

KIC 007458050

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007458050-01 | OBS | No | 0.651776 | 132.097701 | 9.4 | 3.825 | 8.2 | 7.0 | 2.71 | 6865 | 0.96 | 49607.13 |
| 007458050-02 | OBS | No | 57.549431 | 155.812471 | 187.3 | 2.954 | 9.2 | 7.8 | 2.71 | 6865 | 5.08 | 126.17 |
| 007458050-03 | OBS | No | 116.697384 | 201.234447 | 197.4 | 2.894 | 7.8 | 7.4 | 2.71 | 6865 | 4.06 | 49.16 |
| 007458050-04 | OBS | No | 84.000754 | 192.639039 | 212.4 | 2.774 | 8.0 | 7.8 | 2.71 | 6865 | 4.55 | 76.20 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 007458050-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT |
| 007458050-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS |
| 007458050-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS |
| 007458050-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS |

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

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

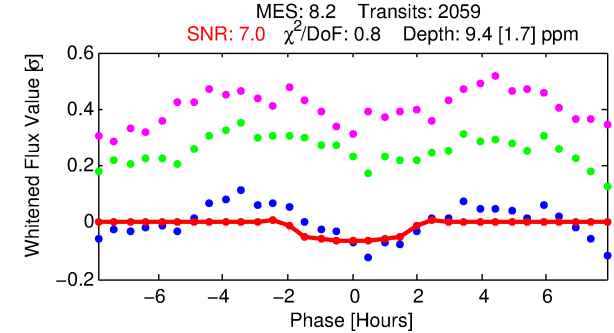
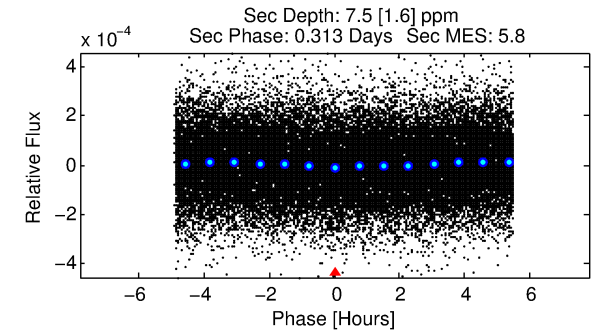
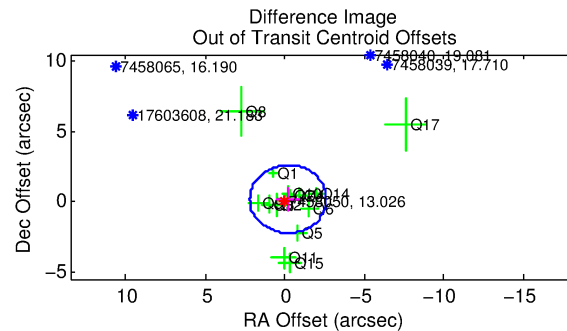
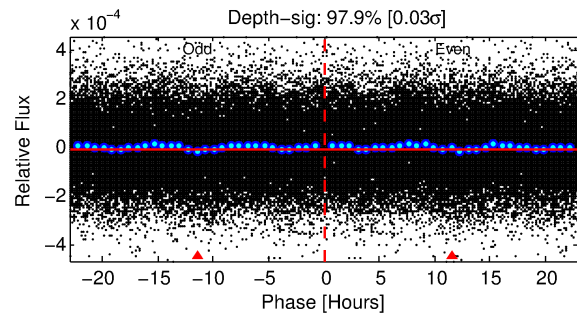
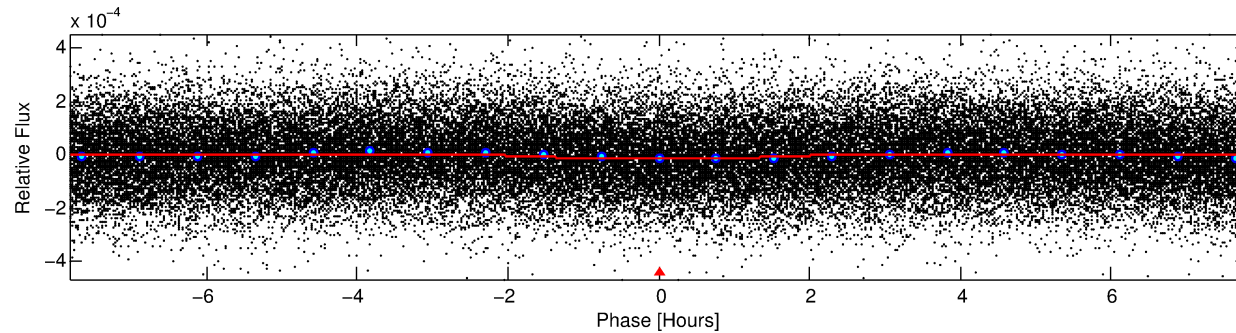
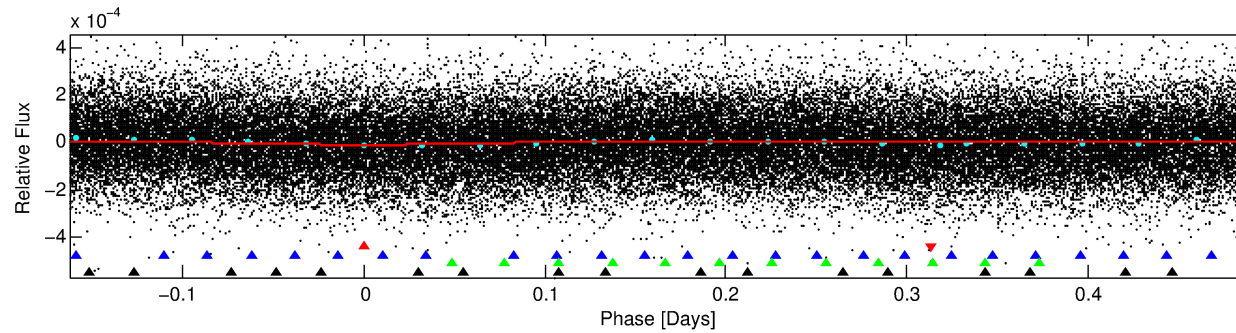
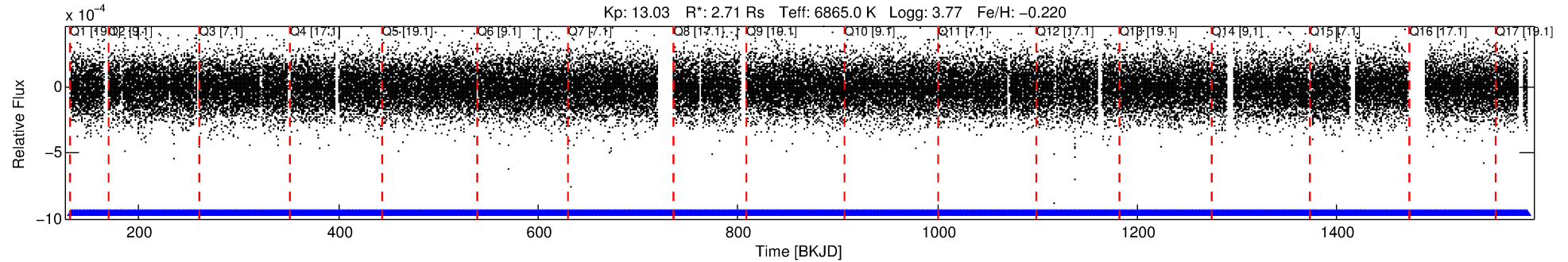
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007458050-01

No Significant Match Found

DV One-Page Summary

KIC: 7458050 Candidate: 1 of 4 Period: 0.652 d



DV Fit Results:

Period = 0.65178 [0.00001] d
Epoch = 132.0977 [0.0053] BKJD
Rp/R* = 0.0033 [0.0016]
a/R* = 1.10 [0.60]
b = 0.90 [0.65]
Seff = 49607.13 [24741.41]
Teq = 3806 [474] K
Rp = 0.96 [0.58] Re
a = 0.0171 [0.0053] AU
Ag = 1.30 [1.46] [0.21 σ]
Teff = 6287 [1607] K [1.48 σ]

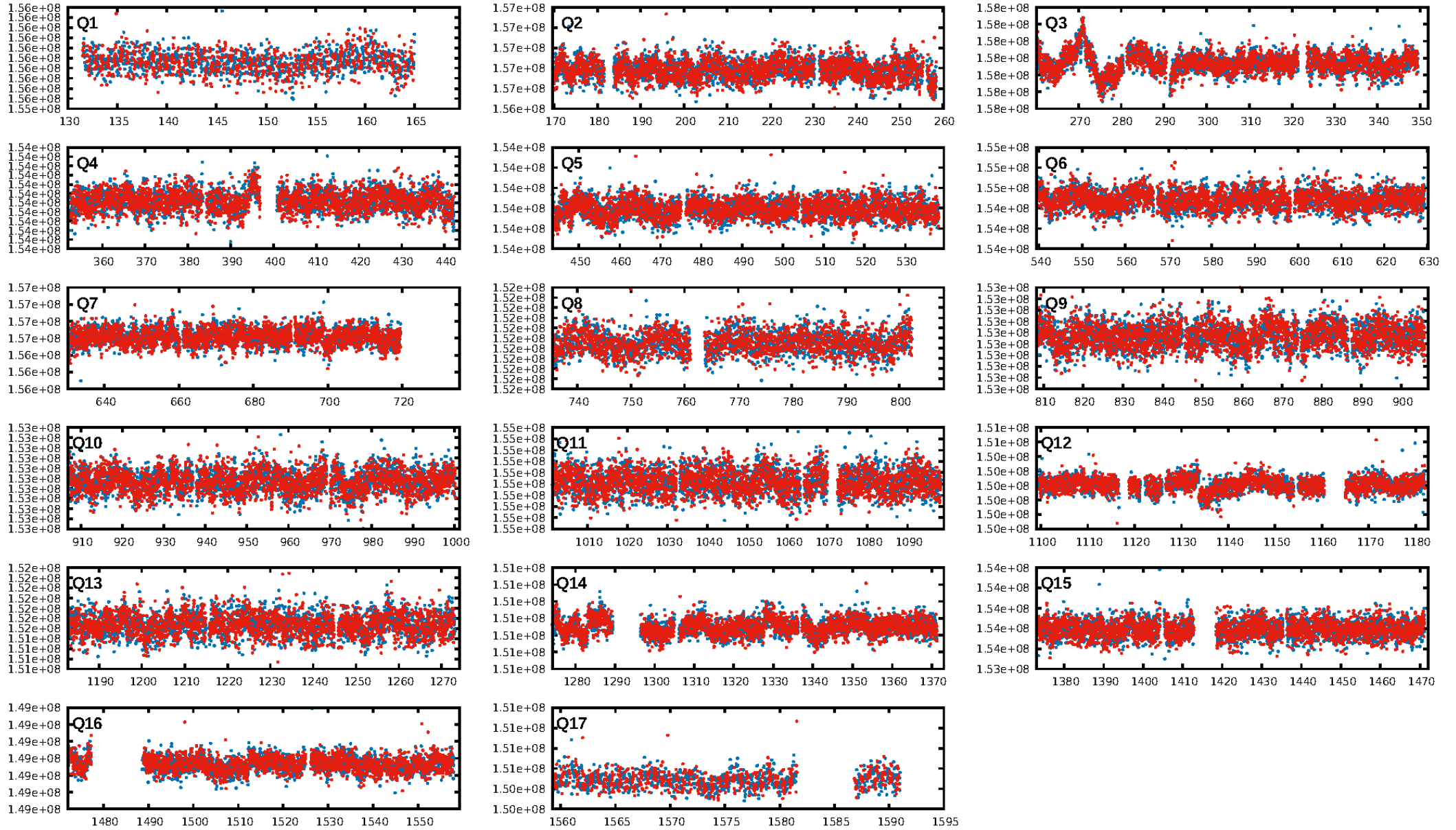
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [282.55 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.40e-09
RollingBand-fgt: 1.00 [1965/1965]
GhostDiagnostic-chr: -15.31
Centroid-sig: 0.0%
Centroid-so: 3.163 arcsec [2.55 σ]
OotOffset-rm: 0.272 arcsec [0.34 σ]
KicOffset-rm: 0.326 arcsec [0.39 σ]
OotOffset-st: 4/4/2/4 [14]
KicOffset-st: 4/4/2/4 [14]
DiffImageQuality-fgm: 0.71 [10/14]
DiffImageOverlap-fno: 1.00 [17/17]

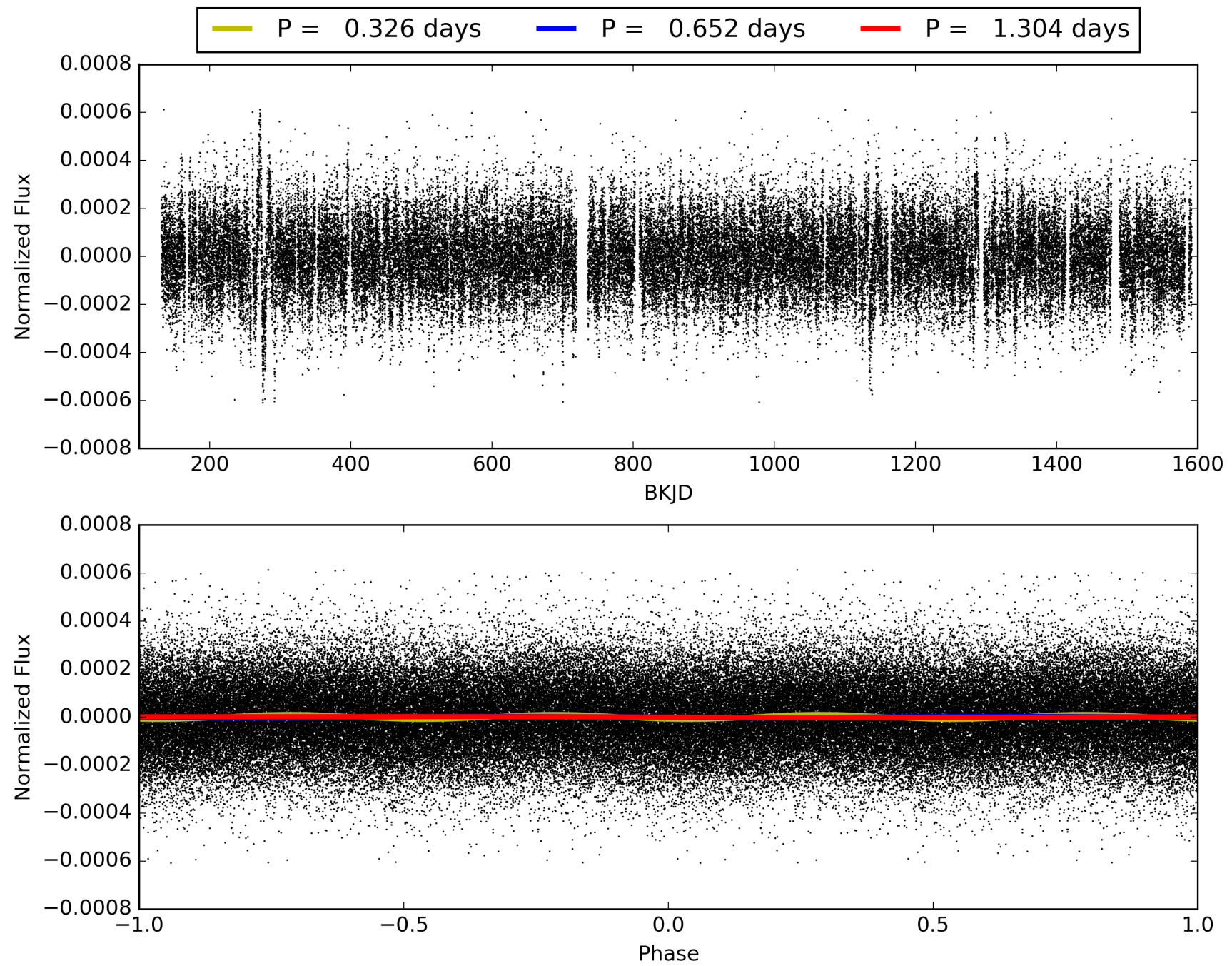
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:01:15 Z

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

TCE 007458050-01, PDC Light Curves

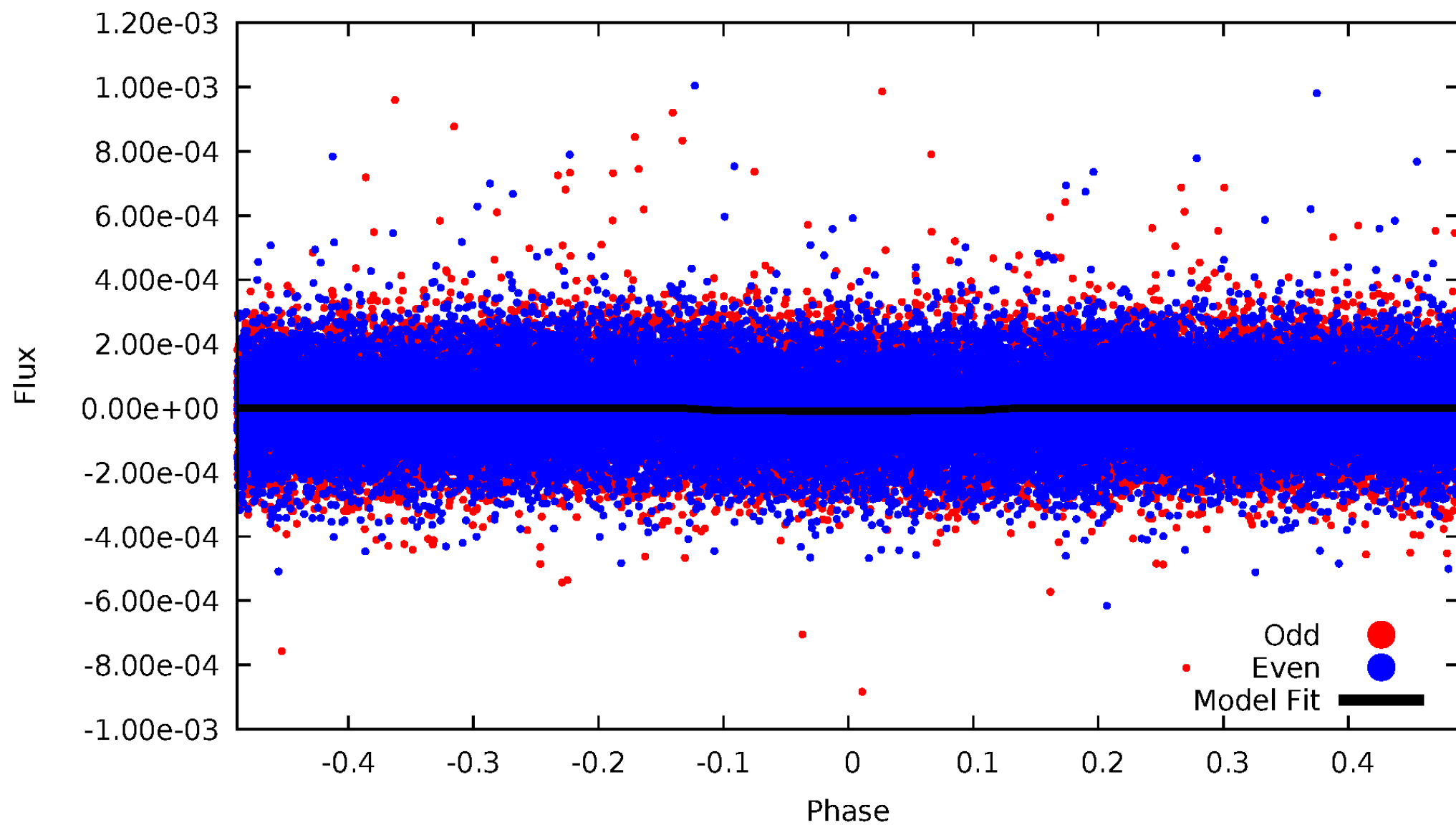


TCE 007458050-01



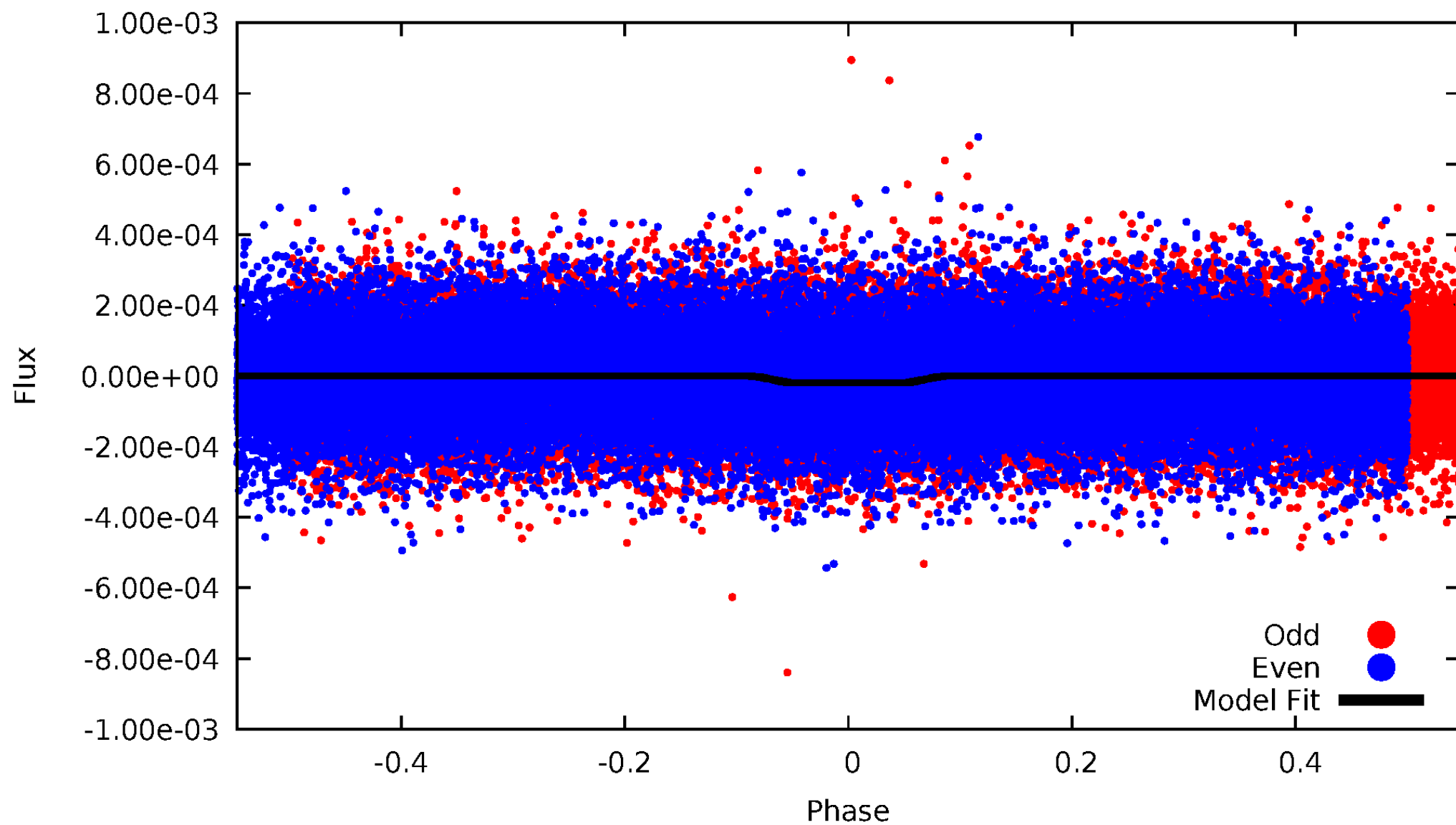
DV Odd/Even

TCE 007458050-01

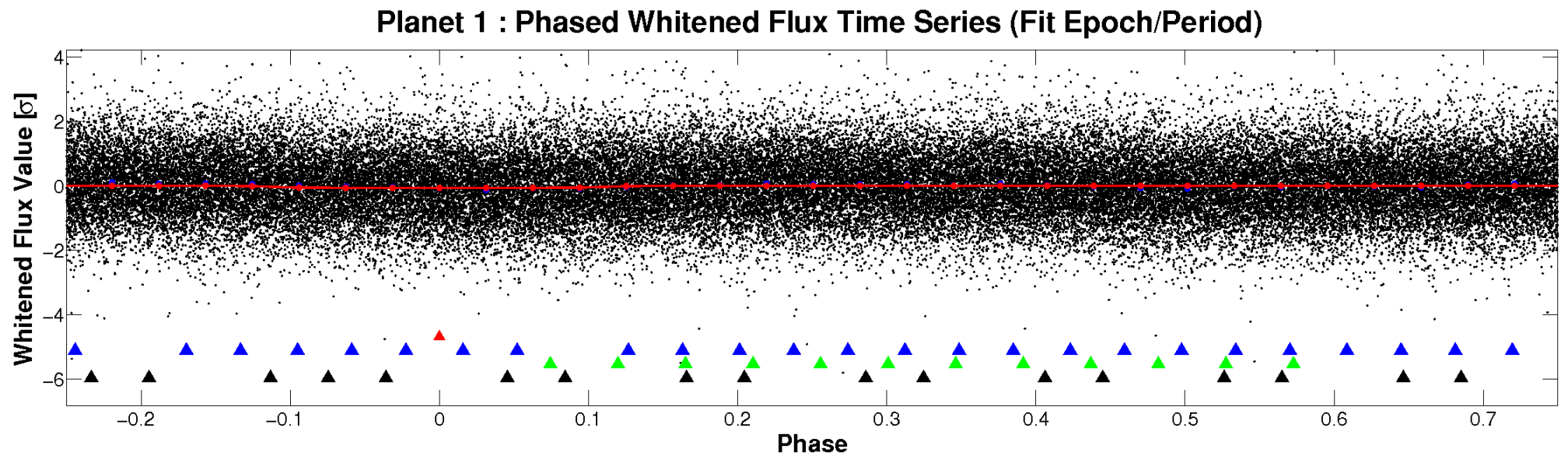
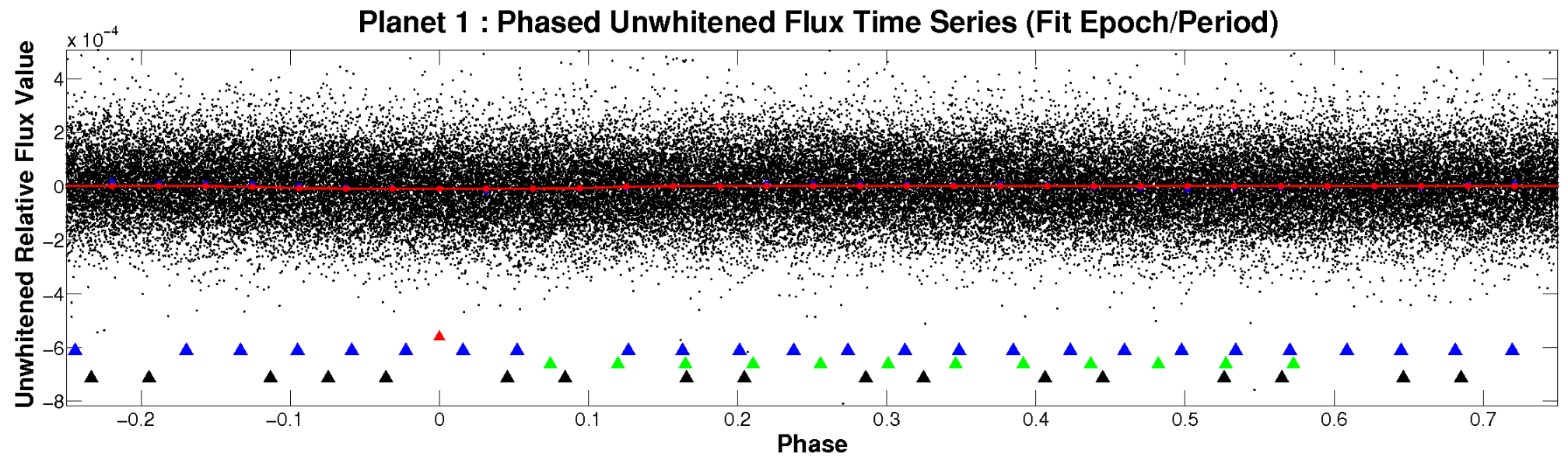


ALT Odd/Even

TCE 007458050-01

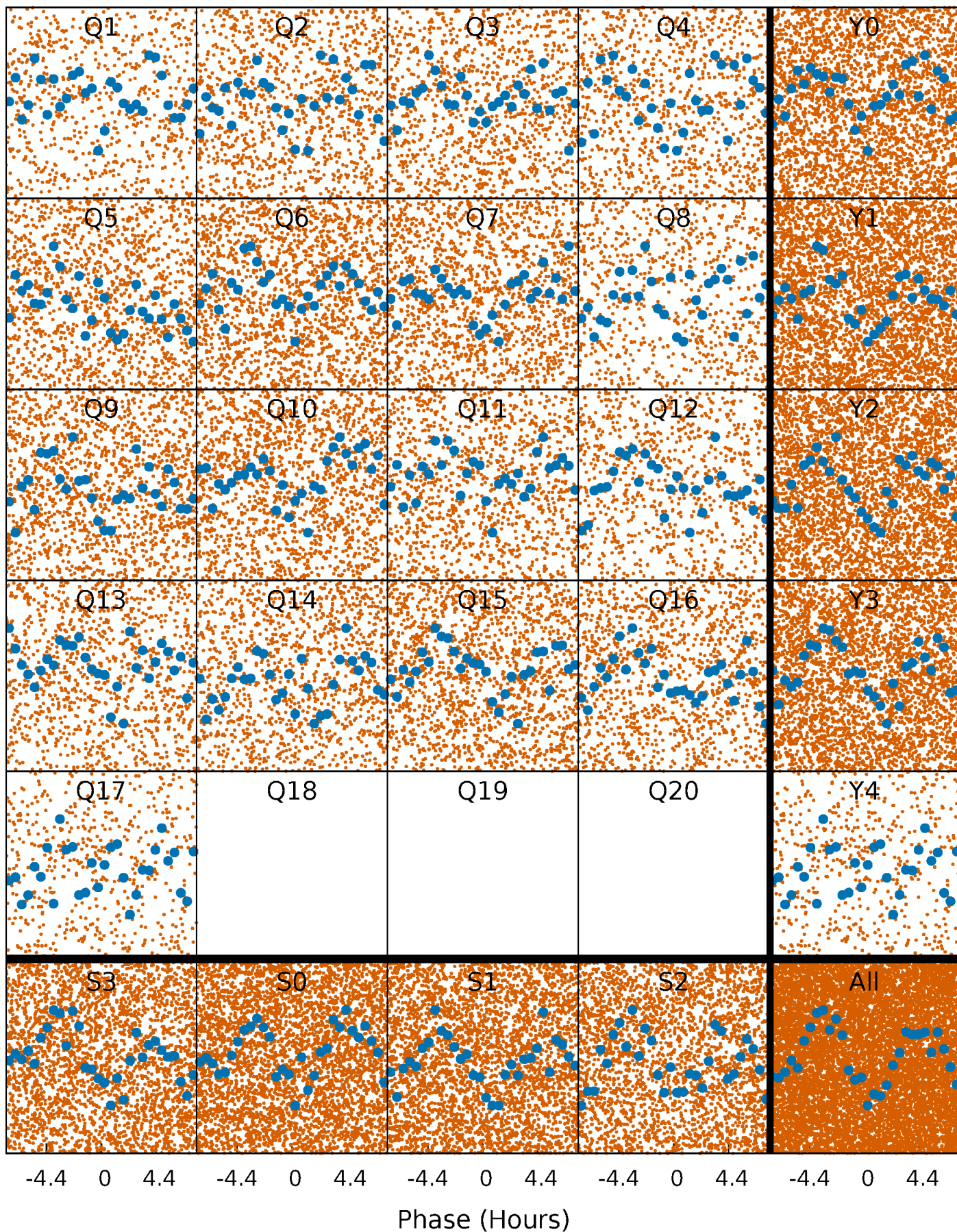


Non-Whitened Vs. Whitened Light Curve



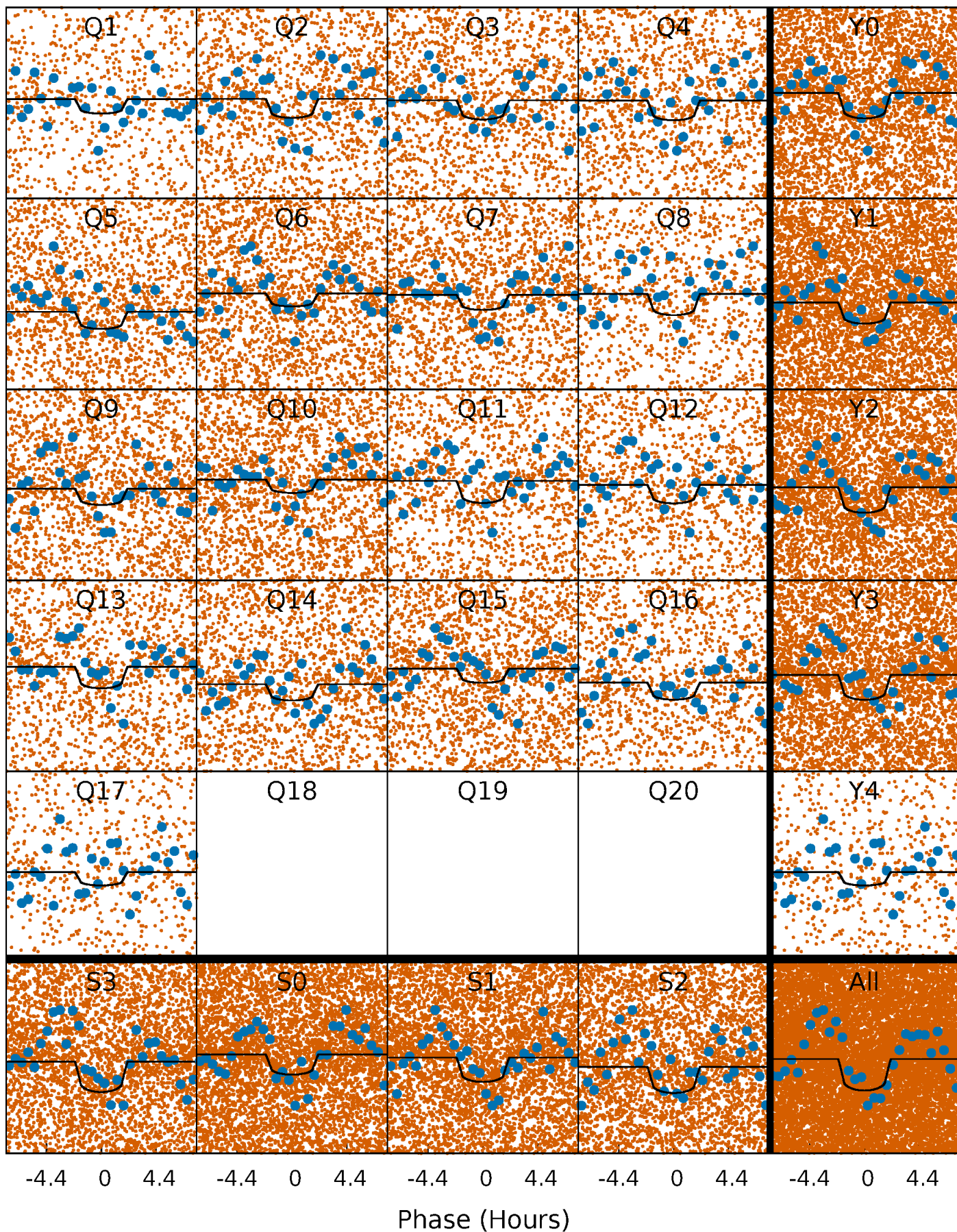
PDC Quarter-Phased Transit Curves

TCE 007458050-01 P= 0.651776 Days $T_0=132.097701$ (BKJD)



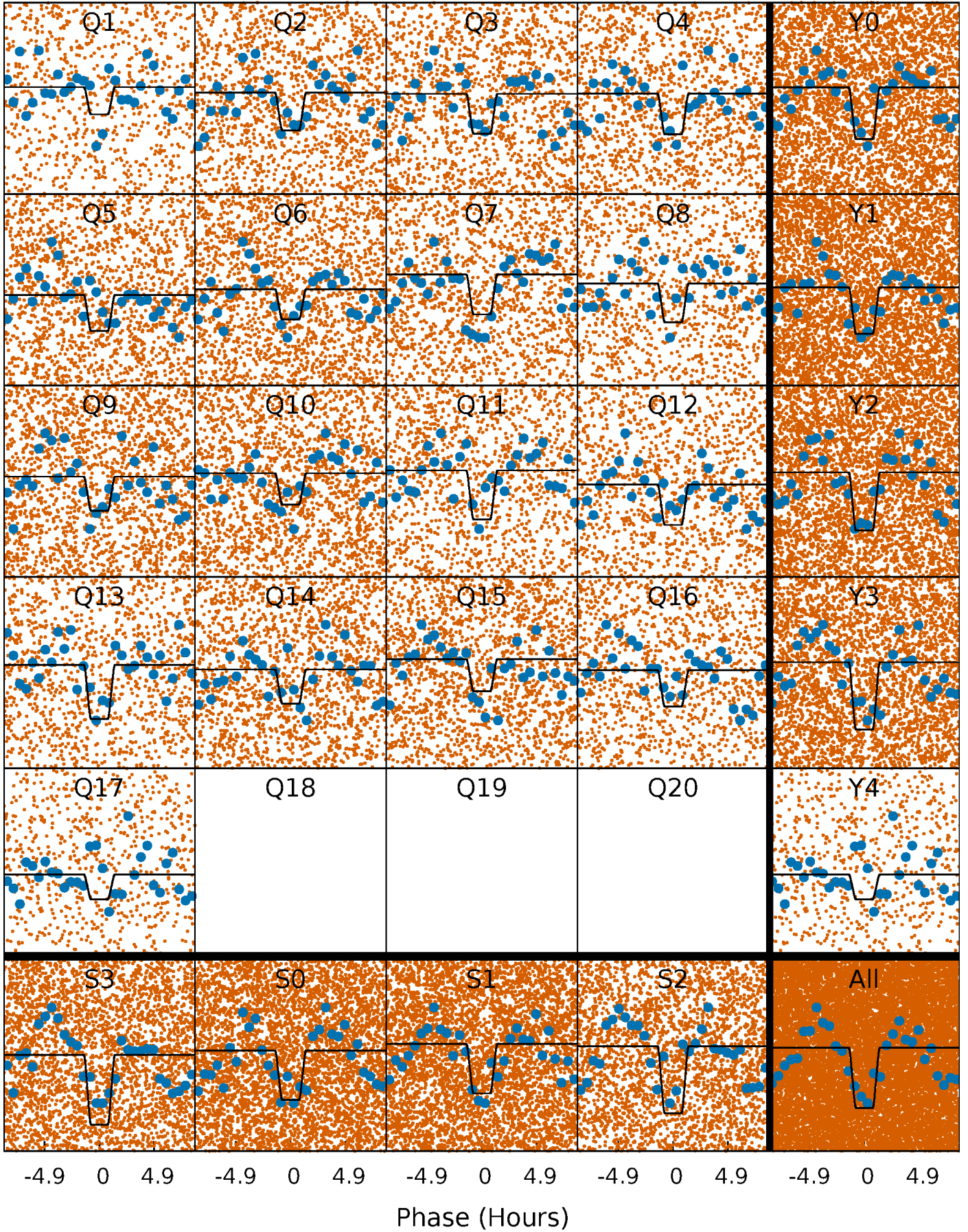
DV Quarter-Phased Transit Curves

TCE 007458050-01 P= 0.651776 Days $T_0=132.097701$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

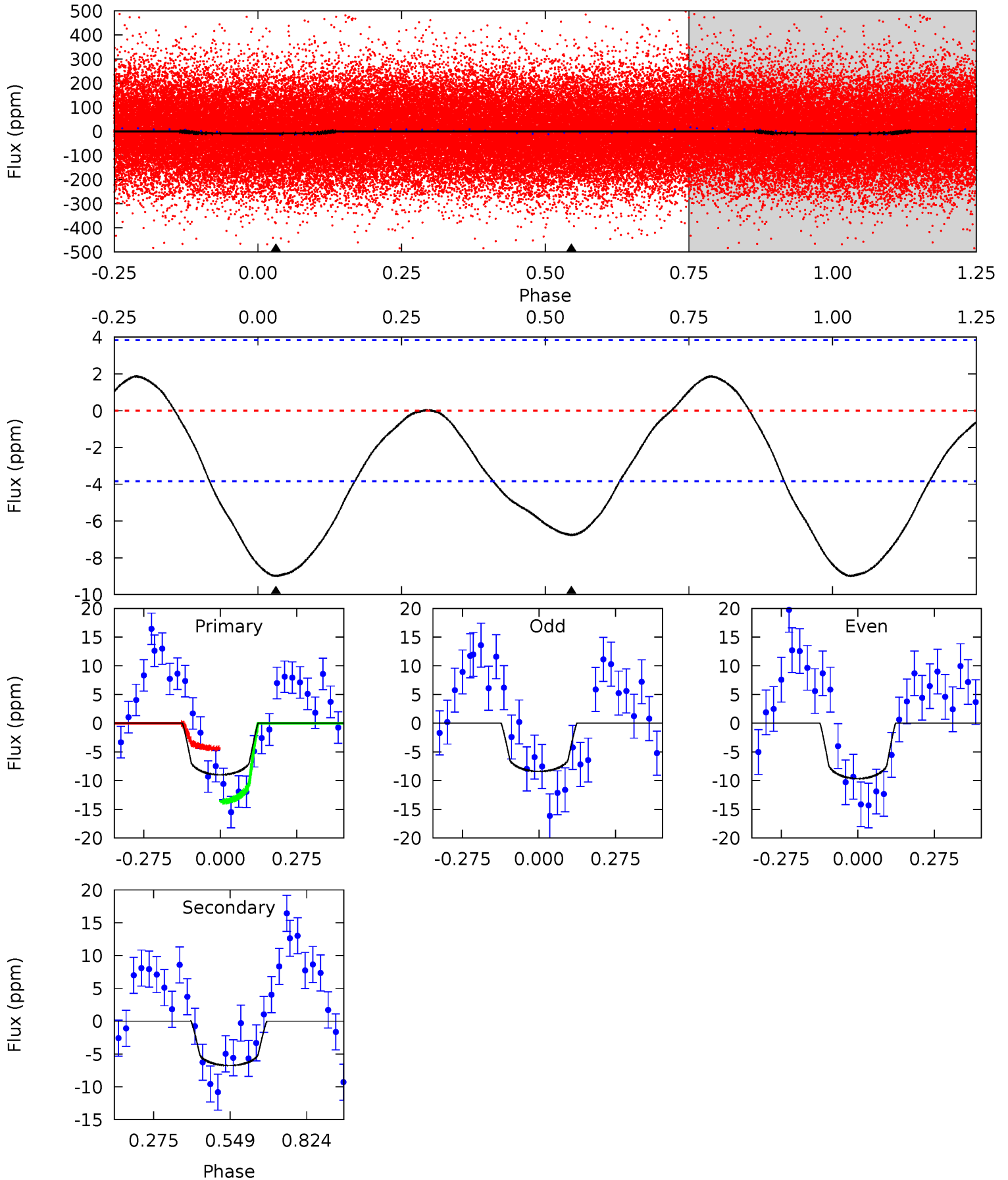
TCE 007458050-01 P= 0.651804 Days $T_0=132.097853$ (BKJD)



DV Model-Shift Uniqueness Test

007458050-01, P = 0.651776 Days, E = 131.445925 Days

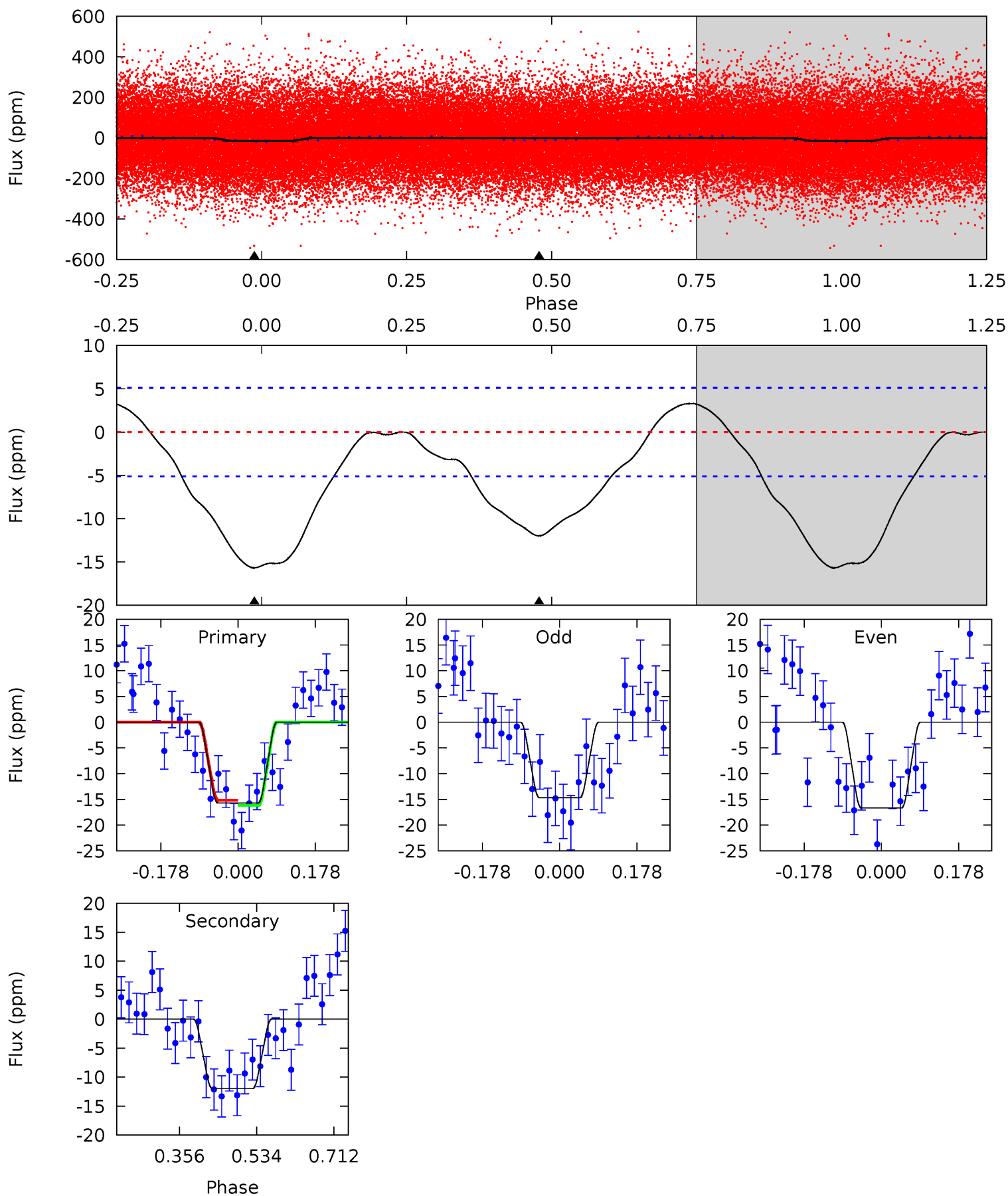
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.2 | 7.65 | 0 | 0 | 4.35 | 1.09 | 1.03 | 10.2 | 10.2 | 7.65 | 7.65 | 0.71 | 1.05 | 0.17 | 5.17 |



Alt Model-Shift Uniqueness Test

007458050-01, P = 0.651804 Days, E = 131.446049 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 13.6 | 10.4 | 0 | 0 | 4.44 | 1.35 | 1.45 | 13.6 | 13.6 | 10.4 | 10.4 | 0.86 | 1.03 | 0.17 | 0.44 |



Stellar Parameters For KIC 007458050

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6865^{+183}_{-224} | $3.772^{+0.278}_{-0.093}$ | $-0.220^{+0.300}_{-0.250}$ | $2.706^{+0.487}_{-0.904}$ | $1.579^{+0.243}_{-0.297}$ | $0.112^{+0.211}_{-0.033}$ |
| | +3%/-3% | +7%/-2% | +136%/-114% | +18%/-33% | +15%/-19% | +188%/-29% |
| Source | PHO1 | FLK73 | 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 007458050-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-------------|------------------------|----------------------|------------------------|---------------------------|
| DV | -7 ± 1 | $0.91^{+0.49}_{-0.46}$ | 5217^{+310}_{-473} | 5655^{+3095}_{-1260} | $1.338^{+3.891}_{-0.764}$ |
| Alt. | -12 ± 1 | $1.20^{+0.53}_{-0.45}$ | 5218^{+325}_{-456} | 5735^{+1762}_{-1088} | $1.345^{+2.038}_{-0.683}$ |

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

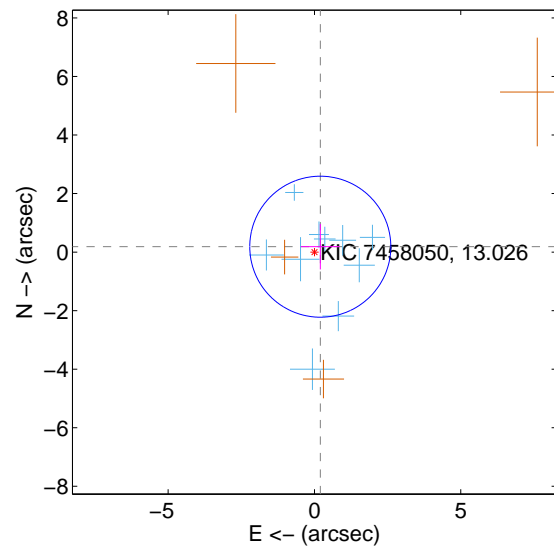
Supplemental centroid analysis for 007458050-01. Kepler magnitude: 13.03. Transit SNR 6.98

There are 10 quarters with good PRF difference image offsets

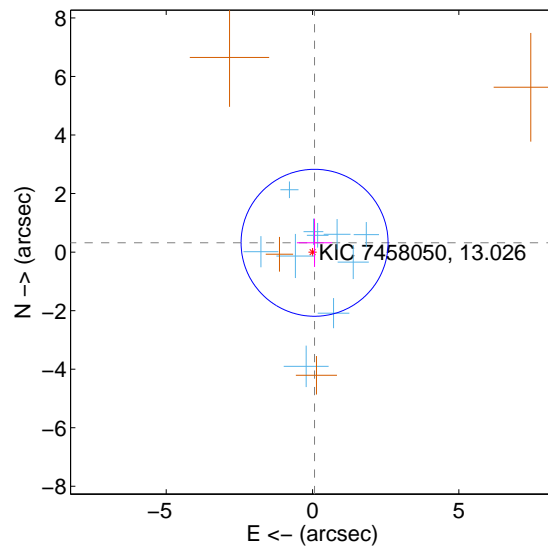
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.272 ± 0.803 | 0.34 | -0.200 ± 0.667 | 0.184 ± 0.777 |
| PRF-fit source offset from KIC position | 0.326 ± 0.837 | 0.39 | -0.070 ± 0.603 | 0.318 ± 0.826 |
| photometric centroid source offset | 3.16 ± 1.24 | 2.55 | -2.84 ± 1.24 | -1.39 ± 1.26 |

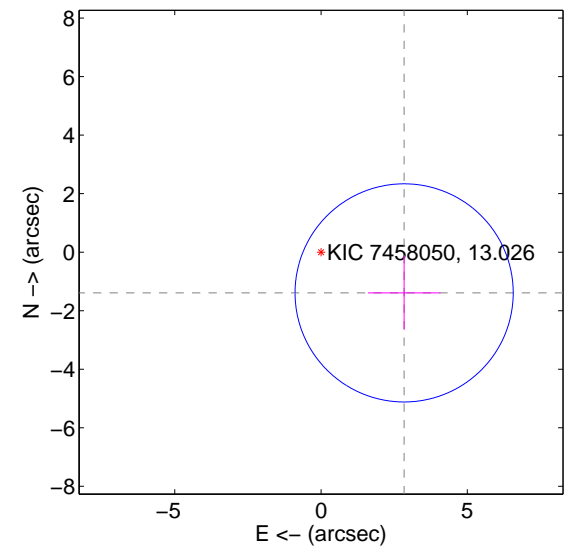
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

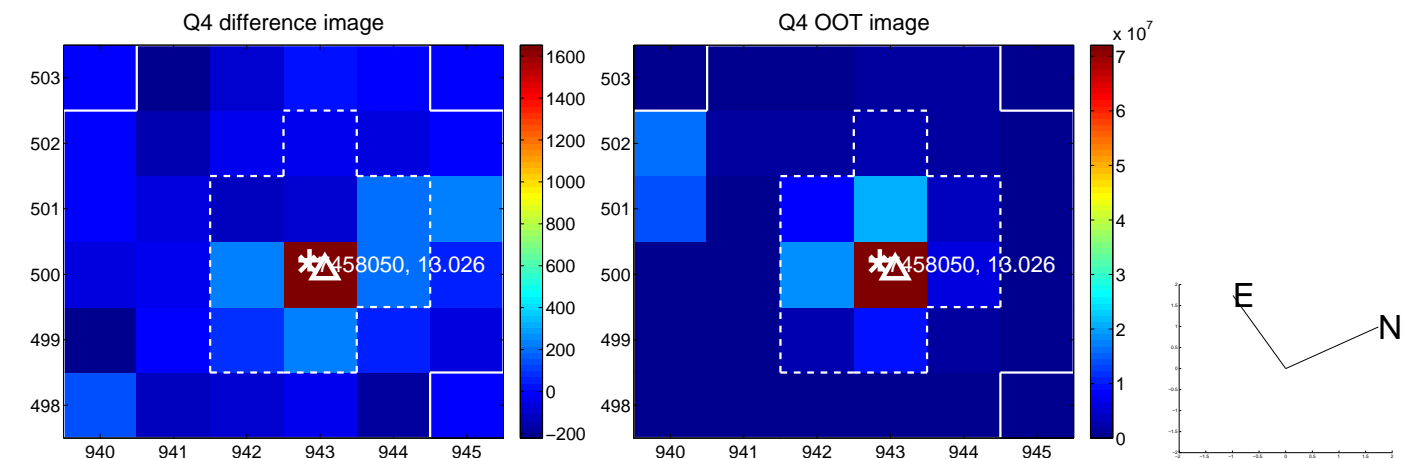
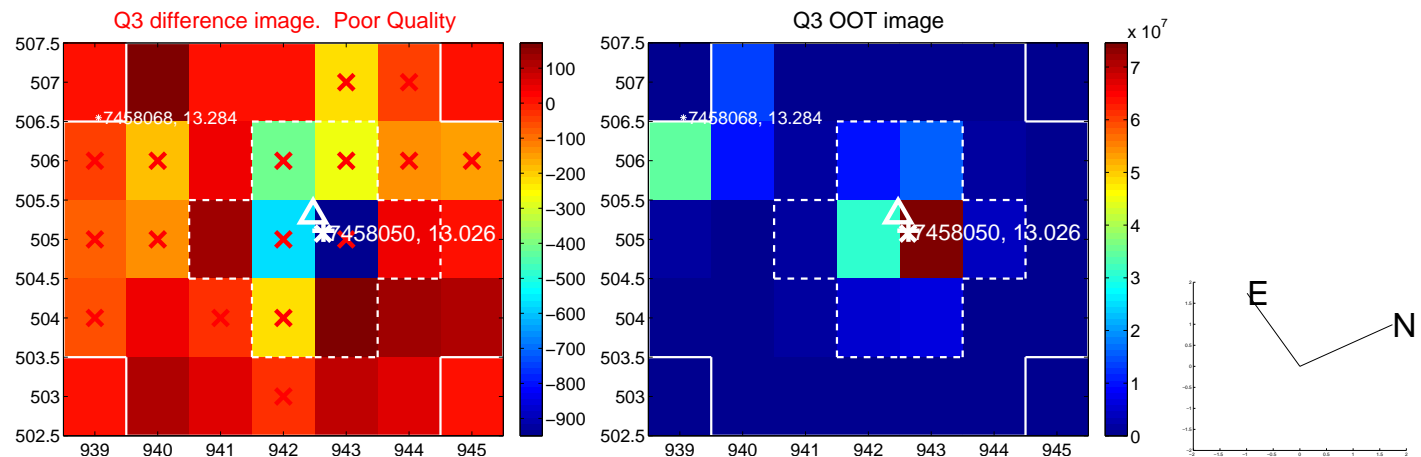
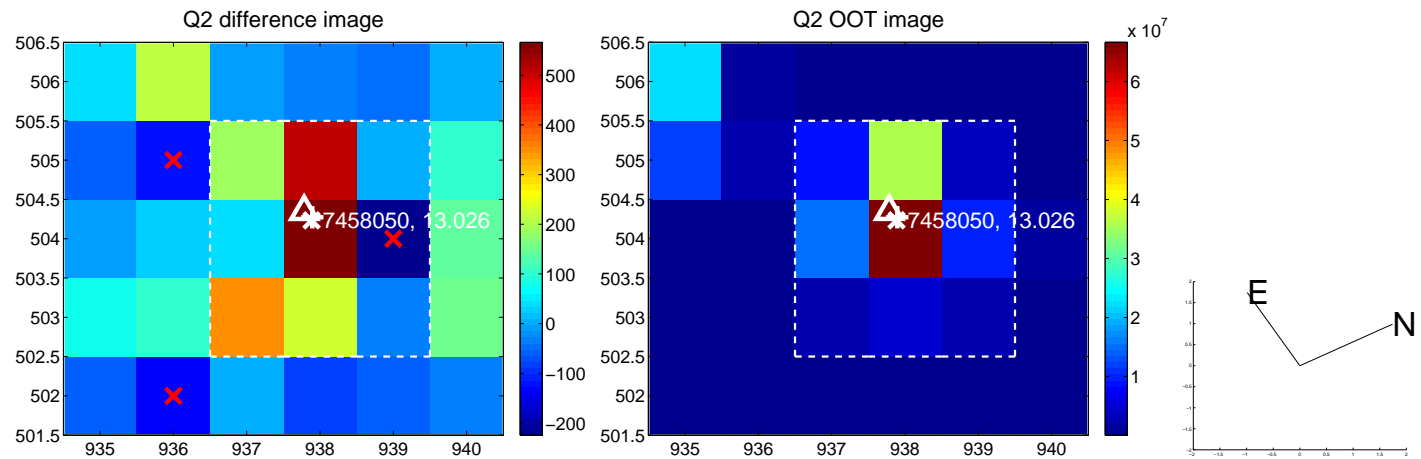
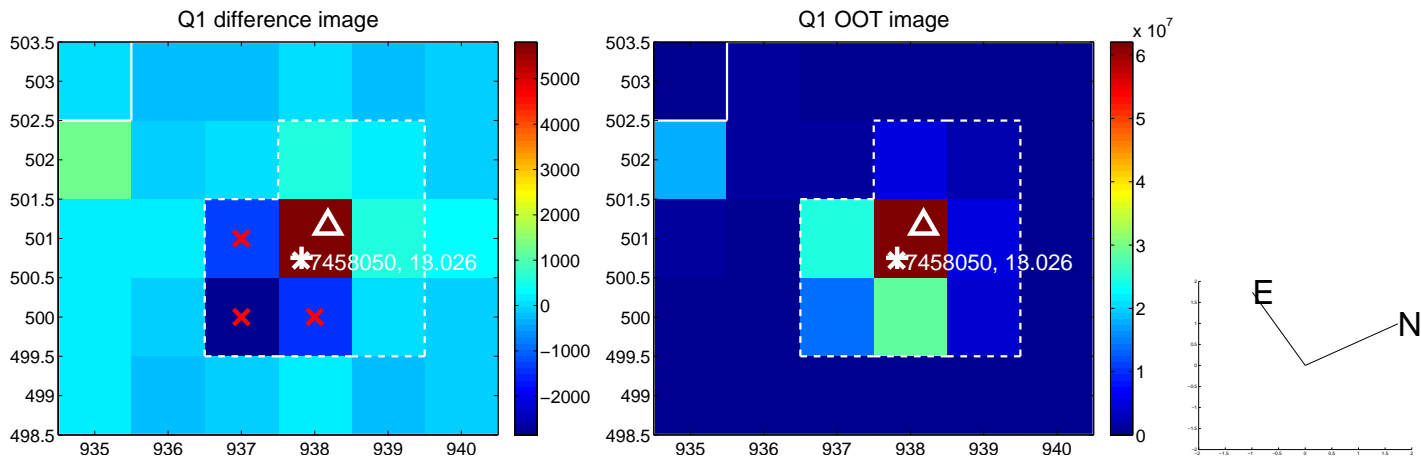


offset from photometric centroids

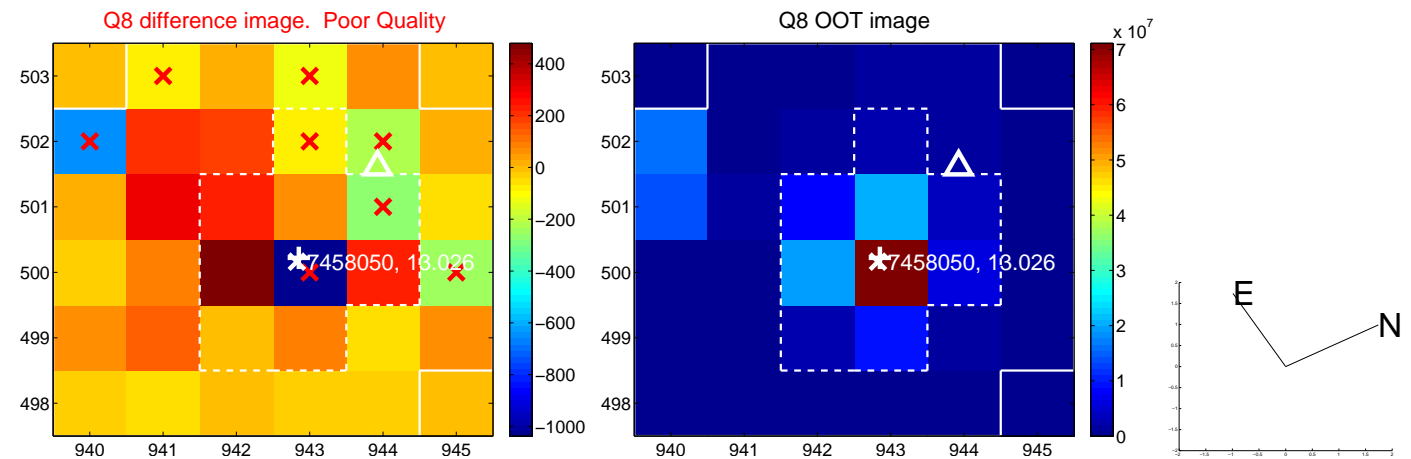
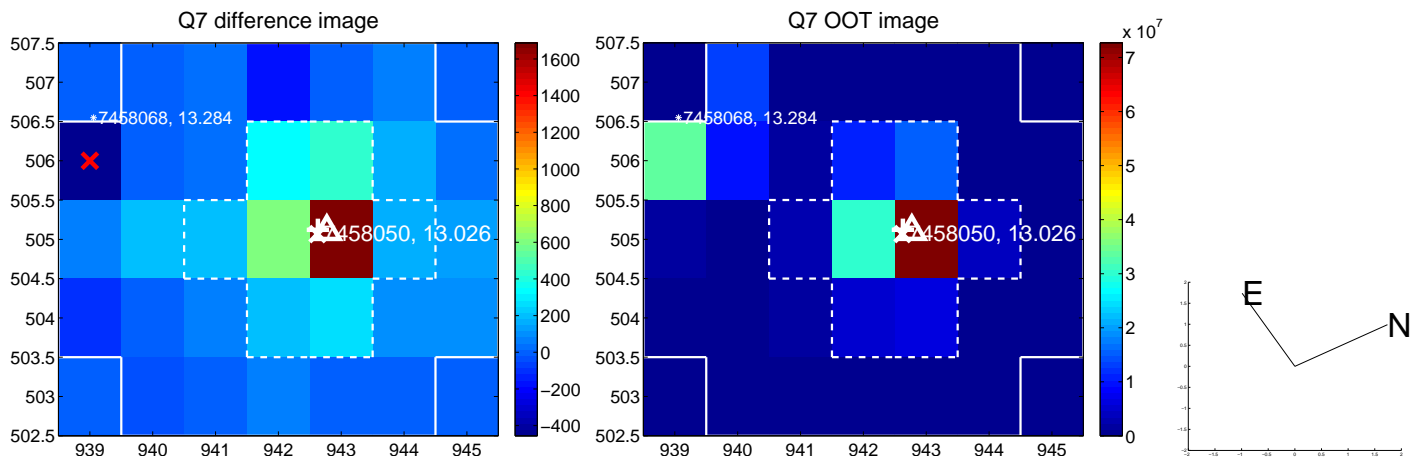
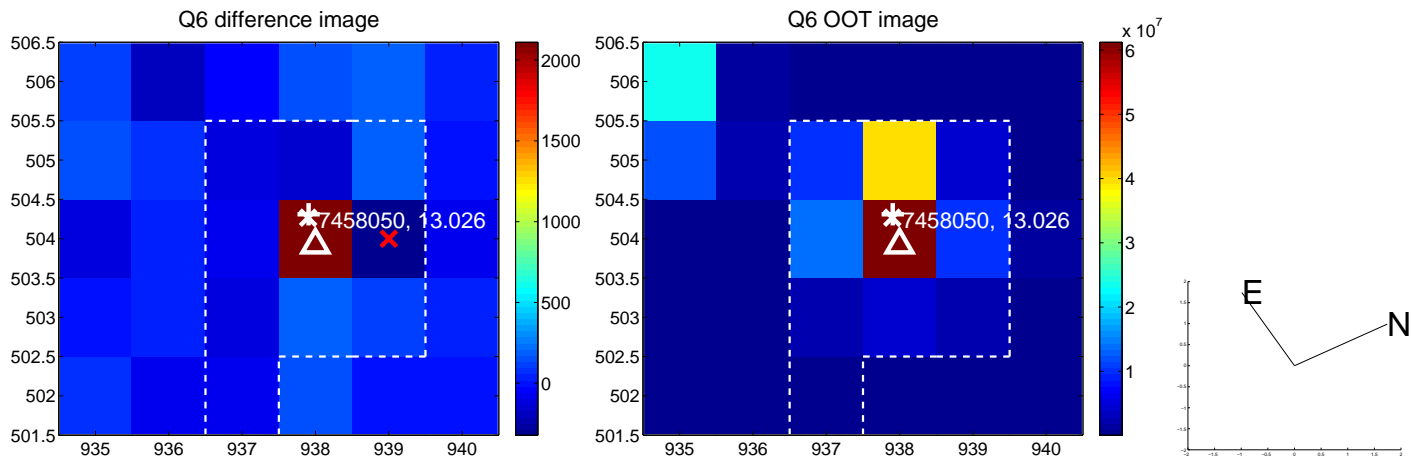
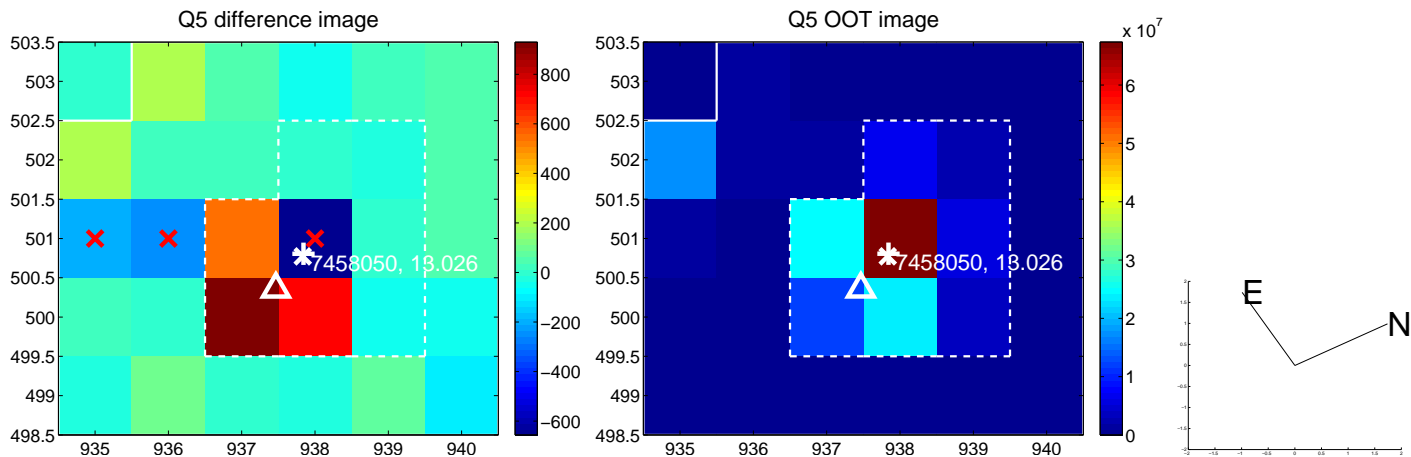


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

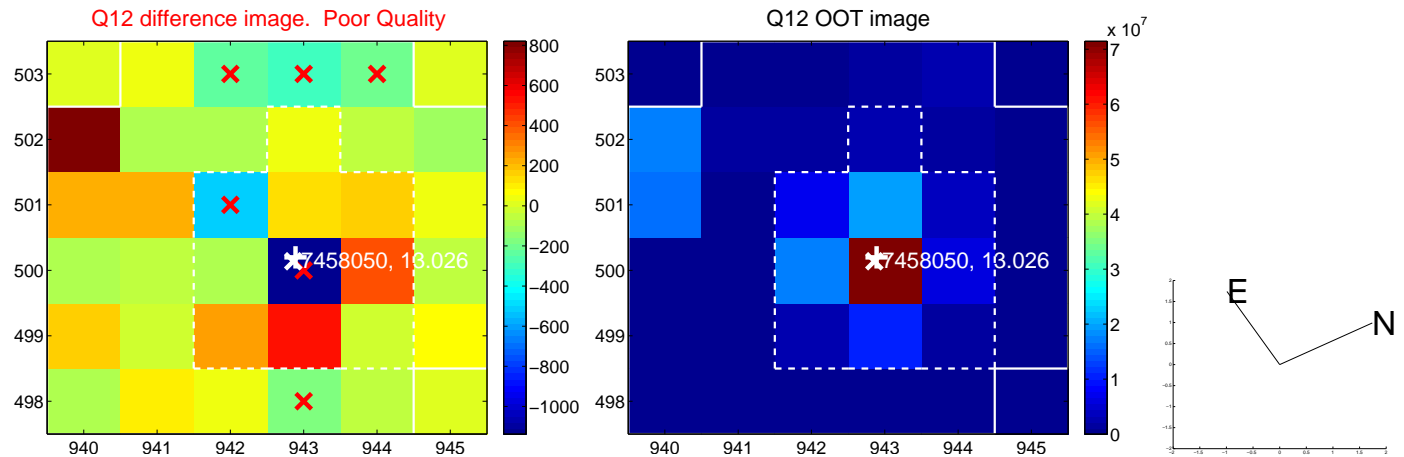
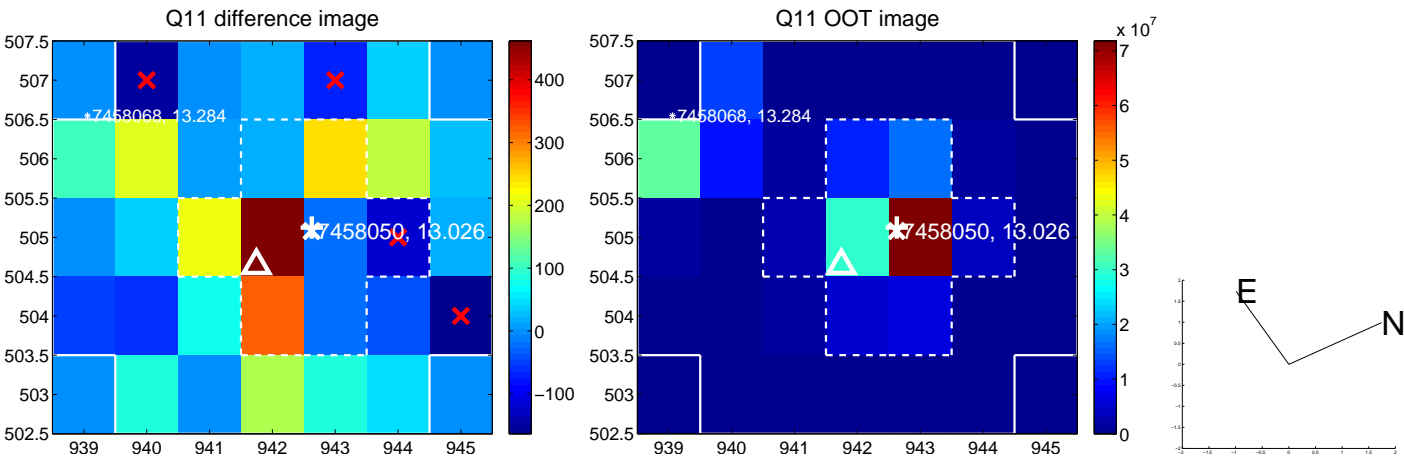
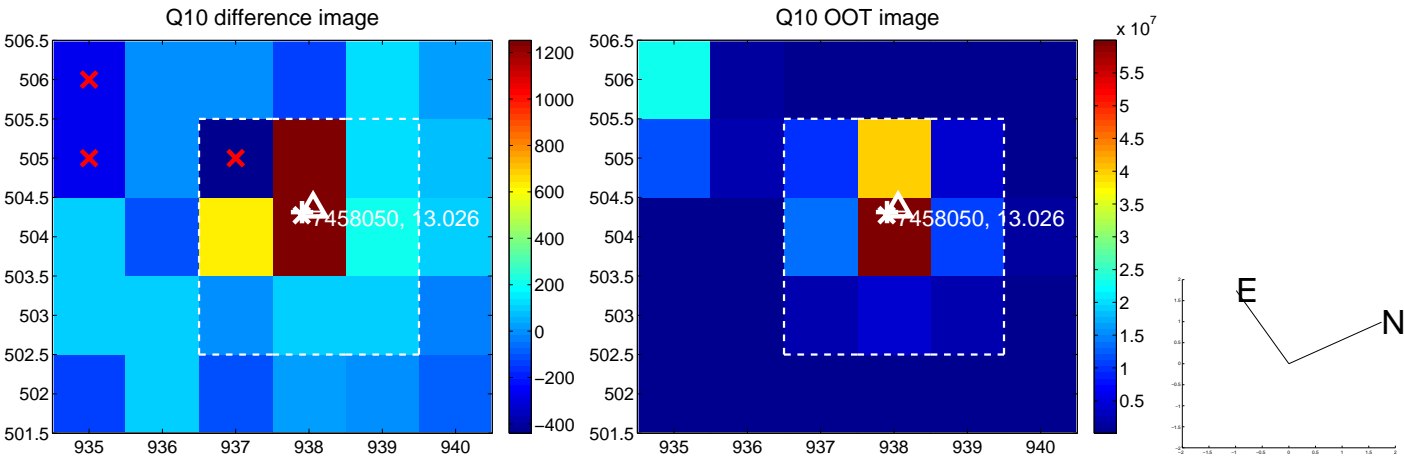
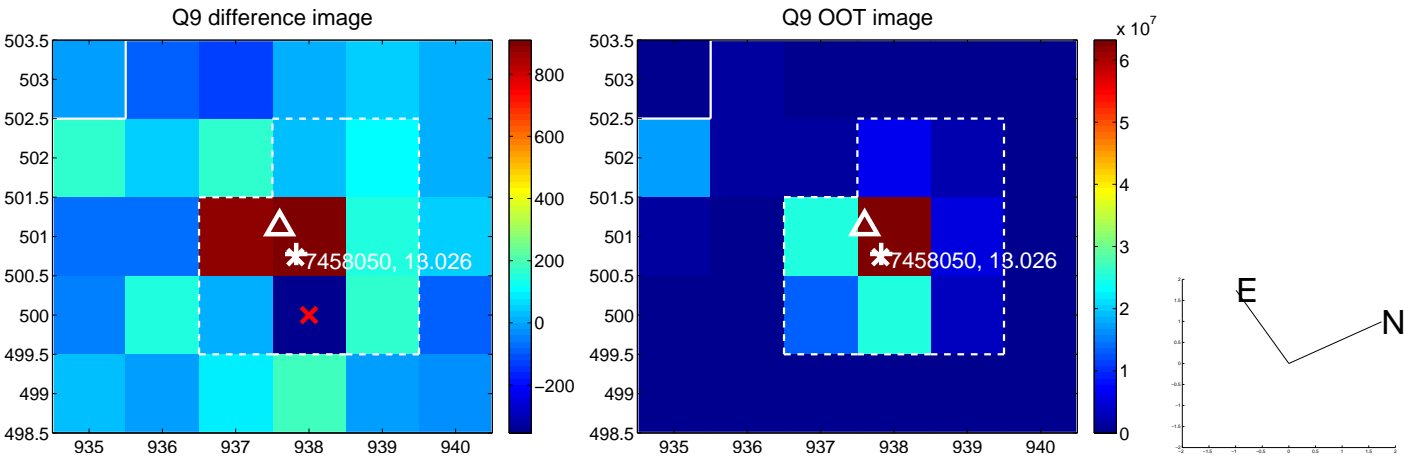
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



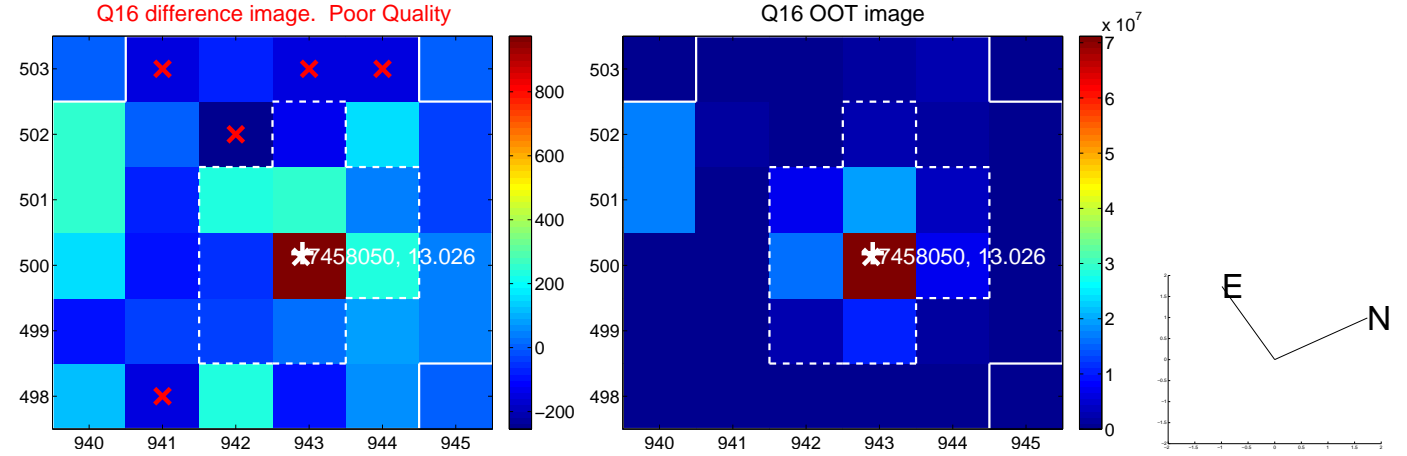
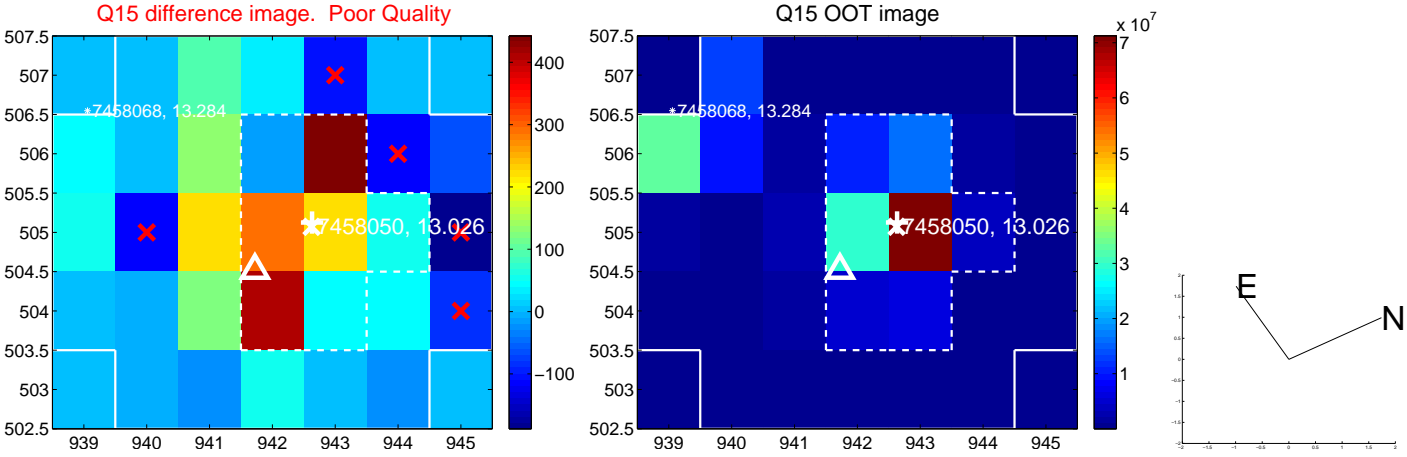
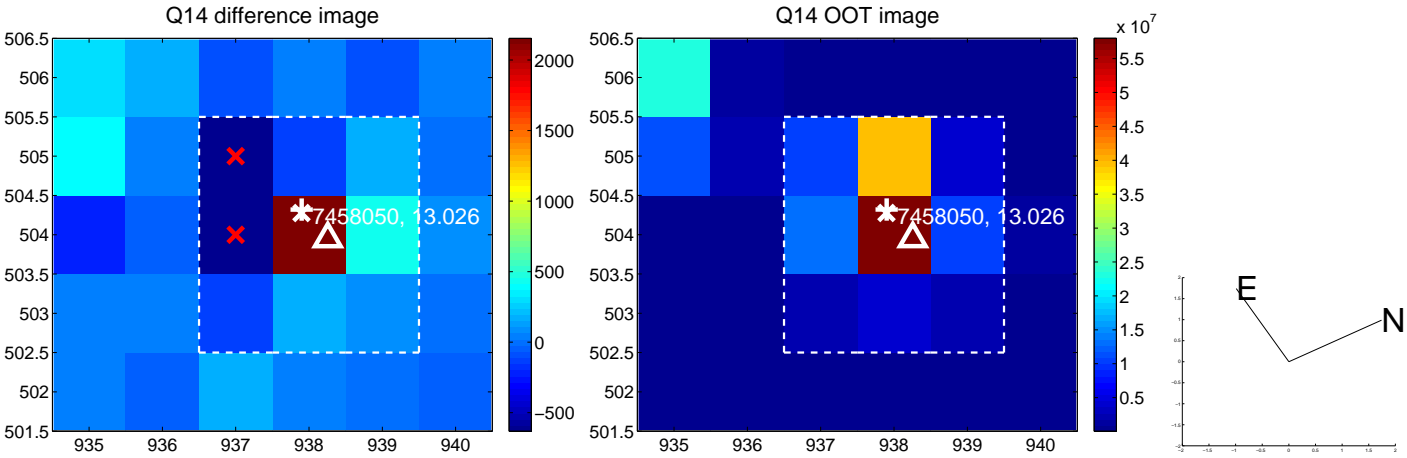
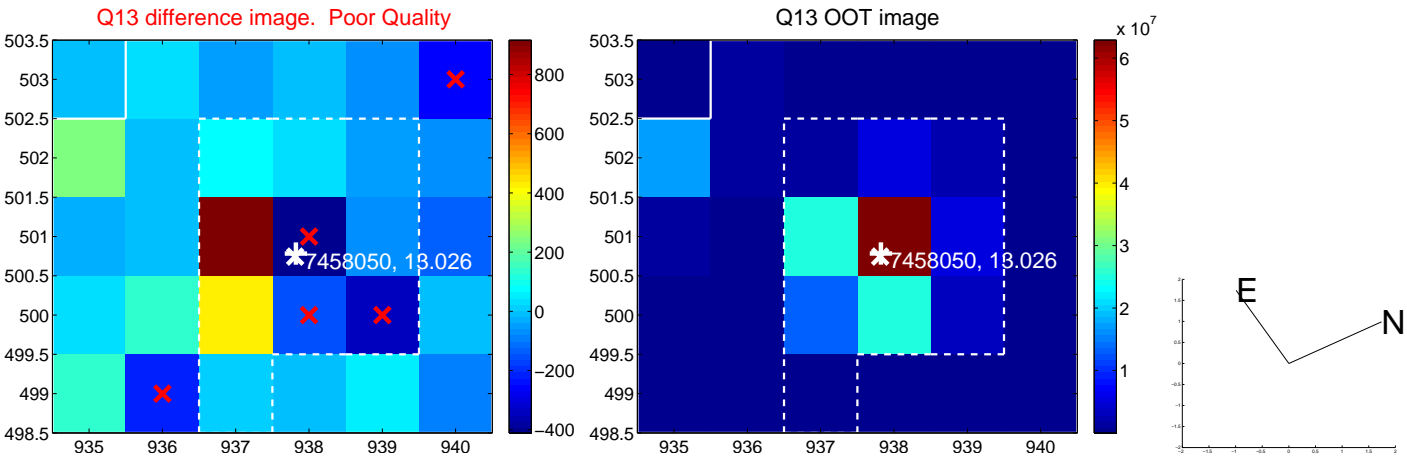
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



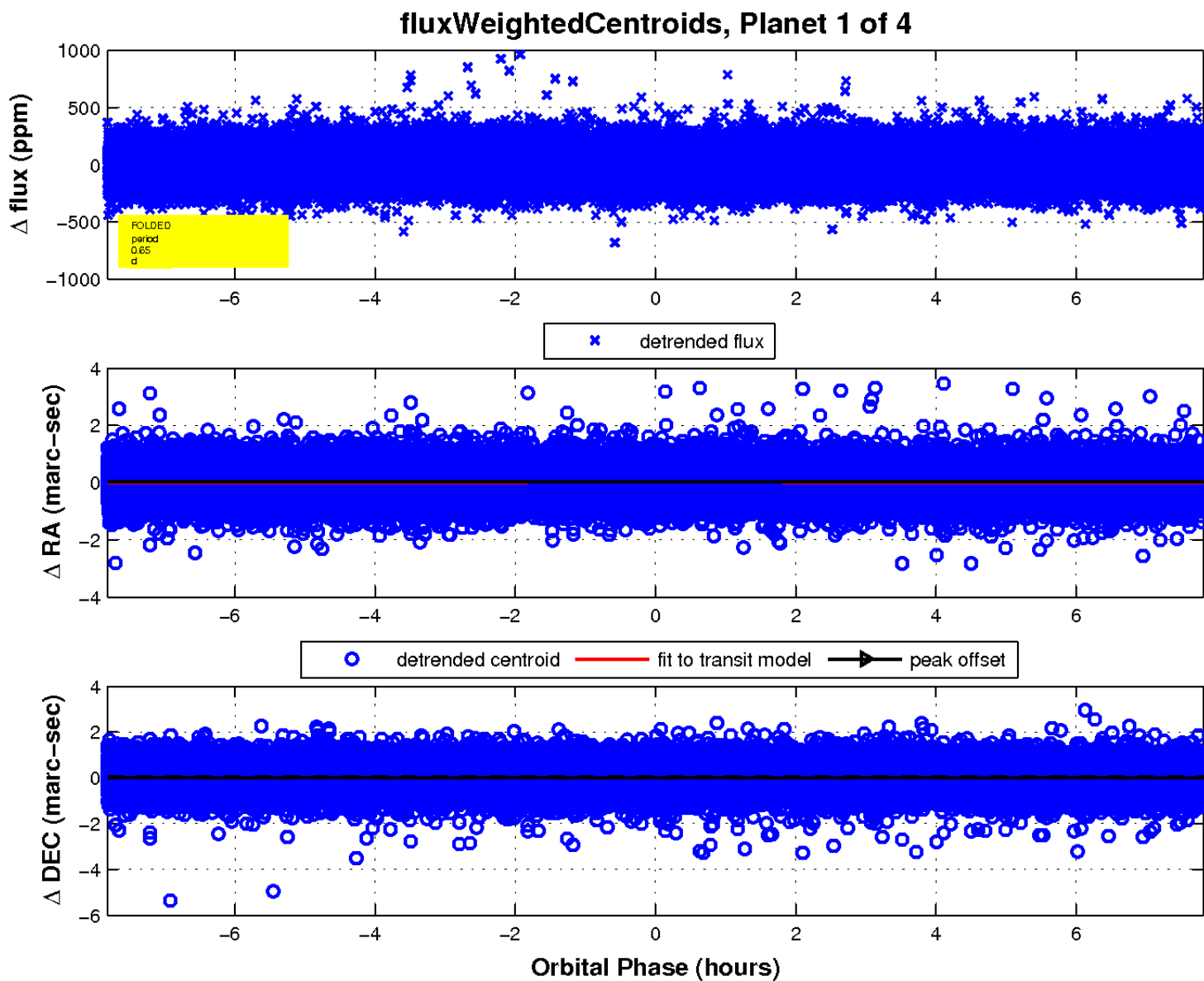
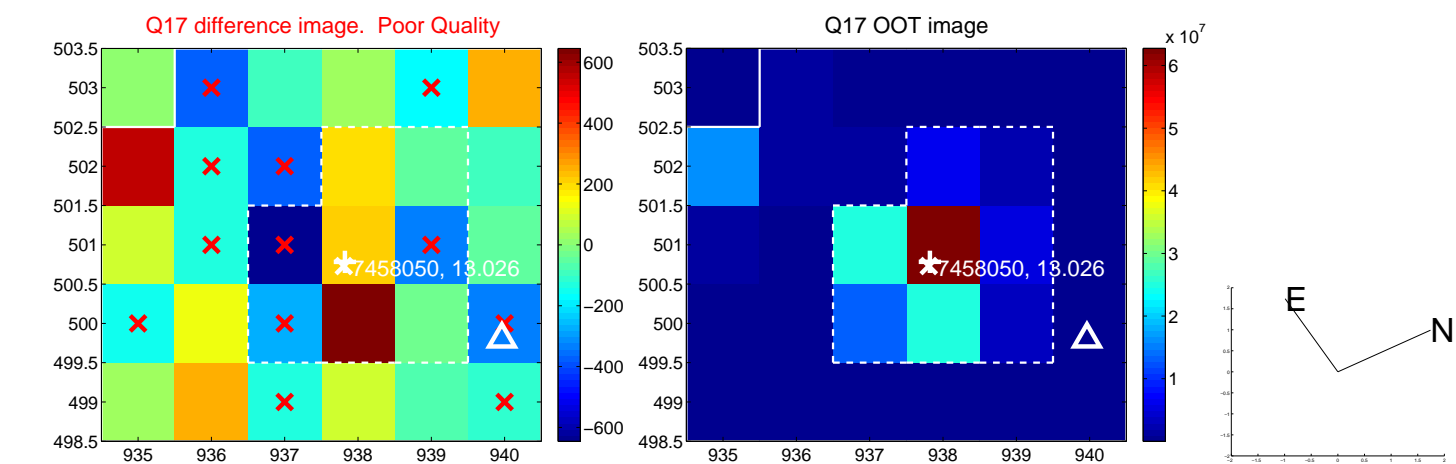
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

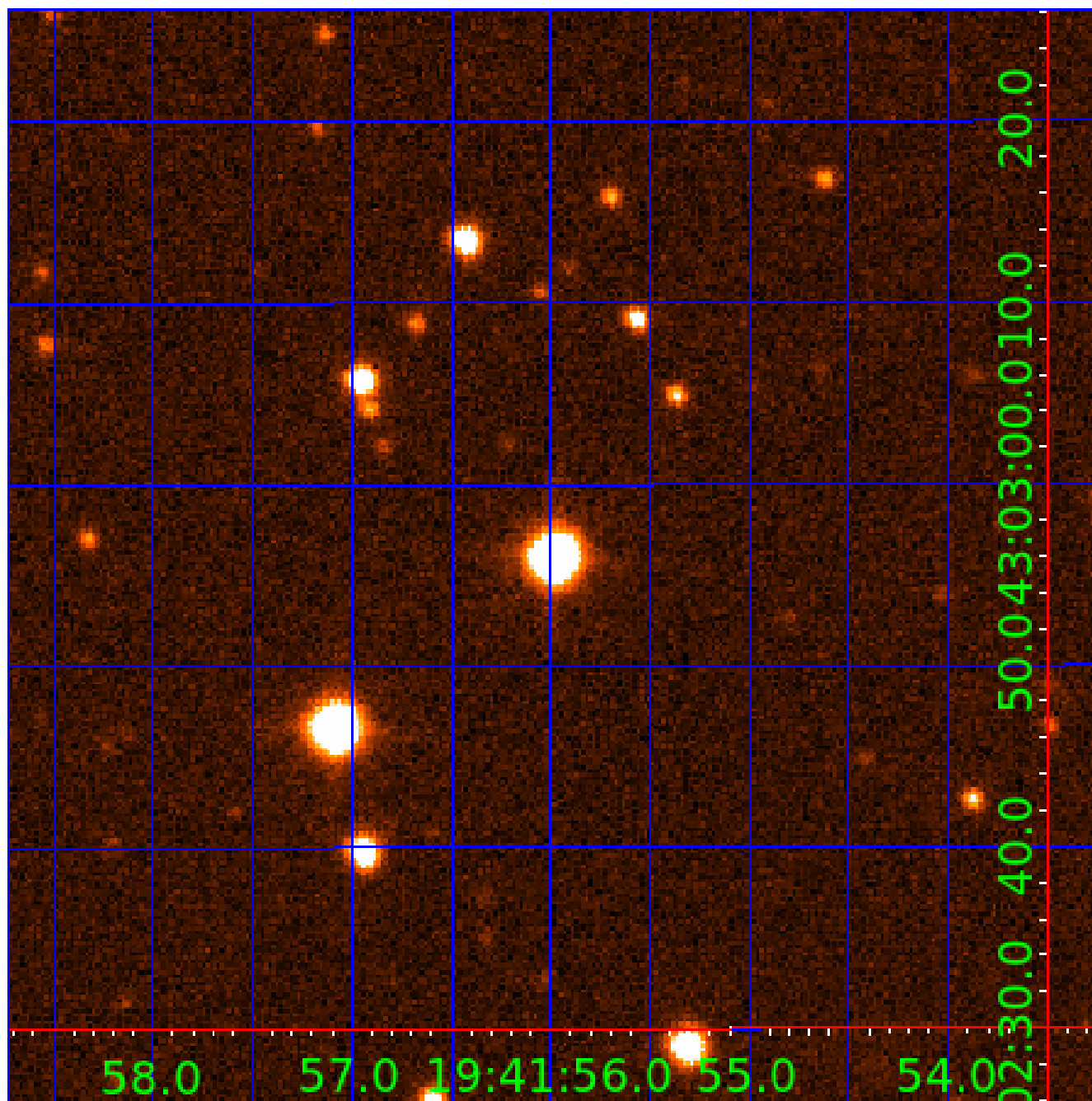


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007458050

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007458050-01 | OBS | No | 0.651776 | 132.097701 | 9.4 | 3.825 | 8.2 | 7.0 | 2.71 | 6865 | 0.96 | 49607.13 |
| 007458050-02 | OBS | No | 57.549431 | 155.812471 | 187.3 | 2.954 | 9.2 | 7.8 | 2.71 | 6865 | 5.08 | 126.17 |
| 007458050-03 | OBS | No | 116.697384 | 201.234447 | 197.4 | 2.894 | 7.8 | 7.4 | 2.71 | 6865 | 4.06 | 49.16 |
| 007458050-04 | OBS | No | 84.000754 | 192.639039 | 212.4 | 2.774 | 8.0 | 7.8 | 2.71 | 6865 | 4.55 | 76.20 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 007458050-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT |
| 007458050-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS |
| 007458050-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS |
| 007458050-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS |

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

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

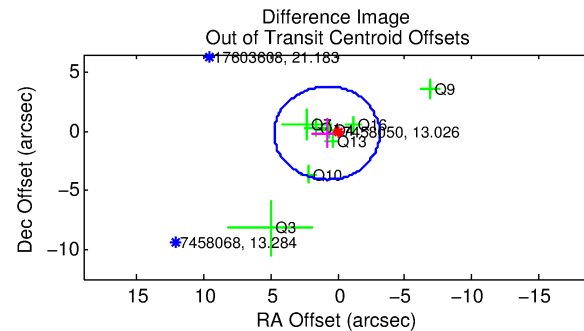
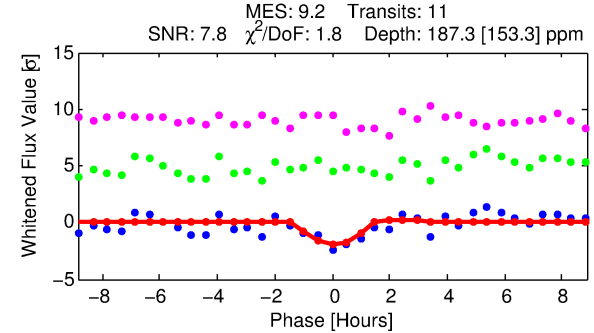
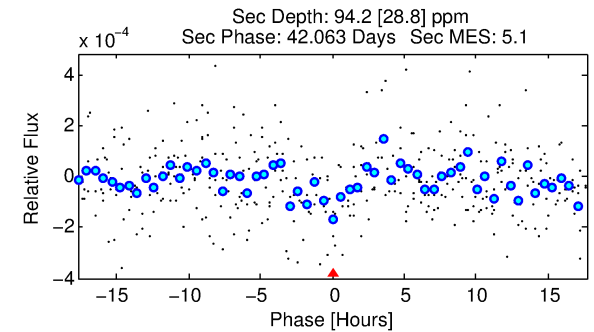
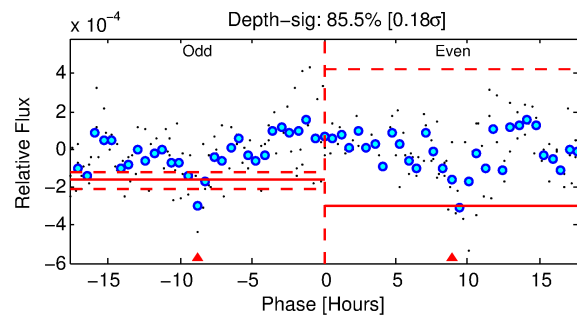
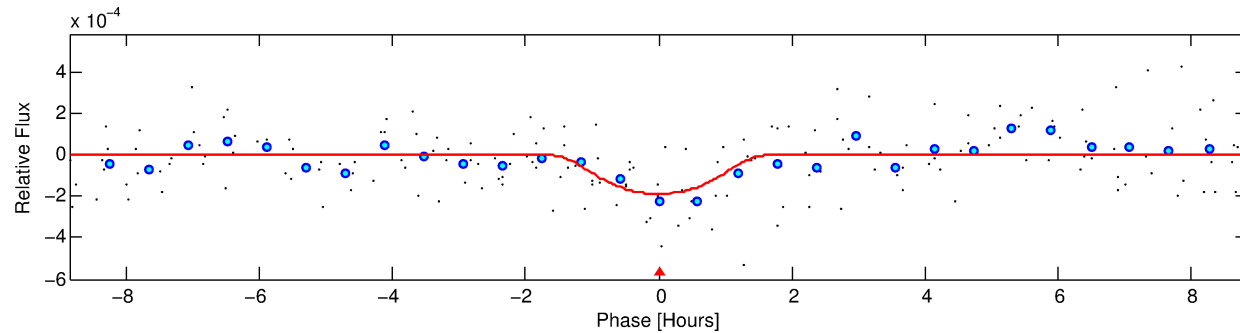
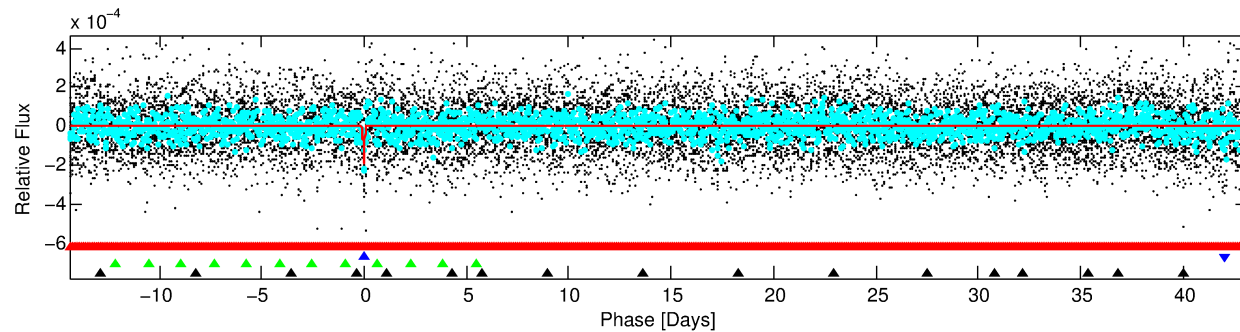
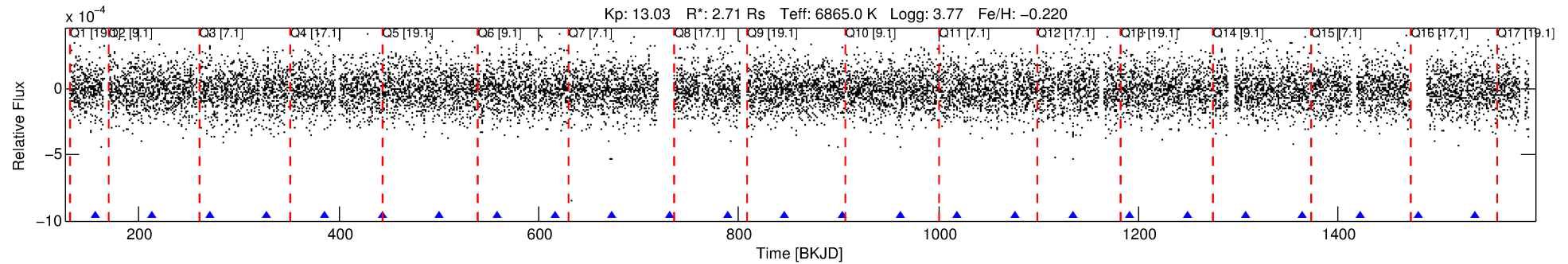
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007458050-02

No Significant Match Found

DV One-Page Summary

KIC: 7458050 Candidate: 2 of 4 Period: 57.549 d



DV Fit Results:

Period = 57.54943 [0.00088] d
Epoch = 155.8125 [0.0137] BKJD
Rp/R* = 0.0172 [0.0131]
a/R* = 37.69 [25.41]
b = 0.99 [0.04]
Seff = 126.17 [62.93]
Teq = 855 [107] K
Rp = 5.08 [4.21] Re
a = 0.3398 [0.1048] AU
Ag = 231.82 [375.78] [0.61 σ]
Teffp = 5156 [2002] K [2.15 σ]

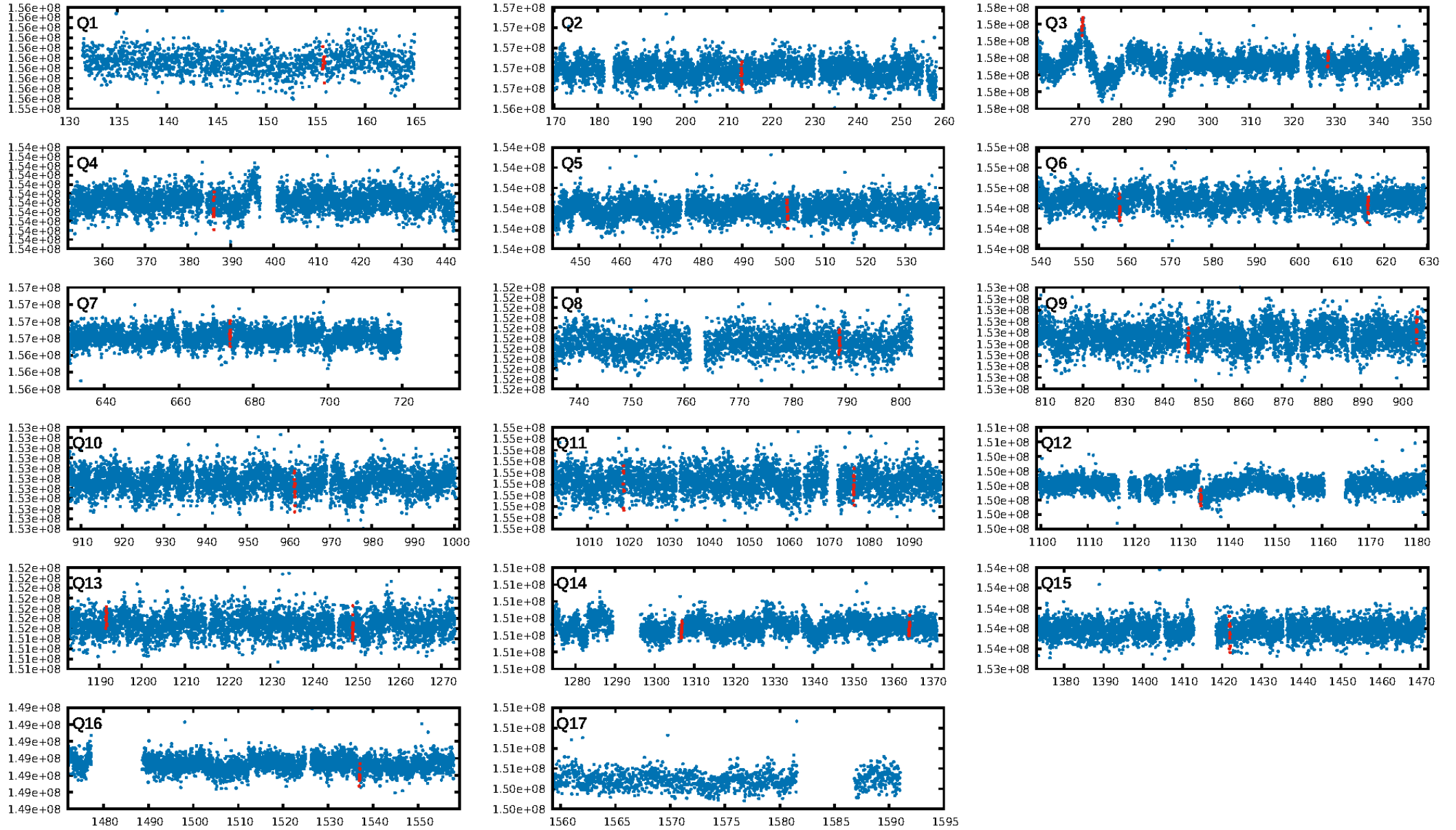
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [282.55 σ]
LongPeriod-sig: 100.0% [156.67 σ]
ModelChiSquare2-sig: 10.0%
ModelChiSquareGof-sig: 99.3%
Bootstrap-pfa: 1.68e-11
RollingBand-fgt: 1.00 [10/10]
GhostDiagnostic-chr: 0.3187
Centroid-sig: 74.9%
Centroid-so: 0.816 arcsec [0.97 σ]
OotOffset-rm: 0.825 arcsec [0.63 σ]
KicOffset-rm: 0.932 arcsec [0.81 σ]
OotOffset-st: 1/2/2/3 [8]
KicOffset-st: 1/2/2/3 [8]
DiffImageQuality-fgm: 0.12 [1/8]
DiffImageOverlap-fno: 0.00 [0/15]

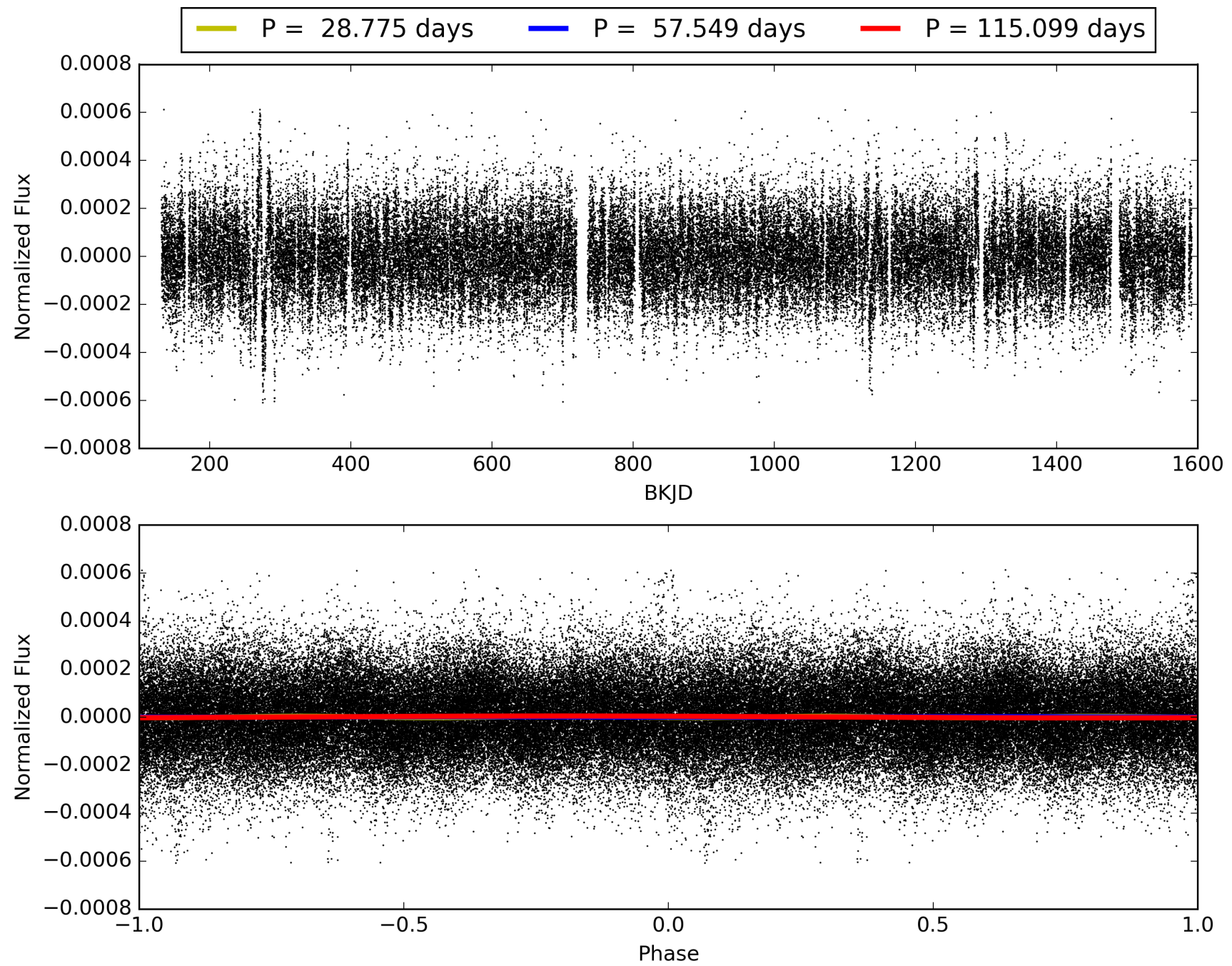
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:01:26 Z

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

TCE 007458050-02, PDC Light Curves

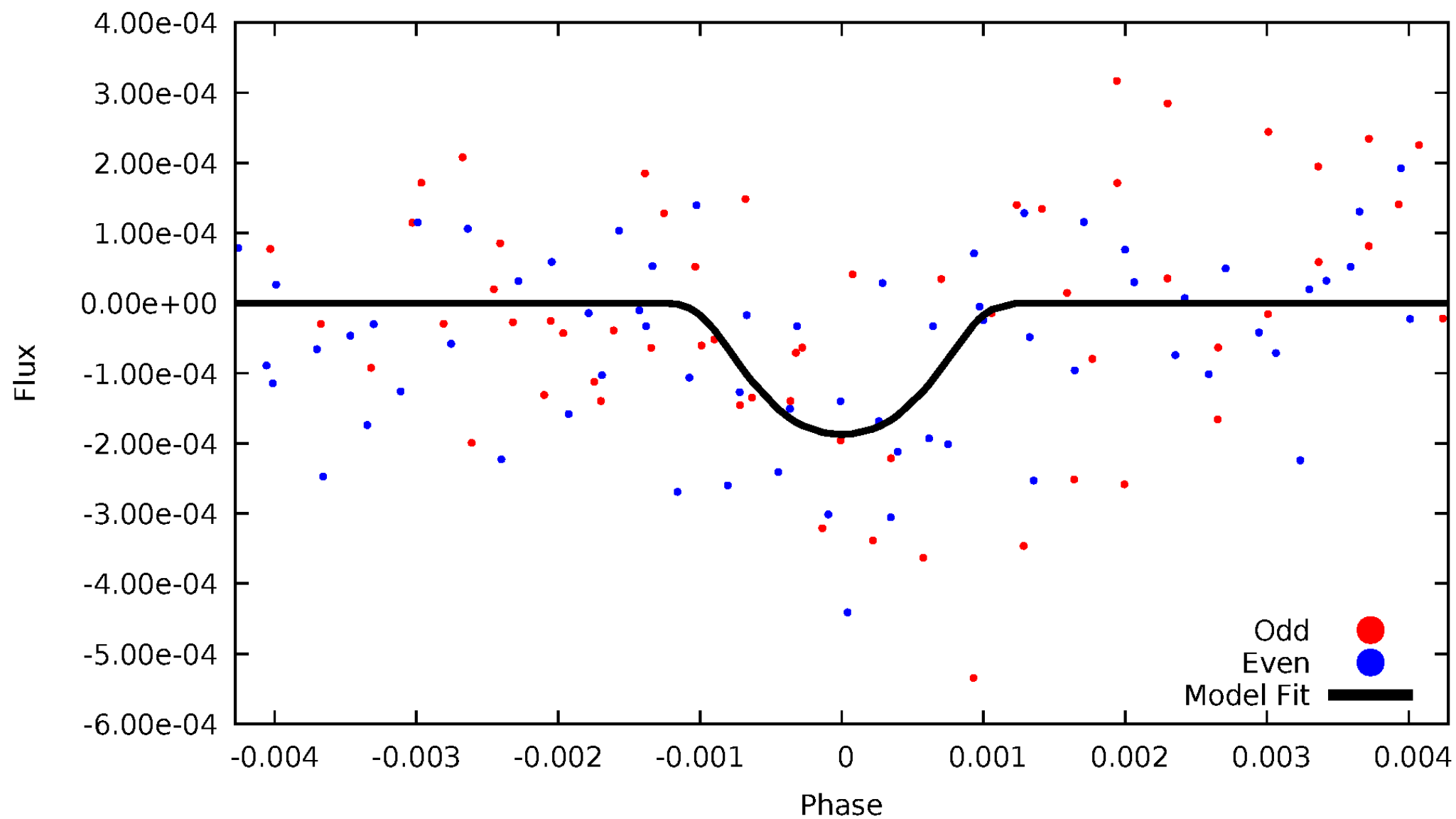


TCE 007458050-02



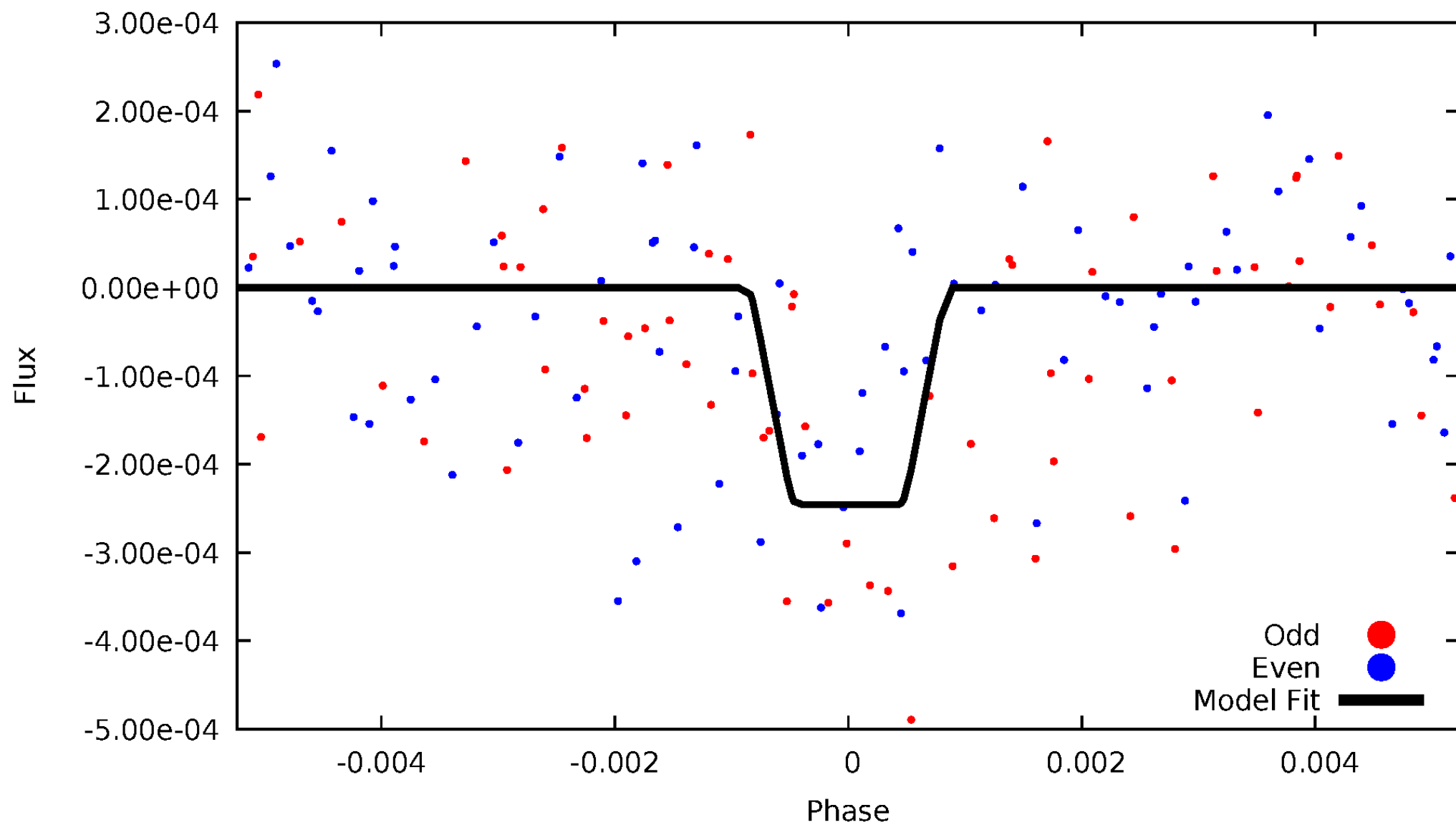
DV Odd/Even

TCE 007458050-02



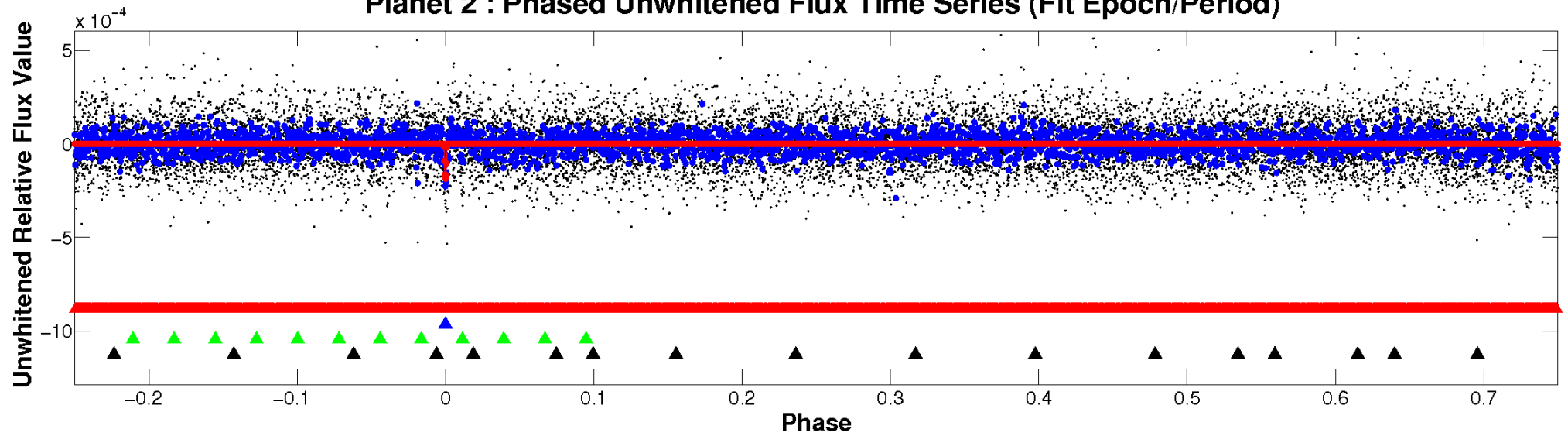
ALT Odd/Even

TCE 007458050-02

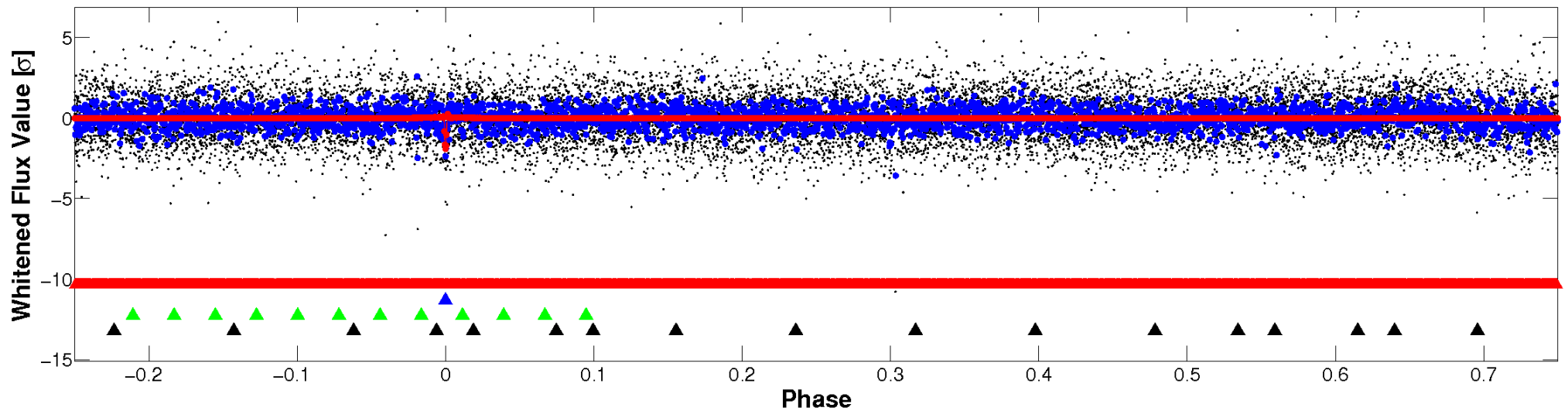


Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

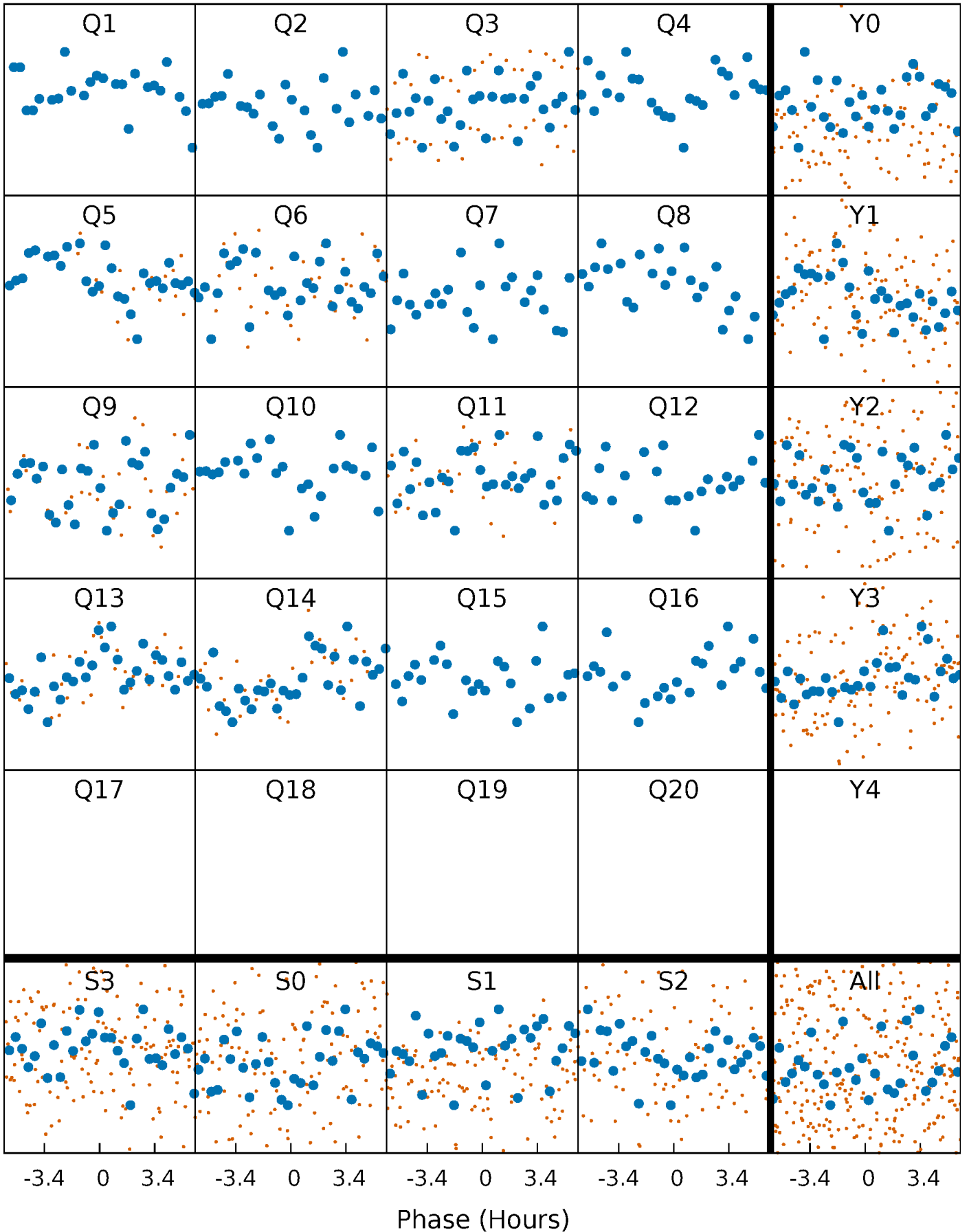


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



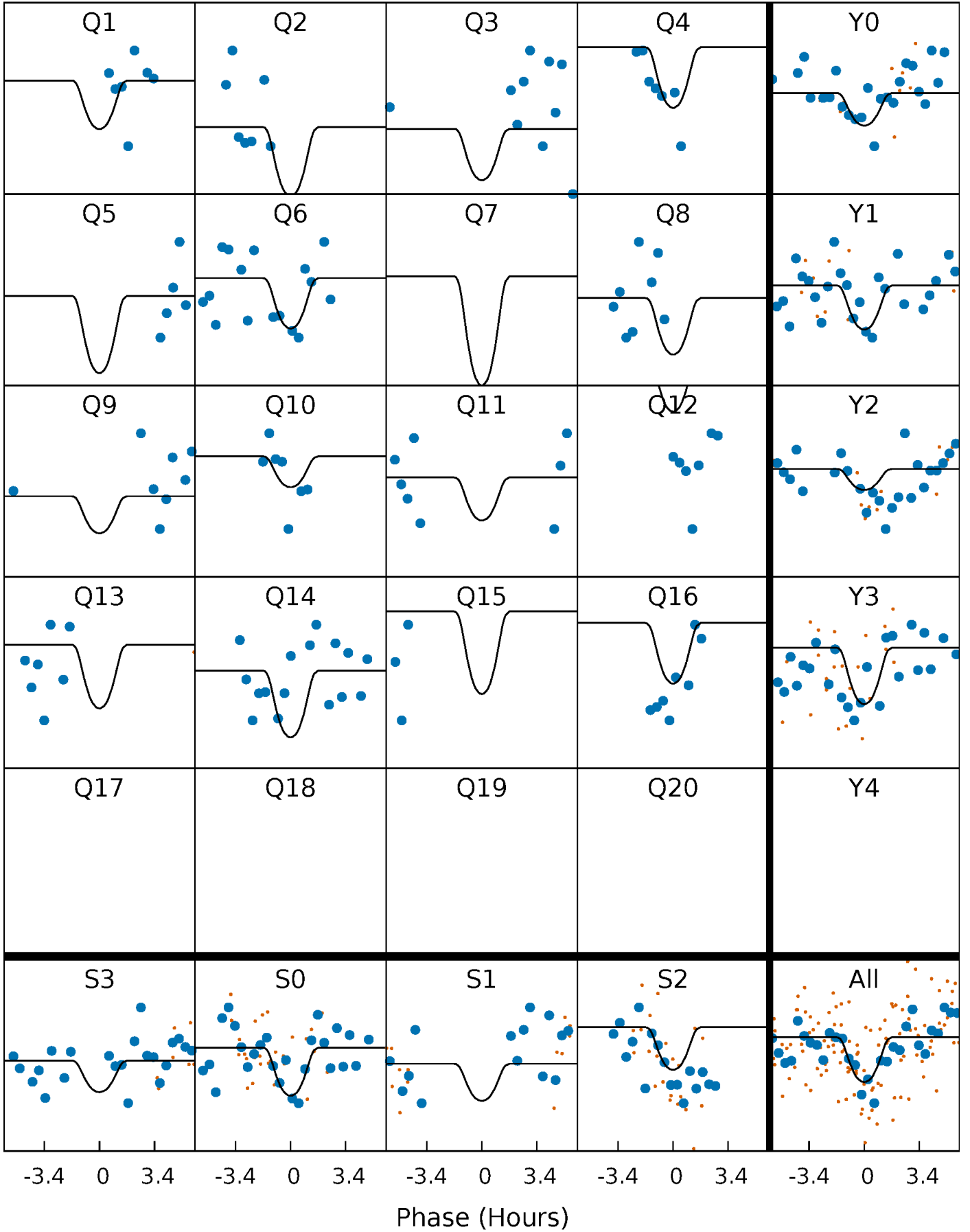
PDC Quarter-Phased Transit Curves

TCE 007458050-02 P= 57.549431 Days $T_0=155.812471$ (BKJD)



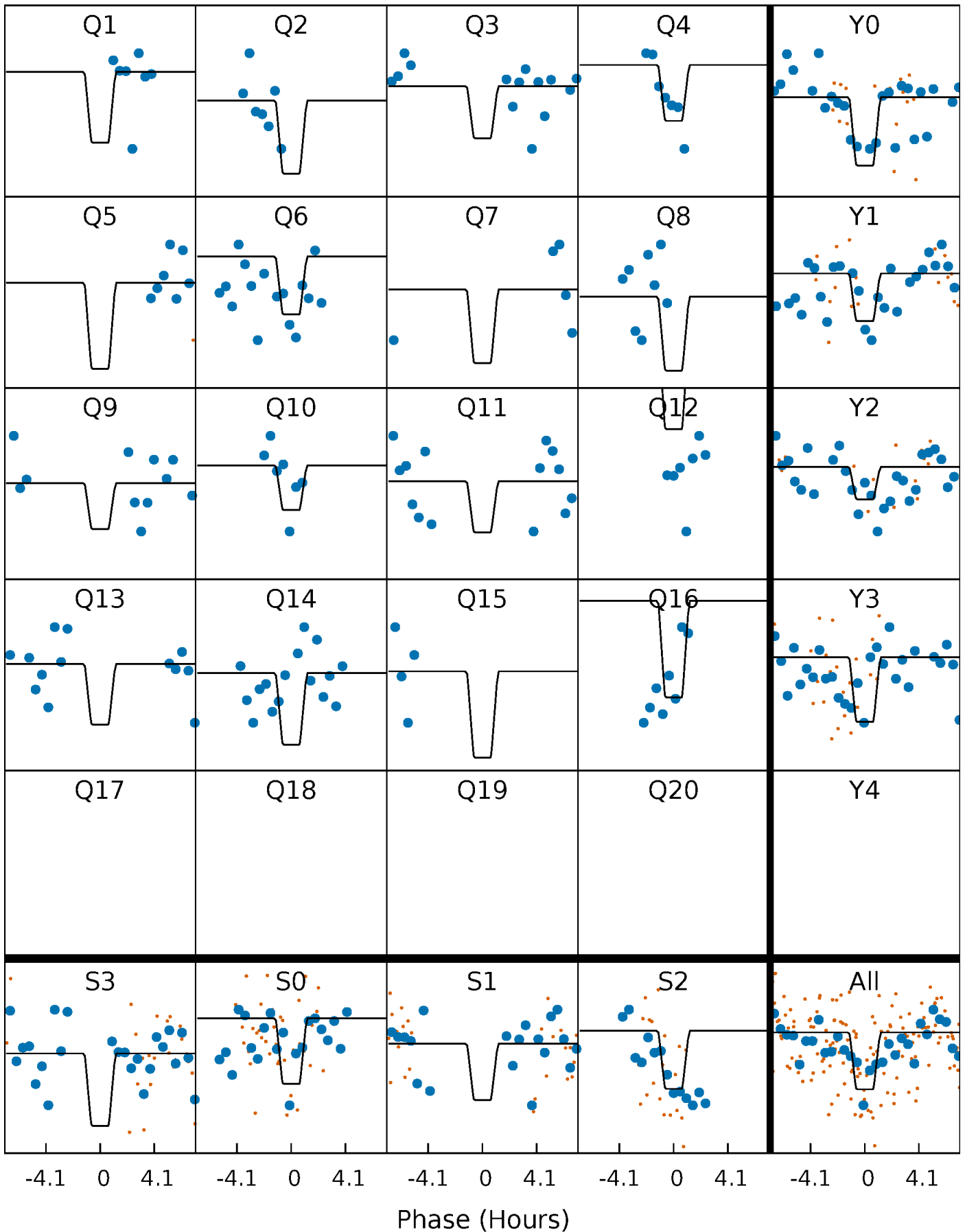
DV Quarter-Phased Transit Curves

TCE 007458050-02 P= 57.549431 Days $T_0=155.812471$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

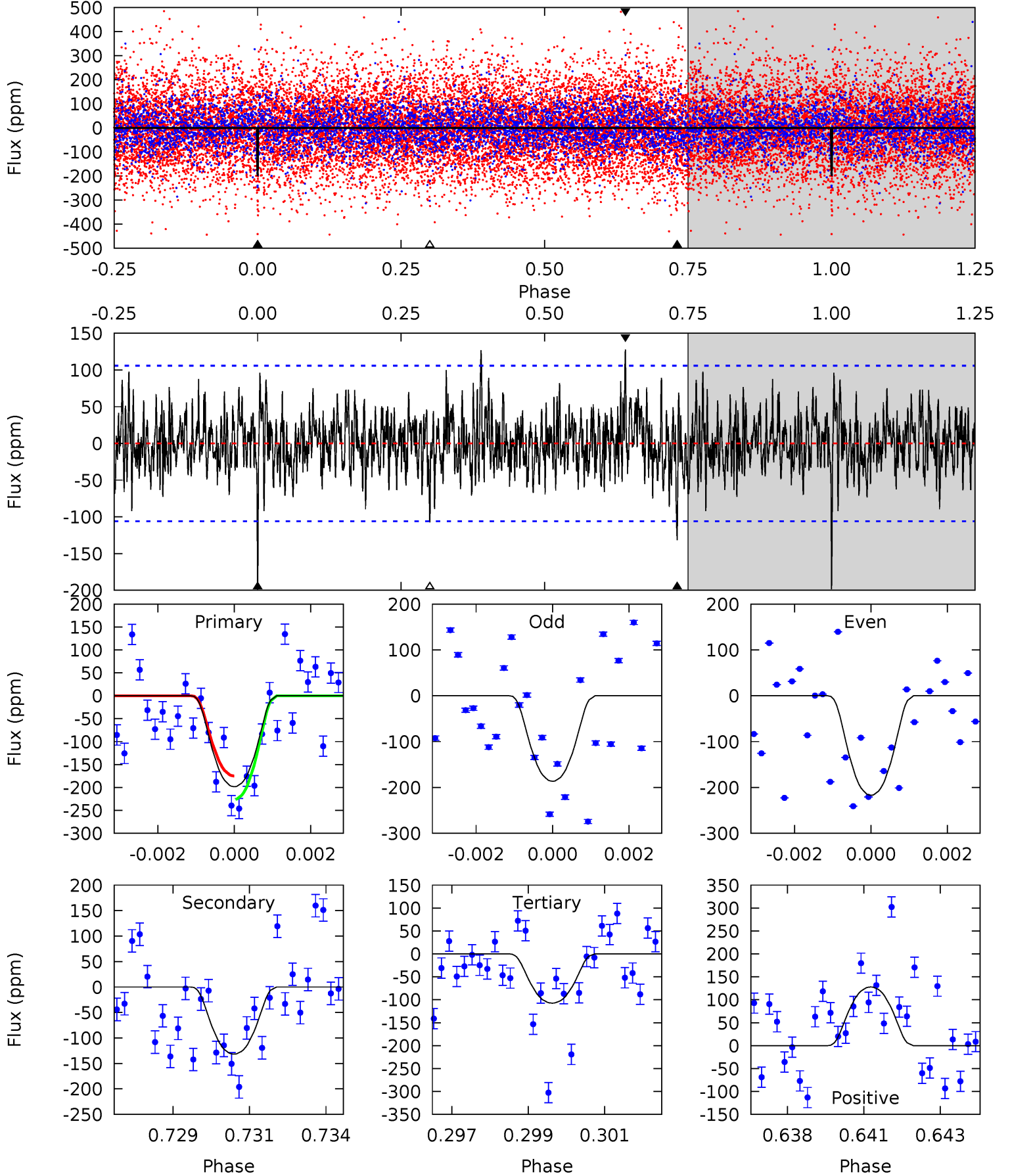
TCE 007458050-02 P= 57.551632 Days $T_0=155.797500$ (BKJD)



DV Model-Shift Uniqueness Test

007458050-02, P = 57.549431 Days, E = 98.263040 Days

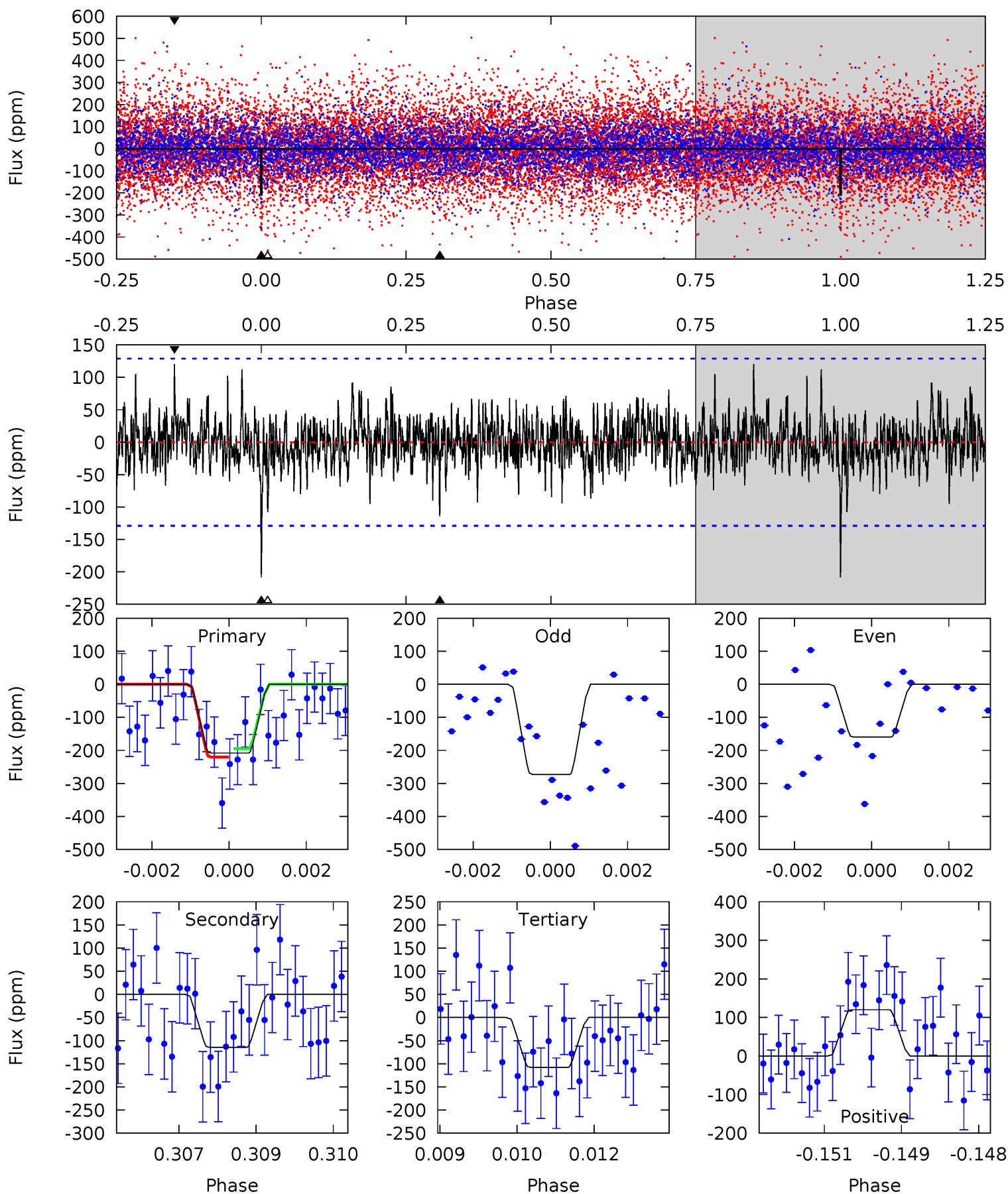
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 9.95 | 6.60 | 5.38 | 6.41 | 5.31 | 3.06 | 1.62 | 4.57 | 3.54 | 1.22 | 0.20 | 0.78 | 0.84 | 0.39 | 1.26 |



Alt Model-Shift Uniqueness Test

007458050-02, P = 57.551632 Days, E = 98.245868 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.66 | 4.76 | 4.48 | 5.00 | 5.35 | 3.14 | 1.24 | 4.18 | 3.66 | 0.28 | -0.23 | 2.33 | 0.86 | 0.37 | 0.54 |



Stellar Parameters For KIC 007458050

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6865^{+183}_{-224} | $3.772^{+0.278}_{-0.093}$ | $-0.220^{+0.300}_{-0.250}$ | $2.706^{+0.487}_{-0.904}$ | $1.579^{+0.243}_{-0.297}$ | $0.112^{+0.211}_{-0.033}$ |
| | +3%/-3% | +7%/-2% | +136%/-114% | +18%/-33% | +15%/-19% | +188%/-29% |
| Source | PHO1 | FLK73 | 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 007458050-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|------------------------|----------------------|
| DV | -132 ± 20 | $5.29^{+3.59}_{-3.23}$ | 1171^{+69}_{-97} | 5414^{+3507}_{-1093} | 304^{+1732}_{-199} |
| Alt. | -115 ± 24 | $5.02^{+3.70}_{-2.92}$ | 1179^{+65}_{-101} | 5298^{+3064}_{-1086} | 290^{+1345}_{-198} |

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

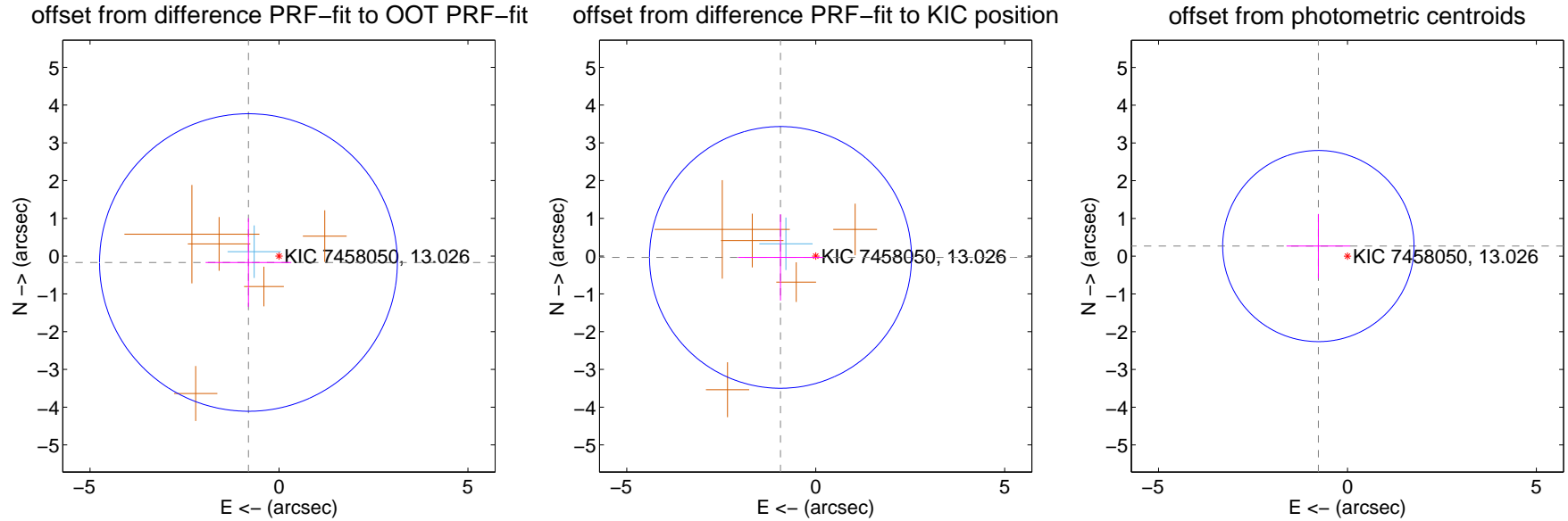
DV Centroid Data

Supplemental centroid analysis for 007458050-02. Kepler magnitude: 13.03. Transit SNR 7.85

There are 1 quarters with good PRF difference image offsets

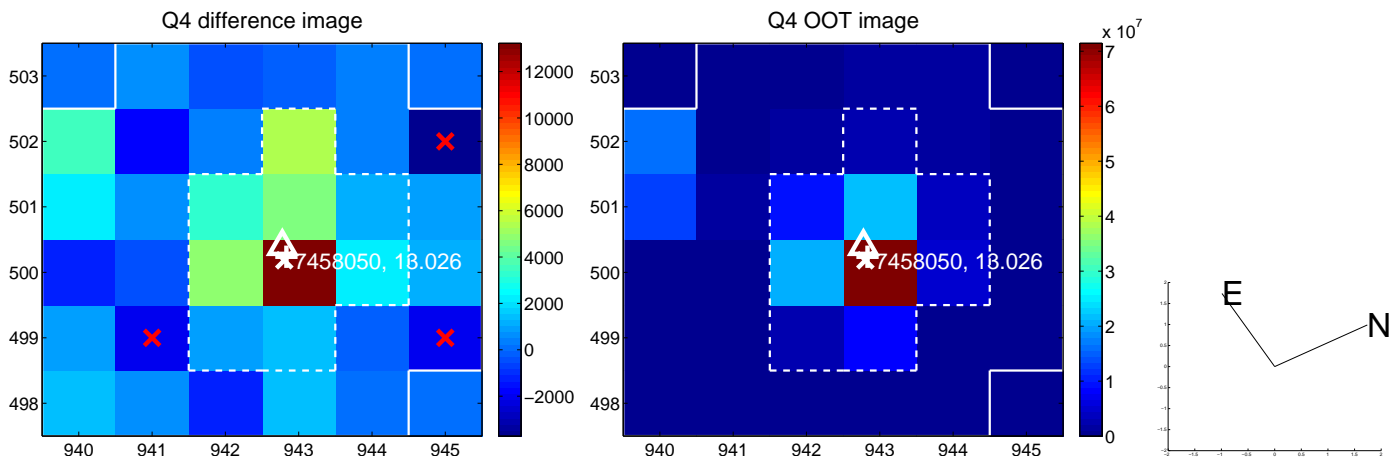
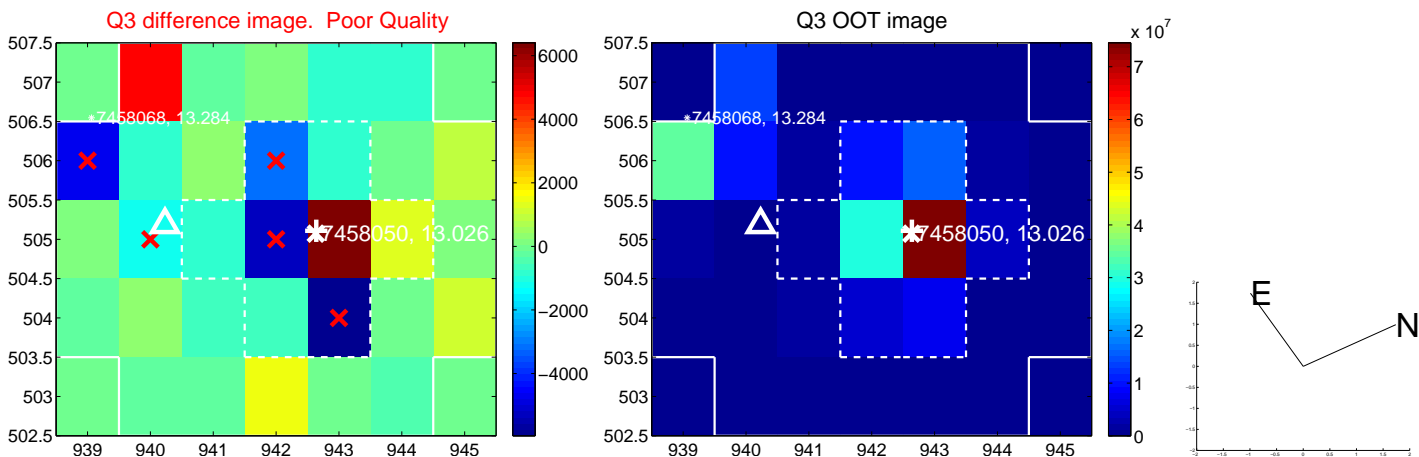
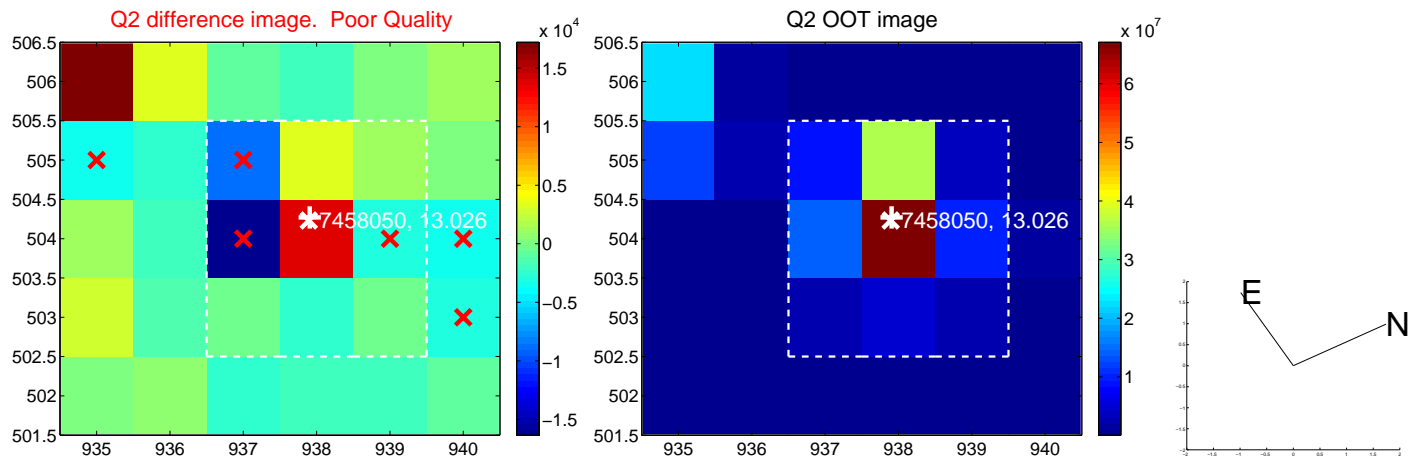
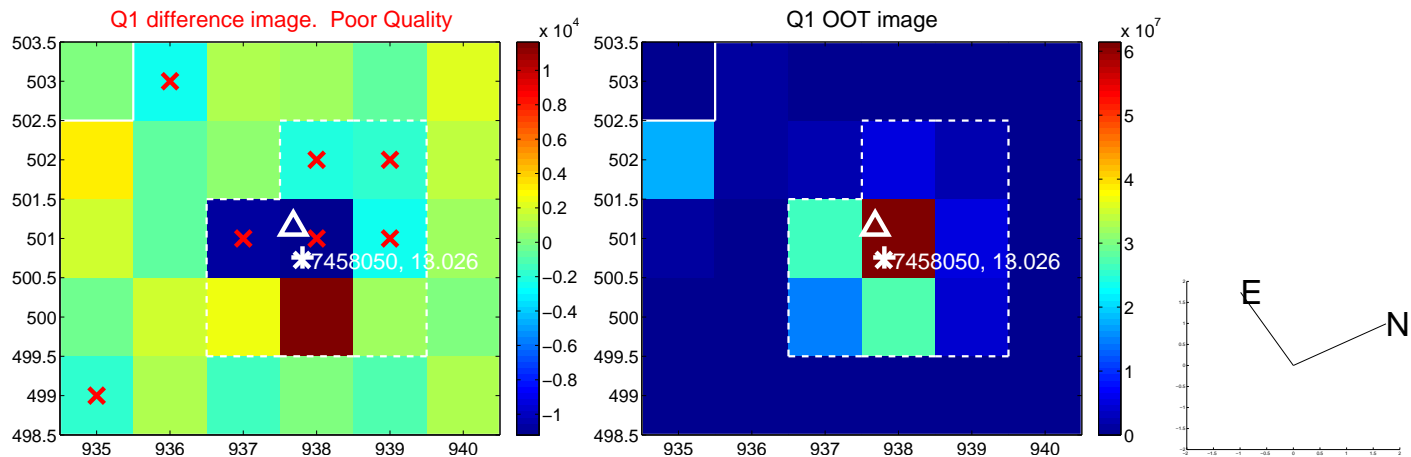
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.825 ± 1.313 | 0.63 | 0.808 ± 1.134 | -0.169 ± 1.171 |
| PRF-fit source offset from KIC position | 0.932 ± 1.155 | 0.81 | 0.932 ± 1.127 | -0.034 ± 1.143 |
| photometric centroid source offset | 0.82 ± 0.84 | 0.97 | 0.77 ± 0.84 | 0.27 ± 0.85 |

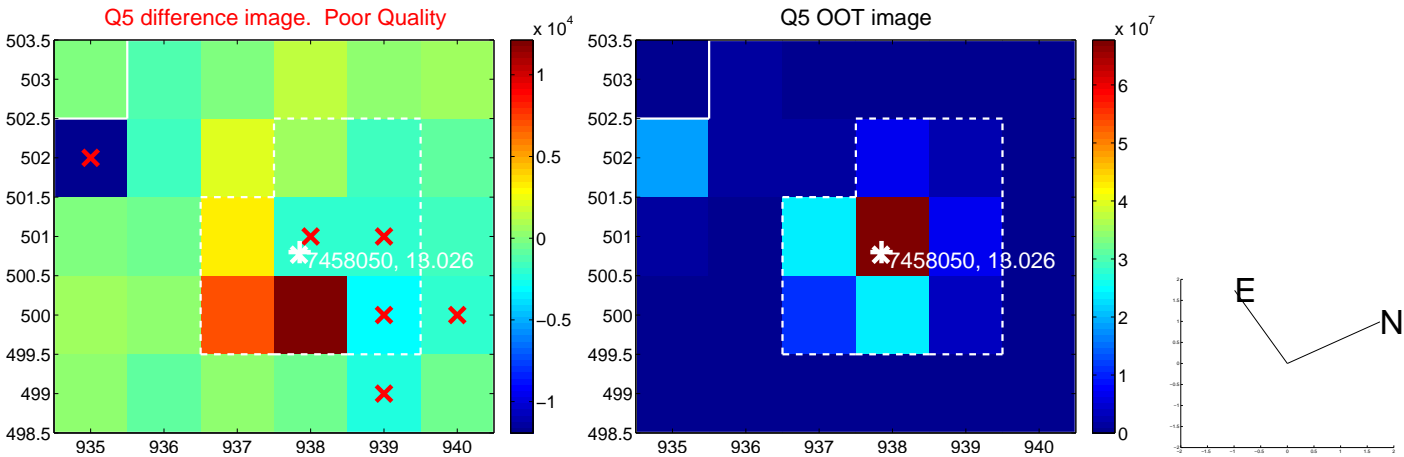


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

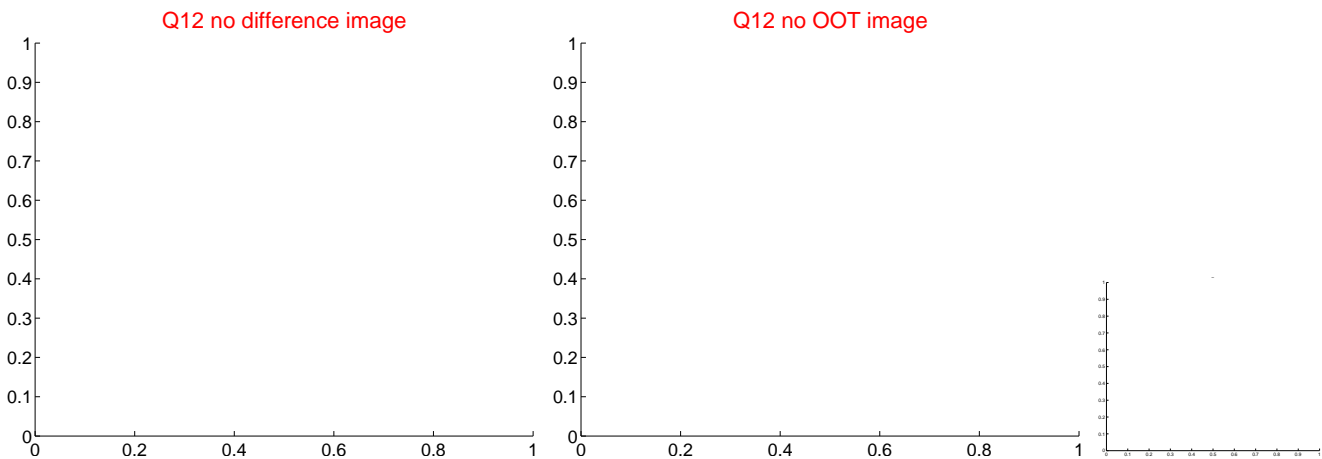
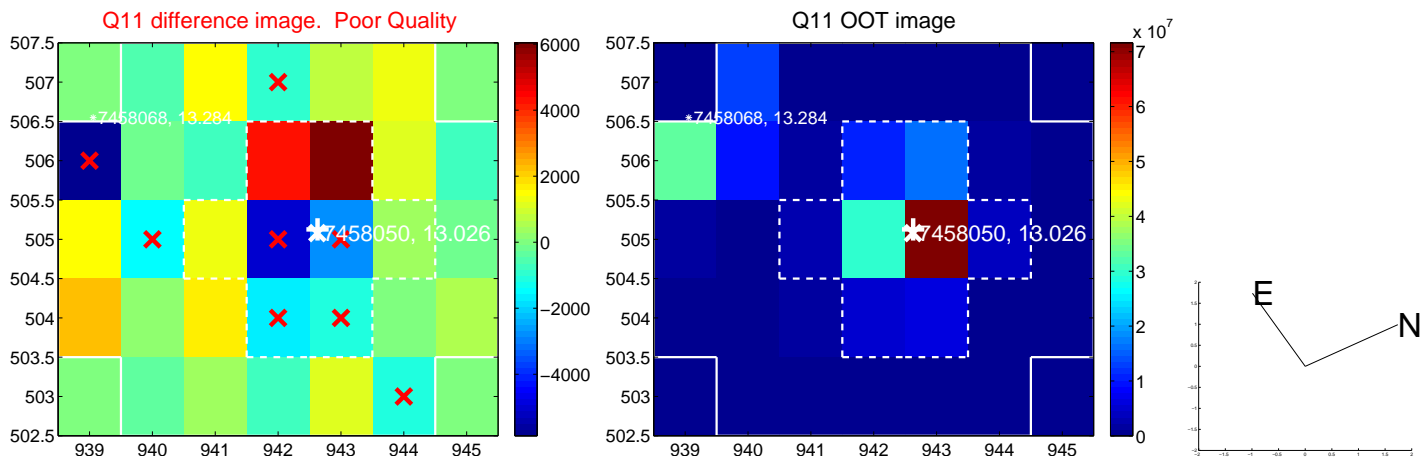
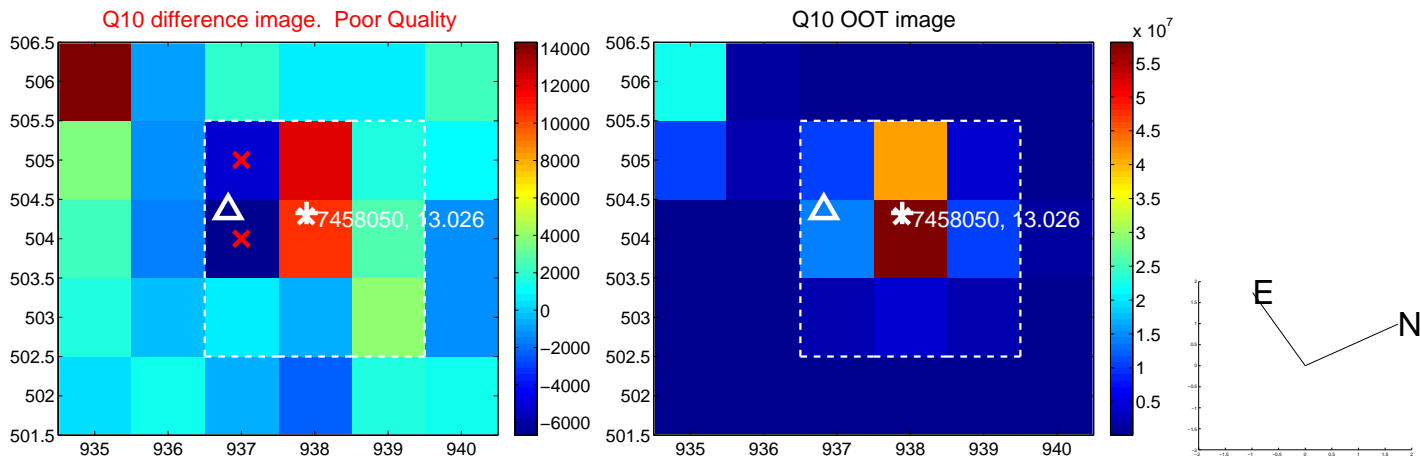
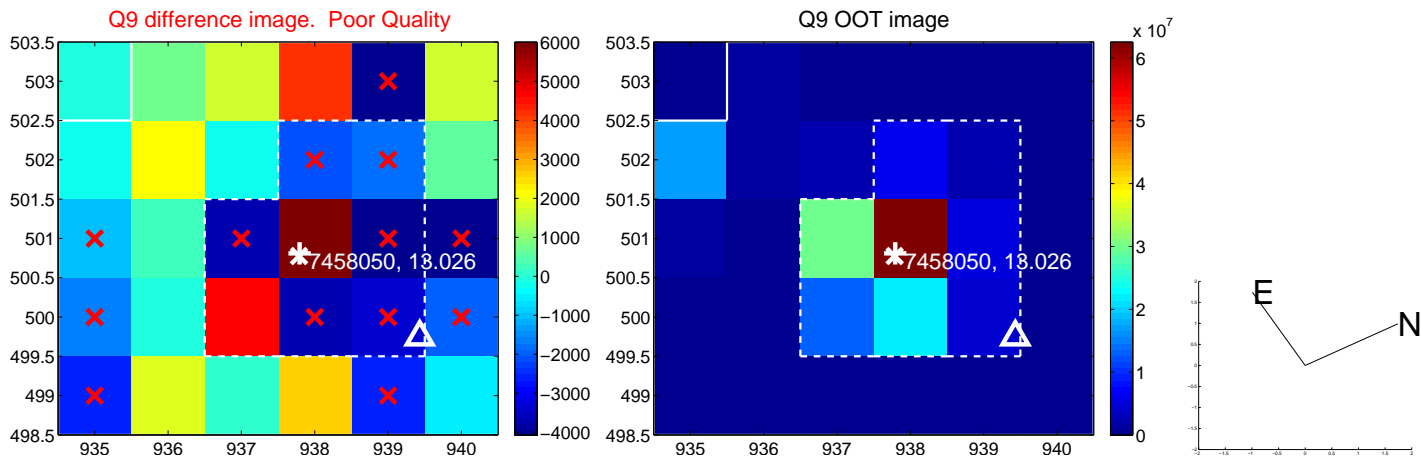
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



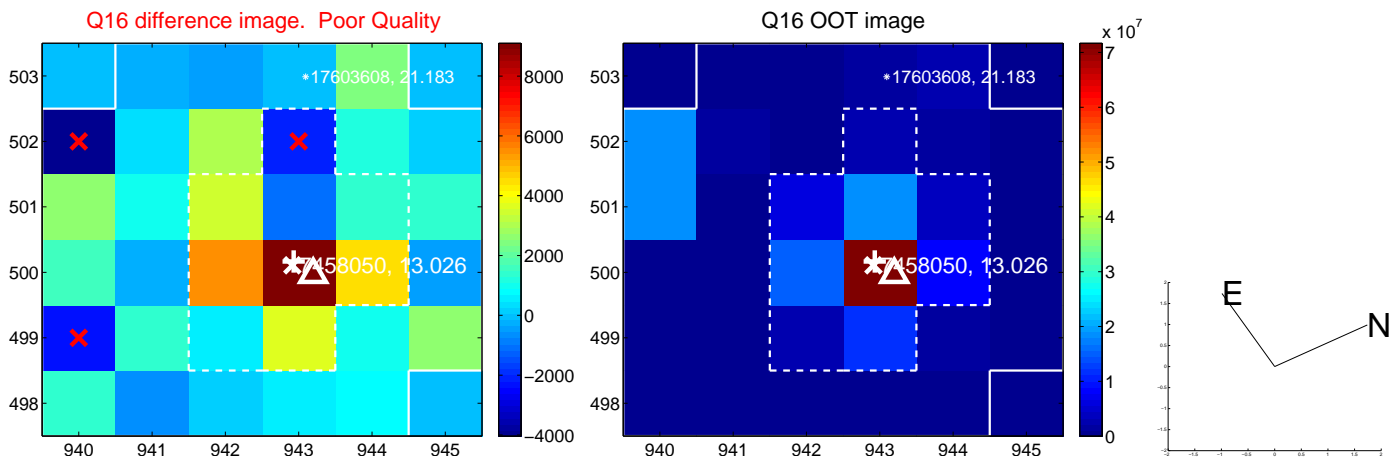
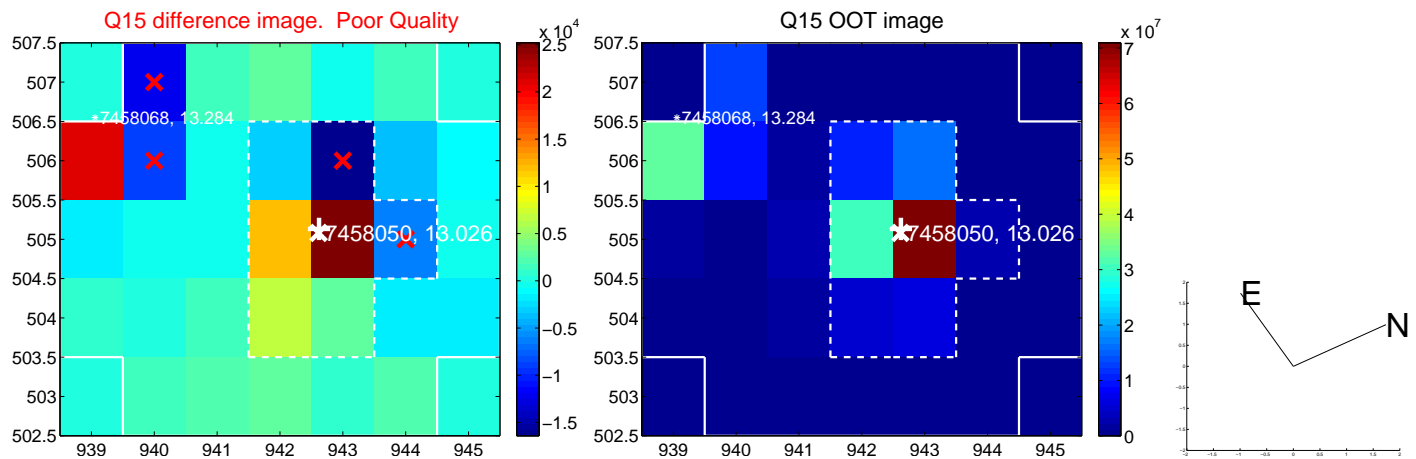
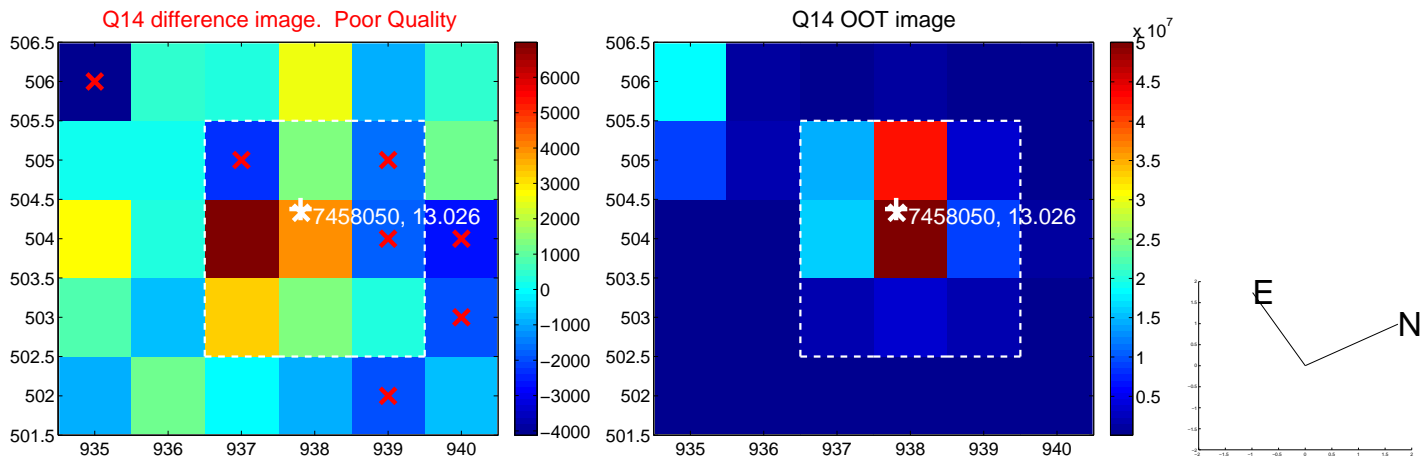
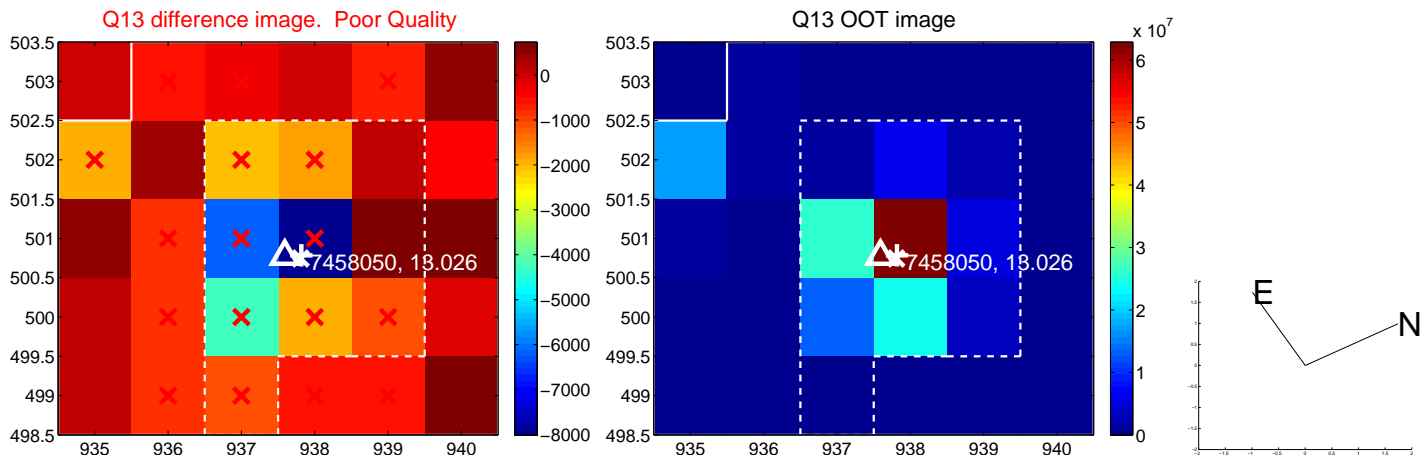
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



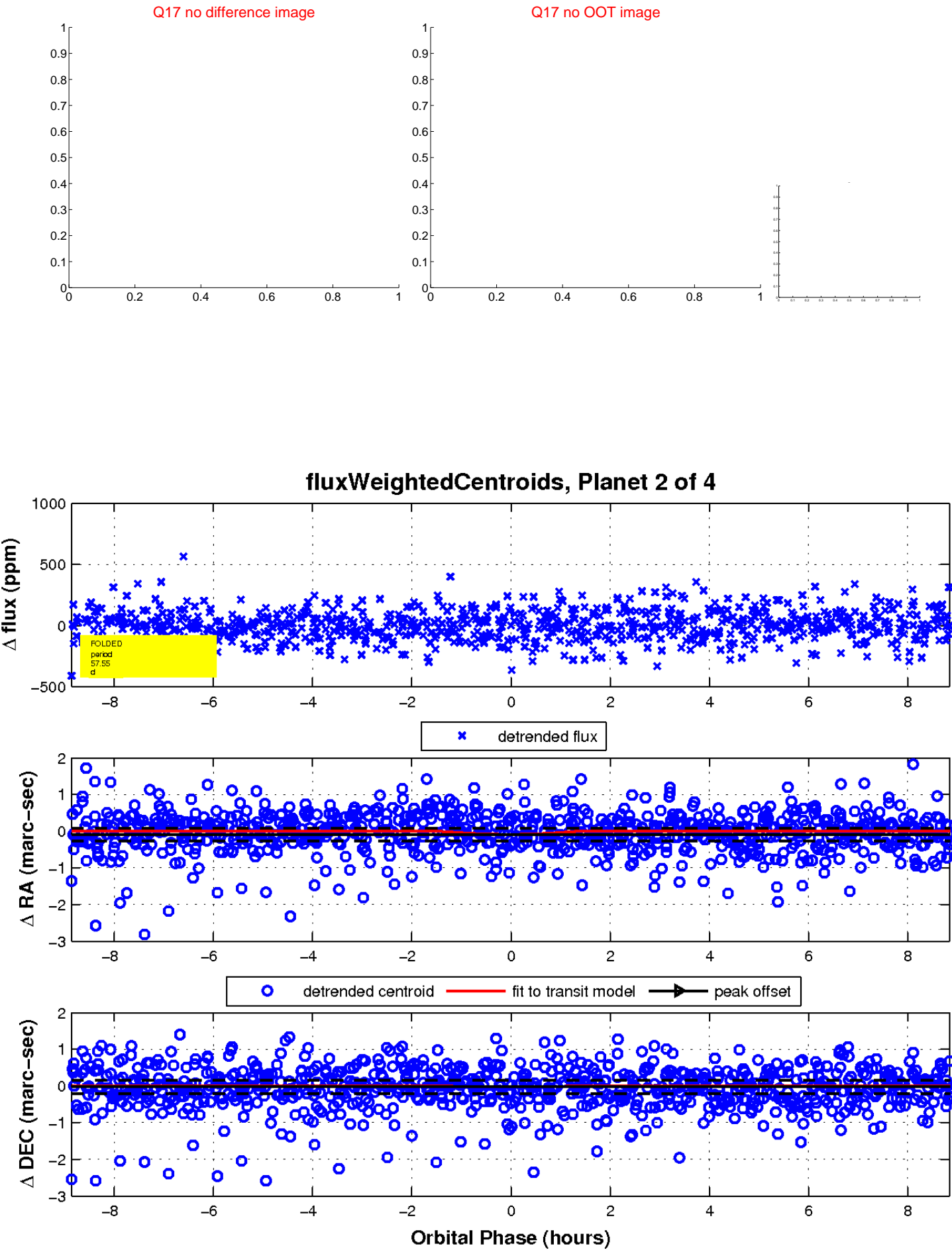
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

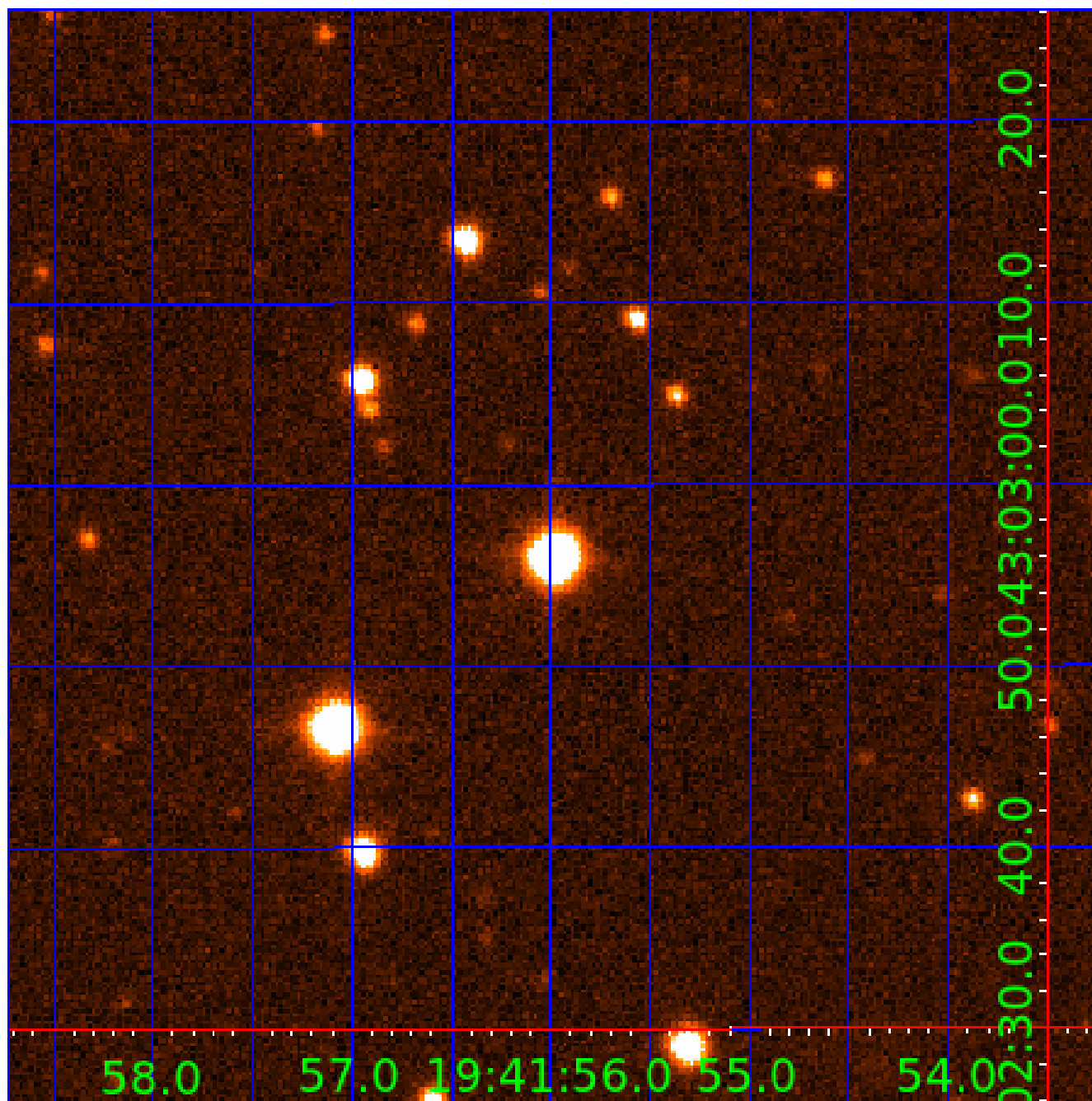


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007458050

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007458050-01 | OBS | No | 0.651776 | 132.097701 | 9.4 | 3.825 | 8.2 | 7.0 | 2.71 | 6865 | 0.96 | 49607.13 |
| 007458050-02 | OBS | No | 57.549431 | 155.812471 | 187.3 | 2.954 | 9.2 | 7.8 | 2.71 | 6865 | 5.08 | 126.17 |
| 007458050-03 | OBS | No | 116.697384 | 201.234447 | 197.4 | 2.894 | 7.8 | 7.4 | 2.71 | 6865 | 4.06 | 49.16 |
| 007458050-04 | OBS | No | 84.000754 | 192.639039 | 212.4 | 2.774 | 8.0 | 7.8 | 2.71 | 6865 | 4.55 | 76.20 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 007458050-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT |
| 007458050-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS |
| 007458050-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS |
| 007458050-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS |

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

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

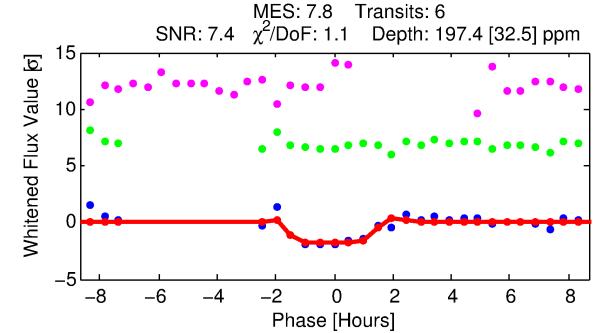
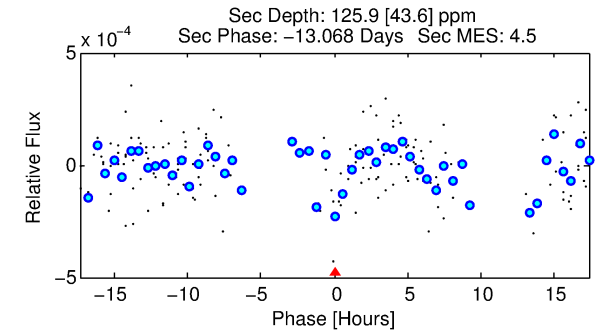
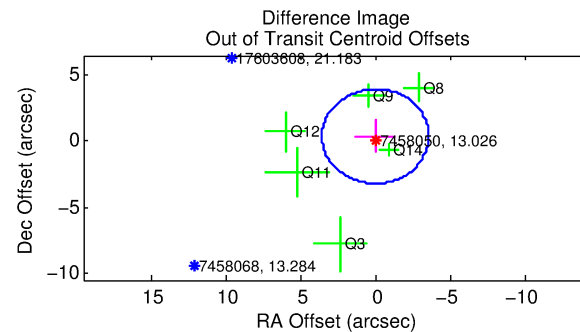
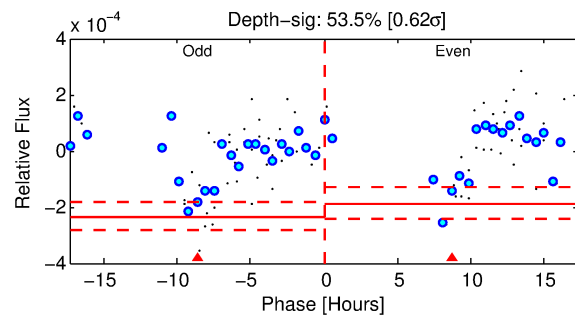
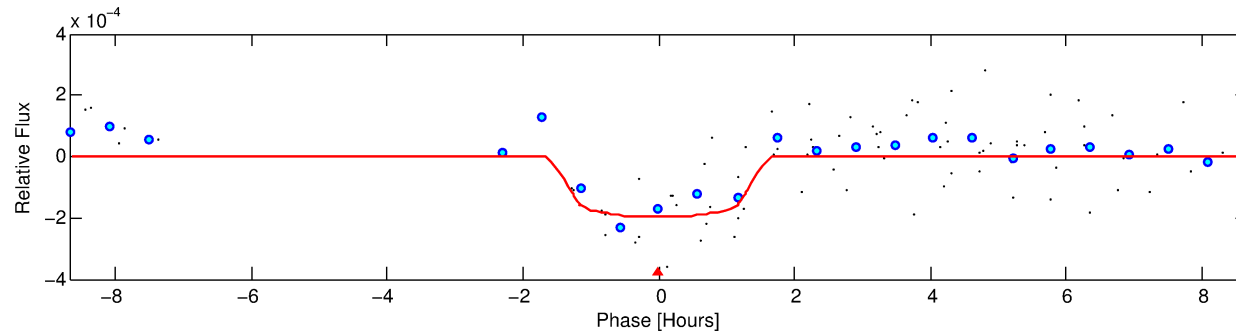
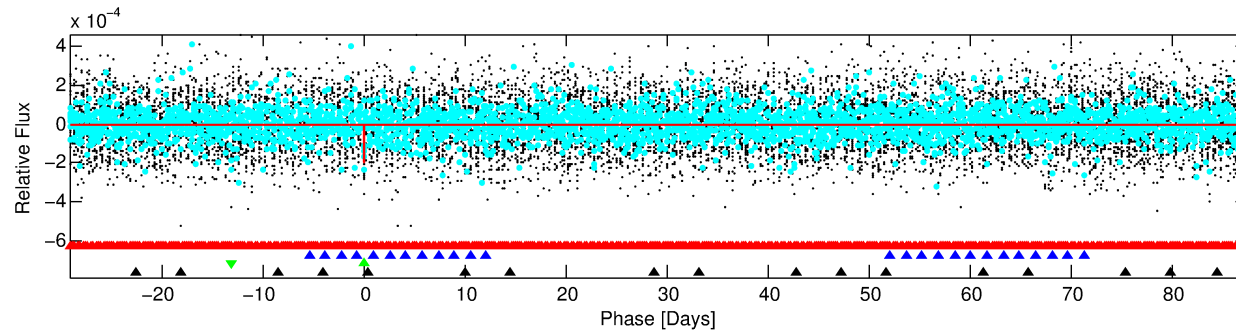
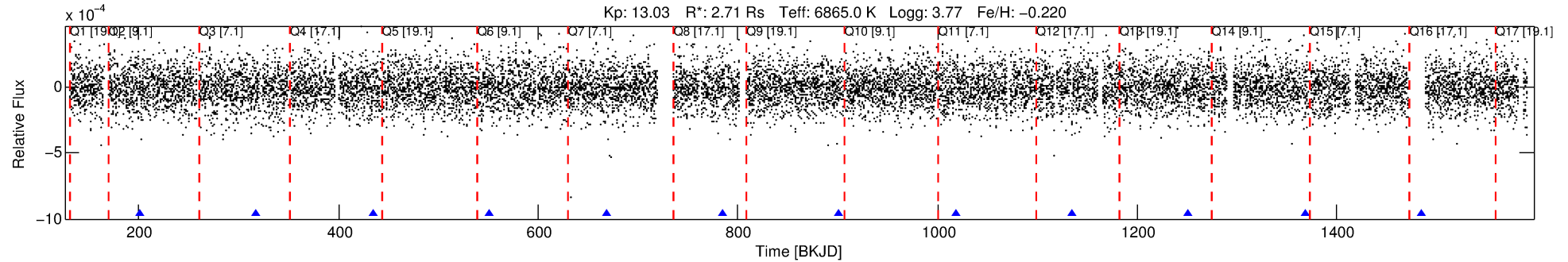
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007458050-03

No Significant Match Found

DV One-Page Summary

KIC: 7458050 Candidate: 3 of 4 Period: 116.697 d



DV Fit Results:

Period = 116.69738 [0.00167] d
Epoch = 201.2344 [0.0136] BKJD
Rp/R* = 0.0138 [0.0178]
a/R* = 229.95 [1733.02]
b = 0.69 [5.87]
Seff = 49.16 [24.52]
Teq = 675 [84] K
Rp = 4.06 [5.43] Re
a = 0.5444 [0.1679] AU
Ag = 1244.37 [3302.40] [0.38σ]
Teffp = 6200 [4050] K [1.36σ]

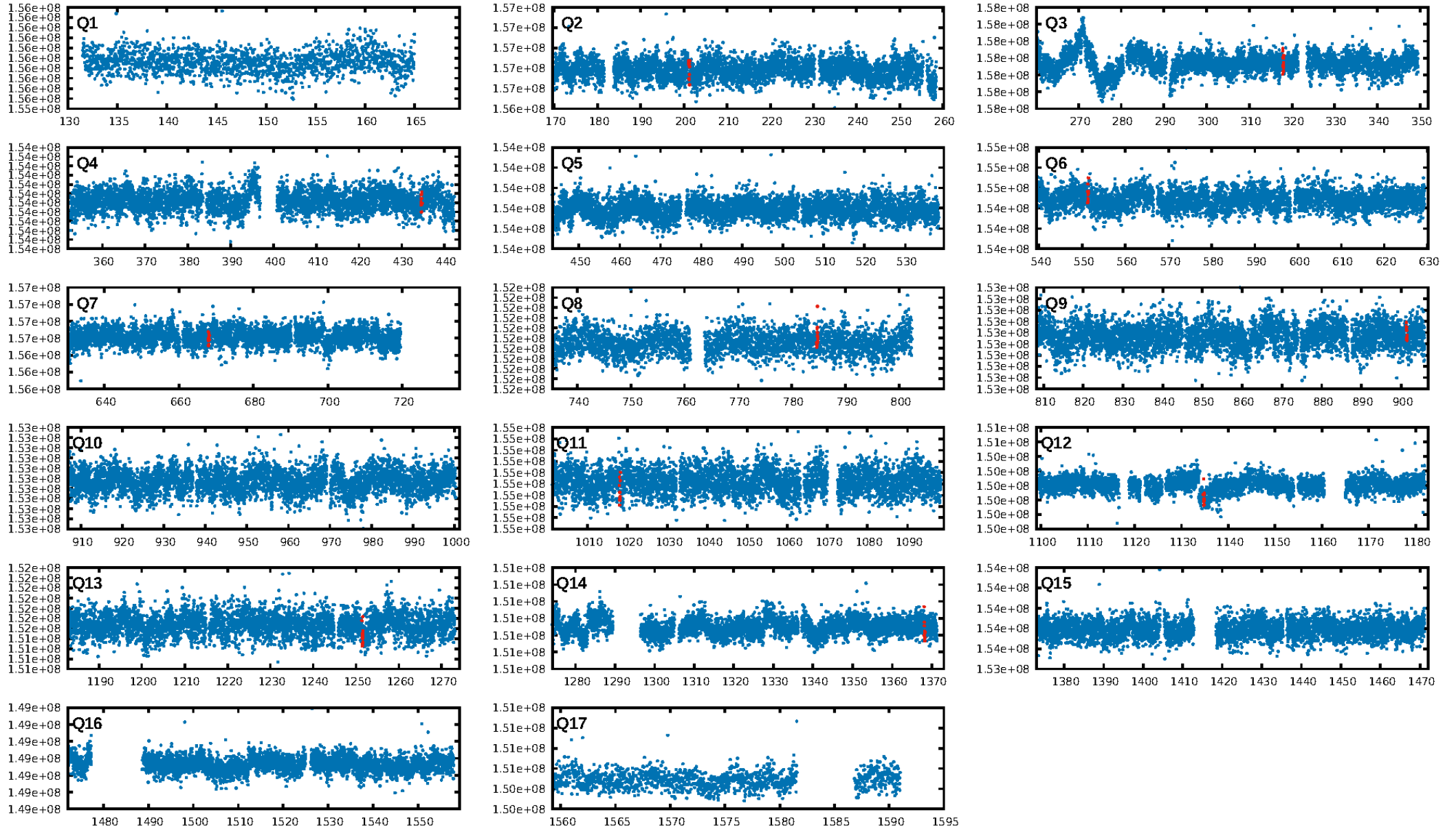
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [195.74σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 3.9%
ModelChiSquareGof-sig: 95.6%
Bootstrap-pfa: 2.89e-08
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: -6.474
Centroid-sig: 29.5%
Centroid-so: 1.041 arcsec [1.06σ]
OotOffset-rm: 0.372 arcsec [0.31σ]
OotOffset-st: 1/2/2/1 [6]
KicOffset-rm: 0.492 arcsec [0.35σ]
KicOffset-st: 1/2/2/1 [6]
DiffImageQuality-fgm: 0.17 [1/6]
DiffImageOverlap-fno: 0.00 [0/11]

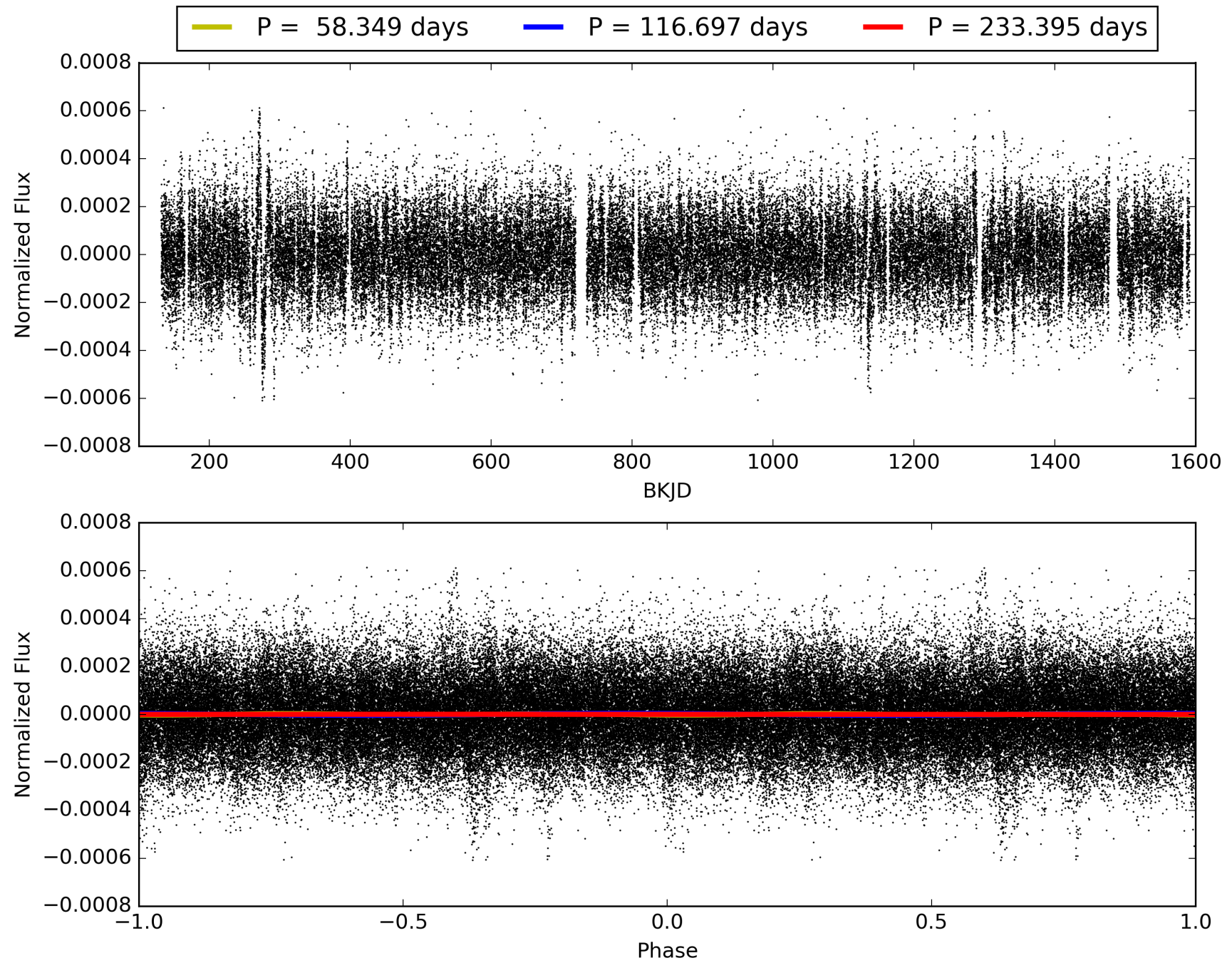
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:01:31 Z

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

TCE 007458050-03, PDC Light Curves

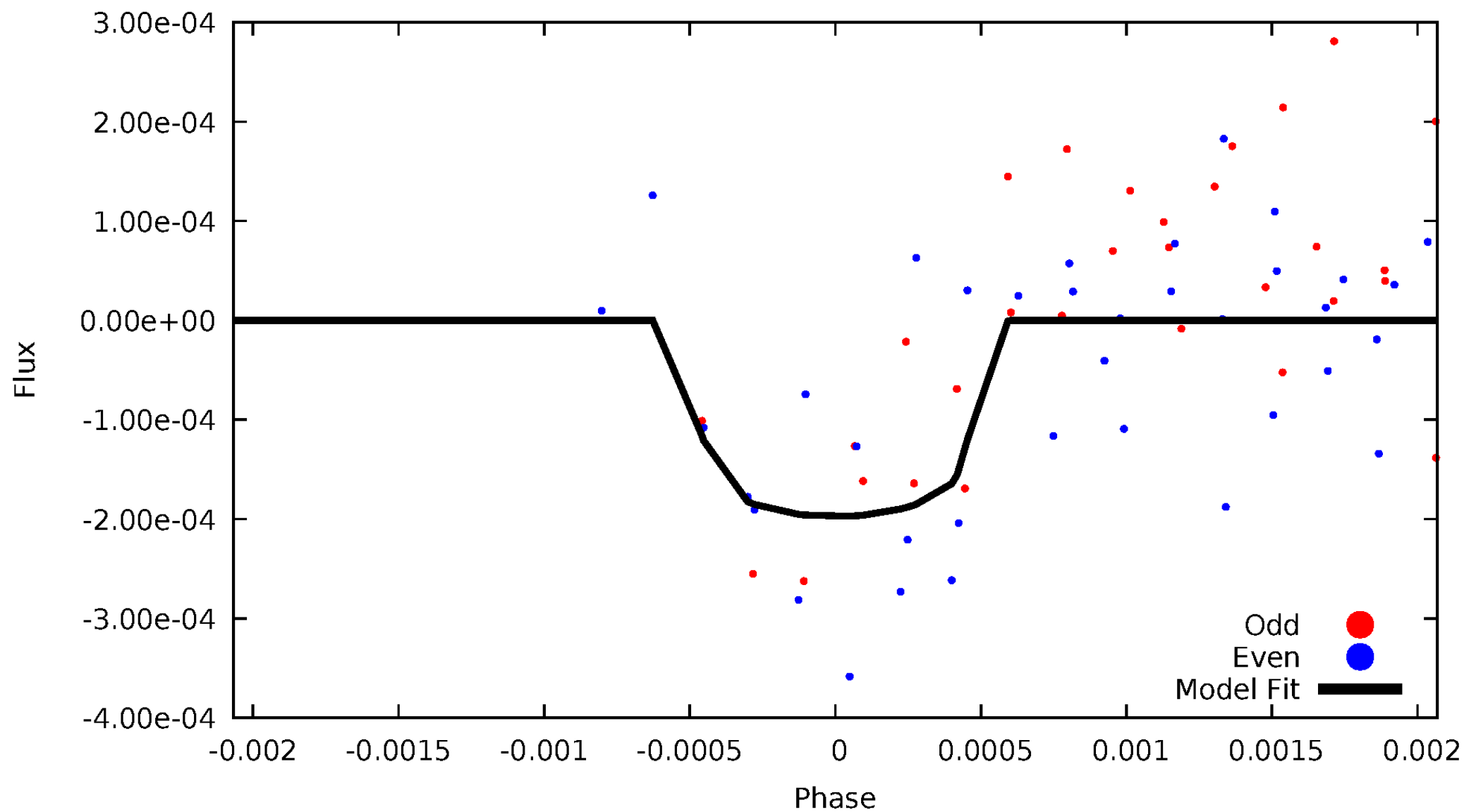


TCE 007458050-03



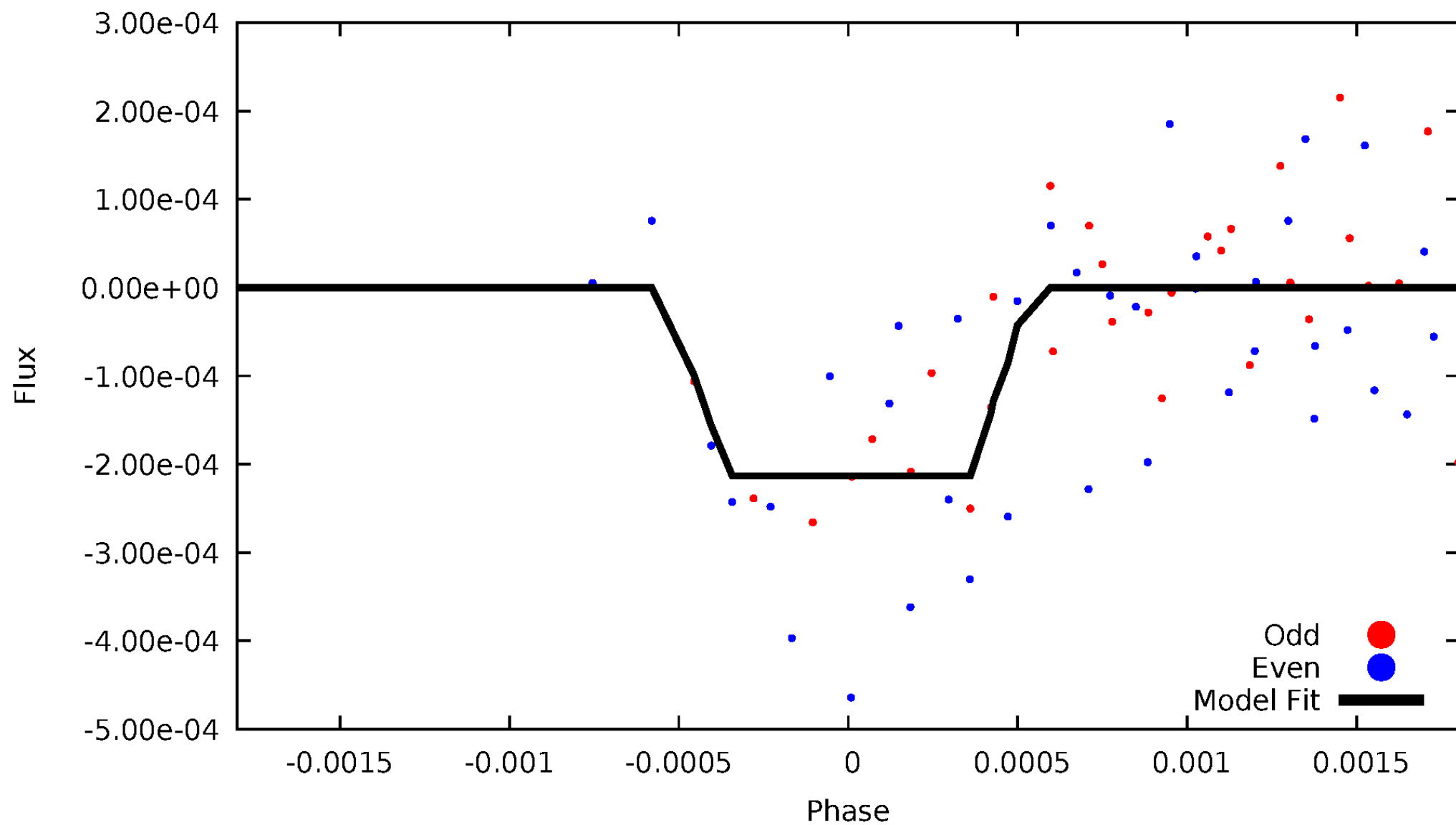
DV Odd/Even

TCE 007458050-03



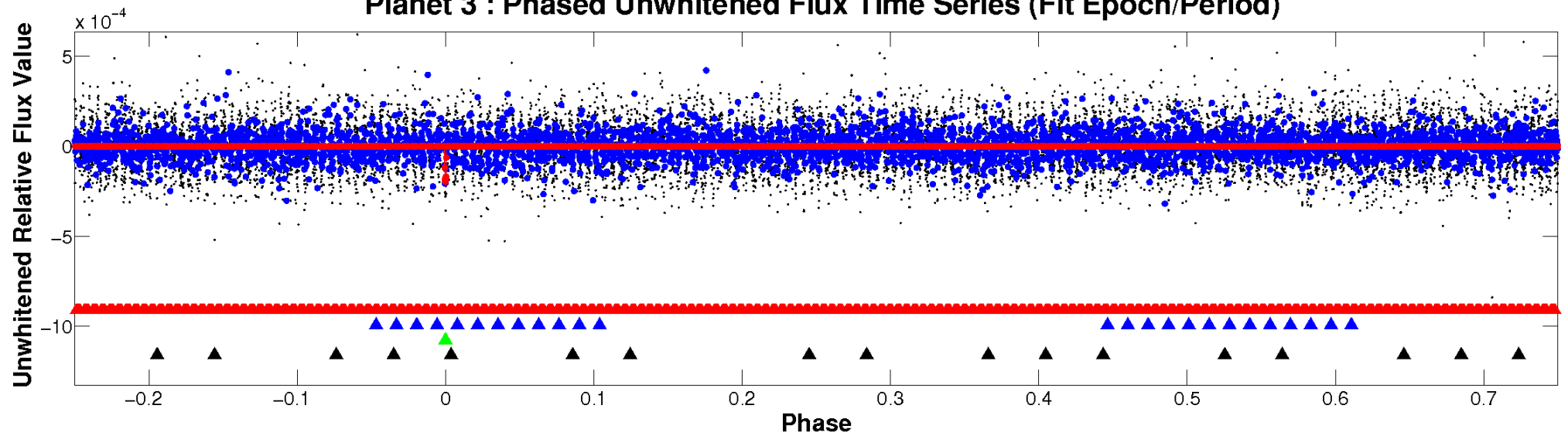
ALT Odd/Even

TCE 007458050-03

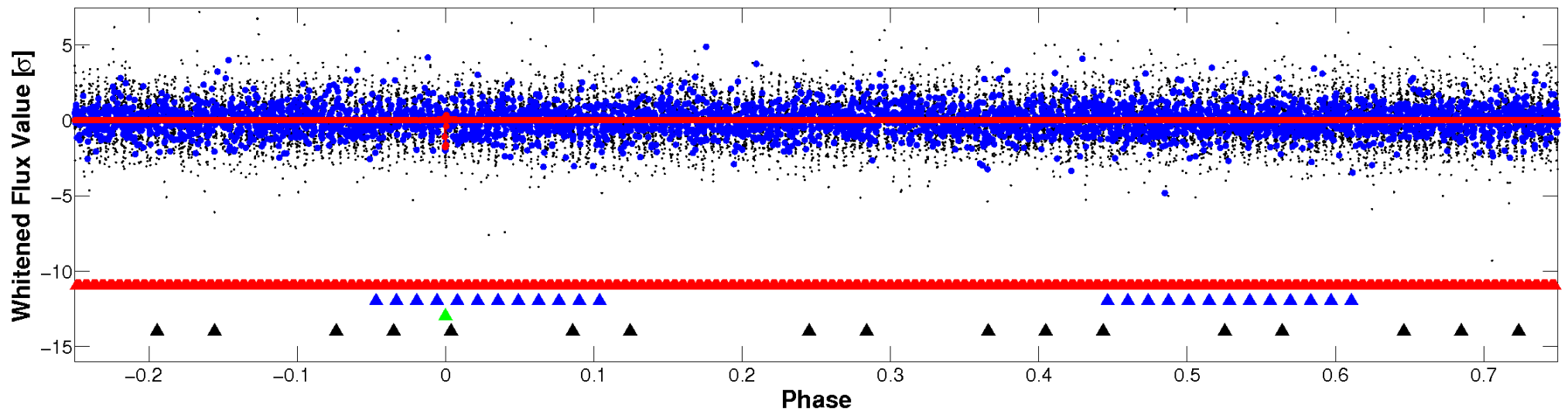


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

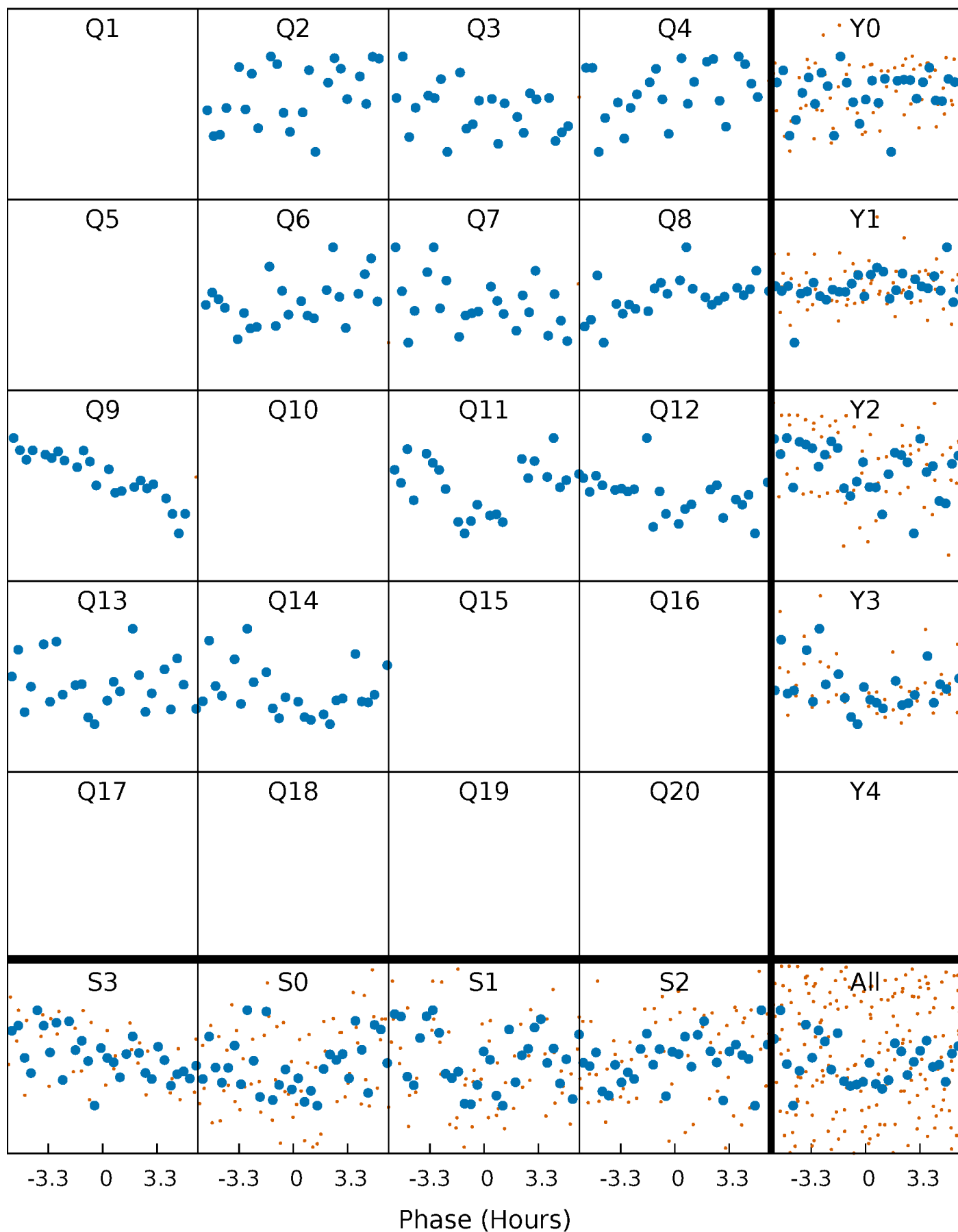


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



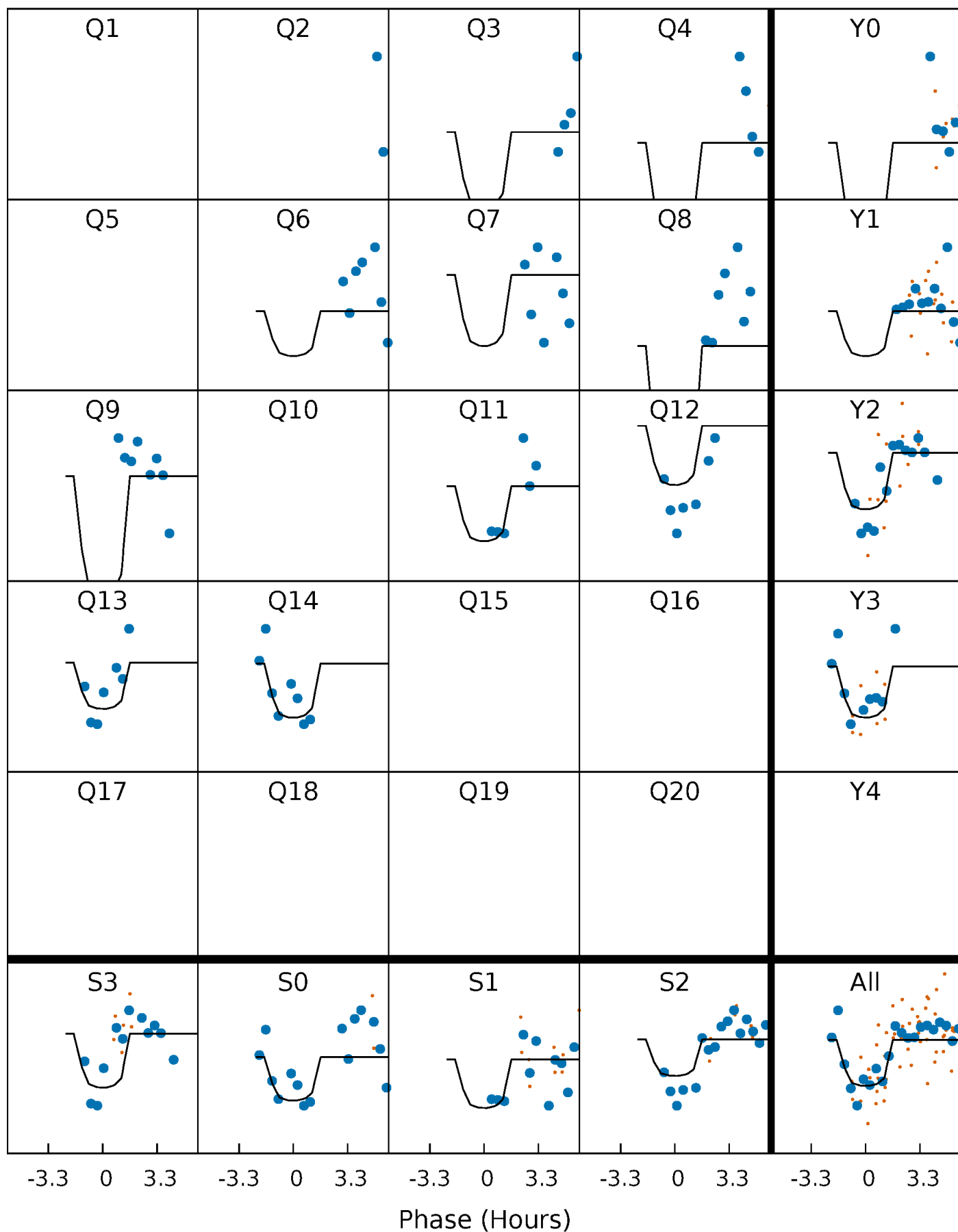
PDC Quarter-Phased Transit Curves

TCE 007458050-03 P=116.697384 Days $T_0=201.234447$ (BKJD)



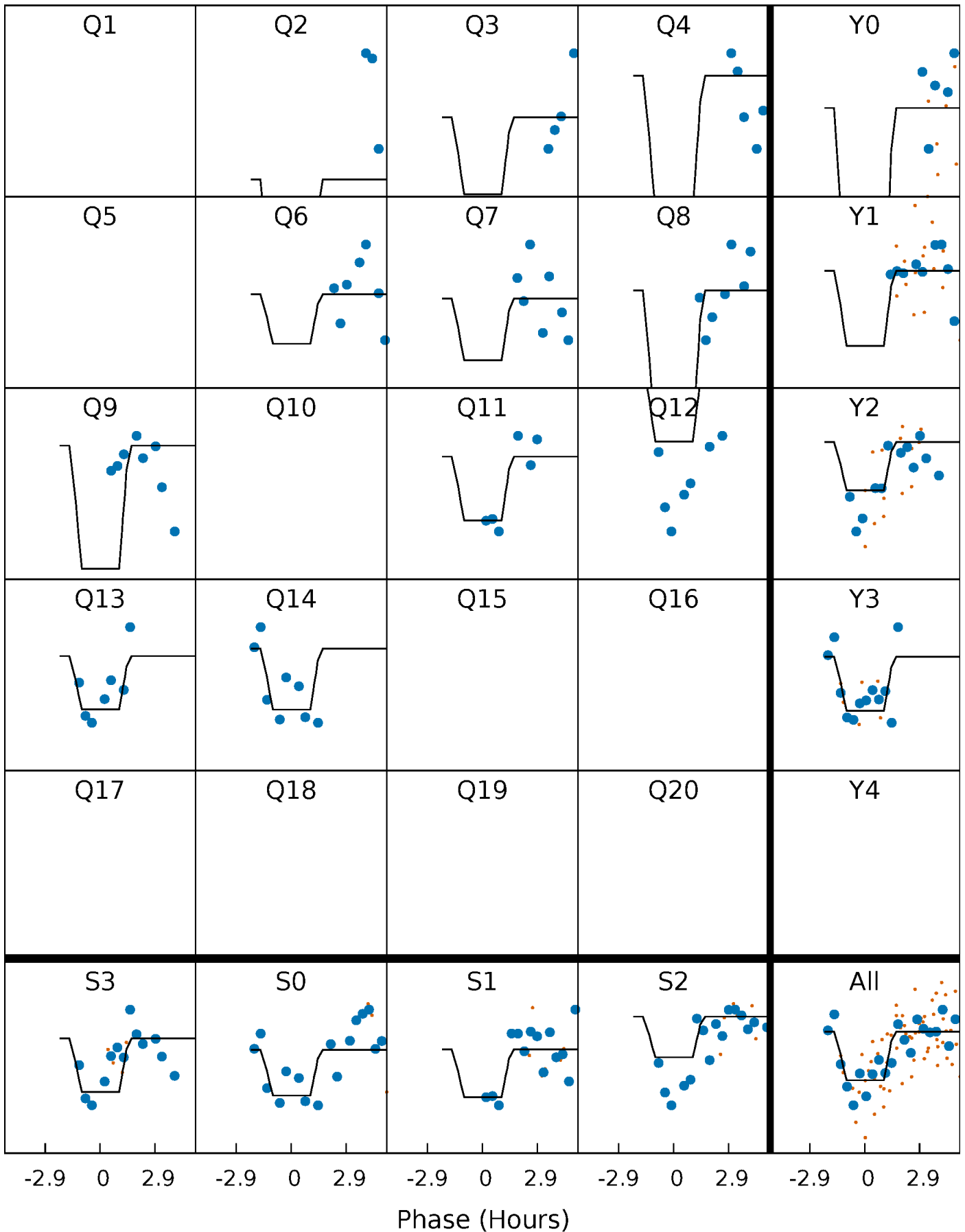
DV Quarter-Phased Transit Curves

TCE 007458050-03 P=116.697384 Days $T_0=201.234447$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

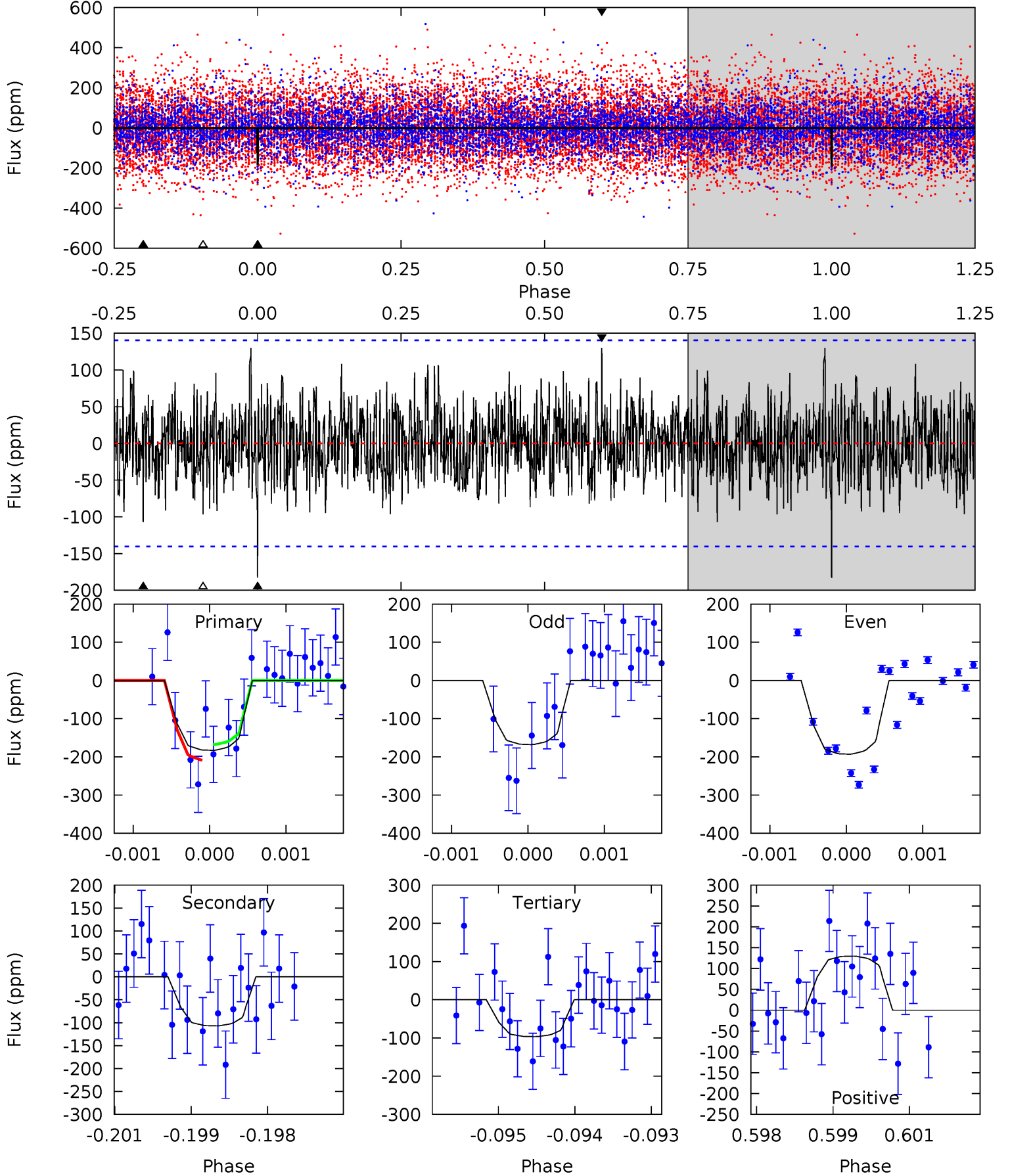
TCE 007458050-03 P=116.692194 Days $T_0=201.280775$ (BKJD)



DV Model-Shift Uniqueness Test

007458050-03, $P = 116.697384$ Days, $E = 84.537063$ Days

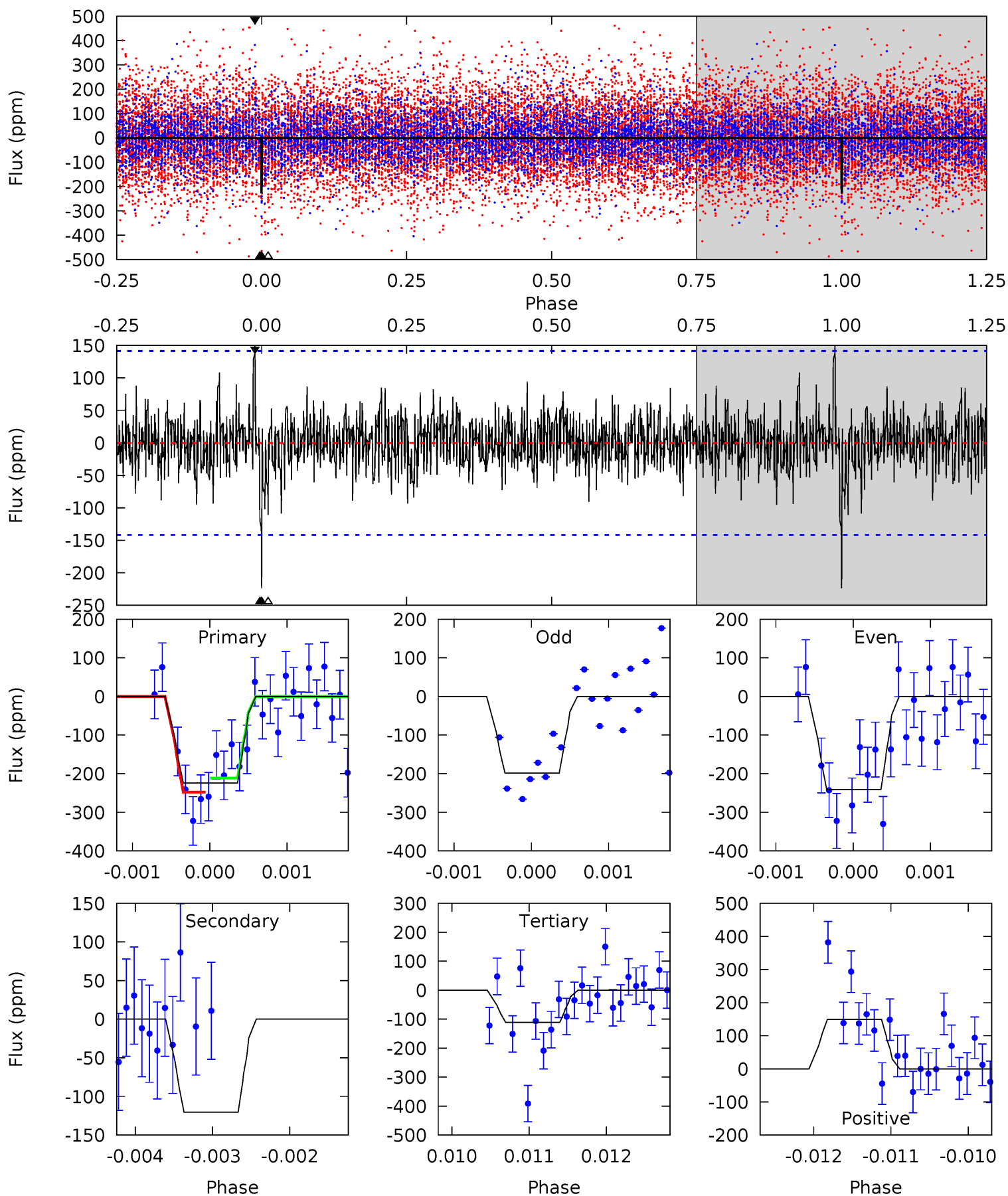
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.09 | 4.15 | 3.74 | 5.03 | 5.44 | 3.27 | 1.33 | 3.35 | 2.06 | 0.41 | -0.88 | 0.48 | 0.87 | 0.41 | 0.74 |



Alt Model-Shift Uniqueness Test

007458050-03, P = 116.692194 Days, E = 84.588581 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.62 | 4.63 | 4.27 | 5.75 | 5.45 | 3.29 | 1.11 | 4.34 | 2.87 | 0.36 | -1.12 | 0.81 | 1.01 | 0.40 | 0.62 |



Stellar Parameters For KIC 007458050

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6865^{+183}_{-224} | $3.772^{+0.278}_{-0.093}$ | $-0.220^{+0.300}_{-0.250}$ | $2.706^{+0.487}_{-0.904}$ | $1.579^{+0.243}_{-0.297}$ | $0.112^{+0.211}_{-0.033}$ |
| | +3%/-3% | +7%/-2% | +136%/-114% | +18%/-33% | +15%/-19% | +188%/-29% |
| Source | PHO1 | FLK73 | 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 007458050-03 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|------------------------|----------------------|
| DV | -107 ± 26 | $5.08^{+4.60}_{-3.44}$ | 927^{+53}_{-79} | 5201^{+4433}_{-1182} | 689^{+6113}_{-508} |
| Alt. | -120 ± 26 | $5.12^{+4.98}_{-3.27}$ | 924^{+59}_{-79} | 5267^{+4221}_{-1192} | 702^{+5066}_{-510} |

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

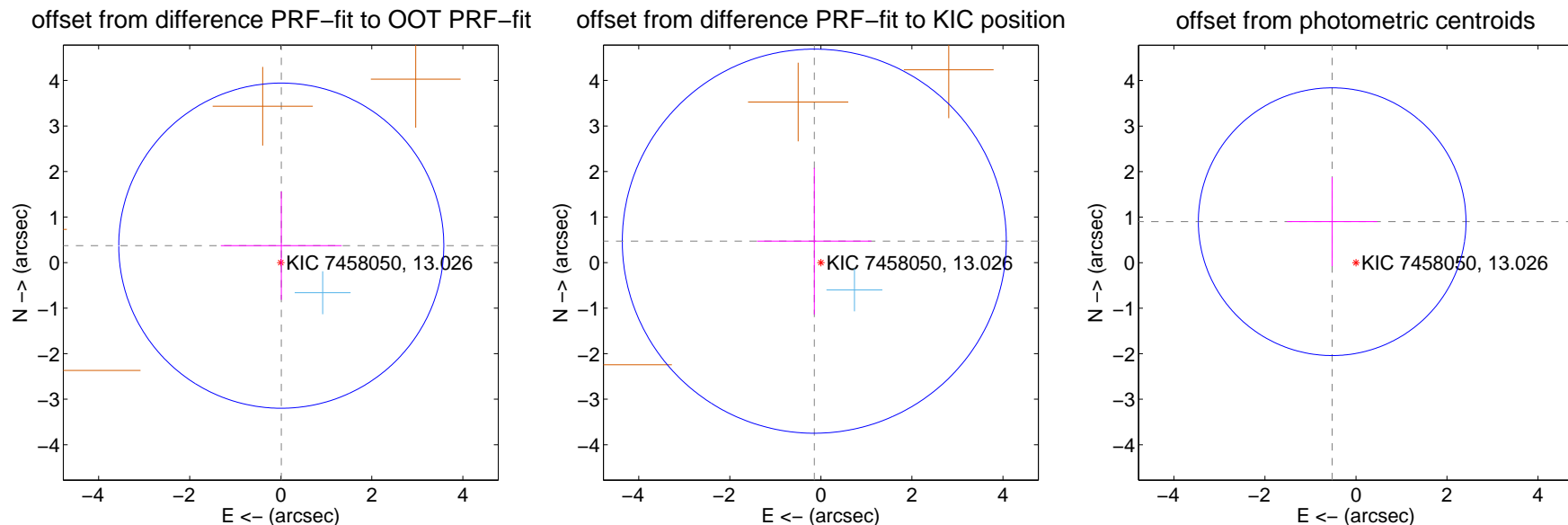
DV Centroid Data

Supplemental centroid analysis for 007458050-03. Kepler magnitude: 13.03. Transit SNR 7.44

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.372 ± 1.190 | 0.31 | -0.011 ± 1.329 | 0.372 ± 1.190 |
| PRF-fit source offset from KIC position | 0.492 ± 1.406 | 0.35 | 0.144 ± 1.256 | 0.470 ± 1.610 |
| photometric centroid source offset | 1.04 ± 0.98 | 1.06 | 0.52 ± 0.99 | 0.90 ± 0.98 |



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.

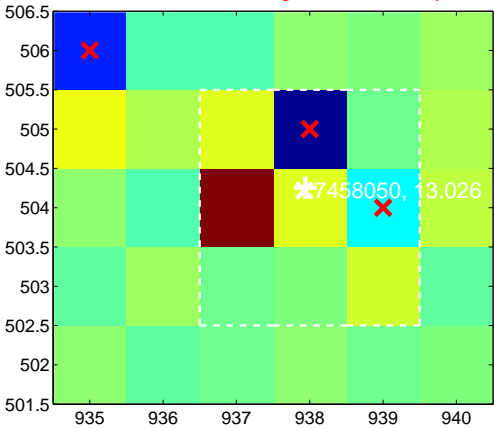
Q1 no difference image



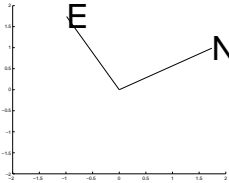
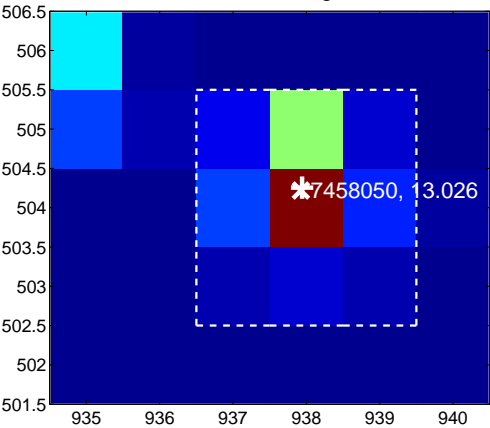
Q1 no OOT image



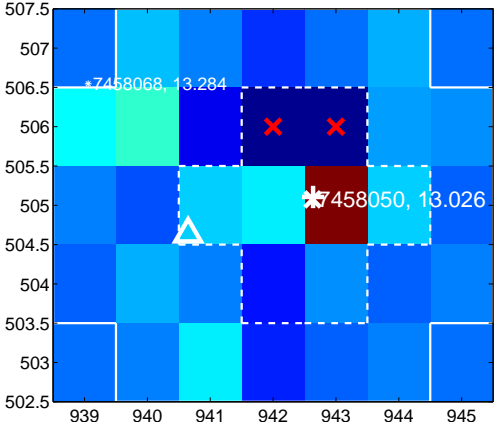
Q2 difference image. Poor Quality



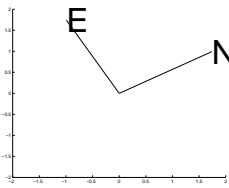
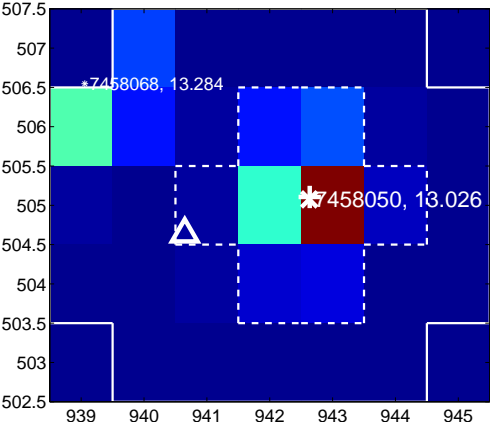
Q2 OOT image



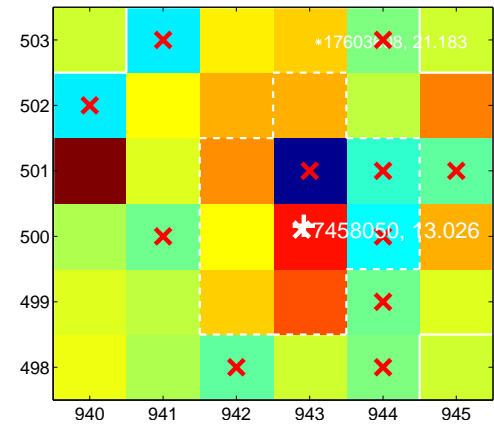
Q3 difference image. Poor Quality



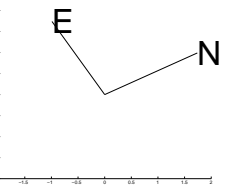
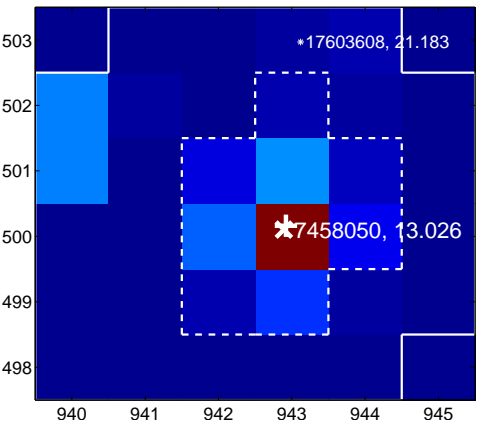
Q3 OOT image



Q4 difference image. Poor Quality



Q4 OOT image



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

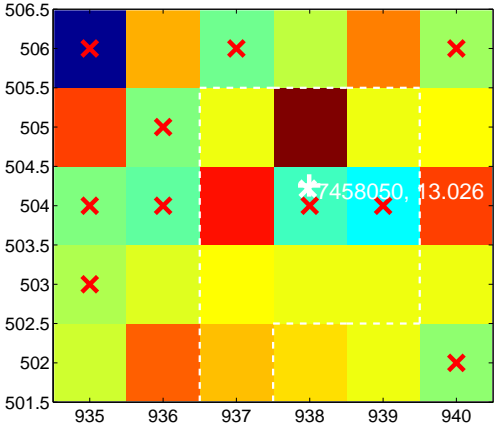
Q5 no difference image



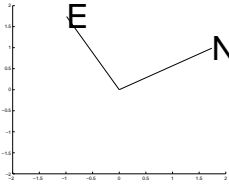
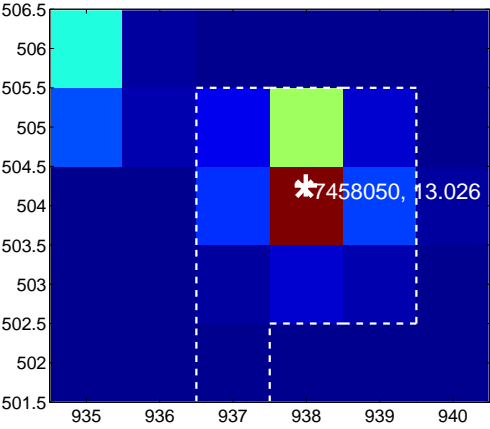
Q5 no OOT image



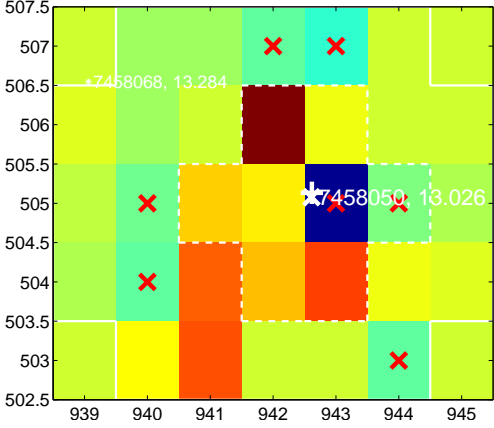
Q6 difference image. Poor Quality



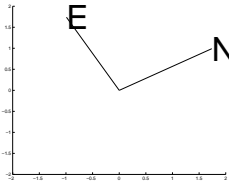
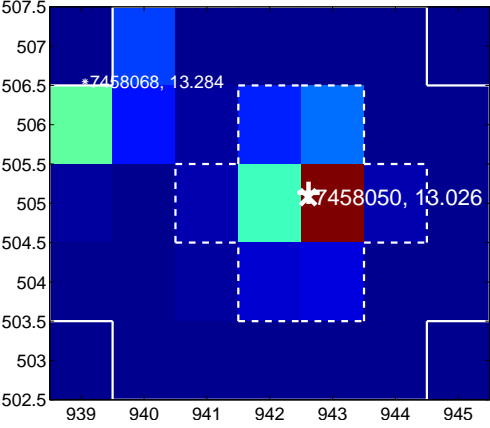
Q6 OOT image



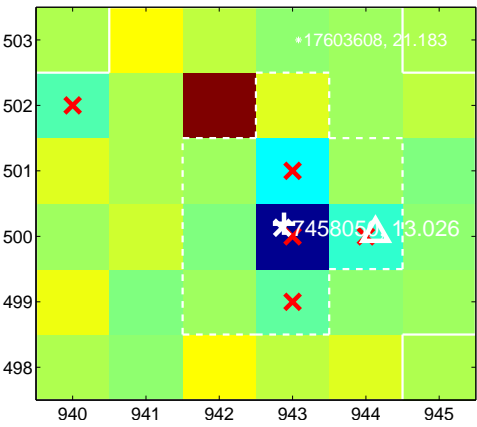
Q7 difference image. Poor Quality



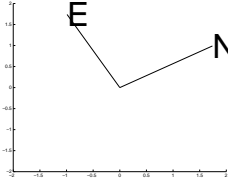
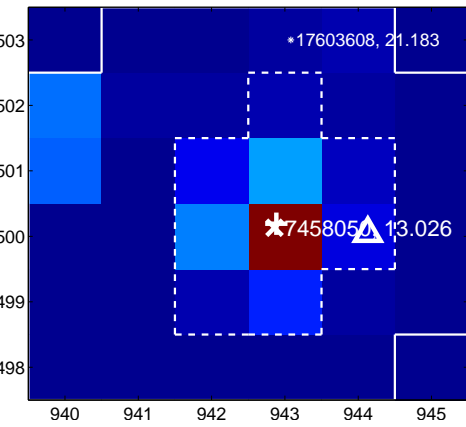
Q7 OOT image



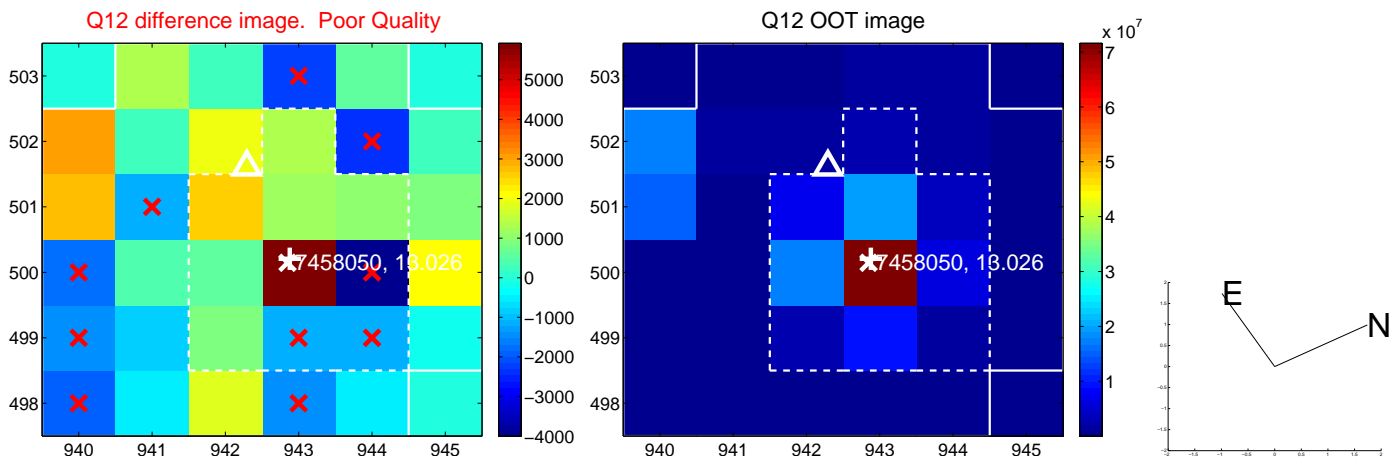
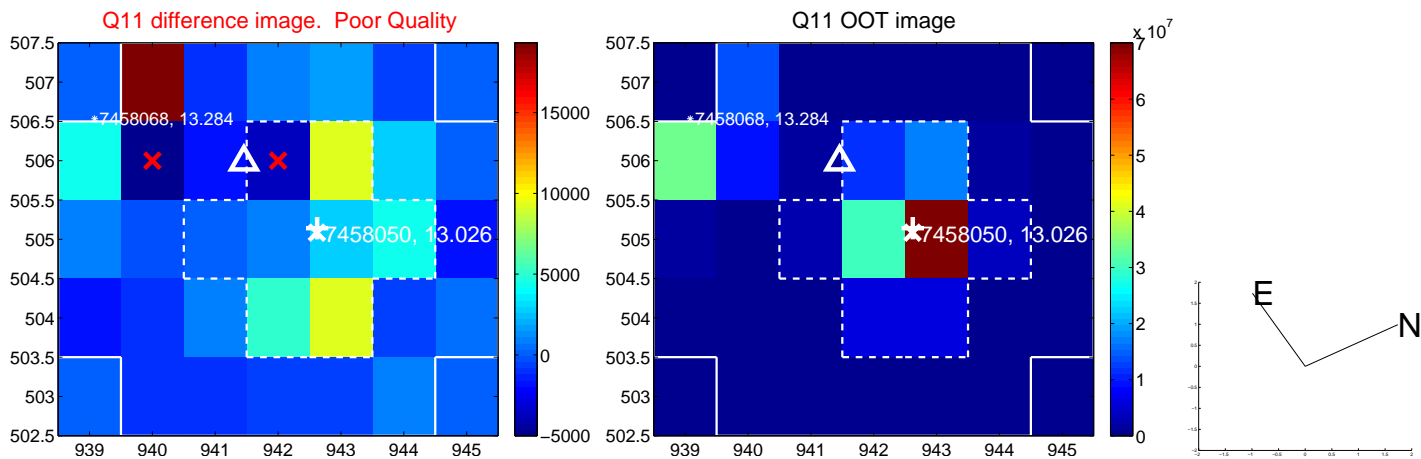
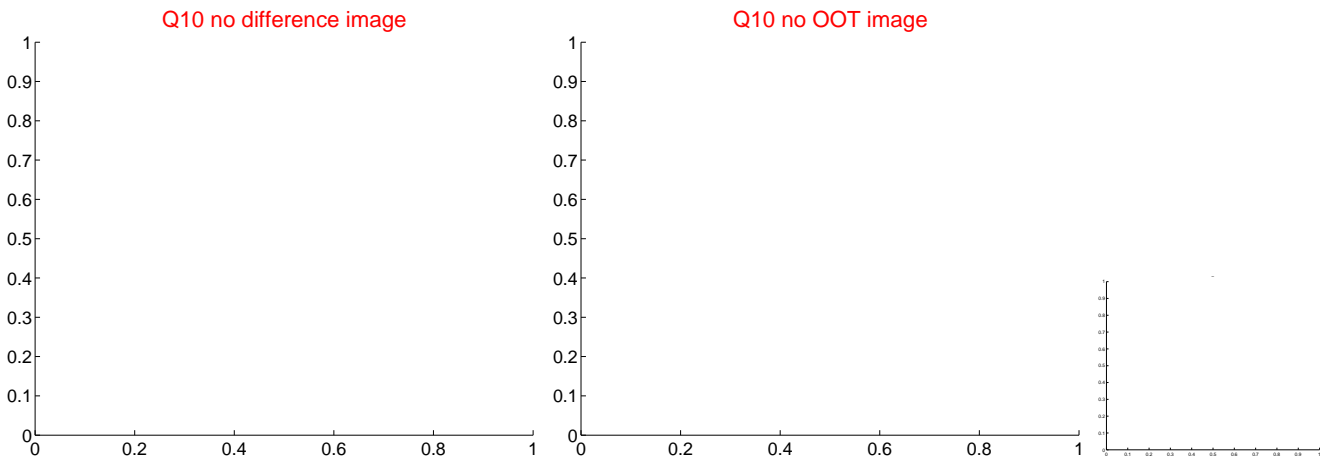
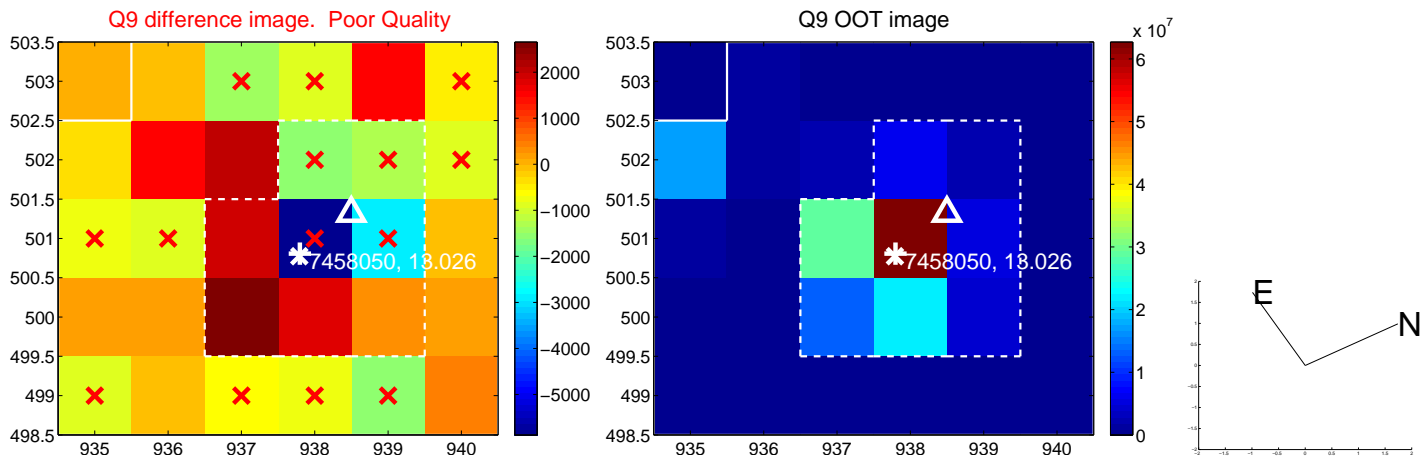
Q8 difference image. Poor Quality



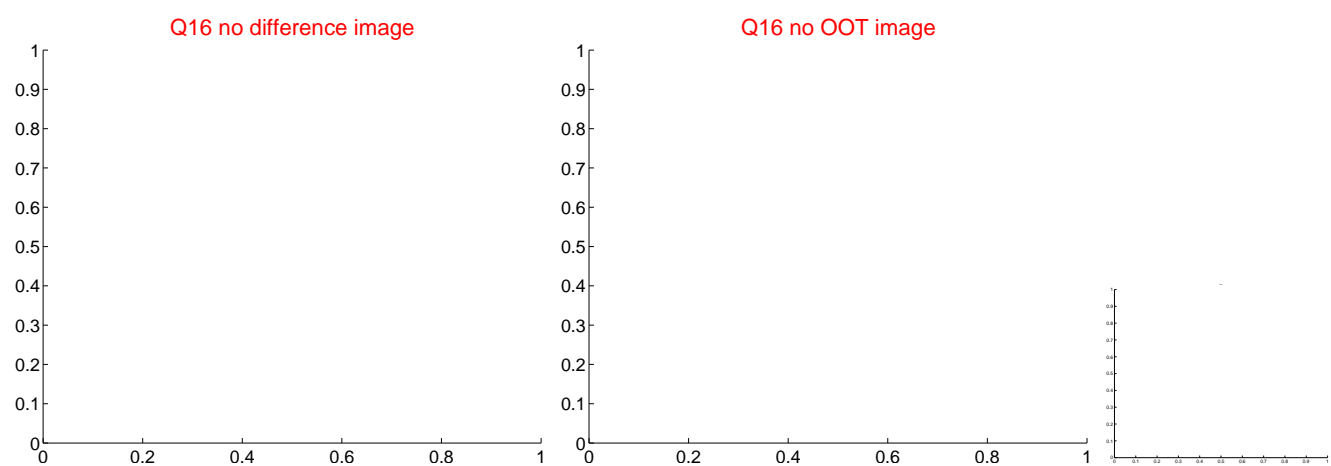
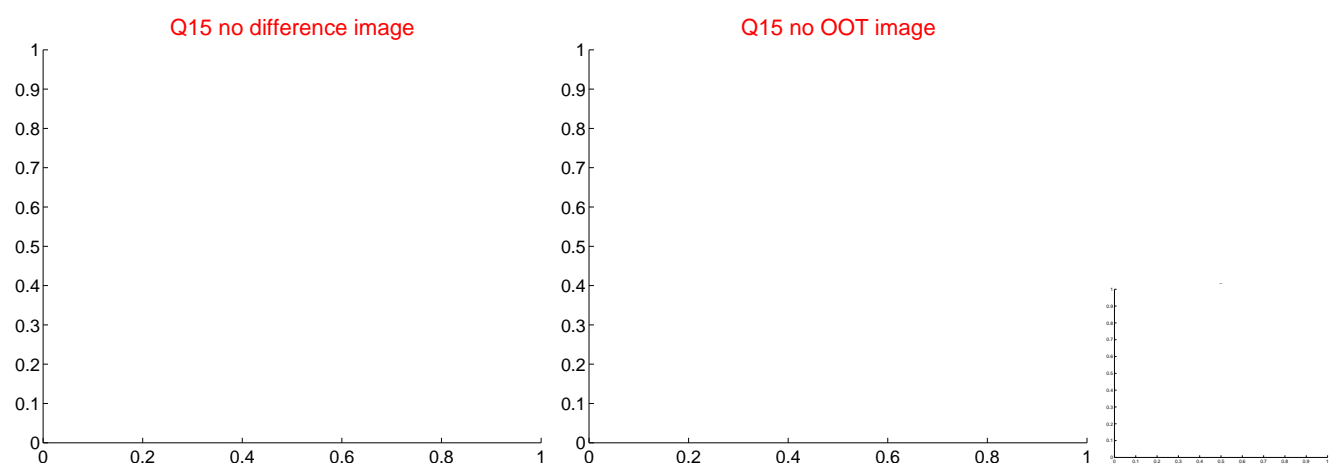
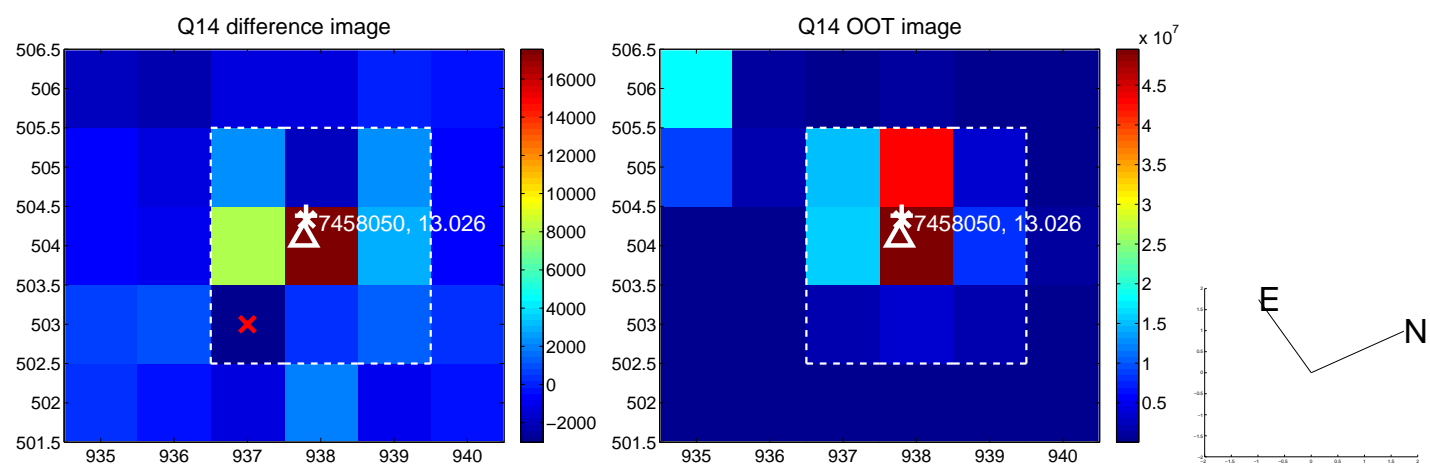
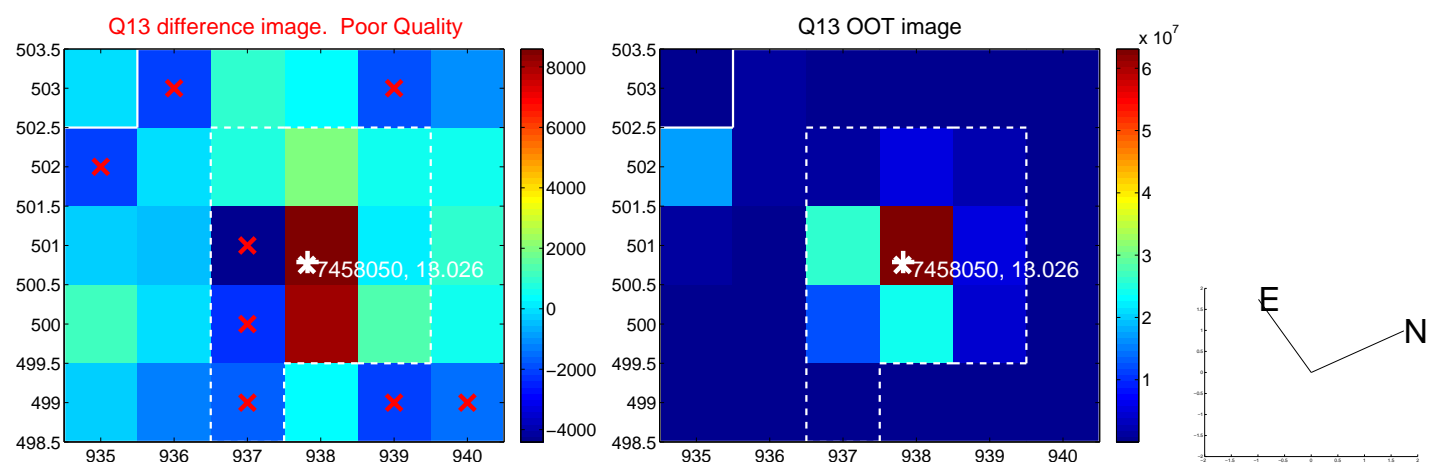
Q8 OOT image



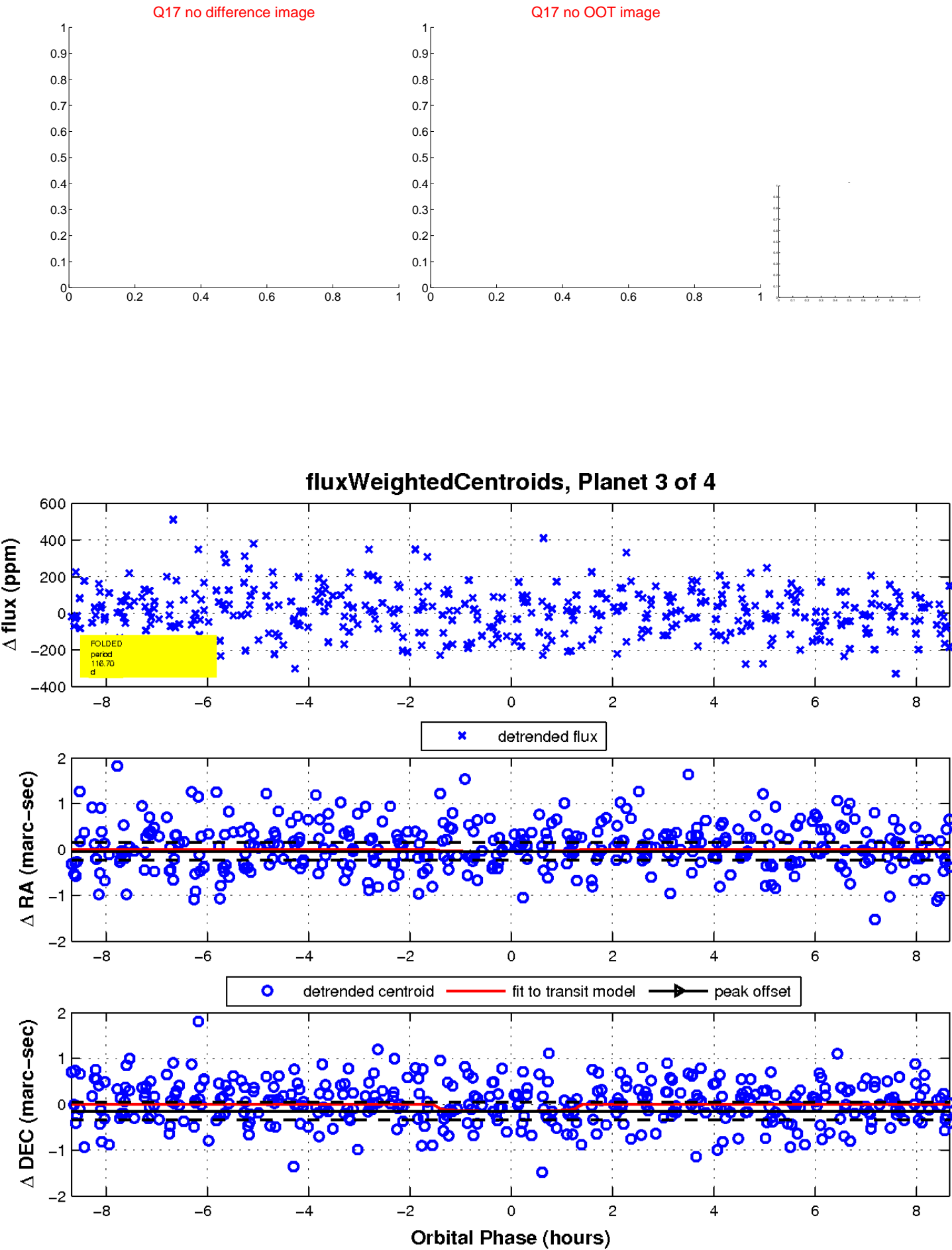
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

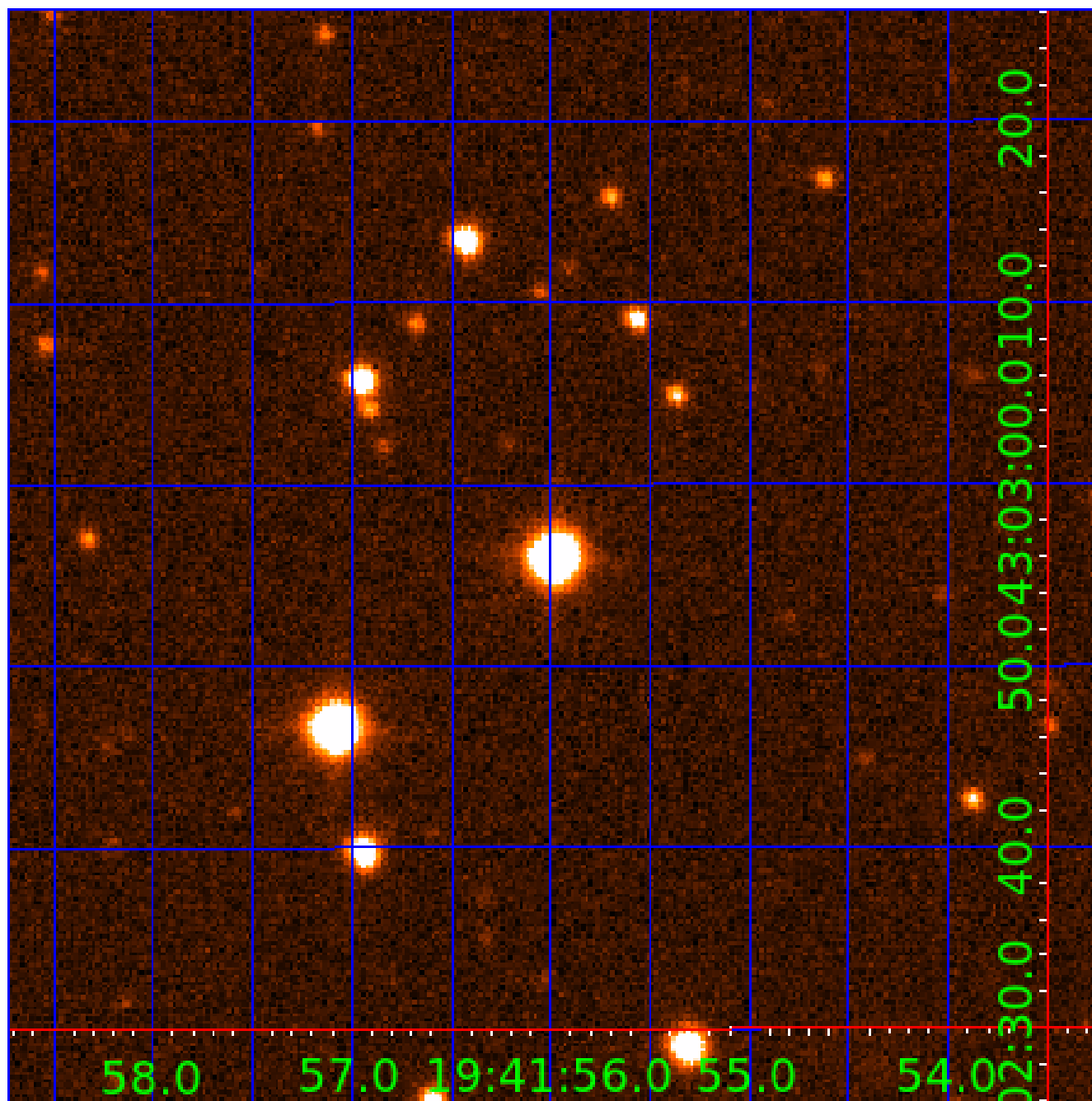


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007458050

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 007458050-01 | OBS | No | 0.651776 | 132.097701 | 9.4 | 3.825 | 8.2 | 7.0 | 2.71 | 6865 | 0.96 | 49607.13 |
| 007458050-02 | OBS | No | 57.549431 | 155.812471 | 187.3 | 2.954 | 9.2 | 7.8 | 2.71 | 6865 | 5.08 | 126.17 |
| 007458050-03 | OBS | No | 116.697384 | 201.234447 | 197.4 | 2.894 | 7.8 | 7.4 | 2.71 | 6865 | 4.06 | 49.16 |
| 007458050-04 | OBS | No | 84.000754 | 192.639039 | 212.4 | 2.774 | 8.0 | 7.8 | 2.71 | 6865 | 4.55 | 76.20 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---|
| 007458050-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT |
| 007458050-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS |
| 007458050-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS |
| 007458050-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_MEAS |

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

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

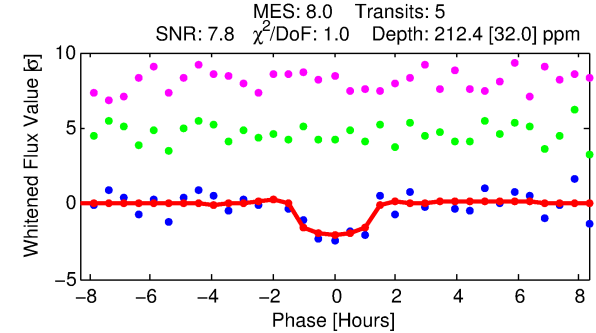
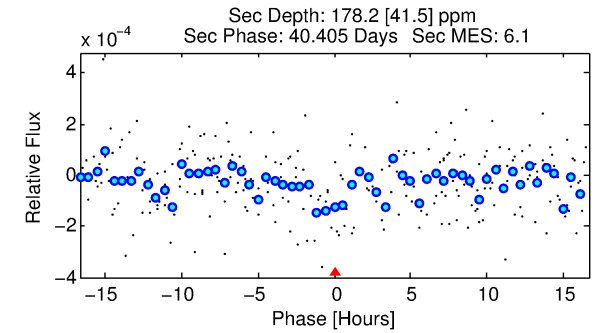
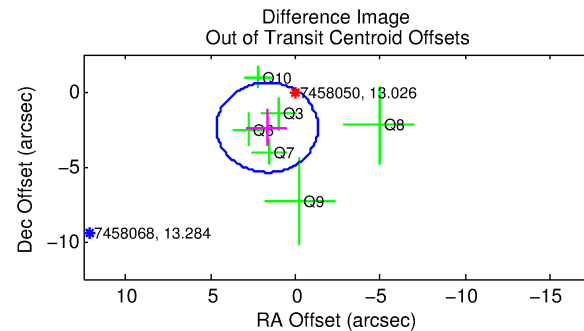
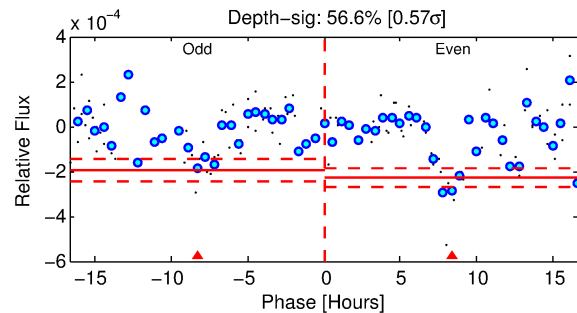
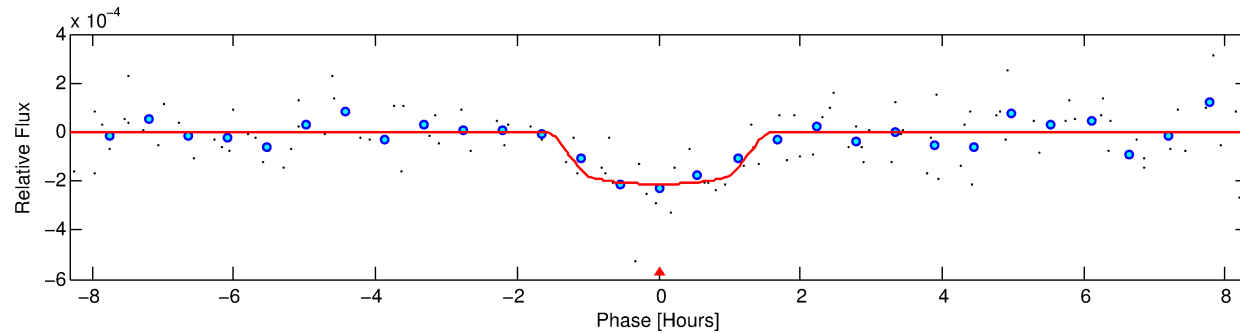
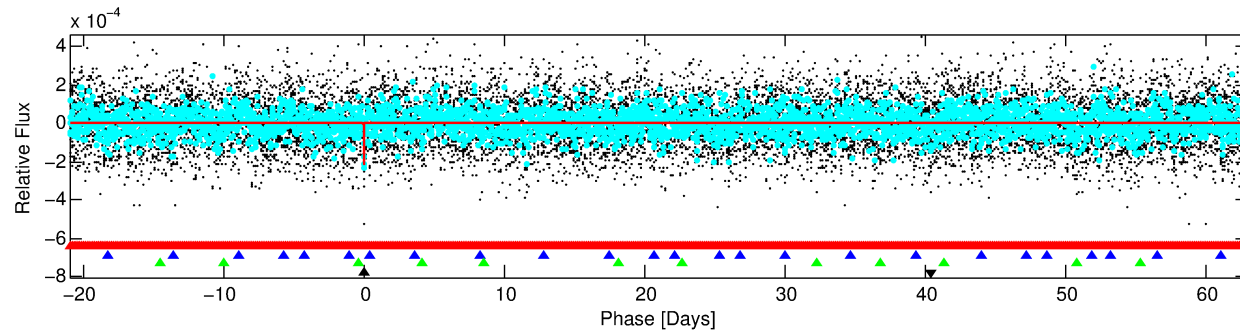
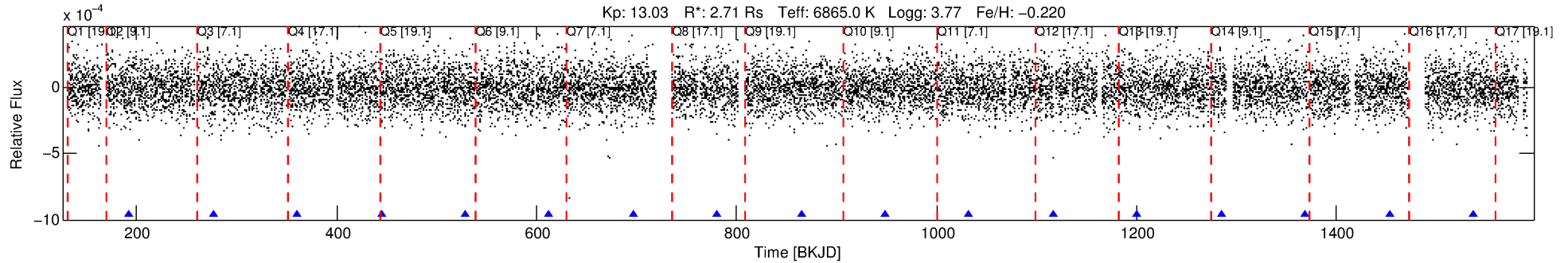
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007458050-04

No Significant Match Found

DV One-Page Summary

KIC: 7458050 Candidate: 4 of 4 Period: 84.001 d



DV Fit Results:

Period = 84.00075 [0.00097] d
Epoch = 192.6390 [0.0072] BKJD
Rp/R* = 0.0154 [0.0259]
a/R* = 113.31 [1172.73]
b = 0.89 [2.44]
Seff = 76.20 [38.01]
Teff = 753 [94] K
Rp = 4.55 [7.81] Re
a = 0.4373 [0.1349] AU
Ag = 903.83 [3077.05] [0.29 σ]
Teffp = 6387 [5385] K [1.05 σ]

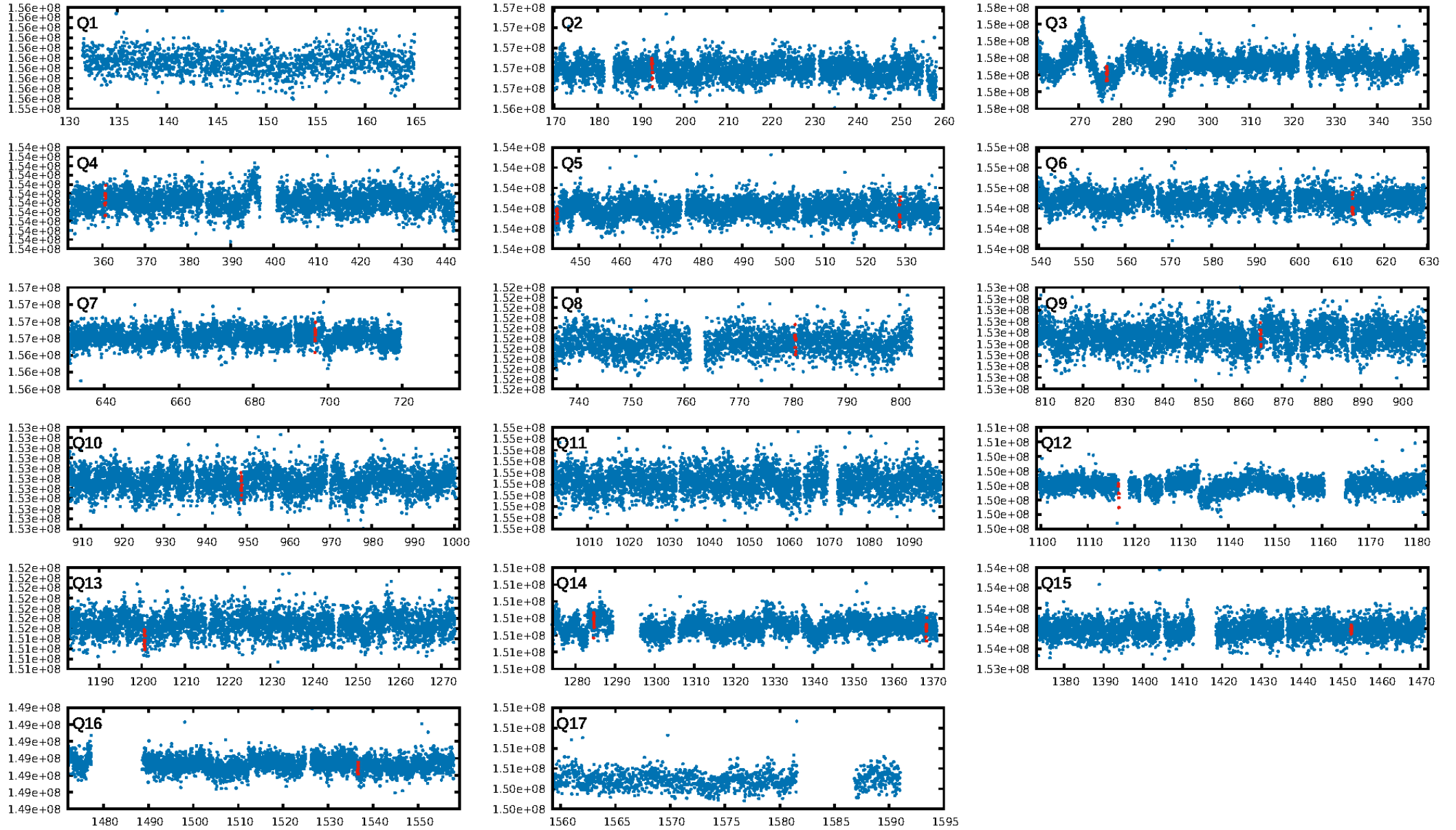
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [156.67 σ]
LongPeriod-sig: 100.0% [195.74 σ]
ModelChiSquare2-sig: 41.2%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 9.54e-09
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 1.01
Centroid-sig: 93.6%
Centroid-so: 0.214 arcsec [0.28 σ]
OotOffset-rm: 2.907 arcsec [2.91 σ]
KicOffset-rm: 2.903 arcsec [2.79 σ]
OotOffset-st: 2/2/1/1 [6]
KicOffset-st: 2/2/1/1 [6]
DiffImageQuality-fgm: 0.00 [0/6]
DiffImageOverlap-fno: 0.00 [0/12]

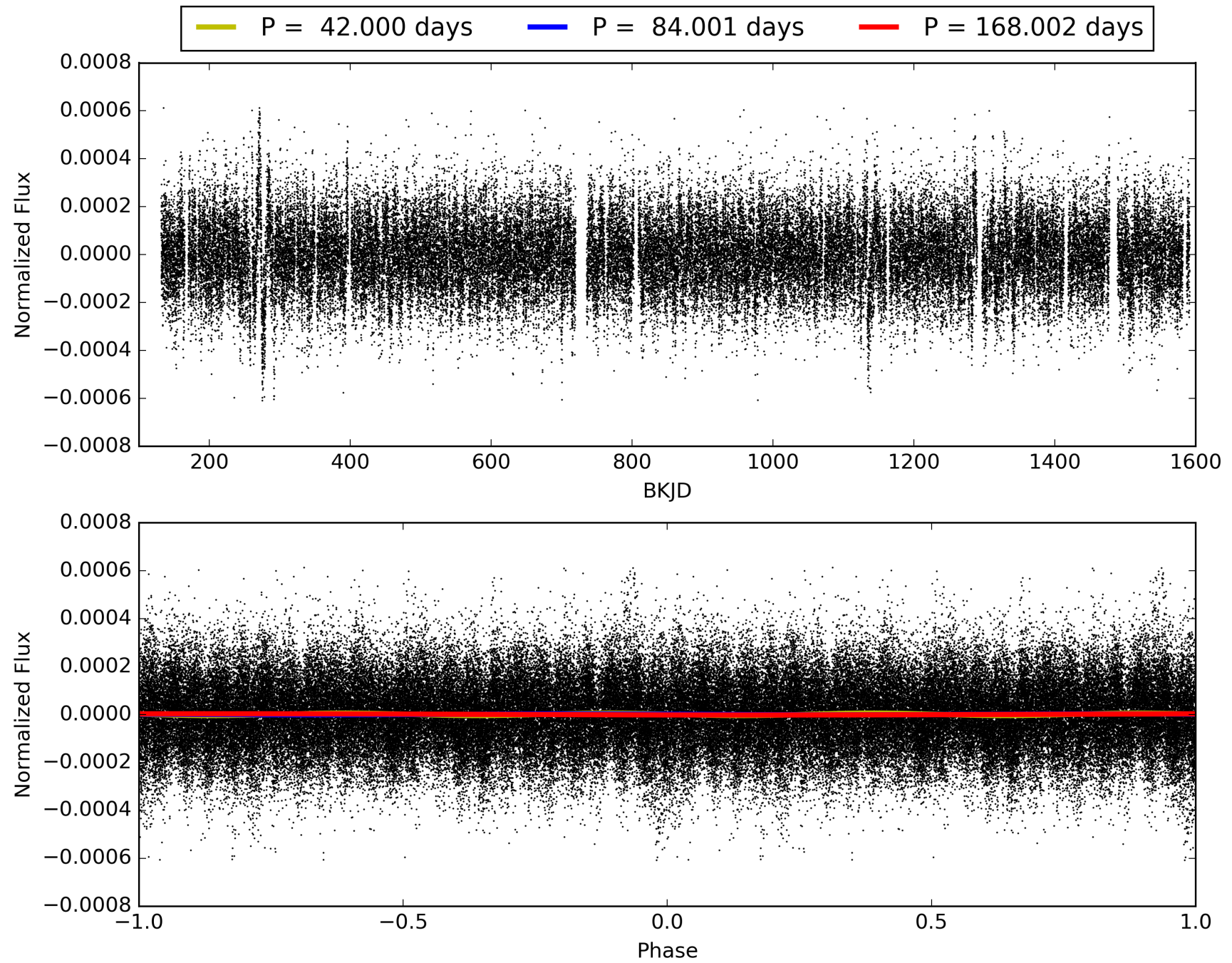
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:01:35 Z

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

TCE 007458050-04, PDC Light Curves

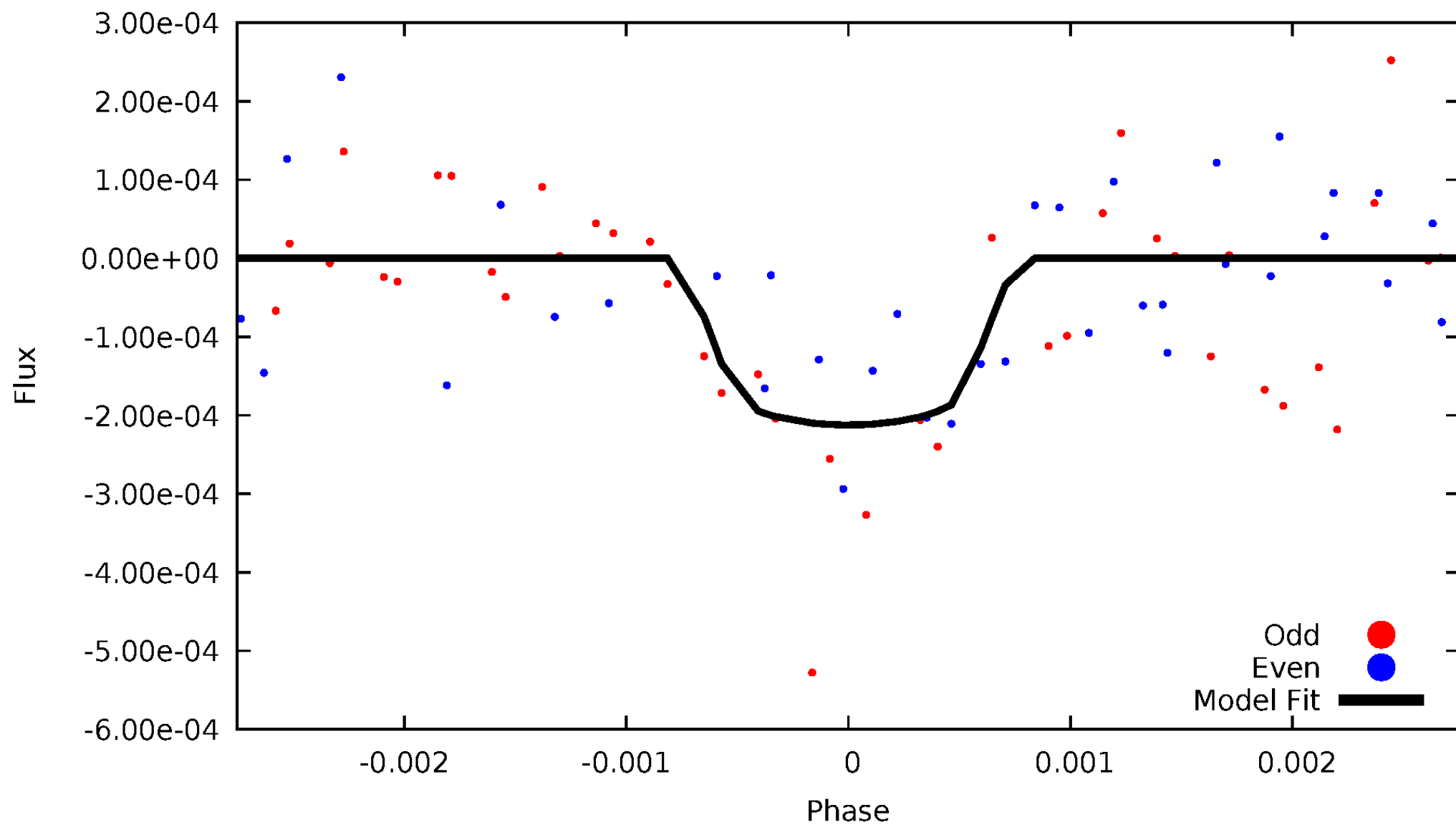


TCE 007458050-04



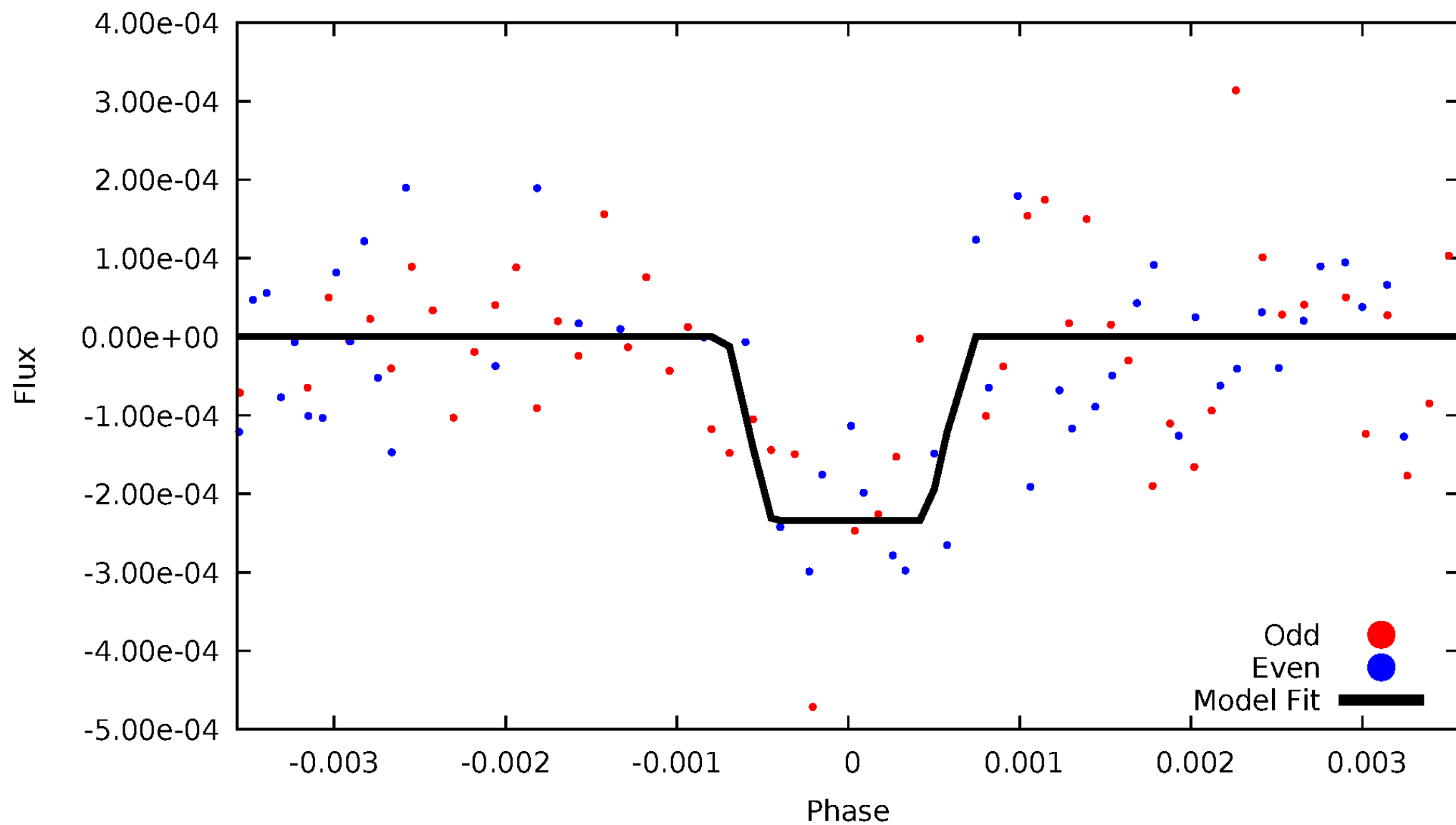
DV Odd/Even

TCE 007458050-04



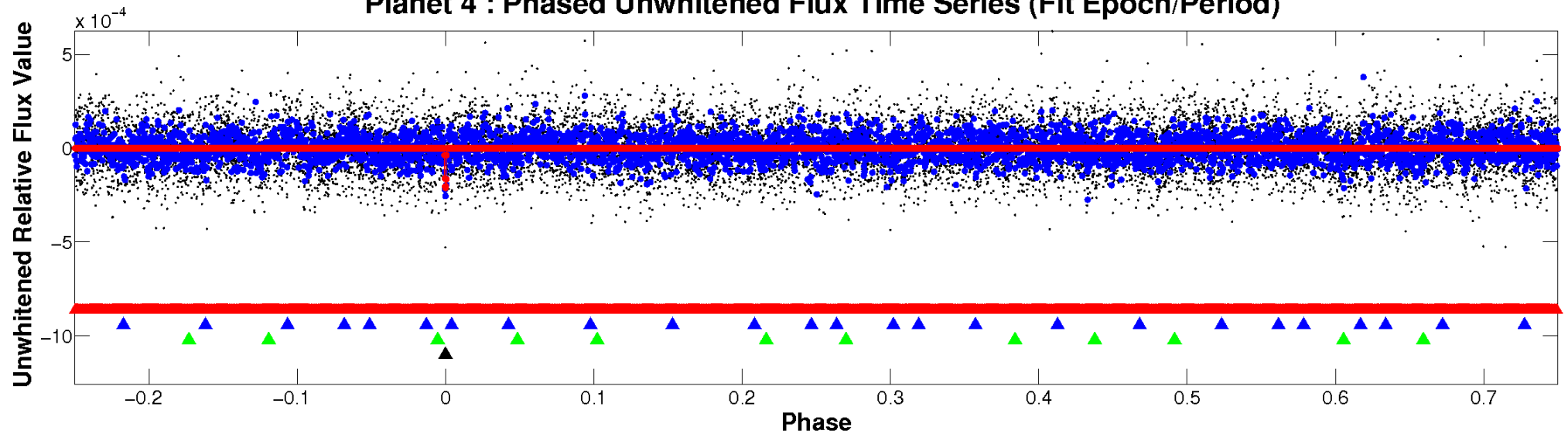
ALT Odd/Even

TCE 007458050-04

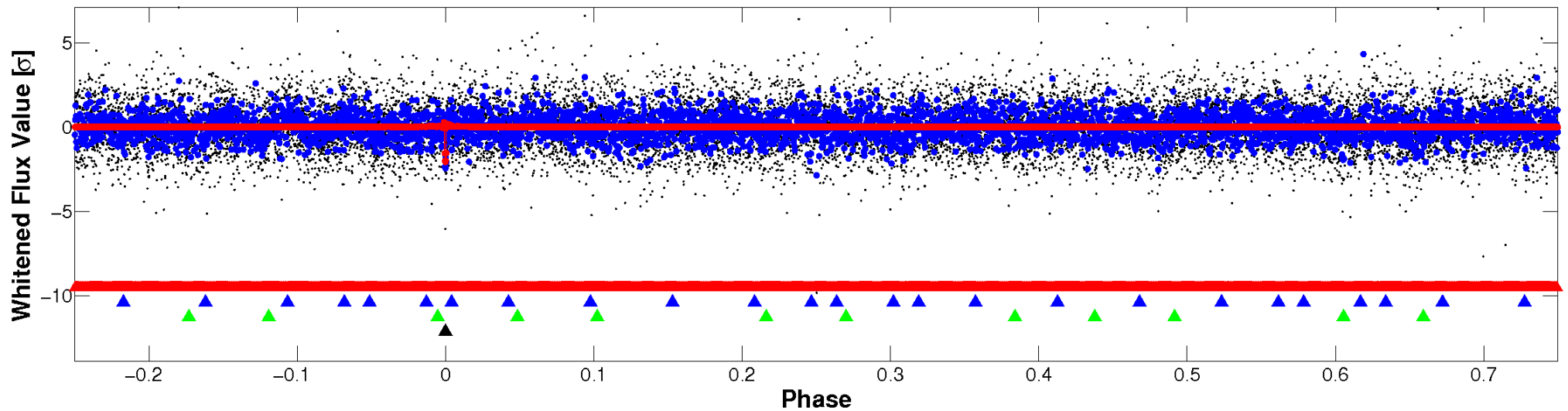


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

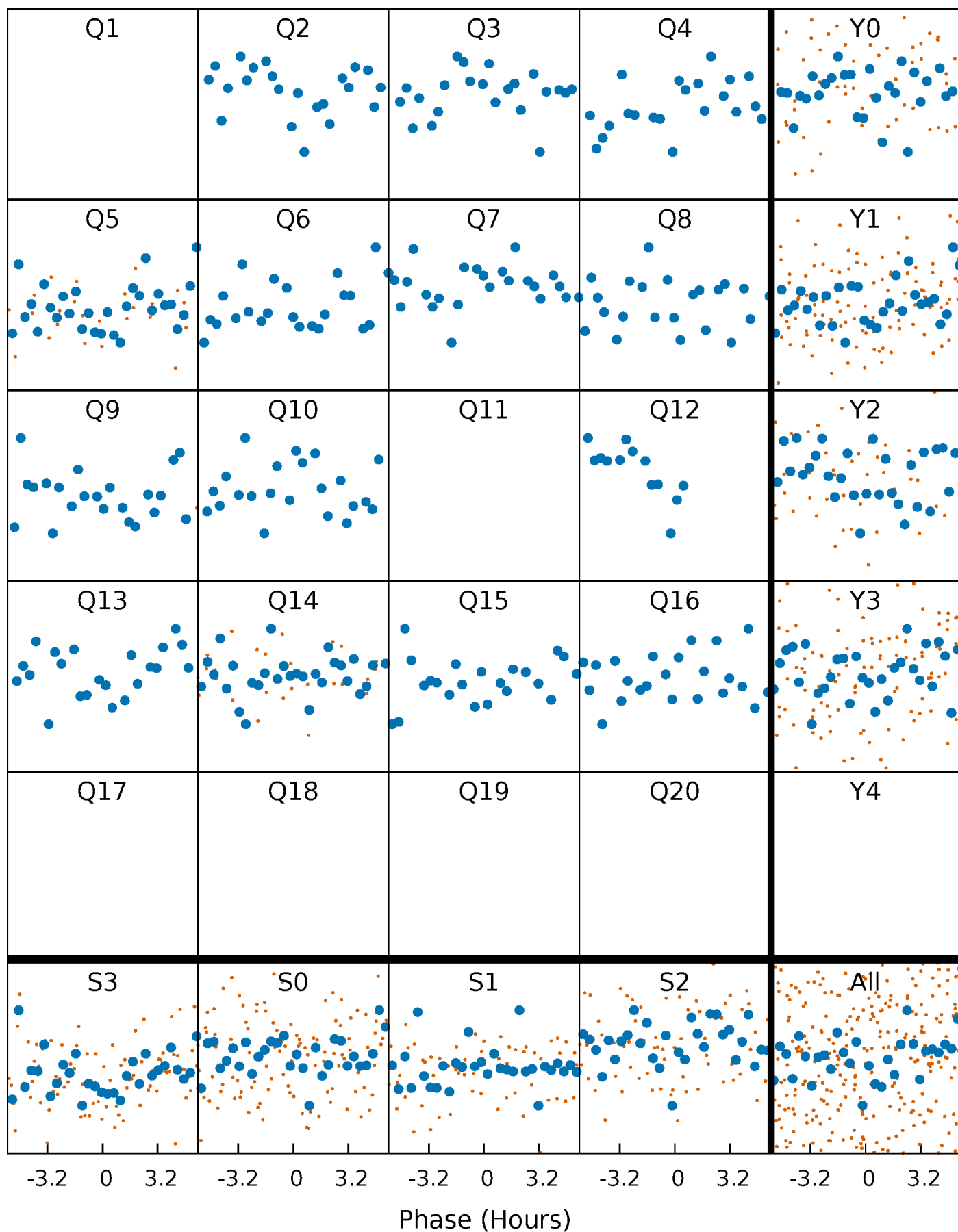


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



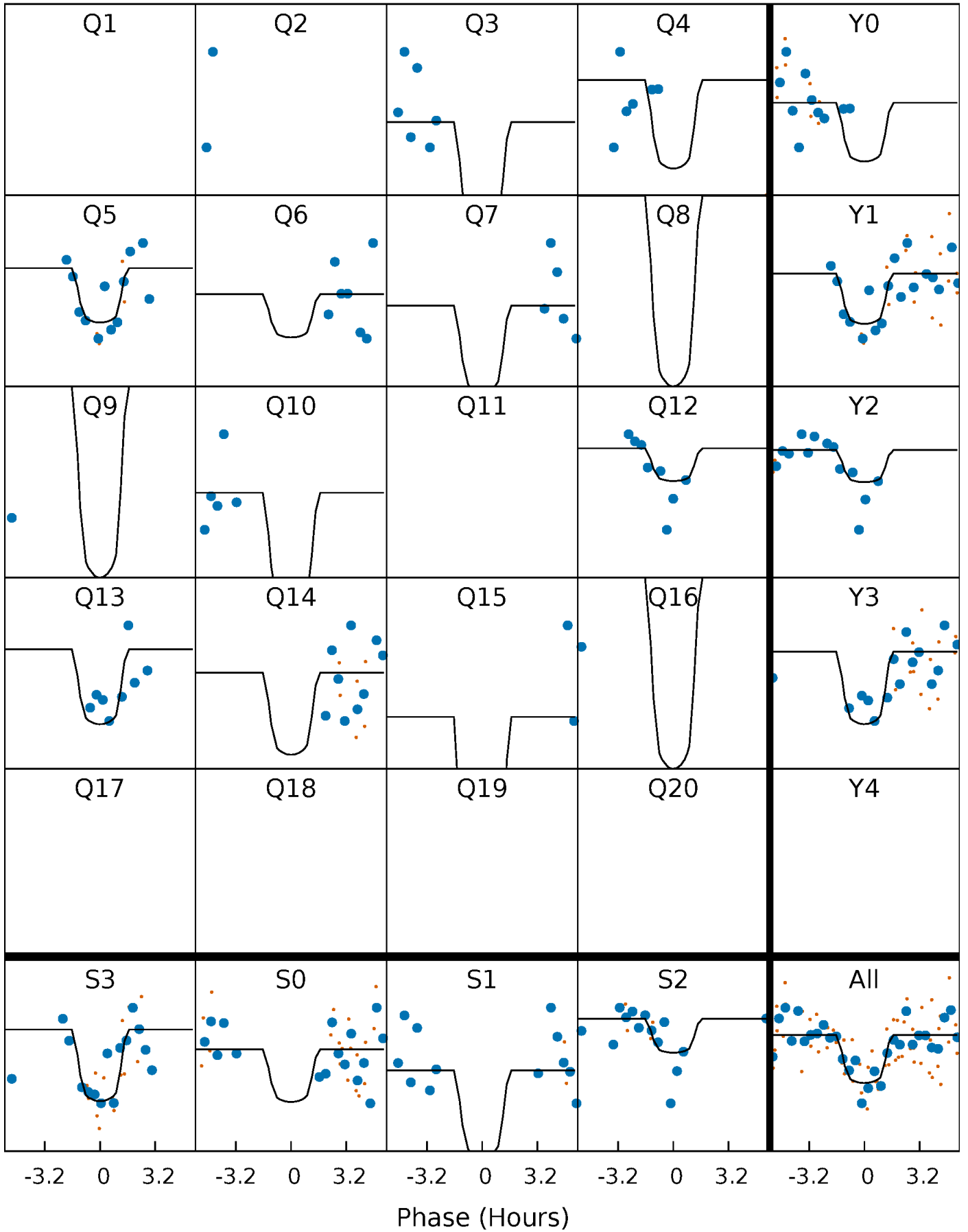
PDC Quarter-Phased Transit Curves

TCE 007458050-04 P= 84.000754 Days $T_0=192.639039$ (BKJD)



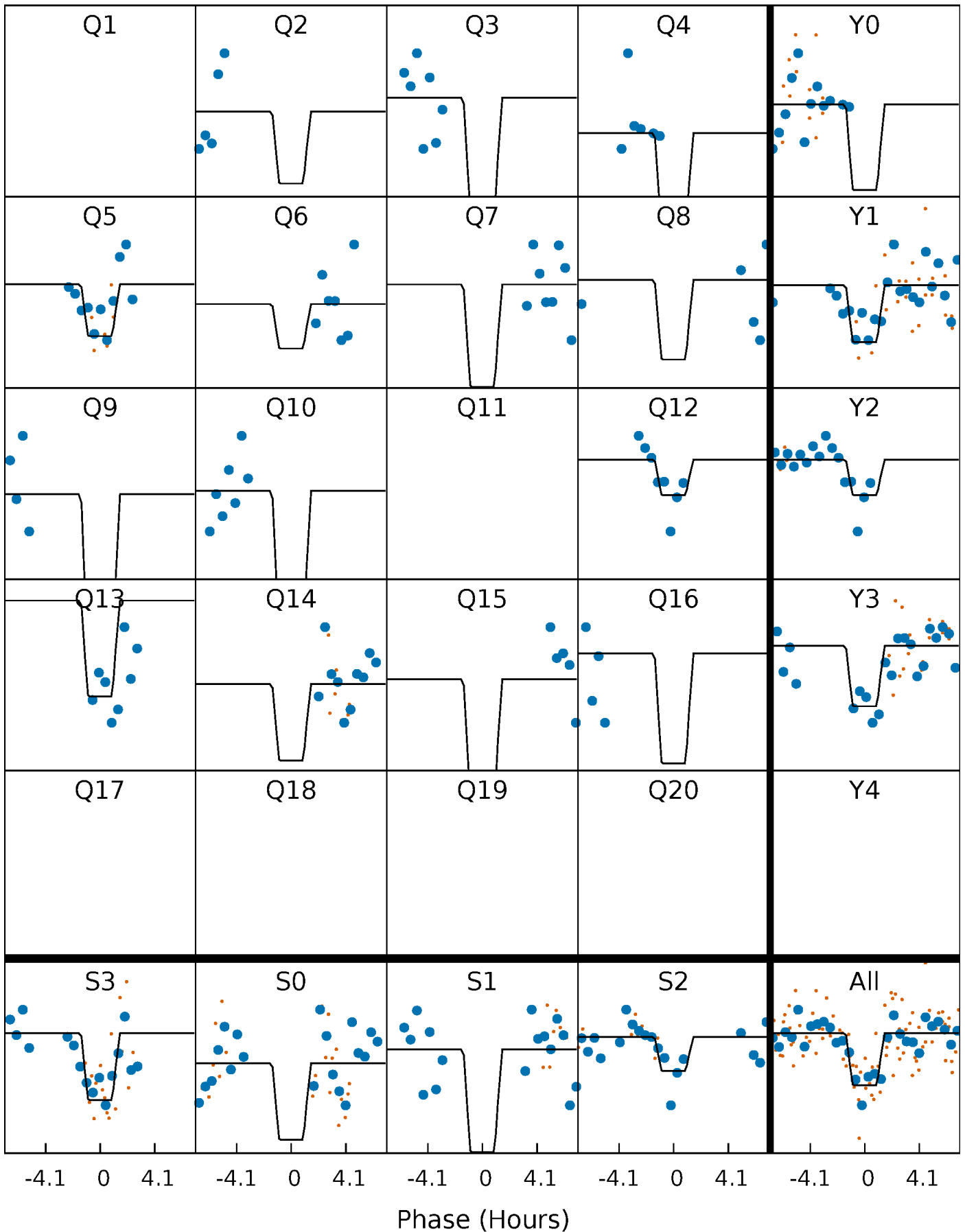
DV Quarter-Phased Transit Curves

TCE 007458050-04 P= 84.000754 Days $T_0=192.639039$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

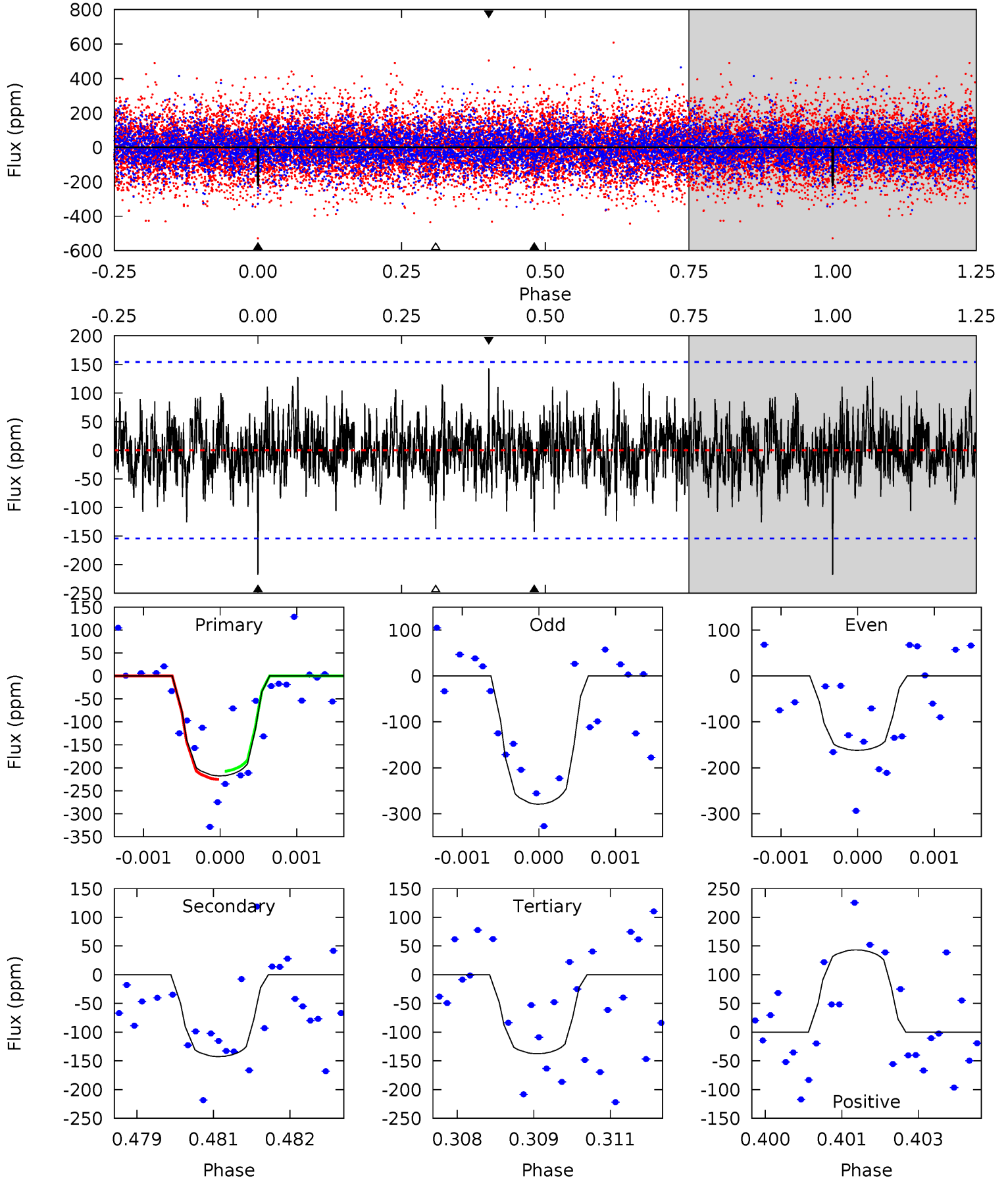
TCE 007458050-04 P= 83.998815 Days $T_0=192.664054$ (BKJD)



DV Model-Shift Uniqueness Test

007458050-04, P = 84.000754 Days, E = 108.638285 Days

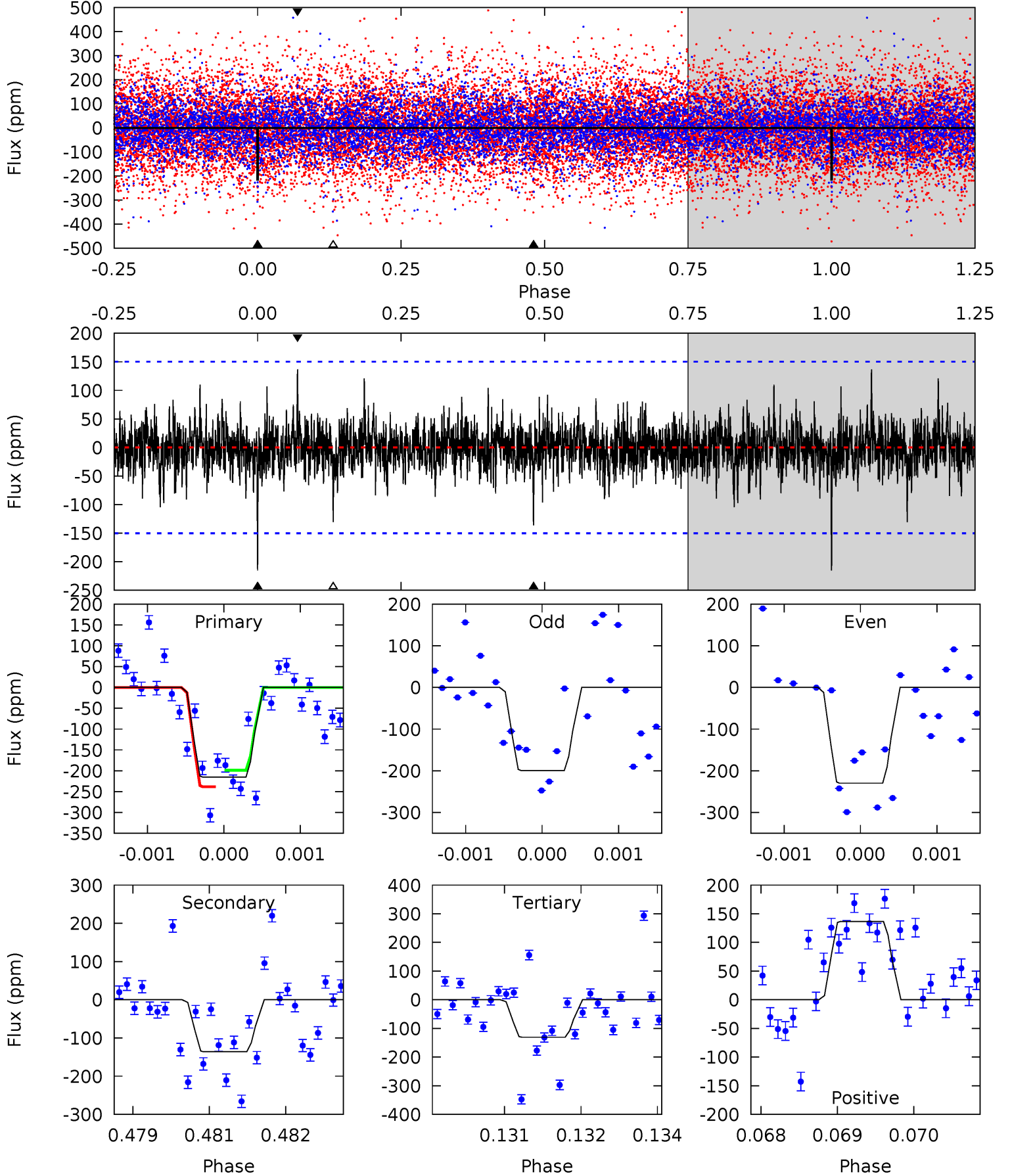
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.63 | 5.00 | 4.82 | 5.03 | 5.40 | 3.22 | 1.34 | 2.81 | 2.60 | 0.18 | -0.03 | 2.06 | 0.93 | 0.40 | 0.31 |



Alt Model-Shift Uniqueness Test

007458050-04, P = 83.998815 Days, E = 108.665239 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.73 | 4.88 | 4.69 | 4.90 | 5.39 | 3.19 | 1.05 | 3.04 | 2.83 | 0.19 | -0.02 | 0.54 | 0.92 | 0.39 | 0.71 |



Stellar Parameters For KIC 007458050

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|--|
| | 6865^{+183}_{-224} | $3.772^{+0.278}_{-0.093}$ | $-0.220^{+0.300}_{-0.250}$ | $2.706^{+0.487}_{-0.904}$ | $1.579^{+0.243}_{-0.297}$ | $0.112^{+0.211}_{-0.033}$ |
| | +3%/-3% | +7%/-2% | +136%/-114% | +18%/-33% | +15%/-19% | +188%/-29% |
| Source | PHO1 | FLK73 | 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 007458050-04 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|------------------------|----------------------|
| DV | -143 ± 29 | $6.91^{+6.71}_{-4.36}$ | 1034^{+65}_{-90} | 4799^{+3062}_{-1033} | 310^{+1927}_{-231} |
| Alt. | -136 ± 28 | $6.60^{+6.43}_{-4.34}$ | 1030^{+63}_{-89} | 4877^{+3626}_{-1137} | 326^{+2577}_{-249} |

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

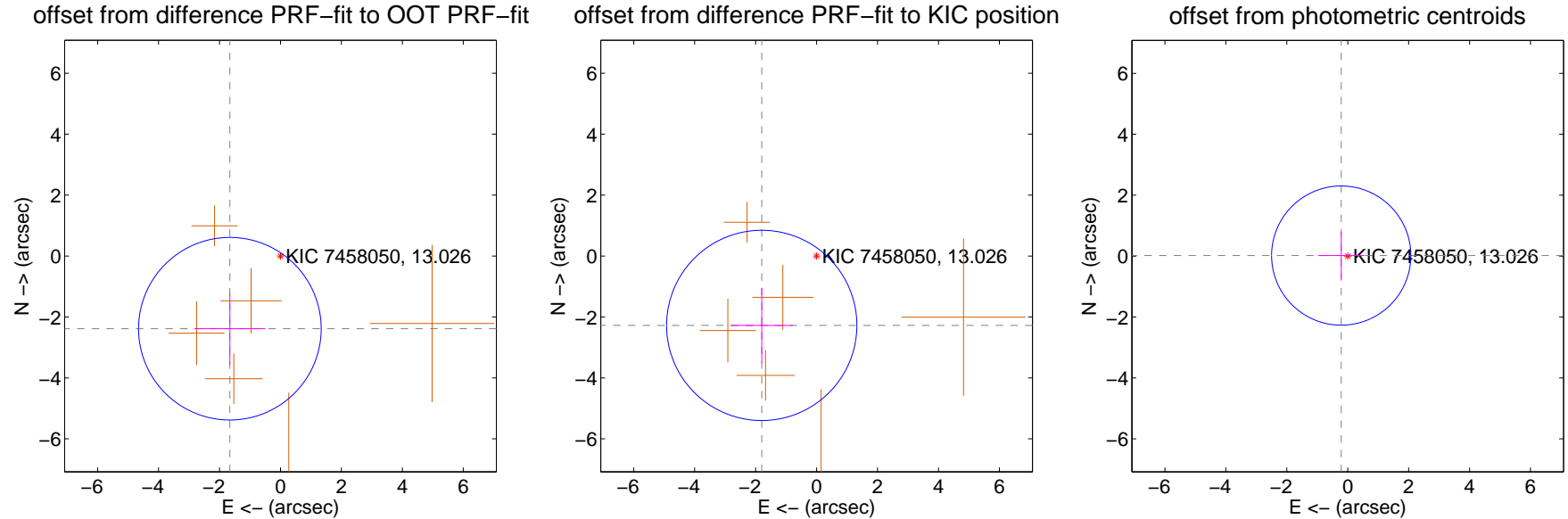
DV Centroid Data

Supplemental centroid analysis for 007458050-04. Kepler magnitude: 13.03. Transit SNR 7.81

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 2.907 ± 0.999 | 2.91 | 1.660 ± 1.168 | -2.386 ± 1.173 |
| PRF-fit source offset from KIC position | 2.903 ± 1.041 | 2.79 | 1.800 ± 1.021 | -2.277 ± 1.233 |
| photometric centroid source offset | 0.21 ± 0.76 | 0.28 | 0.21 ± 0.76 | 0.02 ± 0.78 |



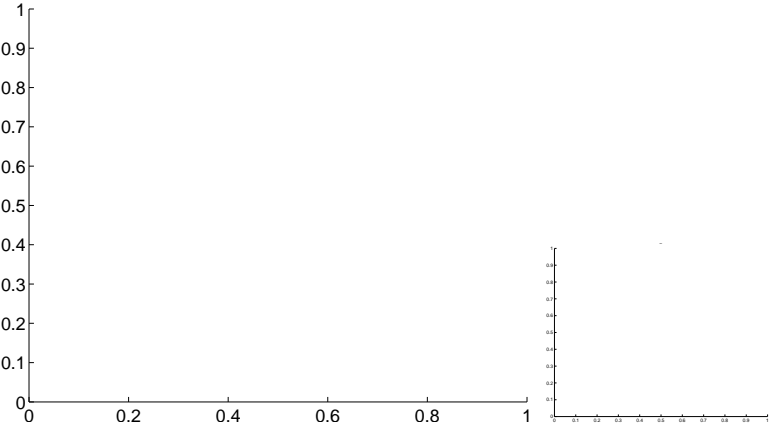
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

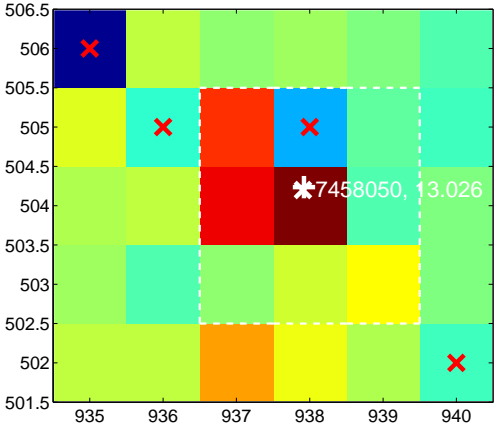
Q1 no difference image



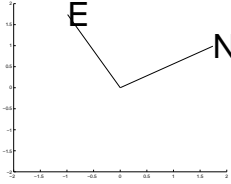
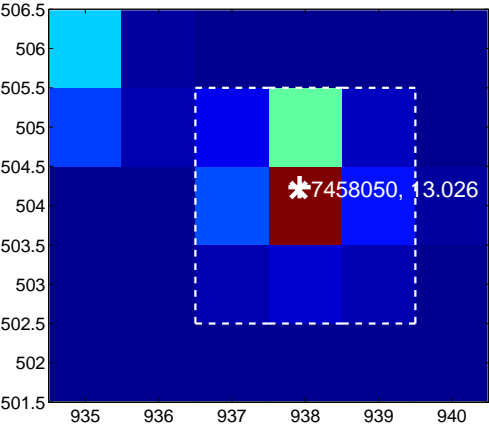
Q1 no OOT image



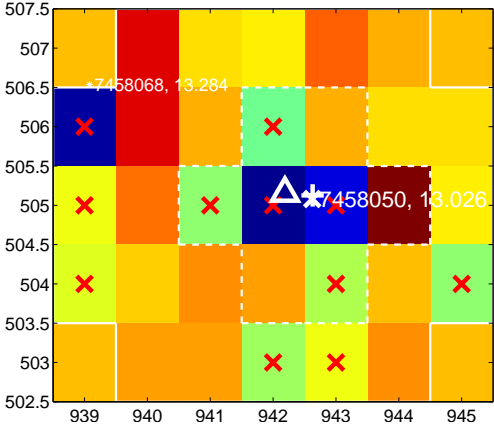
Q2 difference image. Poor Quality



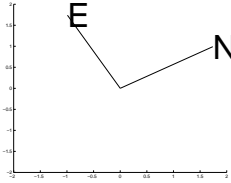
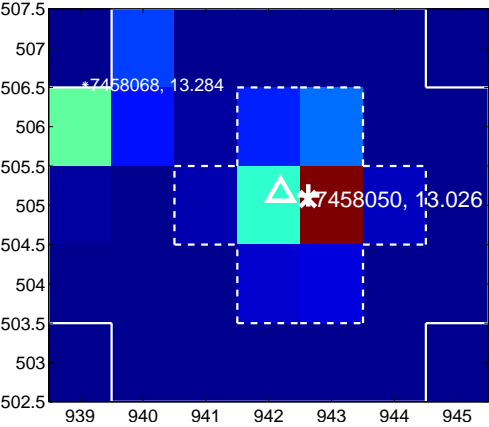
Q2 OOT image



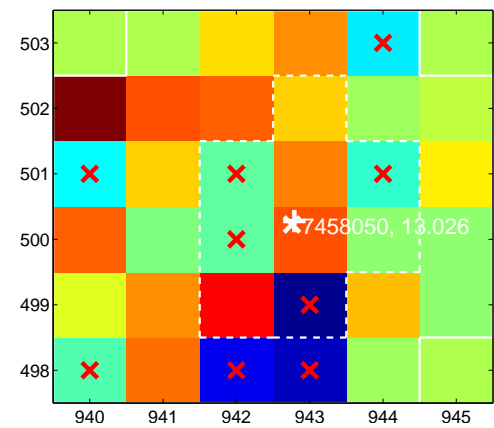
Q3 difference image. Poor Quality



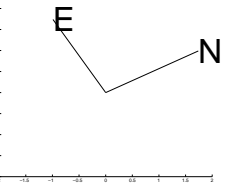
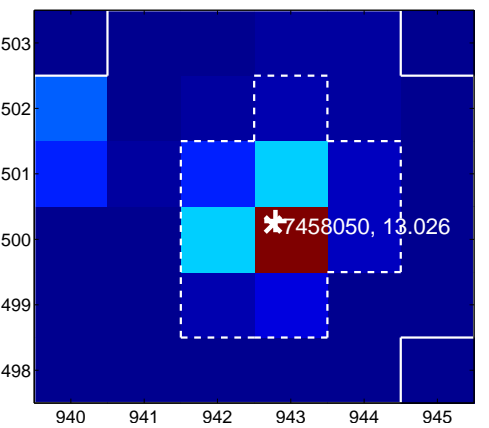
Q3 OOT image



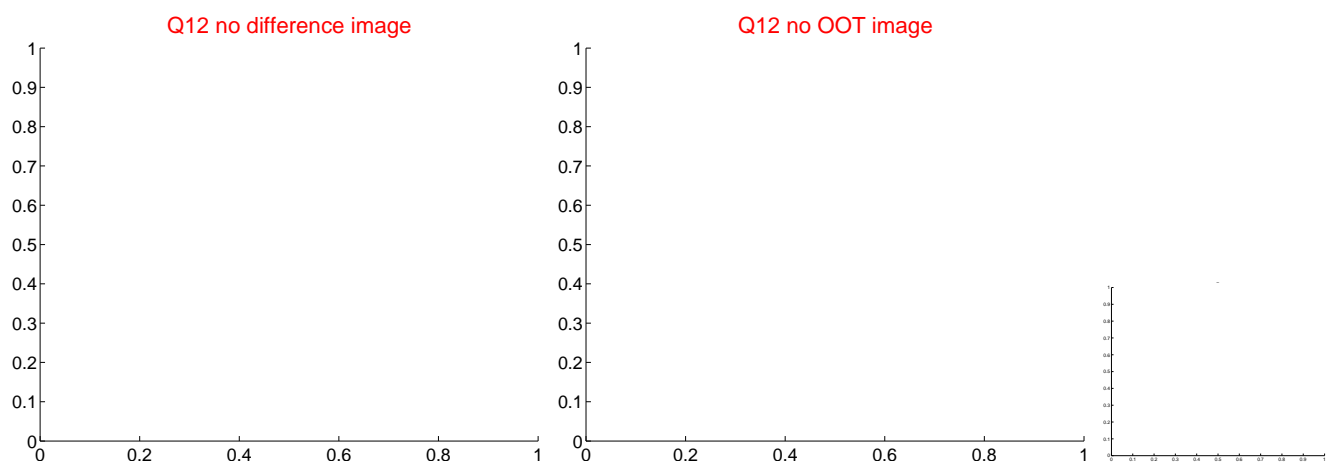
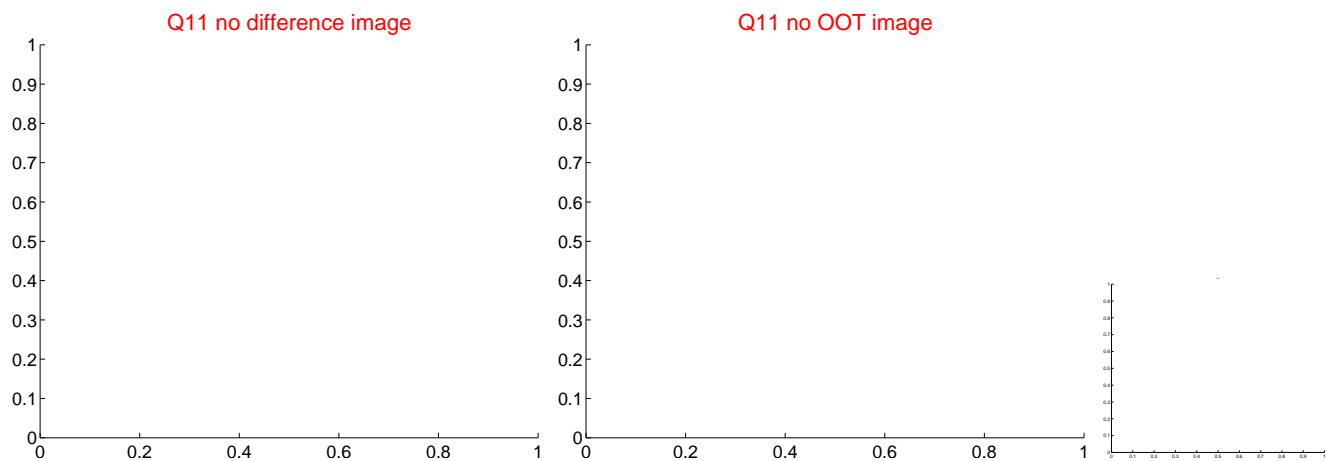
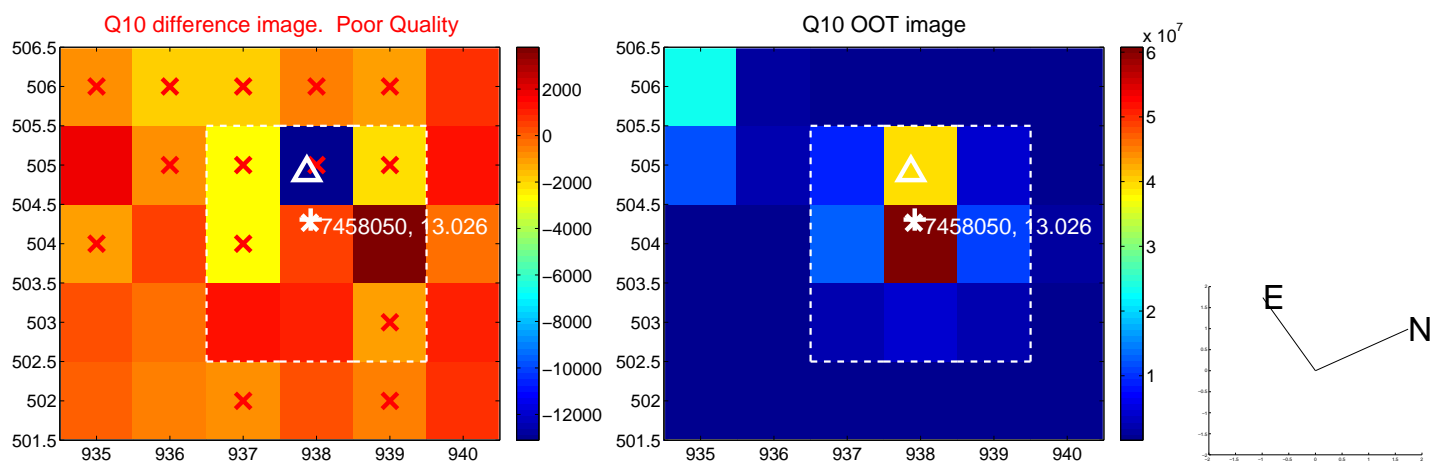
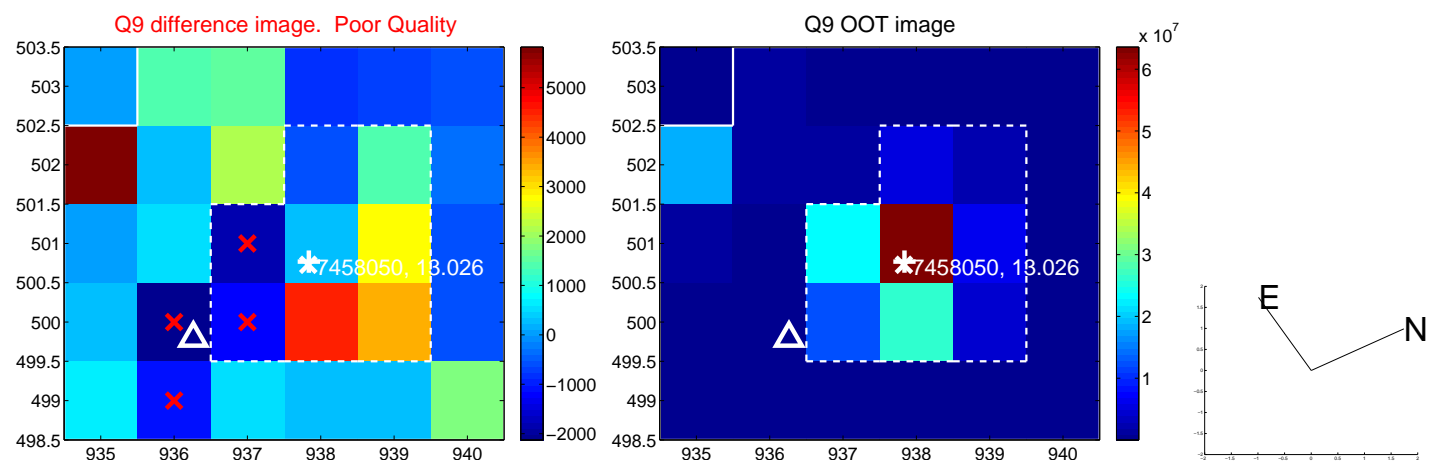
Q4 difference image. Poor Quality



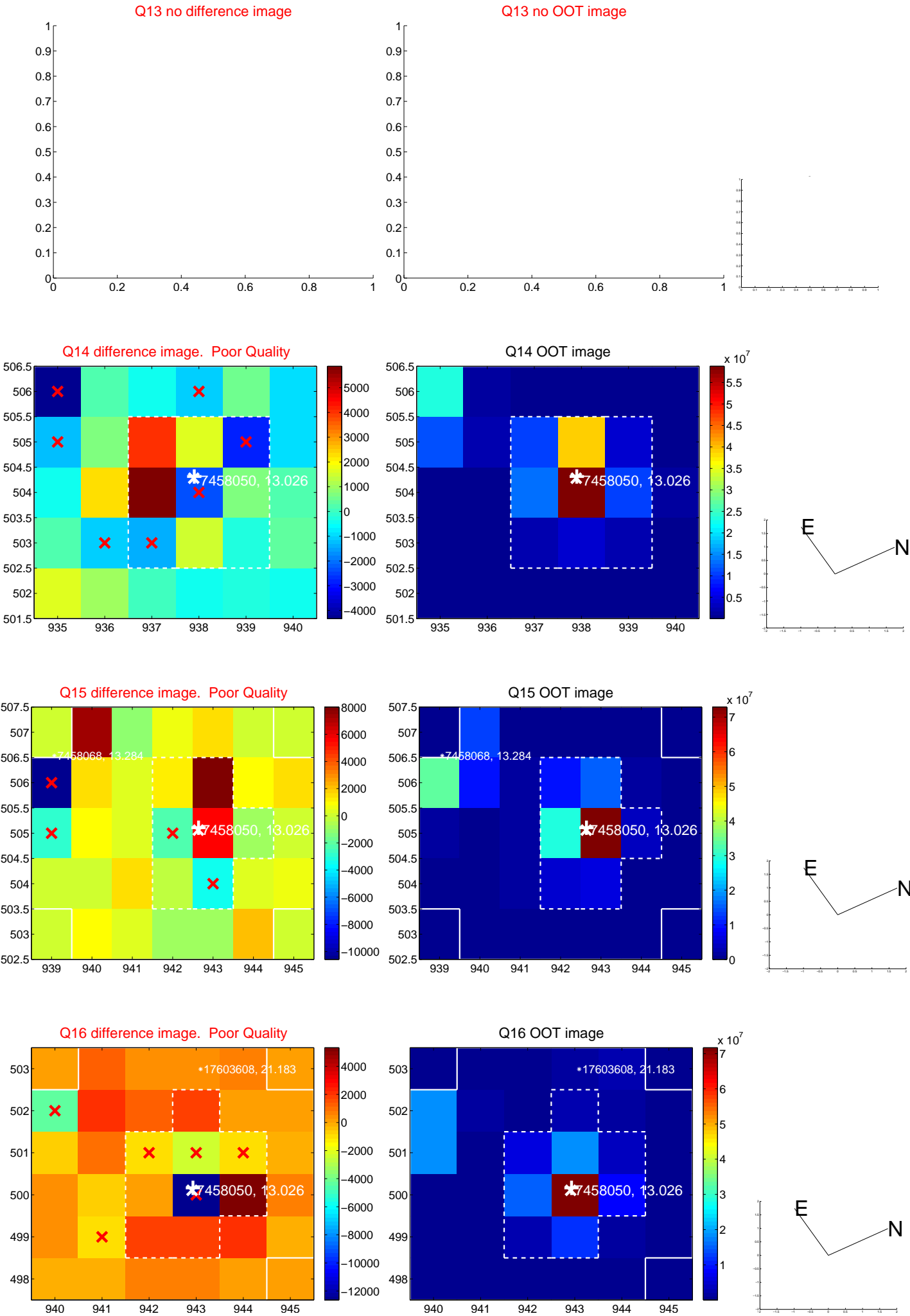
Q4 OOT image



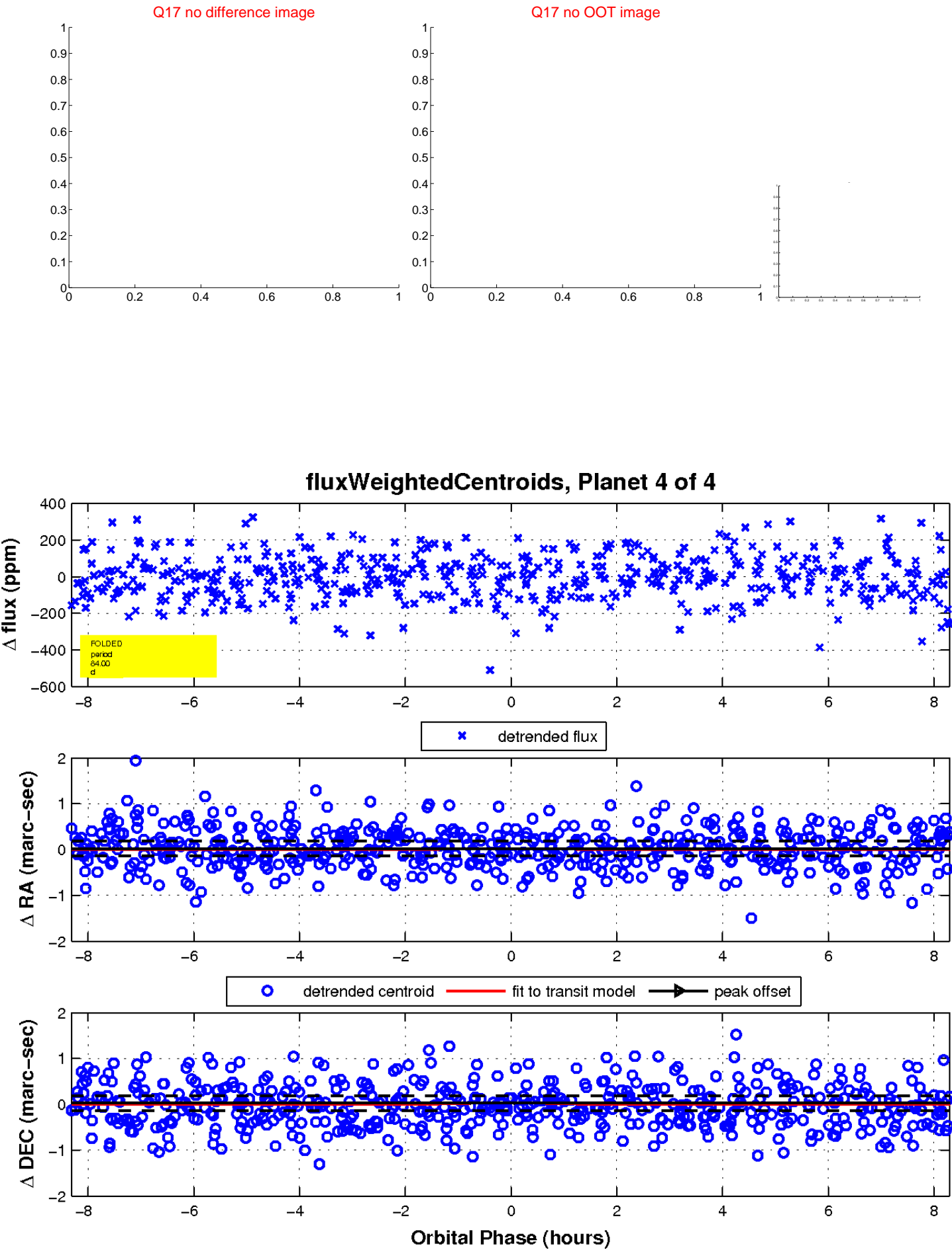
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

Declination

