

KIC 005214951

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005214951-01 | OBS | No | 5.142756 | 136.273793 | 98.9 | 18.388 | 7.9 | 7.2 | 0.84 | 5325 | 0.93 | 174.49 |
| 005214951-02 | OBS | No | 385.880969 | 273.408446 | 2839.9 | 15.000 | 33.4 | -1.0 | 0.84 | 5325 | 4.39 | 0.55 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 005214951-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV |
| 005214951-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_NOFITS |

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

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

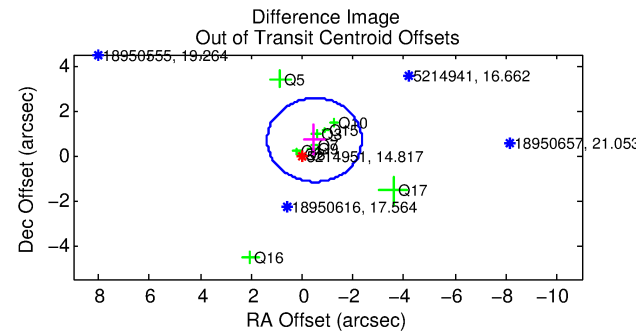
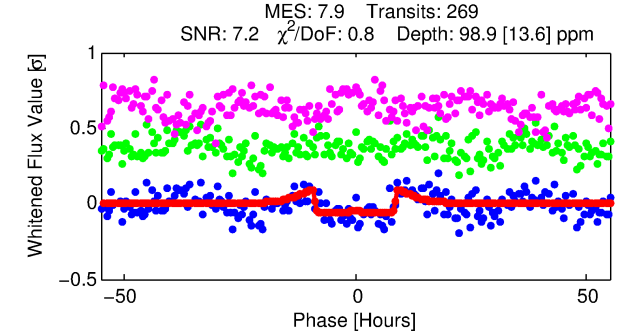
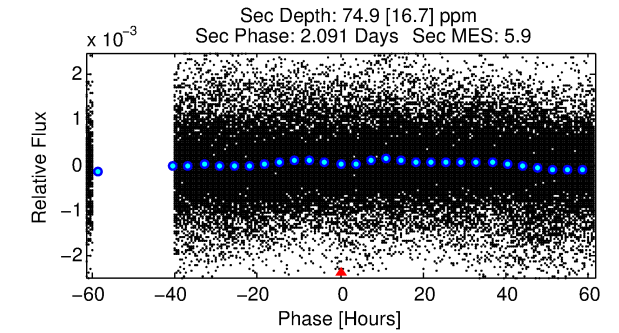
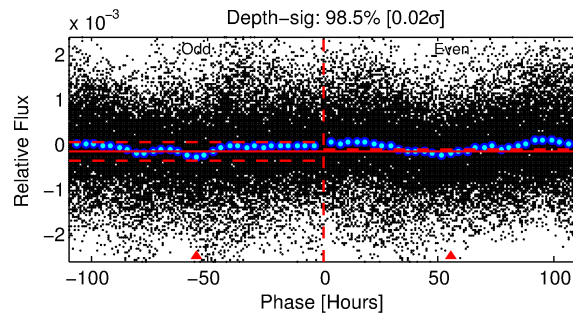
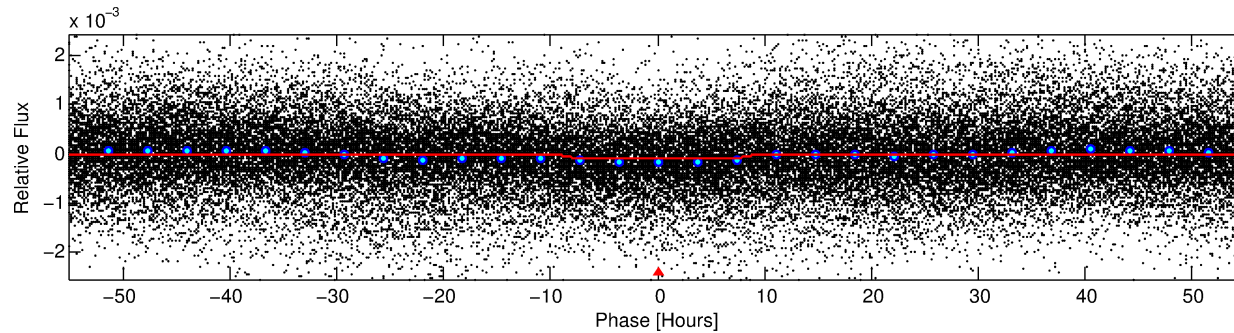
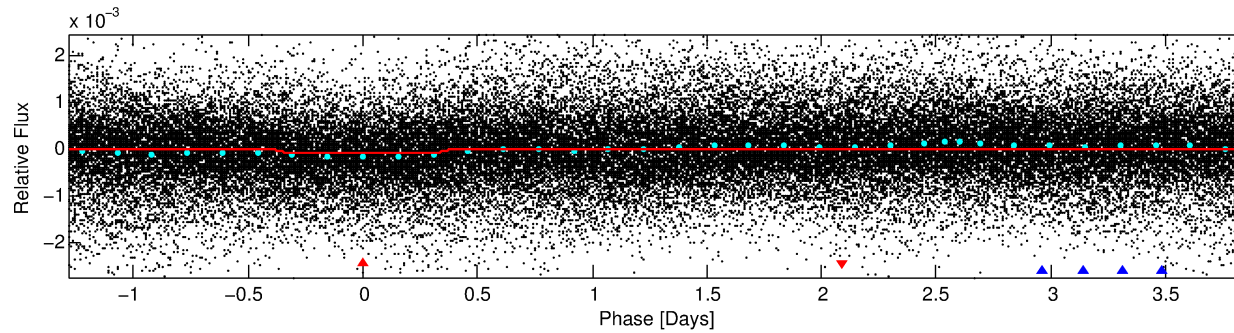
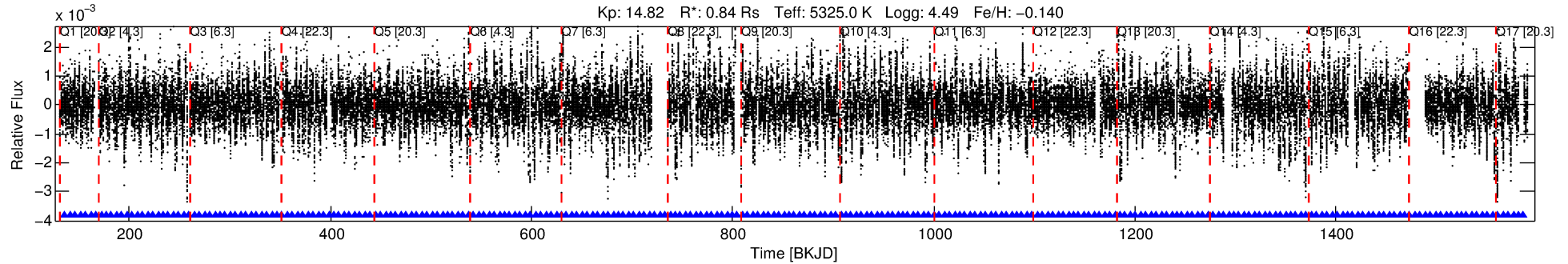
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005214951-01

No Significant Match Found

DV One-Page Summary

KIC: 5214951 Candidate: 1 of 2 Period: 5.143 d



DV Fit Results:

Period = 5.14276 [0.00008] d
Epoch = 136.2738 [0.0121] BKJD
Rp/R* = 0.0102 [0.0021]
a/R* = 1.58 [0.77]
b = 0.80 [0.37]
Seff = 174.49 [39.48]
Teq = 927 [52] K
Rp = 0.93 [0.24] Re
a = 0.0540 [0.0071] AU
Ag = 138.57 [70.37] [1.95σ]
Teffp = 4916 [596] K [6.67σ]

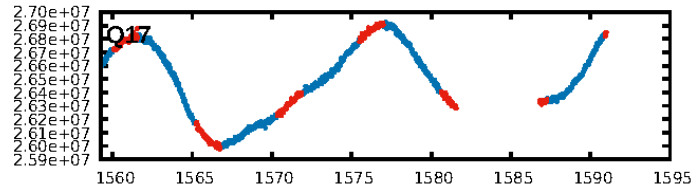
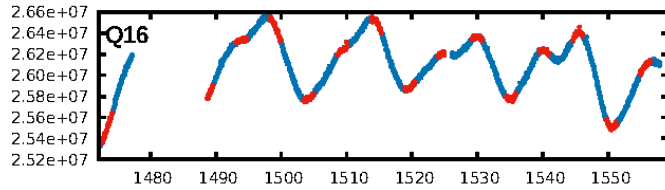
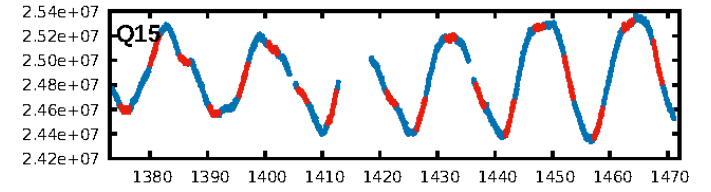
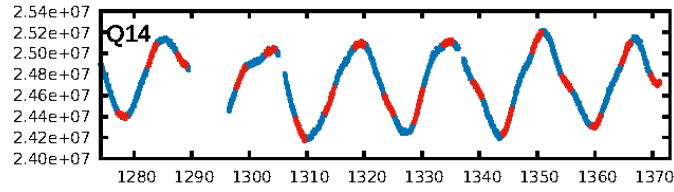
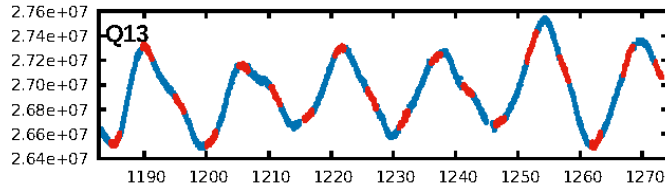
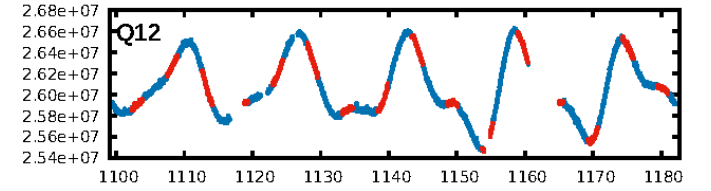
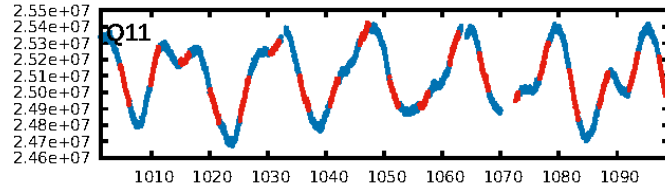
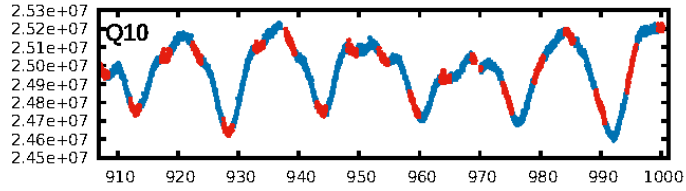
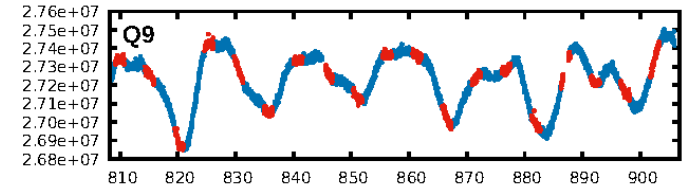
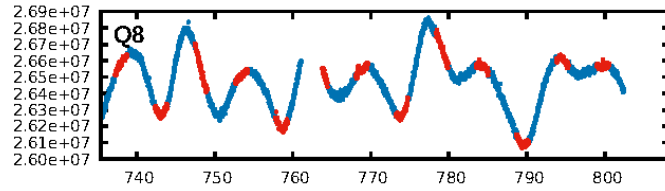
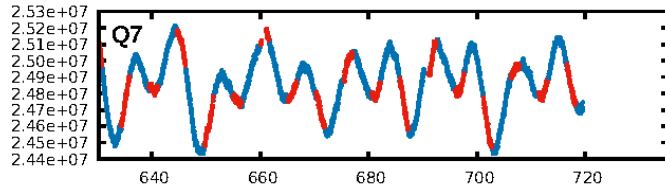
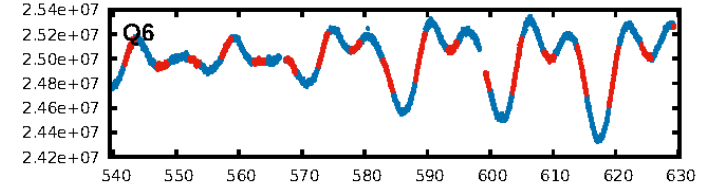
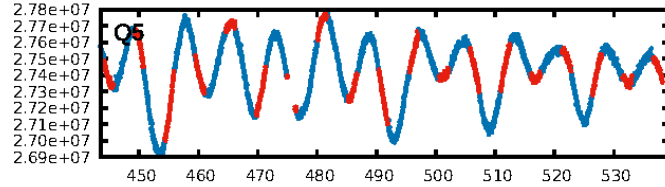
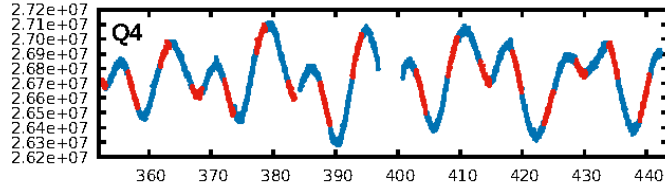
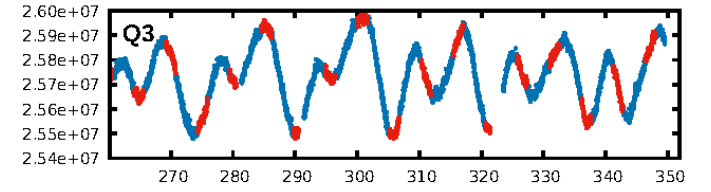
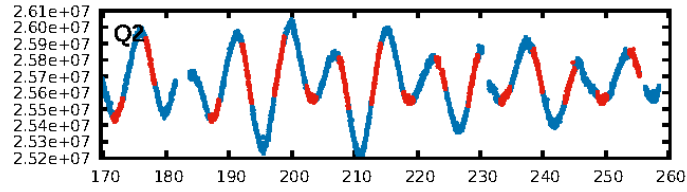
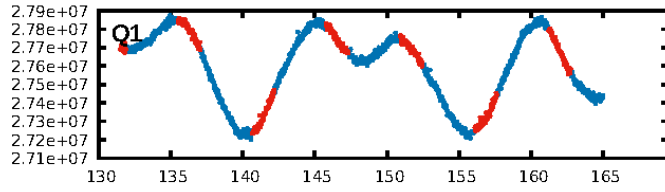
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [385.07σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.31e-12
RollingBand-fgt: 1.00 [256/256]
GhostDiagnostic-chr: -1.08
Centroid-sig: 0.1%
Centroid-so: 2.481 arcsec [1.36σ]
OotOffset-rm: 0.836 arcsec [1.35σ]
KicOffset-rm: 0.716 arcsec [1.14σ]
OotOffset-st: 1/3/3/3 [10]
KicOffset-st: 1/3/3/3 [10]
DiffImageQuality-fgm: 0.60 [6/10]
DiffImageOverlap-fno: 1.00 [17/17]

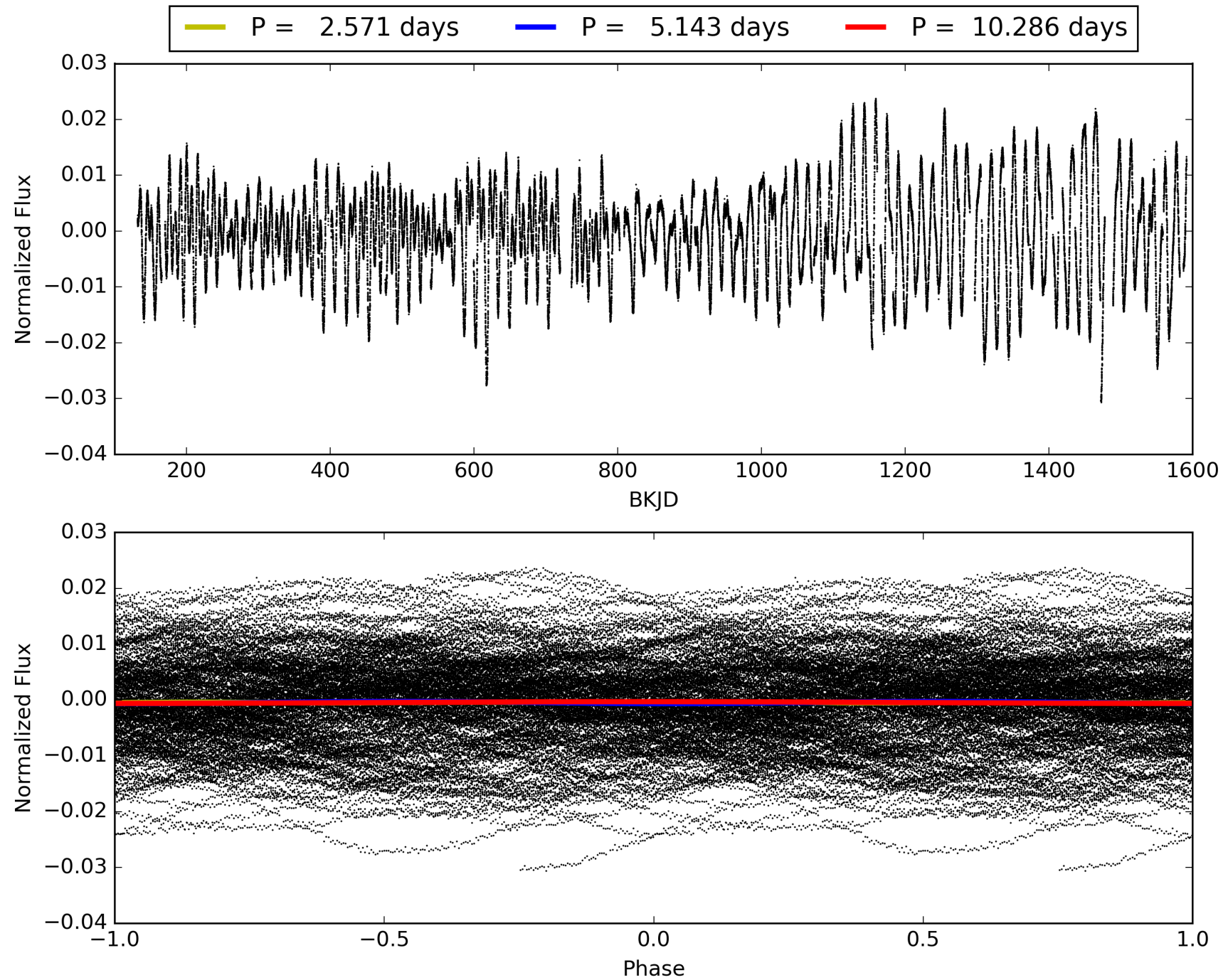
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 14:00:38 Z

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

TCE 005214951-01, PDC Light Curves

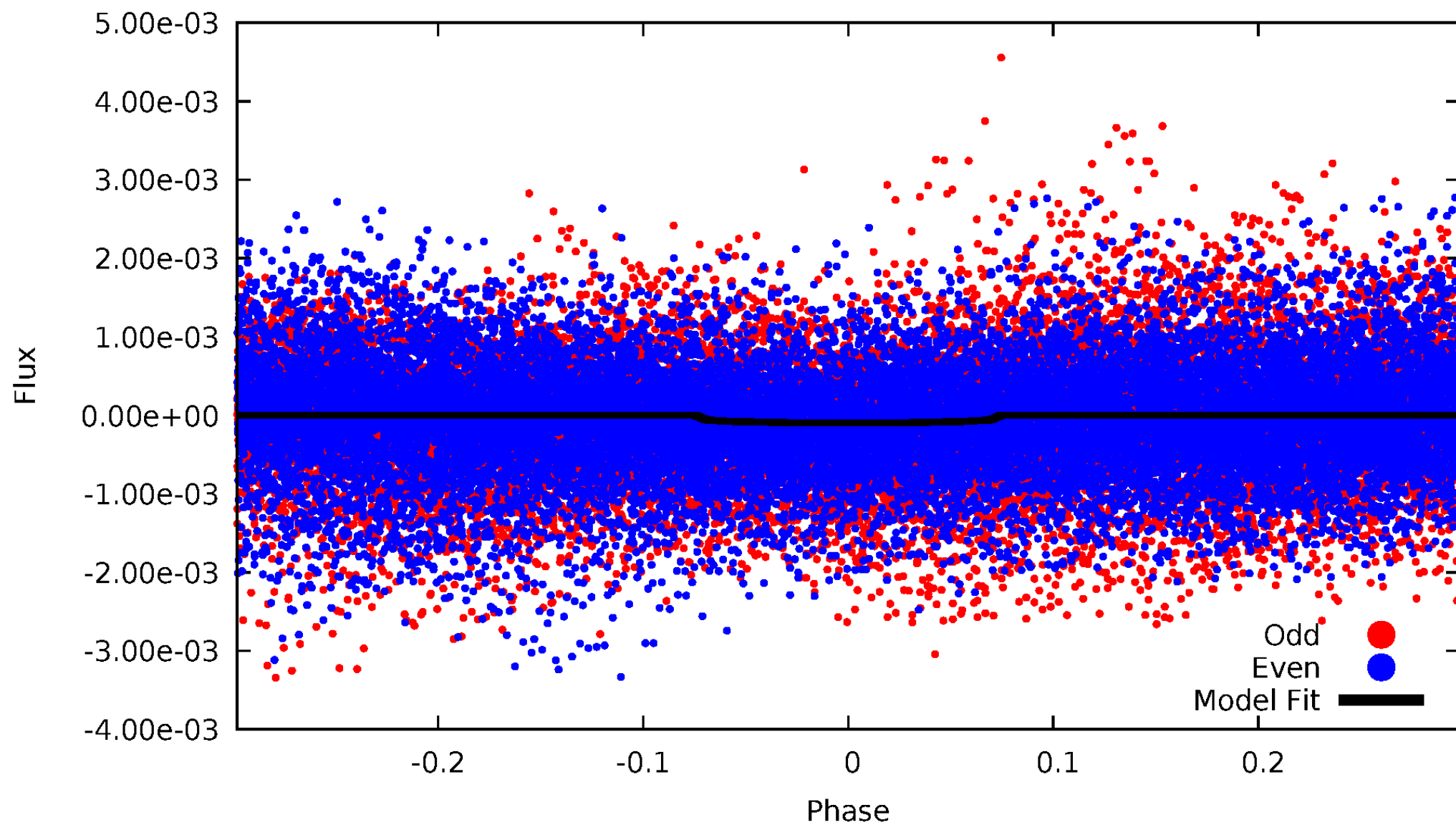


TCE 005214951-01



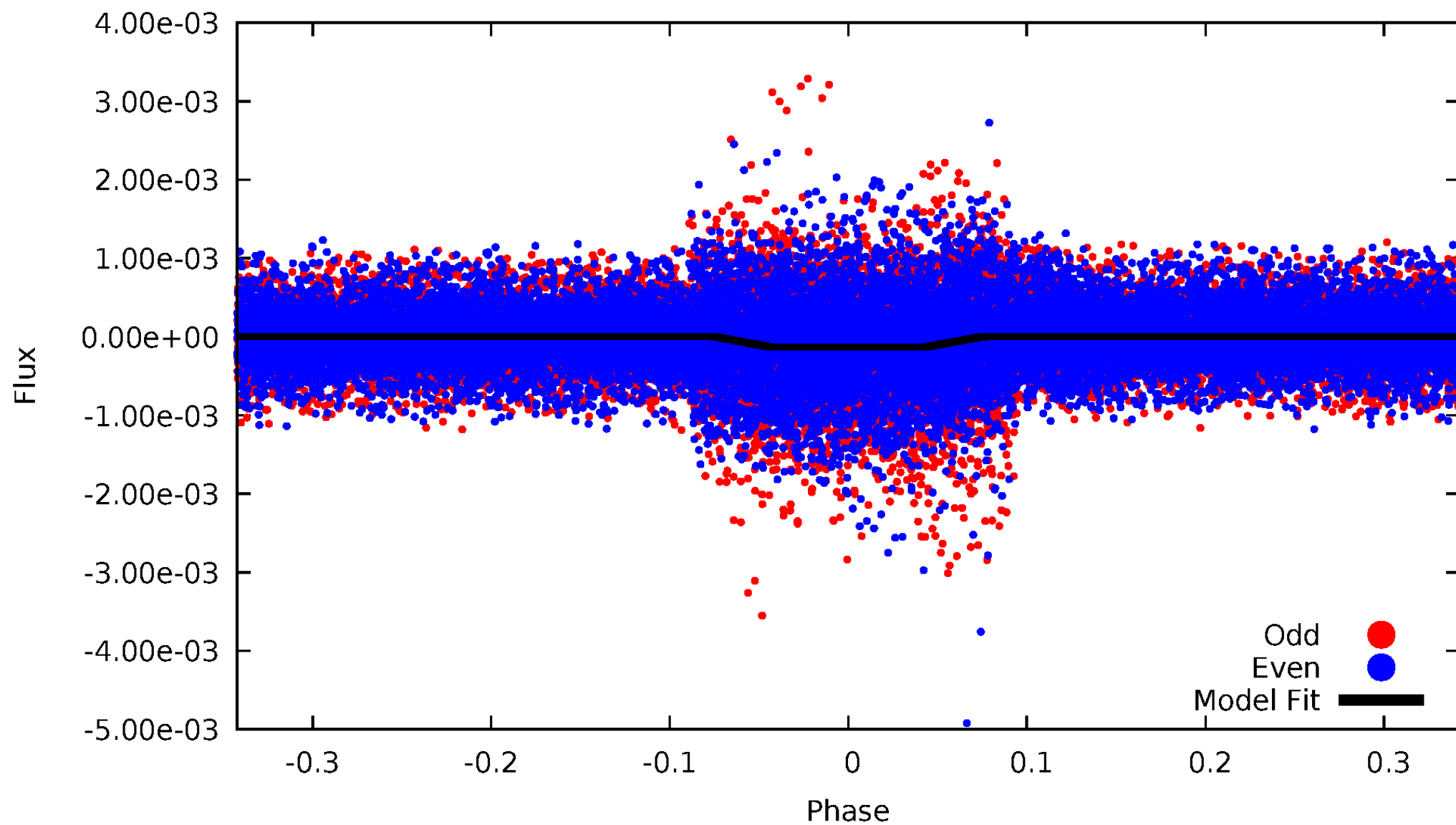
DV Odd/Even

TCE 005214951-01



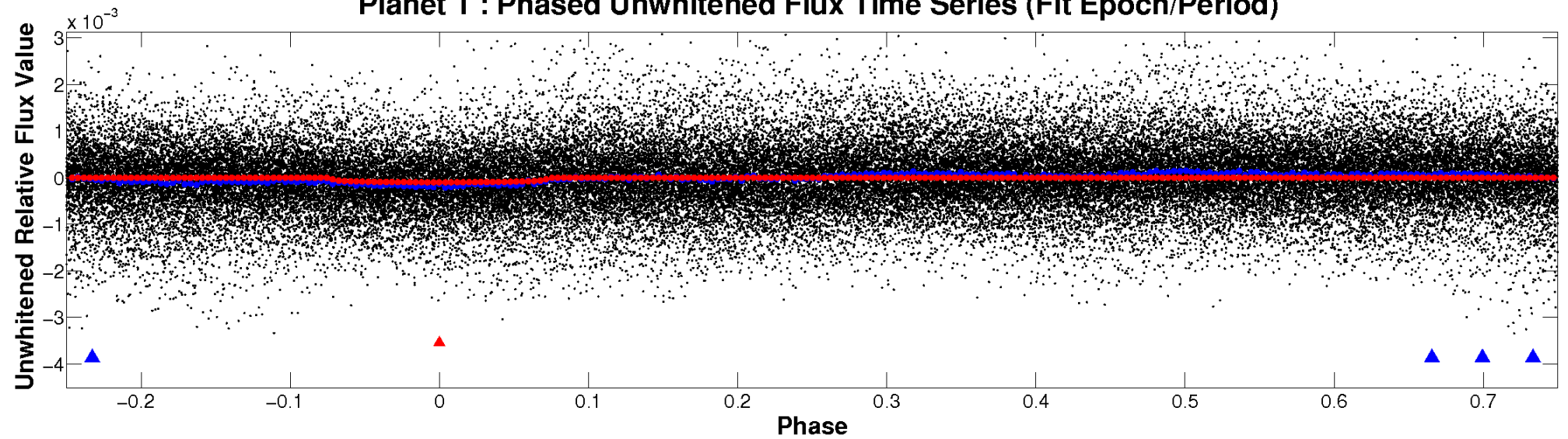
ALT Odd/Even

TCE 005214951-01

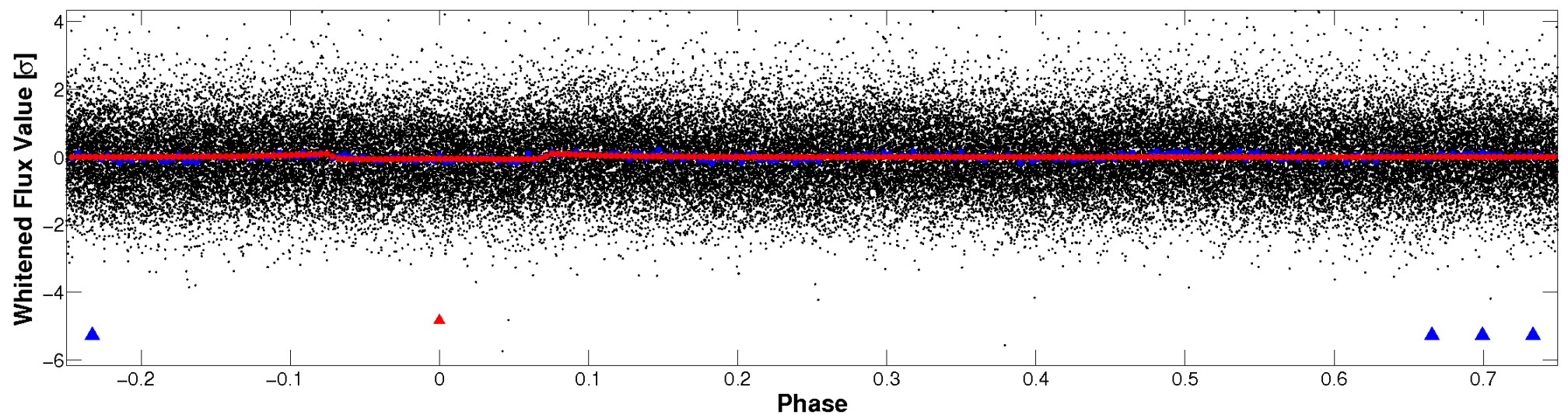


Non-Whitened Vs. Whitened Light Curve

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

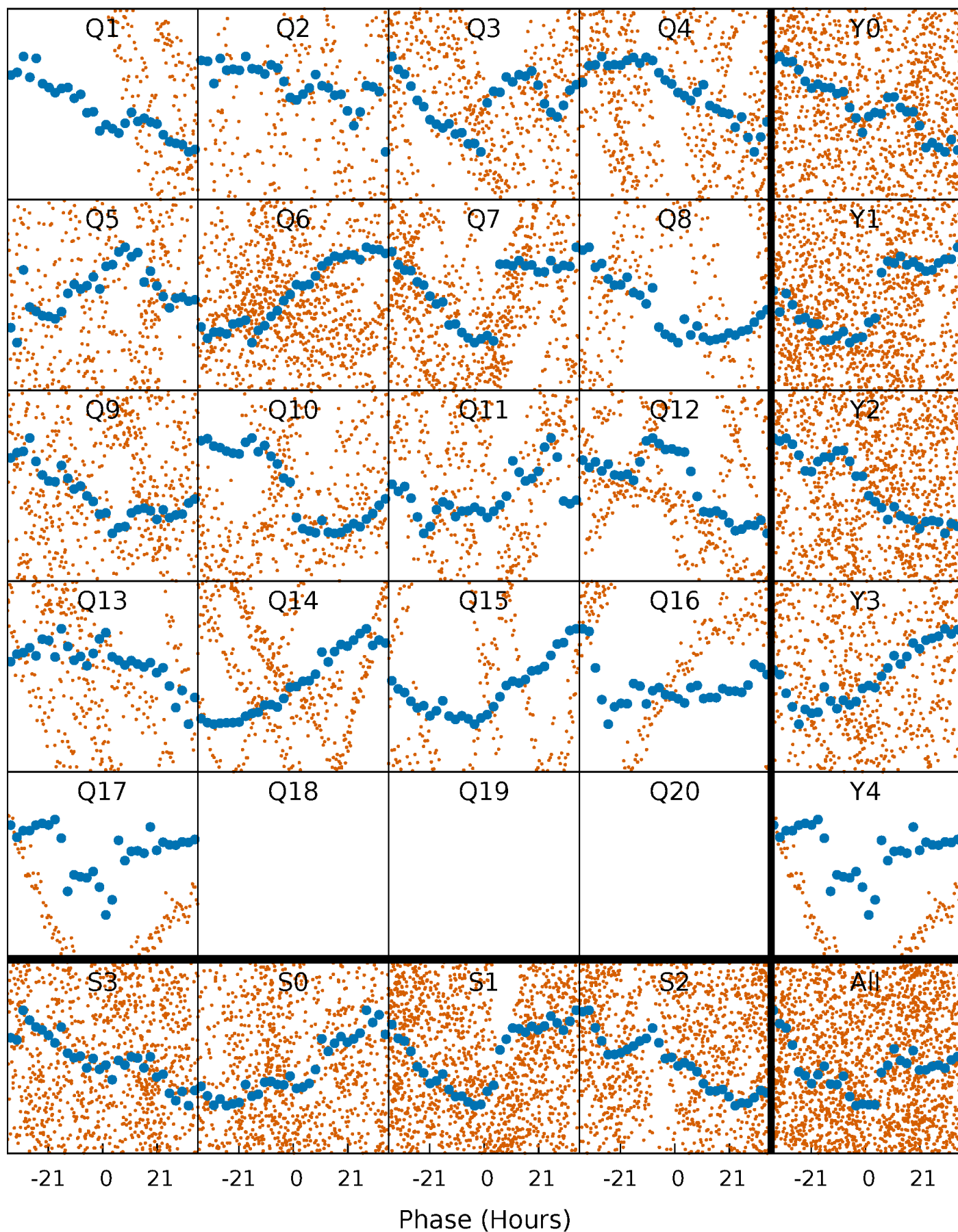


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



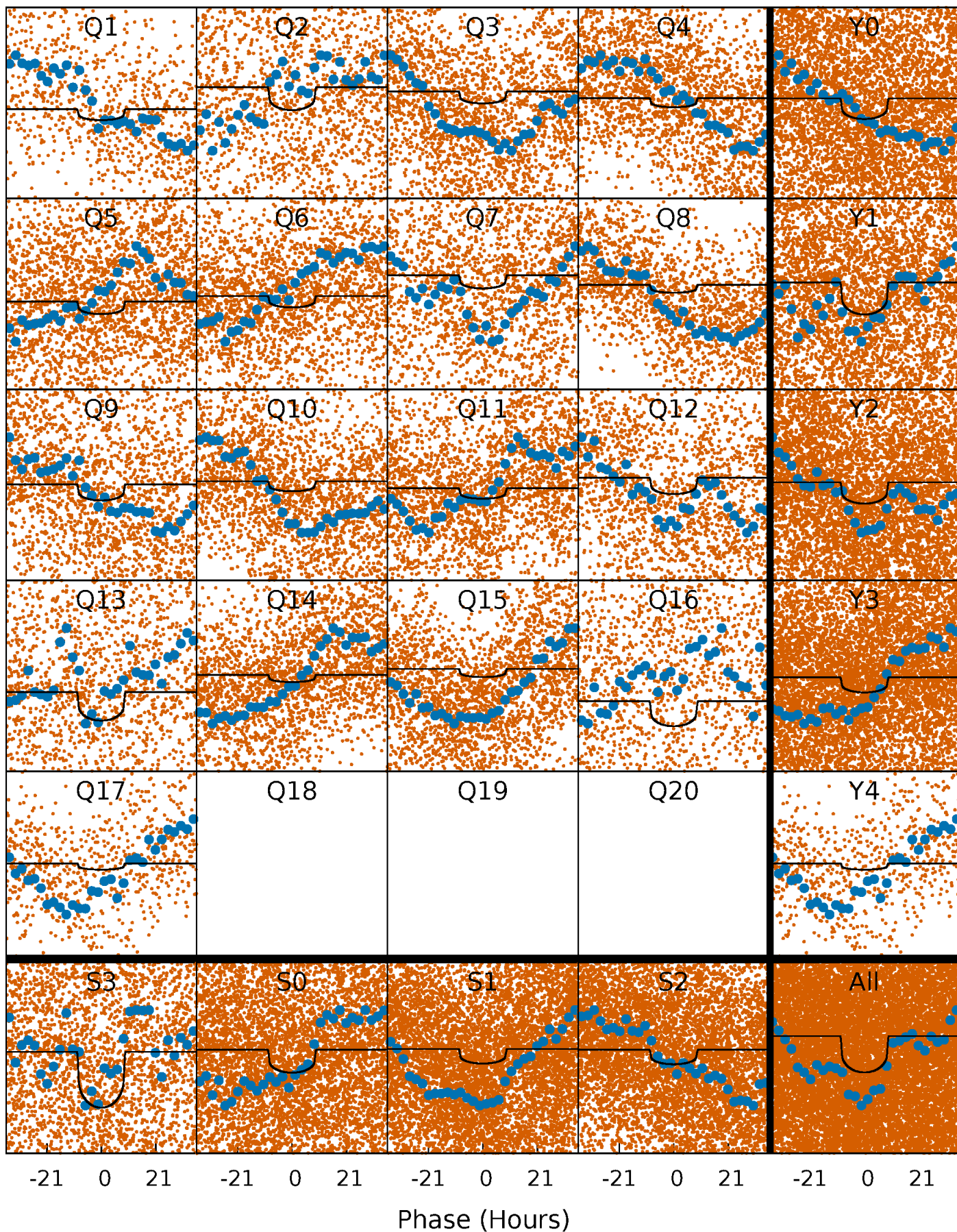
PDC Quarter-Phased Transit Curves

TCE 005214951-01 P= 5.142756 Days $T_0=136.273793$ (BKJD)



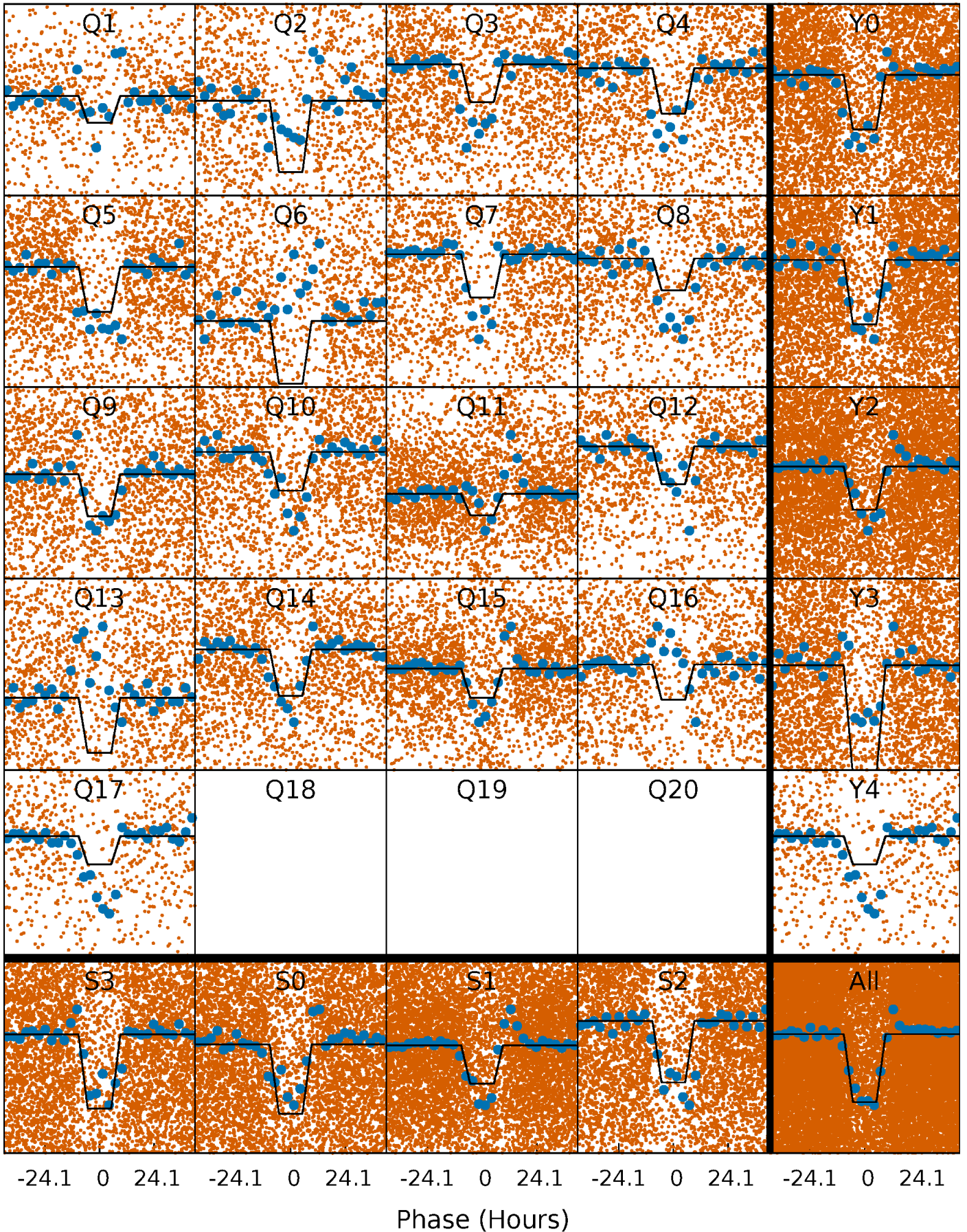
DV Quarter-Phased Transit Curves

TCE 005214951-01 P= 5.142756 Days $T_0=136.273793$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

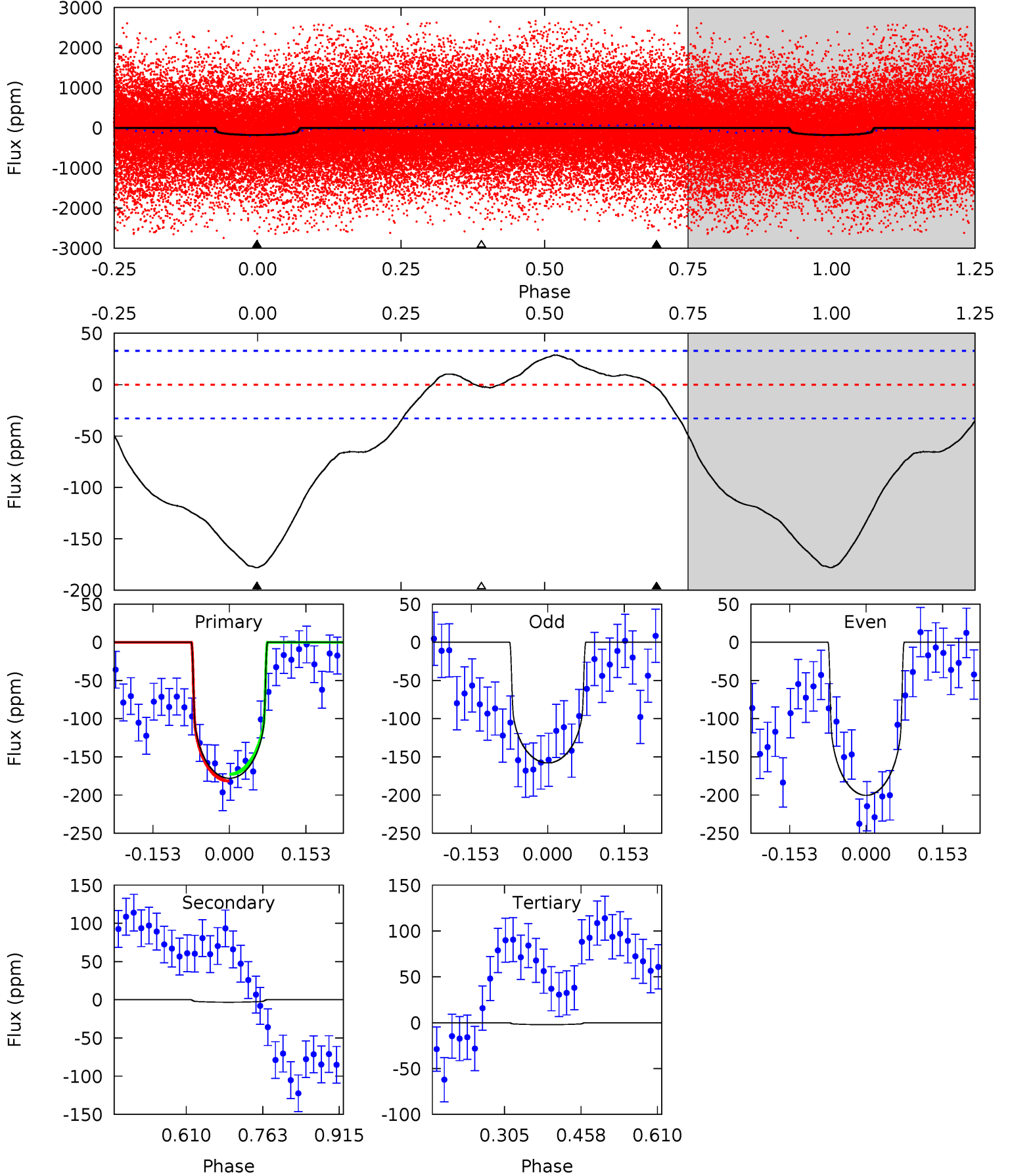
TCE 005214951-01 P= 5.142253 Days $T_0=136.343951$ (BKJD)



DV Model-Shift Uniqueness Test

005214951-01, P = 5.142756 Days, E = 131.131037 Days

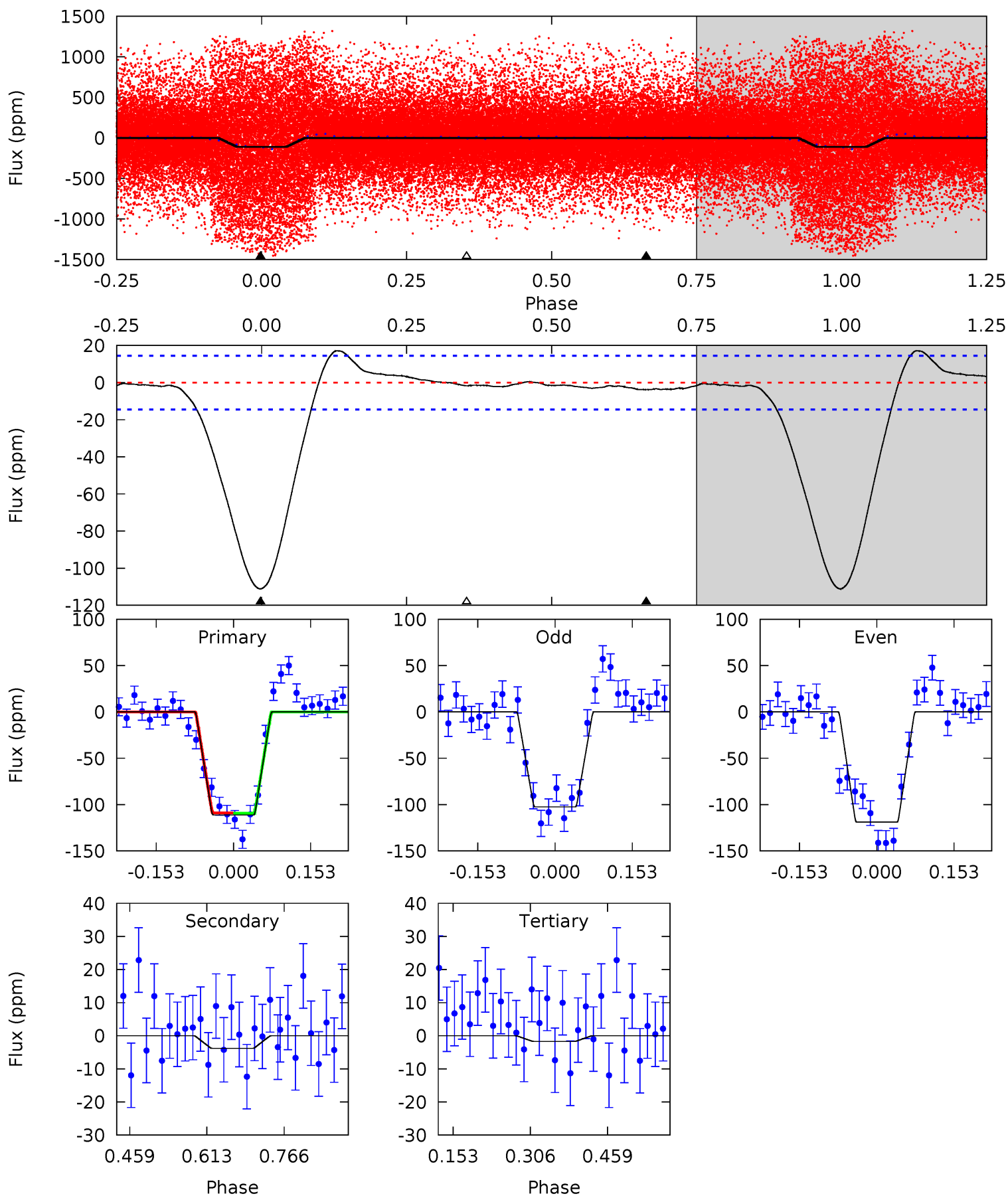
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 24.3 | 0.44 | 0.28 | 0 | 4.48 | 1.43 | 4.19 | 24.0 | 24.3 | 0.15 | 0.44 | 2.91 | 1.25 | 0.14 | 0.60 |



Alt Model-Shift Uniqueness Test

005214951-01, P = 5.142253 Days, E = 131.201698 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 34.4 | 1.18 | 0.53 | 0 | 4.47 | 1.43 | 1.01 | 33.8 | 34.4 | 0.65 | 1.18 | 2.52 | 1.90 | 0.13 | 0.06 |



Stellar Parameters For KIC 005214951

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5325^{+159}_{-159} | $4.489^{+0.095}_{-0.105}$ | $-0.140^{+0.300}_{-0.300}$ | $0.841^{+0.132}_{-0.099}$ | $0.796^{+0.104}_{-0.061}$ | $1.884^{+0.713}_{-0.611}$ |
| | +3%/-3% | +2%/-2% | +214%/-214% | +16%/-12% | +13%/-8% | +38%/-32% |
| Source | PHO1 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 005214951-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-------------|------------------------|--------------------|-----------------------|-----------------------------|
| DV | -3 ± 7 | $0.95^{+0.19}_{-0.20}$ | 1298^{+61}_{-57} | 2869^{+635}_{-5889} | $5.376^{+14.275}_{-12.604}$ |
| Alt. | -4 ± 3 | $1.08^{+0.20}_{-0.20}$ | 1295^{+65}_{-56} | 2838^{+352}_{-704} | $5.008^{+6.476}_{-4.243}$ |

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 $A_{obs} \gg 1.0$

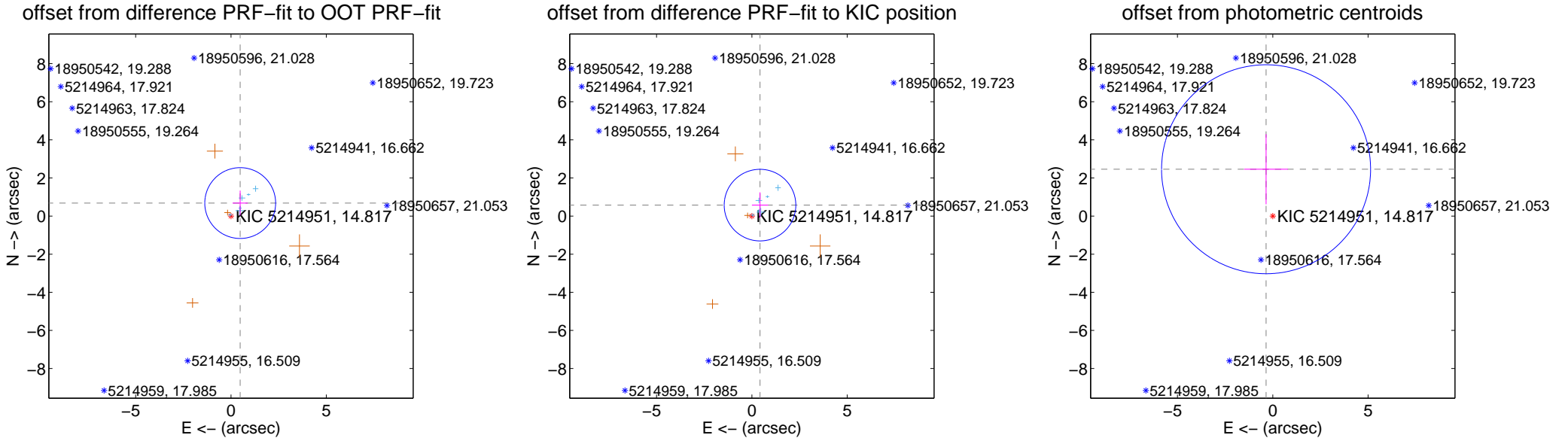
DV Centroid Data

Supplemental centroid analysis for 005214951-01. Kepler magnitude: 14.82. Transit SNR 7.23

There are 6 quarters with good PRF difference image offsets

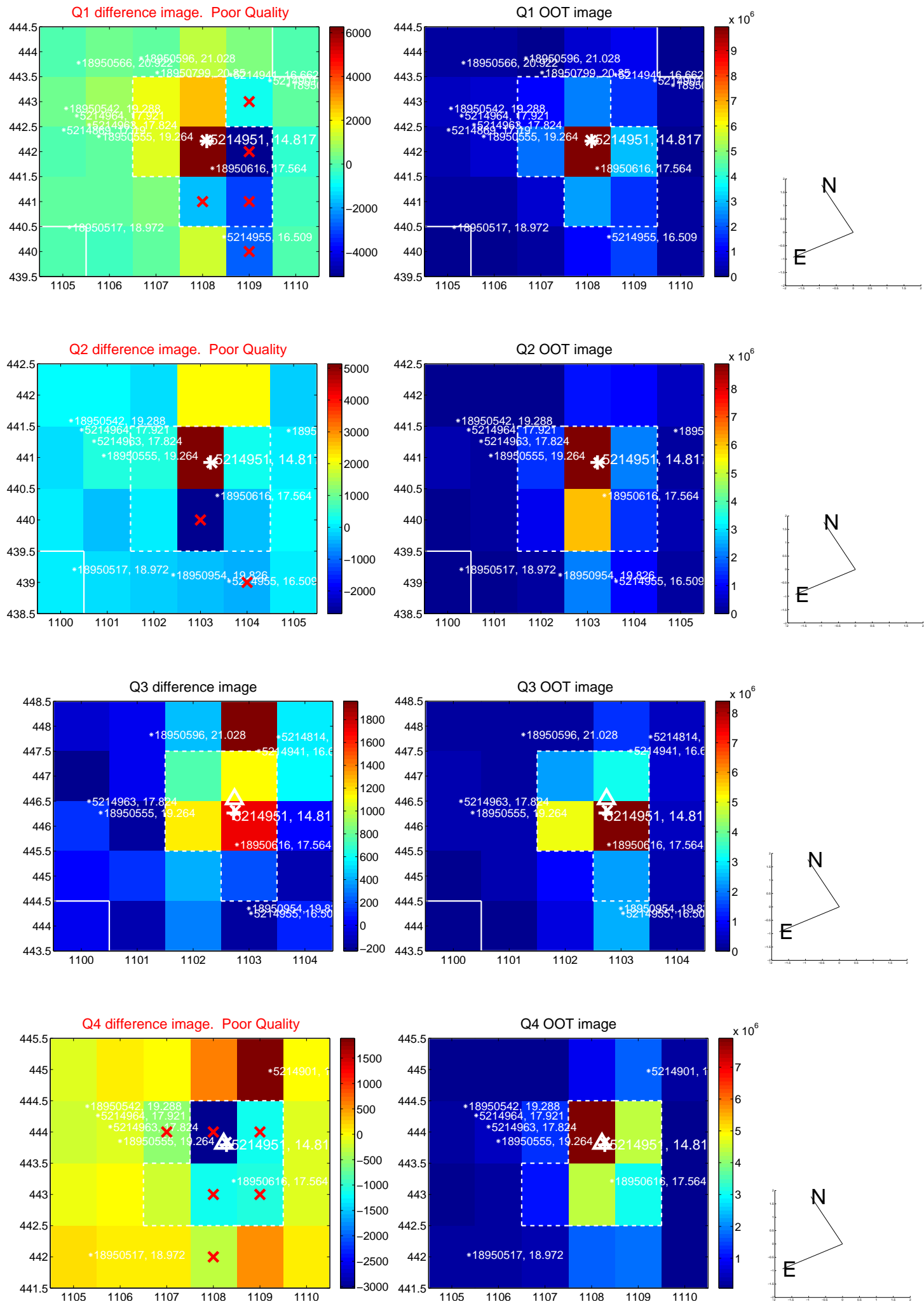
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.836 ± 0.619 | 1.35 | -0.484 ± 0.402 | 0.682 ± 0.655 |
| PRF-fit source offset from KIC position | 0.716 ± 0.626 | 1.14 | -0.427 ± 0.425 | 0.574 ± 0.672 |
| photometric centroid source offset | 2.48 ± 1.83 | 1.36 | 0.35 ± 1.15 | 2.46 ± 1.84 |

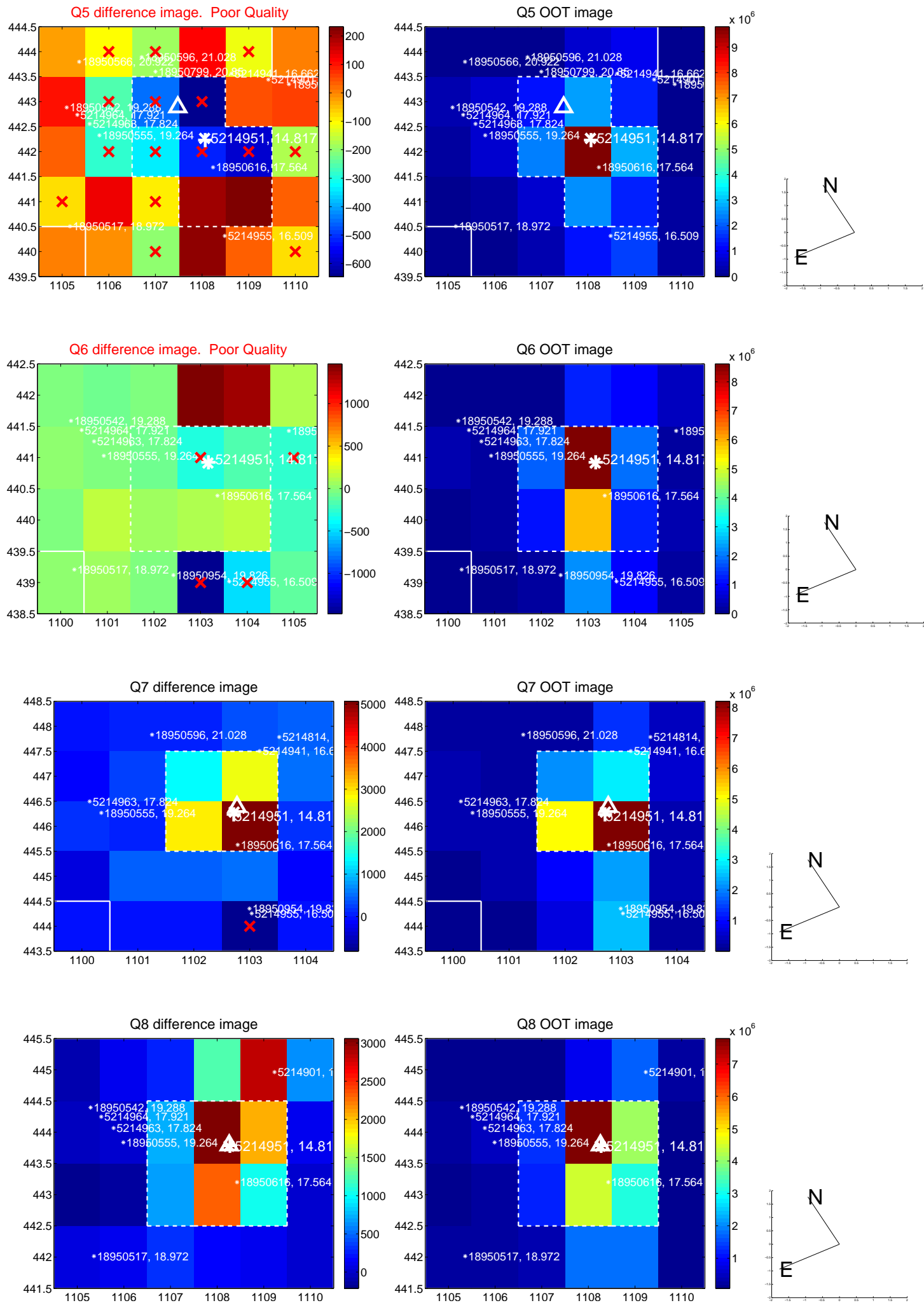


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

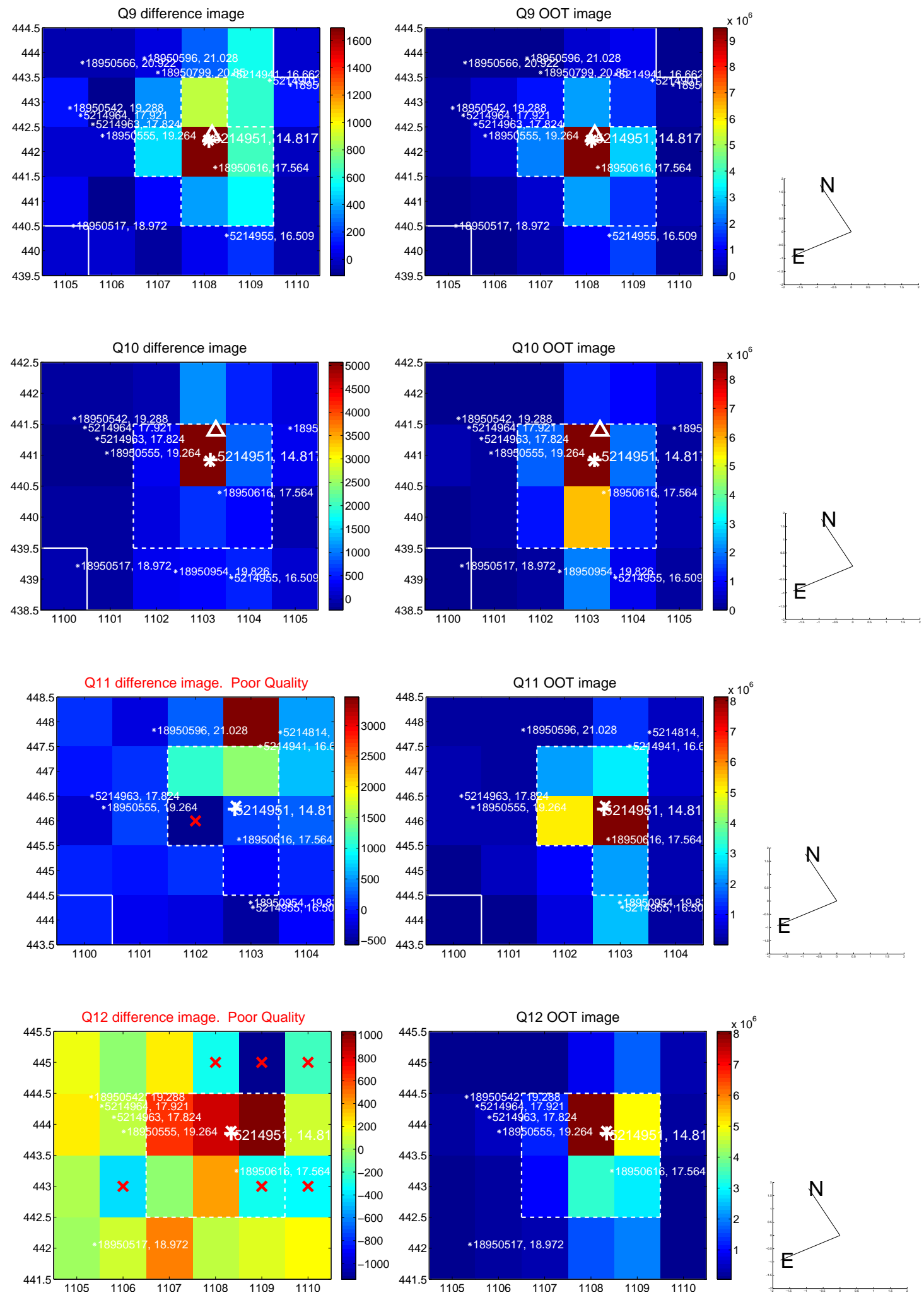
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



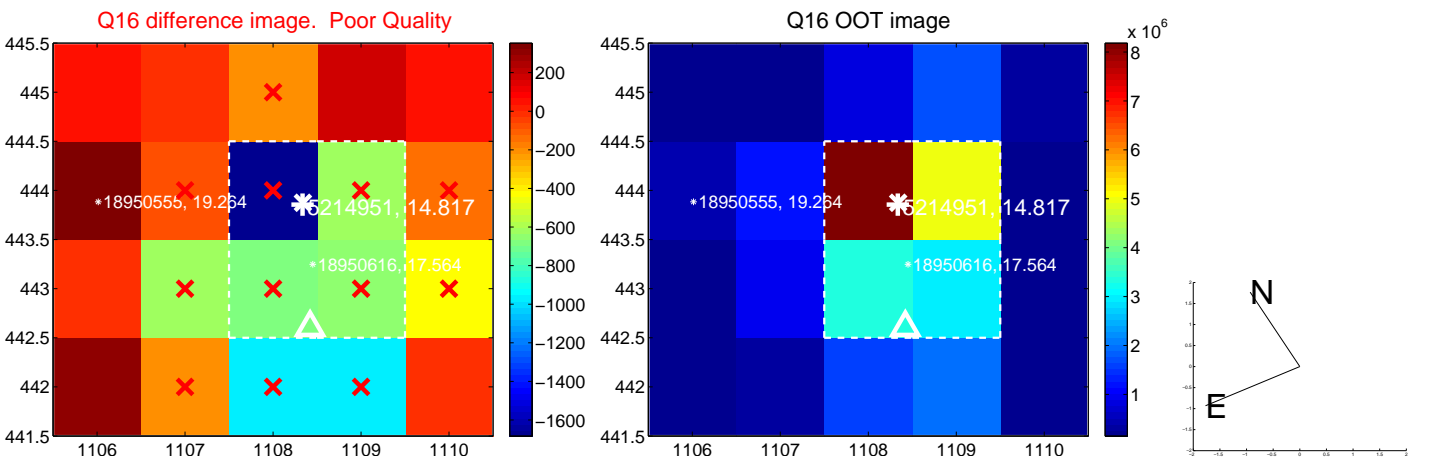
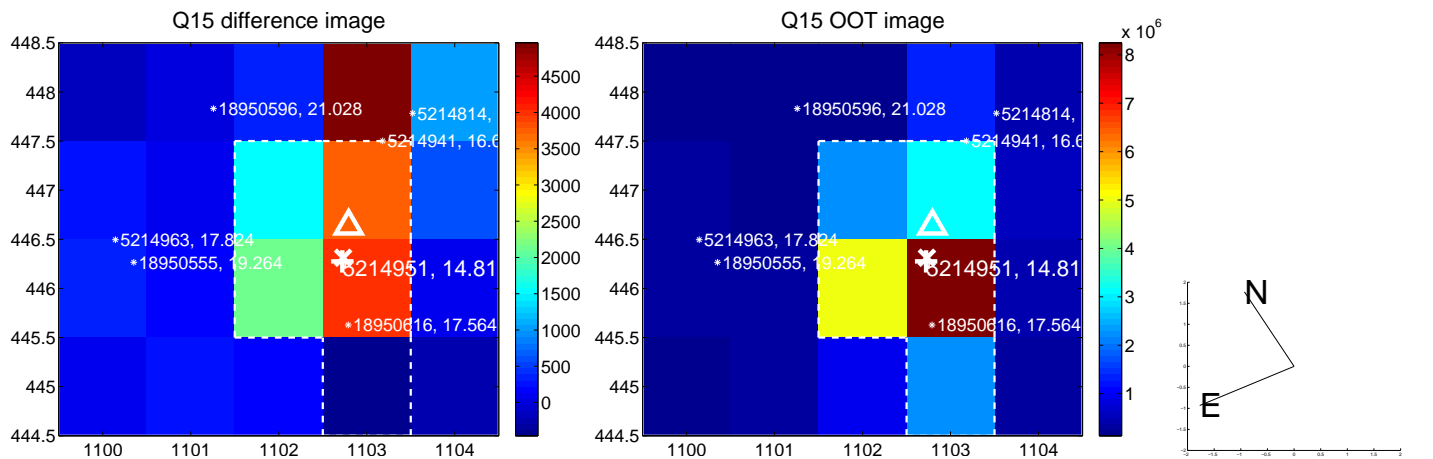
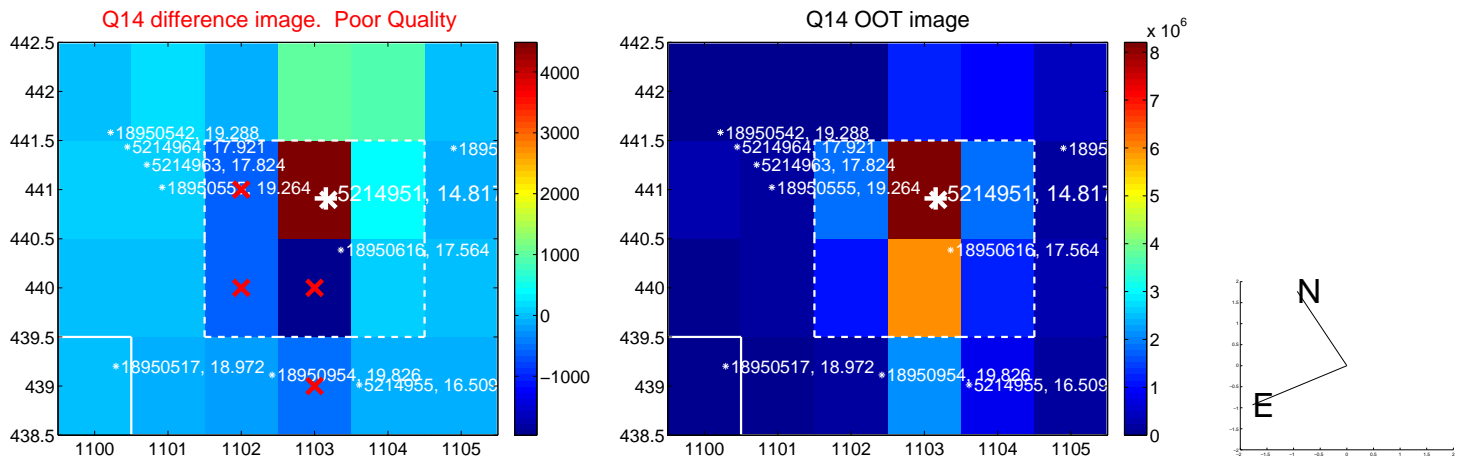
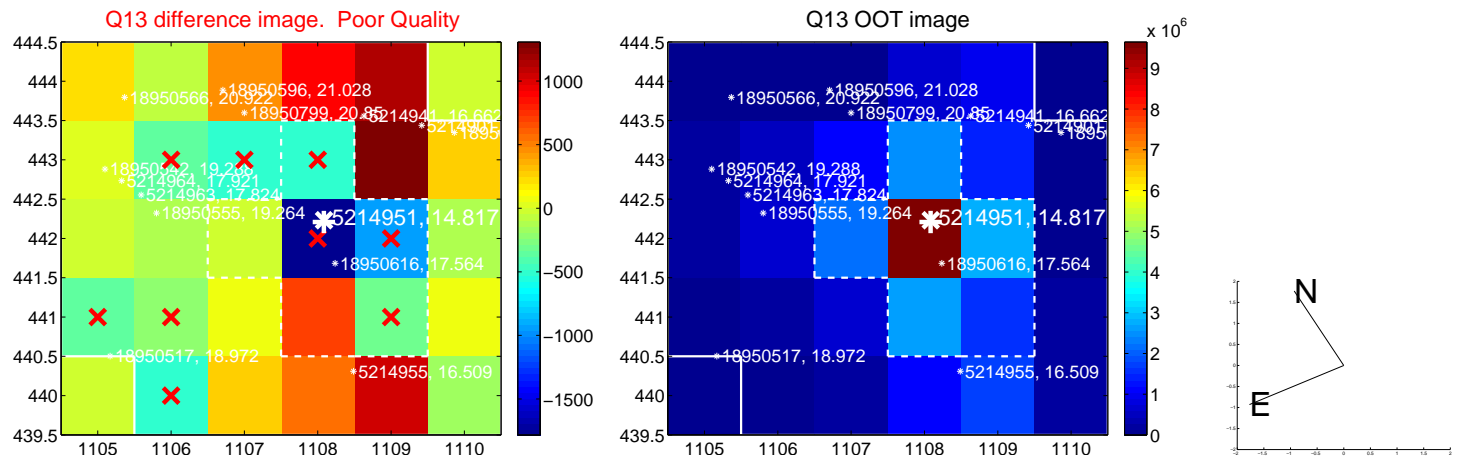
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



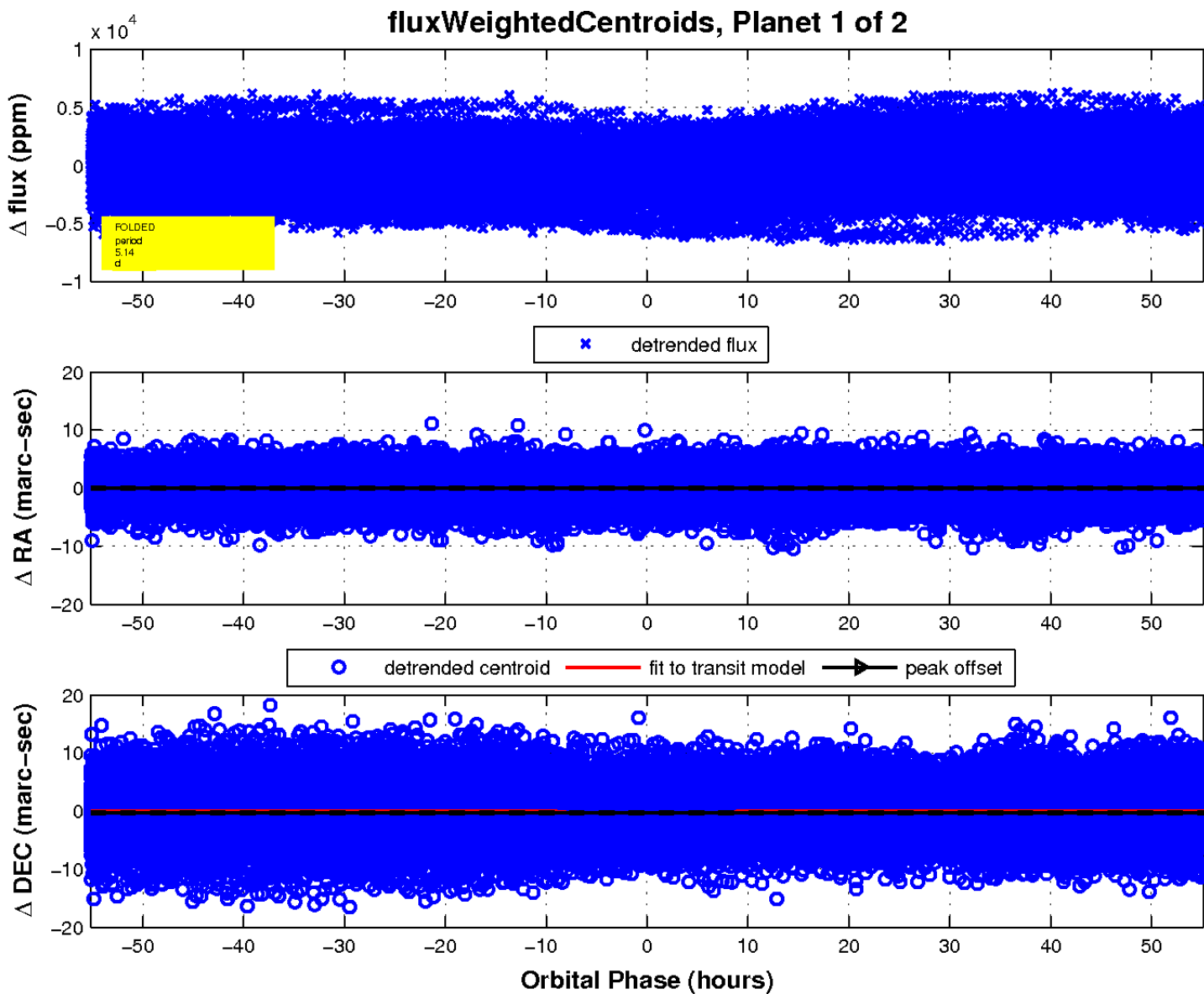
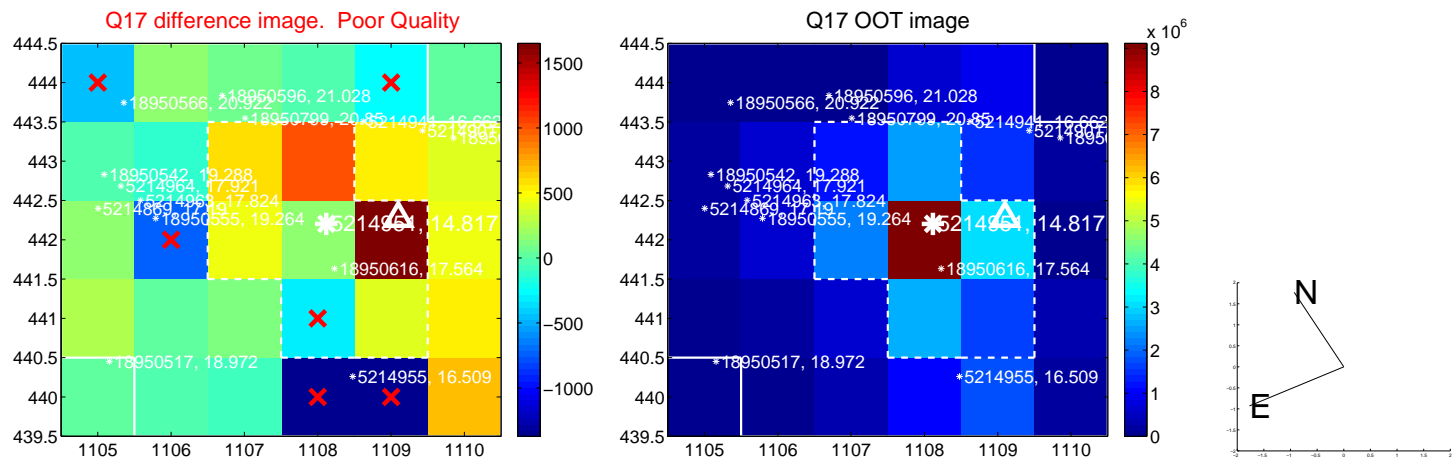
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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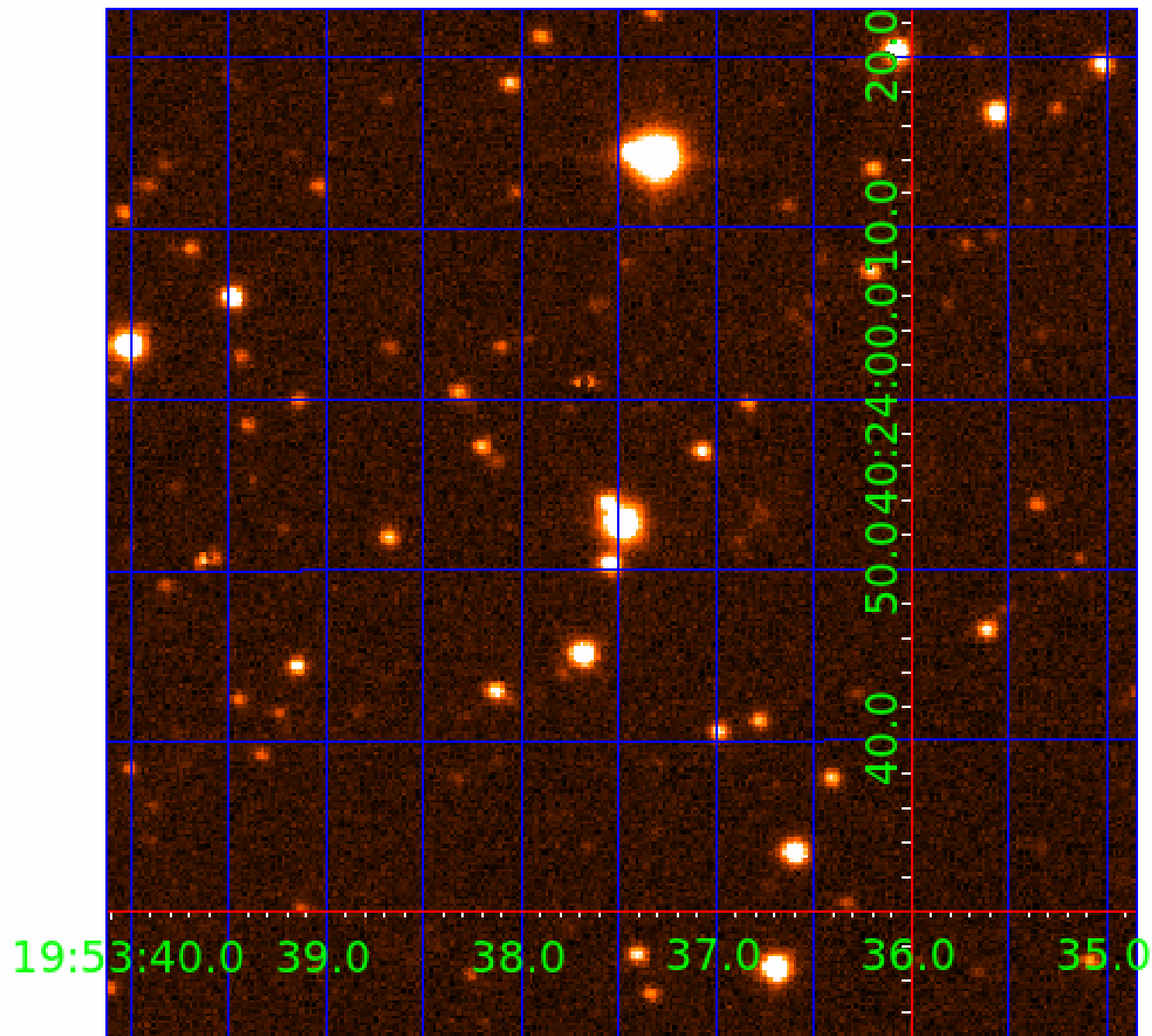


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005214951

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|------|-----------------------------|-----------------|------------------------|------------------------|
| 005214951-01 | OBS | No | 5.142756 | 136.273793 | 98.9 | 18.388 | 7.9 | 7.2 | 0.84 | 5325 | 0.93 | 174.49 |
| 005214951-02 | OBS | No | 385.880969 | 273.408446 | 2839.9 | 15.000 | 33.4 | -1.0 | 0.84 | 5325 | 4.39 | 0.55 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 005214951-01 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | LPP_DV |
| 005214951-02 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—CENT_NOFITS |

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

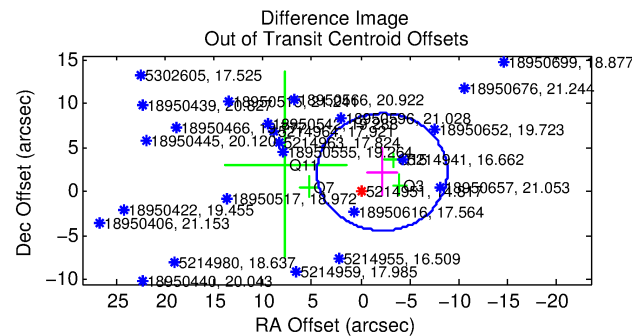
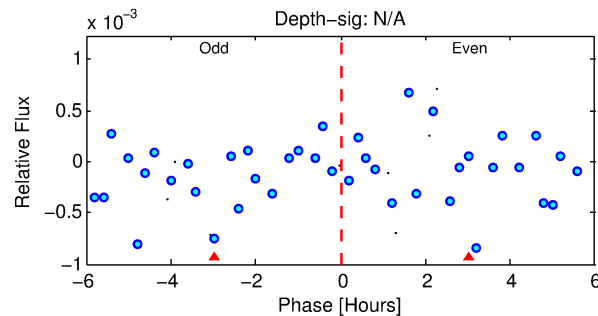
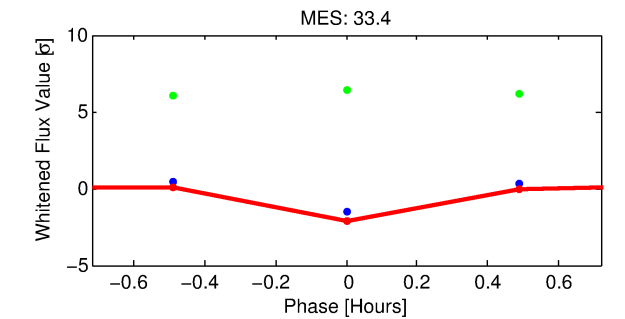
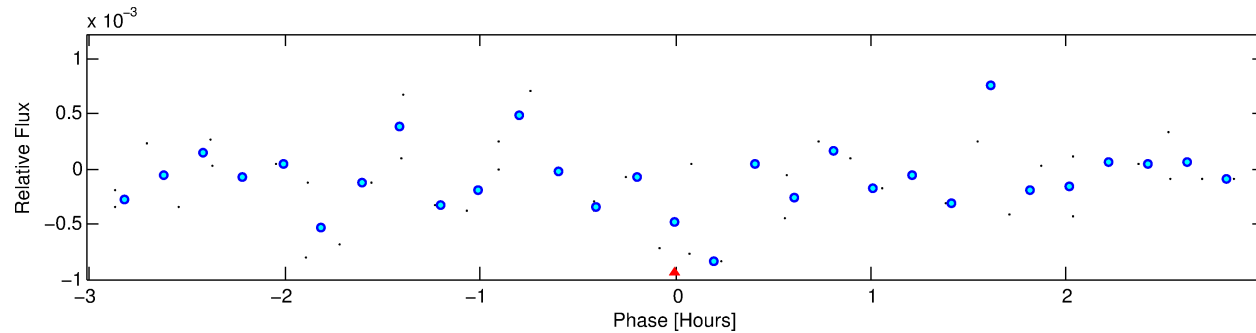
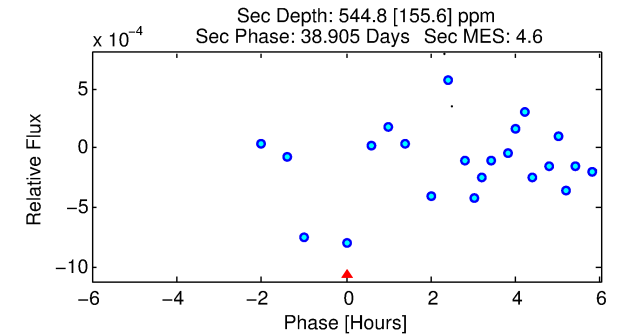
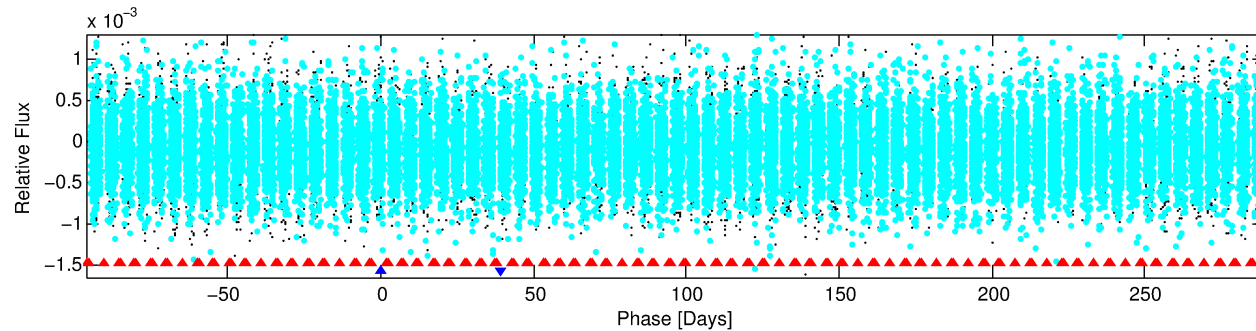
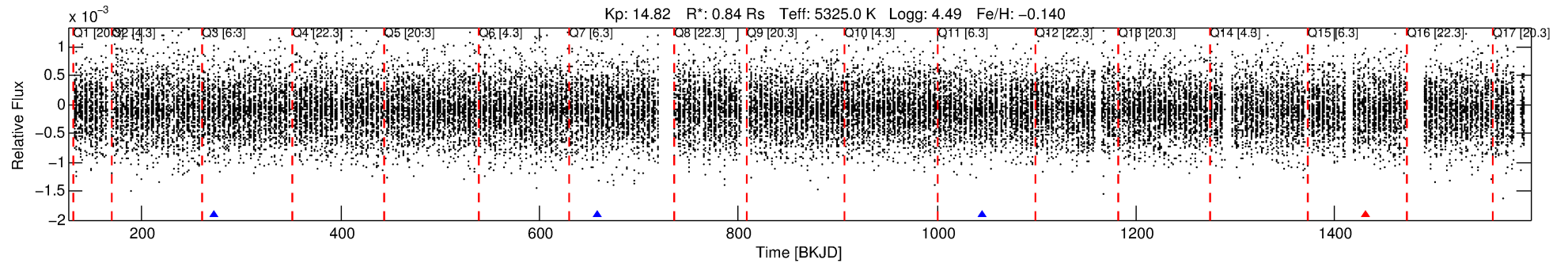
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005214951-02

No Significant Match Found

DV One-Page Summary

KIC: 5214951 Candidate: 2 of 2 Period: 385.881 d



TPS TCE Results:

Period = 385.88097 d
Epoch = 273.4084 BKJD

DV fit results are unavailable

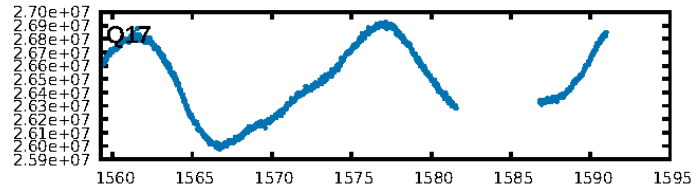
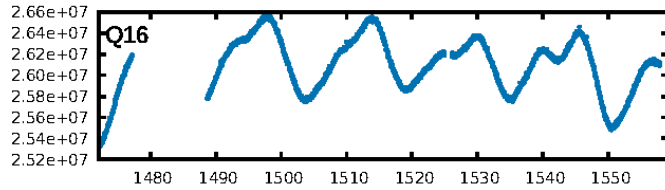
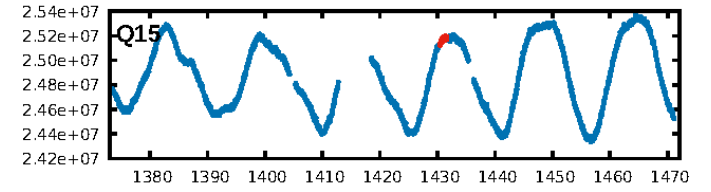
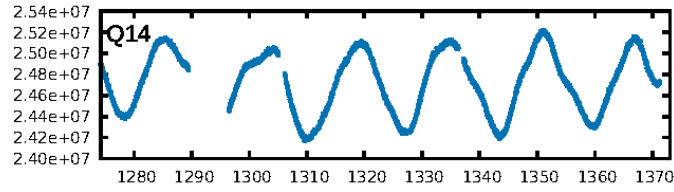
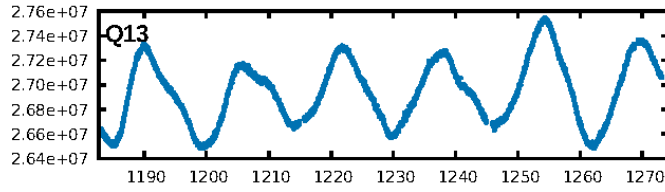
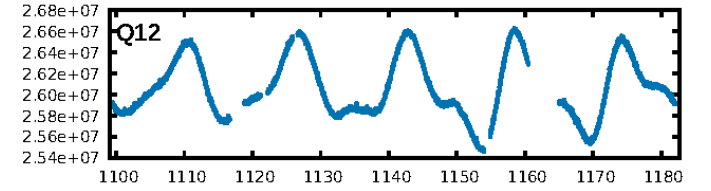
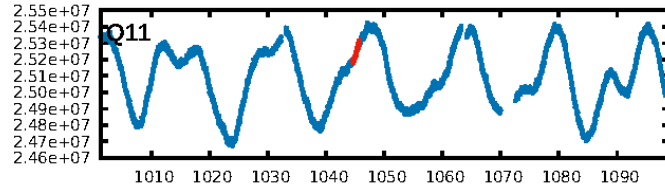
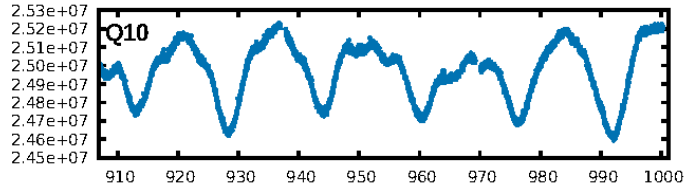
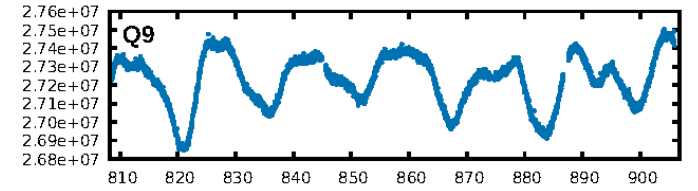
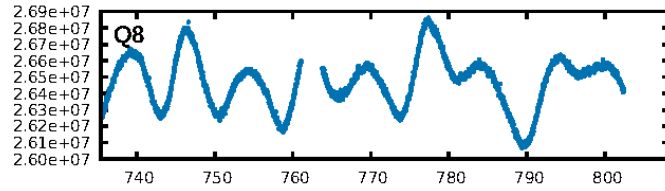
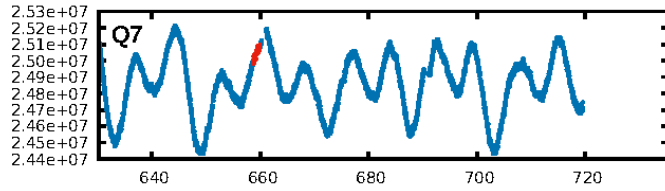
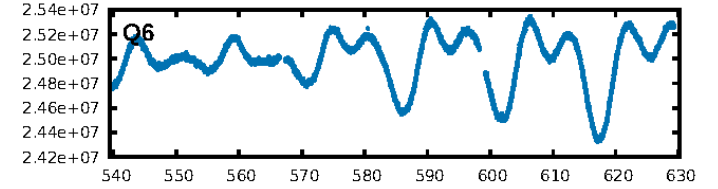
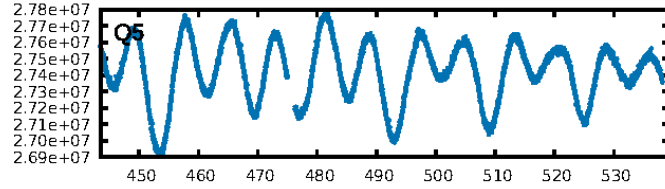
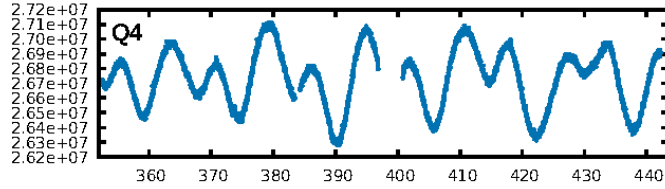
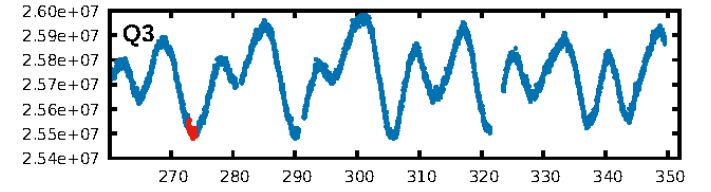
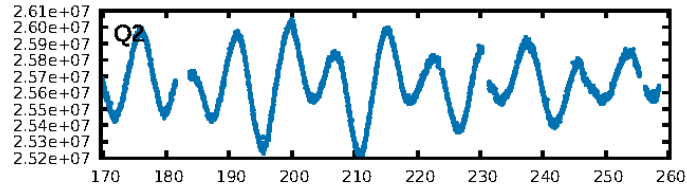
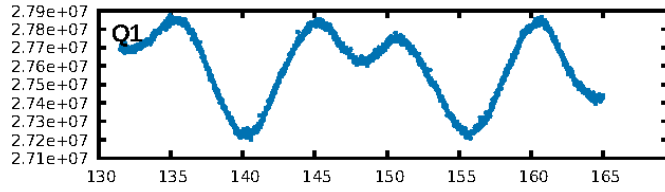
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [385.07σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.17e-100
RollingBand-fgt: 0.75 [3/4]
GhostDiagnostic-chr: -0.2753
Centroid-sig: 32.1%
Centroid-so: 6.305 arcsec [0.70σ]
OotOffset-rm: 3.120 arcsec [1.41σ]
KicOffset-rm: 3.000 arcsec [1.16σ]
OotOffset-st: 0/4/0/0 [4]
KicOffset-st: 0/4/0/0 [4]
DiffImageQuality-fgm: 0.00 [0/4]
DiffImageOverlap-fno: 1.00 [4/4]

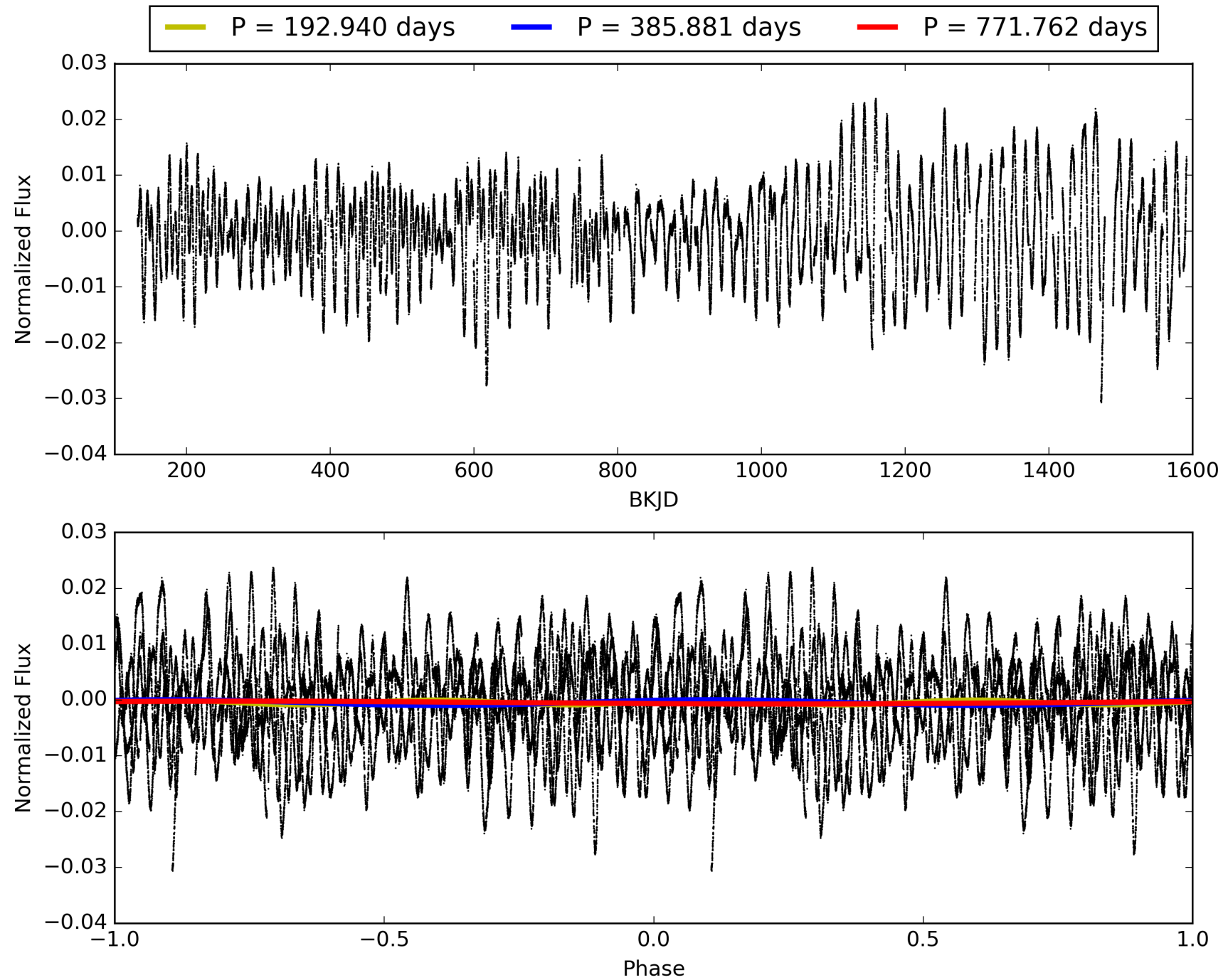
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 14:01:11 Z

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

TCE 005214951-02, PDC Light Curves

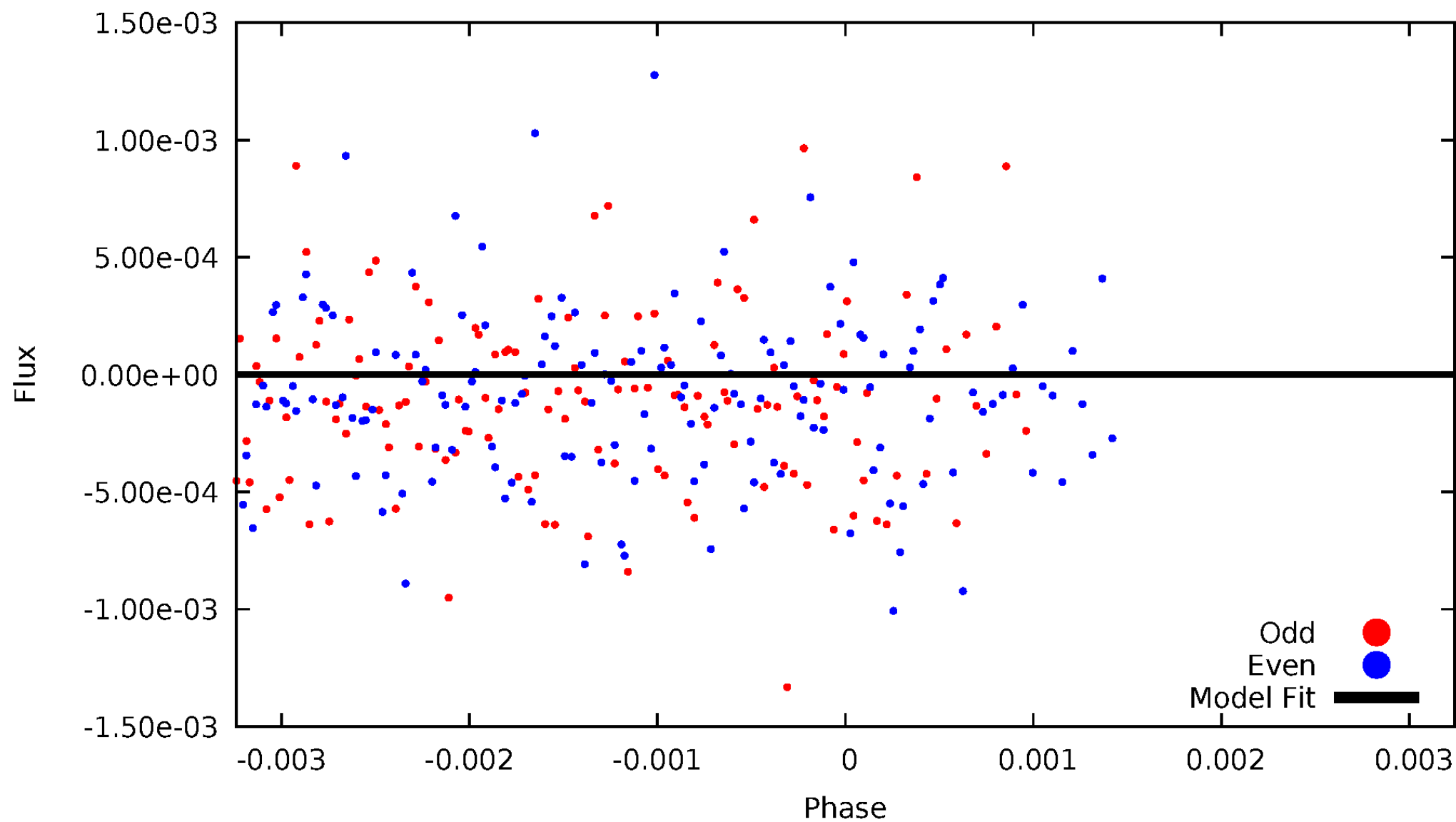


TCE 005214951-02



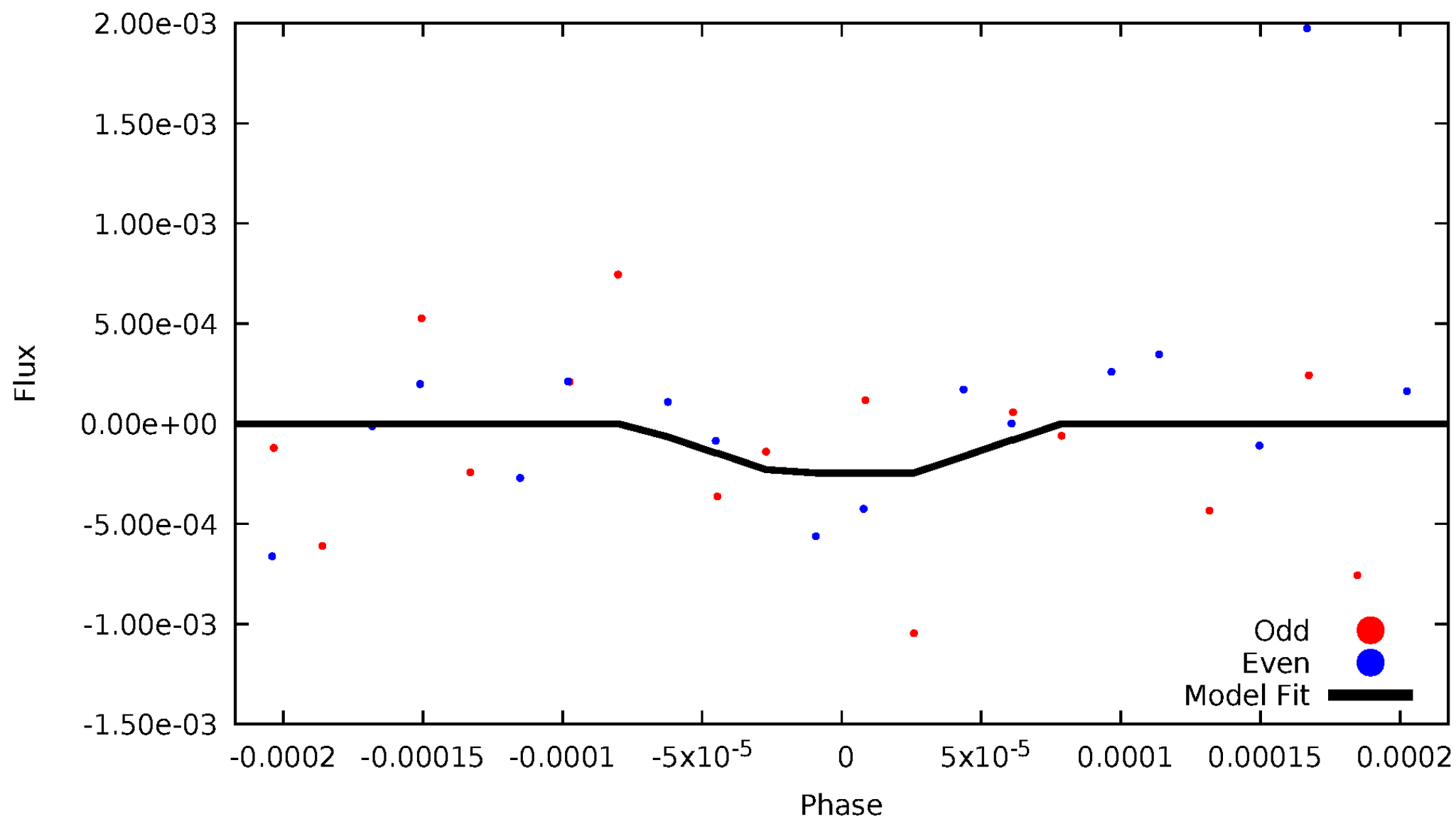
DV Odd/Even

TCE 005214951-02



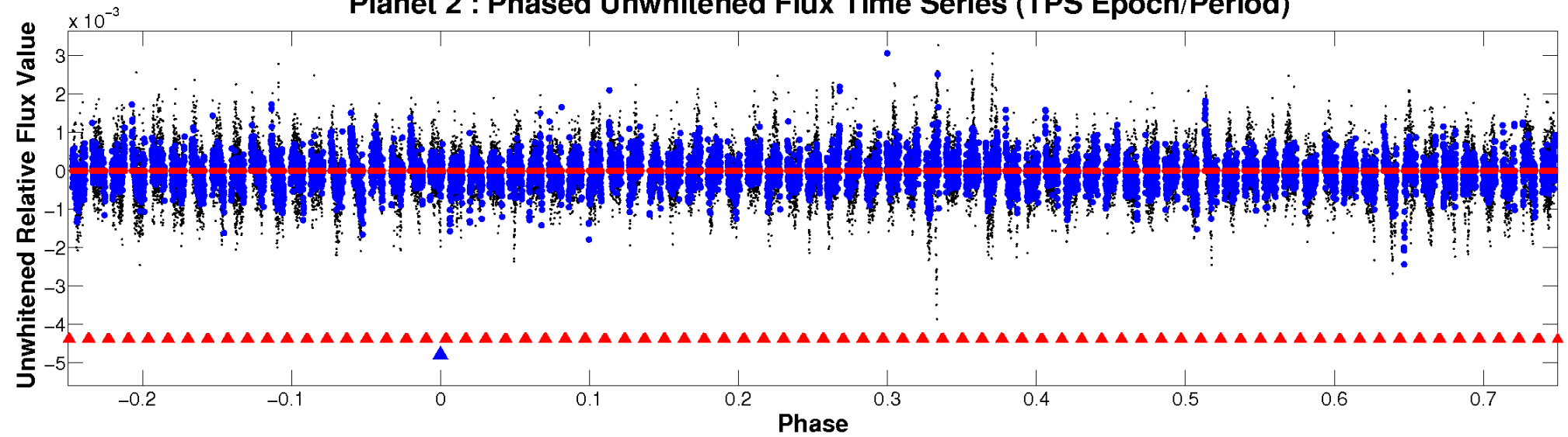
ALT Odd/Even

TCE 005214951-02

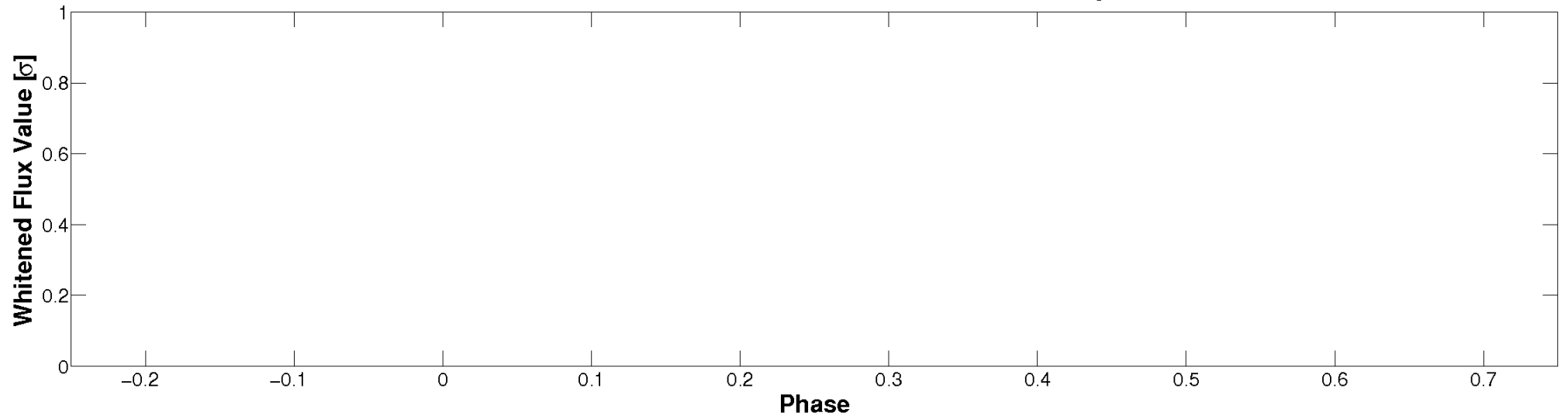


Non-Whitened Vs. Whitened Light Curve

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

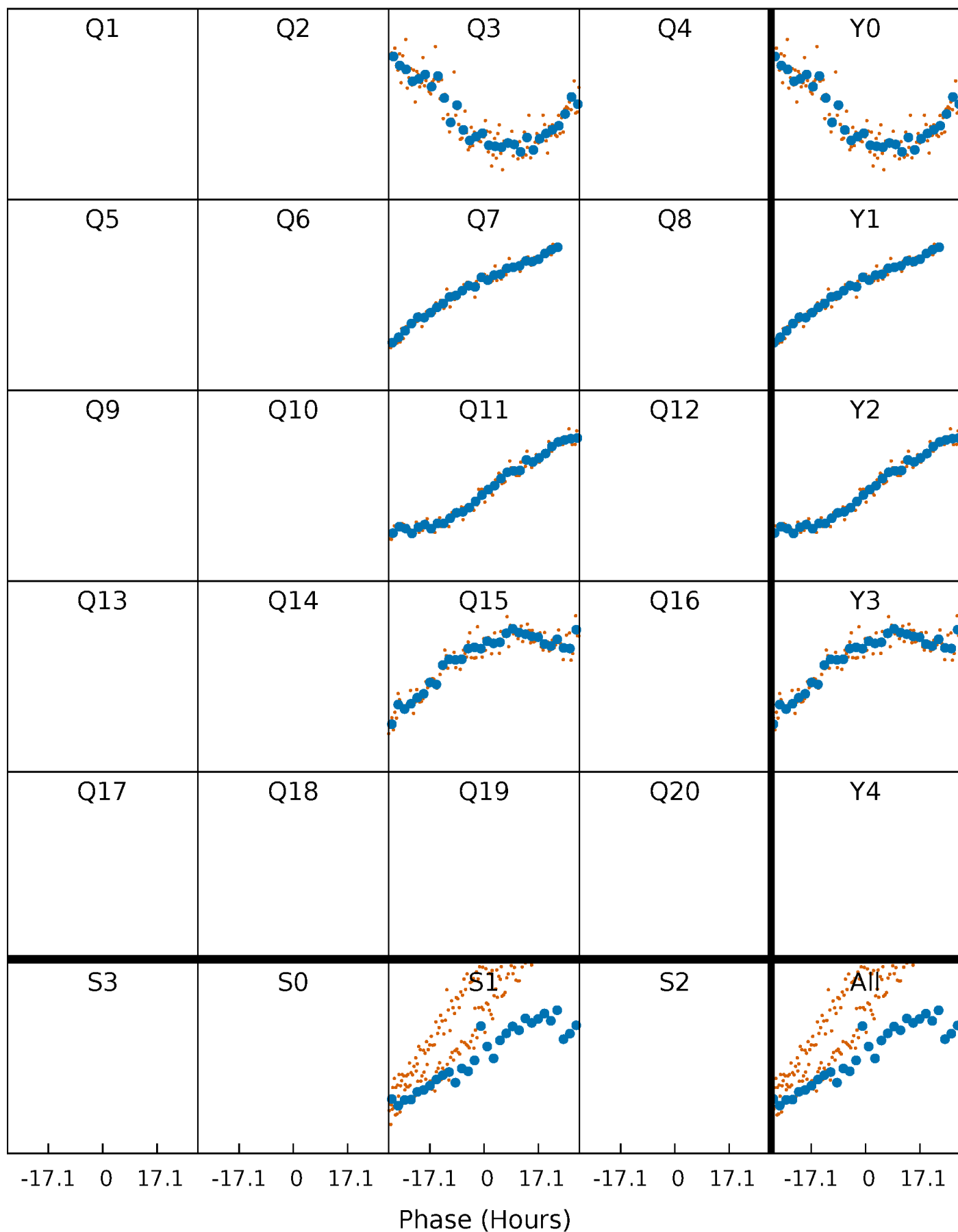


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



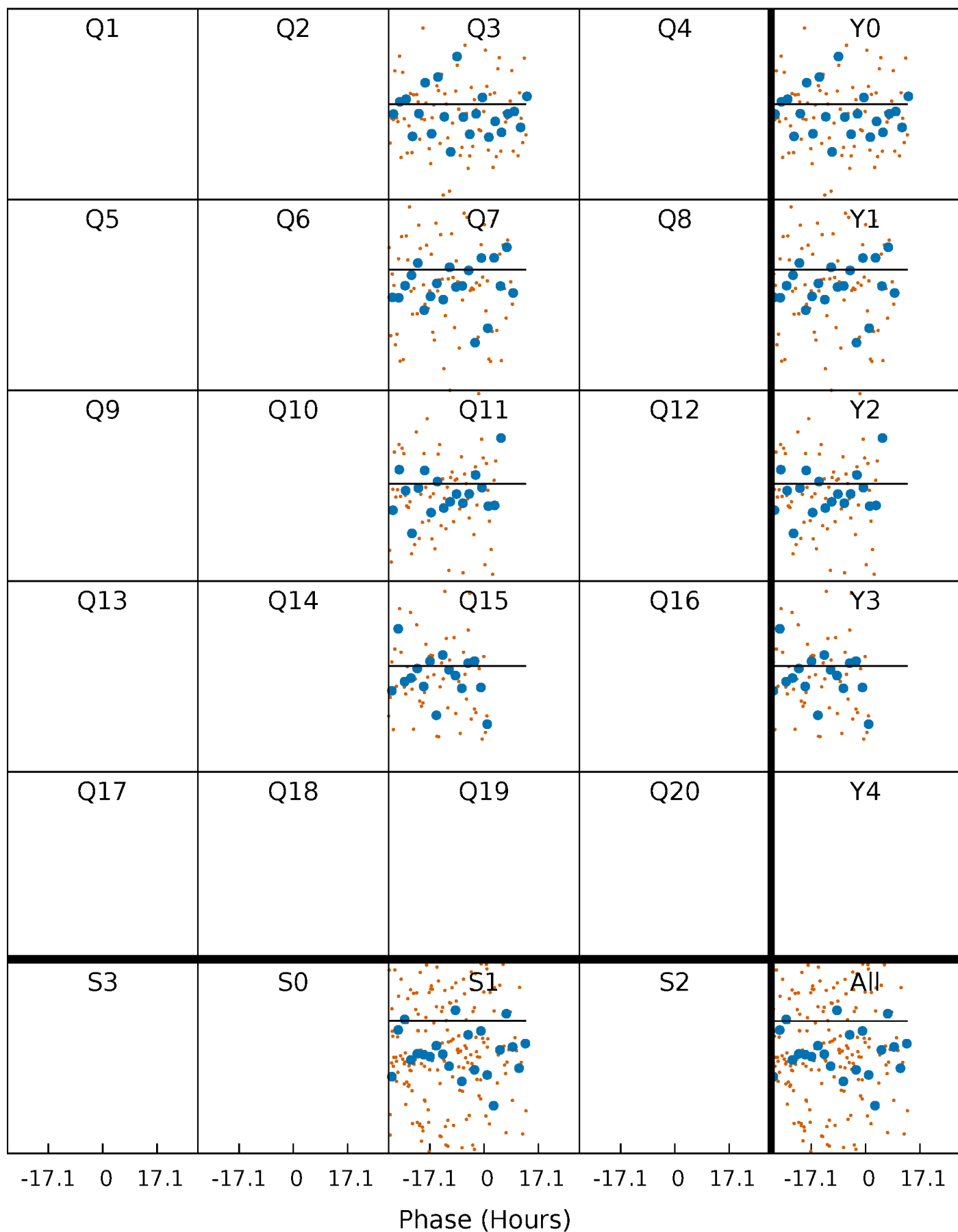
PDC Quarter-Phased Transit Curves

TCE 005214951-02 $P=385.880969$ Days $T_0=273.408446$ (BKJD)



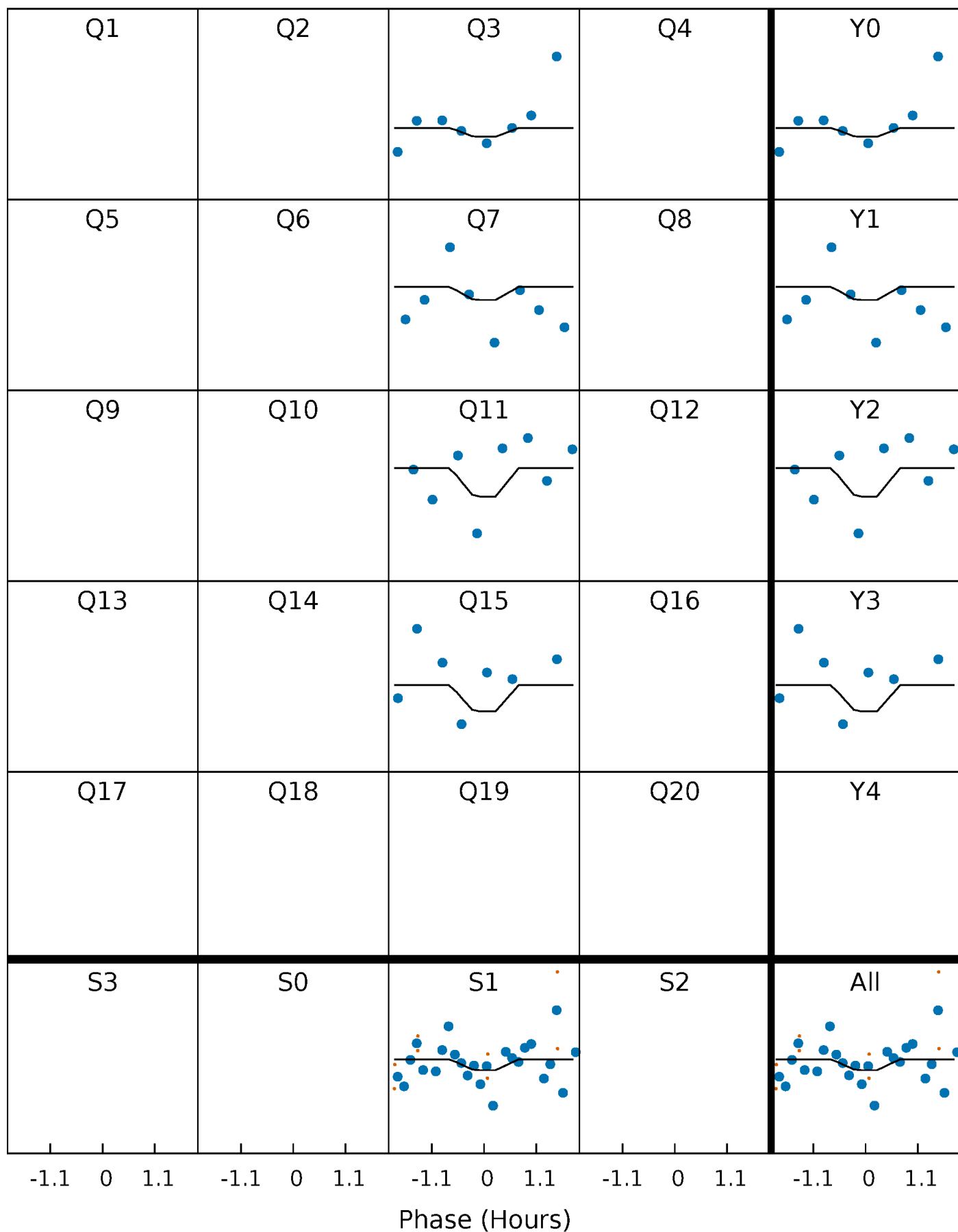
DV Quarter-Phased Transit Curves

TCE 005214951-02 P=385.880969 Days $T_0=273.408446$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

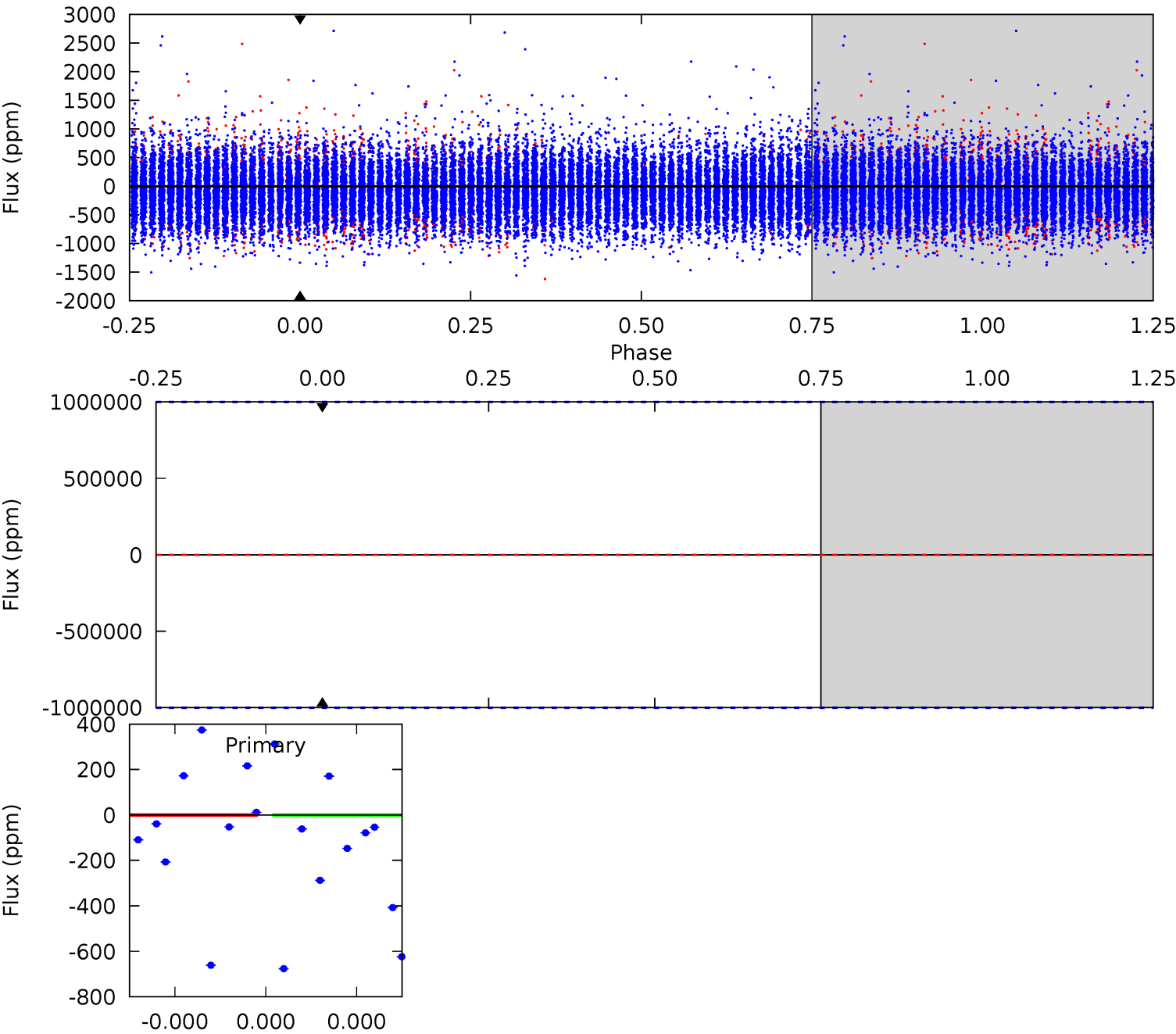
TCE 005214951-02 P=385.880969 Days $T_0=272.952075$ (BKJD)



DV Model-Shift Uniqueness Test

005214951-02, P = 385.880969 Days, E = 273.408446 Days

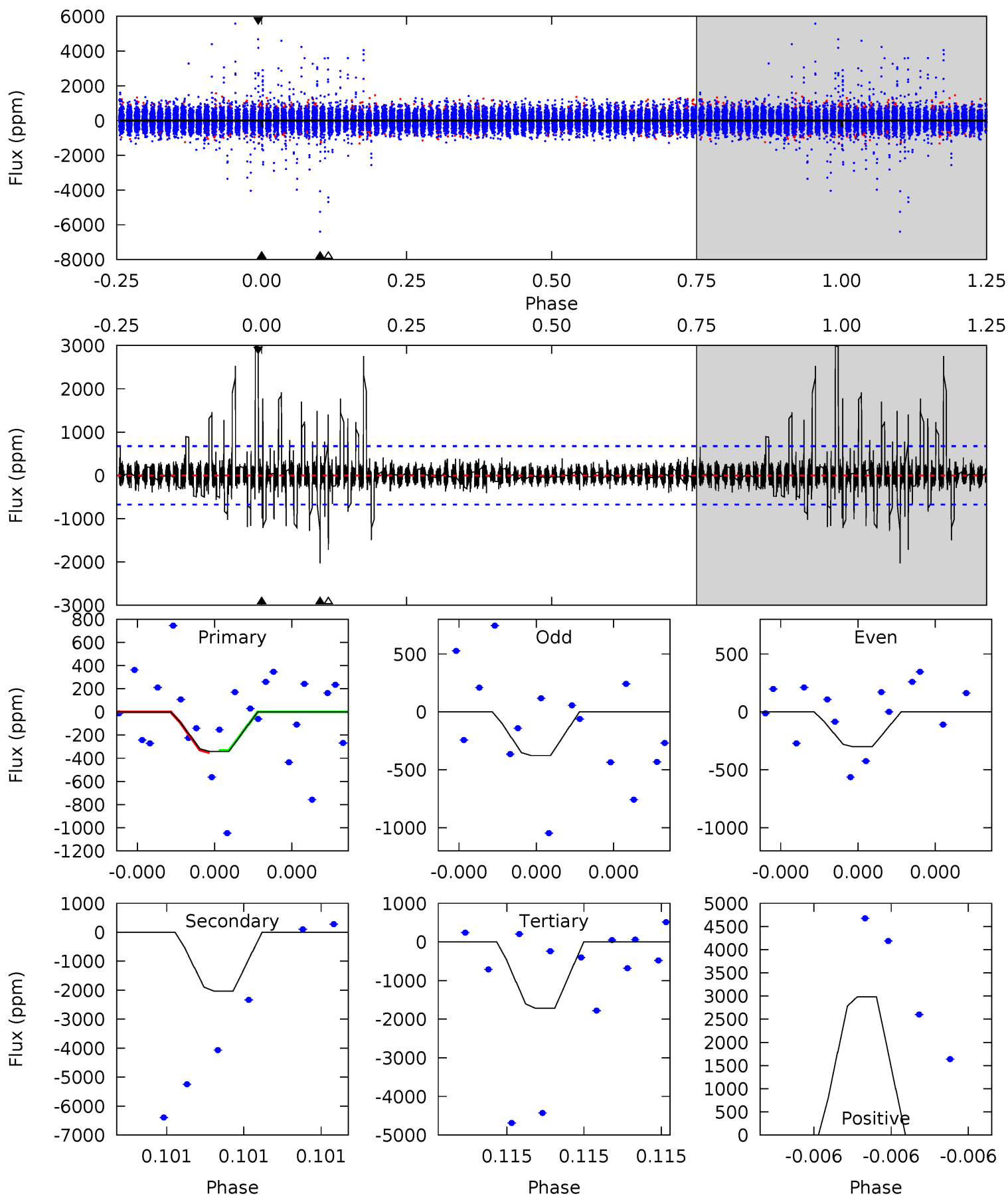
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|-----|-----|-----|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-----|-------|-----|
| 0 | 0 | 0 | 0 | 1.00 | 1.00 | 1.00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |



Alt Model-Shift Uniqueness Test

005214951-02, P = 385.880969 Days, E = 272.952075 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 2.93 | 17.4 | 14.8 | 25.6 | 5.79 | 3.81 | 1.39 | -11.8 | -22.7 | 2.67 | -8.18 | 0.31 | 1.07 | 0.59 | 0.08 |



Stellar Parameters For KIC 005214951

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | $R (R_{\odot})$ | $M(M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 5325^{+159}_{-159} | $4.489^{+0.095}_{-0.105}$ | $-0.140^{+0.300}_{-0.300}$ | $0.841^{+0.132}_{-0.099}$ | $0.796^{+0.104}_{-0.061}$ | $1.884^{+0.713}_{-0.611}$ |
| | +3%/-3% | +2%/-2% | +214%/-214% | +16%/-12% | +13%/-8% | +38%/-32% |
| Source | PHO1 | KIC0 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 005214951-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{max} (K)$ | $T_{obs} (K)$ | A_{obs} |
|---------|-----------------|------------------------|-------------------|---------------------------|--|
| DV | 0 ± 1000000 | $7.86^{+7.82}_{-5.06}$ | 307^{+15}_{-15} | -2374^{+16363}_{-10577} | $-348.092^{+1339047.302}_{-1080355.177}$ |
| Alt. | -2030 ± 116 | $6.72^{+7.32}_{-4.60}$ | 308^{+15}_{-14} | 4384^{+3107}_{-986} | $23021^{+193203}_{-17709}$ |

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 $A_{obs} \gg 1.0$

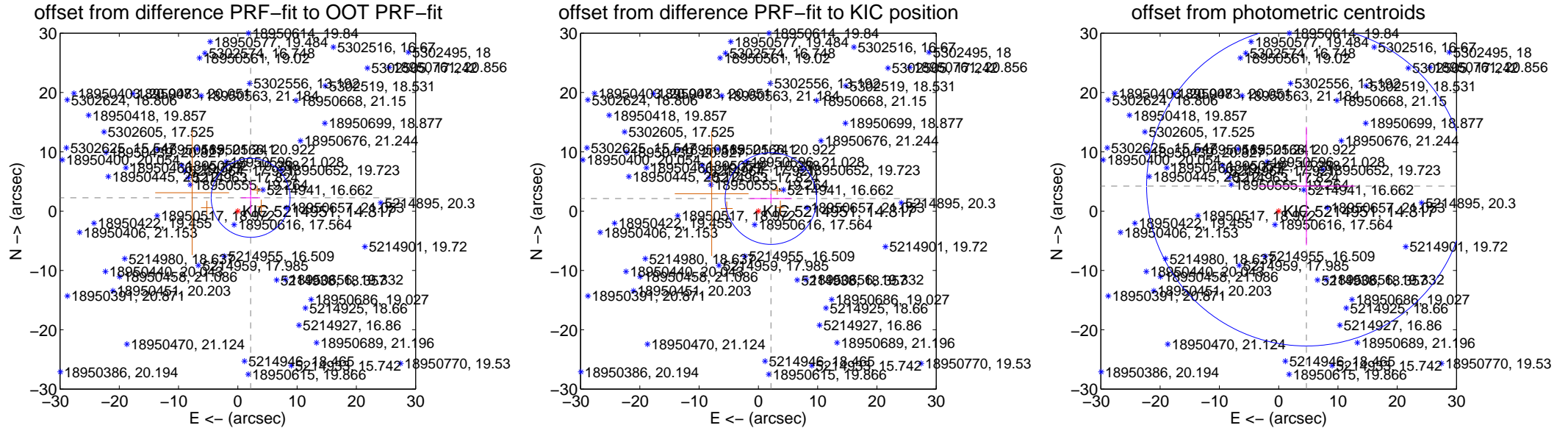
DV Centroid Data

Supplemental centroid analysis for 005214951-02. Kepler magnitude: 14.82. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

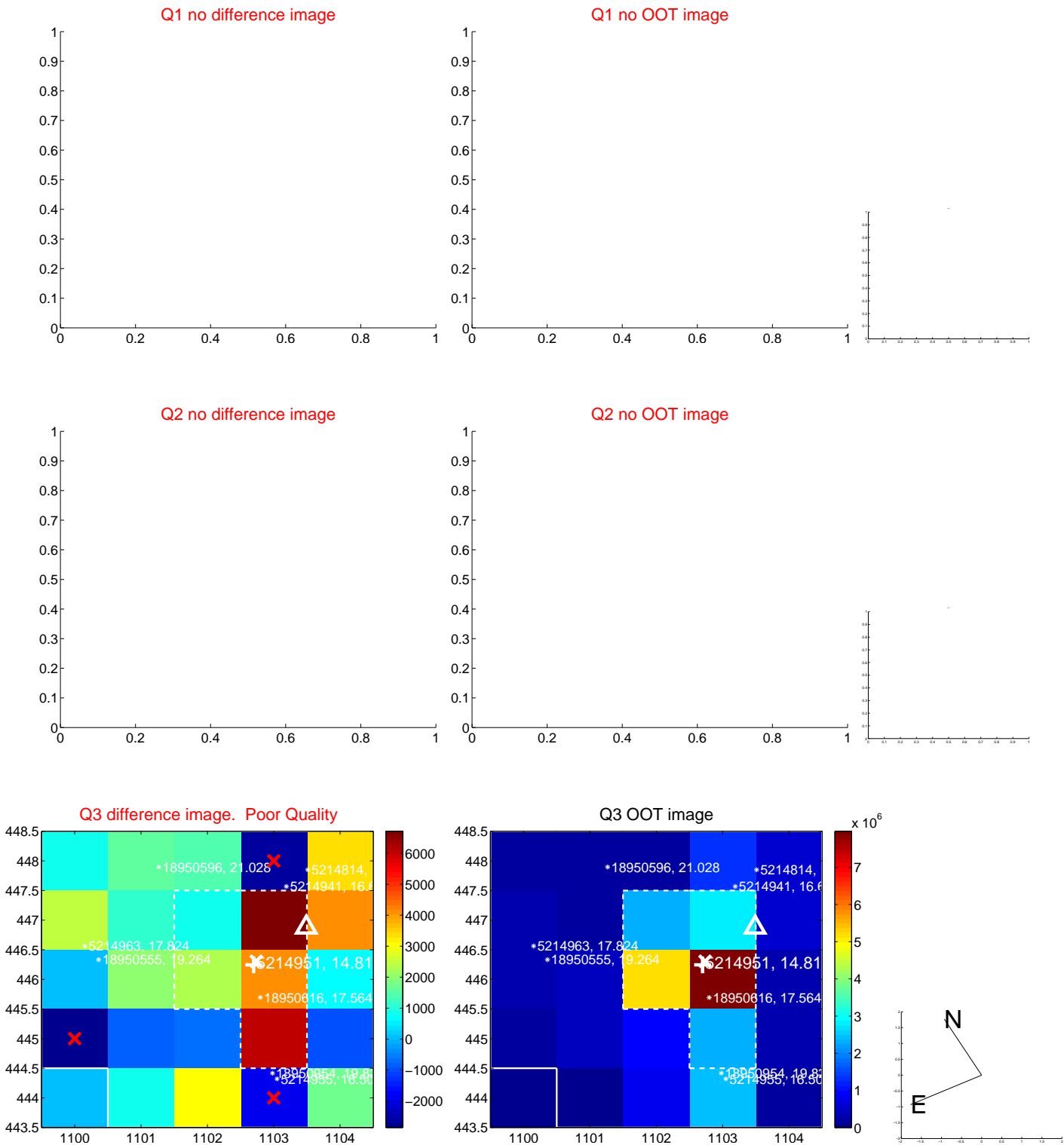
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 3.120 ± 2.219 | 1.41 | -2.166 ± 1.605 | 2.246 ± 2.666 |
| PRF-fit source offset from KIC position | 3.000 ± 2.576 | 1.16 | -2.122 ± 3.537 | 2.121 ± 0.773 |
| photometric centroid source offset | 6.30 ± 8.99 | 0.70 | -4.68 ± 8.09 | 4.23 ± 9.97 |

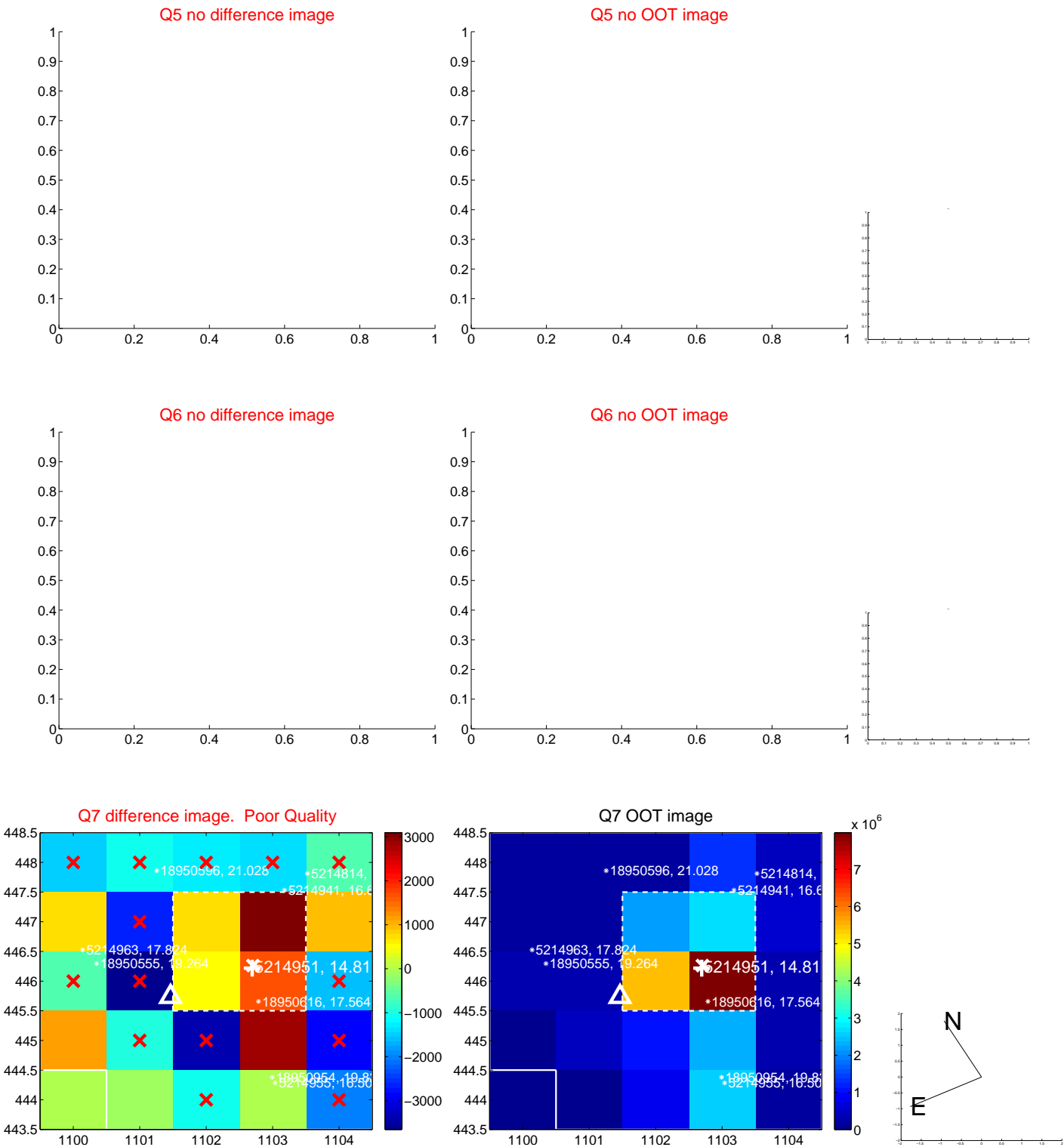


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

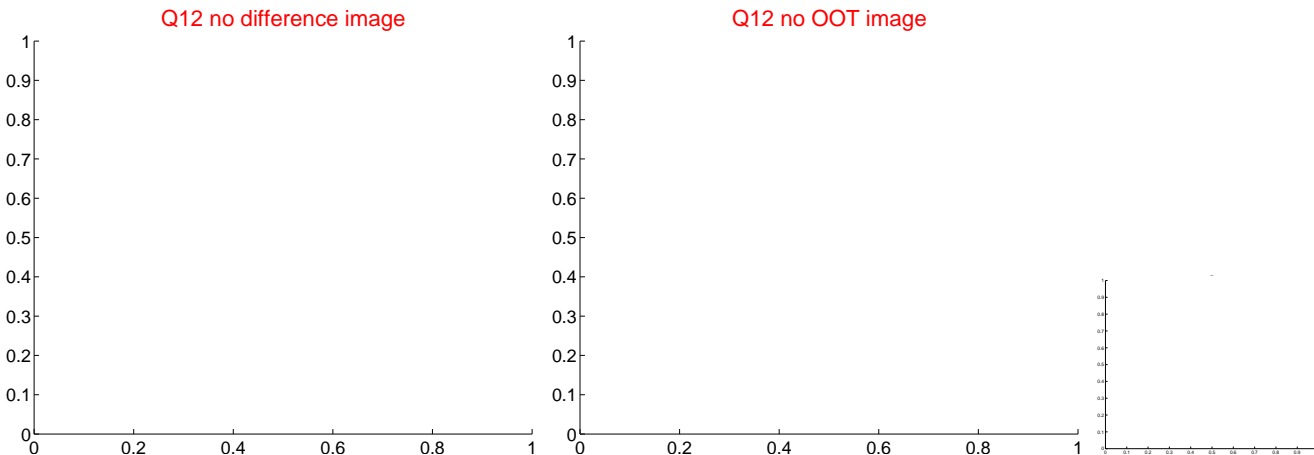
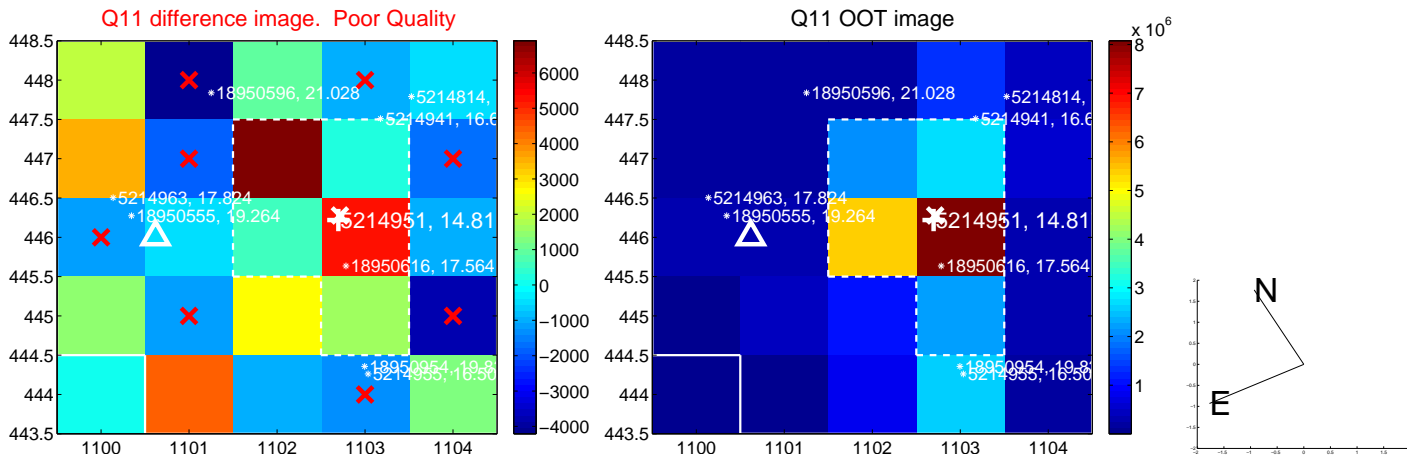
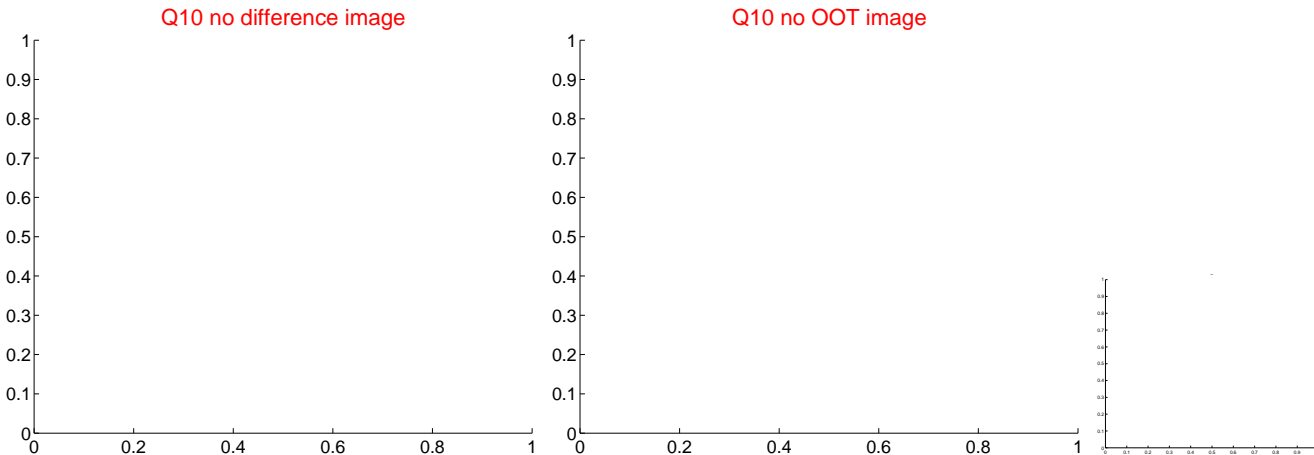
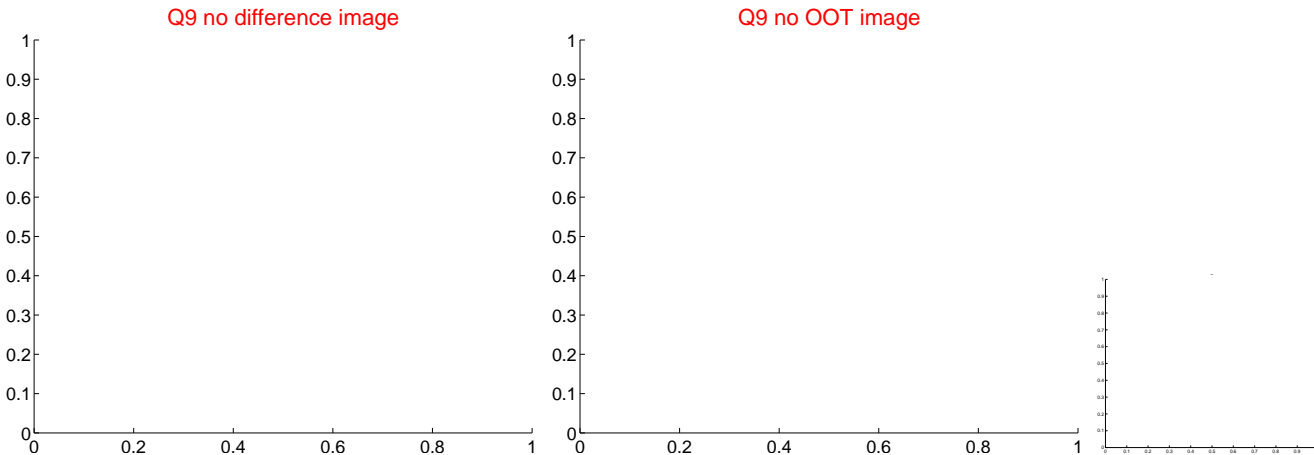
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



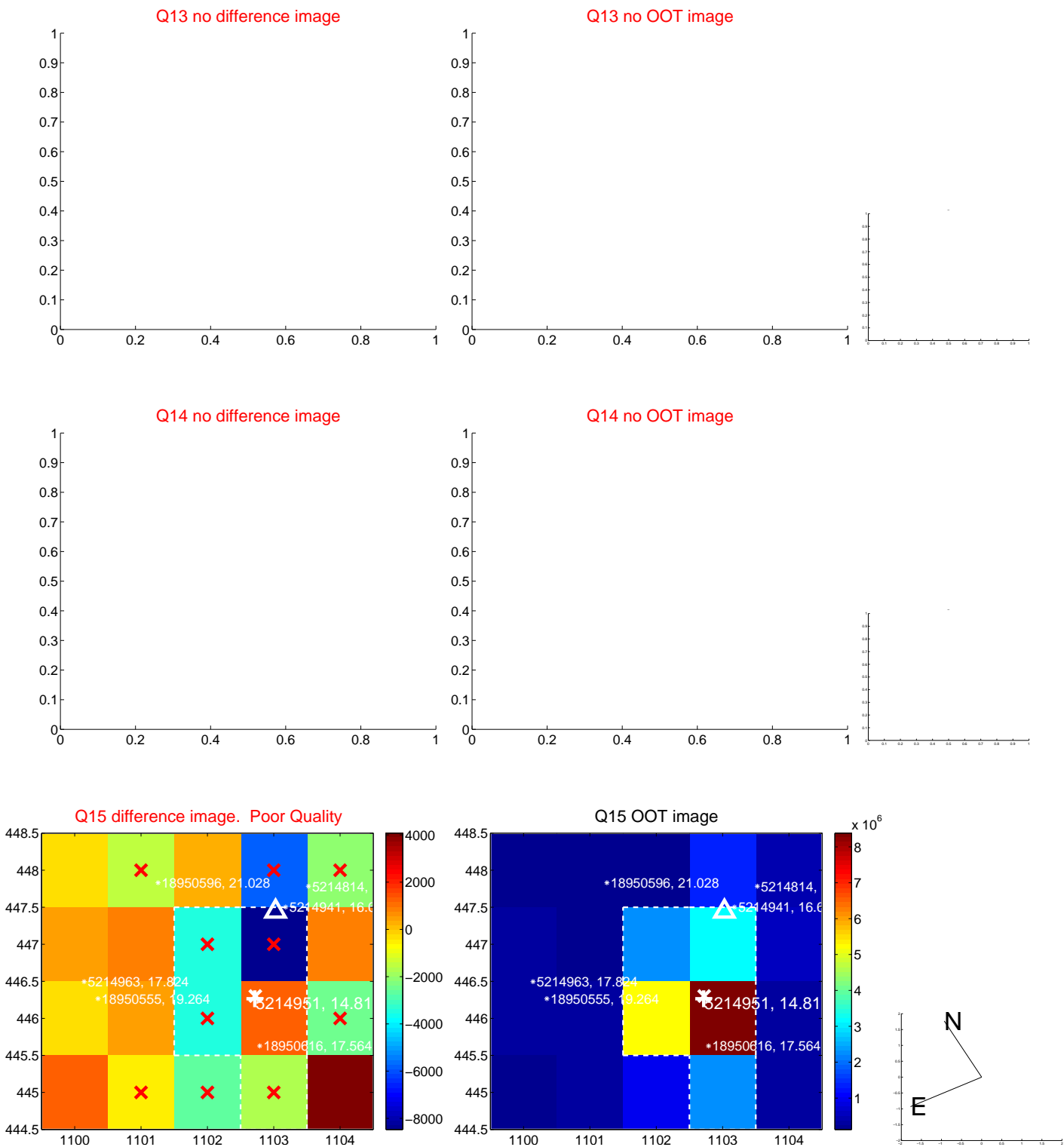
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



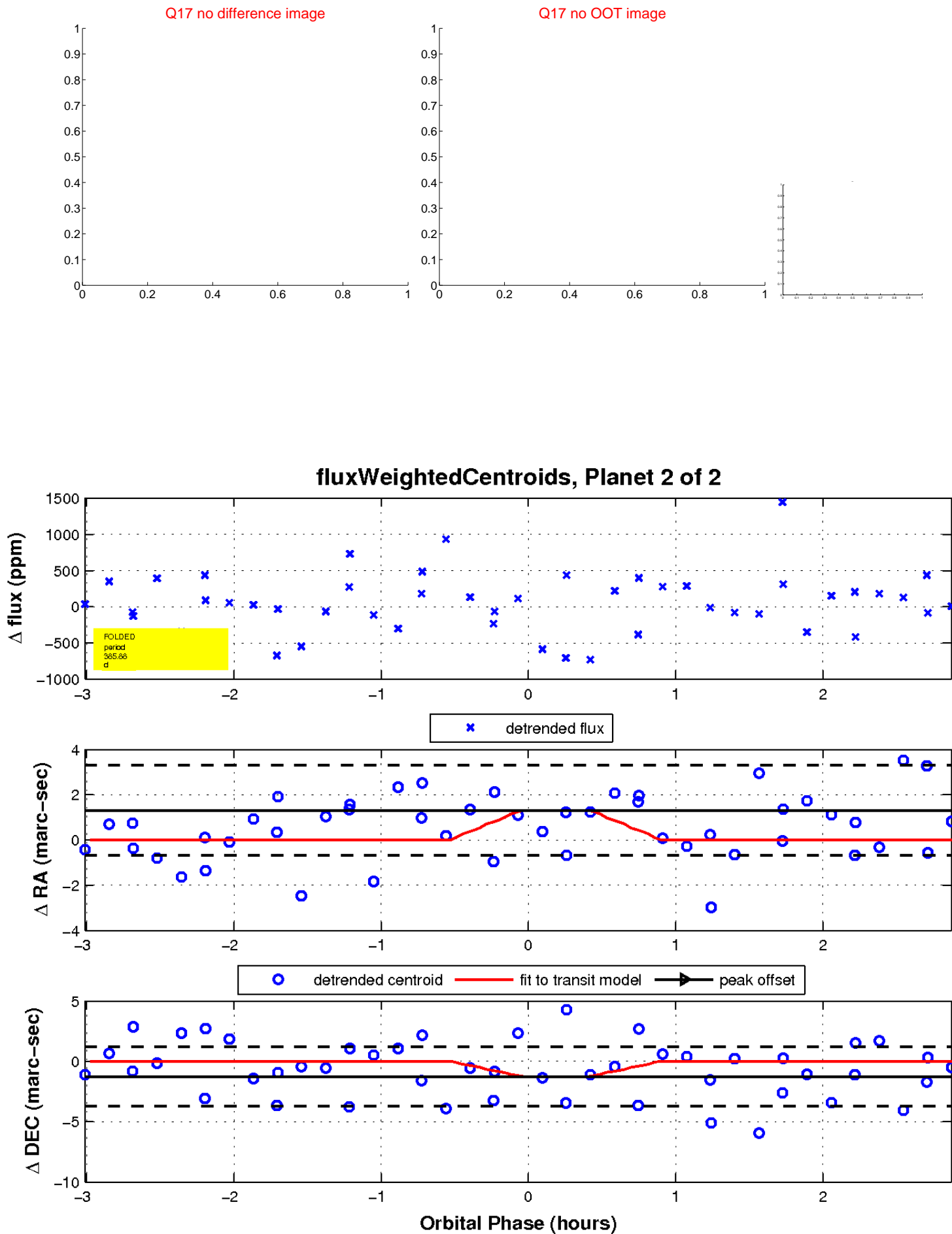
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



white ×: 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

