

KIC 009602421

Q1-17 DR25 TCE Parameters

| TCE | Run Type | KOI? | Period (Days) | Epoch (BKJD) | Depth (ppm) | Duration (Hours) | MES | SNR | R _★ (R _☉) | T _★ (K) | R _p (R _⊕) | S _p (S _⊕) |
|--------------|----------|---------|---------------|--------------|-------------|------------------|-----|-----|----------------------------------|--------------------|----------------------------------|----------------------------------|
| 009602421-01 | OBS | 4631.01 | 3.556670 | 133.491056 | 17.6 | 9.234 | 9.9 | 9.5 | 1.46 | 6018 | 0.72 | 1256.46 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|---------------------------------------|
| 009602421-01 | OBS | FP | 0.00 | 0 | 0 | 1 | 1 | CENT_FEW_DIFFS—HALO_GHOST—EPHEM_MATCH |

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

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

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

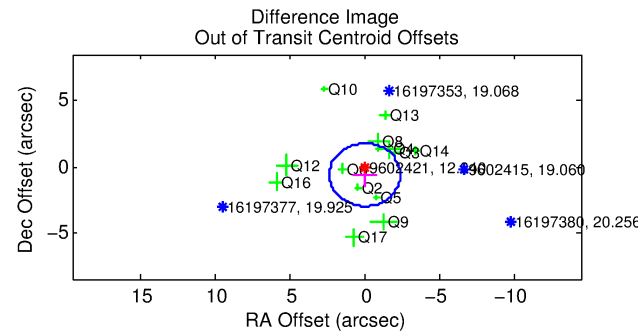
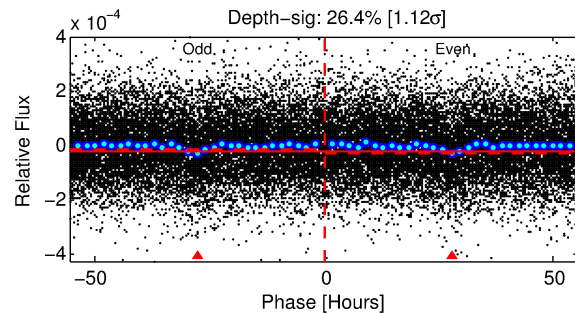
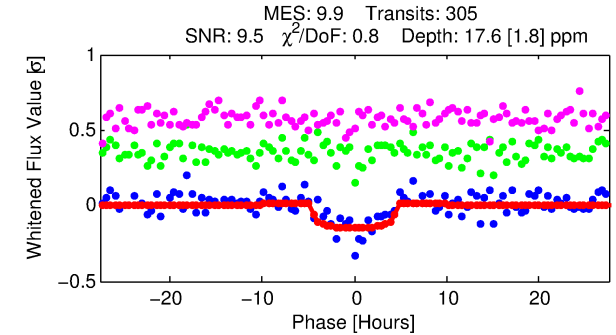
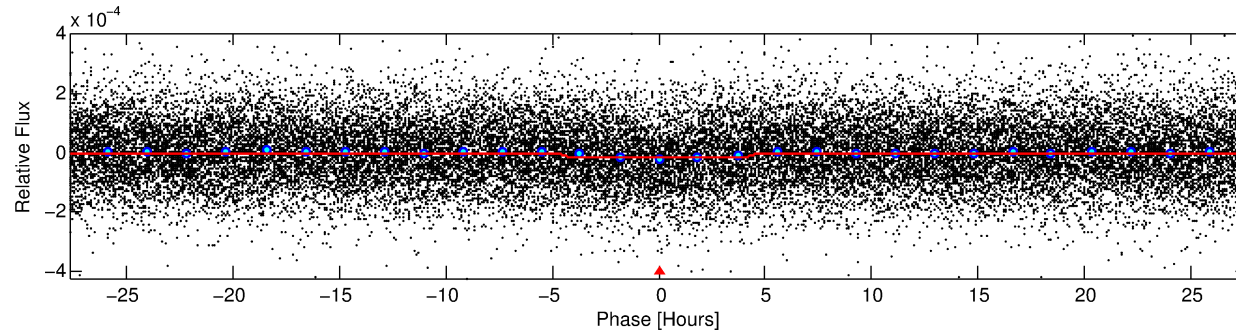
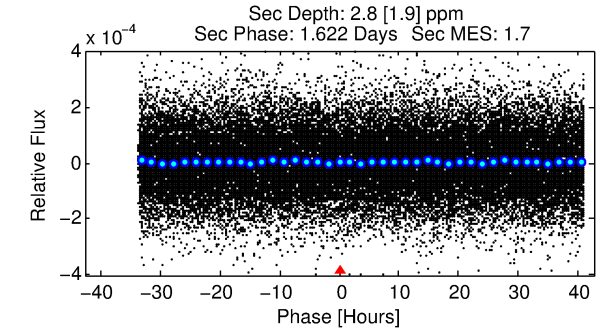
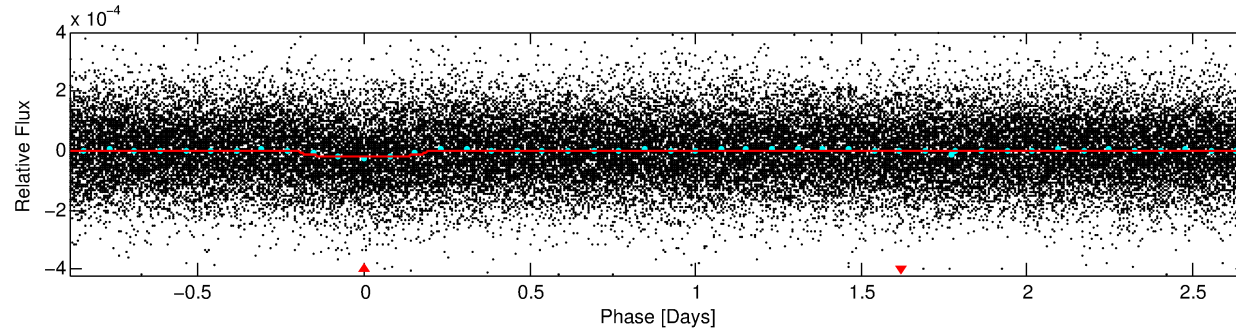
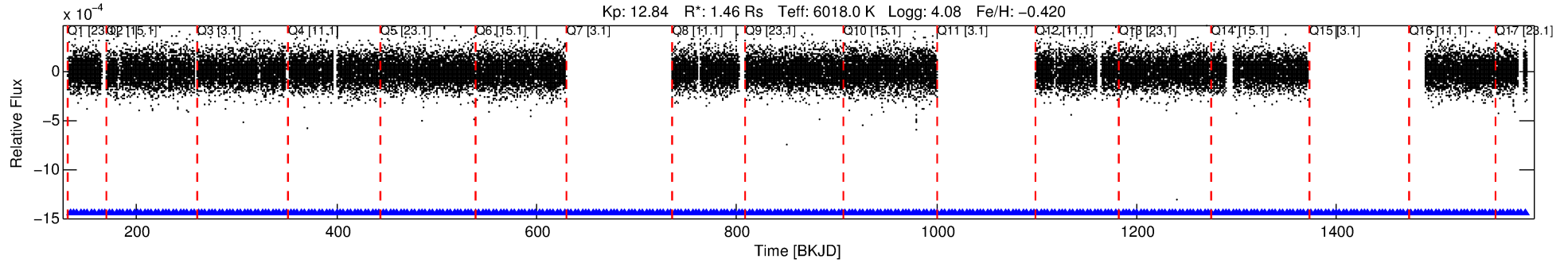
Ephemeris Match Information For 009602421-01

| TCE (1) | KIC | Parent (2) | Parent KIC | P ₁ :P ₂ | Dist (″) | ΔRow | ΔCol | m ₂ | m ₁ | D ₂ /D ₁ | Mechanism | Flag | σ _P | σ _T |
|--------------|---------|--------------|------------|--------------------------------|----------|------|------|----------------|----------------|--------------------------------|------------|------|----------------|----------------|
| 009602421-01 | 9602421 | V995-Cyg-pri | 9602595 | 1:1 | 134.2 | -34 | 1 | 11.88 | 12.84 | 42828.00 | Direct-PRF | 0 | 2.36 | 1.44 |

Notes: P₁:P₂ is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m₂ and m₁ are the magnitudes of the parent and child. D₂/D₁ is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant σ_P < 5.0 and σ_T < 5.0. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 9602421 Candidate: 1 of 1 Period: 3.557 d
KOI: K04631.01 Corr: 0.873



DV Fit Results:

Period = 3.55667 [0.00005] d
Epoch = 133.4911 [0.0098] BKJD
Rp/R* = 0.0045 [0.0012]
a/R* = 1.61 [1.48]
b = 0.90 [0.32]
Seff = 1256.46 [561.10]
Teq = 1518 [169] K
Rp = 0.72 [0.28] Re
a = 0.0446 [0.0120] AU
Ag = 6.03 [5.75] [0.87σ]
Teffp = 3678 [791] K [2.67σ]

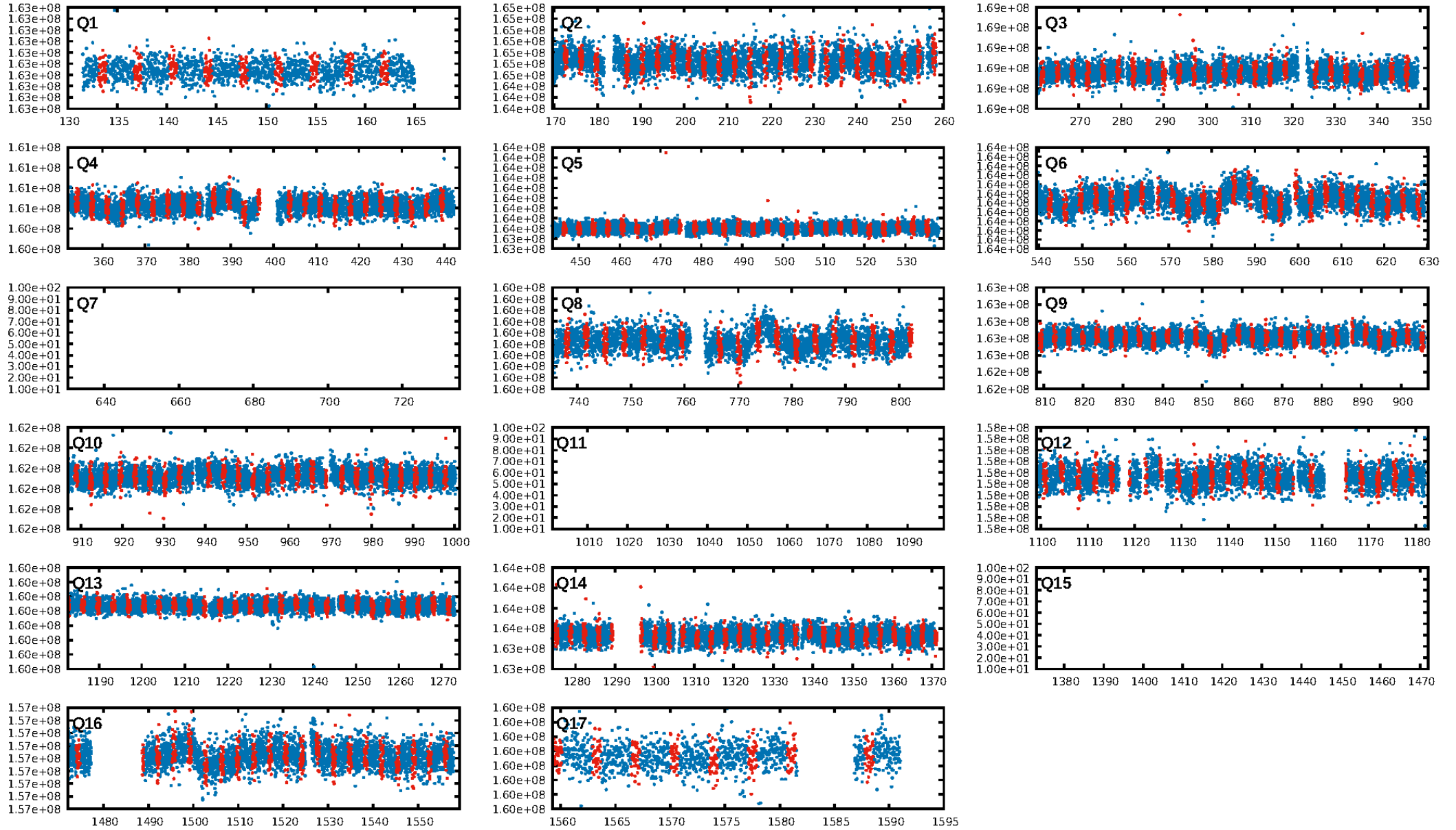
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.72e-22
RollingBand-fgt: 1.00 [288/288]
GhostDiagnostic-chr: 0.05087
Centroid-sig: 0.0%
Centroid-so: 6.680 arcsec [5.12σ]
OotOffset-rm: 0.626 arcsec [0.79σ]
KicOffset-rm: 0.436 arcsec [0.55σ]
OotOffset-st: 4/1/4/4 [13]
KicOffset-st: 4/1/4/4 [13]
DiffImageQuality-fgm: 0.15 [2/13]
DiffImageOverlap-fno: 1.00 [14/14]

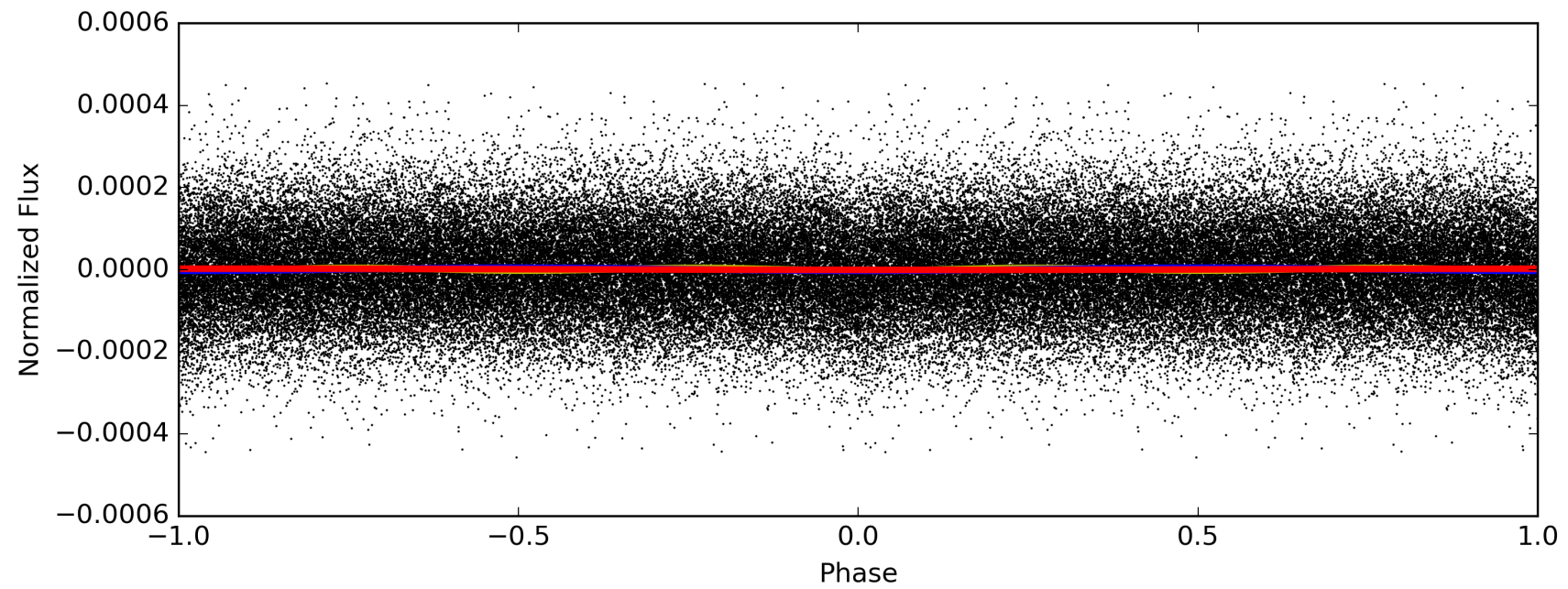
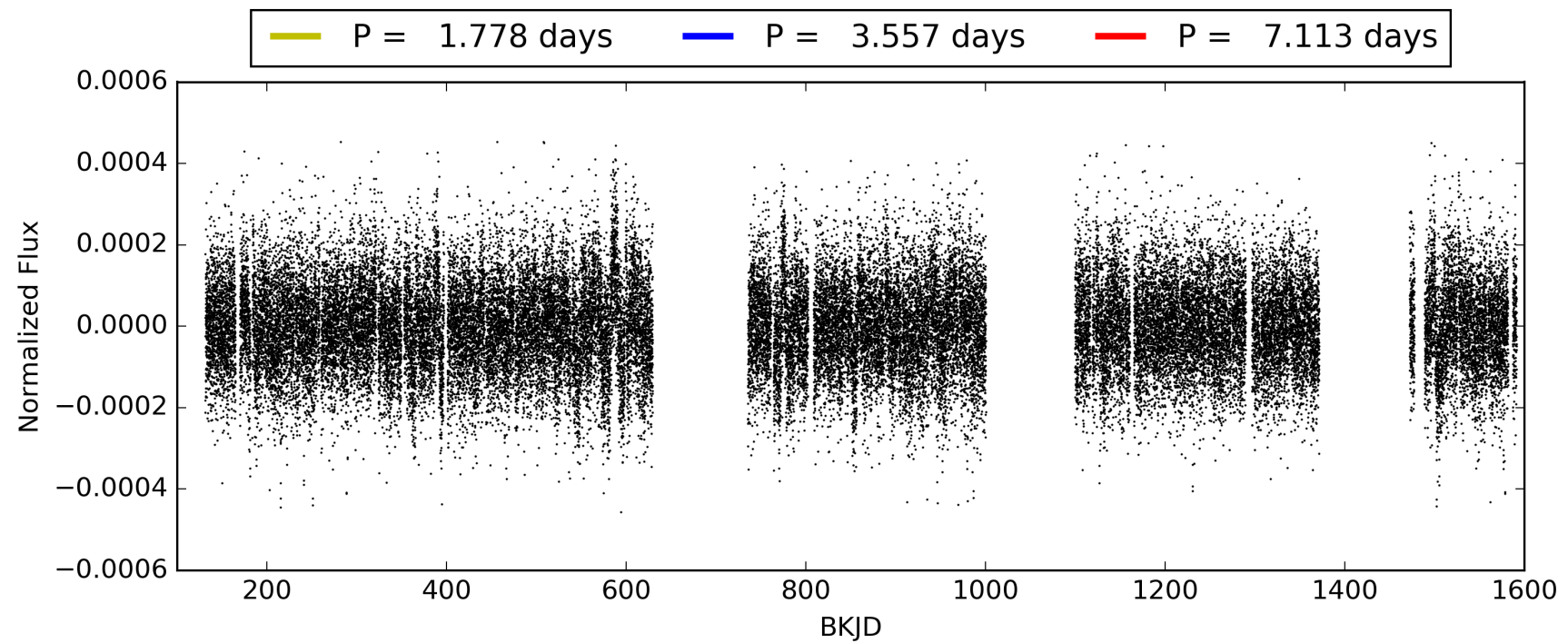
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 09:29:55 Z

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

TCE 009602421-01, PDC Light Curves

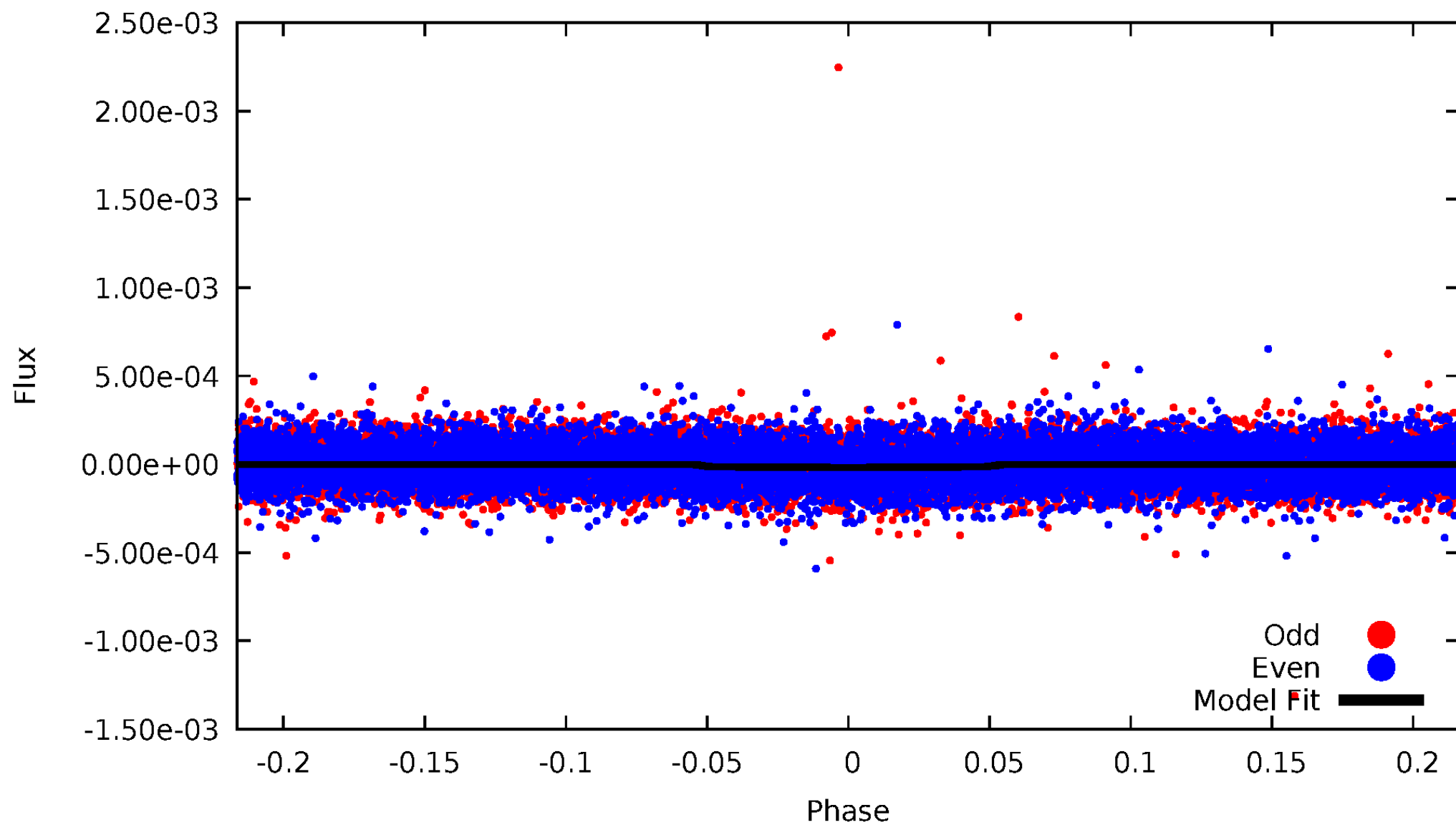


TCE 009602421-01



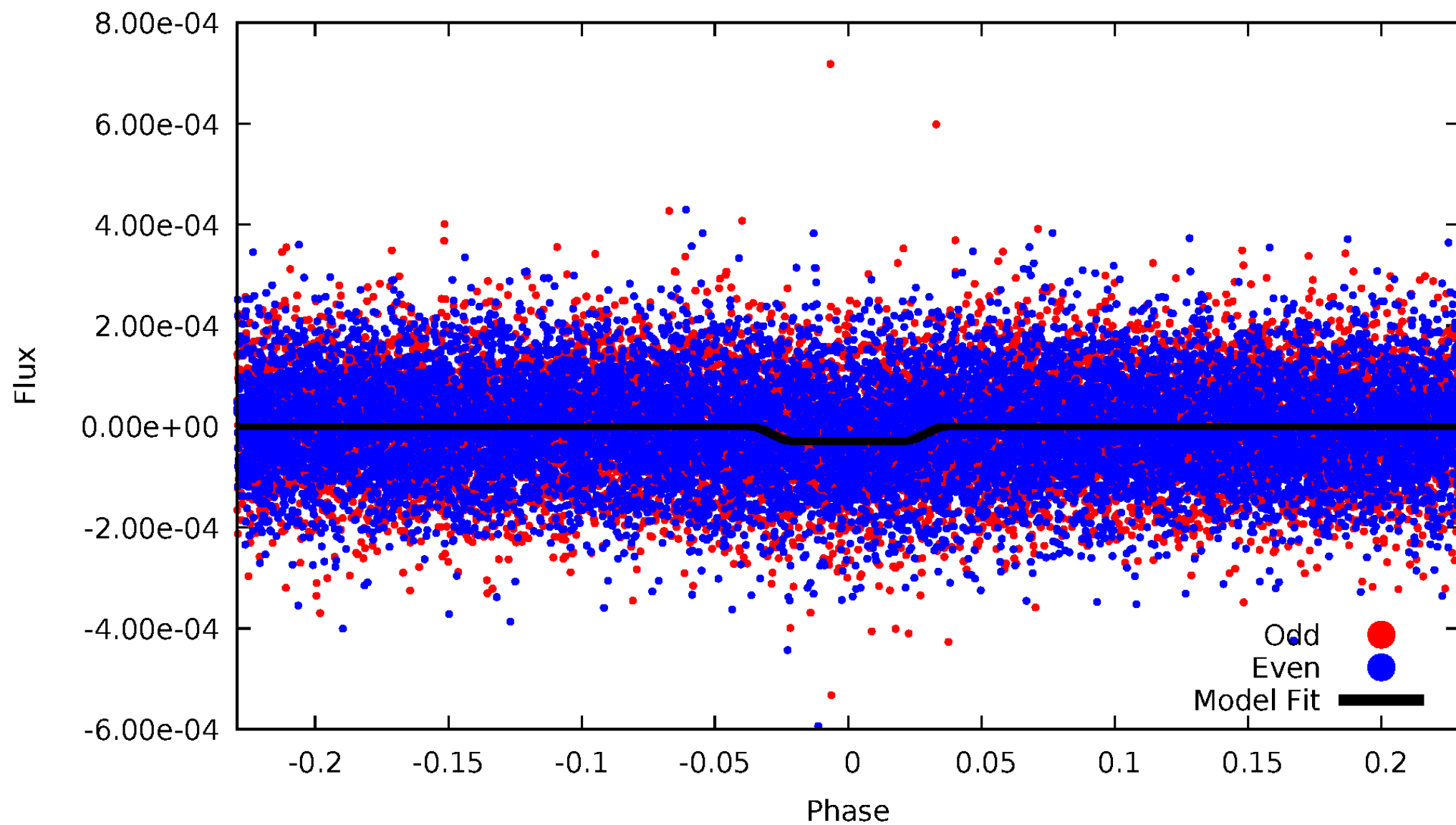
DV Odd/Even

TCE 009602421-01



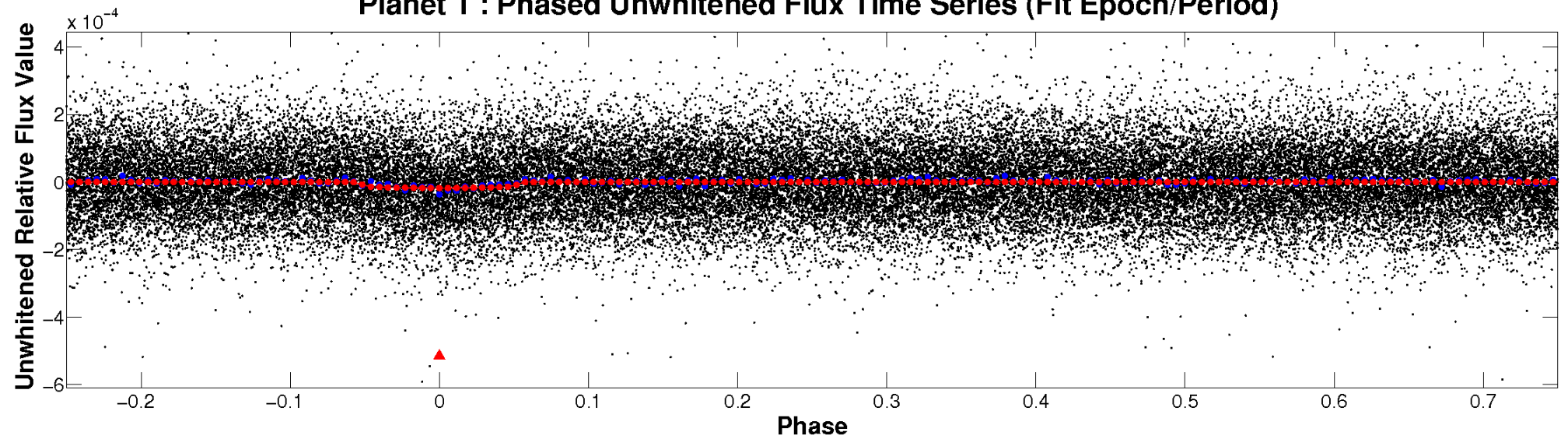
ALT Odd/Even

TCE 009602421-01

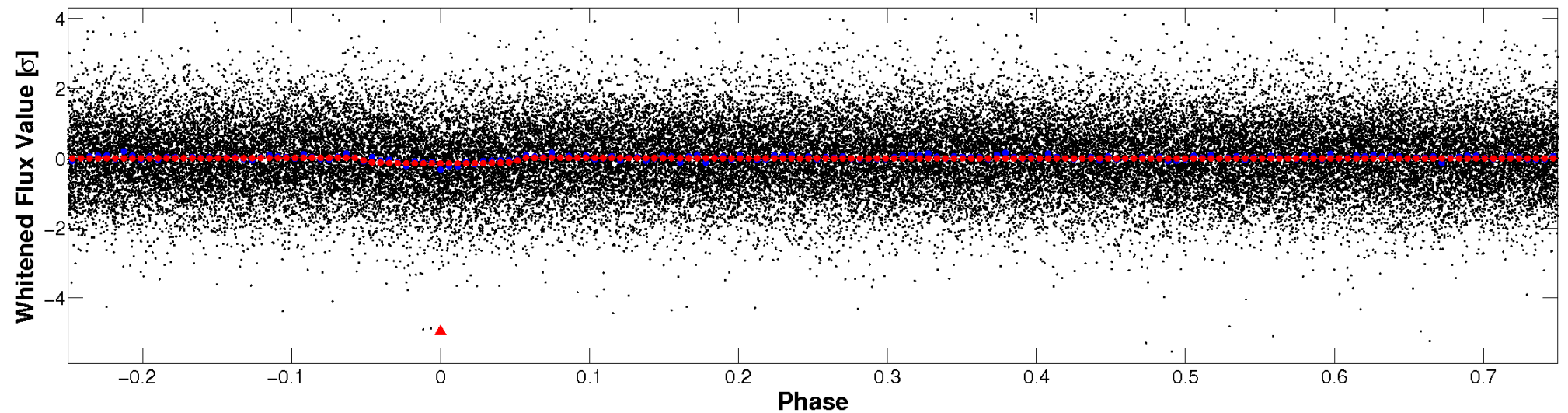


Non-Whitened Vs. Whitened Light Curve

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

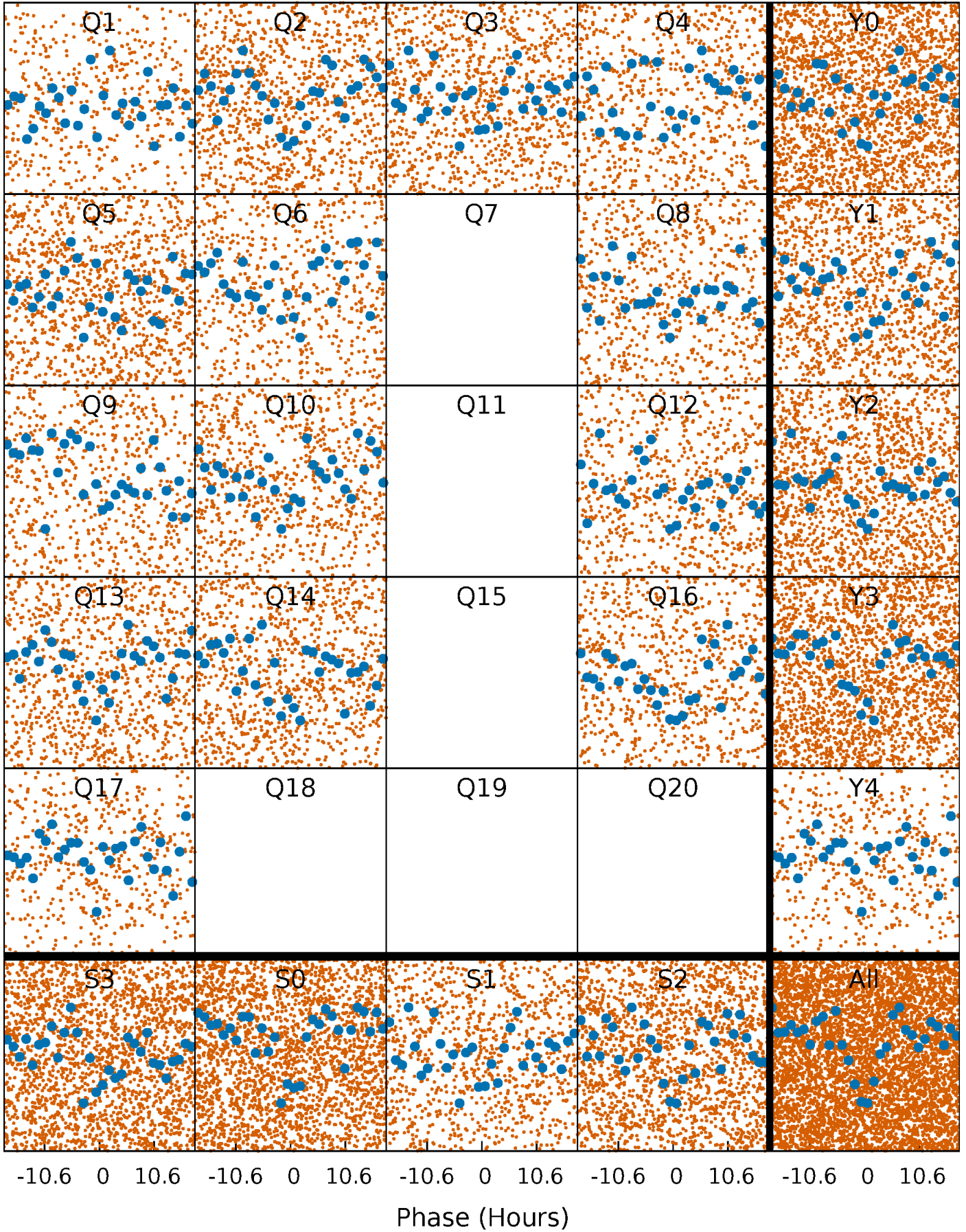


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



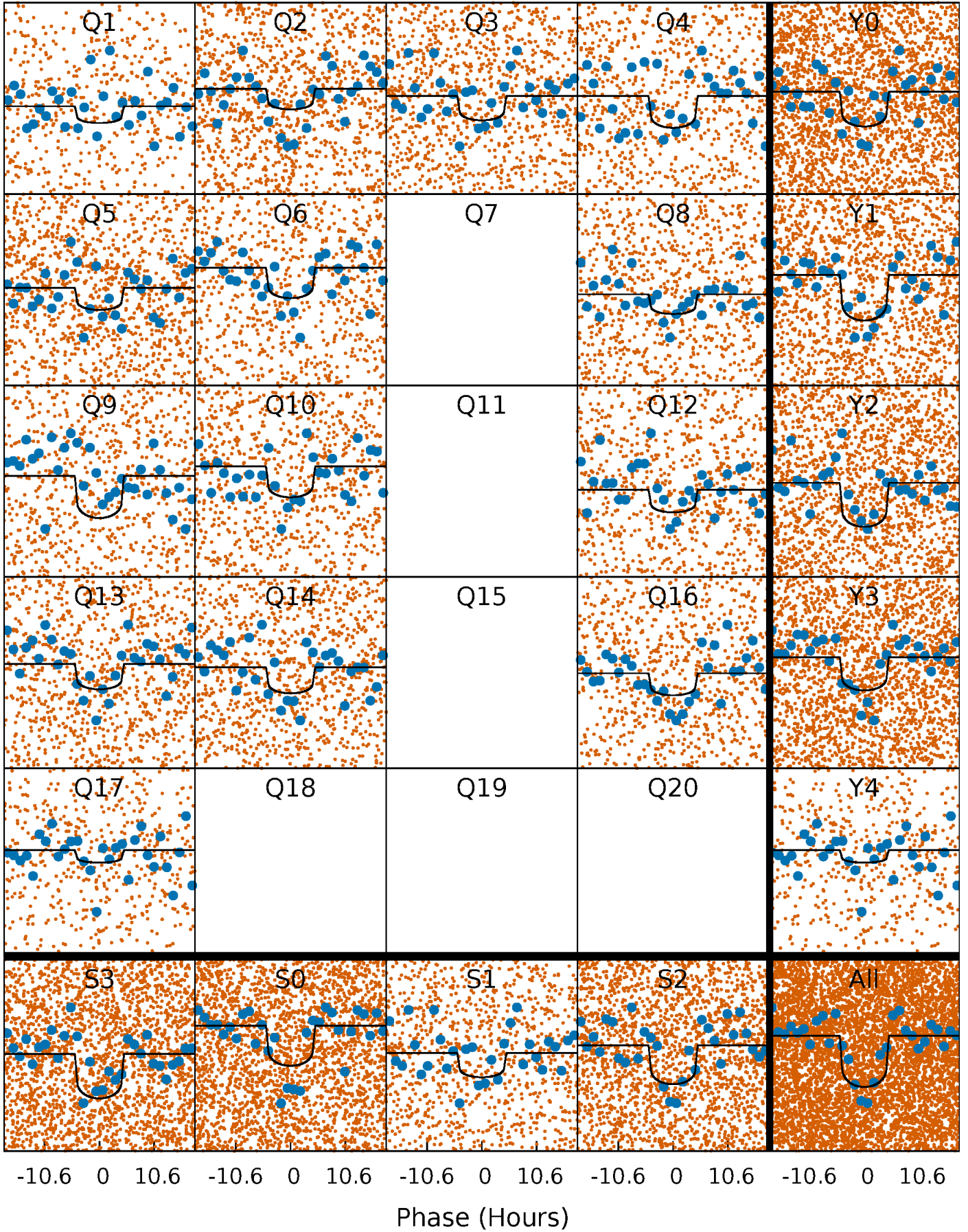
PDC Quarter-Phased Transit Curves

TCE 009602421-01 P= 3.556670 Days $T_0=133.491056$ (BKJD)



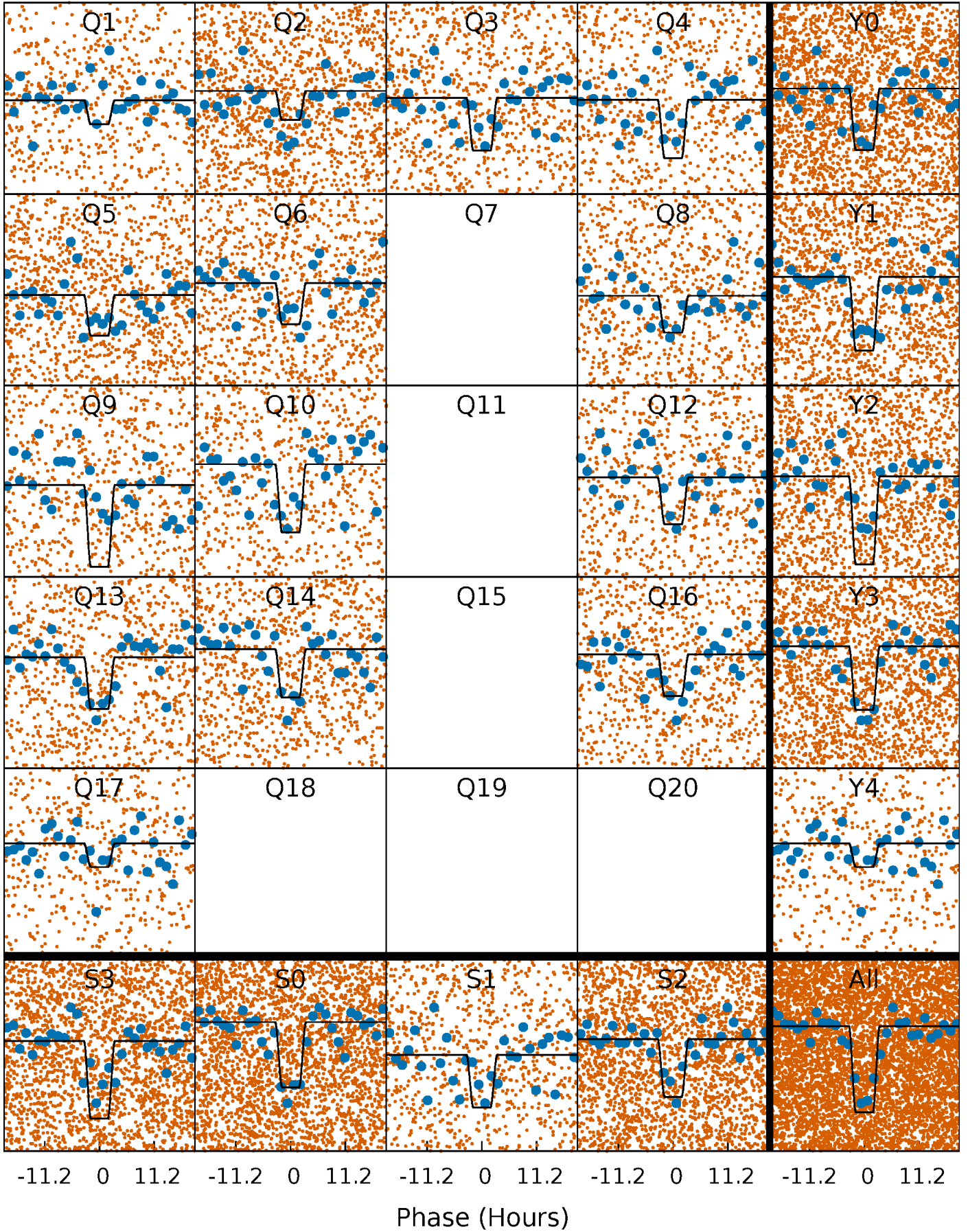
DV Quarter-Phased Transit Curves

TCE 009602421-01 P= 3.556670 Days $T_0=133.491056$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

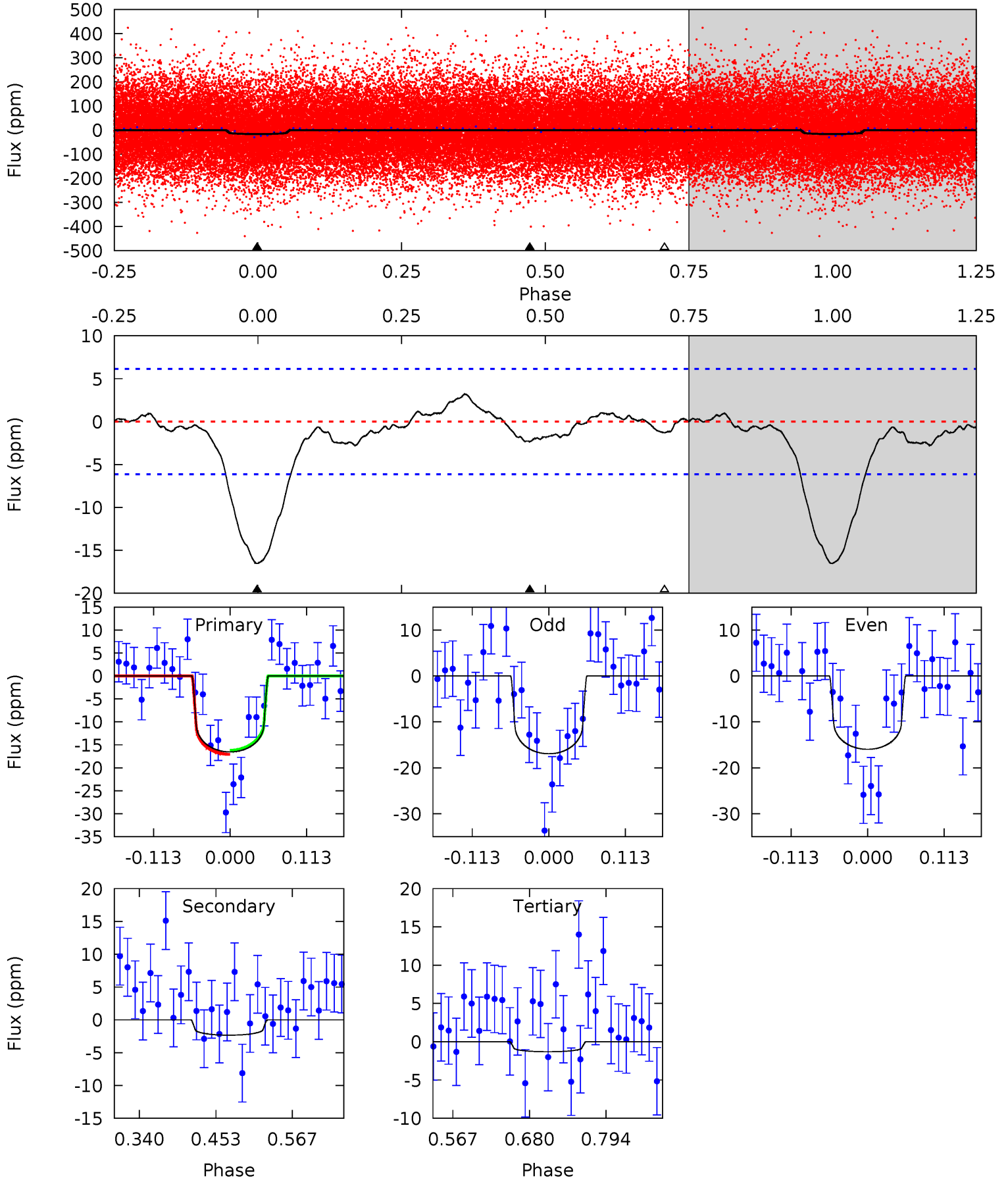
TCE 009602421-01 P= 3.556634 Days $T_0=133.498971$ (BKJD)



DV Model-Shift Uniqueness Test

009602421-01, P = 3.556670 Days, E = 129.934386 Days

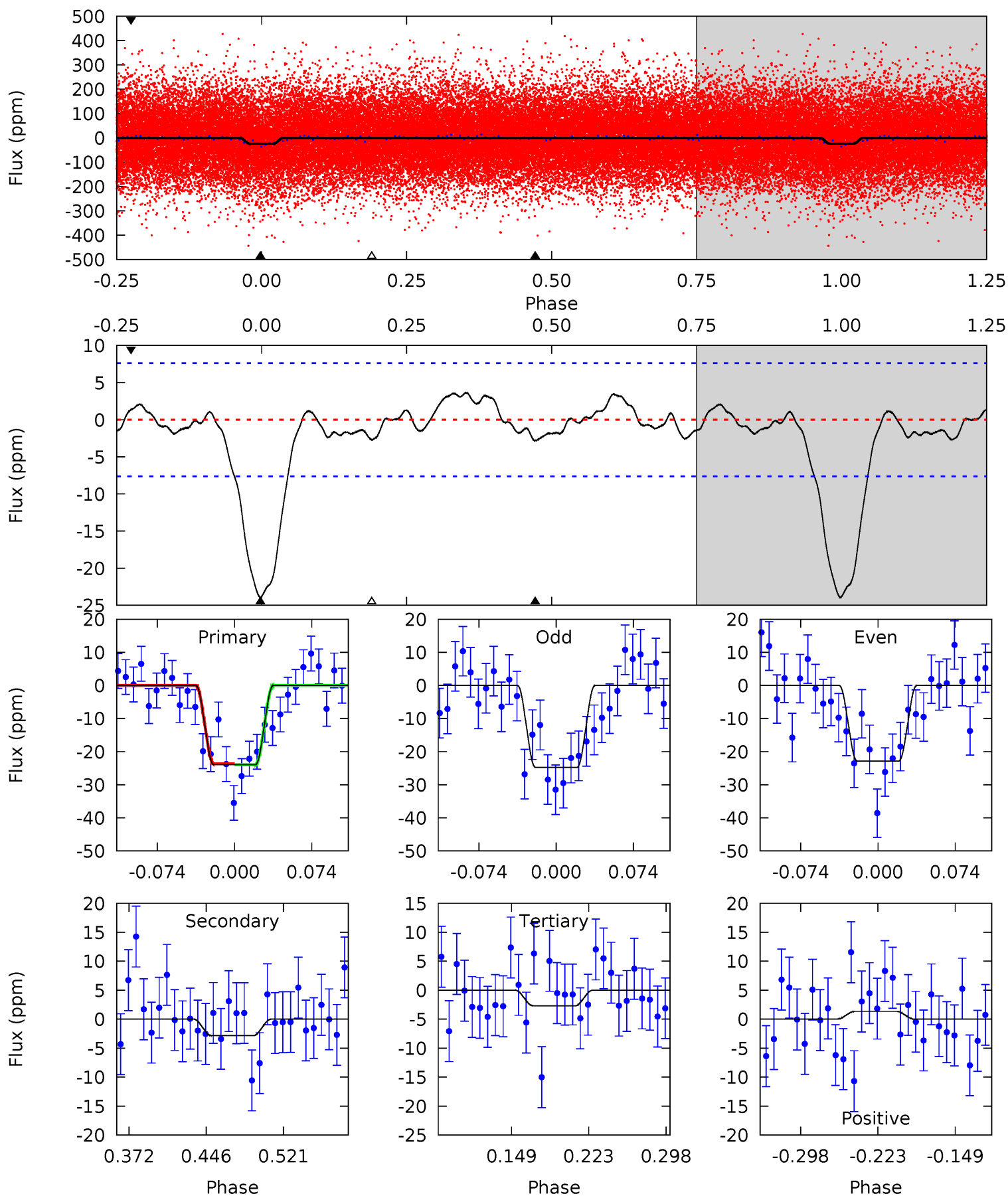
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|-----|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.2 | 1.73 | 0.97 | 0 | 4.54 | 1.58 | 0.90 | 11.3 | 12.2 | 0.76 | 1.73 | 0.36 | 0.96 | 0.16 | 0.33 |



Alt Model-Shift Uniqueness Test

009602421-01, P = 3.556634 Days, E = 129.942337 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 14.5 | 1.72 | 1.64 | 0.81 | 4.63 | 1.78 | 1.04 | 12.9 | 13.7 | 0.08 | 0.91 | 0.58 | 1.01 | 0.13 | 0.07 |



Stellar Parameters For KIC 009602421

| | $T_{\text{eff}}(K)$ | $\log(g)$ | [Fe/H] | R (R_{\odot}) | $M(M_{\odot})$ | p_{\star} ($\text{g}\cdot\text{cm}^{-3}$) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
| | 6018^{+181}_{-163} | $4.081^{+0.253}_{-0.136}$ | $-0.420^{+0.350}_{-0.250}$ | $1.458^{+0.330}_{-0.404}$ | $0.934^{+0.155}_{-0.096}$ | $0.424^{+0.671}_{-0.172}$ |
| | +3%/-3% | +6%/-3% | +83%/-60% | +23%/-28% | +17%/-10% | +158%/-41% |
| Source | PHO1 | FLK73 | KIC0 | DSEP | | |

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

Secondary Eclipse Parameters for KIC 009602421-01 / KOI 4631.01

| Detrend | Depth (ppm) | R_p (R_{\oplus}) | T_{max} (K) | T_{obs} (K) | A_{obs} |
|---------|-------------|------------------------|----------------------|----------------------|---------------------------|
| DV | -2 ± 1 | $0.70^{+0.23}_{-0.21}$ | 2103^{+136}_{-156} | 3810^{+624}_{-669} | $5.069^{+7.263}_{-3.460}$ |
| Alt. | -3 ± 2 | $0.86^{+0.24}_{-0.22}$ | 2113^{+128}_{-165} | 3677^{+483}_{-574} | $4.112^{+4.271}_{-2.667}$ |

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

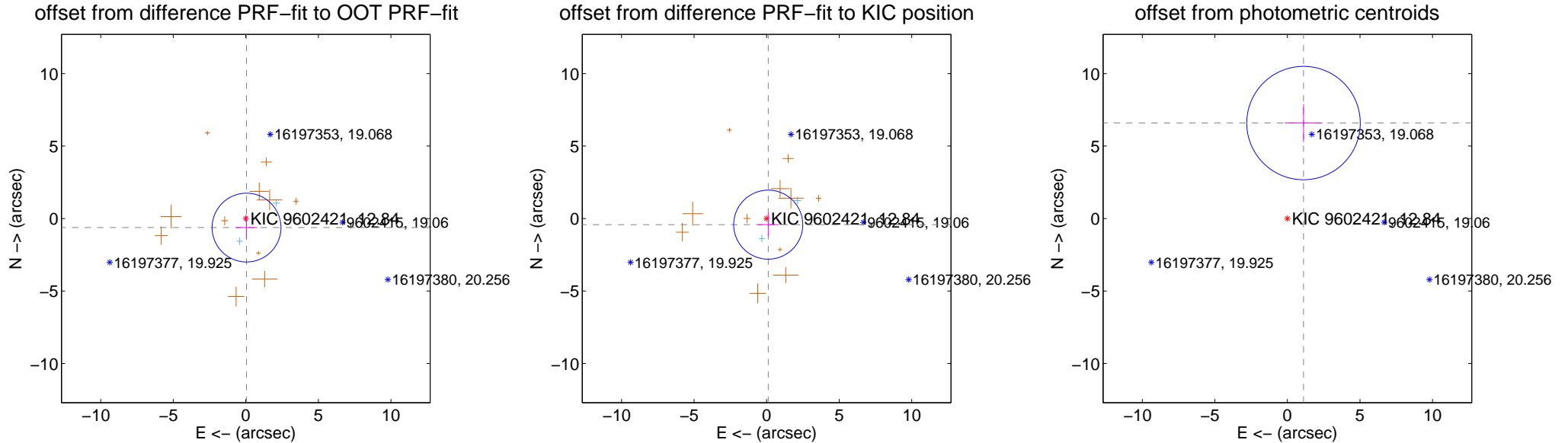
DV Centroid Data

Supplemental centroid analysis for 009602421-01. Kepler magnitude: 12.84. Transit SNR 9.54

There are 2 quarters with good PRF difference image offsets

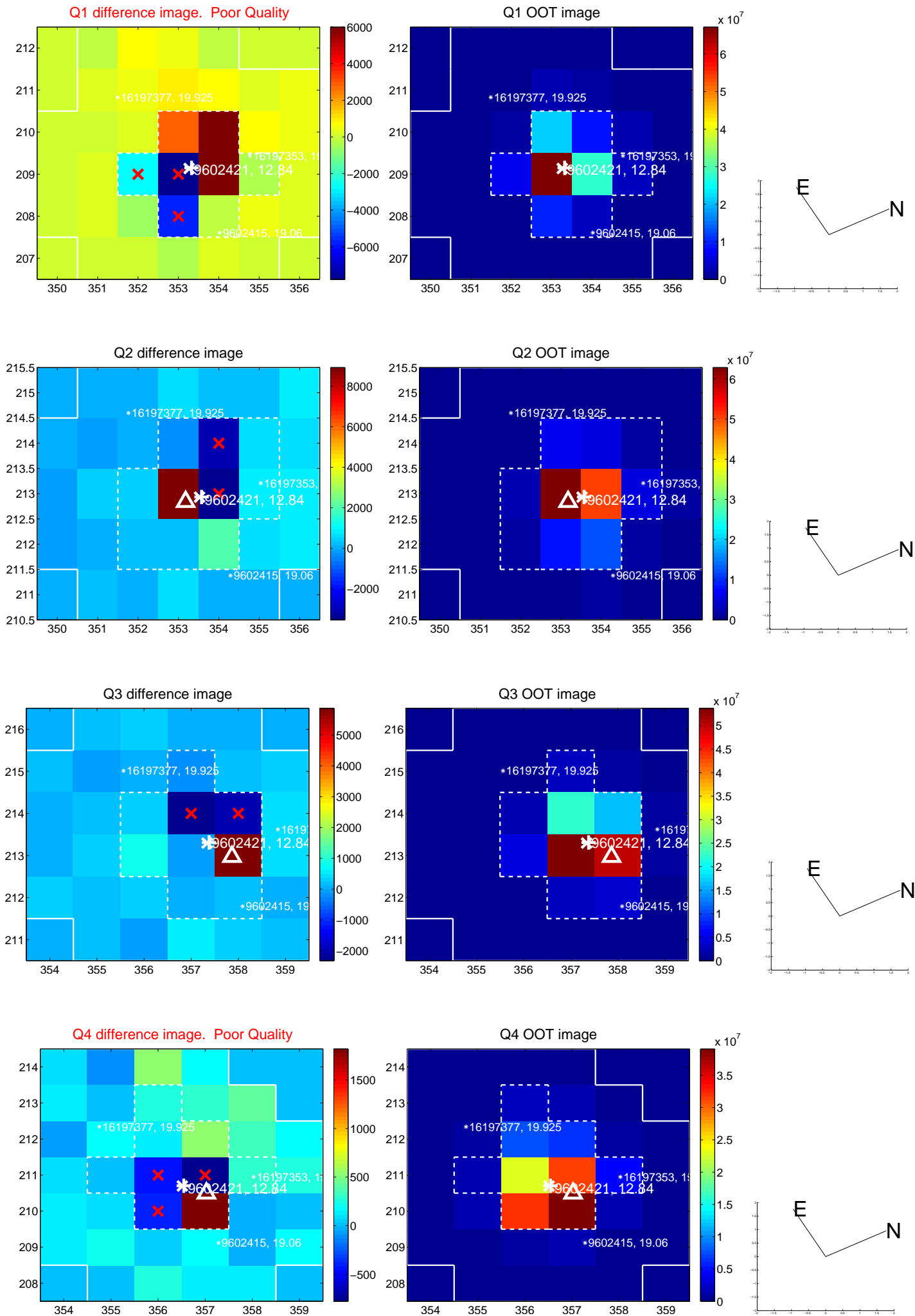
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 0.626 ± 0.791 | 0.79 | -0.047 ± 0.735 | -0.624 ± 0.796 |
| PRF-fit source offset from KIC position | 0.436 ± 0.793 | 0.55 | -0.108 ± 0.723 | -0.423 ± 0.802 |
| photometric centroid source offset | 6.68 ± 1.30 | 5.12 | -1.11 ± 1.30 | 6.59 ± 1.30 |

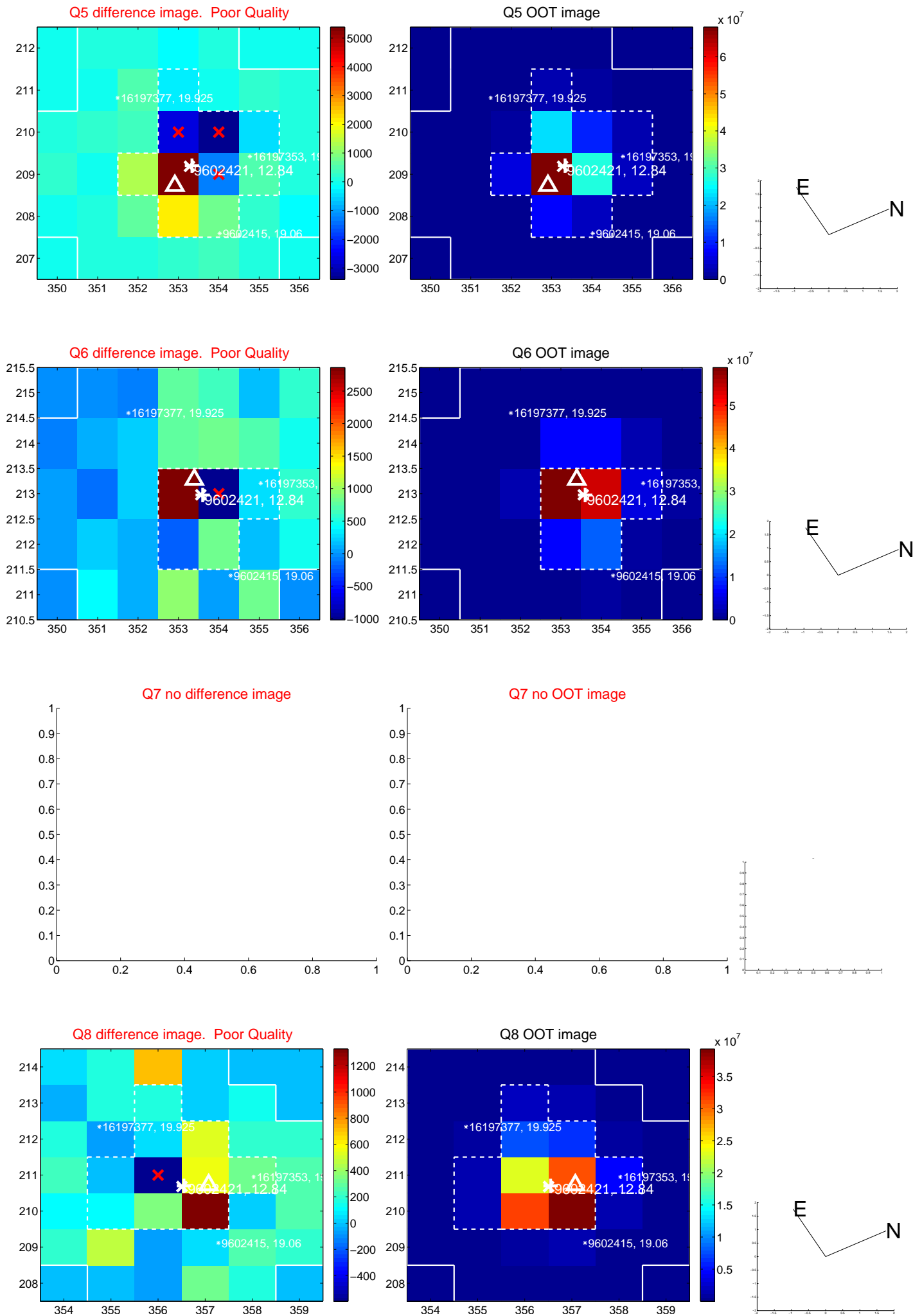


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

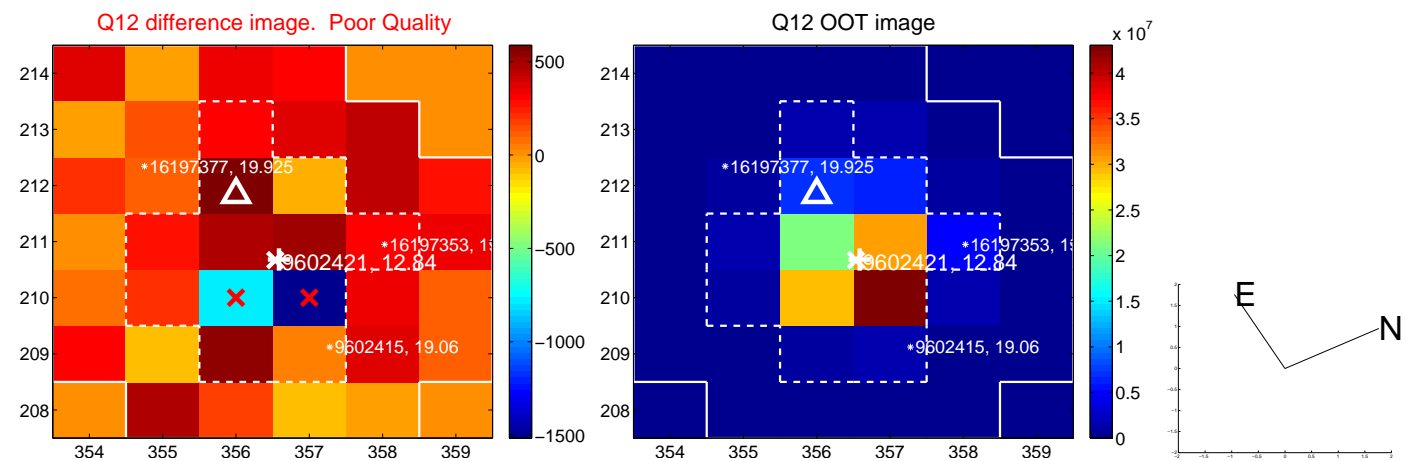
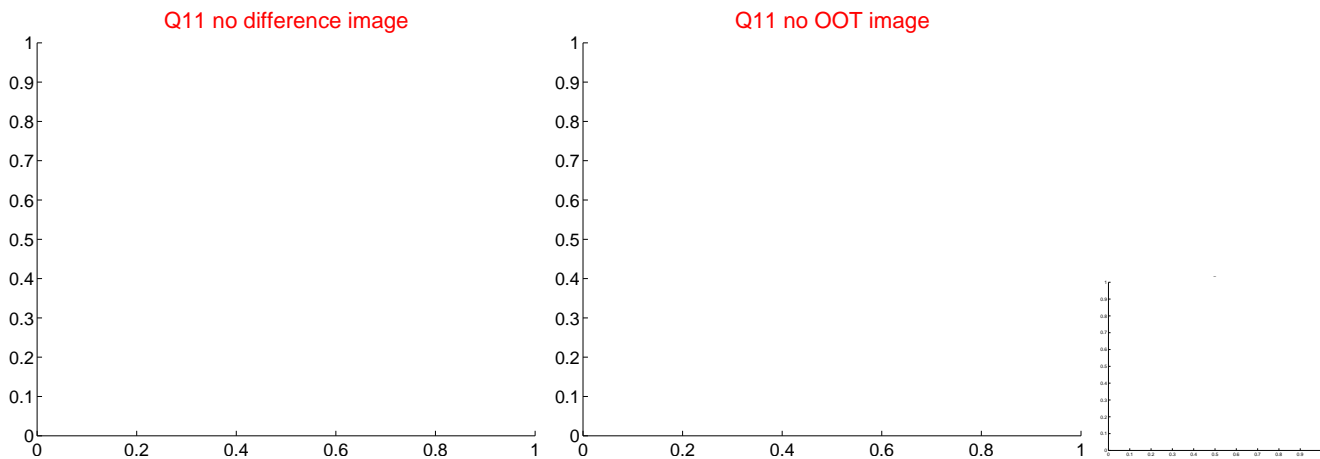
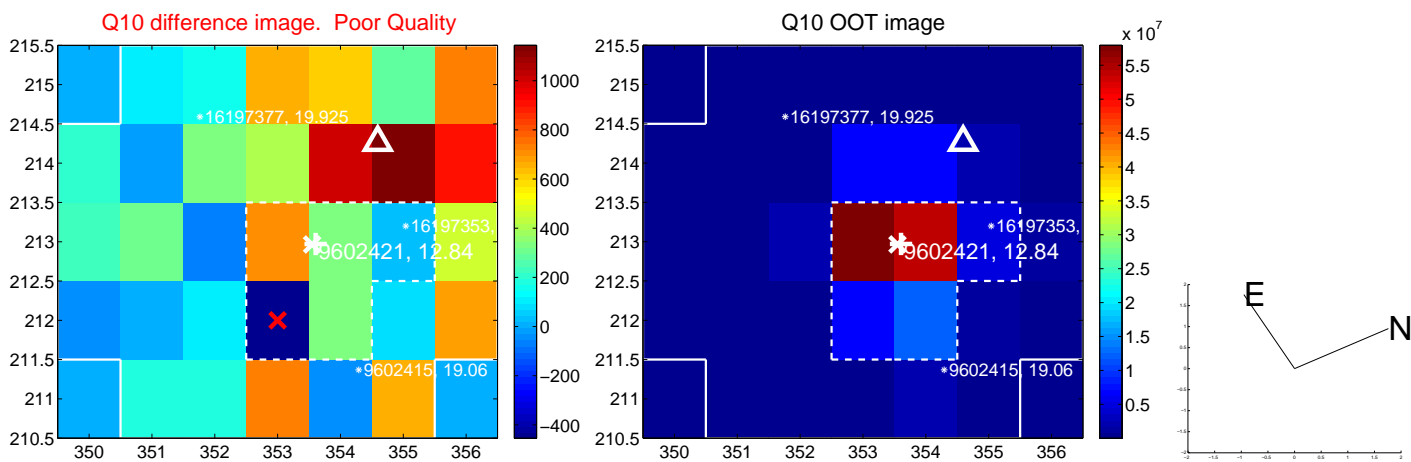
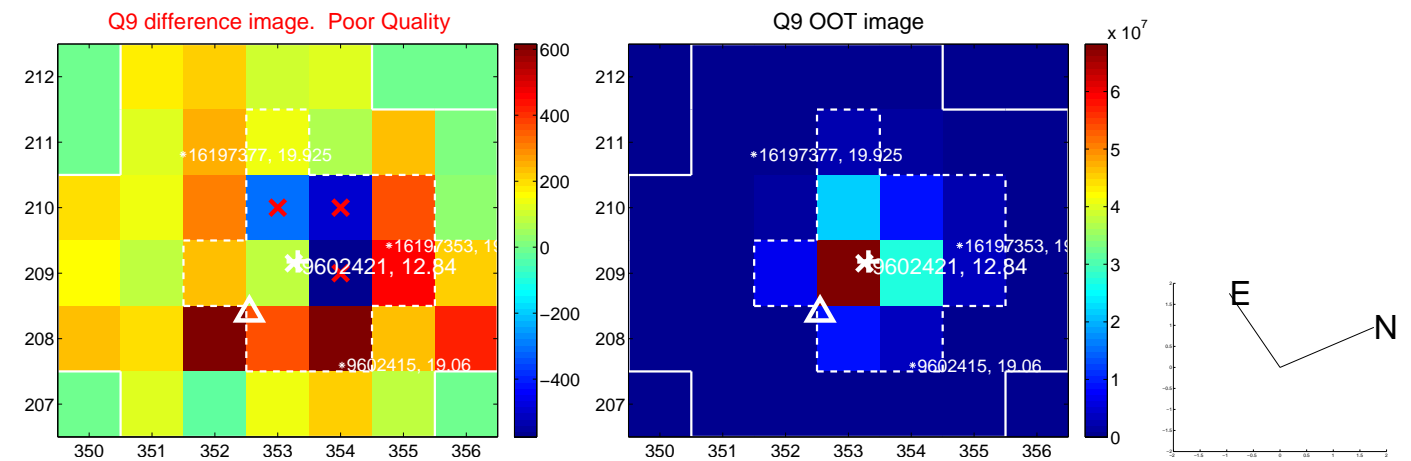
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



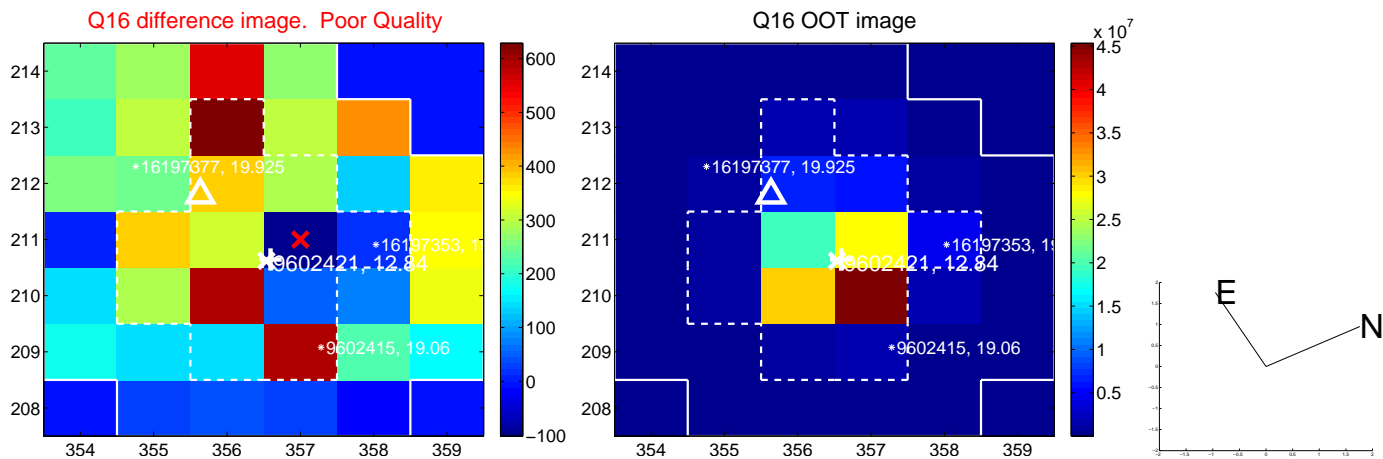
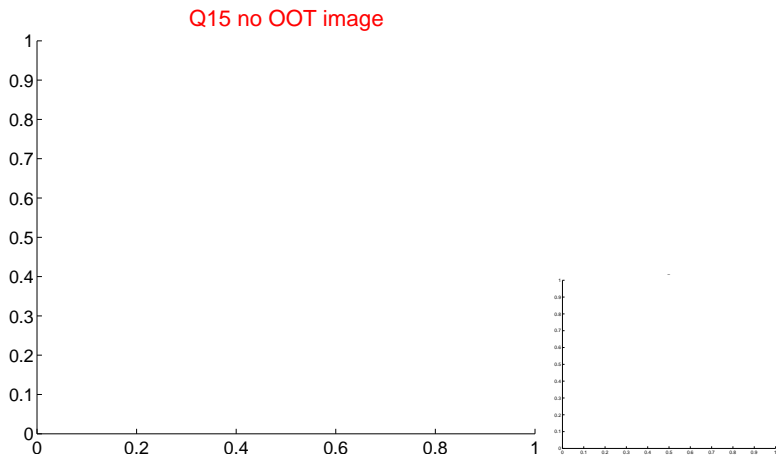
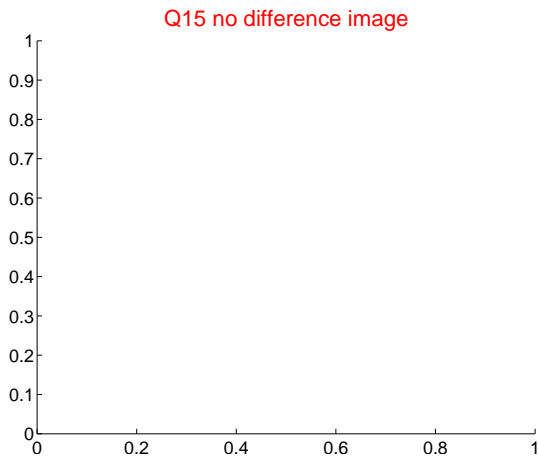
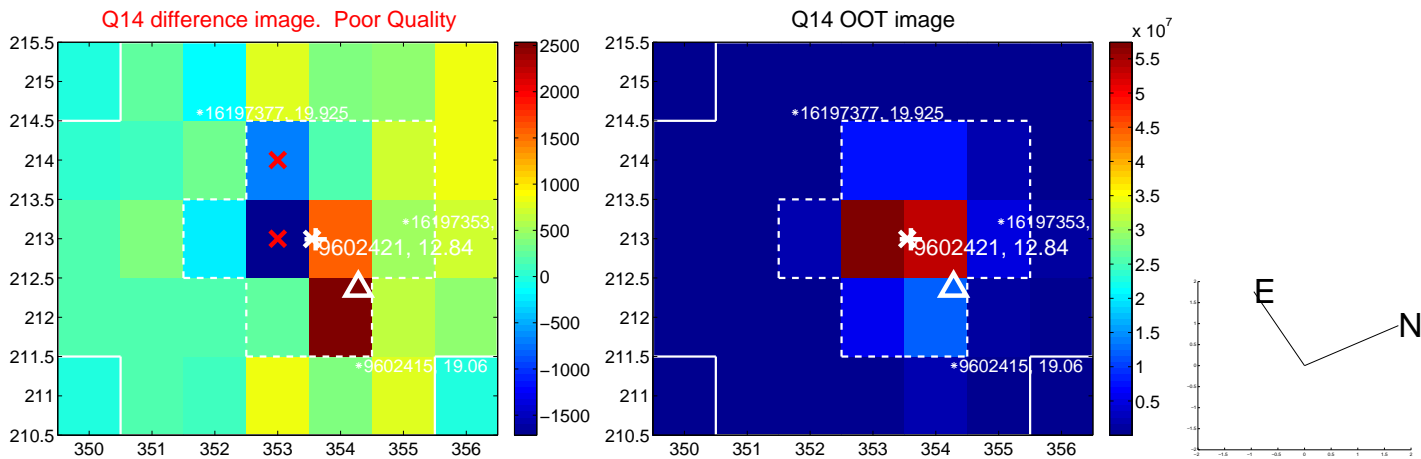
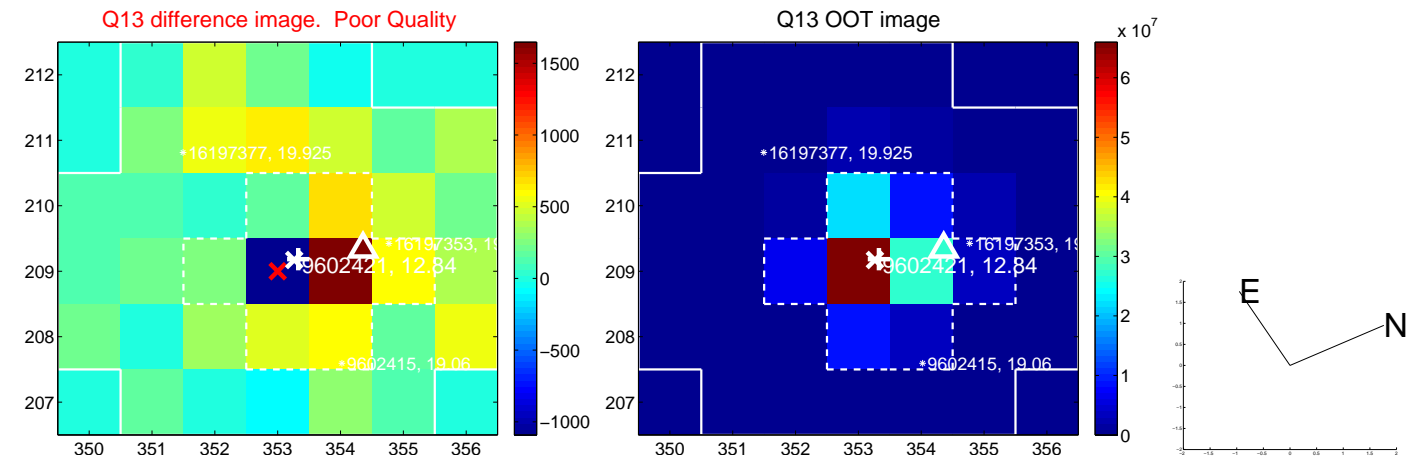
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



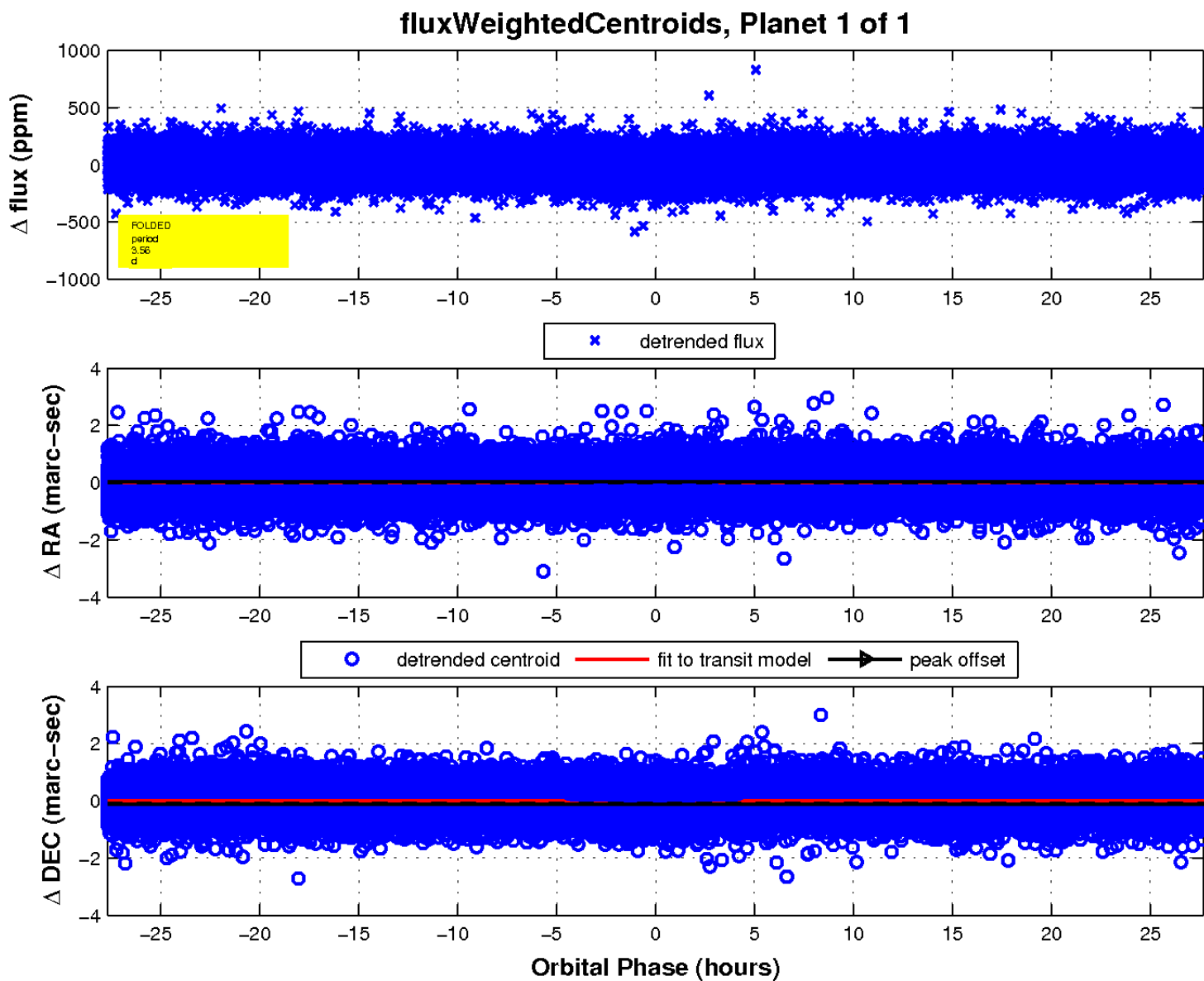
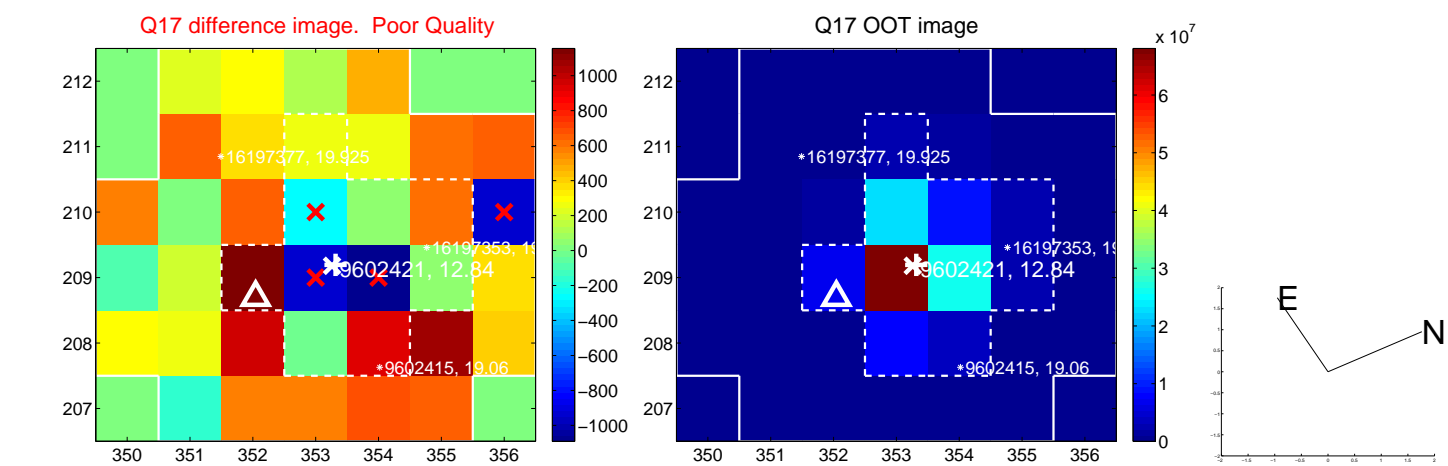
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UKIRT Image

Declination

