

KIC 009077007

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009077007-01 | OBS | No | 342.911416 | 462.564219 | 353.4 | 15.630 | 7.8 | 7.3 | 0.74 | 5069 | 1.52 | 0.45 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 009077007-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL_SKYE--INCONSISTENT_TRANS |

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

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

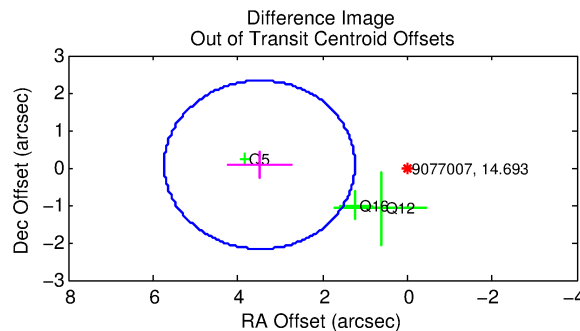
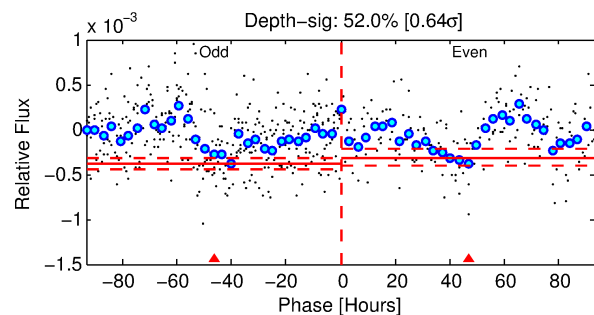
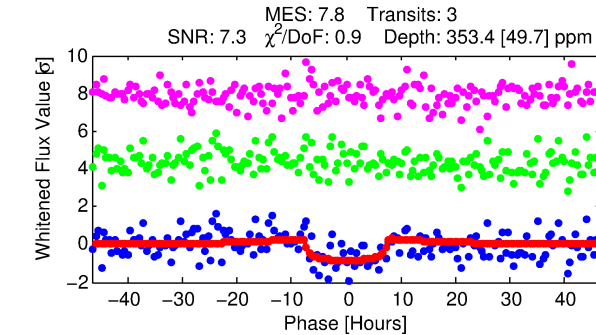
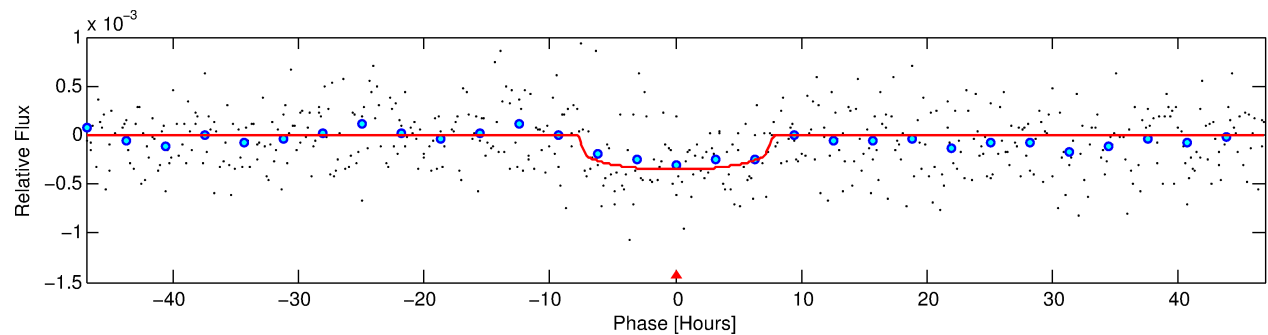
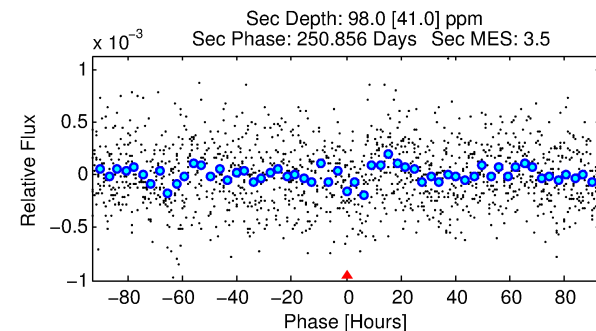
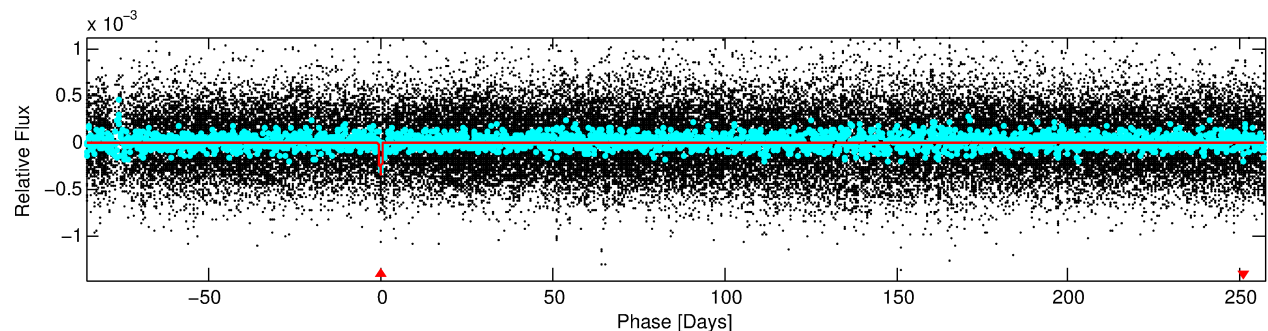
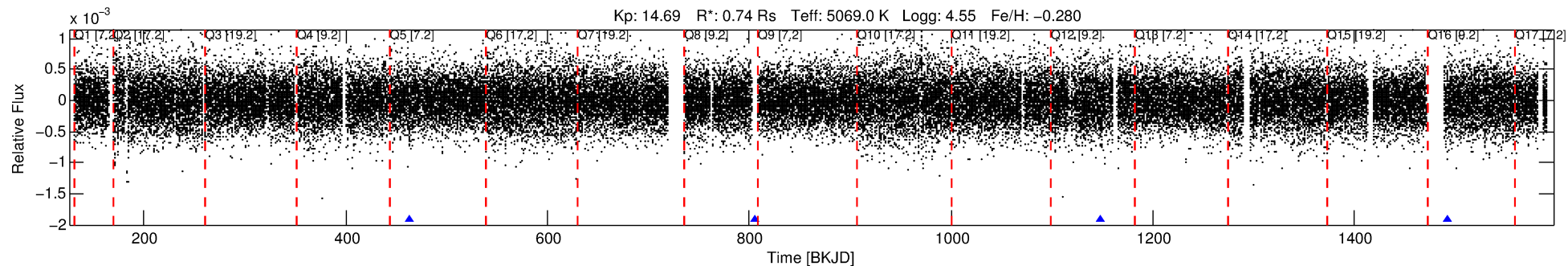
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009077007-01

No Significant Match Found

DV One-Page Summary

KIC: 9077007 Candidate: 1 of 1 Period: 342.911 d



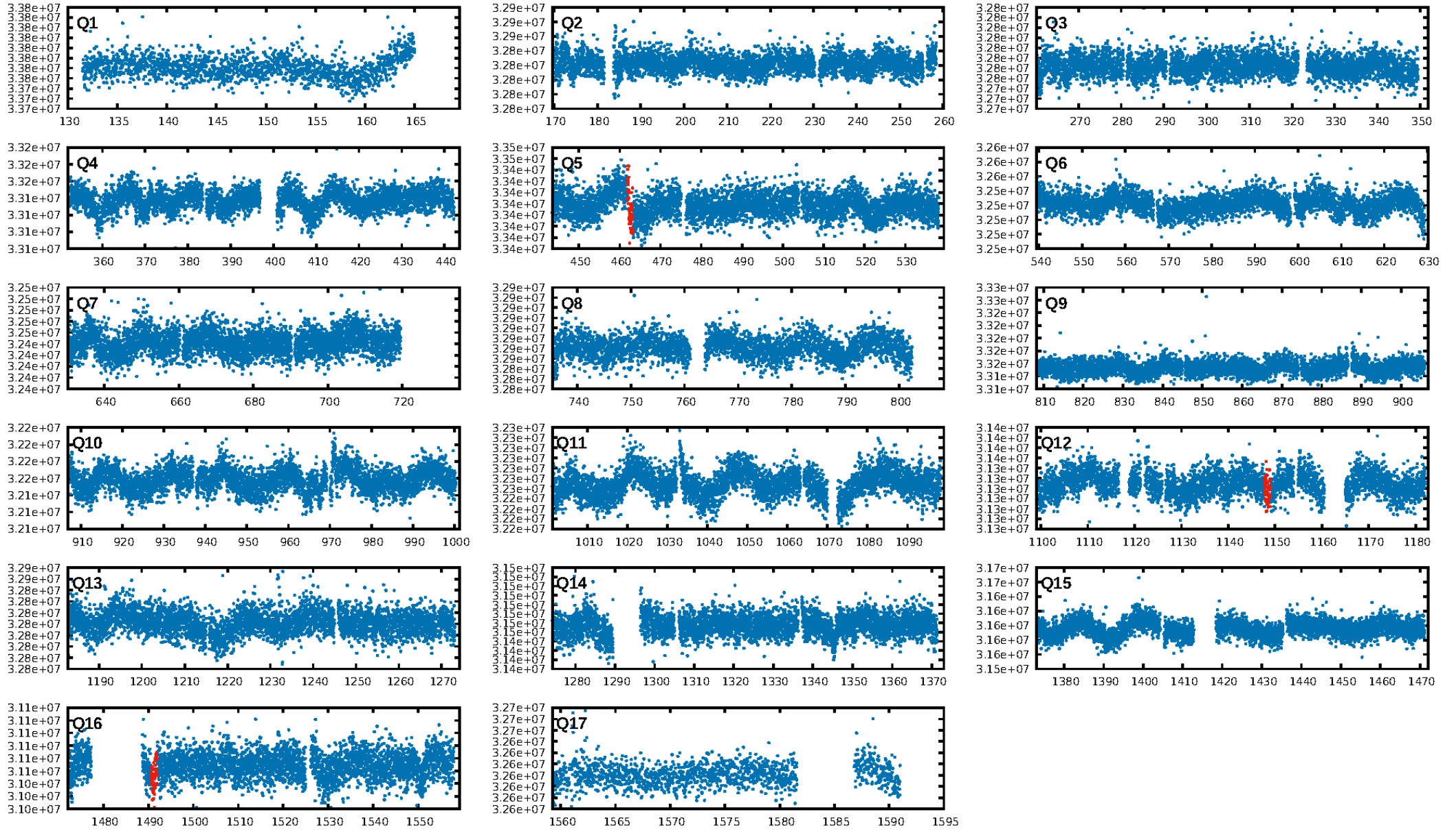
DV Fit Results:

Period = 342.91142 [0.01100] d
Epoch = 462.5642 [0.0227] BKJD
Rp/R* = 0.0187 [0.0081]
a/R* = 115.77 [183.89]
b = 0.75 [0.95]
Seff = 0.45 [0.08]
Teq = 209 [9] K
Rp = 1.52 [0.68] Re
a = 0.8555 [0.0789] AU
Ag = 17051.05 [16554.29] [1.03 σ]
Teffp = 3685 [892] K [3.90 σ]

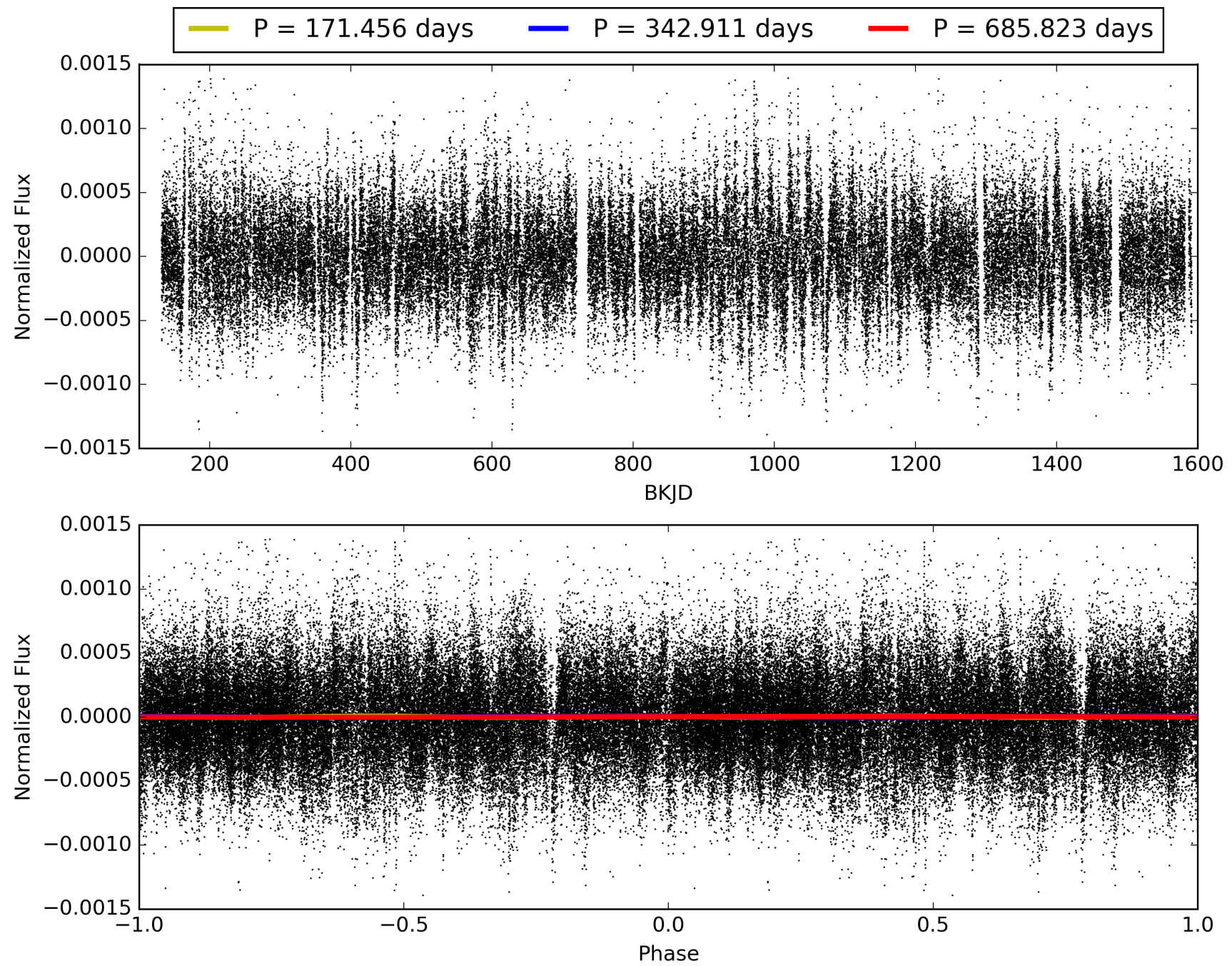
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 26.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 8.39e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.279
Centroid-sig: 20.8%
Centroid-so: 2.143 arcsec [1.03 σ]
OotOffset-rm: 3.481 arcsec [4.65 σ]
KicOffset-rm: 3.256 arcsec [4.65 σ]
OotOffset-st: 0/0/2/1 [3]
KicOffset-st: 0/0/2/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 009077007-01, PDC Light Curves

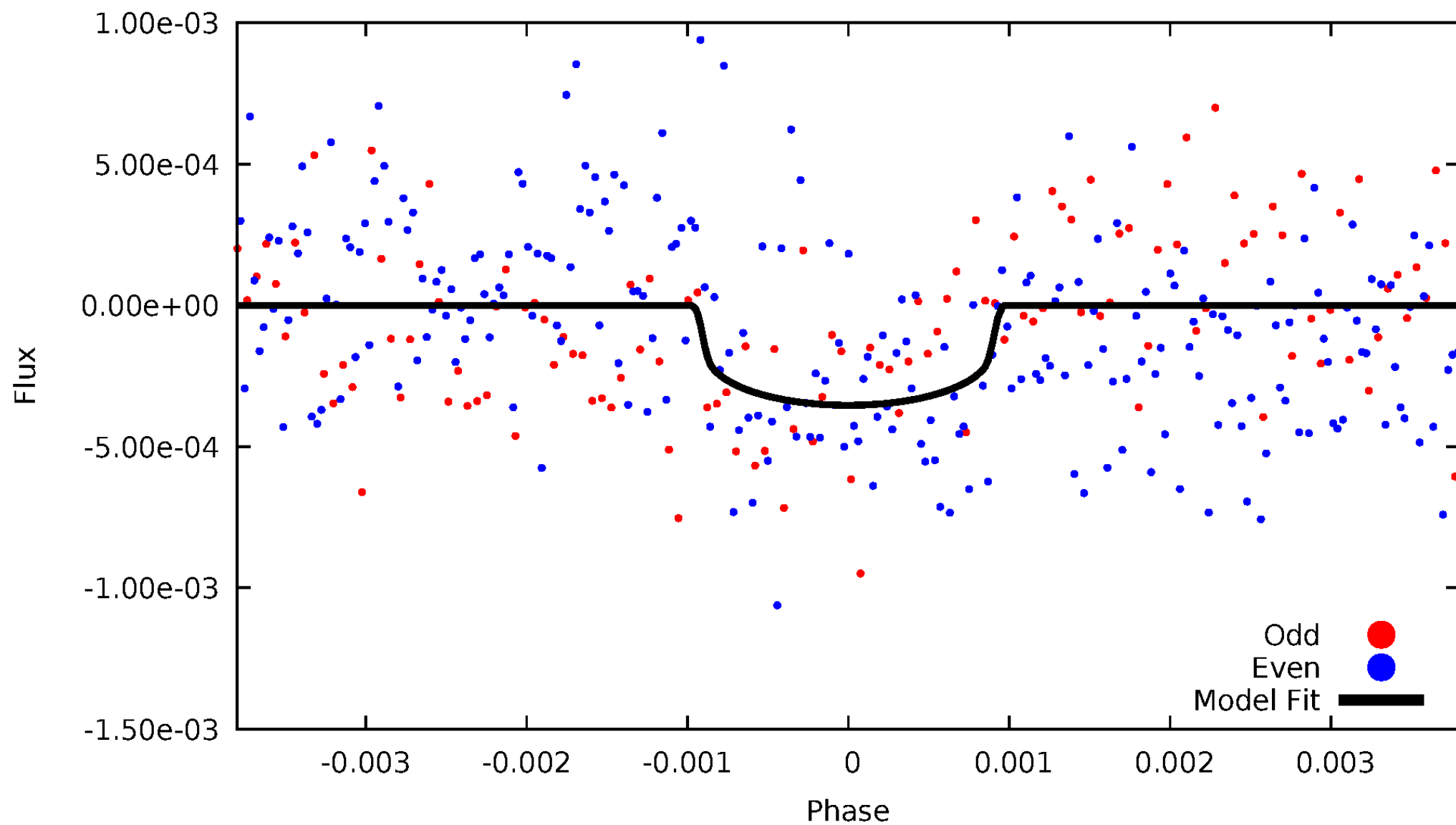


TCE 009077007-01



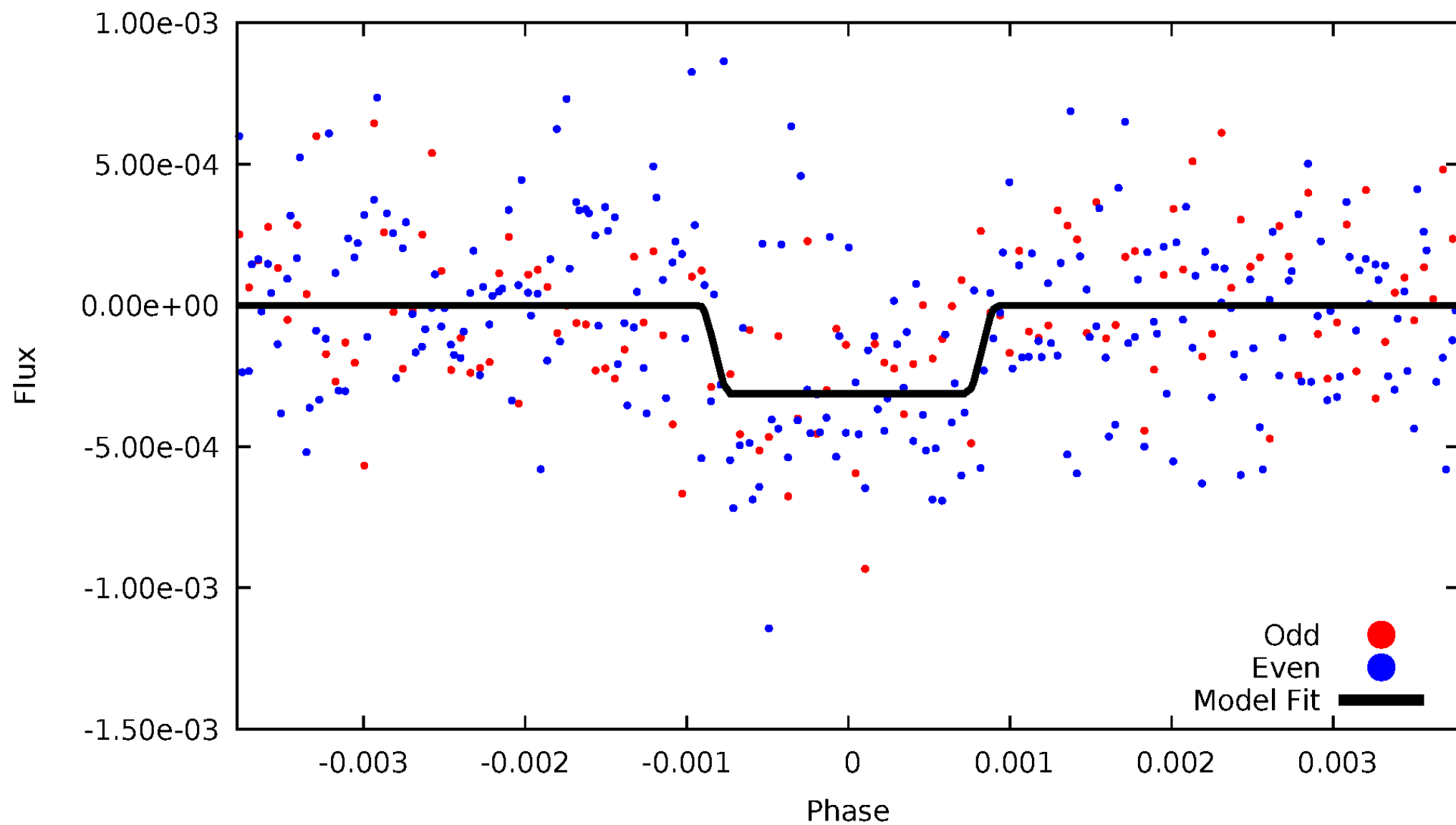
DV Odd/Even

TCE 009077007-01



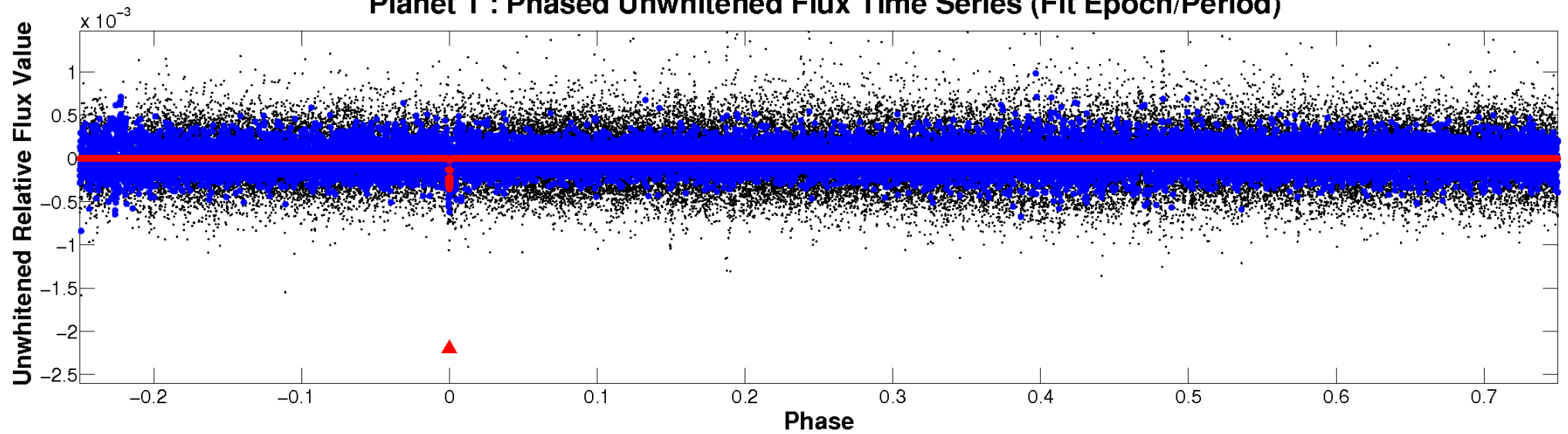
ALT Odd/Even

TCE 009077007-01

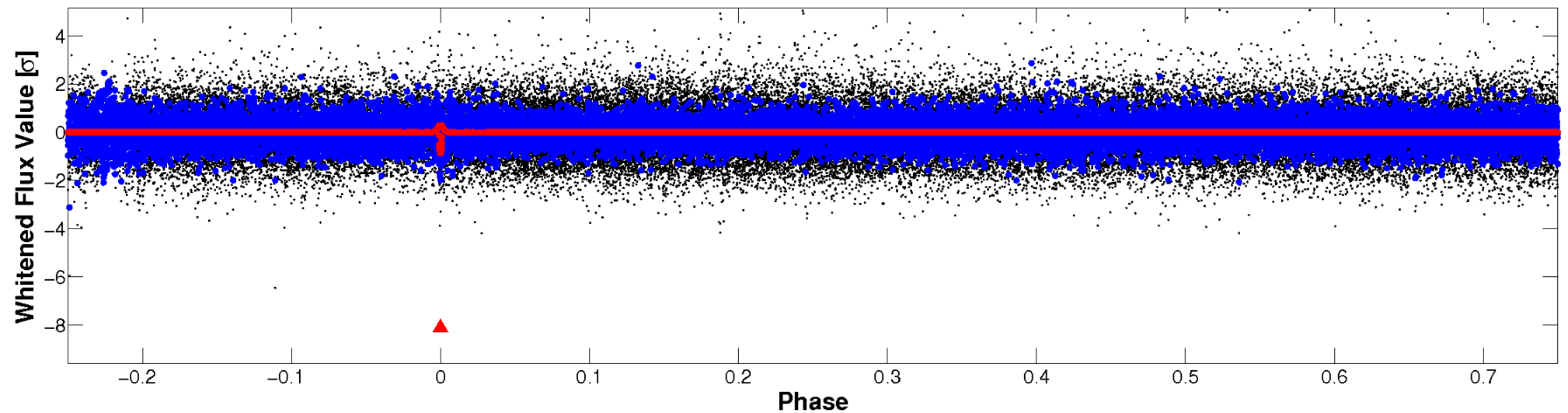


Non-Whitened Vs. Whitened Light Curve

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

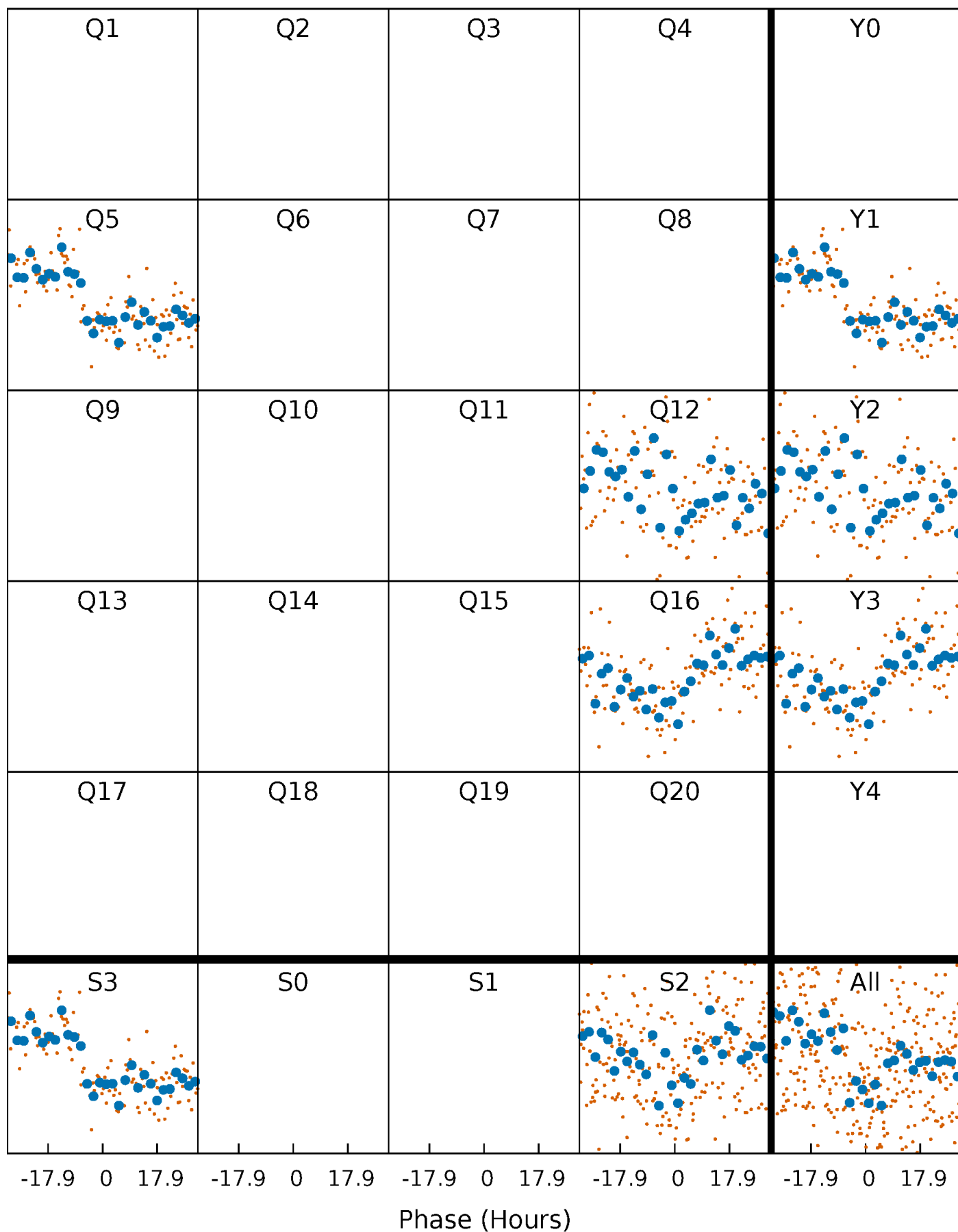


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



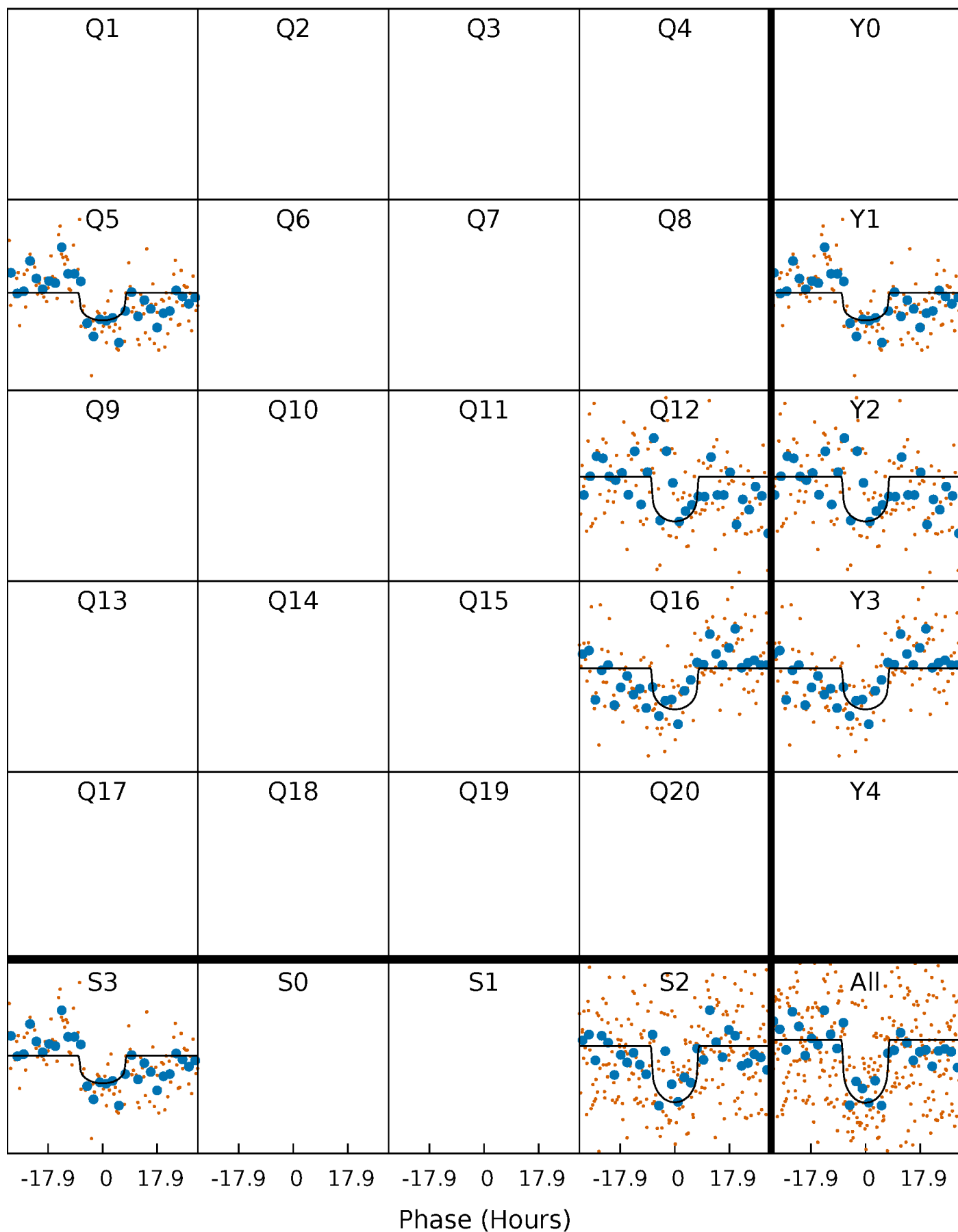
PDC Quarter-Phased Transit Curves

TCE 009077007-01 P=342.911416 Days $T_0=462.564219$ (BKJD)



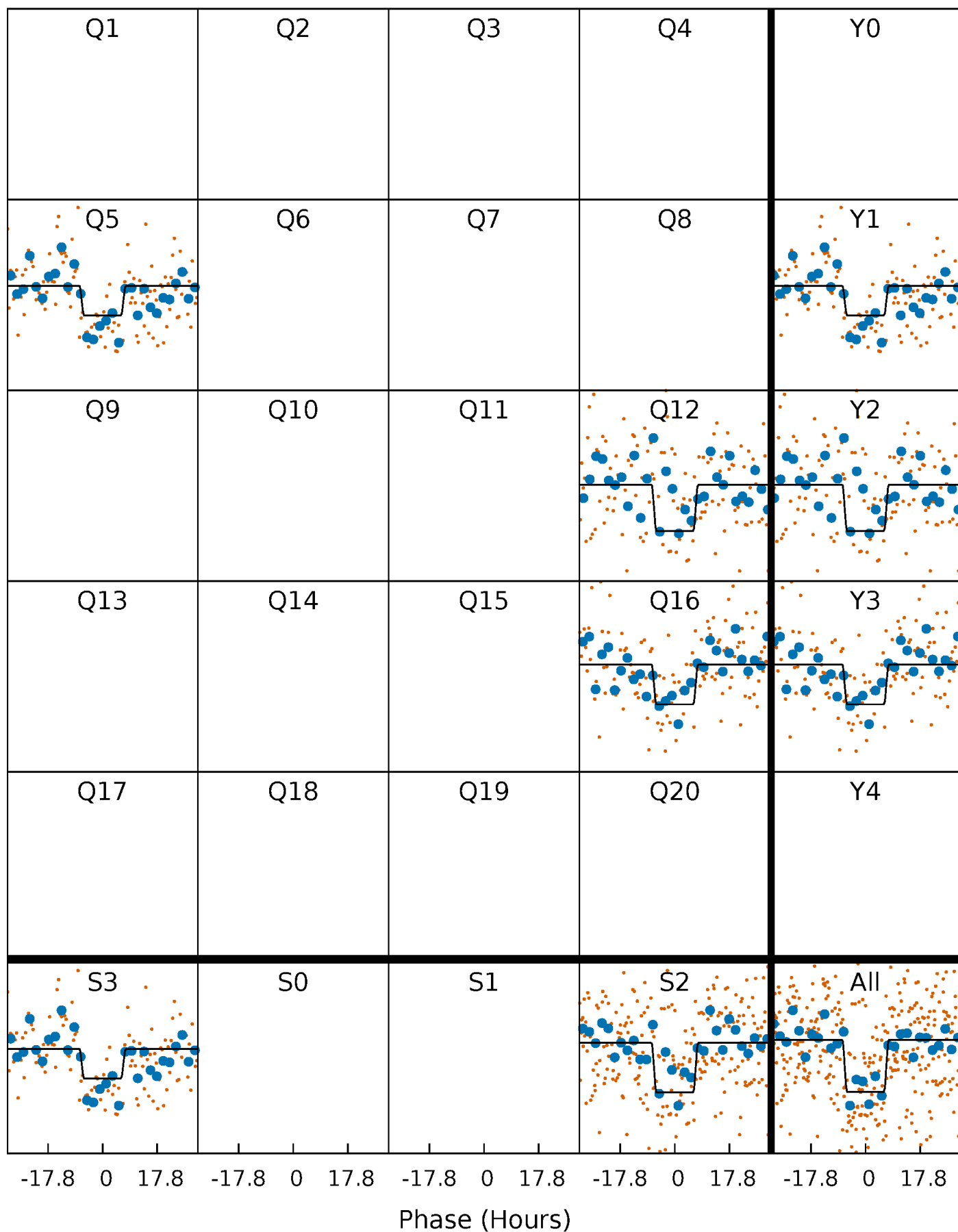
DV Quarter-Phased Transit Curves

TCE 009077007-01 $P=342.911416$ Days $T_0=462.564219$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

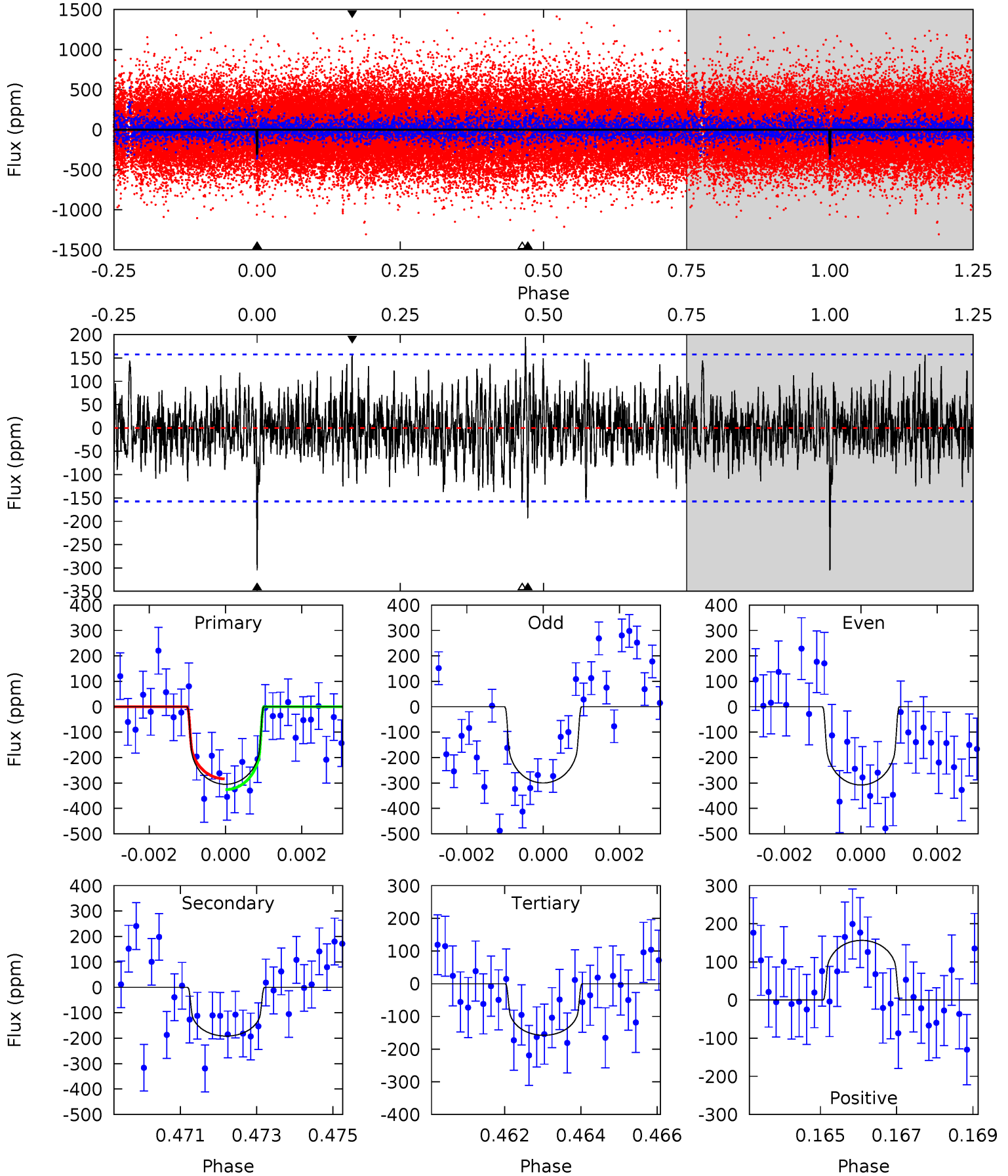
TCE 009077007-01 P=342.902381 Days $T_0=462.581646$ (BKJD)



DV Model-Shift Uniqueness Test

009077007-01, P = 342.911416 Days, E = 119.652803 Days

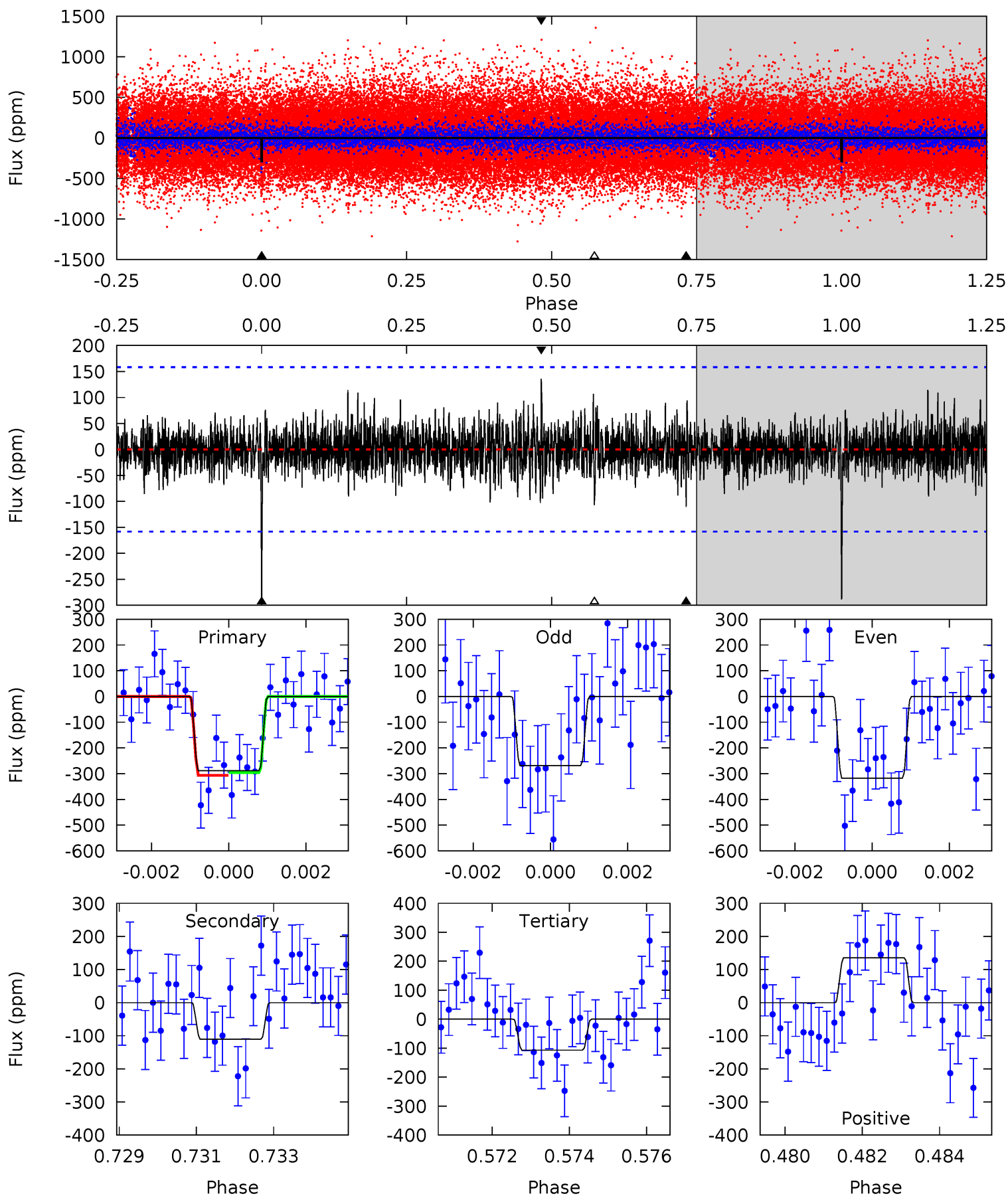
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.3 | 6.49 | 5.34 | 5.29 | 5.33 | 3.10 | 1.58 | 4.98 | 5.03 | 1.15 | 1.20 | 0.13 | 1.02 | 0.39 | 0.72 |



Alt Model-Shift Uniqueness Test

009077007-01, P = 342.902381 Days, E = 119.679265 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.73 | 3.74 | 3.60 | 4.58 | 5.34 | 3.11 | 1.00 | 6.12 | 5.15 | 0.13 | -0.84 | 0.78 | 1.08 | 0.32 | 0.19 |



Stellar Parameters For KIC 009077007

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5069^{+151}_{-151} | $4.546^{+0.077}_{-0.063}$ | $-0.280^{+0.350}_{-0.300}$ | $0.744^{+0.079}_{-0.079}$ | $0.711^{+0.100}_{-0.050}$ | $2.428^{+0.826}_{-0.518}$ |
| | +3%/-3% | +2%/-1% | +125%/-107% | +11%/-11% | +14%/-7% | +34%/-21% |
| 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 009077007-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|---------------|------------------------|-------------------|-----------------------|---------------------------|
| DV | -192 ± 30 | $1.53^{+0.67}_{-0.60}$ | 291^{+10}_{-11} | 4500^{+1098}_{-592} | 34318^{+59098}_{-18478} |
| Alt. | -111 ± 30 | $1.43^{+0.66}_{-0.66}$ | 291^{+12}_{-12} | 4136^{+1097}_{-528} | 22232^{+50581}_{-12506} |

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 $A_{obs} \gg 1.0$

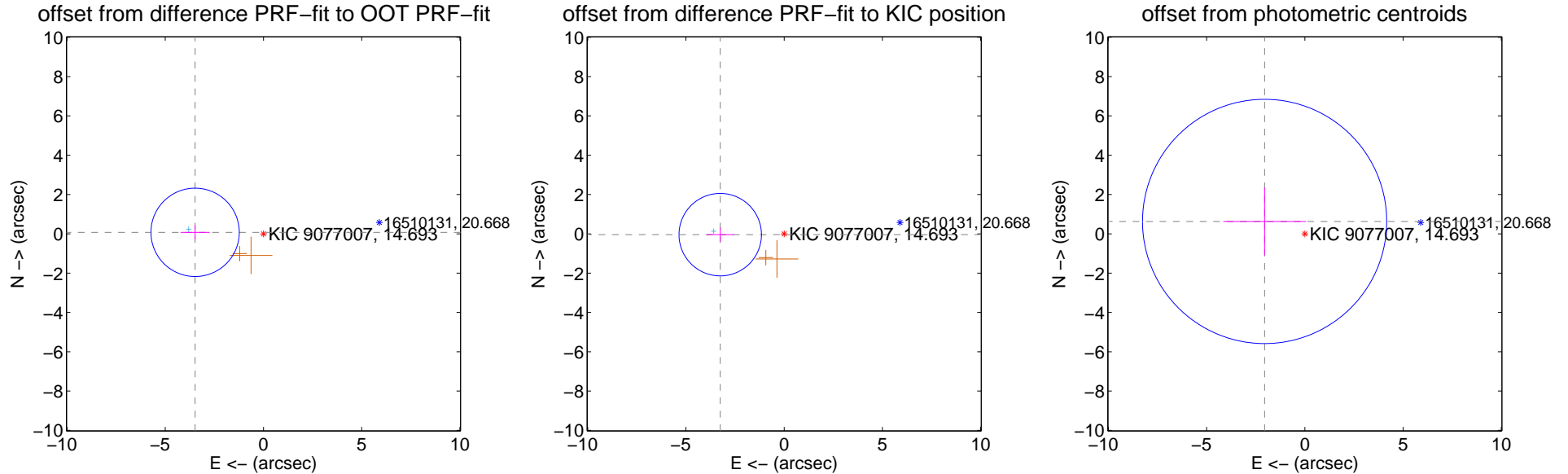
DV Centroid Data

Supplemental centroid analysis for 009077007-01. Kepler magnitude: 14.69. Transit SNR 7.35

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.34 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 3.481 ± 0.749 | 4.65 | 3.480 ± 0.742 | 0.076 ± 0.361 |
| PRF-fit source offset from KIC position | 3.256 ± 0.699 | 4.65 | 3.256 ± 0.700 | -0.043 ± 0.358 |
| photometric centroid source offset | 2.14 ± 2.07 | 1.03 | 2.05 ± 2.10 | 0.63 ± 1.72 |

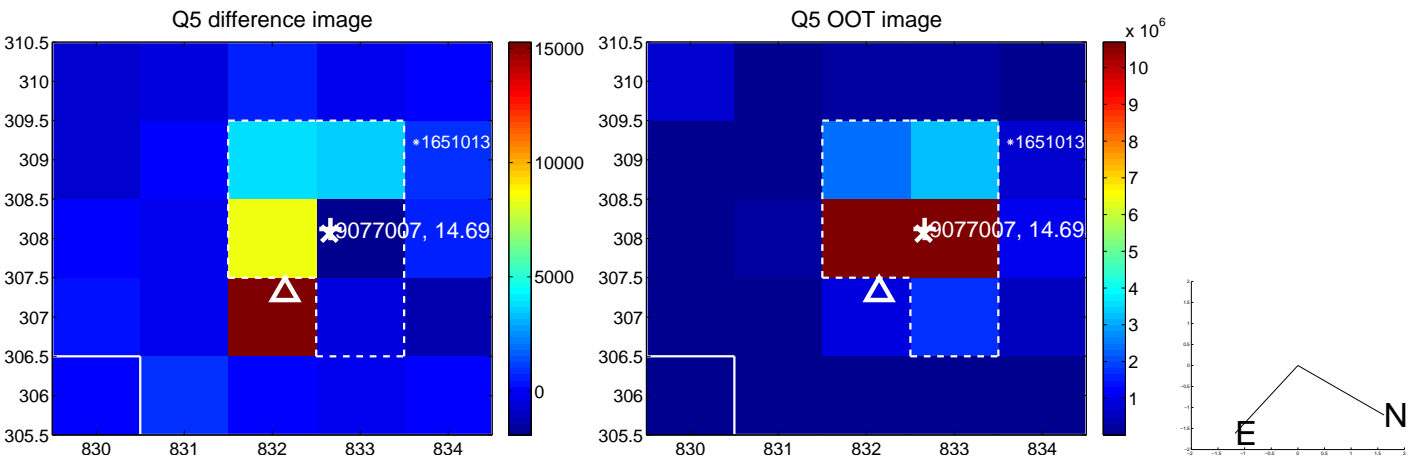


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

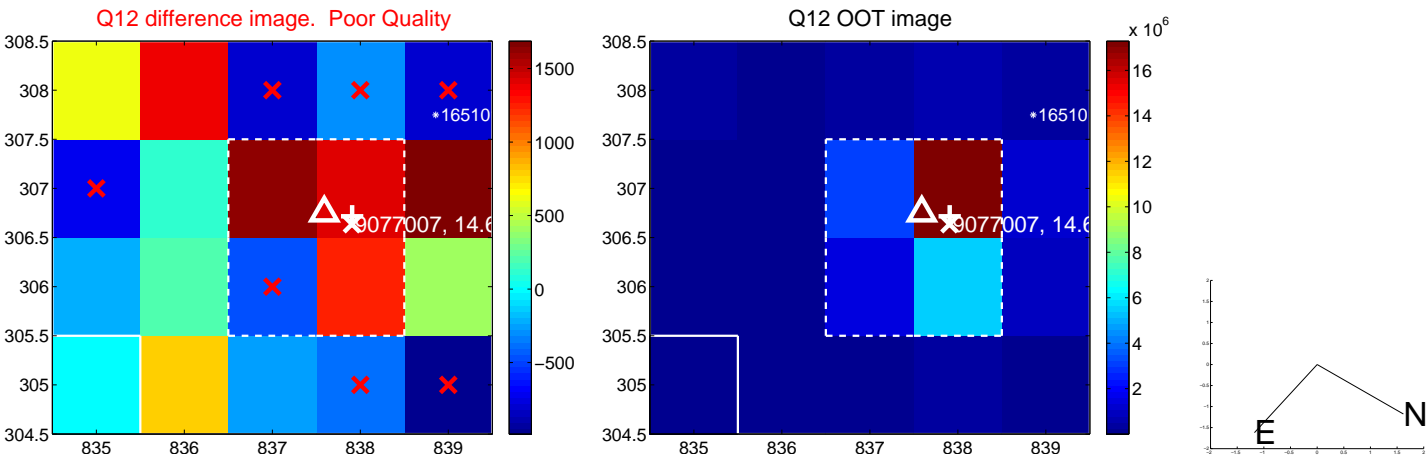
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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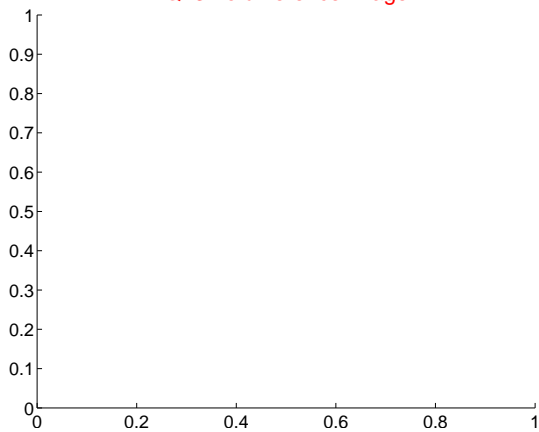


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

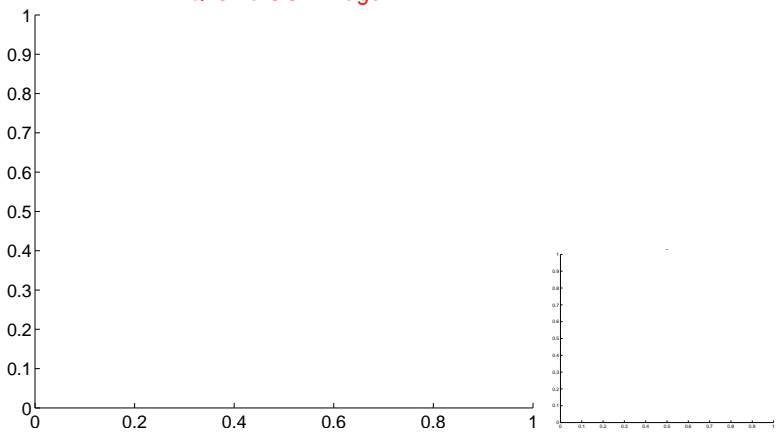


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

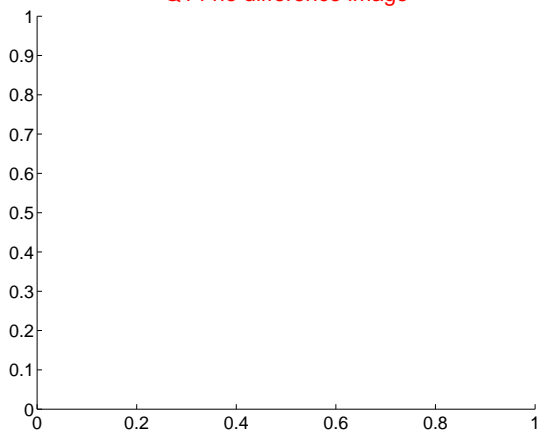
Q13 no difference image



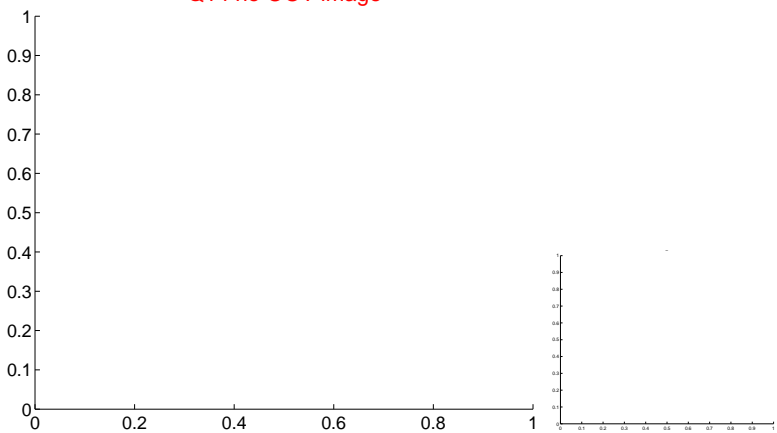
Q13 no OOT image



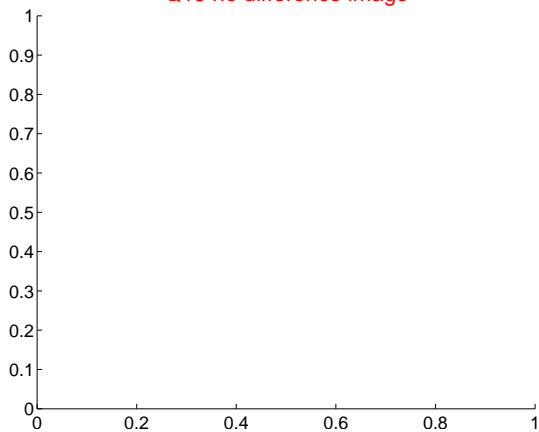
Q14 no difference image



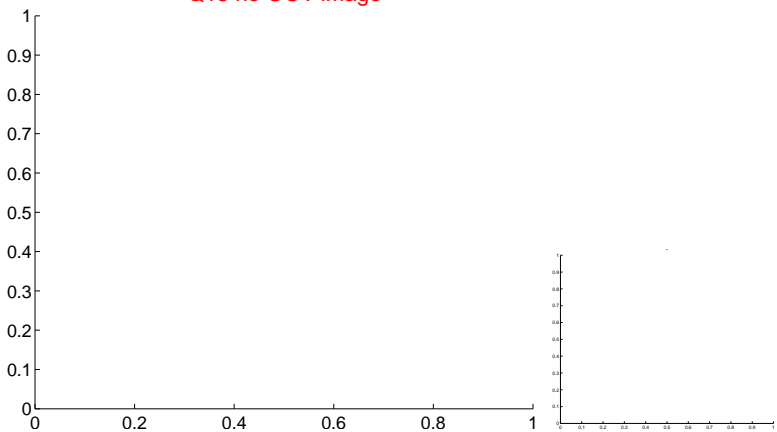
Q14 no OOT image



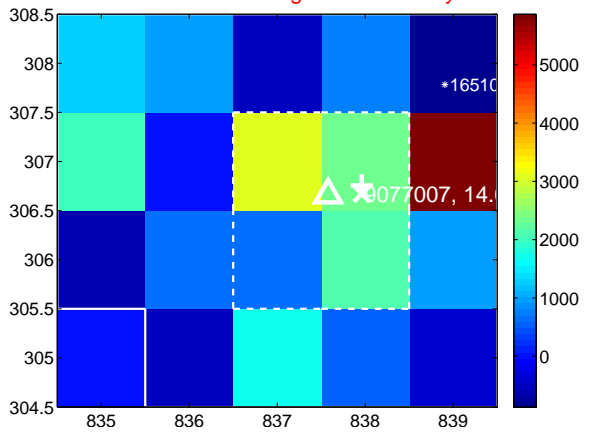
Q15 no difference image



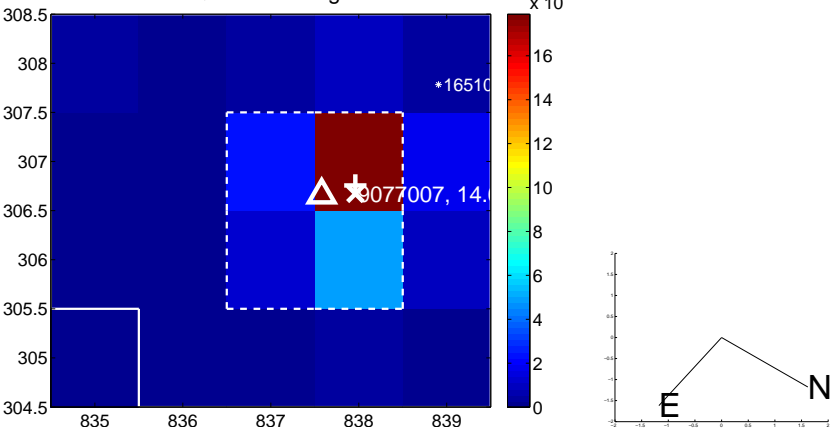
Q15 no OOT image



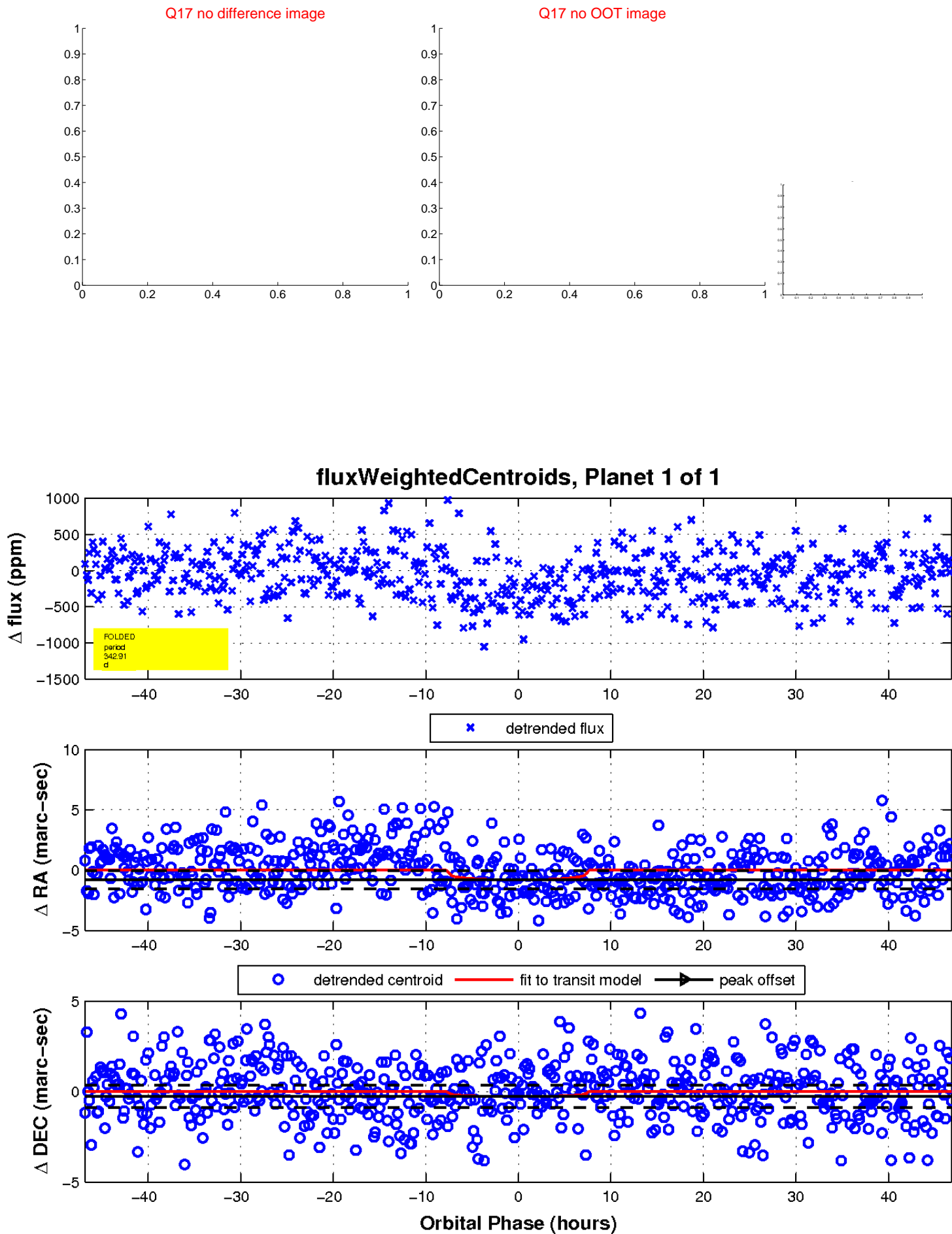
Q16 difference image. Poor Quality



Q16 OOT image



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



UKIRT Image

Declination

