

# KIC 005707897

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005707897-01 | OBS      | No   | 8.415380      | 139.861334   | 31.0        | 16.956           | 13.5 | 13.4 | 1.19                        | 6363            | 0.80                   | 303.97                 |
| 005707897-02 | OBS      | No   | 374.129579    | 192.517826   | 174.8       | 19.646           | 10.0 | 10.0 | 1.19                        | 6363            | 2.05                   | 1.93                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 005707897-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV  |
| 005707897-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—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.

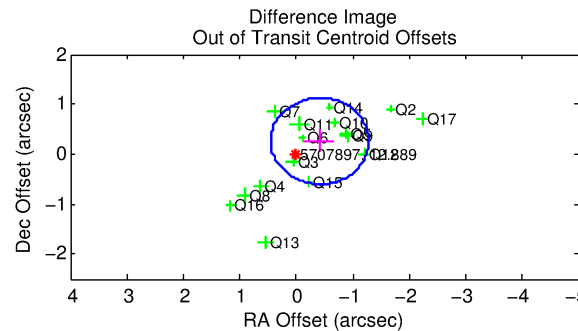
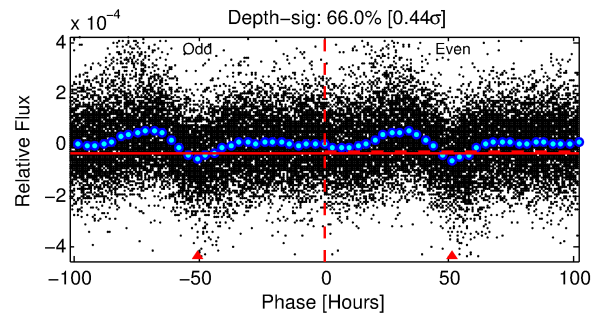
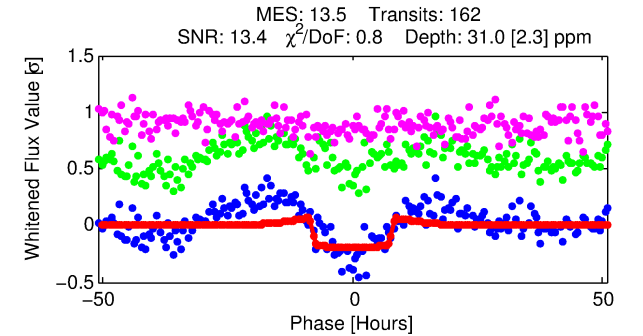
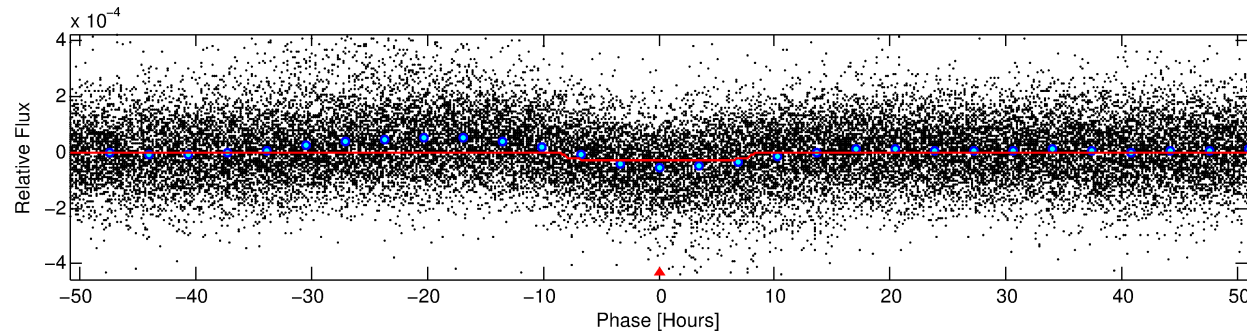
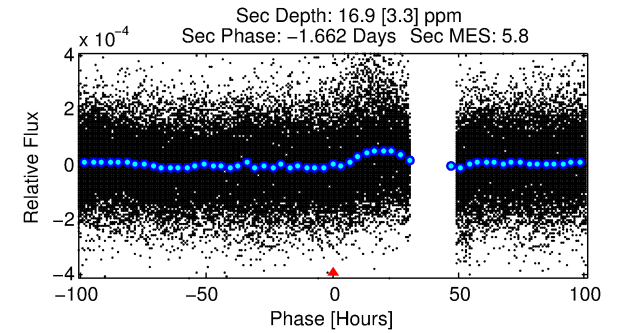
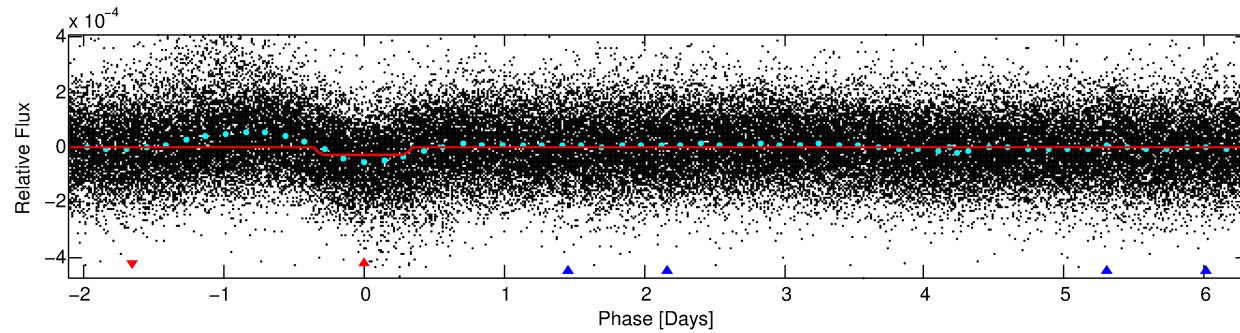
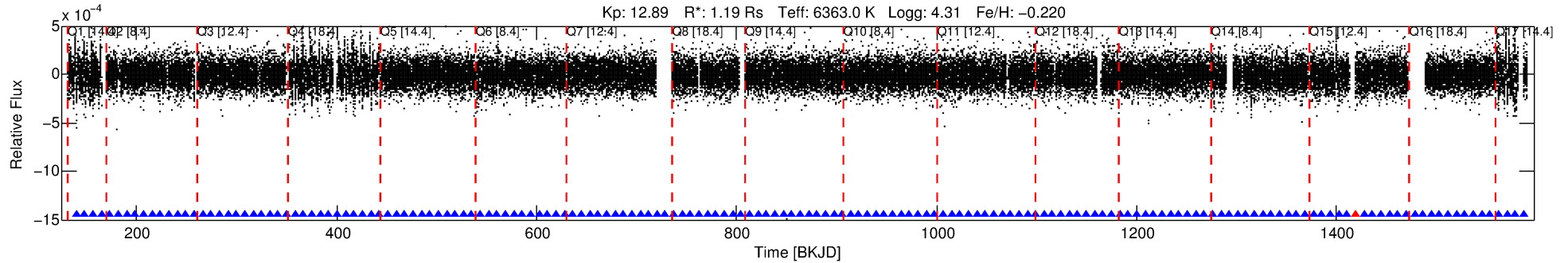
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005707897-01

No Significant Match Found

# DV One-Page Summary

KIC: 5707897 Candidate: 1 of 2 Period: 8.415 d



## DV Fit Results:

Period = 8.41538 [0.00015] d  
Epoch = 139.8613 [0.0137] BKJD  
Rp/R\* = 0.0062 [0.0005]  
a/R\* = 1.71 [0.44]  
b = 0.93 [0.05]  
Seff = 303.97 [85.62]  
Teff = 1065 [75] K  
Rp = 0.80 [0.18] Re  
a = 0.0824 [0.0147] AU  
Ag = 98.80 [35.35] [2.77σ]  
Teffp = 5190 [362] K [11.16σ]

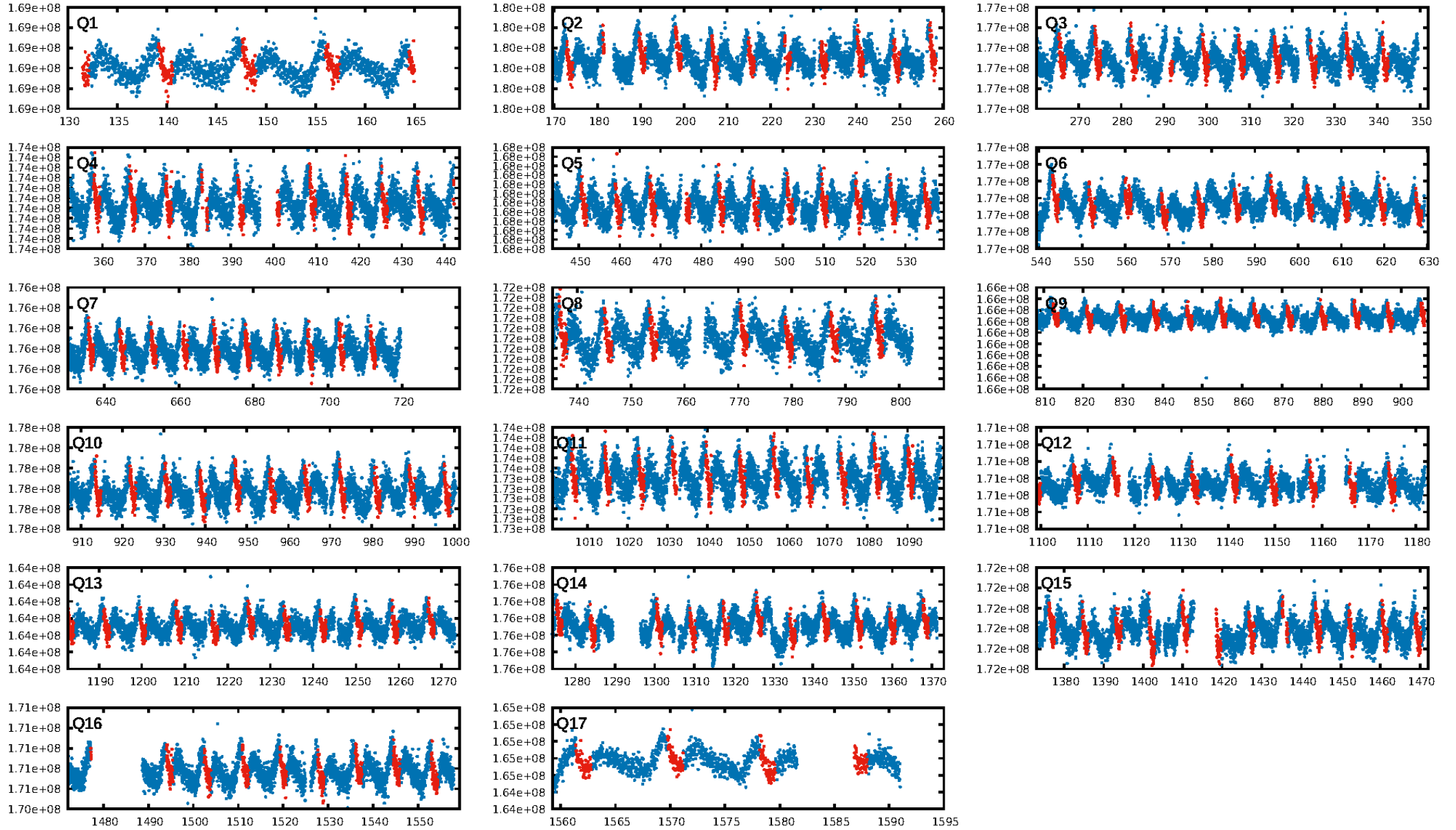
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [338.21σ]  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.67e-35  
RollingBand-fgt: 0.99 [152/153]  
GhostDiagnostic-chr: 4.315  
Centroid-sig: 49.8%  
Centroid-so: 0.836 arcsec [0.74σ]  
OotOffset-rm: 0.486 arcsec [1.69σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-rm: 0.506 arcsec [1.82σ]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [17/17]

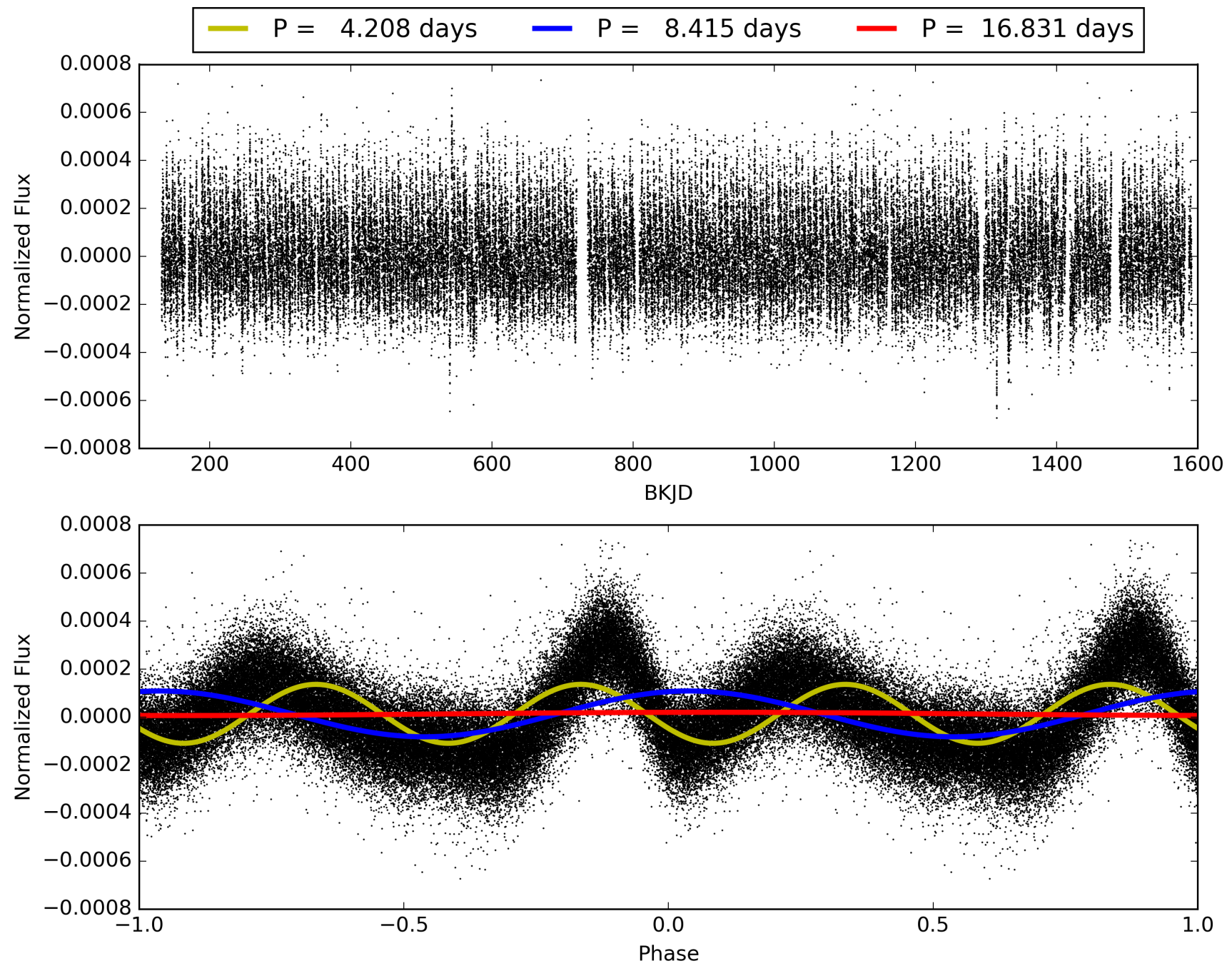
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 20:05:20 Z

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

# TCE 005707897-01, PDC Light Curves

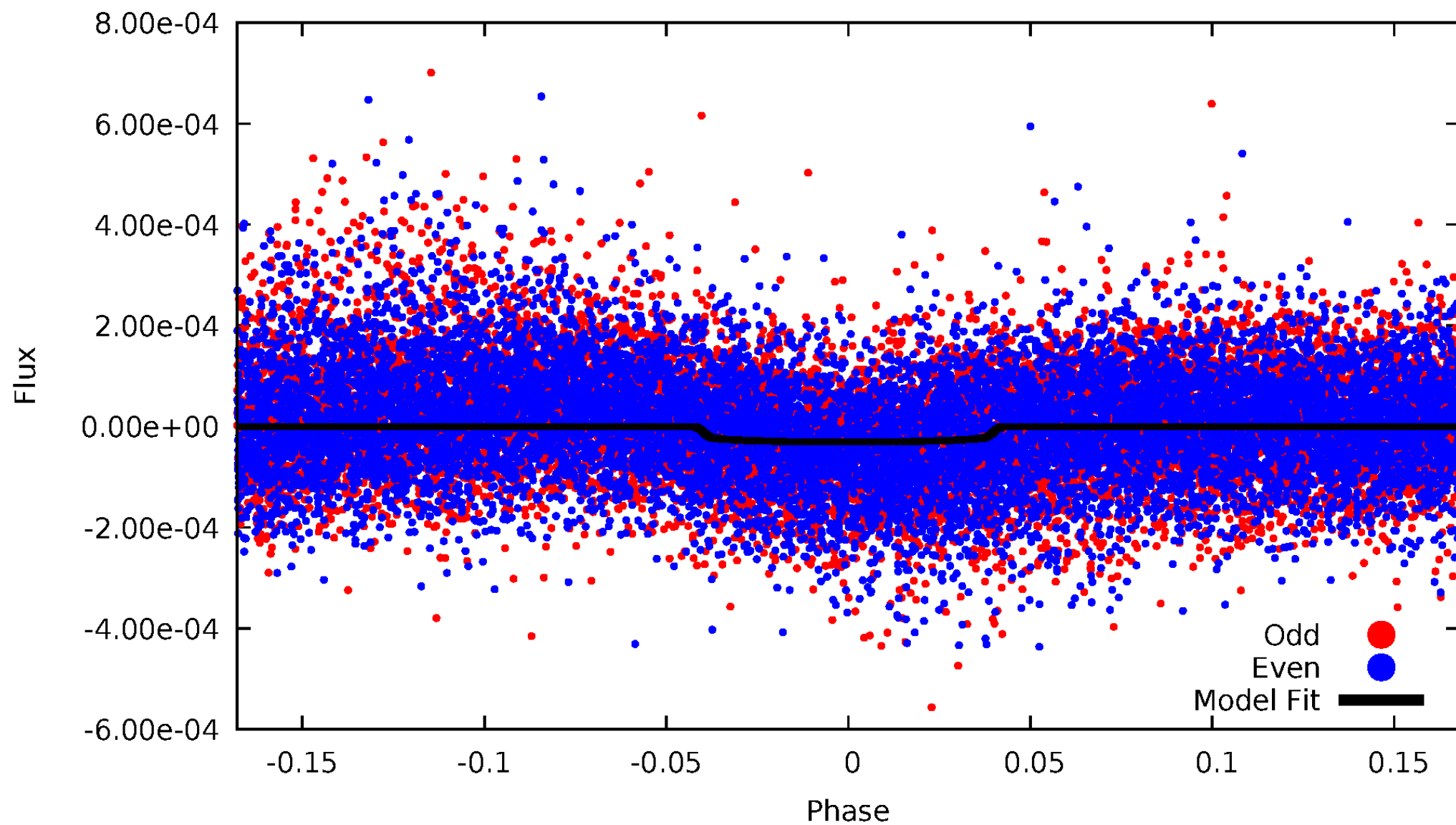


TCE 005707897-01



# DV Odd/Even

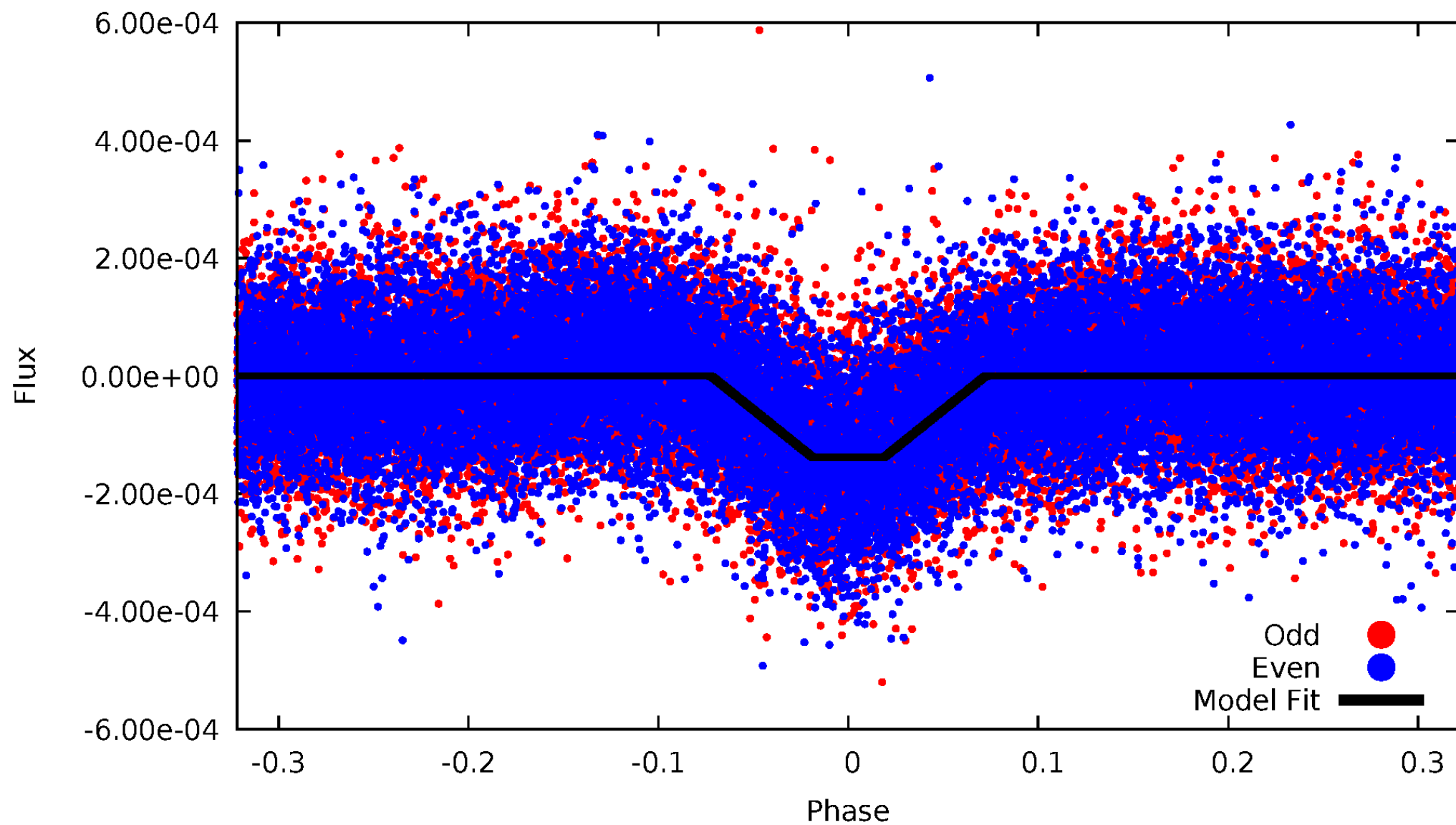
TCE 005707897-01



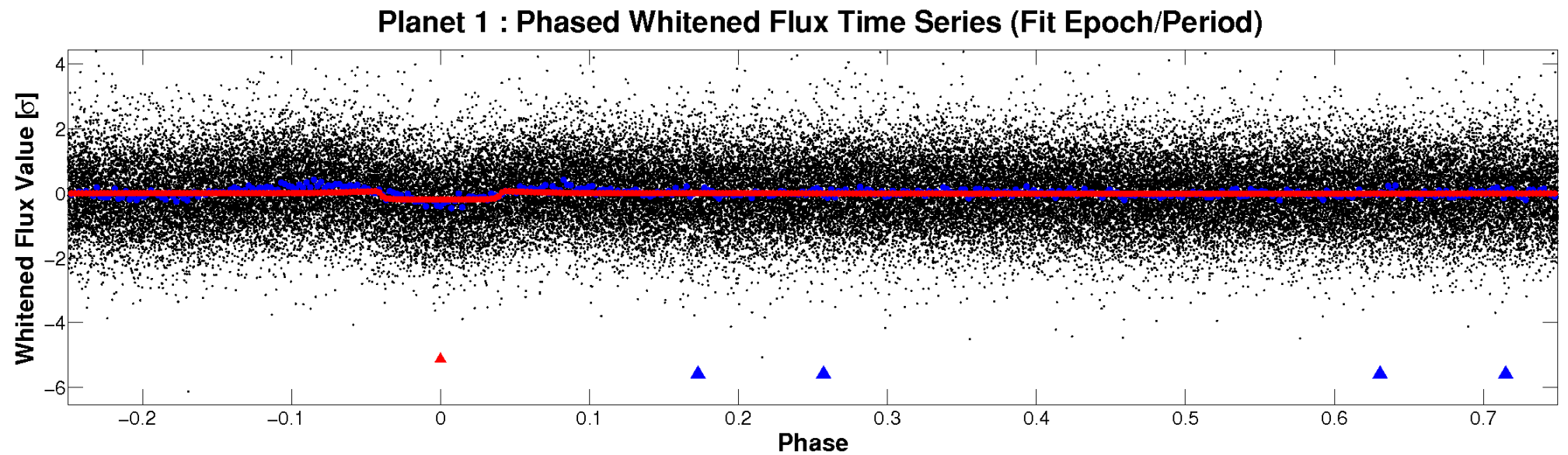
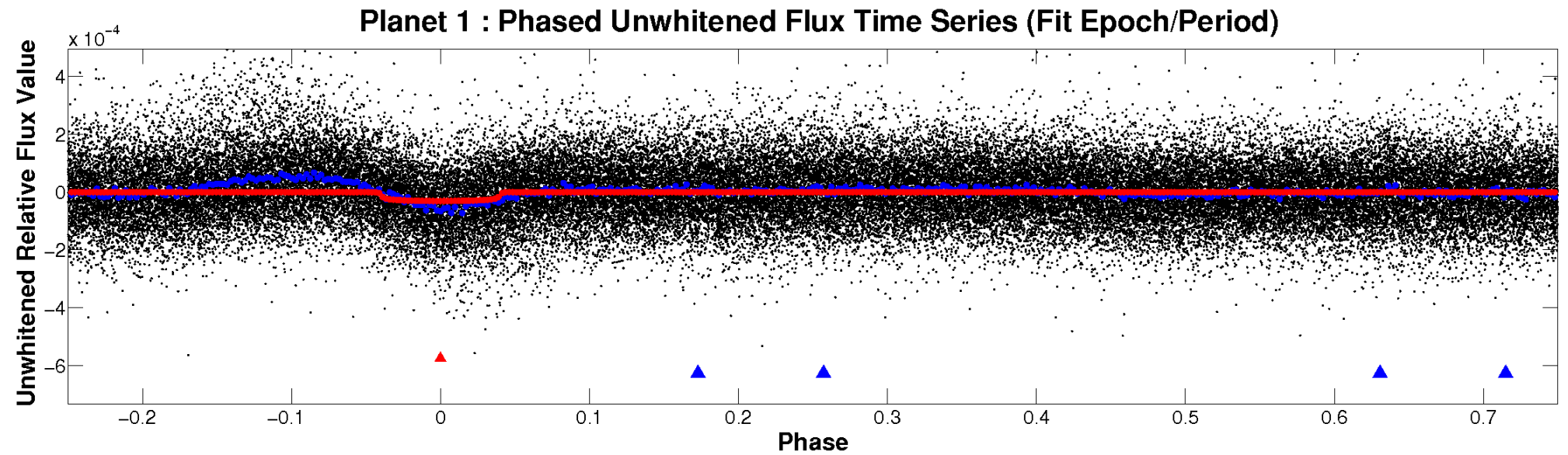


# ALT Odd/Even

TCE 005707897-01

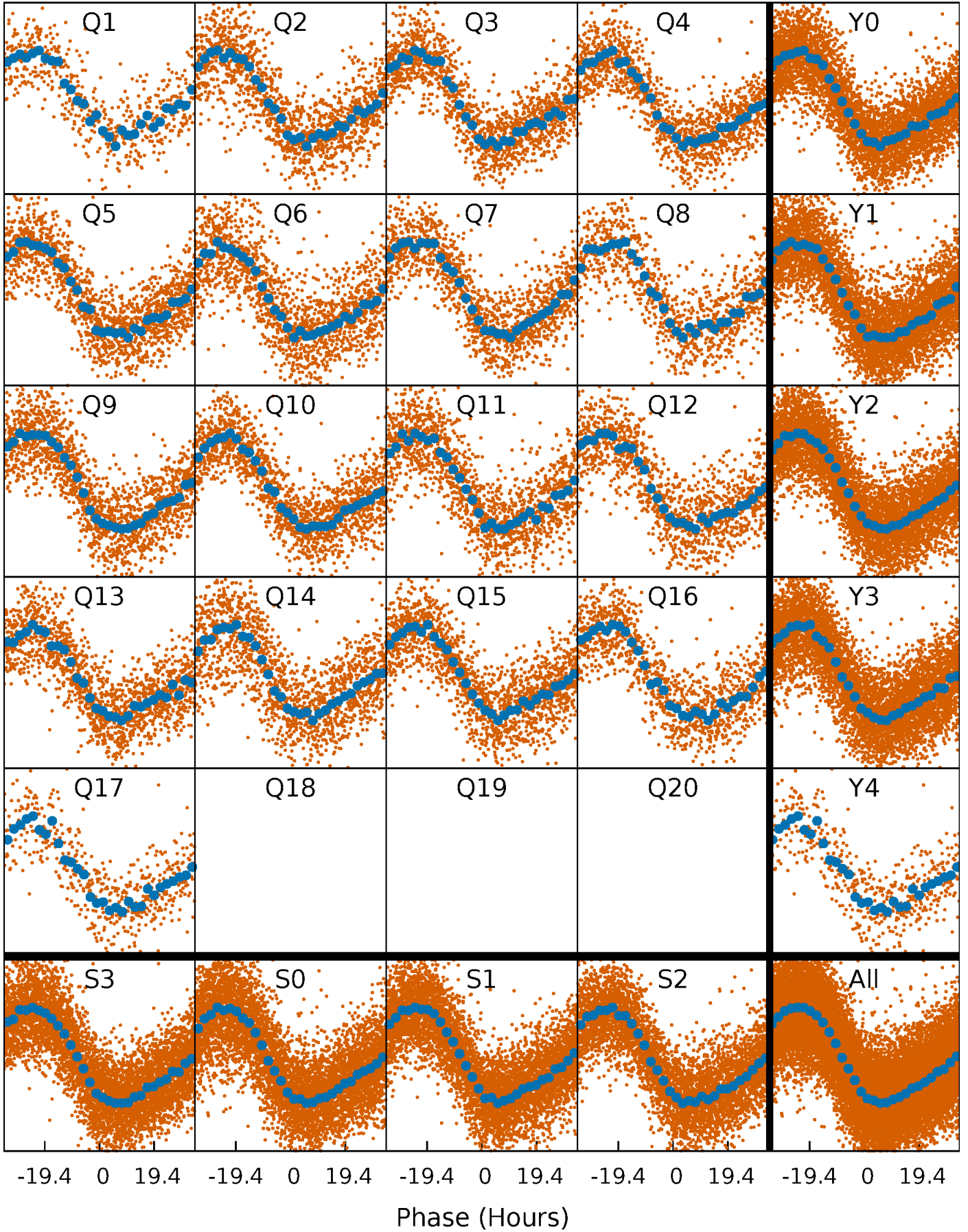


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

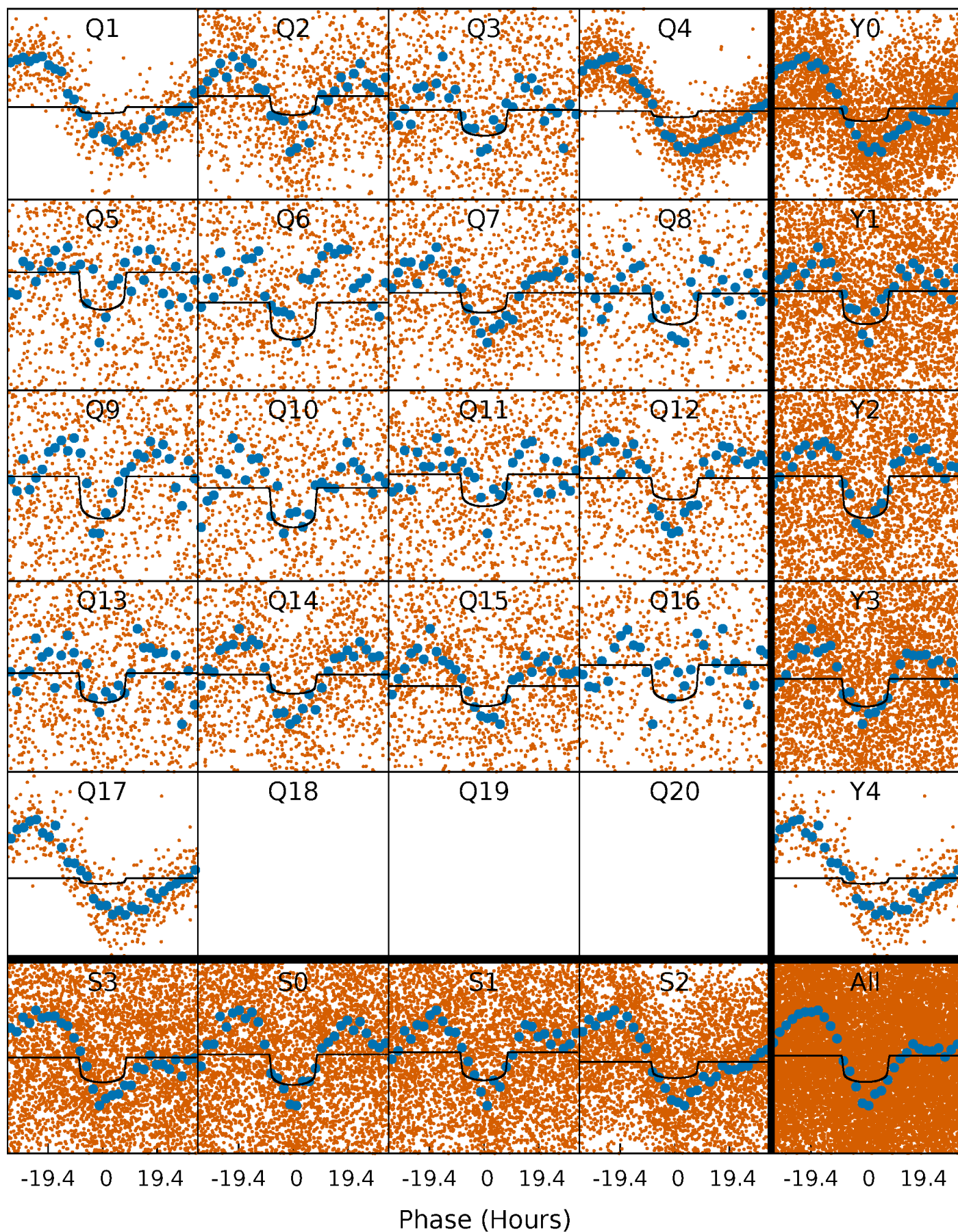
TCE 005707897-01   P= 8.415380 Days    $T_0=139.861334$  (BKJD)





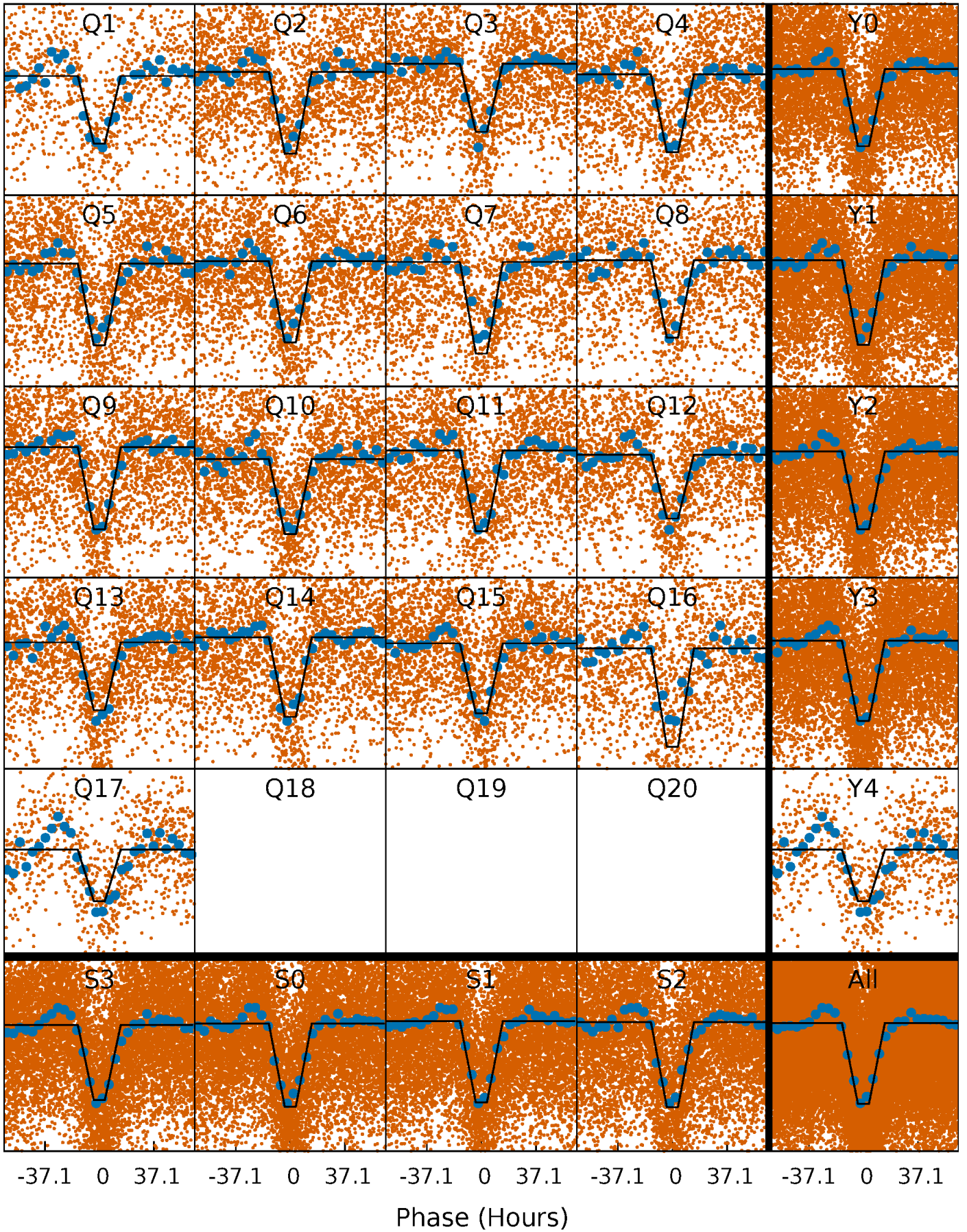
# DV Quarter-Phased Transit Curves

TCE 005707897-01 P= 8.415380 Days  $T_0=139.861334$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005707897-01 P= 8.415681 Days  $T_0=139.904436$  (BKJD)

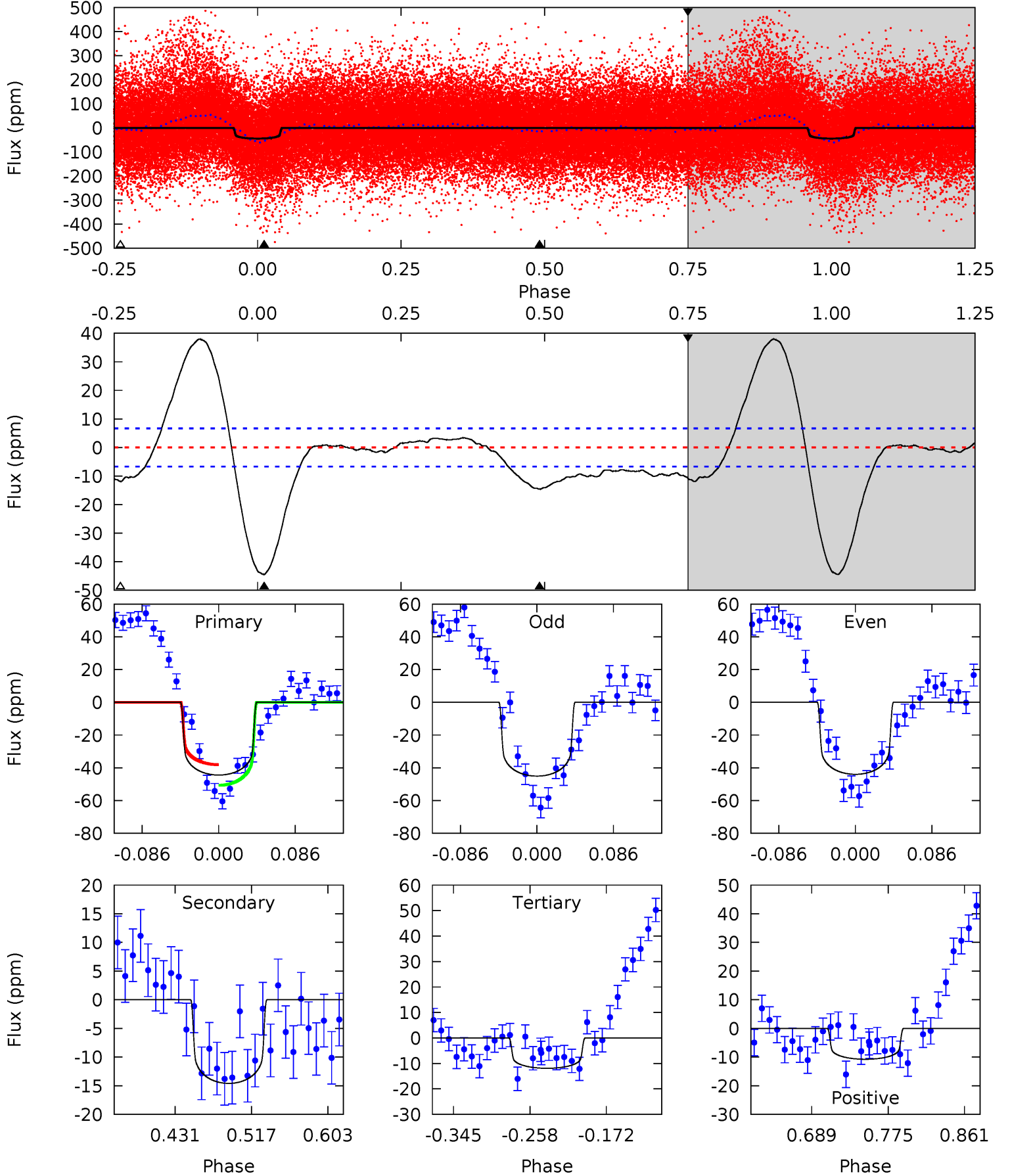




# DV Model-Shift Uniqueness Test

005707897-01, P = 8.415380 Days, E = 131.445954 Days

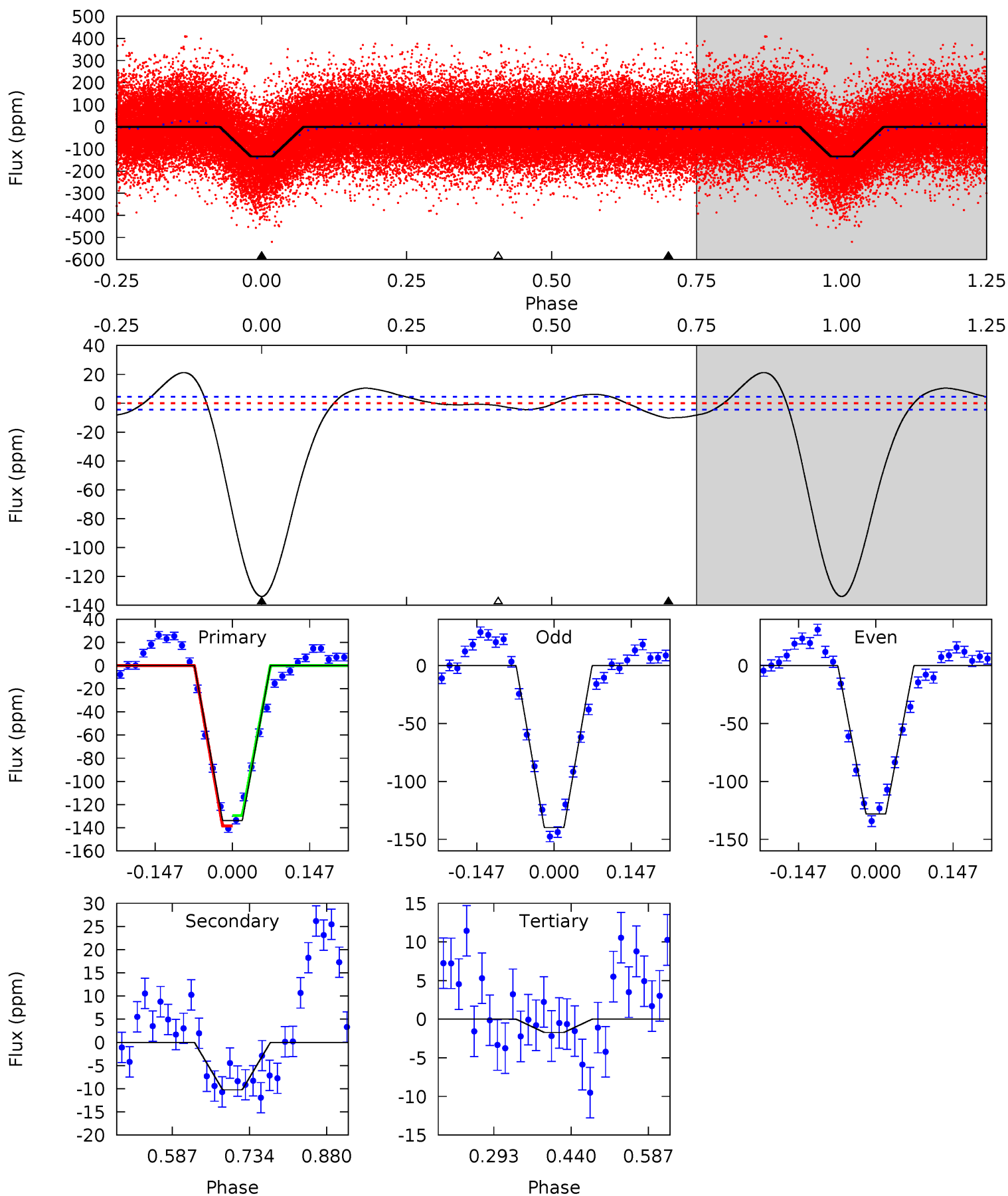
| Pri  | Sec  | Ter  | Pos   | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|-------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 30.6 | 10.1 | 8.20 | -7.41 | 4.60            | 1.72            | 8.55             | 22.4    | 38.0    | 1.85    | 17.5    | 0.38    | 1.30 | 0.46  | 4.36 |



# Alt Model-Shift Uniqueness Test

005707897-01, P = 8.415681 Days, E = 131.488755 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  |
|-------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 133.7 | 10.2 | 1.71 | 0   | 4.48            | 1.45            | 4.88             | 132.0   | 133.7   | 8.49    | 10.2    | 5.86    | 0.98 | 0.14  | 4.42 |





### Stellar Parameters For KIC 005707897

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6363^{+153}_{-192}$ | $4.313^{+0.113}_{-0.137}$ | $-0.220^{+0.250}_{-0.300}$ | $1.186^{+0.255}_{-0.170}$ | $1.049^{+0.152}_{-0.111}$ | $0.887^{+0.447}_{-0.374}$                 |
|        | +2%/-3%              | +3%/-3%                   | +114%/-136%                | +22%/-14%                 | +14%/-11%                 | +50%/-42%                                 |
| 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 005707897-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{max} (K)$      | $T_{obs} (K)$        | $A_{obs}$        |
|---------|-------------|------------------------|--------------------|----------------------|------------------|
| DV      | $-15 \pm 1$ | $0.80^{+0.11}_{-0.09}$ | $1487^{+78}_{-74}$ | $5057^{+236}_{-218}$ | $84^{+24}_{-19}$ |
| Alt.    | $-10 \pm 1$ | $1.53^{+0.20}_{-0.13}$ | $1485^{+87}_{-75}$ | $3703^{+101}_{-108}$ | $16^{+3}_{-4}$   |

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

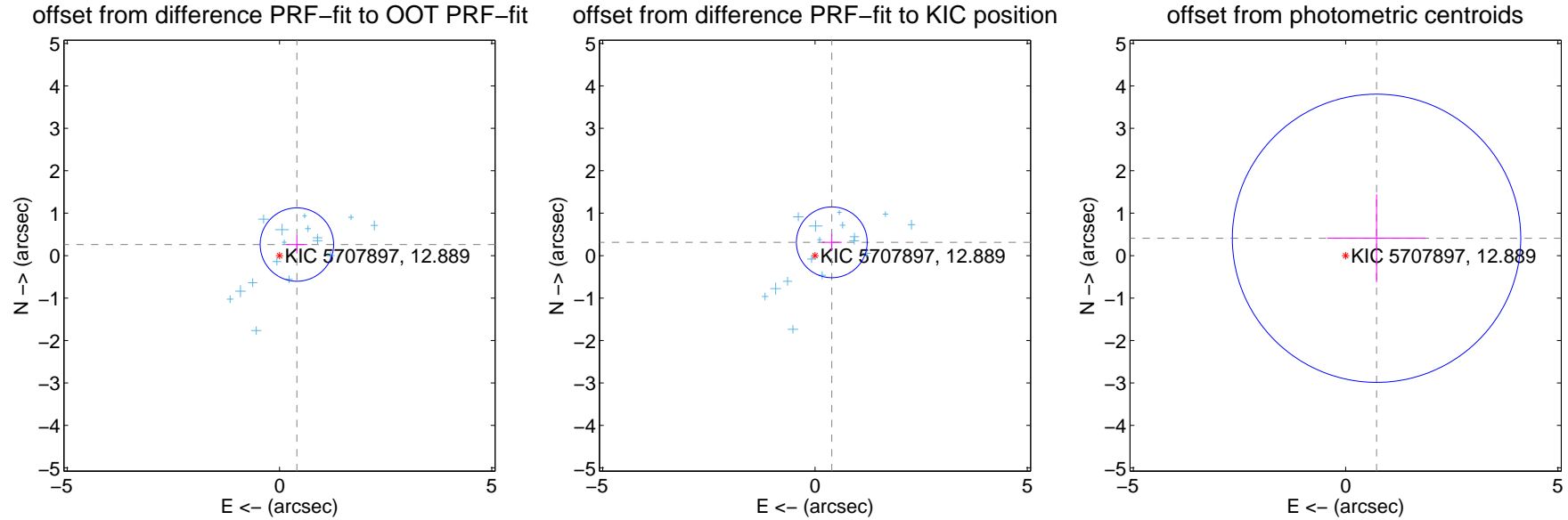
## DV Centroid Data

Supplemental centroid analysis for 005707897-01. Kepler magnitude: 12.89. Transit SNR 13.40

There are 16 quarters with good PRF difference image offsets

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

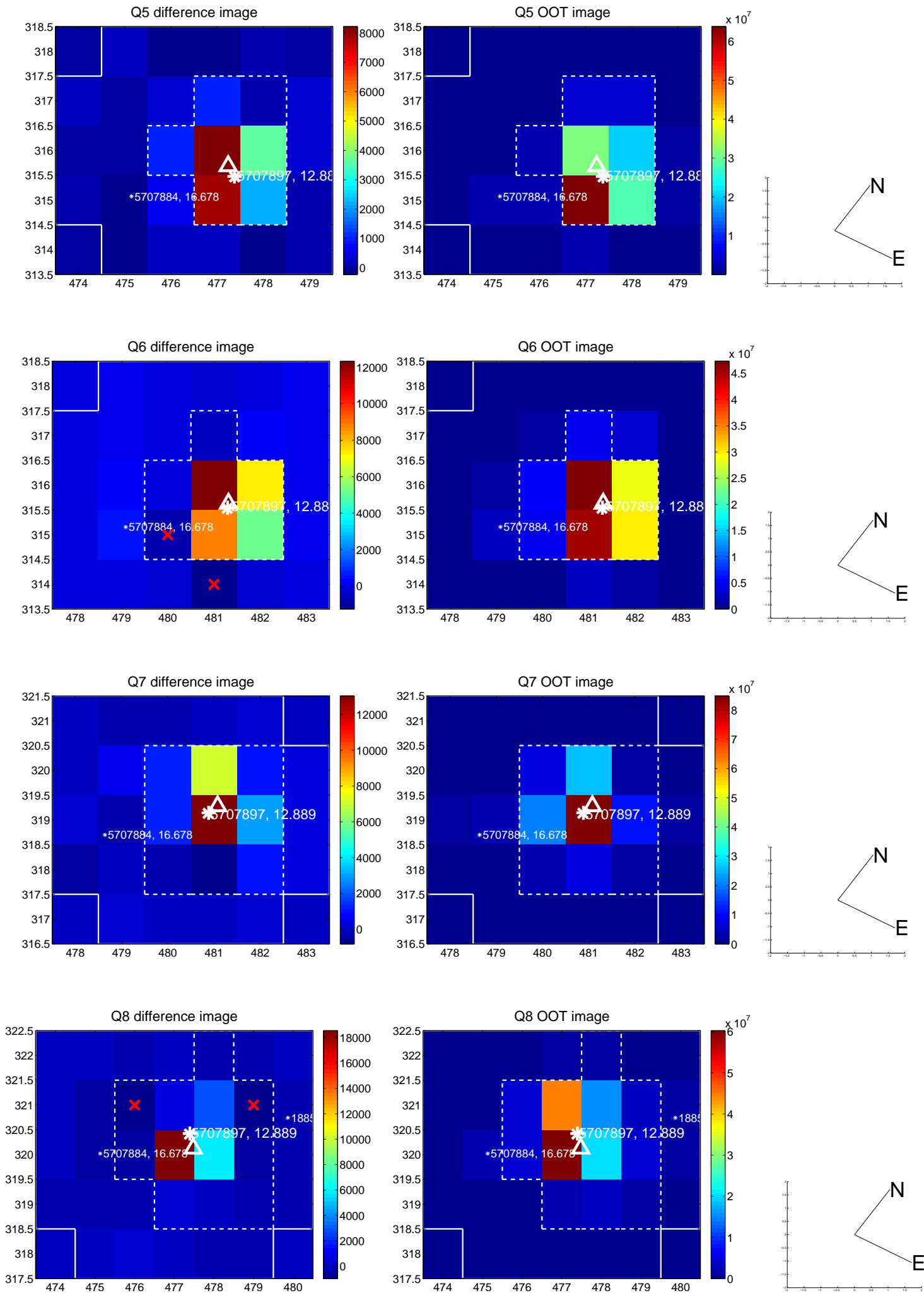
|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | $0.486 \pm 0.288$  | 1.69                | $-0.410 \pm 0.241$ | $0.261 \pm 0.210$ |
| PRF-fit source offset from KIC position | $0.506 \pm 0.278$  | 1.82                | $-0.396 \pm 0.236$ | $0.314 \pm 0.207$ |
| photometric centroid source offset      | $0.84 \pm 1.13$    | 0.74                | $-0.73 \pm 1.16$   | $0.41 \pm 1.04$   |



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.

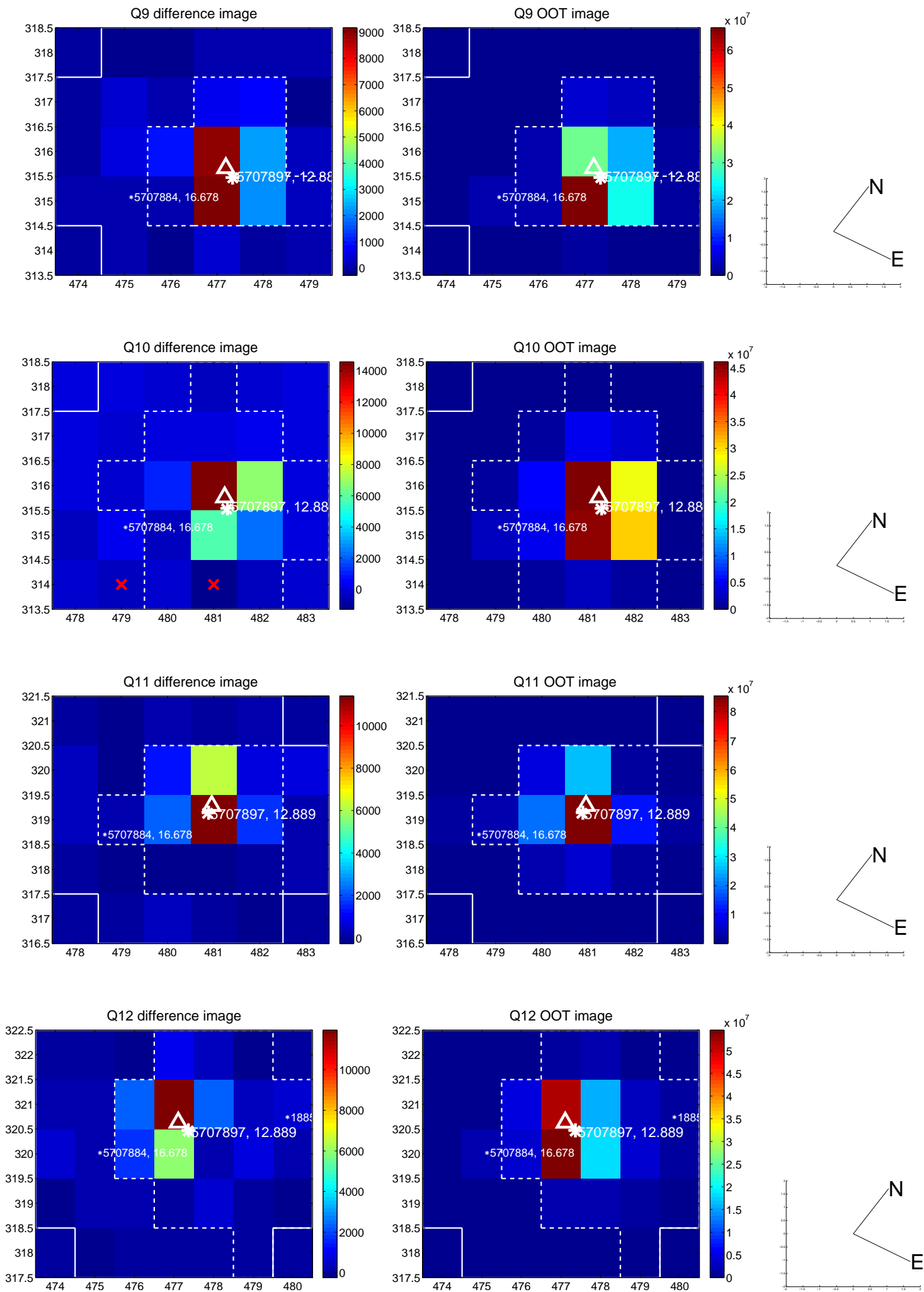


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

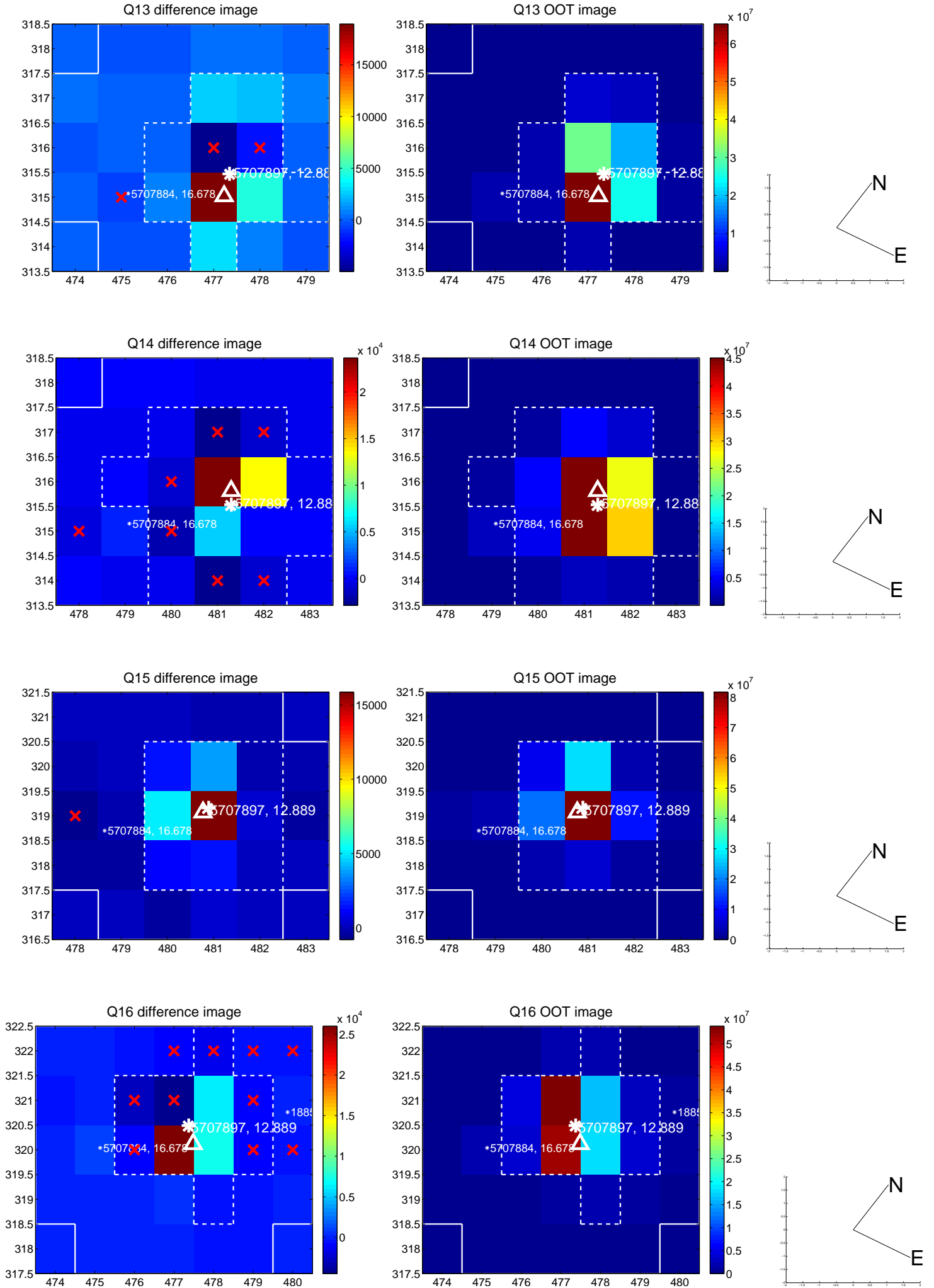




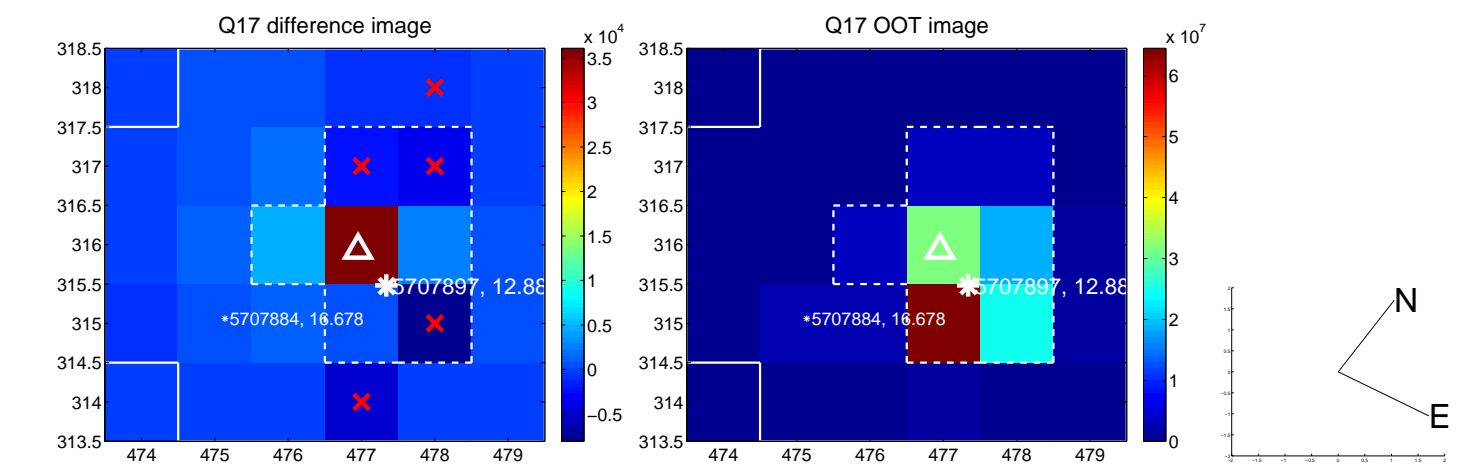
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



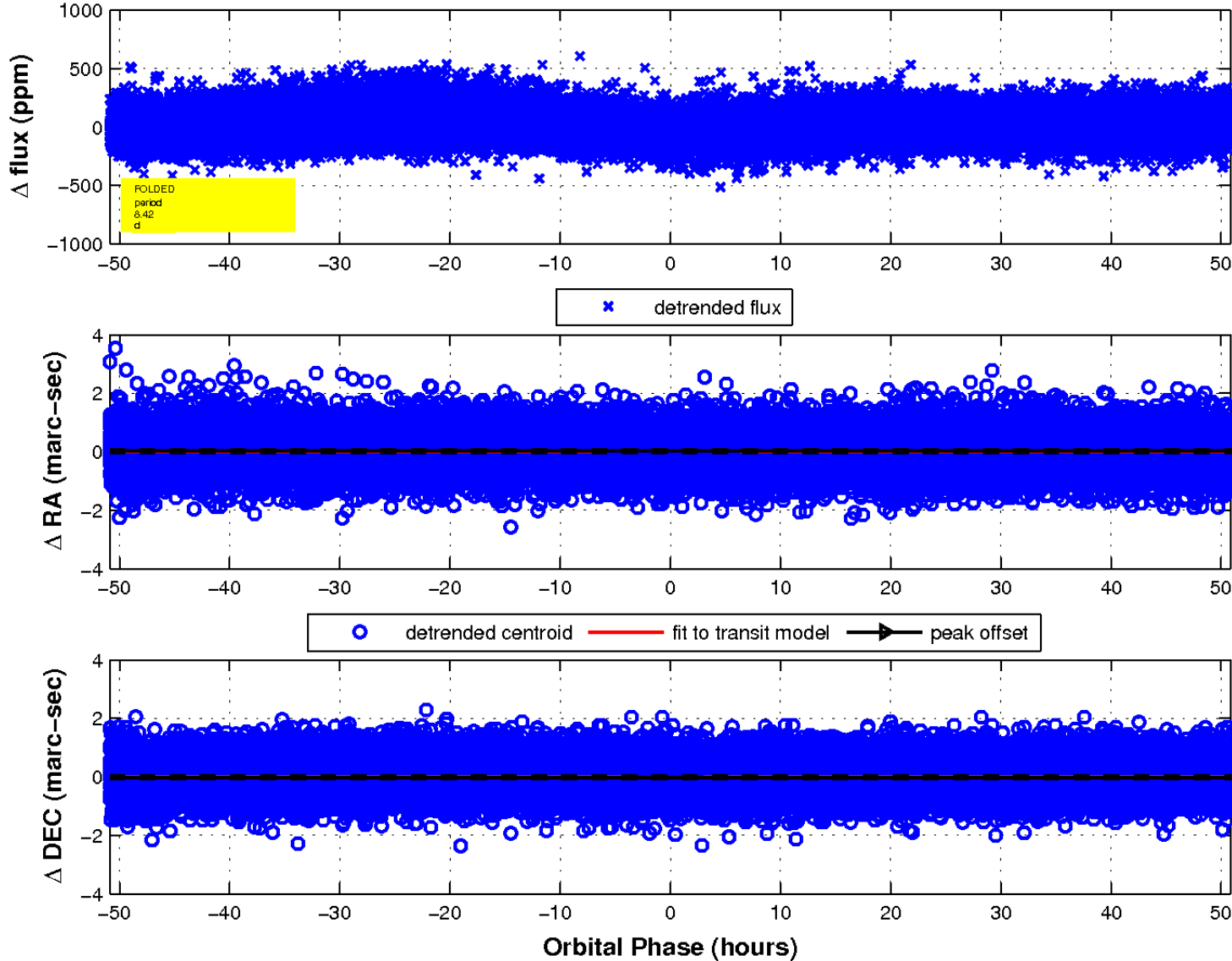
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

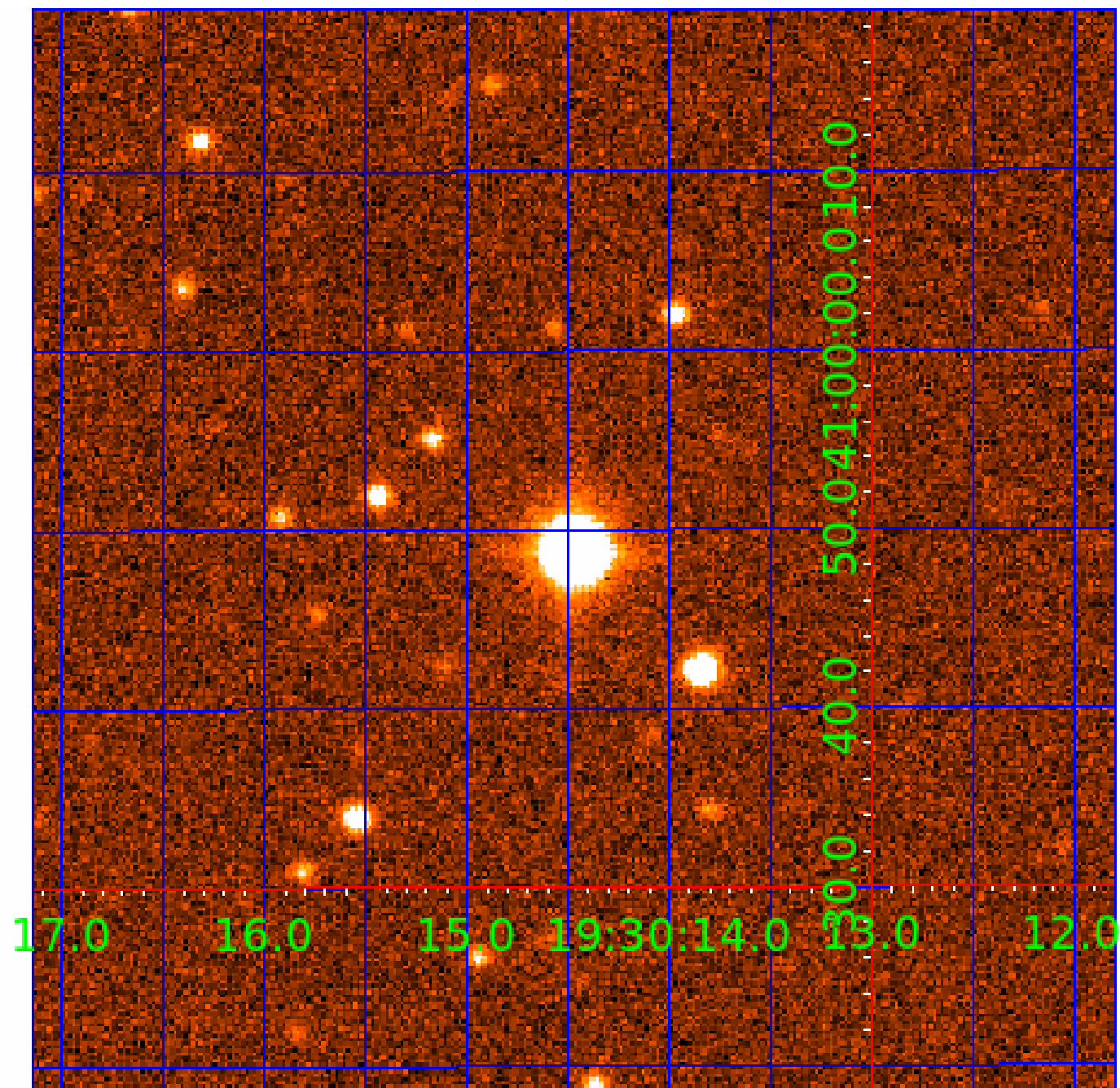


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 005707897

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005707897-01 | OBS      | No   | 8.415380      | 139.861334   | 31.0        | 16.956           | 13.5 | 13.4 | 1.19                        | 6363            | 0.80                   | 303.97                 |
| 005707897-02 | OBS      | No   | 374.129579    | 192.517826   | 174.8       | 19.646           | 10.0 | 10.0 | 1.19                        | 6363            | 2.05                   | 1.93                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 005707897-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | LPP_DV  |
| 005707897-02 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—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.

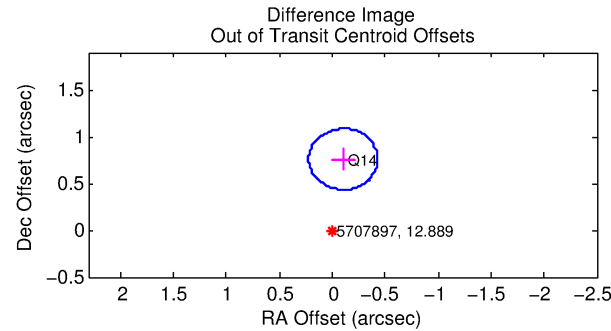
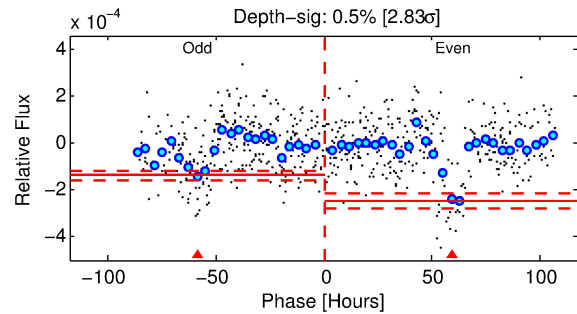
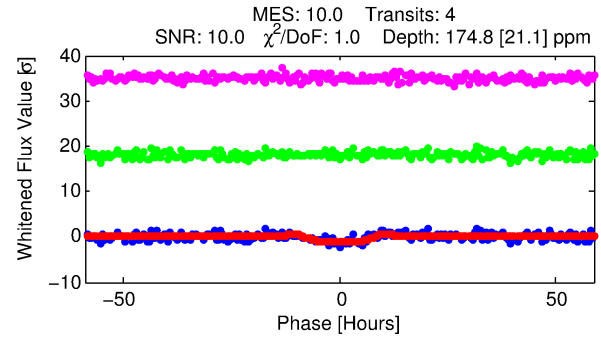
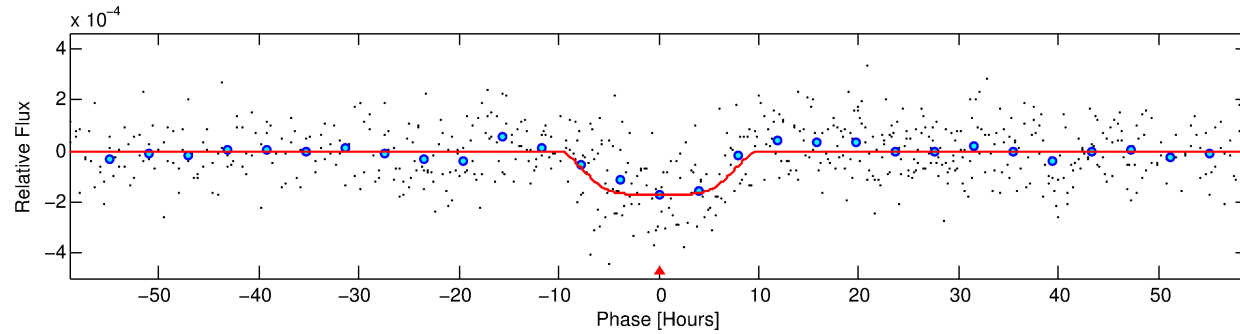
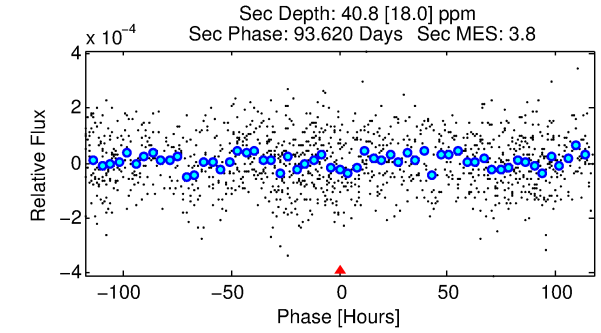
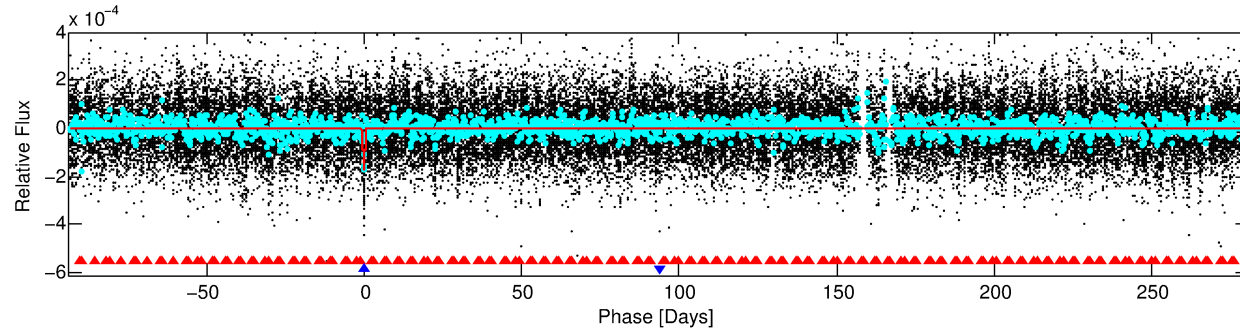
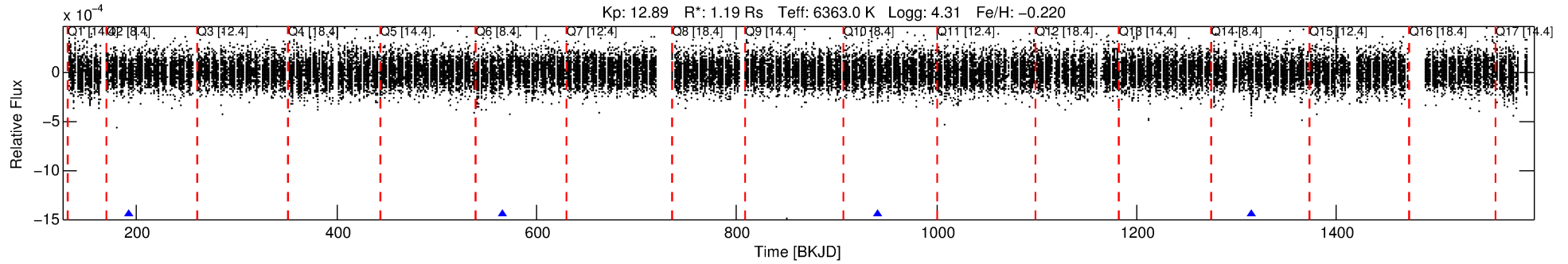
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005707897-02

No Significant Match Found

# DV One-Page Summary

KIC: 5707897 Candidate: 2 of 2 Period: 374.130 d



## DV Fit Results:

Period = 374.12958 [0.01592] d  
Epoch = 192.5178 [0.0306] BKJD  
Rp/R\* = 0.0159 [0.0012]  
a/R\* = 41.40 [7.81]  
b = 0.98 [0.01]  
Seff = 1.93 [0.54]  
Teq = 301 [21] K  
Rp = 2.05 [0.47] Re  
a = 1.0346 [0.1839] AU  
Ag = 5689.28 [3020.64] [1.88 $\sigma$ ]  
Teffp = 4036 [486] K [7.68 $\sigma$ ]

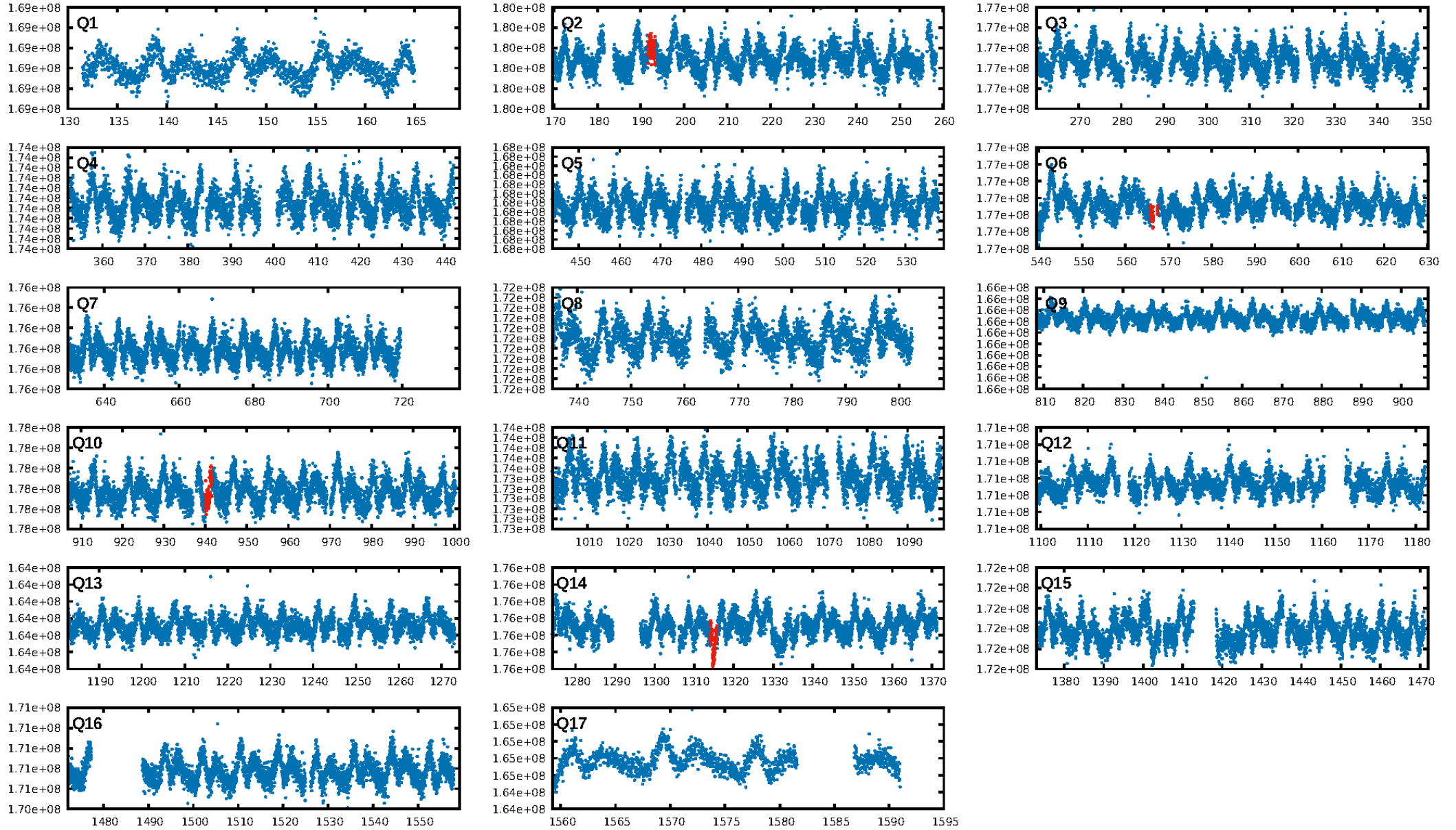
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [338.21 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 1.16e-12  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -1.517  
Centroid-sig: 70.8%  
Centroid-so: 1.046 arcsec [0.64 $\sigma$ ]  
OotOffset-rm: 0.766 arcsec [7.05 $\sigma$ ]  
KicOffset-rm: 0.836 arcsec [7.70 $\sigma$ ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 0.67 [2/3]

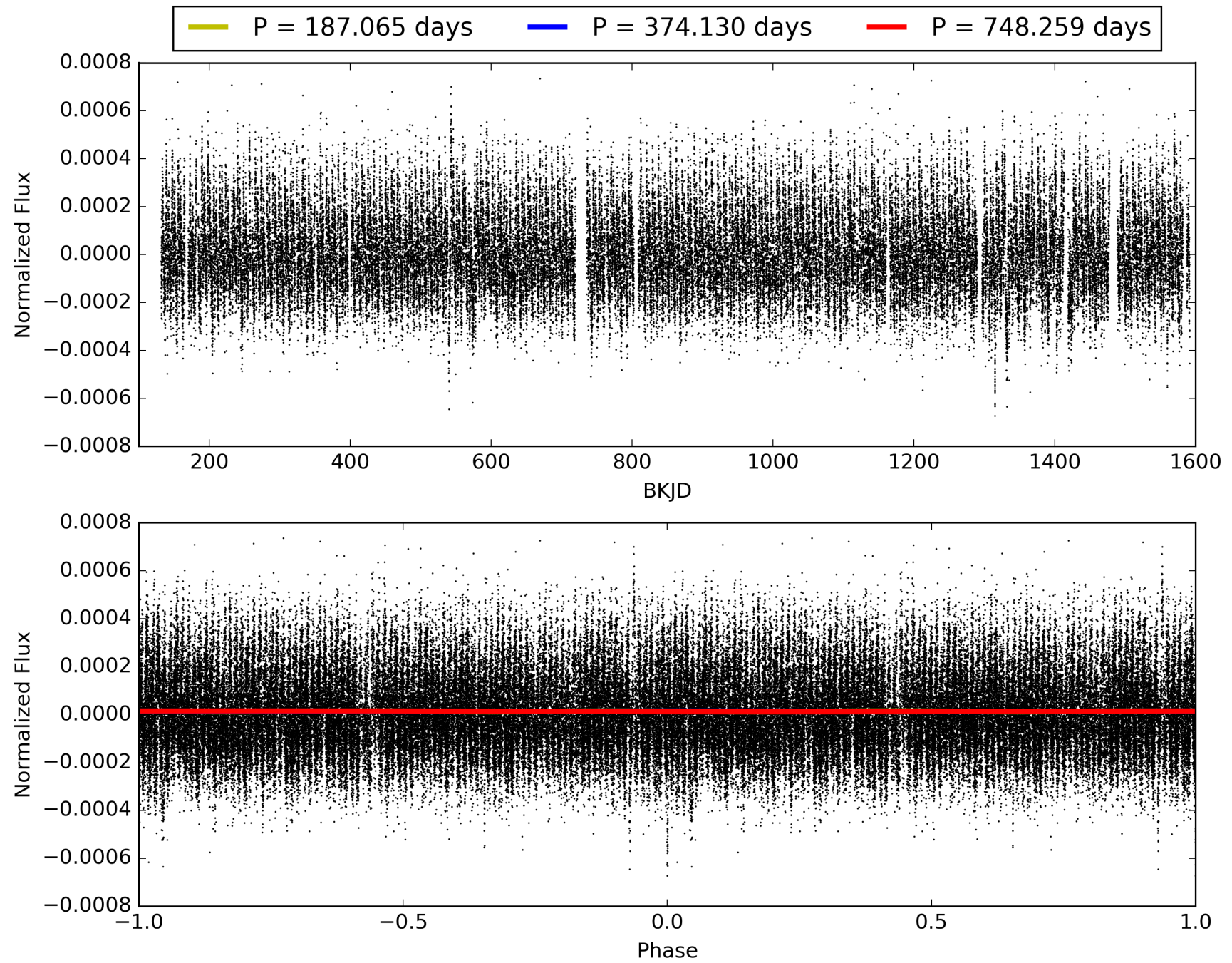
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 20:05:31 Z

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

# TCE 005707897-02, PDC Light Curves

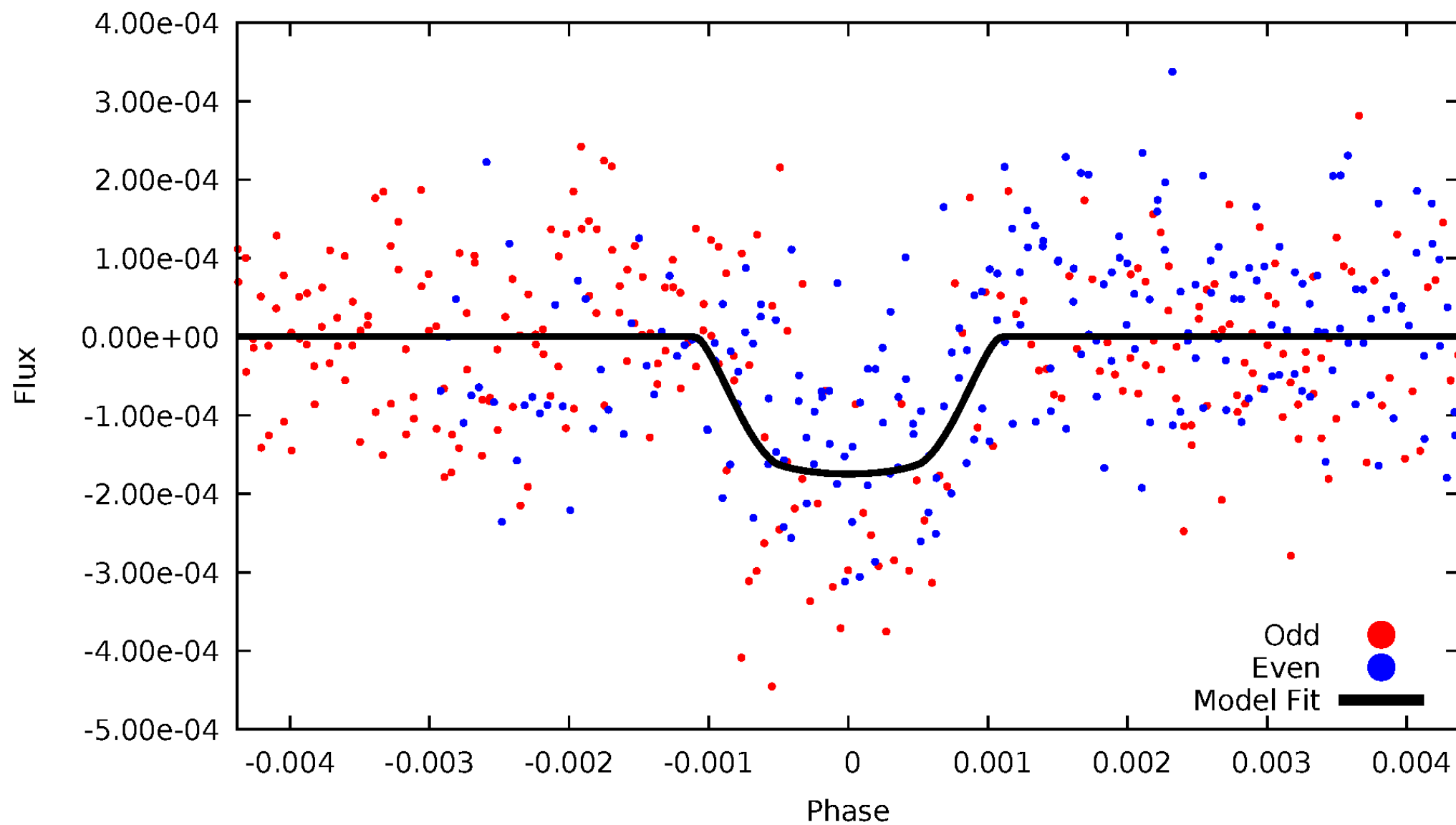


# TCE 005707897-02



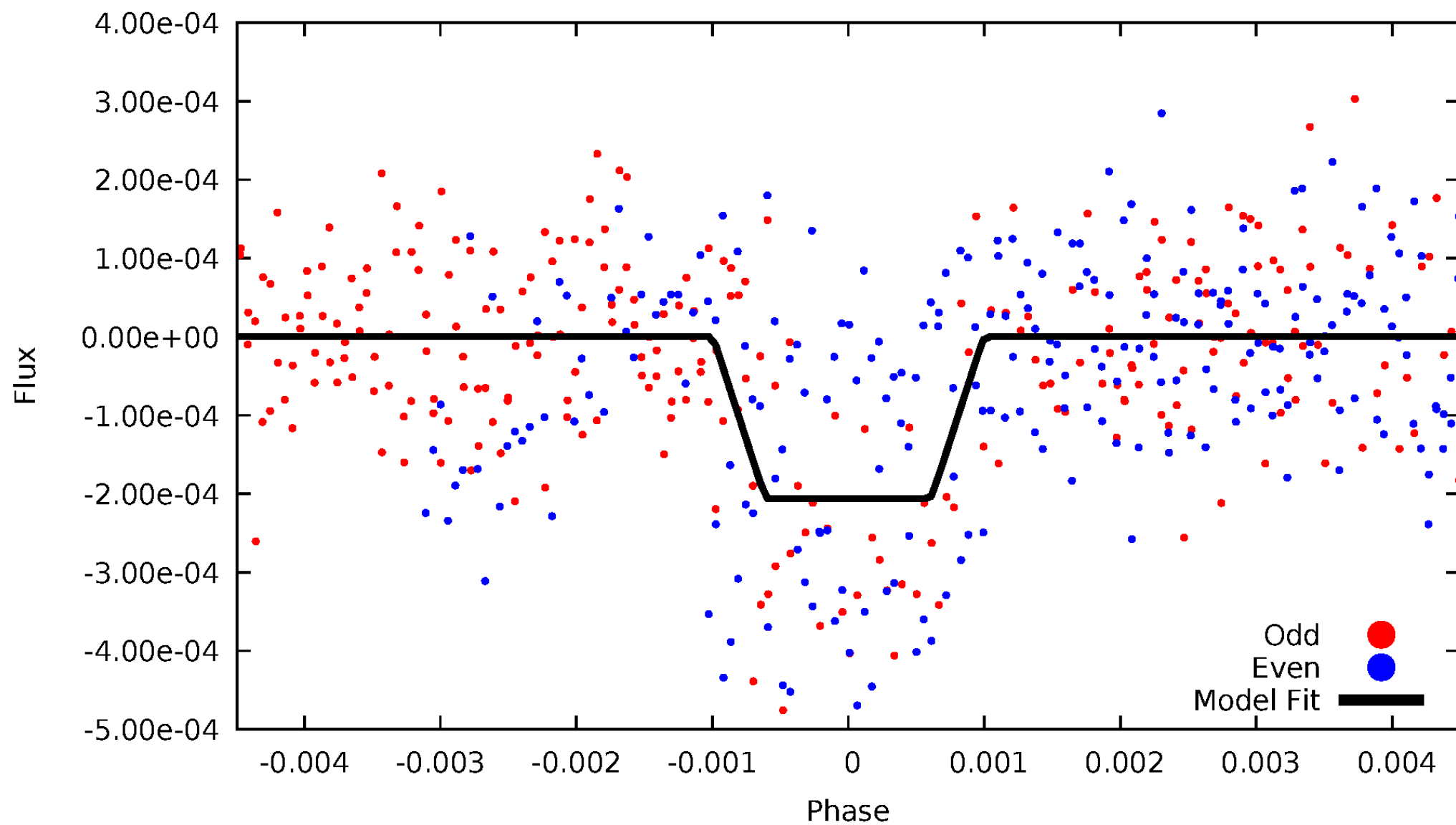
# DV Odd/Even

TCE 005707897-02



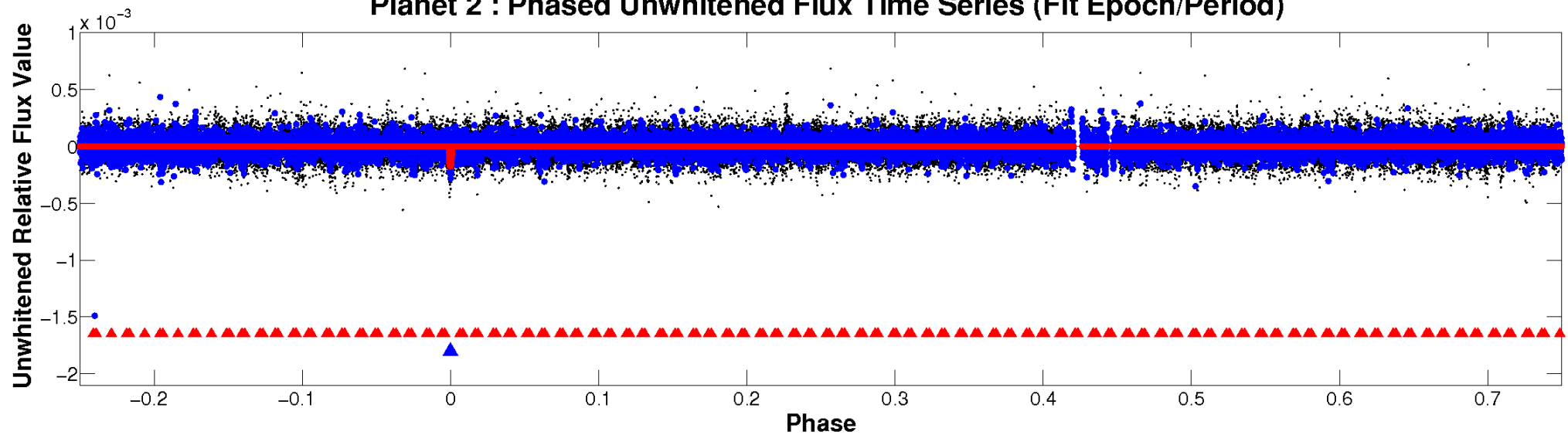
# ALT Odd/Even

TCE 005707897-02

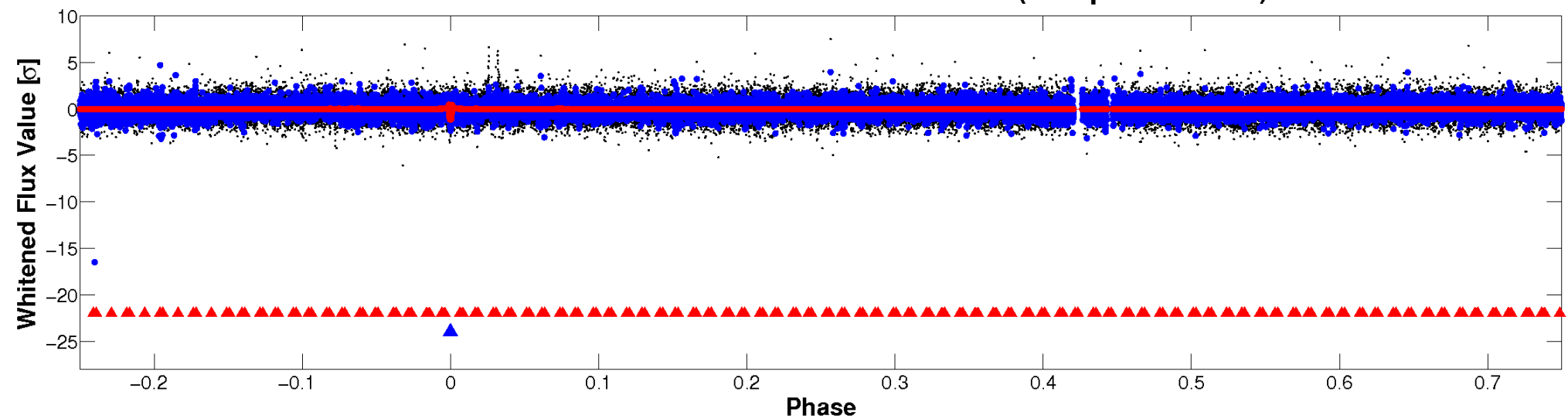


# Non-Whitened Vs. Whitened Light Curve

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



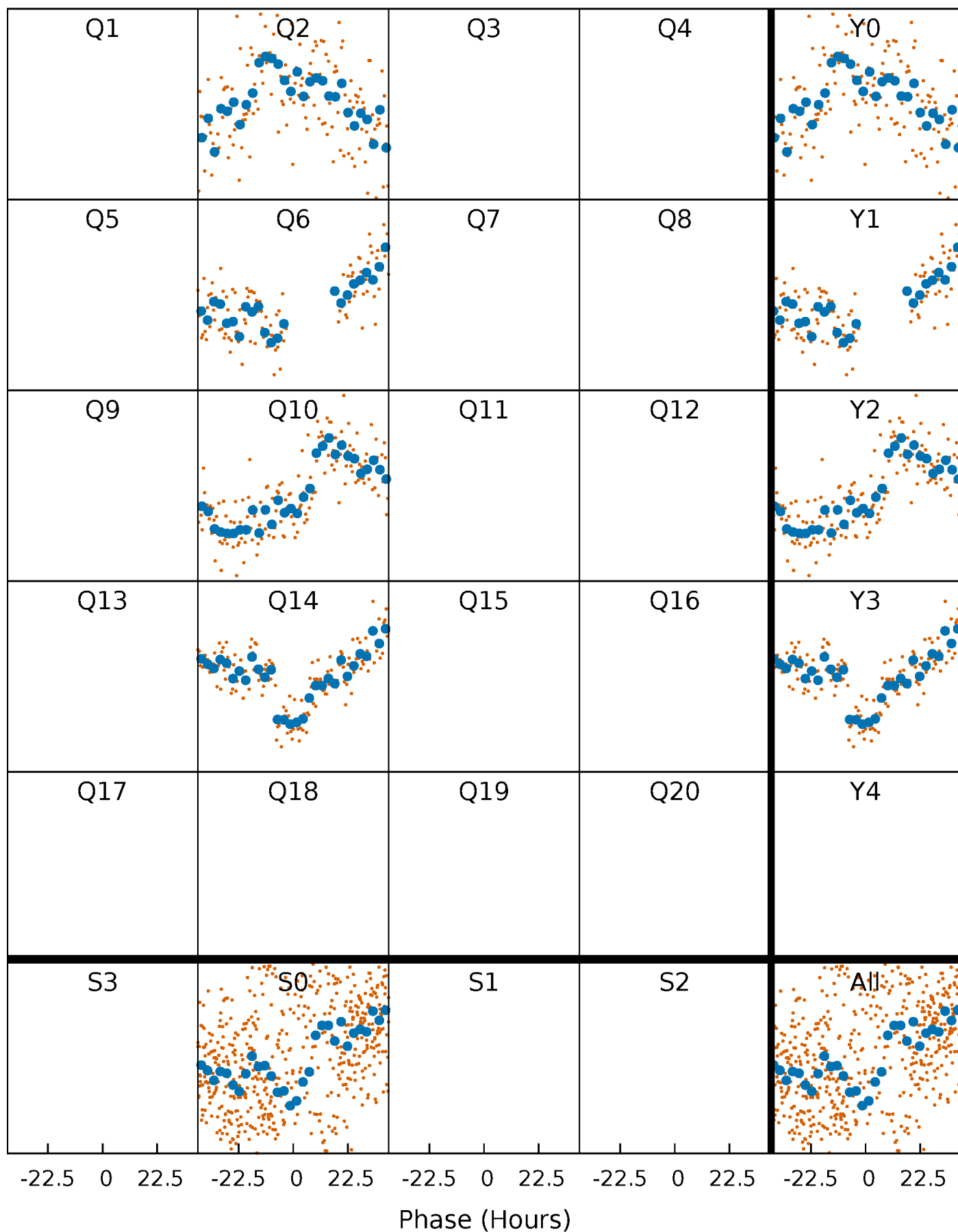
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





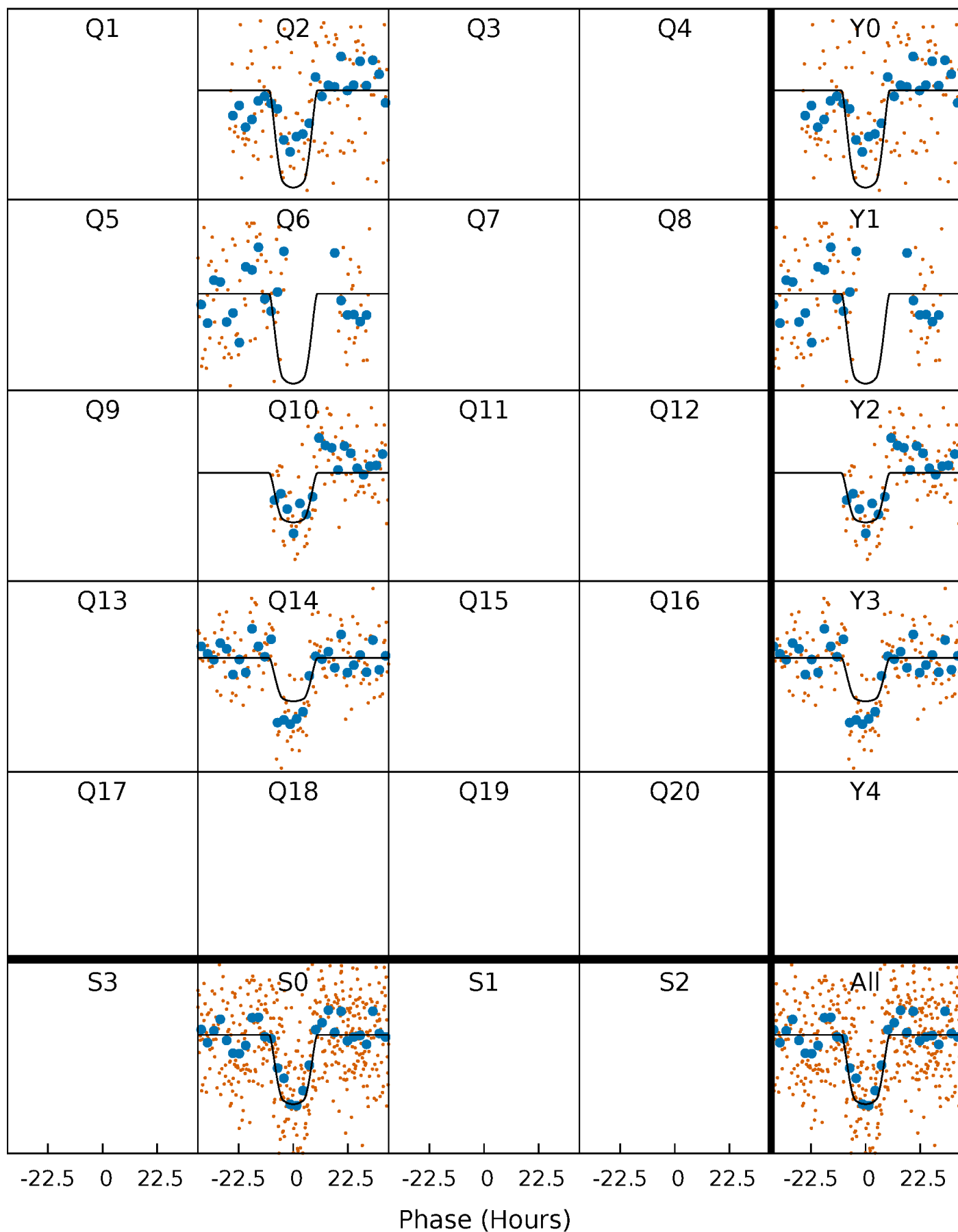
# PDC Quarter-Phased Transit Curves

TCE 005707897-02     $P=374.129579$  Days     $T_0=192.517826$  (BKJD)



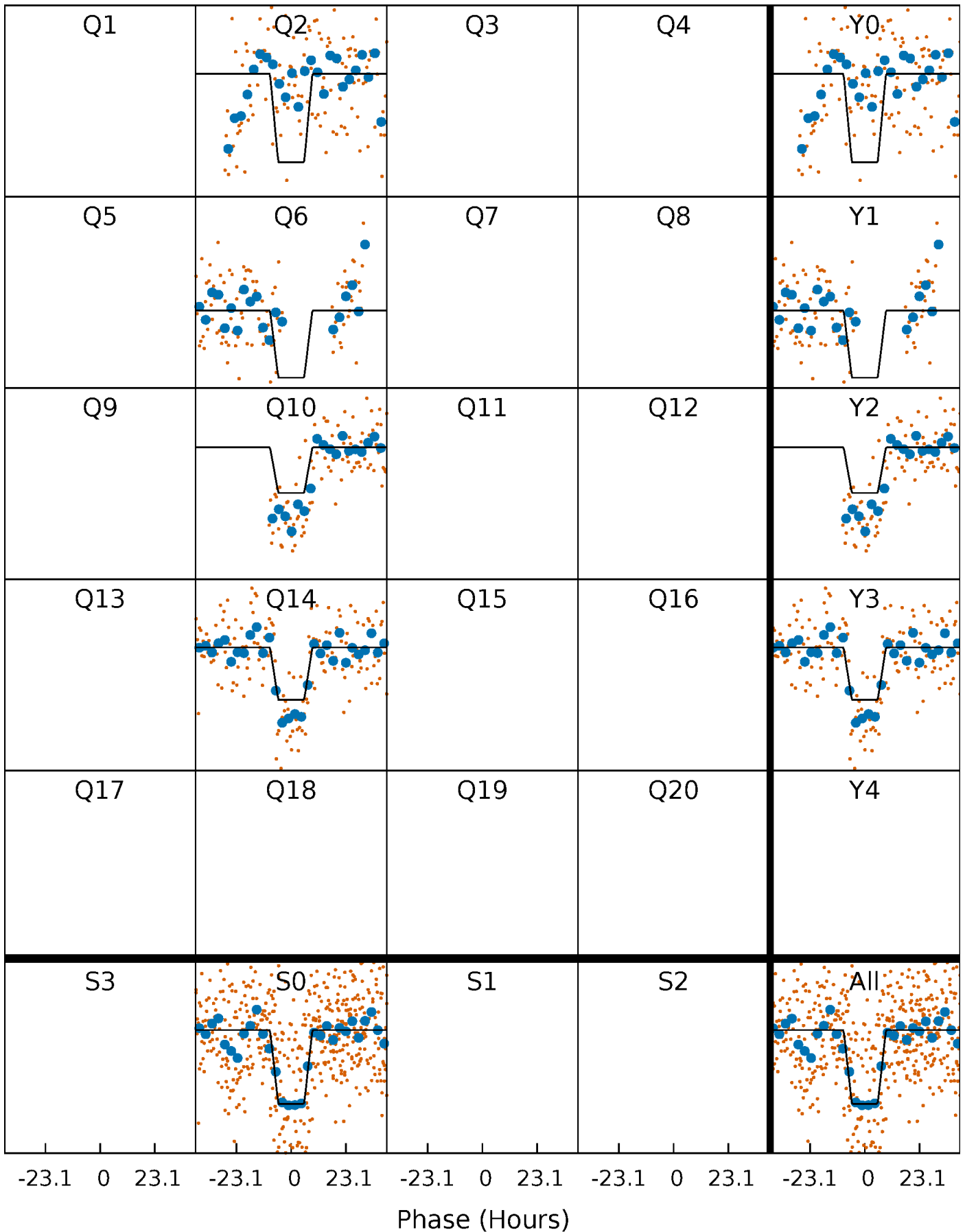
# DV Quarter-Phased Transit Curves

TCE 005707897-02     $P=374.129579$  Days     $T_0=192.517826$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

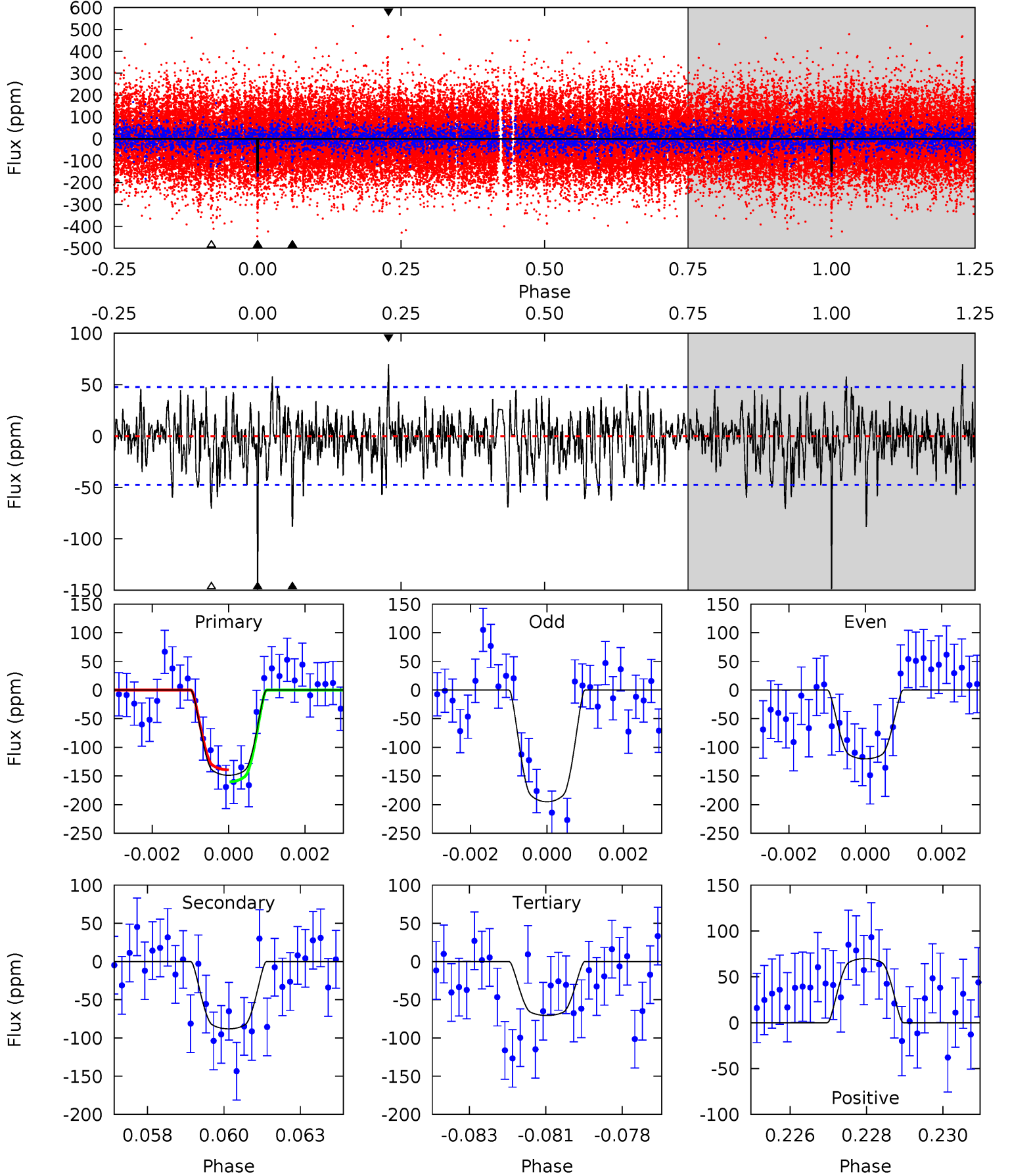
TCE 005707897-02     $P=374.097617$  Days     $T_0=192.588368$  (BKJD)



# DV Model-Shift Uniqueness Test

005707897-02,  $P = 374.129579$  Days,  $E = 192.517826$  Days

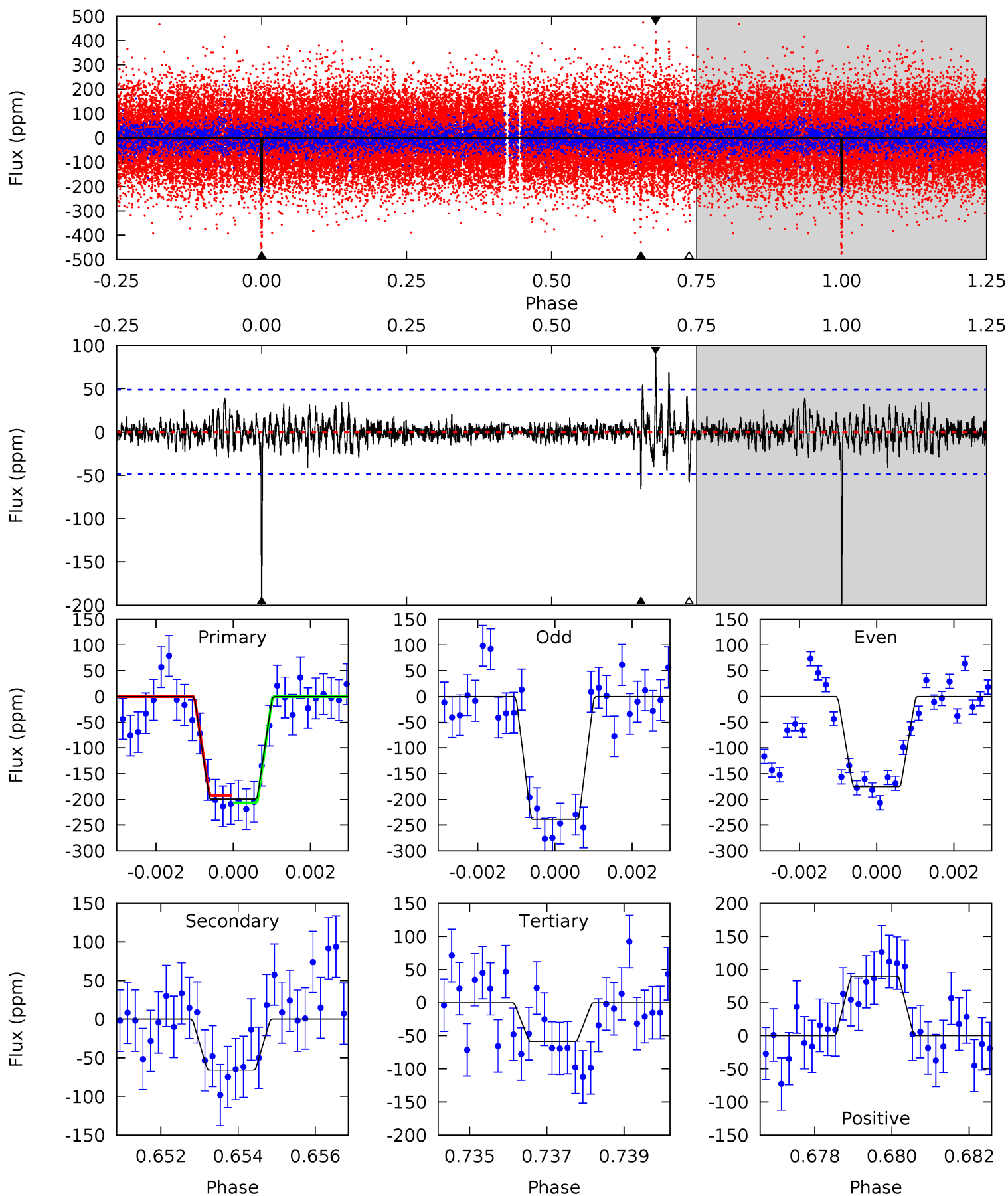
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 16.6 | 9.82 | 7.87 | 7.80 | 5.31            | 3.06            | 2.22             | 8.73    | 8.80    | 1.96    | 2.02    | 4.13    | 0.94 | 0.32  | 1.16 |



# Alt Model-Shift Uniqueness Test

005707897-02, P = 374.097617 Days, E = 192.588368 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 21.7 | 7.22 | 6.39 | 9.83 | 5.33            | 3.09            | 1.23             | 15.4    | 11.9    | 0.83    | -2.61   | 3.36    | 1.07 | 0.31  | 0.77 |





### Stellar Parameters For KIC 005707897

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R (R_{\odot})$           | $M(M_{\odot})$            | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6363^{+153}_{-192}$ | $4.313^{+0.113}_{-0.137}$ | $-0.220^{+0.250}_{-0.300}$ | $1.186^{+0.255}_{-0.170}$ | $1.049^{+0.152}_{-0.111}$ | $0.887^{+0.447}_{-0.374}$                 |
|        | +2%/-3%              | +3%/-3%                   | +114%/-136%                | +22%/-14%                 | +14%/-11%                 | +50%/-42%                                 |
| 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 005707897-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$     | $T_{max} (K)$     | $T_{obs} (K)$        | $A_{obs}$               |
|---------|-------------|------------------------|-------------------|----------------------|-------------------------|
| DV      | $-88 \pm 9$ | $2.06^{+0.29}_{-0.23}$ | $420^{+24}_{-21}$ | $4961^{+228}_{-218}$ | $12000^{+3442}_{-2652}$ |
| Alt.    | $-66 \pm 9$ | $1.88^{+0.27}_{-0.22}$ | $419^{+23}_{-19}$ | $4860^{+275}_{-232}$ | $10977^{+3539}_{-2883}$ |

$T_{max}$  = 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

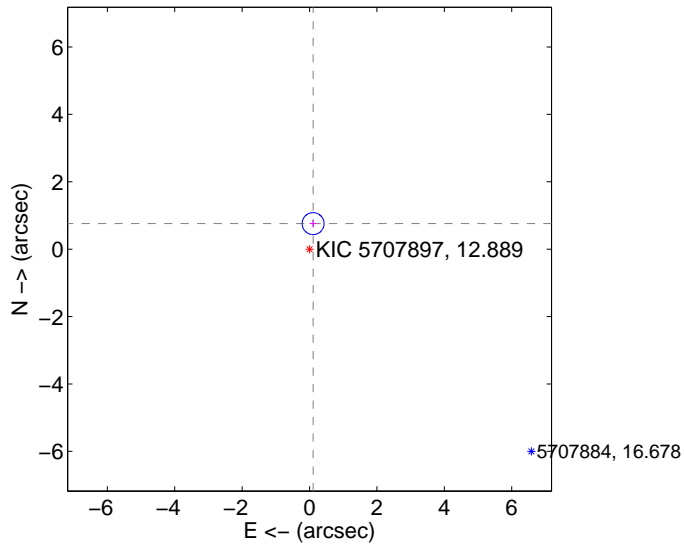
Supplemental centroid analysis for 005707897-02. Kepler magnitude: 12.89. Transit SNR 9.99

There are 1 quarters with good PRF difference image offsets

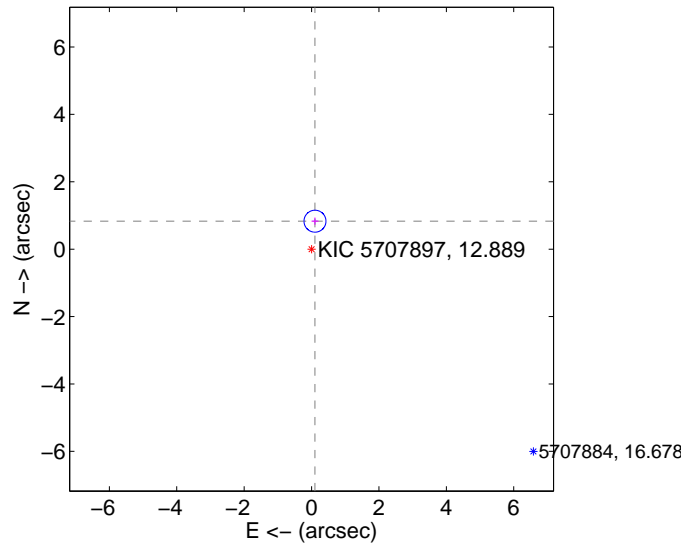
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | $0.766 \pm 0.109$  | 7.05                | $-0.106 \pm 0.103$ | $0.758 \pm 0.109$ |
| PRF-fit source offset from KIC position | $0.836 \pm 0.109$  | 7.70                | $-0.102 \pm 0.103$ | $0.830 \pm 0.109$ |
| photometric centroid source offset      | $1.05 \pm 1.65$    | 0.64                | $-1.03 \pm 1.65$   | $0.20 \pm 1.54$   |

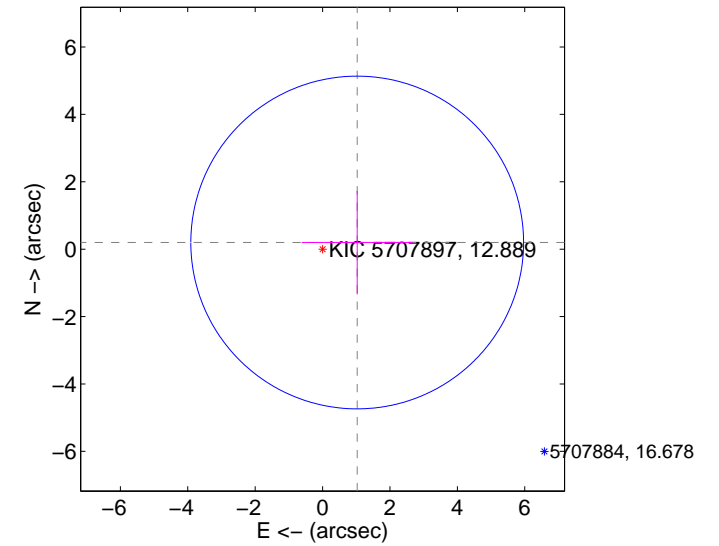
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

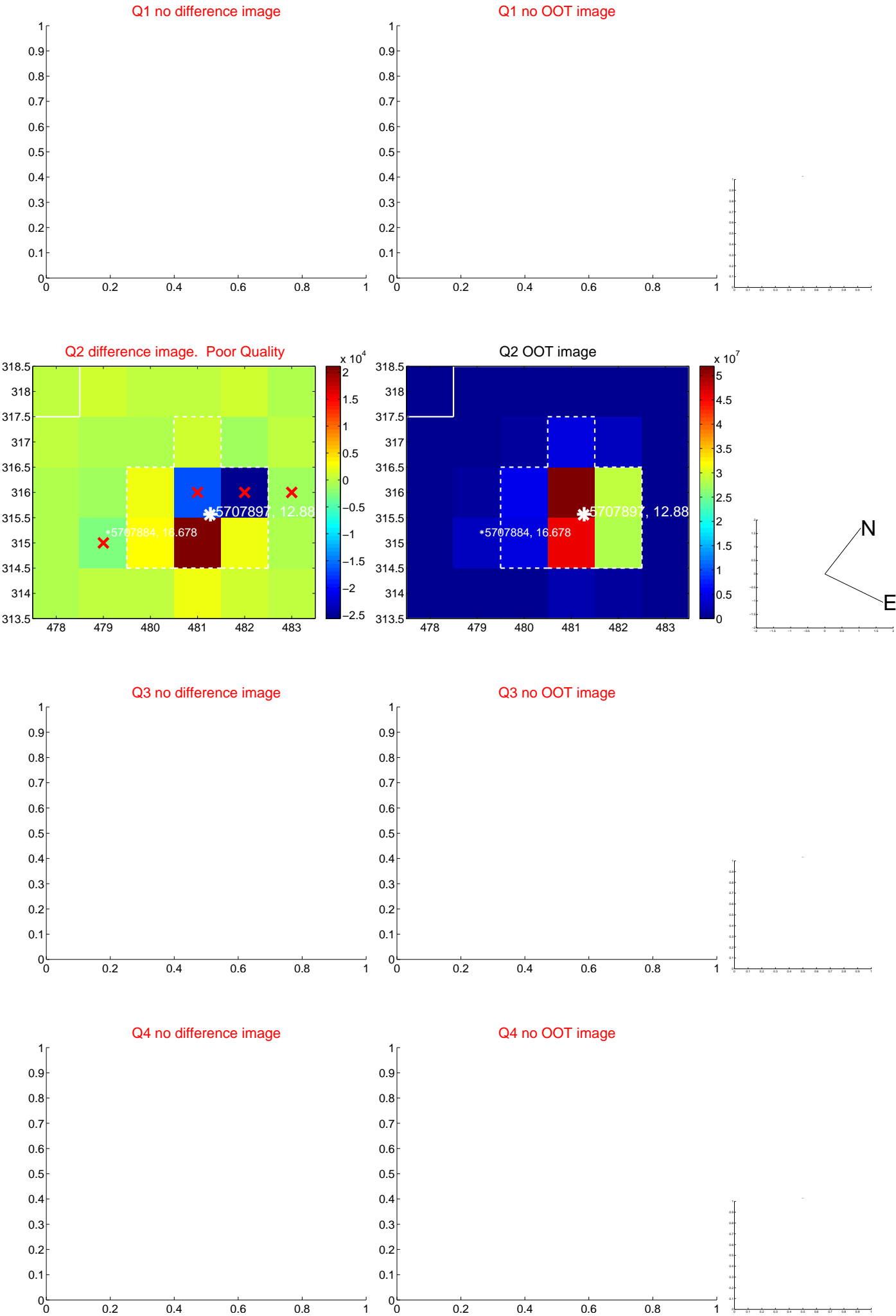


offset from photometric centroids



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.

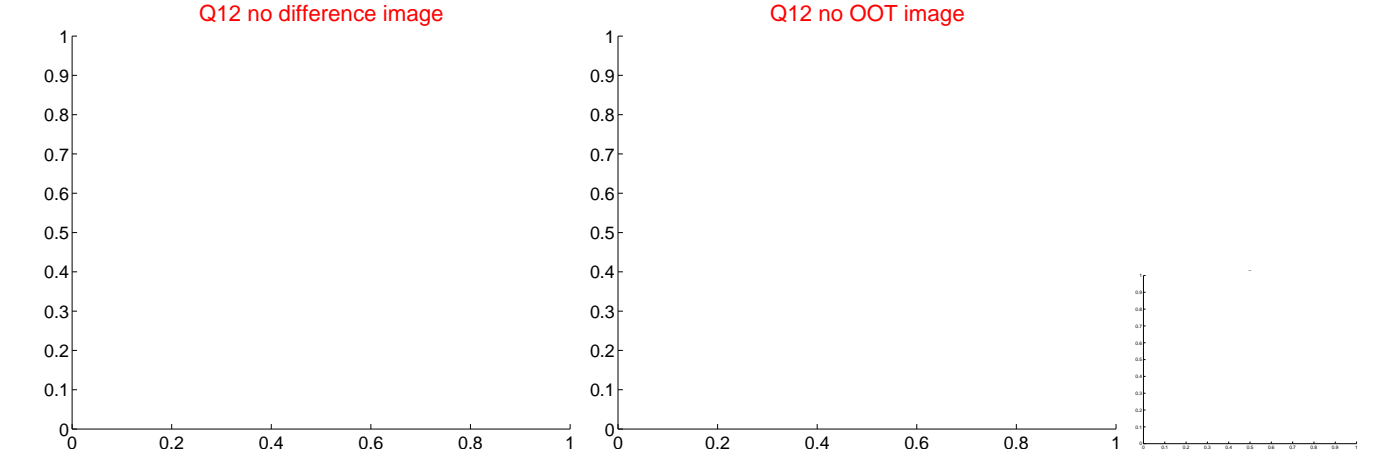
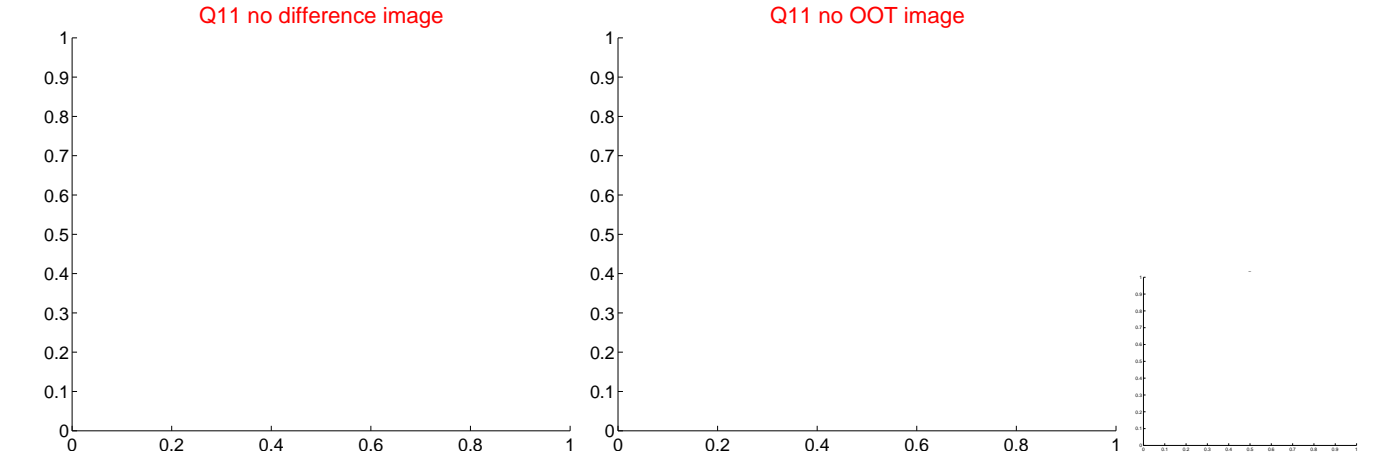
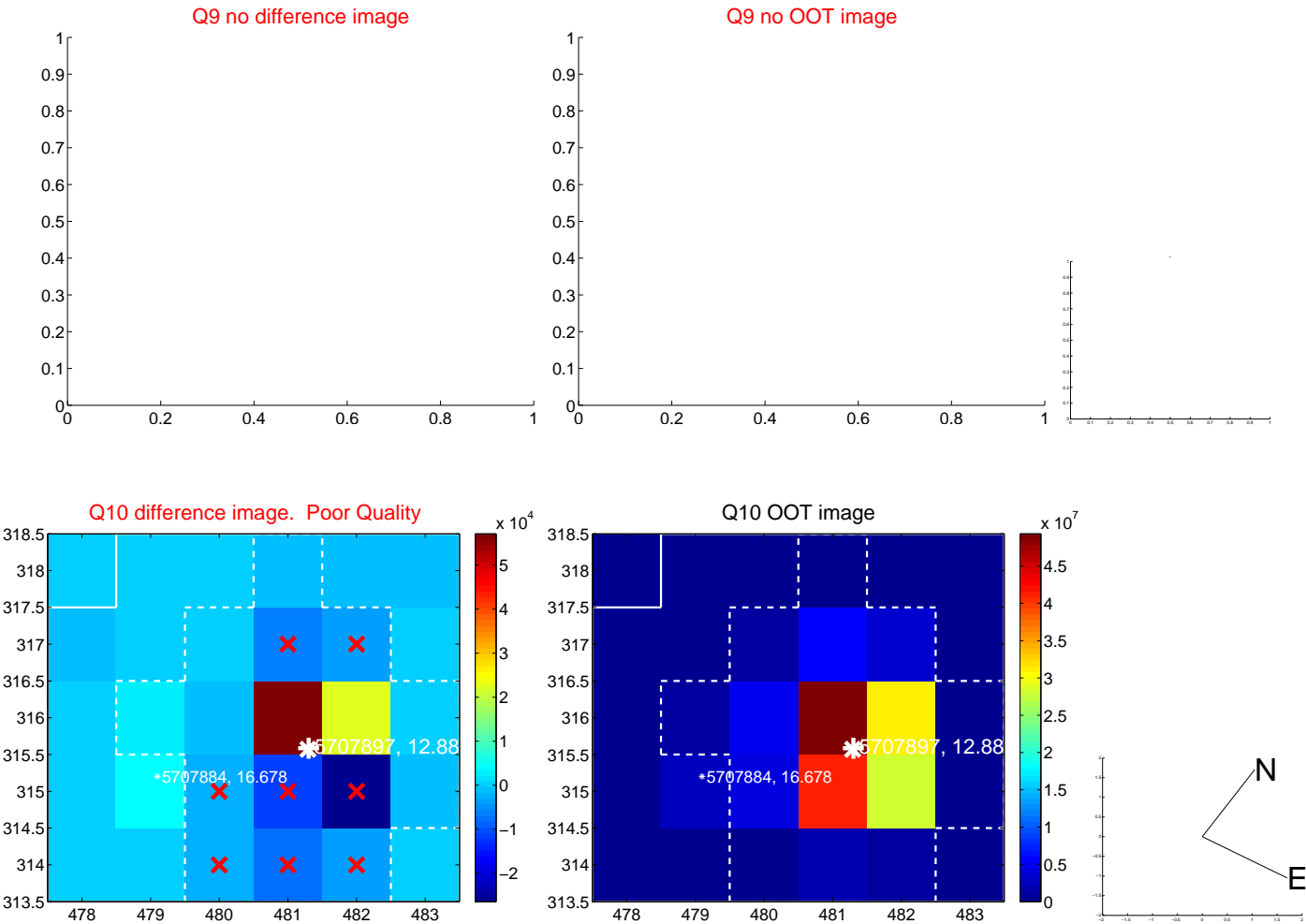
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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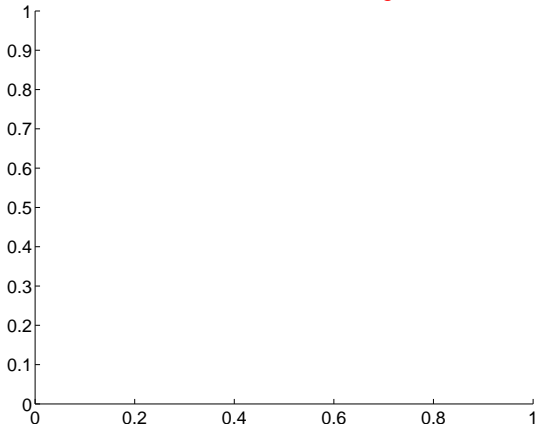
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



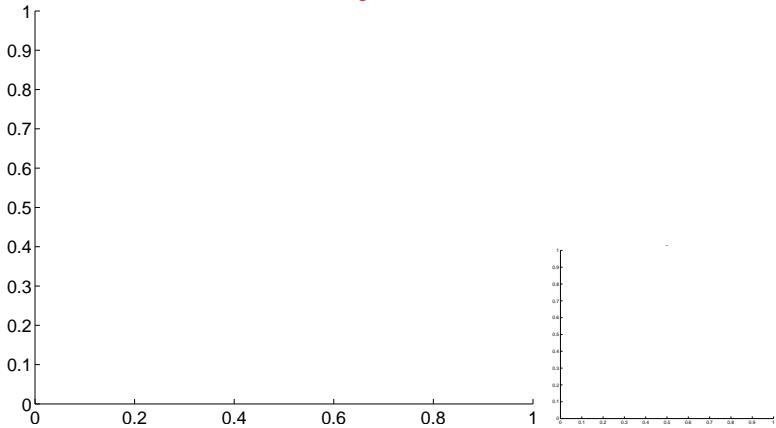


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

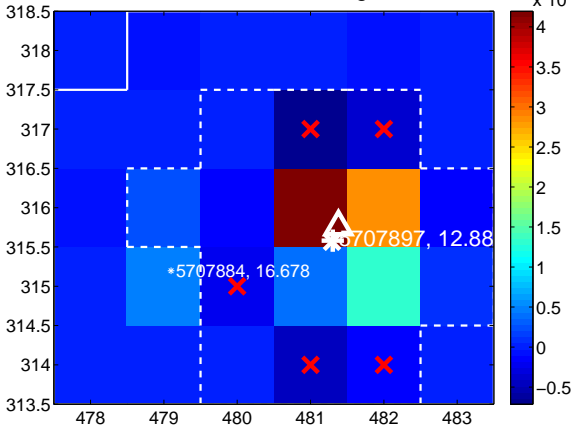
Q13 no difference image



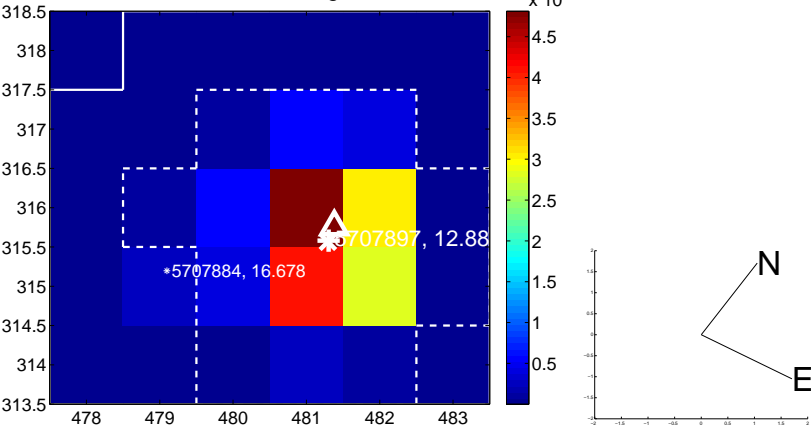
Q13 no OOT image



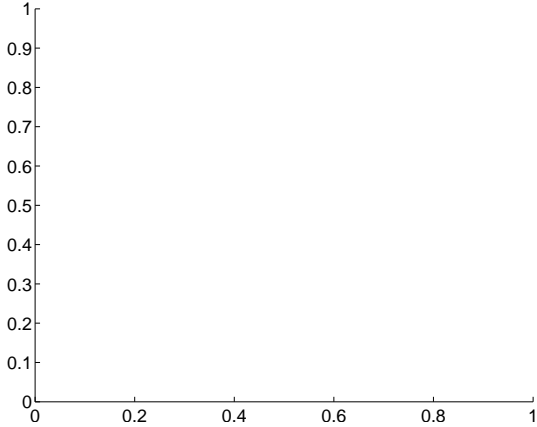
Q14 difference image



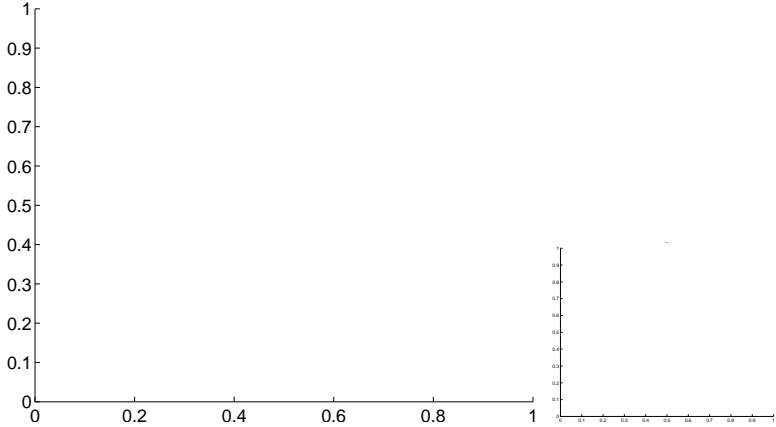
Q14 OOT image



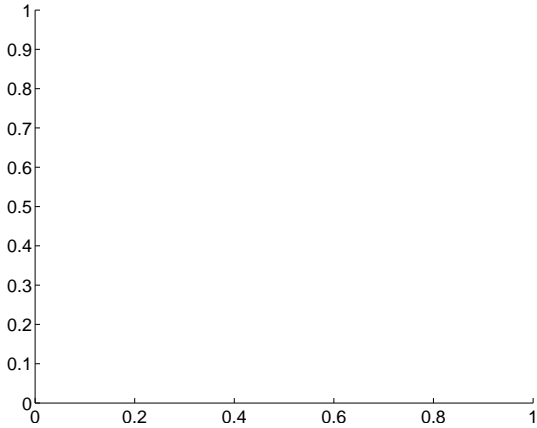
Q15 no difference image



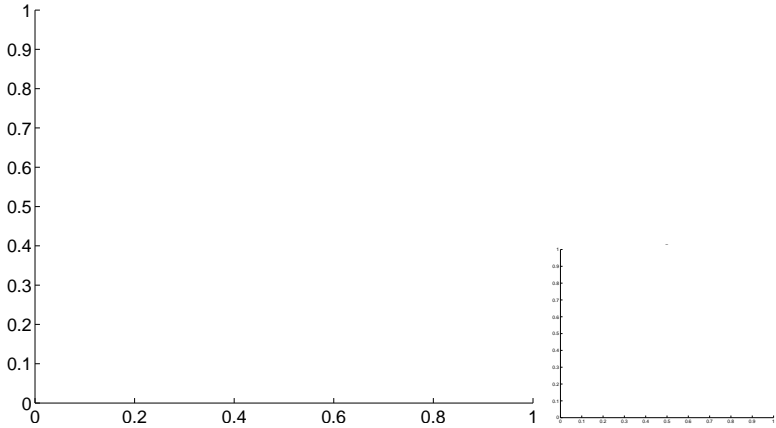
Q15 no OOT image



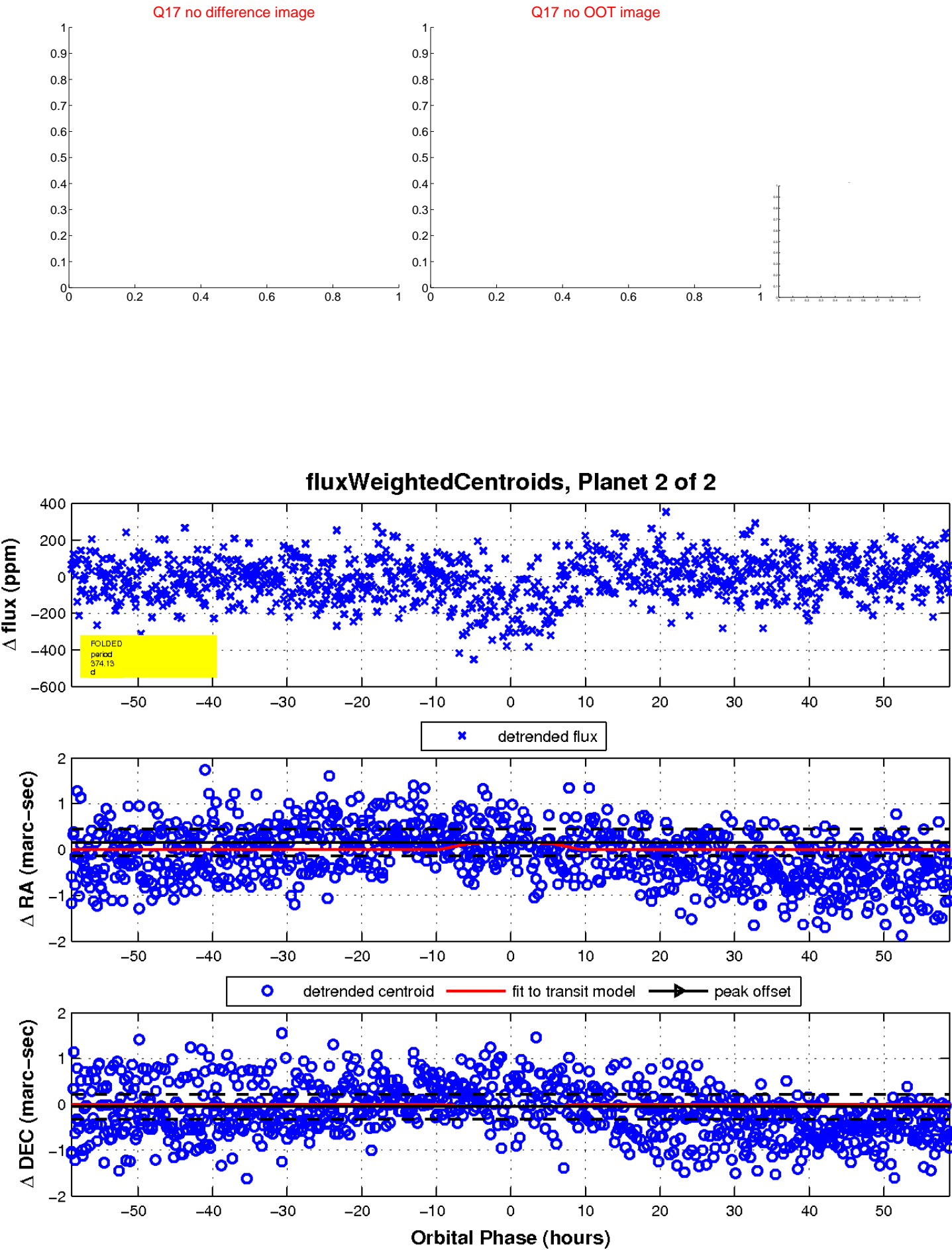
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

