

KIC 009887224

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 009887224-01 | OBS | 2464.01 | 0.874641 | 132.252893 | 62.4 | 1.946 | 17.1 | 18.5 | 0.83 | 5099 | 0.80 | 1541.03 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---------------------------------|
| 009887224-01 | OBS | FP | 0.00 | 0 | 0 | 1 | 0 | CENT_RESOLVED_OFFSET—HALO_GHOST |

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

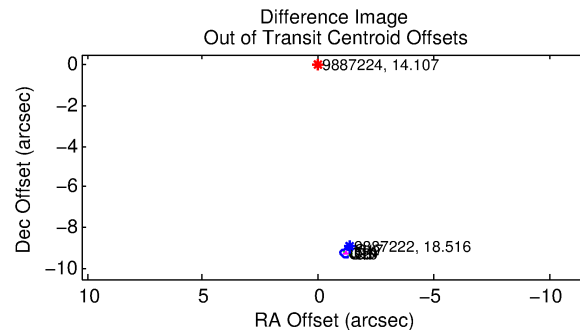
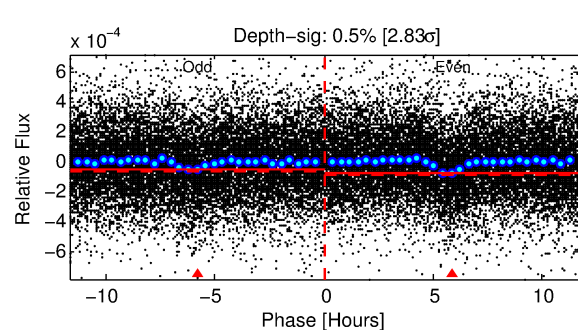
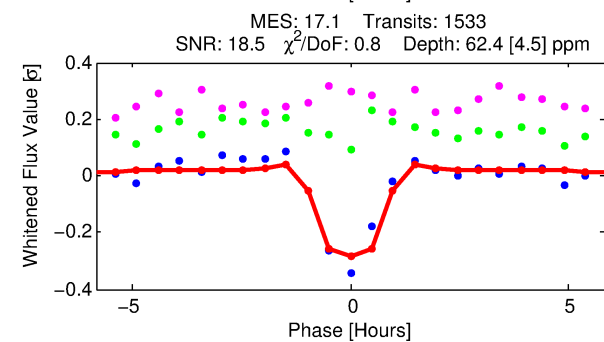
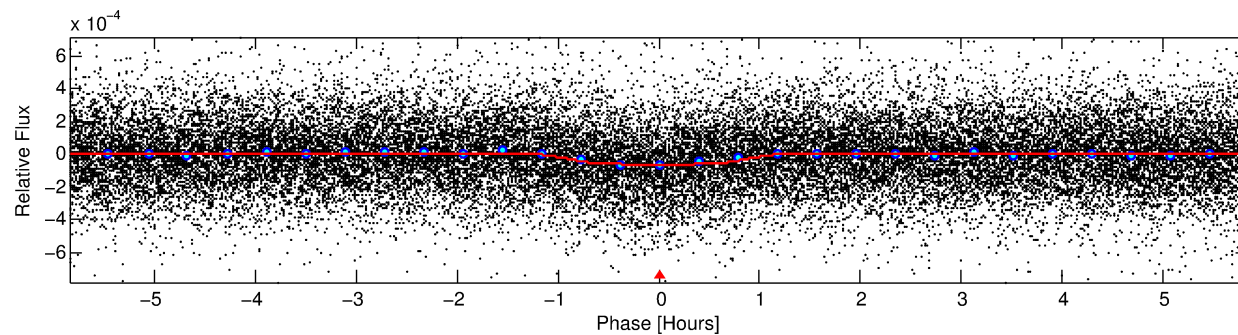
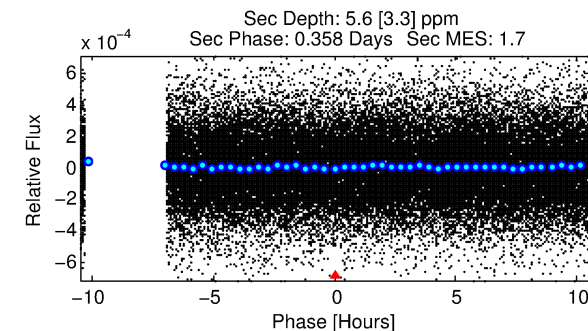
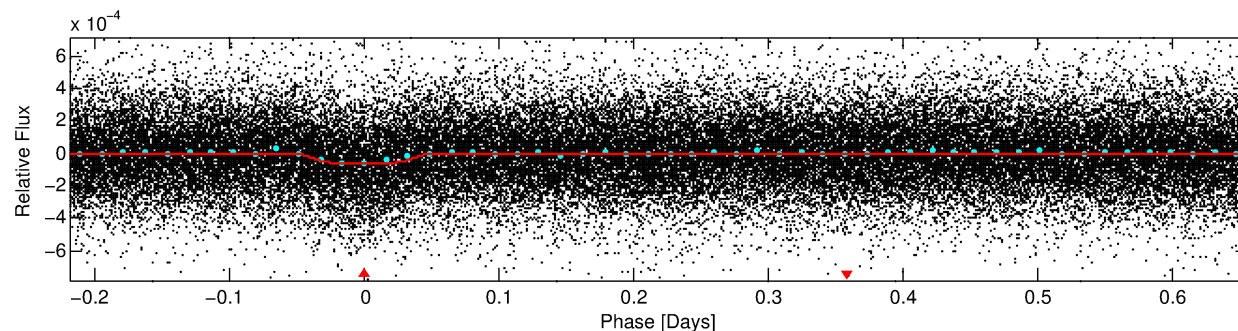
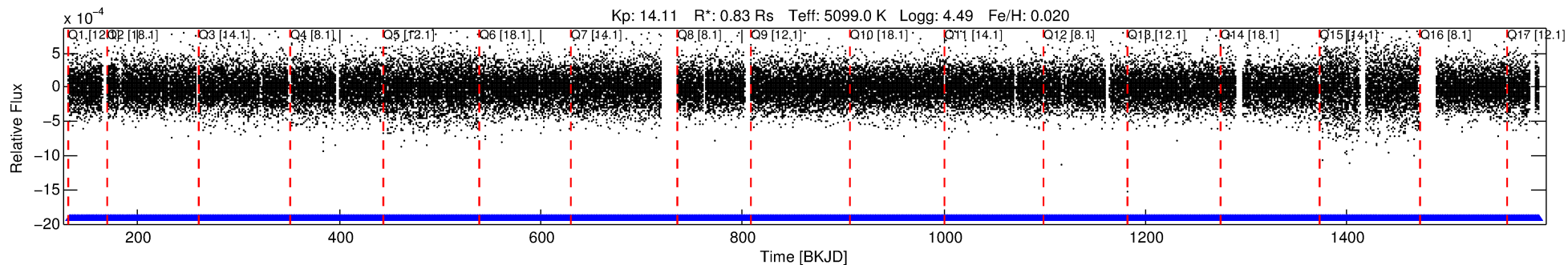
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009887224-01

No Significant Match Found

DV One-Page Summary

KIC: 9887224 Candidate: 1 of 1 Period: 0.875 d
KOI: K02464.01 Corr: 0.928



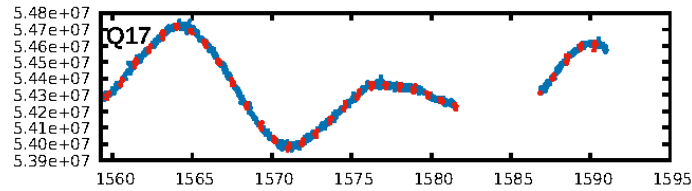
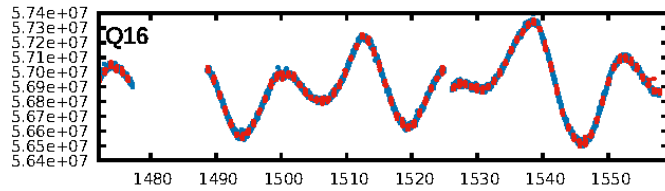
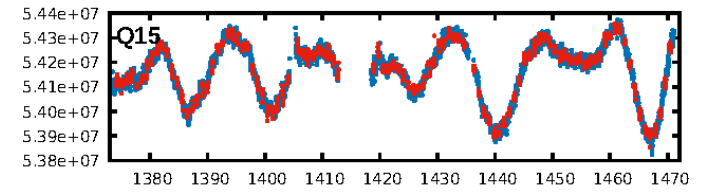
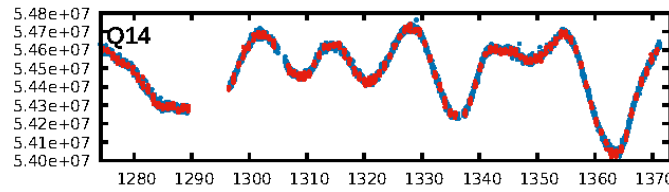
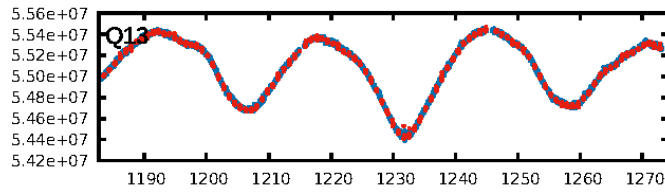
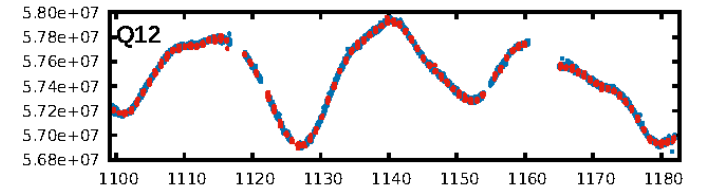
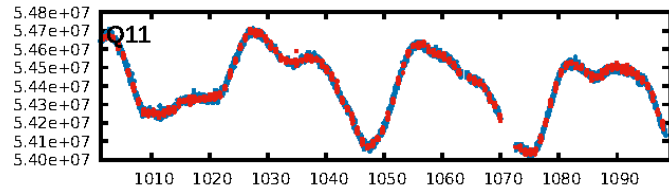
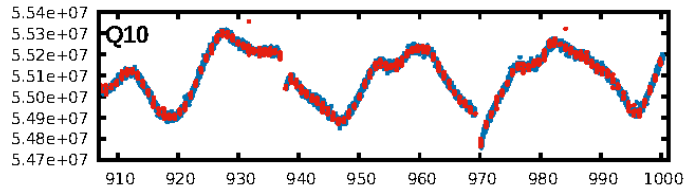
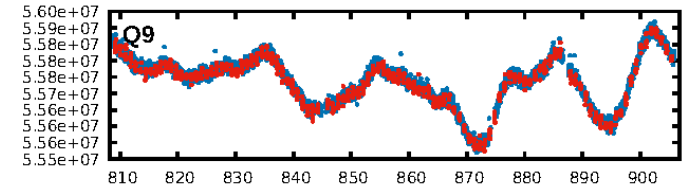
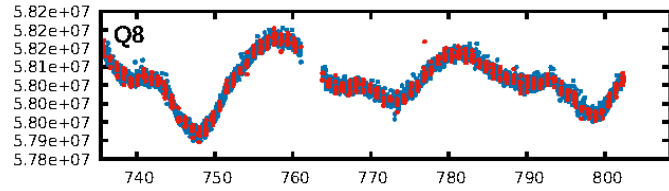
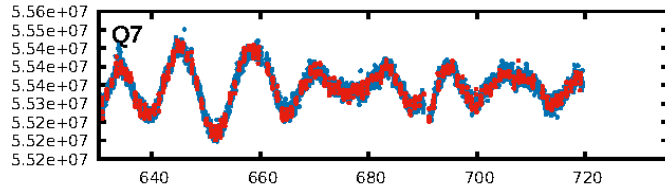
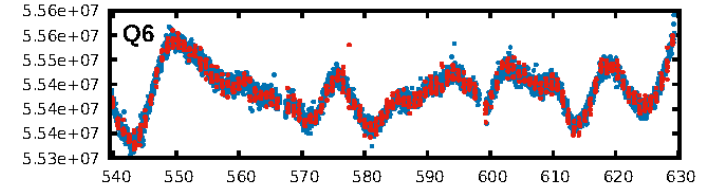
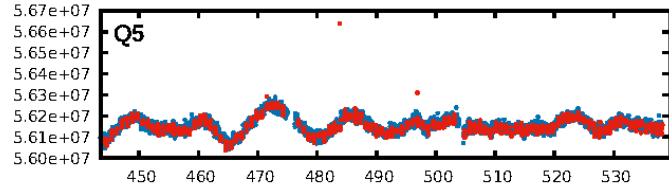
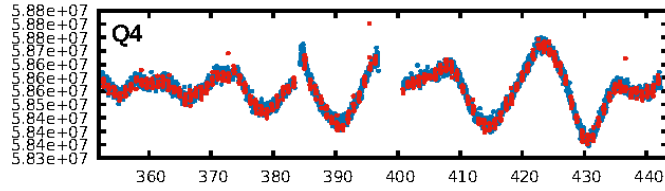
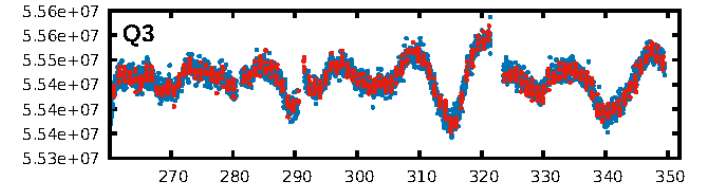
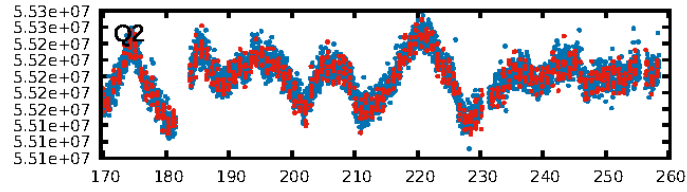
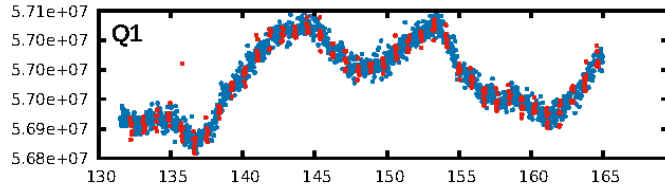
DV Fit Results:

Period = 0.87464 [0.00001] d
Epoch = 132.2529 [0.0013] BKJD
Rp/R* = 0.0088 [0.0030]
a/R* = 1.81 [1.78]
b = 0.90 [0.30]
Seff = 1541.03 [304.24]
Teff = 1598 [79] K
Rp = 0.80 [0.29] Re
a = 0.0165 [0.0017] AU
Ag = 1.30 [1.19] [0.25σ]
Teffp = 2639 [601] K [1.72σ]

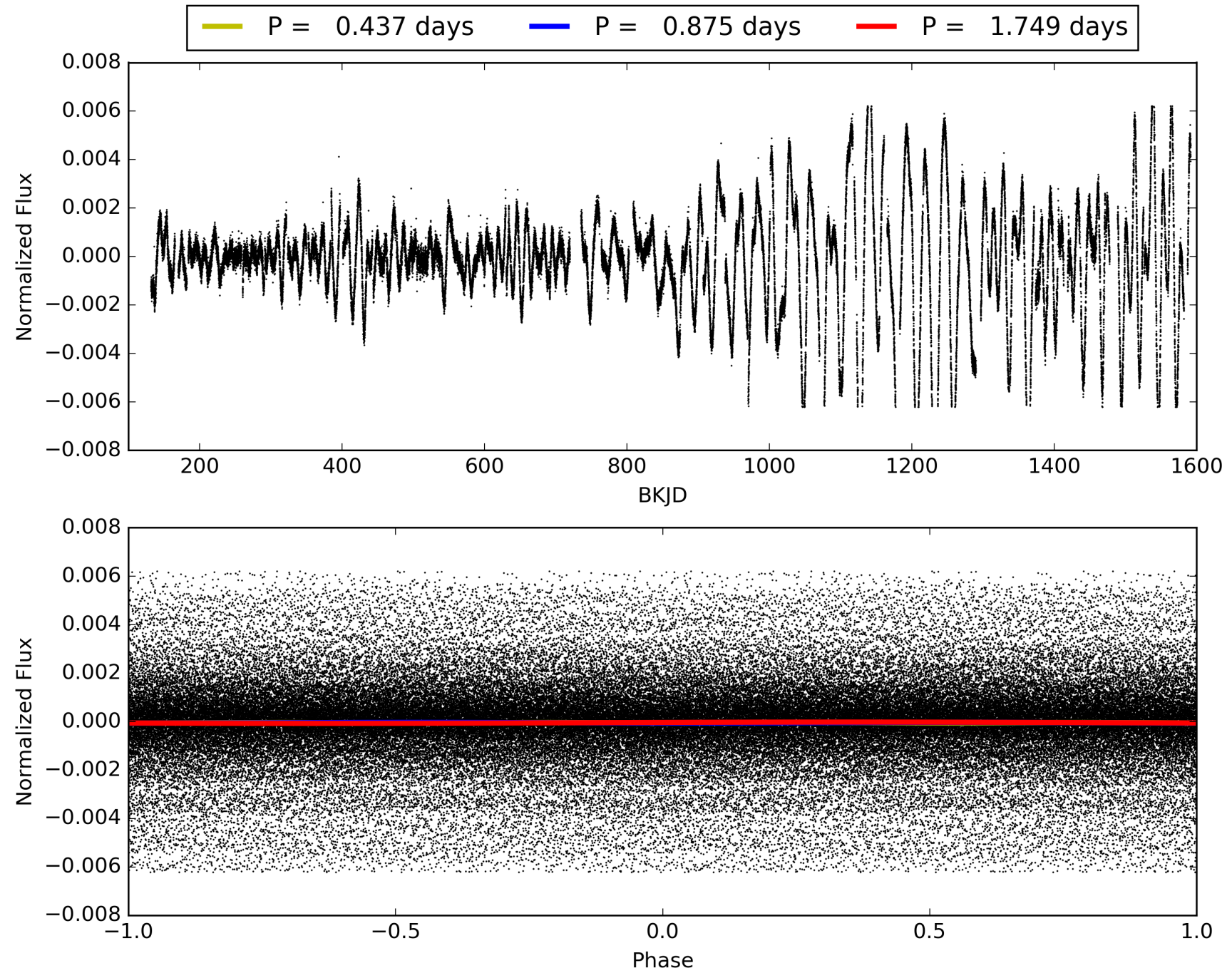
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.51e-61
RollingBand-fgt: 1.00 [1465/1465]
GhostDiagnostic-chr: -0.1228
Centroid-sig: 0.0%
Centroid-so: 197.962 arcsec [331.48σ]
OotOffset-rm: 9.309 arcsec [132.64σ]
KicOffset-rm: 9.591 arcsec [140.35σ]
OotOffset-st: 4/0/0/3 [7]
KicOffset-st: 4/0/0/3 [7]
DiffImageQuality-fgm: 1.00 [7/7]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009887224-01, PDC Light Curves

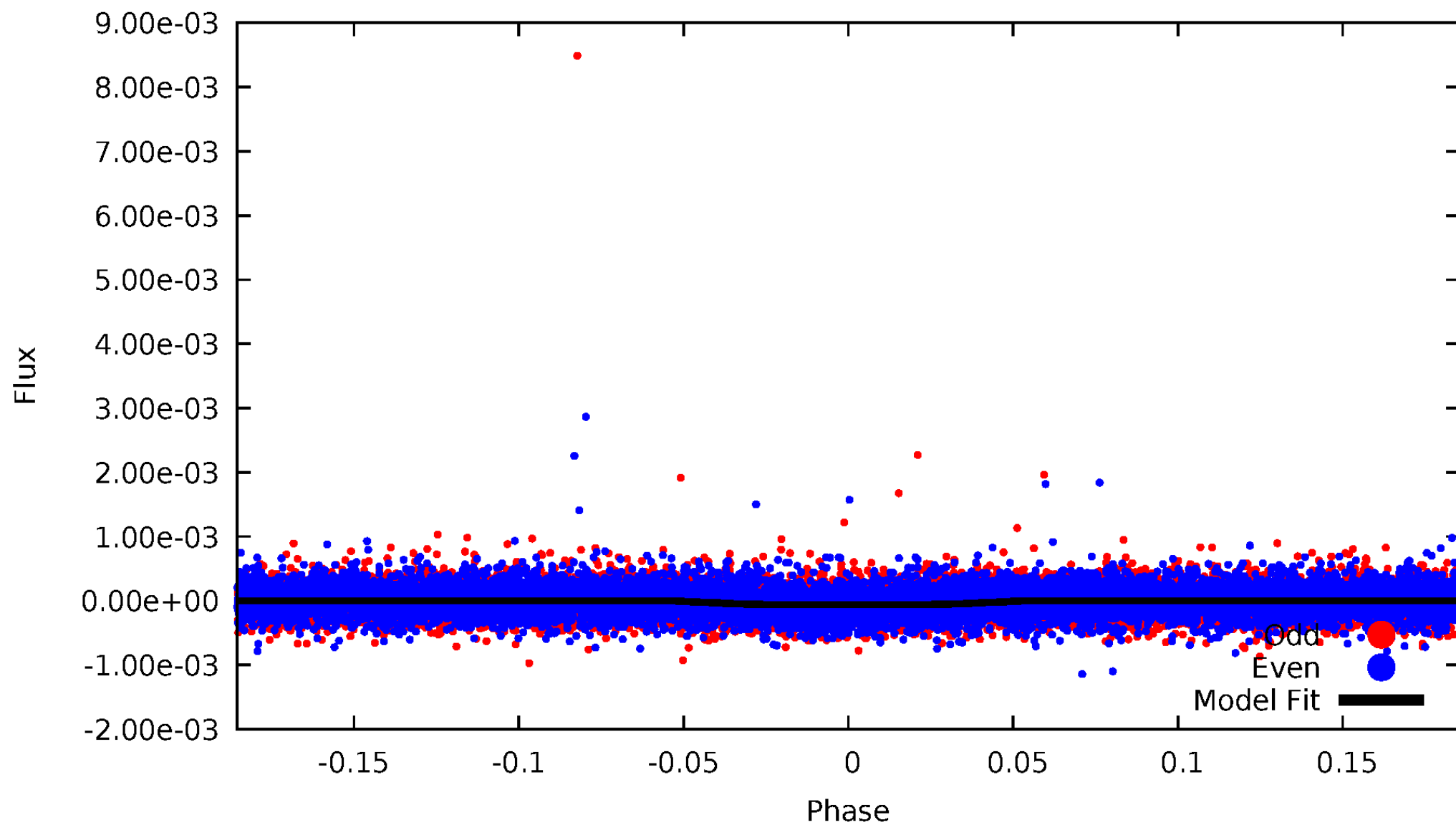


TCE 009887224-01



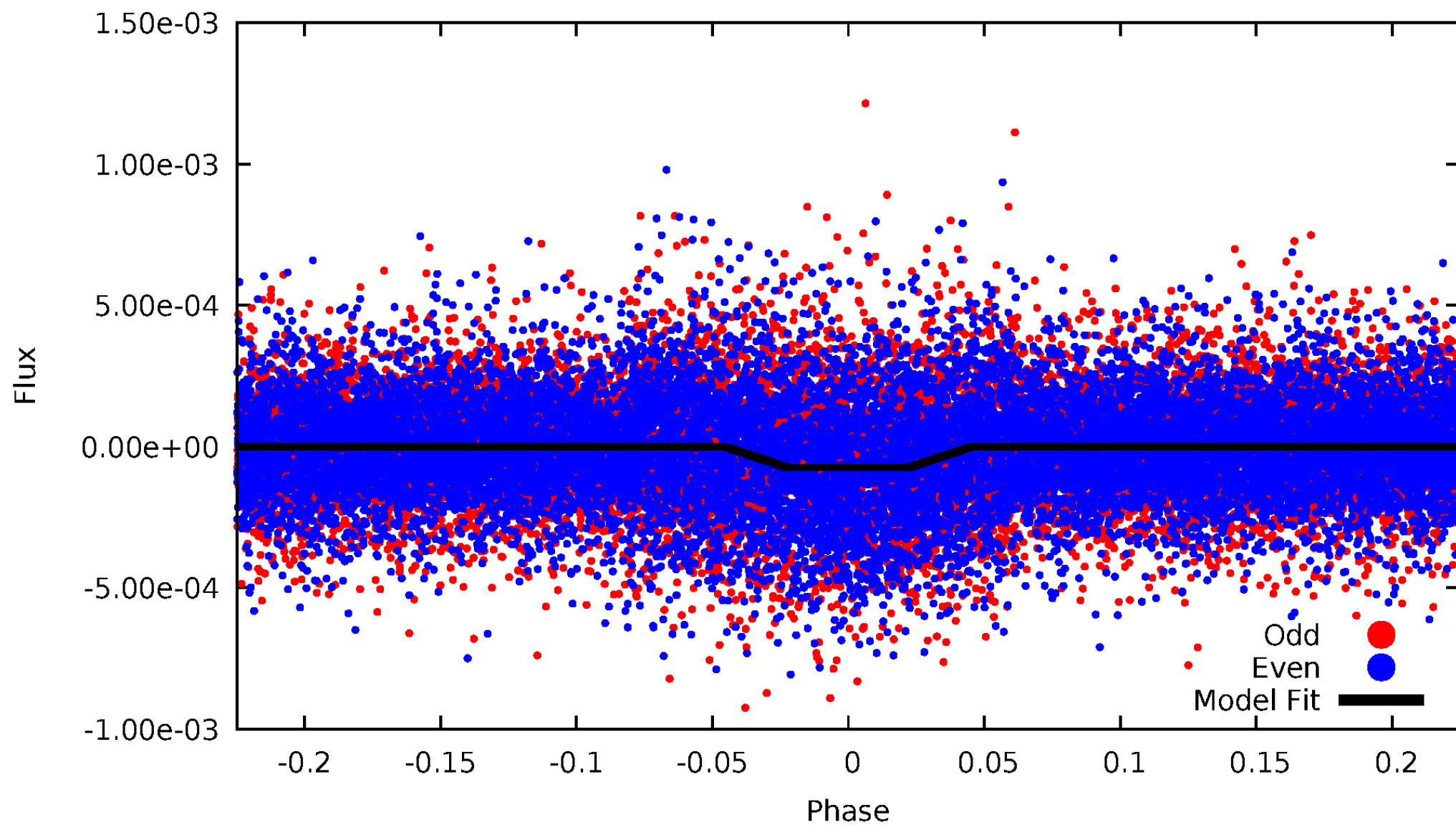
DV Odd/Even

TCE 009887224-01



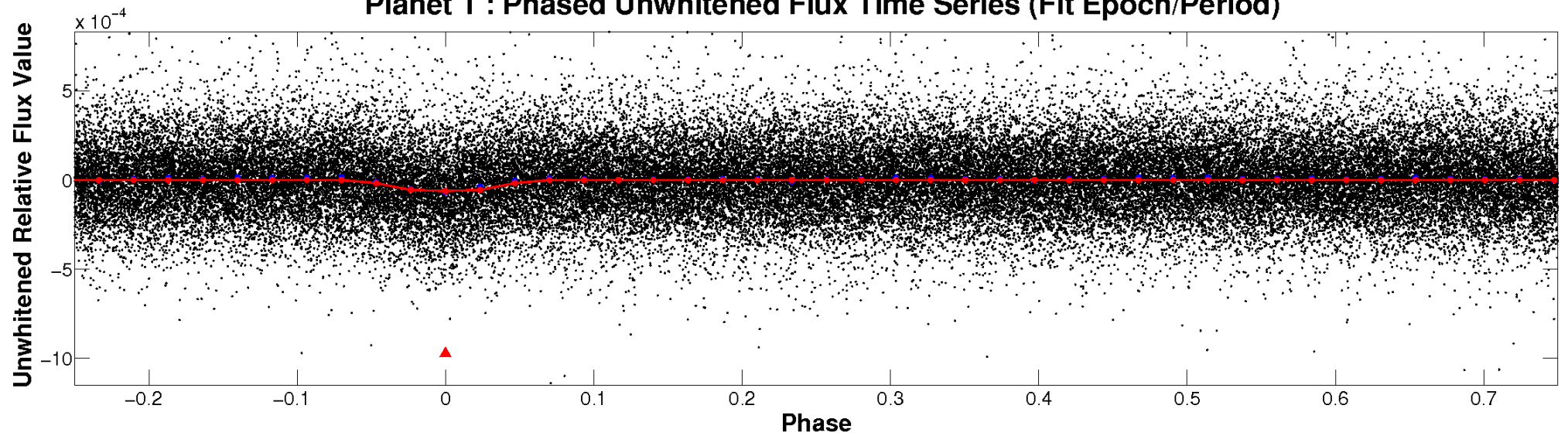
ALT Odd/Even

TCE 009887224-01

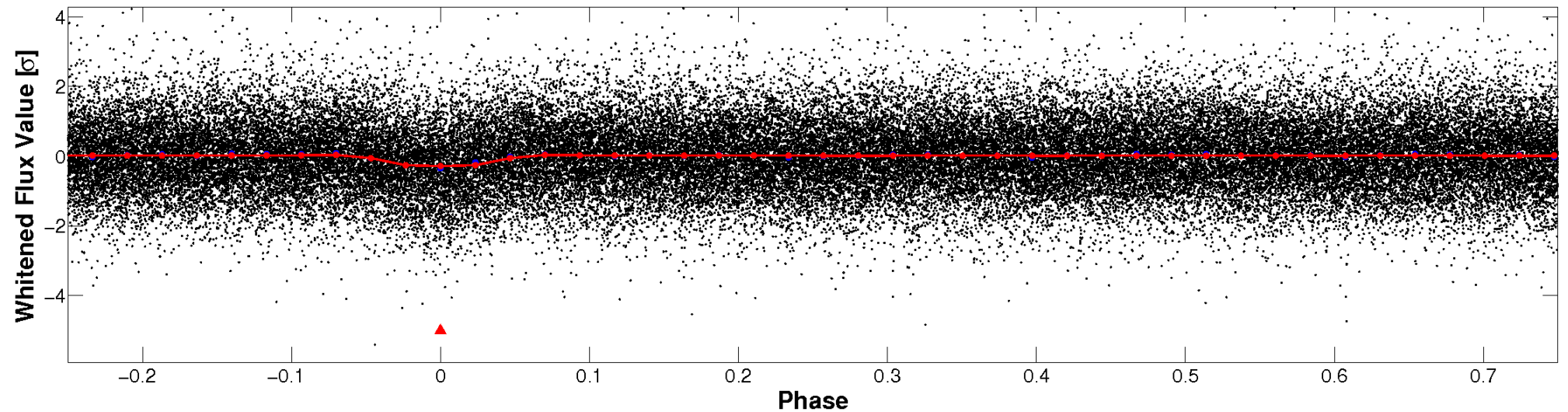


Non-Whitened Vs. Whitened Light Curve

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

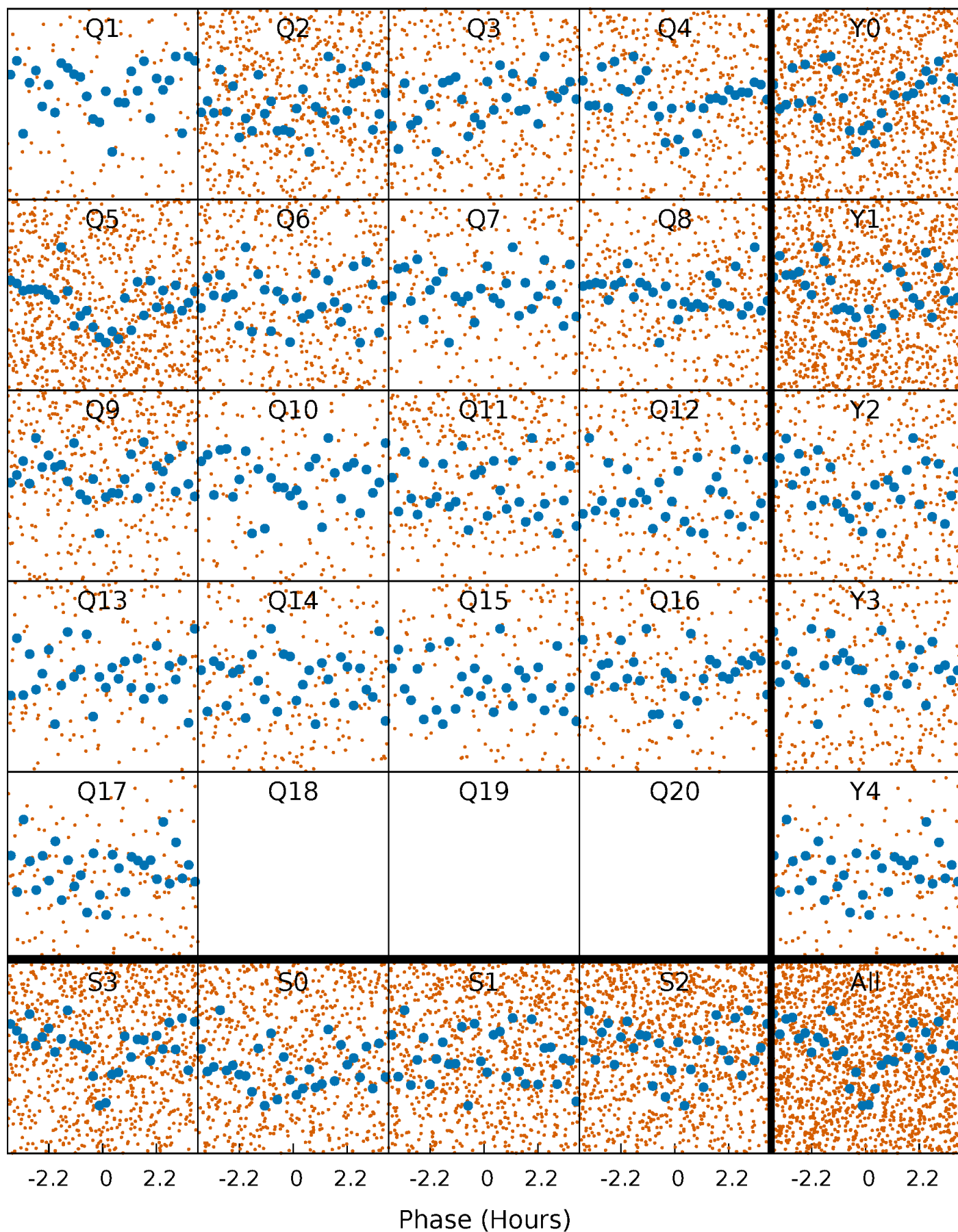


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



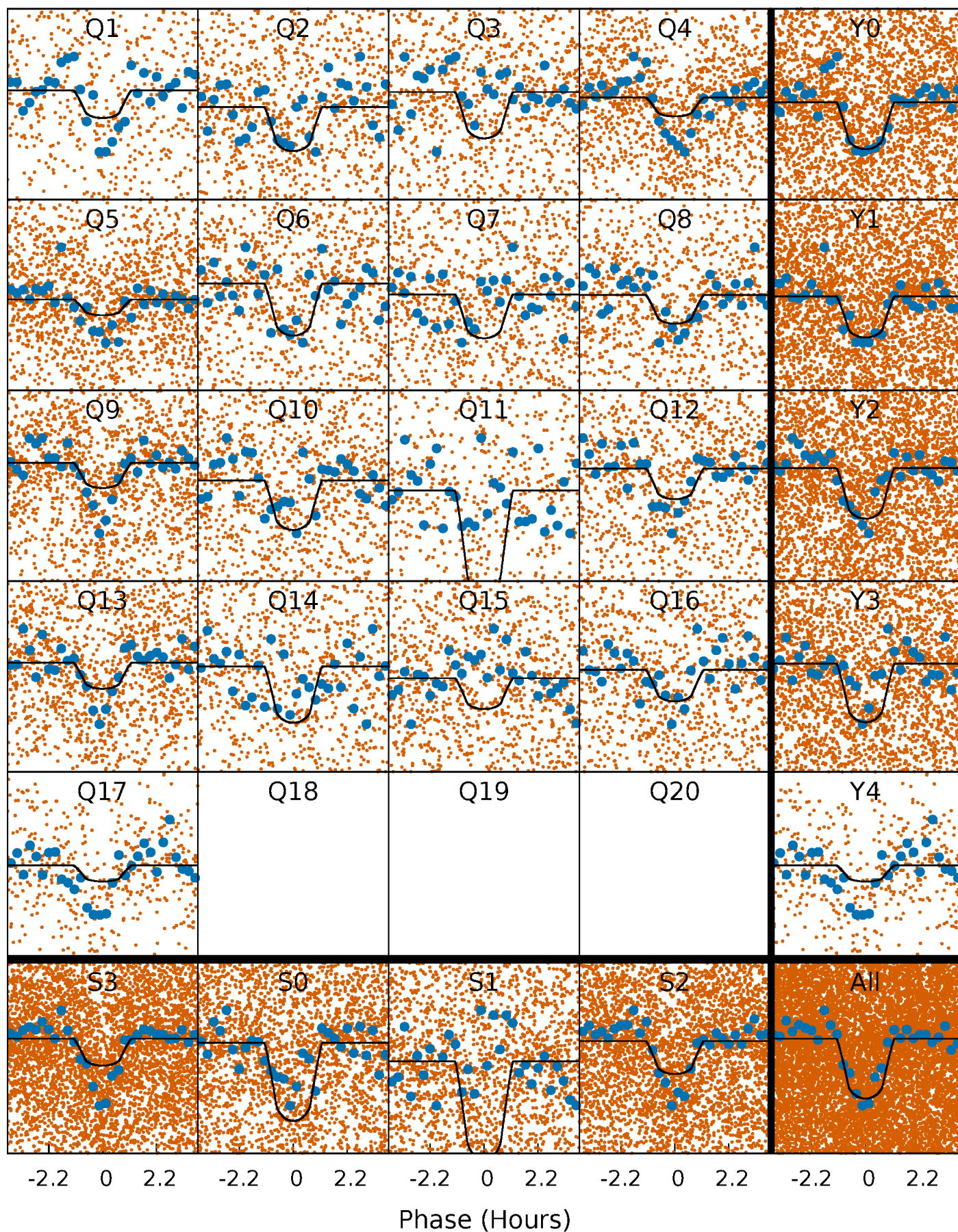
PDC Quarter-Phased Transit Curves

TCE 009887224-01 P= 0.874641 Days $T_0=132.252893$ (BKJD)



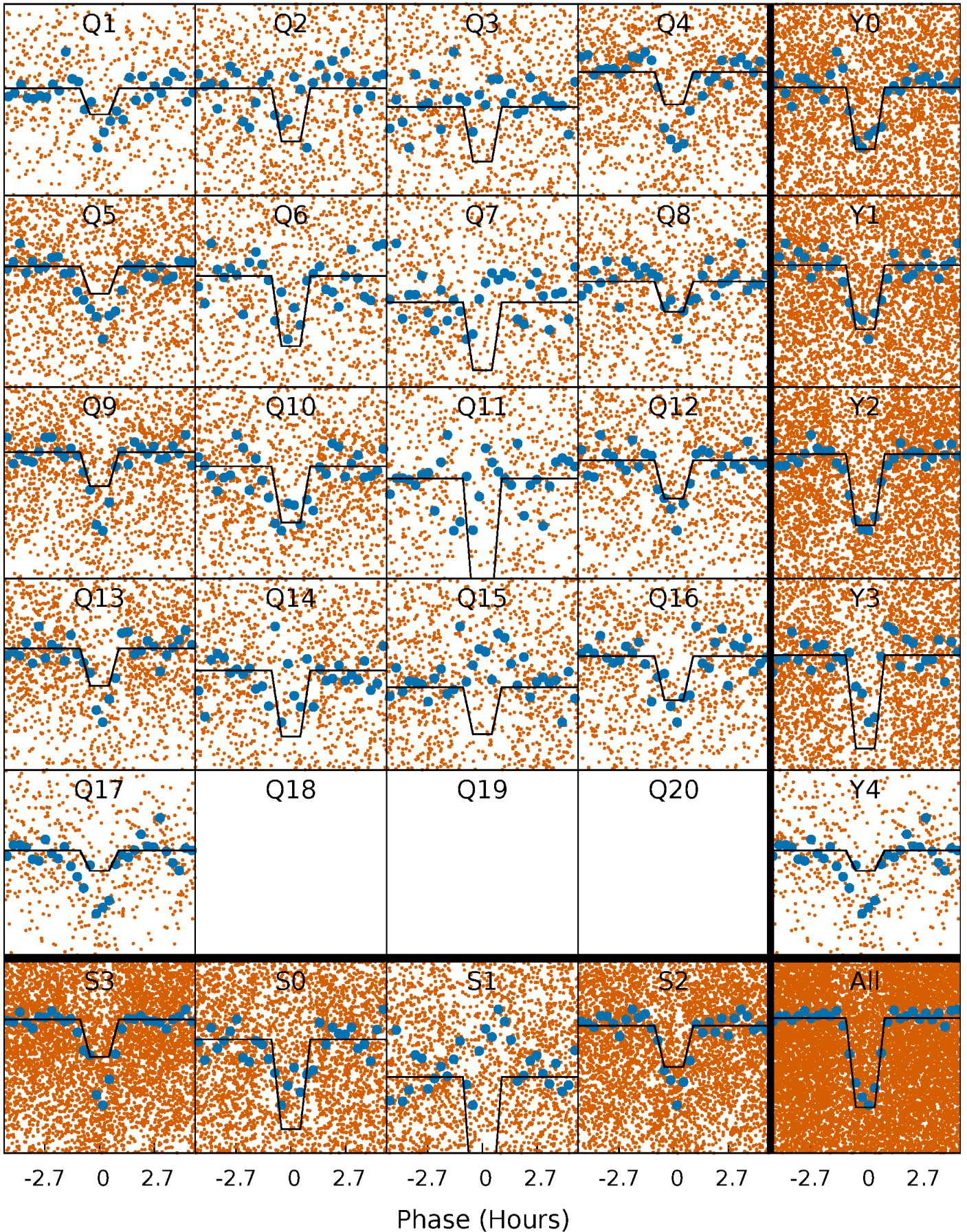
DV Quarter-Phased Transit Curves

TCE 009887224-01 P= 0.874641 Days $T_0=132.252893$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

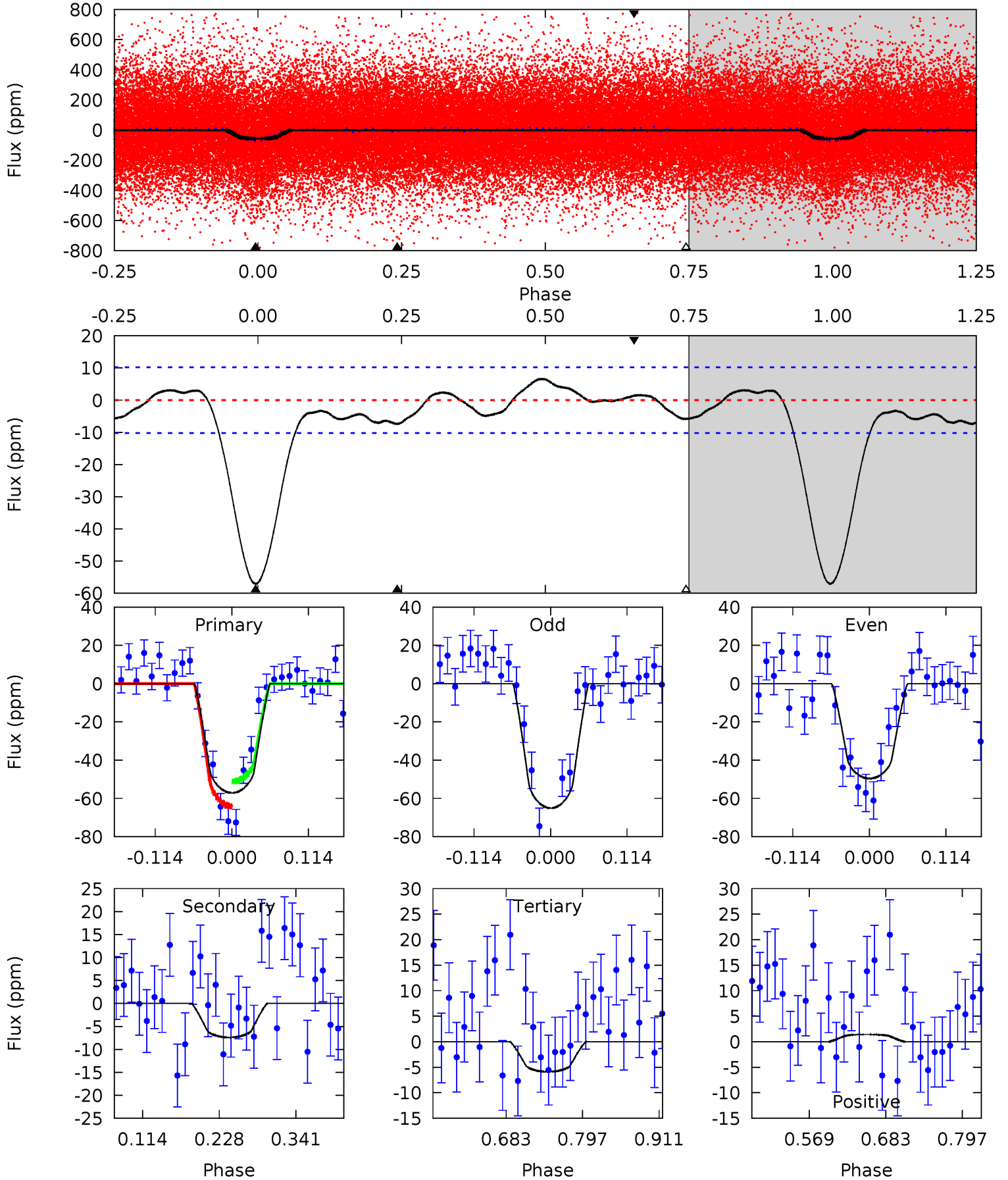
TCE 009887224-01 P= 0.874632 Days $T_0=132.256428$ (BKJD)



DV Model-Shift Uniqueness Test

009887224-01, P = 0.874641 Days, E = 131.378252 Days

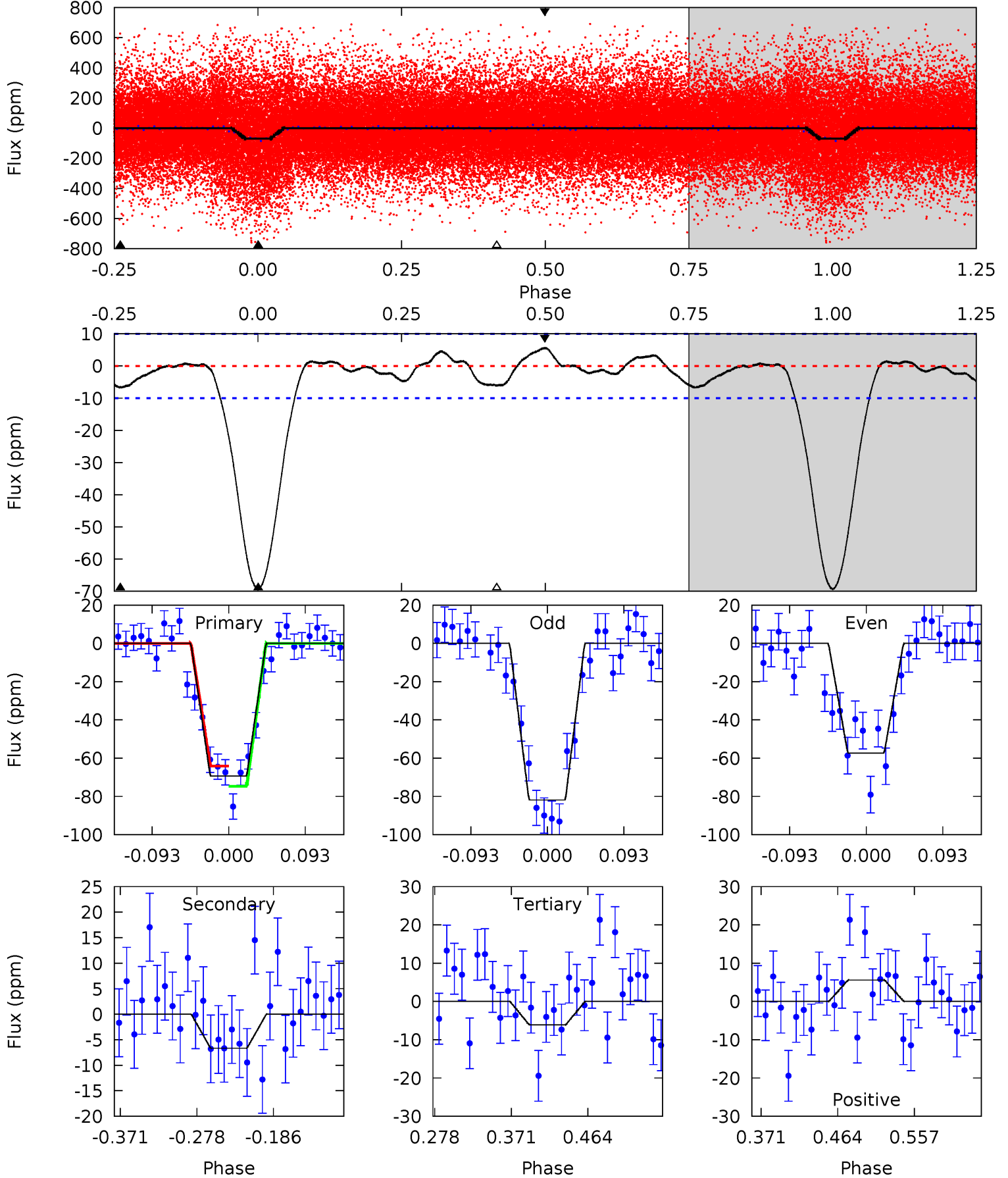
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 25.3 | 3.29 | 2.61 | 0.63 | 4.54 | 1.58 | 1.48 | 22.7 | 24.7 | 0.68 | 2.66 | 3.44 | 0.92 | 0.10 | 2.87 |



Alt Model-Shift Uniqueness Test

009887224-01, P = 0.874632 Days, E = 131.381796 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 31.8 | 3.06 | 2.80 | 2.57 | 4.58 | 1.68 | 1.27 | 29.0 | 29.2 | 0.26 | 0.49 | 5.63 | 0.96 | 0.07 | 2.43 |



Stellar Parameters For KIC 009887224

| | $T_{\text{eff}} (K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 5099^{+152}_{-137} | $4.491^{+0.090}_{-0.081}$ | $0.020^{+0.250}_{-0.300}$ | $0.832^{+0.084}_{-0.094}$ | $0.781^{+0.096}_{-0.055}$ | $1.914^{+0.746}_{-0.452}$ |
| | +3%/-3% | +2%/-2% | +1250%/-1500% | +10%/-11% | +12%/-7% | +39%/-24% |
| 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 009887224-01 / KOI 2464.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|----------------------|---------------------------|
| DV | -7 ± 2 | $0.81^{+0.28}_{-0.29}$ | 2230^{+101}_{-95} | 3233^{+549}_{-412} | $1.708^{+2.690}_{-0.870}$ |
| Alt. | -7 ± 2 | $0.79^{+0.29}_{-0.27}$ | 2236^{+93}_{-96} | 3202^{+566}_{-445} | $1.611^{+2.403}_{-0.849}$ |

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

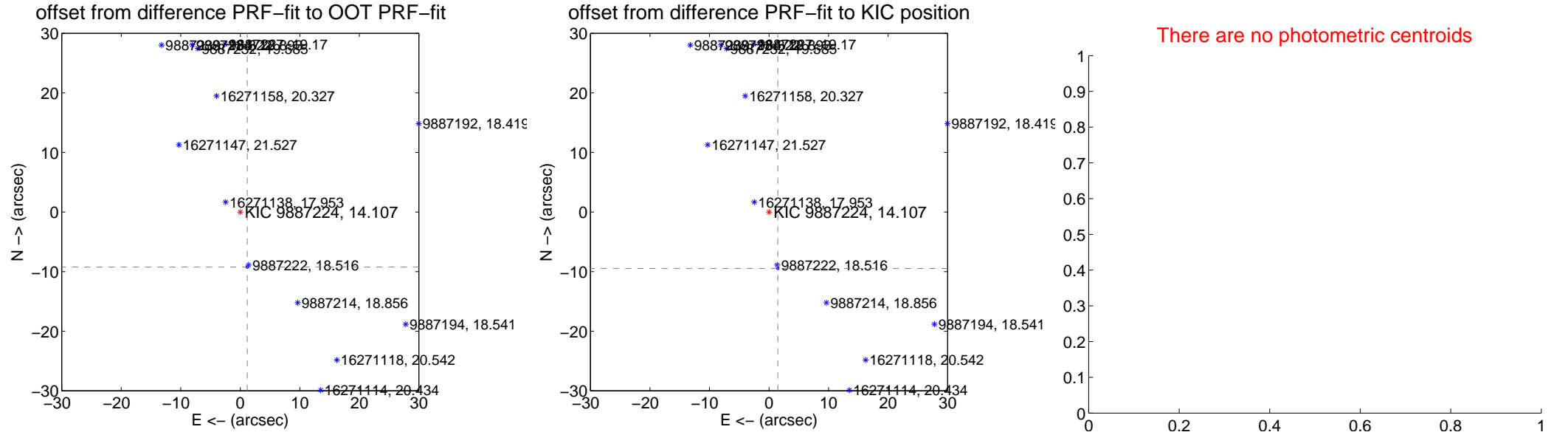
DV Centroid Data

Supplemental centroid analysis for 009887224-01. Kepler magnitude: 14.11. Transit SNR 18.47

There are 7 quarters with good PRF difference image offsets

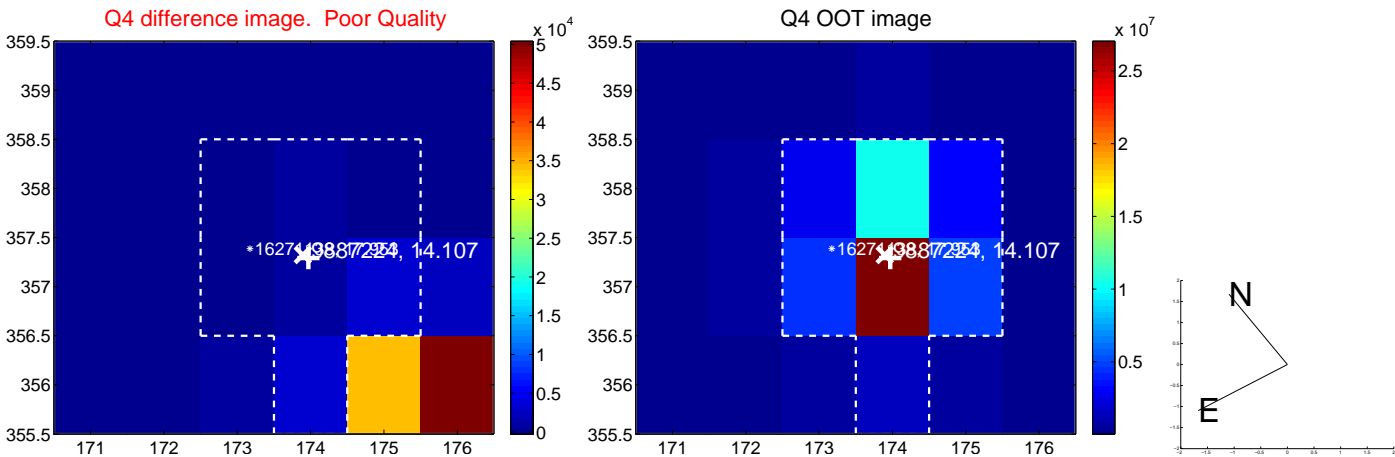
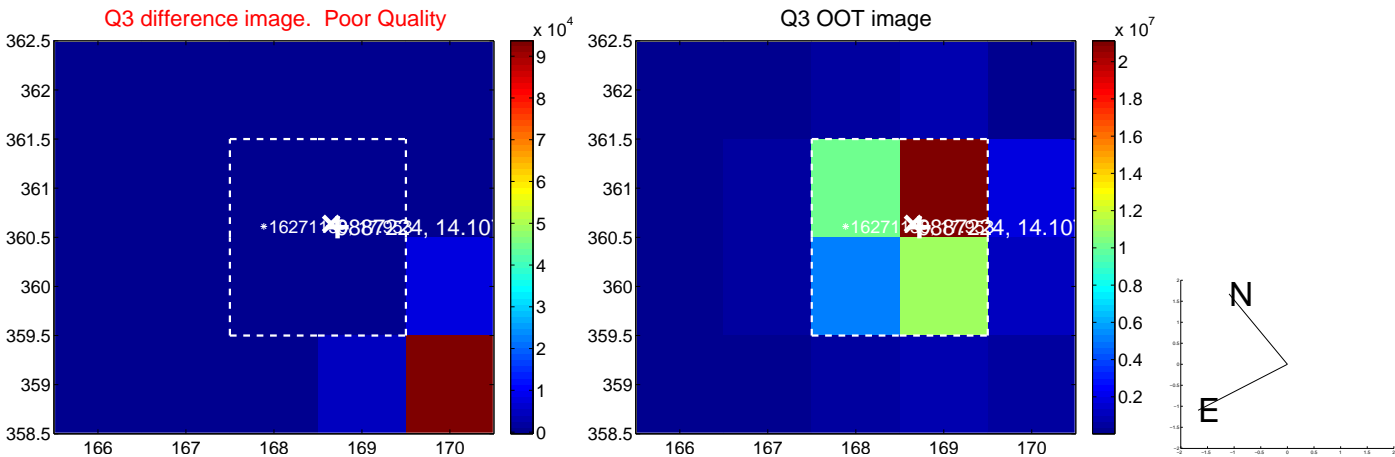
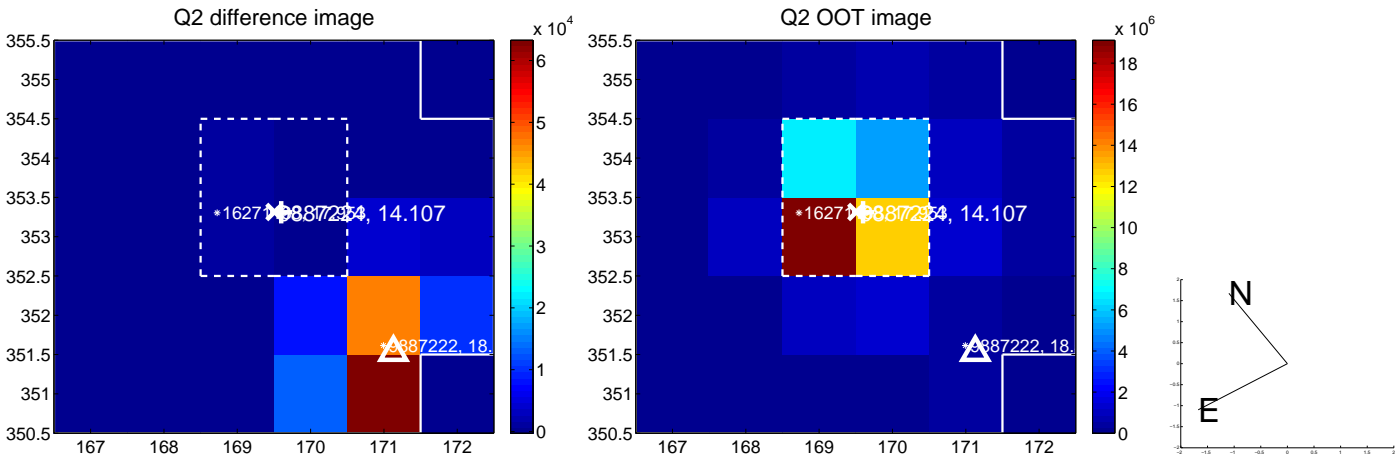
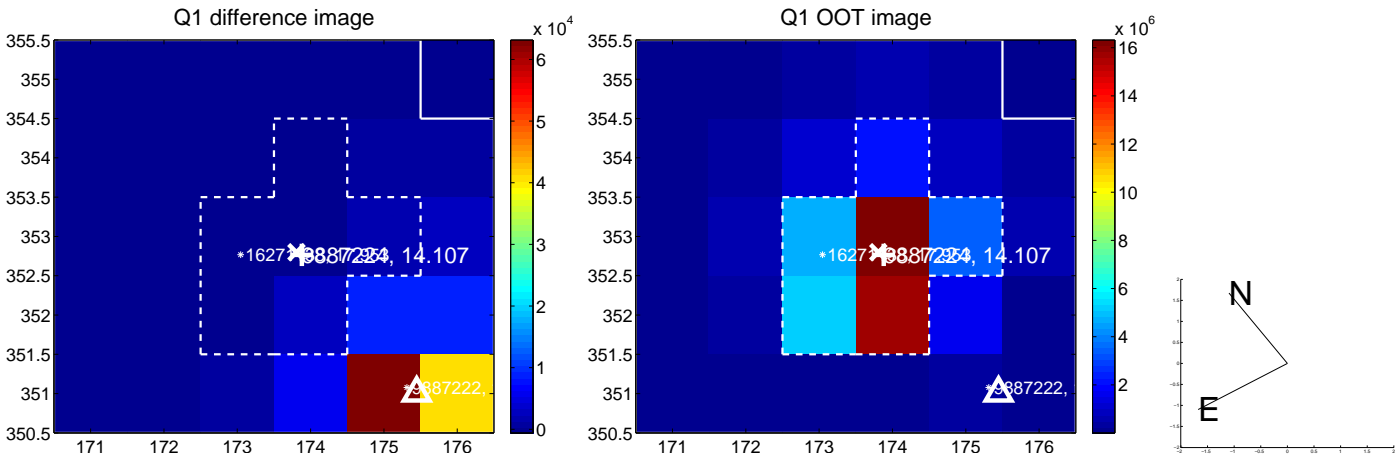
The direct PRF centroid is offset from the target star catalog position by about 0.49 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 9.309 ± 0.070 | 132.64 | -1.168 ± 0.076 | -9.236 ± 0.070 |
| PRF-fit source offset from KIC position | 9.591 ± 0.068 | 140.35 | -1.489 ± 0.067 | -9.474 ± 0.068 |
| photometric centroid source offset | — | — | — | — |

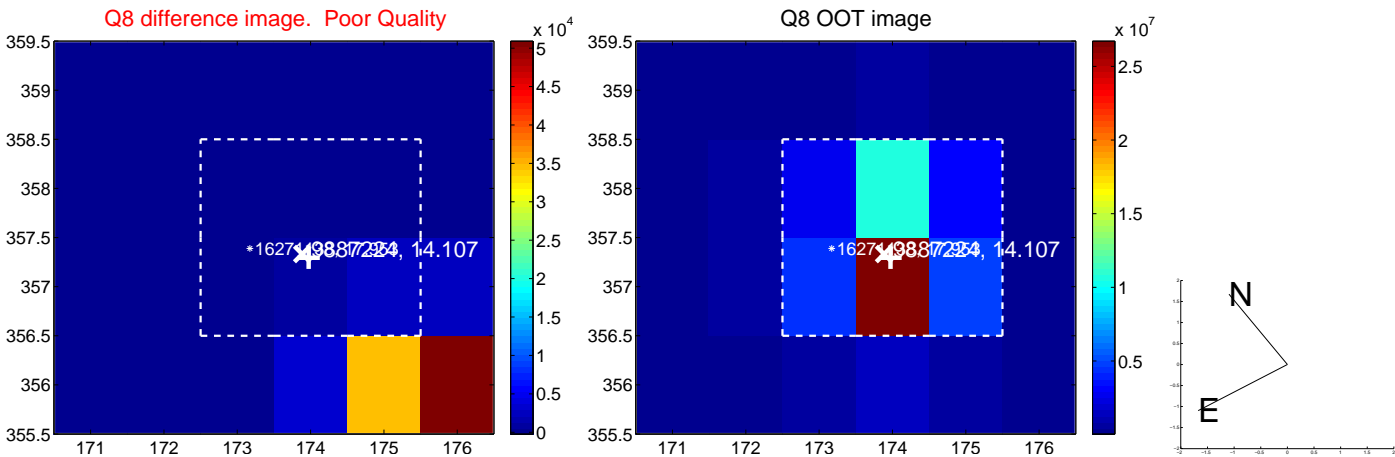
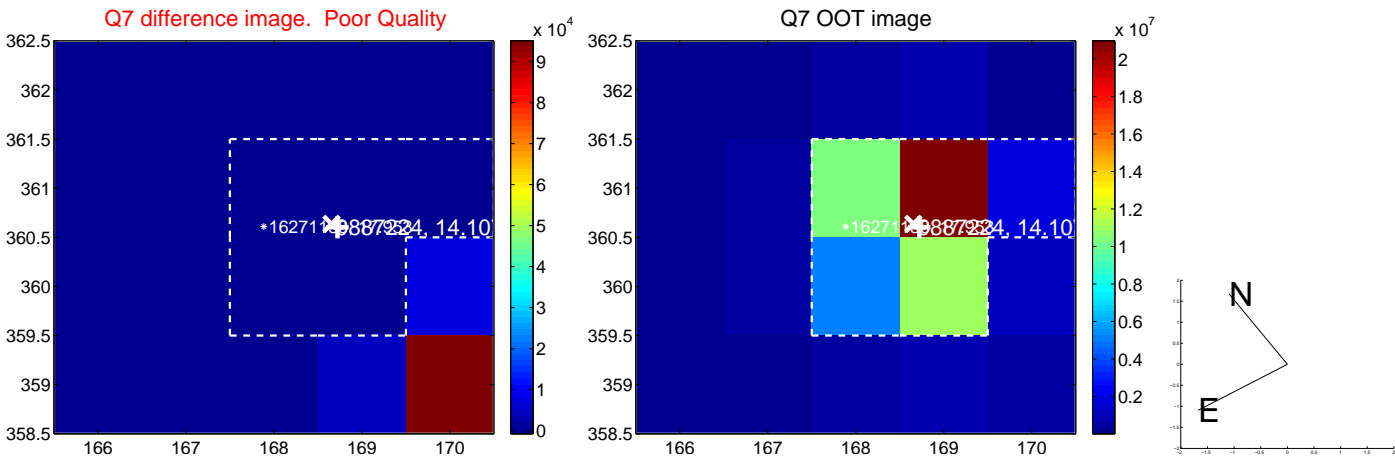
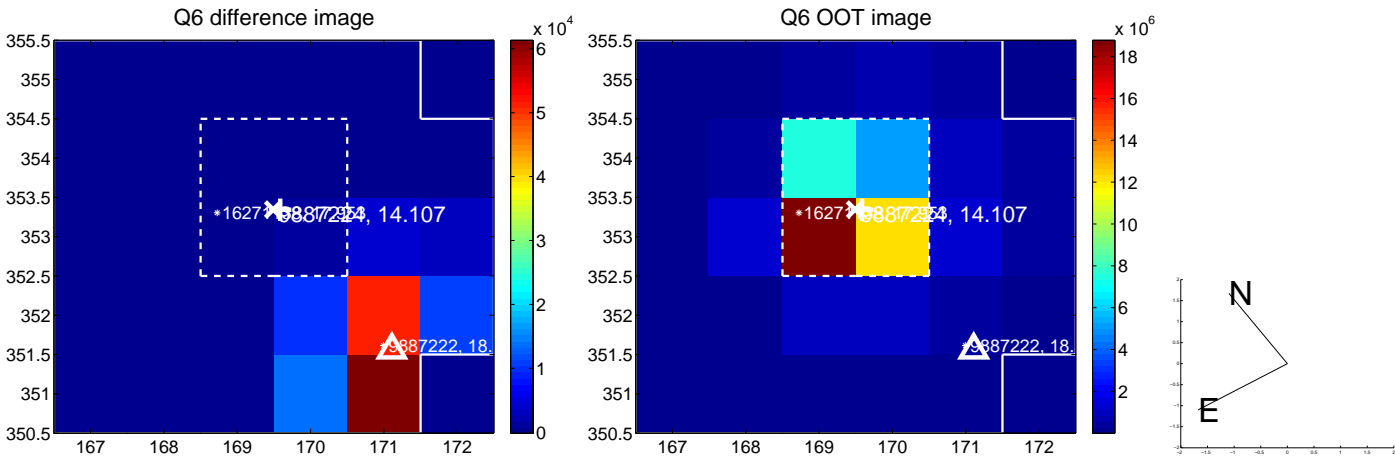
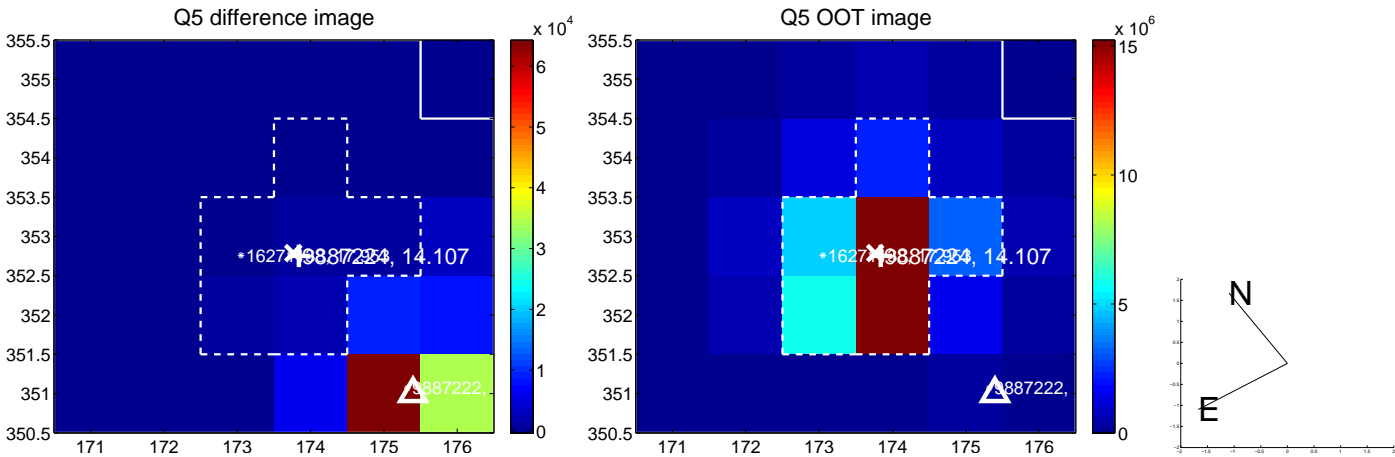


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

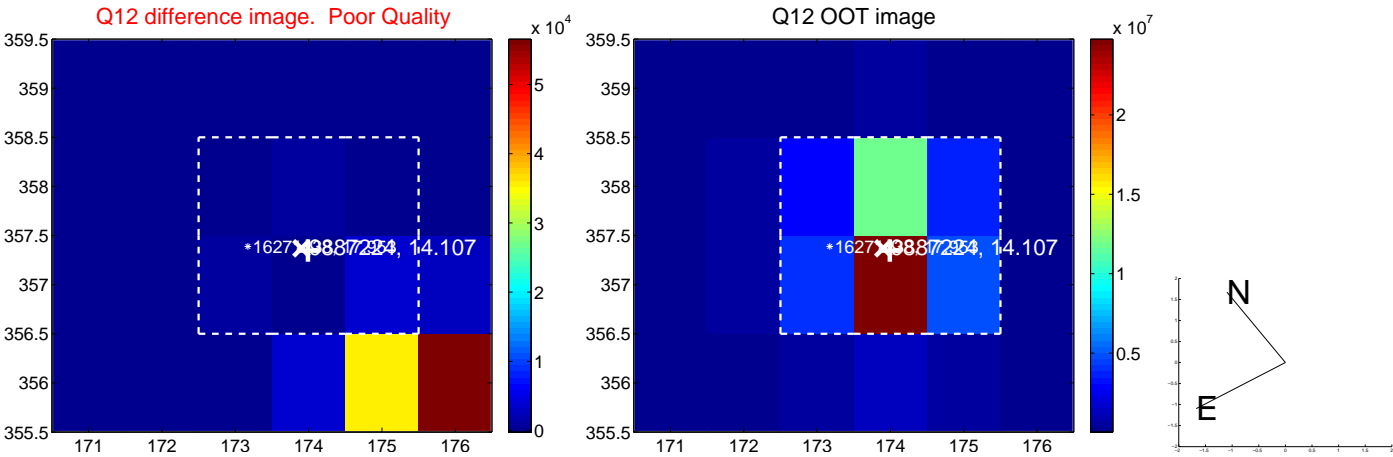
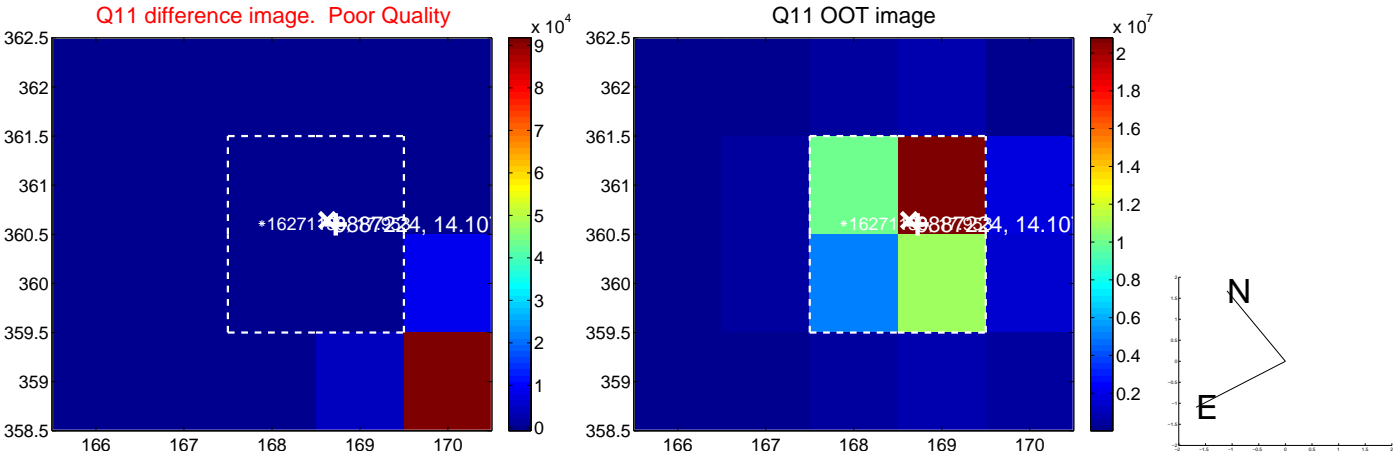
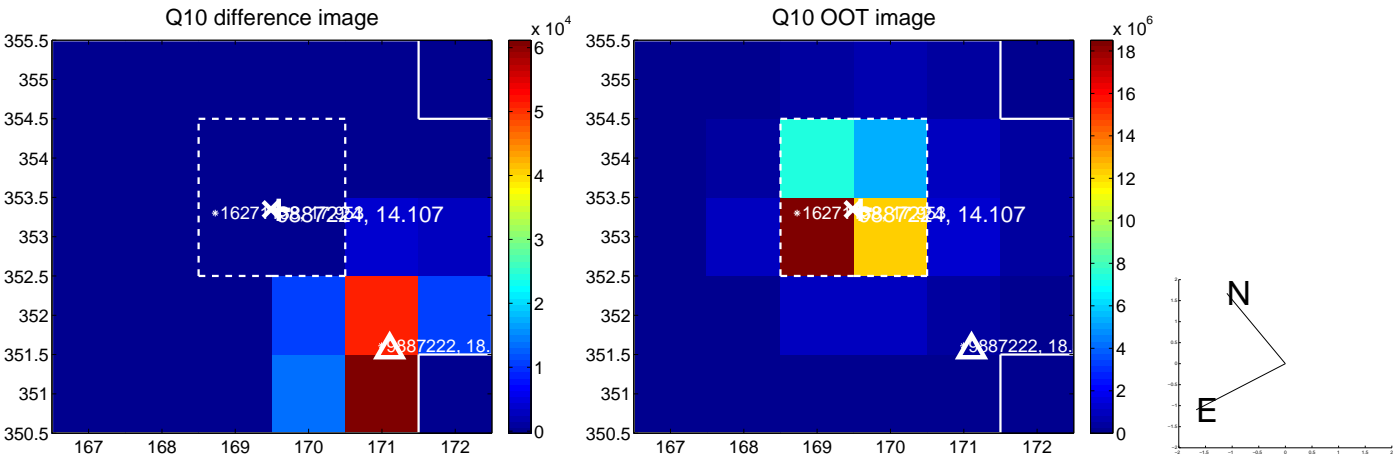
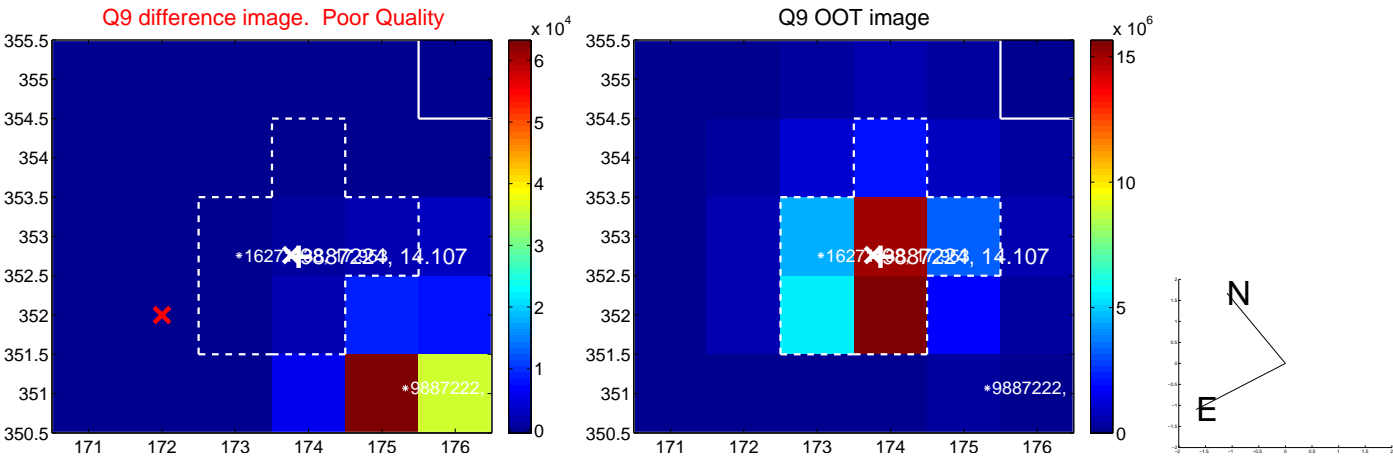
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



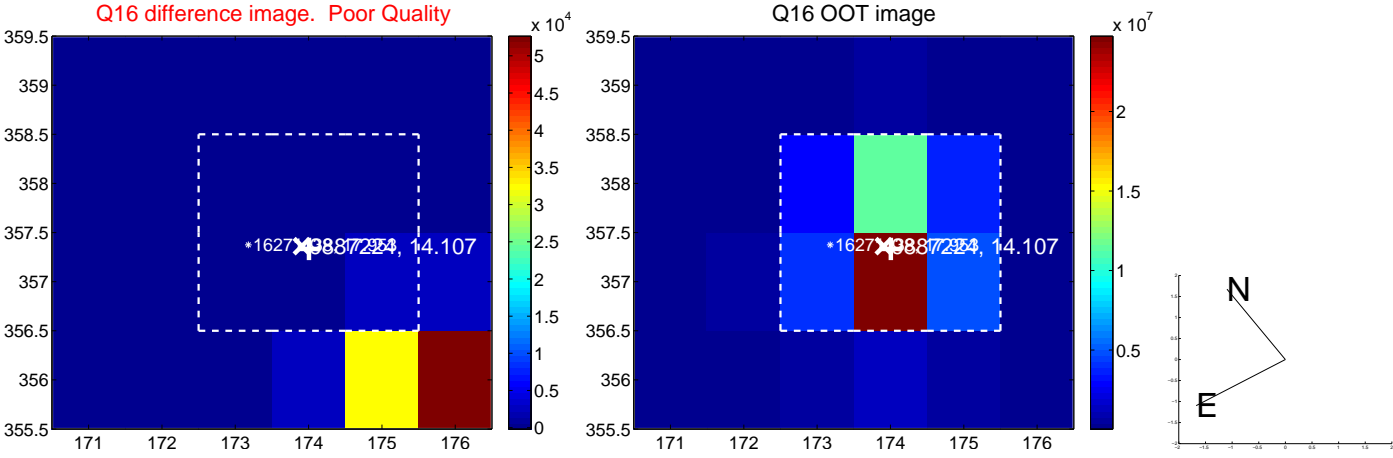
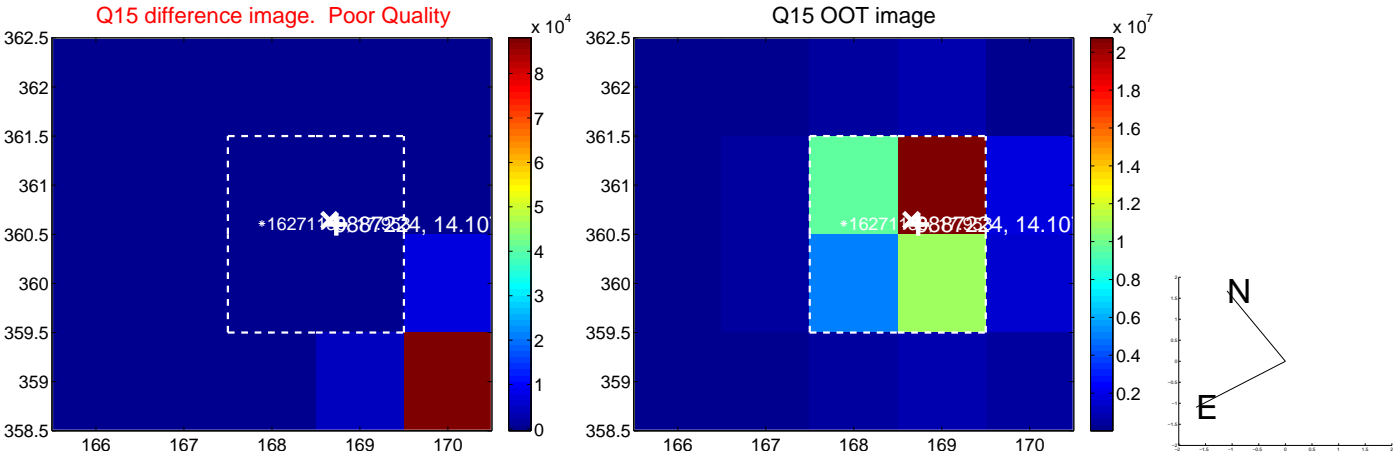
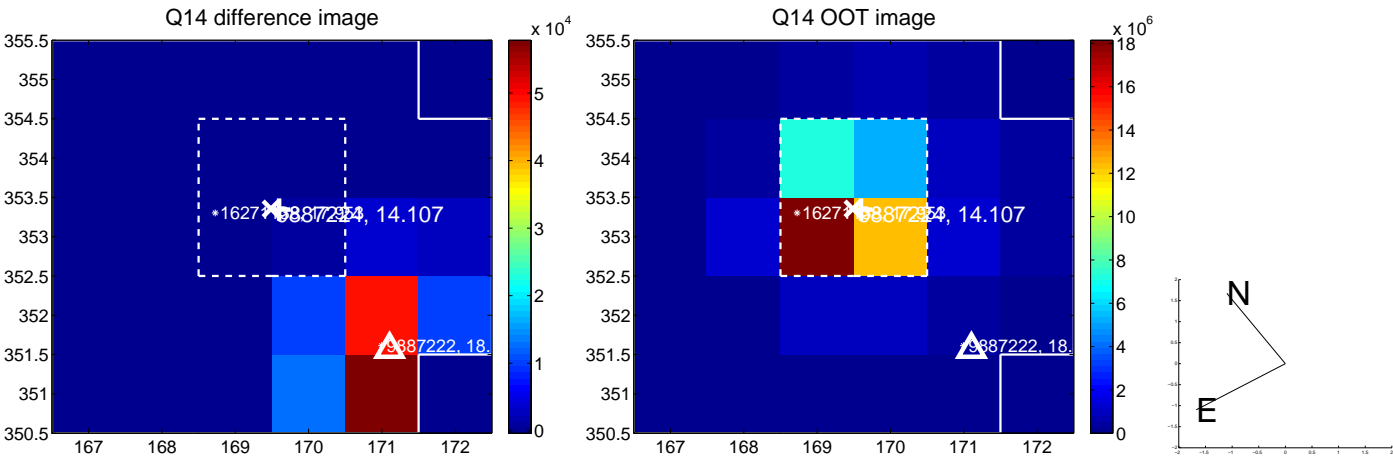
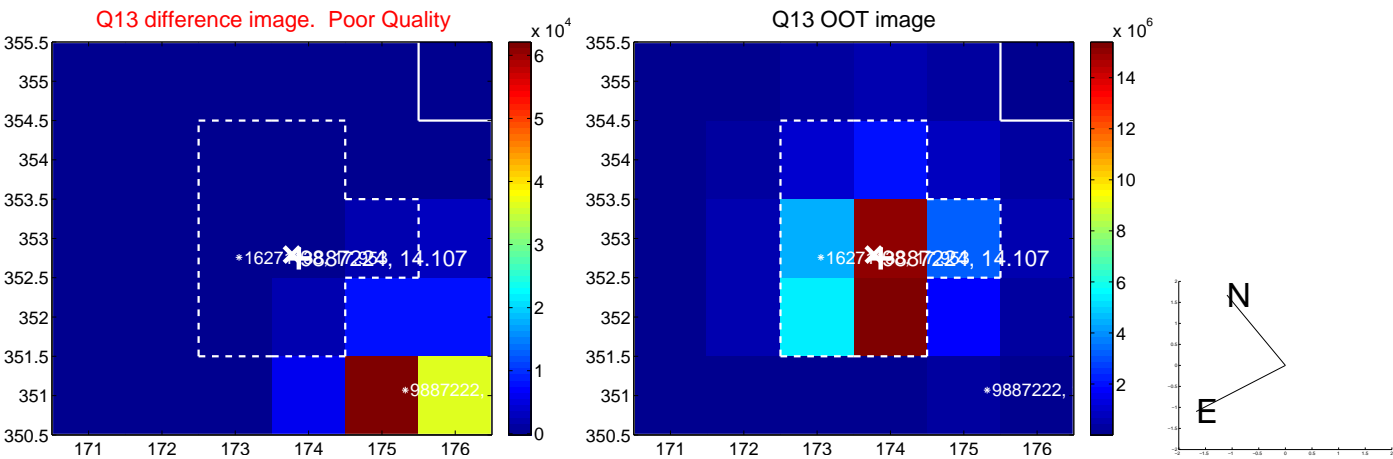
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



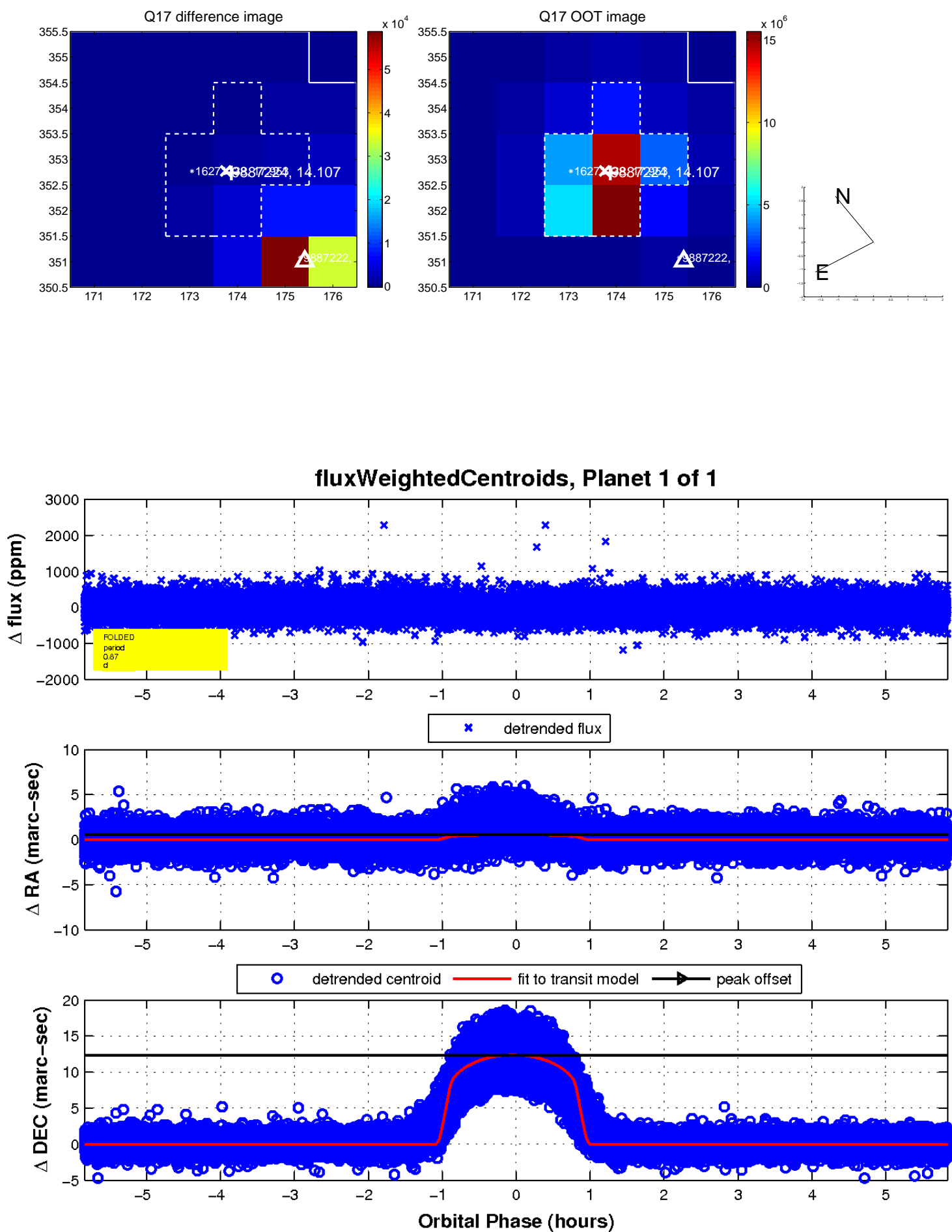
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

