

KIC 006635021

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 006635021-01 | OBS | No | 0.694779 | 132.027032 | 14.5 | 4.436 | 9.3 | 3.4 | 1.28 | 6303 | 0.50 | 9367.89 |
| 006635021-02 | OBS | No | 63.630285 | 148.325752 | 585.1 | 1.808 | 8.5 | 9.2 | 1.28 | 6303 | 3.10 | 22.69 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 006635021-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—MOD_NONUNIQ_ALT |
| 006635021-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST |

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

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

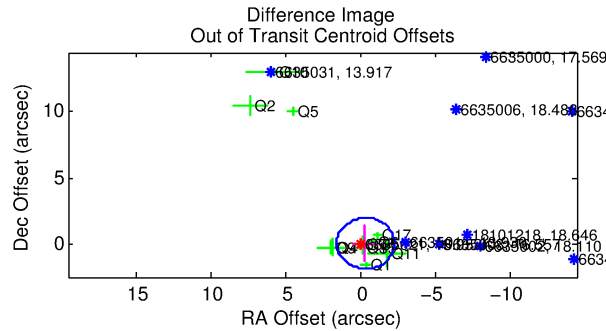
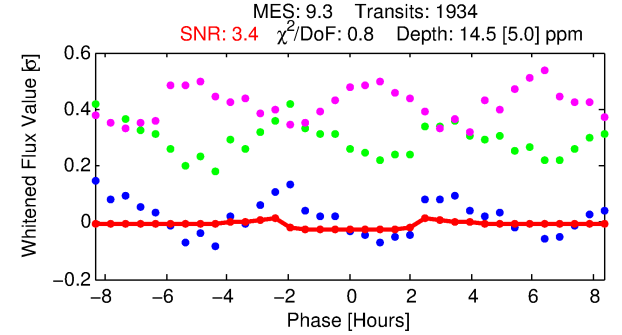
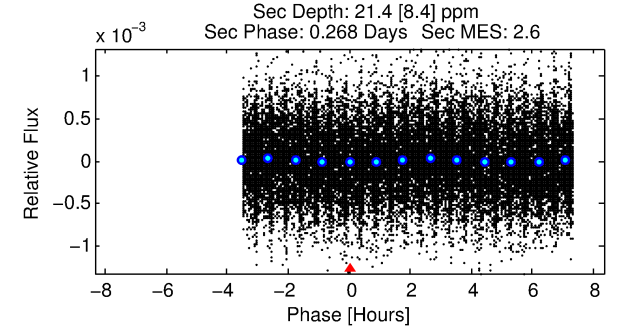
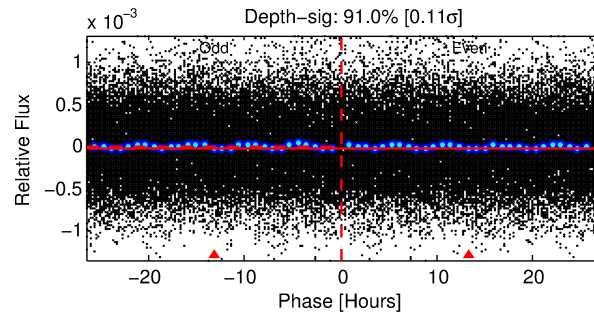
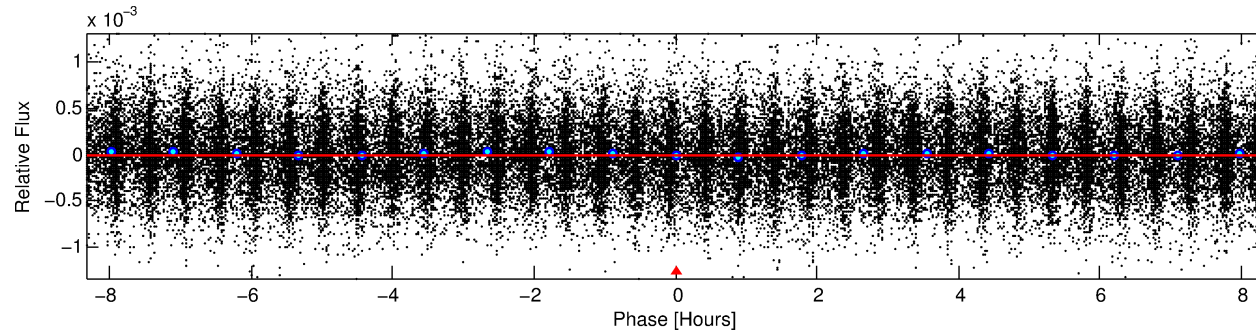
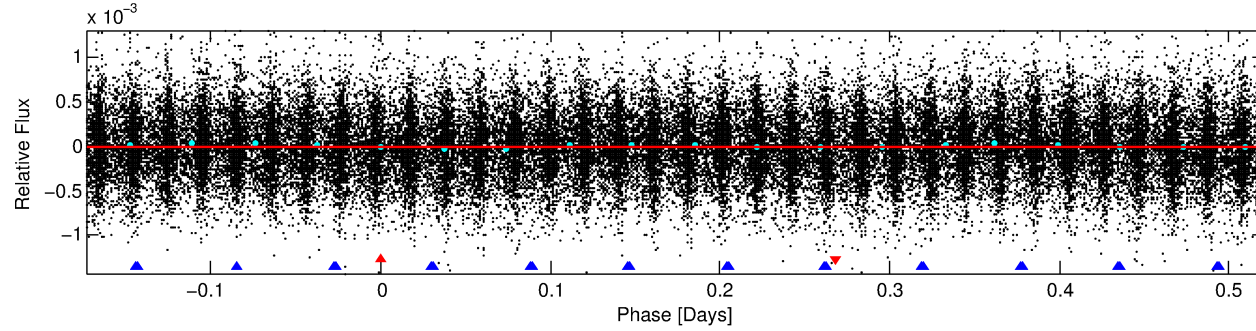
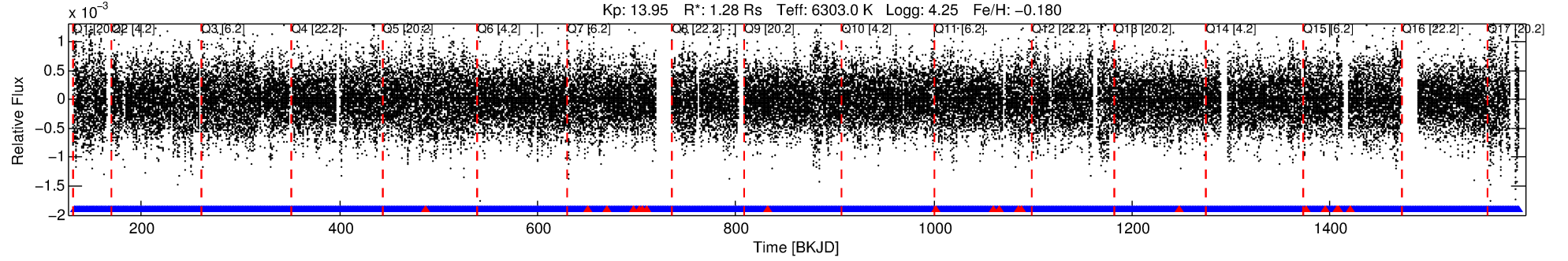
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006635021-01

No Significant Match Found

DV One-Page Summary

KIC: 6635021 Candidate: 1 of 2 Period: 0.695 d



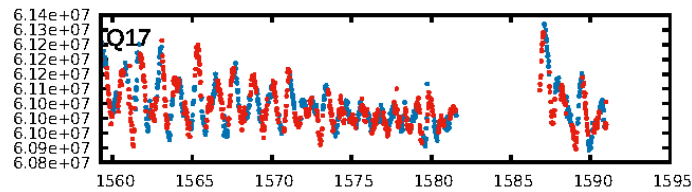
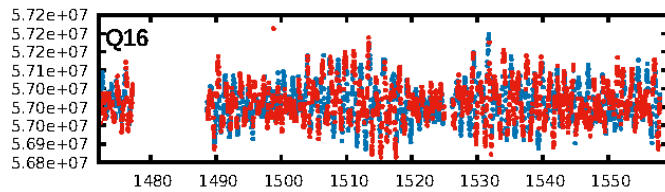
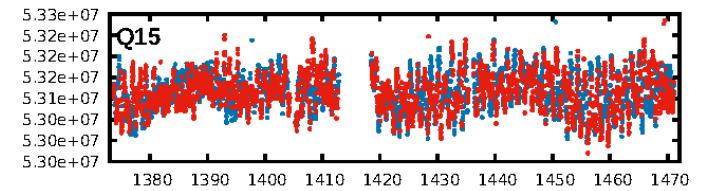
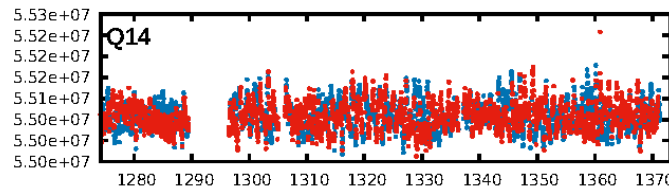
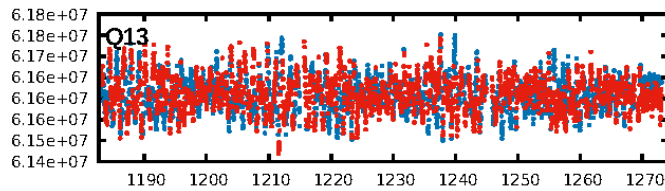
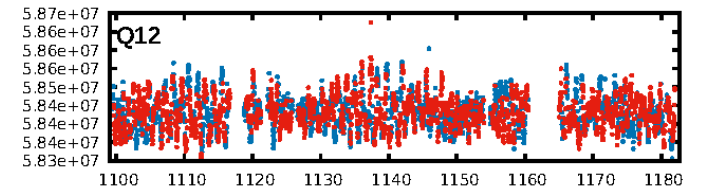
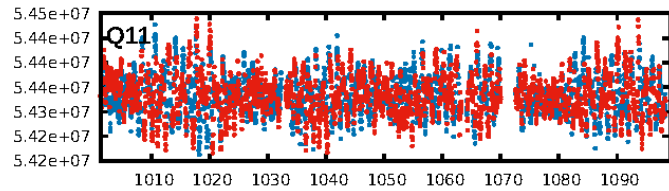
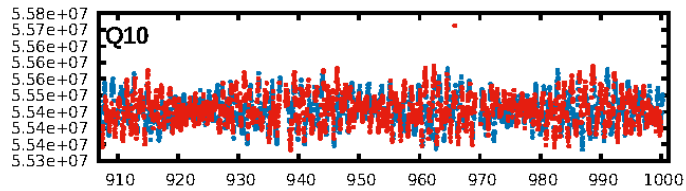
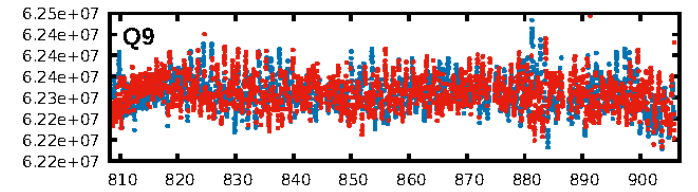
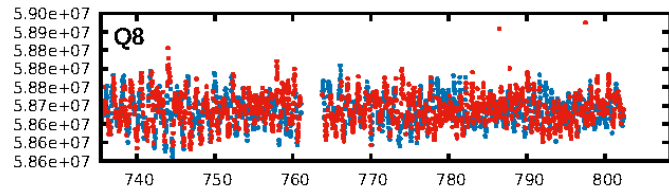
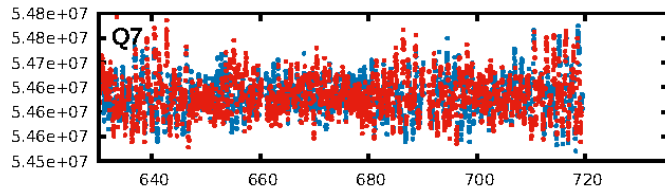
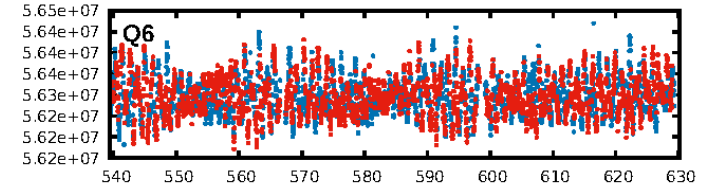
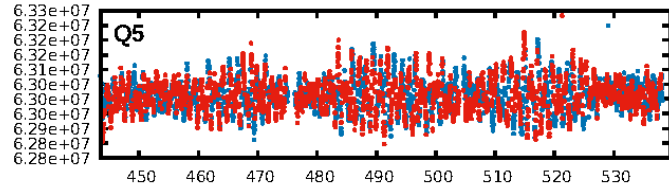
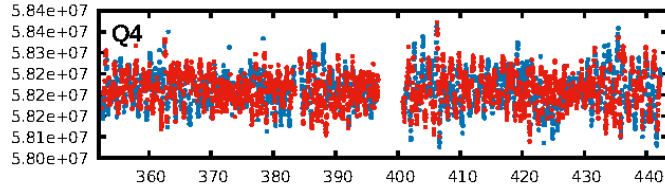
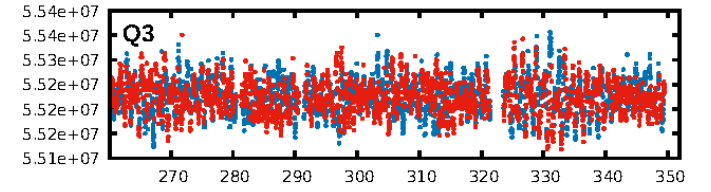
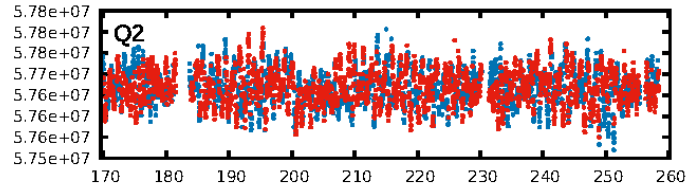
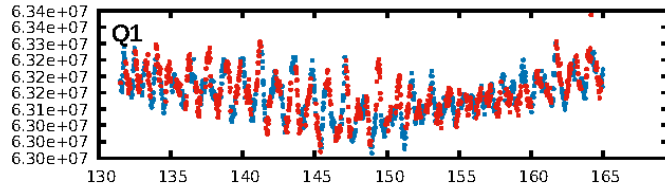
DV Fit Results:

Period = 0.69478 [0.00003] d
Epoch = 132.0270 [0.0078] BKJD
Rp/R* = 0.0036 [0.0039]
a/R* = 1.30 [2.97]
b = 0.43 [10.87]
Seff = 9367.89 [3594.32]
Teff = 2509 [241] K
Rp = 0.50 [0.57] Re
a = 0.0157 [0.0039] AU
Ag = 11.74 [26.53] [0.40 σ]
Teffp = 7179 [4014] K [1.16 σ]

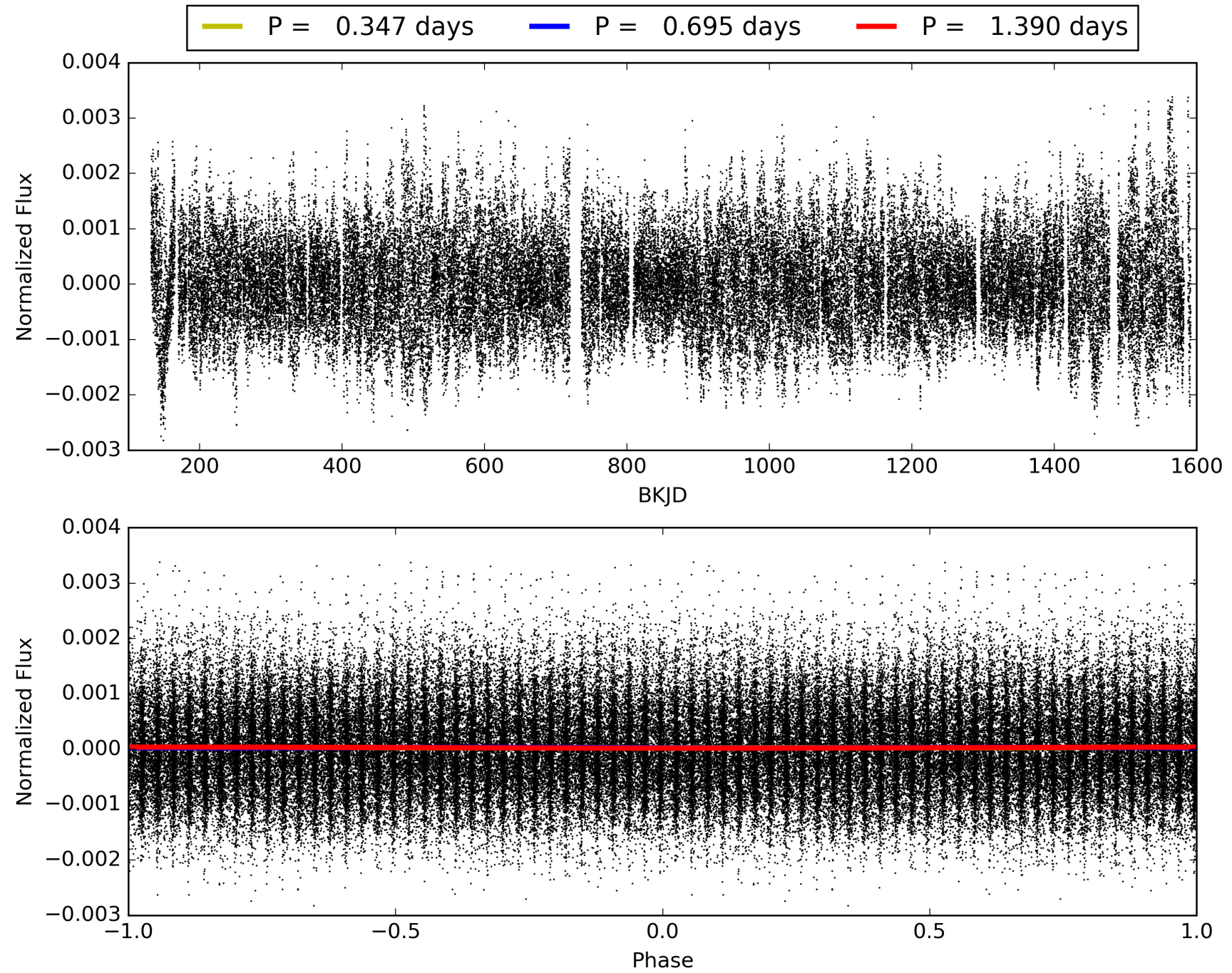
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [315.30 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.15e-12
RollingBand-fgt: 0.99 [1827/1847]
GhostDiagnostic-chr: 2.152
Centroid-sig: 1.4%
Centroid-so: 4.155 arcsec [2.03 σ]
OotOffset-rm: 0.372 arcsec [0.58 σ]
KicOffset-rm: 0.298 arcsec [0.64 σ]
OotOffset-st: 3/4/1/4 [12]
KicOffset-st: 3/4/1/4 [12]
DiffImageQuality-fgm: 0.42 [5/12]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 006635021-01, PDC Light Curves

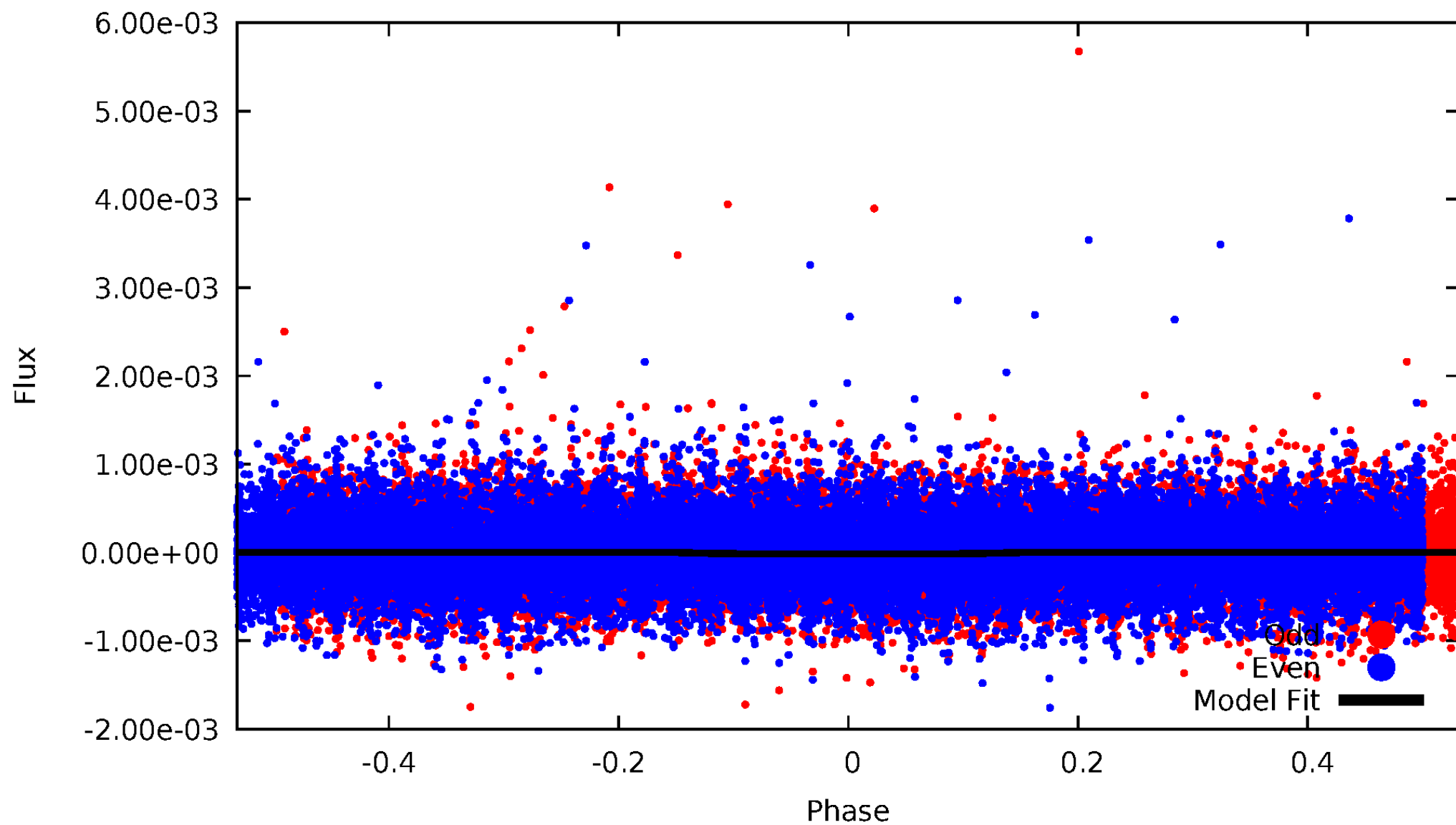


TCE 006635021-01



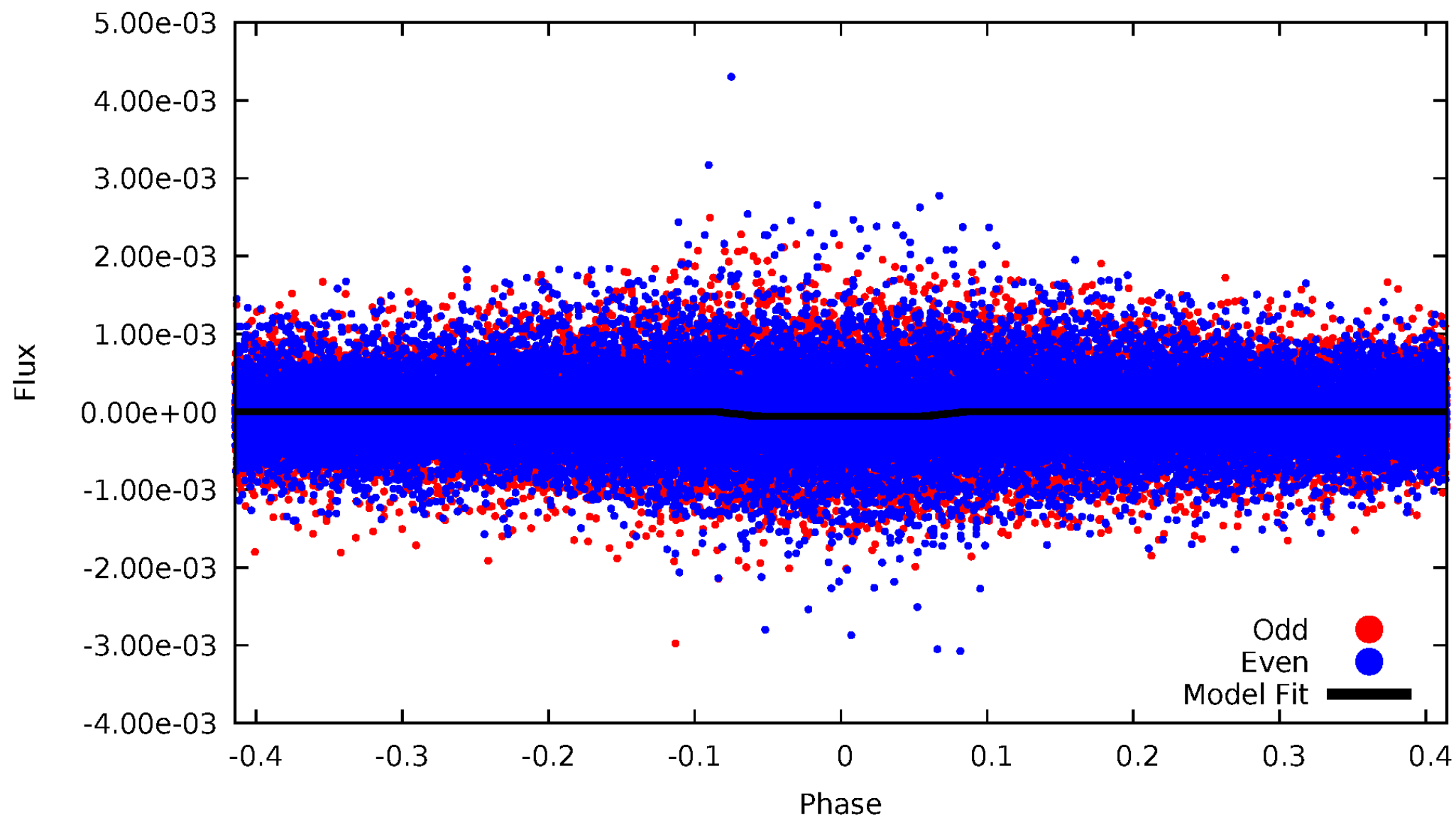
DV Odd/Even

TCE 006635021-01



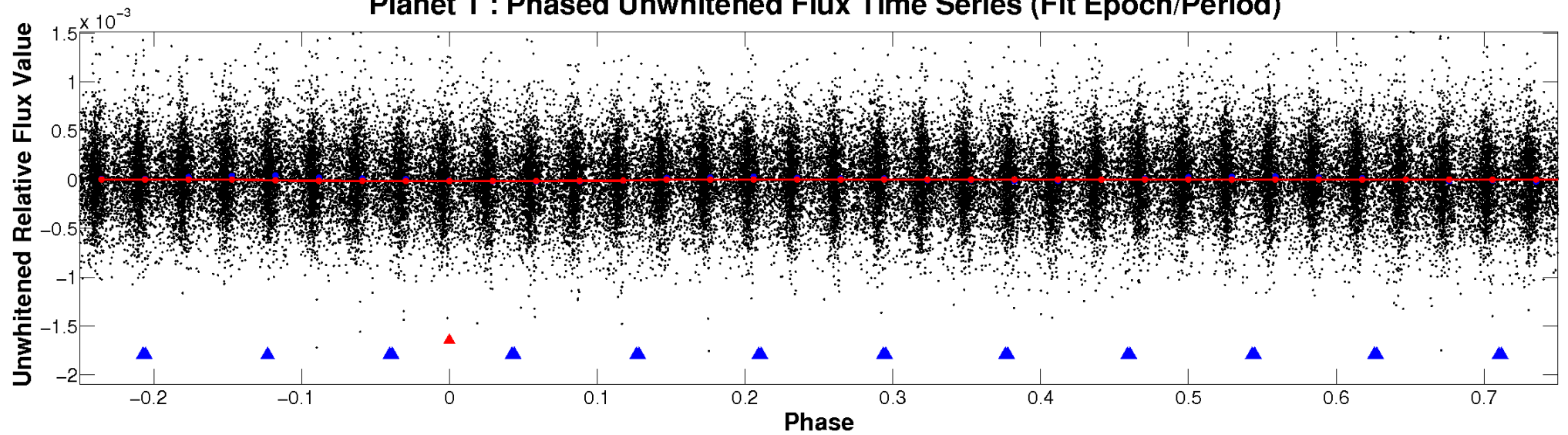
ALT Odd/Even

TCE 006635021-01

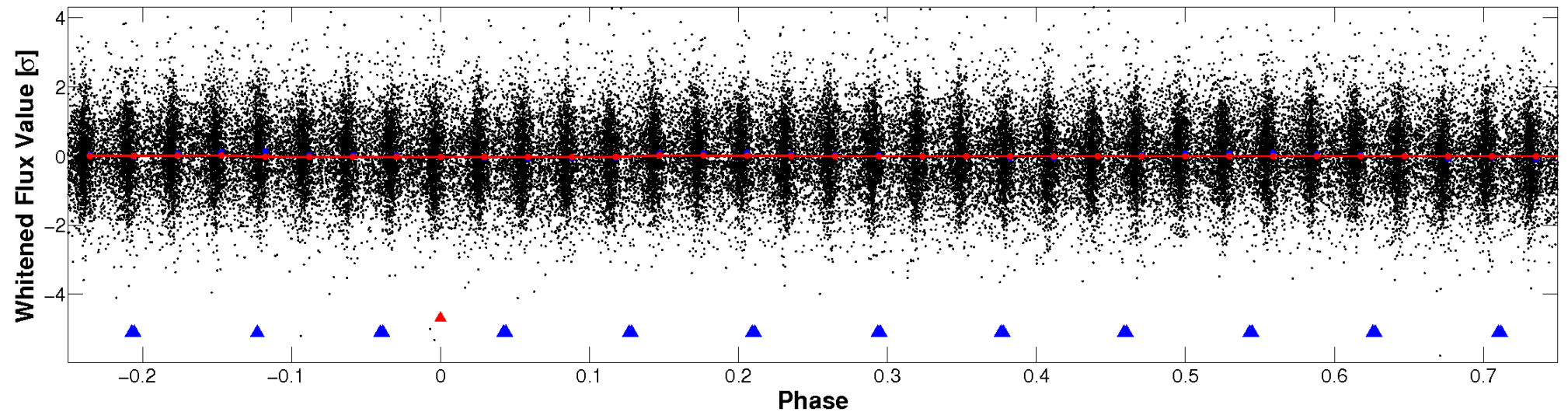


Non-Whitened Vs. Whitened Light Curve

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

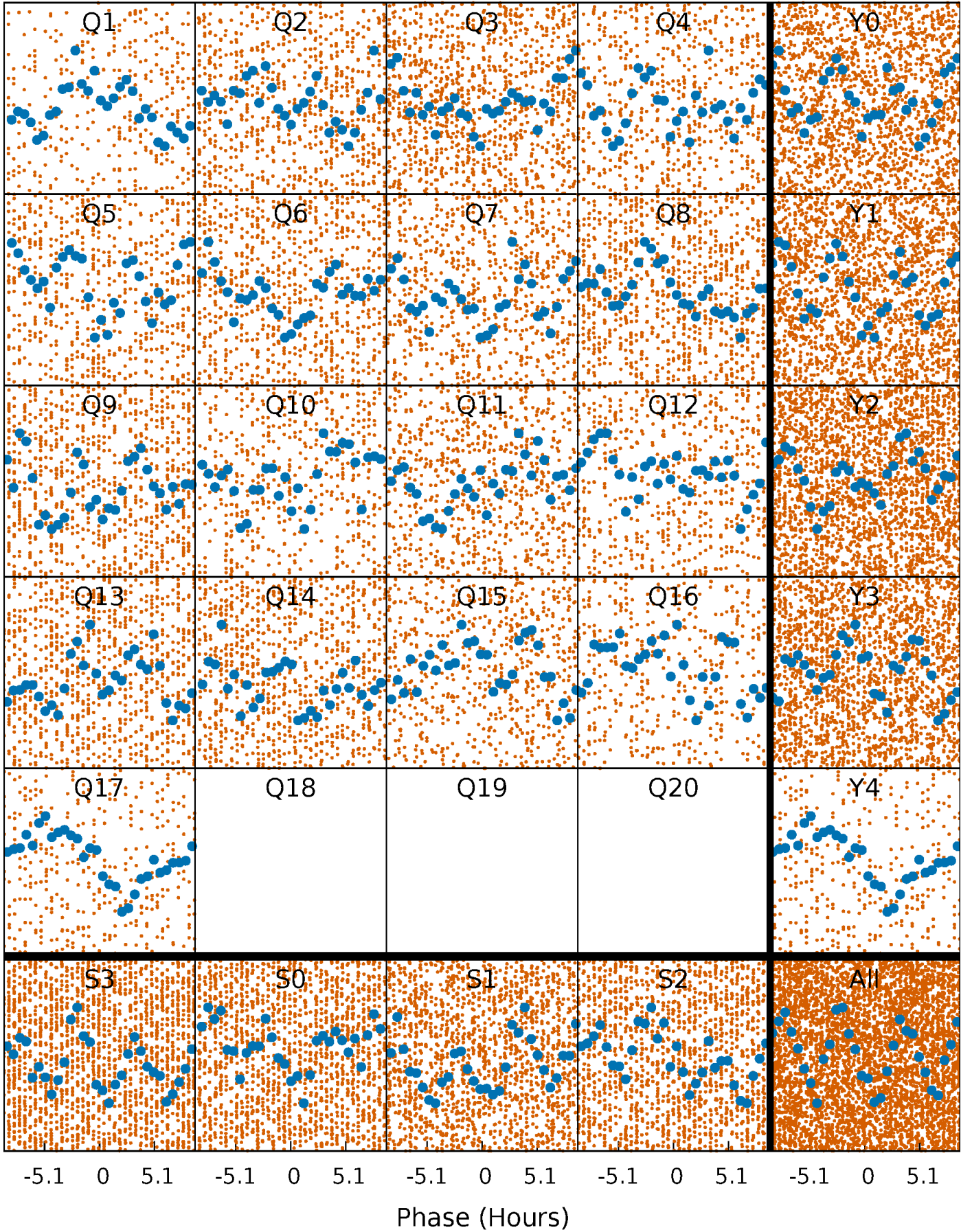


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



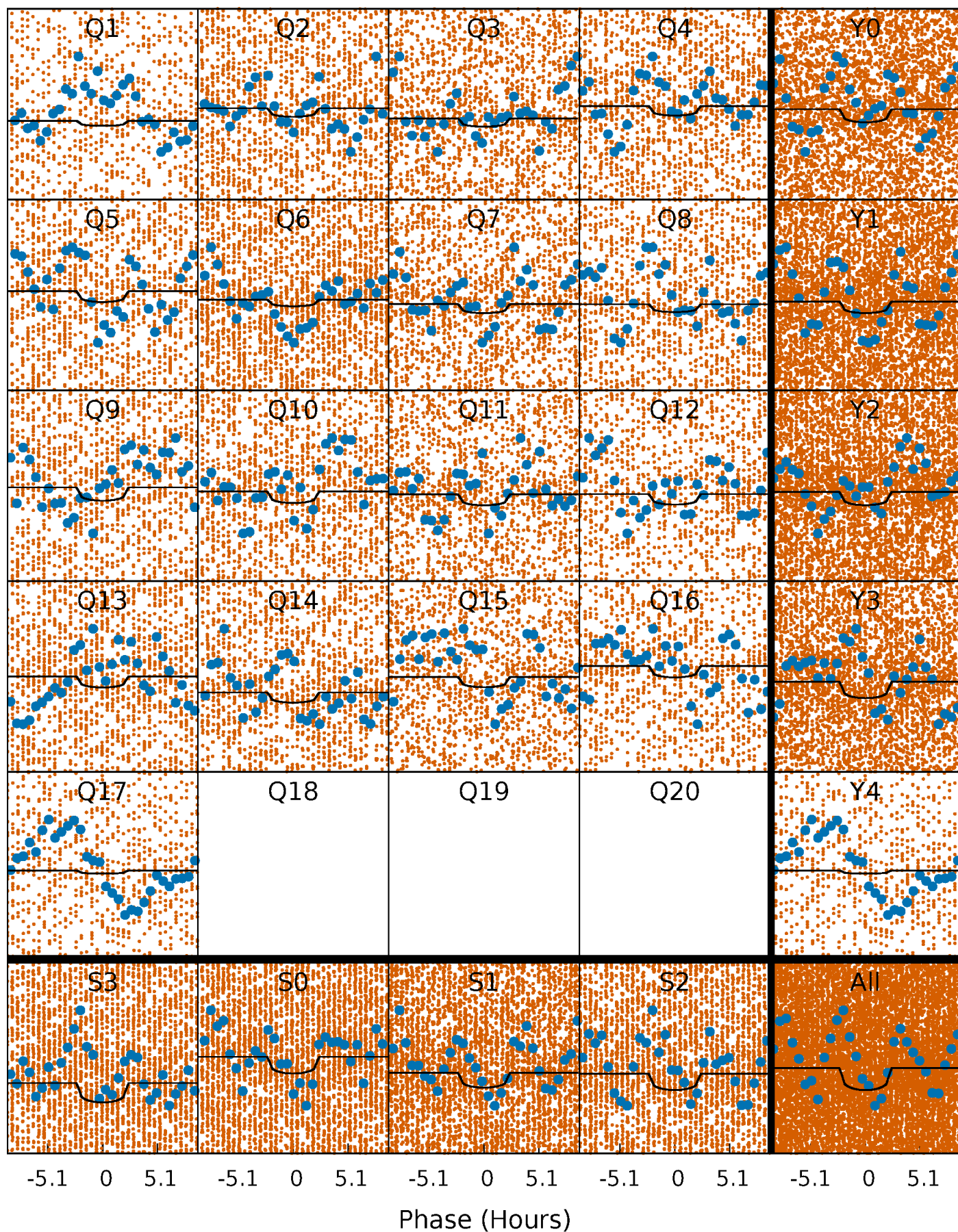
PDC Quarter-Phased Transit Curves

TCE 006635021-01 P= 0.694779 Days $T_0=132.027032$ (BKJD)



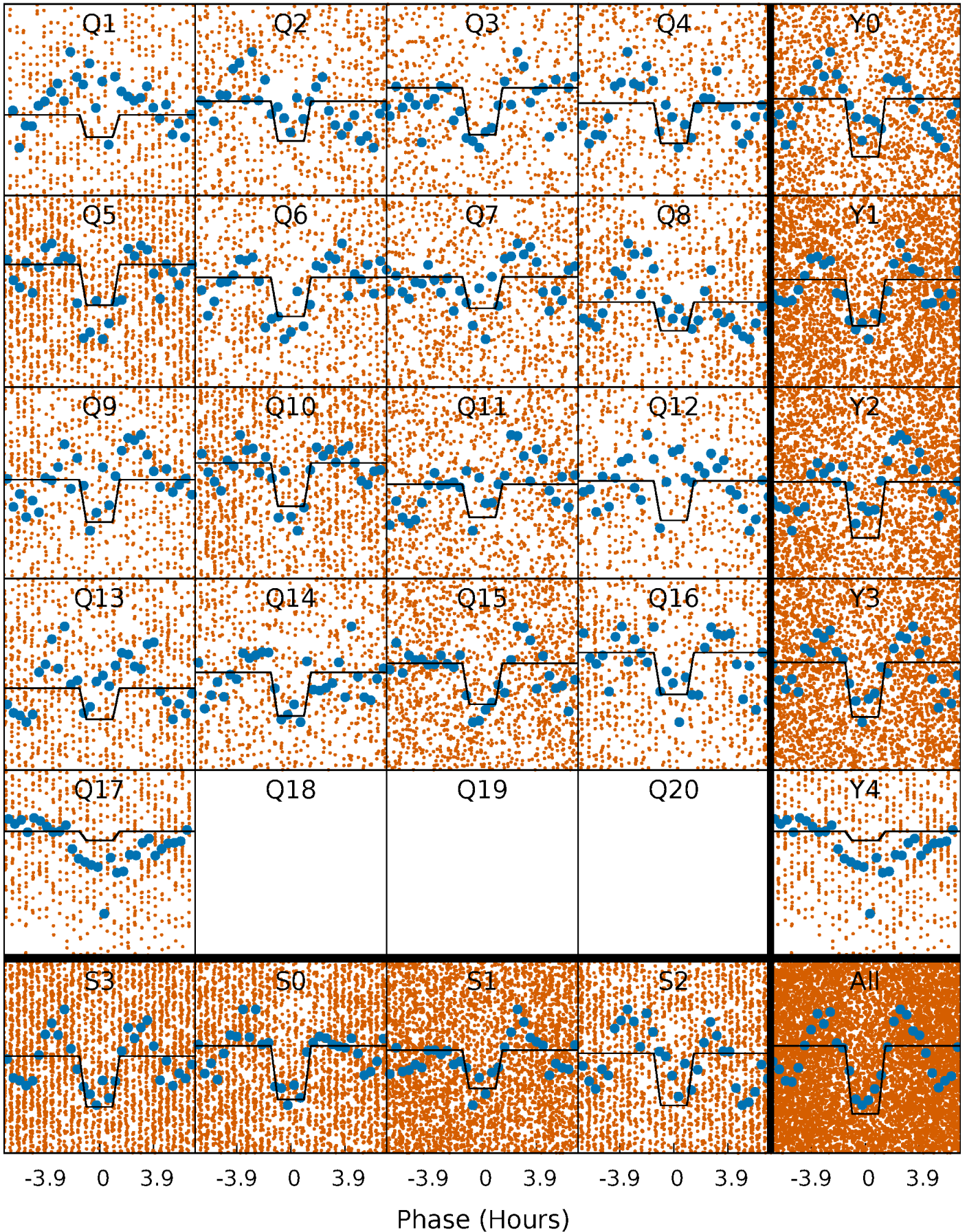
DV Quarter-Phased Transit Curves

TCE 006635021-01 P= 0.694779 Days $T_0=132.027032$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

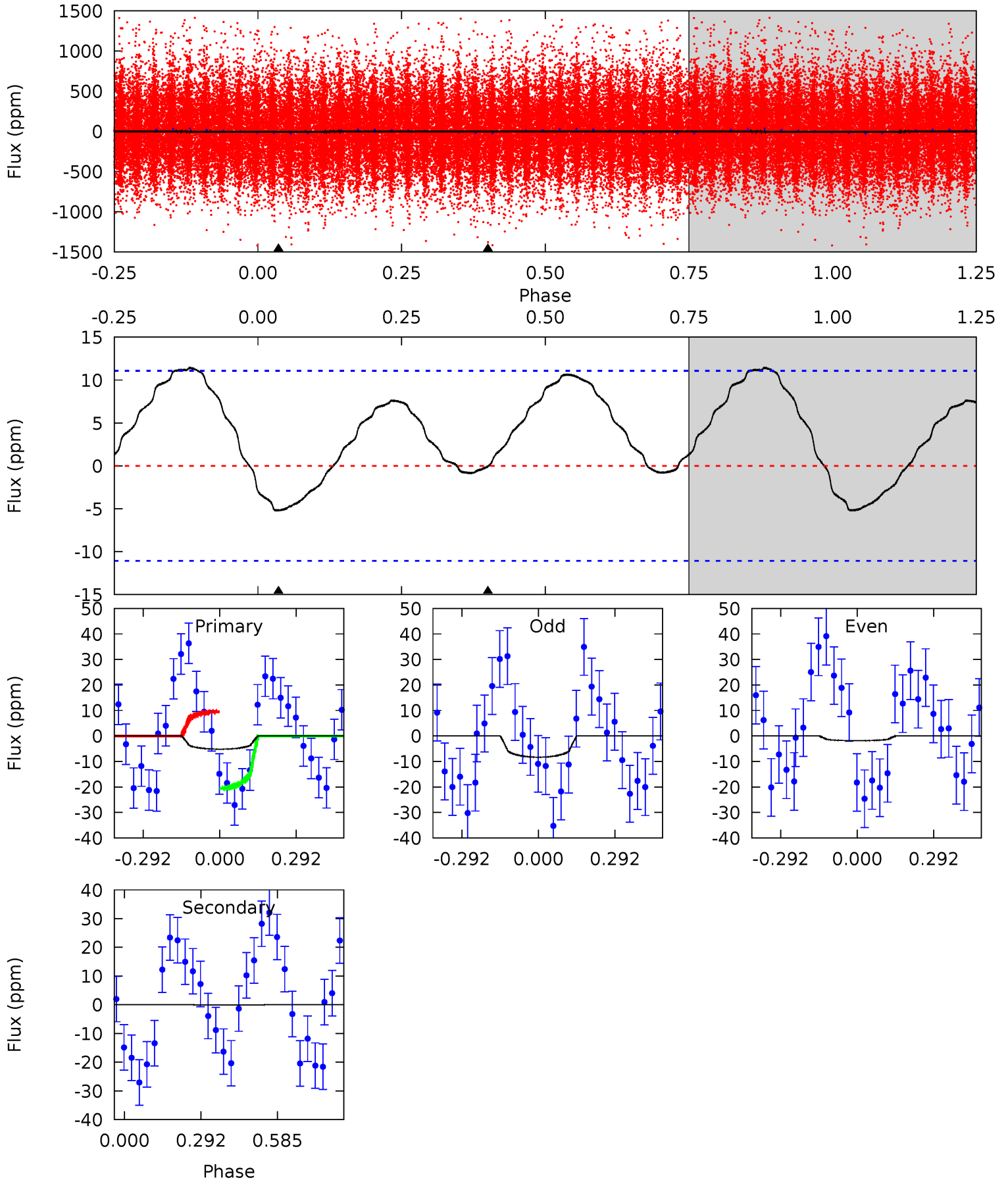
TCE 006635021-01 P= 0.694817 Days $T_0=132.025081$ (BKJD)



DV Model-Shift Uniqueness Test

006635021-01, P = 0.694779 Days, E = 131.332253 Days

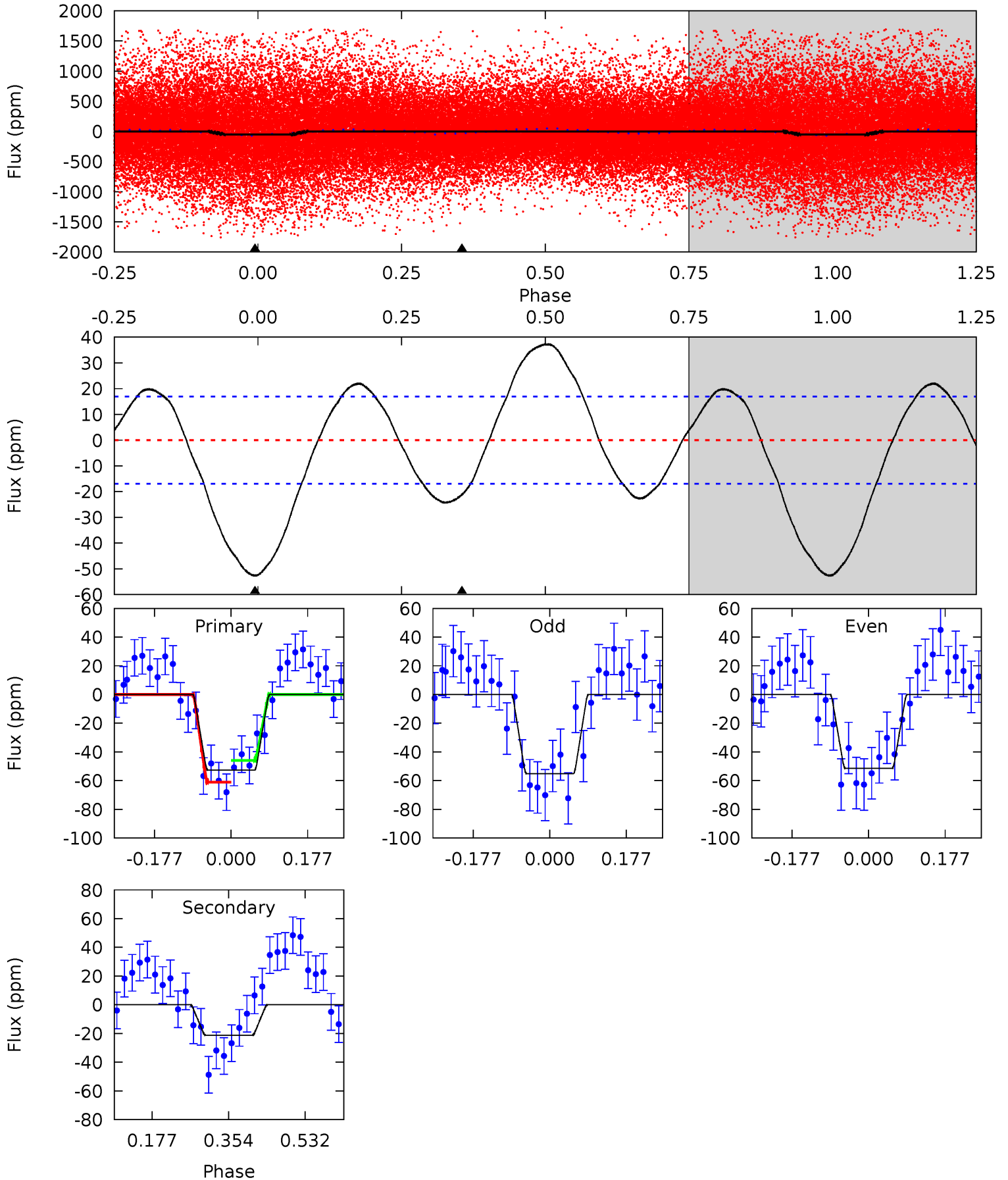
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 2.03 | 0.02 | 0 | 0 | 4.33 | 1.05 | 0.47 | 2.03 | 2.03 | 0.02 | 0.02 | 1.27 | 0.50 | 0.69 | 2.21 |



Alt Model-Shift Uniqueness Test

006635021-01, P = 0.694817 Days, E = 131.330264 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.8 | 5.56 | 0 | 0 | 4.44 | 1.35 | 4.27 | 13.8 | 13.8 | 5.56 | 5.56 | 0.49 | 0.67 | 0.41 | 1.92 |



Stellar Parameters For KIC 006635021

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6303^{+175}_{-219} | $4.254^{+0.158}_{-0.193}$ | $-0.180^{+0.250}_{-0.300}$ | $1.278^{+0.384}_{-0.256}$ | $1.065^{+0.185}_{-0.123}$ | $0.720^{+0.636}_{-0.357}$ |
| | +3%/-3% | +4%/-5% | +139%/-167% | +30%/-20% | +17%/-12% | +88%/-50% |
| Source | PHO1 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 006635021-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|-------------------------|---------------------------|
| DV | -0 ± 3 | $0.65^{+0.49}_{-0.41}$ | 3512^{+275}_{-231} | -3353^{+7707}_{-1021} | $0.030^{+1.516}_{-1.094}$ |
| Alt. | -21 ± 4 | $1.06^{+0.55}_{-0.48}$ | 3528^{+257}_{-243} | 4893^{+1903}_{-910} | $2.586^{+6.698}_{-1.541}$ |

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

DV Centroid Data

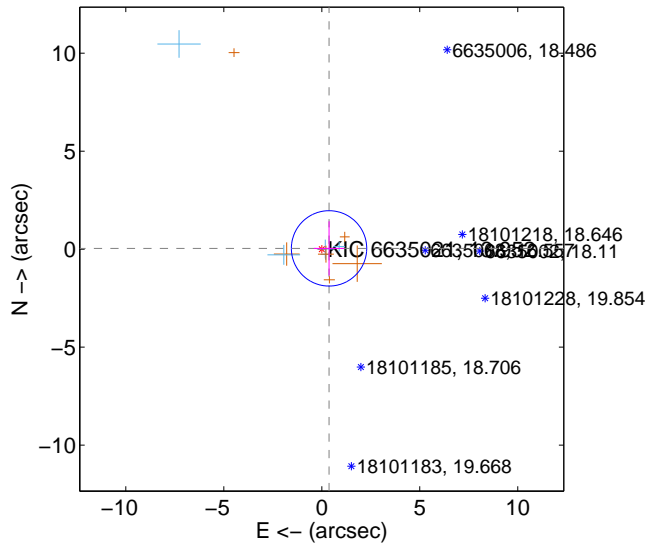
Supplemental centroid analysis for 006635021-01. Kepler magnitude: 13.95. Transit SNR 3.43

There are 5 quarters with good PRF difference image offsets

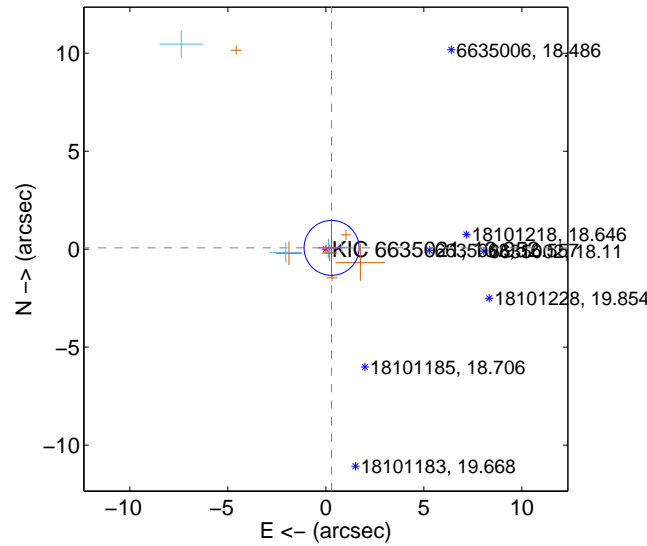
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.372 ± 0.641 | 0.58 | -0.370 ± 0.775 | 0.040 ± 1.385 |
| PRF-fit source offset from KIC position | 0.298 ± 0.467 | 0.64 | -0.291 ± 0.693 | 0.066 ± 1.231 |
| photometric centroid source offset | 4.15 ± 2.04 | 2.03 | 4.12 ± 2.04 | -0.50 ± 2.05 |

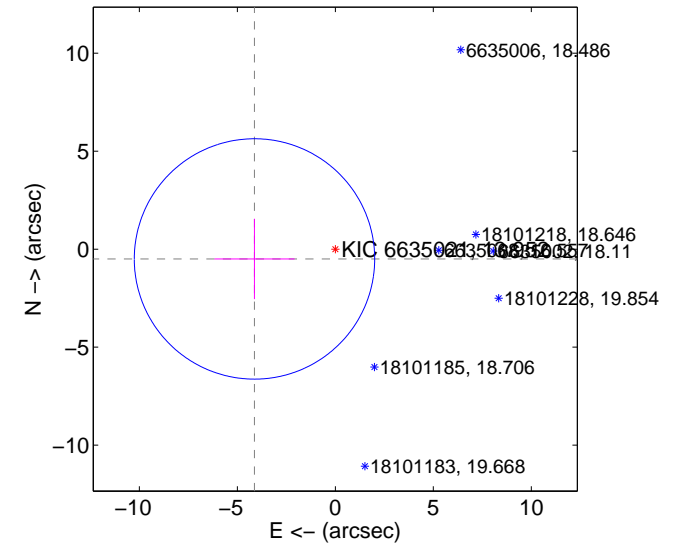
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

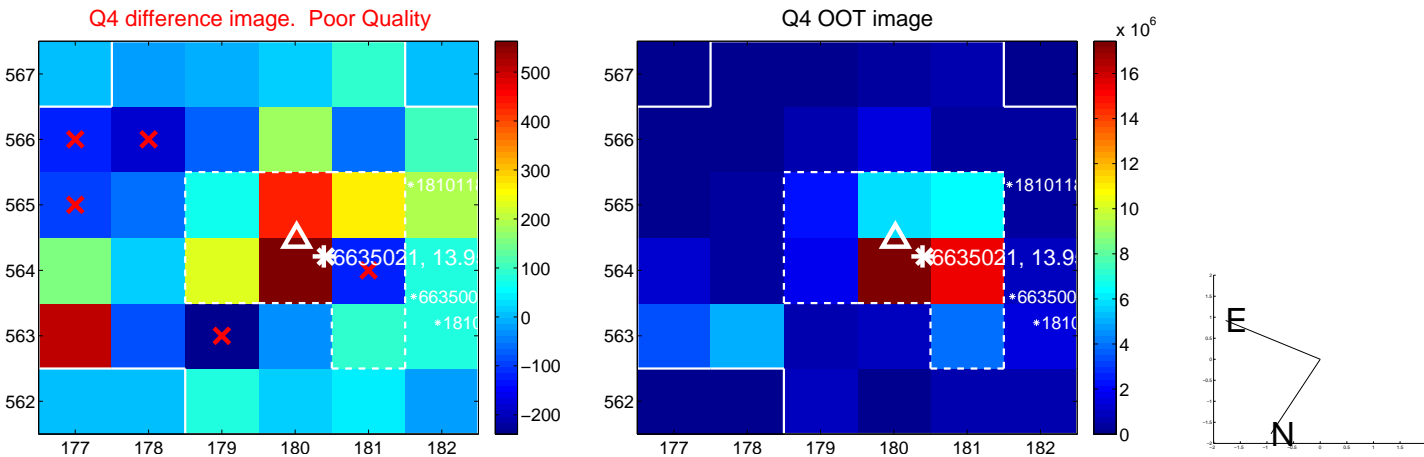
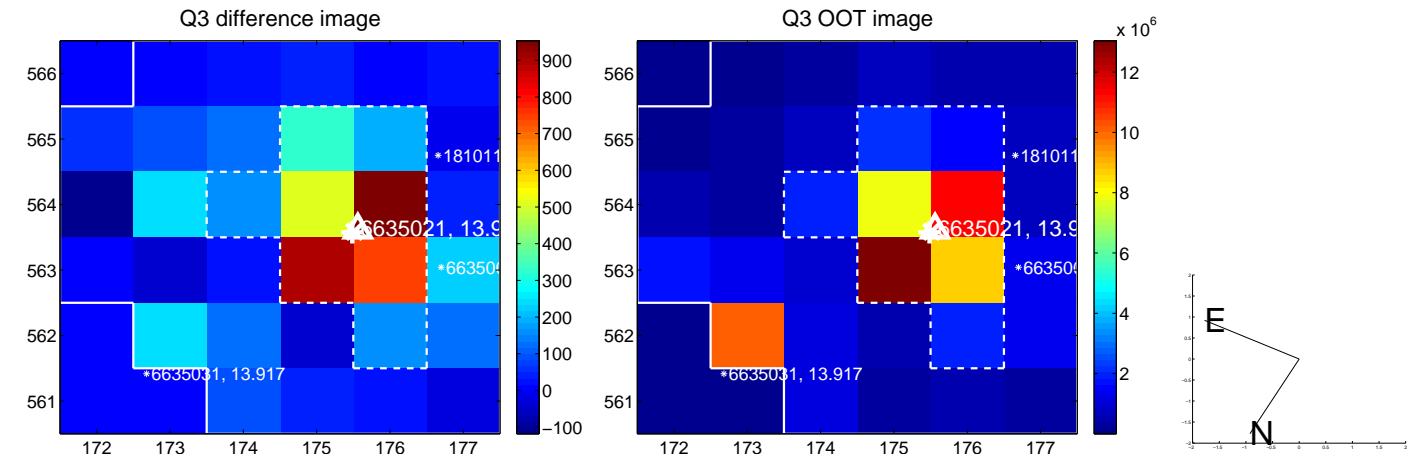
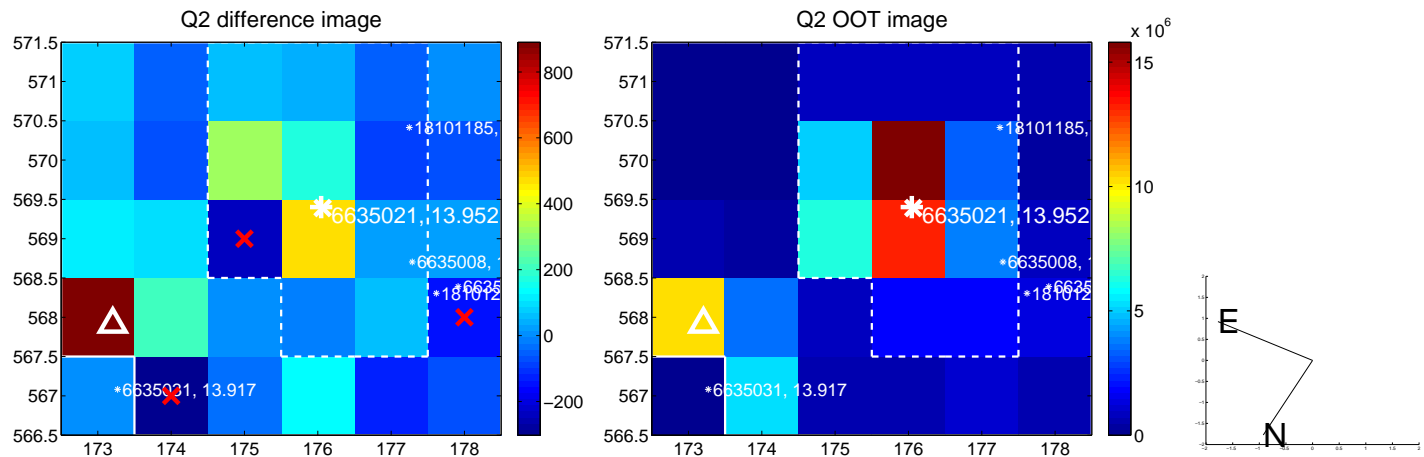
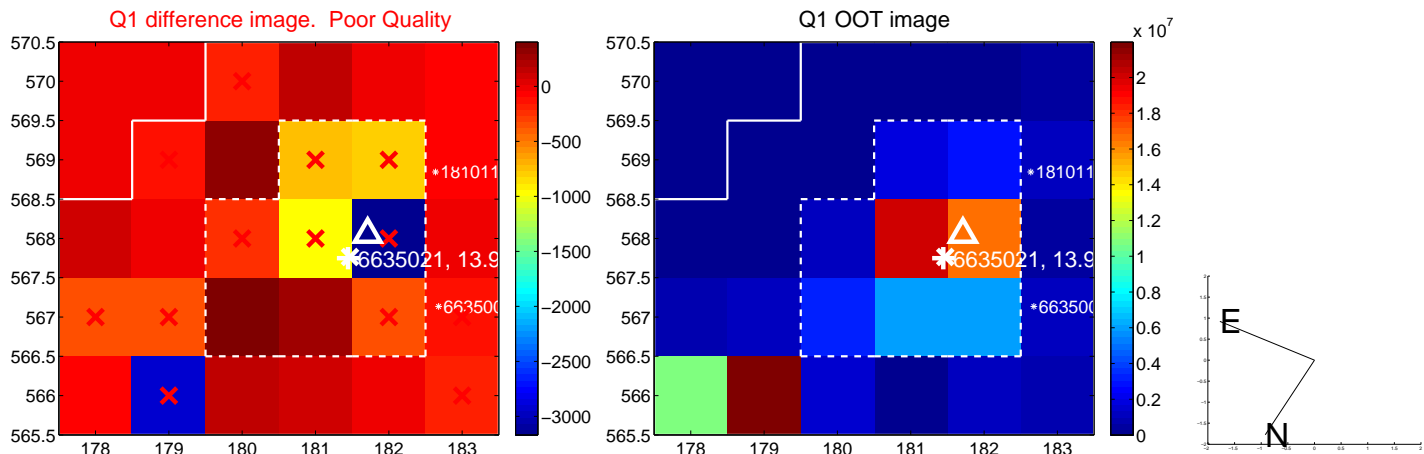


offset from photometric centroids

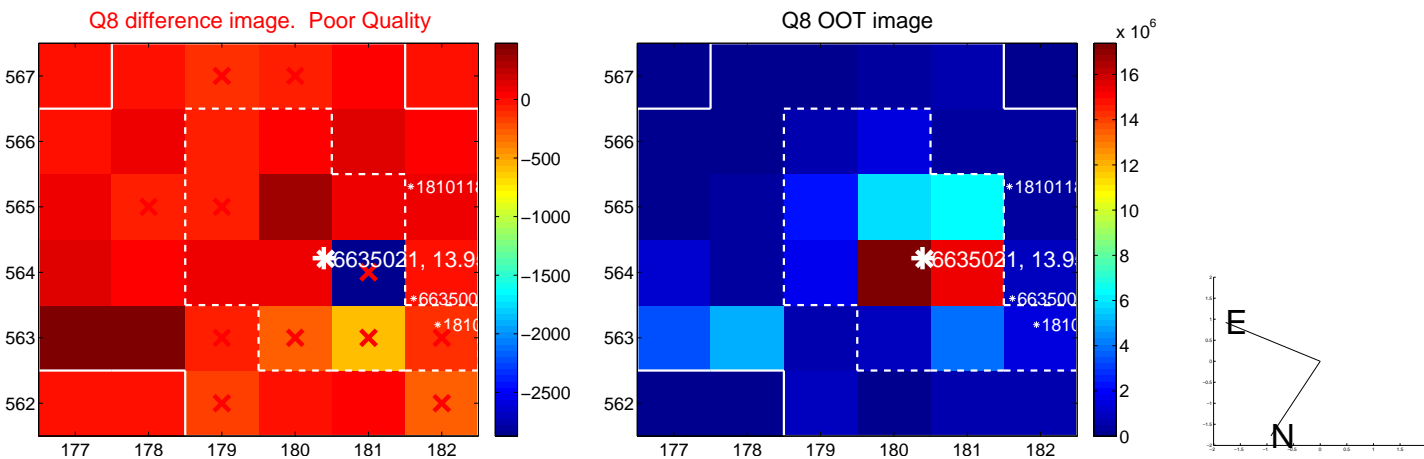
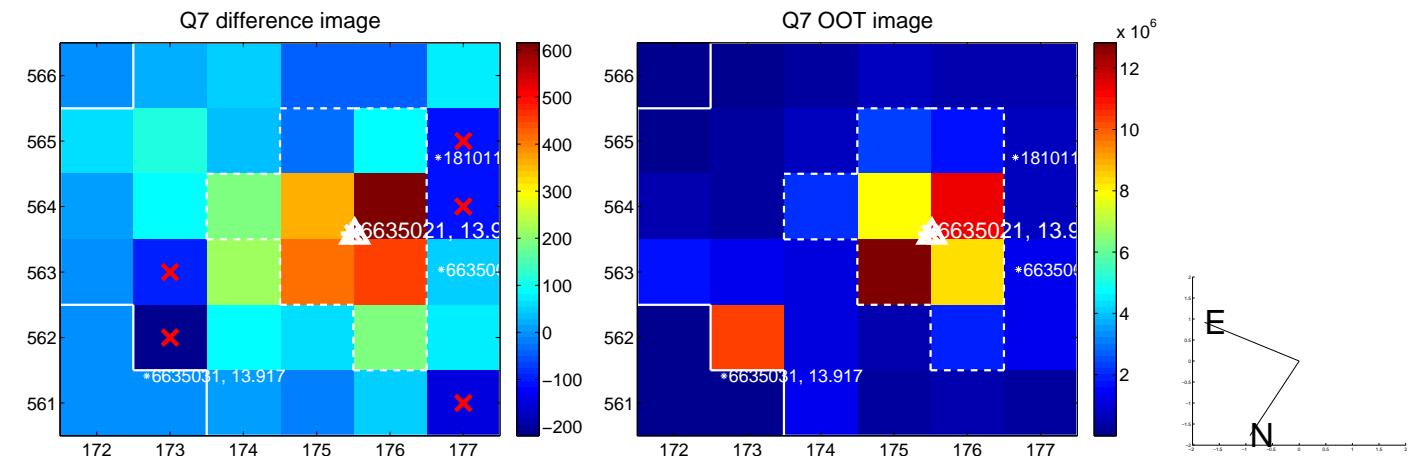
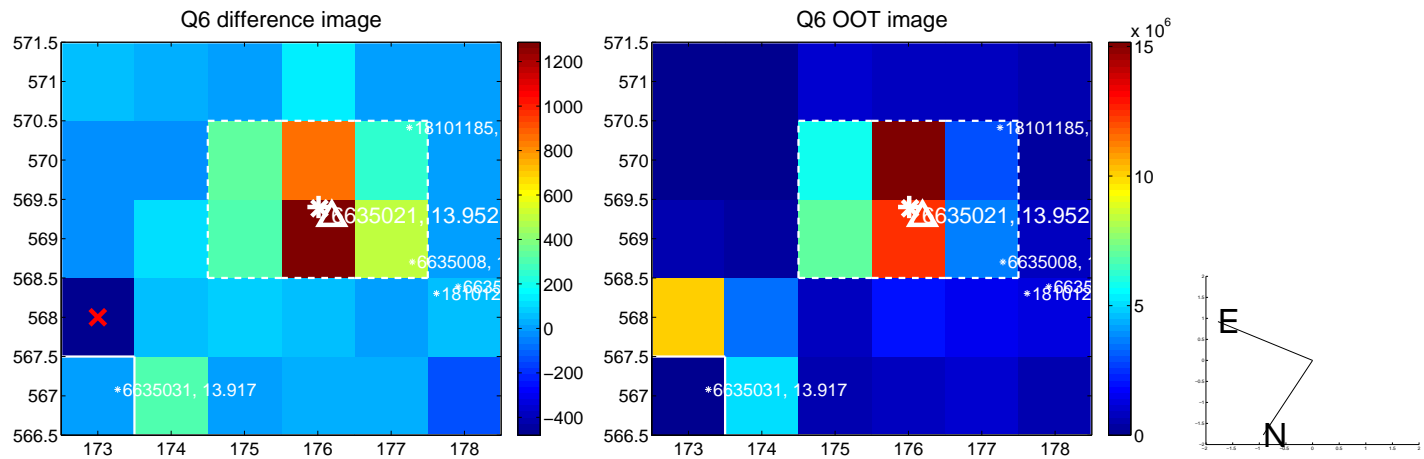
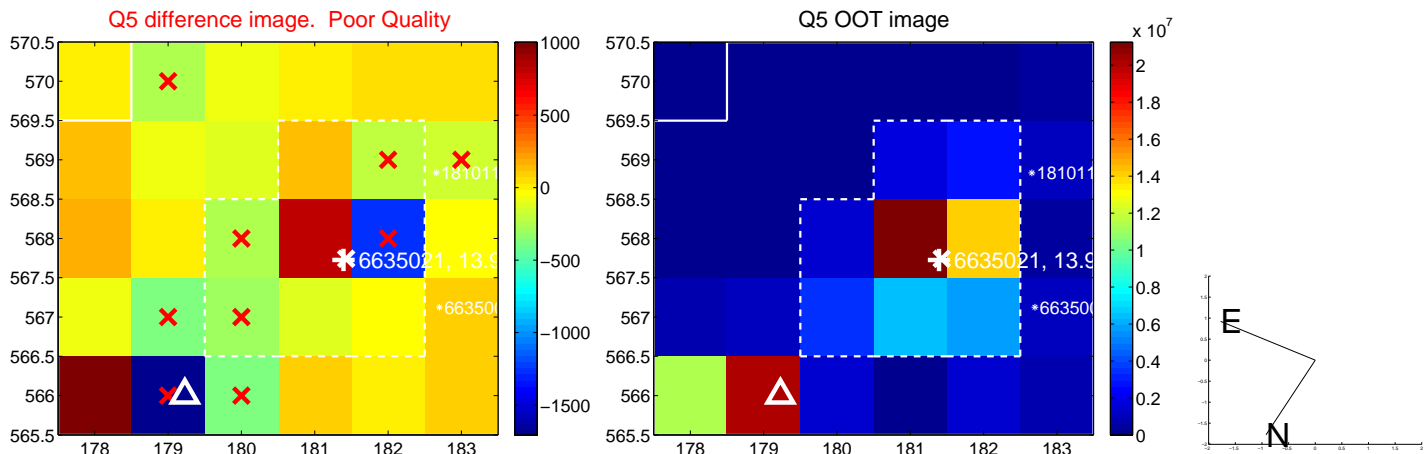


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

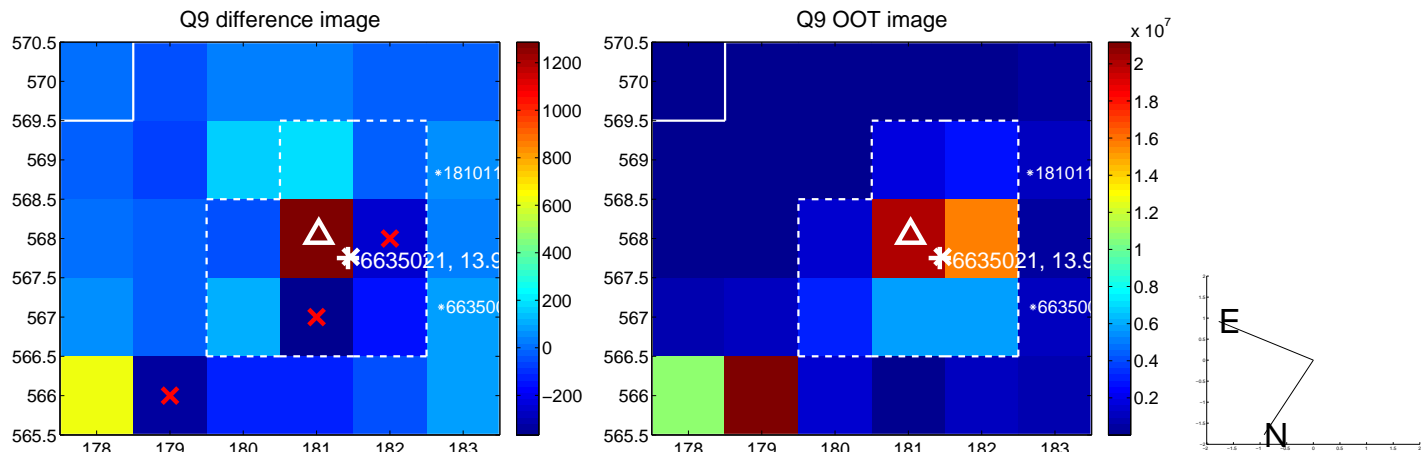
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



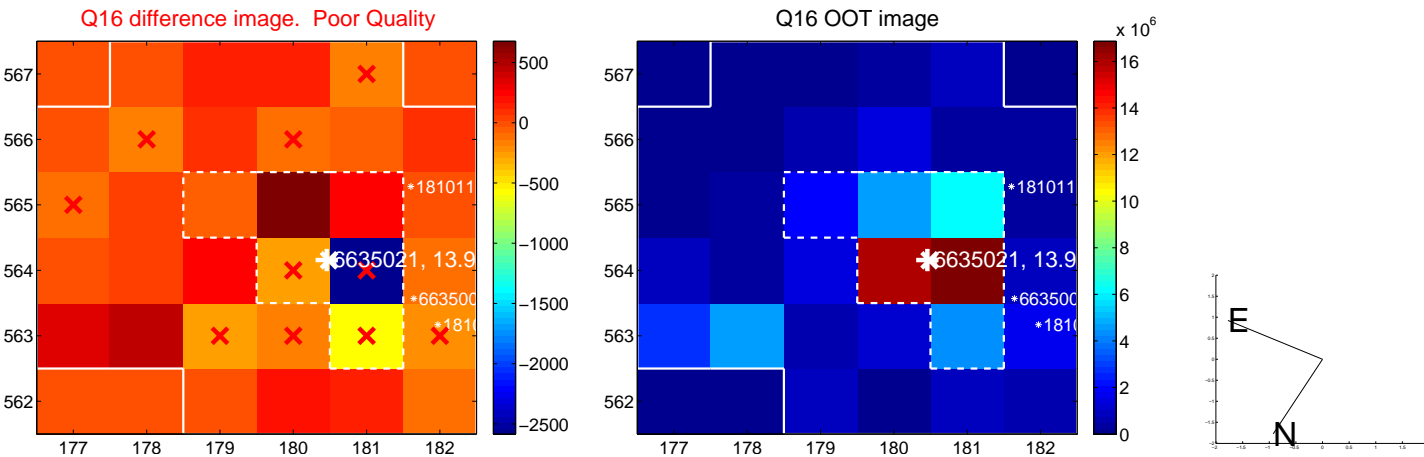
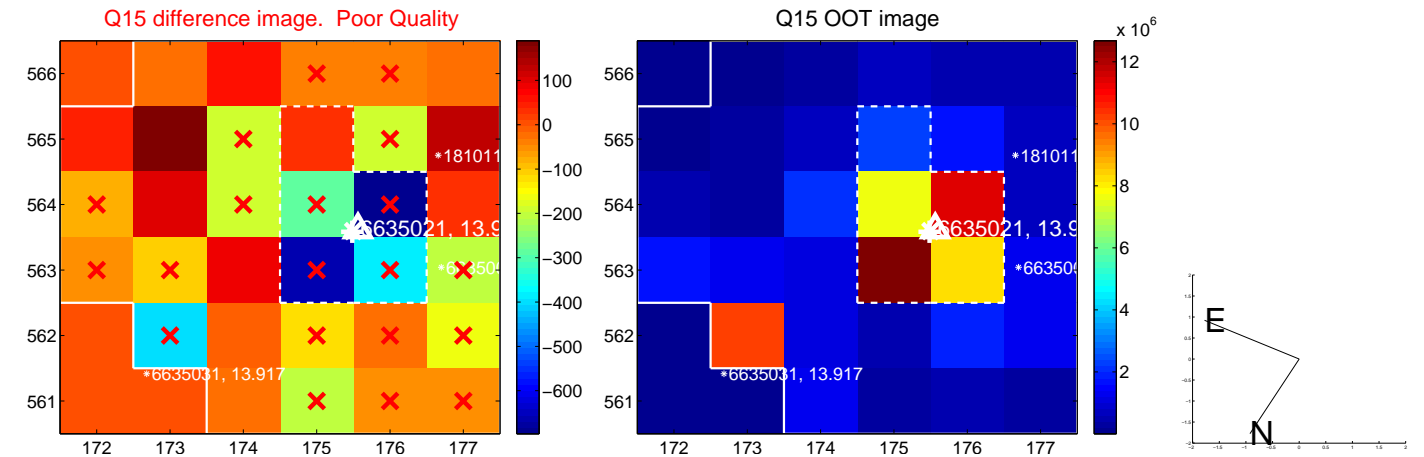
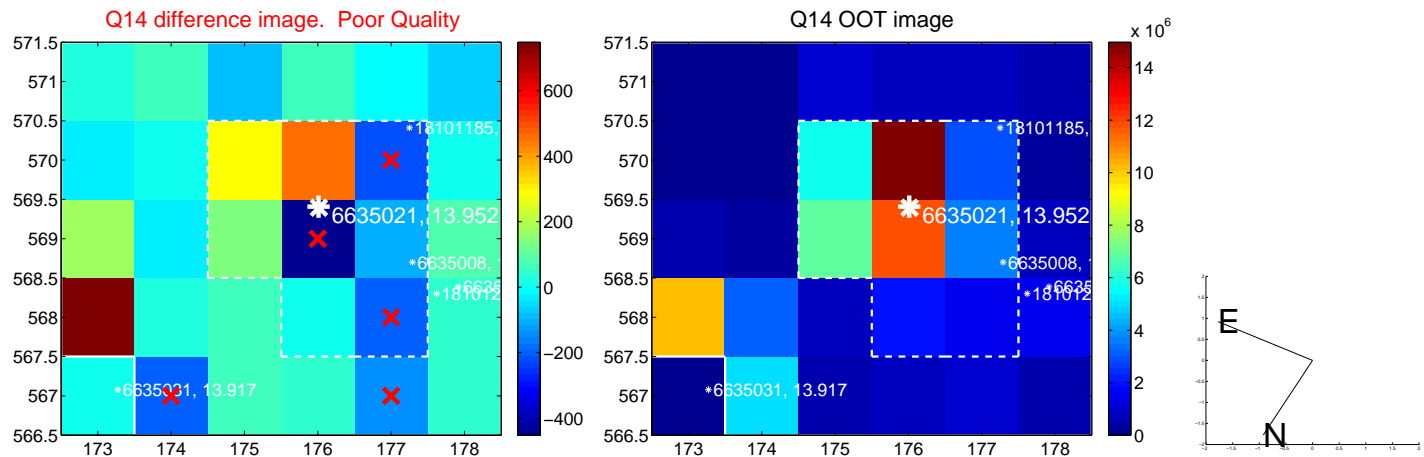
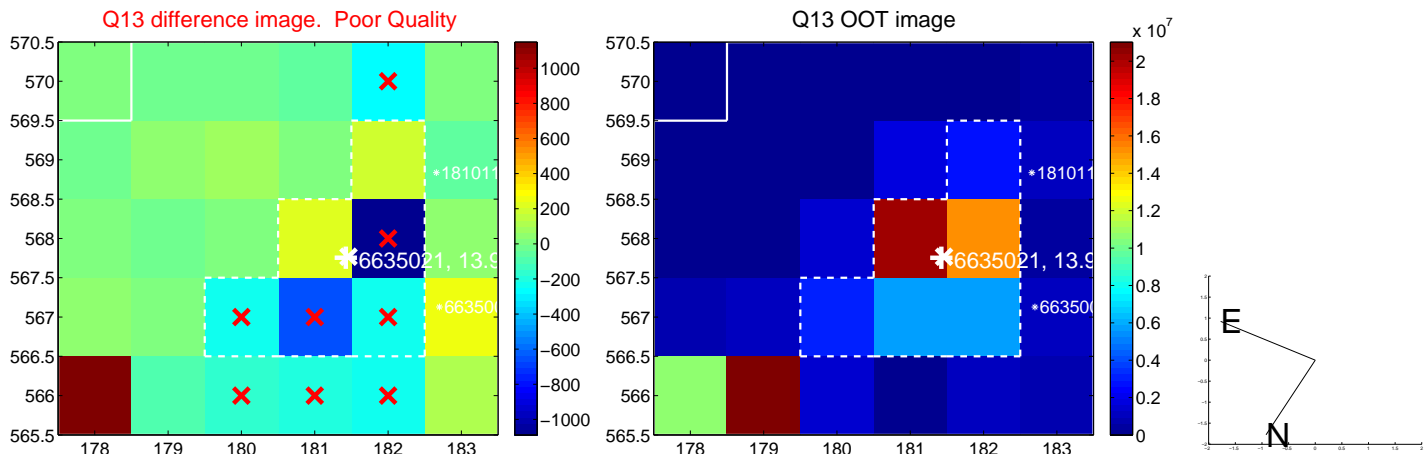
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



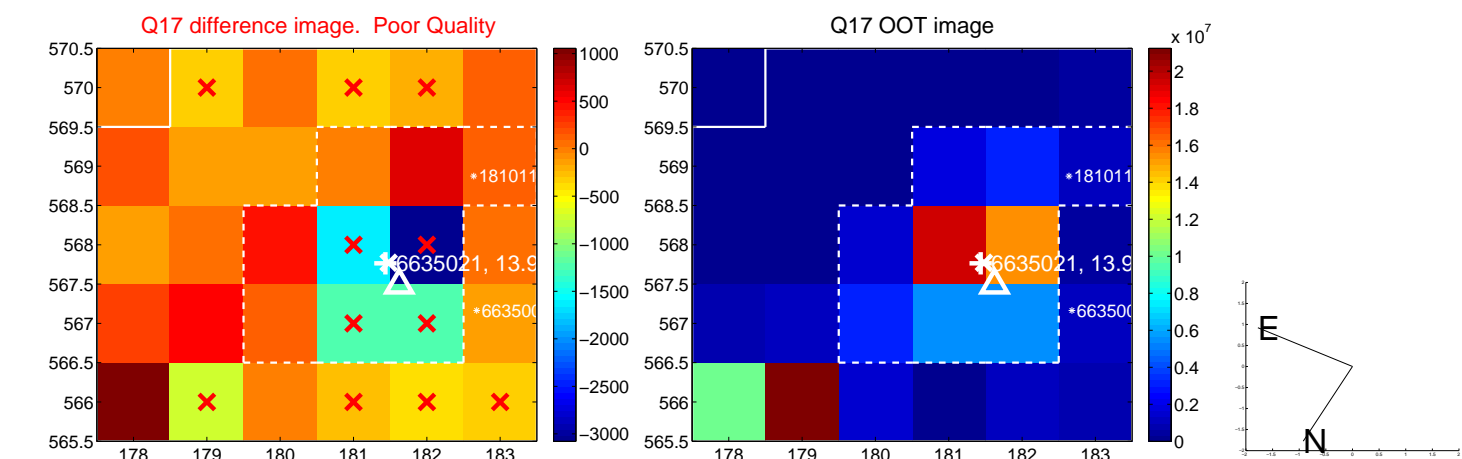
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



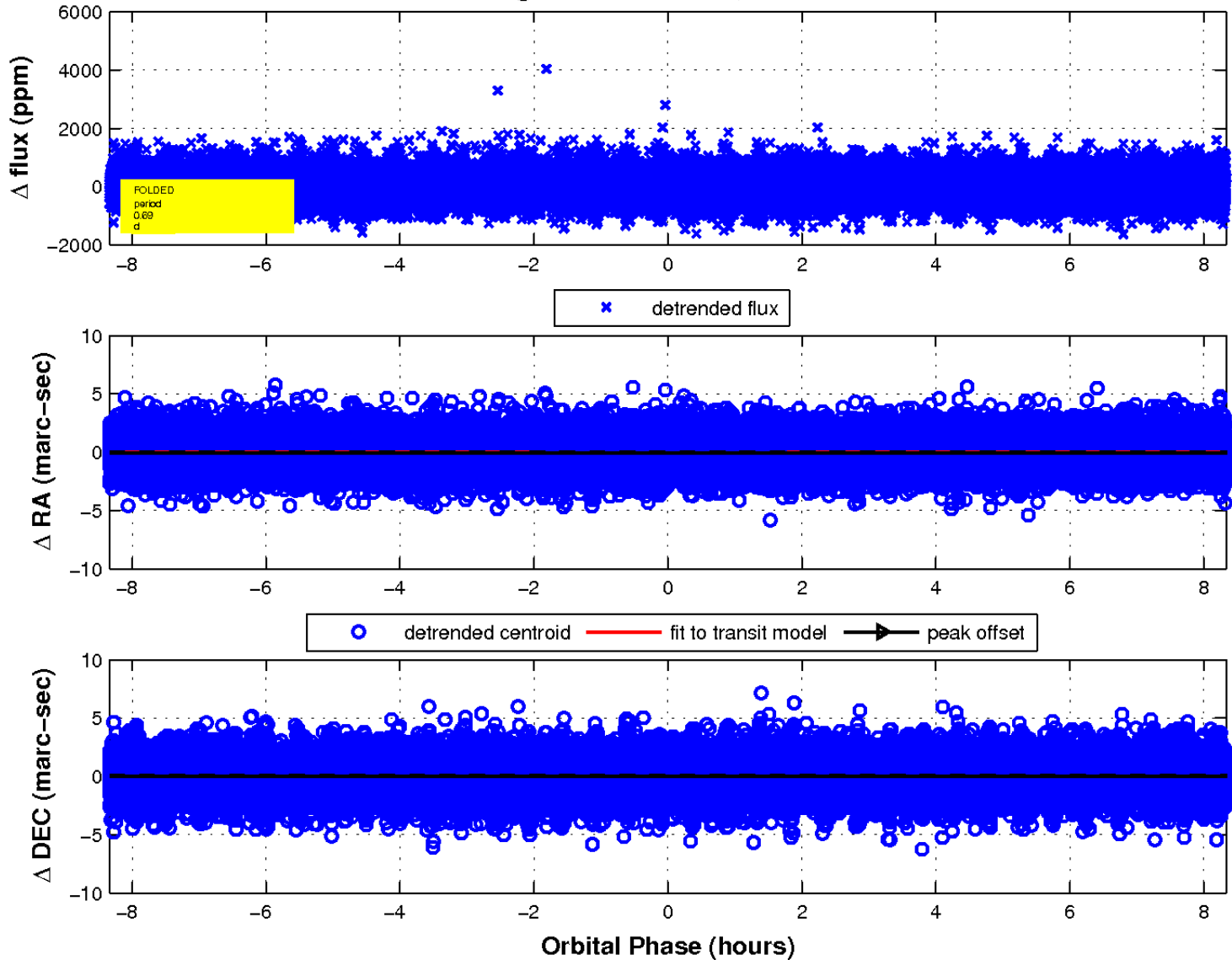
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



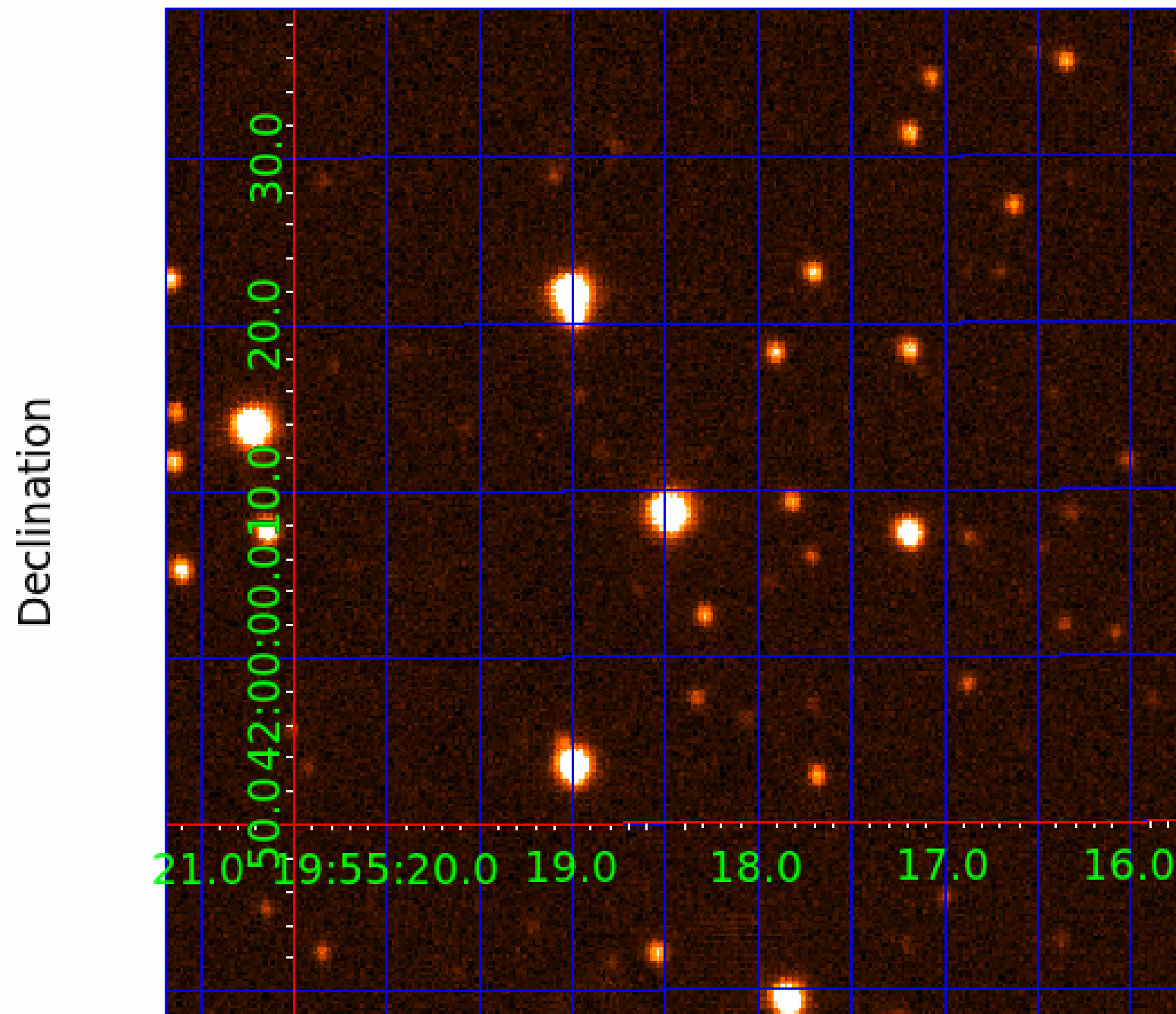
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



KIC 006635021

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 006635021-01 | OBS | No | 0.694779 | 132.027032 | 14.5 | 4.436 | 9.3 | 3.4 | 1.28 | 6303 | 0.50 | 9367.89 |
| 006635021-02 | OBS | No | 63.630285 | 148.325752 | 585.1 | 1.808 | 8.5 | 9.2 | 1.28 | 6303 | 3.10 | 22.69 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 006635021-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—MOD_NONUNIQ_ALT |
| 006635021-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST |

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

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

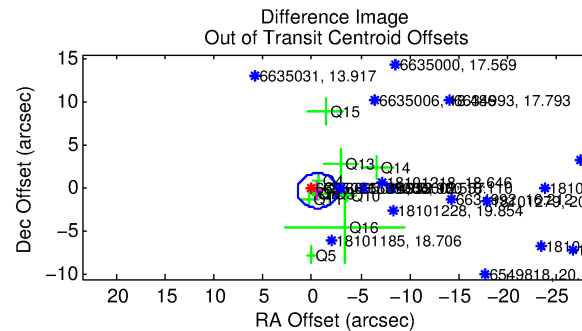
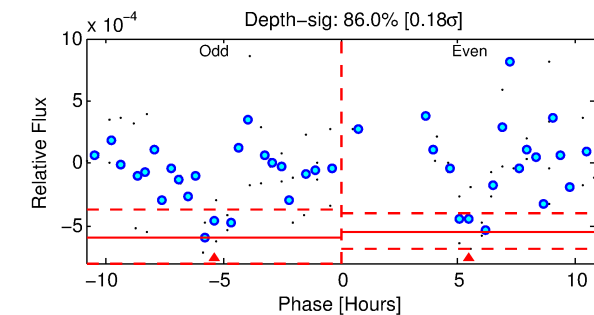
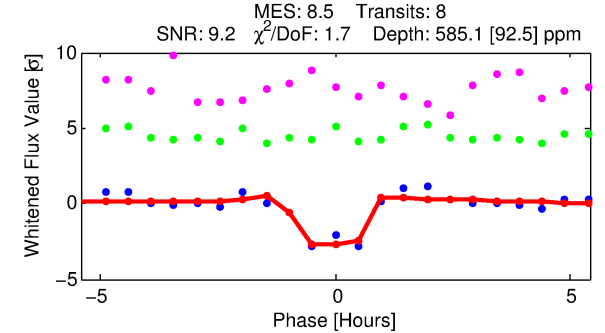
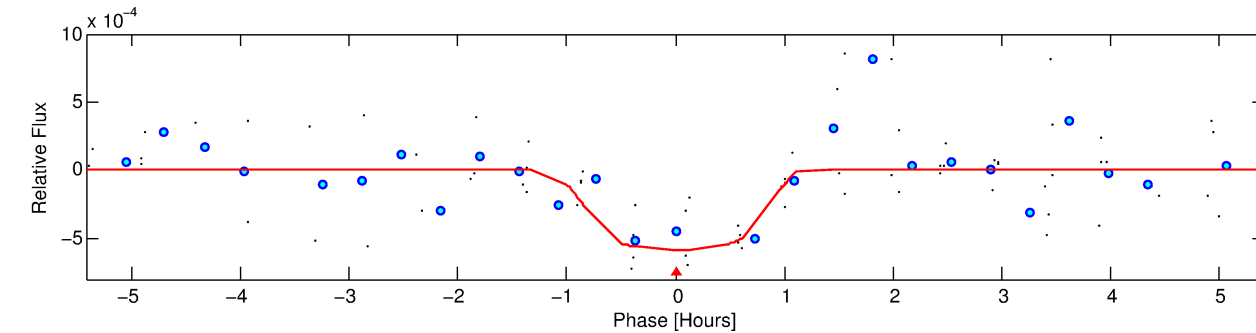
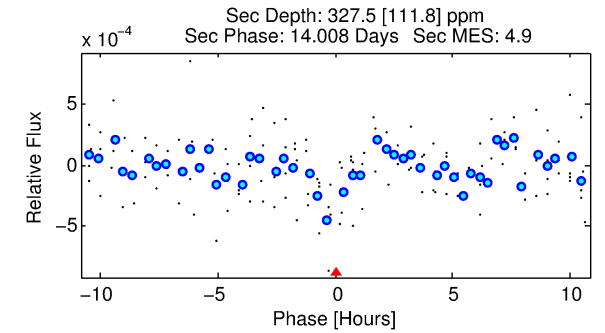
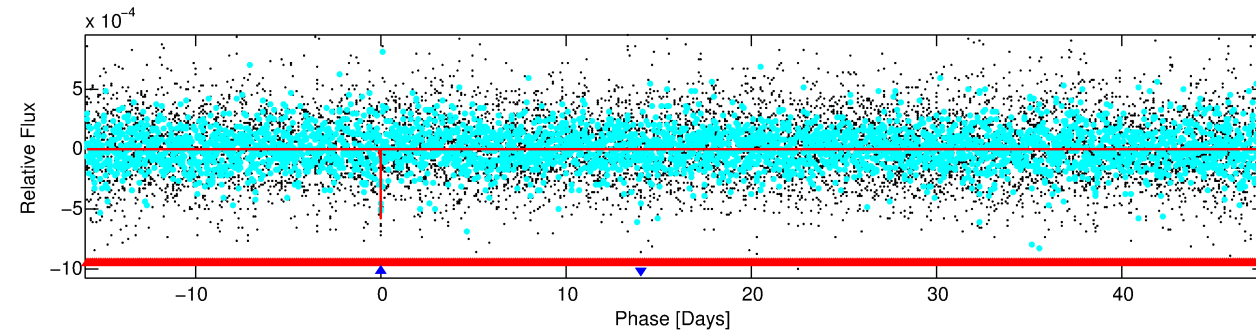
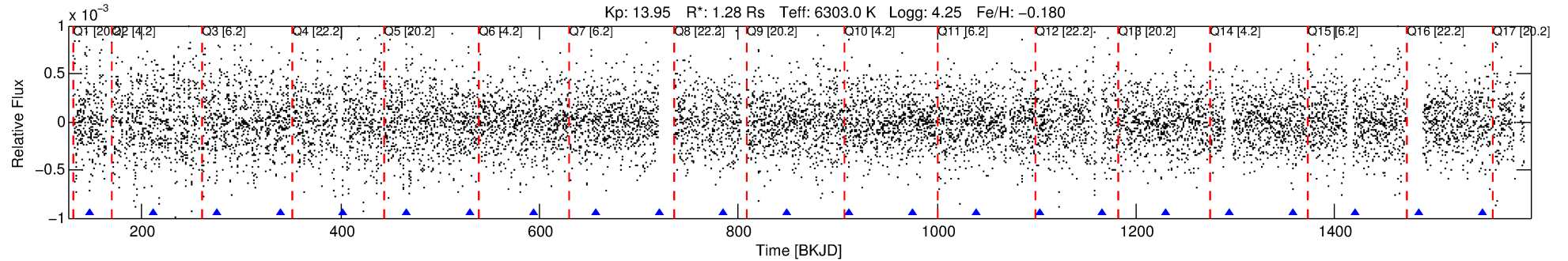
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006635021-02

No Significant Match Found

DV One-Page Summary

KIC: 6635021 Candidate: 2 of 2 Period: 63.630 d



DV Fit Results:

Period = 63.63029 [0.00052] d
Epoch = 148.3258 [0.0060] BKJD
Rp/R* = 0.0223 [0.0283]
a/R* = 274.53 [1757.71]
b = 0.05 [138.56]
Seff = 22.69 [8.71]
Teff = 557 [53] K
Rp = 3.10 [4.06] Re
a = 0.3190 [0.0795] AU
Ag = 1901.94 [4931.23] [0.39 σ]
Teffp = 5682 [3653] K [1.40 σ]

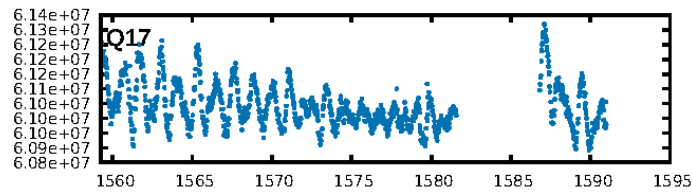
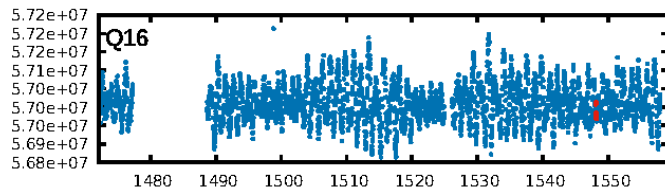
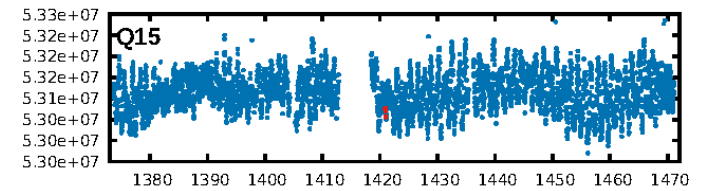
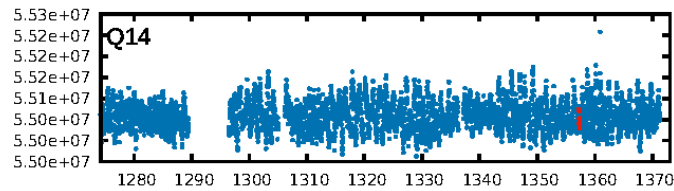
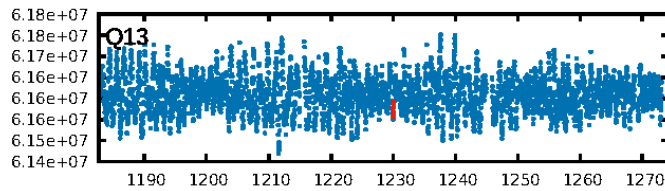
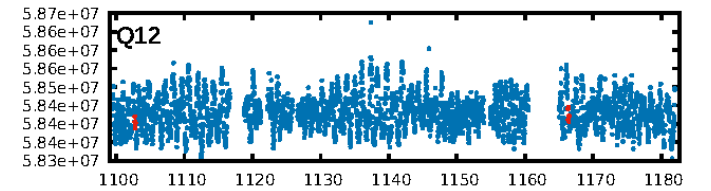
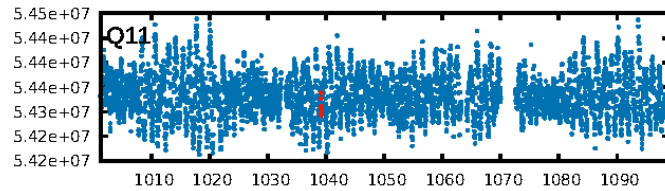
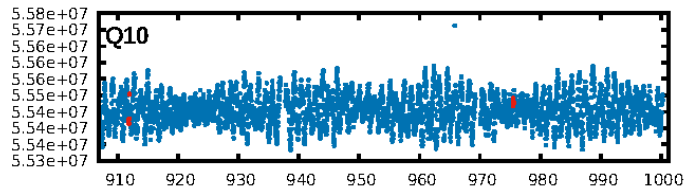
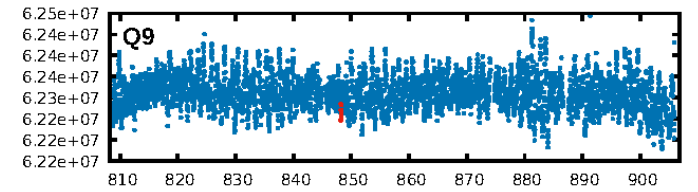
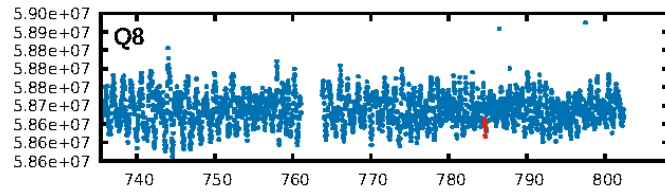
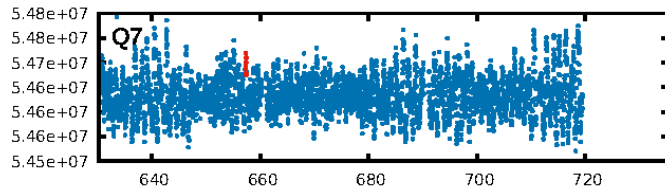
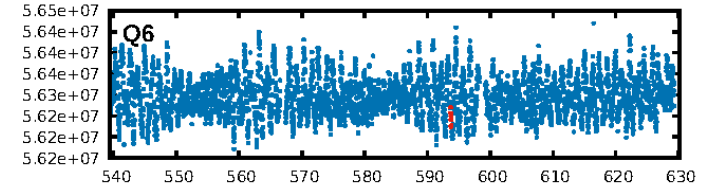
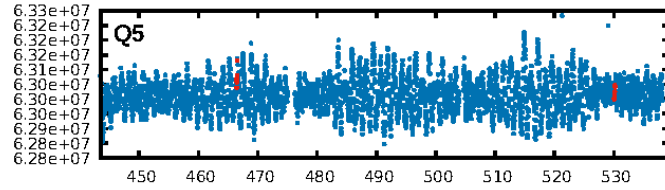
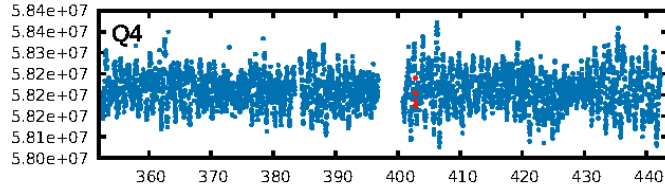
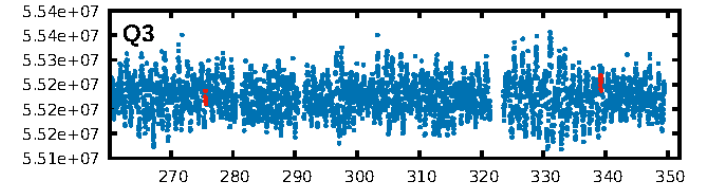
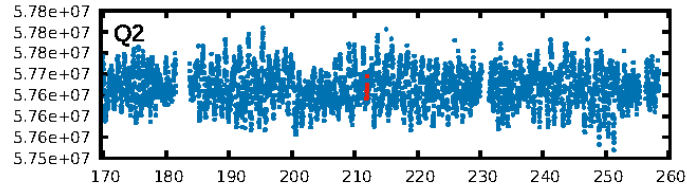
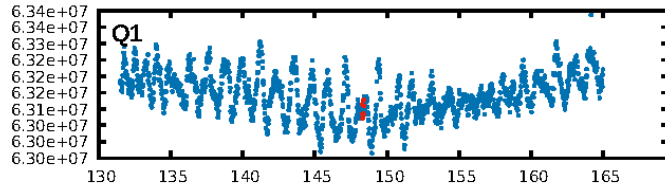
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [315.30 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 16.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.66e-09
RollingBand-ftg: 1.00 [7/7]
GhostDiagnostic-chr: 0.1333
Centroid-sig: 4.4%
Centroid-so: 1.322 arcsec [1.72 σ]
OotOffset-rm: 0.586 arcsec [0.87 σ]
KicOffset-rm: 0.518 arcsec [0.79 σ]
OotOffset-st: 2/4/3/3 [12]
KicOffset-st: 2/4/3/3 [12]
DiffImageQuality-fgm: 0.33 [4/12]
DiffImageOverlap-fno: 0.00 [0/16]

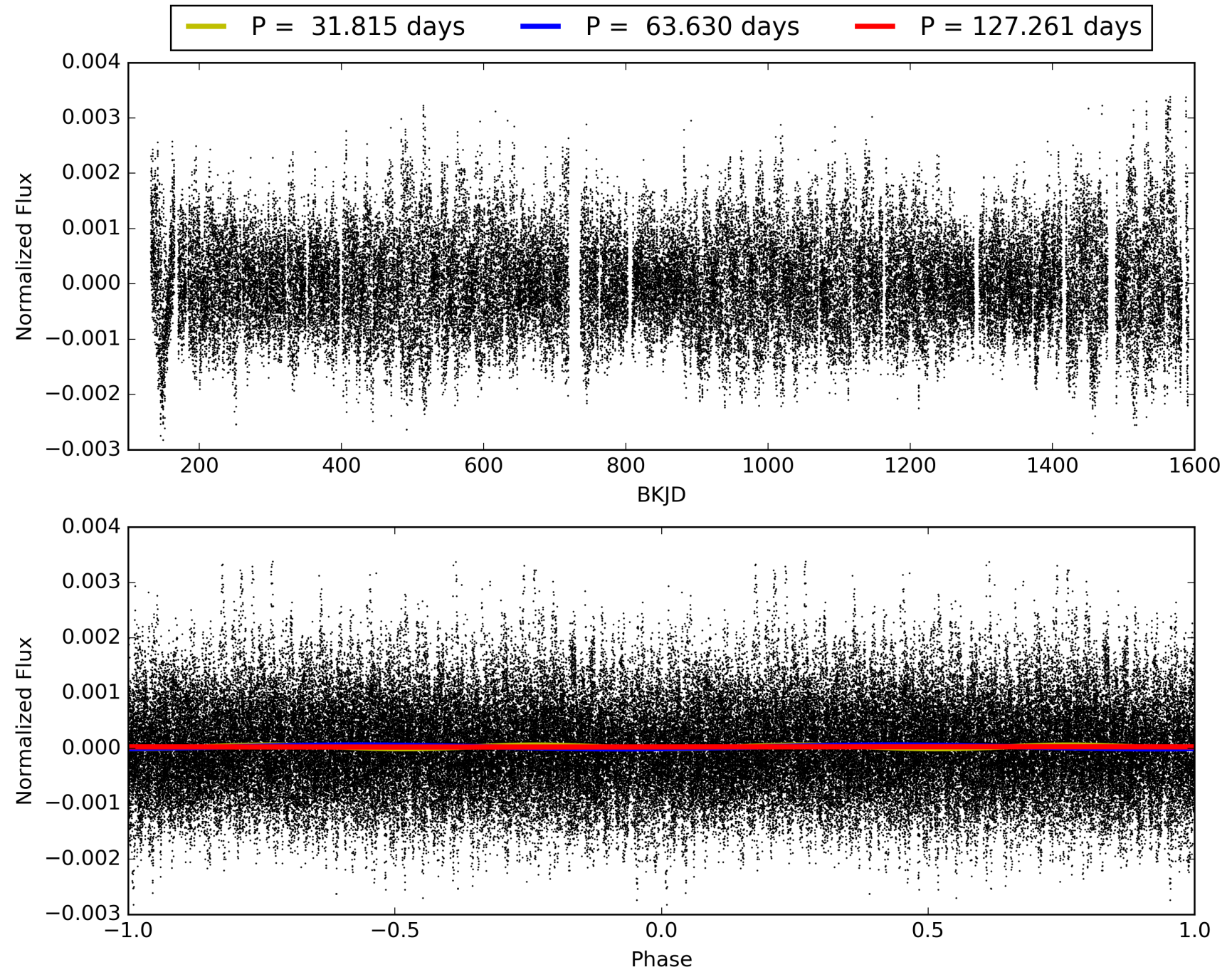
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:59:53 Z

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

TCE 006635021-02, PDC Light Curves

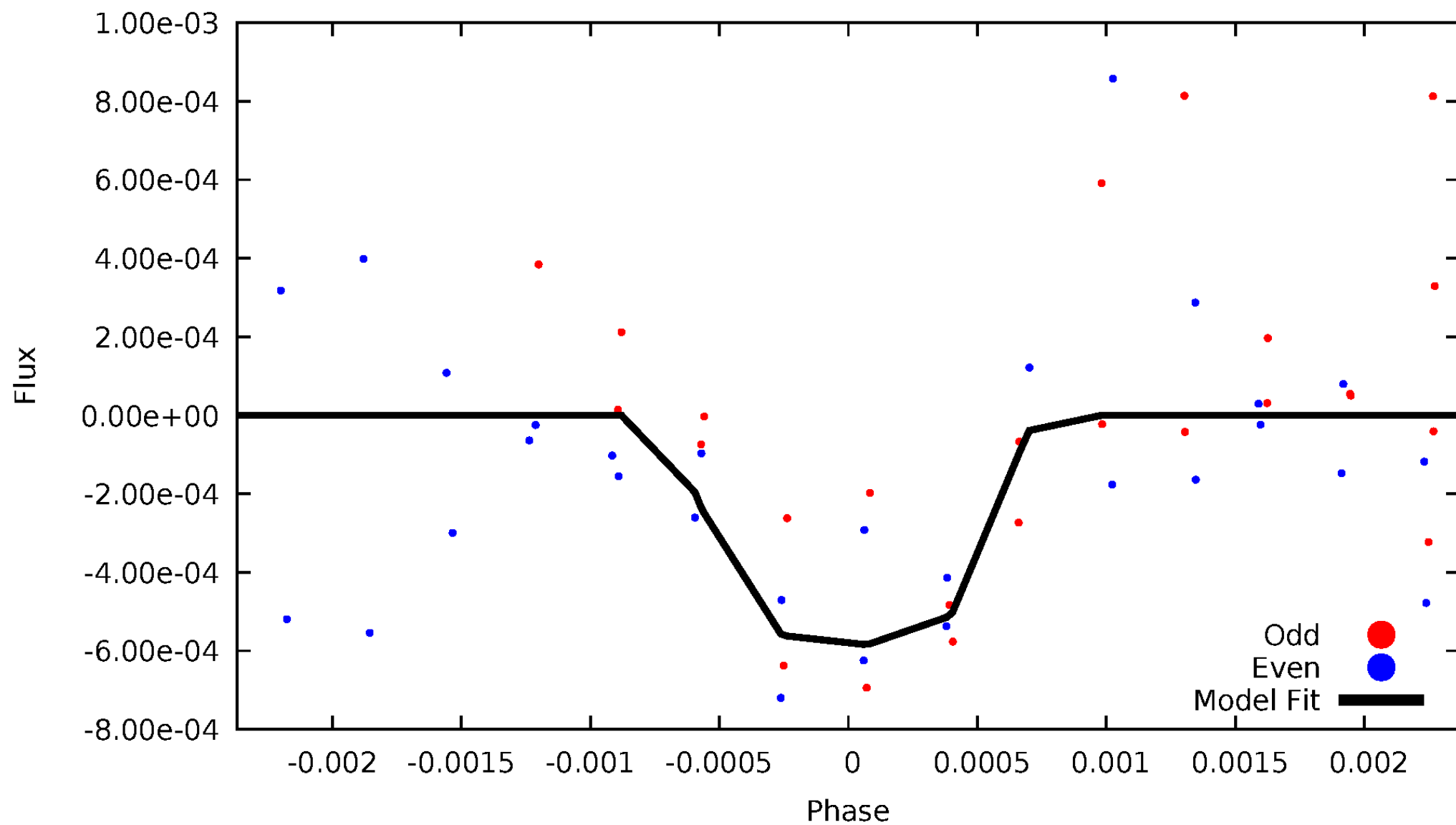


TCE 006635021-02



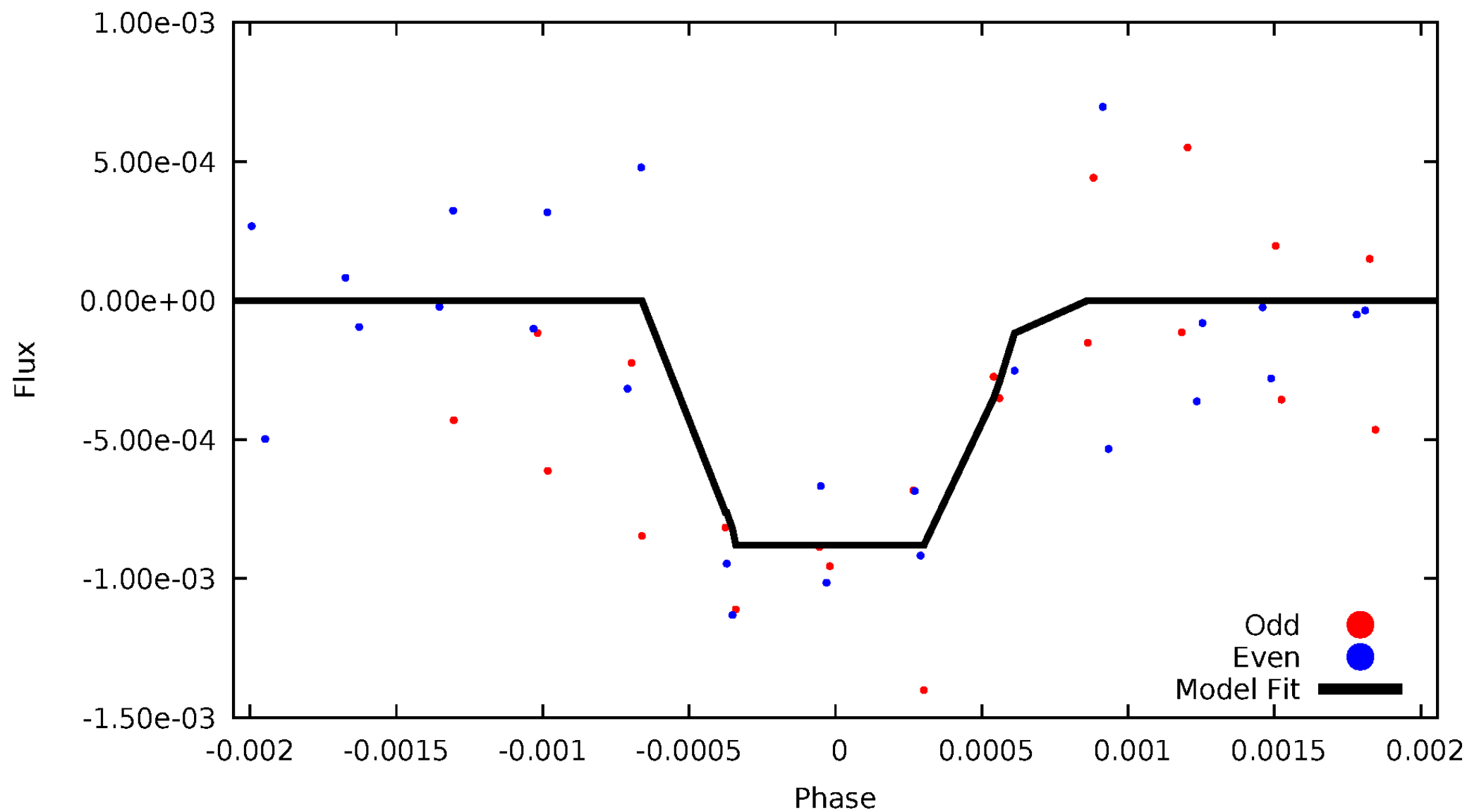
DV Odd/Even

TCE 006635021-02



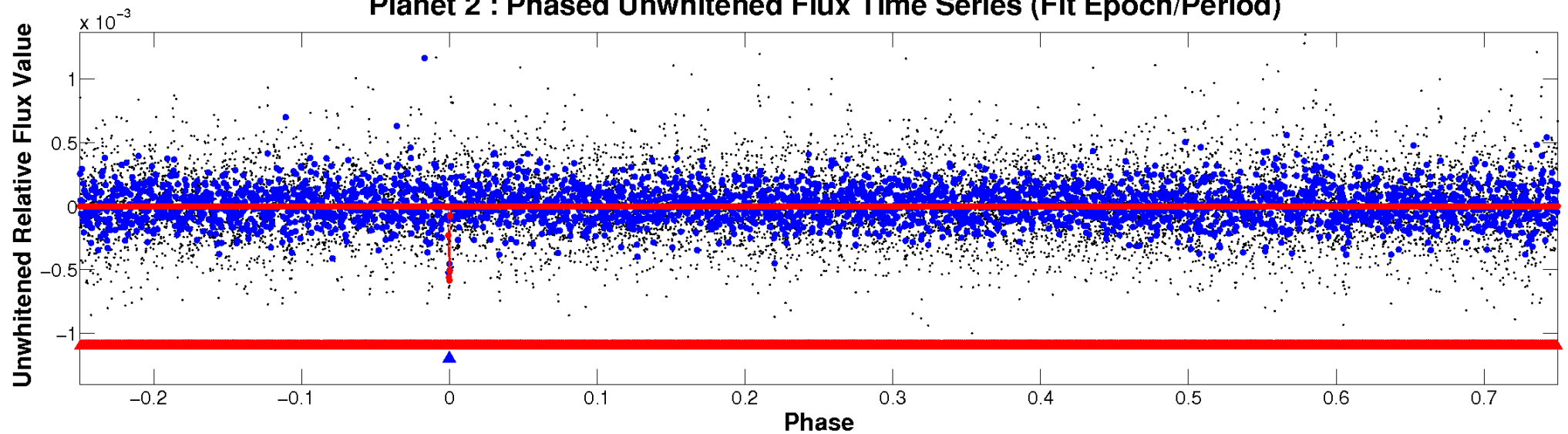
ALT Odd/Even

TCE 006635021-02

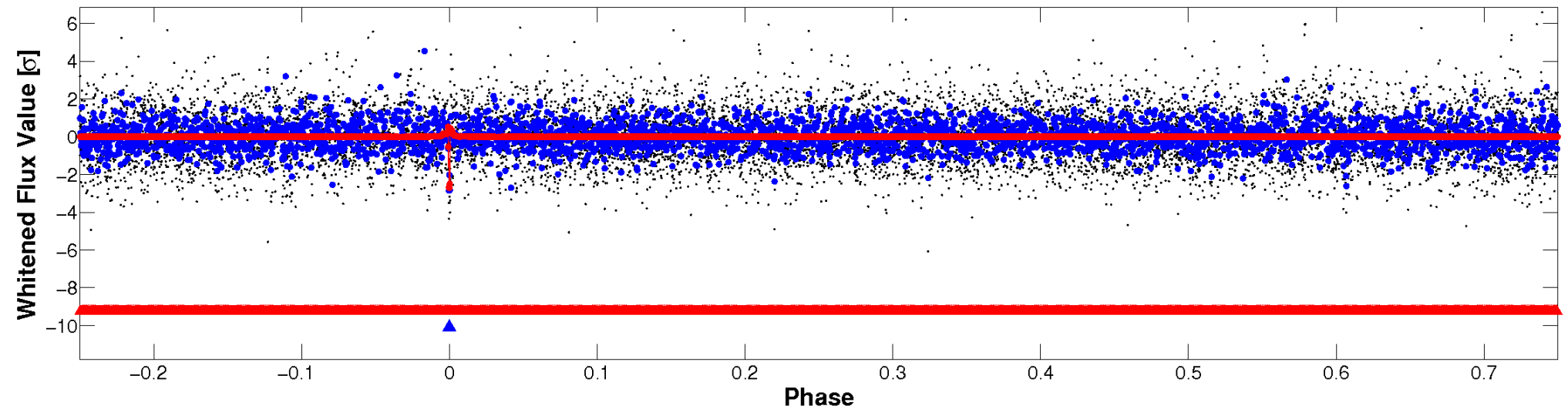


Non-Whitened Vs. Whitened Light Curve

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

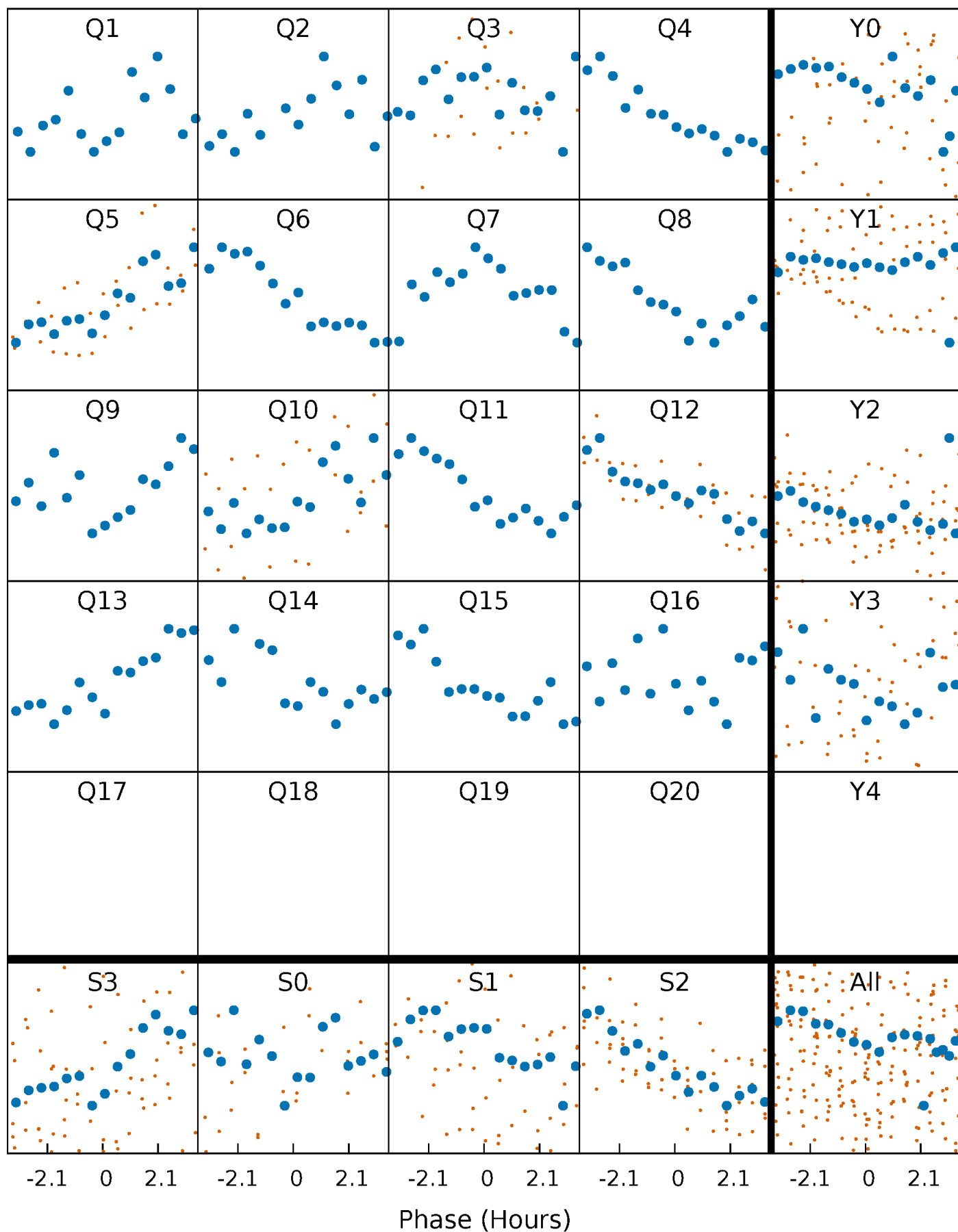


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



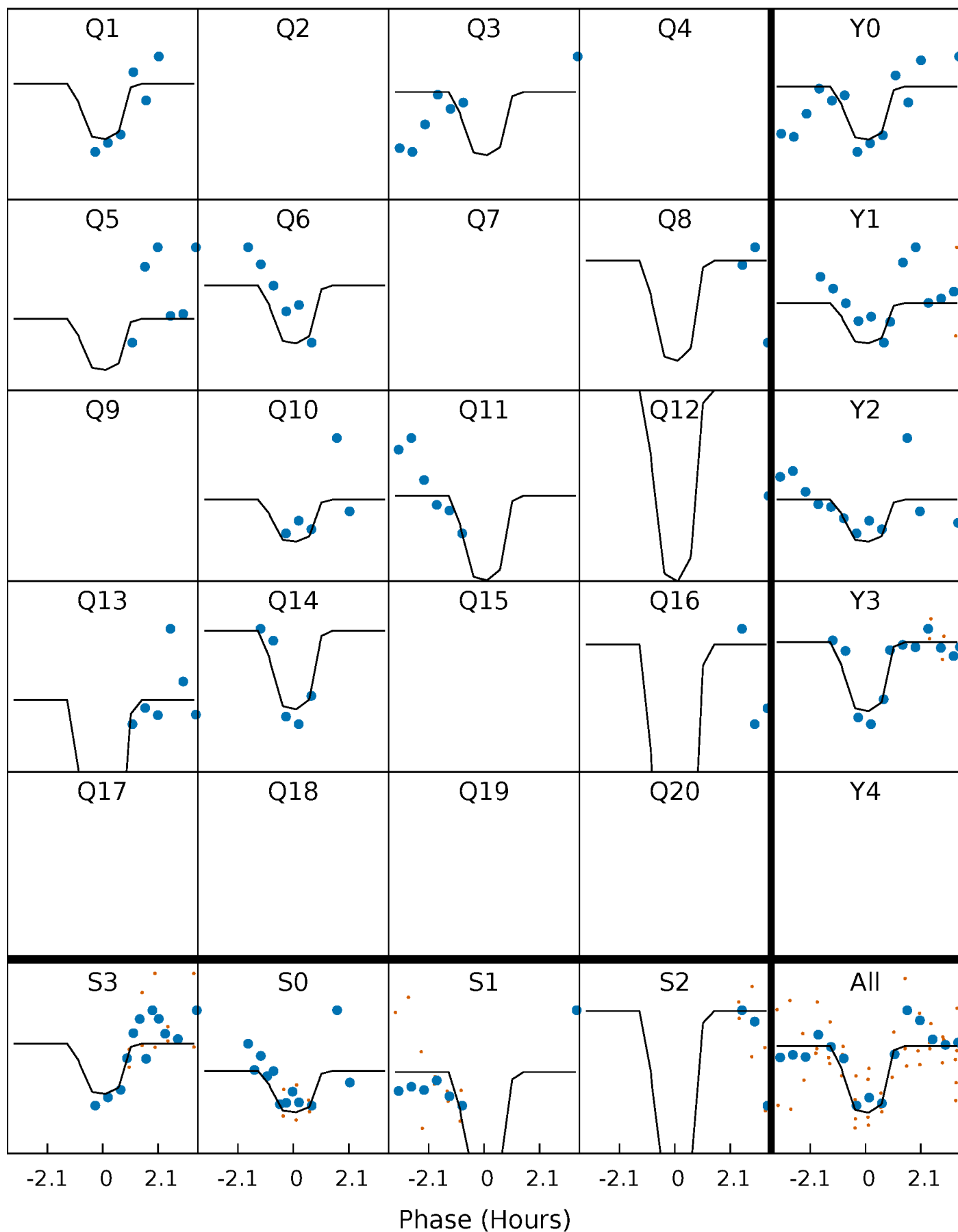
PDC Quarter-Phased Transit Curves

TCE 006635021-02 P= 63.630285 Days $T_0=148.325752$ (BKJD)



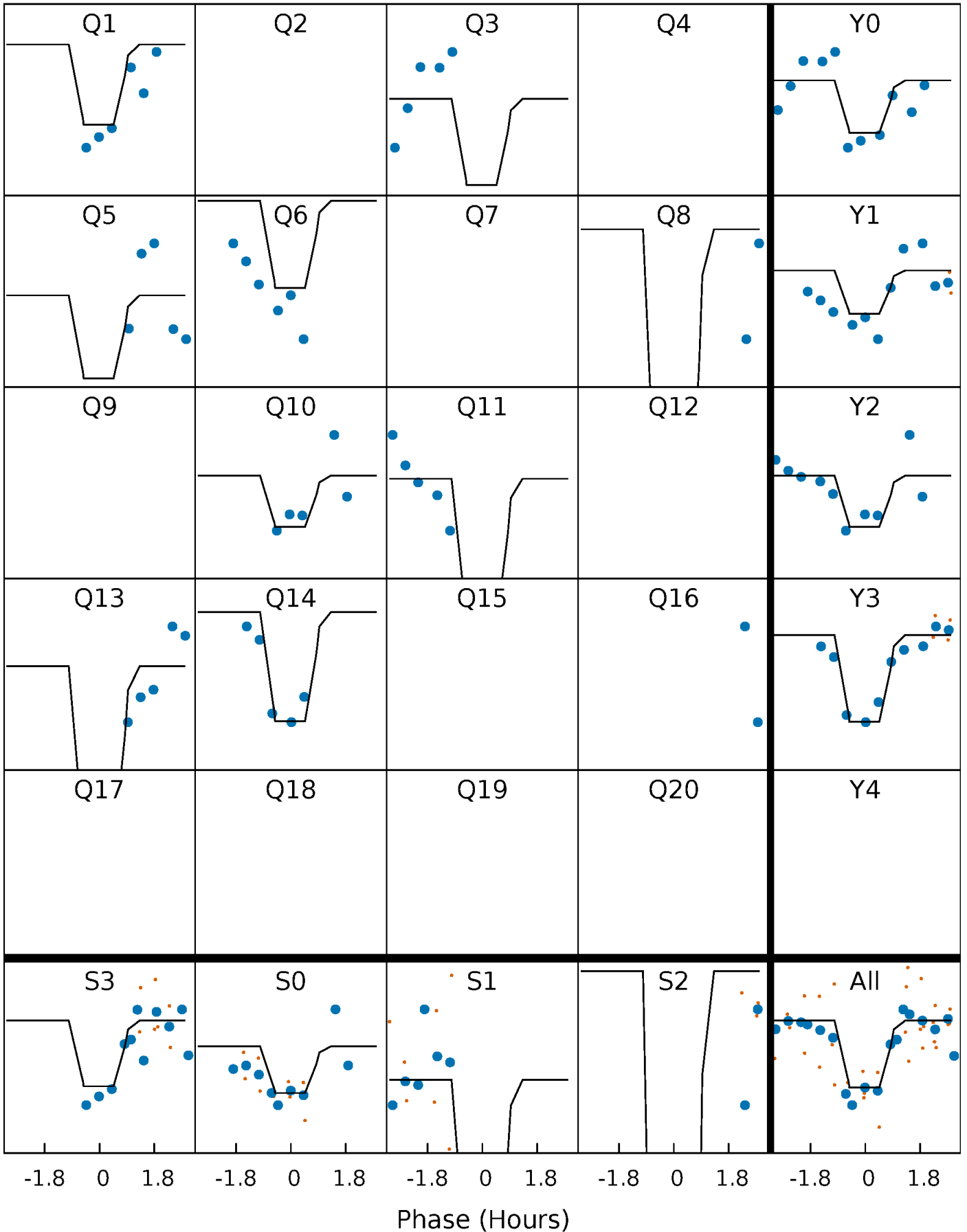
DV Quarter-Phased Transit Curves

TCE 006635021-02 P= 63.630285 Days $T_0=148.325752$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

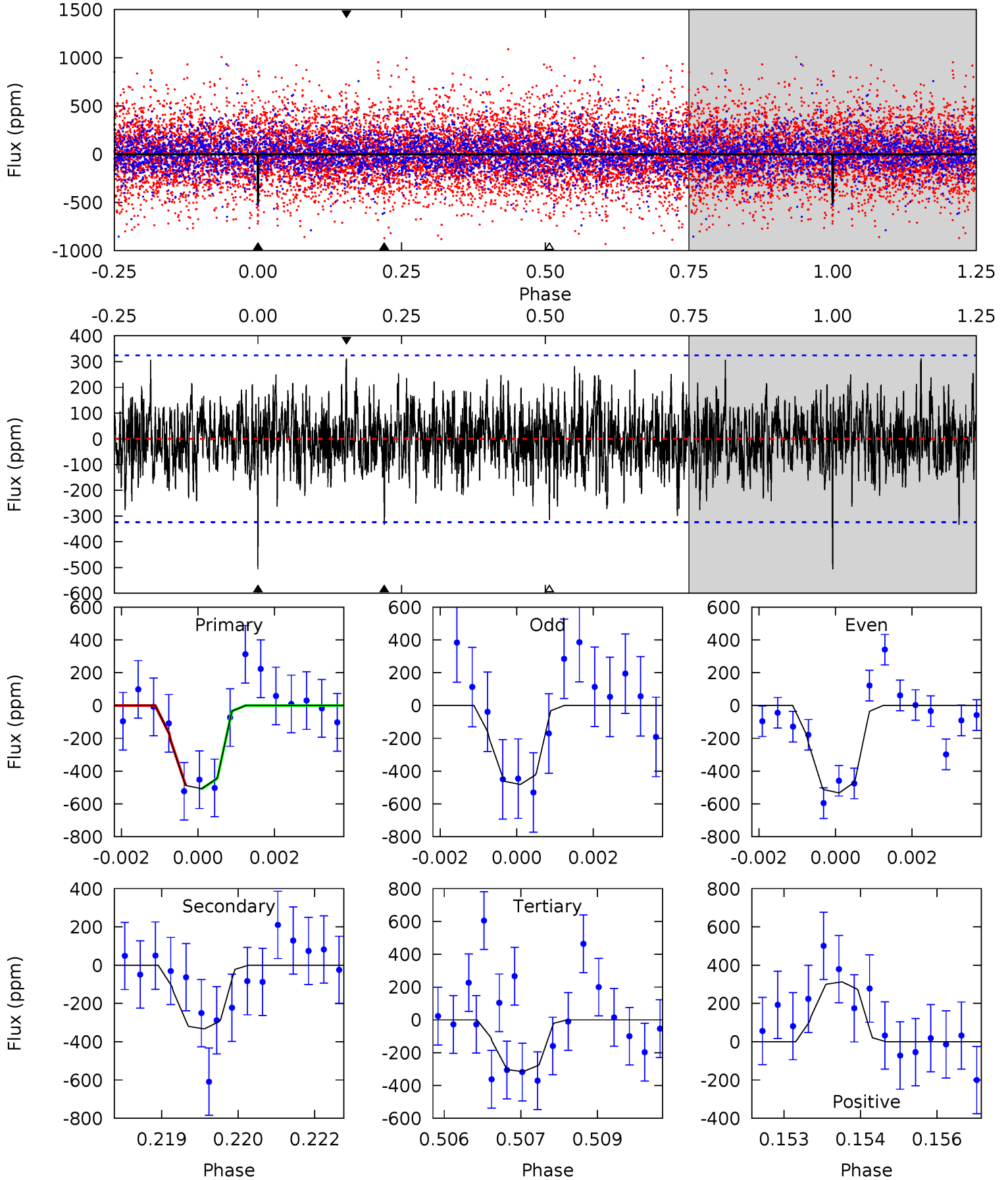
TCE 006635021-02 P= 63.630402 Days $T_0=148.331492$ (BKJD)



DV Model-Shift Uniqueness Test

006635021-02, P = 63.630285 Days, E = 84.695467 Days

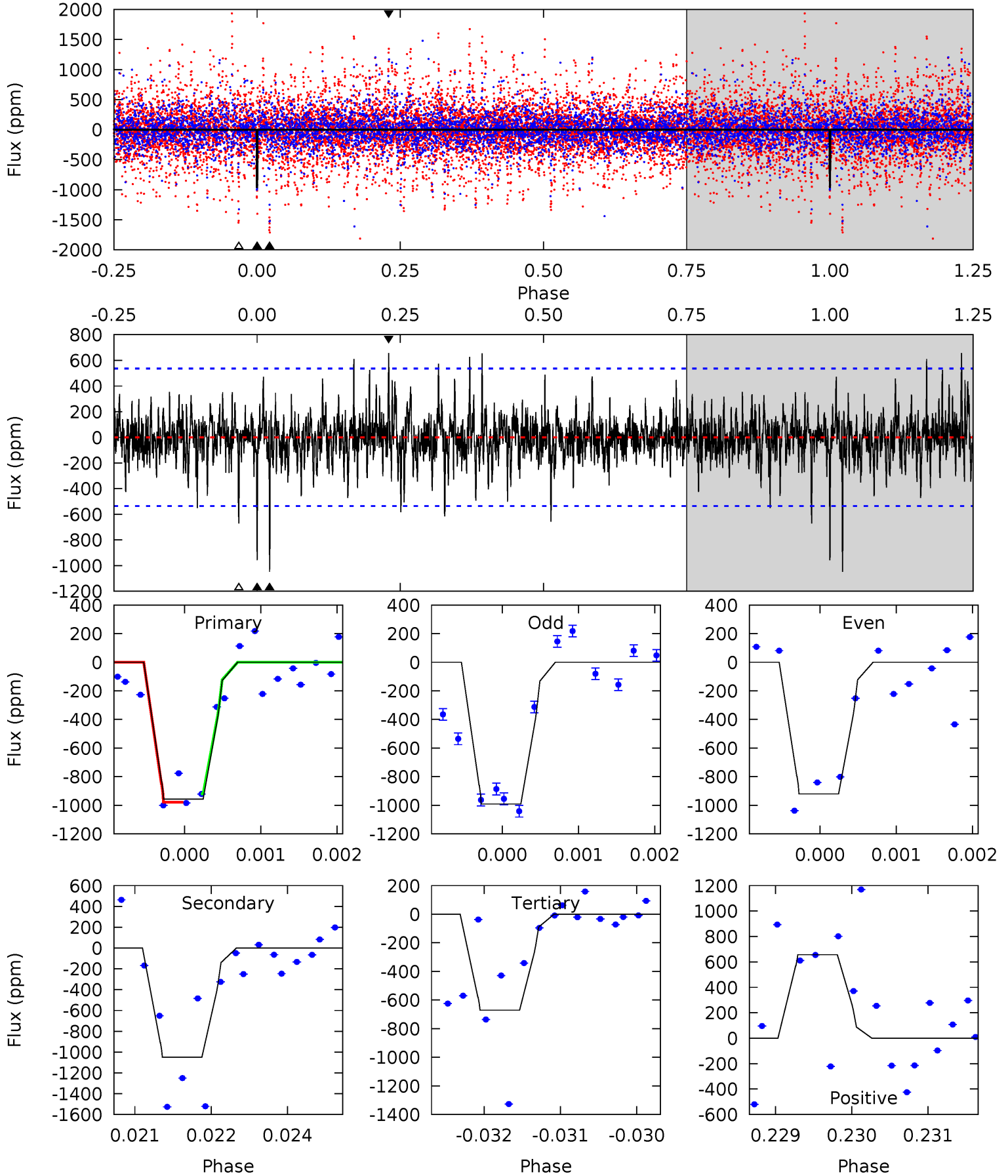
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.39 | 5.51 | 5.22 | 5.18 | 5.37 | 3.16 | 1.51 | 3.17 | 3.22 | 0.29 | 0.34 | 0.42 | 0.98 | 0.38 | 0.19 |



Alt Model-Shift Uniqueness Test

006635021-02, P = 63.630402 Days, E = 84.701090 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.67 | 10.6 | 6.78 | 6.63 | 5.41 | 3.23 | 1.46 | 2.89 | 3.04 | 3.82 | 3.96 | 0.32 | 1.02 | 0.39 | 0.30 |



Stellar Parameters For KIC 006635021

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6303^{+175}_{-219} | $4.254^{+0.158}_{-0.193}$ | $-0.180^{+0.250}_{-0.300}$ | $1.278^{+0.384}_{-0.256}$ | $1.065^{+0.185}_{-0.123}$ | $0.720^{+0.636}_{-0.357}$ |
| | +3%/-3% | +4%/-5% | +139%/-167% | +30%/-20% | +17%/-12% | +88%/-50% |
| Source | PHO1 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 006635021-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|----------------|------------------------|-------------------|------------------------|-------------------------|
| DV | -333 ± 60 | $4.13^{+3.79}_{-2.43}$ | 783^{+58}_{-55} | 5030^{+3271}_{-1085} | 1079^{+5497}_{-789} |
| Alt. | -1048 ± 99 | $5.03^{+3.87}_{-2.95}$ | 781^{+61}_{-54} | 5952^{+4176}_{-1247} | 2293^{+11412}_{-1537} |

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 $A_{obs} \gg 1.0$

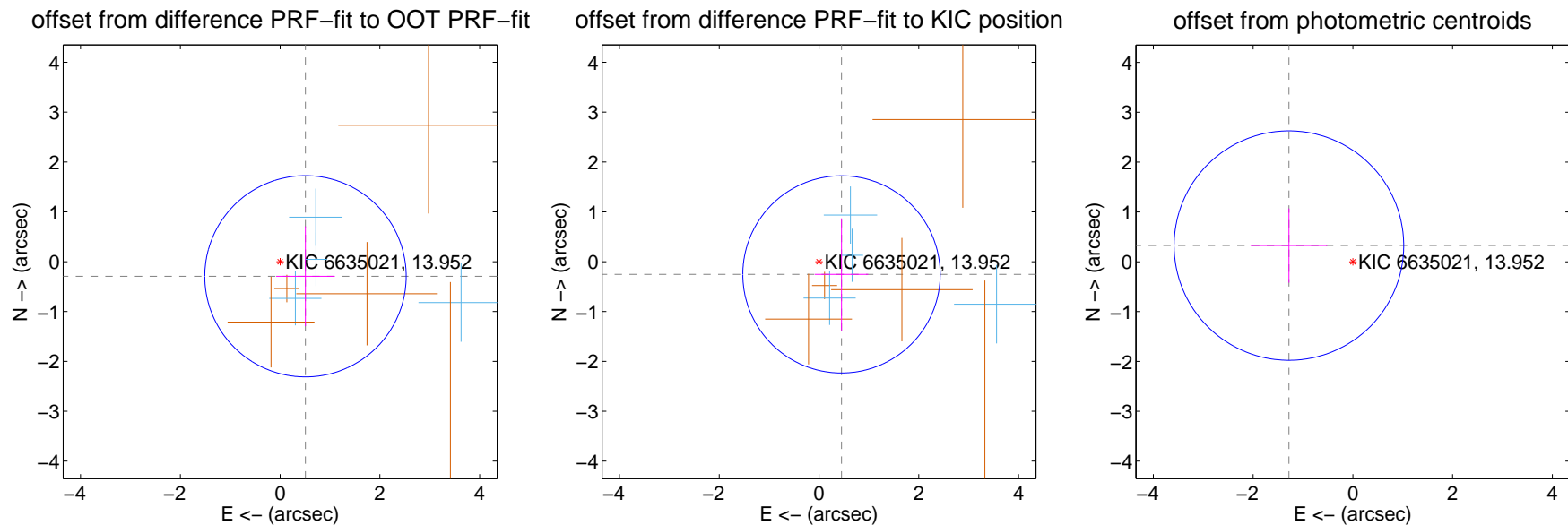
DV Centroid Data

Supplemental centroid analysis for 006635021-02. Kepler magnitude: 13.95. Transit SNR 9.23

There are 4 quarters with good PRF difference image offsets

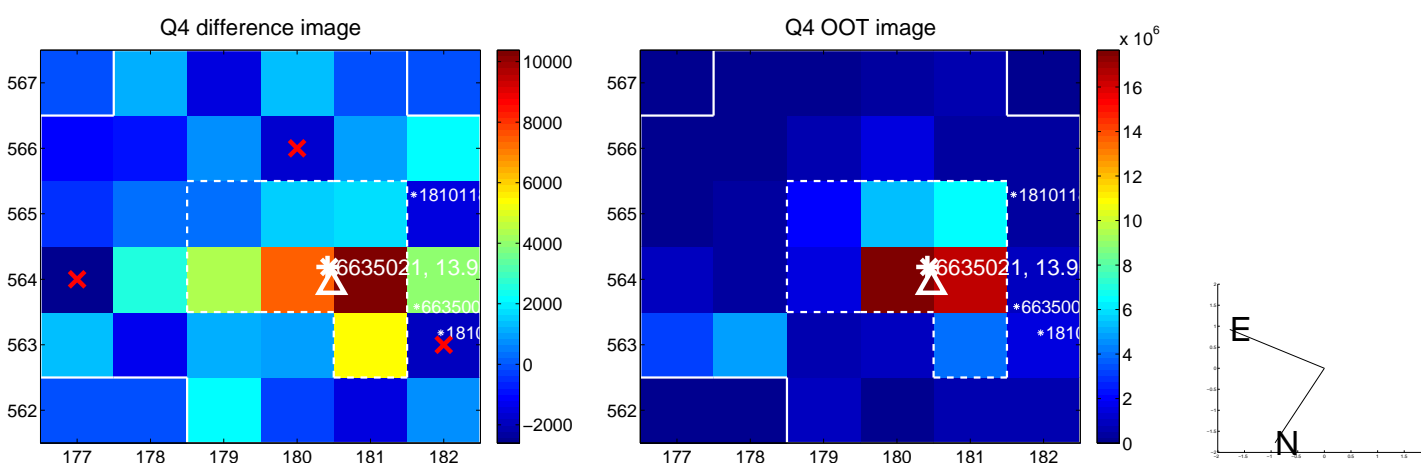
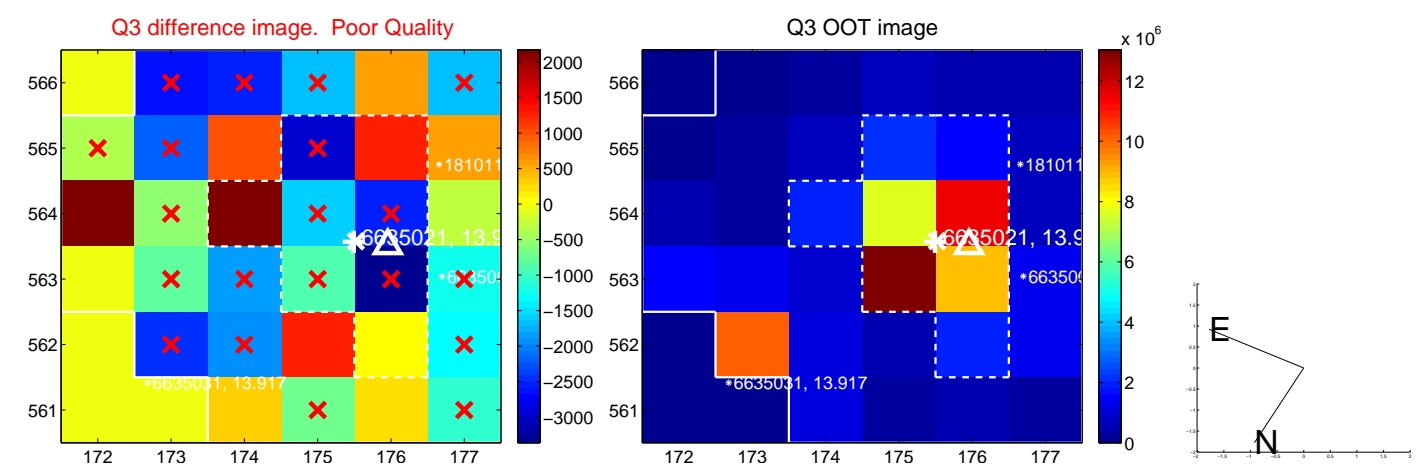
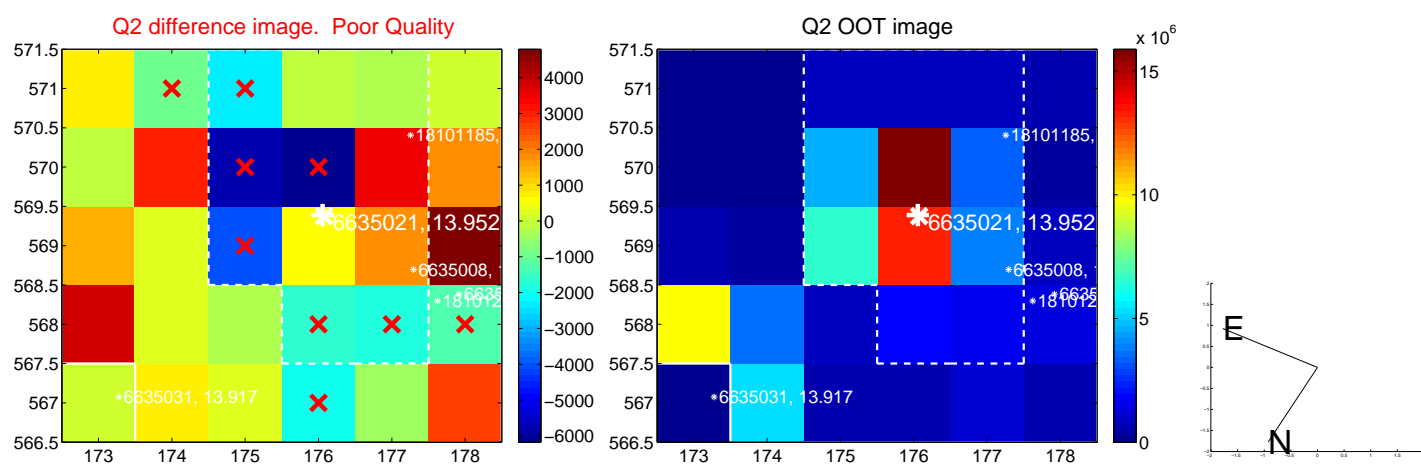
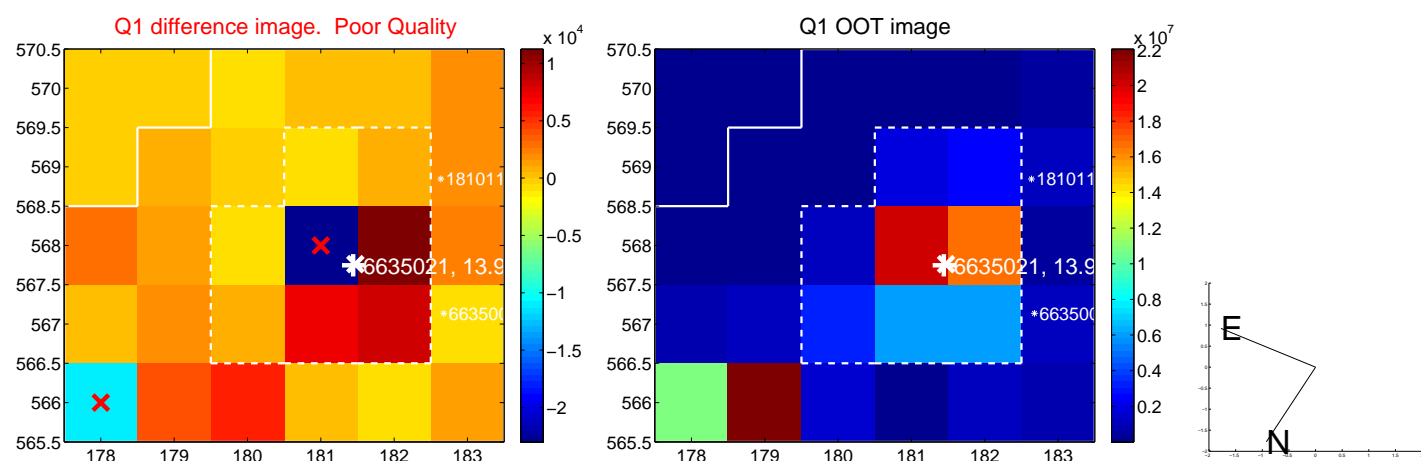
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.586 ± 0.673 | 0.87 | -0.508 ± 0.588 | -0.292 ± 1.002 |
| PRF-fit source offset from KIC position | 0.518 ± 0.659 | 0.79 | -0.451 ± 0.536 | -0.255 ± 1.125 |
| photometric centroid source offset | 1.32 ± 0.77 | 1.72 | 1.28 ± 0.77 | 0.33 ± 0.74 |

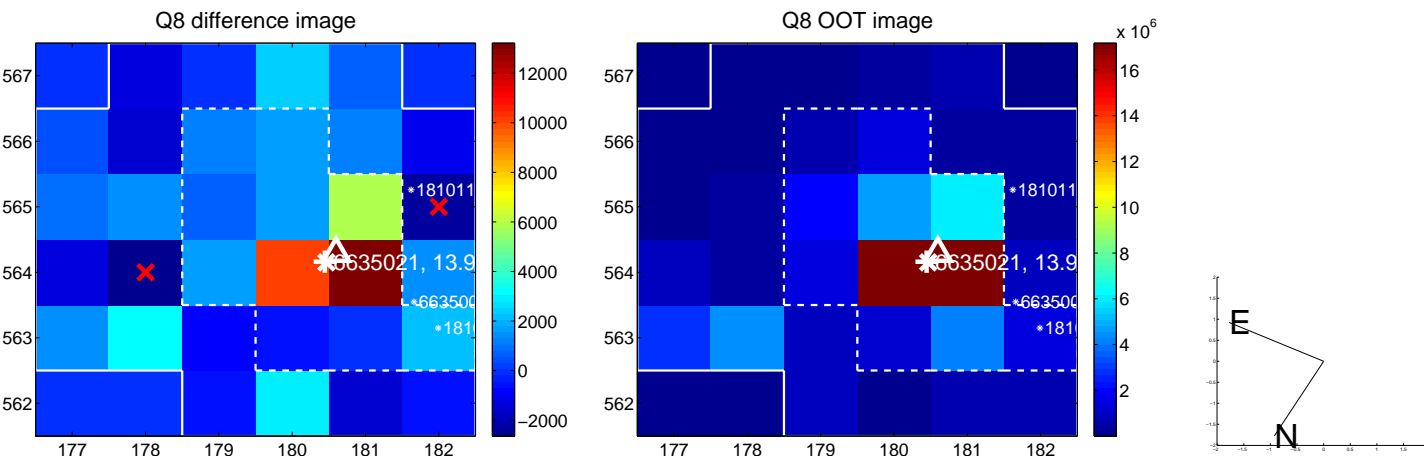
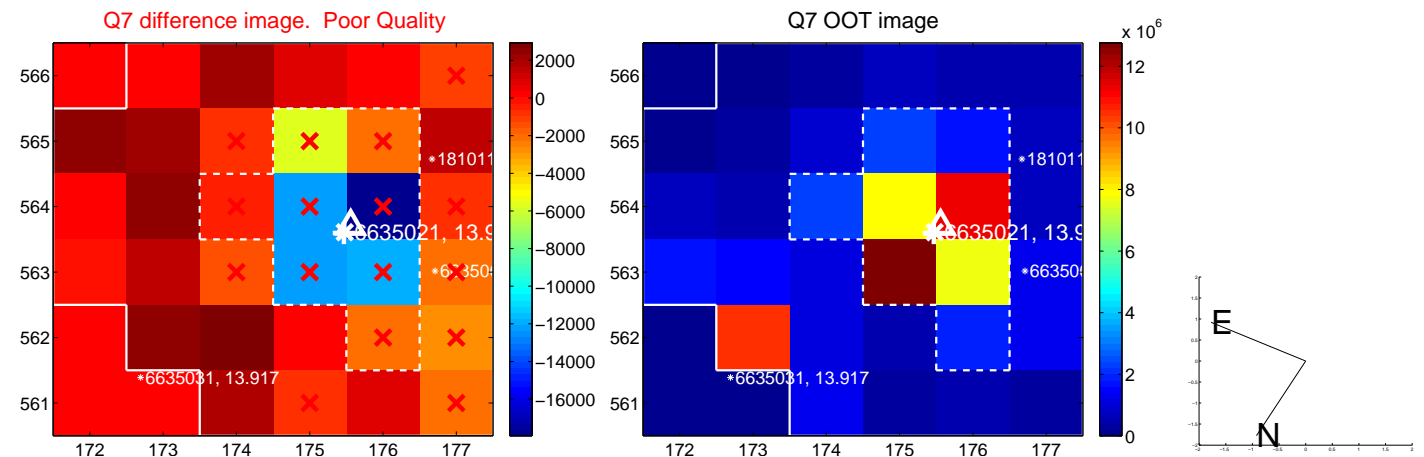
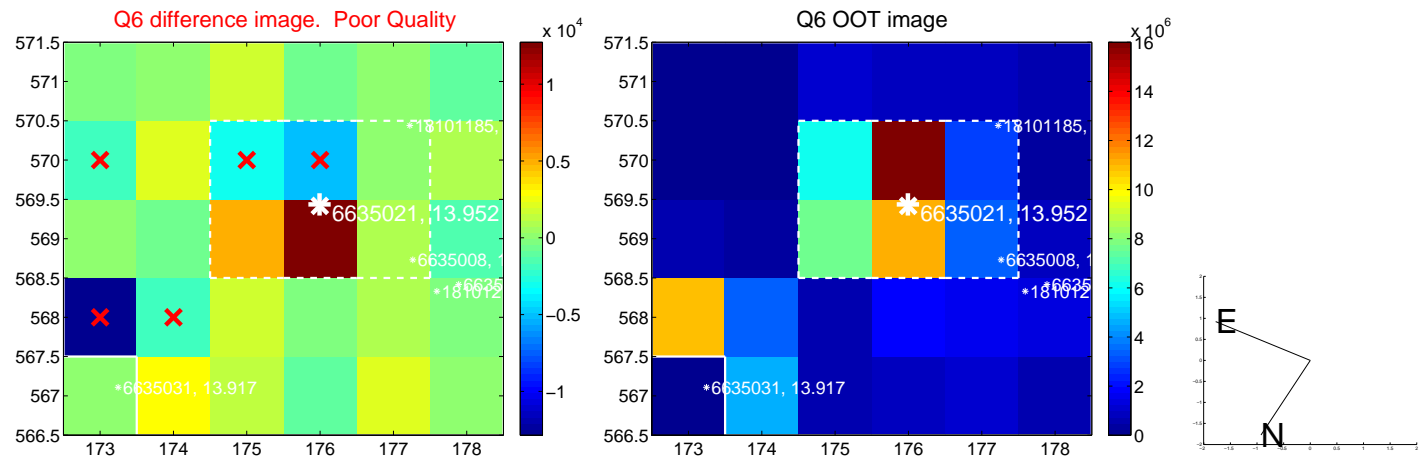
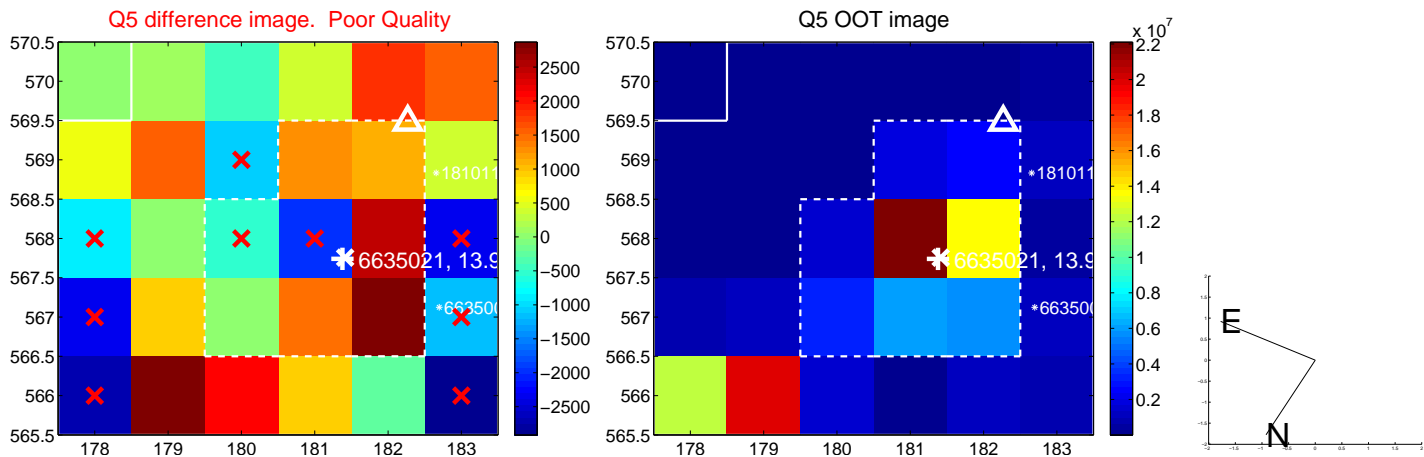


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

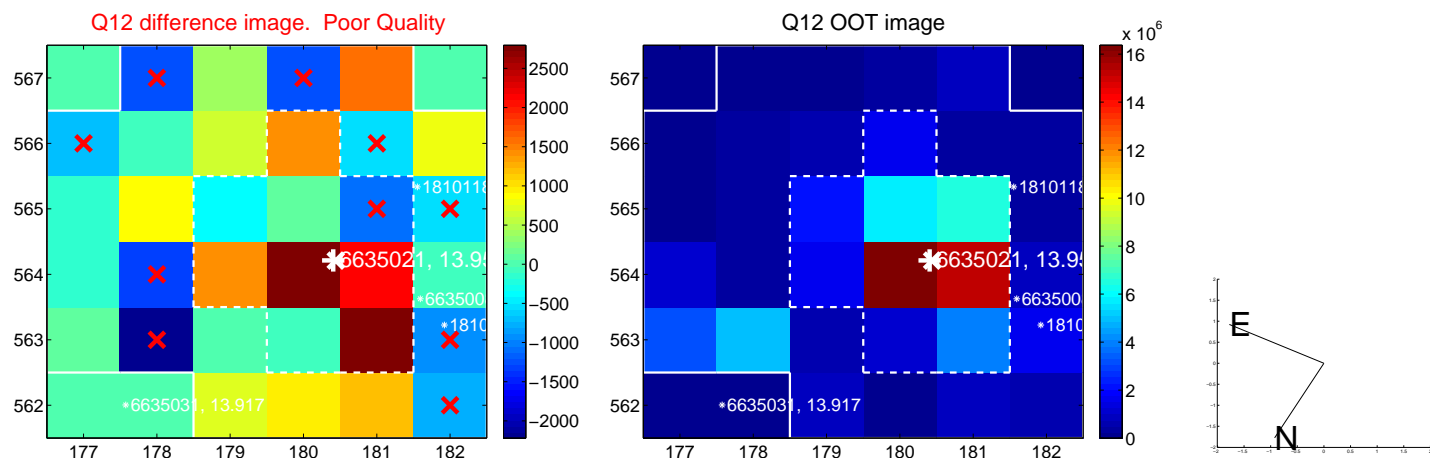
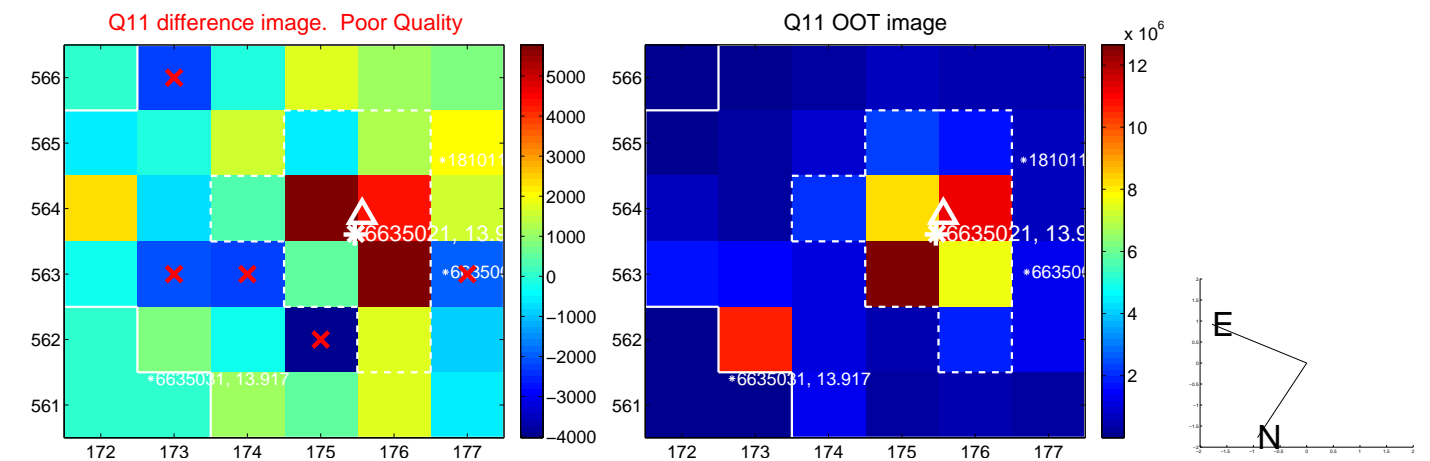
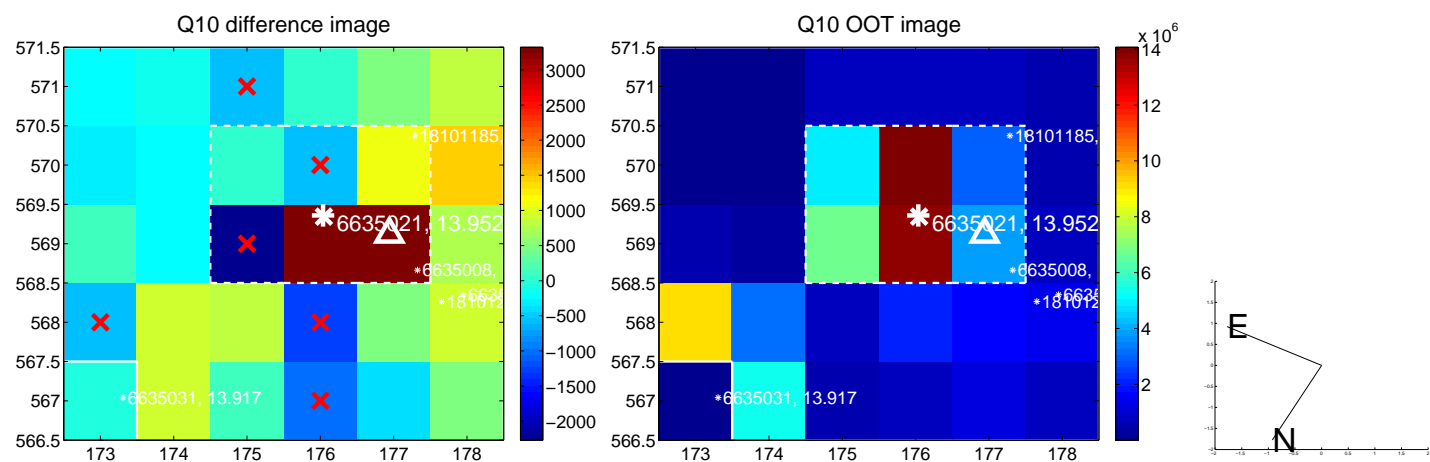
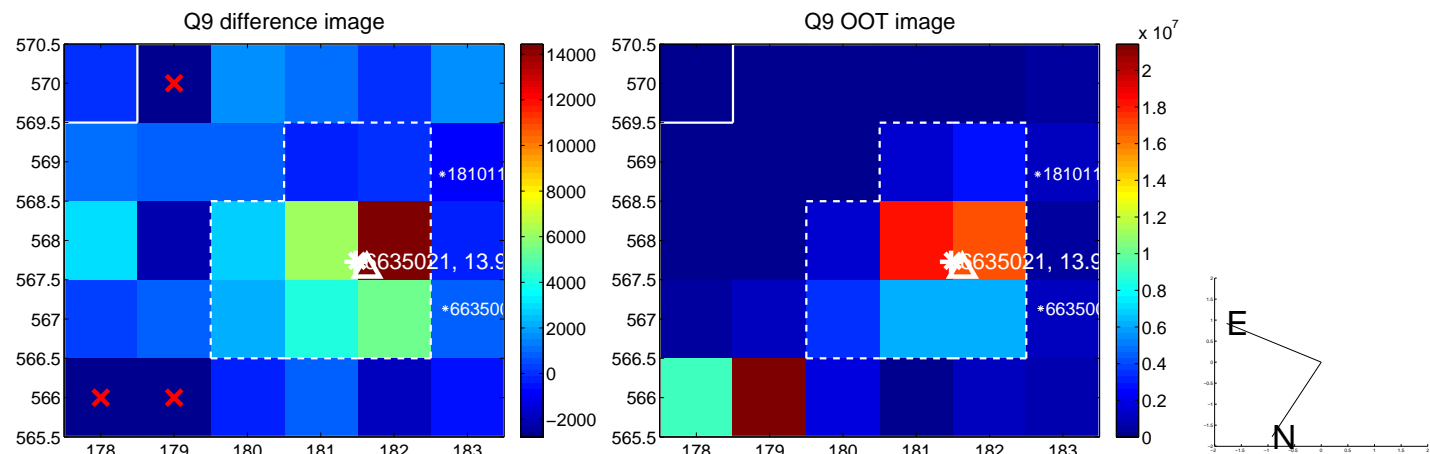
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



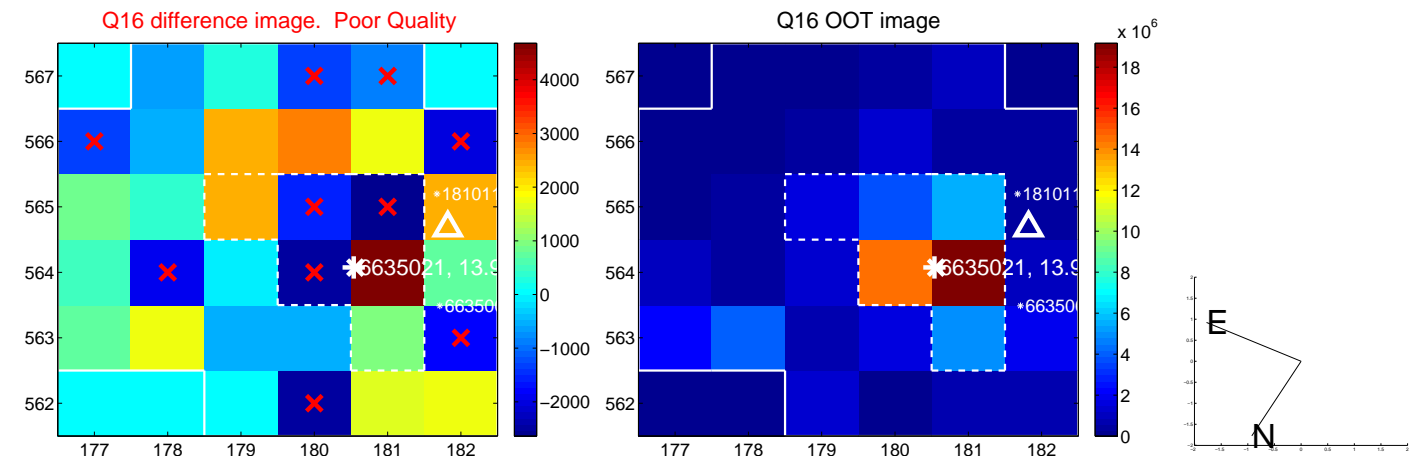
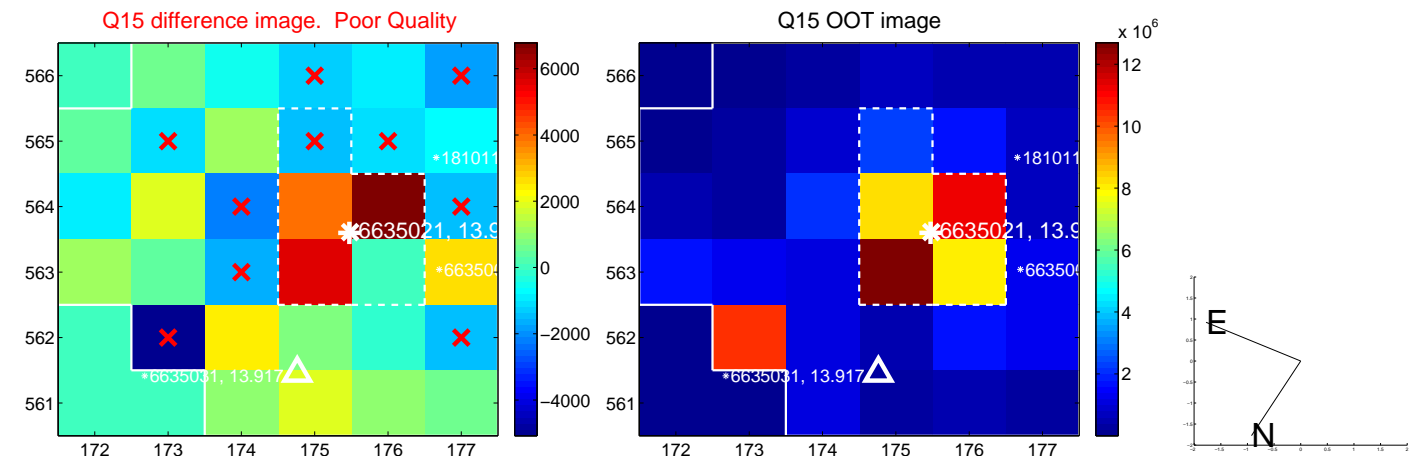
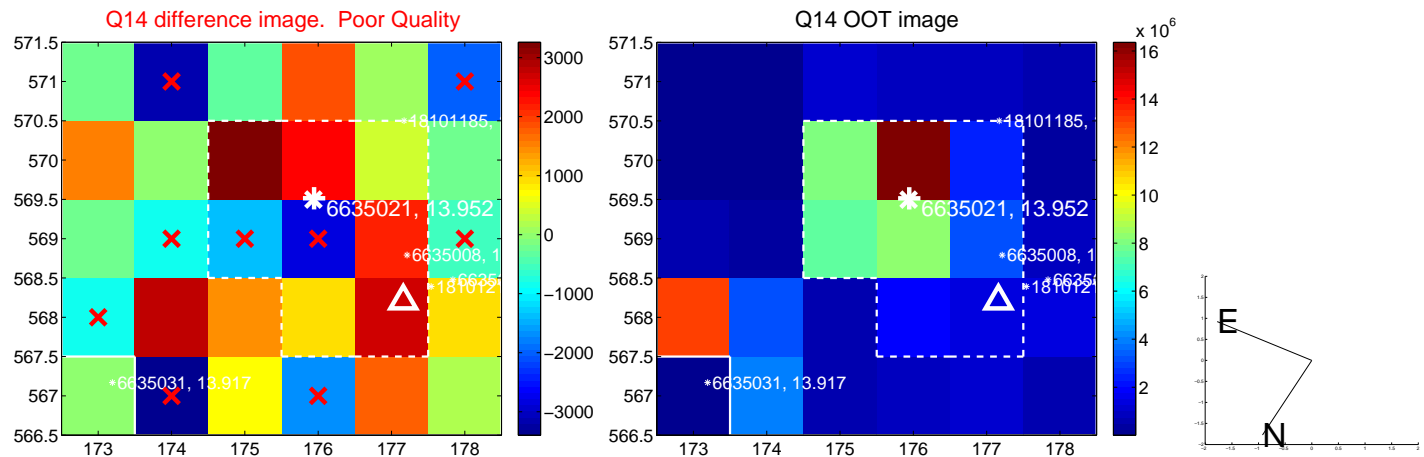
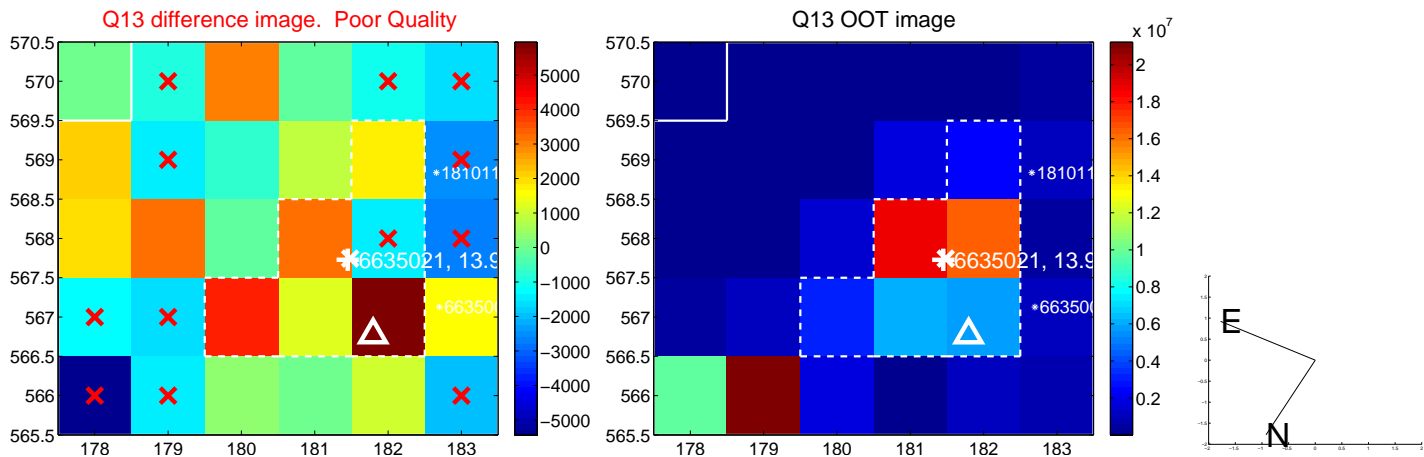
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



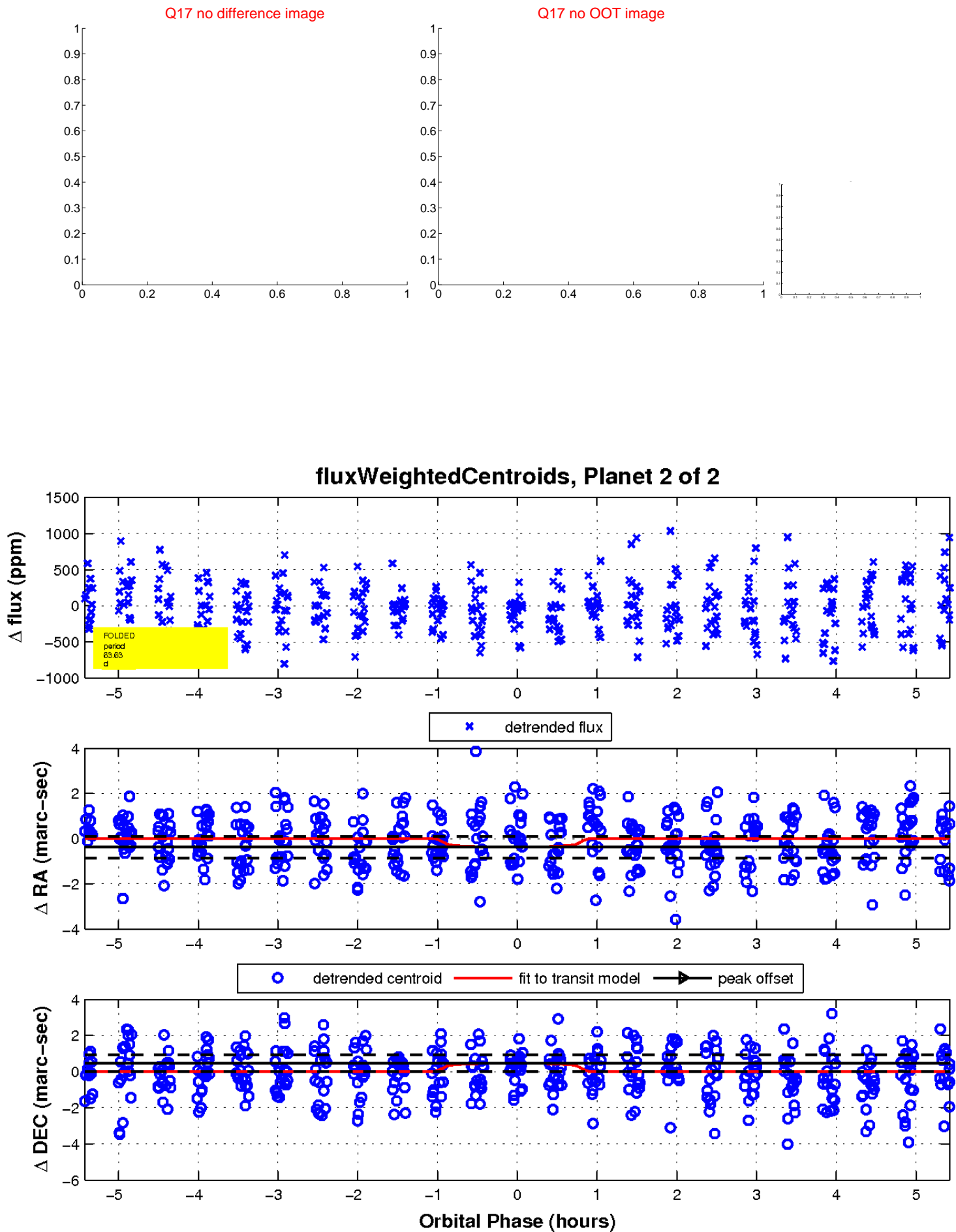
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

