

KIC 004945764

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 004945764-01 | OBS | 4377.01 | 19.875148 | 148.392492 | 106.8 | 7.895 | 11.1 | 11.6 | 2.00 | 6918 | 2.33 | 299.92 |
| 004945764-02 | OBS | No | 0.795981 | 132.274851 | 6.1 | 5.214 | 7.7 | 3.2 | 2.00 | 6918 | 0.53 | 21888.26 |
| 004945764-03 | OBS | No | 48.635289 | 155.599738 | 281.8 | 2.446 | 9.5 | 8.7 | 2.00 | 6918 | 3.94 | 90.95 |
| 004945764-04 | OBS | No | 57.352186 | 131.708621 | 214.0 | 1.689 | 8.5 | 5.8 | 2.00 | 6918 | 5.08 | 73.00 |
| 004945764-05 | OBS | No | 33.460679 | 153.932686 | 174.8 | 3.722 | 8.8 | 8.7 | 2.00 | 6918 | 2.91 | 149.75 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004945764-01 | OBS | PC | 0.93 | 0 | 0 | 0 | 0 | NO_COMMENT |
| 004945764-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT |
| 004945764-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 004945764-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 004945764-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |

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

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

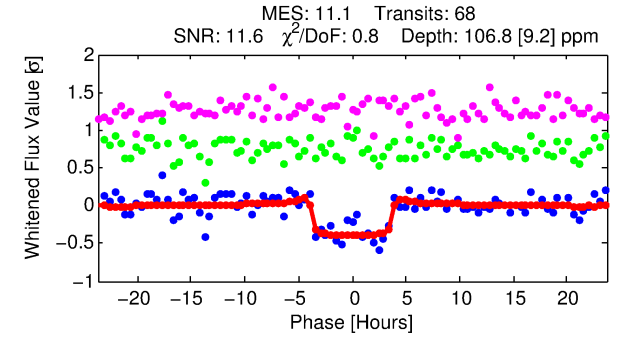
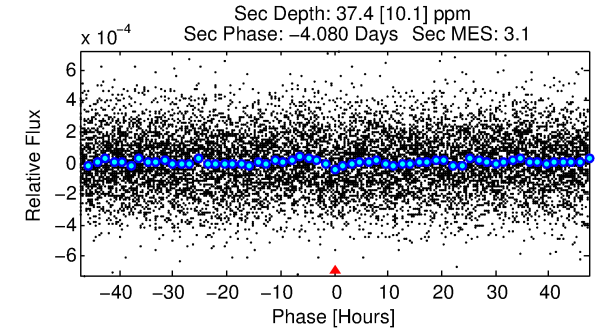
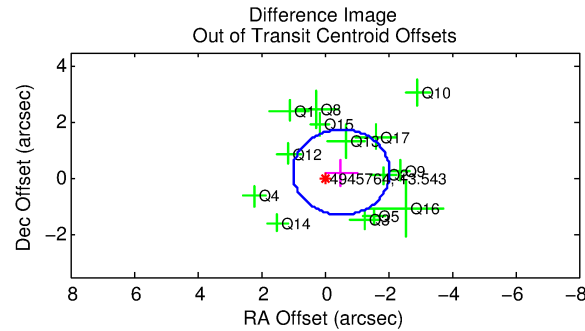
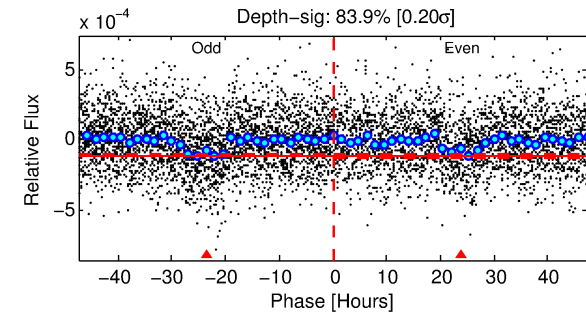
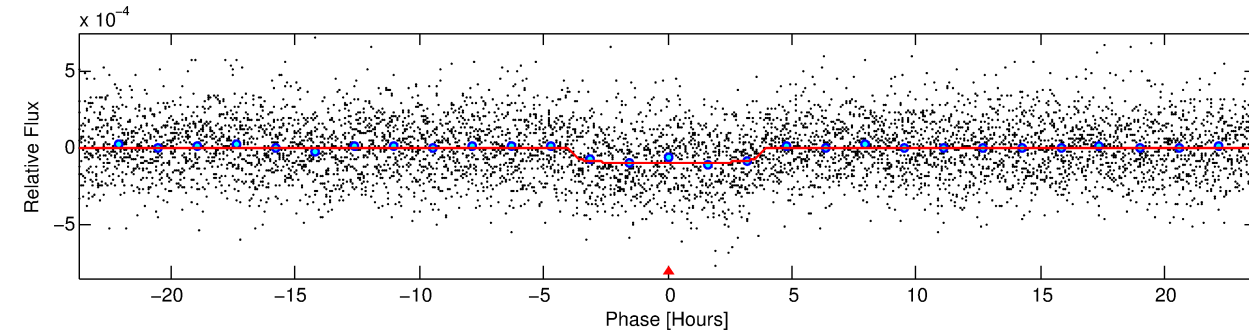
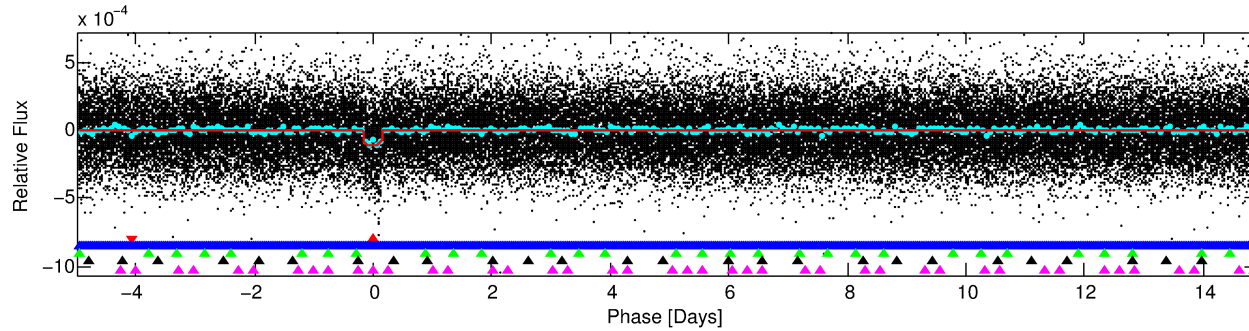
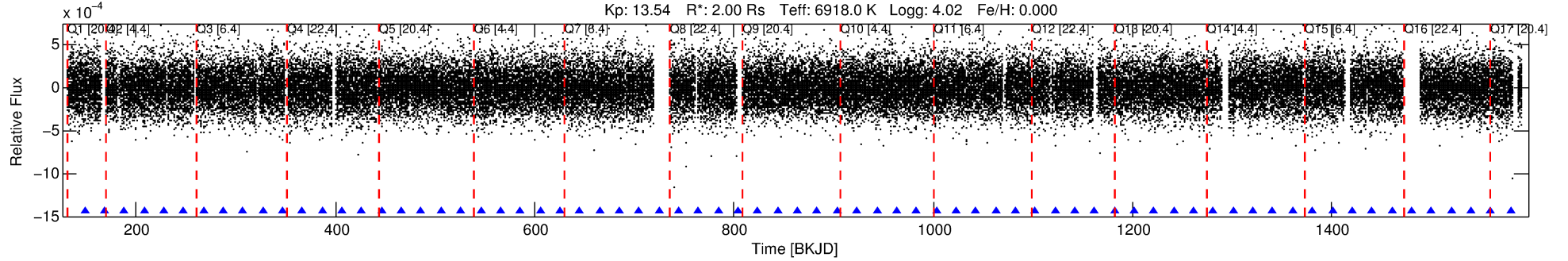
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004945764-01

No Significant Match Found

DV One-Page Summary

KIC: 4945764 Candidate: 1 of 5 Period: 19.875 d
KOI: K04377.01 Corr: 0.985



DV Fit Results:

Period = 19.87515 [0.00022] d
Epoch = 148.3925 [0.0092] BKJD
Rp/R* = 0.0107 [0.0022]
a/R* = 10.55 [12.37]
b = 0.85 [0.39]
Seff = 299.92 [80.92]
Teff = 1061 [72] K
Rp = 2.33 [0.68] Re
a = 0.1658 [0.0296] AU
Ag = 103.82 [57.79] [1.78 σ]
Teffp = 5237 [644] K [6.45 σ]

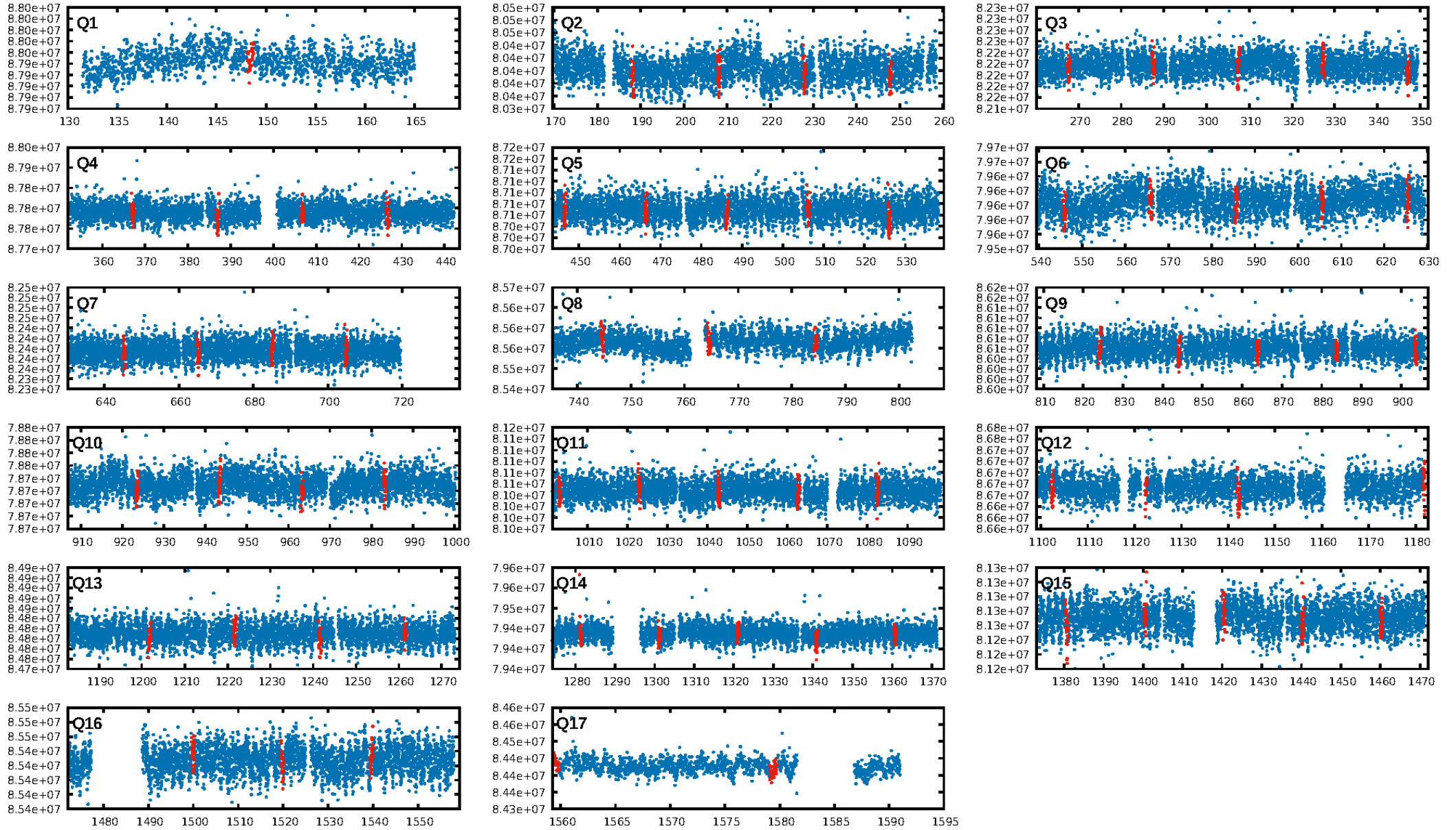
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [48.40 σ]
LongPeriod-sig: 100.0% [37.35 σ]
ModelChiSquare2-sig: 97.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.13e-16
RollingBand-fgt: 1.00 [65/65]
GhostDiagnostic-chr: 3.997
Centroid-sig: 2.7%
Centroid-so: 1.348 arcsec [1.55 σ]
OotOffset-rm: 0.570 arcsec [1.12 σ]
KicOffset-rm: 0.590 arcsec [1.17 σ]
OotOffset-st: 3/2/4/5 [14]
KicOffset-st: 3/2/4/5 [14]
DiffImageQuality-fgm: 0.86 [12/14]
DiffImageOverlap-fno: 0.00 [0/17]

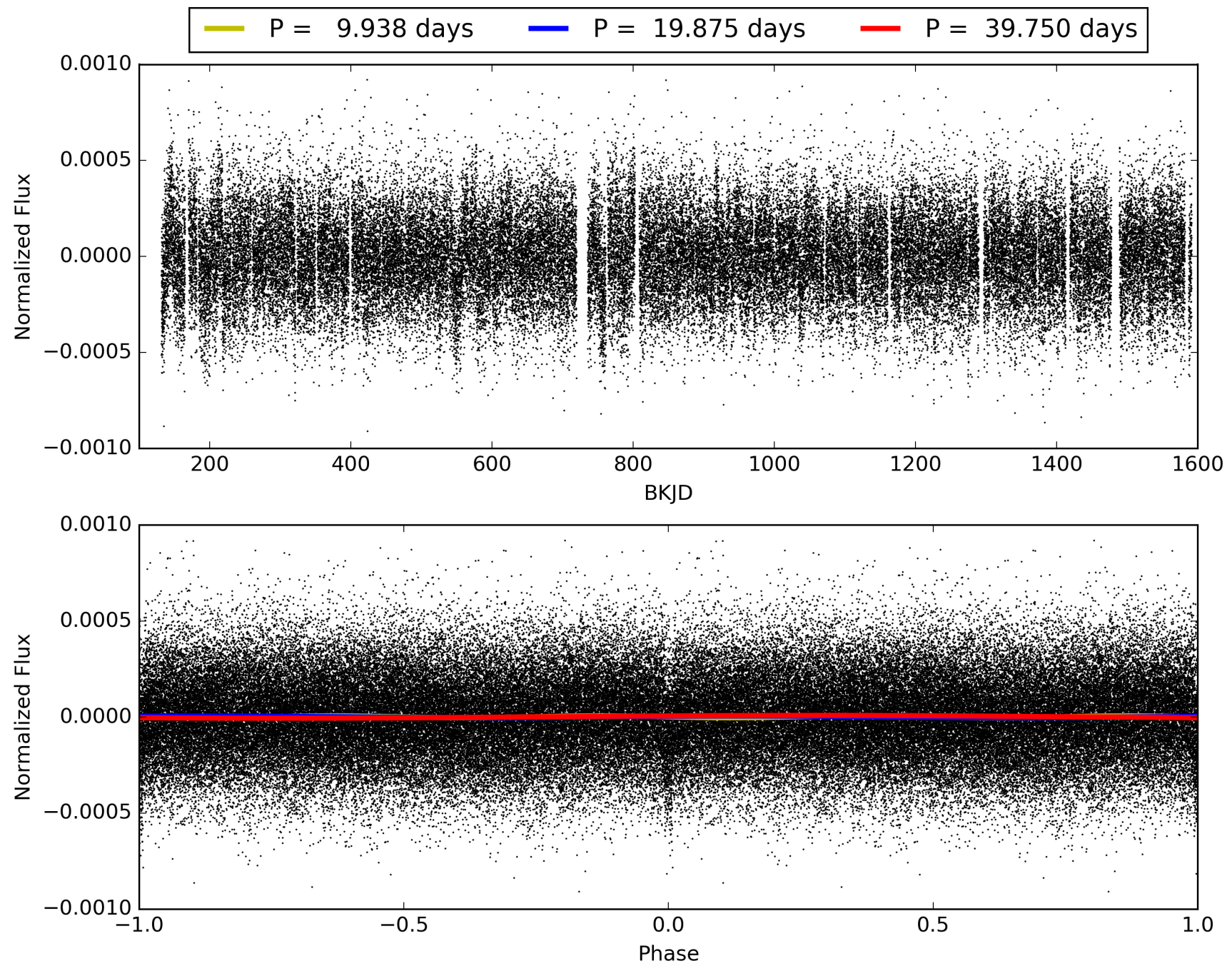
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 07:21:02 Z

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

TCE 004945764-01, PDC Light Curves

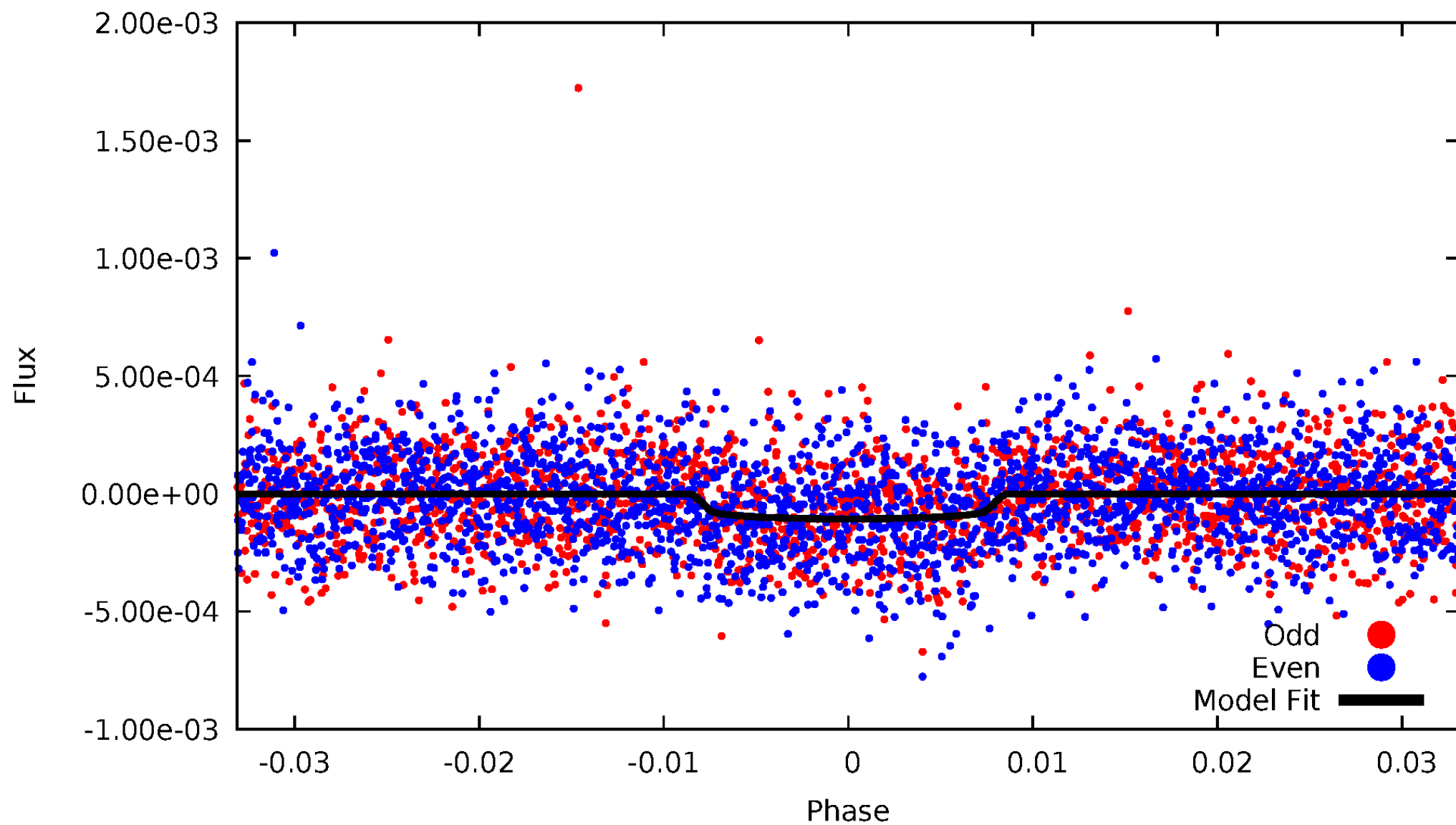


TCE 004945764-01



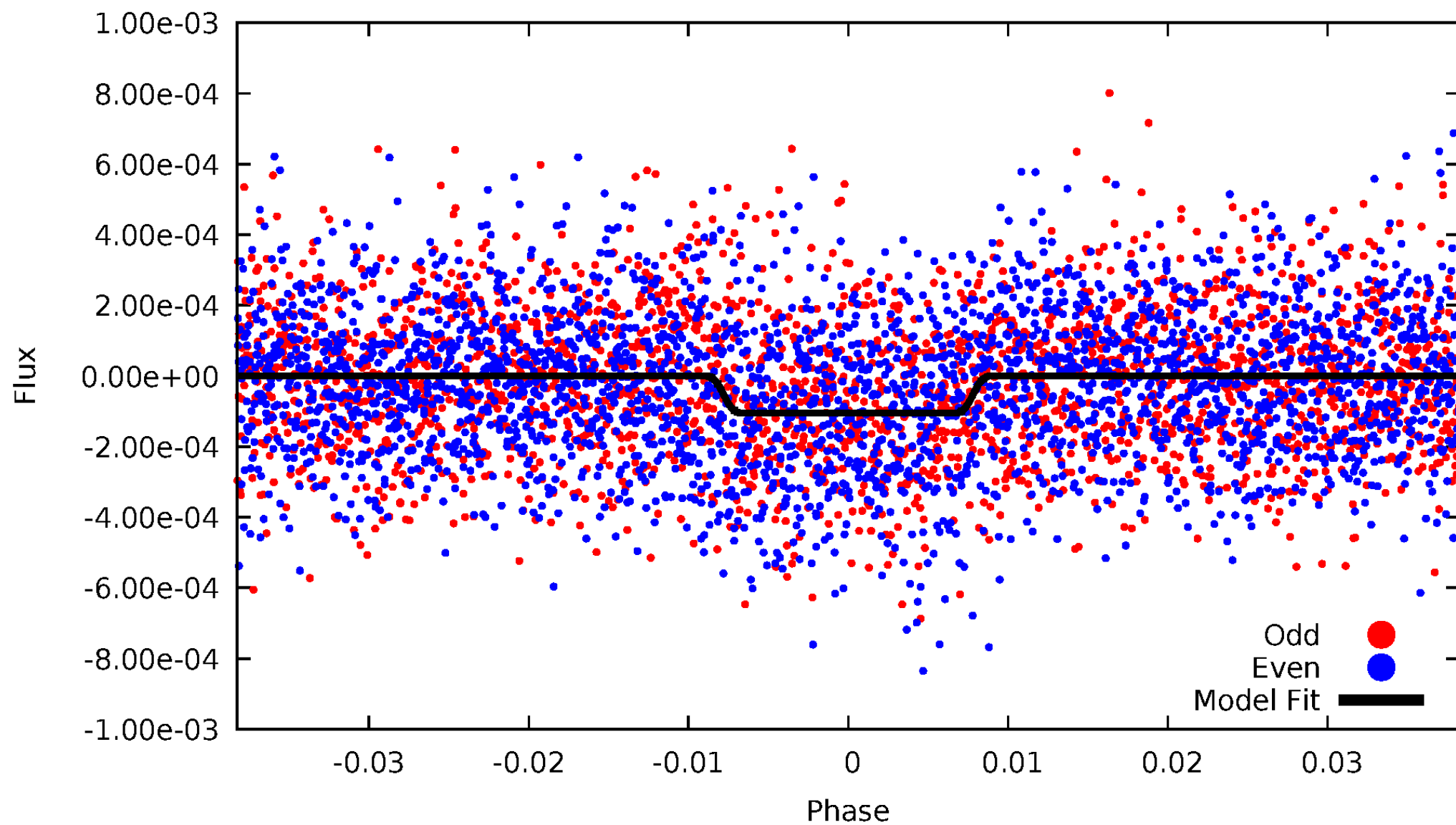
DV Odd/Even

TCE 004945764-01



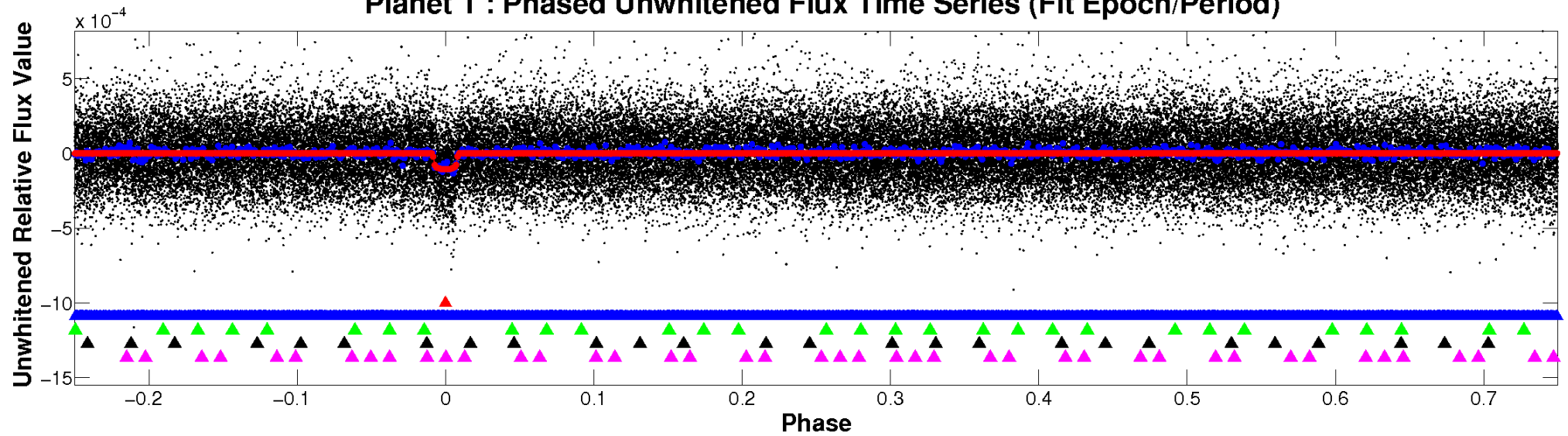
ALT Odd/Even

TCE 004945764-01

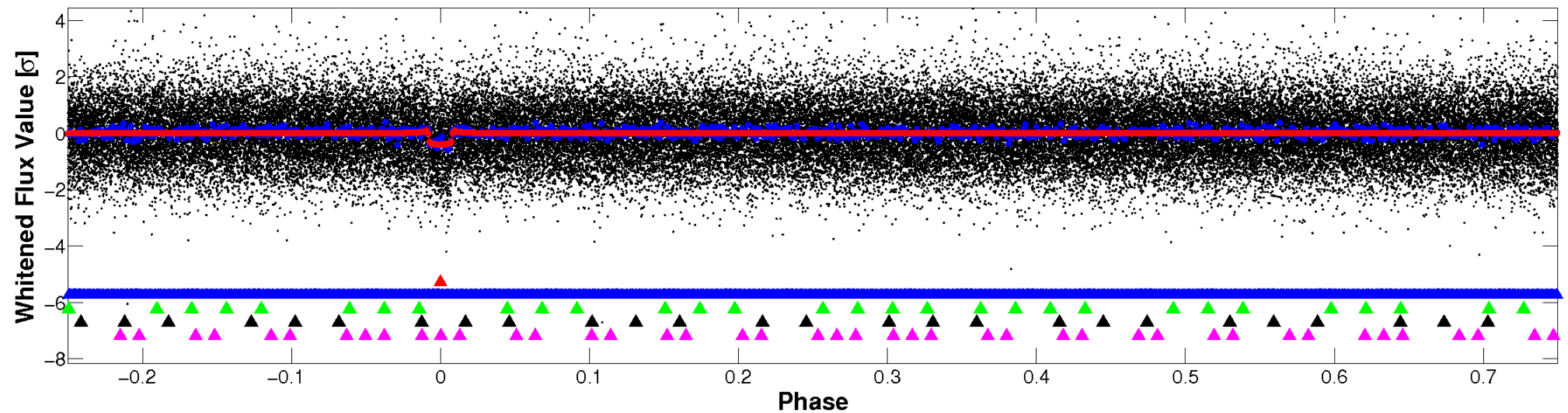


Non-Whitened Vs. Whitened Light Curve

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

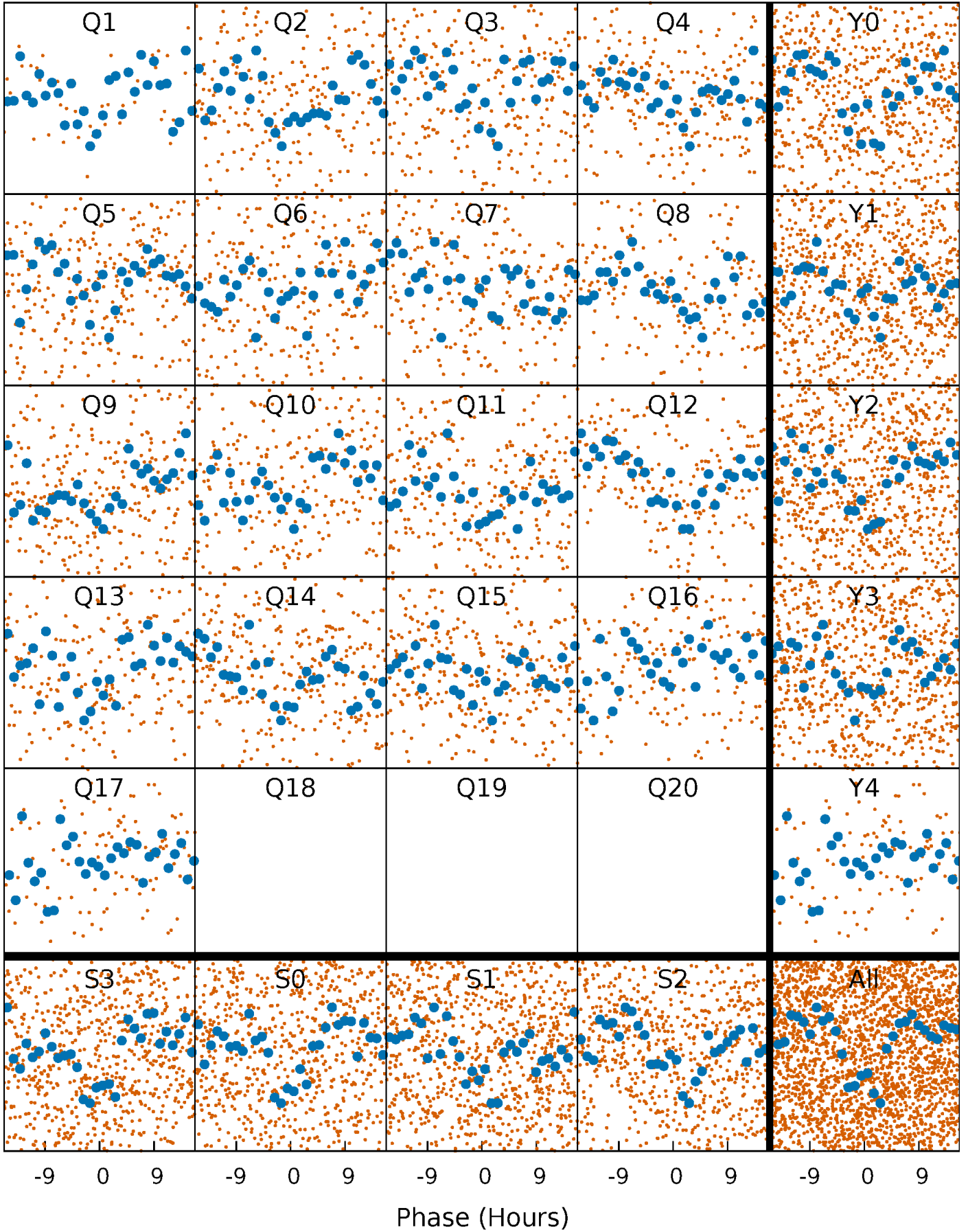


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



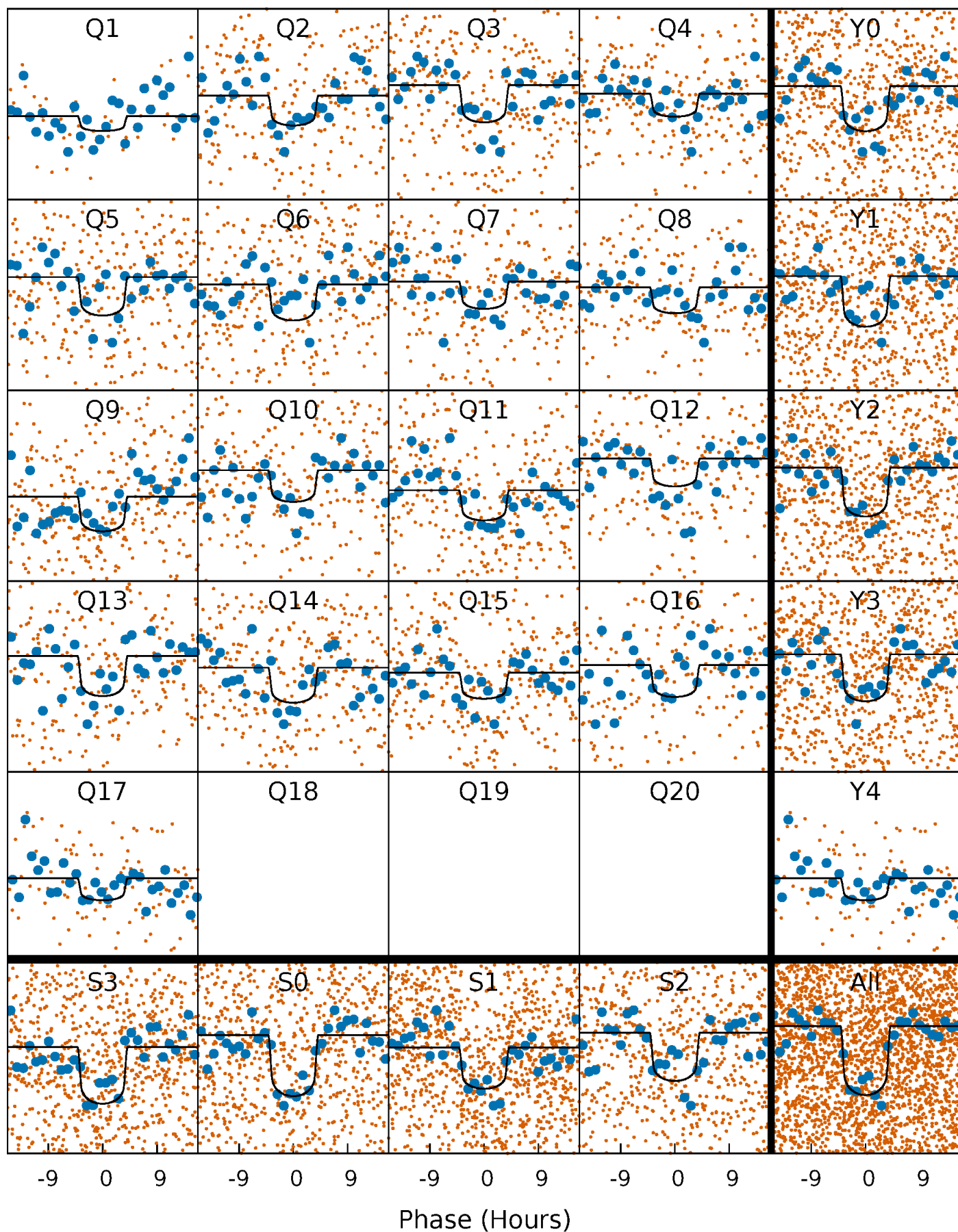
PDC Quarter-Phased Transit Curves

TCE 004945764-01 P= 19.875148 Days $T_0=148.392492$ (BKJD)



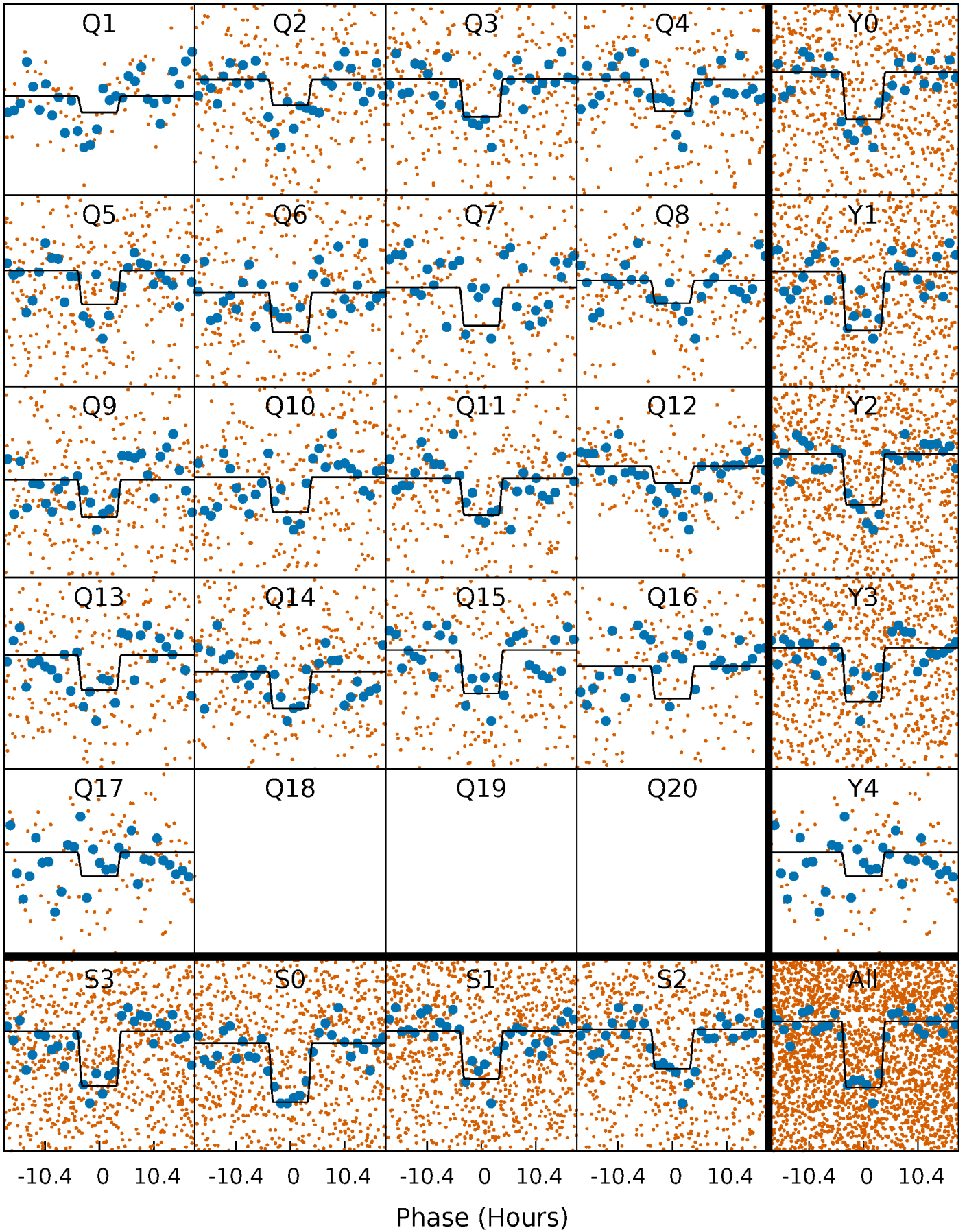
DV Quarter-Phased Transit Curves

TCE 004945764-01 P= 19.875148 Days $T_0=148.392492$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

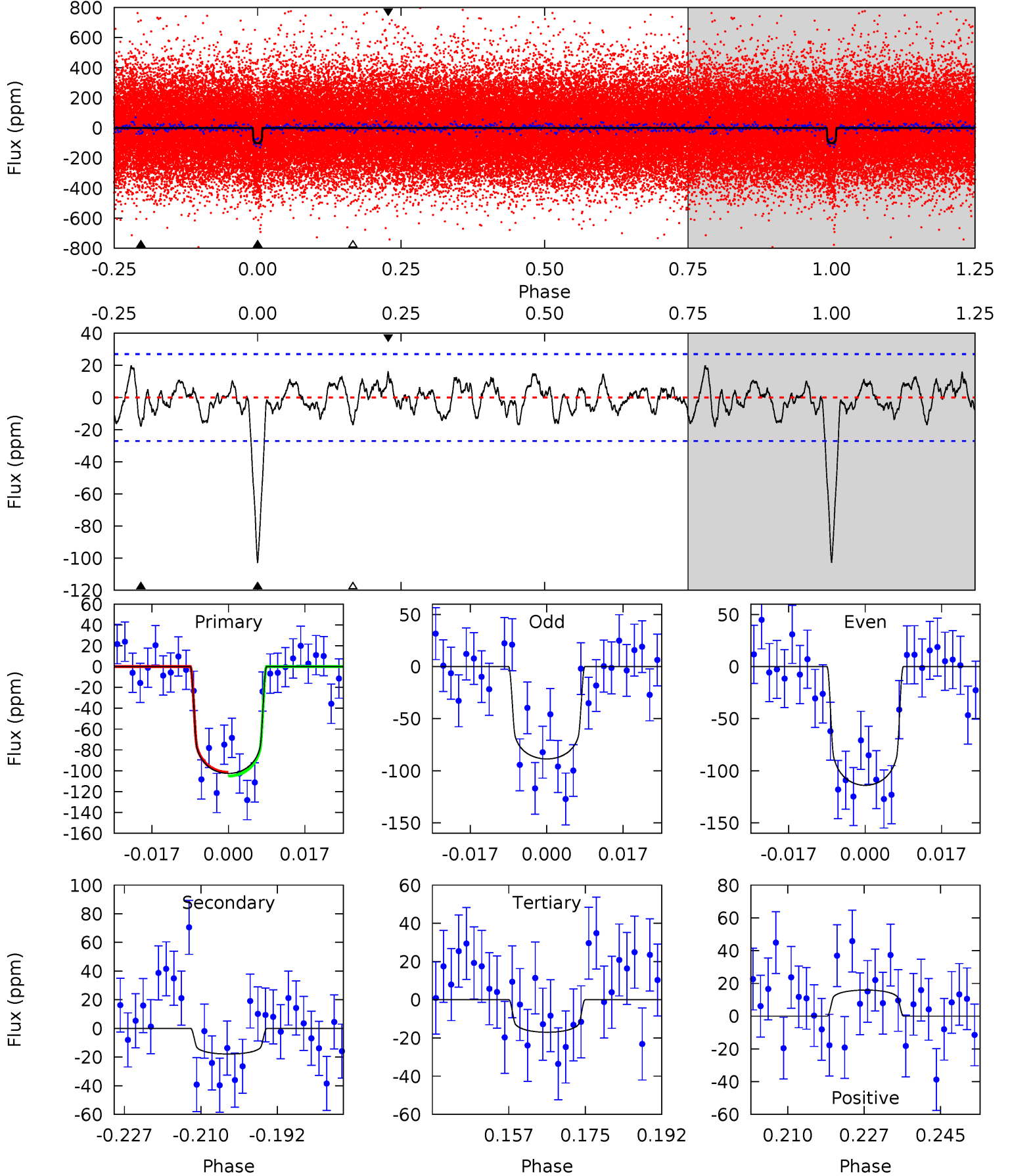
TCE 004945764-01 P= 19.874162 Days $T_0=148.430765$ (BKJD)



DV Model-Shift Uniqueness Test

004945764-01, P = 19.875148 Days, E = 128.517344 Days

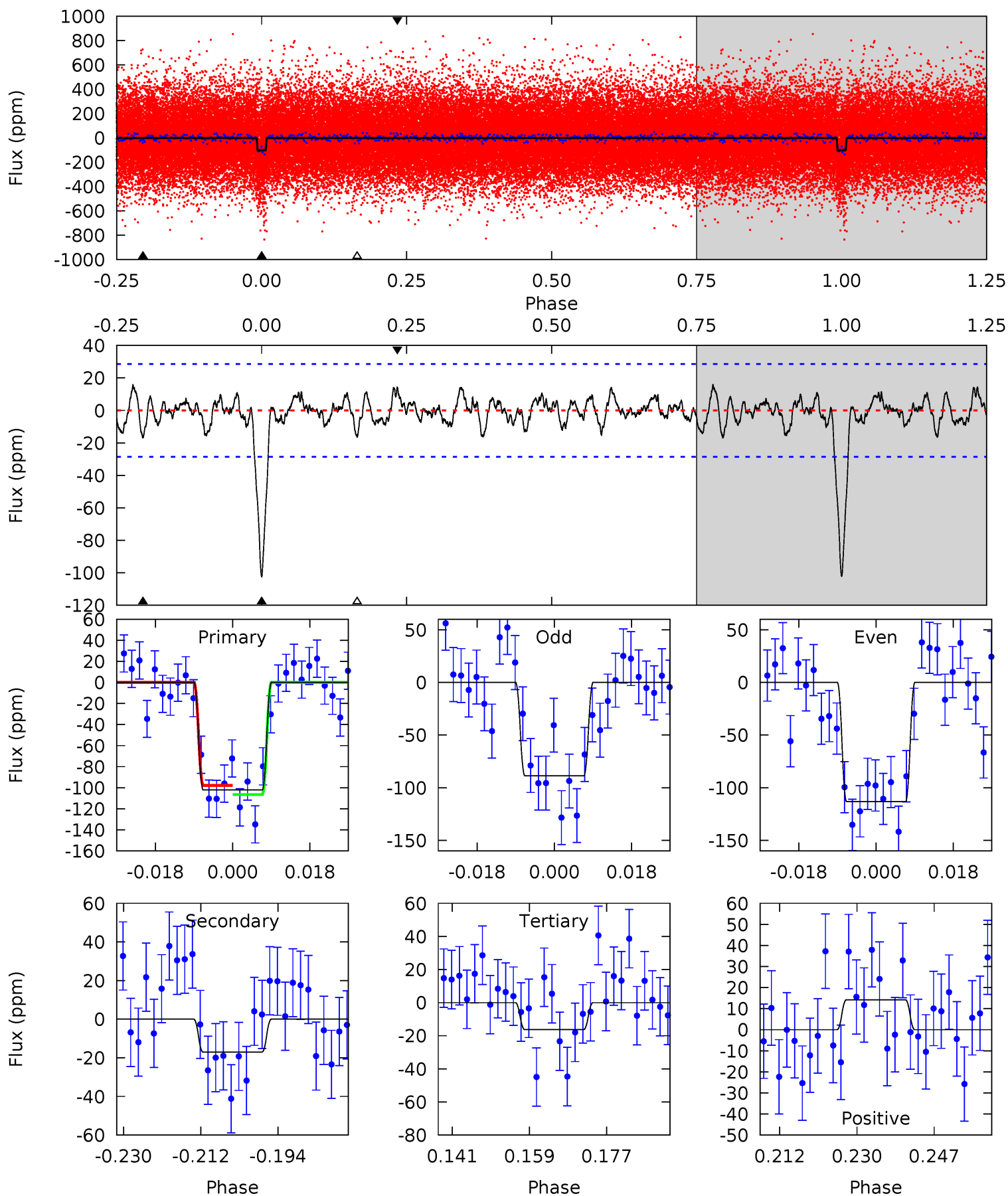
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 18.6 | 3.25 | 3.09 | 2.89 | 4.92 | 2.38 | 1.28 | 15.5 | 15.7 | 0.16 | 0.36 | 2.29 | 1.04 | 0.16 | 0.32 |



Alt Model-Shift Uniqueness Test

004945764-01, $P = 19.874162$ Days, $E = 128.556603$ Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 17.6 | 2.92 | 2.80 | 2.45 | 4.92 | 2.37 | 1.03 | 14.8 | 15.1 | 0.12 | 0.48 | 2.10 | 1.03 | 0.13 | 0.74 |



Stellar Parameters For KIC 004945764

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 6918^{+72}_{-83} | $4.021^{+0.148}_{-0.121}$ | $0.000^{+0.150}_{-0.150}$ | $2.004^{+0.413}_{-0.338}$ | $1.536^{+0.149}_{-0.108}$ | $0.269^{+0.195}_{-0.105}$ |
| | +1%/-1% | +4%/-3% | +inf%/-inf% | +21%/-17% | +10%/-7% | +72%/-39% |
| Source | SPE68 | SPE68 | SPE68 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004945764-01 / KOI 4377.01

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-------------|------------------------|--------------------|----------------------|------------------|
| DV | -18 ± 6 | $2.29^{+0.53}_{-0.52}$ | 1476^{+74}_{-73} | 4491^{+567}_{-392} | 50^{+41}_{-21} |
| Alt. | -17 ± 6 | $2.23^{+0.52}_{-0.50}$ | 1477^{+76}_{-72} | 4554^{+534}_{-455} | 53^{+39}_{-25} |

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

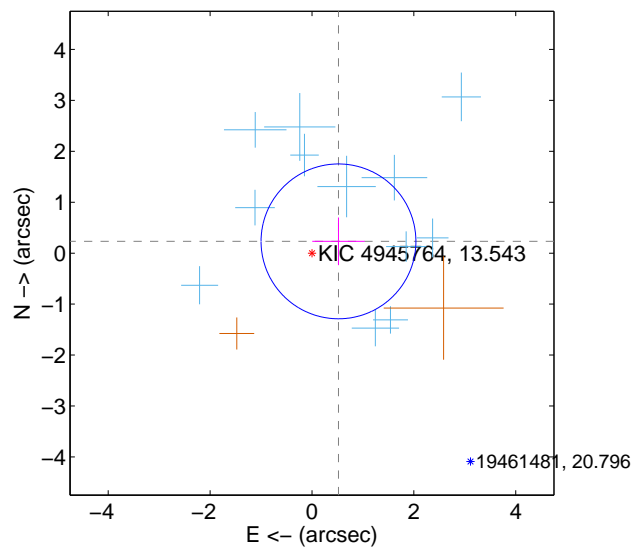
Supplemental centroid analysis for 004945764-01. Kepler magnitude: 13.54. Transit SNR 11.56

There are 12 quarters with good PRF difference image offsets

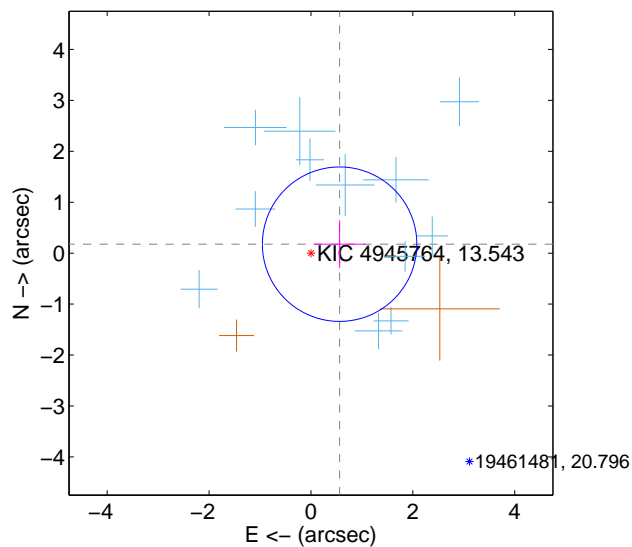
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.570 ± 0.507 | 1.12 | -0.520 ± 0.514 | 0.232 ± 0.468 |
| PRF-fit source offset from KIC position | 0.590 ± 0.505 | 1.17 | -0.563 ± 0.509 | 0.176 ± 0.470 |
| photometric centroid source offset | 1.35 ± 0.87 | 1.55 | 0.05 ± 0.87 | -1.35 ± 0.87 |

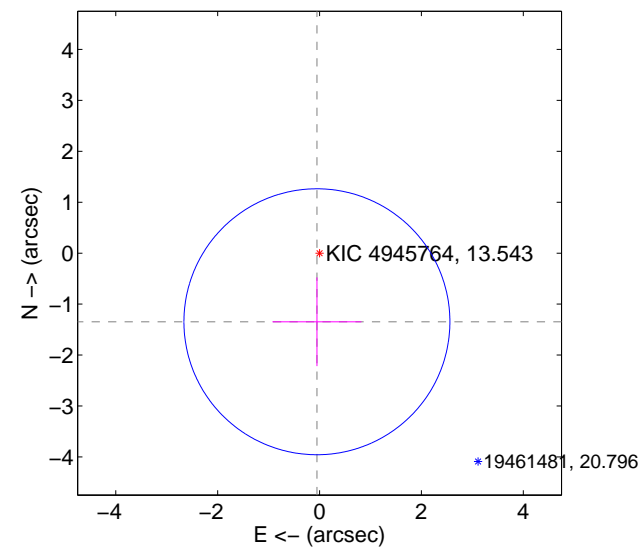
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

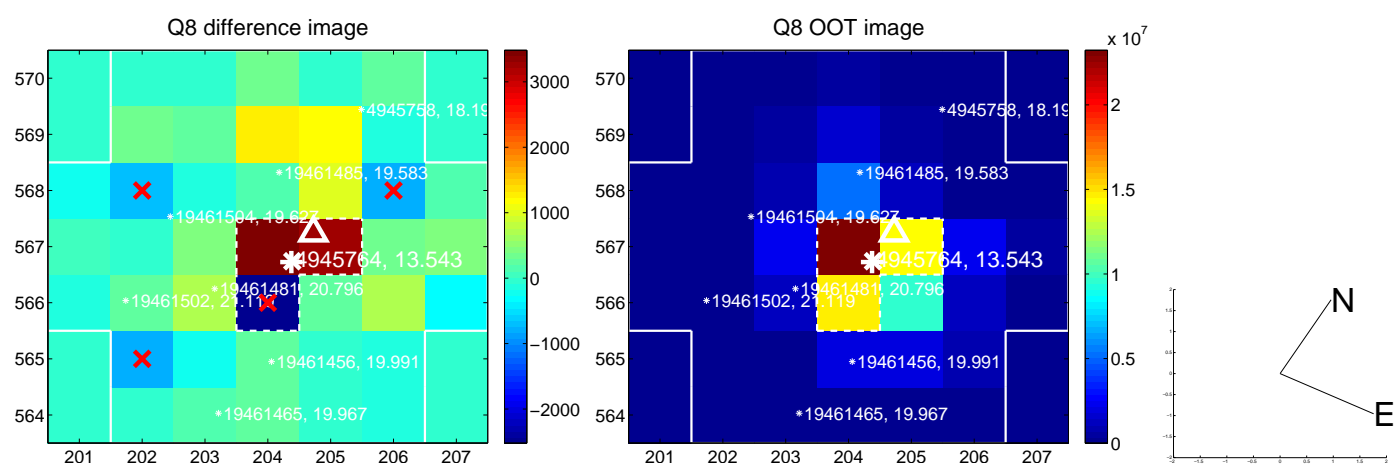
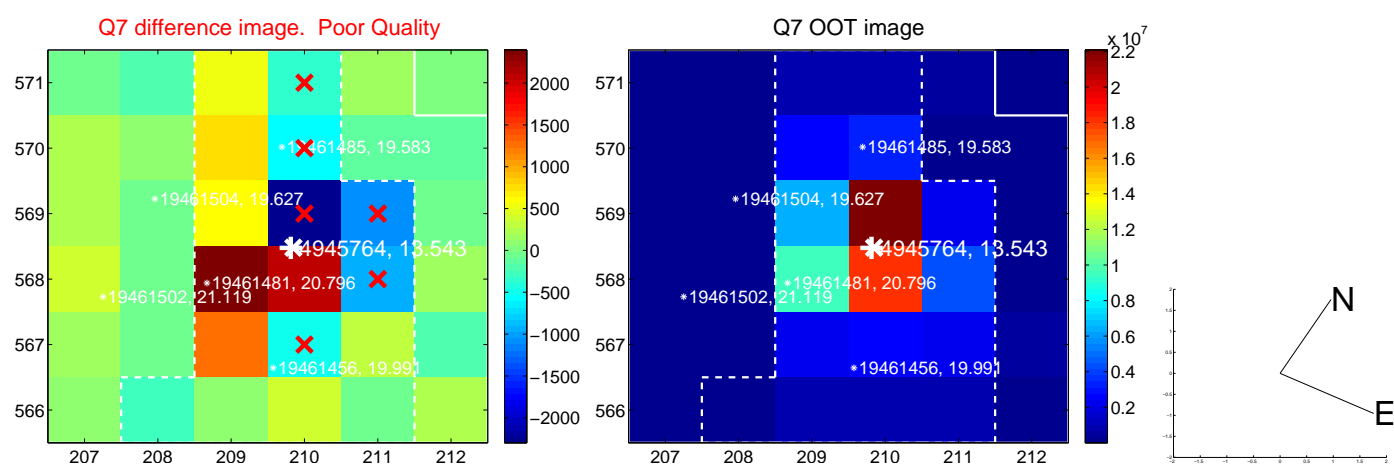
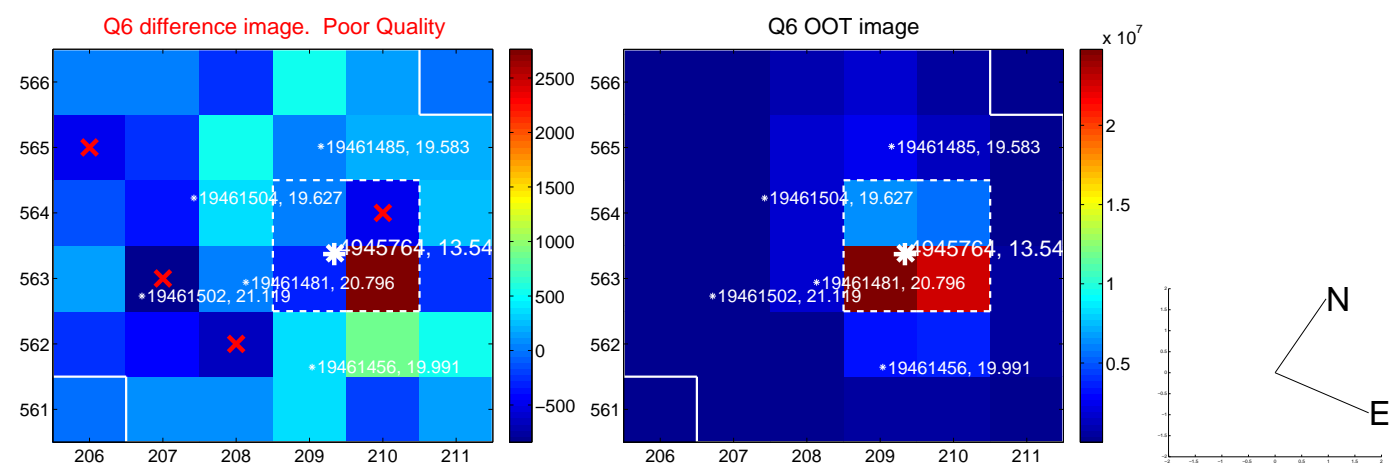
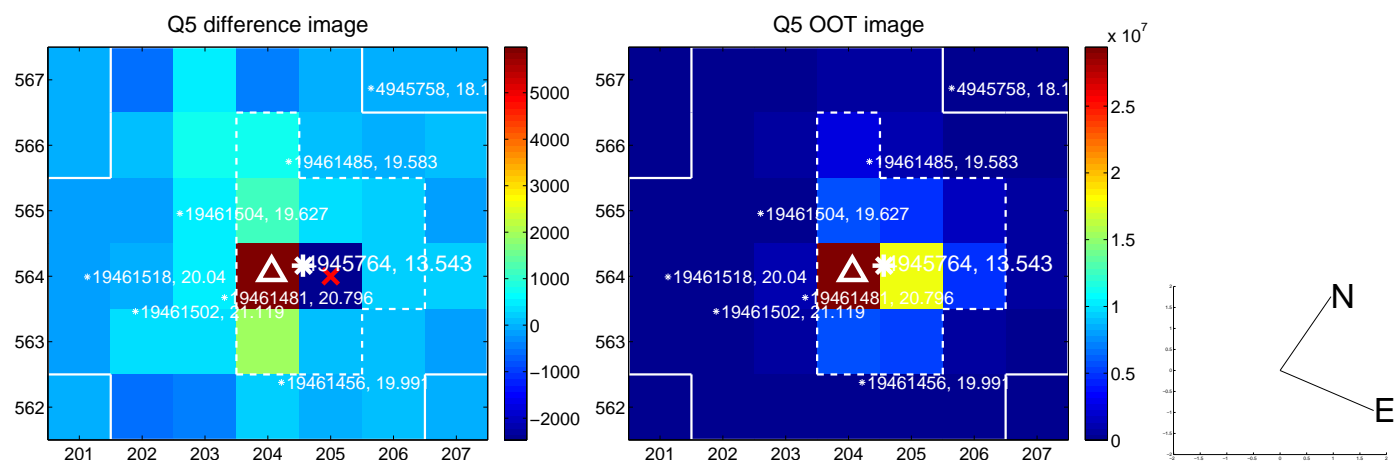


offset from photometric centroids

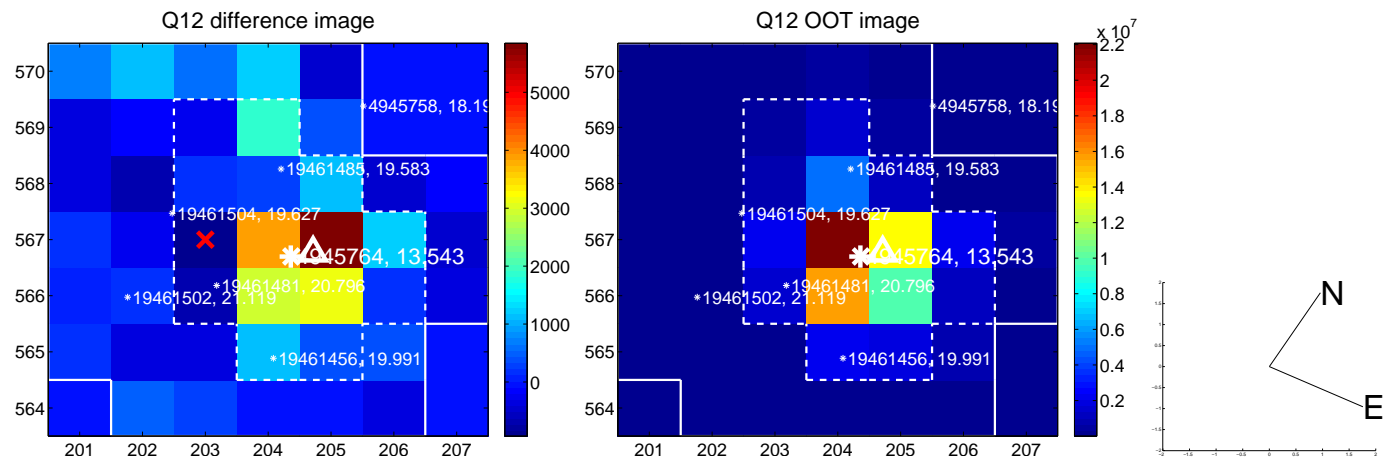
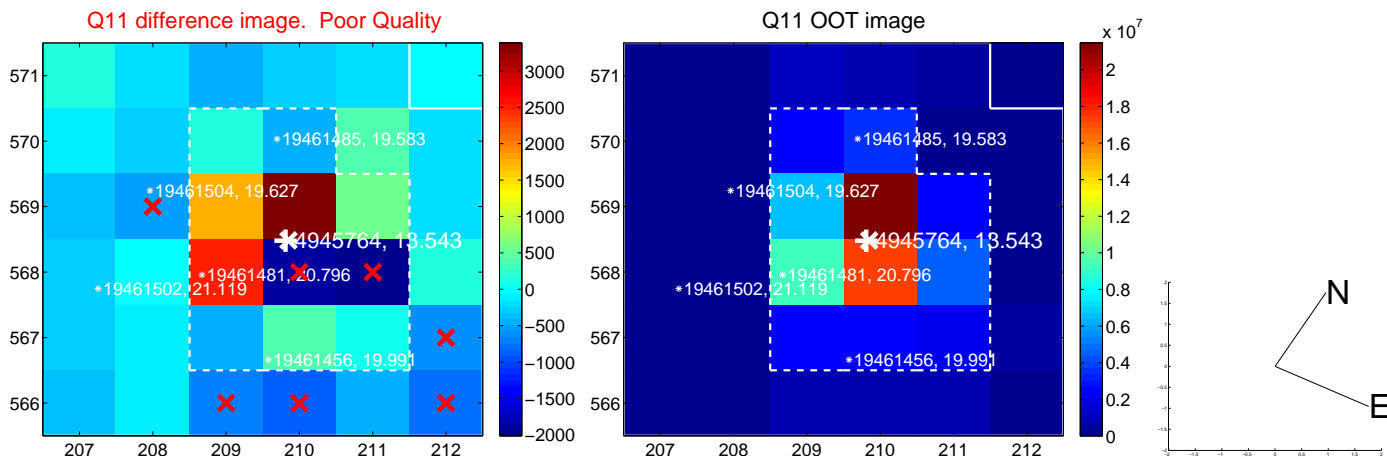
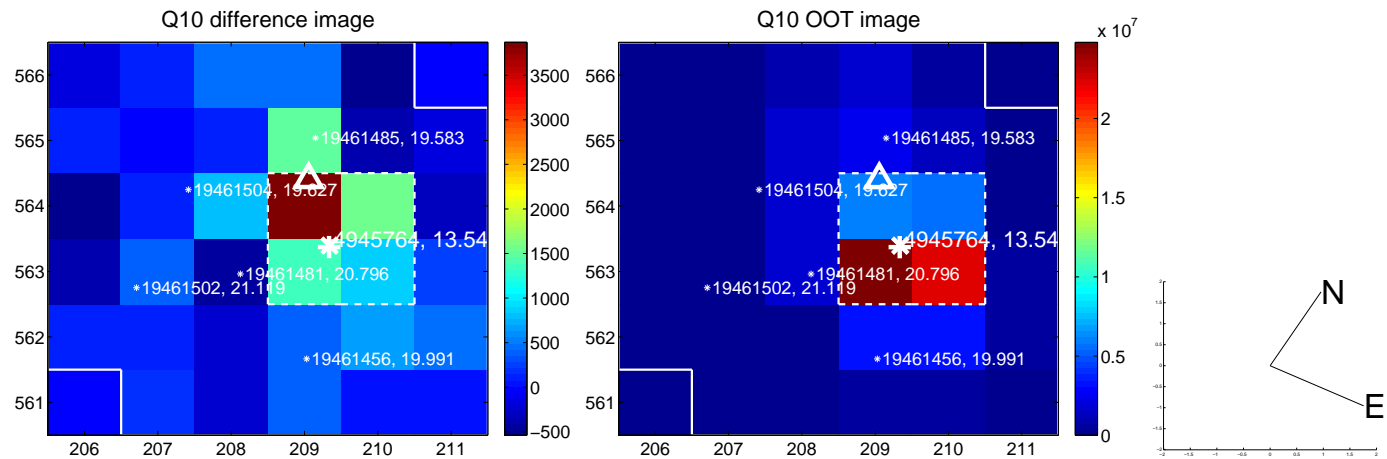
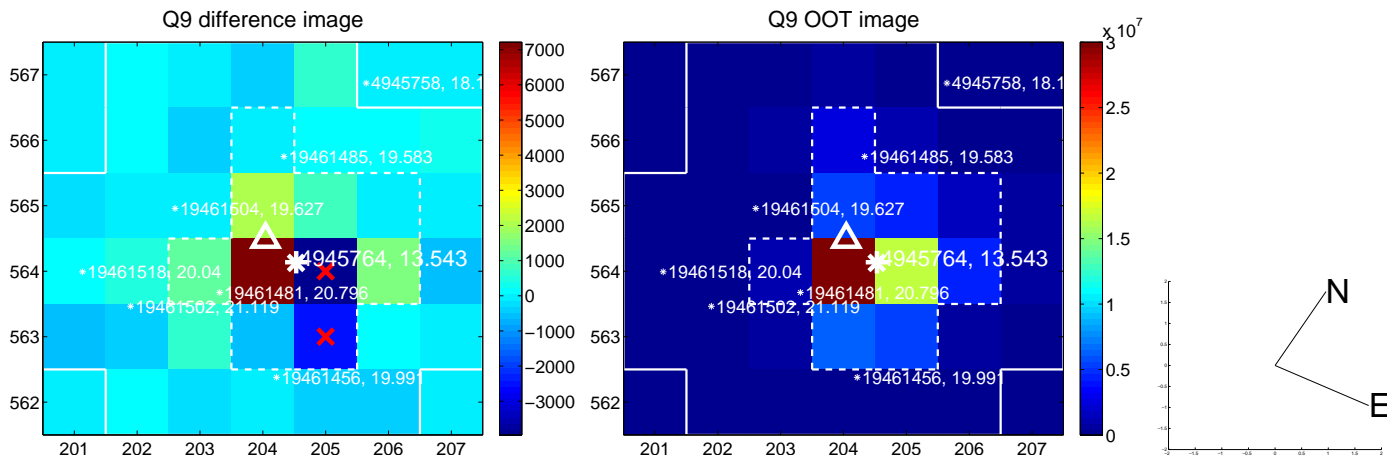


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

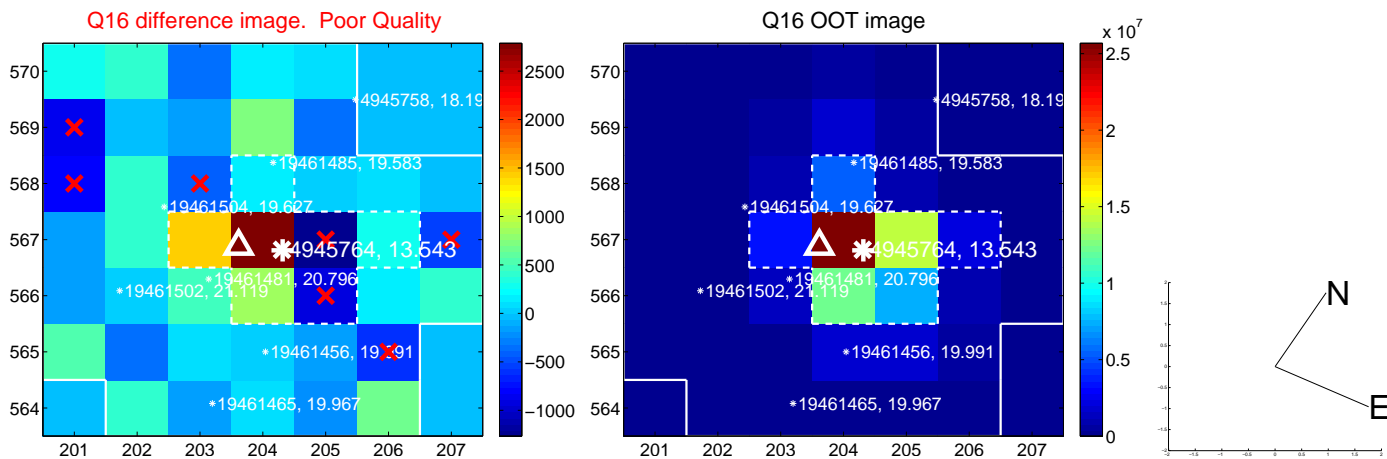
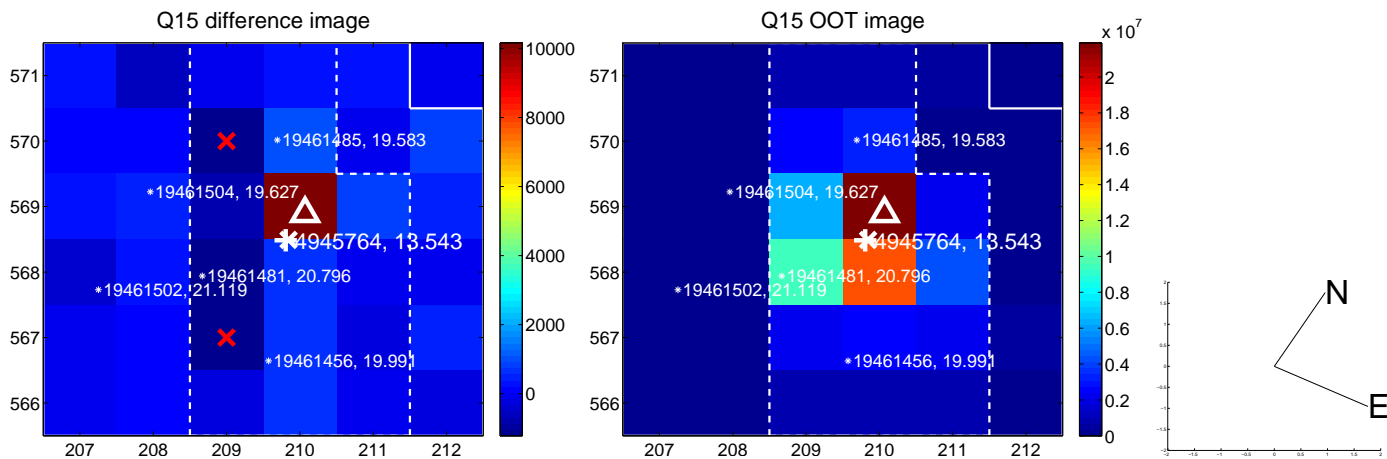
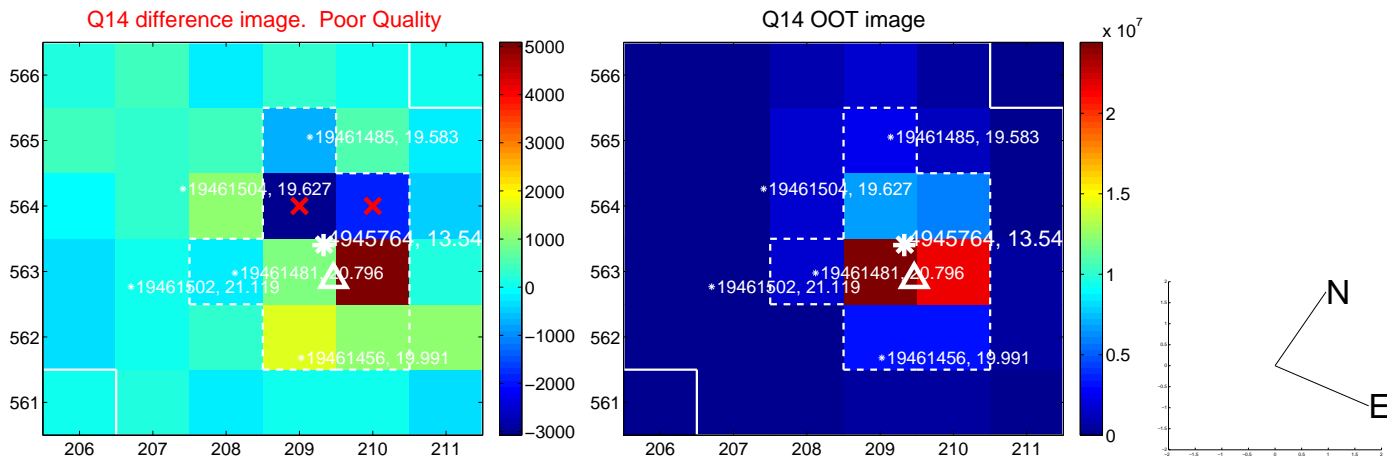
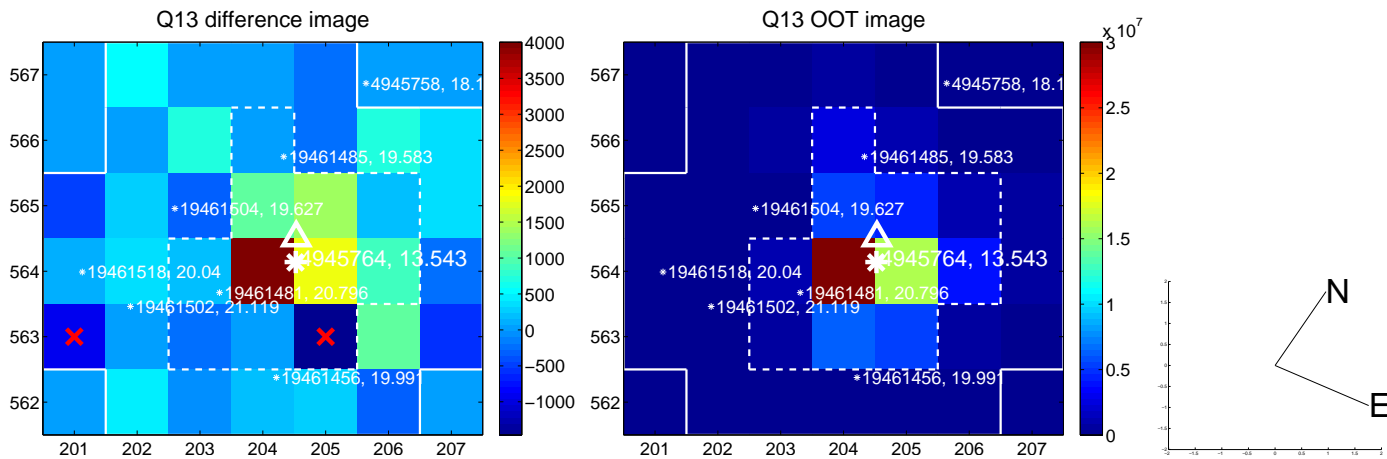
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



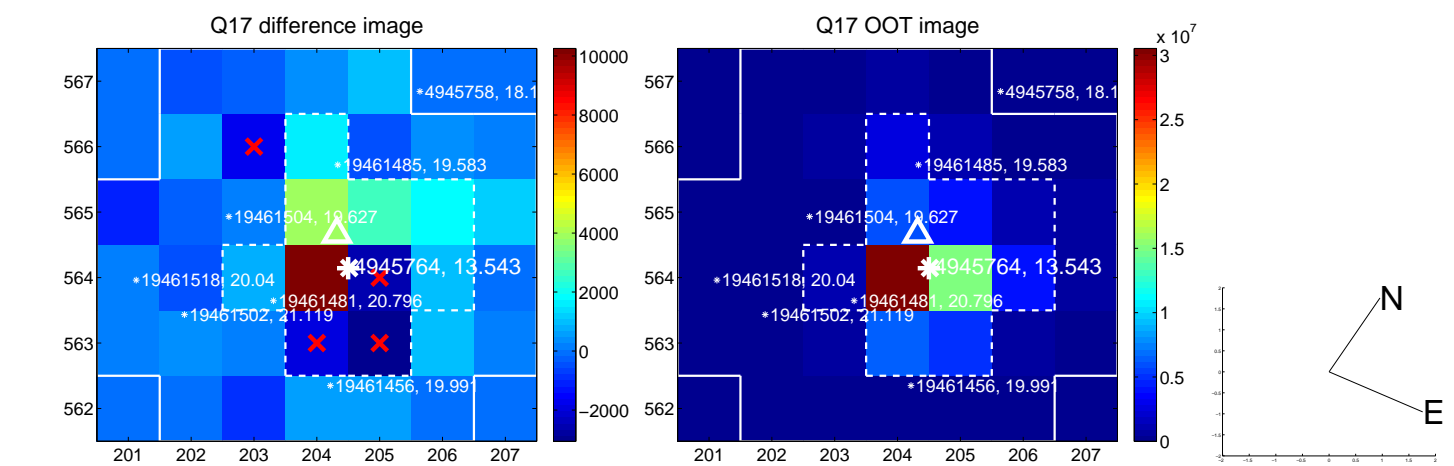
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



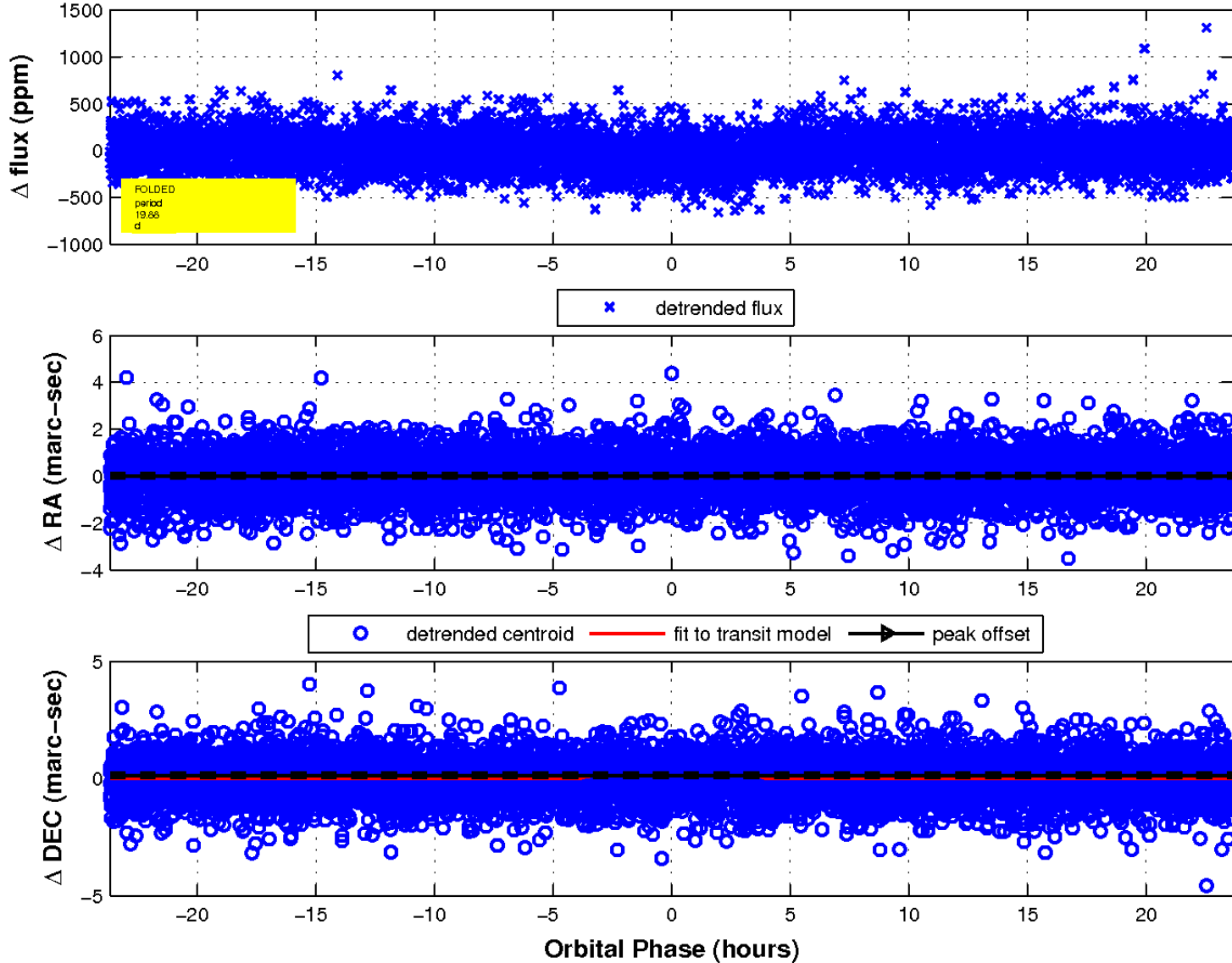
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

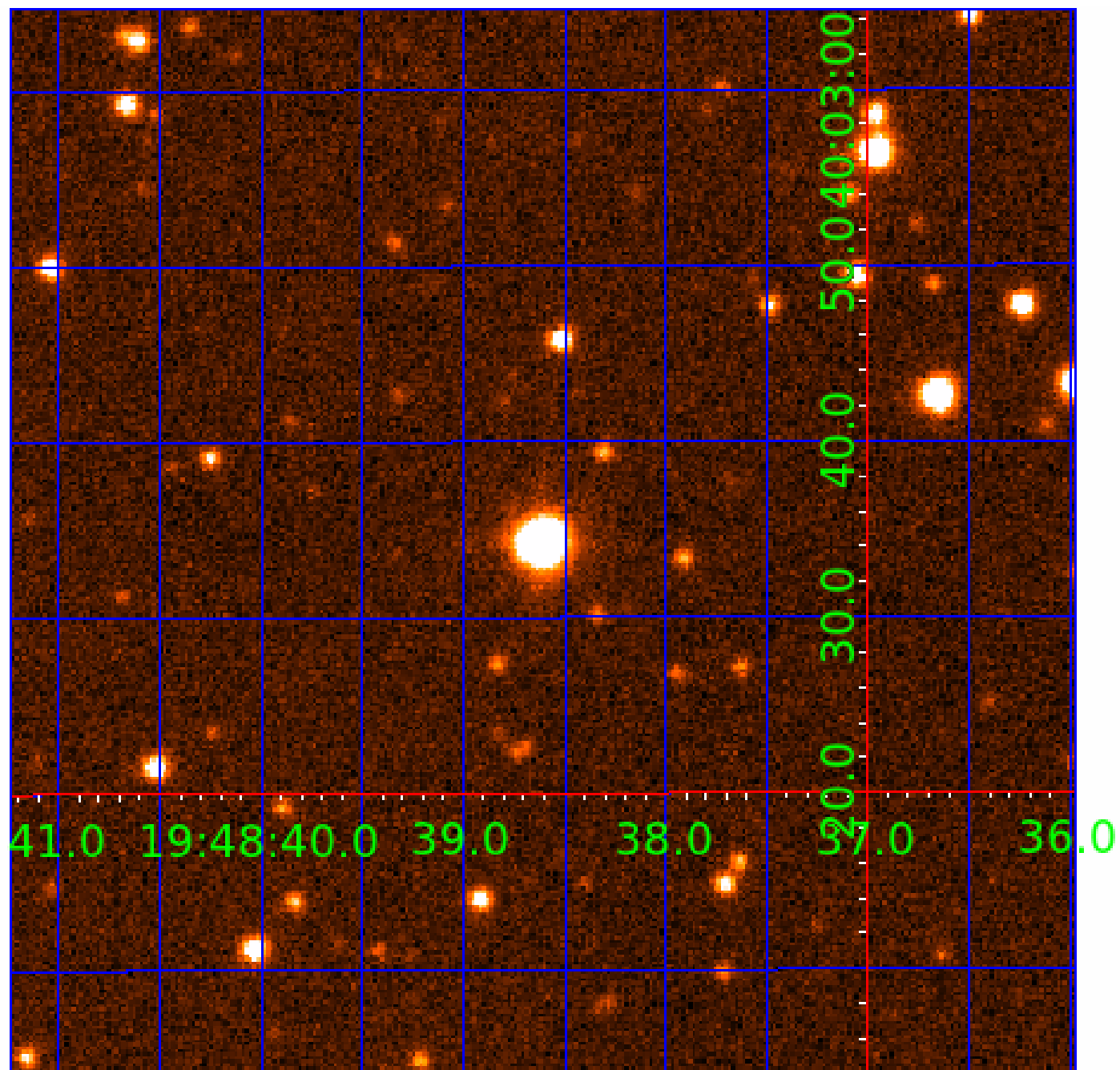


fluxWeightedCentroids, Planet 1 of 5



UKIRT Image

Declination



KIC 004945764

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 004945764-01 | OBS | 4377.01 | 19.875148 | 148.392492 | 106.8 | 7.895 | 11.1 | 11.6 | 2.00 | 6918 | 2.33 | 299.92 |
| 004945764-02 | OBS | No | 0.795981 | 132.274851 | 6.1 | 5.214 | 7.7 | 3.2 | 2.00 | 6918 | 0.53 | 21888.26 |
| 004945764-03 | OBS | No | 48.635289 | 155.599738 | 281.8 | 2.446 | 9.5 | 8.7 | 2.00 | 6918 | 3.94 | 90.95 |
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| 004945764-05 | OBS | No | 33.460679 | 153.932686 | 174.8 | 3.722 | 8.8 | 8.7 | 2.00 | 6918 | 2.91 | 149.75 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004945764-01 | OBS | PC | 0.93 | 0 | 0 | 0 | 0 | NO_COMMENT |
| 004945764-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT |
| 004945764-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 004945764-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 004945764-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |

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 004945764-02

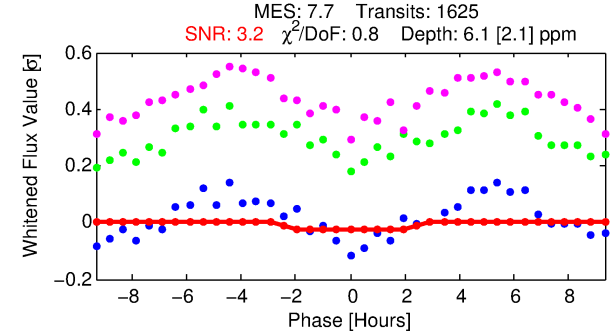
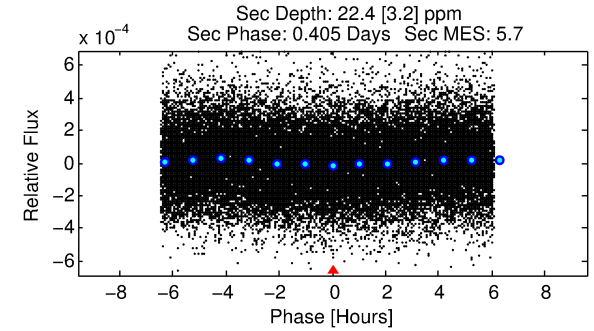
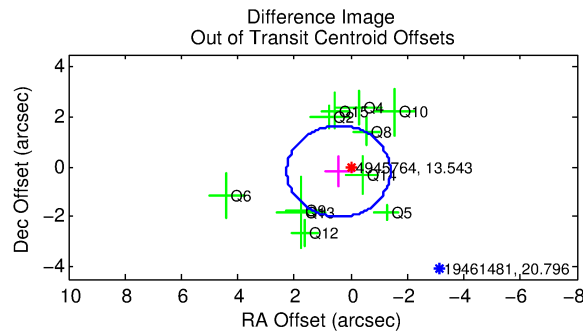
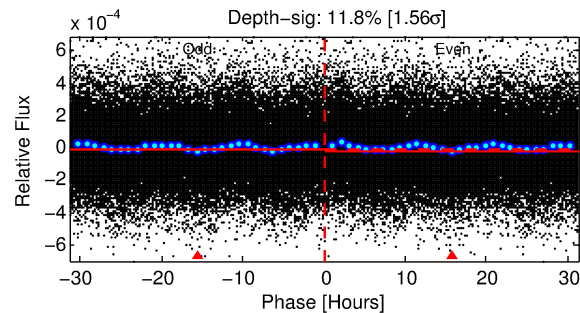
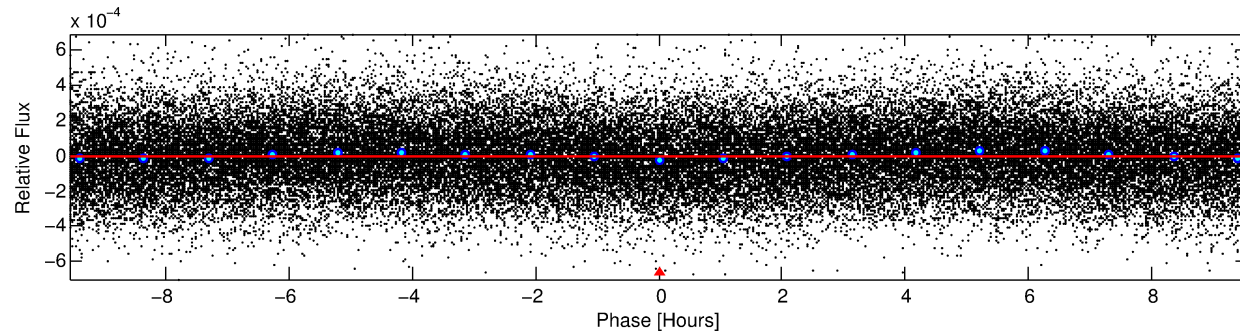
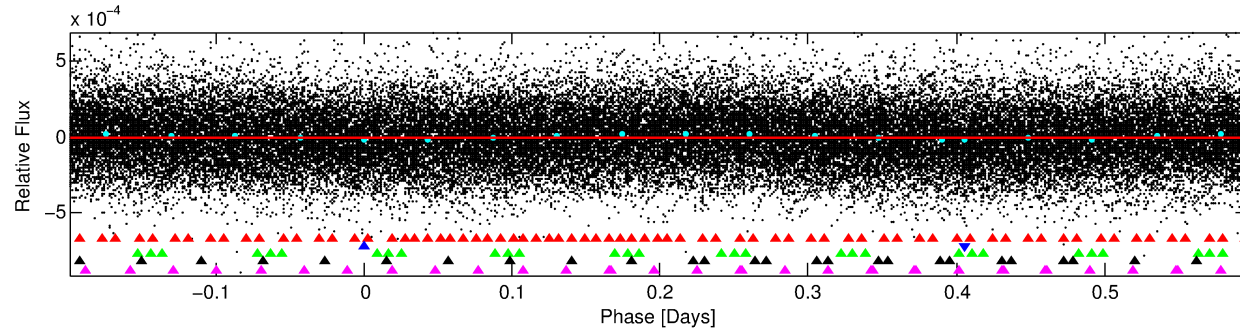
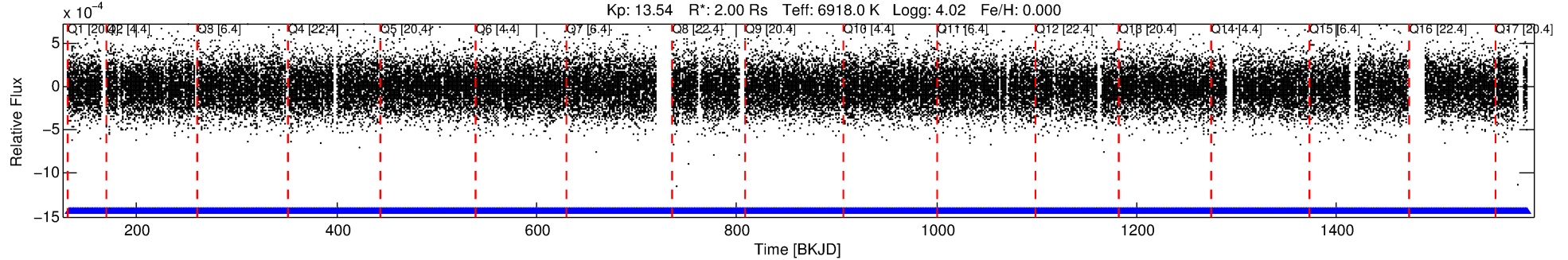
No Significant Match Found

DV One-Page Summary

KIC: 4945764 Candidate: 2 of 5 Period: 0.796 d

KOI: K04377 Corr: No Ephemeris Match

Kp: 13.54 R*: 2.00 Rs Teff: 6918.0 K Logg: 4.02 Fe/H: 0.000



DV Fit Results:

Period = 0.79598 [0.00004] d
Epoch = 132.2749 [0.0149] BKJD
Rp/R* = 0.0024 [0.0018]
a/R* = 1.18 [1.46]
b = 0.70 [3.23]
Seff = 21888.26 [5905.54]
Teq = 3102 [209] K
Rp = 0.53 [0.42] Re
a = 0.0194 [0.0035] AU
Ag = 16.61 [25.88] [0.60σ]
Teffp = 9681 [3718] K [1.77σ]

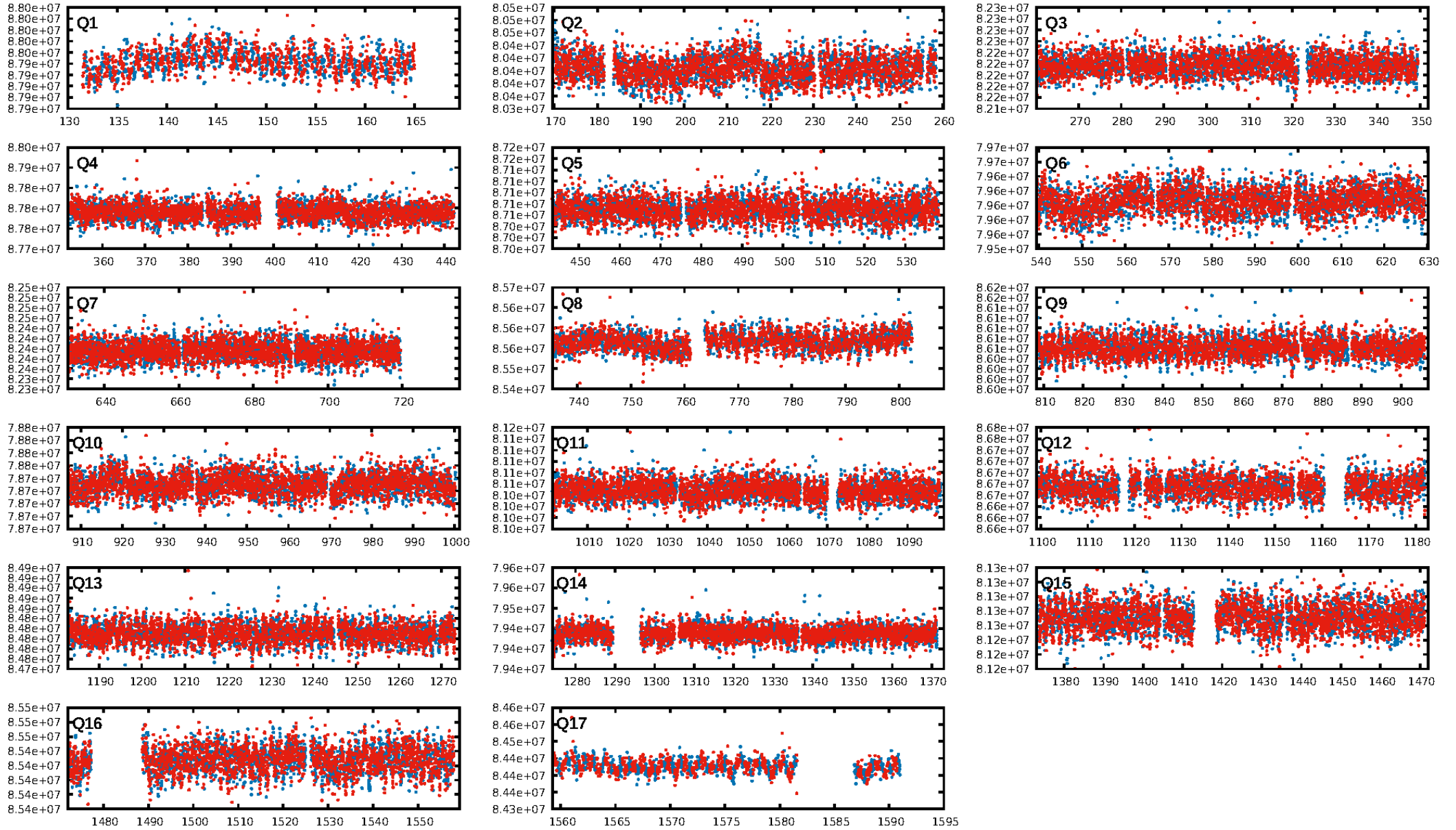
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [48.40σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.02e-07
RollingBand-fgt: 1.00 [1552/1552]
GhostDiagnostic-chr: -4.732
Centroid-sig: 6.9%
Centroid-so: 5.391 arcsec [1.53σ]
OotOffset-rm: 0.473 arcsec [0.78σ]
KicOffset-rm: 0.468 arcsec [0.78σ]
OotOffset-st: 4/1/3/3 [11]
KicOffset-st: 4/1/3/3 [11]
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DiffImageOverlap-fno: 1.00 [17/17]

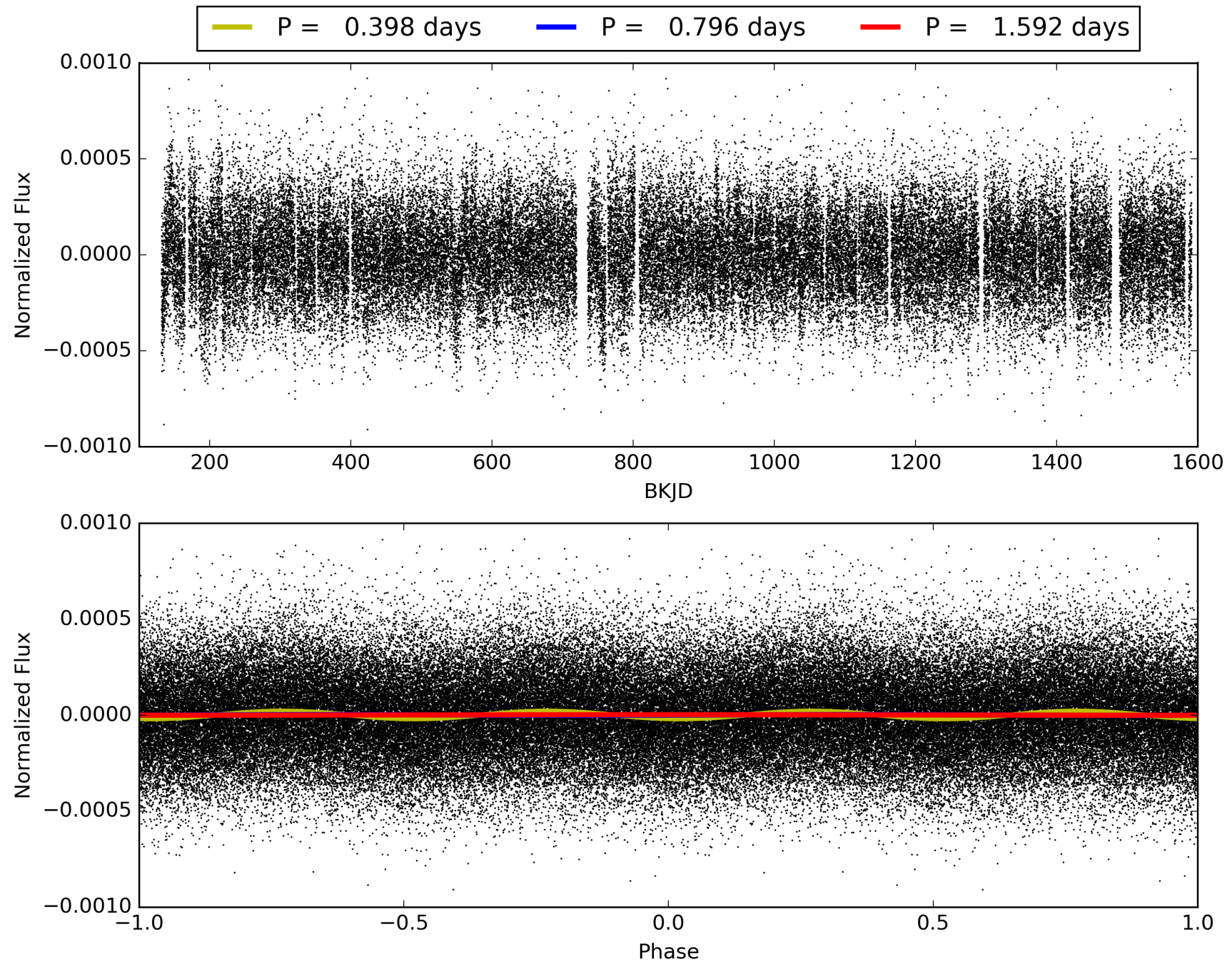
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 07:21:12 Z

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

TCE 004945764-02, PDC Light Curves

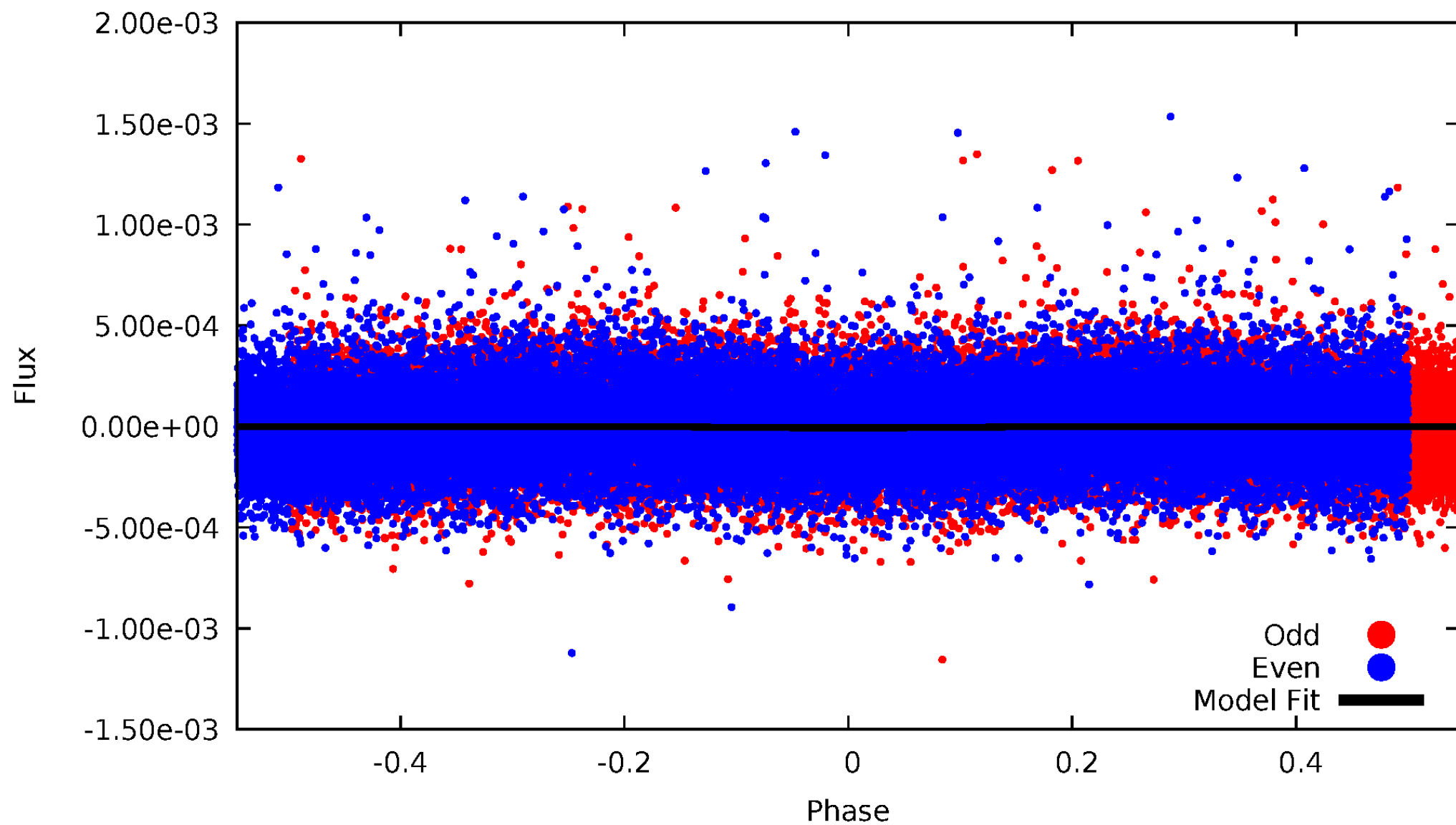


TCE 004945764-02



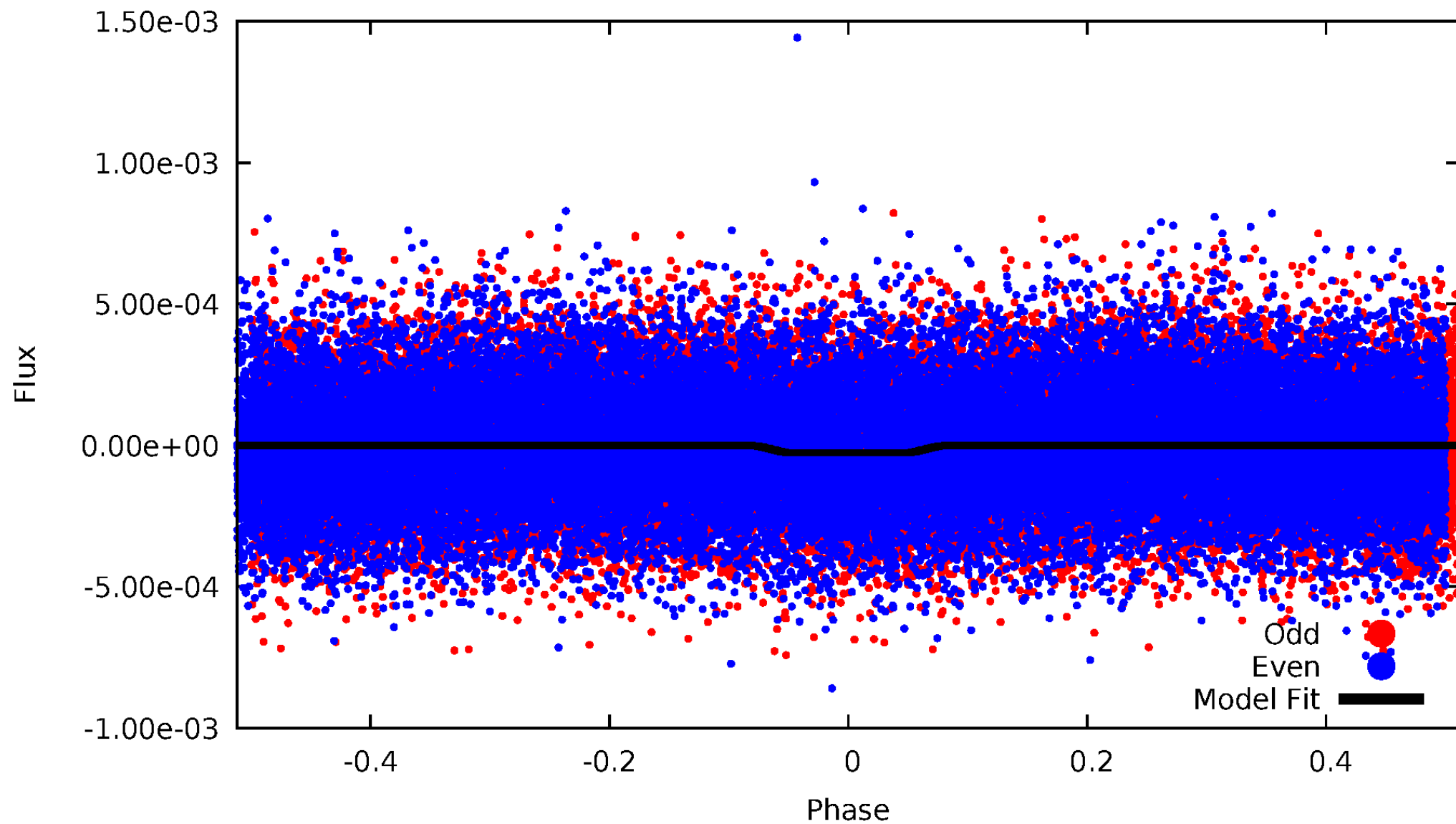
DV Odd/Even

TCE 004945764-02



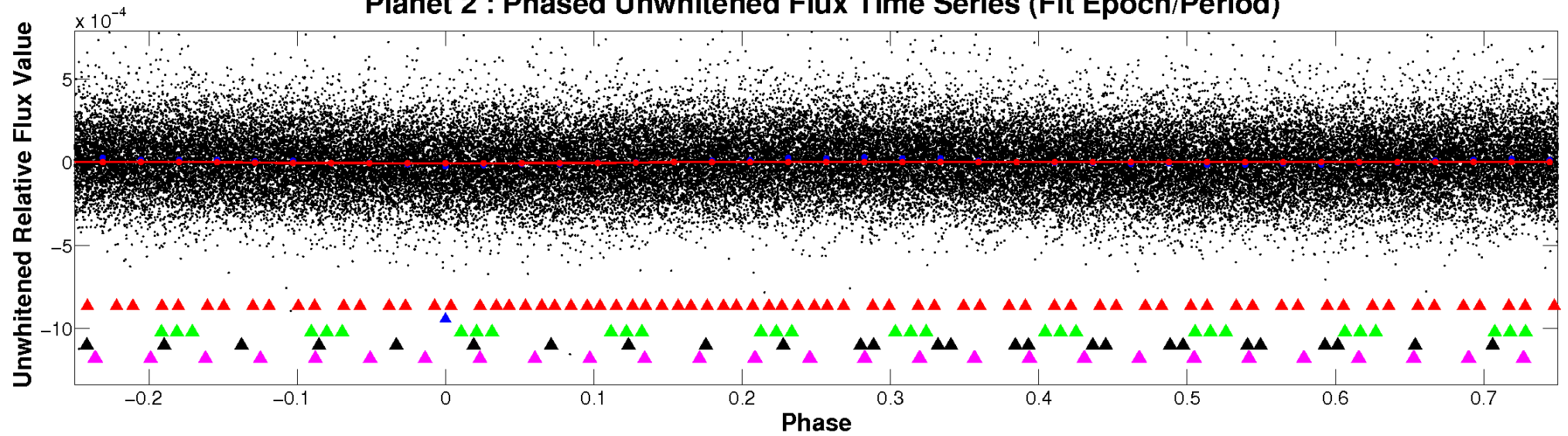
ALT Odd/Even

TCE 004945764-02

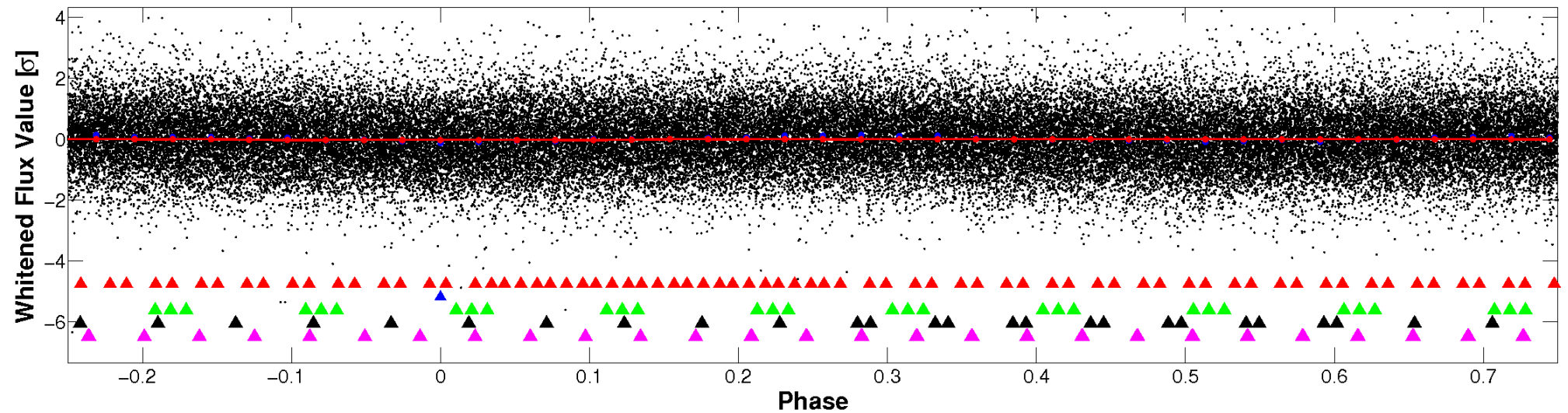


Non-Whitened Vs. Whitened Light Curve

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

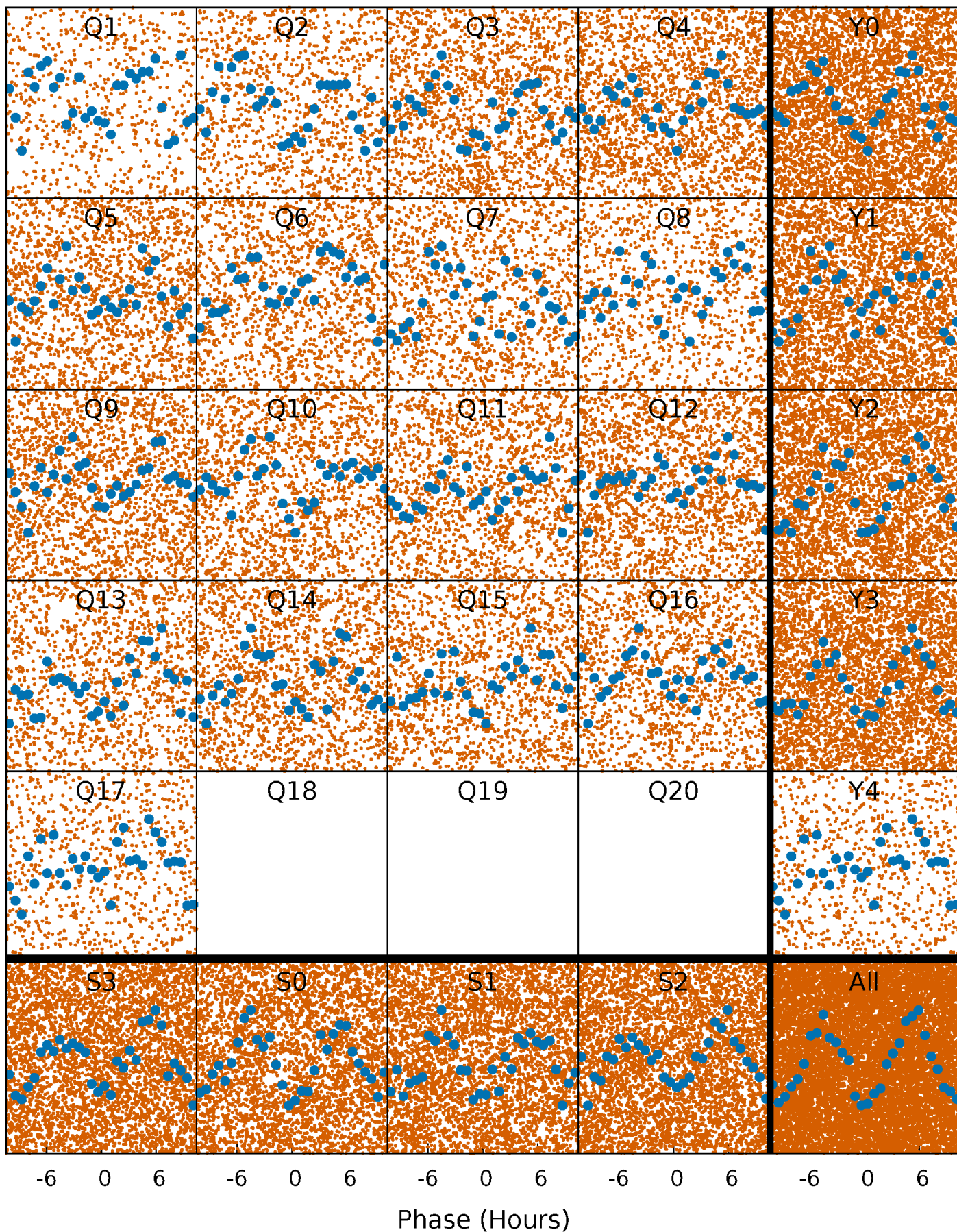


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



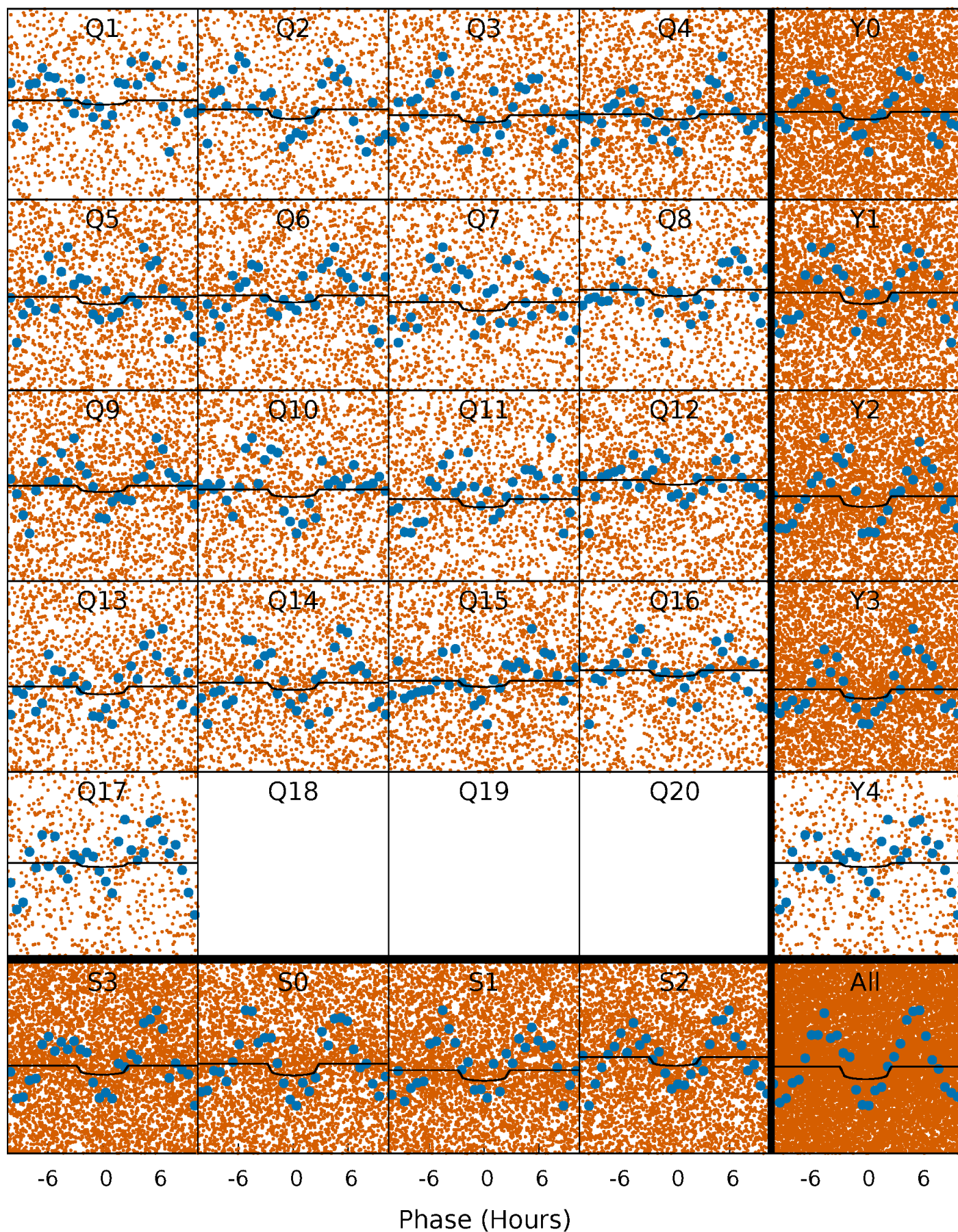
PDC Quarter-Phased Transit Curves

TCE 004945764-02 P= 0.795981 Days $T_0=132.274851$ (BKJD)



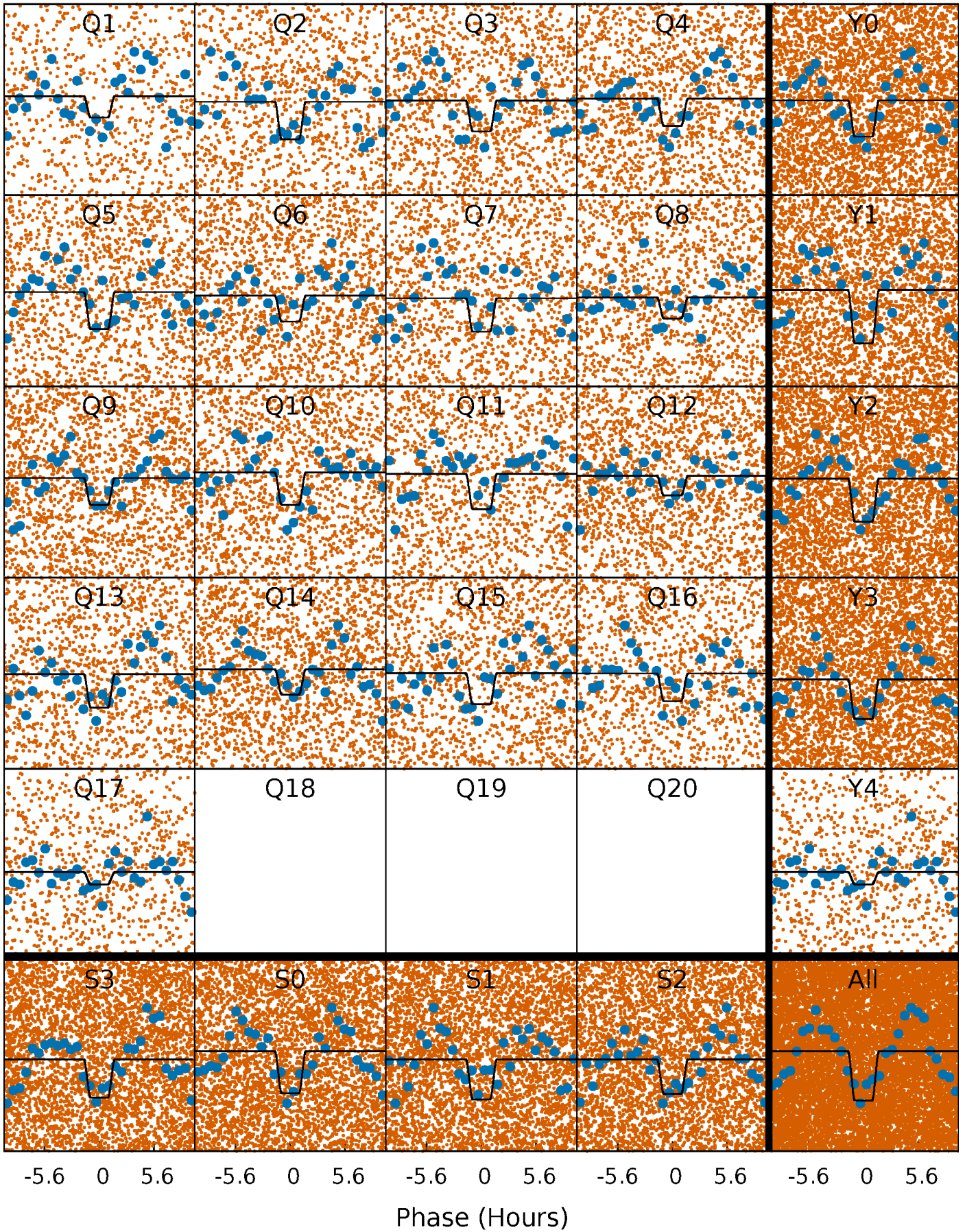
DV Quarter-Phased Transit Curves

TCE 004945764-02 P= 0.795981 Days $T_0=132.274851$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

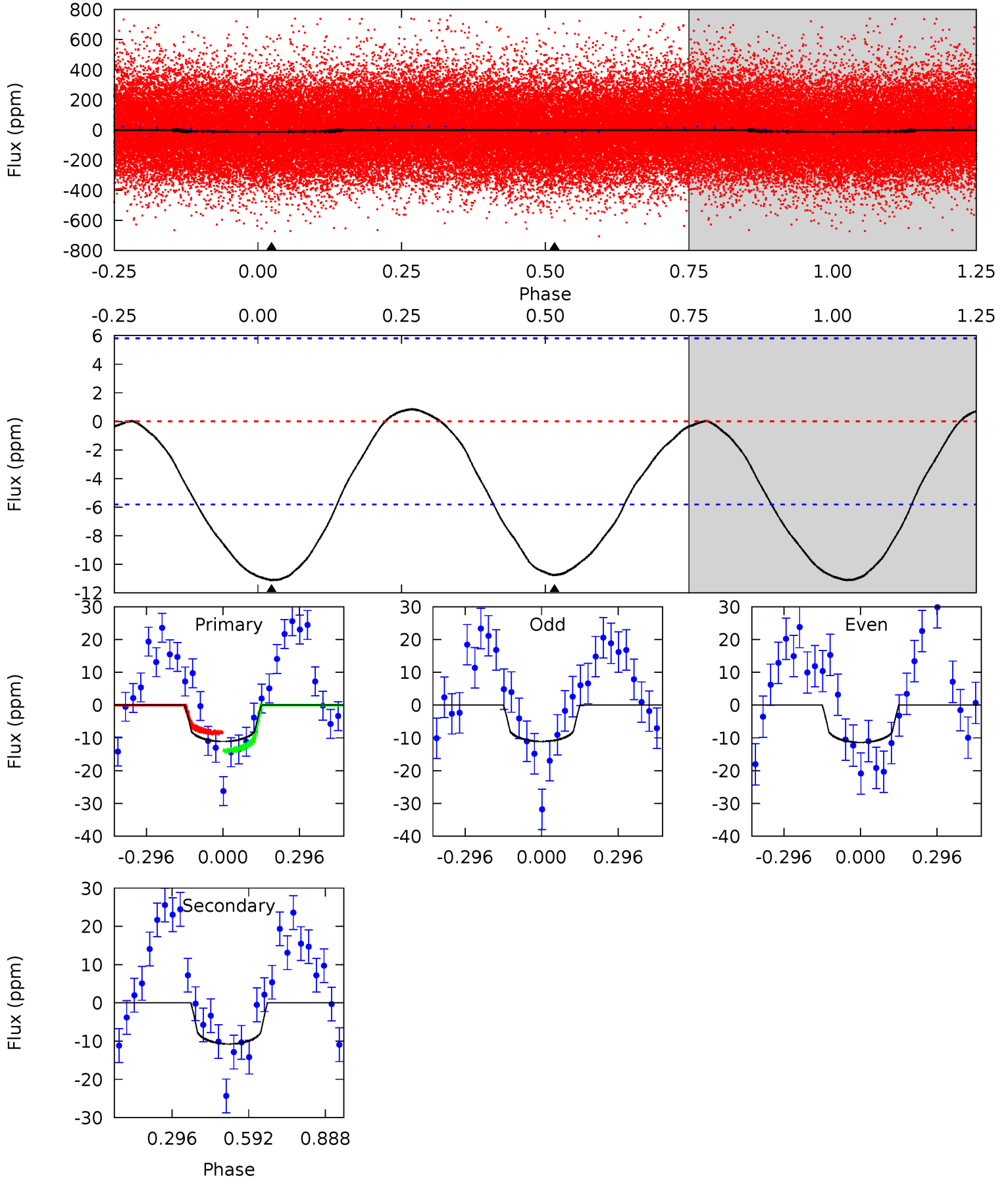
TCE 004945764-02 P= 0.795995 Days $T_0=132.273708$ (BKJD)



DV Model-Shift Uniqueness Test

004945764-02, P = 0.795981 Days, E = 131.478870 Days

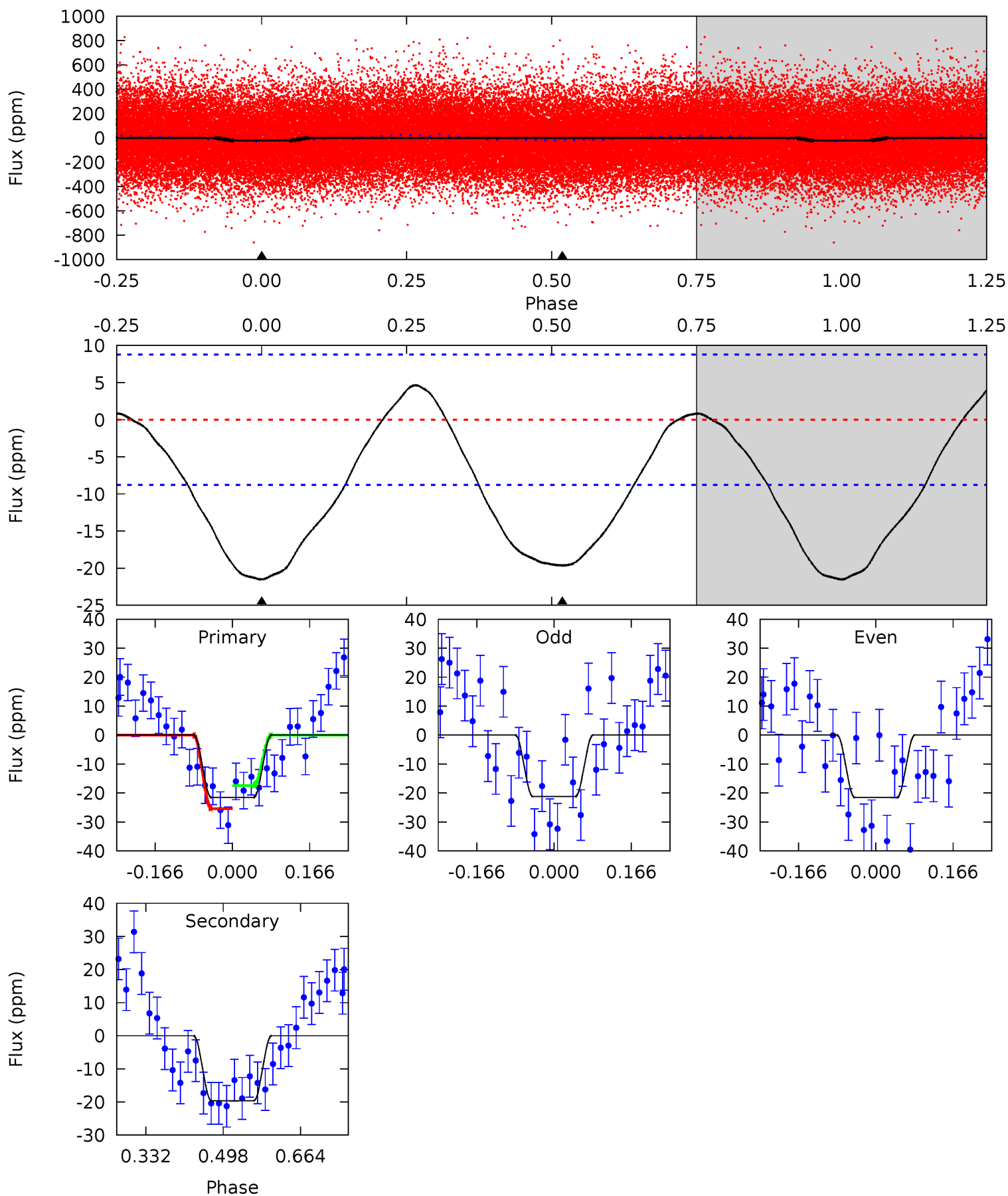
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 8.28 | 8.02 | 0 | 0 | 4.33 | 1.05 | 0.36 | 8.28 | 8.28 | 8.02 | 8.02 | 0.11 | 0.87 | 0.07 | 2.08 |



Alt Model-Shift Uniqueness Test

004945764-02, P = 0.795995 Days, E = 131.477713 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.9 | 9.97 | 0 | 0 | 4.46 | 1.38 | 1.28 | 10.9 | 10.9 | 9.97 | 9.97 | 0.07 | 1.15 | 0.18 | 2.04 |



Stellar Parameters For KIC 004945764

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 6918^{+72}_{-83} | $4.021^{+0.148}_{-0.121}$ | $0.000^{+0.150}_{-0.150}$ | $2.004^{+0.413}_{-0.338}$ | $1.536^{+0.149}_{-0.108}$ | $0.269^{+0.195}_{-0.105}$ |
| | +1%/-1% | +4%/-3% | +inf%/-inf% | +21%/-17% | +10%/-7% | +72%/-39% |
| Source | SPE68 | SPE68 | SPE68 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004945764-02 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-------------|------------------------|----------------------|------------------------|----------------------------|
| DV | -11 \pm 1 | $0.58^{+0.38}_{-0.34}$ | 4316^{+221}_{-207} | 7748^{+7440}_{-2000} | $6.772^{+33.323}_{-4.360}$ |
| Alt. | -20 \pm 2 | $1.11^{+0.43}_{-0.40}$ | 4303^{+231}_{-209} | 6261^{+1788}_{-1009} | $3.310^{+4.916}_{-1.599}$ |

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 $A_{obs} \gg 1.0$

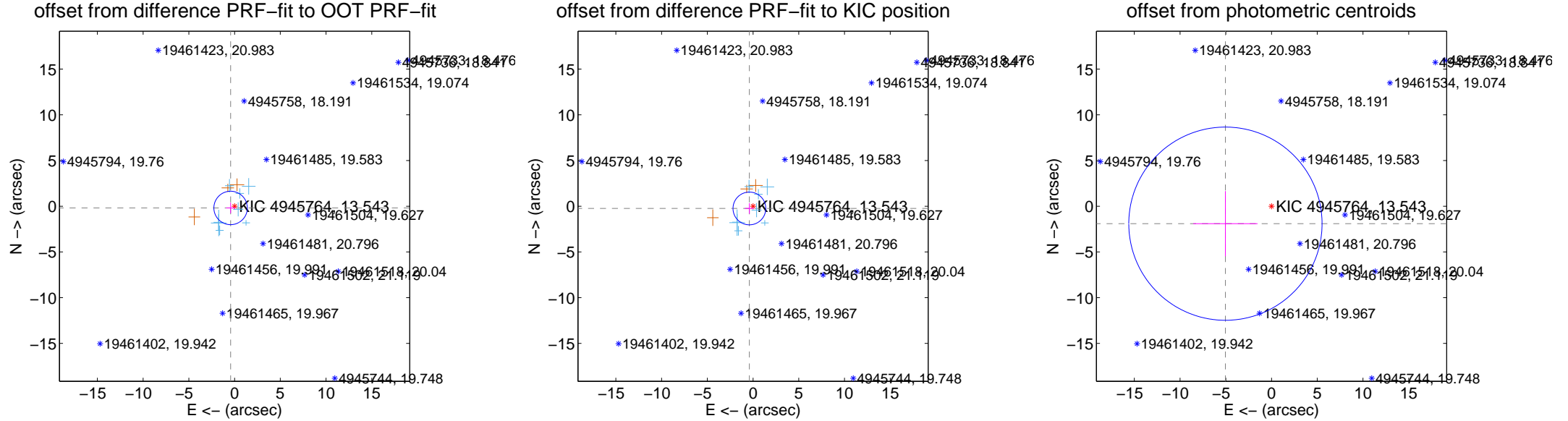
DV Centroid Data

Supplemental centroid analysis for 004945764-02. Kepler magnitude: 13.54. Transit SNR 3.19

There are 8 quarters with good PRF difference image offsets

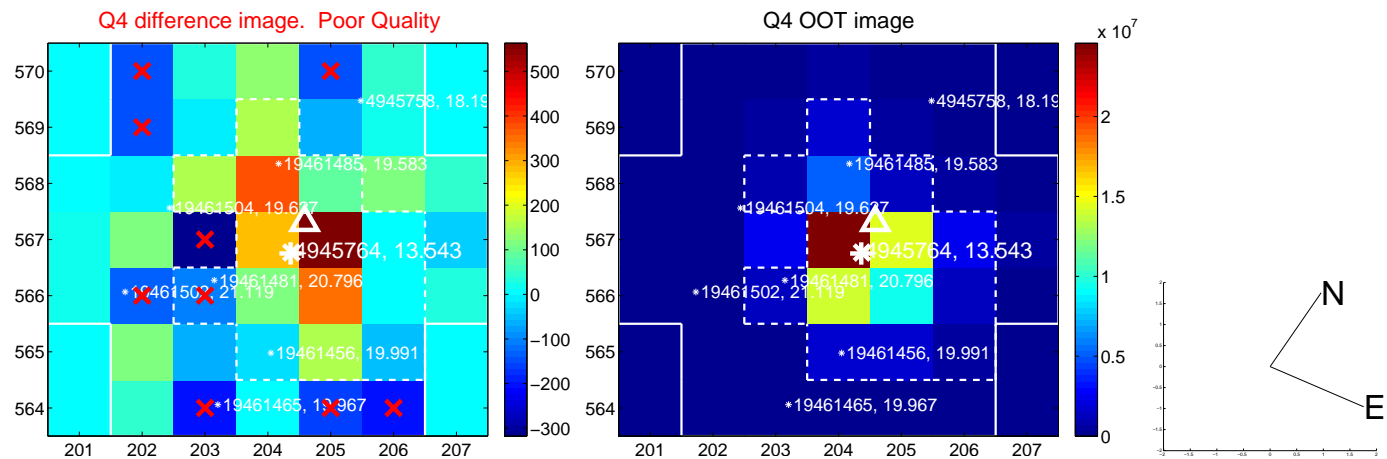
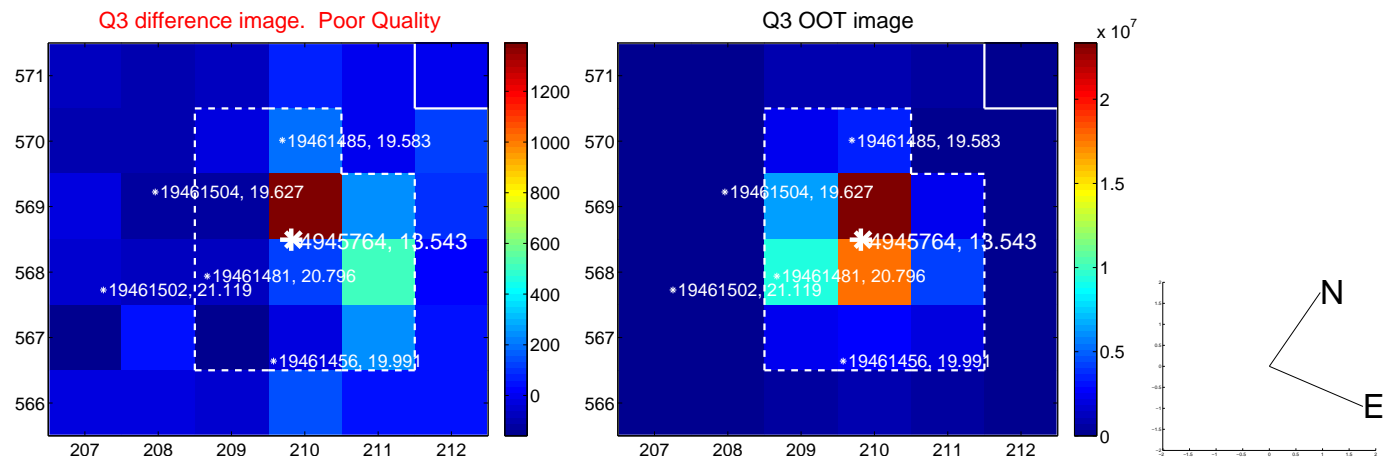
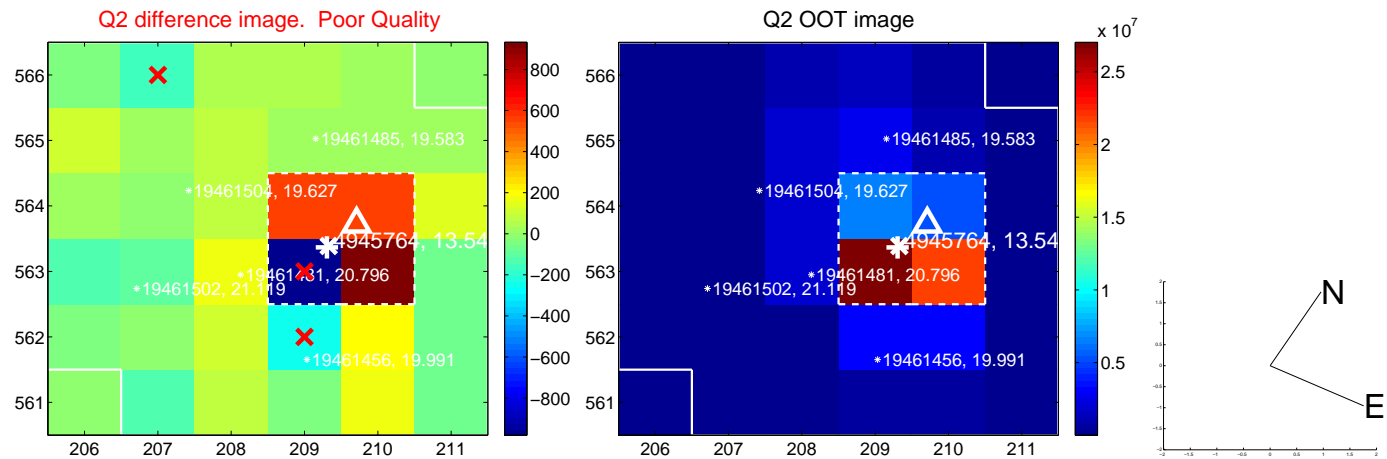
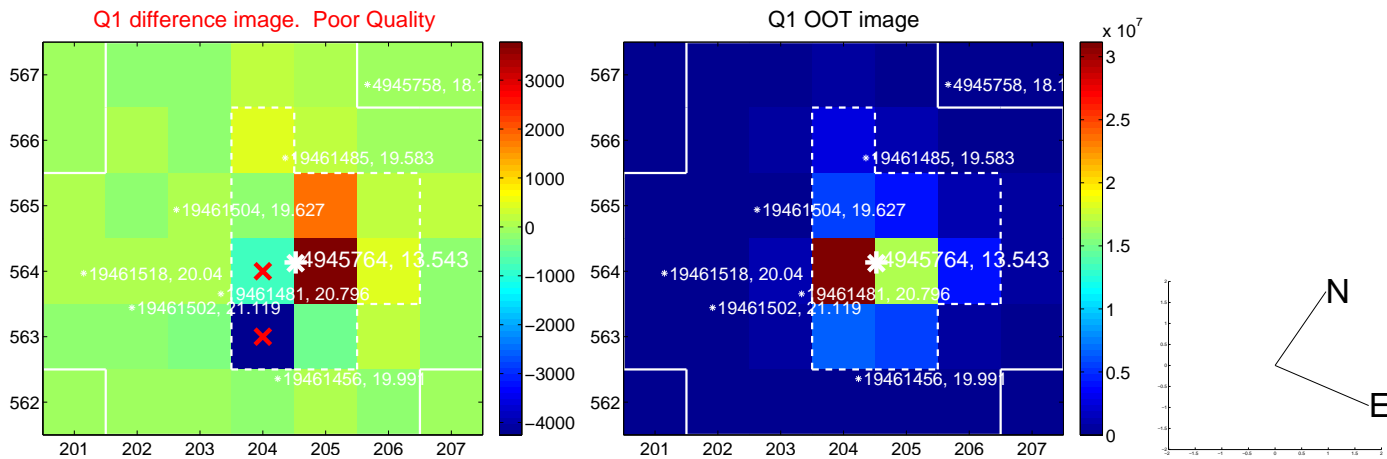
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.473 ± 0.610 | 0.78 | 0.434 ± 0.498 | -0.187 ± 0.581 |
| PRF-fit source offset from KIC position | 0.468 ± 0.597 | 0.78 | 0.400 ± 0.494 | -0.243 ± 0.573 |
| photometric centroid source offset | 5.39 ± 3.52 | 1.53 | 5.04 ± 3.52 | -1.91 ± 3.57 |

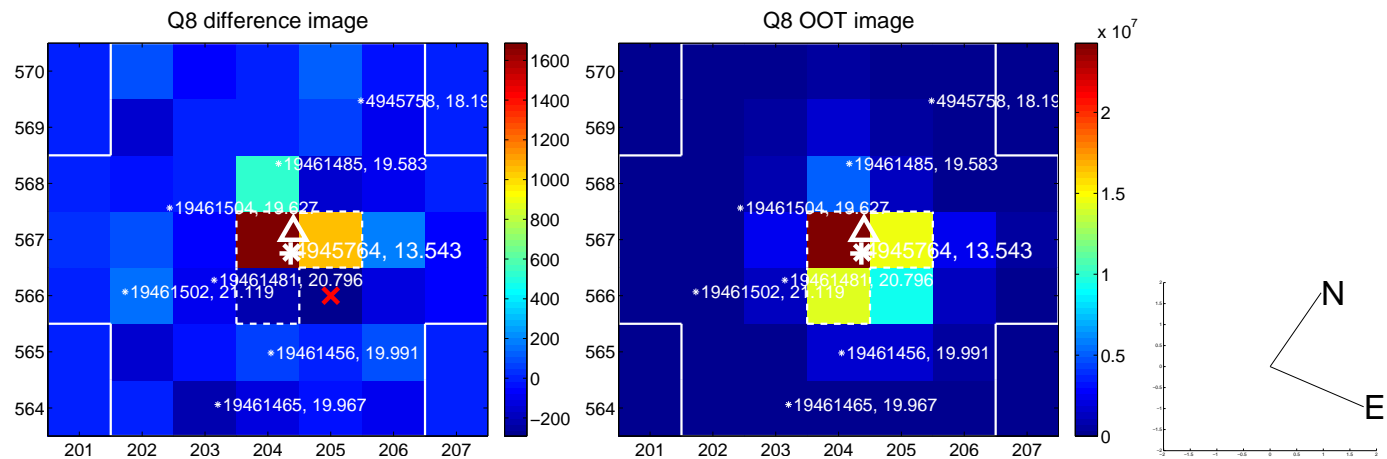
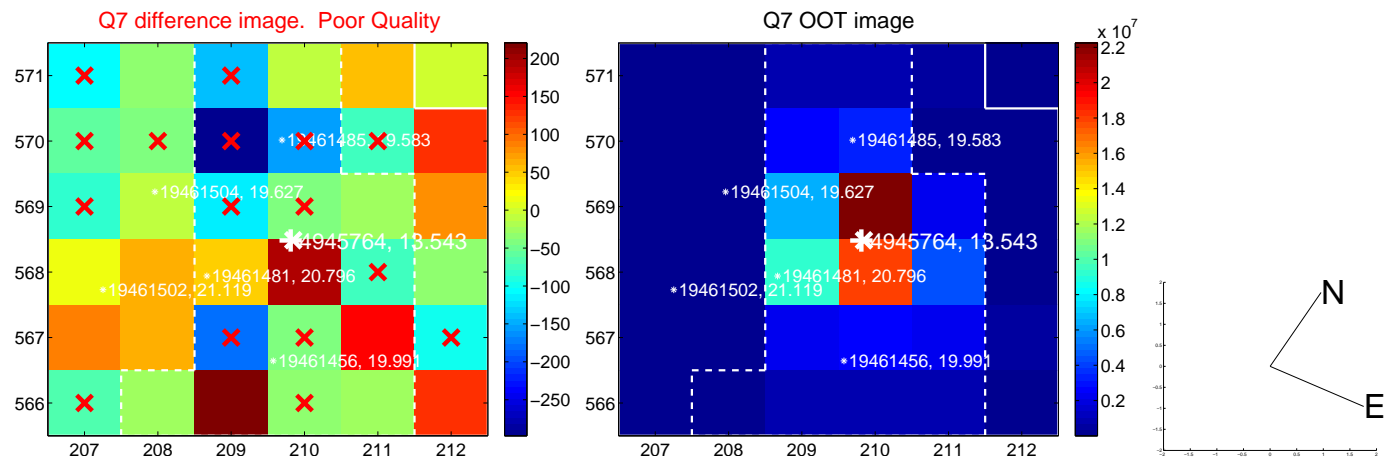
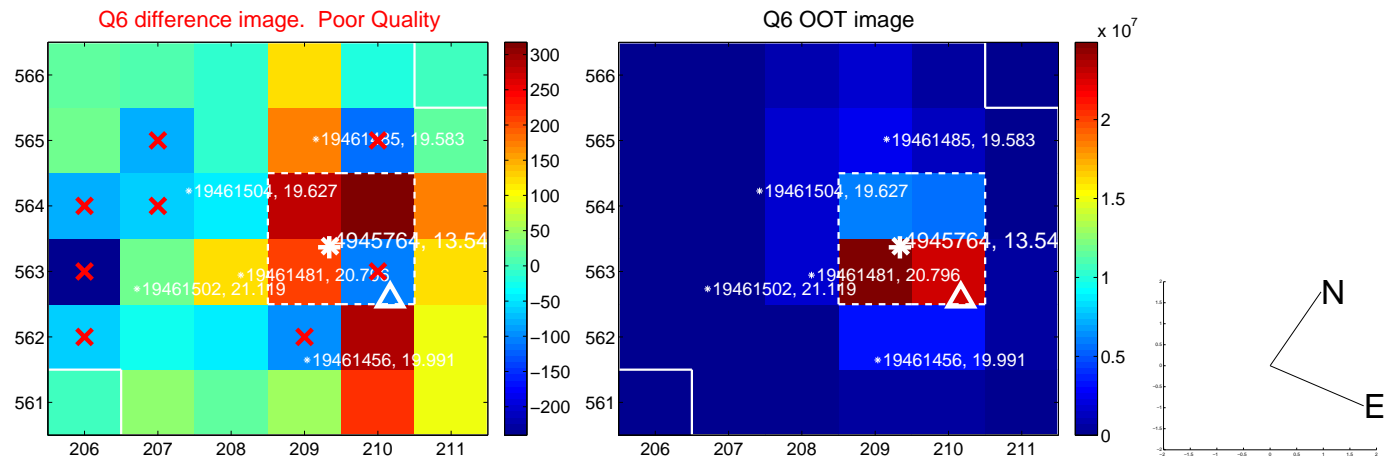
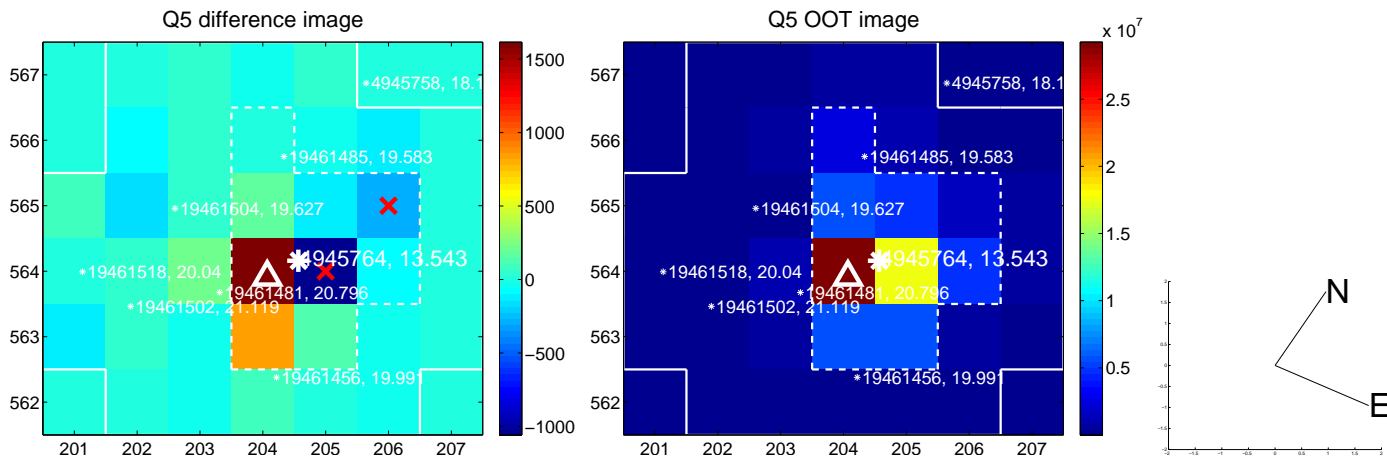


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

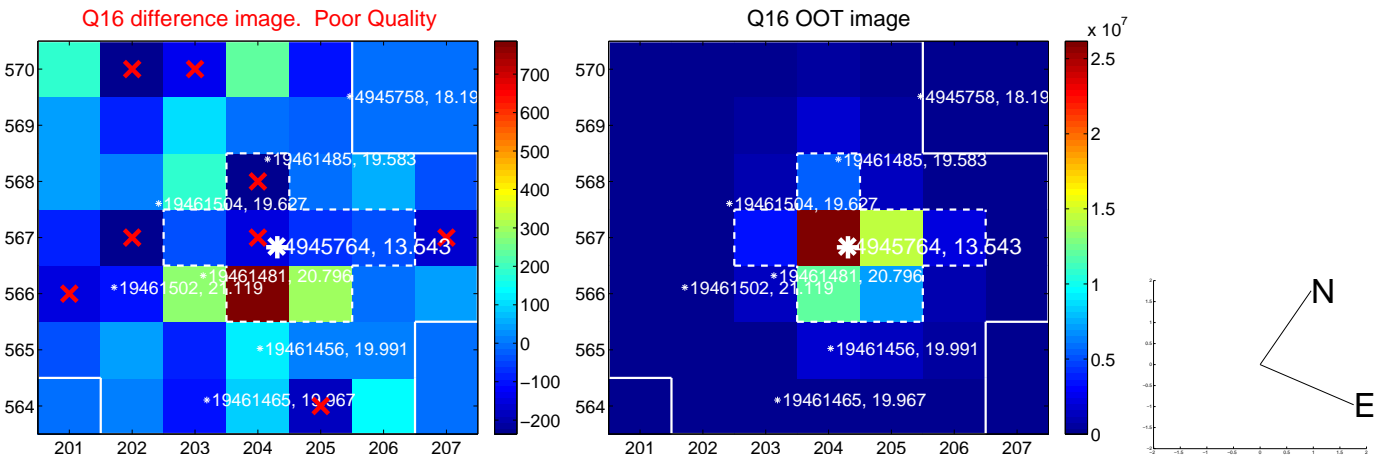
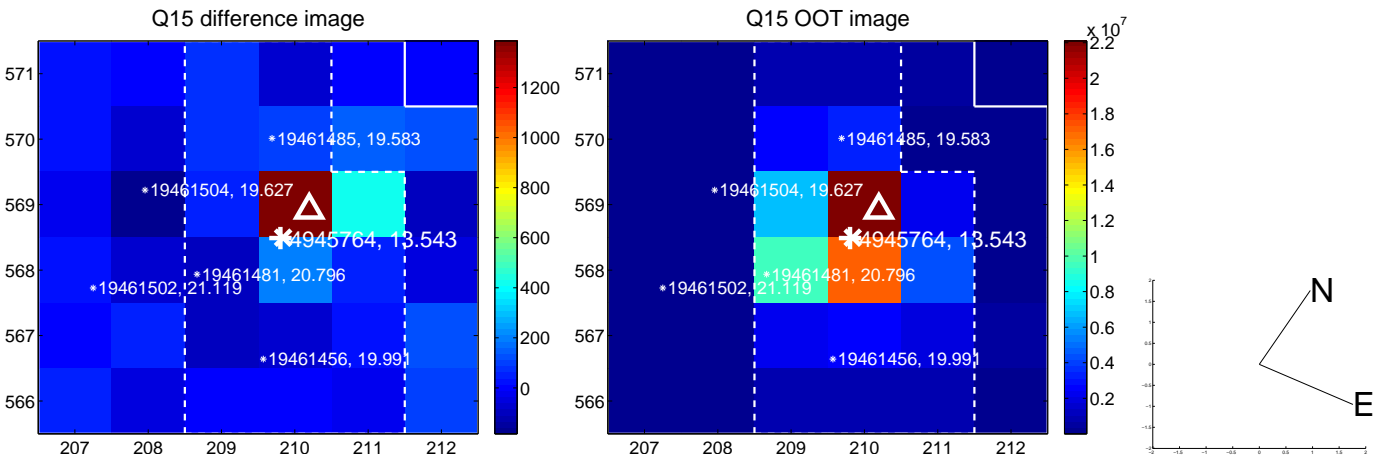
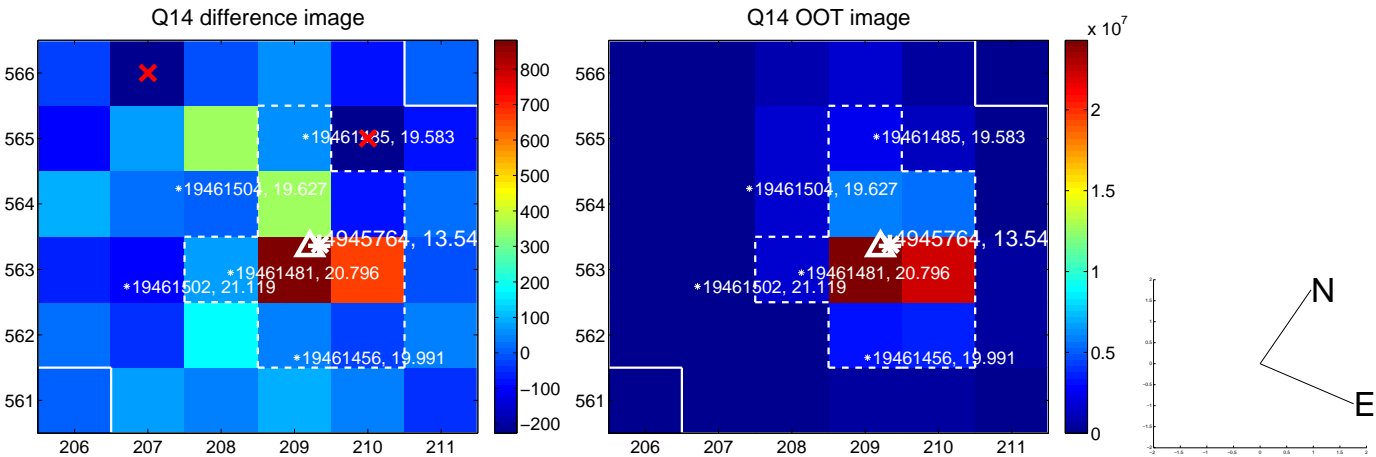
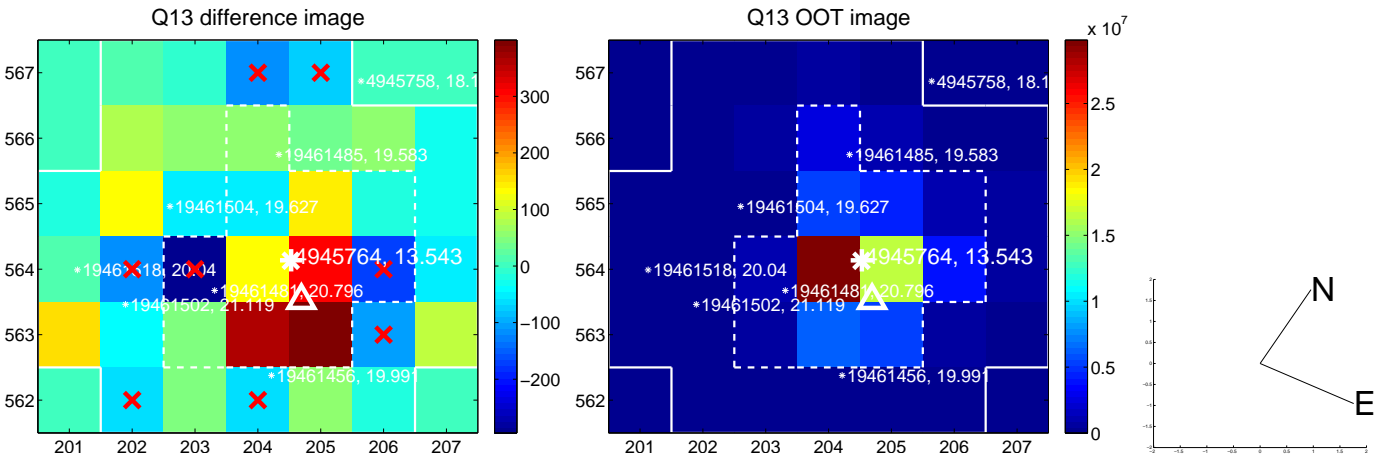
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



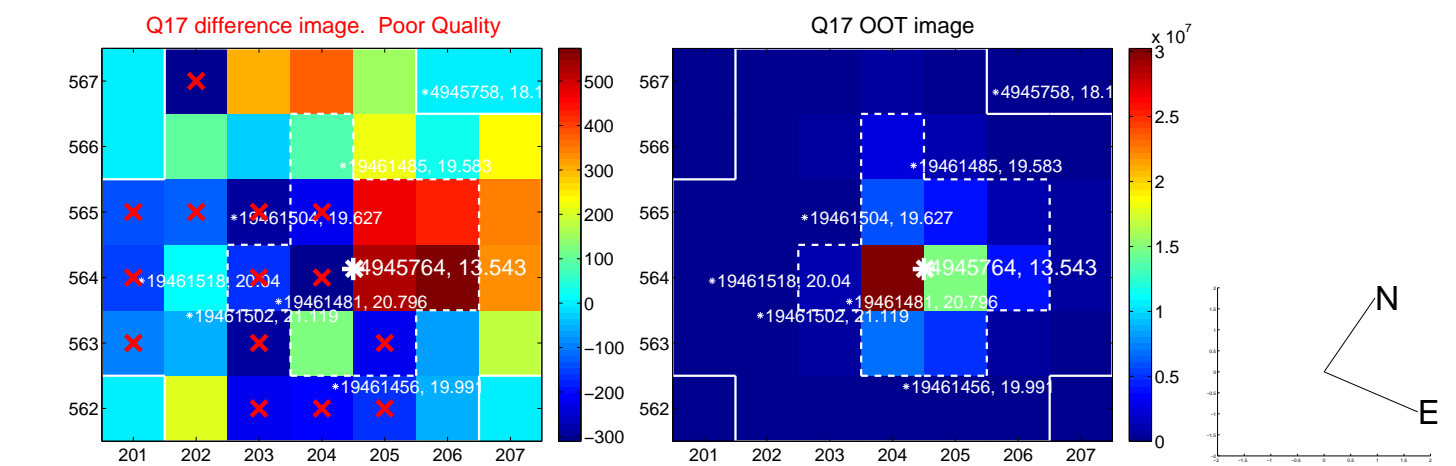
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



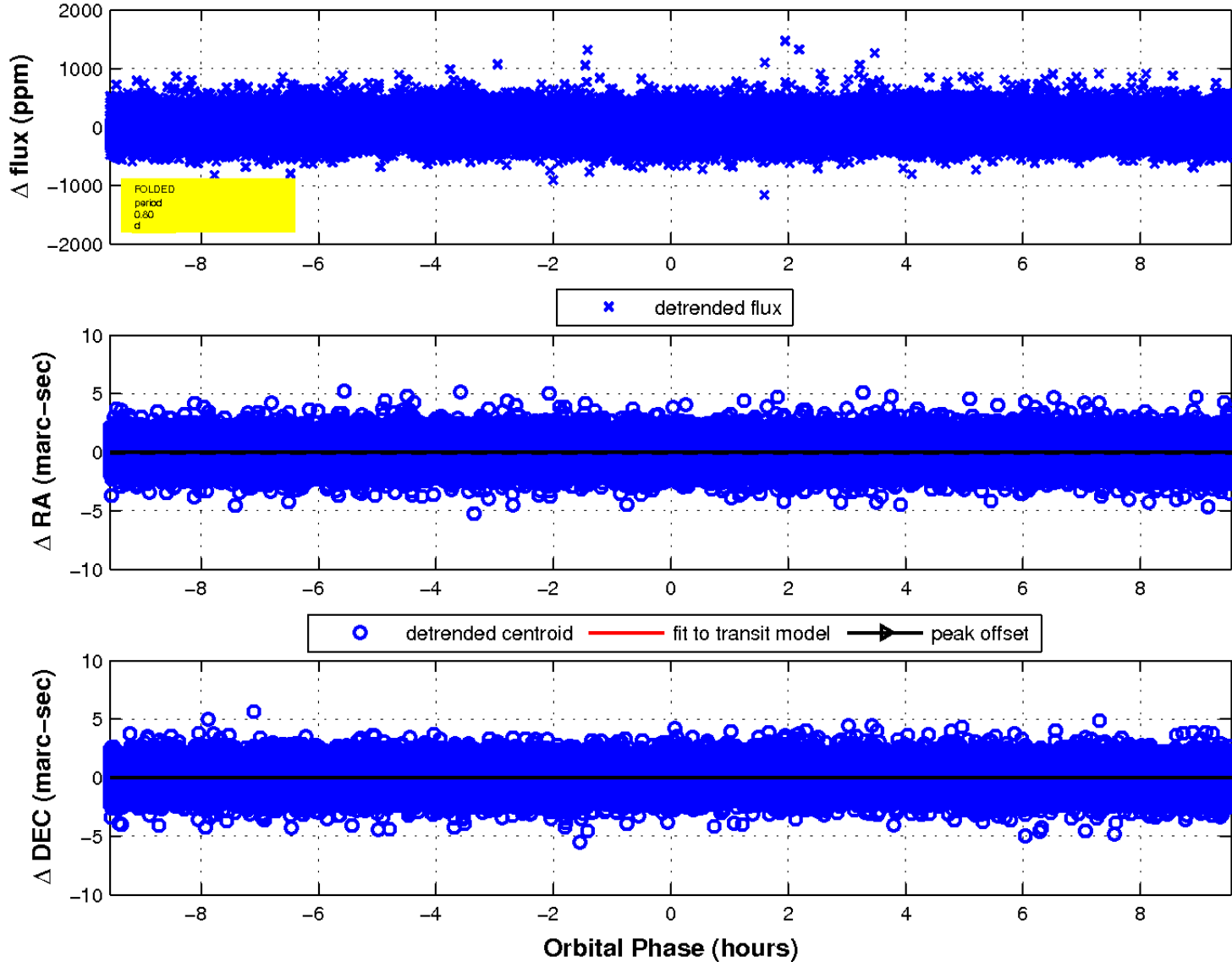
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

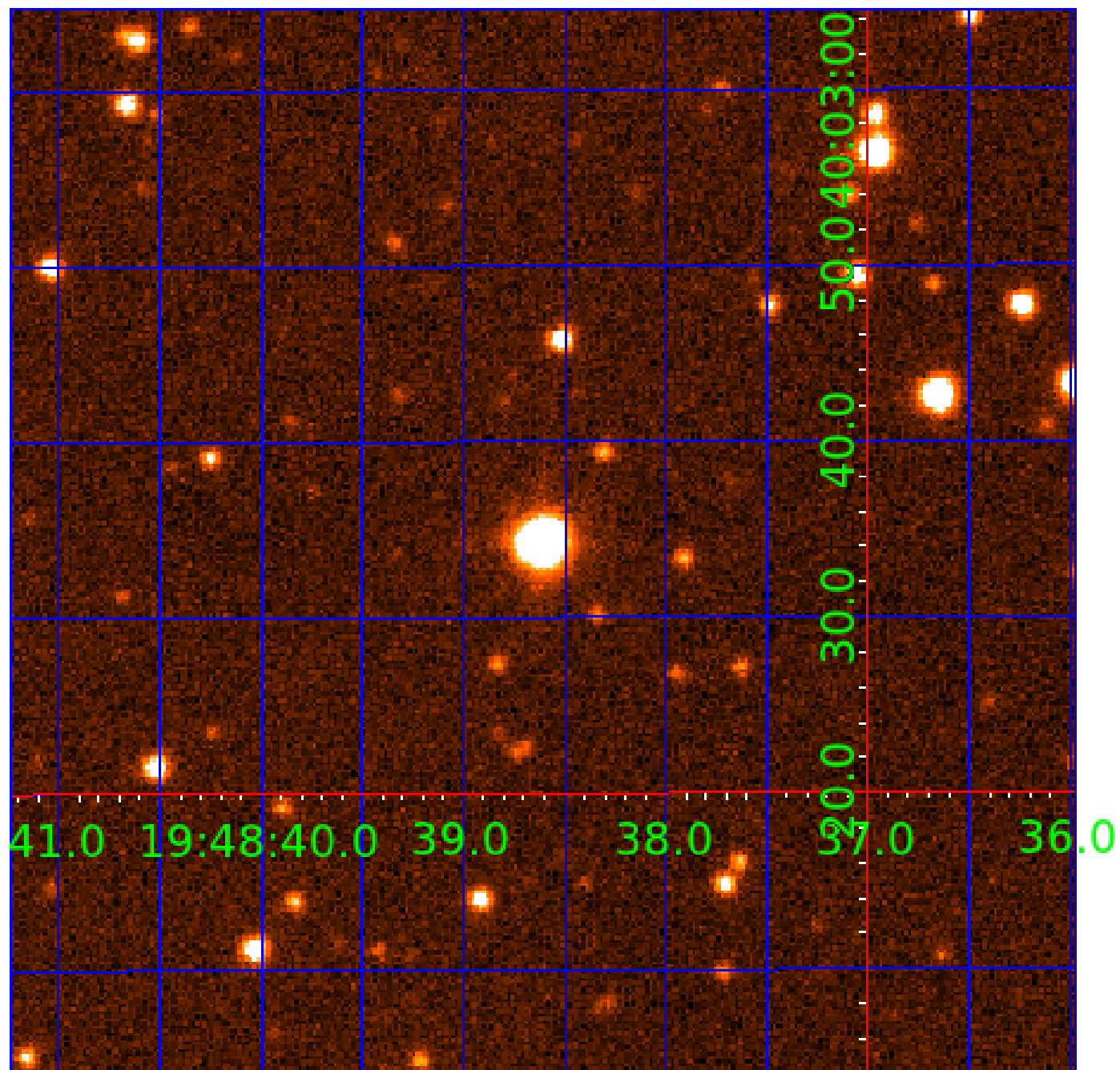


fluxWeightedCentroids, Planet 2 of 5



UKIRT Image

Declination



KIC 004945764

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 004945764-01 | OBS | 4377.01 | 19.875148 | 148.392492 | 106.8 | 7.895 | 11.1 | 11.6 | 2.00 | 6918 | 2.33 | 299.92 |
| 004945764-02 | OBS | No | 0.795981 | 132.274851 | 6.1 | 5.214 | 7.7 | 3.2 | 2.00 | 6918 | 0.53 | 21888.26 |
| 004945764-03 | OBS | No | 48.635289 | 155.599738 | 281.8 | 2.446 | 9.5 | 8.7 | 2.00 | 6918 | 3.94 | 90.95 |
| 004945764-04 | OBS | No | 57.352186 | 131.708621 | 214.0 | 1.689 | 8.5 | 5.8 | 2.00 | 6918 | 5.08 | 73.00 |
| 004945764-05 | OBS | No | 33.460679 | 153.932686 | 174.8 | 3.722 | 8.8 | 8.7 | 2.00 | 6918 | 2.91 | 149.75 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004945764-01 | OBS | PC | 0.93 | 0 | 0 | 0 | 0 | NO_COMMENT |
| 004945764-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT |
| 004945764-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 004945764-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 004945764-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |

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.

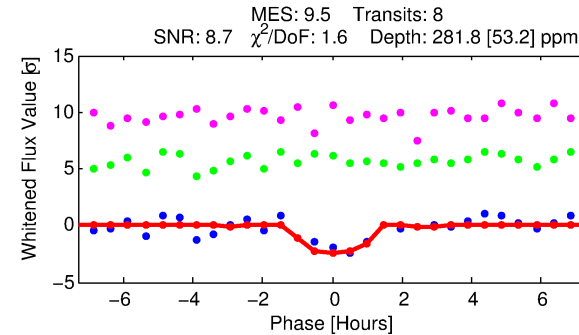
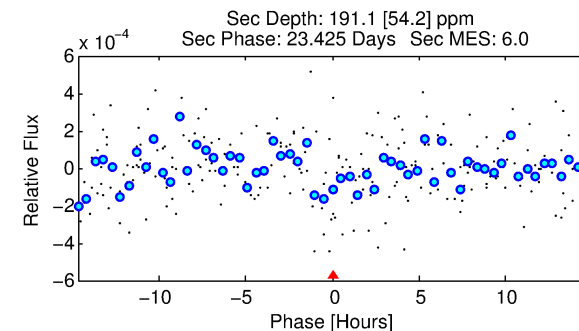
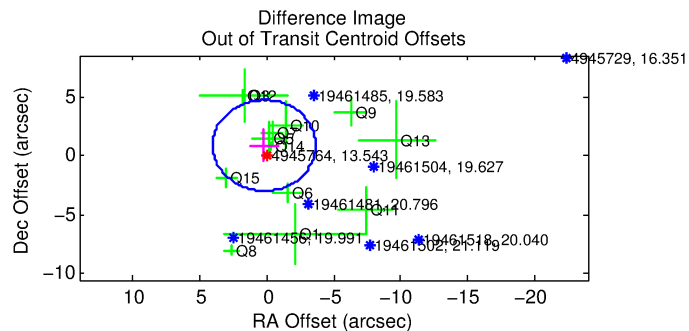
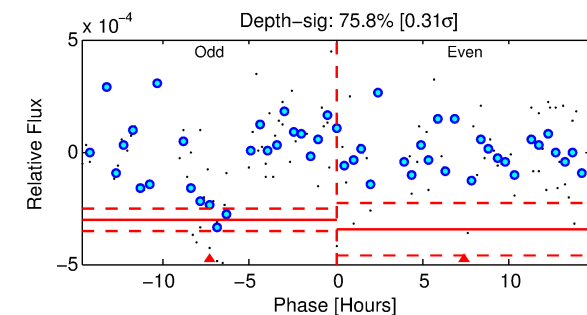
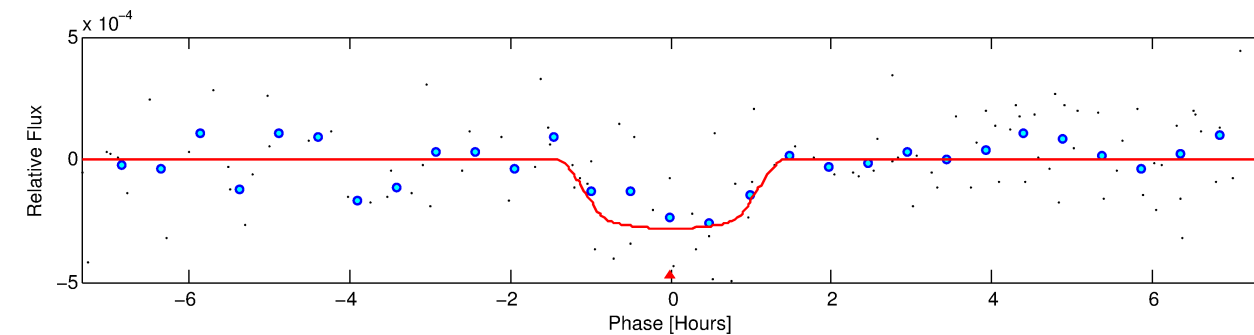
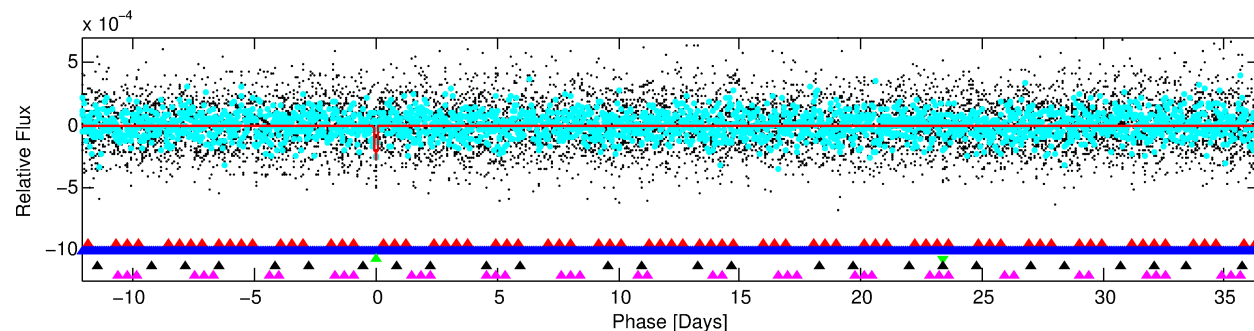
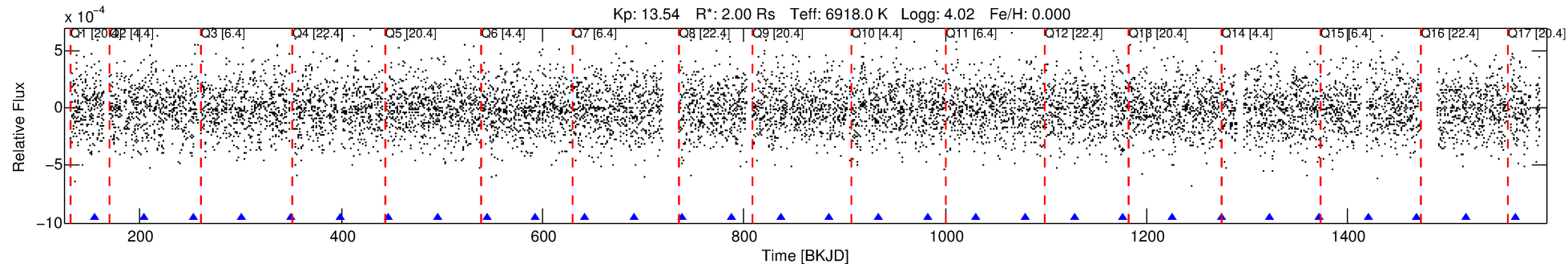
Ephemeris Match Information For 004945764-03

No Significant Match Found

DV One-Page Summary

KIC: 4945764 Candidate: 3 of 5 Period: 48.635 d
KOI: K04377 Corr: No Ephemeris Match

Kp: 13.54 R*: 2.00 Rs Teff: 6918.0 K Logg: 4.02 Fe/H: 0.000



DV Fit Results:

Period = 48.63529 [0.00053] d
Epoch = 155.5997 [0.0068] BKJD
Rp/R* = 0.0180 [0.0174]
a/R* = 69.89 [406.92]
b = 0.91 [1.14]
Seff = 90.95 [24.54]
Teq = 787 [53] K
Rp = 3.94 [3.90] Re
a = 0.3010 [0.0537] AU
Ag = 613.00 [1210.13] [0.51σ]
Teffp = 6058 [2964] K [1.78σ]

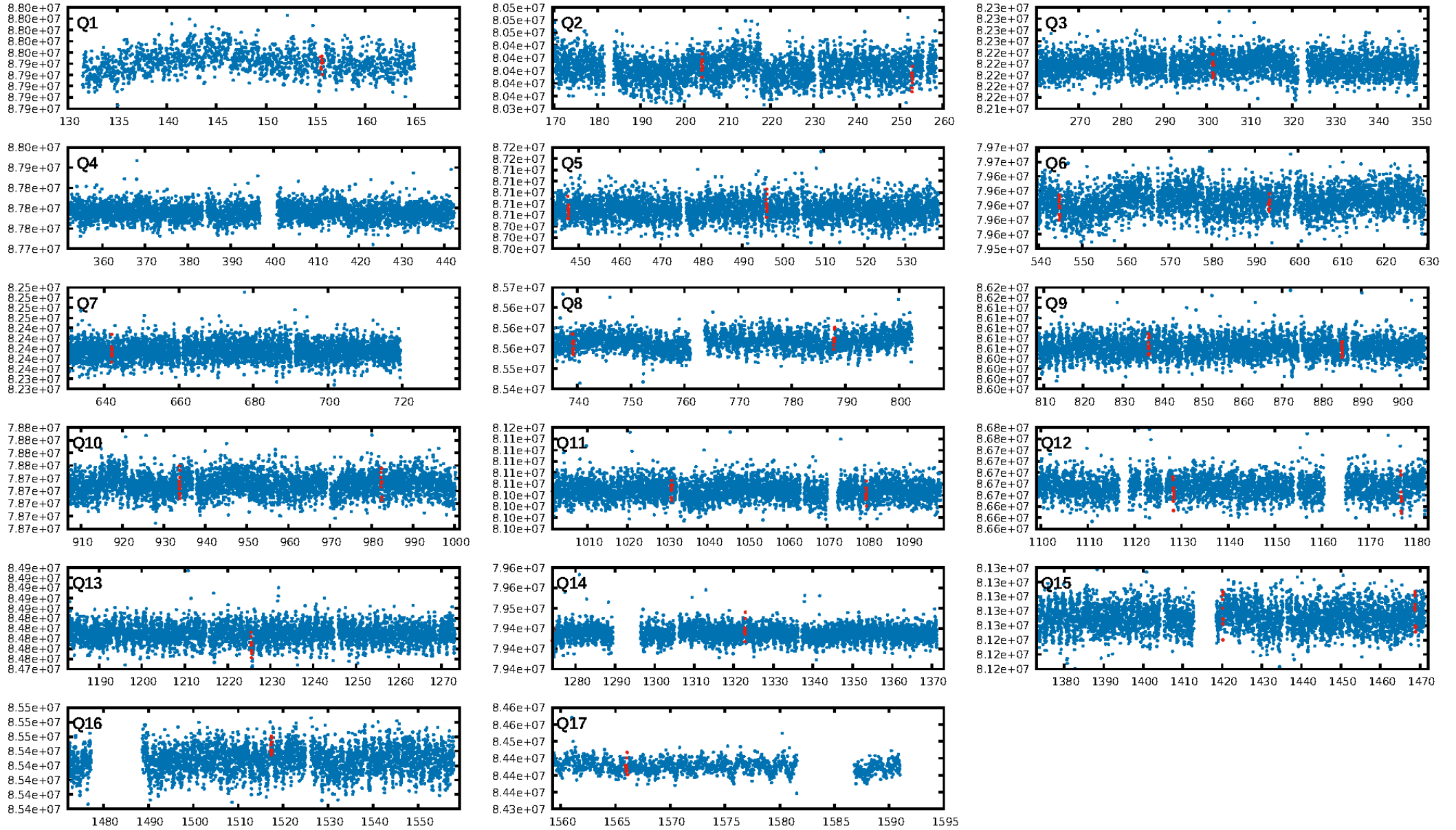
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [81.78σ]
LongPeriod-sig: 100.0% [70.39σ]
ModelChiSquare2-sig: 3.5%
ModelChiSquareGof-sig: 93.0%
Bootstrap-pfa: 9.20e-10
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: 3.017
Centroid-sig: 0.0%
Centroid-so: 2.194 arcsec [2.46σ]
OotOffset-rm: 0.895 arcsec [0.70σ]
KicOffset-rm: 0.790 arcsec [0.68σ]
OotOffset-st: 3/4/2/4 [13]
KicOffset-st: 3/4/2/4 [13]
DiffImageQuality-fgm: 0.00 [0/13]
DiffImageOverlap-fno: 0.00 [0/16]

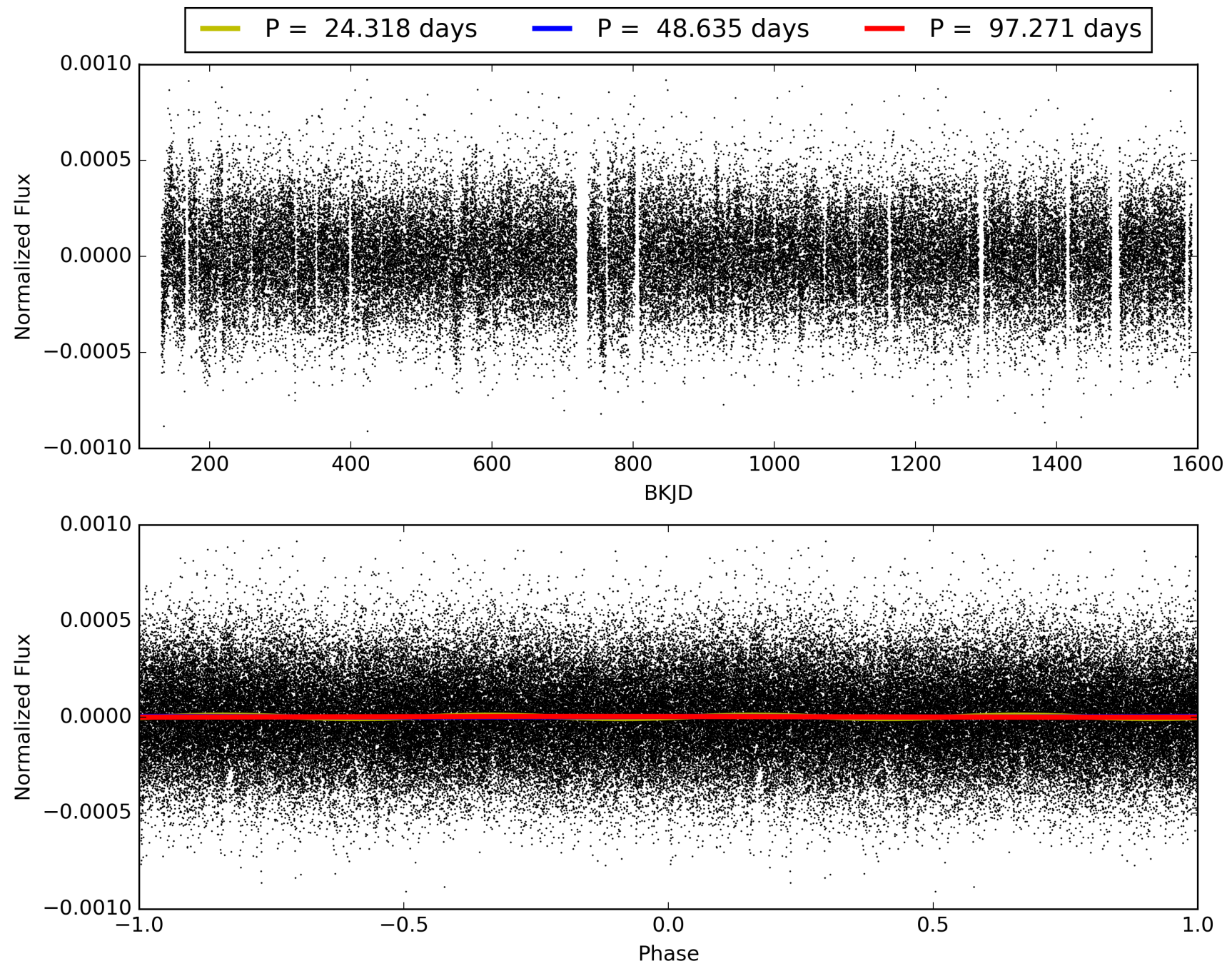
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 07:21:23 Z

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

TCE 004945764-03, PDC Light Curves

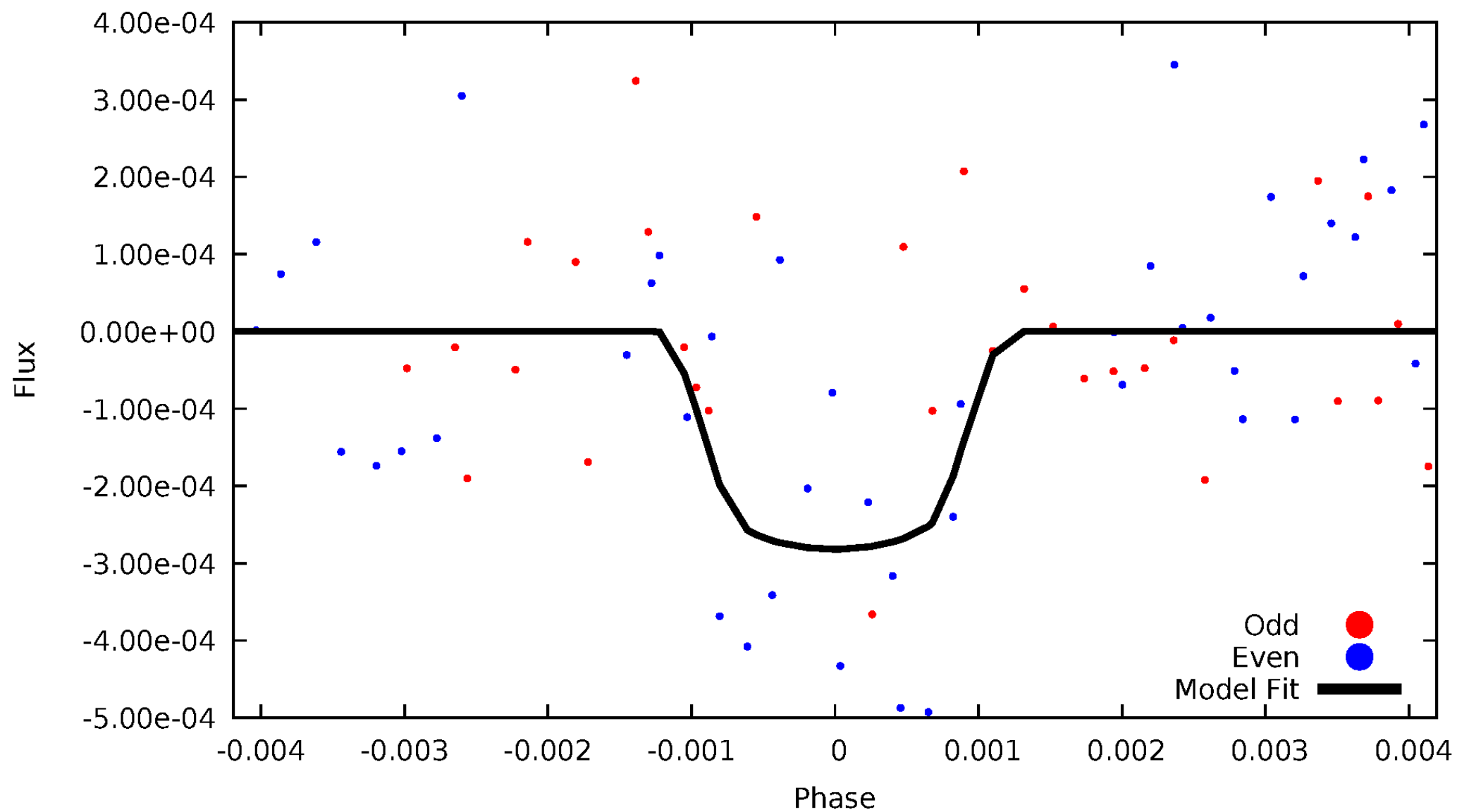


TCE 004945764-03



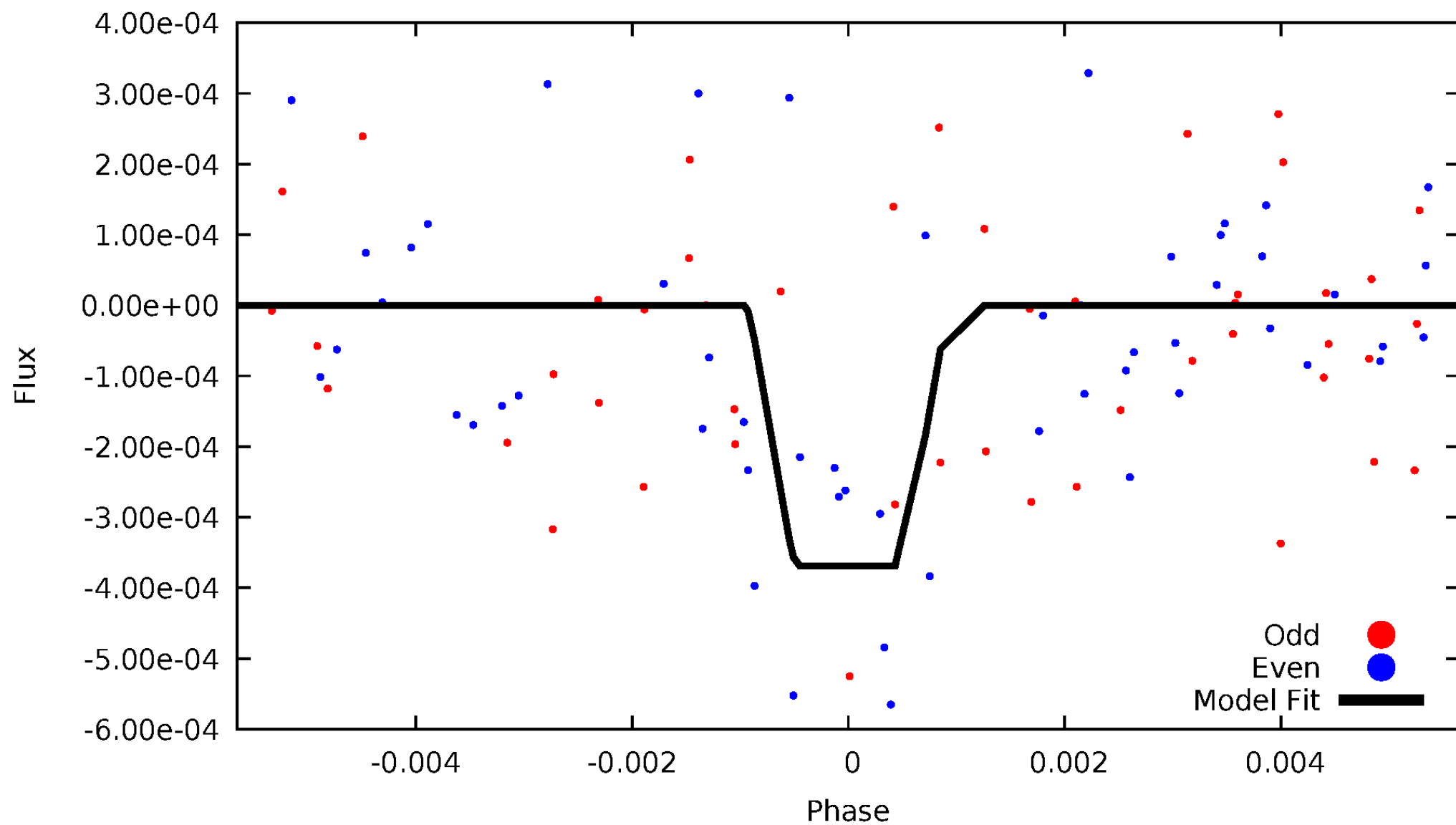
DV Odd/Even

TCE 004945764-03



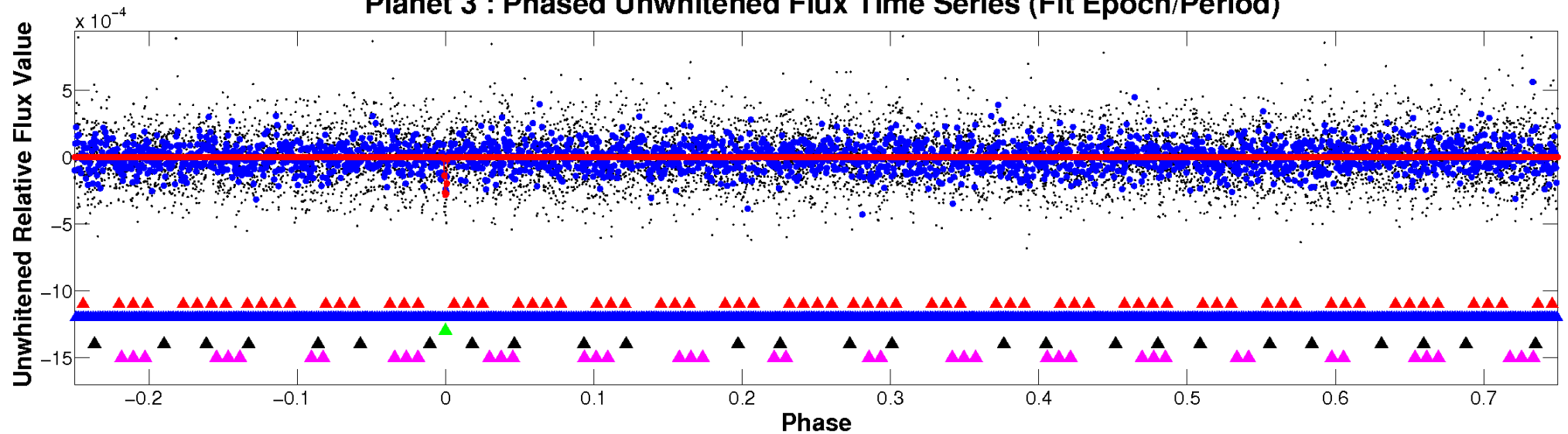
ALT Odd/Even

TCE 004945764-03

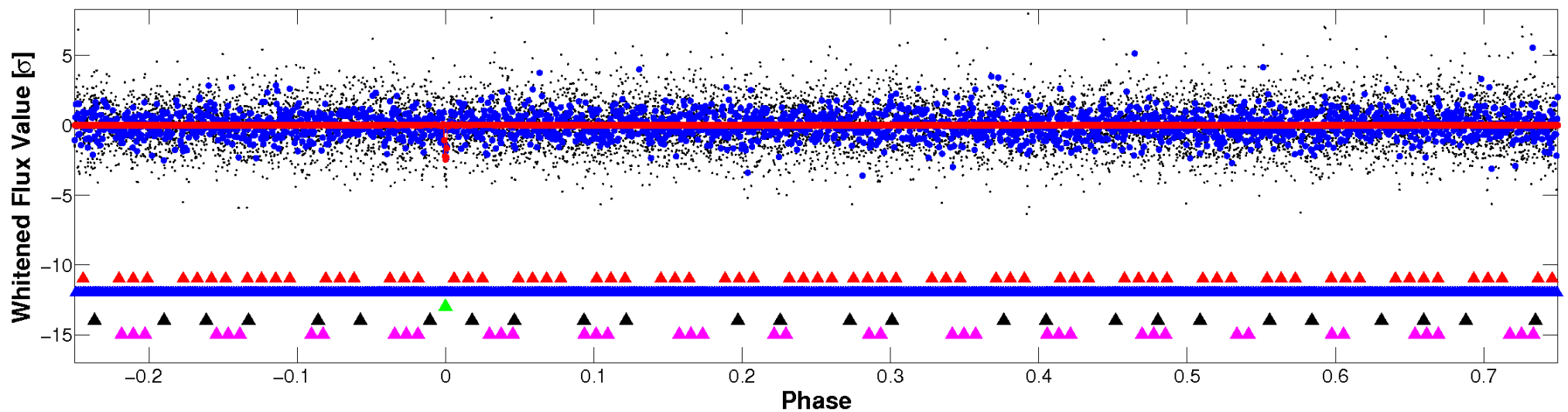


Non-Whitened Vs. Whitened Light Curve

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

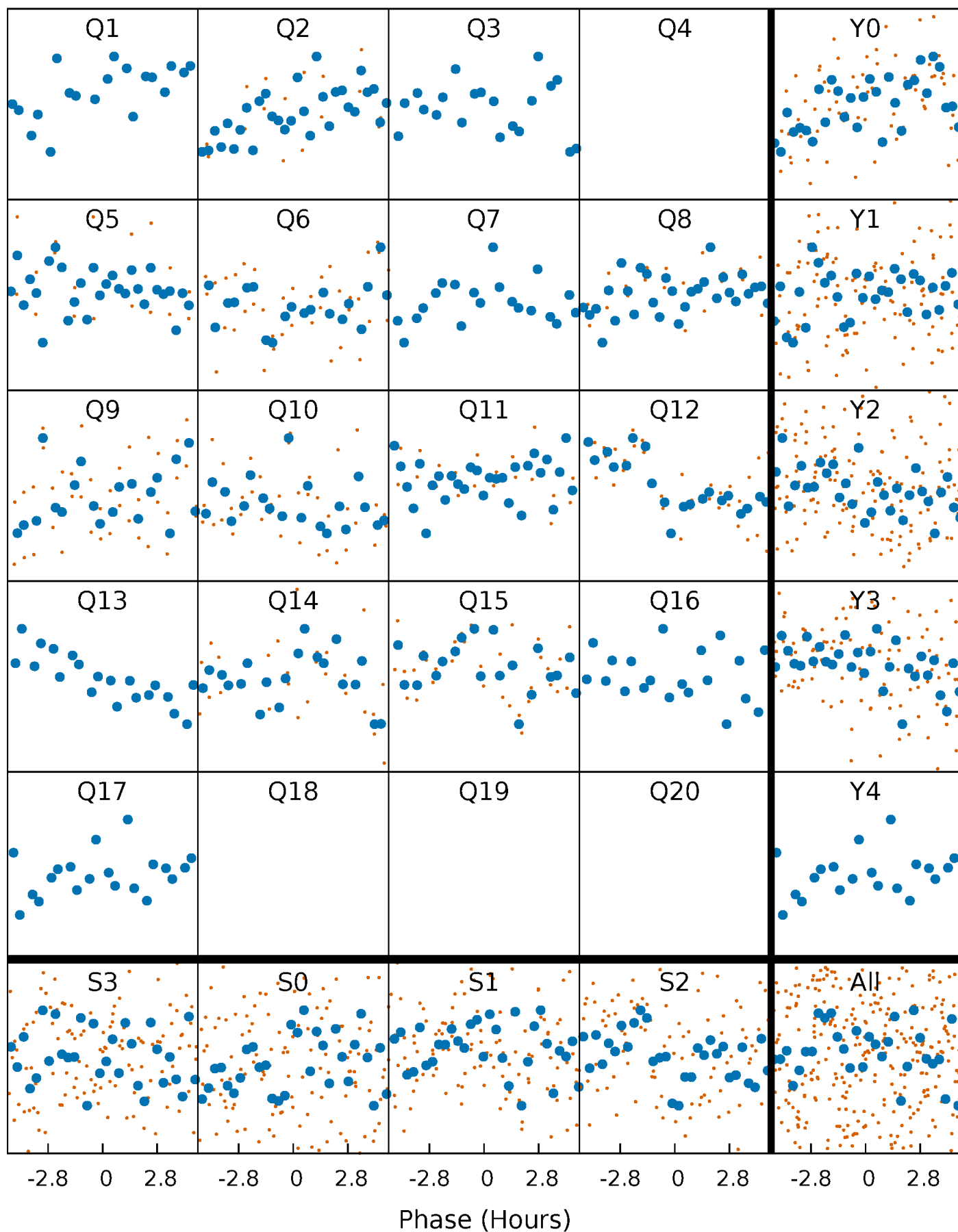


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



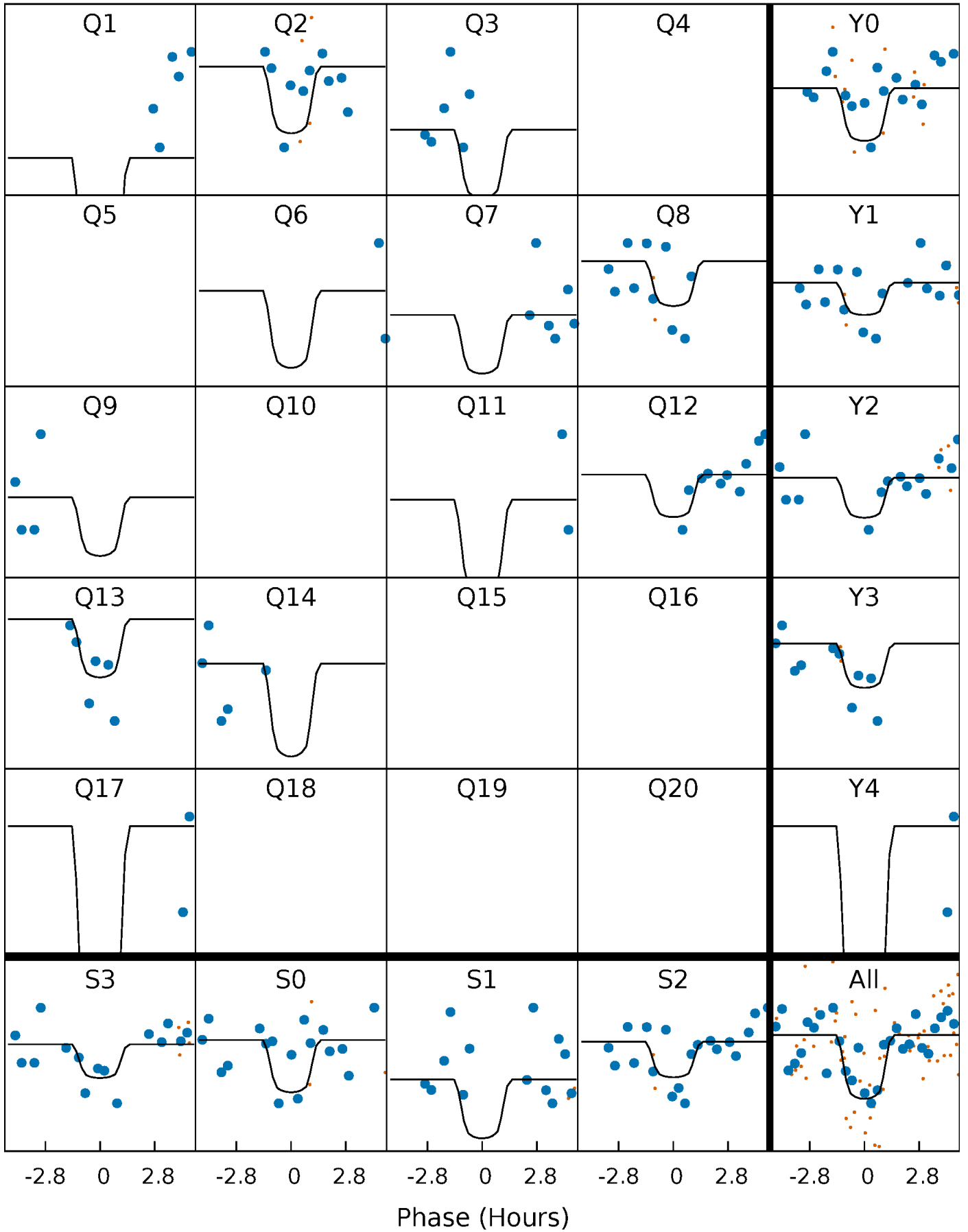
PDC Quarter-Phased Transit Curves

TCE 004945764-03 P= 48.635289 Days $T_0=155.599738$ (BKJD)



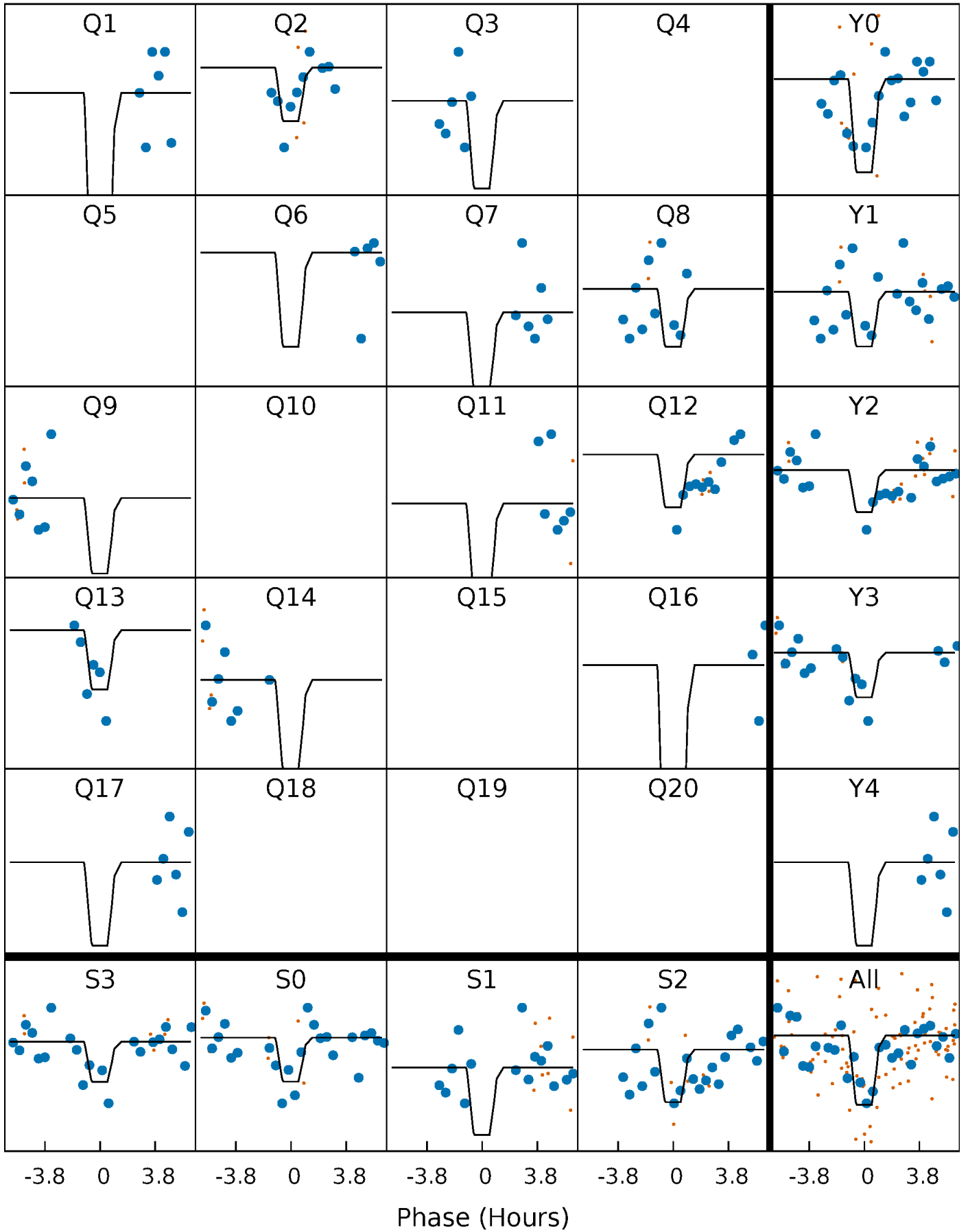
DV Quarter-Phased Transit Curves

TCE 004945764-03 P= 48.635289 Days $T_0=155.599738$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

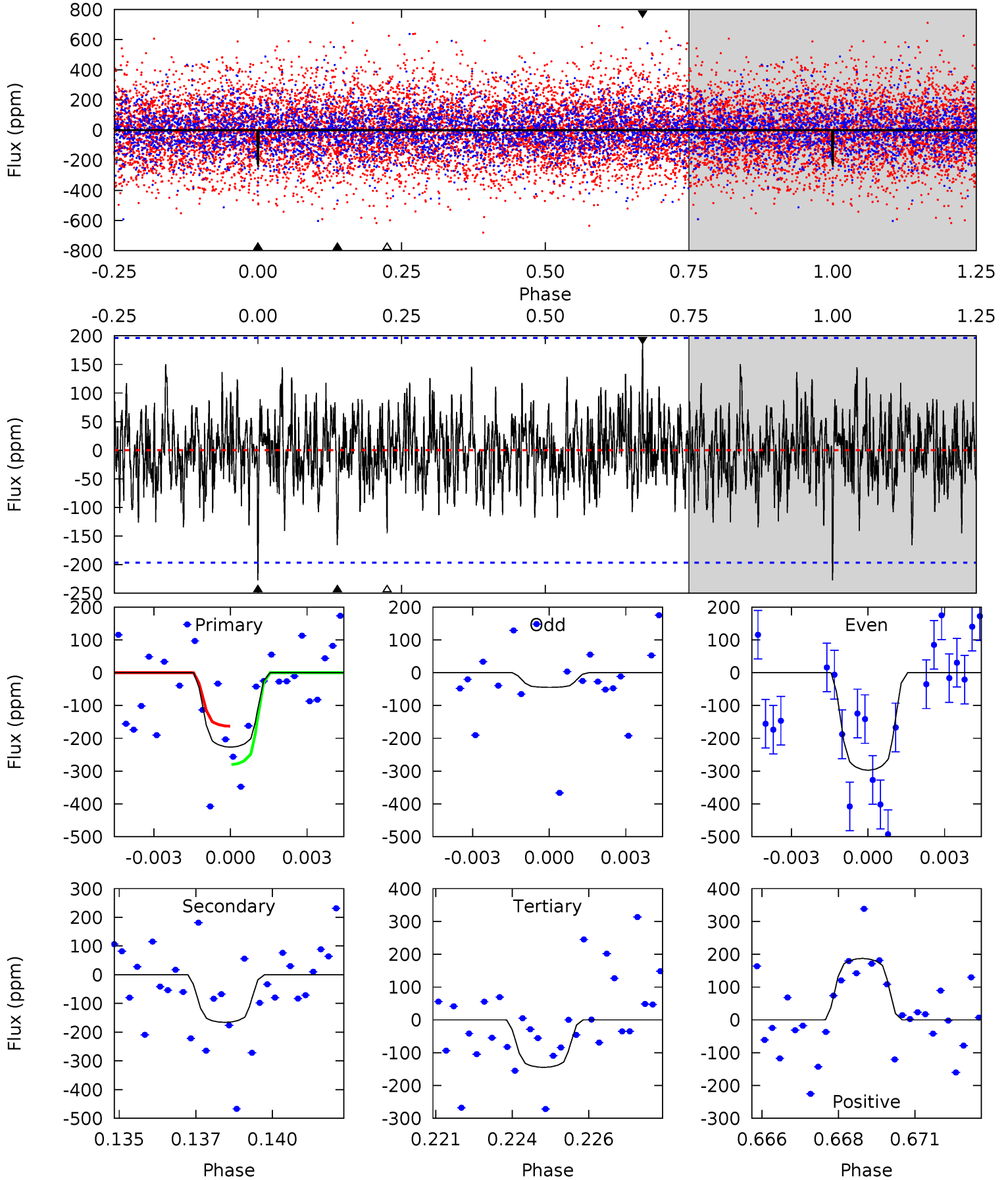
TCE 004945764-03 $P = 48.635745$ Days $T_0 = 155.602206$ (BKJD)



DV Model-Shift Uniqueness Test

004945764-03, P = 48.635289 Days, E = 106.964449 Days

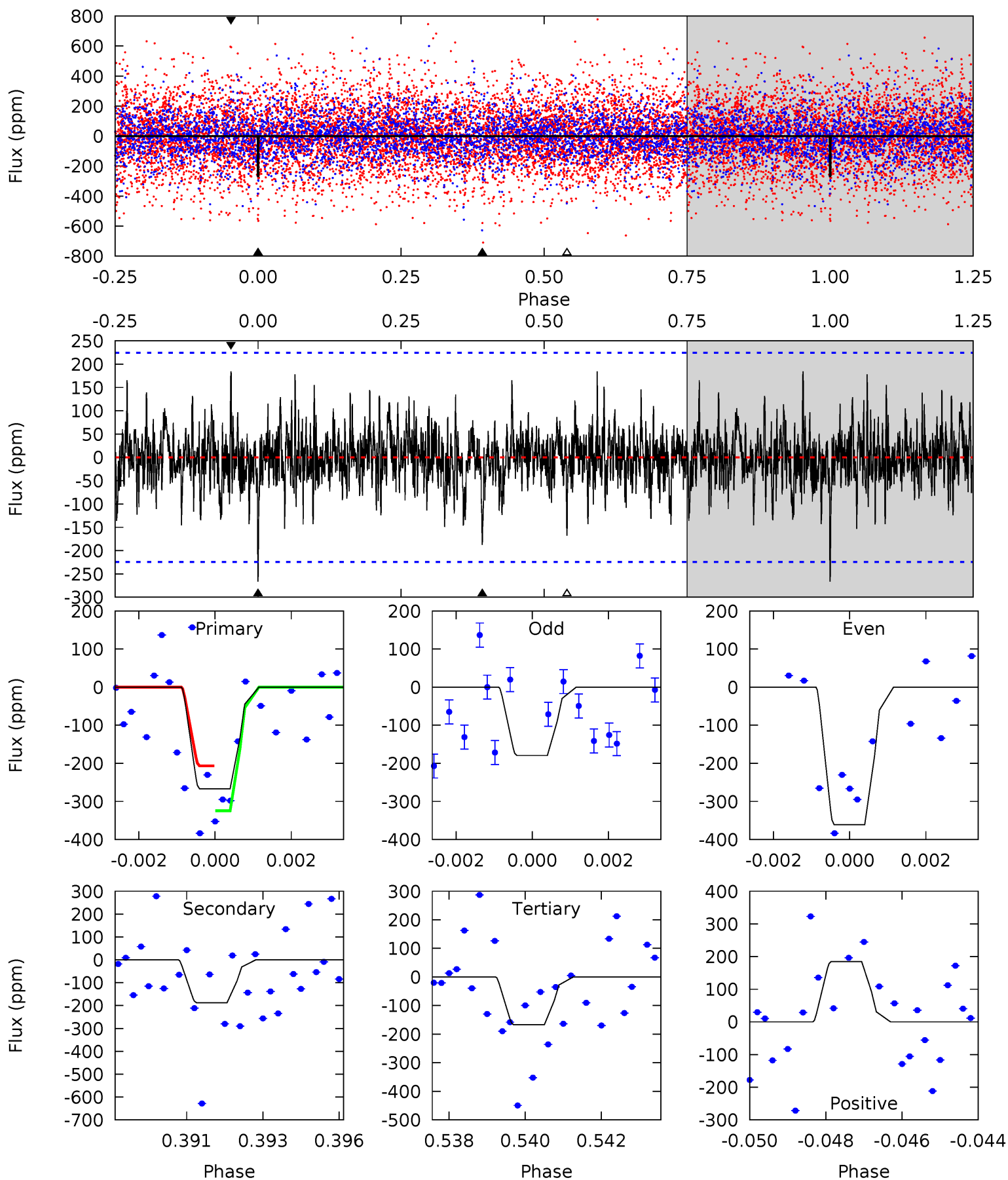
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.11 | 4.46 | 3.90 | 5.03 | 5.28 | 3.02 | 1.31 | 2.21 | 1.08 | 0.56 | -0.57 | 3.30 | 0.57 | 0.45 | 1.58 |



Alt Model-Shift Uniqueness Test

004945764-03, P = 48.635745 Days, E = 106.966461 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 6.31 | 4.43 | 3.96 | 4.36 | 5.31 | 3.06 | 1.13 | 2.35 | 1.94 | 0.47 | 0.07 | 2.00 | 0.62 | 0.41 | 1.39 |



Stellar Parameters For KIC 004945764

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 6918^{+72}_{-83} | $4.021^{+0.148}_{-0.121}$ | $0.000^{+0.150}_{-0.150}$ | $2.004^{+0.413}_{-0.338}$ | $1.536^{+0.149}_{-0.108}$ | $0.269^{+0.195}_{-0.105}$ |
| | +1%/-1% | +4%/-3% | +inf%/-inf% | +21%/-17% | +10%/-7% | +72%/-39% |
| Source | SPE68 | SPE68 | SPE68 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004945764-03 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|------------------------|--------------------|------------------------|----------------------|
| DV | -166 ± 37 | $4.62^{+3.76}_{-2.78}$ | 1102^{+54}_{-57} | 5457^{+3704}_{-1276} | 396^{+2101}_{-286} |
| Alt. | -187 ± 42 | $4.70^{+3.69}_{-2.89}$ | 1092^{+54}_{-52} | 5426^{+3888}_{-1134} | 416^{+2433}_{-291} |

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 $A_{obs} \gg 1.0$

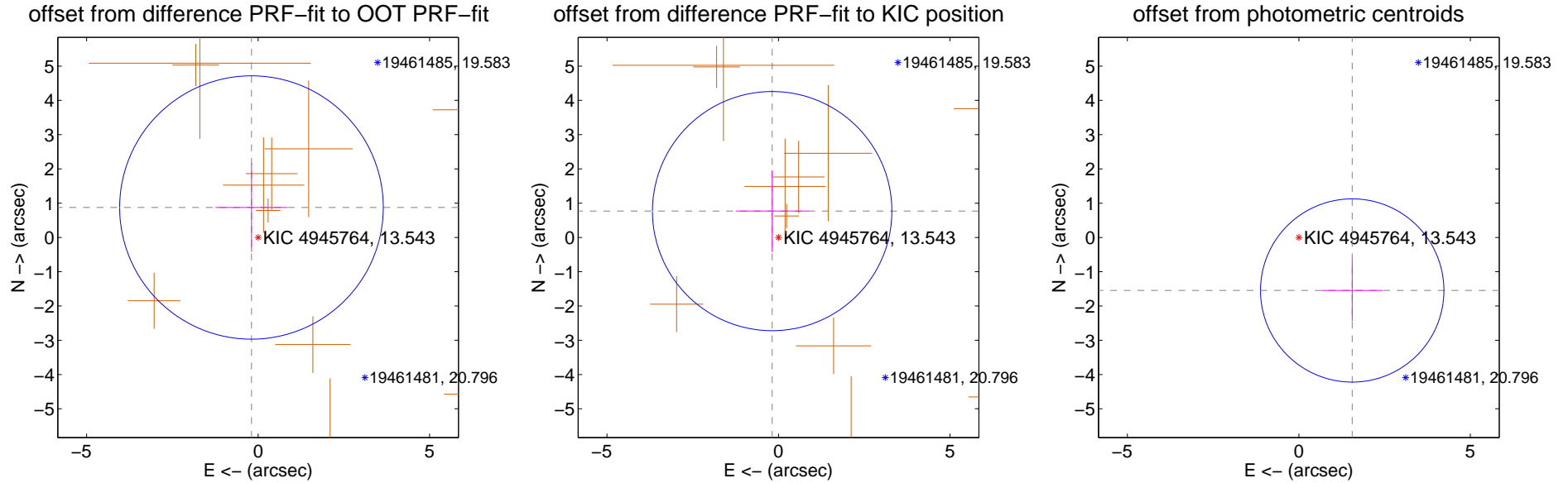
DV Centroid Data

Supplemental centroid analysis for 004945764-03. Kepler magnitude: 13.54. Transit SNR 8.68

There are 0 quarters with good PRF difference image offsets

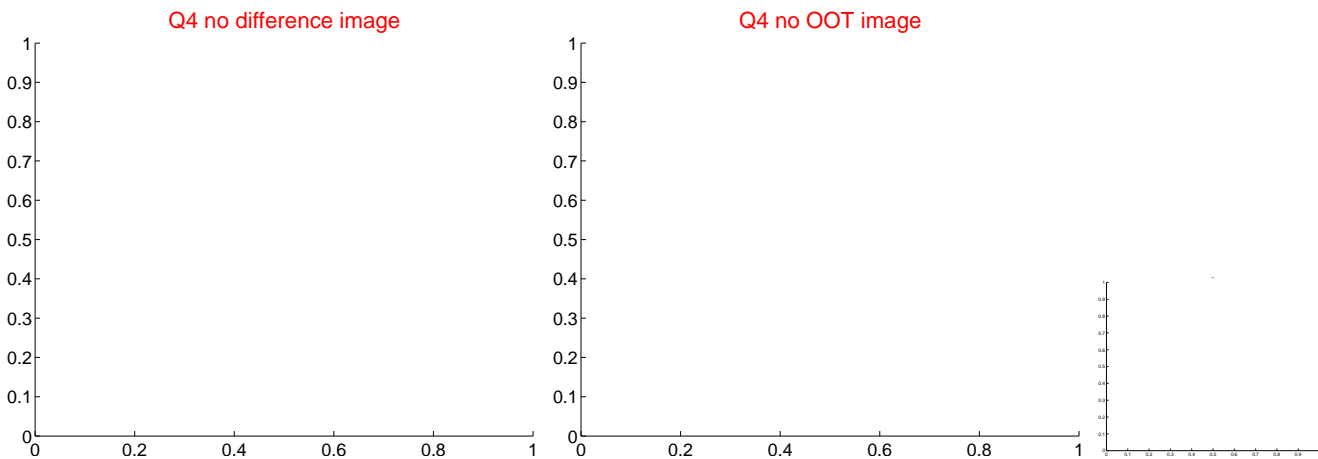
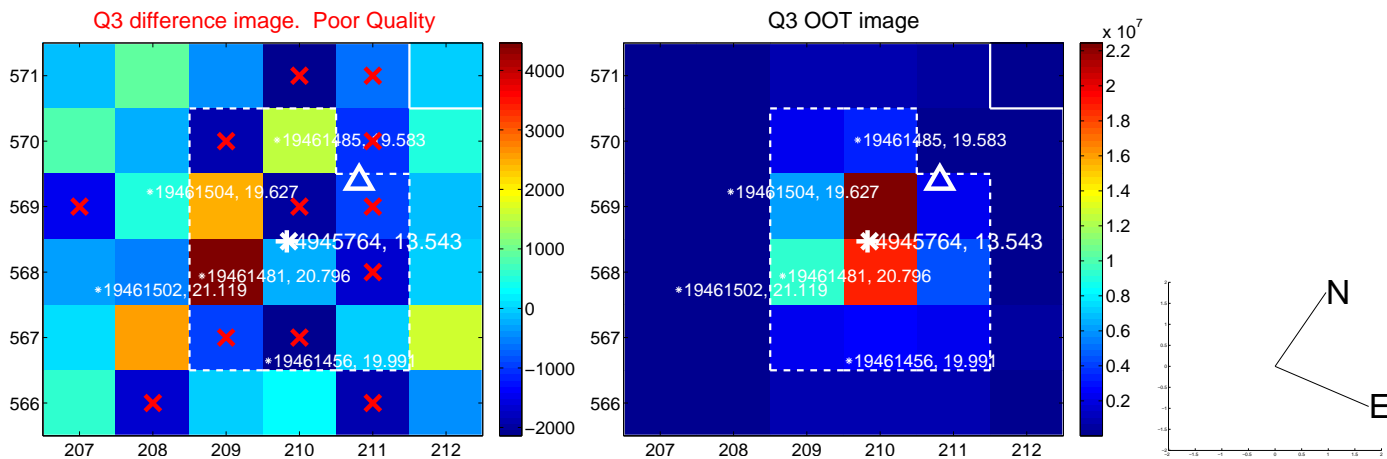
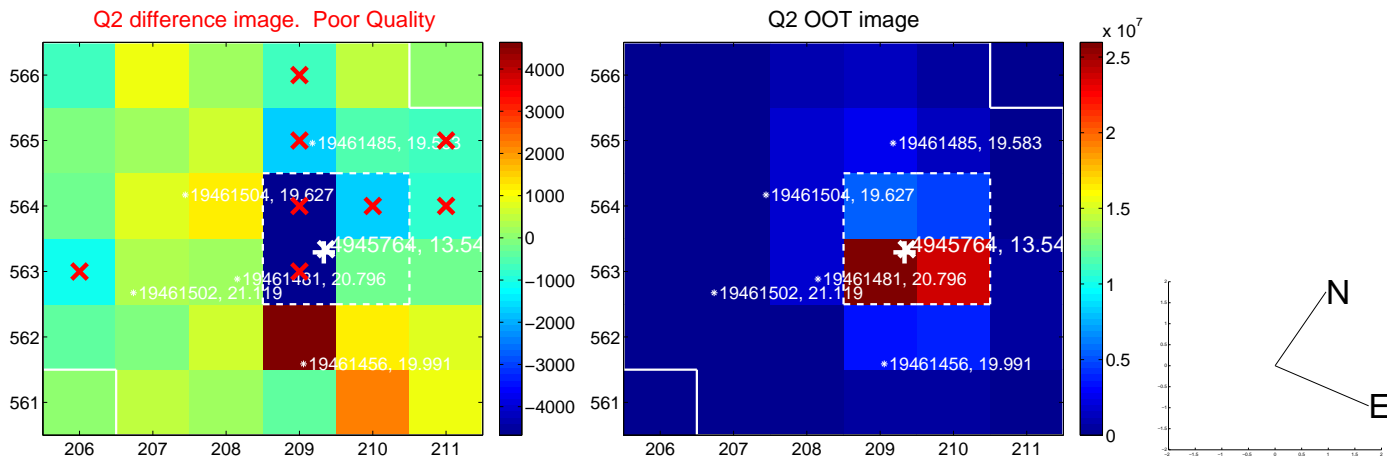
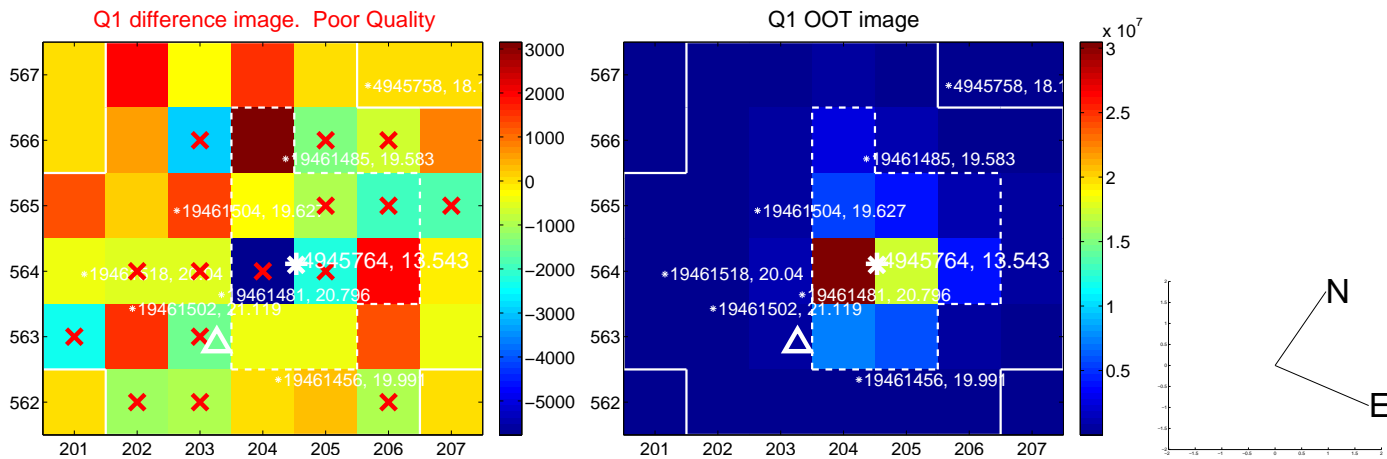
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 0.895 ± 1.281 | 0.70 | 0.193 ± 1.049 | 0.874 ± 1.293 |
| PRF-fit source offset from KIC position | 0.790 ± 1.163 | 0.68 | 0.184 ± 1.064 | 0.768 ± 1.189 |
| photometric centroid source offset | 2.19 ± 0.89 | 2.46 | -1.55 ± 0.89 | -1.55 ± 0.89 |

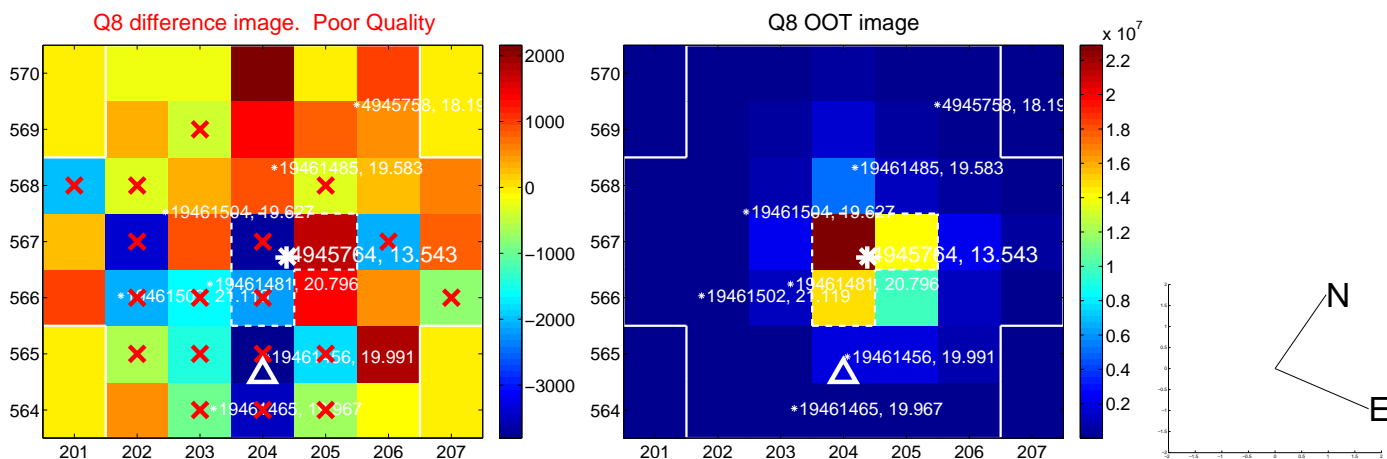
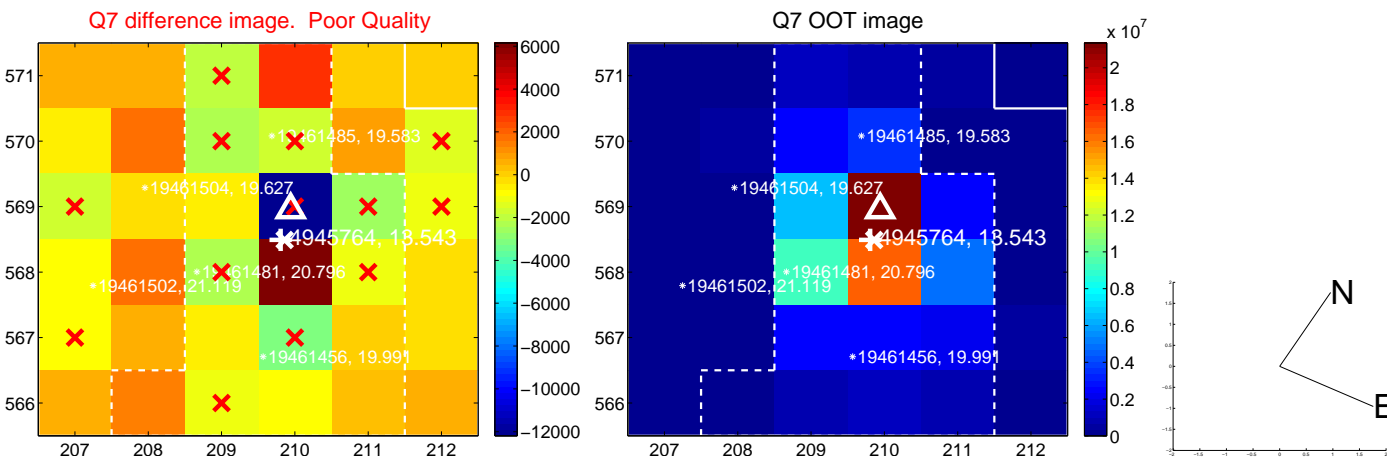
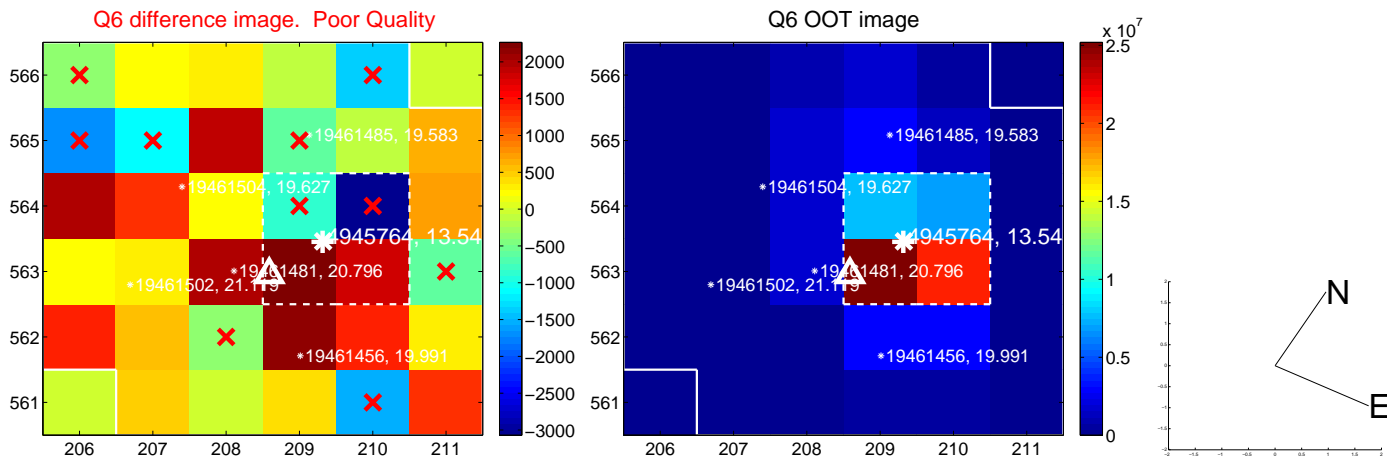
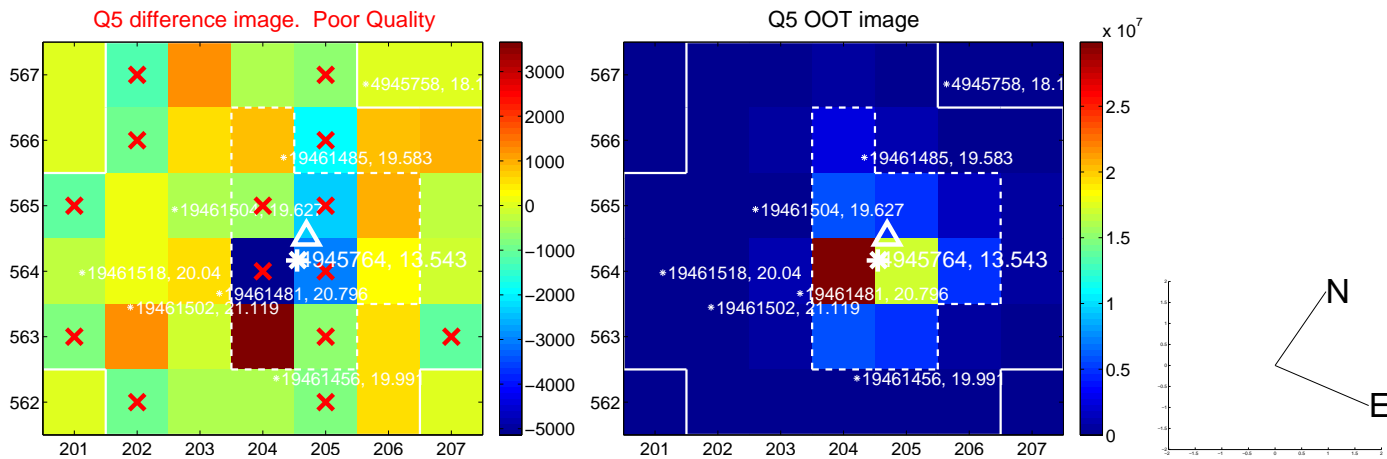


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

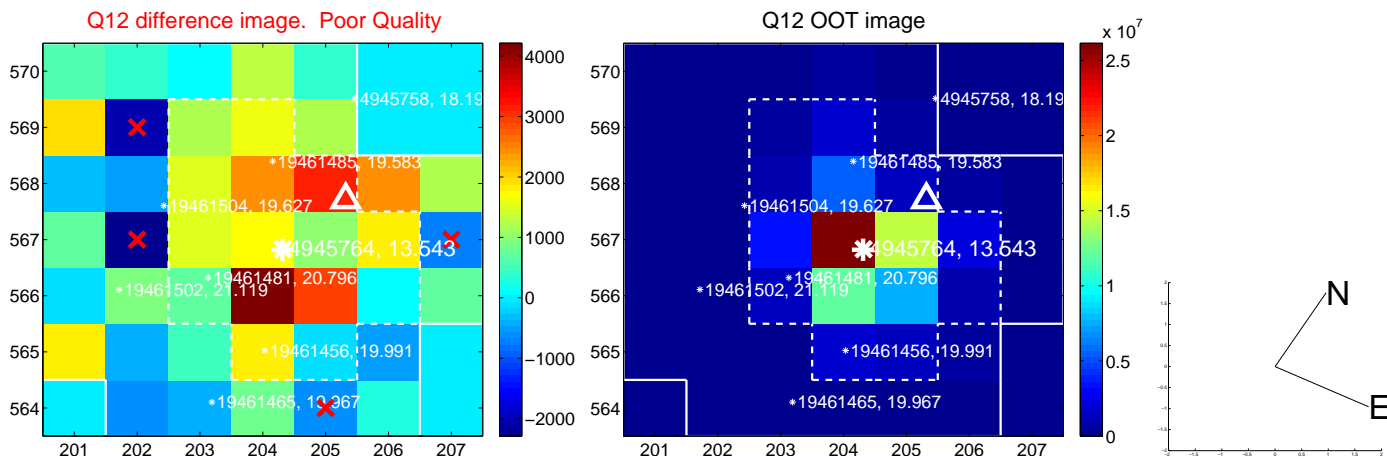
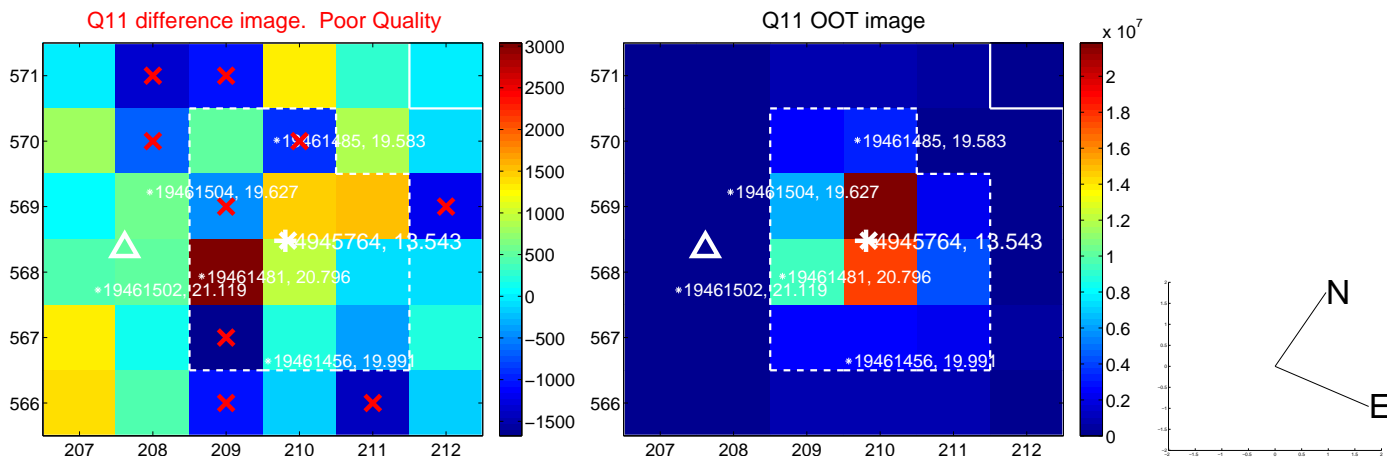
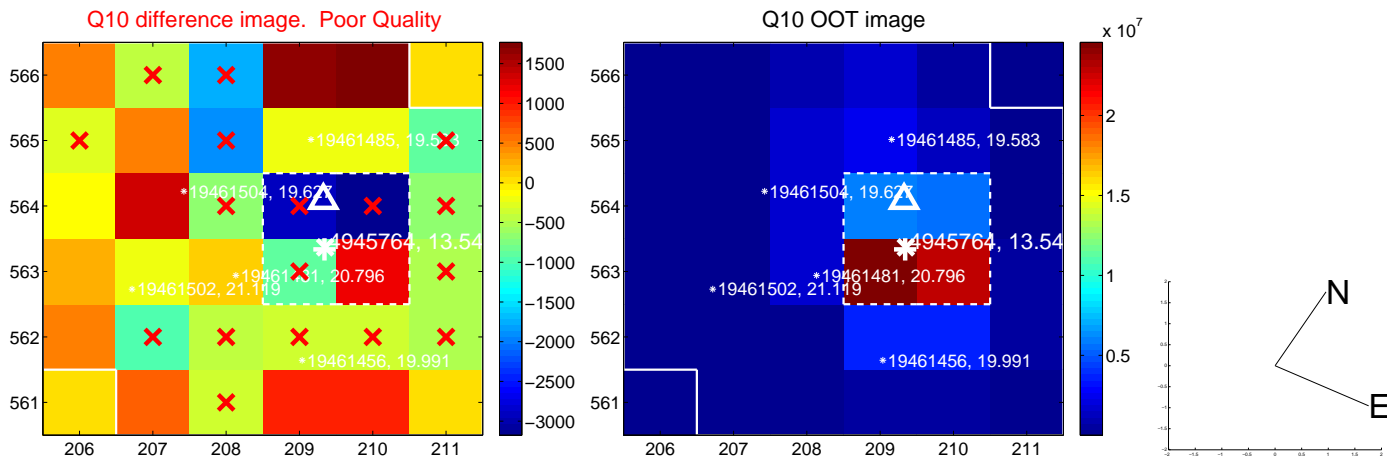
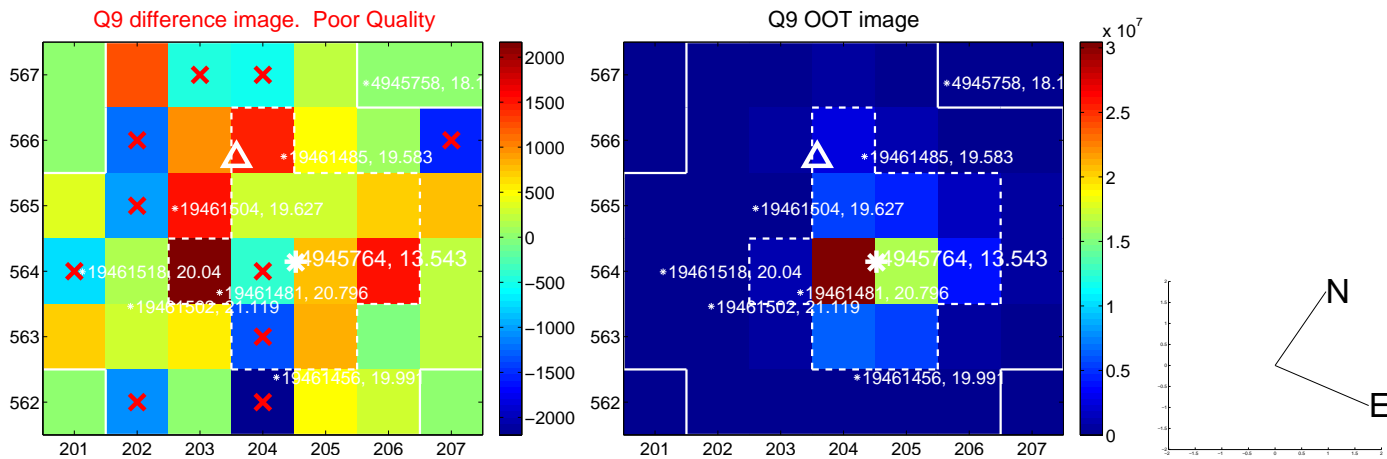
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



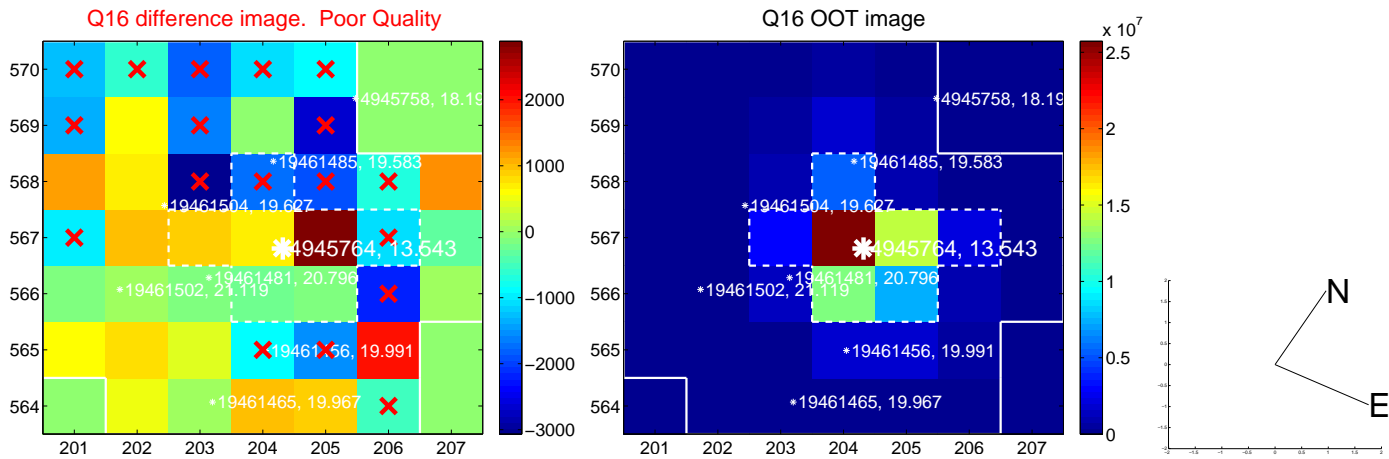
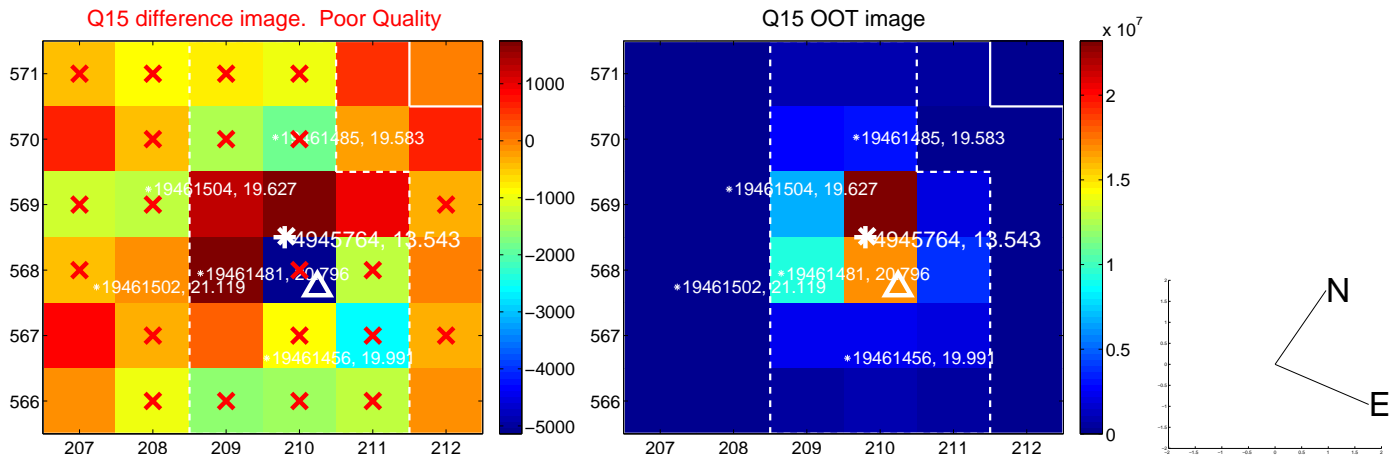
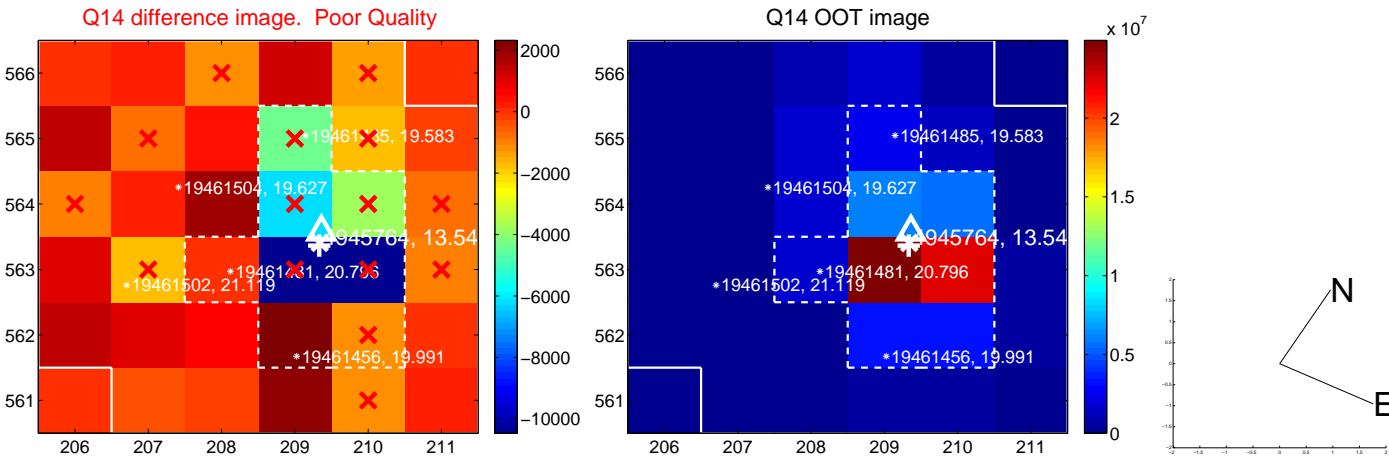
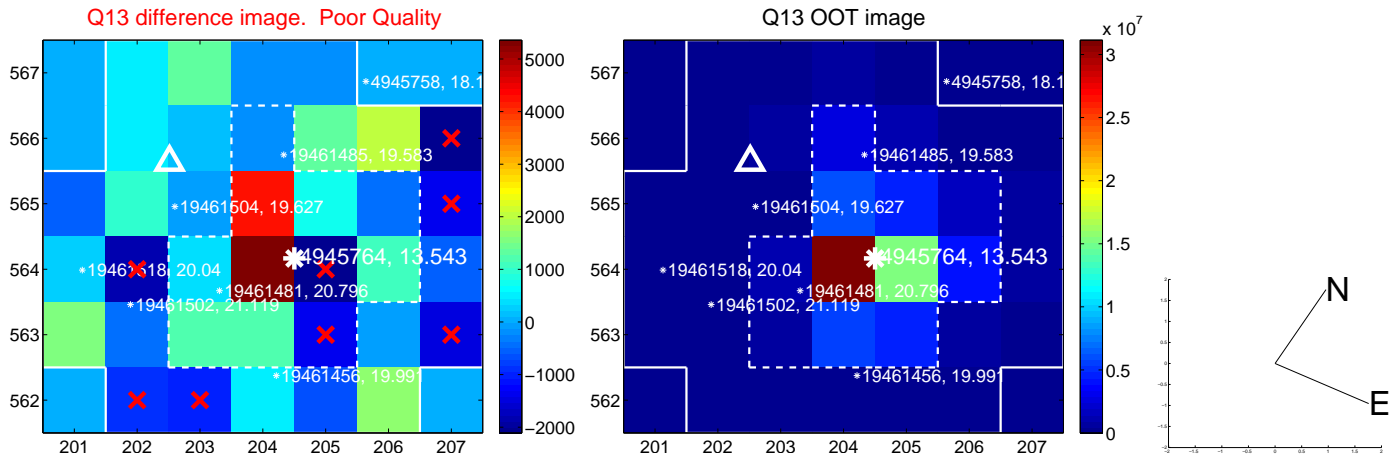
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



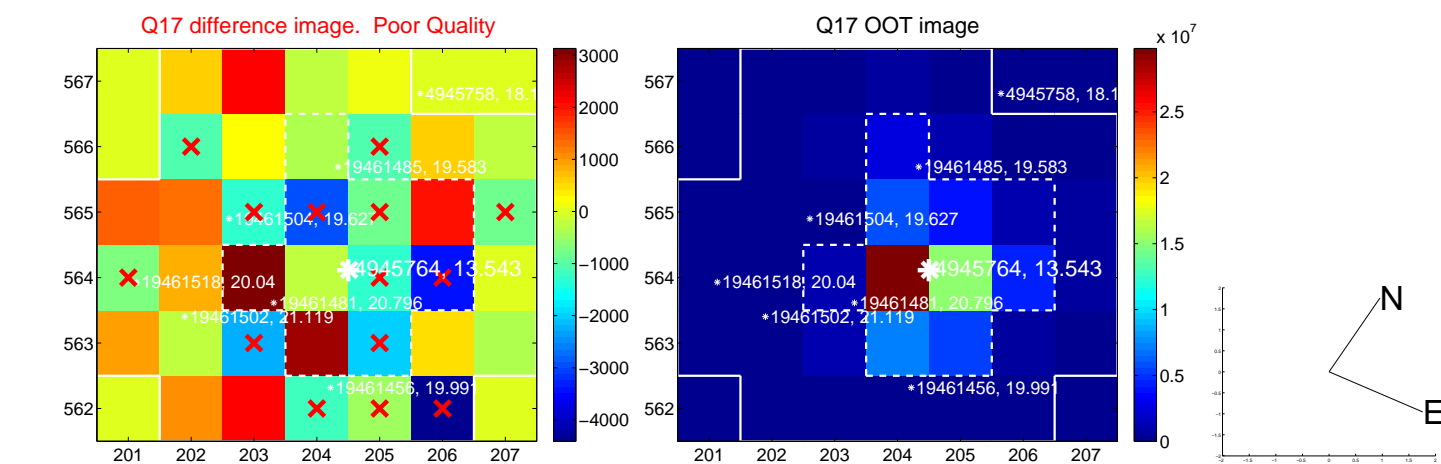
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



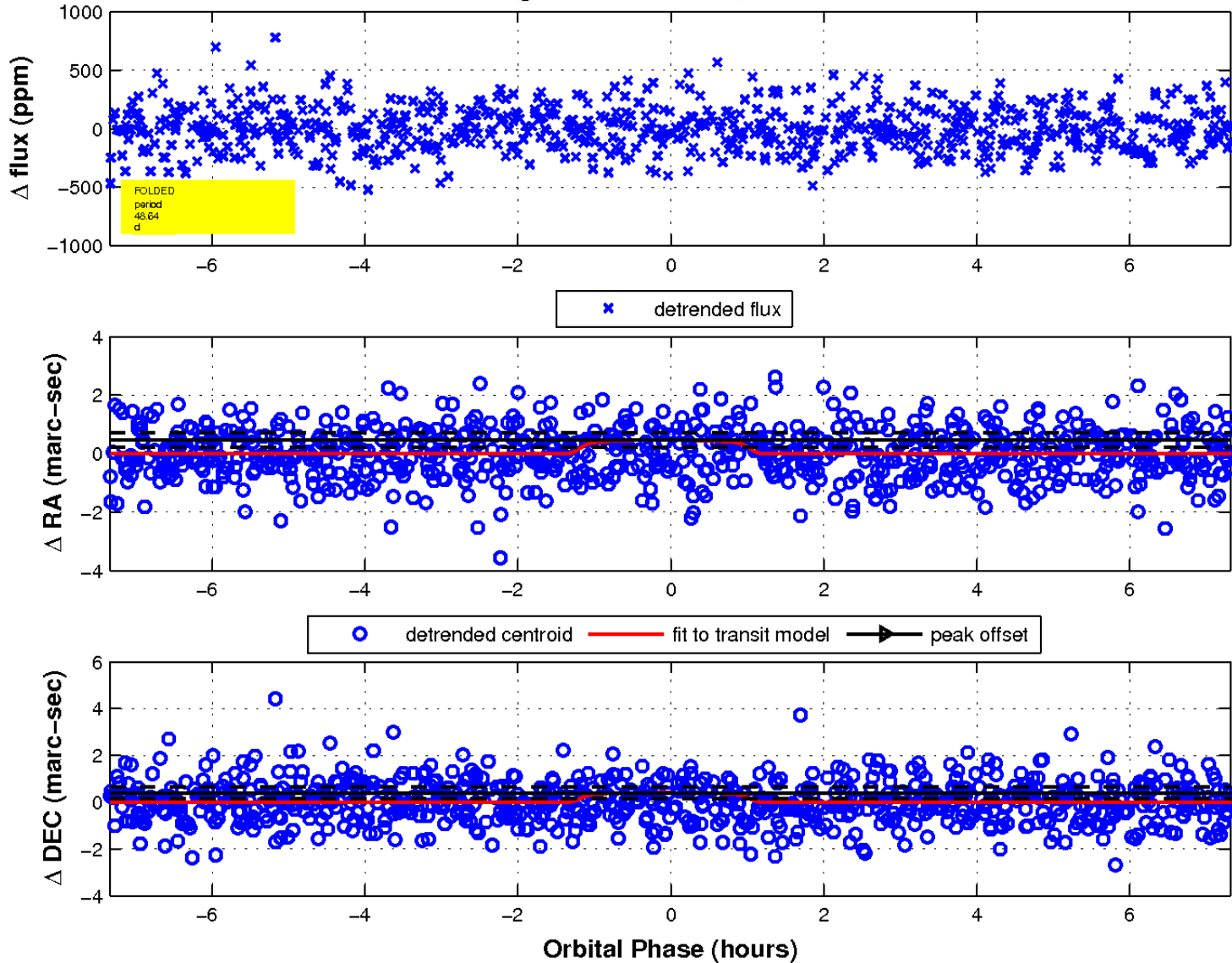
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

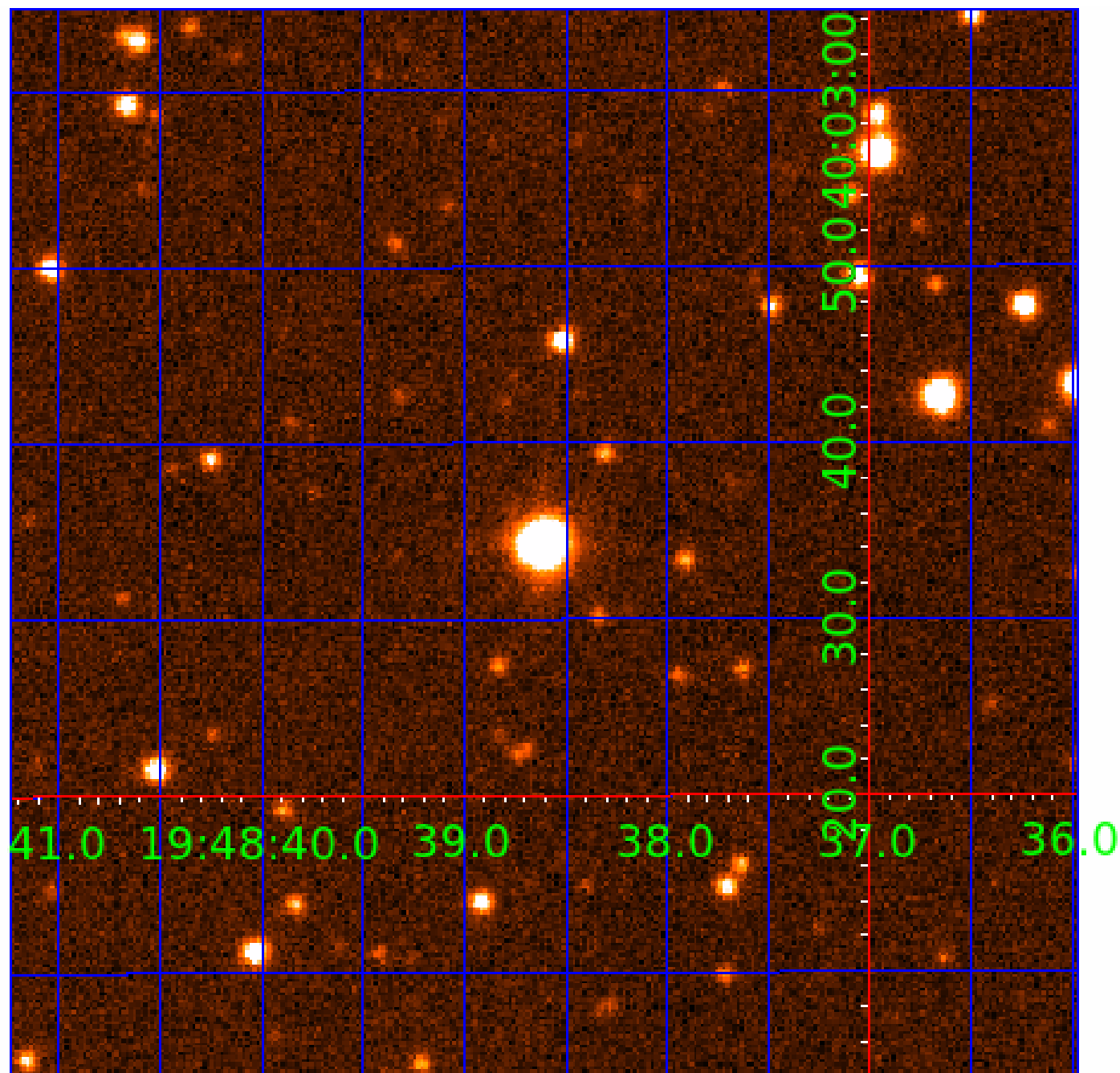


fluxWeightedCentroids, Planet 3 of 5



UKIRT Image

Declination



KIC 004945764

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 004945764-01 | OBS | 4377.01 | 19.875148 | 148.392492 | 106.8 | 7.895 | 11.1 | 11.6 | 2.00 | 6918 | 2.33 | 299.92 |
| 004945764-02 | OBS | No | 0.795981 | 132.274851 | 6.1 | 5.214 | 7.7 | 3.2 | 2.00 | 6918 | 0.53 | 21888.26 |
| 004945764-03 | OBS | No | 48.635289 | 155.599738 | 281.8 | 2.446 | 9.5 | 8.7 | 2.00 | 6918 | 3.94 | 90.95 |
| 004945764-04 | OBS | No | 57.352186 | 131.708621 | 214.0 | 1.689 | 8.5 | 5.8 | 2.00 | 6918 | 5.08 | 73.00 |
| 004945764-05 | OBS | No | 33.460679 | 153.932686 | 174.8 | 3.722 | 8.8 | 8.7 | 2.00 | 6918 | 2.91 | 149.75 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004945764-01 | OBS | PC | 0.93 | 0 | 0 | 0 | 0 | NO_COMMENT |
| 004945764-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT |
| 004945764-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 004945764-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 004945764-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |

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.

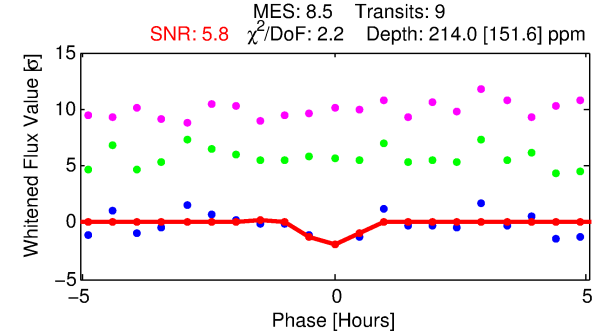
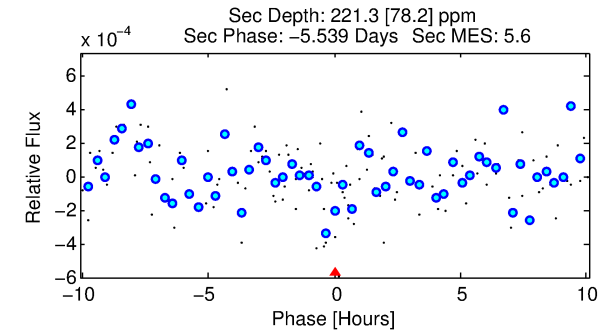
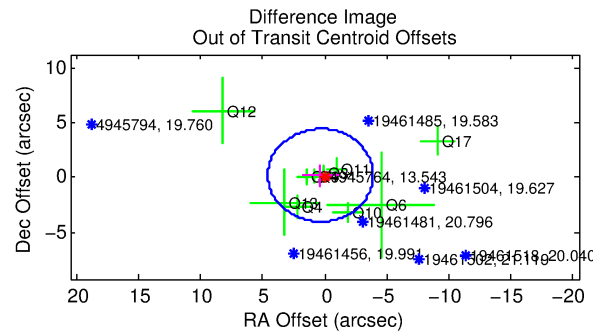
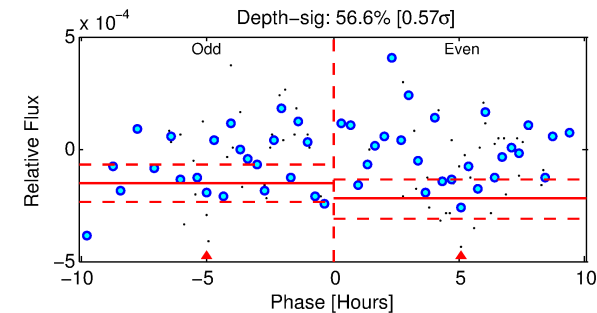
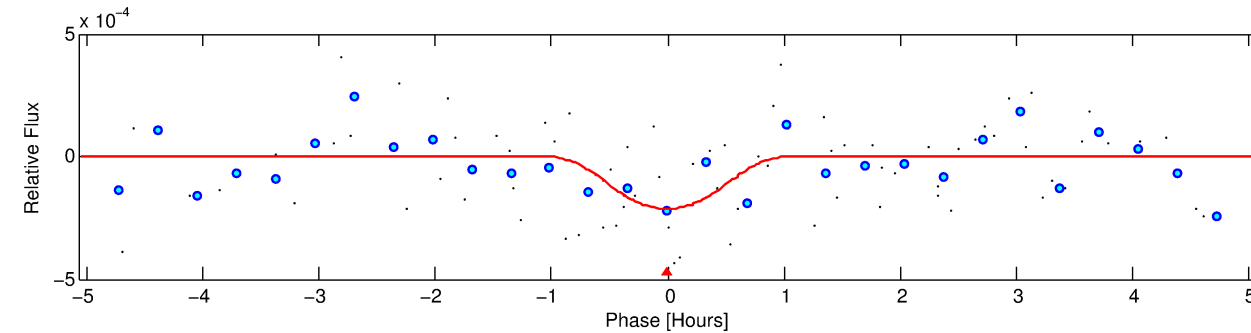
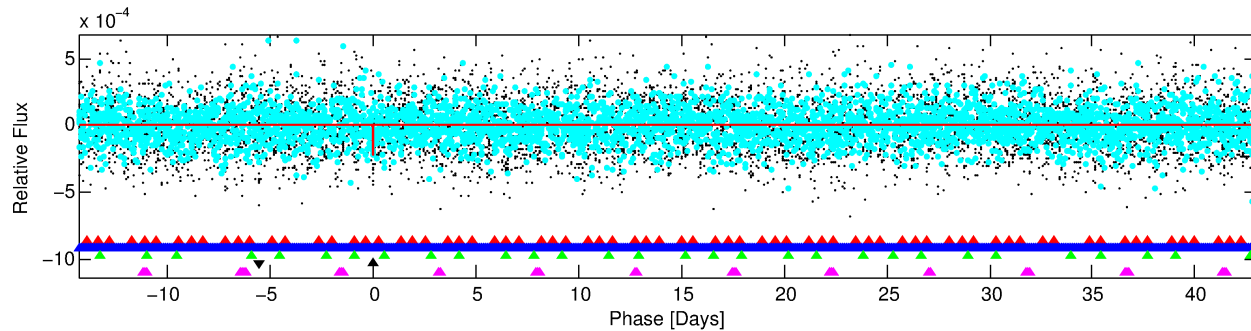
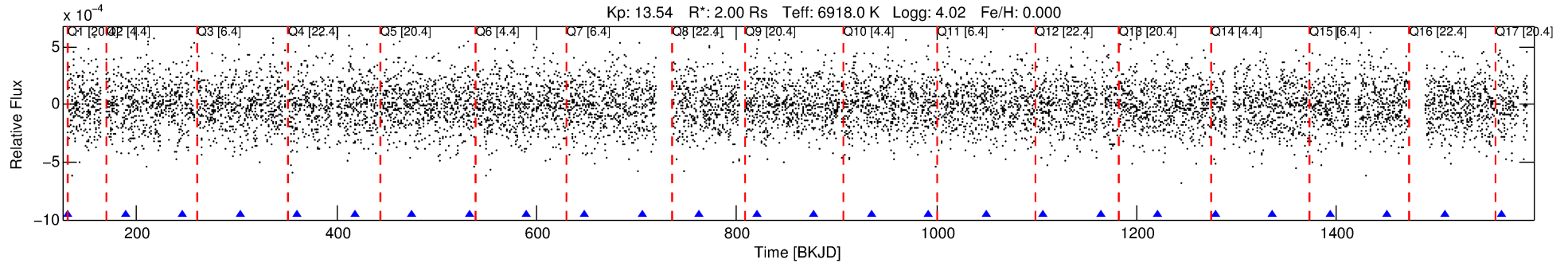
Ephemeris Match Information For 004945764-04

No Significant Match Found

DV One-Page Summary

KIC: 4945764 Candidate: 4 of 5 Period: 57.352 d
KOI: K04377 Corr: No Ephemeris Match

Kp: 13.54 R*: 2.00 Rs Teff: 6918.0 K Logg: 4.02 Fe/H: 0.000



DV Fit Results:

Period = 57.35219 [0.00060] d
Epoch = 131.7086 [0.0101] BKJD
Rp/R* = 0.0232 [0.2530]
a/R* = 62.43 [241.11]
b = 0.99 [0.43]
Seff = 73.00 [19.70]
Teq = 745 [50] K
Rp = 5.08 [55.33] Re
a = 0.3360 [0.0599] AU
Ag = 533.56 [11634.10] [0.05σ]
Teffp = 5539 [30190] K [0.16σ]

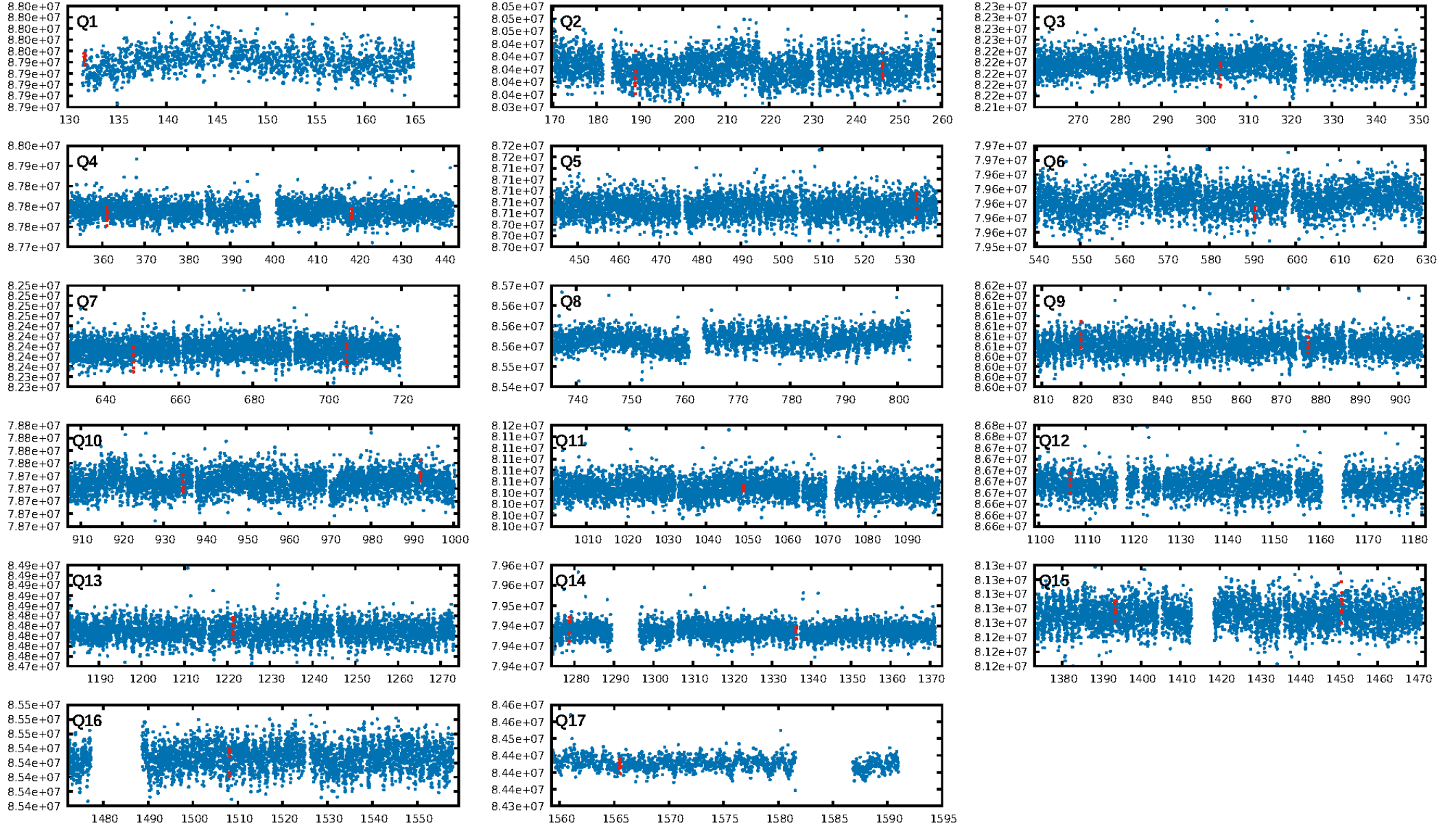
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [70.39σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 4.5%
Bootstrap-pfa: 1.16e-07
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: -1.788
Centroid-sig: 40.4%
Centroid-so: 1.362 arcsec [0.70σ]
OotOffset-rm: 0.399 arcsec [0.28σ]
KicOffset-rm: 0.347 arcsec [0.28σ]
OotOffset-st: 2/3/2/3 [10]
KicOffset-st: 2/3/2/3 [10]
DiffImageQuality-fgm: 0.30 [3/10]
DiffImageOverlap-fno: 0.25 [4/16]

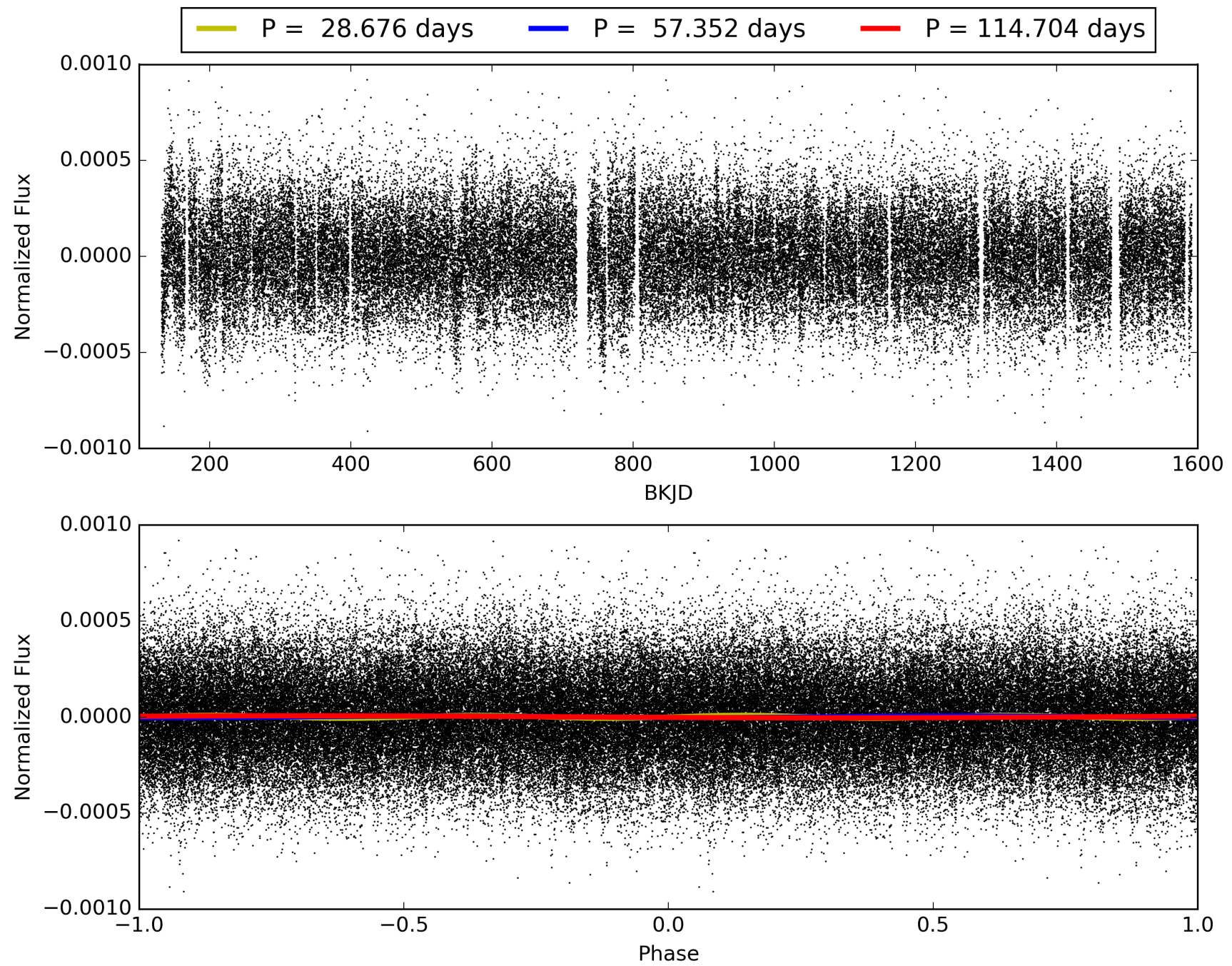
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 07:21:27 Z

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

TCE 004945764-04, PDC Light Curves

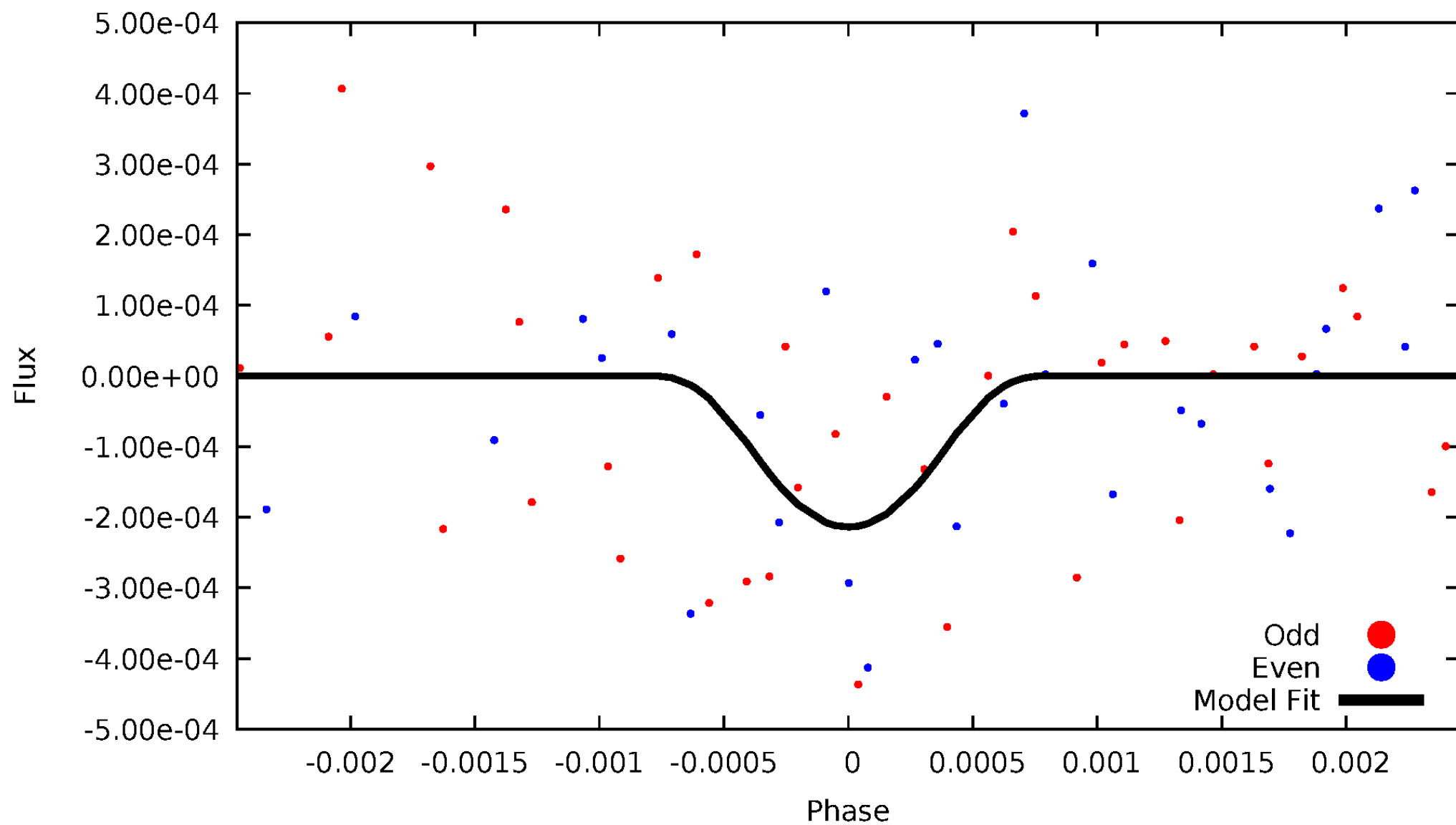


TCE 004945764-04



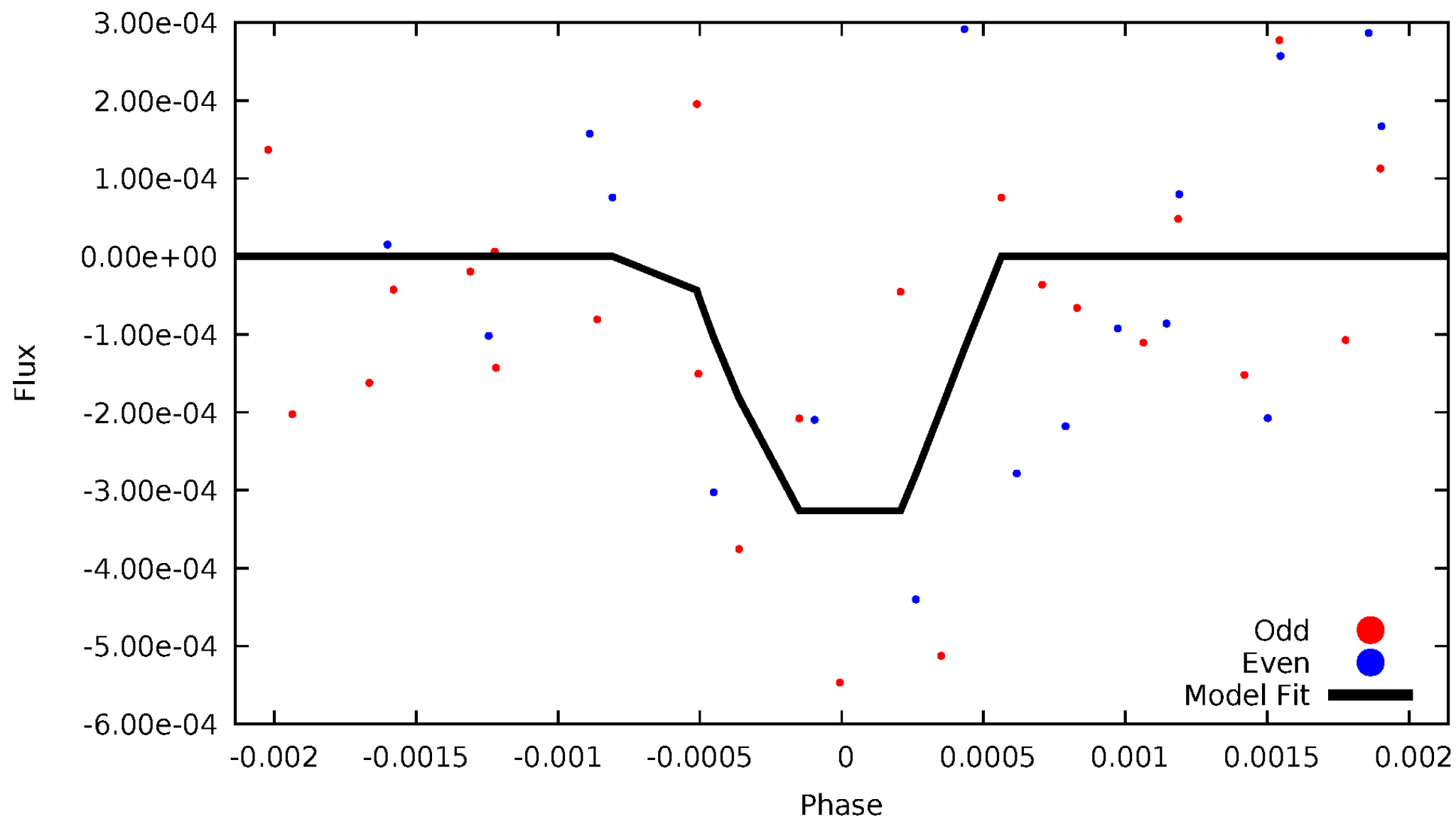
DV Odd/Even

TCE 004945764-04



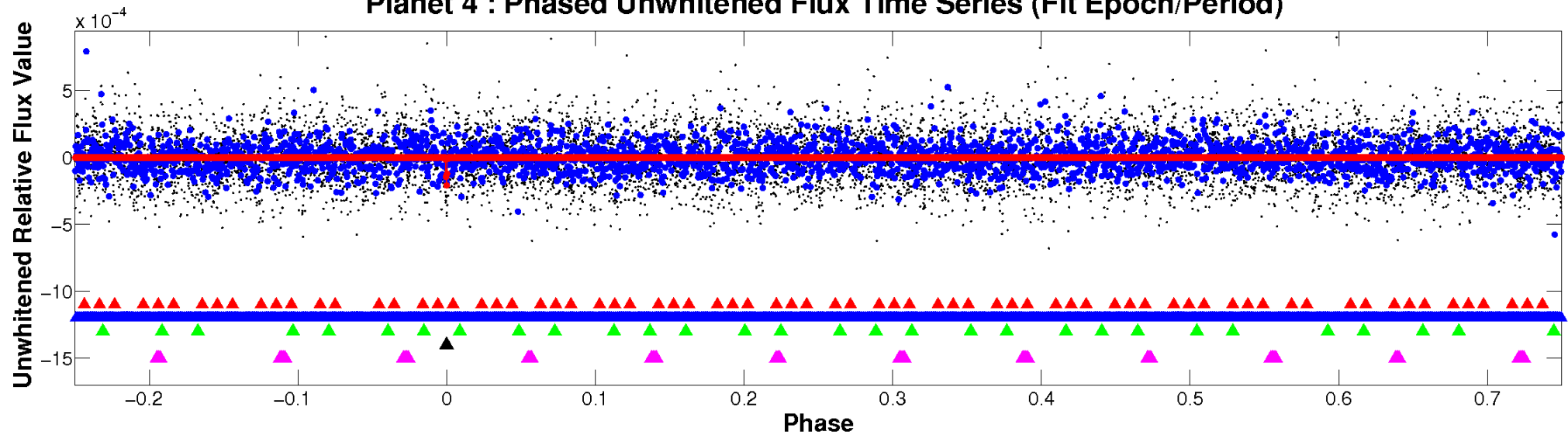
ALT Odd/Even

TCE 004945764-04

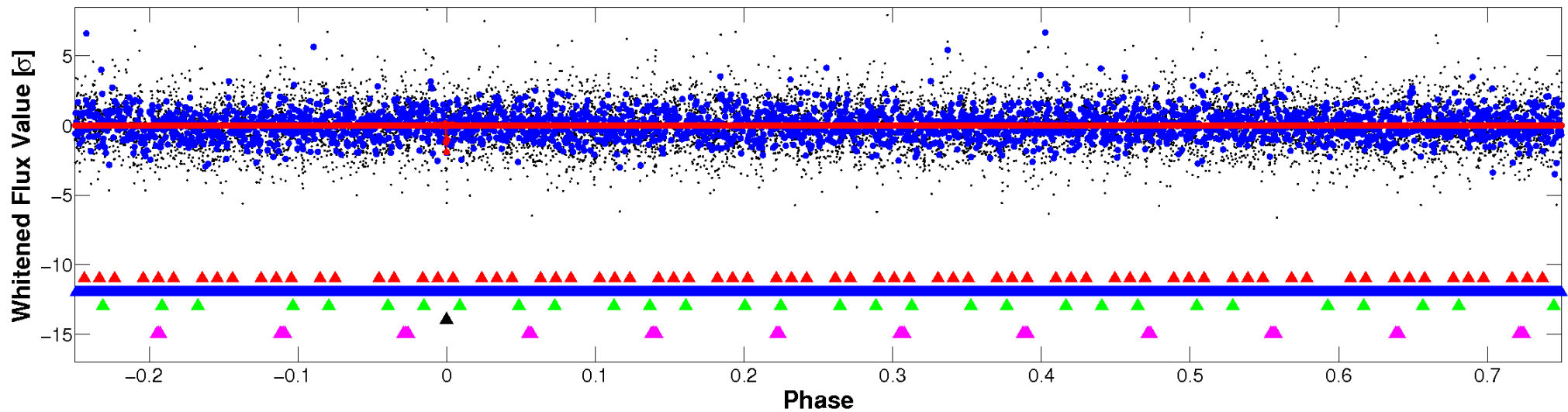


Non-Whitened Vs. Whitened Light Curve

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

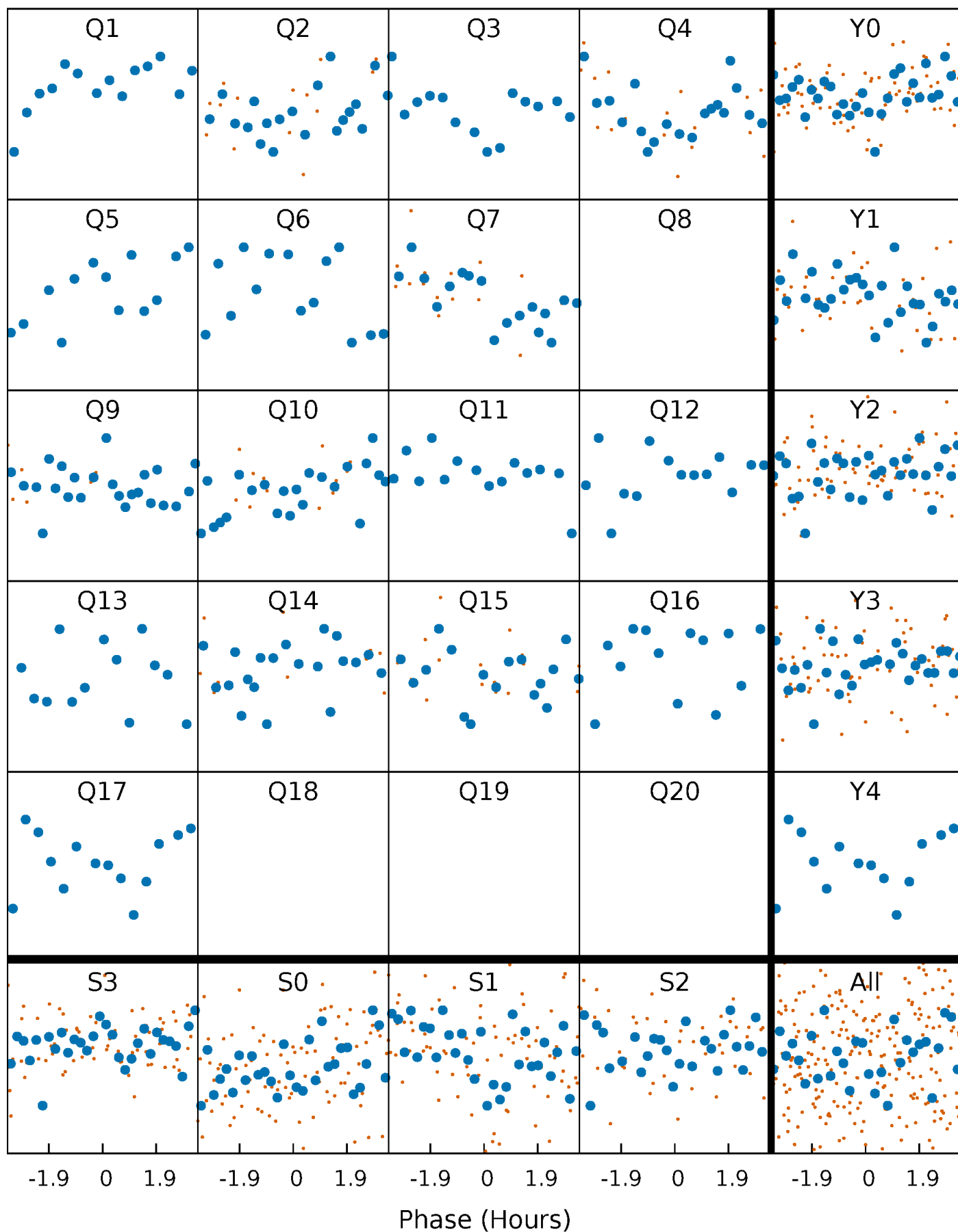


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



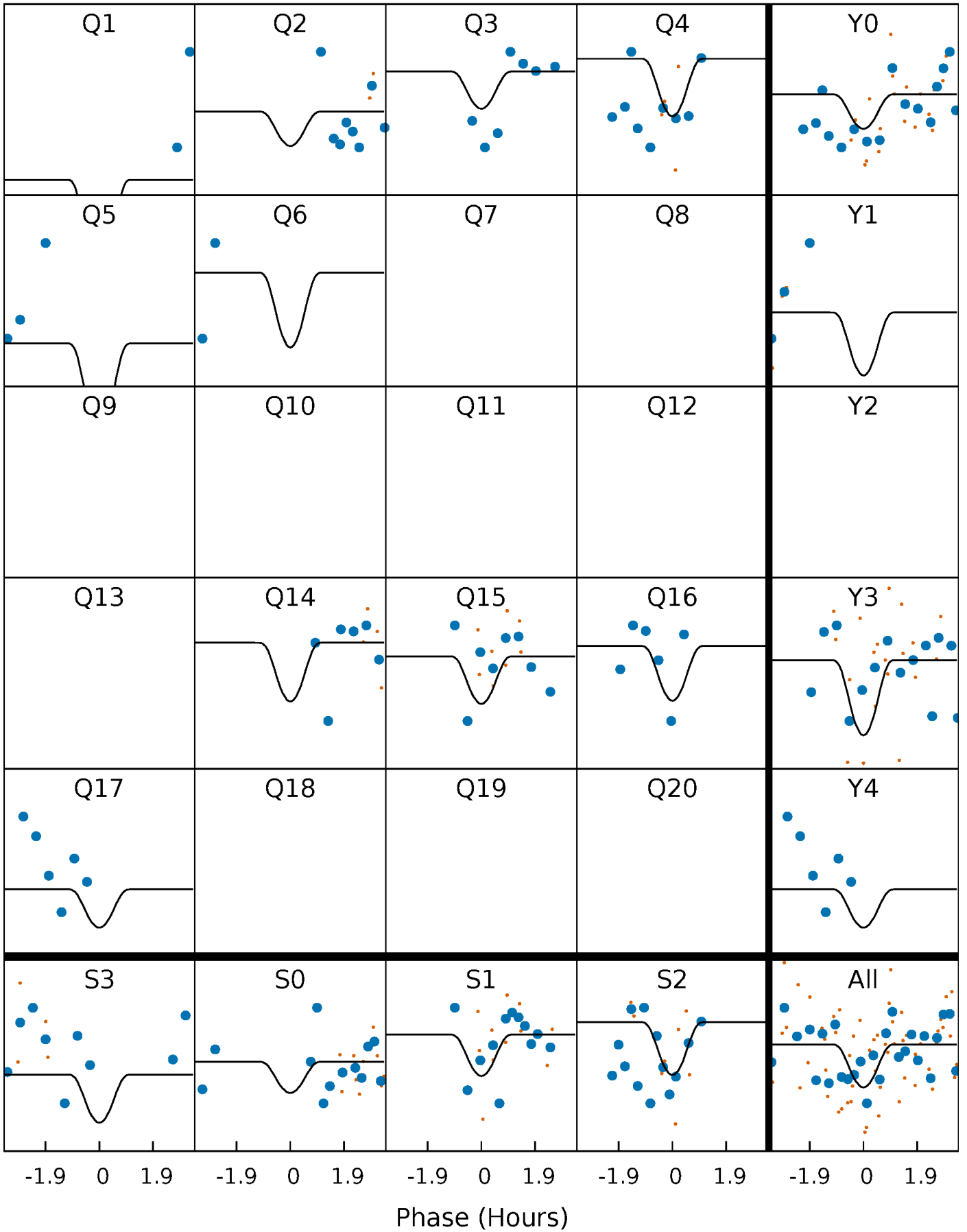
PDC Quarter-Phased Transit Curves

TCE 004945764-04 P= 57.352186 Days $T_0=131.708621$ (BKJD)



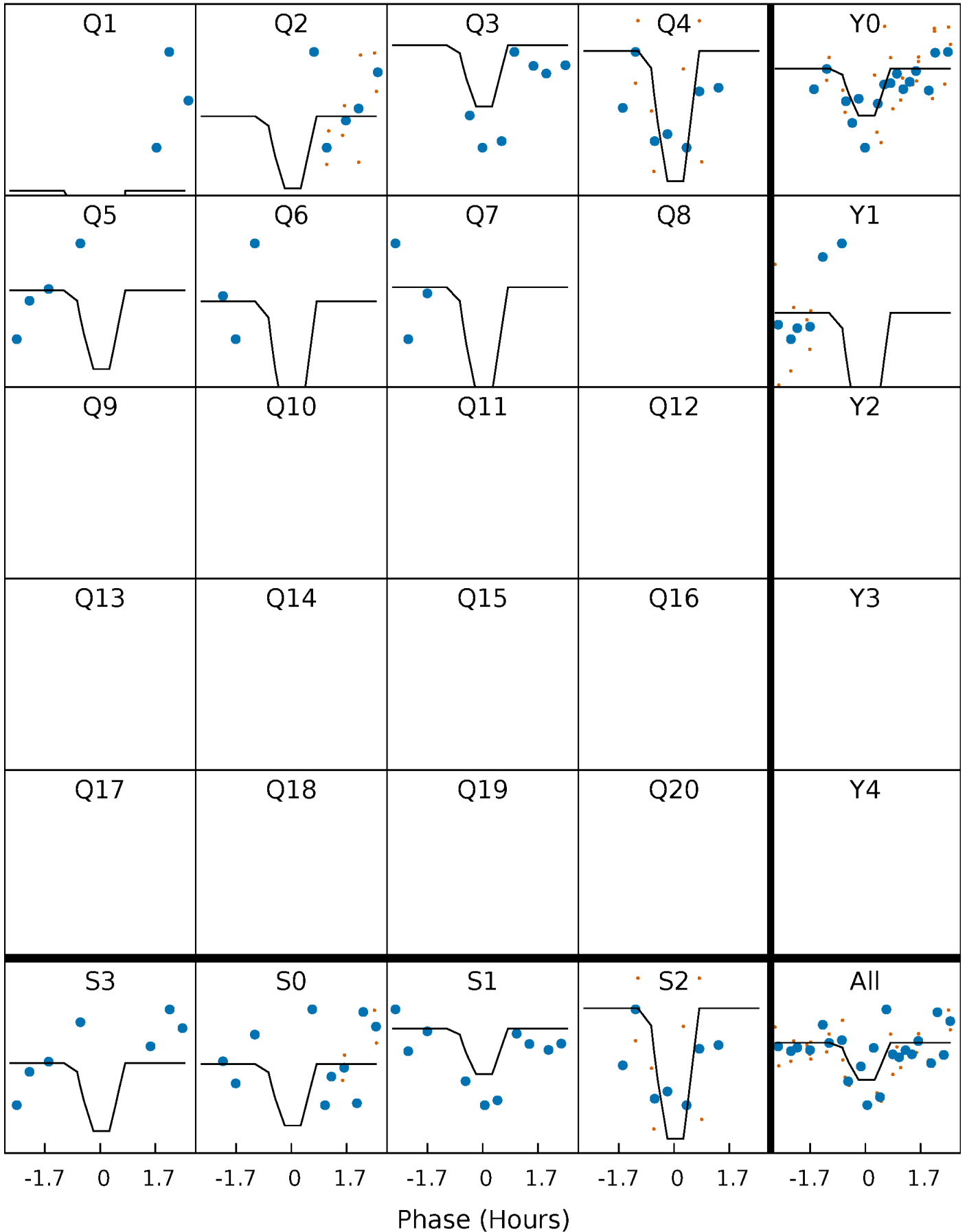
DV Quarter-Phased Transit Curves

TCE 004945764-04 $P = 57.352186$ Days $T_0 = 131.708621$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

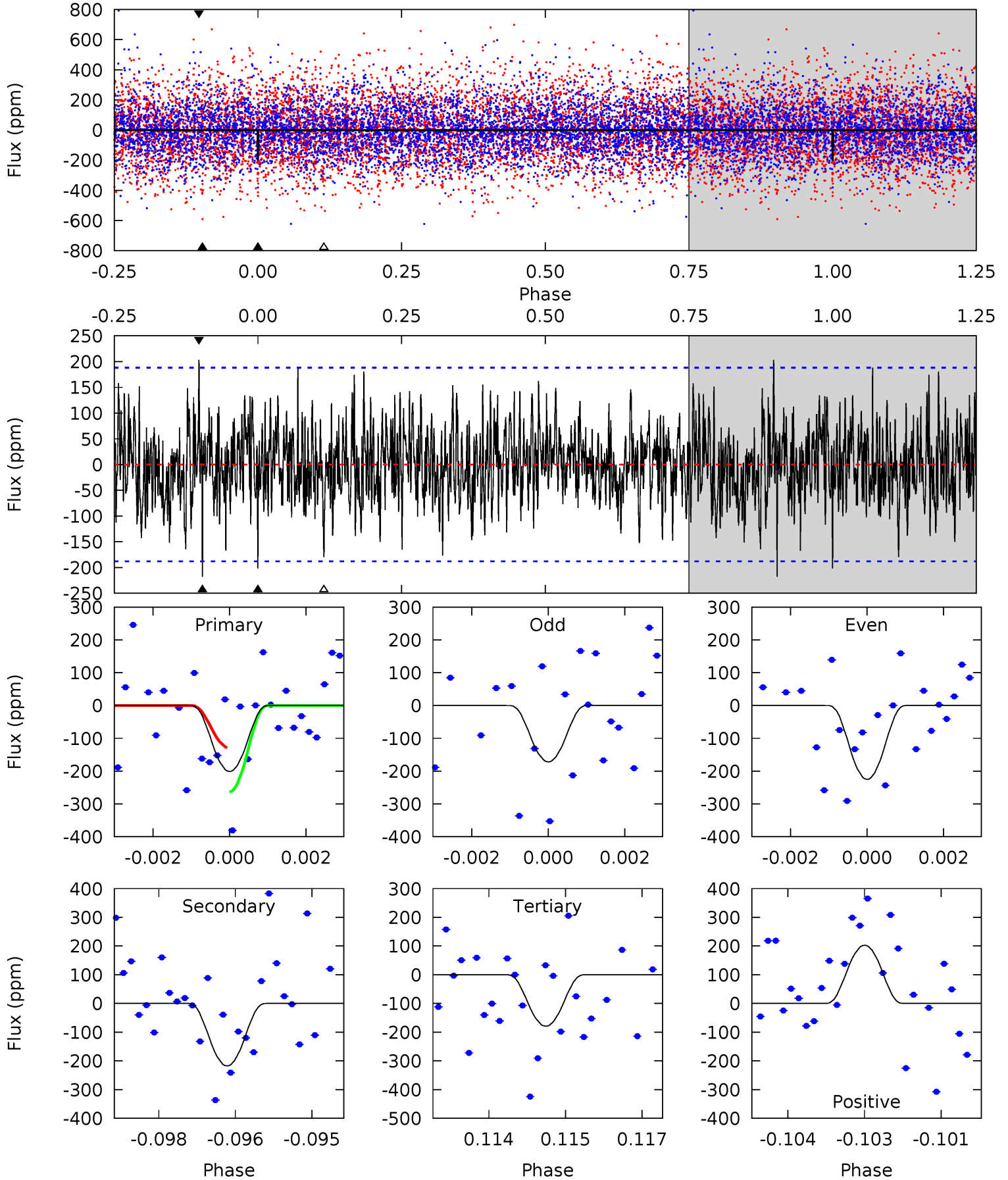
TCE 004945764-04 P= 57.339129 Days $T_0=131.750415$ (BKJD)



DV Model-Shift Uniqueness Test

004945764-04, P = 57.352186 Days, E = 131.708621 Days

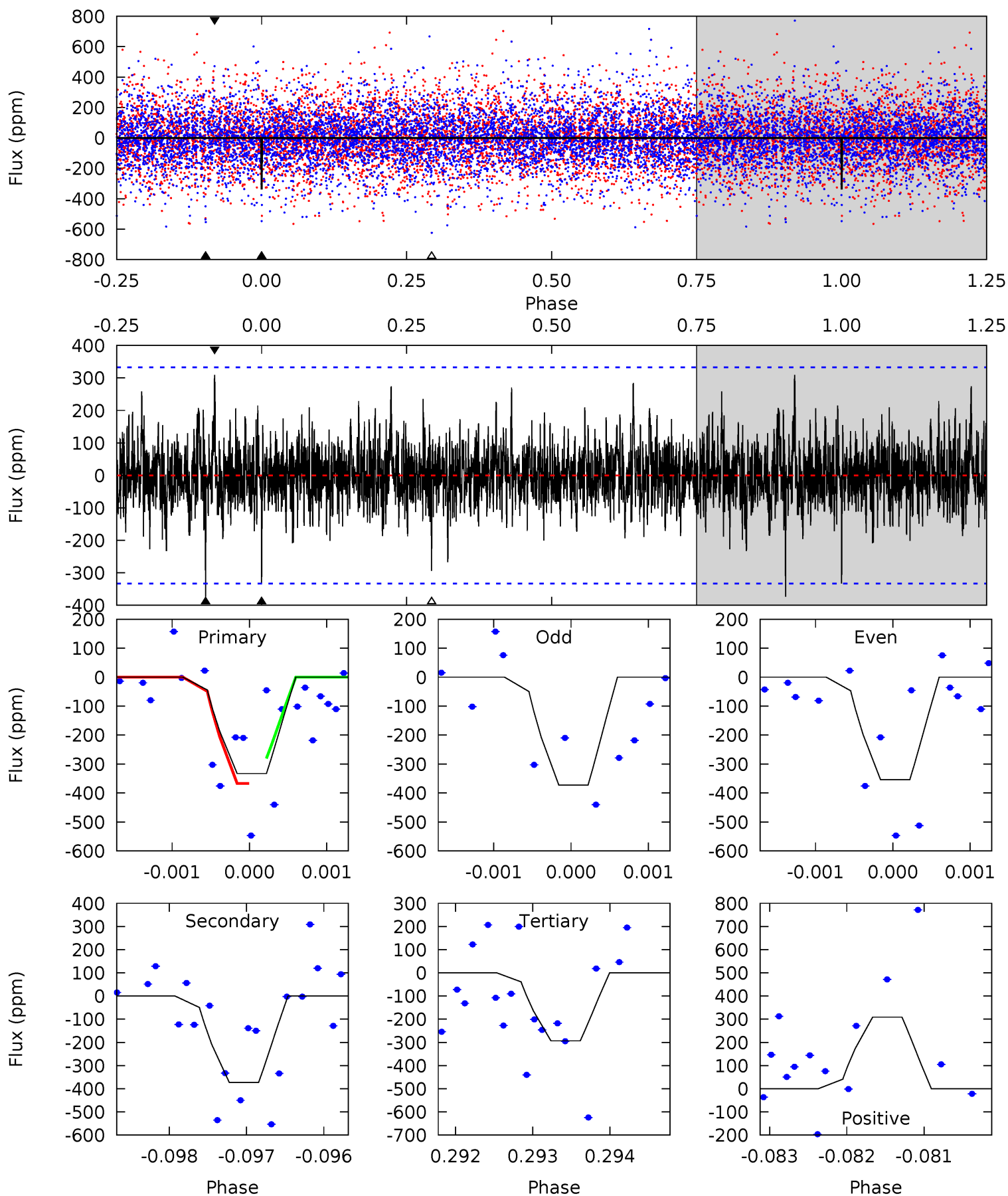
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 5.76 | 6.22 | 5.13 | 5.80 | 5.37 | 3.16 | 1.68 | 0.63 | -0.05 | 1.10 | 0.42 | 0.76 | 0.97 | 0.48 | 1.93 |



Alt Model-Shift Uniqueness Test

004945764-04, P = 57.339129 Days, E = 131.750415 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 5.47 | 6.12 | 4.82 | 5.07 | 5.46 | 3.31 | 1.18 | 0.65 | 0.40 | 1.31 | 1.06 | 0.15 | 1.03 | 0.45 | 0.69 |



Stellar Parameters For KIC 004945764

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 6918^{+72}_{-83} | $4.021^{+0.148}_{-0.121}$ | $0.000^{+0.150}_{-0.150}$ | $2.004^{+0.413}_{-0.338}$ | $1.536^{+0.149}_{-0.108}$ | $0.269^{+0.195}_{-0.105}$ |
| | +1%/-1% | +4%/-3% | +inf%/-inf% | +21%/-17% | +10%/-7% | +72%/-39% |
| Source | SPE68 | SPE68 | SPE68 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004945764-04 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|---------------------------|--------------------|-----------------------|-----------------------------|
| DV | -218 ± 35 | $38.47^{+39.77}_{-27.76}$ | 1037^{+50}_{-48} | 2732^{+1365}_{-453} | $9.175^{+110.885}_{-6.939}$ |
| Alt. | -373 ± 61 | $40.16^{+42.92}_{-28.92}$ | 1038^{+53}_{-51} | 2924^{+1396}_{-514} | 15^{+159}_{-11} |

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 $A_{obs} \gg 1.0$

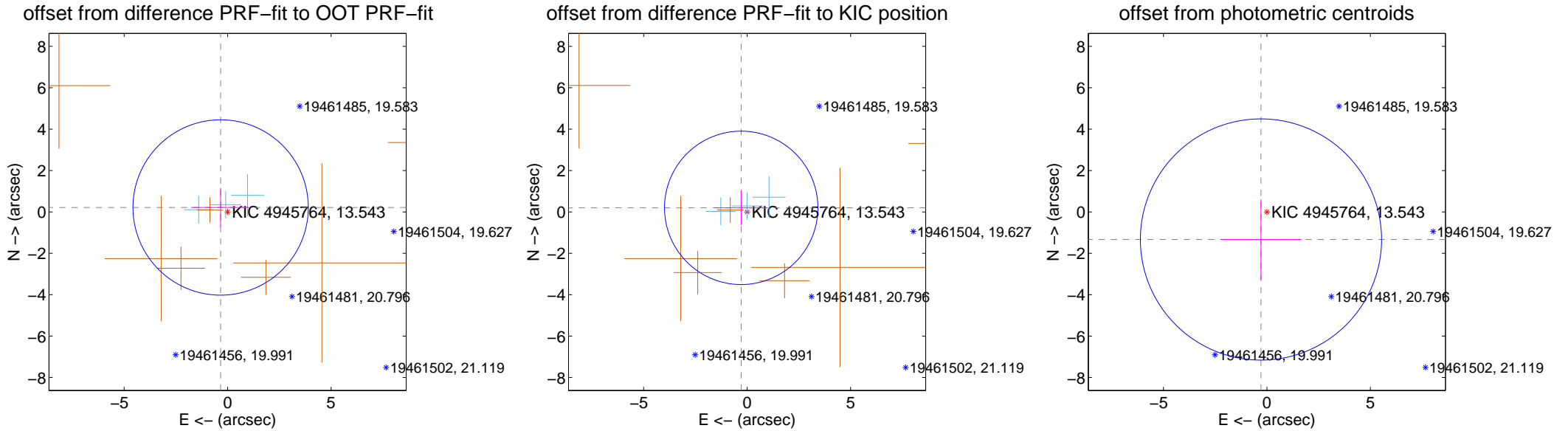
DV Centroid Data

Supplemental centroid analysis for 004945764-04. Kepler magnitude: 13.54. Transit SNR 5.80

There are 3 quarters with good PRF difference image offsets

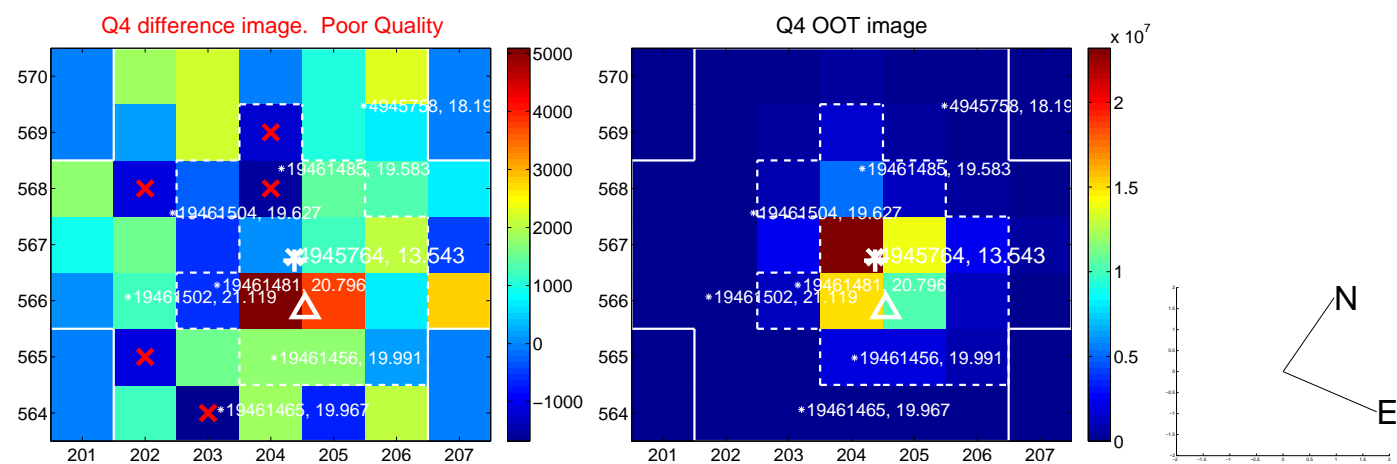
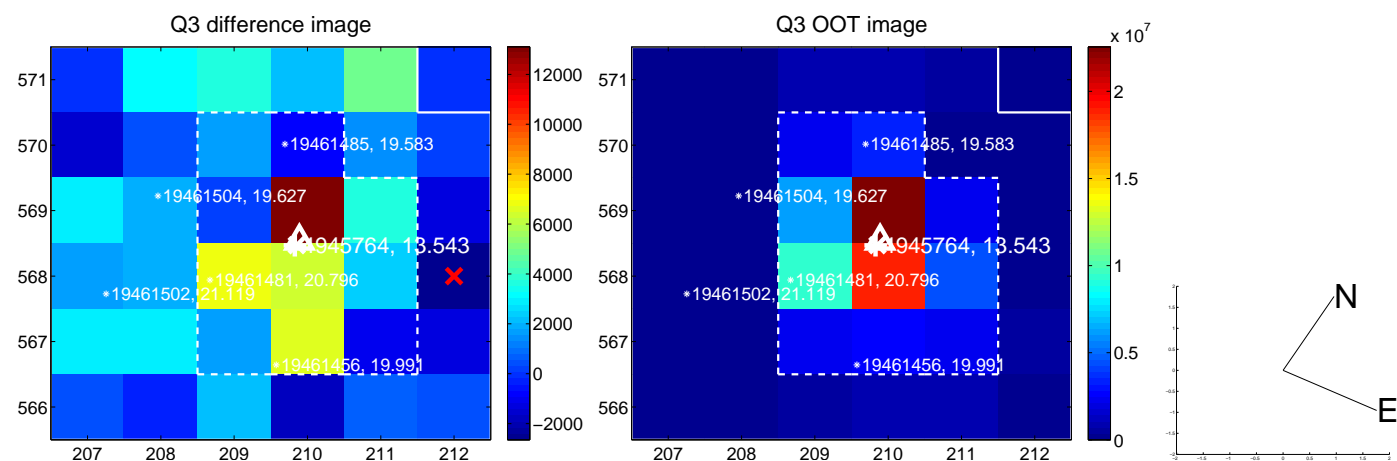
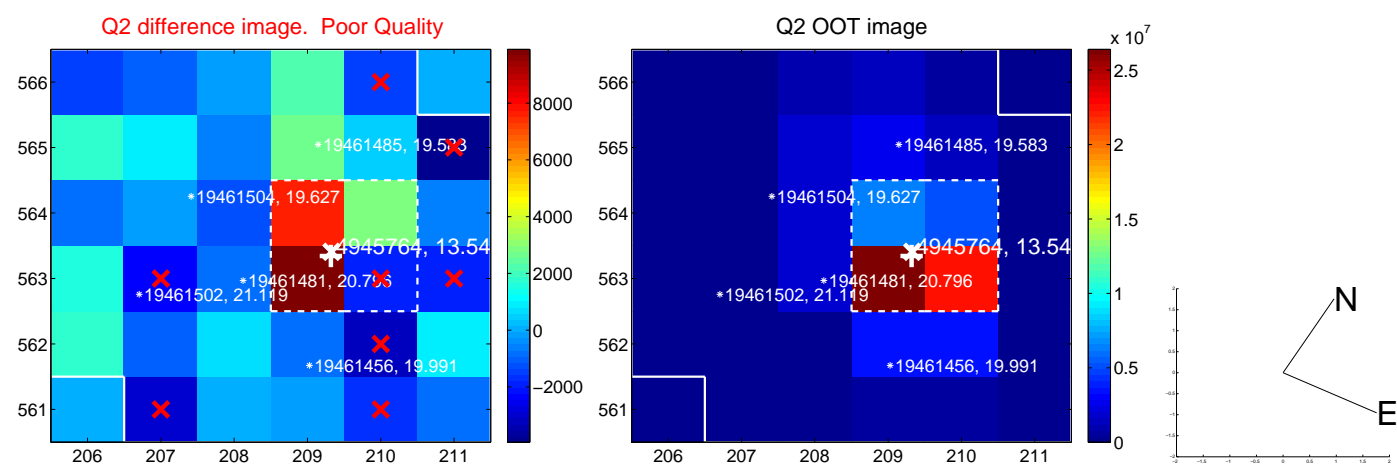
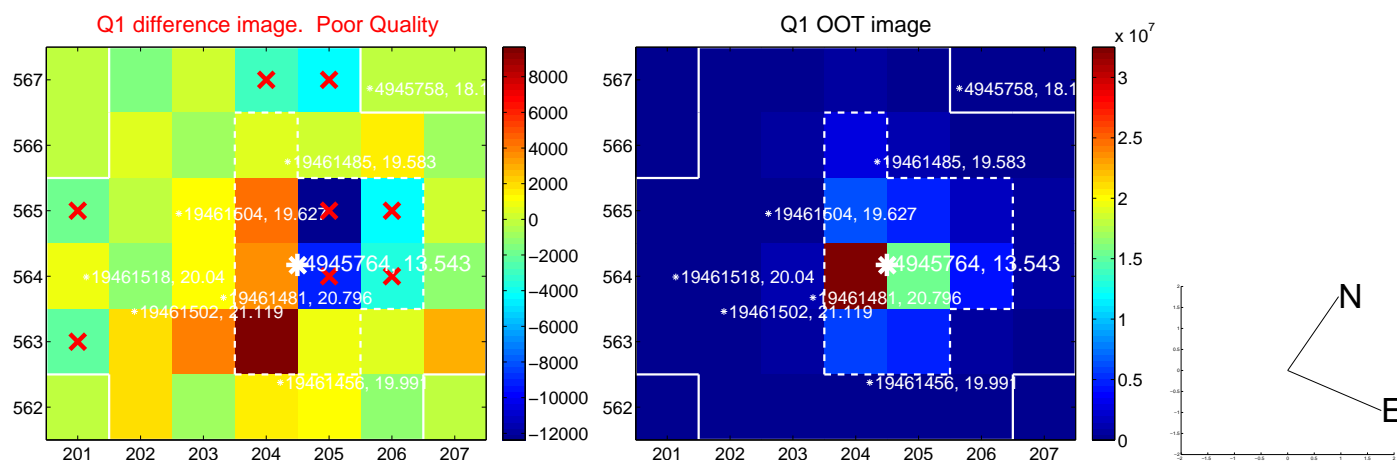
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 0.399 ± 1.412 | 0.28 | 0.336 ± 1.432 | 0.215 ± 0.944 |
| PRF-fit source offset from KIC position | 0.347 ± 1.235 | 0.28 | 0.286 ± 1.276 | 0.197 ± 0.830 |
| photometric centroid source offset | 1.36 ± 1.94 | 0.70 | 0.29 ± 1.94 | -1.33 ± 1.94 |

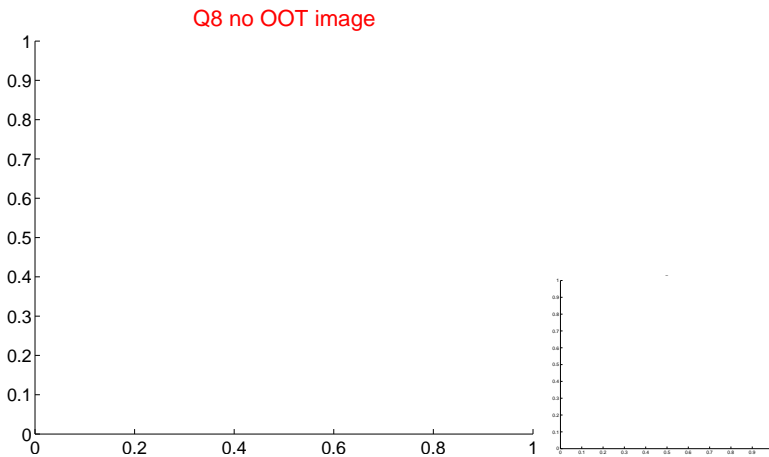
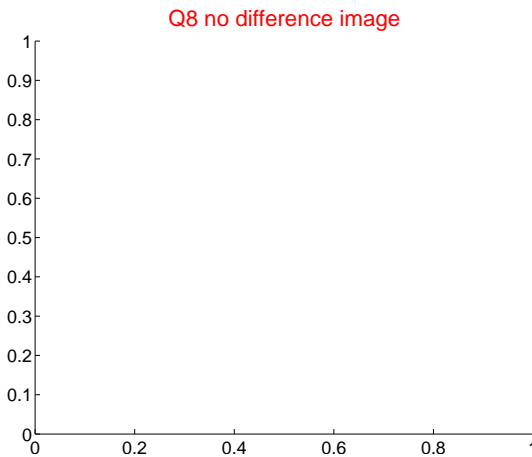
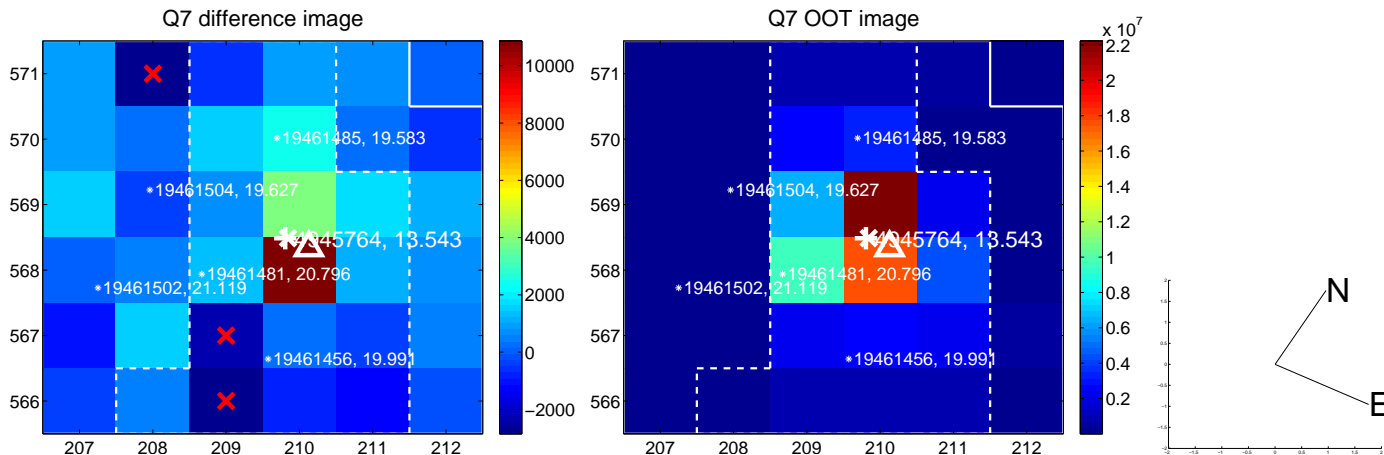
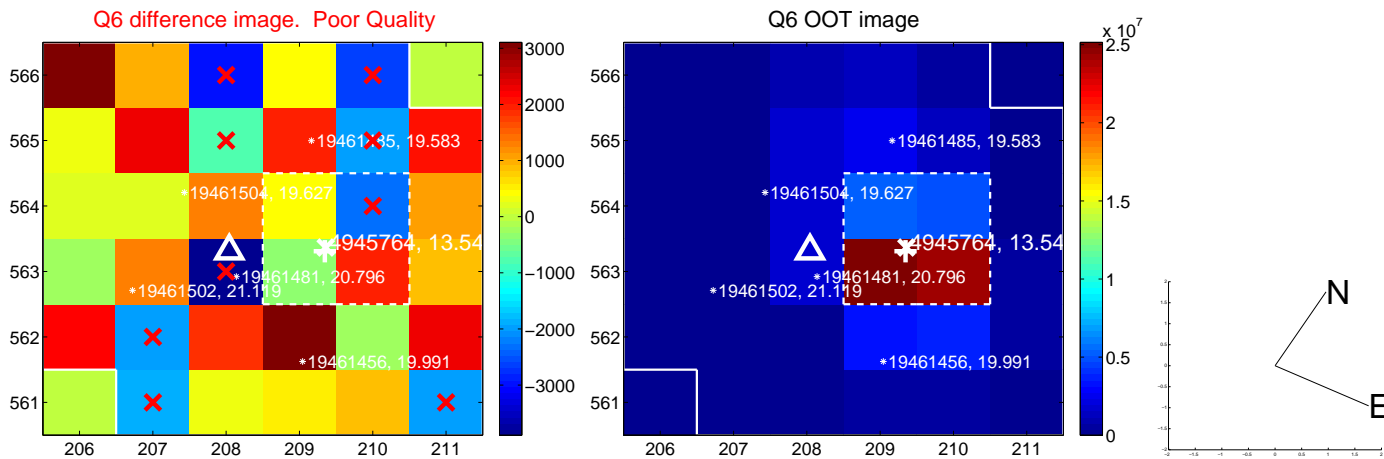
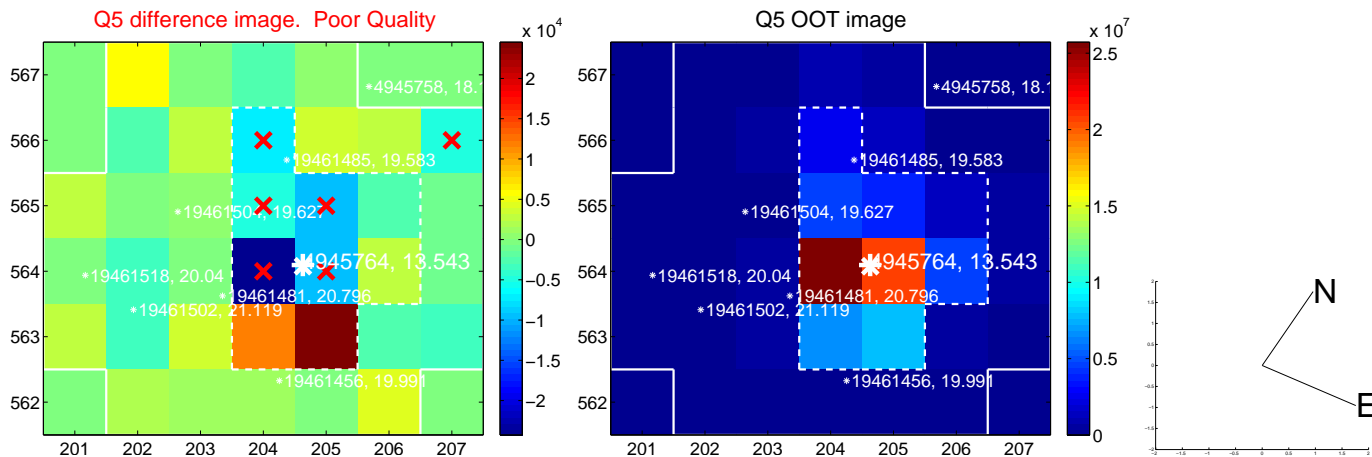


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

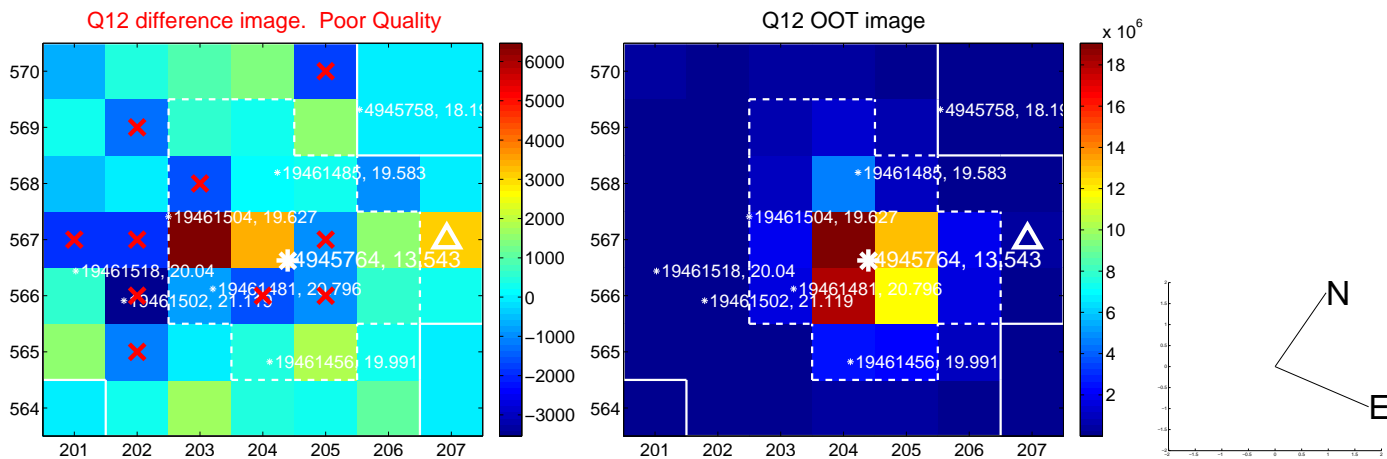
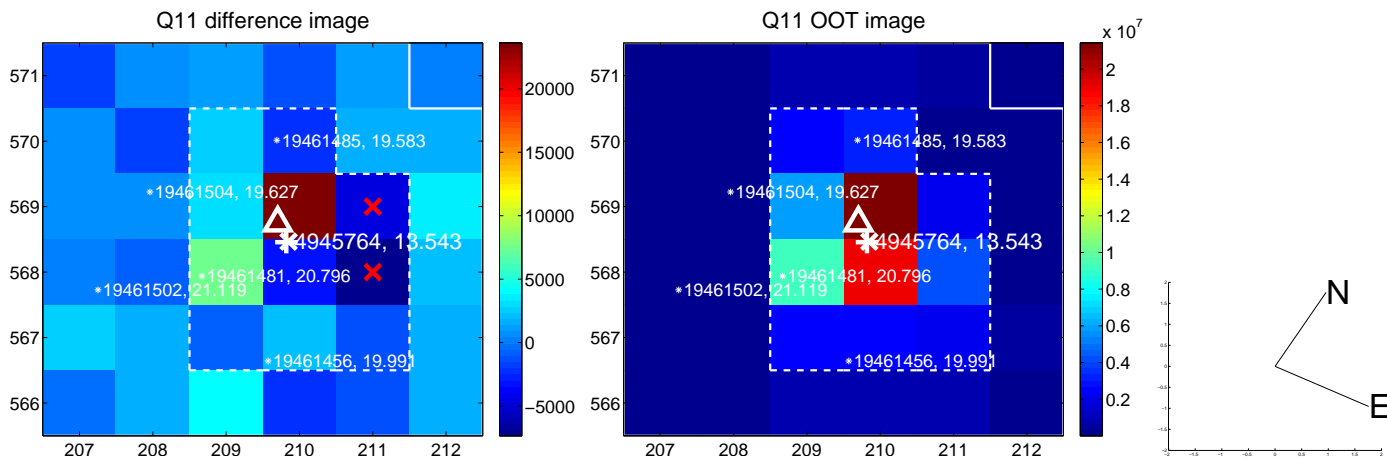
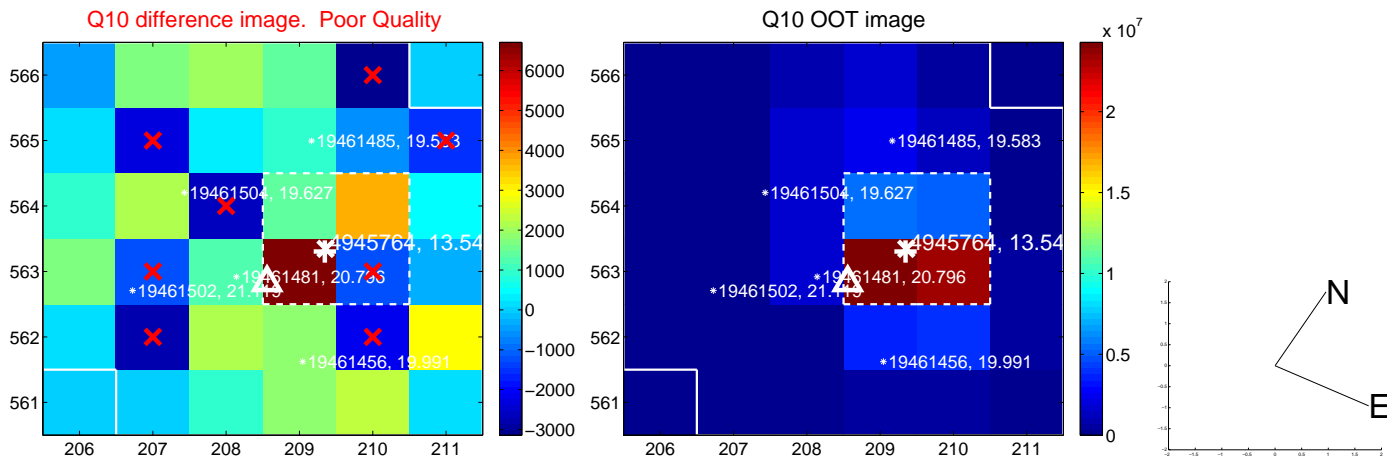
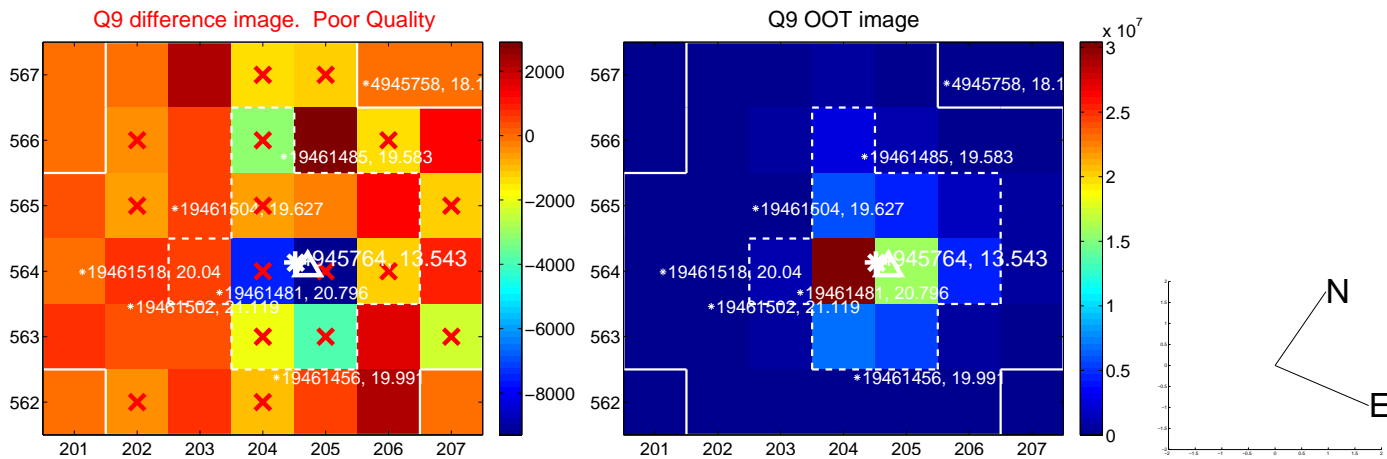
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



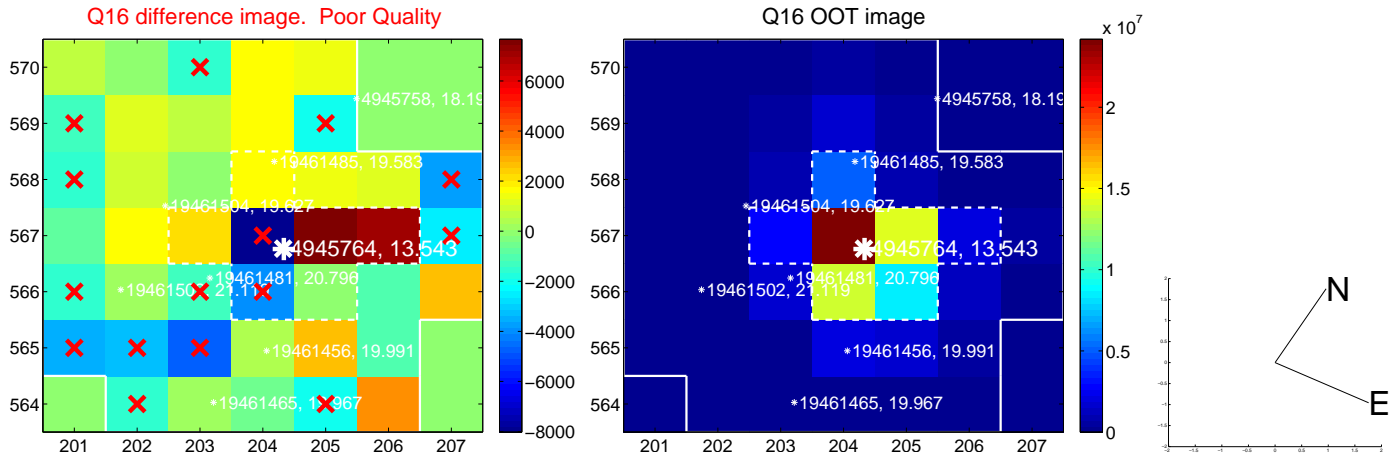
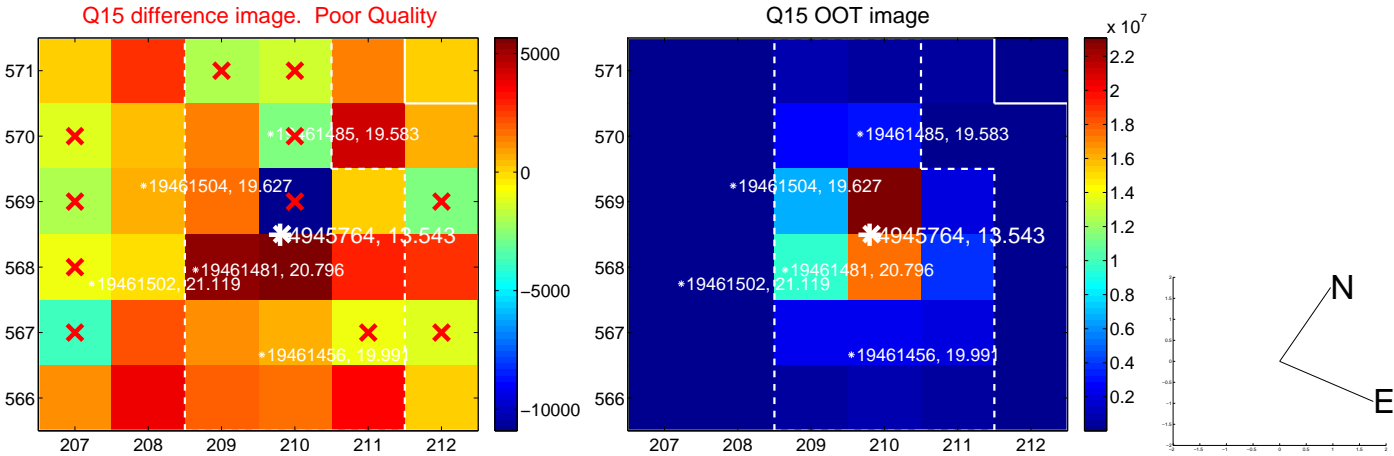
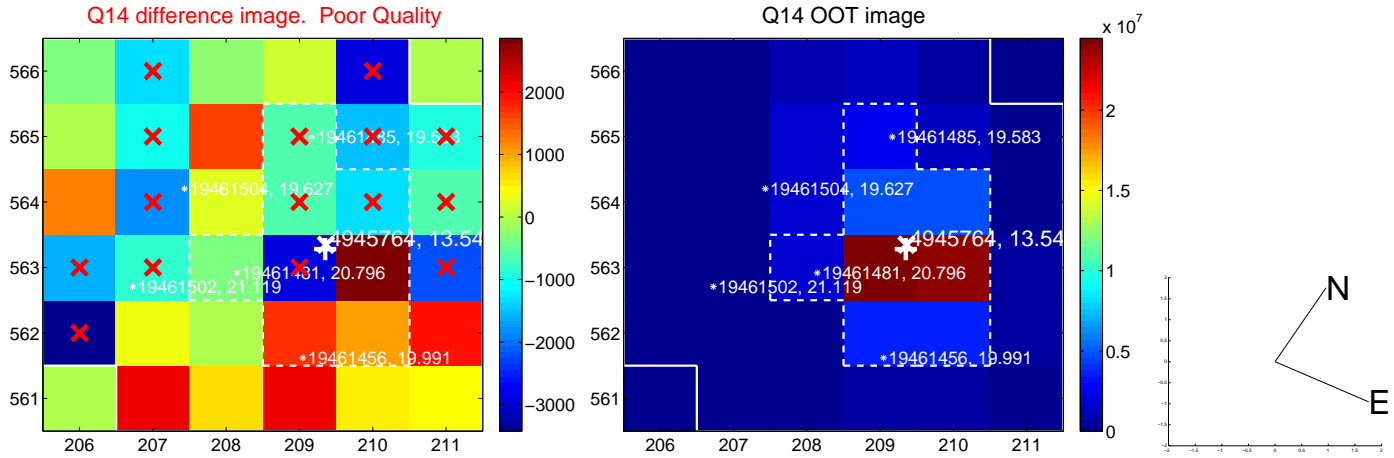
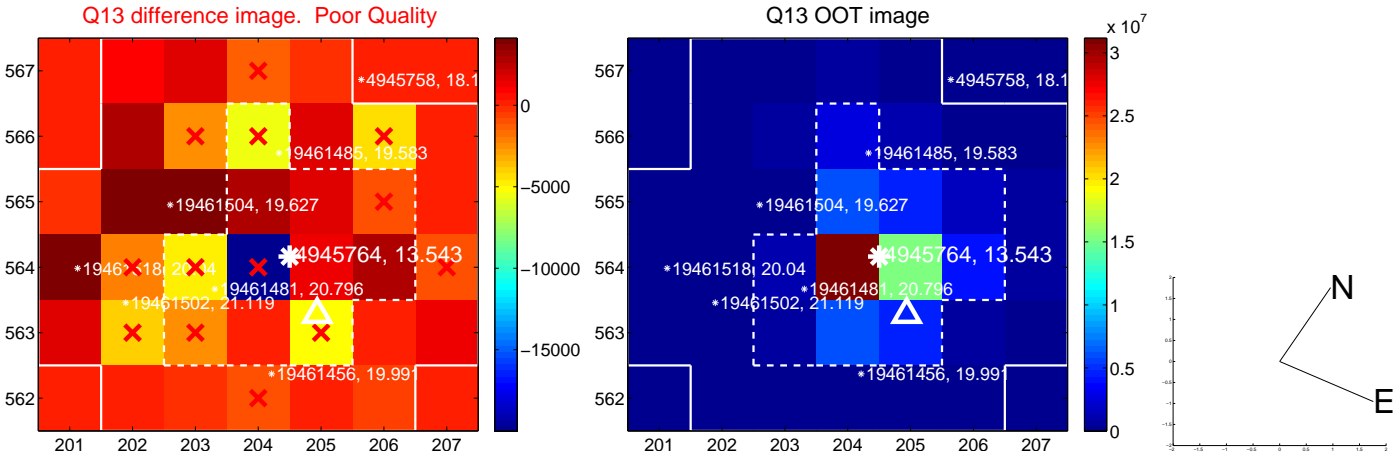
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



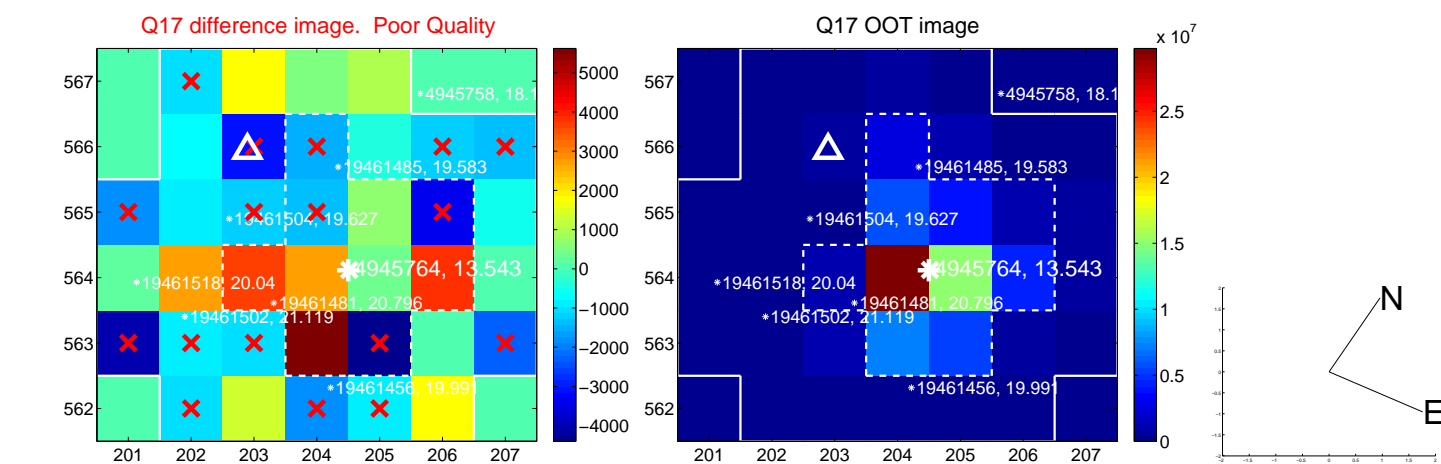
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



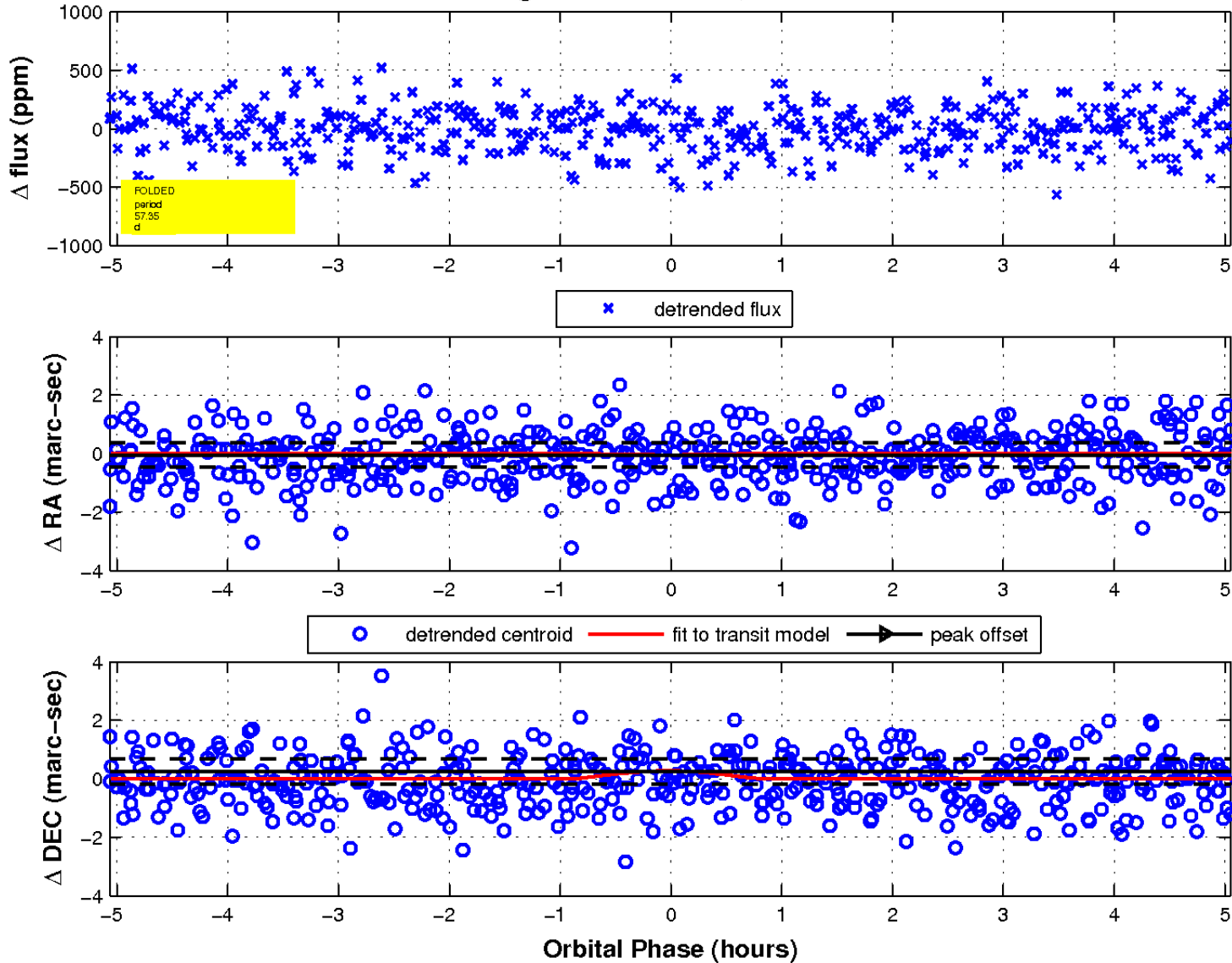
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

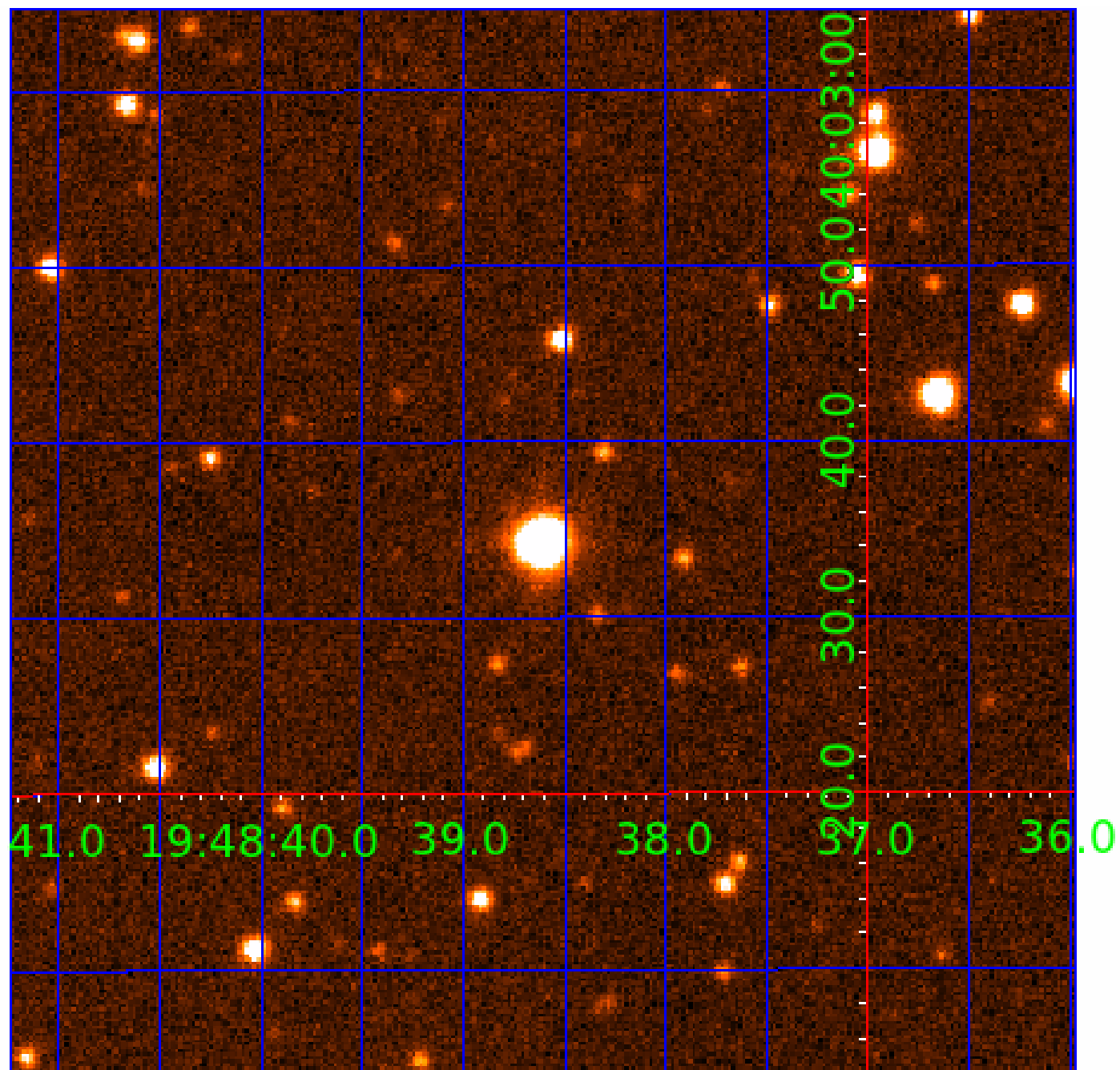


fluxWeightedCentroids, Planet 4 of 5



UKIRT Image

Declination



KIC 004945764

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}) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 004945764-01 | OBS | 4377.01 | 19.875148 | 148.392492 | 106.8 | 7.895 | 11.1 | 11.6 | 2.00 | 6918 | 2.33 | 299.92 |
| 004945764-02 | OBS | No | 0.795981 | 132.274851 | 6.1 | 5.214 | 7.7 | 3.2 | 2.00 | 6918 | 0.53 | 21888.26 |
| 004945764-03 | OBS | No | 48.635289 | 155.599738 | 281.8 | 2.446 | 9.5 | 8.7 | 2.00 | 6918 | 3.94 | 90.95 |
| 004945764-04 | OBS | No | 57.352186 | 131.708621 | 214.0 | 1.689 | 8.5 | 5.8 | 2.00 | 6918 | 5.08 | 73.00 |
| 004945764-05 | OBS | No | 33.460679 | 153.932686 | 174.8 | 3.722 | 8.8 | 8.7 | 2.00 | 6918 | 2.91 | 149.75 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004945764-01 | OBS | PC | 0.93 | 0 | 0 | 0 | 0 | NO_COMMENT |
| 004945764-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV—LPP_ALT |
| 004945764-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS |
| 004945764-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT |
| 004945764-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT |

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

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

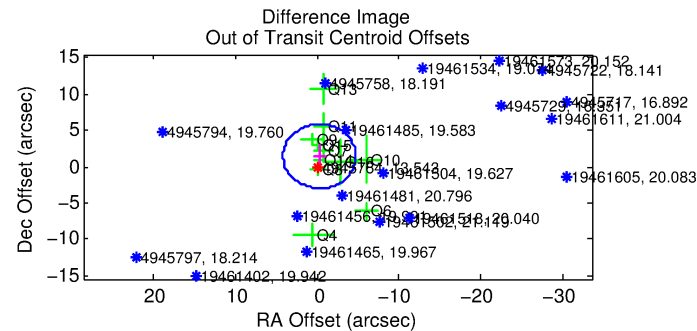
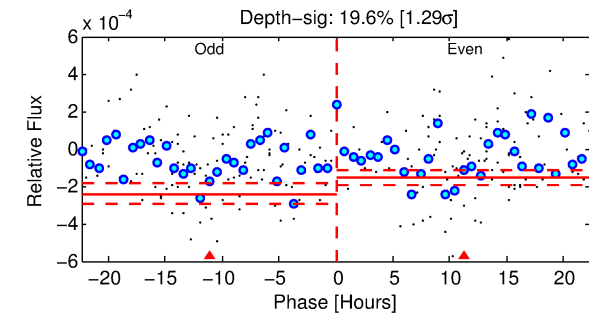
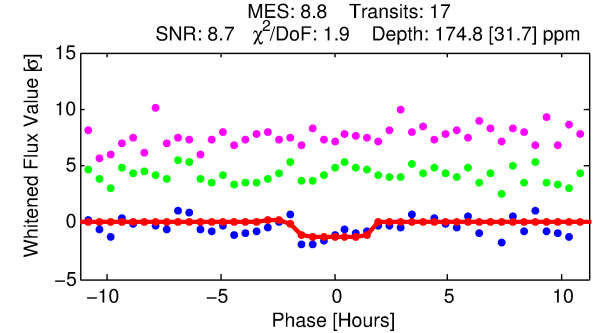
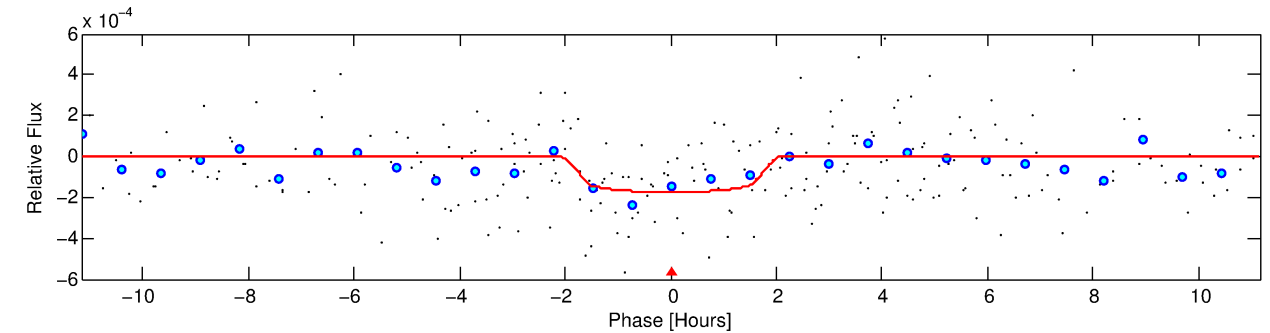
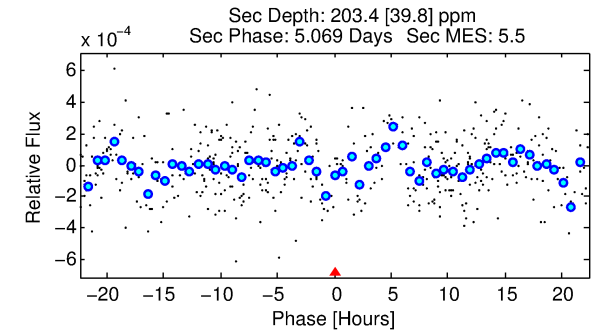
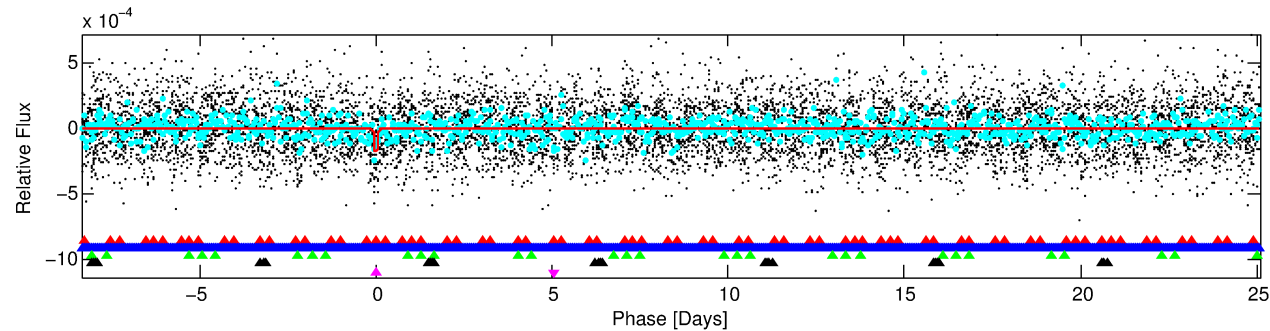
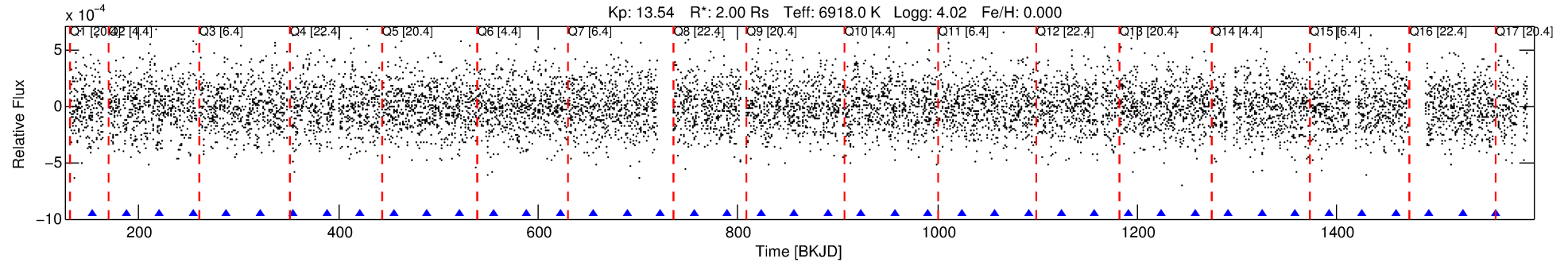
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004945764-05

No Significant Match Found

DV One-Page Summary

KIC: 4945764 Candidate: 5 of 5 Period: 33.461 d
KOI: K04377 Corr: No Ephemeris Match



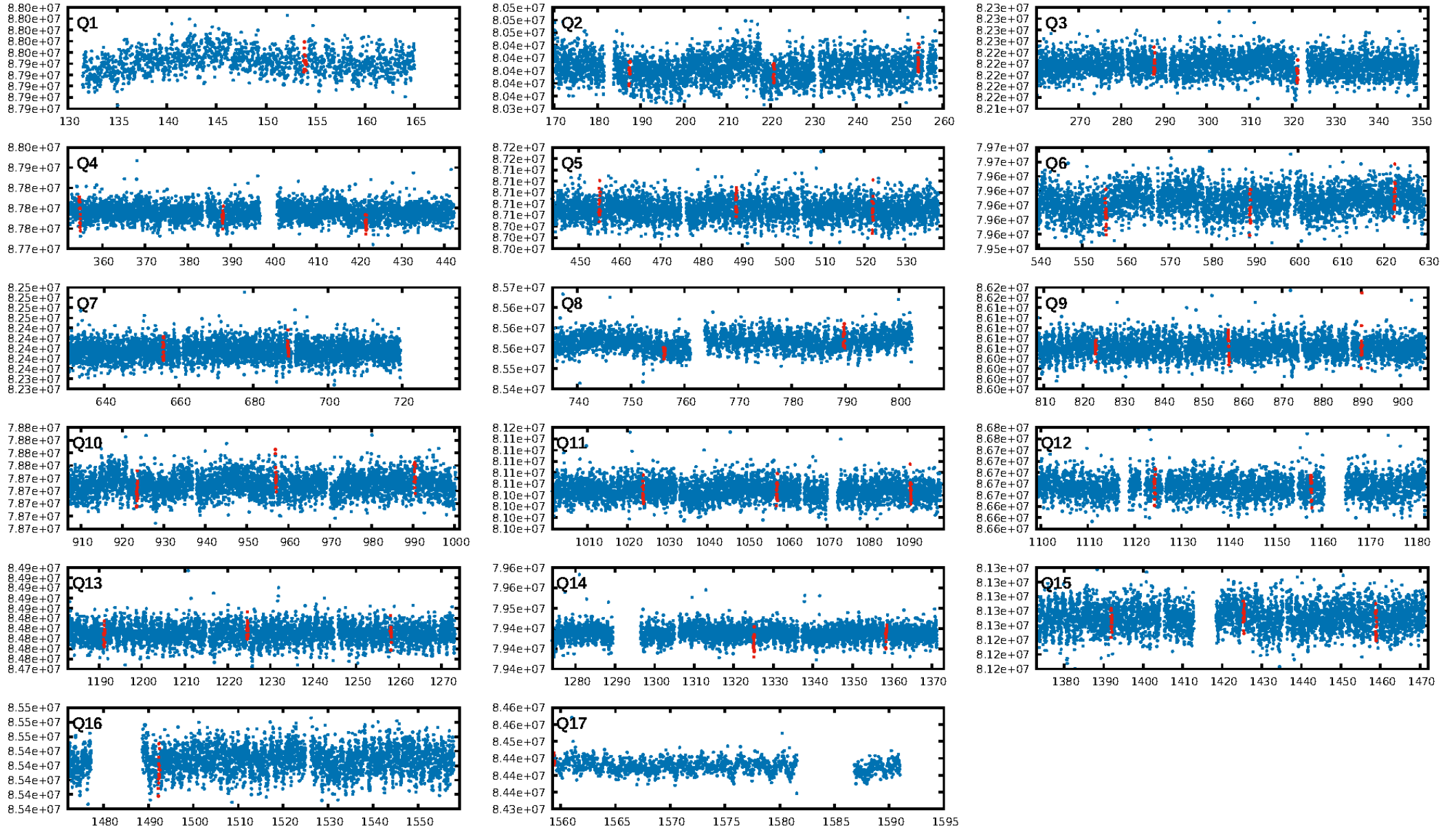
DV Fit Results:

Period = 33.46068 [0.00052] d
Epoch = 153.9327 [0.0125] BKJD
Rp/R* = 0.0133 [0.0114]
a/R* = 44.07 [217.56]
b = 0.78 [2.45]
Seff = 149.75 [40.40]
Teff = 892 [60] K
Rp = 2.91 [2.57] Re
a = 0.2346 [0.0418] AU
Ag = 728.46 [1273.21] [0.57 σ]
Teffp = 7165 [3096] K [2.03 σ]

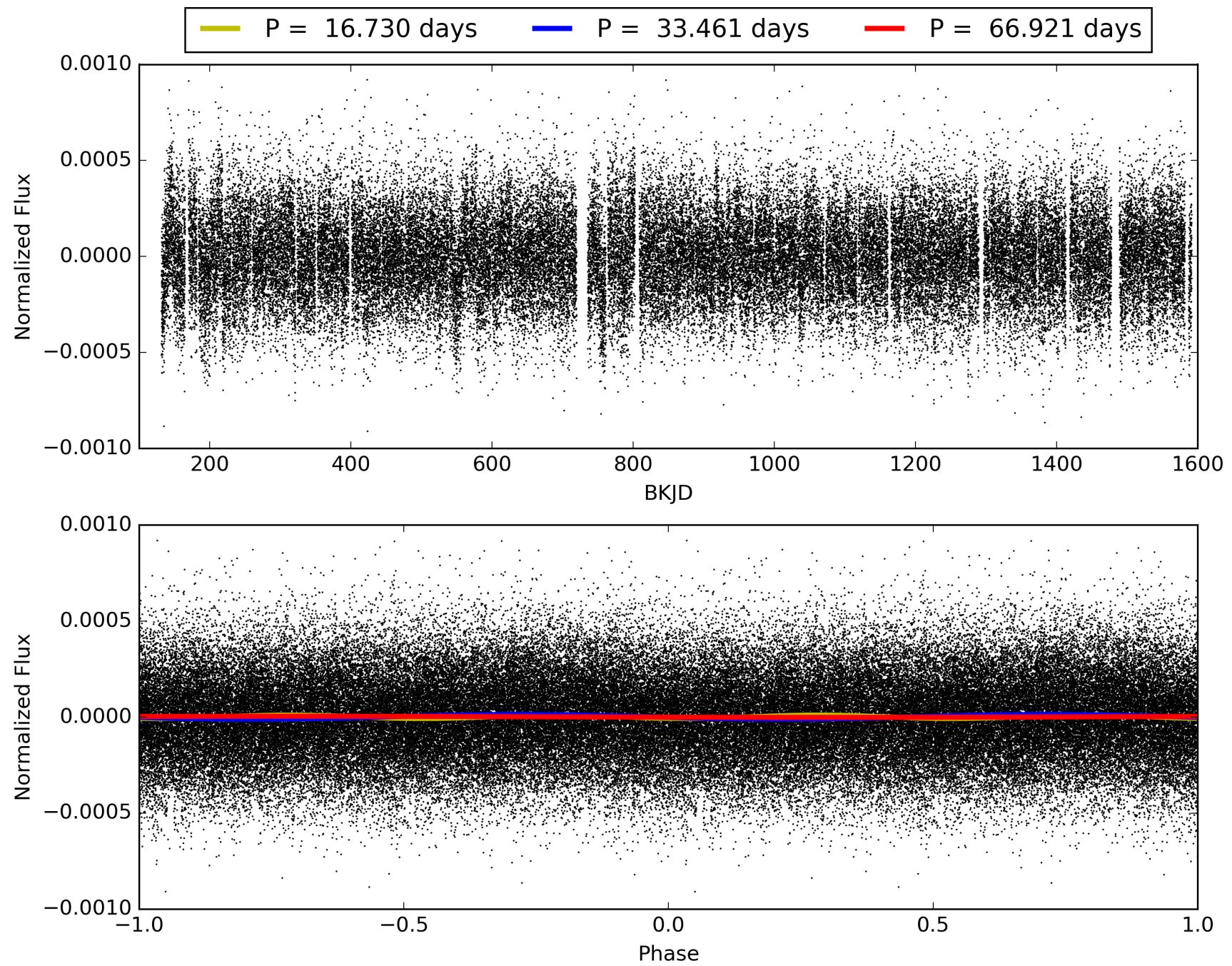
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [37.35 σ]
LongPeriod-sig: 100.0% [81.78 σ]
ModelChiSquare2-sig: 5.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.94e-08
RollingBand-fgt: 1.00 [17/17]
GhostDiagnostic-chr: -1.922
Centroid-sig: 16.2%
Centroid-so: 1.136 arcsec [1.20 σ]
OotOffset-rm: 1.469 arcsec [0.99 σ]
KicOffset-rm: 1.369 arcsec [0.99 σ]
OotOffset-st: 3/3/3/2 [11]
KicOffset-st: 3/3/3/2 [11]
DiffImageQuality-fgm: 0.18 [2/11]
DiffImageOverlap-fno: 0.00 [0/16]

TCE 004945764-05, PDC Light Curves

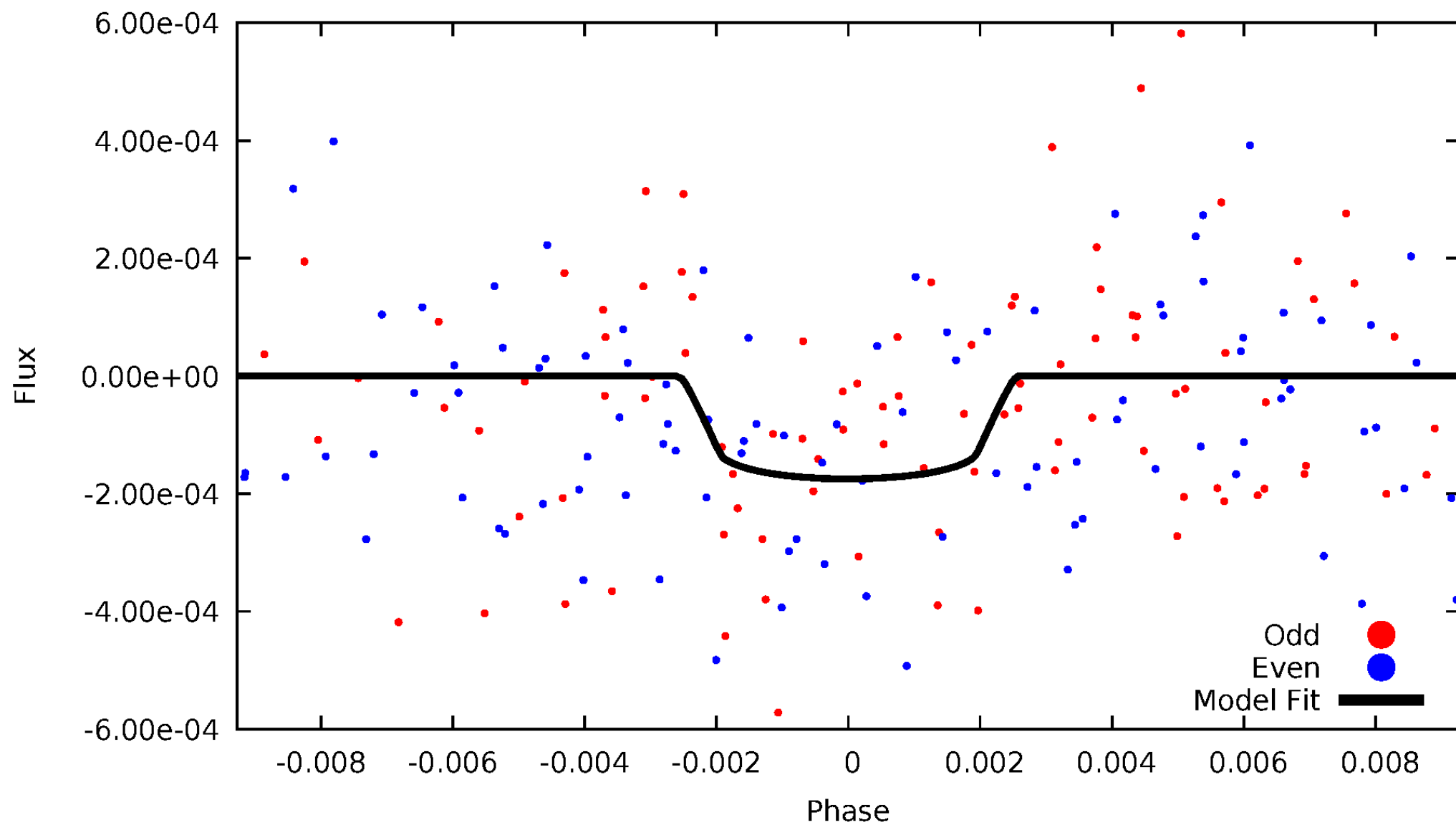


TCE 004945764-05



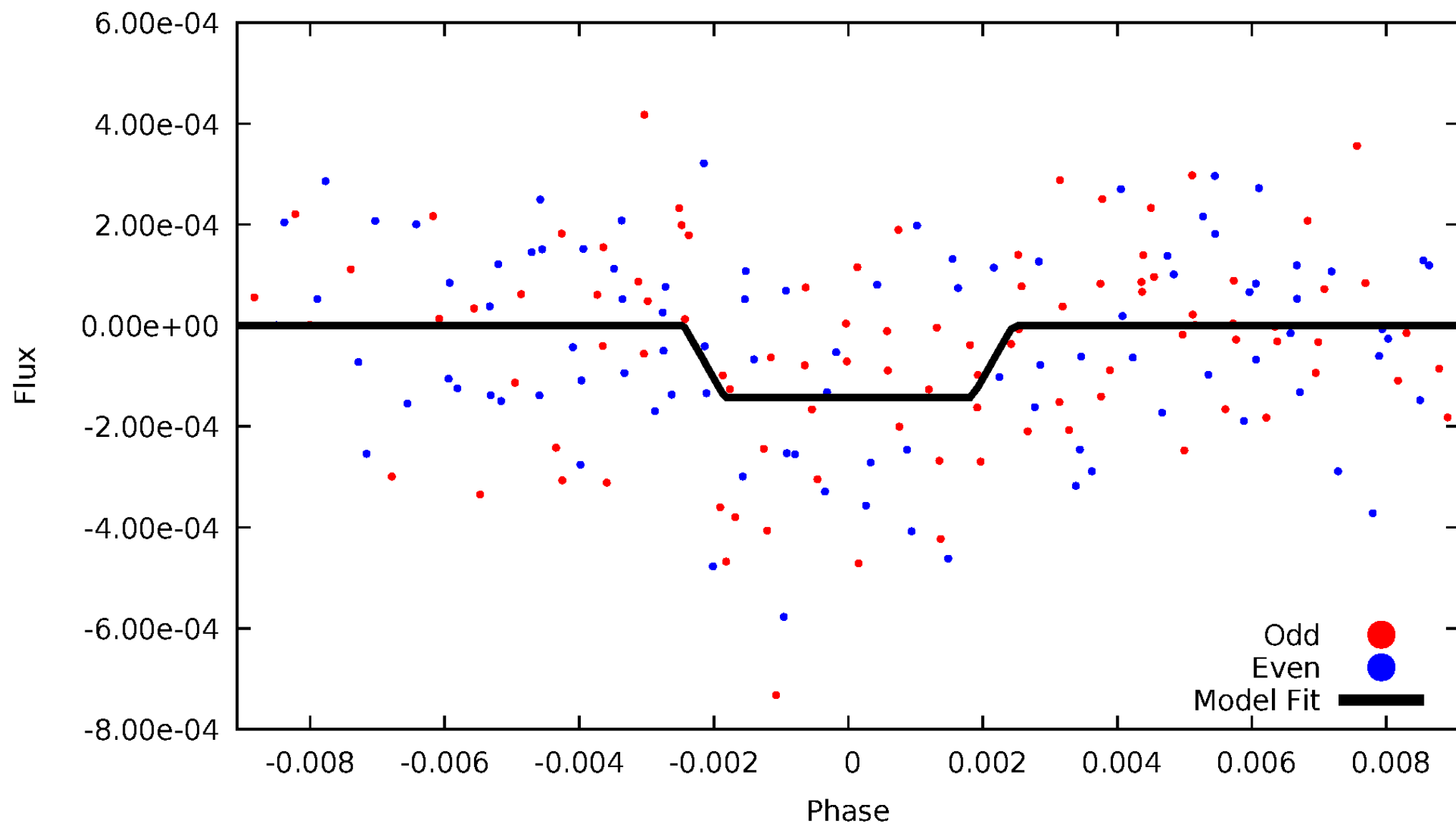
DV Odd/Even

TCE 004945764-05



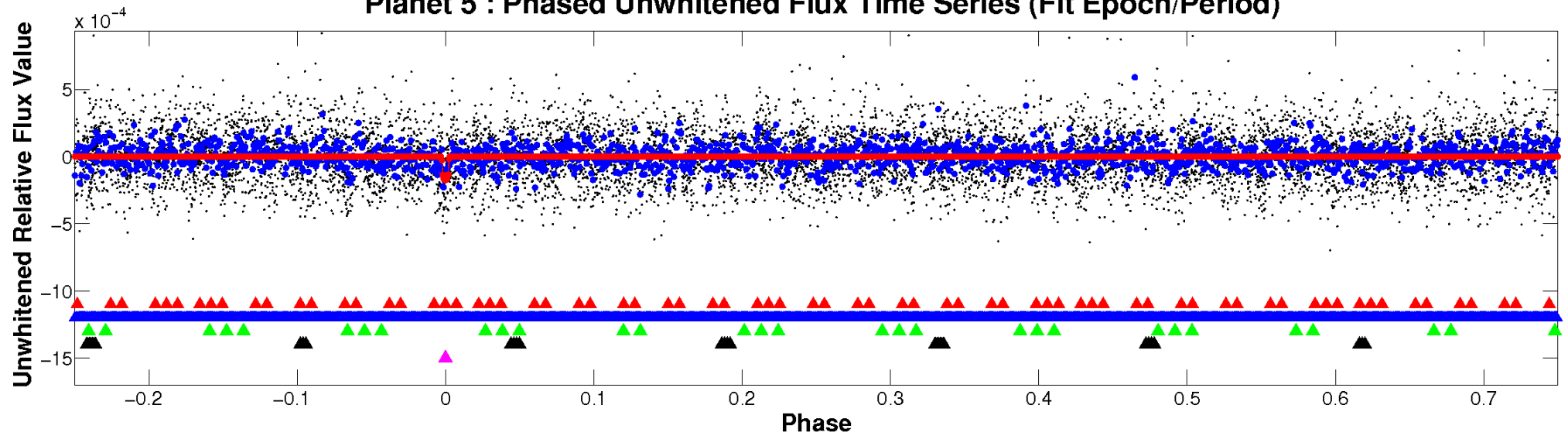
ALT Odd/Even

TCE 004945764-05

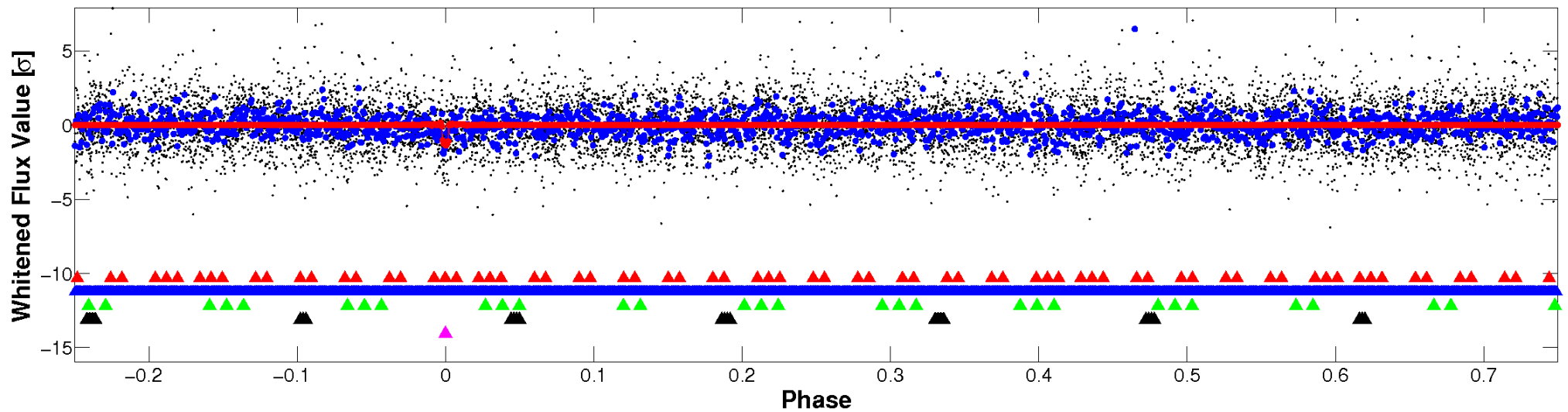


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

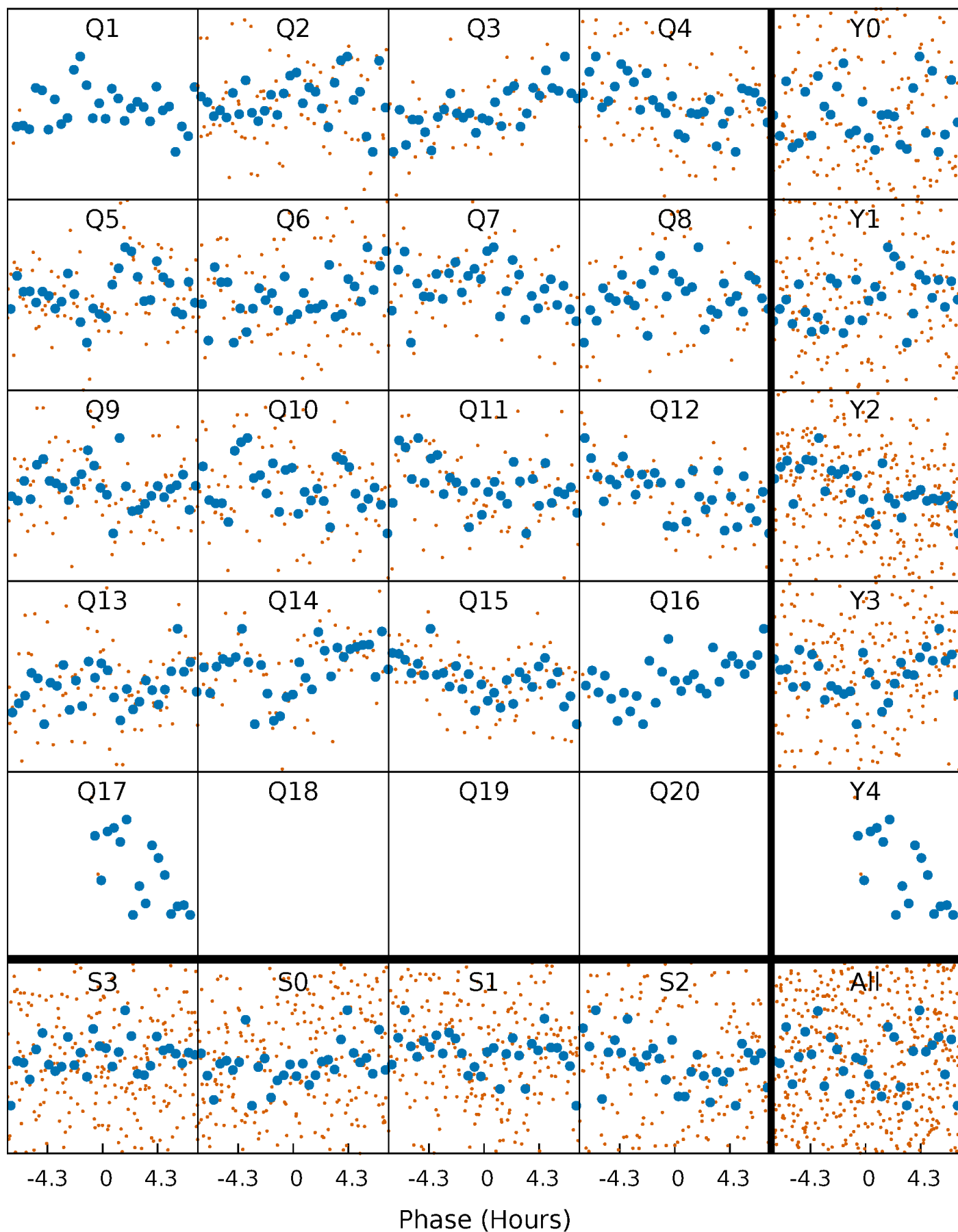


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



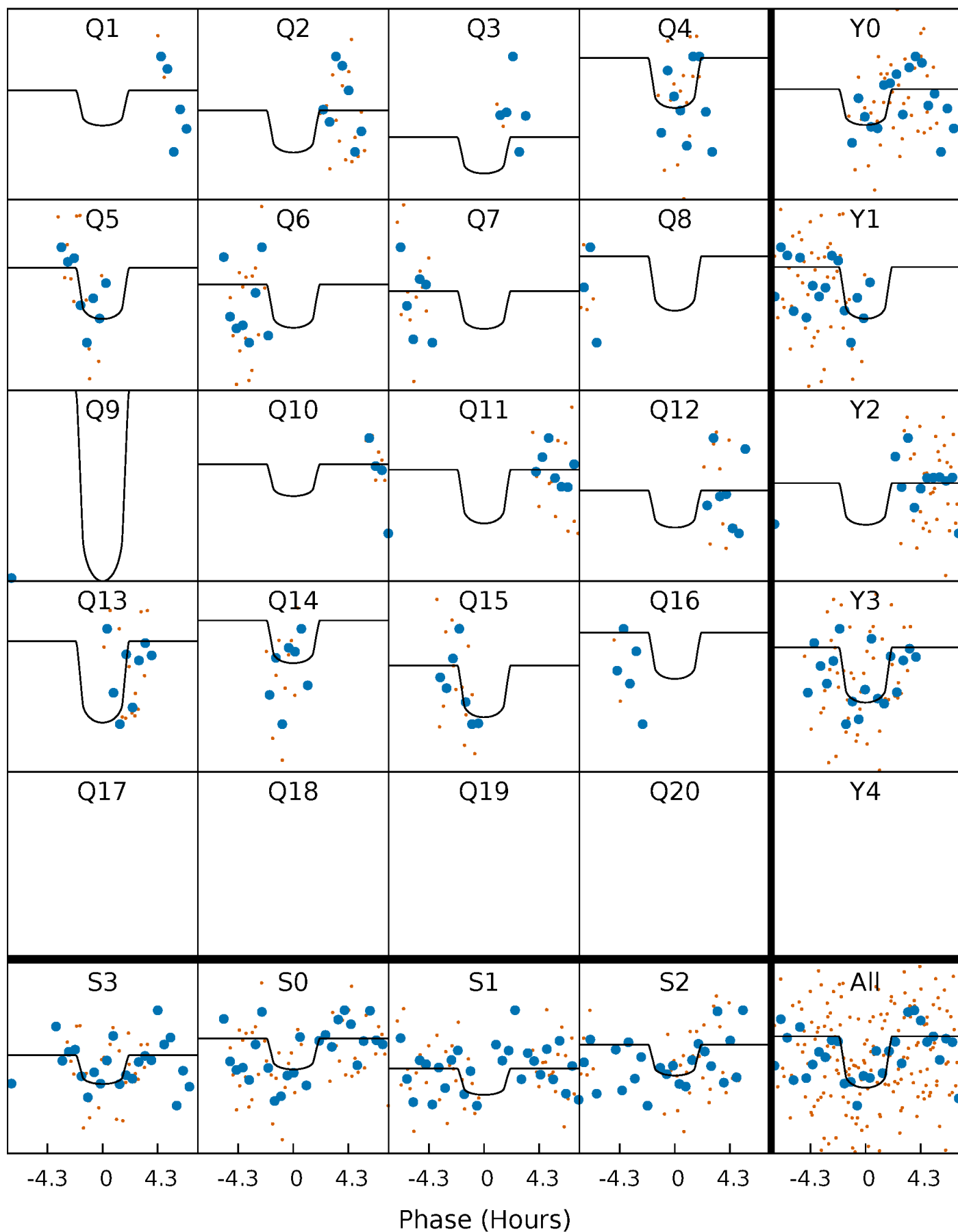
PDC Quarter-Phased Transit Curves

TCE 004945764-05 $P = 33.460679$ Days $T_0 = 153.932686$ (BKJD)



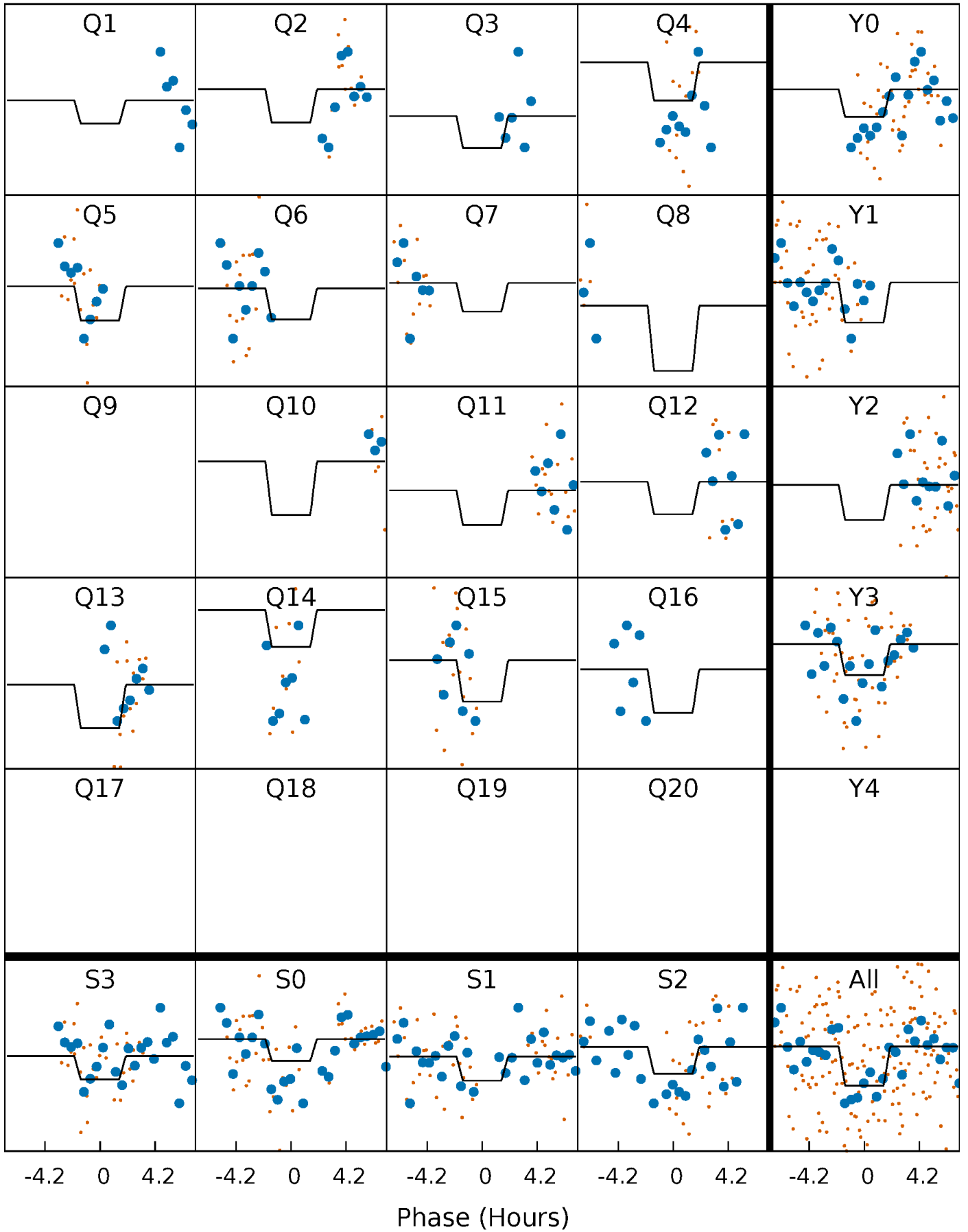
DV Quarter-Phased Transit Curves

TCE 004945764-05 P= 33.460679 Days $T_0=153.932686$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

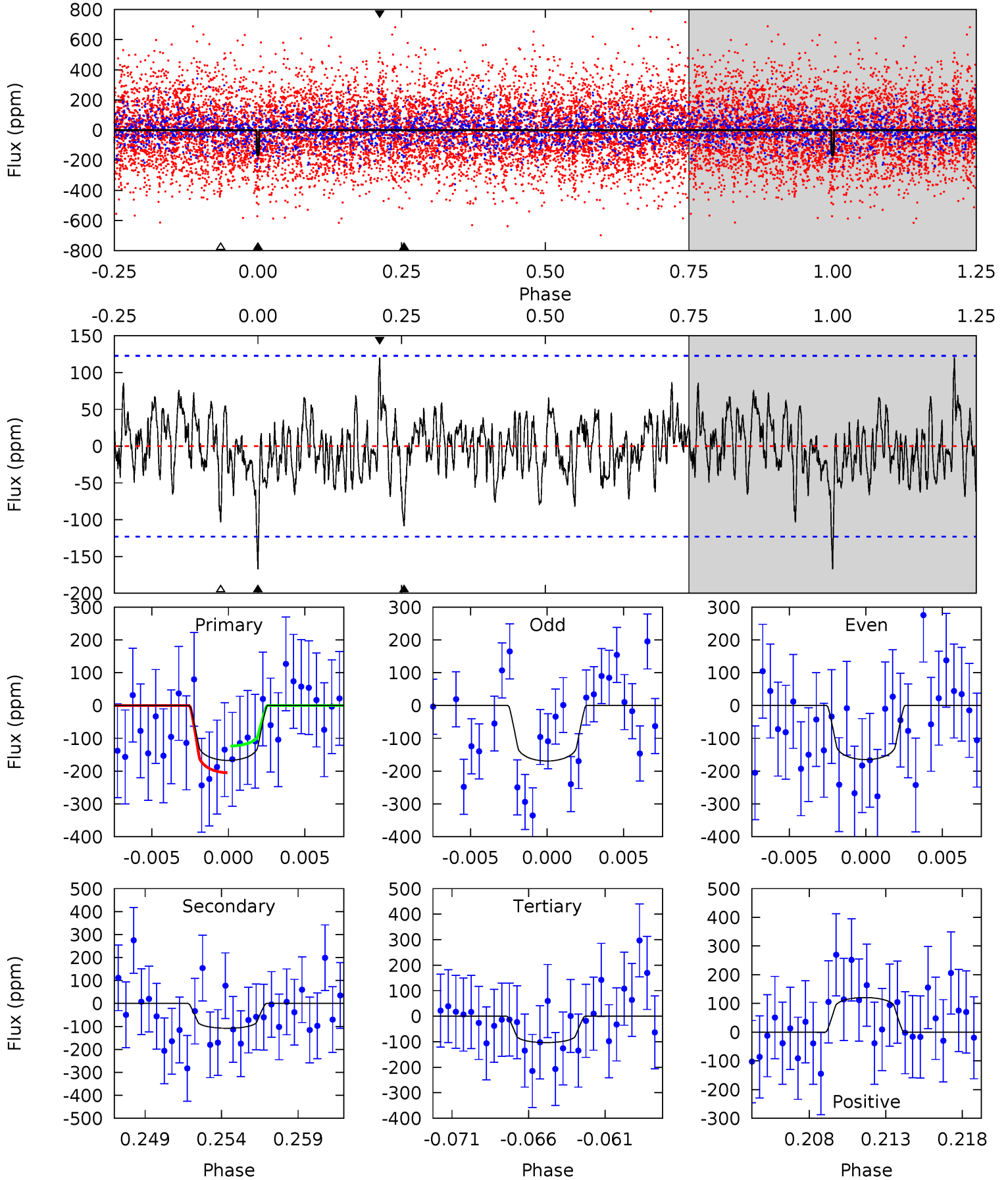
TCE 004945764-05 $P = 33.460750$ Days $T_0 = 153.930415$ (BKJD)



DV Model-Shift Uniqueness Test

004945764-05, P = 33.460679 Days, E = 120.472007 Days

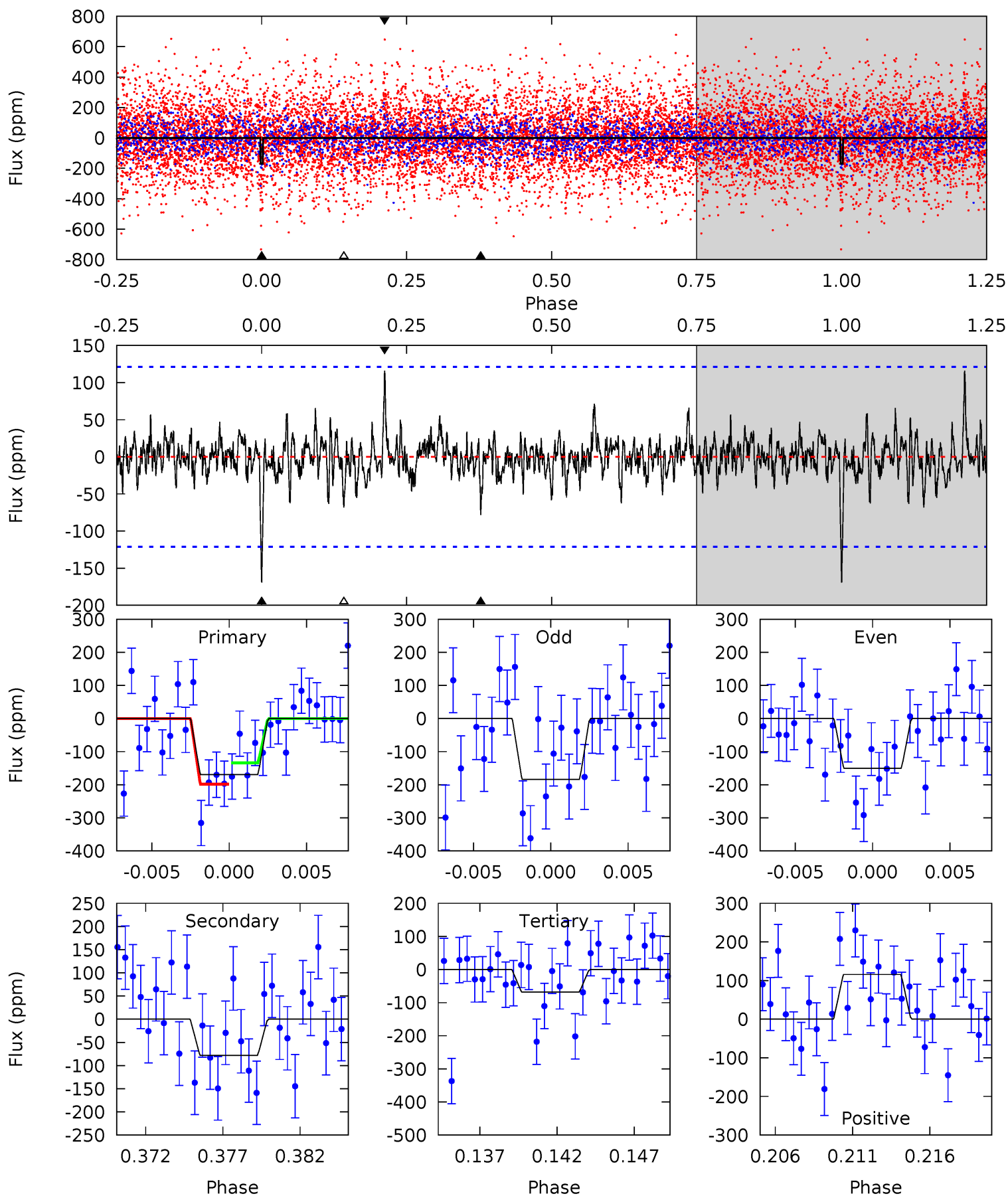
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.02 | 4.53 | 4.34 | 5.06 | 5.15 | 2.80 | 1.34 | 2.68 | 1.96 | 0.19 | -0.53 | 0.09 | 1.00 | 0.42 | 1.71 |



Alt Model-Shift Uniqueness Test

004945764-05, P = 33.460750 Days, E = 120.469665 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.21 | 3.33 | 2.90 | 4.93 | 5.16 | 2.81 | 0.93 | 4.31 | 2.28 | 0.43 | -1.60 | 0.72 | 1.59 | 0.41 | 1.38 |



Stellar Parameters For KIC 004945764

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 6918^{+72}_{-83} | $4.021^{+0.148}_{-0.121}$ | $0.000^{+0.150}_{-0.150}$ | $2.004^{+0.413}_{-0.338}$ | $1.536^{+0.149}_{-0.108}$ | $0.269^{+0.195}_{-0.105}$ |
| | +1%/-1% | +4%/-3% | +inf%/-inf% | +21%/-17% | +10%/-7% | +72%/-39% |
| Source | SPE68 | SPE68 | SPE68 | DSEP | | |

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

Secondary Eclipse Parameters for KIC 004945764-05 / KOI

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|---------------|------------------------|--------------------|------------------------|----------------------|
| DV | -108 ± 24 | $3.21^{+2.48}_{-1.87}$ | 1239^{+70}_{-61} | 5776^{+4153}_{-1272} | 318^{+1616}_{-220} |
| Alt. | -78 ± 23 | $3.02^{+2.51}_{-1.81}$ | 1241^{+62}_{-59} | 5451^{+3784}_{-1162} | 254^{+1350}_{-178} |

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

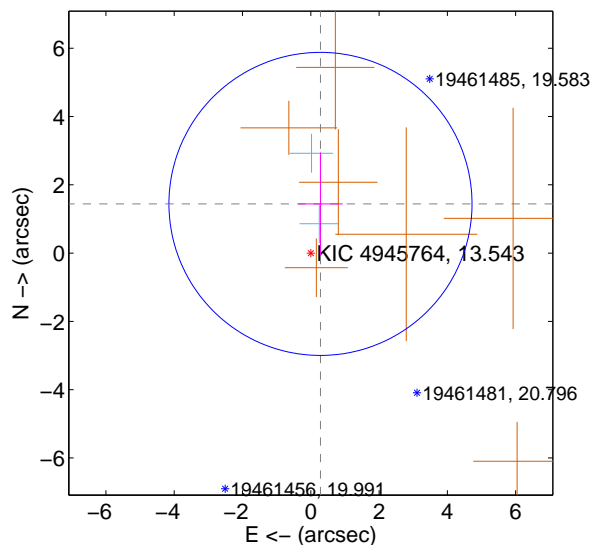
Supplemental centroid analysis for 004945764-05. Kepler magnitude: 13.54. Transit SNR 8.68

There are 2 quarters with good PRF difference image offsets

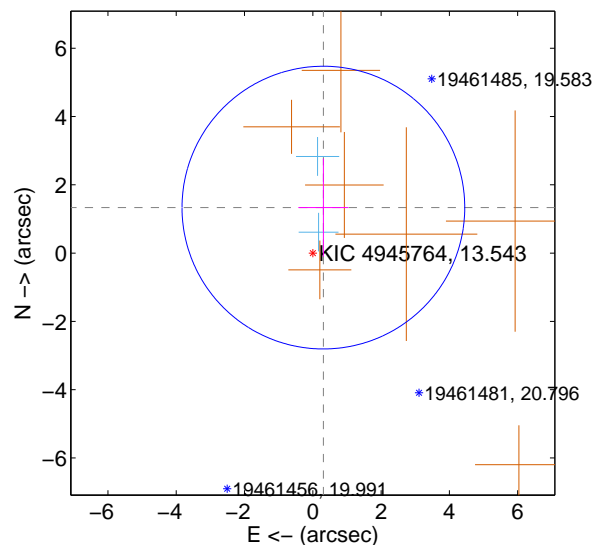
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 1.469 ± 1.480 | 0.99 | -0.284 ± 0.652 | 1.441 ± 1.510 |
| PRF-fit source offset from KIC position | 1.369 ± 1.380 | 0.99 | -0.310 ± 0.736 | 1.333 ± 1.435 |
| photometric centroid source offset | 1.14 ± 0.95 | 1.20 | -0.84 ± 0.95 | -0.76 ± 0.94 |

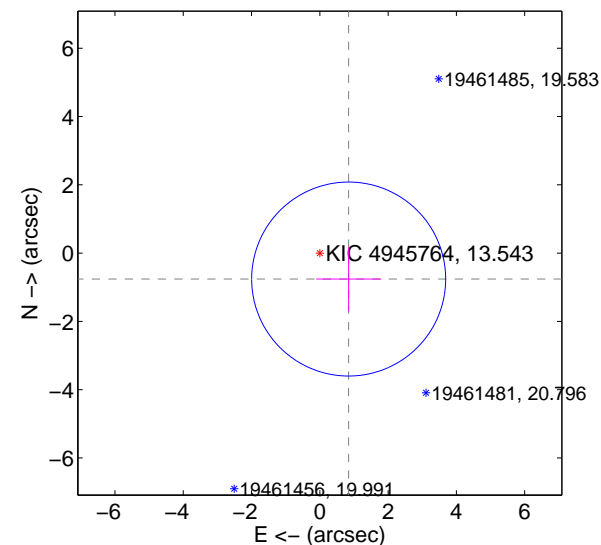
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

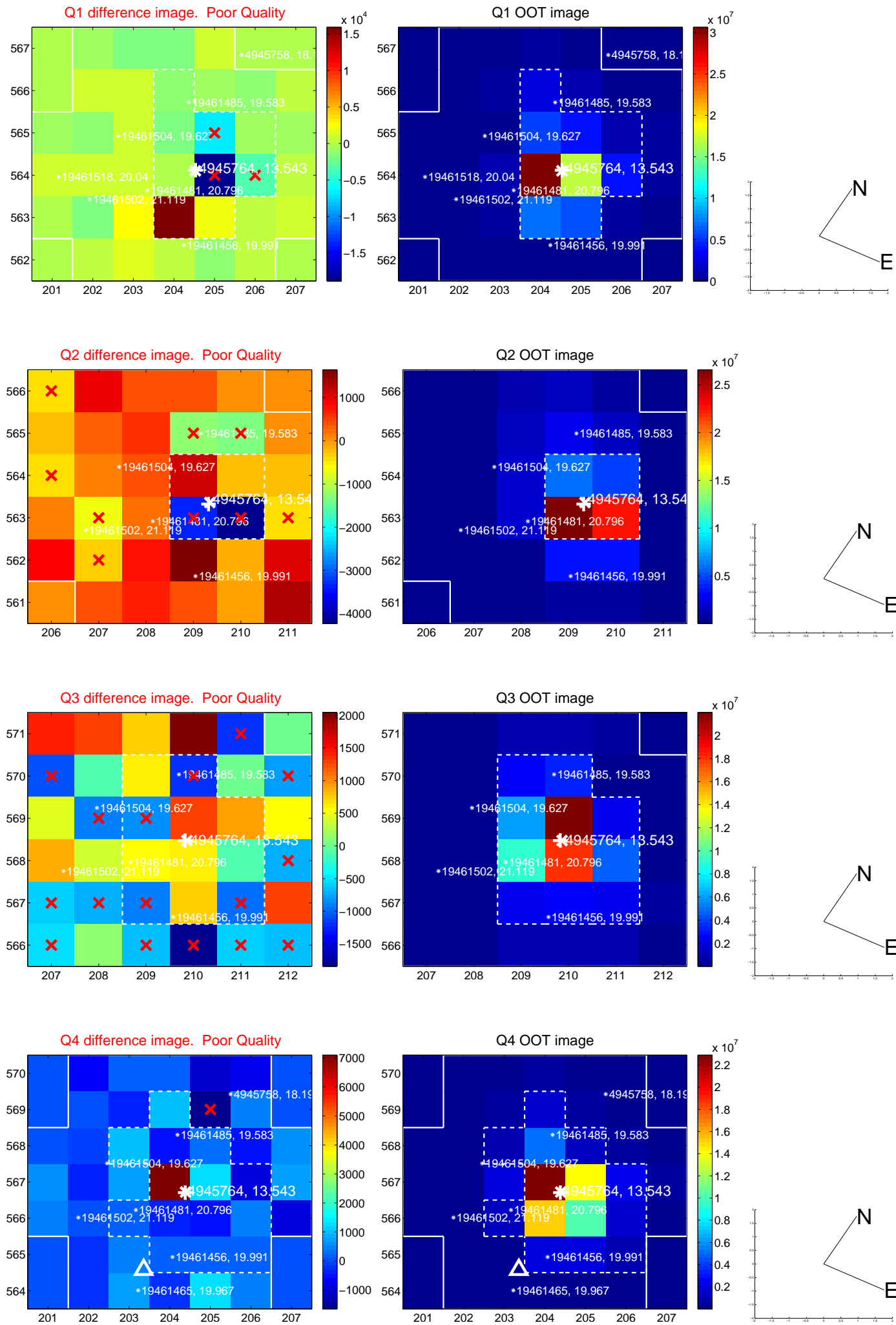


offset from photometric centroids

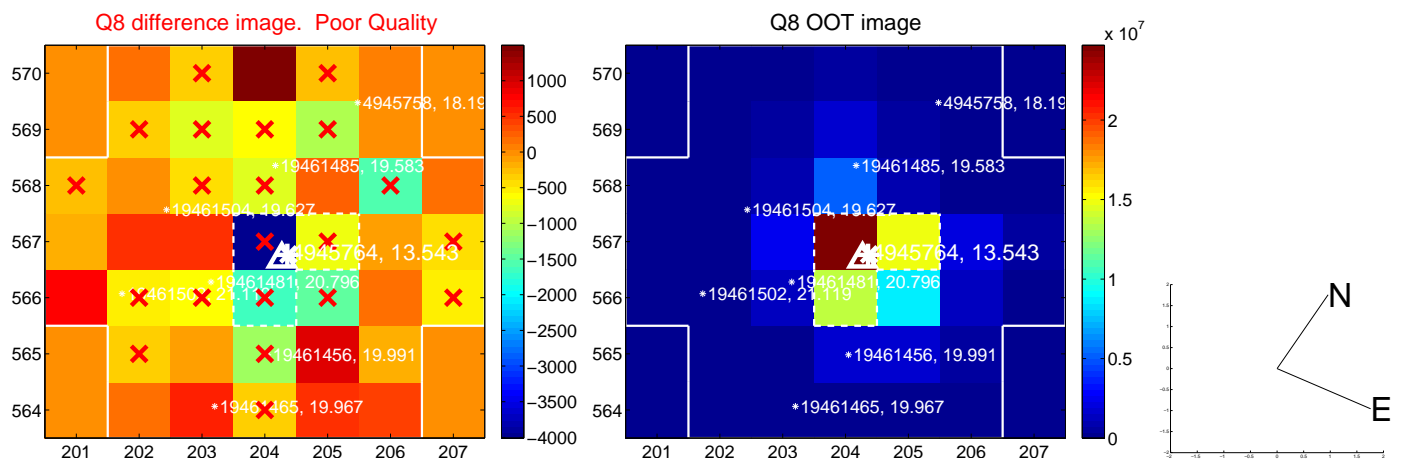
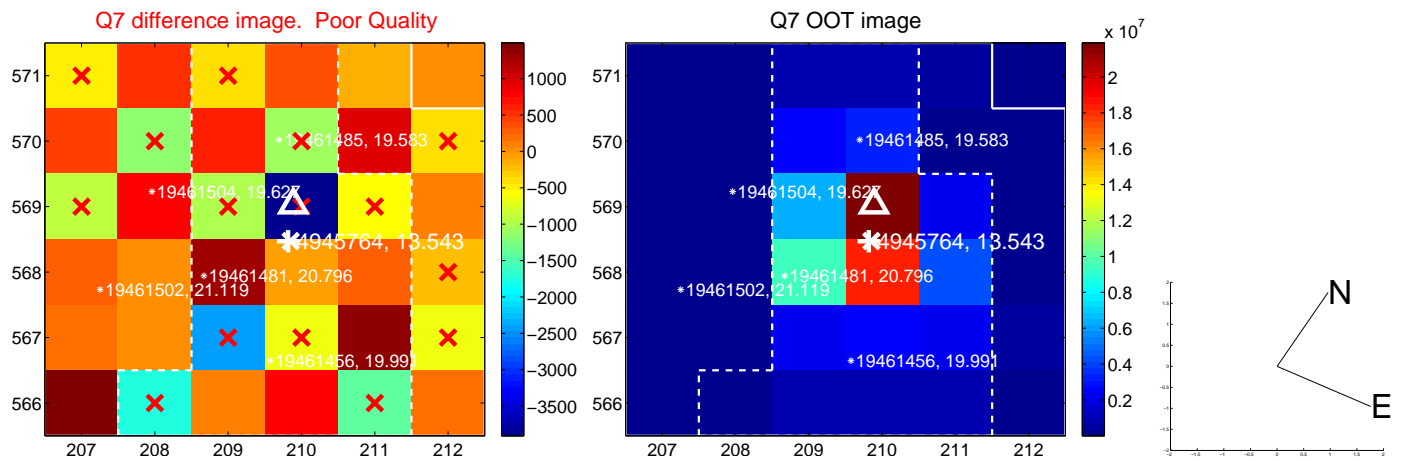
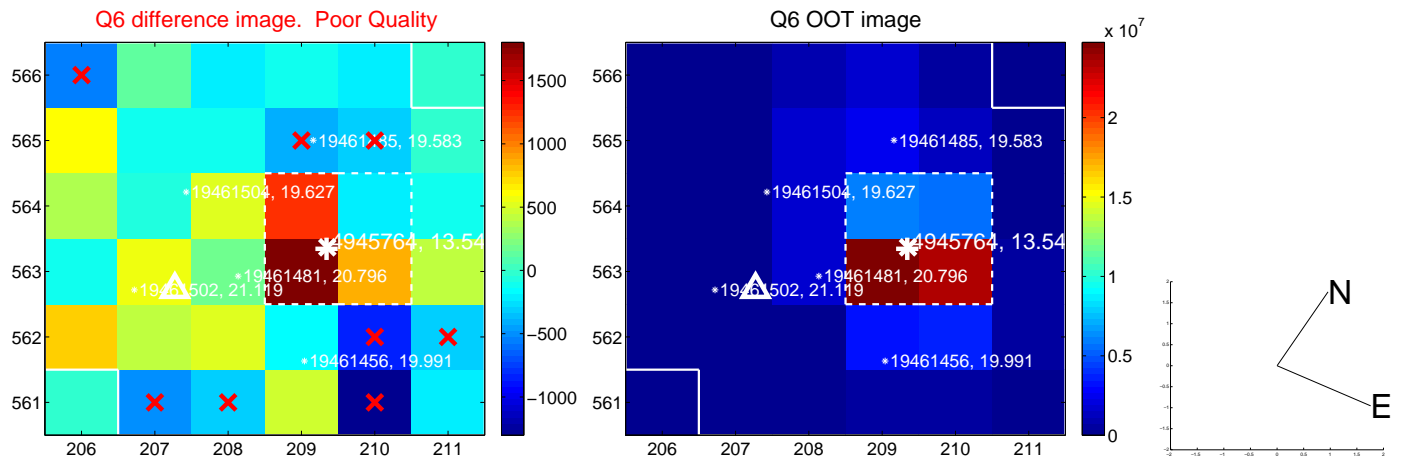
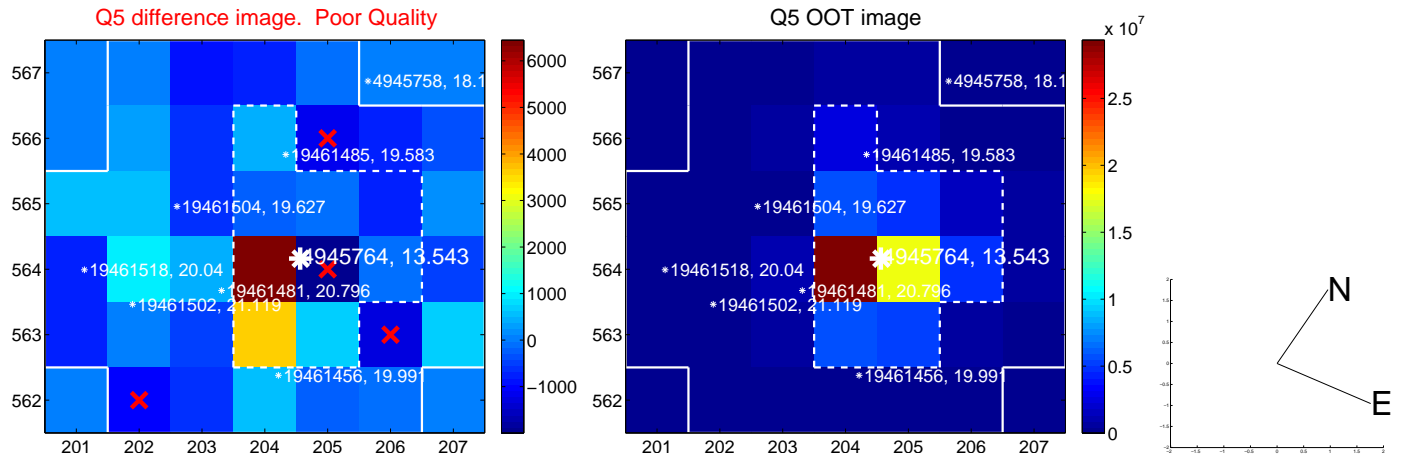


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

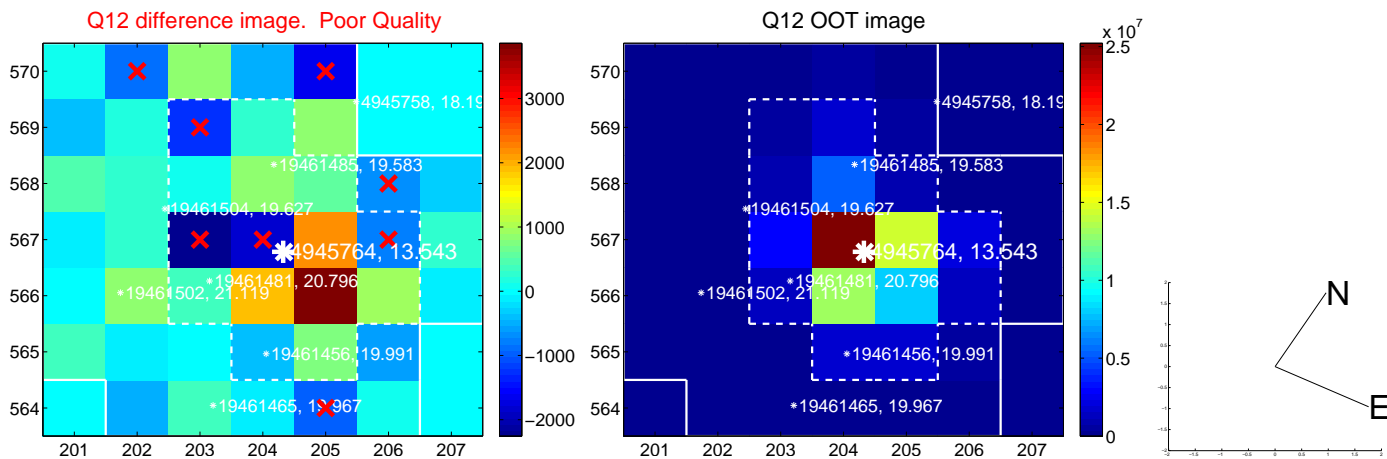
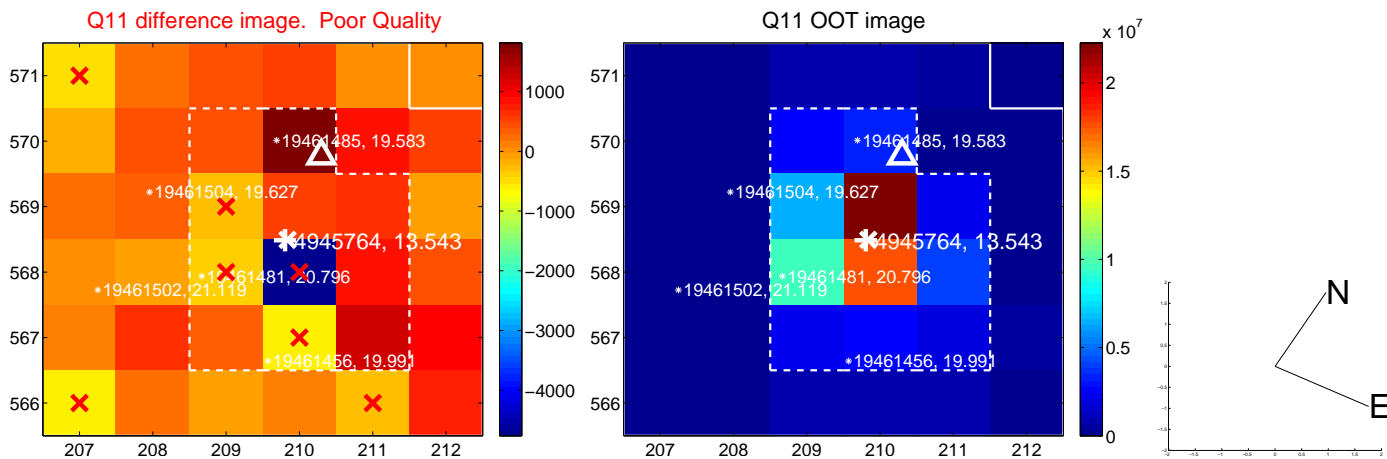
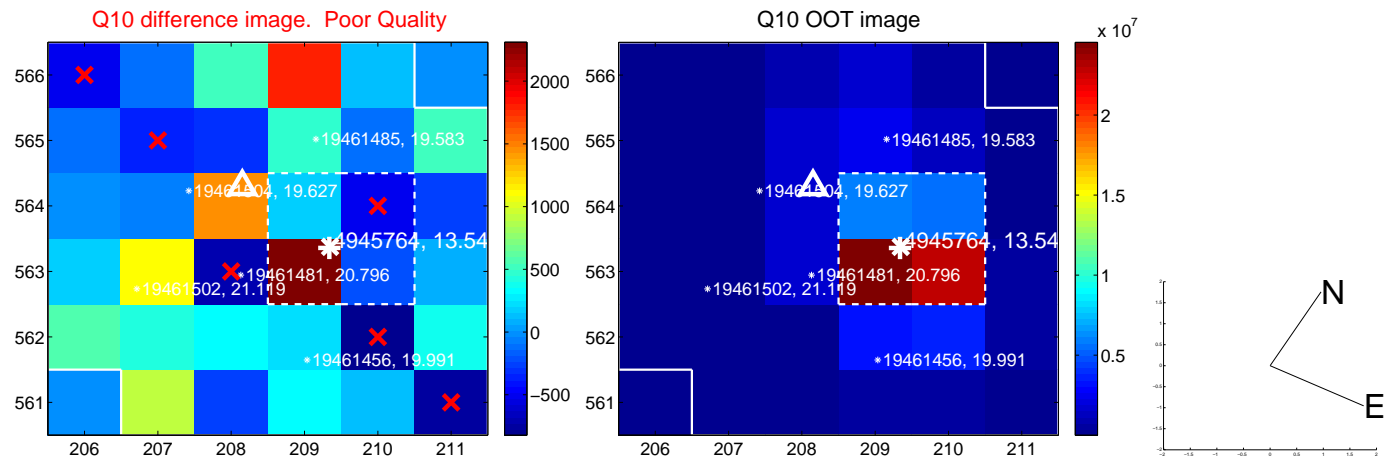
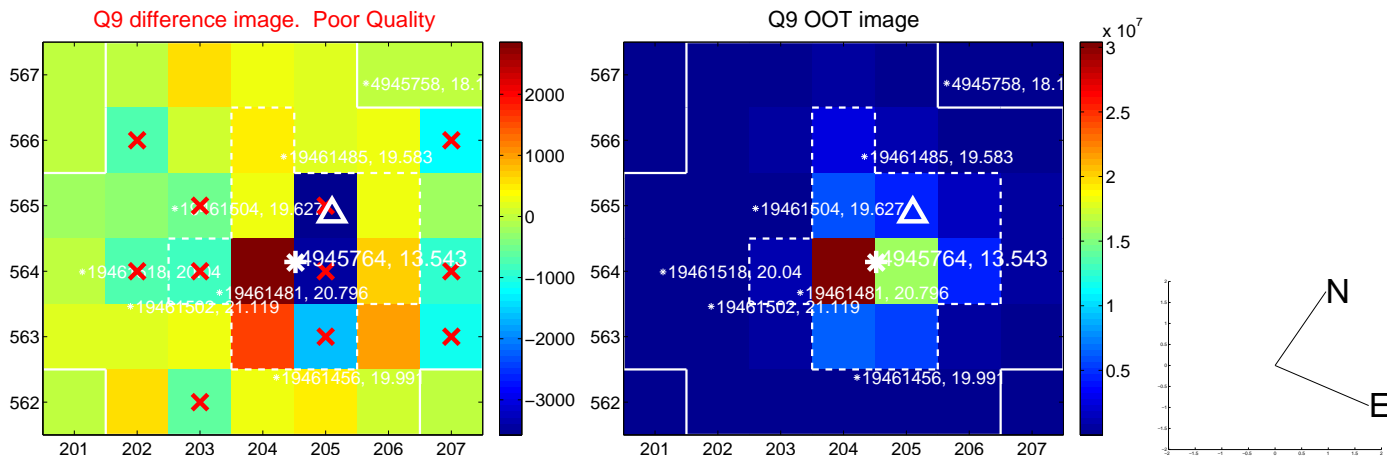
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



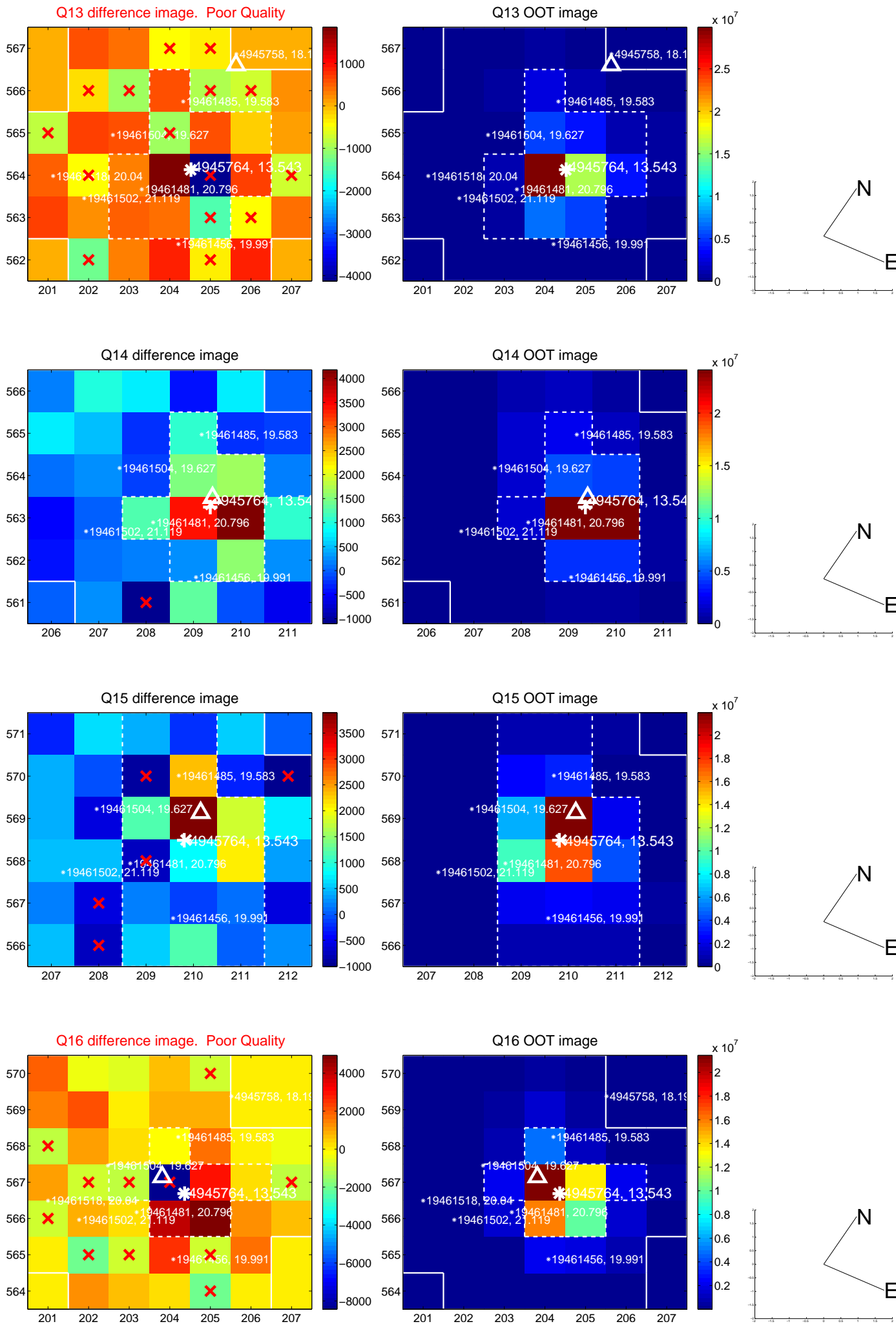
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



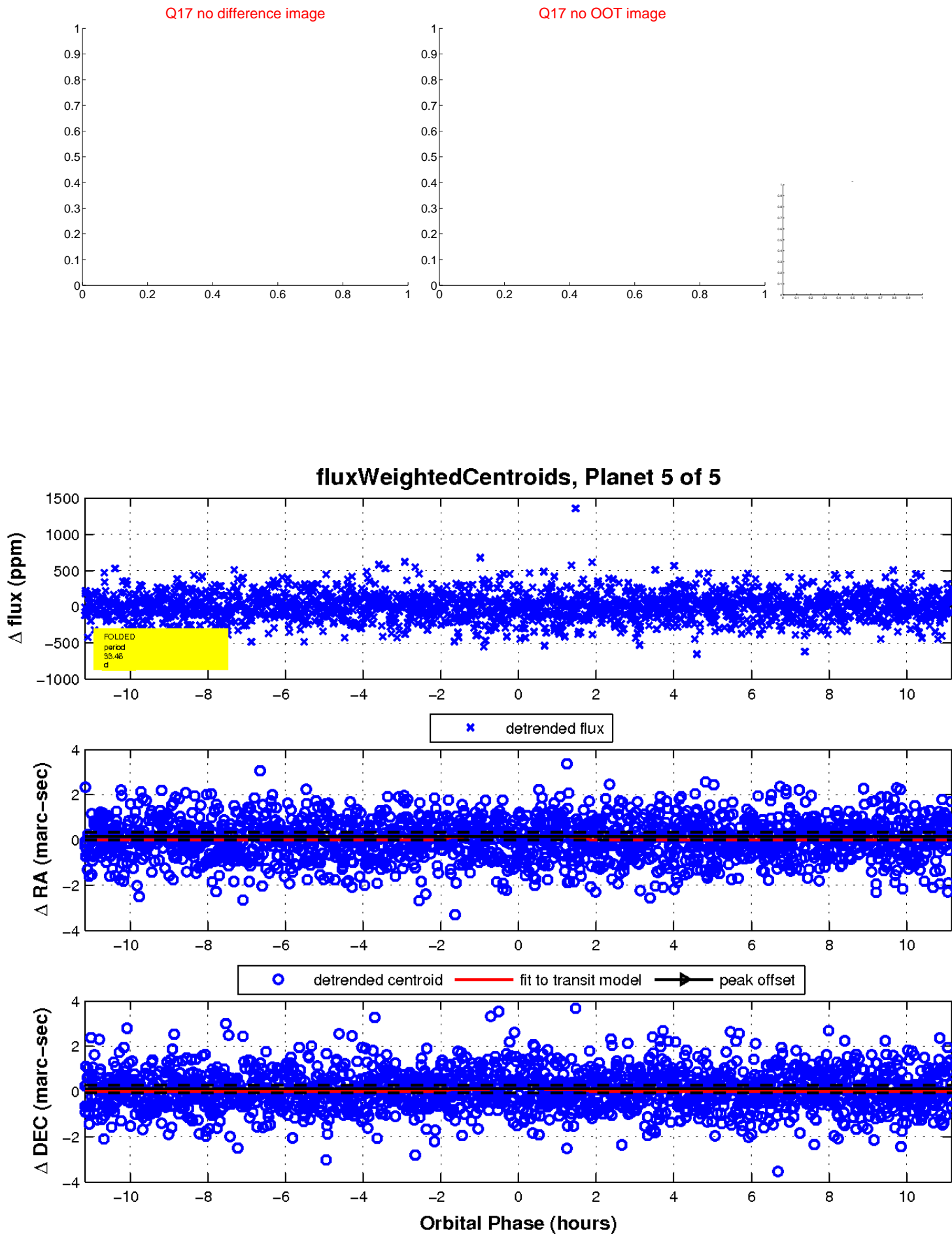
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

