

KIC 006422070

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 006422070-01 | OBS | 0852.01 | 3.761883 | 134.275113 | 499.6 | 3.778 | 30.0 | 33.2 | 0.95 | 5653 | 2.77 | 374.09 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|------------|
| 006422070-01 | OBS | PC | 0.88 | 0 | 0 | 0 | 0 | NO_COMMENT |

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.

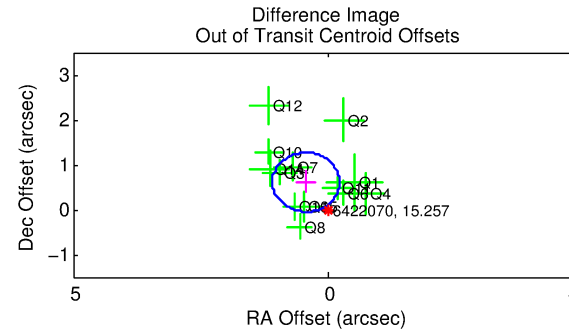
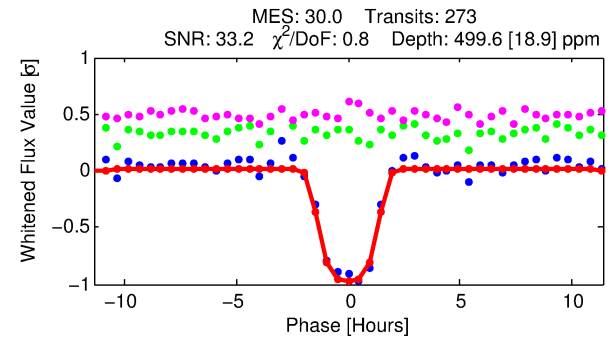
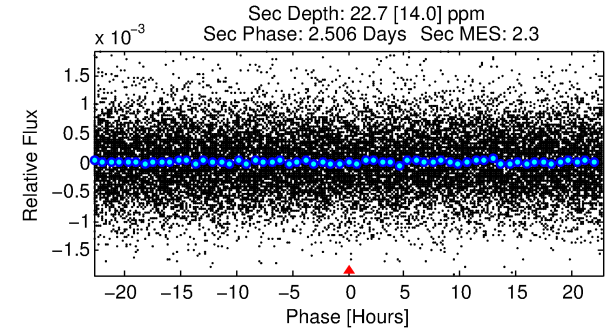
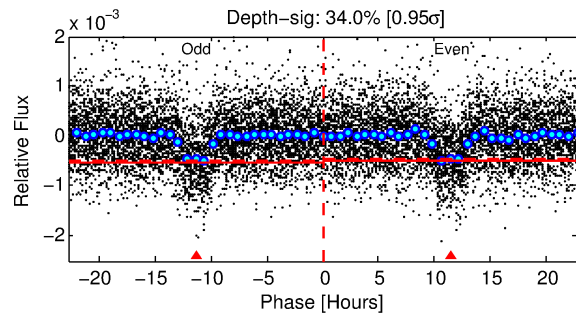
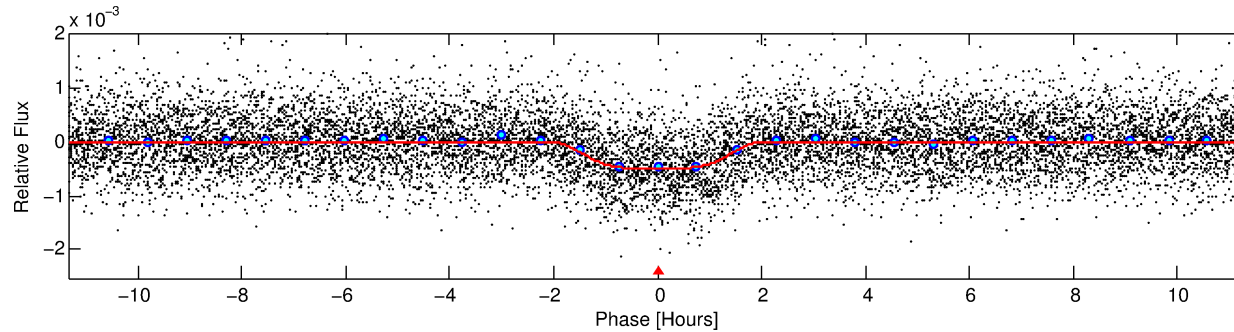
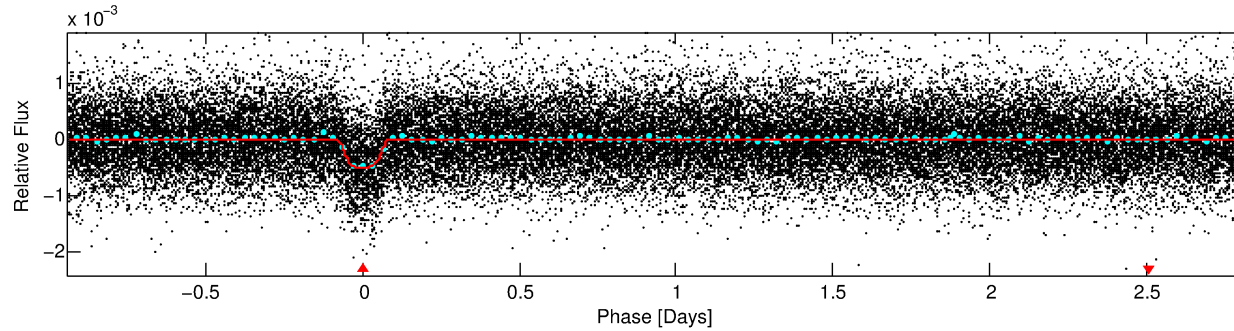
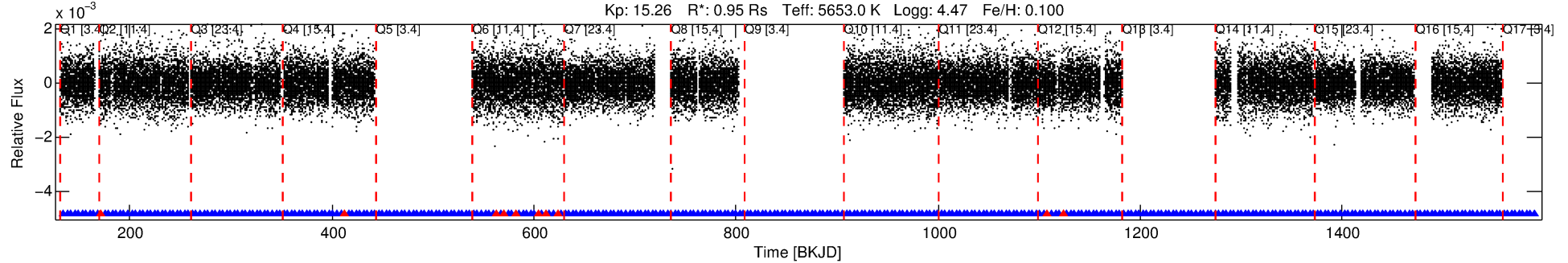
Ephemeris Match Information For 006422070-01

No Significant Match Found

DV One-Page Summary

KIC: 6422070 Candidate: 1 of 1 Period: 3.762 d
KOI: K00852.01 Corr: 0.942

Kp: 15.26 R*: 0.95 Rs Teff: 5653.0 K Logg: 4.47 Fe/H: 0.100



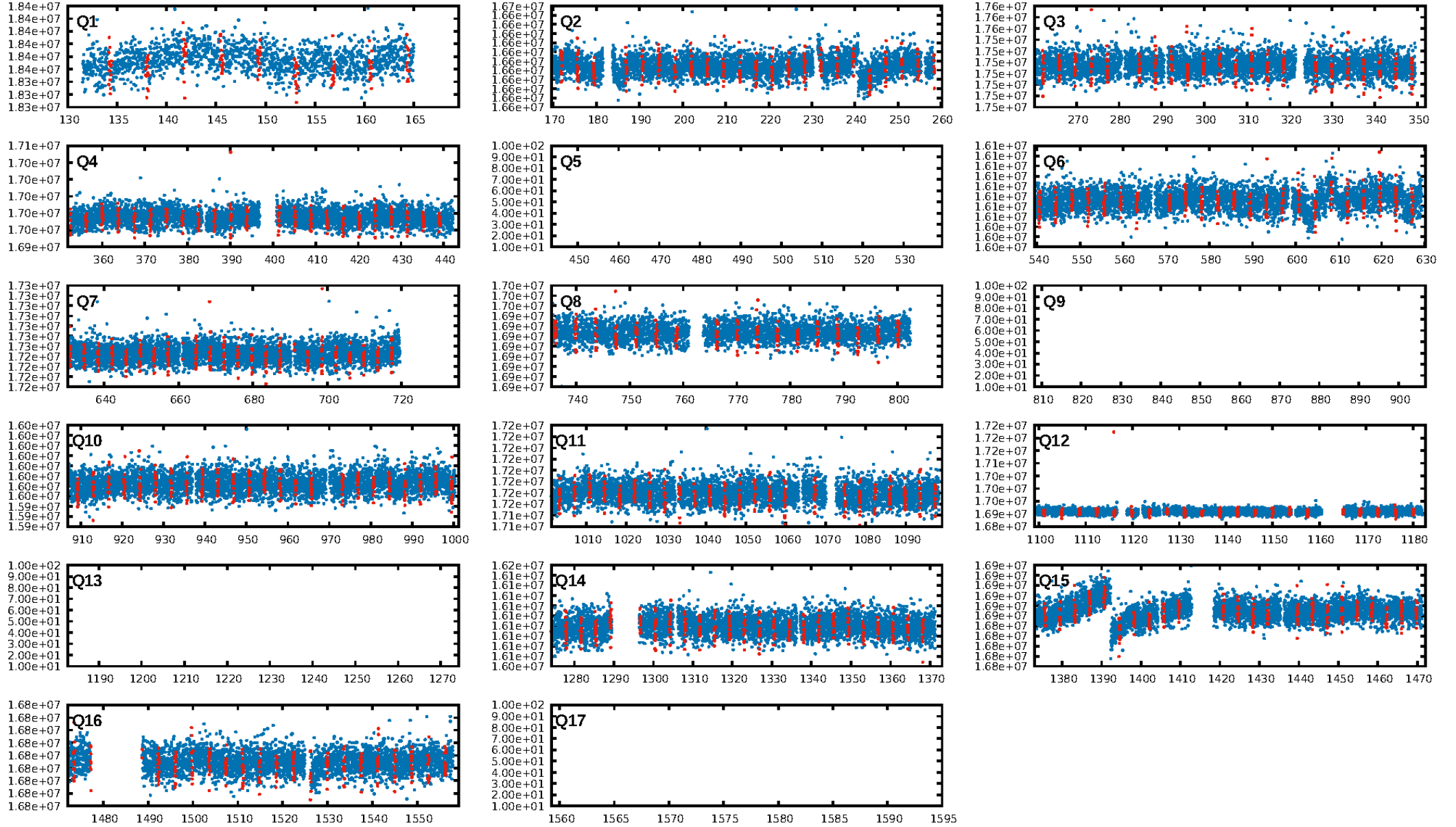
DV Fit Results:

Period = 3.76188 [0.00001] d
Epoch = 134.2751 [0.0022] BKJD
Rp/R* = 0.0267 [0.0009]
a/R* = 2.96 [0.28]
b = 0.96 [0.01]
Seff = 374.09 [135.55]
Teq = 1121 [102] K
Rp = 2.77 [0.76] Re
a = 0.0469 [0.0109] AU
Ag = 3.59 [2.54] [1.02σ]
Teffp = 2386 [378] K [3.23σ]

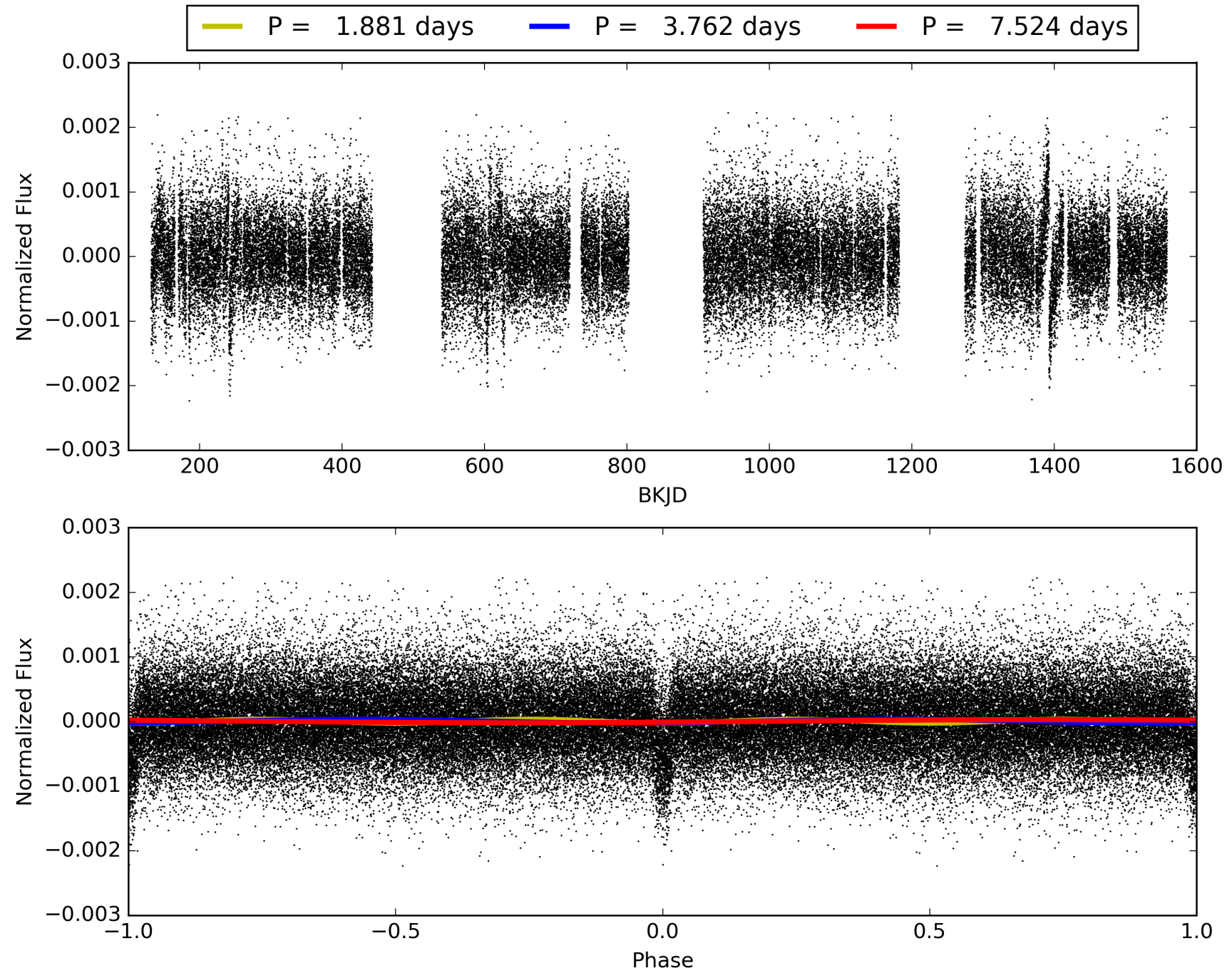
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.97e-192
RollingBand-fgt: 0.96 [254/264]
GhostDiagnostic-chr: 5.33
Centroid-sig: 2.0%
Centroid-so: 0.228 arcsec [0.59σ]
OotOffset-rm: 0.743 arcsec [3.39σ]
KicOffset-rm: 0.063 arcsec [0.37σ]
OotOffset-st: 4/4/4/1 [13]
KicOffset-st: 4/4/4/1 [13]
DiffImageQuality-fgm: 1.00 [13/13]
DiffImageOverlap-fno: 1.00 [13/13]

TCE 006422070-01, PDC Light Curves

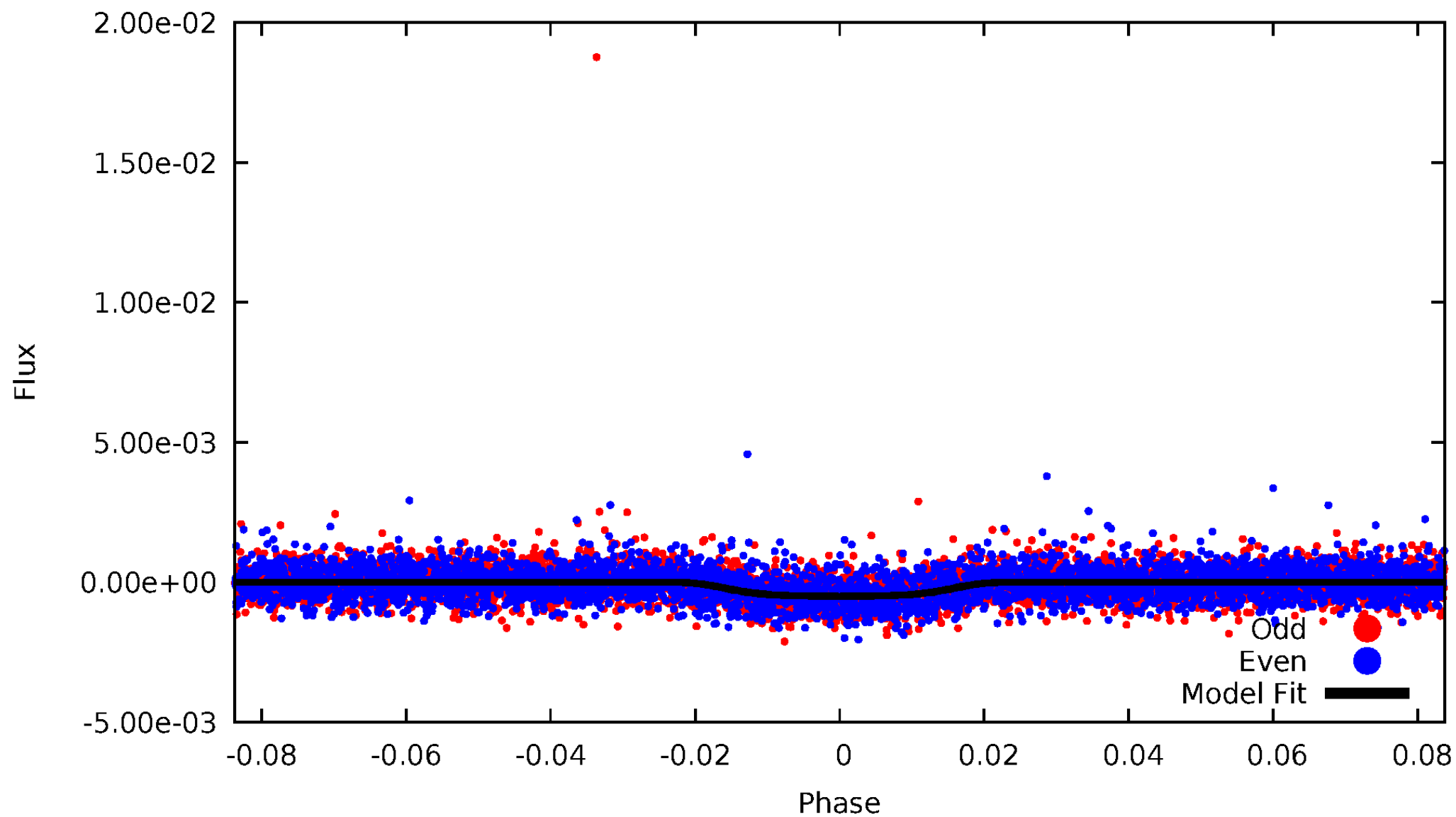


TCE 006422070-01



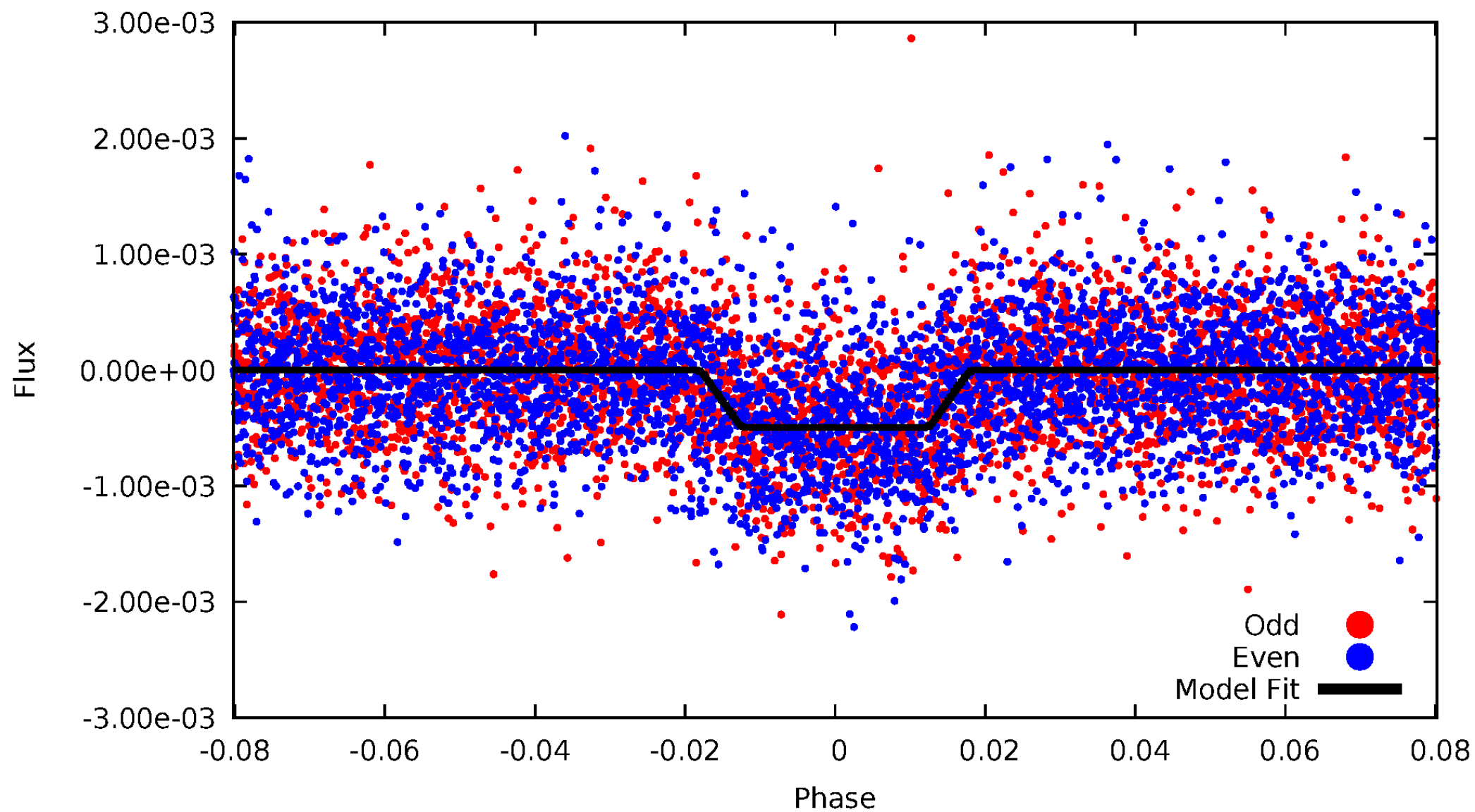
DV Odd/Even

TCE 006422070-01



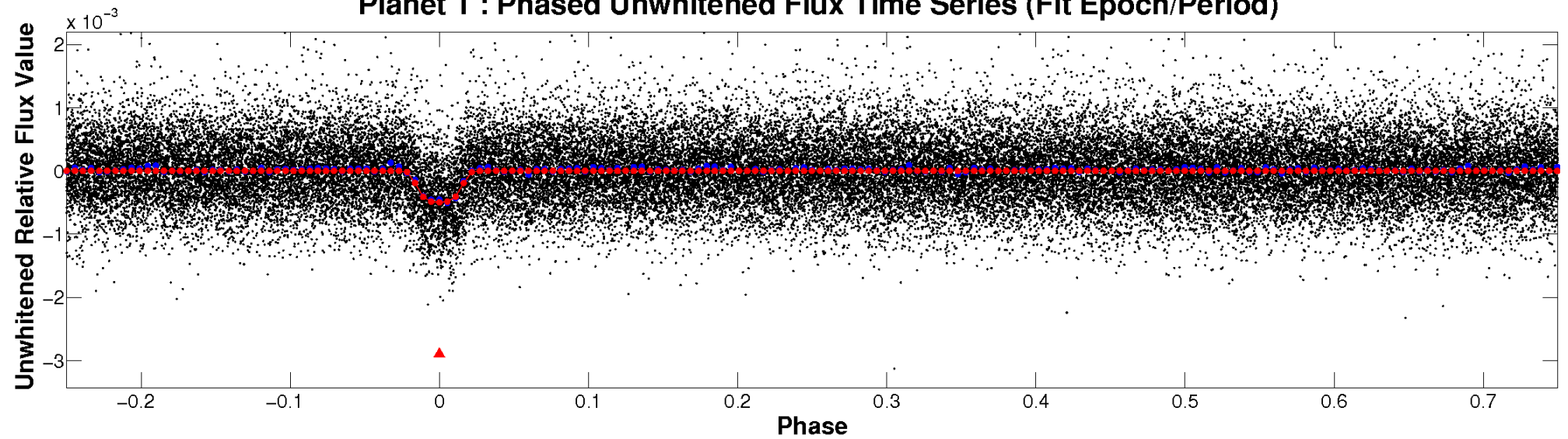
ALT Odd/Even

TCE 006422070-01

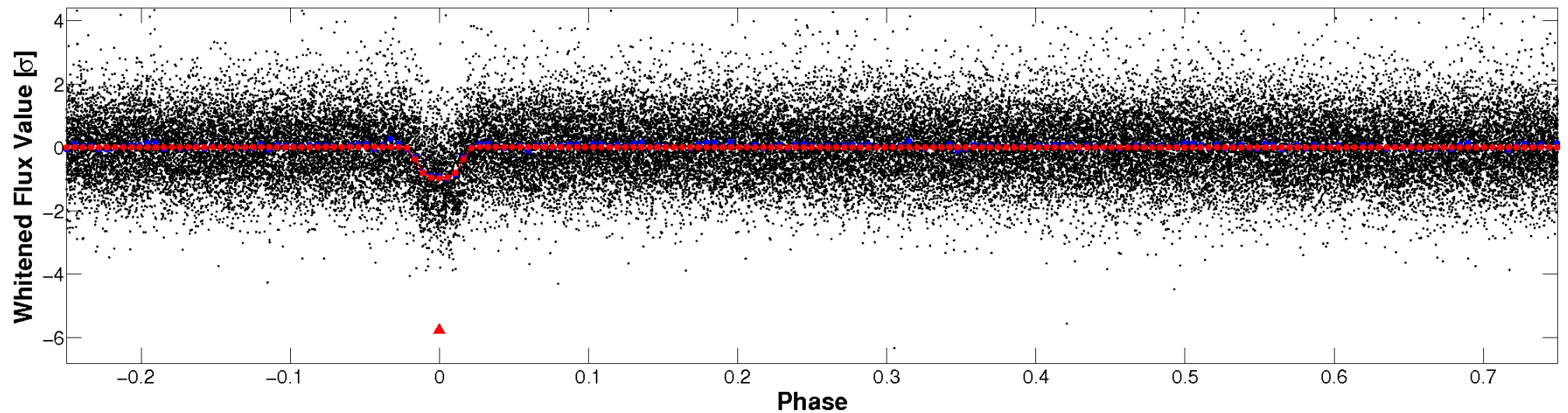


Non-Whitened Vs. Whitened Light Curve

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

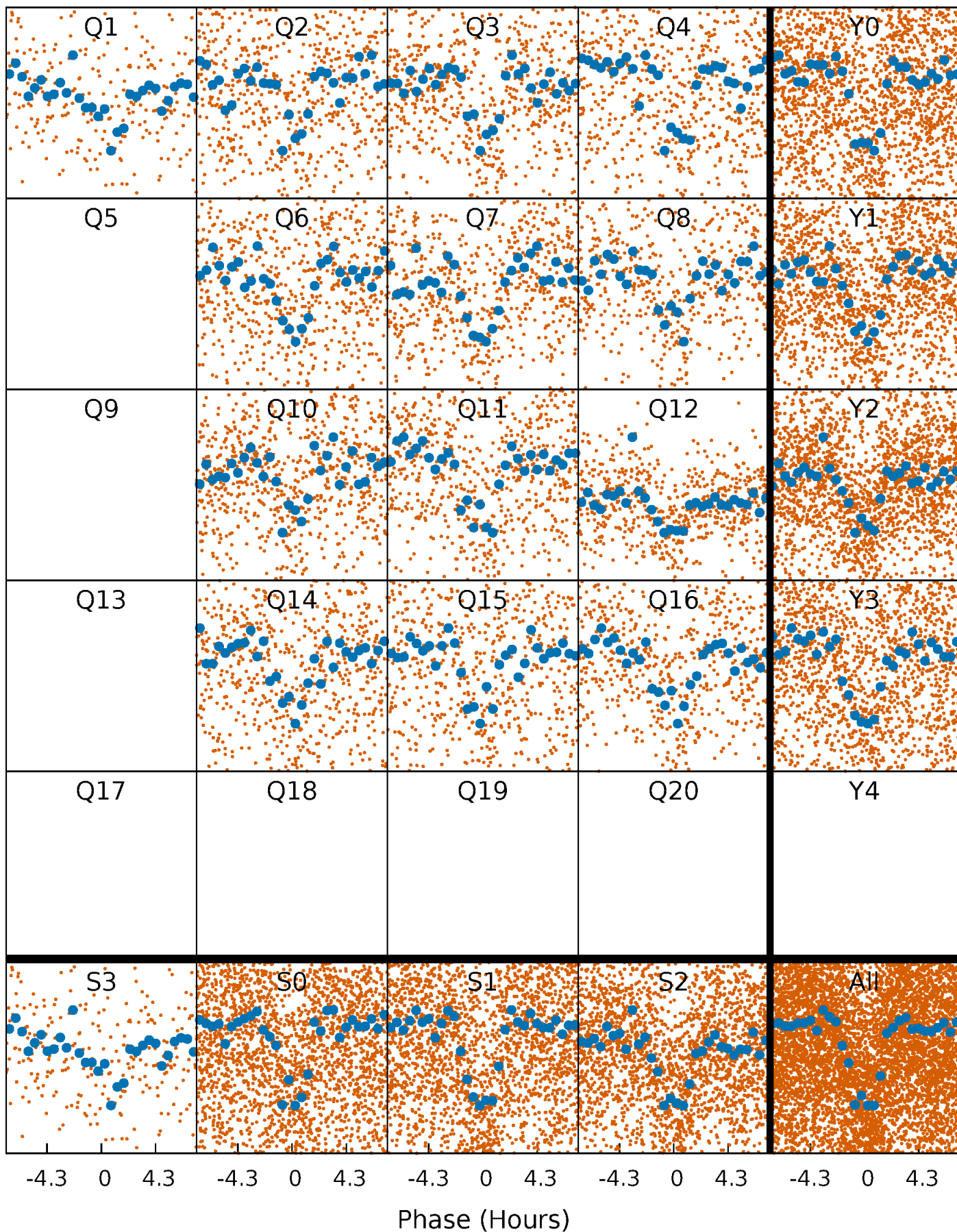


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



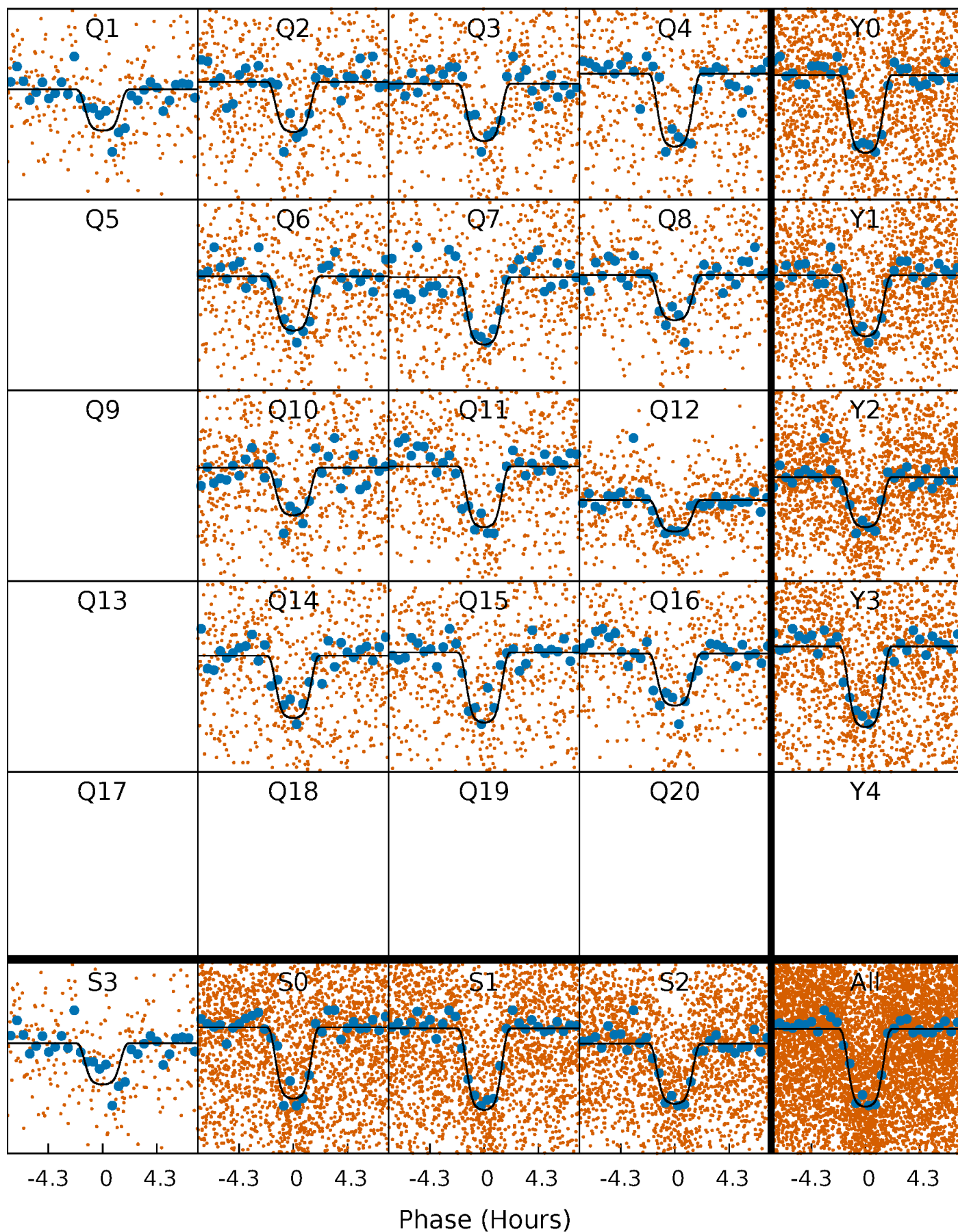
PDC Quarter-Phased Transit Curves

TCE 006422070-01 P= 3.761883 Days $T_0=134.275113$ (BKJD)



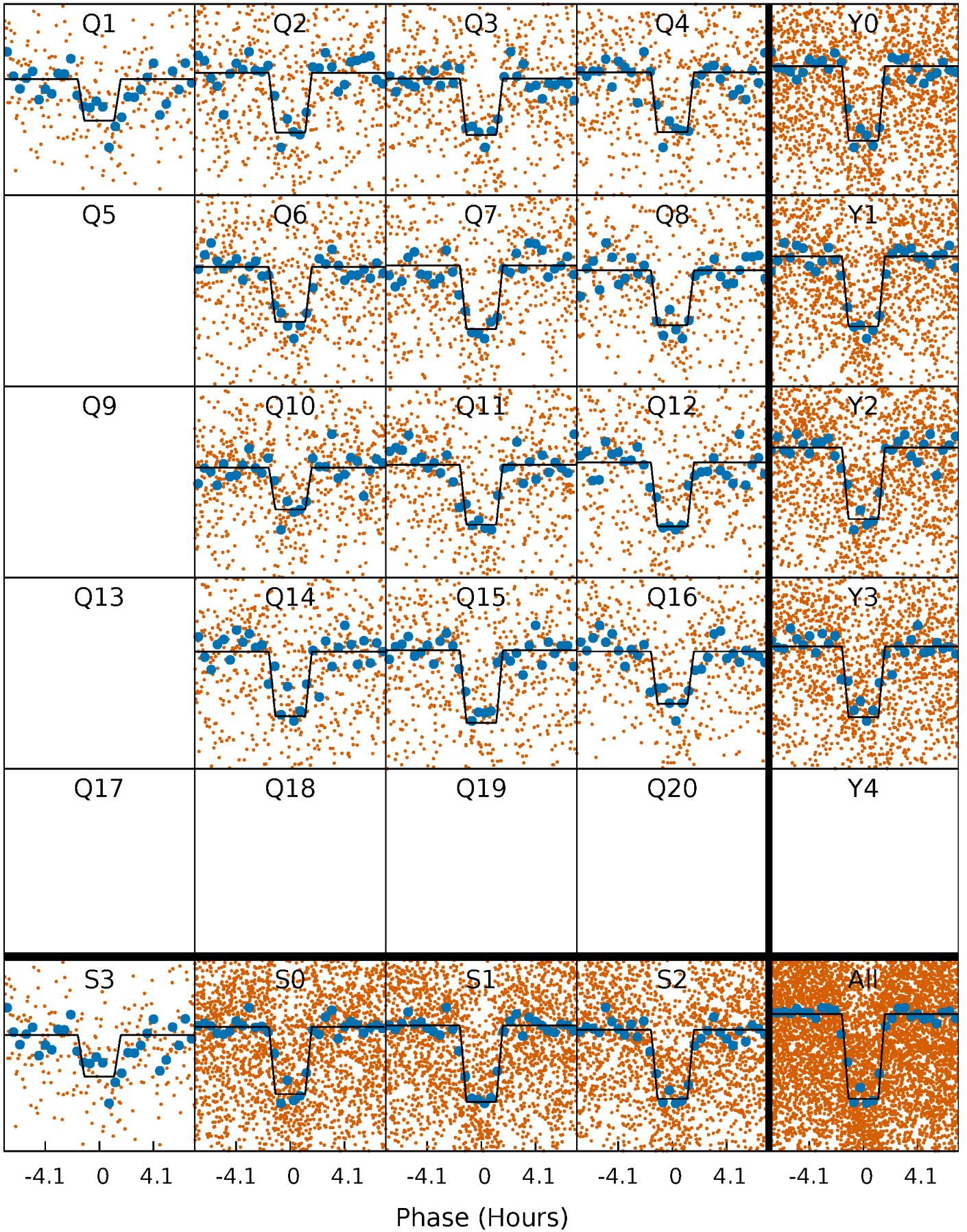
DV Quarter-Phased Transit Curves

TCE 006422070-01 P= 3.761883 Days $T_0=134.275113$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

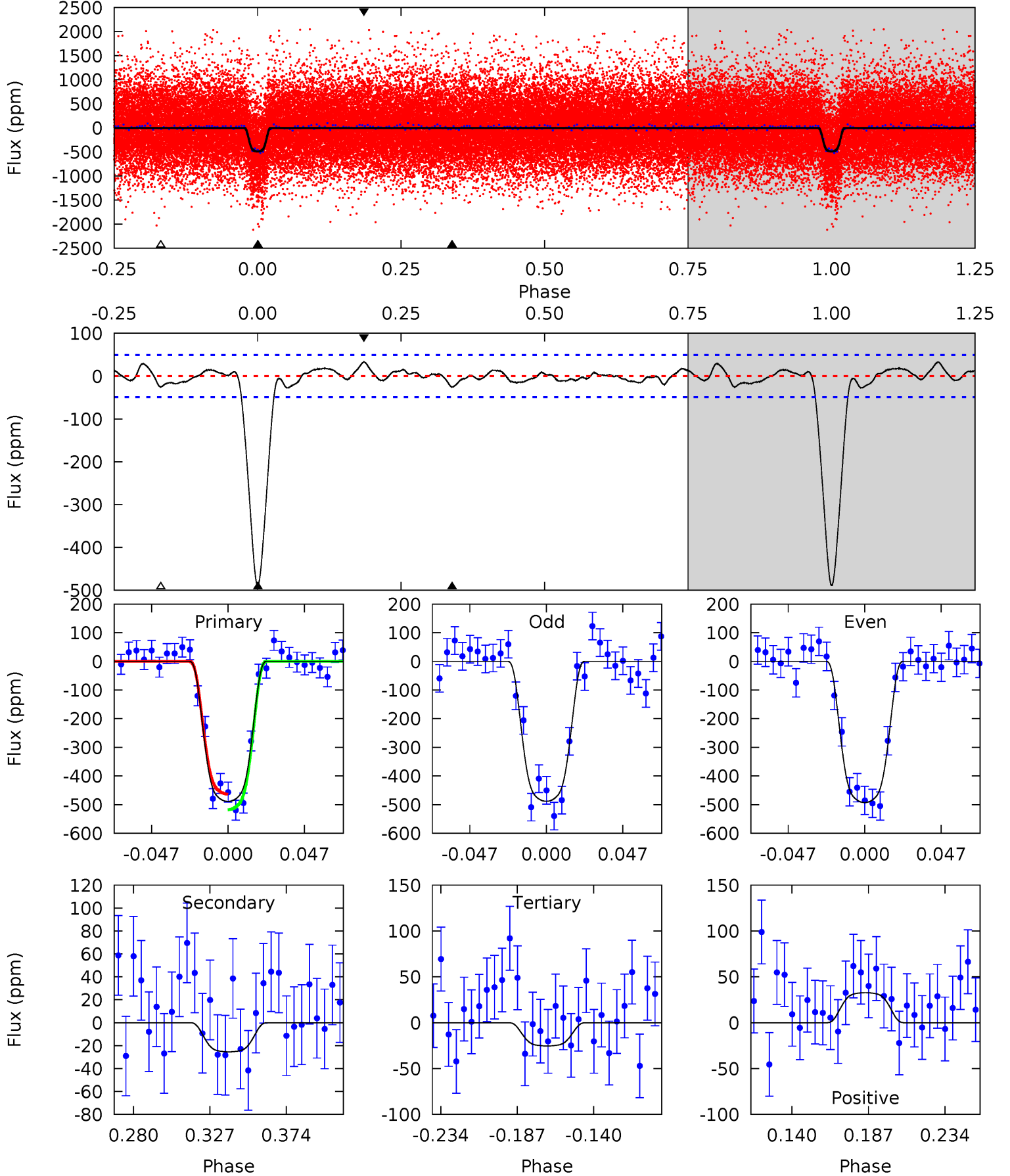
TCE 006422070-01 P= 3.761858 Days $T_0=134.278766$ (BKJD)



DV Model-Shift Uniqueness Test

006422070-01, P = 3.761883 Days, E = 130.513230 Days

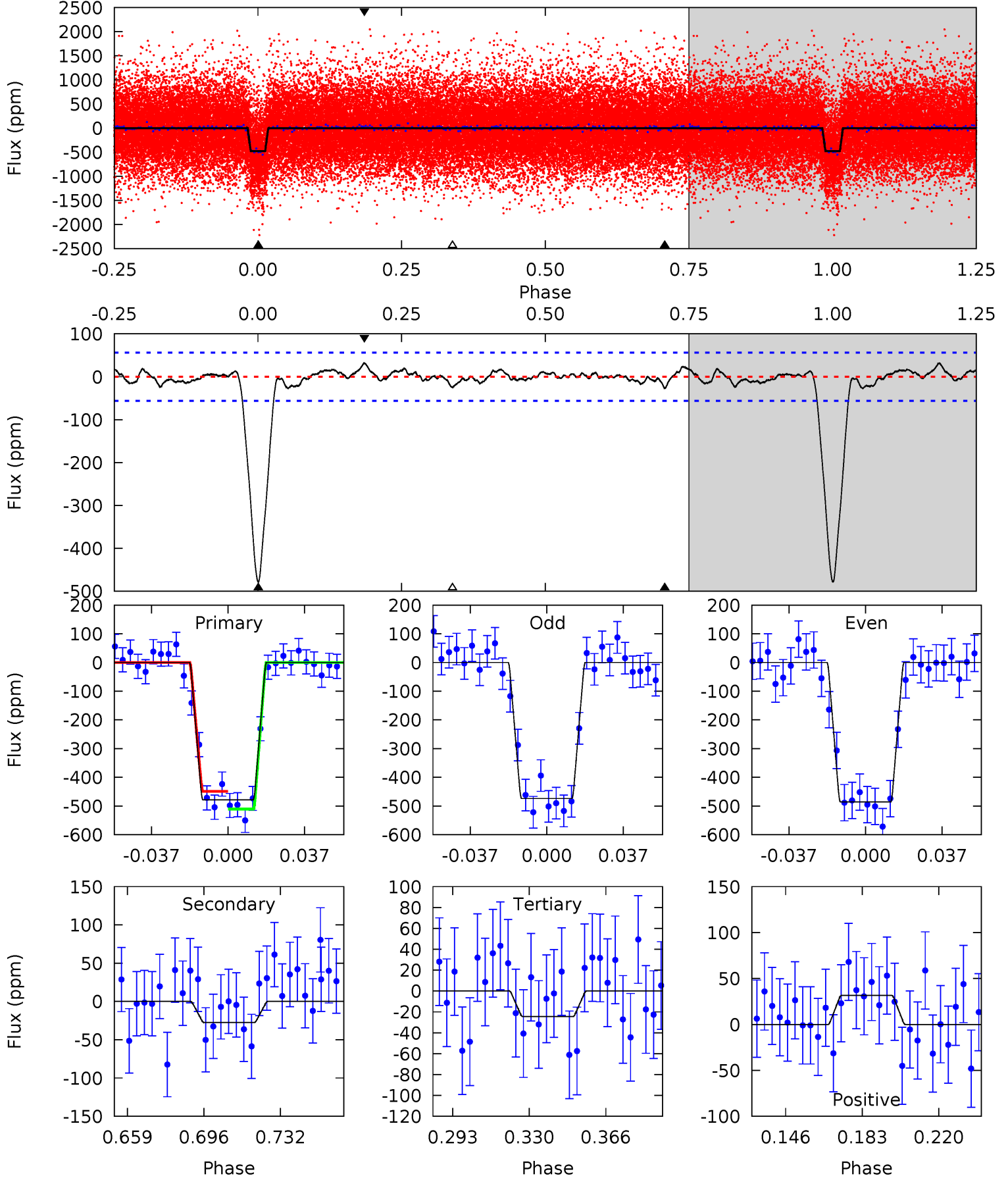
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 46.7 | 2.43 | 2.43 | 3.13 | 4.72 | 1.99 | 1.13 | 44.3 | 43.6 | 0.01 | -0.69 | 0.21 | 1.00 | 0.06 | 2.61 |



Alt Model-Shift Uniqueness Test

006422070-01, P = 3.761858 Days, E = 130.516908 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 40.6 | 2.33 | 2.08 | 2.68 | 4.77 | 2.09 | 0.88 | 38.5 | 37.9 | 0.25 | -0.35 | 0.50 | 0.99 | 0.06 | 2.63 |



Stellar Parameters For KIC 006422070

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5653^{+154}_{-171} | $4.472^{+0.062}_{-0.188}$ | $0.100^{+0.250}_{-0.300}$ | $0.949^{+0.260}_{-0.093}$ | $0.974^{+0.100}_{-0.111}$ | $1.607^{+0.516}_{-0.762}$ |
| | +3%/-3% | +1%/-4% | +250%/-300% | +27%/-10% | +10%/-11% | +32%/-47% |
| 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 006422070-01 / KOI 0852.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|--------------|------------------------|----------------------|----------------------|---------------------------|
| DV | -25 ± 10 | $2.83^{+0.43}_{-0.23}$ | 1592^{+110}_{-73} | 3042^{+180}_{-239} | $3.599^{+1.852}_{-1.608}$ |
| Alt. | -27 ± 12 | $2.34^{+0.37}_{-0.19}$ | 1588^{+110}_{-65} | 3264^{+208}_{-290} | $5.551^{+3.008}_{-2.542}$ |

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 $A_{\text{obs}} \gg 1.0$

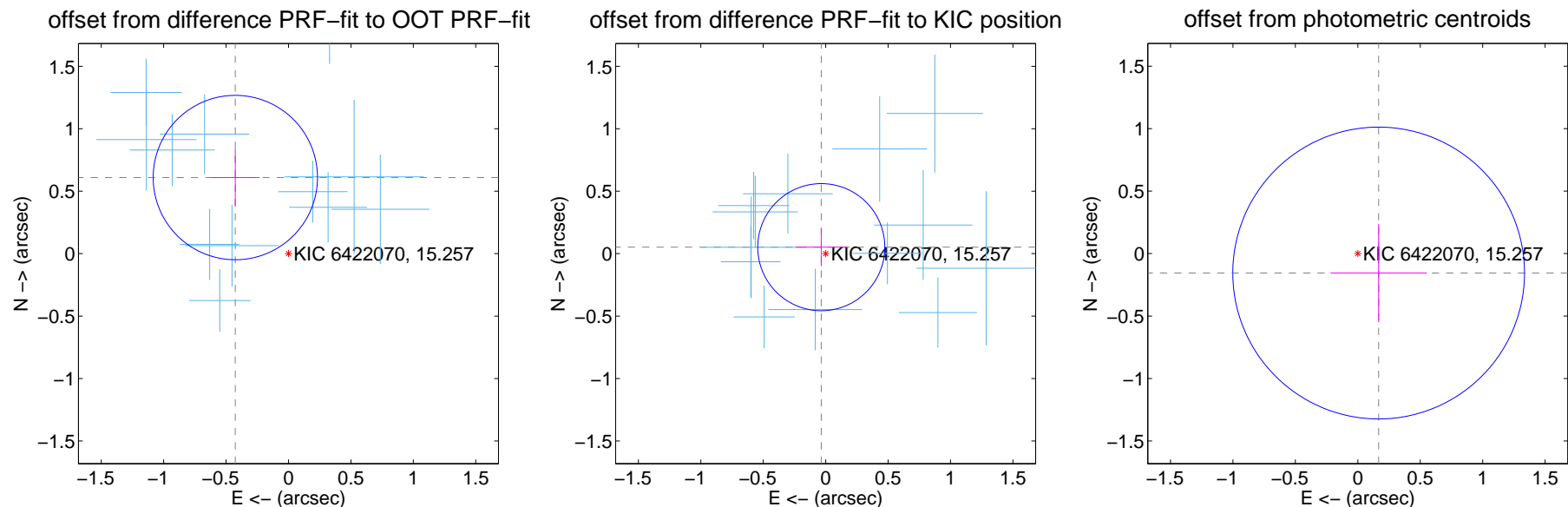
DV Centroid Data

Supplemental centroid analysis for 006422070-01. Kepler magnitude: 15.26. Transit SNR 33.23

There are 13 quarters with good PRF difference image offsets

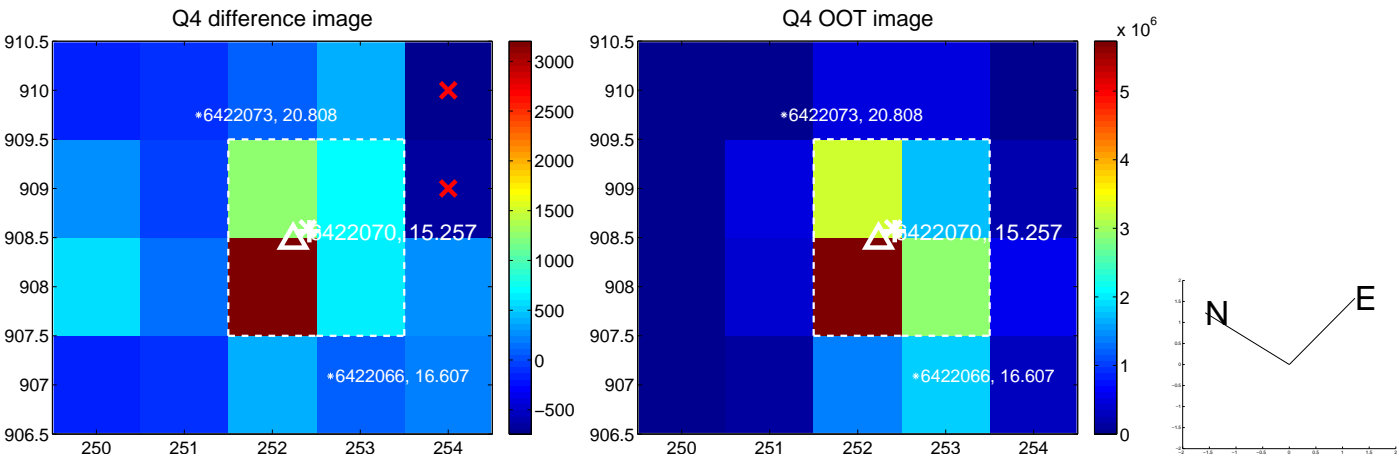
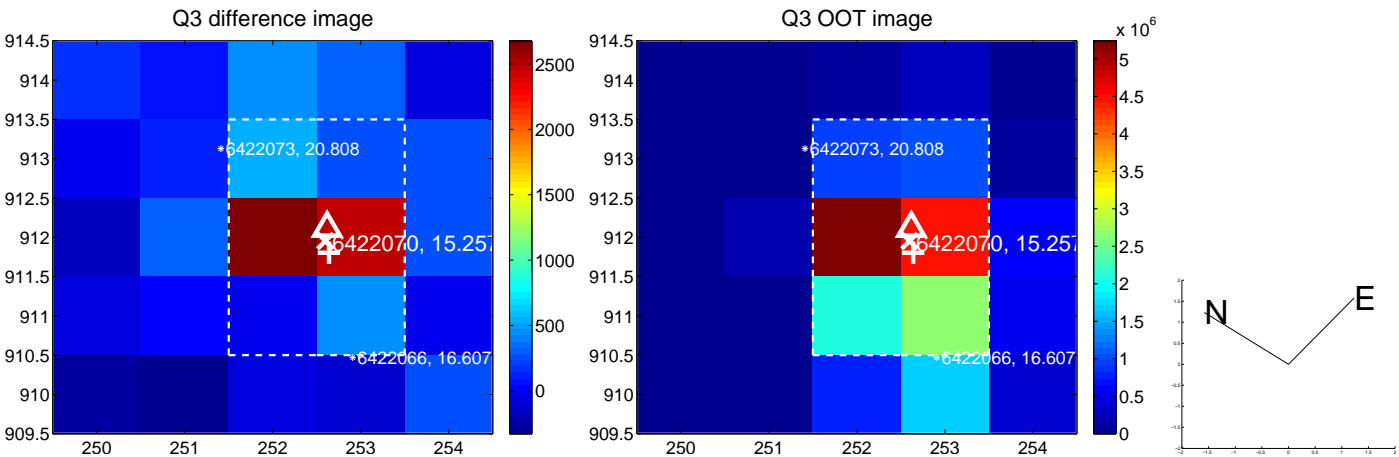
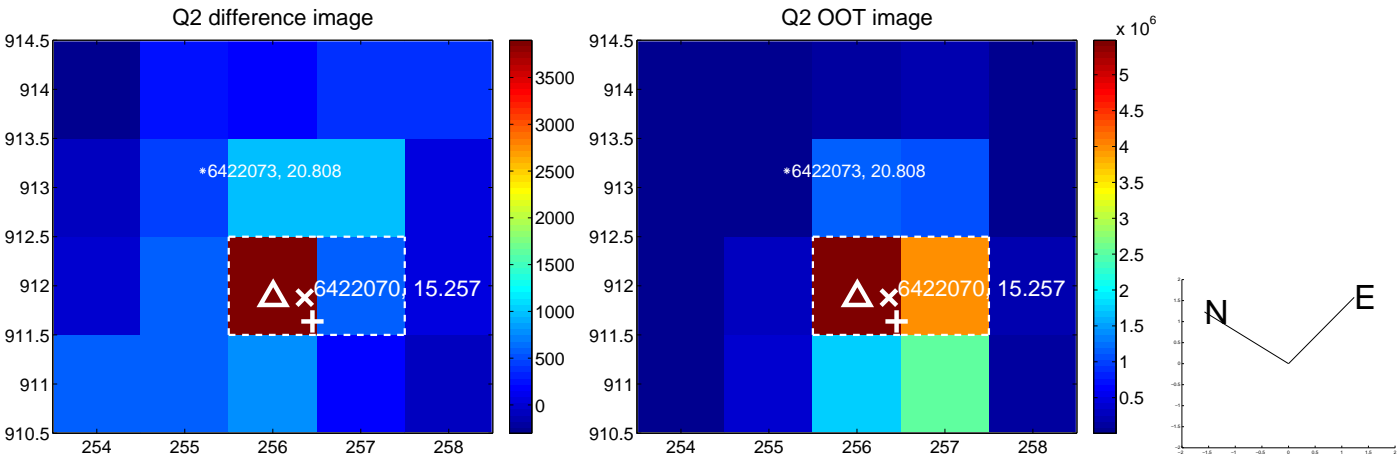
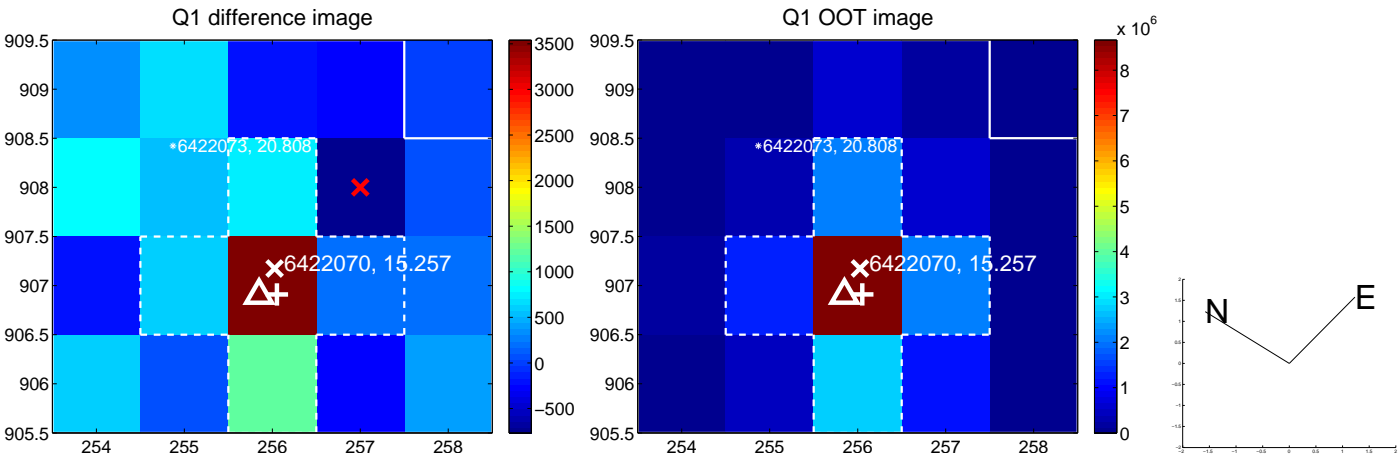
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 0.743 \pm 0.219 | 3.39 | 0.426 \pm 0.196 | 0.609 \pm 0.230 |
| PRF-fit source offset from KIC position | 0.063 \pm 0.170 | 0.37 | 0.035 \pm 0.205 | 0.052 \pm 0.151 |
| photometric centroid source offset | 0.23 \pm 0.39 | 0.59 | -0.17 \pm 0.39 | -0.16 \pm 0.39 |

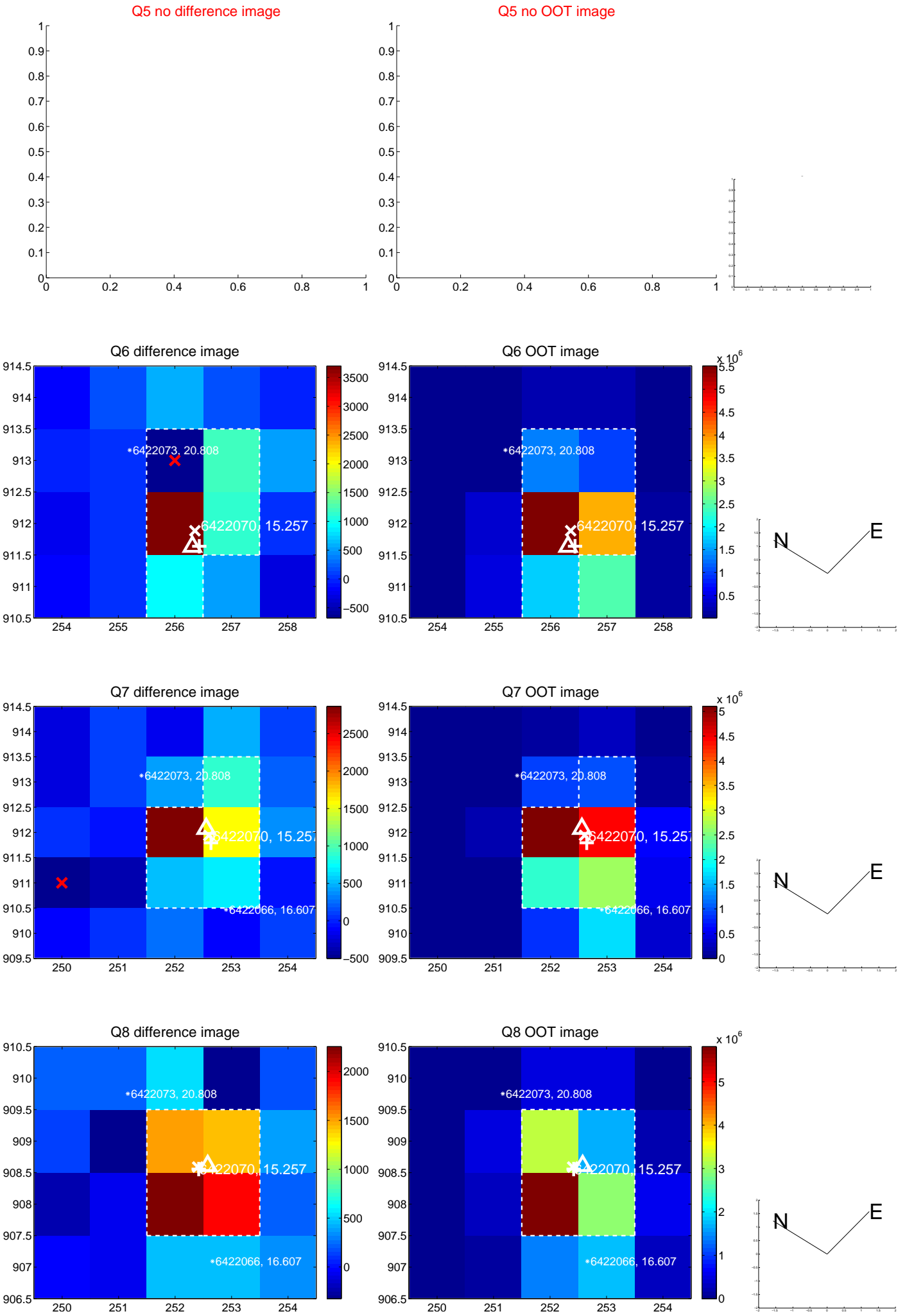


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

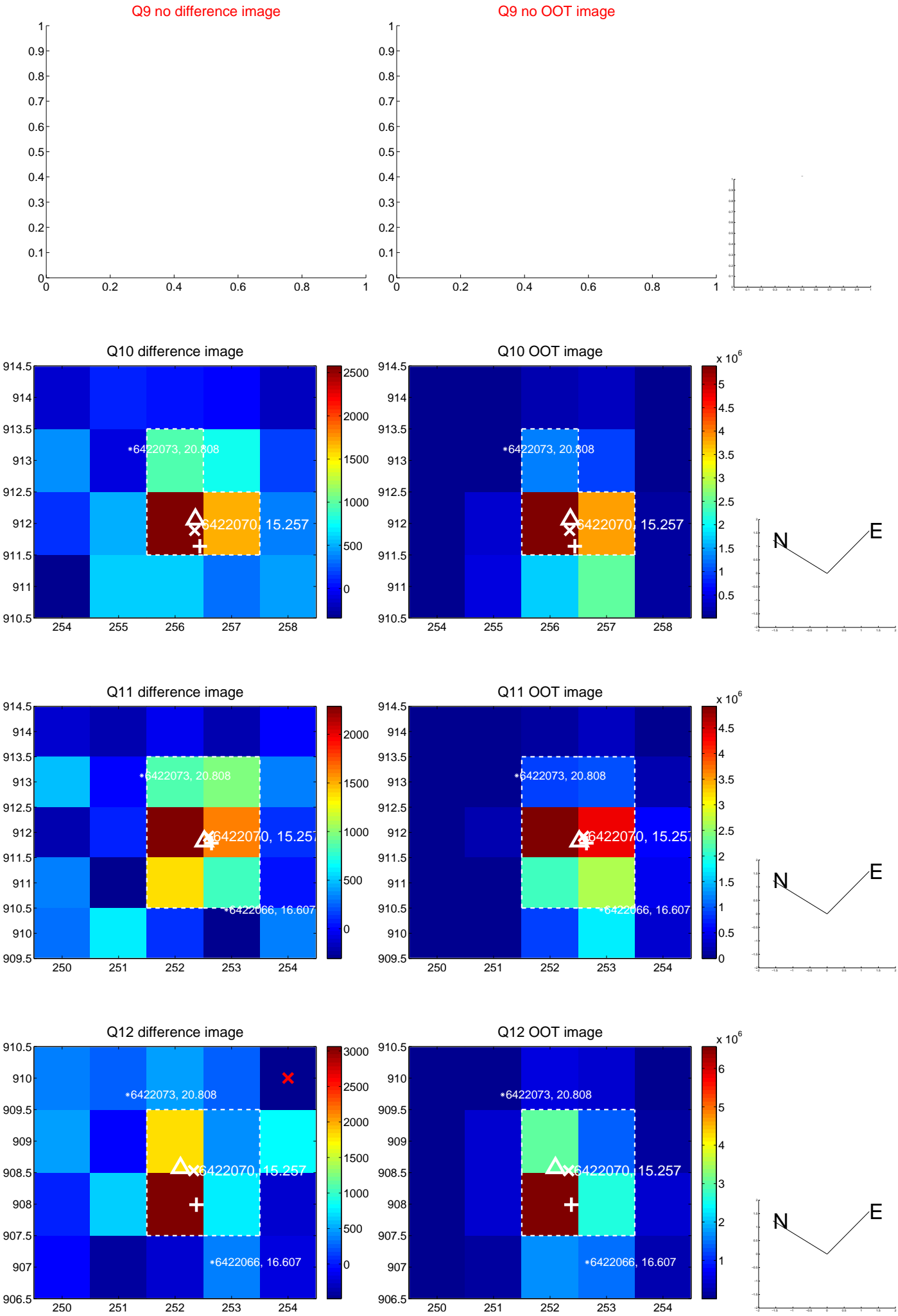
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



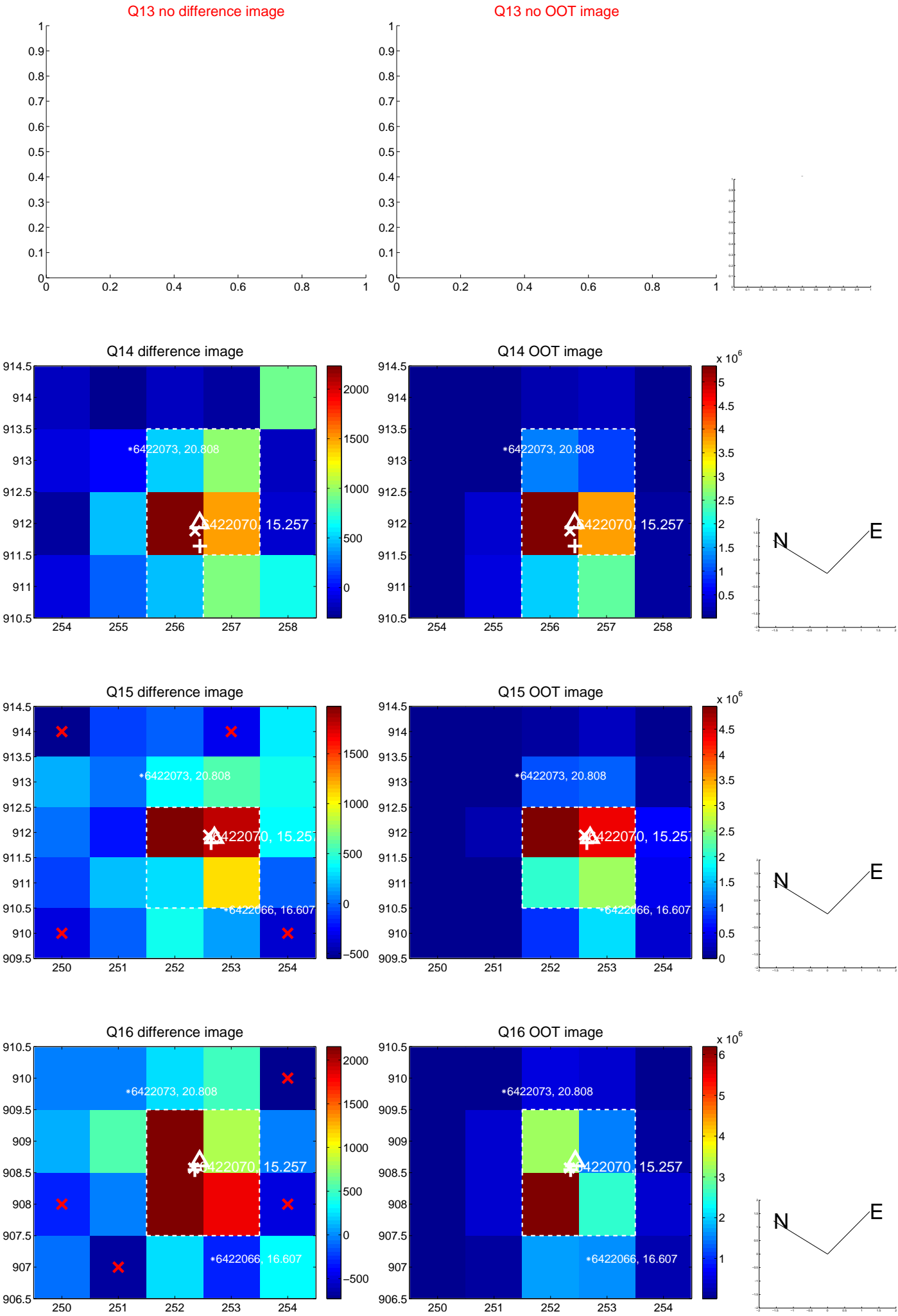
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



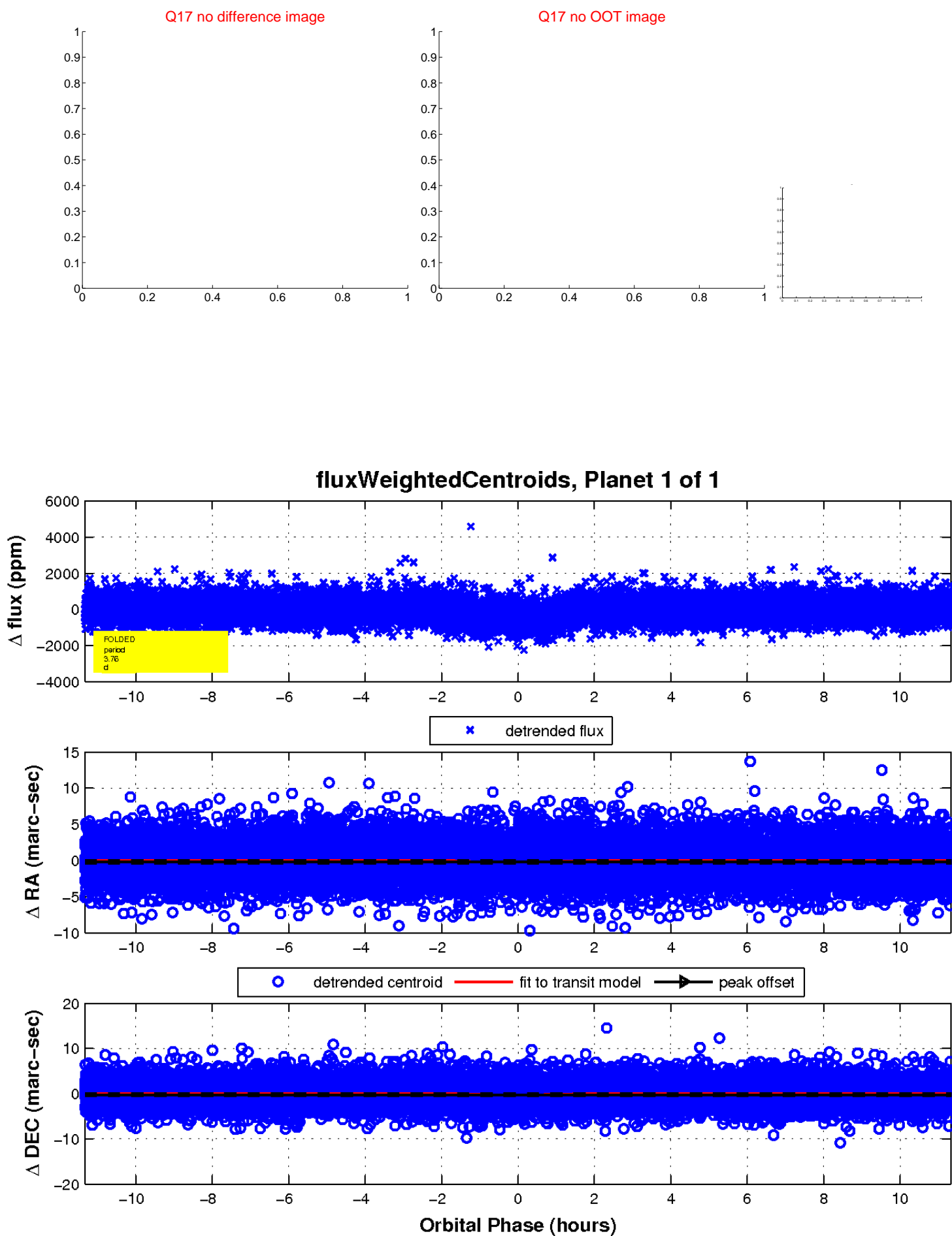
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

