

# KIC 007624741

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007624741-01 | OBS      | No   | 1.402699      | 132.839748   | 9.6         | 6.989            | 8.2  | 8.4 | 0.92                        | 6170            | 0.33                   | 1943.92                |
| 007624741-02 | OBS      | No   | 96.648958     | 212.896189   | 114.2       | 13.213           | 15.5 | 8.8 | 0.92                        | 6170            | 1.10                   | 6.88                   |
| 007624741-03 | OBS      | No   | 208.799977    | 217.835866   | 102.5       | 22.397           | 11.7 | 5.4 | 0.92                        | 6170            | 1.00                   | 2.46                   |
| 007624741-04 | OBS      | No   | 159.903131    | 203.605495   | 100.1       | 14.641           | 8.7  | 6.7 | 0.92                        | 6170            | 1.04                   | 3.52                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 007624741-01 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | LPP_DV—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET   |
| 007624741-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—CENT_FEW_DIFFS   |
| 007624741-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS             |
| 007624741-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |

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

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

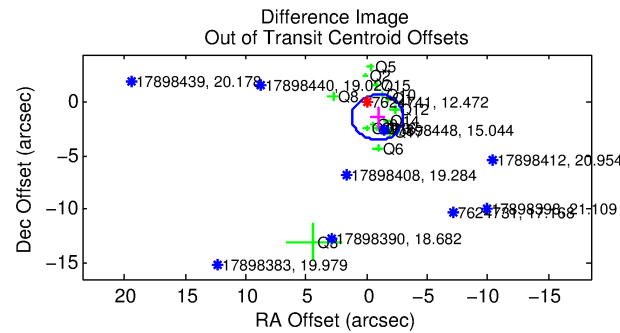
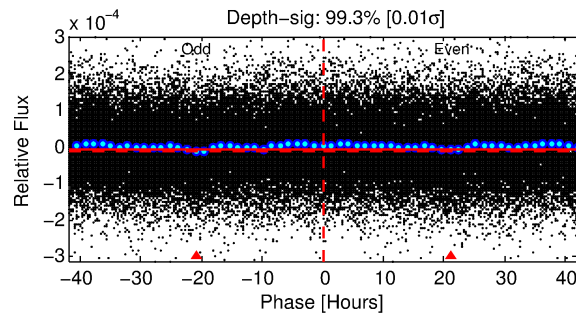
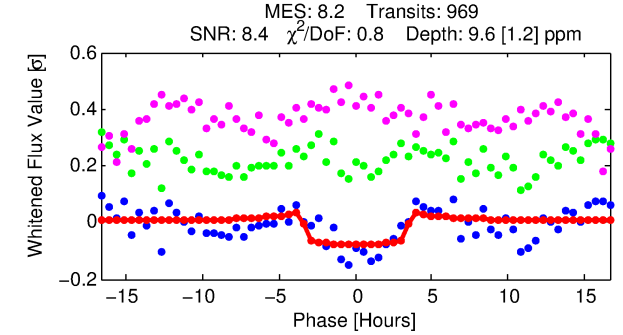
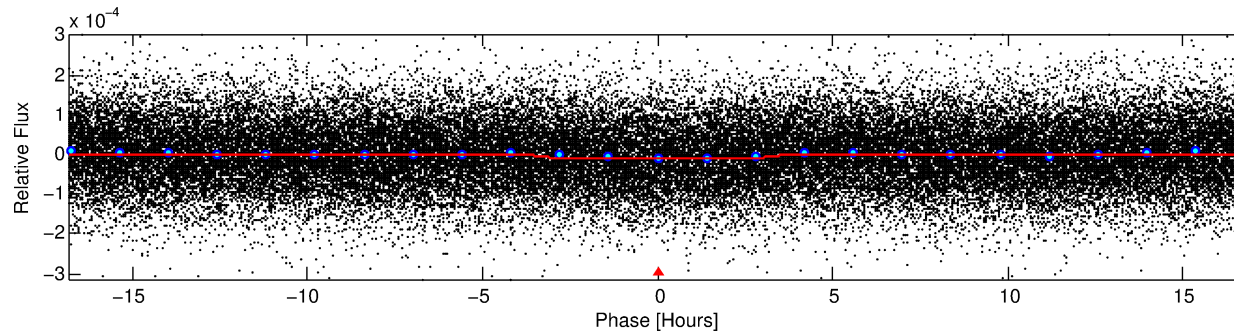
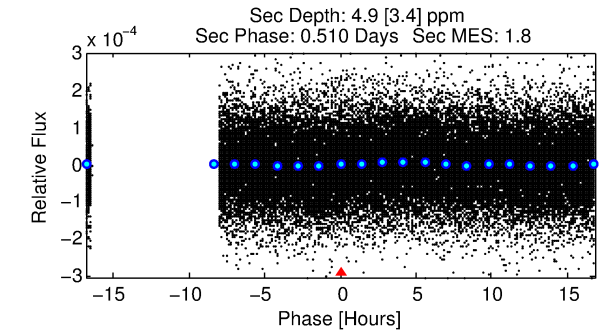
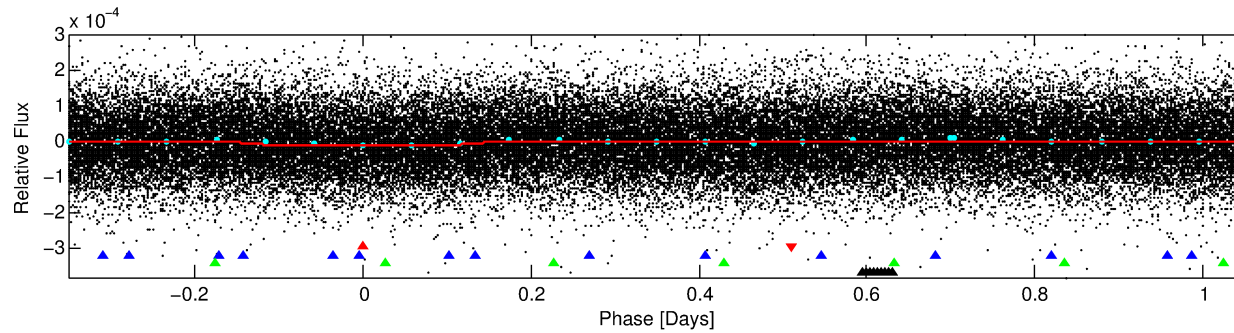
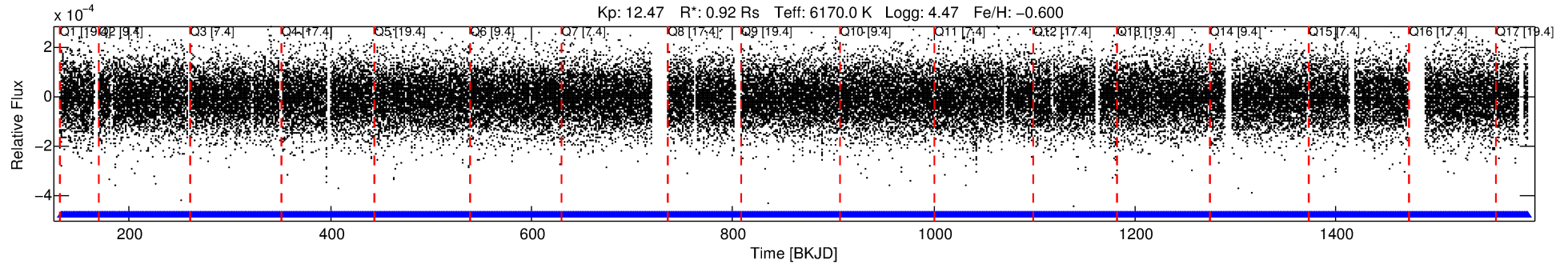
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007624741-01

No Significant Match Found

# DV One-Page Summary

KIC: 7624741 Candidate: 1 of 4 Period: 1.403 d



## DV Fit Results:

Period = 1.40270 [0.00002] d  
Epoch = 132.8397 [0.0060] BKJD  
Rp/R\* = 0.0033 [0.0012]  
a/R\* = 1.16 [0.58]  
b = 0.90 [0.42]  
Seff = 1943.92 [517.63]  
Teff = 1693 [113] K  
Rp = 0.33 [0.13] Re  
a = 0.0237 [0.0038] AU  
Ag = 13.79 [13.95] [0.92σ]  
Teffp = 5044 [1249] K [2.67σ]

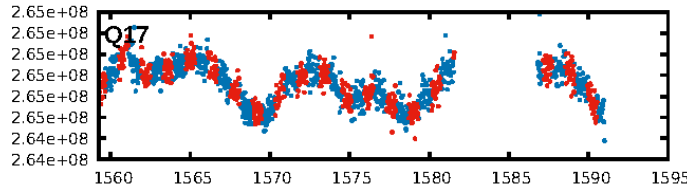
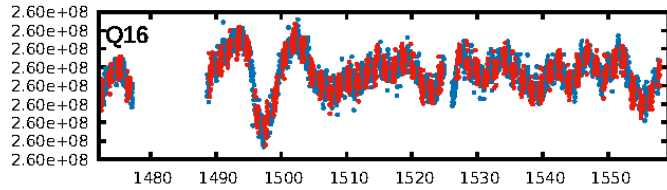
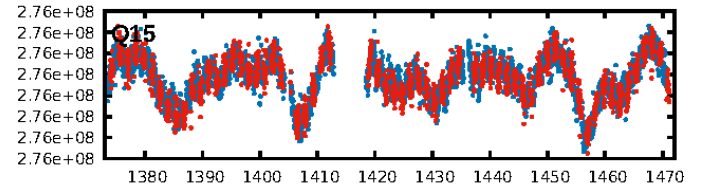
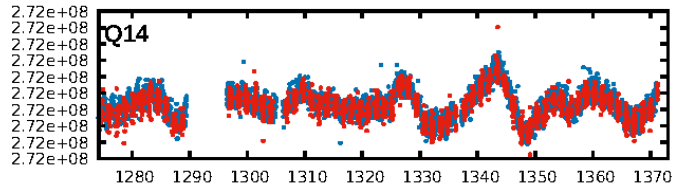
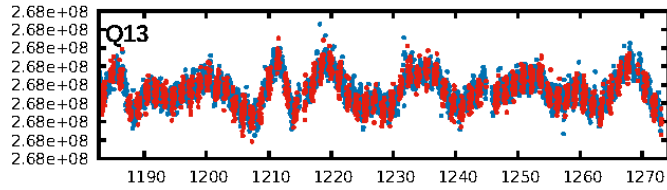
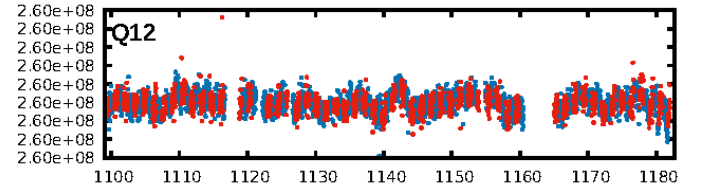
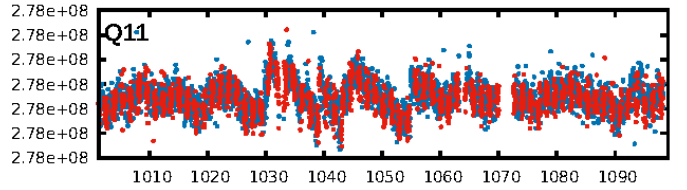
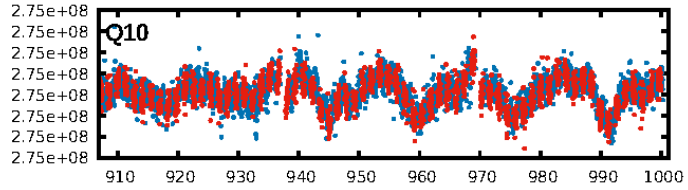
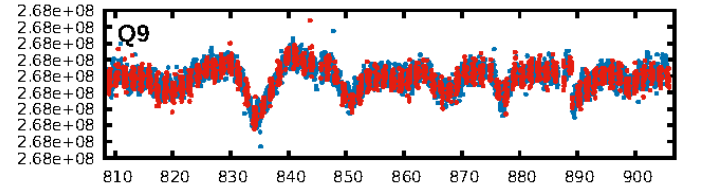
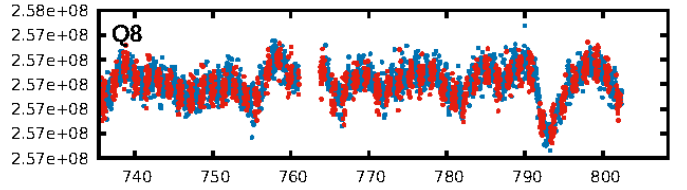
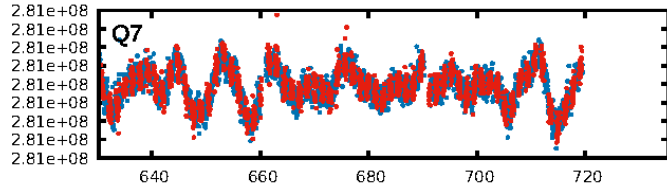
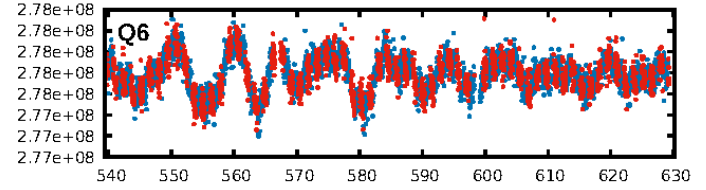
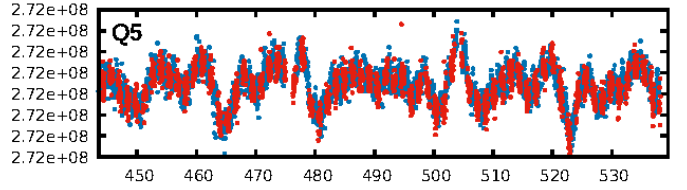
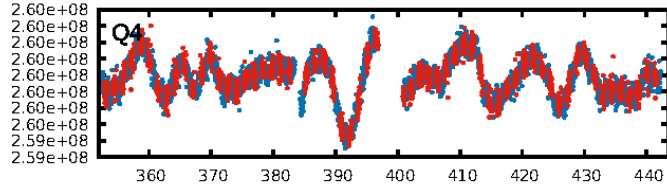
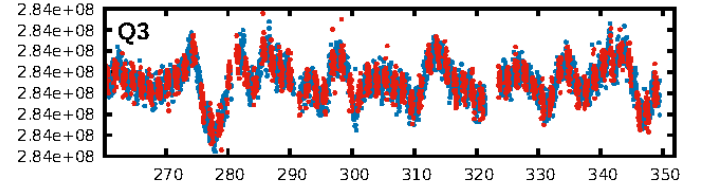
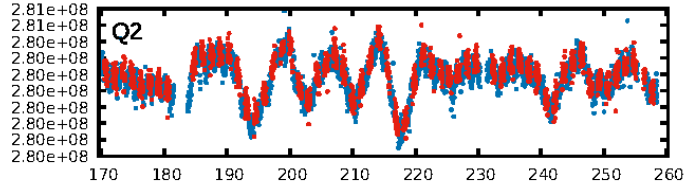
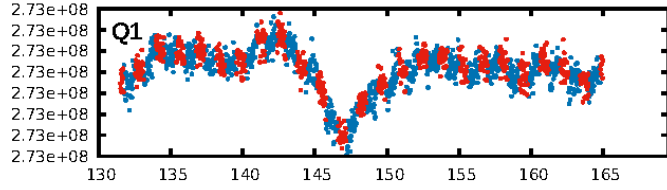
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [152.93σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.58e-15  
RollingBand-fgt: 1.00 [925/925]  
GhostDiagnostic-chr: 7.033  
Centroid-sig: 0.0%  
Centroid-so: 3.799 arcsec [3.46σ]  
OotOffset-rm: 1.655 arcsec [2.33σ]  
KicOffset-rm: 2.073 arcsec [3.07σ]  
OotOffset-st: 4/3/3/5 [15]  
KicOffset-st: 4/3/3/5 [15]  
DiffImageQuality-fgm: 0.73 [11/15]  
DiffImageOverlap-fno: 1.00 [17/17]

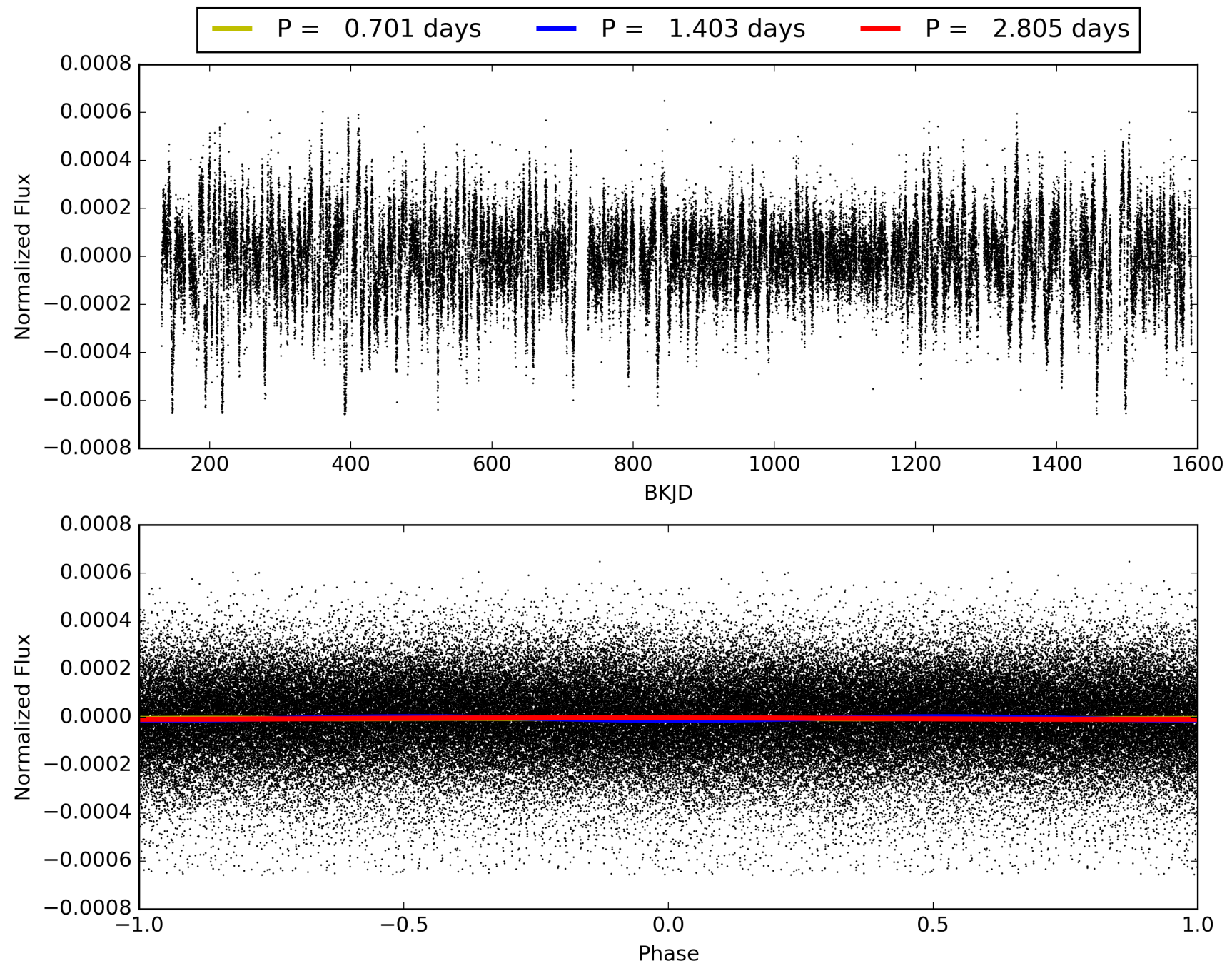
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:19:47 Z

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

## TCE 007624741-01, PDC Light Curves



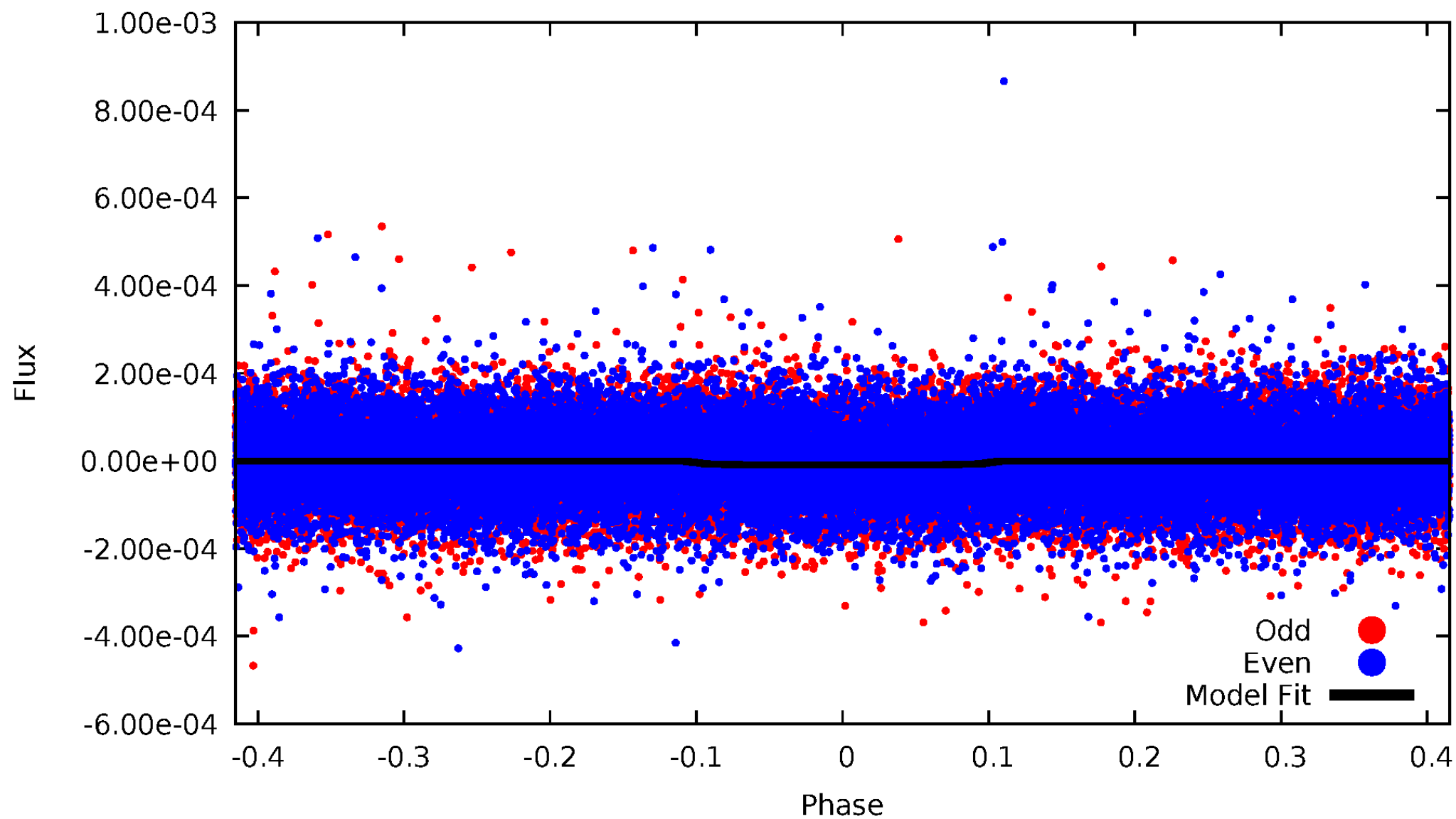
TCE 007624741-01





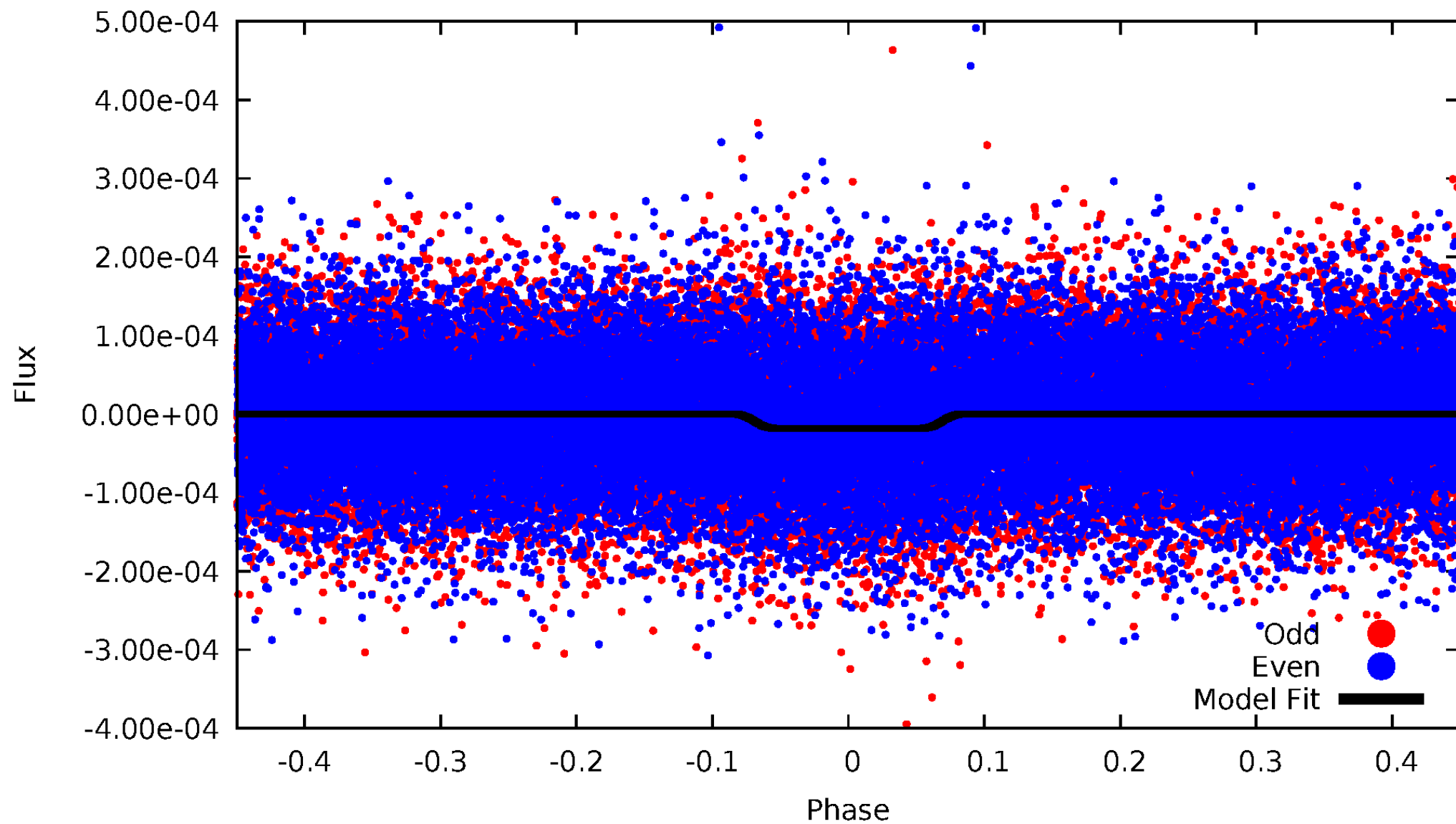
# DV Odd/Even

TCE 007624741-01

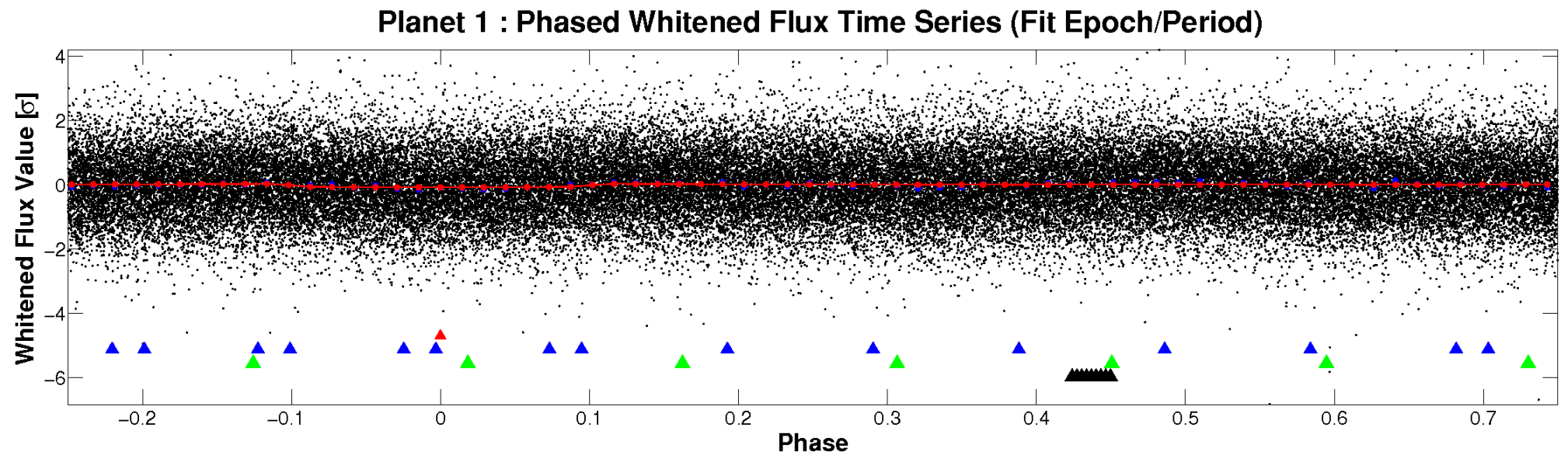
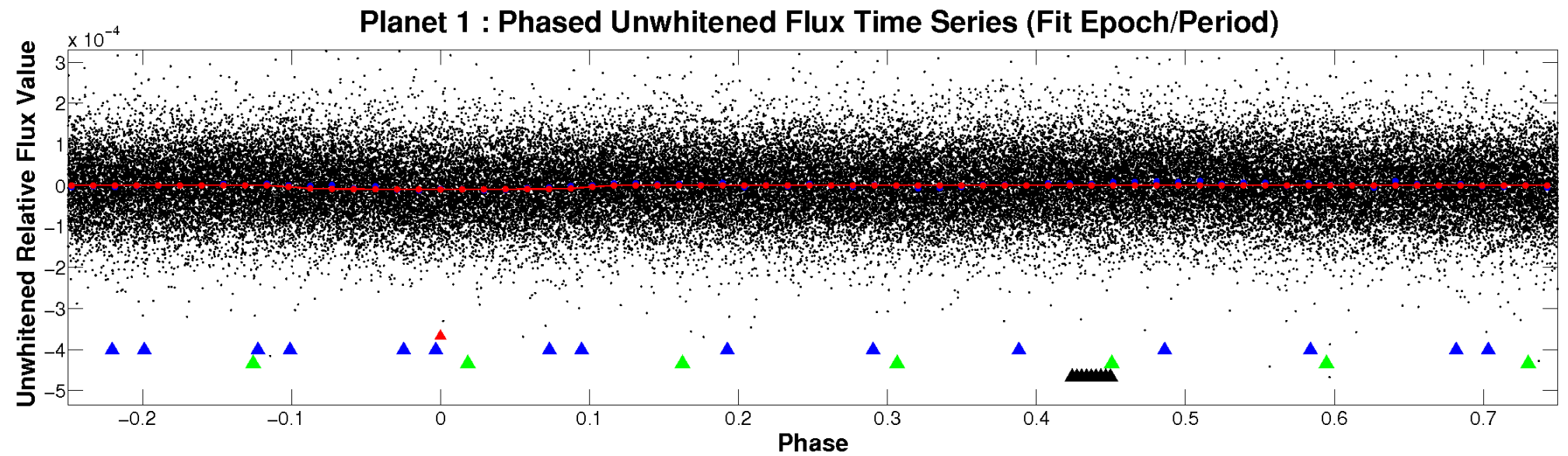


# ALT Odd/Even

TCE 007624741-01

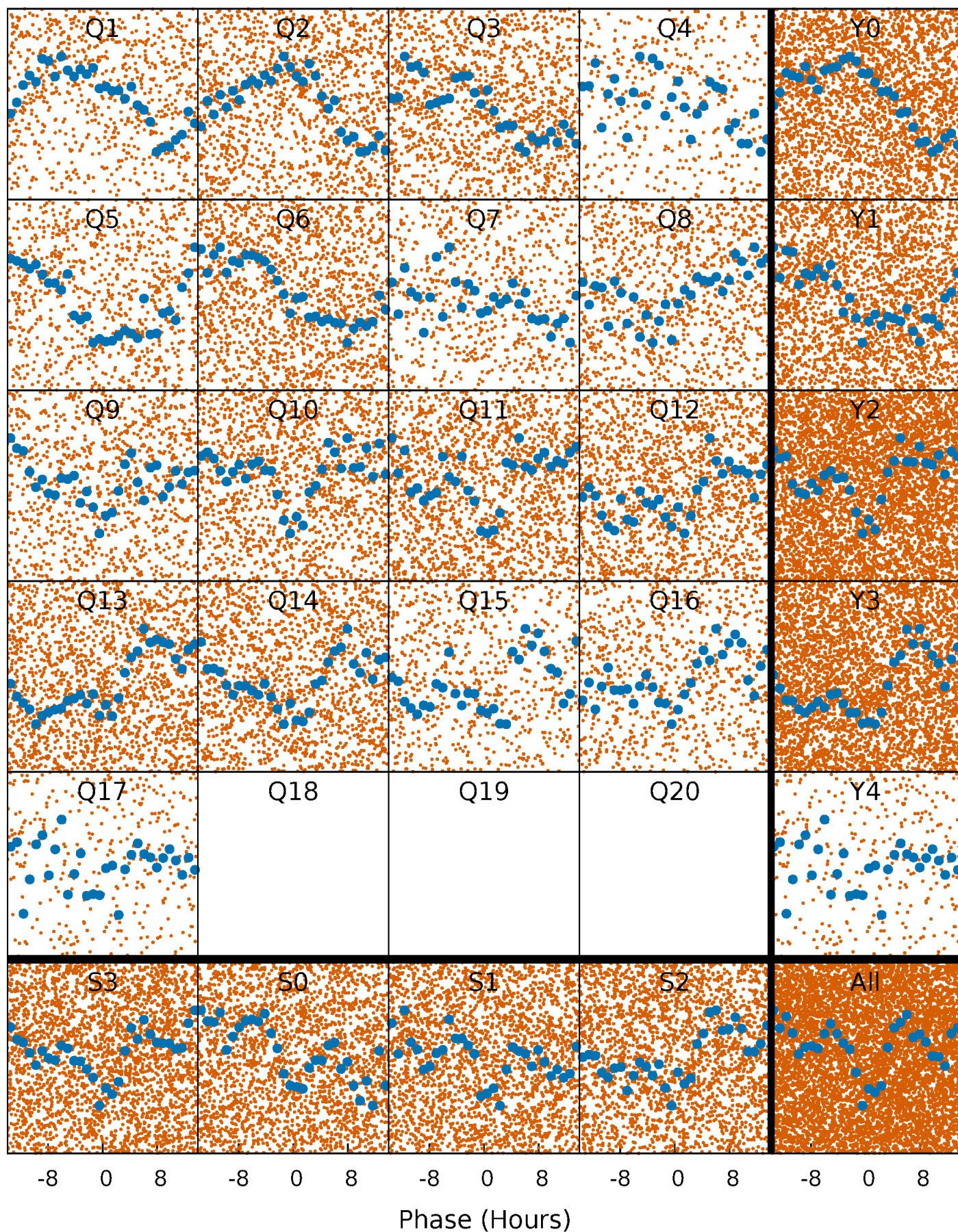


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

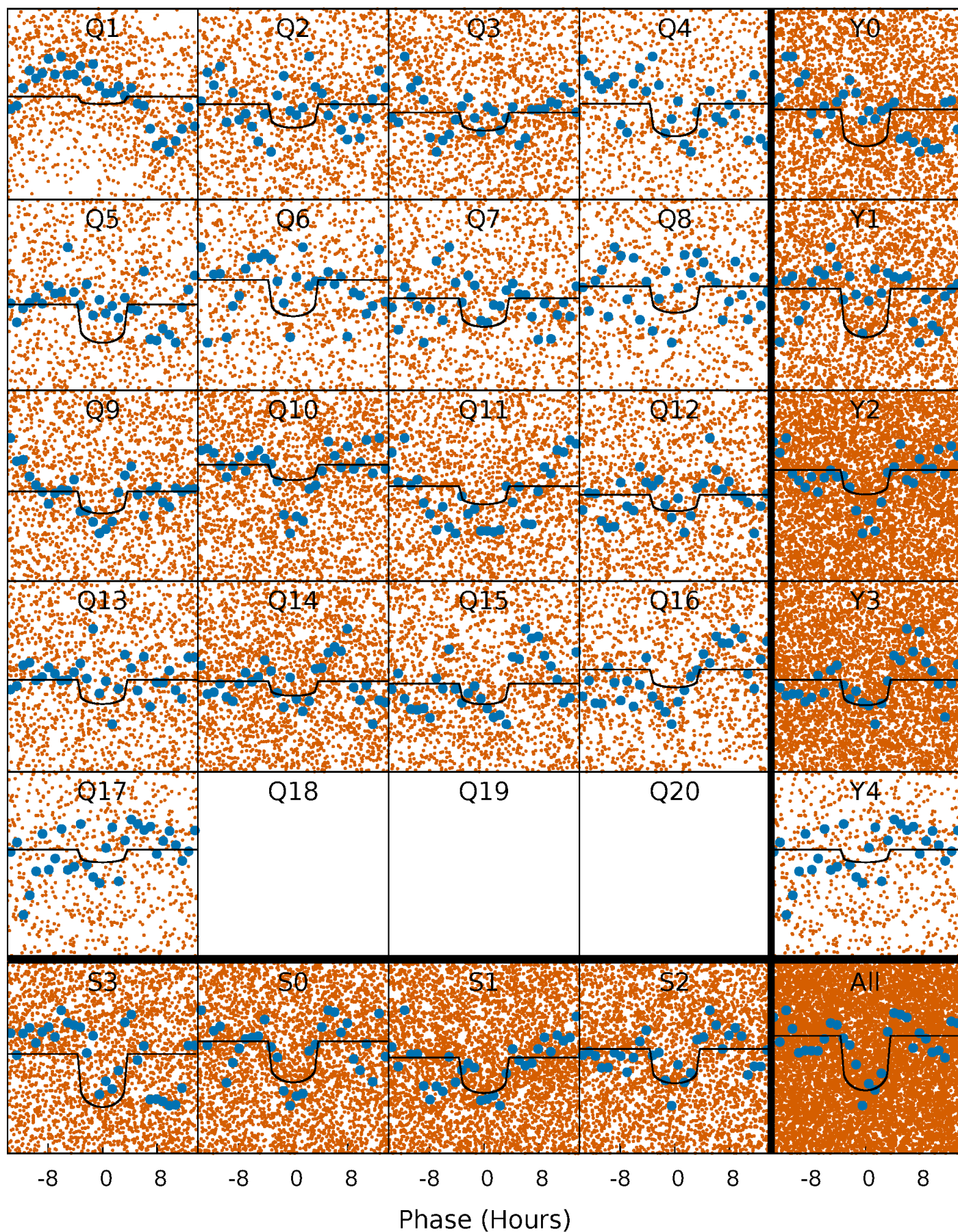
TCE 007624741-01 P= 1.402699 Days  $T_0=132.839748$  (BKJD)





# DV Quarter-Phased Transit Curves

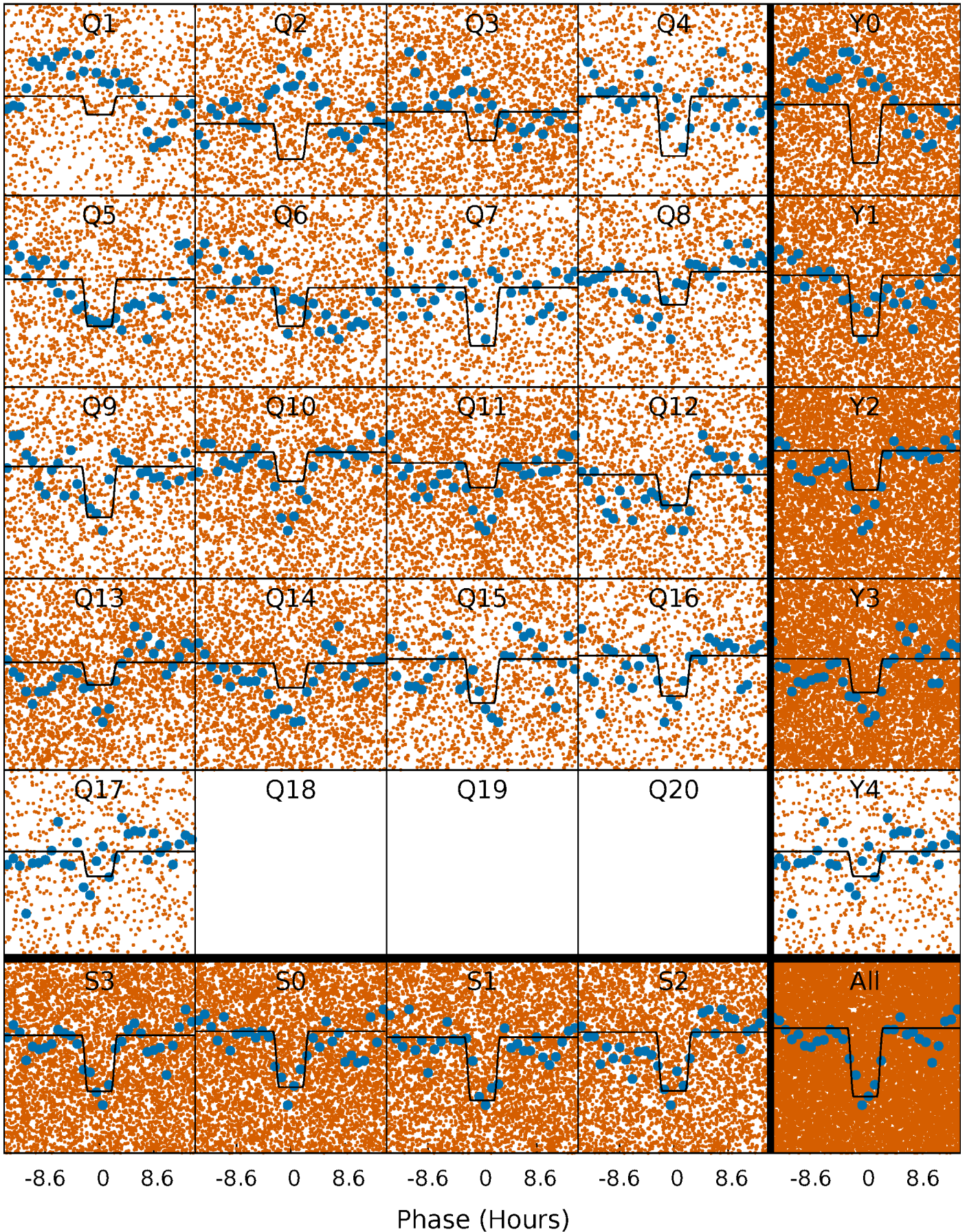
TCE 007624741-01 P= 1.402699 Days  $T_0=132.839748$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

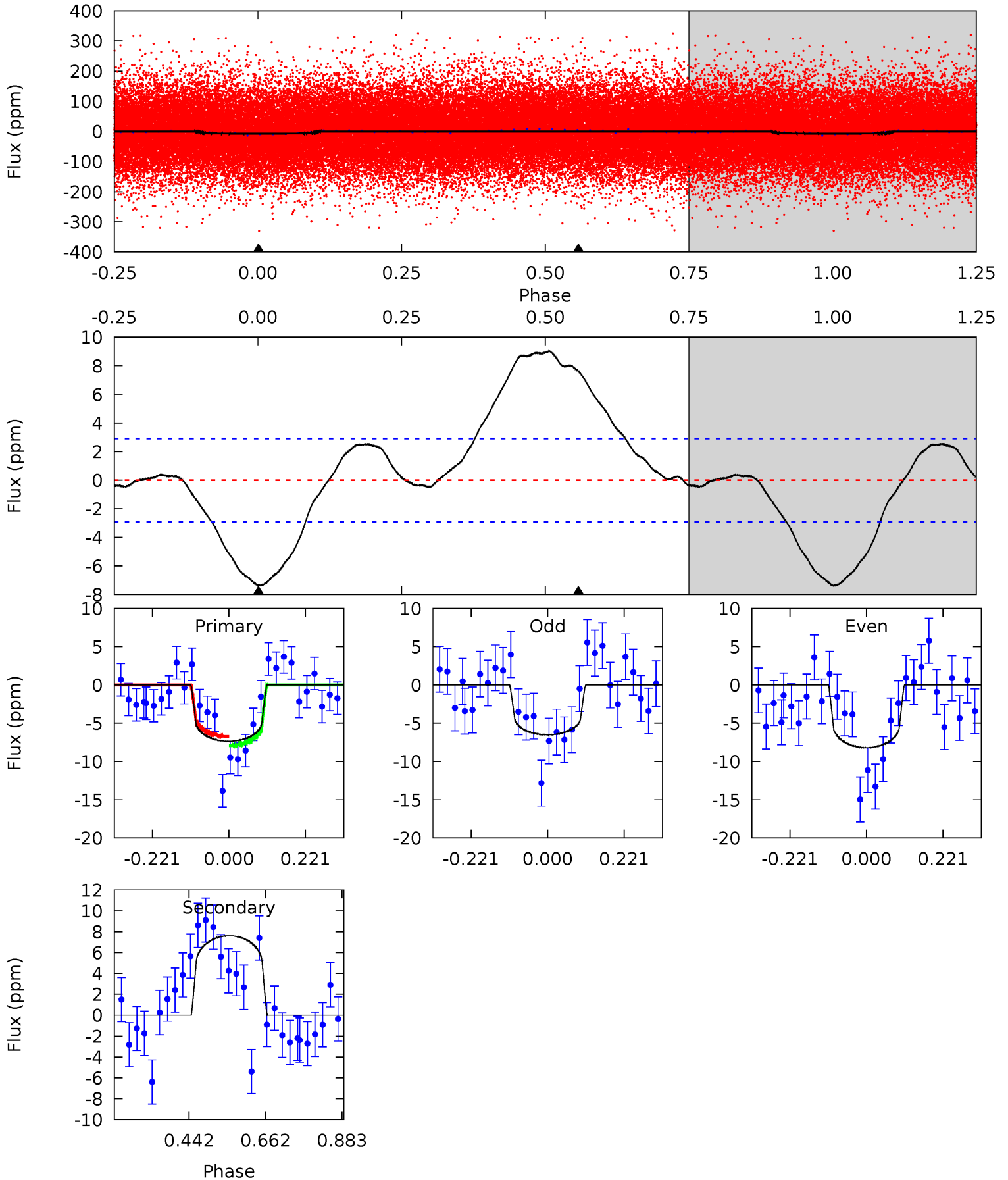
TCE 007624741-01 P= 1.402720 Days  $T_0=132.839488$  (BKJD)



# DV Model-Shift Uniqueness Test

007624741-01, P = 1.402699 Days, E = 131.437049 Days

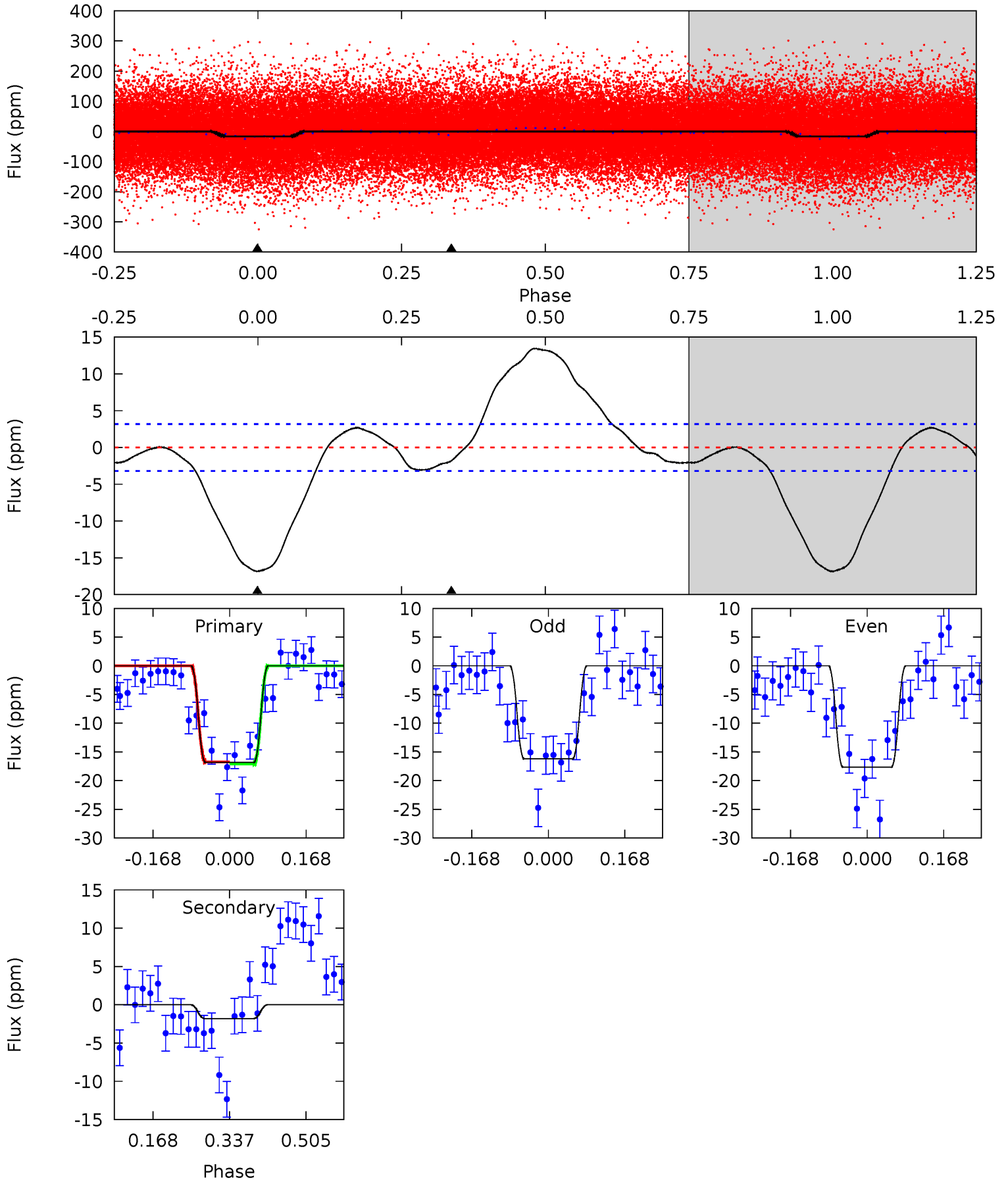
| Pri  | Sec   | Ter | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|-------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.1 | -11.5 | 0   | 0   | 4.40            | 1.22            | 0.87             | 11.1    | 11.1    | -11.5   | -11.5   | 1.28    | 1.32 | 0.55  | 0.92 |



# Alt Model-Shift Uniqueness Test

007624741-01, P = 1.402720 Days, E = 131.436768 Days

| Pri  | Sec  | Ter | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 23.6 | 2.53 | 0   | 0   | 4.45            | 1.38            | 6.78             | 23.6    | 23.6    | 2.53    | 2.53    | 1.01    | 1.00 | 0.44  | 0.23 |





### Stellar Parameters For KIC 007624741

|        | $T_{\text{eff}} (K)$ | $\log(g)$                 | $[\text{Fe}/\text{H}]$     | $R (R_{\odot})$           | $M (M_{\odot})$           | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6170^{+168}_{-186}$ | $4.468^{+0.077}_{-0.132}$ | $-0.600^{+0.300}_{-0.300}$ | $0.916^{+0.170}_{-0.099}$ | $0.898^{+0.095}_{-0.095}$ | $1.645^{+0.607}_{-0.619}$                 |
|        | +3%/-3%              | +2%/-3%                   | +50%/-50%                  | +19%/-11%                 | +11%/-11%                 | +37%/-38%                                 |
| Source | PHO1                 | FLK73                     | 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 007624741-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$   | $A_{\text{obs}}$             |
|---------|-------------|------------------------|----------------------|------------------------|------------------------------|
| DV      | $8 \pm 1$   | $0.34^{+0.12}_{-0.12}$ | $2386^{+124}_{-110}$ | $-5640^{+702}_{-1358}$ | $-20.392^{+9.479}_{-26.123}$ |
| Alt.    | $-2 \pm 1$  | $0.44^{+0.12}_{-0.13}$ | $2383^{+118}_{-114}$ | $3694^{+565}_{-436}$   | $2.725^{+3.061}_{-1.391}$    |

$T_{\text{max}}$  = 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

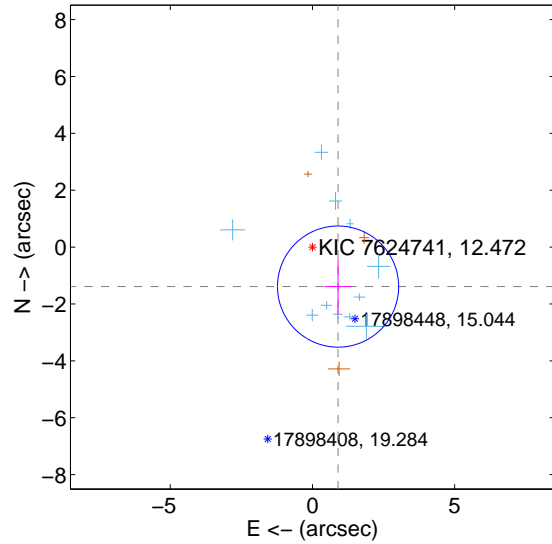
Supplemental centroid analysis for 007624741-01. Kepler magnitude: 12.47. Transit SNR 8.41

There are 11 quarters with good PRF difference image offsets

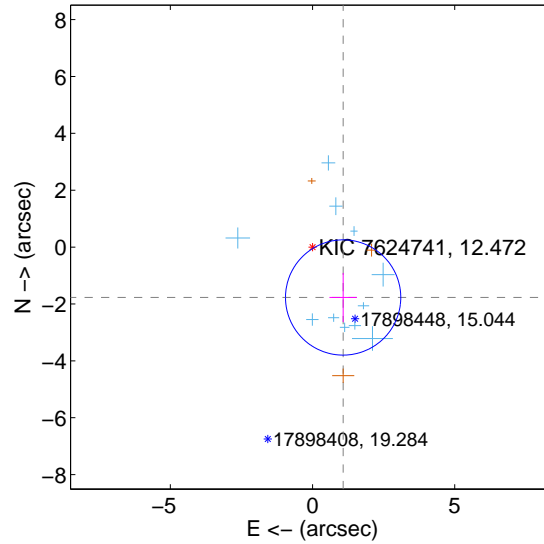
The direct PRF centroid is offset from the target star catalog position by about 0.48 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $1.655 \pm 0.710$  | 2.33                | $-0.901 \pm 0.475$ | $-1.388 \pm 0.984$ |
| PRF-fit source offset from KIC position | $2.073 \pm 0.676$  | 3.07                | $-1.076 \pm 0.484$ | $-1.772 \pm 0.865$ |
| photometric centroid source offset      | $3.80 \pm 1.10$    | 3.46                | $-2.17 \pm 1.04$   | $-3.12 \pm 1.12$   |

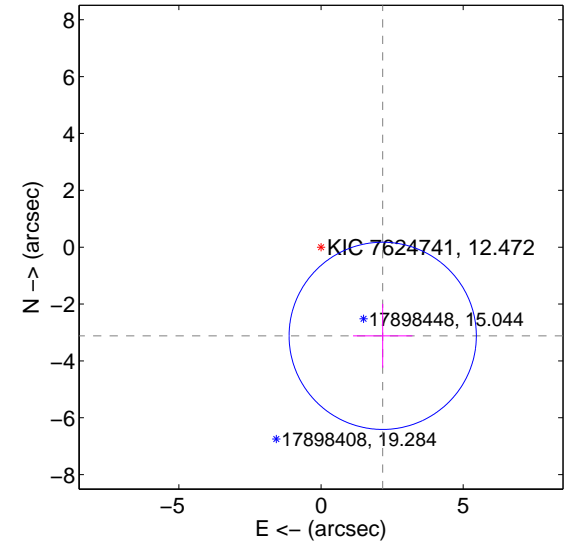
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

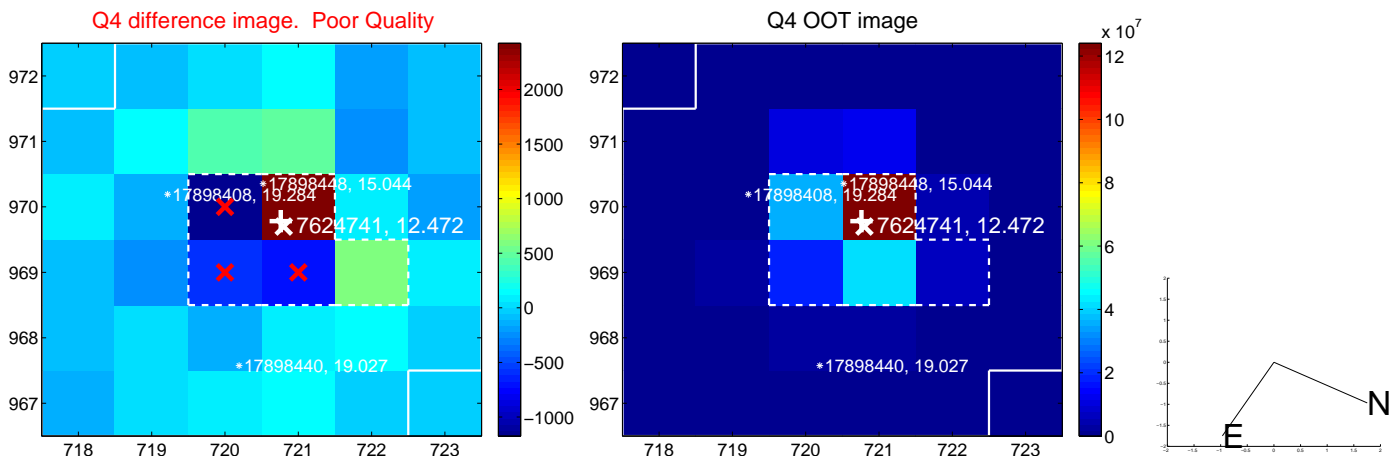
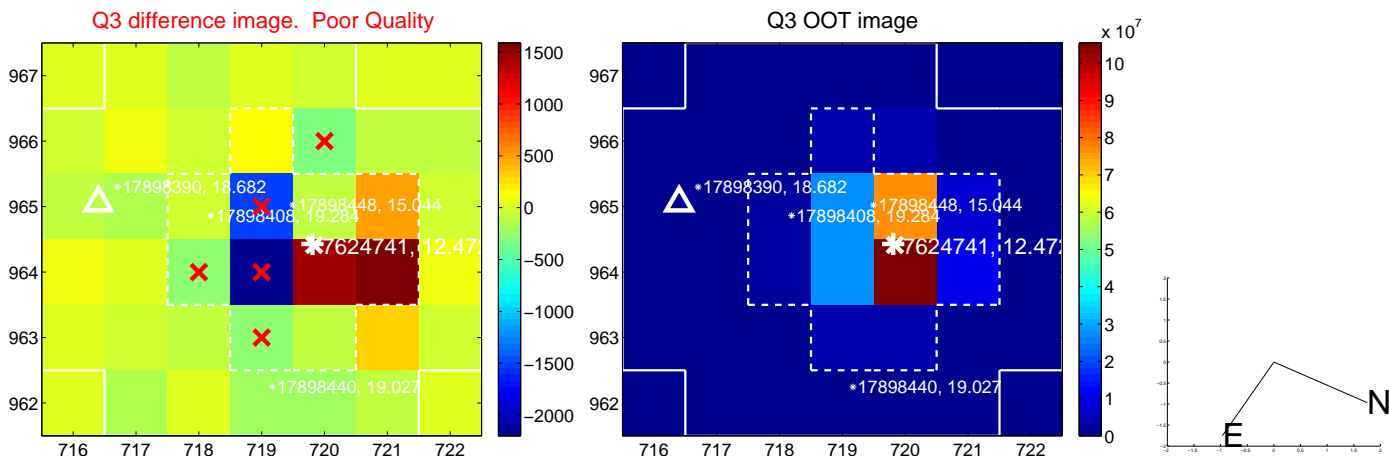
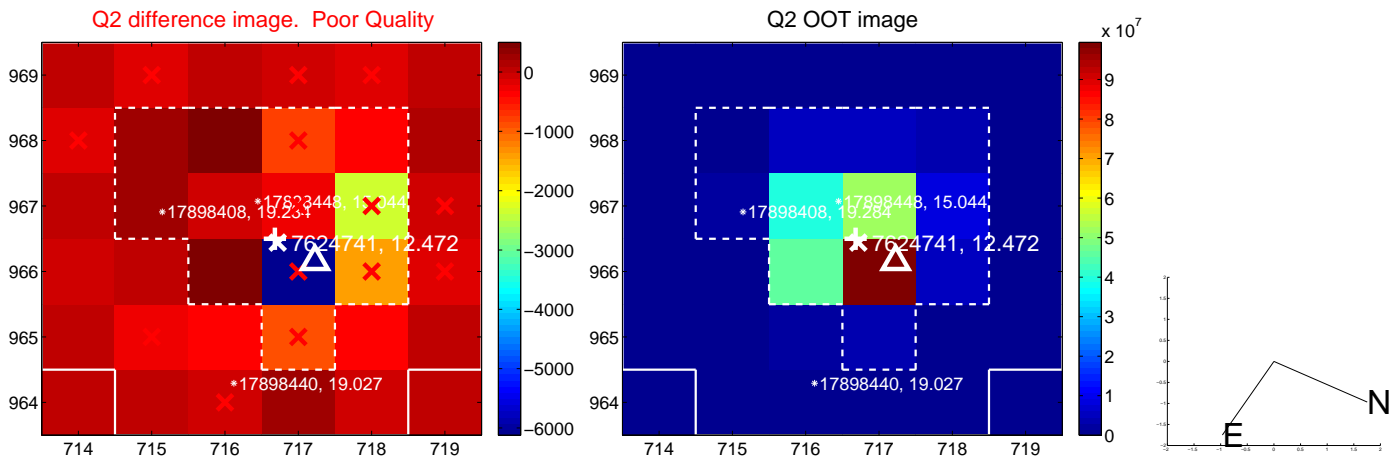
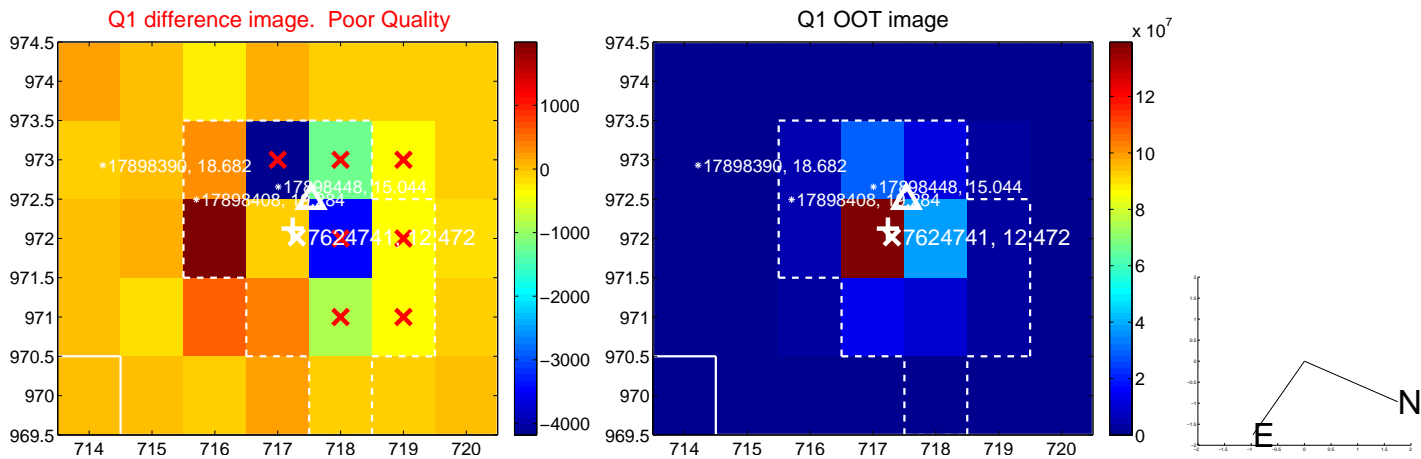


offset from photometric centroids

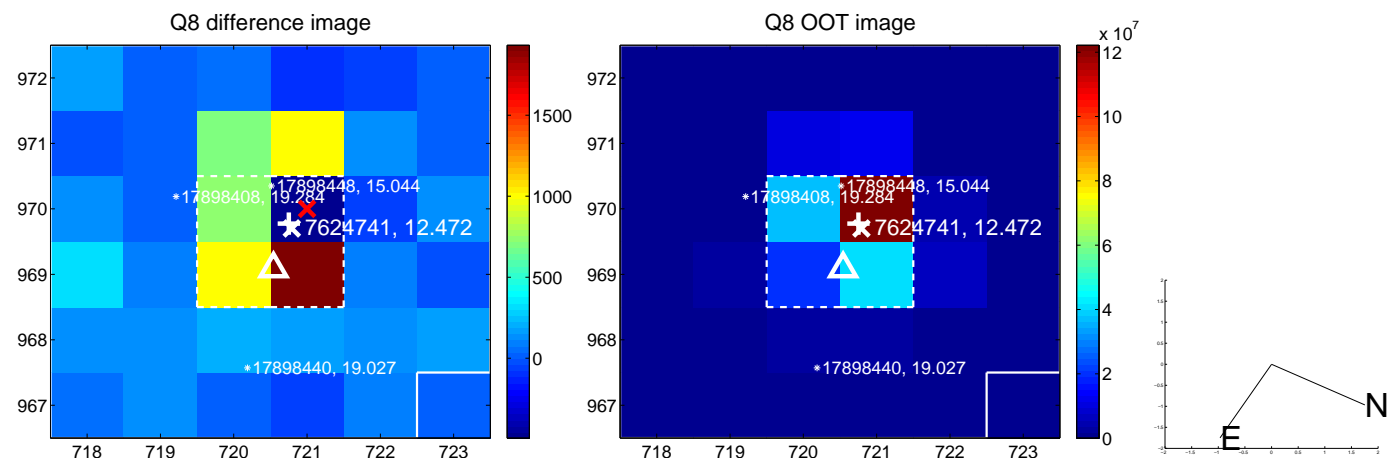
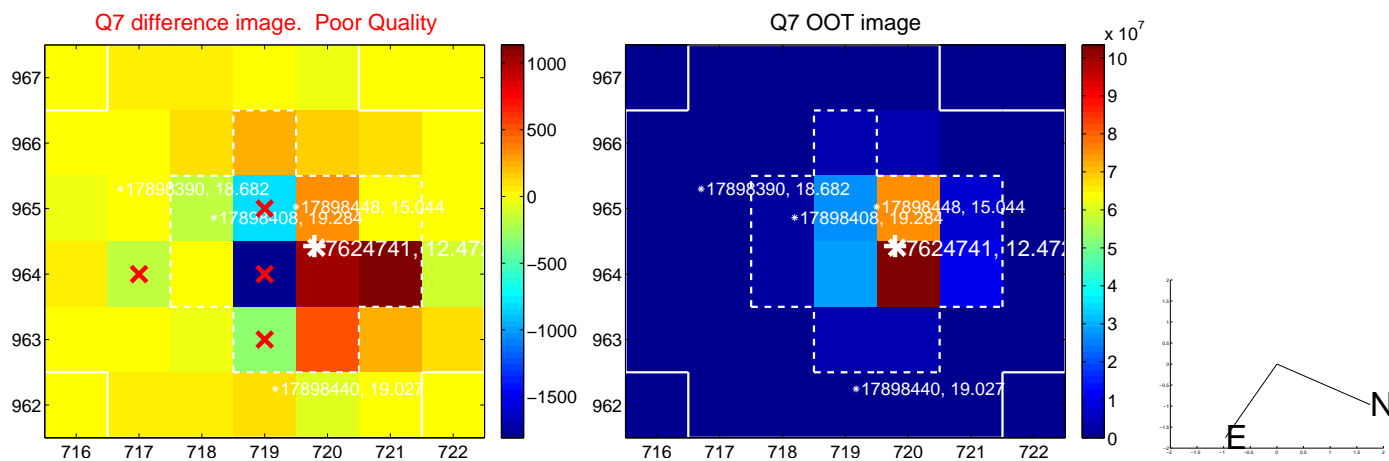
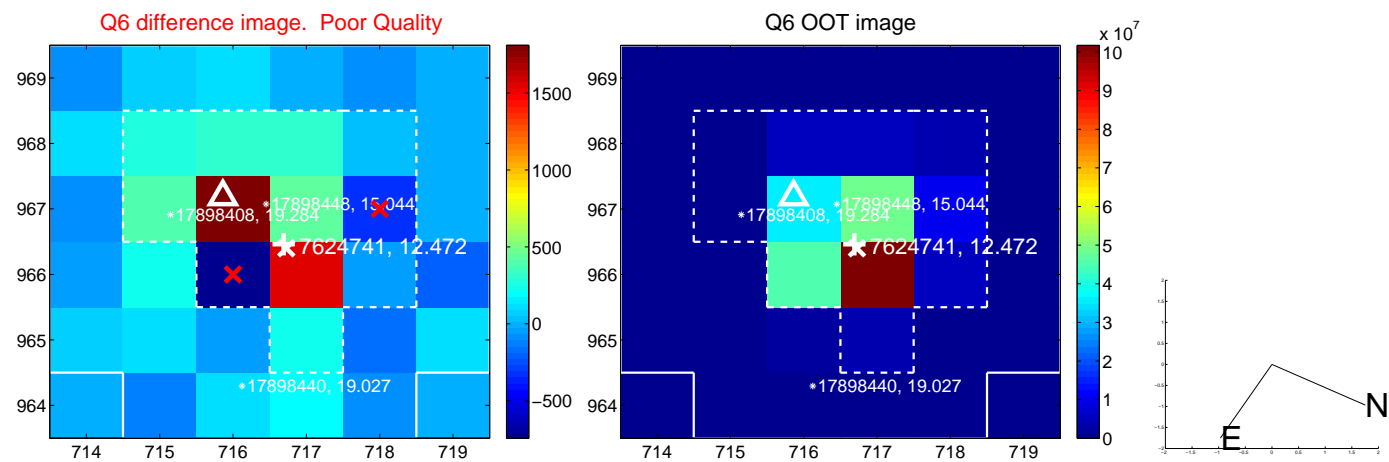
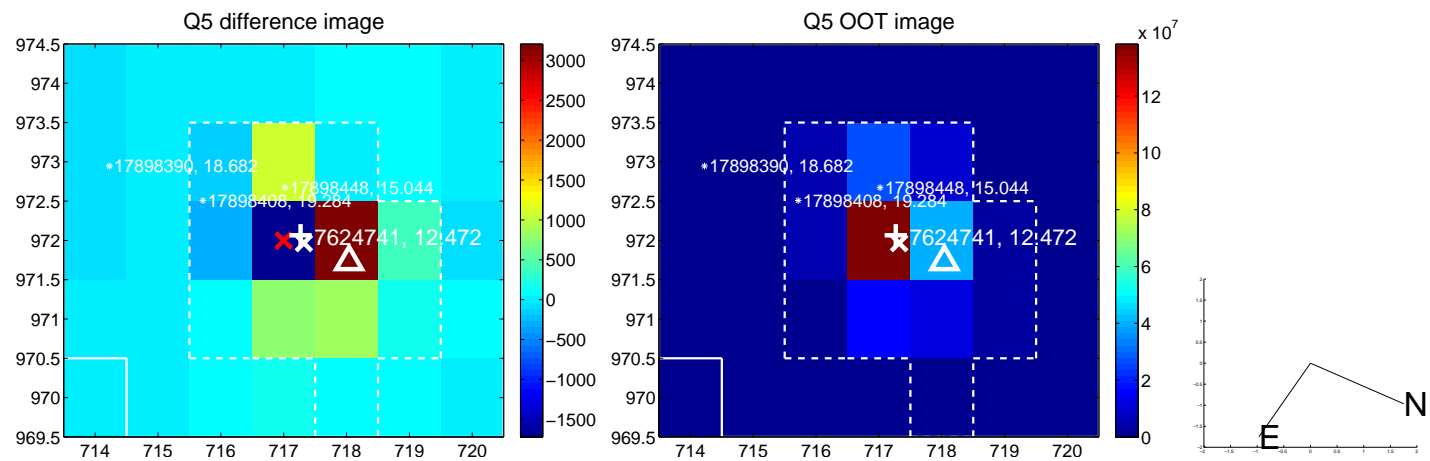


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

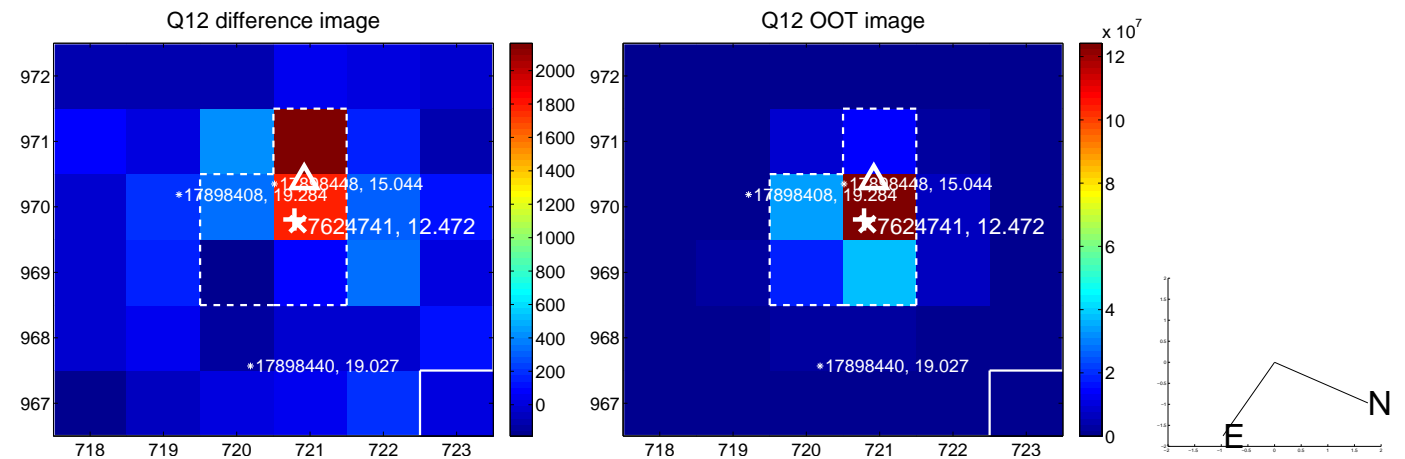
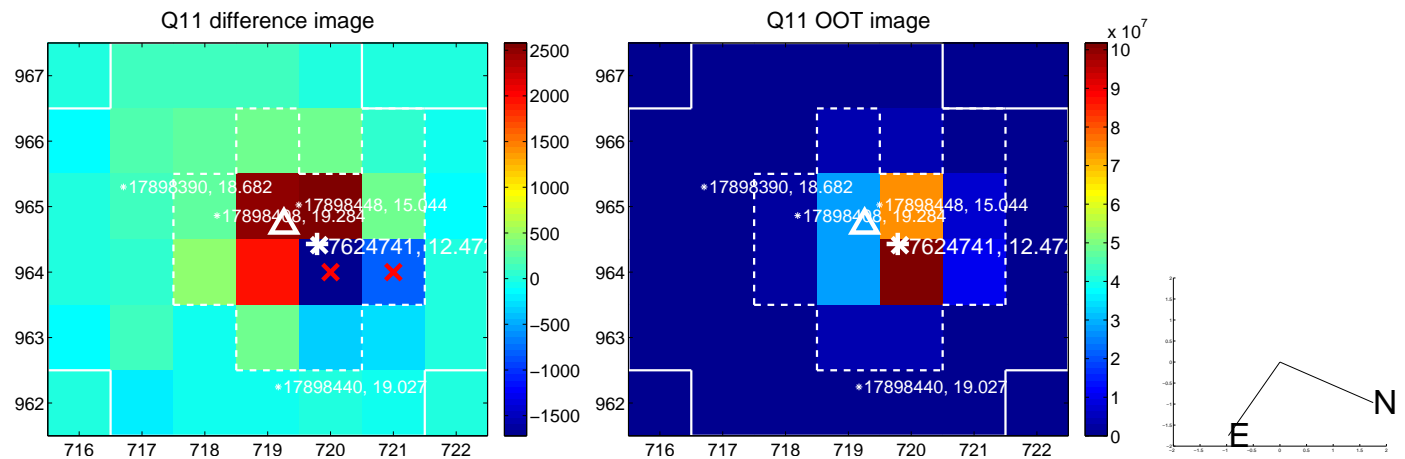
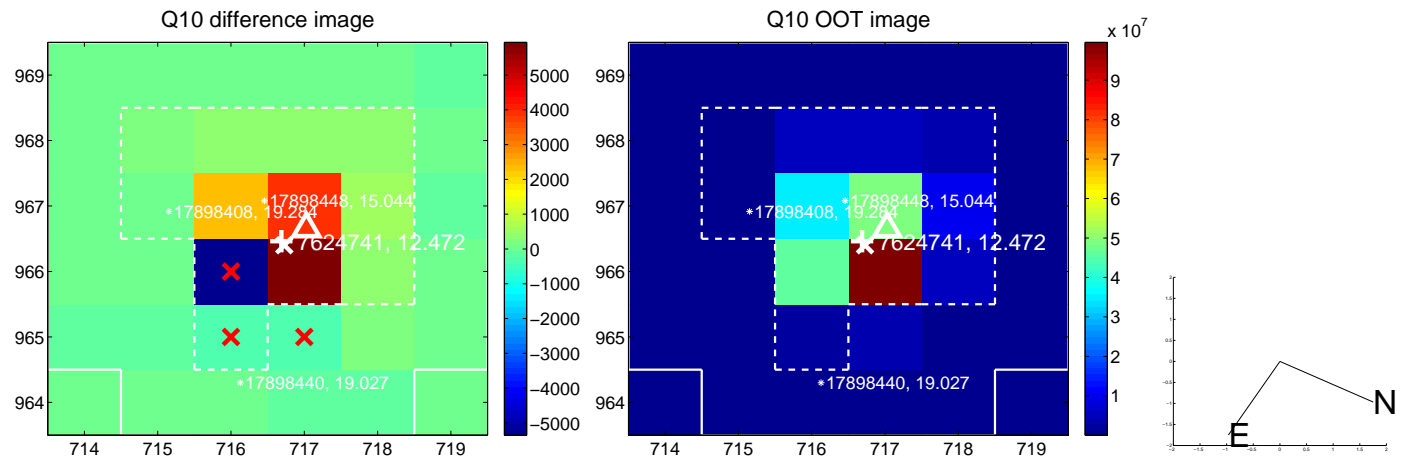
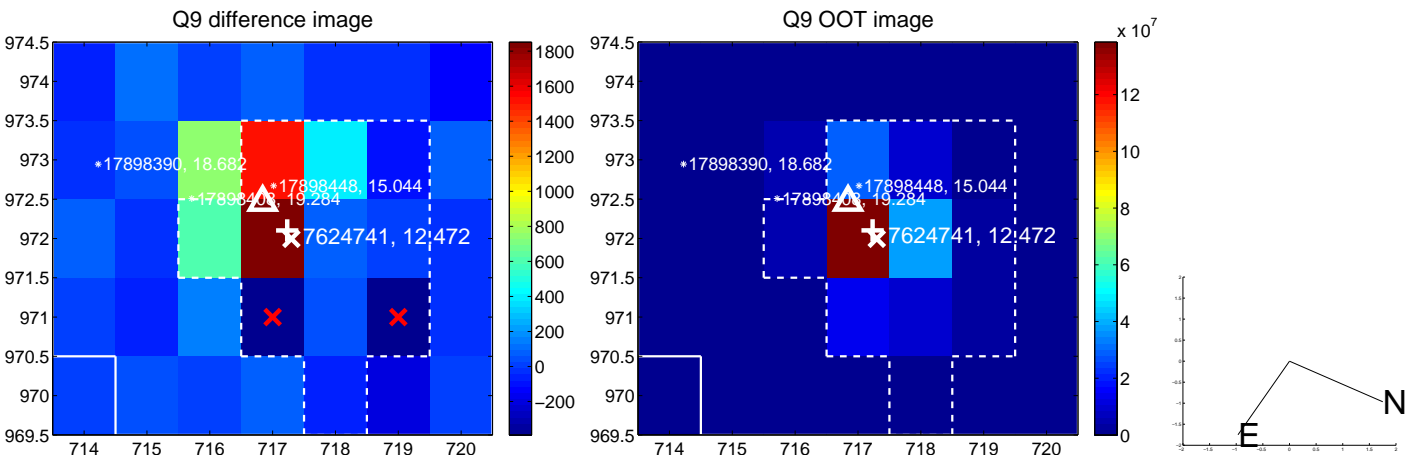


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

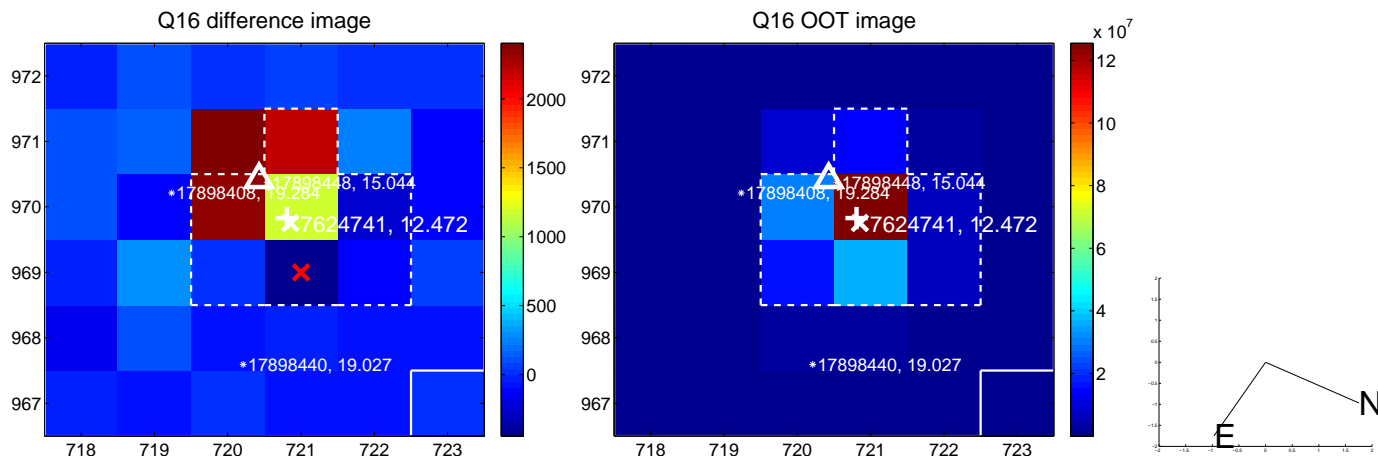
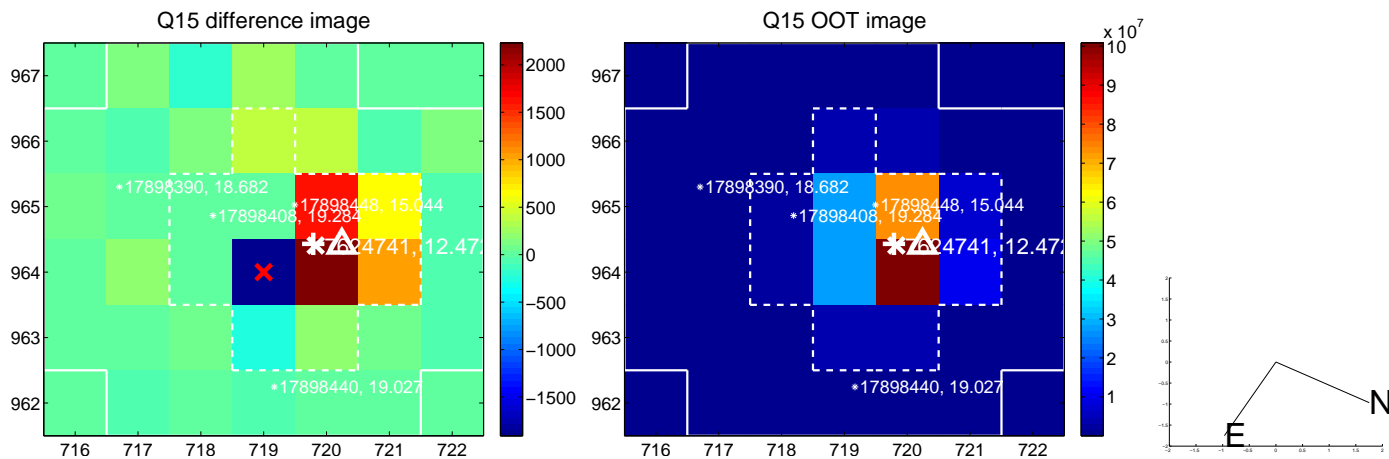
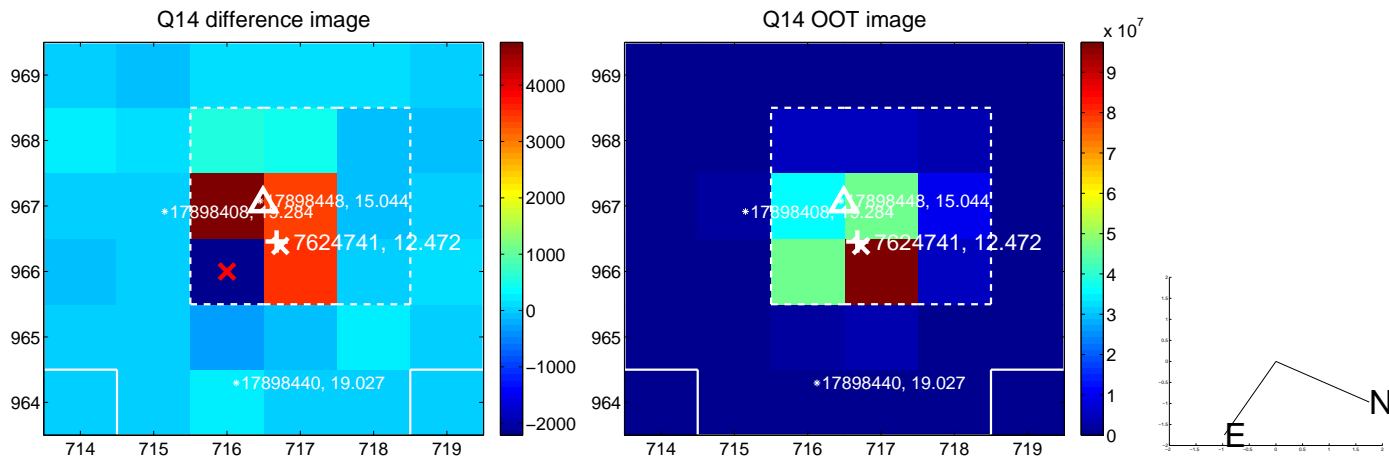
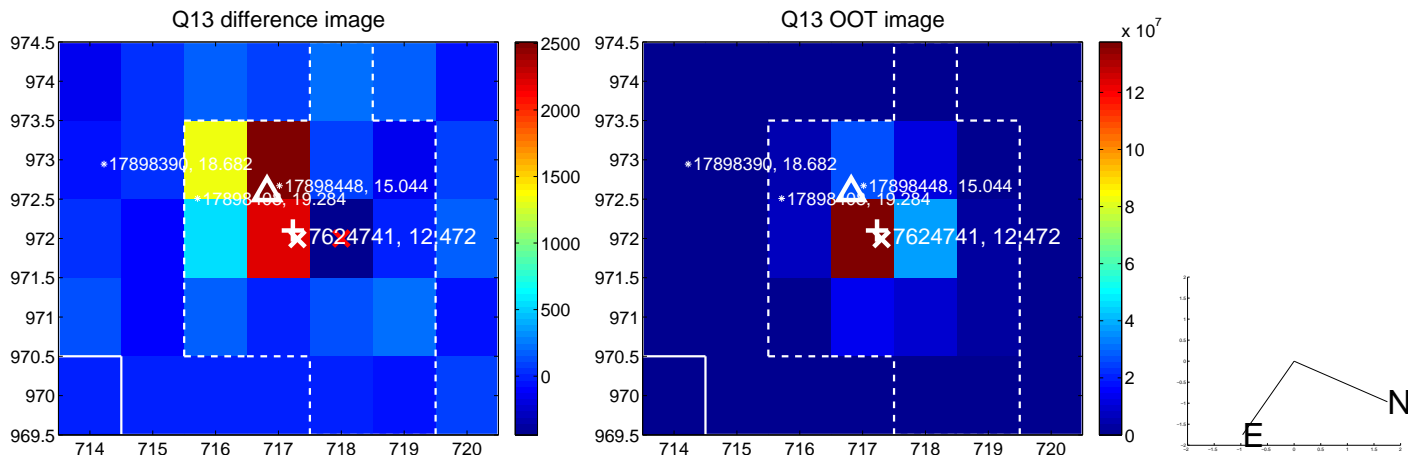




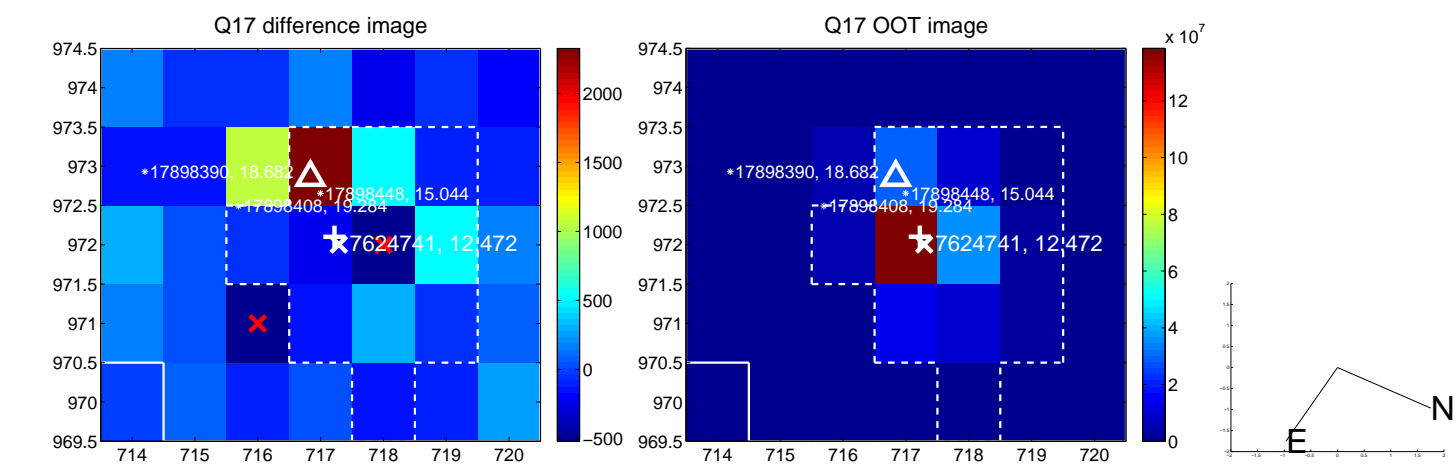
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



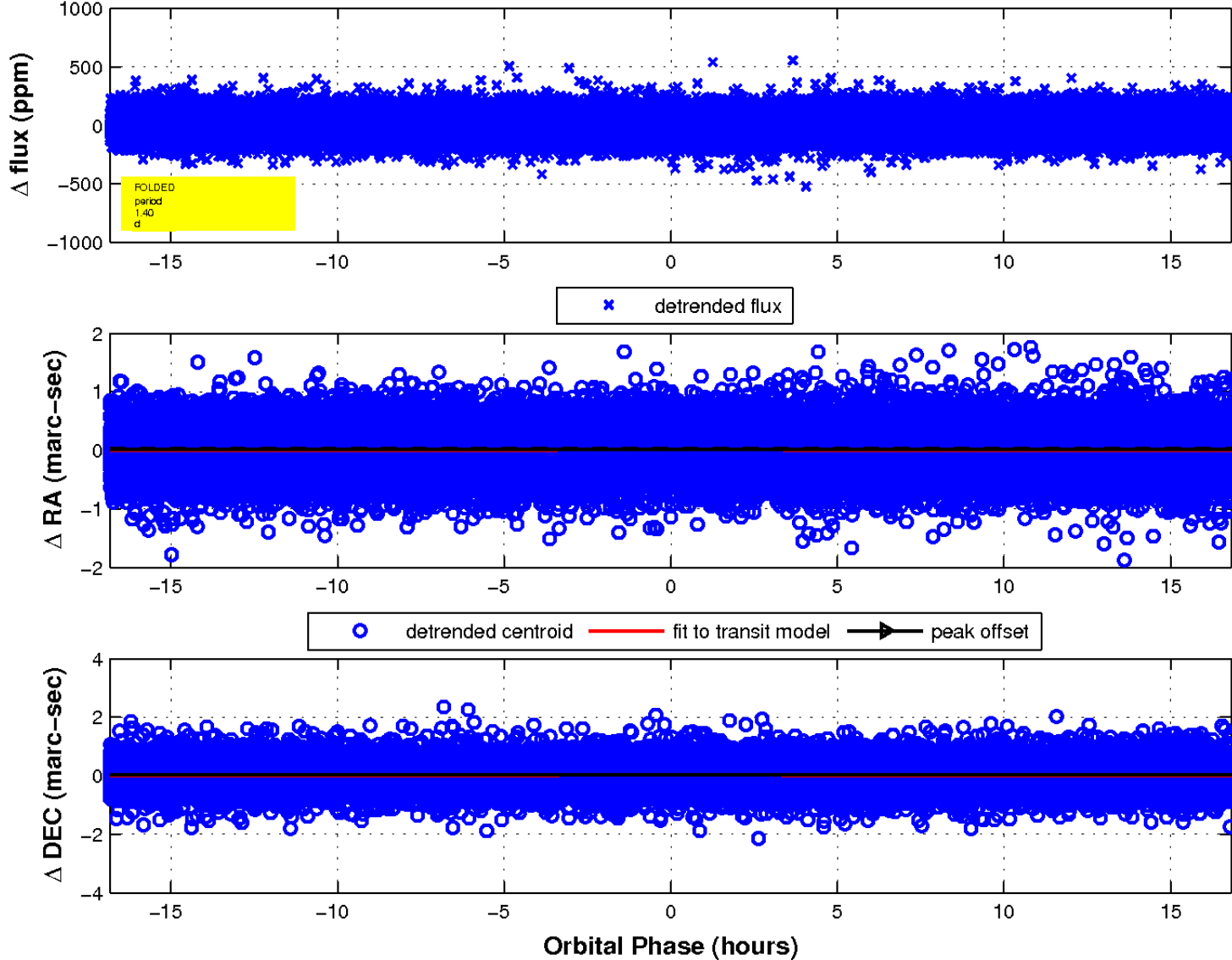
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

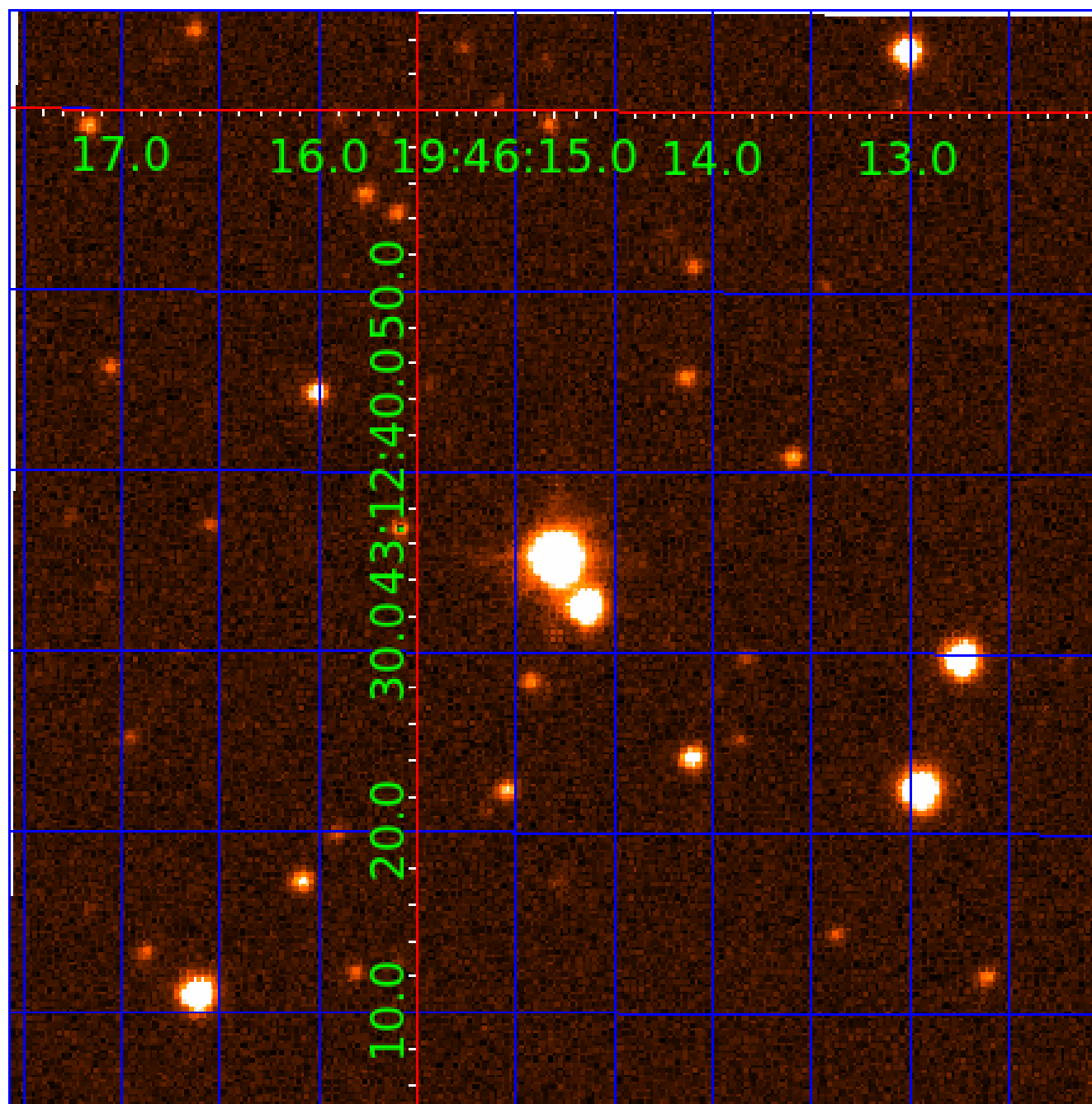


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination





# KIC 007624741

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007624741-01 | OBS      | No   | 1.402699      | 132.839748   | 9.6         | 6.989            | 8.2  | 8.4 | 0.92                        | 6170            | 0.33                   | 1943.92                |
| 007624741-02 | OBS      | No   | 96.648958     | 212.896189   | 114.2       | 13.213           | 15.5 | 8.8 | 0.92                        | 6170            | 1.10                   | 6.88                   |
| 007624741-03 | OBS      | No   | 208.799977    | 217.835866   | 102.5       | 22.397           | 11.7 | 5.4 | 0.92                        | 6170            | 1.00                   | 2.46                   |
| 007624741-04 | OBS      | No   | 159.903131    | 203.605495   | 100.1       | 14.641           | 8.7  | 6.7 | 0.92                        | 6170            | 1.04                   | 3.52                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 007624741-01 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | LPP_DV—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET   |
| 007624741-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—CENT_FEW_DIFFS   |
| 007624741-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS             |
| 007624741-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |

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

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

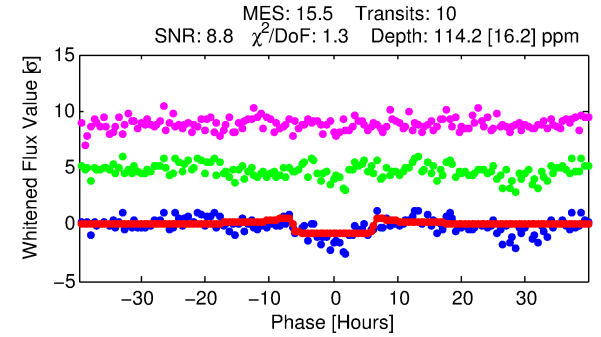
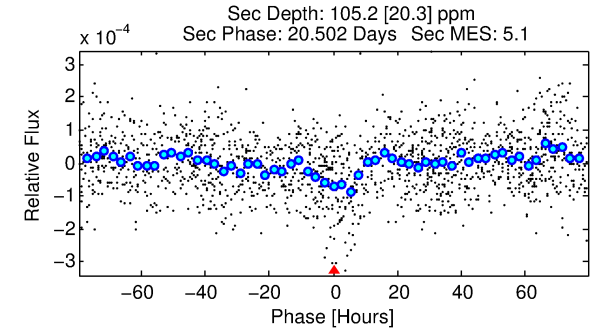
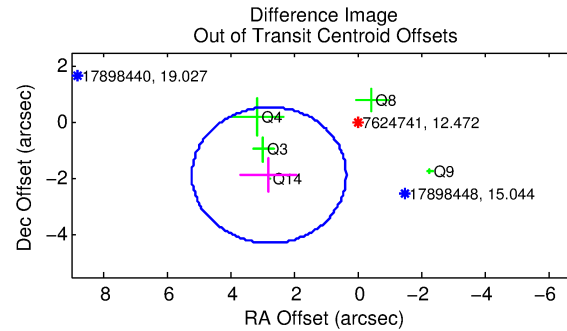
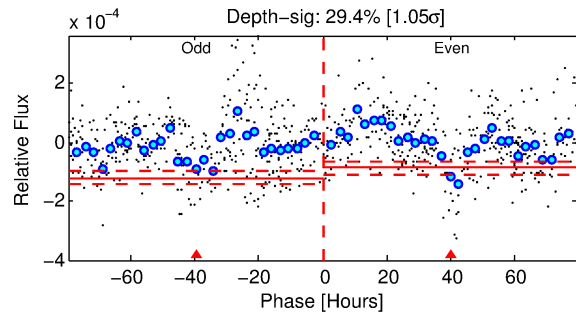
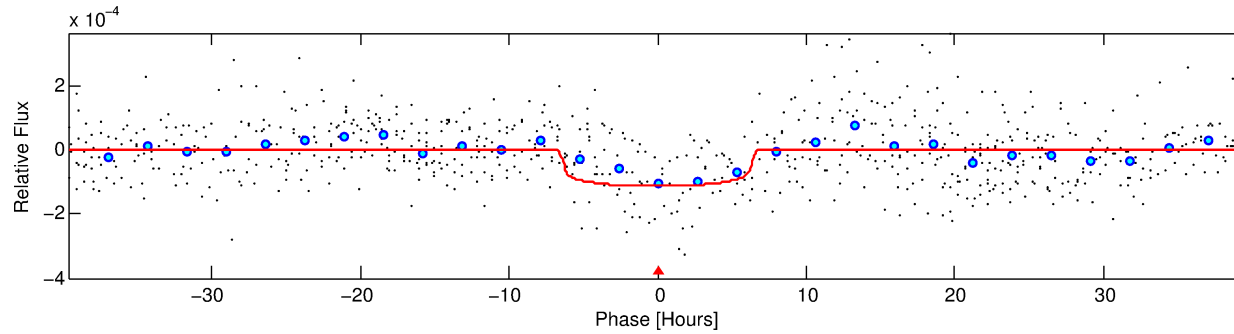
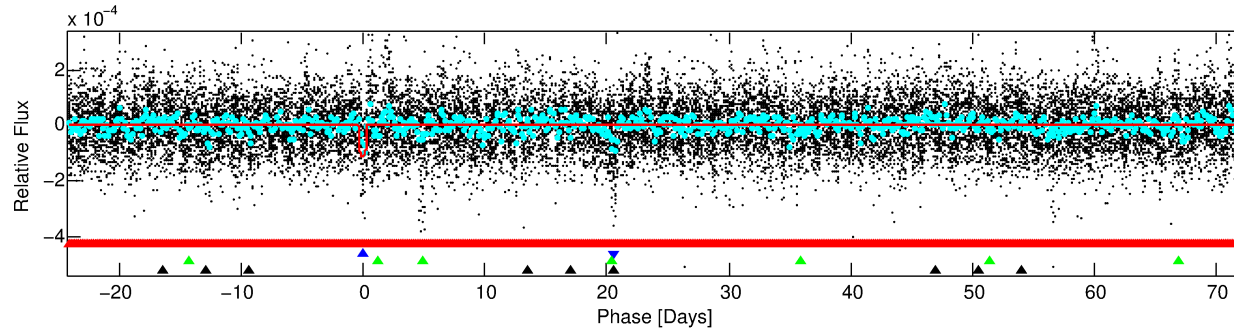
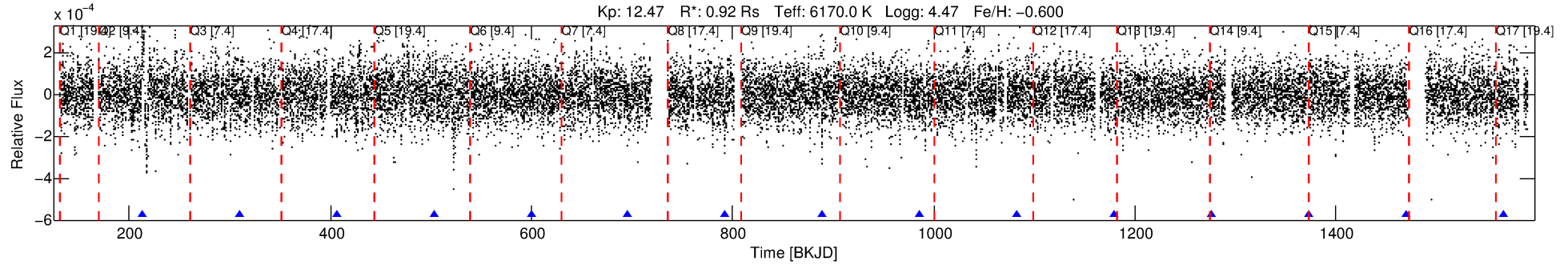
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007624741-02

No Significant Match Found

# DV One-Page Summary

KIC: 7624741 Candidate: 2 of 4 Period: 96.649 d



## DV Fit Results:

Period = 96.64896 [0.00251] d  
Epoch = 212.8962 [0.0220] BKJD  
Rp/R\* = 0.0110 [0.0023]  
a/R\* = 31.84 [33.81]  
b = 0.84 [0.38]  
Seff = 6.88 [1.83]  
Teq = 413 [27] K  
Rp = 1.10 [0.31] Re  
a = 0.3979 [0.0636] AU  
Ag = 7587.49 [3949.53] [1.92 $\sigma$ ]  
Teffp = 5960 [713] K [7.77 $\sigma$ ]

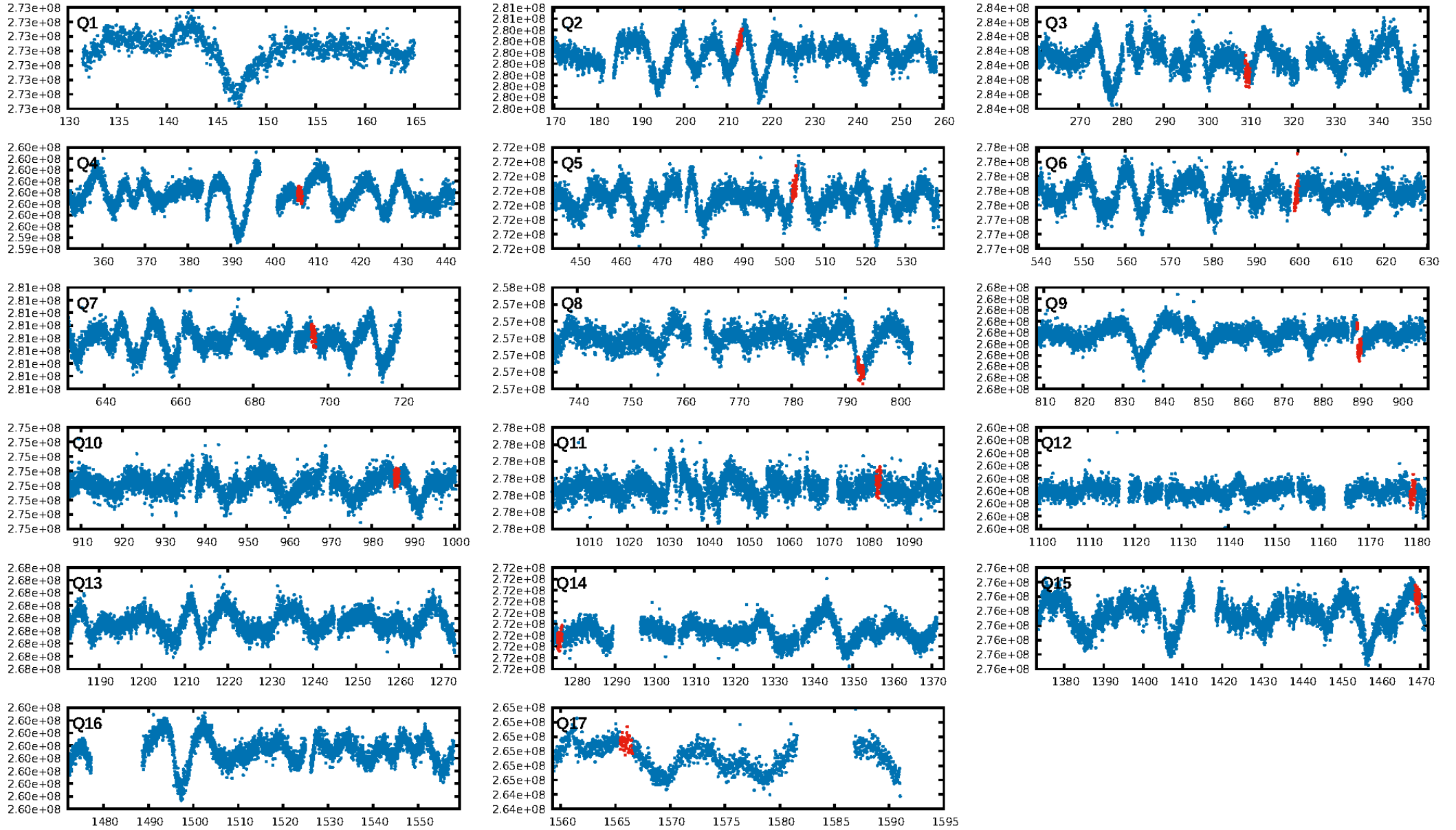
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [152.93 $\sigma$ ]  
LongPeriod-sig: 100.0% [76.98 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.26e-27  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: 2.125  
Centroid-sig: 0.1%  
Centroid-so: 1.171 arcsec [1.76 $\sigma$ ]  
OotOffset-rm: 3.348 arcsec [4.15 $\sigma$ ]  
KicOffset-rm: 3.467 arcsec [4.16 $\sigma$ ]  
OotOffset-st: 1/1/2/1 [5]  
KicOffset-st: 1/1/2/1 [5]  
DiffImageQuality-fgm: 0.60 [3/5]  
DiffImageOverlap-fno: 0.00 [0/11]

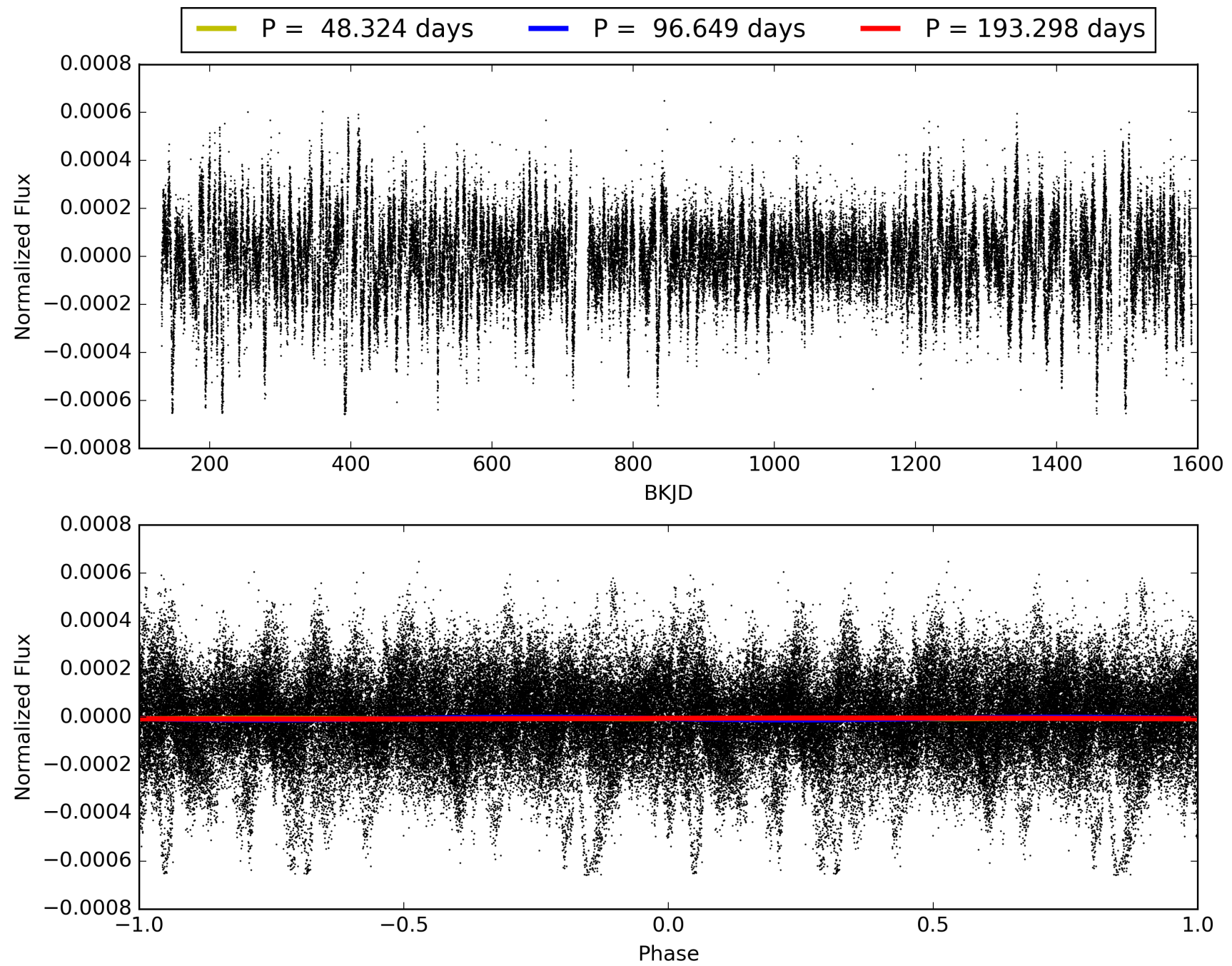
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:19:58 Z

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

# TCE 007624741-02, PDC Light Curves

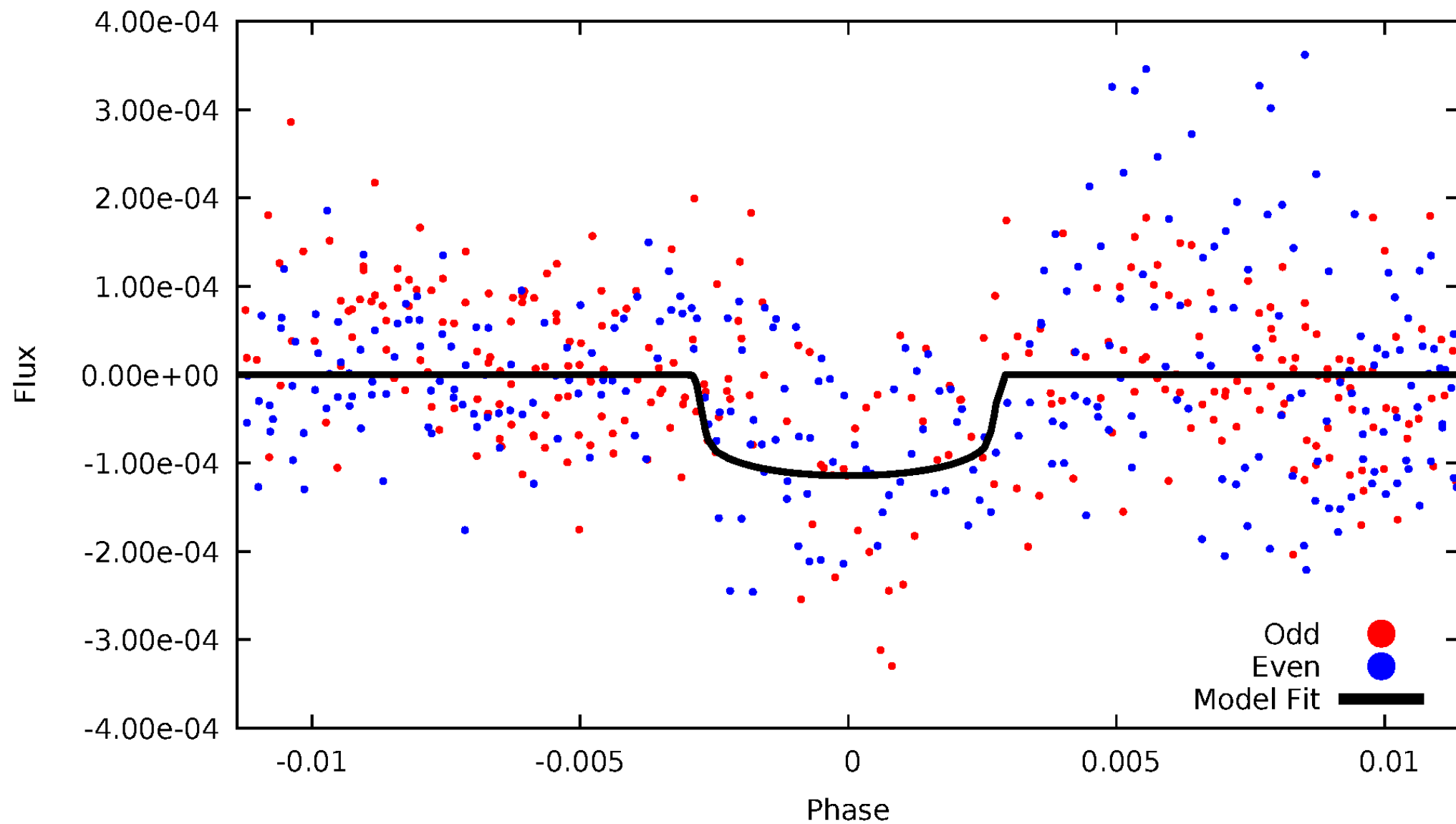


TCE 007624741-02



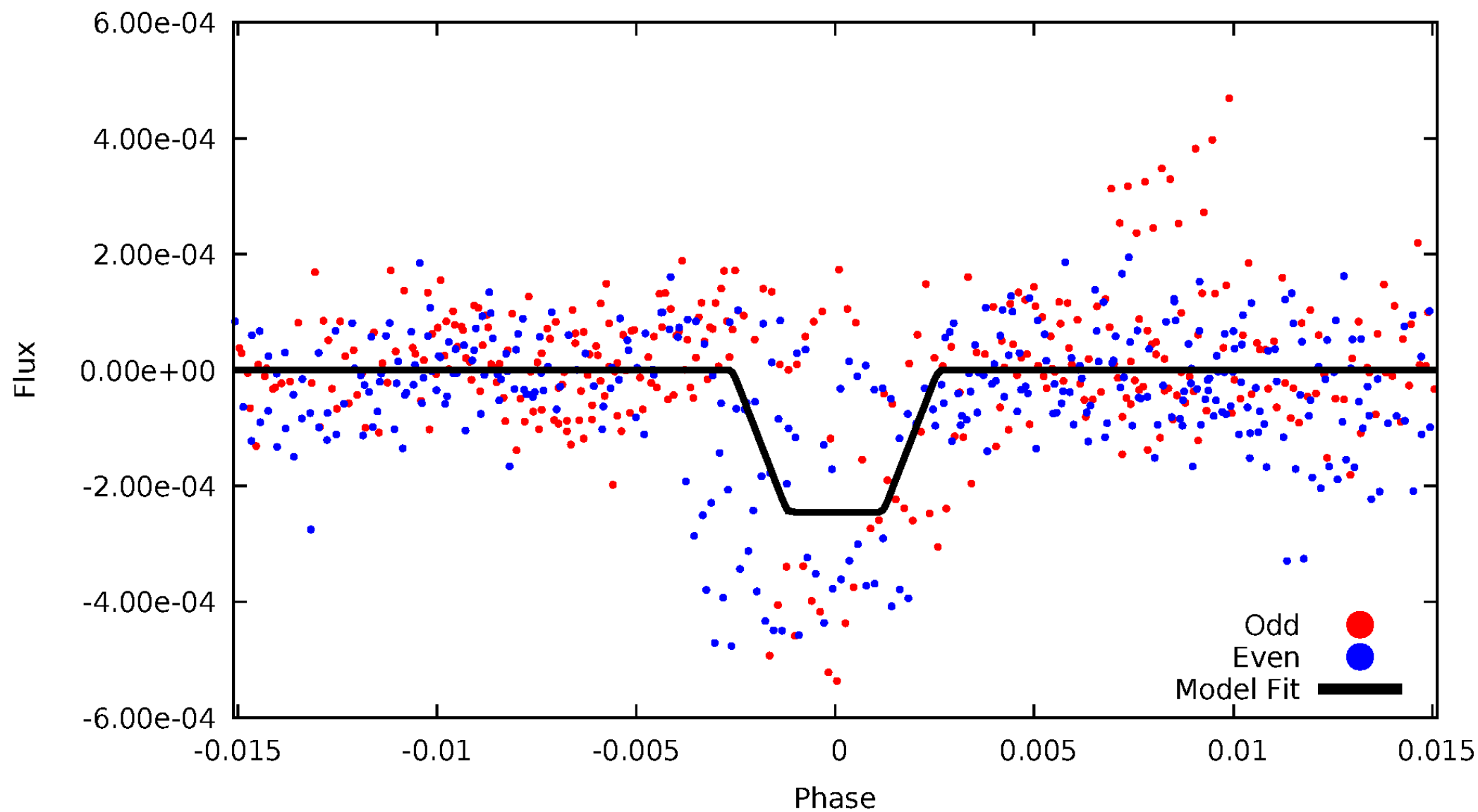
# DV Odd/Even

TCE 007624741-02



# ALT Odd/Even

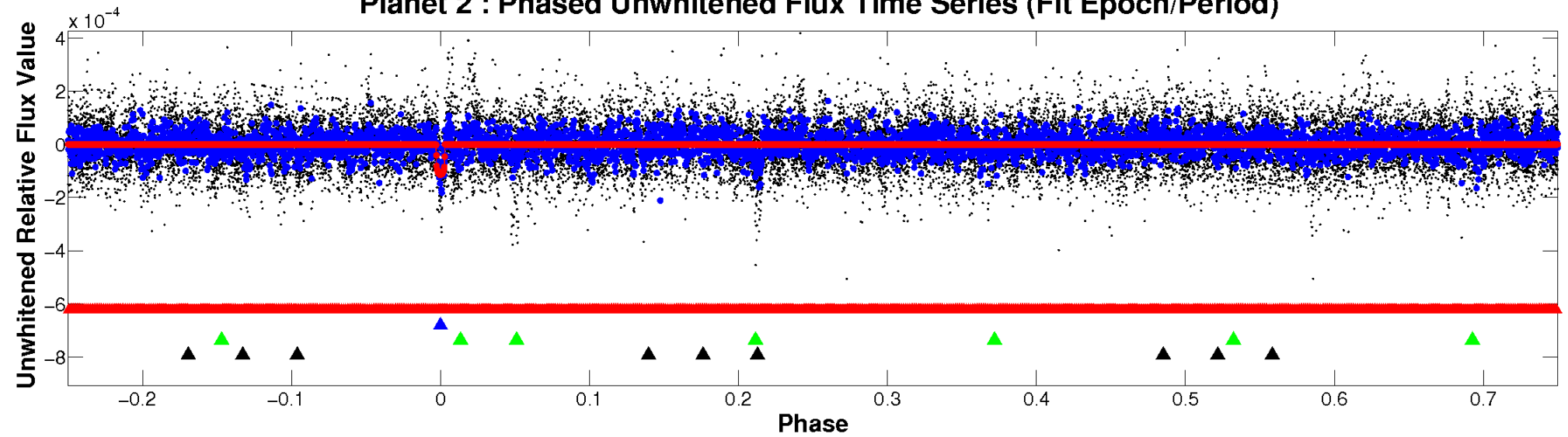
TCE 007624741-02



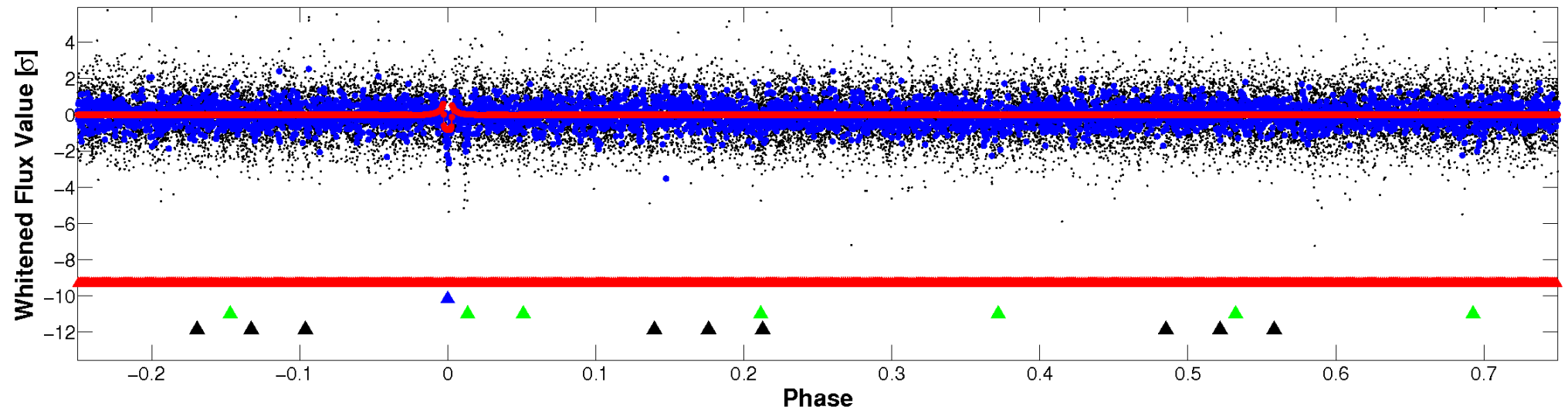


# Non-Whitened Vs. Whitened Light Curve

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



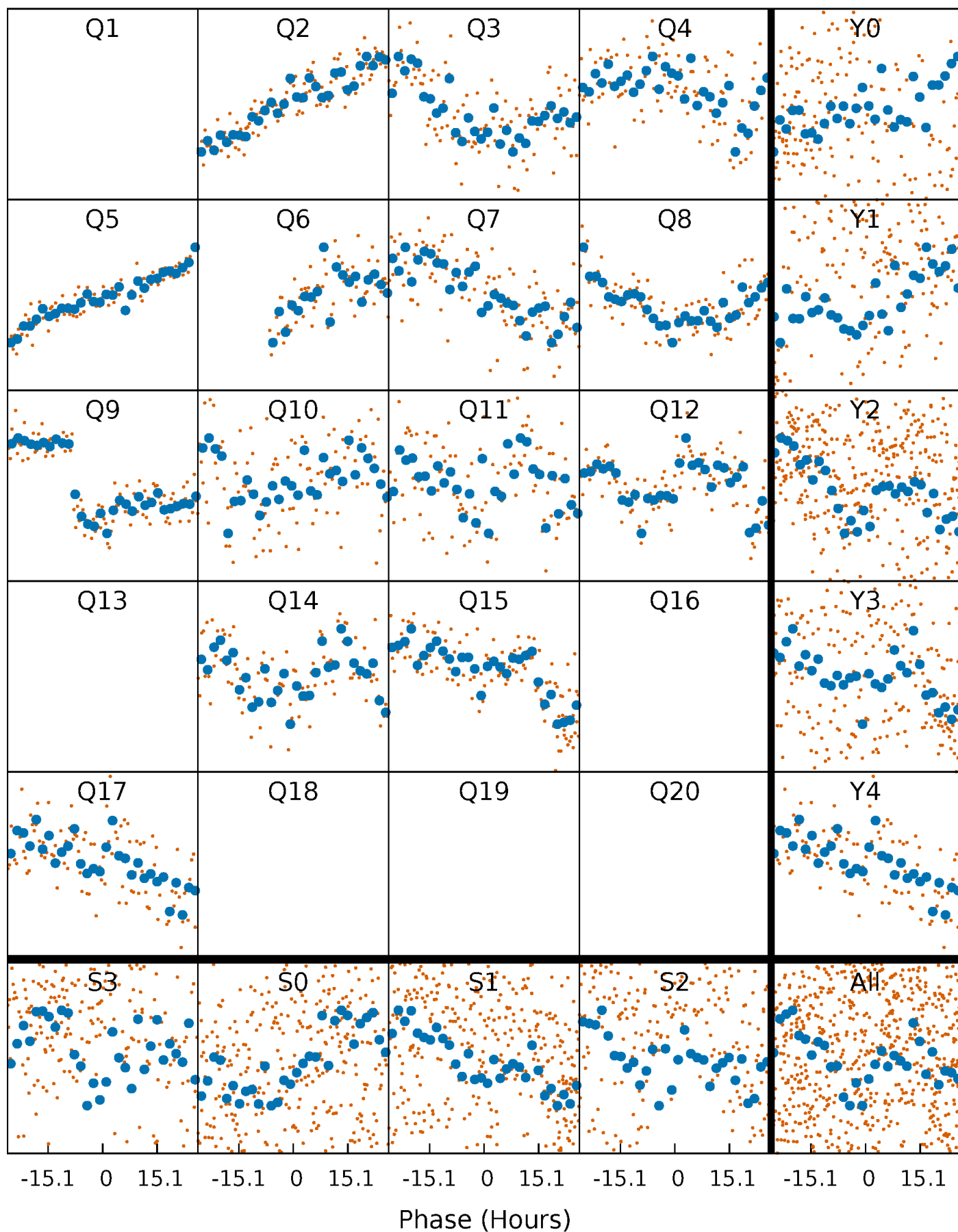
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





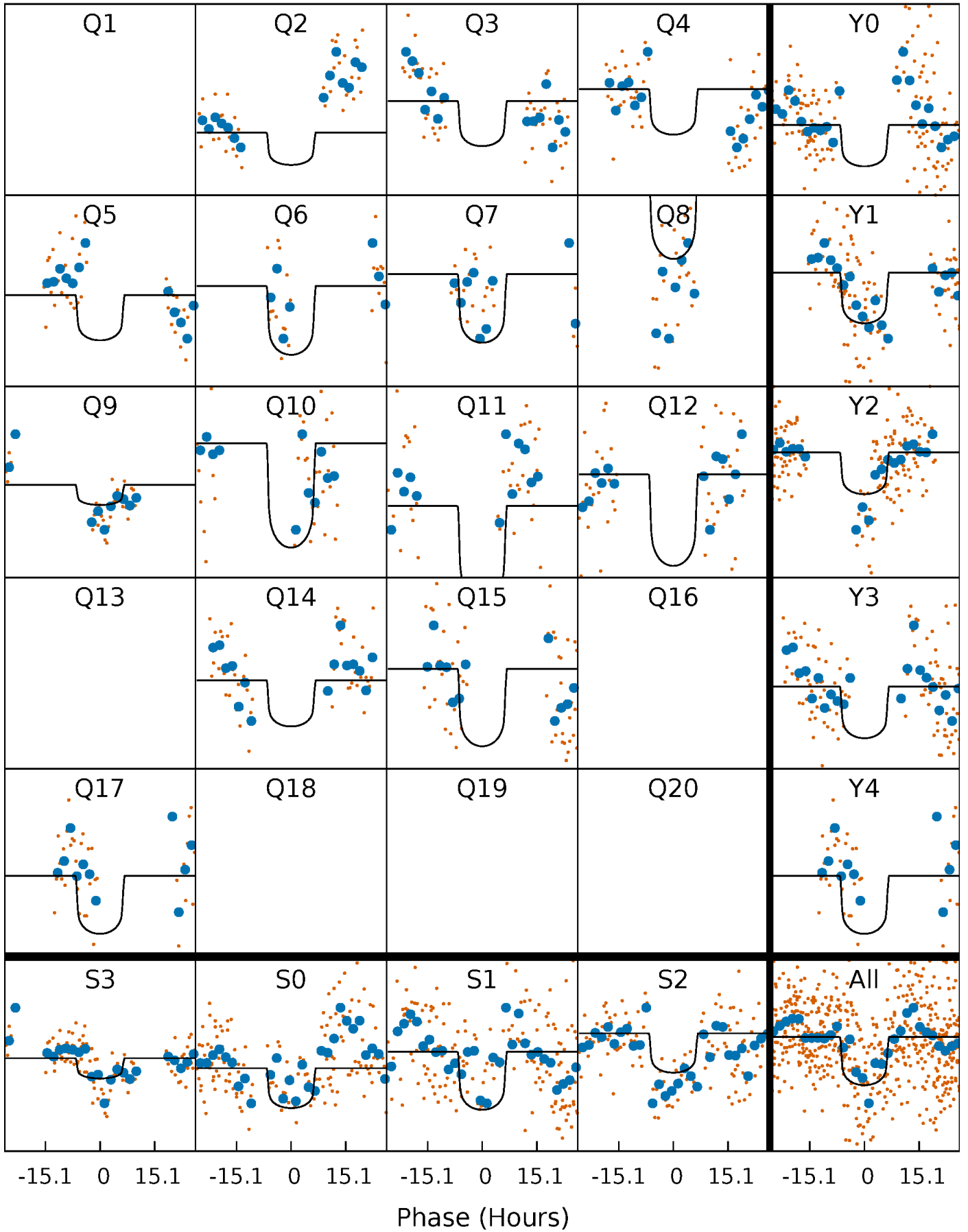
# PDC Quarter-Phased Transit Curves

TCE 007624741-02 P= 96.648958 Days  $T_0=212.896189$  (BKJD)



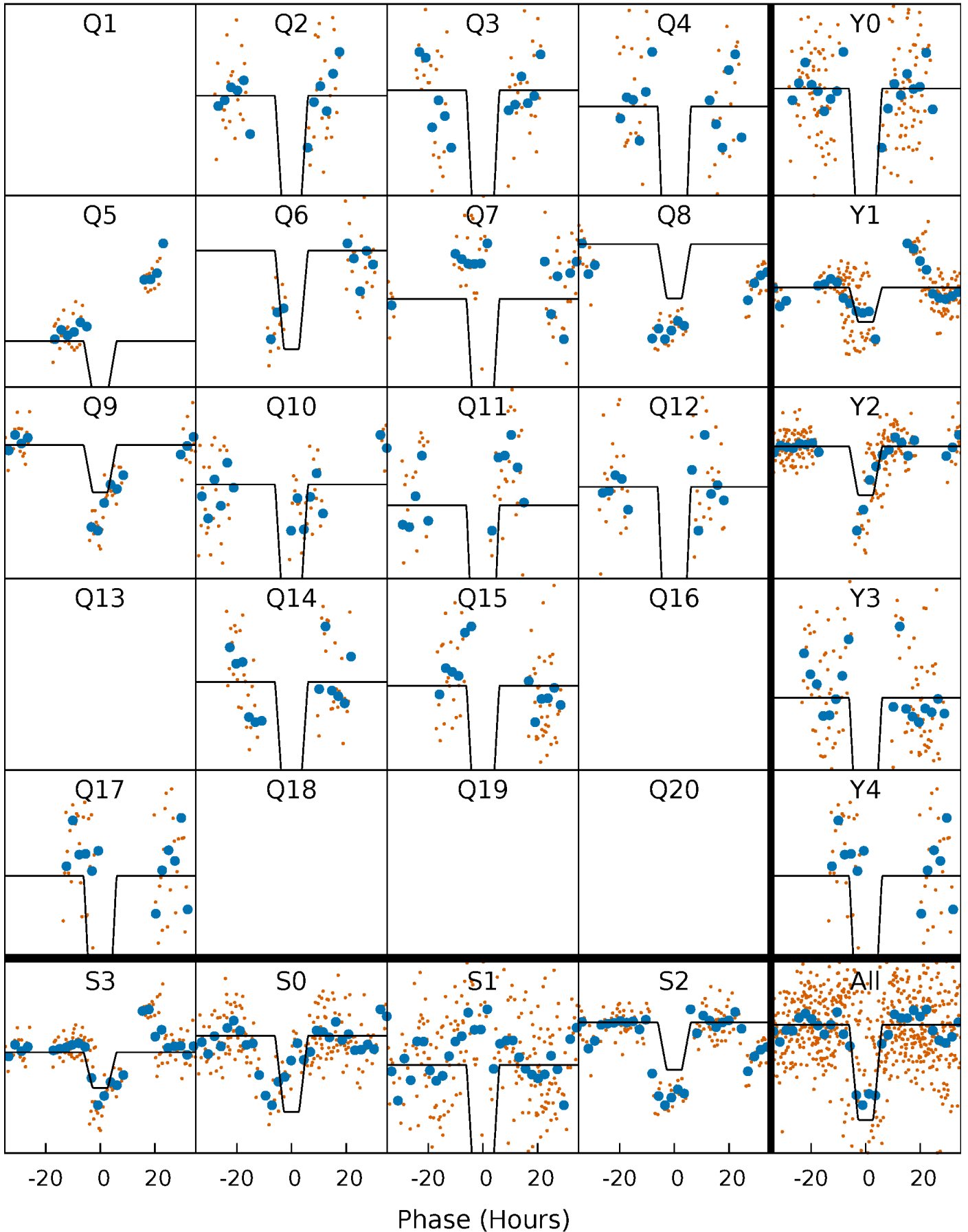
# DV Quarter-Phased Transit Curves

TCE 007624741-02 P= 96.648958 Days  $T_0=212.896189$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

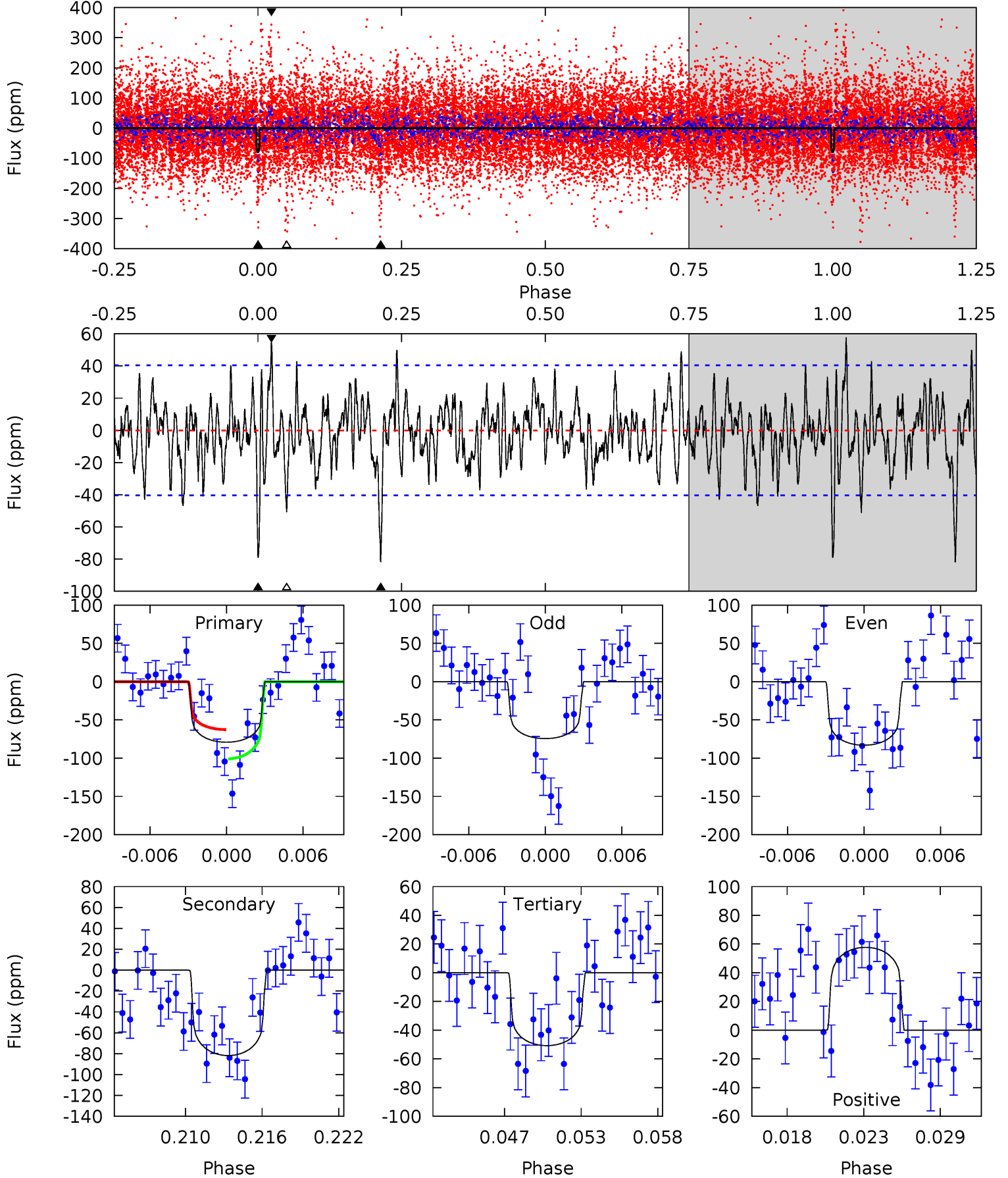
TCE 007624741-02   P= 96.643928 Days    $T_0=213.006036$  (BKJD)



# DV Model-Shift Uniqueness Test

007624741-02, P = 96.648958 Days, E = 116.247231 Days

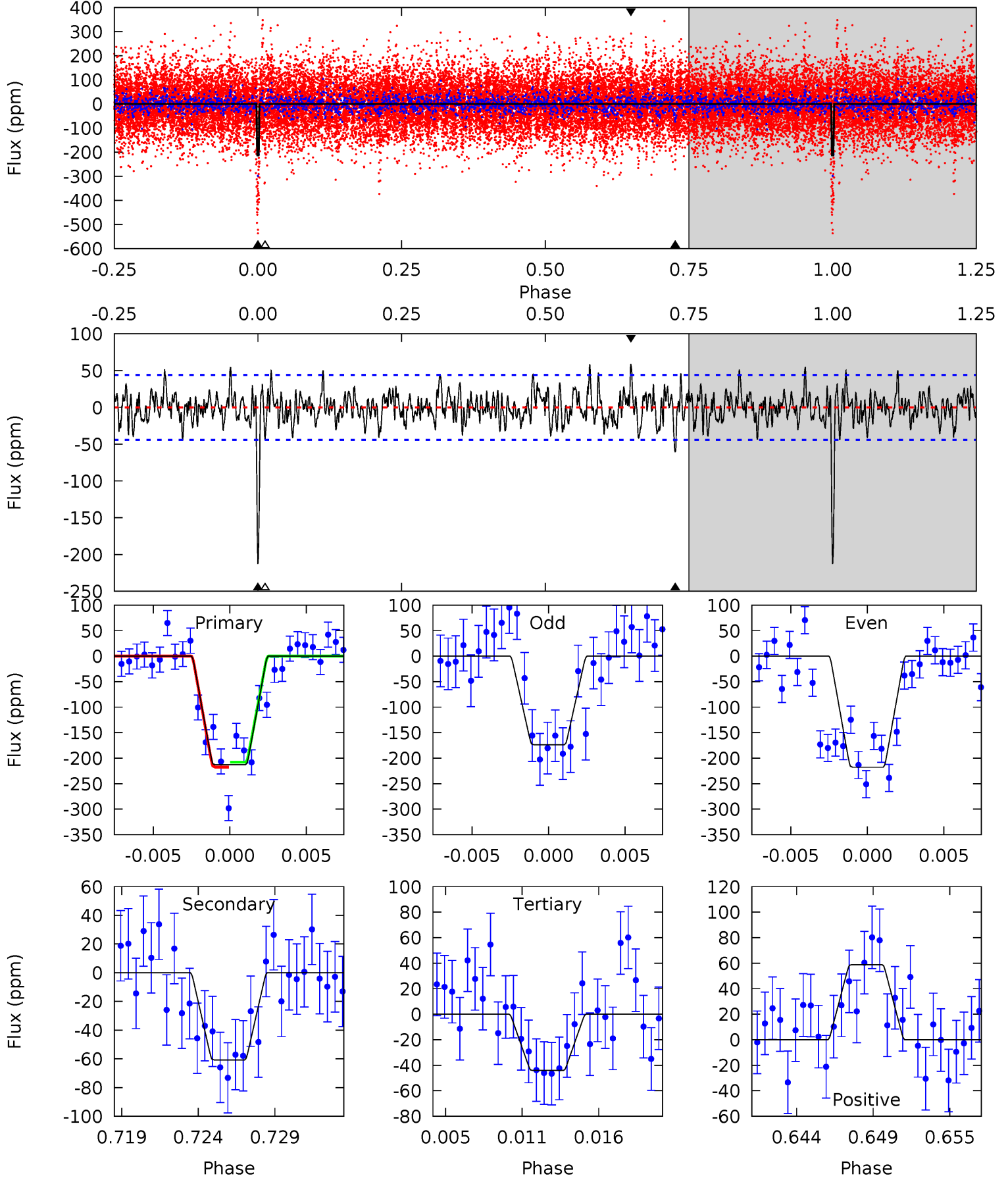
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.0 | 10.4 | 6.44 | 7.32 | 5.13            | 2.76            | 2.06             | 3.61    | 2.73    | 3.94    | 3.06    | 0.55    | 1.32 | 0.41  | 2.39 |



# Alt Model-Shift Uniqueness Test

007624741-02, P = 96.643928 Days, E = 116.362108 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 24.8 | 7.07 | 5.14 | 6.85 | 5.15            | 2.79            | 1.96             | 19.7    | 17.9    | 1.93    | 0.21    | 2.58    | 1.23 | 0.22  | 0.55 |



### Stellar Parameters For KIC 007624741

|        | $T_{\text{eff}} (K)$ | $\log(g)$                 | $[\text{Fe}/\text{H}]$     | $R (R_{\odot})$           | $M (M_{\odot})$           | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6170^{+168}_{-186}$ | $4.468^{+0.077}_{-0.132}$ | $-0.600^{+0.300}_{-0.300}$ | $0.916^{+0.170}_{-0.099}$ | $0.898^{+0.095}_{-0.095}$ | $1.645^{+0.607}_{-0.619}$                 |
|        | +3%/-3%              | +2%/-3%                   | +50%/-50%                  | +19%/-11%                 | +11%/-11%                 | +37%/-38%                                 |
| Source | PHO1                 | FLK73                     | 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 007624741-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | $A_{\text{obs}}$       |
|---------|-------------|------------------------|----------------------|----------------------|------------------------|
| DV      | $-82 \pm 8$ | $1.11^{+0.27}_{-0.26}$ | $581^{+30}_{-26}$    | $5588^{+770}_{-492}$ | $5707^{+3906}_{-2024}$ |
| Alt.    | $-61 \pm 9$ | $1.58^{+0.28}_{-0.26}$ | $582^{+29}_{-26}$    | $4520^{+366}_{-264}$ | $2031^{+1082}_{-580}$  |

$T_{\text{max}}$  = 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

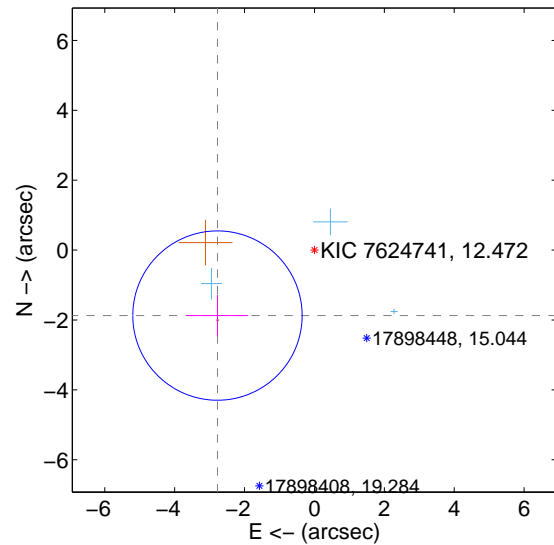
Supplemental centroid analysis for 007624741-02. Kepler magnitude: 12.47. Transit SNR 8.77

There are 3 quarters with good PRF difference image offsets

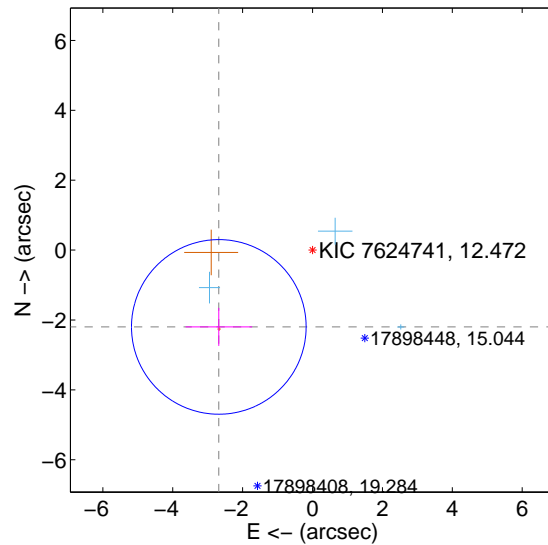
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $3.348 \pm 0.808$  | 4.15                | $2.775 \pm 0.880$ | $-1.874 \pm 0.588$ |
| PRF-fit source offset from KIC position | $3.467 \pm 0.833$  | 4.16                | $2.681 \pm 0.952$ | $-2.198 \pm 0.544$ |
| photometric centroid source offset      | $1.17 \pm 0.66$    | 1.76                | $-0.73 \pm 0.66$  | $0.91 \pm 0.66$    |

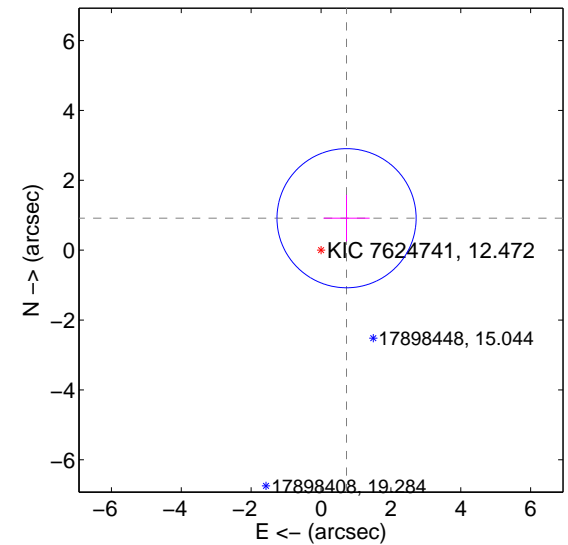
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



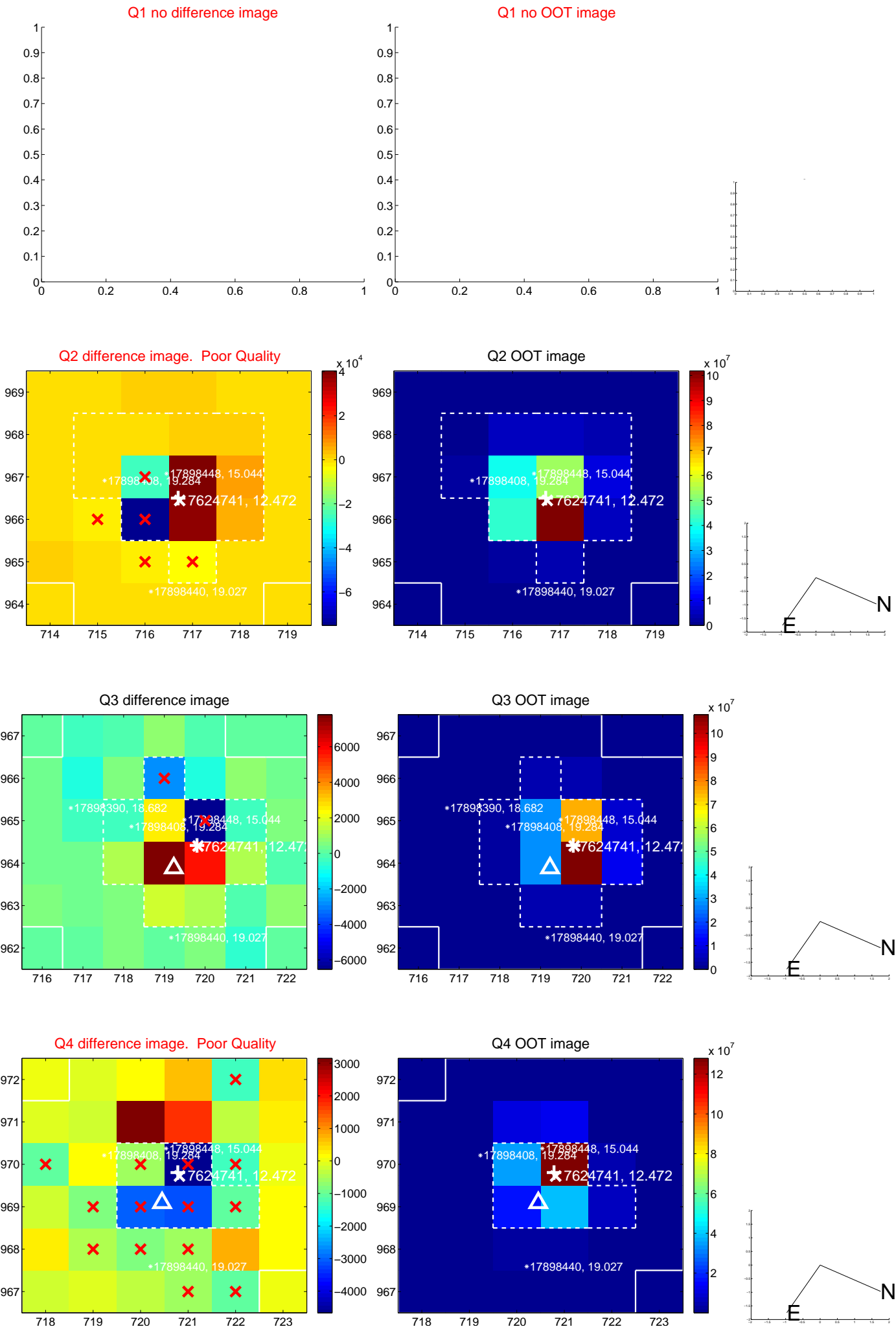
offset from photometric centroids



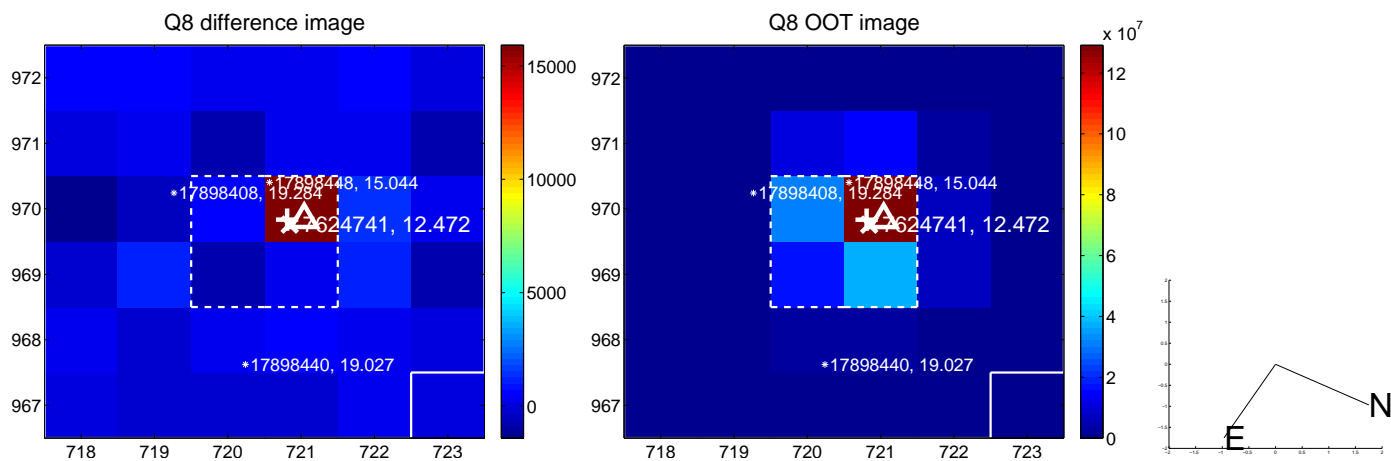
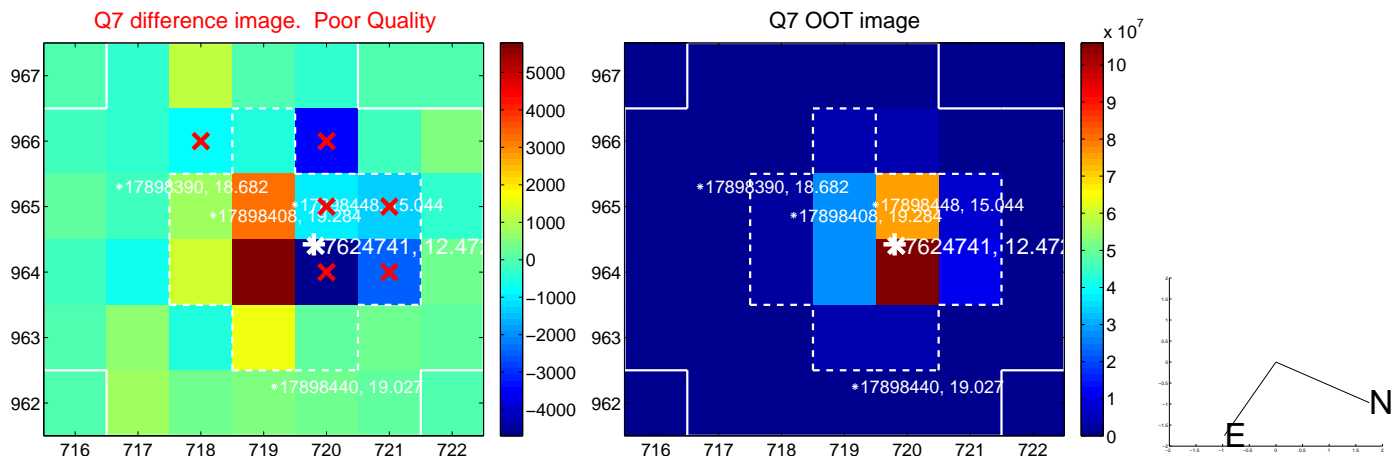
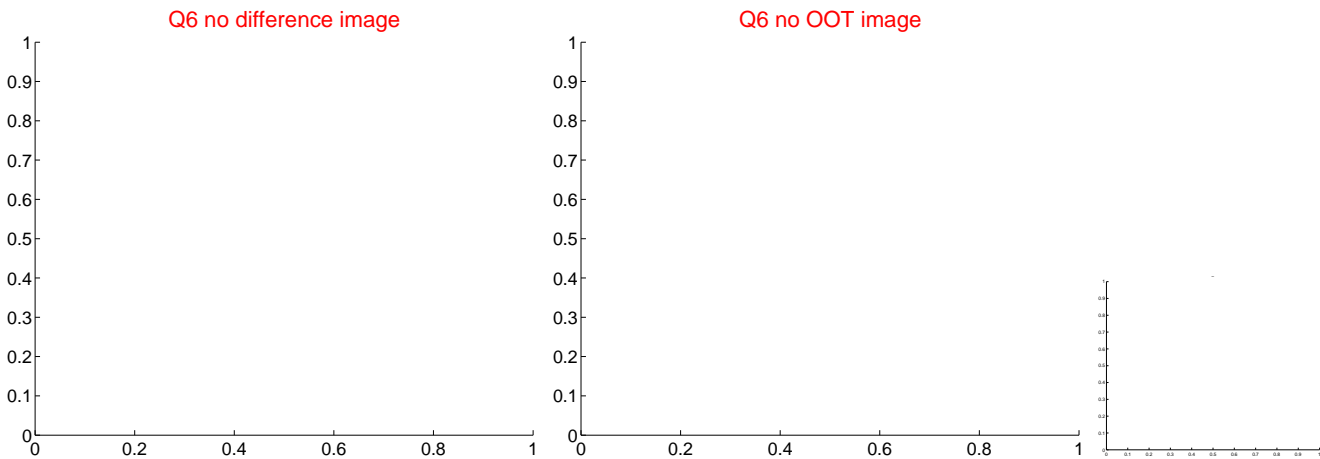
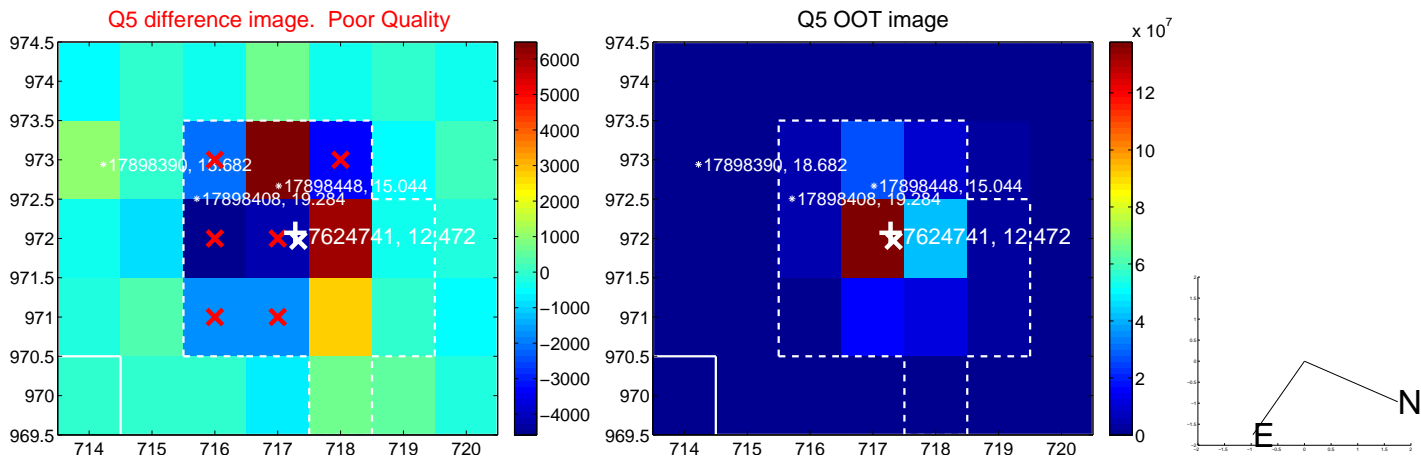
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



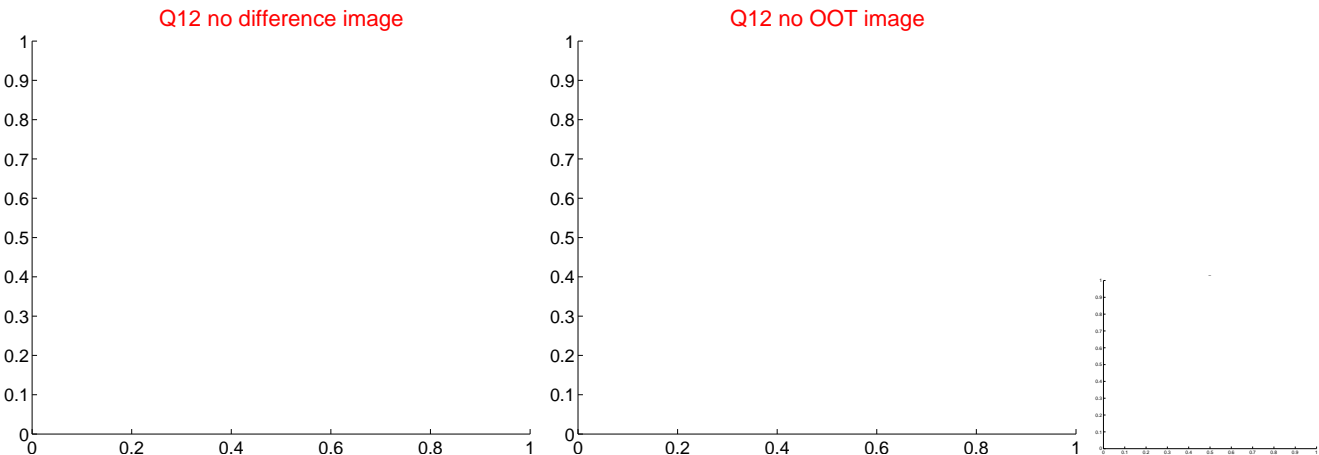
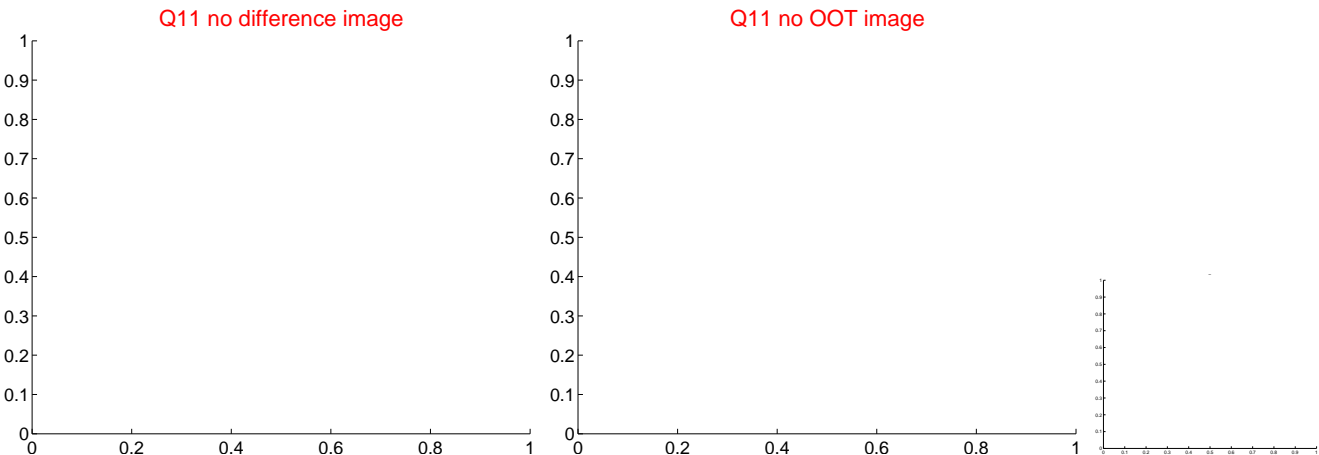
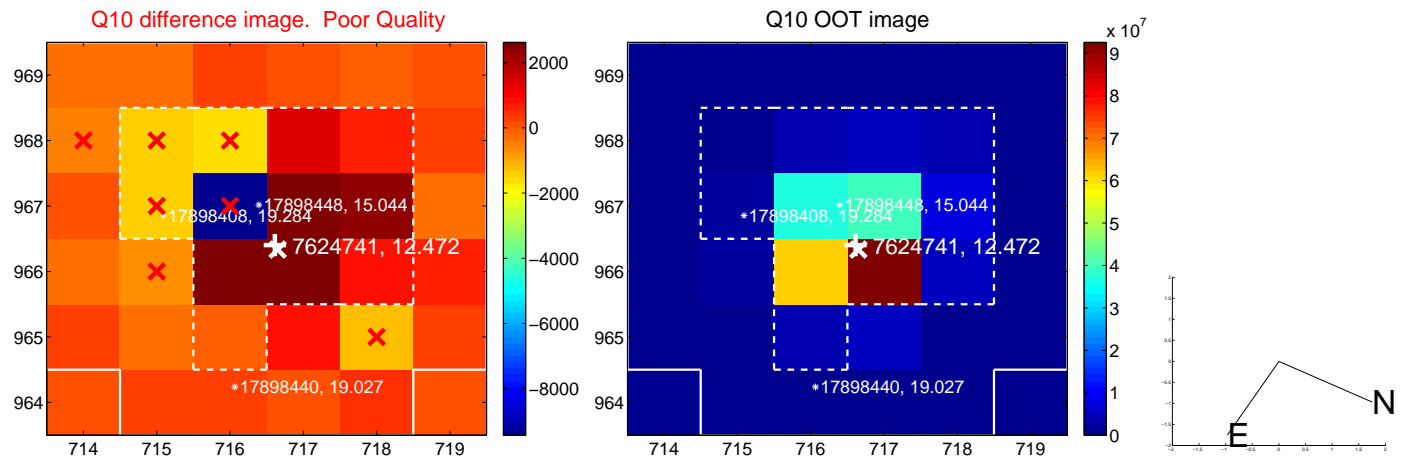
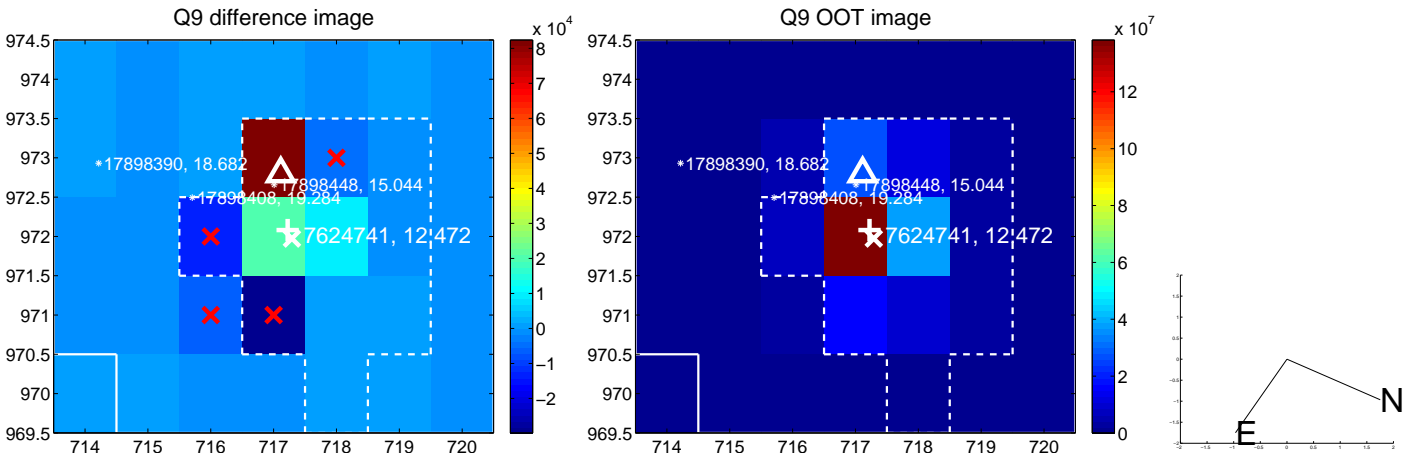
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



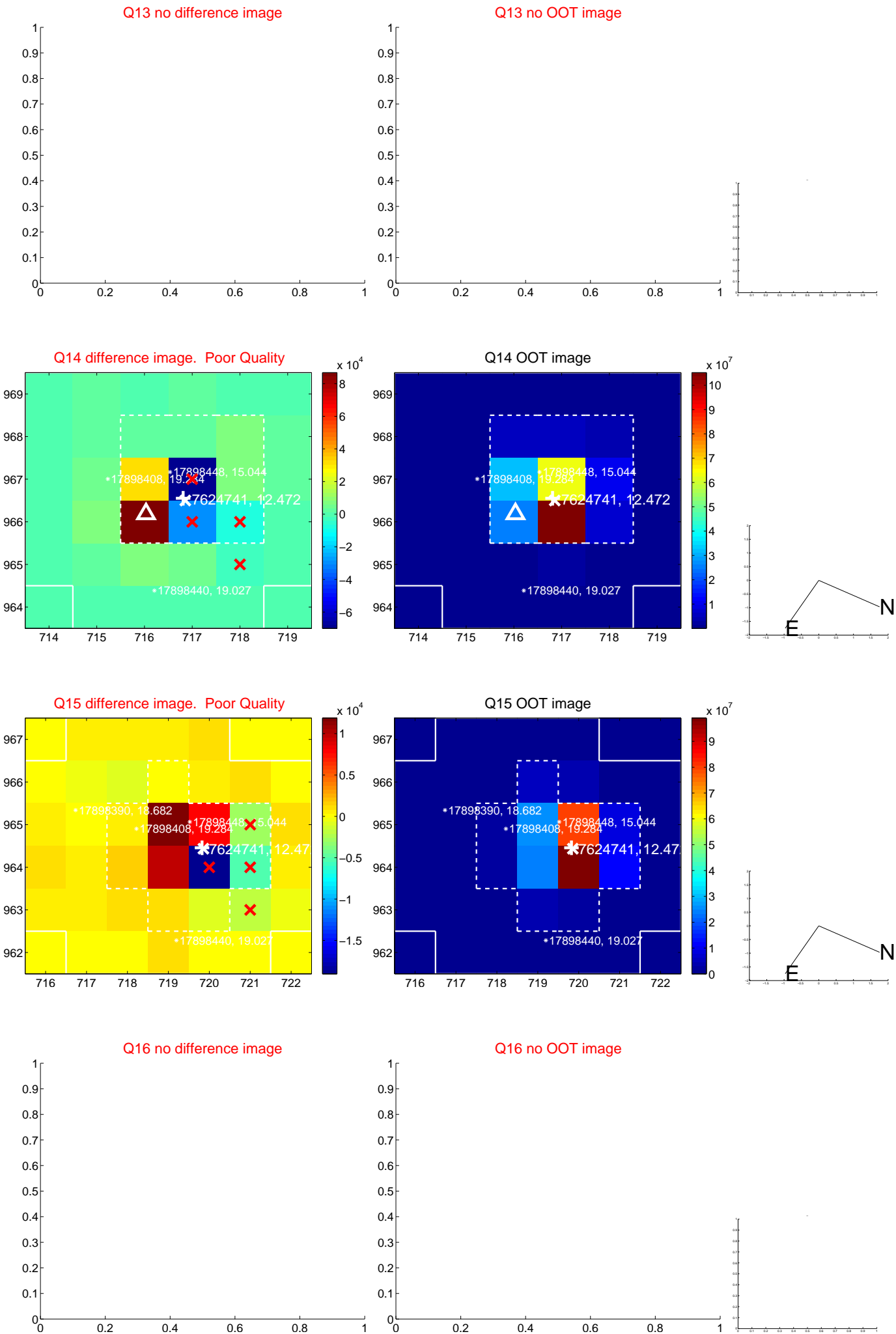
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



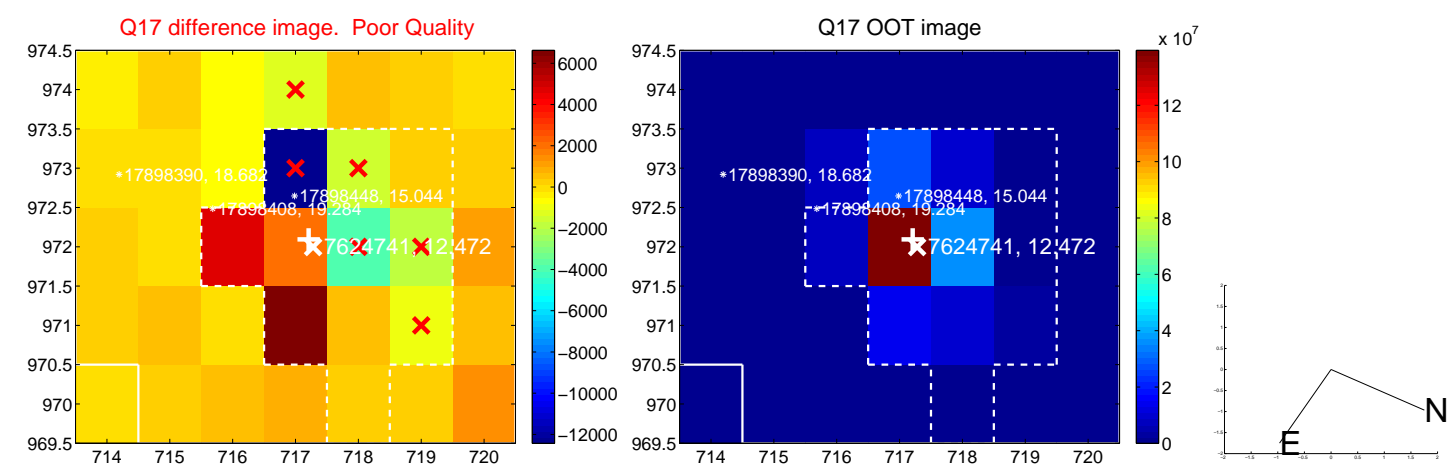
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



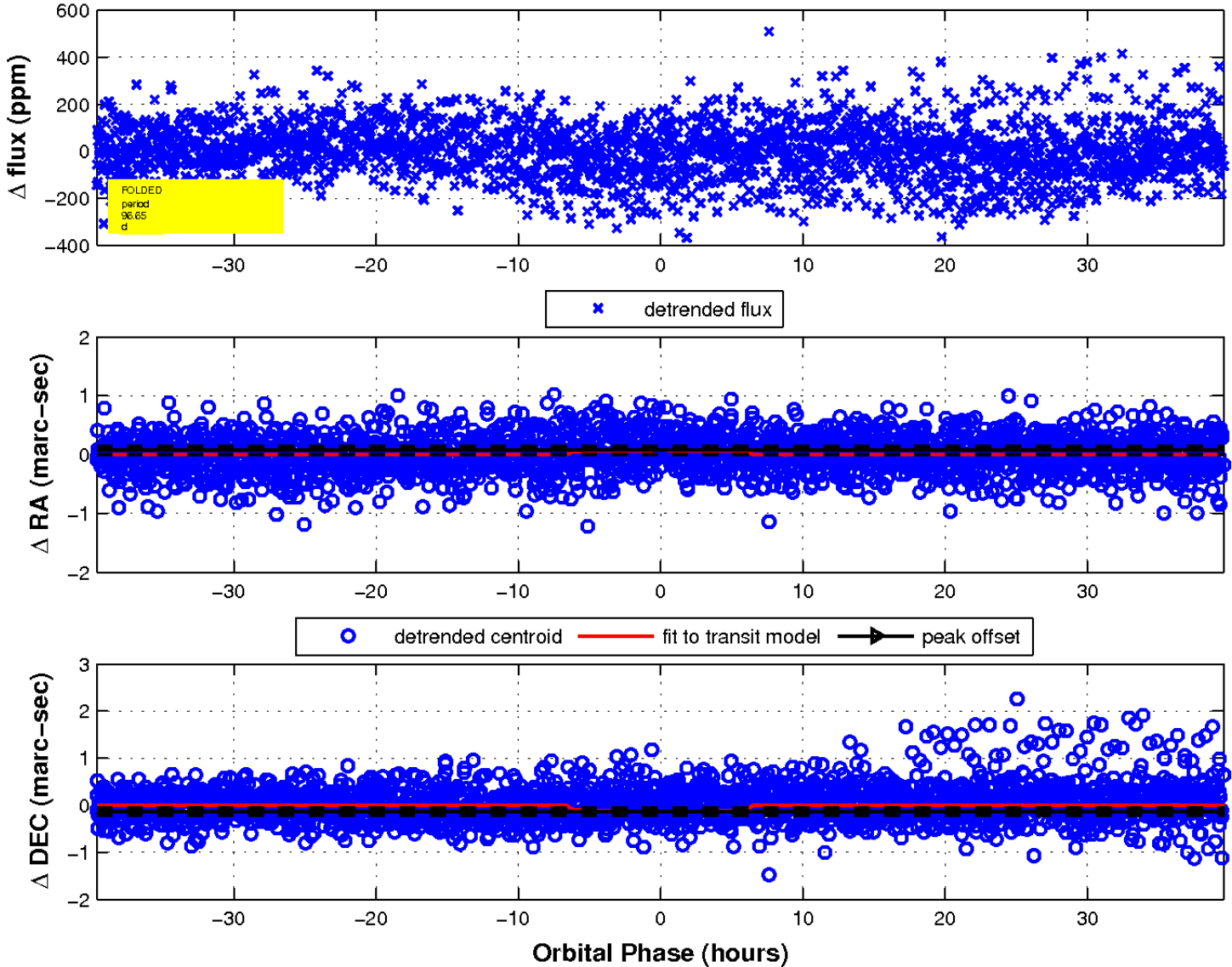
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

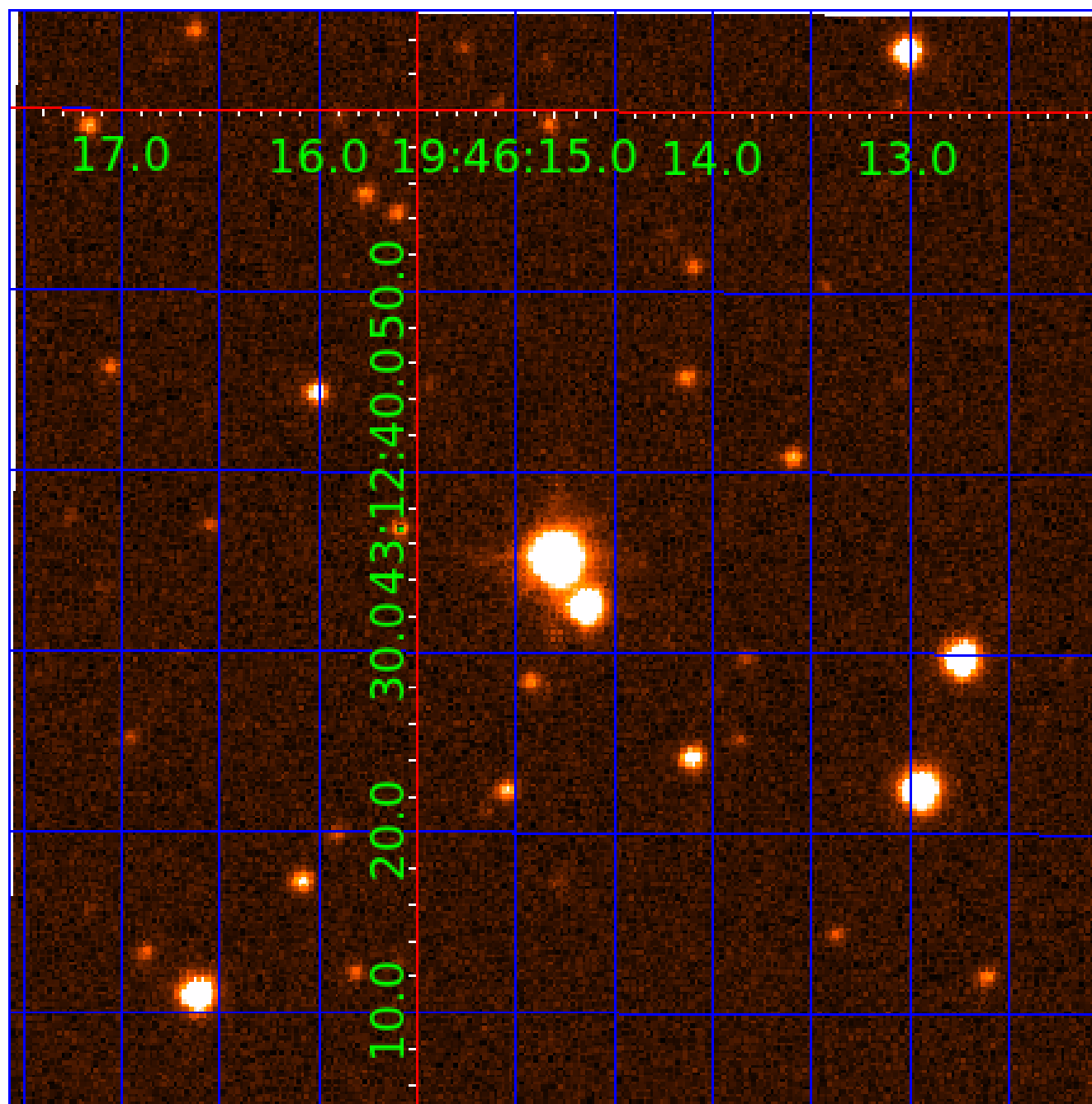


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination





# KIC 007624741

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007624741-01 | OBS      | No   | 1.402699      | 132.839748   | 9.6         | 6.989            | 8.2  | 8.4 | 0.92                        | 6170            | 0.33                   | 1943.92                |
| 007624741-02 | OBS      | No   | 96.648958     | 212.896189   | 114.2       | 13.213           | 15.5 | 8.8 | 0.92                        | 6170            | 1.10                   | 6.88                   |
| 007624741-03 | OBS      | No   | 208.799977    | 217.835866   | 102.5       | 22.397           | 11.7 | 5.4 | 0.92                        | 6170            | 1.00                   | 2.46                   |
| 007624741-04 | OBS      | No   | 159.903131    | 203.605495   | 100.1       | 14.641           | 8.7  | 6.7 | 0.92                        | 6170            | 1.04                   | 3.52                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 007624741-01 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | LPP_DV—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET   |
| 007624741-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—CENT_FEW_DIFFS   |
| 007624741-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS             |
| 007624741-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |

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

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

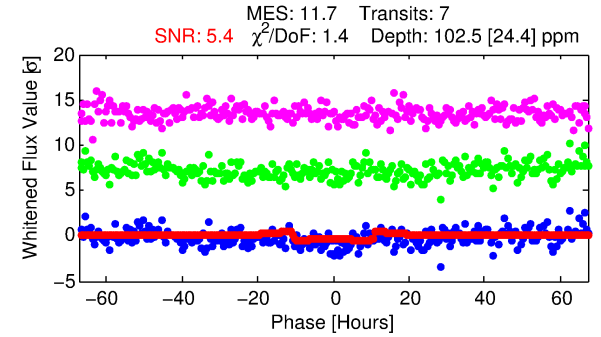
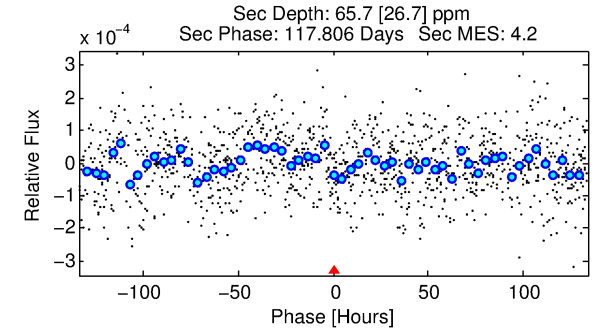
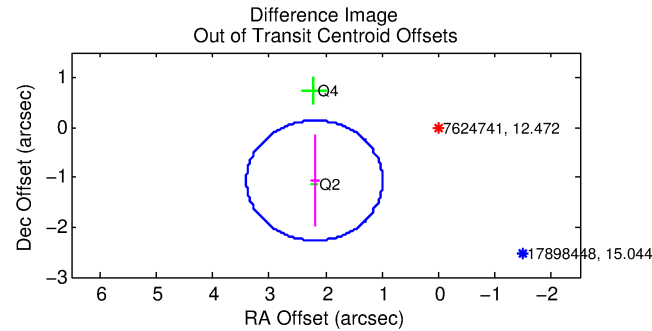
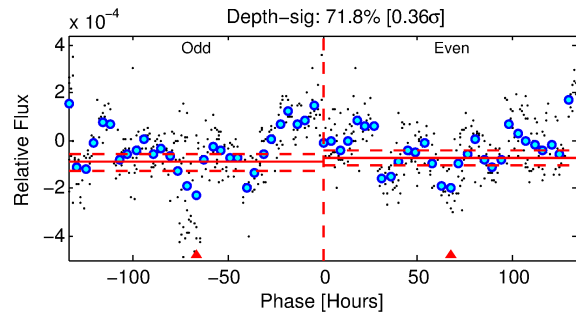
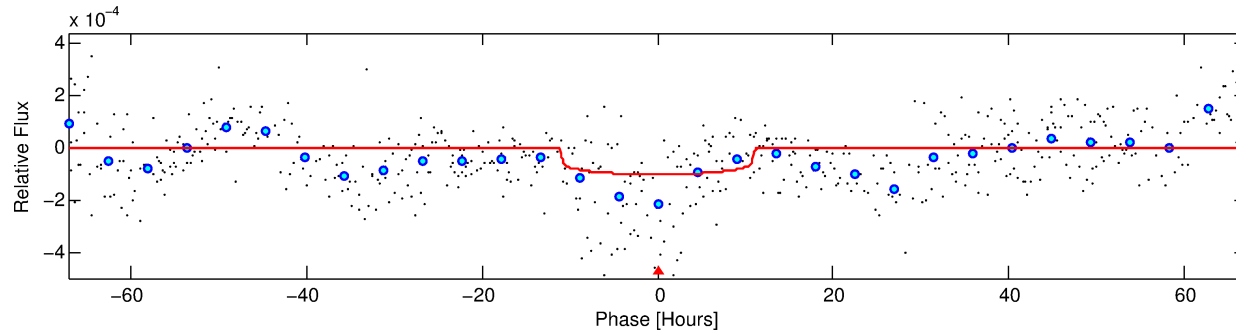
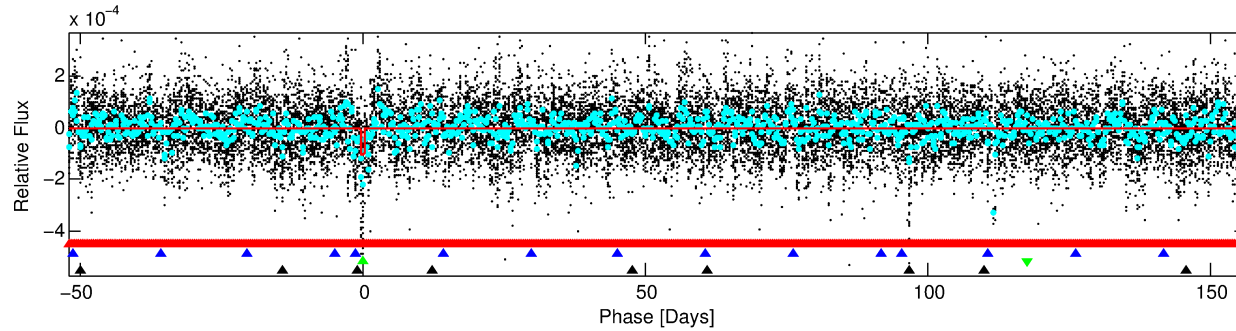
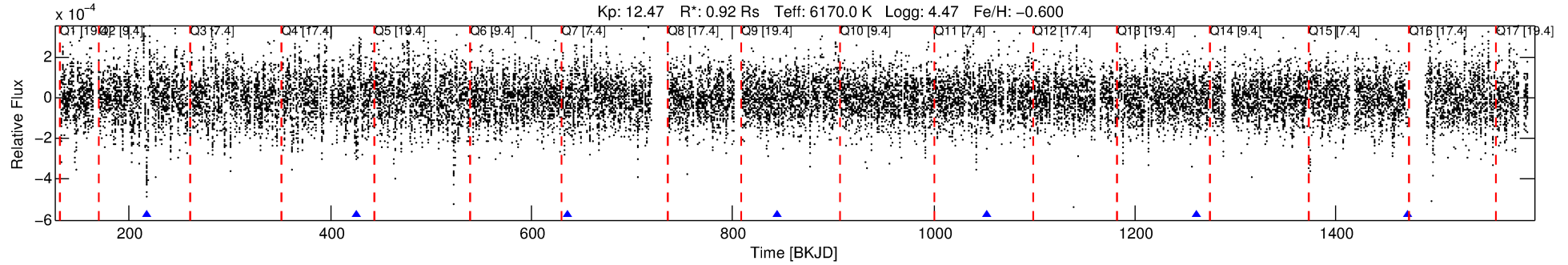
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007624741-03

No Significant Match Found

# DV One-Page Summary

KIC: 7624741 Candidate: 3 of 4 Period: 208.800 d



## DV Fit Results:

Period = 208.79998 [0.01725] d  
Epoch = 217.8359 [0.0772] BKJD  
Rp/R\* = 0.0100 [0.0031]  
a/R\* = 50.35 [76.05]  
b = 0.72 [0.99]  
Seff = 2.46 [0.66]  
Teq = 319 [21] K  
Rp = 1.00 [0.36] Re  
a = 0.6649 [0.1063] AU  
Ag = 16039.83 [12494.75] [1.28 $\sigma$ ]  
Teffp = 5559 [1045] K [5.01 $\sigma$ ]

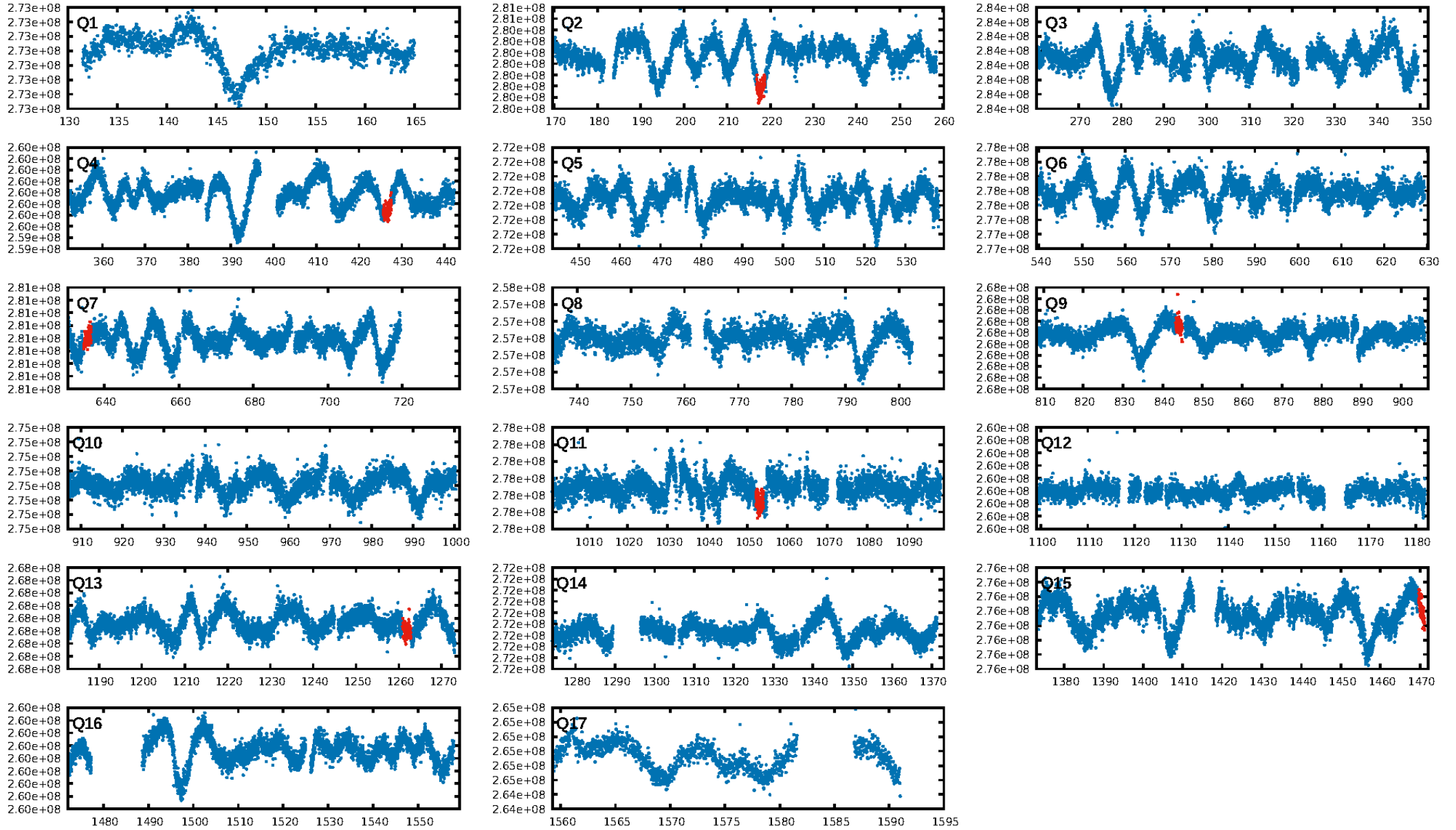
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [43.86 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.73e-15  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: -1.96  
Centroid-sig: 3.1%  
Centroid-so: 1.219 arcsec [1.40 $\sigma$ ]  
OotOffset-rm: 2.442 arcsec [6.09 $\sigma$ ]  
KicOffset-rm: 2.434 arcsec [8.93 $\sigma$ ]  
OotOffset-st: 1/0/1/0 [2]  
KicOffset-st: 1/0/1/0 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 0.00 [0/4]

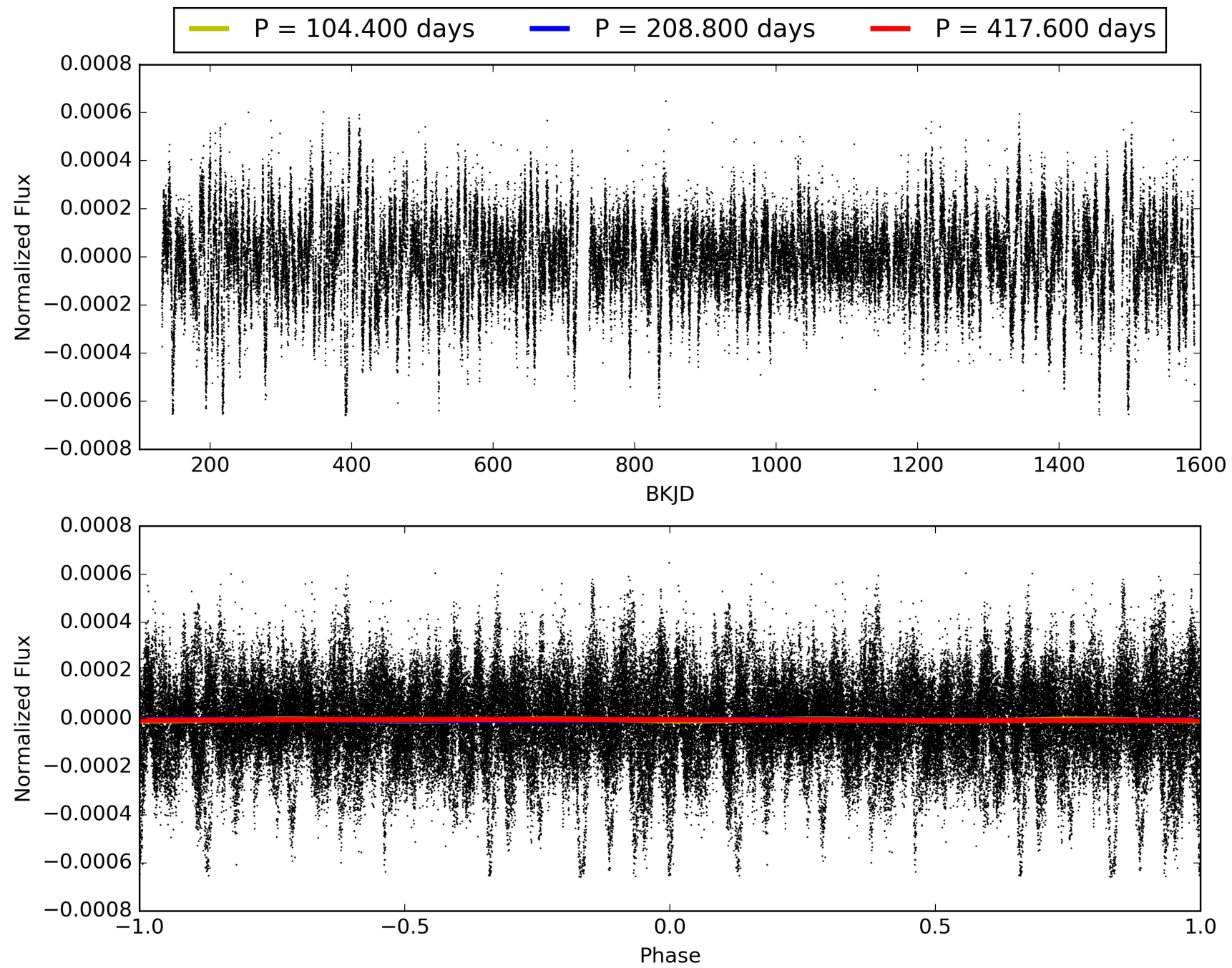
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:20:03 Z

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

# TCE 007624741-03, PDC Light Curves

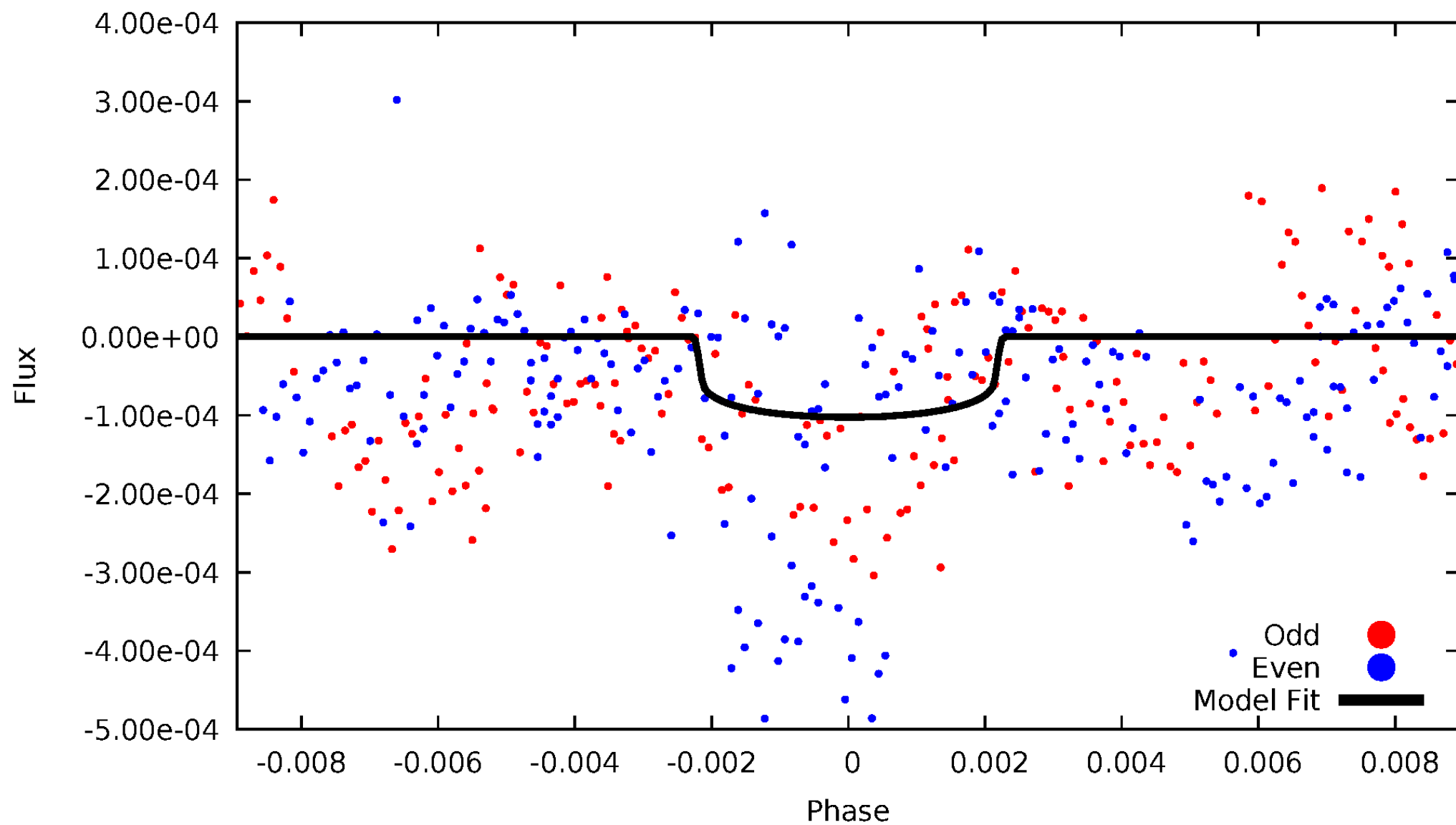


TCE 007624741-03



# DV Odd/Even

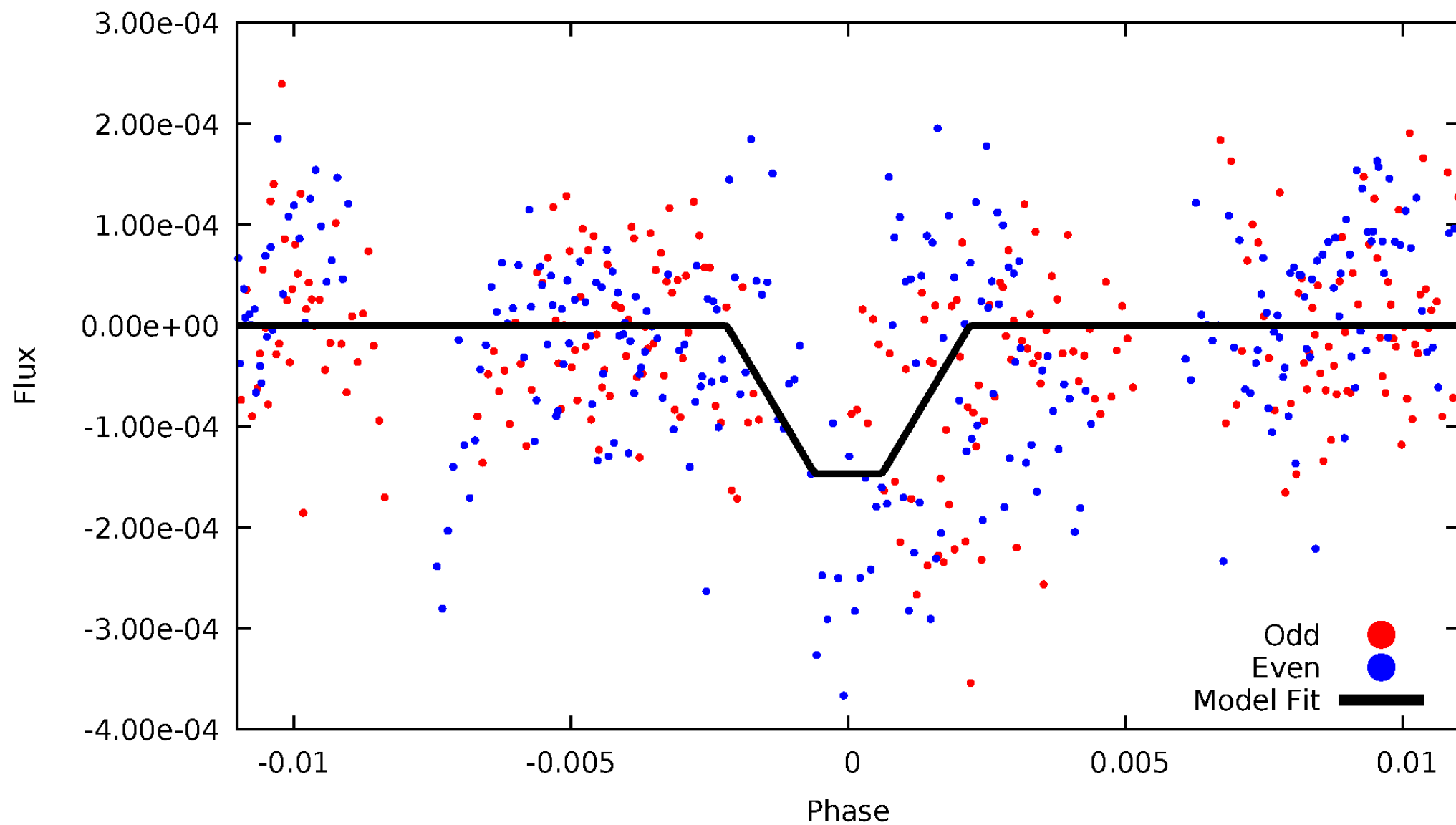
TCE 007624741-03





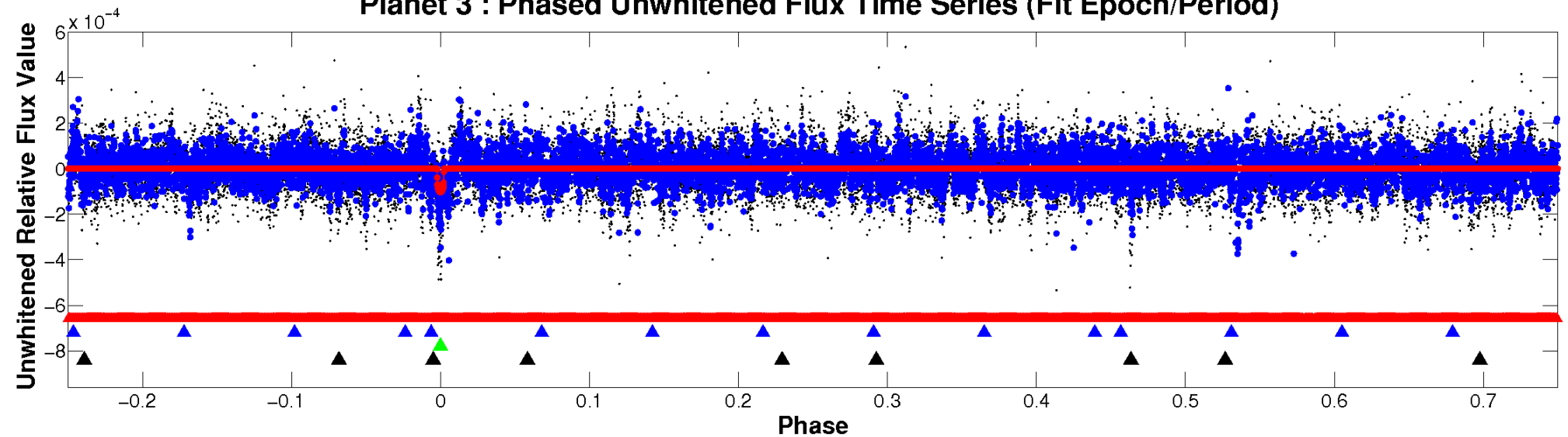
# ALT Odd/Even

TCE 007624741-03

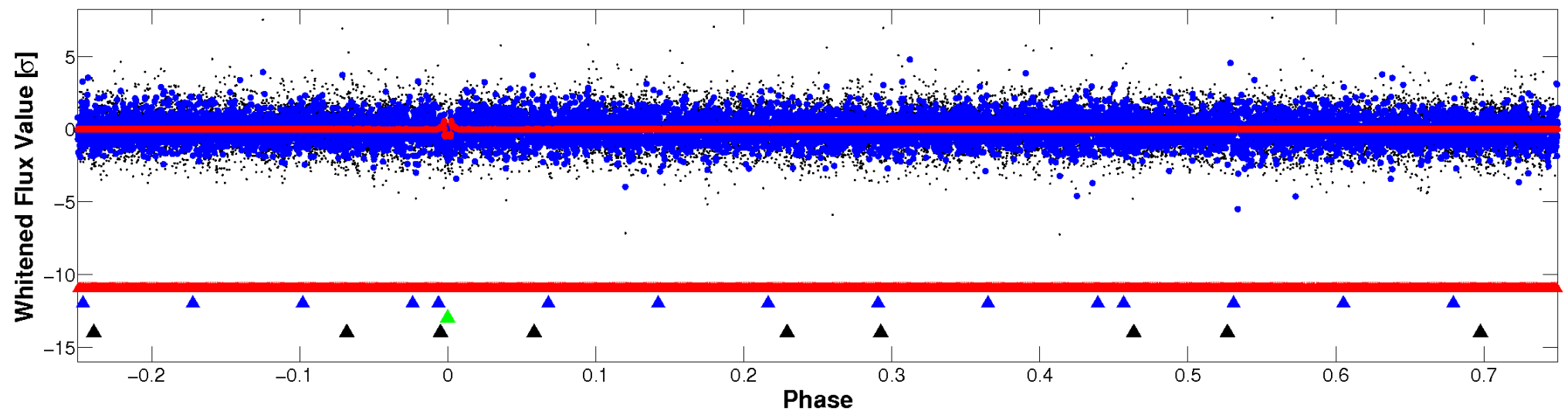


# Non-Whitened Vs. Whitened Light Curve

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

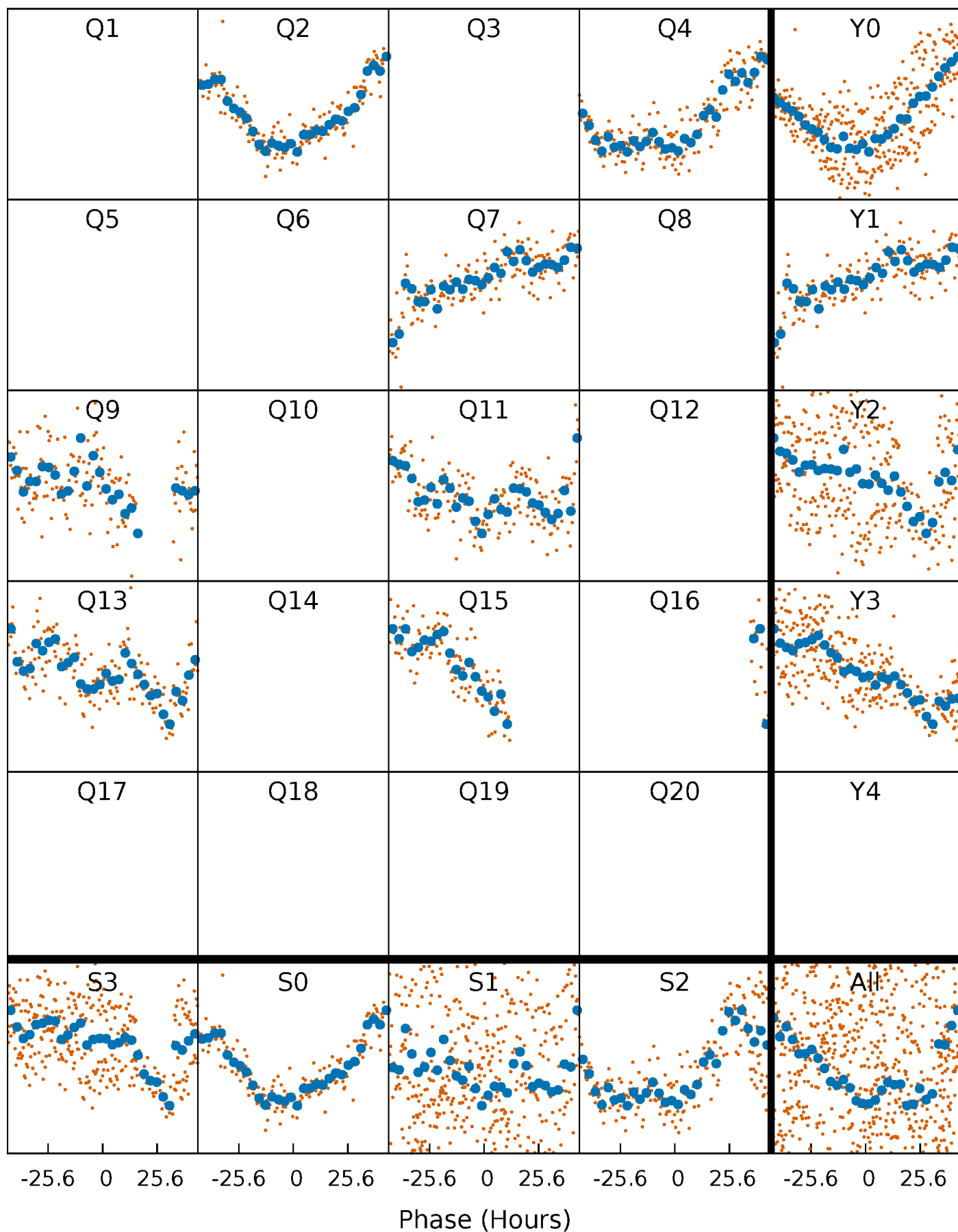


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



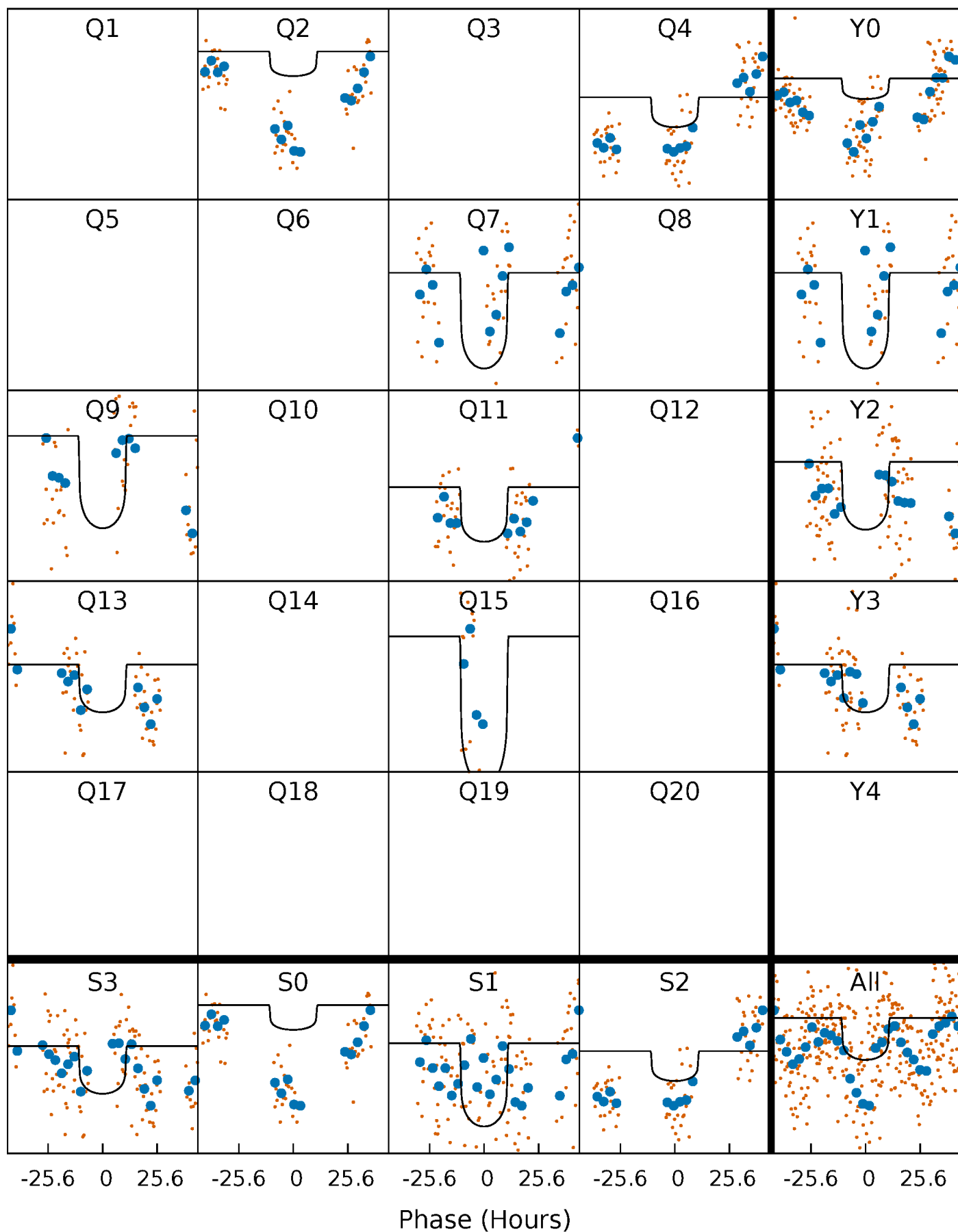
# PDC Quarter-Phased Transit Curves

TCE 007624741-03 P=208.799977 Days  $T_0=217.835866$  (BKJD)



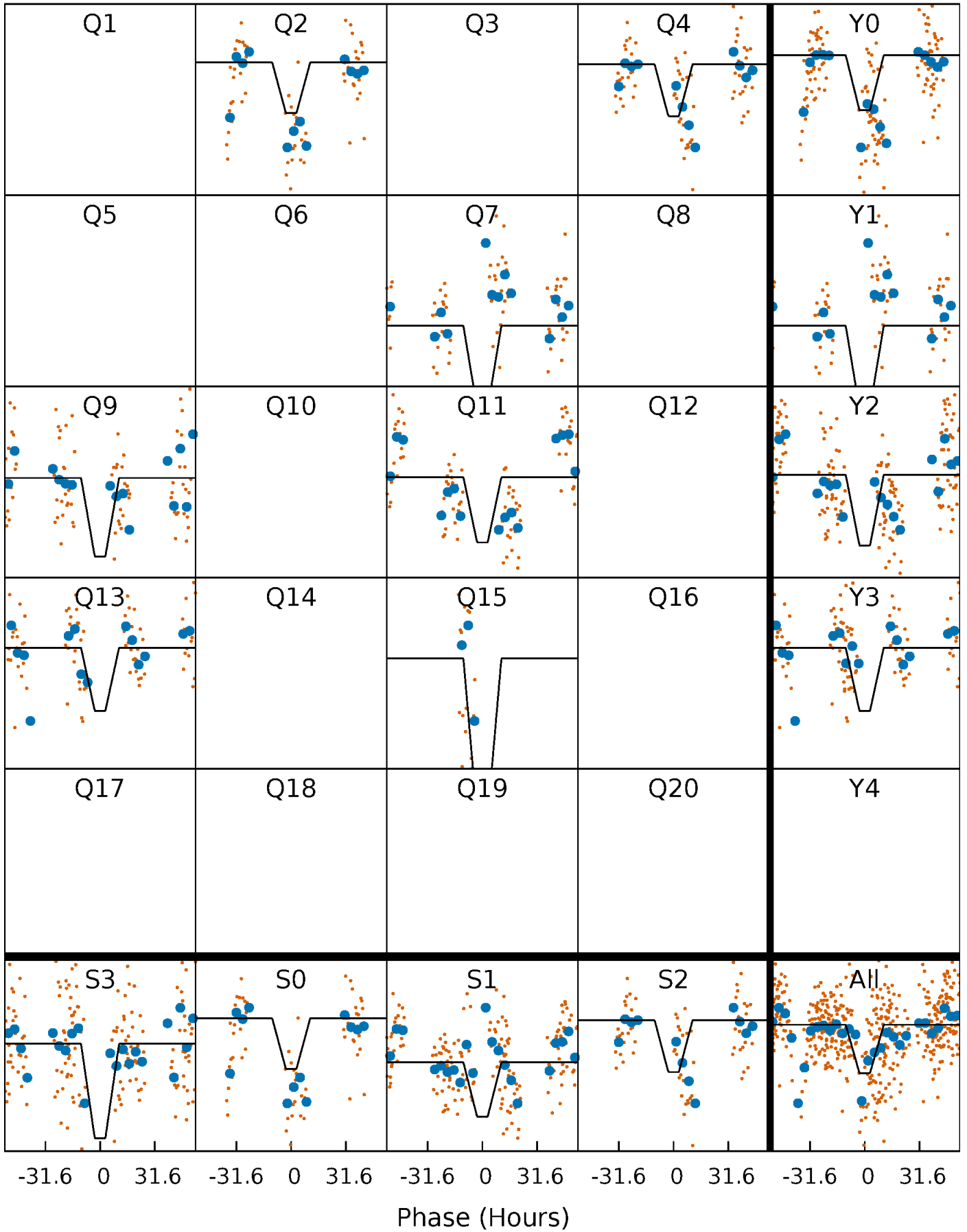
# DV Quarter-Phased Transit Curves

TCE 007624741-03     $P=208.799977$  Days     $T_0=217.835866$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

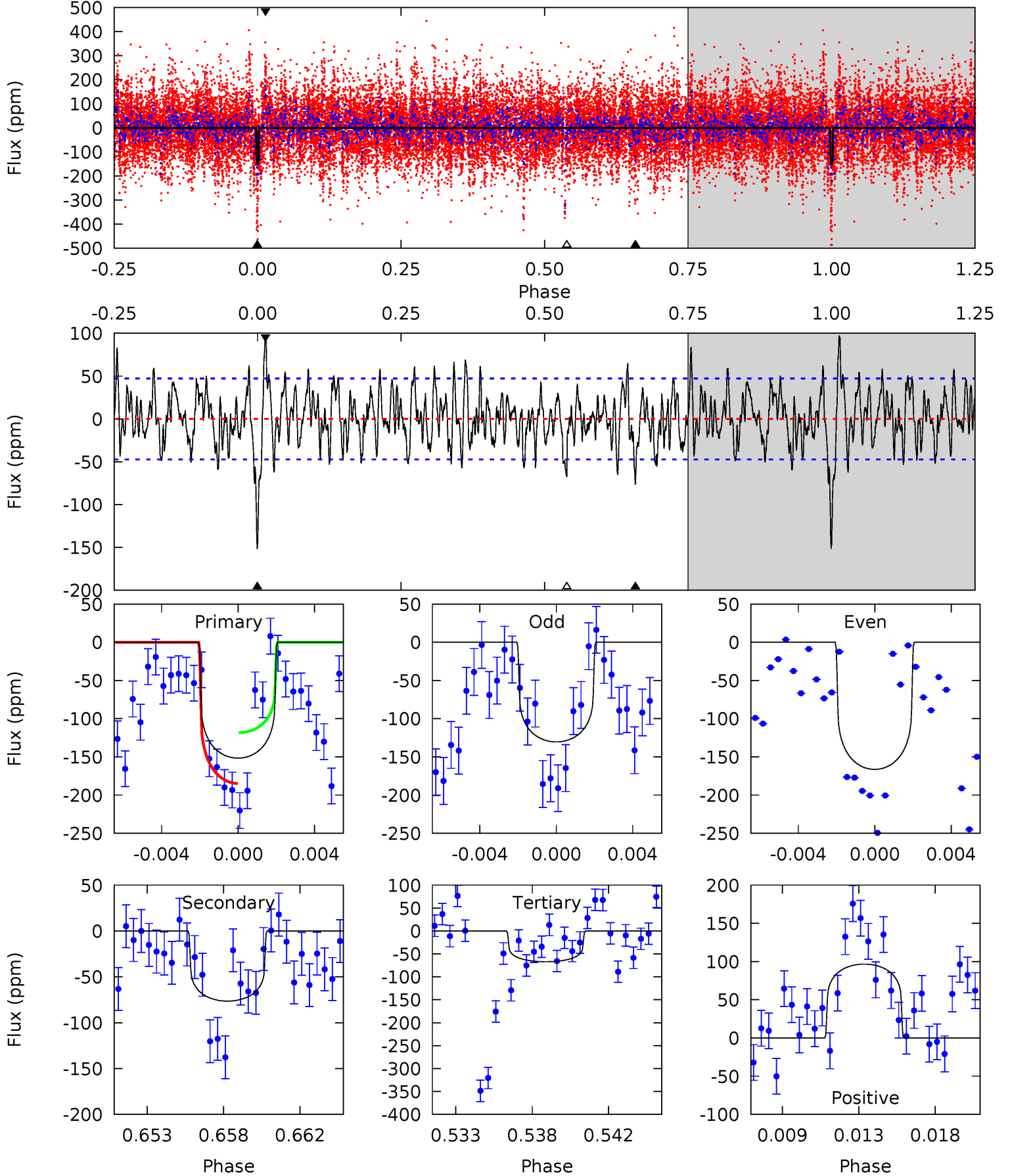
TCE 007624741-03 P=208.858228 Days  $T_0=217.598098$  (BKJD)



# DV Model-Shift Uniqueness Test

007624741-03, P = 208.799977 Days, E = 9.035889 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 16.6 | 8.40 | 7.37 | 10.6 | 5.18            | 2.84            | 2.88             | 9.28    | 6.03    | 1.02    | -2.22   | 1.95    | 1.15 | 0.39  | 3.64 |

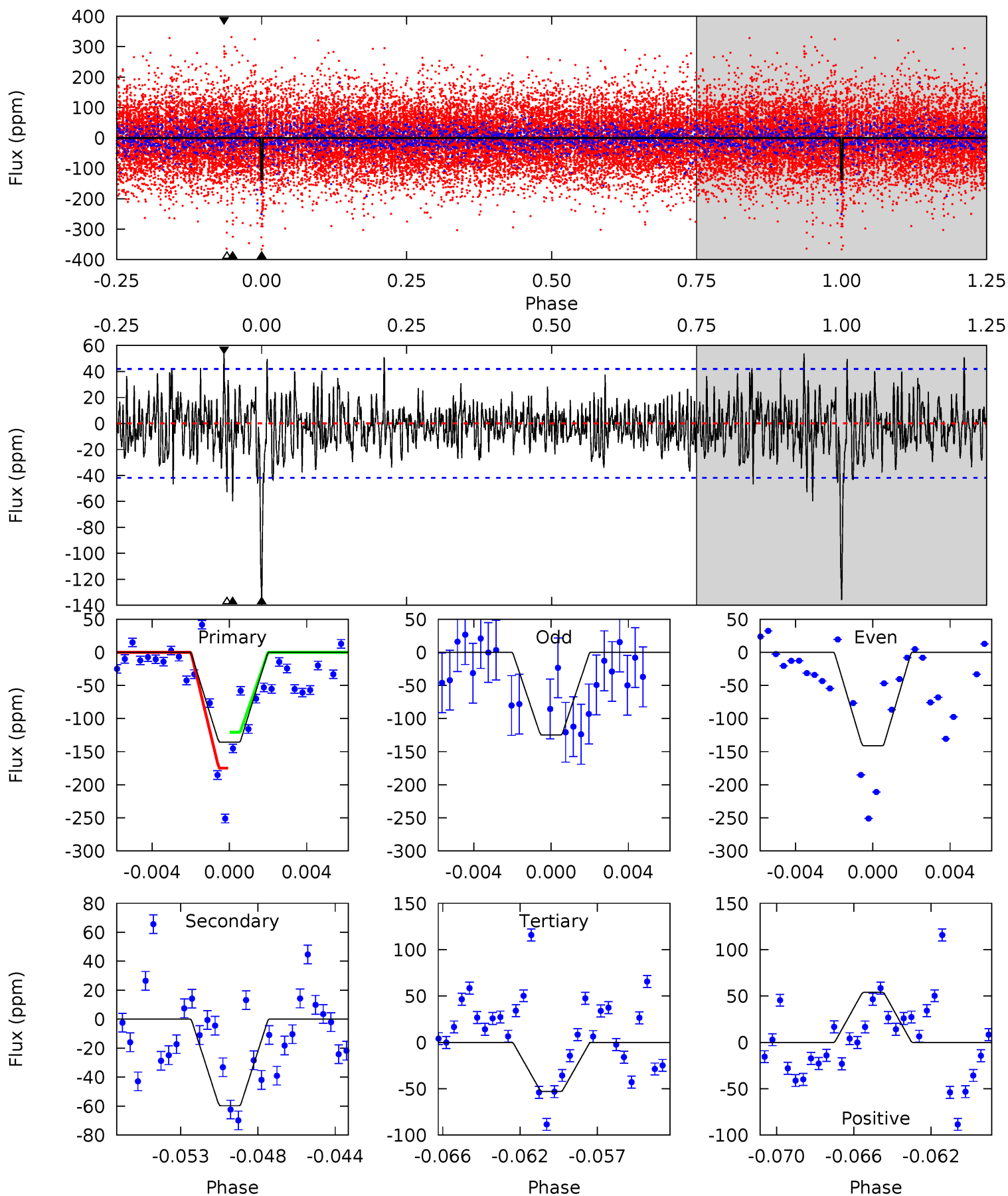




# Alt Model-Shift Uniqueness Test

007624741-03, P = 208.858228 Days, E = 8.739870 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 16.8 | 7.37 | 6.53 | 6.65 | 5.18            | 2.85            | 1.72             | 10.2    | 10.1    | 0.84    | 0.72    | 0.98    | 4.40 | 0.28  | 3.01 |



### Stellar Parameters For KIC 007624741

|        | $T_{\text{eff}} (K)$ | $\log(g)$                 | $[\text{Fe}/\text{H}]$     | $R (R_{\odot})$           | $M (M_{\odot})$           | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6170^{+168}_{-186}$ | $4.468^{+0.077}_{-0.132}$ | $-0.600^{+0.300}_{-0.300}$ | $0.916^{+0.170}_{-0.099}$ | $0.898^{+0.095}_{-0.095}$ | $1.645^{+0.607}_{-0.619}$                 |
|        | +3%/-3%              | +2%/-3%                   | +50%/-50%                  | +19%/-11%                 | +11%/-11%                 | +37%/-38%                                 |
| Source | PHO1                 | FLK73                     | 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 007624741-03 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$  | $A_{\text{obs}}$         |
|---------|-------------|------------------------|----------------------|-----------------------|--------------------------|
| DV      | $-76 \pm 9$ | $1.02^{+0.34}_{-0.33}$ | $449^{+25}_{-21}$    | $5768^{+1194}_{-745}$ | $17453^{+21181}_{-7759}$ |
| Alt.    | $-60 \pm 8$ | $1.24^{+0.33}_{-0.32}$ | $449^{+23}_{-19}$    | $4993^{+741}_{-482}$  | $9409^{+7793}_{-3771}$   |

$T_{\text{max}}$  = 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

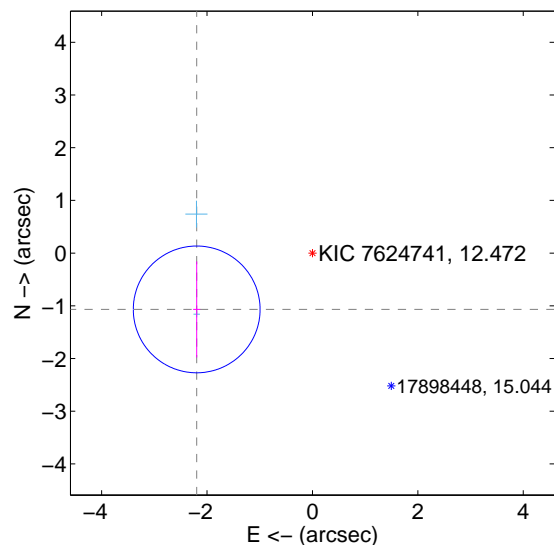
Supplemental centroid analysis for 007624741-03. Kepler magnitude: 12.47. Transit SNR 5.39

There are 2 quarters with good PRF difference image offsets

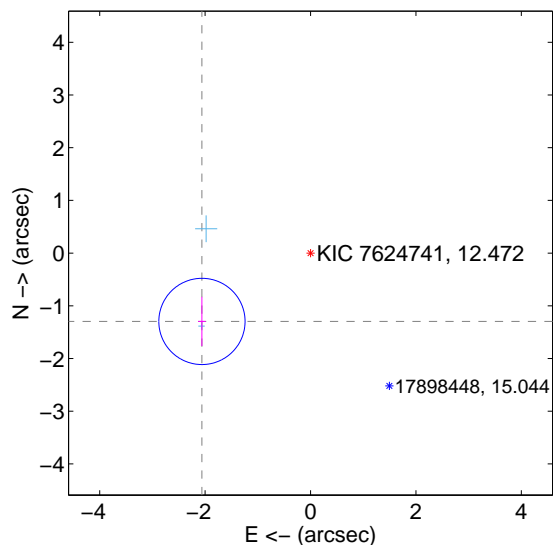
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec       |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT          | $2.442 \pm 0.401$  | 6.09                | $2.196 \pm 0.067$ | $-1.068 \pm 0.911$ |
| PRF-fit source offset from KIC position | $2.434 \pm 0.273$  | 8.93                | $2.060 \pm 0.070$ | $-1.296 \pm 0.467$ |
| photometric centroid source offset      | $1.22 \pm 0.87$    | 1.40                | $-1.02 \pm 0.84$  | $0.67 \pm 0.93$    |

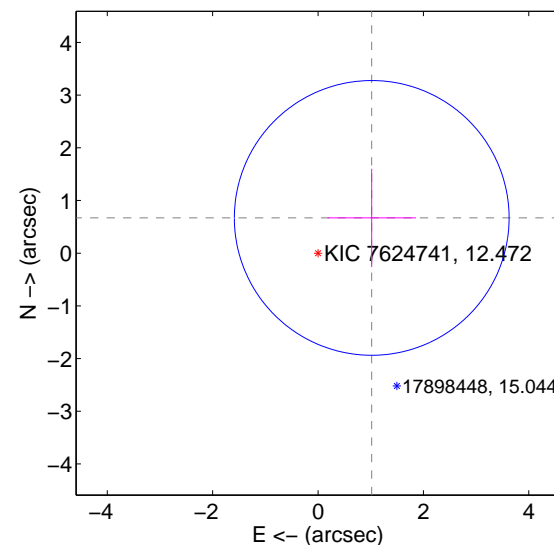
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

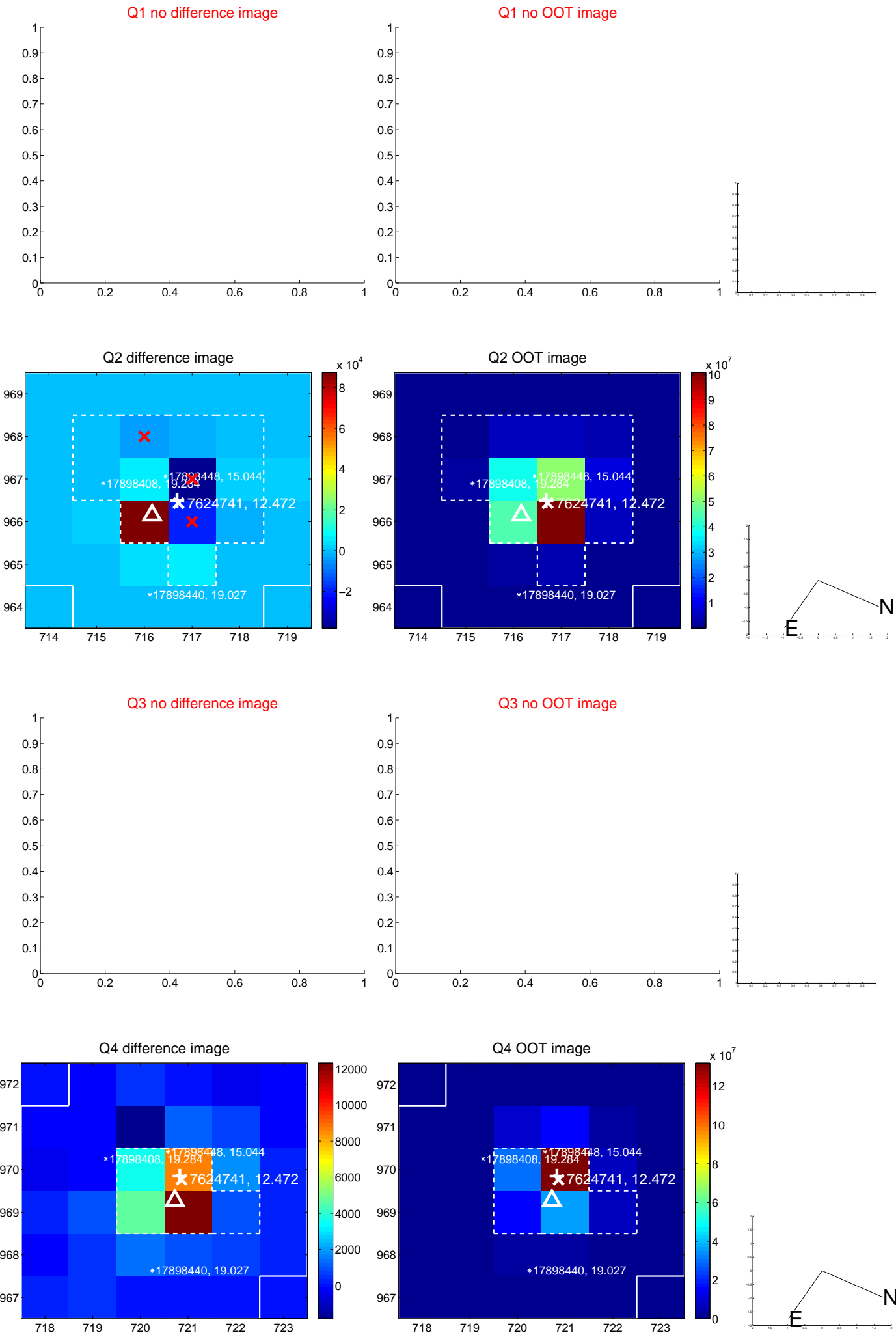


offset from photometric centroids



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.

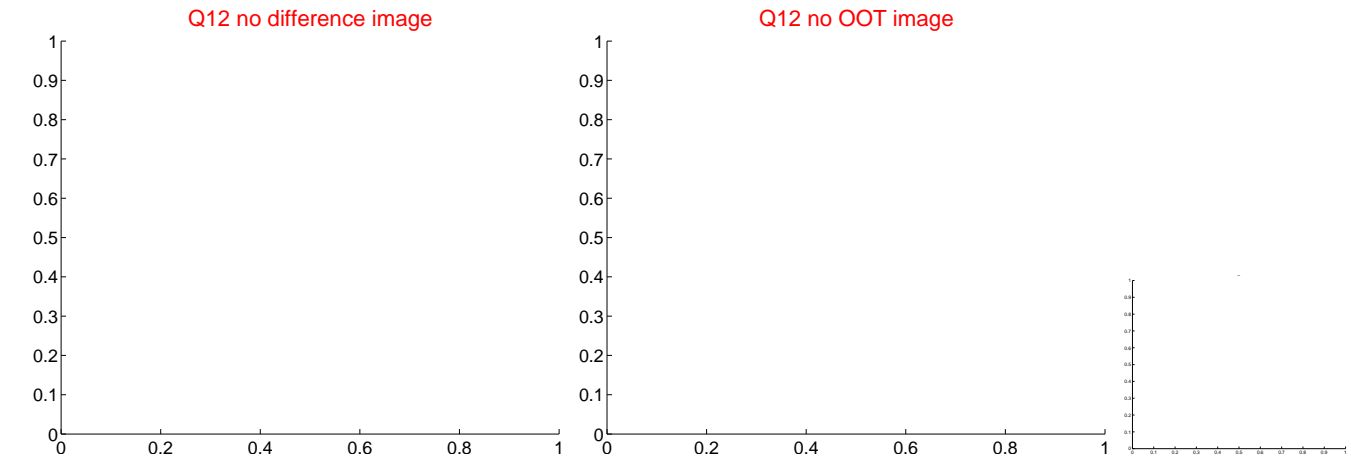
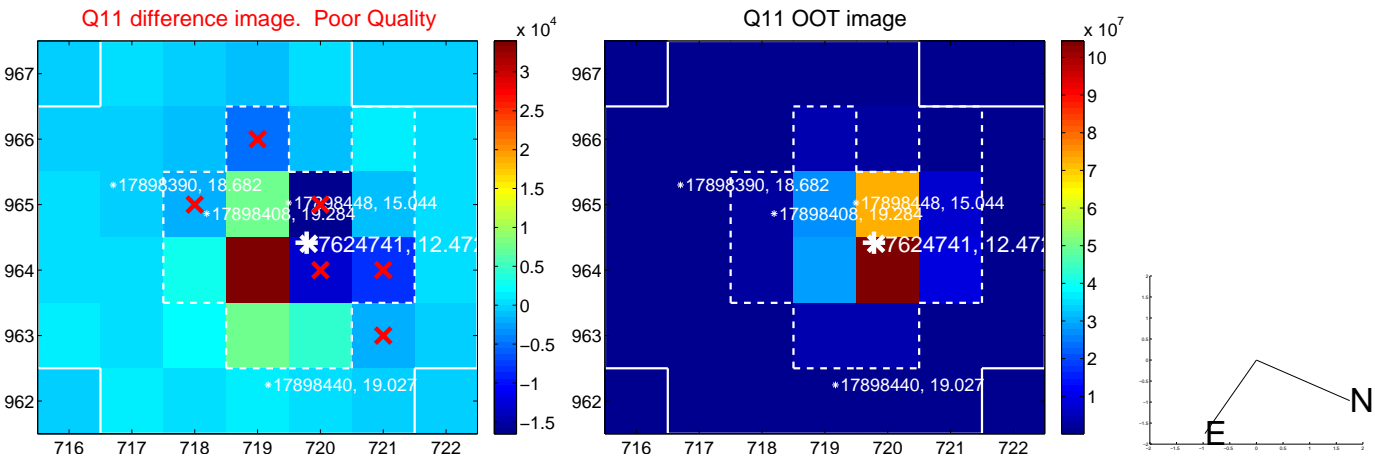
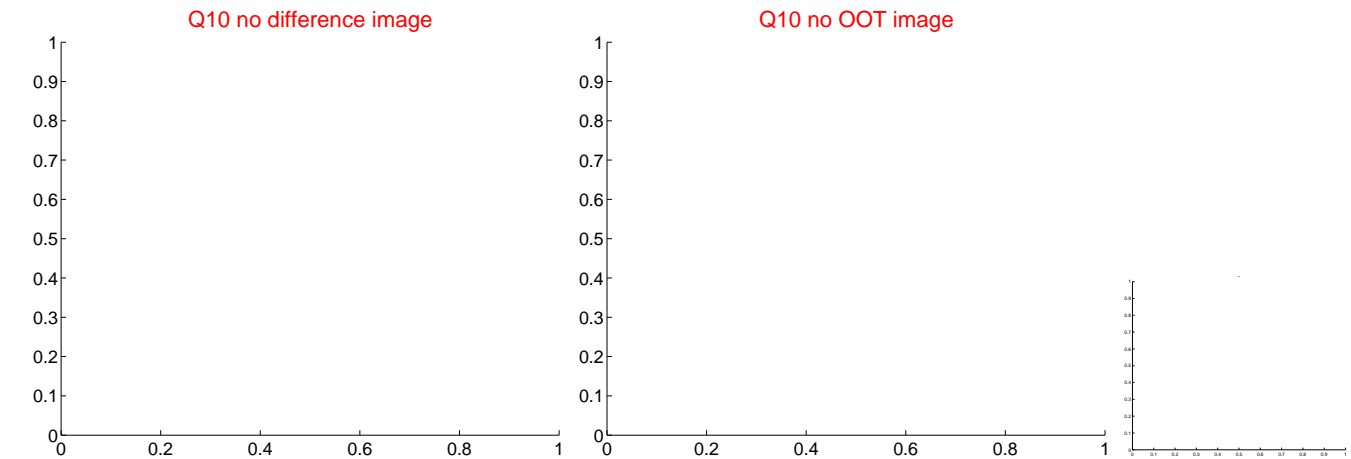
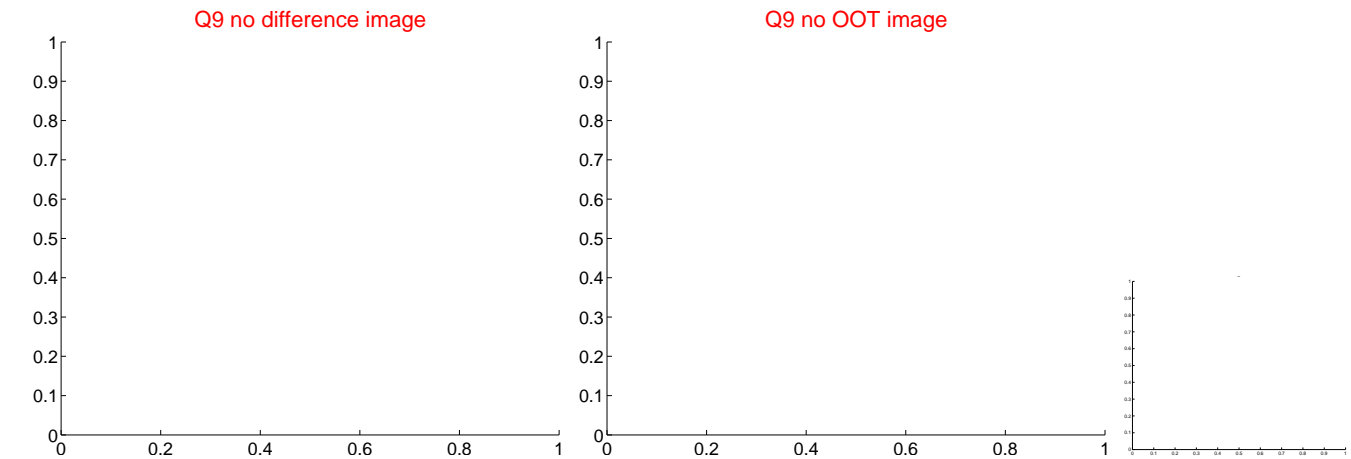
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

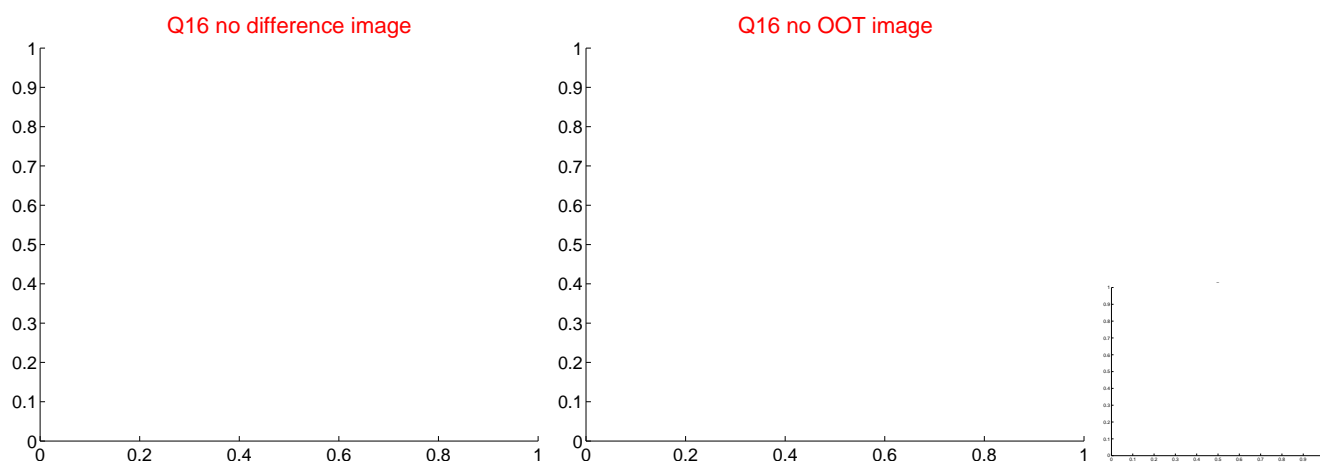
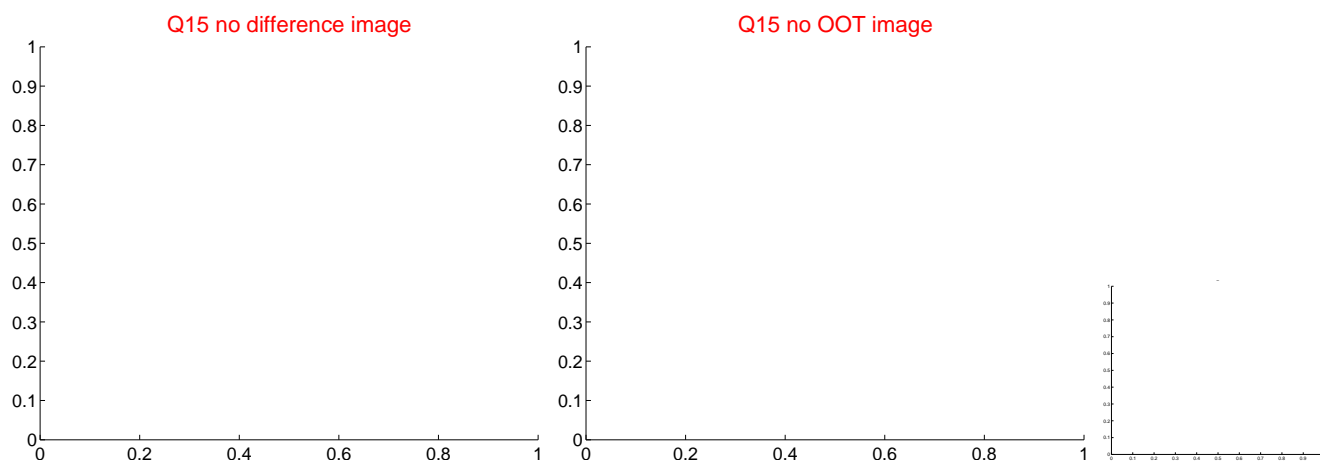
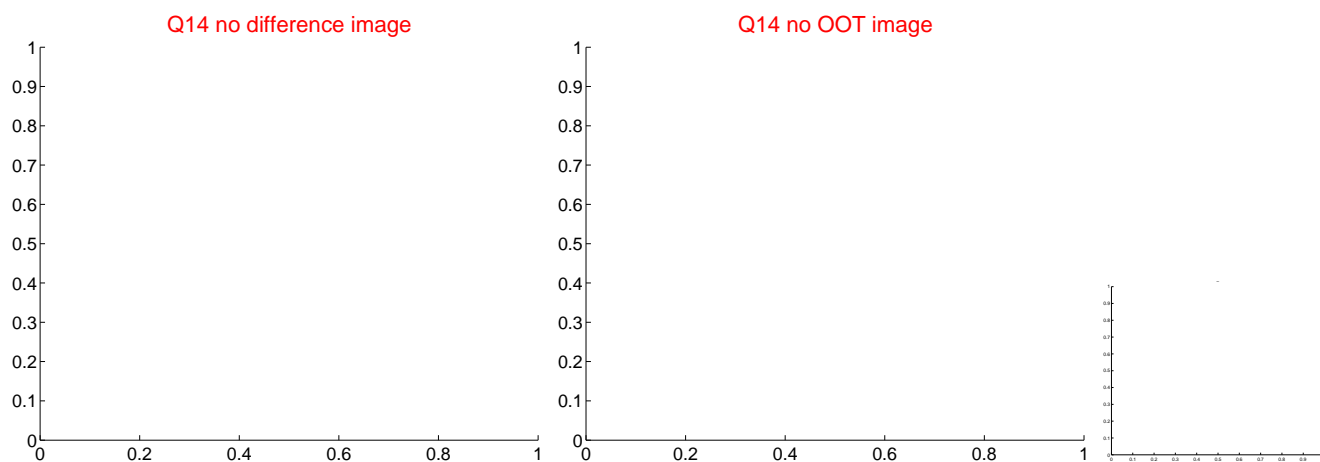
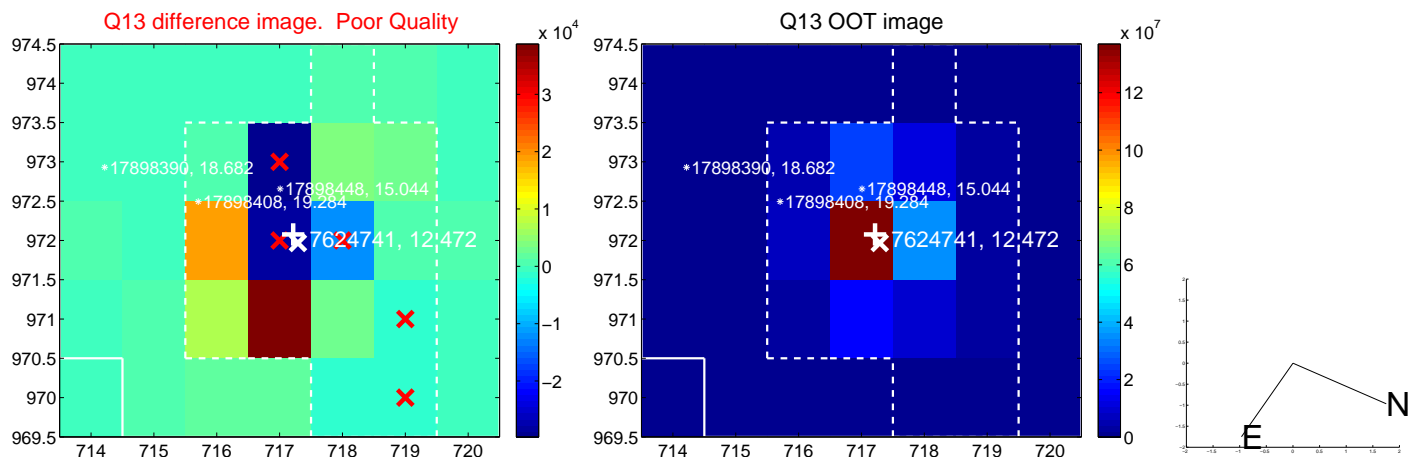


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

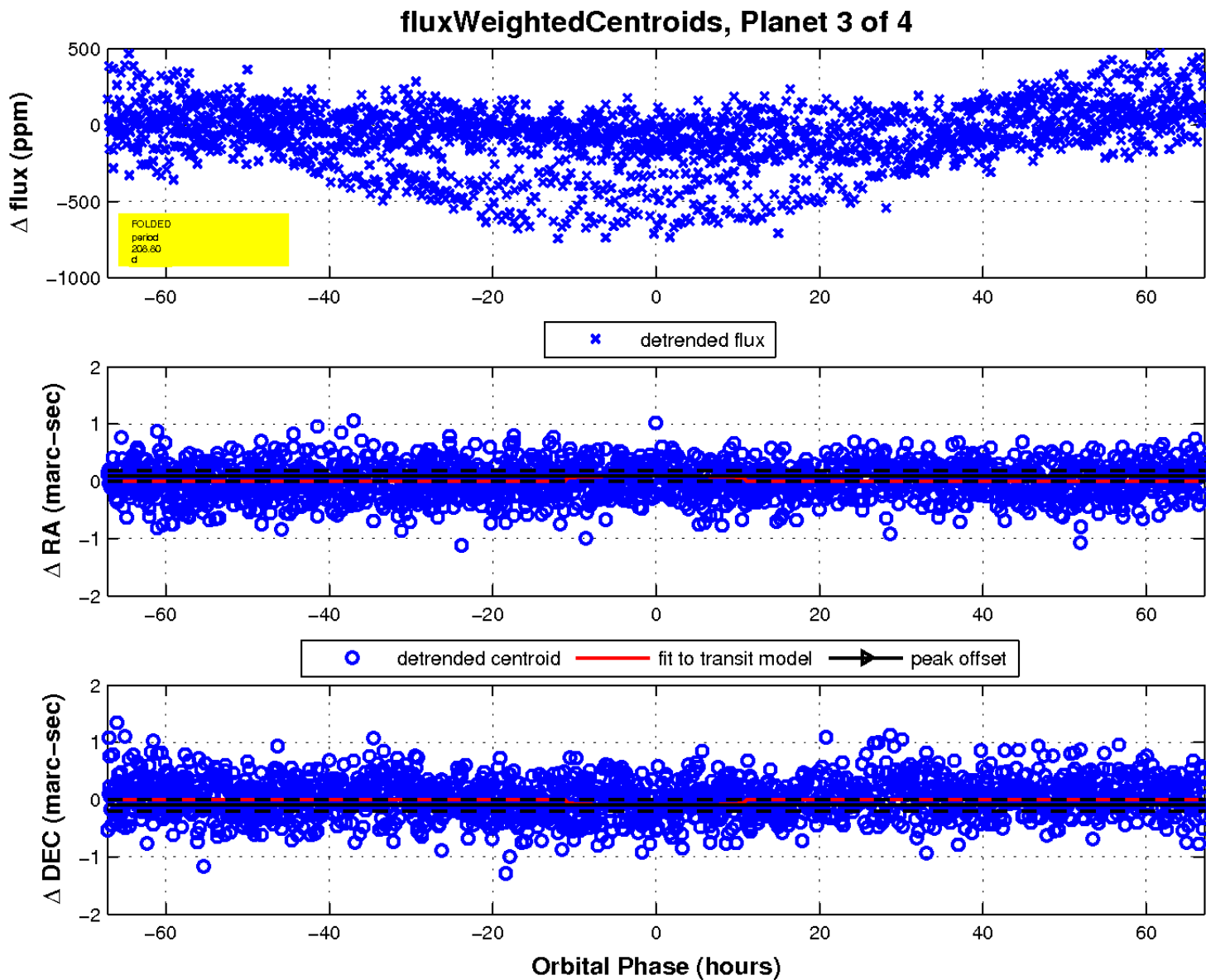
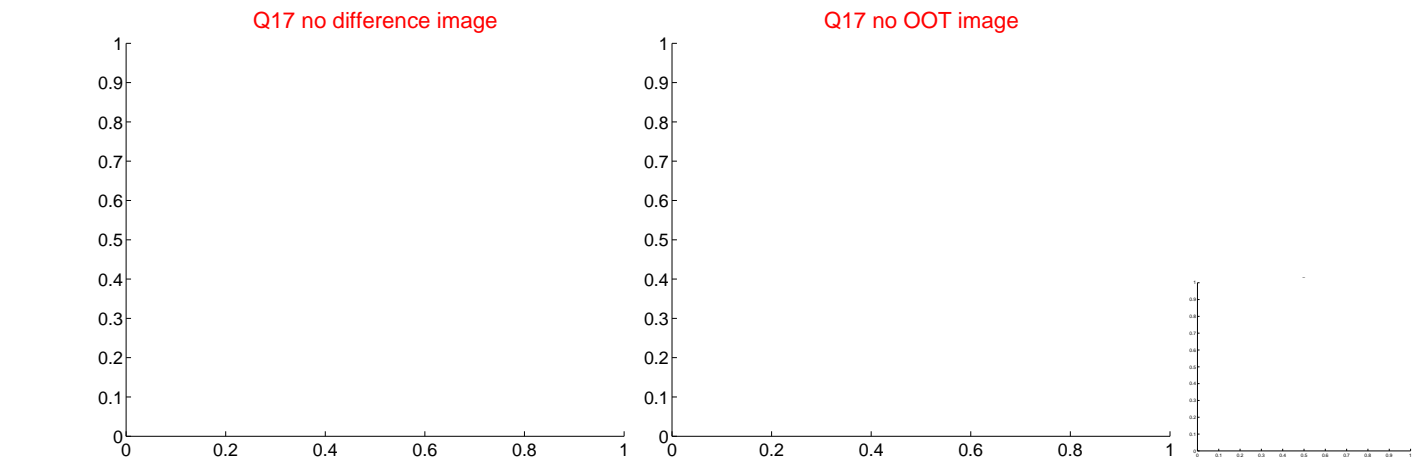




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

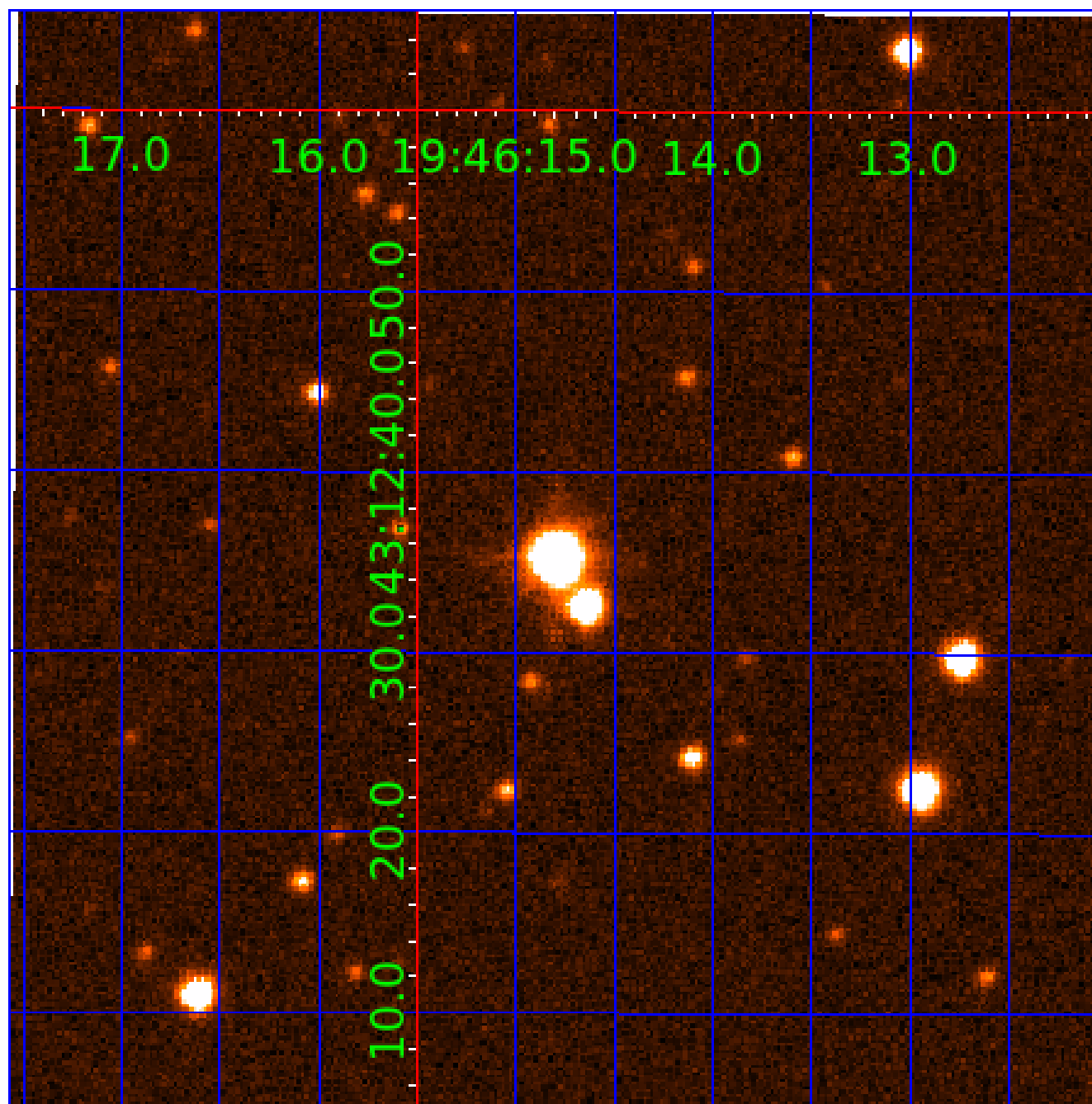


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007624741

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007624741-01 | OBS      | No   | 1.402699      | 132.839748   | 9.6         | 6.989            | 8.2  | 8.4 | 0.92                        | 6170            | 0.33                   | 1943.92                |
| 007624741-02 | OBS      | No   | 96.648958     | 212.896189   | 114.2       | 13.213           | 15.5 | 8.8 | 0.92                        | 6170            | 1.10                   | 6.88                   |
| 007624741-03 | OBS      | No   | 208.799977    | 217.835866   | 102.5       | 22.397           | 11.7 | 5.4 | 0.92                        | 6170            | 1.00                   | 2.46                   |
| 007624741-04 | OBS      | No   | 159.903131    | 203.605495   | 100.1       | 14.641           | 8.7  | 6.7 | 0.92                        | 6170            | 1.04                   | 3.52                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 007624741-01 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | LPP_DV—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET   |
| 007624741-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—CENT_FEW_DIFFS   |
| 007624741-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS             |
| 007624741-04 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS |

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

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

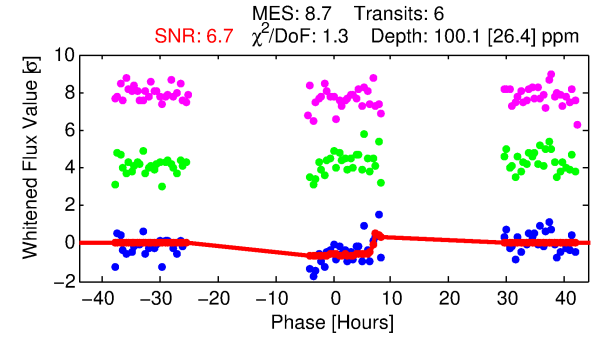
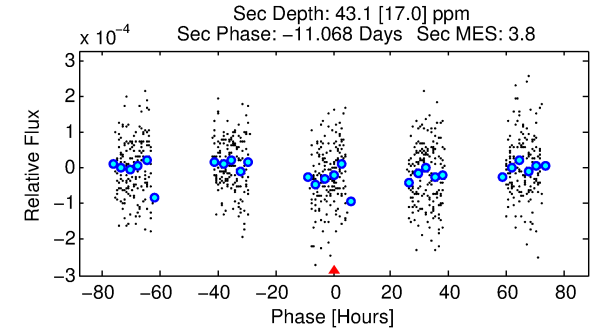
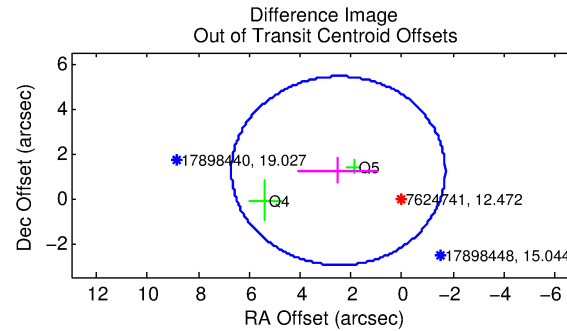
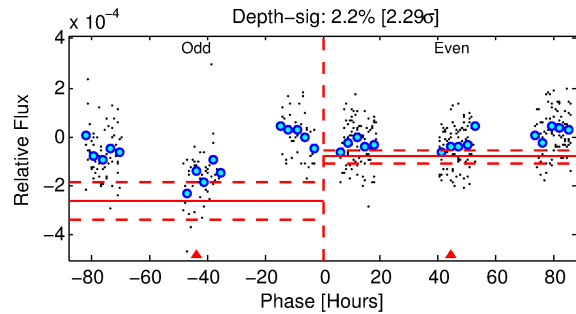
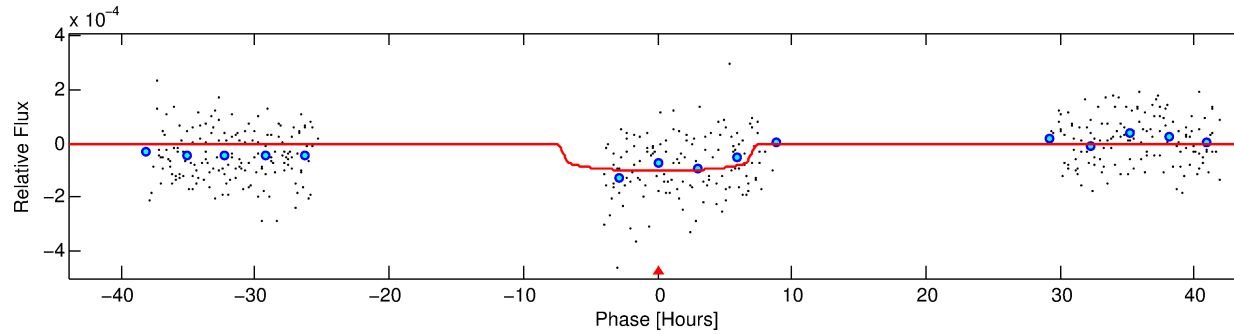
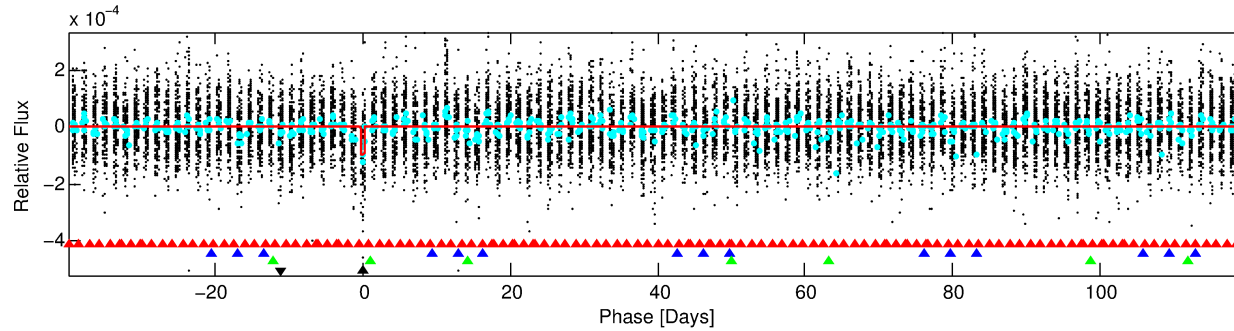
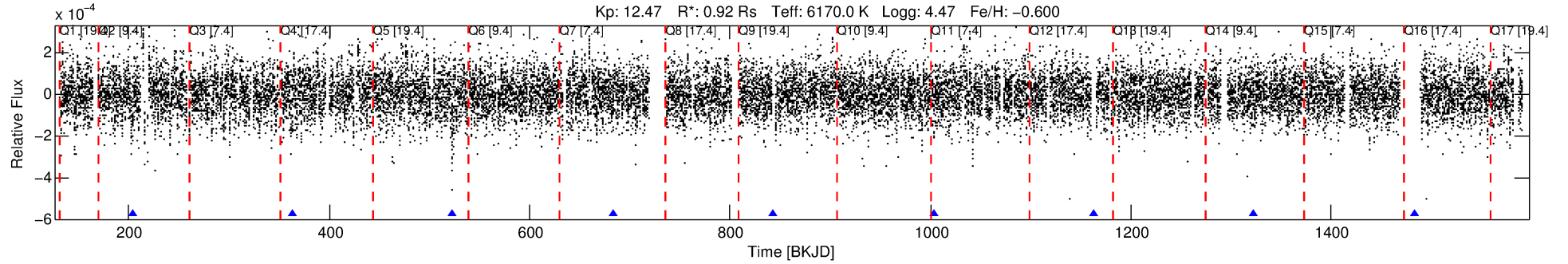
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007624741-04

No Significant Match Found

# DV One-Page Summary

KIC: 7624741 Candidate: 4 of 4 Period: 159.903 d



## DV Fit Results:

Period = 159.90313 [0.00557] d  
Epoch = 203.6055 [0.0988] BKJD  
Rp/R\* = 0.0104 [0.0048]  
a/R\* = 44.46 [104.24]  
b = 0.86 [0.64]  
Seff = 3.52 [0.94]  
Teq = 349 [23] K  
Rp = 1.04 [0.52] Re  
a = 0.5566 [0.0890] AU  
Ag = 6758.84 [6975.90] [0.97 $\sigma$ ]  
Teffp = 4895 [1238] K [3.67 $\sigma$ ]

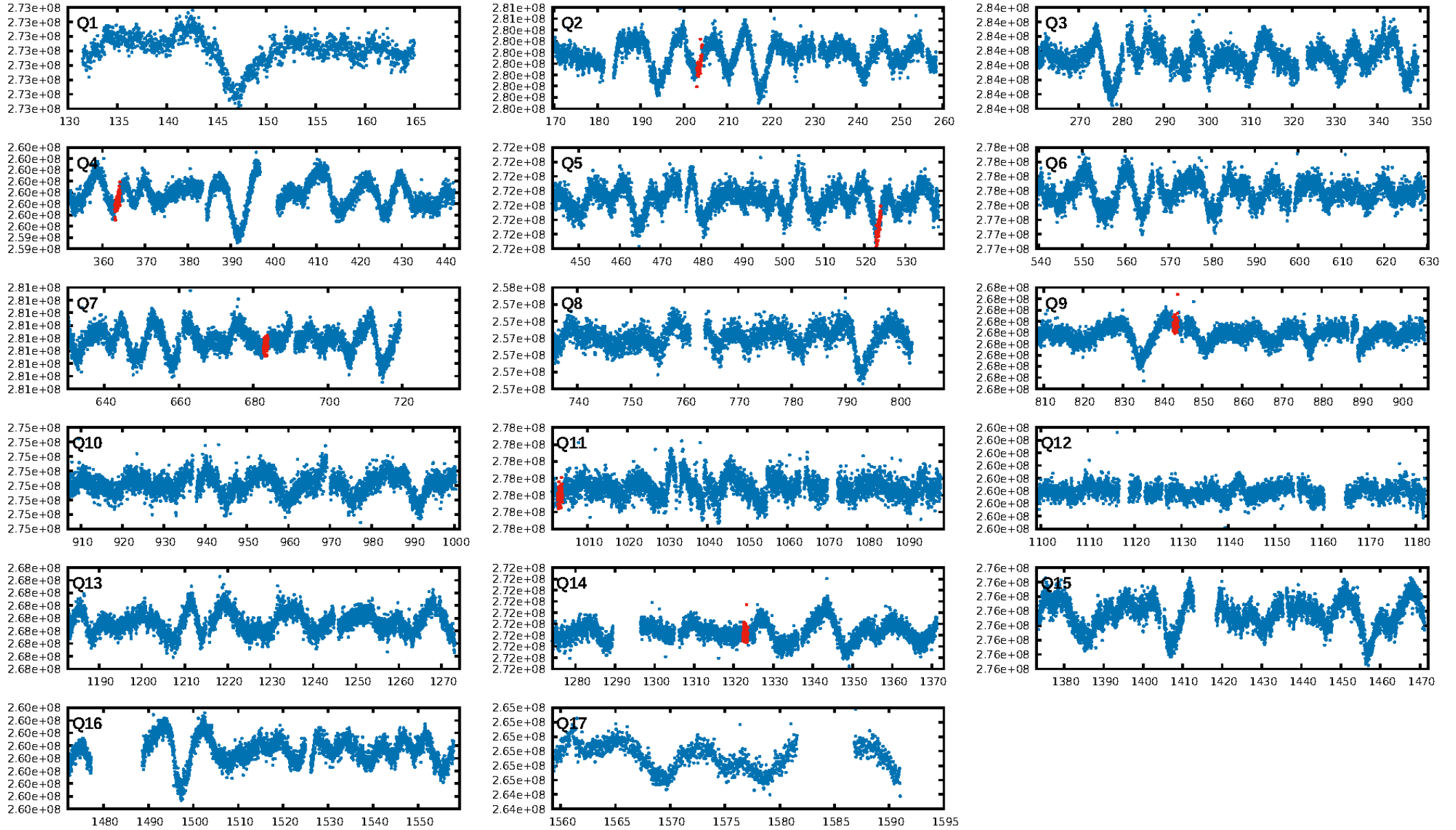
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [76.98 $\sigma$ ]  
LongPeriod-sig: 100.0% [43.86 $\sigma$ ]  
ModelChiSquare2-sig: 0.2%  
ModelChiSquareGof-sig: 99.3%  
Bootstrap-pfa: 6.04e-11  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 1.664  
Centroid-sig: 42.5%  
Centroid-so: 0.853 arcsec [0.82 $\sigma$ ]  
OotOffset-rm: 2.779 arcsec [1.98 $\sigma$ ]  
KicOffset-rm: 2.403 arcsec [1.59 $\sigma$ ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 1.00 [2/2]  
DiffImageOverlap-fno: 0.00 [0/6]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:20:08 Z

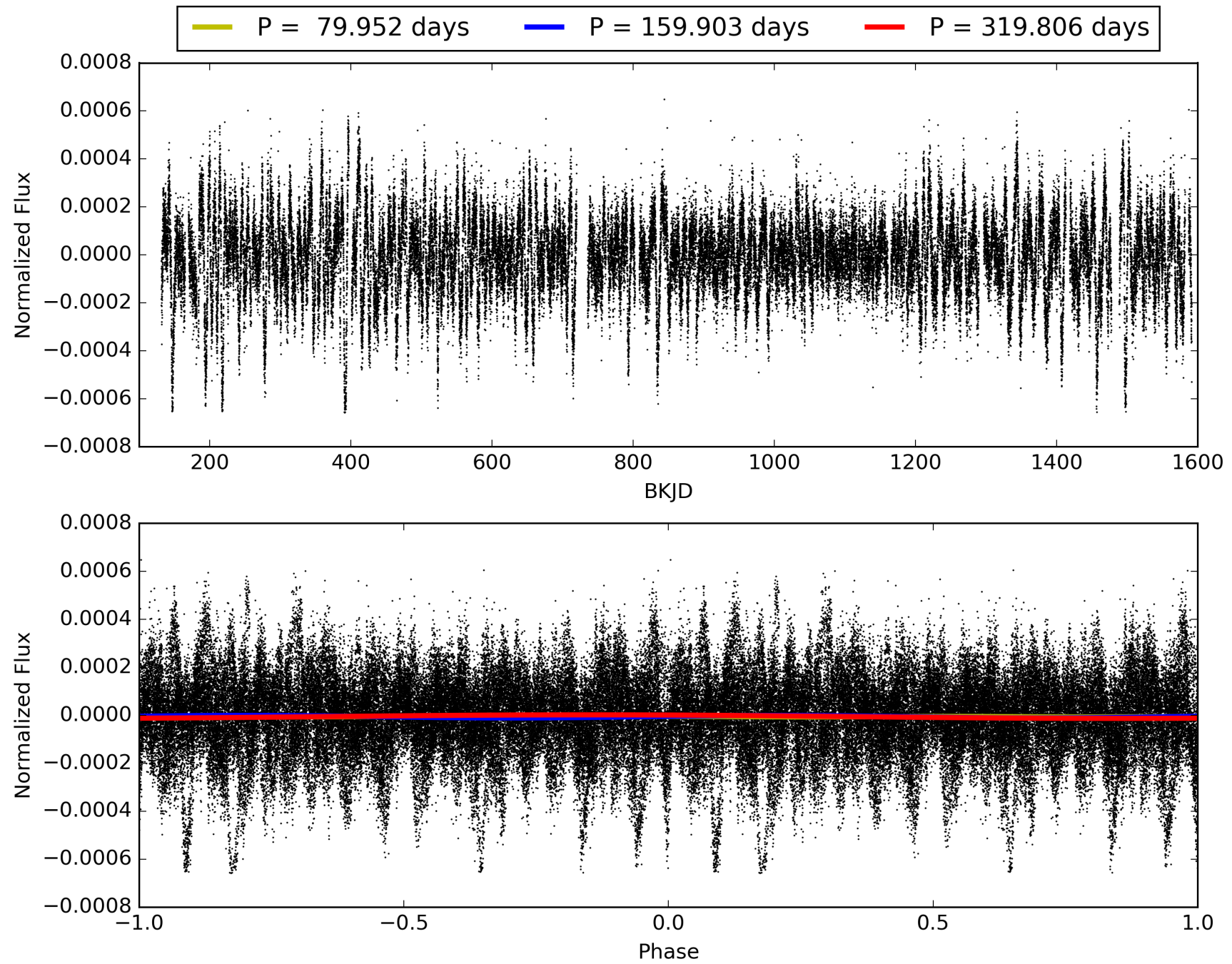
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007624741-04, PDC Light Curves



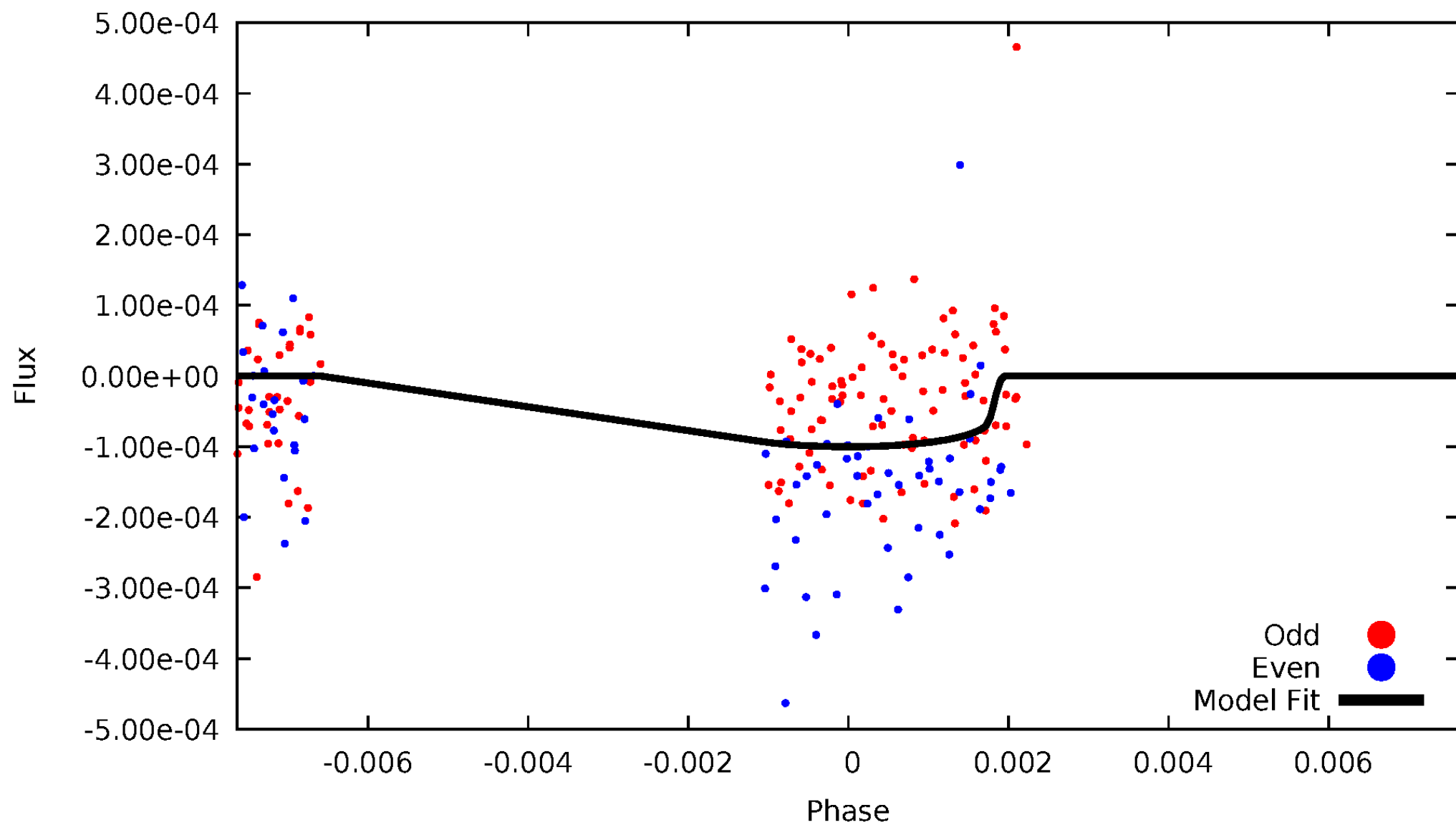


TCE 007624741-04



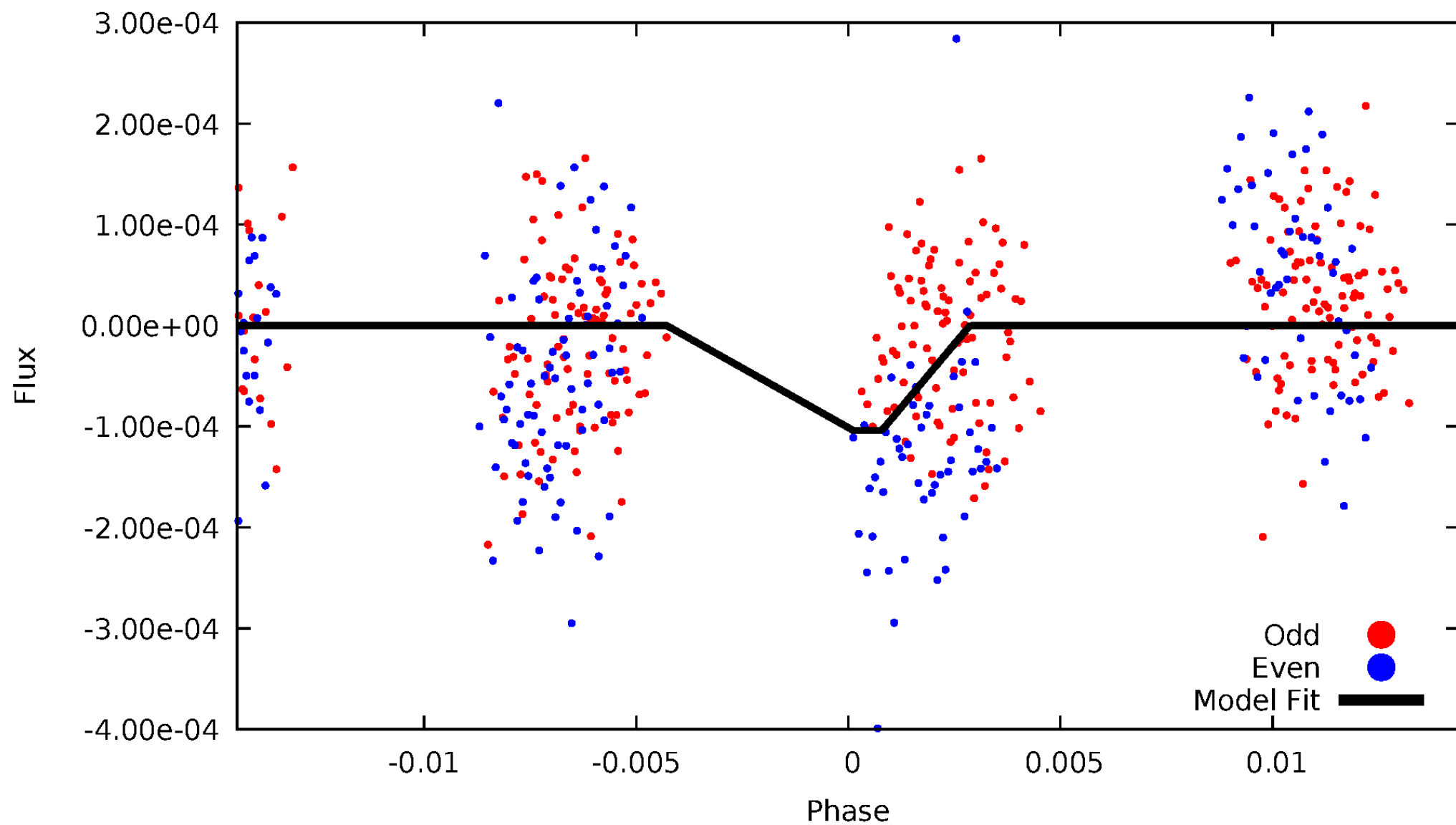
# DV Odd/Even

TCE 007624741-04



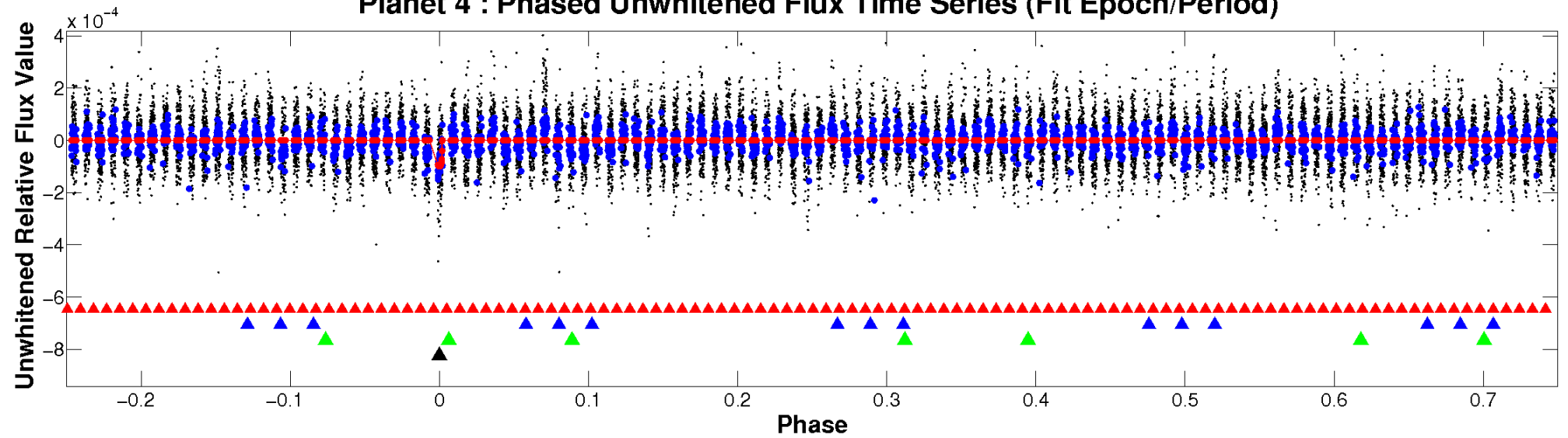
# ALT Odd/Even

TCE 007624741-04

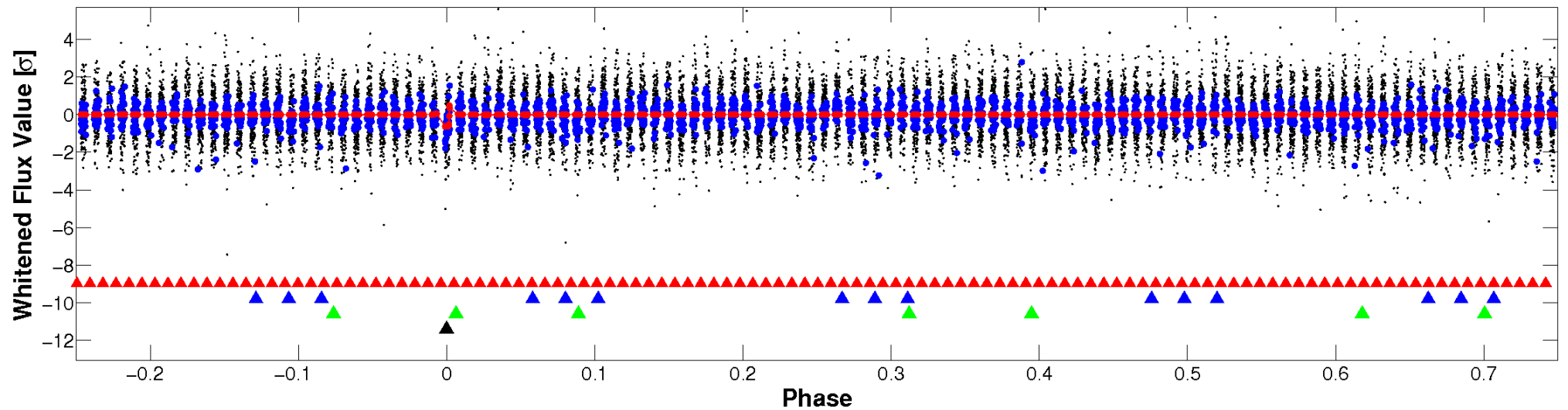


# Non-Whitened Vs. Whitened Light Curve

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

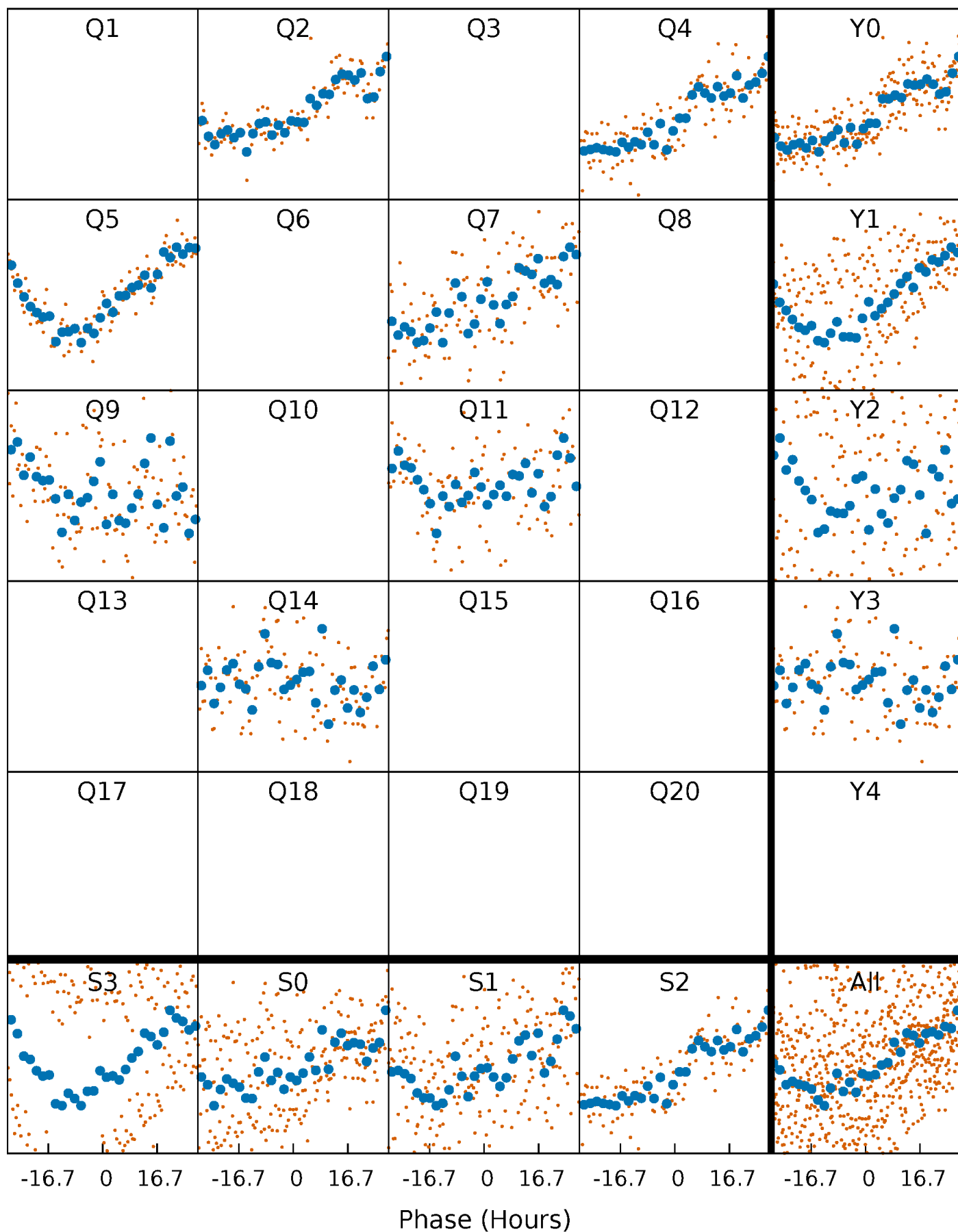


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



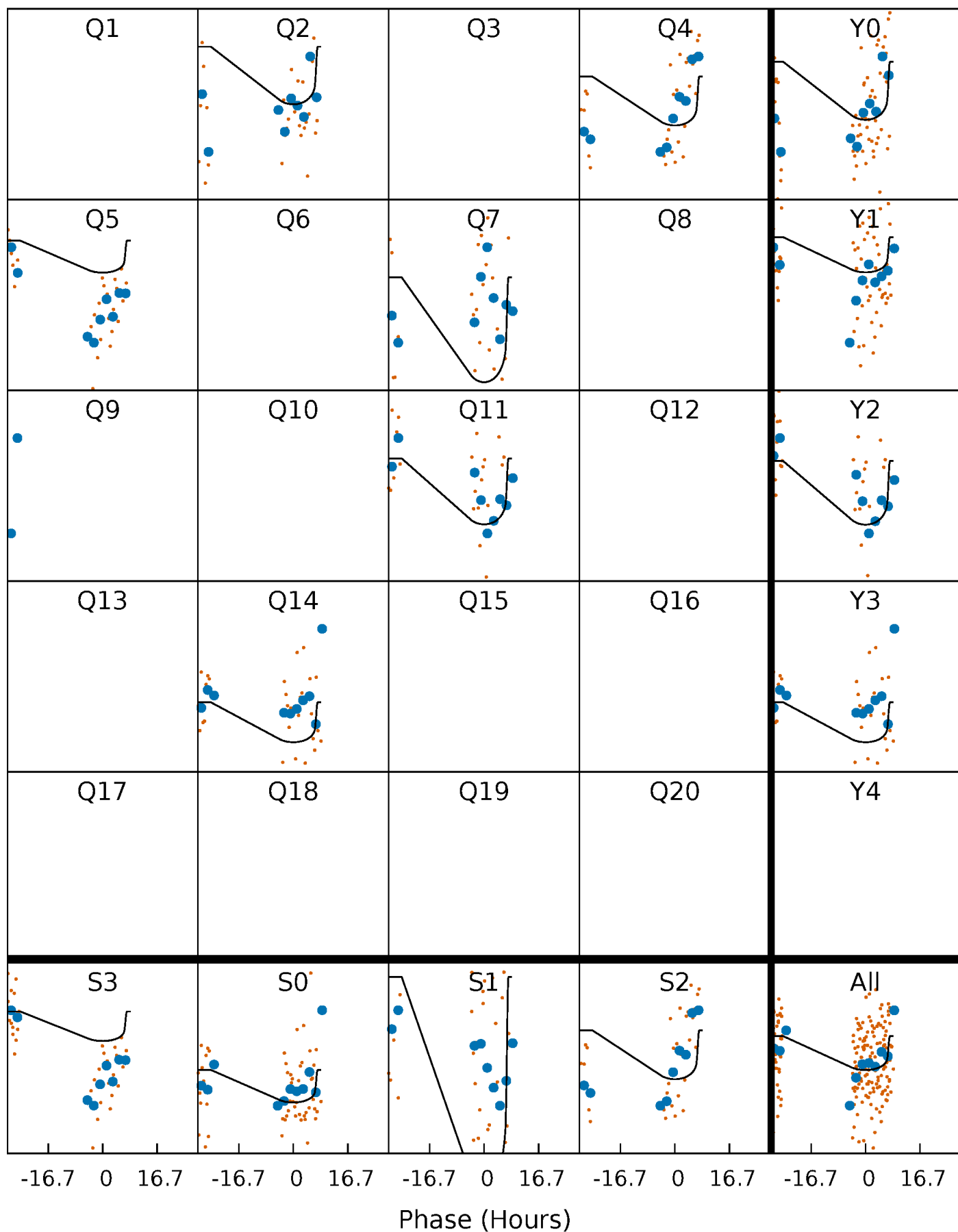
# PDC Quarter-Phased Transit Curves

TCE 007624741-04 P=159.903131 Days  $T_0=203.605495$  (BKJD)



# DV Quarter-Phased Transit Curves

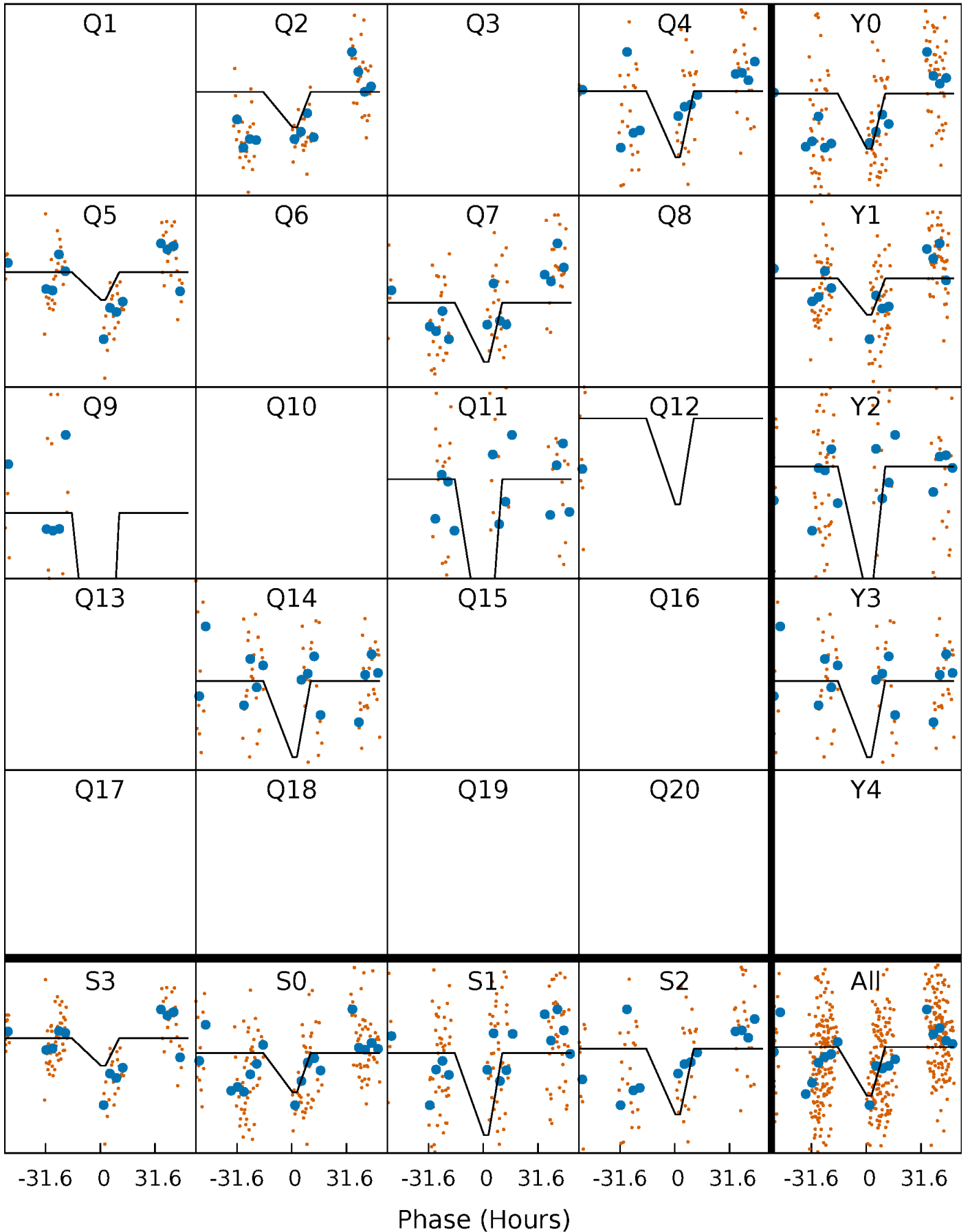
TCE 007624741-04 P=159.903131 Days  $T_0=203.605495$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

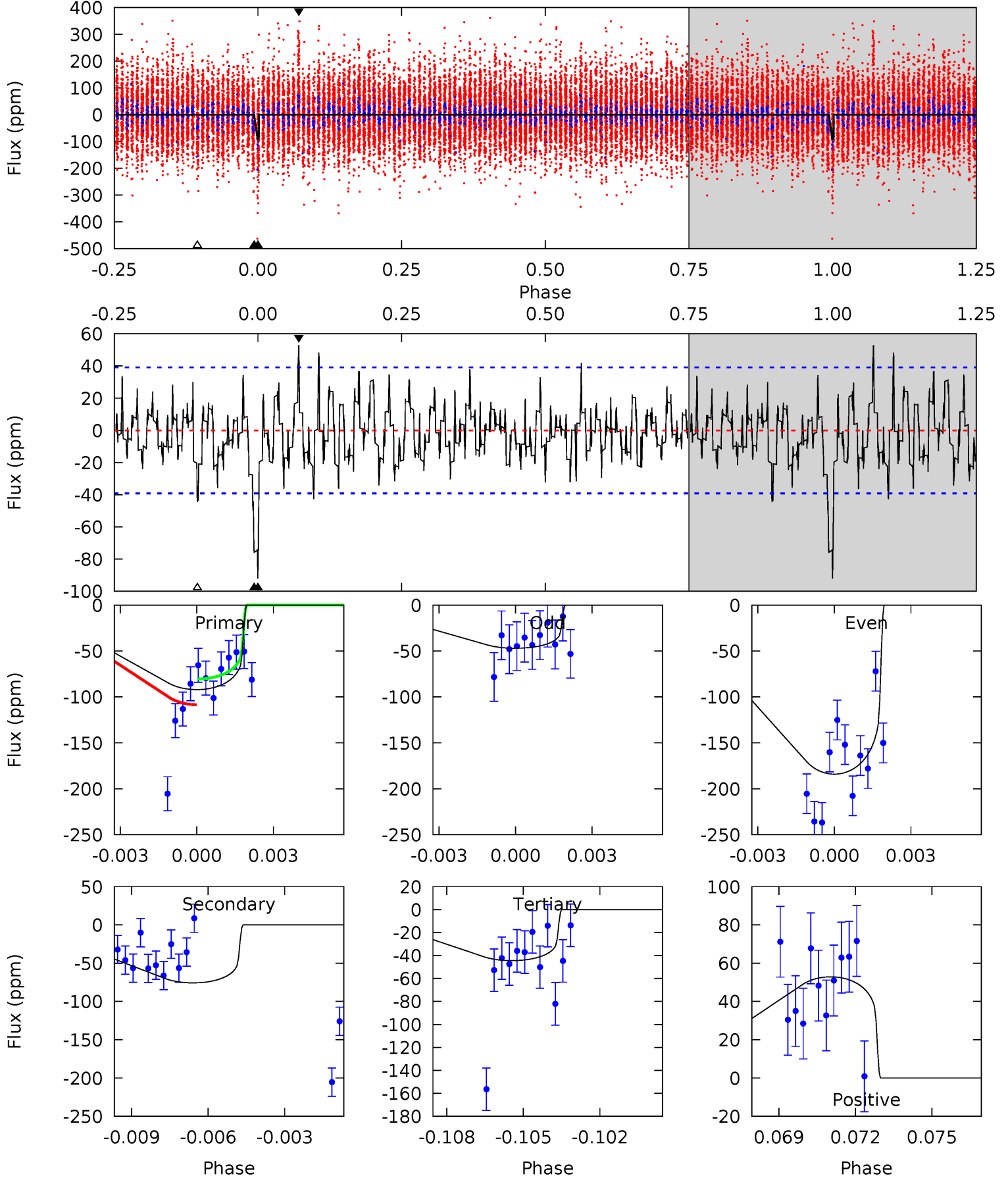
TCE 007624741-04 P=159.876745 Days  $T_0=203.421493$  (BKJD)



# DV Model-Shift Uniqueness Test

007624741-04, P = 159.903131 Days, E = 43.702364 Days

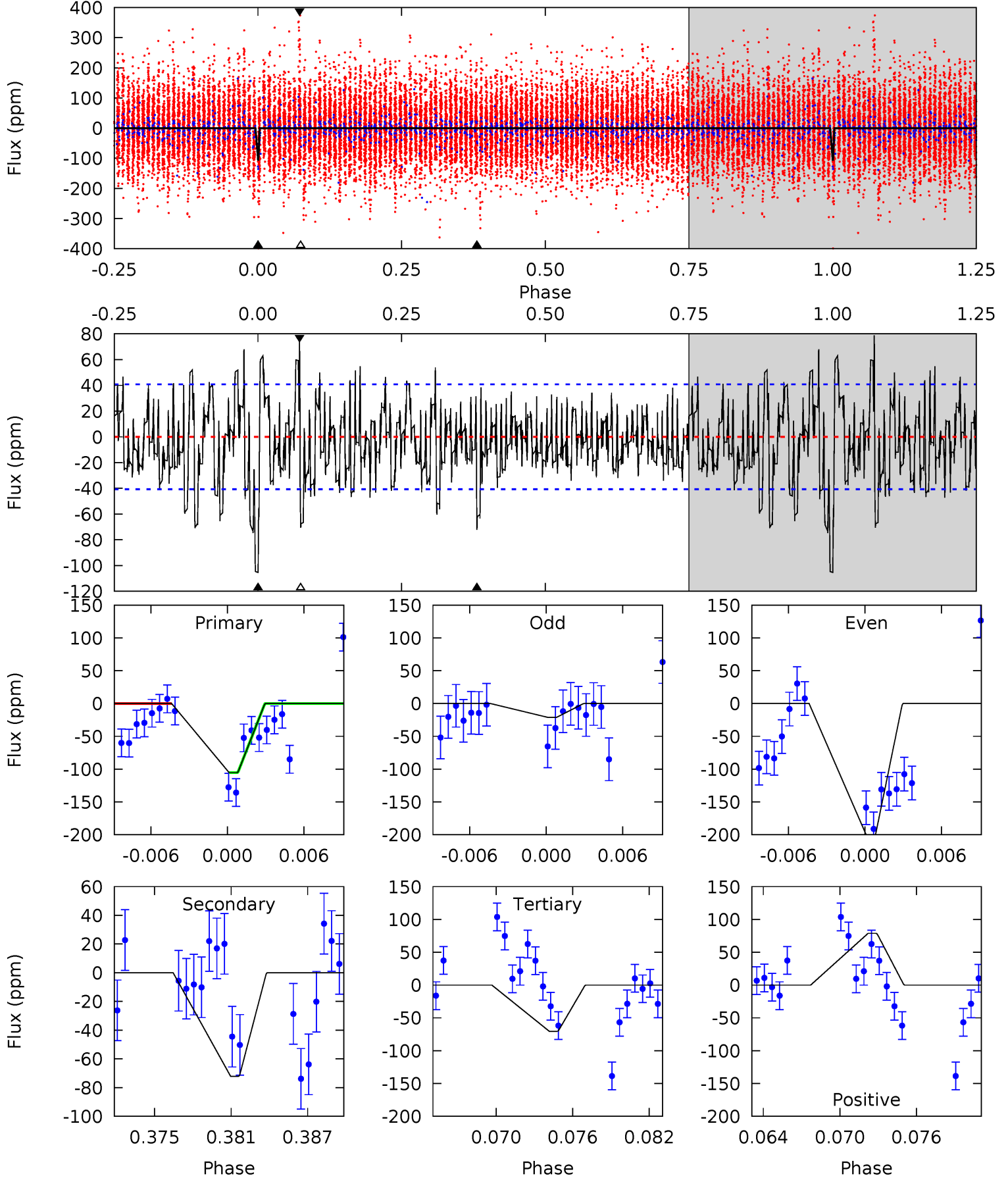
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.3 | 10.2 | 5.96 | 7.09 | 5.25            | 2.97            | 2.01             | 6.38    | 5.25    | 4.20    | 3.07    | 8.67    | 1.26 | 0.36  | 1.79 |



# Alt Model-Shift Uniqueness Test

007624741-04, P = 159.876745 Days, E = 43.544748 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 |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 13.3 | 9.08 | 8.87 | 9.91 | 5.13            | 2.76            | 2.52             | 4.39    | 3.35    | 0.21    | -0.83   | 11.1    | 2.65 | 0.43  | 0   |



### Stellar Parameters For KIC 007624741

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6170^{+168}_{-186}$ | $4.468^{+0.077}_{-0.132}$ | $-0.600^{+0.300}_{-0.300}$ | $0.916^{+0.170}_{-0.099}$ | $0.898^{+0.095}_{-0.095}$ | $1.645^{+0.607}_{-0.619}$                 |
|        | +3%/-3%              | +2%/-3%                   | +50%/-50%                  | +19%/-11%                 | +11%/-11%                 | +37%/-38%                                 |
| Source | PHO1                 | FLK73                     | 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 007624741-04 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{max} (K)$     | $T_{obs} (K)$         | $A_{obs}$                |
|---------|-------------|------------------------|-------------------|-----------------------|--------------------------|
| DV      | $-76 \pm 7$ | $1.07^{+0.49}_{-0.48}$ | $491^{+26}_{-24}$ | $5606^{+1970}_{-835}$ | $11376^{+24702}_{-6189}$ |
| Alt.    | $-72 \pm 8$ | $1.03^{+0.53}_{-0.44}$ | $490^{+26}_{-22}$ | $5603^{+2094}_{-892}$ | $11320^{+24669}_{-6343}$ |

$T_{max}$  = 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

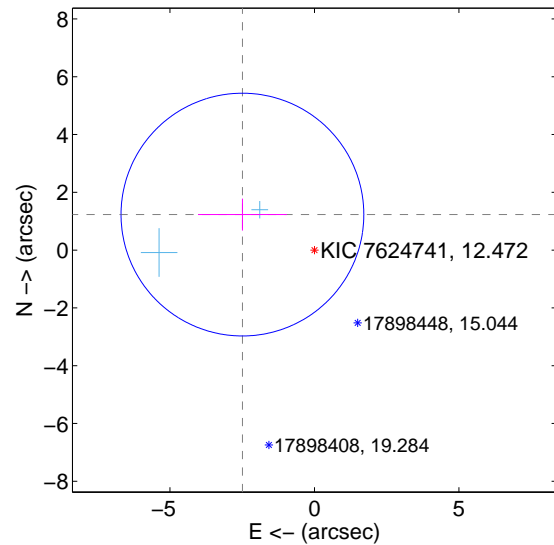
Supplemental centroid analysis for 007624741-04. Kepler magnitude: 12.47. Transit SNR 6.74

There are 2 quarters with good PRF difference image offsets

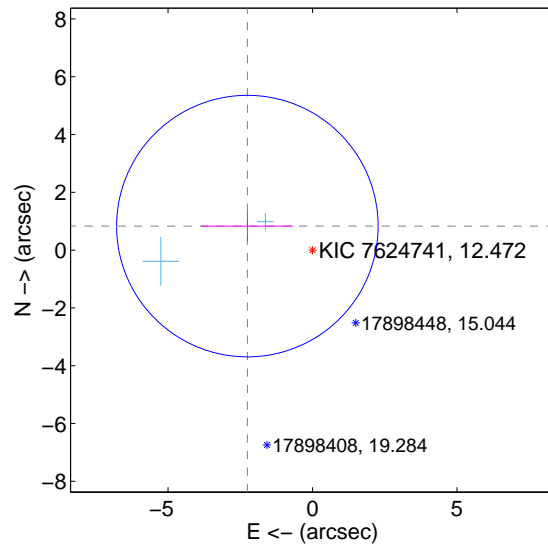
The direct PRF centroid is offset from the target star catalog position by about 0.49 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $2.779 \pm 1.400$  | 1.98                | $2.492 \pm 1.537$ | $1.229 \pm 0.552$ |
| PRF-fit source offset from KIC position | $2.403 \pm 1.509$  | 1.59                | $2.255 \pm 1.597$ | $0.831 \pm 0.512$ |
| photometric centroid source offset      | $0.85 \pm 1.04$    | 0.82                | $0.75 \pm 1.02$   | $-0.40 \pm 1.11$  |

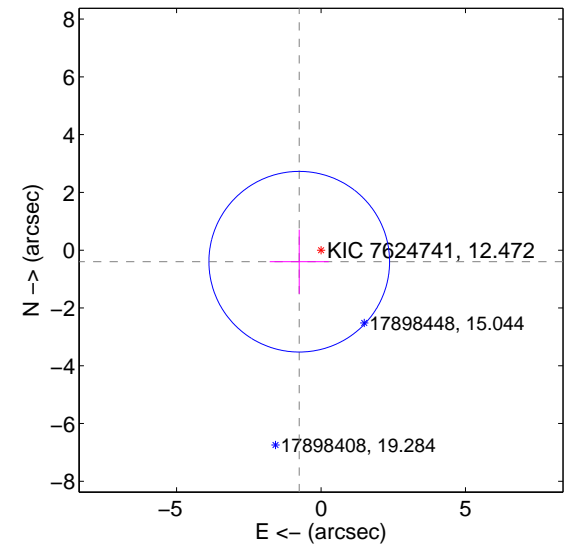
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

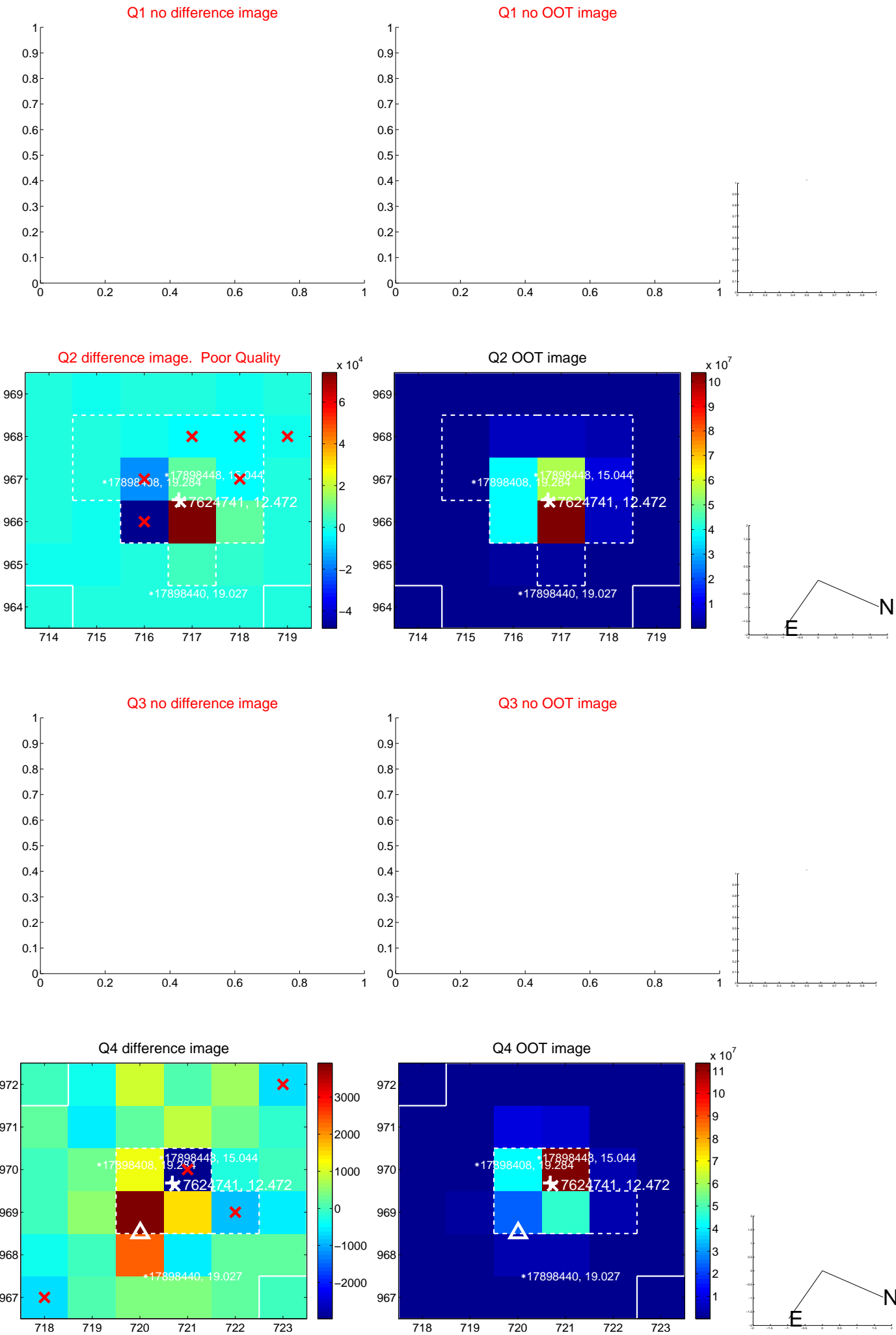


offset from photometric centroids

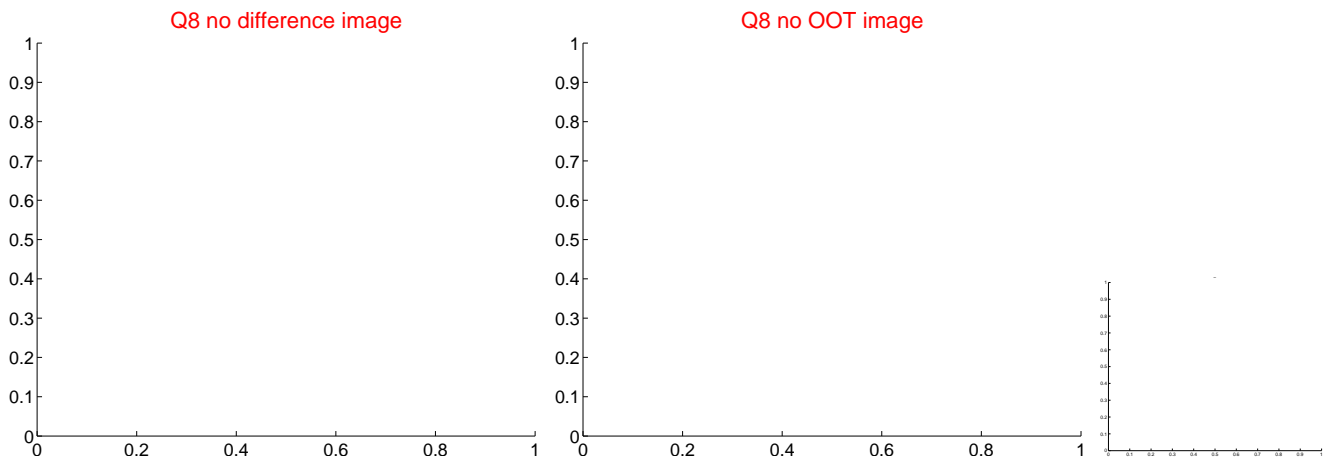
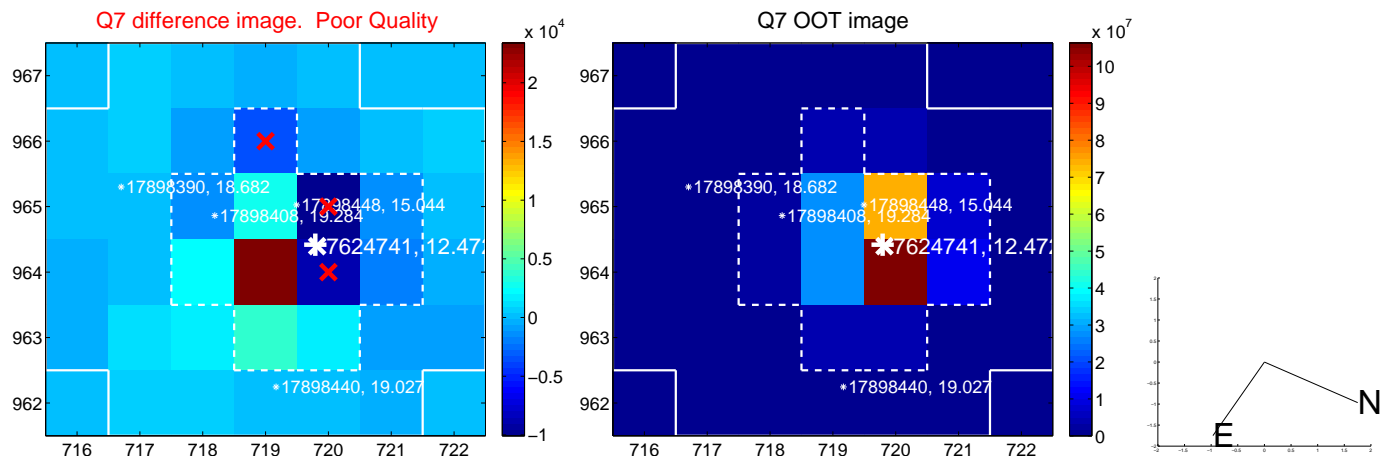
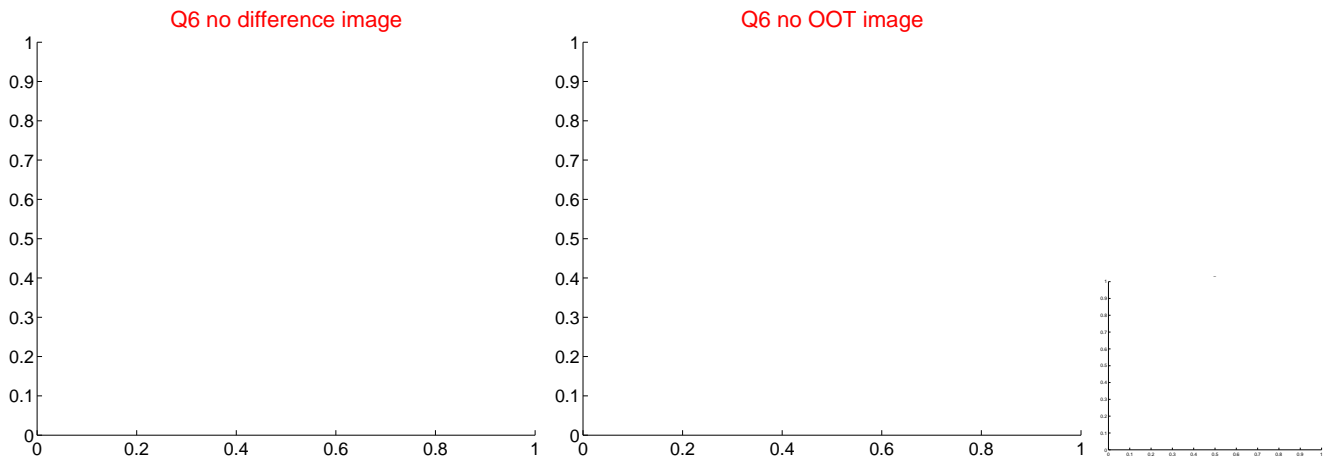
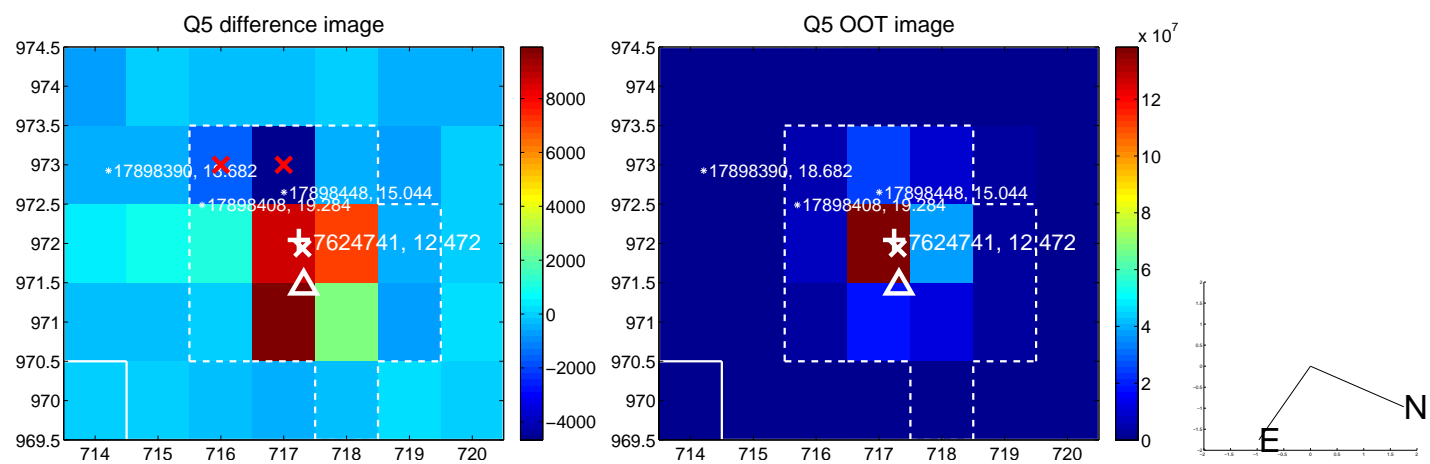


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

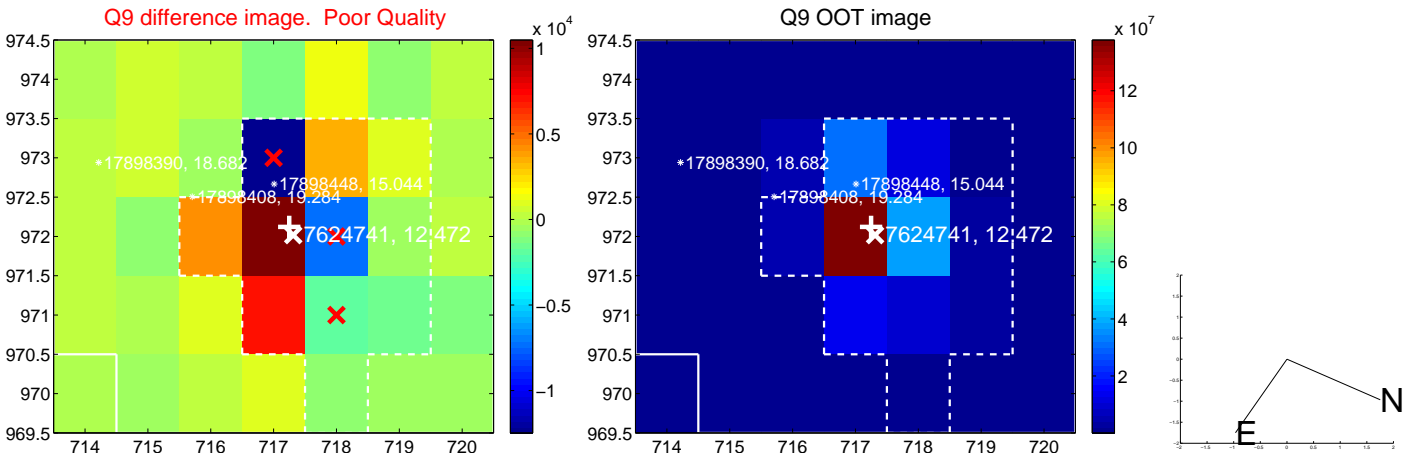


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

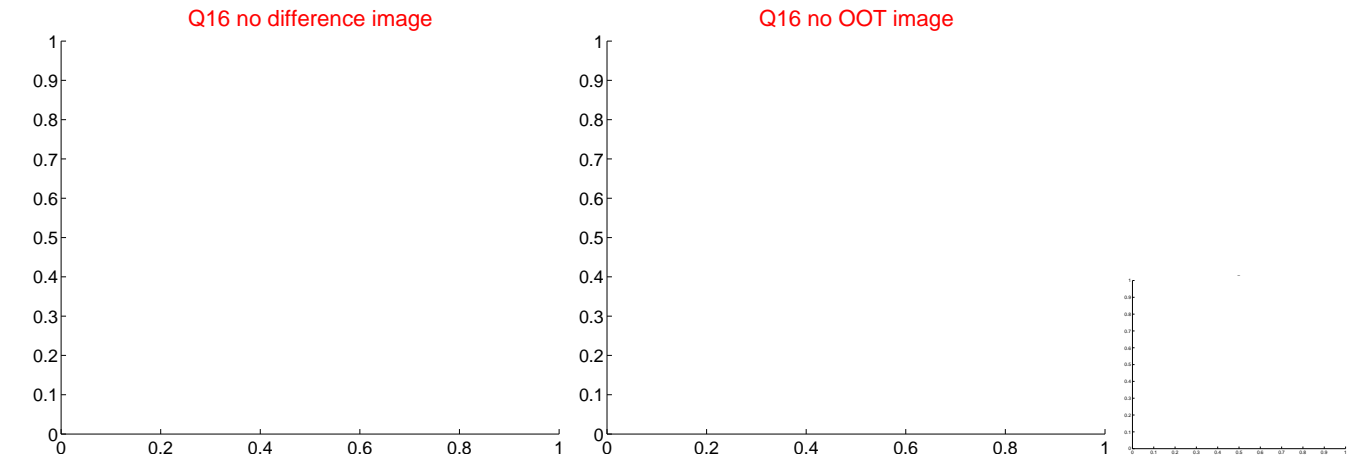
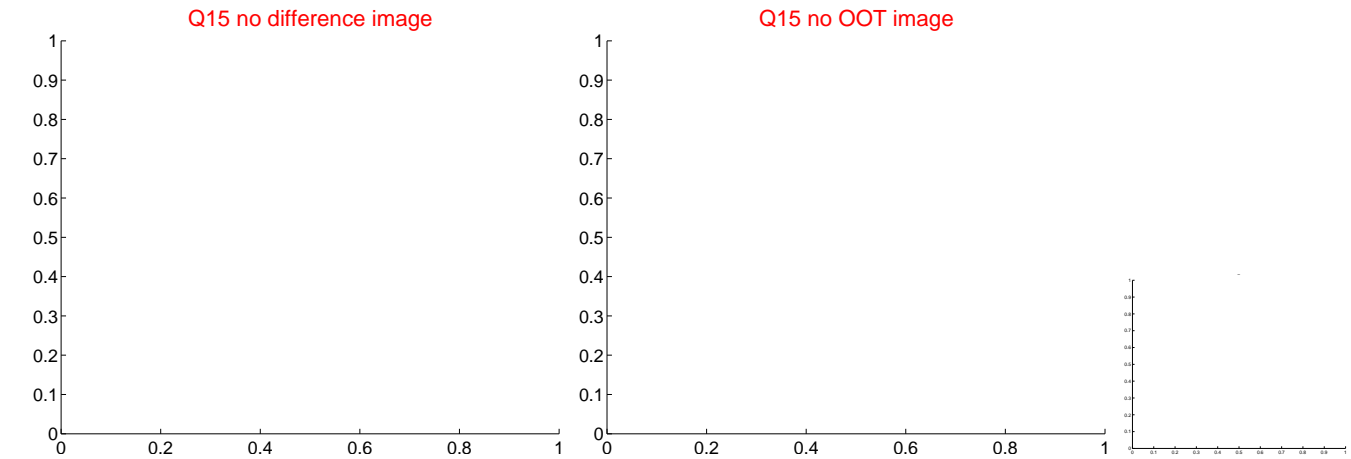
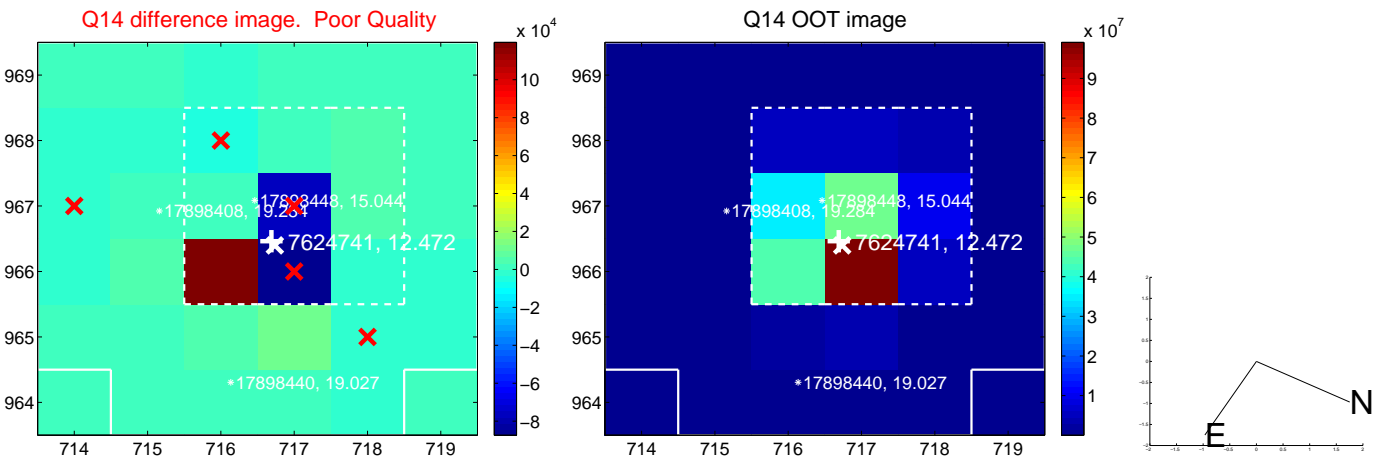
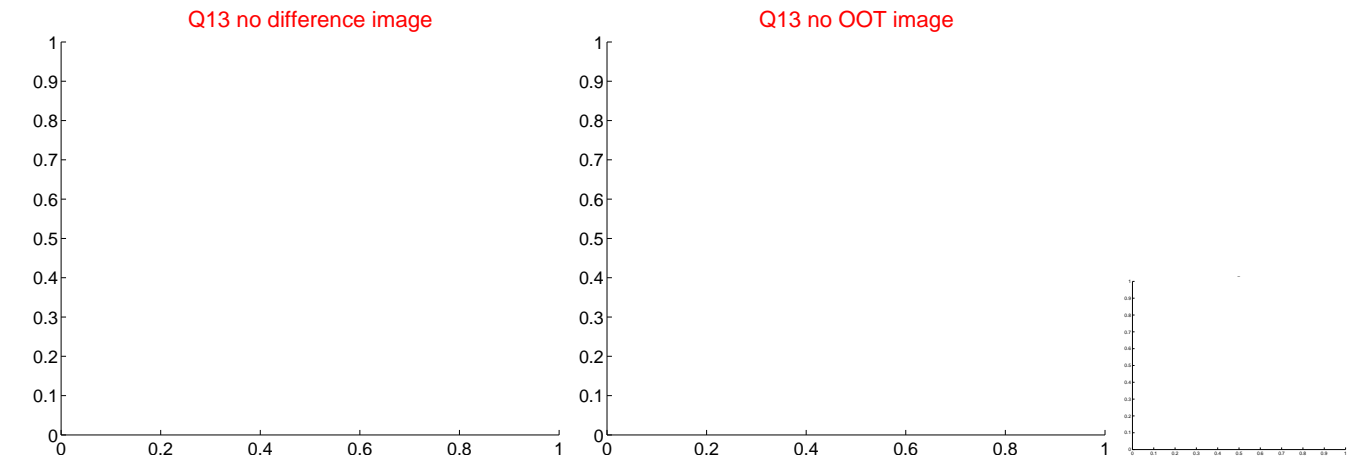




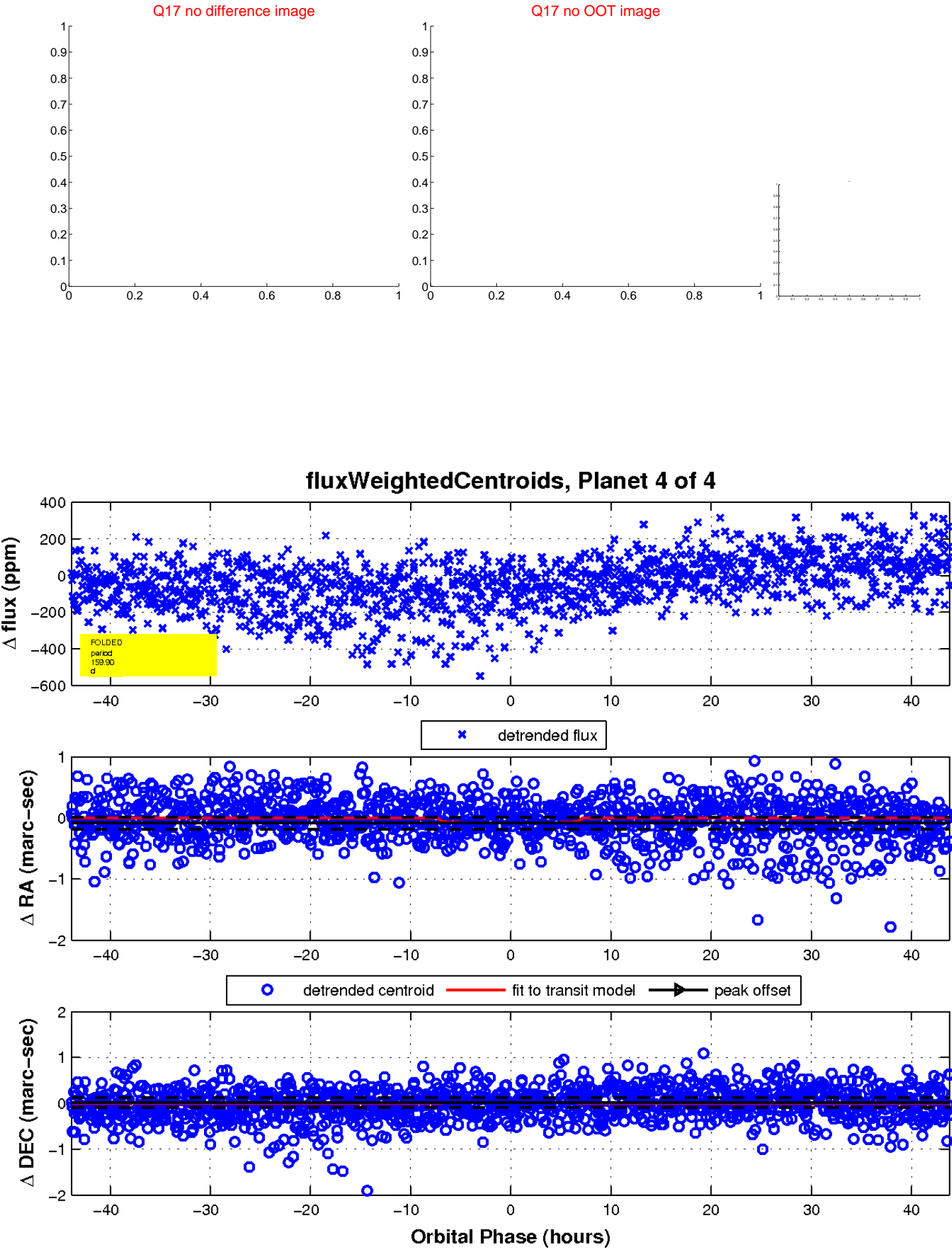
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



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



UKIRT Image

Declination

