

KIC 008687499

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|------|-----------------------------|-----------------|------------------------|------------------------|
| 008687499-01 | OBS | No | 375.069117 | 507.085734 | 1727.8 | 57.379 | 9.7 | 15.7 | 0.81 | 5510 | 6.49 | 0.56 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 008687499-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 1 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—CENT_FEW_DIFFS—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.

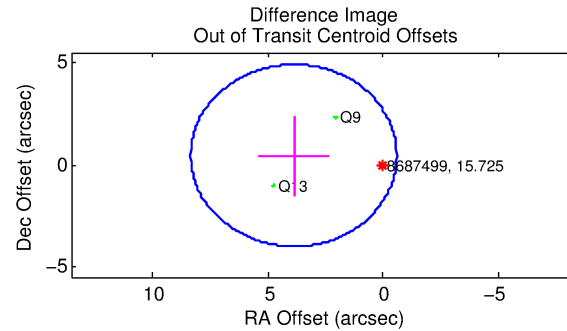
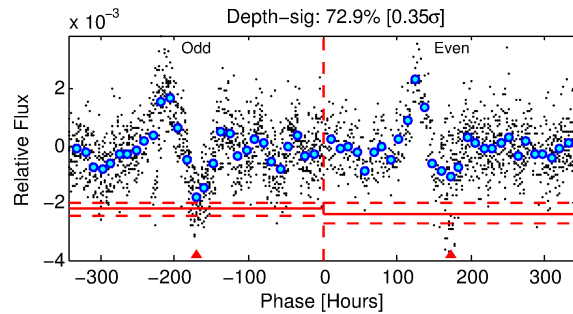
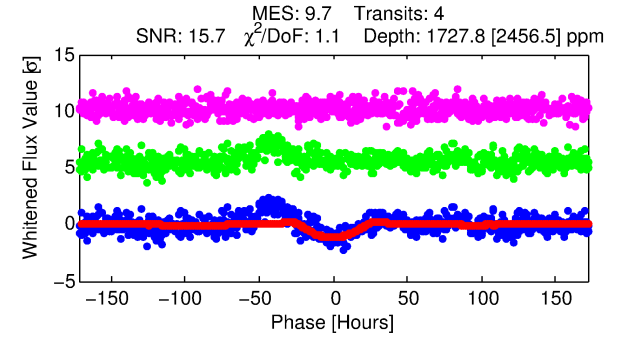
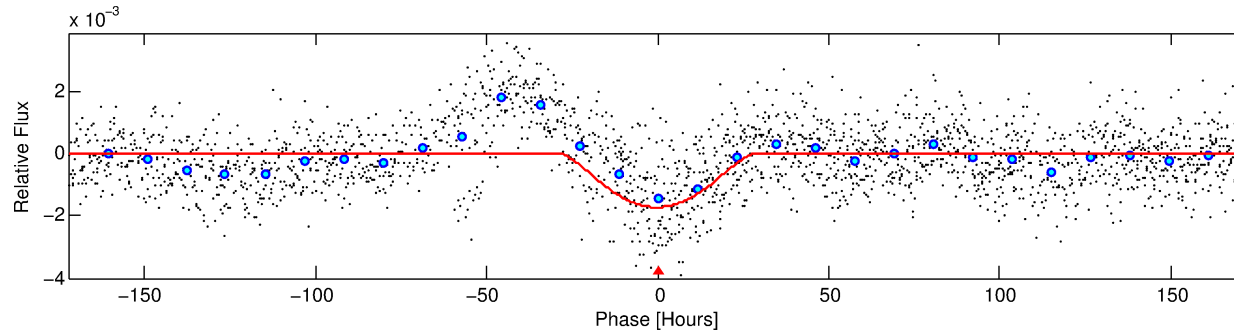
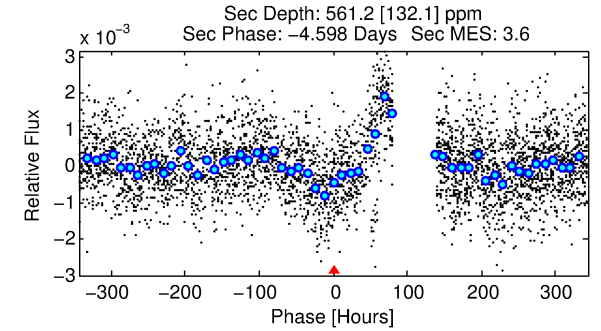
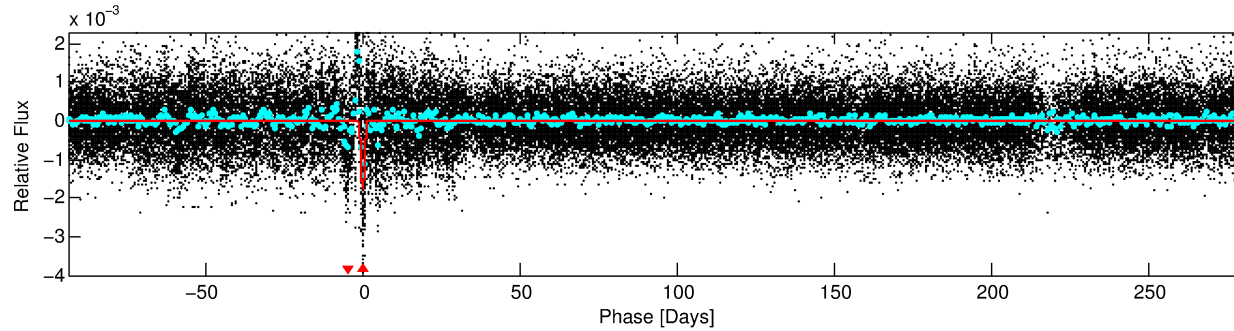
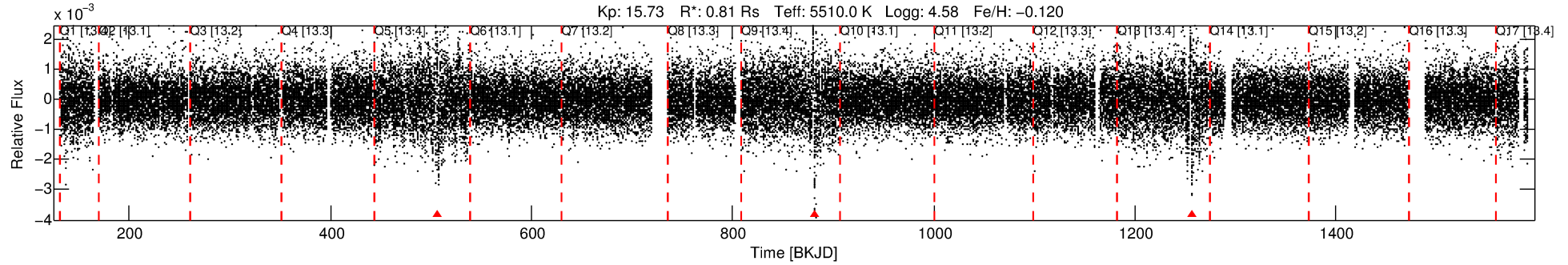
Ephemeris Match Information For 008687499-01

| 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 |
|--------------|---------|--------------|------------|-----------|---------------|--------------|--------------|-------|-------|-----------|-------------|------|------------|------------|
| 008687499-01 | 8687499 | 008752590-01 | 8752590 | 1:1 | 923.3 | 232 | 3 | 15.56 | 15.72 | 1.15 | Col-Anomaly | 1 | 2.29 | 1.98 |

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: 8687499 Candidate: 1 of 1 Period: 375.069 d



DV Fit Results:

Period = 375.06912 [0.04229] d
Epoch = 507.0857 [0.0551] BKJD
Rp/R* = 0.0737 [0.1466]
a/R* = 19.55 [8.35]
b = 1.00 [0.14]
Seff = 0.56 [0.15]
Teq = 220 [15] K
Rp = 6.49 [12.98] Re
a = 0.9825 [0.1676] AU
Ag = 7070.63 [28226.29] [0.25σ]
Teffp = 3123 [3113] K [0.93σ]

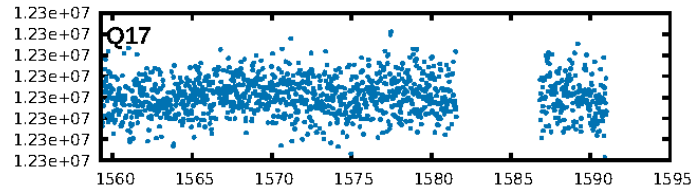
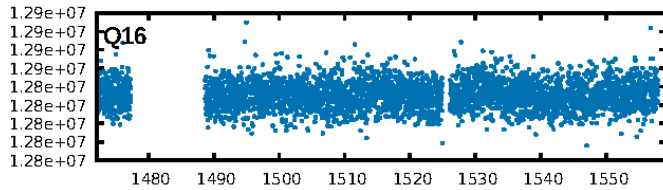
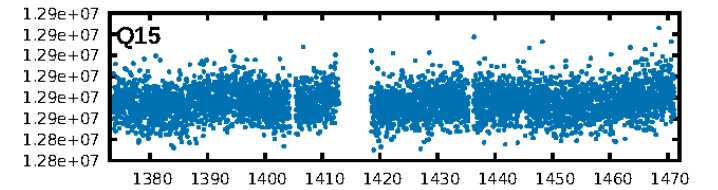
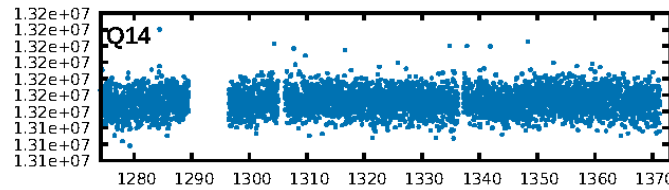
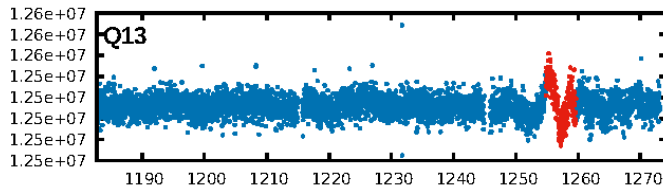
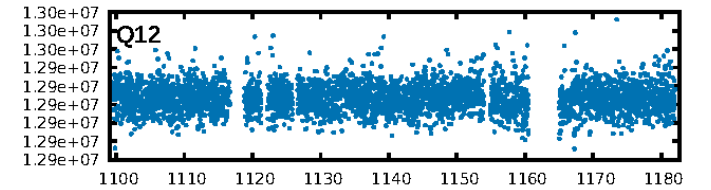
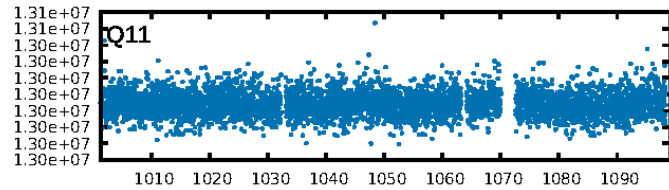
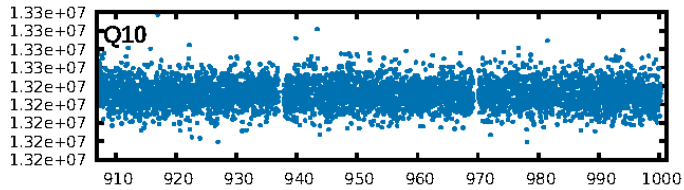
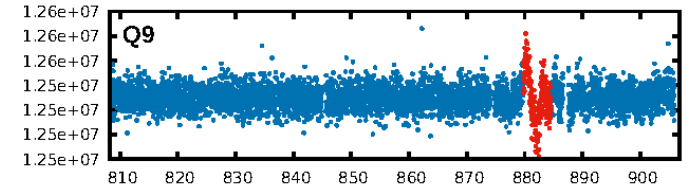
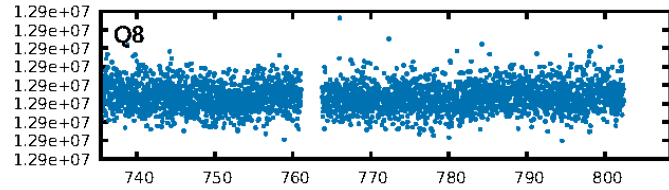
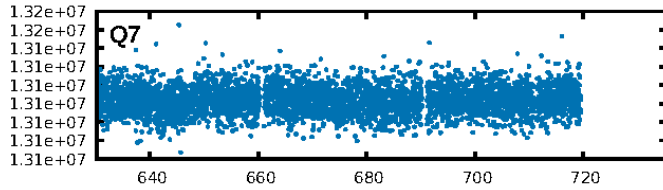
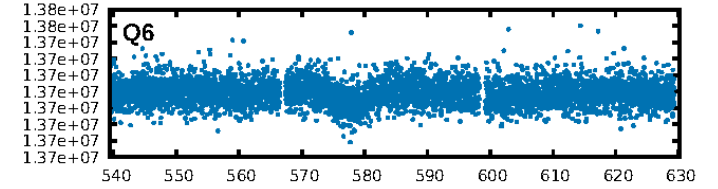
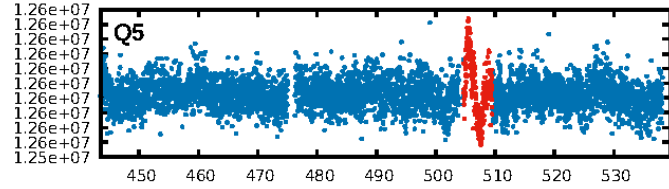
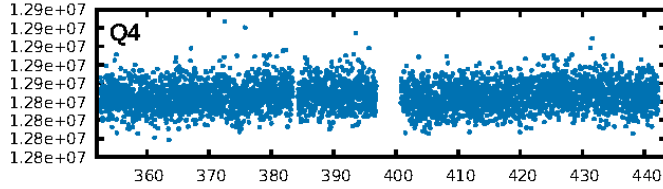
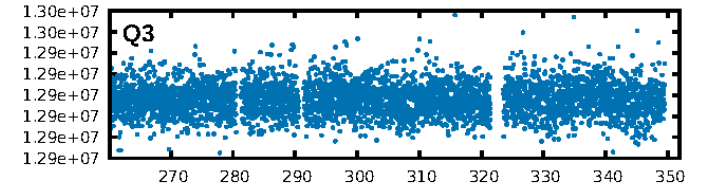
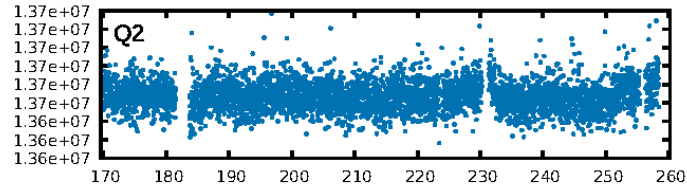
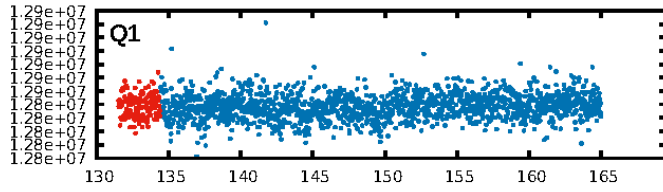
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 98.9%
Bootstrap-pfa: 3.78e-23
RollingBand-fgt: 0.00 [0/3]
GhostDiagnostic-chr: 0.7917
Centroid-sig: 44.7%
Centroid-so: 0.736 arcsec [0.92σ]
OotOffset-rm: 3.900 arcsec [2.63σ]
KicOffset-rm: 3.949 arcsec [2.67σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 1.00 [2/2]

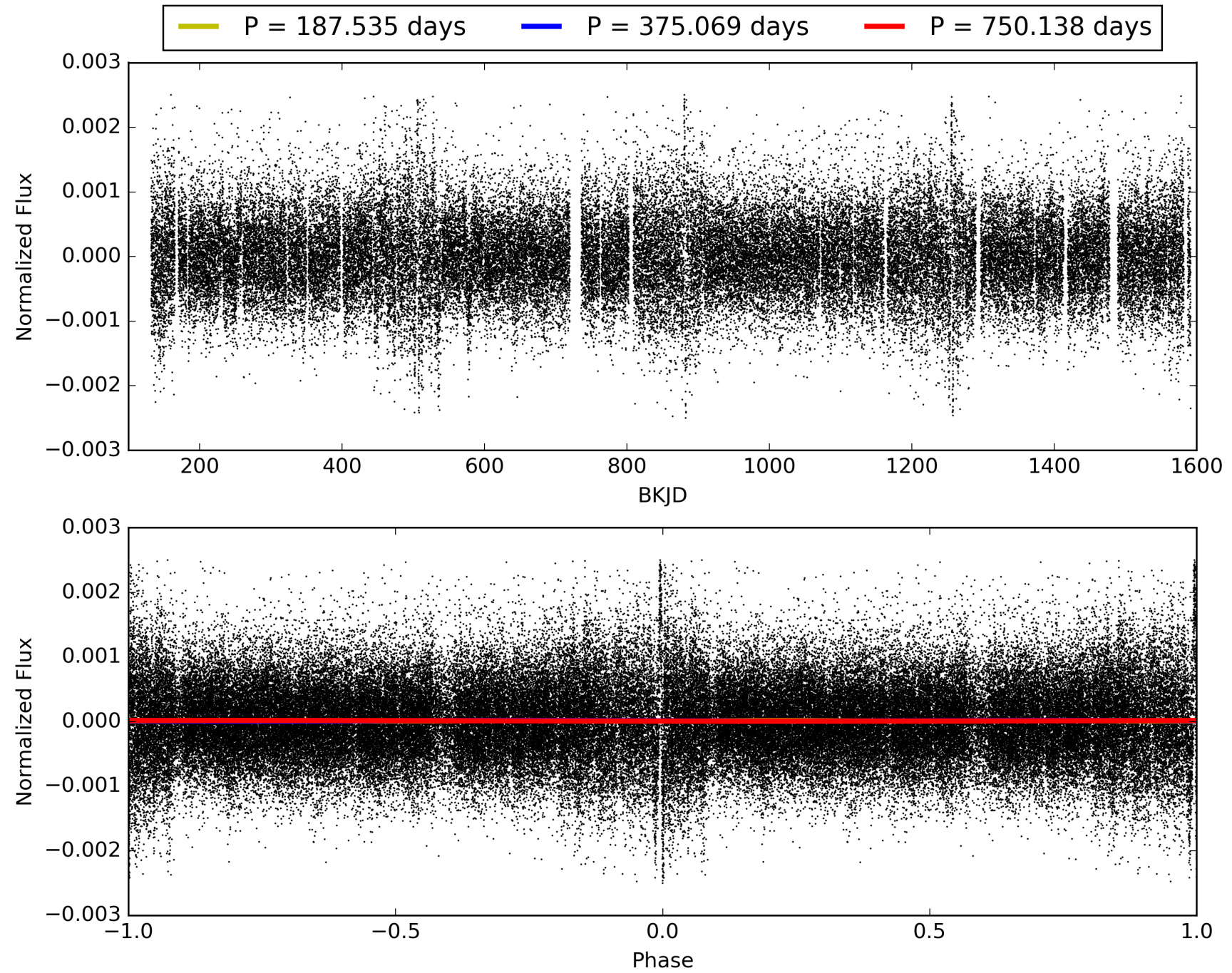
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008687499-01, PDC Light Curves

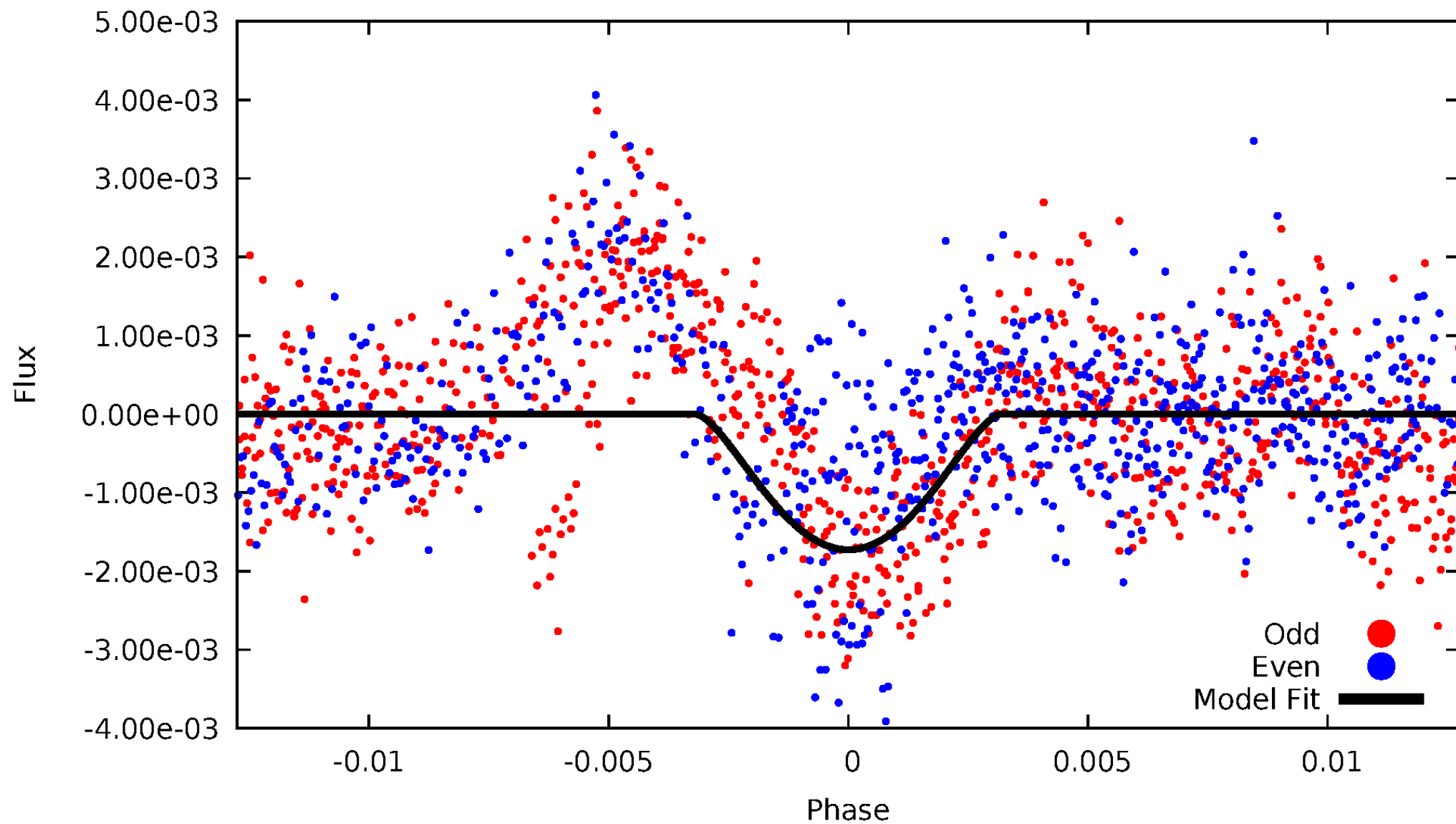


TCE 008687499-01



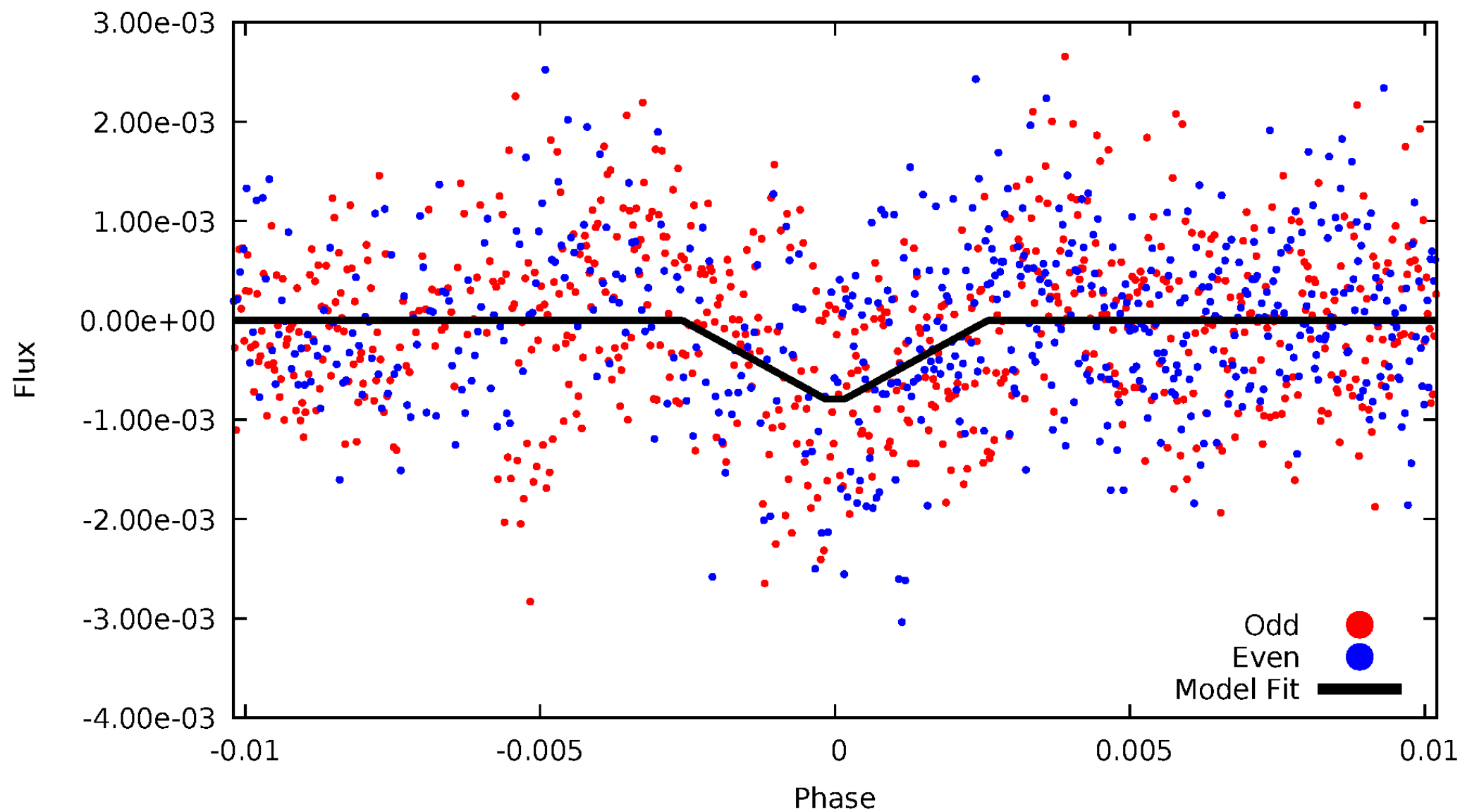
DV Odd/Even

TCE 008687499-01



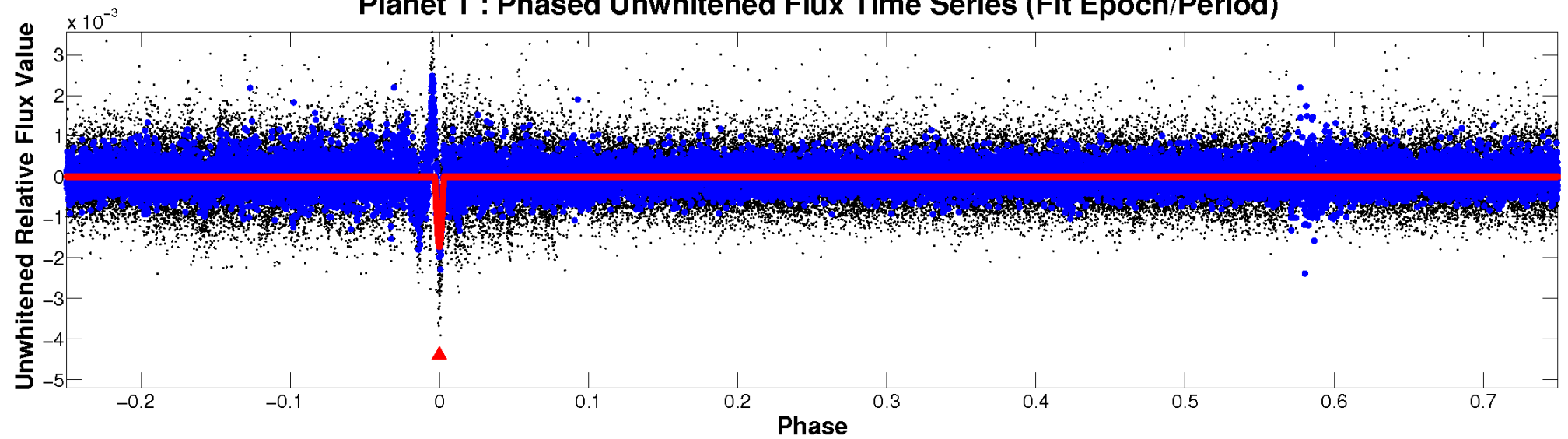
ALT Odd/Even

TCE 008687499-01

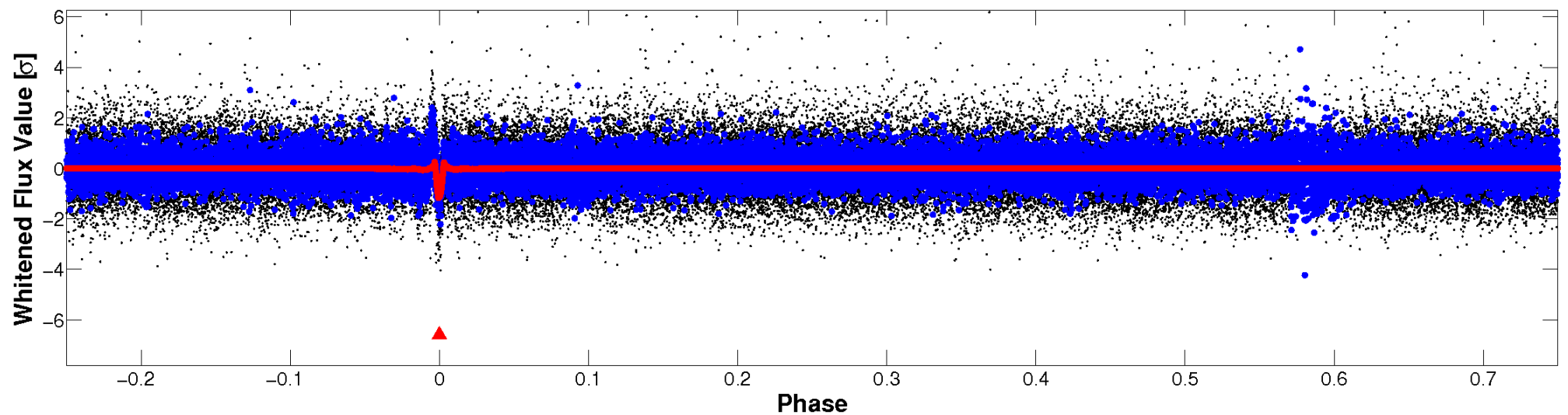


Non-Whitened Vs. Whitened Light Curve

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

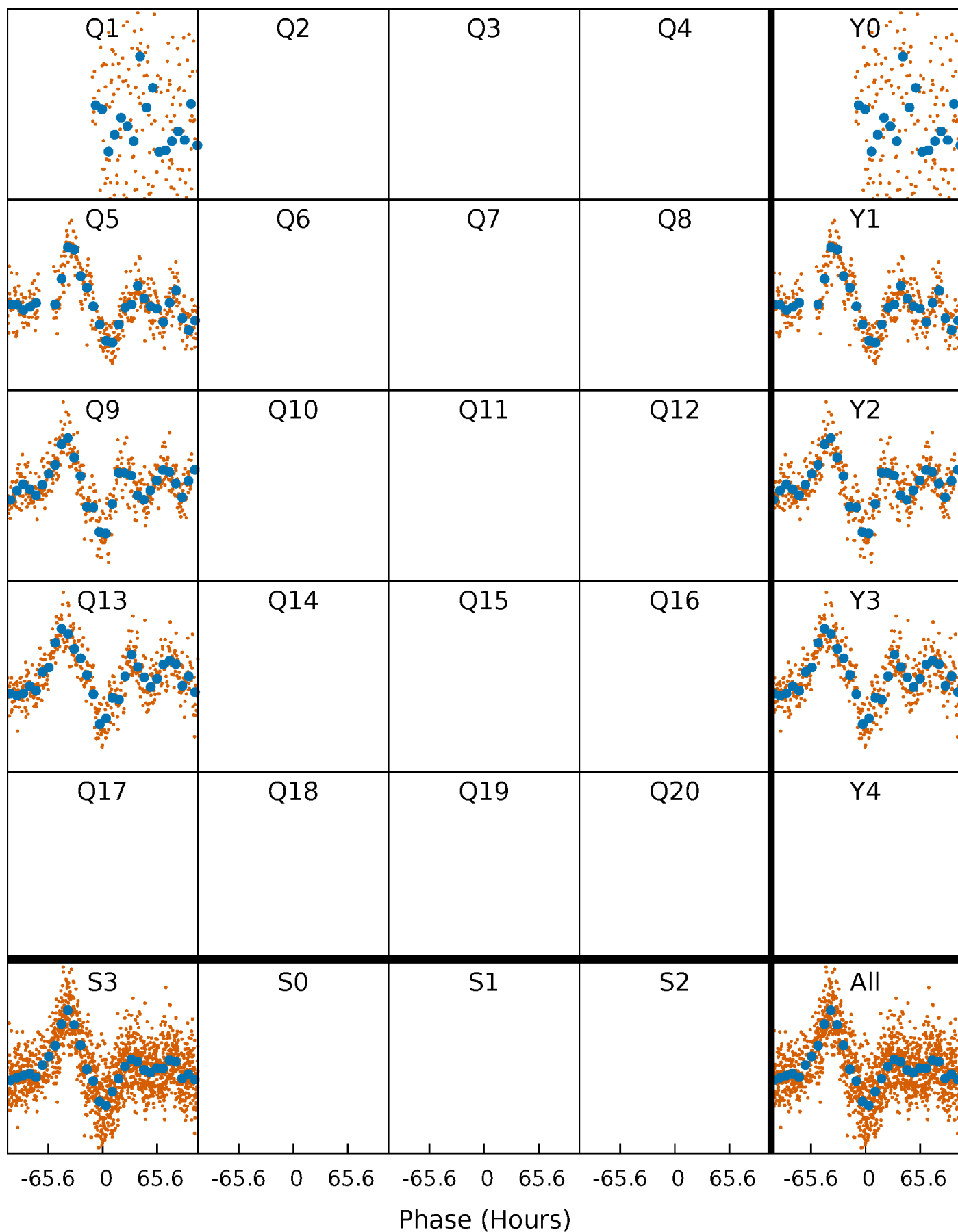


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



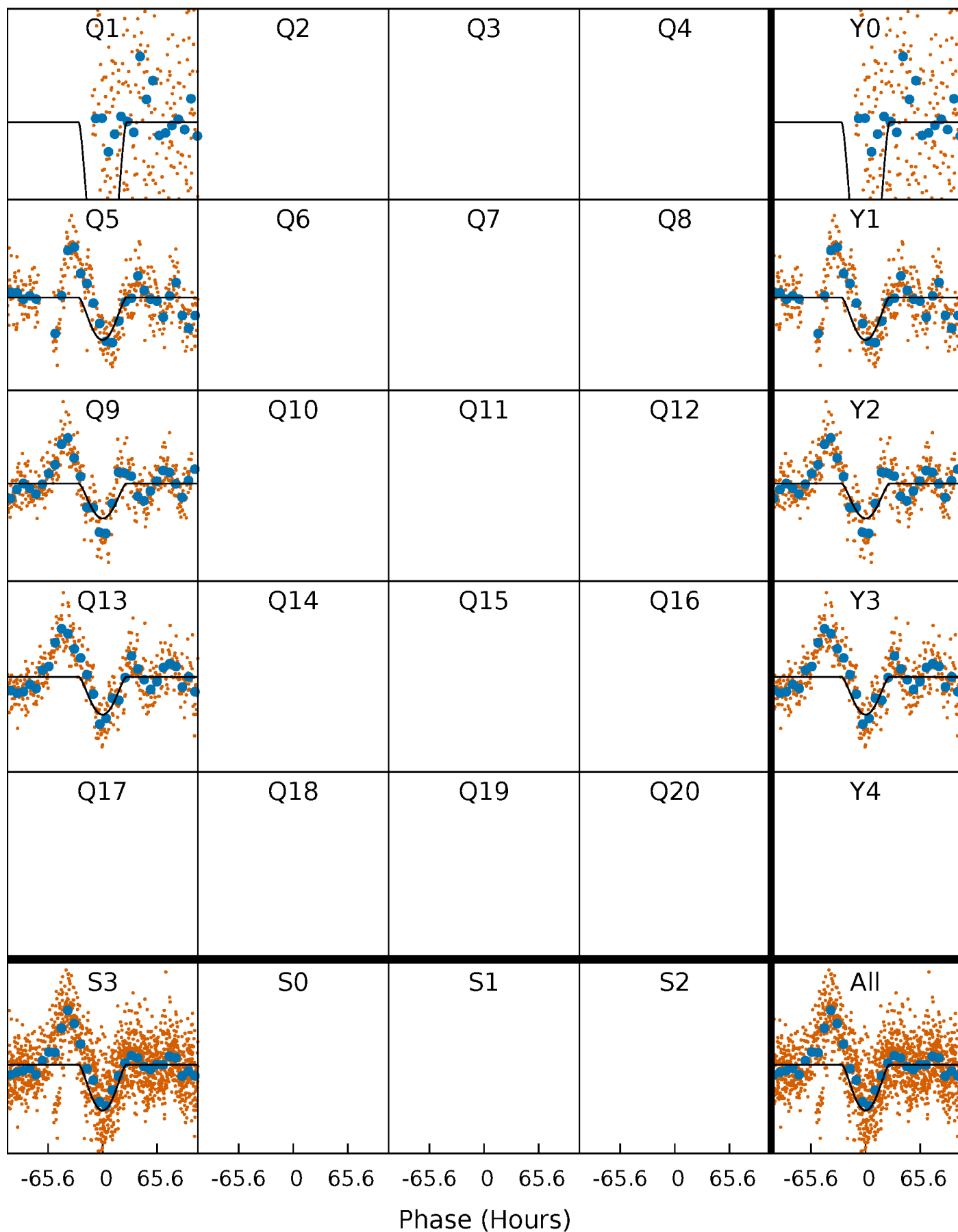
PDC Quarter-Phased Transit Curves

TCE 008687499-01 $P=375.069117$ Days $T_0=507.085734$ (BKJD)



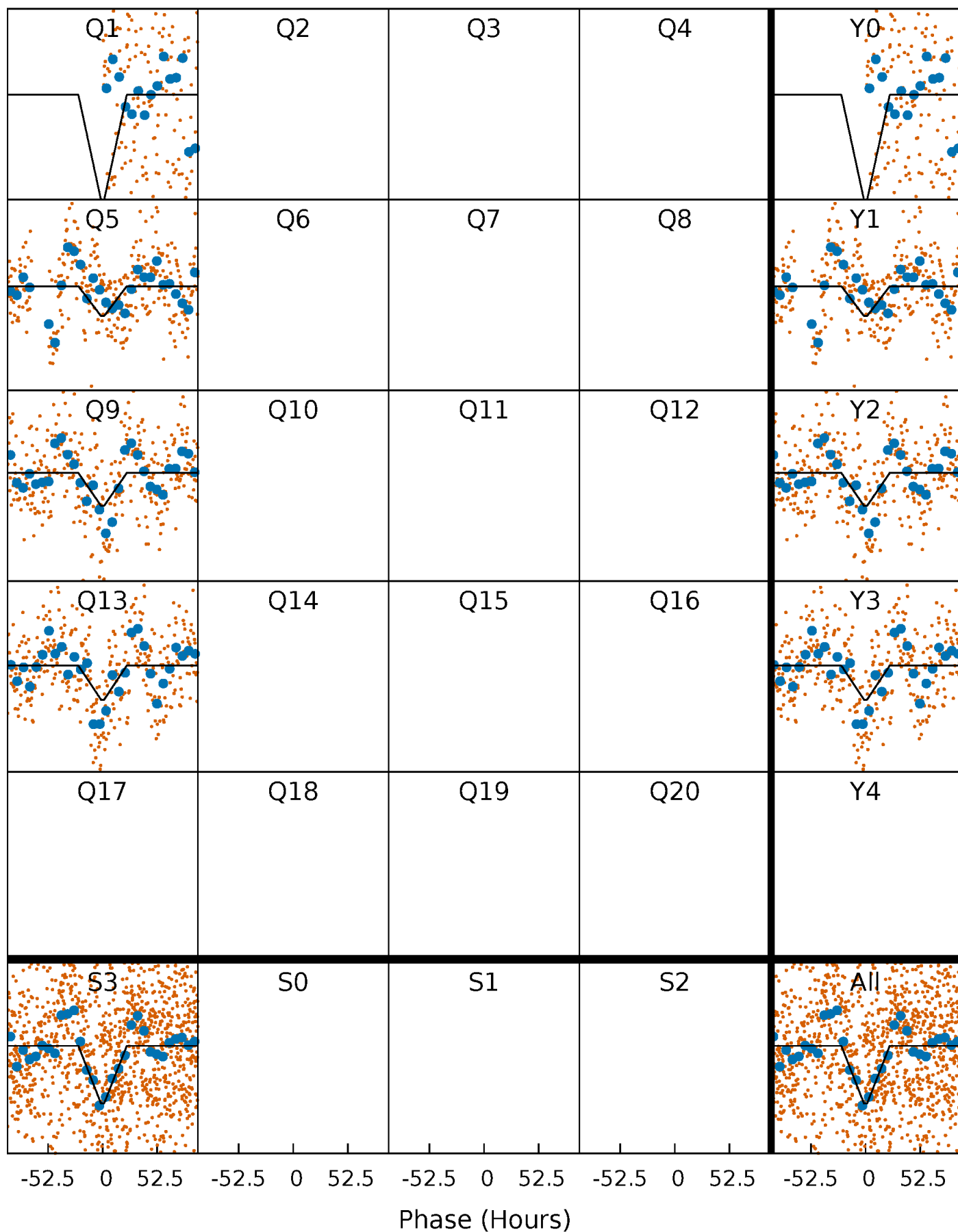
DV Quarter-Phased Transit Curves

TCE 008687499-01 P=375.069117 Days $T_0=507.085734$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

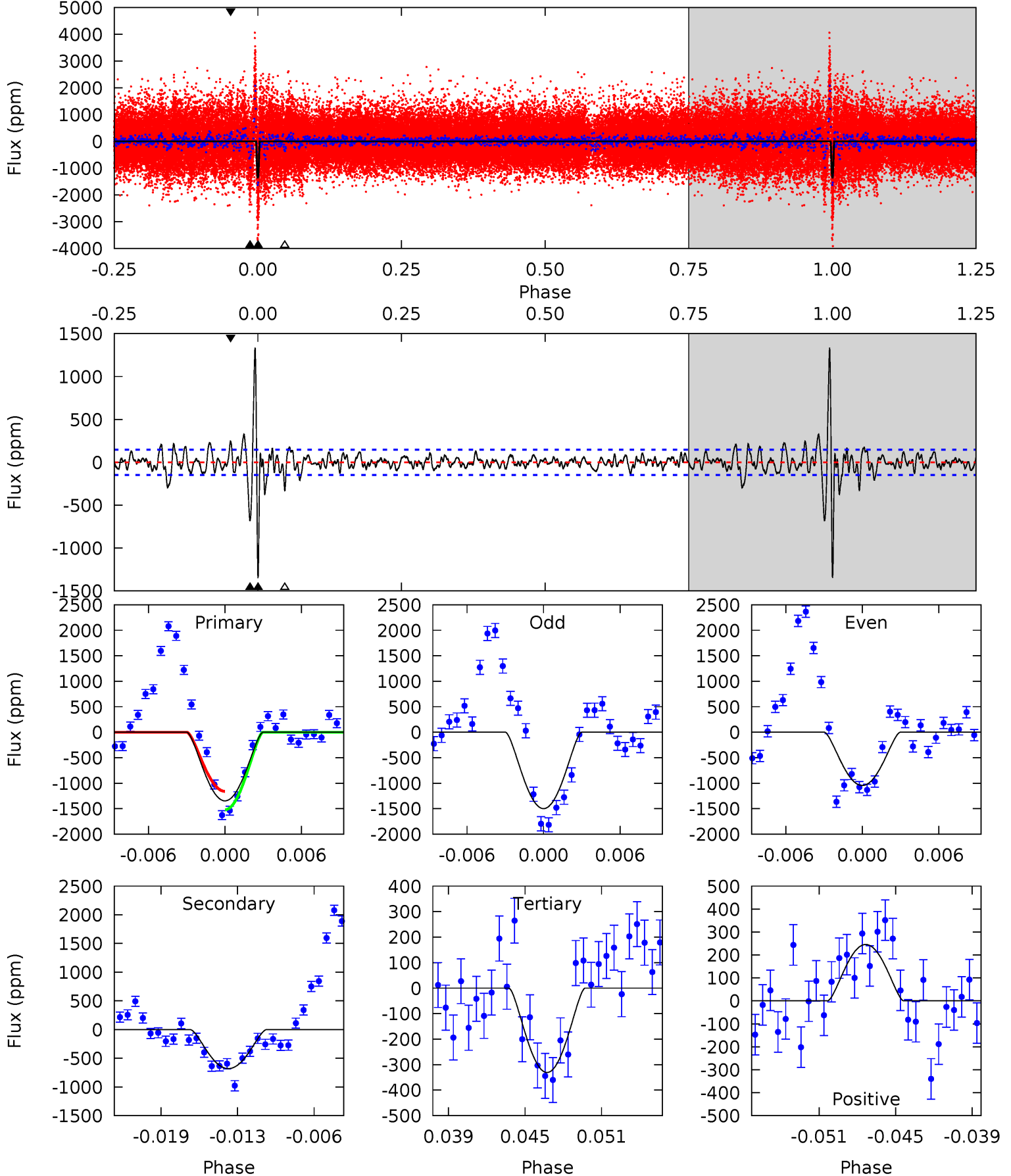
TCE 008687499-01 P=375.269141 Days $T_0=506.752899$ (BKJD)



DV Model-Shift Uniqueness Test

008687499-01, $P = 375.069117$ Days, $E = 132.016617$ Days

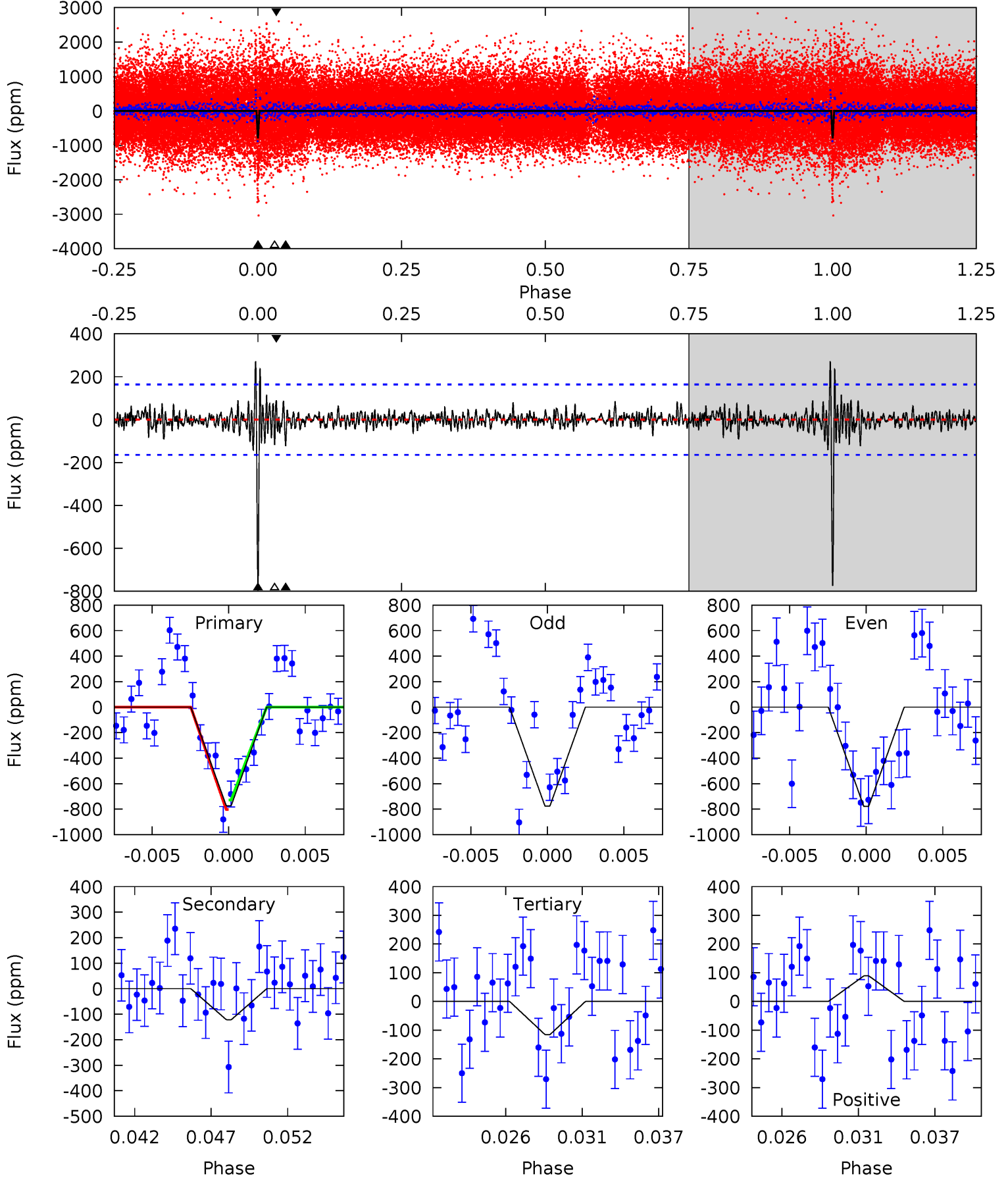
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 46.7 | 23.6 | 11.5 | 8.52 | 5.11 | 2.73 | 2.75 | 35.2 | 38.2 | 12.1 | 15.1 | 7.90 | 0.84 | 0.50 | 6.18 |



Alt Model-Shift Uniqueness Test

008687499-01, P = 375.269141 Days, E = 131.483758 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 24.3 | 3.81 | 3.63 | 2.80 | 5.15 | 2.79 | 0.86 | 20.6 | 21.5 | 0.19 | 1.02 | 0.04 | 0.84 | 0.26 | 1.15 |



Stellar Parameters For KIC 008687499

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | M (M_{\odot}) | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5510^{+166}_{-166} | $4.578^{+0.036}_{-0.135}$ | $-0.120^{+0.300}_{-0.300}$ | $0.807^{+0.164}_{-0.070}$ | $0.904^{+0.074}_{-0.111}$ | $2.424^{+0.437}_{-0.949}$ |
| | +3%/-3% | +1%/-3% | +250%/-250% | +20%/-9% | +8%/-12% | +18%/-39% |
| 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 008687499-01 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|--------------------------|-------------------|-----------------------|-------------------------|
| DV | -680 ± 29 | $12.20^{+10.33}_{-8.49}$ | 313^{+16}_{-13} | 3083^{+1429}_{-487} | 2413^{+23807}_{-1723} |
| Alt. | -122 ± 32 | $9.63^{+10.58}_{-6.28}$ | 314^{+17}_{-13} | 2571^{+945}_{-406} | 635^{+4746}_{-494} |

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 $A_{obs} \gg 1.0$

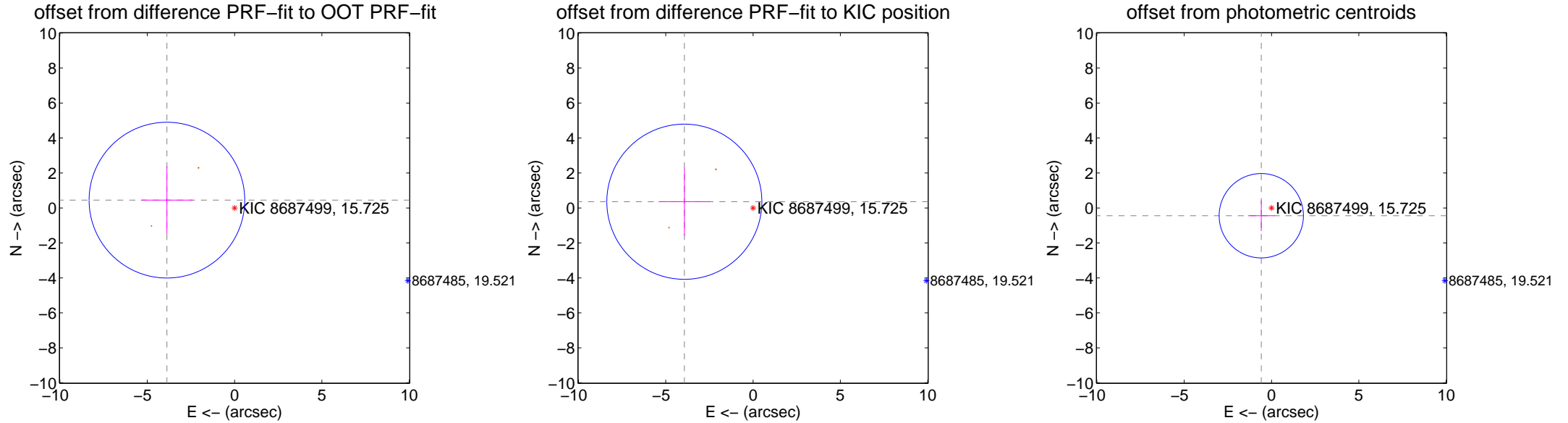
DV Centroid Data

Supplemental centroid analysis for 008687499-01. Kepler magnitude: 15.72. Transit SNR 15.72

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 3.900 ± 1.485 | 2.63 | 3.874 ± 1.478 | 0.447 ± 1.931 |
| PRF-fit source offset from KIC position | 3.949 ± 1.479 | 2.67 | 3.933 ± 1.475 | 0.356 ± 1.938 |
| photometric centroid source offset | 0.74 ± 0.80 | 0.92 | 0.59 ± 0.76 | -0.44 ± 0.88 |



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.

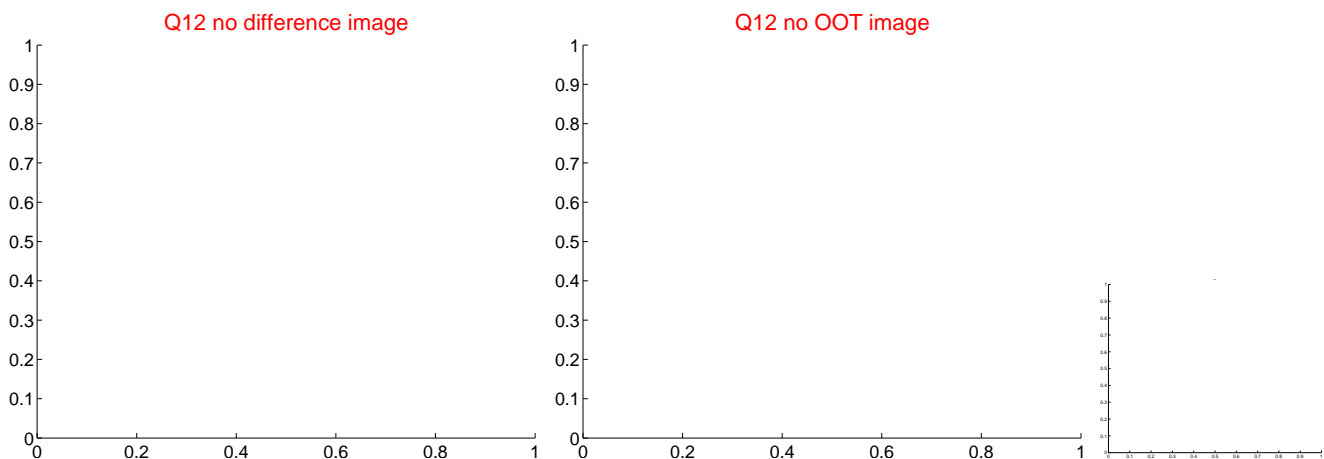
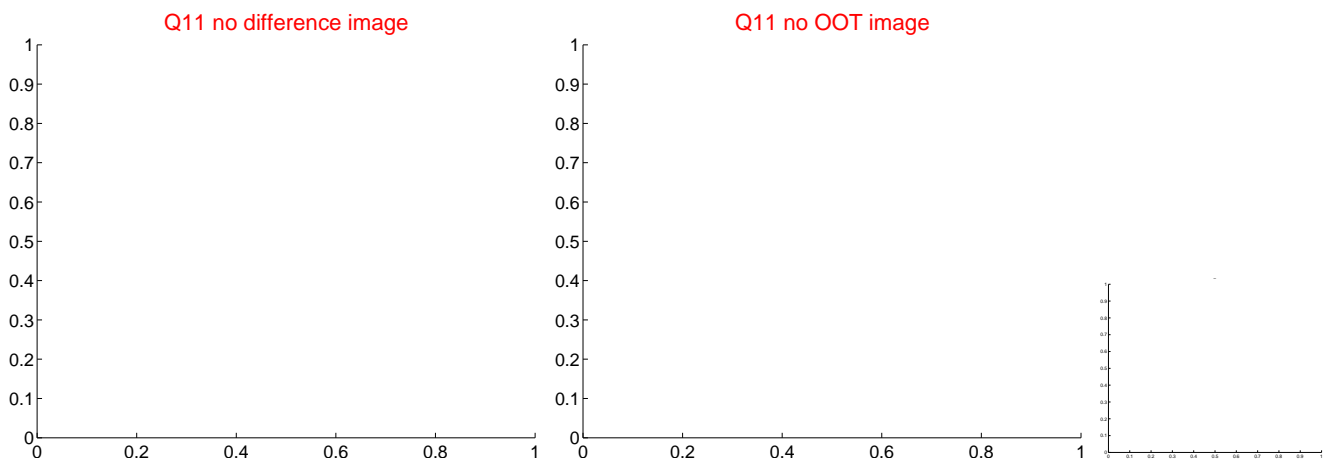
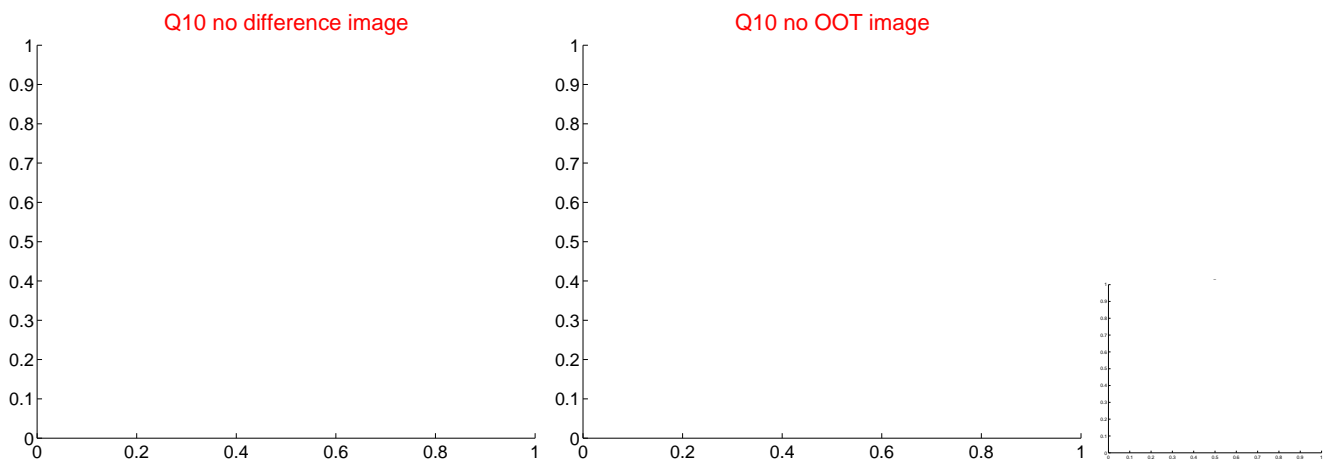
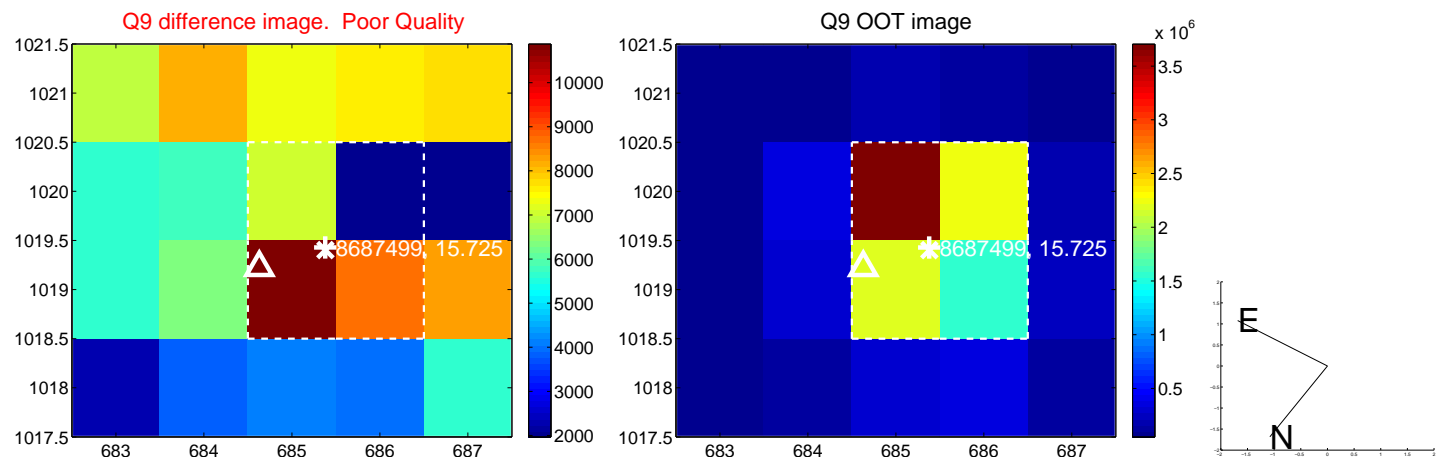
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



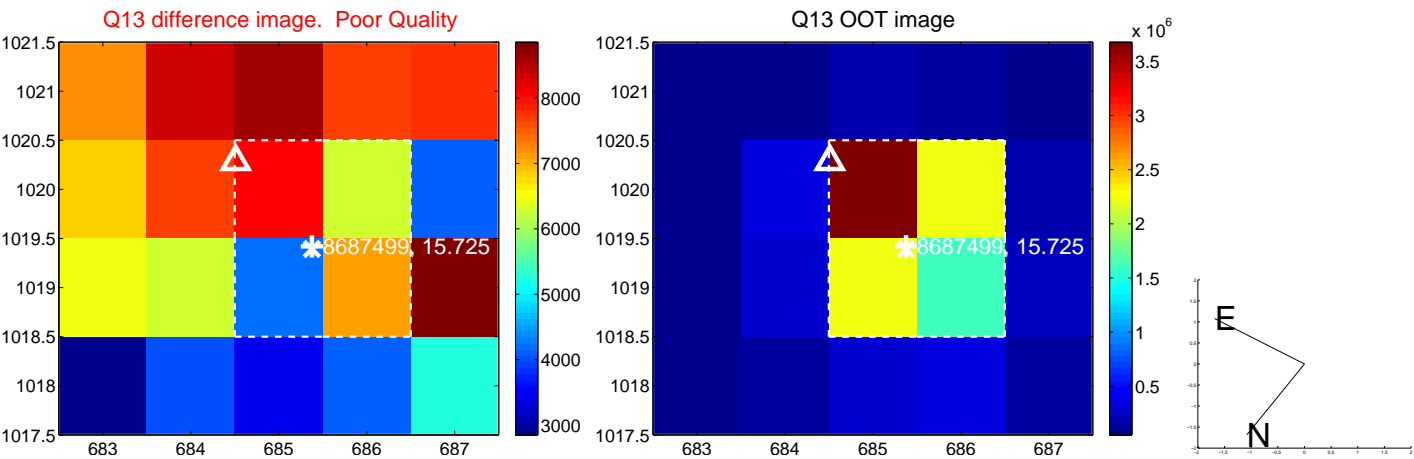
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



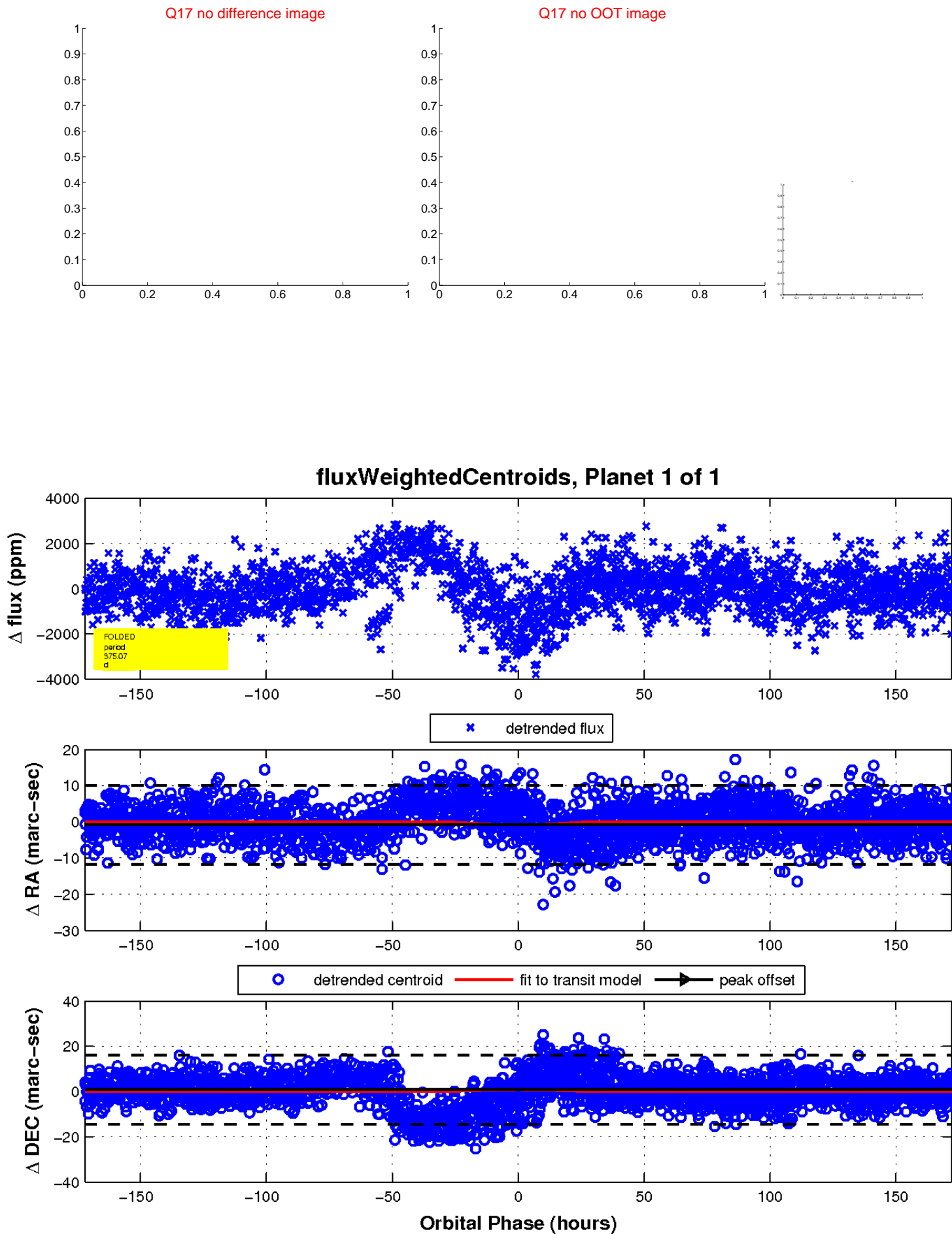
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

