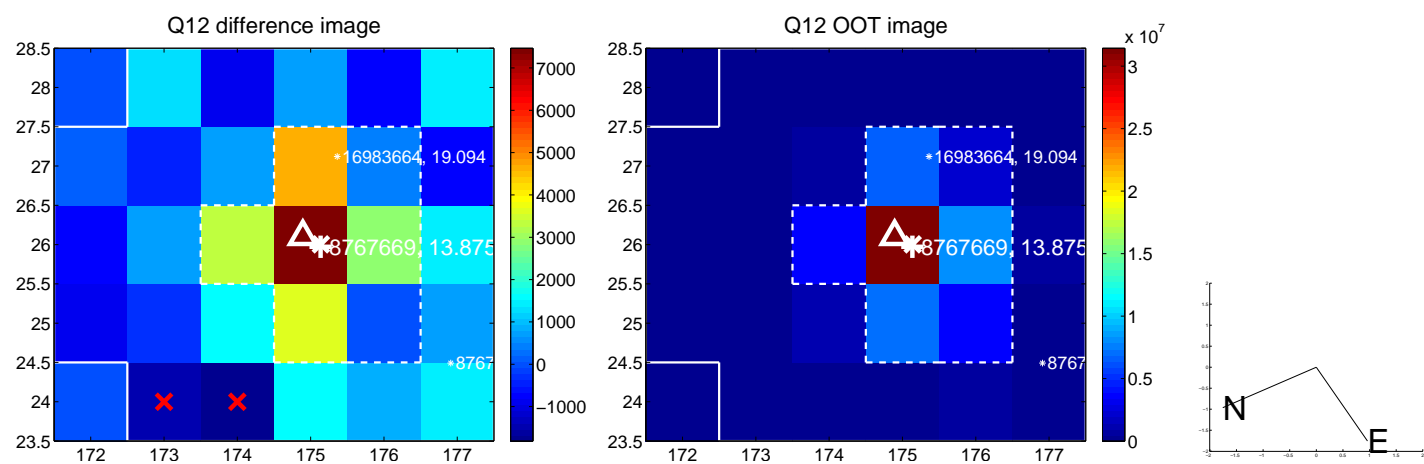
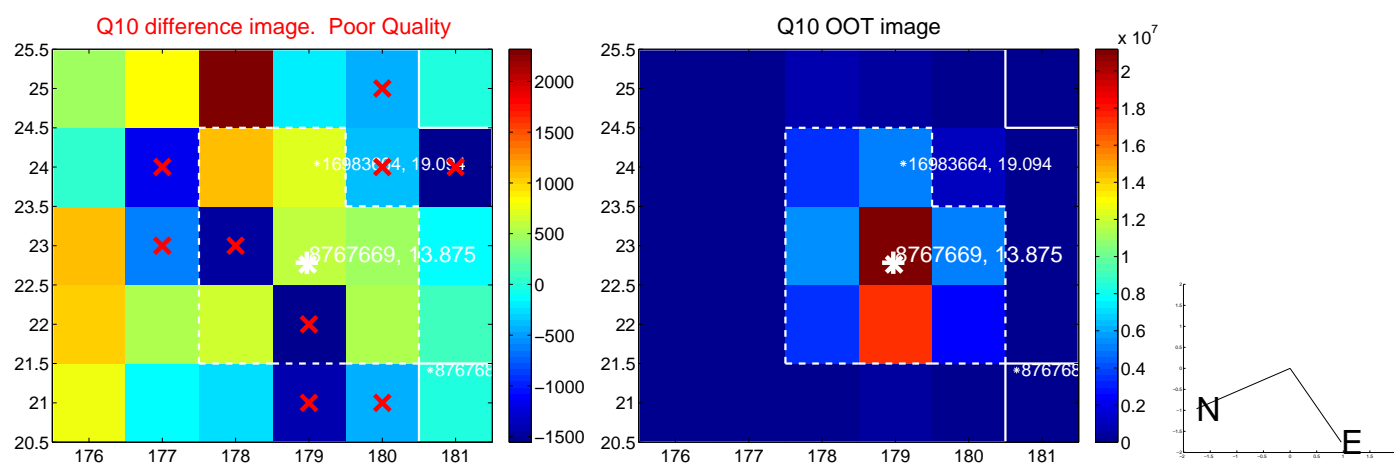
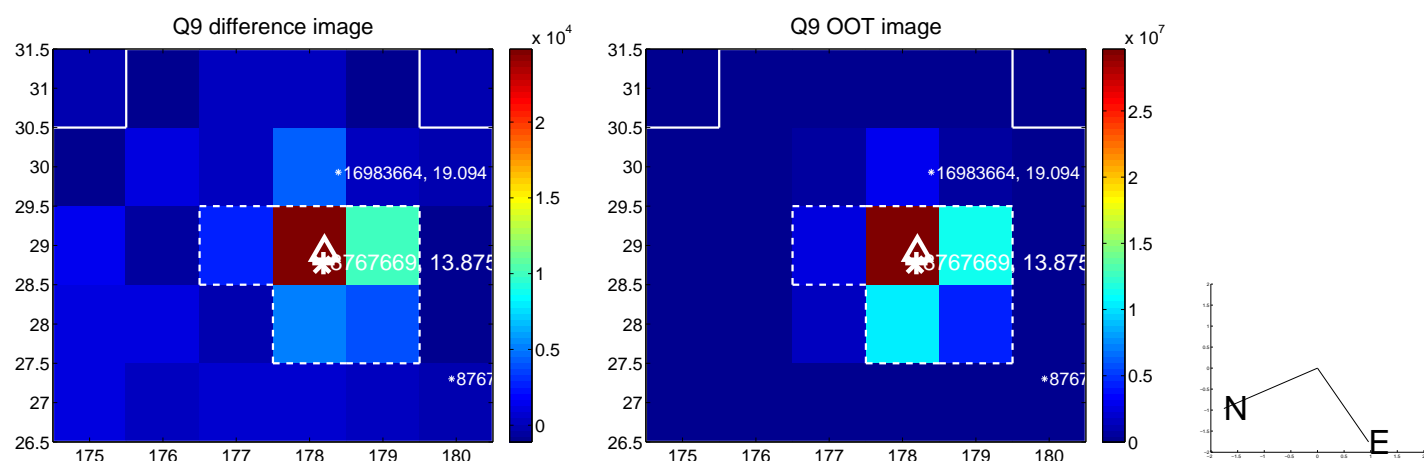


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

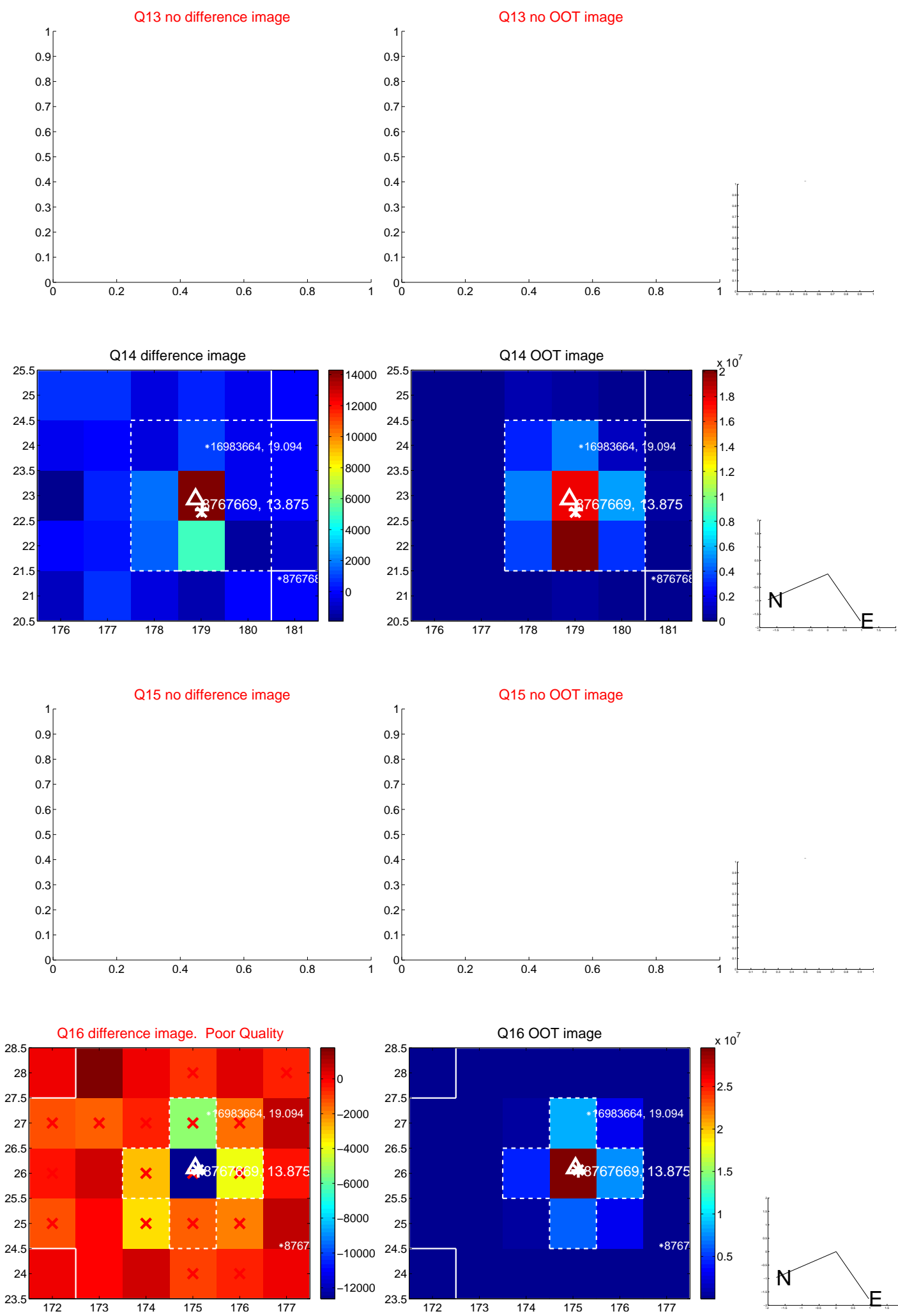




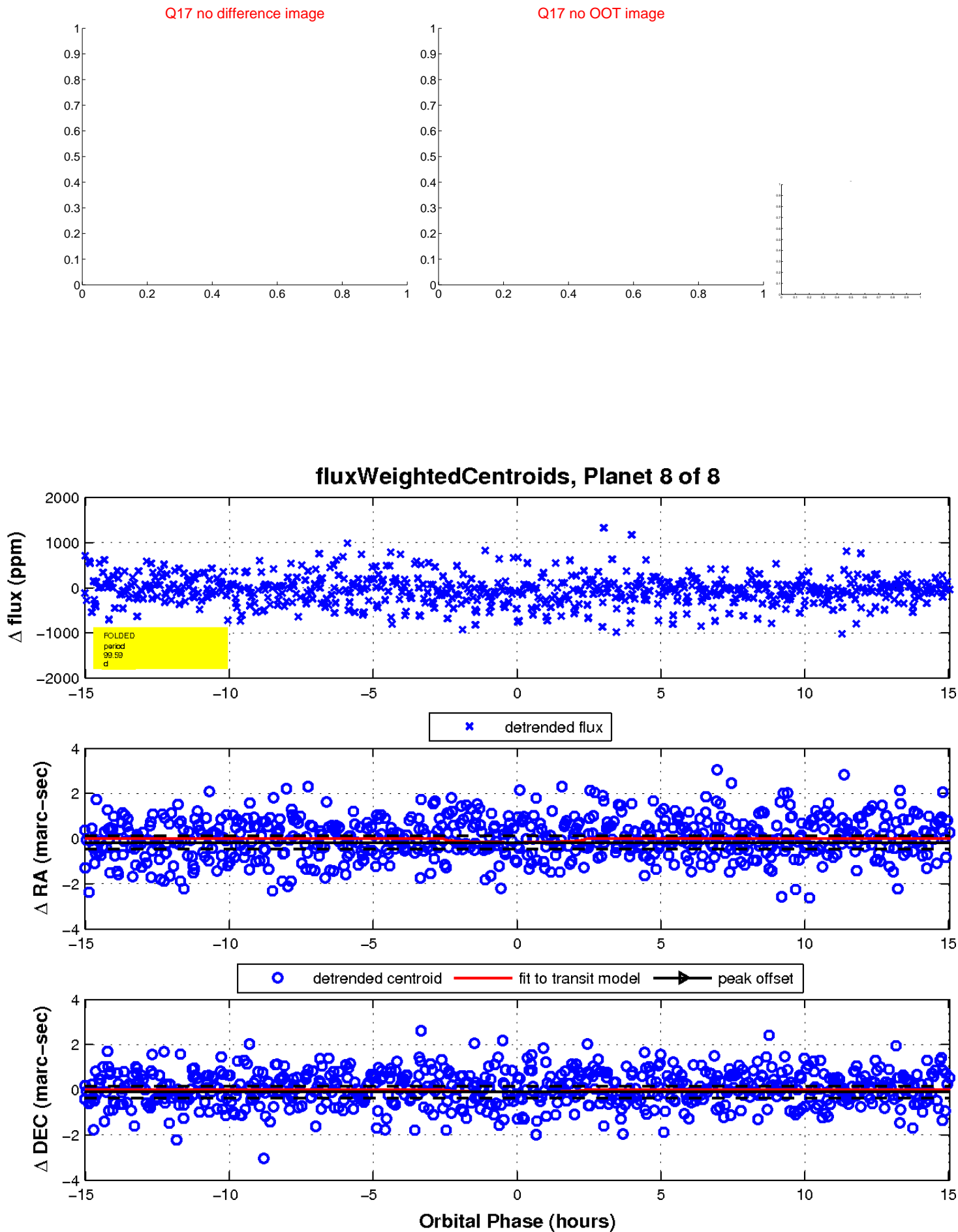
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

