

KIC 005623915

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005623915-01 | OBS | No | 1.133623 | 132.363350 | 17.1 | 3.888 | 12.5 | 10.1 | 1.15 | 6075 | 0.56 | 3583.05 |
| 005623915-02 | OBS | No | 1.133613 | 131.846955 | 11.9 | 5.992 | 13.5 | 8.5 | 1.15 | 6075 | 0.41 | 3583.09 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 005623915-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 1 | SWEET_NTL—LPP_DV—LPP_ALT—CENT_CROWDED—HALO_GHOST—EPHEM_MATCH |
| 005623915-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 1 | SWEET_NTL—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH |

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.

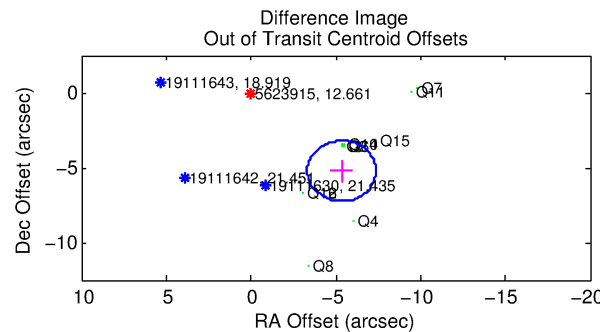
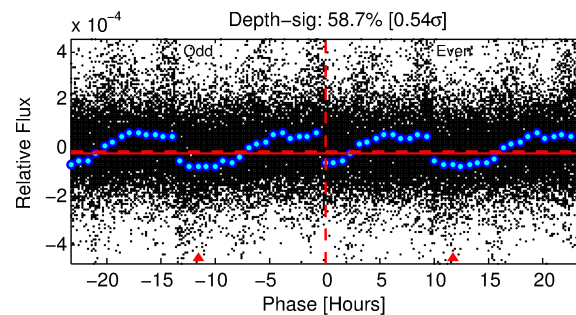
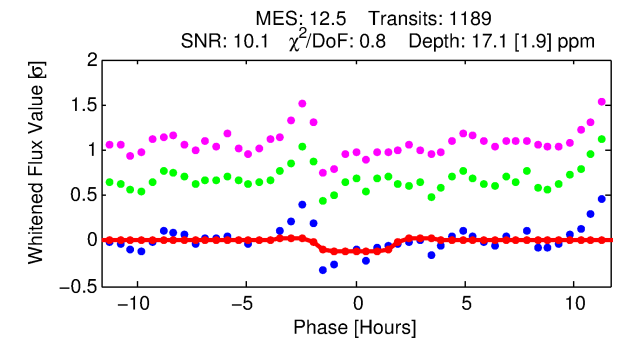
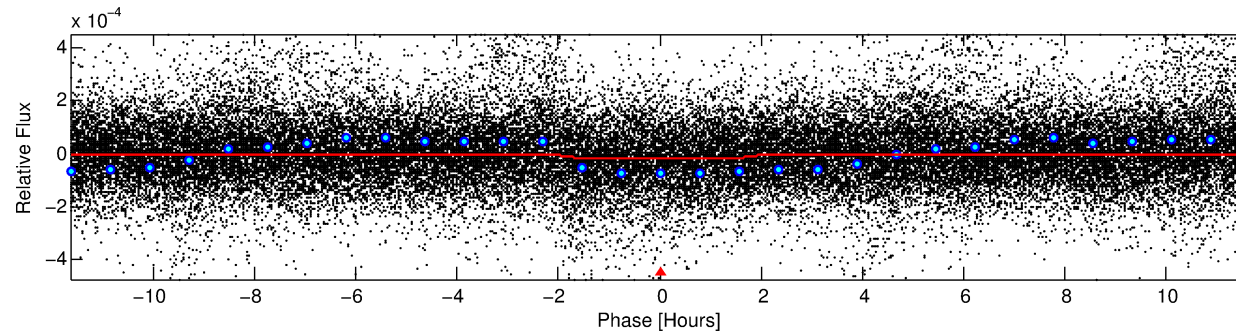
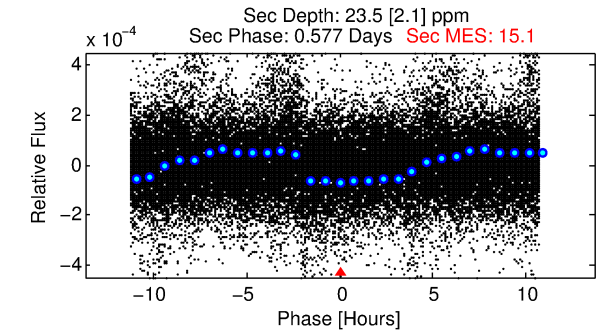
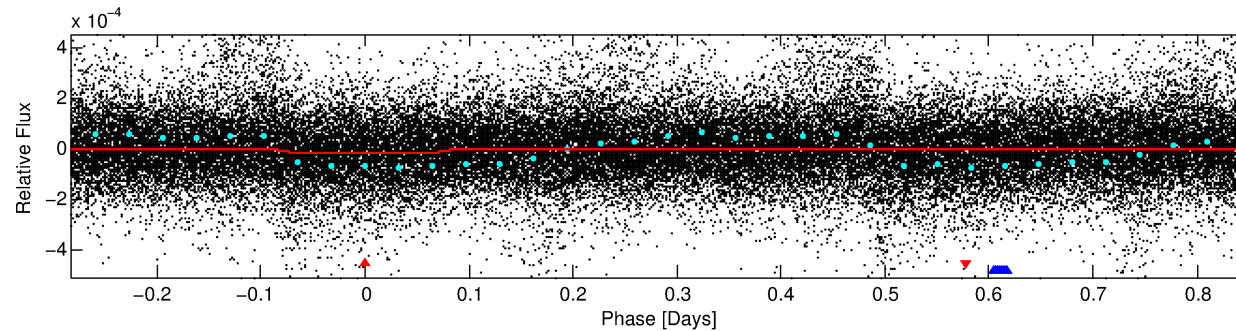
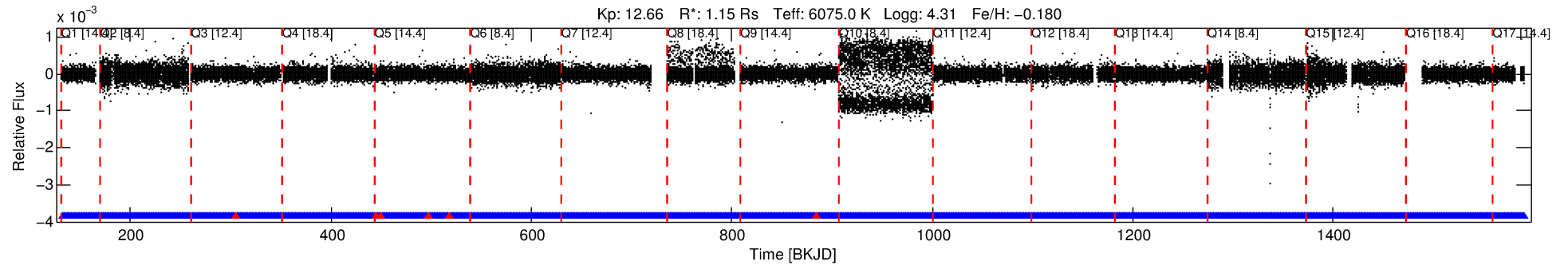
Ephemeris Match Information For 005623915-01

| TCE (1) | KIC | Parent (2) | Parent KIC | $P_1:P_2$ | Dist ($''$) | Δ Row | Δ Col | m_2 | m_1 | D_2/D_1 | Mechanism | Flag | σ_P | σ_T |
|--------------|---------|------------|------------|-----------|---------------|--------------|--------------|-------|-------|-----------|-------------|------|------------|------------|
| 005623915-01 | 5623915 | RR-Lyr-pri | 7198959 | 2:1 | 8296.2 | -21 | 1 | 7.86 | 12.66 | 36664.00 | Col-Anomaly | 0 | 2.63 | 8.97 |

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 5623915 Candidate: 1 of 2 Period: 1.134 d



DV Fit Results:

Period = 1.13362 [0.00001] d
Epoch = 132.3633 [0.0037] BKJD
Rp/R* = 0.0045 [0.0016]
a/R* = 1.37 [1.19]
b = 0.90 [0.40]
Seff = 3583.05 [816.01]
Teq = 1973 [112] K
Rp = 0.56 [0.22] Re
a = 0.0212 [0.0031] AU
Ag = 18.58 [13.77] [1.28σ]
Teff = 6333 [1123] K [3.86σ]

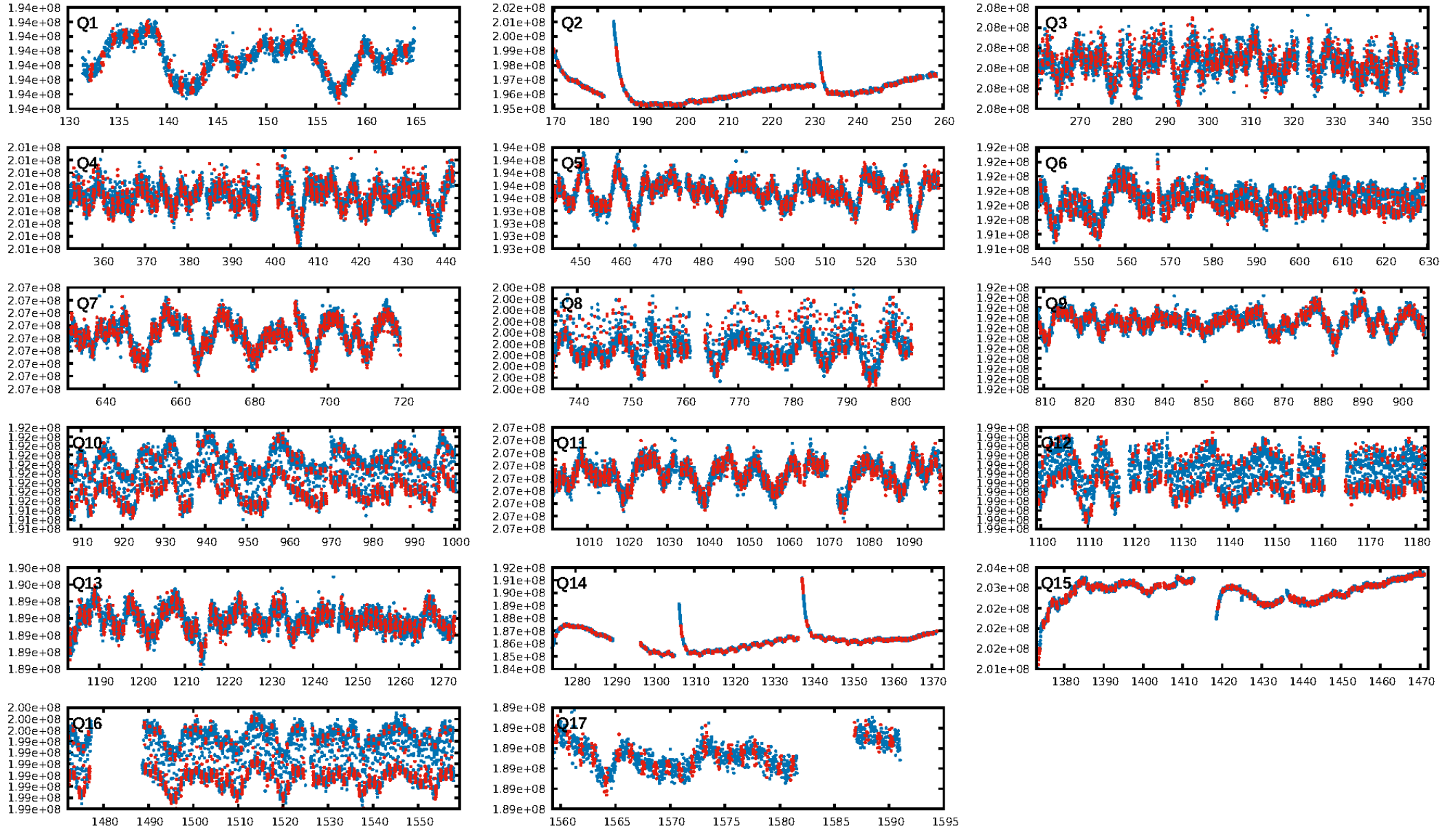
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.99 [1130/1136]
GhostDiagnostic-chr: -0.193
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: 7.466 arcsec [11.11σ]
KicOffset-rm: 7.587 arcsec [11.29σ]
OotOffset-st: 4/3/4/0 [11]
KicOffset-st: 4/3/4/0 [11]
DiffImageQuality-fgm: 0.36 [4/11]
DiffImageOverlap-fno: 1.00 [17/17]

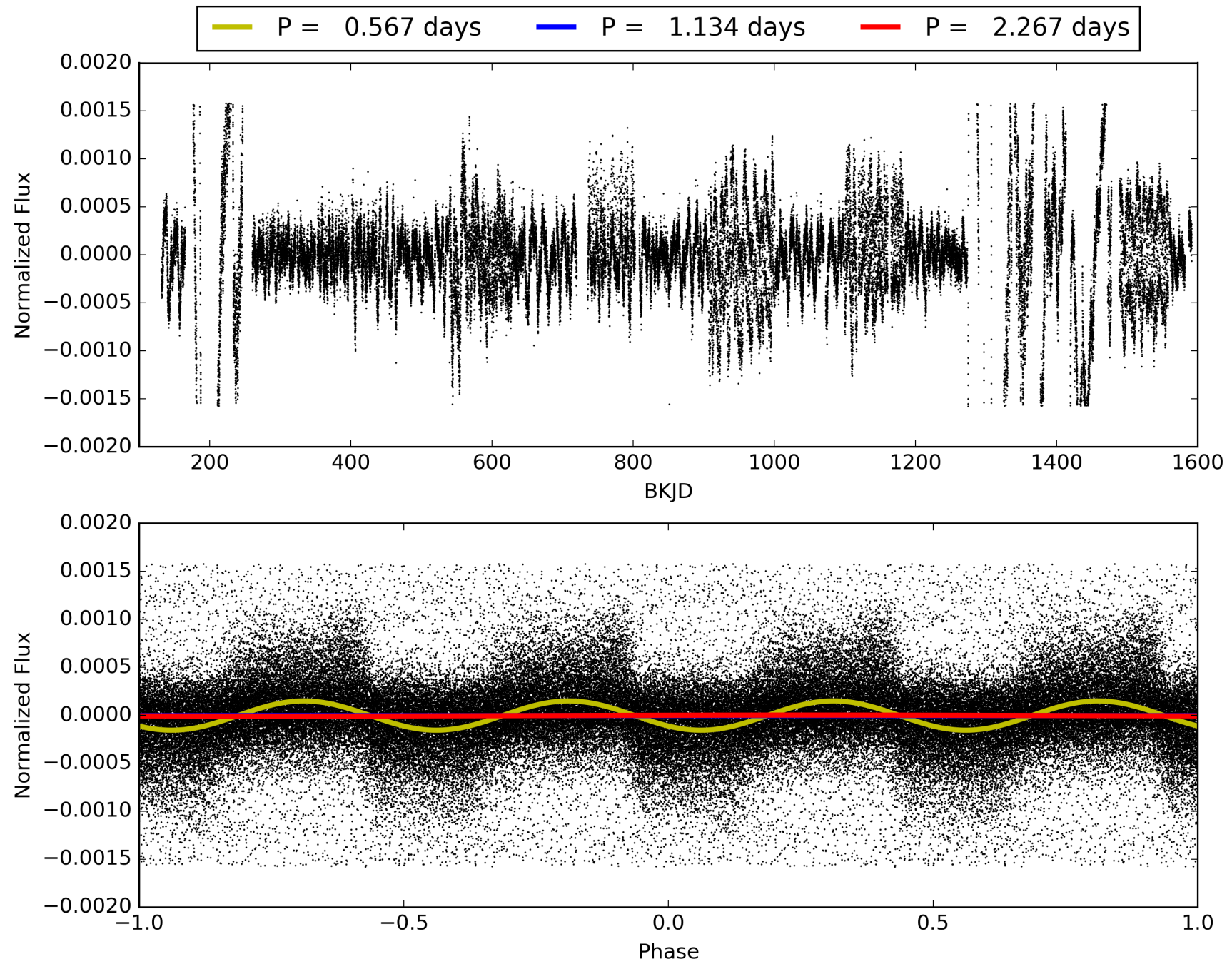
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:20:46 Z

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

TCE 005623915-01, PDC Light Curves

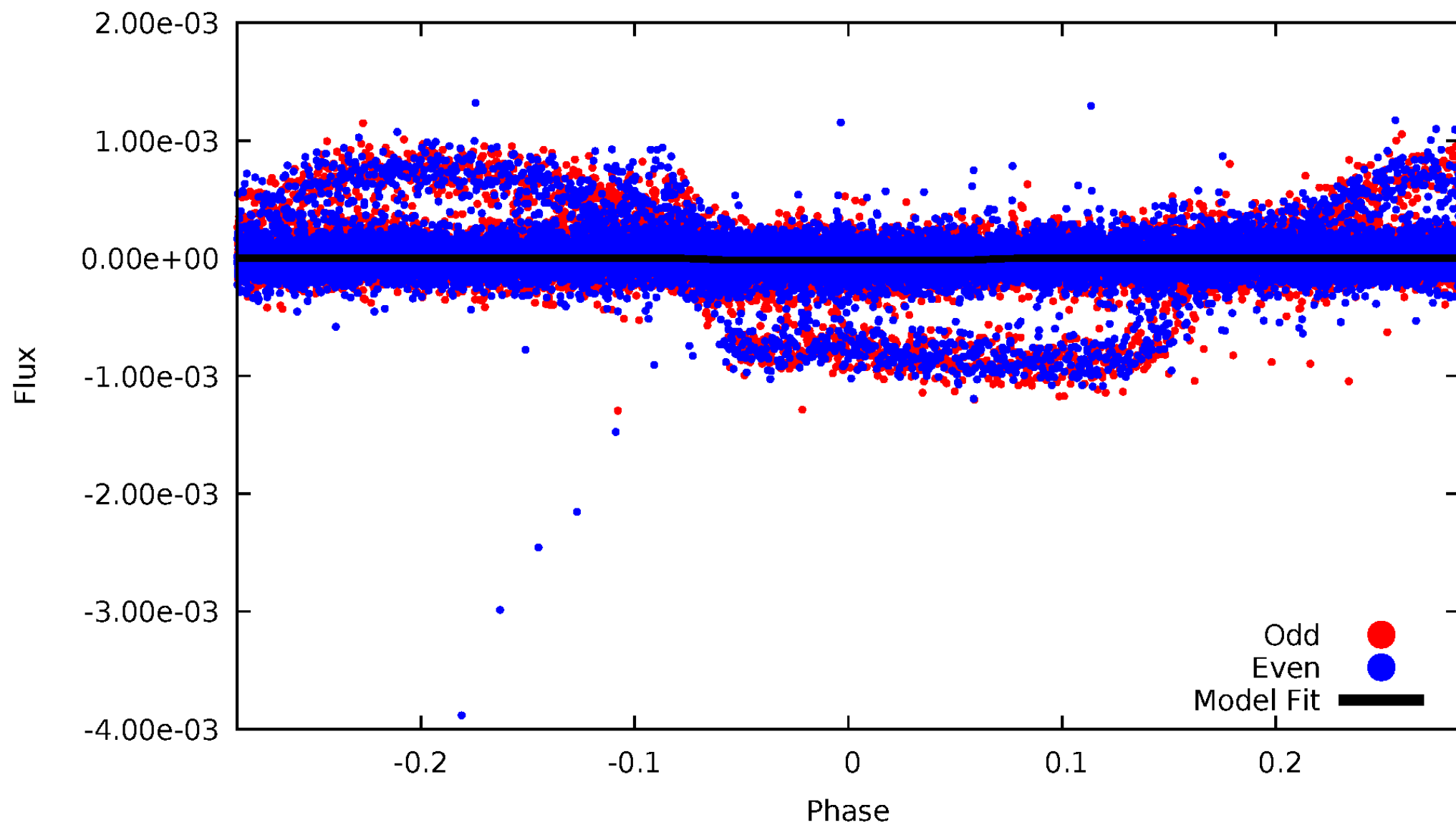


TCE 005623915-01



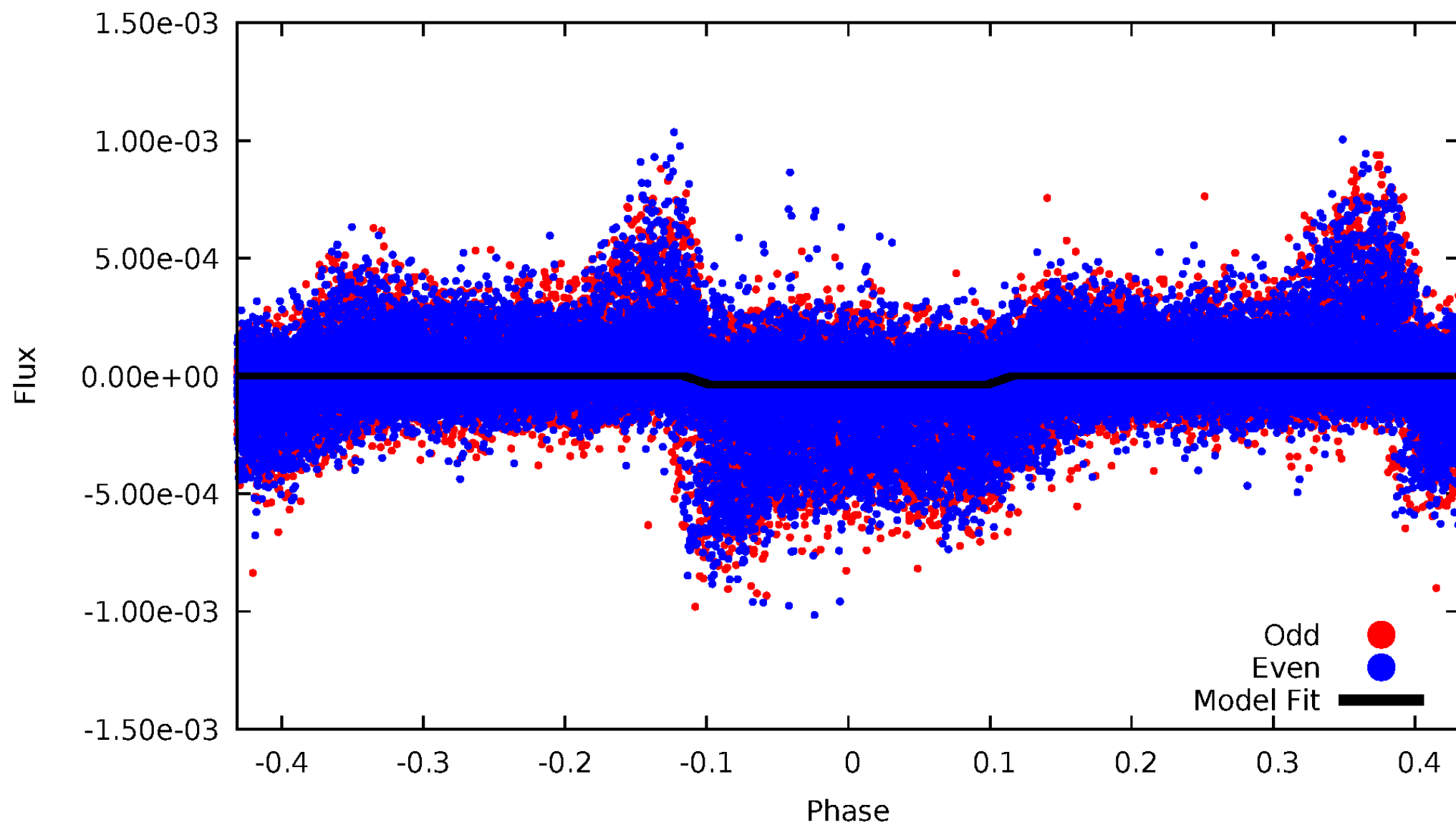
DV Odd/Even

TCE 005623915-01



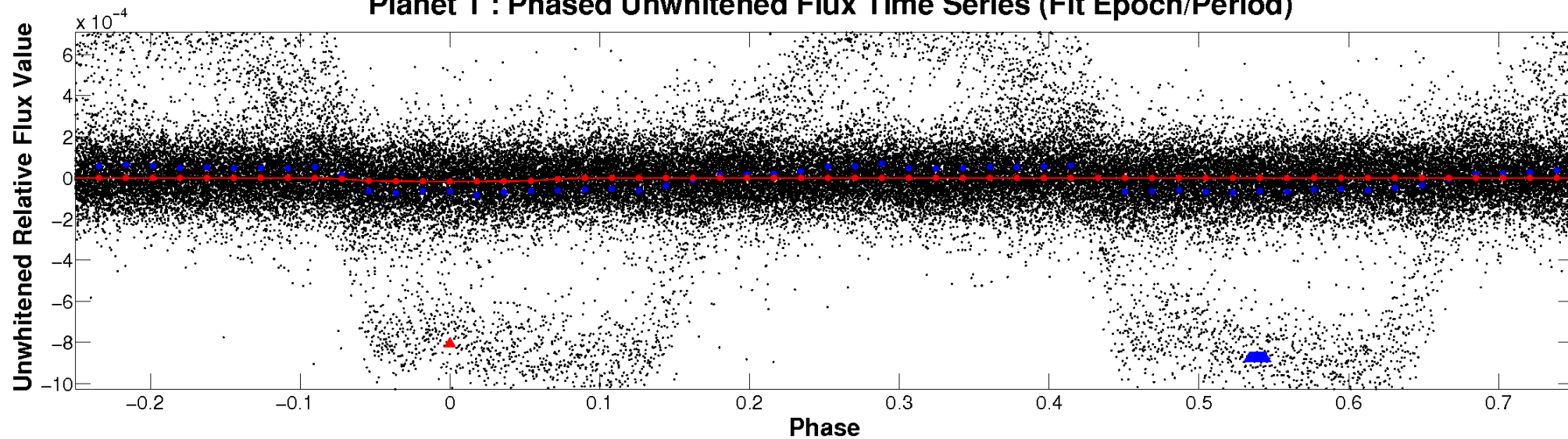
ALT Odd/Even

TCE 005623915-01

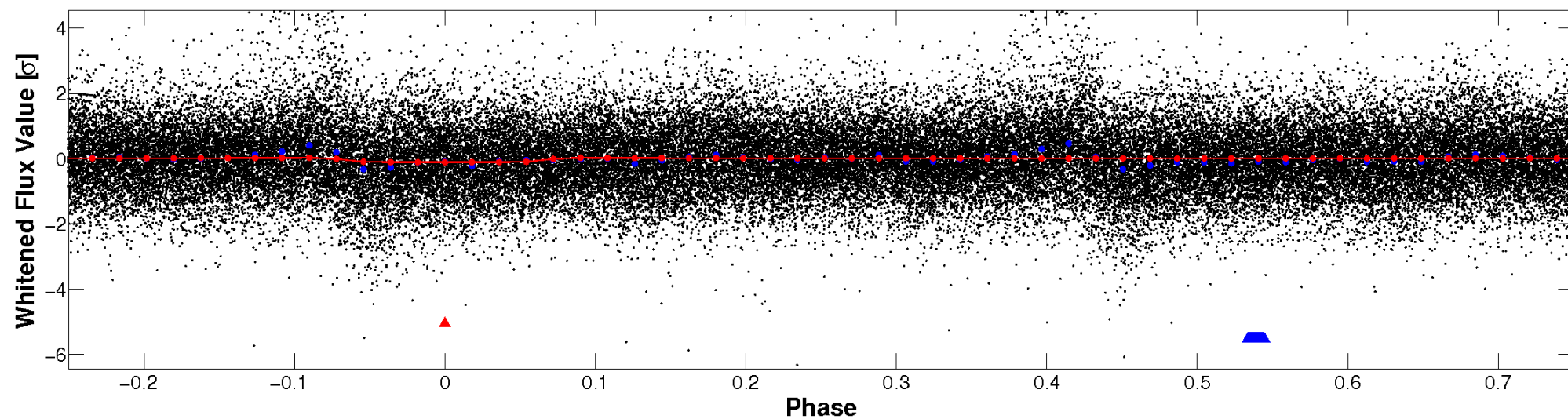


Non-Whitened Vs. Whitened Light Curve

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

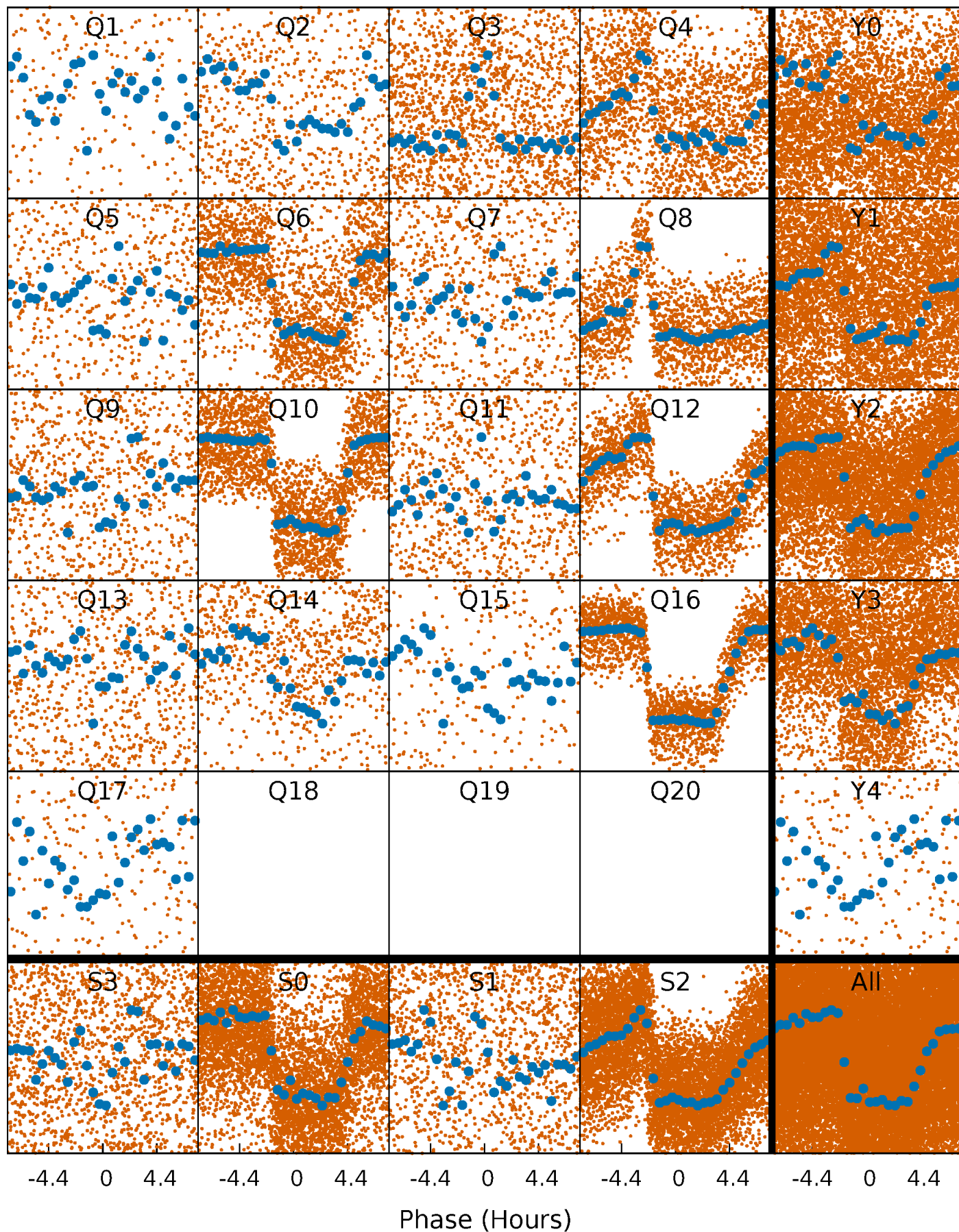


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



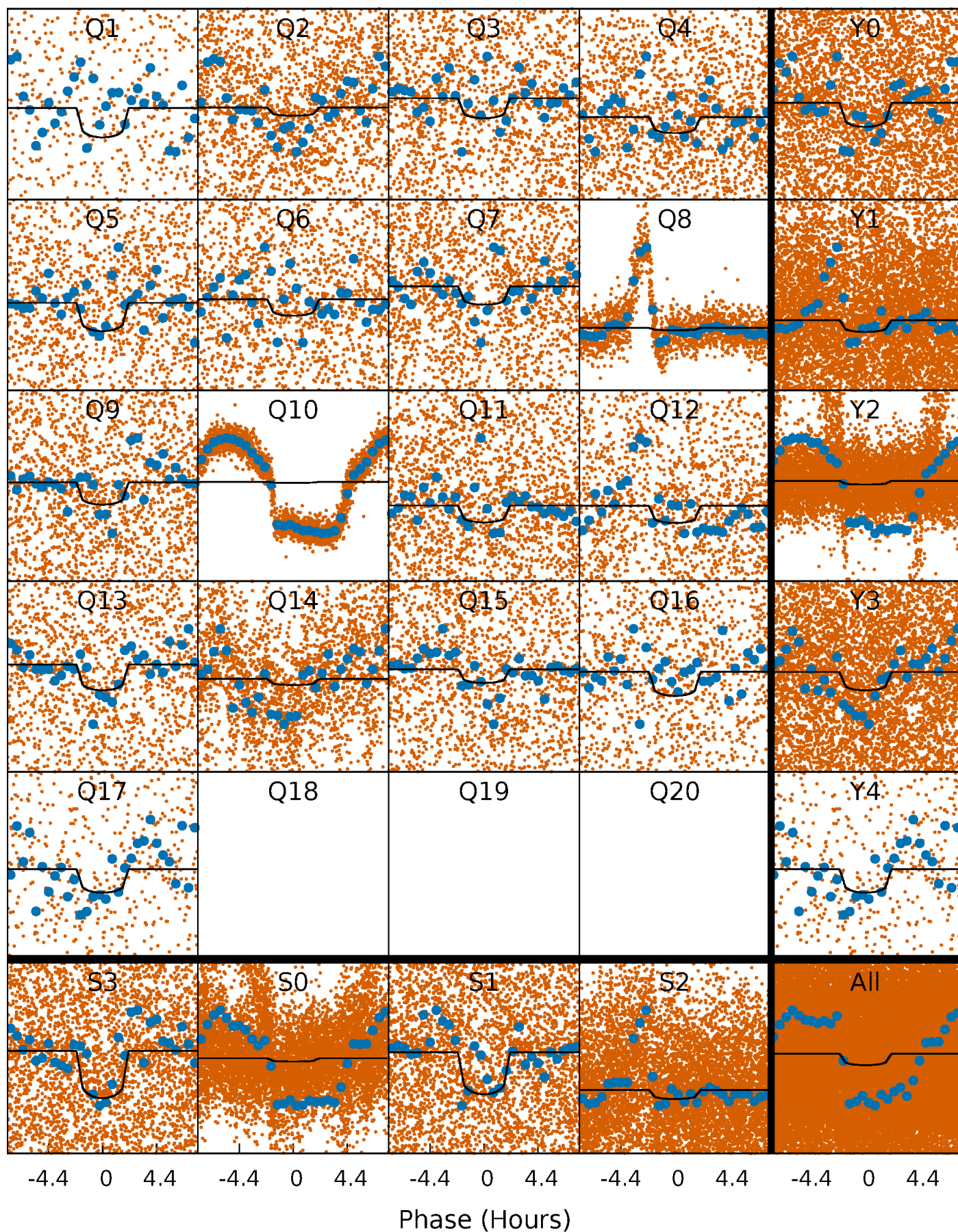
PDC Quarter-Phased Transit Curves

TCE 005623915-01 P= 1.133623 Days $T_0=132.363350$ (BKJD)



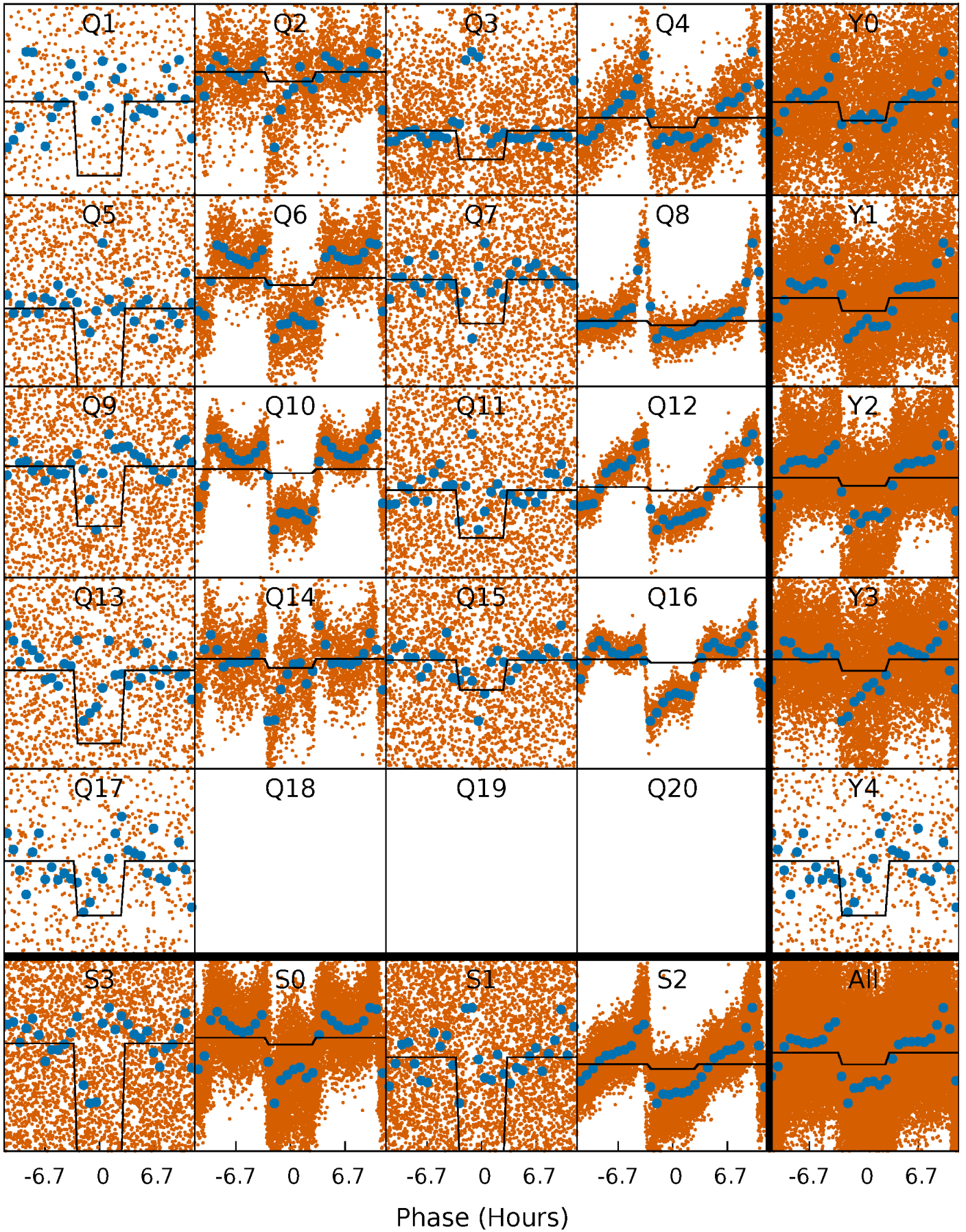
DV Quarter-Phased Transit Curves

TCE 005623915-01 P= 1.133623 Days $T_0=132.363350$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

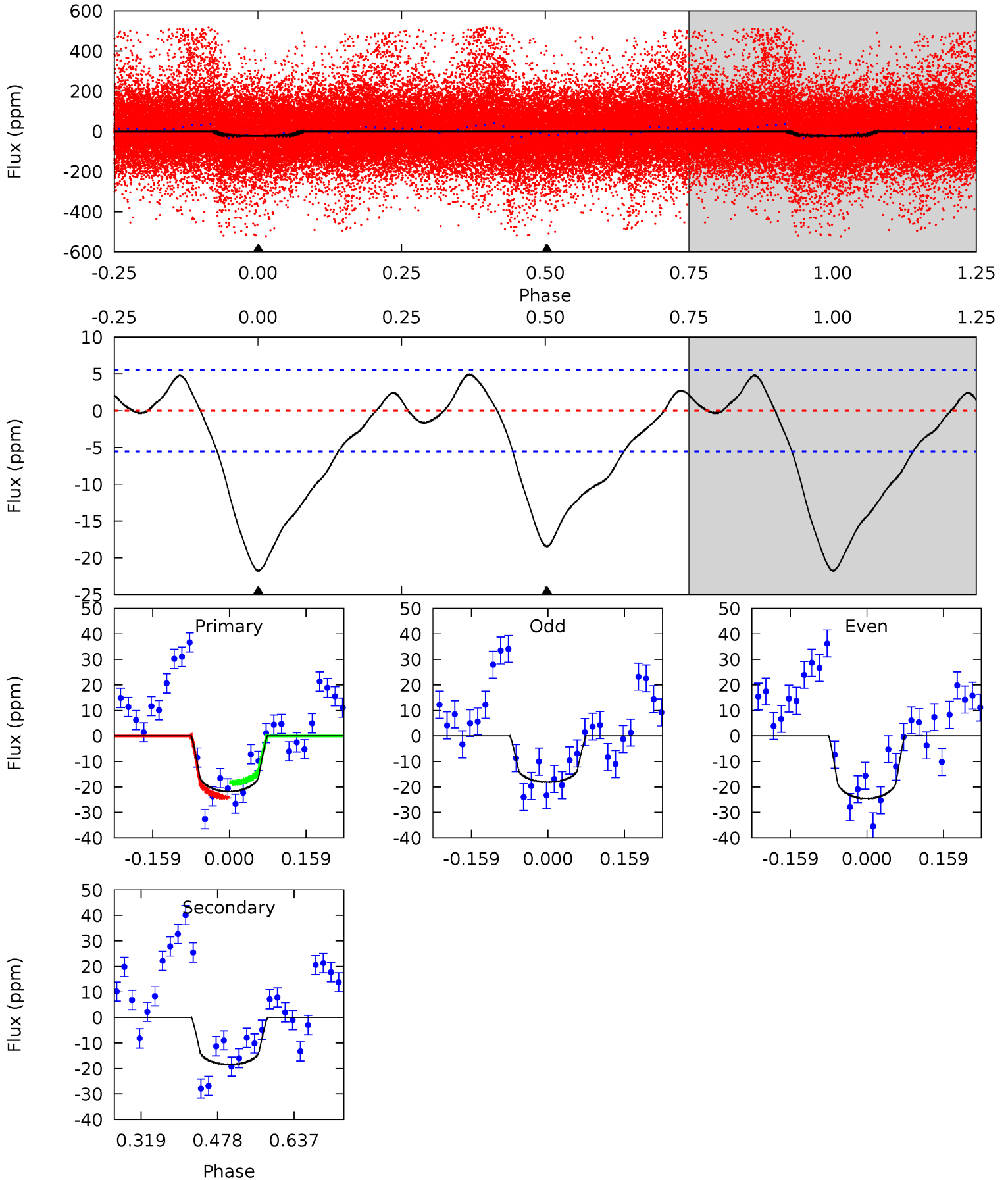
TCE 005623915-01 P= 1.133623 Days $T_0=132.403850$ (BKJD)



DV Model-Shift Uniqueness Test

005623915-01, P = 1.133623 Days, E = 131.229727 Days

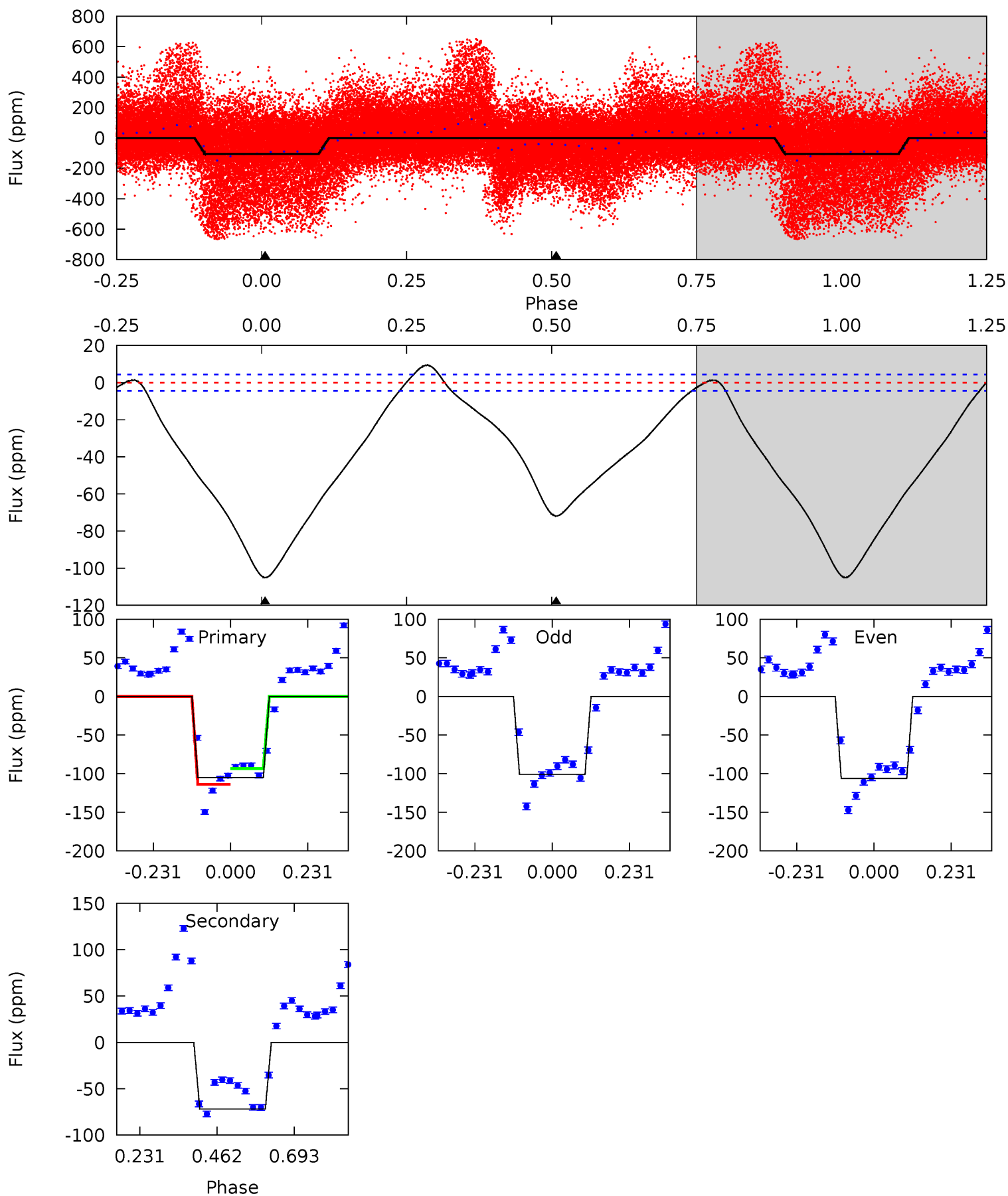
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 17.6 | 14.9 | 0 | 0 | 4.47 | 1.41 | 1.35 | 17.6 | 17.6 | 14.9 | 14.9 | 2.61 | 3.54 | 0.18 | 2.25 |



Alt Model-Shift Uniqueness Test

005623915-01, P = 1.133623 Days, E = 131.270227 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 106.0 | 72.6 | 0 | 0 | 4.39 | 1.20 | 4.61 | 106.0 | 106.0 | 72.6 | 72.6 | 2.64 | 2.20 | 0.08 | 10.3 |



Stellar Parameters For KIC 005623915

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|---------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6075^{+82}_{-82} | $4.313^{+0.125}_{-0.112}$ | $-0.180^{+0.150}_{-0.150}$ | $1.150^{+0.190}_{-0.156}$ | $0.991^{+0.072}_{-0.058}$ | $0.918^{+0.492}_{-0.321}$ |
| | +1%/-1% | +3%/-3% | +83%/-83% | +17%/-14% | +7%/-6% | +54%/-35% |
| Source | SPE68 | SPE68 | SPE68 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 005623915-01 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-------------|------------------------|----------------------|-----------------------|------------------|
| DV | -18 ± 1 | $0.55^{+0.22}_{-0.19}$ | 2746^{+129}_{-111} | 5978^{+1544}_{-859} | 15^{+22}_{-8} |
| Alt. | -72 ± 1 | $0.77^{+0.20}_{-0.20}$ | 2743^{+118}_{-118} | 7204^{+1341}_{-822} | 31^{+25}_{-12} |

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 $A_{obs} \gg 1.0$

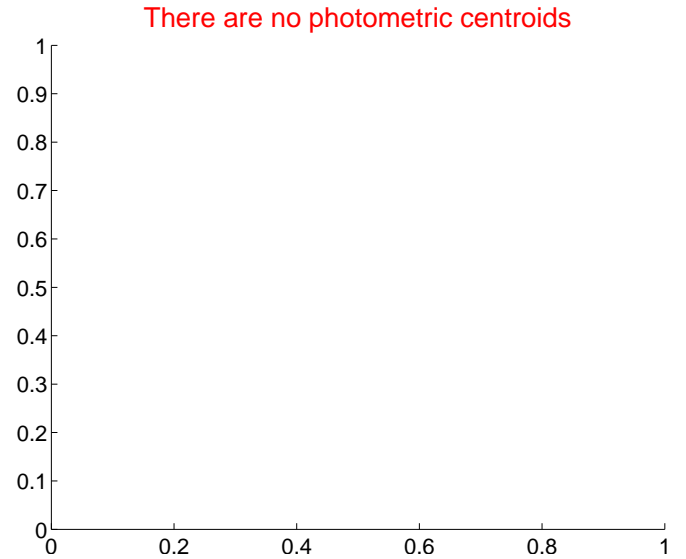
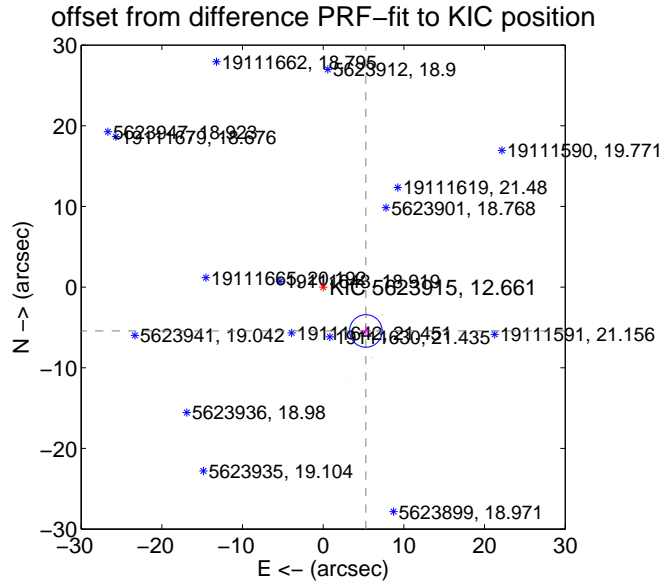
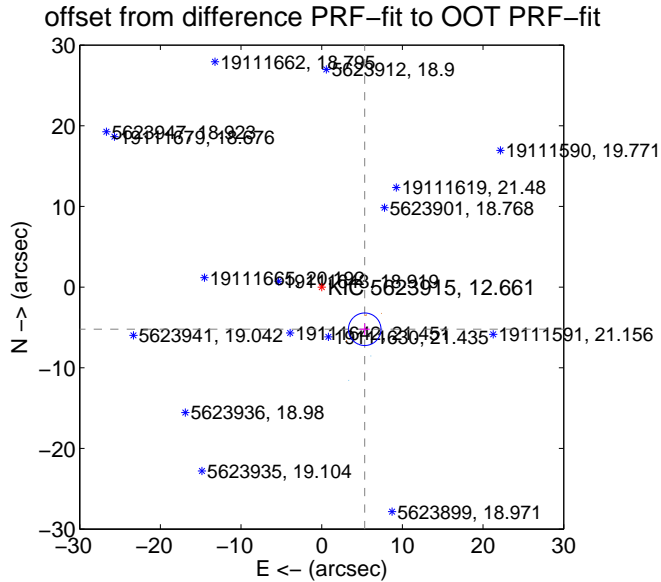
DV Centroid Data

Supplemental centroid analysis for 005623915-01. Kepler magnitude: 12.66. Transit SNR 10.12

There are 4 quarters with good PRF difference image offsets

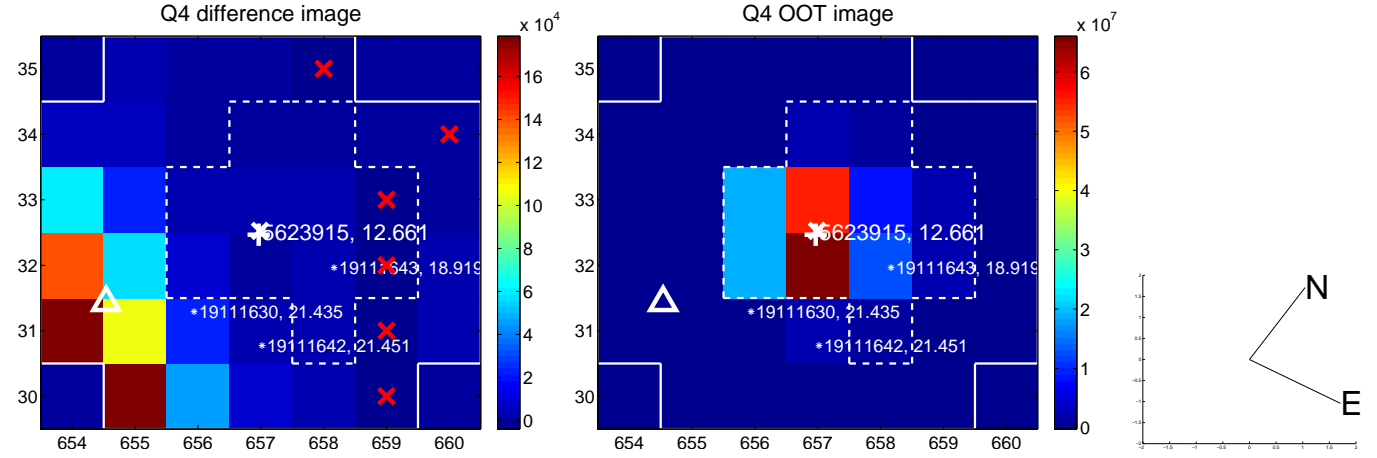
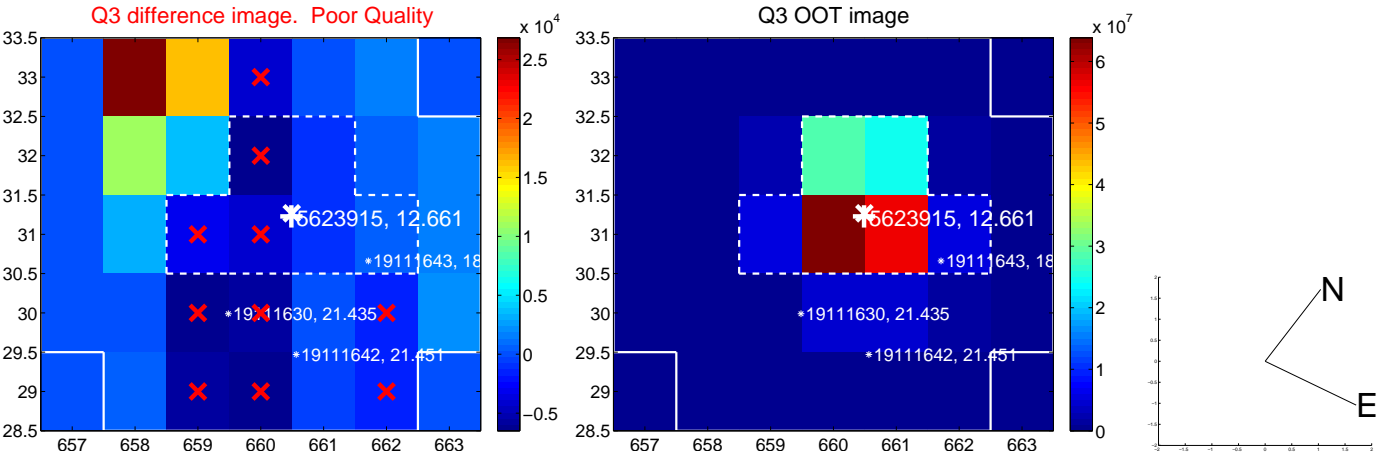
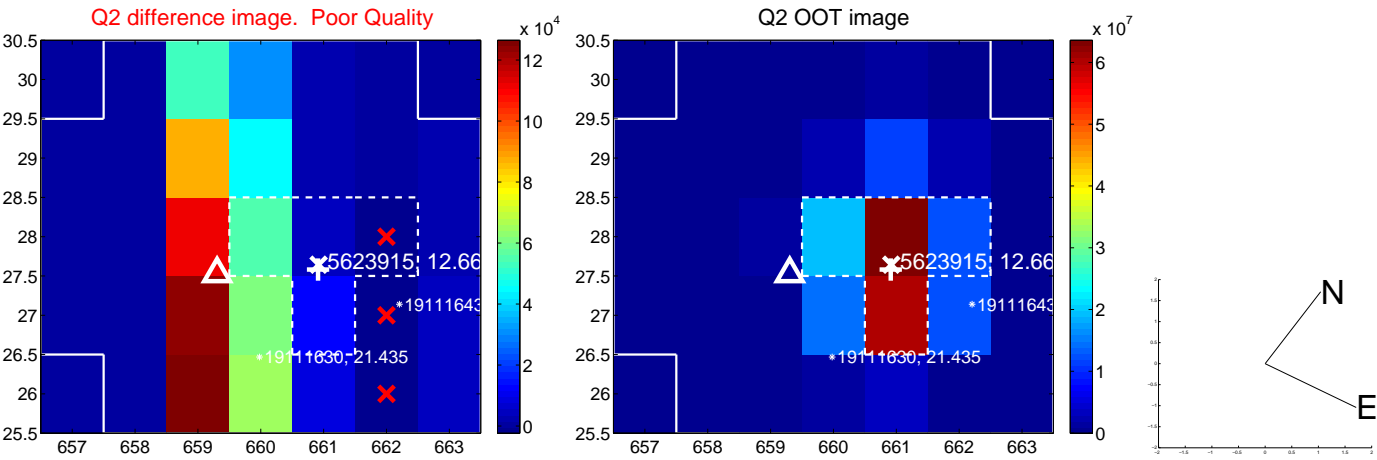
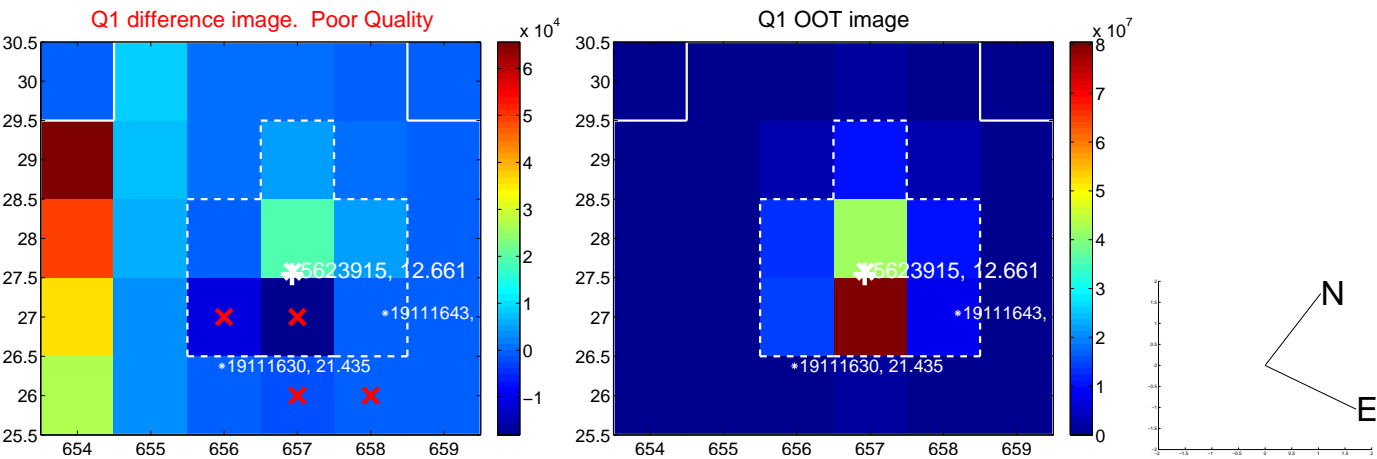
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 7.466 ± 0.672 | 11.11 | -5.334 ± 0.636 | -5.224 ± 0.708 |
| PRF-fit source offset from KIC position | 7.587 ± 0.672 | 11.29 | -5.291 ± 0.631 | -5.437 ± 0.709 |
| photometric centroid source offset | — | — | — | — |

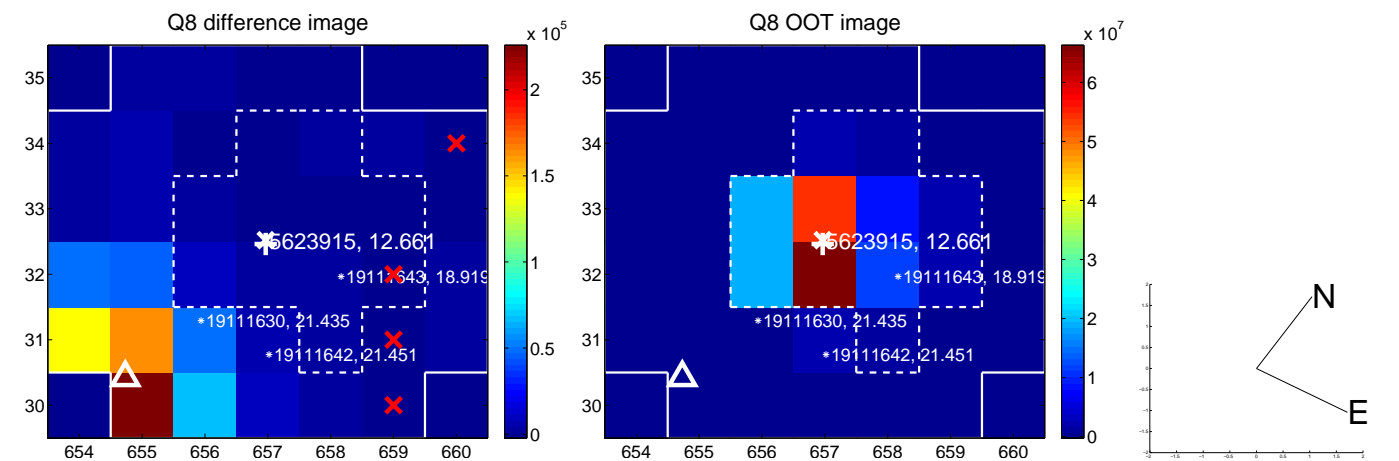
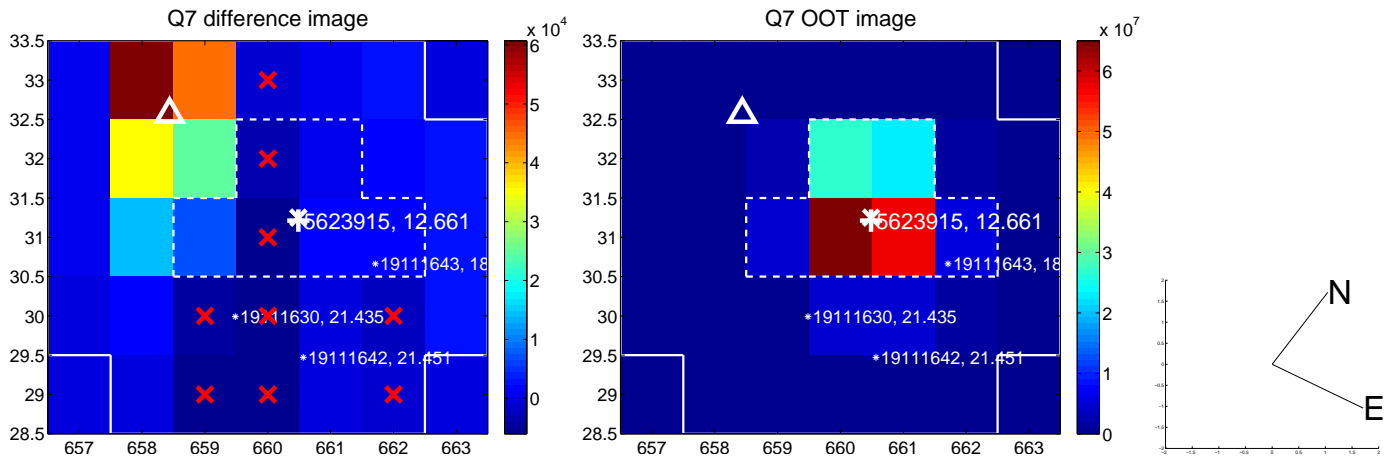
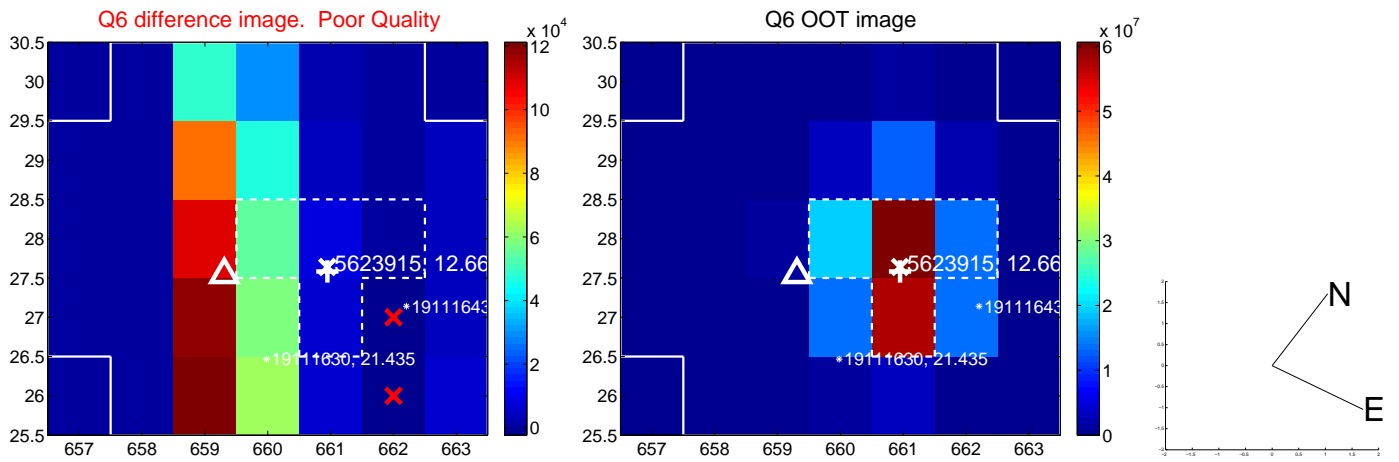
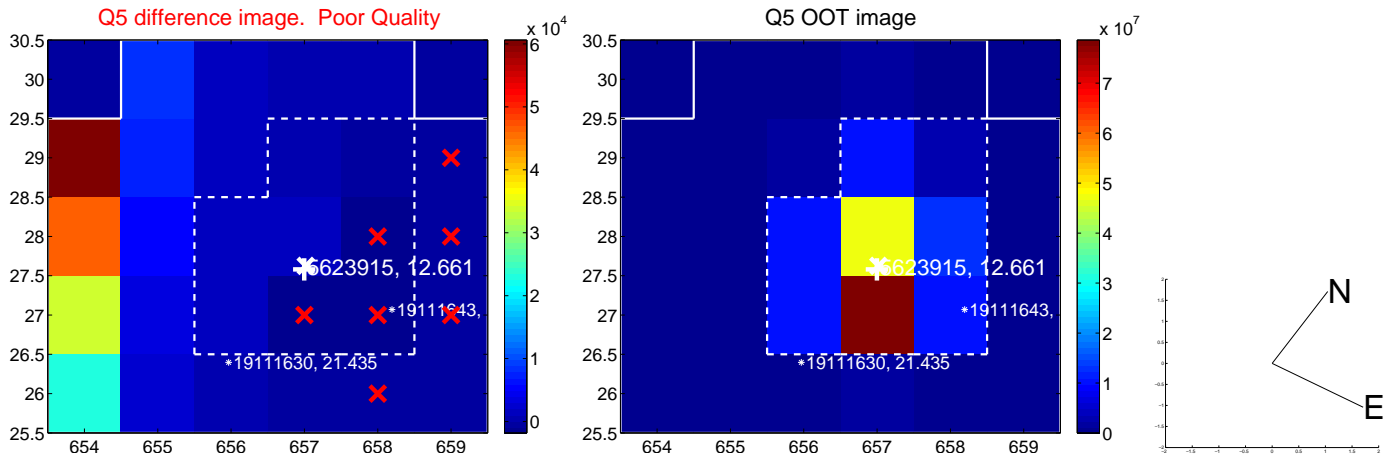


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

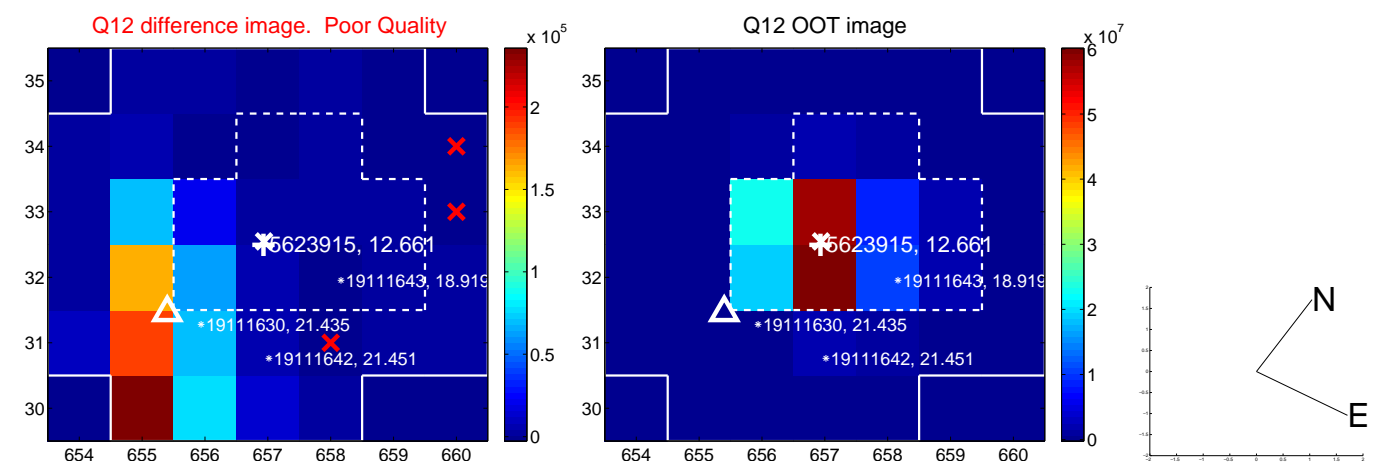
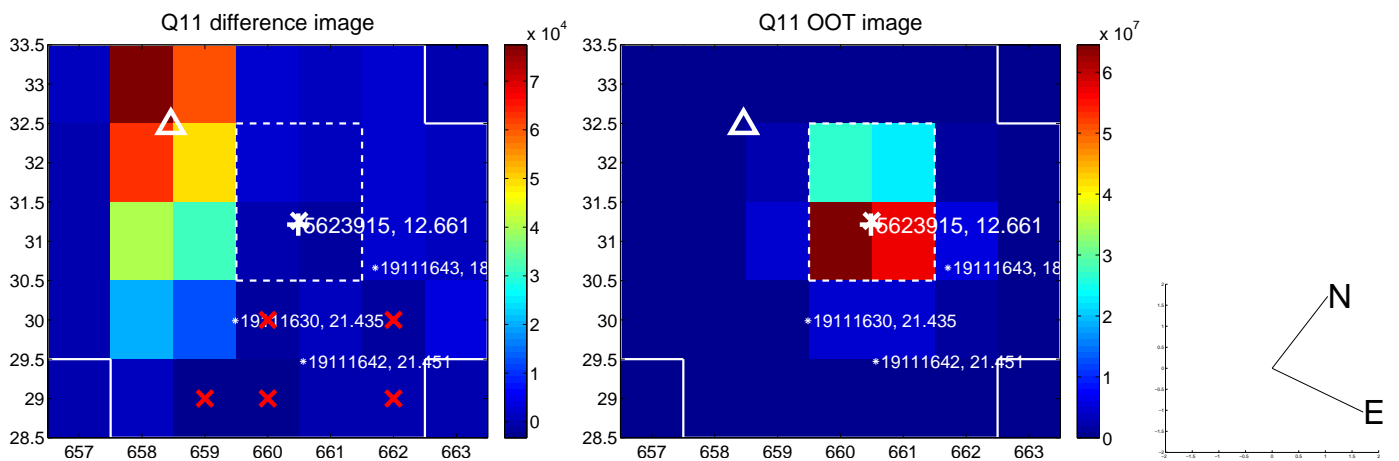
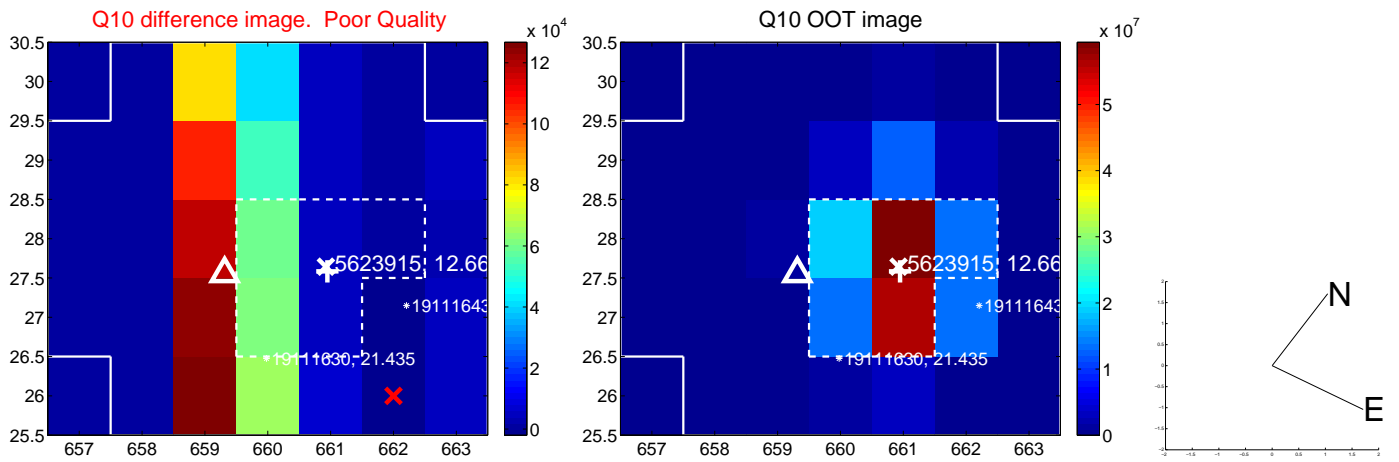
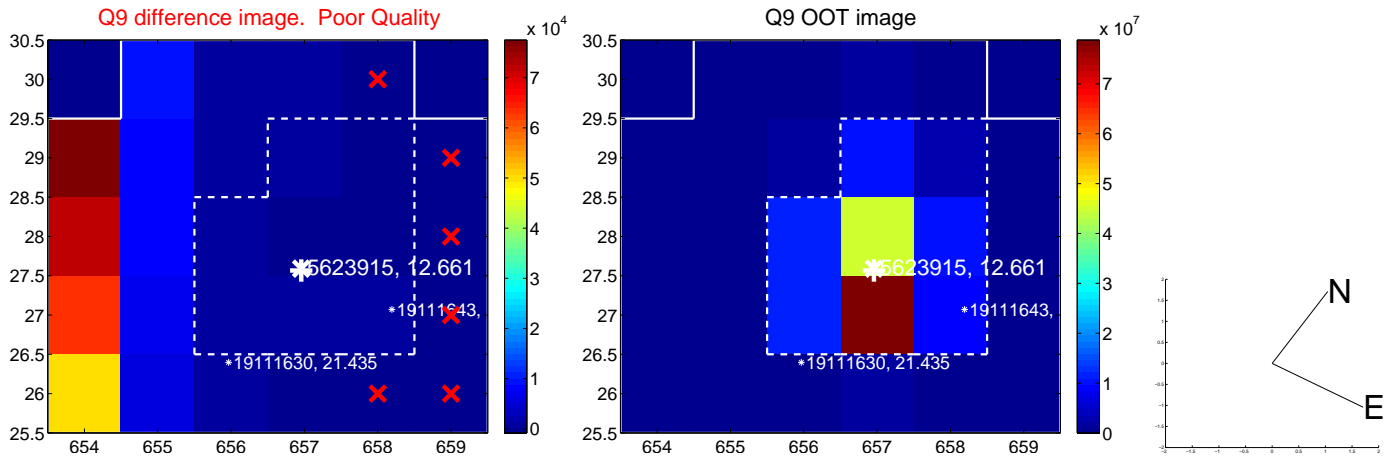
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



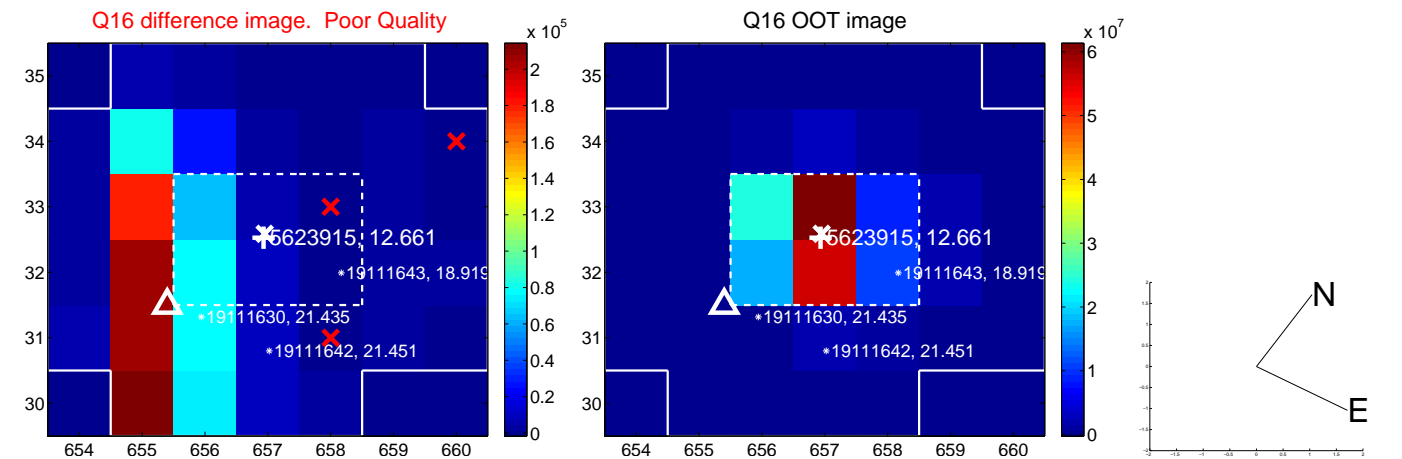
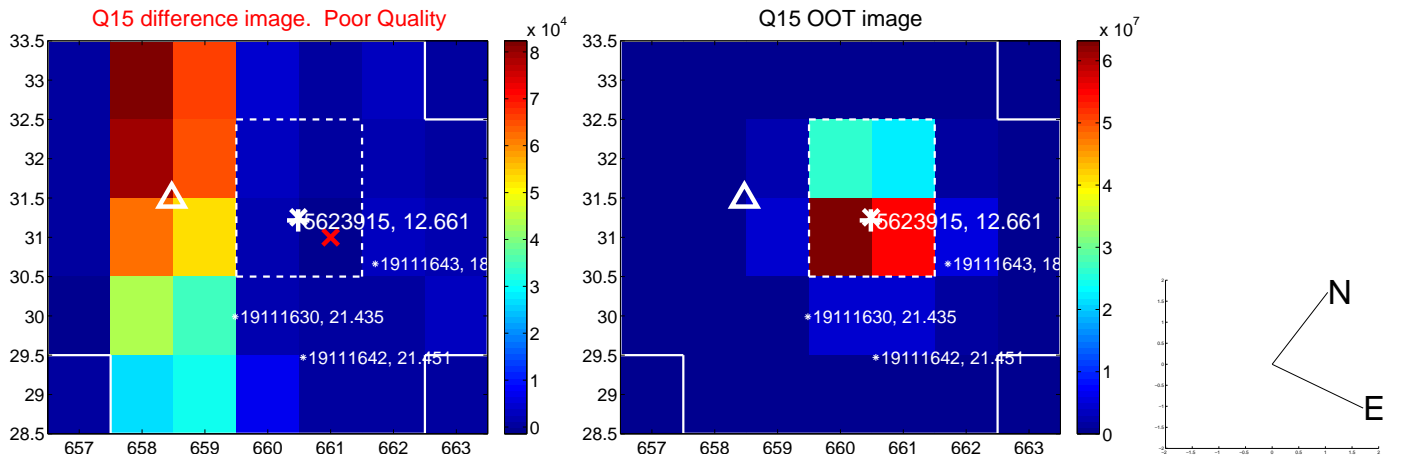
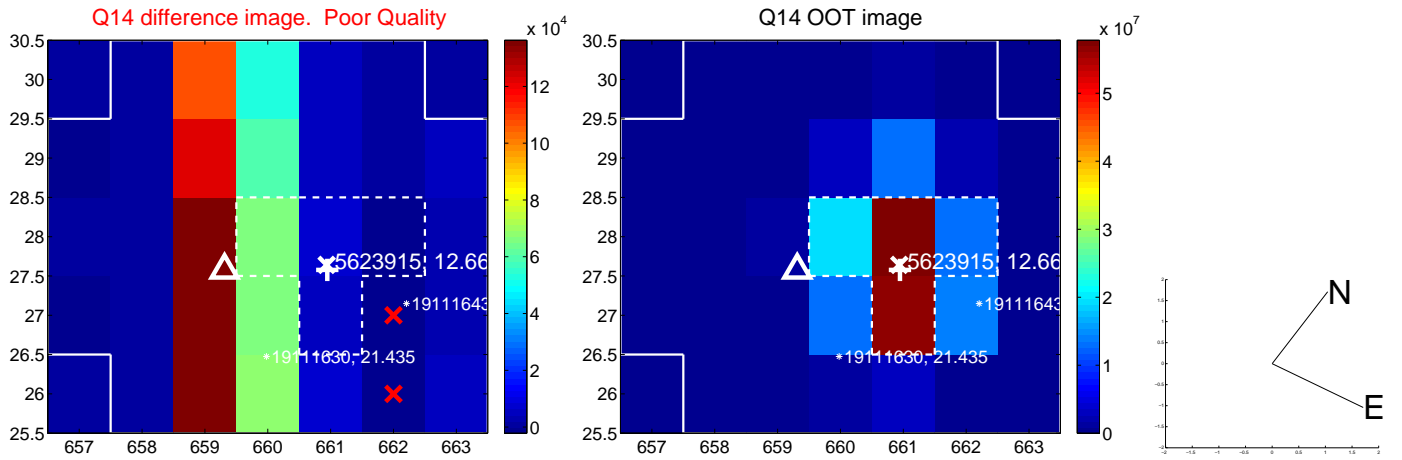
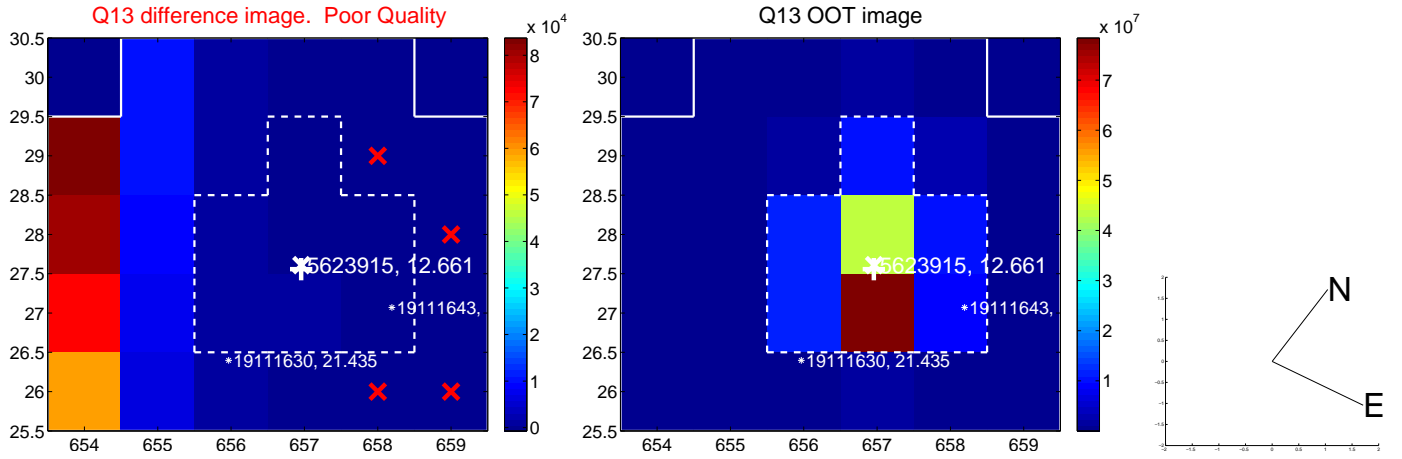
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



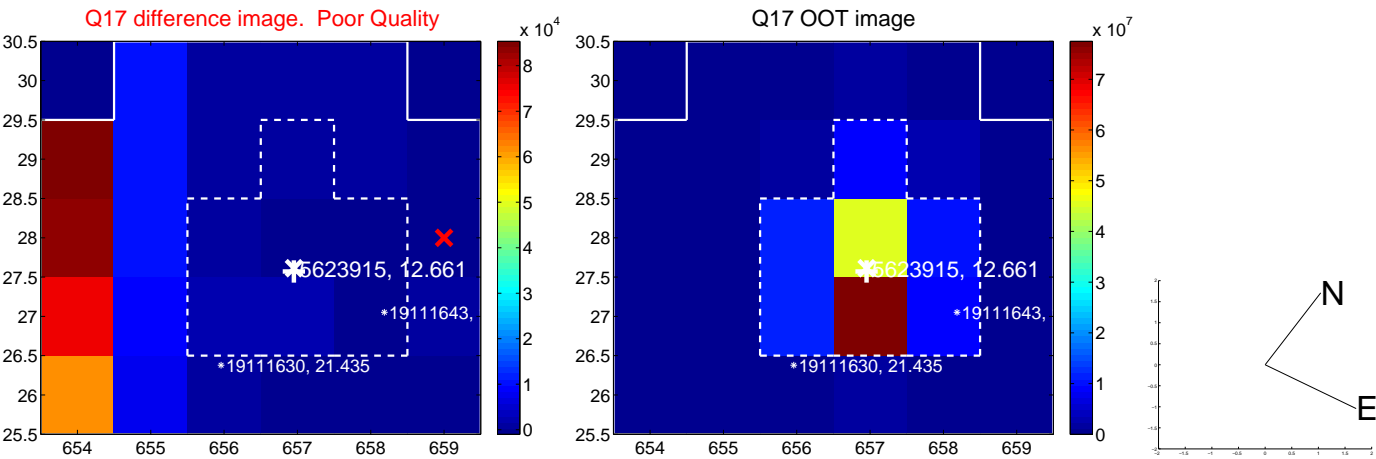
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



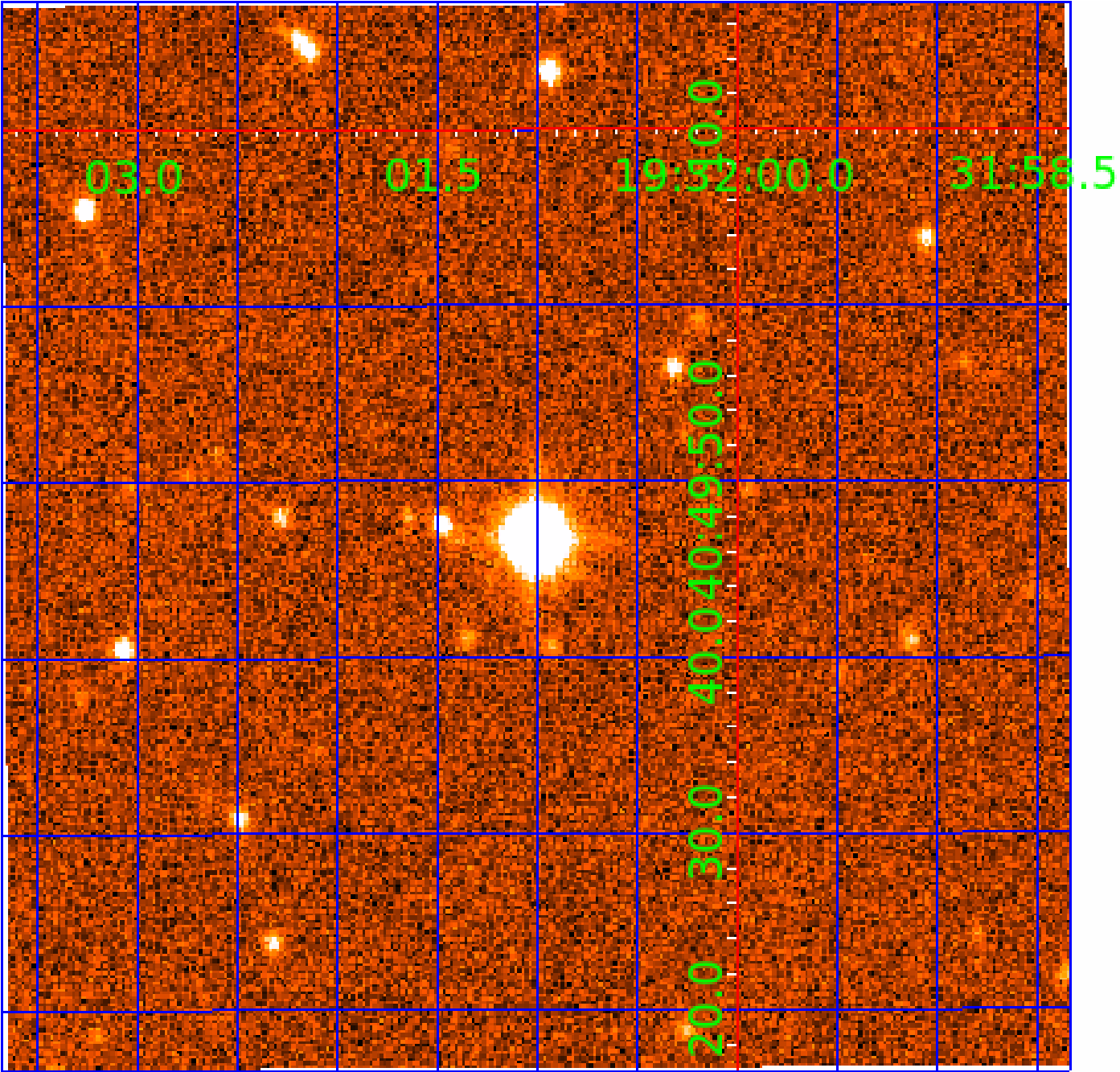
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



KIC 005623915

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005623915-01 | OBS | No | 1.133623 | 132.363350 | 17.1 | 3.888 | 12.5 | 10.1 | 1.15 | 6075 | 0.56 | 3583.05 |
| 005623915-02 | OBS | No | 1.133613 | 131.846955 | 11.9 | 5.992 | 13.5 | 8.5 | 1.15 | 6075 | 0.41 | 3583.09 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 005623915-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 1 | SWEET_NTL—LPP_DV—LPP_ALT—CENT_CROWDED—HALO_GHOST—EPHEM_MATCH |
| 005623915-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 1 | SWEET_NTL—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH |

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.

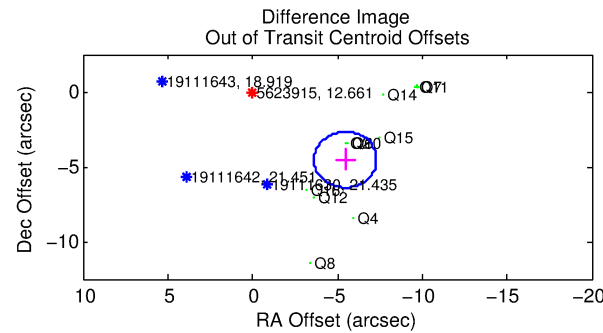
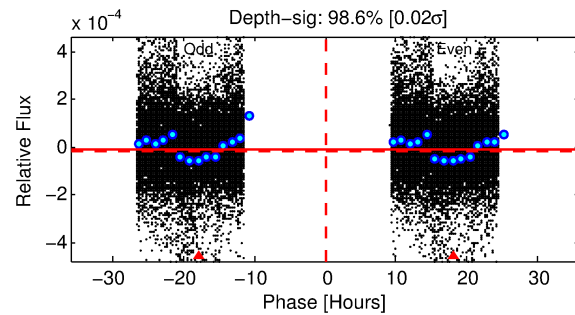
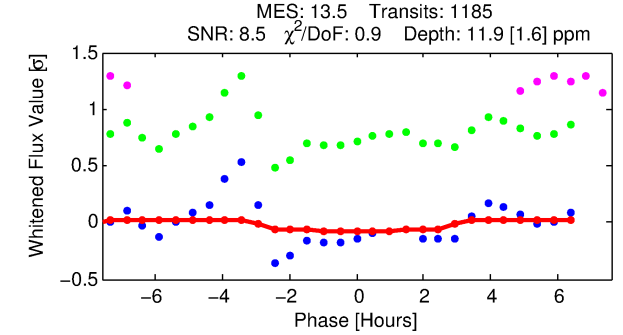
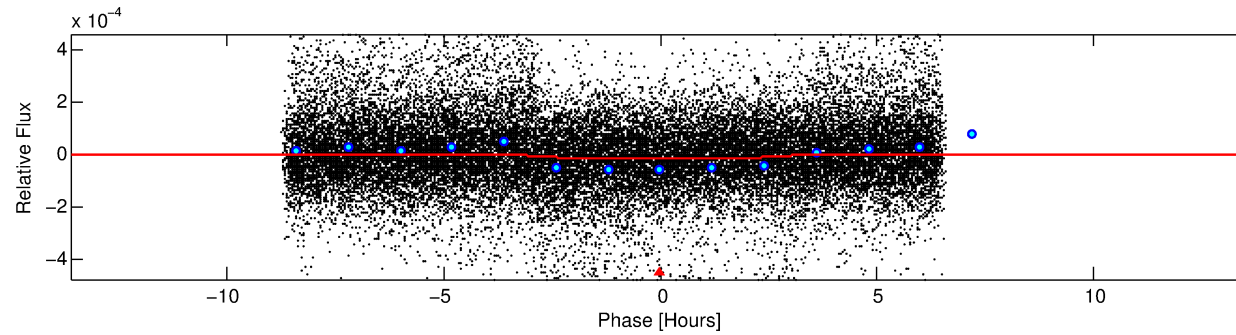
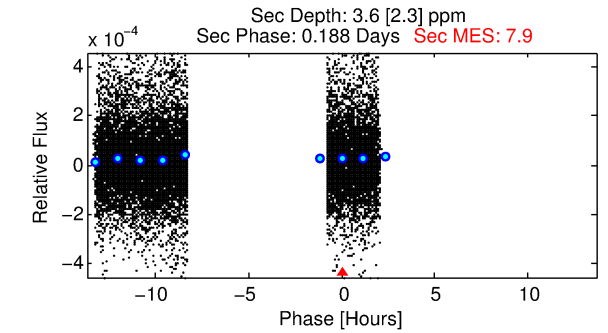
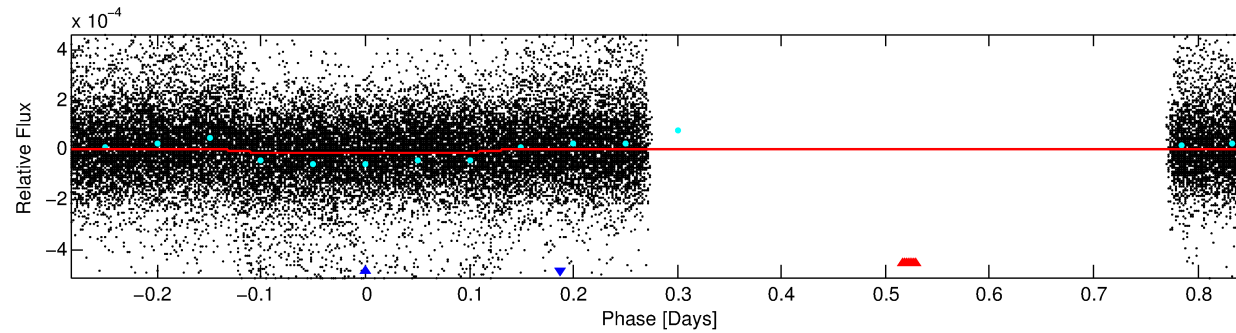
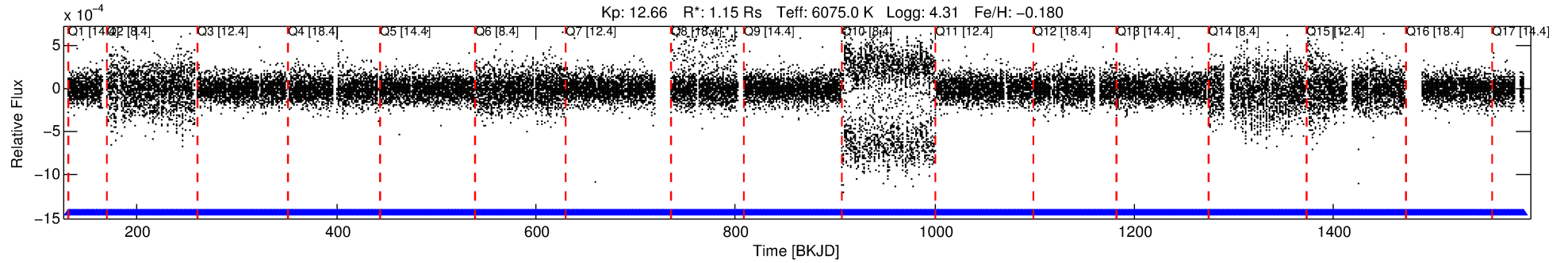
Ephemeris Match Information For 005623915-02

| TCE (1) | KIC | Parent (2) | Parent KIC | $P_1:P_2$ | Dist (μ) | Δ Row | Δ Col | m_2 | m_1 | D_2/D_1 | Mechanism | Flag | σ_P | σ_T |
|--------------|---------|------------|------------|-----------|----------------|--------------|--------------|-------|-------|-----------|-------------|------|------------|------------|
| 005623915-02 | 5623915 | RR-Lyr-pri | 7198959 | 2:1 | 8296.2 | -21 | 1 | 7.86 | 12.66 | 51941.00 | Col-Anomaly | 0 | 3.53 | 17.16 |

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 5623915 Candidate: 2 of 2 Period: 1.134 d



DV Fit Results:

Period = 1.13361 [0.00002] d
Epoch = 131.8470 [0.0061] BKJD
Rp/R* = 0.0032 [0.0013]
a/R* = 1.45 [1.52]
b = 0.49 [3.05]
Seff = 3583.09 [816.02]
Teq = 1973 [112] K
Rp = 0.41 [0.18] Re
a = 0.0212 [0.0031] AU
Ag = 5.43 [5.74] [0.77σ]
Teffp = 4656 [1204] K [2.22σ]

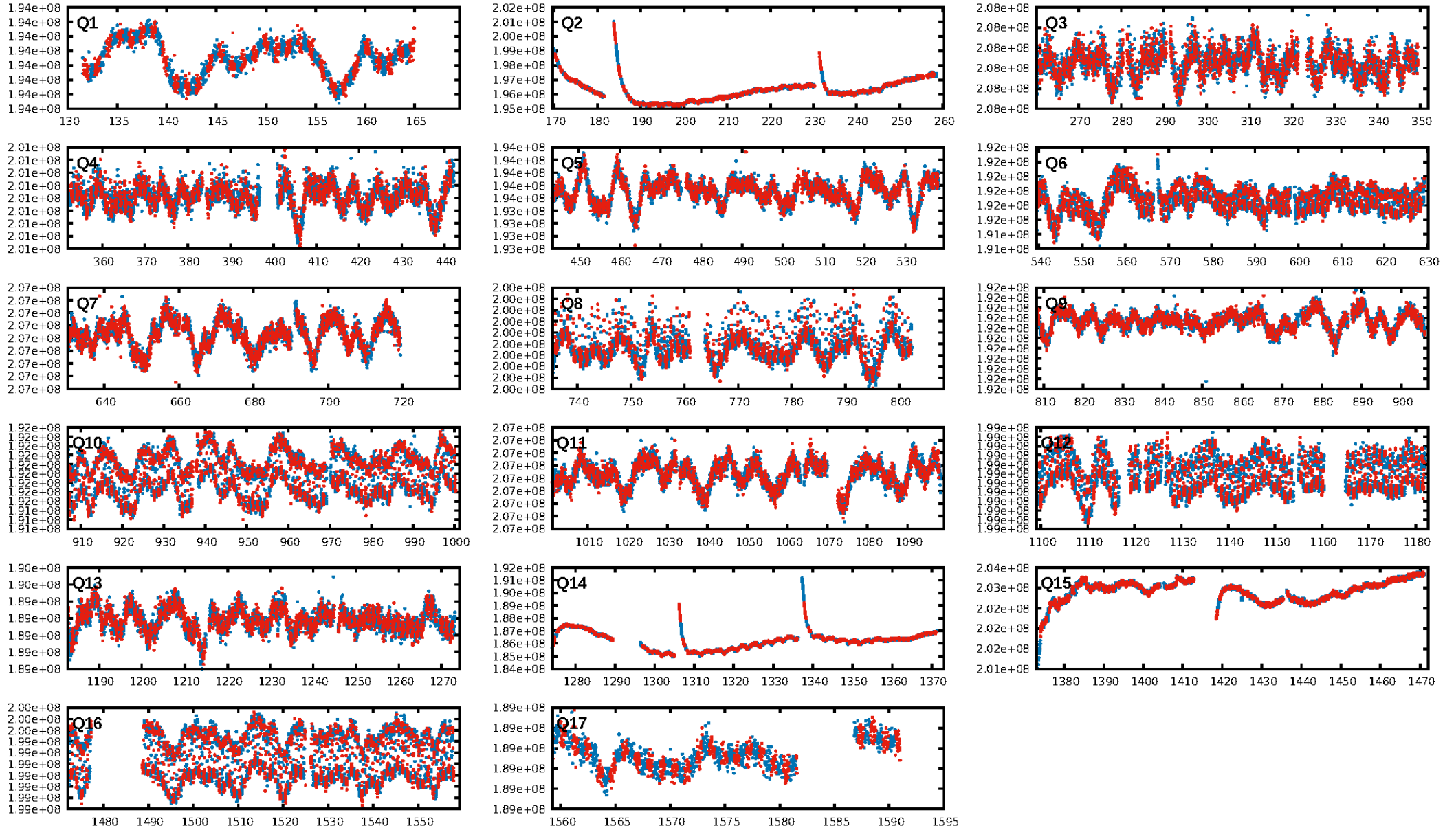
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1132/1132]
GhostDiagnostic-chr: -0.02011
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: 7.095 arcsec [11.48σ]
KicOffset-rm: 7.262 arcsec [12.14σ]
OotOffset-st: 4/3/4/0 [11]
KicOffset-st: 4/3/4/0 [11]
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DiffImageOverlap-fno: 0.00 [0/17]

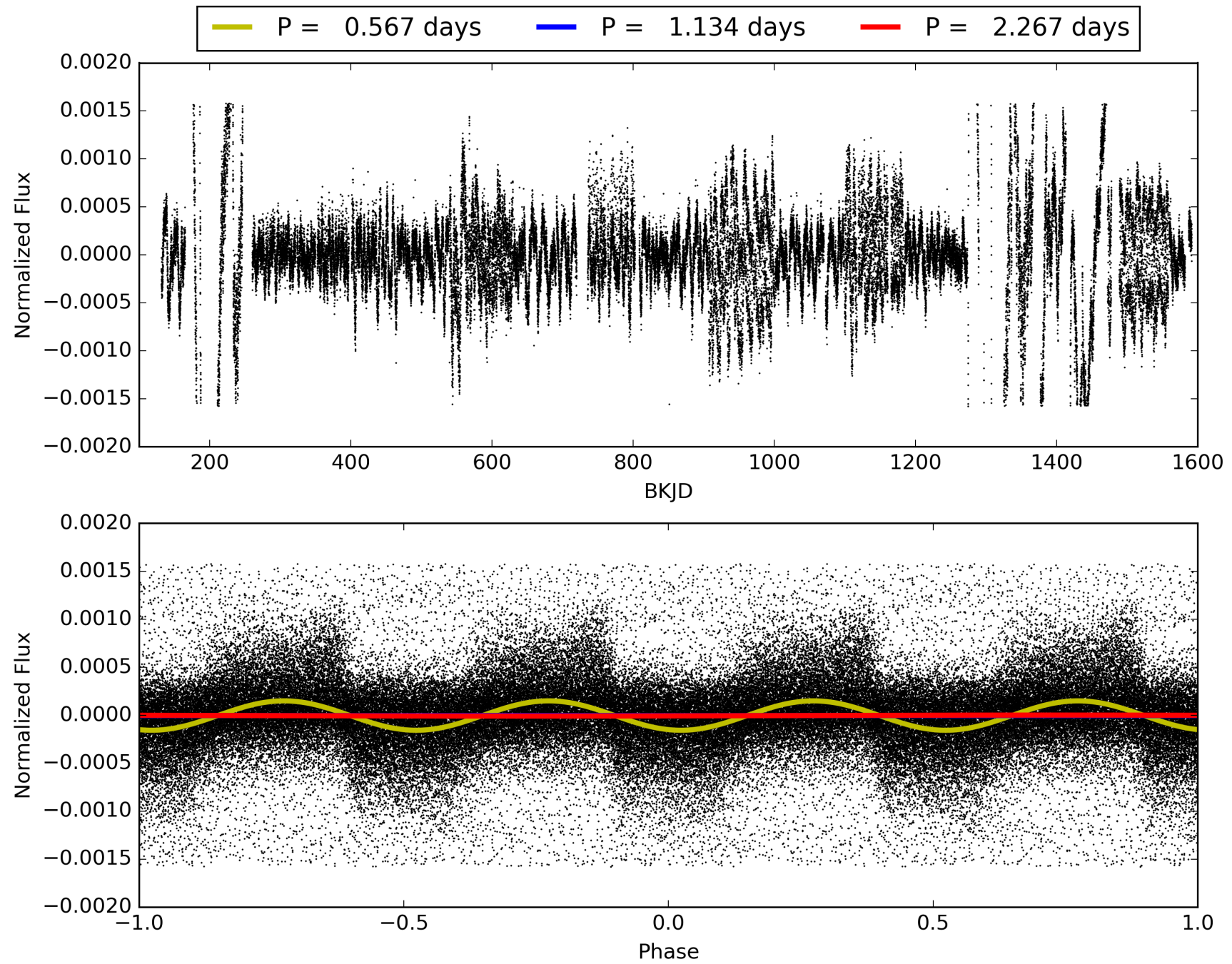
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:20:58 Z

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

TCE 005623915-02, PDC Light Curves

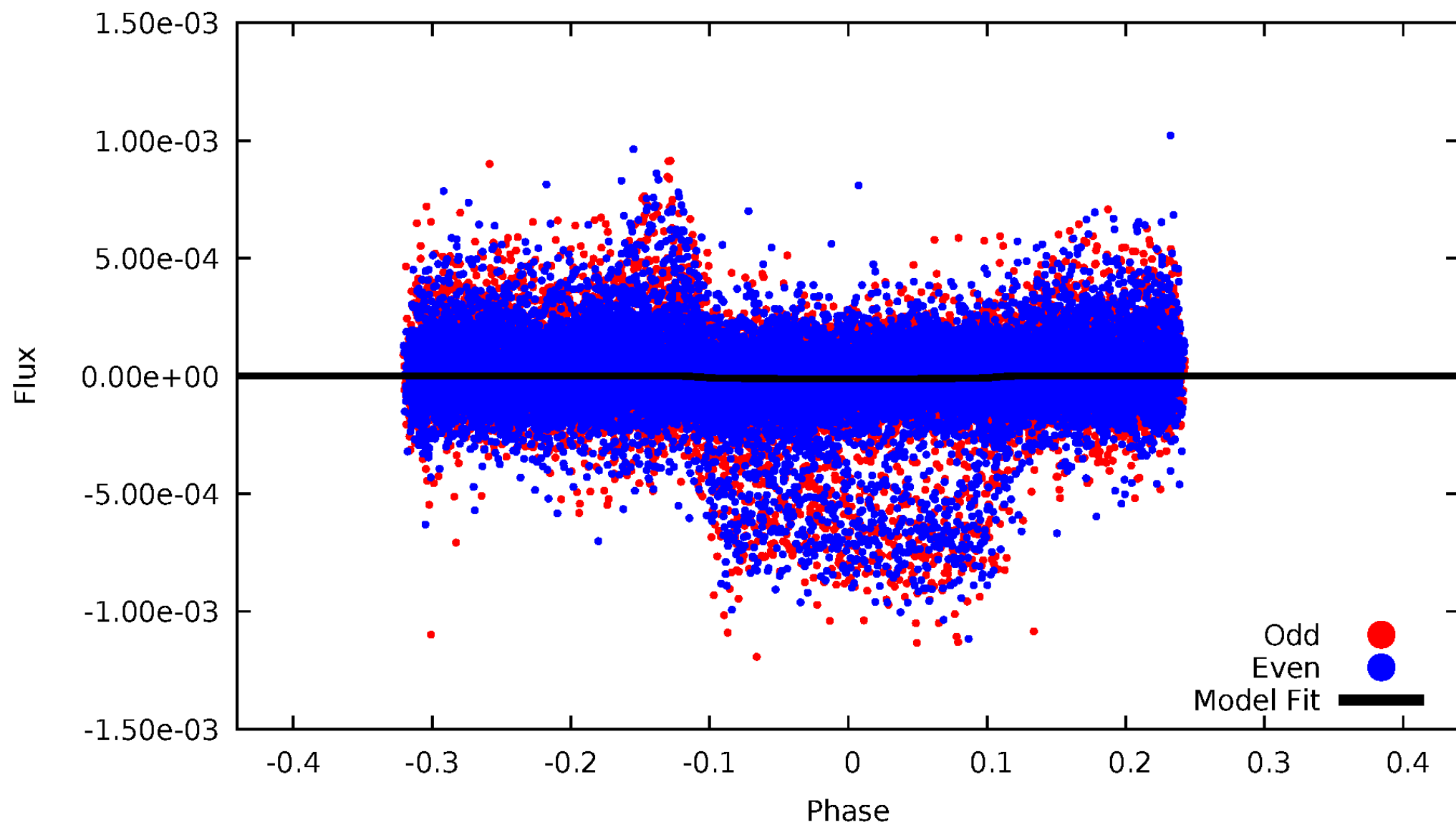


TCE 005623915-02



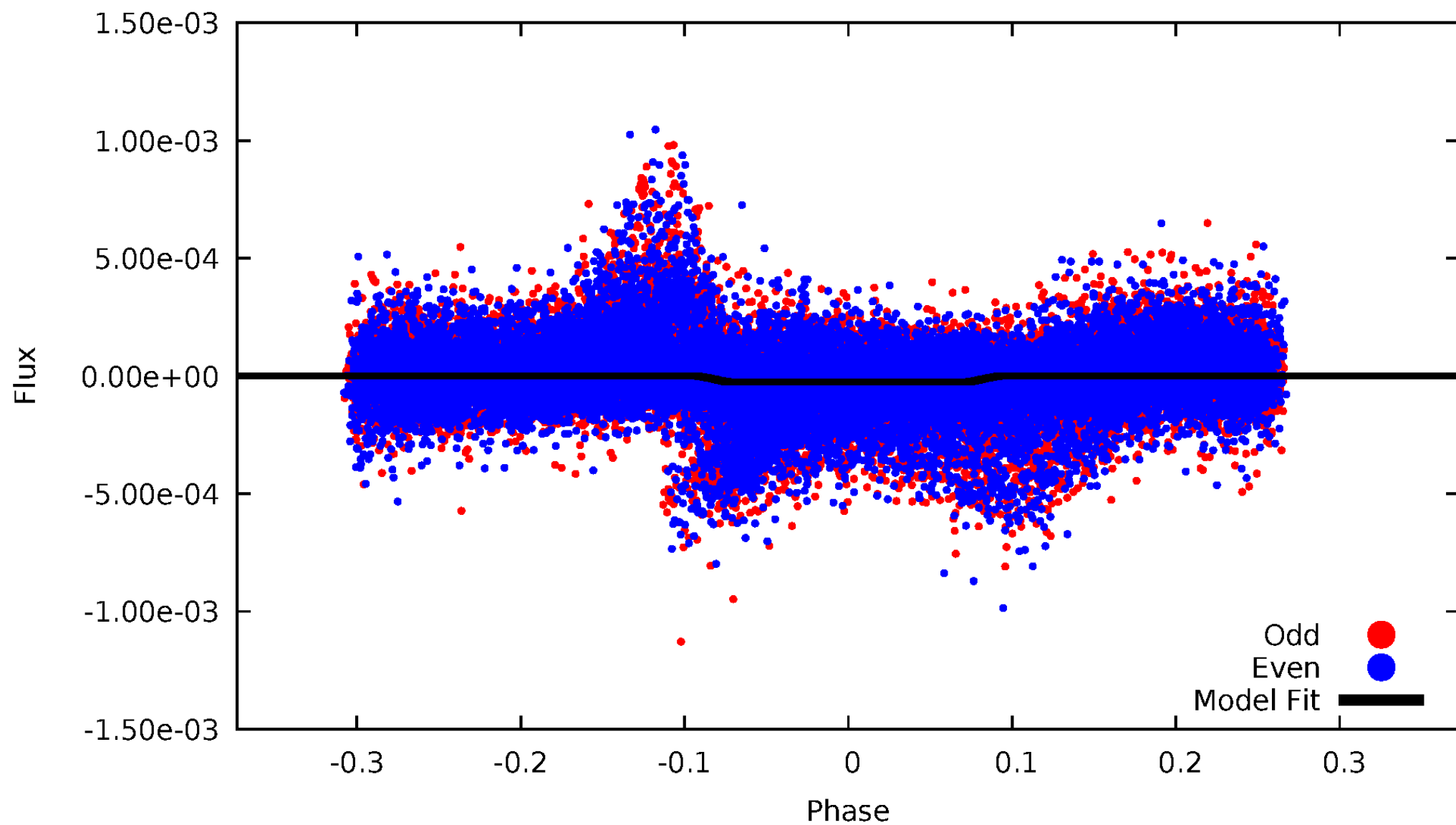
DV Odd/Even

TCE 005623915-02



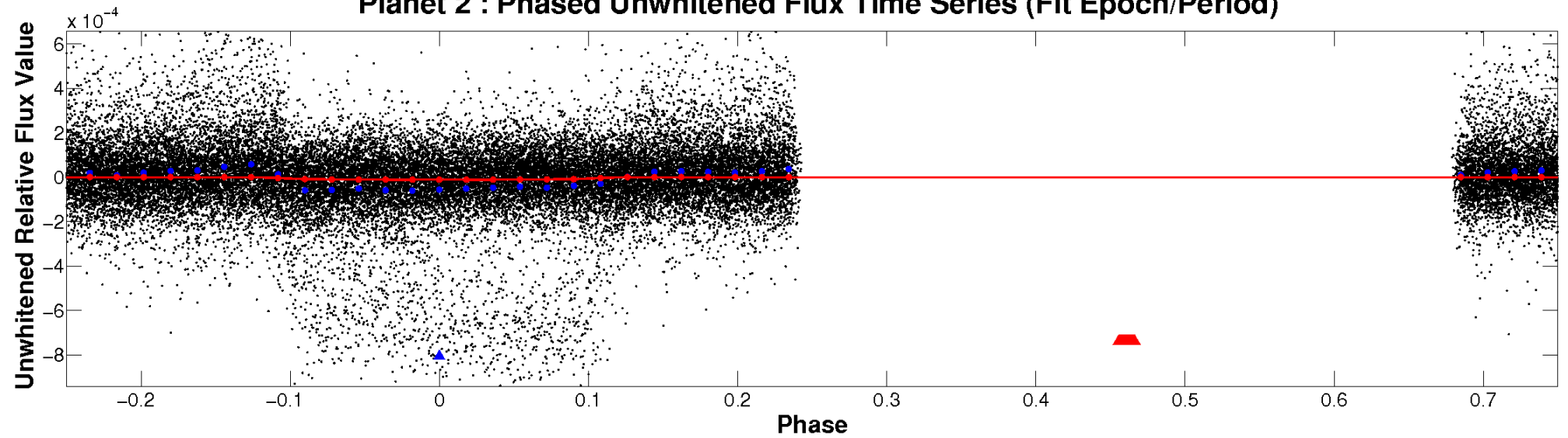
ALT Odd/Even

TCE 005623915-02

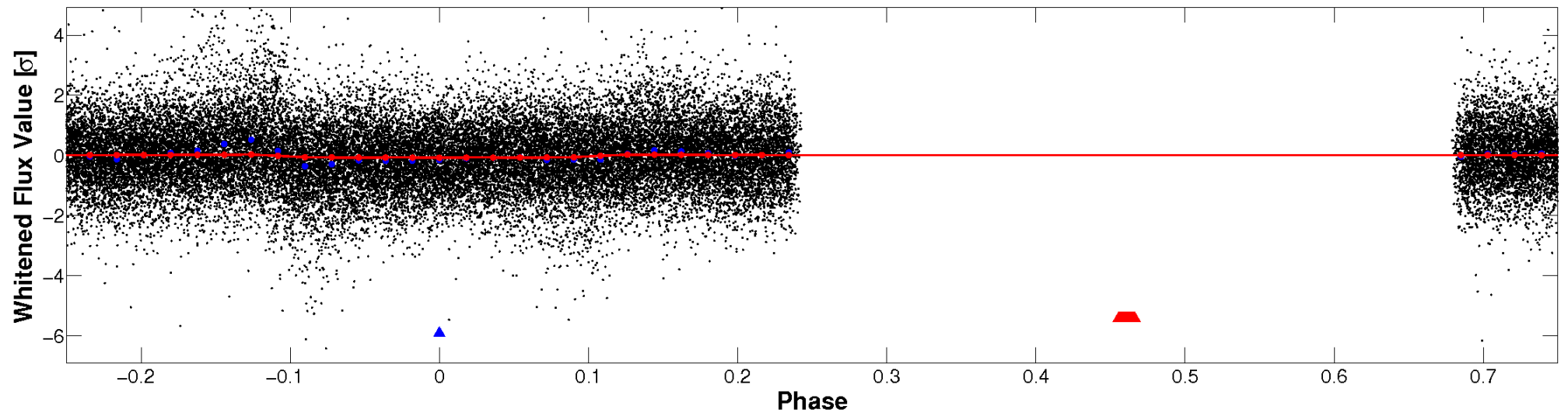


Non-Whitened Vs. Whitened Light Curve

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

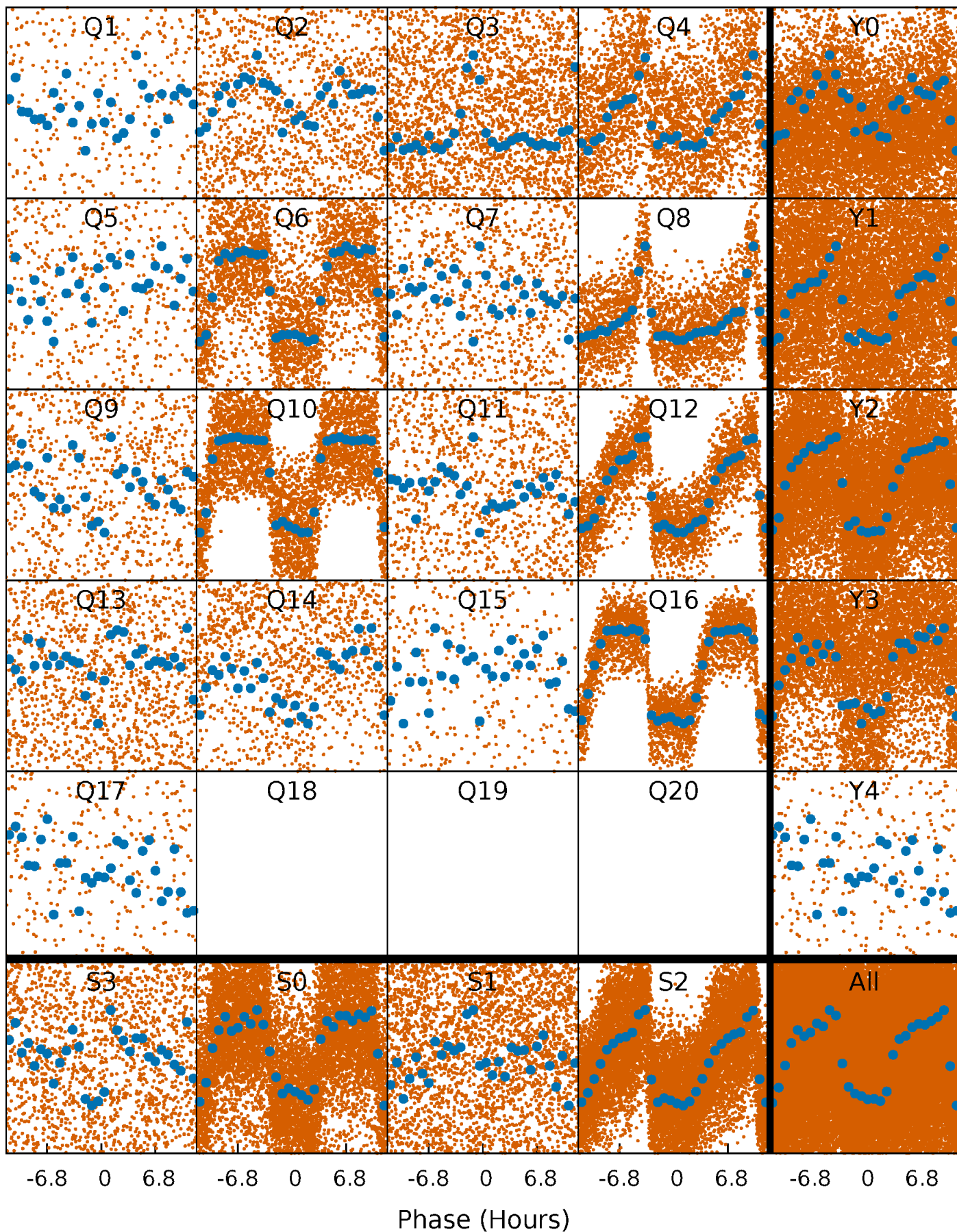


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



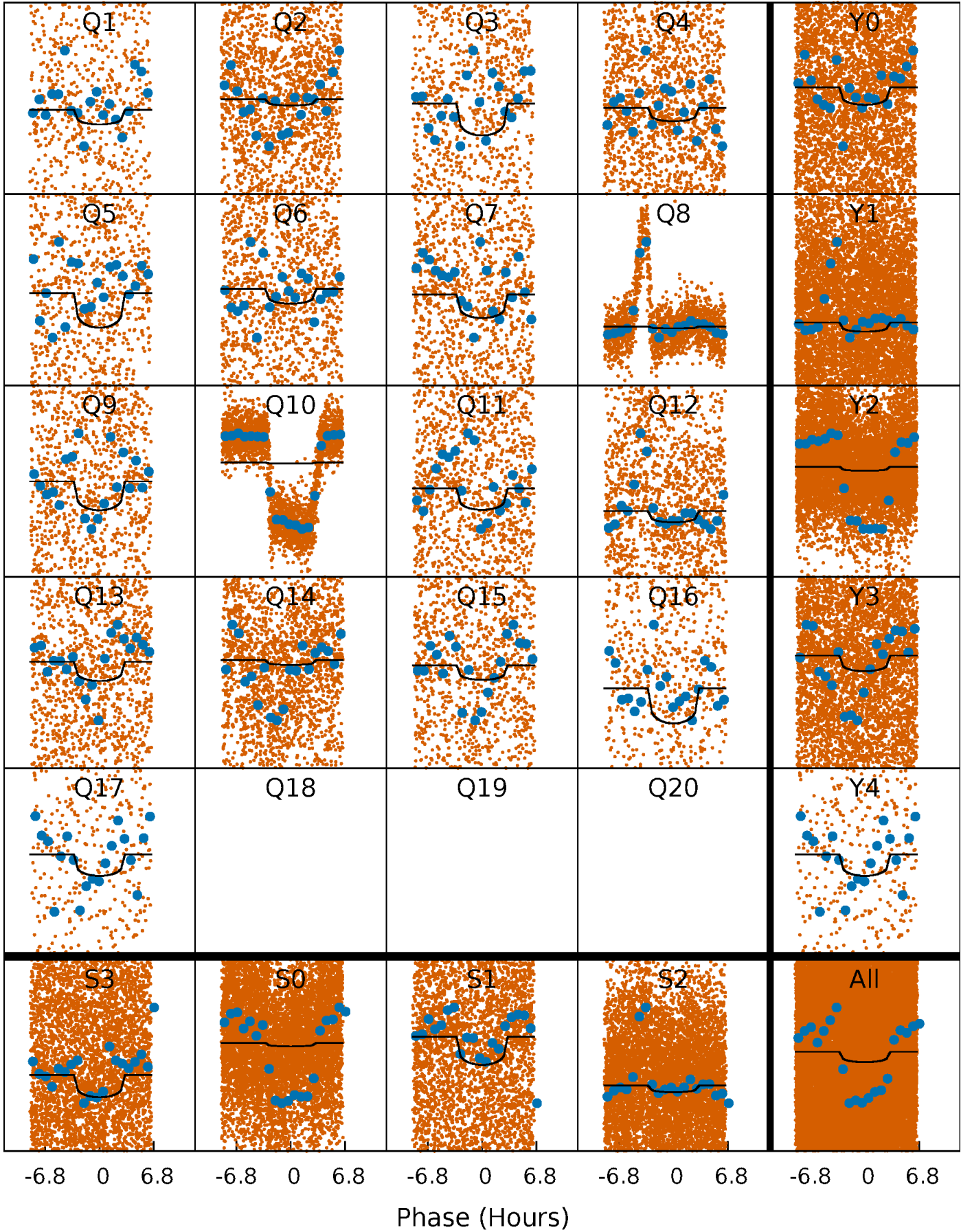
PDC Quarter-Phased Transit Curves

TCE 005623915-02 P= 1.133613 Days $T_0=131.846955$ (BKJD)



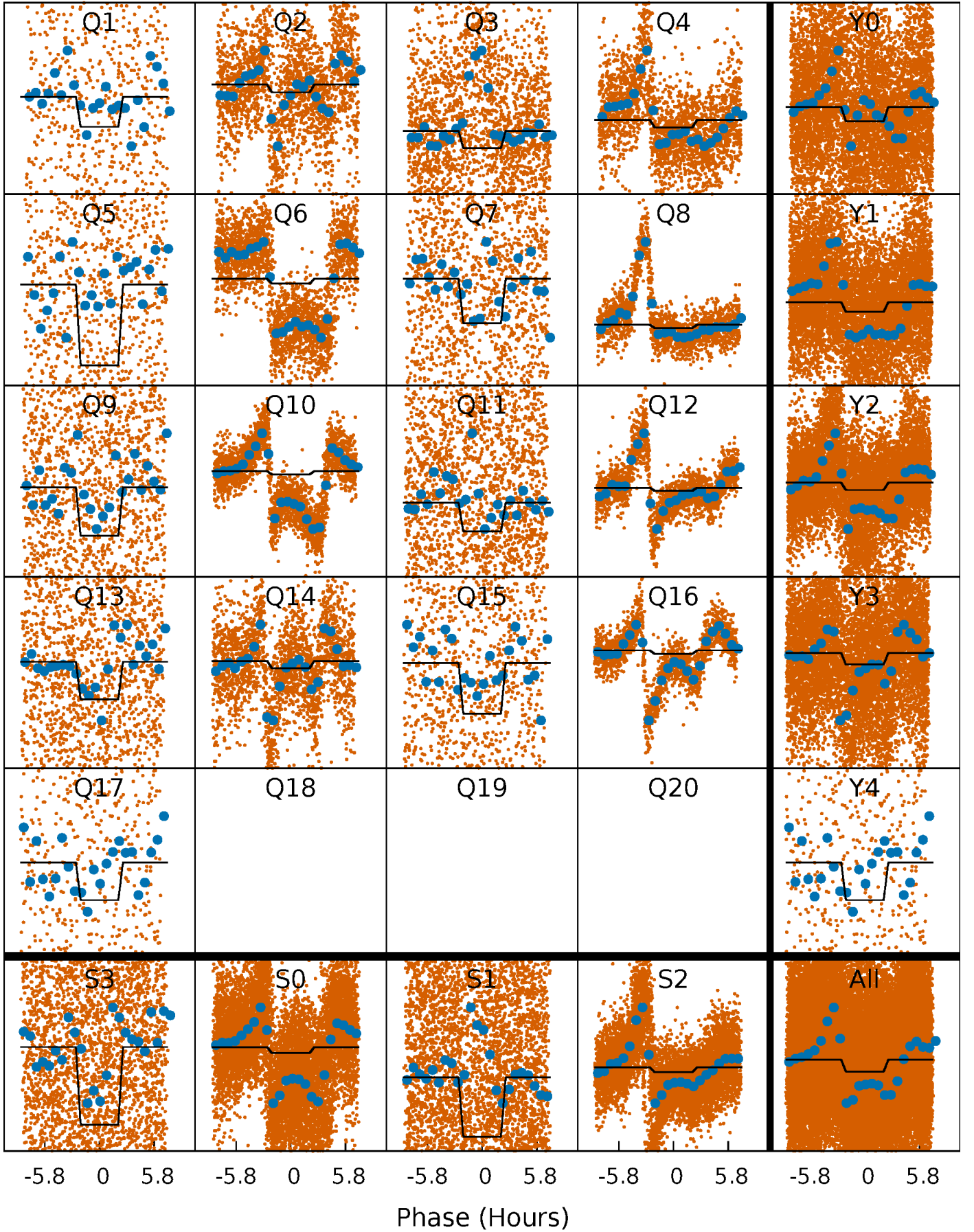
DV Quarter-Phased Transit Curves

TCE 005623915-02 P= 1.133613 Days $T_0=131.846955$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

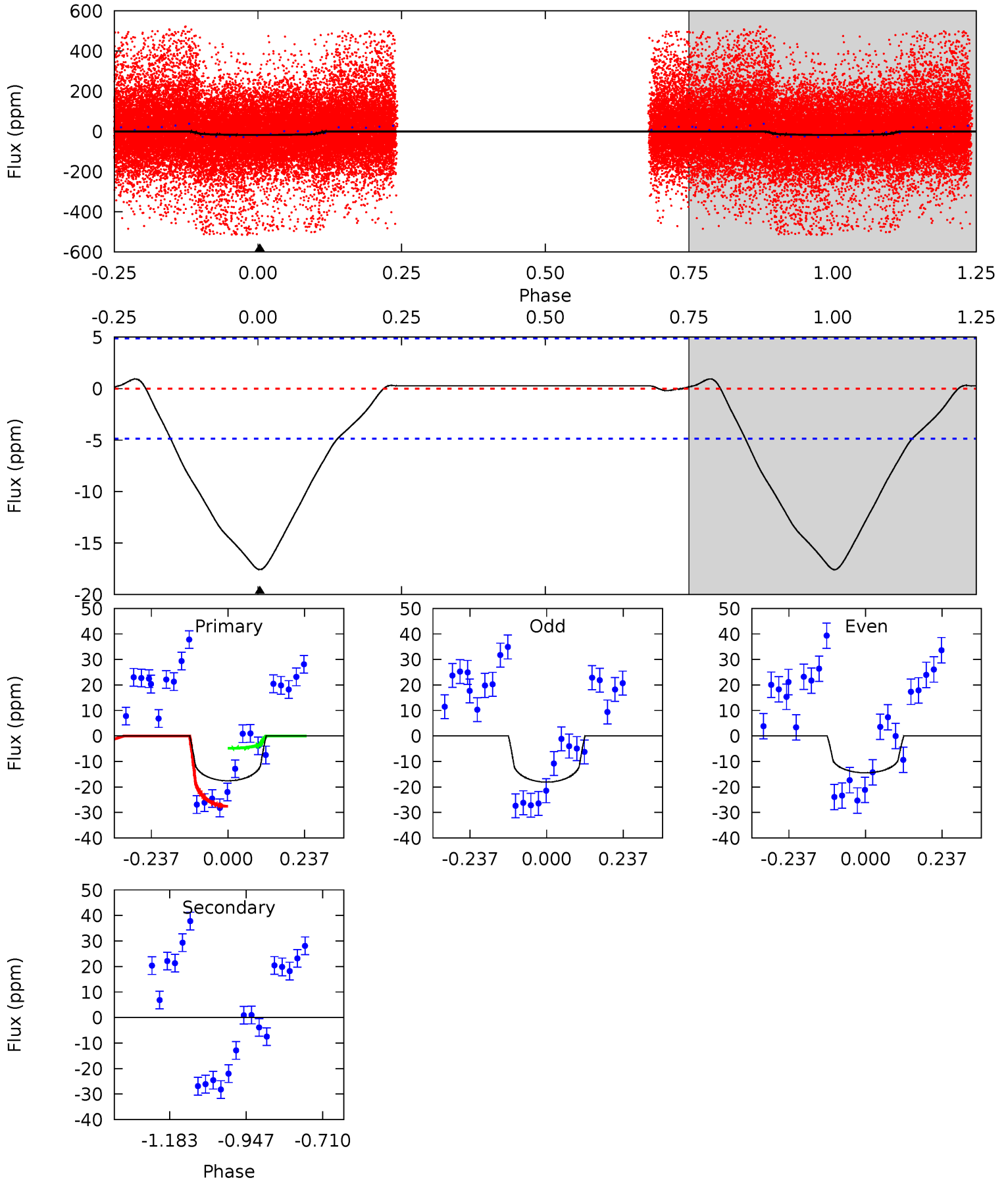
TCE 005623915-02 P= 1.133642 Days $T_0=131.806661$ (BKJD)



DV Model-Shift Uniqueness Test

005623915-02, P = 1.133613 Days, E = 130.713342 Days

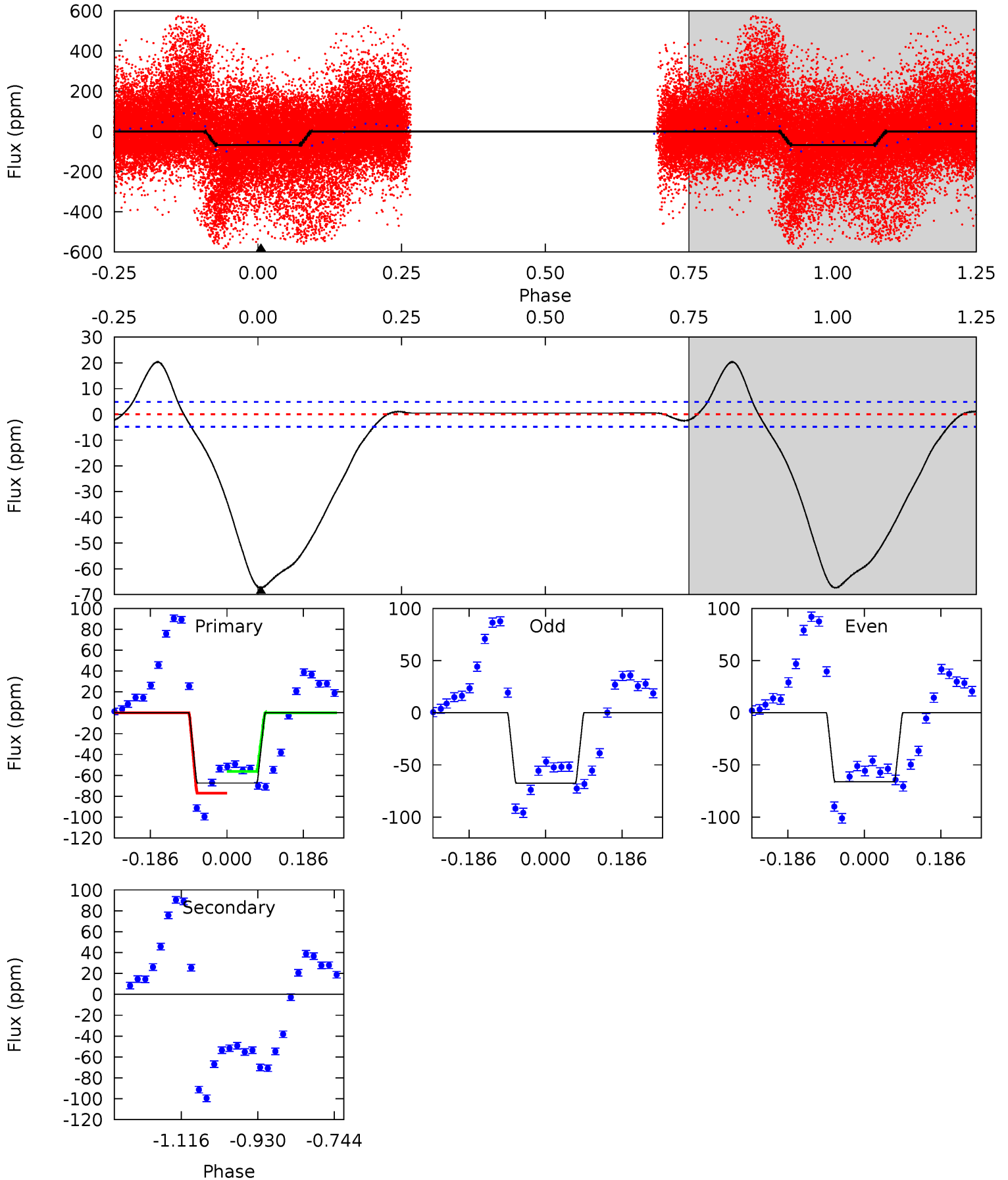
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 15.8 | 0 | 0 | 0 | 4.38 | 1.18 | 0.16 | 15.8 | 15.8 | 0 | 0 | 1.66 | 5.07 | 0.05 | 10.2 |



Alt Model-Shift Uniqueness Test

005623915-02, P = 1.133642 Days, E = 130.673019 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 62.0 | 0 | 0 | 0 | 4.43 | 1.32 | 5.74 | 62.0 | 62.0 | 0 | 0 | 0.63 | 1.67 | 0.23 | 9.36 |



Stellar Parameters For KIC 005623915

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|---------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6075^{+82}_{-82} | $4.313^{+0.125}_{-0.112}$ | $-0.180^{+0.150}_{-0.150}$ | $1.150^{+0.190}_{-0.156}$ | $0.991^{+0.072}_{-0.058}$ | $0.918^{+0.492}_{-0.321}$ |
| | +1%/-1% | +3%/-3% | +83%/-83% | +17%/-14% | +7%/-6% | +54%/-35% |
| Source | SPE68 | SPE68 | SPE68 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 005623915-02 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-------------|------------------------|----------------------|-------------------------|---------------------------|
| DV | 0 ± 1 | $0.42^{+0.17}_{-0.17}$ | 2757^{+114}_{-113} | -2948^{+6690}_{-1053} | $0.013^{+1.731}_{-1.884}$ |
| Alt. | 0 ± 1 | $0.63^{+0.16}_{-0.16}$ | 2758^{+118}_{-117} | -2934^{+6043}_{-627} | $0.012^{+0.739}_{-0.778}$ |

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 $A_{obs} \gg 1.0$

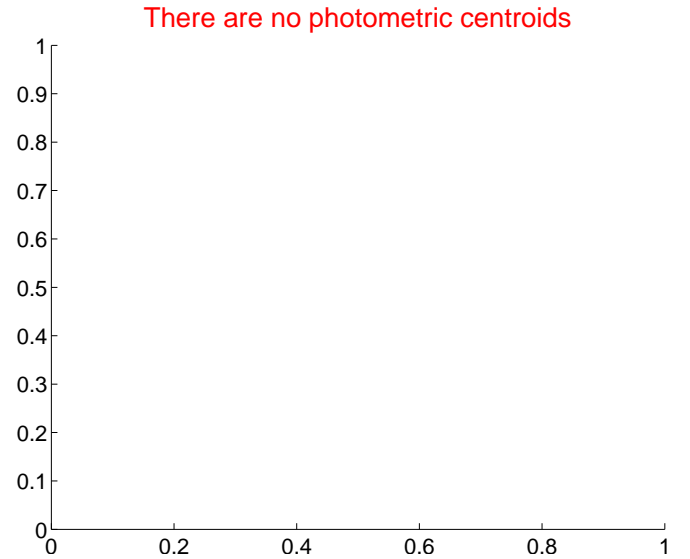
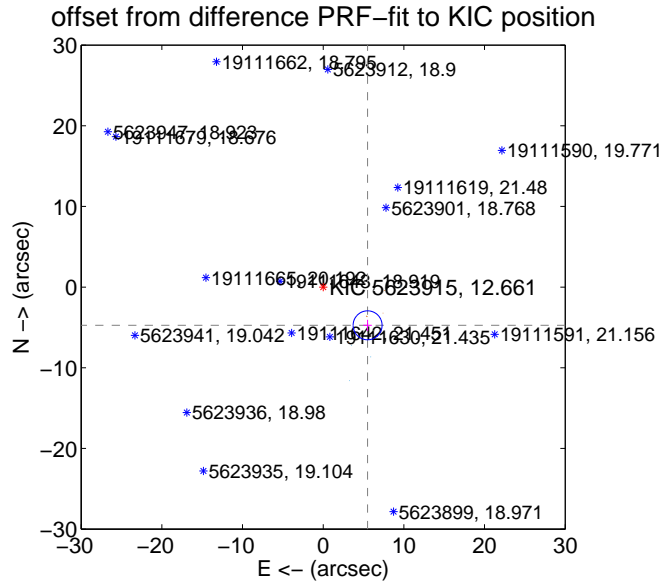
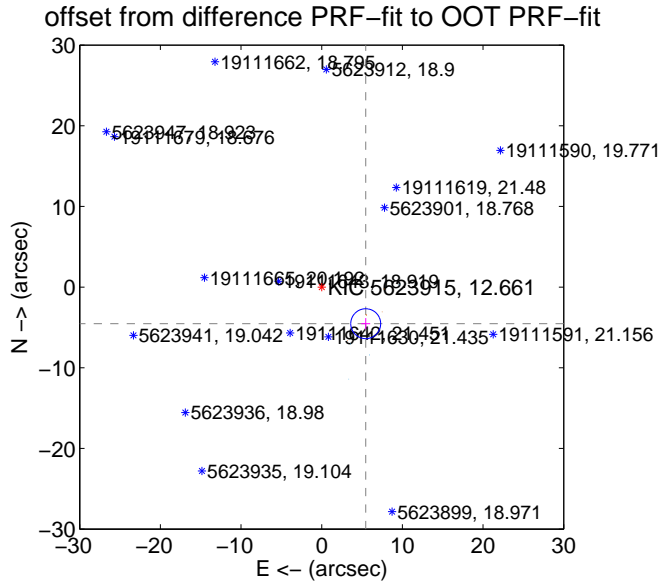
DV Centroid Data

Supplemental centroid analysis for 005623915-02. Kepler magnitude: 12.66. Transit SNR 8.50

There are 5 quarters with good PRF difference image offsets

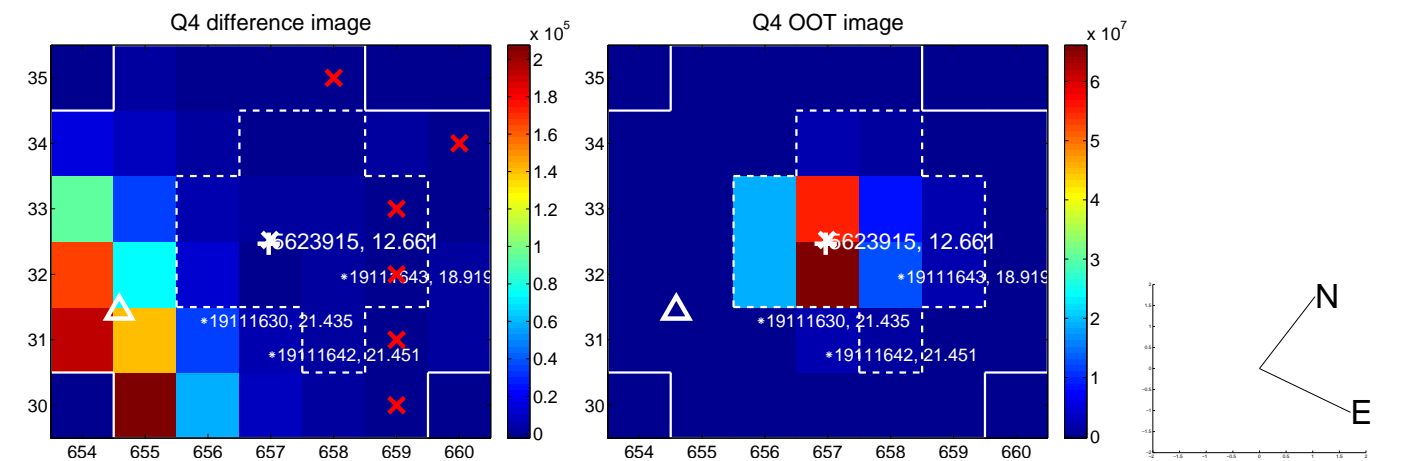
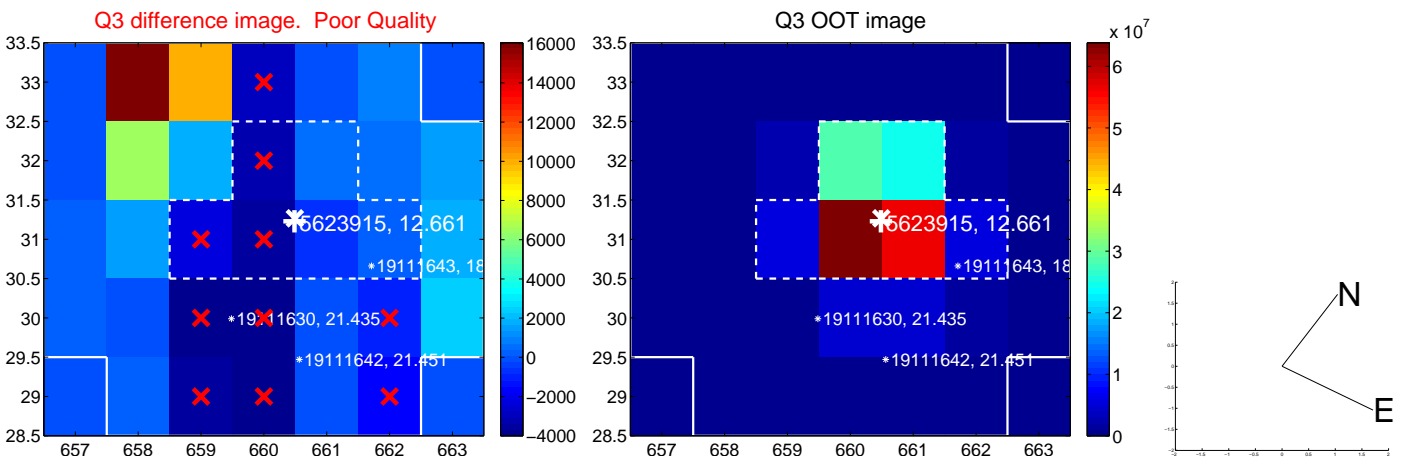
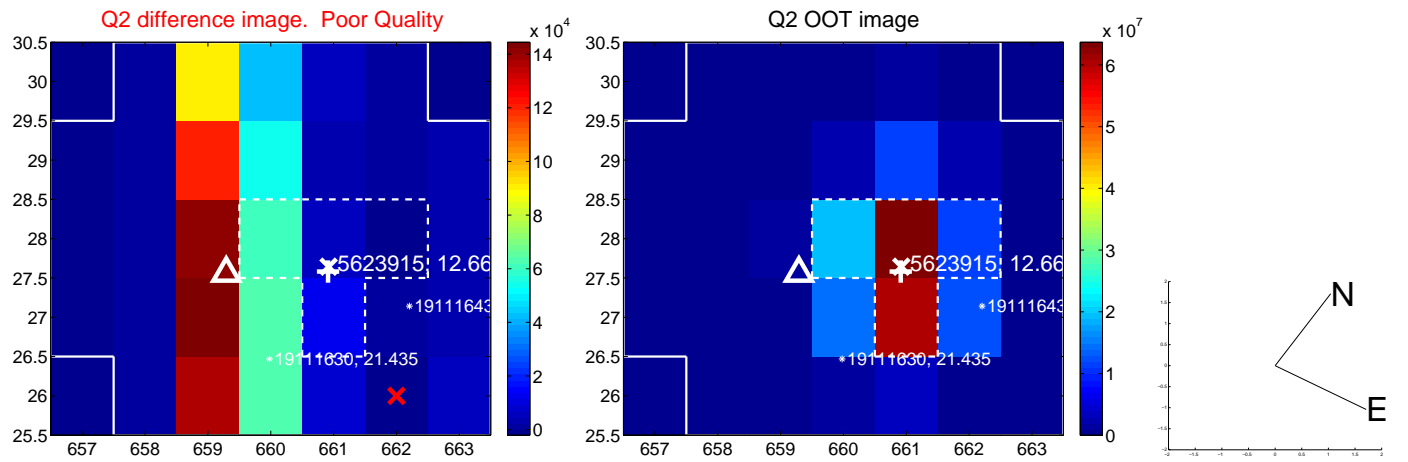
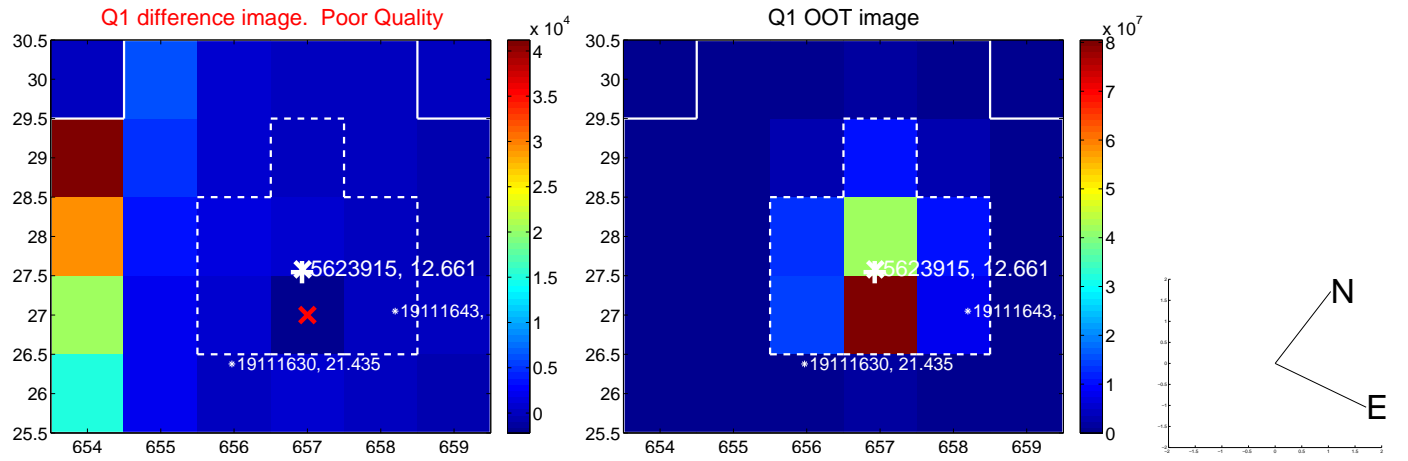
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 7.095 ± 0.618 | 11.48 | -5.455 ± 0.558 | -4.537 ± 0.696 |
| PRF-fit source offset from KIC position | 7.262 ± 0.598 | 12.14 | -5.505 ± 0.522 | -4.737 ± 0.688 |
| photometric centroid source offset | — | — | — | — |

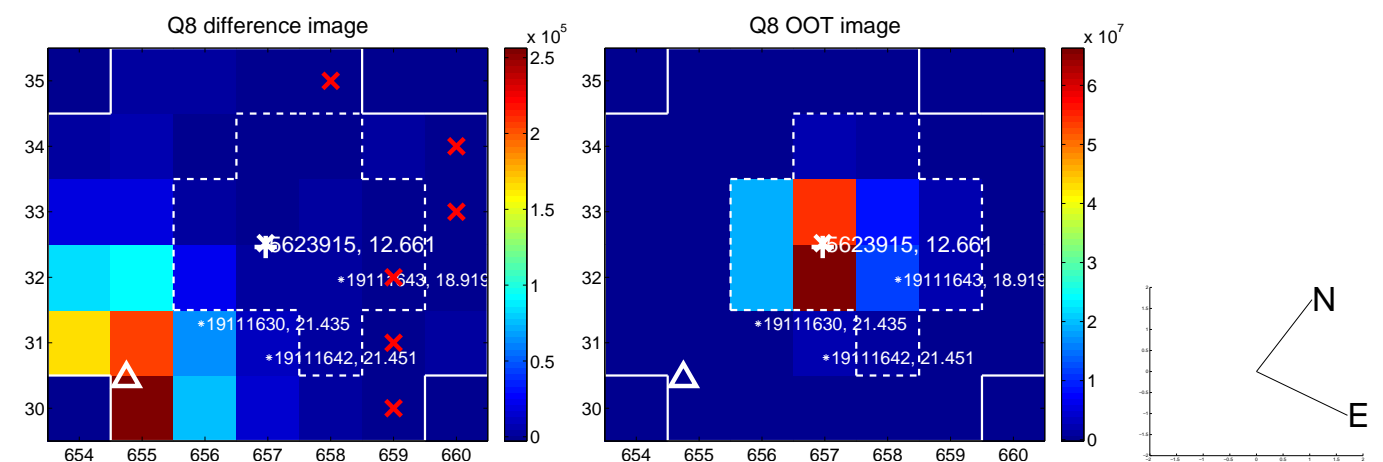
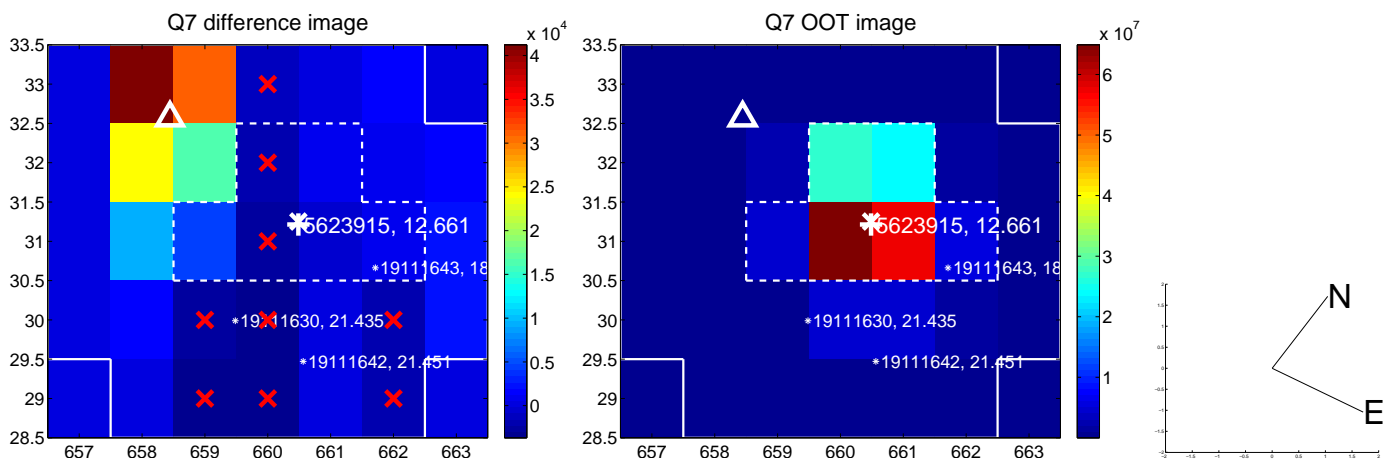
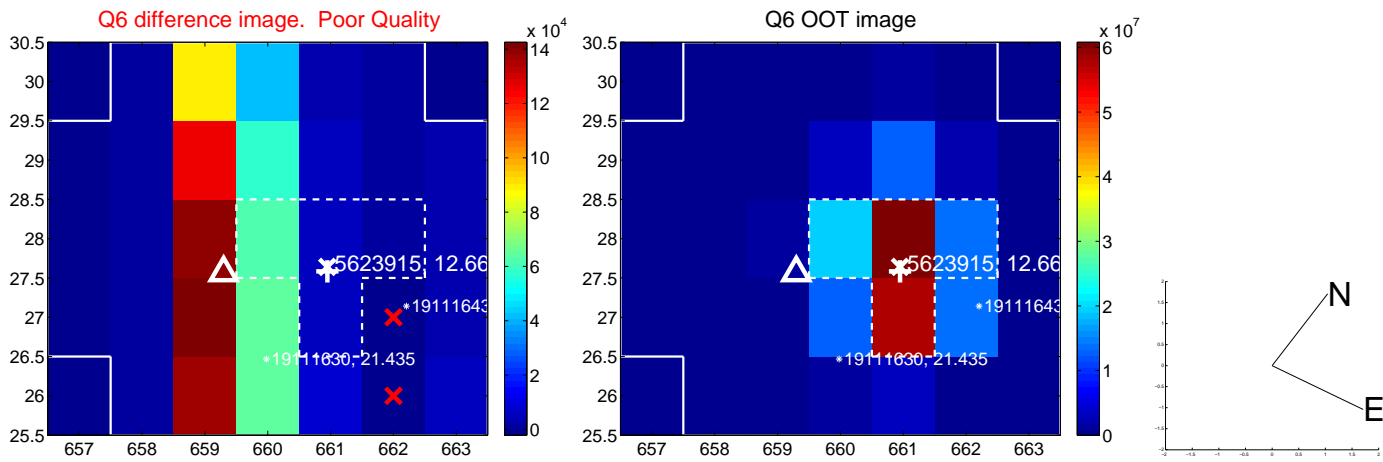
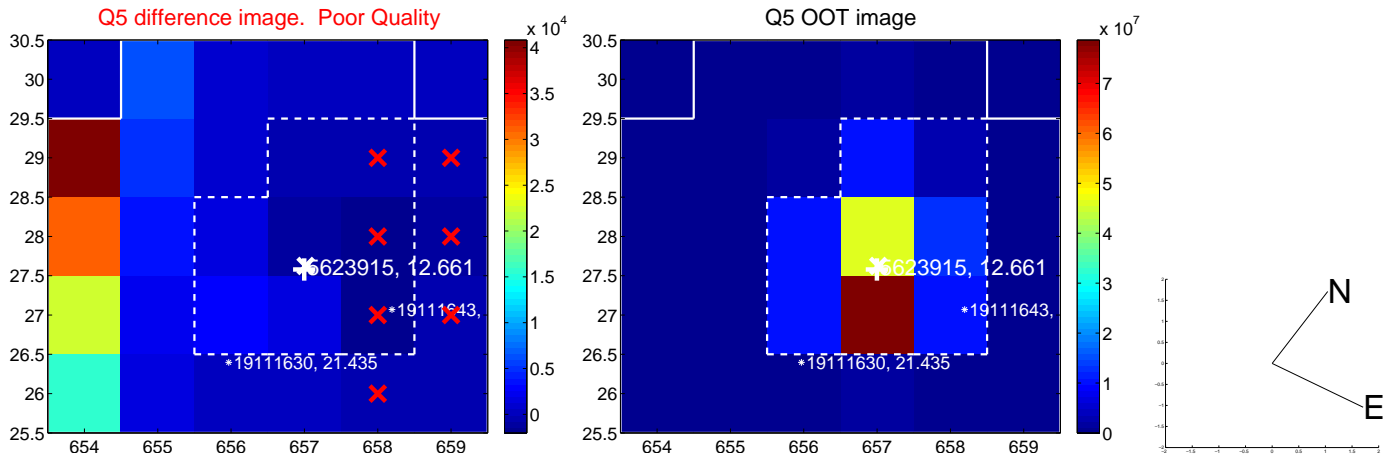


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

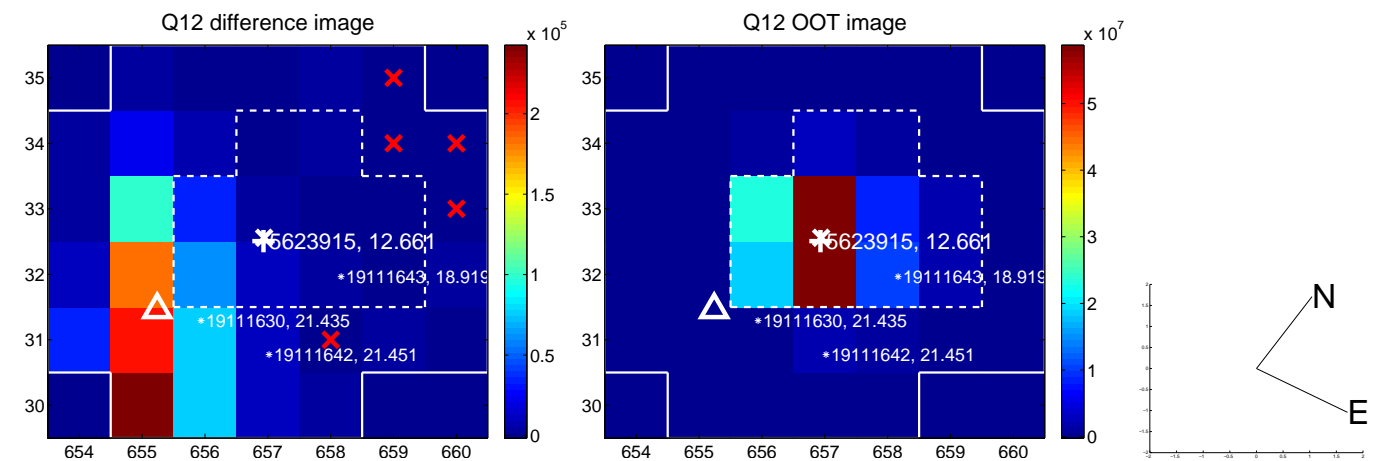
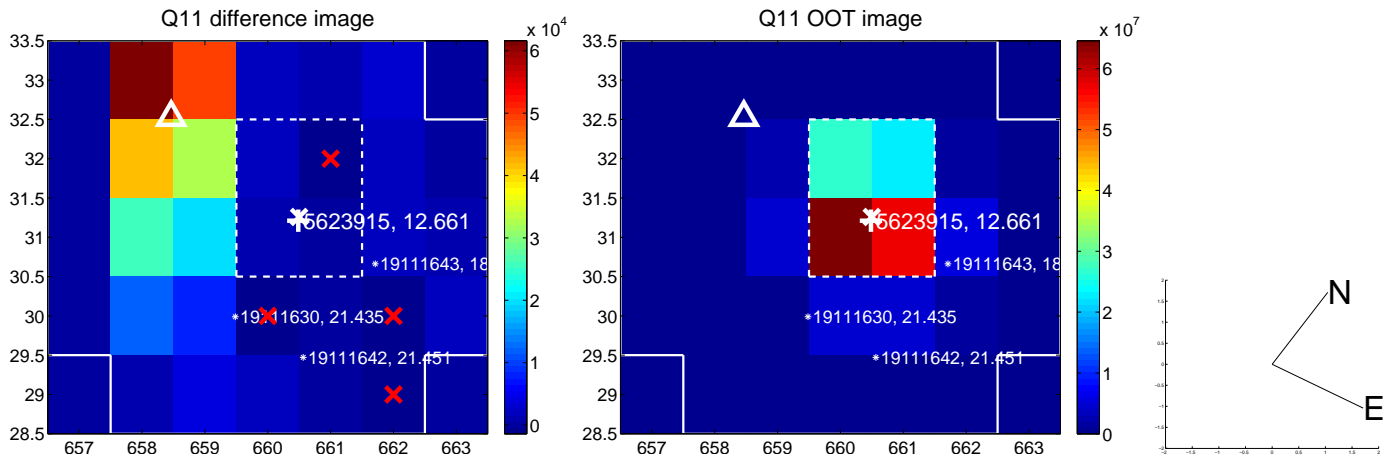
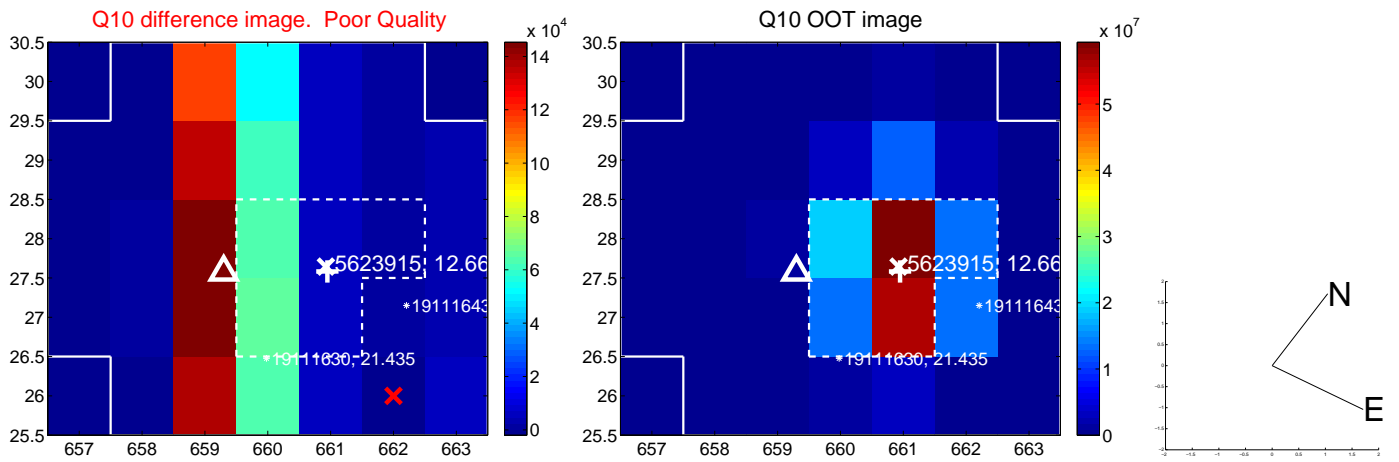
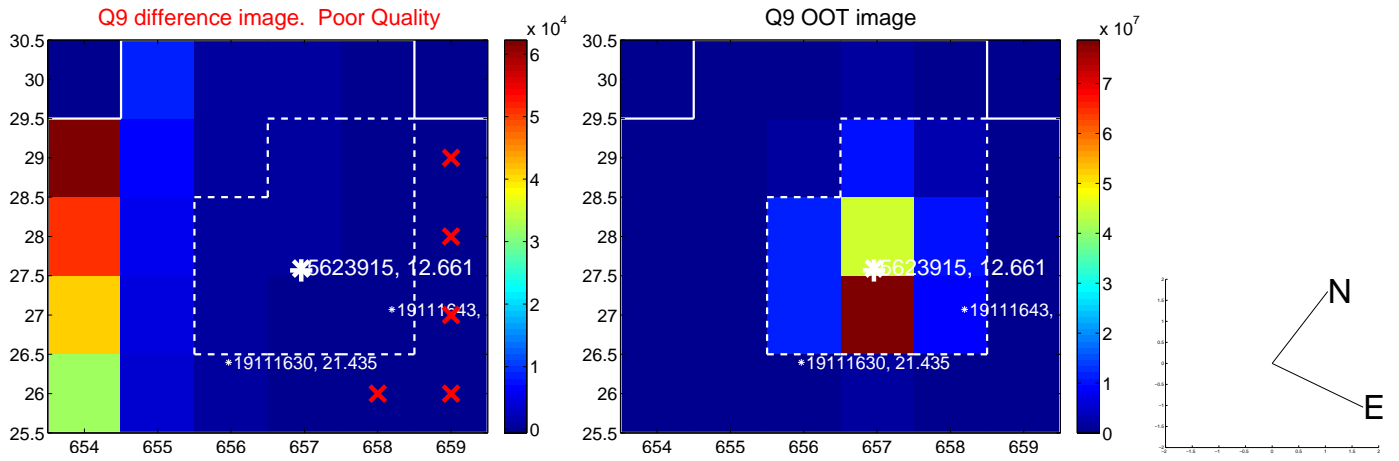
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



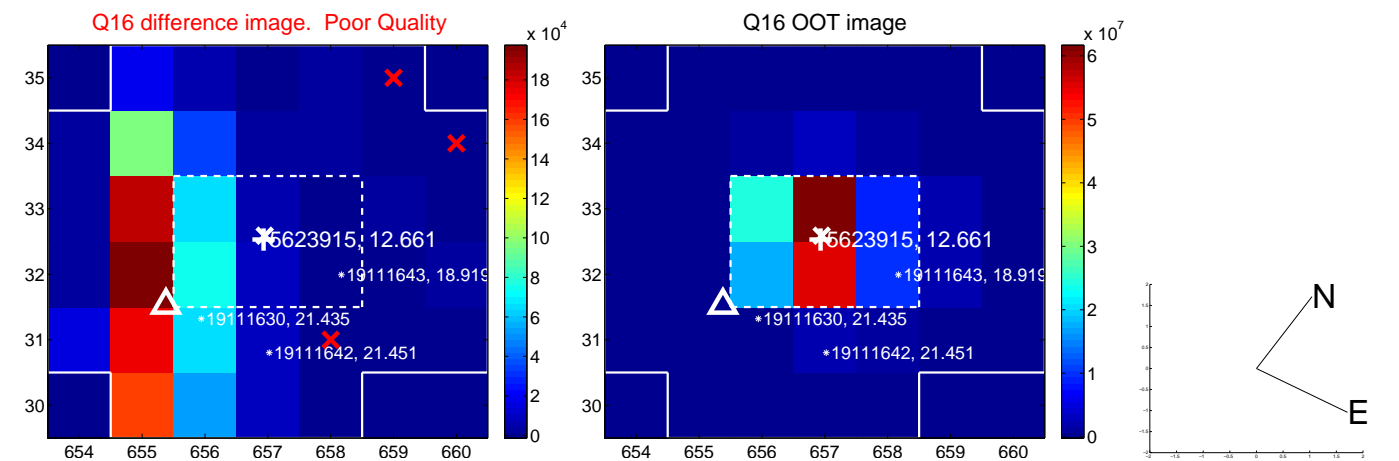
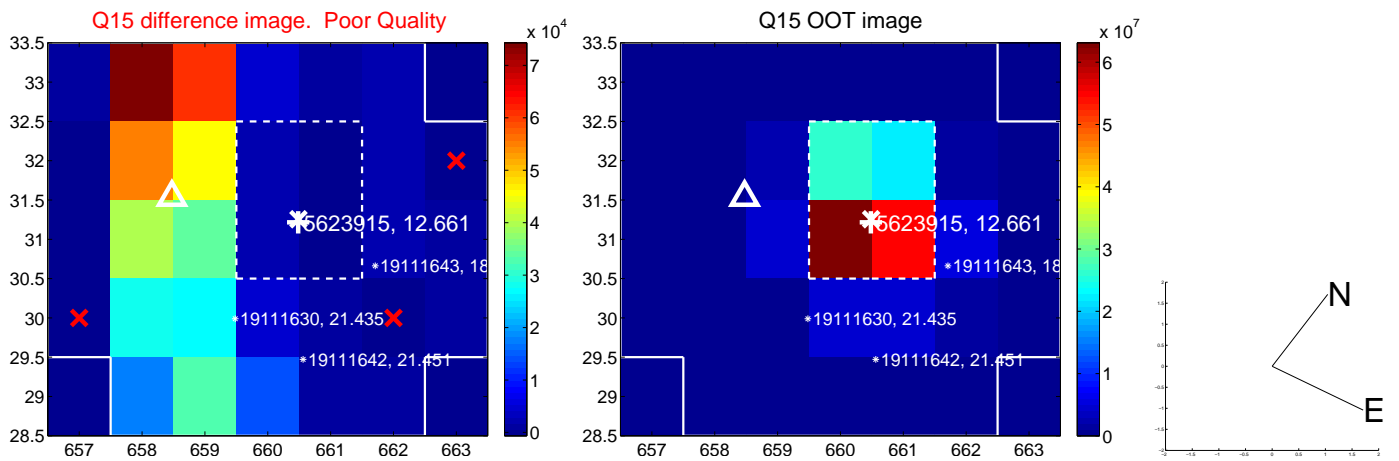
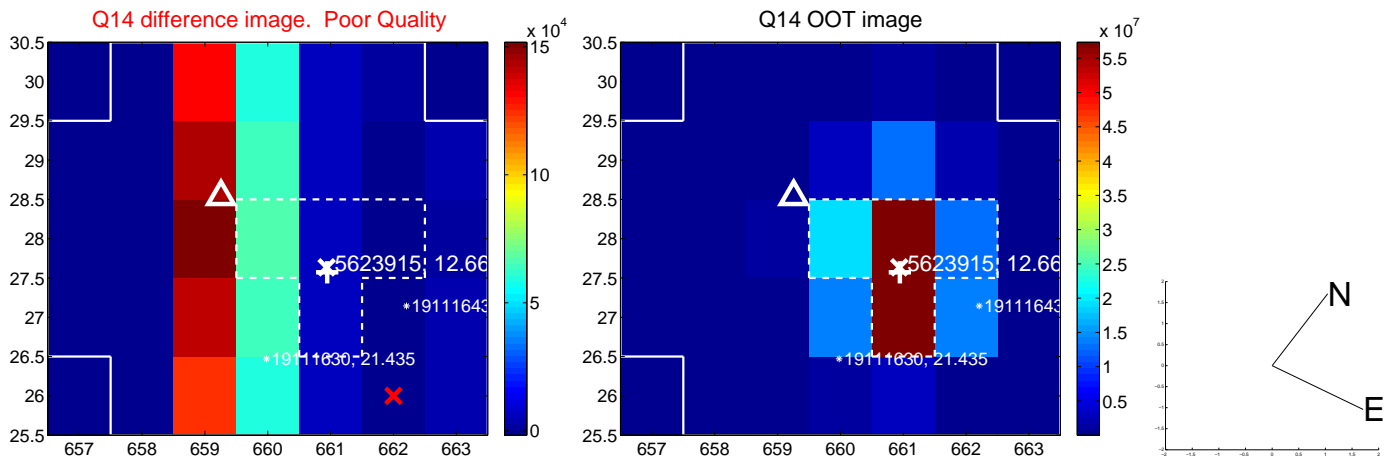
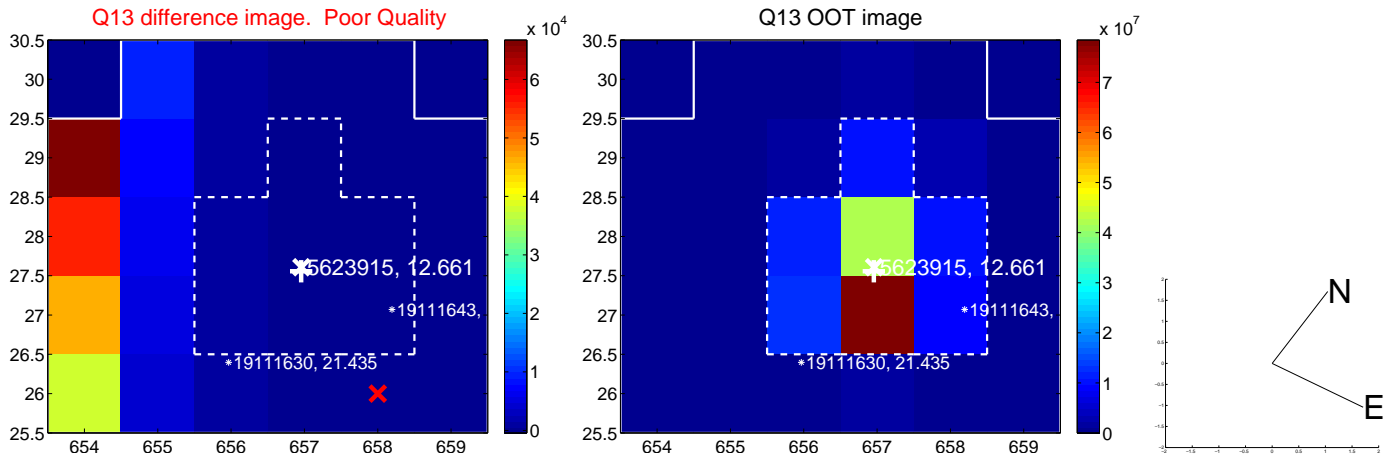
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



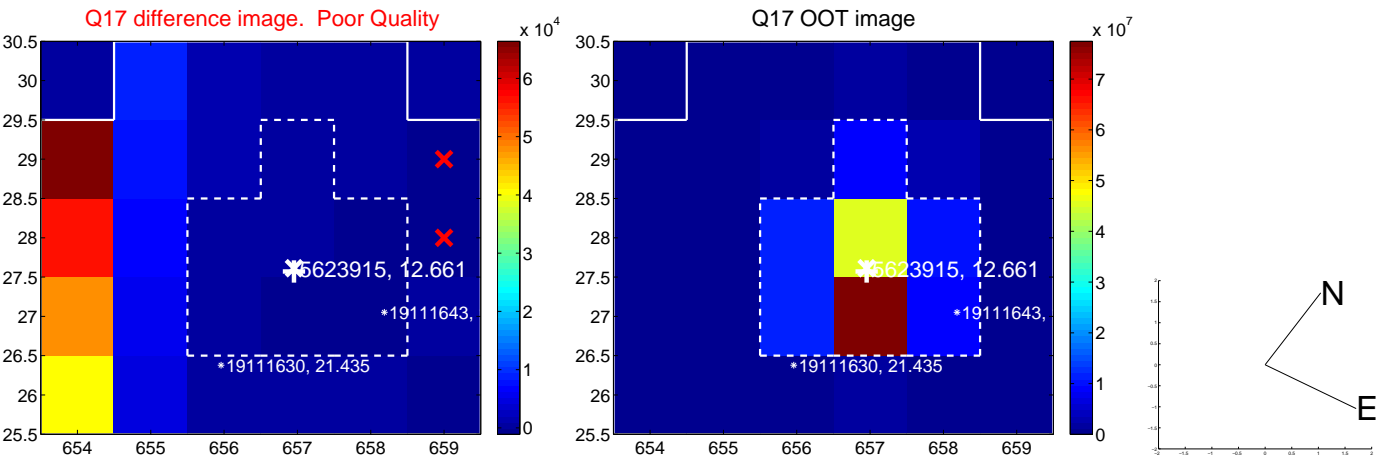
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



folded centroid time series figure for this object.

UKIRT Image

Declination

