

KIC 010616571

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 010616571-01 | OBS | No | 23.670321 | 136.994528 | 15641.5 | 3.000 | 539.6 | -1.0 | 1.18 | 5769 | 14.53 | 49.53 |
| 010616571-02 | OBS | 0340.01 | 23.673169 | 136.955826 | 19914.9 | 14.295 | 518.4 | 453.0 | 1.18 | 5769 | 16.36 | 49.52 |
| 010616571-03 | OBS | No | 23.673102 | 144.497891 | 613.7 | 5.697 | 35.2 | 37.4 | 1.18 | 5769 | 3.42 | 49.52 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010616571-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—CENT_NOFITS |
| 010616571-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—SAME_NTL_PERIOD |
| 010616571-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_ALT—SAME_NTL_PERIOD |

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 010616571-01

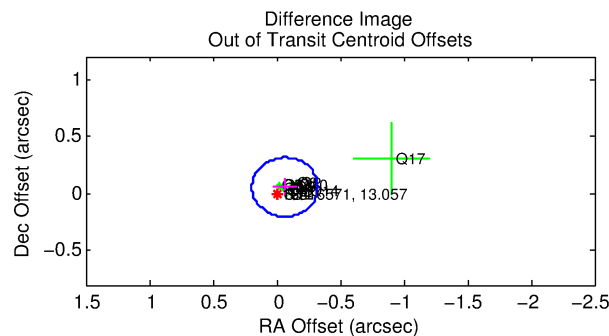
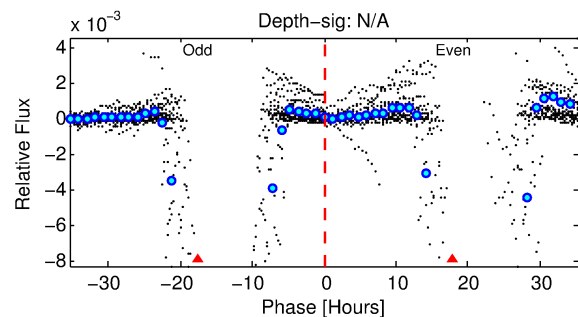
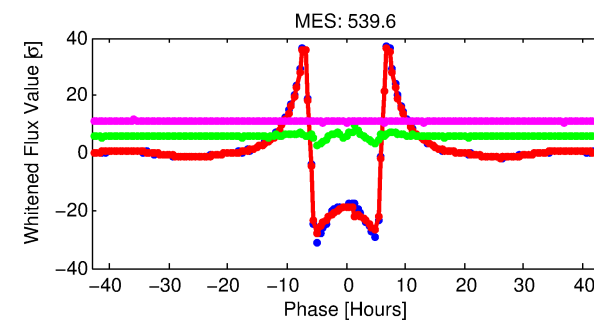
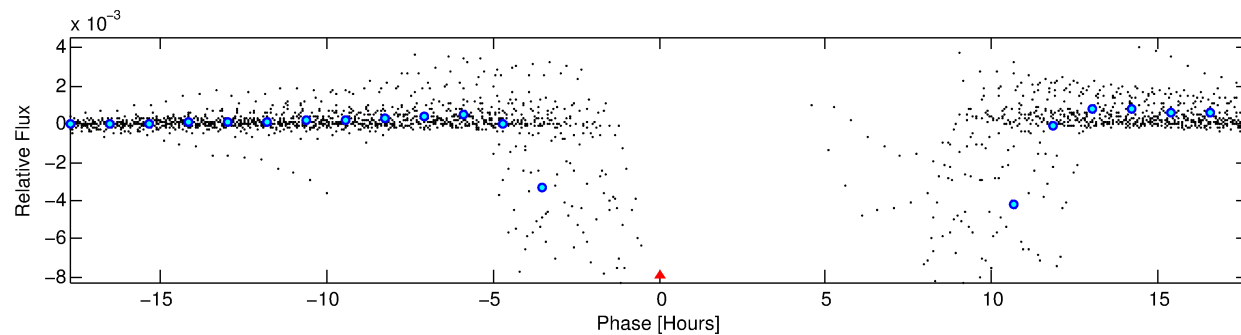
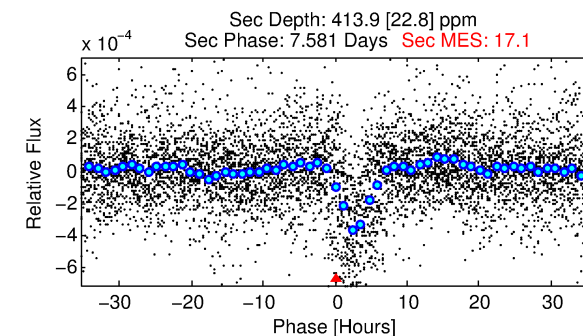
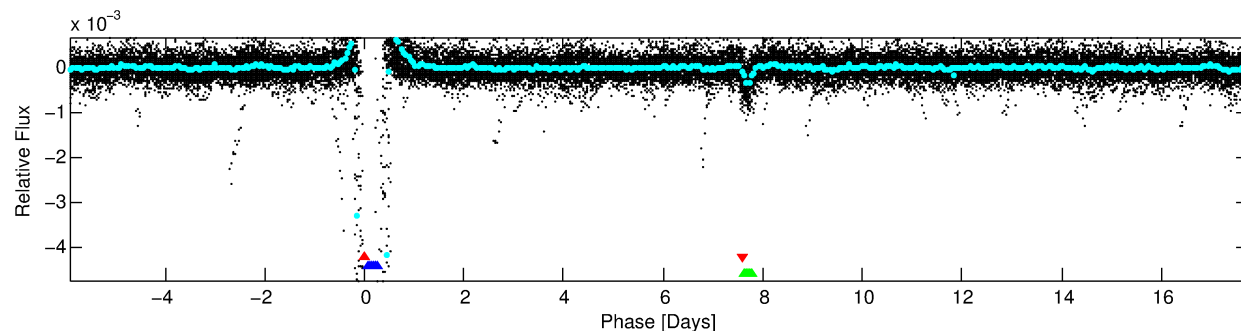
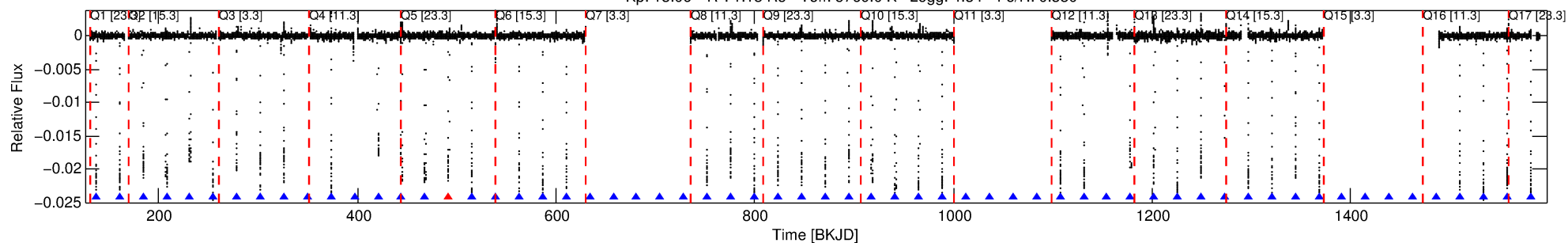
No Significant Match Found

DV One-Page Summary

KIC: 10616571 Candidate: 1 of 3 Period: 23.670 d

KOI: K00340 Corr: No Ephemeris Match

Kp: 13.06 R*: 1.18 Rs Teff: 5769.0 K Logg: 4.34 Fe/H: 0.380



TPS TCE Results:

Period = 23.67032 d
Epoch = 136.9945 BKJD

DV fit results are unavailable

DV Diagnostic Results:

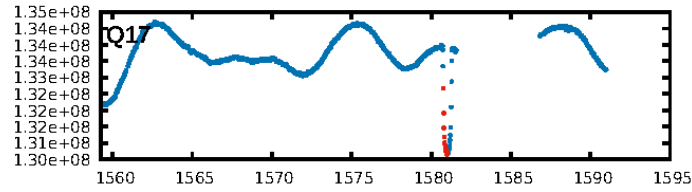
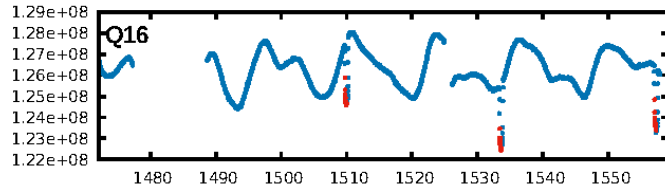
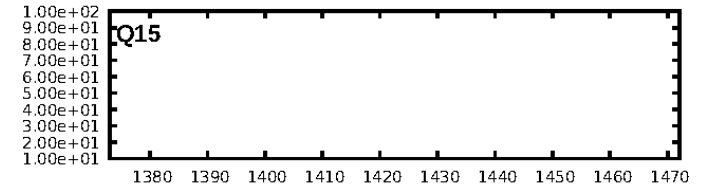
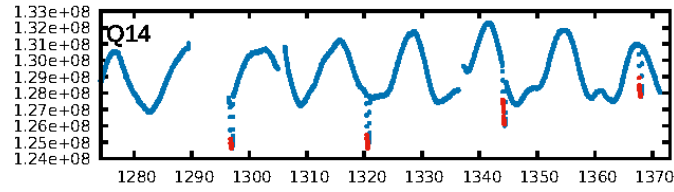
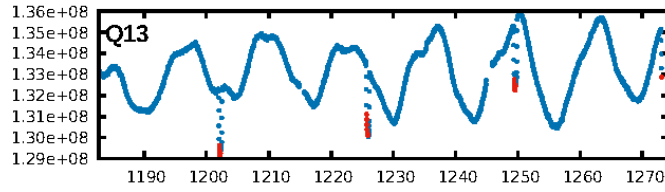
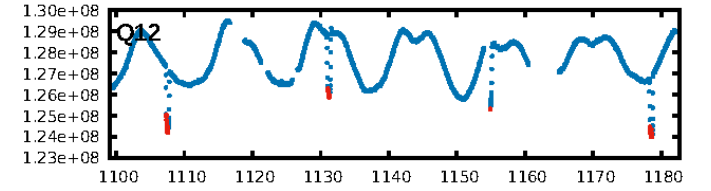
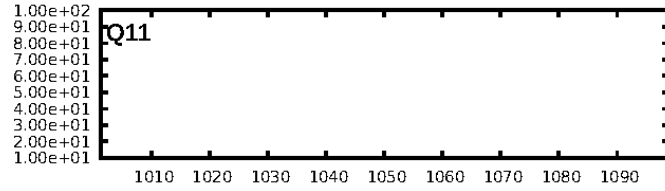
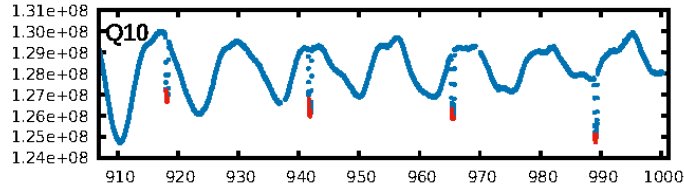
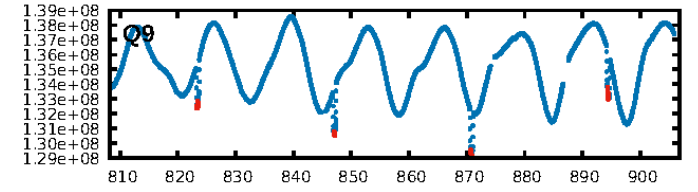
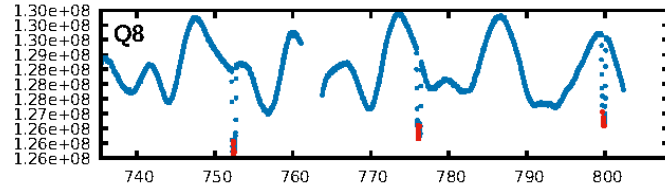
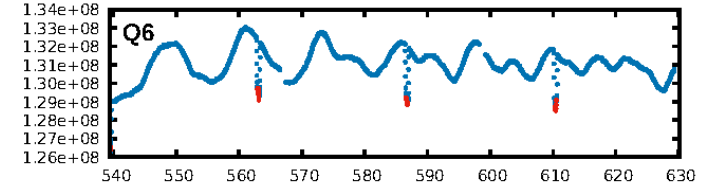
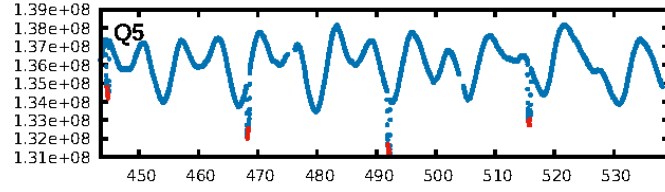
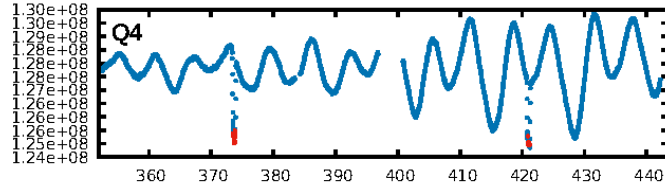
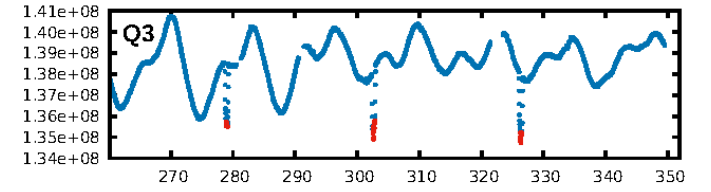
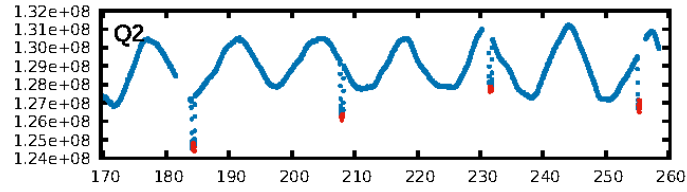
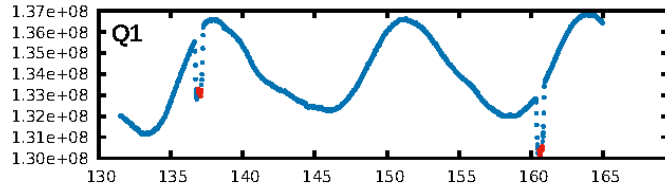
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LongPeriod-sig: 0.8% [0.01σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.98 [40/41]
GhostDiagnostic-chr: -0.2562

Centroid-sig: N/A
Centroid-so: 1.195 arcsec [15.33σ]
OotOffset-rm: 0.086 arcsec [1.00σ]
KicOffset-rm: 0.154 arcsec [1.65σ]
OotOffset-st: 4/1/3/5 [13]
KicOffset-st: 4/1/3/5 [13]
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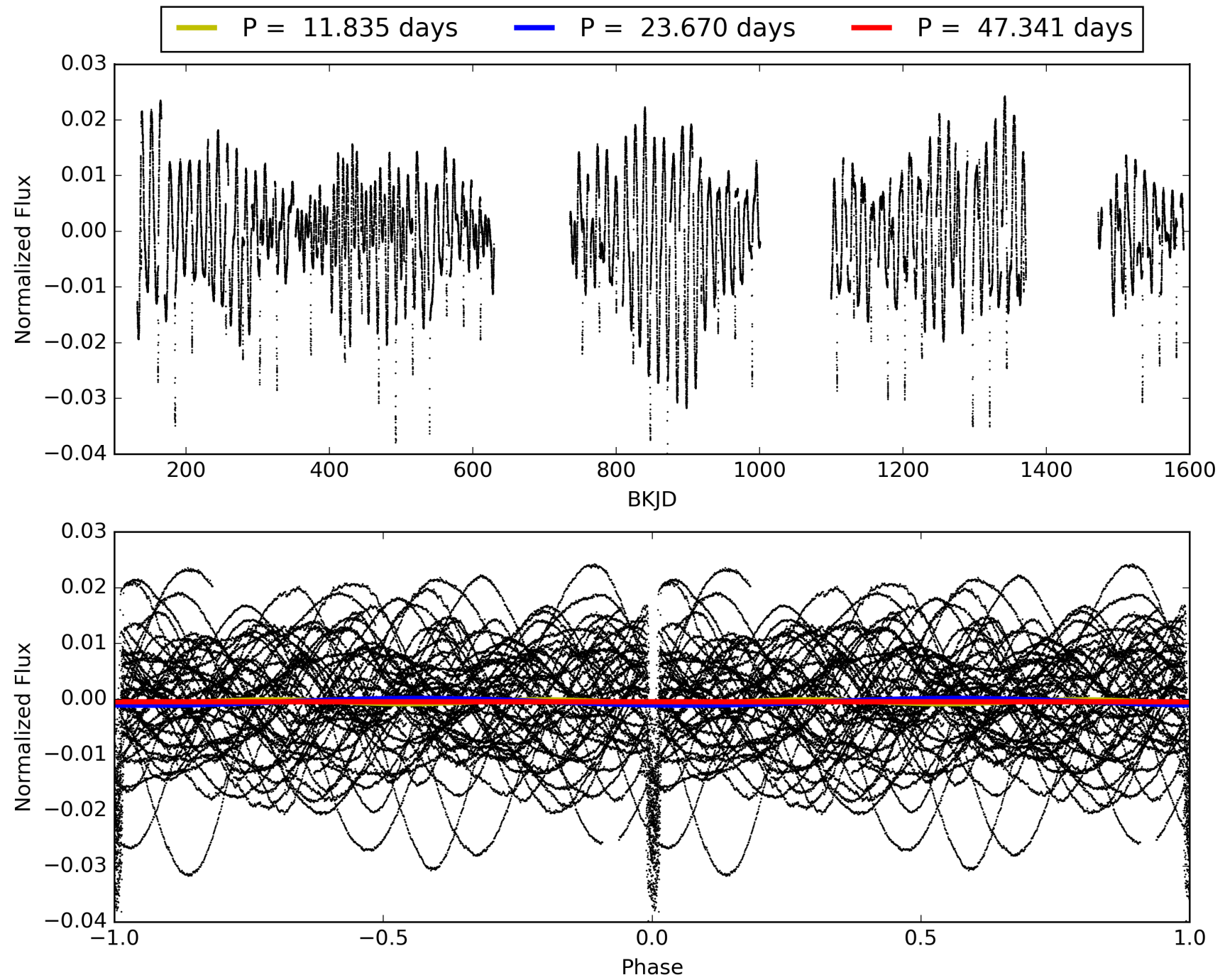
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 010616571-01, PDC Light Curves

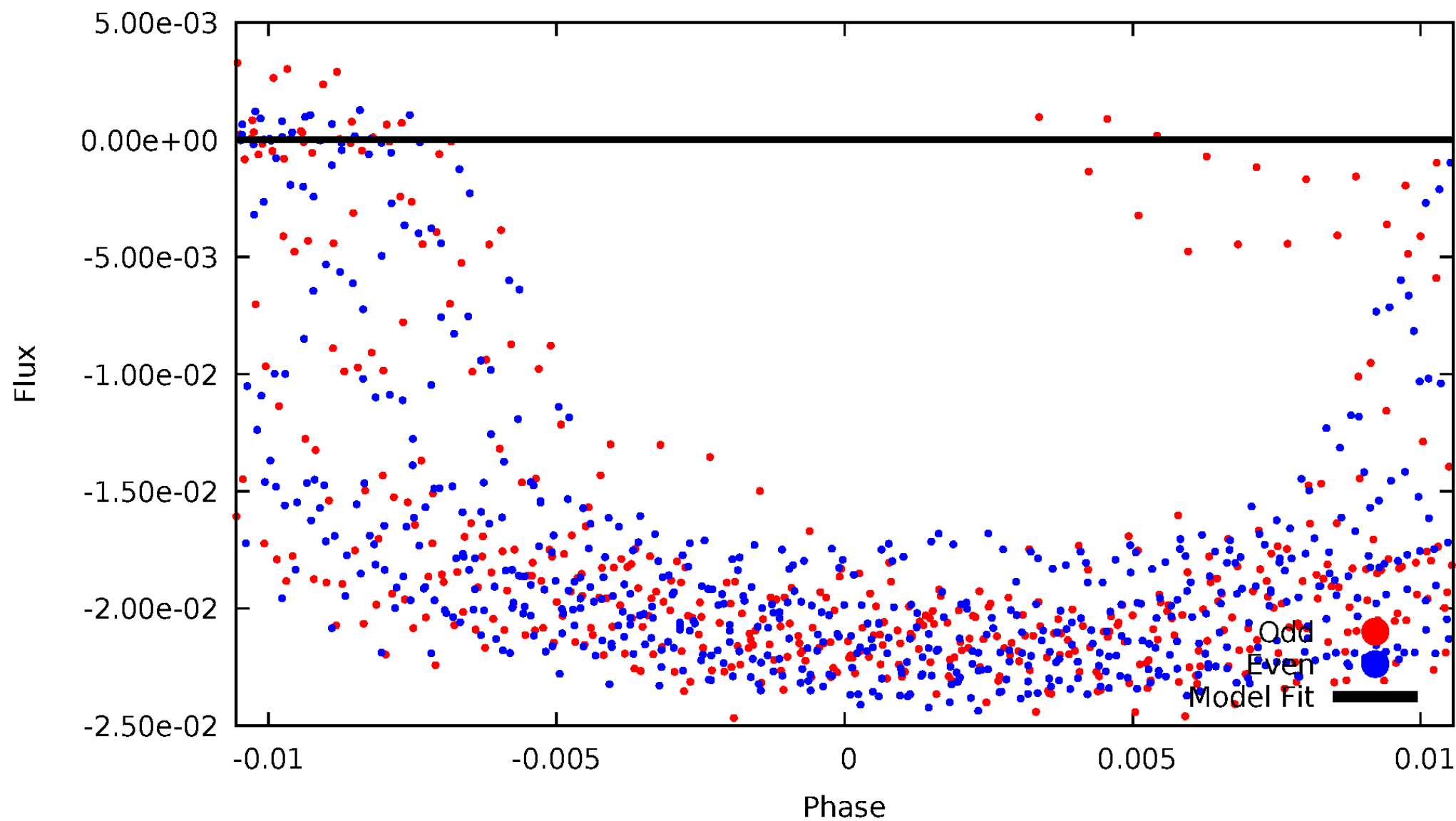


TCE 010616571-01



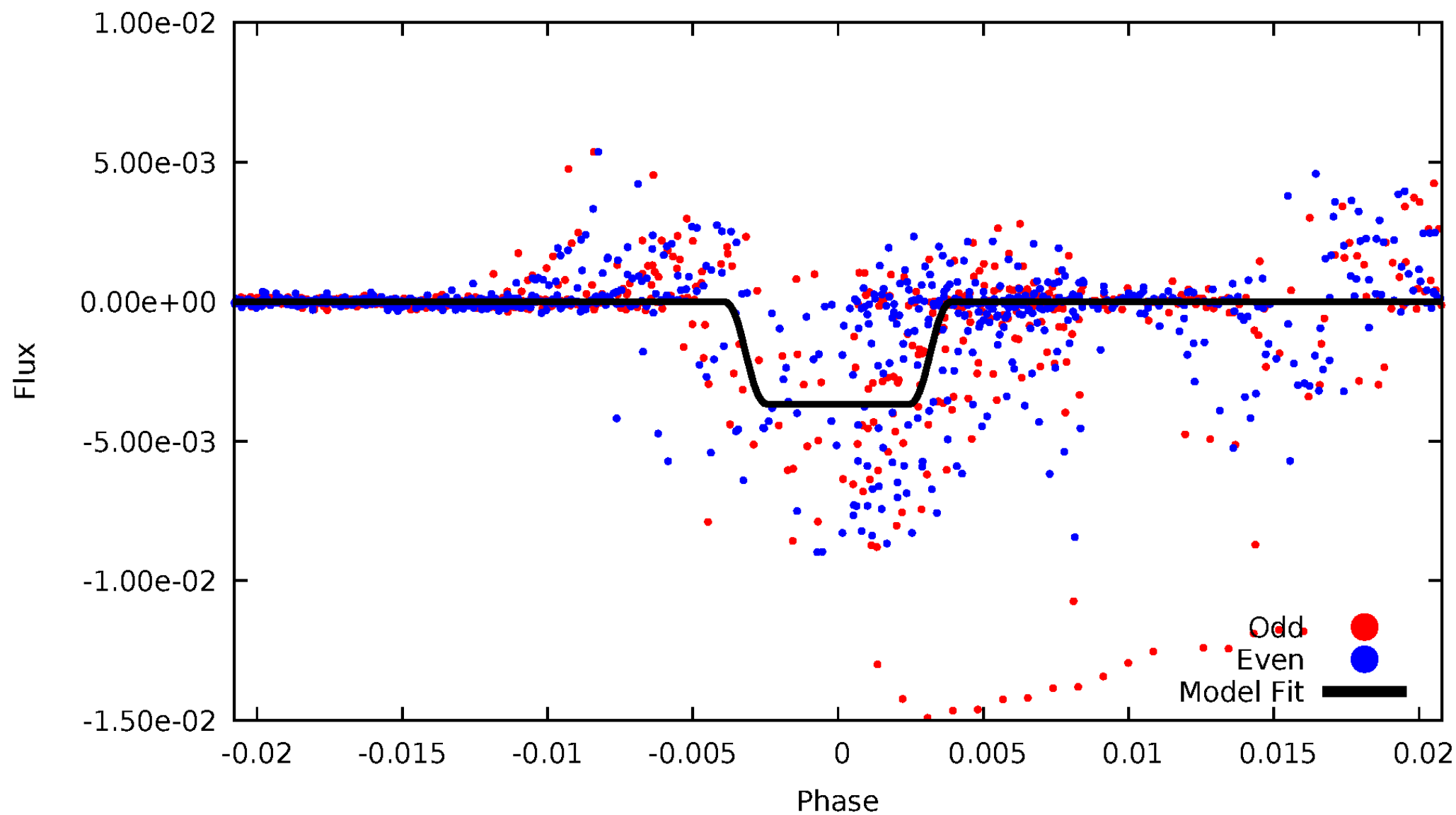
DV Odd/Even

TCE 010616571-01

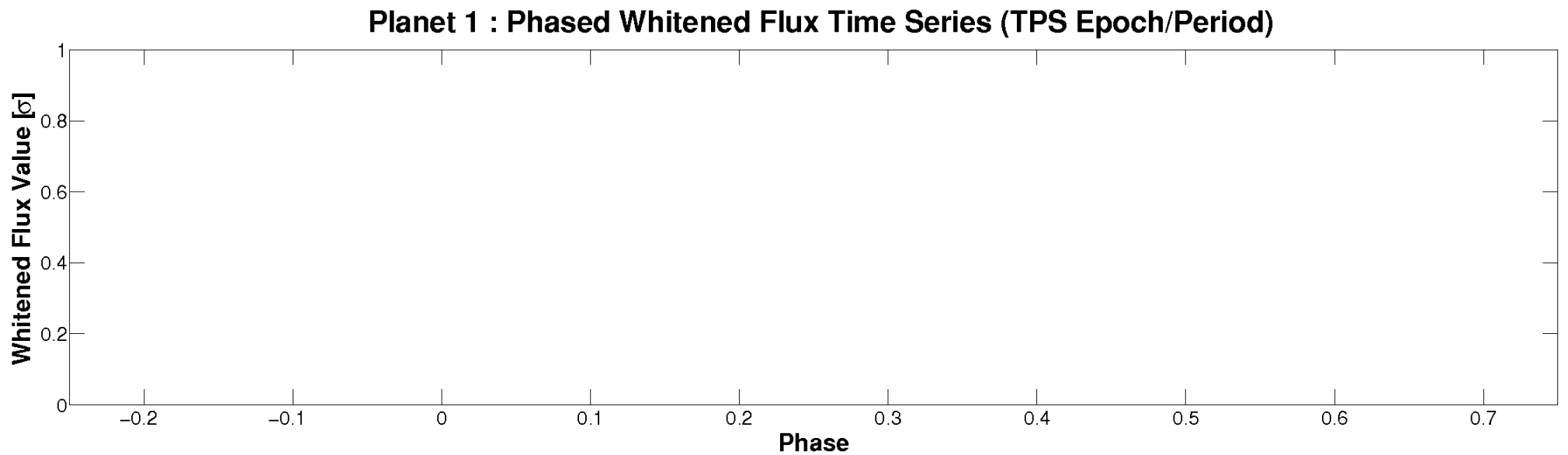
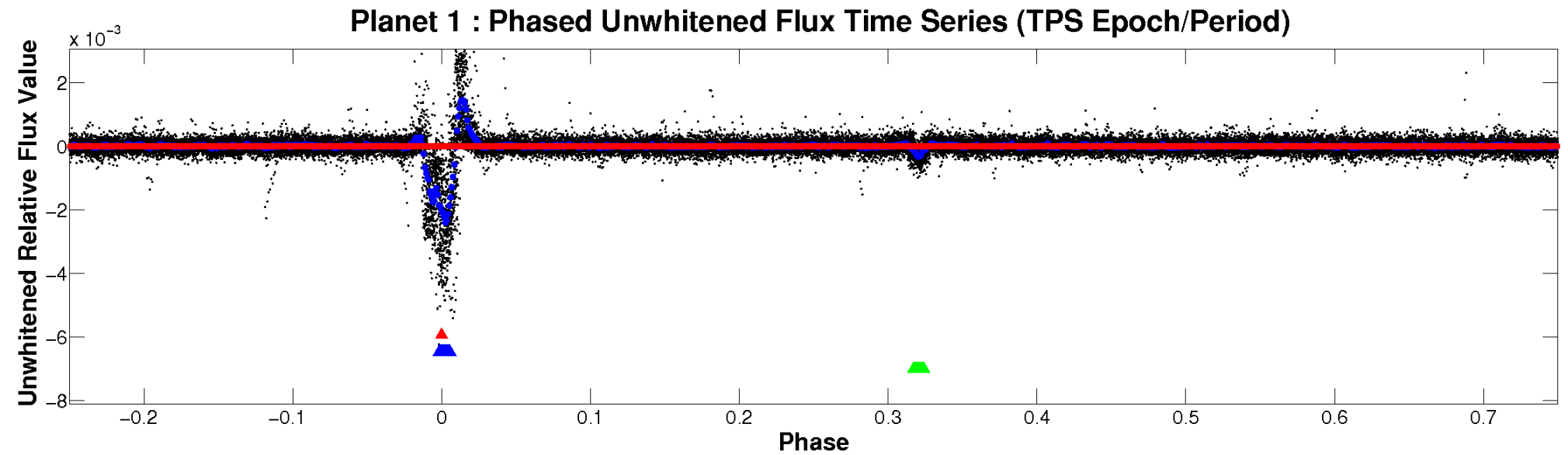


ALT Odd/Even

TCE 010616571-01

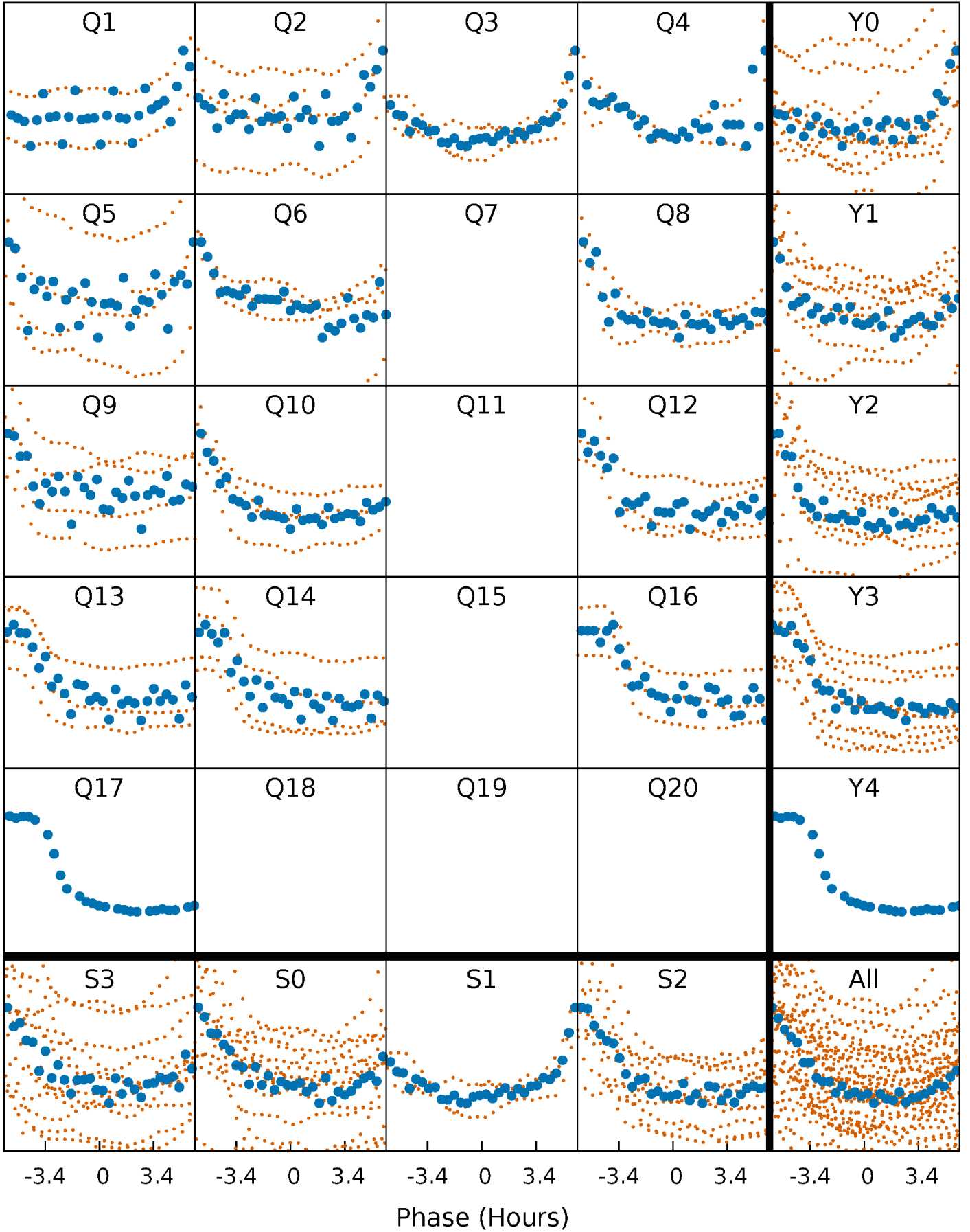


Non-Whitened Vs. Whitened Light Curve



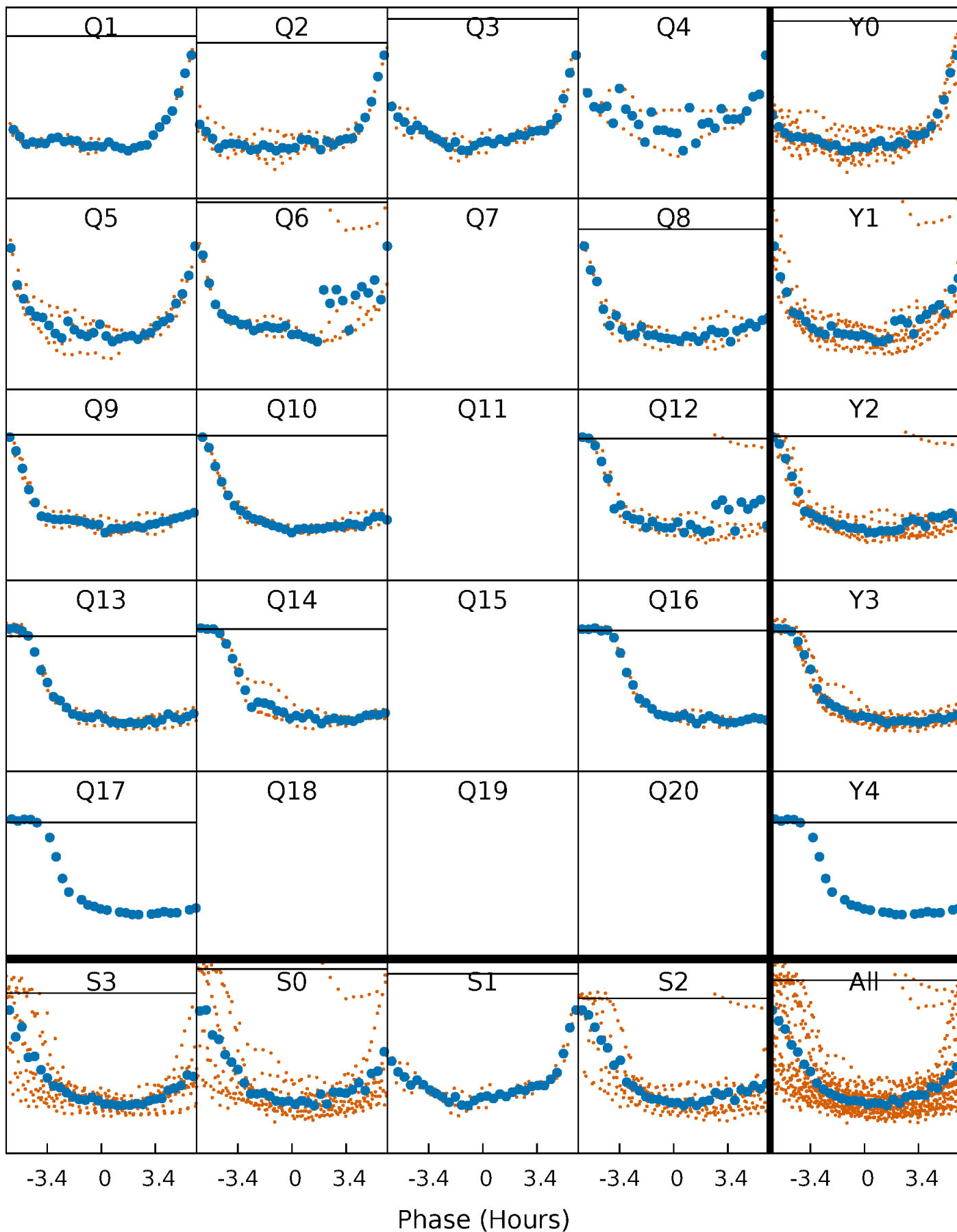
PDC Quarter-Phased Transit Curves

TCE 010616571-01 P= 23.670321 Days $T_0=136.994528$ (BKJD)



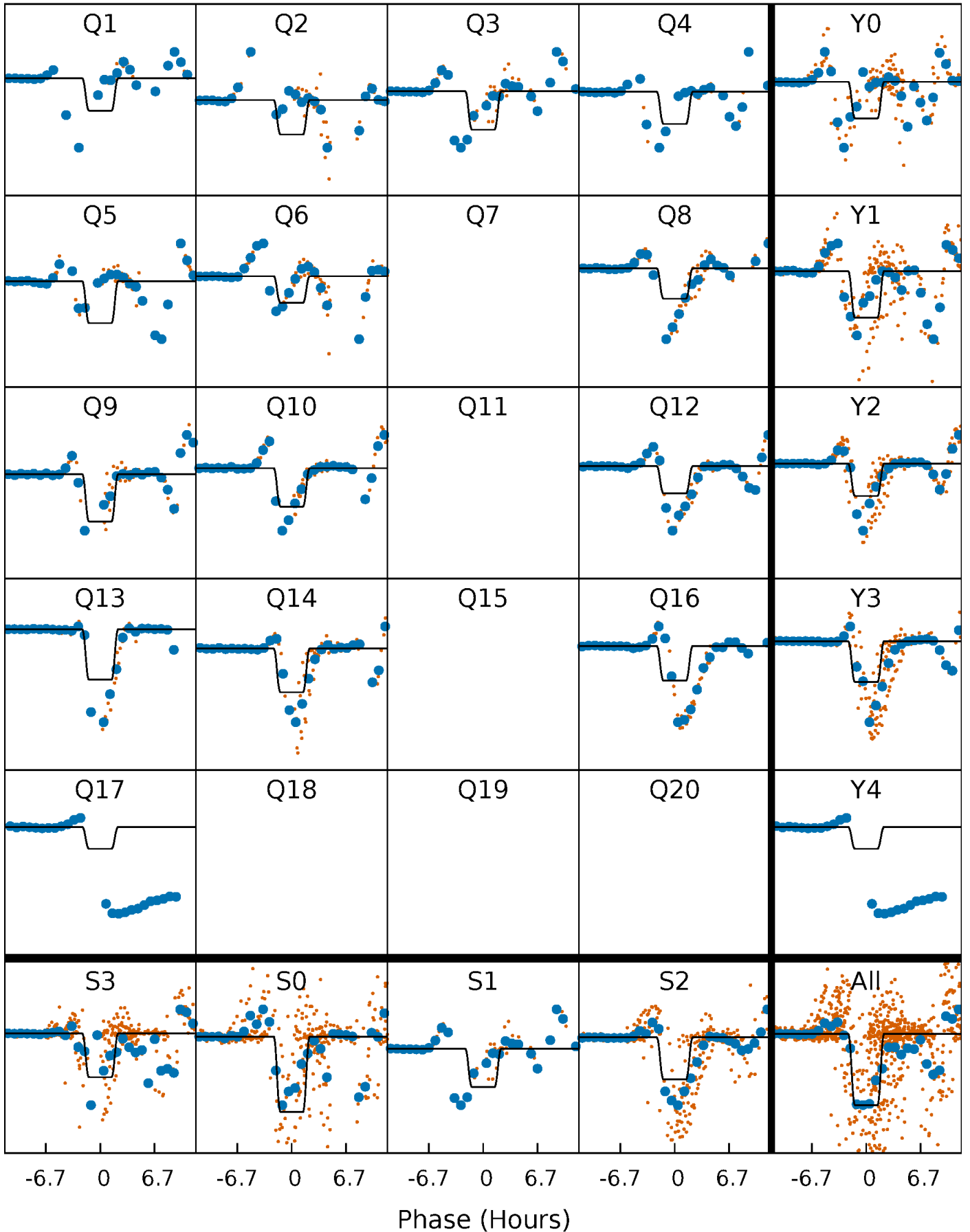
DV Quarter-Phased Transit Curves

TCE 010616571-01 P= 23.670321 Days $T_0=136.994528$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

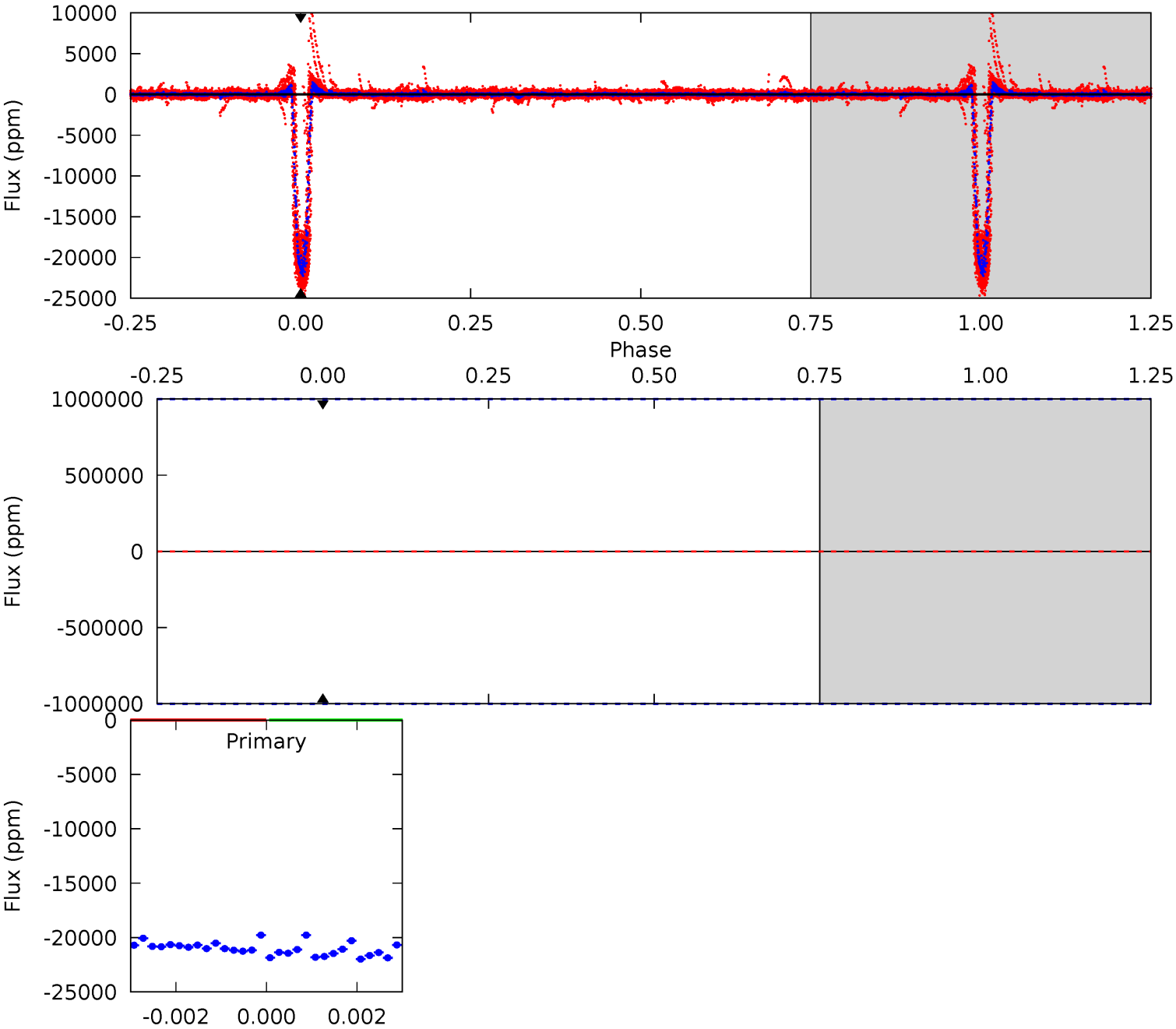
TCE 010616571-01 P= 23.670321 Days $T_0=136.882484$ (BKJD)



DV Model-Shift Uniqueness Test

010616571-01, P = 23.670321 Days, E = 113.324207 Days

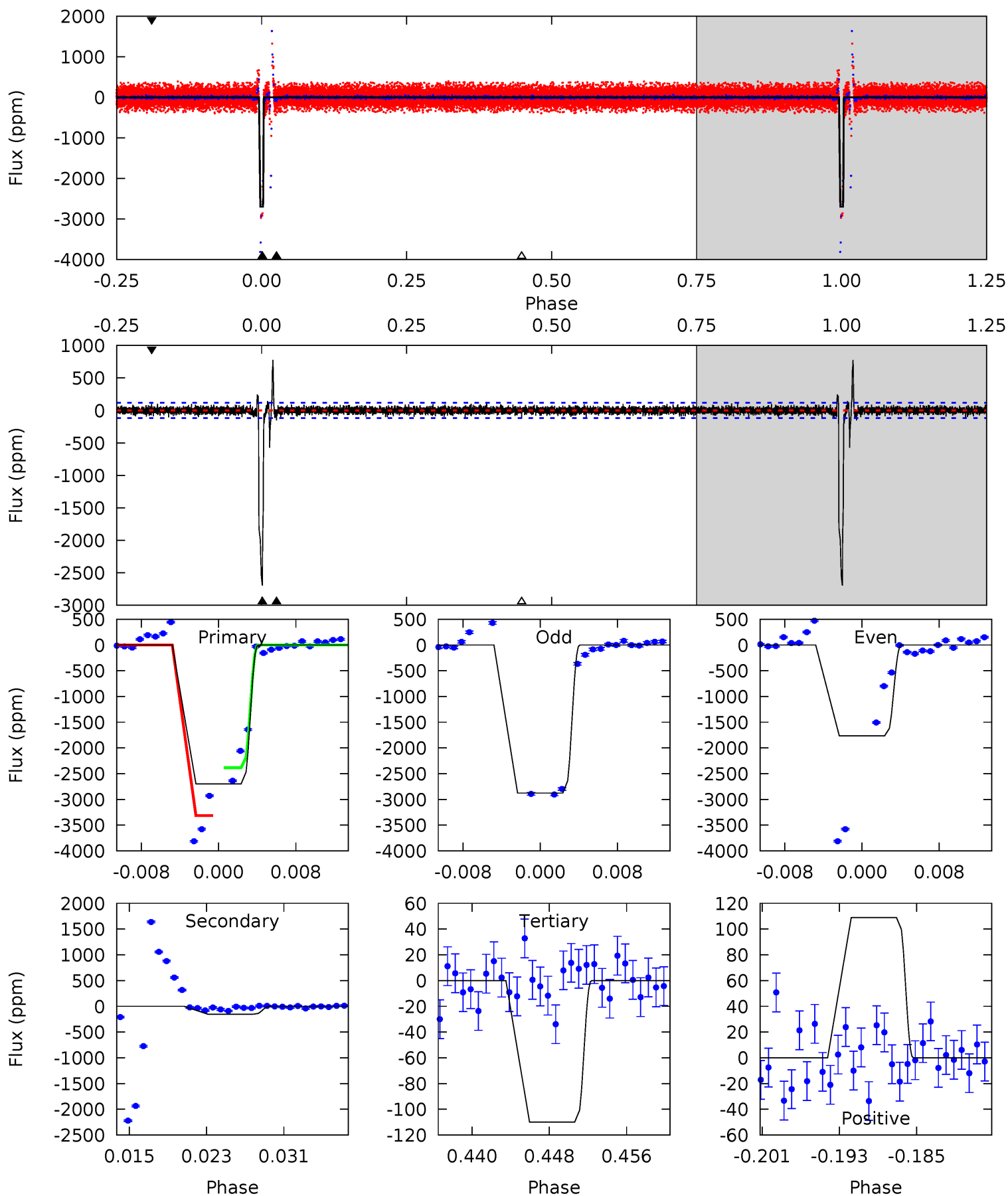
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-----|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-----|-------|-----|
| 0 | 0 | 0 | 0 | 1.00 | 1.00 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



Alt Model-Shift Uniqueness Test

010616571-01, P = 23.670321 Days, E = 113.212163 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 116.3 | 6.59 | 4.74 | 4.70 | 5.08 | 2.66 | 1.32 | 111.5 | 111.6 | 1.85 | 1.89 | 27.0 | 1.26 | 0.22 | 0 |



Stellar Parameters For KIC 010616571

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5769^{+104}_{-116} | $4.338^{+0.095}_{-0.126}$ | $0.380^{+0.050}_{-0.150}$ | $1.177^{+0.209}_{-0.129}$ | $1.100^{+0.068}_{-0.068}$ | $0.950^{+0.341}_{-0.351}$ |
| | +2%/-2% | +2%/-3% | +13%/-39% | +18%/-11% | +6%/-6% | +36%/-37% |
| Source | SPE3 | SPE3 | SPE3 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 010616571-01 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-----------------|---------------------------|-------------------|-------------------------|------------------------|
| DV | 0 ± 1000000 | $16.19^{+12.08}_{-10.31}$ | 947^{+45}_{-37} | 3741^{+8905}_{-14507} | 110^{+10021}_{-7224} |
| Alt. | -153 ± 23 | $12.48^{+10.84}_{-7.79}$ | 945^{+46}_{-35} | 2804^{+990}_{-439} | 15^{+92}_{-11} |

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 $A_{obs} \gg 1.0$

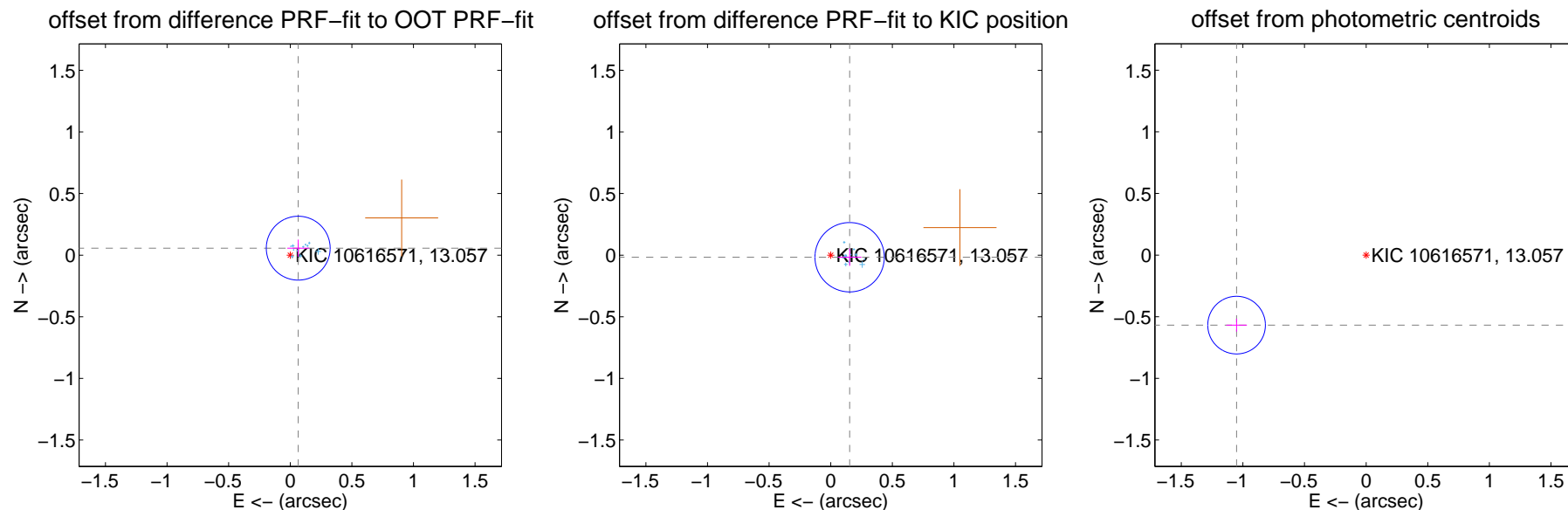
DV Centroid Data

Supplemental centroid analysis for 010616571-01. Kepler magnitude: 13.06. Transit SNR -1.00

There are 12 quarters with good PRF difference image offsets

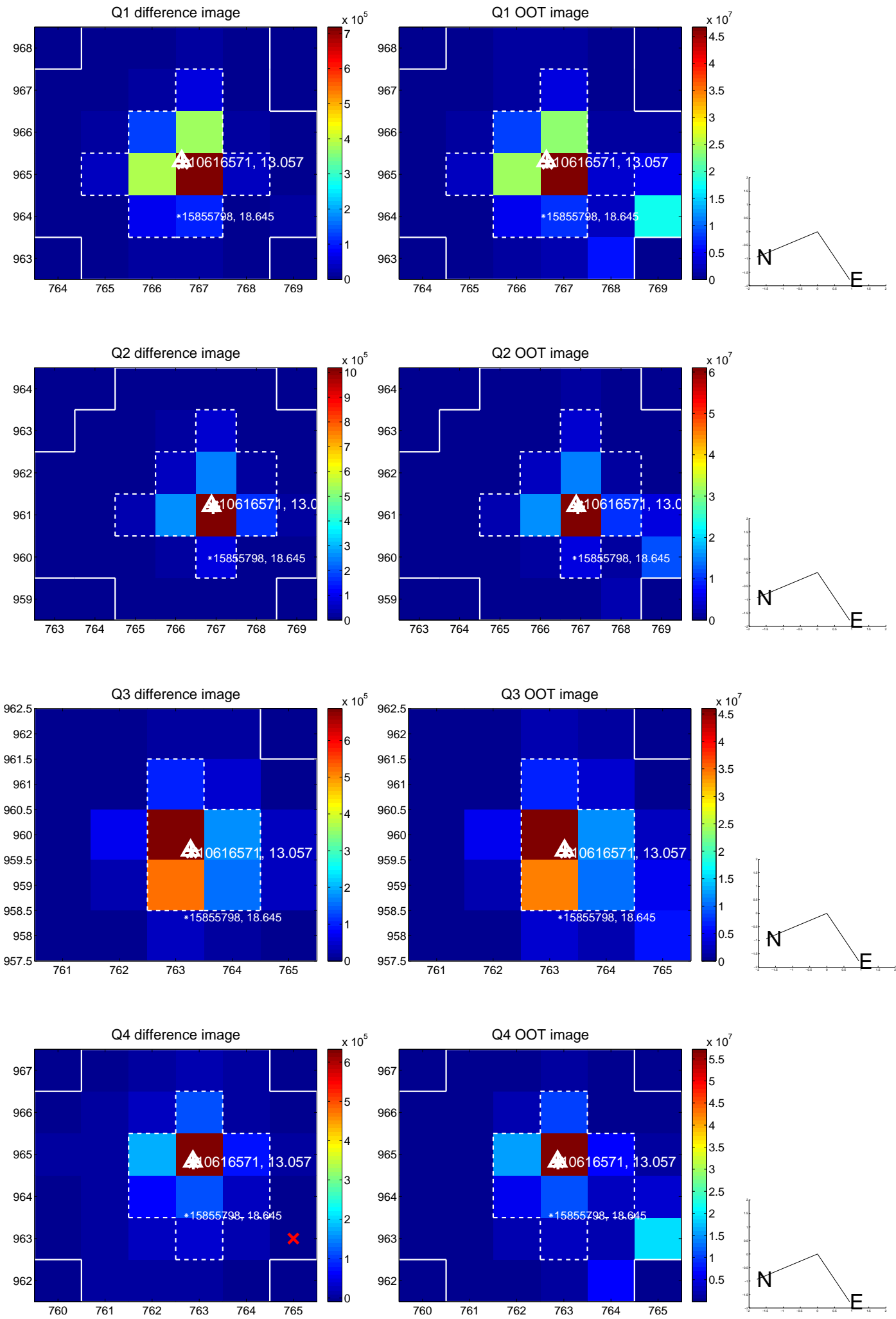
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.086 ± 0.086 | 1.00 | -0.065 ± 0.089 | 0.057 ± 0.069 |
| PRF-fit source offset from KIC position | 0.154 ± 0.094 | 1.65 | -0.153 ± 0.095 | -0.017 ± 0.070 |
| photometric centroid source offset | 1.19 ± 0.08 | 15.33 | 1.05 ± 0.08 | -0.57 ± 0.05 |

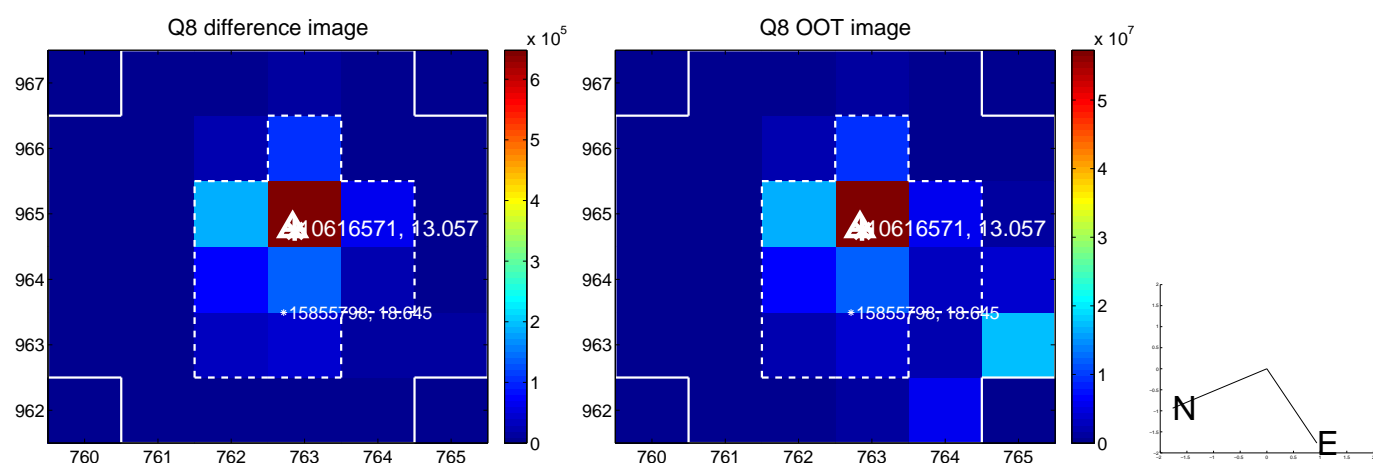
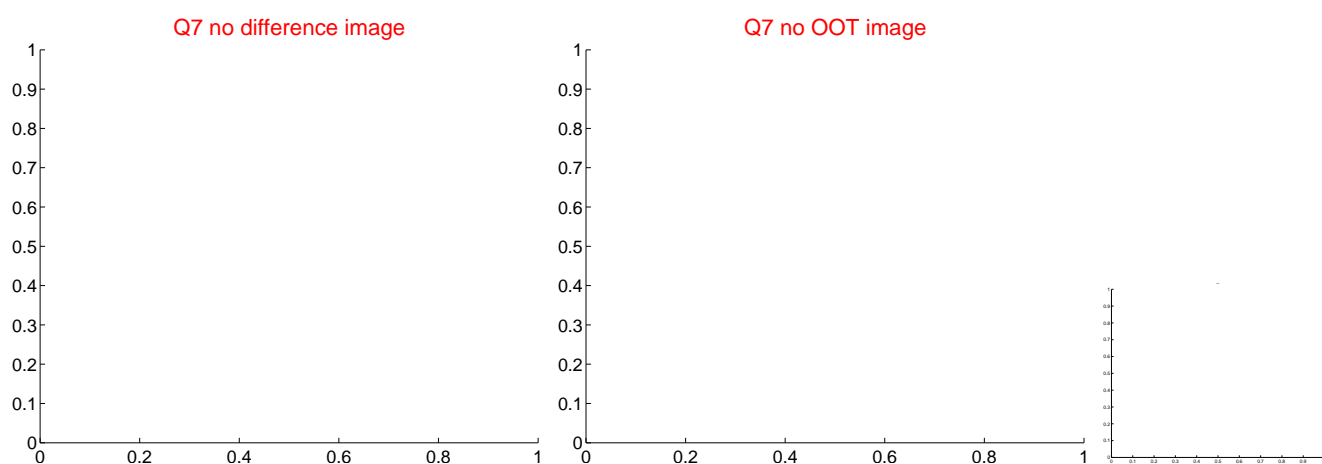
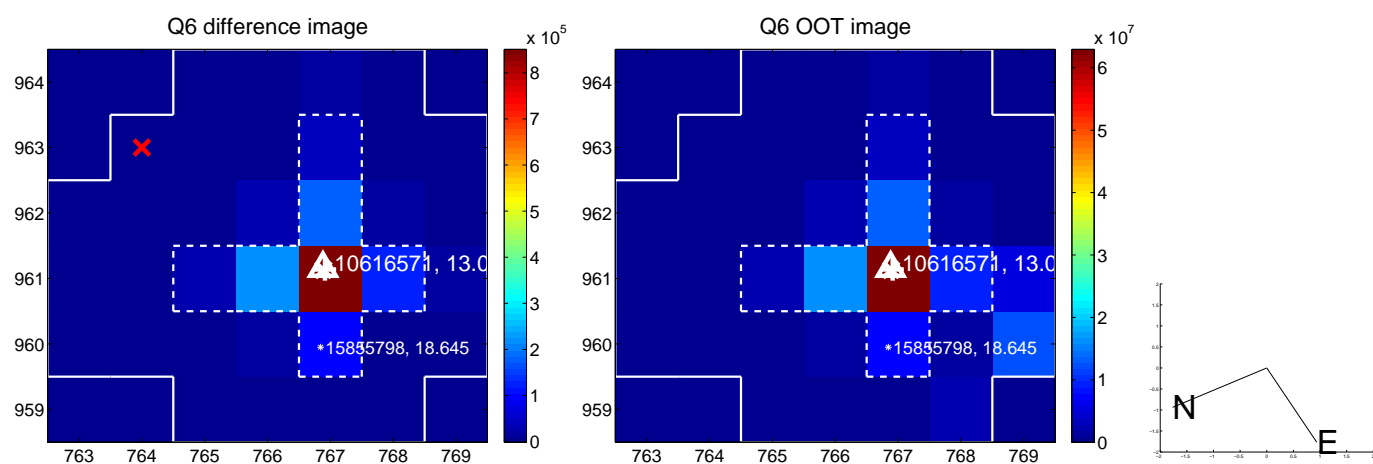
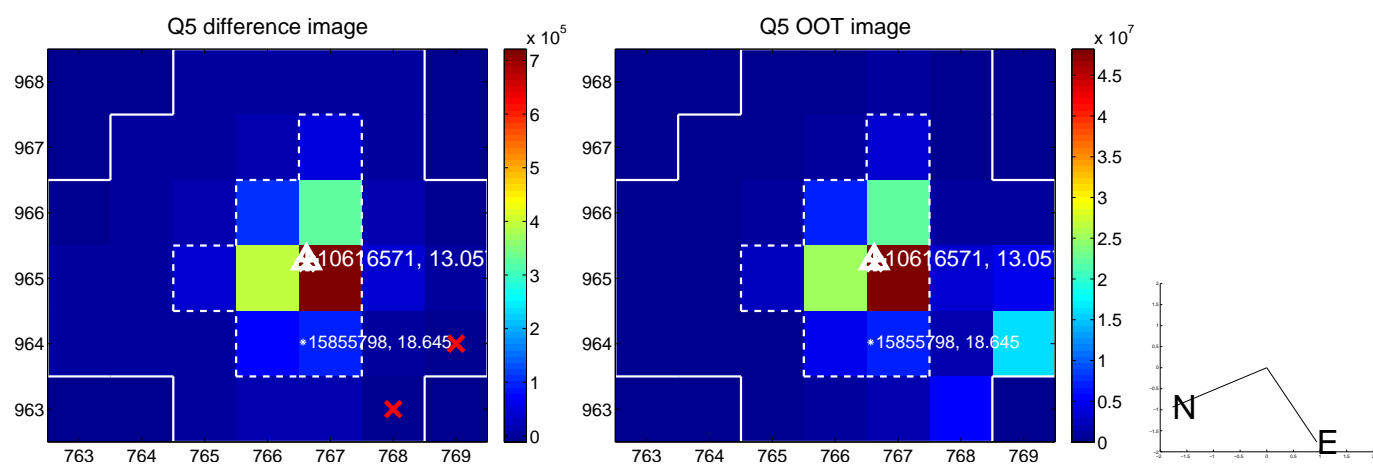


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

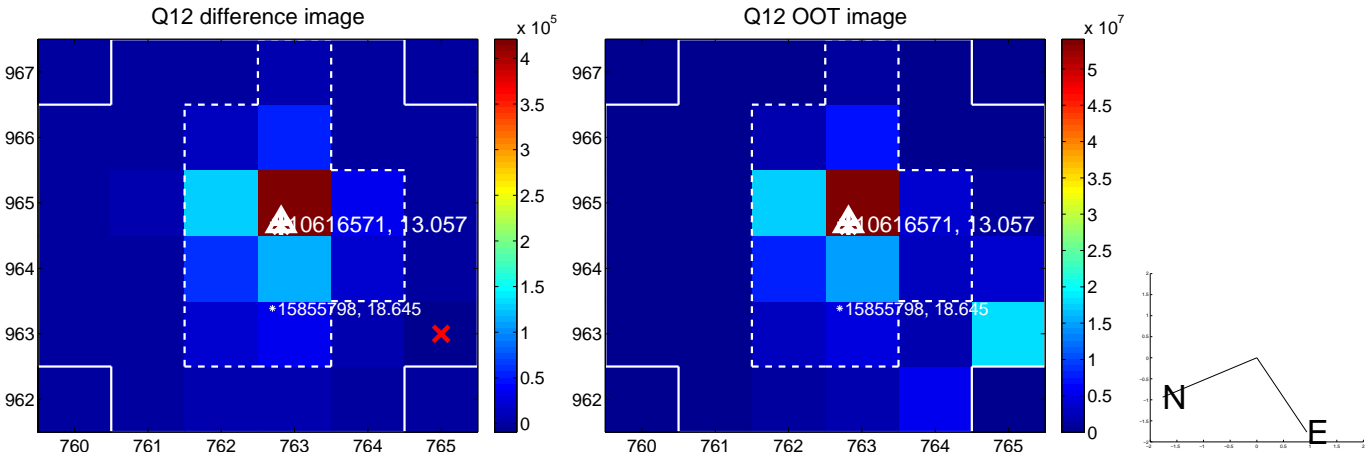
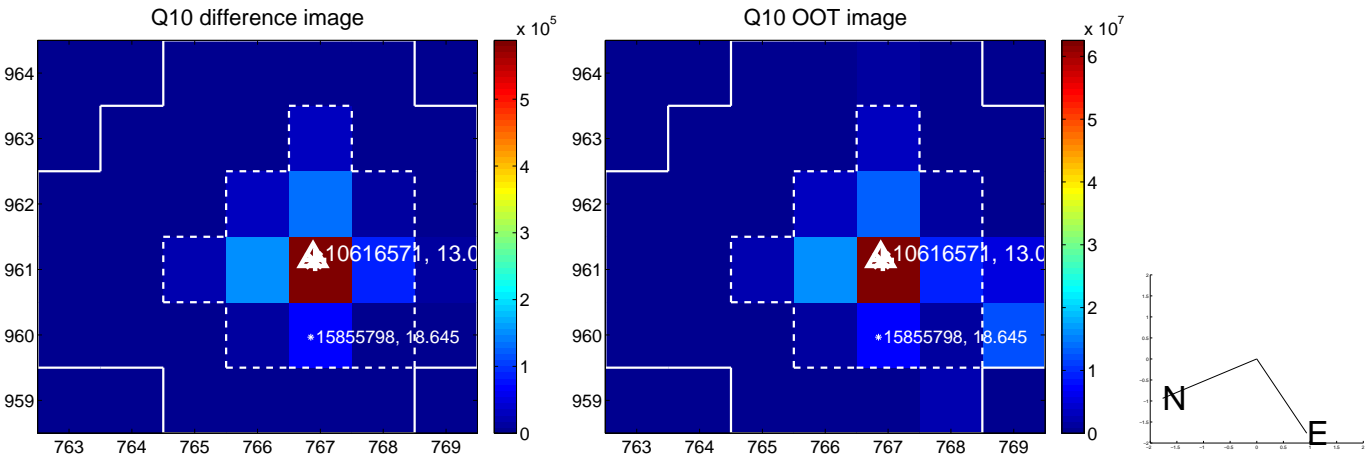
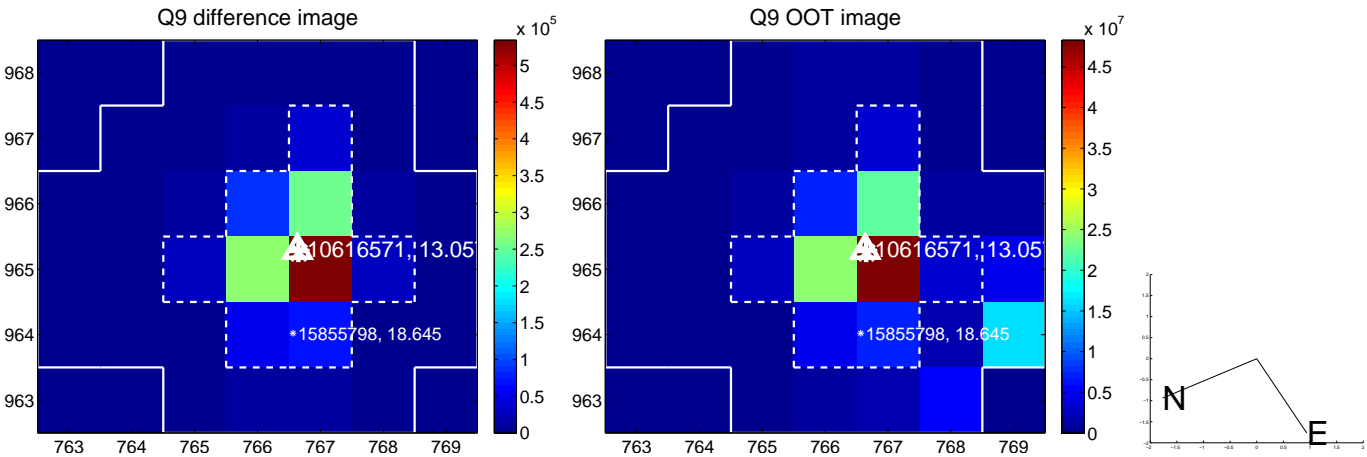
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



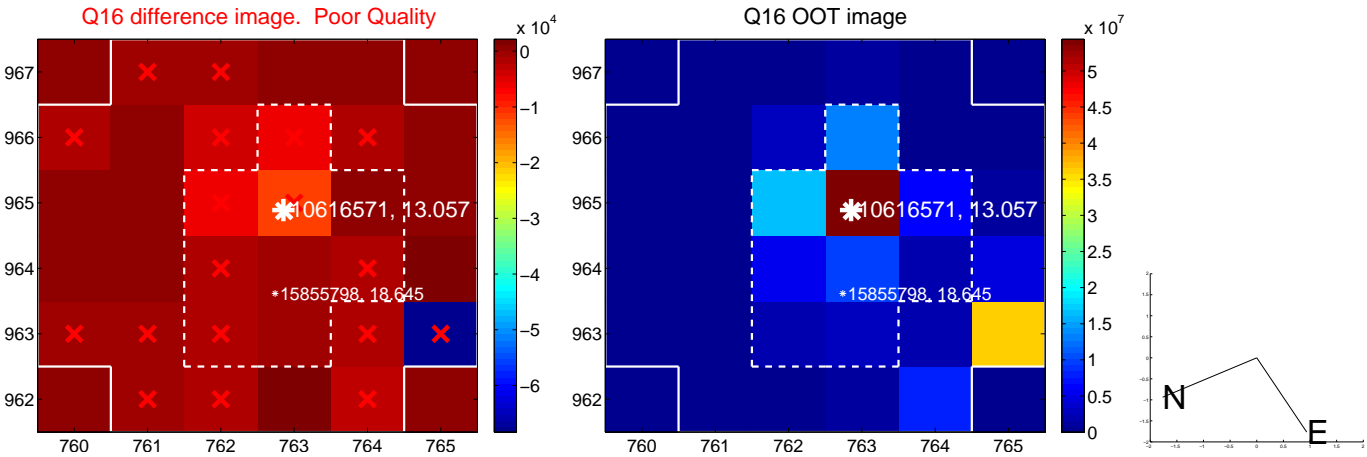
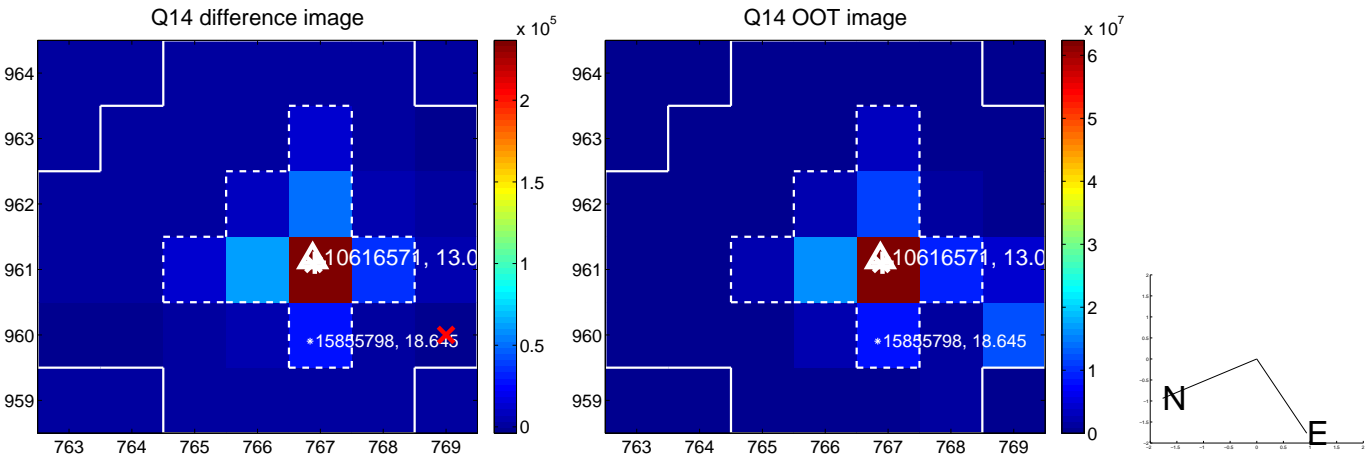
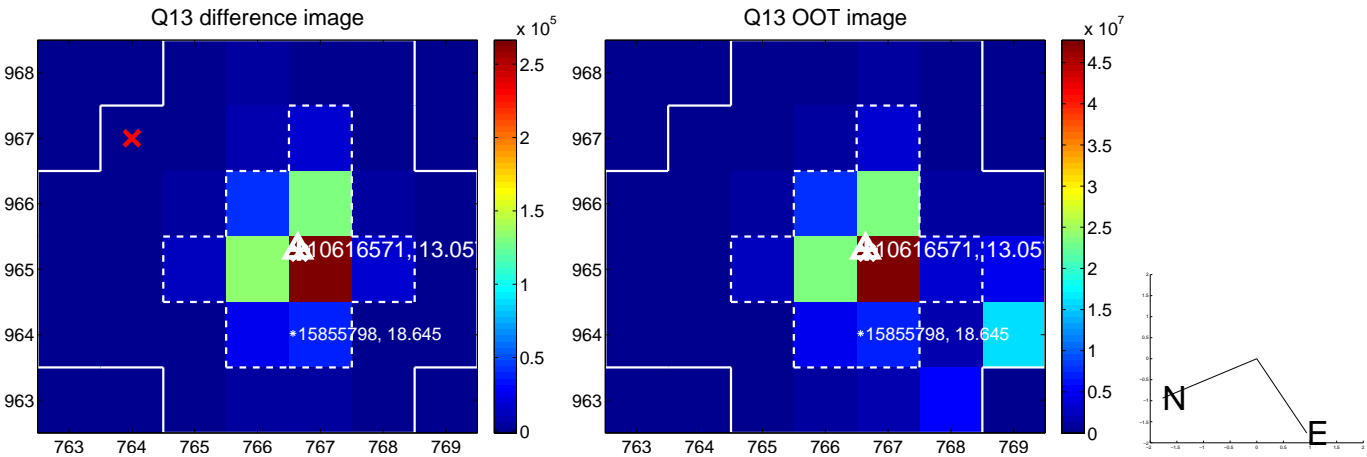
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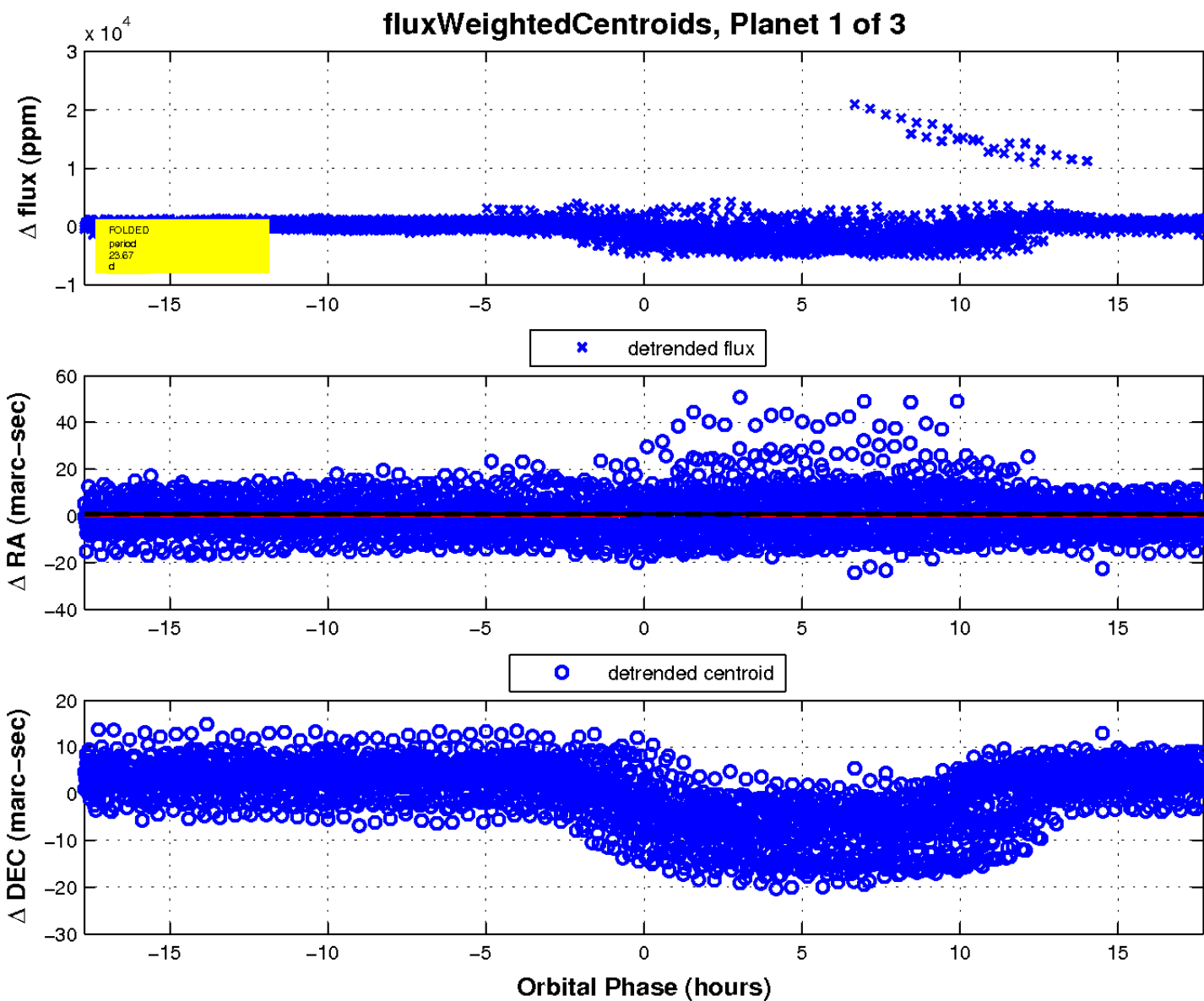
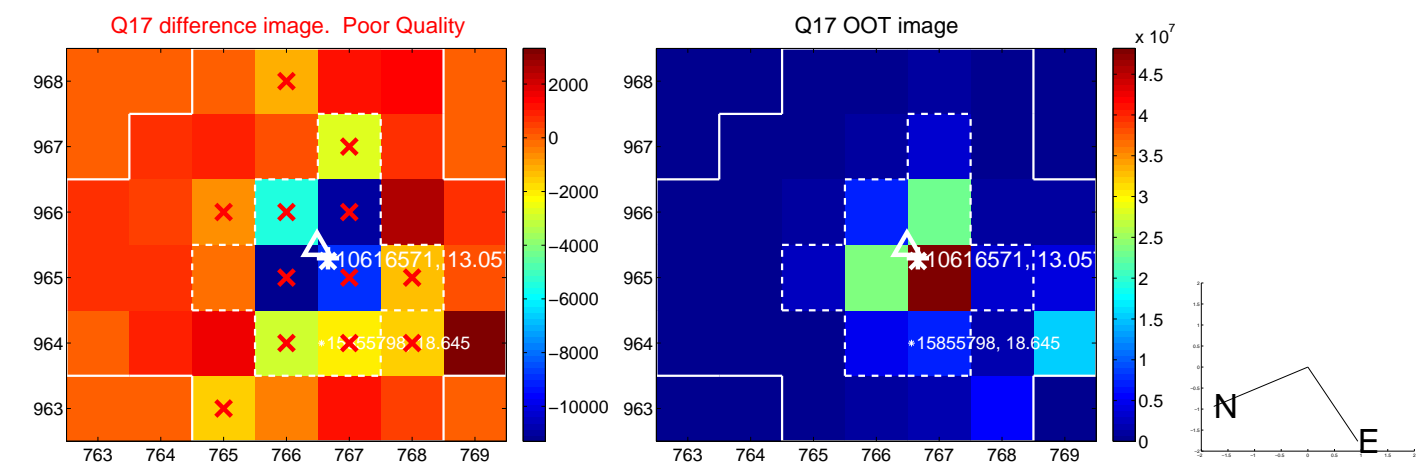
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

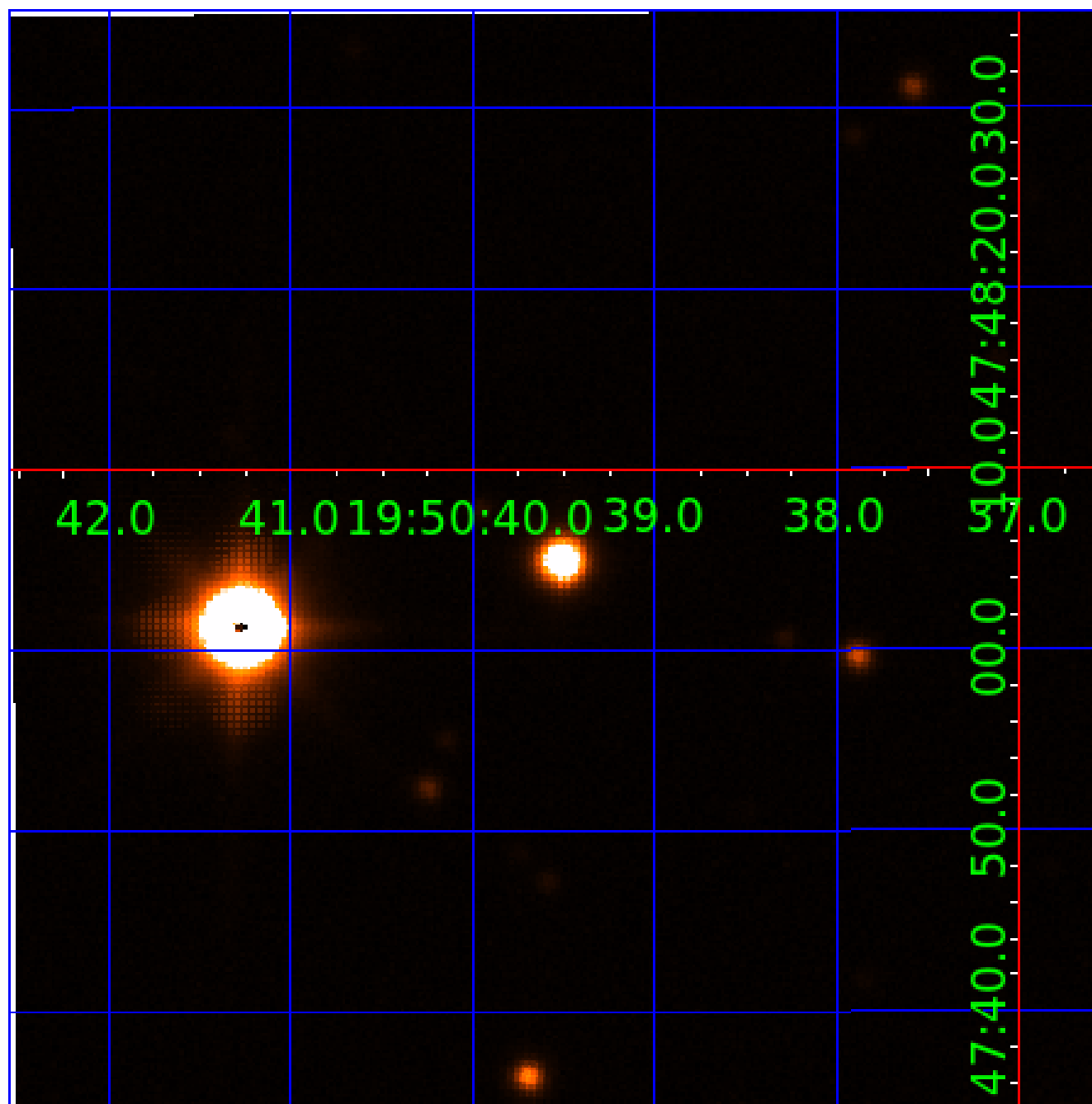


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010616571

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 010616571-01 | OBS | No | 23.670321 | 136.994528 | 15641.5 | 3.000 | 539.6 | -1.0 | 1.18 | 5769 | 14.53 | 49.53 |
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| 010616571-03 | OBS | No | 23.673102 | 144.497891 | 613.7 | 5.697 | 35.2 | 37.4 | 1.18 | 5769 | 3.42 | 49.52 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010616571-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—CENT_NOFITS |
| 010616571-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—SAME_NTL_PERIOD |
| 010616571-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_ALT—SAME_NTL_PERIOD |

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.

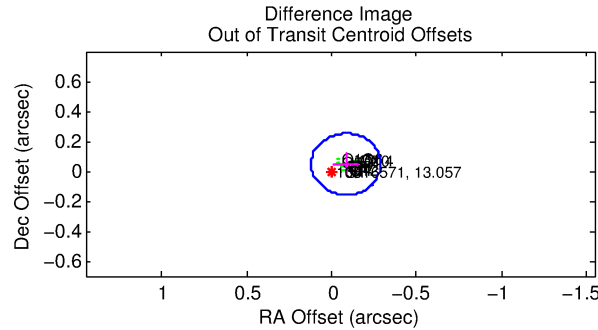
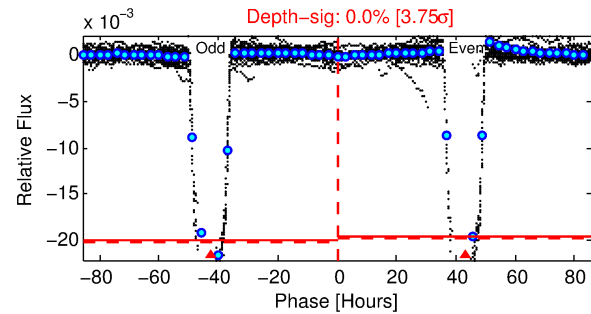
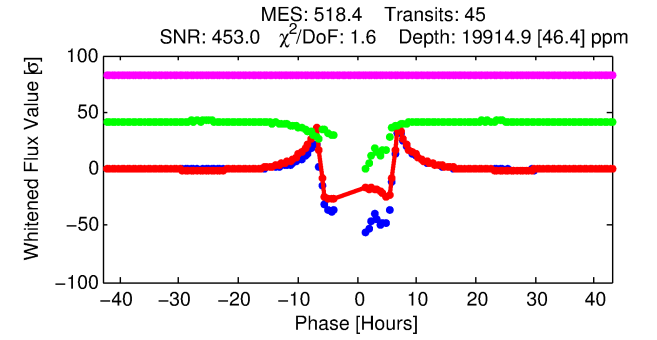
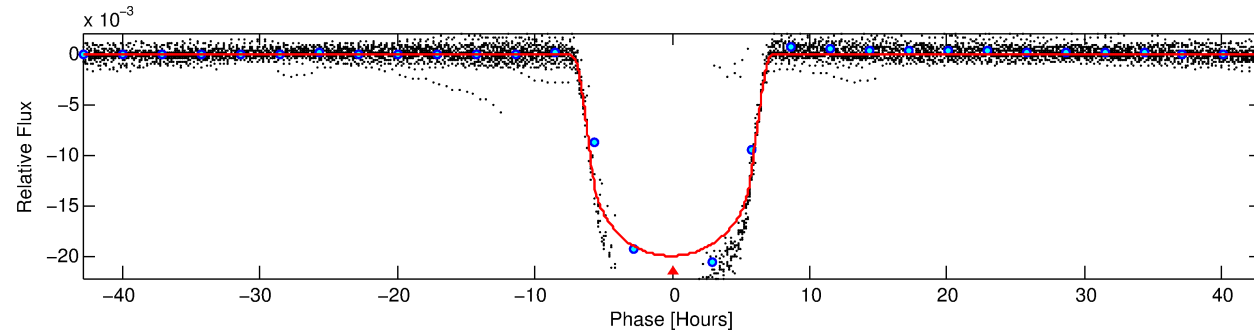
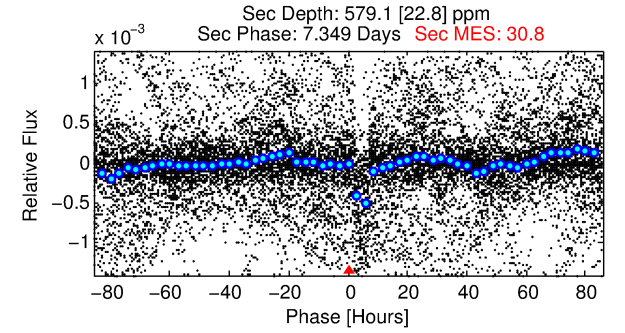
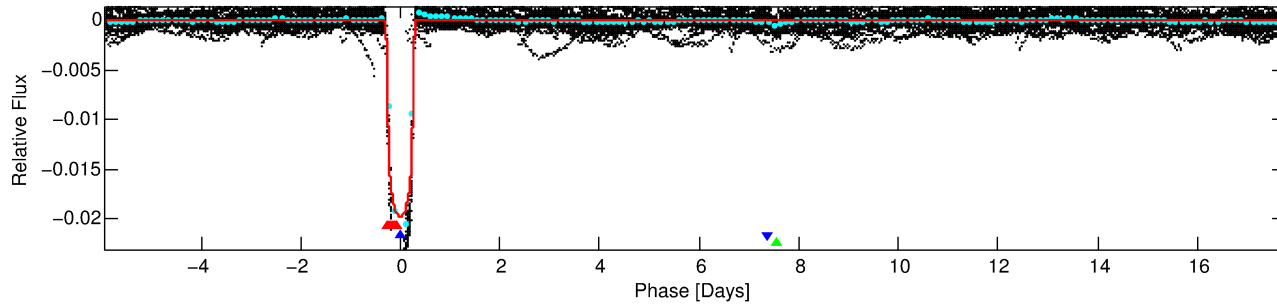
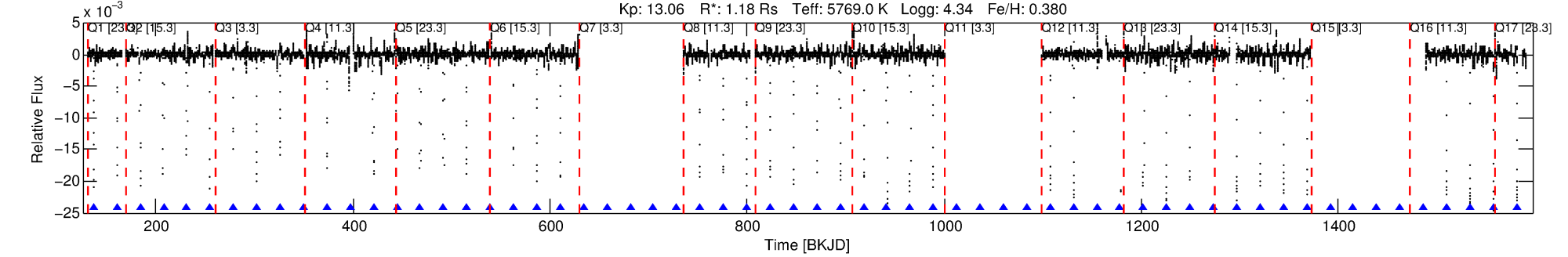
Ephemeris Match Information For 010616571-02

No Significant Match Found

DV One-Page Summary

KIC: 10616571 Candidate: 2 of 3 Period: 23.673 d
KOI: K00340.01 Corr: 0.994

Kp: 13.06 R*: 1.18 Rs Teff: 5769.0 K Logg: 4.34 Fe/H: 0.380



DV Fit Results:

Period = 23.67317 [0.00001] d
Epoch = 136.9558 [0.0002] BKJD
Rp/R* = 0.1274 [0.0002]
a/R* = 14.28 [0.04]
b = 0.00 [1.65]
Seff = 49.52 [11.92]
Teq = 676 [41] K
Rp = 16.36 [2.90] Re
a = 0.1666 [0.0255] AU
Ag = 33.05 [7.61] [4.21σ]
Teffp = 2508 [56] K [26.40σ]

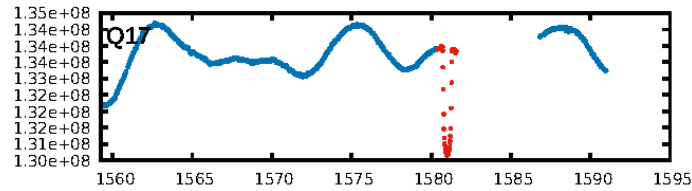
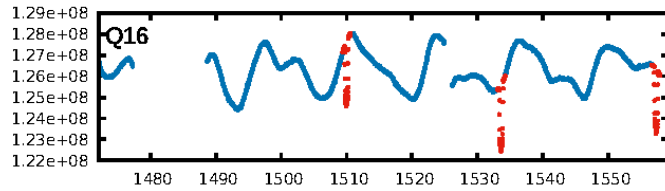
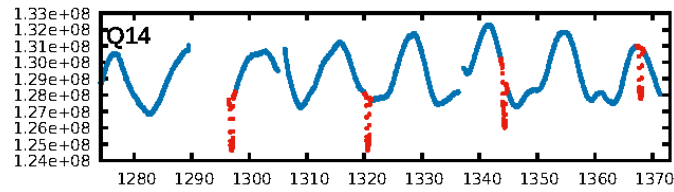
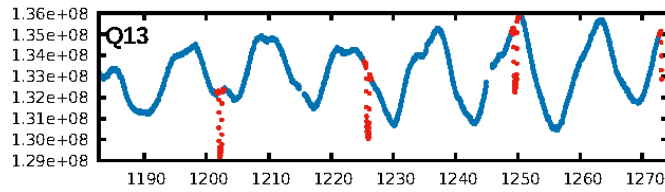
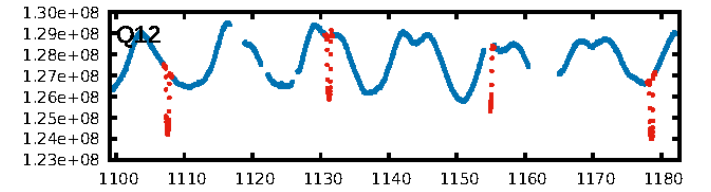
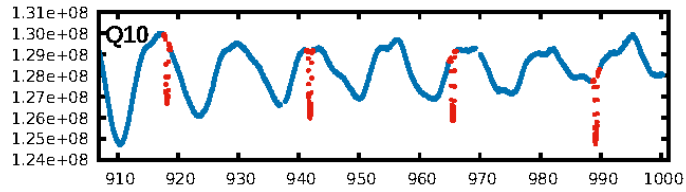
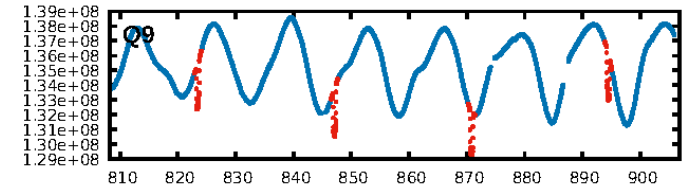
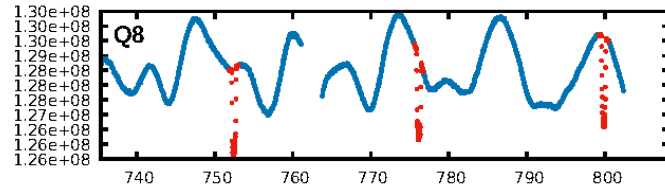
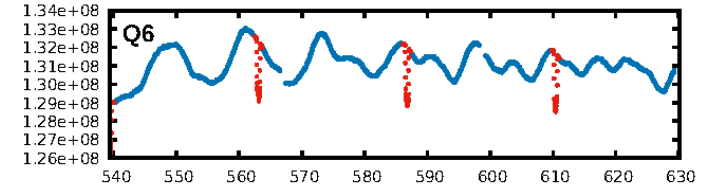
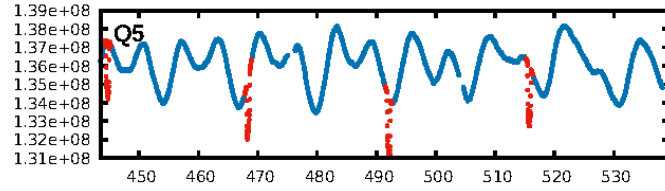
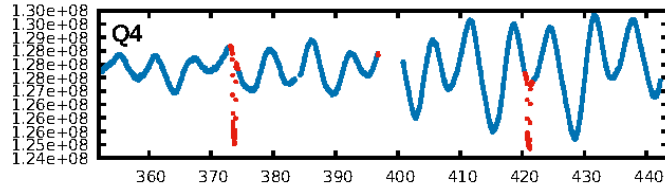
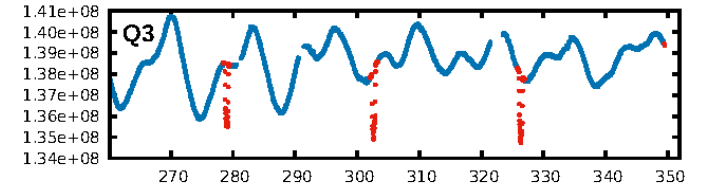
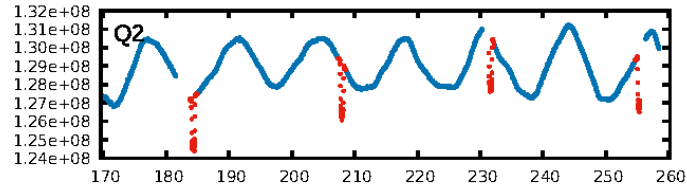
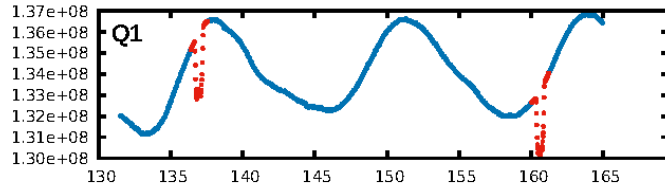
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [42/42]
GhostDiagnostic-chr: 1.907
Centroid-sig: N/A
Centroid-so: 0.237 arcsec [12.04σ]
OotOffset-rm: 0.096 arcsec [1.41σ]
KicOffset-rm: 0.181 arcsec [2.65σ]
OotOffset-st: 4/1/3/4 [12]
KicOffset-st: 4/1/3/4 [12]
DiffImageQuality-fgm: 1.00 [12/12]
DiffImageOverlap-fno: 0.00 [0/12]

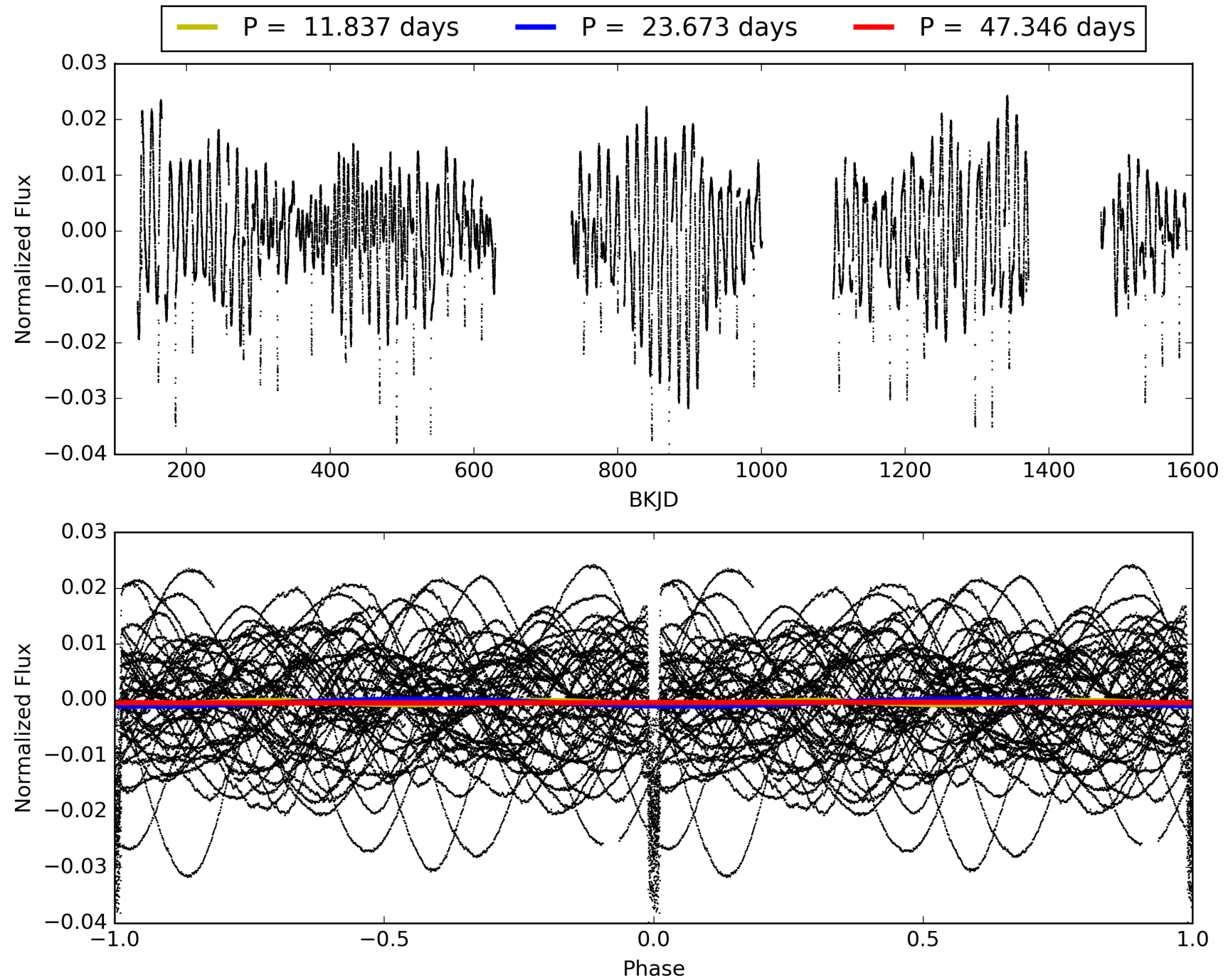
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:31:06 Z

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

TCE 010616571-02, PDC Light Curves

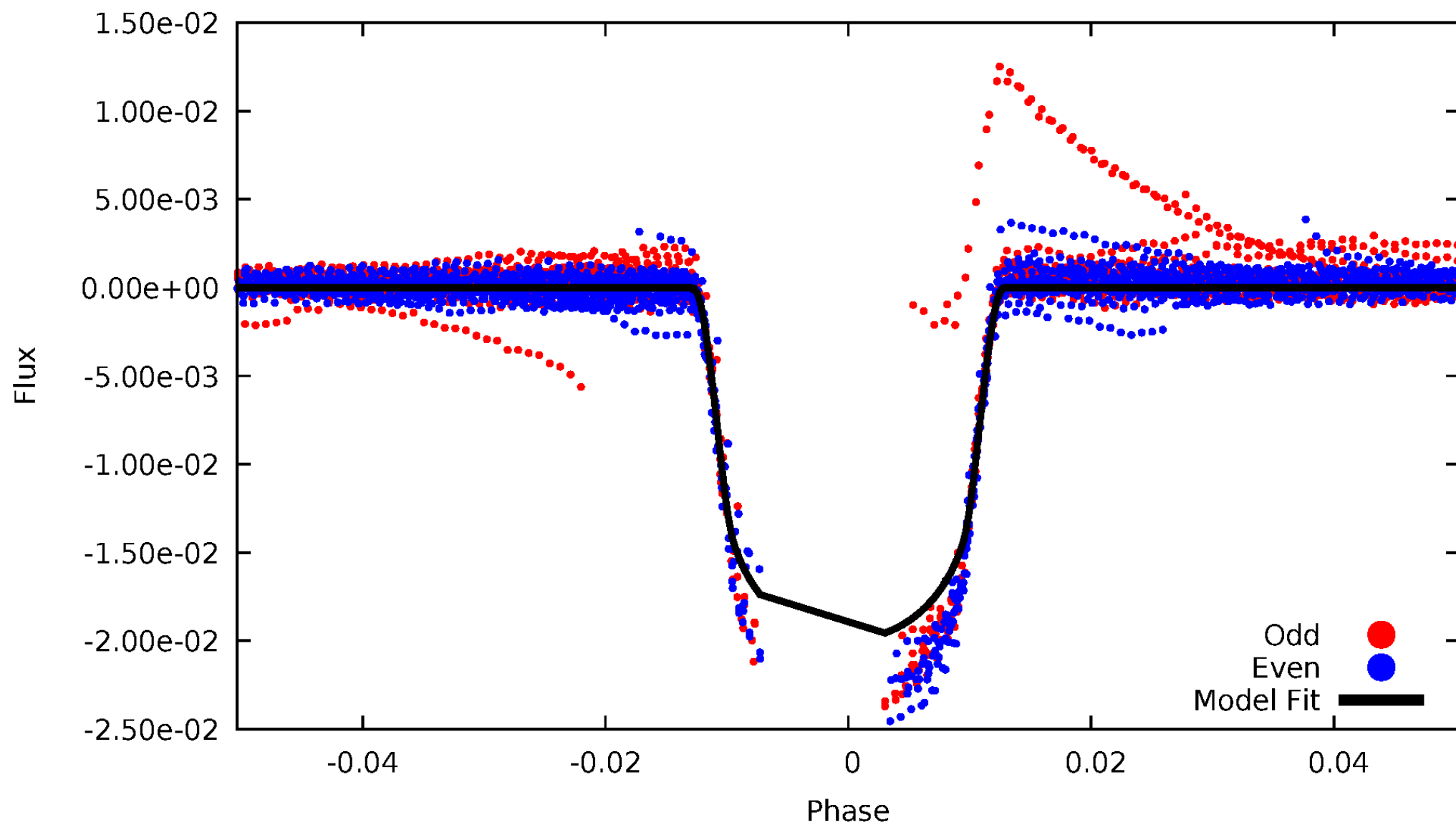


TCE 010616571-02



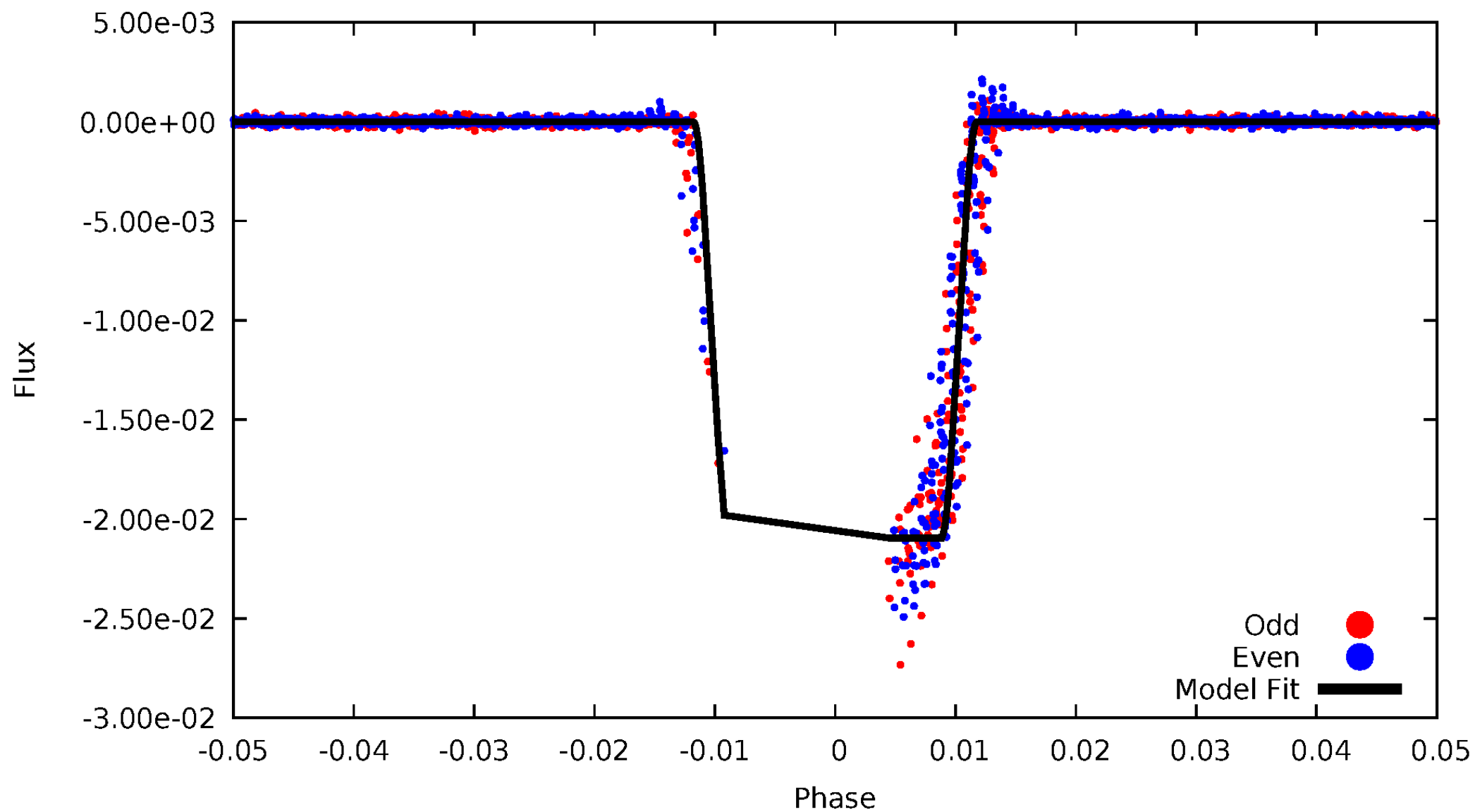
DV Odd/Even

TCE 010616571-02



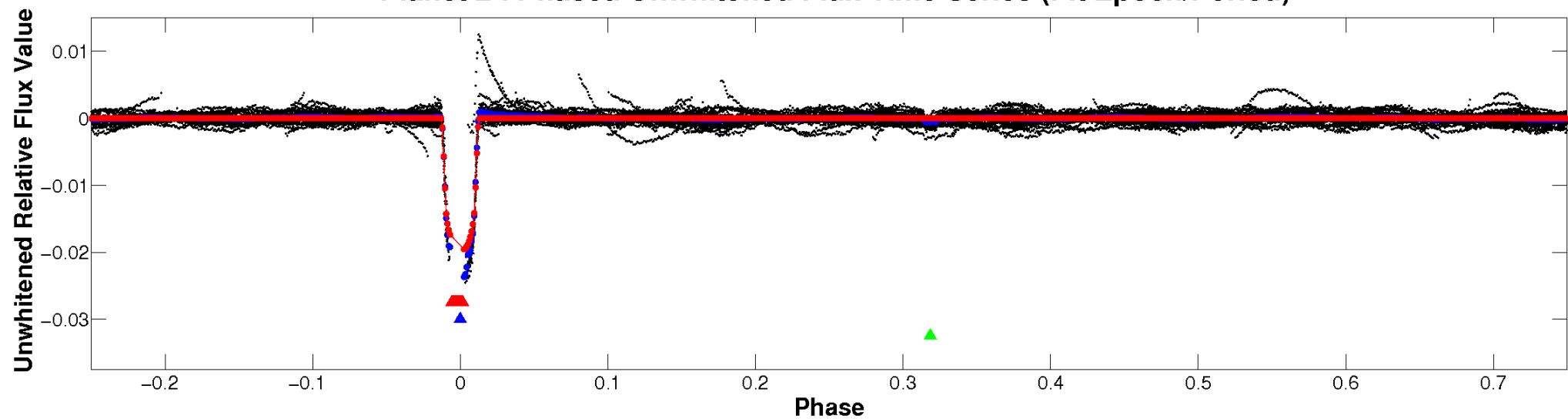
ALT Odd/Even

TCE 010616571-02

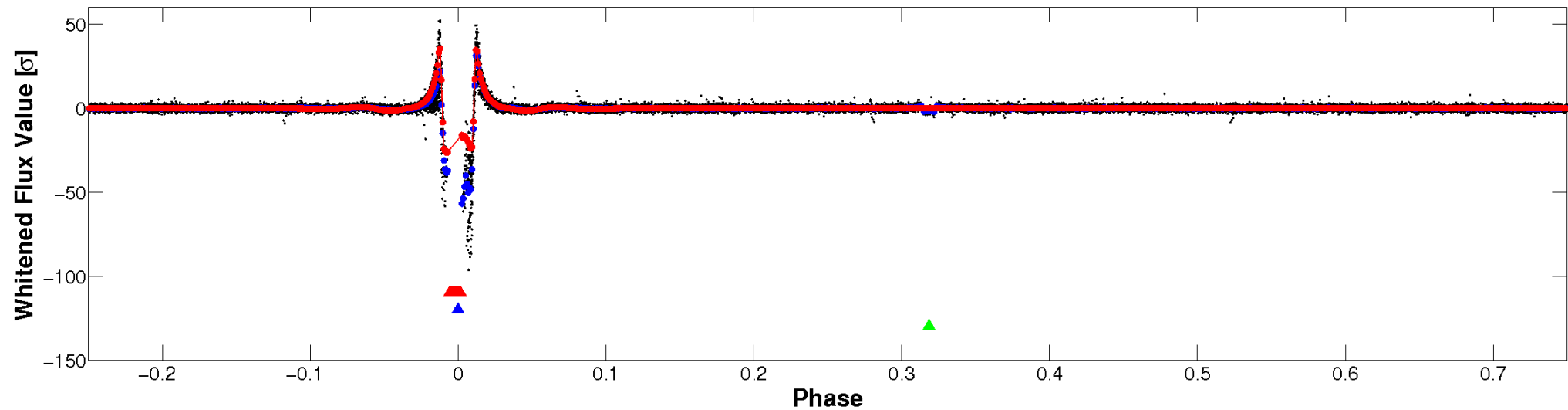


Non-Whitened Vs. Whitened Light Curve

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

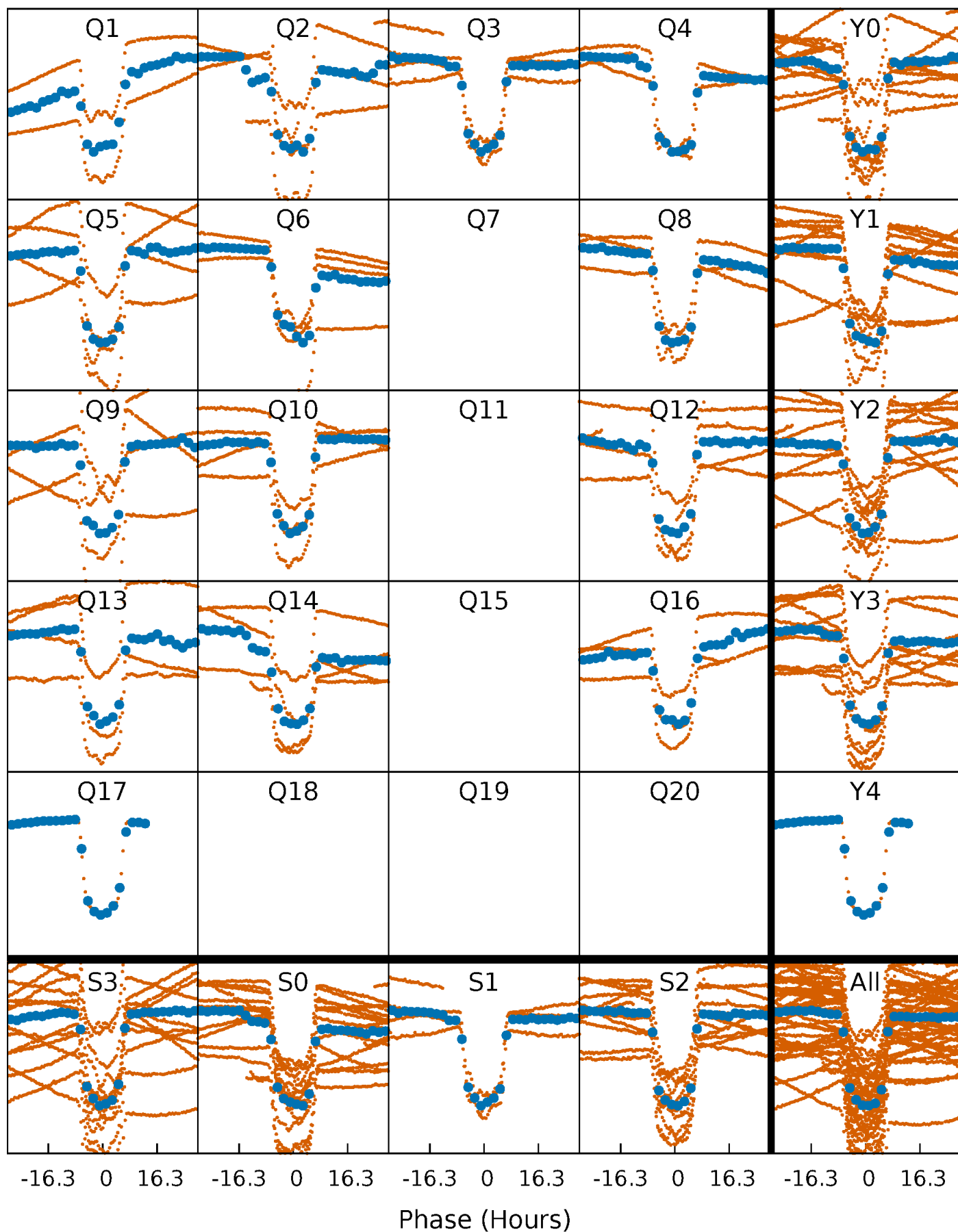


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



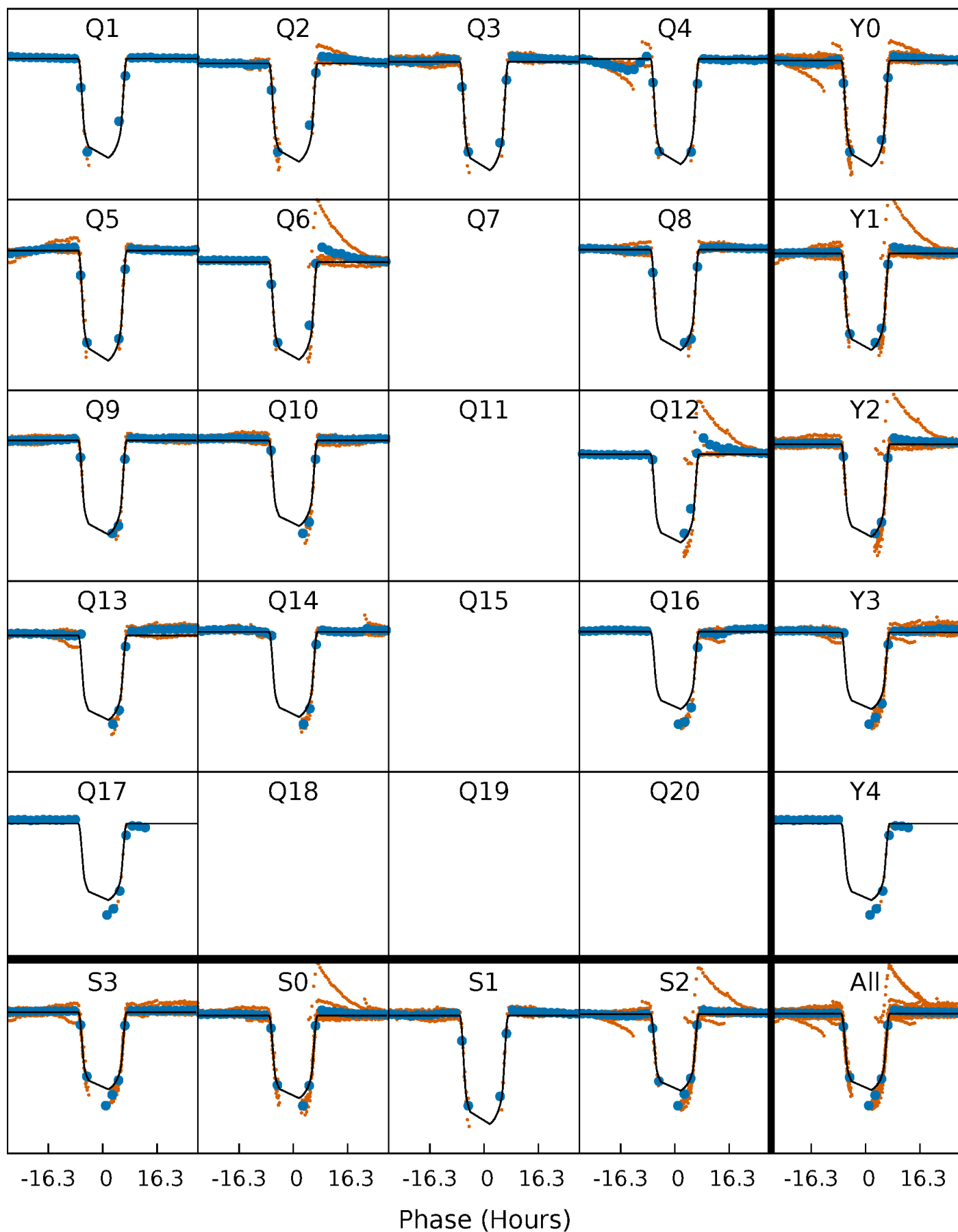
PDC Quarter-Phased Transit Curves

TCE 010616571-02 P= 23.673169 Days $T_0=136.955826$ (BKJD)



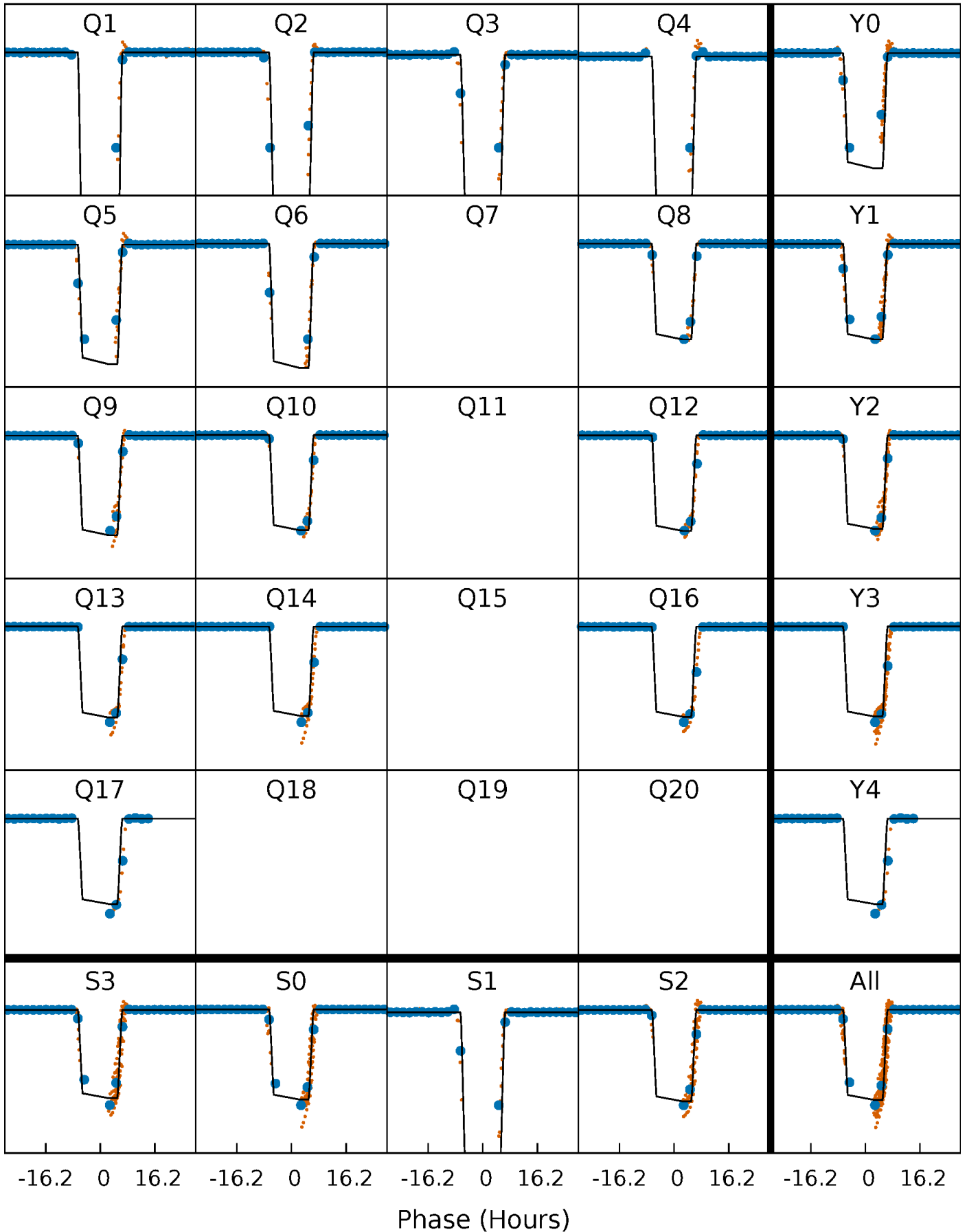
DV Quarter-Phased Transit Curves

TCE 010616571-02 P= 23.673169 Days $T_0=136.955826$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

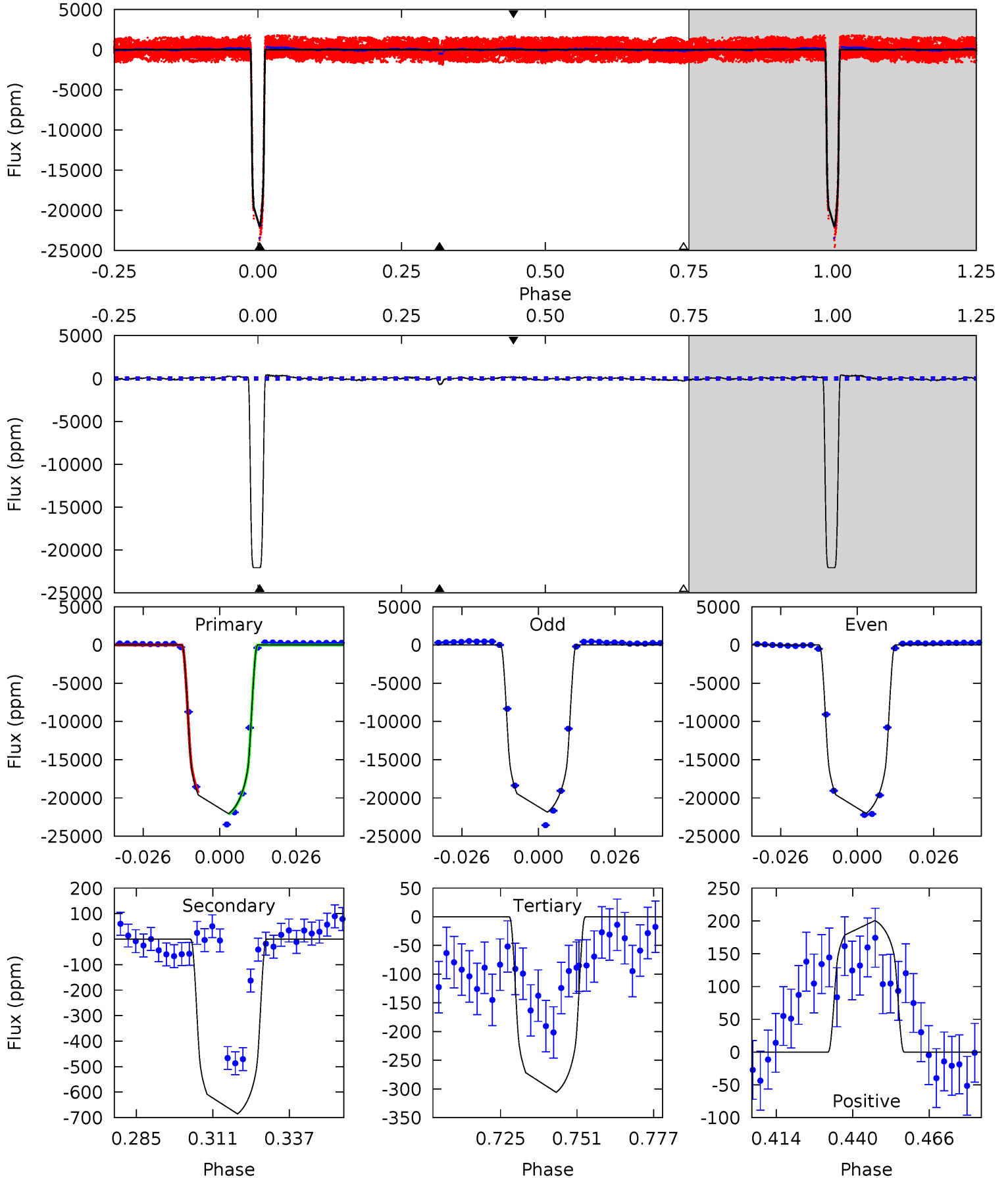
TCE 010616571-02 P= 23.672087 Days $T_0=136.985952$ (BKJD)



DV Model-Shift Uniqueness Test

010616571-02, P = 23.673169 Days, E = 113.282657 Days

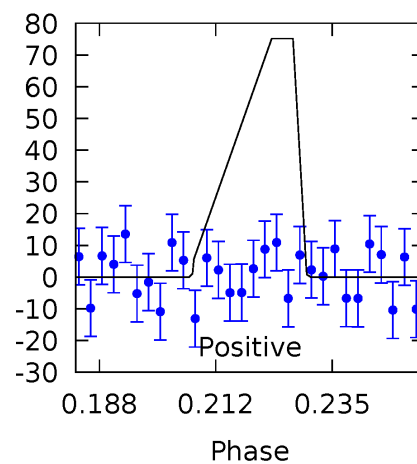
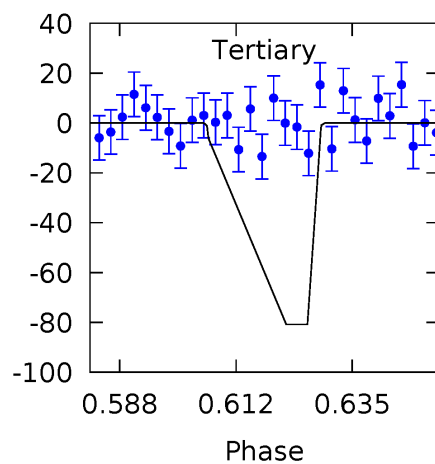
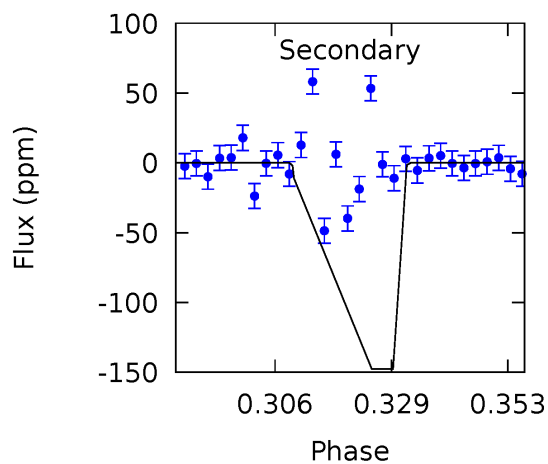
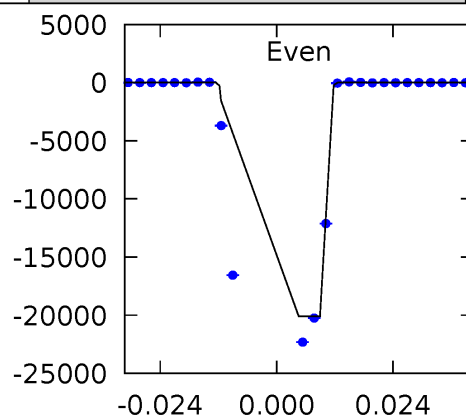
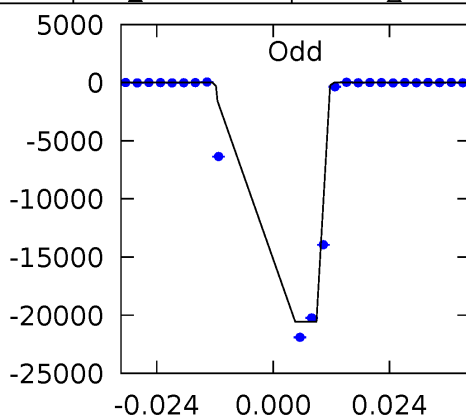
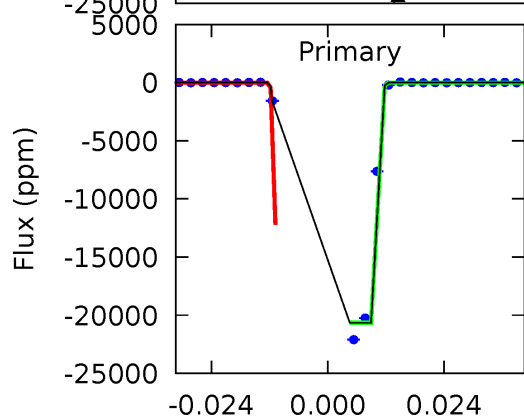
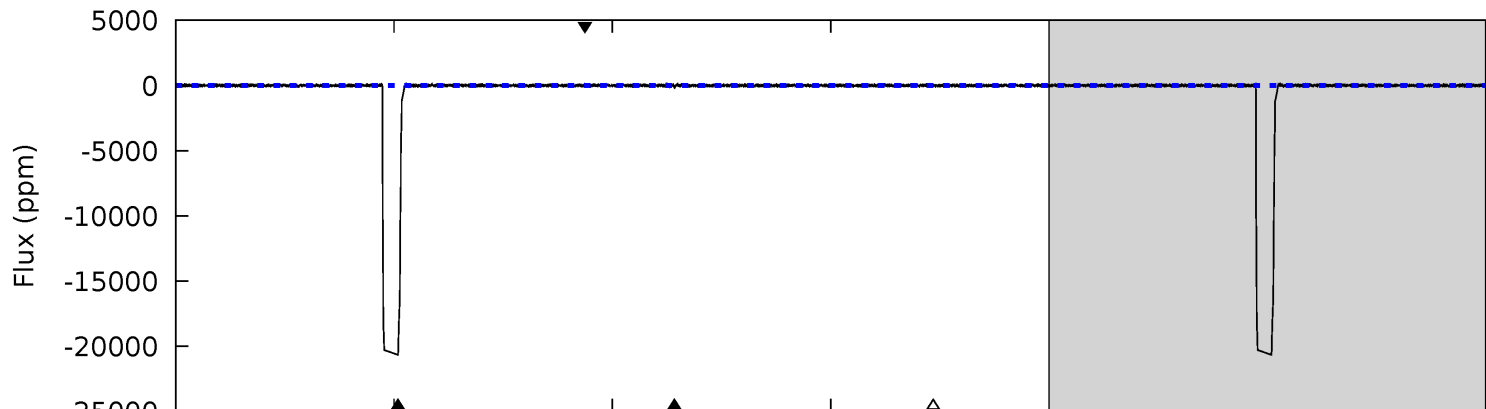
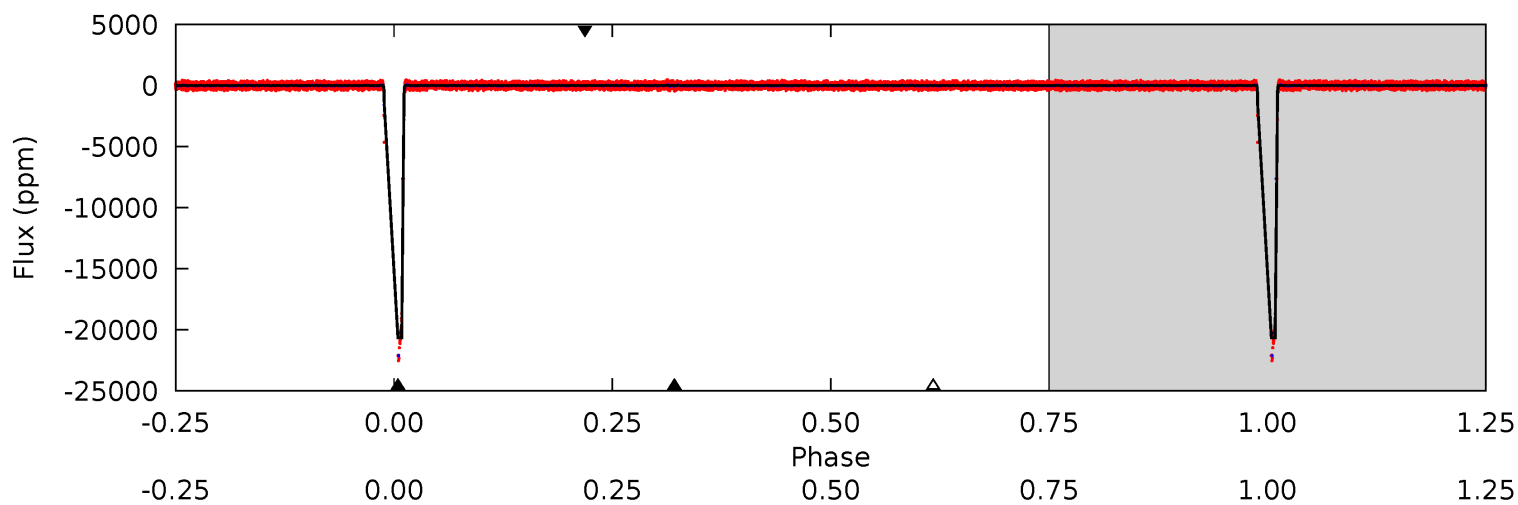
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 820.3 | 25.5 | 11.4 | 7.46 | 4.84 | 2.23 | 4.10 | 808.9 | 812.8 | 14.1 | 18.0 | 3.20 | 0.95 | 0.02 | 49.8 |



Alt Model-Shift Uniqueness Test

010616571-02, P = 23.672087 Days, E = 113.313865 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 1139 | 8.14 | 4.45 | 4.14 | 4.86 | 2.26 | 1.13 | 1134 | 1134 | 3.69 | 4.00 | 13.8 | 0.94 | 0.01 | 0 |



Stellar Parameters For KIC 010616571

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5769^{+104}_{-116} | $4.338^{+0.095}_{-0.126}$ | $0.380^{+0.050}_{-0.150}$ | $1.177^{+0.209}_{-0.129}$ | $1.100^{+0.068}_{-0.068}$ | $0.950^{+0.341}_{-0.351}$ |
| | +2%/-2% | +2%/-3% | +13%/-39% | +18%/-11% | +6%/-6% | +36%/-37% |
| Source | SPE3 | SPE3 | SPE3 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 010616571-02 / KOI 0340.01

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|-------------------------|-------------------|--------------------|---------------------------|
| DV | -685 ± 27 | $16.32^{+1.64}_{-1.02}$ | 946^{+45}_{-36} | 3204^{+41}_{-45} | 39^{+5}_{-6} |
| Alt. | -148 ± 18 | $18.60^{+1.85}_{-1.18}$ | 946^{+45}_{-37} | 2499^{+47}_{-48} | $6.357^{+1.225}_{-1.150}$ |

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 $A_{obs} \gg 1.0$

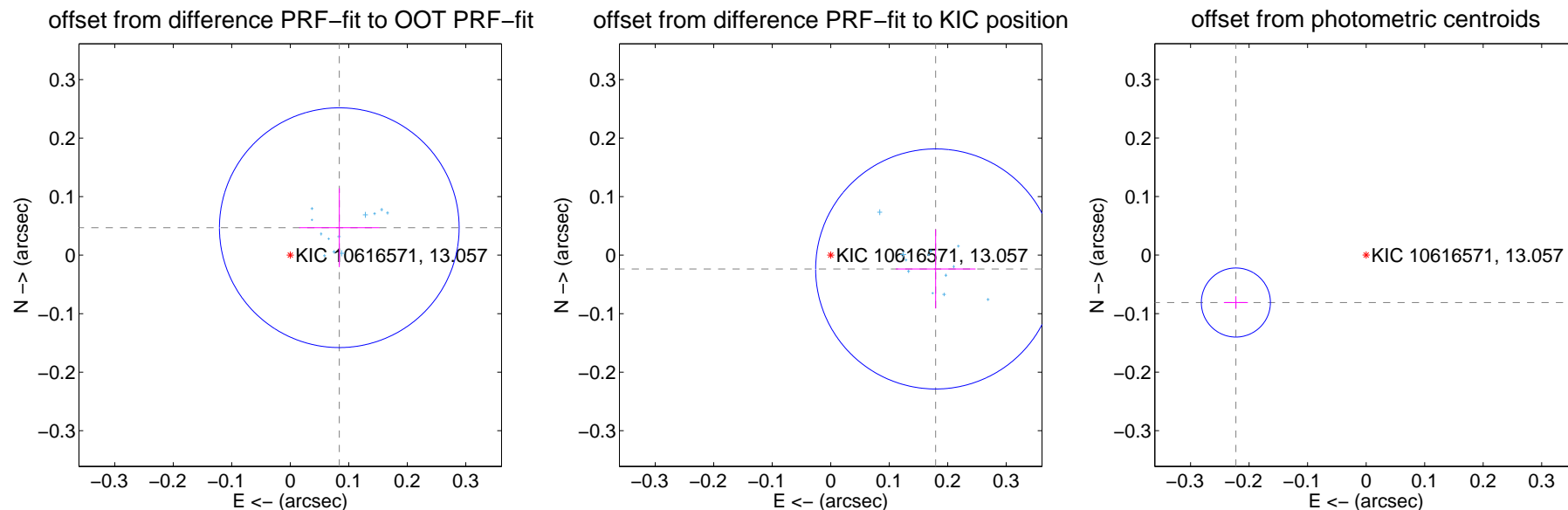
DV Centroid Data

Supplemental centroid analysis for 010616571-02. Kepler magnitude: 13.06. Transit SNR 452.99

There are 12 quarters with good PRF difference image offsets

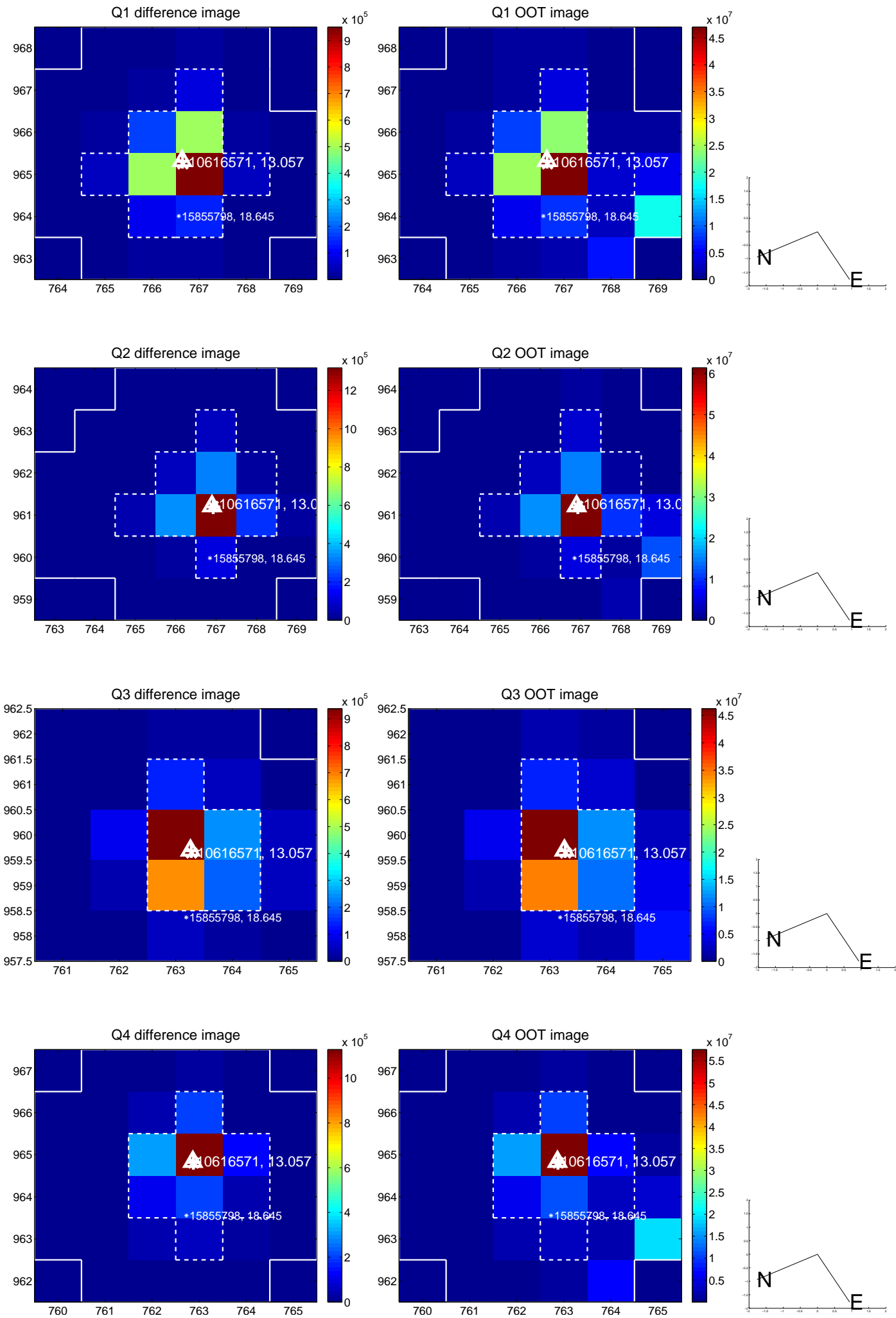
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.096 ± 0.068 | 1.41 | -0.084 ± 0.069 | 0.047 ± 0.067 |
| PRF-fit source offset from KIC position | 0.181 ± 0.068 | 2.65 | -0.179 ± 0.068 | -0.024 ± 0.068 |
| photometric centroid source offset | 0.24 ± 0.02 | 12.04 | 0.22 ± 0.02 | -0.08 ± 0.01 |

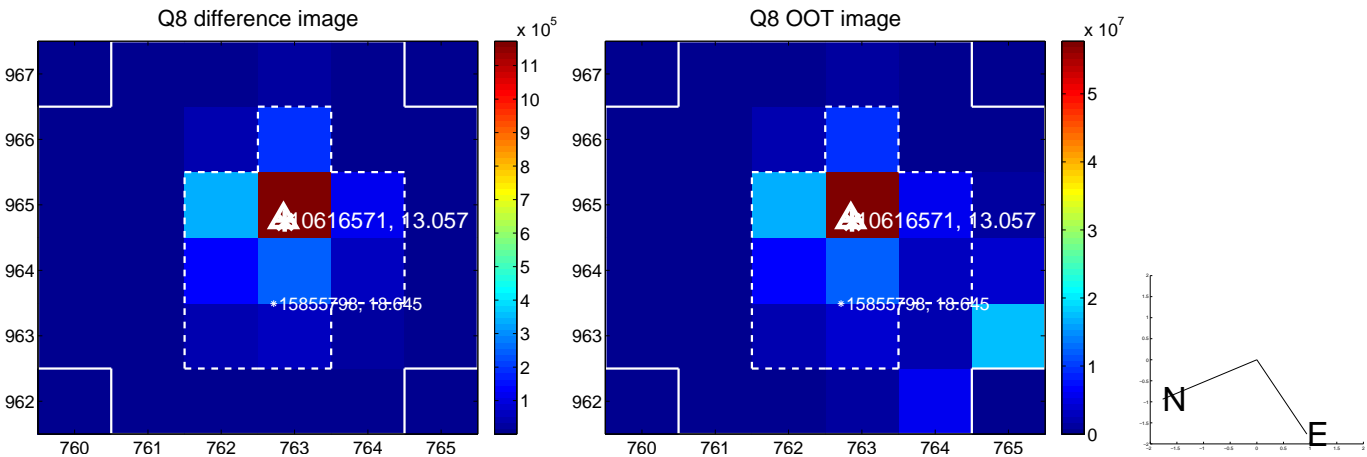
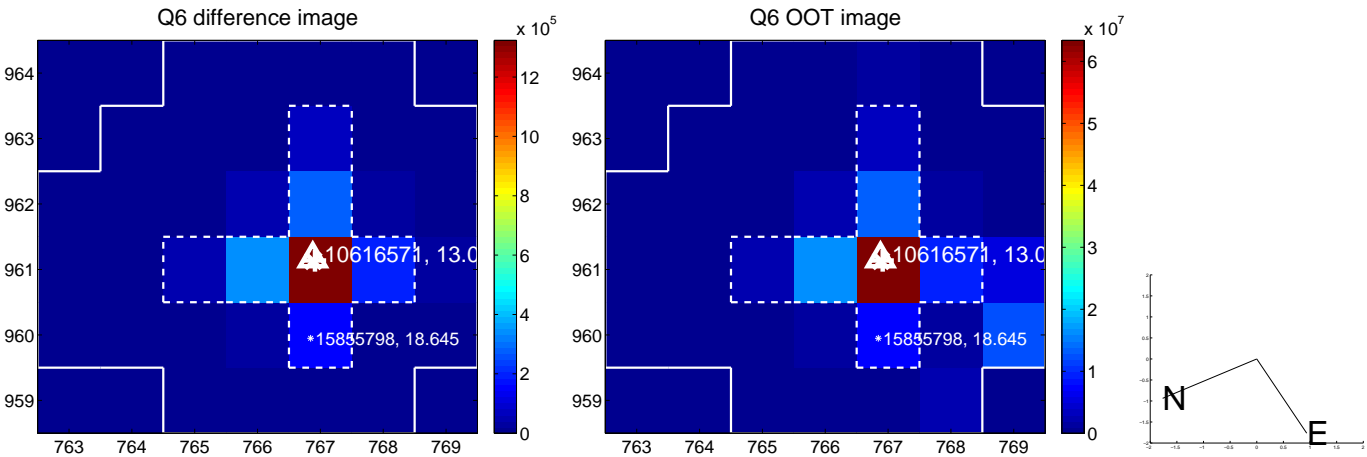
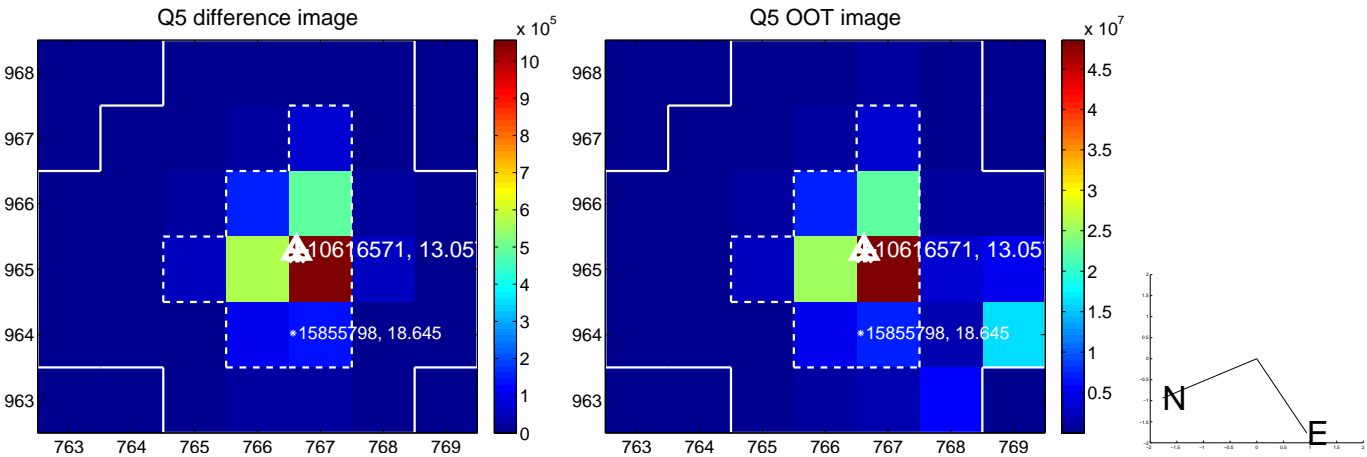


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

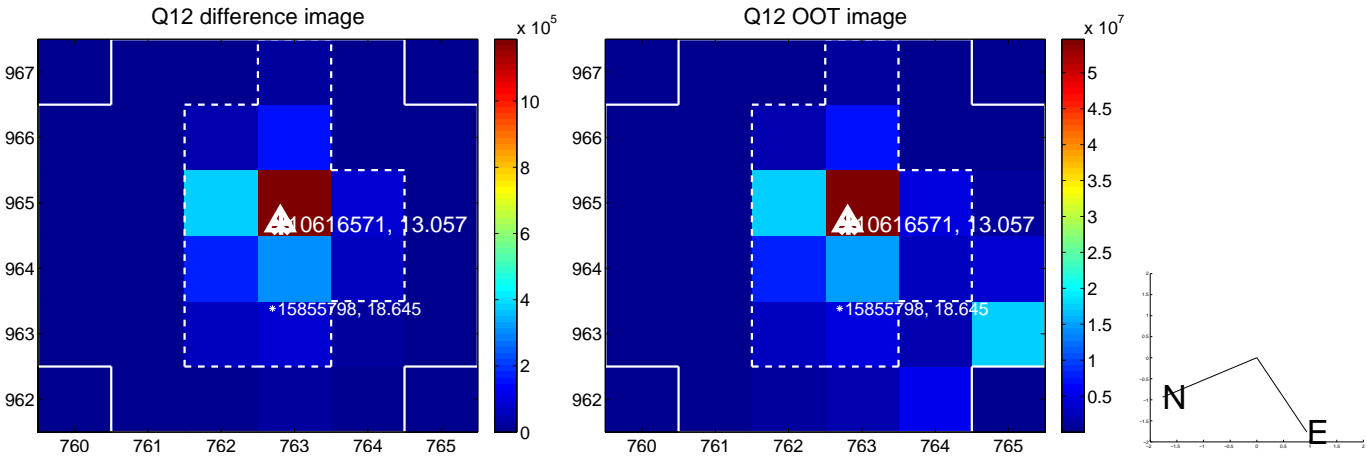
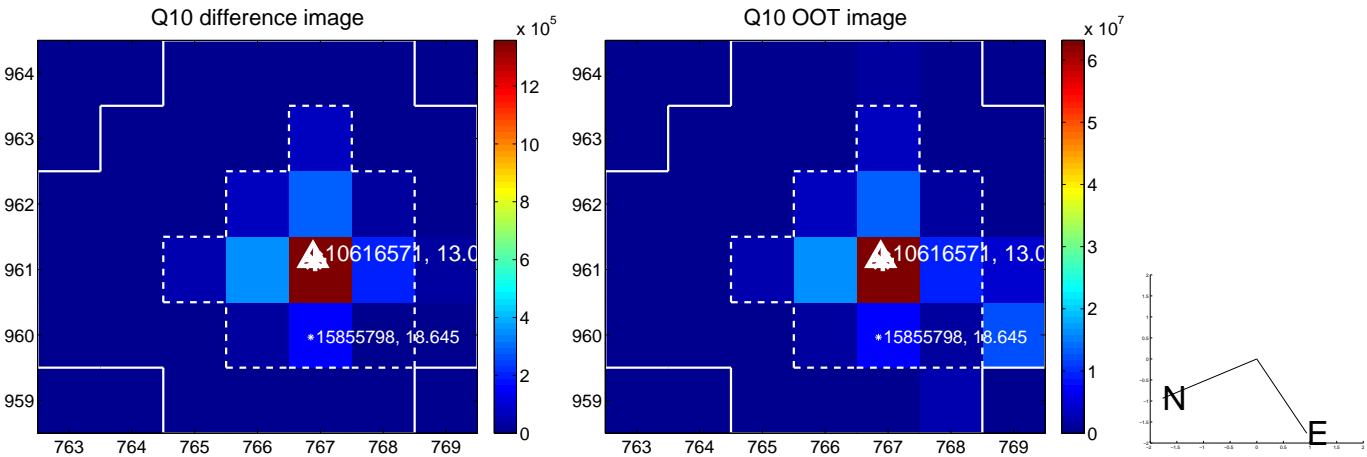
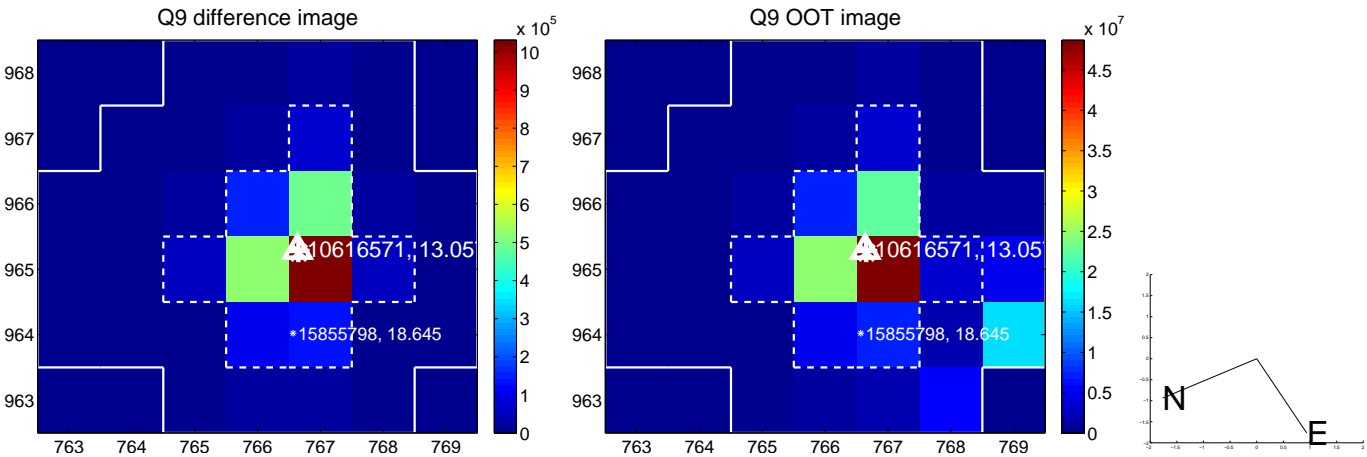
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



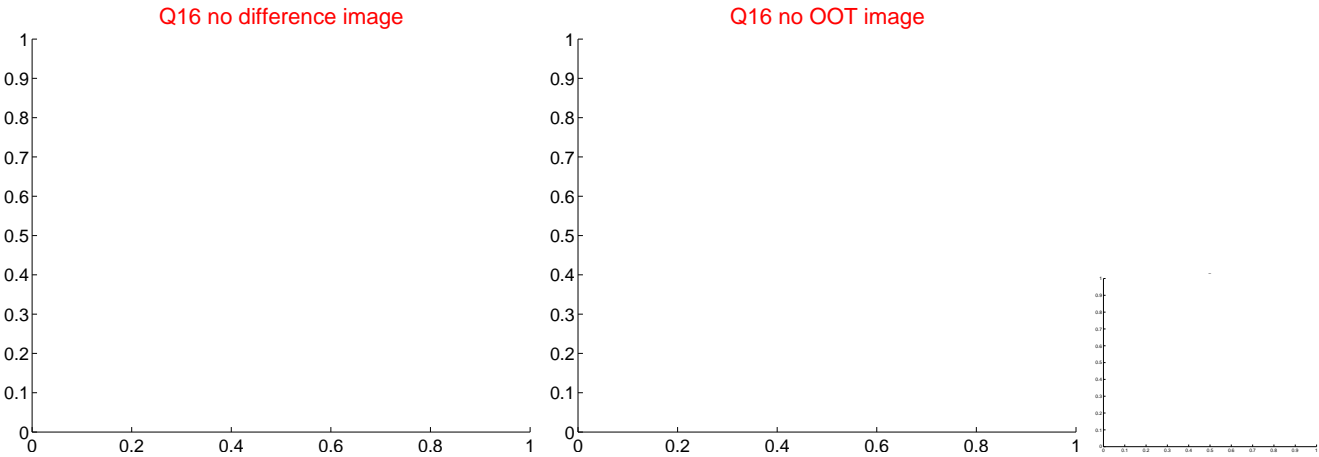
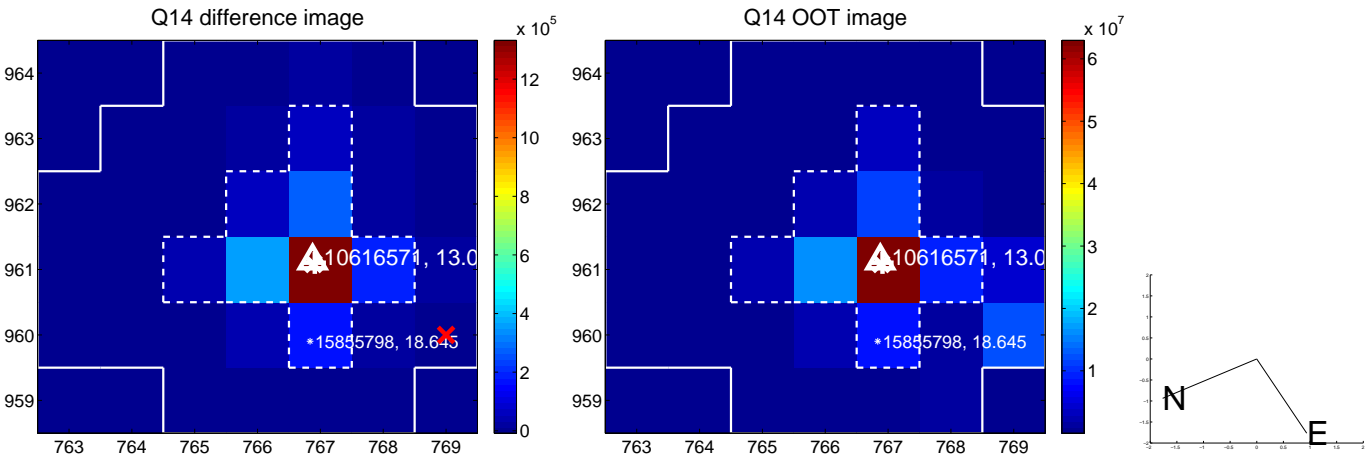
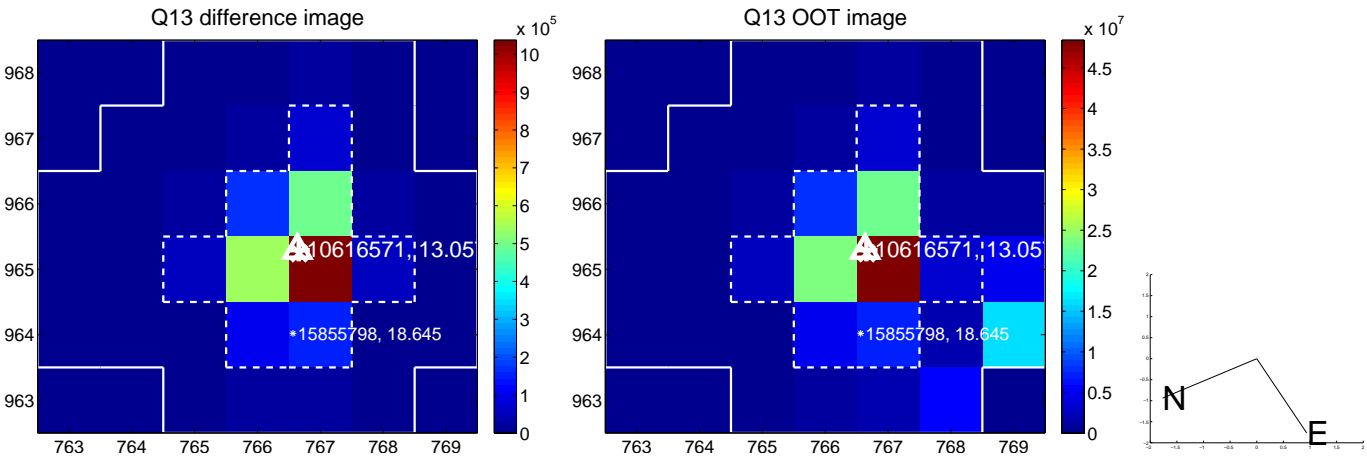
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



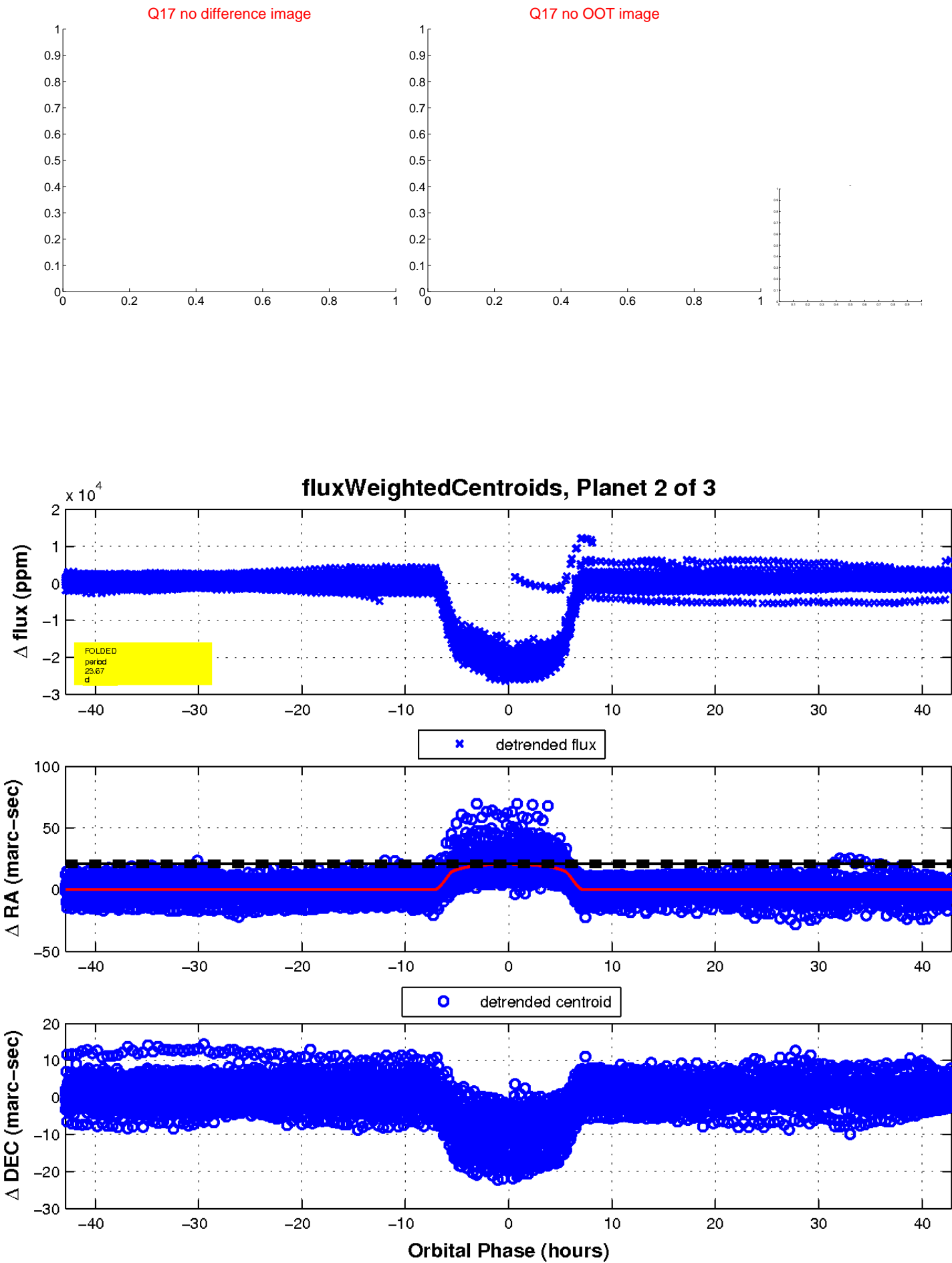
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

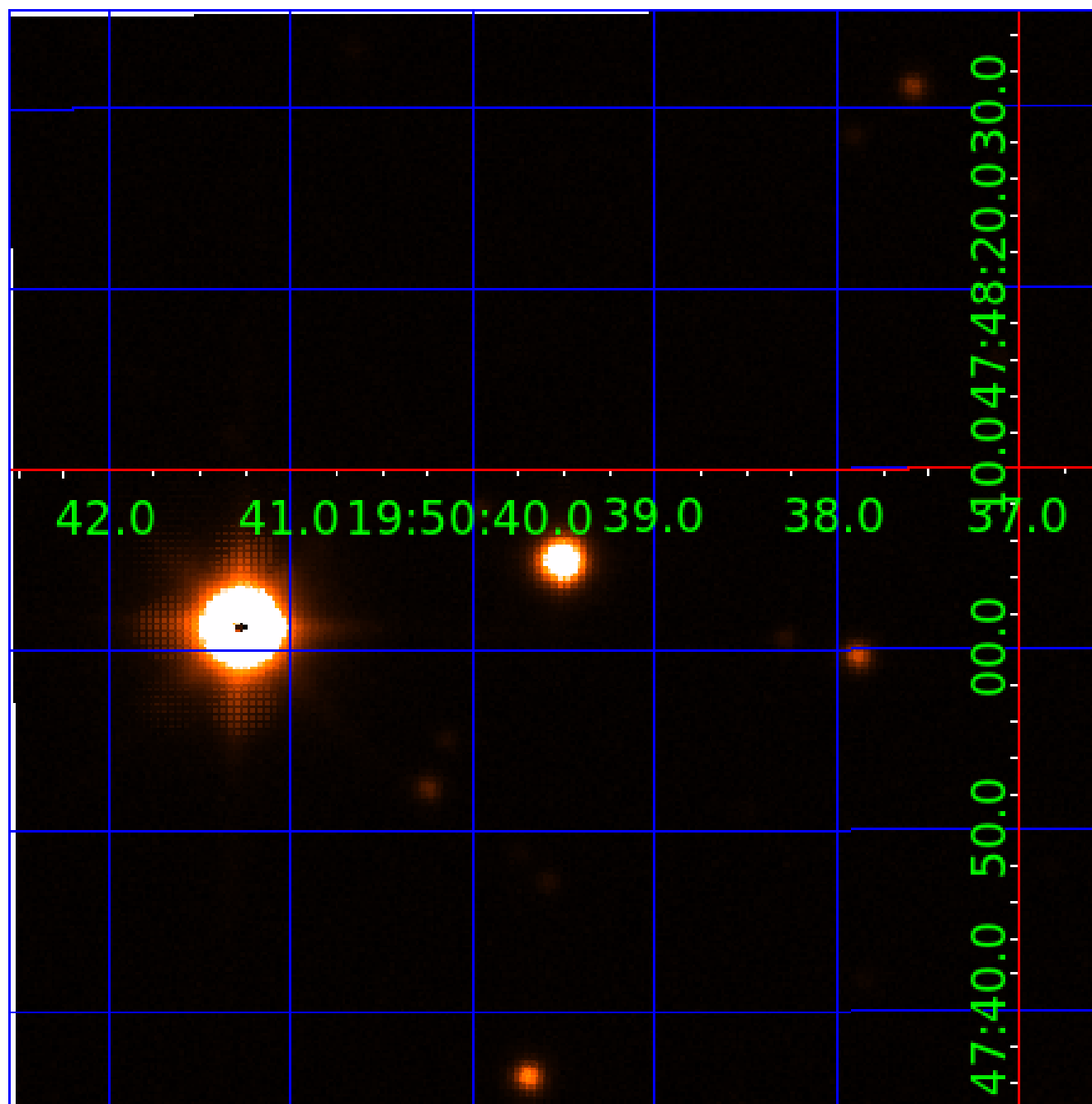


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010616571

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-------|-------|-----------------------------|-----------------|------------------------|------------------------|
| 010616571-01 | OBS | No | 23.670321 | 136.994528 | 15641.5 | 3.000 | 539.6 | -1.0 | 1.18 | 5769 | 14.53 | 49.53 |
| 010616571-02 | OBS | 0340.01 | 23.673169 | 136.955826 | 19914.9 | 14.295 | 518.4 | 453.0 | 1.18 | 5769 | 16.36 | 49.52 |
| 010616571-03 | OBS | No | 23.673102 | 144.497891 | 613.7 | 5.697 | 35.2 | 37.4 | 1.18 | 5769 | 3.42 | 49.52 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 010616571-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT—CENT_NOFITS |
| 010616571-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—LPP_DV—LPP_ALT—SAME_NTL_PERIOD |
| 010616571-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_ALT—SAME_NTL_PERIOD |

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.

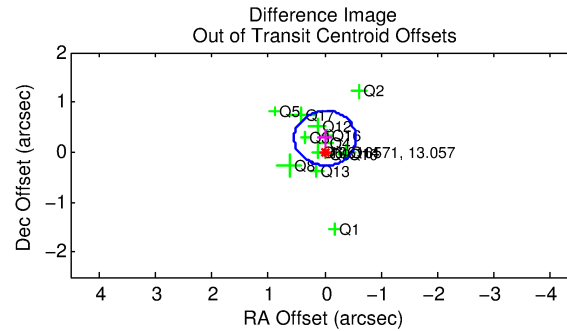
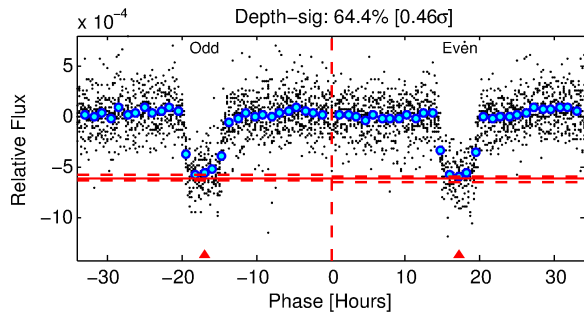
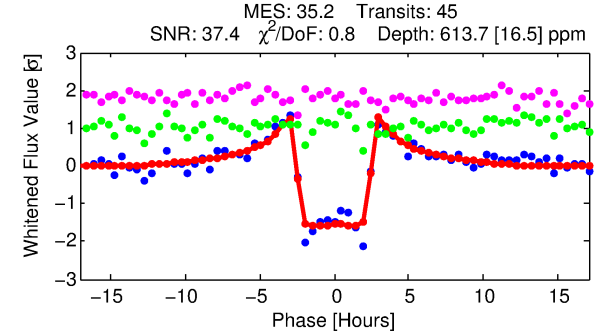
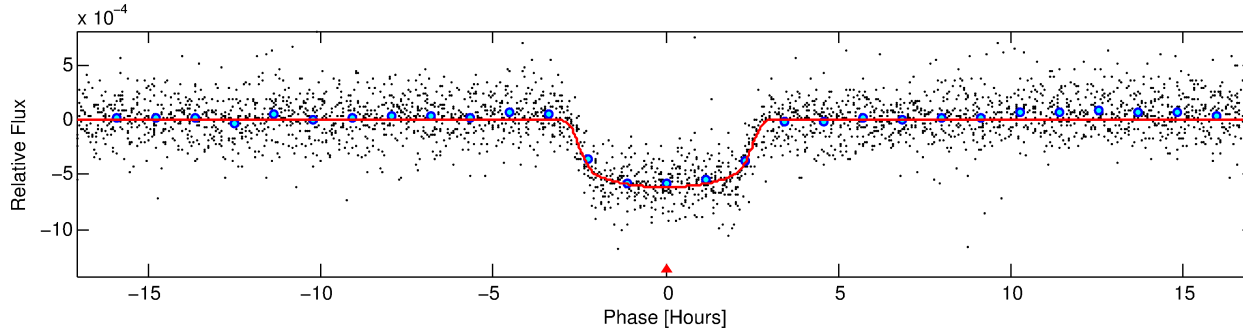
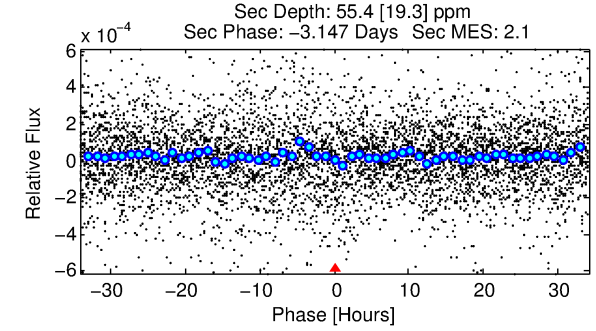
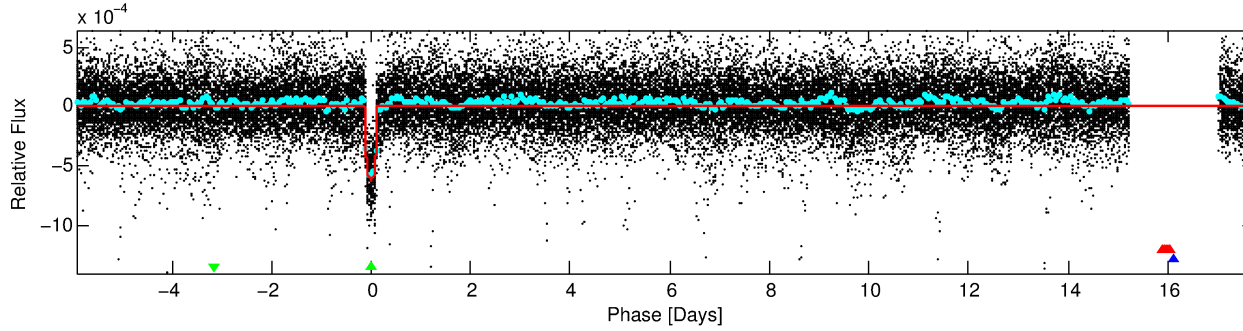
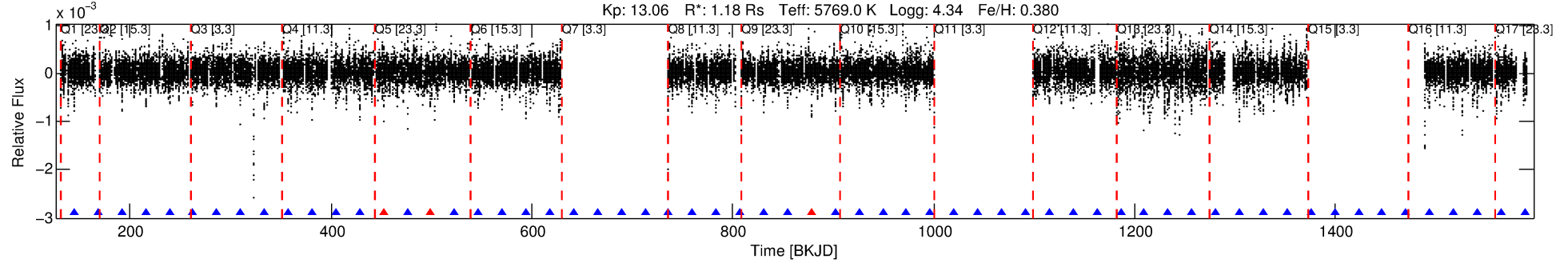
Ephemeris Match Information For 010616571-03

No Significant Match Found

DV One-Page Summary

KIC: 10616571 Candidate: 3 of 3 Period: 23.673 d
KOI: K00340 Corr: No Ephemeris Match

Kp: 13.06 R*: 1.18 Rs Teff: 5769.0 K Logg: 4.34 Fe/H: 0.380



DV Fit Results:

Period = 23.67310 [0.00005] d
Epoch = 144.4979 [0.0017] BKJD
Rp/R* = 0.0266 [0.0008]
a/R* = 16.80 [1.94]
b = 0.88 [0.03]
Seff = 49.52 [11.92]
Teq = 676 [41] K
Rp = 3.42 [0.62] Re
a = 0.1666 [0.0255] AU
Ag = 72.25 [30.36] [2.35σ]
Teffp = 3049 [277] K [8.49σ]

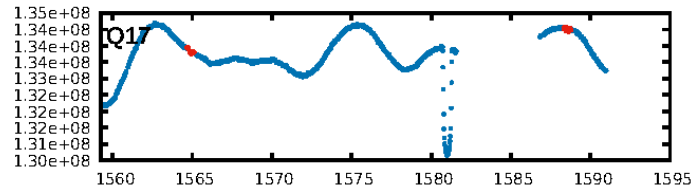
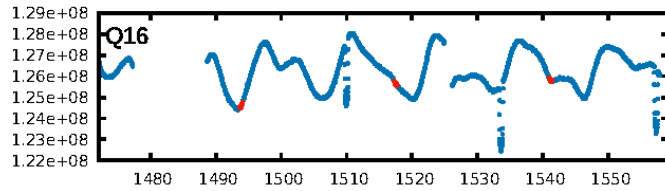
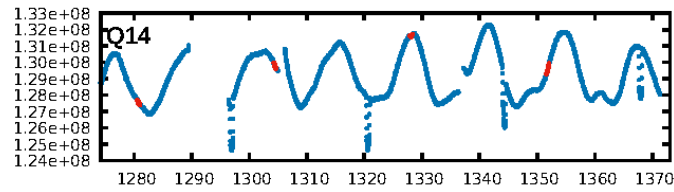
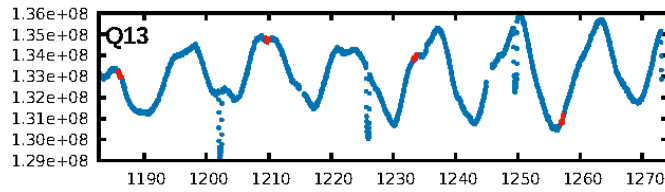
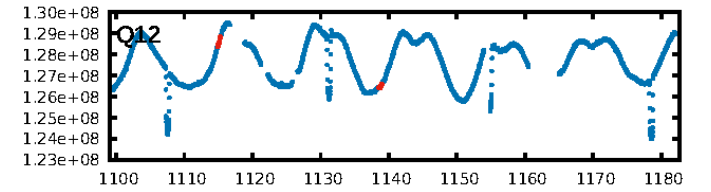
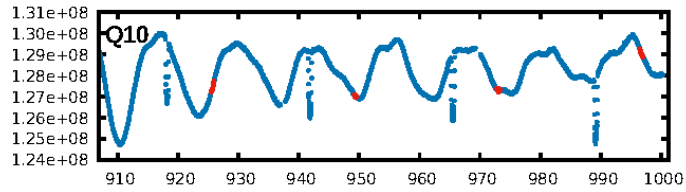
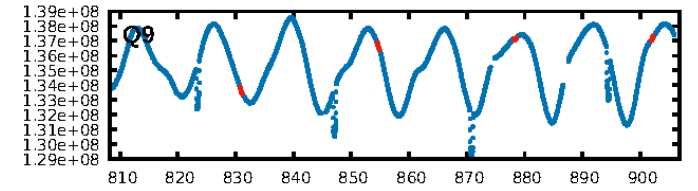
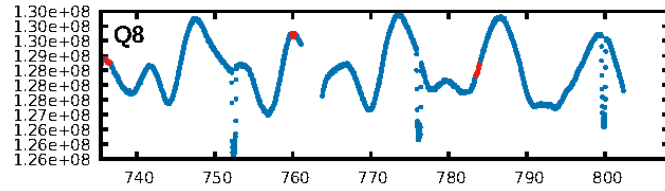
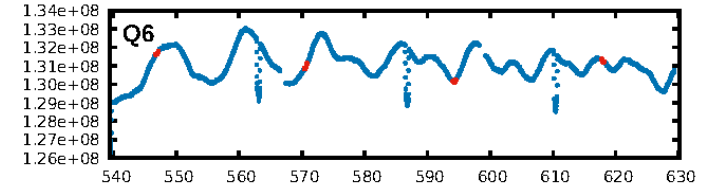
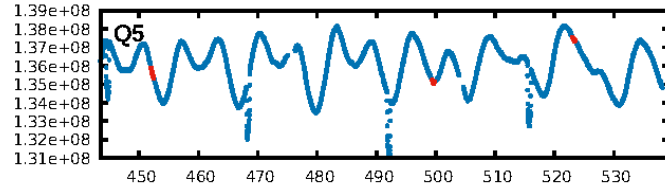
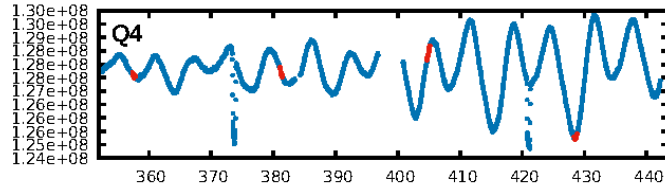
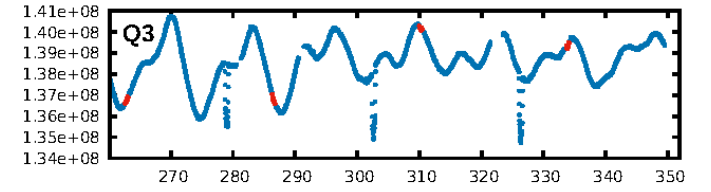
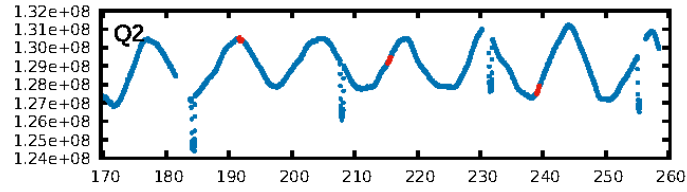
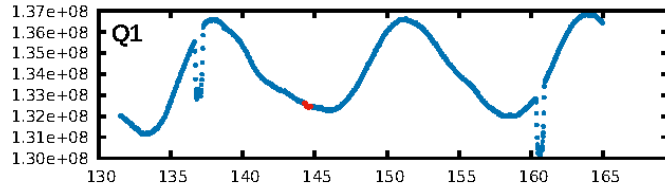
DV Diagnostic Results:

ShortPeriod-sig: 0.8% [0.01σ]
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 99.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.64e-214
RollingBand-fgt: 0.93 [39/42]
GhostDiagnostic-chr: -14.14
Centroid-sig: N/A
Centroid-so: 0.448 arcsec [0.88σ]
OotOffset-rm: 0.279 arcsec [1.53σ]
KicOffset-rm: 0.233 arcsec [1.36σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

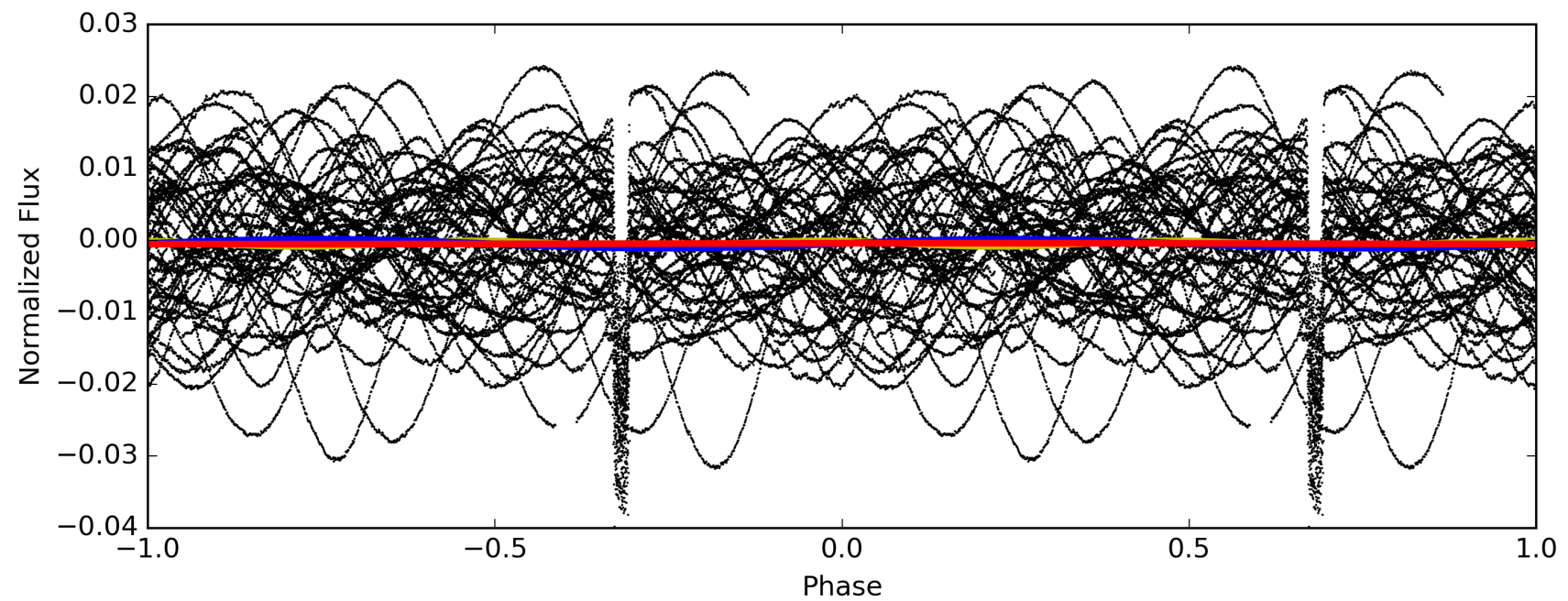
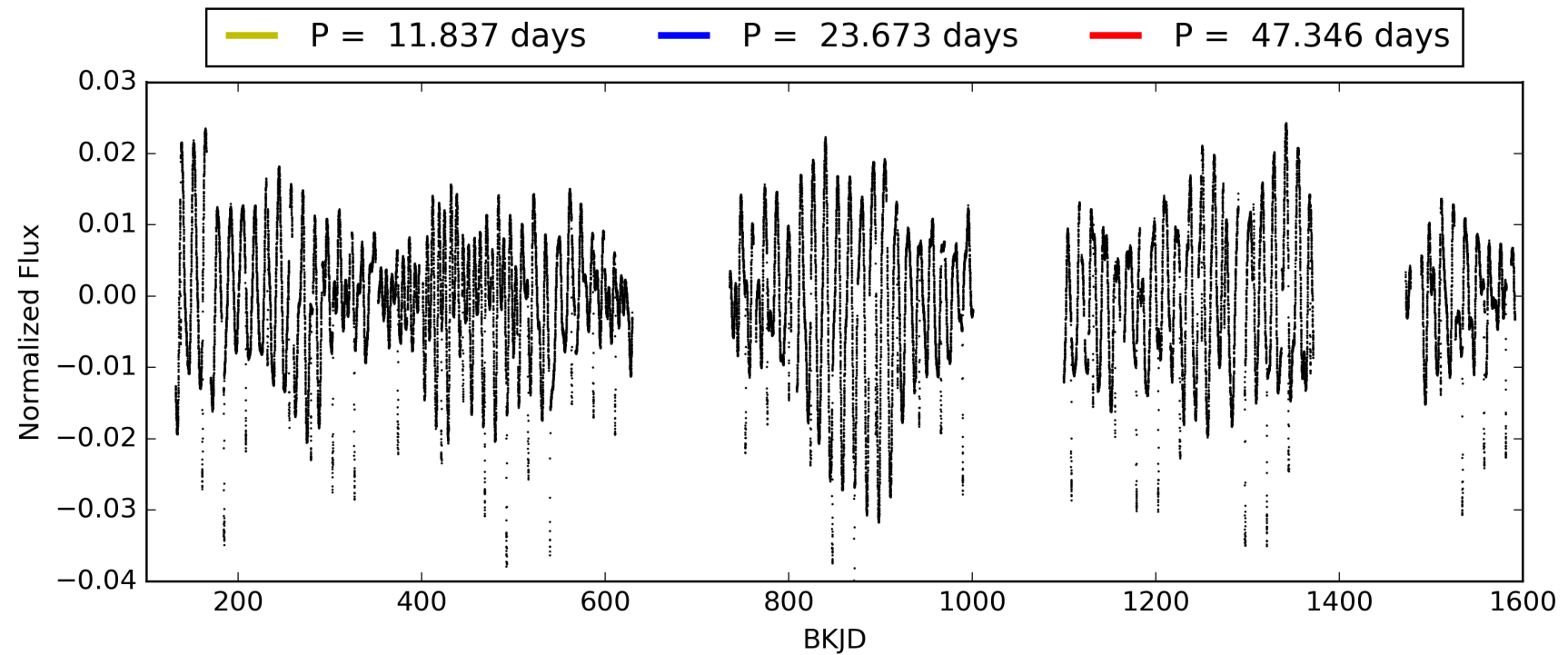
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 08:31:11 Z

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

TCE 010616571-03, PDC Light Curves

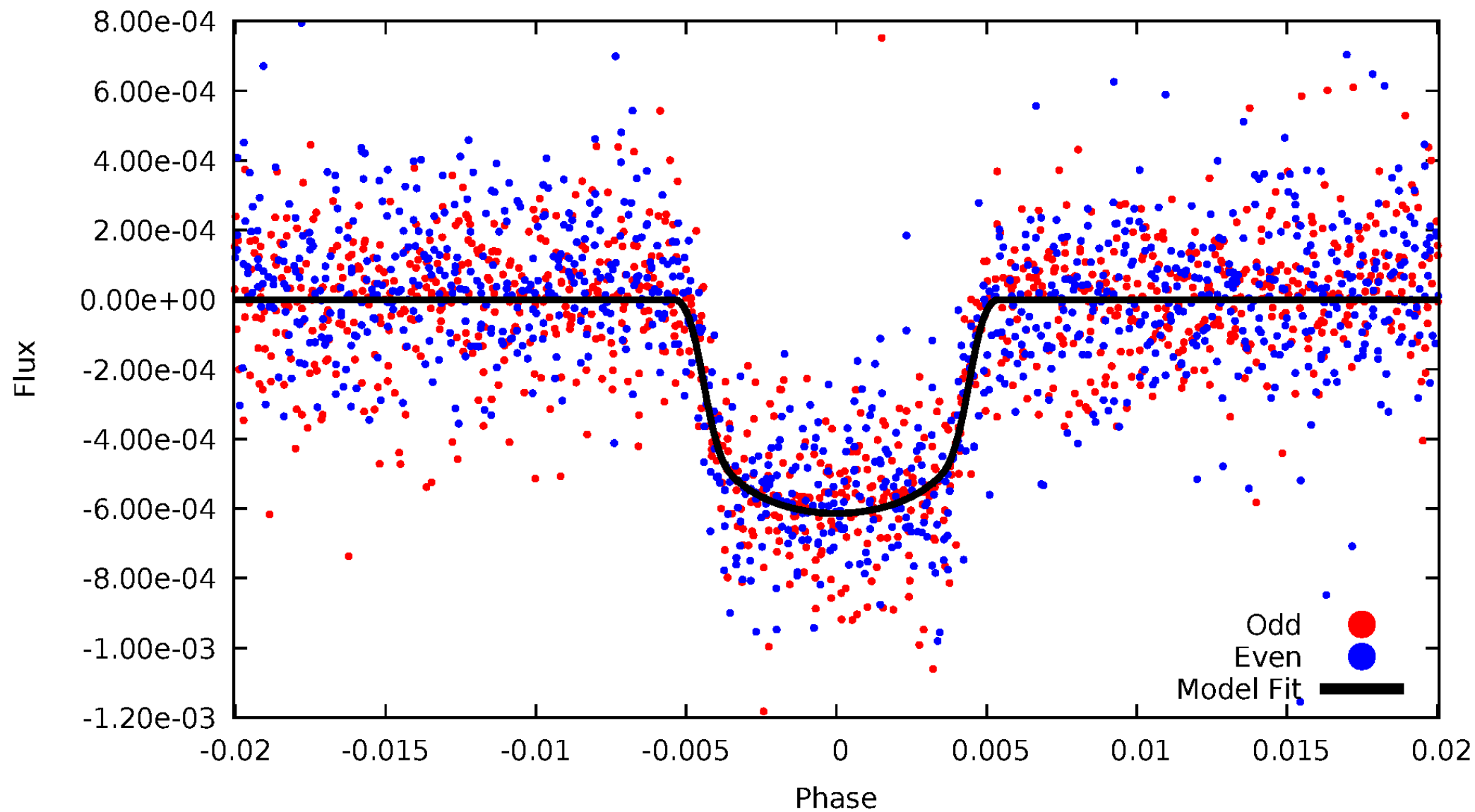


TCE 010616571-03



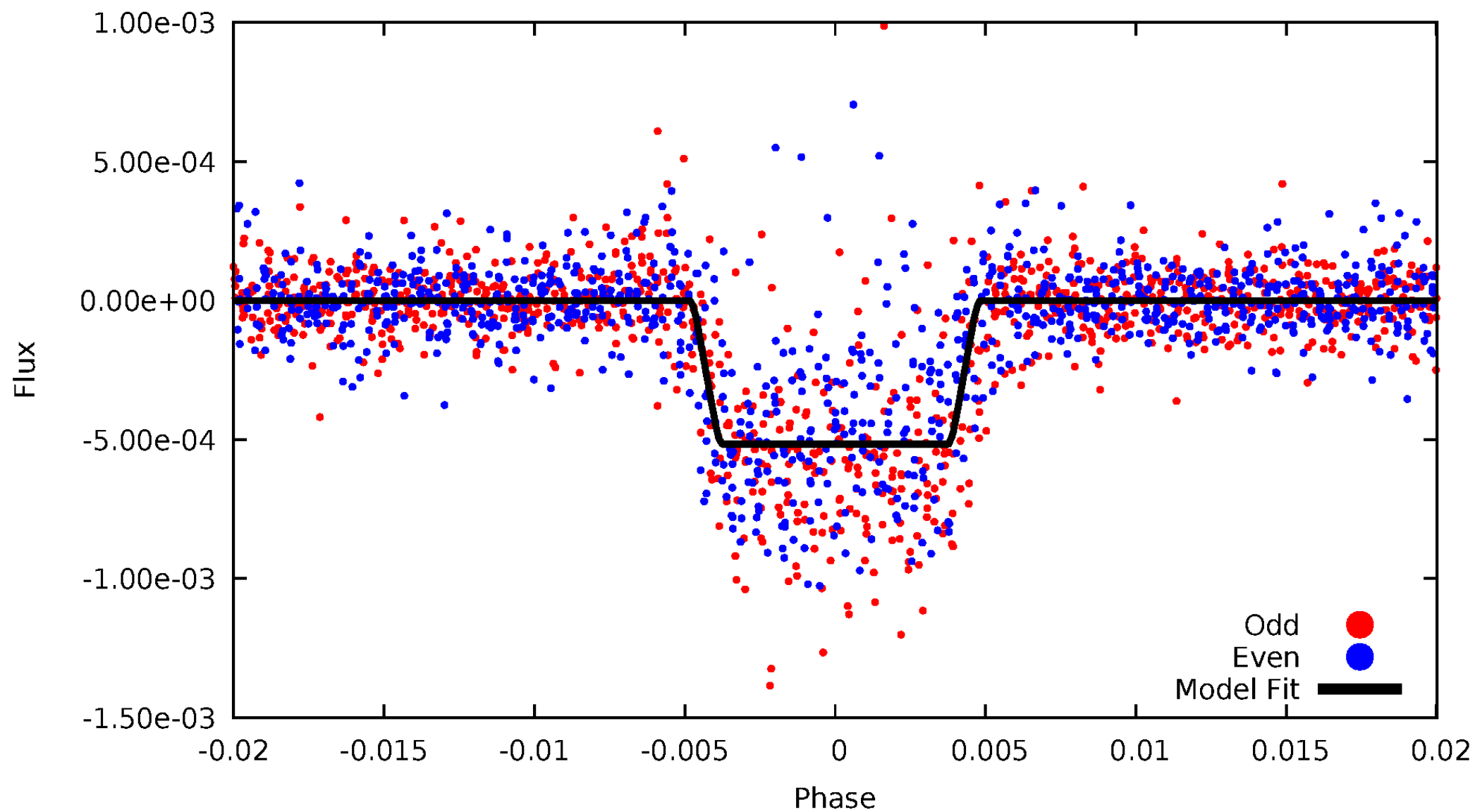
DV Odd/Even

TCE 010616571-03



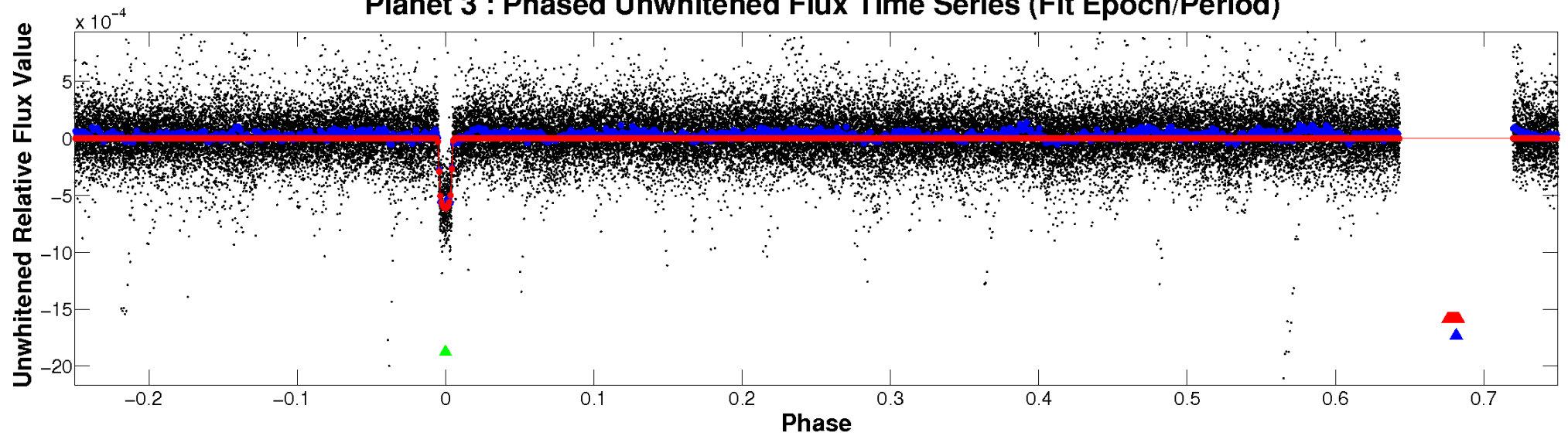
ALT Odd/Even

TCE 010616571-03

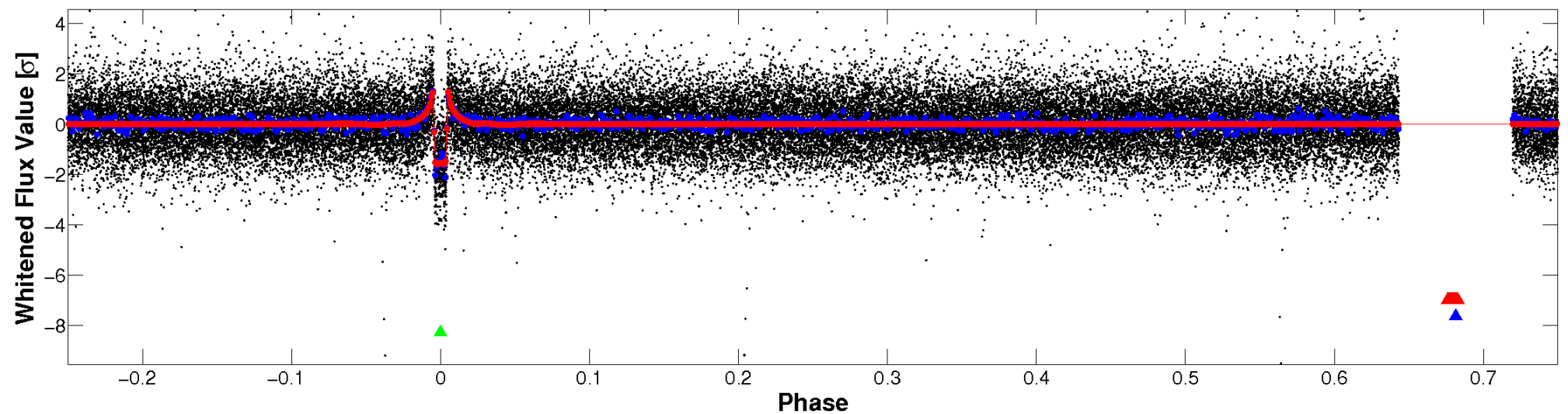


Non-Whitened Vs. Whitened Light Curve

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

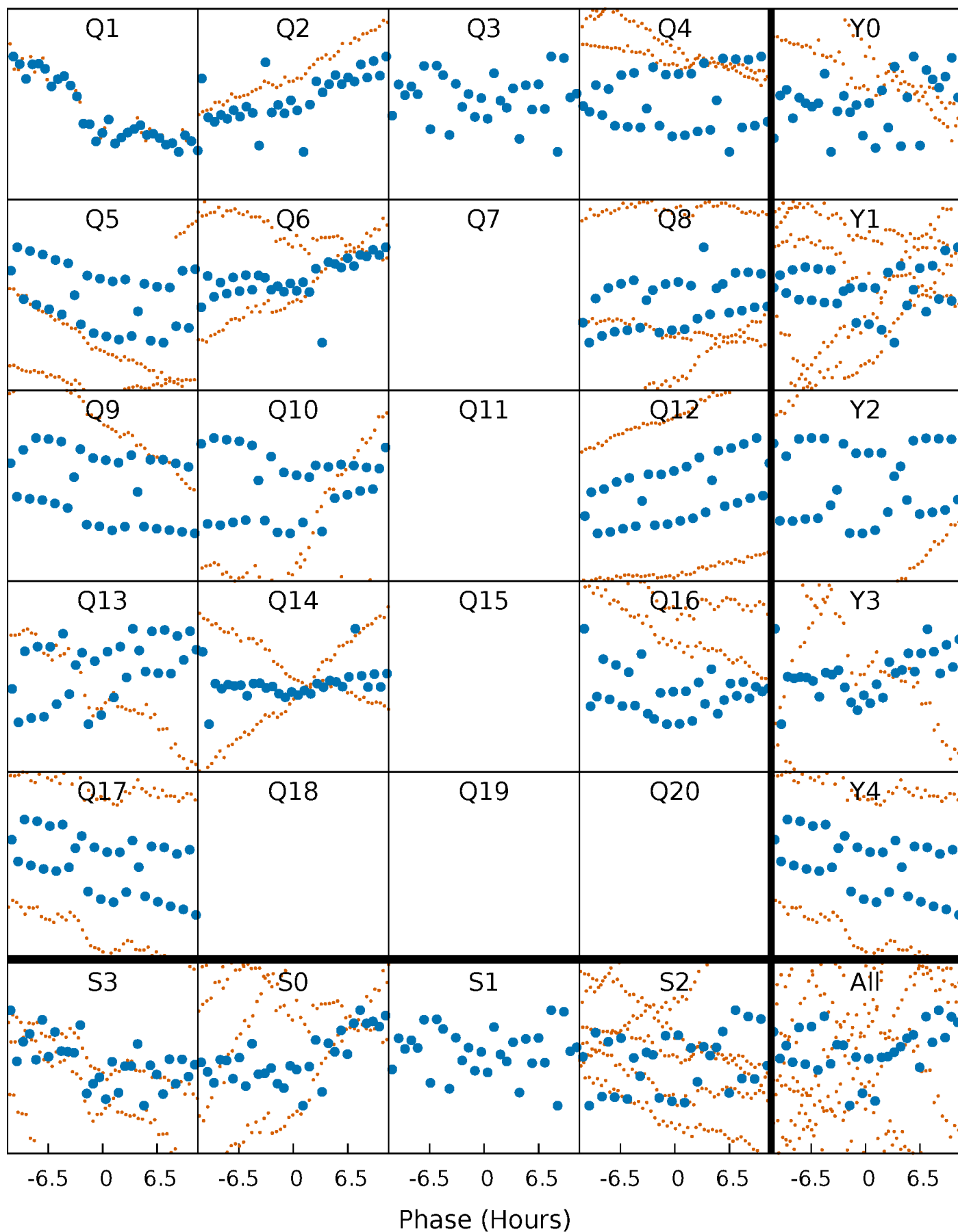


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



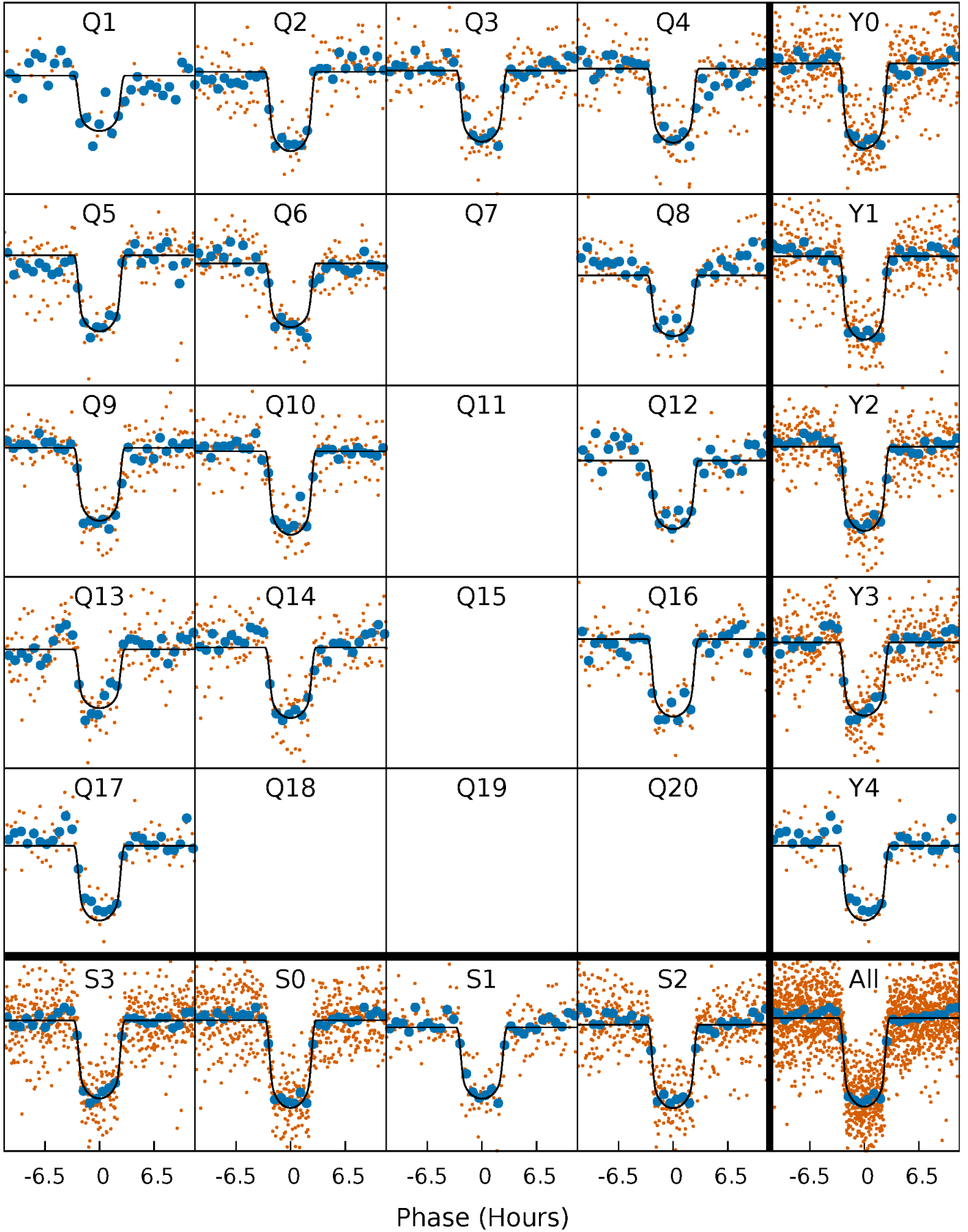
PDC Quarter-Phased Transit Curves

TCE 010616571-03 P= 23.673102 Days $T_0=144.497891$ (BKJD)



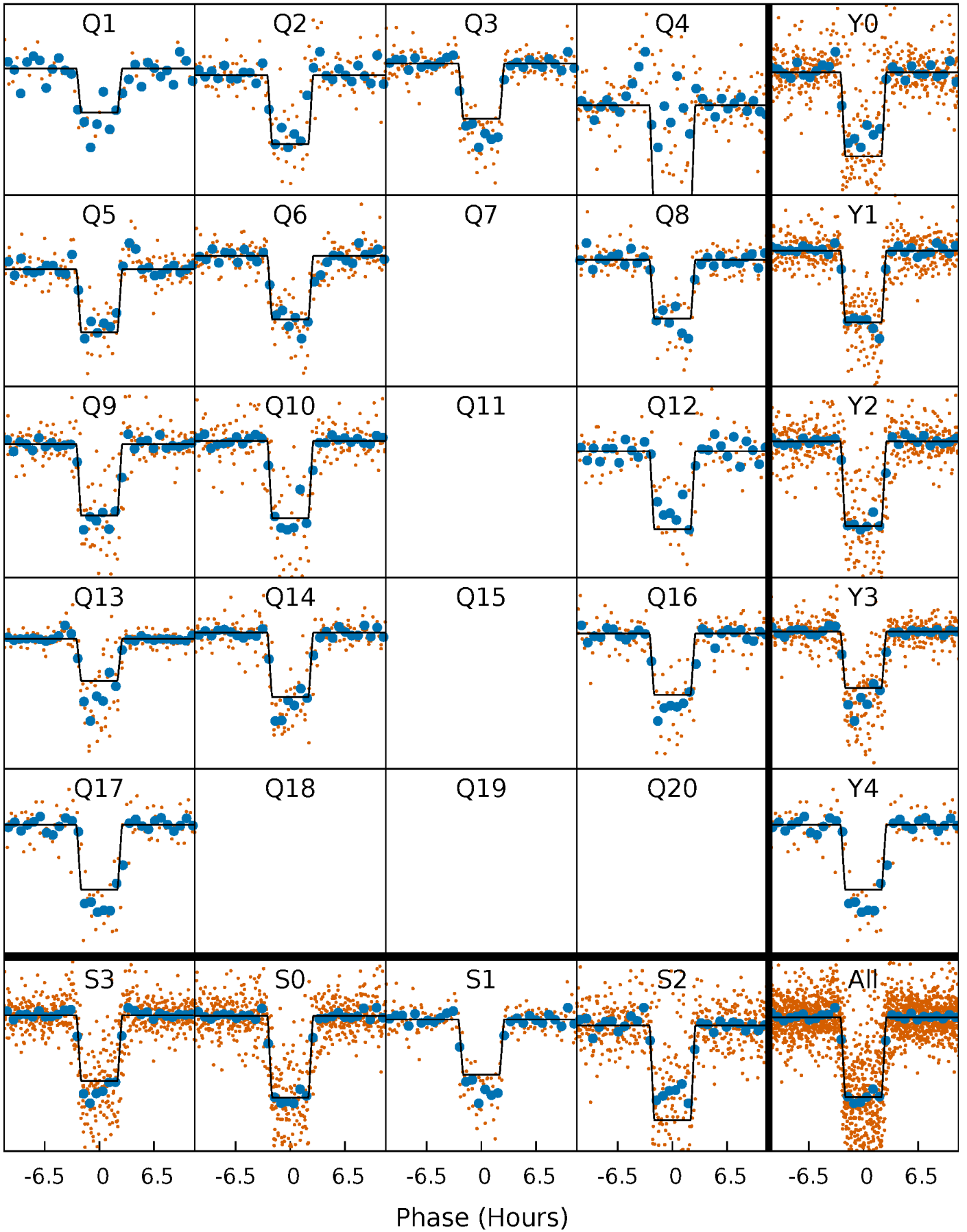
DV Quarter-Phased Transit Curves

TCE 010616571-03 $P = 23.673102$ Days $T_0 = 144.497891$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

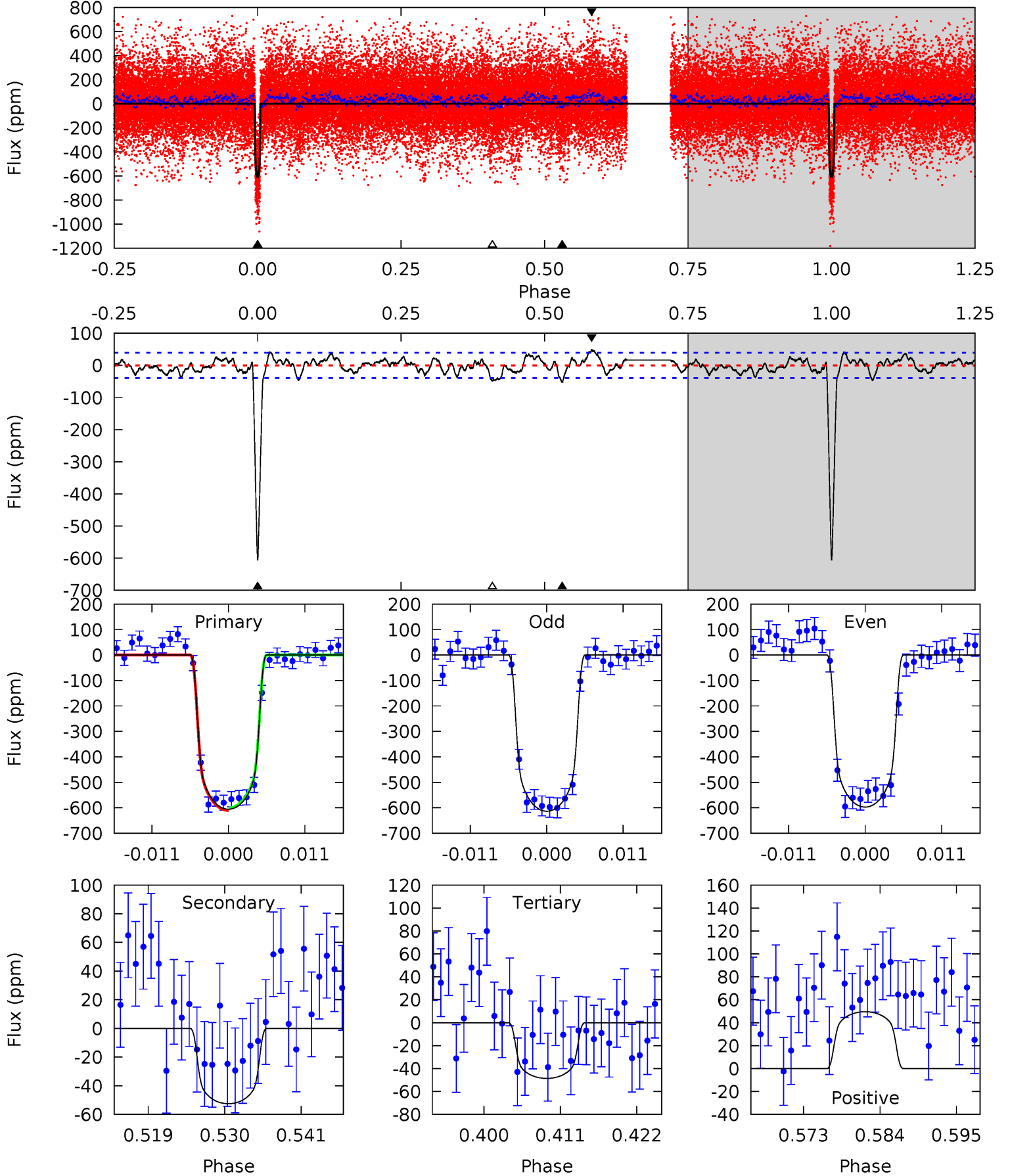
TCE 010616571-03 P= 23.672759 Days $T_0=144.507222$ (BKJD)



DV Model-Shift Uniqueness Test

010616571-03, $P = 23.673102$ Days, $E = 120.824789$ Days

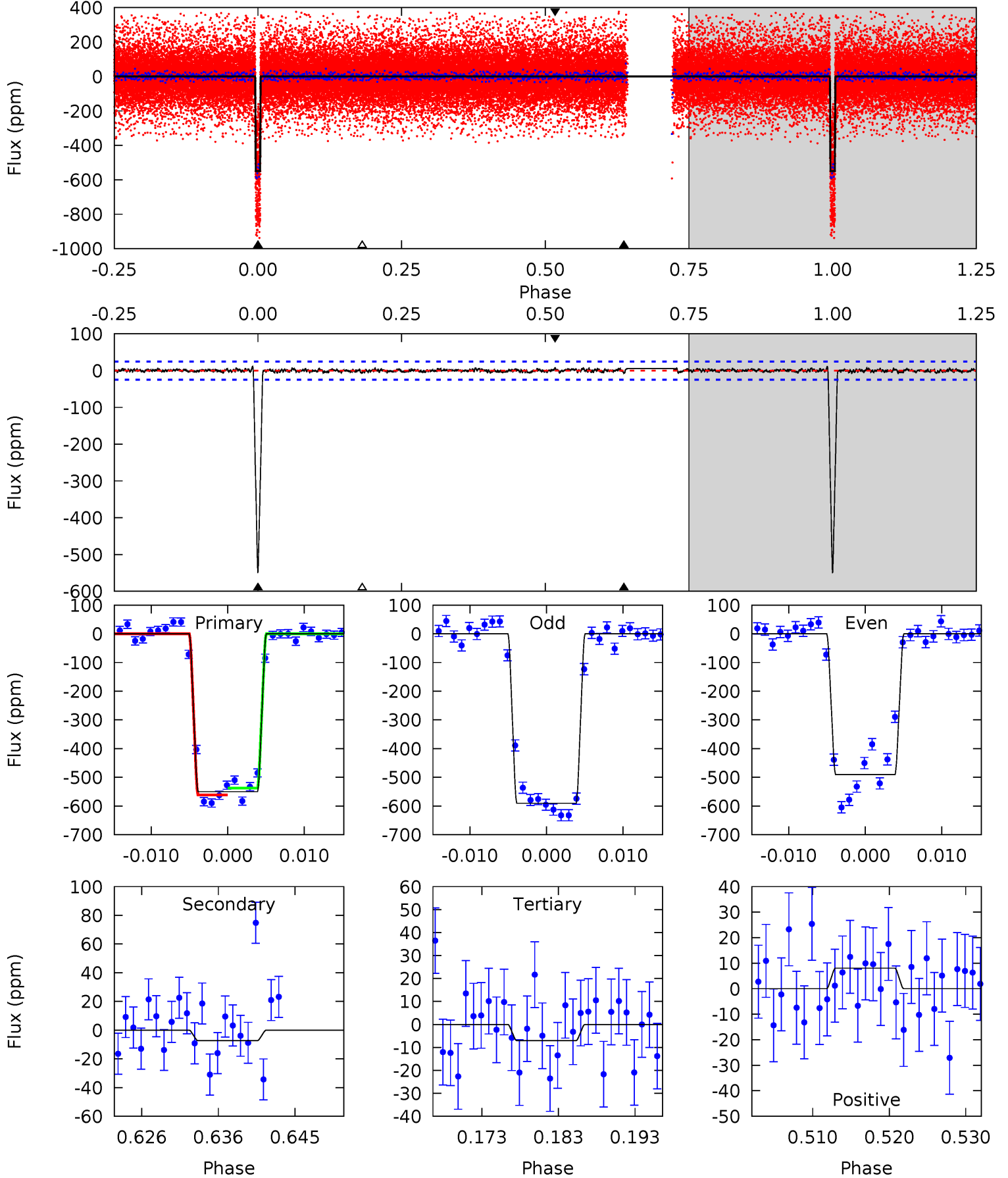
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 77.5 | 6.73 | 6.22 | 6.35 | 5.01 | 2.55 | 2.32 | 71.3 | 71.2 | 0.50 | 0.38 | 1.04 | 1.00 | 0.08 | 0.63 |



Alt Model-Shift Uniqueness Test

010616571-03, P = 23.672759 Days, E = 120.834463 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 112.0 | 1.49 | 1.43 | 1.64 | 5.03 | 2.59 | 0.51 | 110.5 | 110.3 | 0.06 | -0.15 | 10.2 | 0.92 | 0.02 | 2.40 |



Stellar Parameters For KIC 010616571

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5769^{+104}_{-116} | $4.338^{+0.095}_{-0.126}$ | $0.380^{+0.050}_{-0.150}$ | $1.177^{+0.209}_{-0.129}$ | $1.100^{+0.068}_{-0.068}$ | $0.950^{+0.341}_{-0.351}$ |
| | +2%/-2% | +2%/-3% | +13%/-39% | +18%/-11% | +6%/-6% | +36%/-37% |
| Source | SPE3 | SPE3 | SPE3 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 010616571-03 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-------------|------------------------|-------------------|----------------------|------------------|
| DV | -53 ± 8 | $3.42^{+0.36}_{-0.25}$ | 945^{+44}_{-37} | 3485^{+103}_{-105} | 68^{+16}_{-15} |
| Alt. | -7 ± 5 | $2.92^{+0.32}_{-0.22}$ | 949^{+44}_{-39} | 2754^{+205}_{-341} | 13^{+10}_{-8} |

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 $A_{obs} \gg 1.0$

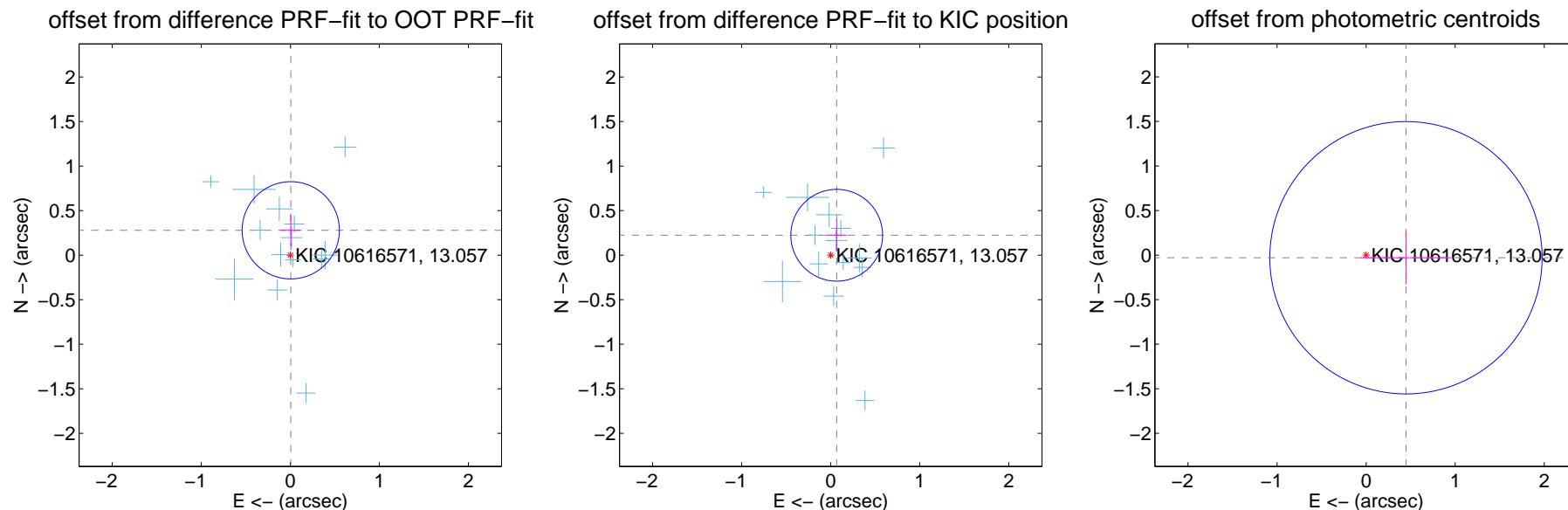
DV Centroid Data

Supplemental centroid analysis for 010616571-03. Kepler magnitude: 13.06. Transit SNR 37.36

There are 14 quarters with good PRF difference image offsets

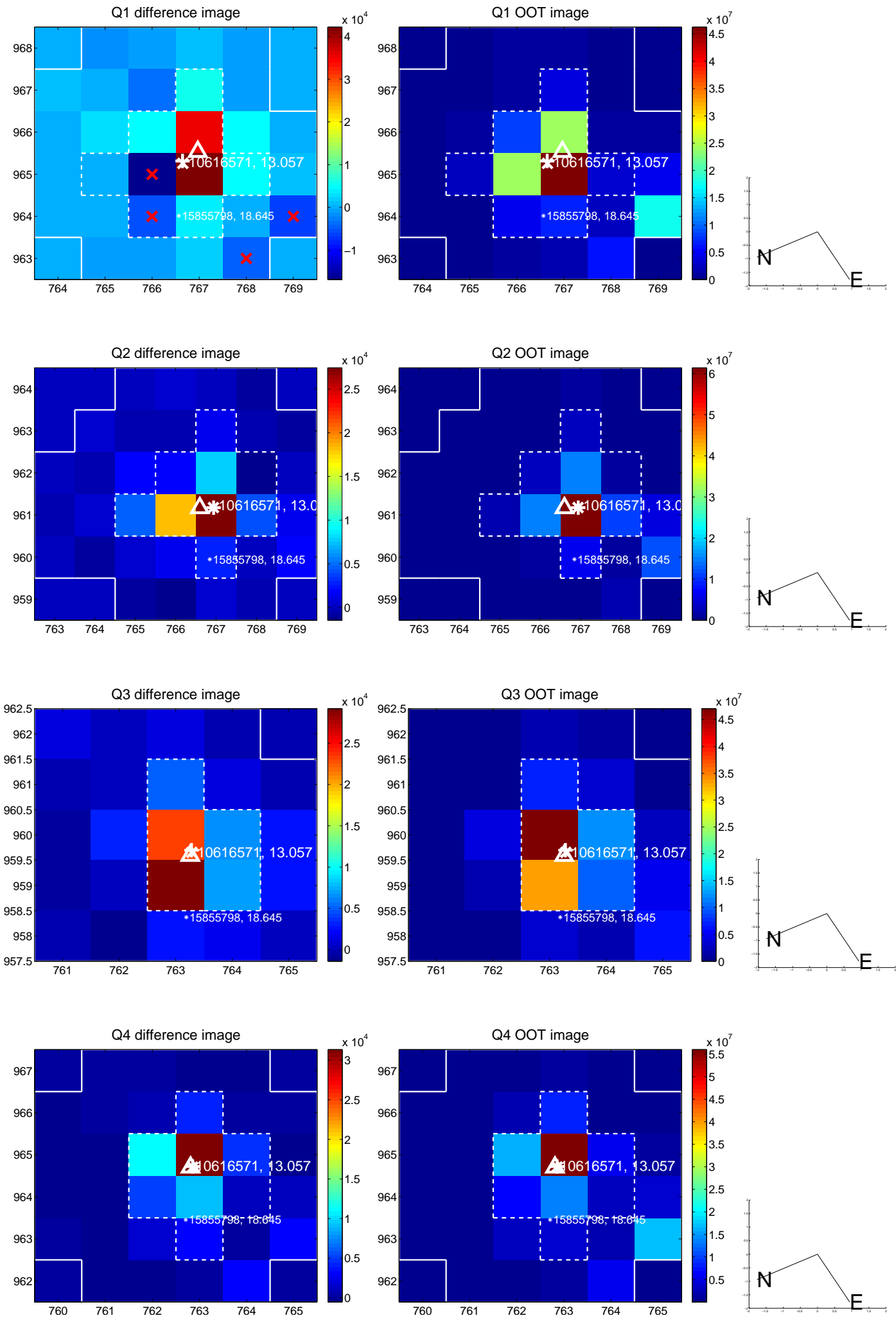
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.279 ± 0.182 | 1.53 | -0.006 ± 0.120 | 0.279 ± 0.182 |
| PRF-fit source offset from KIC position | 0.233 ± 0.172 | 1.36 | -0.067 ± 0.113 | 0.223 ± 0.180 |
| photometric centroid source offset | 0.45 ± 0.51 | 0.88 | -0.45 ± 0.51 | -0.03 ± 0.30 |

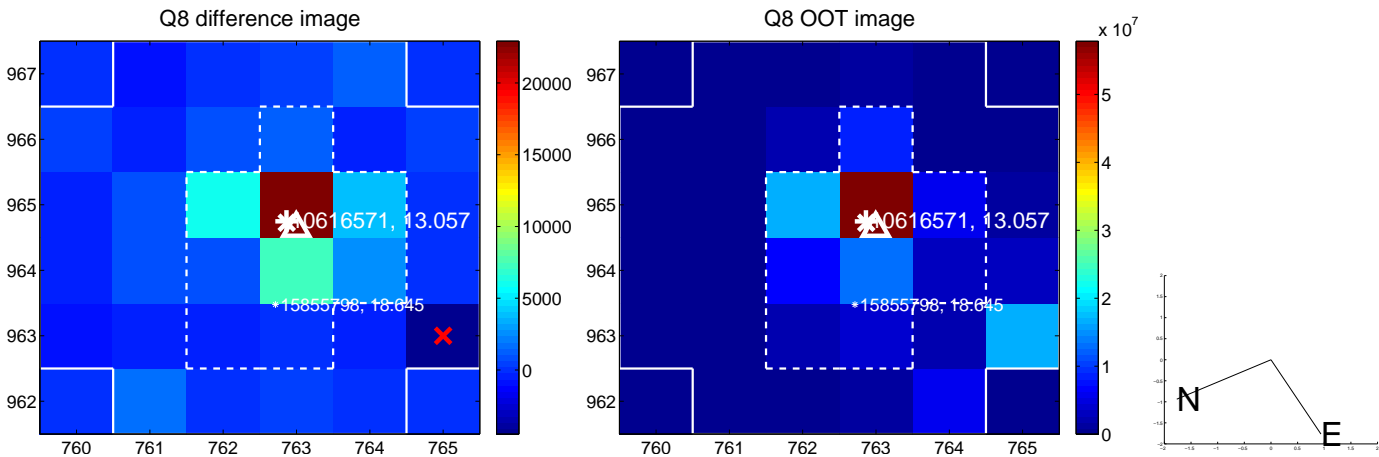
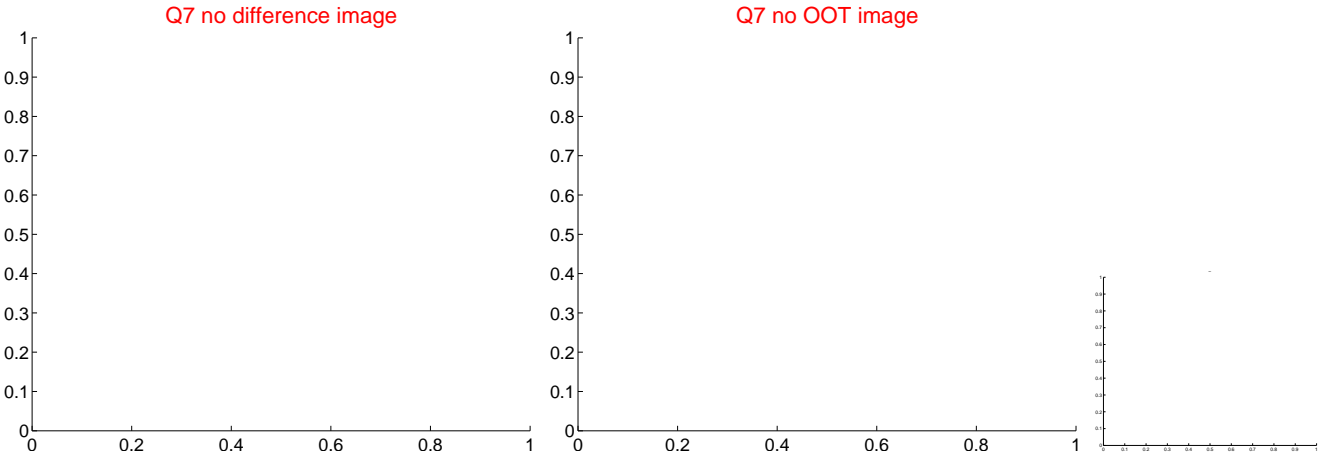
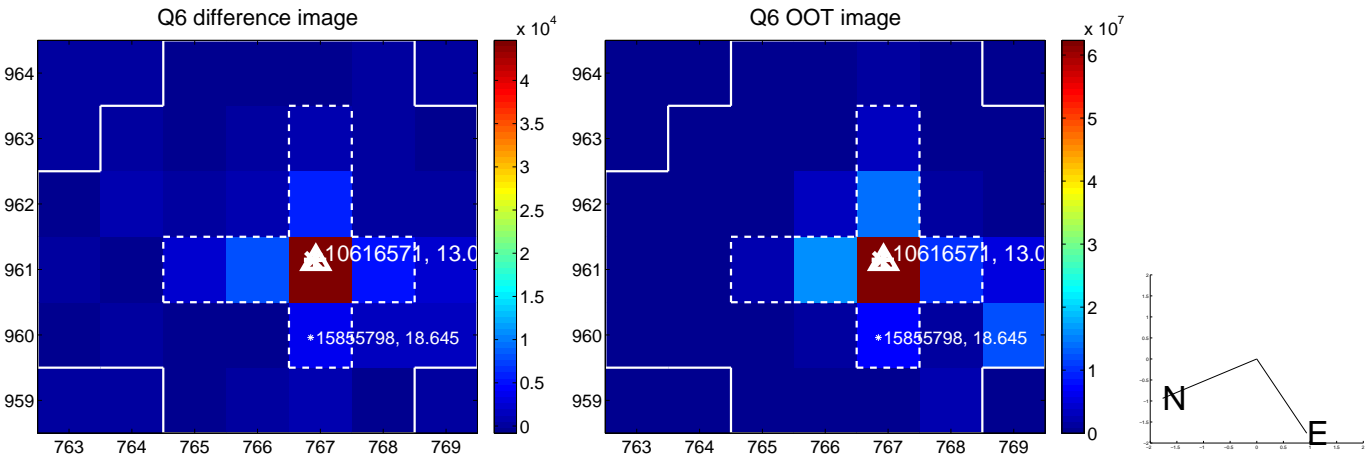
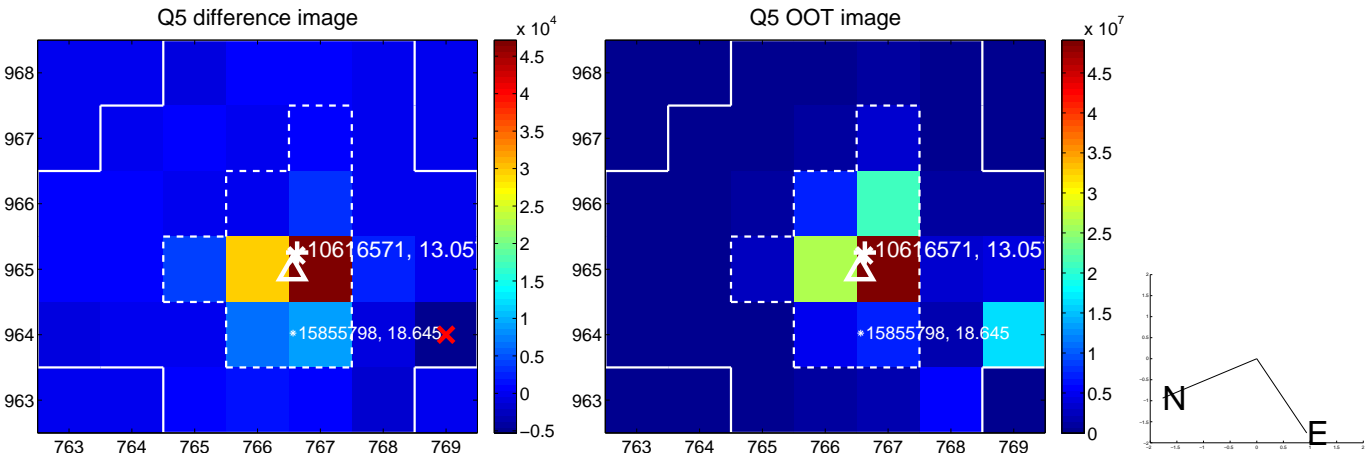


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

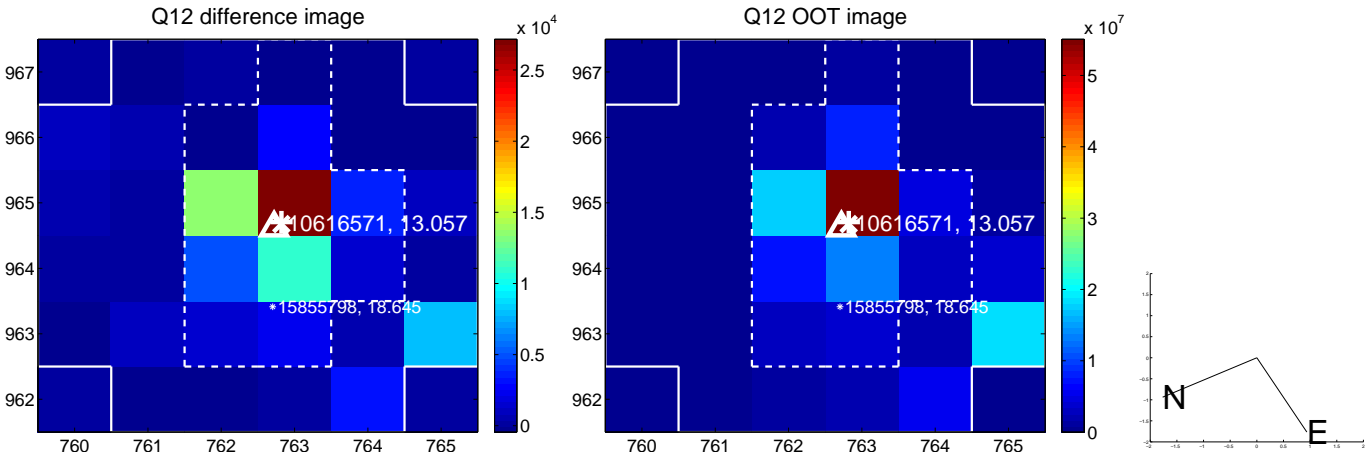
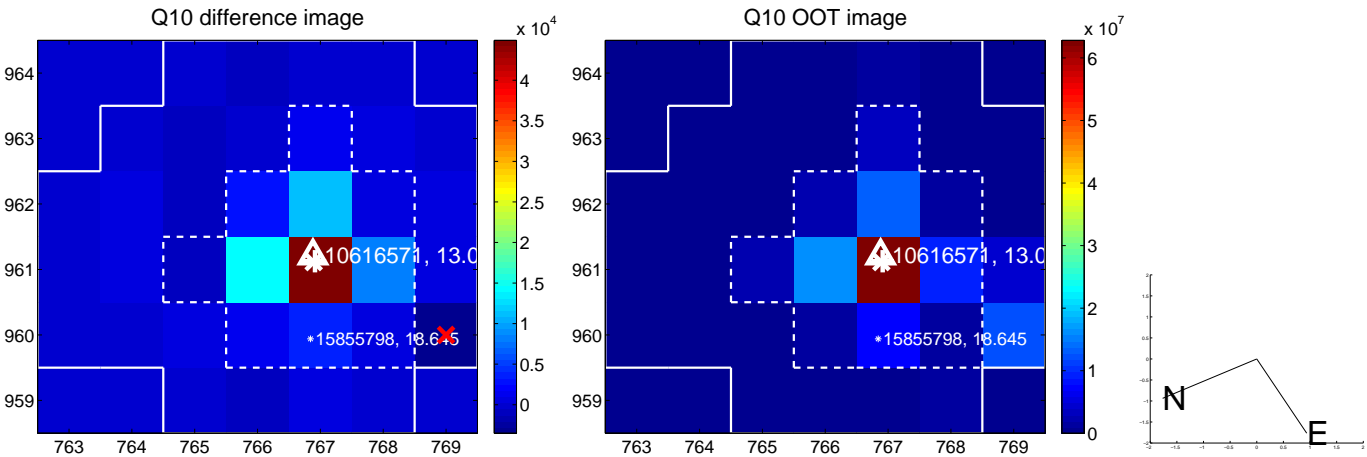
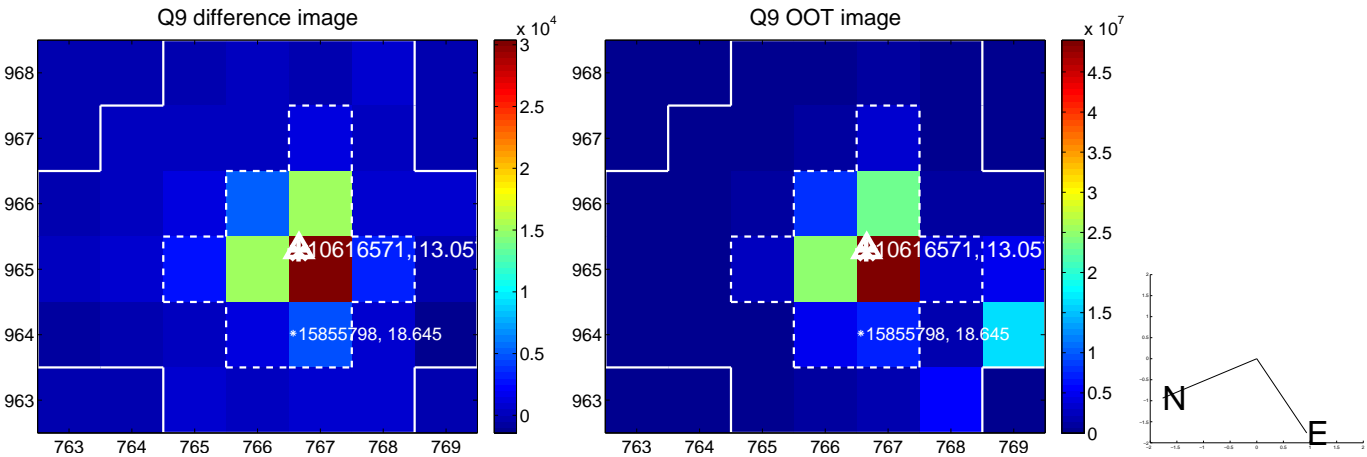
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



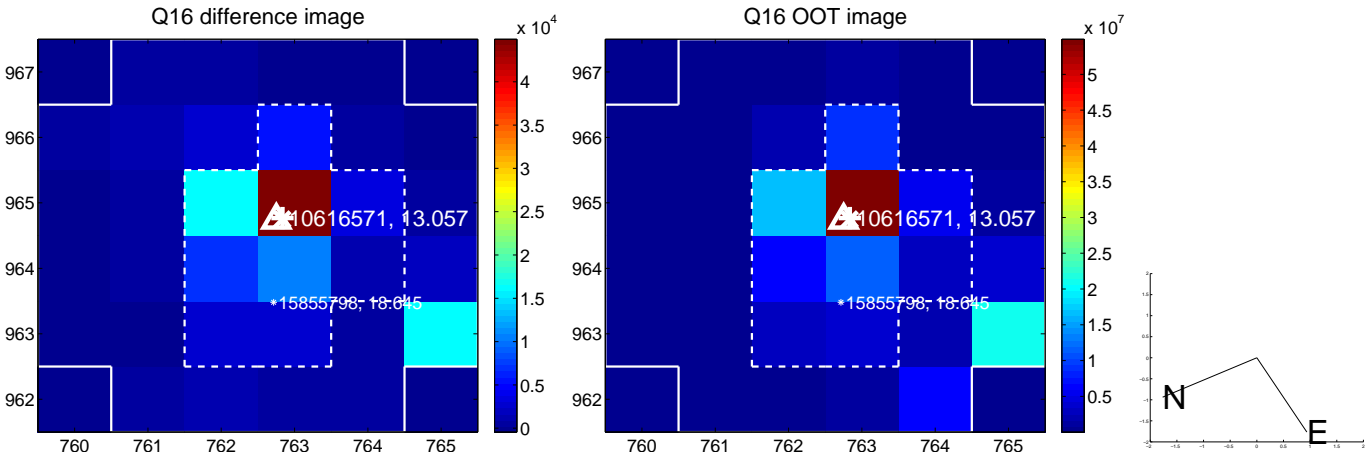
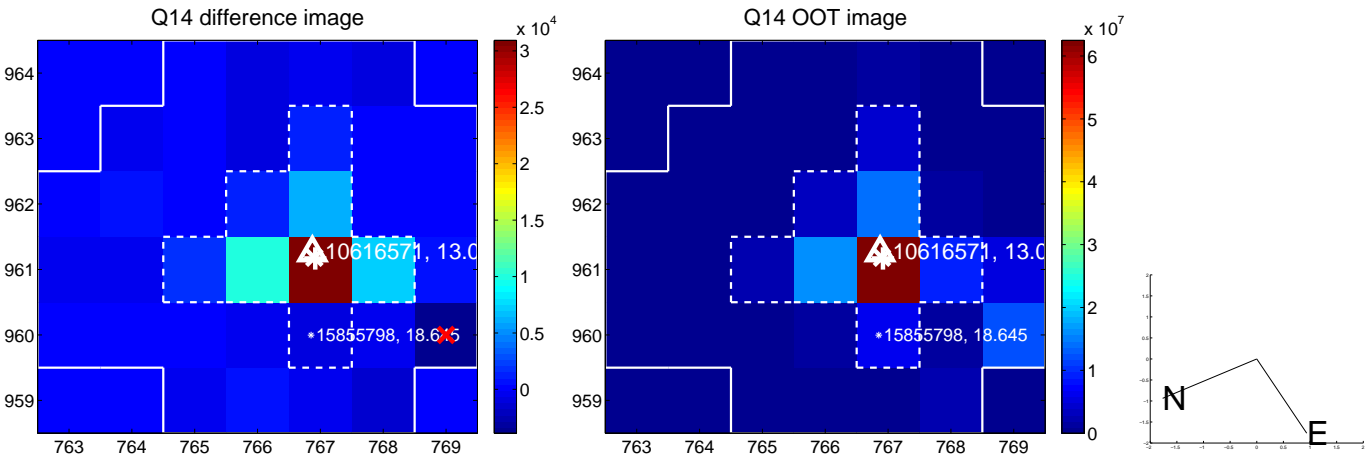
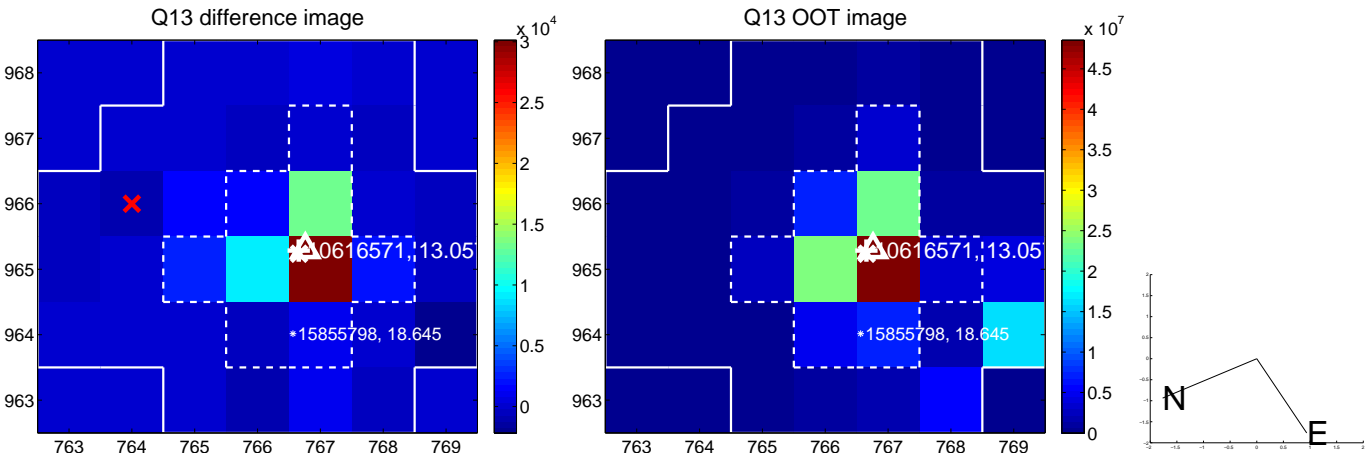
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



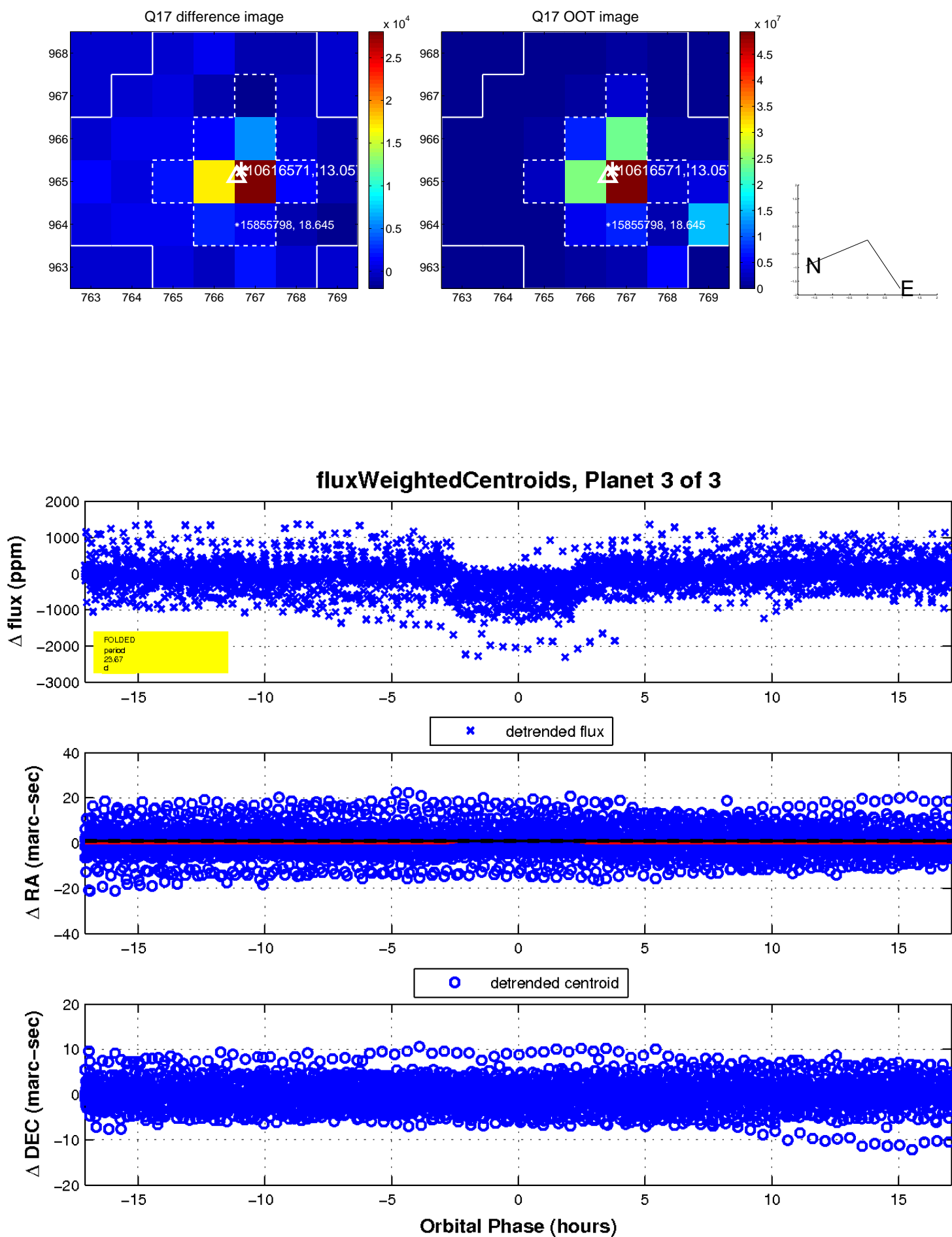
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

