

KIC 001296164

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 001296164-01 | OBS | No | 1.961092 | 132.264305 | 41.6 | 7.659 | 11.3 | 10.2 | 1.75 | 6977 | 1.14 | 5526.23 |
| 001296164-02 | OBS | No | 65.235397 | 154.517775 | 264.8 | 3.252 | 7.4 | 7.9 | 1.75 | 6977 | 3.58 | 51.66 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|-------------------------------------|
| 001296164-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—MOD_NONUNIQ_ALT |
| 001296164-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT |

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

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

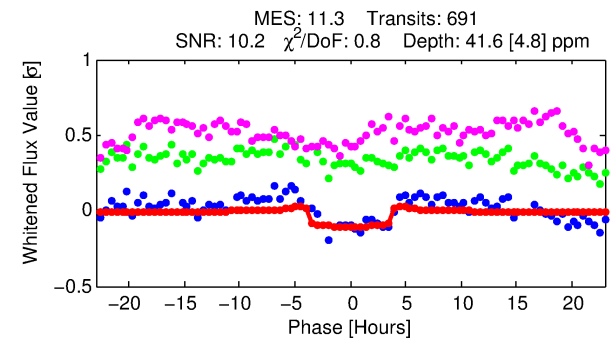
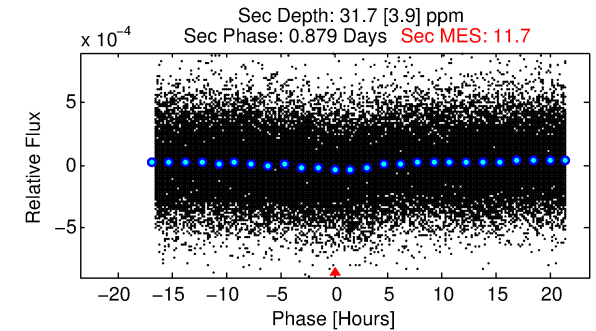
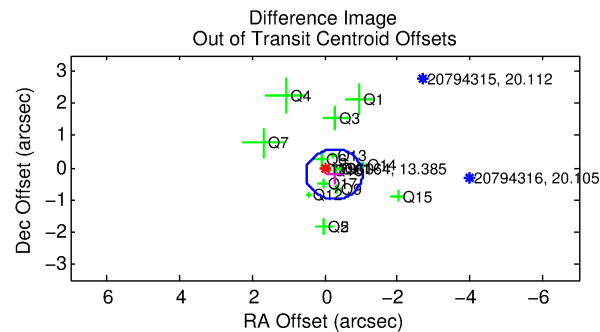
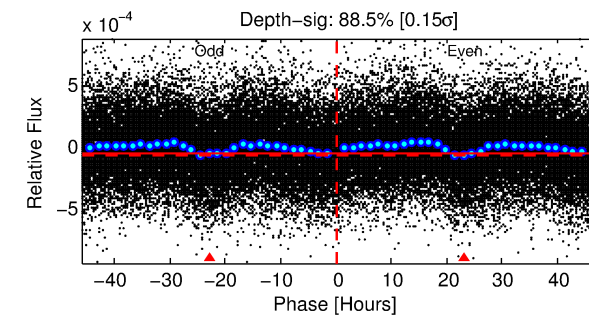
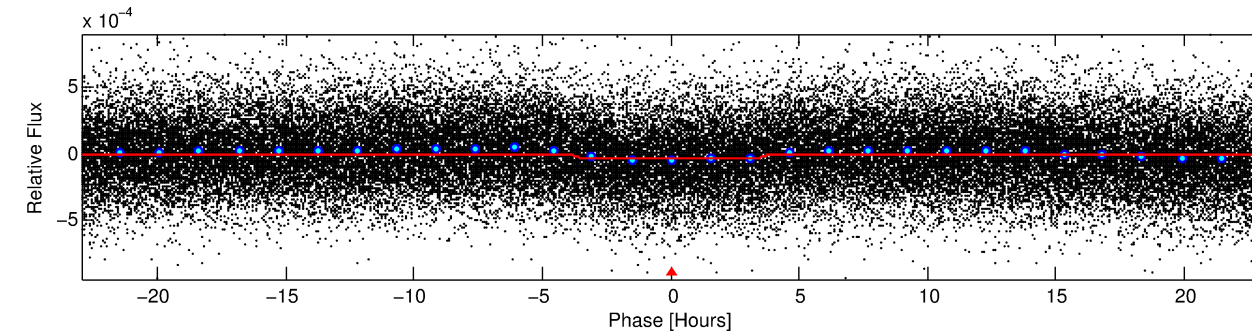
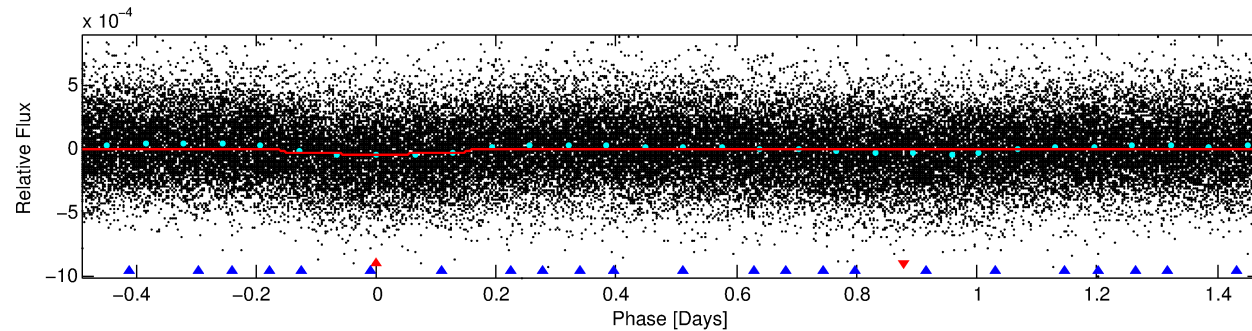
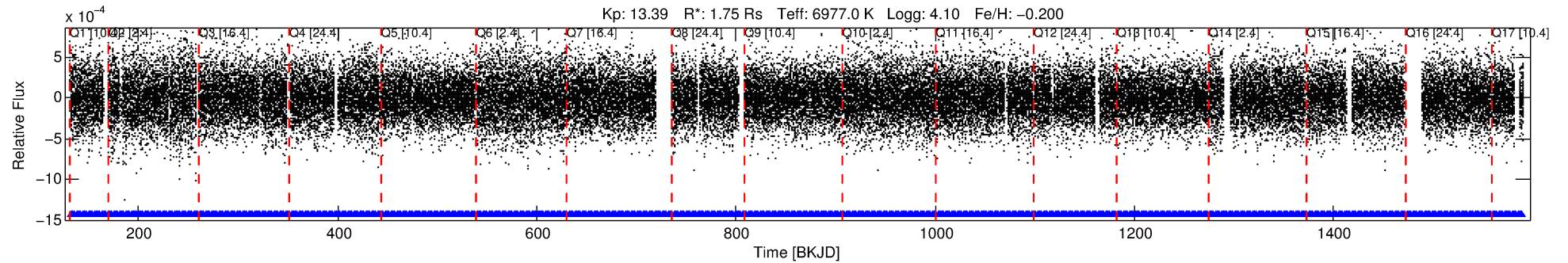
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 001296164-01

No Significant Match Found

DV One-Page Summary

KIC: 1296164 Candidate: 1 of 2 Period: 1.961 d



DV Fit Results:

Period = 1.96109 [0.00002] d
Epoch = 132.2643 [0.0047] BKJD
Rp/R* = 0.0060 [0.0044]
a/R* = 2.06 [6.50]
b = 0.01 [514.17]
Seff = 5526.23 [2302.06]
Teq = 2199 [229] K
Rp = 1.14 [0.91] Re
a = 0.0343 [0.0089] AU
Ag = 15.75 [23.90] [0.62 σ]
Teffp = 6772 [2503] K [1.82 σ]

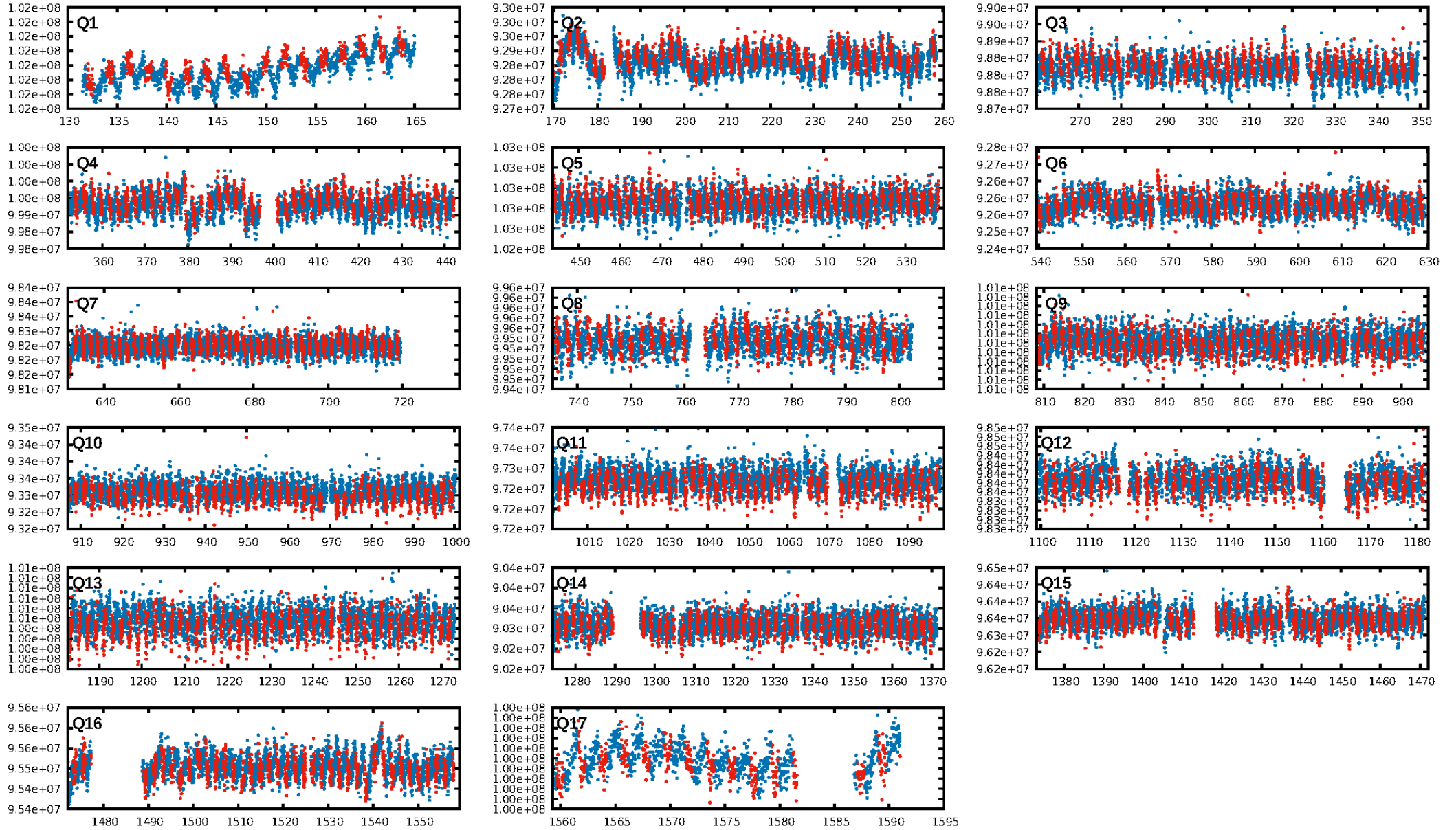
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [182.50 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.57e-21
RollingBand-fgt: 1.00 [660/660]
GhostDiagnostic-chr: 1.901
Centroid-sig: 0.0%
Centroid-so: 3.332 arcsec [3.77 σ]
OotOffset-rm: 0.333 arcsec [1.29 σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-rm: 0.090 arcsec [0.37 σ]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 0.62 [10/16]
DiffImageOverlap-fno: 1.00 [17/17]

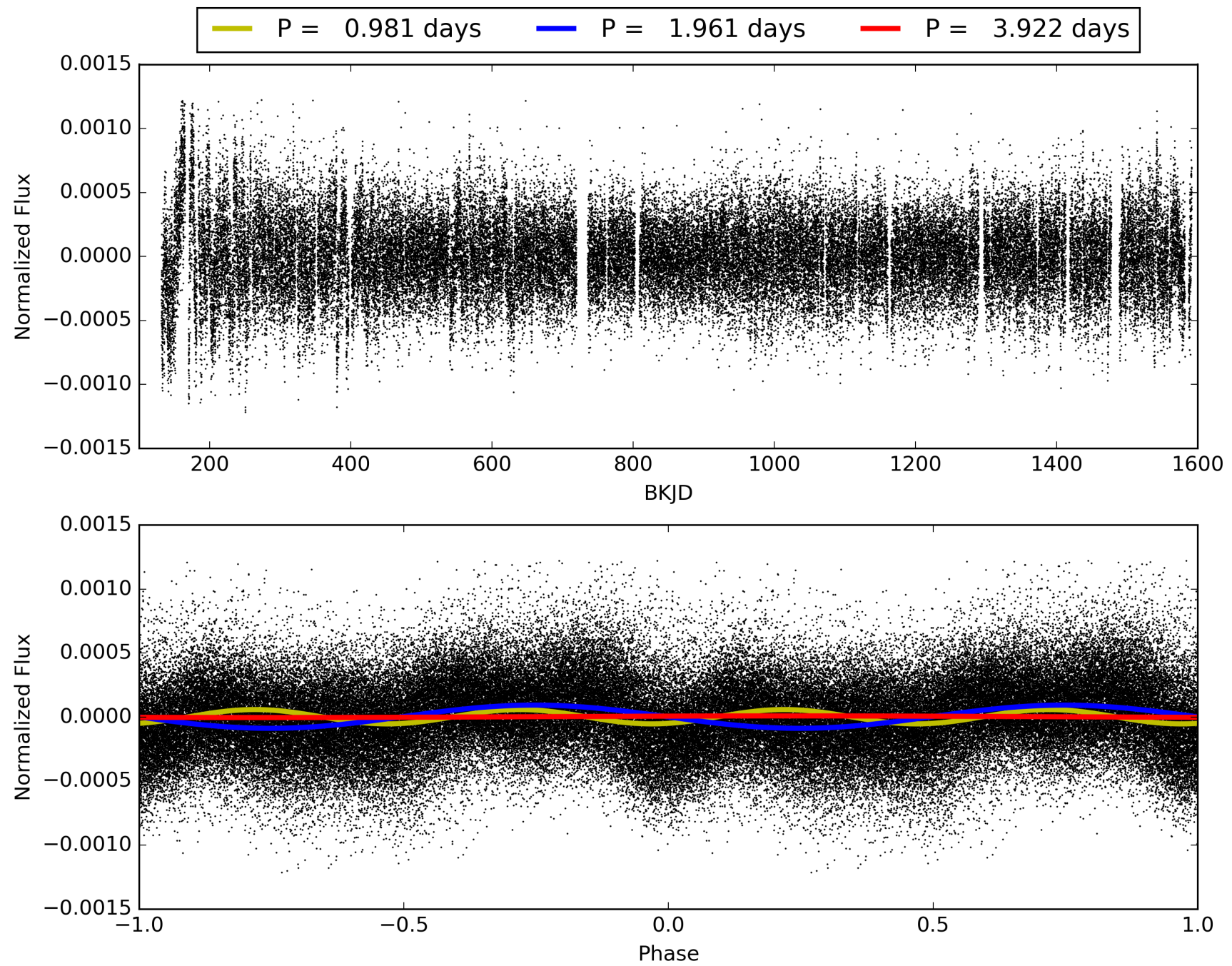
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:22:45 Z

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

TCE 001296164-01, PDC Light Curves

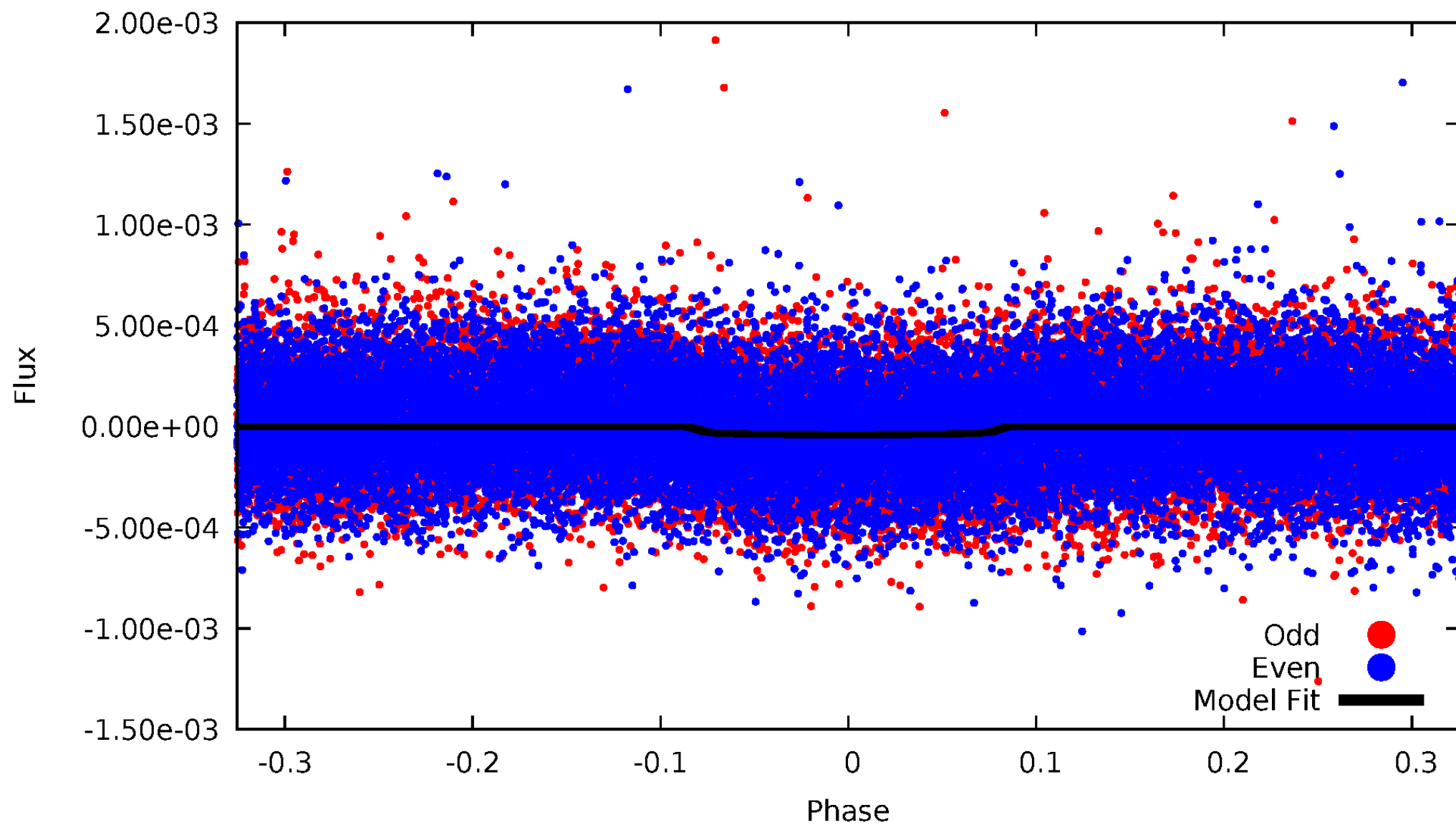


TCE 001296164-01



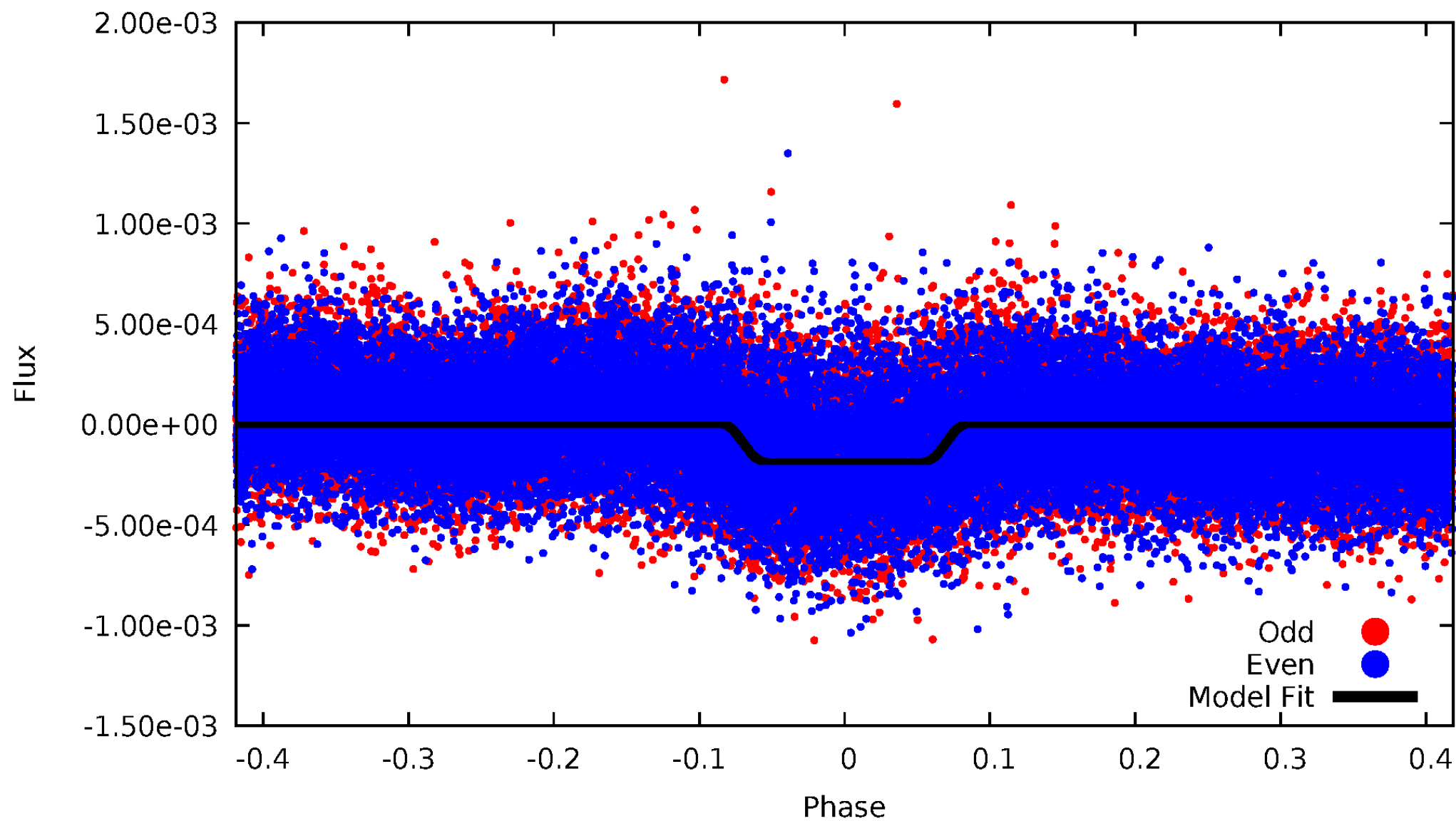
DV Odd/Even

TCE 001296164-01

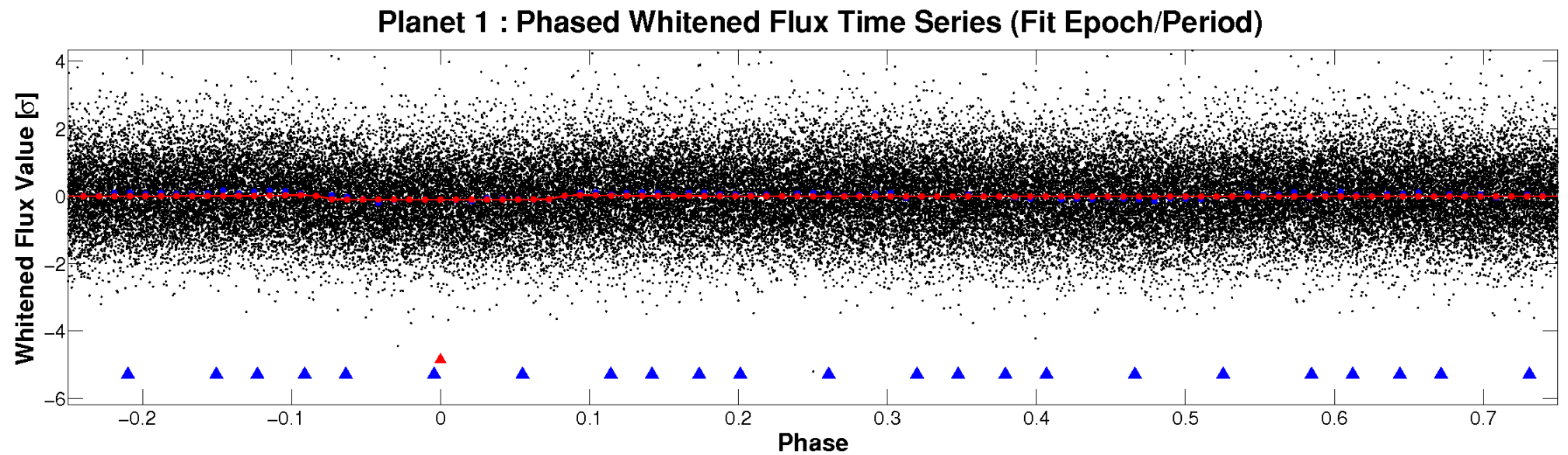
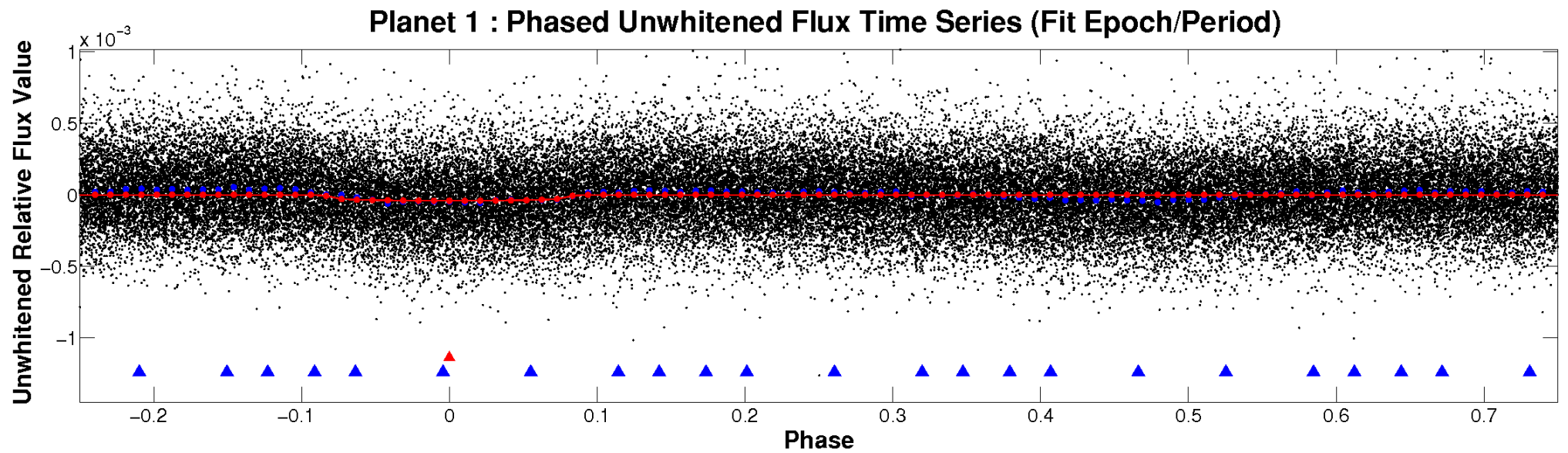


ALT Odd/Even

TCE 001296164-01

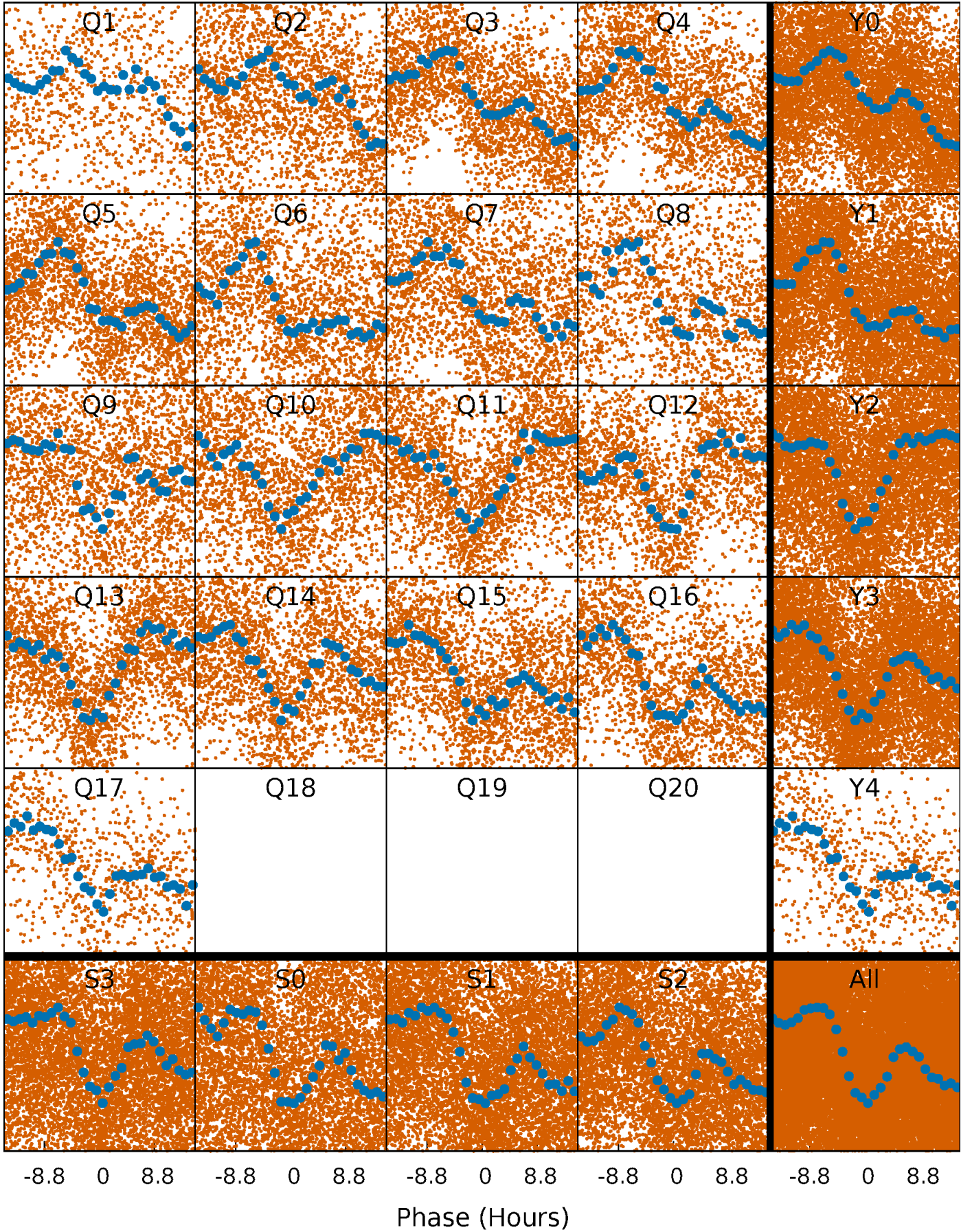


Non-Whitened Vs. Whitened Light Curve



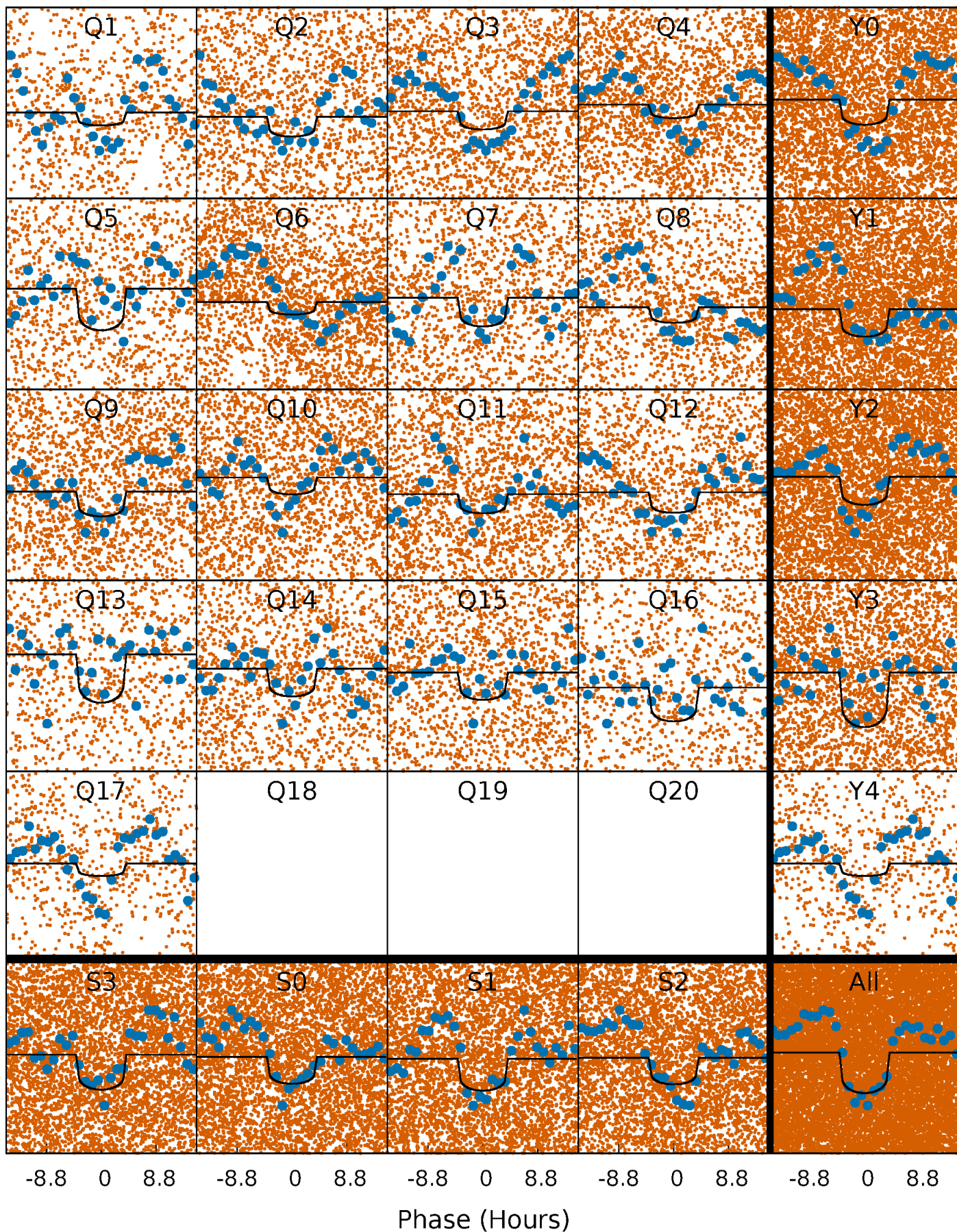
PDC Quarter-Phased Transit Curves

TCE 001296164-01 P= 1.961092 Days $T_0=132.264306$ (BKJD)



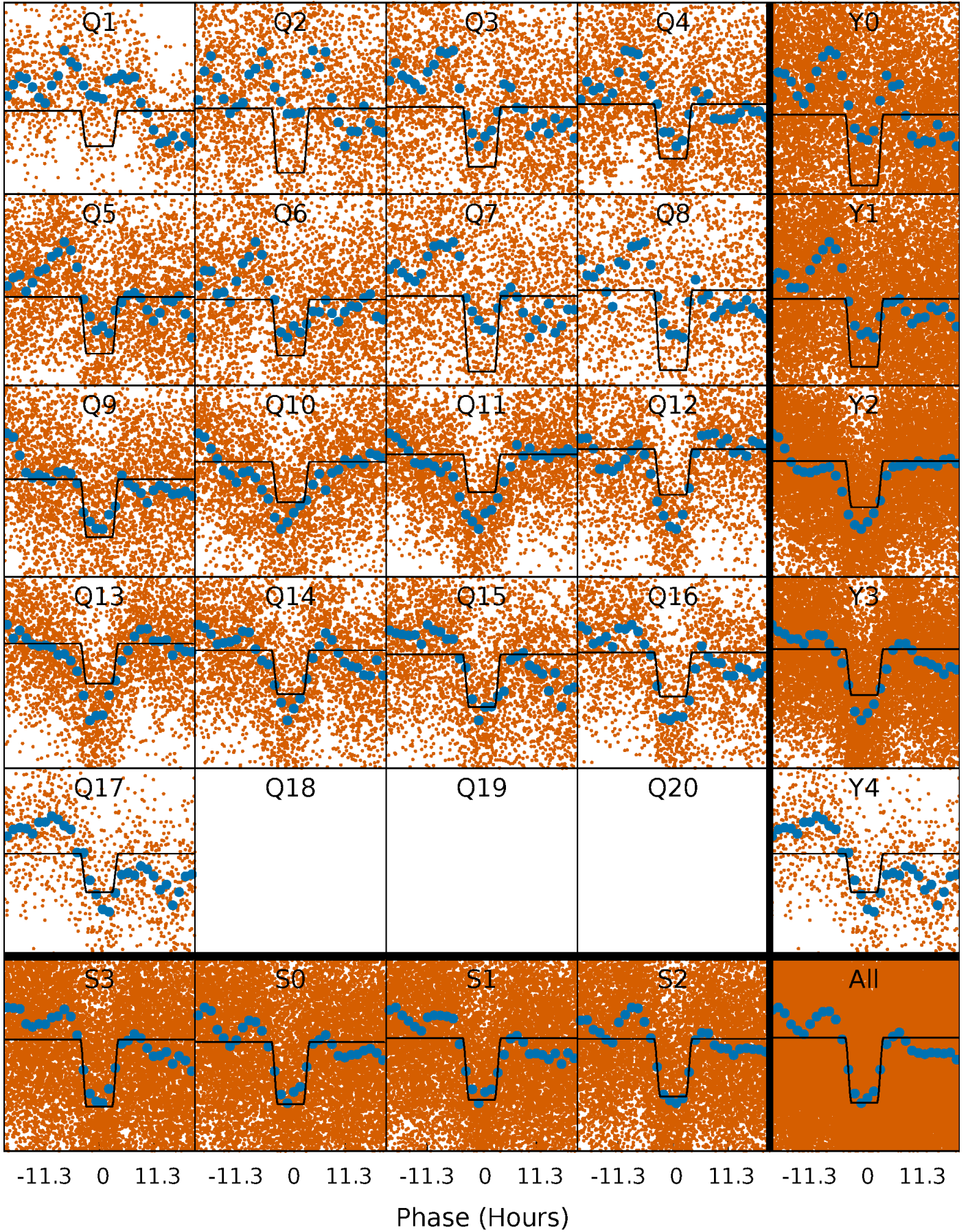
DV Quarter-Phased Transit Curves

TCE 001296164-01 P= 1.961092 Days $T_0=132.264306$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

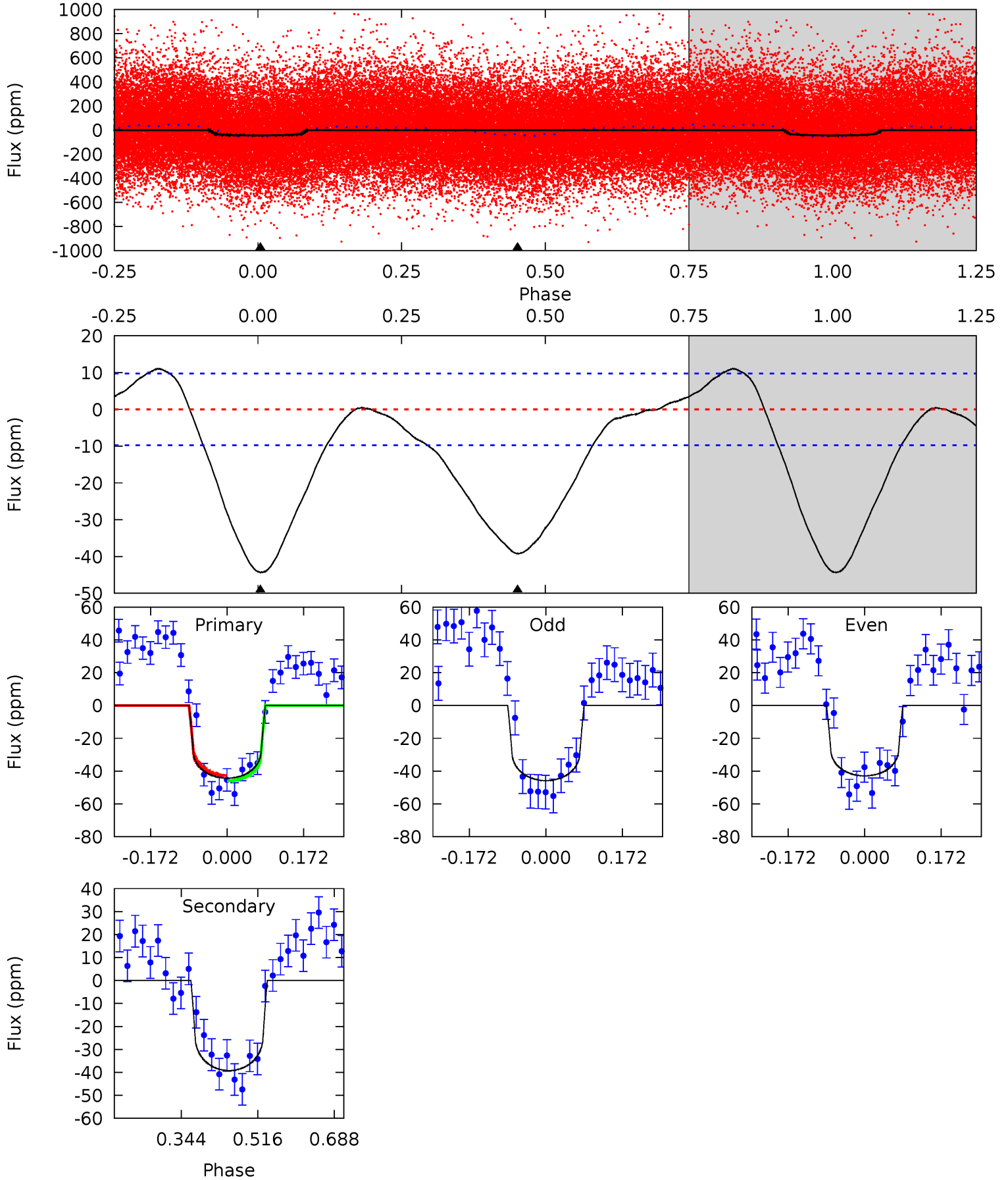
TCE 001296164-01 P= 1.960913 Days $T_0=132.340258$ (BKJD)



DV Model-Shift Uniqueness Test

001296164-01, P = 1.961092 Days, E = 130.303214 Days

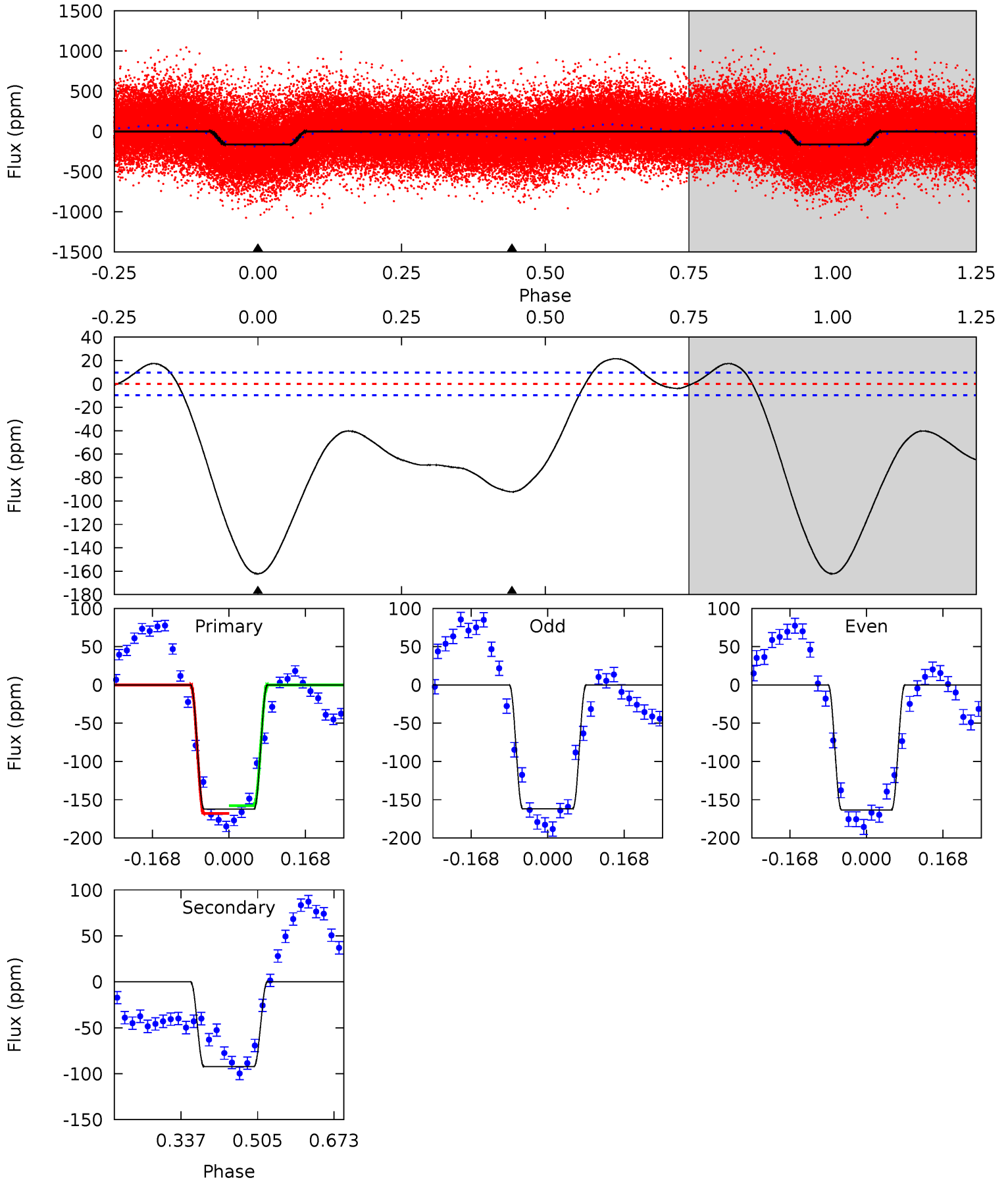
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 20.2 | 17.9 | 0 | 0 | 4.45 | 1.37 | 2.16 | 20.2 | 20.2 | 17.9 | 17.9 | 0.67 | 0.95 | 0.20 | 0.73 |



Alt Model-Shift Uniqueness Test

001296164-01, P = 1.960913 Days, E = 130.379345 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 74.5 | 42.4 | 0 | 0 | 4.45 | 1.38 | 14.4 | 74.5 | 74.5 | 42.4 | 42.4 | 0.34 | 0.94 | 0.12 | 2.35 |



Stellar Parameters For KIC 001296164

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|--|
| | 6977^{+197}_{-296} | $4.098^{+0.209}_{-0.171}$ | $-0.200^{+0.250}_{-0.350}$ | $1.751^{+0.537}_{-0.488}$ | $1.404^{+0.208}_{-0.255}$ | $0.368^{+0.425}_{-0.184}$ |
| | +3%/-4% | +5%/-4% | +125%/-175% | +31%/-28% | +15%/-18% | +115%/-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 001296164-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|------------------------|----------------------------|
| DV | -39 ± 2 | $1.21^{+0.91}_{-0.66}$ | 3046^{+263}_{-238} | 6875^{+4289}_{-1679} | 17^{+68}_{-12} |
| Alt. | -92 ± 2 | $2.60^{+1.03}_{-0.92}$ | 3037^{+280}_{-217} | 5774^{+1218}_{-781} | $8.990^{+11.990}_{-4.412}$ |

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

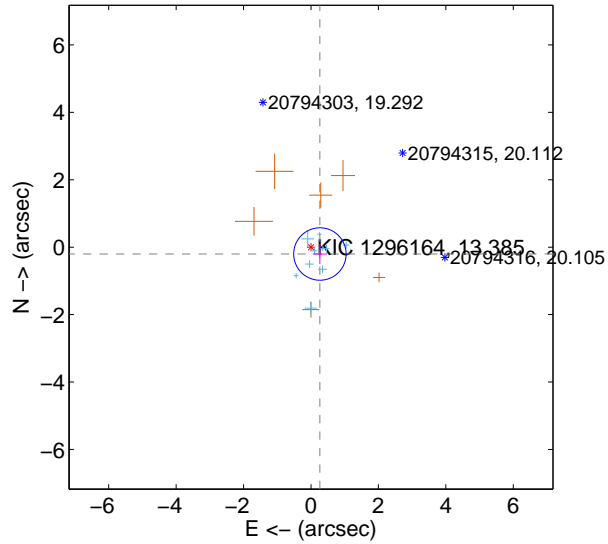
Supplemental centroid analysis for 001296164-01. Kepler magnitude: 13.38. Transit SNR 10.17

There are 10 quarters with good PRF difference image offsets

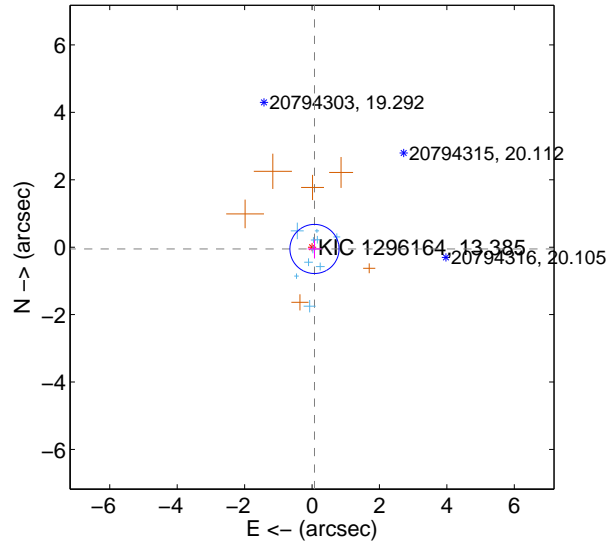
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.333 ± 0.259 | 1.29 | -0.264 ± 0.211 | -0.203 ± 0.301 |
| PRF-fit source offset from KIC position | 0.090 ± 0.243 | 0.37 | -0.073 ± 0.199 | -0.053 ± 0.276 |
| photometric centroid source offset | 3.33 ± 0.88 | 3.77 | -2.35 ± 0.86 | -2.37 ± 0.91 |

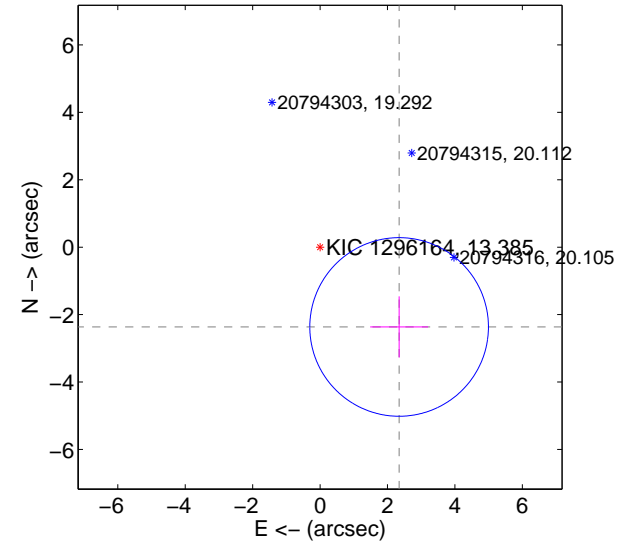
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

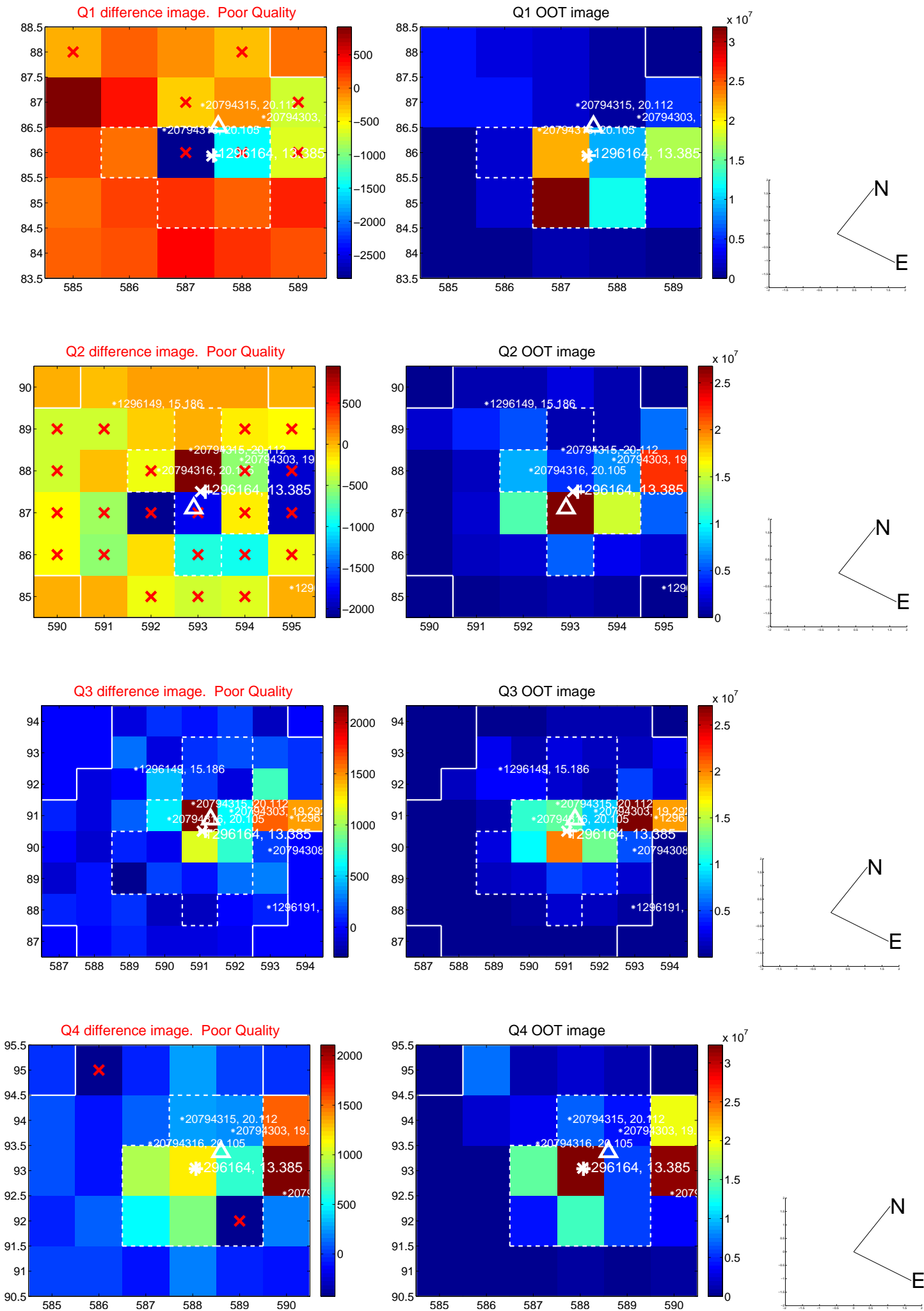


offset from photometric centroids

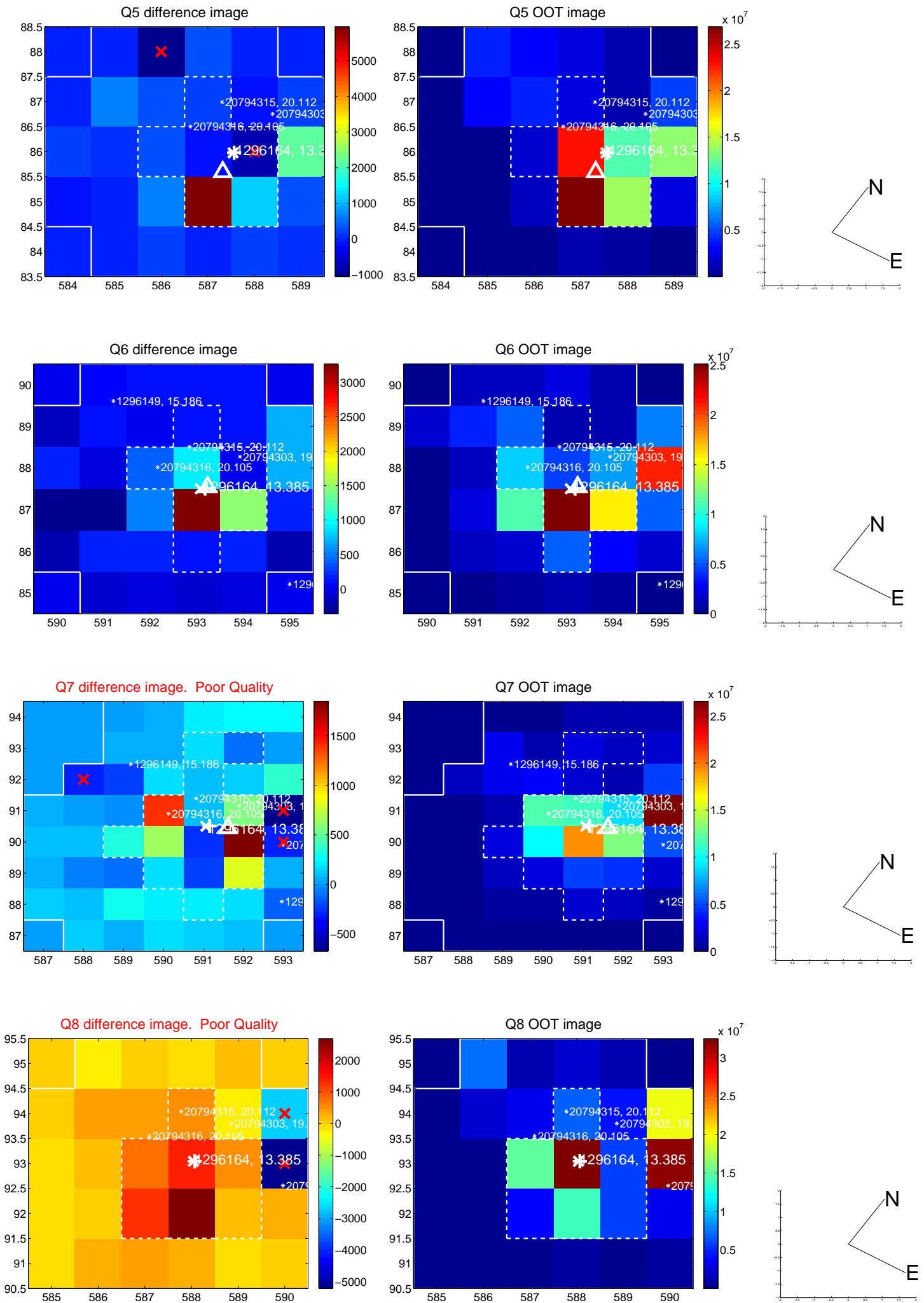


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

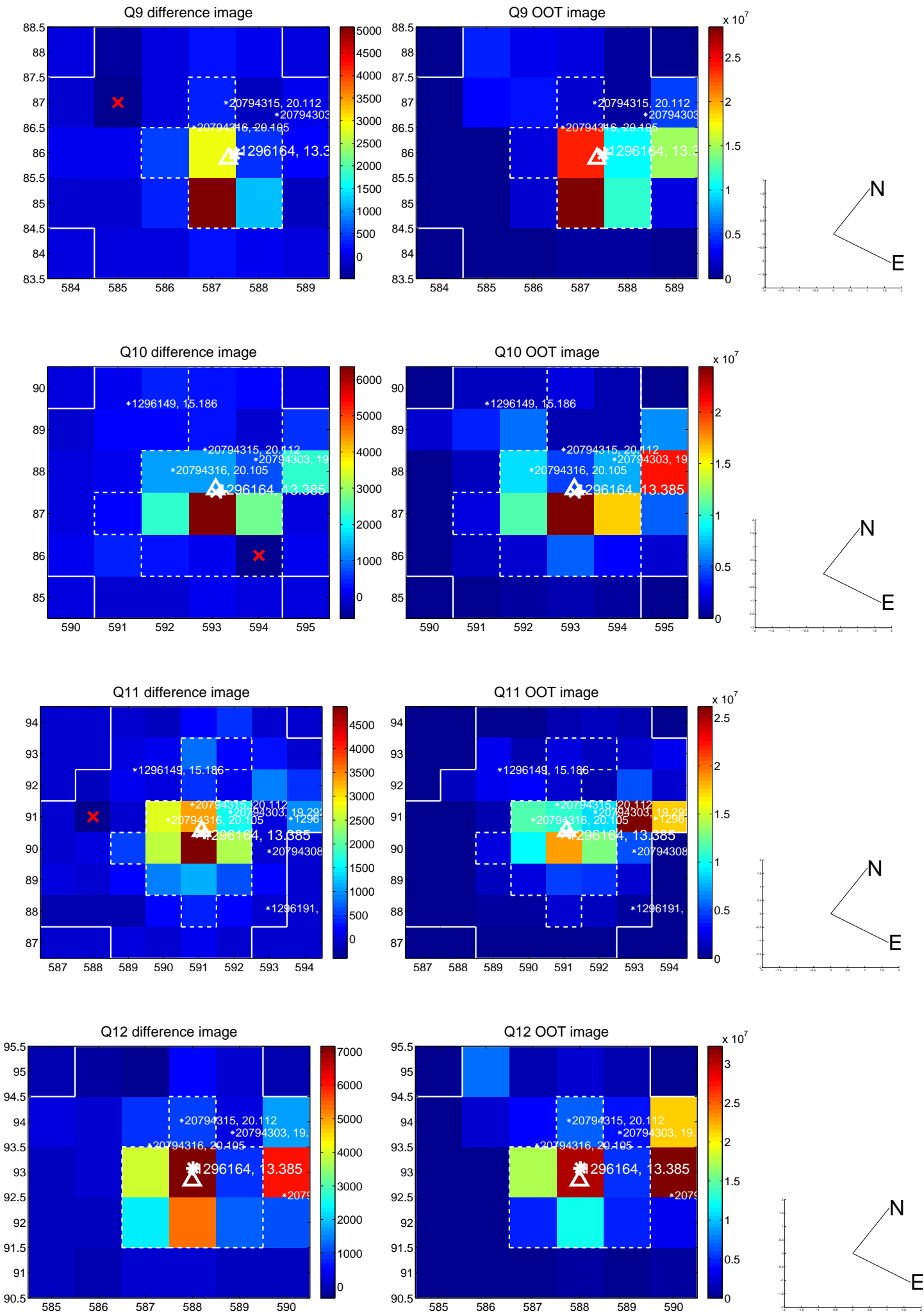
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



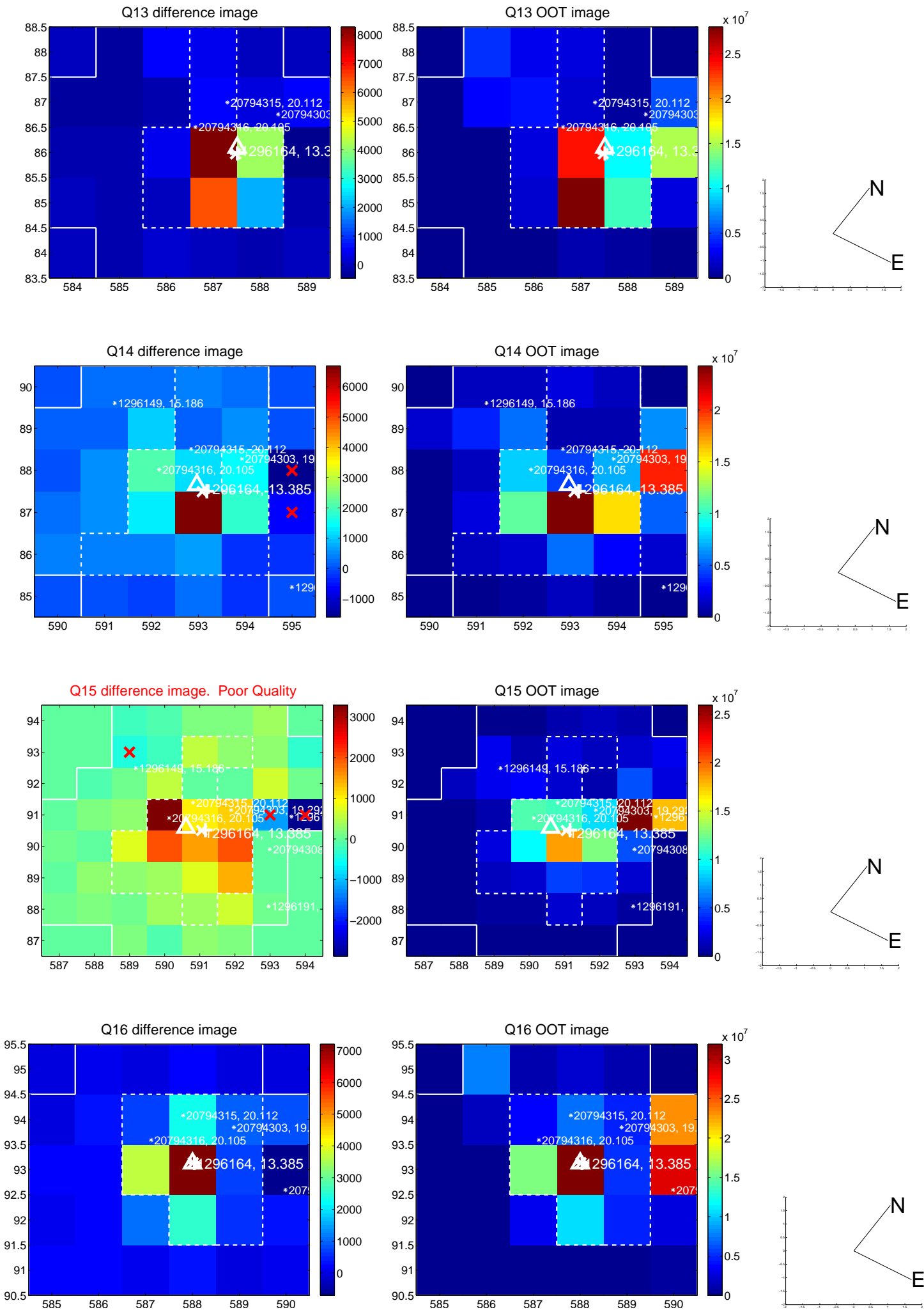
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



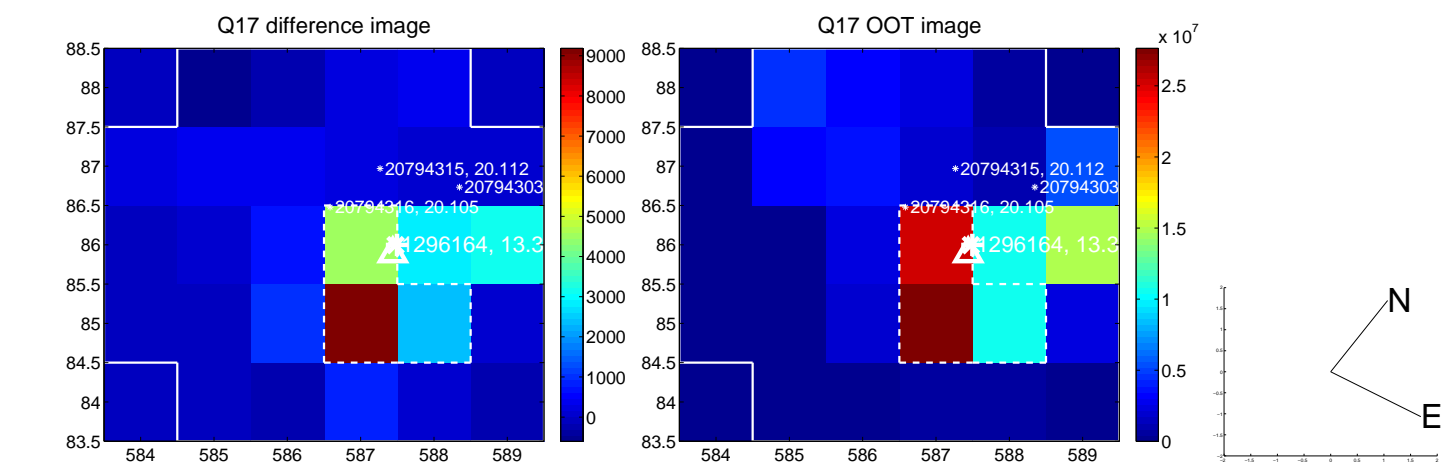
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



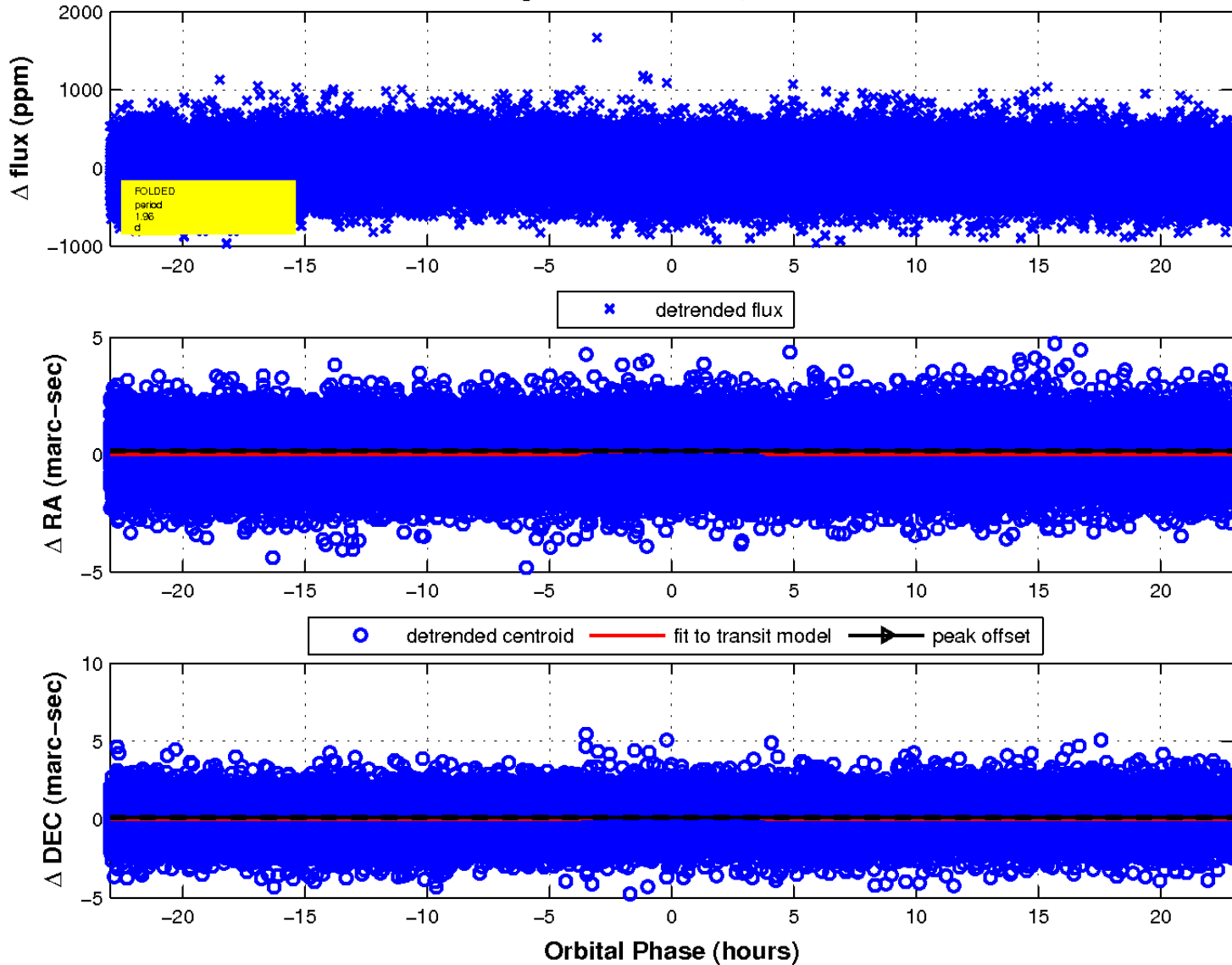
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



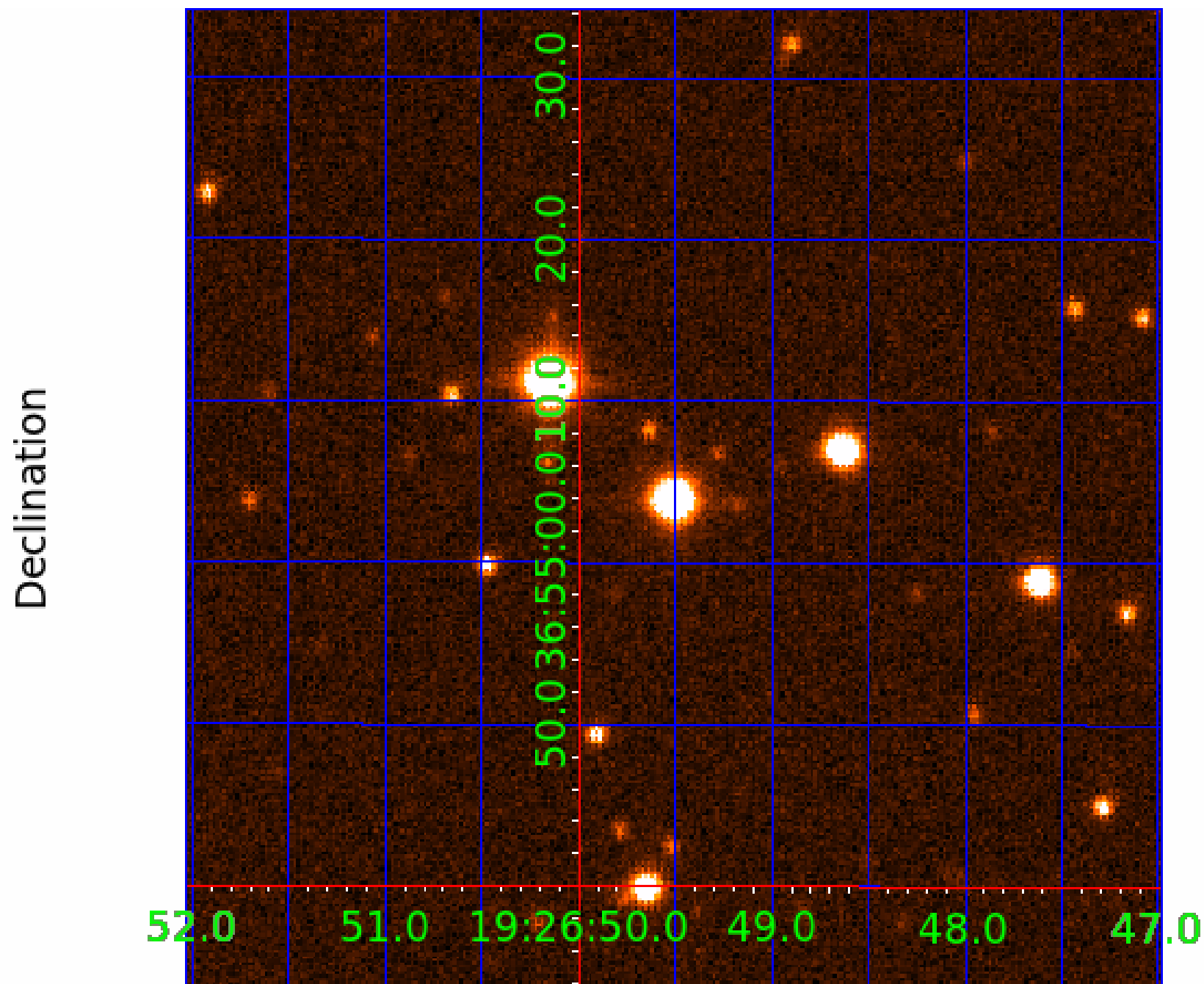
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



KIC 001296164

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 001296164-01 | OBS | No | 1.961092 | 132.264305 | 41.6 | 7.659 | 11.3 | 10.2 | 1.75 | 6977 | 1.14 | 5526.23 |
| 001296164-02 | OBS | No | 65.235397 | 154.517775 | 264.8 | 3.252 | 7.4 | 7.9 | 1.75 | 6977 | 3.58 | 51.66 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|-------------------------------------|
| 001296164-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—MOD_NONUNIQ_ALT |
| 001296164-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT |

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

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

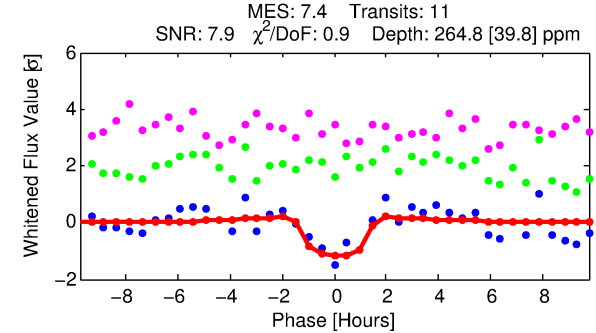
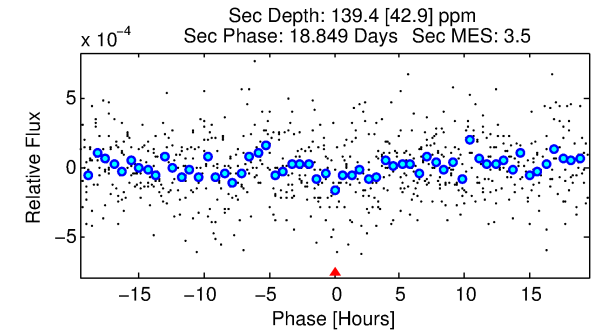
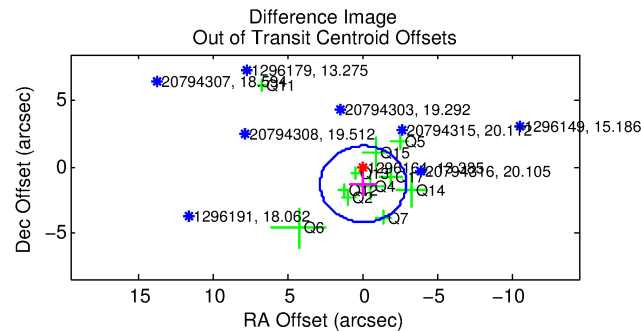
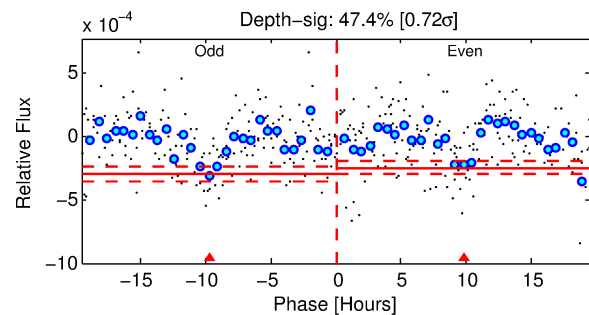
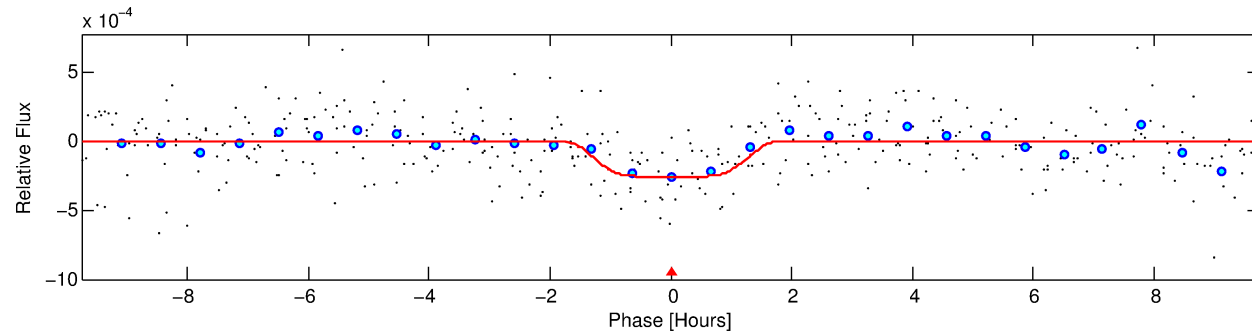
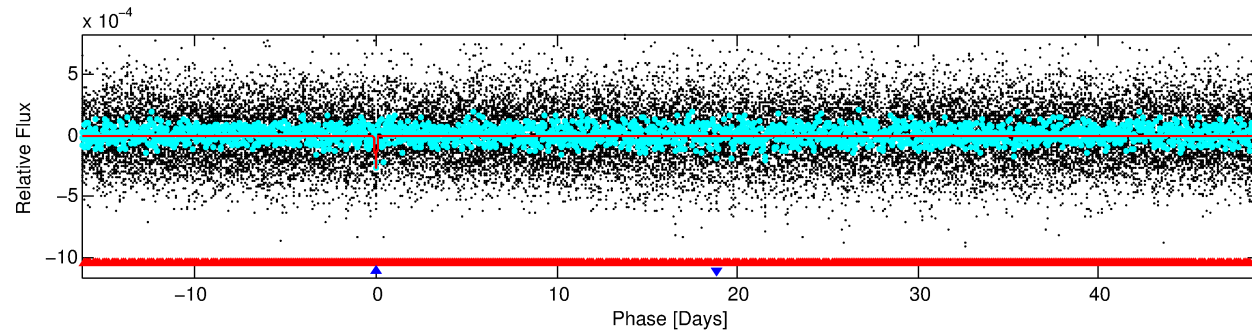
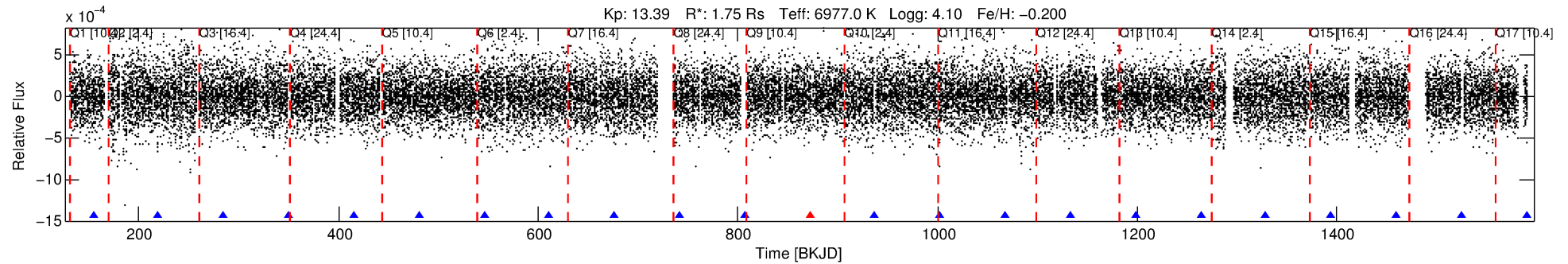
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 001296164-02

No Significant Match Found

DV One-Page Summary

KIC: 1296164 Candidate: 2 of 2 Period: 65.235 d



DV Fit Results:

Period = 65.23540 [0.00068] d
Epoch = 154.5178 [0.0078] BKJD
Rp/R* = 0.0187 [0.0023]
a/R* = 50.62 [23.84]
b = 0.96 [0.04]
Seff = 51.66 [21.52]
Teq = 684 [71] K
Rp = 3.58 [1.18] Re
a = 0.3550 [0.0923] AU
Ag = 755.26 [411.80] [1.83 σ]
Teffp = 5541 [590] K [8.17 σ]

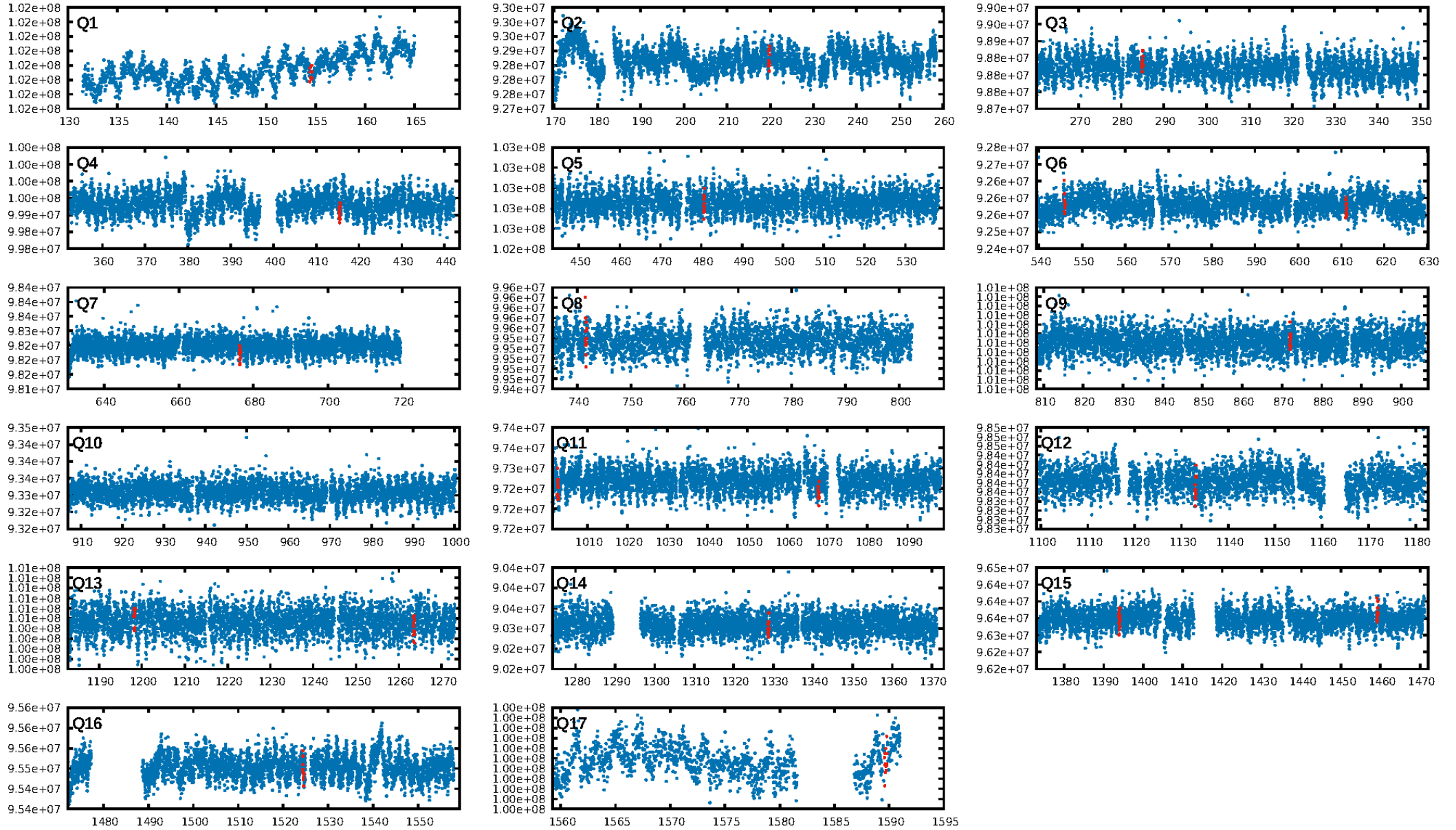
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [182.50 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 42.2%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 1.48e-09
RollingBand-fgt: 0.90 [9/10]
GhostDiagnostic-chr: 1.547
Centroid-sig: 0.2%
Centroid-so: 3.509 arcsec [2.90 σ]
OotOffset-rm: 1.315 arcsec [1.37 σ]
KicOffset-rm: 1.224 arcsec [1.47 σ]
OotOffset-st: 3/3/2/3 [11]
KicOffset-st: 3/3/2/3 [11]
DiffImageQuality-fgm: 0.27 [3/11]
DiffImageOverlap-fno: 0.62 [10/16]

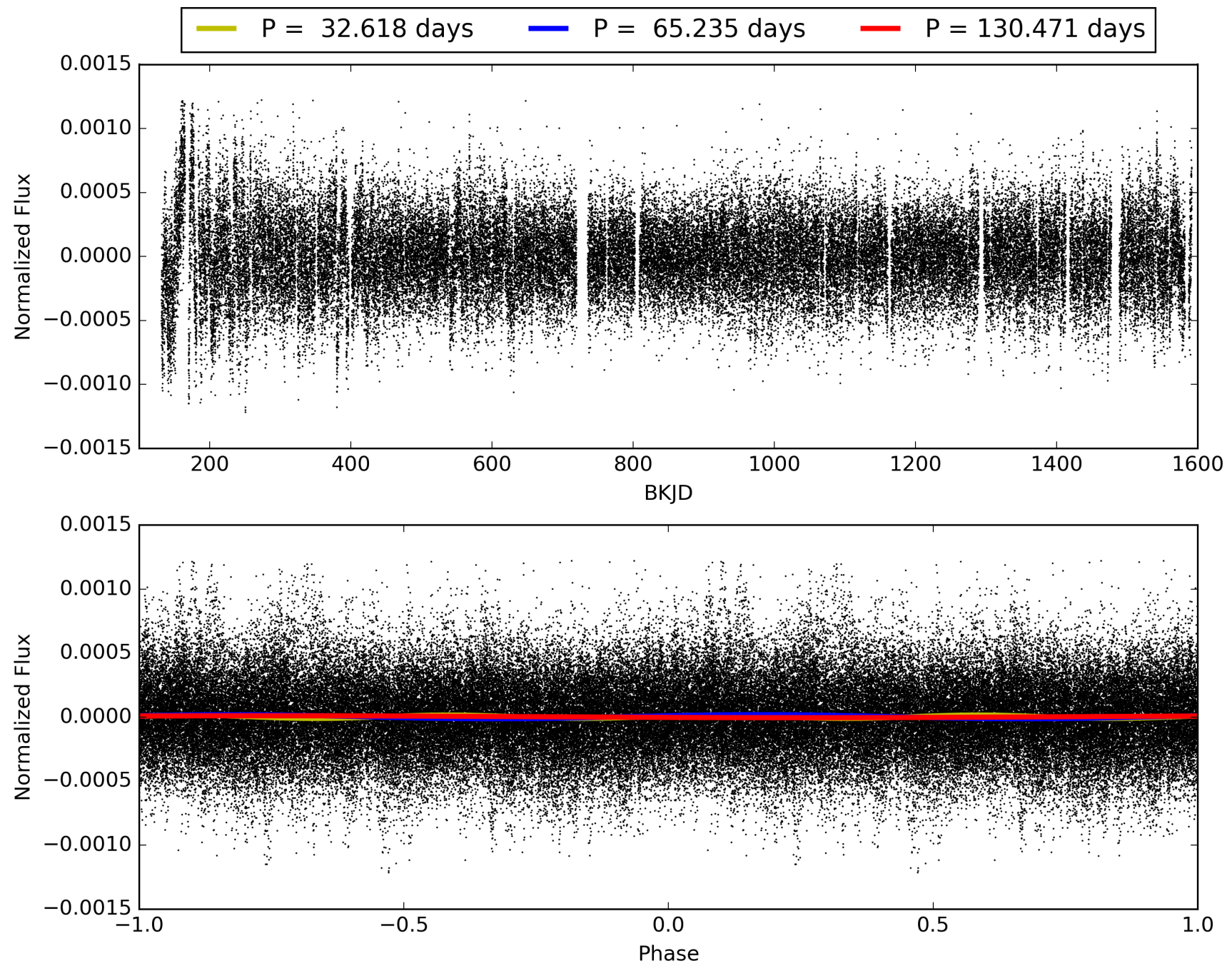
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:22:56 Z

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

TCE 001296164-02, PDC Light Curves

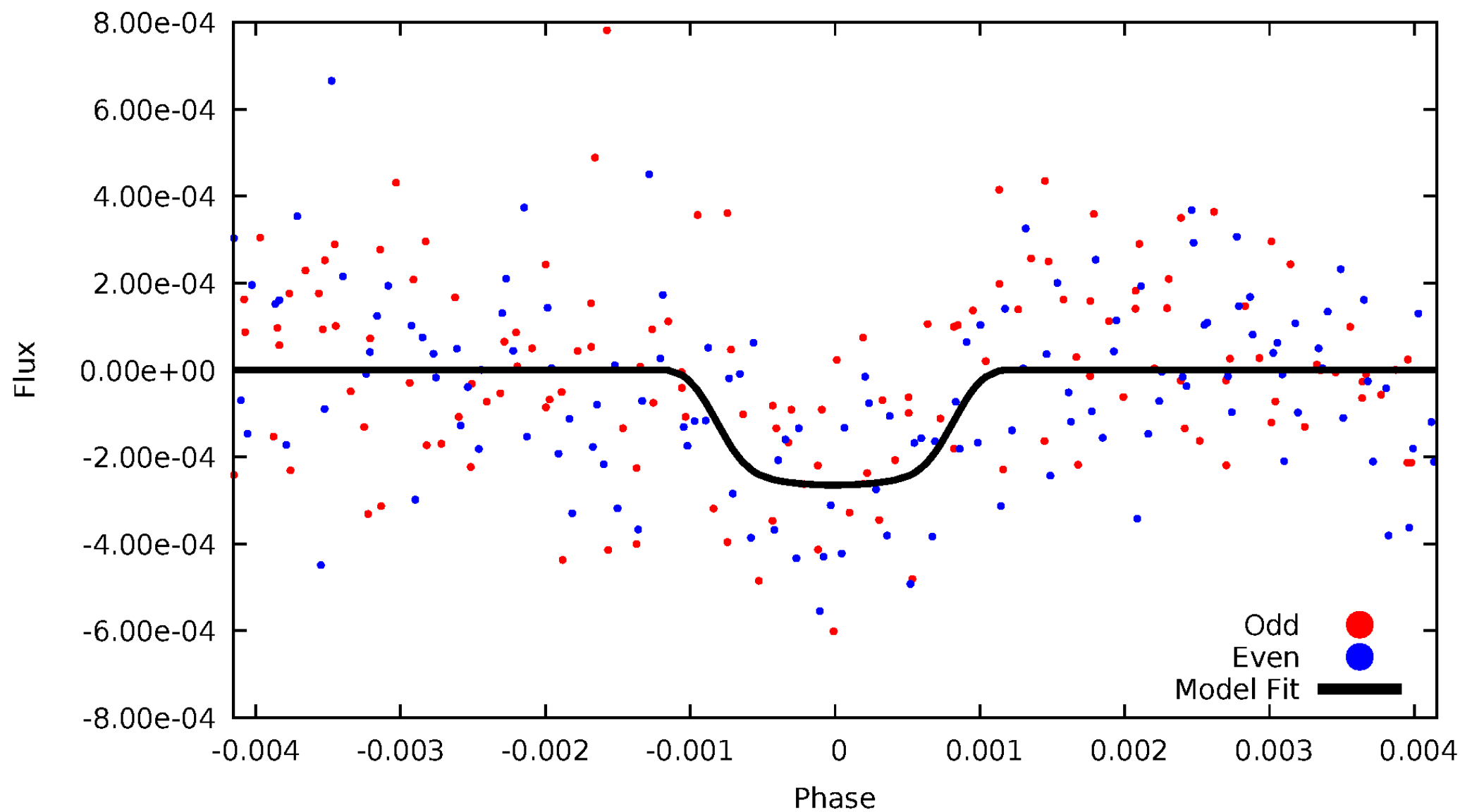


TCE 001296164-02



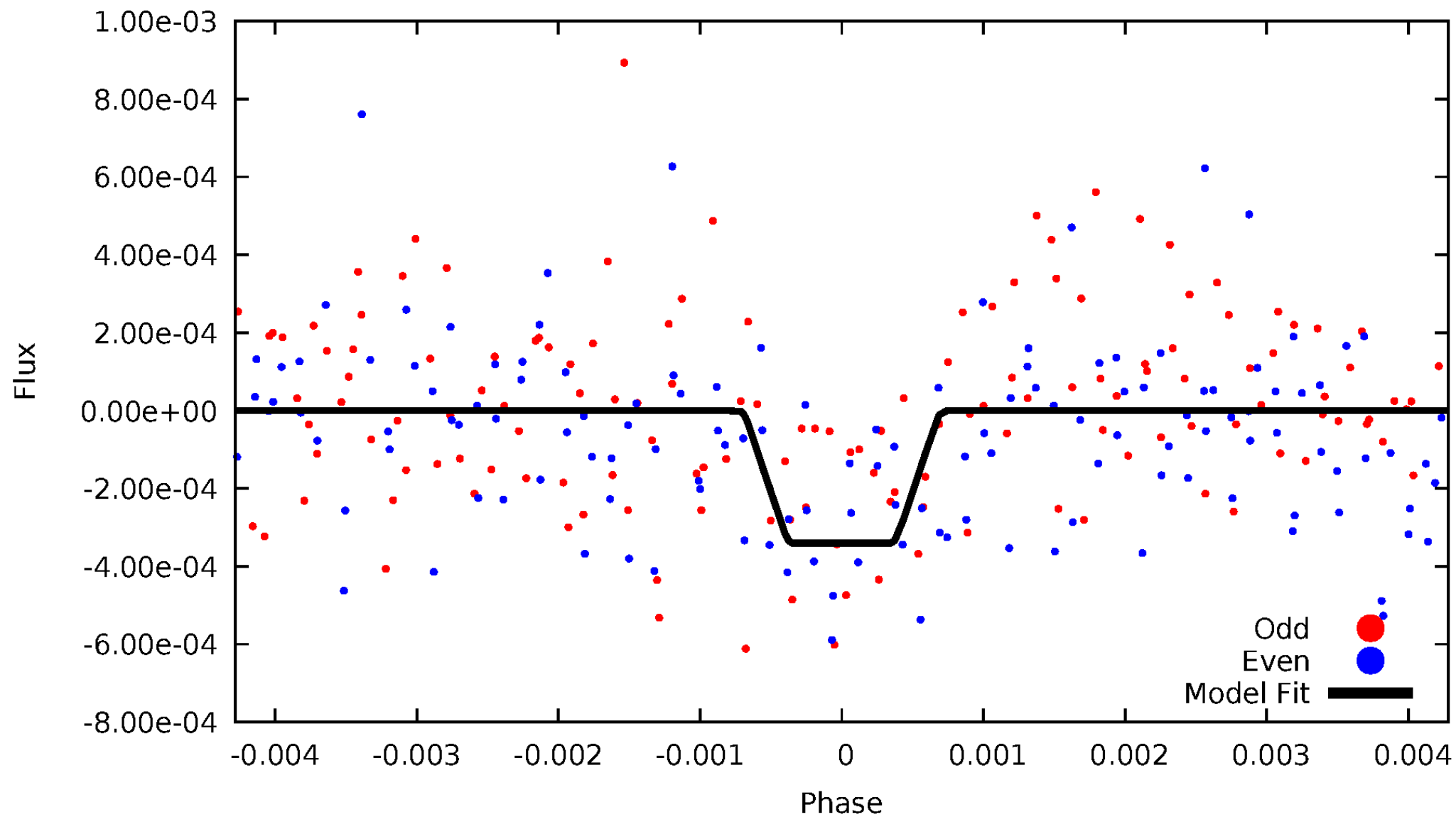
DV Odd/Even

TCE 001296164-02



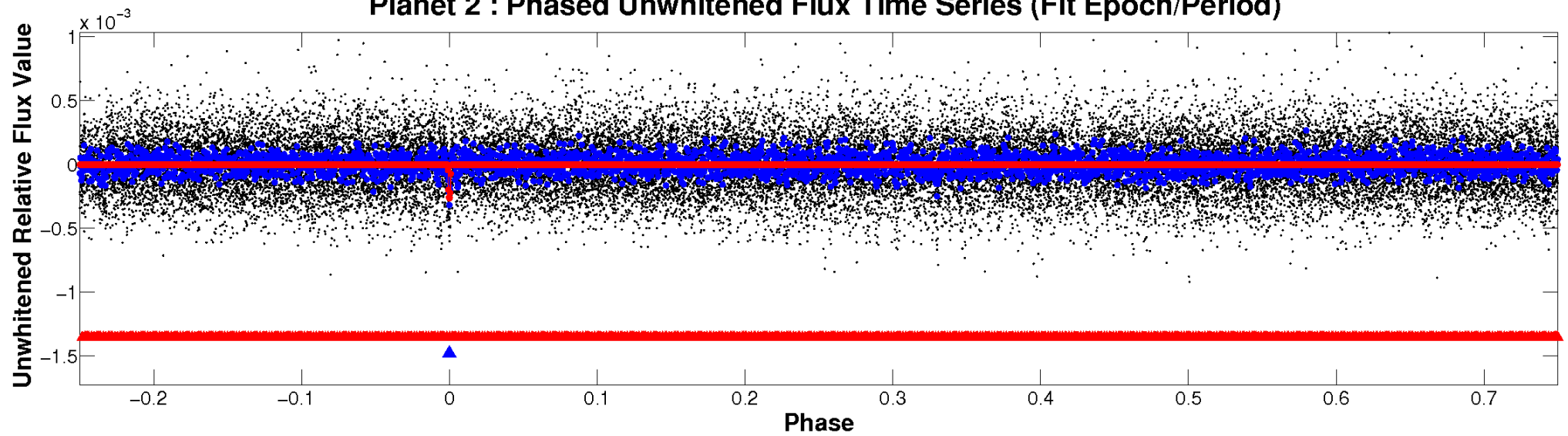
ALT Odd/Even

TCE 001296164-02

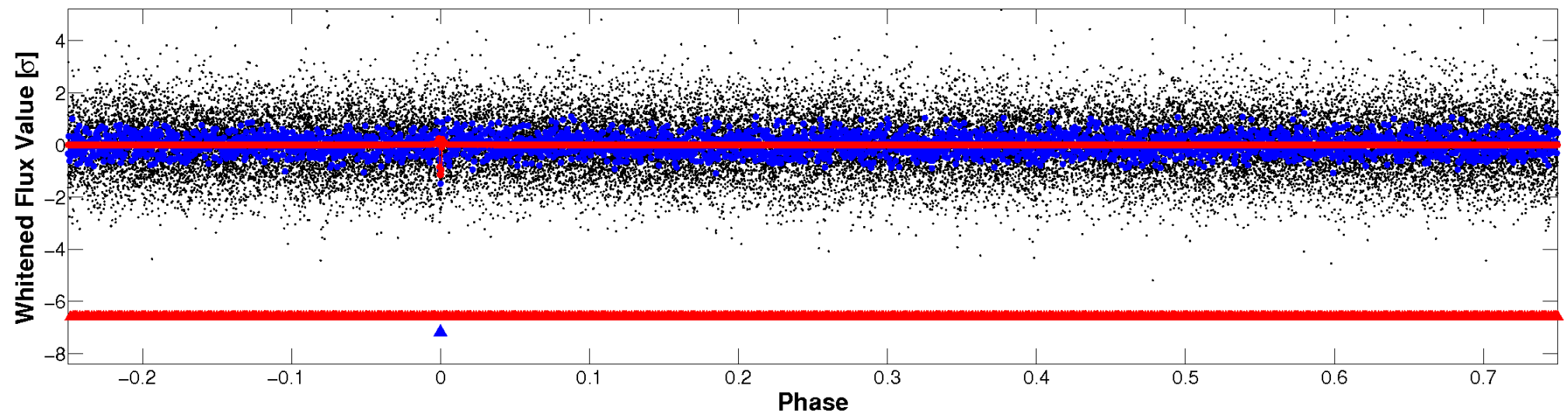


Non-Whitened Vs. Whitened Light Curve

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

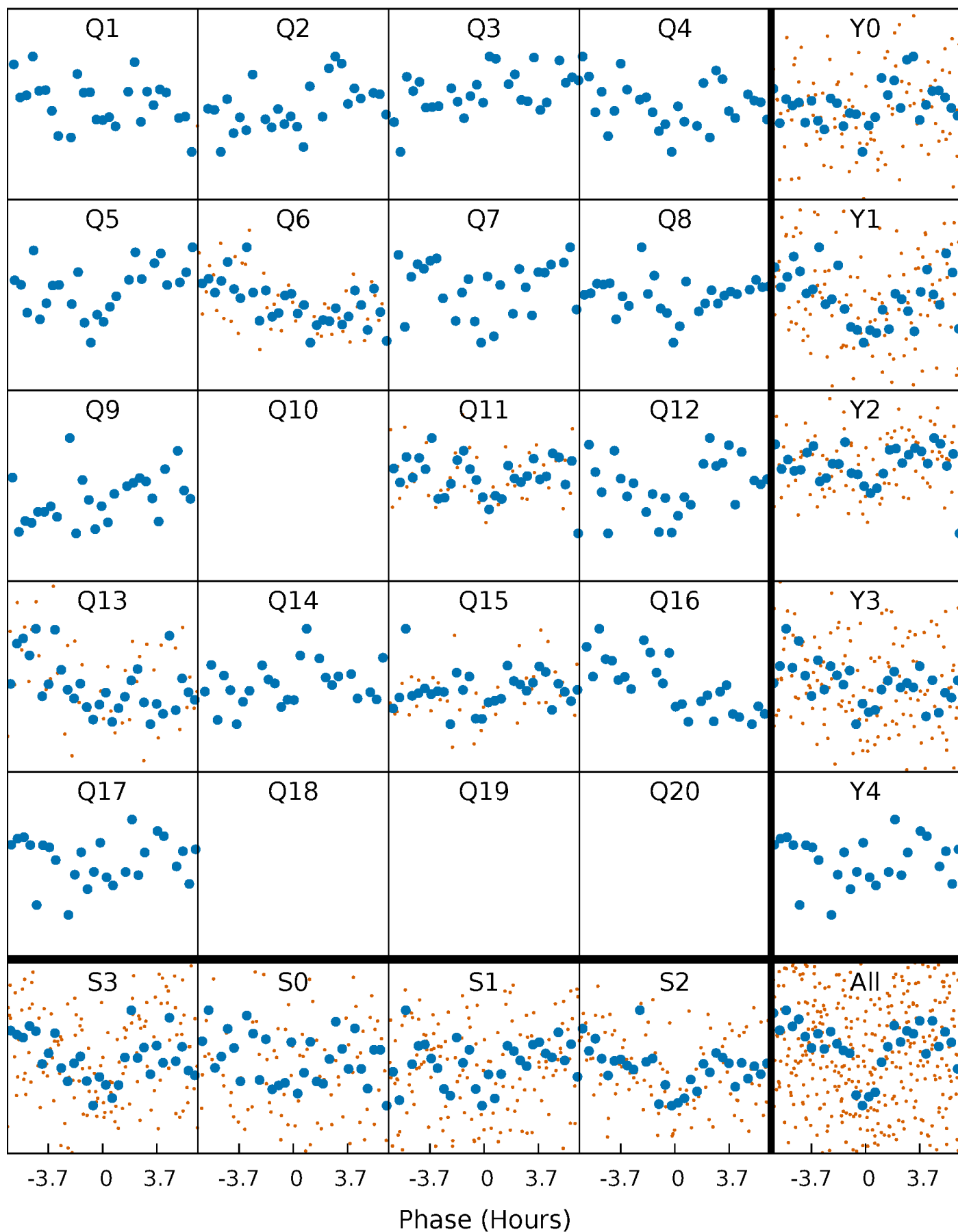


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



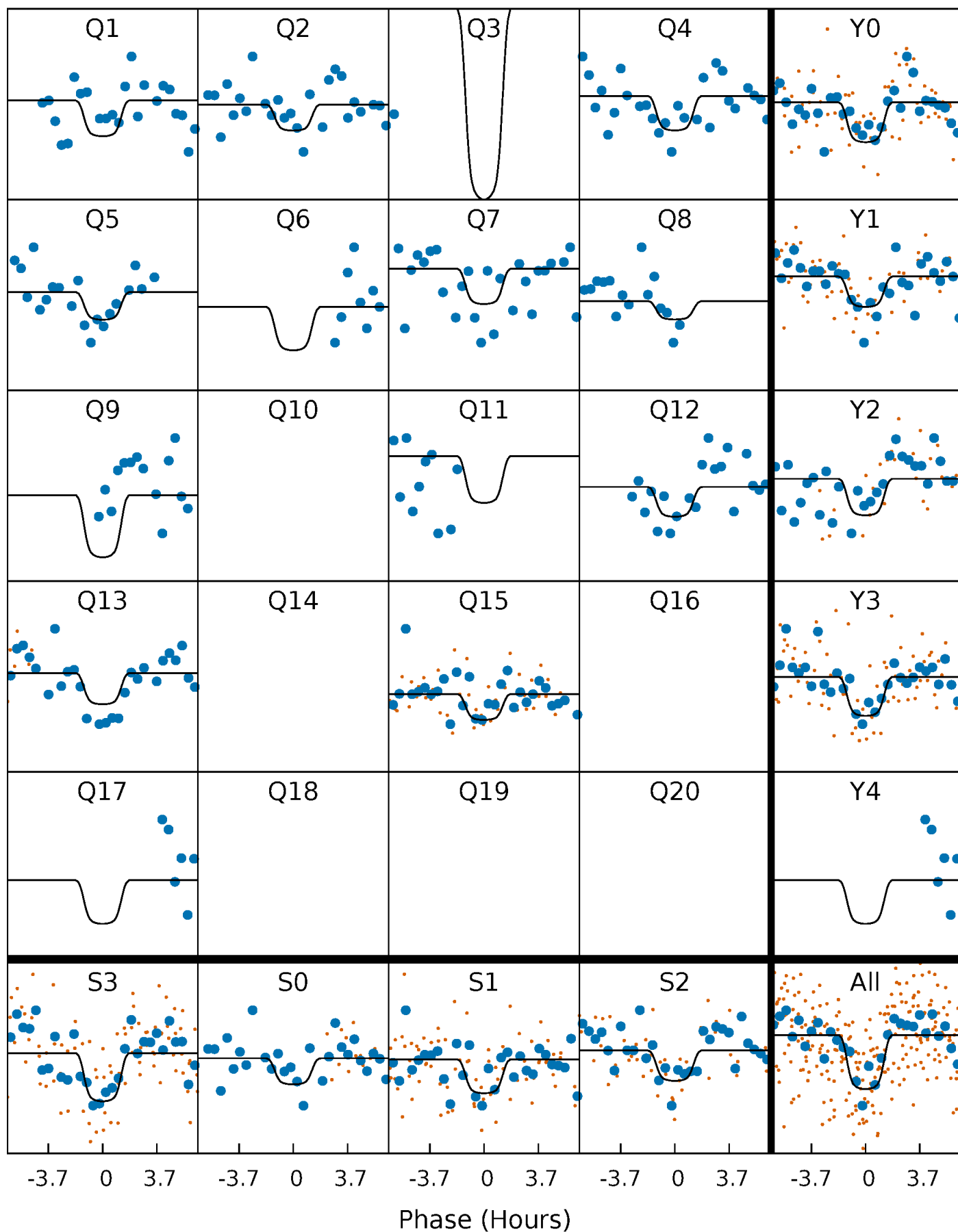
PDC Quarter-Phased Transit Curves

TCE 001296164-02 P= 65.235397 Days $T_0=154.517775$ (BKJD)



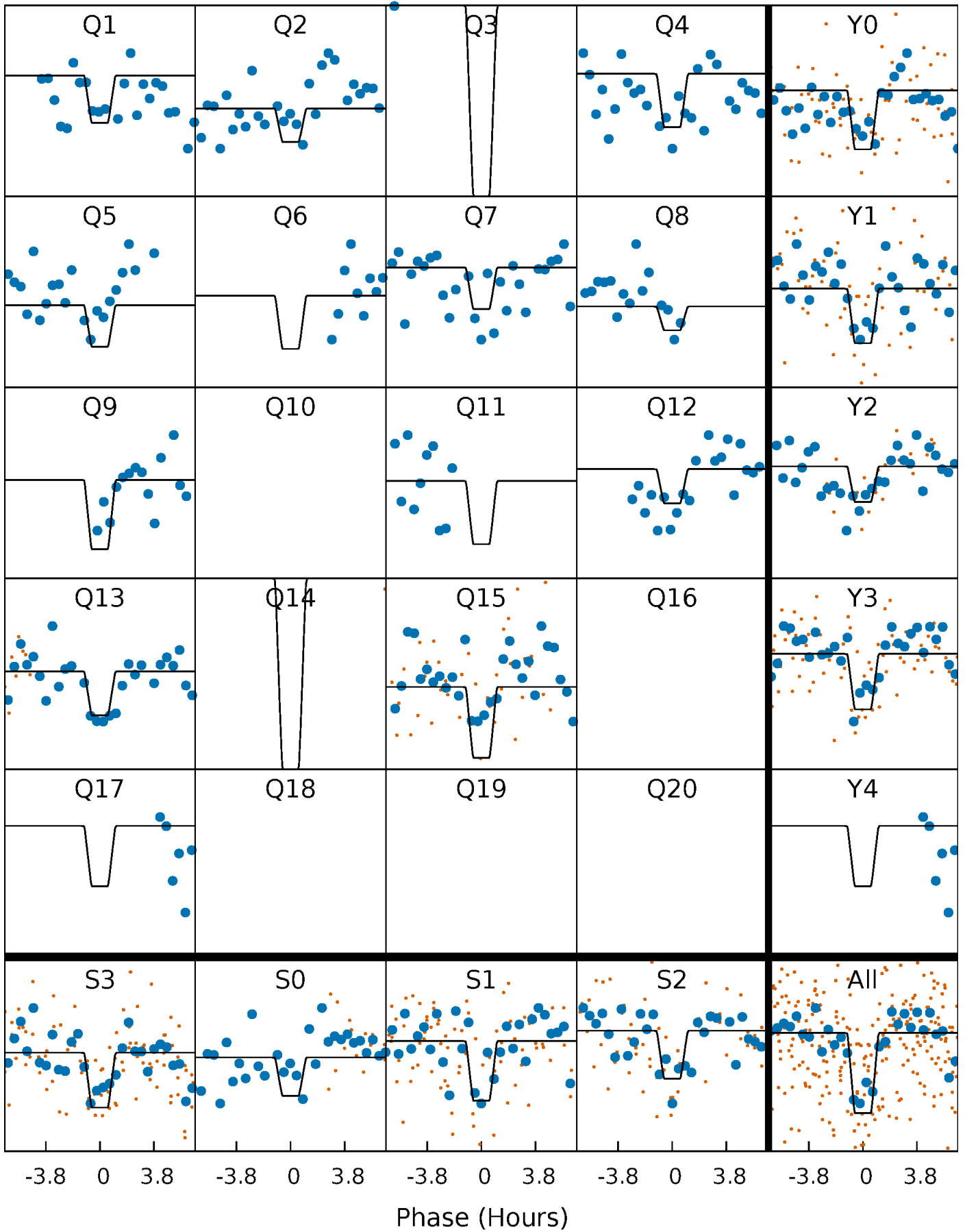
DV Quarter-Phased Transit Curves

TCE 001296164-02 P= 65.235397 Days $T_0=154.517775$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

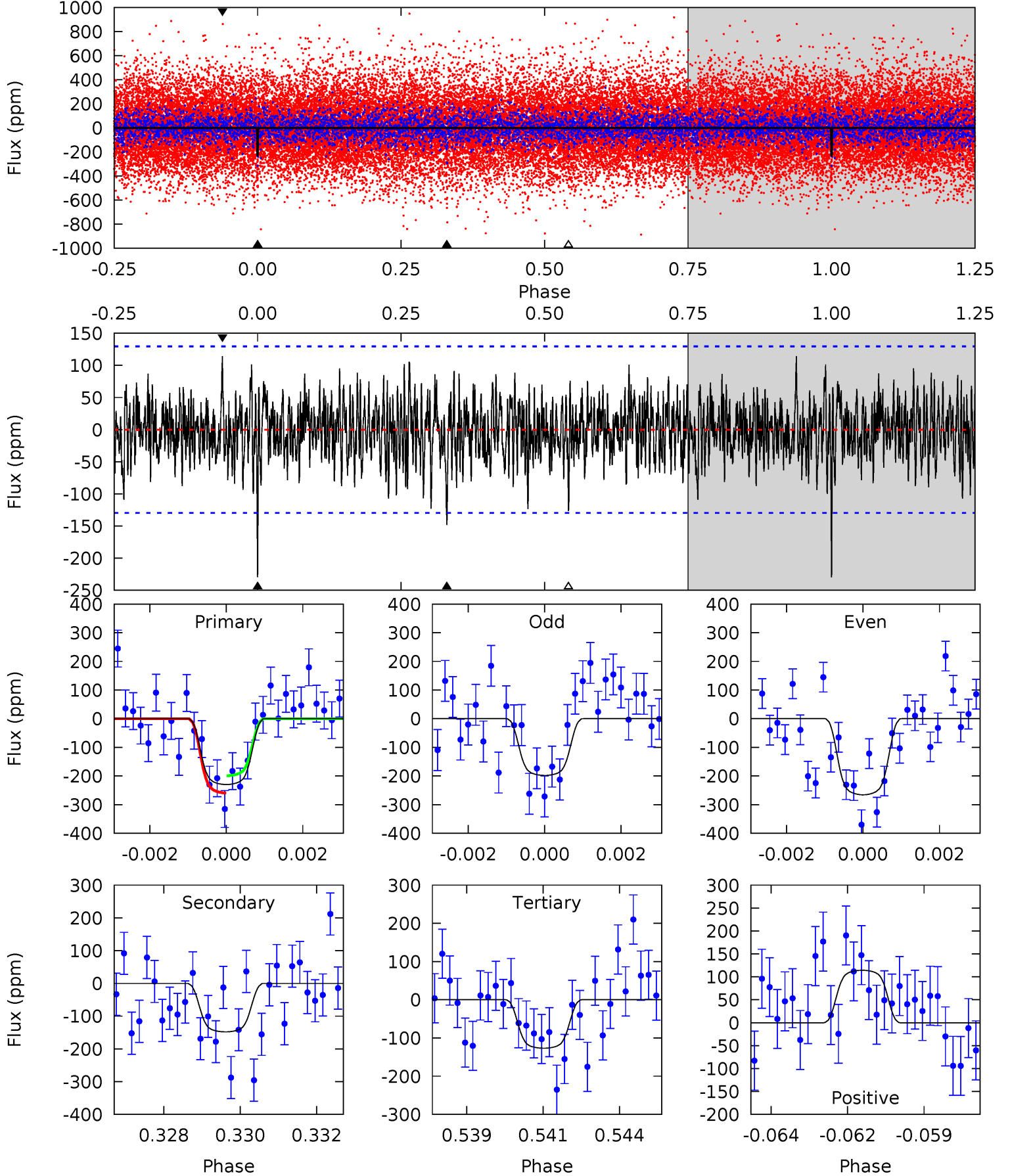
TCE 001296164-02 P= 65.235116 Days $T_0=154.517657$ (BKJD)



DV Model-Shift Uniqueness Test

001296164-02, P = 65.235397 Days, E = 89.282378 Days

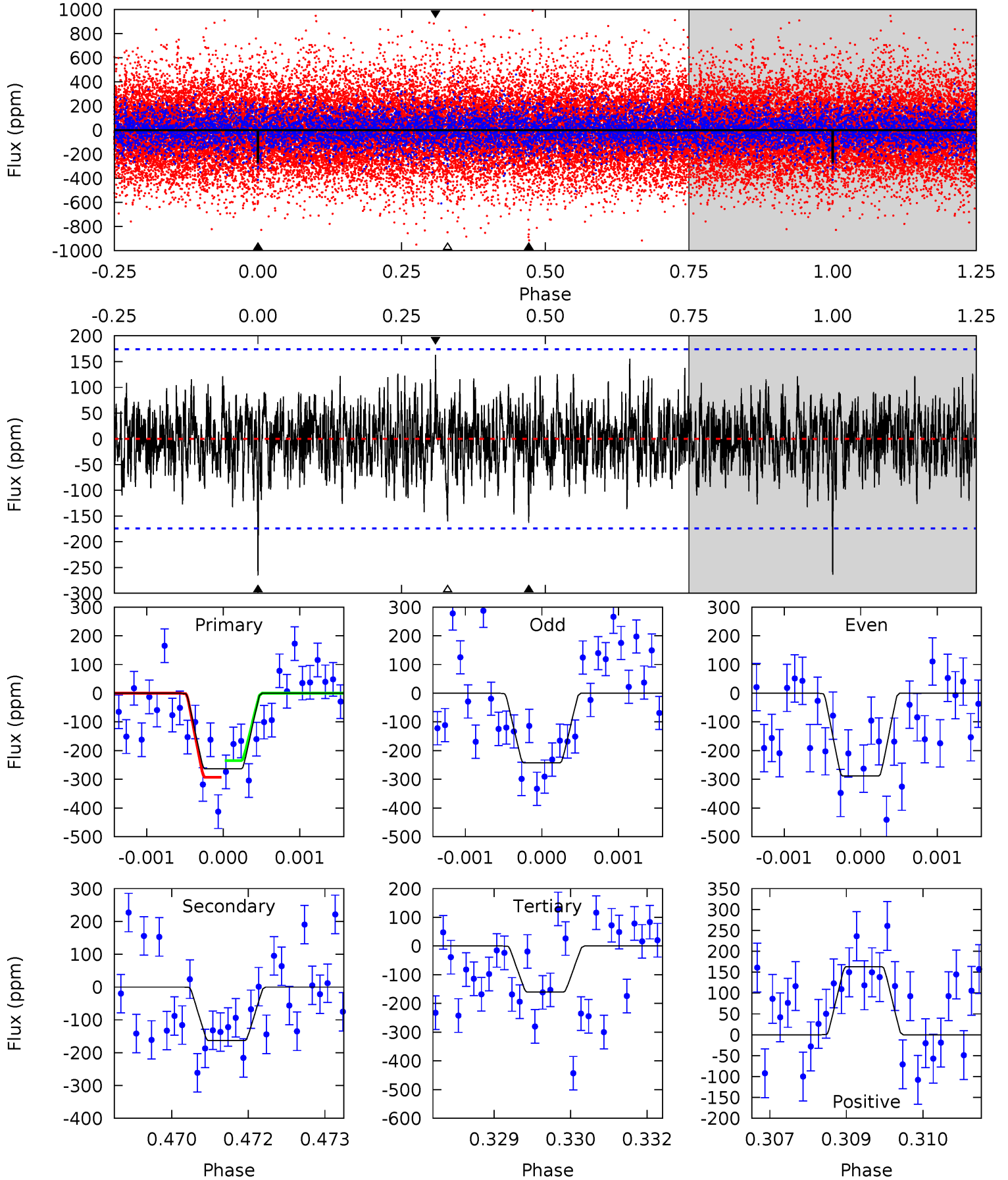
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.39 | 6.05 | 5.18 | 4.67 | 5.30 | 3.04 | 1.54 | 4.21 | 4.72 | 0.87 | 1.38 | 1.38 | 0.87 | 0.33 | 1.24 |



Alt Model-Shift Uniqueness Test

001296164-02, P = 65.235116 Days, E = 89.282541 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.16 | 5.06 | 4.96 | 5.04 | 5.38 | 3.18 | 1.41 | 3.20 | 3.12 | 0.10 | 0.02 | 0.71 | 1.05 | 0.38 | 0.90 |



Stellar Parameters For KIC 001296164

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6977^{+197}_{-296} | $4.098^{+0.209}_{-0.171}$ | $-0.200^{+0.250}_{-0.350}$ | $1.751^{+0.537}_{-0.488}$ | $1.404^{+0.208}_{-0.255}$ | $0.368^{+0.425}_{-0.184}$ |
| | +3%/-4% | +5%/-4% | +125%/-175% | +31%/-28% | +15%/-18% | +115%/-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 001296164-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|-------------------|----------------------|---------------------|
| DV | -148 ± 24 | $3.48^{+0.78}_{-0.66}$ | 947^{+71}_{-76} | 5582^{+450}_{-385} | 827^{+462}_{-285} |
| Alt. | -163 ± 32 | $3.45^{+0.75}_{-0.66}$ | 946^{+72}_{-74} | 5746^{+495}_{-448} | 930^{+547}_{-338} |

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

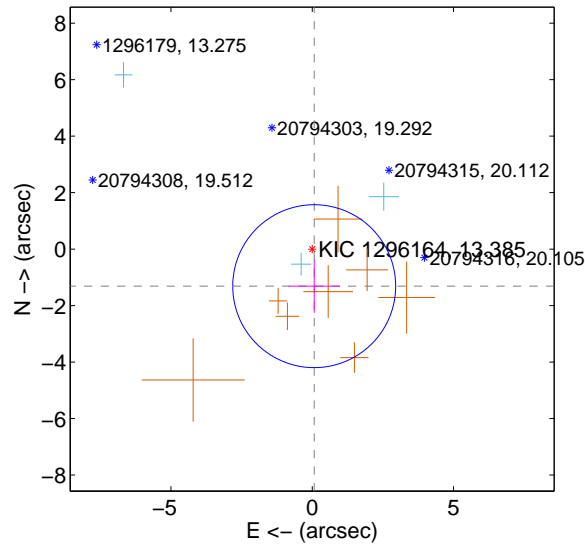
Supplemental centroid analysis for 001296164-02. Kepler magnitude: 13.38. Transit SNR 7.87

There are 3 quarters with good PRF difference image offsets

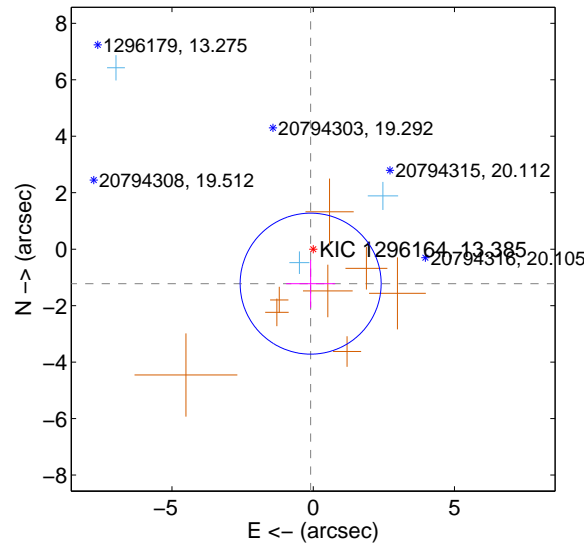
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 1.315 ± 0.961 | 1.37 | -0.070 ± 0.913 | -1.313 ± 0.943 |
| PRF-fit source offset from KIC position | 1.224 ± 0.832 | 1.47 | 0.091 ± 0.867 | -1.221 ± 0.848 |
| photometric centroid source offset | 3.51 ± 1.21 | 2.90 | 2.13 ± 1.27 | 2.79 ± 1.18 |

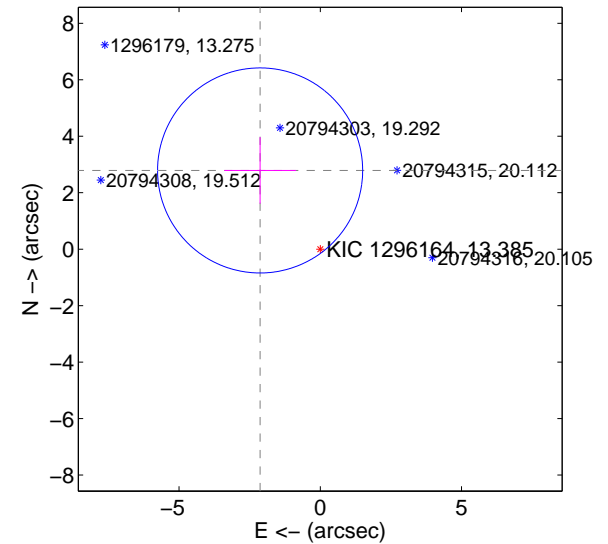
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

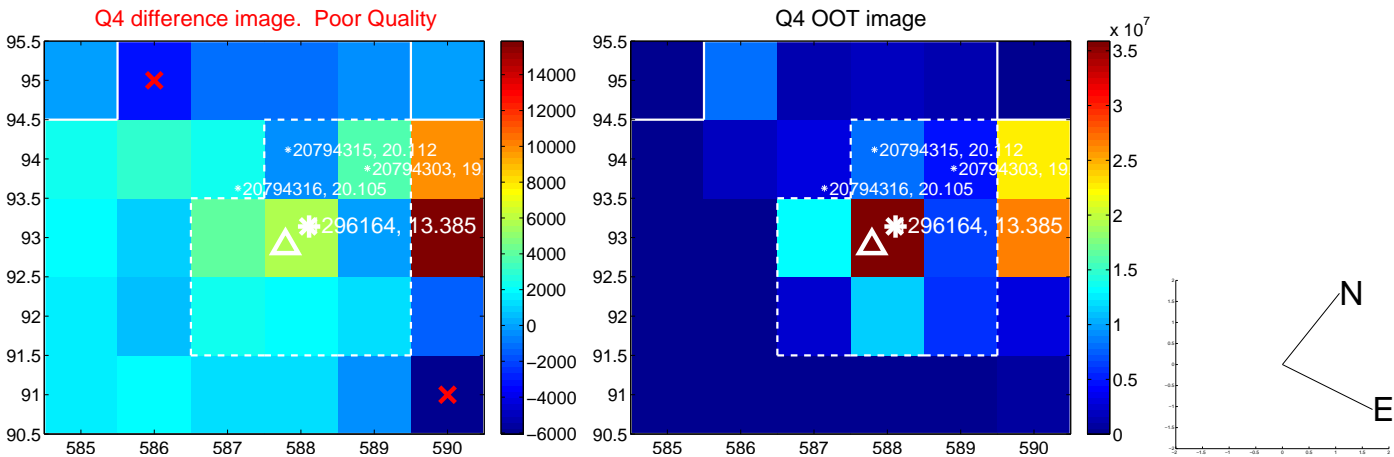
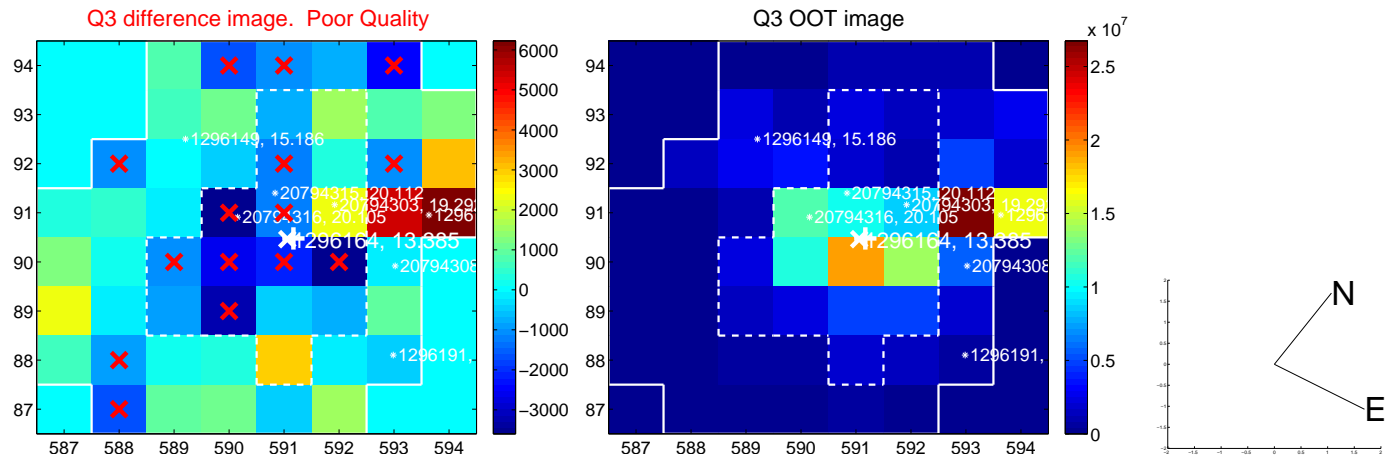
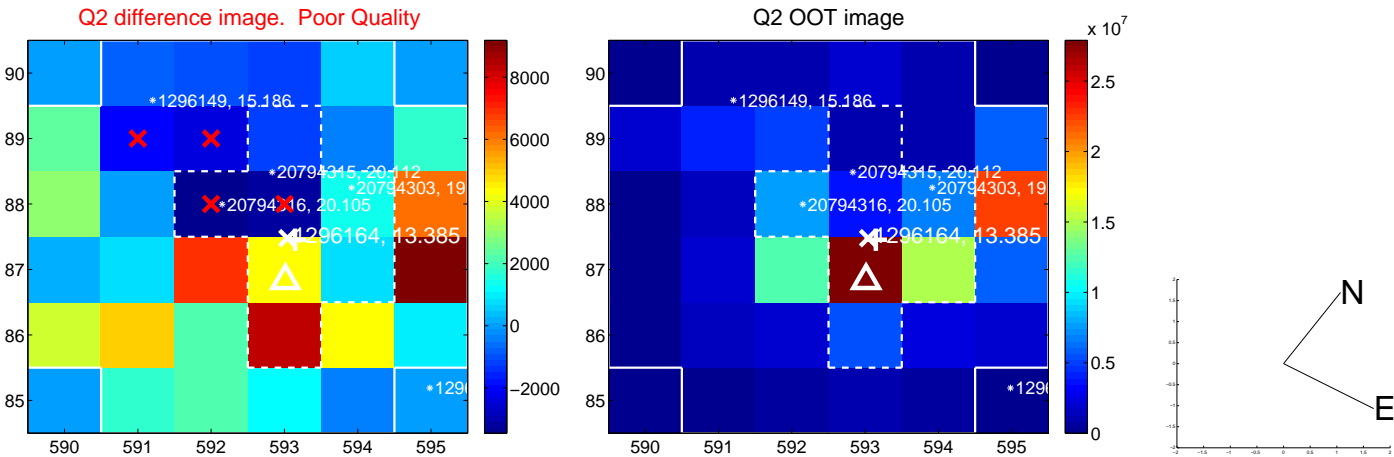
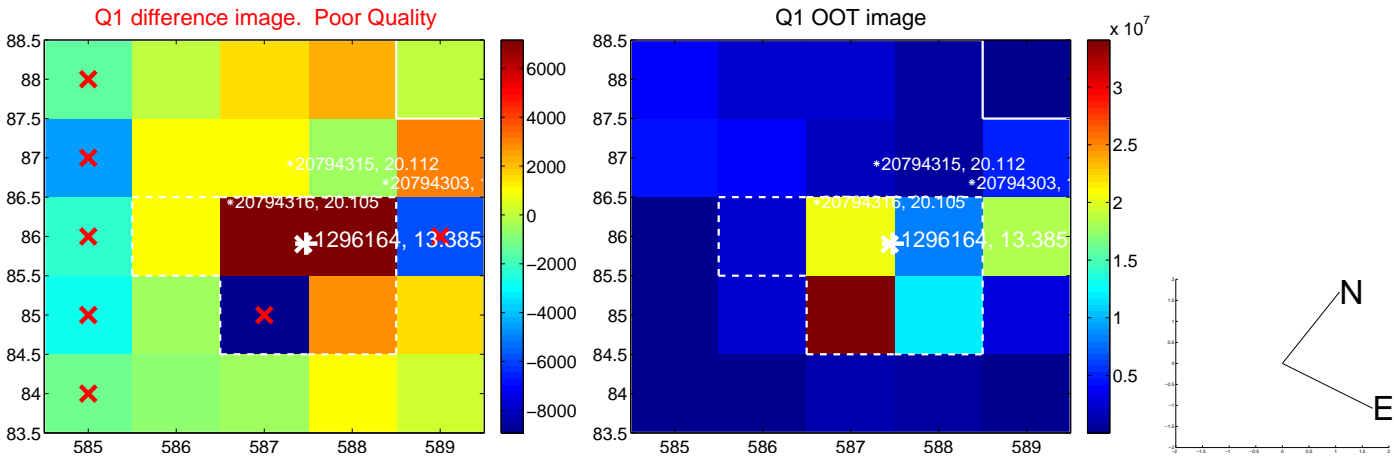


offset from photometric centroids

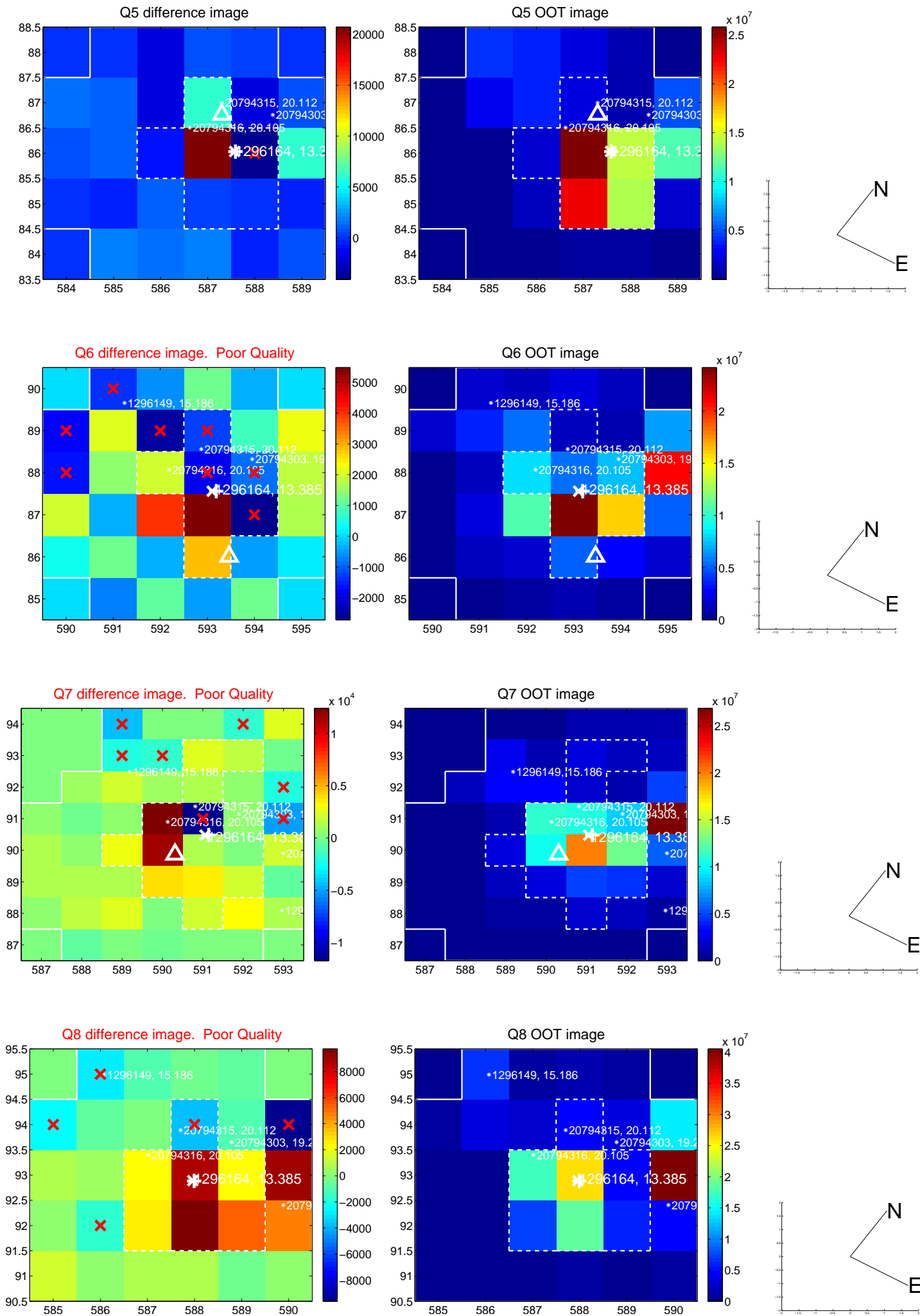


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

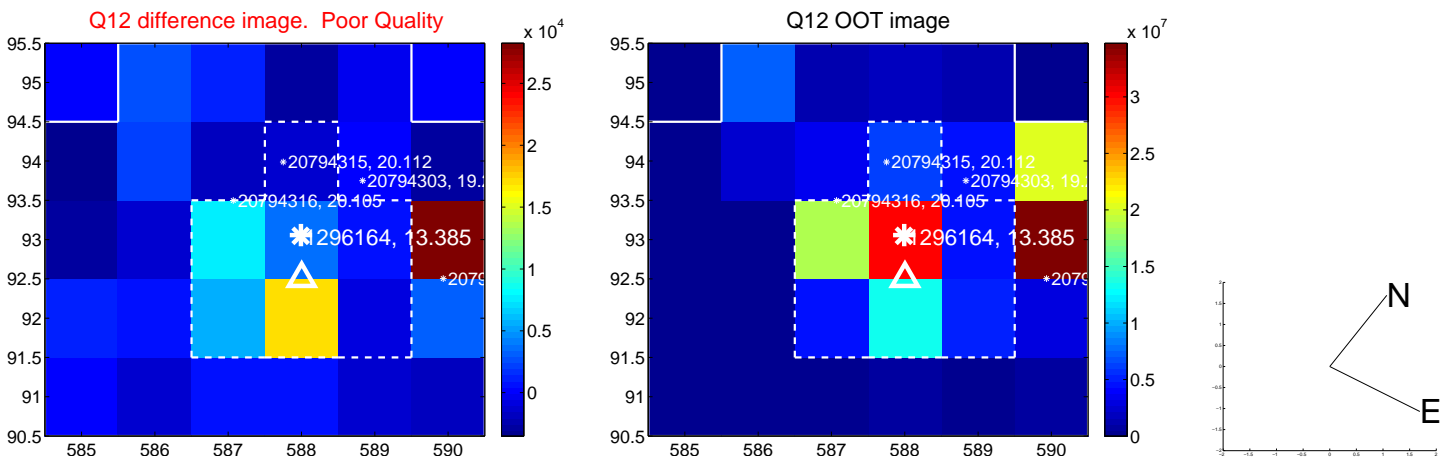
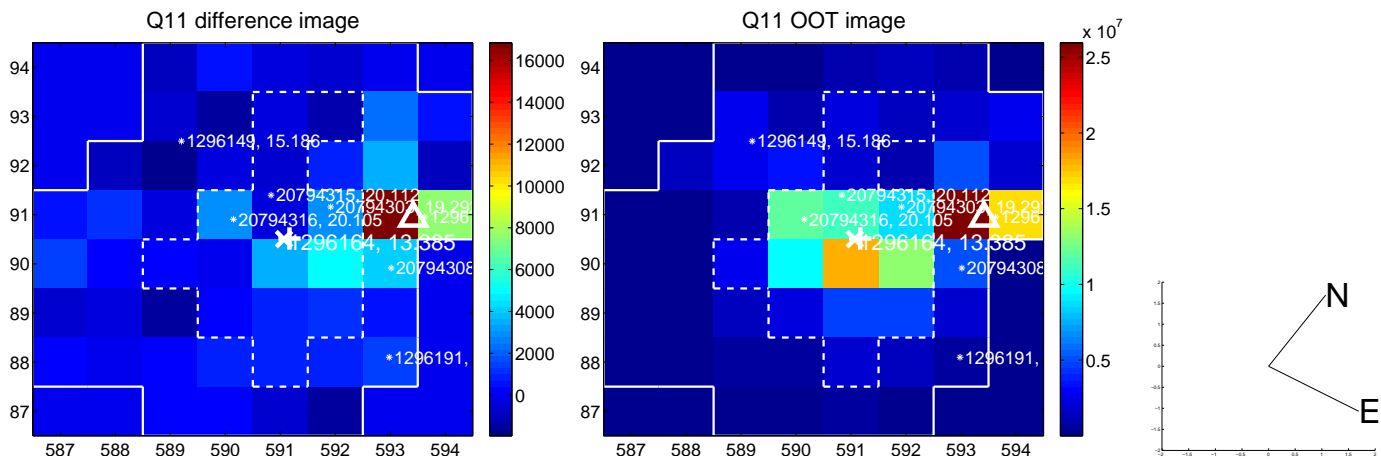
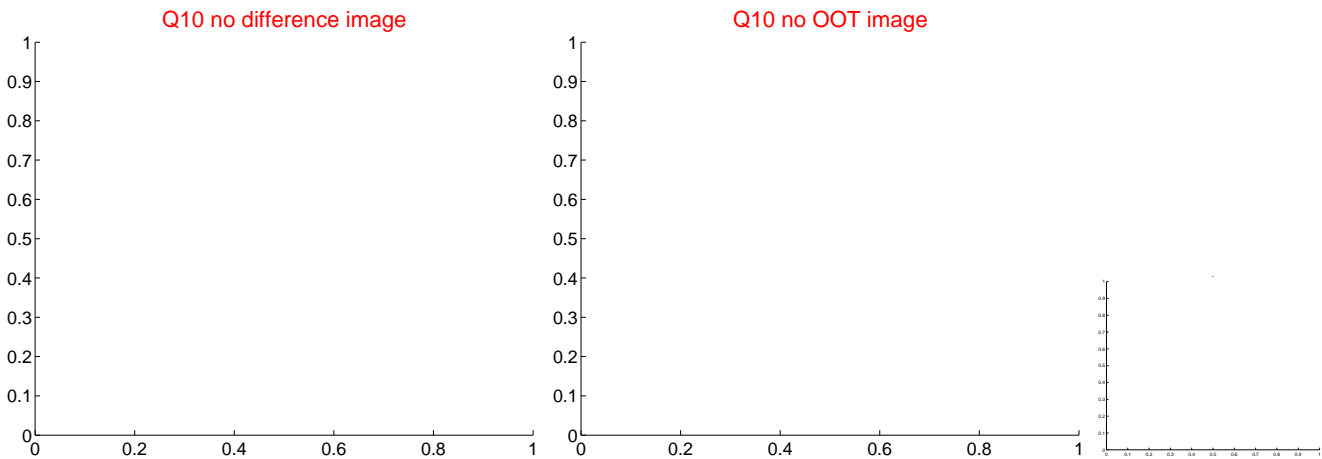
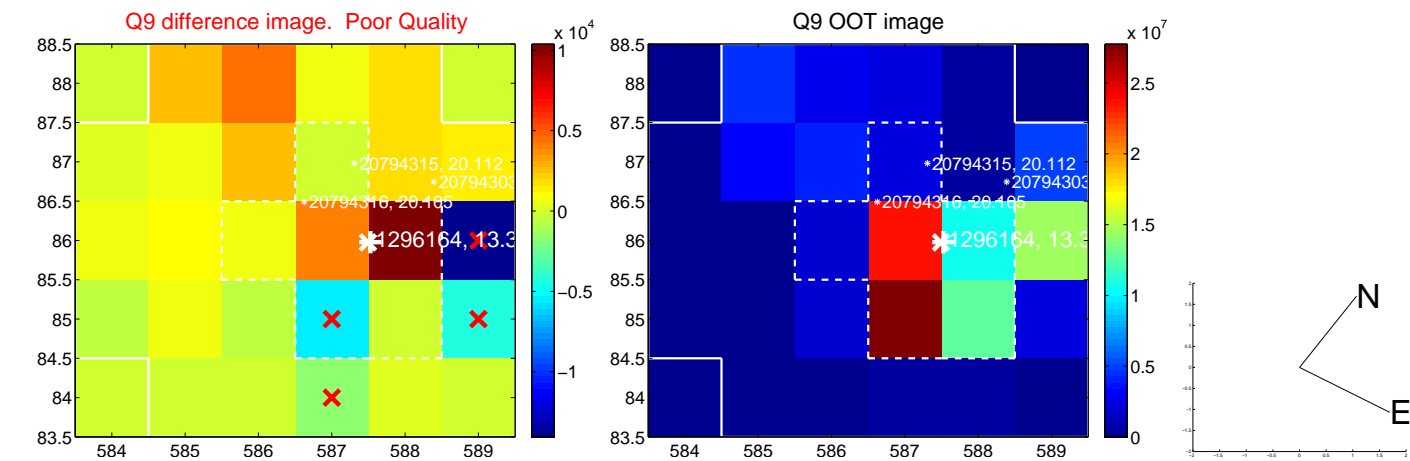
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



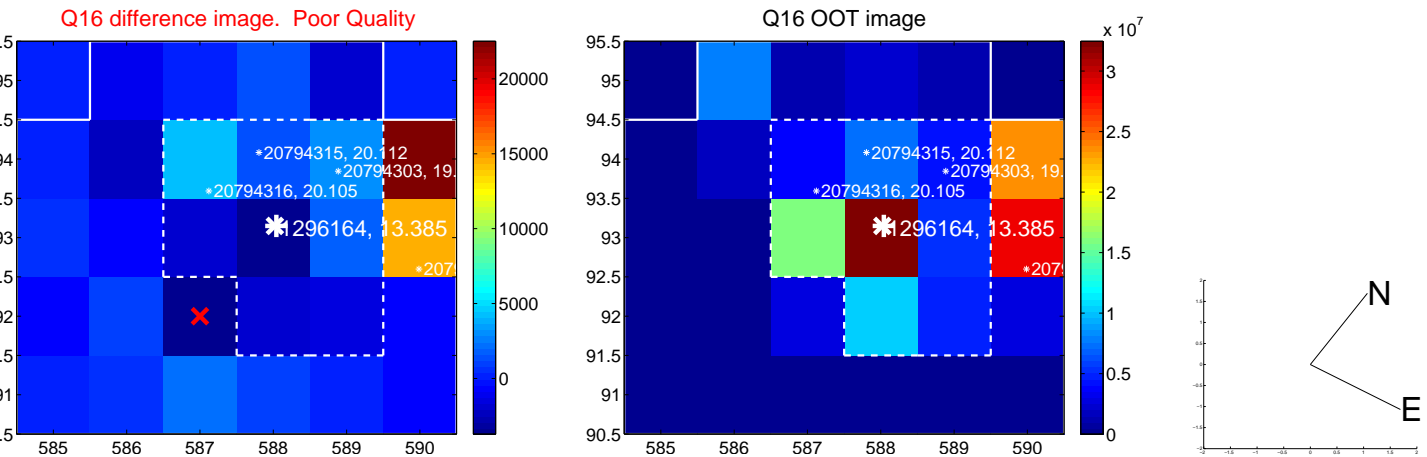
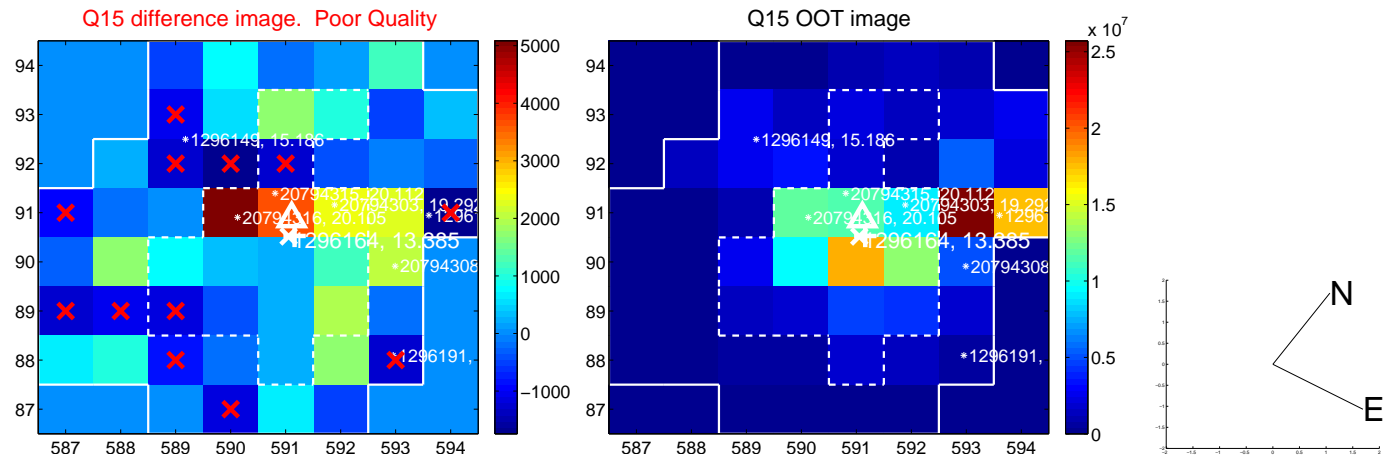
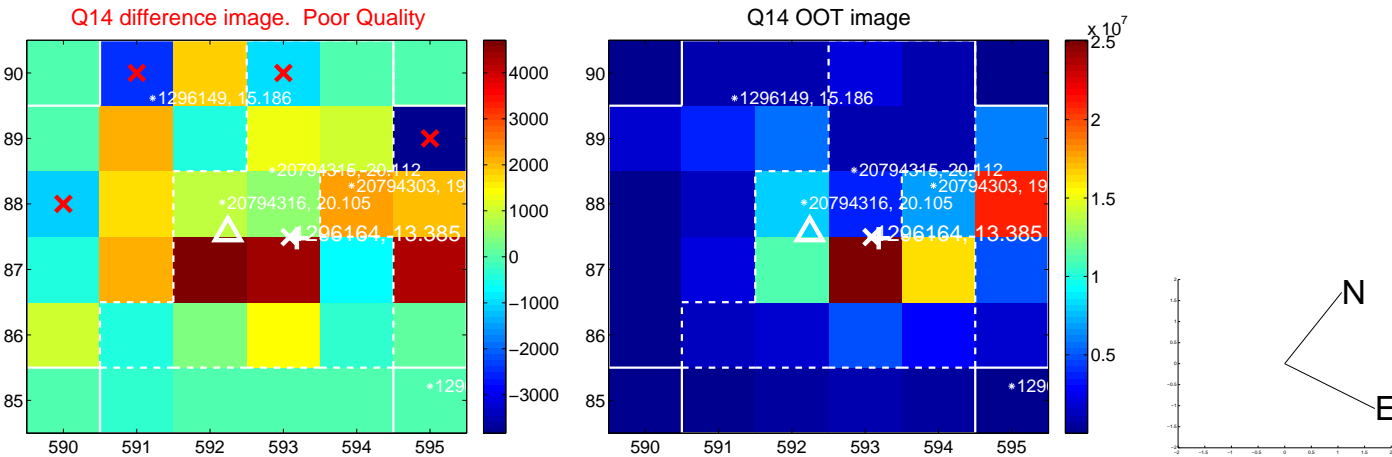
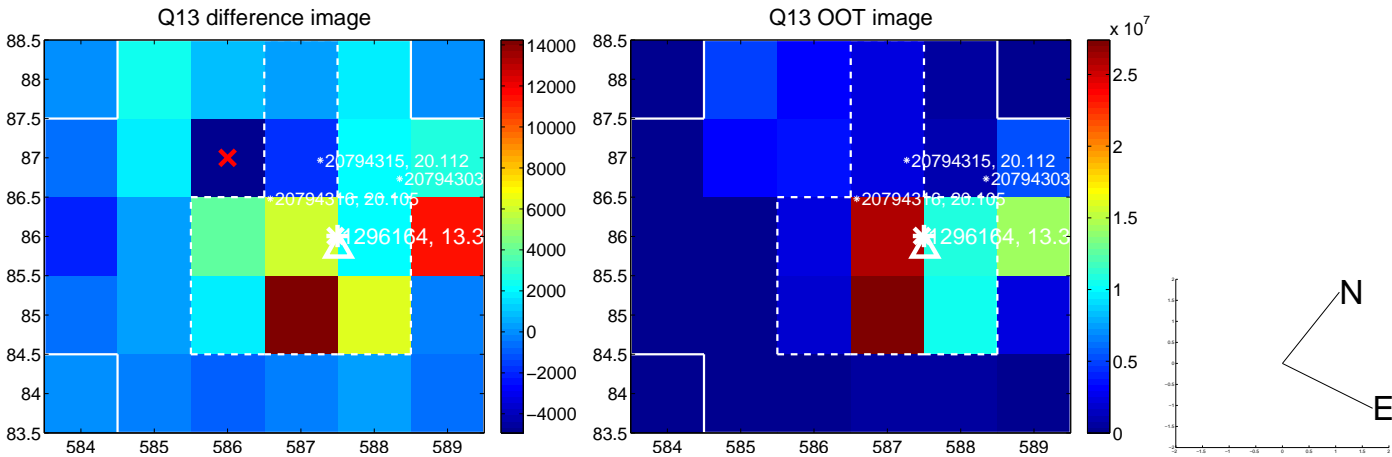
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

