

KIC 010730838

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 010730838-01 | OBS | No | 7.888980 | 138.781948 | 76.9 | 17.076 | 17.2 | 20.0 | 2.41 | 8057 | 2.82 | 2398.16 |
| 010730838-02 | OBS | No | 7.888845 | 137.637611 | 63.5 | 12.055 | 12.7 | 15.4 | 2.41 | 8057 | 2.56 | 2398.21 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 010730838-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—CENT_FEW_DIFFS |
| 010730838-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—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.

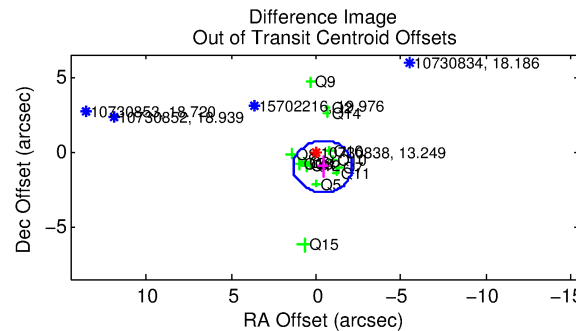
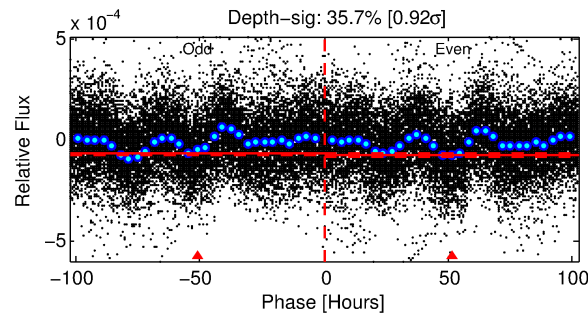
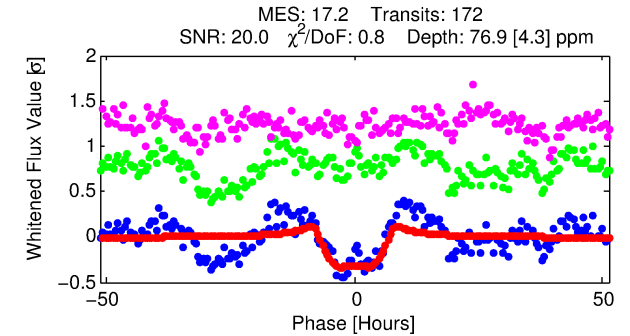
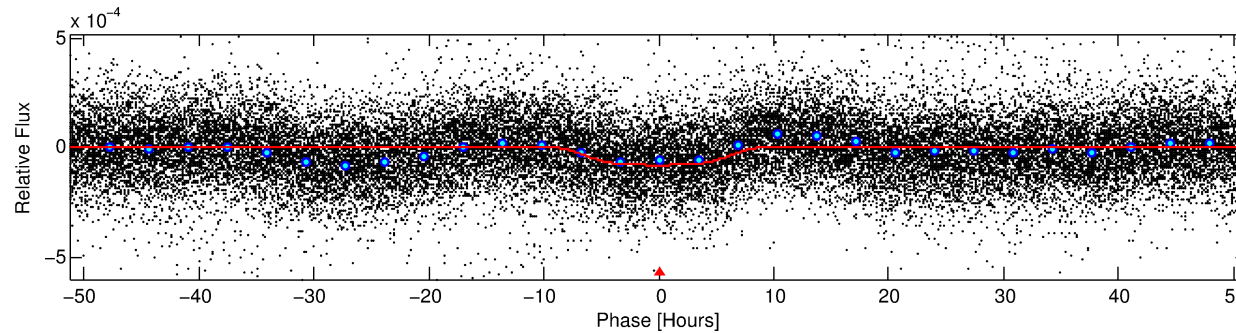
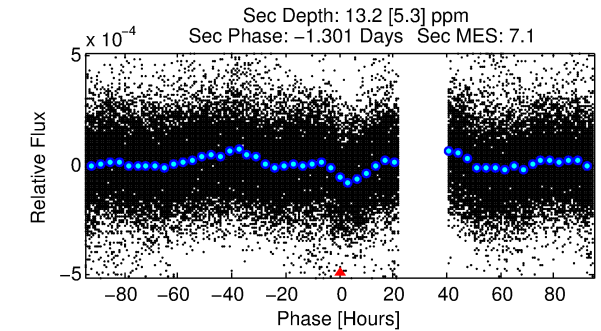
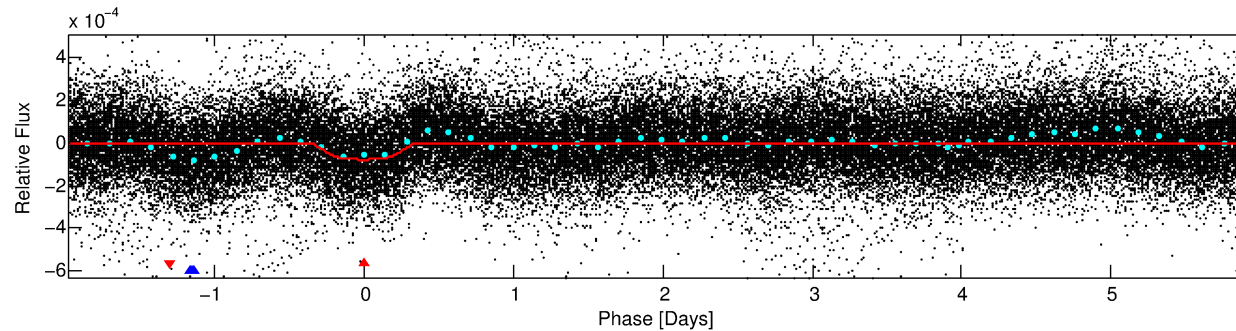
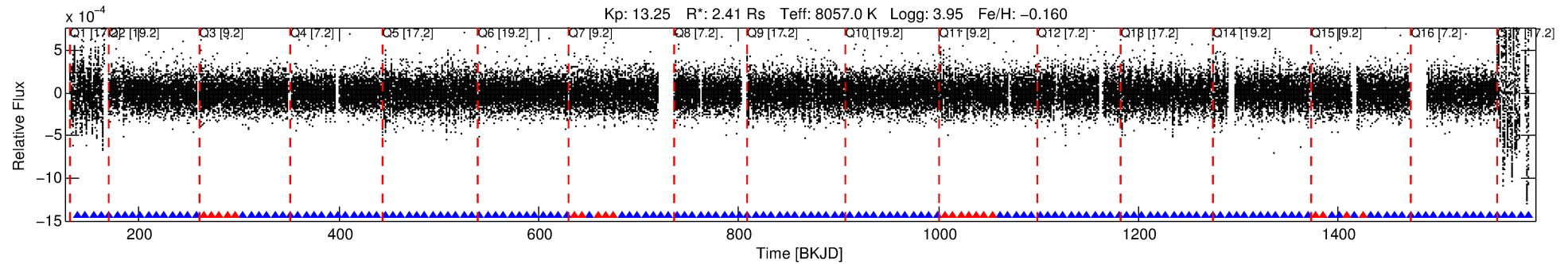
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010730838-01

No Significant Match Found

DV One-Page Summary

KIC: 10730838 Candidate: 1 of 2 Period: 7.889 d



DV Fit Results:

Period = 7.88898 [0.00014] d
Epoch = 138.7819 [0.0143] BKJD
Rp/R* = 0.0107 [0.0003]
a/R* = 1.27 [0.03]
b = 0.99 [0.00]
Seff = 2398.16 [1083.10]
Teff = 1784 [201] K
Rp = 2.82 [0.92] Re
a = 0.0955 [0.0269] AU
Ag = 8.32 [4.84] [1.51σ]
Teffp = 4686 [512] K [5.27σ]

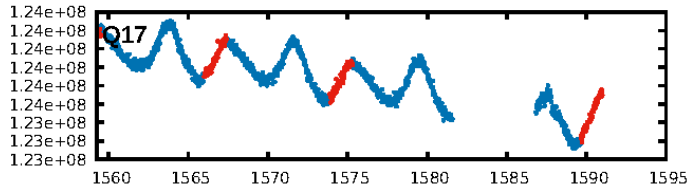
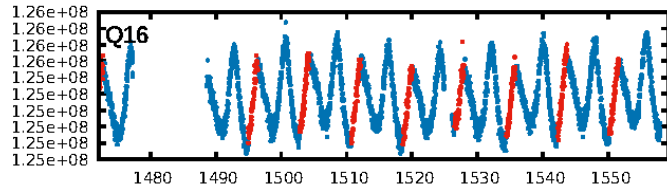
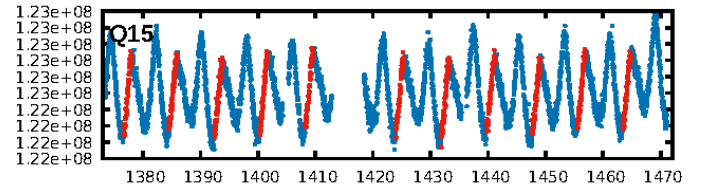
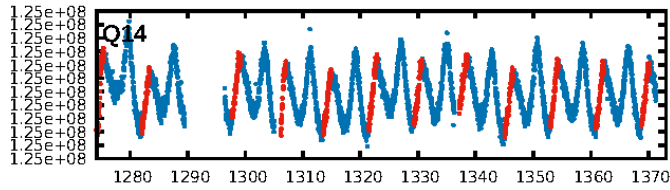
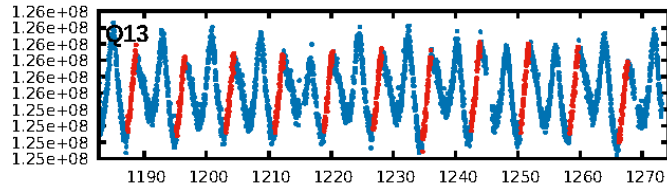
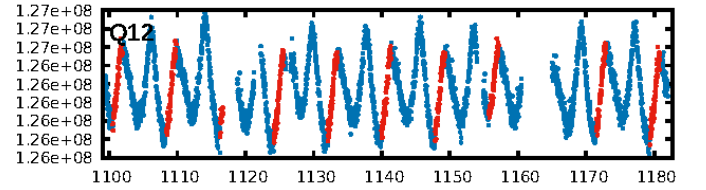
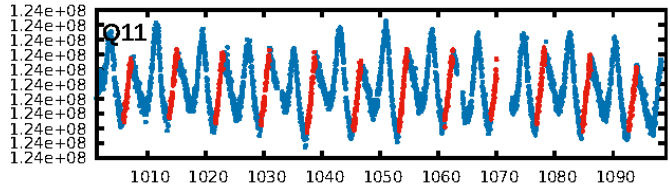
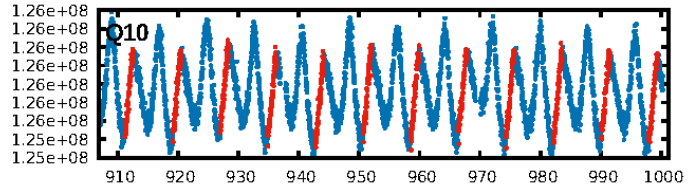
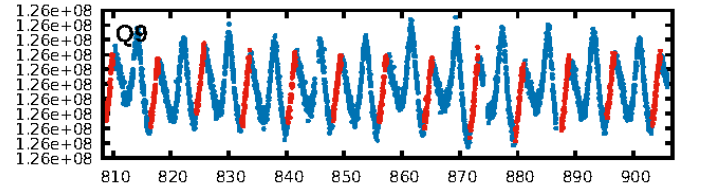
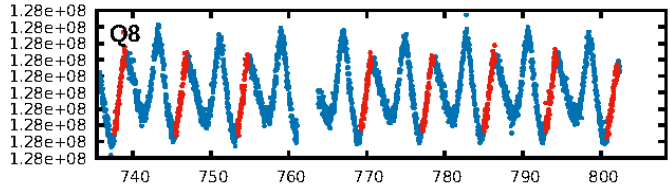
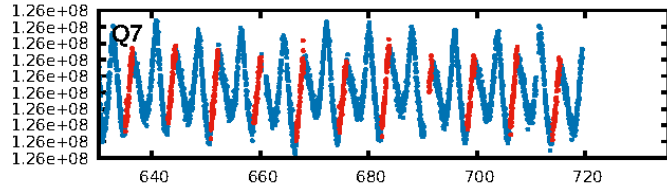
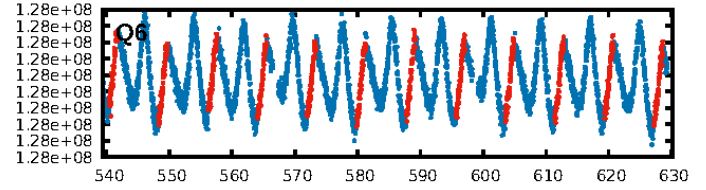
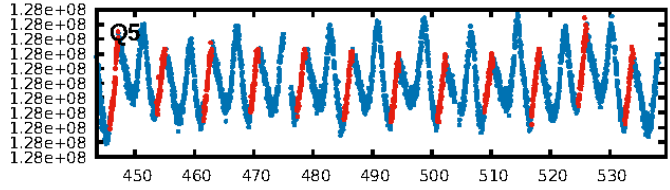
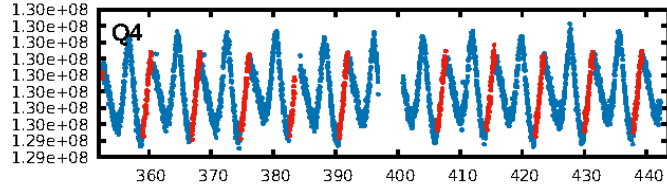
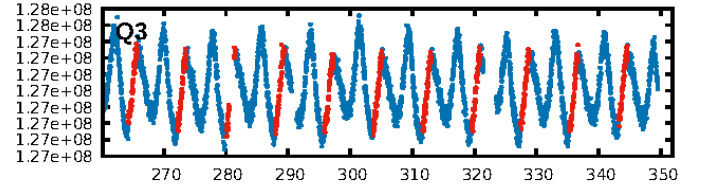
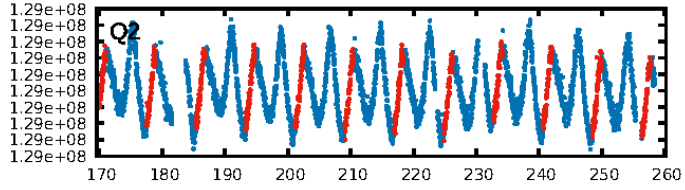
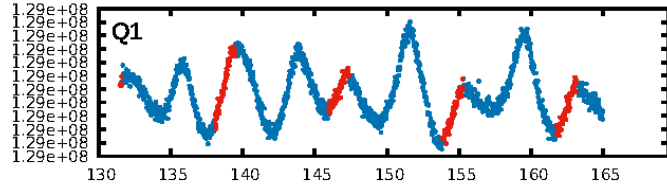
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 96.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.60e-49
RollingBand-fgt: 0.87 [144/165]
GhostDiagnostic-chr: -9.803
Centroid-sig: 4.0%
Centroid-so: 1.026 arcsec [1.89σ]
OotOffset-rm: 1.074 arcsec [1.85σ]
KicOffset-rm: 1.237 arcsec [2.15σ]
OotOffset-st: 4/3/4/3 [14]
KicOffset-st: 4/3/4/3 [14]
DiffImageQuality-fgm: 0.00 [0/14]
DiffImageOverlap-fno: 0.00 [0/17]

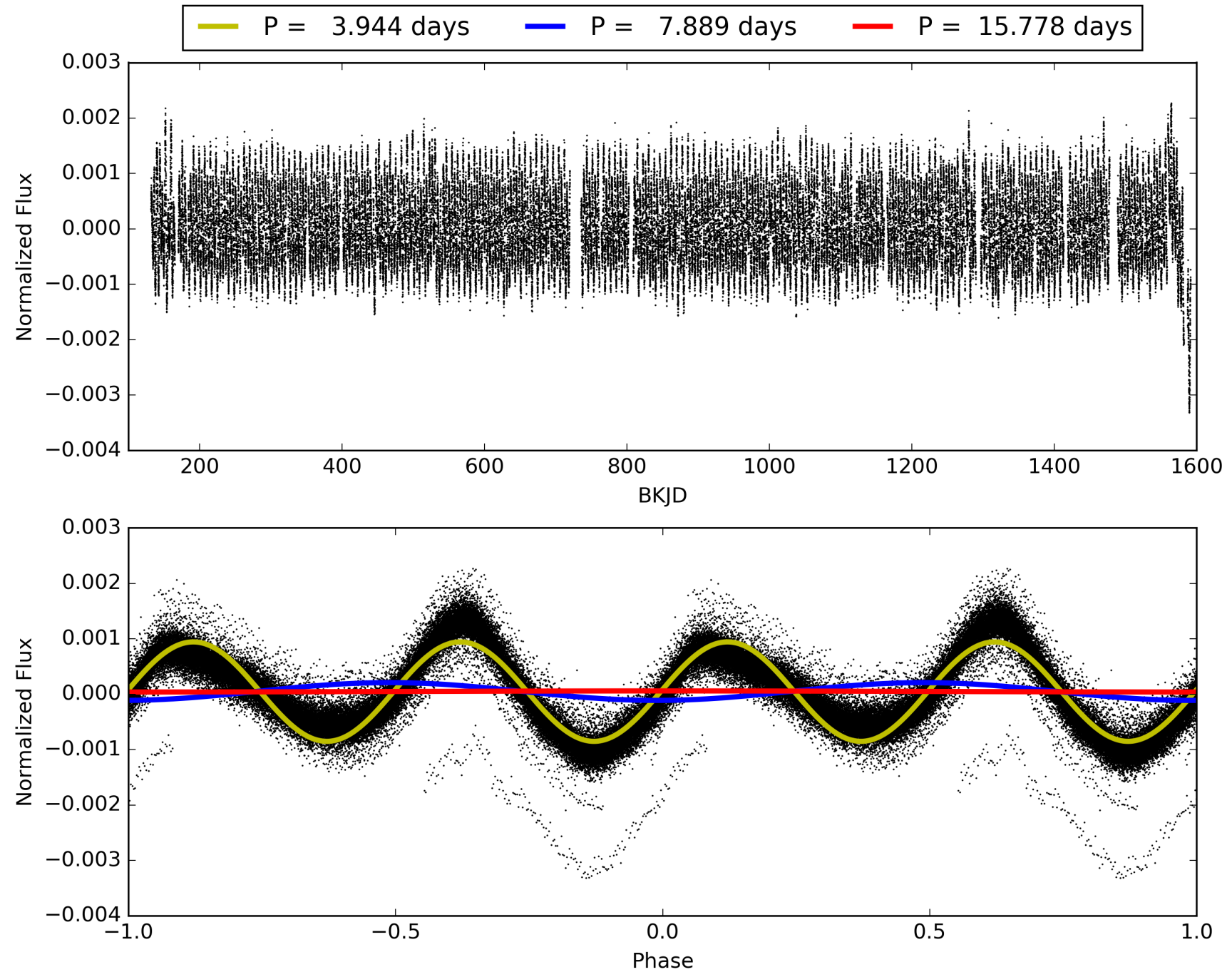
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:45:00 Z

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

TCE 010730838-01, PDC Light Curves

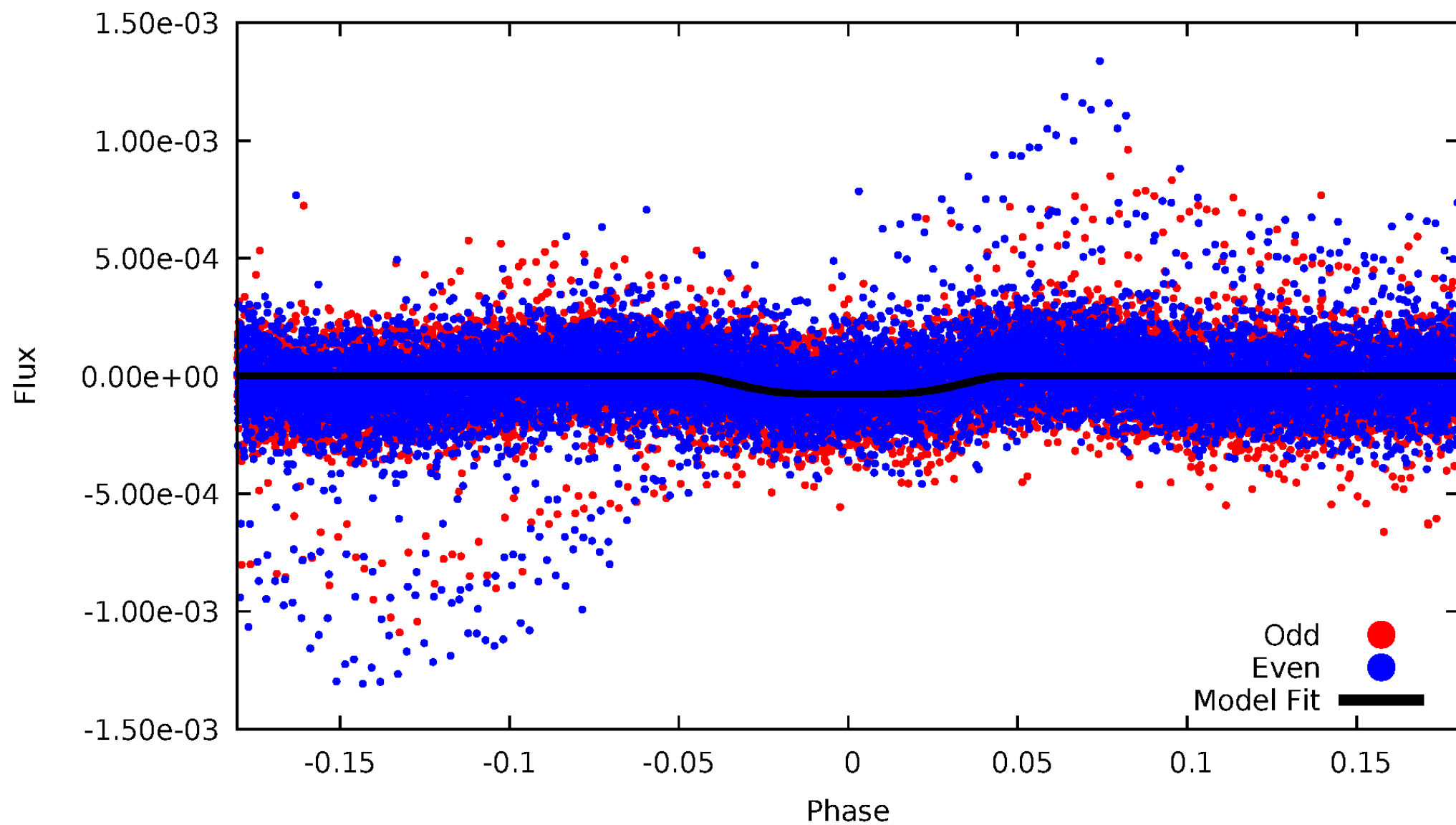


TCE 010730838-01



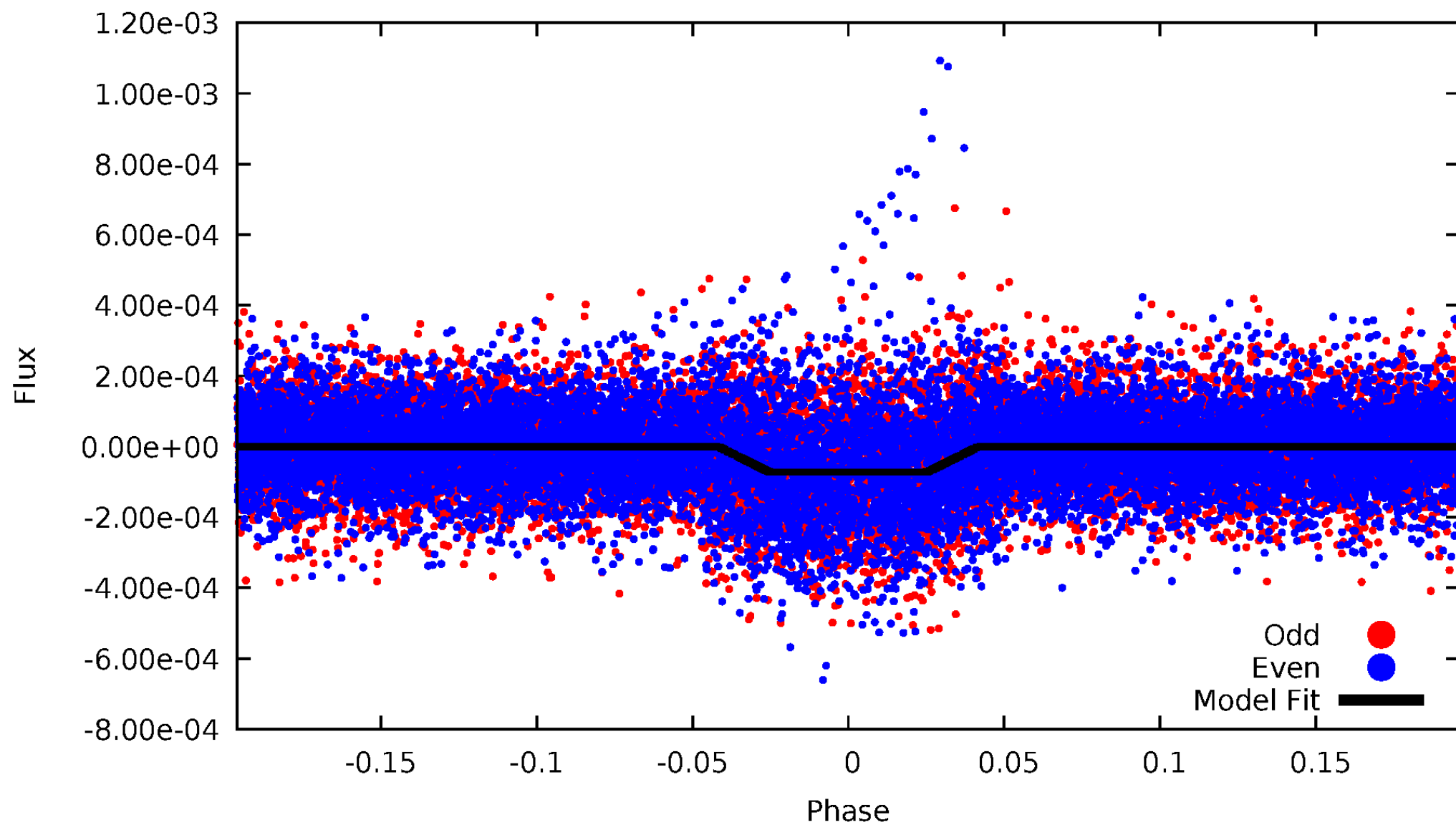
DV Odd/Even

TCE 010730838-01



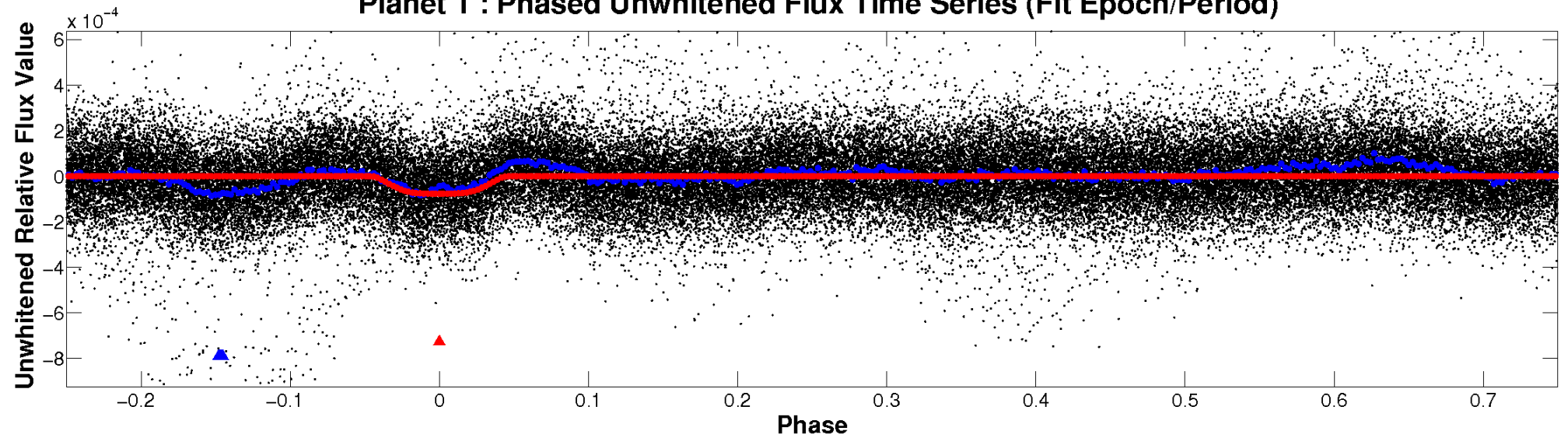
ALT Odd/Even

TCE 010730838-01

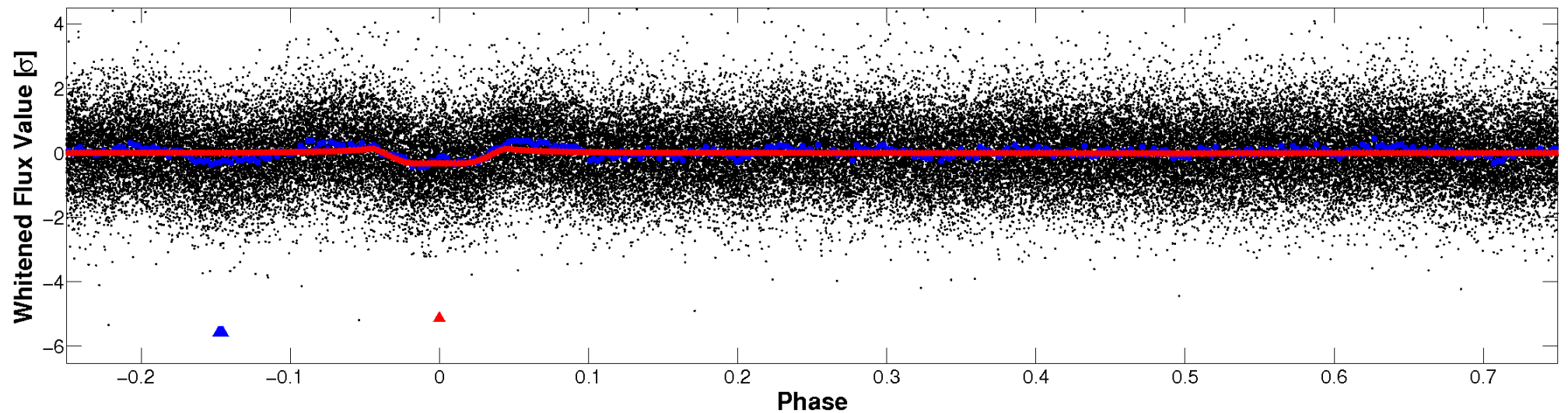


Non-Whitened Vs. Whitened Light Curve

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

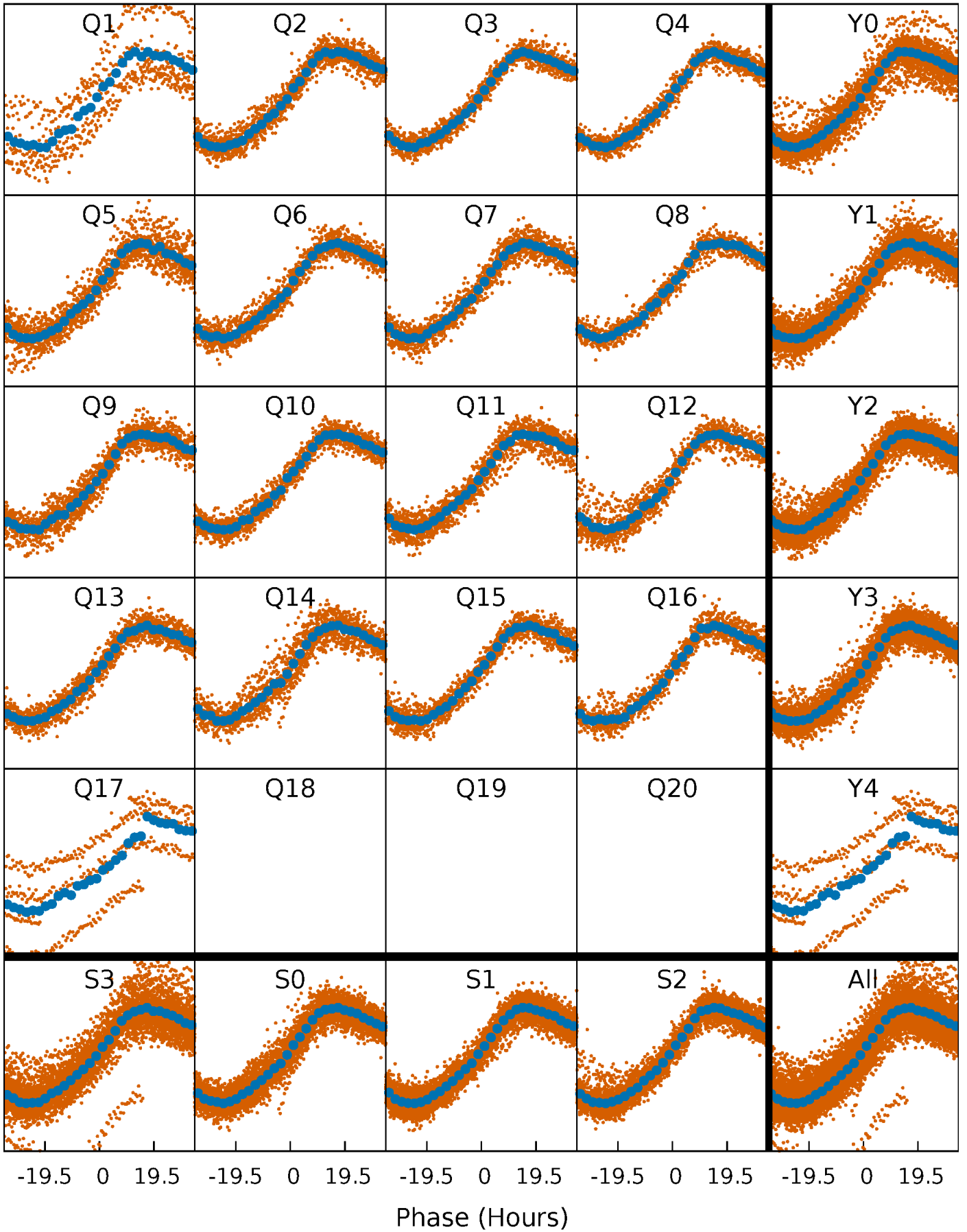


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



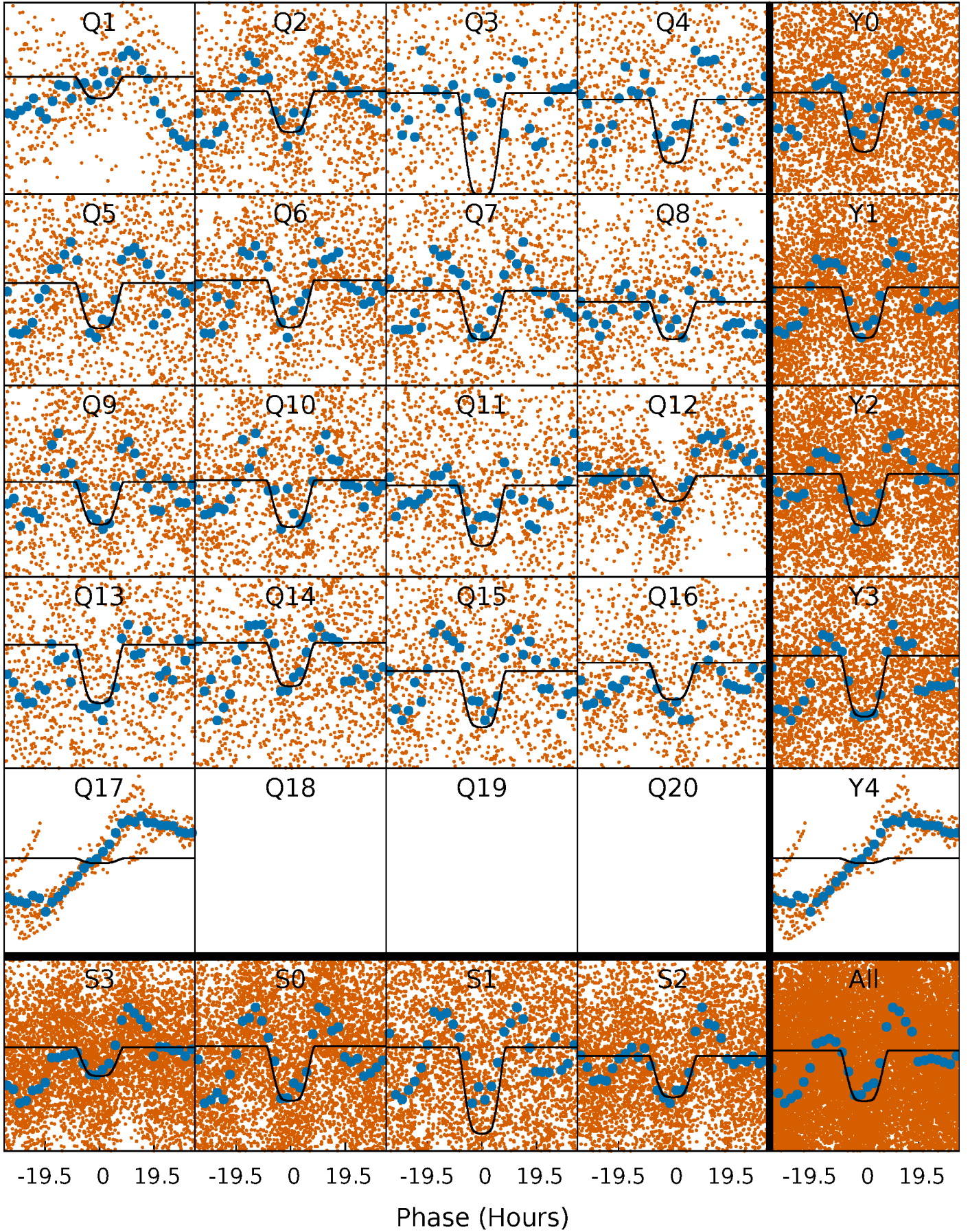
PDC Quarter-Phased Transit Curves

TCE 010730838-01 P= 7.888980 Days $T_0=138.781948$ (BKJD)



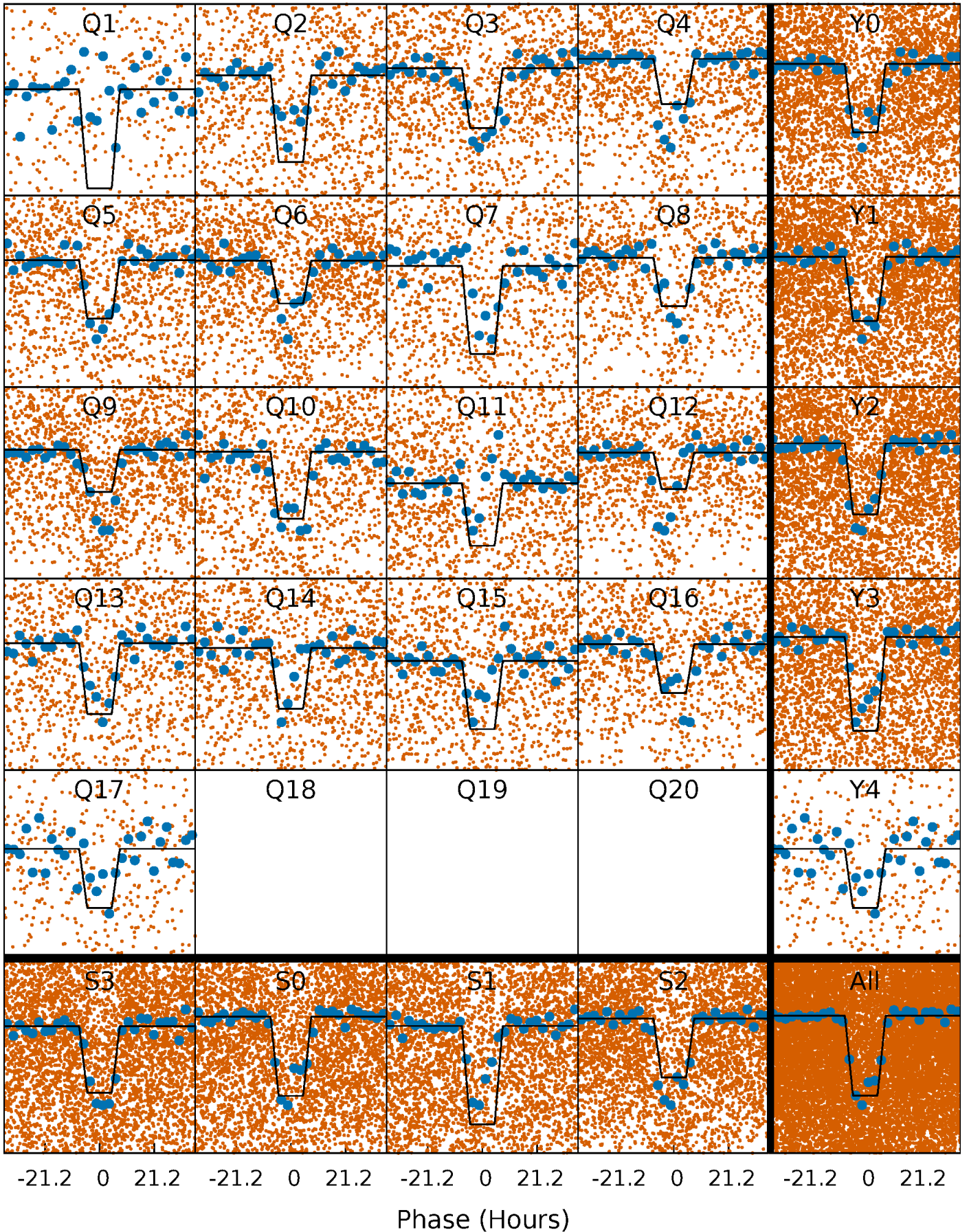
DV Quarter-Phased Transit Curves

TCE 010730838-01 P= 7.888980 Days $T_0=138.781948$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

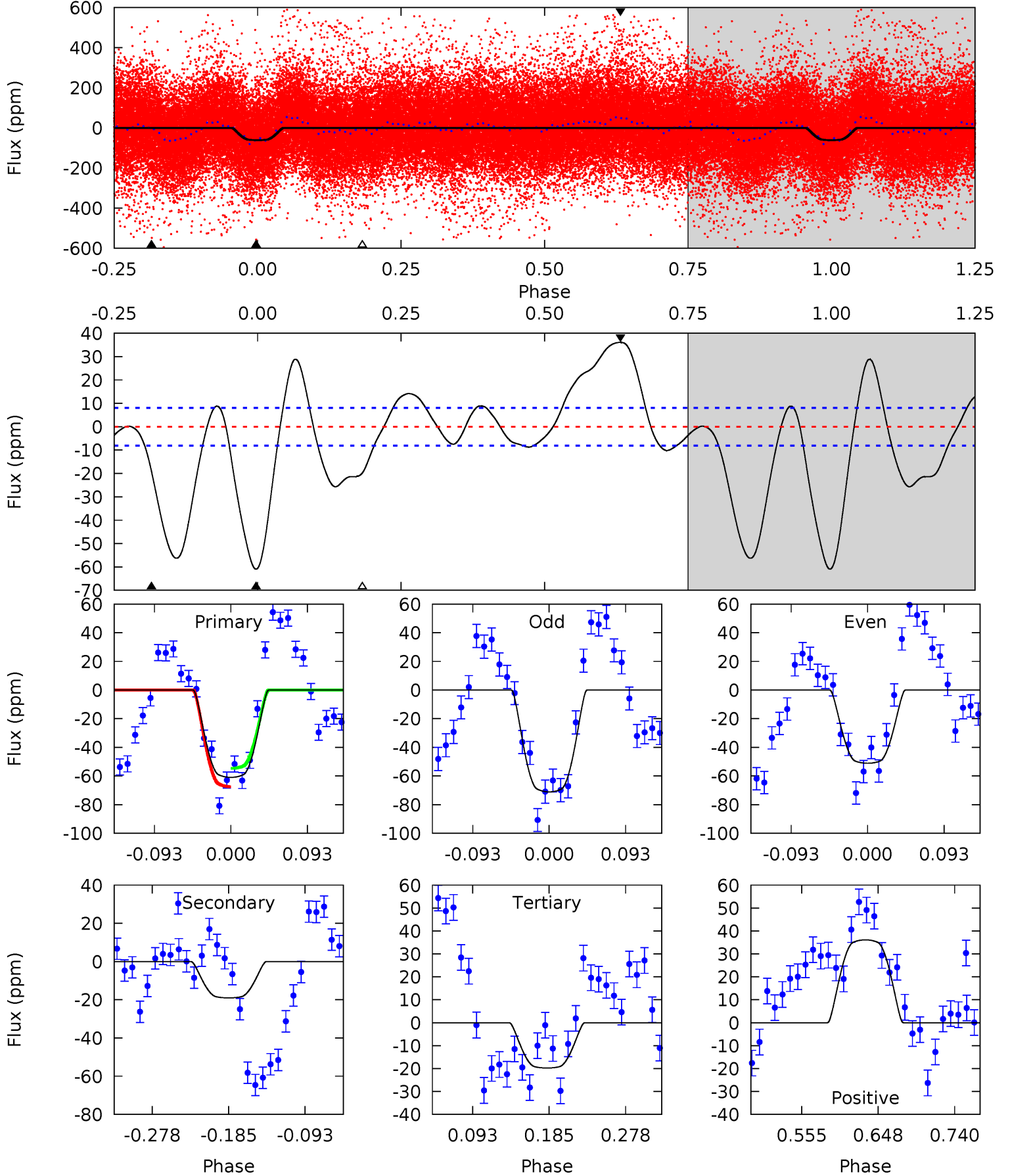
TCE 010730838-01 P= 7.889181 Days $T_0=138.748595$ (BKJD)



DV Model-Shift Uniqueness Test

010730838-01, P = 7.888980 Days, E = 130.892968 Days

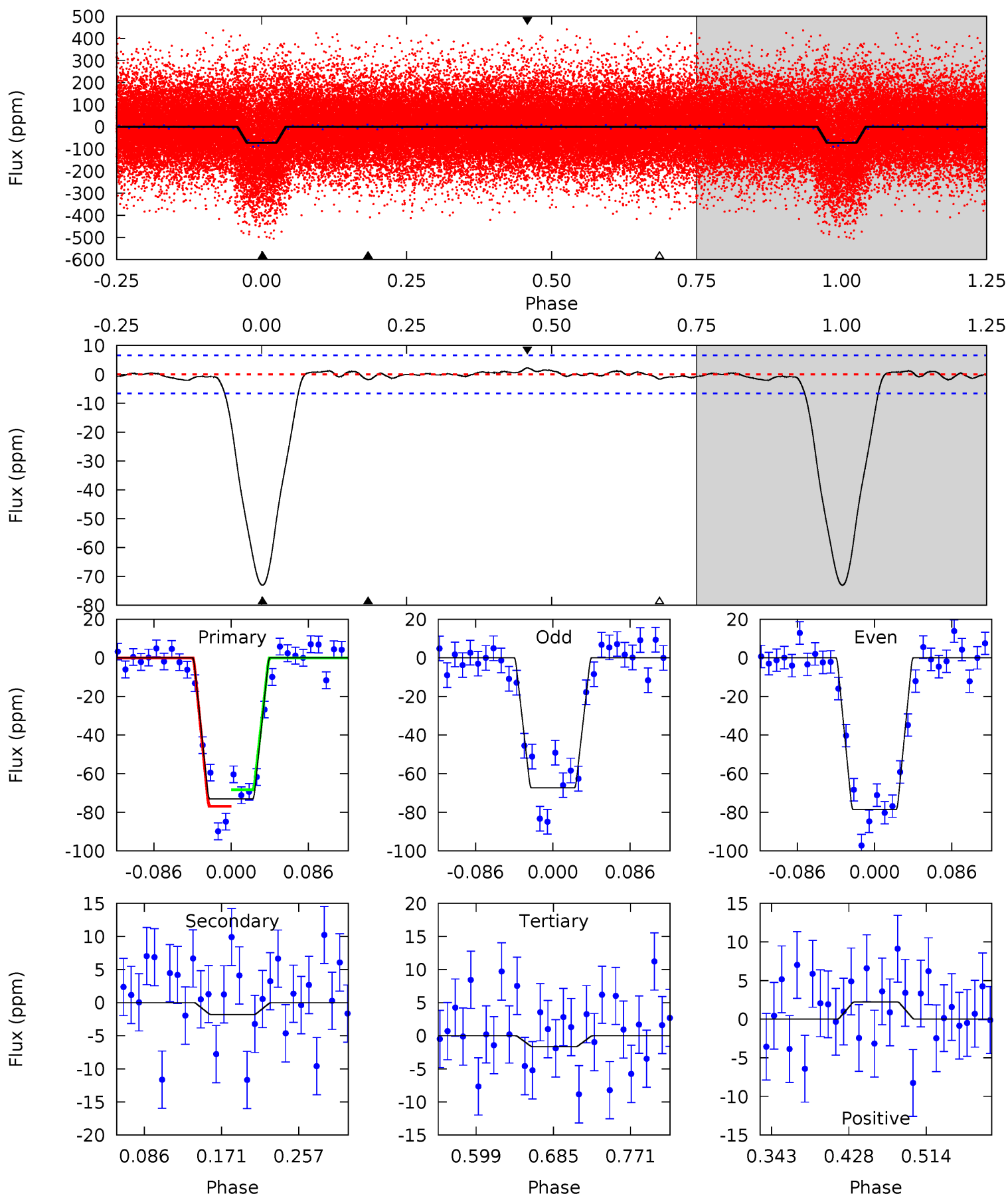
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 34.6 | 10.8 | 11.2 | 20.5 | 4.58 | 1.68 | 8.92 | 23.4 | 14.1 | -0.44 | -9.71 | 5.72 | 0.83 | 0.37 | 3.65 |



Alt Model-Shift Uniqueness Test

010730838-01, P = 7.889181 Days, E = 130.859414 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 50.8 | 1.25 | 1.16 | 1.54 | 4.60 | 1.72 | 0.59 | 49.6 | 49.2 | 0.09 | -0.30 | 3.91 | 0.86 | 0.03 | 2.98 |



Stellar Parameters For KIC 010730838

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 8057^{+225}_{-338} | $3.946^{+0.234}_{-0.126}$ | $-0.160^{+0.200}_{-0.350}$ | $2.407^{+0.421}_{-0.781}$ | $1.868^{+0.127}_{-0.380}$ | $0.189^{+0.306}_{-0.063}$ |
| | +3%/-4% | +6%/-3% | +125%/-219% | +17%/-32% | +7%/-20% | +162%/-33% |
| Source | KIC0 | 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 010730838-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|-----------------------|---------------------------|
| DV | -19±2 | $2.78^{+0.34}_{-0.42}$ | 2470^{+158}_{-197} | 5046^{+159}_{-180} | 12^{+4}_{-3} |
| Alt. | -2±1 | $2.19^{+0.28}_{-0.37}$ | 2464^{+167}_{-212} | 3462^{+418}_{-1245} | $1.877^{+1.905}_{-1.527}$ |

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 $A_{obs} \gg 1.0$

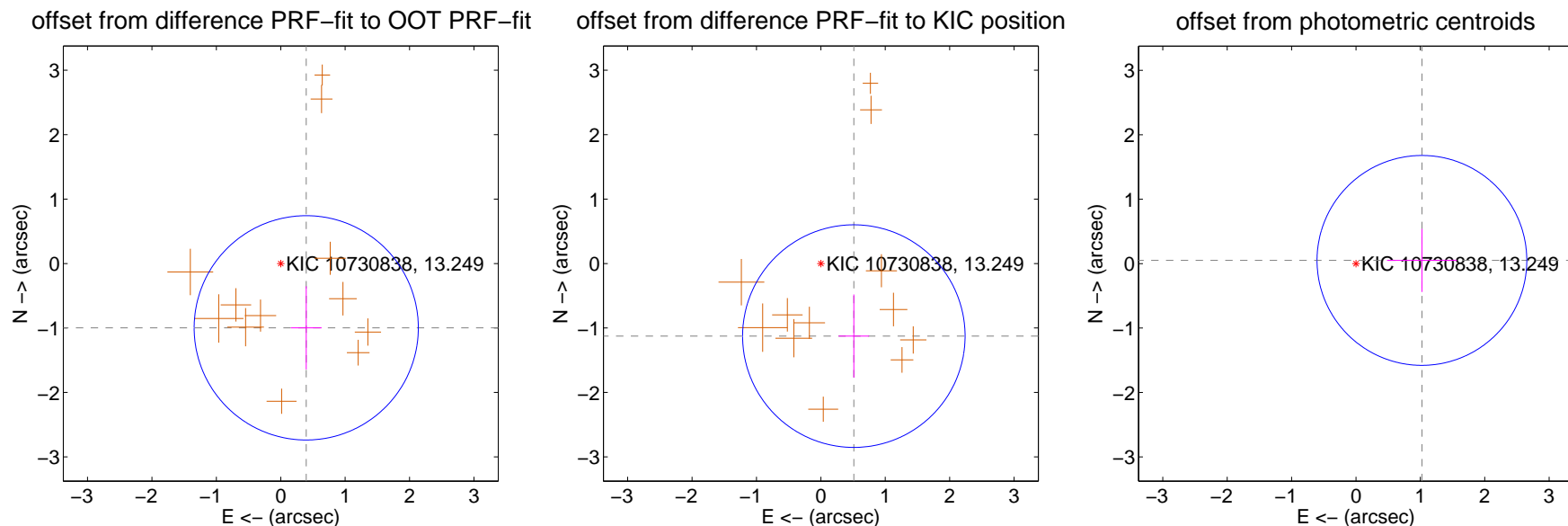
DV Centroid Data

Supplemental centroid analysis for 010730838-01. Kepler magnitude: 13.25. Transit SNR 19.97

There are 0 quarters with good PRF difference image offsets

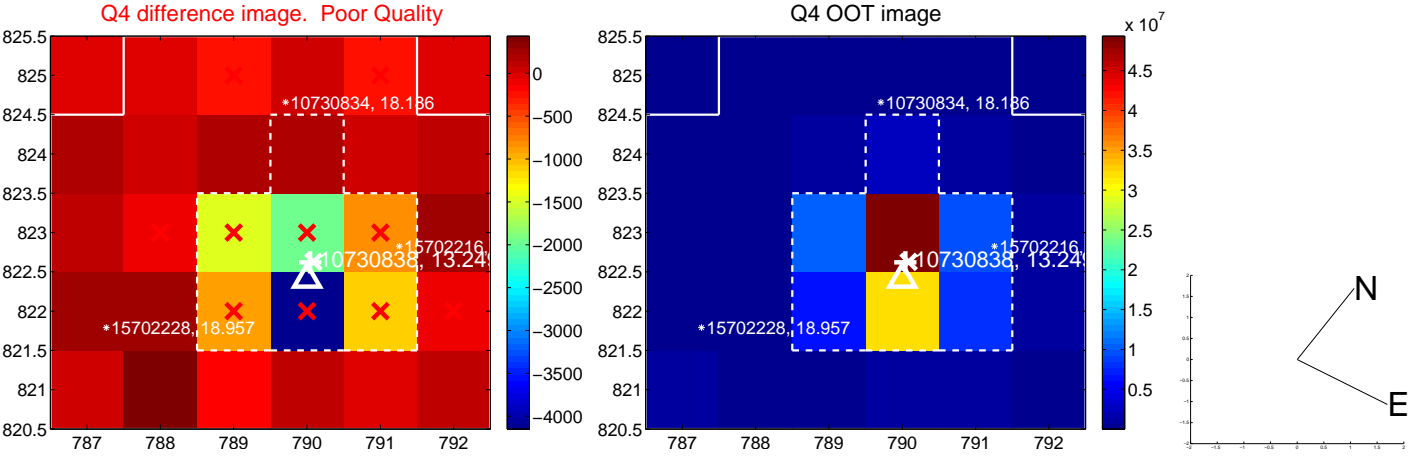
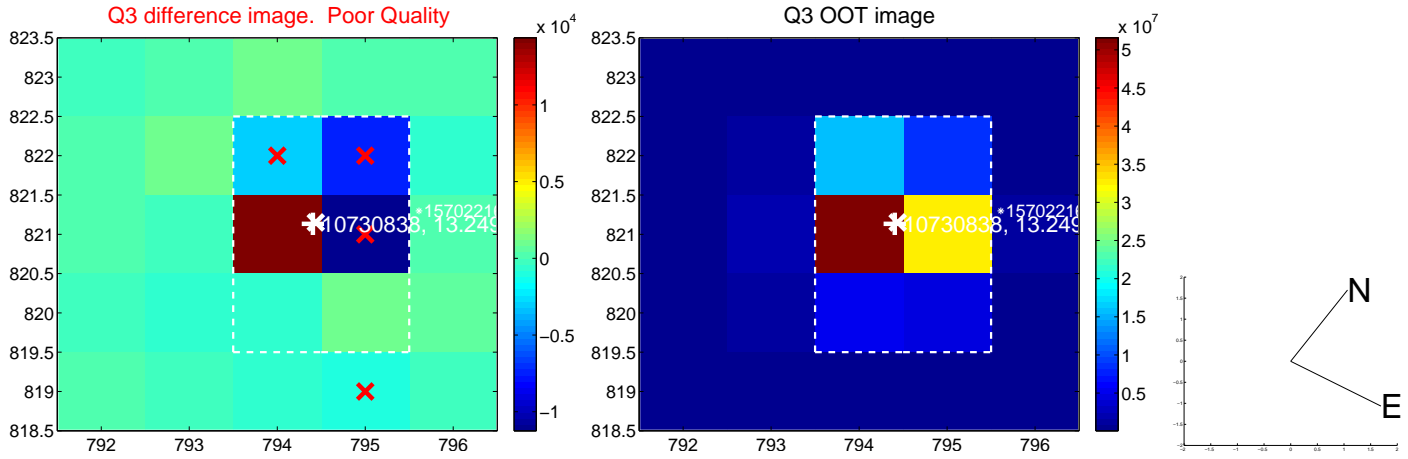
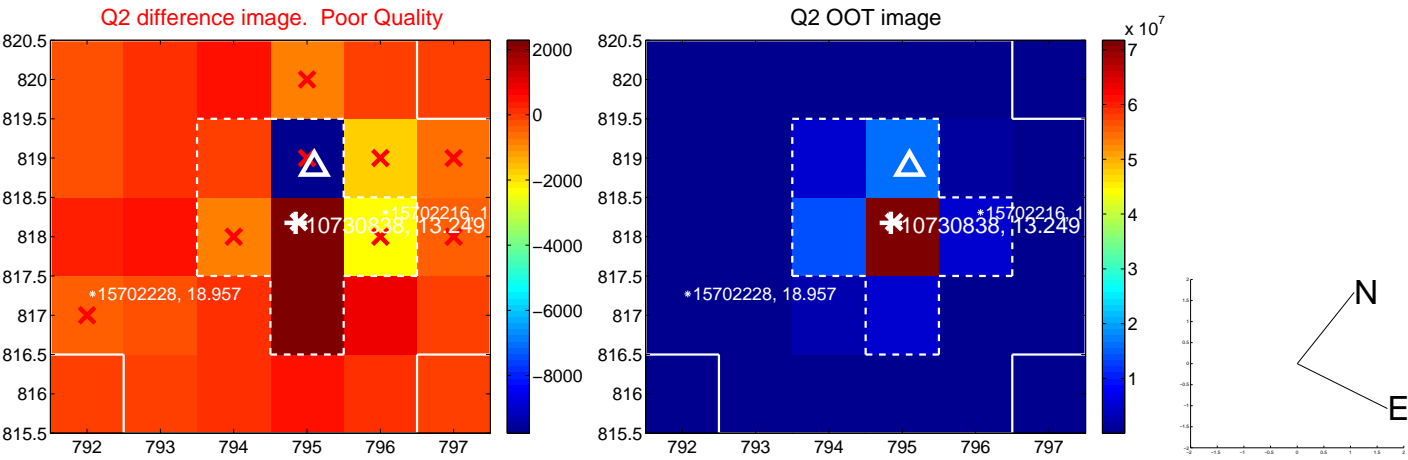
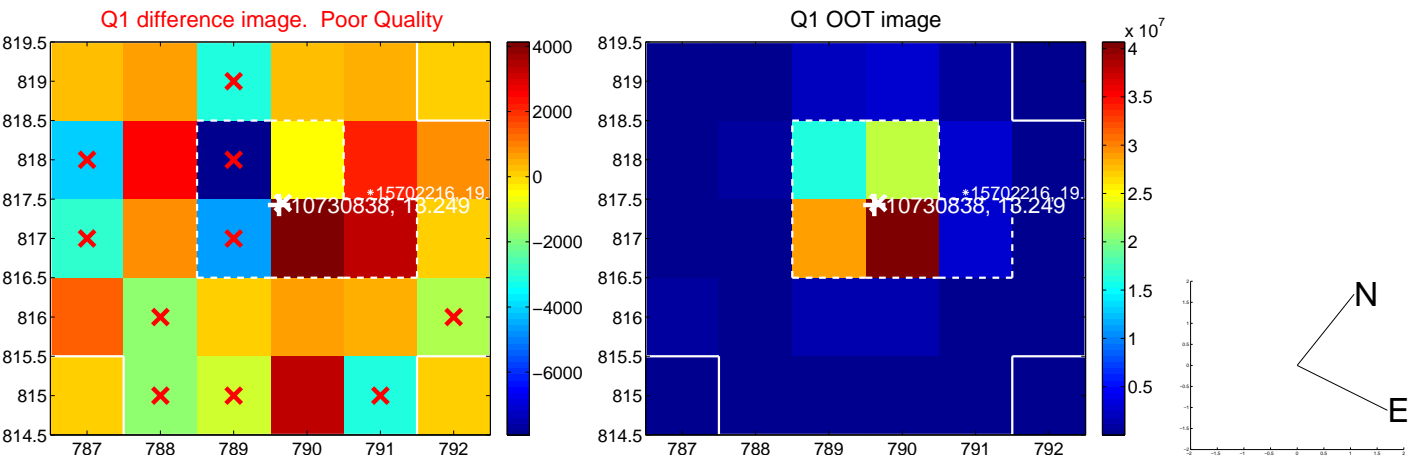
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 1.074 ± 0.580 | 1.85 | -0.396 ± 0.239 | -0.998 ± 0.646 |
| PRF-fit source offset from KIC position | 1.237 ± 0.576 | 2.15 | -0.512 ± 0.236 | -1.126 ± 0.645 |
| photometric centroid source offset | 1.03 ± 0.54 | 1.89 | -1.02 ± 0.54 | 0.05 ± 0.49 |

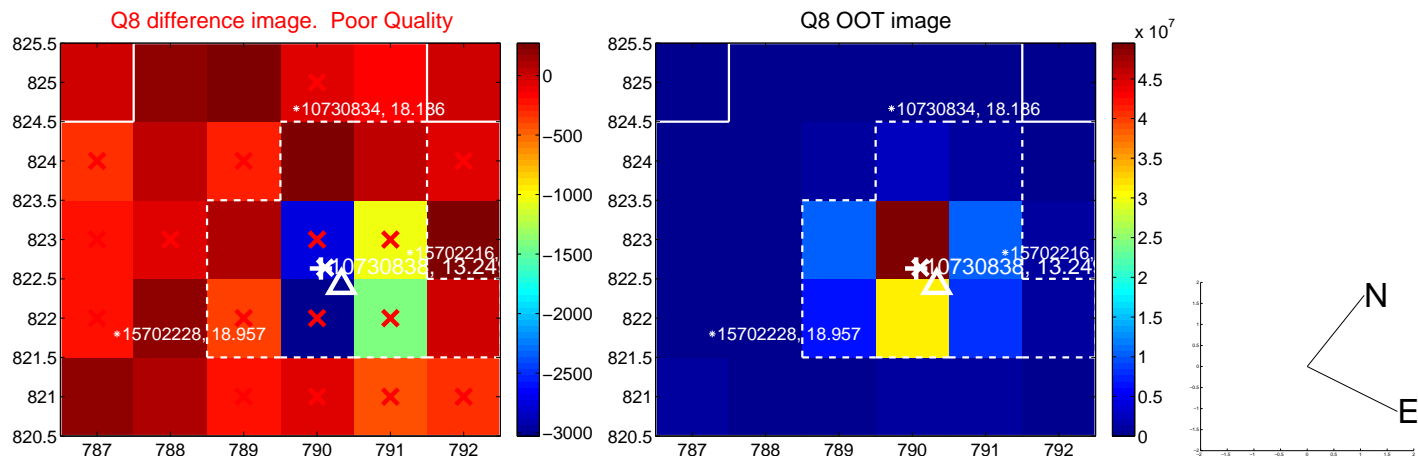
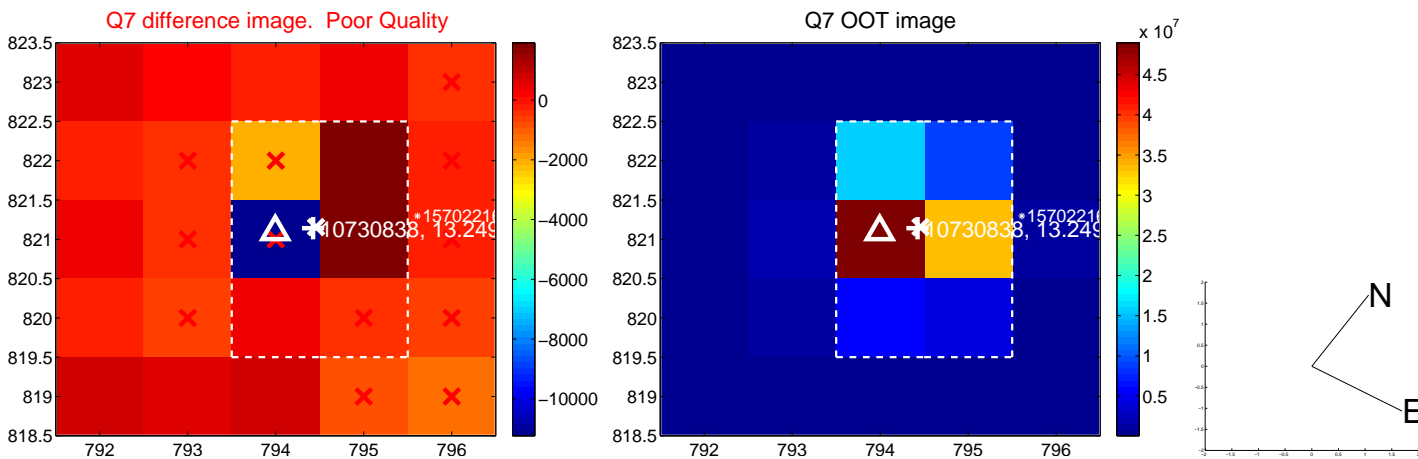
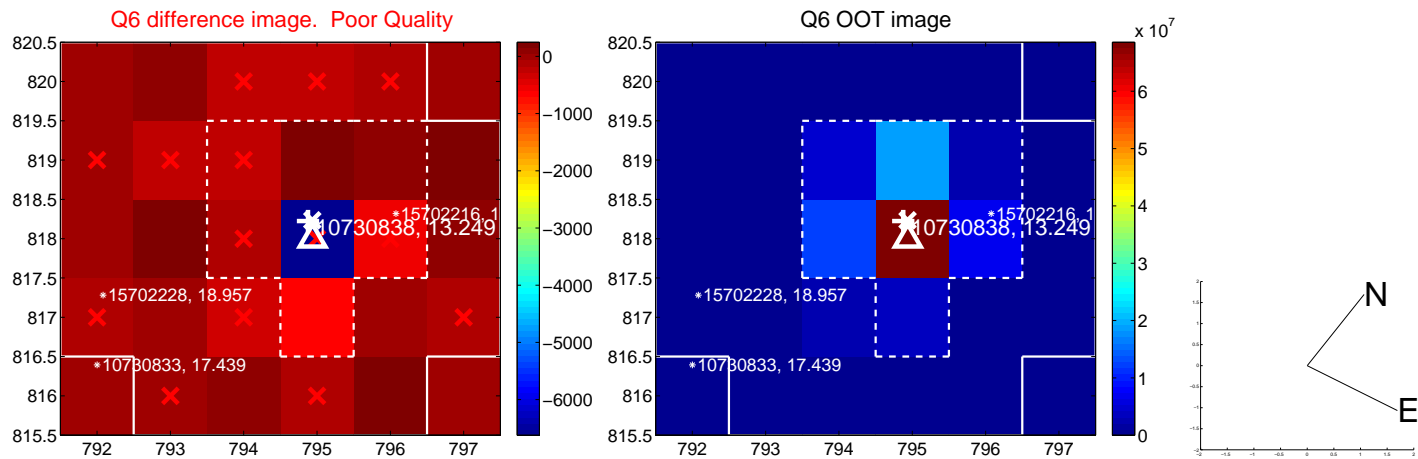
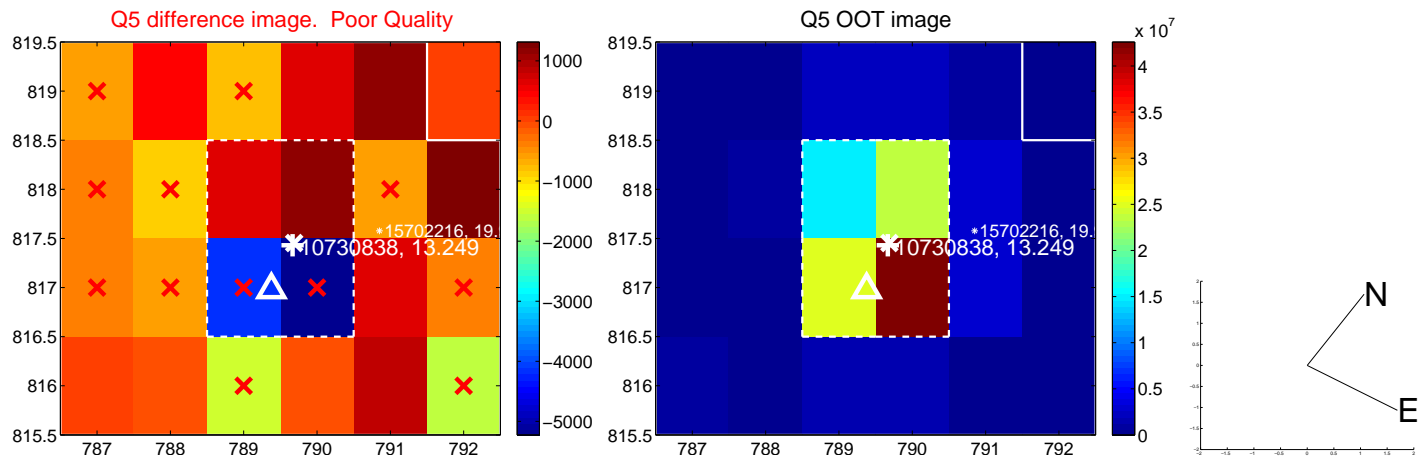


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

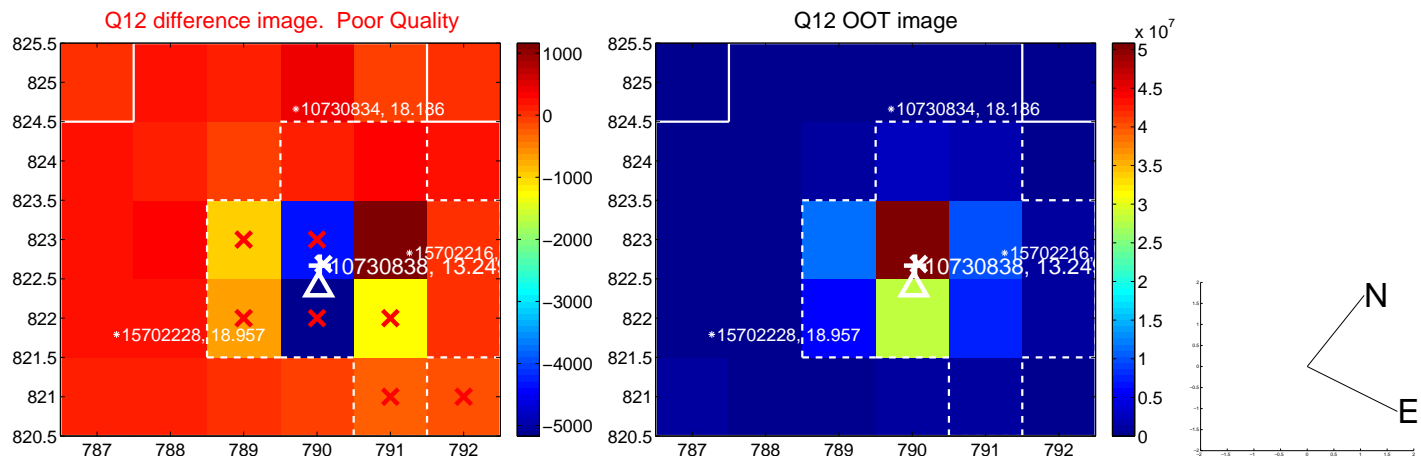
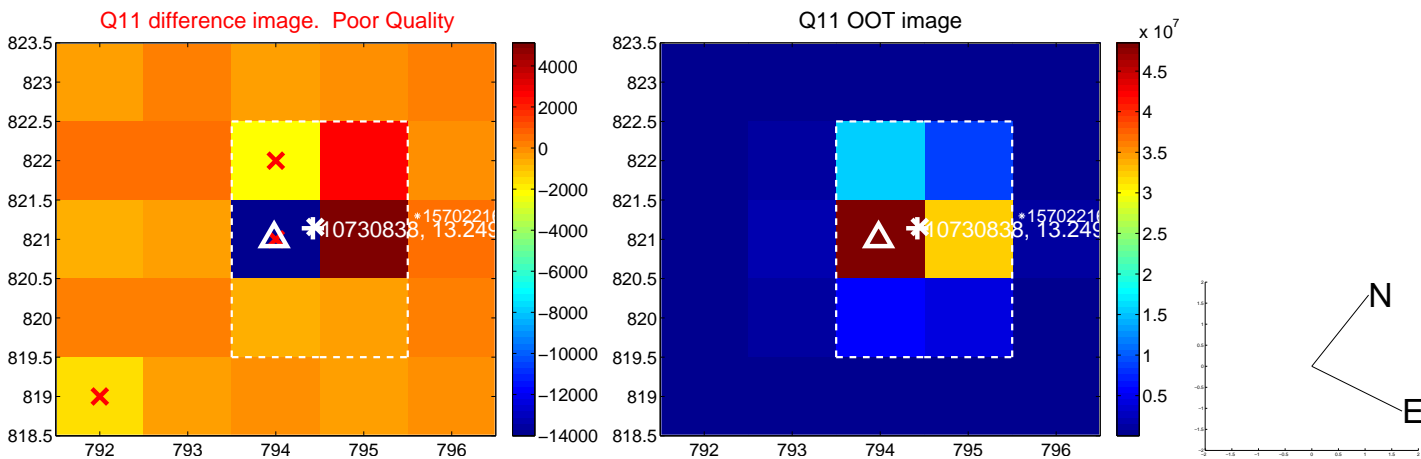
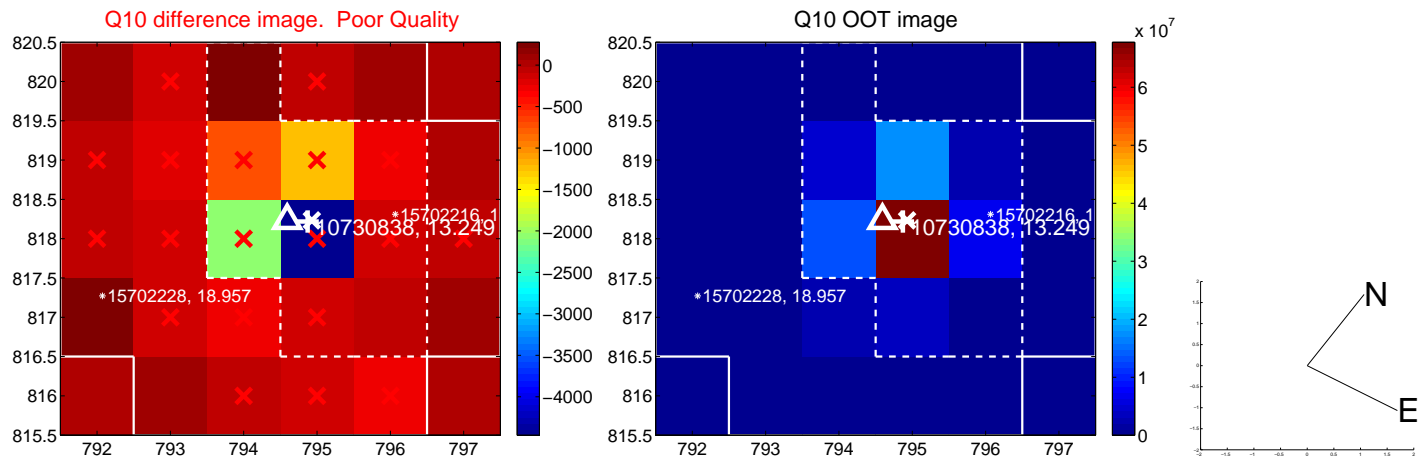
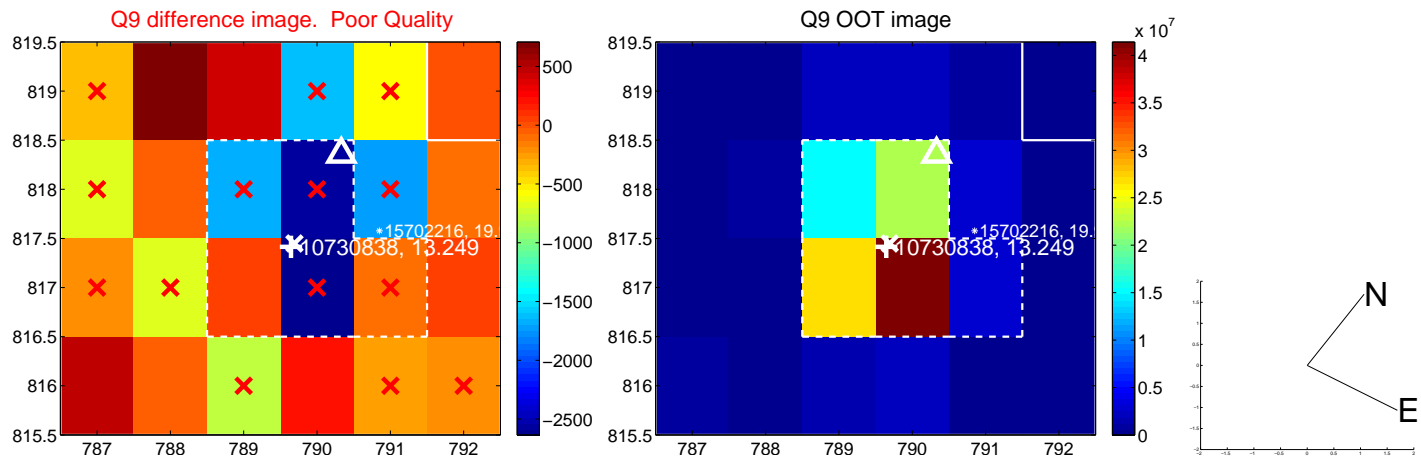
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



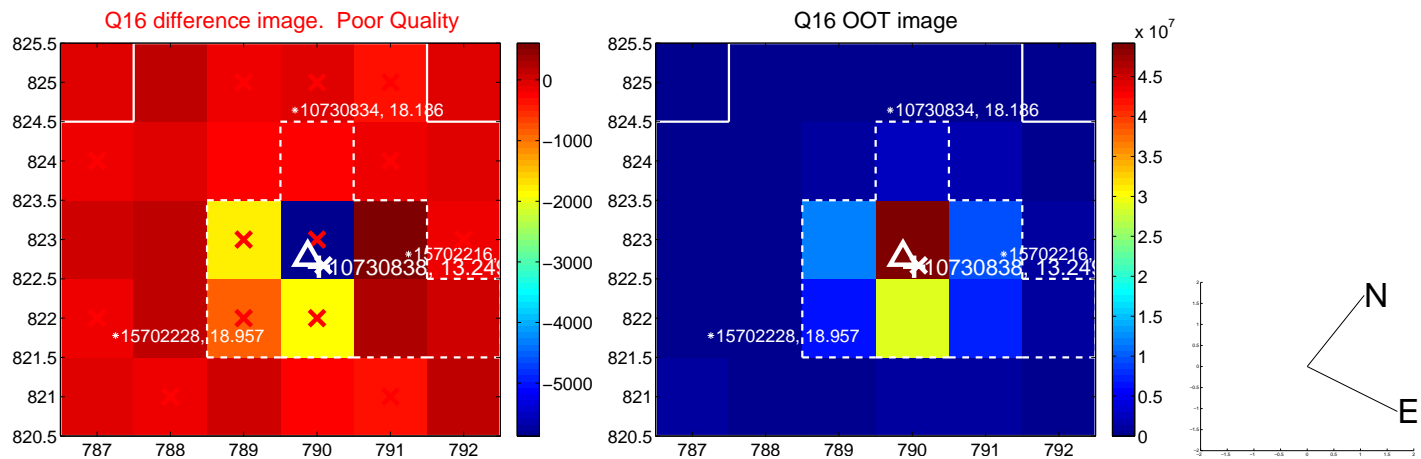
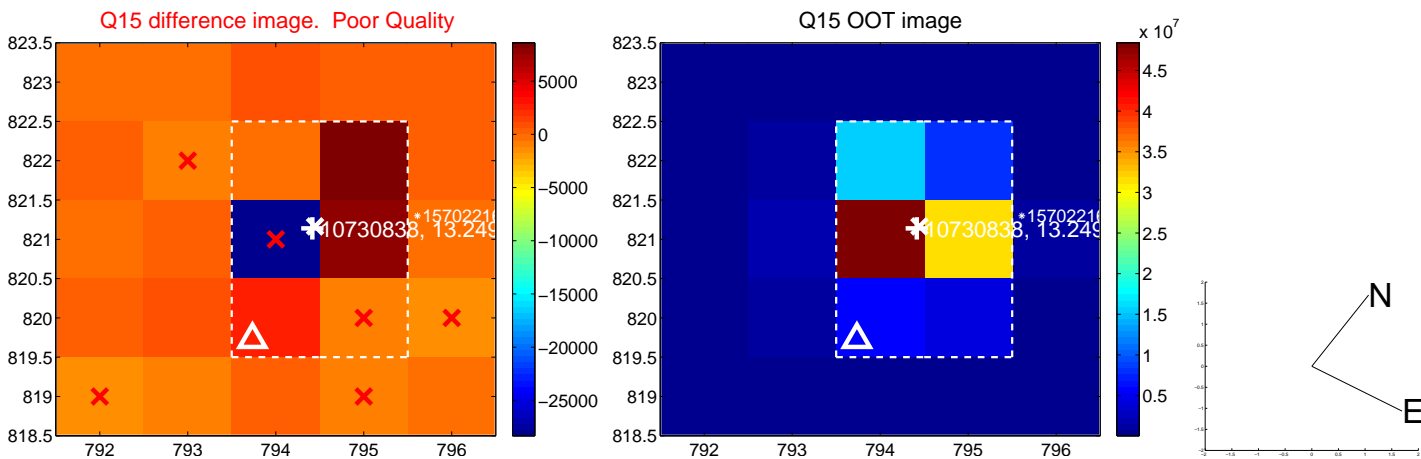
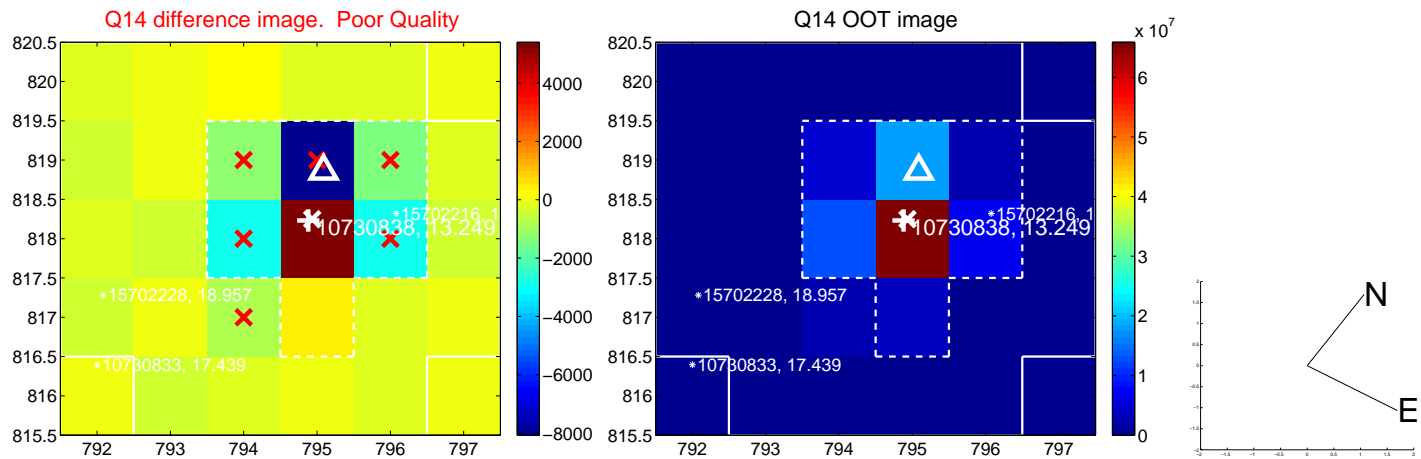
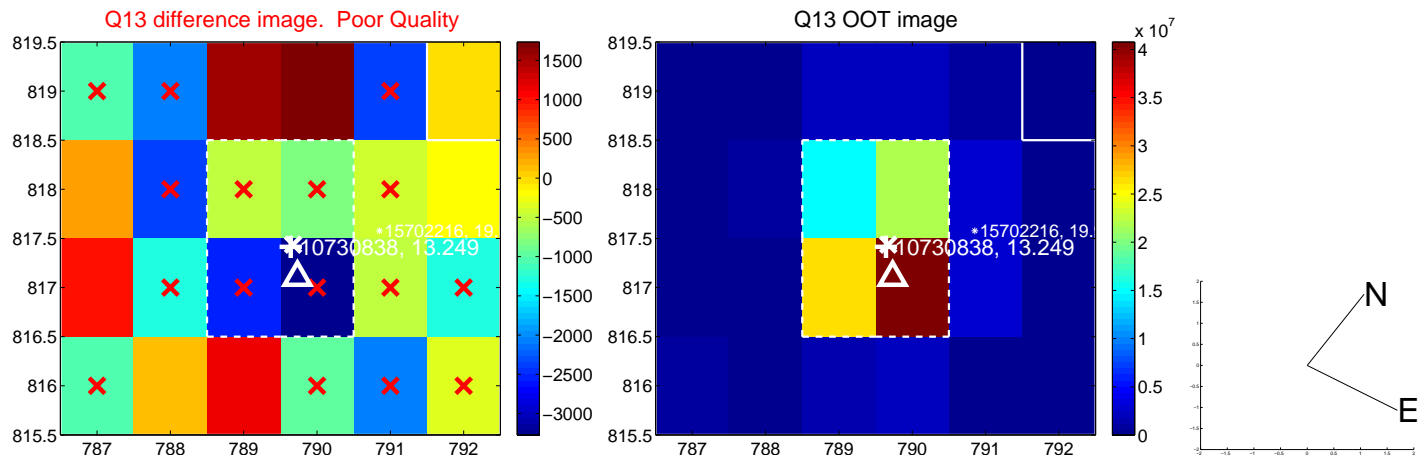
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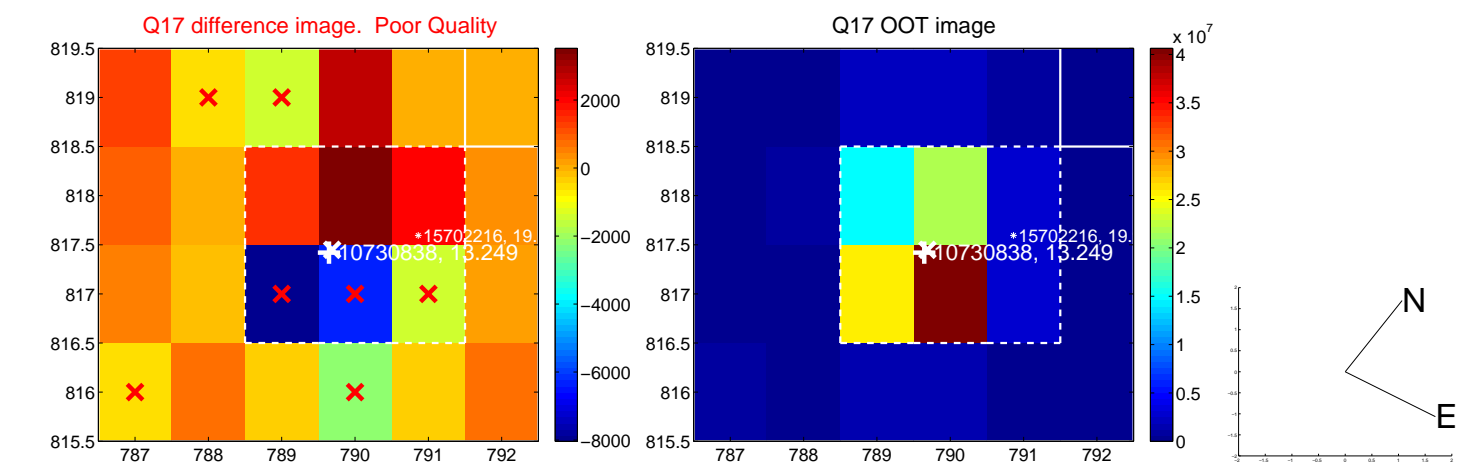
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



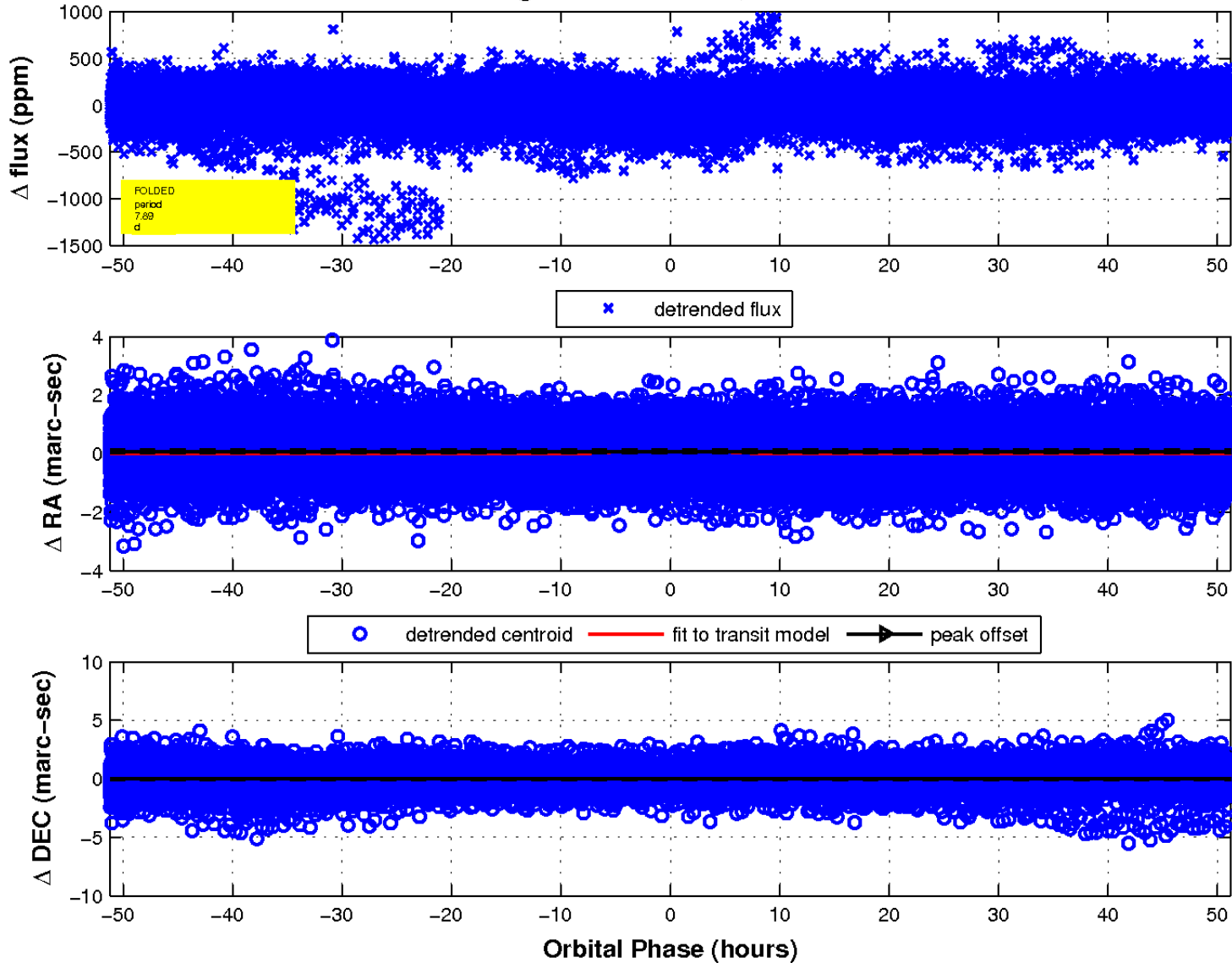
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

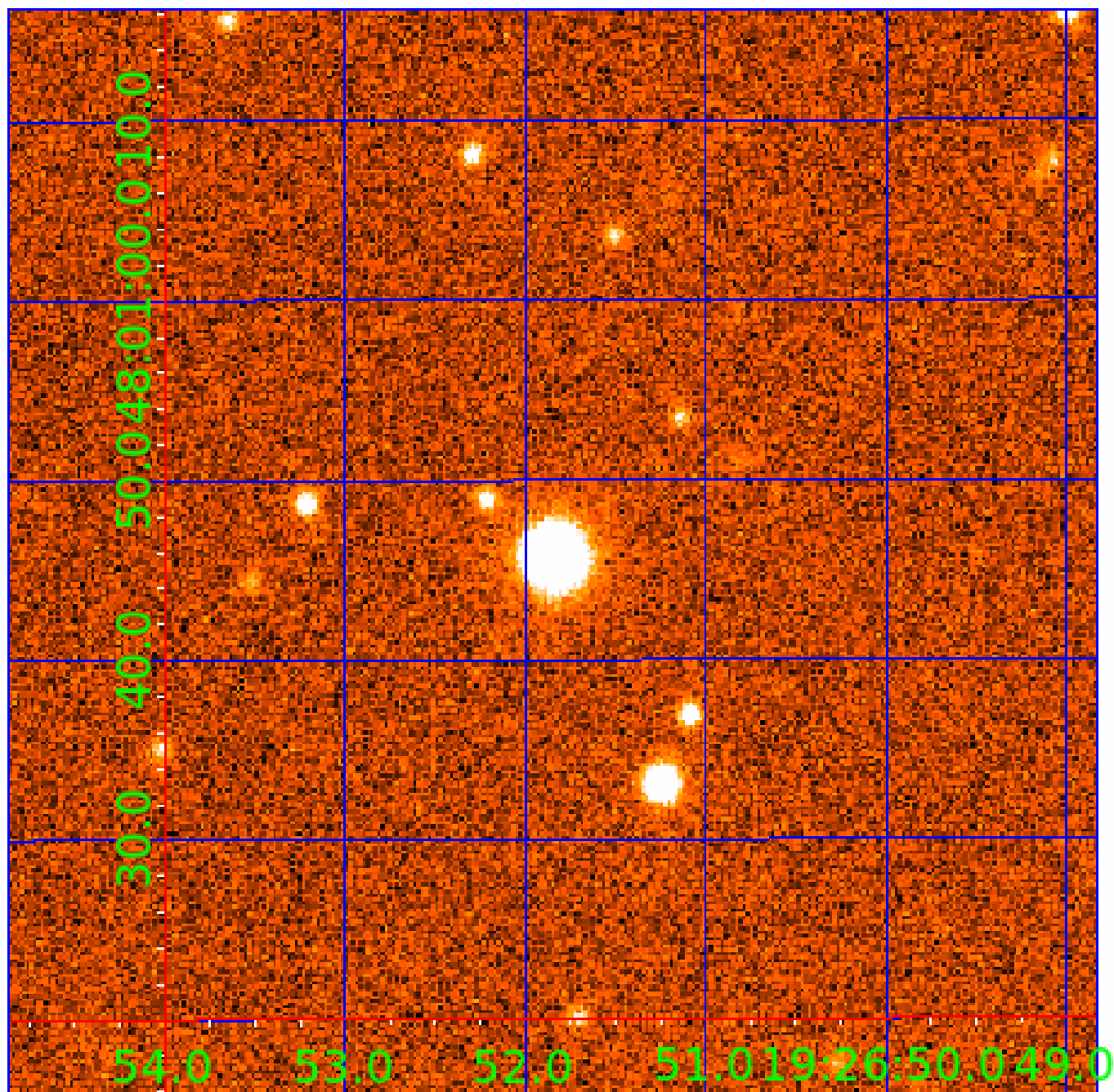


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010730838

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 010730838-01 | OBS | No | 7.888980 | 138.781948 | 76.9 | 17.076 | 17.2 | 20.0 | 2.41 | 8057 | 2.82 | 2398.16 |
| 010730838-02 | OBS | No | 7.888845 | 137.637611 | 63.5 | 12.055 | 12.7 | 15.4 | 2.41 | 8057 | 2.56 | 2398.21 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 010730838-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—CENT_FEW_DIFFS |
| 010730838-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—MOD_NONUNIQ_DV—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.

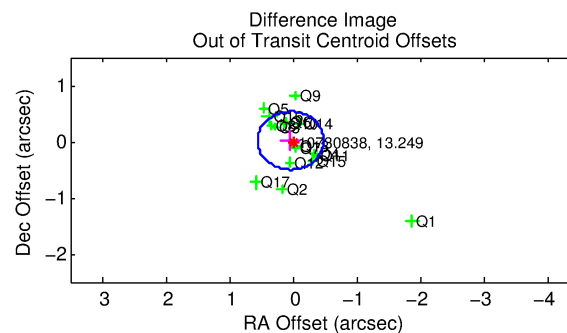
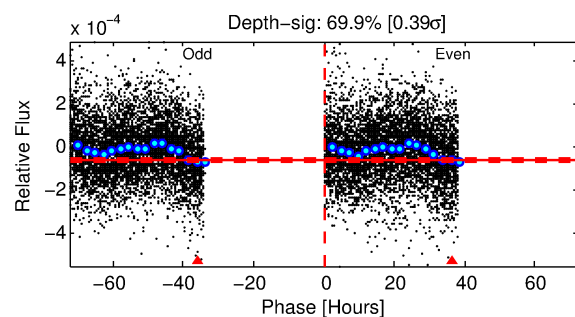
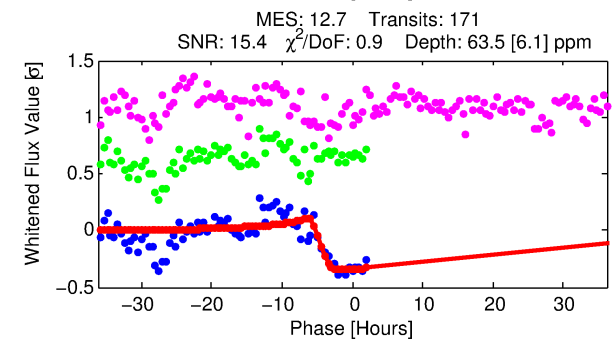
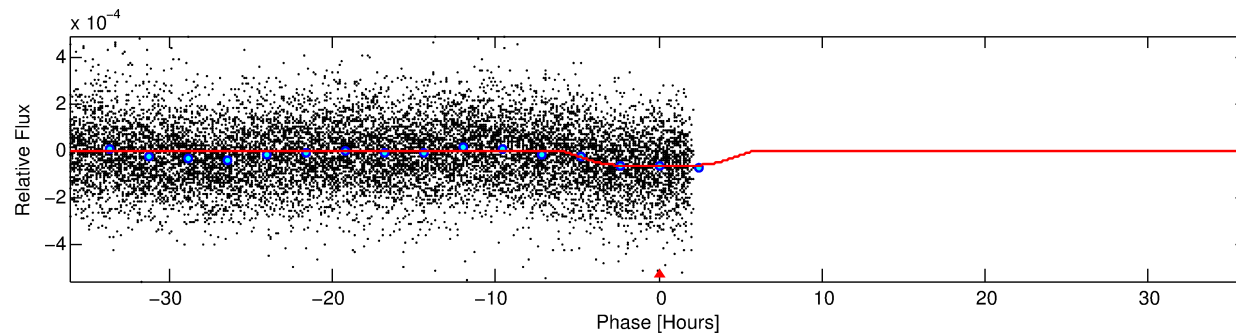
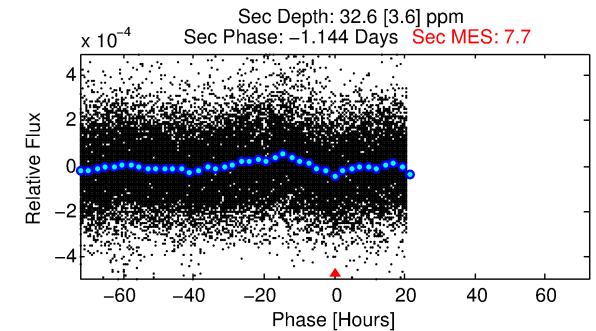
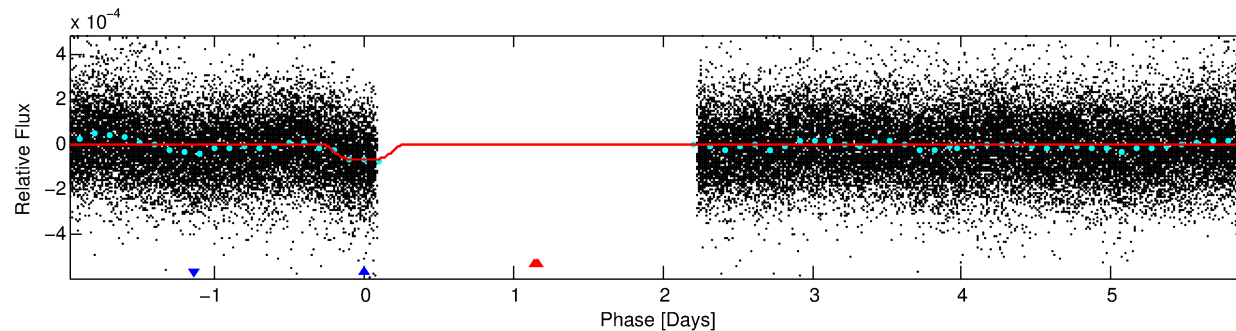
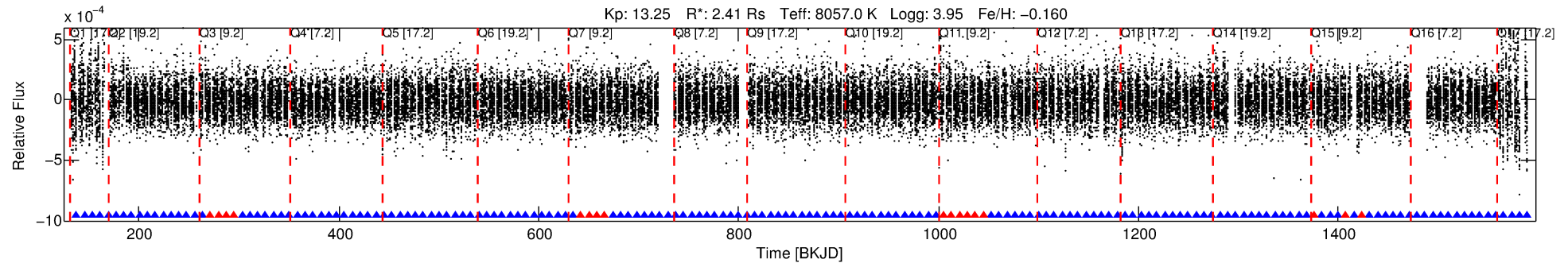
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010730838-02

No Significant Match Found

DV One-Page Summary

KIC: 10730838 Candidate: 2 of 2 Period: 7.889 d



DV Fit Results:

Period = 7.88884 [0.00017] d
Epoch = 137.6376 [0.0463] BKJD
Rp/R* = 0.0097 [0.0005]
a/R* = 1.48 [0.15]
b = 0.99 [0.01]
Seff = 2398.21 [1083.12]
Teq = 1784 [201] K
Rp = 2.56 [0.84] Re
a = 0.0955 [0.0269] AU
Ag = 25.02 [11.12] [2.16σ]
Teffp = 6171 [344] K [11.01σ]

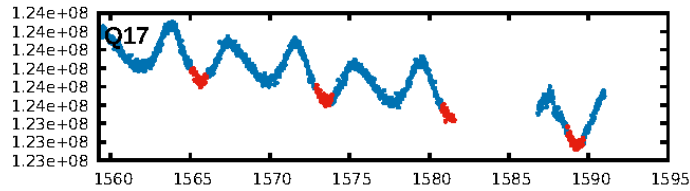
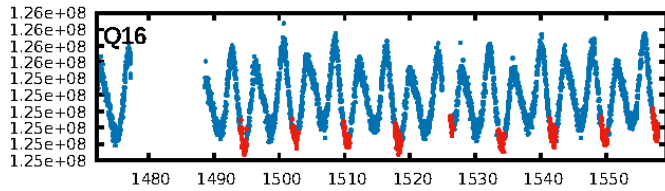
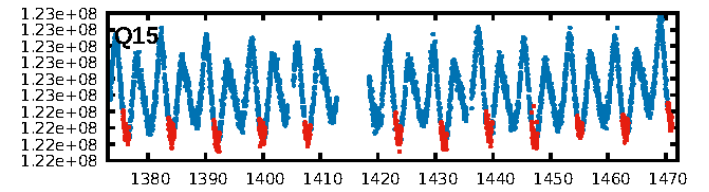
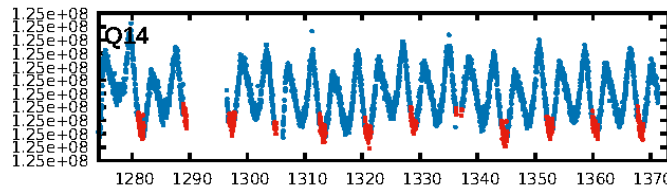
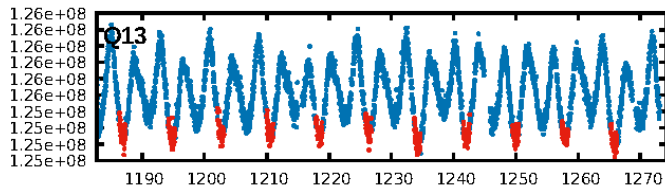
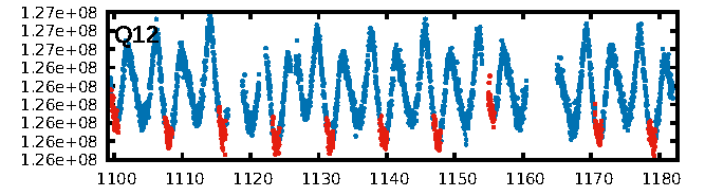
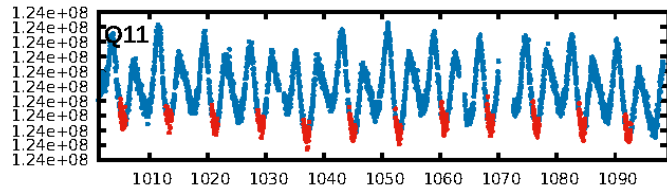
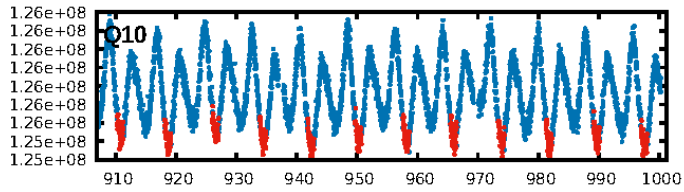
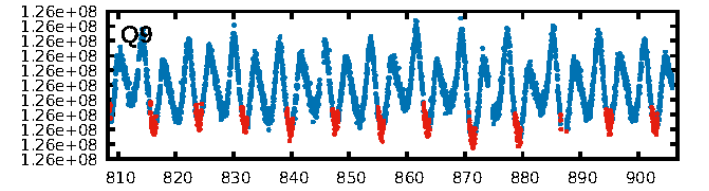
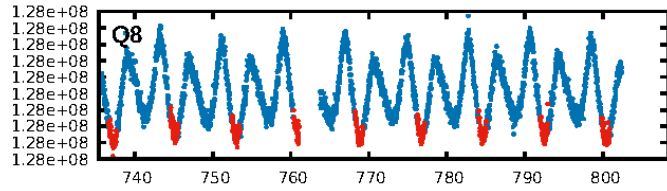
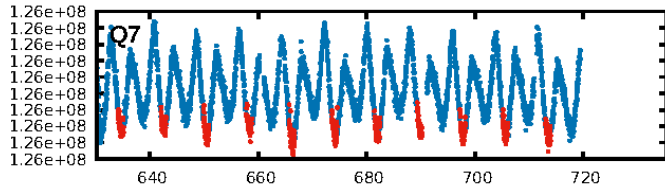
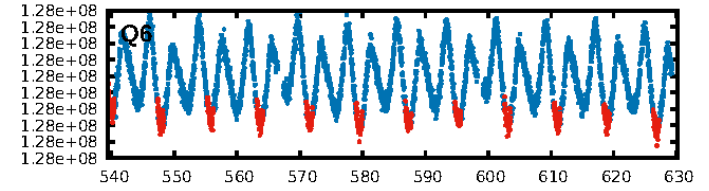
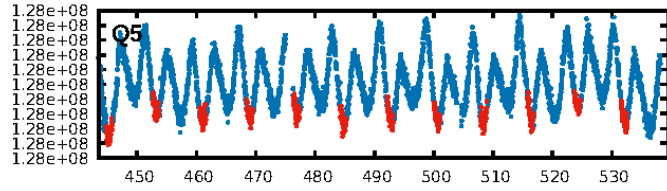
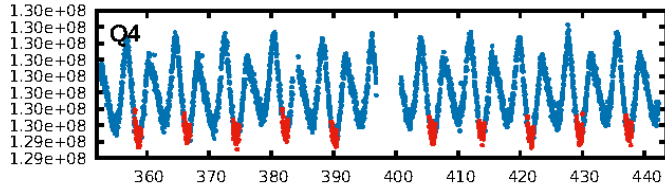
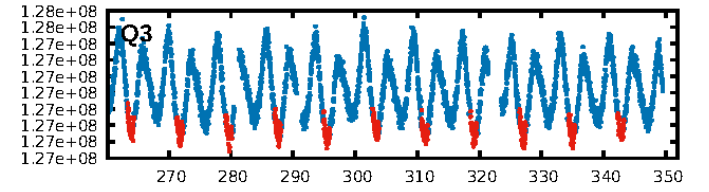
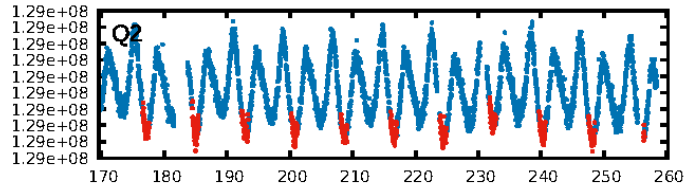
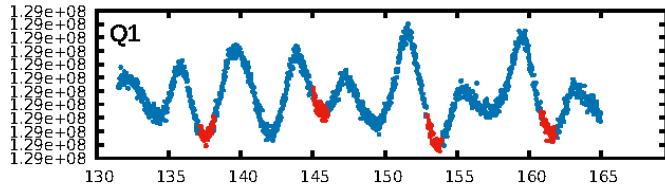
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 82.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.40e-30
RollingBand-fgt: 0.90 [146/163]
GhostDiagnostic-chr: 4.924
Centroid-sig: 0.4%
Centroid-so: 1.272 arcsec [1.87σ]
OotOffset-rm: 0.044 arcsec [0.25σ]
KicOffset-rm: 0.147 arcsec [0.81σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

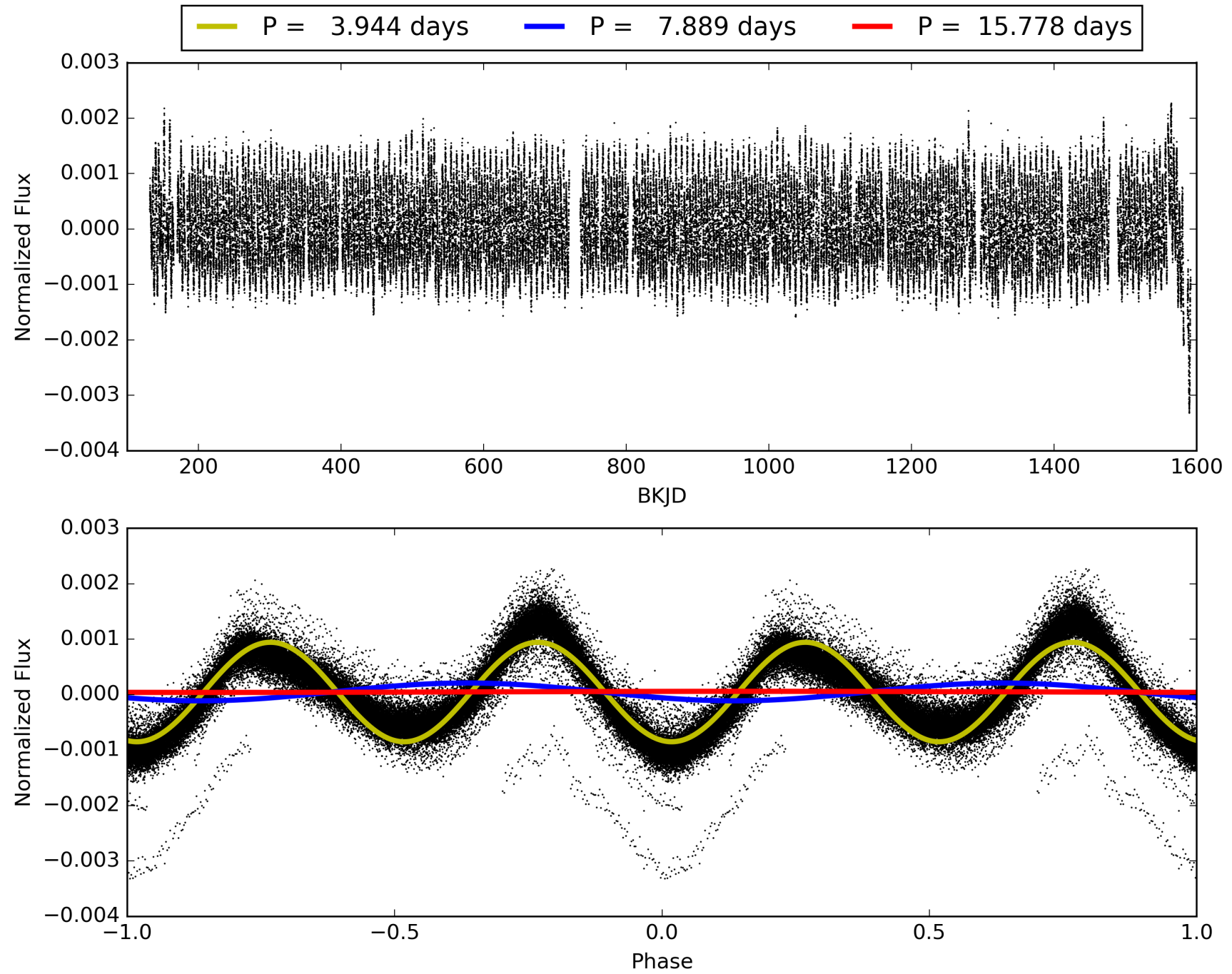
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 03:45:10 Z

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

TCE 010730838-02, PDC Light Curves

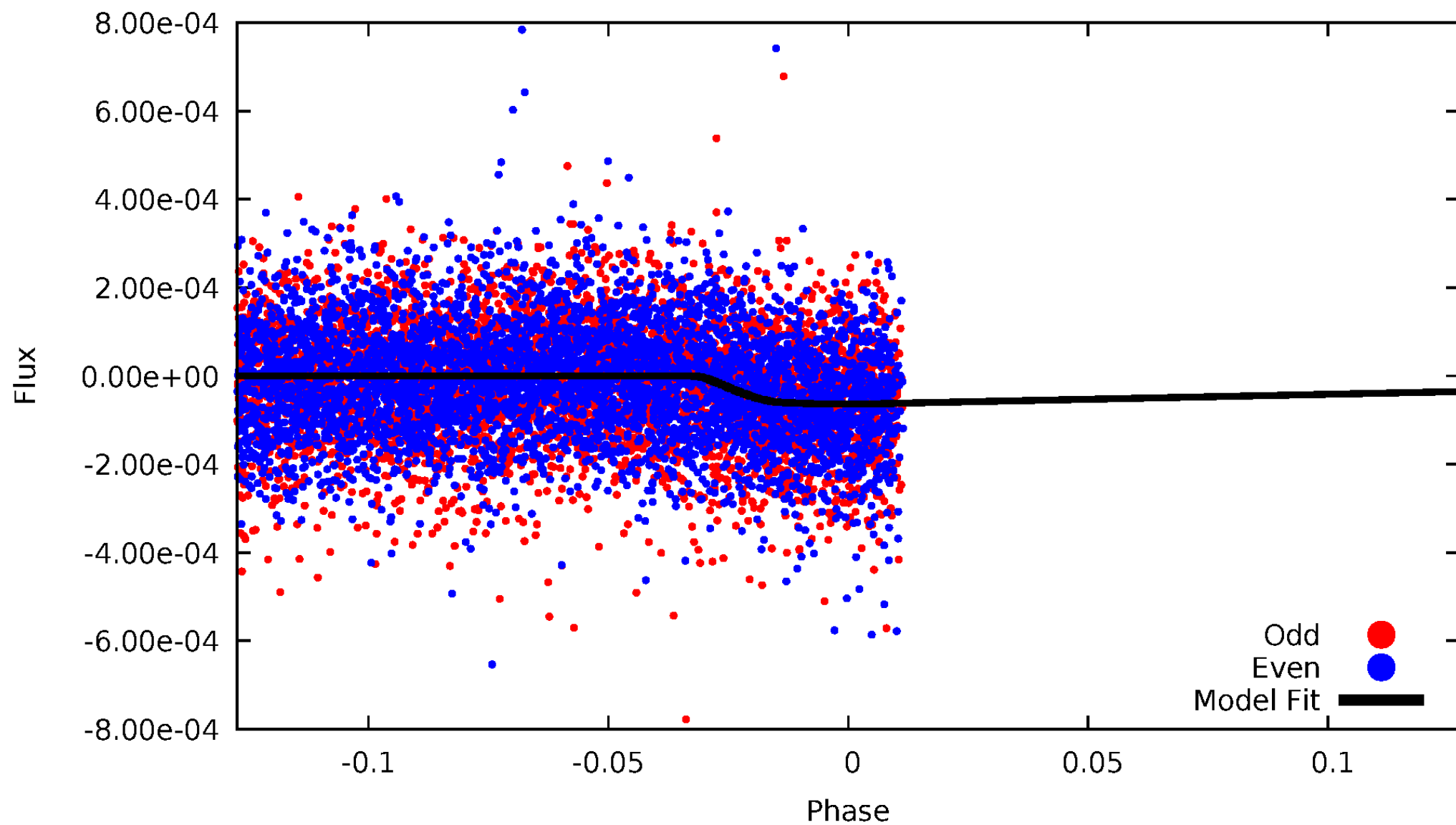


TCE 010730838-02



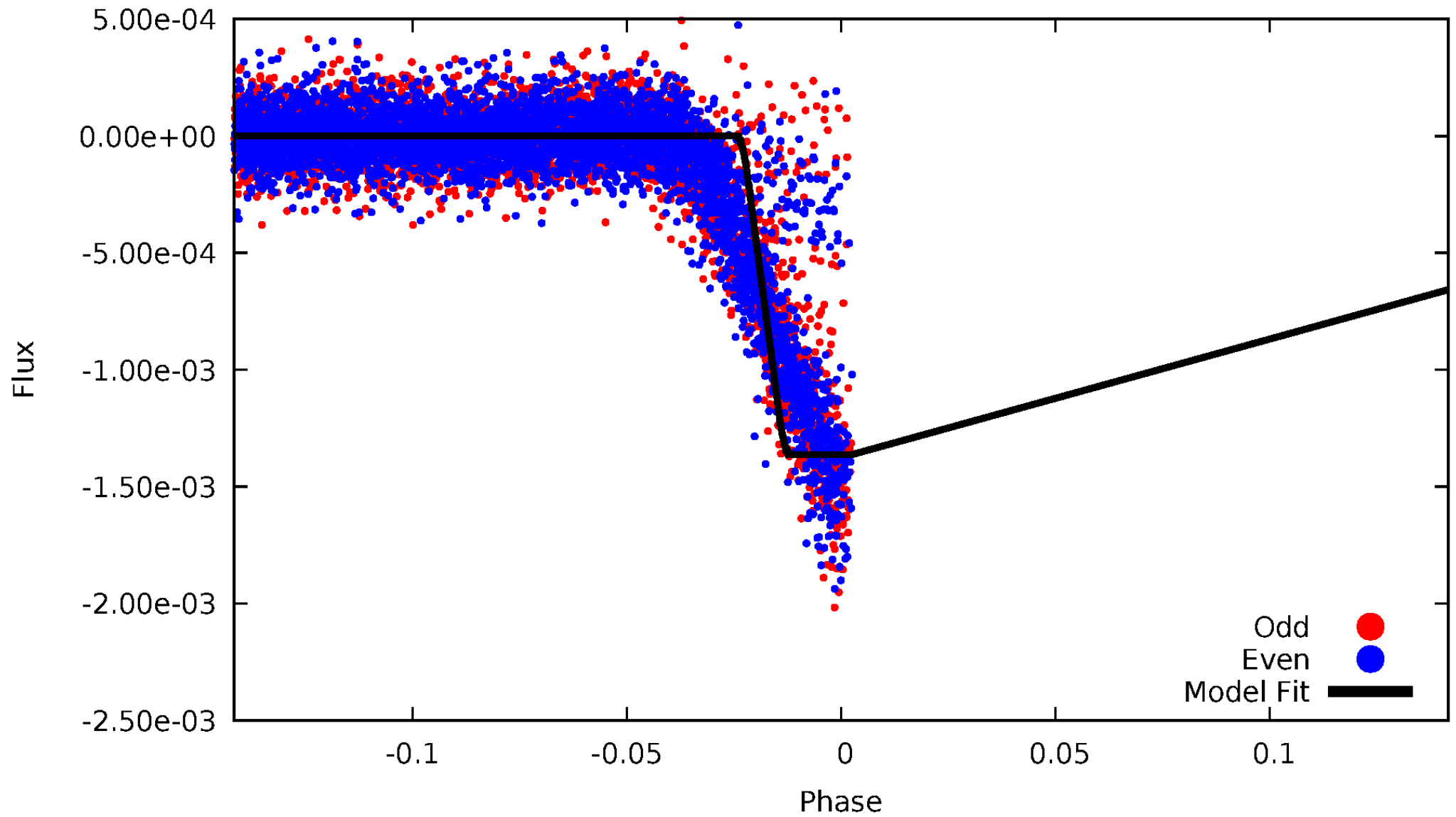
DV Odd/Even

TCE 010730838-02



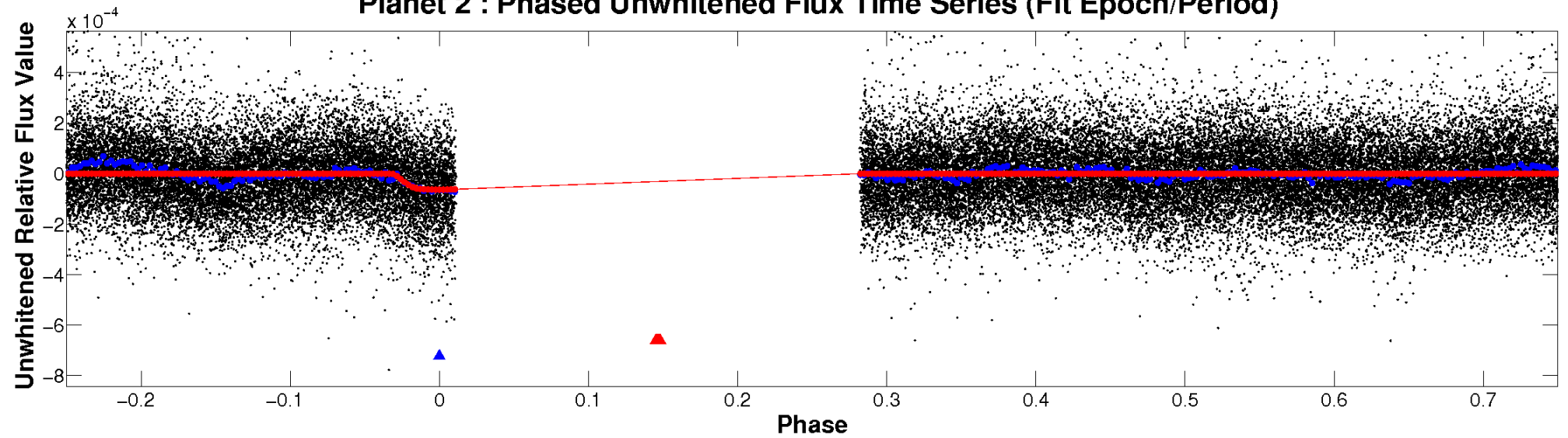
ALT Odd/Even

TCE 010730838-02

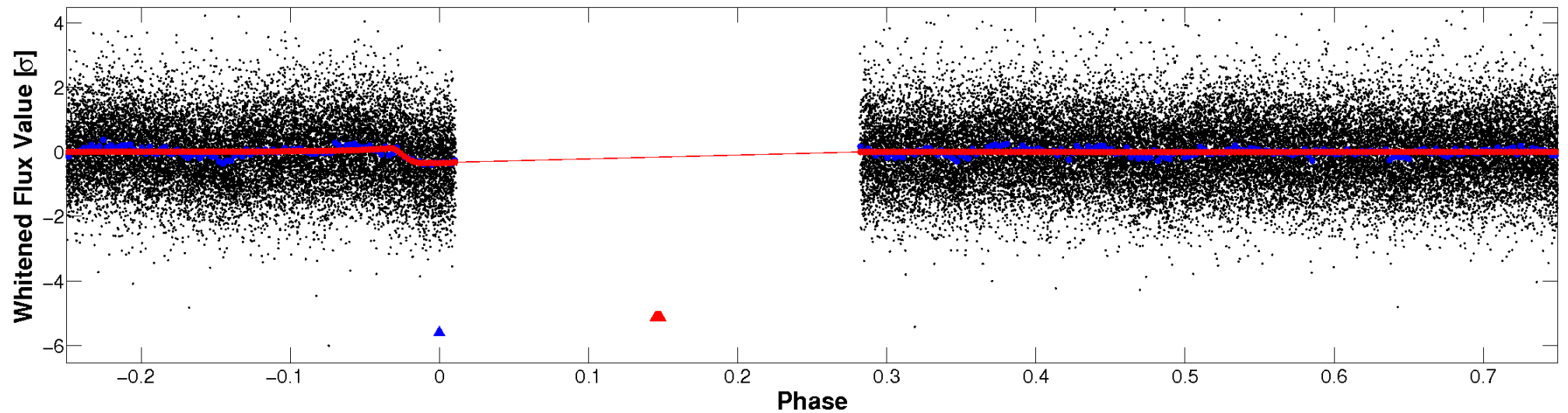


Non-Whitened Vs. Whitened Light Curve

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

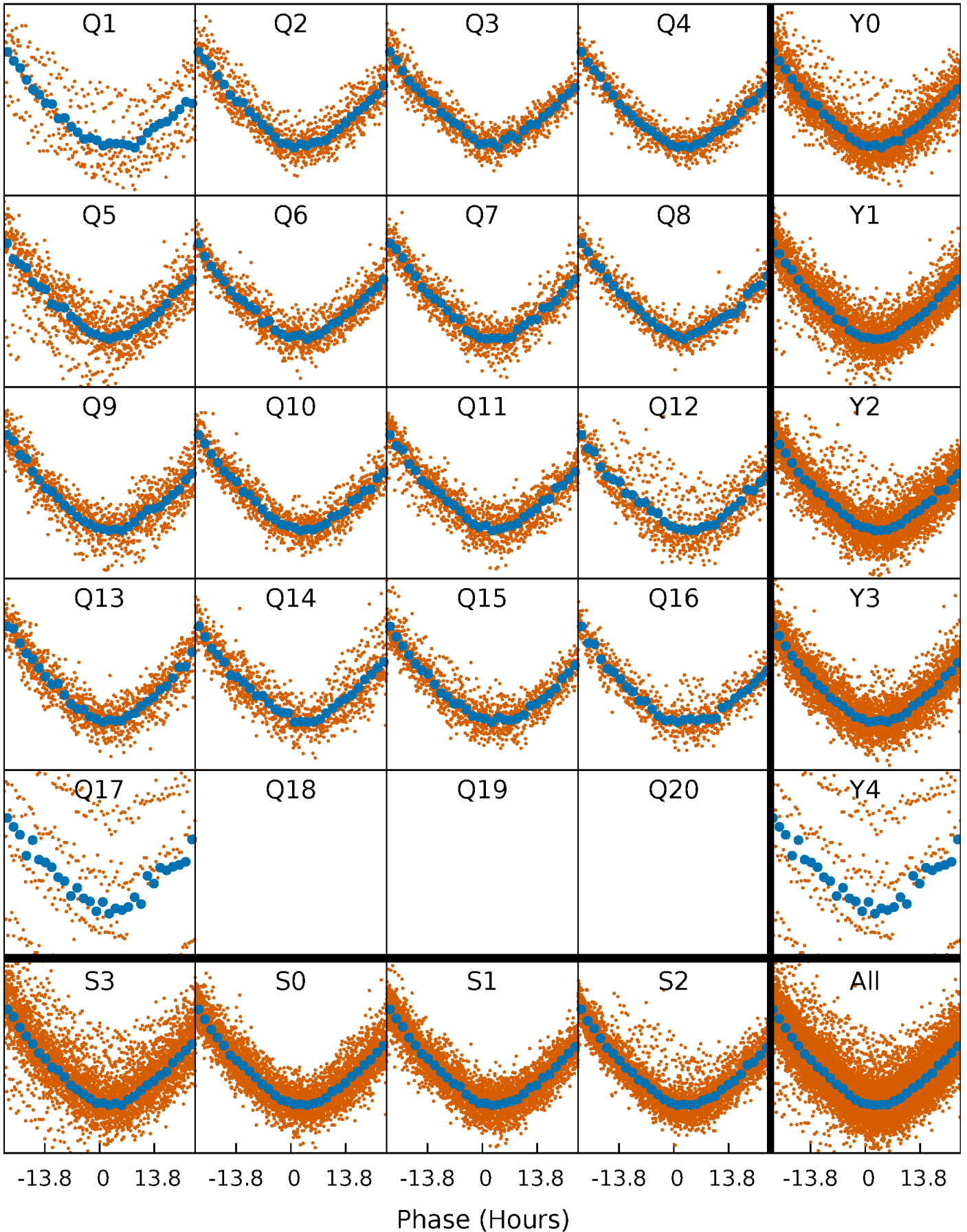


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



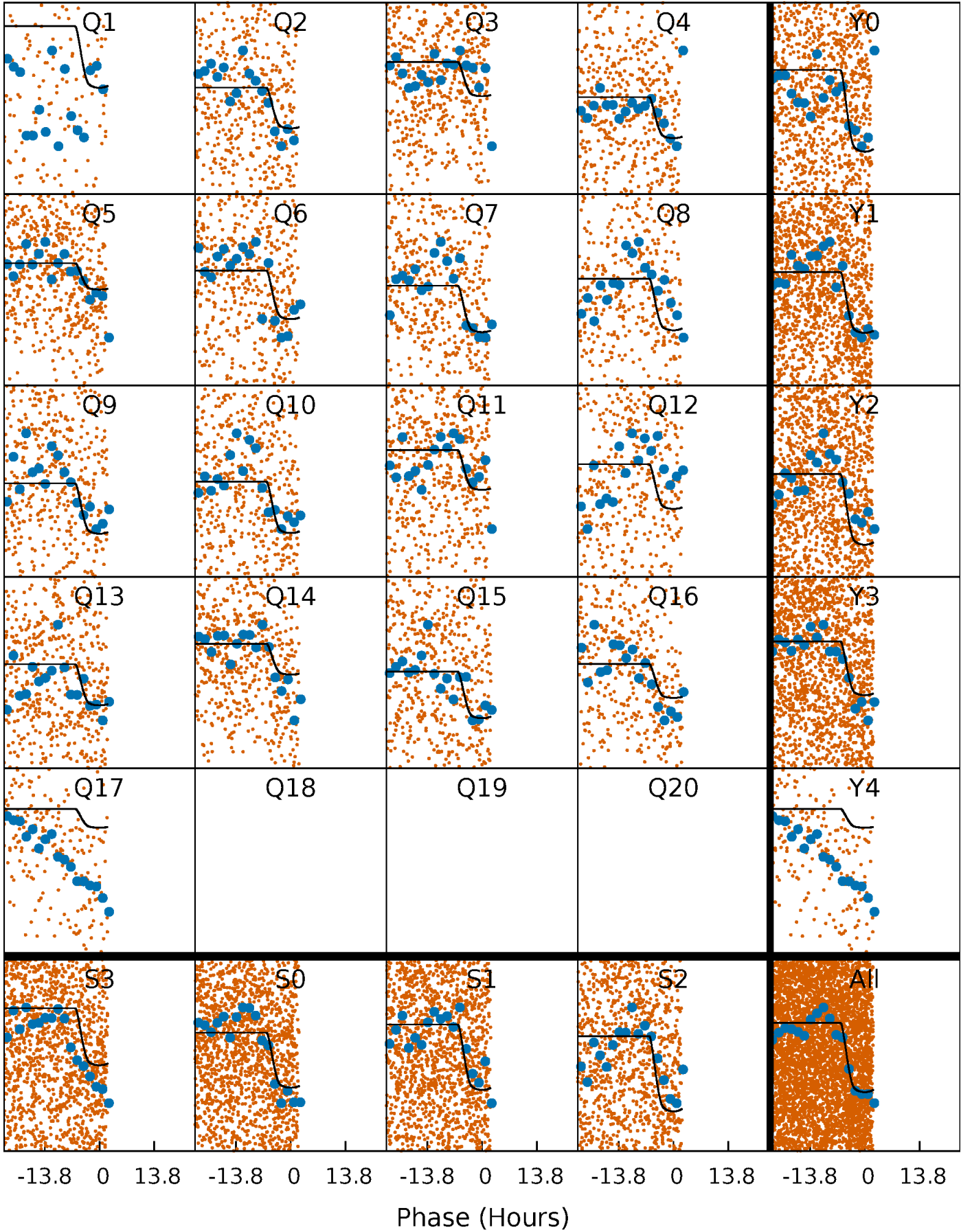
PDC Quarter-Phased Transit Curves

TCE 010730838-02 P= 7.888845 Days $T_0=137.637611$ (BKJD)



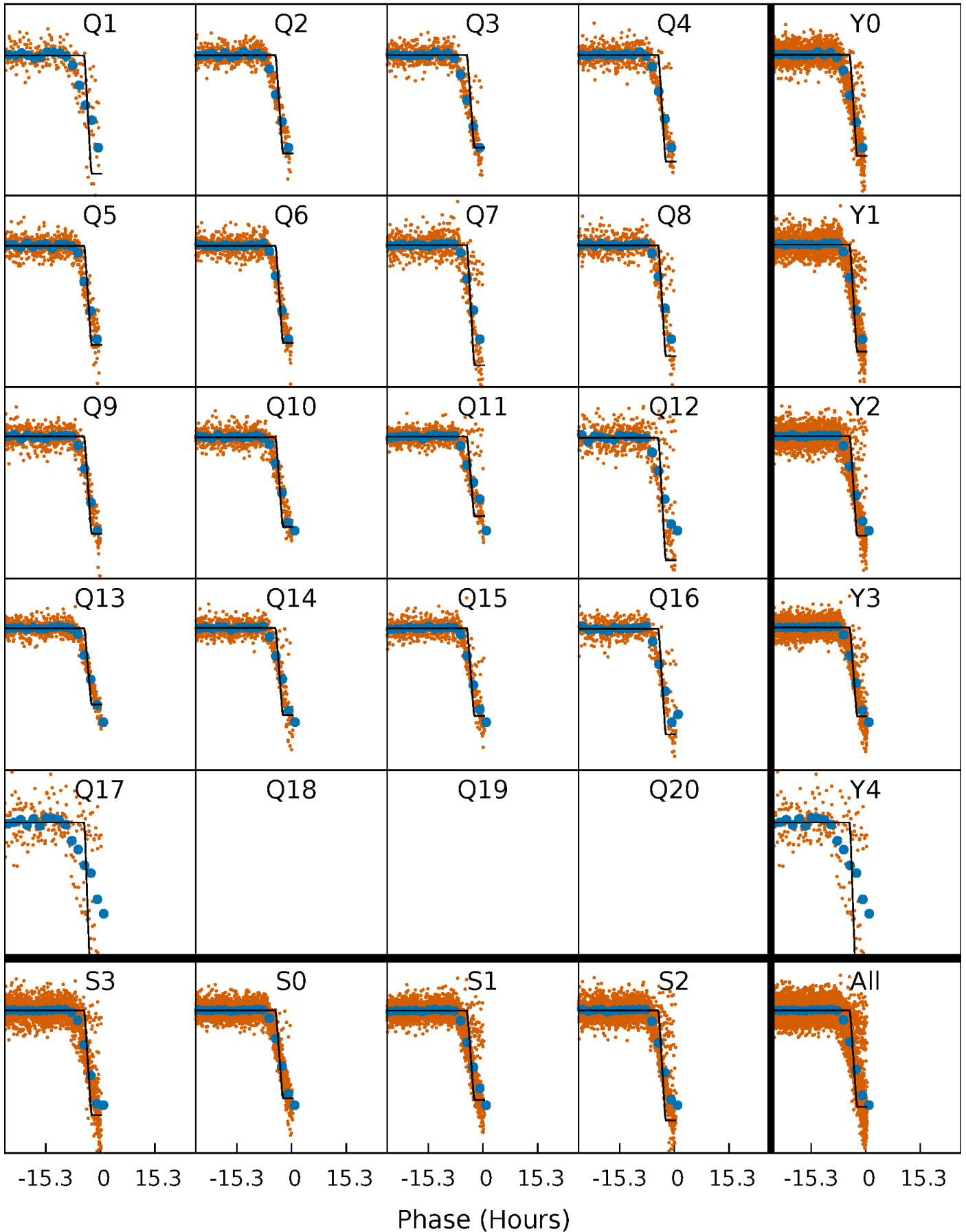
DV Quarter-Phased Transit Curves

TCE 010730838-02 P= 7.888845 Days $T_0=137.637611$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

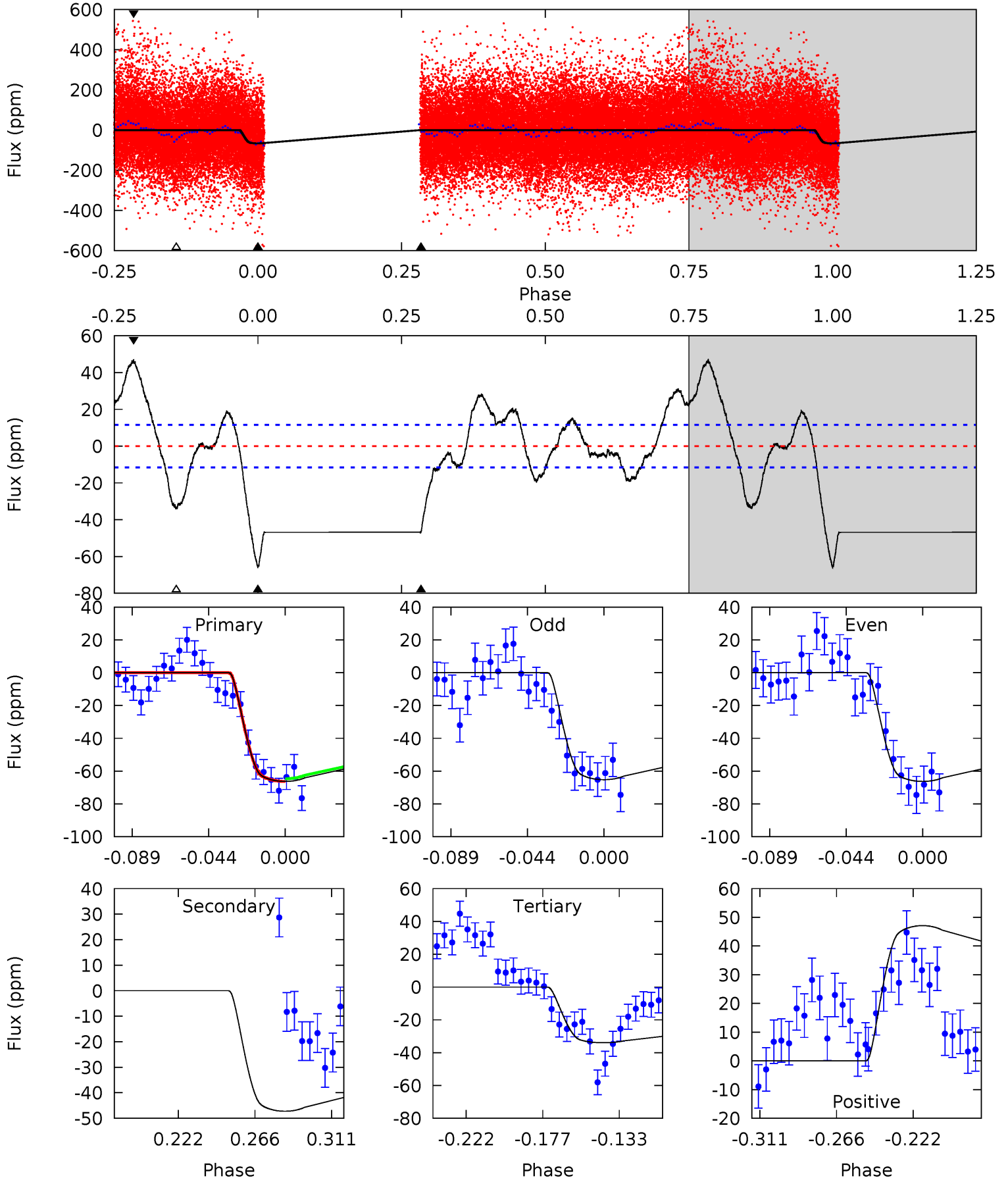
TCE 010730838-02 $P = 7.888774$ Days $T_0 = 137.719859$ (BKJD)



DV Model-Shift Uniqueness Test

010730838-02, P = 7.888845 Days, E = 129.748766 Days

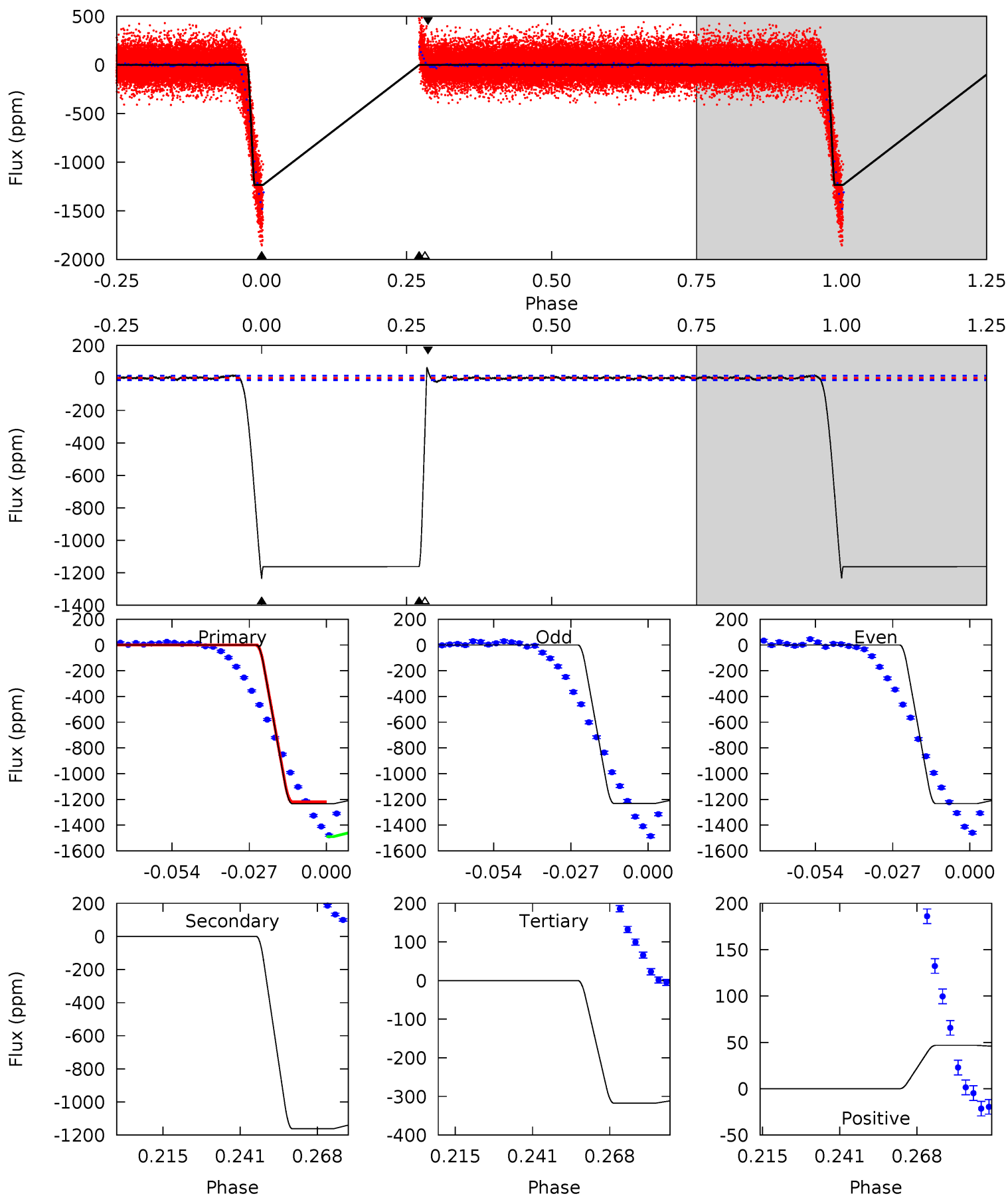
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 27.1 | 19.3 | 13.9 | 19.3 | 4.73 | 2.01 | 7.16 | 13.2 | 7.85 | 5.43 | 0.06 | 0.22 | 0.98 | 0.42 | 0.29 |



Alt Model-Shift Uniqueness Test

010730838-02, P = 7.888774 Days, E = 129.831085 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|-------|-------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 444.1 | 418.4 | 114.3 | 16.8 | 4.83 | 2.21 | 19.7 | 329.7 | 427.3 | 304.1 | 401.6 | 0.27 | 0.94 | 0.05 | 16.7 |



Stellar Parameters For KIC 010730838

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 8057^{+225}_{-338} | $3.946^{+0.234}_{-0.126}$ | $-0.160^{+0.200}_{-0.350}$ | $2.407^{+0.421}_{-0.781}$ | $1.868^{+0.127}_{-0.380}$ | $0.189^{+0.306}_{-0.063}$ |
| | +3%/-4% | +6%/-3% | +125%/-219% | +17%/-32% | +7%/-20% | +162%/-33% |
| Source | KIC0 | 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 010730838-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|----------------------|------------------|
| DV | -47 ± 2 | $2.53^{+0.31}_{-0.41}$ | 2473^{+153}_{-199} | 6564^{+274}_{-276} | 37^{+13}_{-8} |
| Alt. | -1162 ± 3 | $9.65^{+0.96}_{-1.43}$ | 2470^{+168}_{-192} | 7644^{+240}_{-290} | 63^{+19}_{-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 $A_{obs} \gg 1.0$

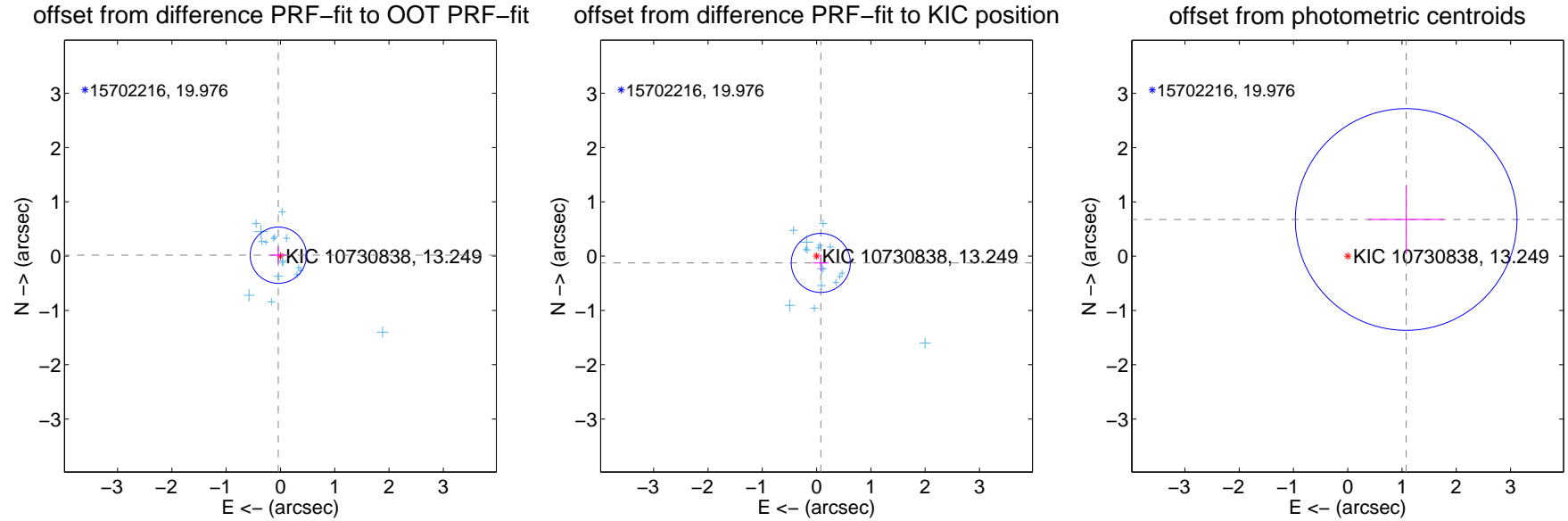
DV Centroid Data

Supplemental centroid analysis for 010730838-02. Kepler magnitude: 13.25. Transit SNR 15.37

There are 17 quarters with good PRF difference image offsets

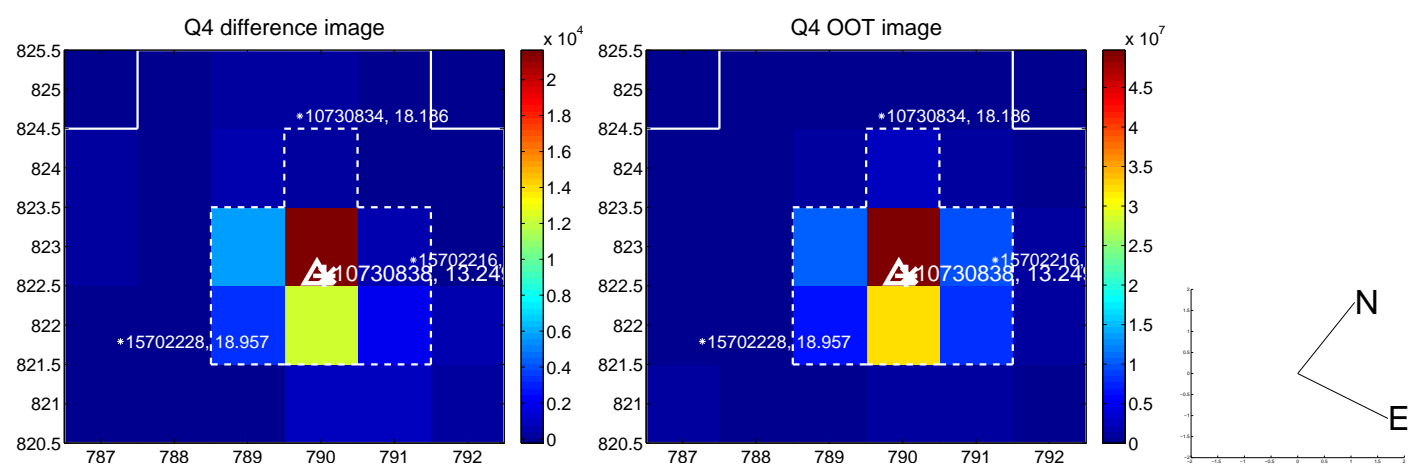
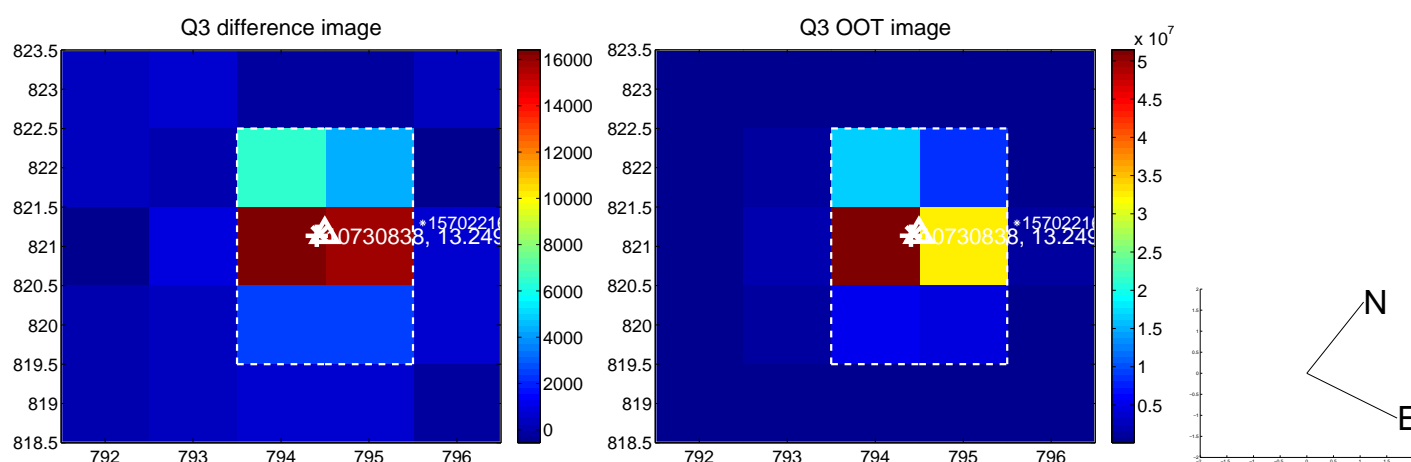
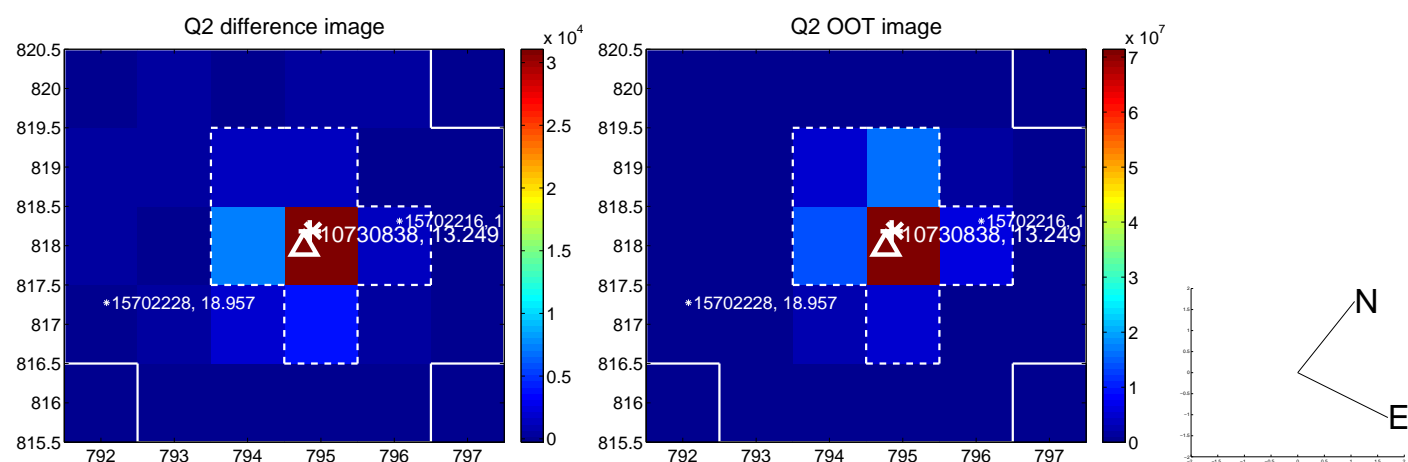
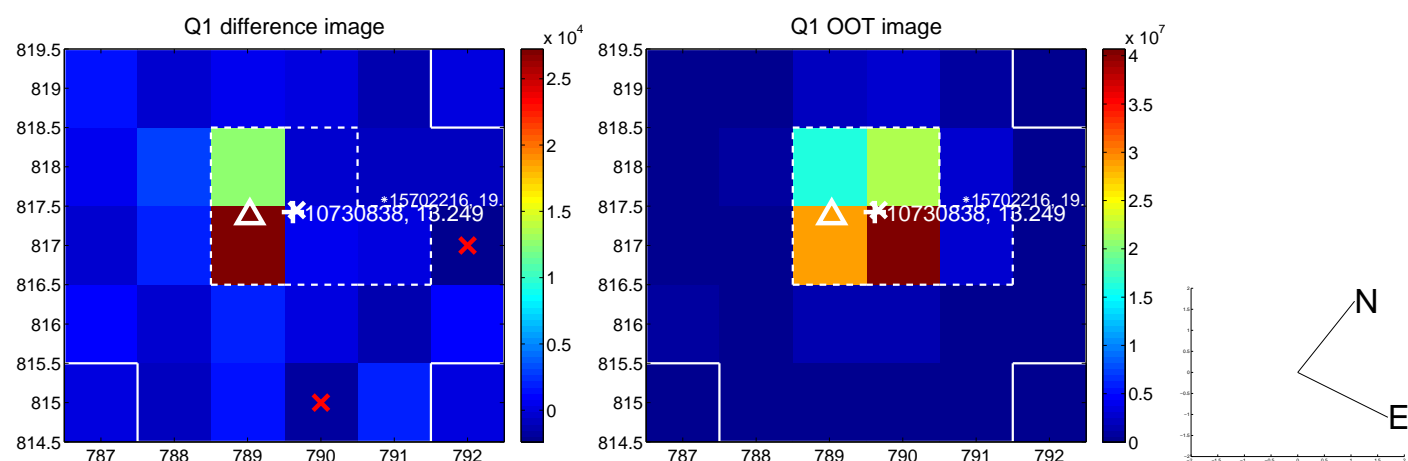
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.044 ± 0.173 | 0.25 | 0.040 ± 0.148 | 0.017 ± 0.153 |
| PRF-fit source offset from KIC position | 0.147 ± 0.181 | 0.81 | -0.077 ± 0.144 | -0.125 ± 0.156 |
| photometric centroid source offset | 1.27 ± 0.68 | 1.87 | -1.08 ± 0.70 | 0.68 ± 0.63 |

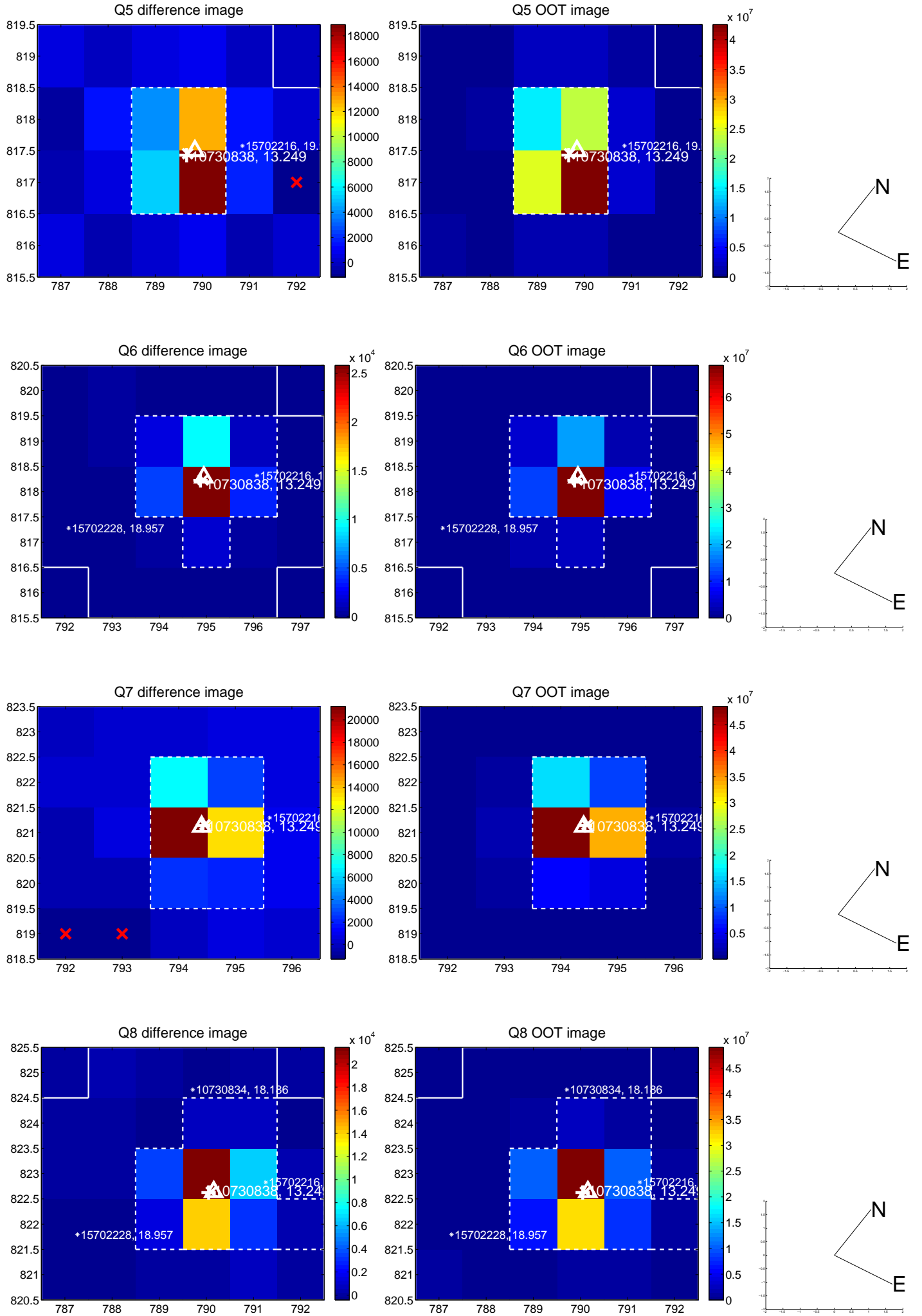


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

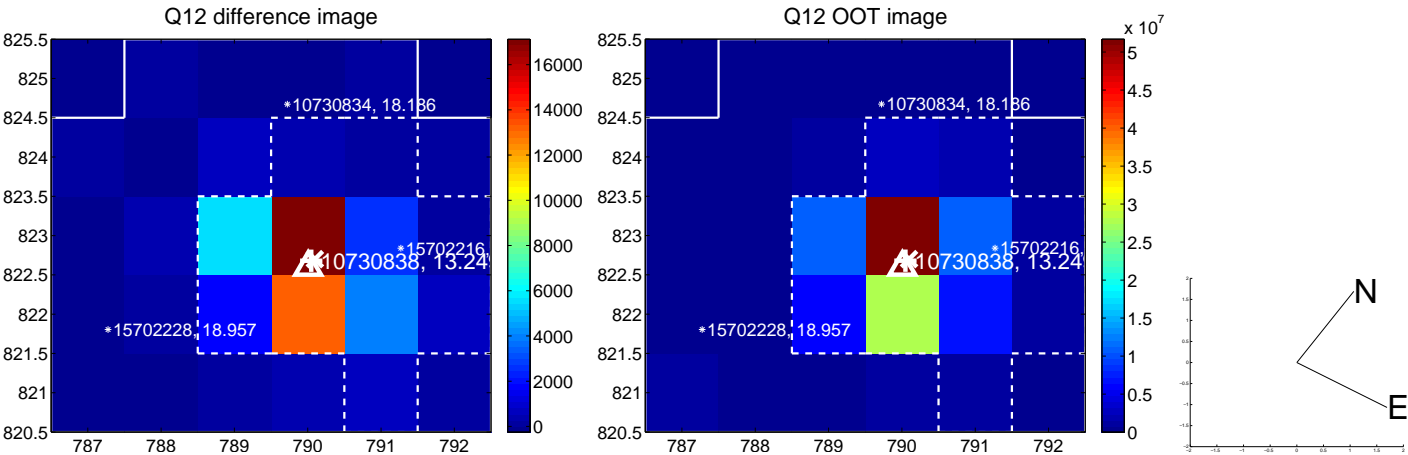
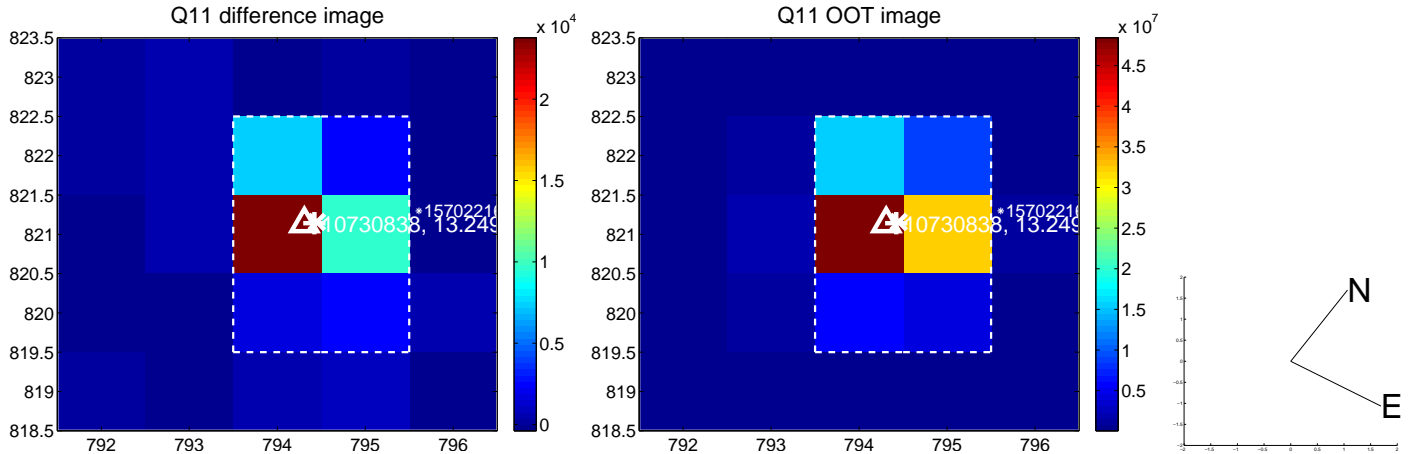
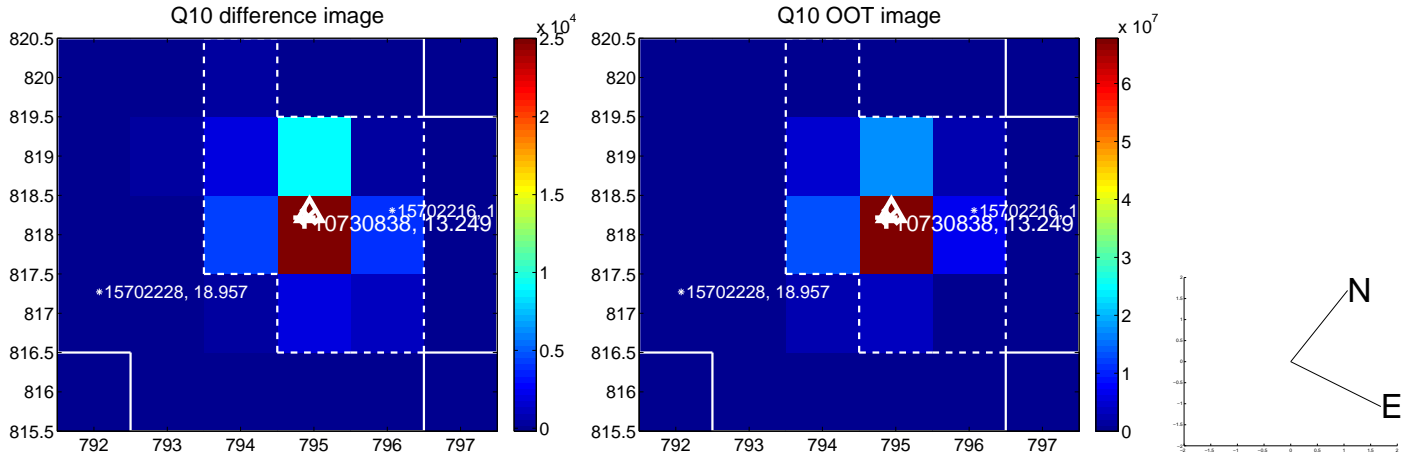
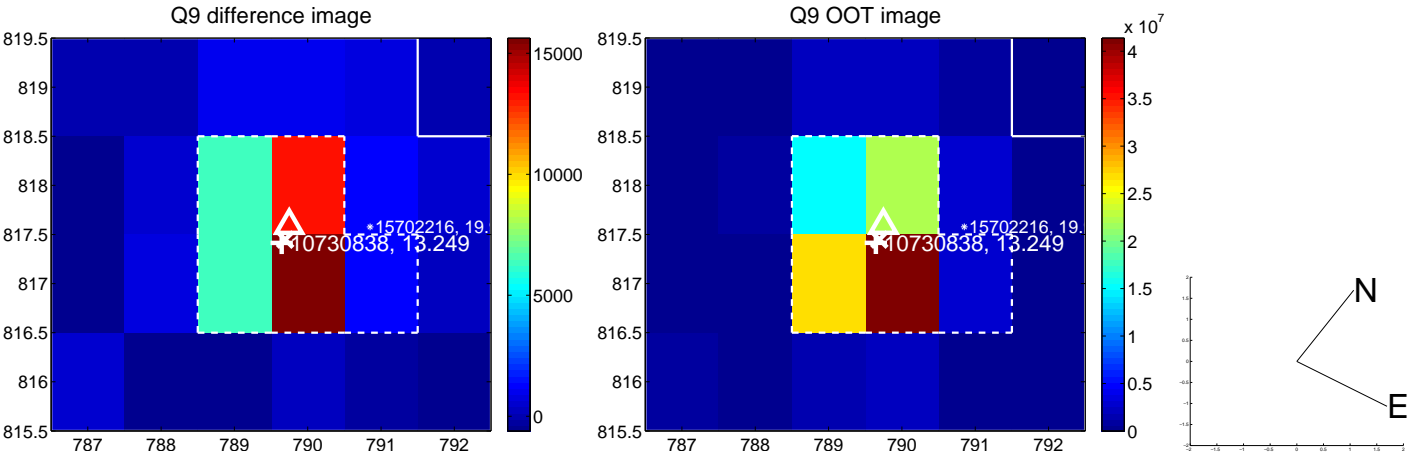
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



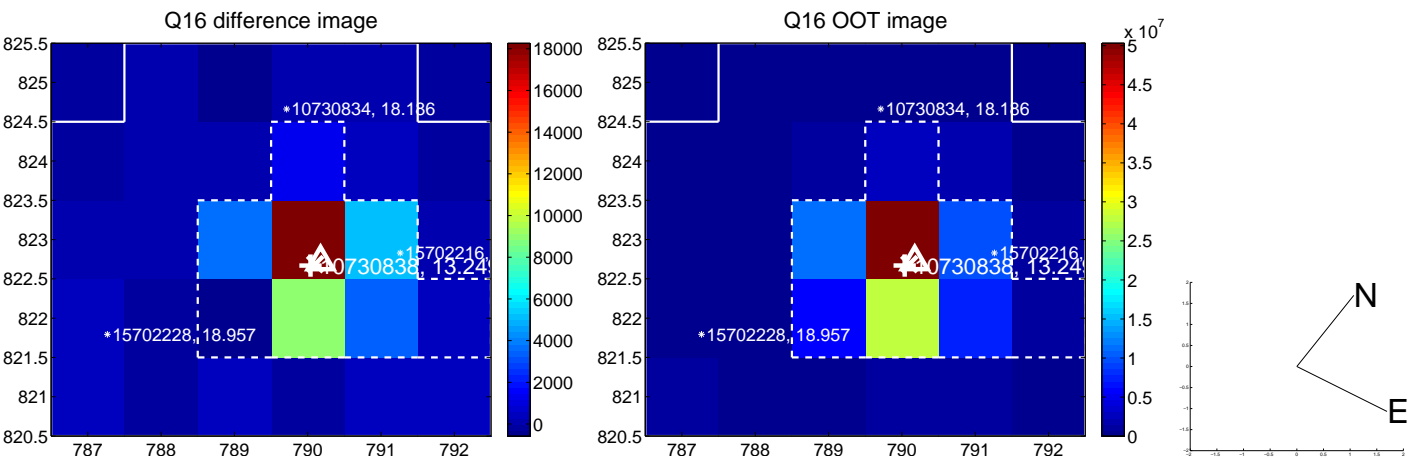
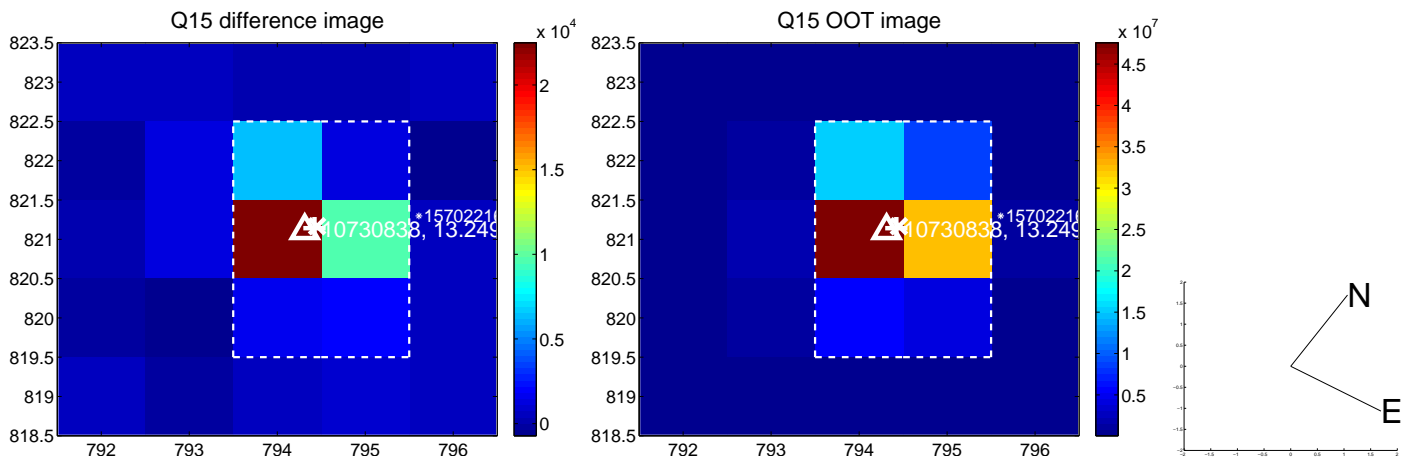
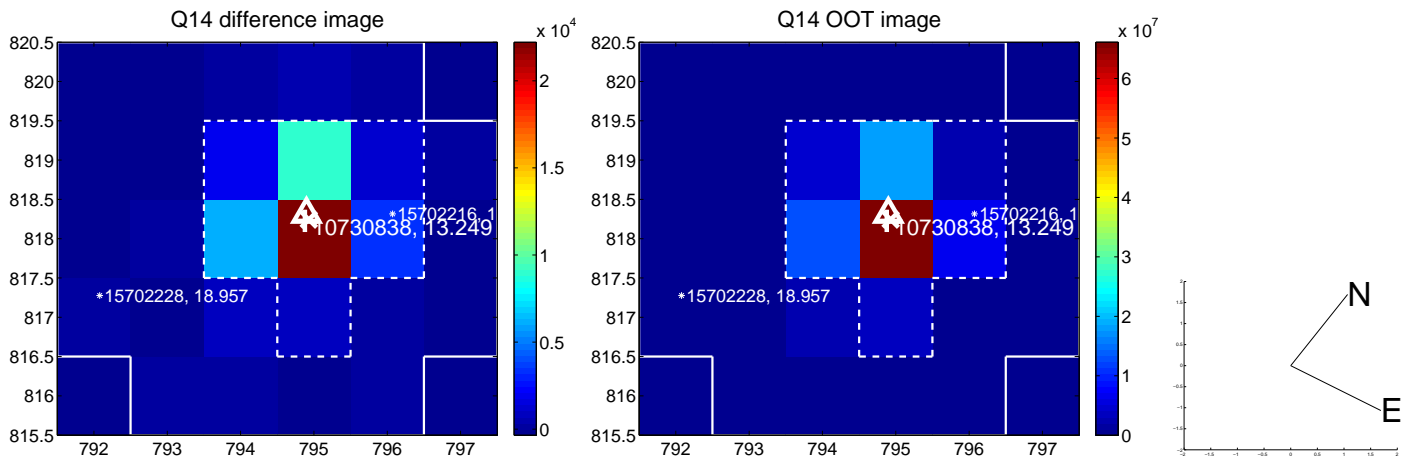
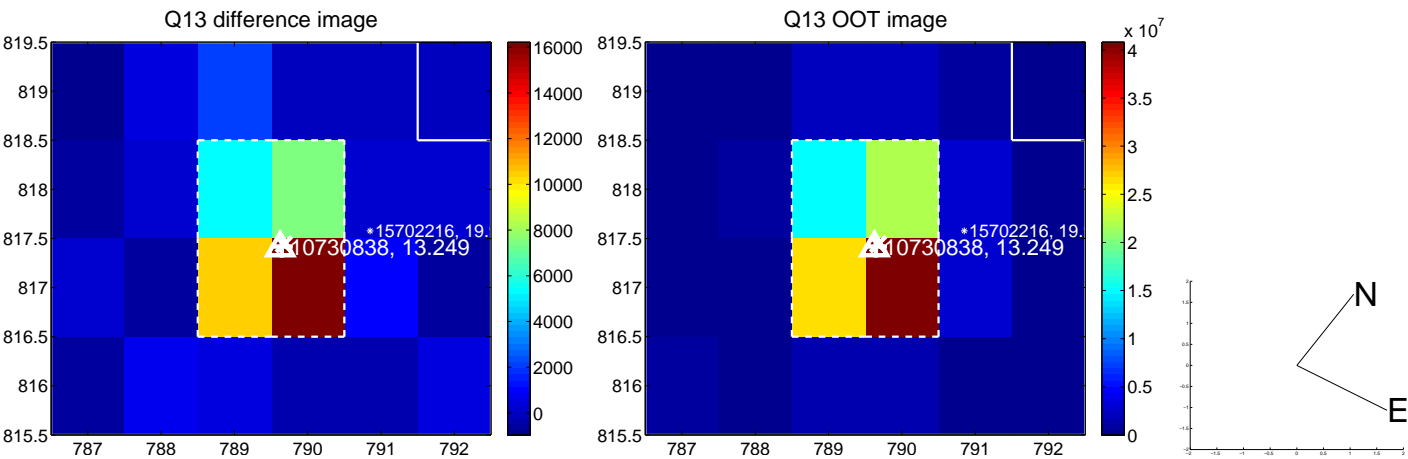
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



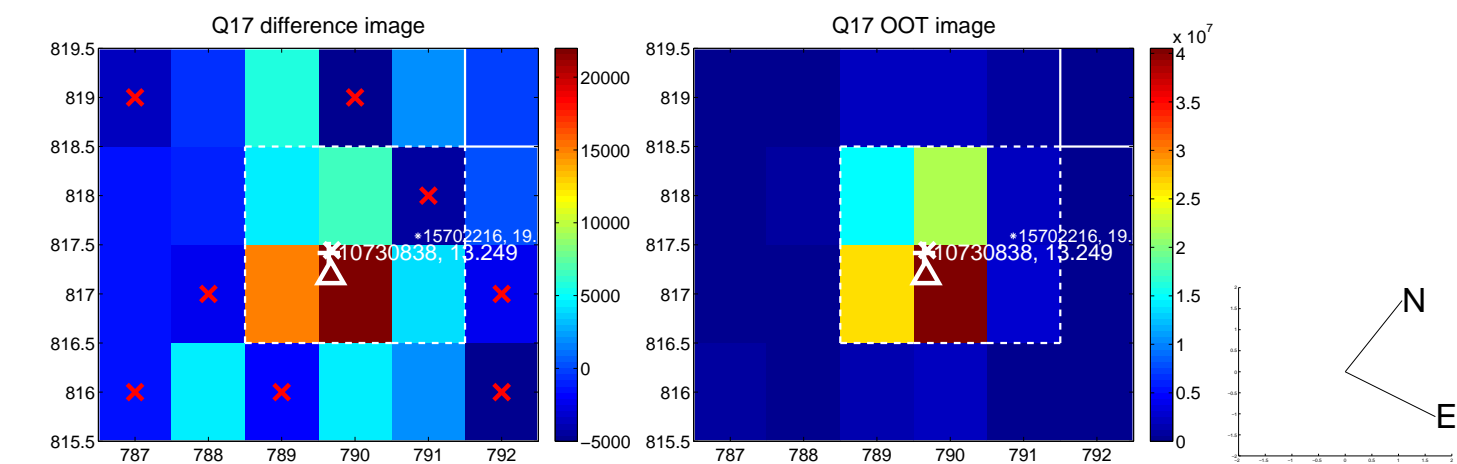
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



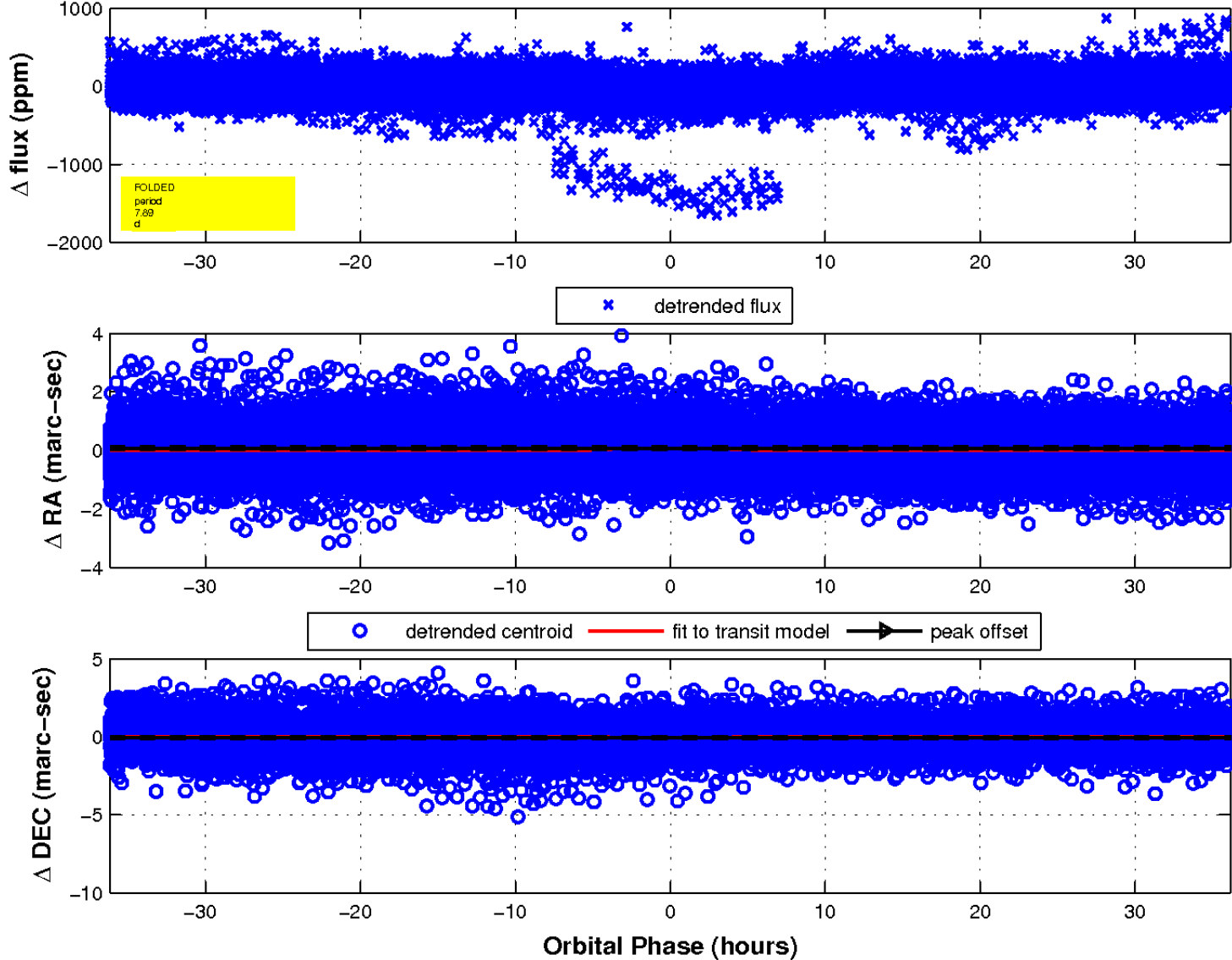
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

