

KIC 004740688

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-----|------|-----------------------------|-----------------|------------------------|------------------------|
| 004740688-01 | OBS | 6444.01 | 3.454280 | 131.696556 | 140.1 | 3.763 | 9.5 | 10.1 | 0.64 | 4186 | 0.90 | 72.02 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|----------------------------------|
| 004740688-01 | OBS | FP | 0.00 | 0 | 0 | 1 | 1 | CENT_RESOLVED_OFFSET—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 004740688-01

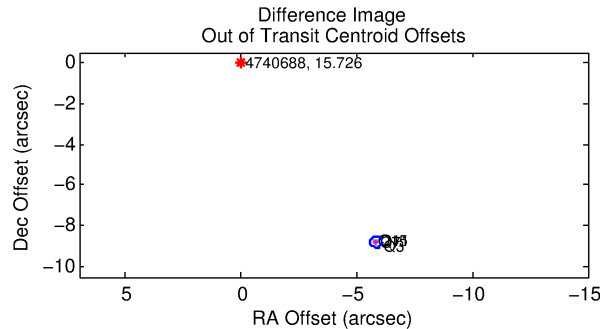
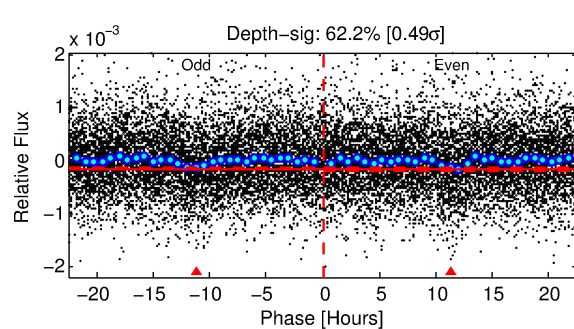
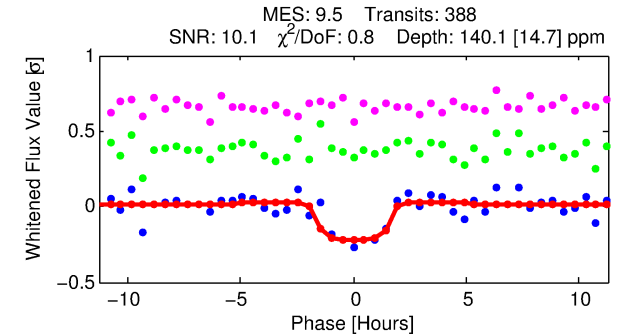
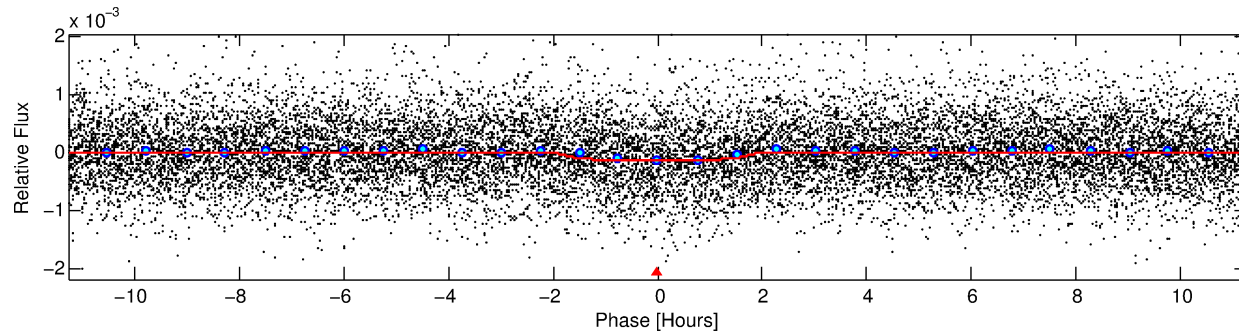
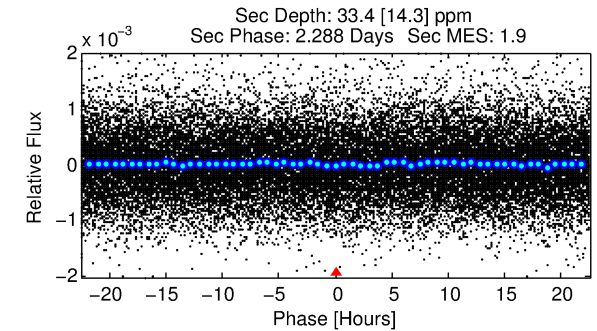
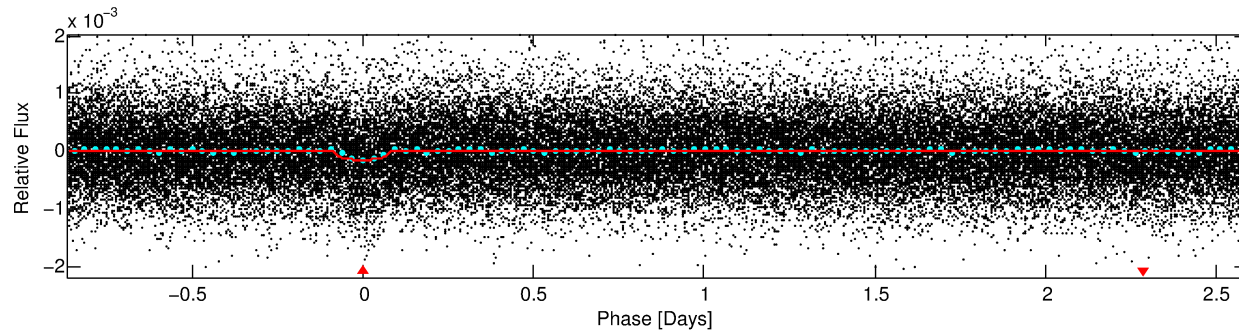
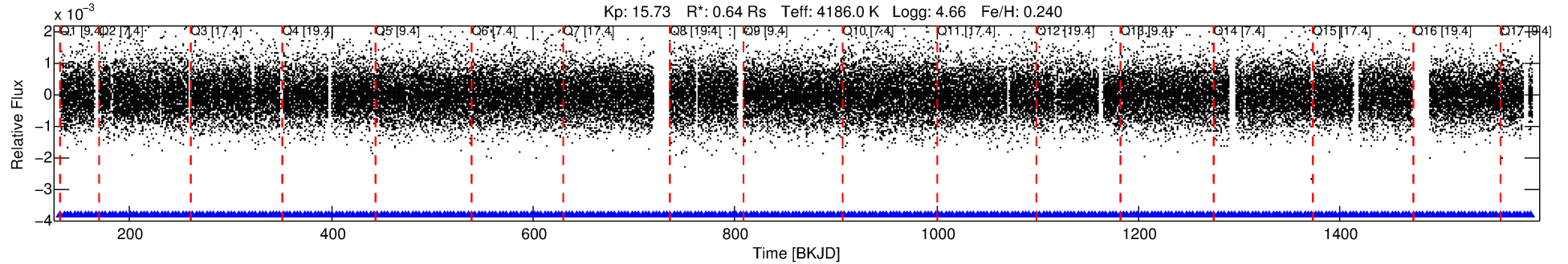
| TCE (1) | KIC | Parent (2) | Parent KIC | $P_1:P_2$ | Dist ($''$) | Δ Row | Δ Col | m_2 | m_1 | D_2/D_1 | Mechanism | Flag | σ_P | σ_T |
|--------------|---------|---------------|------------|-----------|---------------|--------------|--------------|-------|-------|-----------|------------|------|------------|------------|
| 004740688-01 | 4740688 | 004740676-pri | 4740676 | 1:1 | 19.3 | 2 | 4 | 13.20 | 15.73 | 670.00 | Direct-PRF | 0 | 0.64 | 0.65 |

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: 4740688 Candidate: 1 of 1 Period: 3.454 d
KOI: K06444.01 Corr: 0.892

Kp: 15.73 R*: 0.64 Rs Teff: 4186.0 K Logg: 4.66 Fe/H: 0.240



DV Fit Results:

Period = 3.45428 [0.00003] d
Epoch = 131.6966 [0.0053] BKJD
Rp/R* = 0.0129 [0.0098]
a/R* = 3.74 [9.56]
b = 0.87 [0.78]
Seff = 72.02 [12.33]
Teff = 743 [32] K
Rp = 0.90 [0.68] Re
a = 0.0392 [0.0022] AU
Ag = 35.18 [55.42] [0.62σ]
Teffp = 2797 [1106] K [1.86σ]

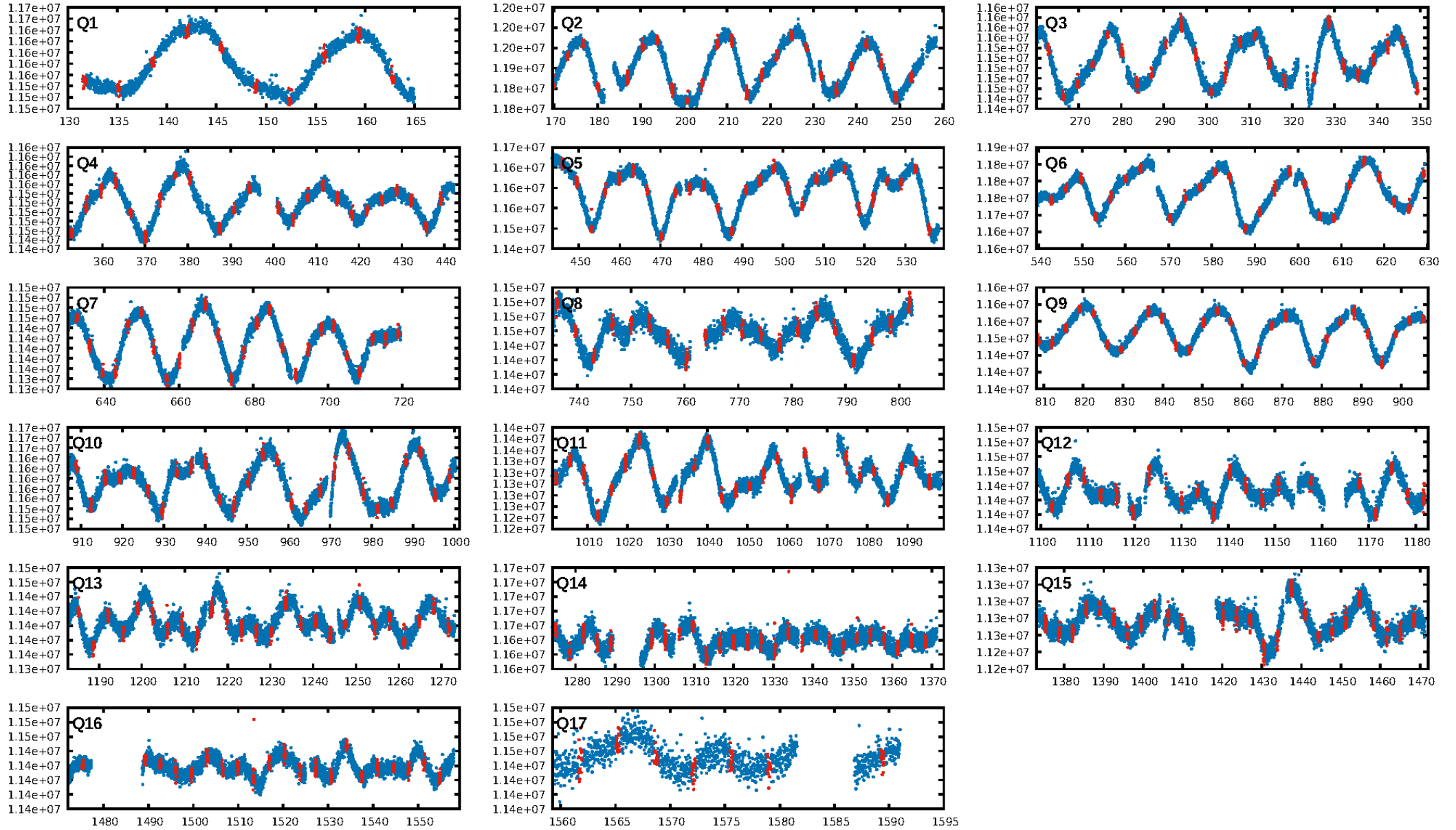
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 7.98e-21
RollingBand-fgt: 1.00 [371/371]
GhostDiagnostic-chr: -0.4227
Centroid-sig: 0.0%
Centroid-so: 46.021 arcsec [31.34σ]
OotOffset-rm: 10.535 arcsec [111.89σ]
KicOffset-rm: 10.708 arcsec [120.75σ]
OotOffset-st: 0/4/0/0 [4]
KicOffset-st: 0/4/0/0 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [17/17]

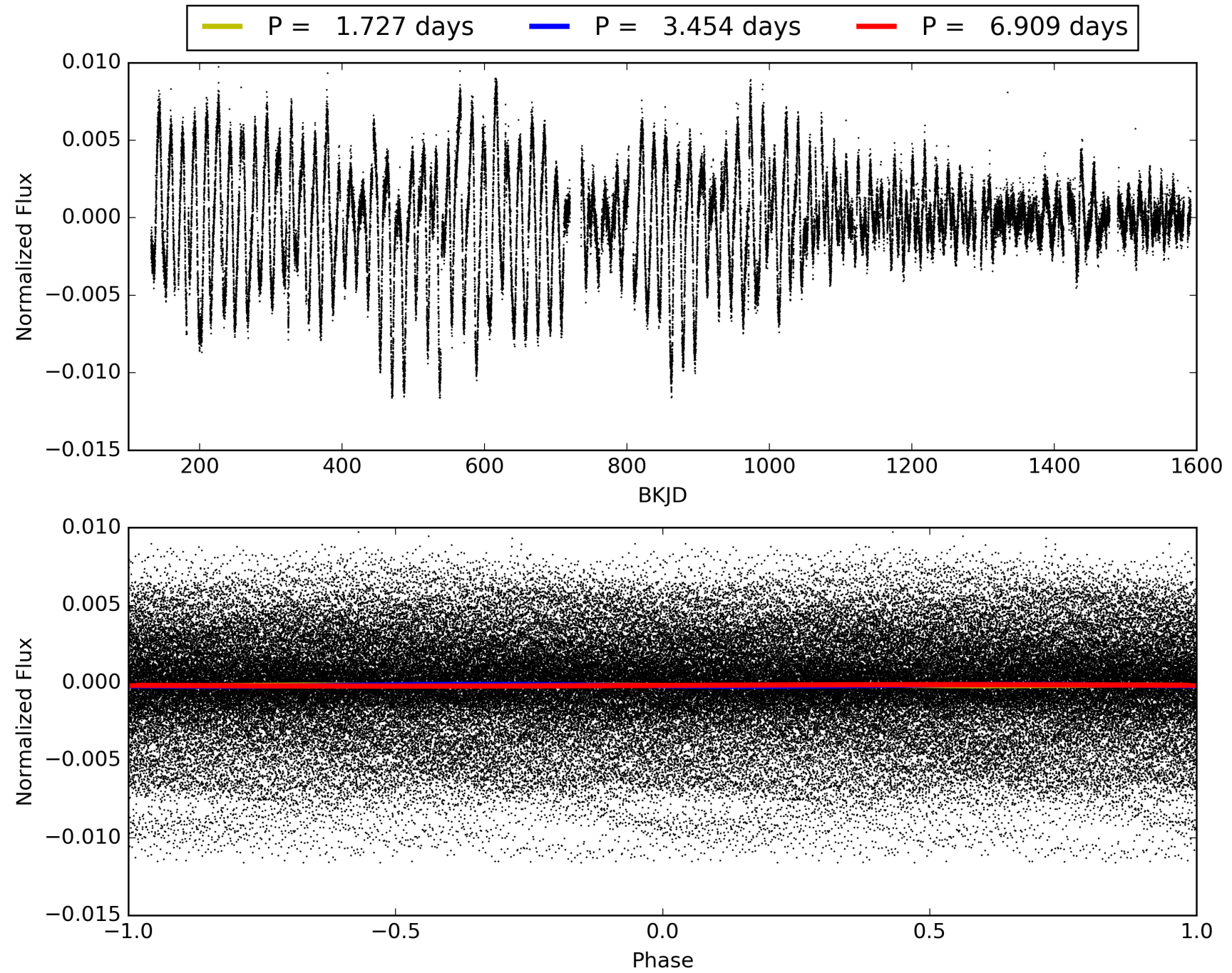
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:45:13 Z

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

TCE 004740688-01, PDC Light Curves

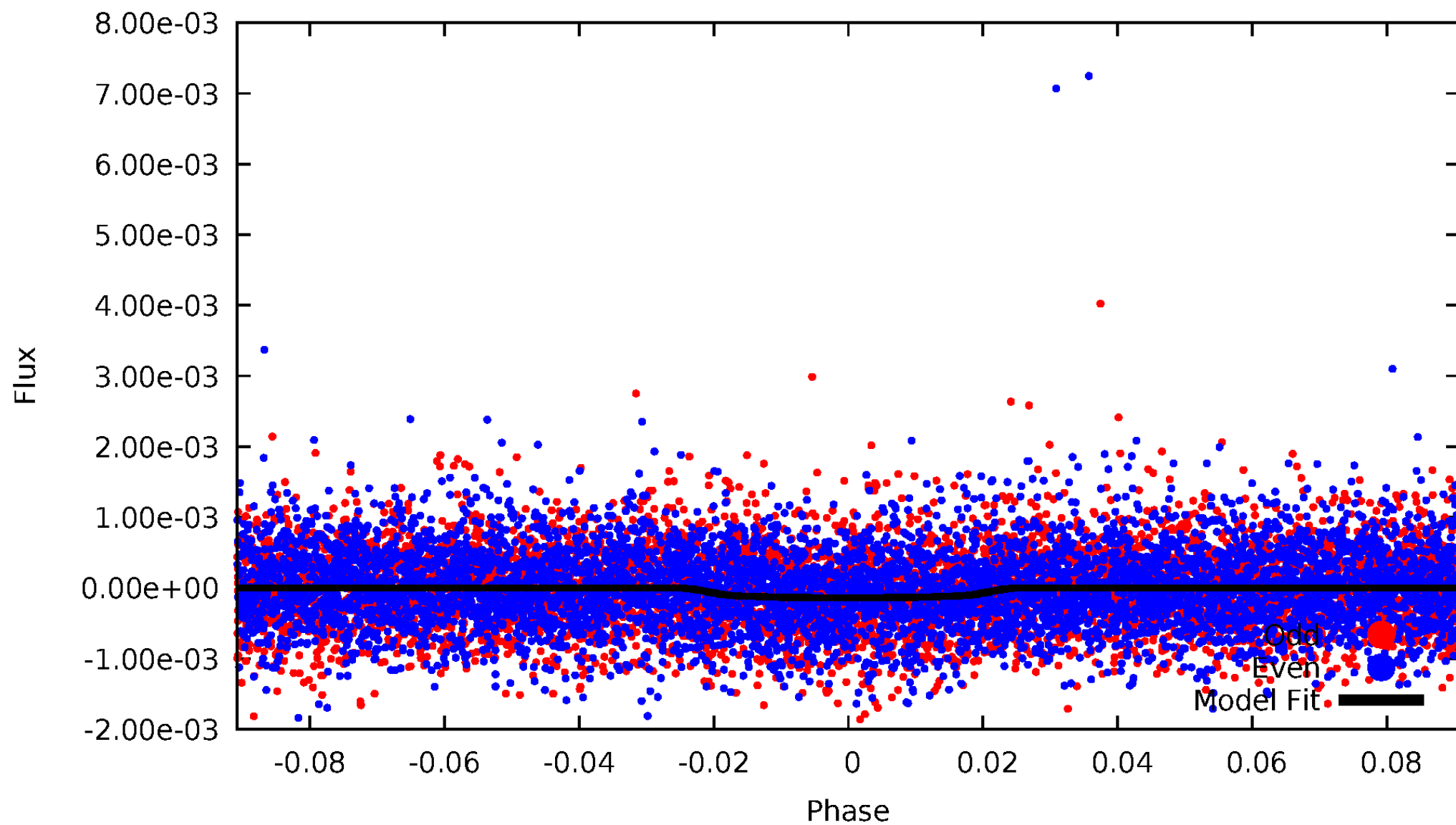


TCE 004740688-01



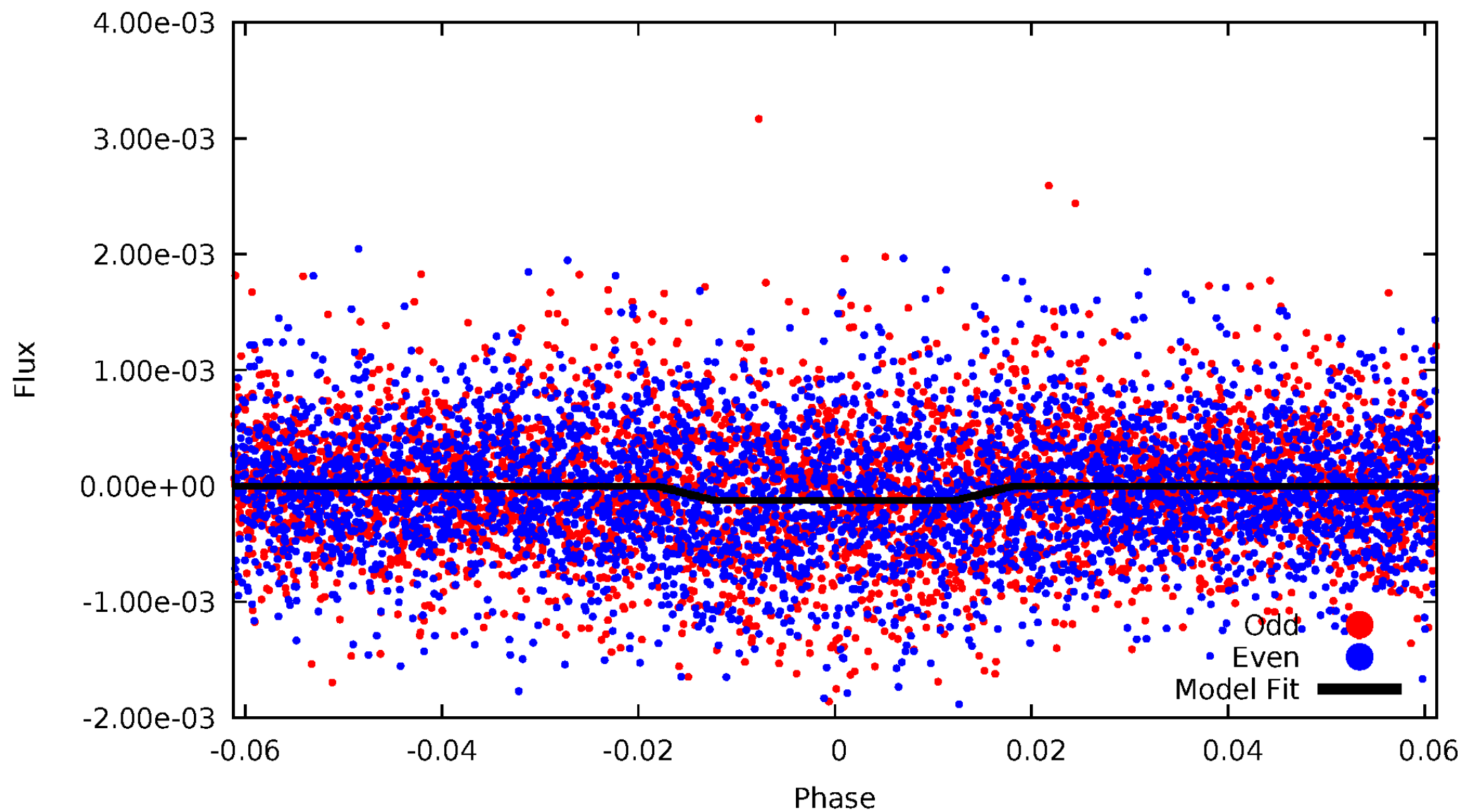
DV Odd/Even

TCE 004740688-01

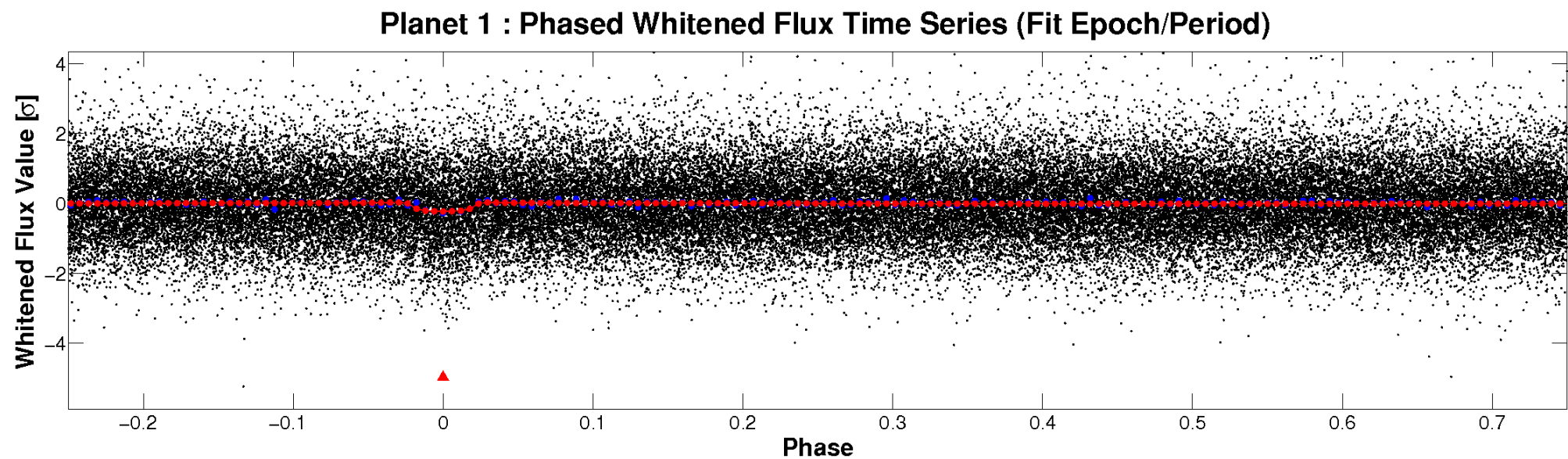
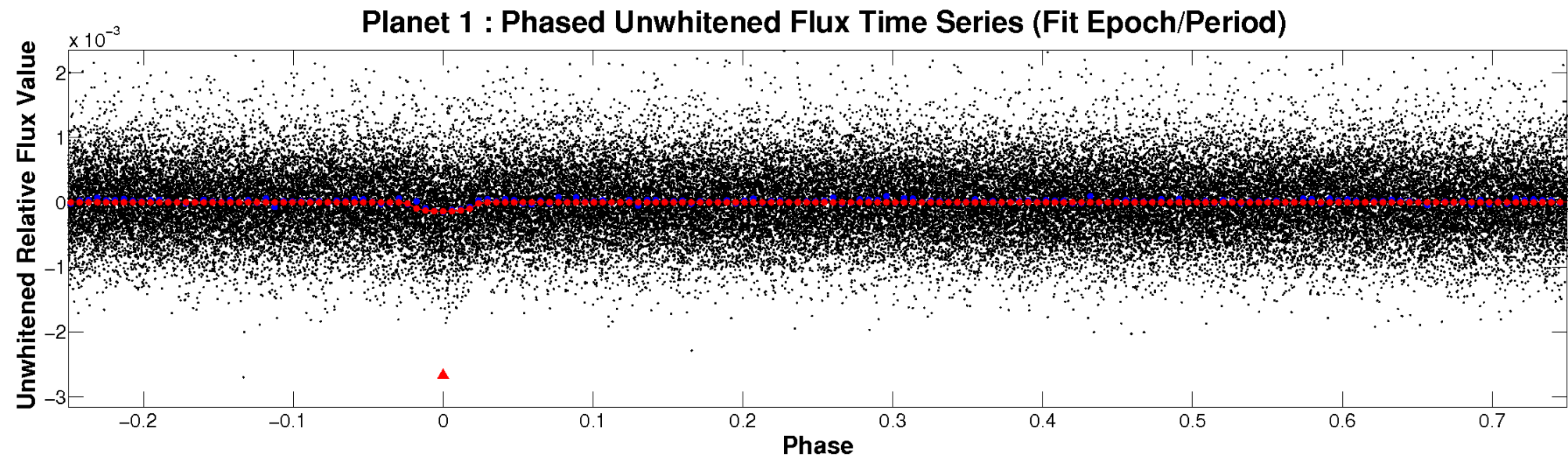


ALT Odd/Even

TCE 004740688-01

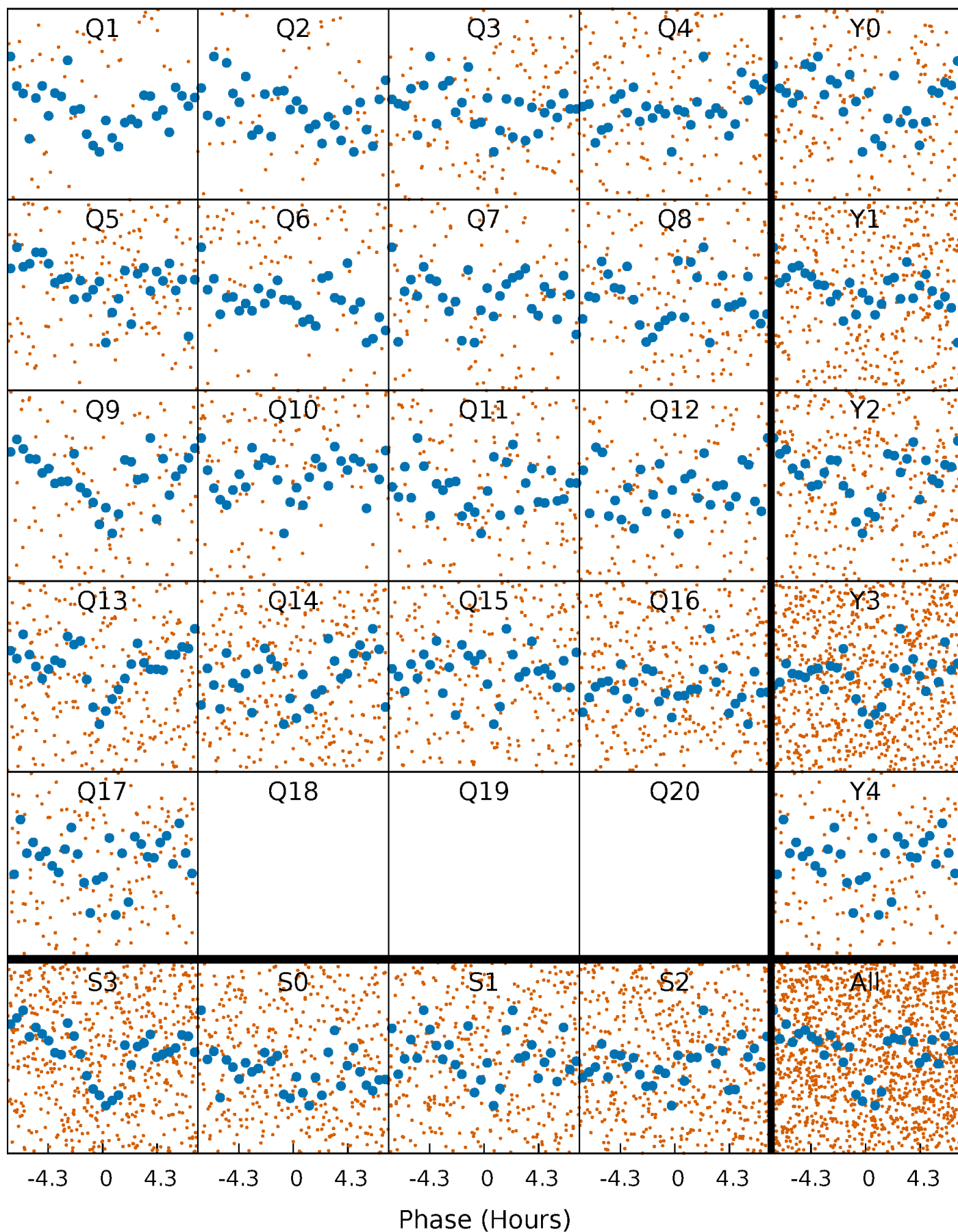


Non-Whitened Vs. Whitened Light Curve



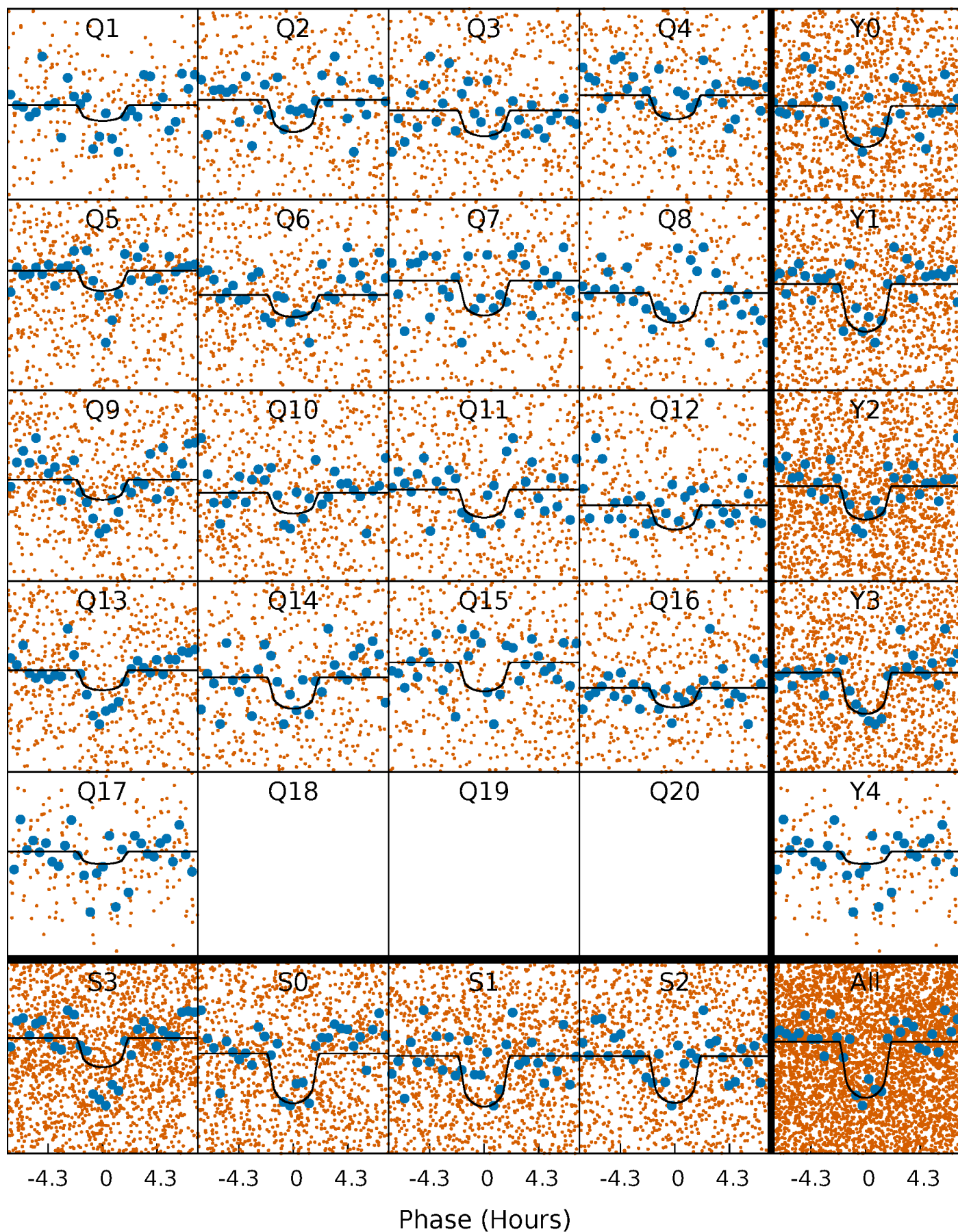
PDC Quarter-Phased Transit Curves

TCE 004740688-01 P= 3.454280 Days $T_0=131.696556$ (BKJD)



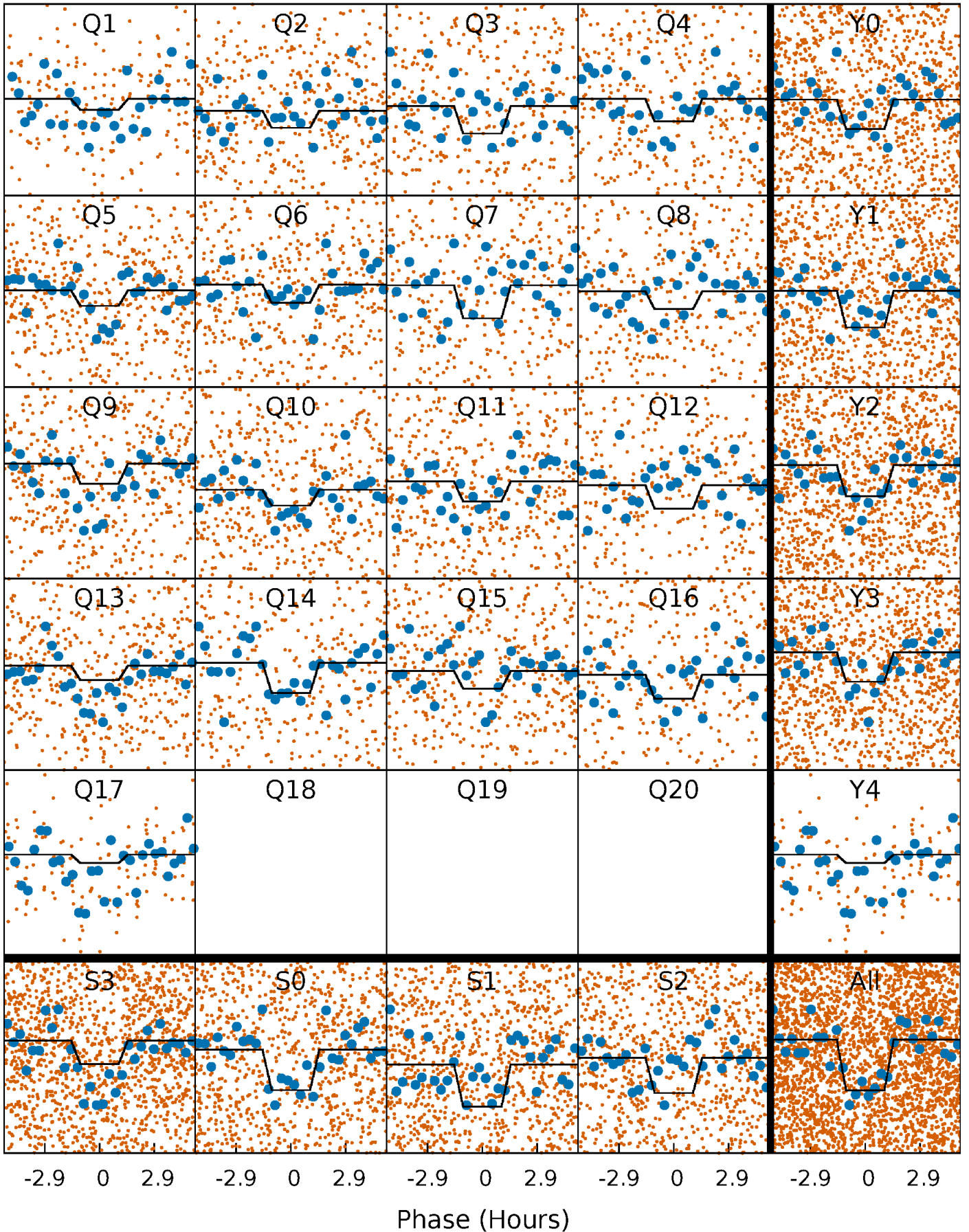
DV Quarter-Phased Transit Curves

TCE 004740688-01 P= 3.454280 Days $T_0=131.696556$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

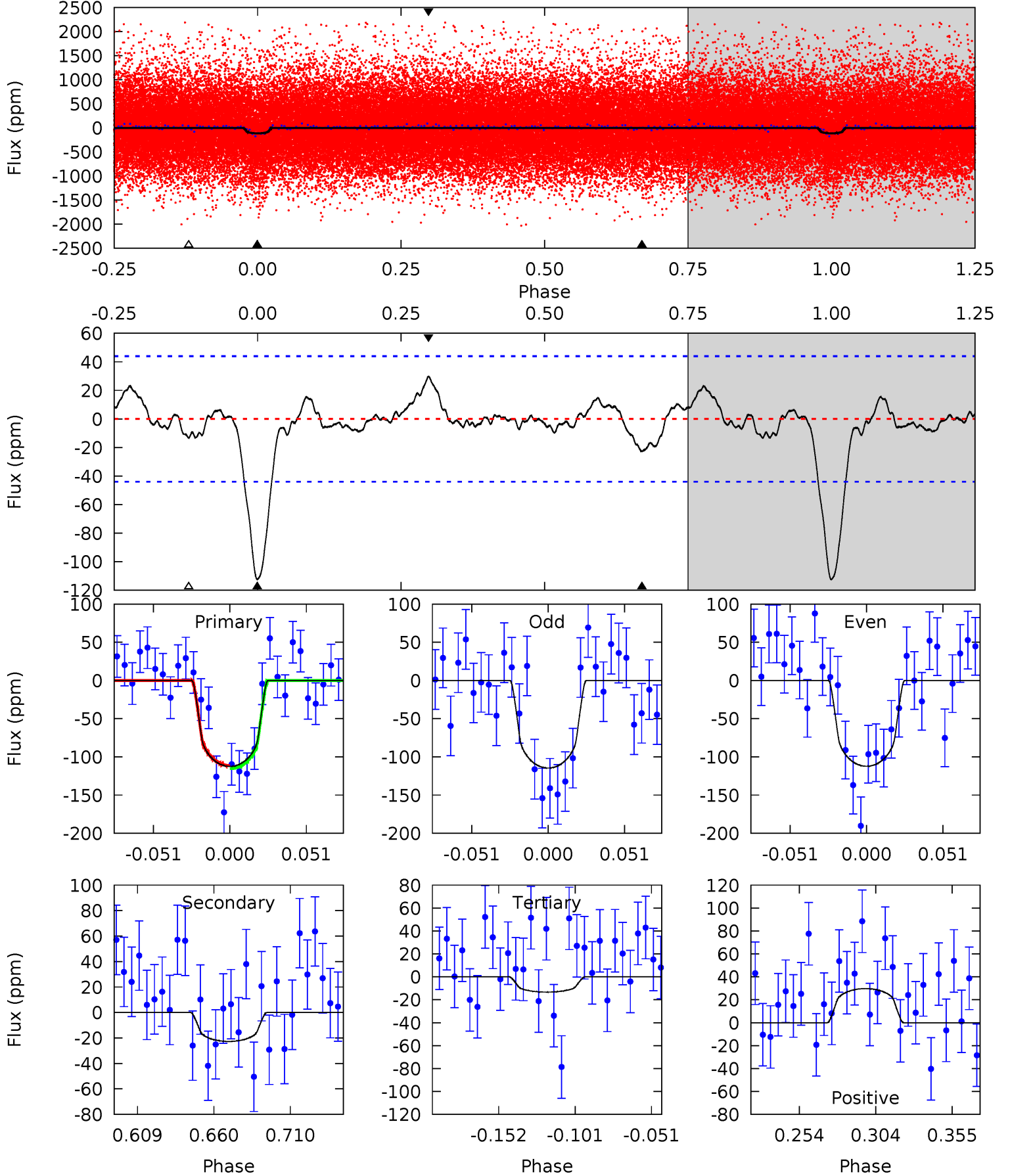
TCE 004740688-01 P= 3.454280 Days $T_0=131.704573$ (BKJD)



DV Model-Shift Uniqueness Test

004740688-01, P = 3.454280 Days, E = 128.242276 Days

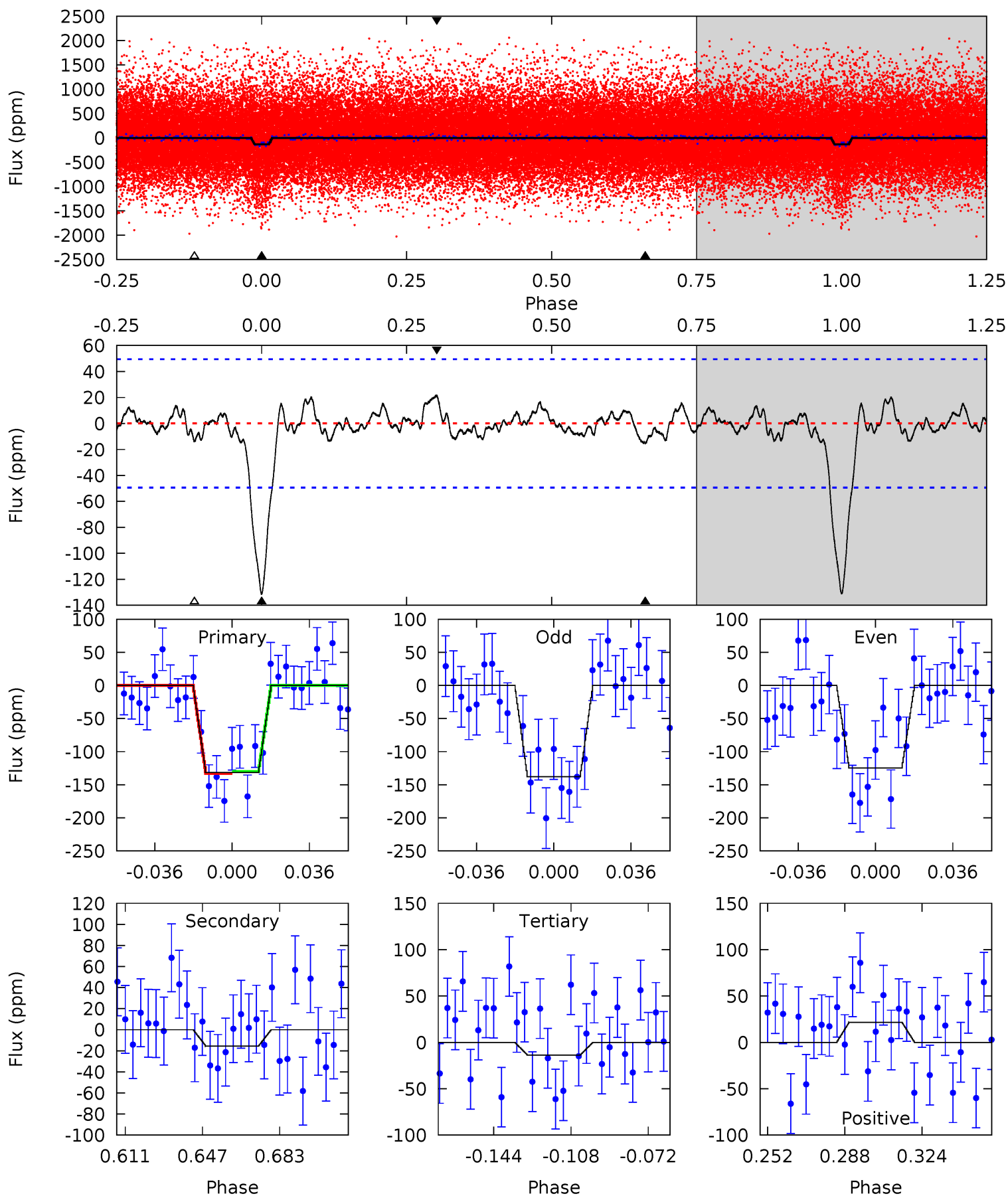
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.0 | 2.44 | 1.43 | 3.19 | 4.71 | 1.95 | 0.92 | 10.6 | 8.85 | 1.01 | -0.75 | 0.12 | 1.03 | 0.21 | 0.21 |



Alt Model-Shift Uniqueness Test

004740688-01, P = 3.454280 Days, E = 128.250293 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.7 | 1.49 | 1.32 | 2.09 | 4.77 | 2.10 | 0.72 | 11.4 | 10.6 | 0.17 | -0.60 | 0.63 | 1.19 | 0.14 | 0.14 |



Stellar Parameters For KIC 004740688

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | M (M_{\odot}) | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 4186^{+146}_{-161} | $4.662^{+0.028}_{-0.038}$ | $0.240^{+0.200}_{-0.300}$ | $0.635^{+0.041}_{-0.045}$ | $0.686^{+0.035}_{-0.065}$ | $3.763^{+0.544}_{-0.572}$ |
| | +3%/-4% | +1%/-1% | +83%/-125% | +6%/-7% | +5%/-9% | +14%/-15% |
| Source | PHO1 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 004740688-01 / KOI 6444.01

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|--------------|------------------------|----------------------|----------------------|------------------|
| DV | -23 ± 9 | $0.96^{+0.66}_{-0.55}$ | 1038^{+43}_{-41} | 2962^{+951}_{-452} | 20^{+95}_{-14} |
| Alt. | -15 ± 10 | $0.91^{+0.59}_{-0.53}$ | 1038^{+43}_{-39} | 2761^{+862}_{-512} | 12^{+63}_{-9} |

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

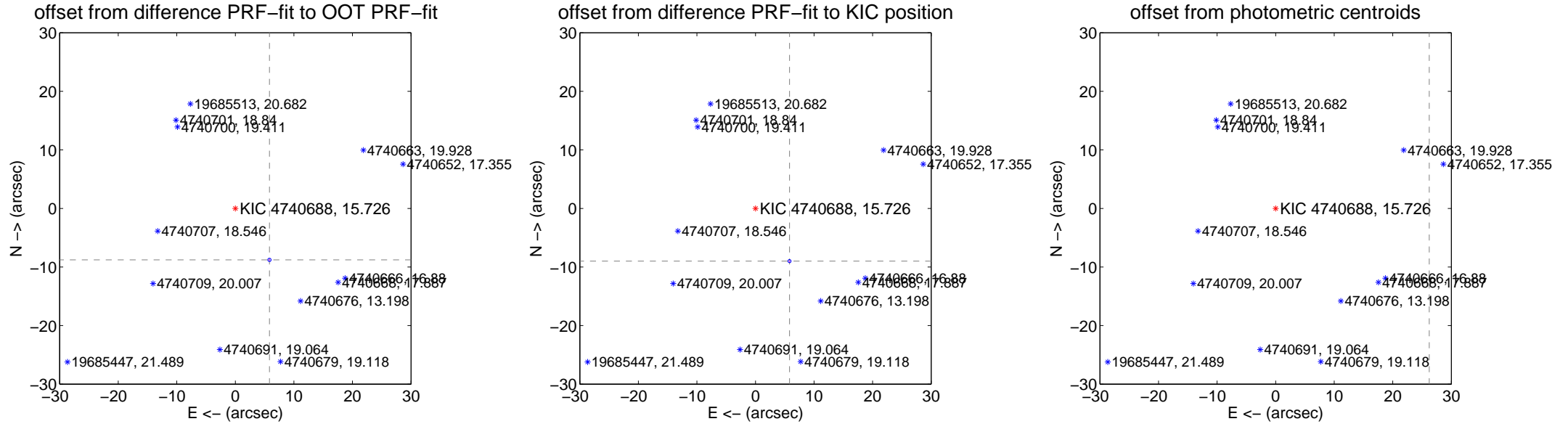
DV Centroid Data

Supplemental centroid analysis for 004740688-01. Kepler magnitude: 15.73. Transit SNR 10.10

There are 4 quarters with good PRF difference image offsets

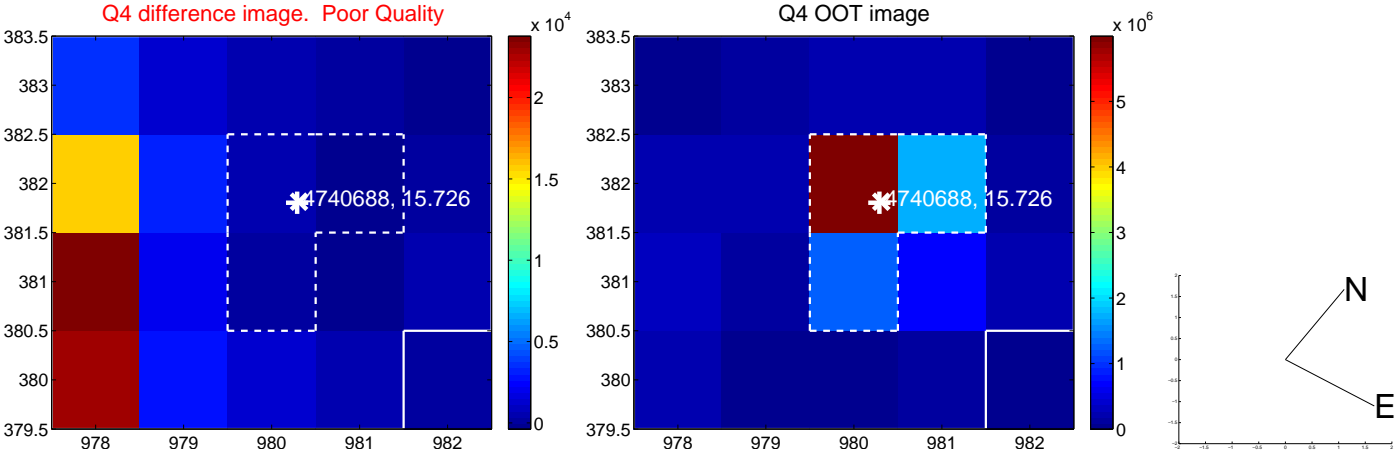
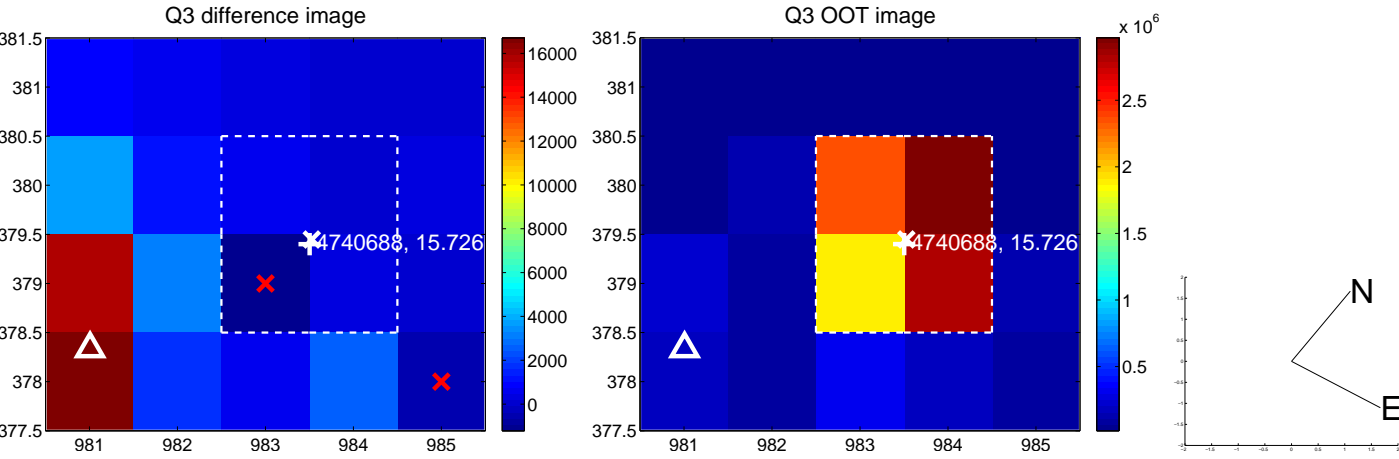
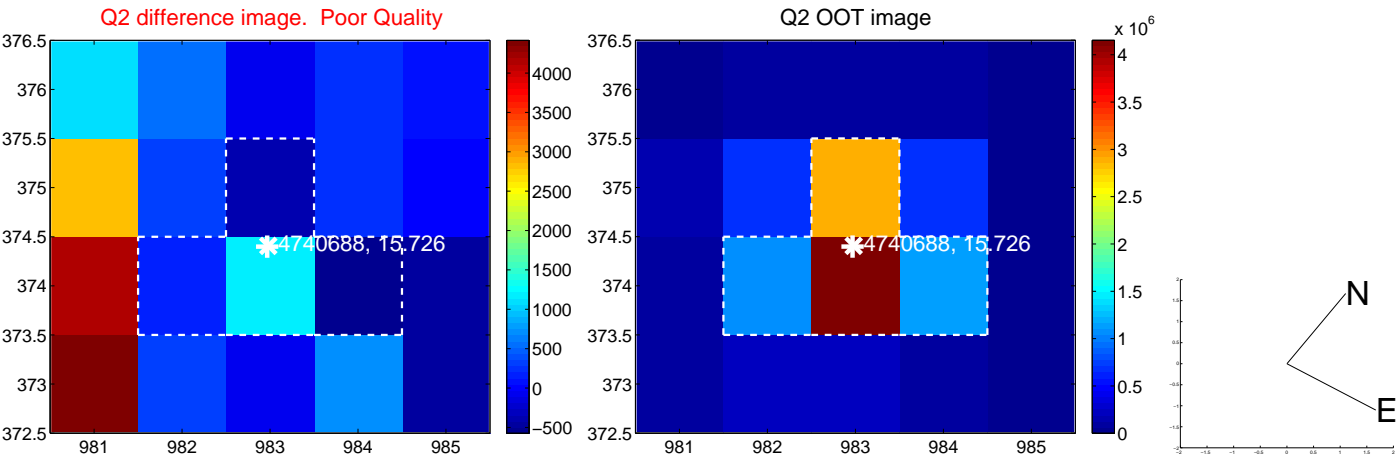
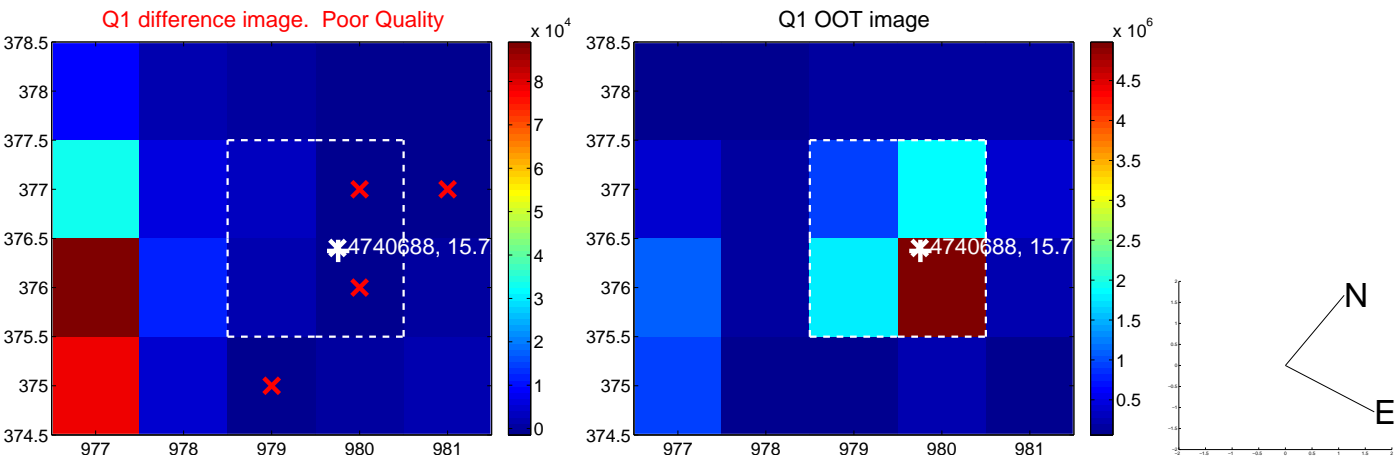
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 10.535 ± 0.094 | 111.89 | -5.824 ± 0.073 | -8.779 ± 0.090 |
| PRF-fit source offset from KIC position | 10.708 ± 0.089 | 120.75 | -5.808 ± 0.077 | -8.996 ± 0.093 |
| photometric centroid source offset | 46.02 ± 1.47 | 31.34 | -26.24 ± 1.47 | -37.81 ± 1.47 |

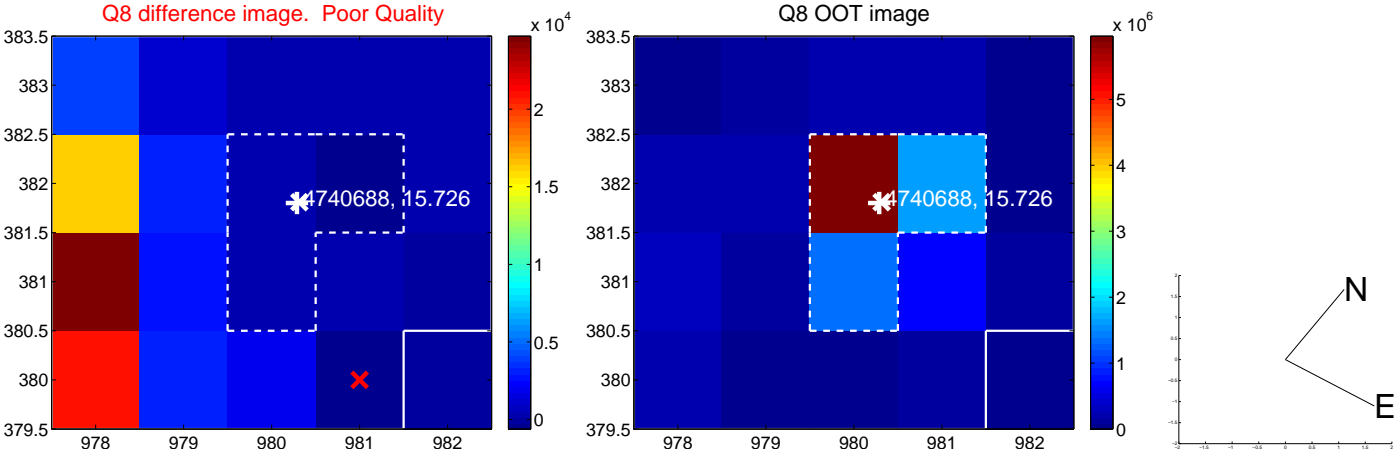
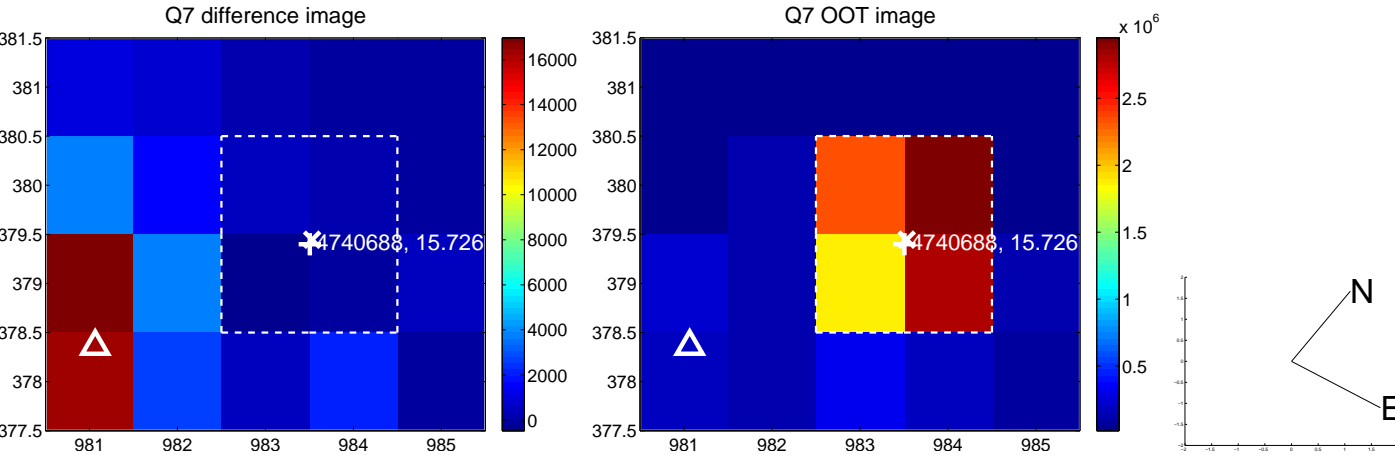
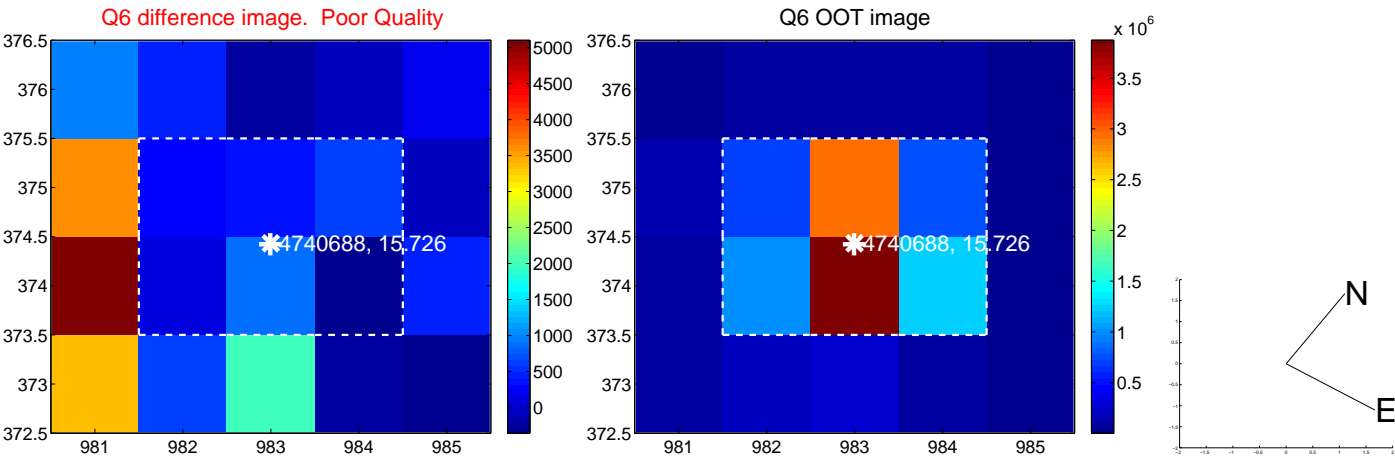
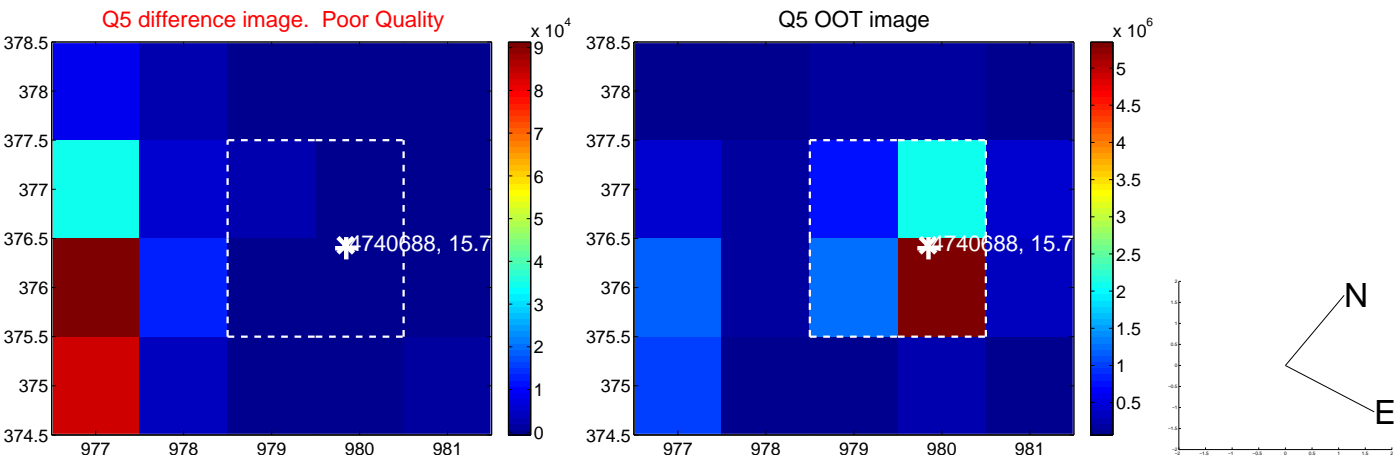


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

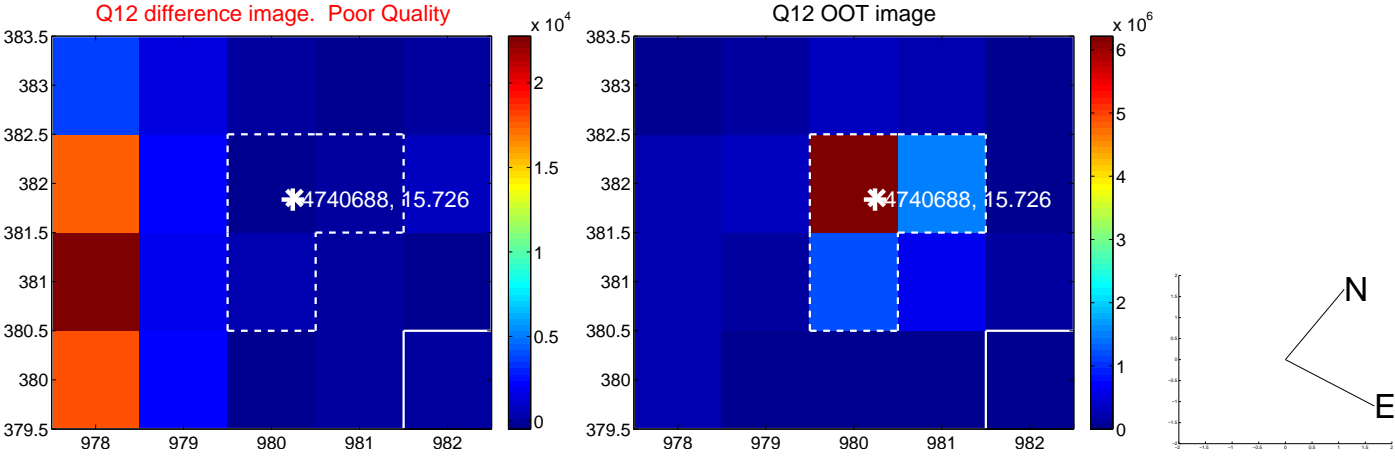
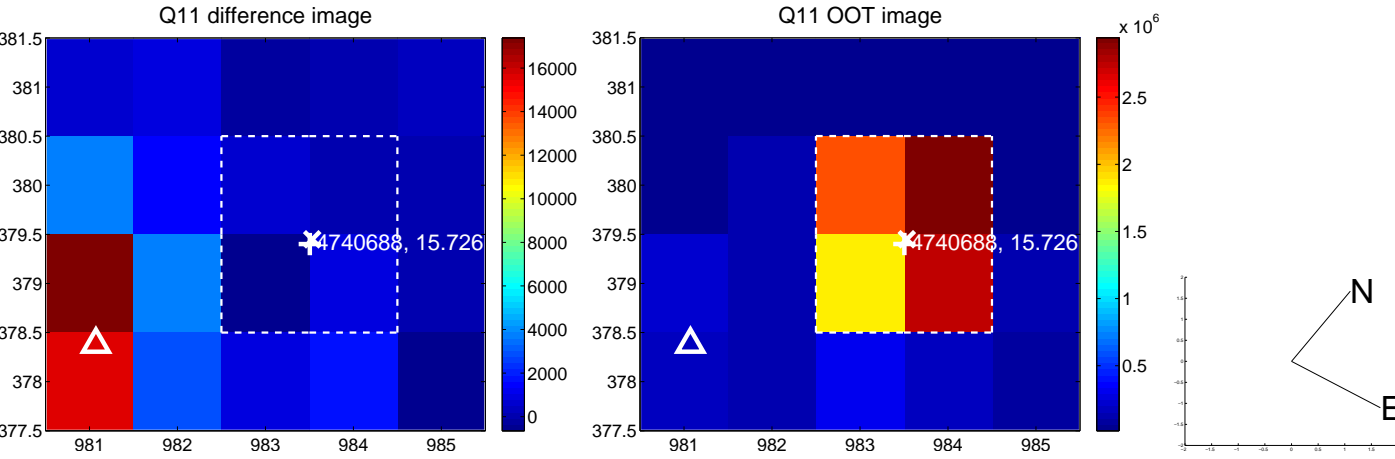
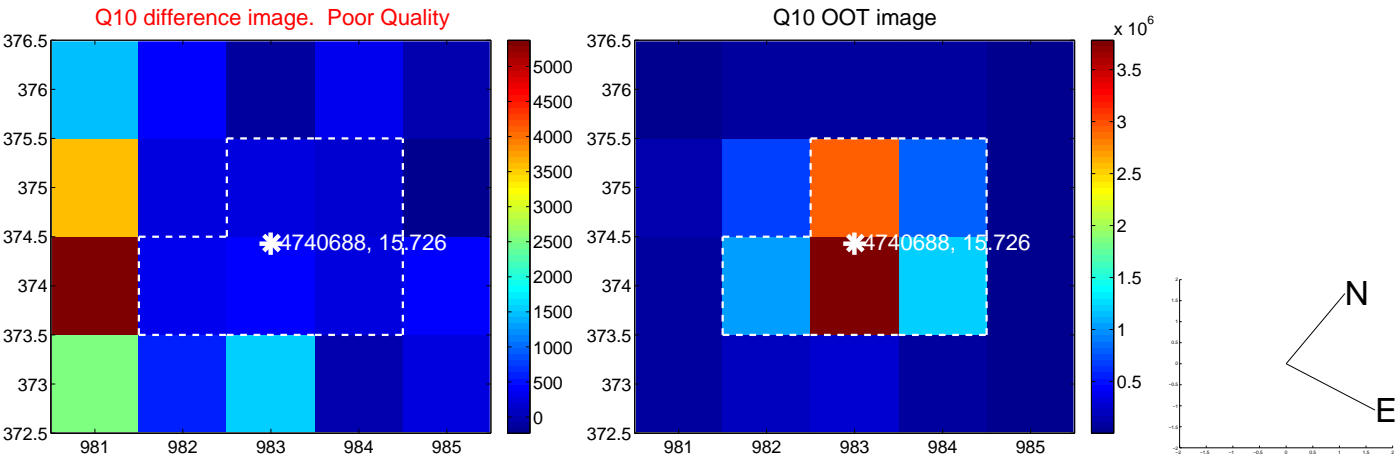
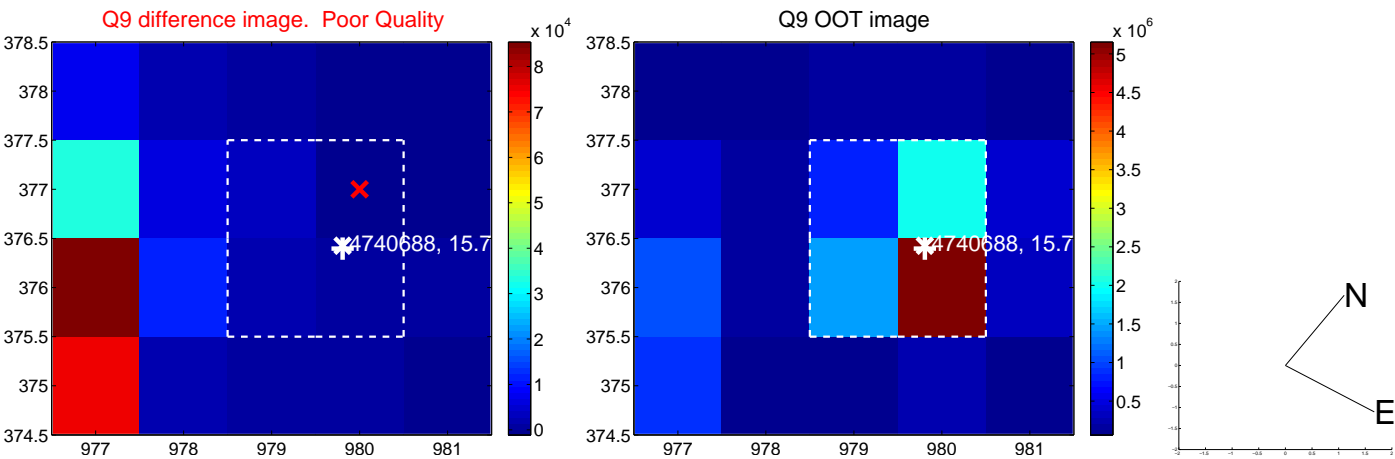
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



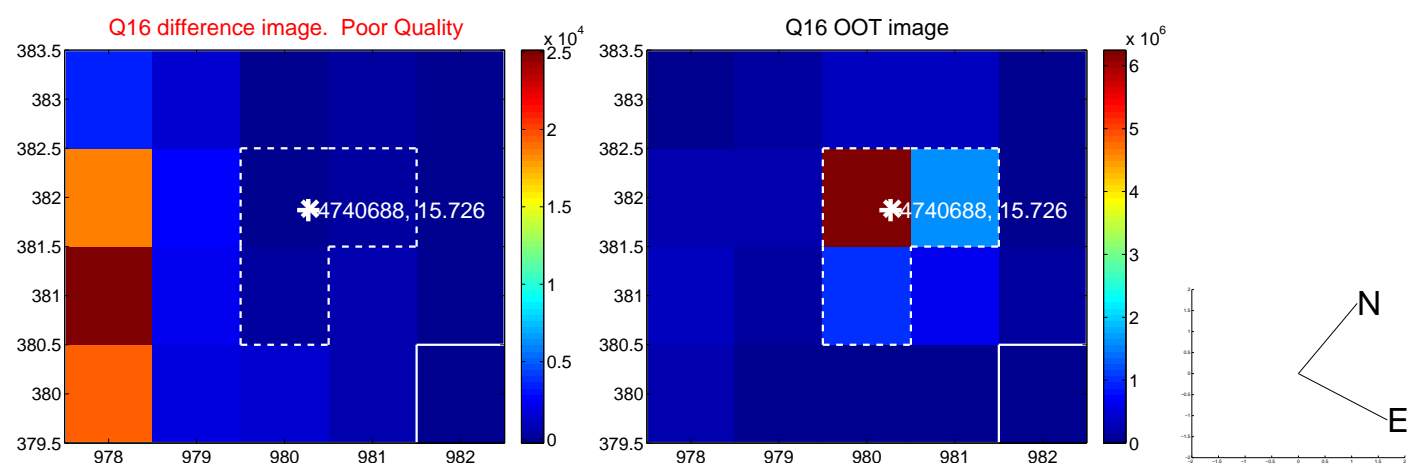
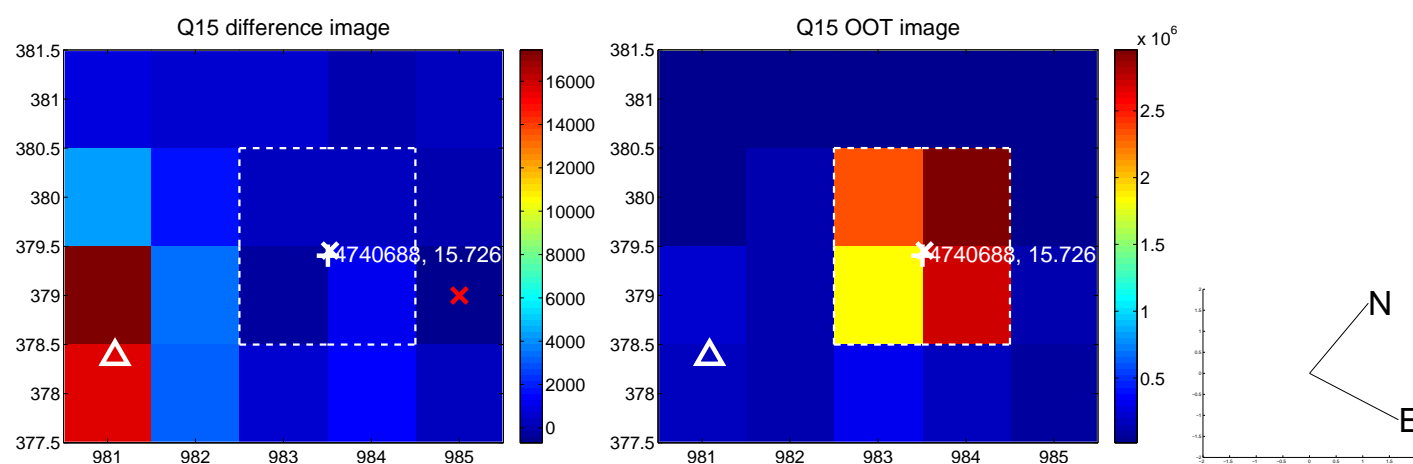
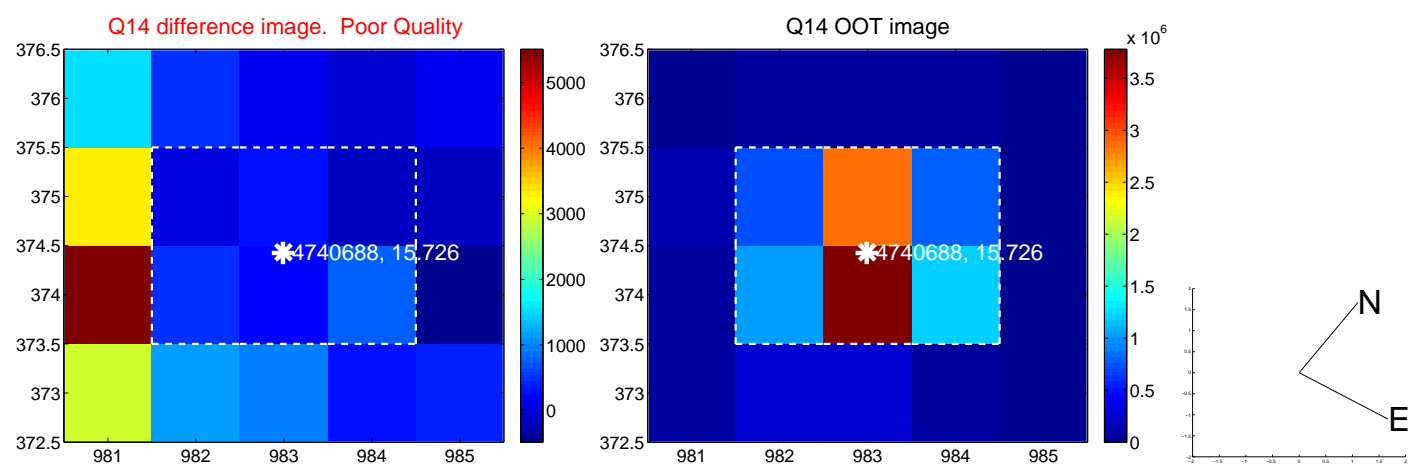
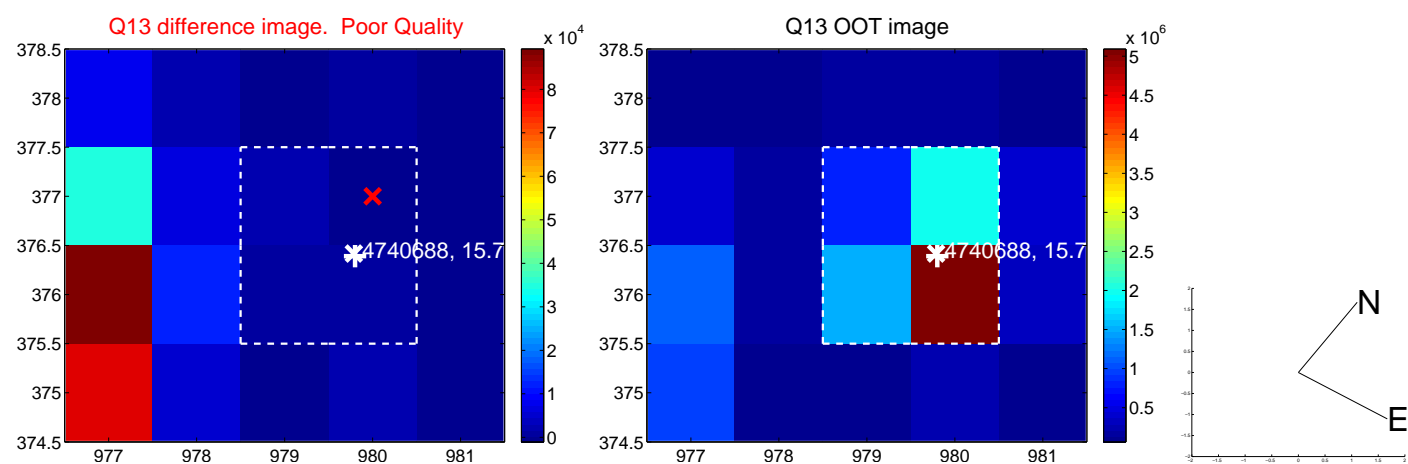
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

