

# KIC 009279763

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009279763-01 | OBS      | No   | 1.926636      | 133.216535   | 23.6        | 6.693            | 8.9 | 8.8 | 3.57                        | 6889            | 1.77                   | 19875.26               |
| 009279763-02 | OBS      | No   | 325.487920    | 261.872374   | 112.6       | 16.812           | 8.6 | 5.4 | 3.57                        | 6889            | 4.28                   | 21.28                  |
| 009279763-03 | OBS      | No   | 294.942838    | 216.691314   | 248.2       | 4.007            | 8.1 | 8.5 | 3.57                        | 6889            | 5.84                   | 24.27                  |
| 009279763-05 | OBS      | No   | 201.317343    | 169.291612   | 244.2       | 8.995            | 7.3 | 7.3 | 3.57                        | 6889            | 9.73                   | 40.38                  |
| 009279763-06 | OBS      | No   | 226.806773    | 152.502787   | 180.3       | 1.557            | 7.8 | 3.9 | 3.57                        | 6889            | 5.56                   | 34.45                  |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 009279763-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | SWEET_NTL—LPP_DV—CENT_SATURATED   |
| 009279763-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—<br>MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST |
| 009279763-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_SATURATED  |
| 009279763-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED  |
| 009279763-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED   |

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

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

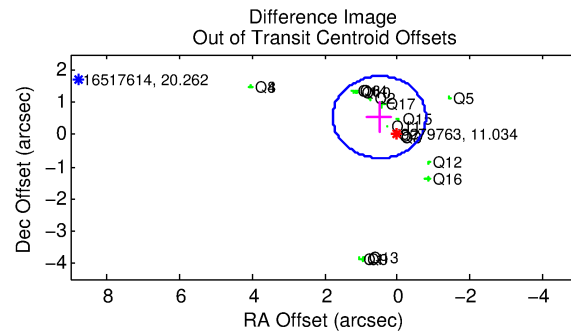
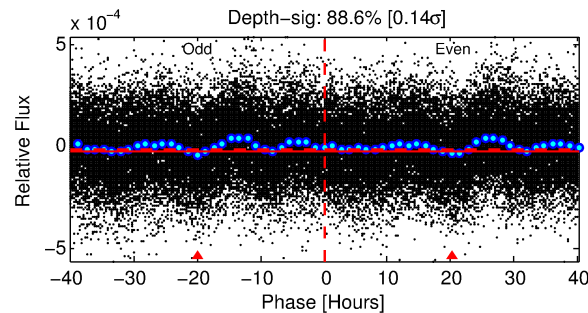
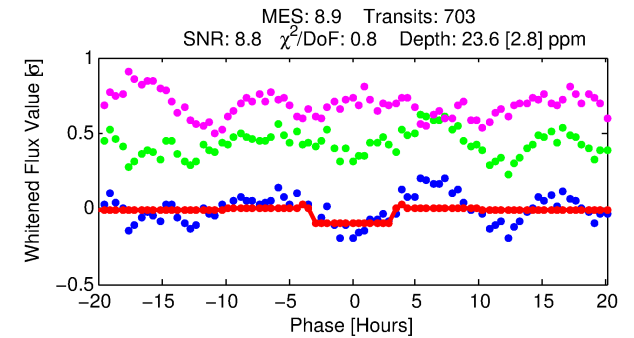
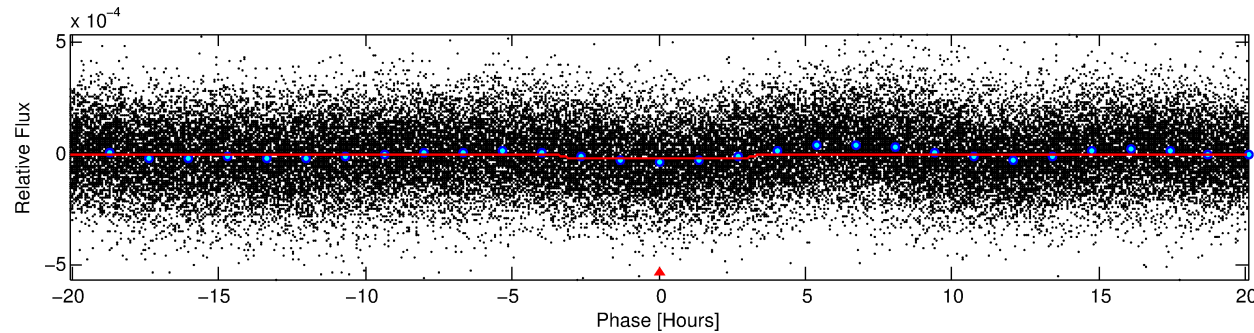
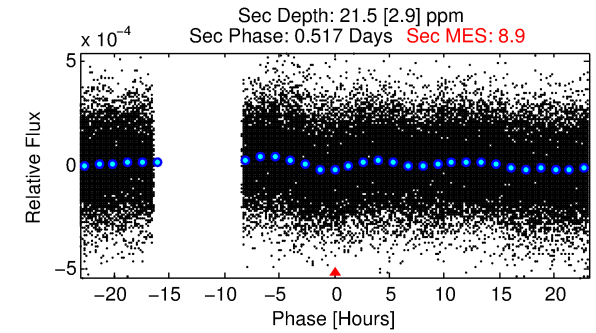
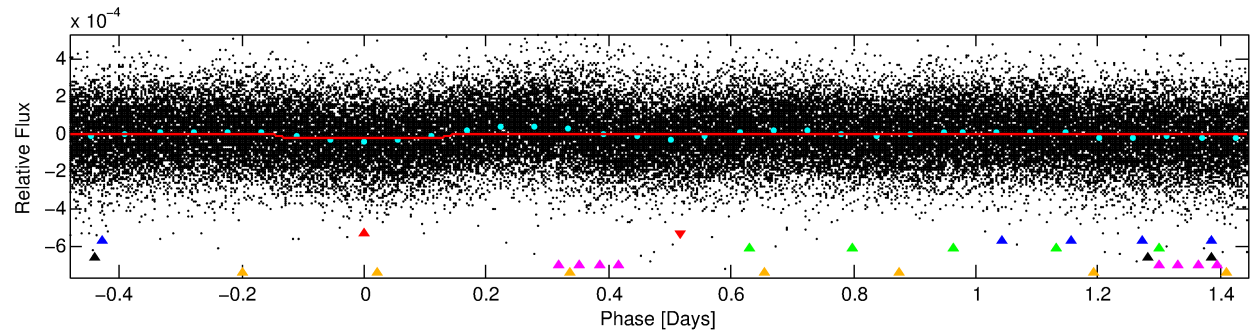
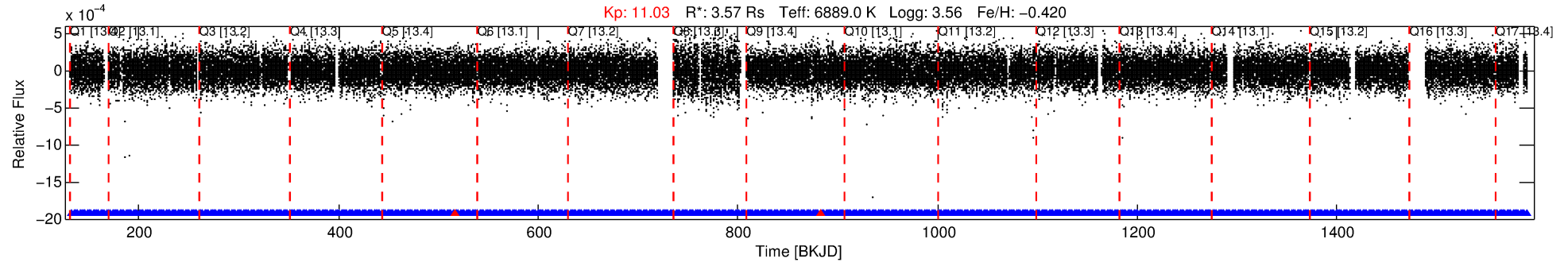
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009279763-01

No Significant Match Found

# DV One-Page Summary

KIC: 9279763 Candidate: 1 of 6 Period: 1.927 d



## DV Fit Results:

Period = 1.92664 [0.00002] d  
Epoch = 133.2165 [0.0041] BKJD  
Rp/R\* = 0.0045 [0.0016]  
a/R\* = 2.20 [3.52]  
b = 0.31 [5.87]  
Seff = 19875.26 [11304.85]  
Teq = 3028 [431] K  
Rp = 1.77 [0.93] Re  
a = 0.0360 [0.0128] AU  
Ag = 4.91 [4.52] [0.87σ]  
Teffp = 6969 [1288] K [2.90σ]

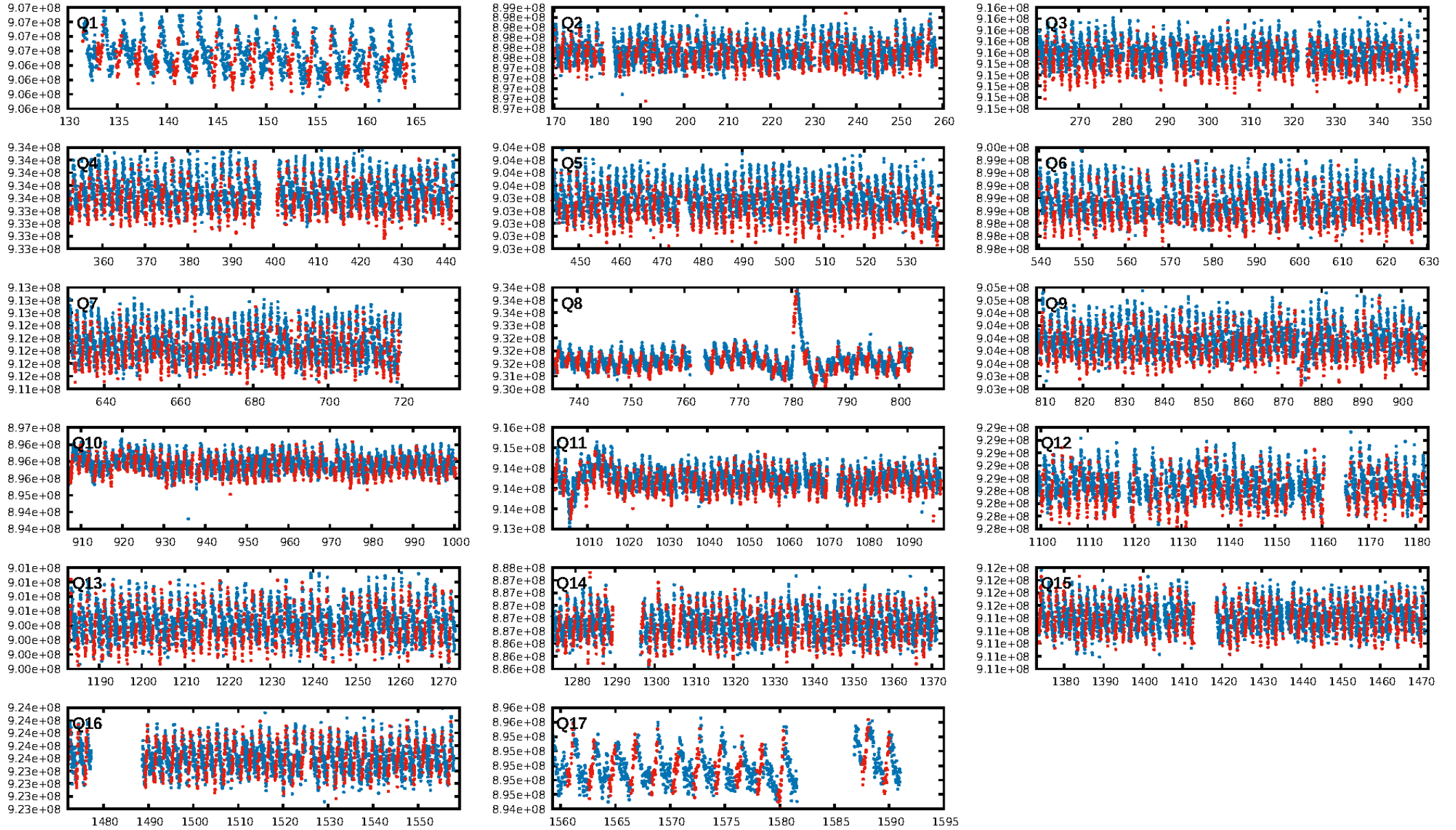
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [426.79σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.24e-12  
RollingBand-fgt: 1.00 [671/673]  
GhostDiagnostic-chr: 1.103  
Centroid-sig: 0.0%  
Centroid-so: 1.050 arcsec [2.42σ]  
OotOffset-rm: 0.735 arcsec [1.73σ]  
KicOffset-rm: 0.655 arcsec [1.41σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.94 [16/17]  
DiffImageOverlap-fno: 1.00 [17/17]

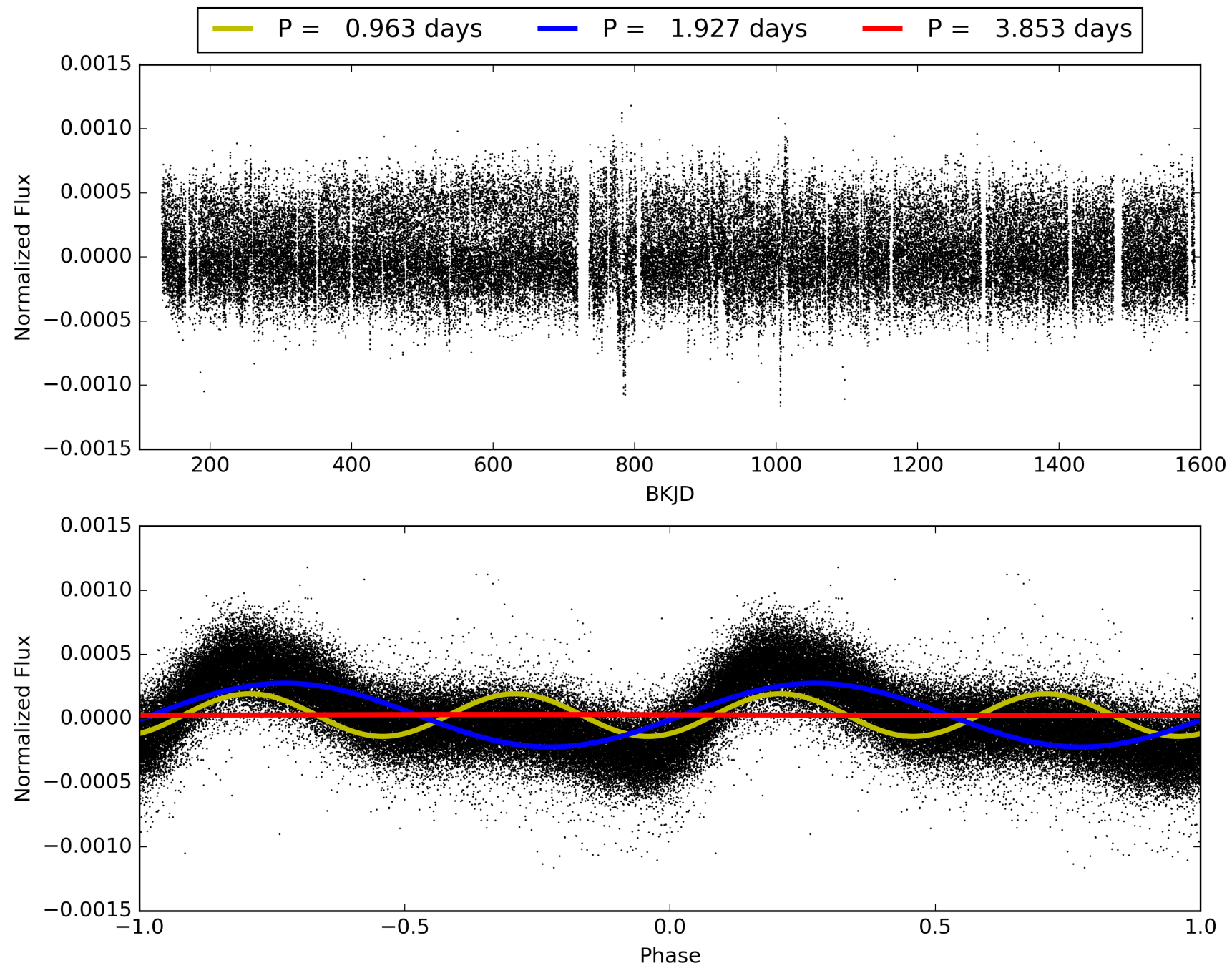
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:44:08 Z

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

# TCE 009279763-01, PDC Light Curves



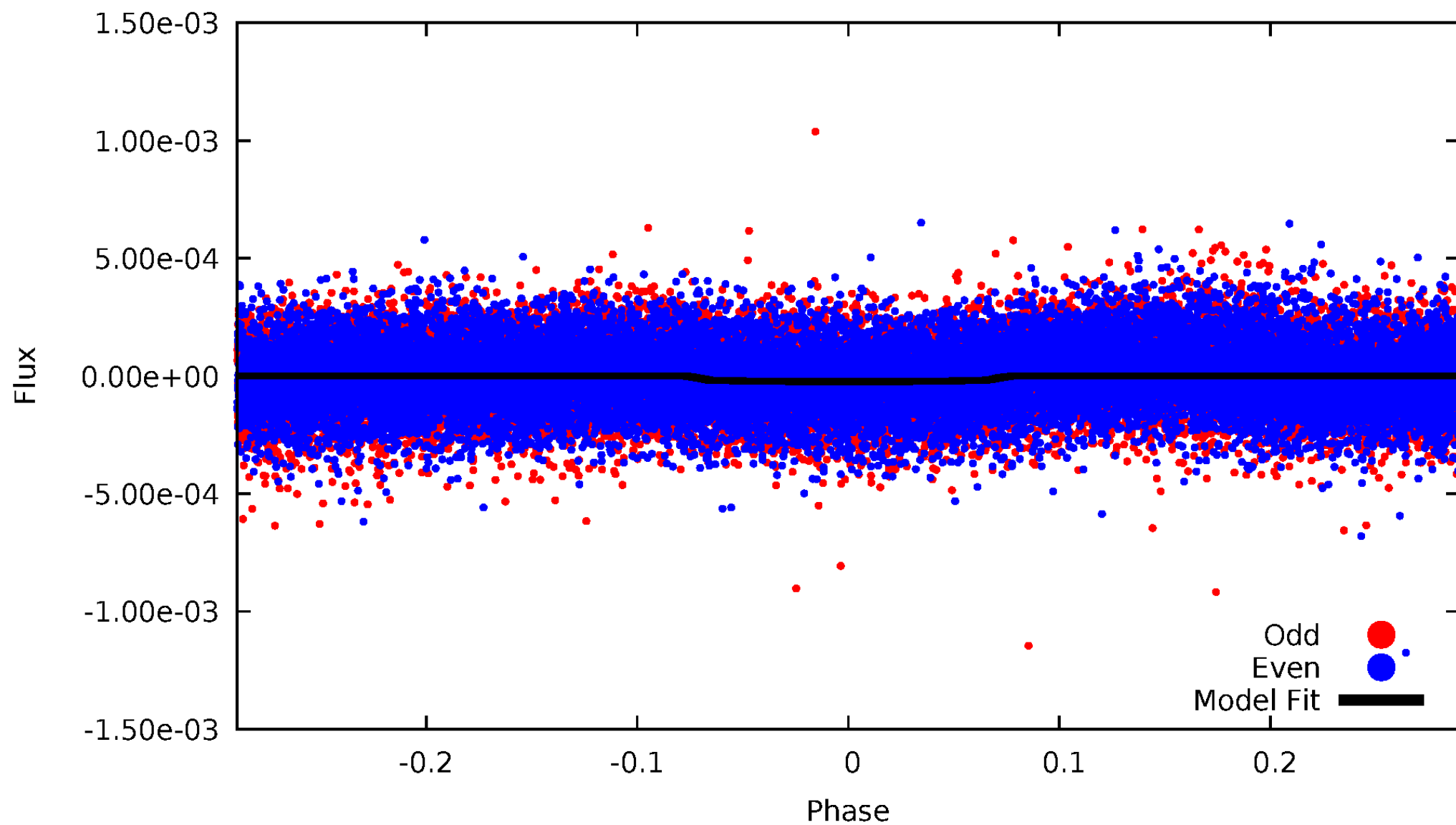
TCE 009279763-01





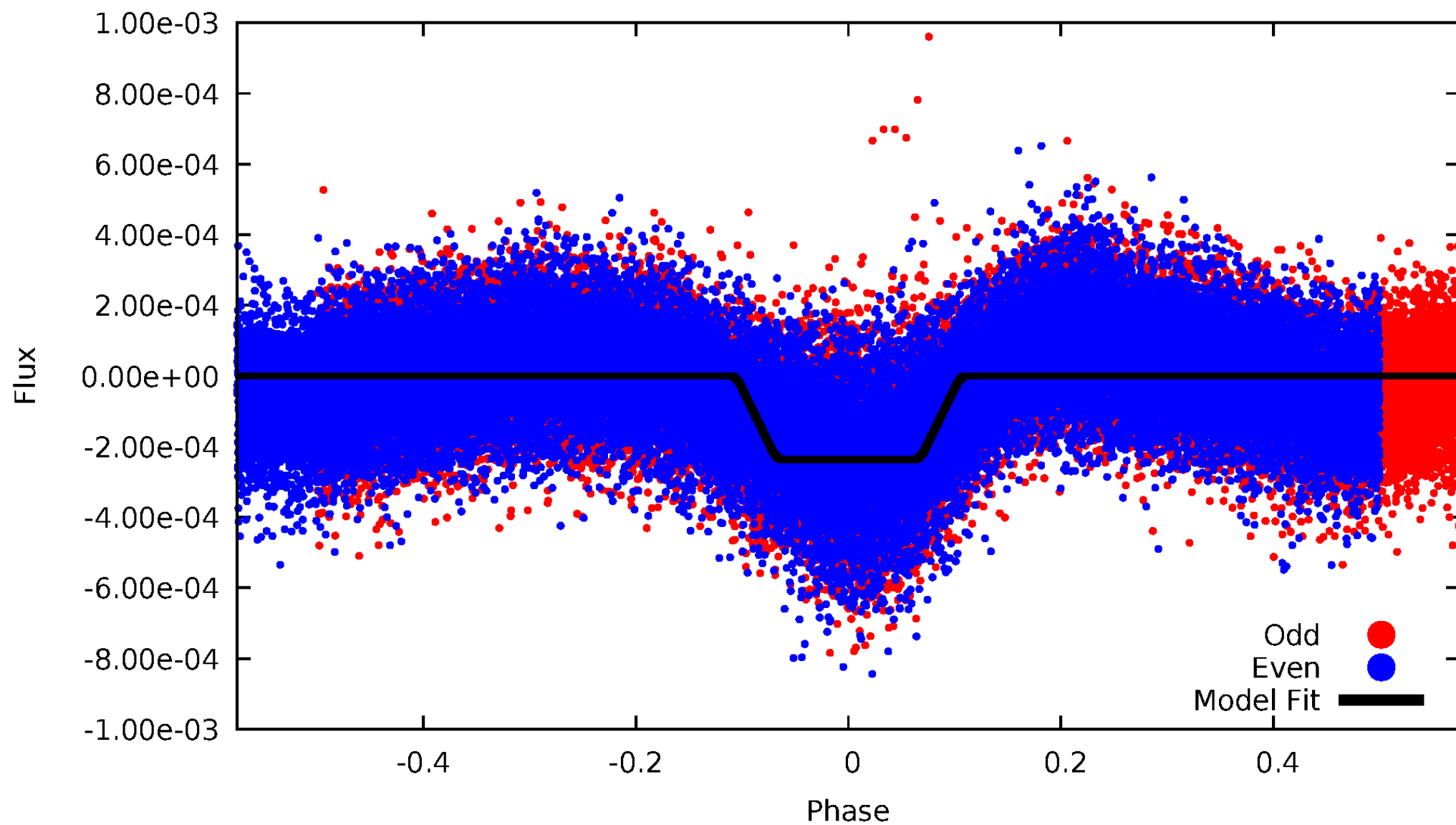
# DV Odd/Even

TCE 009279763-01

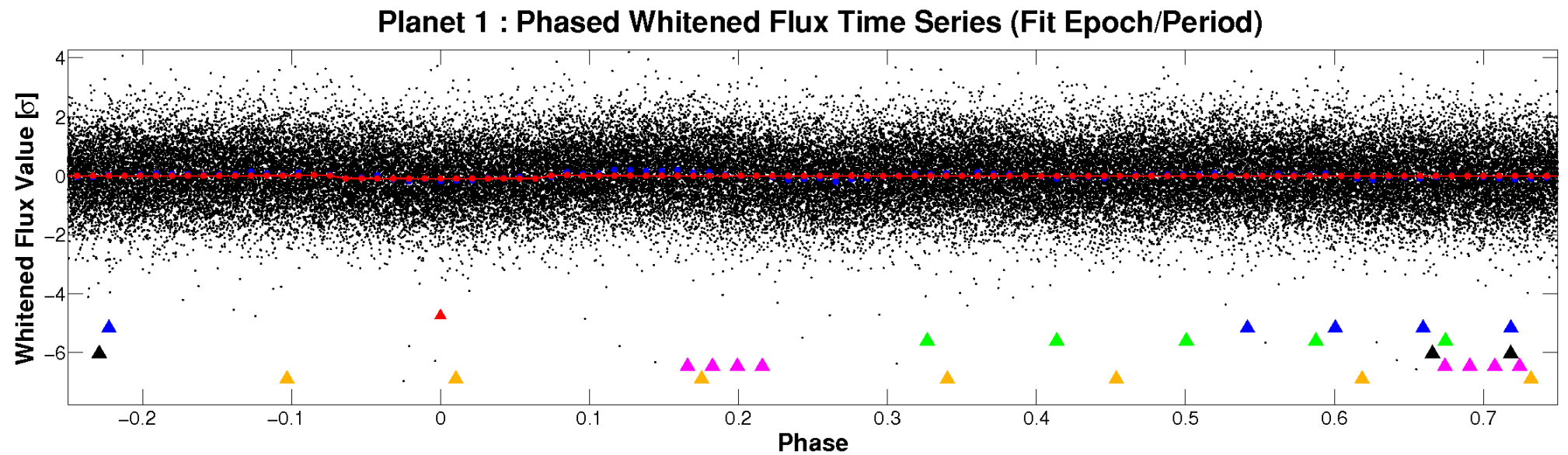
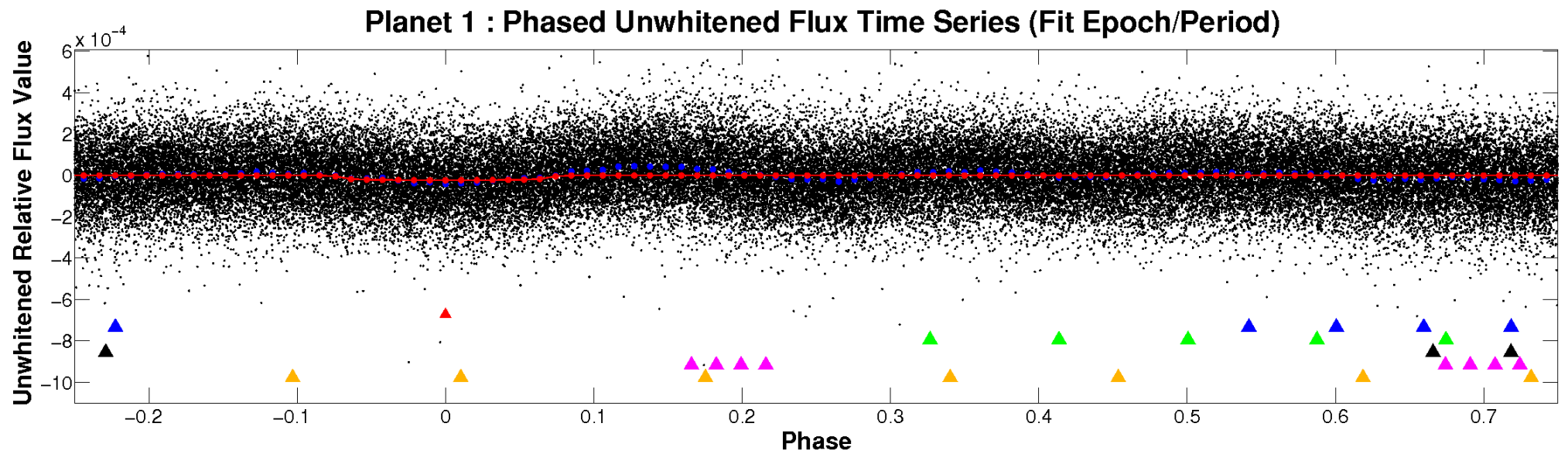


# ALT Odd/Even

TCE 009279763-01

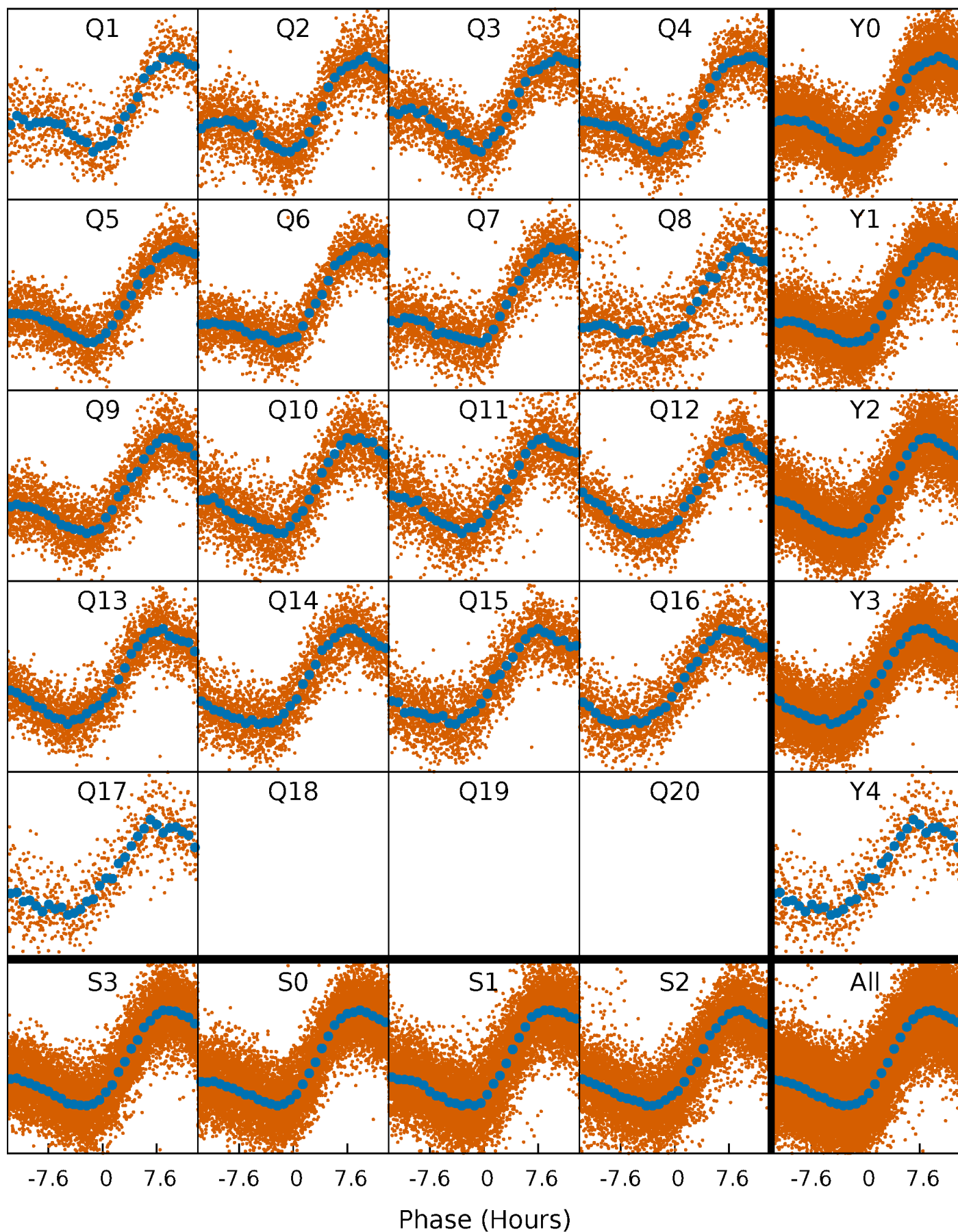


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

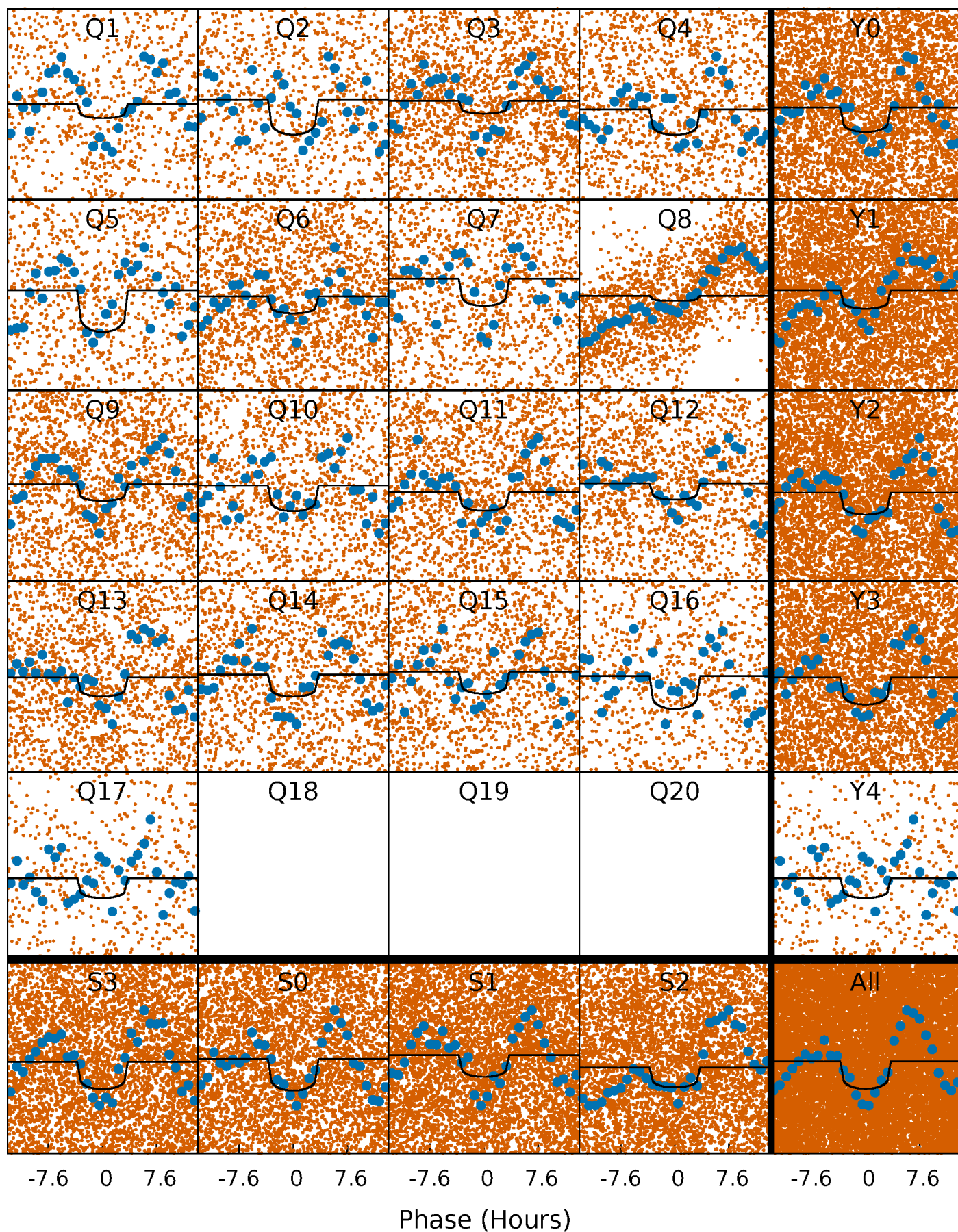
TCE 009279763-01 P= 1.926636 Days  $T_0=133.216535$  (BKJD)





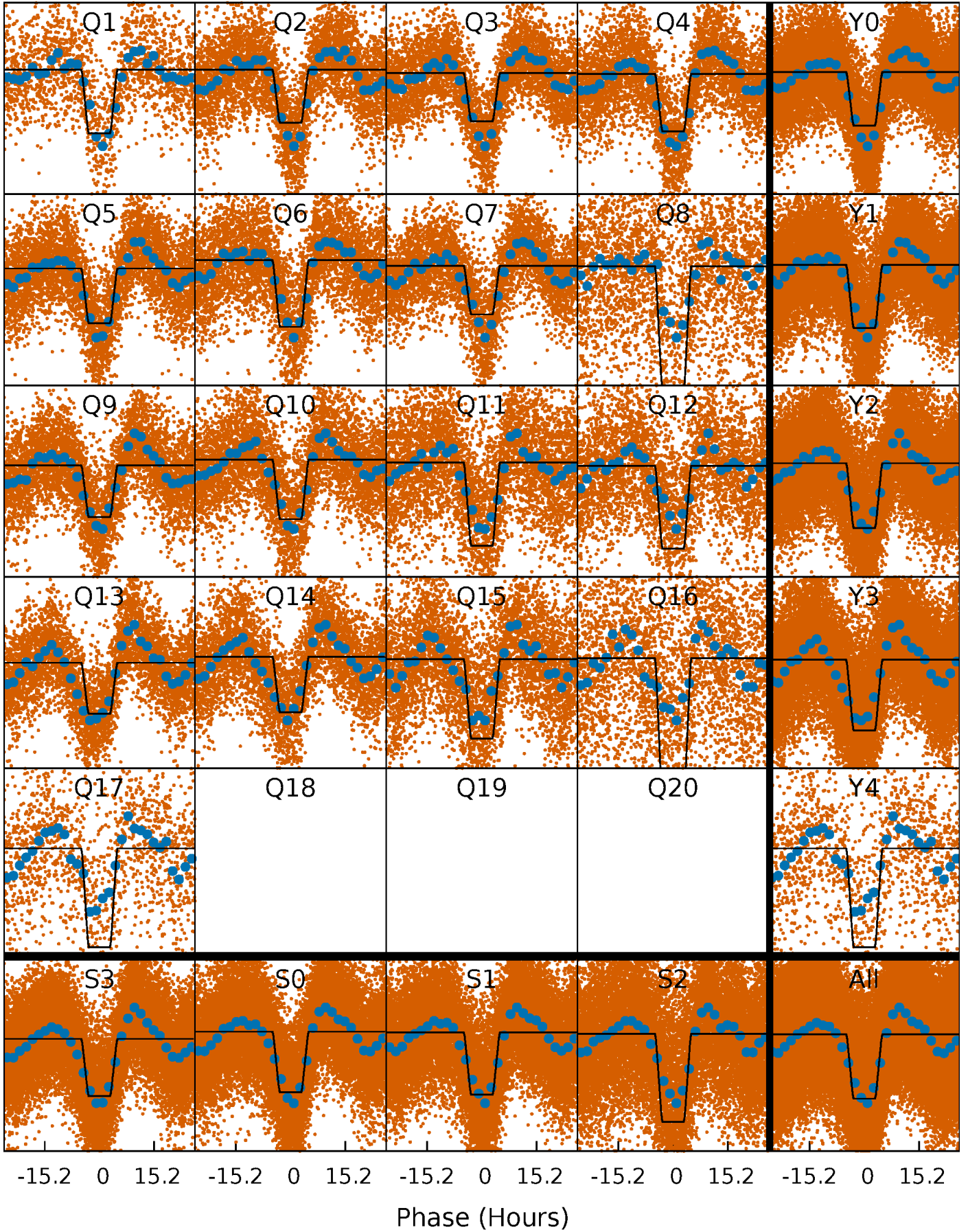
# DV Quarter-Phased Transit Curves

TCE 009279763-01 P= 1.926636 Days  $T_0=133.216535$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009279763-01 P= 1.926573 Days  $T_0=133.190055$  (BKJD)

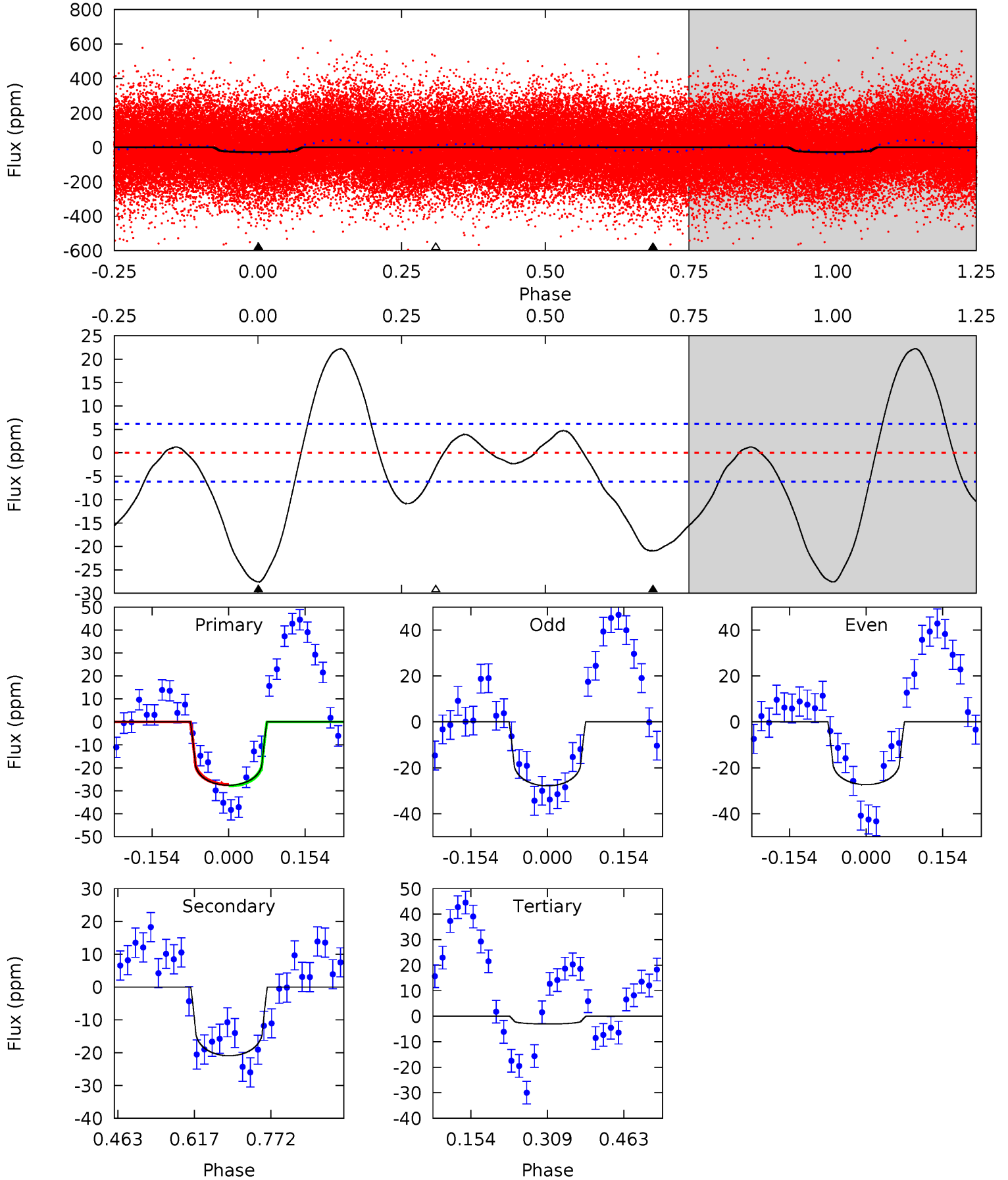




# DV Model-Shift Uniqueness Test

009279763-01, P = 1.926636 Days, E = 131.289899 Days

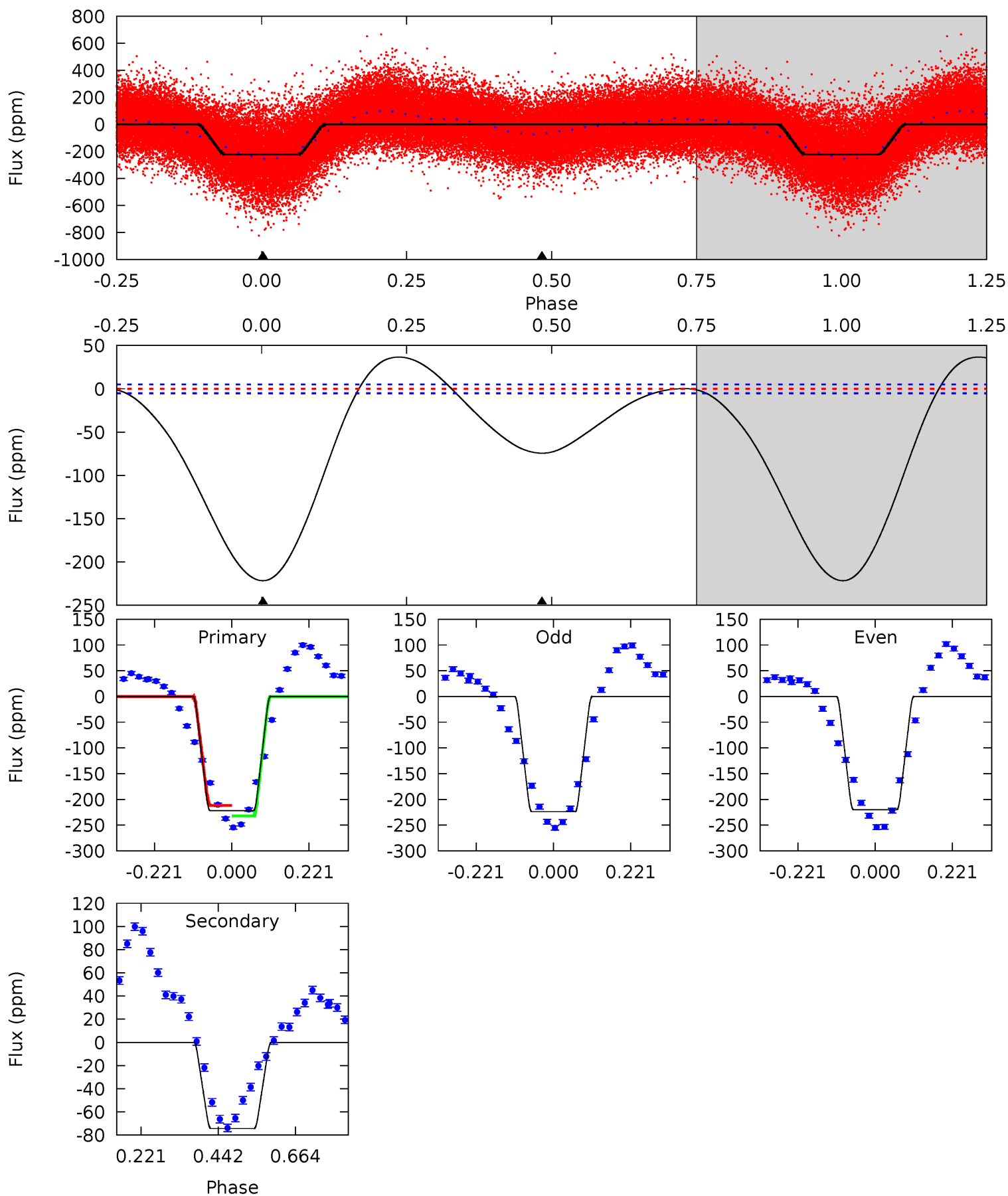
| Pri  | Sec  | Ter  | Pos | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 20.0 | 15.2 | 2.21 | 0   | 4.47            | 1.42            | 4.93             | 17.8    | 20.0    | 13.0    | 15.2    | 0.18    | 1.07 | 0.45  | 0.20 |



# Alt Model-Shift Uniqueness Test

009279763-01, P = 1.926573 Days, E = 131.263482 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  |
|-------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 192.2 | 64.5 | 0   | 0   | 4.40            | 1.22            | 15.7             | 192.2   | 192.2   | 64.5    | 64.5    | 1.72    | 0.99 | 0.14  | 8.98 |





### Stellar Parameters For KIC 009279763

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M$ ( $M_{\odot}$ )       | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6889^{+173}_{-190}$ | $3.556^{+0.323}_{-0.086}$ | $-0.420^{+0.350}_{-0.250}$ | $3.571^{+0.428}_{-1.371}$ | $1.671^{+0.195}_{-0.363}$ | $0.052^{+0.125}_{-0.014}$                     |
|        | +3%/-3%              | +9%/-2%                   | +83%/-60%                  | +12%/-38%                 | +12%/-22%                 | +242%/-26%                                    |
| 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 009279763-01 / KOI

| Detrend | Depth (ppm) | $R_p$ ( $R_{\oplus}$ ) | $T_{max}$ (K)        | $T_{obs}$ (K)          | $A_{obs}$                 |
|---------|-------------|------------------------|----------------------|------------------------|---------------------------|
| DV      | $-21 \pm 1$ | $1.61^{+0.73}_{-0.61}$ | $4158^{+229}_{-390}$ | $6822^{+2395}_{-1109}$ | $5.713^{+8.579}_{-2.958}$ |
| Alt.    | $-74 \pm 1$ | $5.76^{+0.99}_{-1.11}$ | $4162^{+224}_{-382}$ | $4968^{+307}_{-277}$   | $1.610^{+0.790}_{-0.398}$ |

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

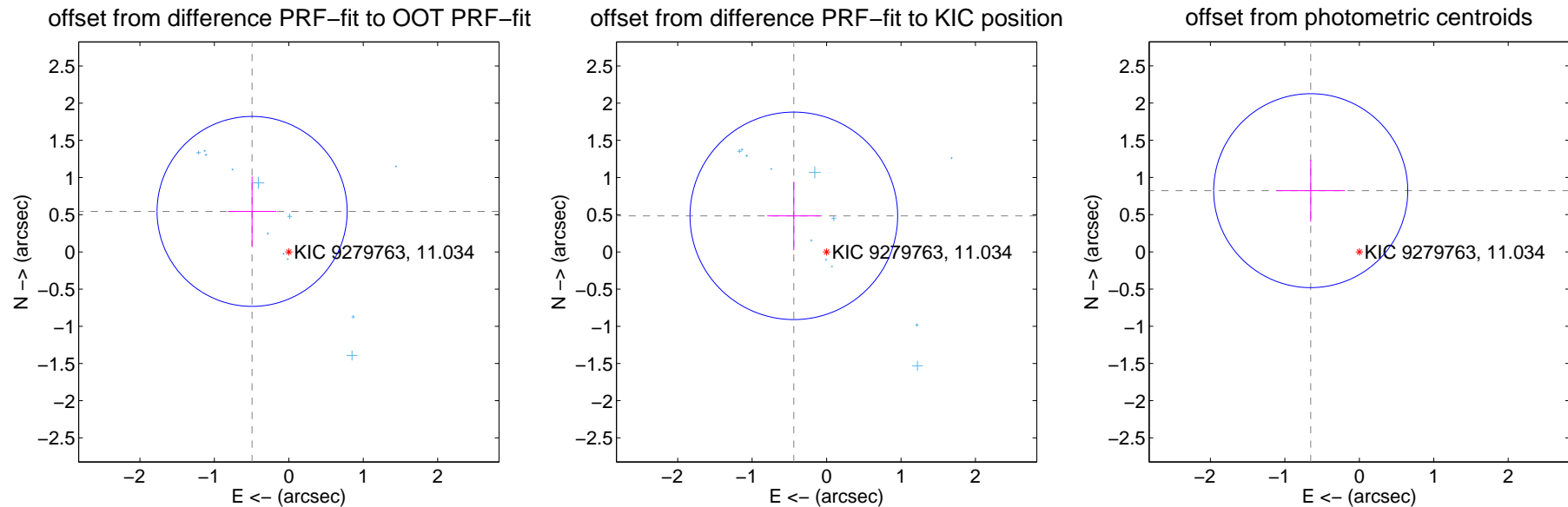
## DV Centroid Data

Supplemental centroid analysis for 009279763-01. **Kepler magnitude: 11.03.** Transit SNR 8.82

There are 16 quarters with good PRF difference image offsets

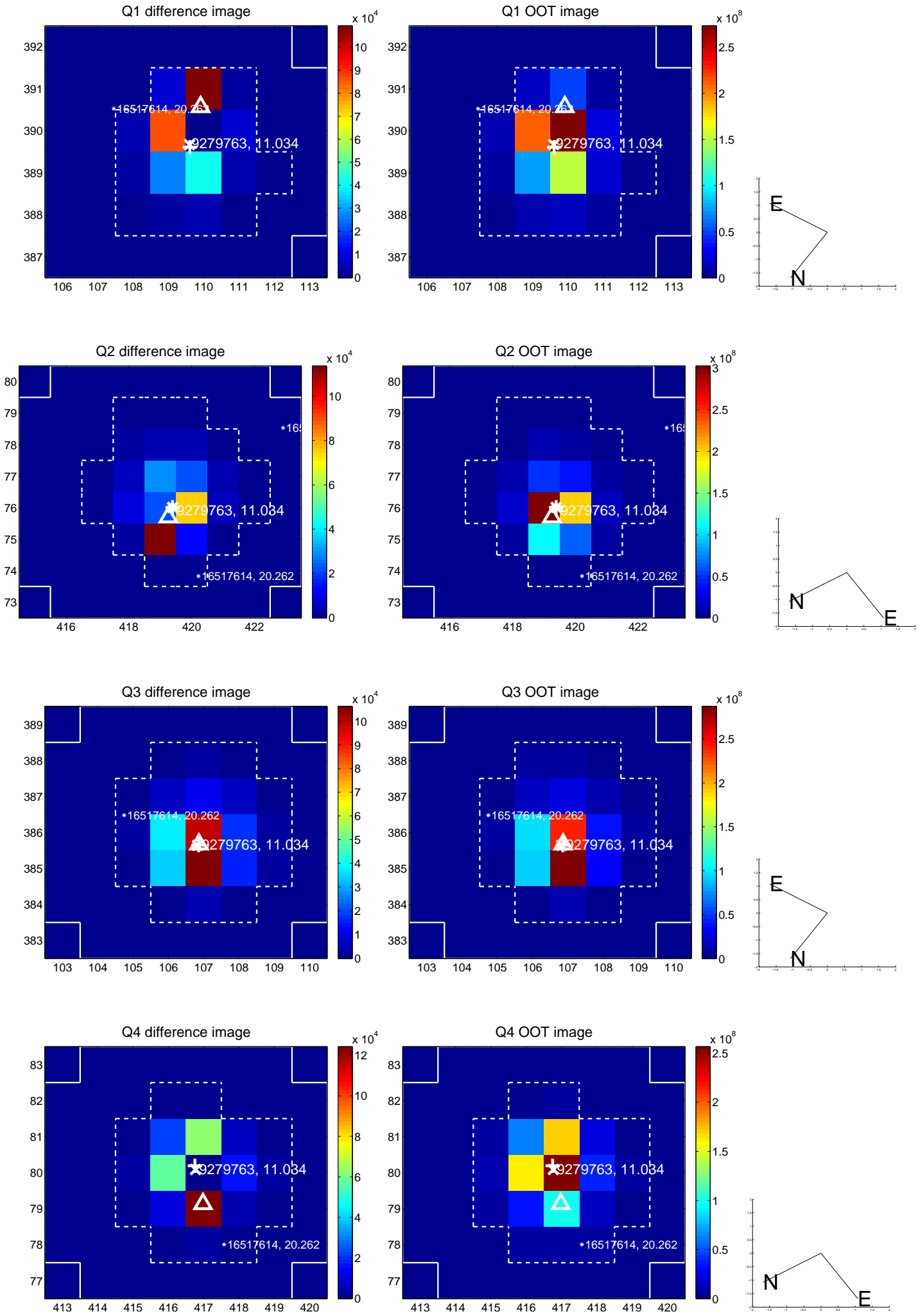
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | $0.735 \pm 0.426$  | 1.73                | $0.493 \pm 0.325$ | $0.545 \pm 0.468$ |
| PRF-fit source offset from KIC position | $0.655 \pm 0.465$  | 1.41                | $0.440 \pm 0.357$ | $0.485 \pm 0.461$ |
| photometric centroid source offset      | $1.05 \pm 0.43$    | 2.42                | $0.65 \pm 0.46$   | $0.82 \pm 0.42$   |

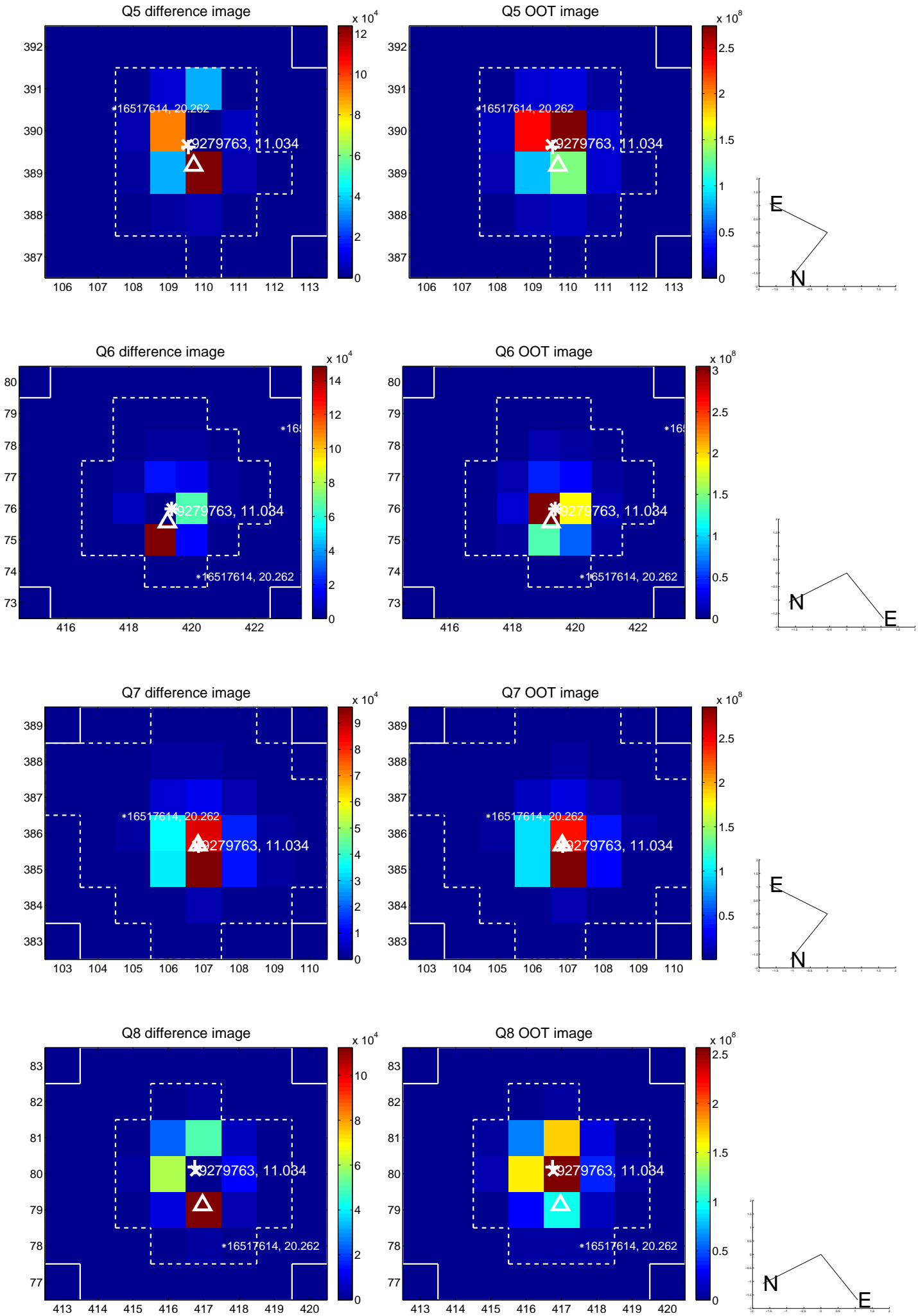


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

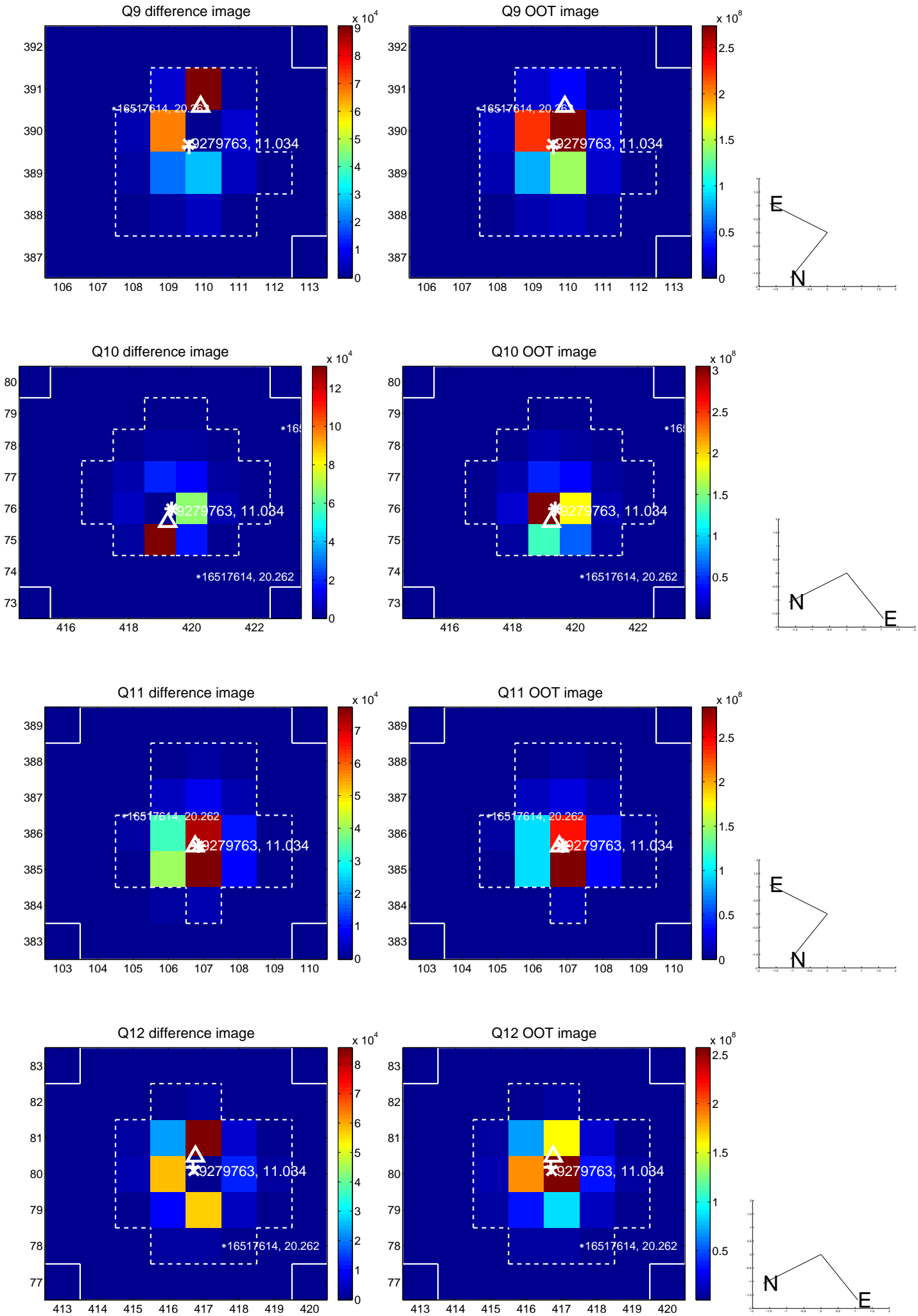


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

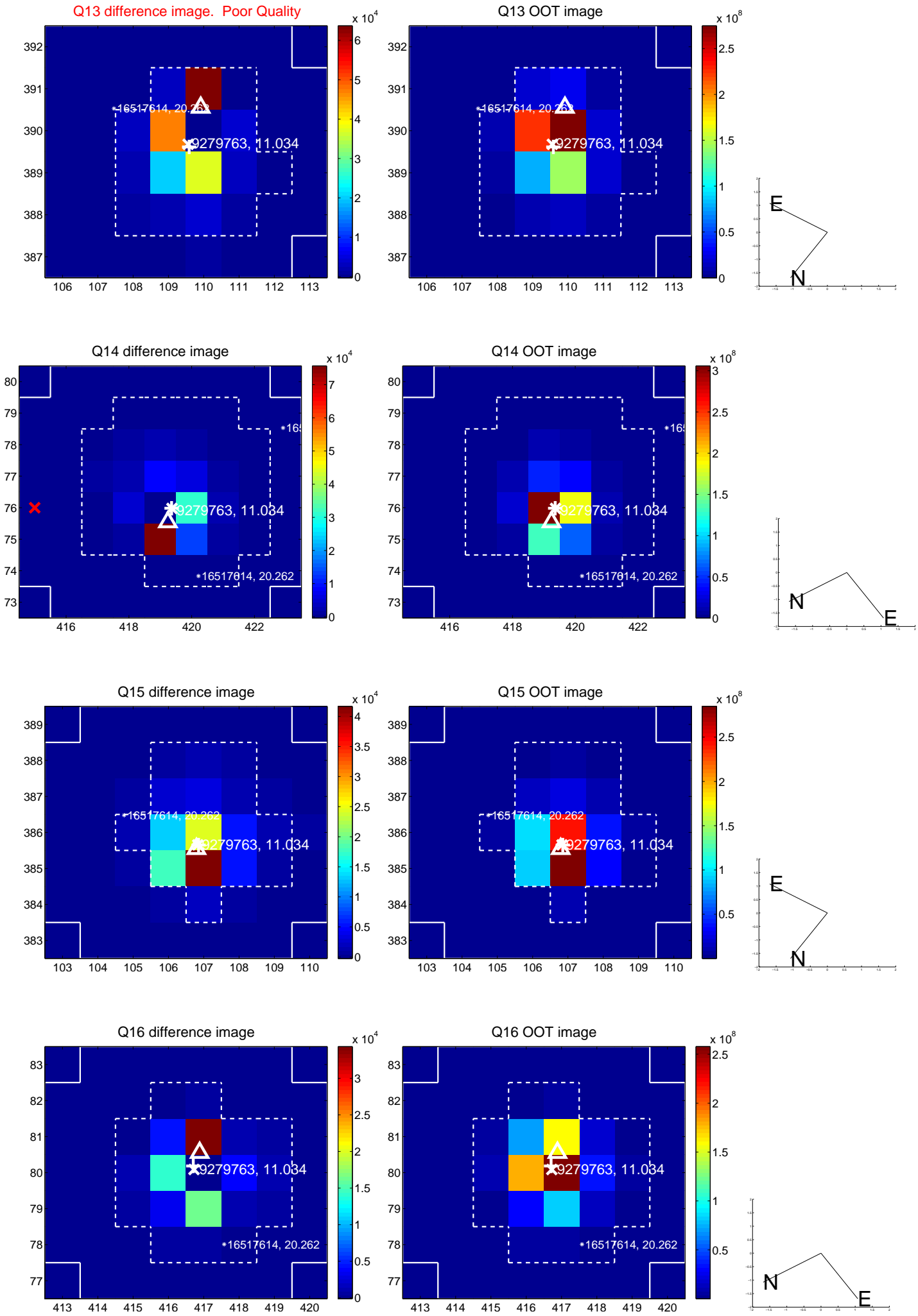




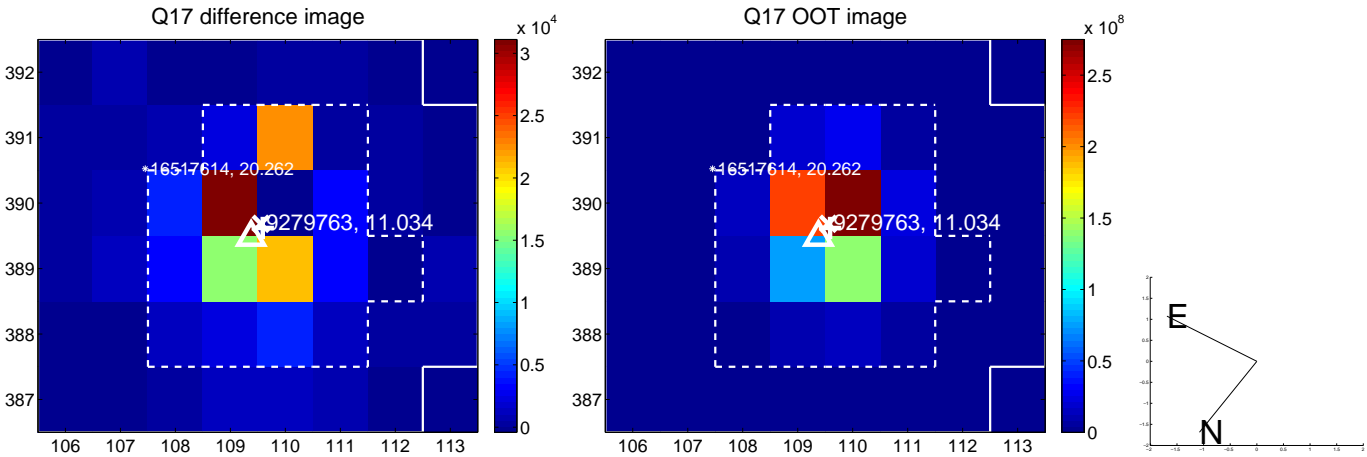
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



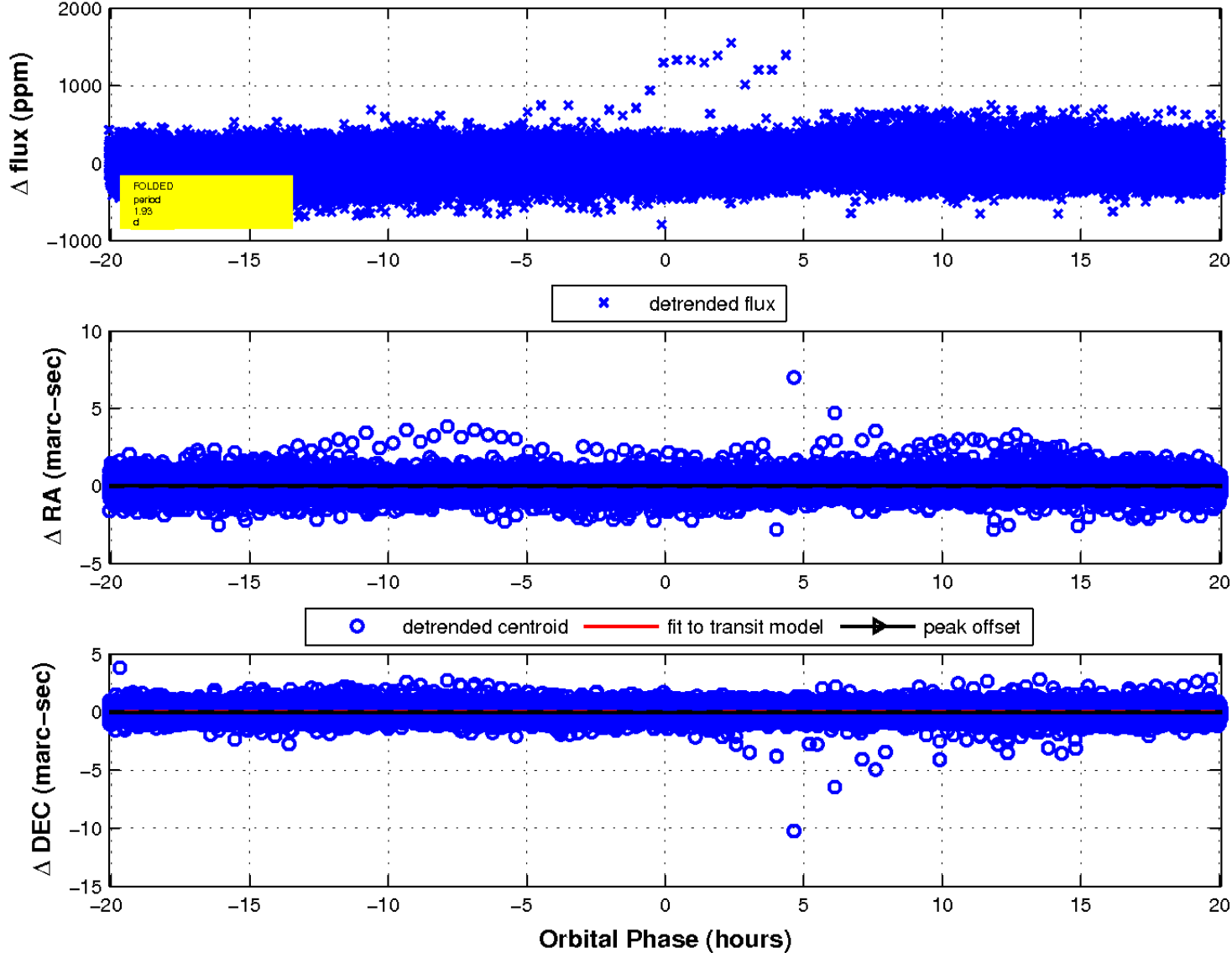
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

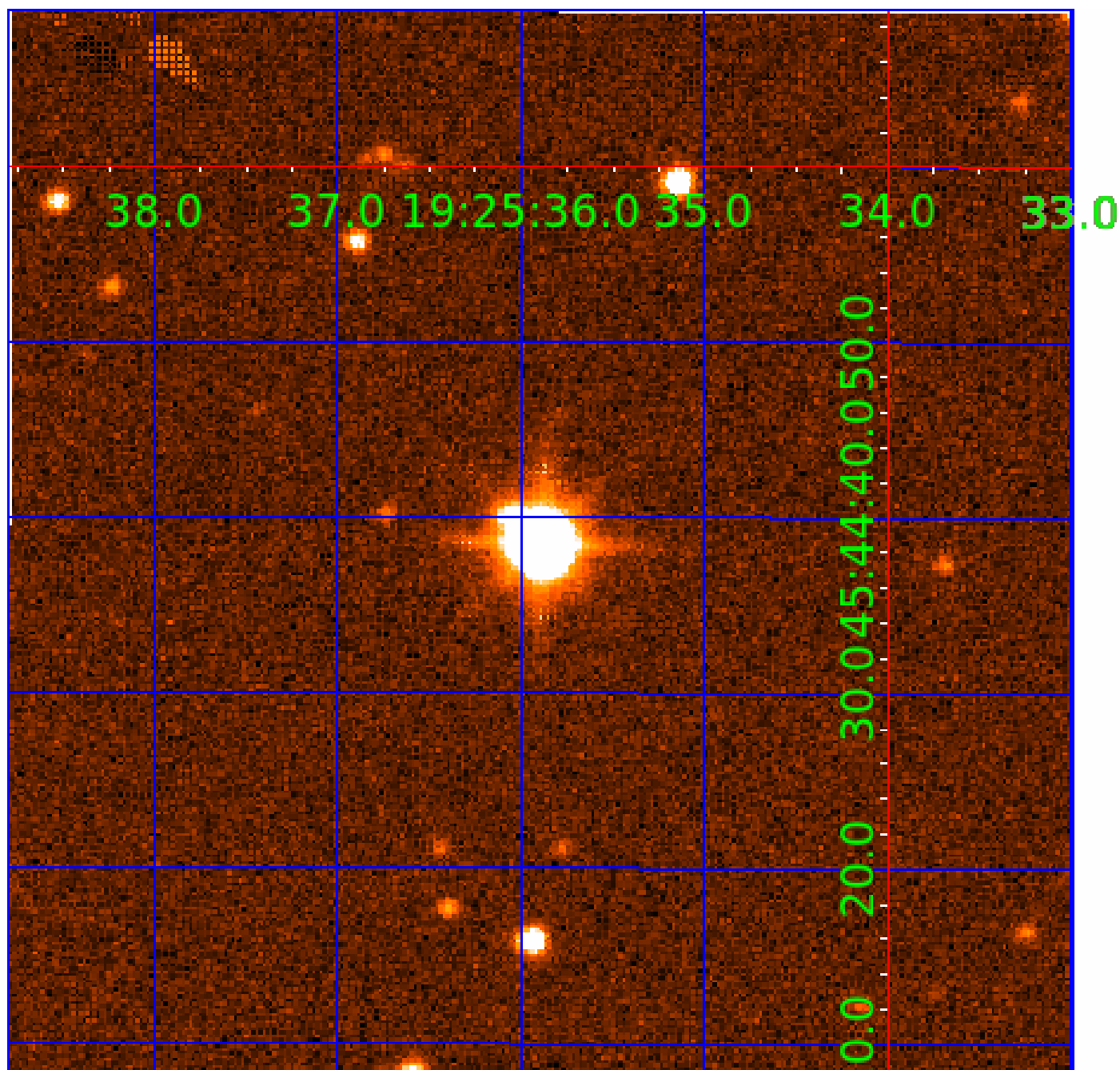


fluxWeightedCentroids, Planet 1 of 6



UKIRT Image

Declination





# KIC 009279763

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009279763-01 | OBS      | No   | 1.926636      | 133.216535   | 23.6        | 6.693            | 8.9 | 8.8 | 3.57                        | 6889            | 1.77                   | 19875.26               |
| 009279763-02 | OBS      | No   | 325.487920    | 261.872374   | 112.6       | 16.812           | 8.6 | 5.4 | 3.57                        | 6889            | 4.28                   | 21.28                  |
| 009279763-03 | OBS      | No   | 294.942838    | 216.691314   | 248.2       | 4.007            | 8.1 | 8.5 | 3.57                        | 6889            | 5.84                   | 24.27                  |
| 009279763-05 | OBS      | No   | 201.317343    | 169.291612   | 244.2       | 8.995            | 7.3 | 7.3 | 3.57                        | 6889            | 9.73                   | 40.38                  |
| 009279763-06 | OBS      | No   | 226.806773    | 152.502787   | 180.3       | 1.557            | 7.8 | 3.9 | 3.57                        | 6889            | 5.56                   | 34.45                  |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 009279763-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | SWEET_NTL—LPP_DV—CENT_SATURATED   |
| 009279763-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—<br>MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST |
| 009279763-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_SATURATED  |
| 009279763-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED  |
| 009279763-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED   |

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

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

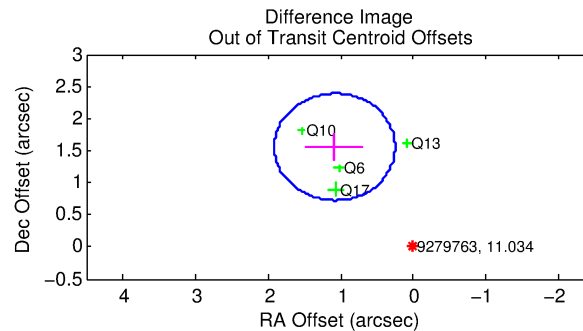
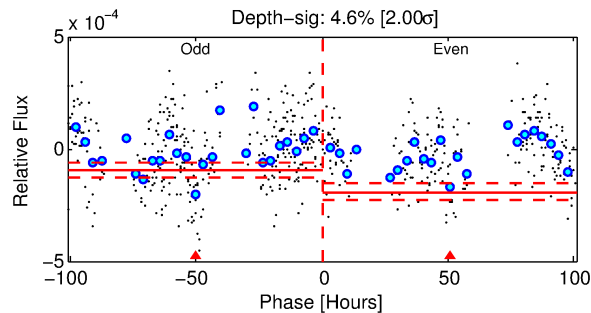
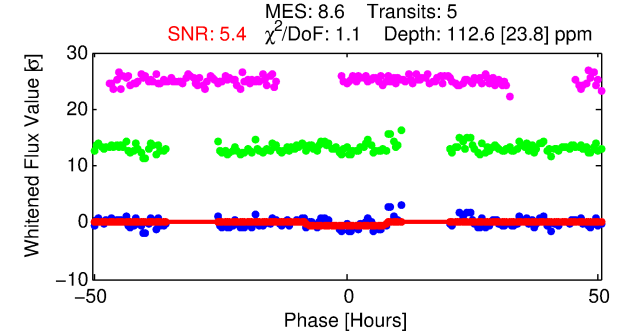
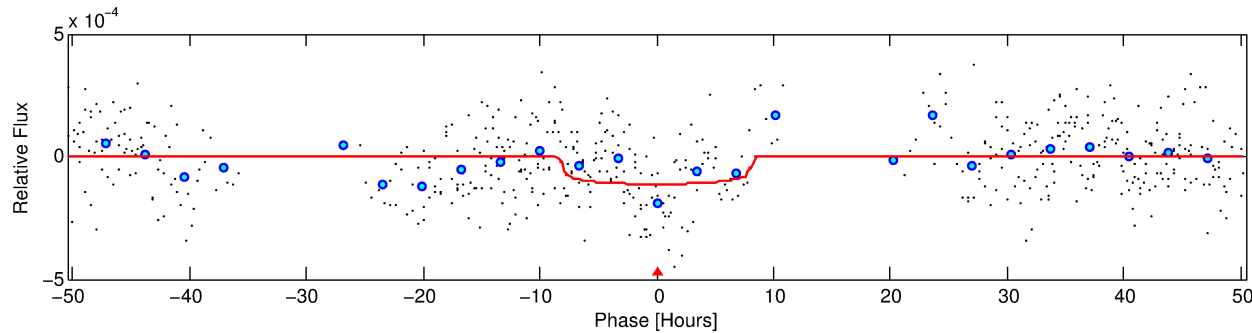
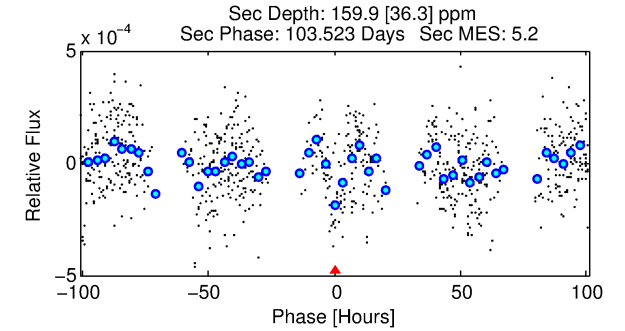
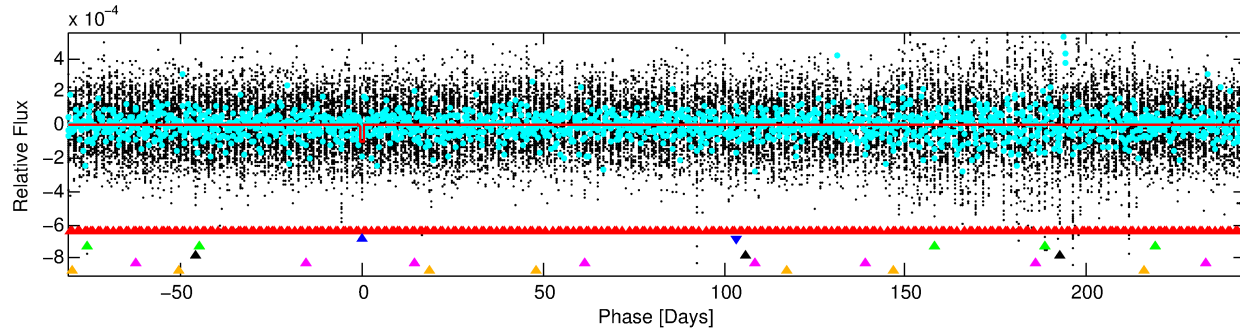
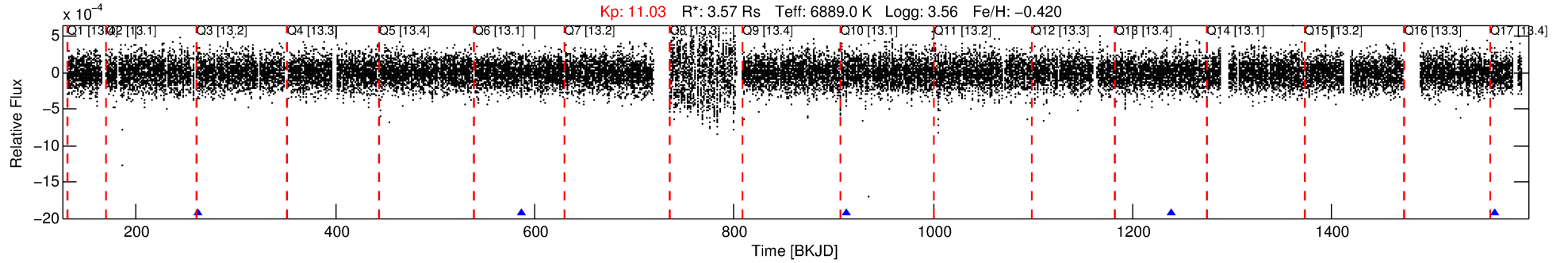
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Ephemeris Match Information For 009279763-02

No Significant Match Found

# DV One-Page Summary

KIC: 9279763 Candidate: 2 of 6 Period: 325.488 d



## DV Fit Results:

Period = 325.48792 [0.01491] d  
Epoch = 261.8724 [0.0475] BKJD  
Rp/R\* = 0.0110 [0.0022]  
a/R\* = 79.39 [75.60]  
b = 0.86 [0.30]  
Seff = 21.28 [12.10]  
Teq = 548 [78] K  
Rp = 4.28 [1.85] Re  
a = 1.0996 [0.3918] AU  
Ag = 5794.36 [4163.25] [1.39 $\sigma$ ]  
Teffp = 7388 [861] K [7.92 $\sigma$ ]

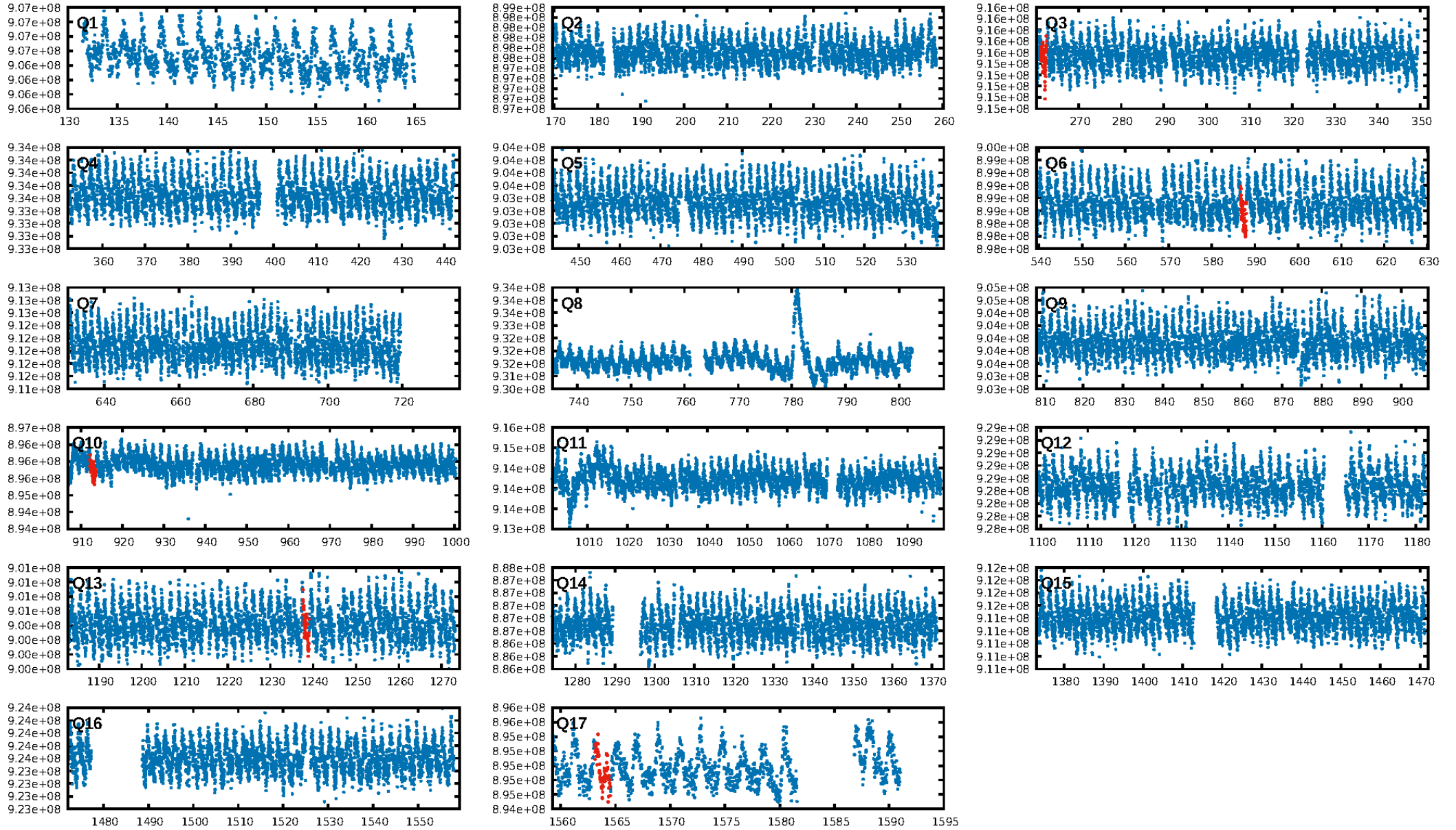
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [42.42 $\sigma$ ]  
LongPeriod-sig: 100.0% [93.38 $\sigma$ ]  
ModelChiSquare2-sig: 14.8%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.47e-11  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.2376  
Centroid-sig: 36.1%  
Centroid-so: 0.860 arcsec [0.81 $\sigma$ ]  
OotOffset-rm: 1.896 arcsec [6.83 $\sigma$ ]  
KicOffset-rm: 1.878 arcsec [6.72 $\sigma$ ]  
OotOffset-st: 2/0/0/2 [4]  
KicOffset-st: 2/0/0/2 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 0.00 [0/4]

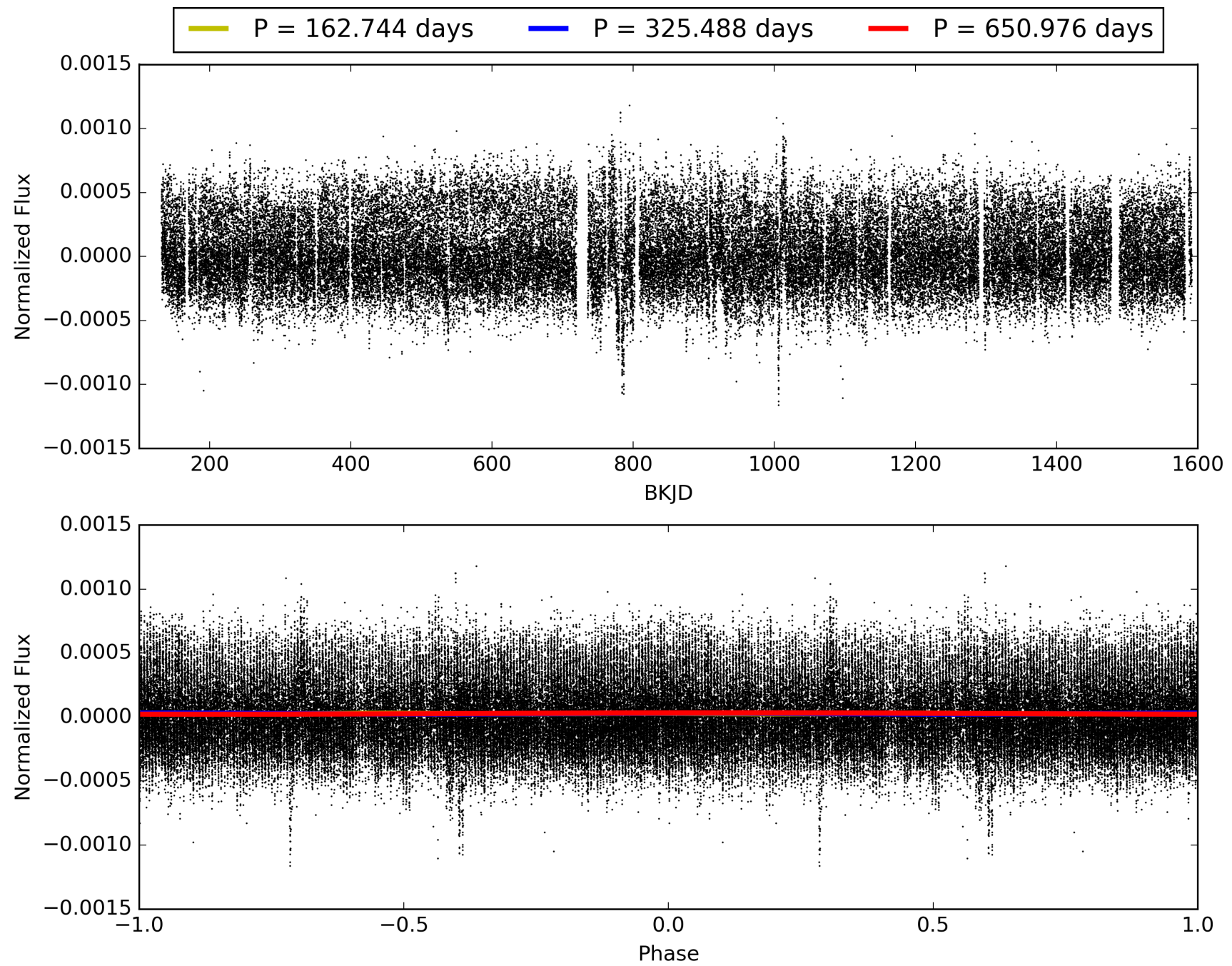
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009279763-02, PDC Light Curves

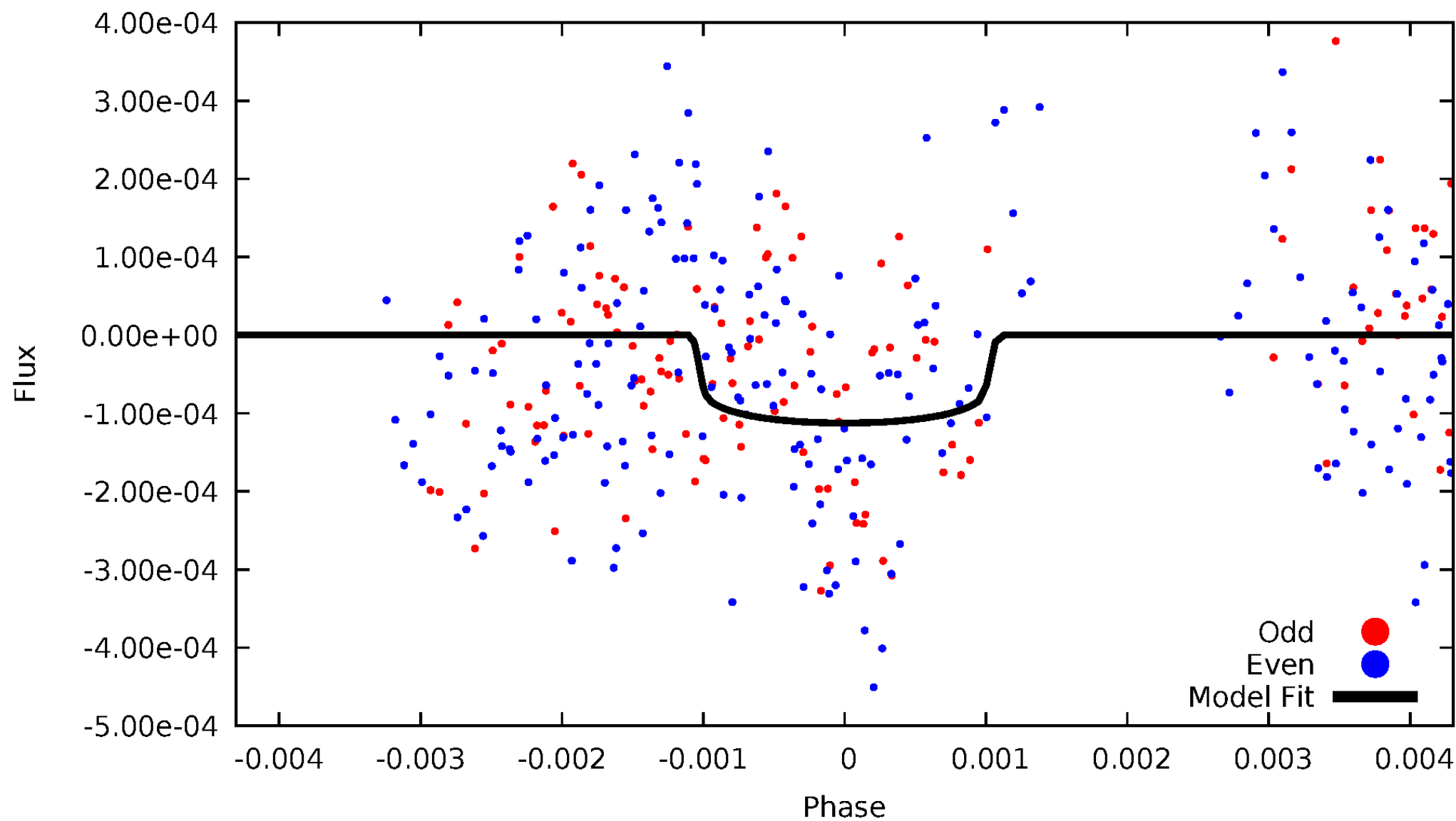


TCE 009279763-02



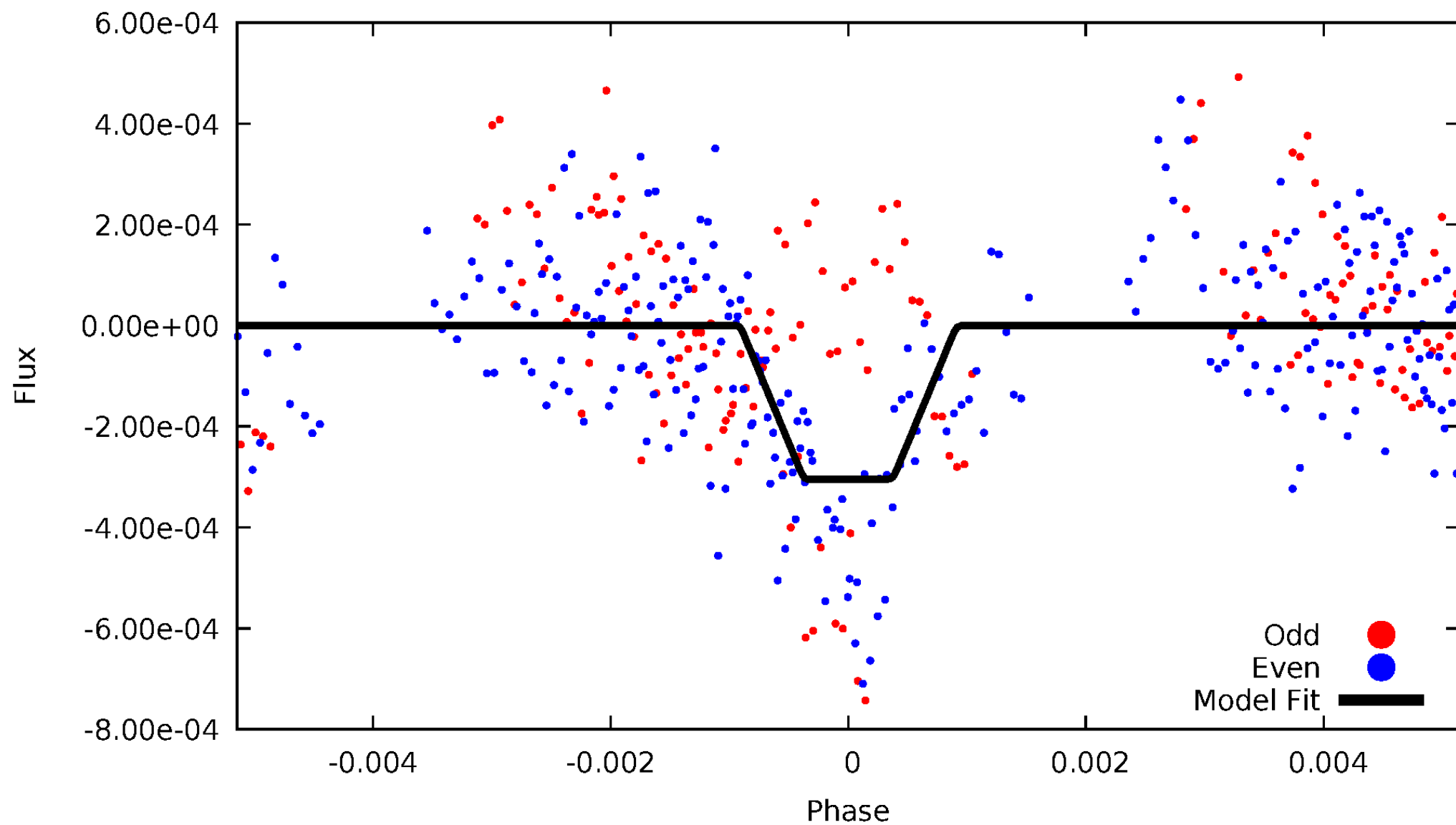
# DV Odd/Even

TCE 009279763-02



# ALT Odd/Even

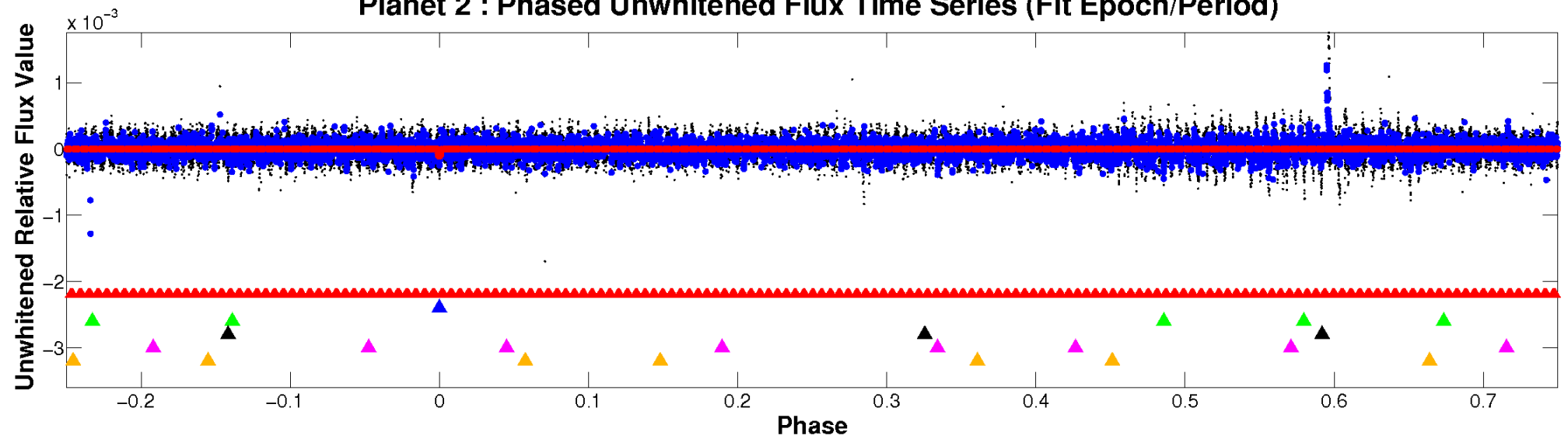
TCE 009279763-02



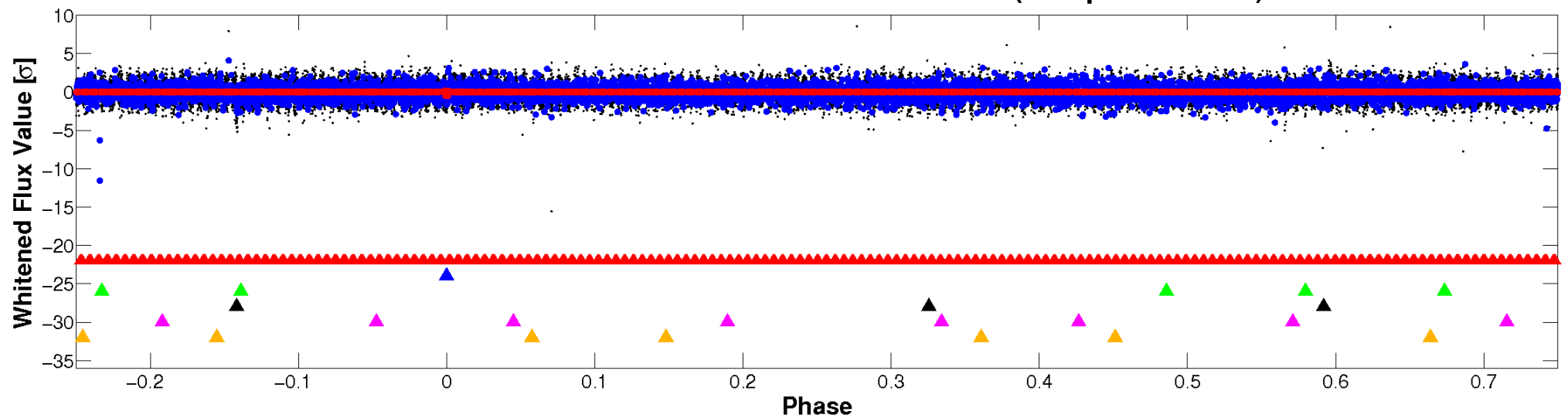


# Non-Whitened Vs. Whitened Light Curve

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

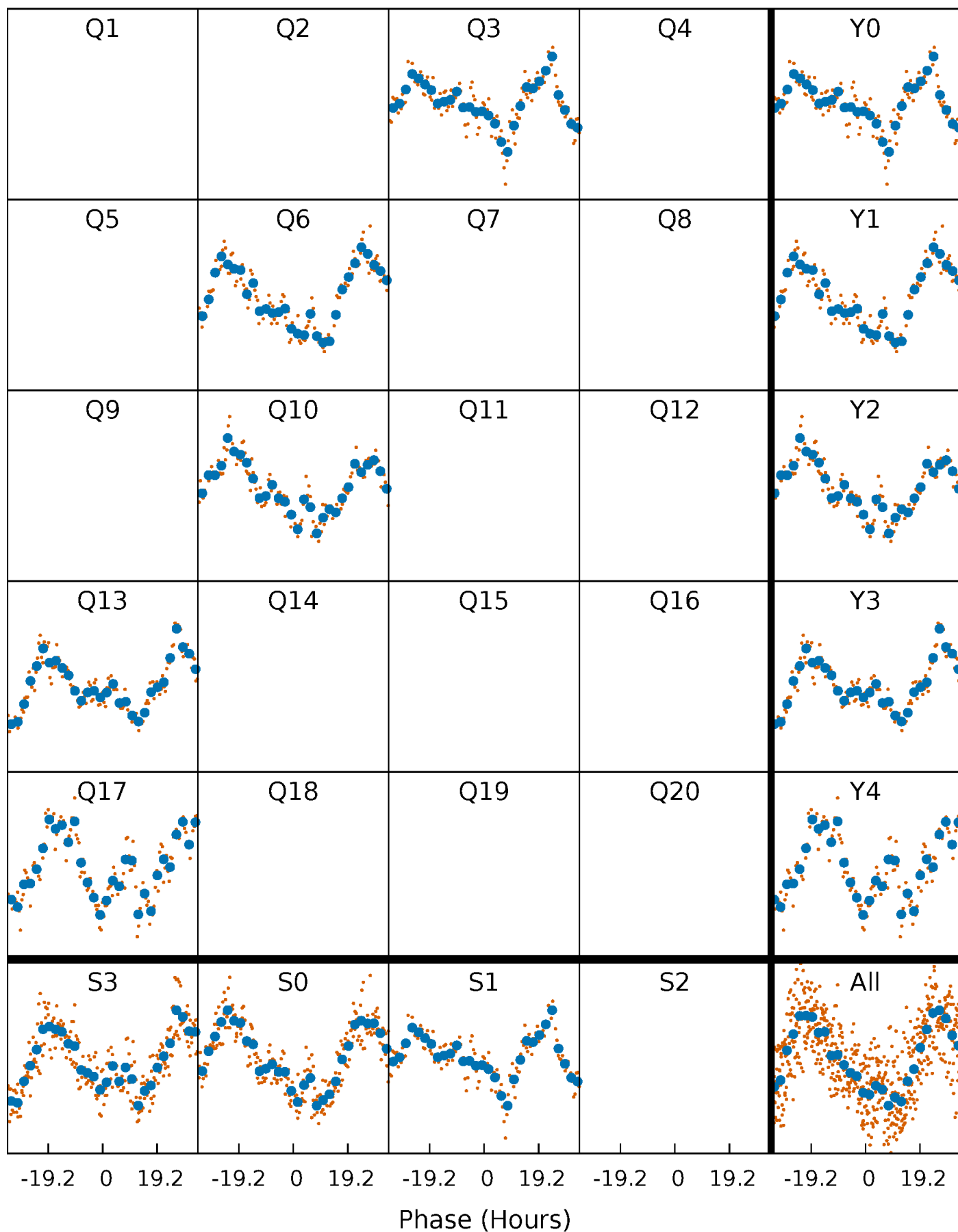


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



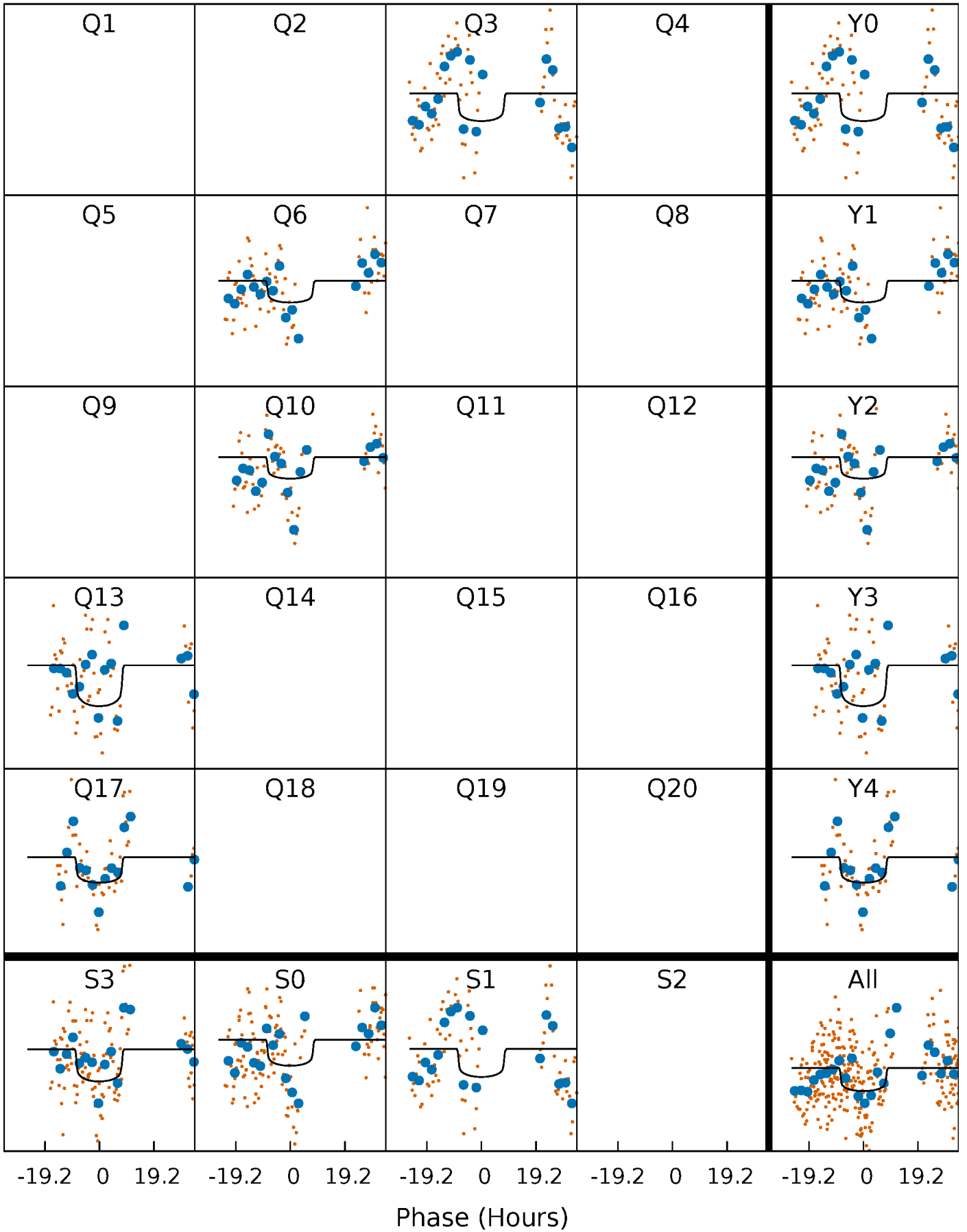
# PDC Quarter-Phased Transit Curves

TCE 009279763-02     $P=325.487920$  Days     $T_0=261.872374$  (BKJD)



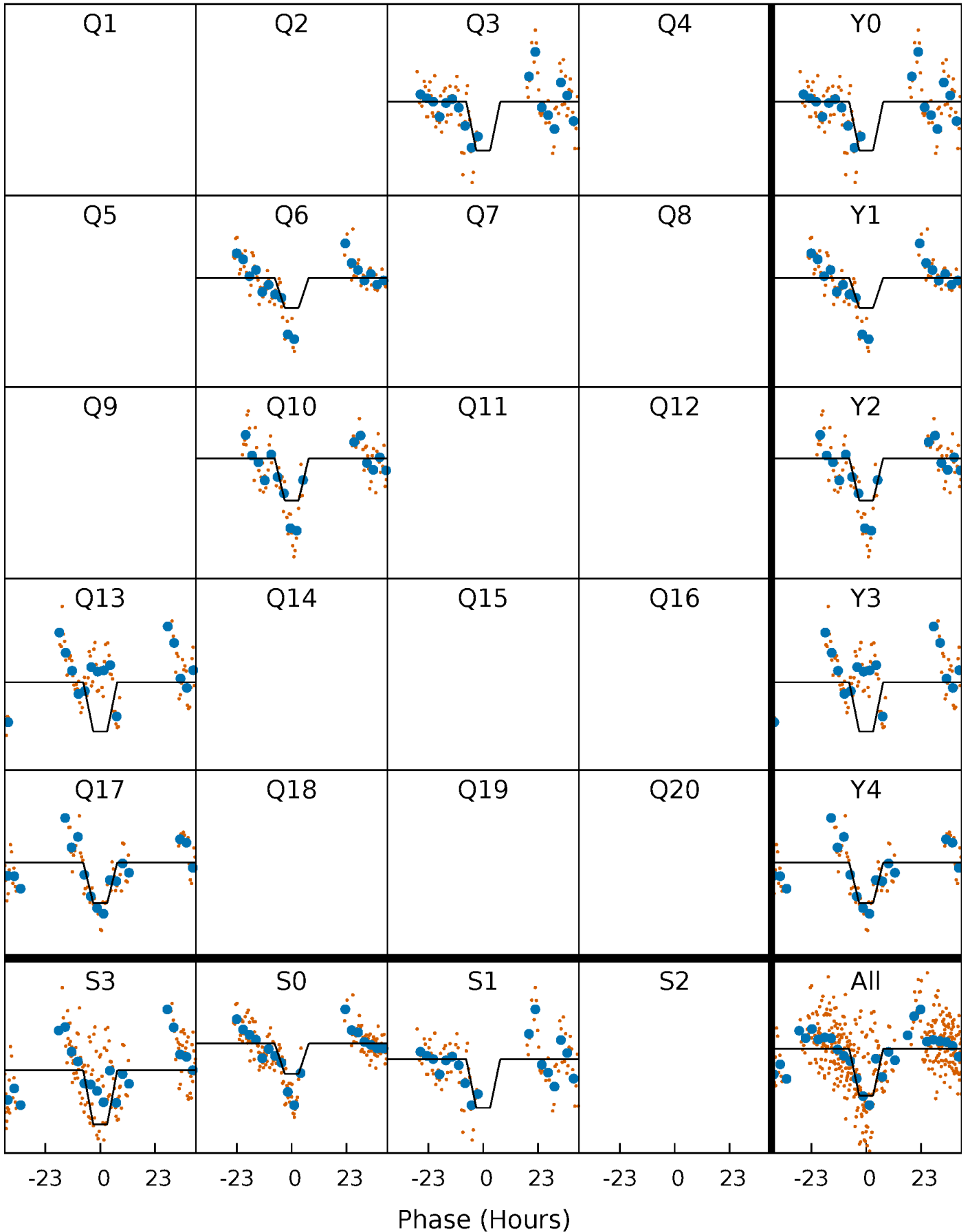
# DV Quarter-Phased Transit Curves

TCE 009279763-02     $P=325.487920$  Days     $T_0=261.872374$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

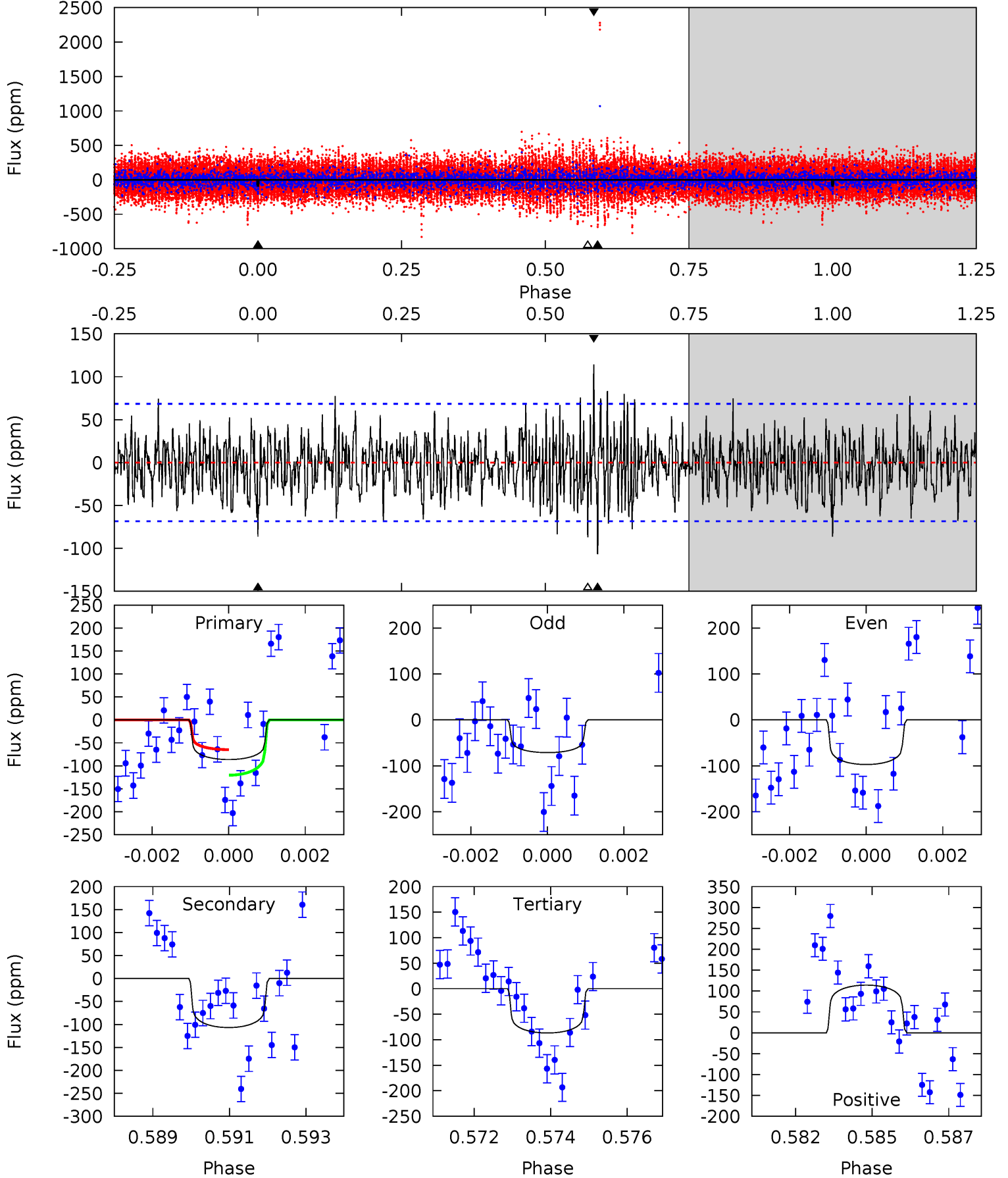
TCE 009279763-02 P=325.452121 Days  $T_0=261.970918$  (BKJD)



# DV Model-Shift Uniqueness Test

009279763-02, P = 325.487920 Days, E = 261.872374 Days

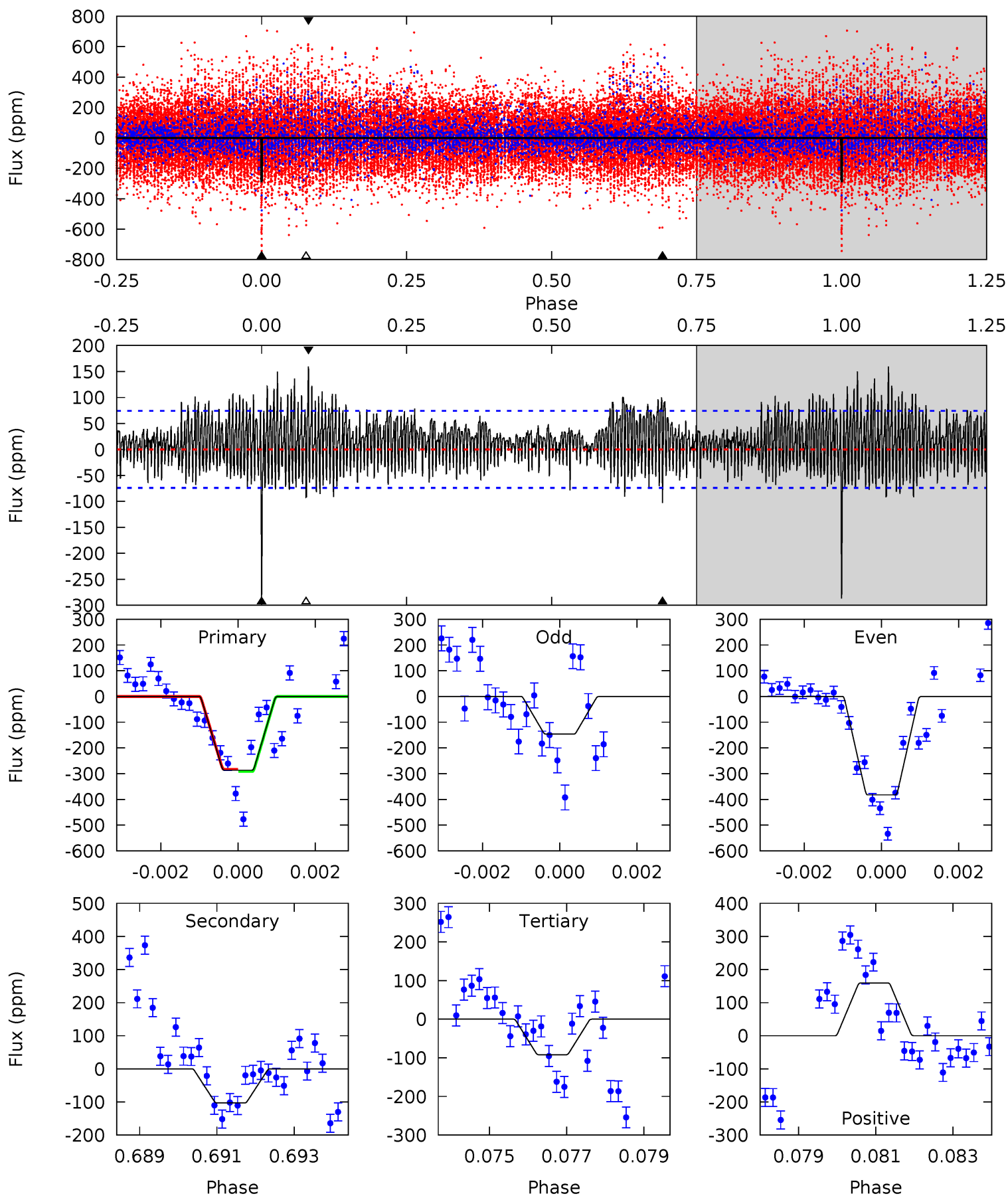
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.71 | 8.30 | 6.74 | 8.87 | 5.32            | 3.07            | 2.03             | -0.04   | -2.16   | 1.56    | -0.57   | 0.95    | 0.84 | 0.52  | 2.11 |



# Alt Model-Shift Uniqueness Test

009279763-02, P = 325.452121 Days, E = 261.970918 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 20.7 | 7.42 | 6.63 | 11.5 | 5.34            | 3.11            | 2.82             | 14.0    | 9.18    | 0.79    | -4.05   | 8.44    | 0.83 | 0.36  | 0.28 |





### Stellar Parameters For KIC 009279763

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M$ ( $M_{\odot}$ )       | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6889^{+173}_{-190}$ | $3.556^{+0.323}_{-0.086}$ | $-0.420^{+0.350}_{-0.250}$ | $3.571^{+0.428}_{-1.371}$ | $1.671^{+0.195}_{-0.363}$ | $0.052^{+0.125}_{-0.014}$                     |
|        | +3%/-3%              | +9%/-2%                   | +83%/-60%                  | +12%/-38%                 | +12%/-22%                 | +242%/-26%                                    |
| 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 009279763-02 / KOI

| Detrend | Depth (ppm)   | $R_p$ ( $R_{\oplus}$ ) | $T_{max}$ (K)     | $T_{obs}$ (K)        | $A_{obs}$              |
|---------|---------------|------------------------|-------------------|----------------------|------------------------|
| DV      | $-107 \pm 13$ | $4.02^{+1.10}_{-1.02}$ | $752^{+38}_{-69}$ | $6611^{+887}_{-578}$ | $4460^{+3256}_{-1724}$ |
| Alt.    | $-103 \pm 14$ | $6.46^{+1.26}_{-1.34}$ | $753^{+40}_{-65}$ | $5261^{+389}_{-334}$ | $1629^{+846}_{-503}$   |

$T_{max}$  = 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

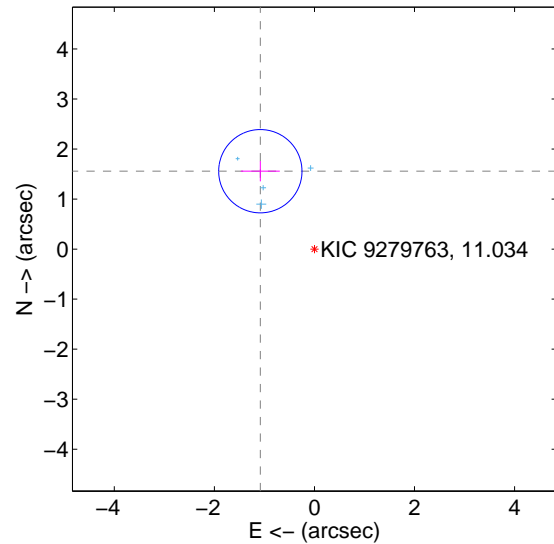
Supplemental centroid analysis for 009279763-02. **Kepler magnitude: 11.03.** Transit SNR 5.38

There are 4 quarters with good PRF difference image offsets

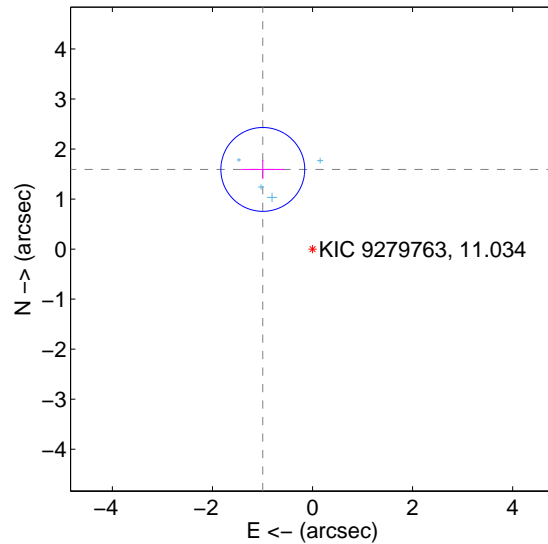
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

|   | Distance in arcsec                  | Distance / $\sigma$ | $\Delta$ RA       | $\Delta$ Dec      |
|---|-------------------------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT          | <b><math>1.896 \pm 0.278</math></b> | <b>6.83</b>         | $1.082 \pm 0.389$ | $1.557 \pm 0.203$ |
| PRF-fit source offset from KIC position | <b><math>1.878 \pm 0.279</math></b> | <b>6.72</b>         | $0.994 \pm 0.431$ | $1.593 \pm 0.190$ |
| photometric centroid source offset      | $0.86 \pm 1.06$                     | 0.81                | $-0.15 \pm 1.01$  | $-0.85 \pm 1.06$  |

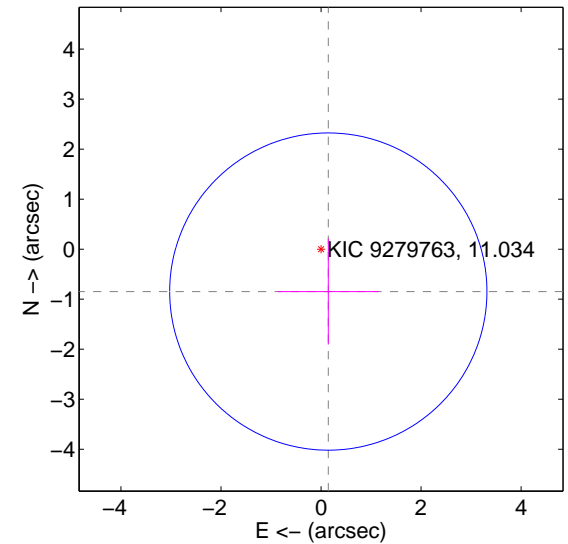
offset from difference PRF-fit to OOT PRF-fit



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.

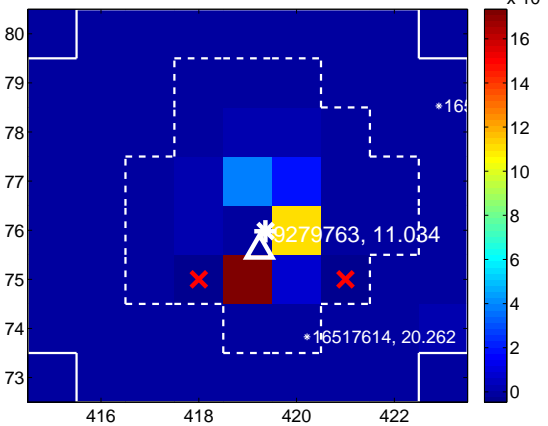
Q5 no difference image



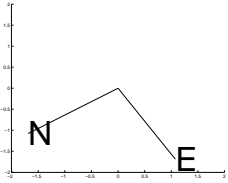
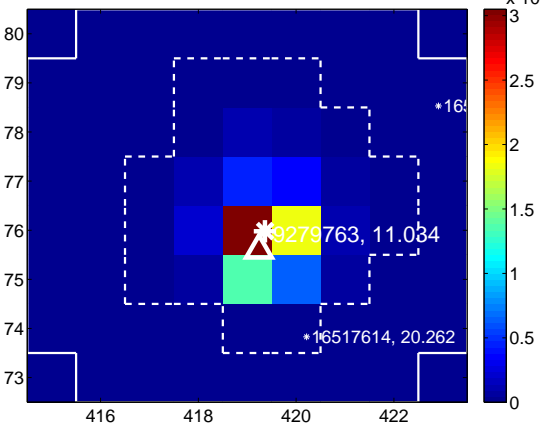
Q5 no OOT image



Q6 difference image



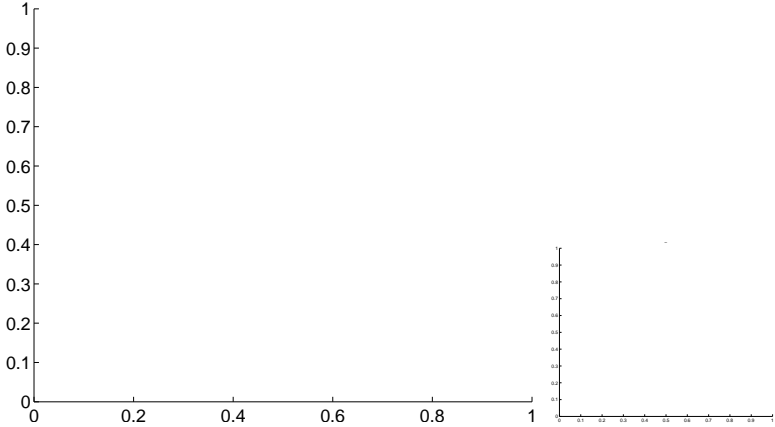
Q6 OOT image



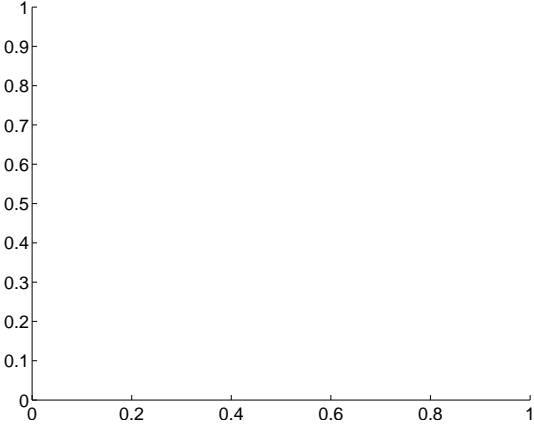
Q7 no difference image



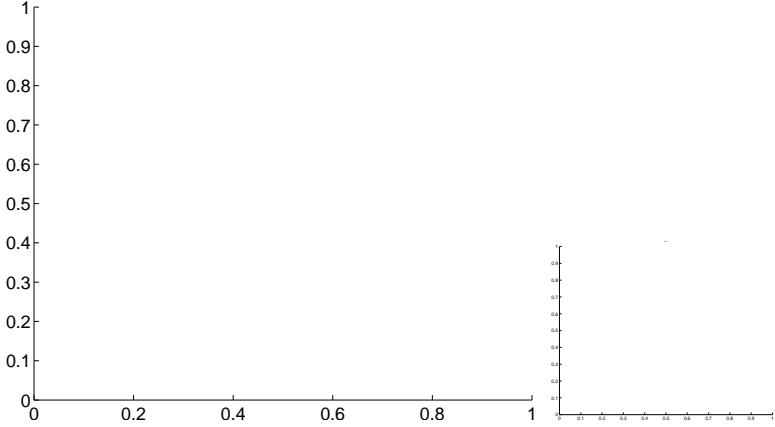
Q7 no OOT image



Q8 no difference image



Q8 no OOT image

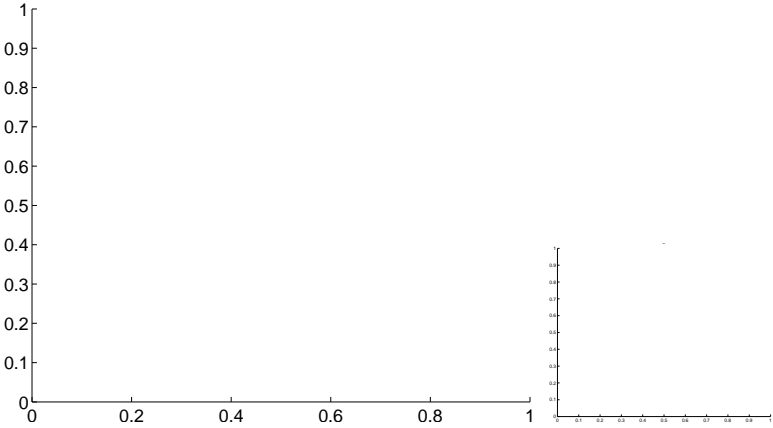


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

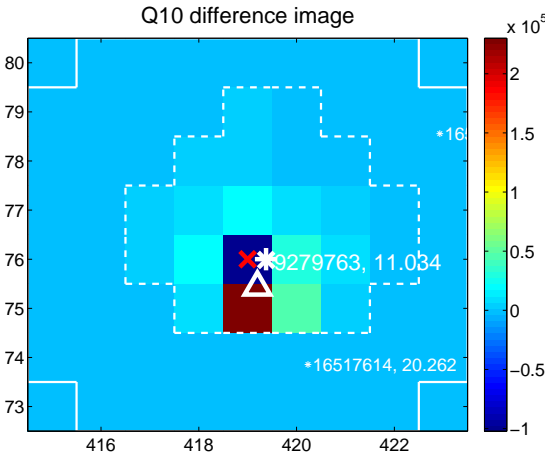
Q9 no difference image



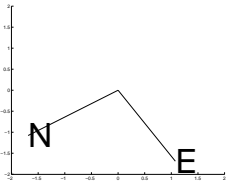
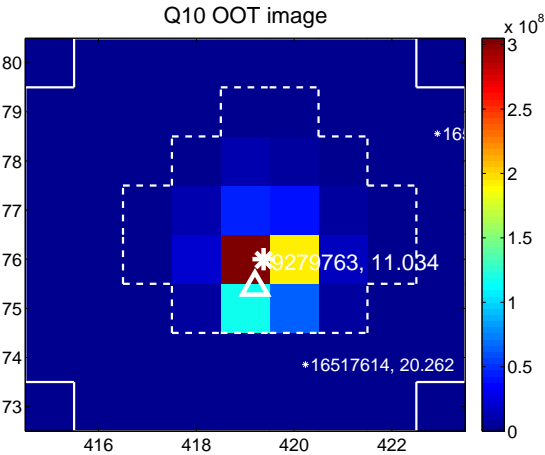
Q9 no OOT image



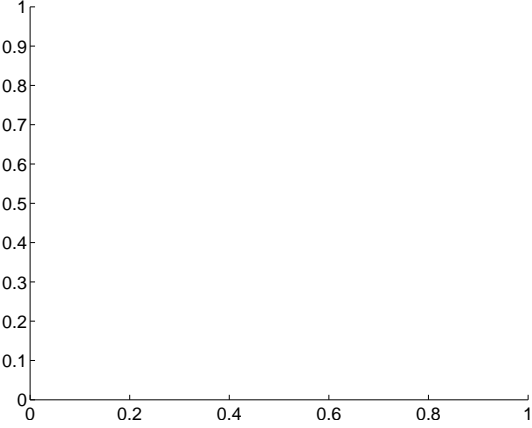
Q10 difference image



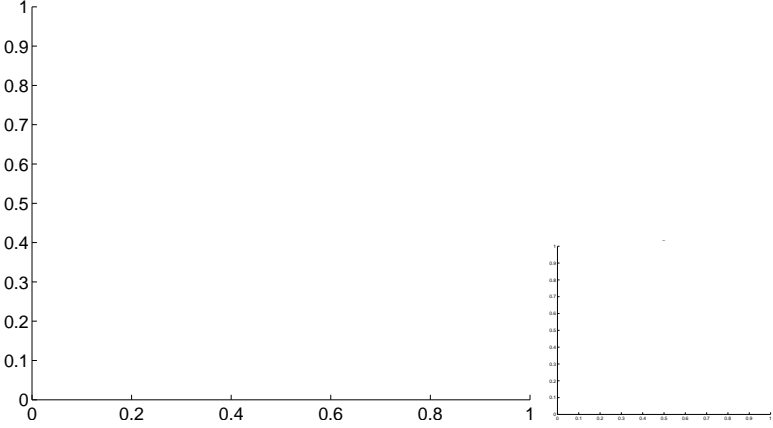
Q10 OOT image



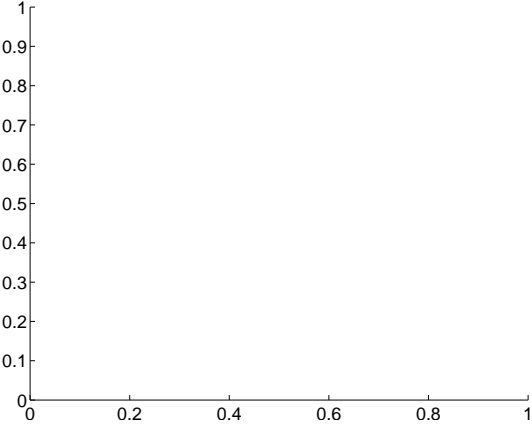
Q11 no difference image



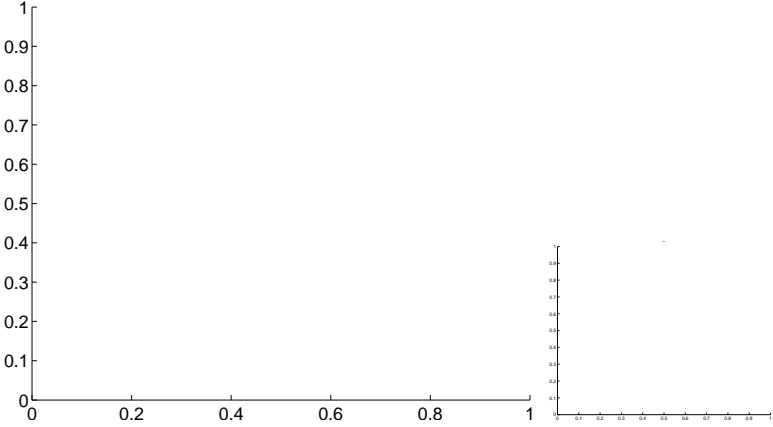
Q11 no OOT image



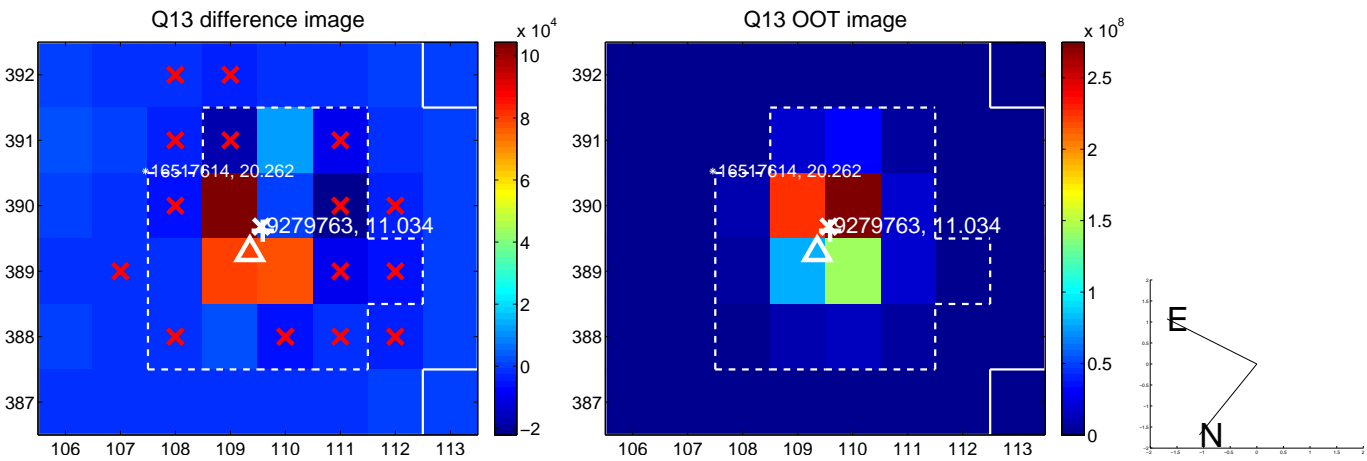
Q12 no difference image



Q12 no OOT image

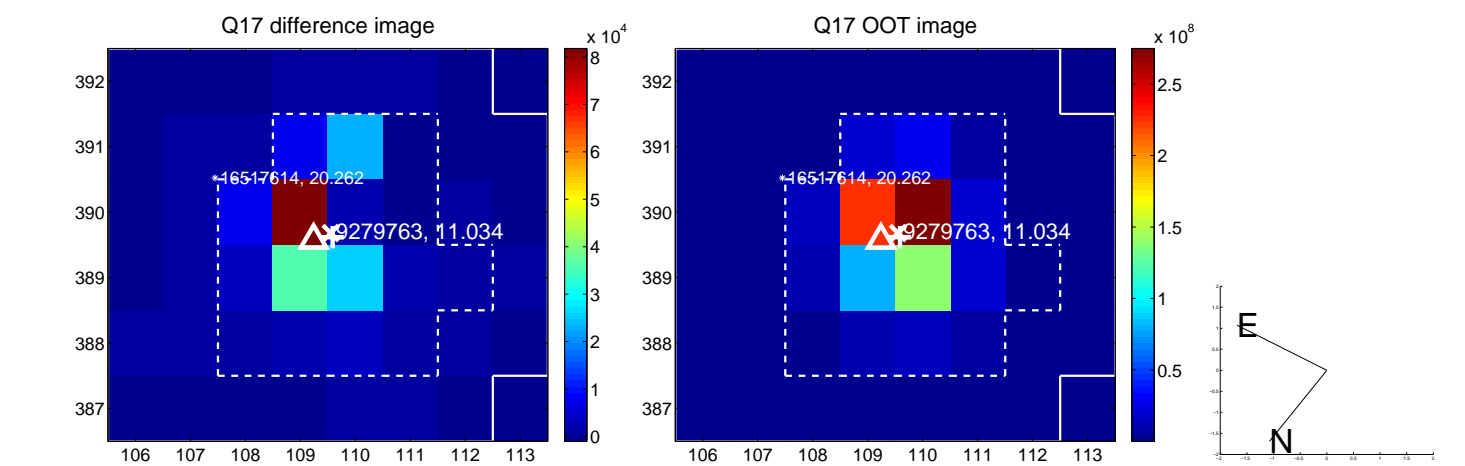


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

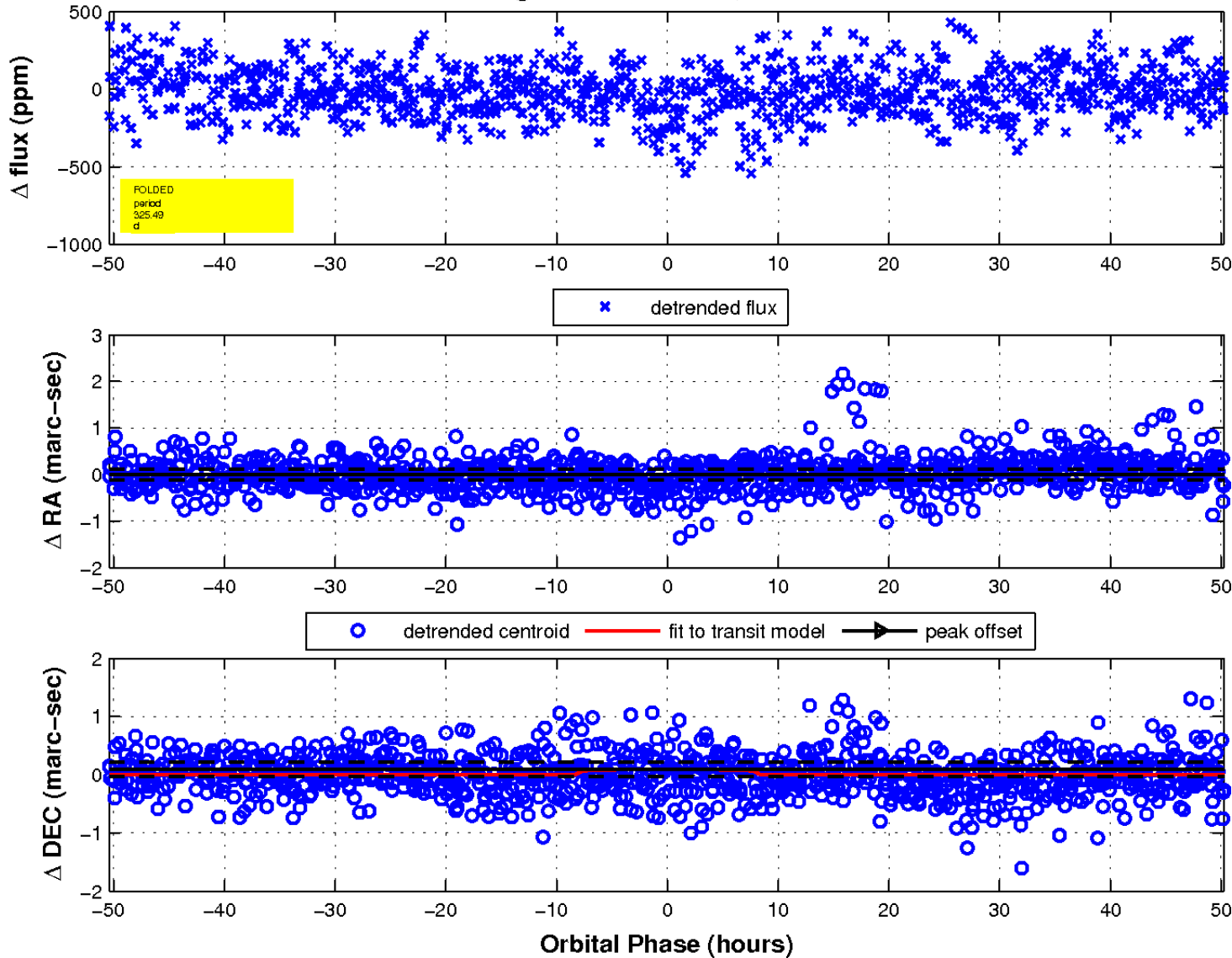




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

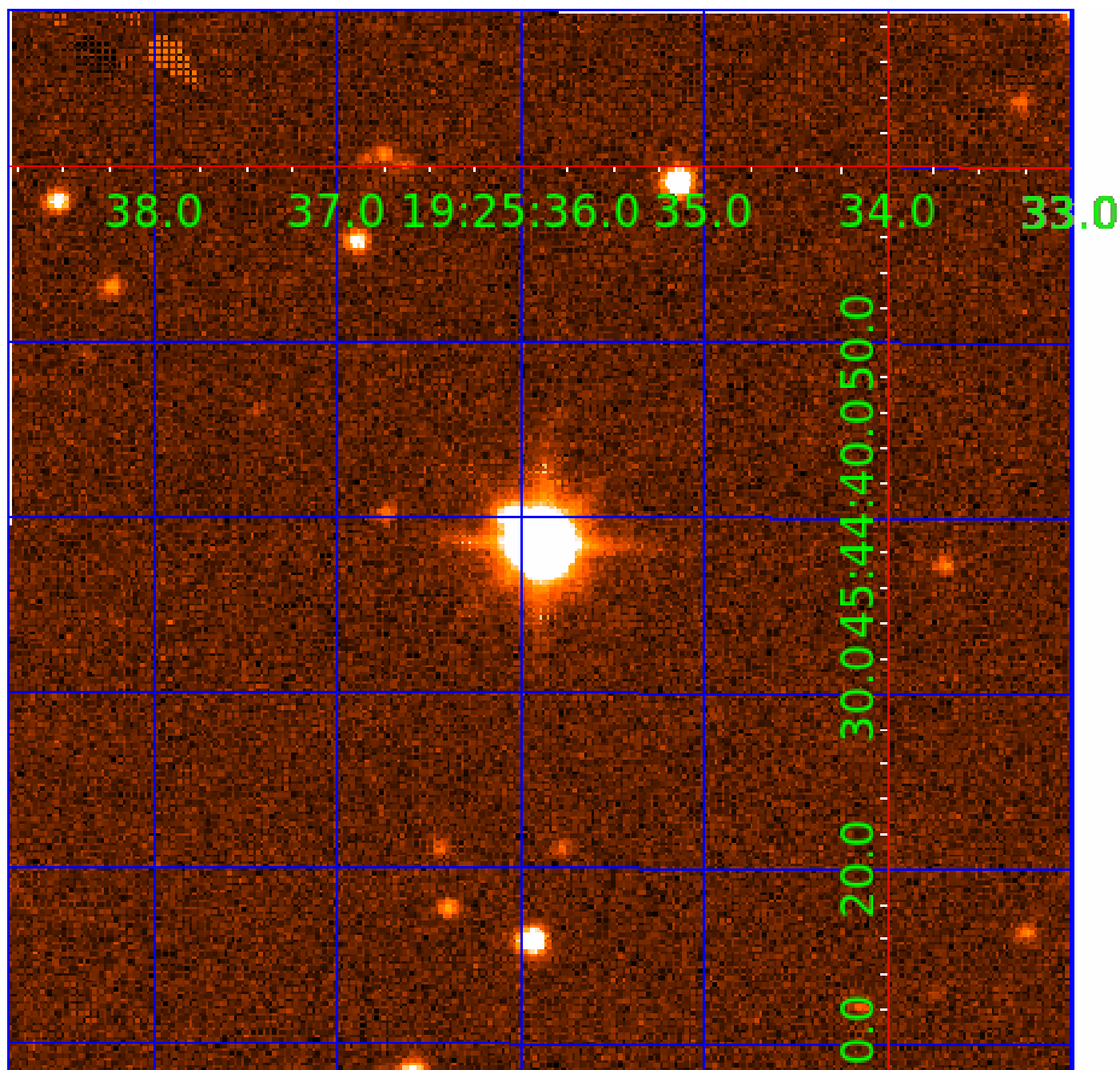


fluxWeightedCentroids, Planet 2 of 6



UKIRT Image

Declination



# KIC 009279763

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009279763-01 | OBS      | No   | 1.926636      | 133.216535   | 23.6        | 6.693            | 8.9 | 8.8 | 3.57                        | 6889            | 1.77                   | 19875.26               |
| 009279763-02 | OBS      | No   | 325.487920    | 261.872374   | 112.6       | 16.812           | 8.6 | 5.4 | 3.57                        | 6889            | 4.28                   | 21.28                  |
| 009279763-03 | OBS      | No   | 294.942838    | 216.691314   | 248.2       | 4.007            | 8.1 | 8.5 | 3.57                        | 6889            | 5.84                   | 24.27                  |
| 009279763-05 | OBS      | No   | 201.317343    | 169.291612   | 244.2       | 8.995            | 7.3 | 7.3 | 3.57                        | 6889            | 9.73                   | 40.38                  |
| 009279763-06 | OBS      | No   | 226.806773    | 152.502787   | 180.3       | 1.557            | 7.8 | 3.9 | 3.57                        | 6889            | 5.56                   | 34.45                  |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 009279763-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | SWEET_NTL—LPP_DV—CENT_SATURATED   |
| 009279763-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—<br>MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST |
| 009279763-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_SATURATED  |
| 009279763-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED  |
| 009279763-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED   |

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

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

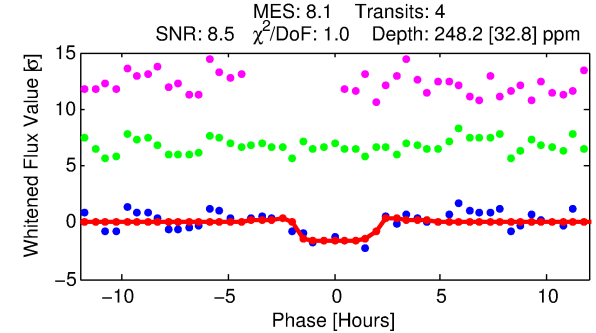
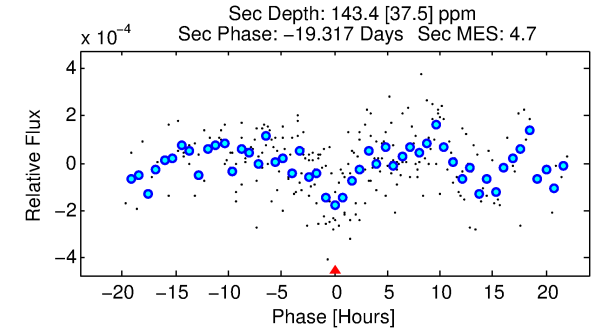
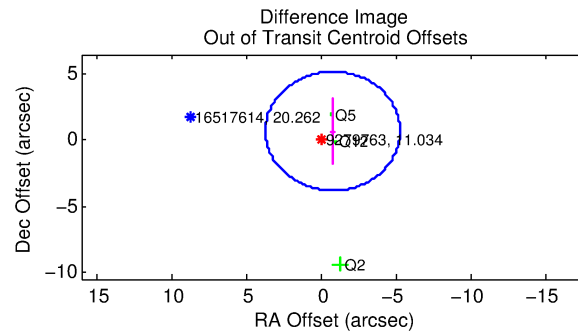
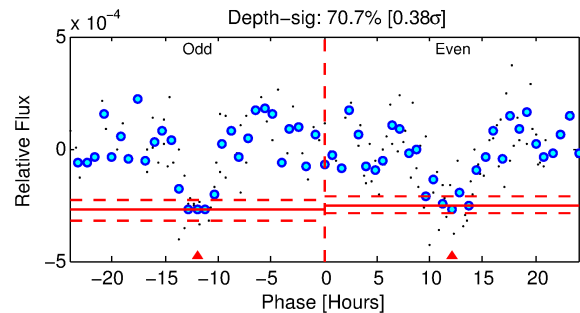
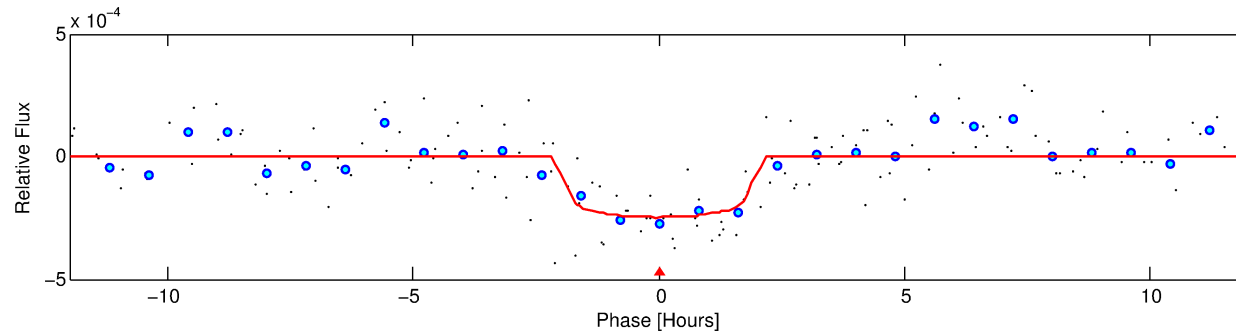
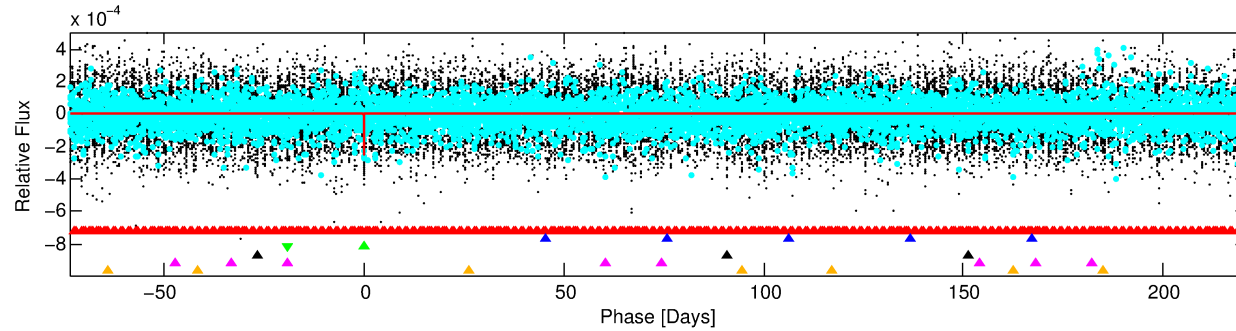
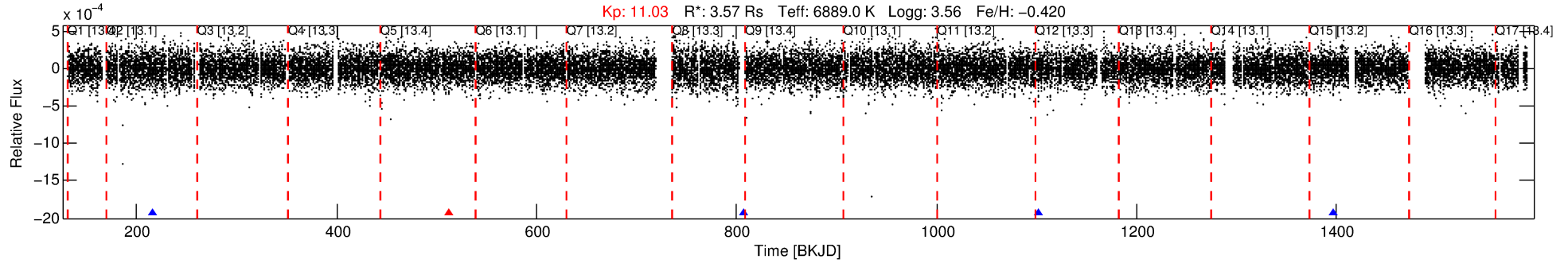
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009279763-03

No Significant Match Found

# DV One-Page Summary

KIC: 9279763 Candidate: 3 of 6 Period: 294.943 d



## DV Fit Results:

Period = 294.94284 [0.00229] d  
Epoch = 216.6913 [0.0067] BKJD  
 $R_p/R^*$  = 0.0150 [0.0153]  
 $a/R^*$  = 492.41 [2886.24]  
 $b$  = 0.51 [8.45]  
 $S_{\text{eff}}$  = 24.27 [13.80]  
 $T_{\text{eq}}$  = 566 [80] K  
 $R_p$  = 5.84 [6.39]  $R_e$   
 $a$  = 1.0297 [0.3669] AU  
 $A_g$  = 2453.18 [5248.36] [0.47 $\sigma$ ]  
 $T_{\text{effp}}$  = 6158 [3184] K [1.76 $\sigma$ ]

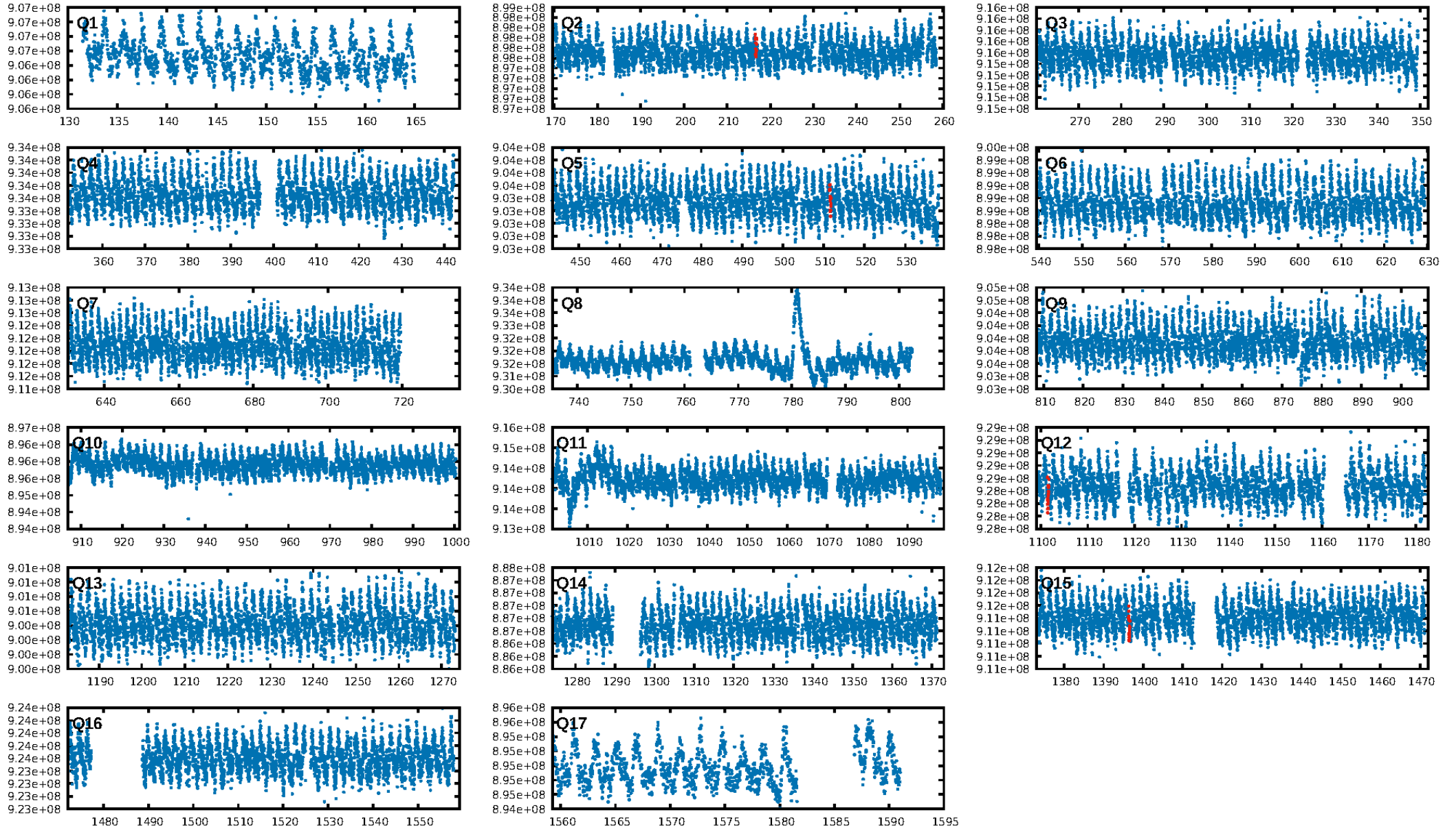
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [380.35 $\sigma$ ]  
LongPeriod-sig: 100.0% [42.42 $\sigma$ ]  
ModelChiSquare2-sig: 95.6%  
ModelChiSquareGof-sig: 91.9%  
**Bootstrap-pfa: 9.91e-10**  
**RollingBand-fgt: 0.75 [3/4]**  
GhostDiagnostic-chr: 86.44  
Centroid-sig: 45.8%  
Centroid-so: 0.453 arcsec [0.71 $\sigma$ ]  
OotOffset-rm: 1.053 arcsec [0.70 $\sigma$ ]  
KicOffset-rm: 1.284 arcsec [0.84 $\sigma$ ]  
OotOffset-st: 1/0/1/1 [3]  
KicOffset-st: 1/0/1/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:44:27 Z

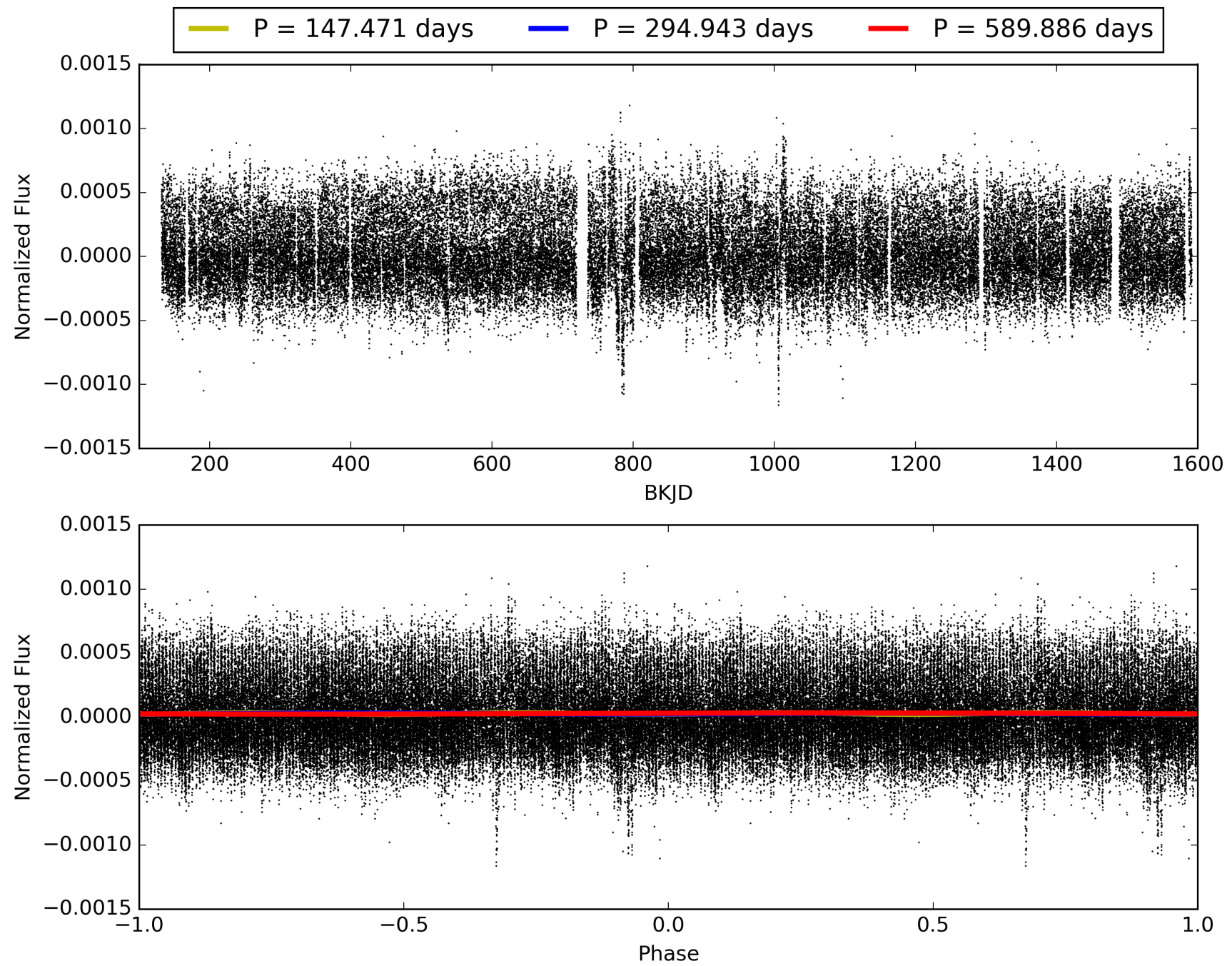
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009279763-03, PDC Light Curves





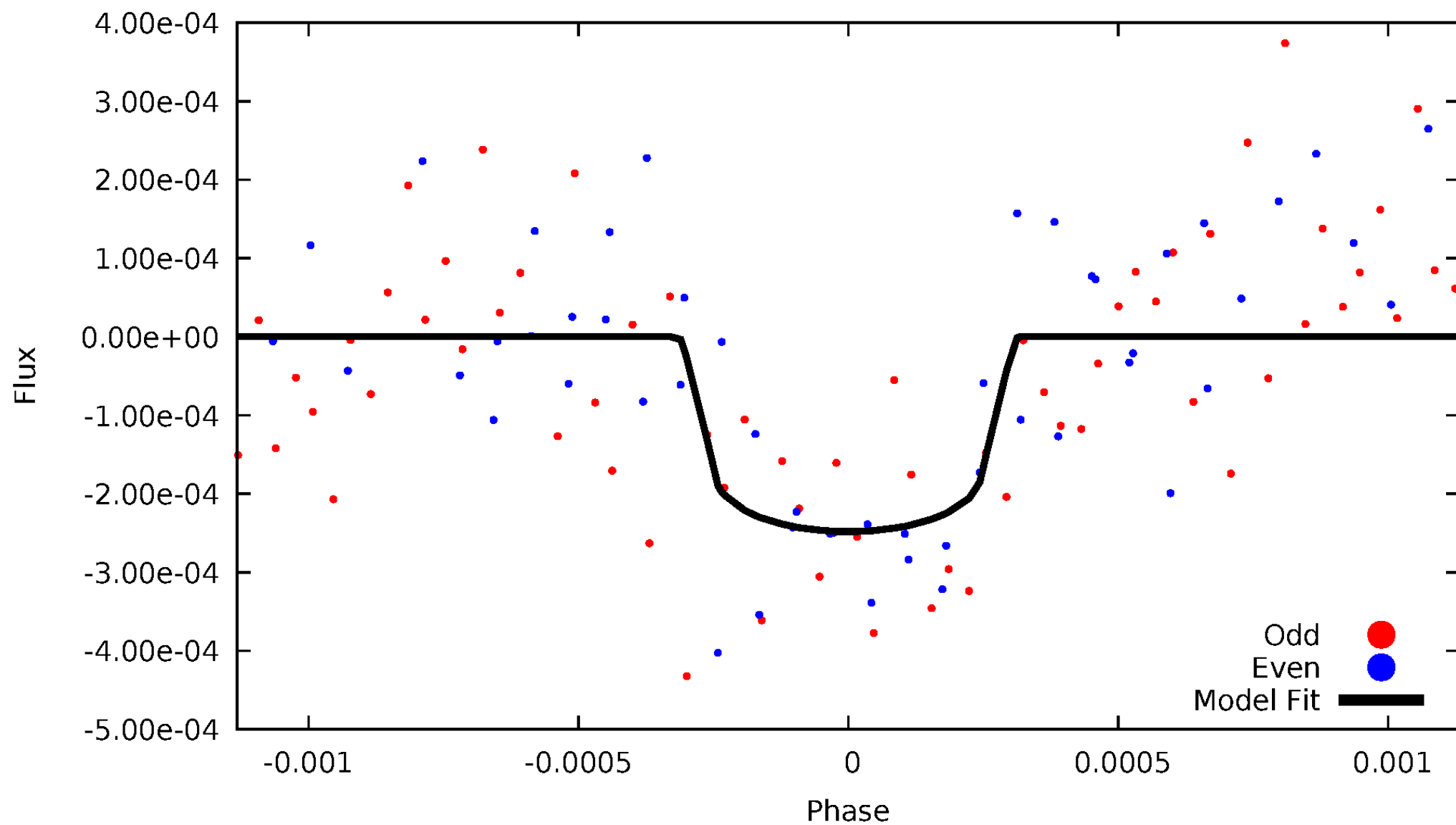
TCE 009279763-03





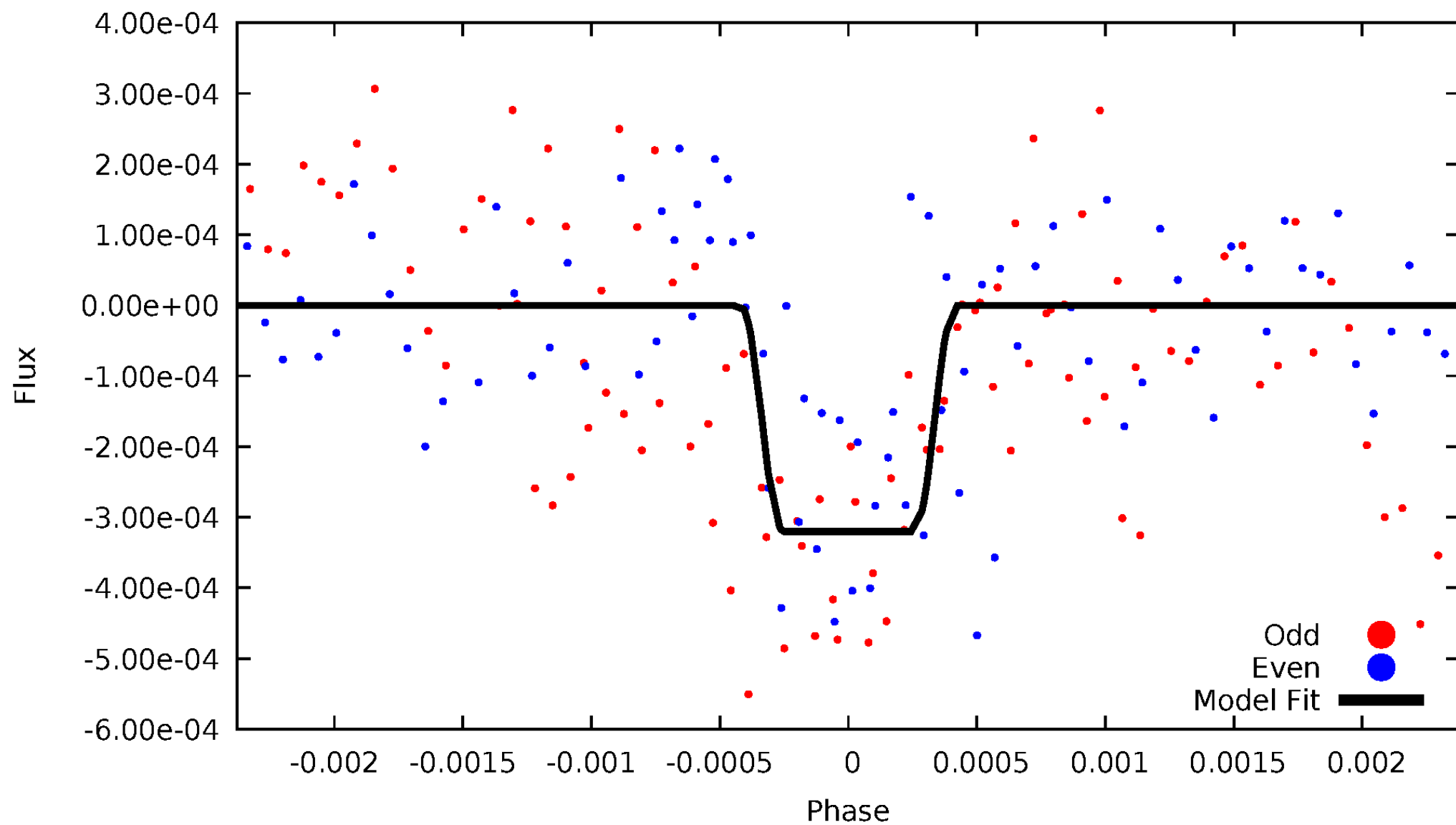
# DV Odd/Even

TCE 009279763-03



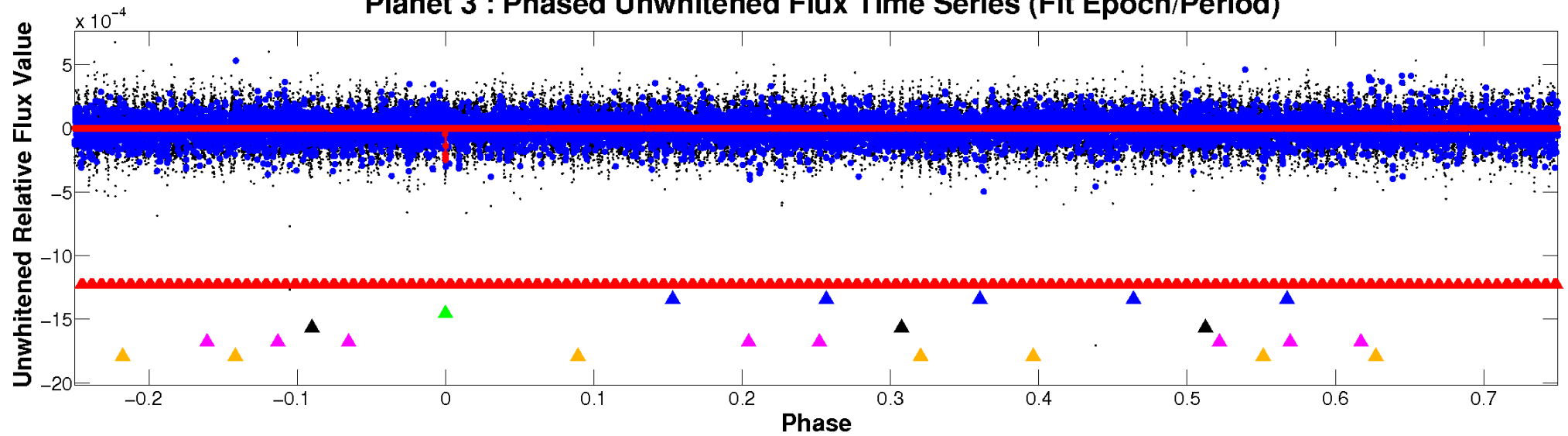
# ALT Odd/Even

TCE 009279763-03

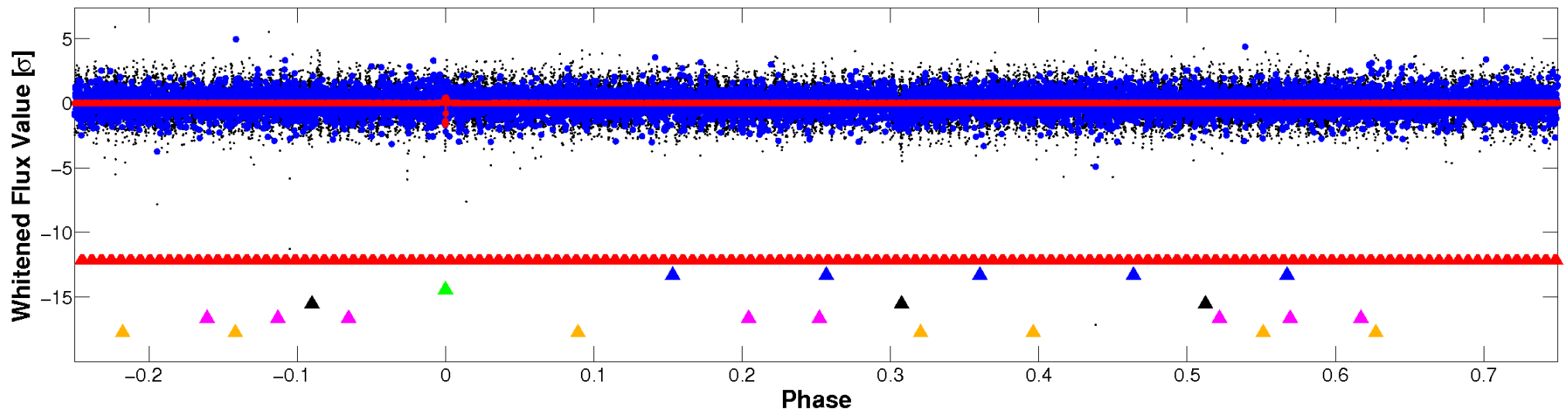


# Non-Whitened Vs. Whitened Light Curve

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

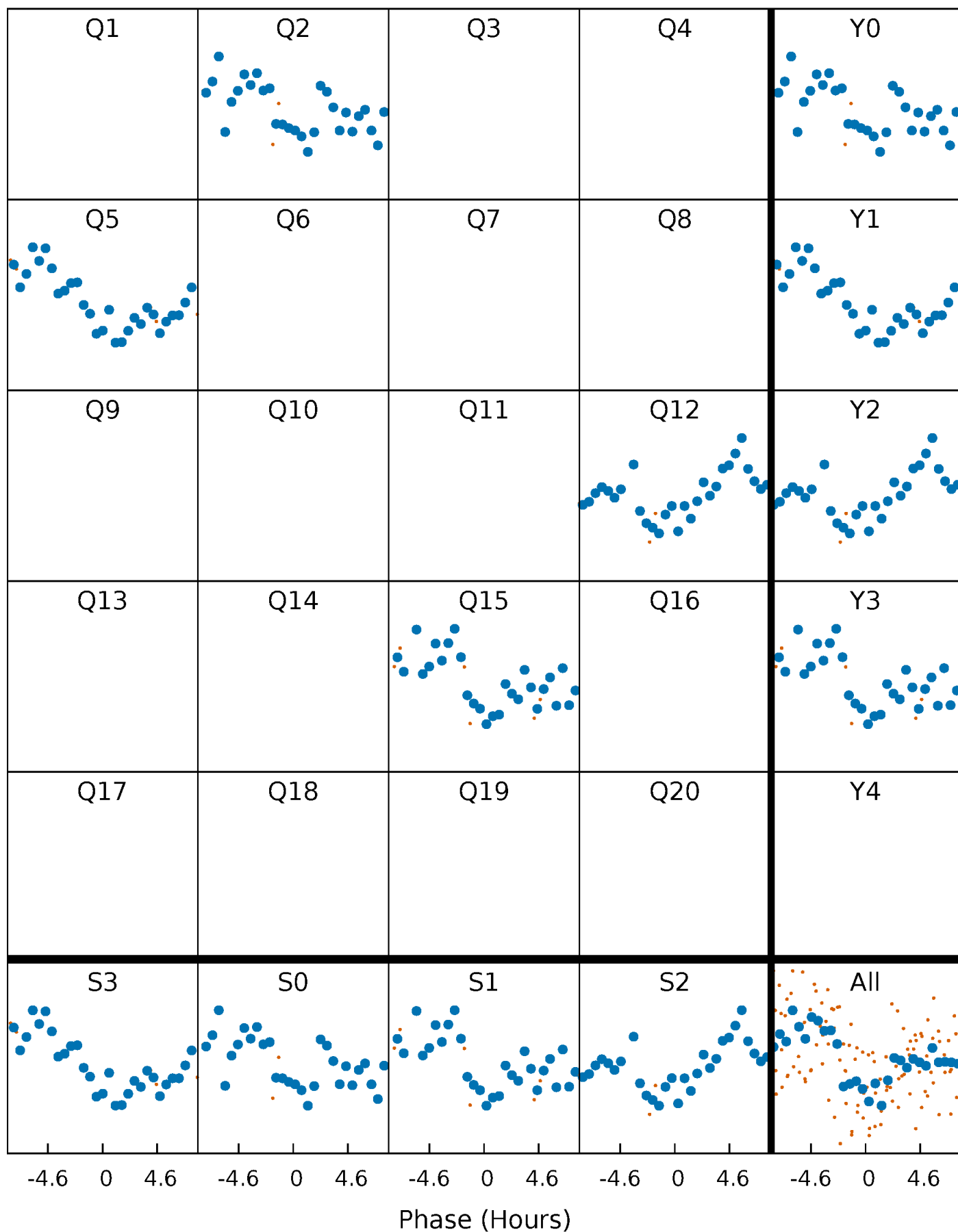


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



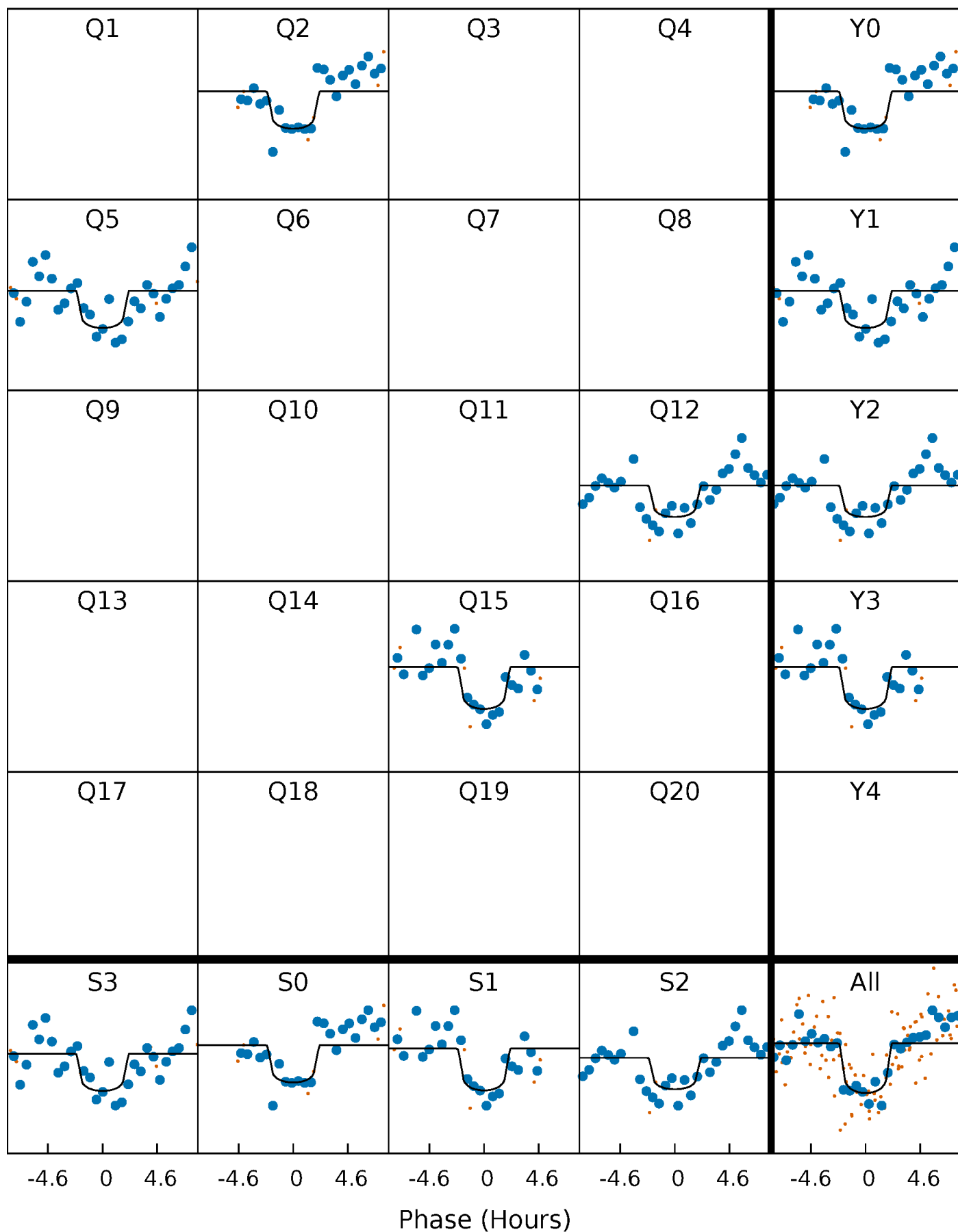
# PDC Quarter-Phased Transit Curves

TCE 009279763-03     $P=294.942838$  Days     $T_0=216.691314$  (BKJD)



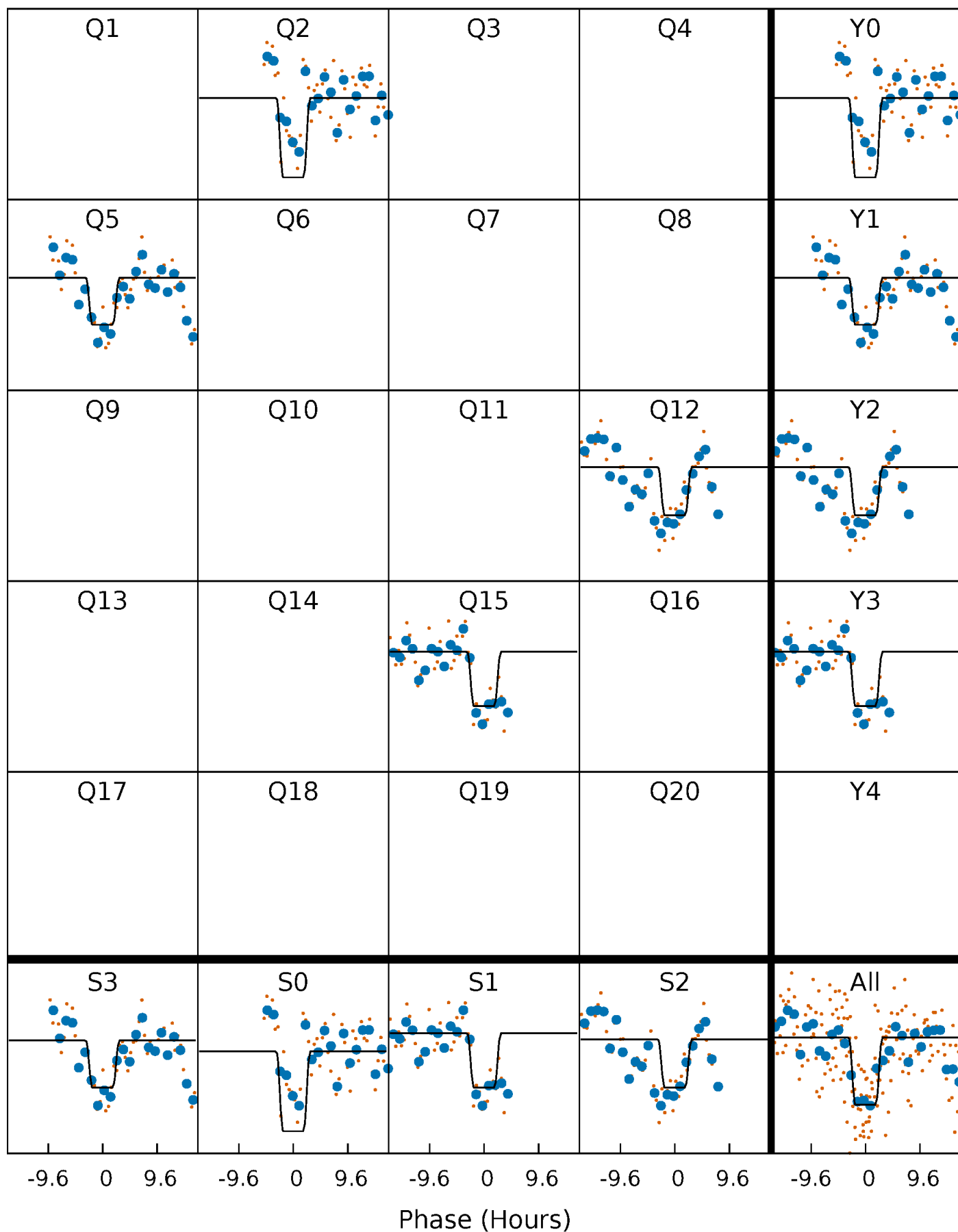
# DV Quarter-Phased Transit Curves

TCE 009279763-03 P=294.942838 Days  $T_0=216.691314$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

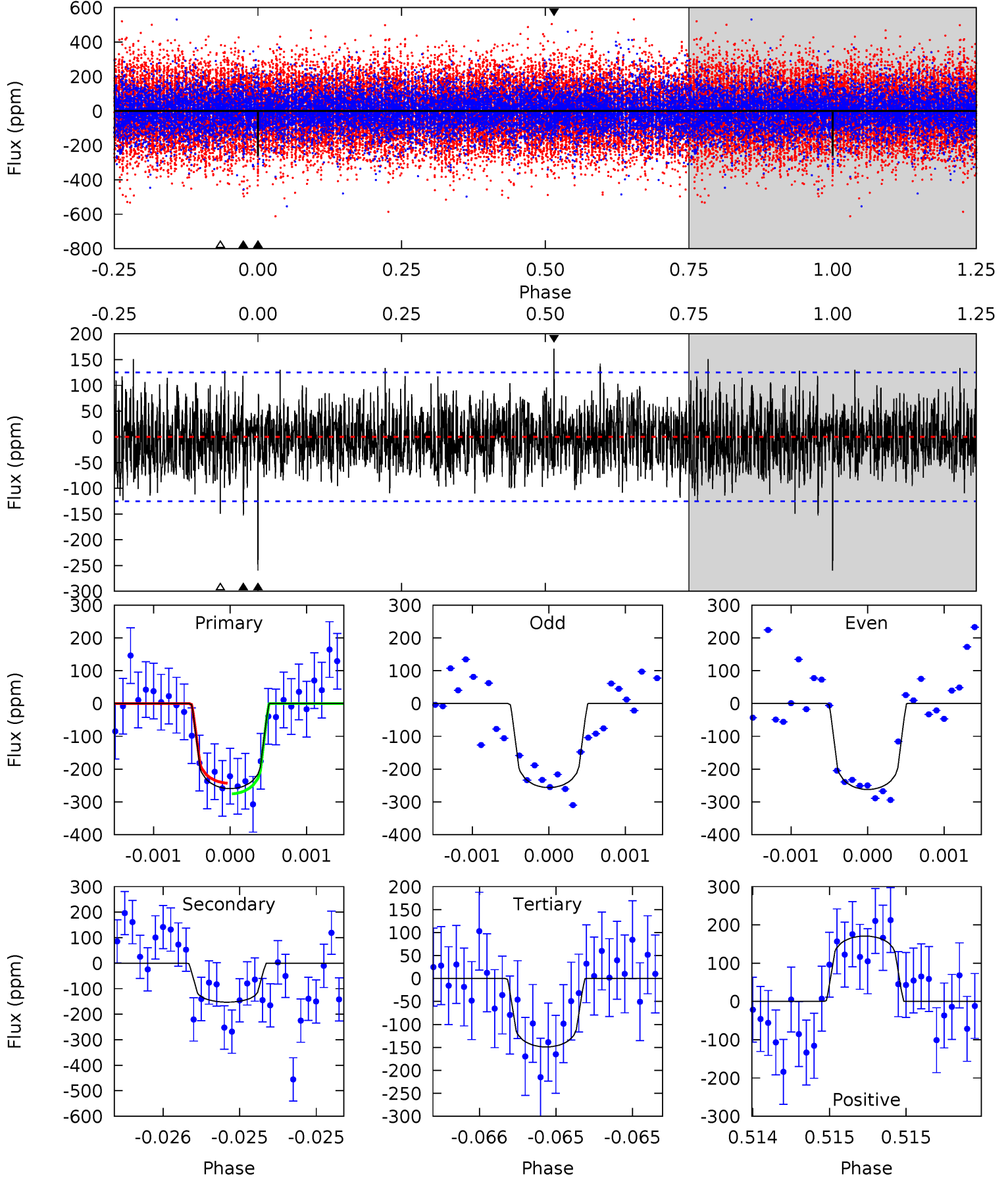
TCE 009279763-03 P=294.944816 Days  $T_0=216.711714$  (BKJD)



# DV Model-Shift Uniqueness Test

009279763-03, P = 294.942838 Days, E = 216.691314 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 11.5 | 6.75 | 6.59 | 7.56 | 5.54            | 3.42            | 1.75             | 4.88    | 3.91    | 0.16    | -0.81   | 0.13    | 0.99 | 0.40  | 0.72 |

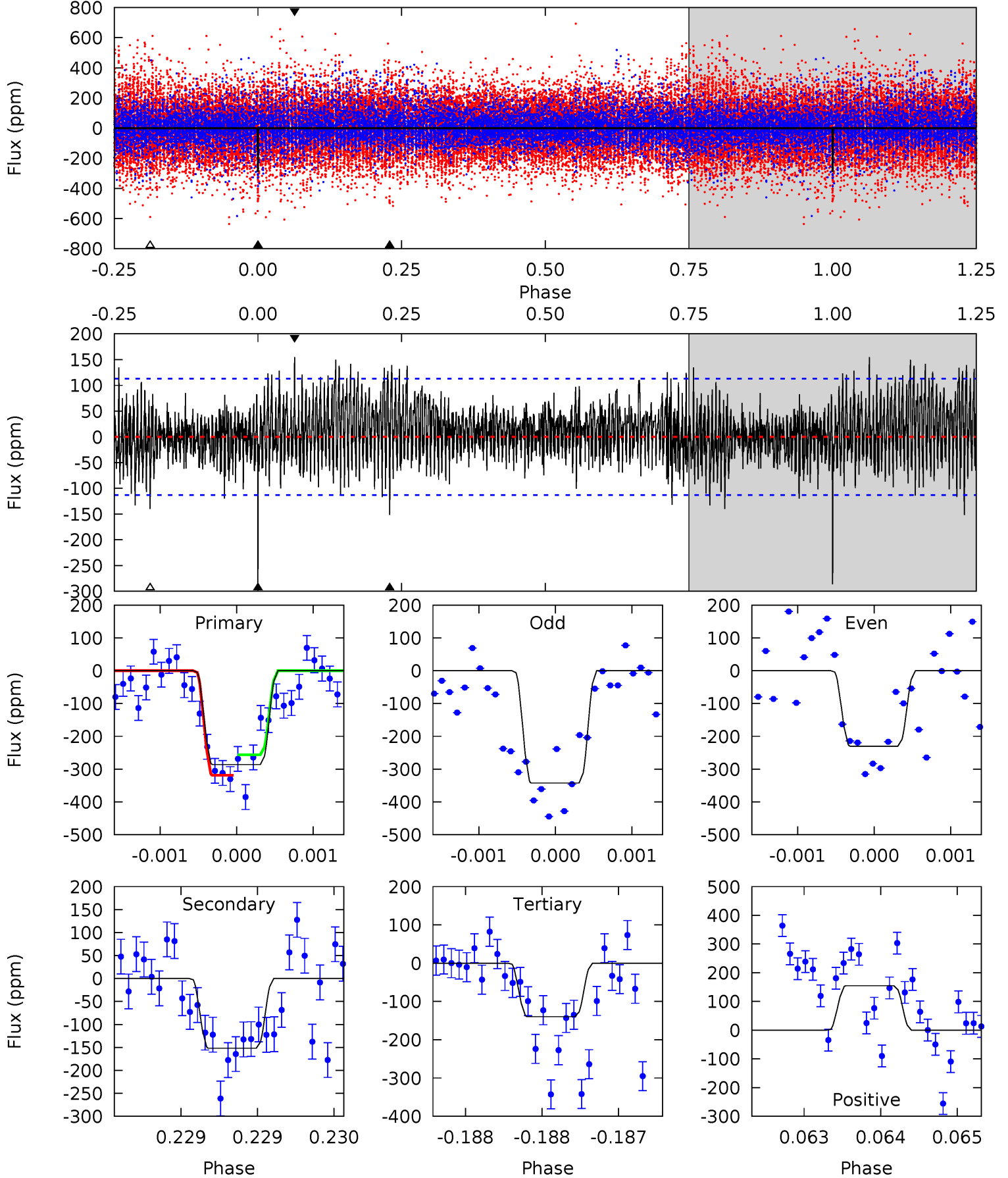




# Alt Model-Shift Uniqueness Test

009279763-03, P = 294.944816 Days, E = 216.711714 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.9 | 7.38 | 6.79 | 7.52 | 5.49            | 3.36            | 1.89             | 7.11    | 6.39    | 0.59    | -0.14   | 2.77    | 0.84 | 0.35  | 1.53 |



### Stellar Parameters For KIC 009279763

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M(M_{\odot})$            | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6889^{+173}_{-190}$ | $3.556^{+0.323}_{-0.086}$ | $-0.420^{+0.350}_{-0.250}$ | $3.571^{+0.428}_{-1.371}$ | $1.671^{+0.195}_{-0.363}$ | $0.052^{+0.125}_{-0.014}$                     |
|        | +3%/-3%              | +9%/-2%                   | +83%/-60%                  | +12%/-38%                 | +12%/-22%                 | +242%/-26%                                    |
| 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 009279763-03 / KOI

| Detrend | Depth (ppm)   | $R_p$ ( $R_{\oplus}$ ) | $T_{max}$ (K)     | $T_{obs}$ (K)          | $A_{obs}$               |
|---------|---------------|------------------------|-------------------|------------------------|-------------------------|
| DV      | $-153 \pm 23$ | $6.70^{+5.45}_{-4.13}$ | $774^{+44}_{-73}$ | $5568^{+3949}_{-1171}$ | $1992^{+11487}_{-1398}$ |
| Alt.    | $-152 \pm 21$ | $7.16^{+5.60}_{-4.38}$ | $776^{+42}_{-68}$ | $5372^{+3653}_{-1067}$ | $1716^{+9936}_{-1191}$  |

$T_{max}$  = 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

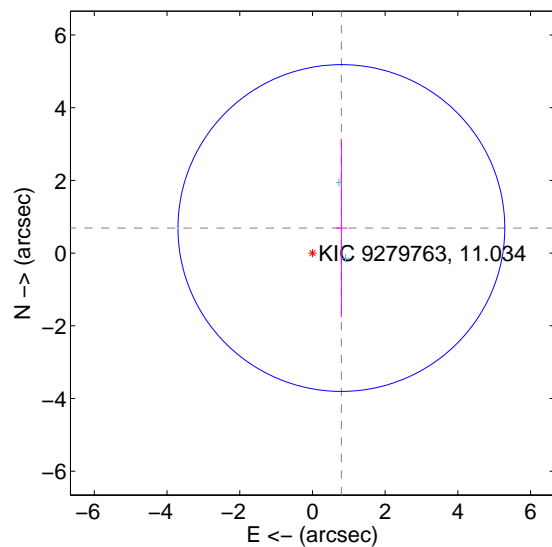
Supplemental centroid analysis for 009279763-03. **Kepler magnitude: 11.03.** Transit SNR 8.47

**There are 2 quarters with good PRF difference image offsets**

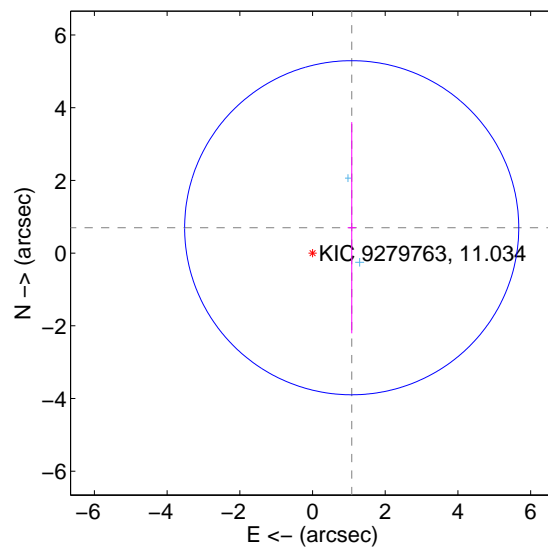
The direct PRF centroid is offset from the target star catalog position by about 0.40 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | $1.053 \pm 1.498$  | 0.70                | $-0.796 \pm 0.159$ | $0.690 \pm 2.452$ |
| PRF-fit source offset from KIC position | $1.284 \pm 1.532$  | 0.84                | $-1.078 \pm 0.113$ | $0.698 \pm 2.903$ |
| photometric centroid source offset      | $0.45 \pm 0.64$    | 0.71                | $-0.20 \pm 0.72$   | $-0.41 \pm 0.62$  |

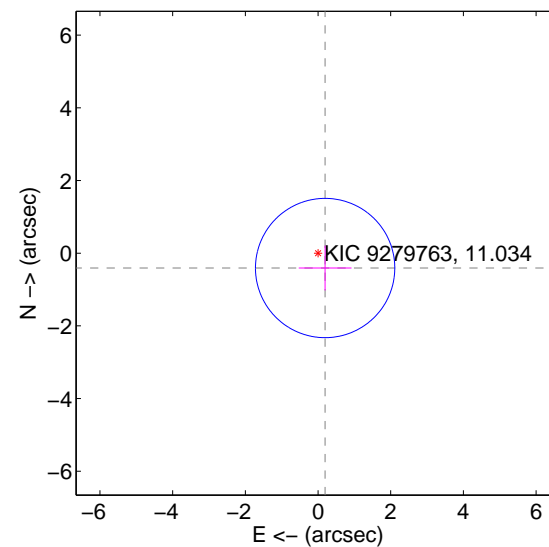
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

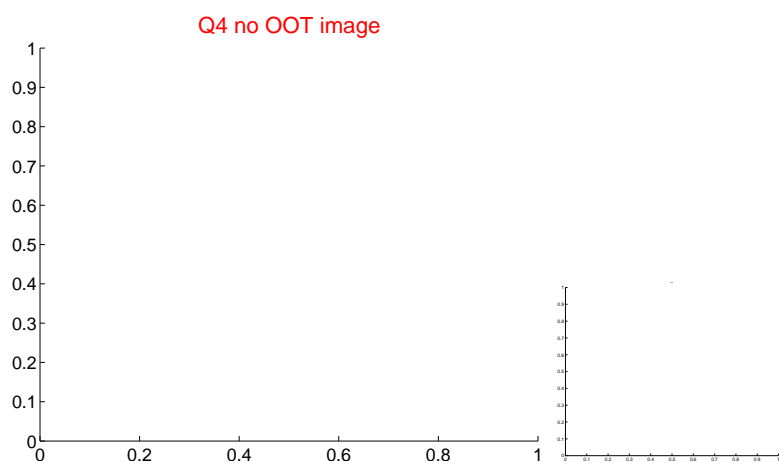
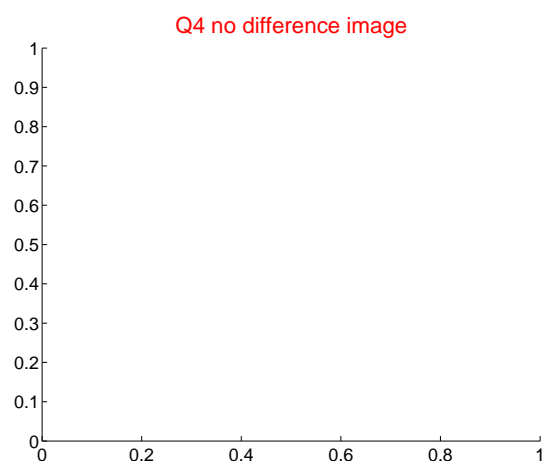
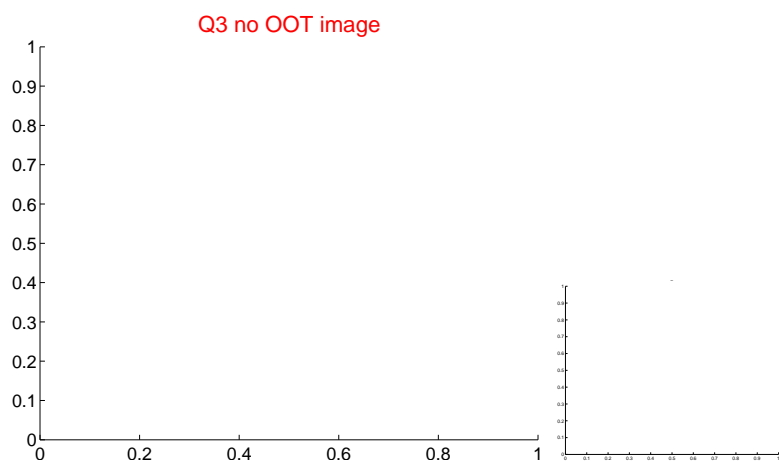
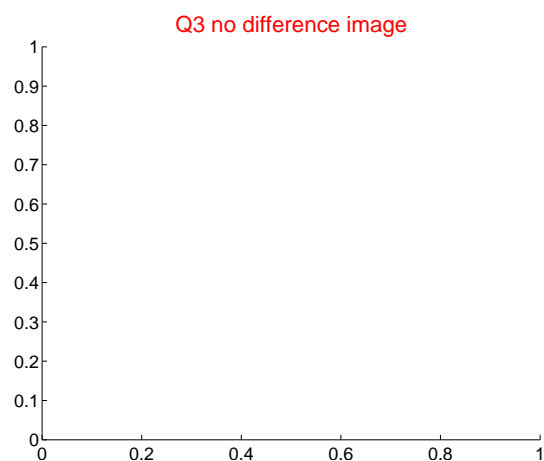
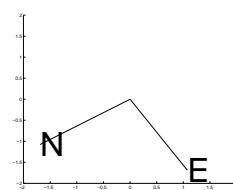
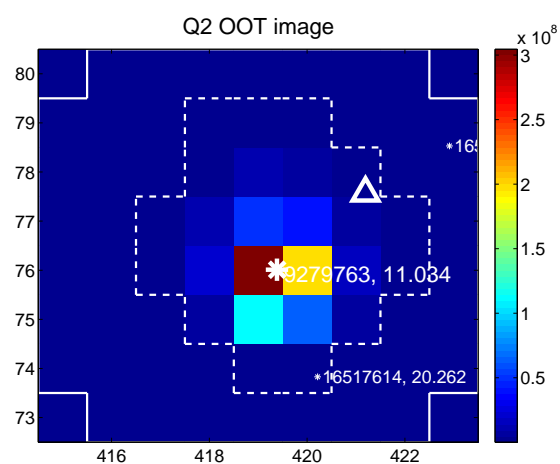
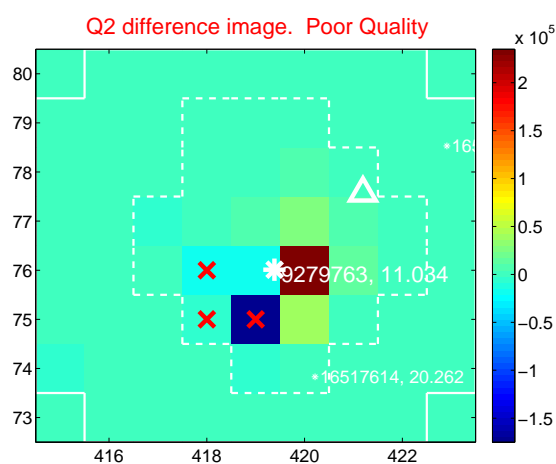
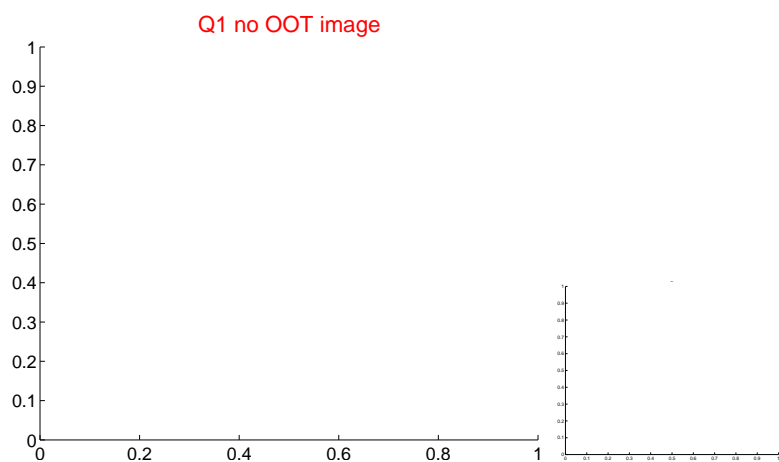
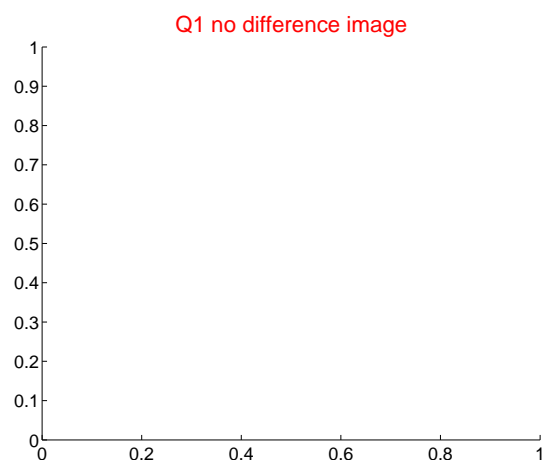


offset from photometric centroids

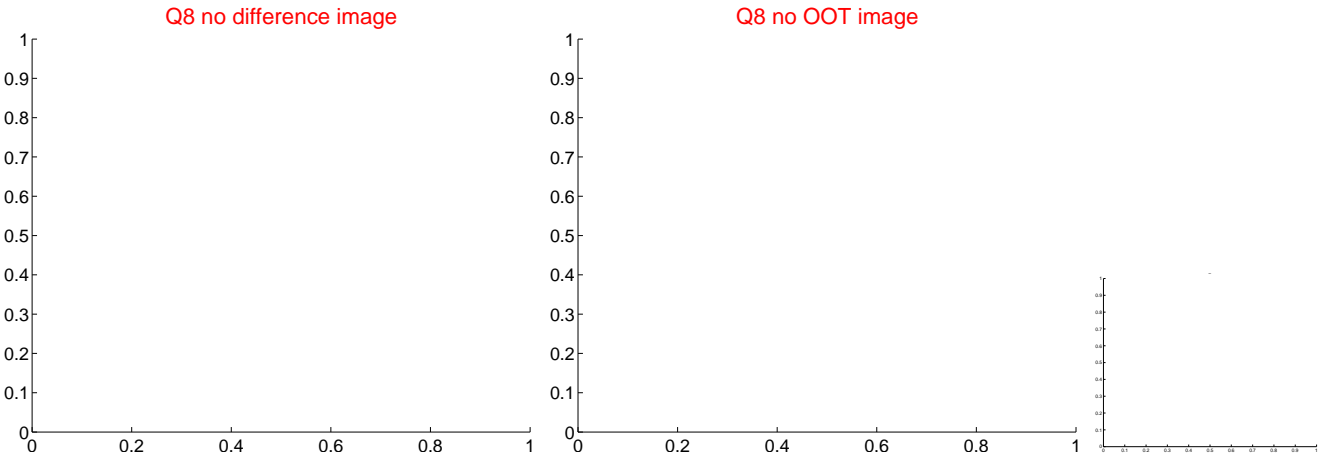
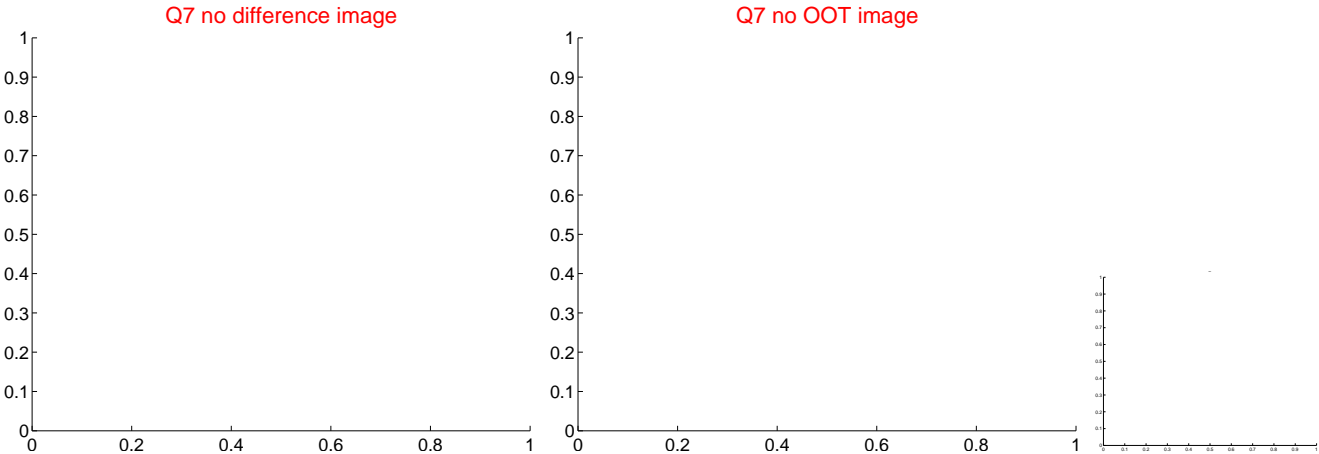
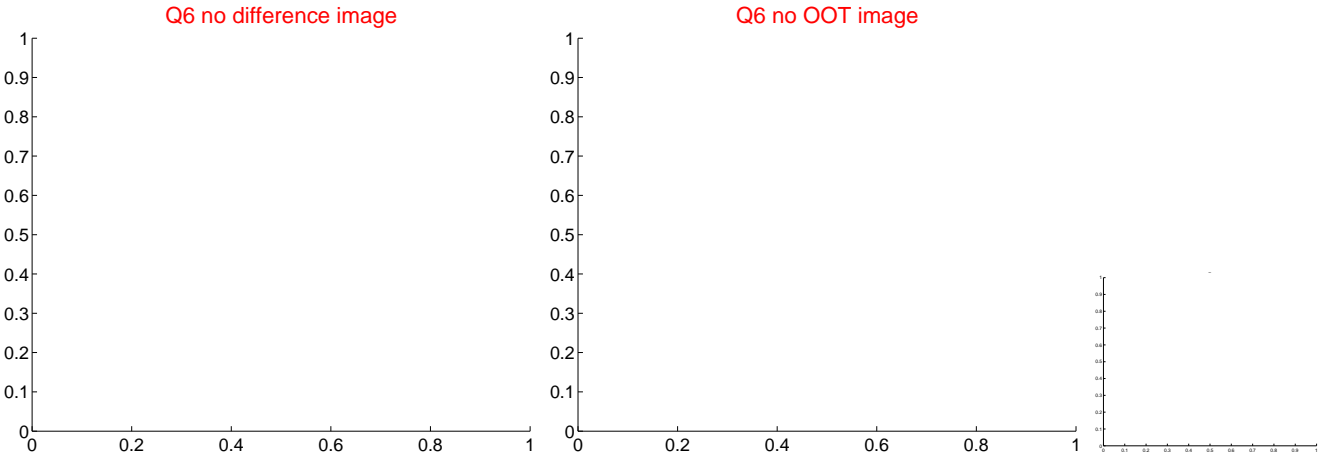
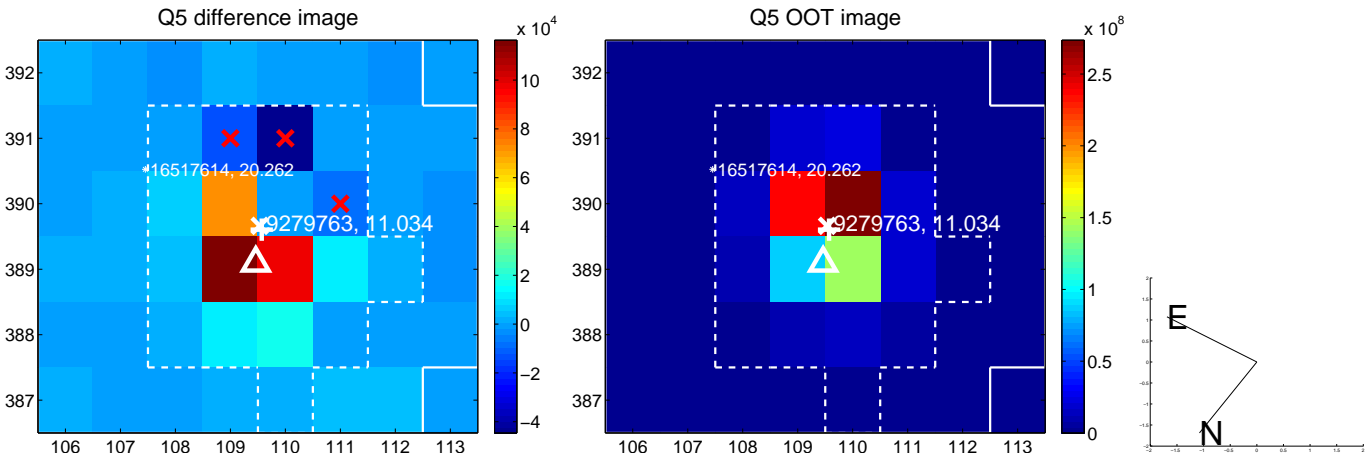


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

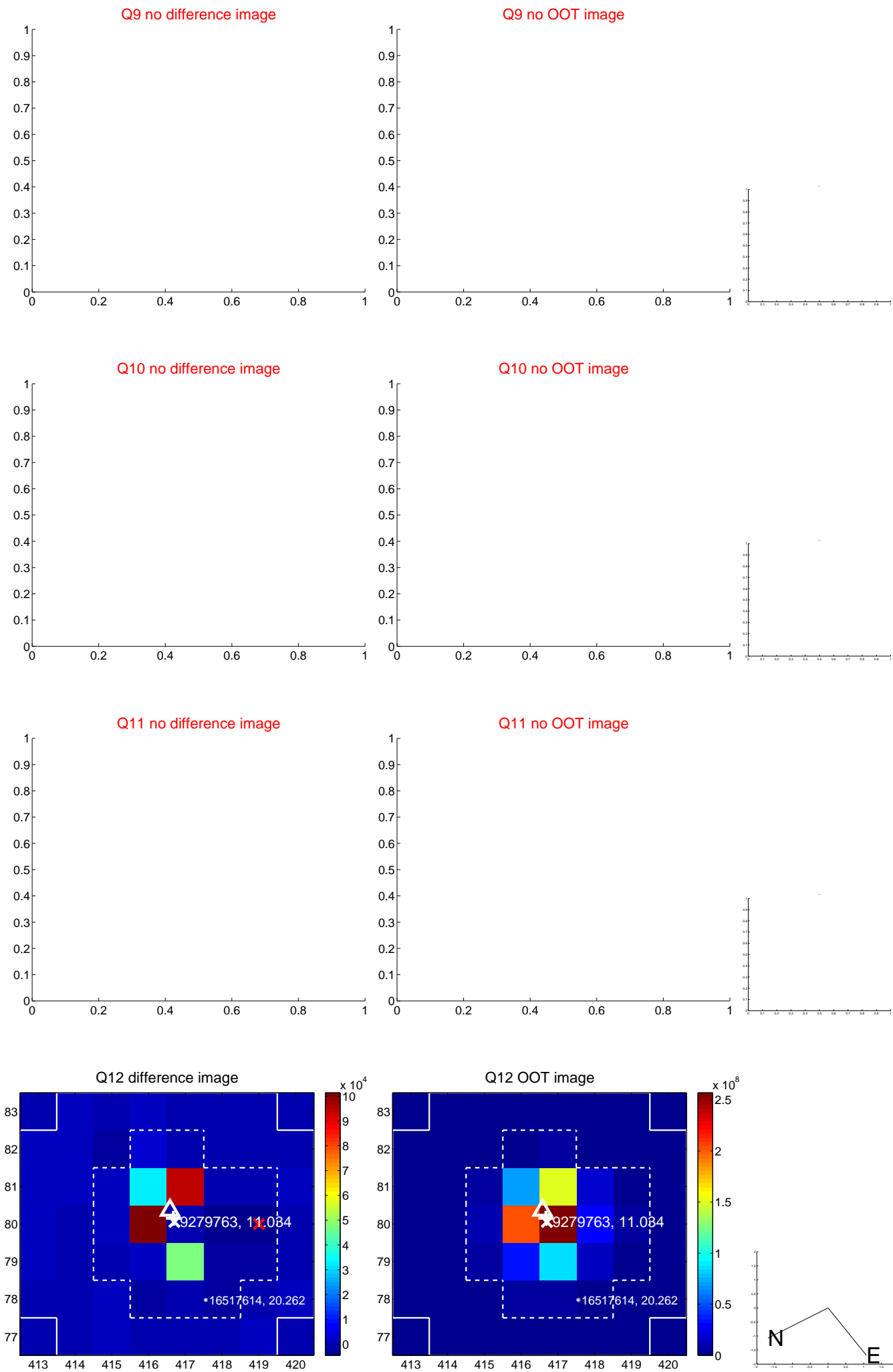
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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.

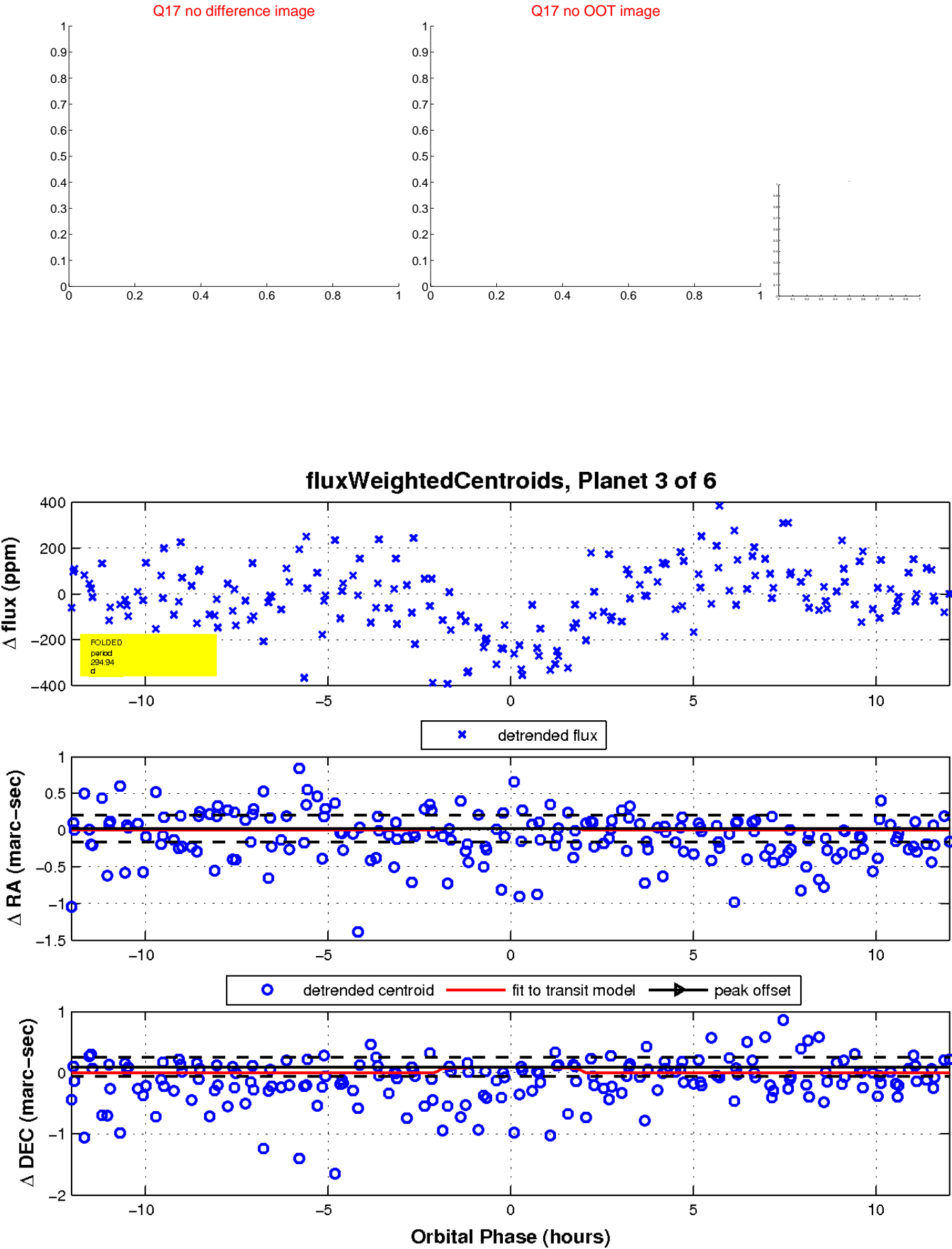


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



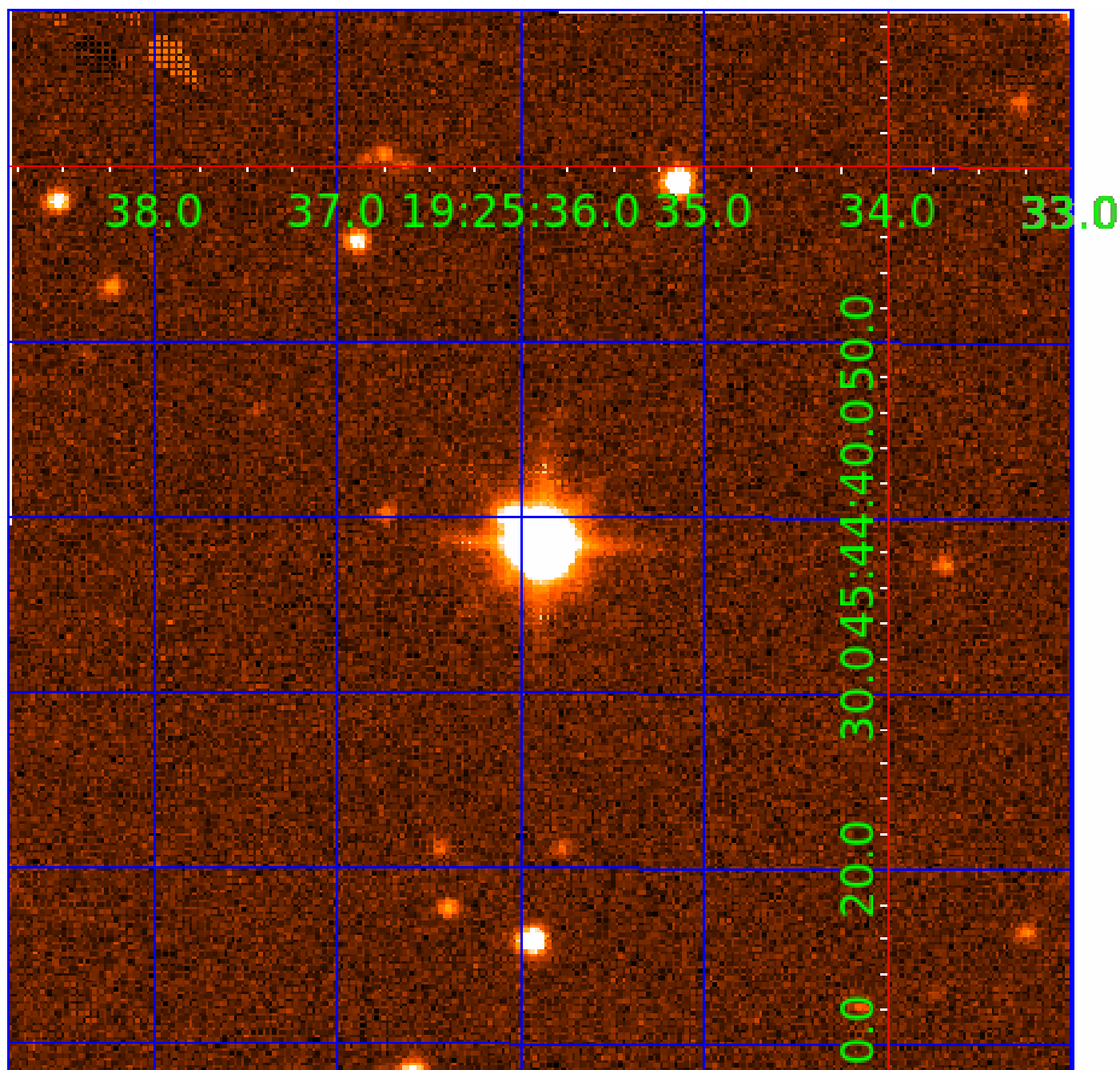


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009279763

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009279763-01 | OBS      | No   | 1.926636      | 133.216535   | 23.6        | 6.693            | 8.9 | 8.8 | 3.57                        | 6889            | 1.77                   | 19875.26               |
| 009279763-02 | OBS      | No   | 325.487920    | 261.872374   | 112.6       | 16.812           | 8.6 | 5.4 | 3.57                        | 6889            | 4.28                   | 21.28                  |
| 009279763-03 | OBS      | No   | 294.942838    | 216.691314   | 248.2       | 4.007            | 8.1 | 8.5 | 3.57                        | 6889            | 5.84                   | 24.27                  |
| 009279763-05 | OBS      | No   | 201.317343    | 169.291612   | 244.2       | 8.995            | 7.3 | 7.3 | 3.57                        | 6889            | 9.73                   | 40.38                  |
| 009279763-06 | OBS      | No   | 226.806773    | 152.502787   | 180.3       | 1.557            | 7.8 | 3.9 | 3.57                        | 6889            | 5.56                   | 34.45                  |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 009279763-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | SWEET_NTL—LPP_DV—CENT_SATURATED   |
| 009279763-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—<br>MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST |
| 009279763-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_SATURATED  |
| 009279763-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED  |
| 009279763-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED   |

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

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

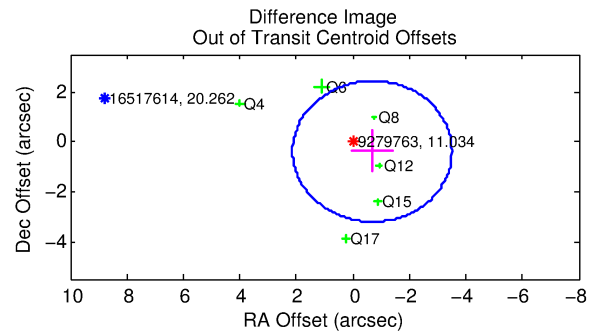
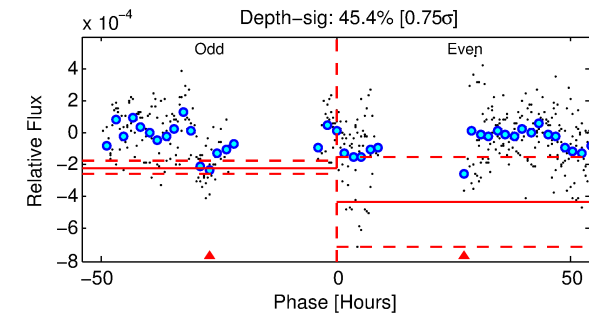
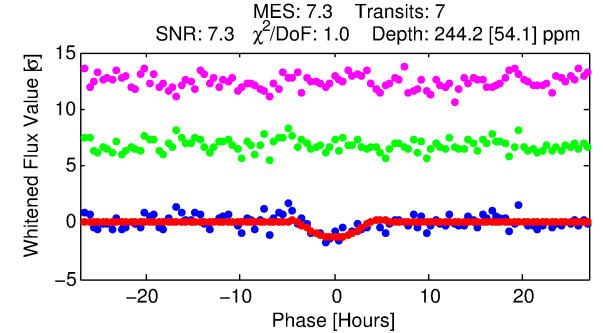
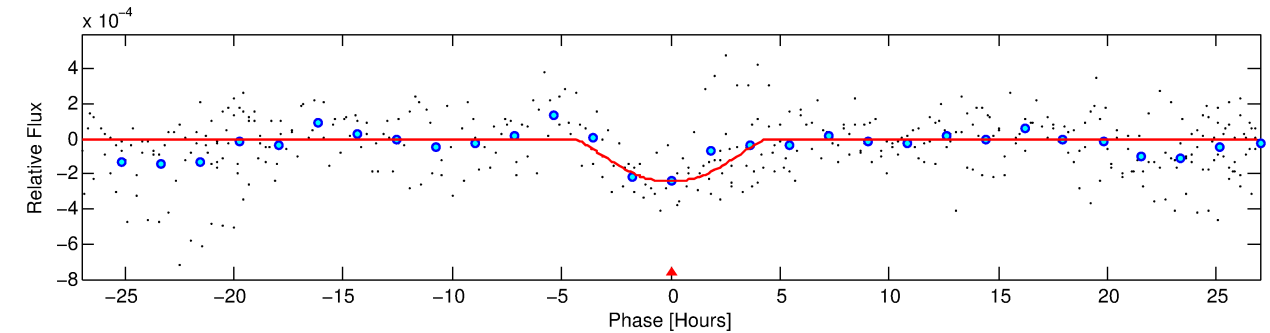
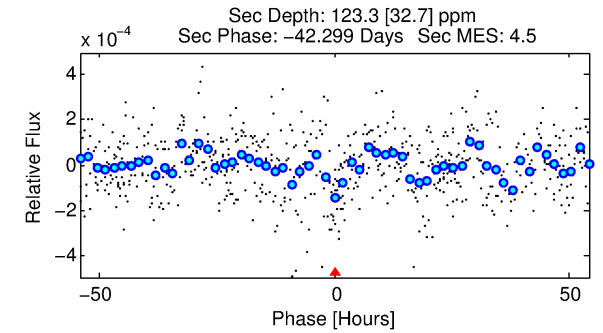
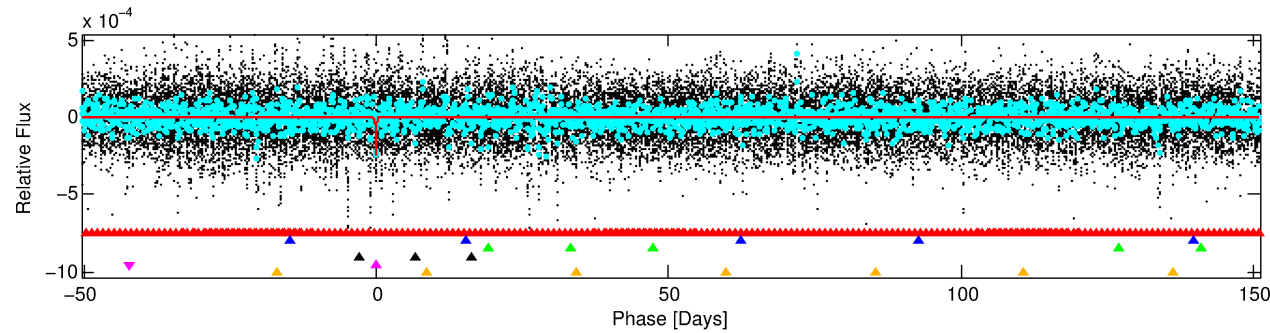
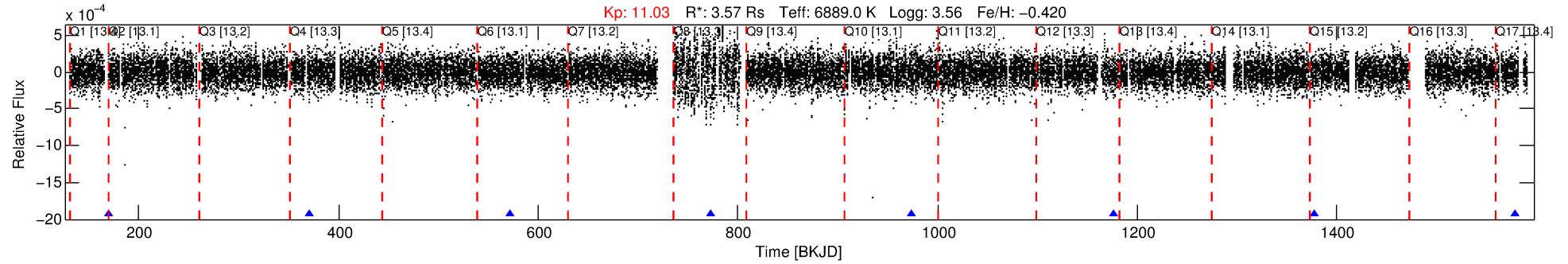
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009279763-05

No Significant Match Found

# DV One-Page Summary

KIC: 9279763 Candidate: 5 of 6 Period: 201.317 d



## DV Fit Results:

Period = 201.31734 [0.00739] d  
Epoch = 169.2916 [0.0339] BKJD  
 $R_p/R^* = 0.0250$  [0.0620]  
 $a/R^* = 41.72$  [31.71]  
 $b = 1.00$  [0.10]  
 $S_{\text{eff}} = 40.38$  [22.97]  
 $T_{\text{eq}} = 643$  [91] K  
 $R_p = 9.73$  [24.46]  $R_e$   
 $a = 0.7983$  [0.2844] AU  
 $A_g = 456.14$  [2282.35] [0.20σ]  
 $T_{\text{eff}} = 4593$  [5711] K [0.69σ]

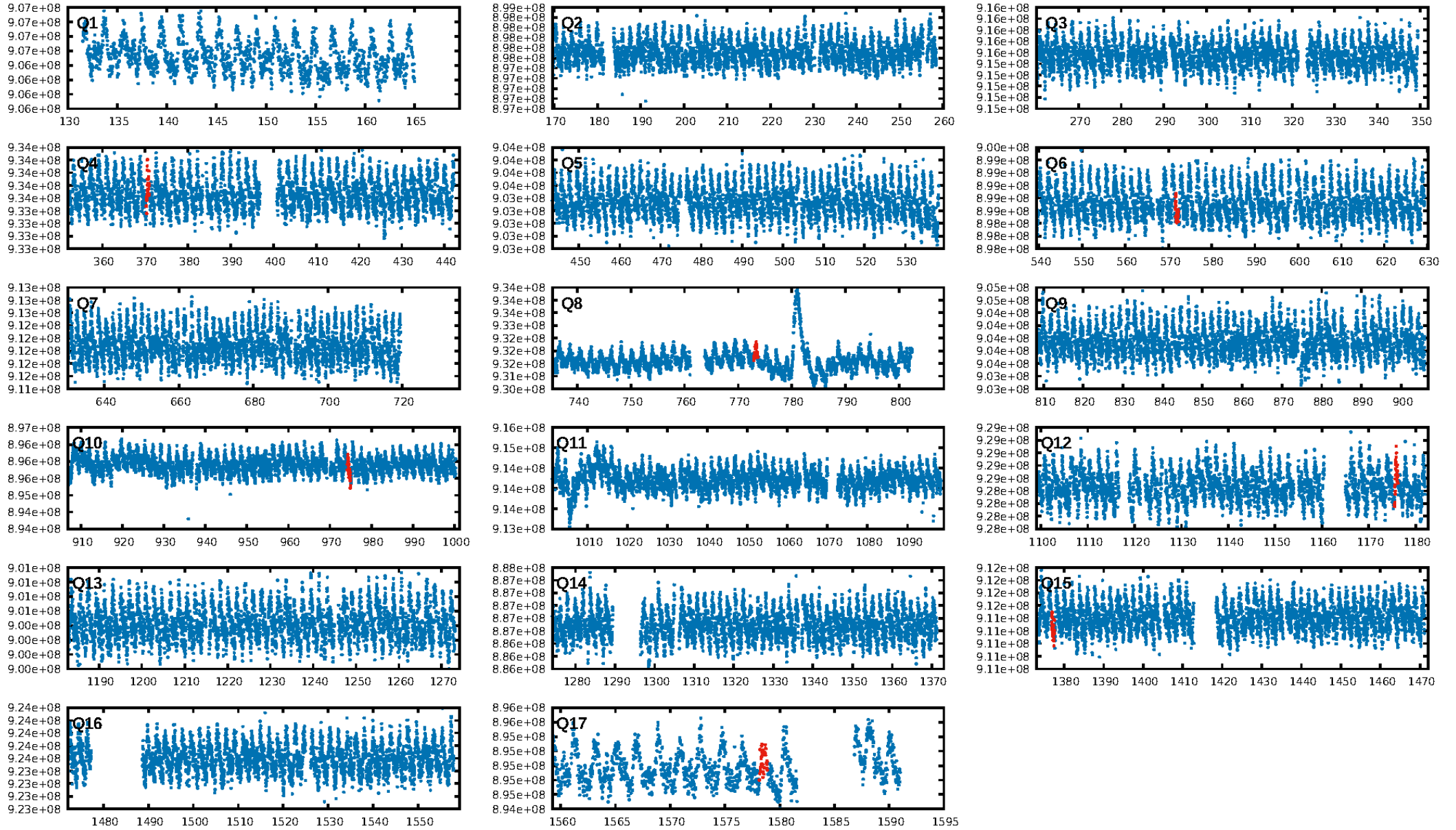
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [426.79σ]  
LongPeriod-sig: 100.0% [67.01σ]  
ModelChiSquare2-sig: 35.4%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.42e-08**  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 1.907  
Centroid-sig: 90.3%  
Centroid-so: 0.108 arcsec [0.20σ]  
OotOffset-rm: 0.789 arcsec [0.84σ]  
KicOffset-rm: 1.071 arcsec [1.24σ]  
OotOffset-st: 1/1/3/1 [6]  
KicOffset-st: 1/1/3/1 [6]  
DiffImageQuality-fgm: 0.33 [2/6]  
DiffImageOverlap-fno: 0.00 [0/7]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:44:39 Z

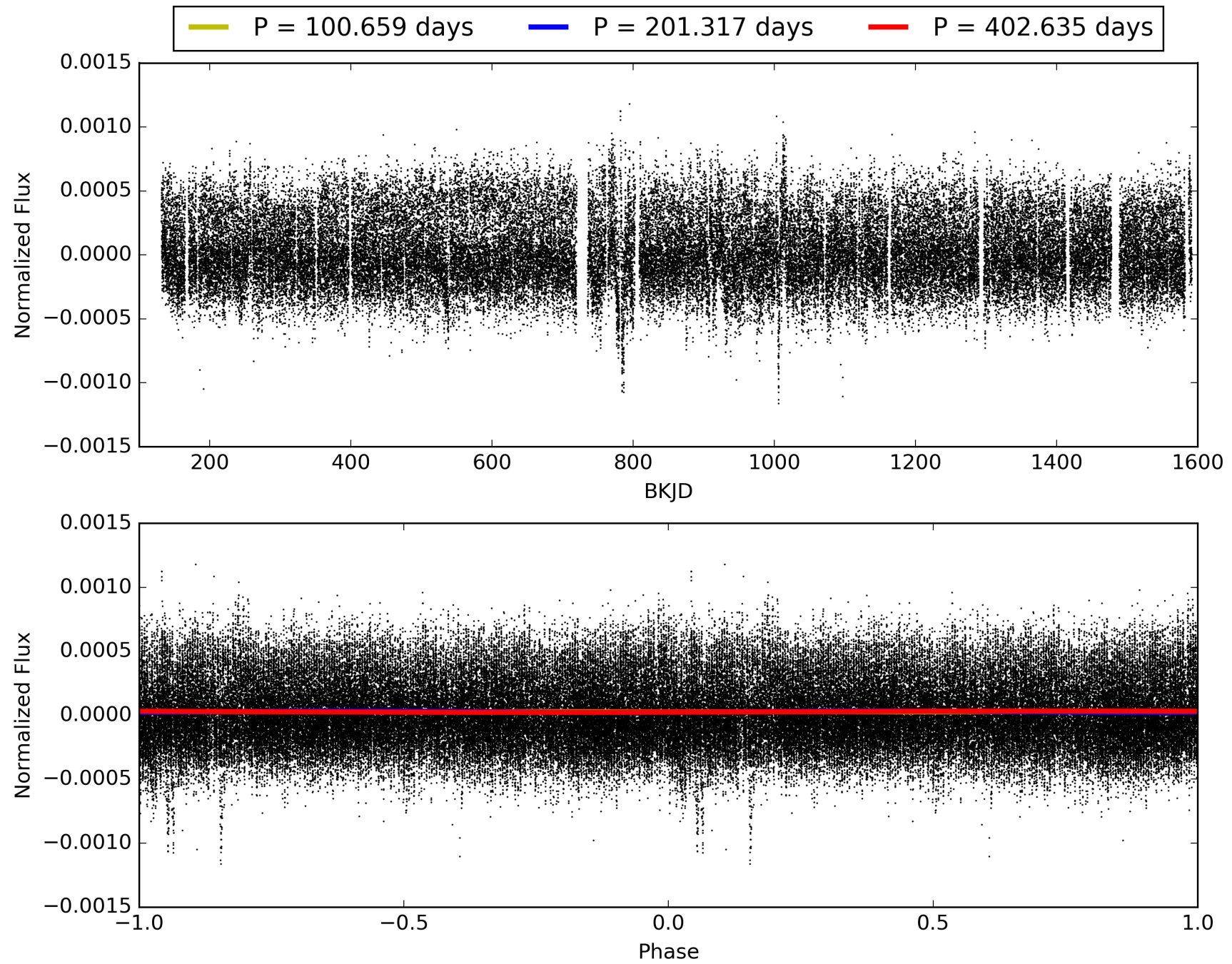
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009279763-05, PDC Light Curves



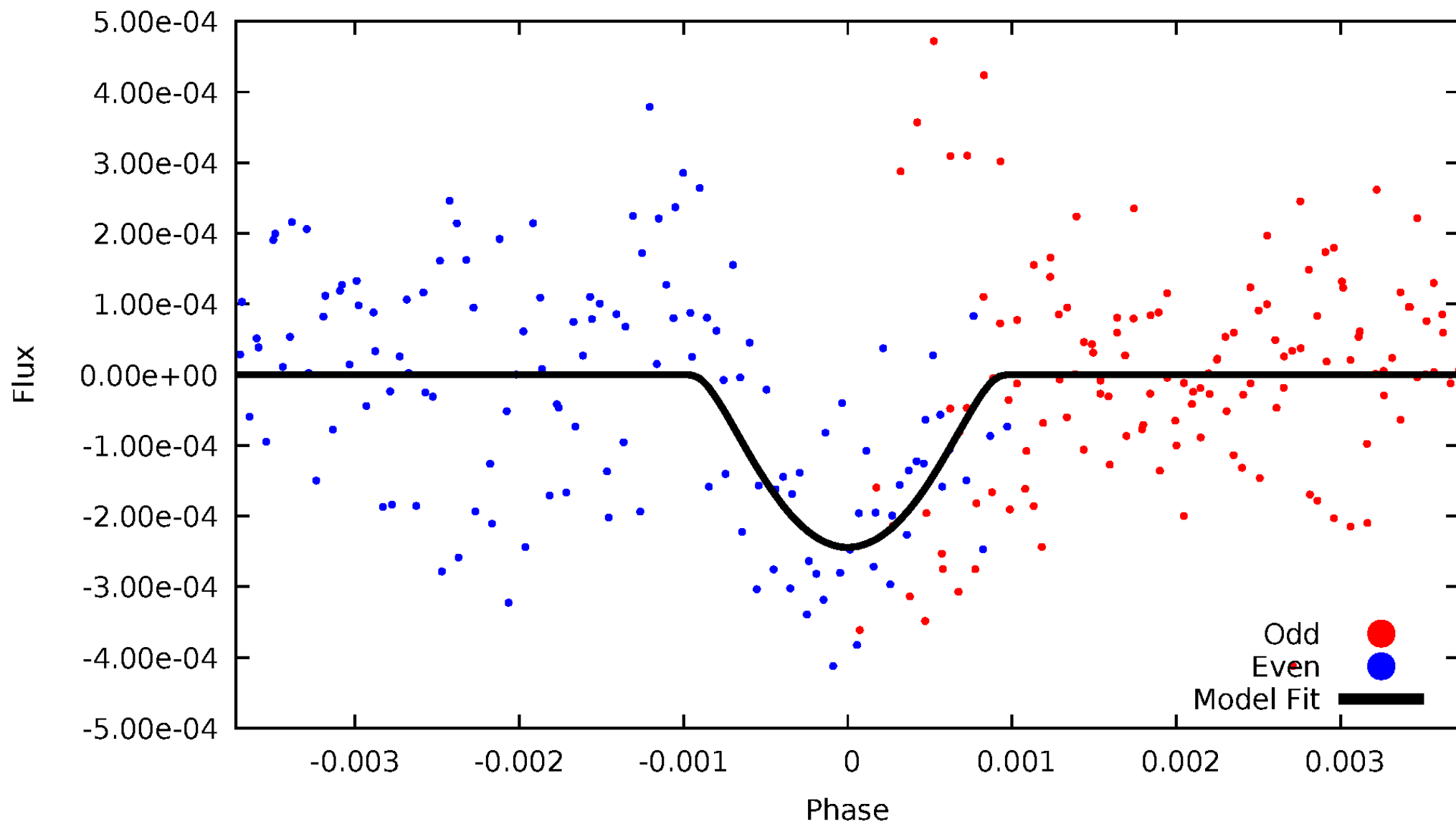


TCE 009279763-05



# DV Odd/Even

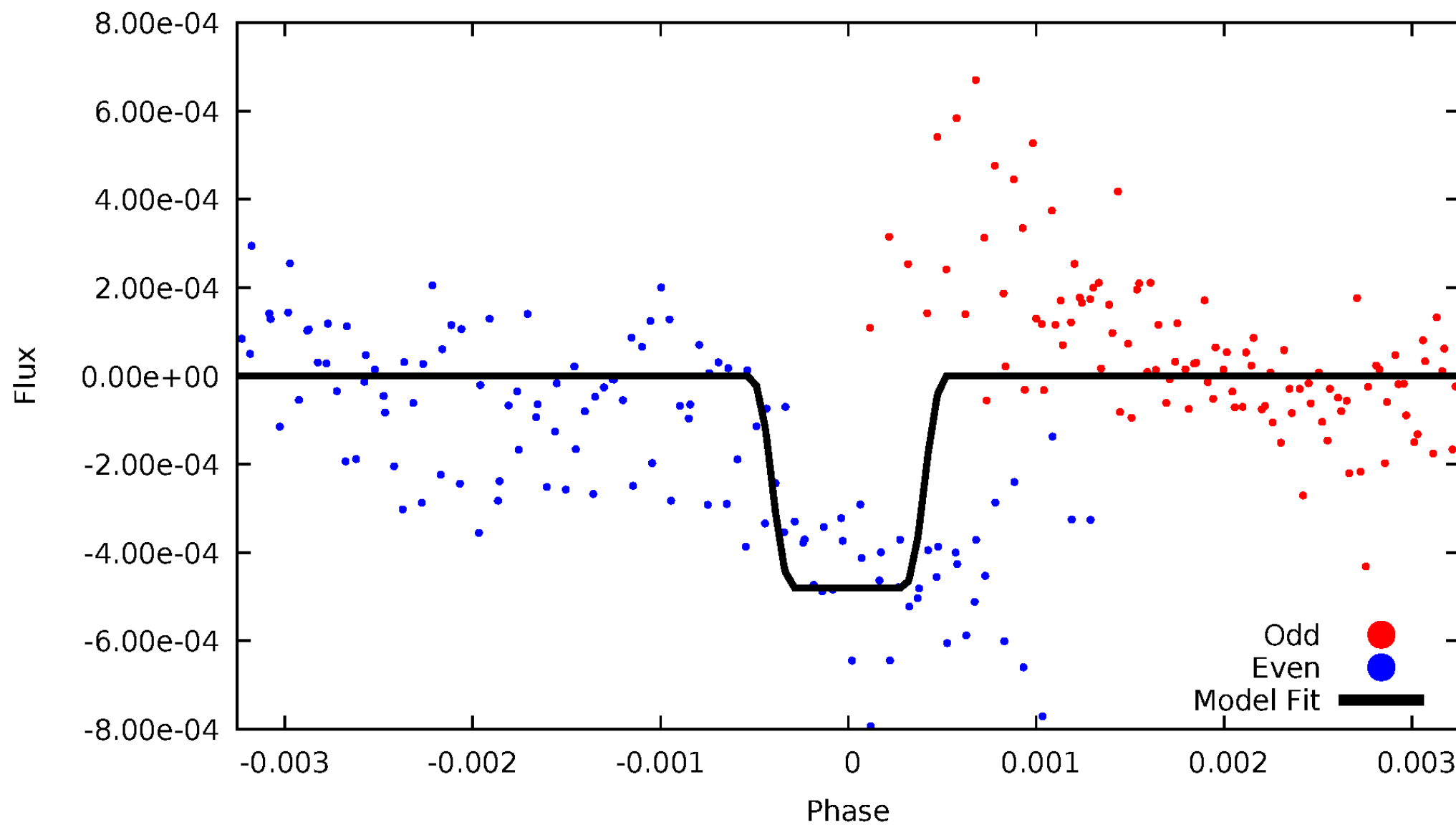
TCE 009279763-05





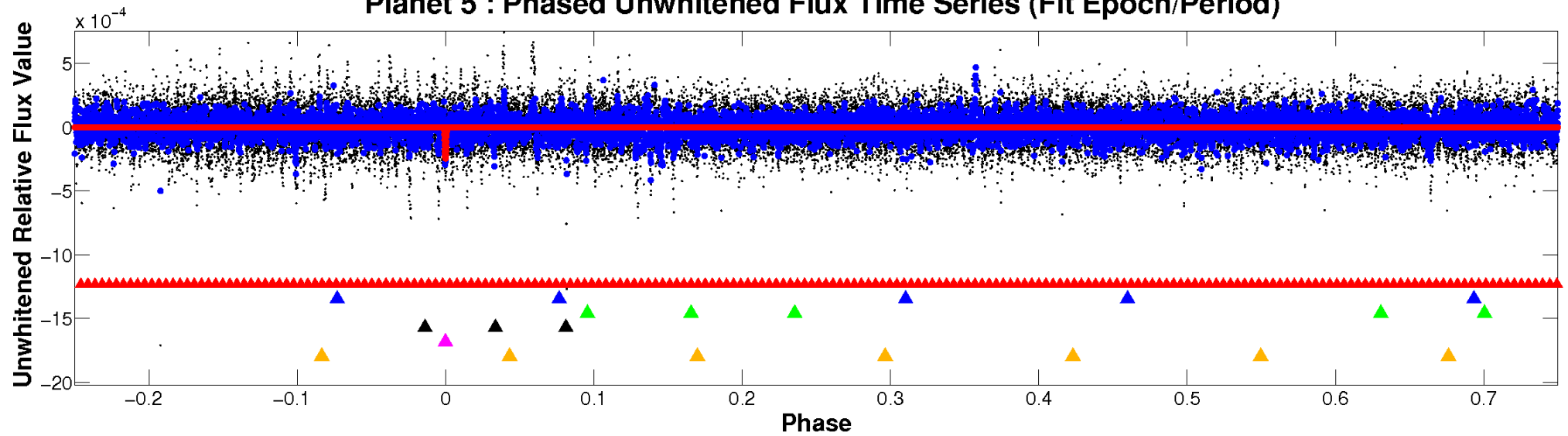
# ALT Odd/Even

TCE 009279763-05

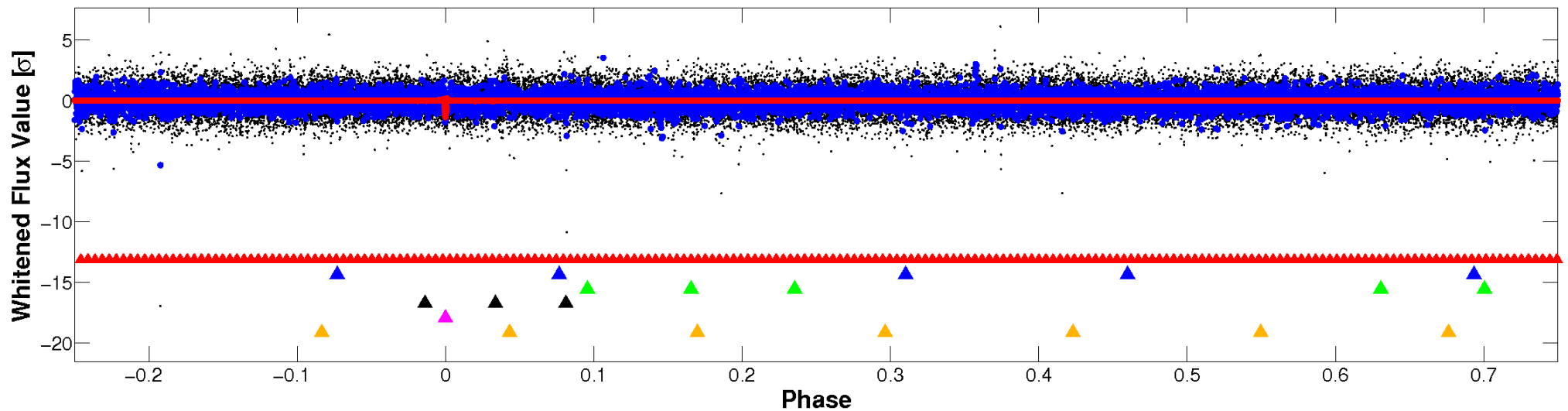


# Non-Whitened Vs. Whitened Light Curve

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

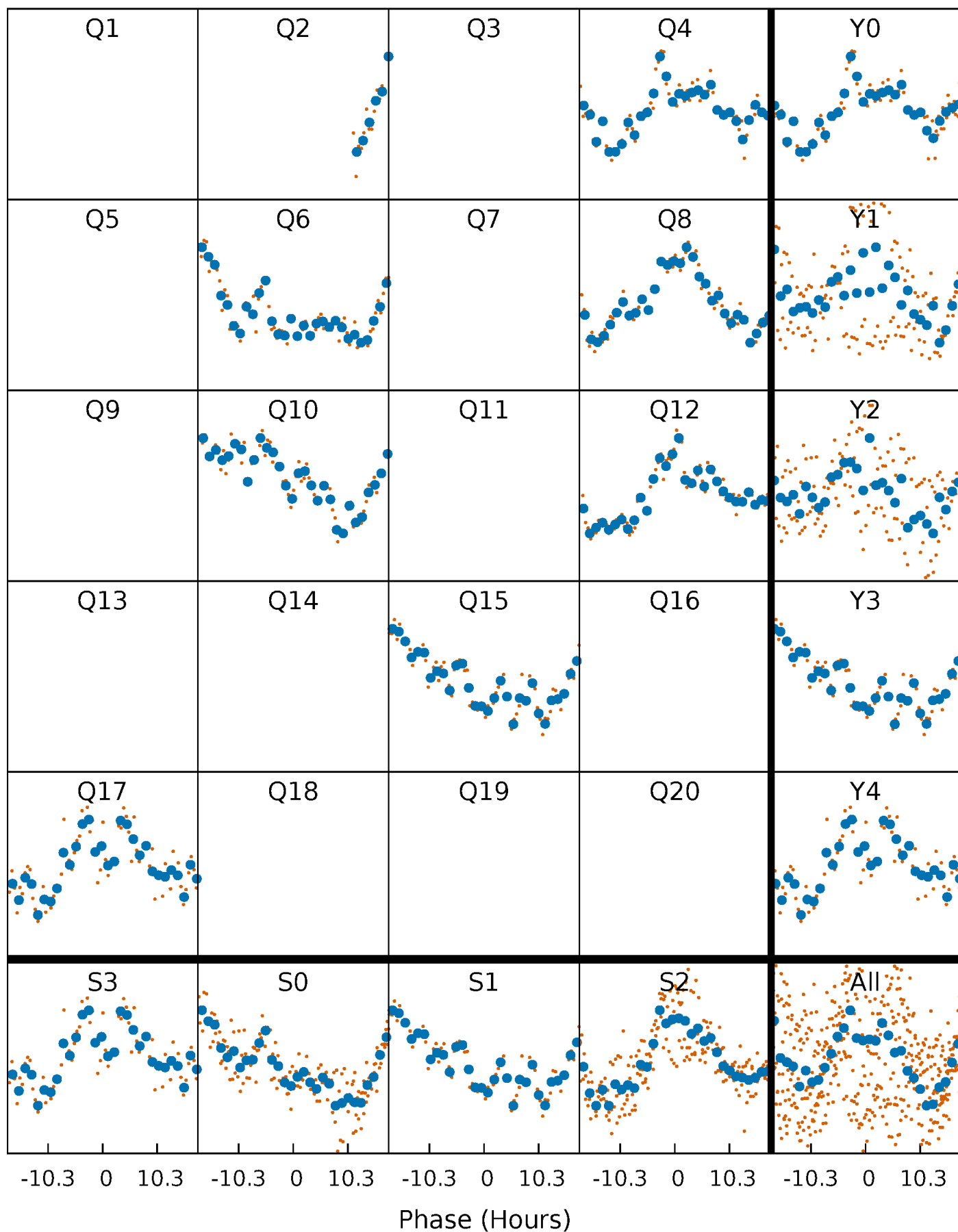


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



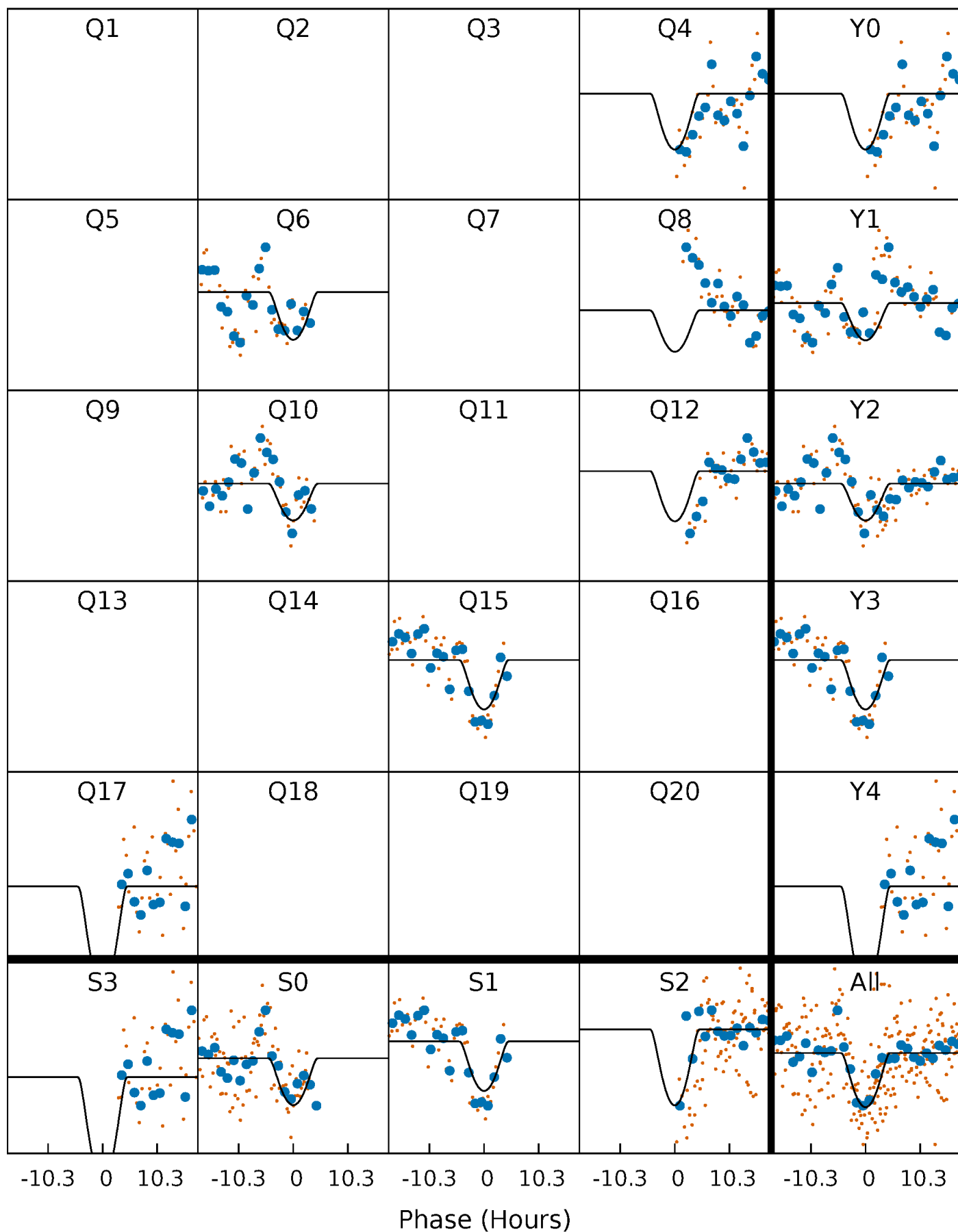
# PDC Quarter-Phased Transit Curves

TCE 009279763-05     $P=201.317343$  Days     $T_0=169.291612$  (BKJD)



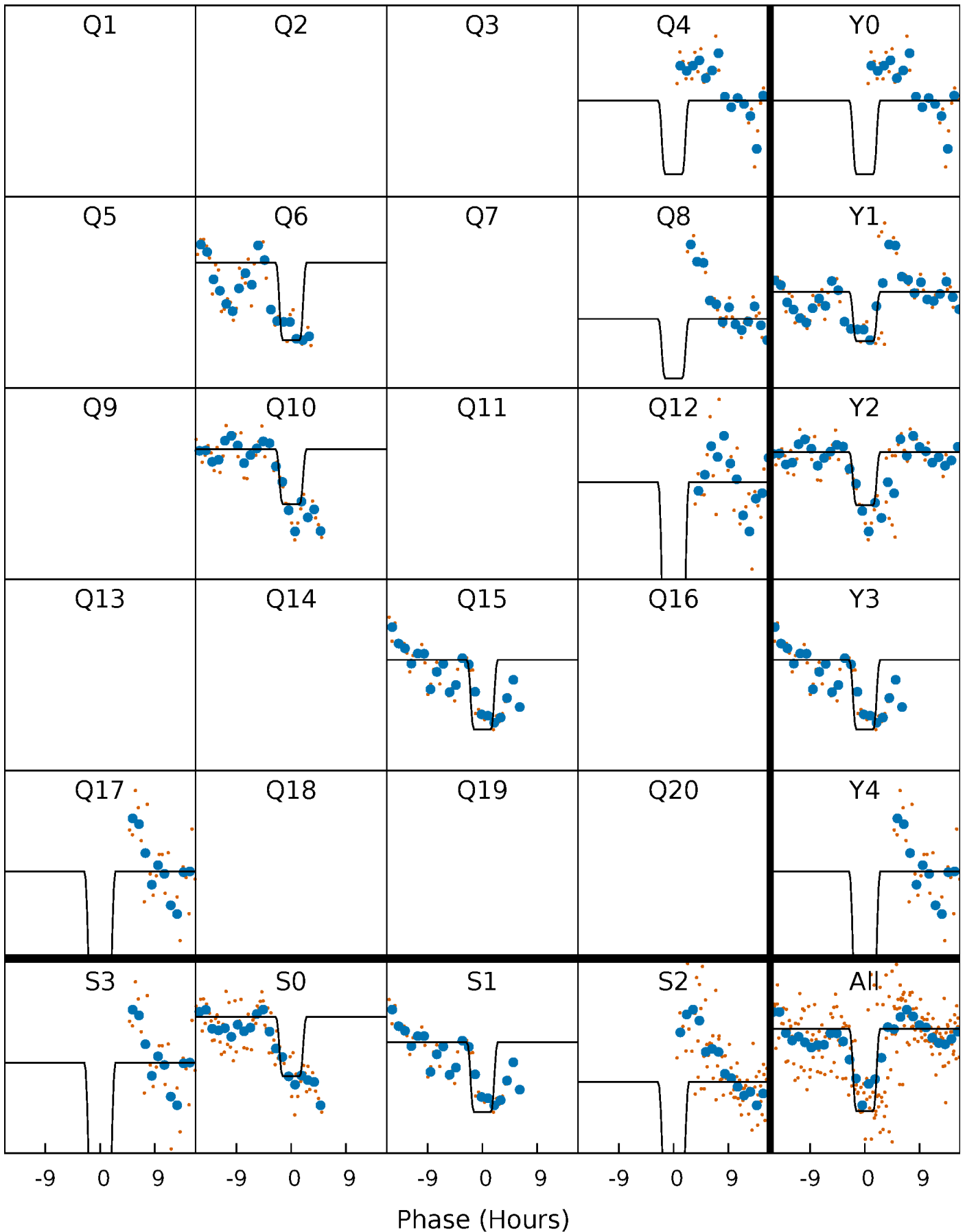
# DV Quarter-Phased Transit Curves

TCE 009279763-05     $P=201.317343$  Days     $T_0=169.291612$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

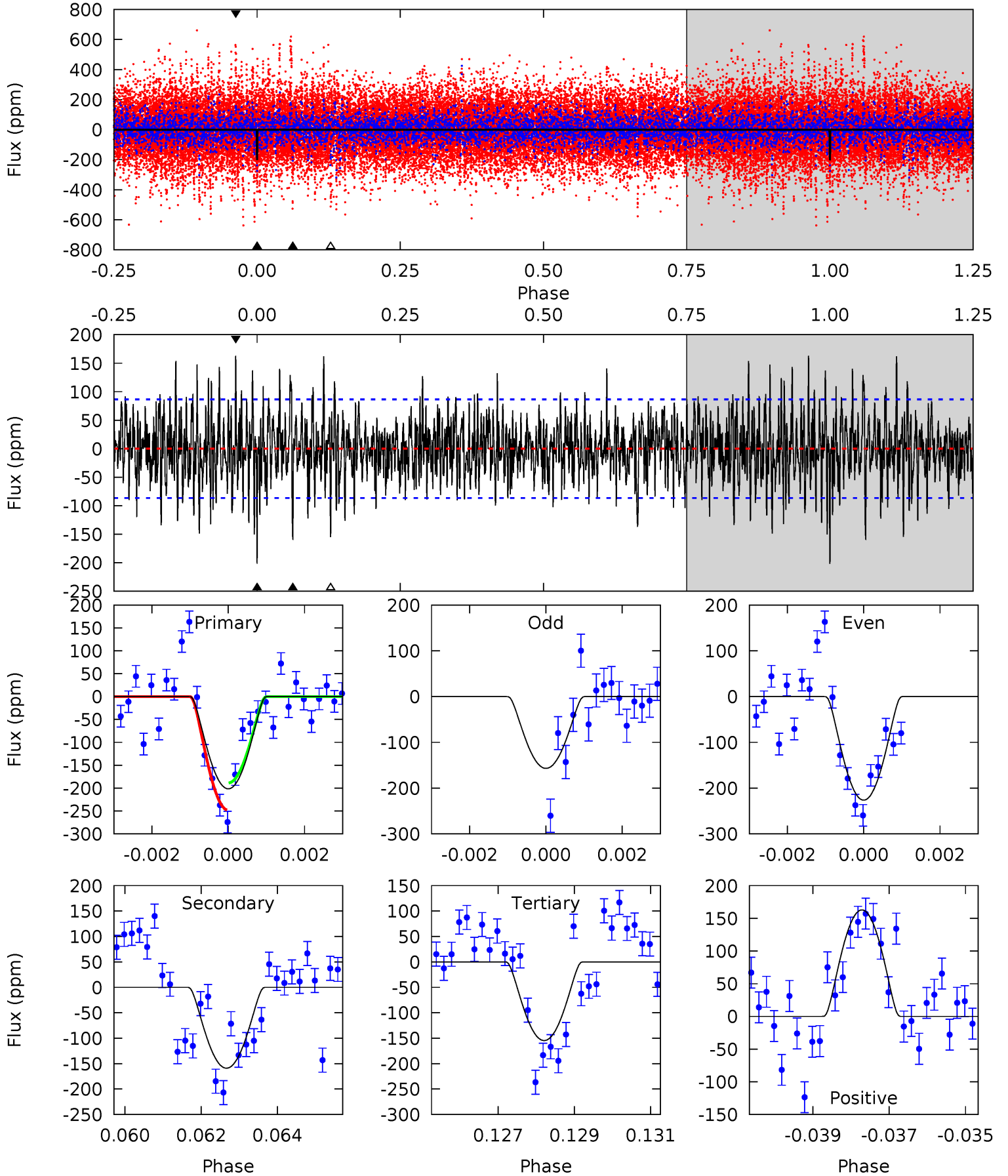
TCE 009279763-05     $P=201.306153$  Days     $T_0=169.294270$  (BKJD)



# DV Model-Shift Uniqueness Test

009279763-05, P = 201.317343 Days, E = 169.291612 Days

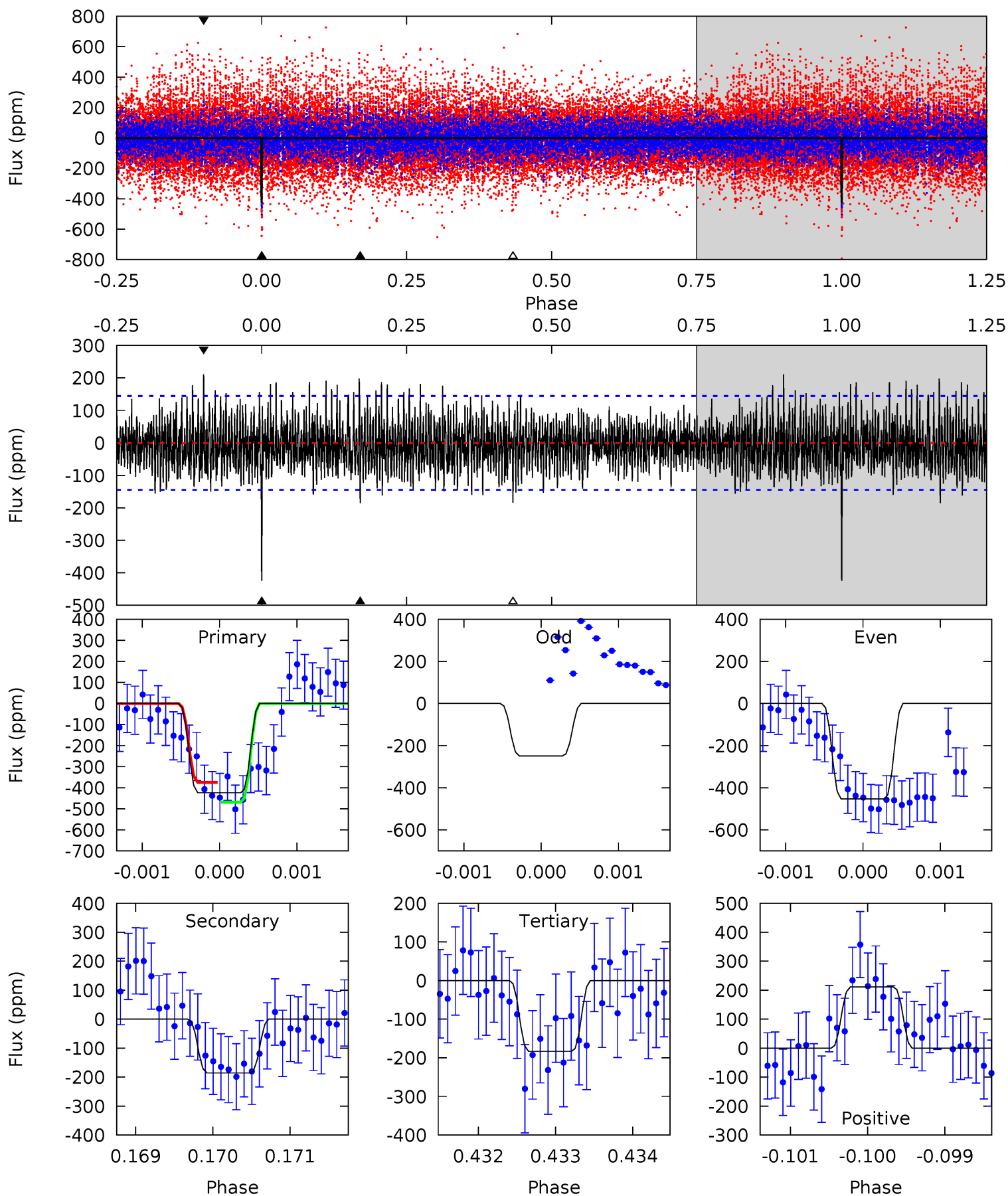
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.5 | 9.81 | 9.55 | 10.1 | 5.33            | 3.10            | 2.80             | 2.90    | 2.40    | 0.26    | -0.24   | 1.96    | 0.84 | 0.45  | 1.75 |



# Alt Model-Shift Uniqueness Test

009279763-05, P = 201.306153 Days, E = 169.294270 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  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 16.0 | 7.00 | 6.91 | 7.96 | 5.45            | 3.29            | 2.22             | 9.07    | 8.03    | 0.09    | -0.96   | 2.94    | 0.70 | 0.33  | 1.78 |





### Stellar Parameters For KIC 009279763

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M(M_{\odot})$            | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6889^{+173}_{-190}$ | $3.556^{+0.323}_{-0.086}$ | $-0.420^{+0.350}_{-0.250}$ | $3.571^{+0.428}_{-1.371}$ | $1.671^{+0.195}_{-0.363}$ | $0.052^{+0.125}_{-0.014}$                     |
|        | +3%/-3%              | +9%/-2%                   | +83%/-60%                  | +12%/-38%                 | +12%/-22%                 | +242%/-26%                                    |
| 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 009279763-05 / KOI

| Detrend | Depth (ppm)   | $R_p$ ( $R_{\oplus}$ )    | $T_{max}$ (K)     | $T_{obs}$ (K)         | $A_{obs}$            |
|---------|---------------|---------------------------|-------------------|-----------------------|----------------------|
| DV      | $-159 \pm 16$ | $19.59^{+19.13}_{-13.40}$ | $883^{+48}_{-75}$ | $3686^{+2173}_{-653}$ | $144^{+1167}_{-107}$ |
| Alt.    | $-186 \pm 27$ | $17.83^{+18.58}_{-12.34}$ | $881^{+45}_{-74}$ | $3913^{+2471}_{-783}$ | $201^{+1784}_{-150}$ |

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

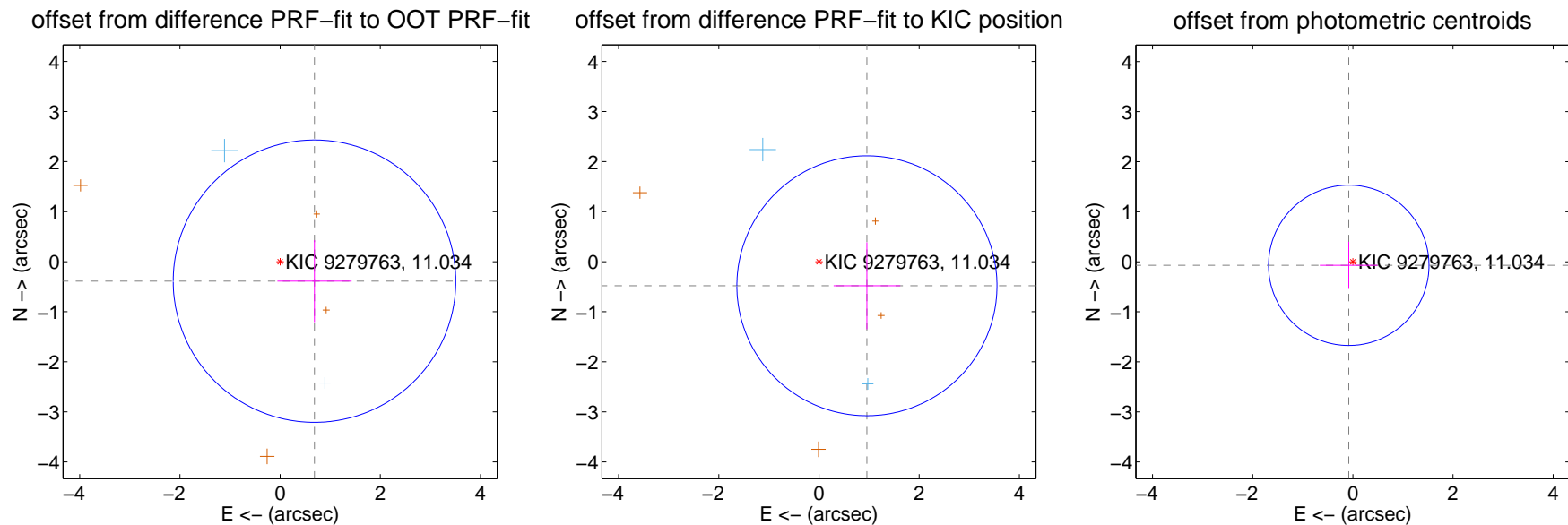
## DV Centroid Data

Supplemental centroid analysis for 009279763-05. **Kepler magnitude: 11.03.** Transit SNR 7.28

**There are 2 quarters with good PRF difference image offsets**

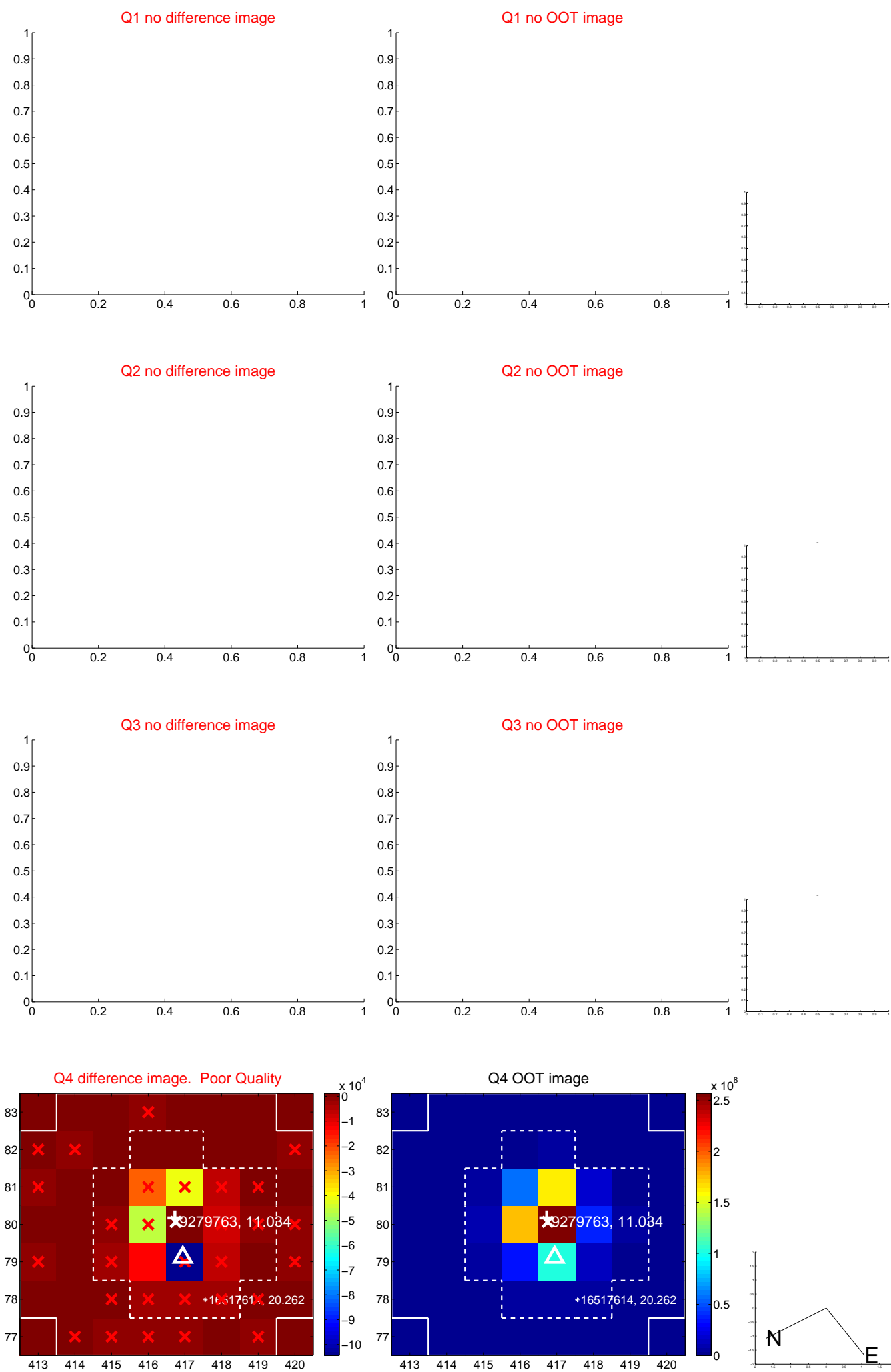
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $0.789 \pm 0.940$  | 0.84                | $-0.686 \pm 0.741$ | $-0.389 \pm 0.819$ |
| PRF-fit source offset from KIC position | $1.071 \pm 0.865$  | 1.24                | $-0.957 \pm 0.665$ | $-0.481 \pm 0.868$ |
| photometric centroid source offset      | $0.11 \pm 0.53$    | 0.20                | $0.08 \pm 0.58$    | $-0.07 \pm 0.47$   |



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

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



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

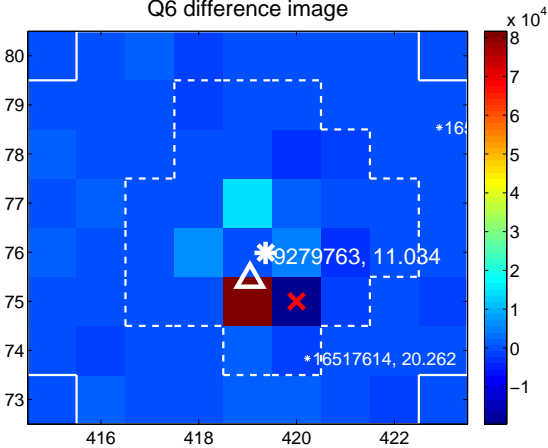
Q5 no difference image



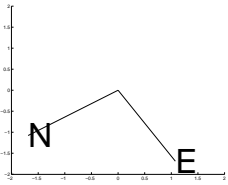
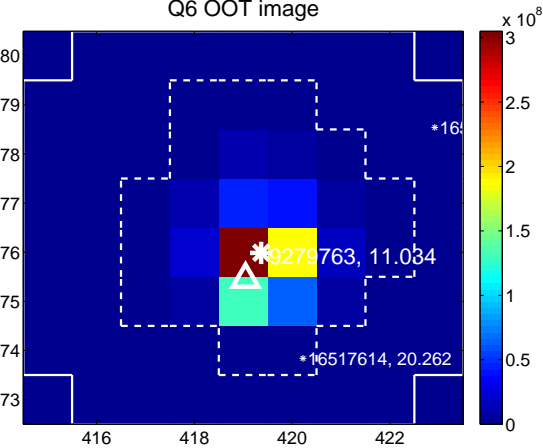
Q5 no OOT image



Q6 difference image



Q6 OOT image



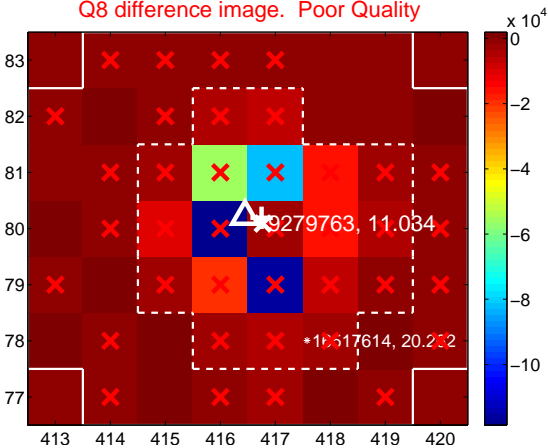
Q7 no difference image



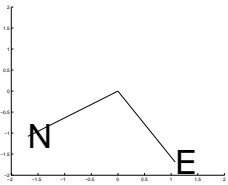
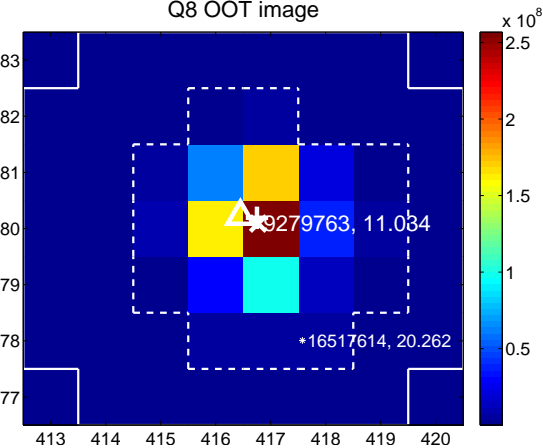
Q7 no OOT image



Q8 difference image. Poor Quality



Q8 OOT image



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

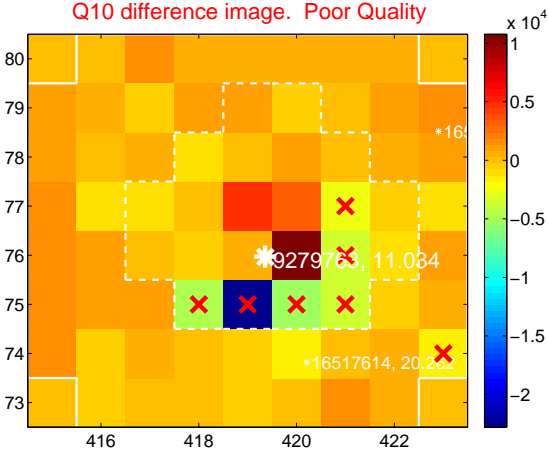
Q9 no difference image



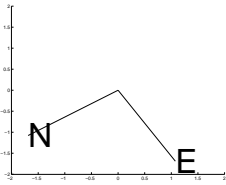
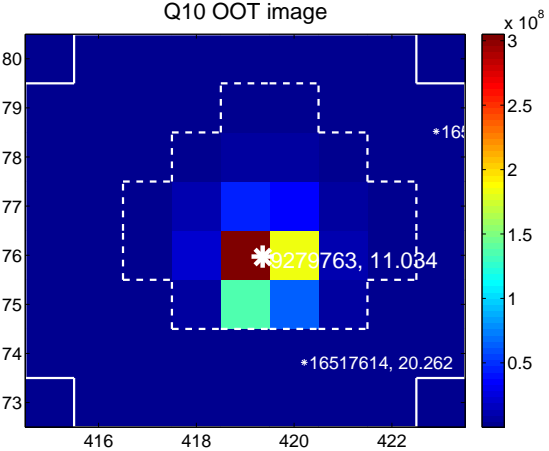
Q9 no OOT image



Q10 difference image. Poor Quality



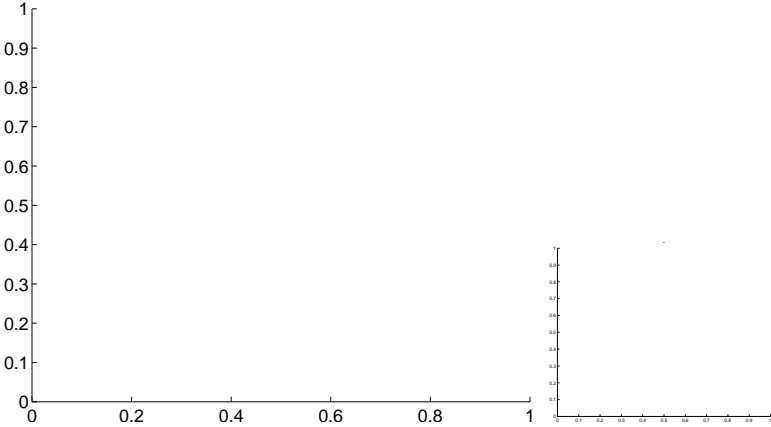
Q10 OOT image



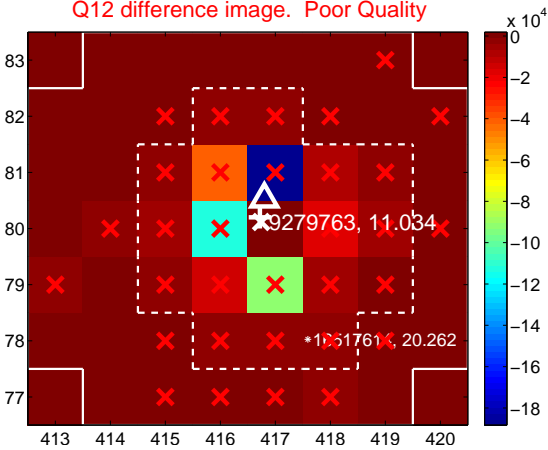
Q11 no difference image



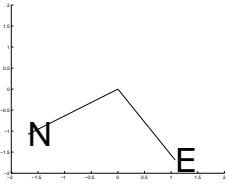
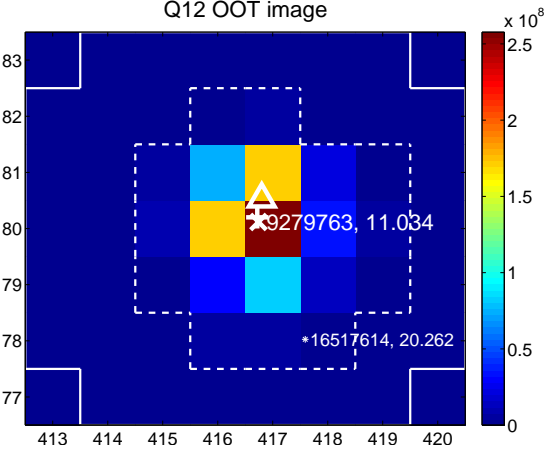
Q11 no OOT image



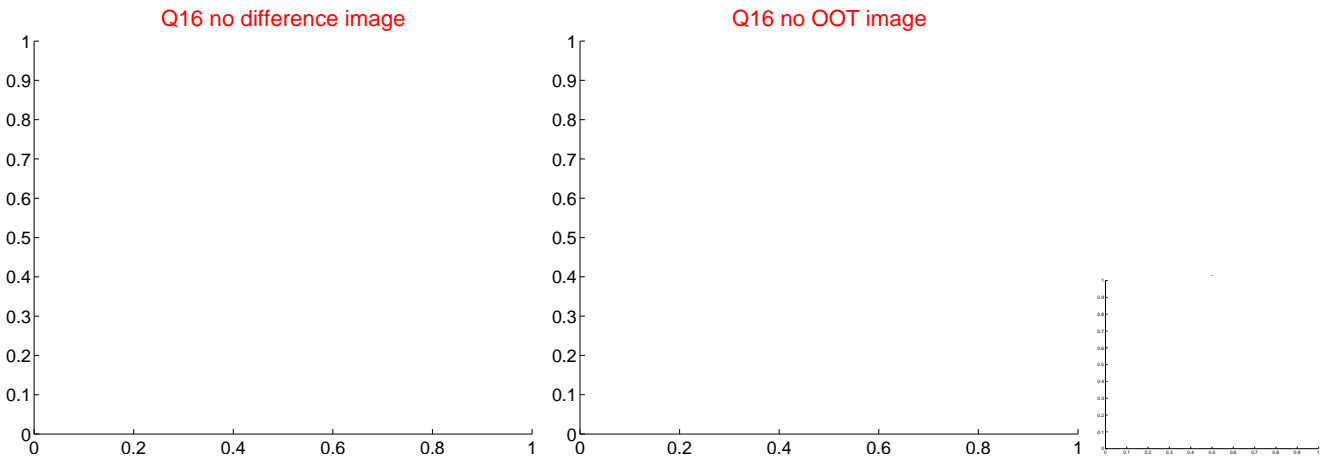
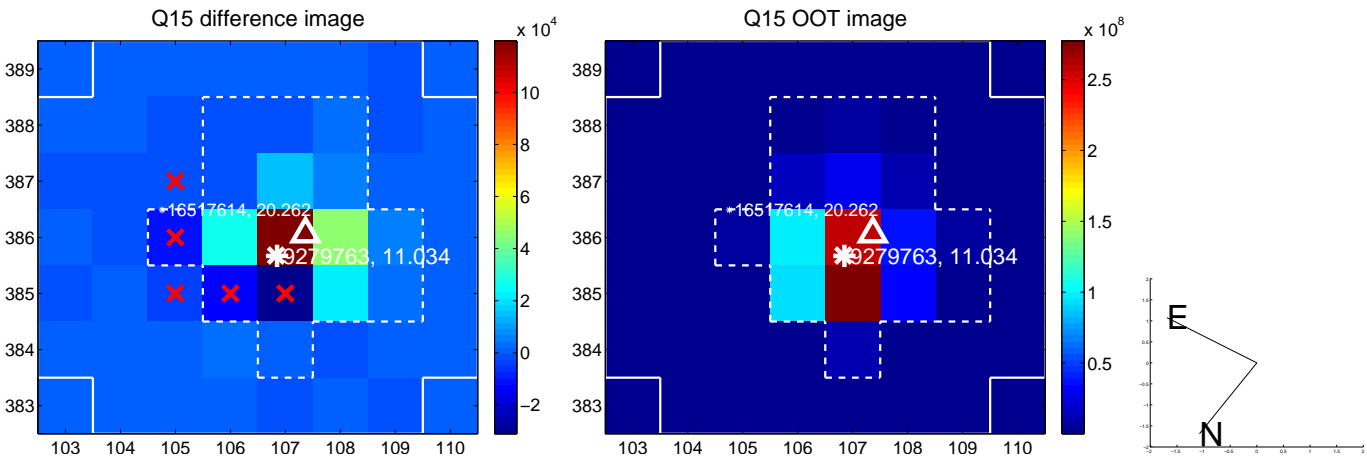
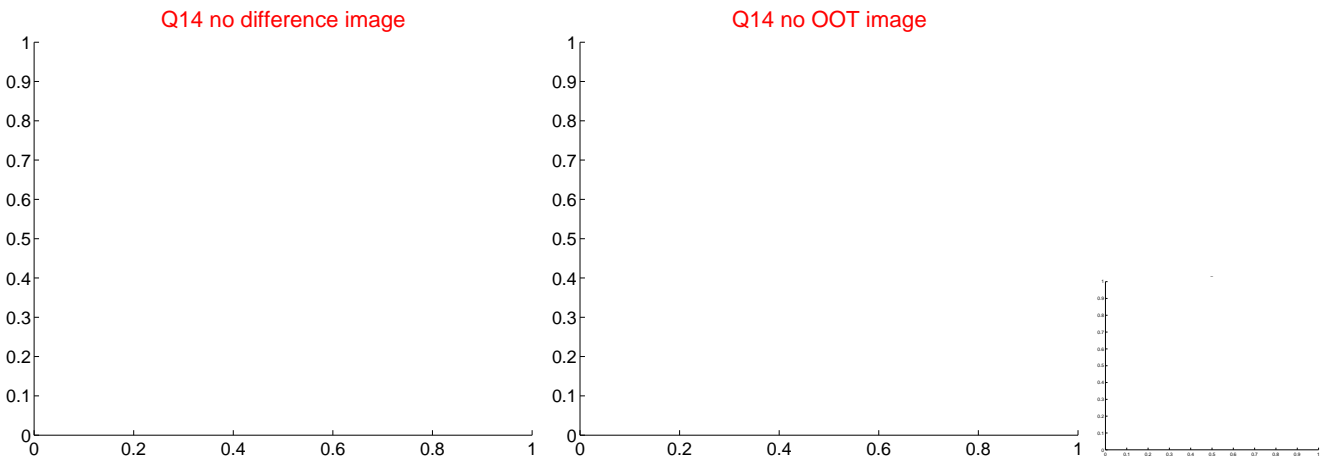
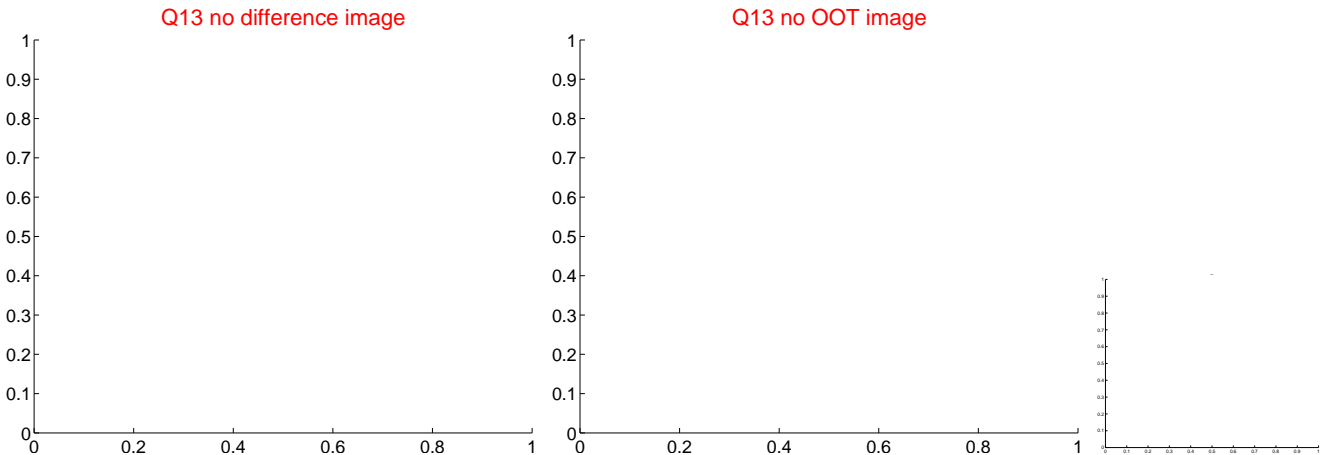
Q12 difference image. Poor Quality



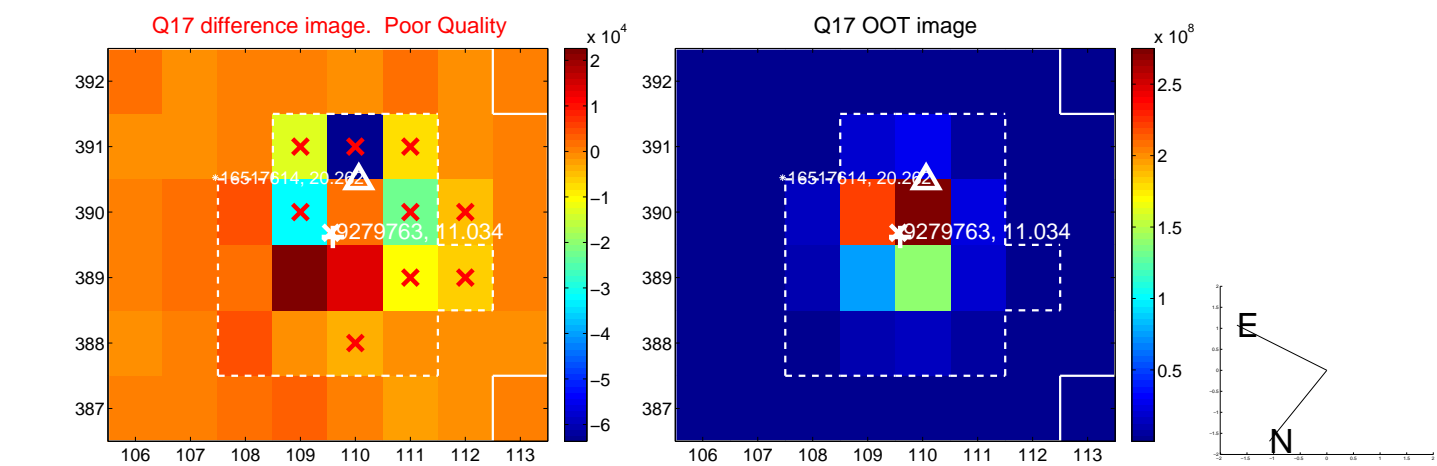
Q12 OOT image



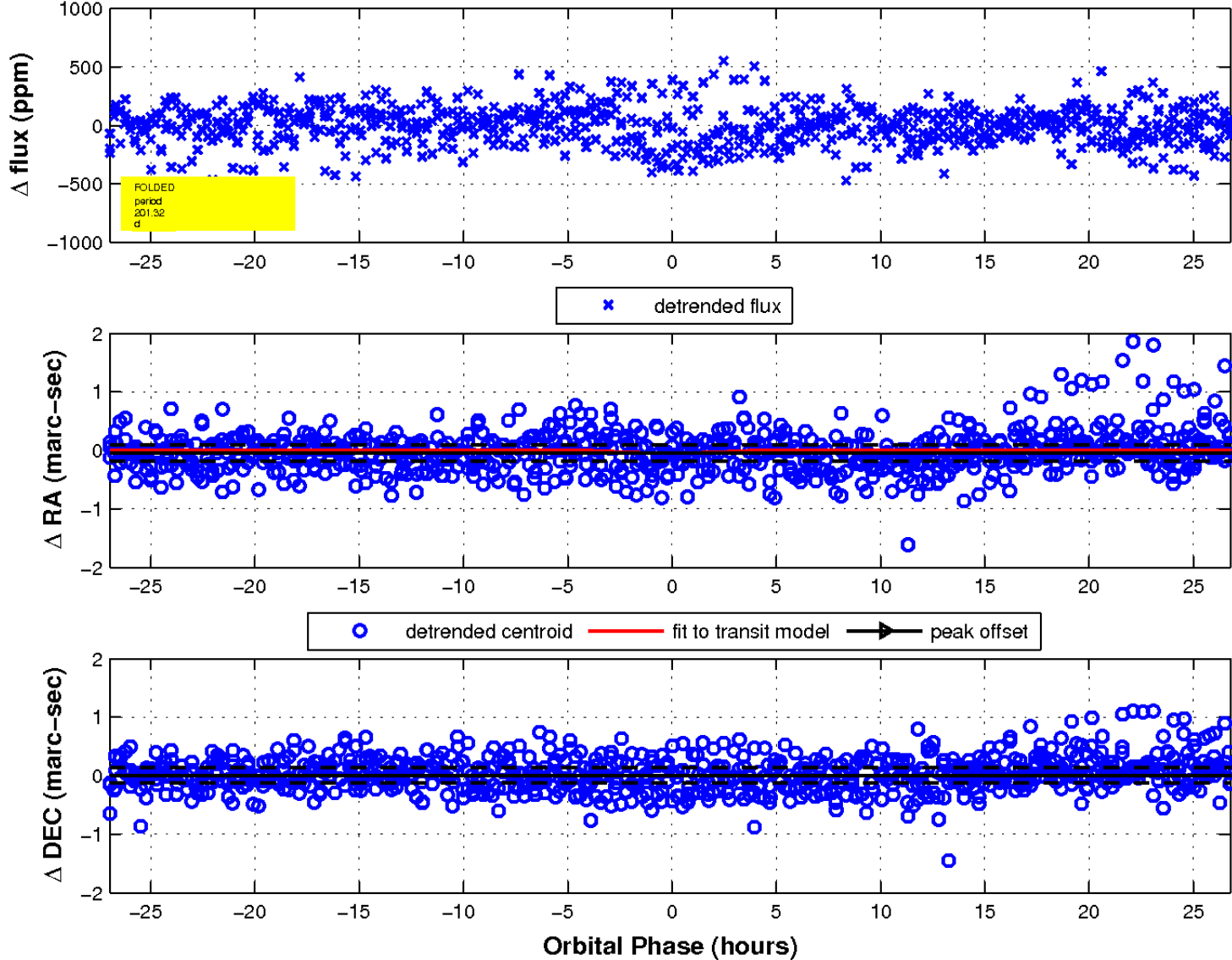
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

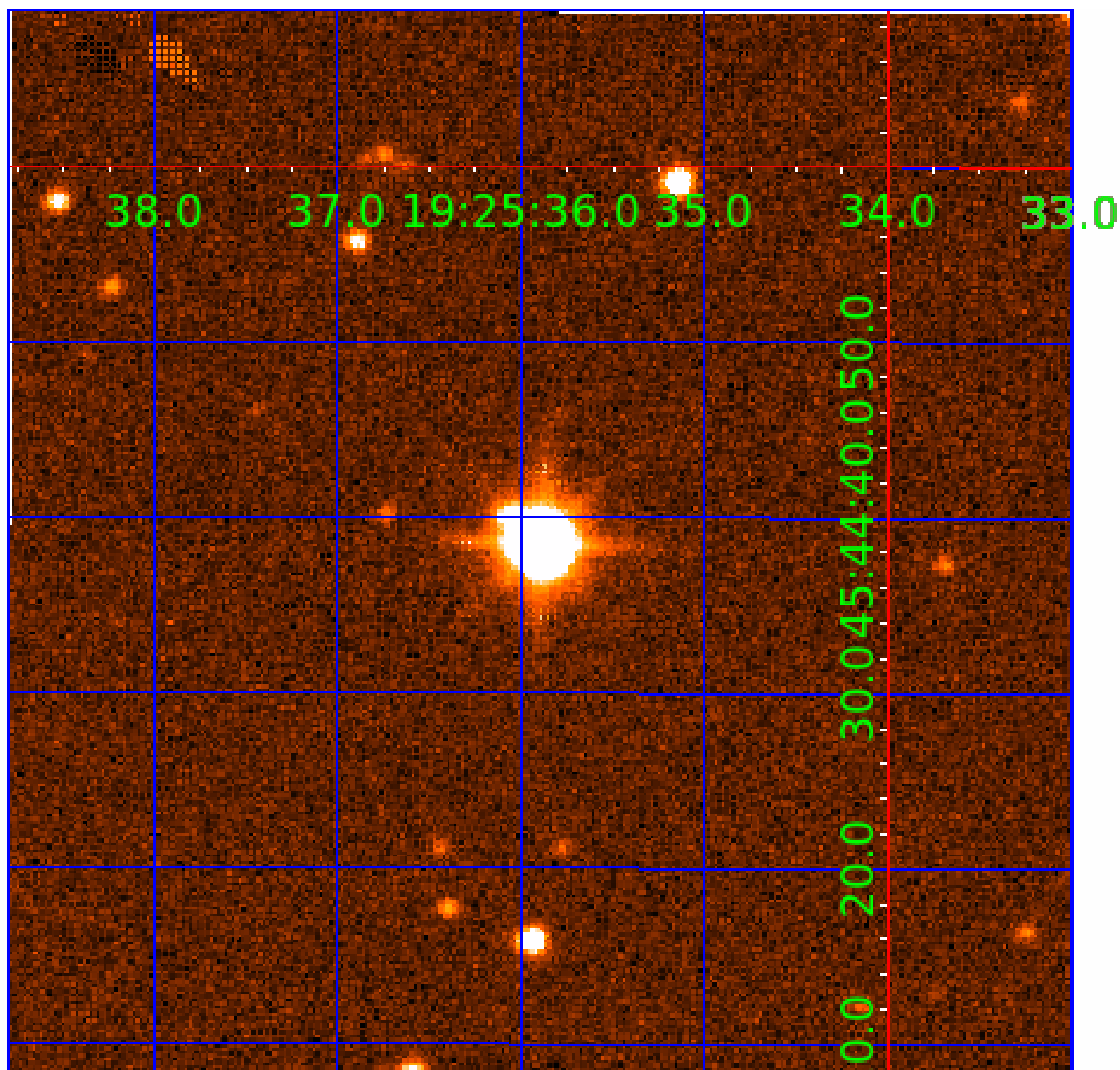


fluxWeightedCentroids, Planet 5 of 6



UKIRT Image

Declination





# KIC 009279763

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009279763-01 | OBS      | No   | 1.926636      | 133.216535   | 23.6        | 6.693            | 8.9 | 8.8 | 3.57                        | 6889            | 1.77                   | 19875.26               |
| 009279763-02 | OBS      | No   | 325.487920    | 261.872374   | 112.6       | 16.812           | 8.6 | 5.4 | 3.57                        | 6889            | 4.28                   | 21.28                  |
| 009279763-03 | OBS      | No   | 294.942838    | 216.691314   | 248.2       | 4.007            | 8.1 | 8.5 | 3.57                        | 6889            | 5.84                   | 24.27                  |
| 009279763-05 | OBS      | No   | 201.317343    | 169.291612   | 244.2       | 8.995            | 7.3 | 7.3 | 3.57                        | 6889            | 9.73                   | 40.38                  |
| 009279763-06 | OBS      | No   | 226.806773    | 152.502787   | 180.3       | 1.557            | 7.8 | 3.9 | 3.57                        | 6889            | 5.56                   | 34.45                  |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments  |
|--------------|----------|------|-------|---|---|---|---|---|
| 009279763-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | SWEET_NTL—LPP_DV—CENT_SATURATED   |
| 009279763-02 | OBS      | FP   | 0.00  | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—<br>MOD_NONUNIQ_ALT—CENT_SATURATED—HALO_GHOST |
| 009279763-03 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_SATURATED  |
| 009279763-05 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED  |
| 009279763-06 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_SATURATED   |

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

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

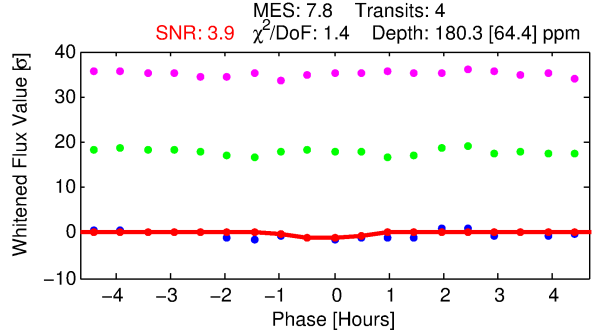
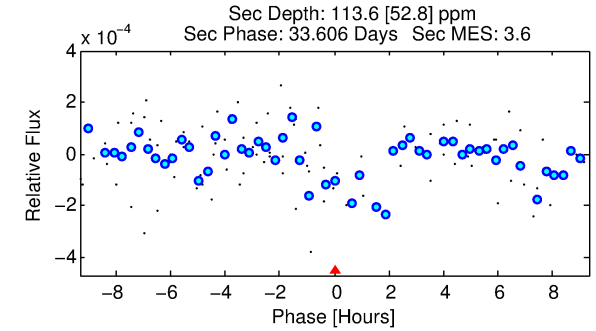
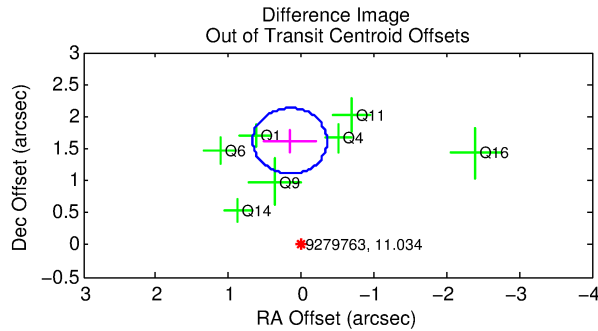
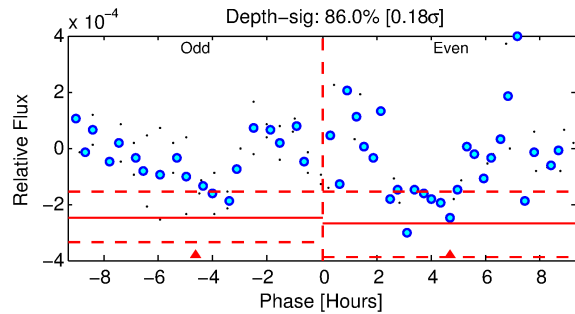
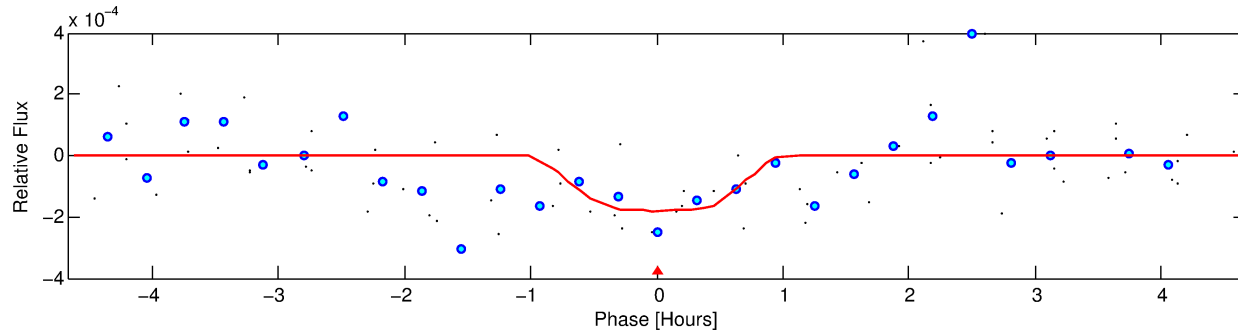
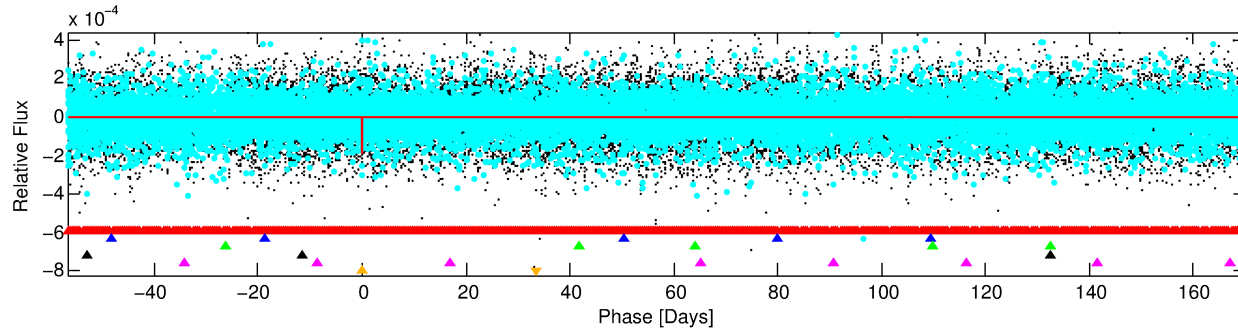
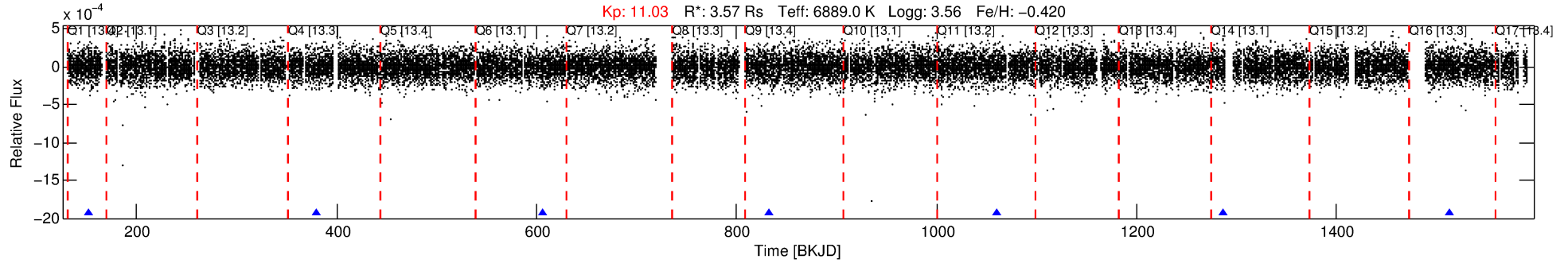
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009279763-06

No Significant Match Found

# DV One-Page Summary

KIC: 9279763 Candidate: 6 of 6 Period: 226.807 d



## DV Fit Results:

Period = 226.80677 [0.00296] d  
Epoch = 152.5028 [0.0118] BKJD  
Rp/R\* = 0.0143 [0.0296]  
a/R\* = 537.30 [6879.63]  
b = 0.89 [2.96]  
Seff = 34.45 [19.59]  
Teq = 618 [88] K  
Rp = 5.56 [11.72] Re  
a = 0.8643 [0.3080] AU  
Ag = 1510.81 [6362.05] [0.24 $\sigma$ ]  
Teffp = 5955 [6216] K [0.86 $\sigma$ ]

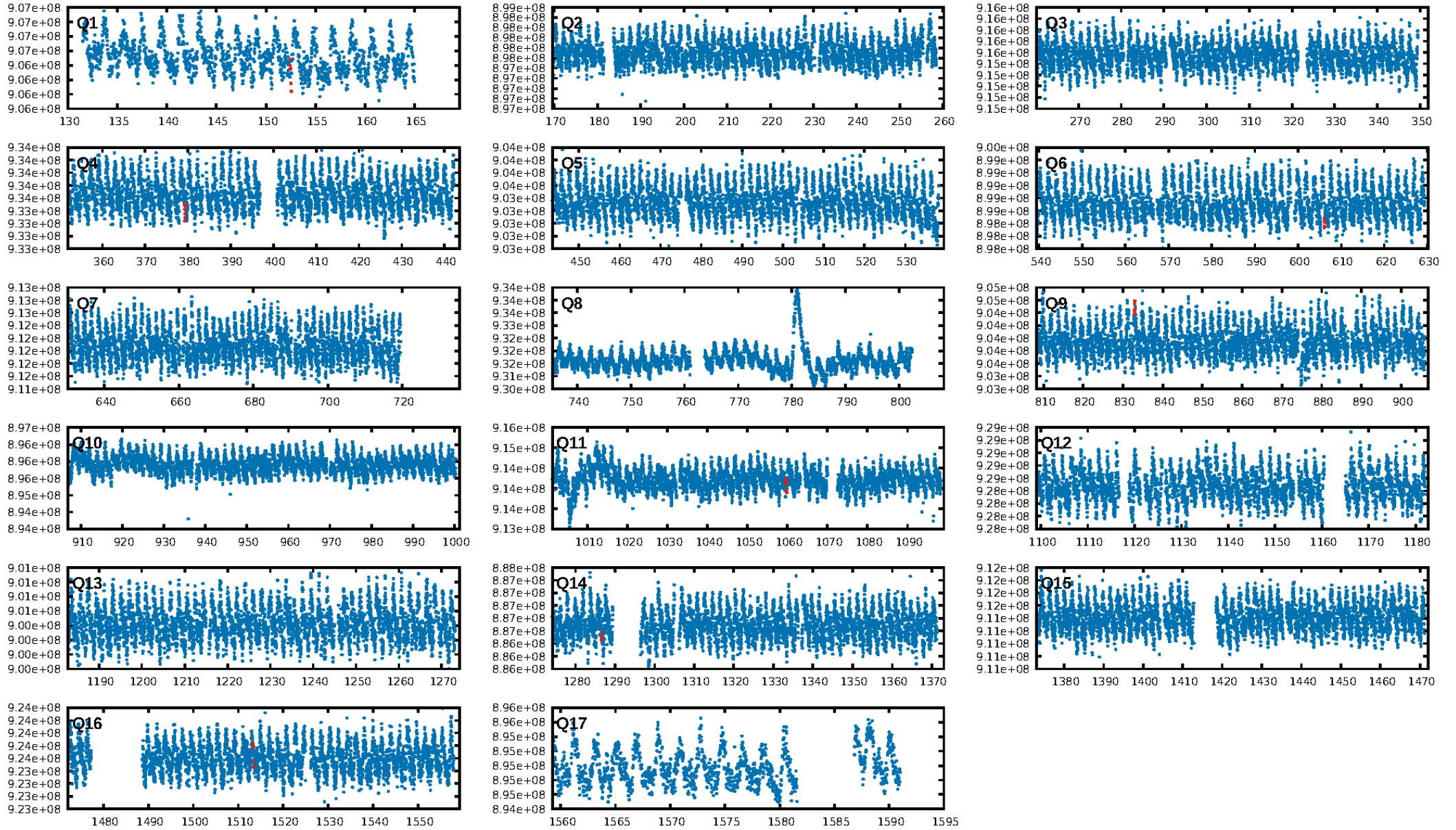
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [67.01 $\sigma$ ]  
LongPeriod-sig: 100.0% [380.35 $\sigma$ ]  
ModelChiSquare2-sig: 44.5%  
ModelChiSquareGof-sig: 81.7%  
Bootstrap-pfa: 1.34e-09  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 3.586  
Centroid-sig: 75.1%  
Centroid-so: 0.507 arcsec [0.48 $\sigma$ ]  
OotOffset-rm: 1.628 arcsec [9.55 $\sigma$ ]  
KicOffset-rm: 1.593 arcsec [7.75 $\sigma$ ]  
OotOffset-st: 2/1/2/2 [7]  
KicOffset-st: 2/1/2/2 [7]  
DiffImageQuality-fgm: 0.71 [5/7]  
DiffImageOverlap-fno: 0.57 [4/7]

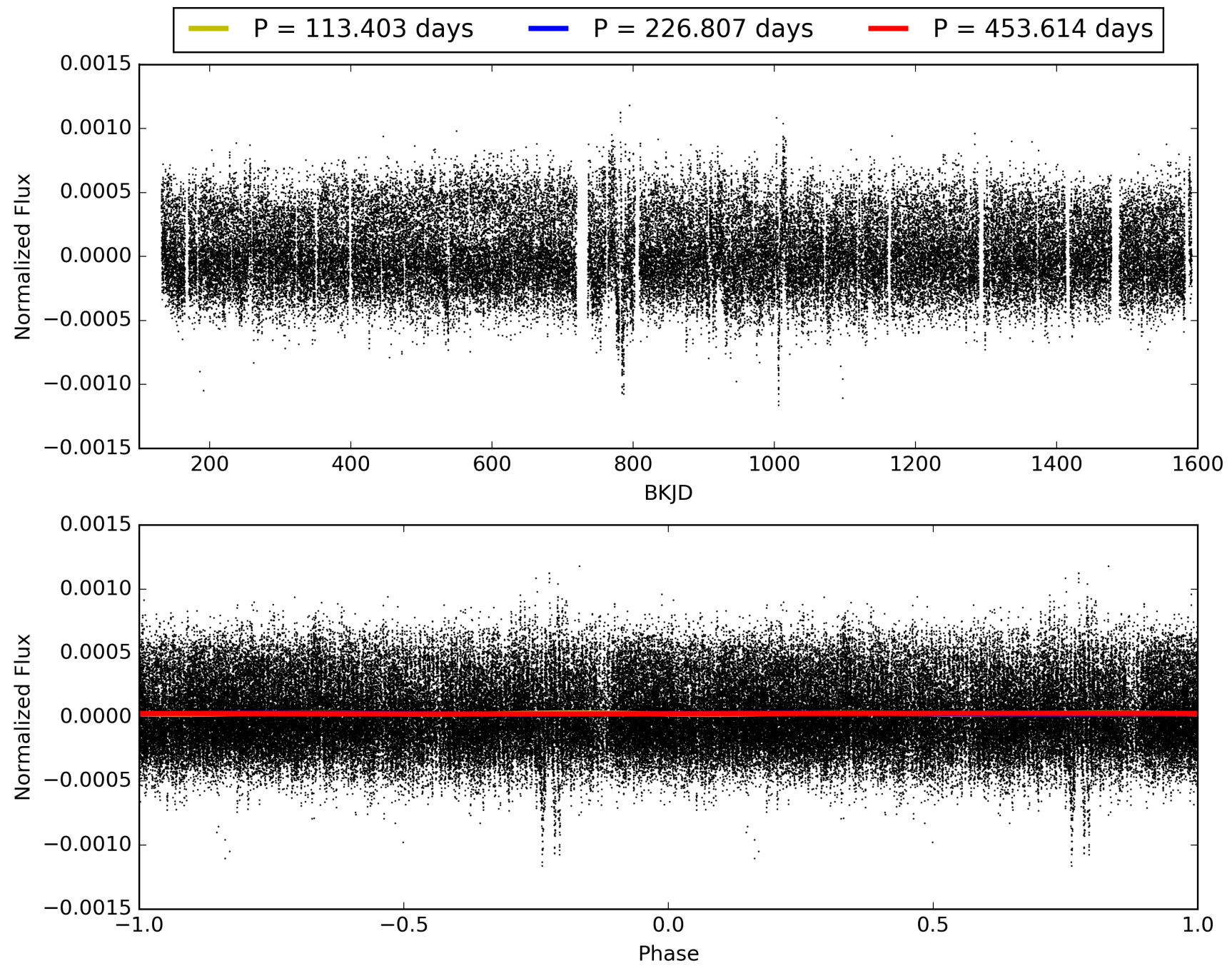
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:44:52 Z

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

# TCE 009279763-06, PDC Light Curves

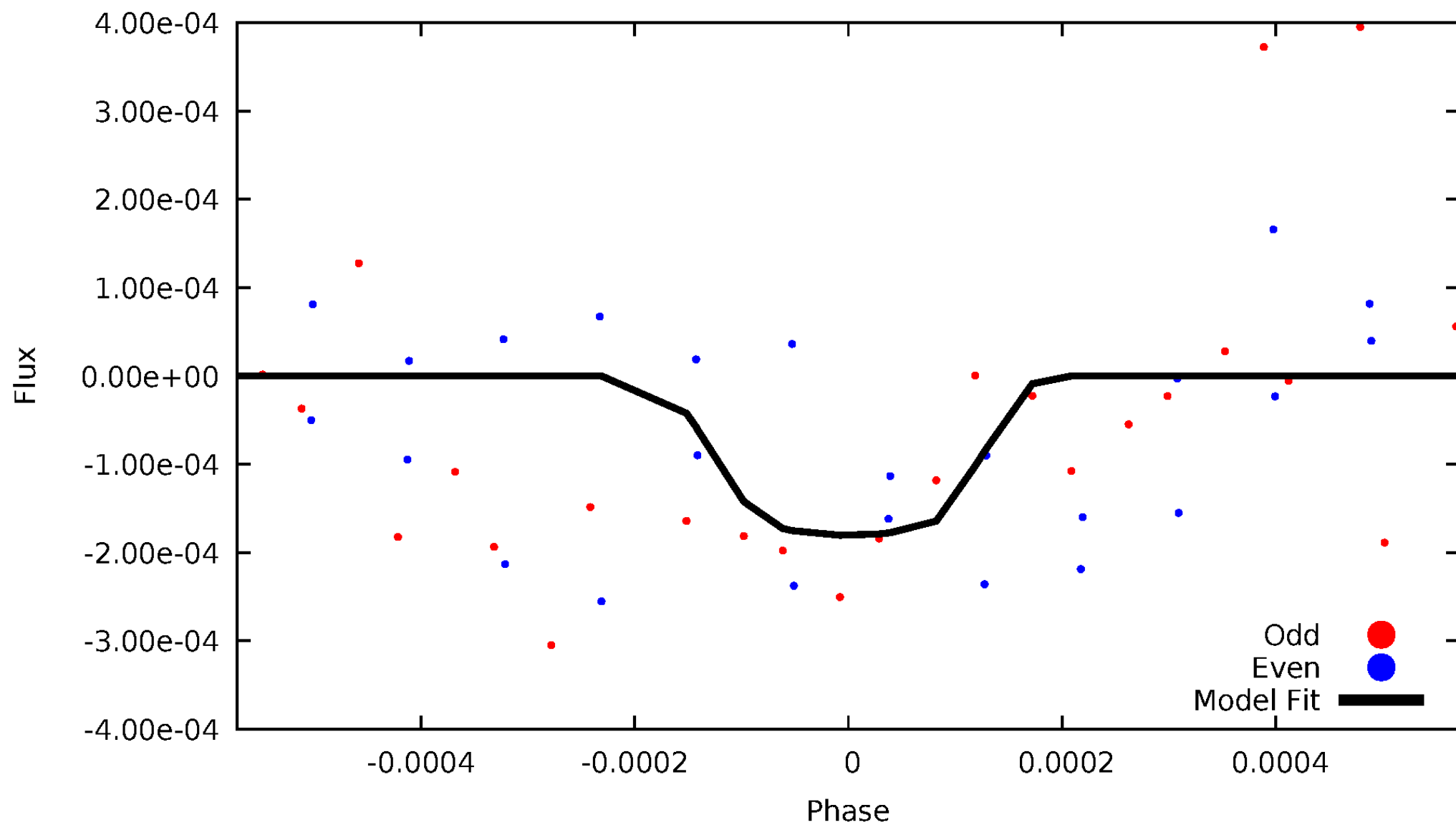


TCE 009279763-06



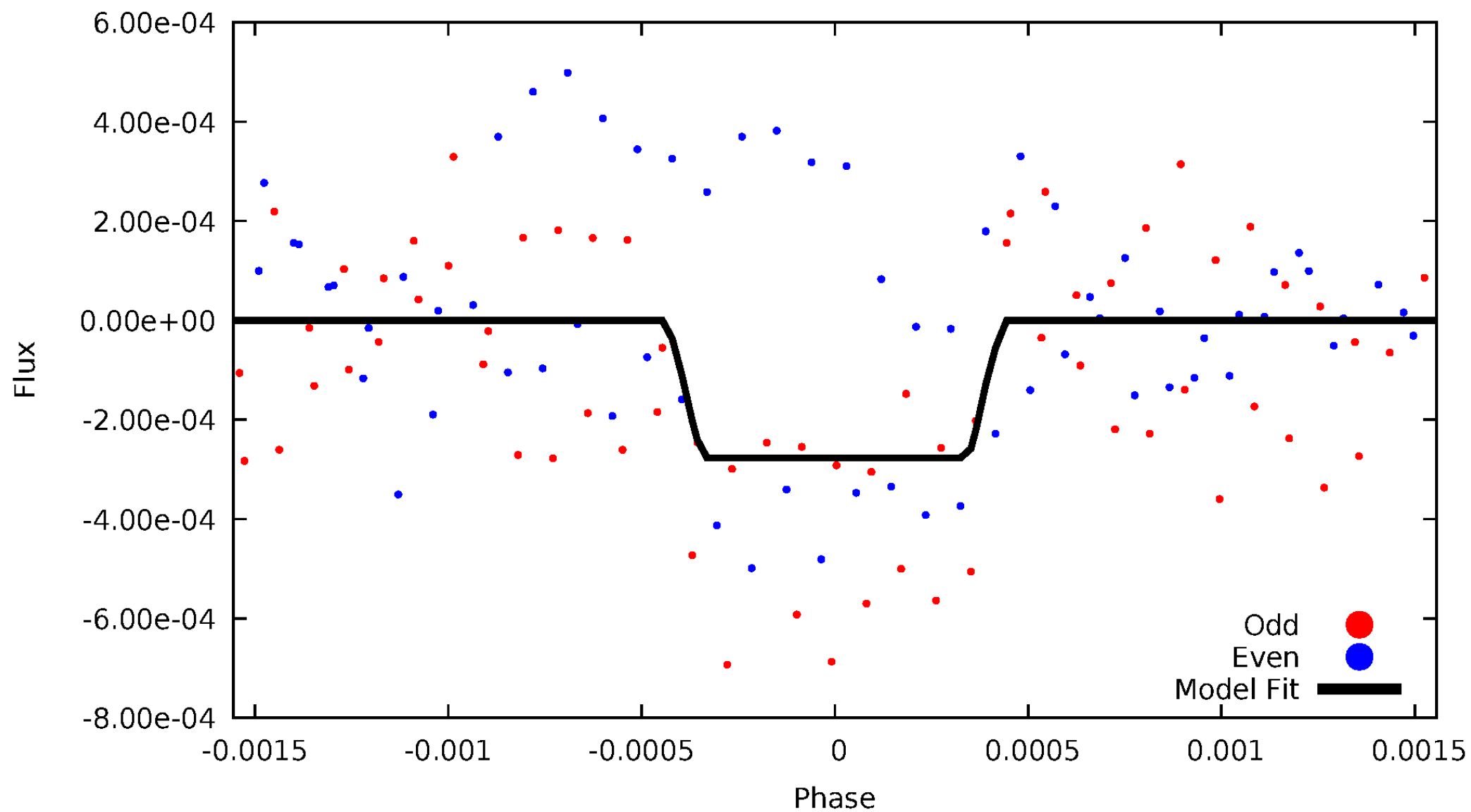
# DV Odd/Even

TCE 009279763-06



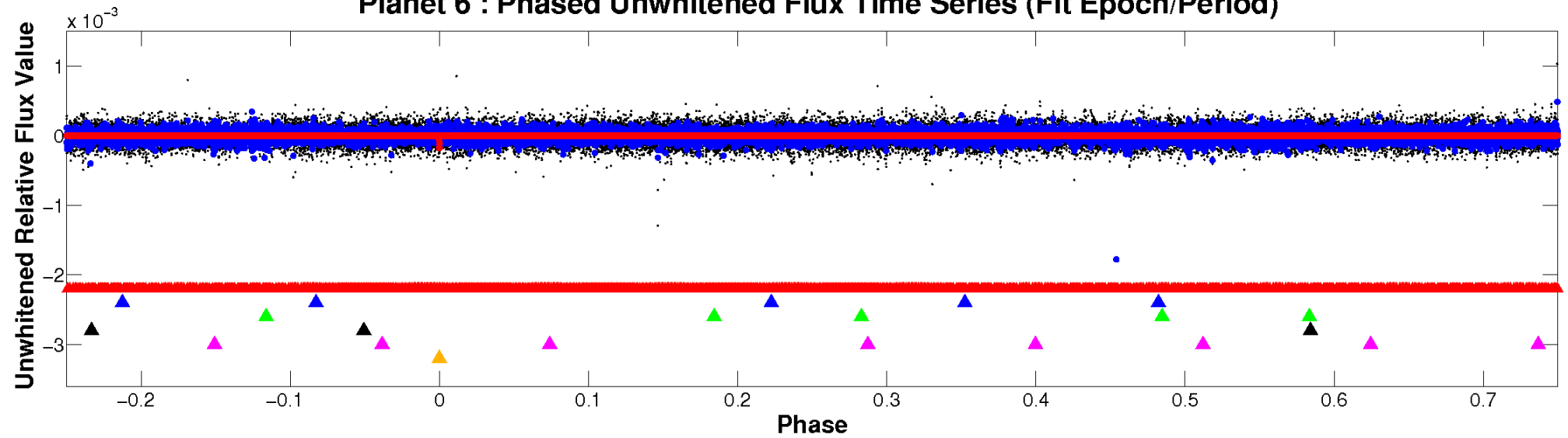
# ALT Odd/Even

TCE 009279763-06

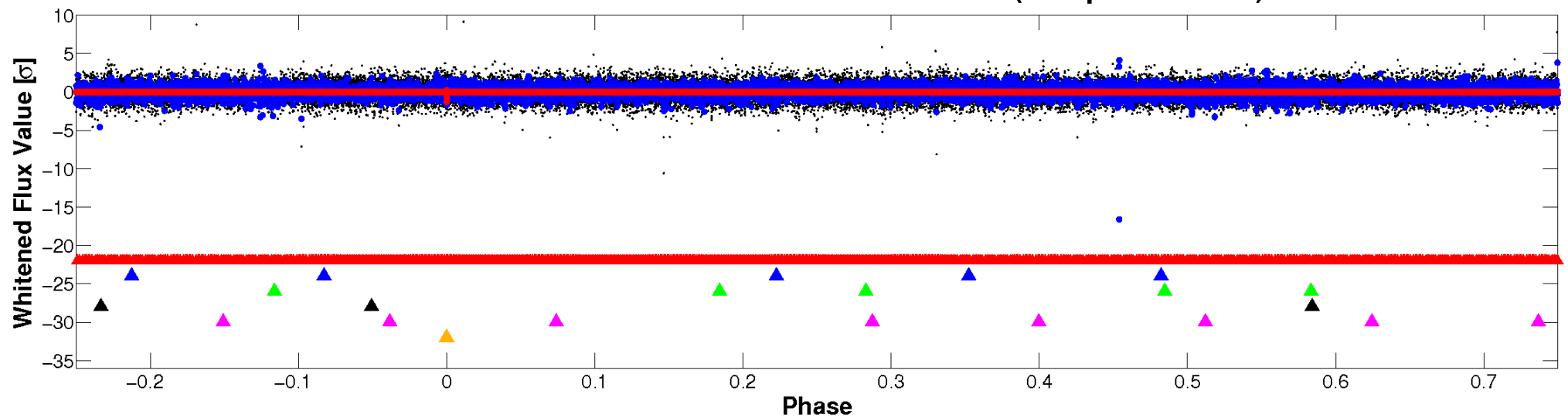


# Non-Whitened Vs. Whitened Light Curve

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

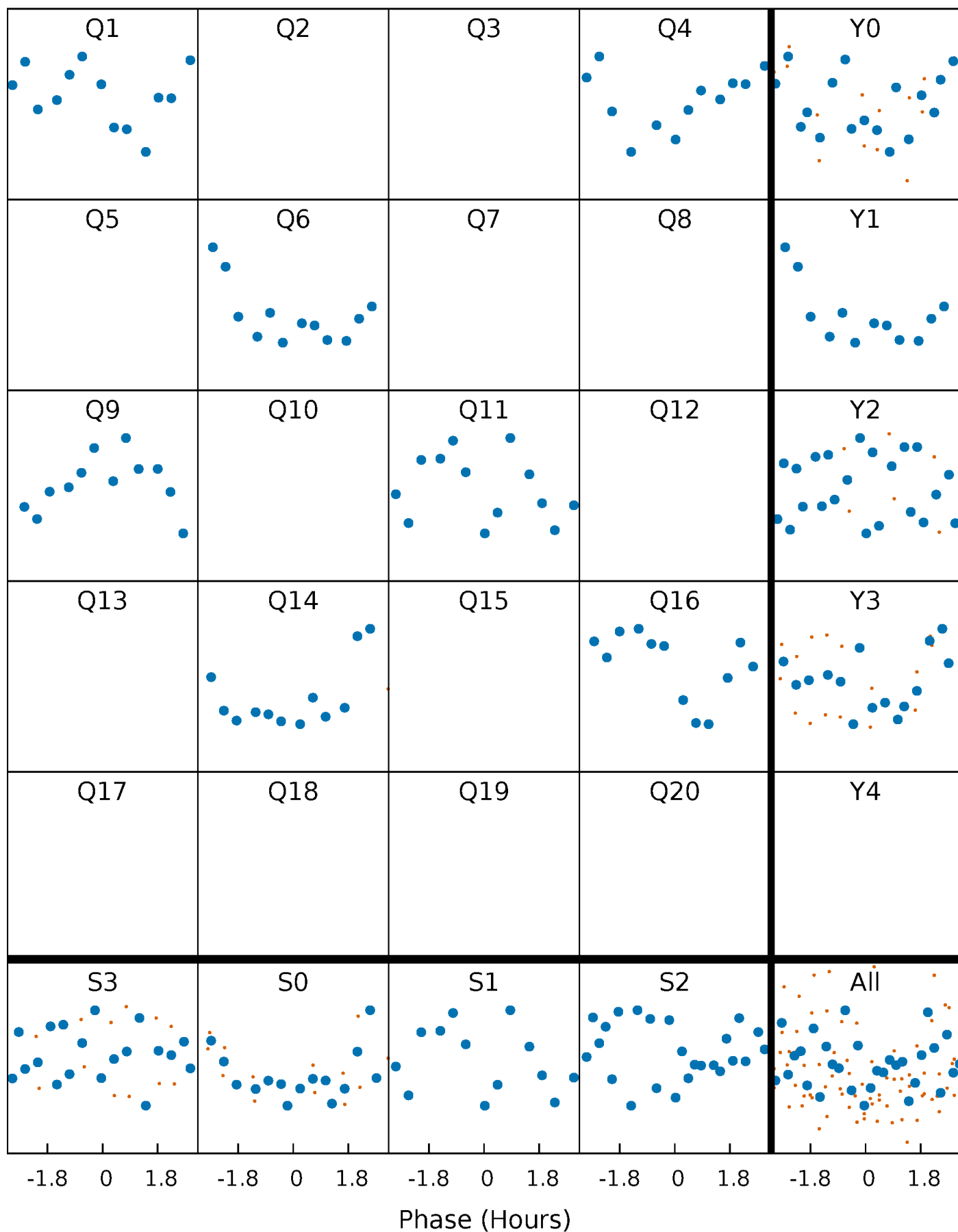


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

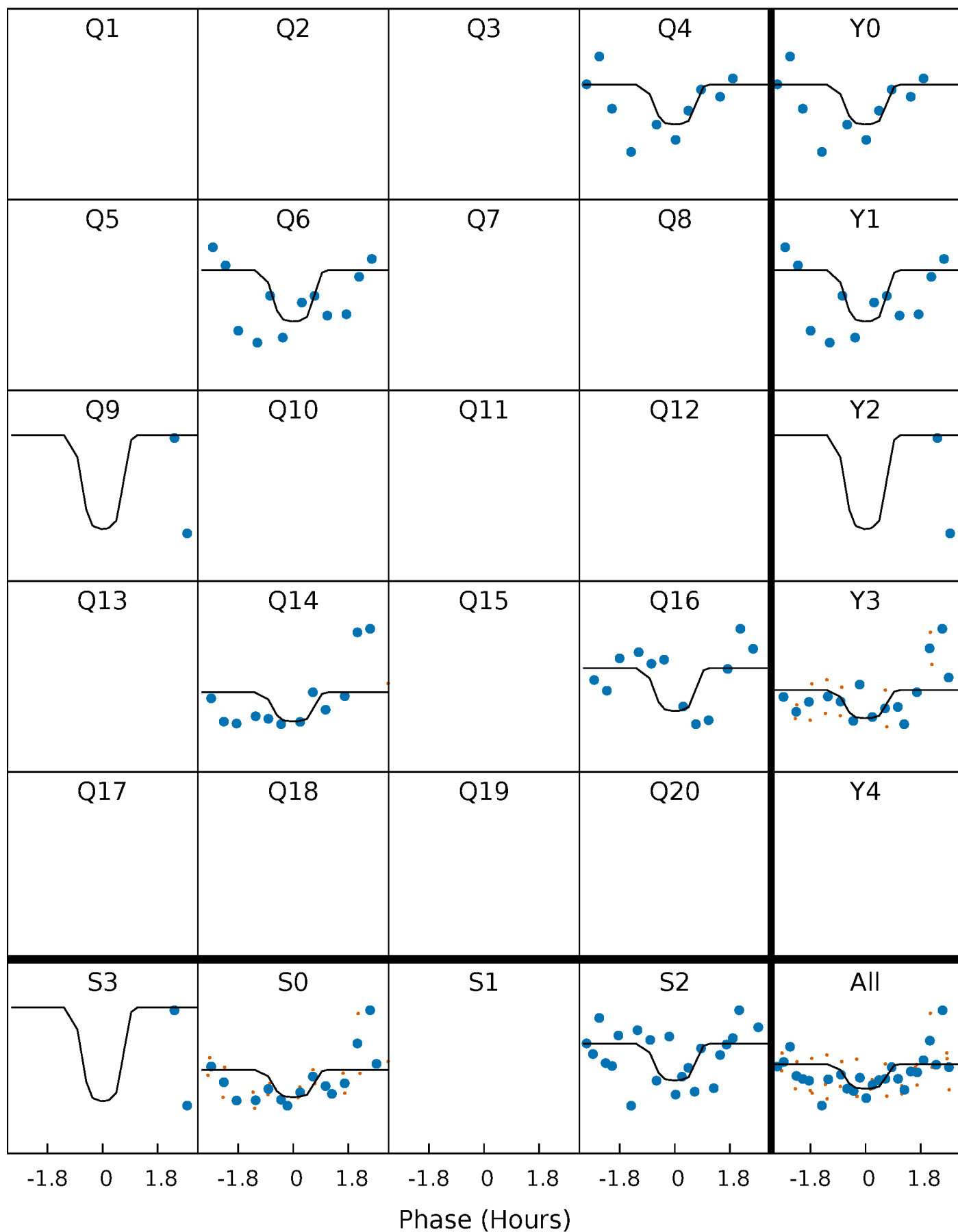
TCE 009279763-06 P=226.806773 Days  $T_0=152.502787$  (BKJD)





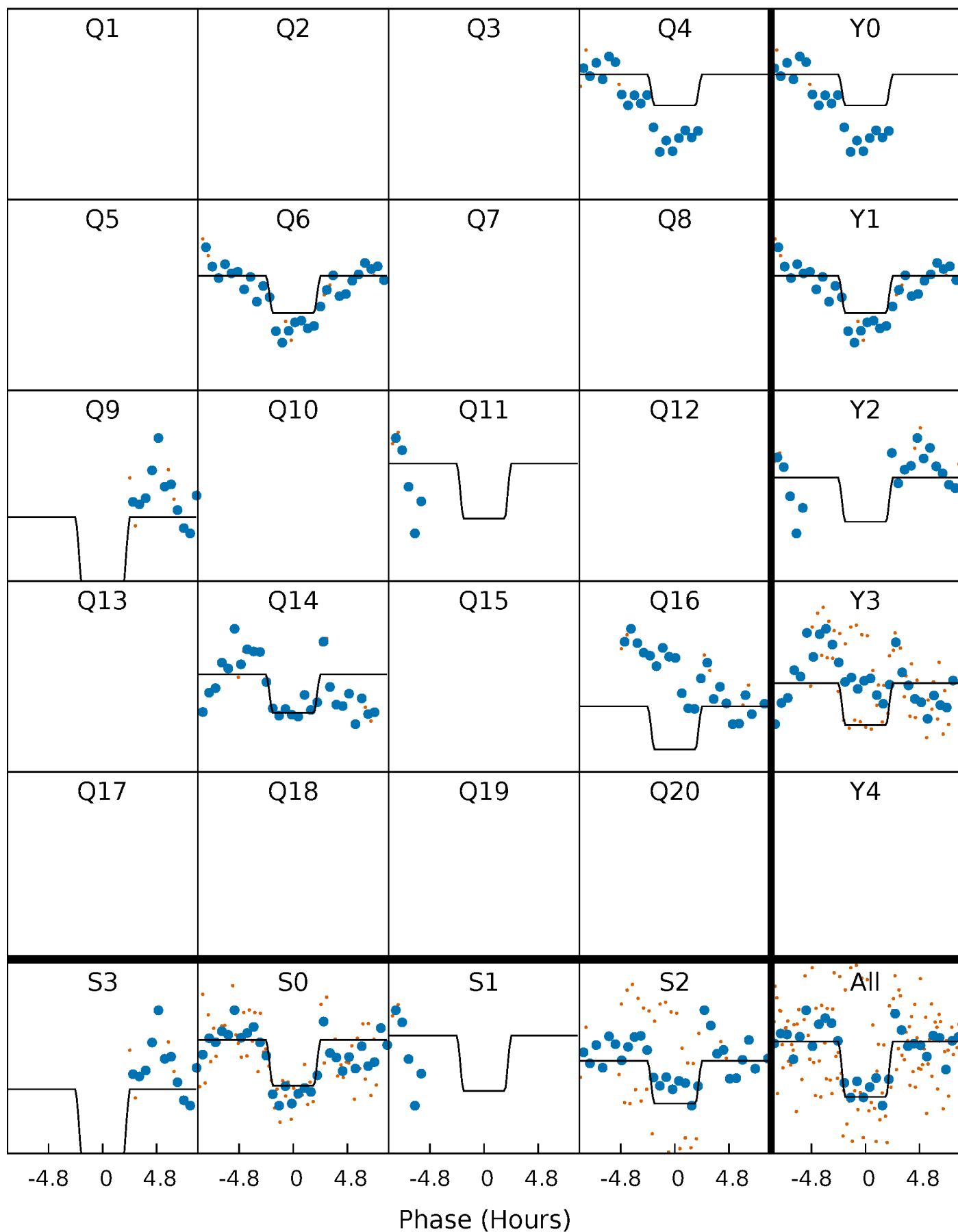
# DV Quarter-Phased Transit Curves

TCE 009279763-06 P=226.806773 Days  $T_0=152.502787$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

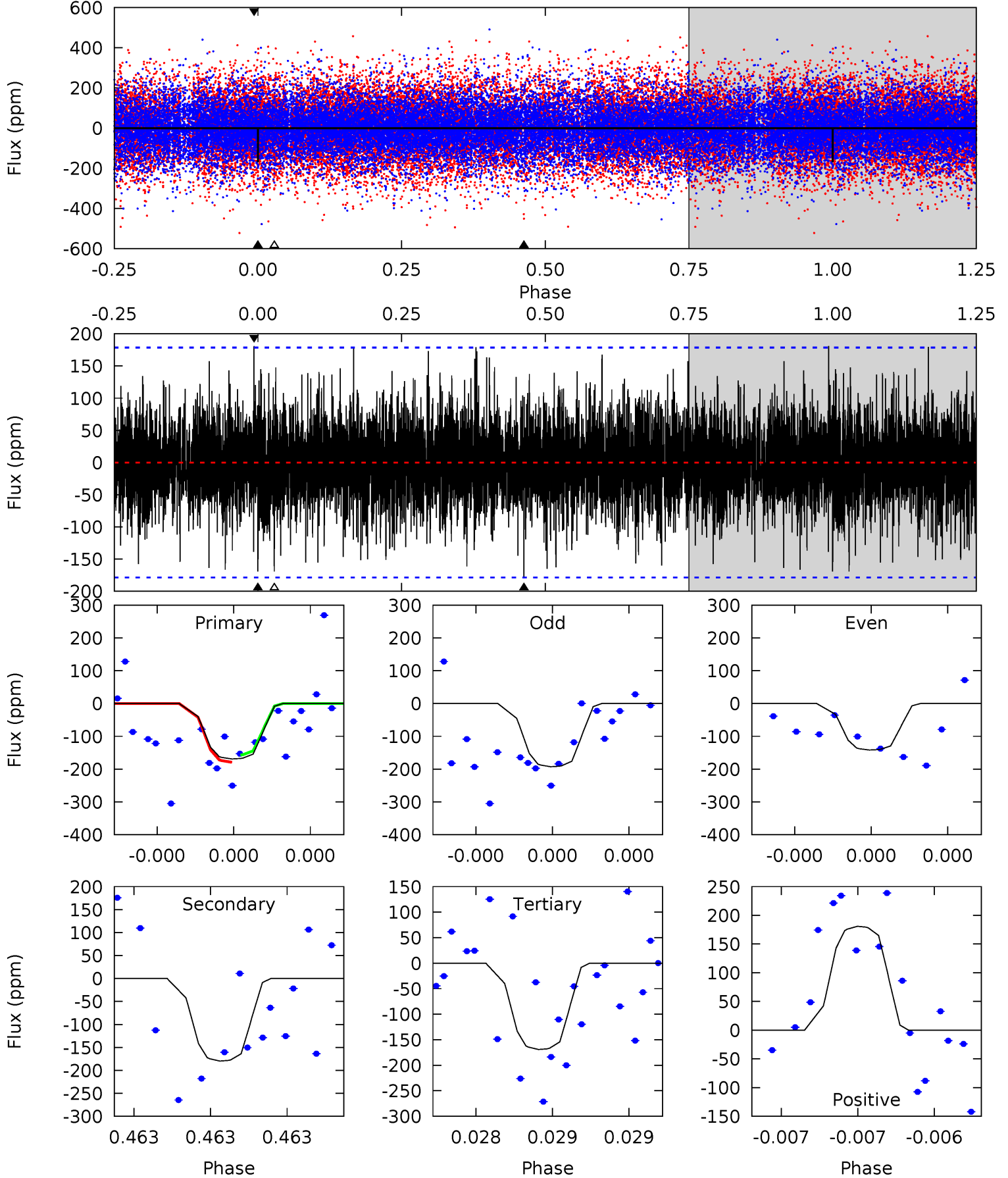
TCE 009279763-06 P=226.803004 Days  $T_0=152.506745$  (BKJD)



# DV Model-Shift Uniqueness Test

009279763-06, P = 226.806773 Days, E = 152.502787 Days

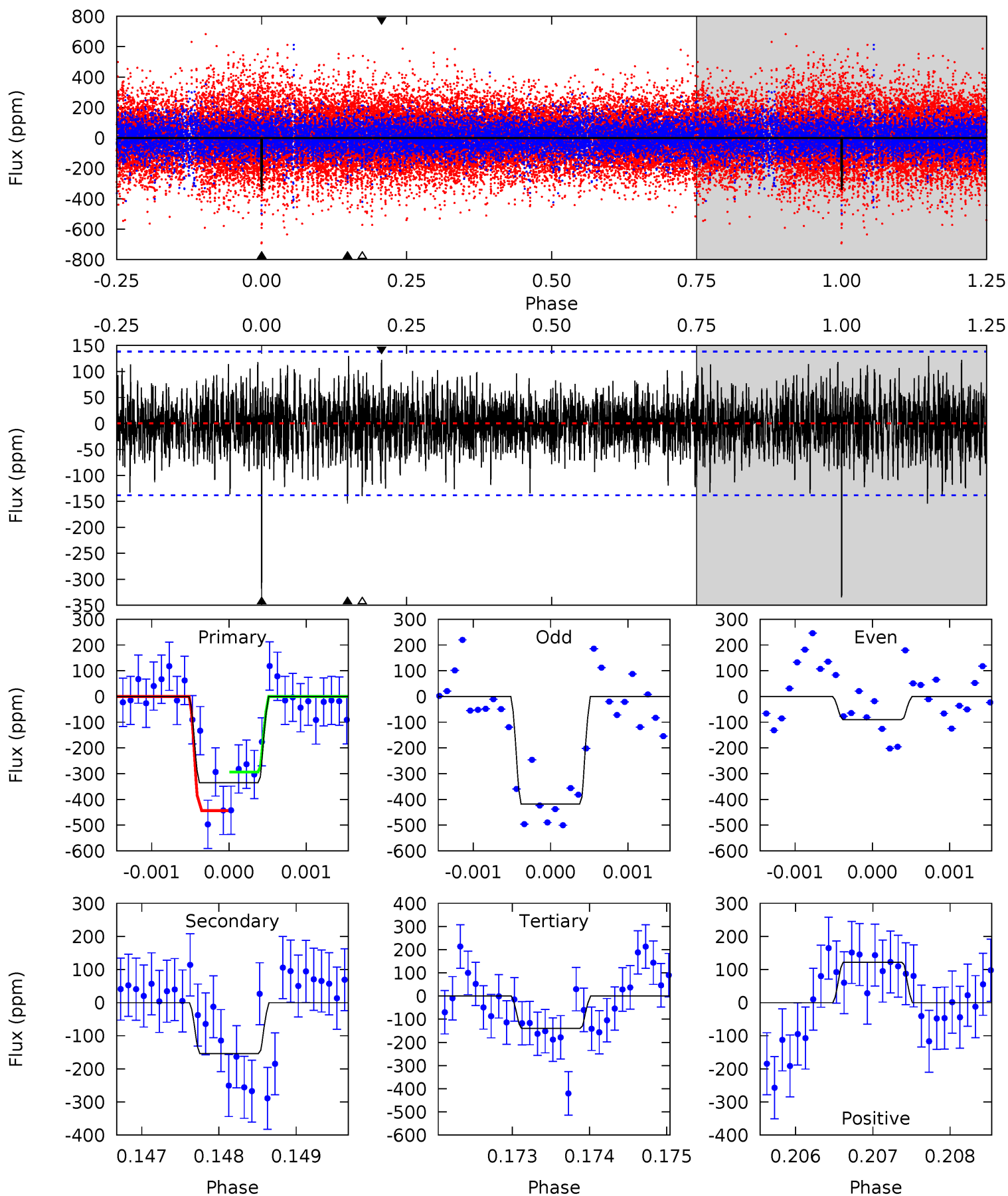
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 5.35 | 5.69 | 5.35 | 5.72 | 5.65            | 3.60            | 1.49             | -0.00   | -0.37   | 0.33    | -0.04   | 0.80    | 0.92 | 0.50  | 0.35 |



# Alt Model-Shift Uniqueness Test

009279763-06, P = 226.803004 Days, E = 152.506745 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 | 6.10 | 5.52 | 4.84 | 5.48            | 3.33            | 1.49             | 7.74    | 8.42    | 0.58    | 1.26    | 6.89    | 0.78 | 0.28  | 2.90 |



### Stellar Parameters For KIC 009279763

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M(M_{\odot})$            | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6889^{+173}_{-190}$ | $3.556^{+0.323}_{-0.086}$ | $-0.420^{+0.350}_{-0.250}$ | $3.571^{+0.428}_{-1.371}$ | $1.671^{+0.195}_{-0.363}$ | $0.052^{+0.125}_{-0.014}$                     |
|        | +3%/-3%              | +9%/-2%                   | +83%/-60%                  | +12%/-38%                 | +12%/-22%                 | +242%/-26%                                    |
| 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 009279763-06 / KOI

| Detrend | Depth (ppm)   | $R_p$ ( $R_{\oplus}$ ) | $T_{max}$ (K)     | $T_{obs}$ (K)          | $A_{obs}$            |
|---------|---------------|------------------------|-------------------|------------------------|----------------------|
| DV      | $-180 \pm 32$ | $9.12^{+9.68}_{-6.49}$ | $851^{+45}_{-80}$ | $5022^{+4405}_{-1139}$ | $848^{+9050}_{-646}$ |
| Alt.    | $-154 \pm 25$ | $8.98^{+9.60}_{-5.82}$ | $849^{+42}_{-86}$ | $4894^{+3186}_{-1073}$ | $751^{+5507}_{-565}$ |

$T_{max}$  = 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

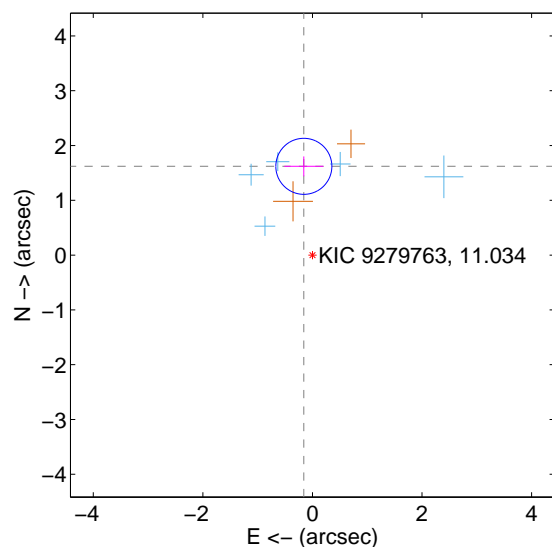
Supplemental centroid analysis for 009279763-06. **Kepler magnitude: 11.03.** Transit SNR 3.93

There are 5 quarters with good PRF difference image offsets

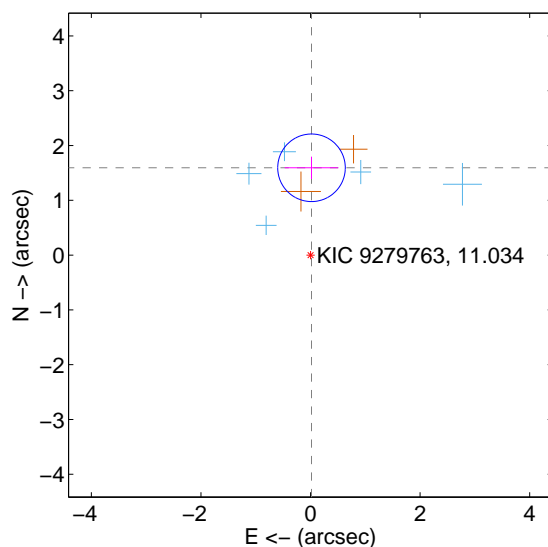
The direct PRF centroid is offset from the target star catalog position by about 0.40 arcsec

|   | Distance in arcsec                  | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec      |
|---|-------------------------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT          | <b><math>1.628 \pm 0.170</math></b> | <b>9.55</b>         | $0.157 \pm 0.357$  | $1.620 \pm 0.180$ |
| PRF-fit source offset from KIC position | <b><math>1.593 \pm 0.205</math></b> | <b>7.75</b>         | $-0.018 \pm 0.490$ | $1.593 \pm 0.204$ |
| photometric centroid source offset      | $0.51 \pm 1.06$                     | 0.48                | $0.51 \pm 1.06$    | $-0.03 \pm 0.94$  |

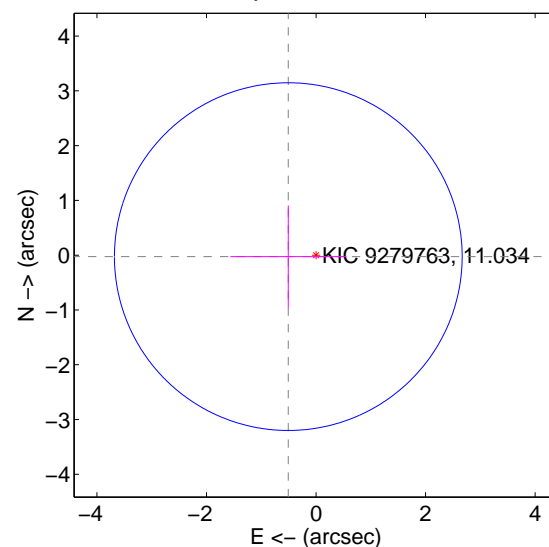
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

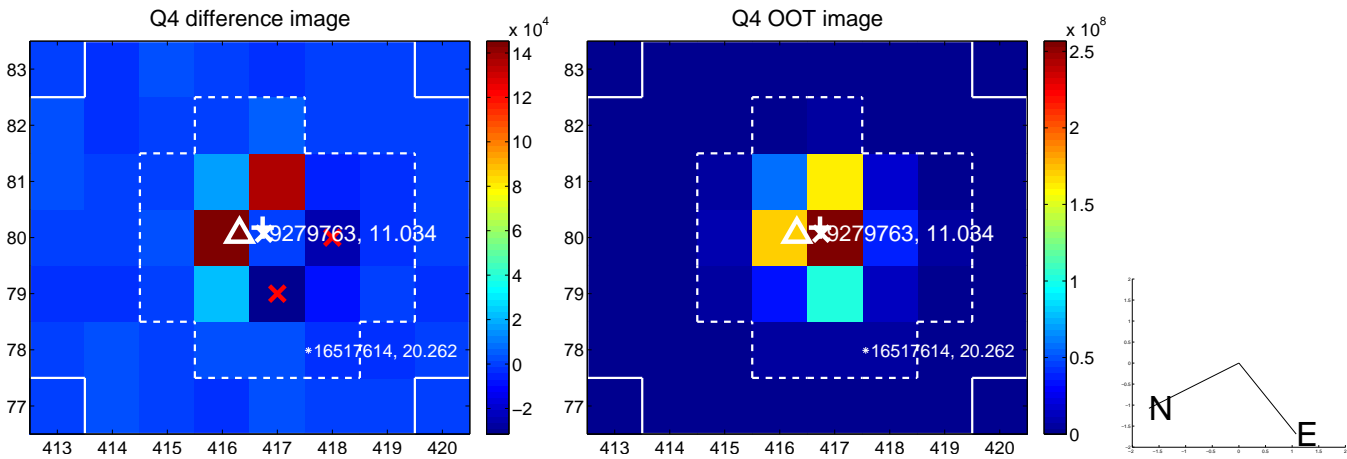
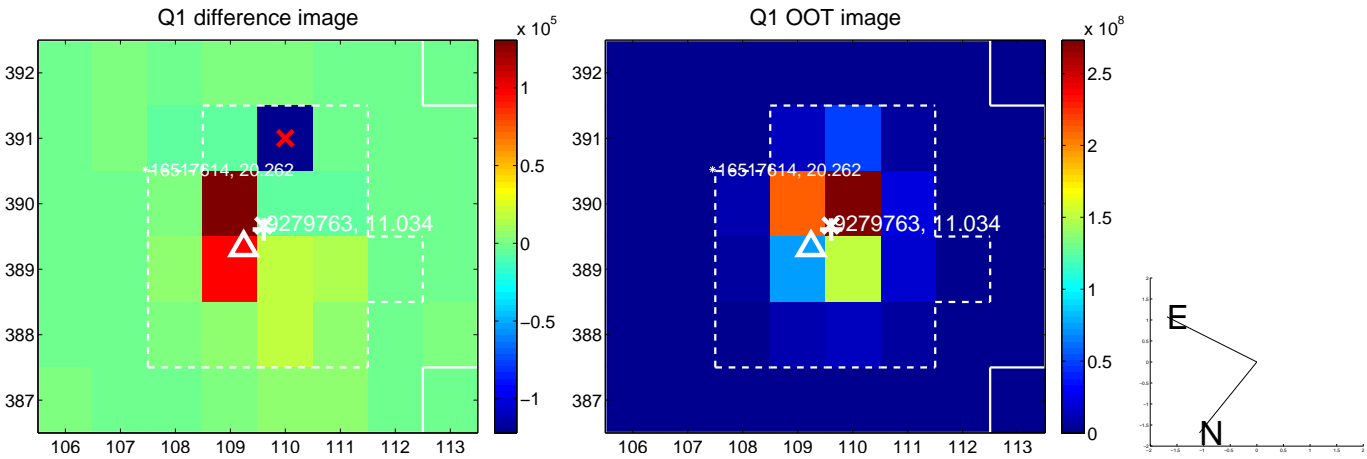


offset from photometric centroids



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

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



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

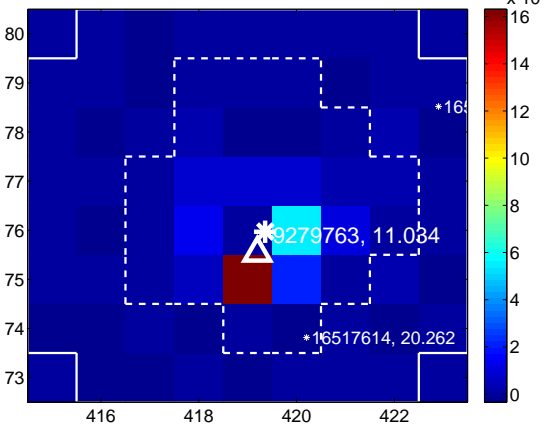
Q5 no difference image



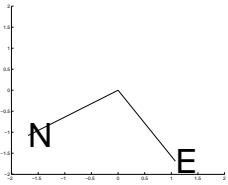
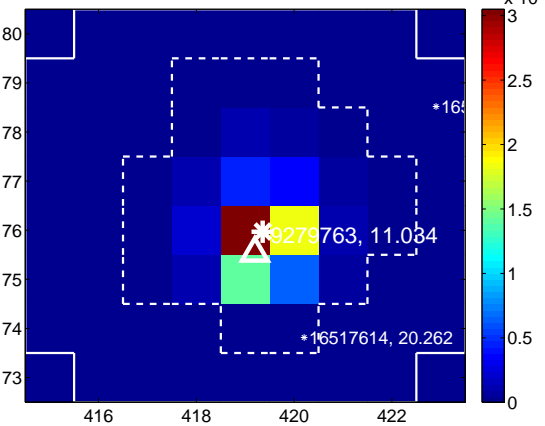
Q5 no OOT image



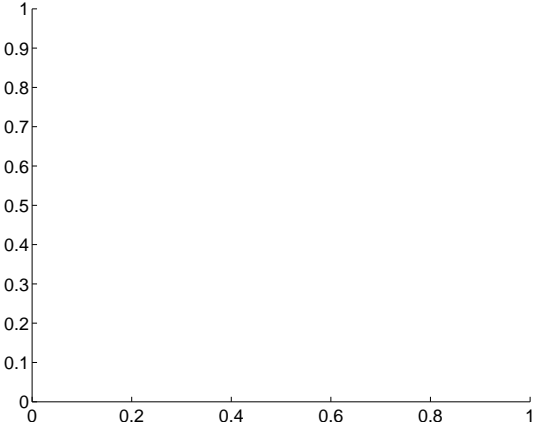
Q6 difference image



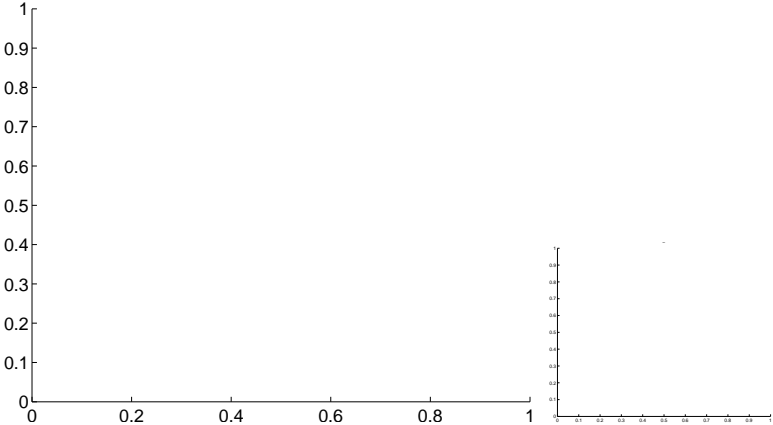
Q6 OOT image



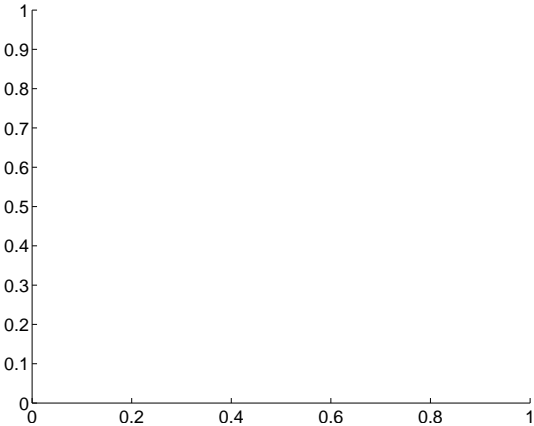
Q7 no difference image



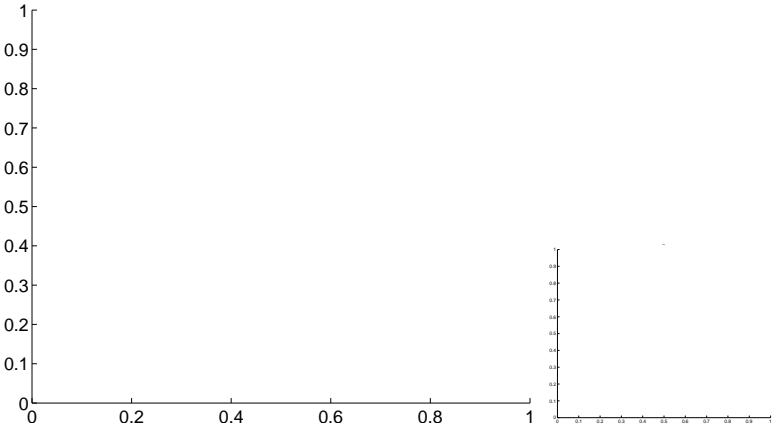
Q7 no OOT image



Q8 no difference image

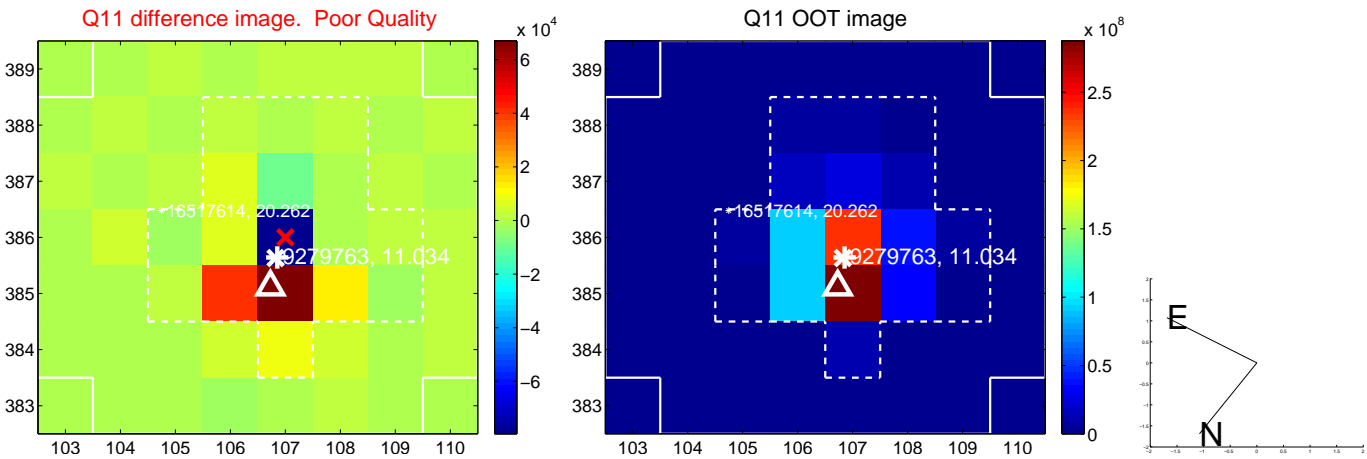
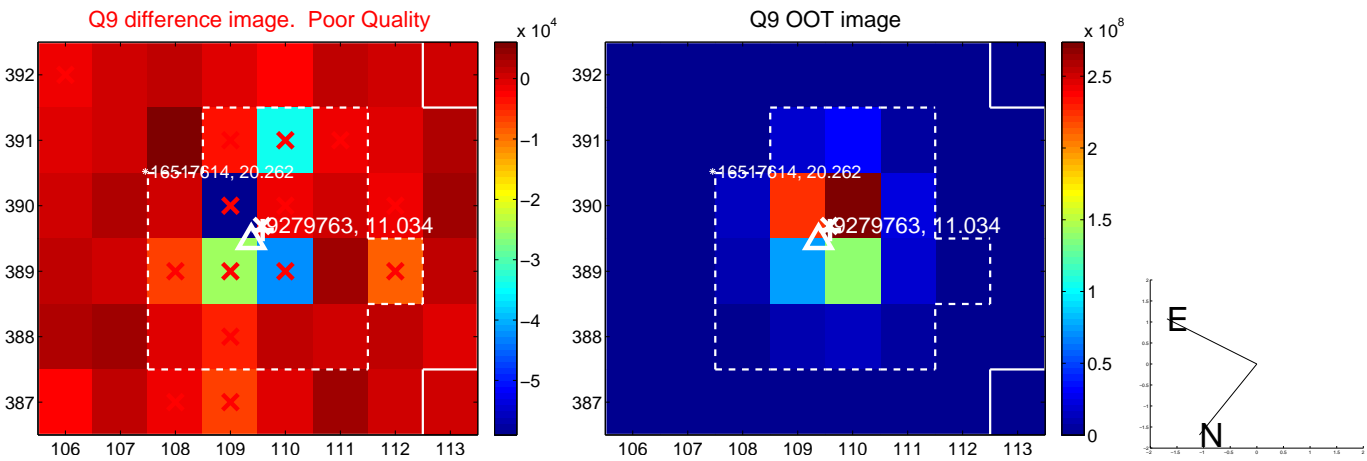


Q8 no OOT image





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.

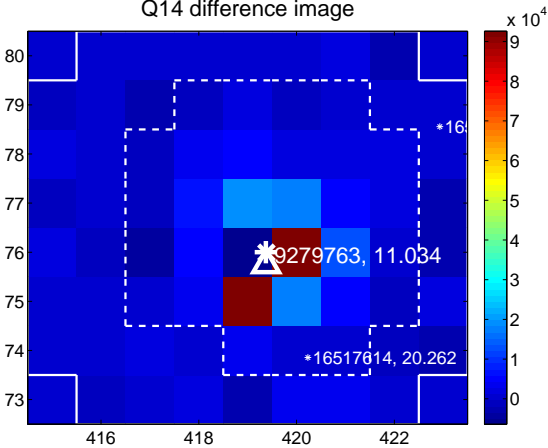
Q13 no difference image



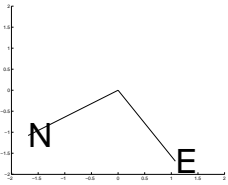
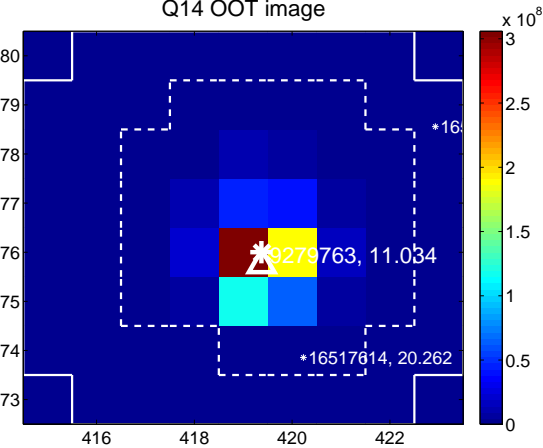
Q13 no OOT image



Q14 difference image



Q14 OOT image



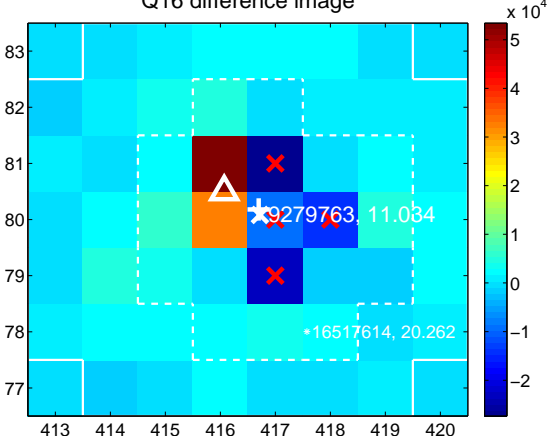
Q15 no difference image



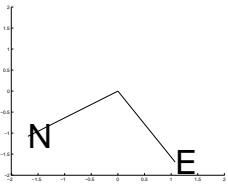
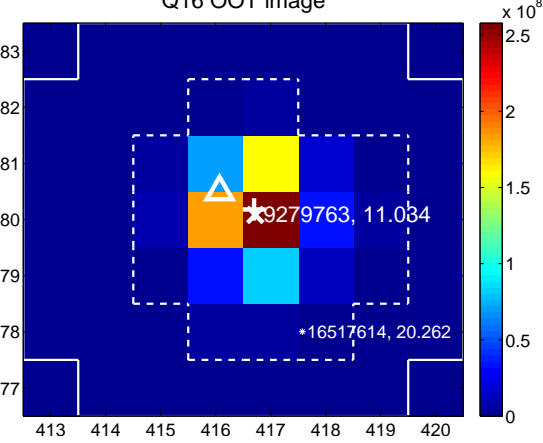
Q15 no OOT image



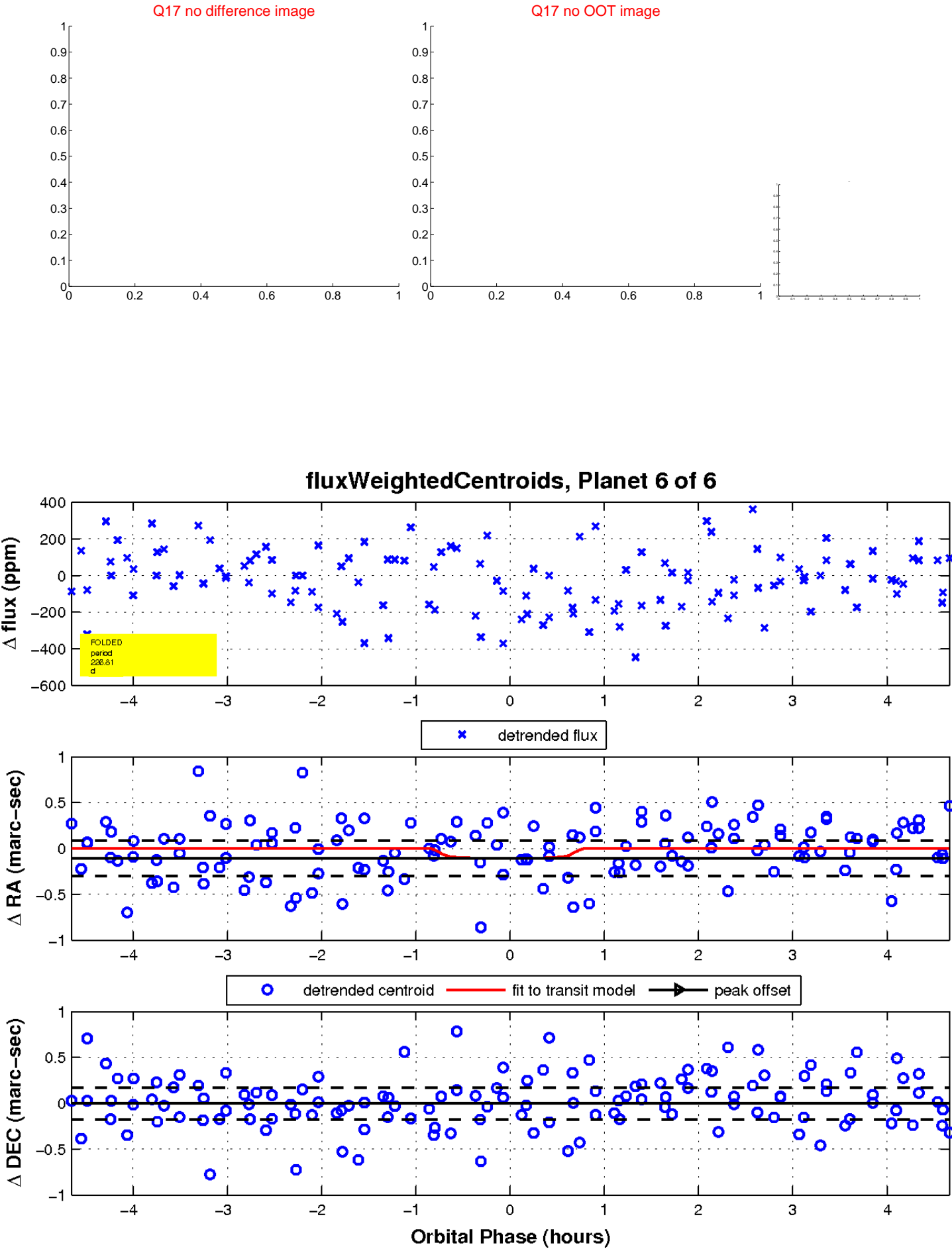
Q16 difference image



Q16 OOT image



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



UKIRT Image

Declination

