

KIC 009640649

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009640649-01 | OBS | 7951.01 | 0.862324 | 132.166168 | 118.8 | 1.206 | 8.8 | 9.7 | 0.90 | 5806 | 1.17 | 2626.32 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|------------|
| 009640649-01 | OBS | PC | 0.97 | 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.

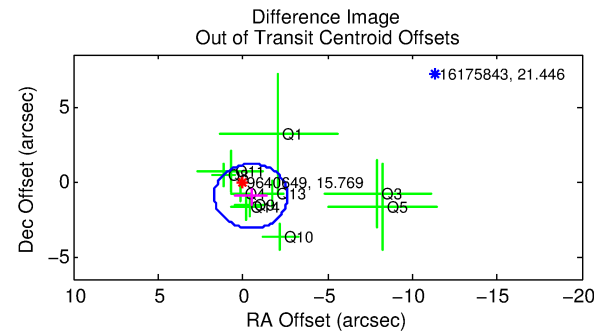
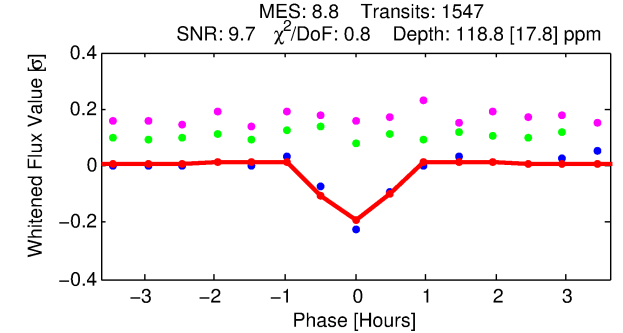
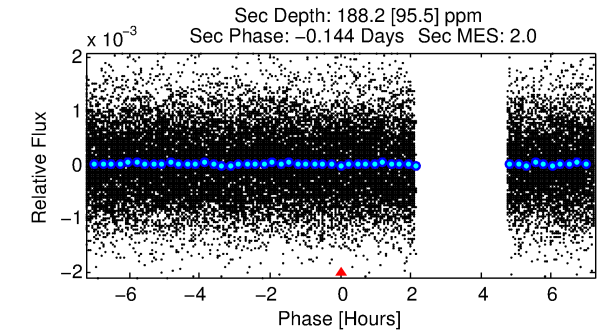
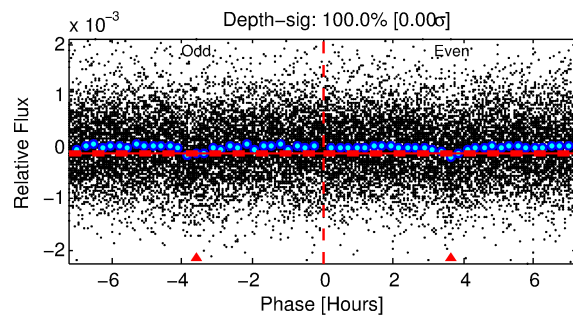
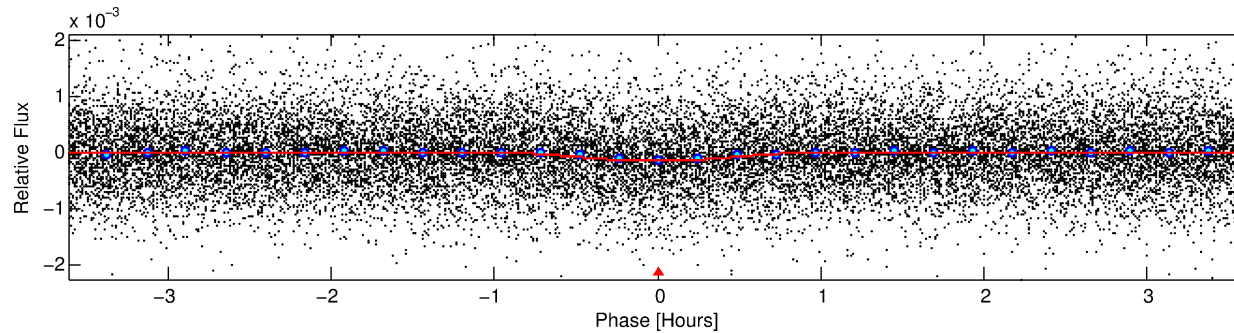
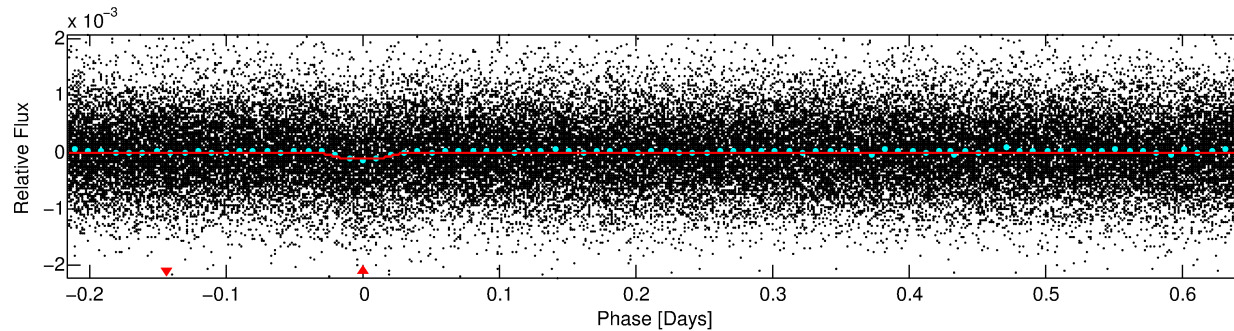
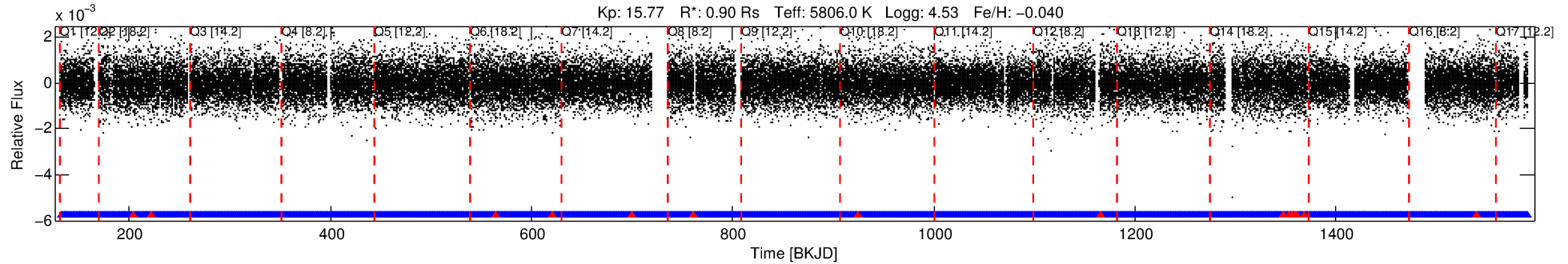
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009640649-01

No Significant Match Found

DV One-Page Summary

KIC: 9640649 Candidate: 1 of 1 Period: 0.862 d



DV Fit Results:

Period = 0.86232 [0.00001] d
Epoch = 132.1662 [0.0019] BKJD
Rp/R* = 0.0119 [0.0101]
a/R* = 2.70 [9.51]
b = 0.90 [0.88]
Seff = 2626.32 [995.90]
Teq = 1825 [173] K
Rp = 1.17 [1.05] Re
a = 0.0177 [0.0043] AU
Ag = 23.68 [42.67] [0.53σ]
Teffp = 6226 [2759] K [1.59σ]

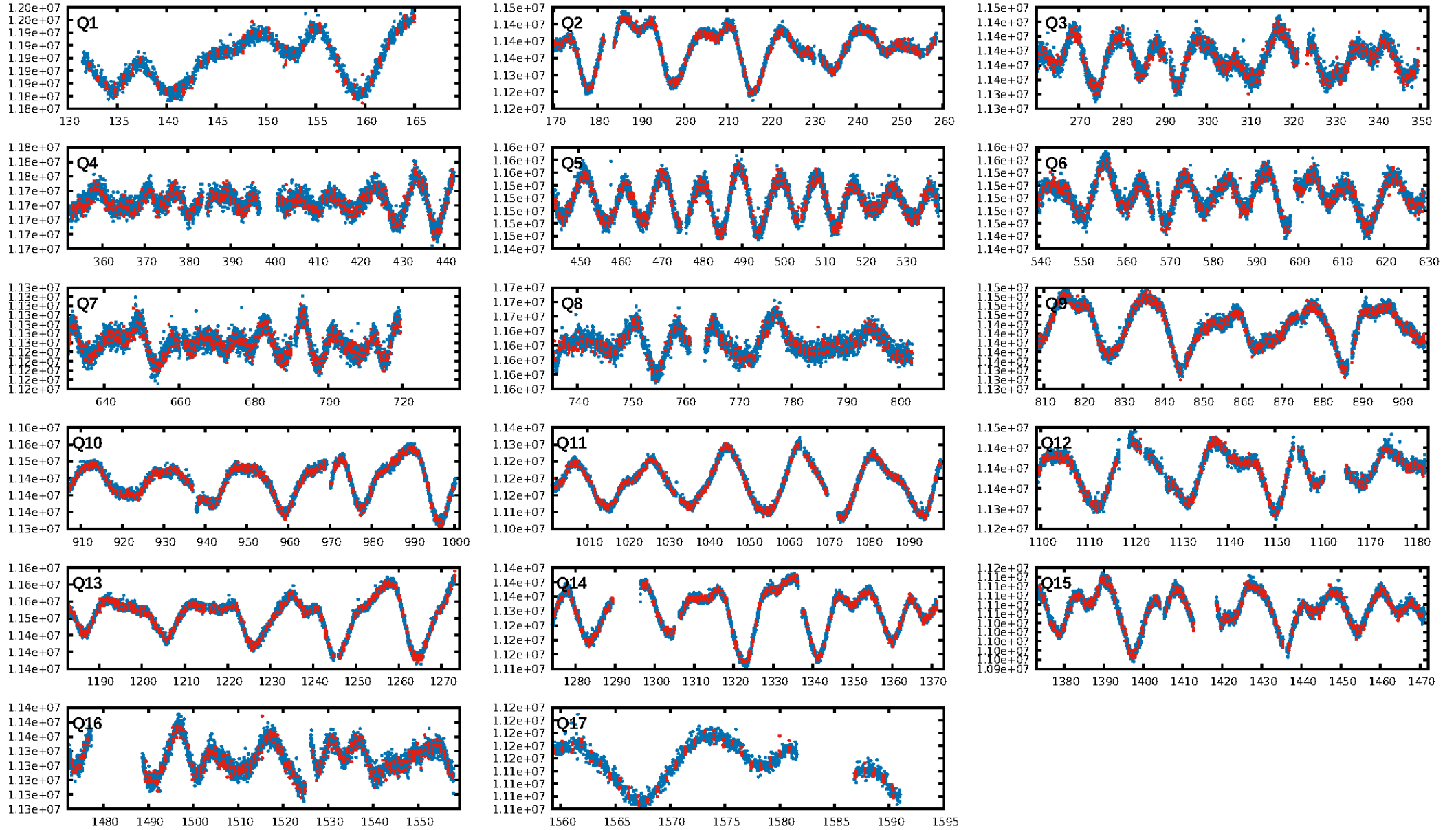
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.28e-19
RollingBand-fgt: 0.99 [1462/1477]
GhostDiagnostic-chr: 6.365
Centroid-sig: 23.2%
Centroid-so: 1.887 arcsec [1.20σ]
OotOffset-rm: 1.082 arcsec [1.51σ]
KicOffset-rm: 1.123 arcsec [1.64σ]
OotOffset-st: 2/2/2/4 [10]
KicOffset-st: 2/2/2/4 [10]
DiffImageQuality-fgm: 0.20 [2/10]
DiffImageOverlap-fno: 1.00 [17/17]

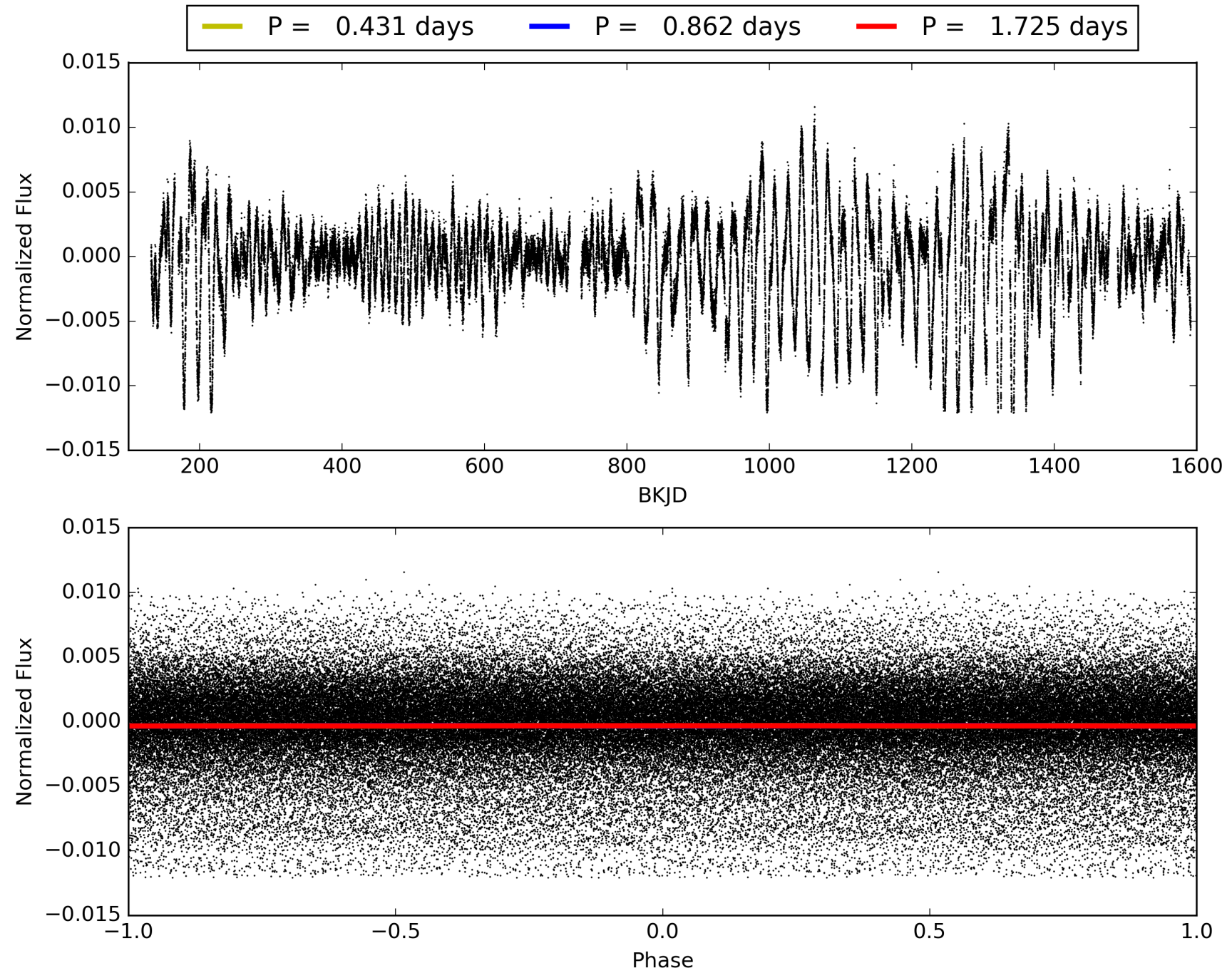
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 00:47:34 Z

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

TCE 009640649-01, PDC Light Curves

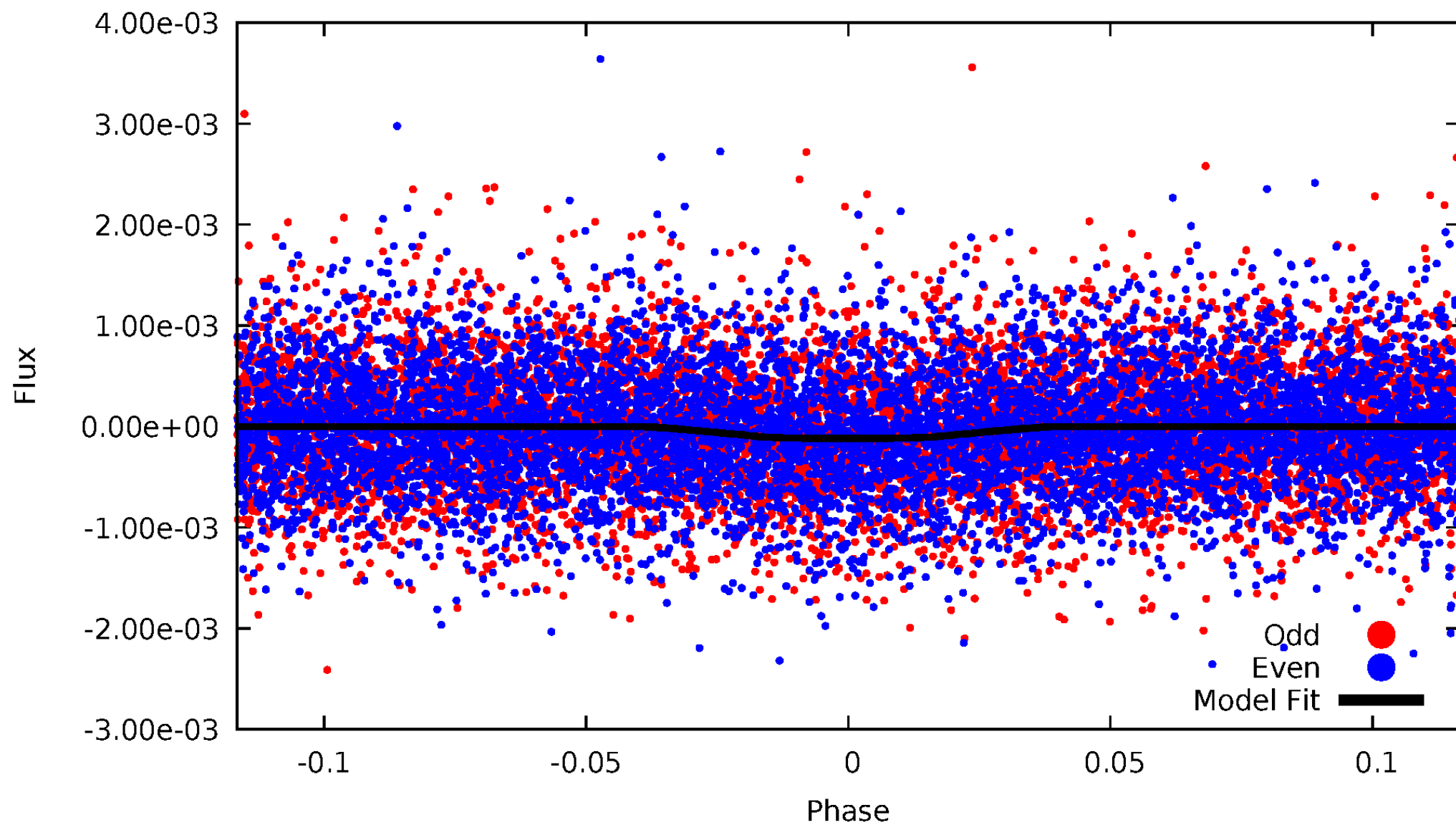


TCE 009640649-01



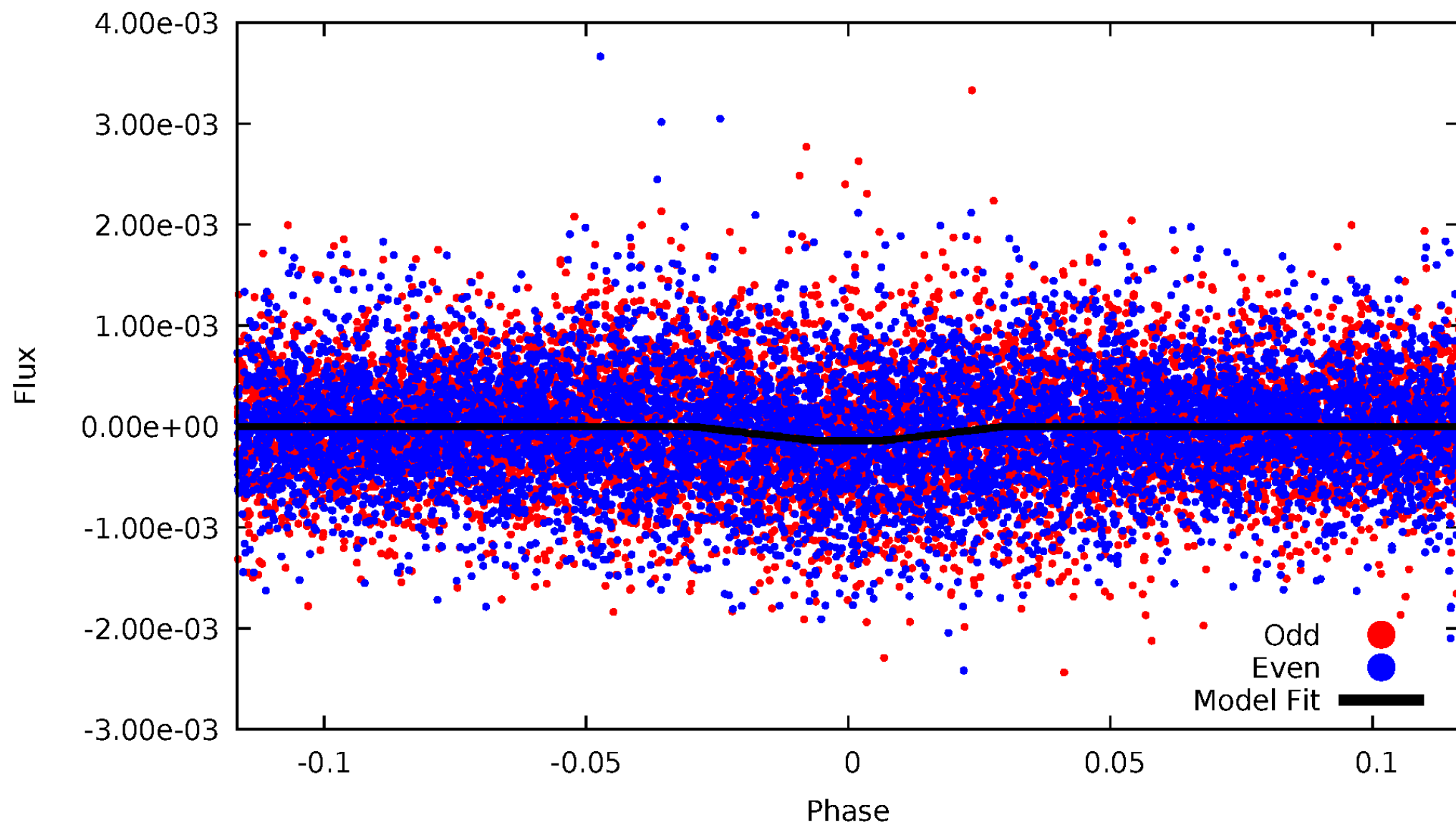
DV Odd/Even

TCE 009640649-01



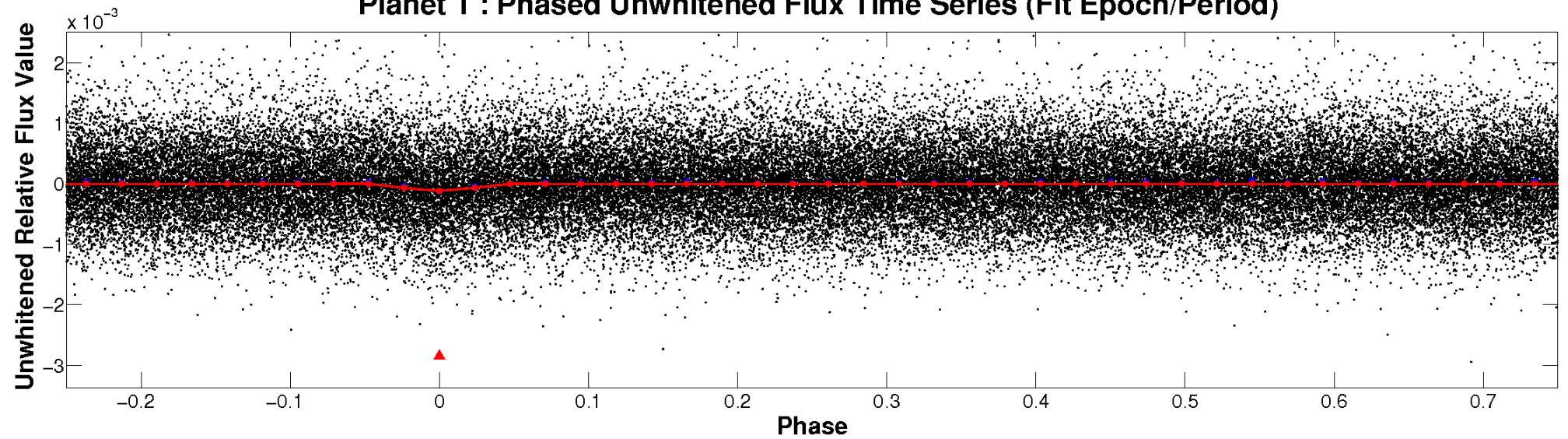
ALT Odd/Even

TCE 009640649-01

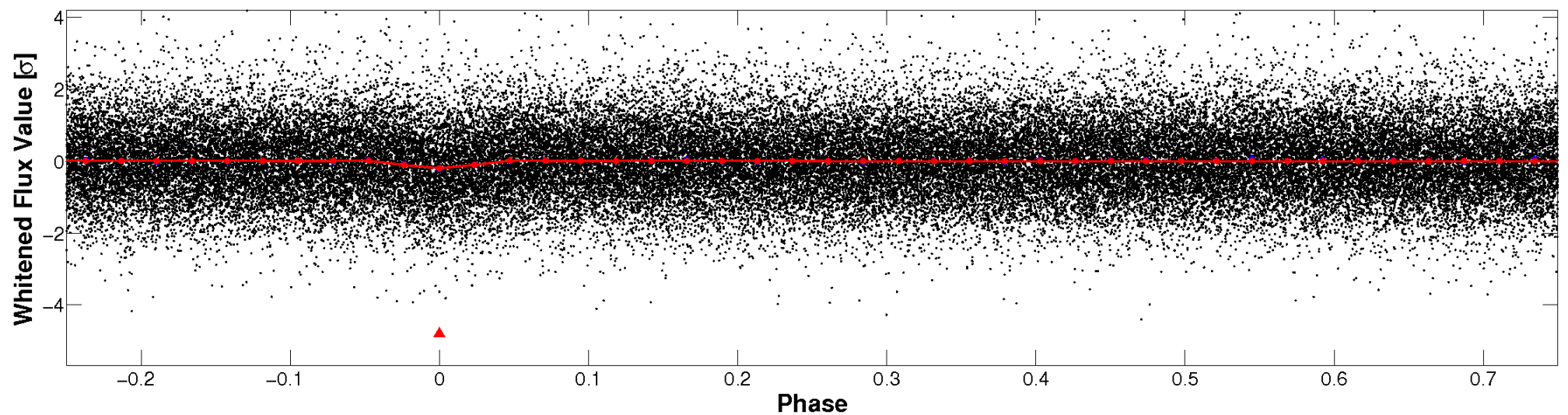


Non-Whitened Vs. Whitened Light Curve

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

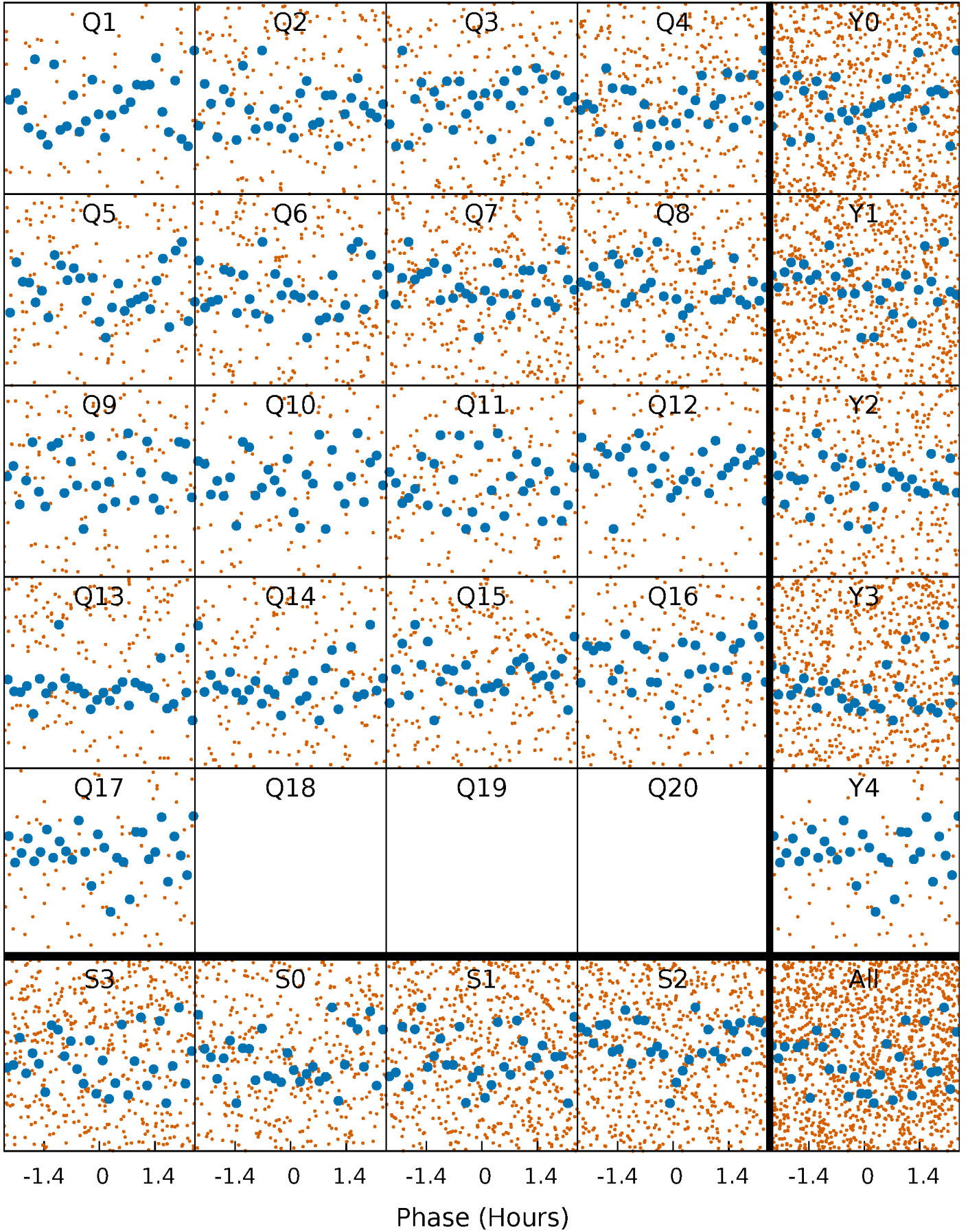


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



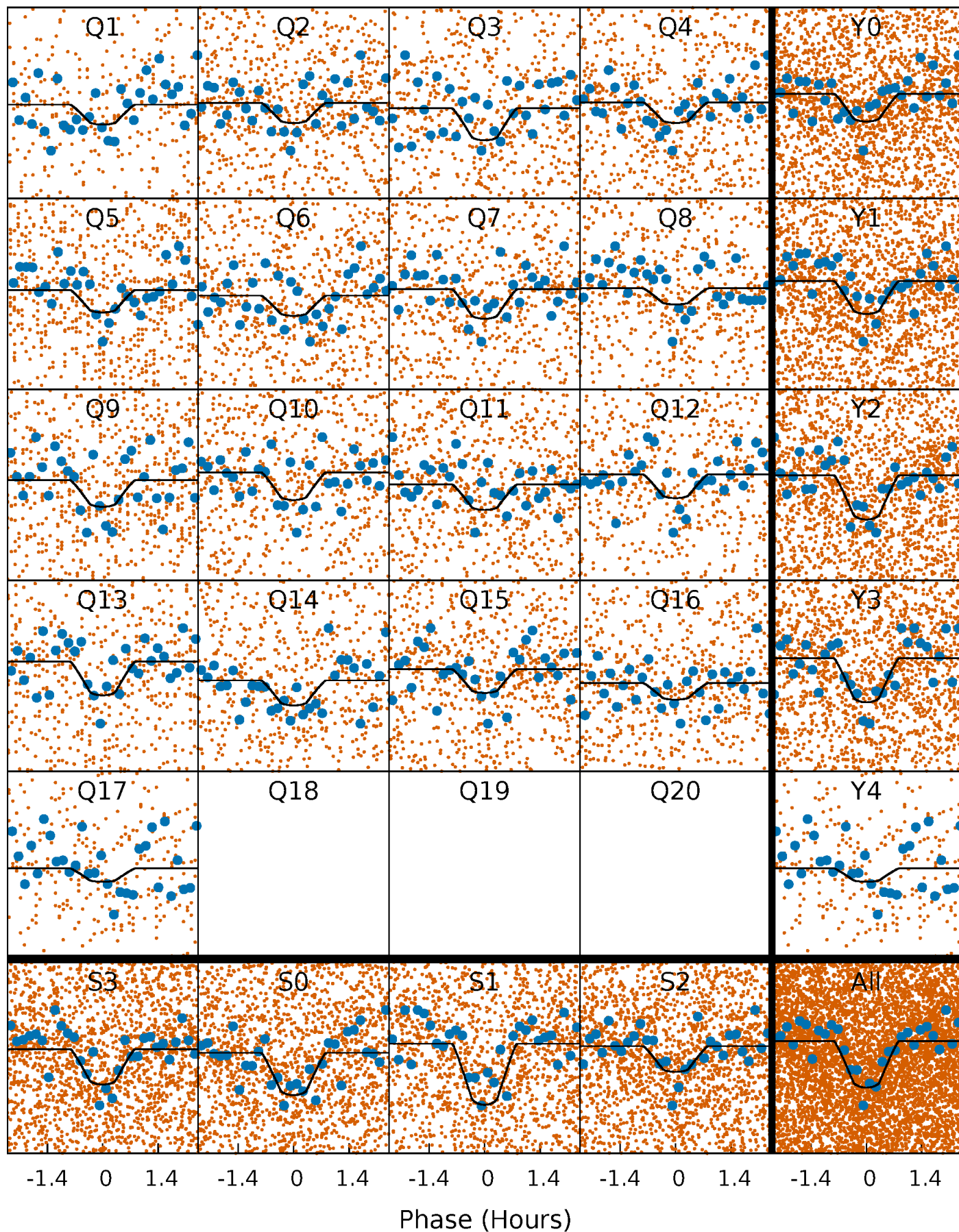
PDC Quarter-Phased Transit Curves

TCE 009640649-01 P= 0.862324 Days $T_0=132.166168$ (BKJD)



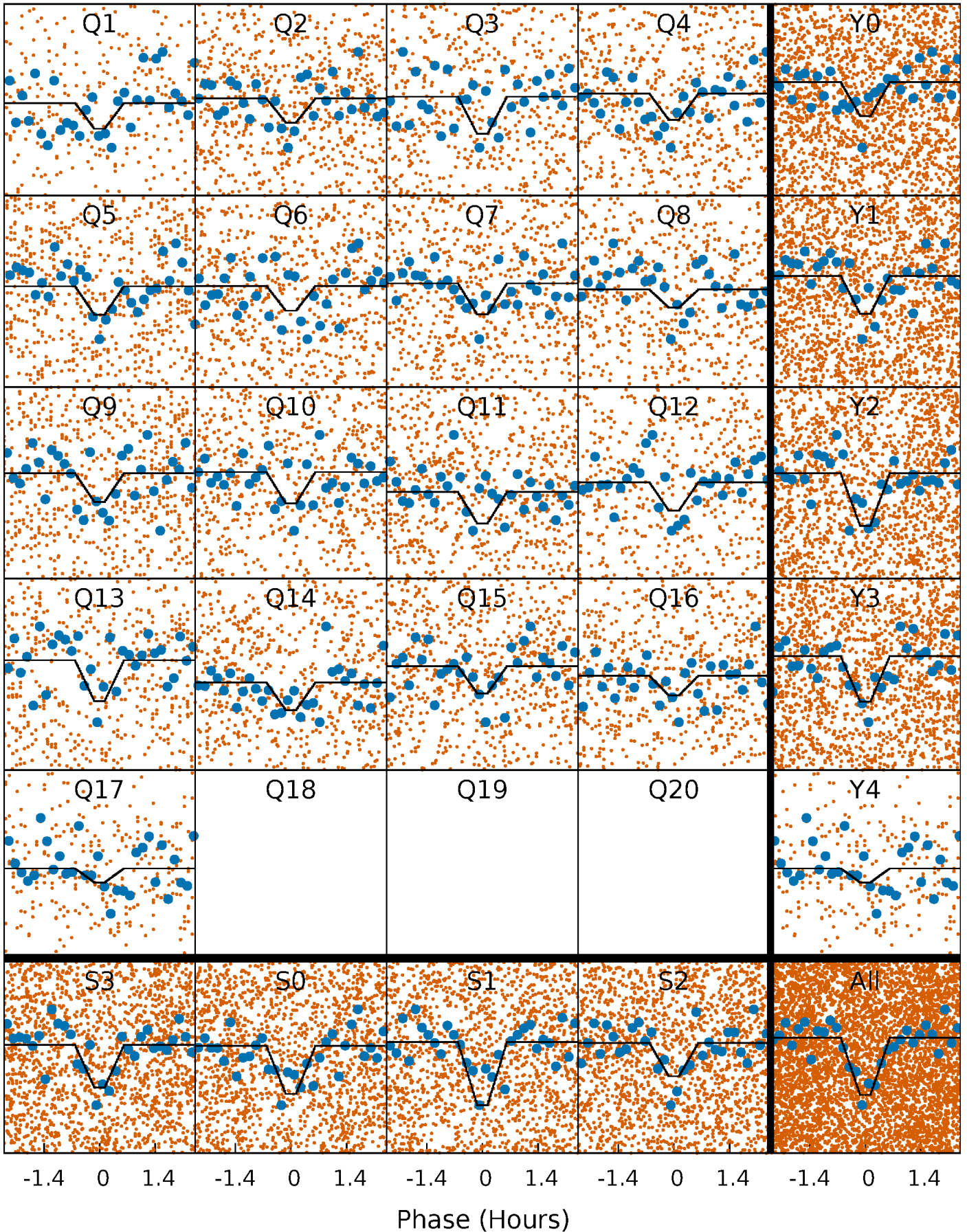
DV Quarter-Phased Transit Curves

TCE 009640649-01 P= 0.862324 Days $T_0=132.166168$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

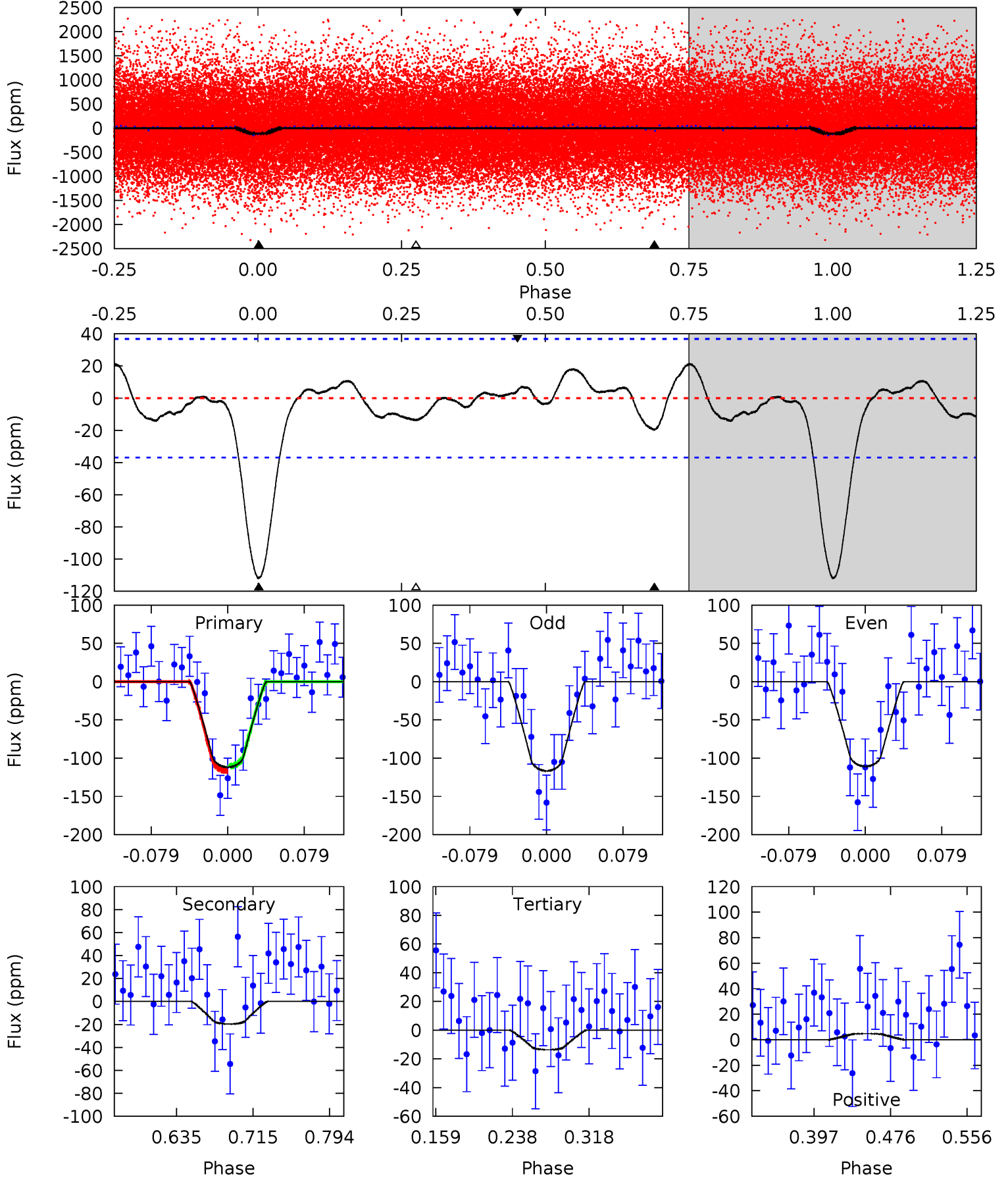
TCE 009640649-01 P= 0.862324 Days $T_0=132.166166$ (BKJD)



DV Model-Shift Uniqueness Test

009640649-01, P = 0.862324 Days, E = 131.303844 Days

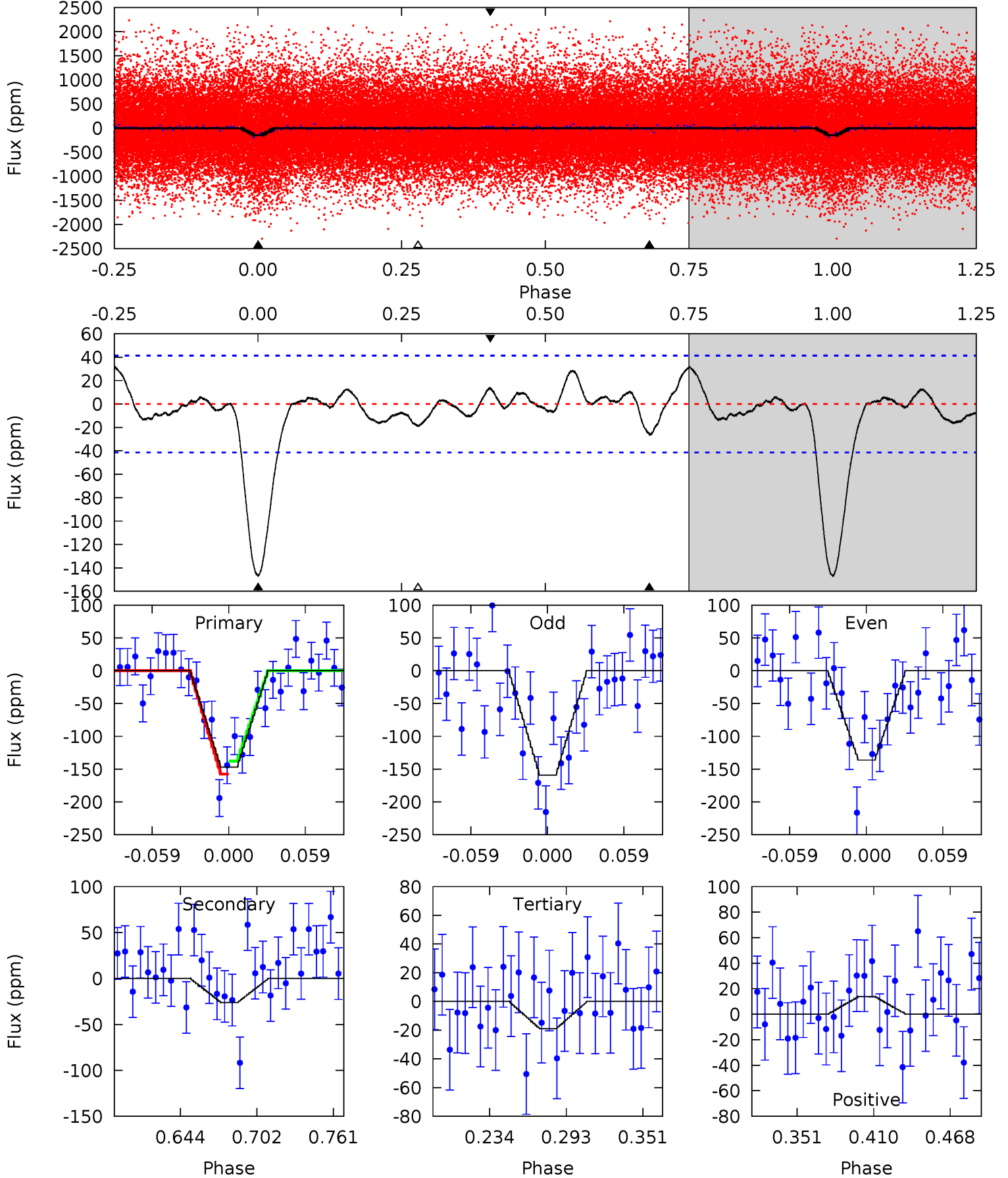
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.0 | 2.46 | 1.71 | 0.60 | 4.61 | 1.75 | 1.00 | 12.3 | 13.4 | 0.75 | 1.86 | 0.37 | 0.92 | 0.16 | 0.38 |



Alt Model-Shift Uniqueness Test

009640649-01, P = 0.862324 Days, E = 131.303842 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 16.6 | 2.97 | 2.15 | 1.56 | 4.68 | 1.89 | 1.18 | 14.5 | 15.0 | 0.82 | 1.41 | 1.30 | 0.89 | 0.18 | 1.11 |



Stellar Parameters For KIC 009640649

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|--|
| | 5806^{+163}_{-204} | $4.528^{+0.036}_{-0.192}$ | $-0.040^{+0.250}_{-0.300}$ | $0.899^{+0.260}_{-0.087}$ | $0.996^{+0.116}_{-0.127}$ | $1.928^{+0.388}_{-1.010}$ |
| | +3%/-4% | +1%/-4% | +625%/-750% | +29%/-10% | +12%/-13% | +20%/-52% |
| 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 009640649-01 / KOI 7951.01

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|-----------------------|----------------------------|
| DV | -20 ± 8 | $1.40^{+1.03}_{-0.84}$ | 2613^{+167}_{-116} | 3592^{+1580}_{-916} | $1.645^{+8.569}_{-1.178}$ |
| Alt. | -26 ± 9 | $1.36^{+1.05}_{-0.85}$ | 2611^{+174}_{-121} | 3770^{+2075}_{-797} | $2.149^{+15.242}_{-1.454}$ |

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

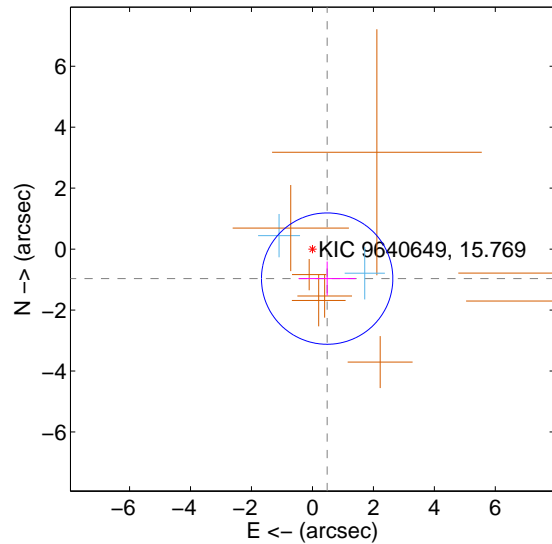
Supplemental centroid analysis for 009640649-01. Kepler magnitude: 15.77. Transit SNR 9.72

There are 2 quarters with good PRF difference image offsets

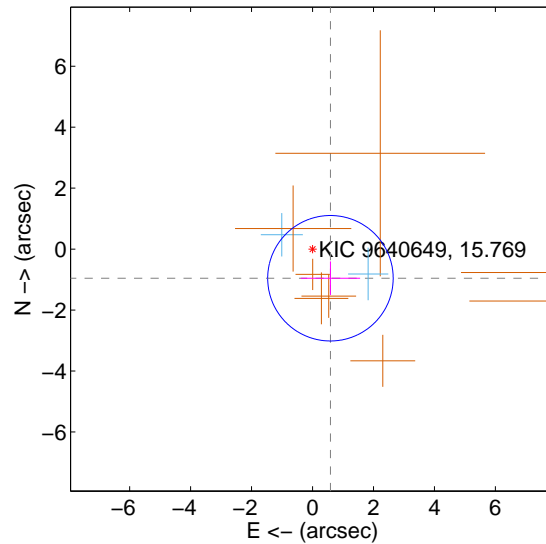
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 1.082 ± 0.719 | 1.51 | -0.483 ± 0.936 | -0.969 ± 0.560 |
| PRF-fit source offset from KIC position | 1.123 ± 0.686 | 1.64 | -0.588 ± 0.973 | -0.957 ± 0.554 |
| photometric centroid source offset | 1.89 ± 1.58 | 1.20 | 1.76 ± 1.59 | -0.67 ± 1.49 |

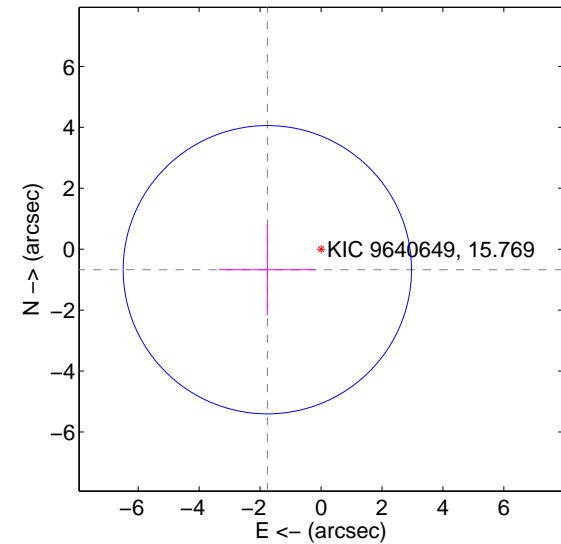
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

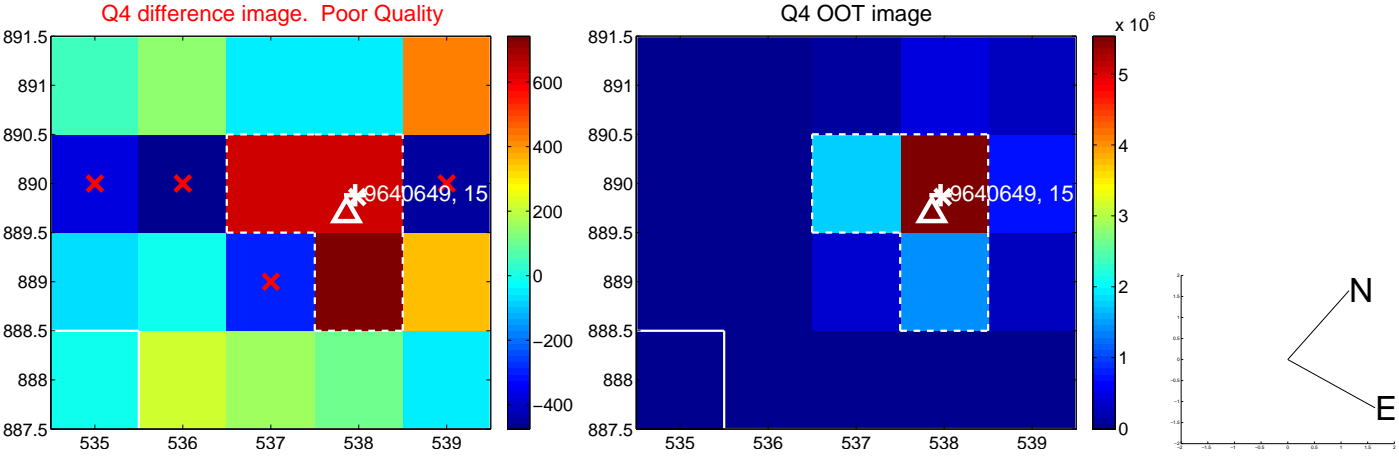
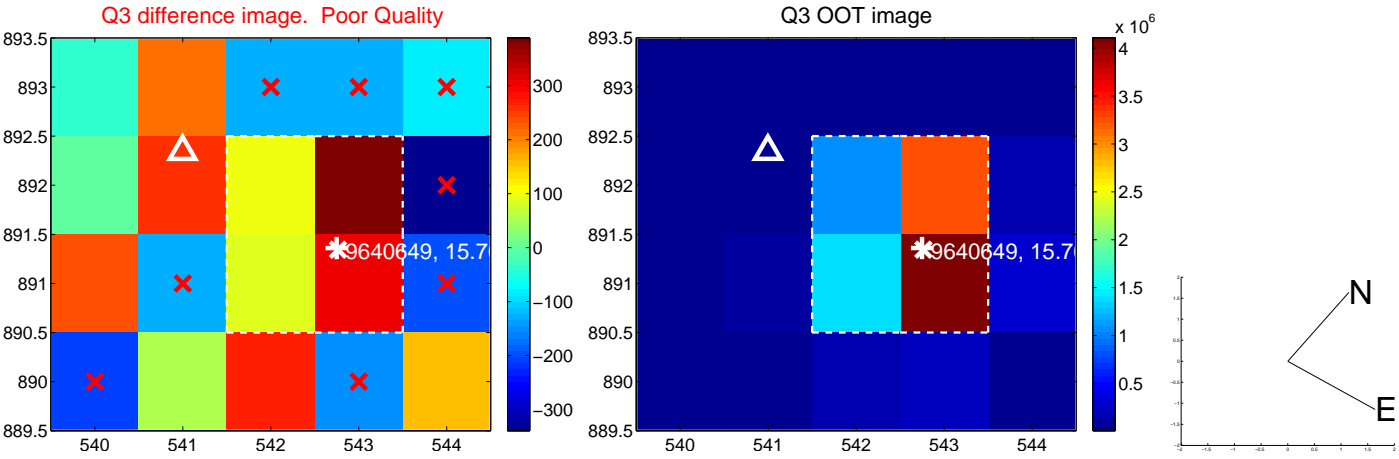
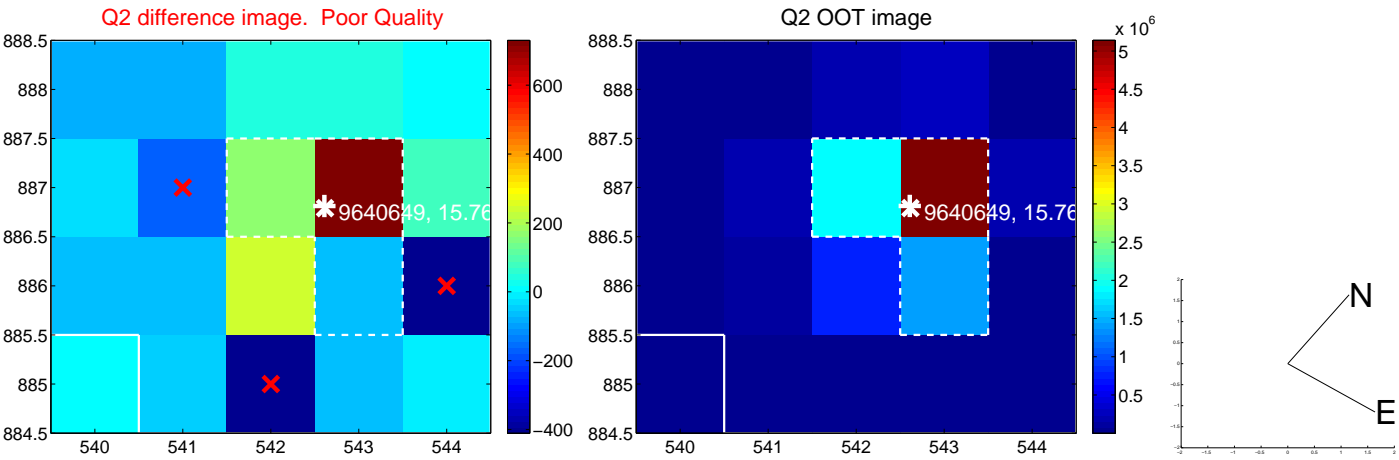
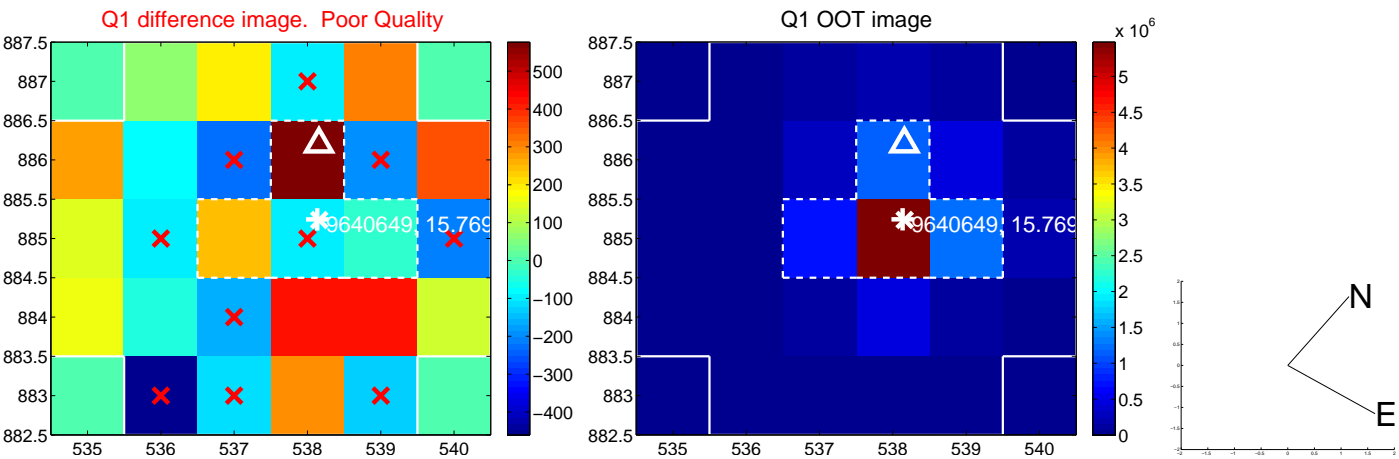


offset from photometric centroids

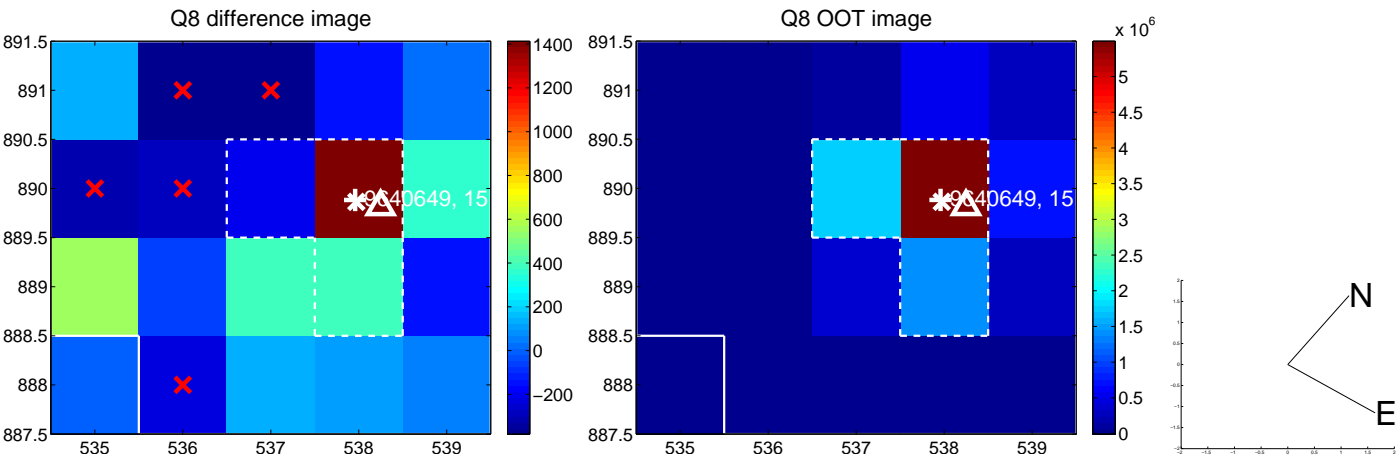
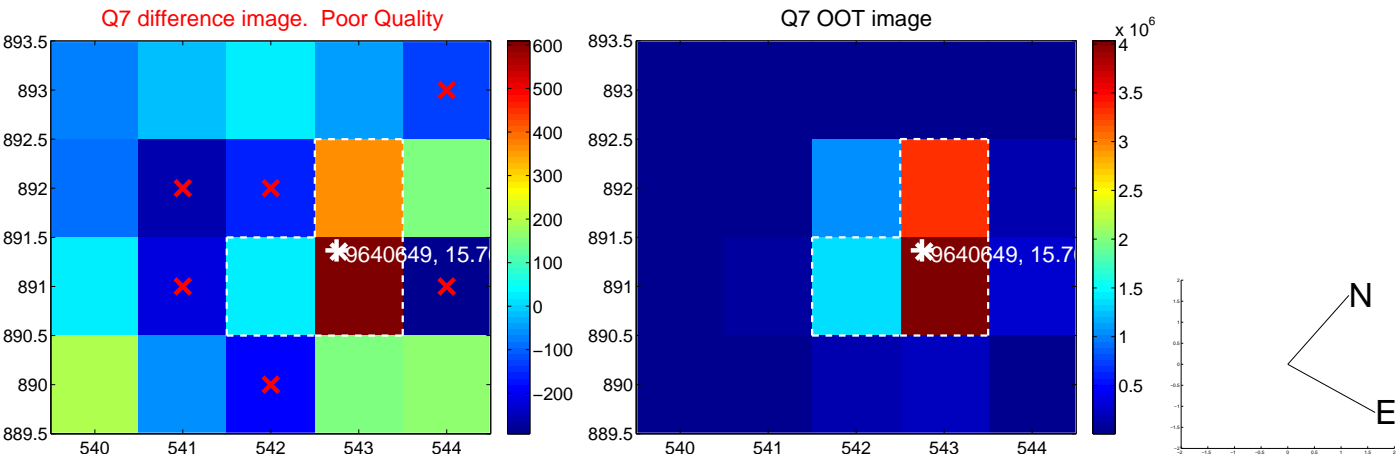
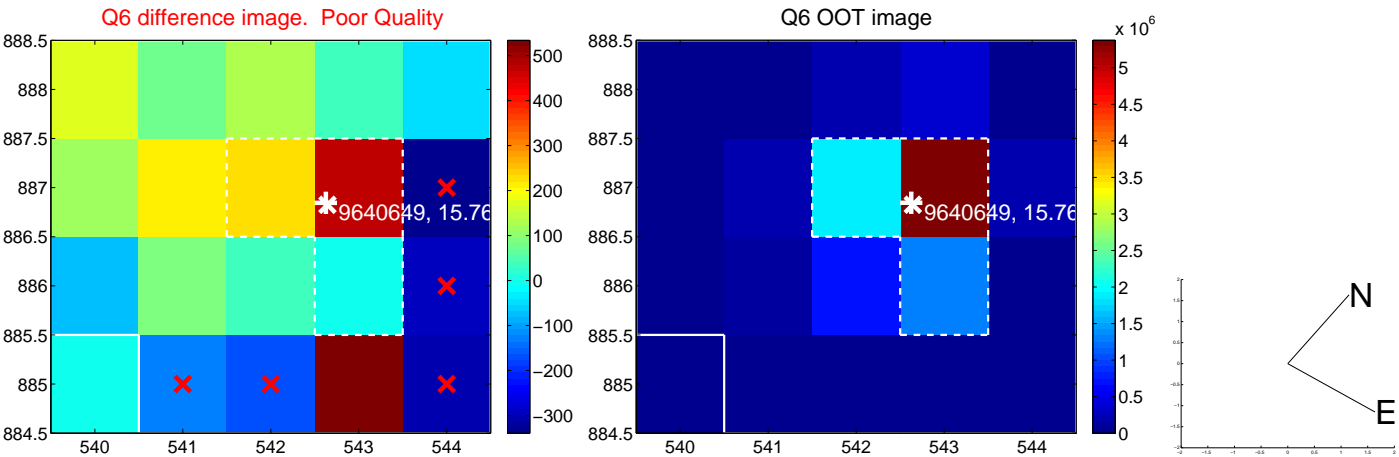
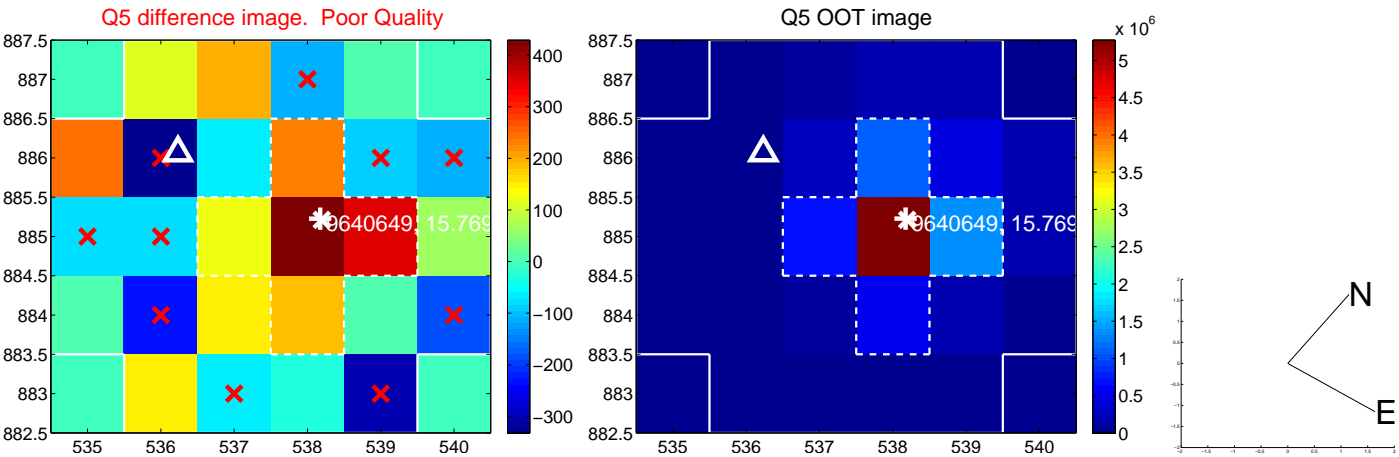


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

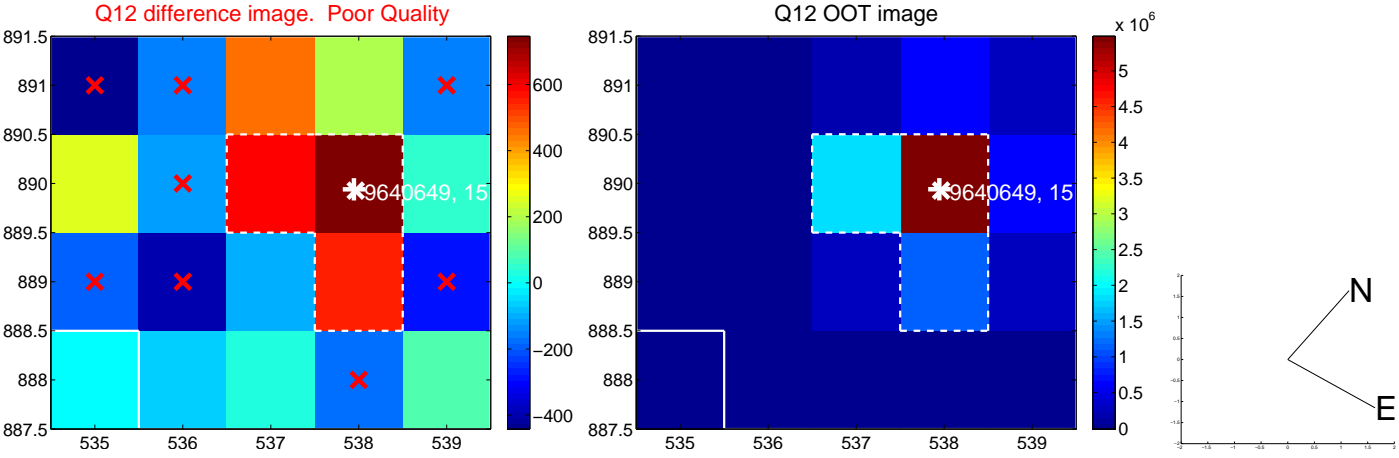
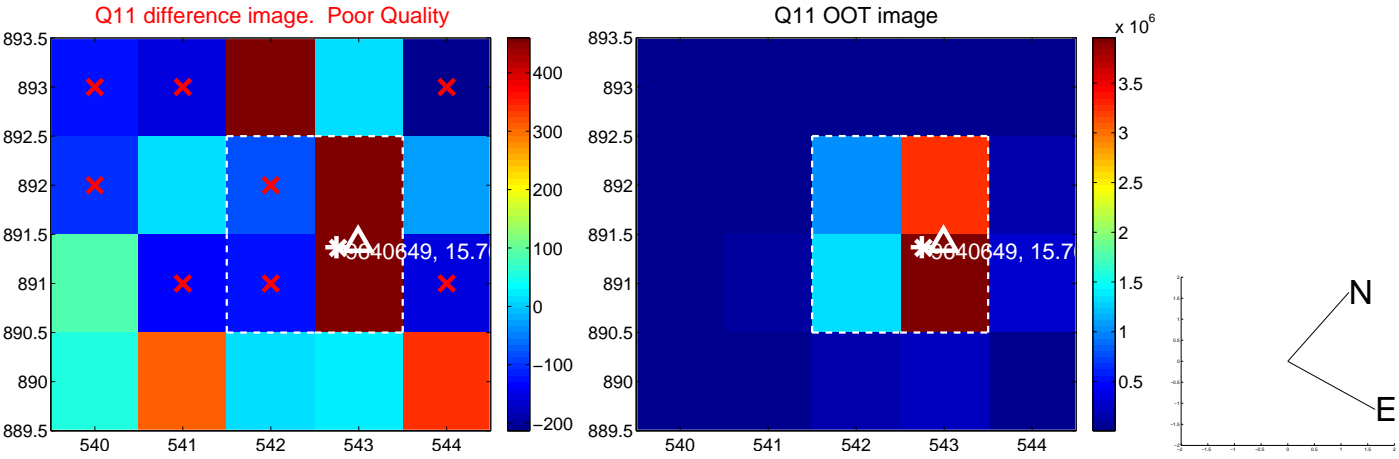
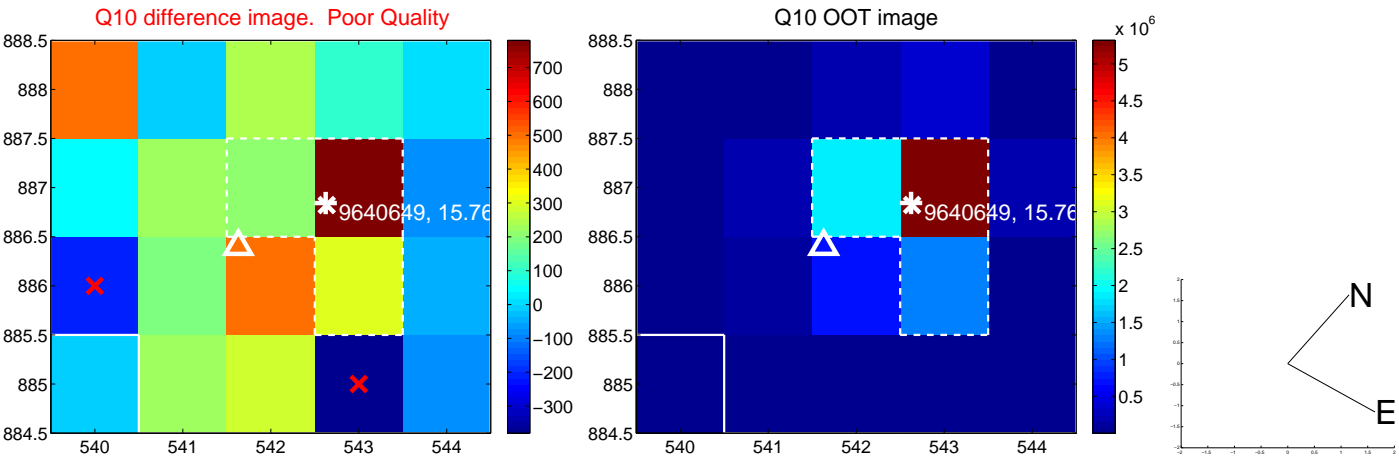
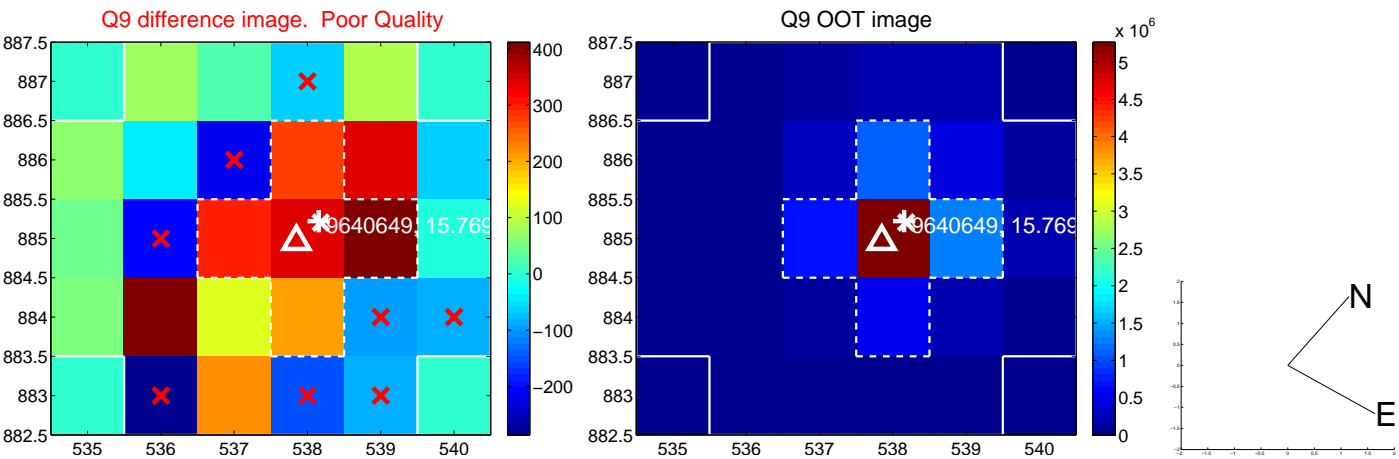
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



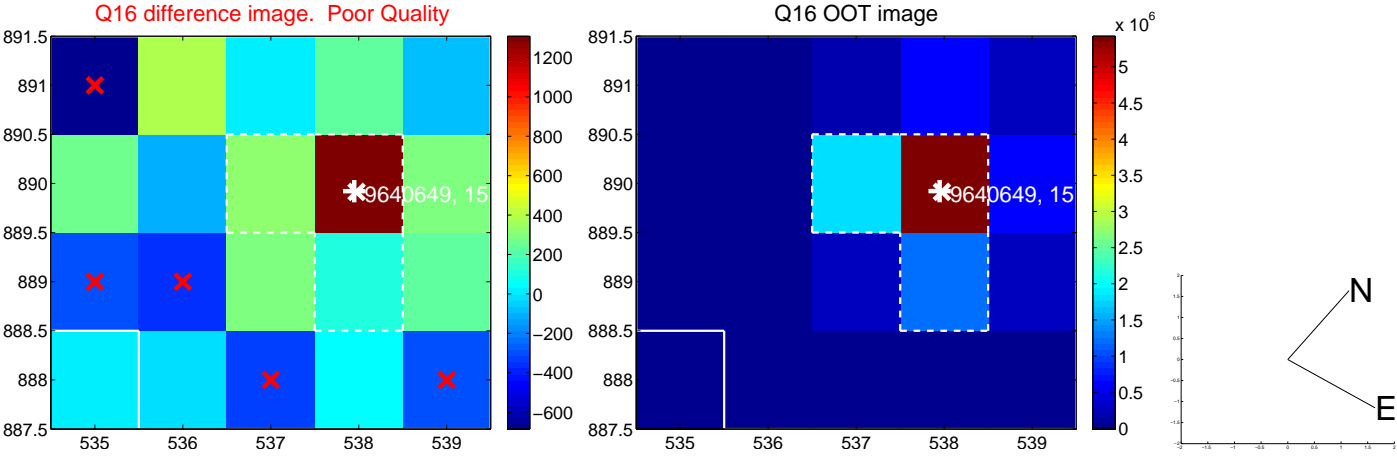
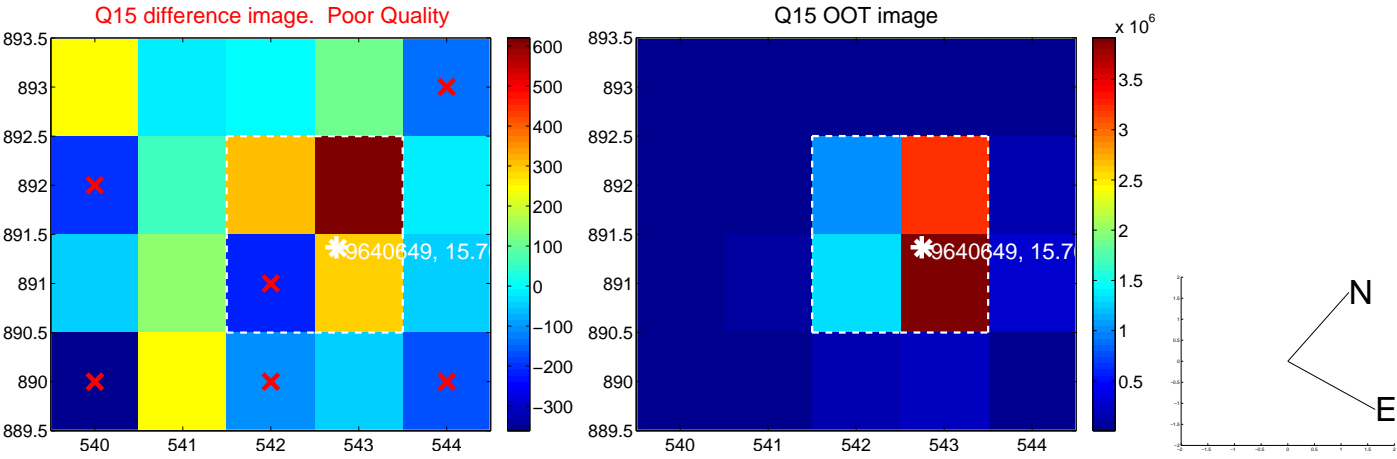
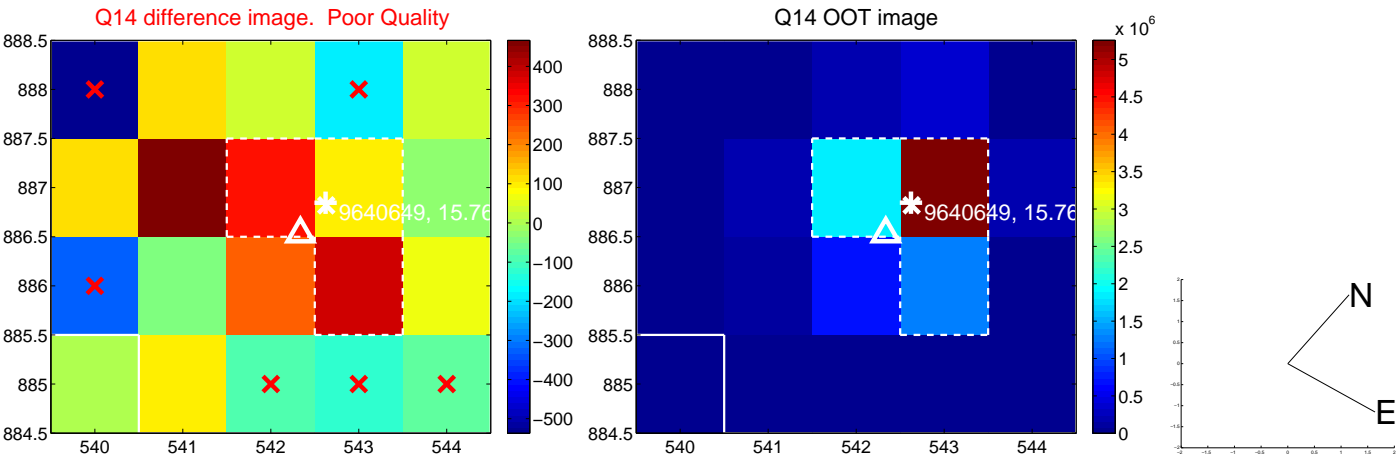
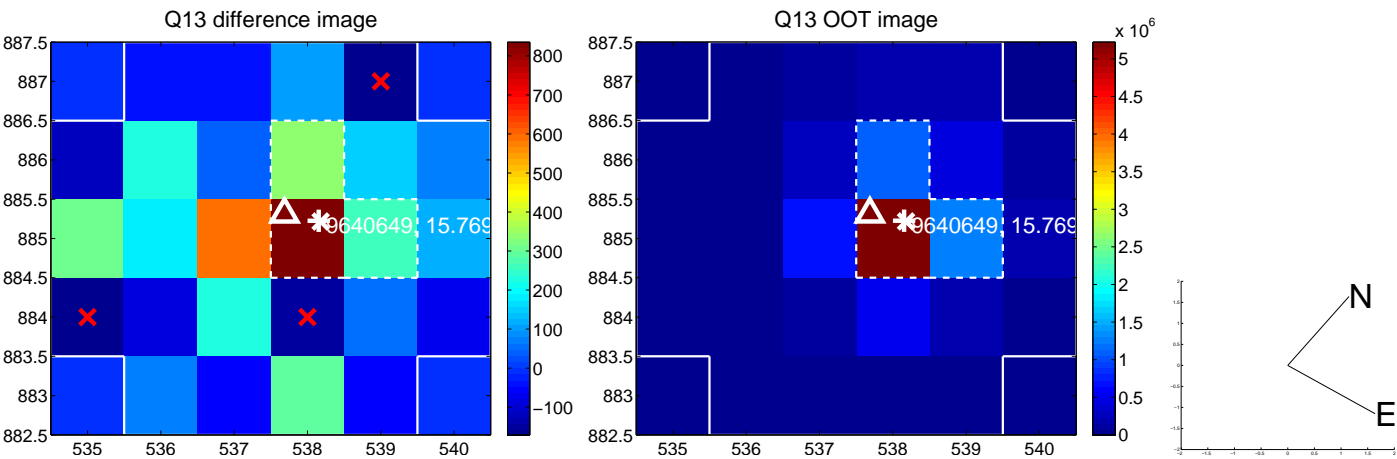
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



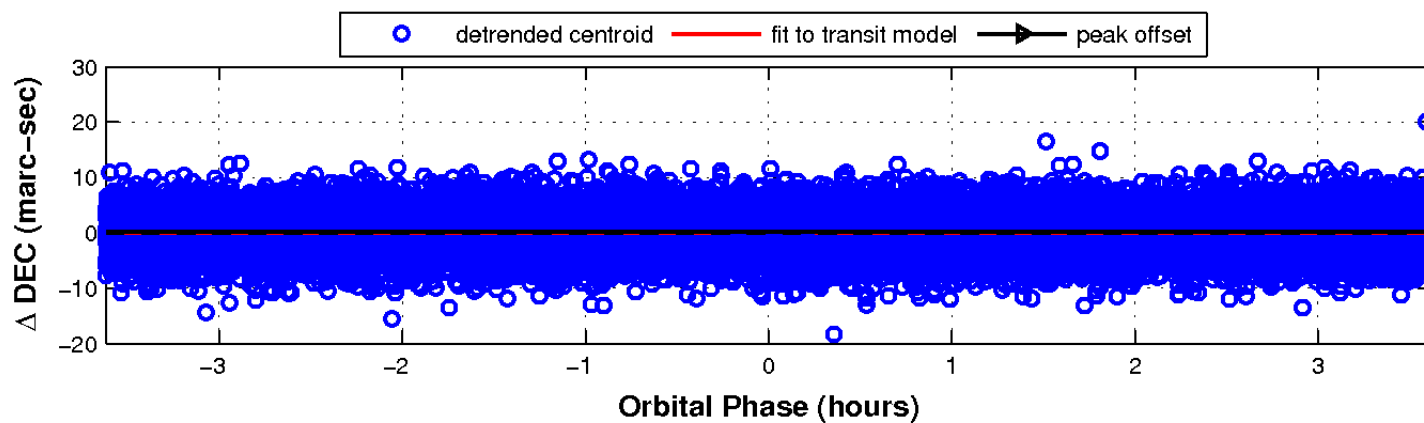
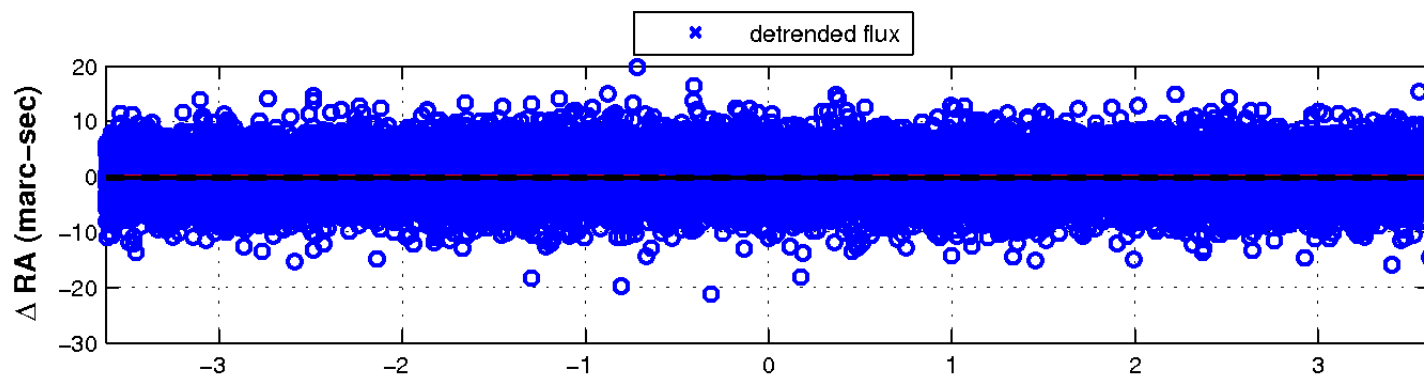
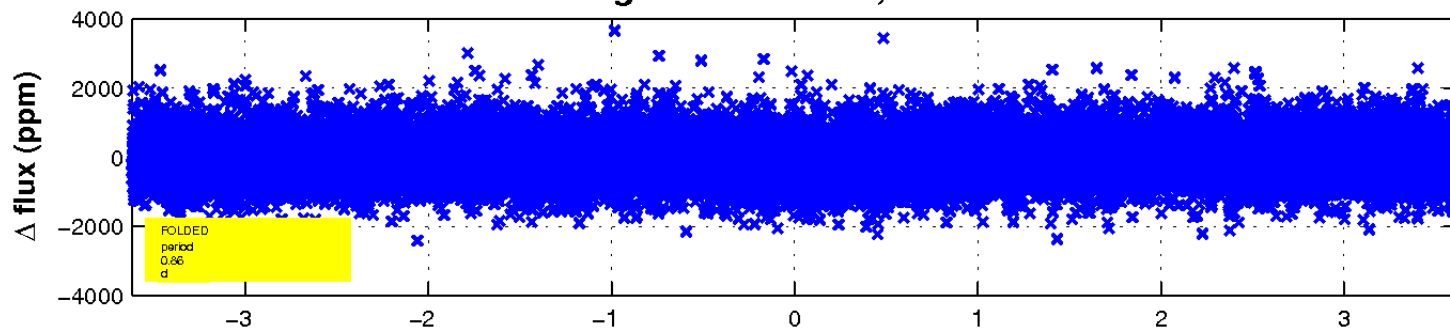
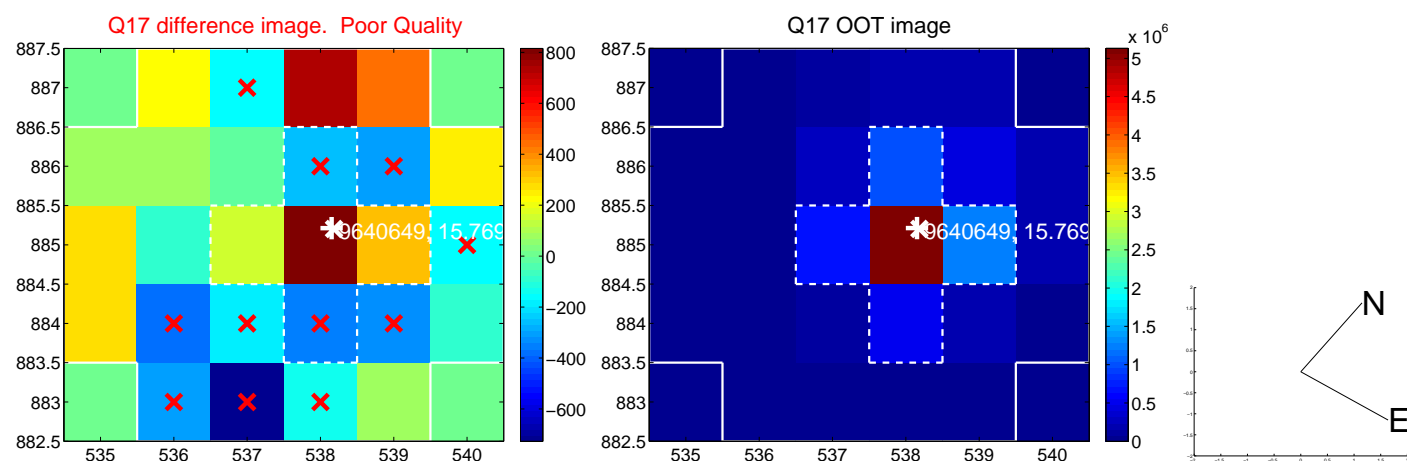
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

