

KIC 004142890

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 004142890-01 | OBS | No | 533.492090 | 241.820037 | 1263.6 | 3.005 | 14.1 | 8.3 | 0.56 | 3683 | 2.24 | 0.05 |
| 004142890-02 | OBS | No | 325.435129 | 367.547618 | 869.1 | 5.548 | 11.6 | 7.4 | 0.56 | 3683 | 1.79 | 0.09 |
| 004142890-03 | OBS | No | 313.437790 | 176.431613 | 1336.2 | 4.578 | 12.0 | 7.5 | 0.56 | 3683 | 3.50 | 0.09 |
| 004142890-04 | OBS | No | 322.392681 | 355.557359 | 882.5 | 6.223 | 11.0 | 7.2 | 0.56 | 3683 | 2.17 | 0.09 |
| 004142890-05 | OBS | No | 362.308167 | 331.601435 | 891.7 | 5.840 | 9.5 | 7.2 | 0.56 | 3683 | 1.76 | 0.08 |
| 004142890-06 | OBS | No | 525.072046 | 391.984959 | 887.5 | 4.002 | 11.4 | 5.6 | 0.56 | 3683 | 1.81 | 0.05 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004142890-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST |
| 004142890-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—HALO_GHOST |
| 004142890-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |
| 004142890-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV |
| 004142890-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_KIC_POS |
| 004142890-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |

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

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

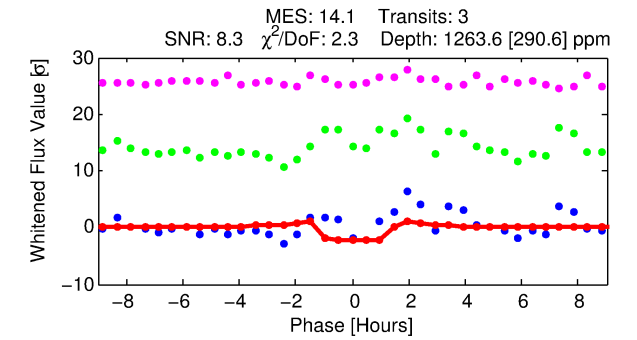
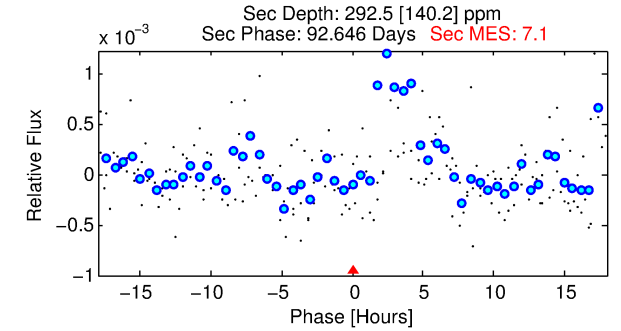
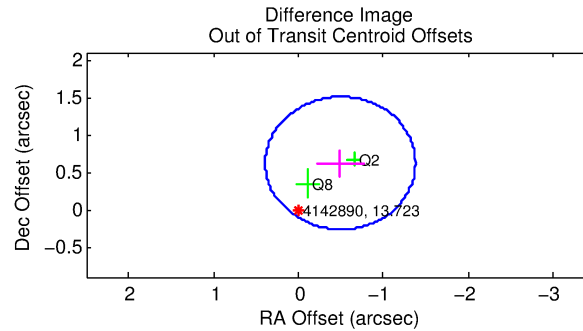
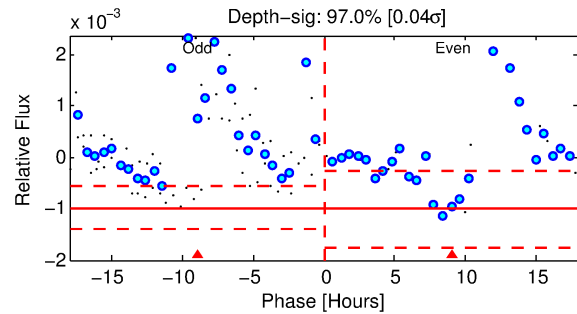
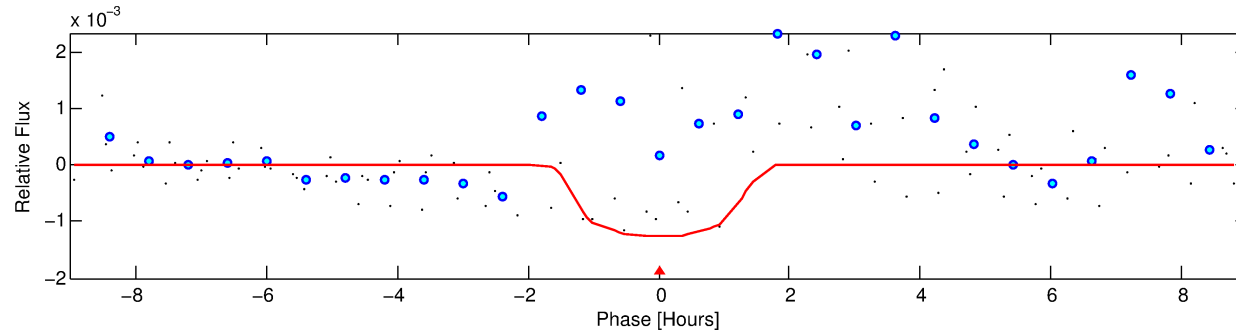
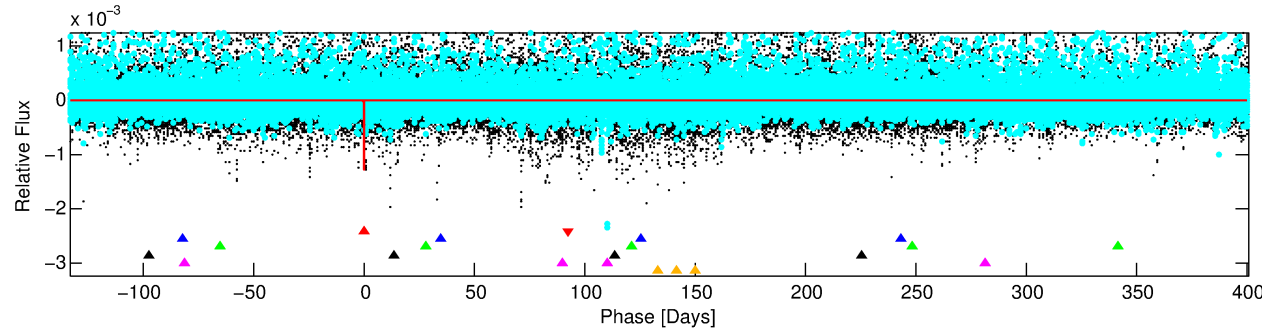
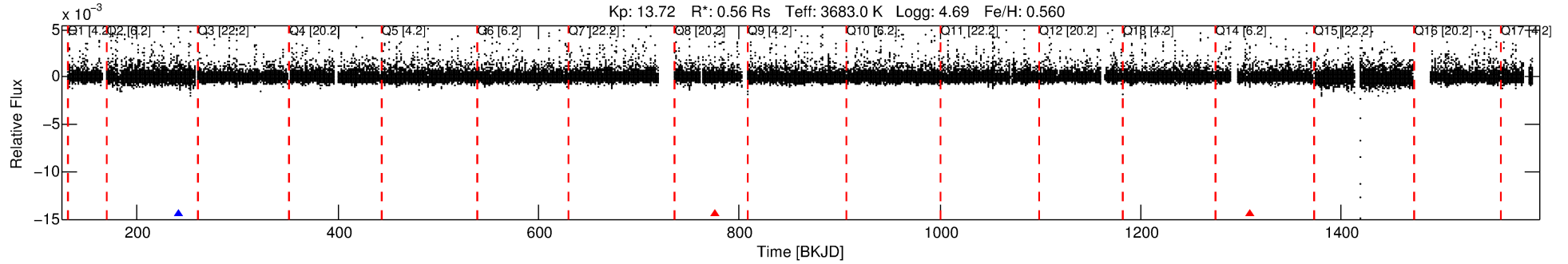
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004142890-01

No Significant Match Found

DV One-Page Summary

KIC: 4142890 Candidate: 1 of 6 Period: 533.492 d



DV Fit Results:

Period = 533.49209 [0.00721] d
Epoch = 241.8200 [0.0106] BKJD
Rp/R* = 0.0364 [0.0405]
a/R* = 907.40 [3416.04]
b = 0.79 [1.81]
Seff = 0.05 [0.01]
Teq = 118 [7] K
Rp = 2.24 [2.51] Re
a = 1.0636 [0.1233] AU
Ag = 36299.36 [82696.57] [0.44 σ]
Teffp = 2523 [1437] K [1.67 σ]

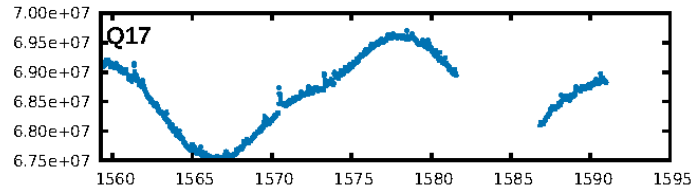
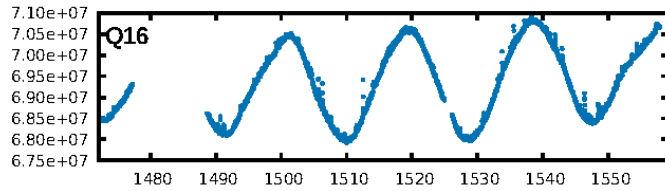
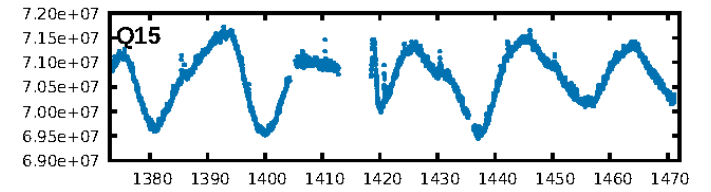
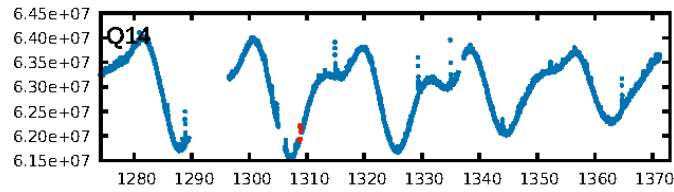
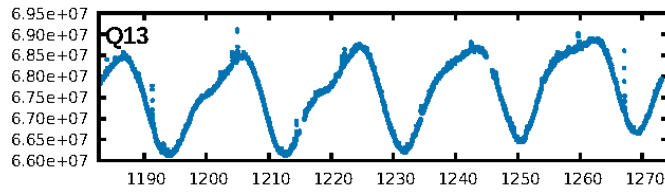
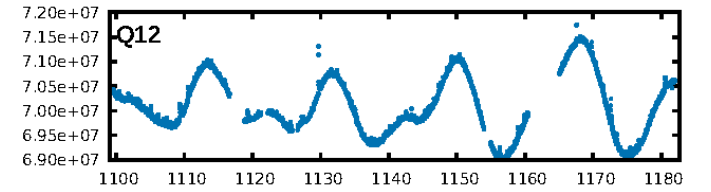
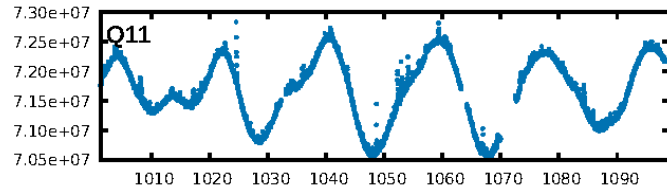
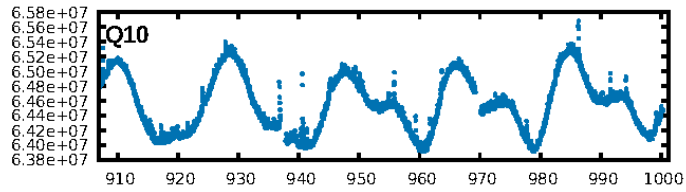
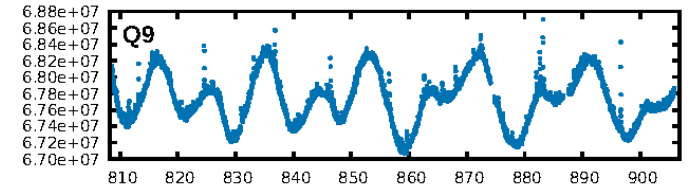
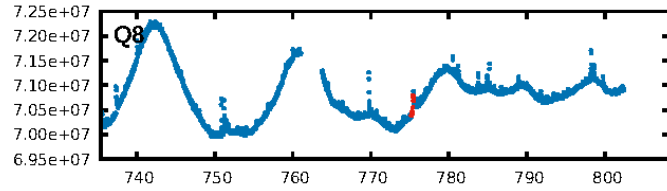
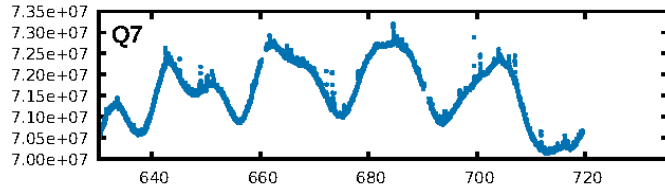
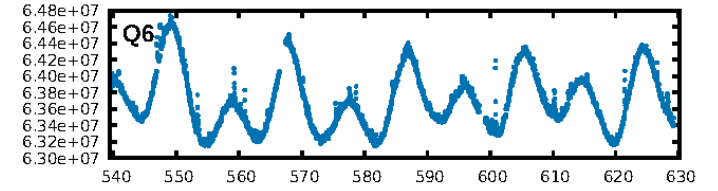
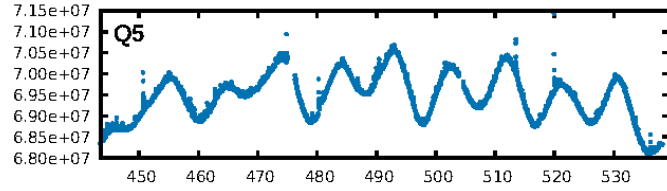
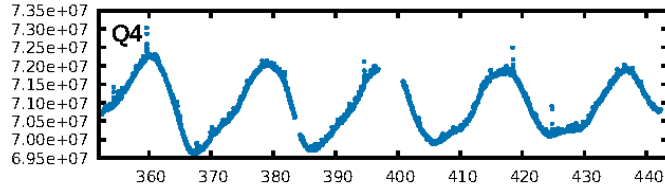
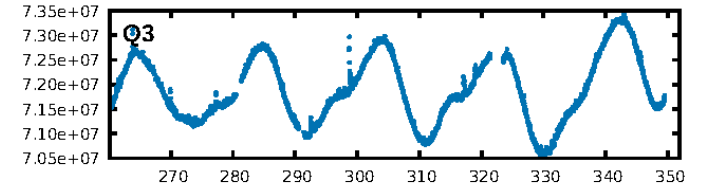
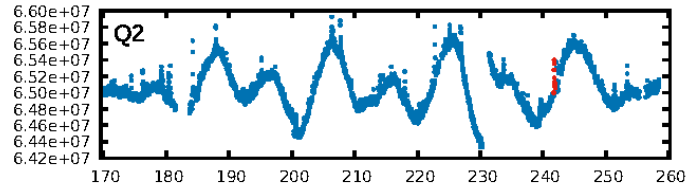
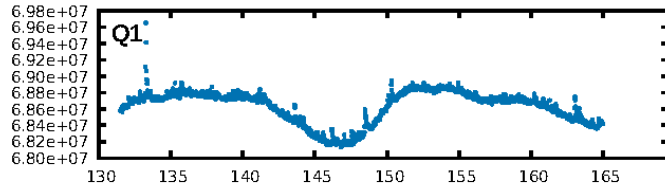
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [40.38 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 84.6%
ModelChiSquareGof-sig: 41.4%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.33 [1/3]
GhostDiagnostic-chr: 0.02234
Centroid-sig: 34.6%
Centroid-so: 0.987 arcsec [1.42 σ]
OotOffset-rm: 0.795 arcsec [2.69 σ]
OotOffset-st: 1/0/1/0 [2]
KicOffset-rm: 1.414 arcsec [6.67 σ]
KicOffset-st: 1/0/1/0 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 1.00 [3/3]

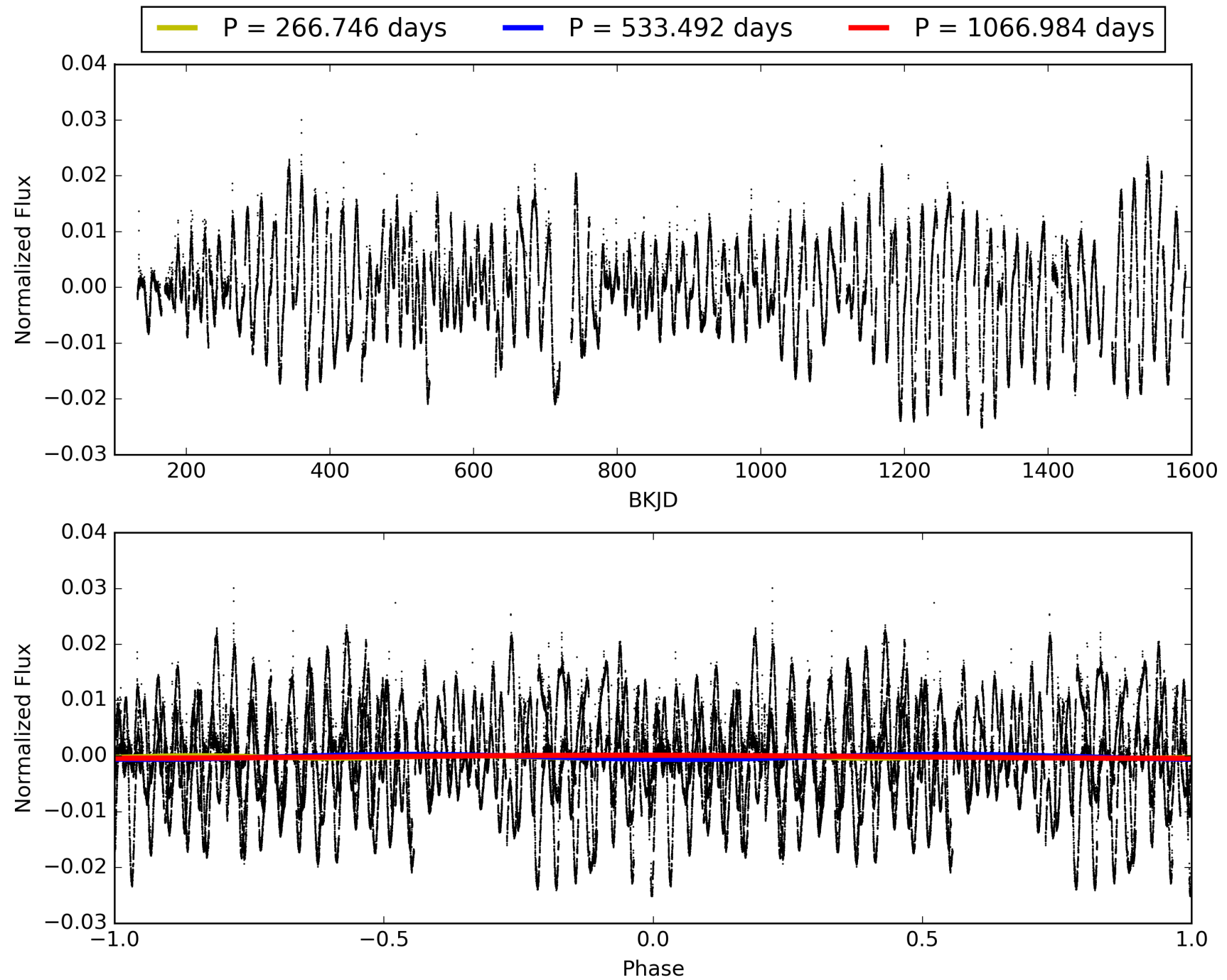
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:29:18 Z

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

TCE 004142890-01, PDC Light Curves

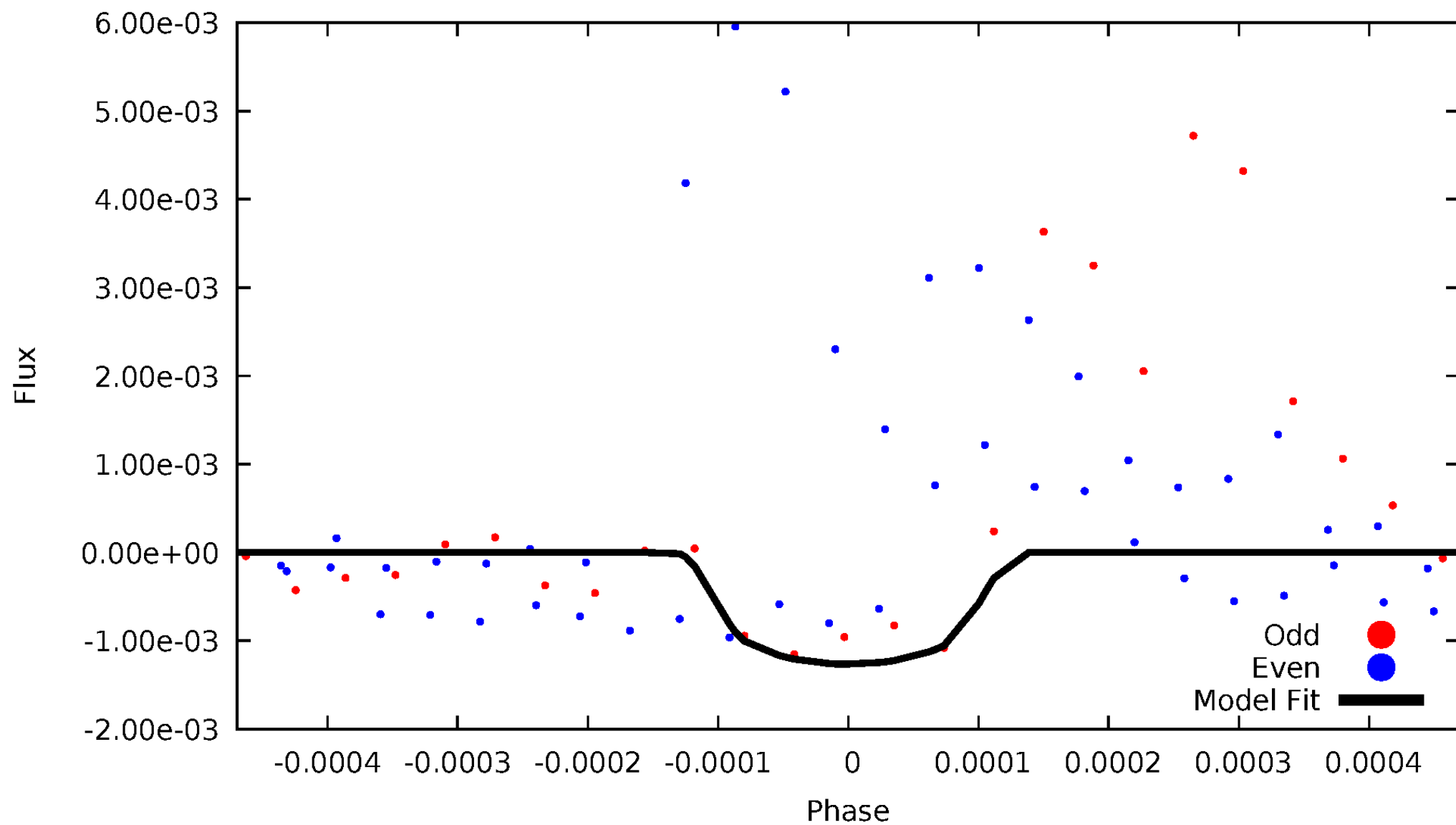


TCE 004142890-01



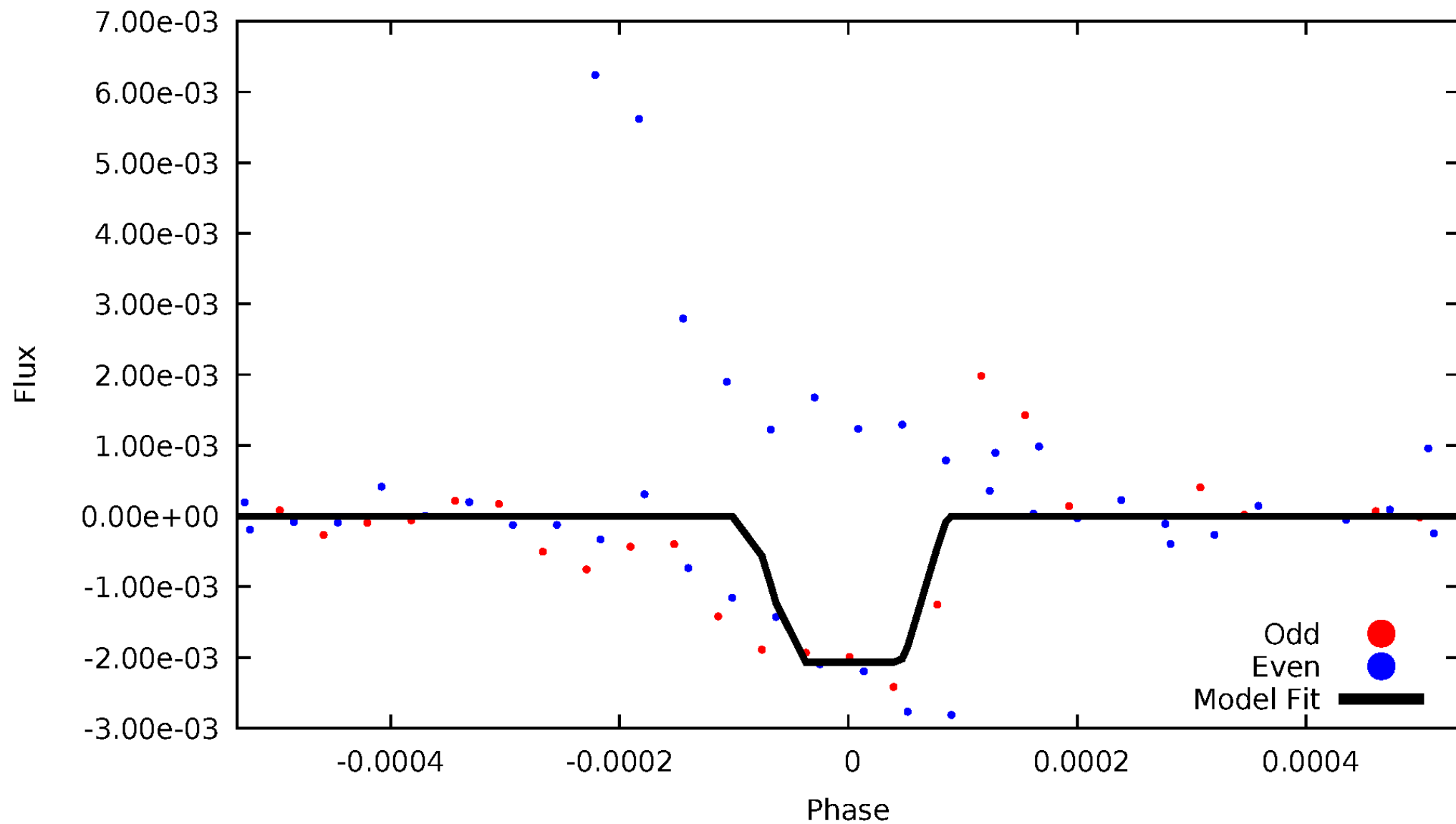
DV Odd/Even

TCE 004142890-01



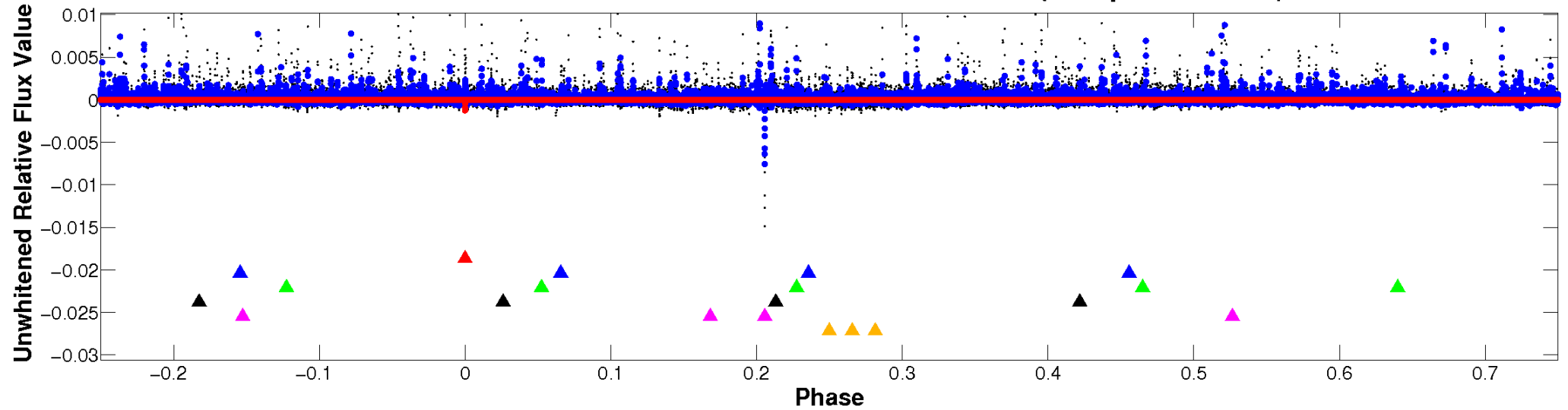
ALT Odd/Even

TCE 004142890-01

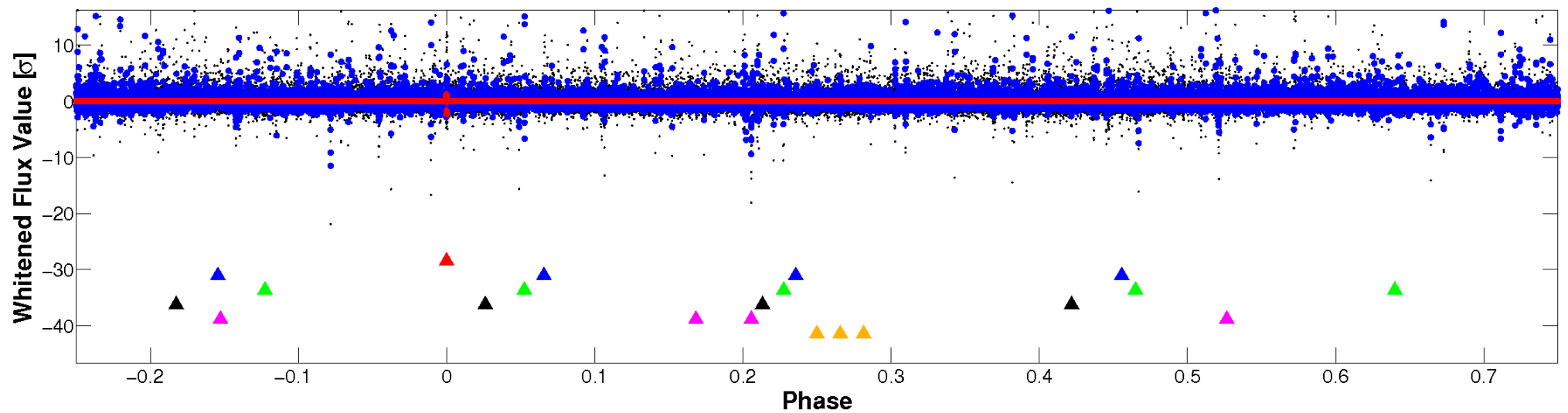


Non-Whitened Vs. Whitened Light Curve

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

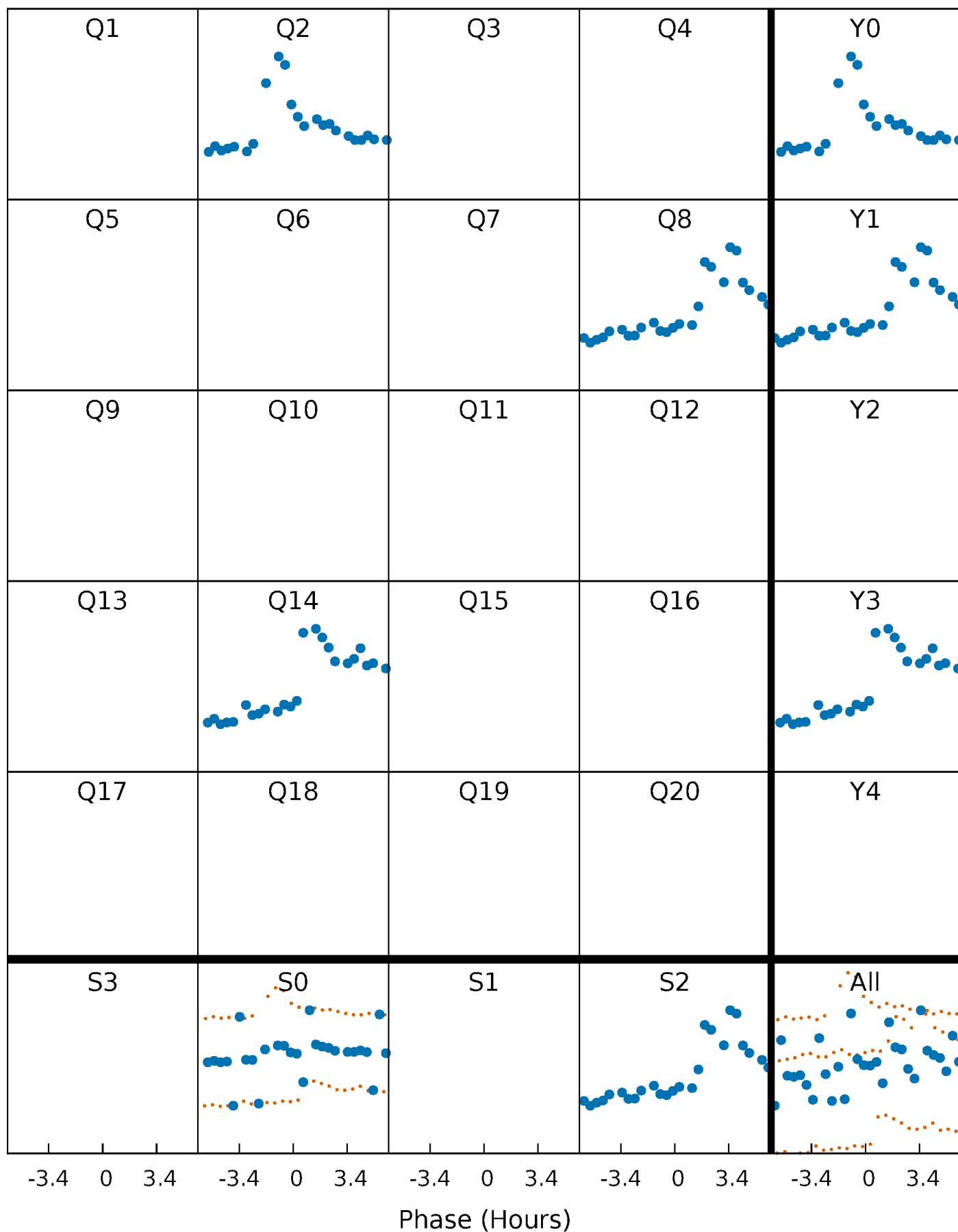


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



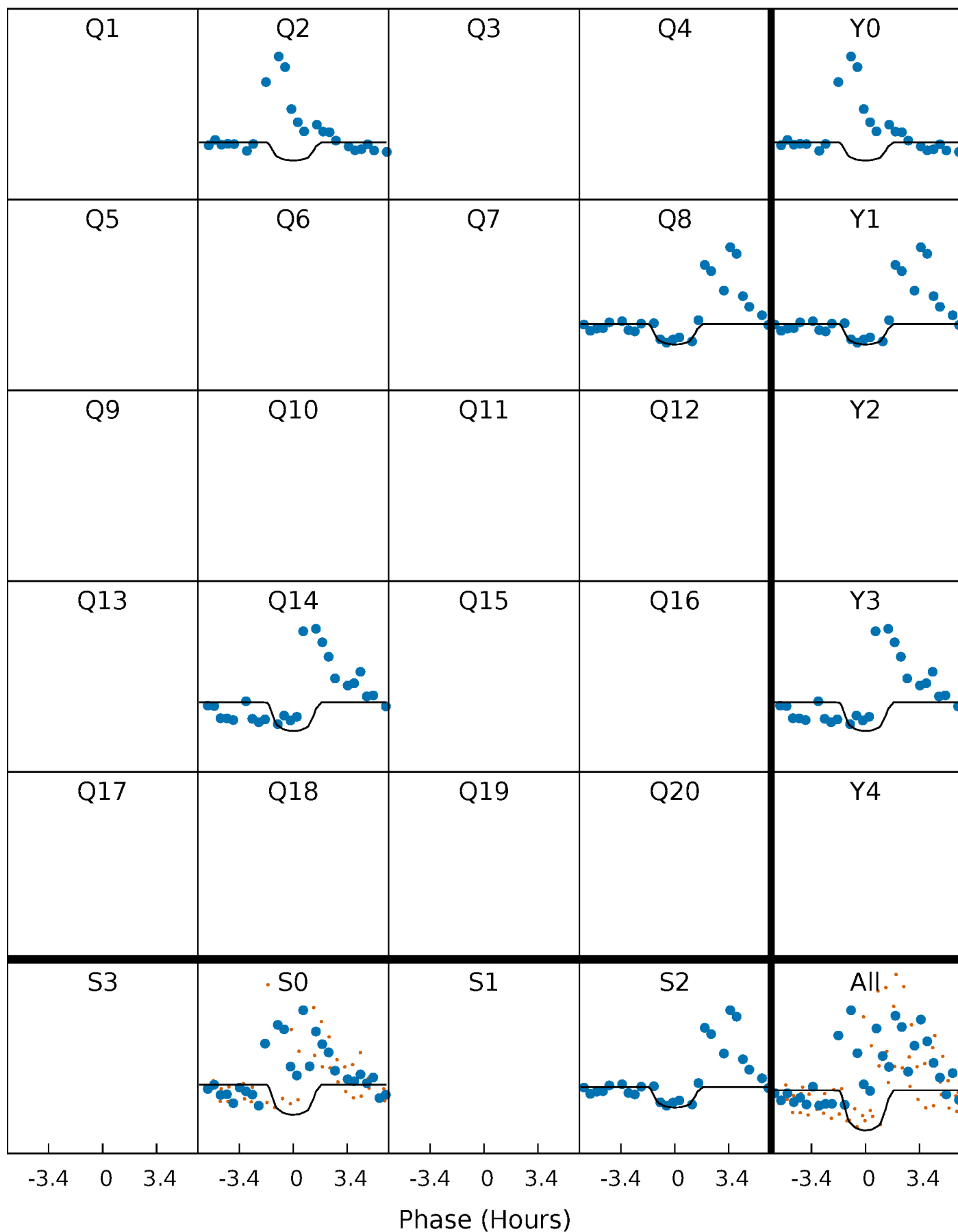
PDC Quarter-Phased Transit Curves

TCE 004142890-01 P=533.492090 Days $T_0=241.820037$ (BKJD)



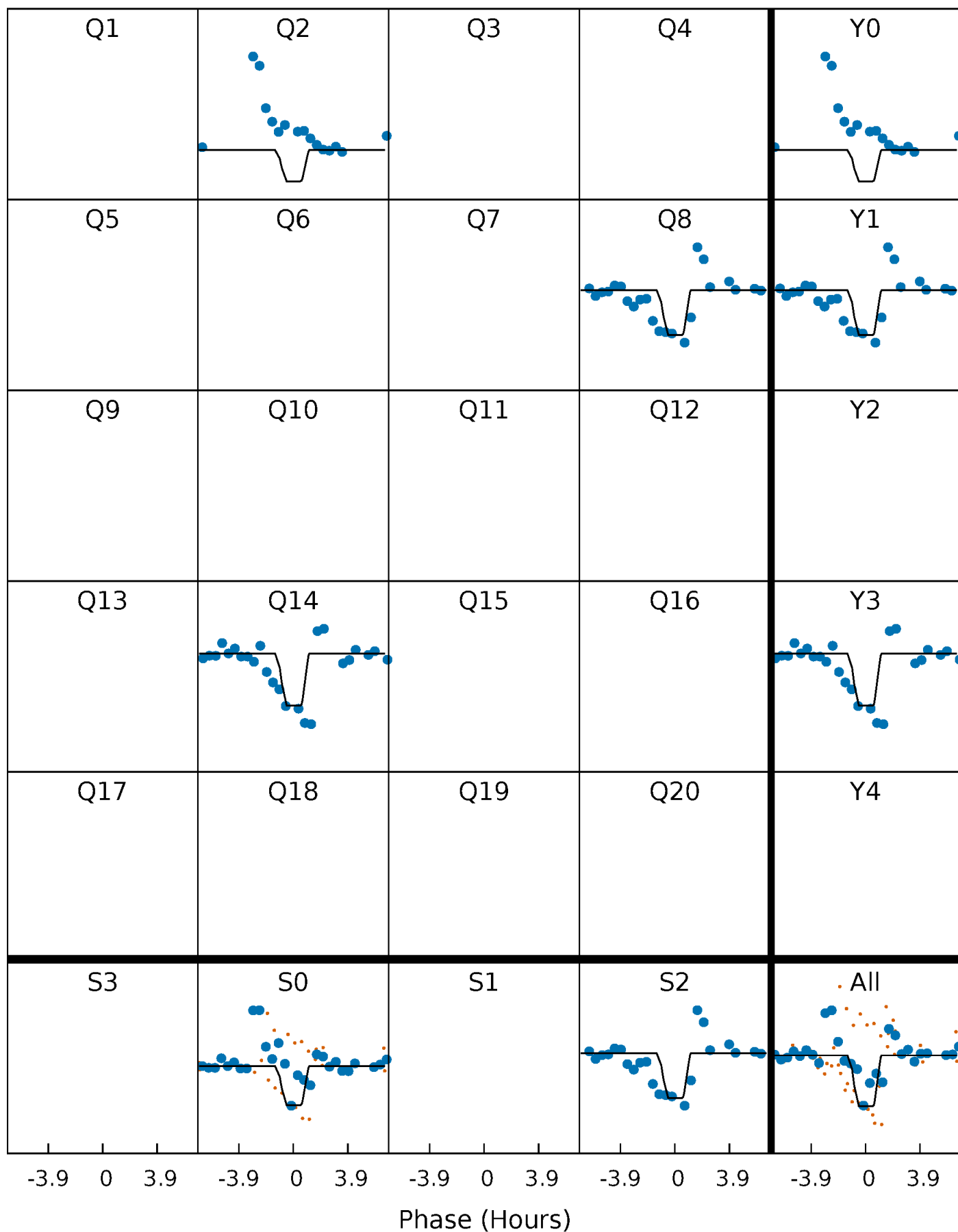
DV Quarter-Phased Transit Curves

TCE 004142890-01 P=533.492090 Days $T_0=241.820037$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

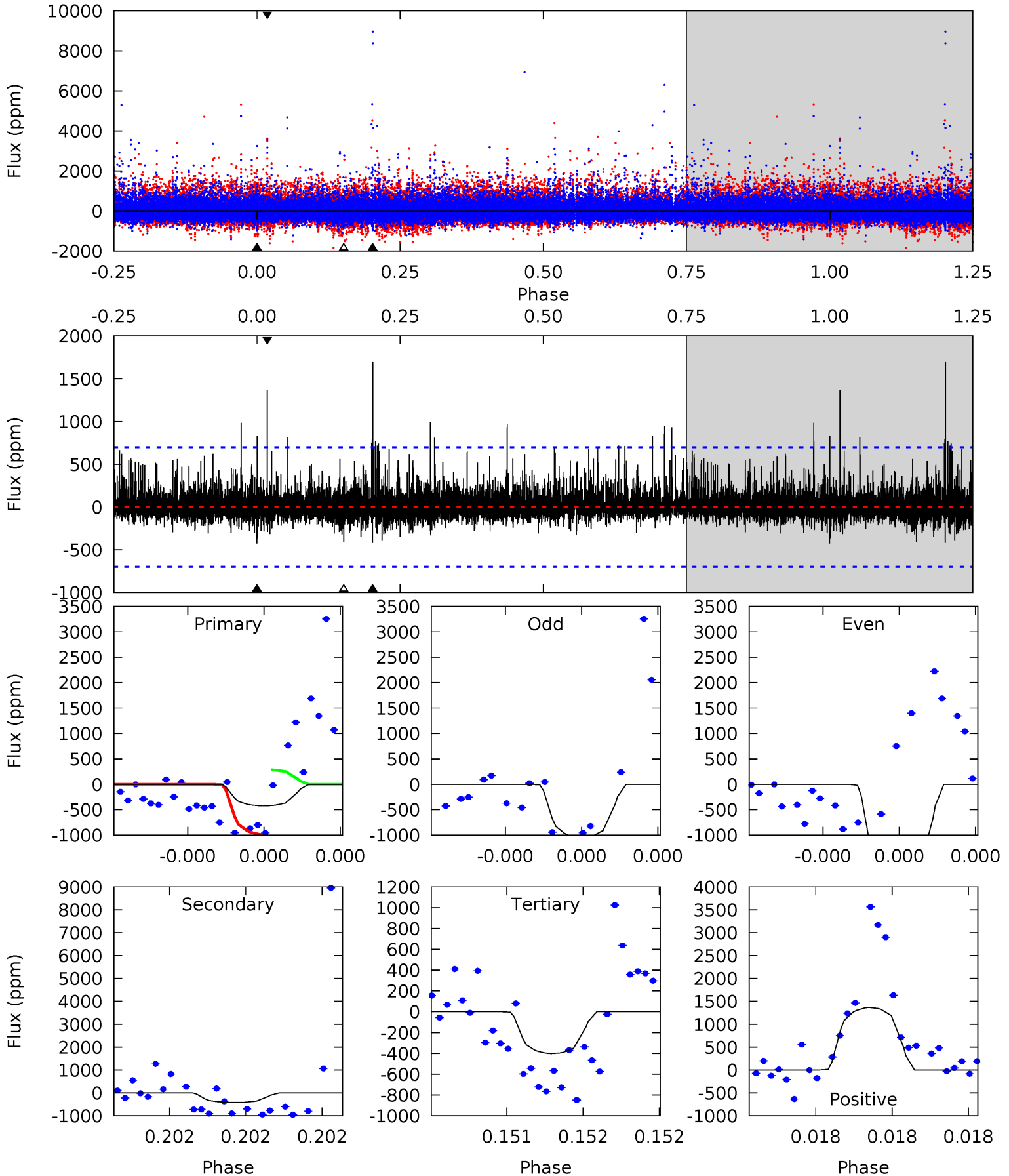
TCE 004142890-01 P=533.438517 Days $T_0=241.891753$ (BKJD)



DV Model-Shift Uniqueness Test

004142890-01, P = 533.492090 Days, E = 241.820037 Days

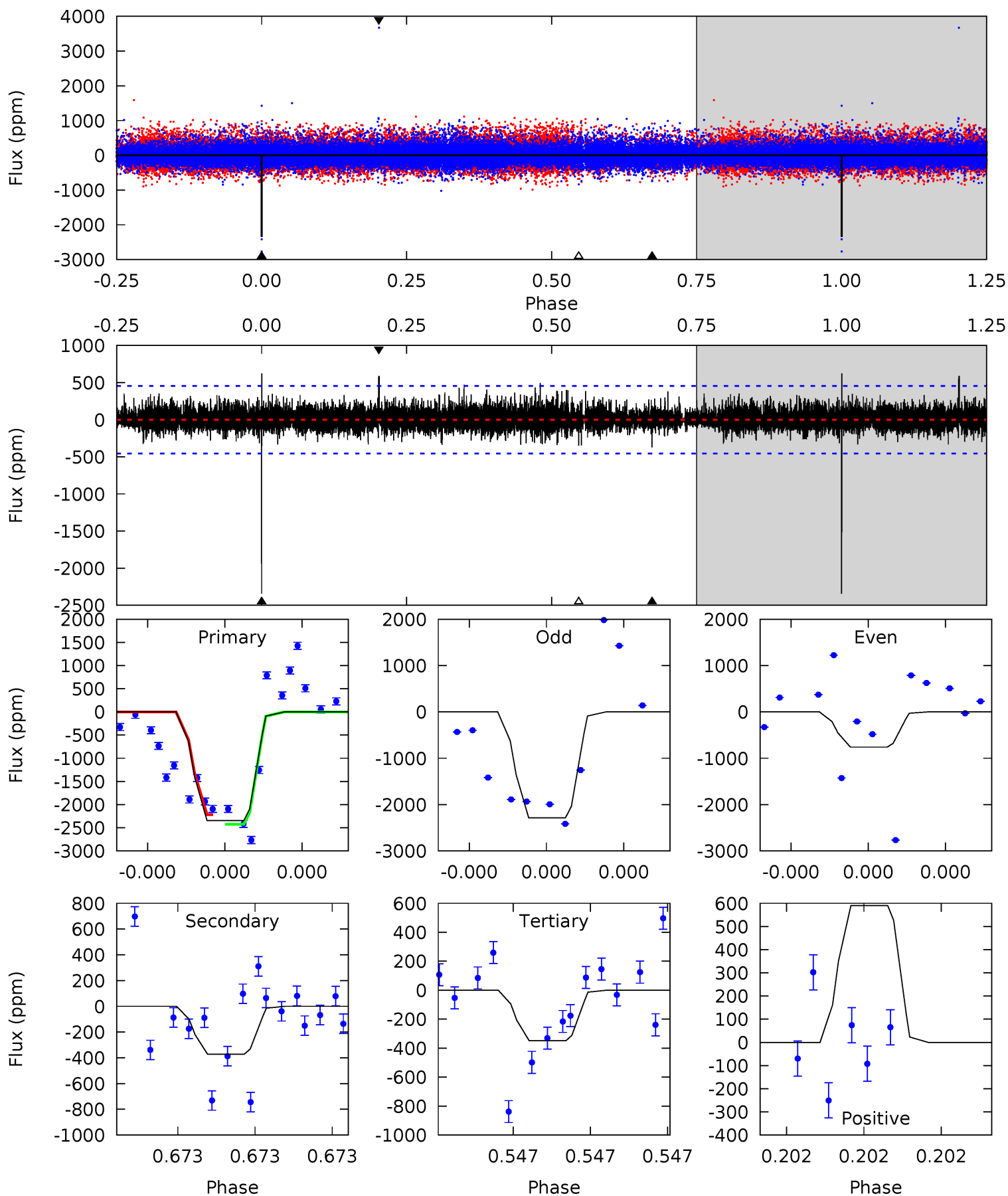
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 3.46 | 3.40 | 3.28 | 11.1 | 5.70 | 3.68 | 1.01 | 0.17 | -7.69 | 0.11 | -7.75 | 2.47 | 2.27 | 0.80 | 2.88 |



Alt Model-Shift Uniqueness Test

004142890-01, P = 533.438517 Days, E = 241.891753 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 29.7 | 4.71 | 4.42 | 7.48 | 5.77 | 3.77 | 1.07 | 25.3 | 22.2 | 0.29 | -2.77 | 10.2 | 0.47 | 0.21 | 1.26 |



Stellar Parameters For KIC 004142890

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 3683^{+117}_{-147} | $4.688^{+0.080}_{-0.020}$ | $0.560^{+0.050}_{-0.300}$ | $0.563^{+0.030}_{-0.083}$ | $0.564^{+0.036}_{-0.072}$ | $4.449^{+1.718}_{-0.458}$ |
| | +3%/-4% | +2%/-0% | +9%/-54% | +5%/-15% | +6%/-13% | +39%/-10% |
| Source | KIC0 | 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 004142890-01 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|----------------|------------------------|----------------------|-----------------------|----------------------------|
| DV | -417 ± 123 | $2.71^{+2.25}_{-1.82}$ | 163^{+6}_{-7} | 2905^{+1122}_{-447} | $36191^{+239857}_{-26086}$ |
| Alt. | -371 ± 79 | $2.98^{+2.16}_{-1.82}$ | 163^{+6}_{-7} | 2756^{+879}_{-366} | $24910^{+144250}_{-16763}$ |

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

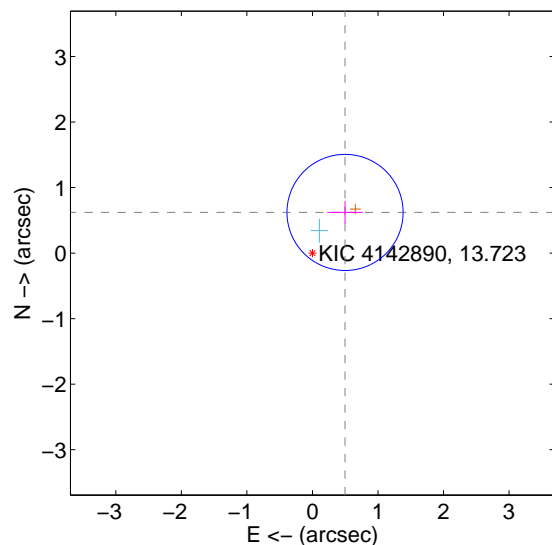
Supplemental centroid analysis for 004142890-01. Kepler magnitude: 13.72. Transit SNR 8.26

There are 1 quarters with good PRF difference image offsets

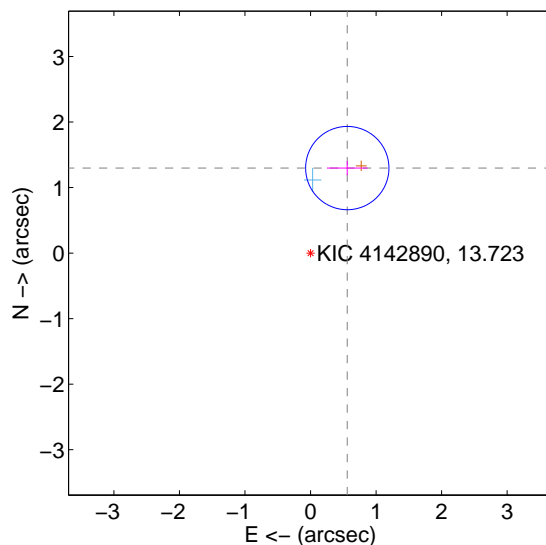
The direct PRF centroid is offset from the target star catalog position by about 0.78 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.795 ± 0.295 | 2.69 | -0.497 ± 0.271 | 0.621 ± 0.172 |
| PRF-fit source offset from KIC position | 1.414 ± 0.212 | 6.67 | -0.561 ± 0.310 | 1.298 ± 0.110 |
| photometric centroid source offset | 0.99 ± 0.70 | 1.42 | -0.48 ± 0.69 | 0.86 ± 0.70 |

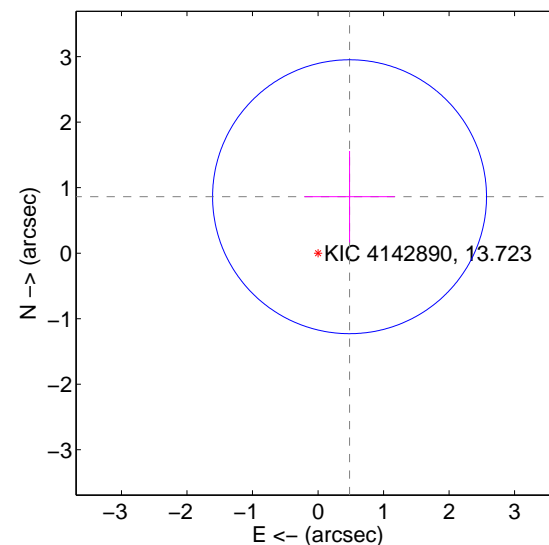
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

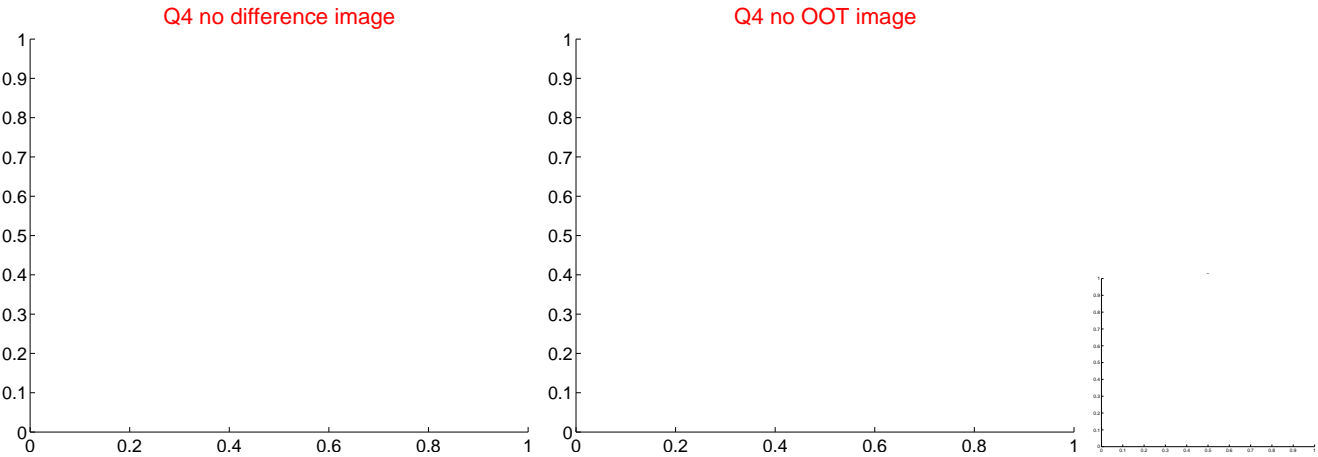
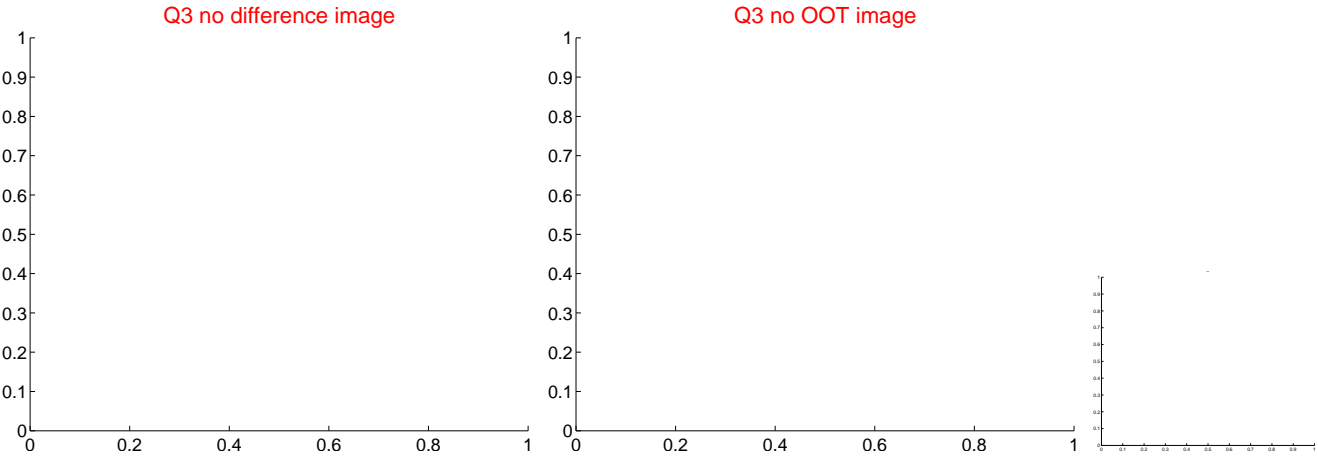
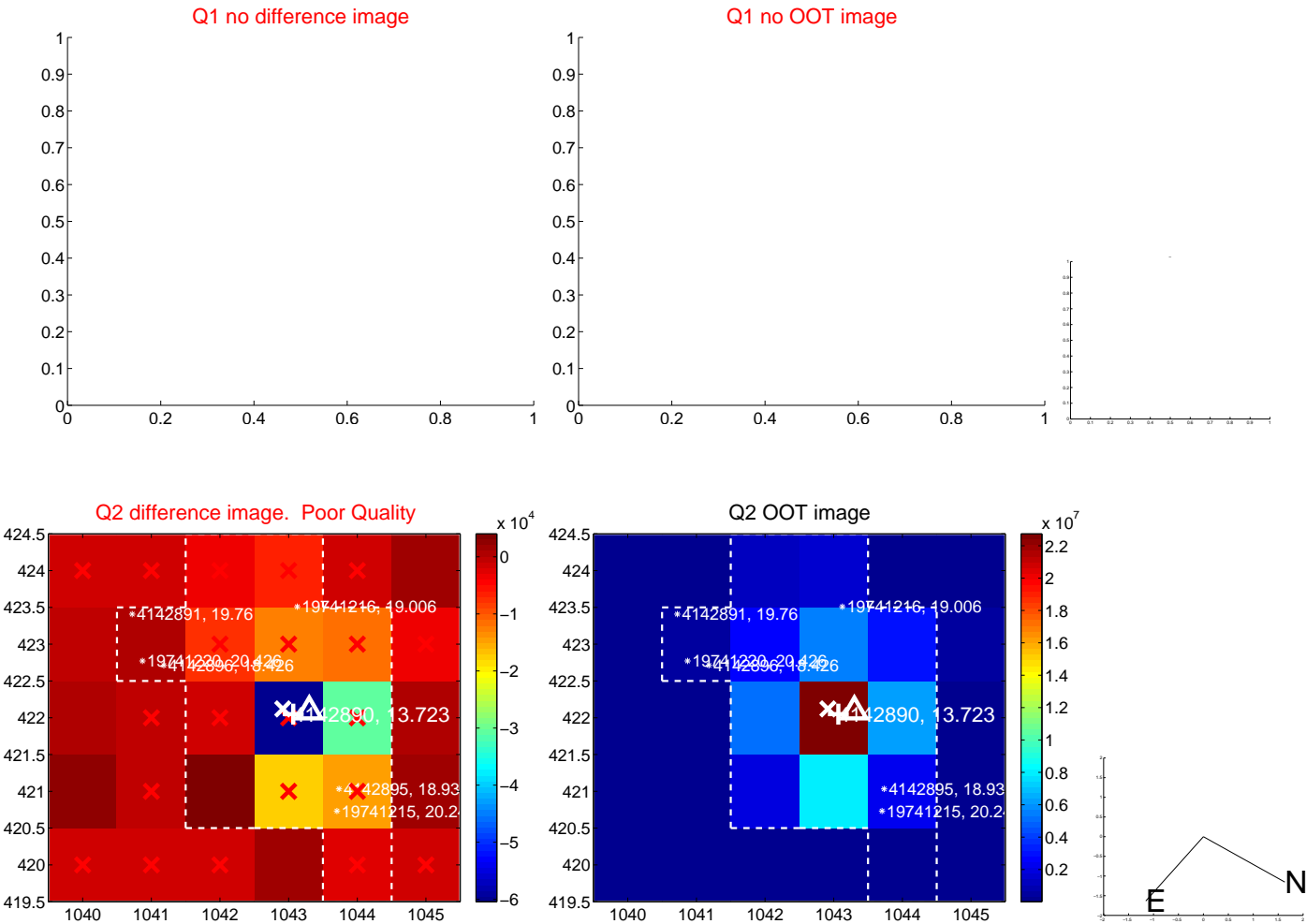


offset from photometric centroids

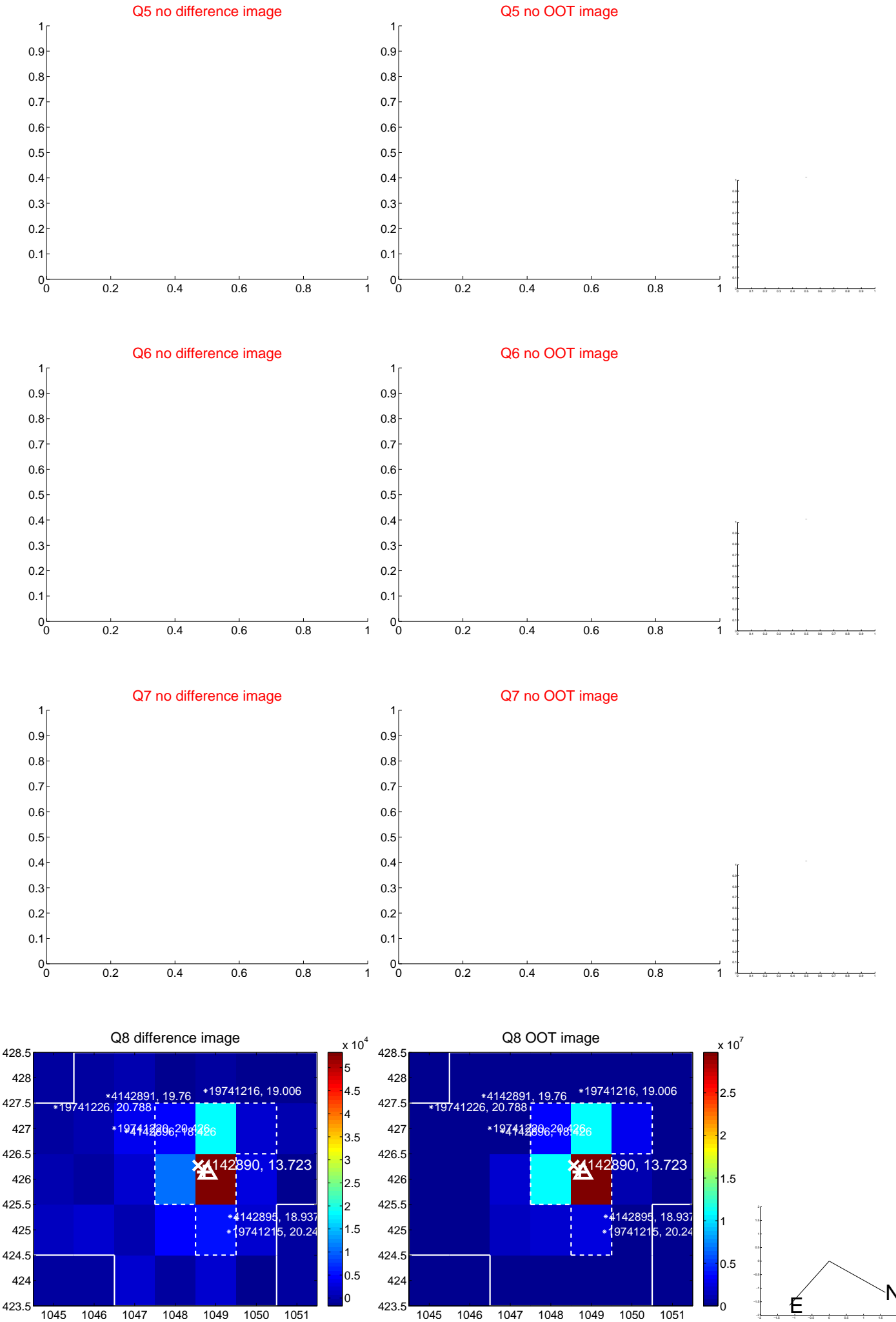


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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



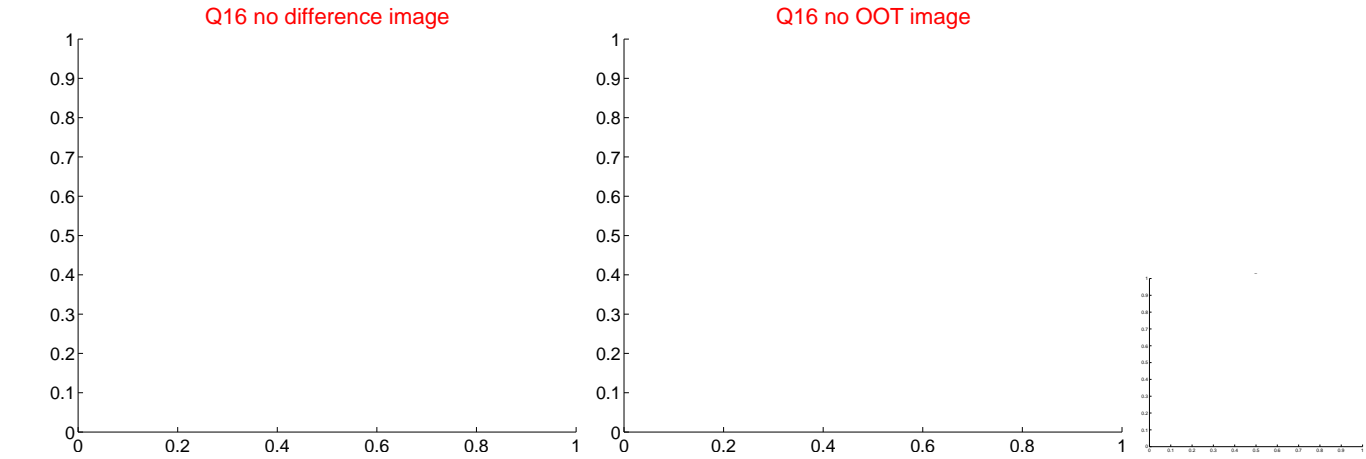
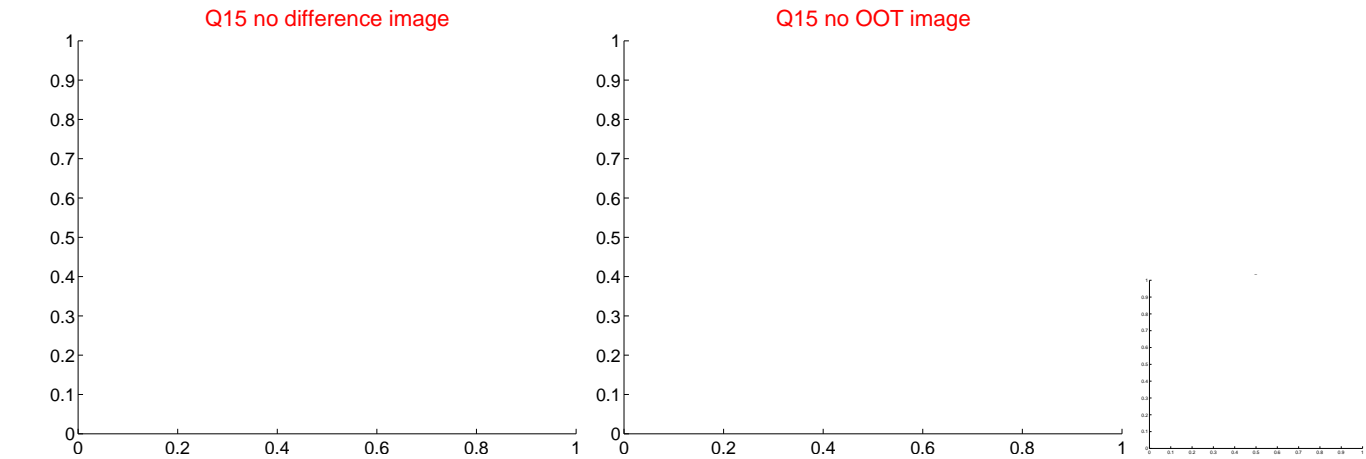
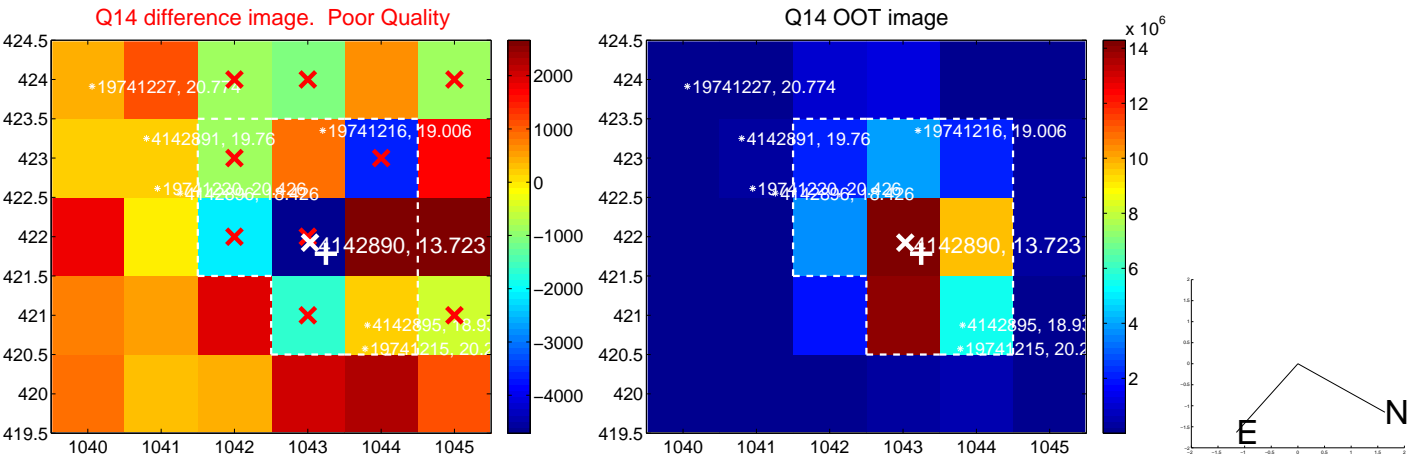
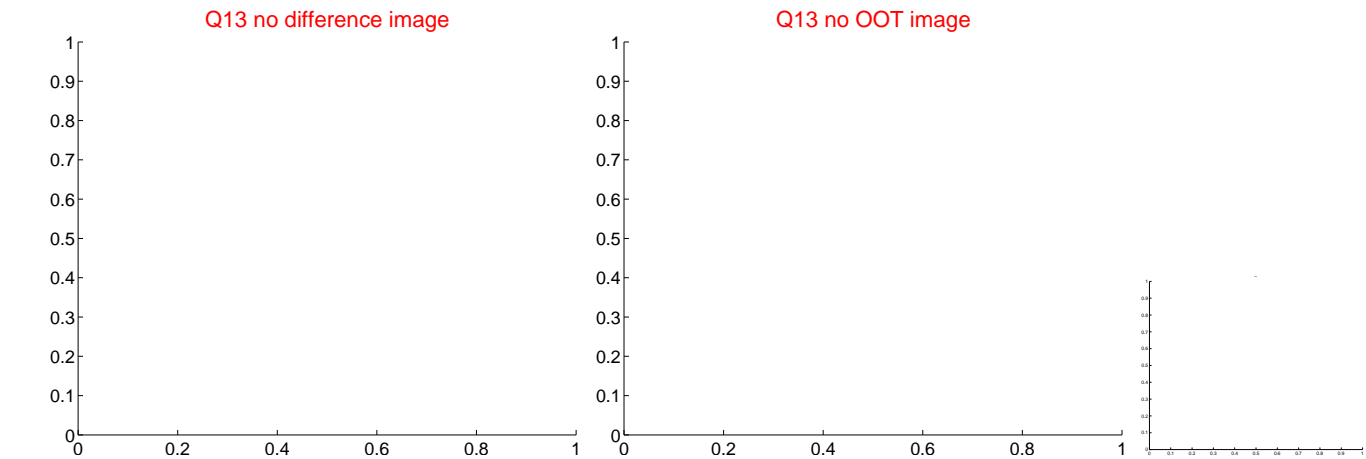
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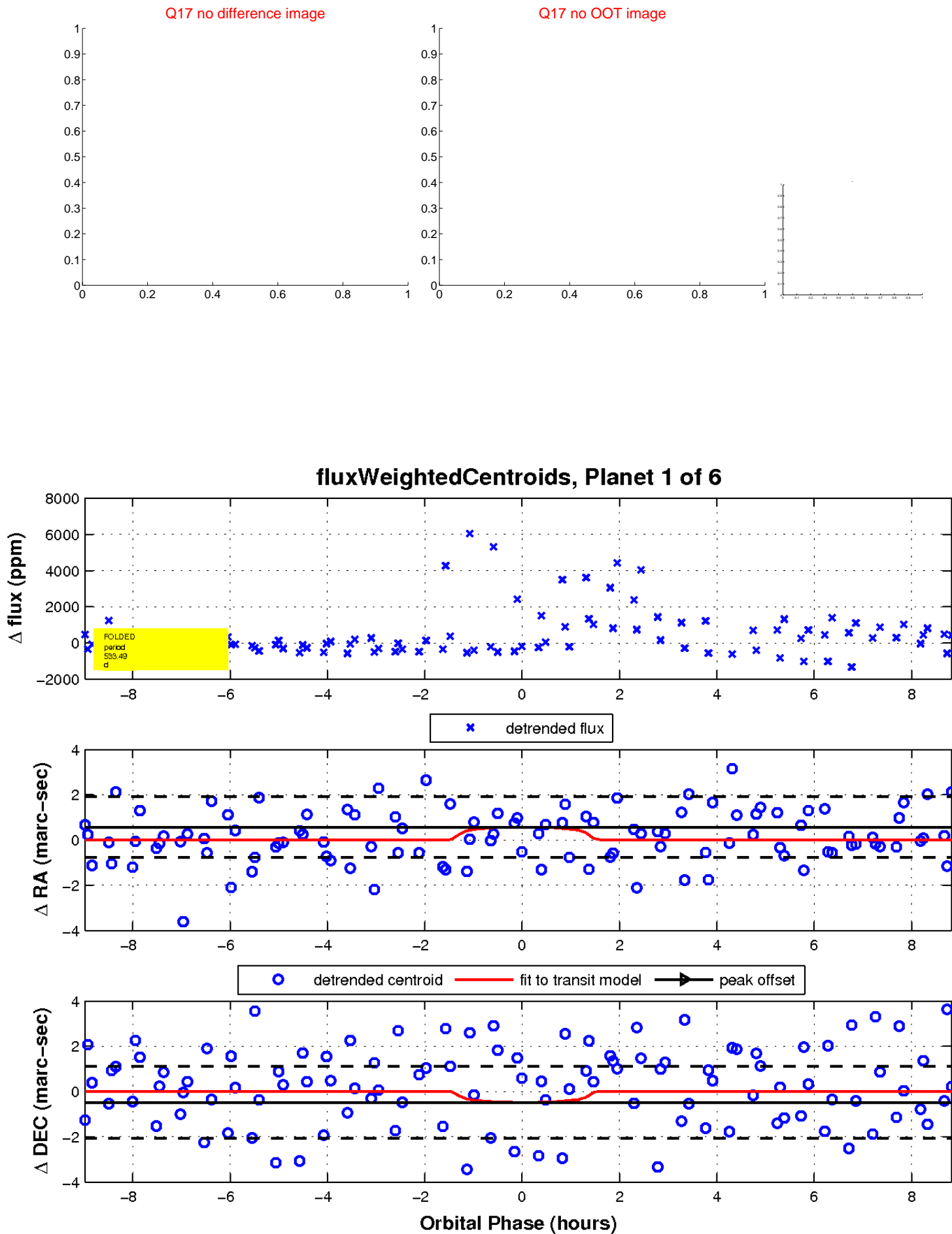
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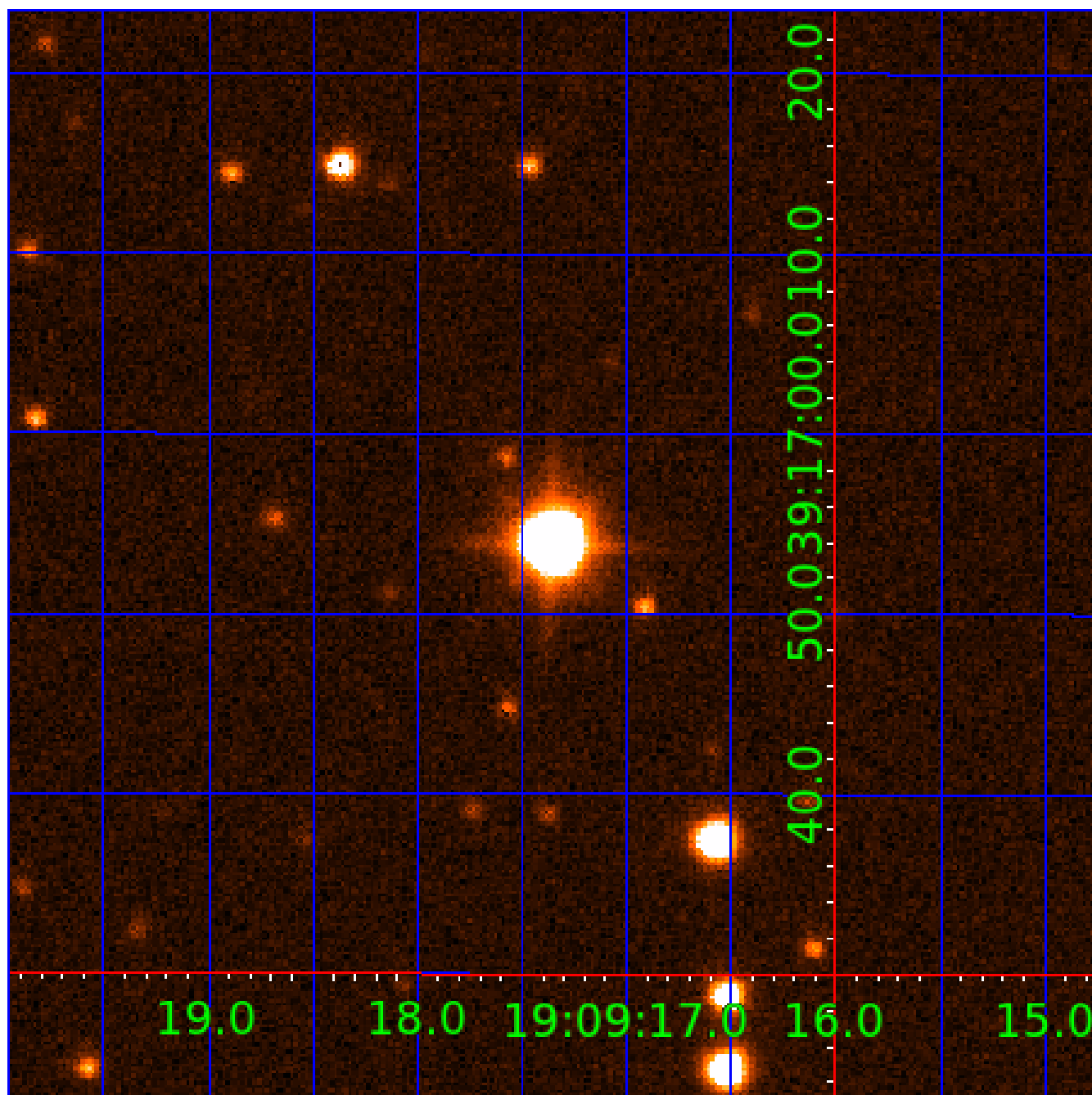


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UKIRT Image

Declination



KIC 004142890

Q1-17 DR25 TCE Parameters

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|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
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Robovetter Results

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| 004142890-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV |
| 004142890-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_KIC_POS |
| 004142890-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |

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

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

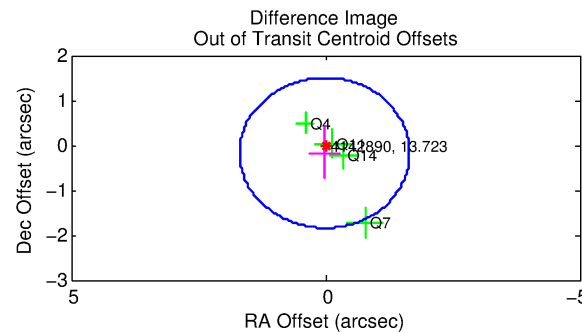
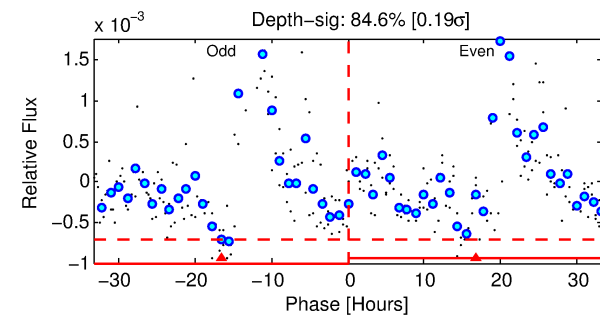
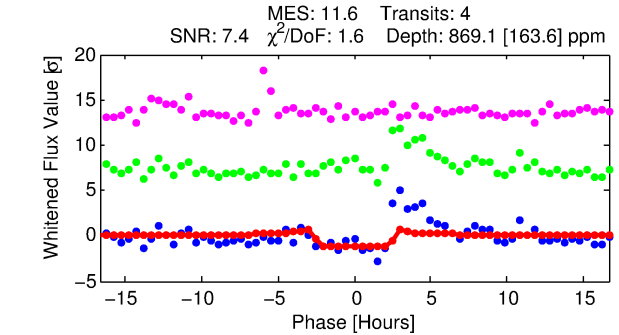
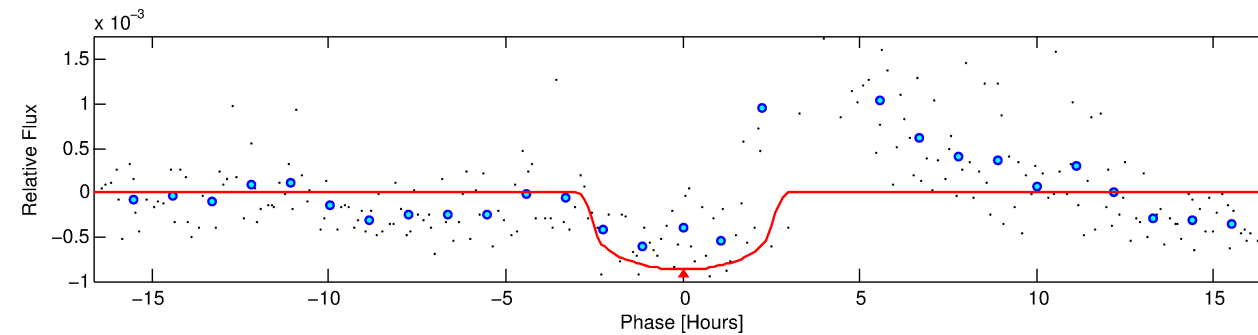
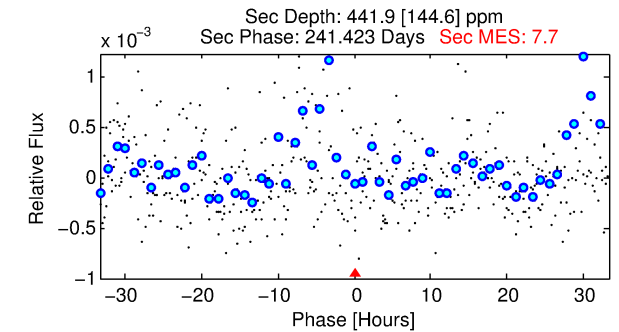
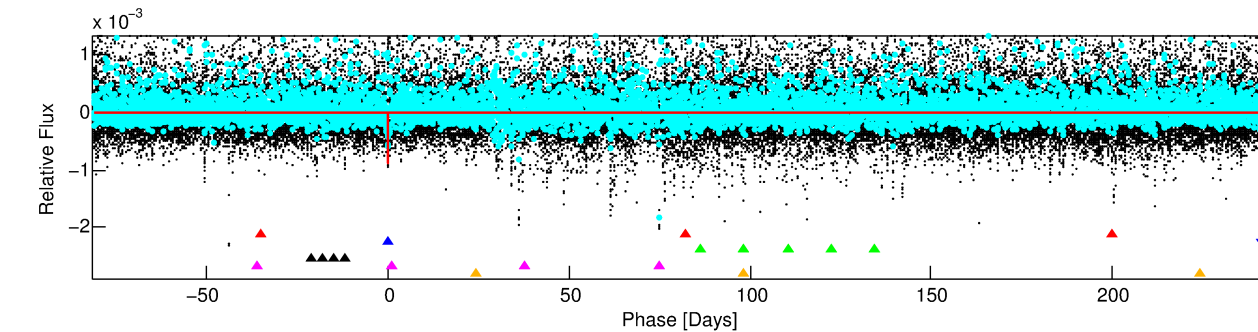
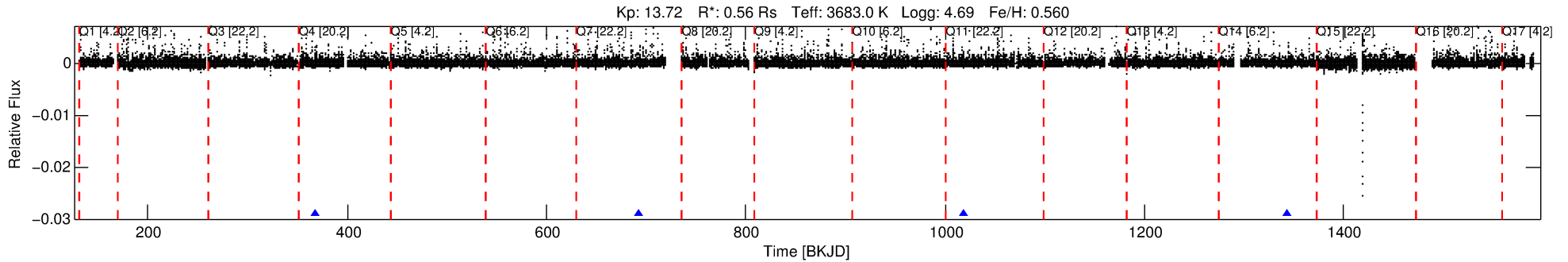
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004142890-02

No Significant Match Found

DV One-Page Summary

KIC: 4142890 Candidate: 2 of 6 Period: 325.435 d



DV Fit Results:

Period = 325.43513 [0.00487] d
Epoch = 367.5476 [0.0096] BKJD
Rp/R* = 0.0291 [0.0219]
a/R* = 329.97 [835.10]
b = 0.72 [1.73]
Seff = 0.09 [0.02]
Teq = 139 [8] K
Rp = 1.79 [1.37] Re
a = 0.7650 [0.0887] AU
Ag = 44607.48 [69155.40] [0.65σ]
Teffp = 3132 [1214] K [2.46σ]

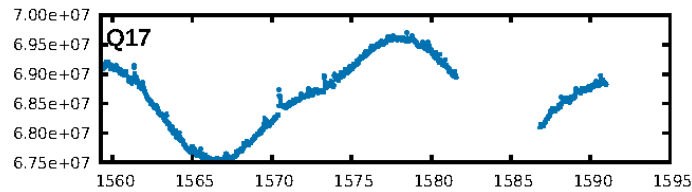
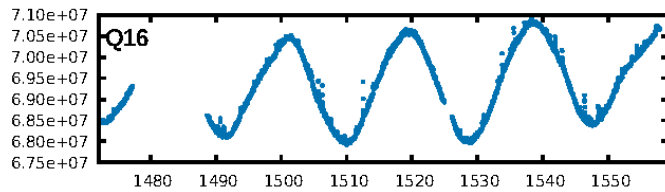
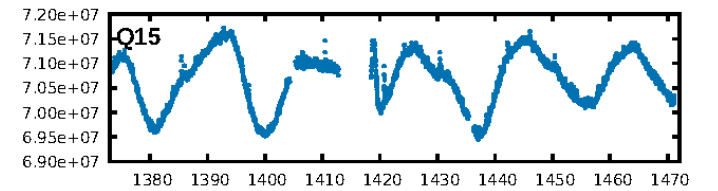
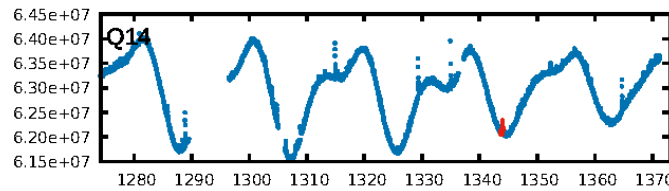
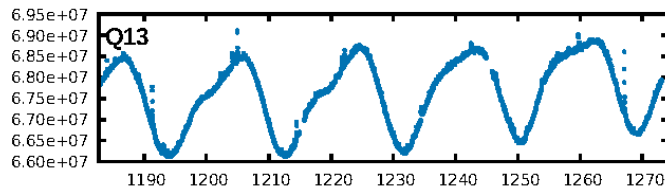
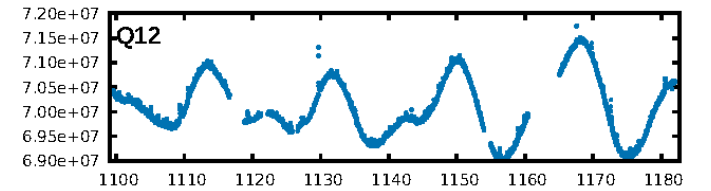
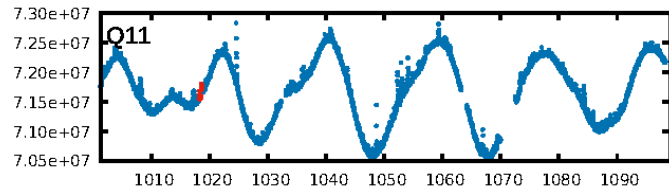
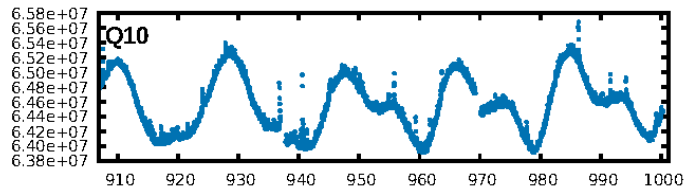
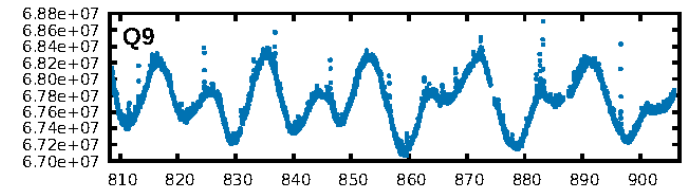
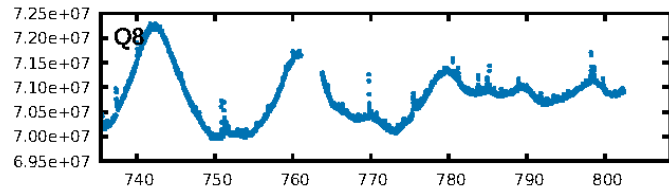
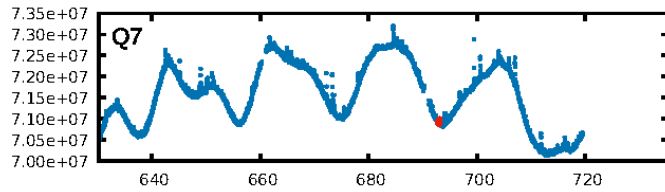
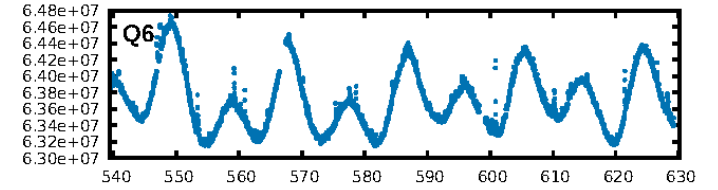
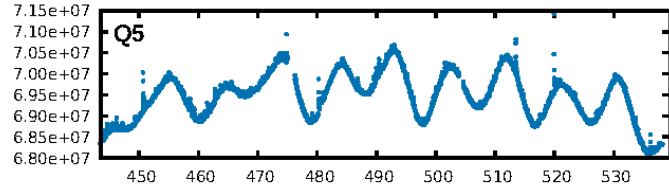
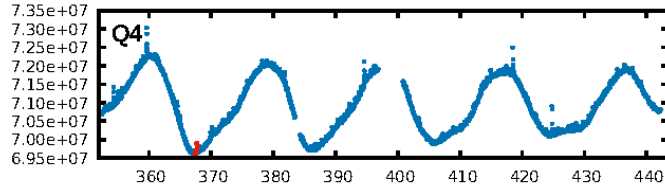
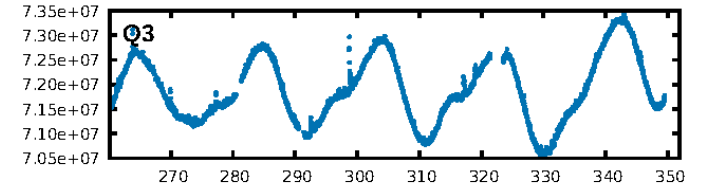
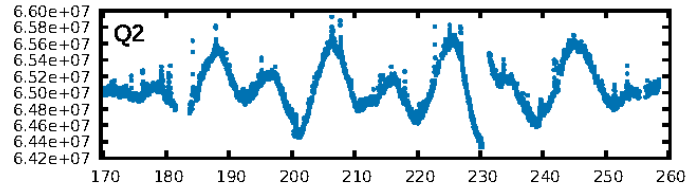
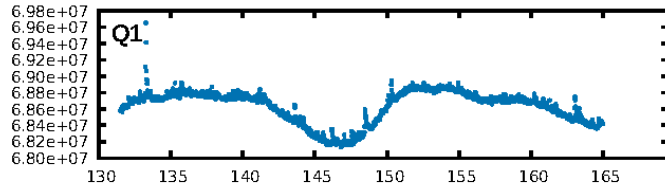
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.76σ]
LongPeriod-sig: 100.0% [109.87σ]
ModelChiSquare2-sig: 39.5%
ModelChiSquareGof-sig: 40.4%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.2082
Centroid-sig: 4.3%
Centroid-so: 0.678 arcsec [1.08σ]
OotOffset-rm: 0.174 arcsec [0.31σ]
KicOffset-rm: 0.746 arcsec [1.34σ]
OotOffset-st: 1/2/1/0 [4]
KicOffset-st: 1/2/1/0 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [4/4]

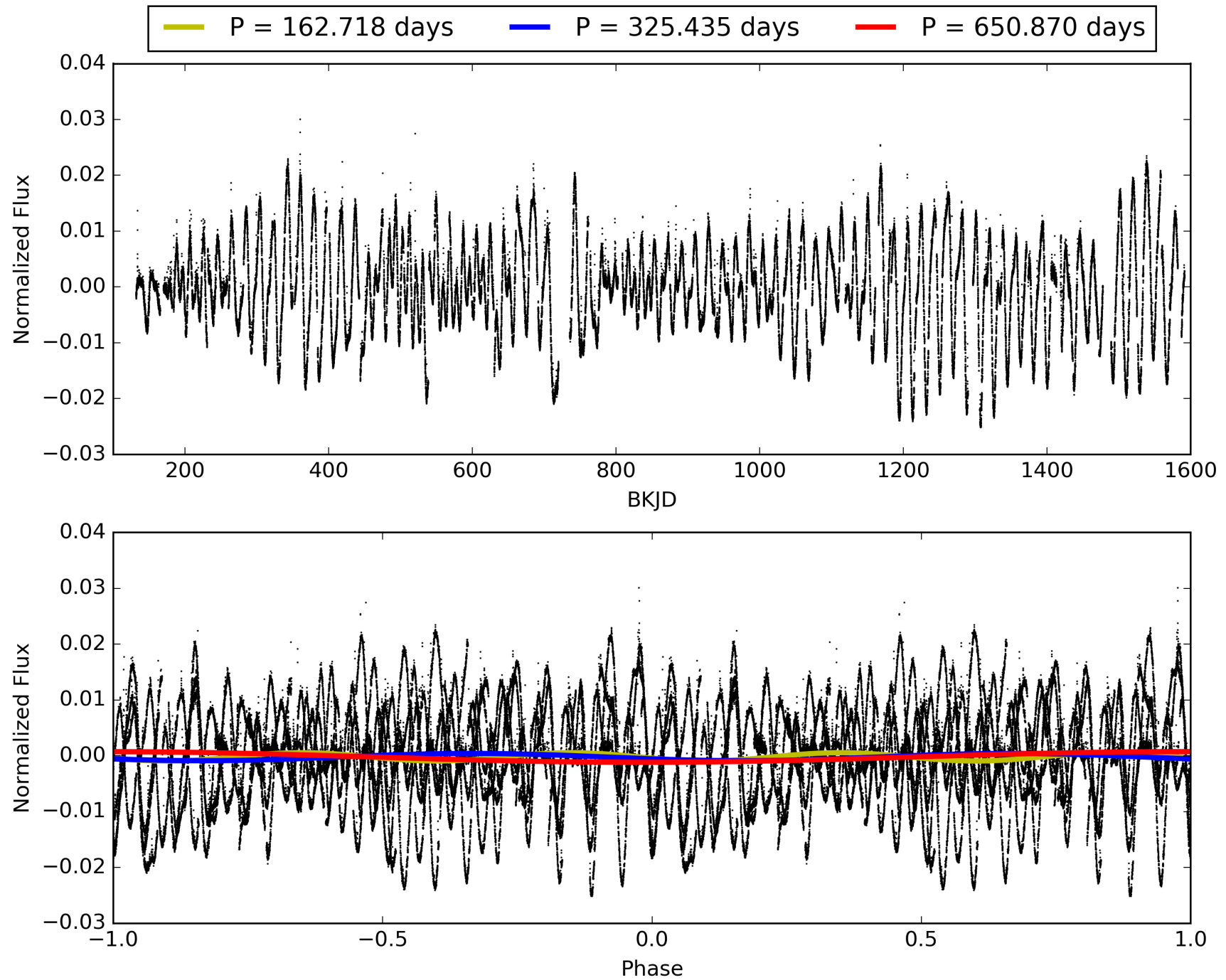
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:29:31 Z

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

TCE 004142890-02, PDC Light Curves

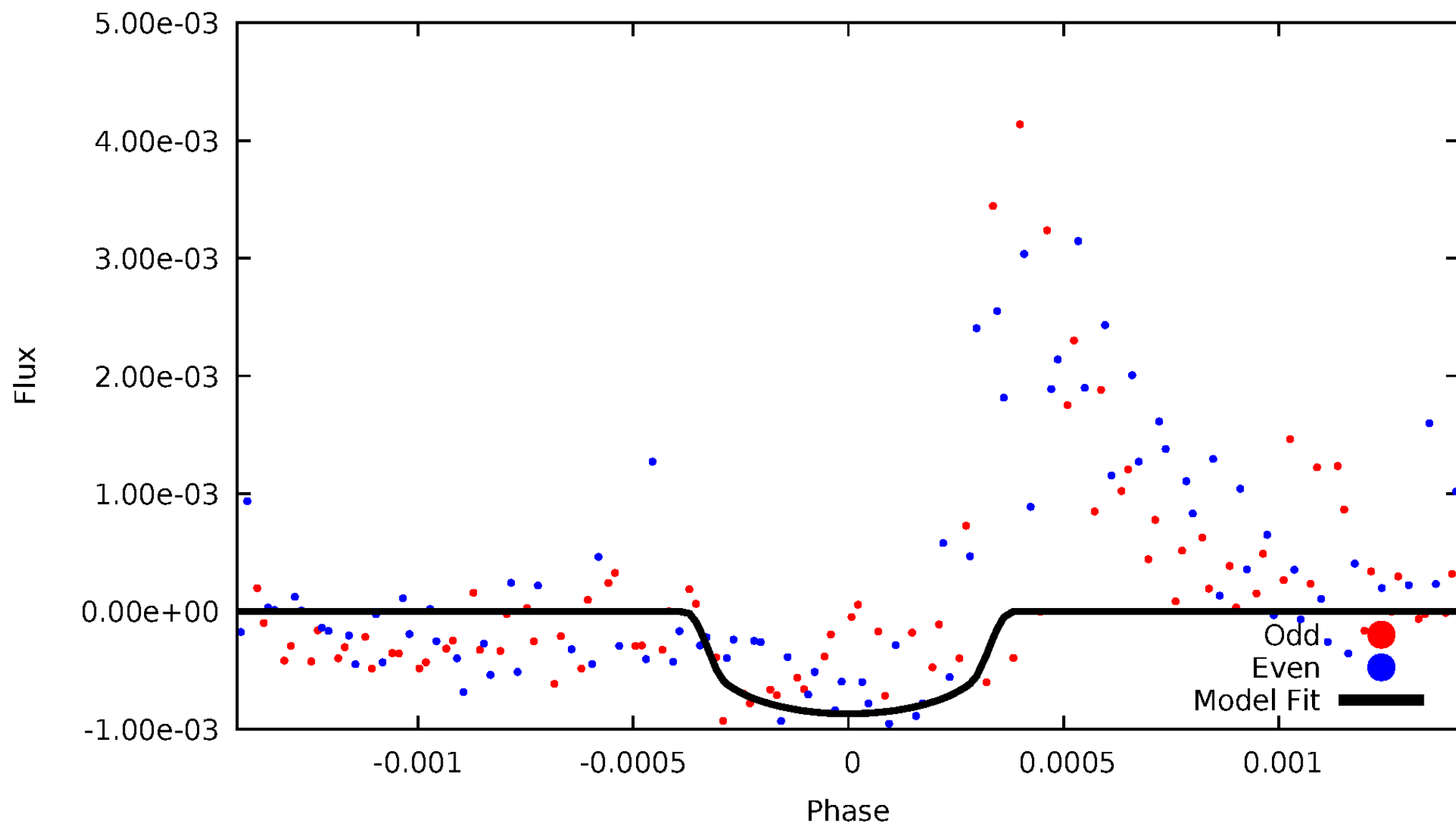


TCE 004142890-02



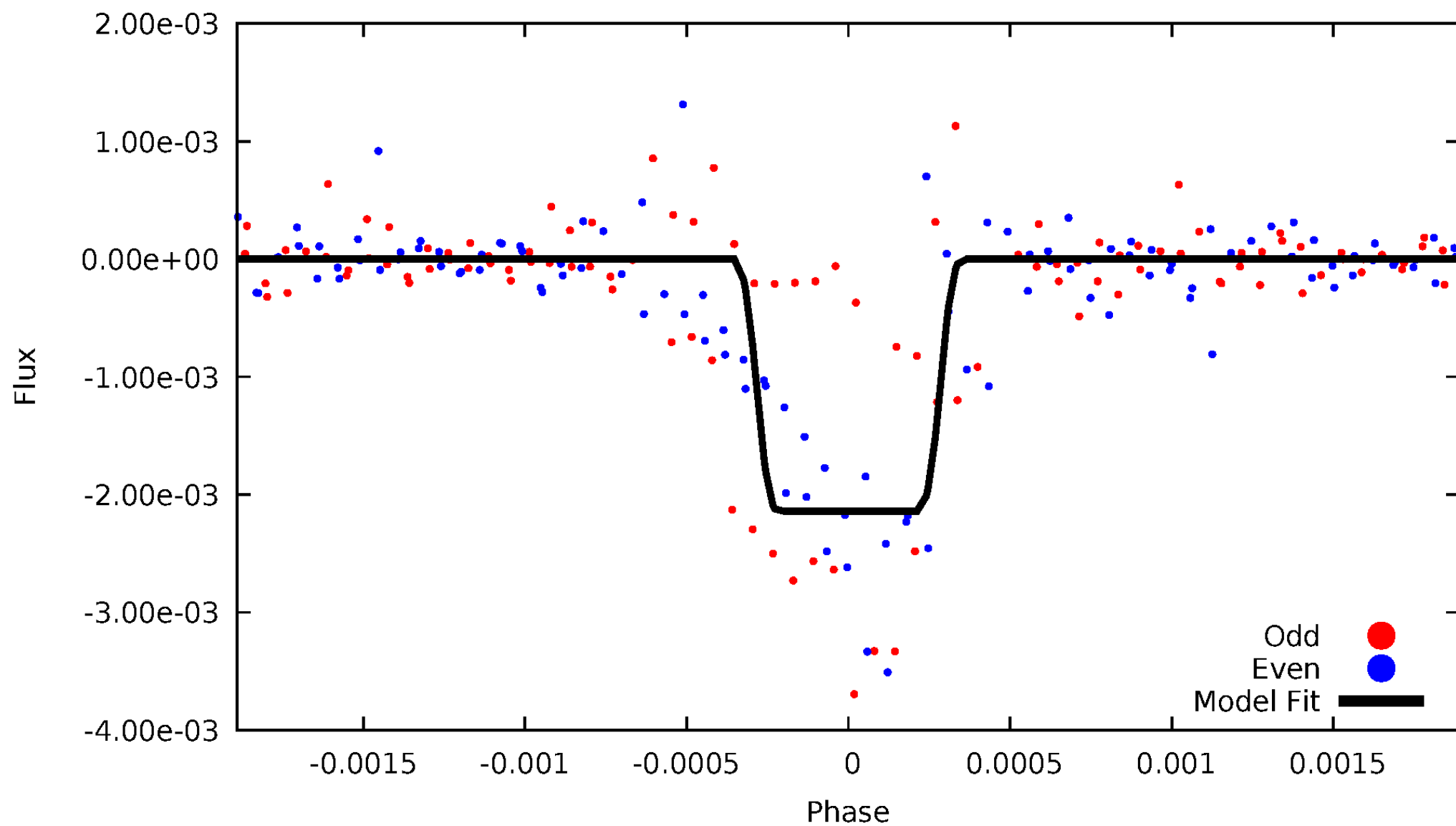
DV Odd/Even

TCE 004142890-02



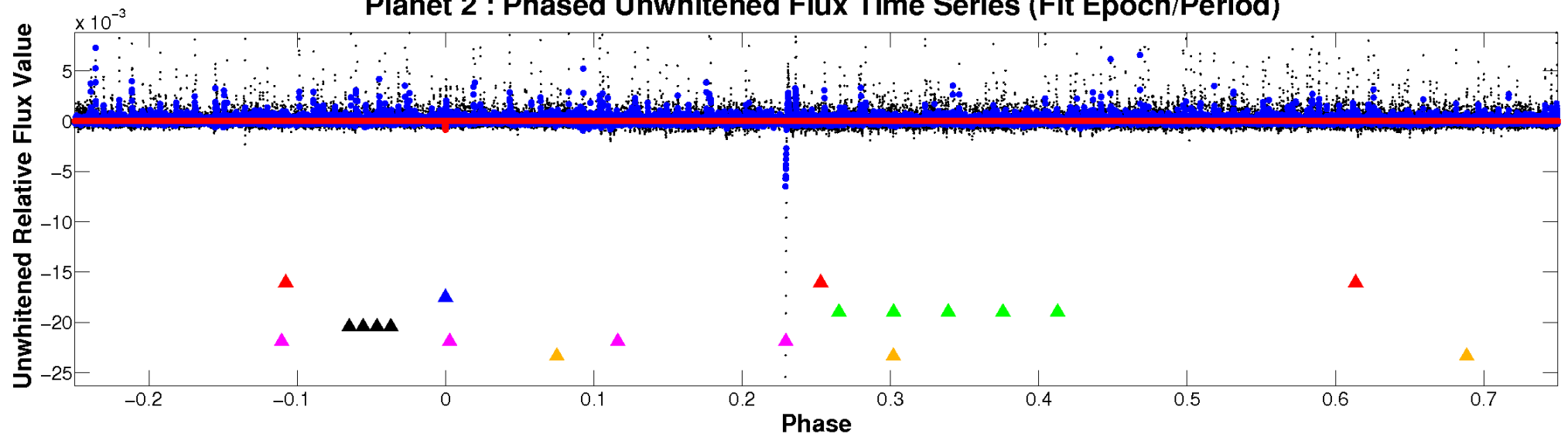
ALT Odd/Even

TCE 004142890-02

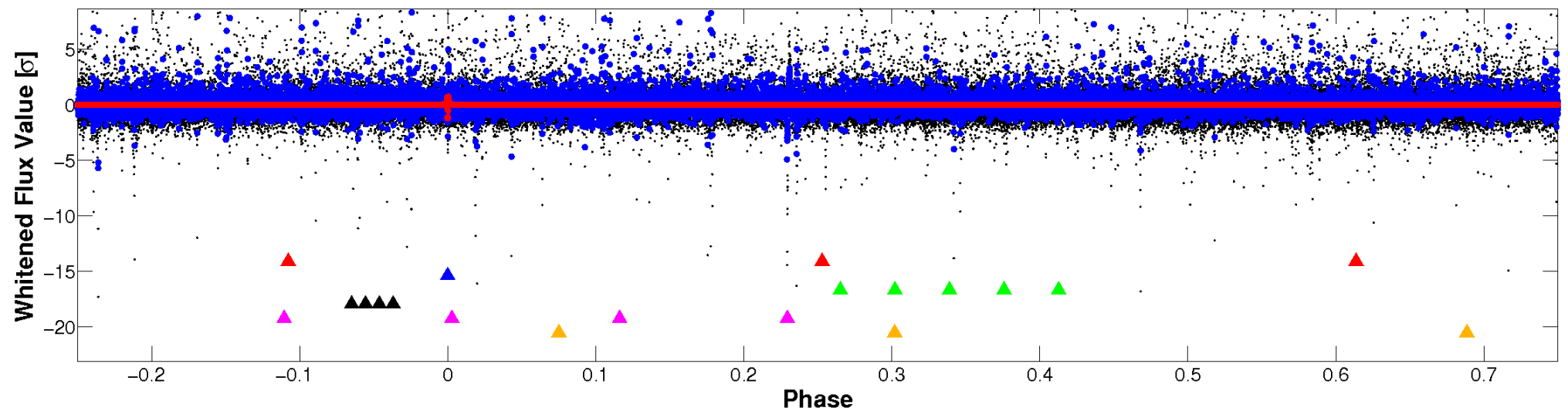


Non-Whitened Vs. Whitened Light Curve

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

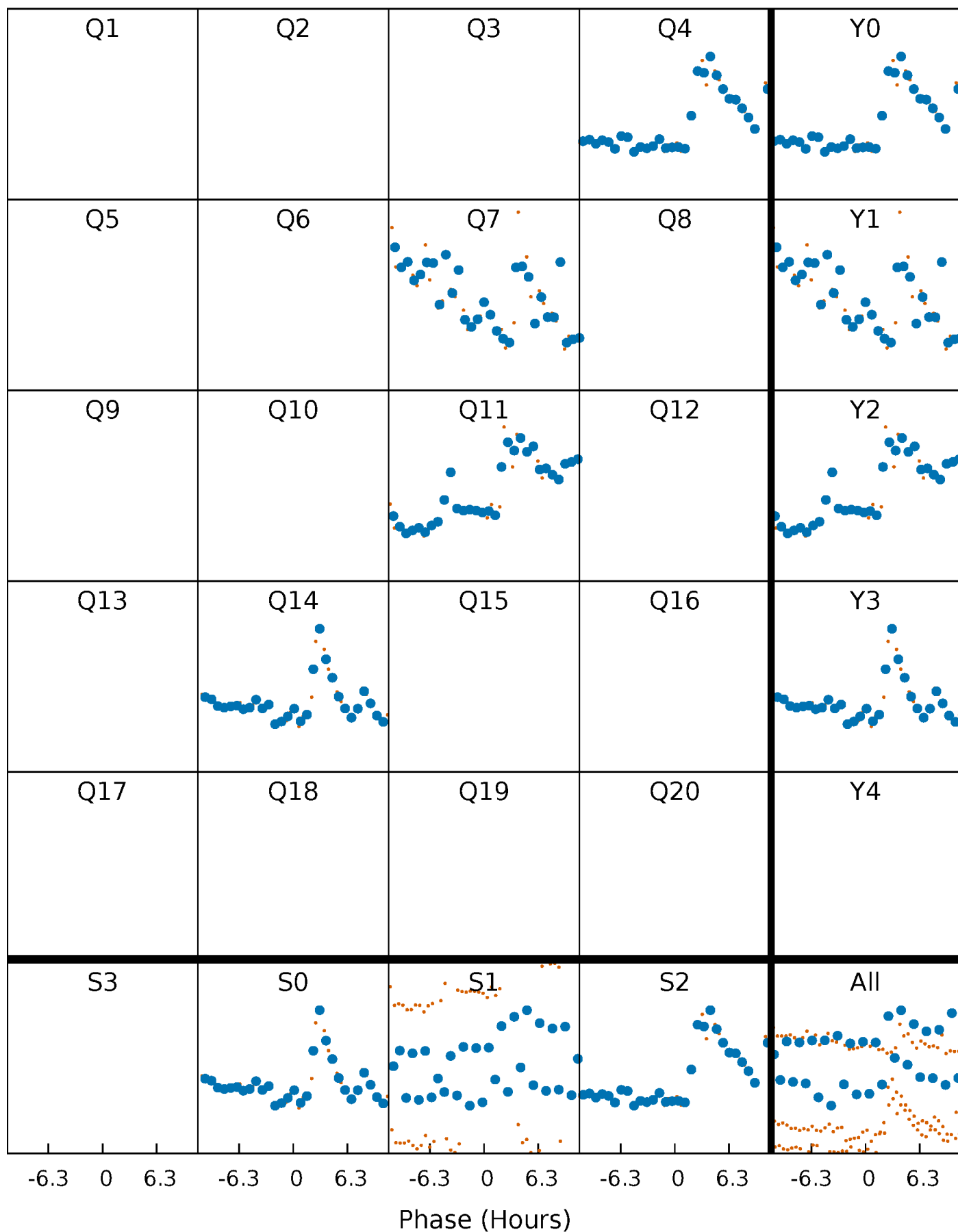


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



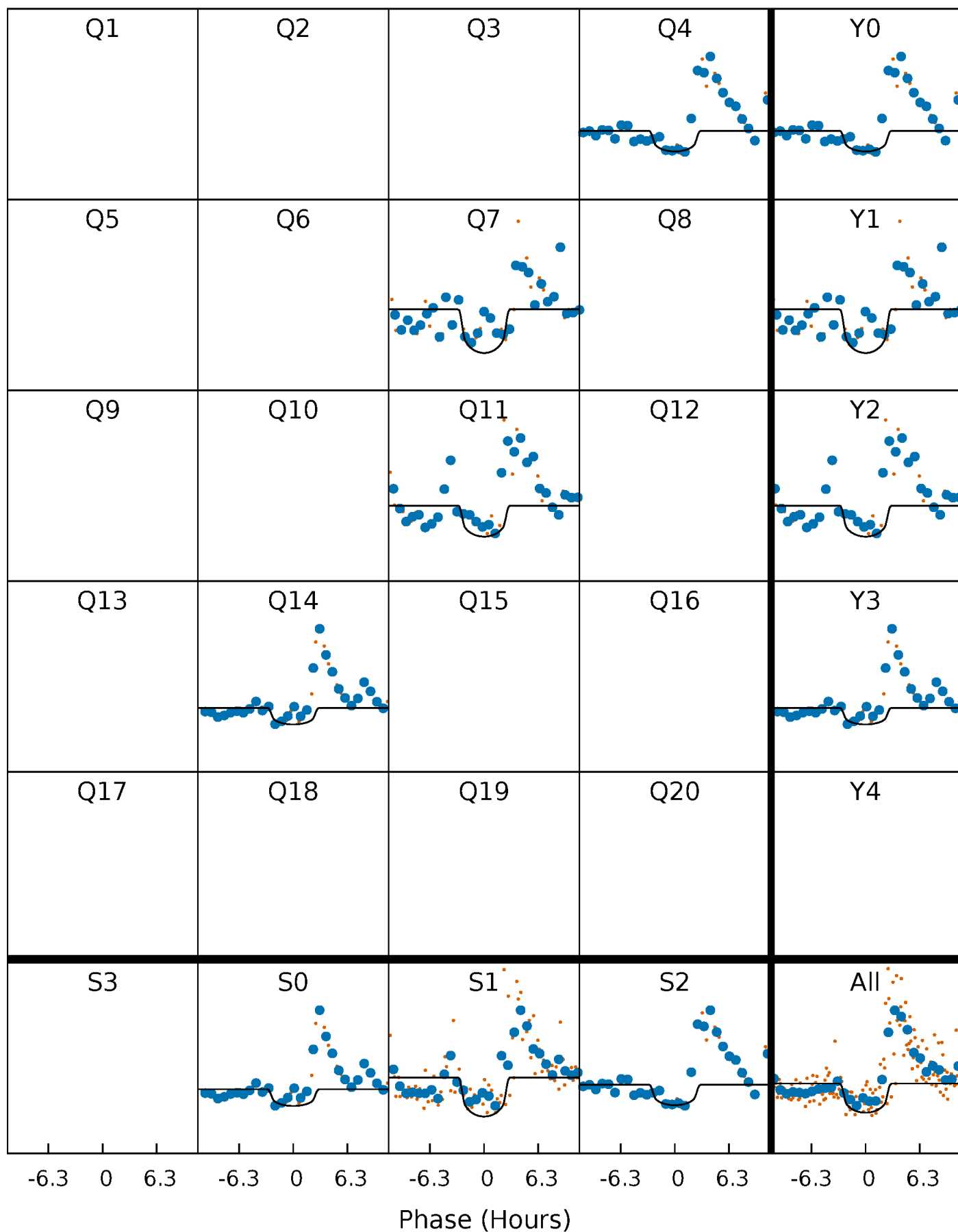
PDC Quarter-Phased Transit Curves

TCE 004142890-02 $P=325.435129$ Days $T_0=367.547618$ (BKJD)



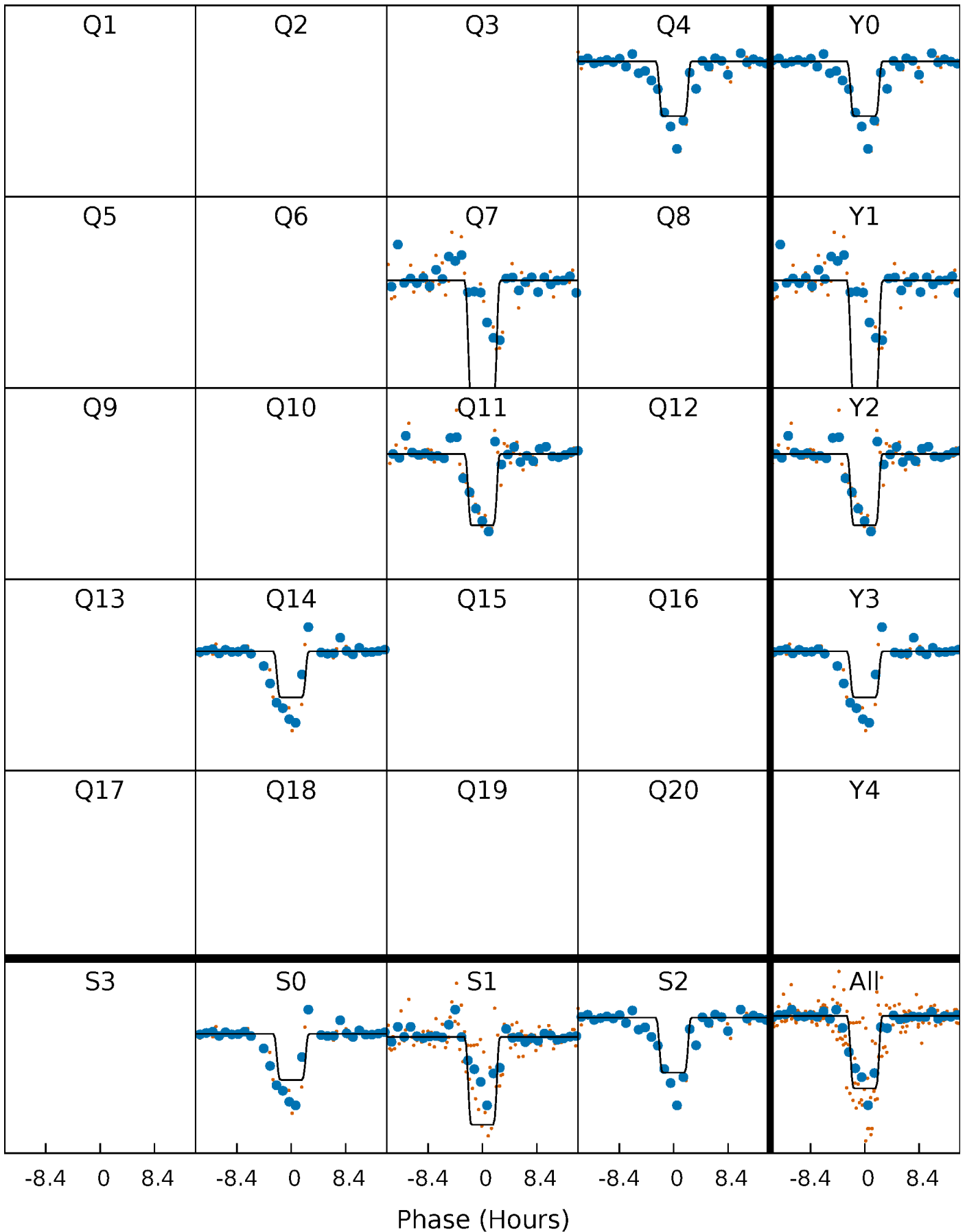
DV Quarter-Phased Transit Curves

TCE 004142890-02 $P=325.435129$ Days $T_0=367.547618$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

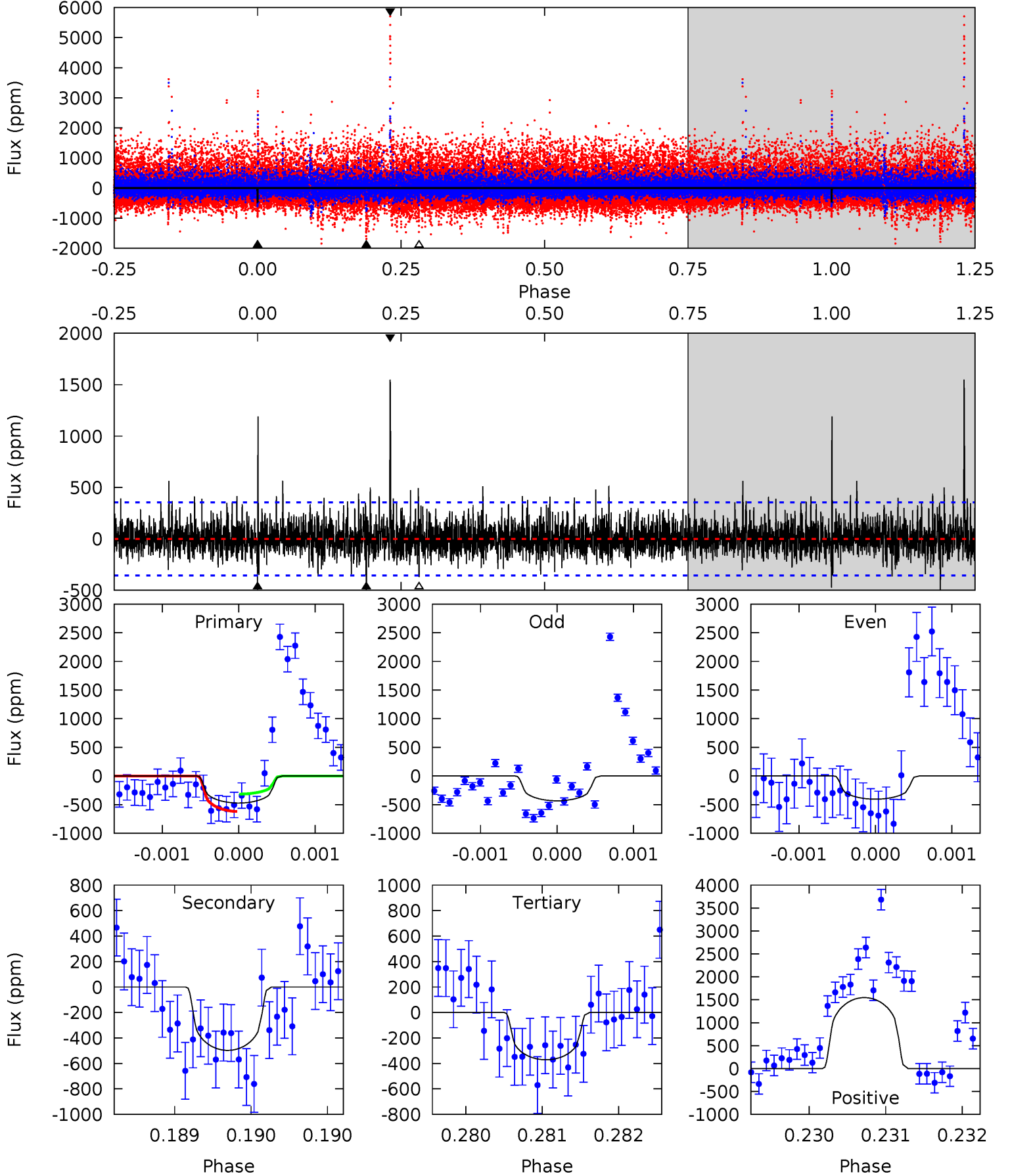
TCE 004142890-02 $P=325.438499$ Days $T_0=367.559394$ (BKJD)



DV Model-Shift Uniqueness Test

004142890-02, P = 325.435129 Days, E = 42.112489 Days

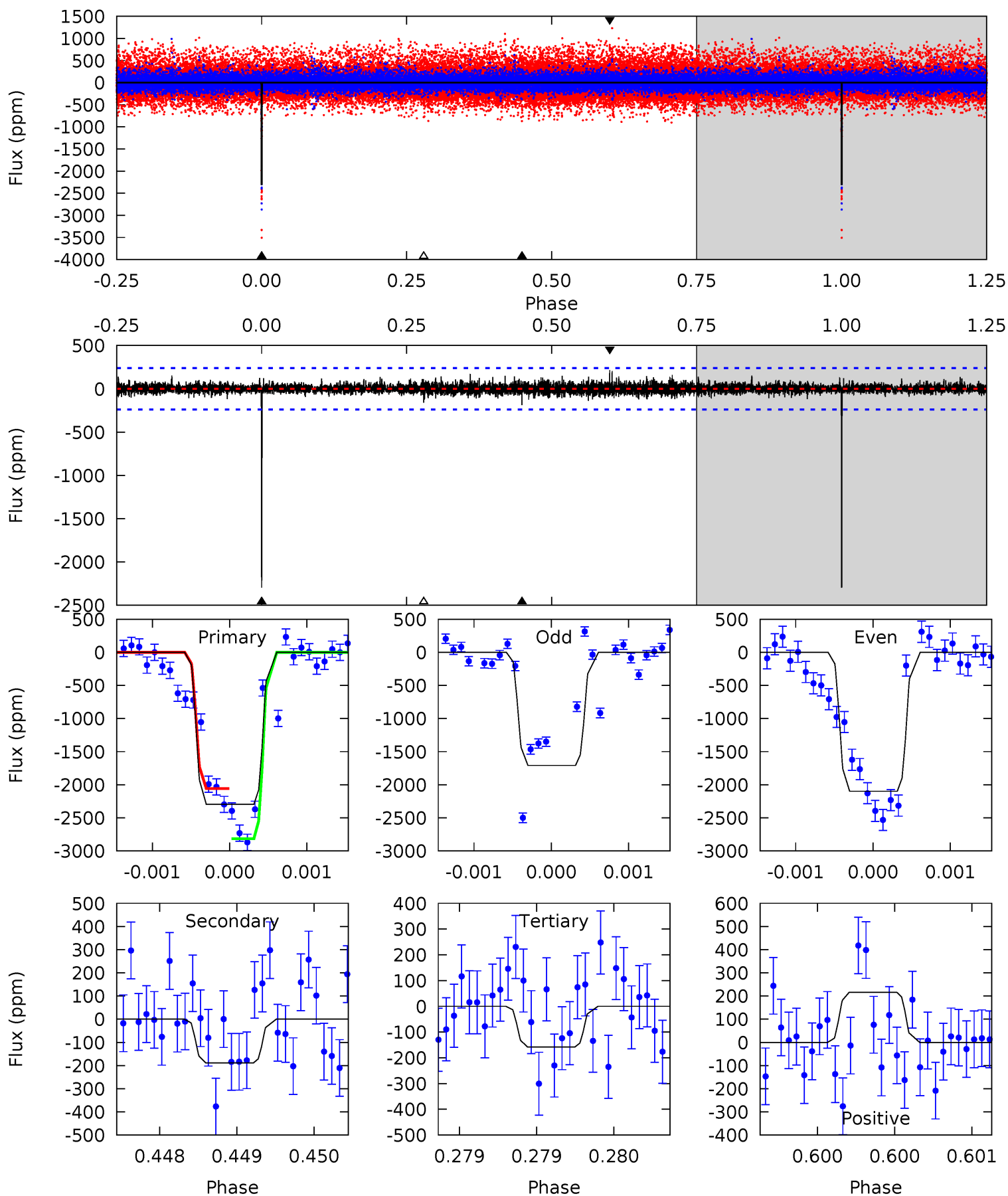
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.33 | 7.72 | 5.76 | 24.0 | 5.51 | 3.38 | 1.91 | 1.57 | -16.7 | 1.96 | -16.3 | 0.20 | 0.98 | 0.76 | 2.37 |



Alt Model-Shift Uniqueness Test

004142890-02, P = 325.438499 Days, E = 42.120895 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 52.9 | 4.36 | 3.63 | 4.98 | 5.53 | 3.41 | 0.80 | 49.3 | 47.9 | 0.73 | -0.62 | 4.83 | 0.90 | 0.09 | 8.79 |



Stellar Parameters For KIC 004142890

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 3683^{+117}_{-147} | $4.688^{+0.080}_{-0.020}$ | $0.560^{+0.050}_{-0.300}$ | $0.563^{+0.030}_{-0.083}$ | $0.564^{+0.036}_{-0.072}$ | $4.449^{+1.718}_{-0.458}$ |
| | +3%/-4% | +2%/-0% | +9%/-54% | +5%/-15% | +6%/-13% | +39%/-10% |
| Source | KIC0 | 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 004142890-02 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|-----------------------|----------------------------|
| DV | -497 ± 64 | $1.88^{+1.23}_{-1.12}$ | 192^{+8}_{-8} | 3273^{+1201}_{-426} | $43891^{+235628}_{-27329}$ |
| Alt. | -189 ± 43 | $2.77^{+1.31}_{-1.27}$ | 192^{+7}_{-8} | 2593^{+475}_{-263} | 8020^{+20703}_{-4552} |

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

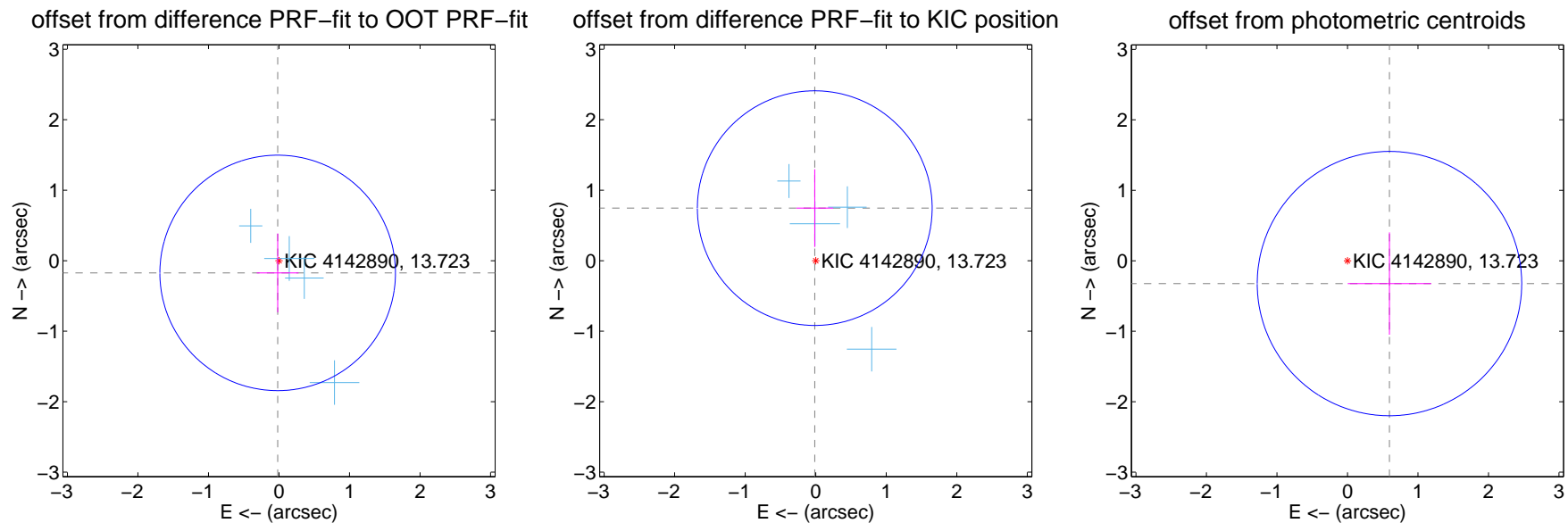
DV Centroid Data

Supplemental centroid analysis for 004142890-02. Kepler magnitude: 13.72. Transit SNR 7.42

There are 4 quarters with good PRF difference image offsets

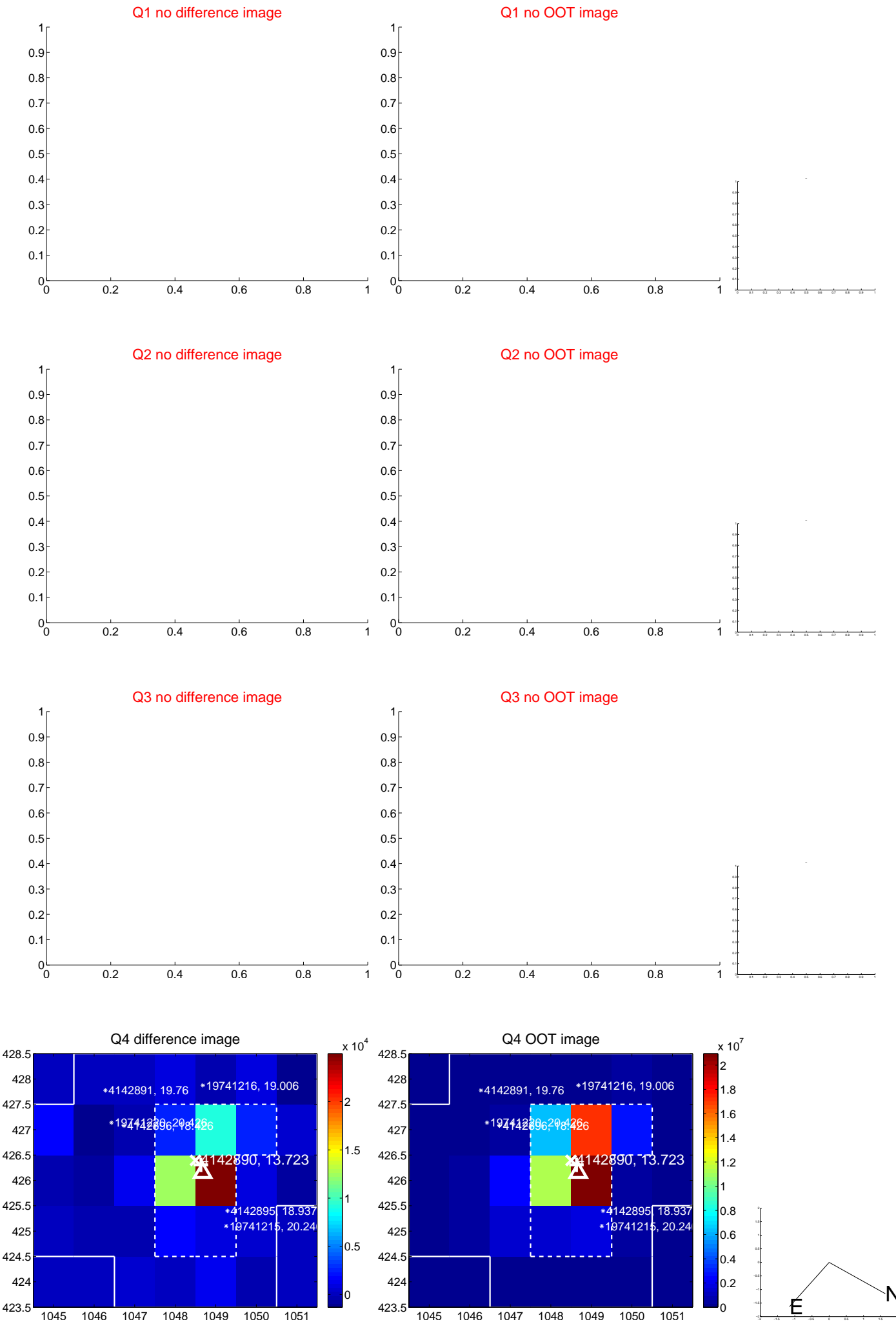
The direct PRF centroid is offset from the target star catalog position by about 1.01 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|--------------------|
| PRF-fit source offset from OOT | 0.174 ± 0.557 | 0.31 | 0.019 ± 0.296 | -0.173 ± 0.559 |
| PRF-fit source offset from KIC position | 0.746 ± 0.555 | 1.34 | 0.014 ± 0.262 | 0.746 ± 0.551 |
| photometric centroid source offset | 0.68 ± 0.63 | 1.08 | -0.60 ± 0.59 | -0.32 ± 0.73 |



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.

Q5 no difference image



Q5 no OOT image



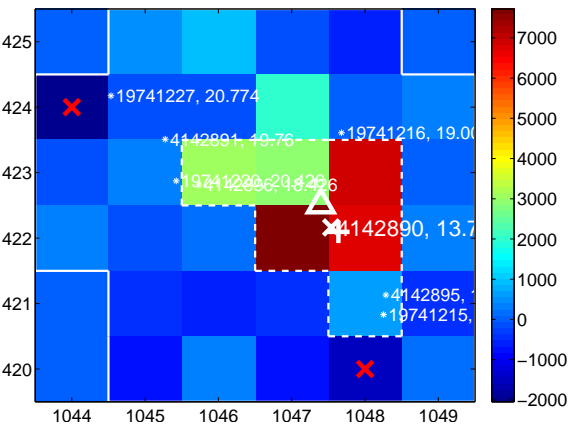
Q6 no difference image



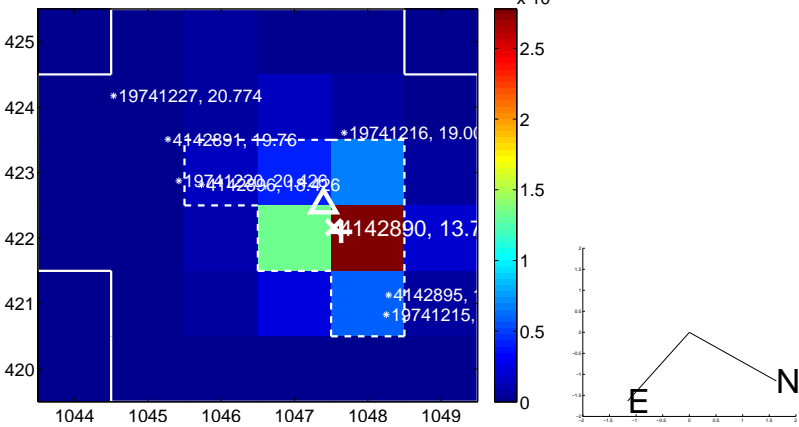
Q6 no OOT image



Q7 difference image



Q7 OOT image



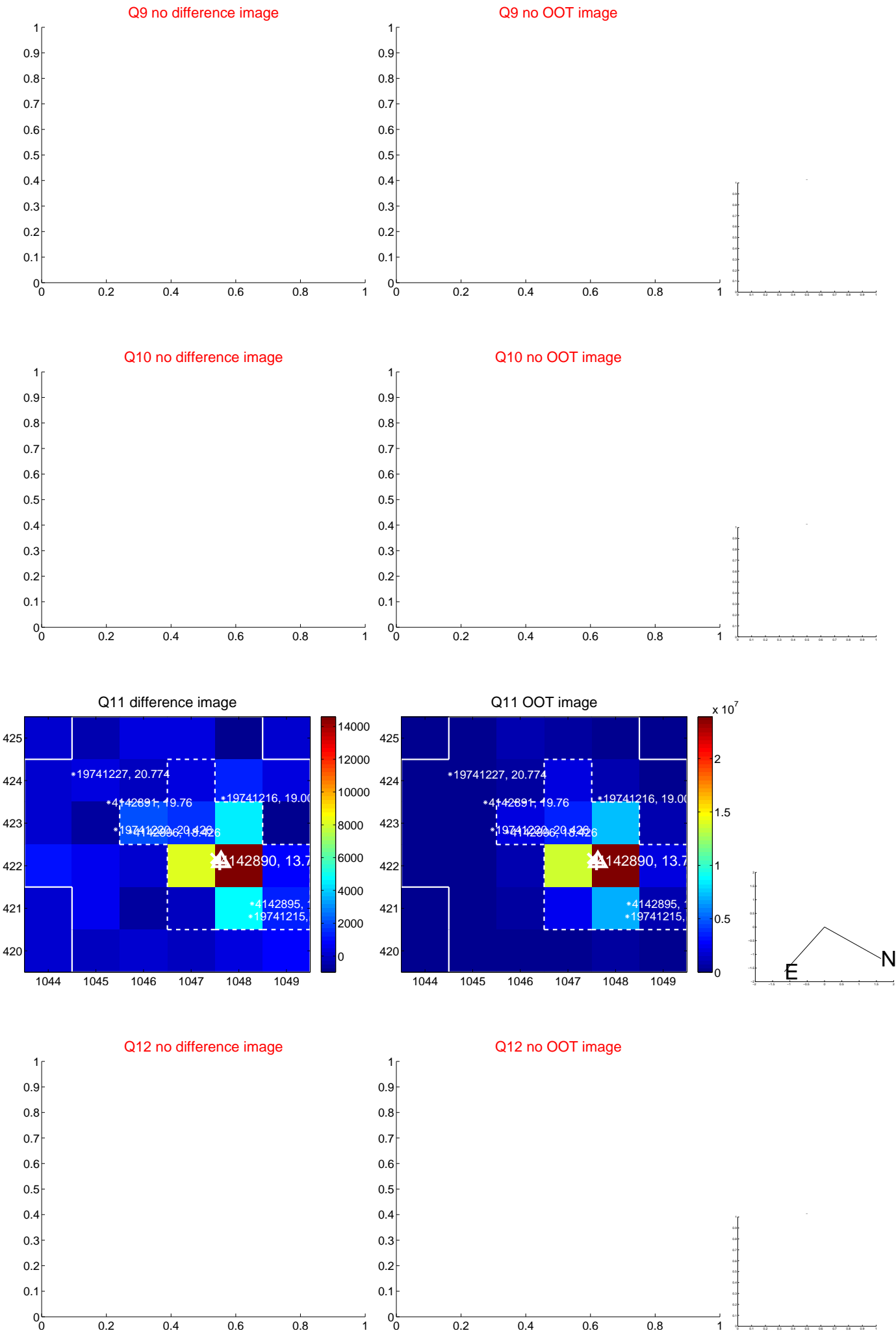
Q8 no difference image



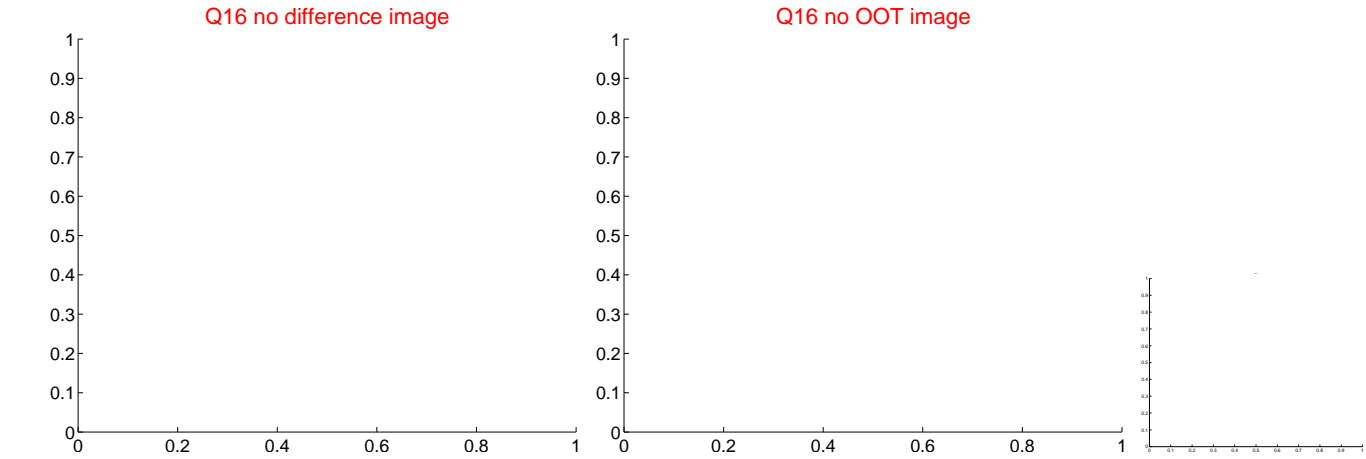
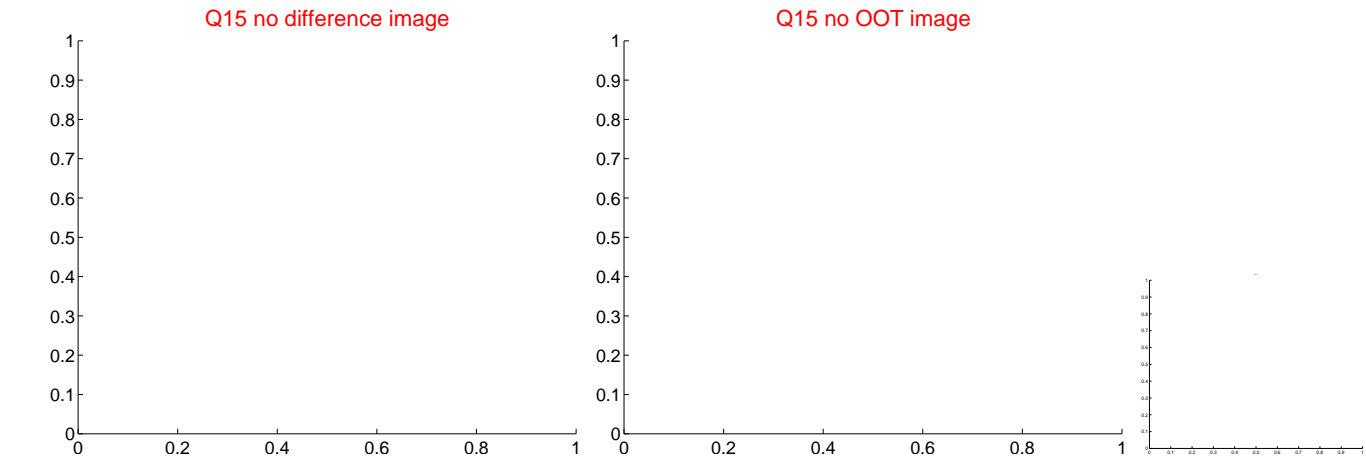
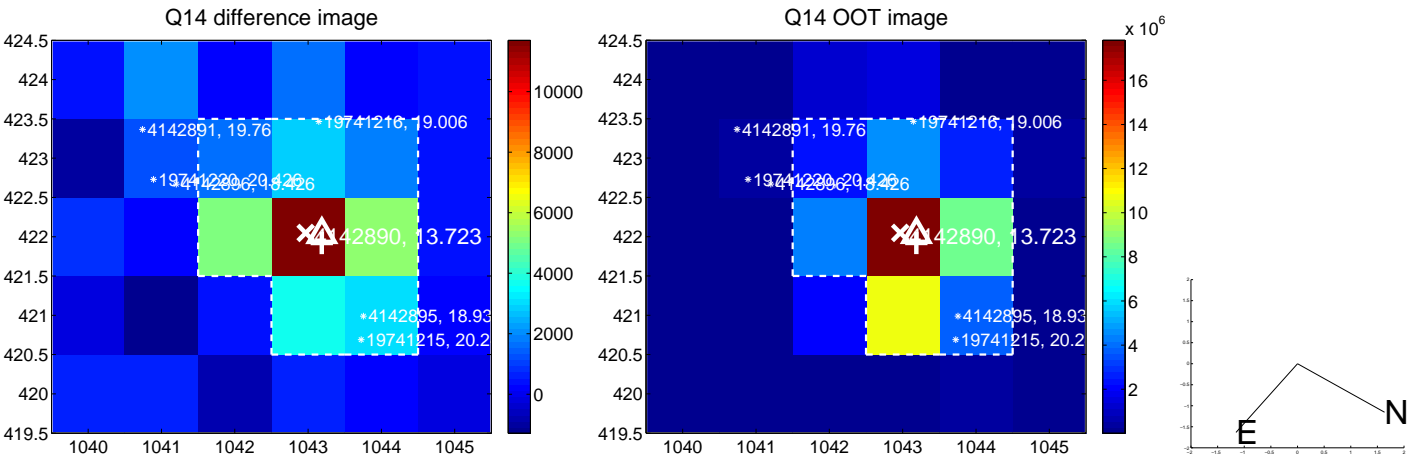
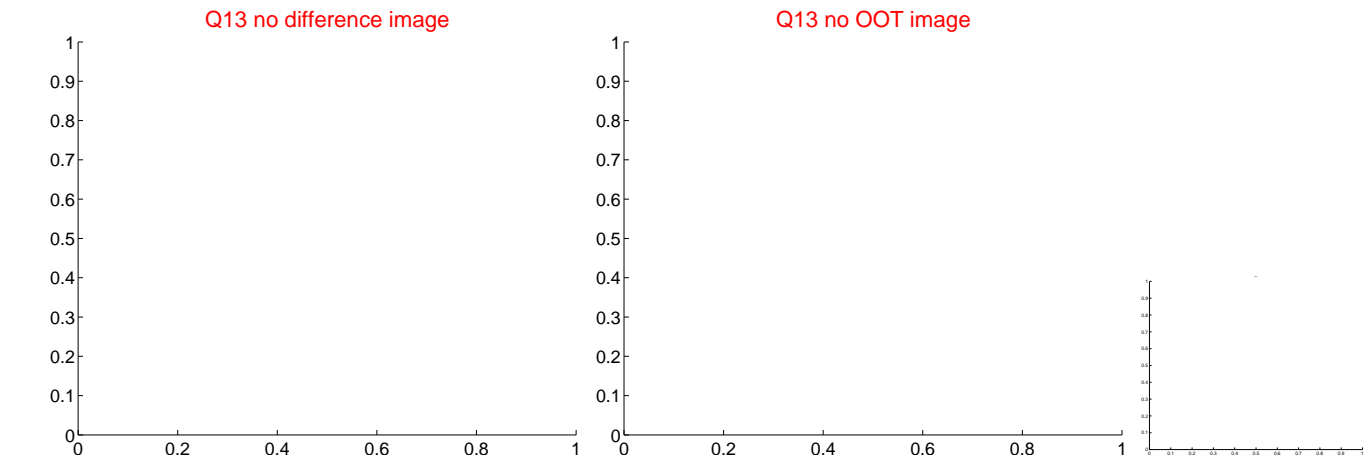
Q8 no OOT image



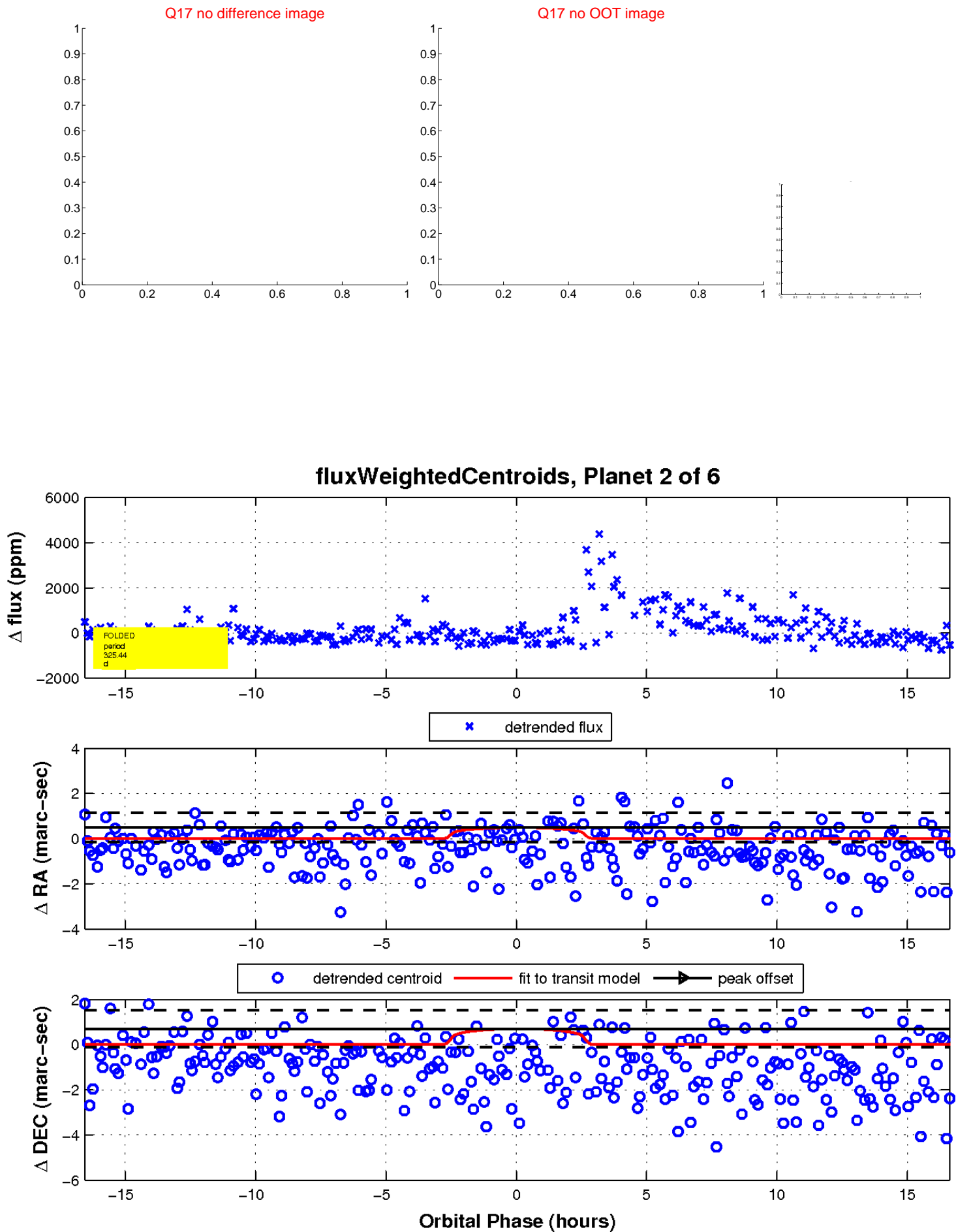
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

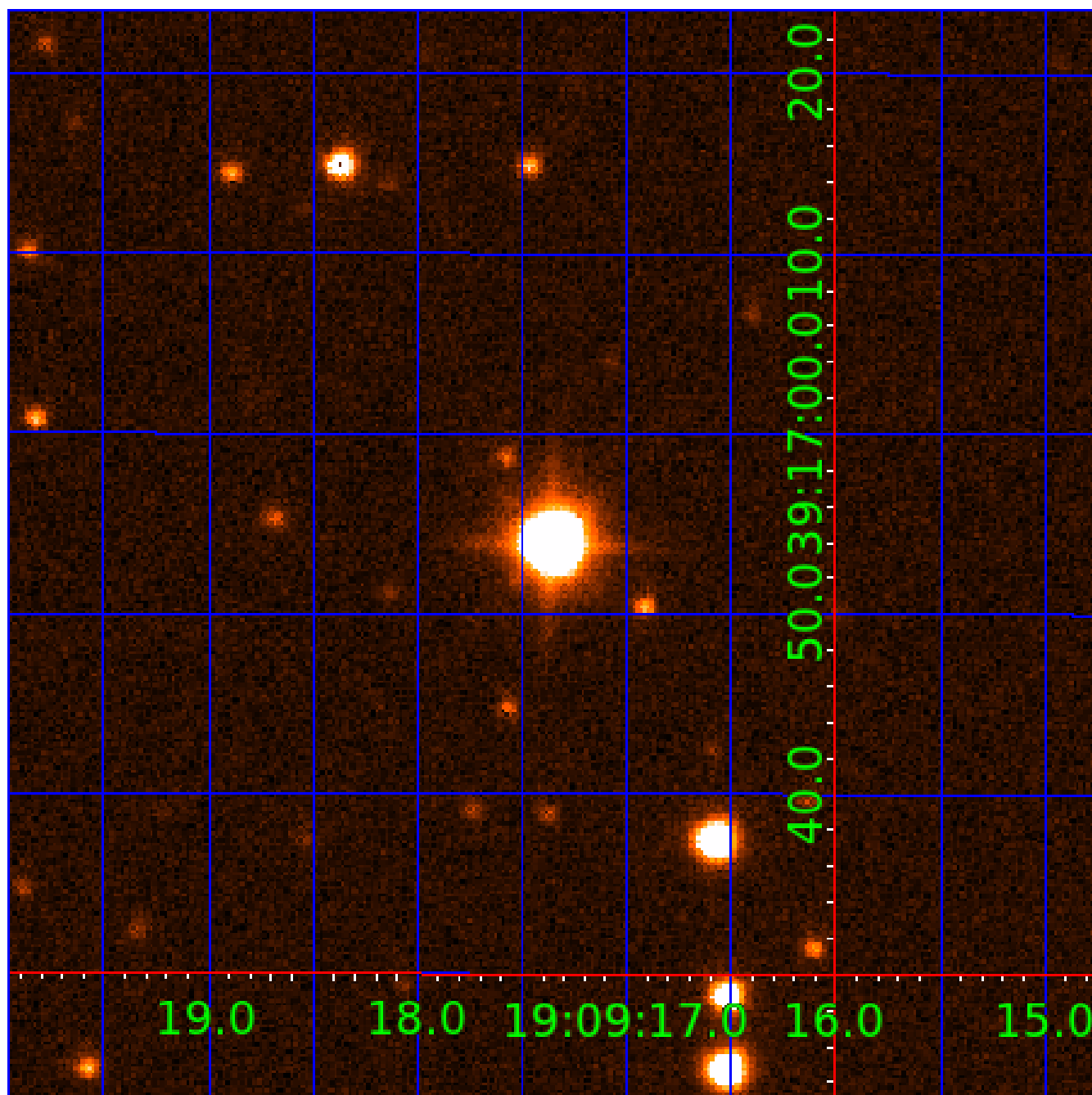


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004142890

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 004142890-01 | OBS | No | 533.492090 | 241.820037 | 1263.6 | 3.005 | 14.1 | 8.3 | 0.56 | 3683 | 2.24 | 0.05 |
| 004142890-02 | OBS | No | 325.435129 | 367.547618 | 869.1 | 5.548 | 11.6 | 7.4 | 0.56 | 3683 | 1.79 | 0.09 |
| 004142890-03 | OBS | No | 313.437790 | 176.431613 | 1336.2 | 4.578 | 12.0 | 7.5 | 0.56 | 3683 | 3.50 | 0.09 |
| 004142890-04 | OBS | No | 322.392681 | 355.557359 | 882.5 | 6.223 | 11.0 | 7.2 | 0.56 | 3683 | 2.17 | 0.09 |
| 004142890-05 | OBS | No | 362.308167 | 331.601435 | 891.7 | 5.840 | 9.5 | 7.2 | 0.56 | 3683 | 1.76 | 0.08 |
| 004142890-06 | OBS | No | 525.072046 | 391.984959 | 887.5 | 4.002 | 11.4 | 5.6 | 0.56 | 3683 | 1.81 | 0.05 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004142890-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST |
| 004142890-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—HALO_GHOST |
| 004142890-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |
| 004142890-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV |
| 004142890-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_KIC_POS |
| 004142890-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |

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

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

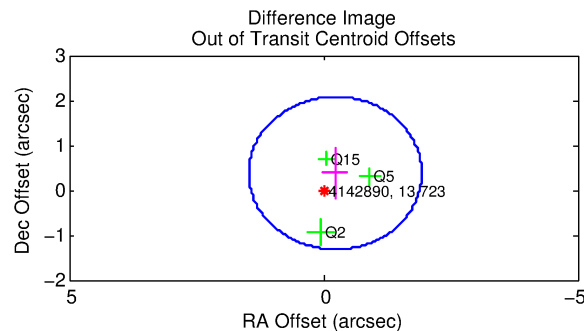
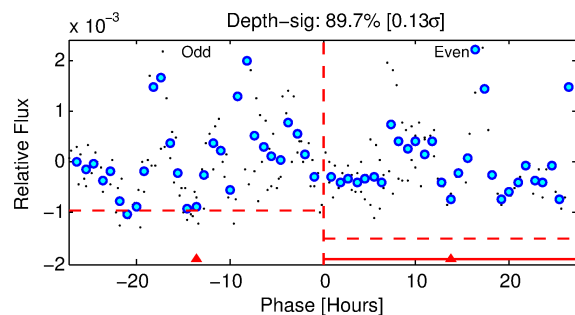
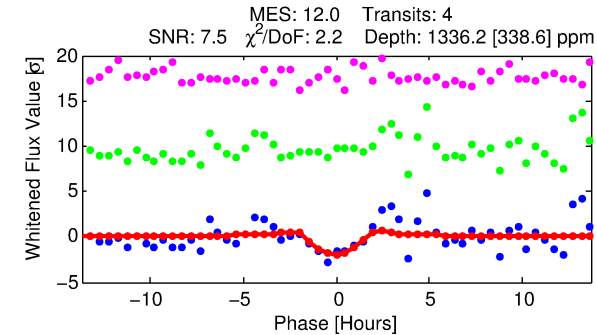
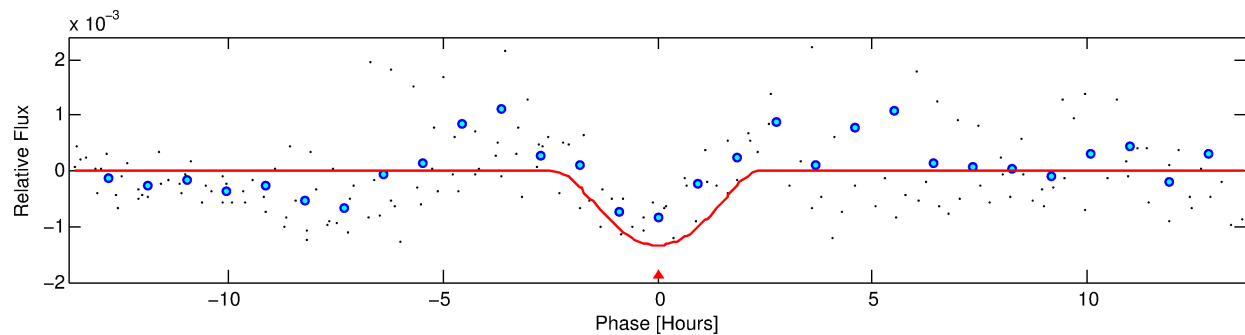
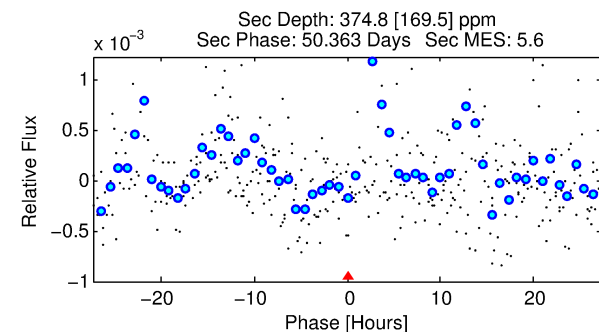
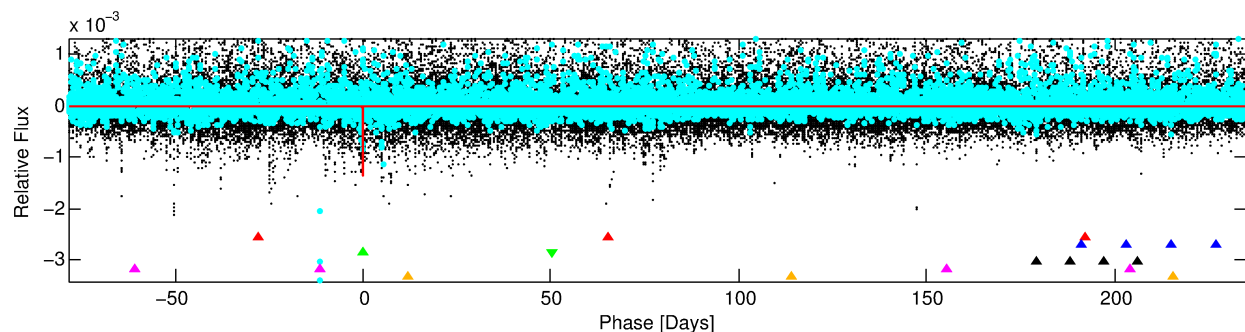
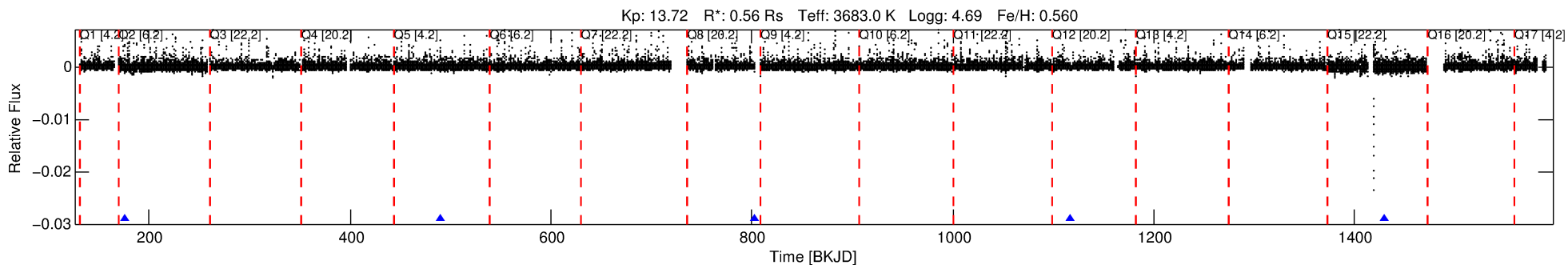
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004142890-03

No Significant Match Found

DV One-Page Summary

KIC: 4142890 Candidate: 3 of 6 Period: 313.438 d



DV Fit Results:

Period = 313.43779 [0.00727] d
Epoch = 176.4316 [0.0135] BKJD
Rp/R* = 0.0570 [0.1438]
a/R* = 204.30 [155.02]
b = 0.98 [0.25]
Seff = 0.09 [0.02]
Teq = 141 [8] K
Rp = 3.50 [8.85] Re
a = 0.7461 [0.0865] AU
Ag = 9373.93 [47554.34] [0.20σ]
Teffp = 2147 [2723] K [0.74σ]

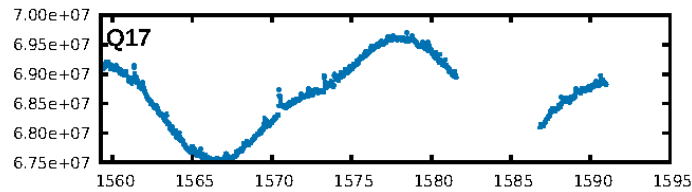
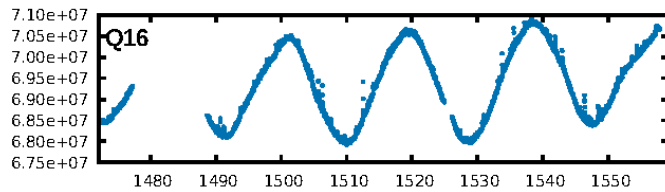
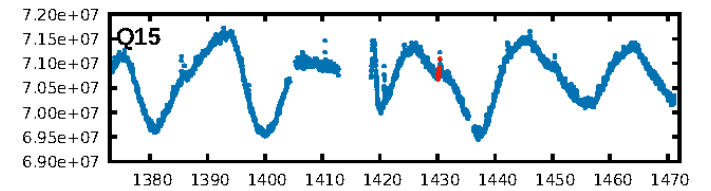
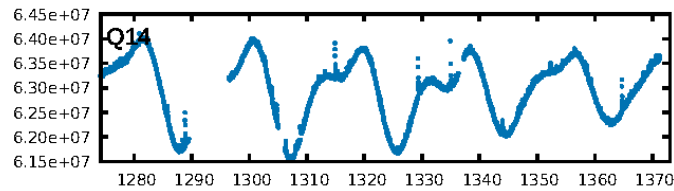
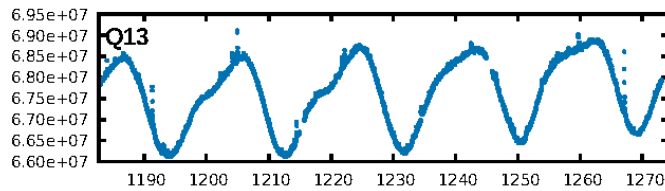
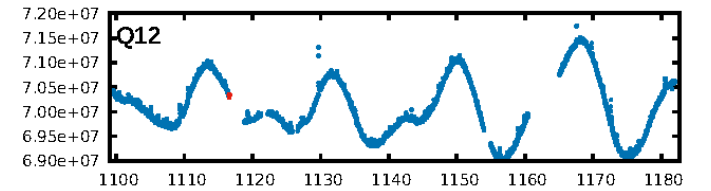
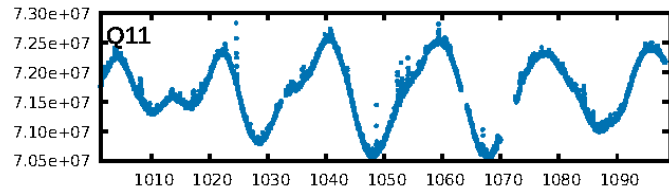
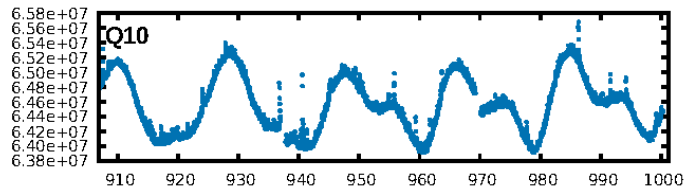
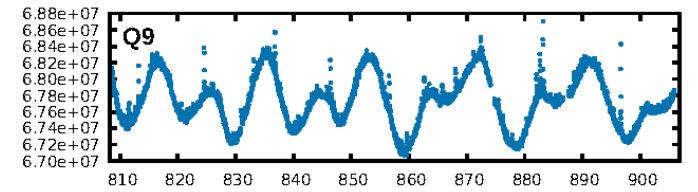
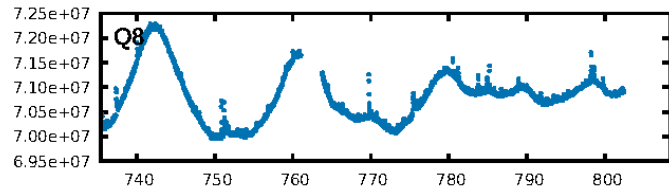
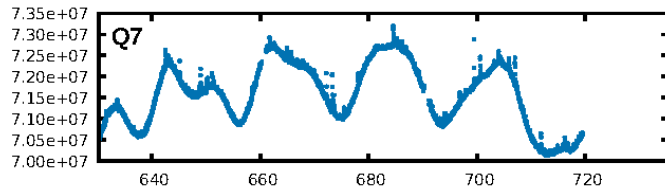
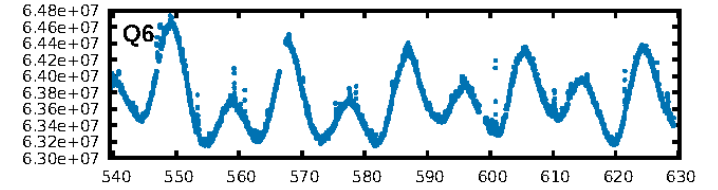
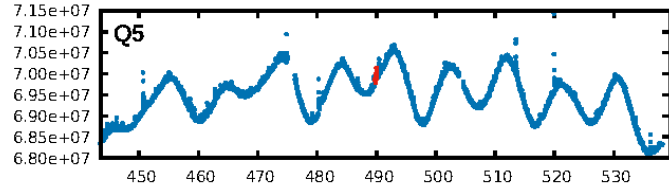
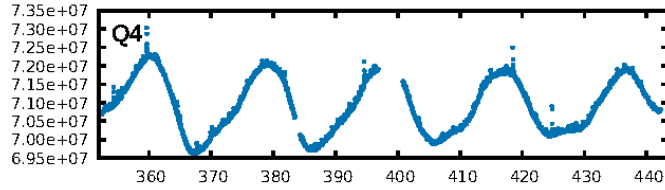
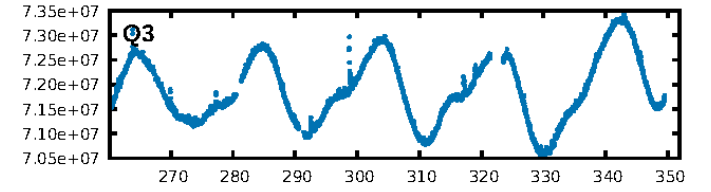
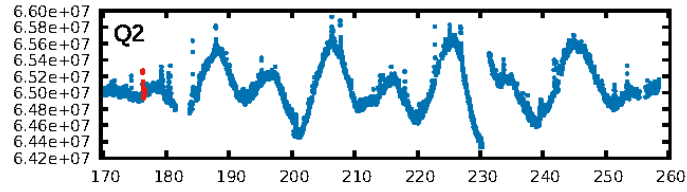
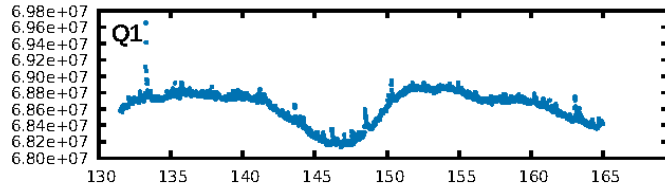
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [27.82σ]
ModelChiSquare2-sig: 97.4%
ModelChiSquareGof-sig: 93.8%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.052
Centroid-sig: 69.7%
Centroid-so: 0.750 arcsec [1.25σ]
OotOffset-rm: 0.442 arcsec [0.78σ]
KicOffset-rm: 0.989 arcsec [2.47σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

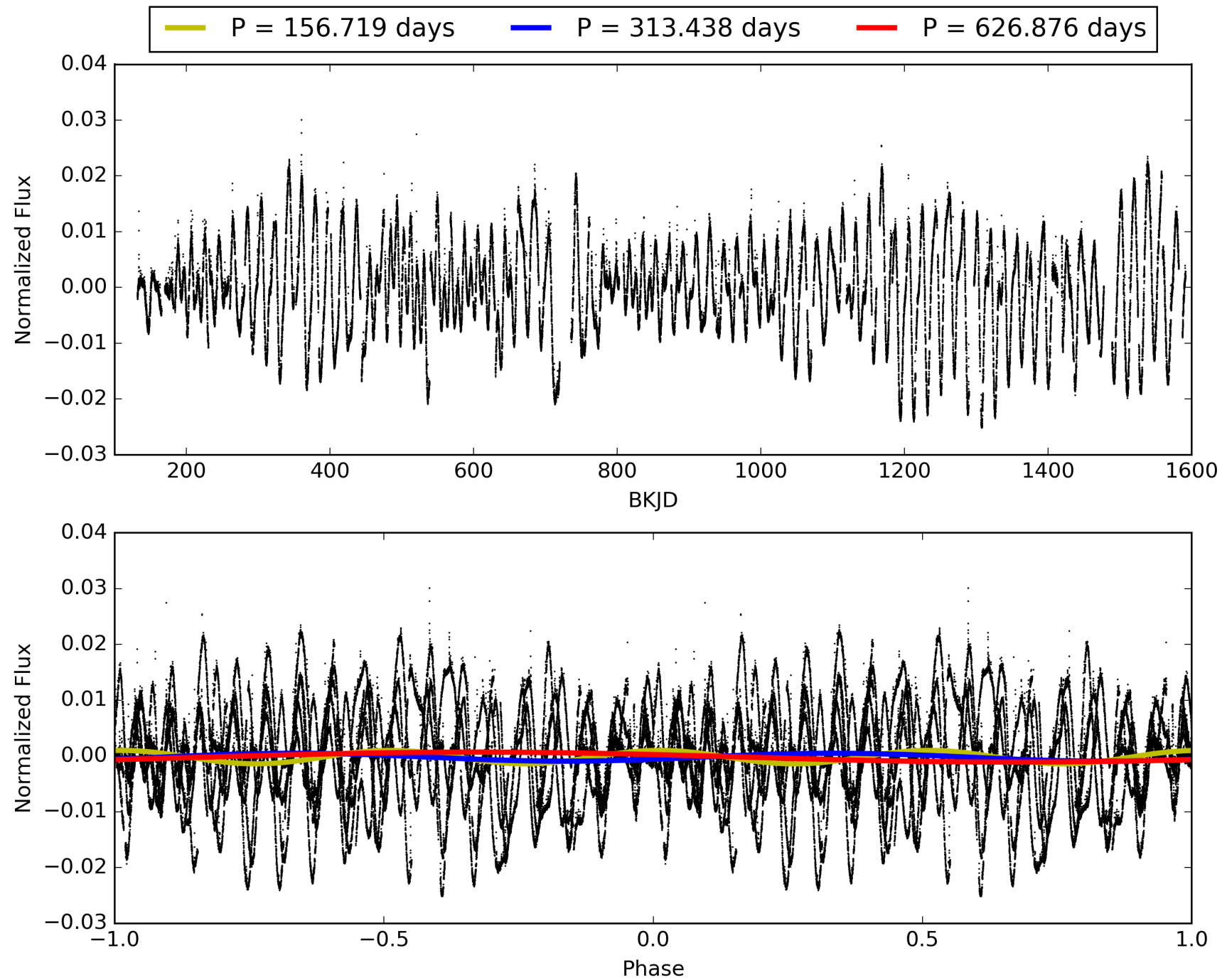
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:29:42 Z

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

TCE 004142890-03, PDC Light Curves

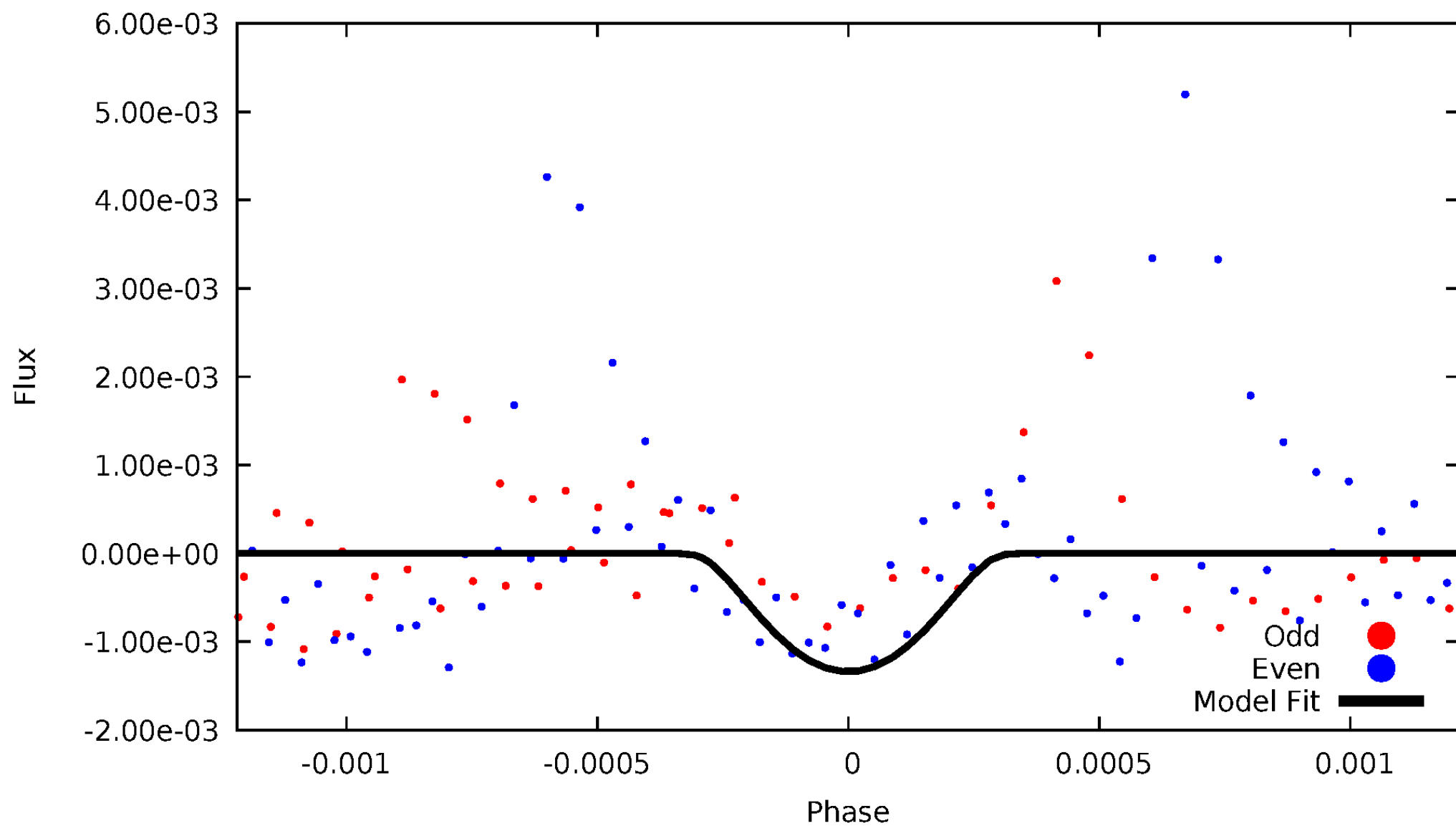


TCE 004142890-03



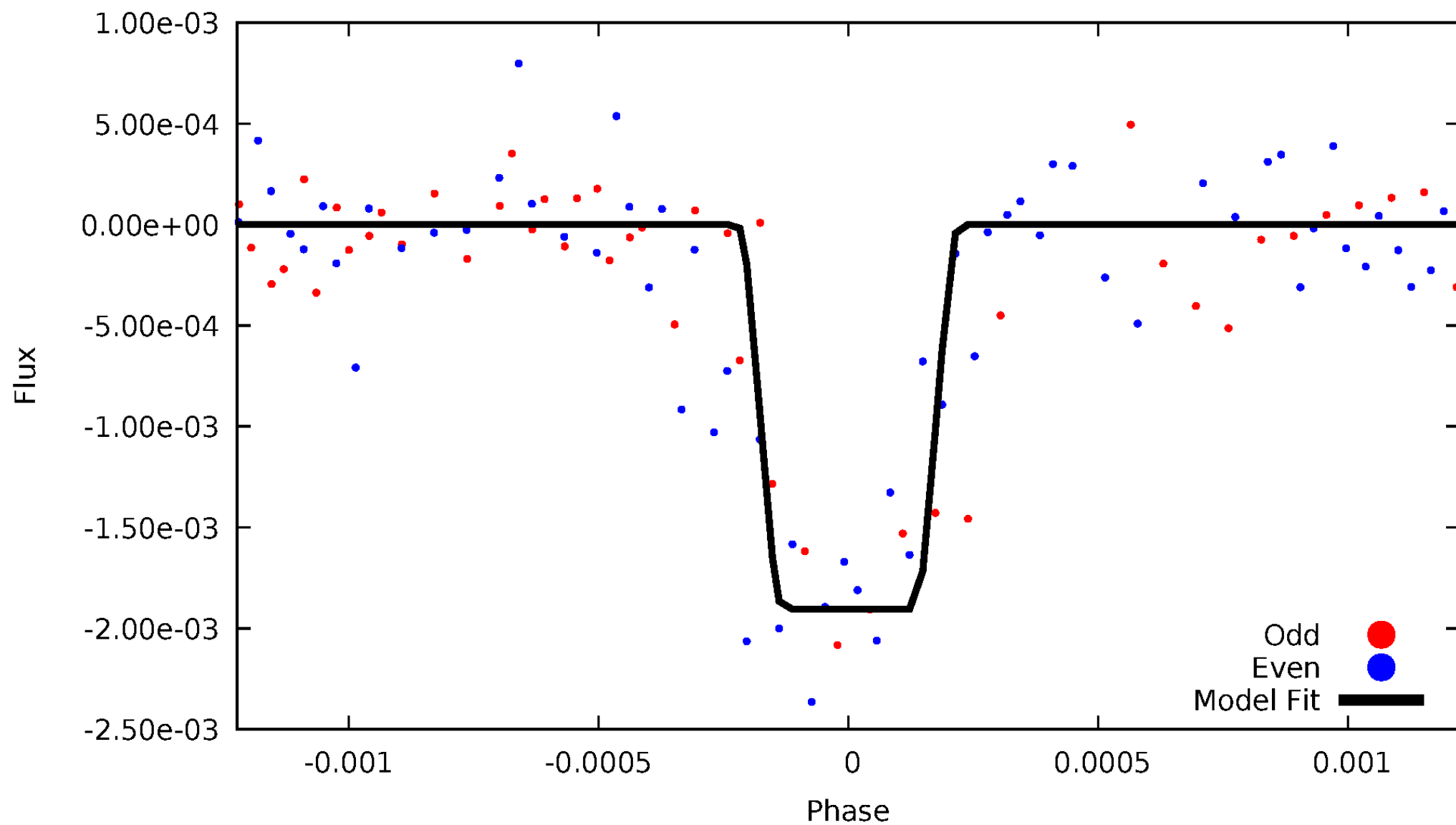
DV Odd/Even

TCE 004142890-03



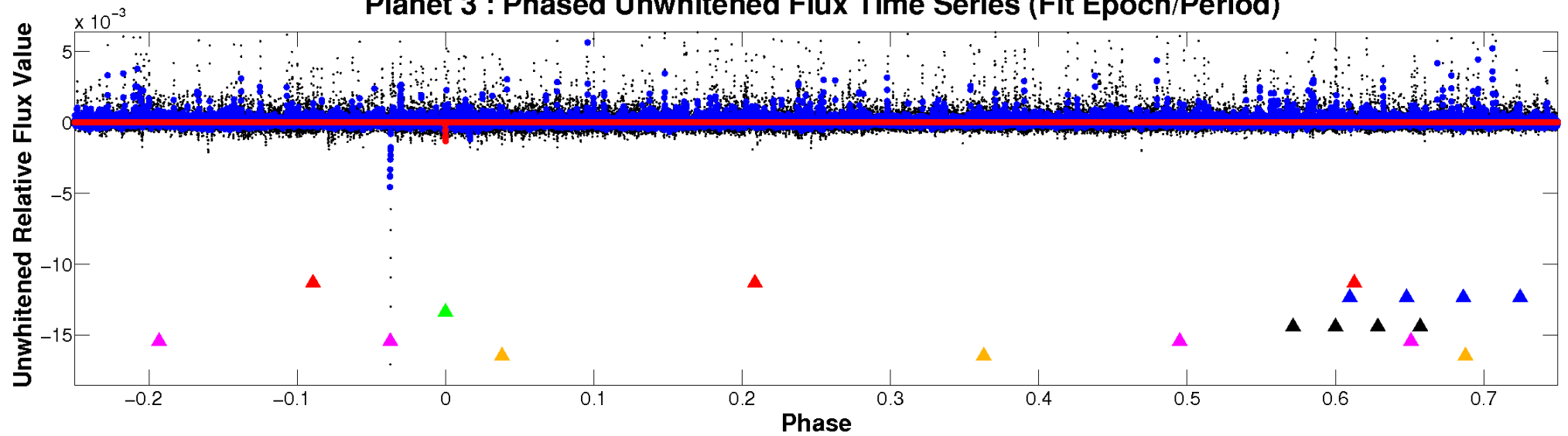
ALT Odd/Even

TCE 004142890-03

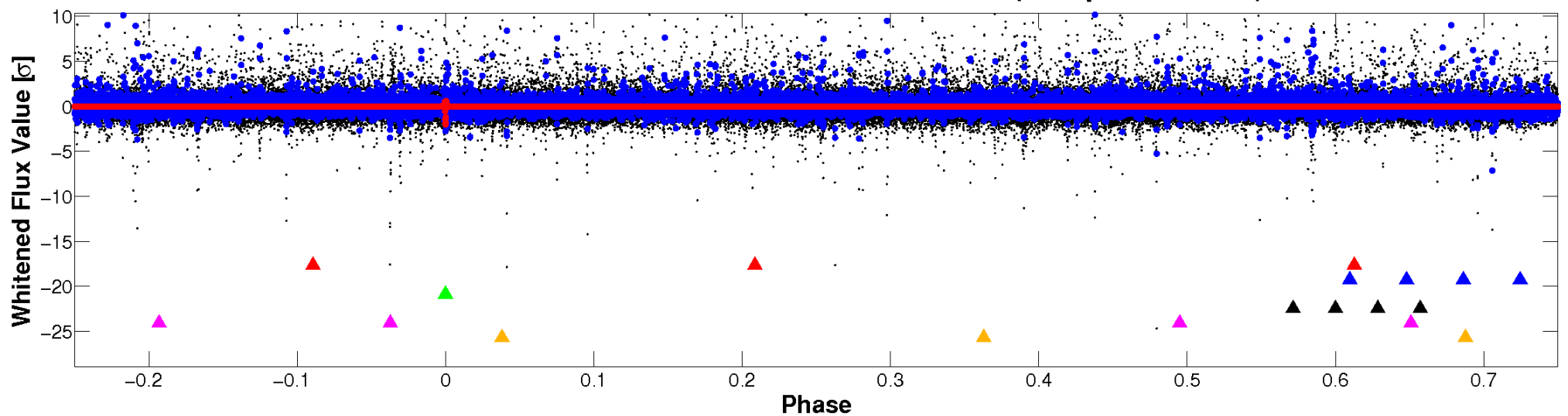


Non-Whitened Vs. Whitened Light Curve

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

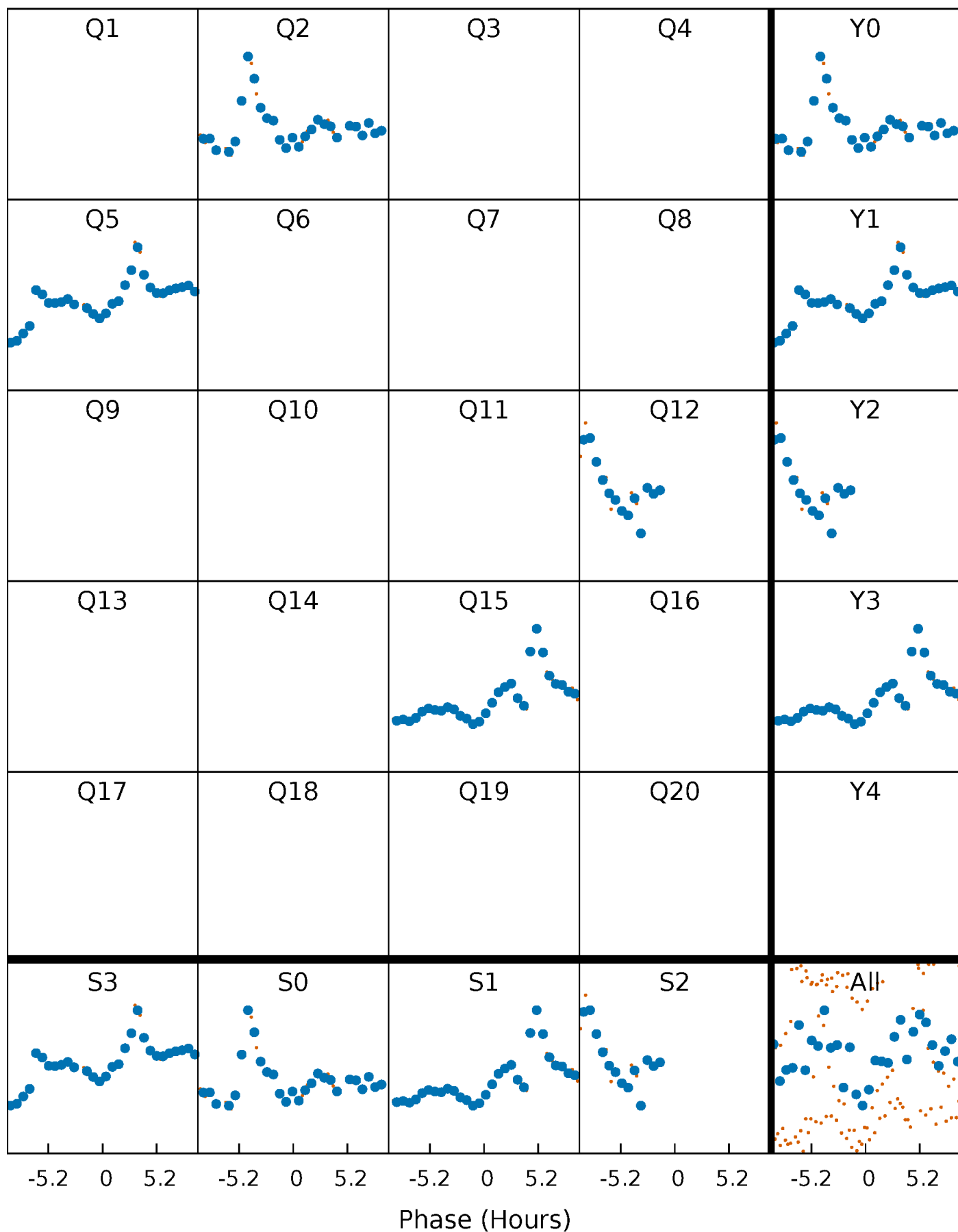


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



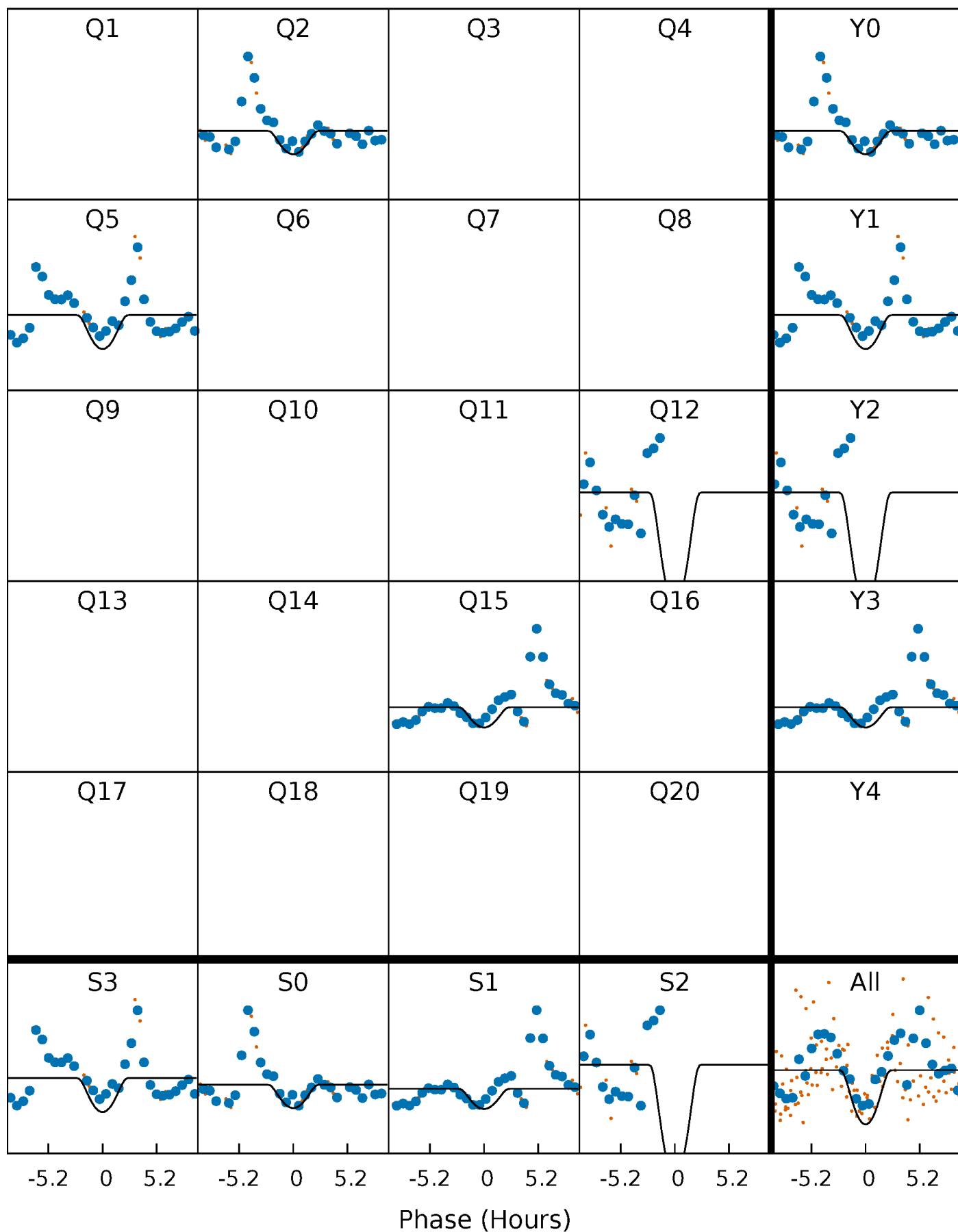
PDC Quarter-Phased Transit Curves

TCE 004142890-03 $P=313.437790$ Days $T_0=176.431613$ (BKJD)



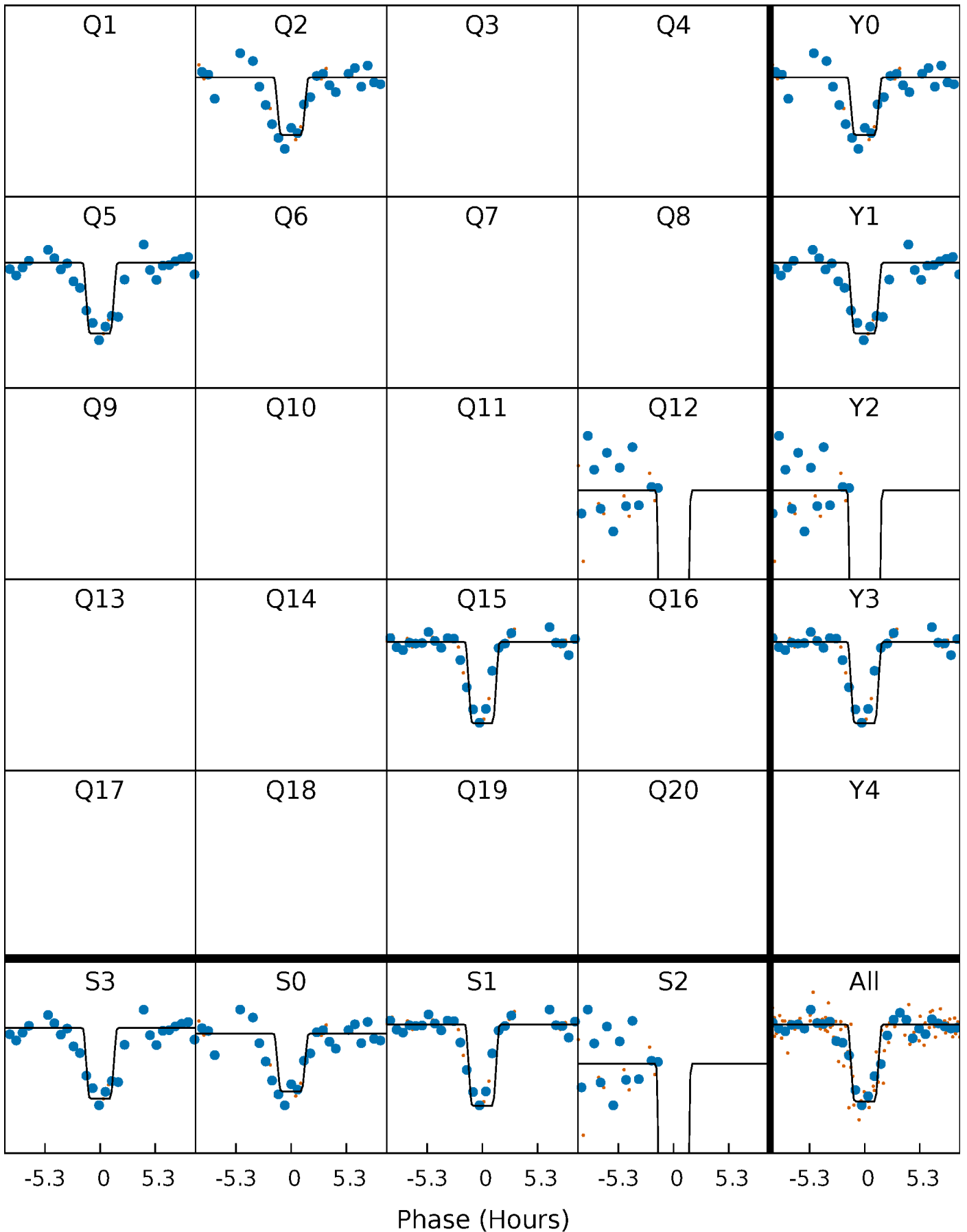
DV Quarter-Phased Transit Curves

TCE 004142890-03 $P=313.437790$ Days $T_0=176.431613$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

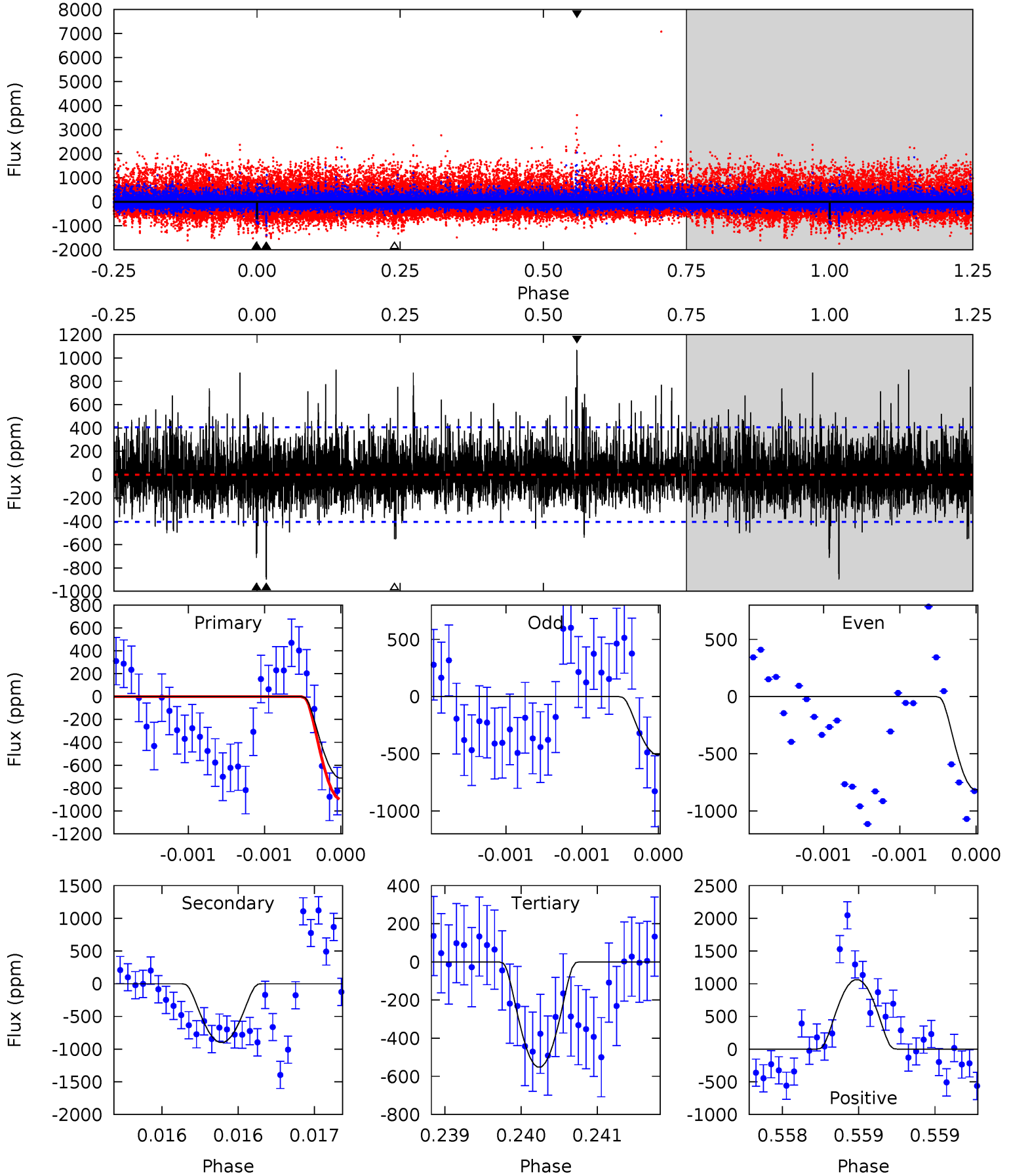
TCE 004142890-03 $P=313.433175$ Days $T_0=176.429865$ (BKJD)



DV Model-Shift Uniqueness Test

004142890-03, P = 313.437790 Days, E = 176.431613 Days

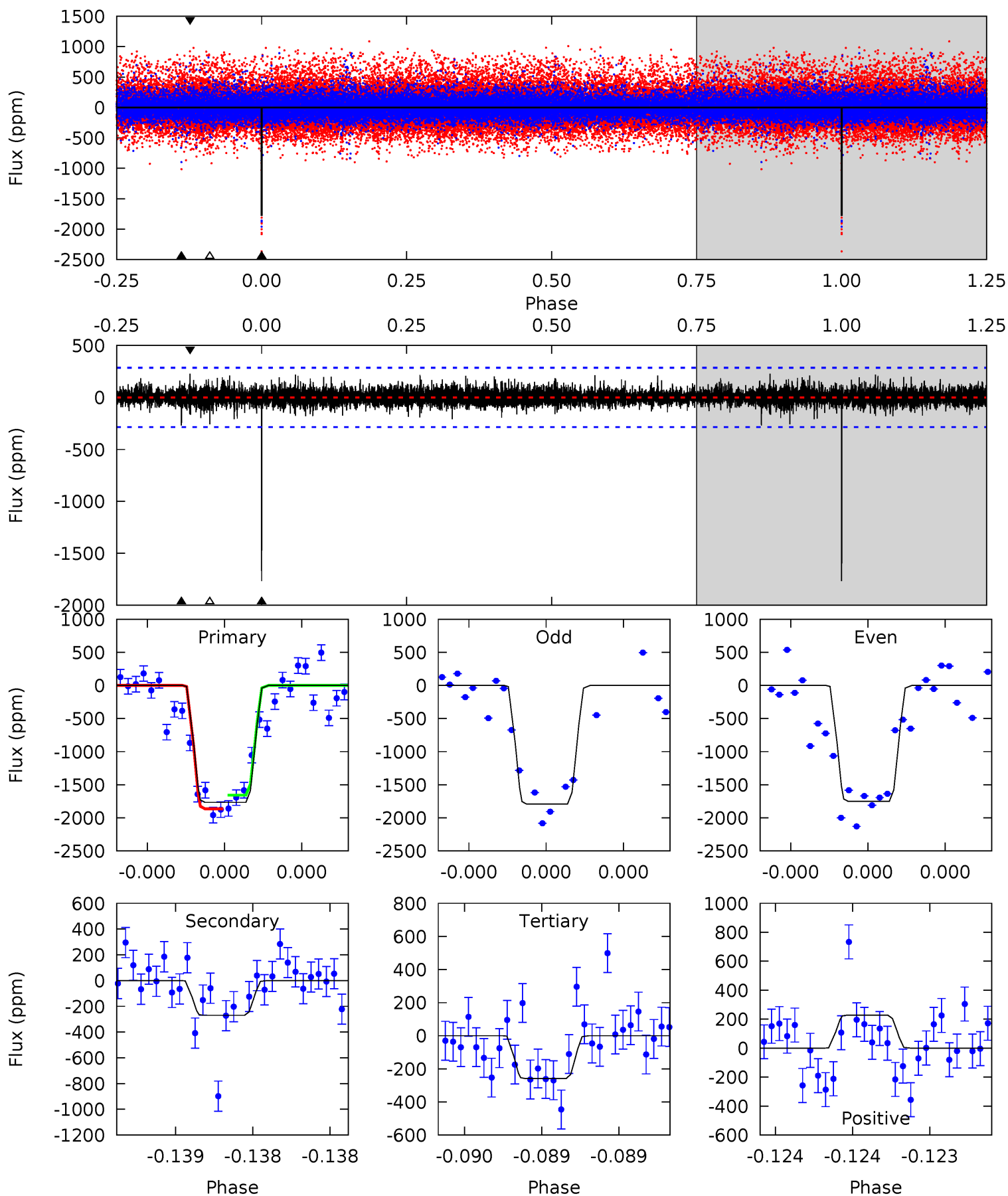
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|-------|-------|------|
| 9.71 | 12.2 | 7.51 | 14.5 | 5.53 | 3.41 | 2.27 | 2.20 | -4.75 | 4.73 | -2.22 | 1.75 | -0.06 | 0.54 | 2.53 |



Alt Model-Shift Uniqueness Test

004142890-03, P = 313.433175 Days, E = 176.429865 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 34.6 | 5.30 | 5.07 | 4.46 | 5.59 | 3.51 | 0.95 | 29.6 | 30.2 | 0.22 | 0.84 | 0.35 | 0.99 | 0.11 | 2.04 |



Stellar Parameters For KIC 004142890

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 3683^{+117}_{-147} | $4.688^{+0.080}_{-0.020}$ | $0.560^{+0.050}_{-0.300}$ | $0.563^{+0.030}_{-0.083}$ | $0.564^{+0.036}_{-0.072}$ | $4.449^{+1.718}_{-0.458}$ |
| | +3%/-4% | +2%/-0% | +9%/-54% | +5%/-15% | +6%/-13% | +39%/-10% |
| Source | KIC0 | 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 004142890-03 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|----------------------|-------------------------|
| DV | -899 ± 73 | $7.53^{+6.55}_{-4.89}$ | 195^{+8}_{-9} | 2458^{+805}_{-324} | 5049^{+34314}_{-3657} |
| Alt. | -270 ± 51 | $7.10^{+6.91}_{-4.52}$ | 195^{+7}_{-9} | 2168^{+641}_{-298} | 1615^{+11300}_{-1224} |

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

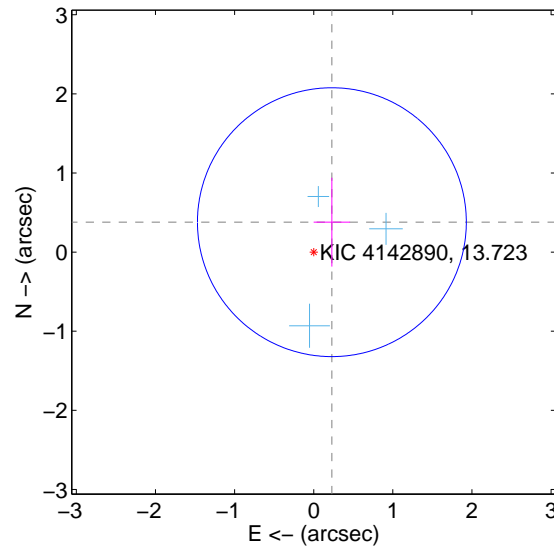
Supplemental centroid analysis for 004142890-03. Kepler magnitude: 13.72. Transit SNR 7.54

There are 3 quarters with good PRF difference image offsets

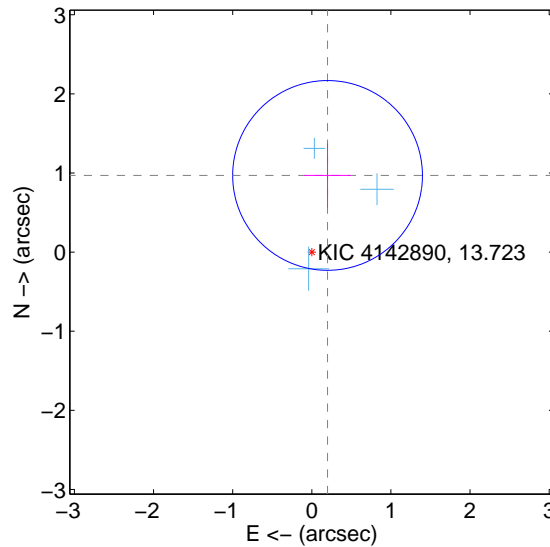
The direct PRF centroid is offset from the target star catalog position by about 0.61 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|-------------------|
| PRF-fit source offset from OOT | 0.442 ± 0.566 | 0.78 | -0.230 ± 0.231 | 0.378 ± 0.562 |
| PRF-fit source offset from KIC position | 0.989 ± 0.400 | 2.47 | -0.199 ± 0.294 | 0.969 ± 0.404 |
| photometric centroid source offset | 0.75 ± 0.60 | 1.25 | -0.16 ± 0.52 | 0.73 ± 0.60 |

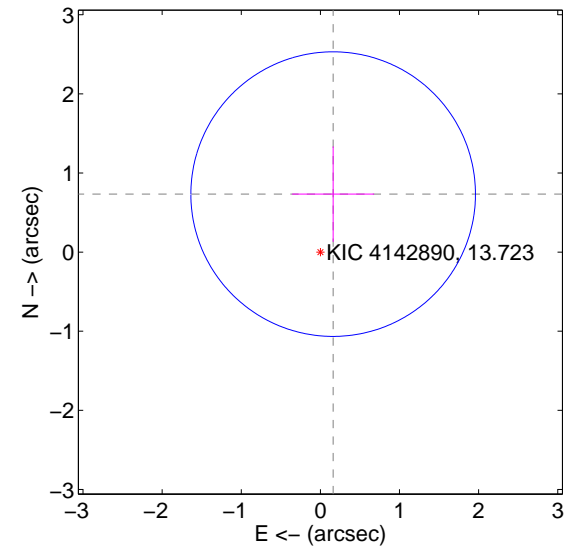
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

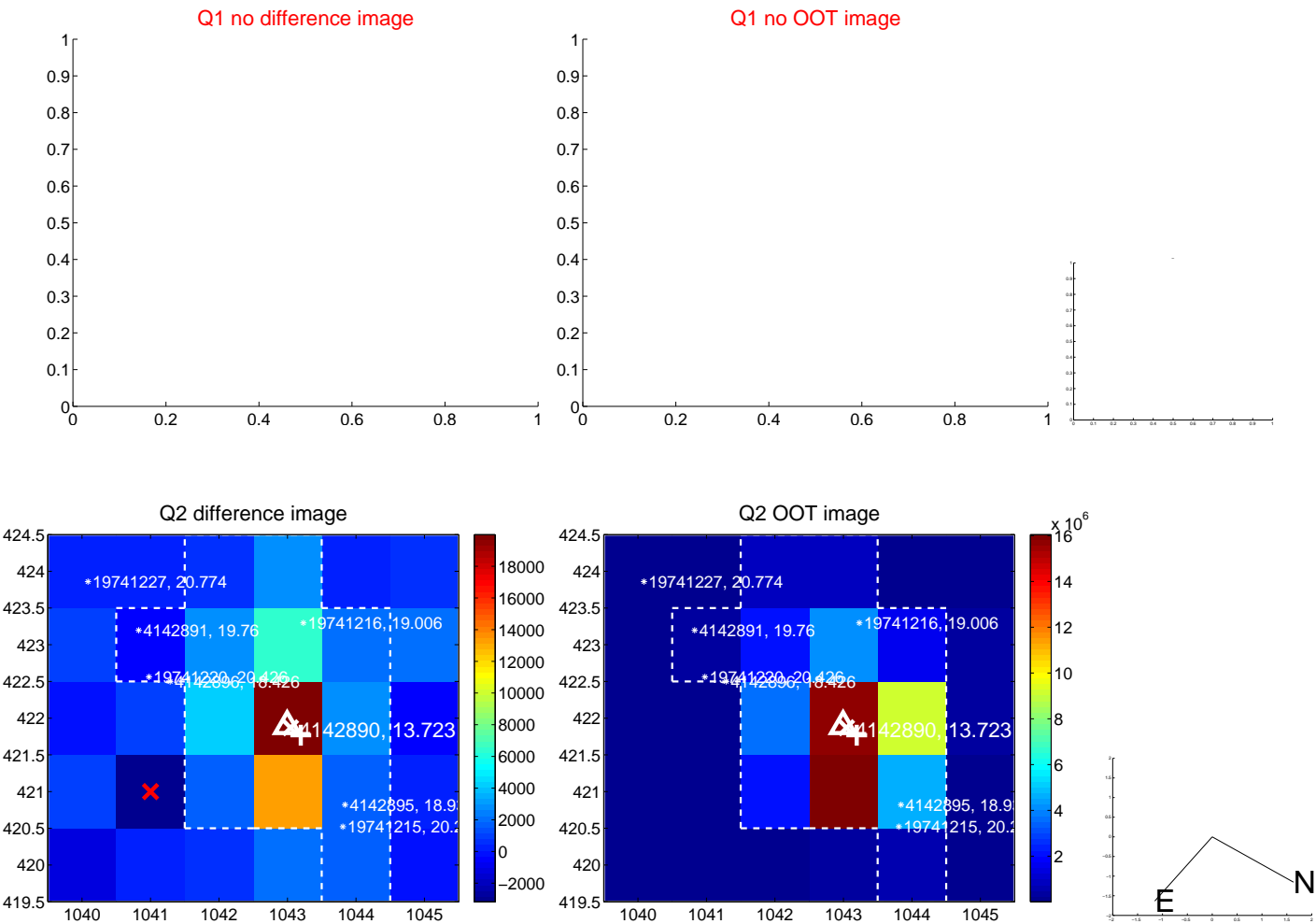


offset from photometric centroids

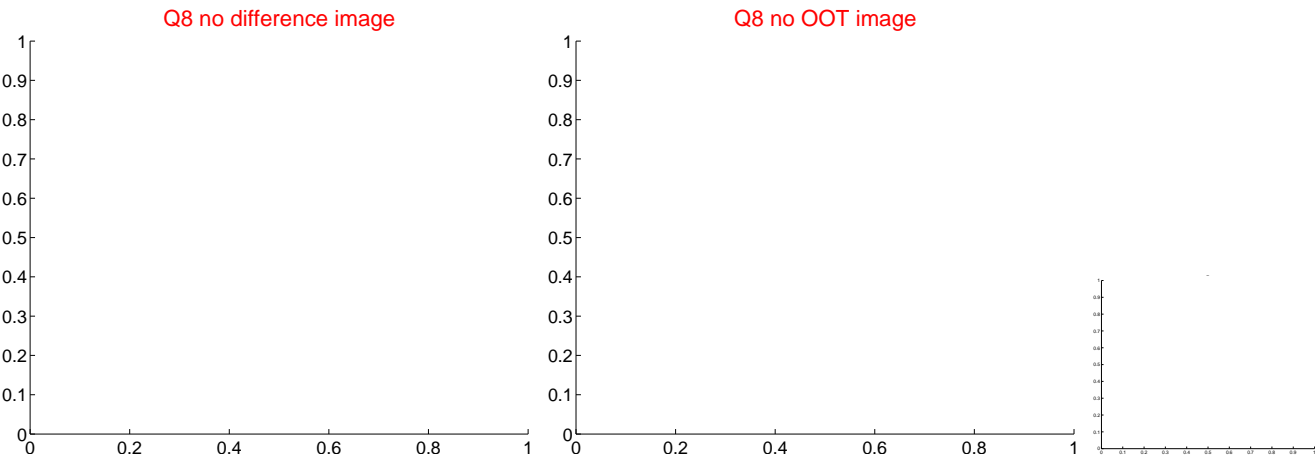
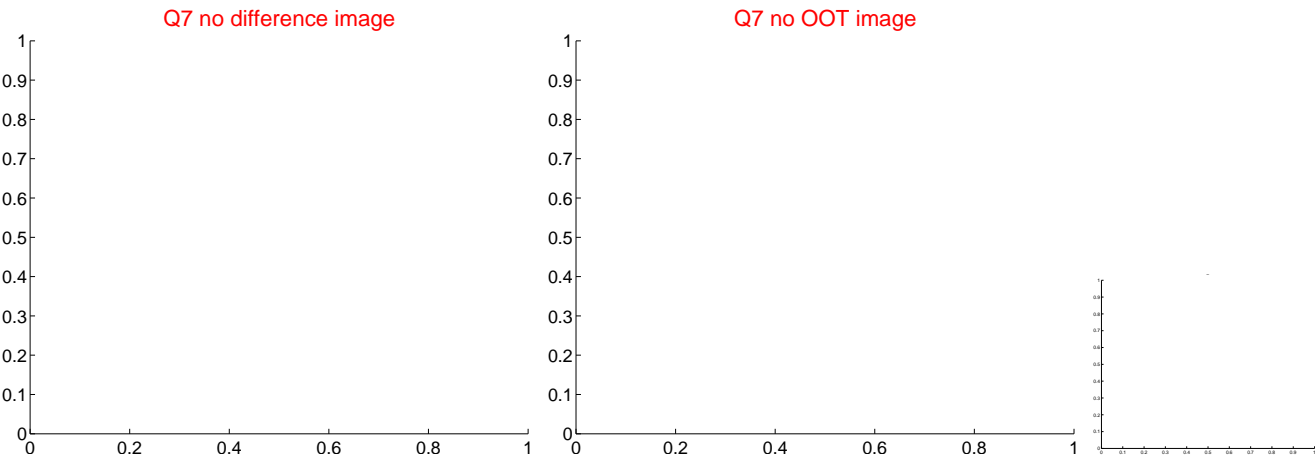
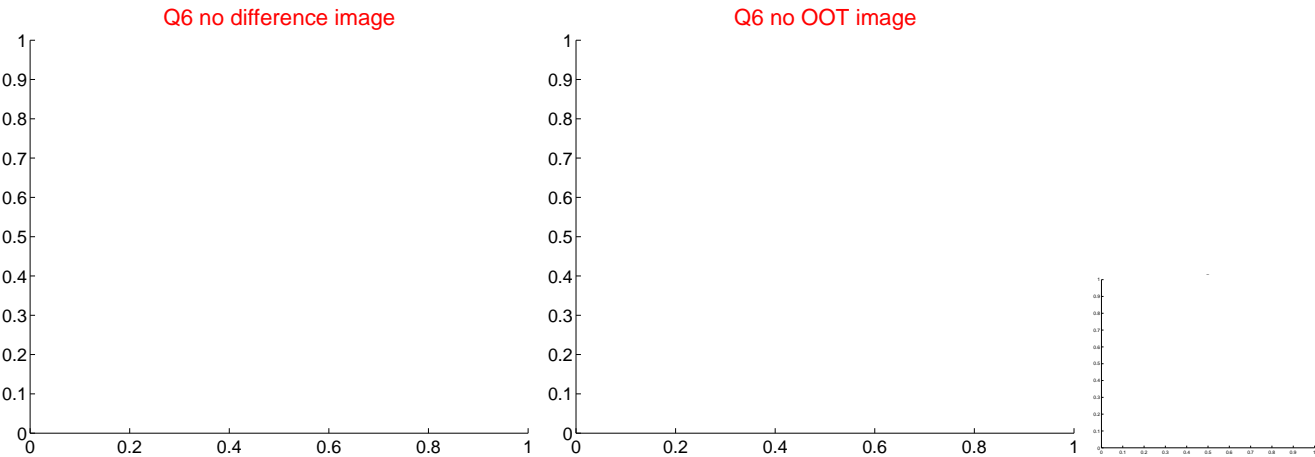
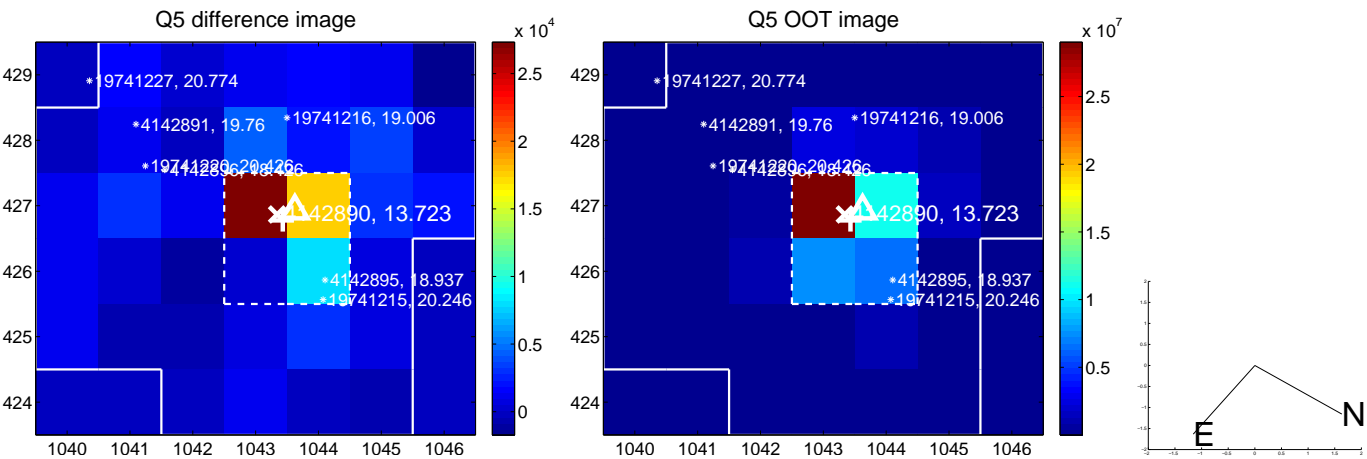


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

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



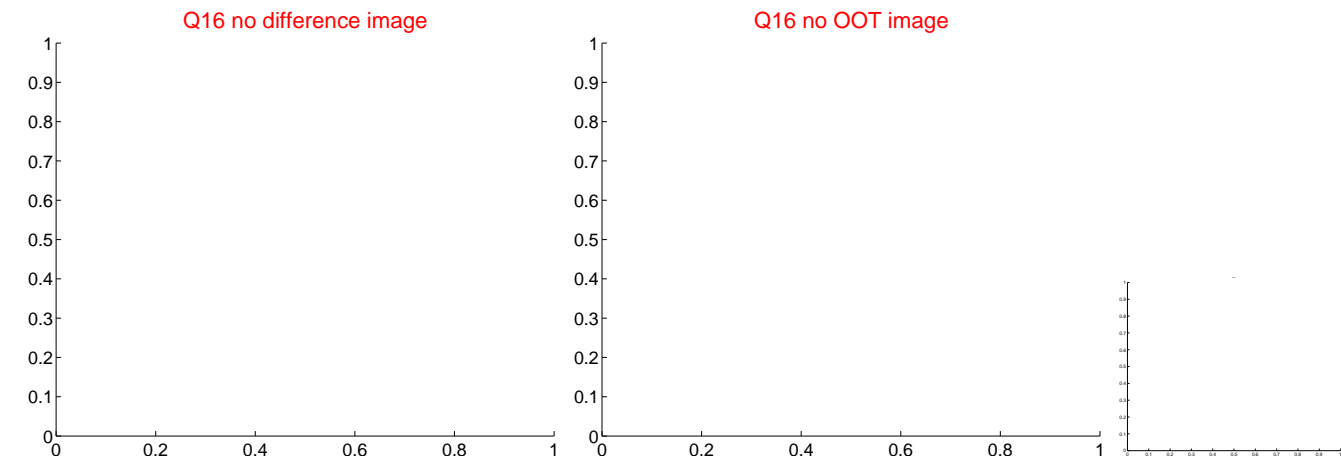
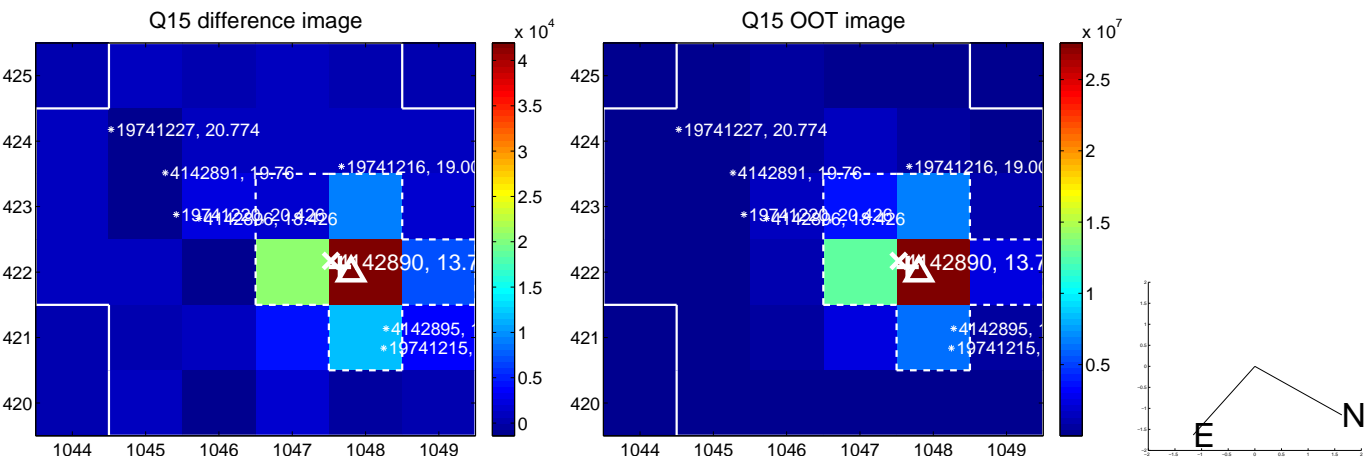
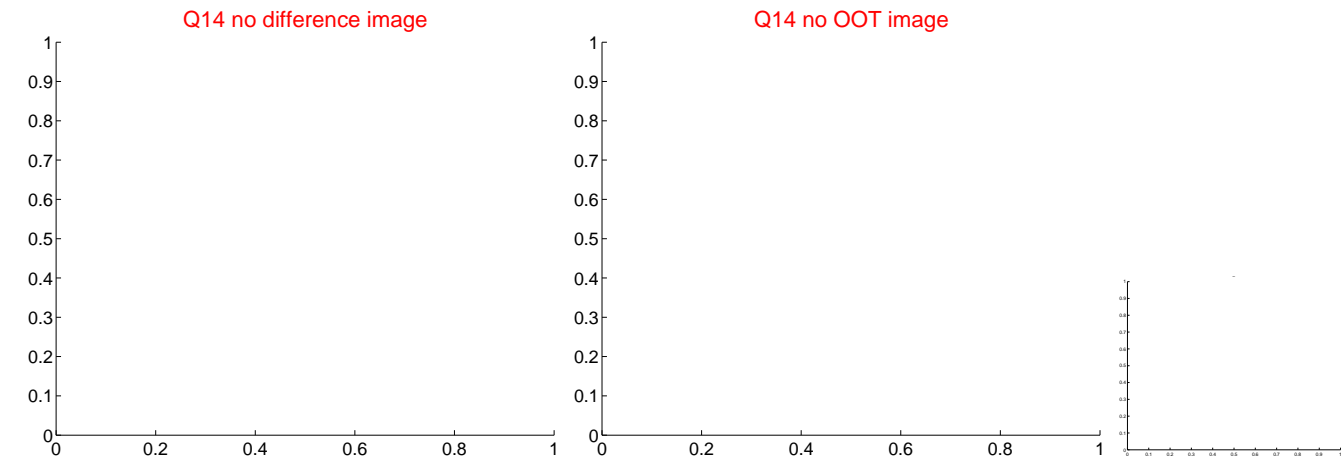
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



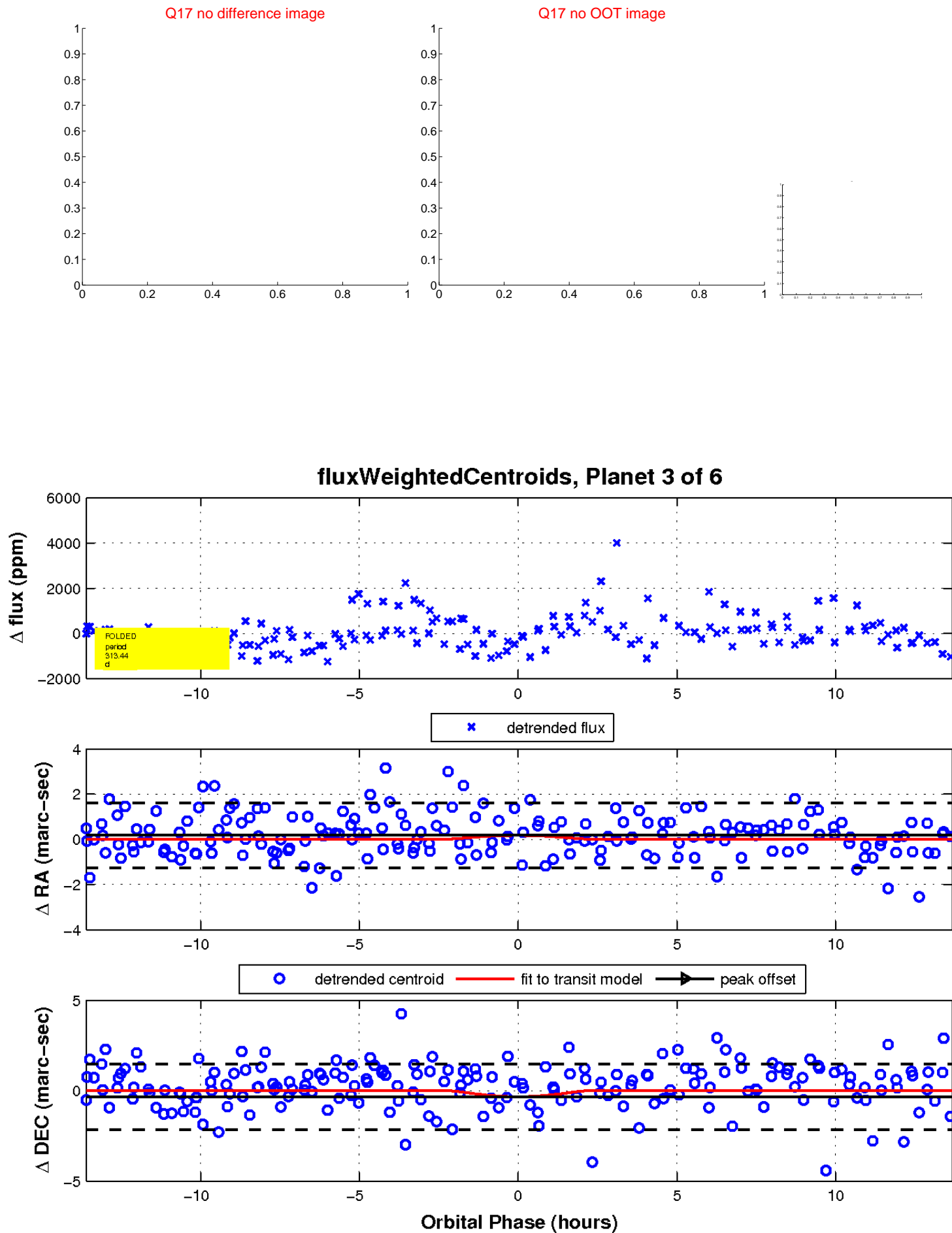
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

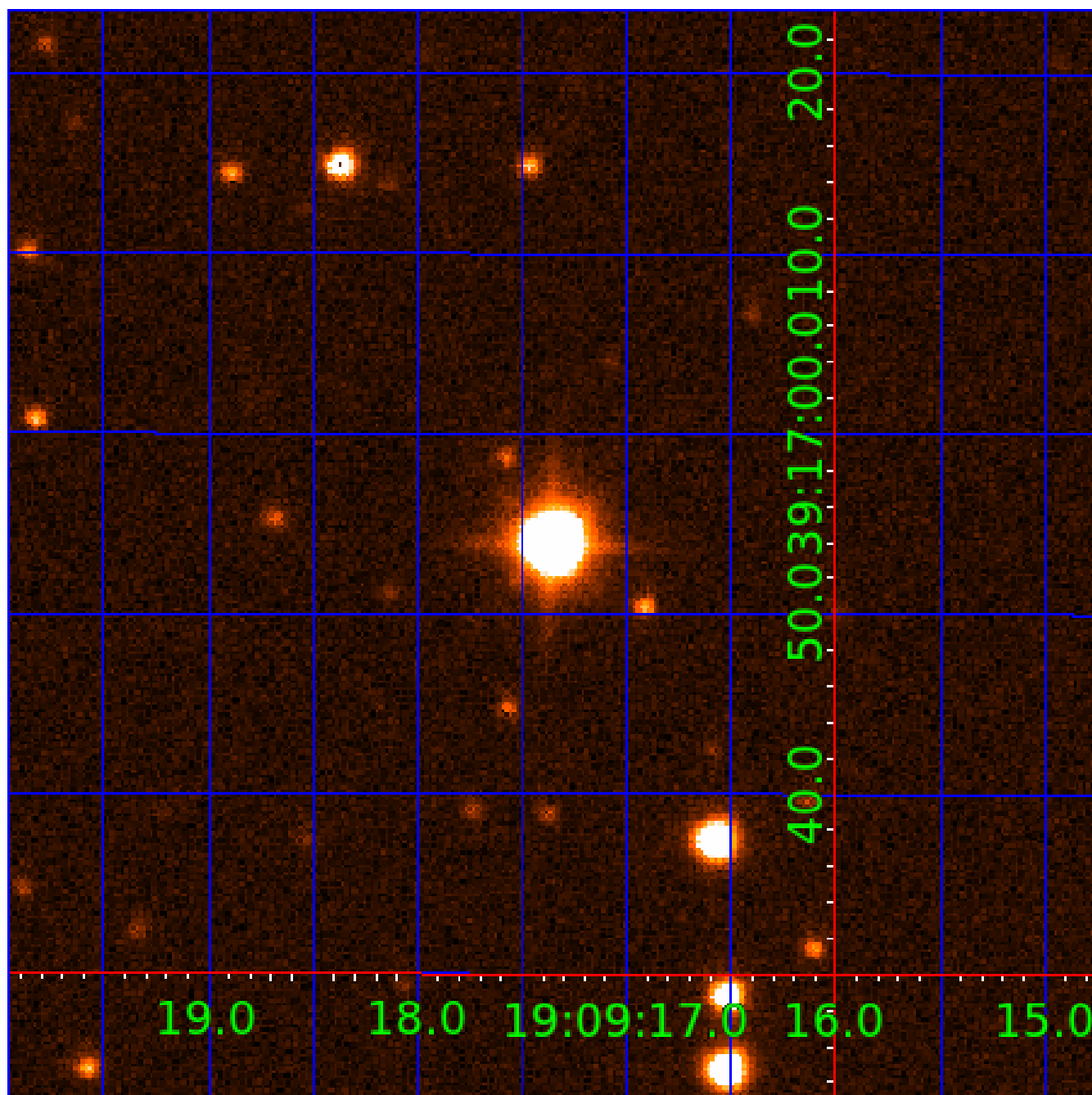


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004142890

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 004142890-01 | OBS | No | 533.492090 | 241.820037 | 1263.6 | 3.005 | 14.1 | 8.3 | 0.56 | 3683 | 2.24 | 0.05 |
| 004142890-02 | OBS | No | 325.435129 | 367.547618 | 869.1 | 5.548 | 11.6 | 7.4 | 0.56 | 3683 | 1.79 | 0.09 |
| 004142890-03 | OBS | No | 313.437790 | 176.431613 | 1336.2 | 4.578 | 12.0 | 7.5 | 0.56 | 3683 | 3.50 | 0.09 |
| 004142890-04 | OBS | No | 322.392681 | 355.557359 | 882.5 | 6.223 | 11.0 | 7.2 | 0.56 | 3683 | 2.17 | 0.09 |
| 004142890-05 | OBS | No | 362.308167 | 331.601435 | 891.7 | 5.840 | 9.5 | 7.2 | 0.56 | 3683 | 1.76 | 0.08 |
| 004142890-06 | OBS | No | 525.072046 | 391.984959 | 887.5 | 4.002 | 11.4 | 5.6 | 0.56 | 3683 | 1.81 | 0.05 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004142890-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST |
| 004142890-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—HALO_GHOST |
| 004142890-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |
| 004142890-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV |
| 004142890-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_KIC_POS |
| 004142890-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |

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

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

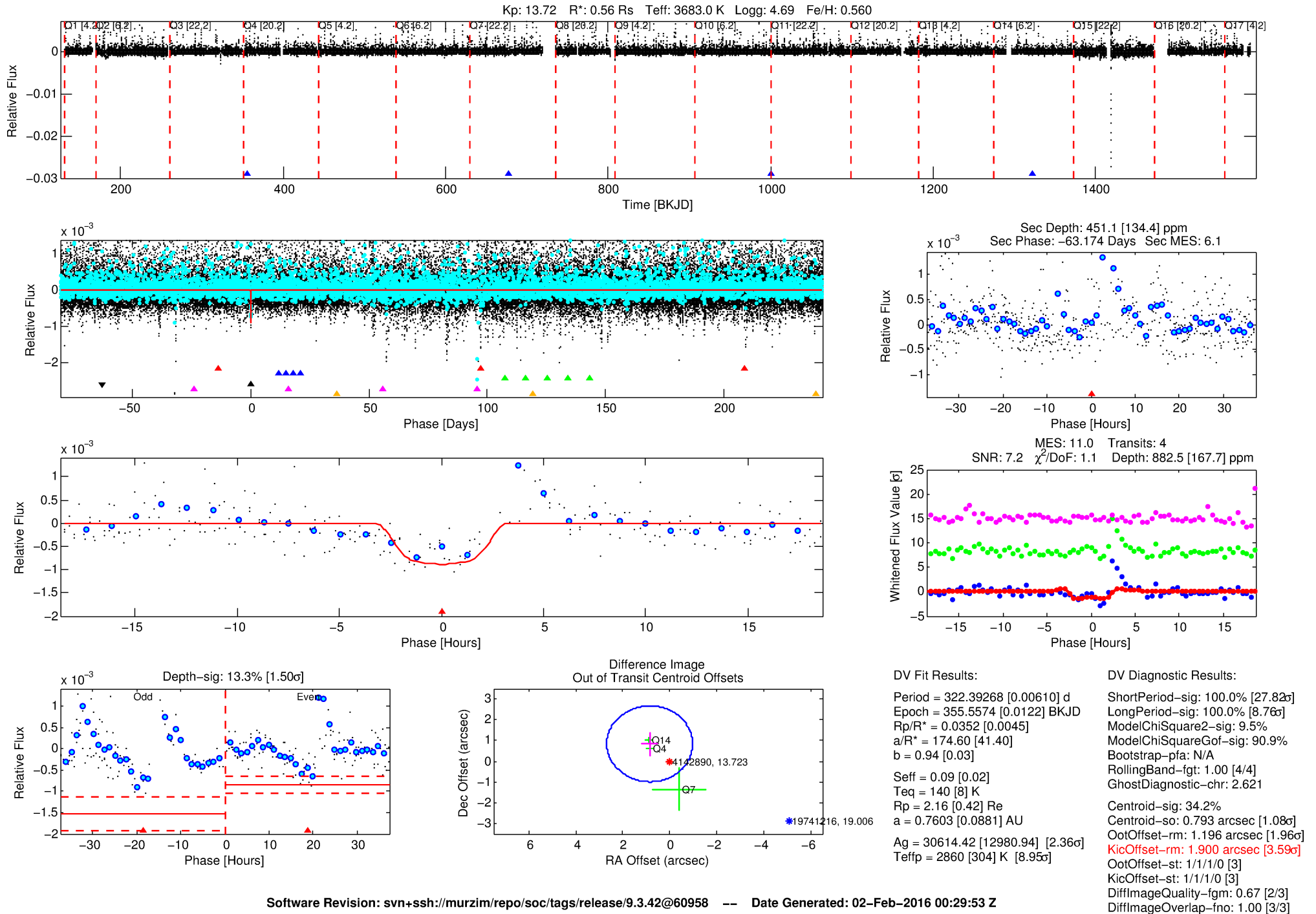
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004142890-04

No Significant Match Found

DV One-Page Summary

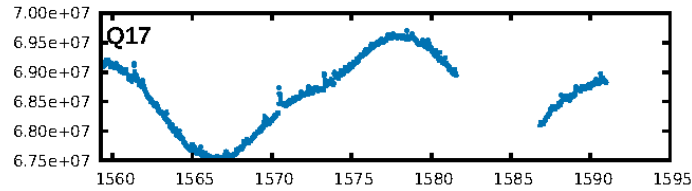
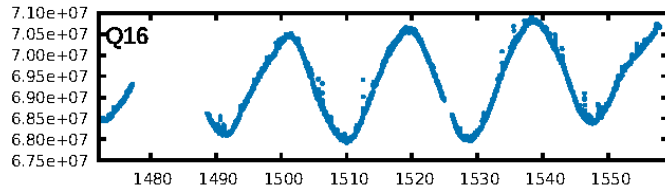
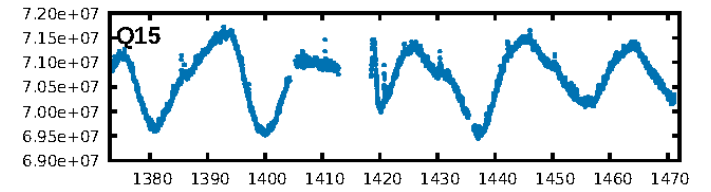
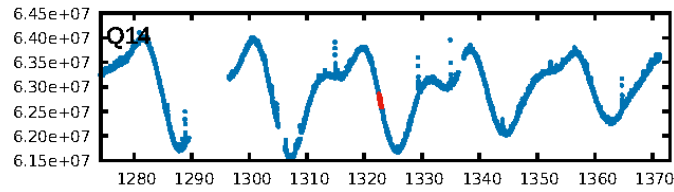
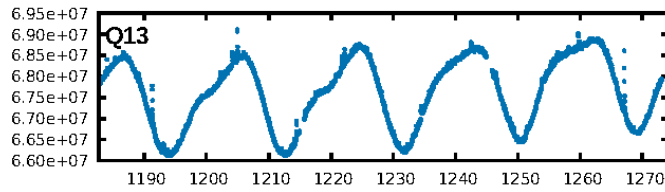
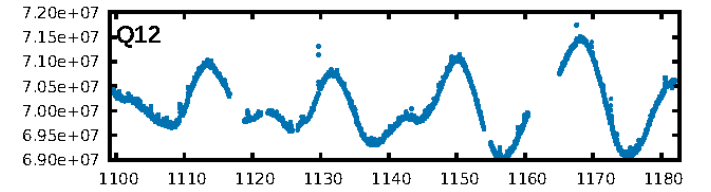
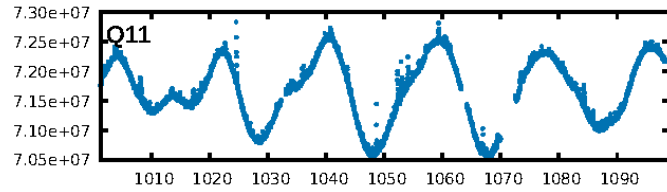
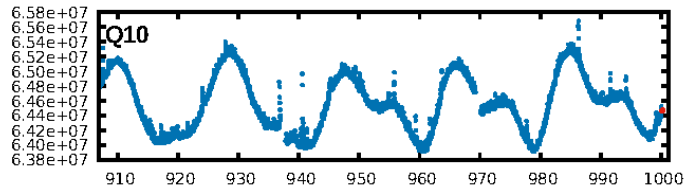
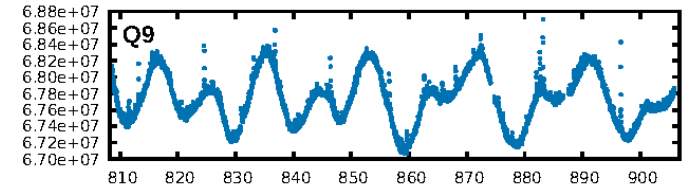
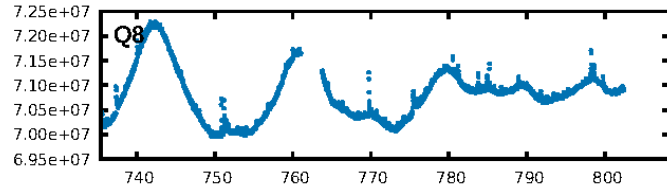
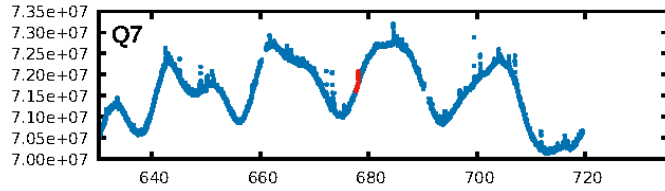
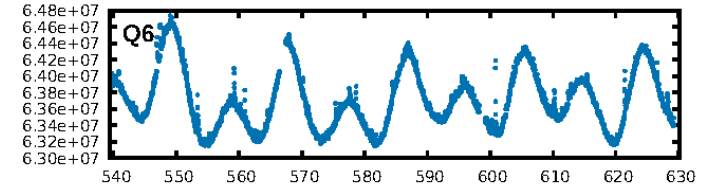
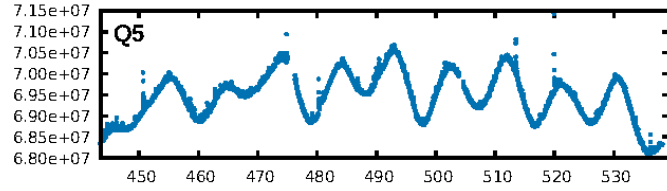
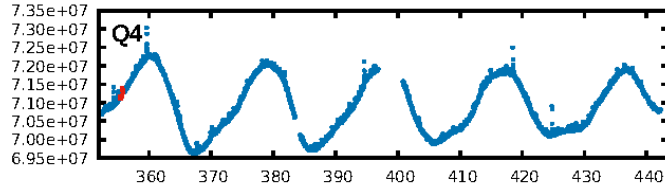
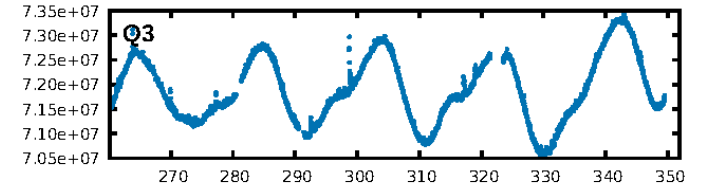
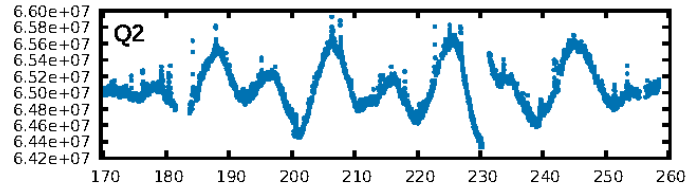
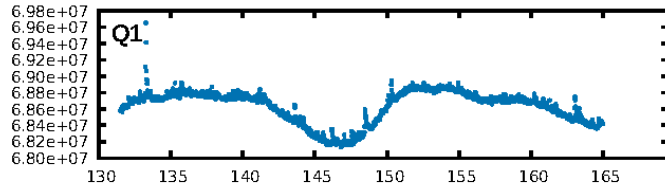
KIC: 4142890 Candidate: 4 of 6 Period: 322.393 d



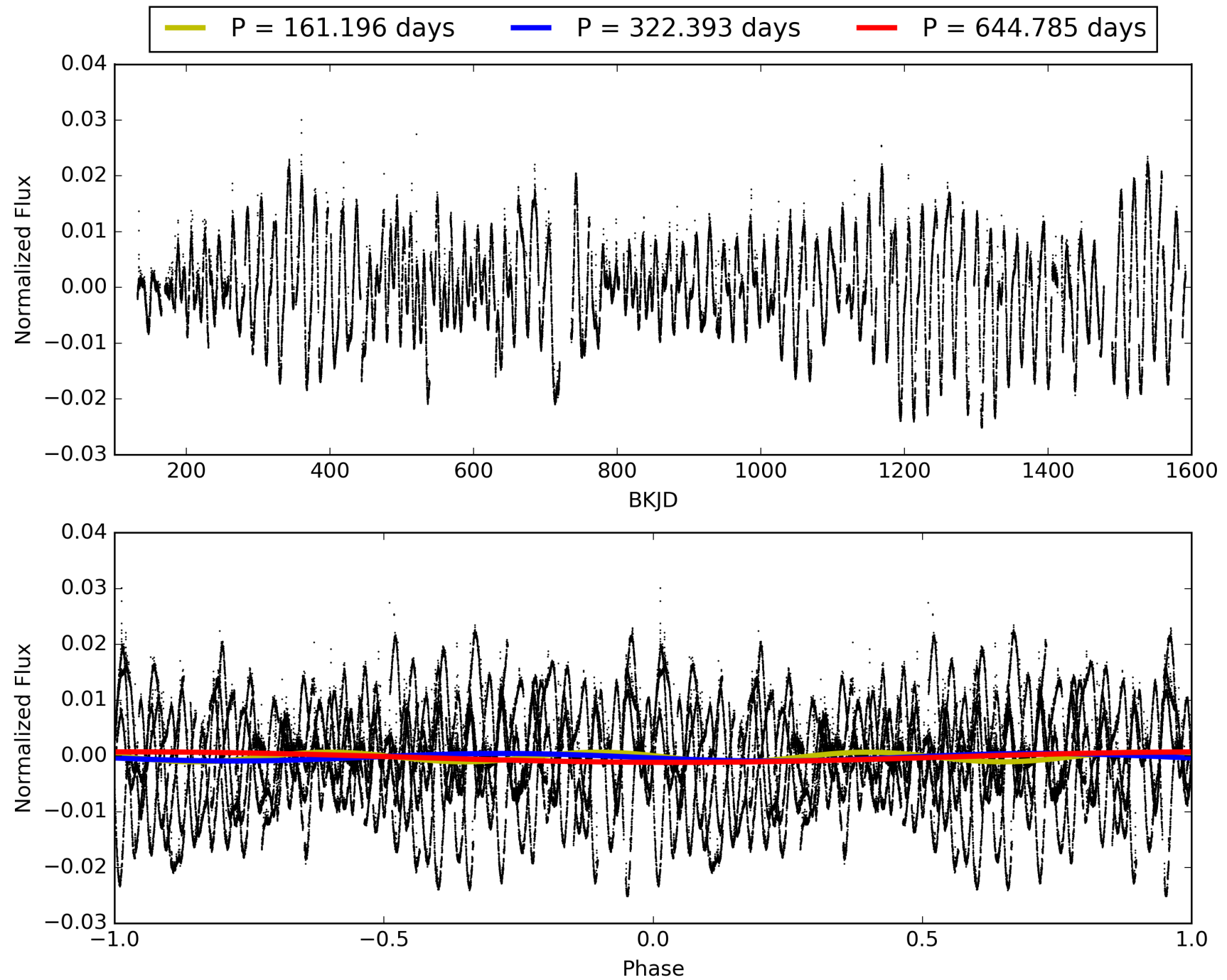
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:29:53 Z

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

TCE 004142890-04, PDC Light Curves

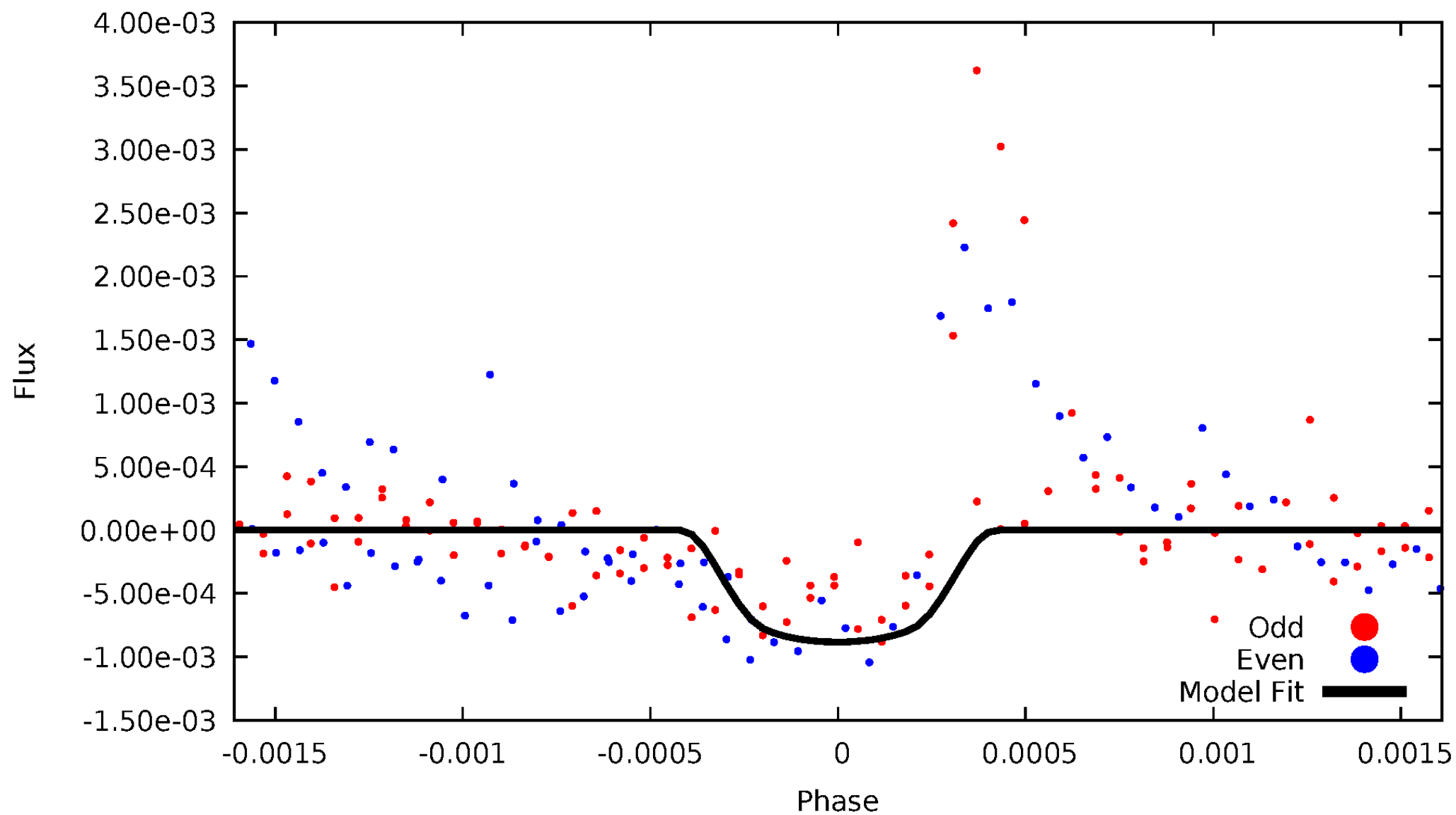


TCE 004142890-04



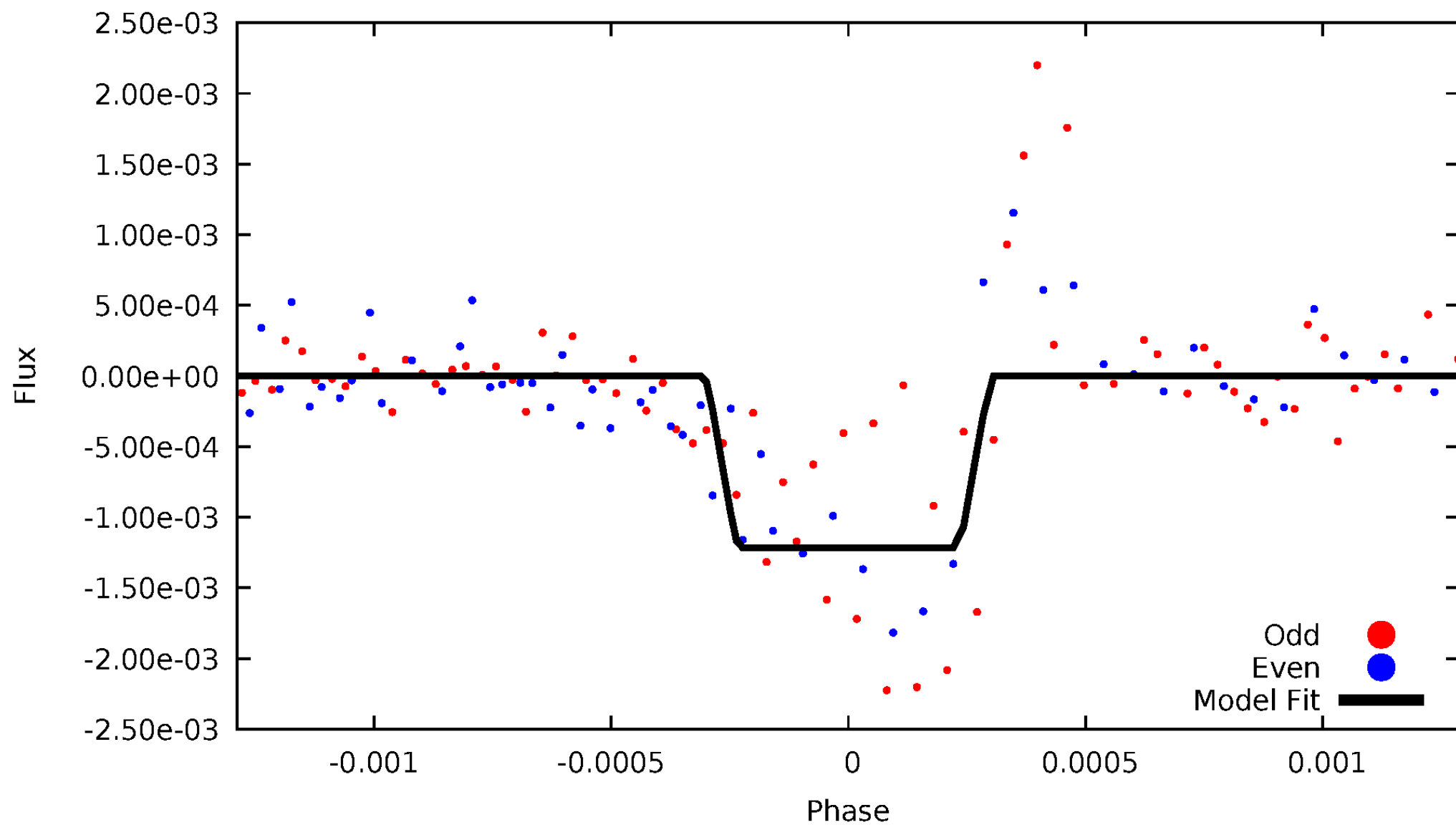
DV Odd/Even

TCE 004142890-04



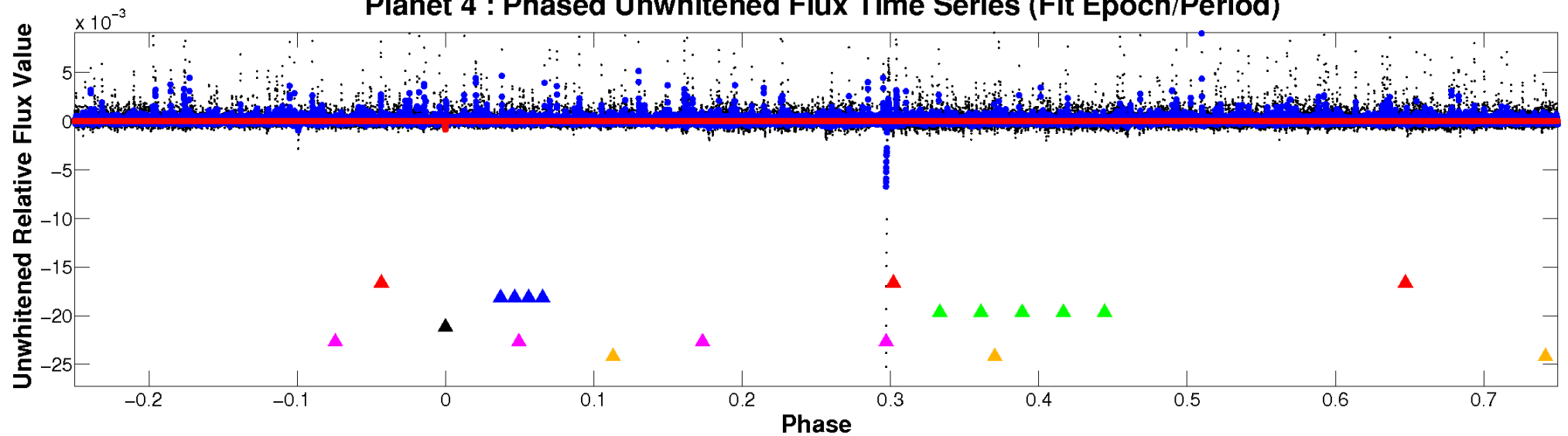
ALT Odd/Even

TCE 004142890-04

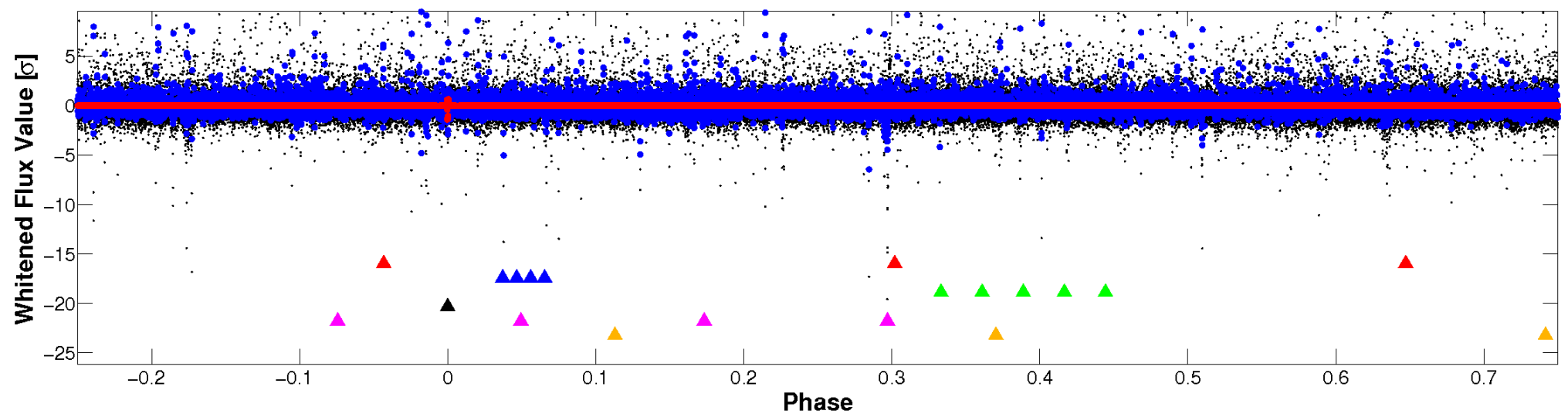


Non-Whitened Vs. Whitened Light Curve

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

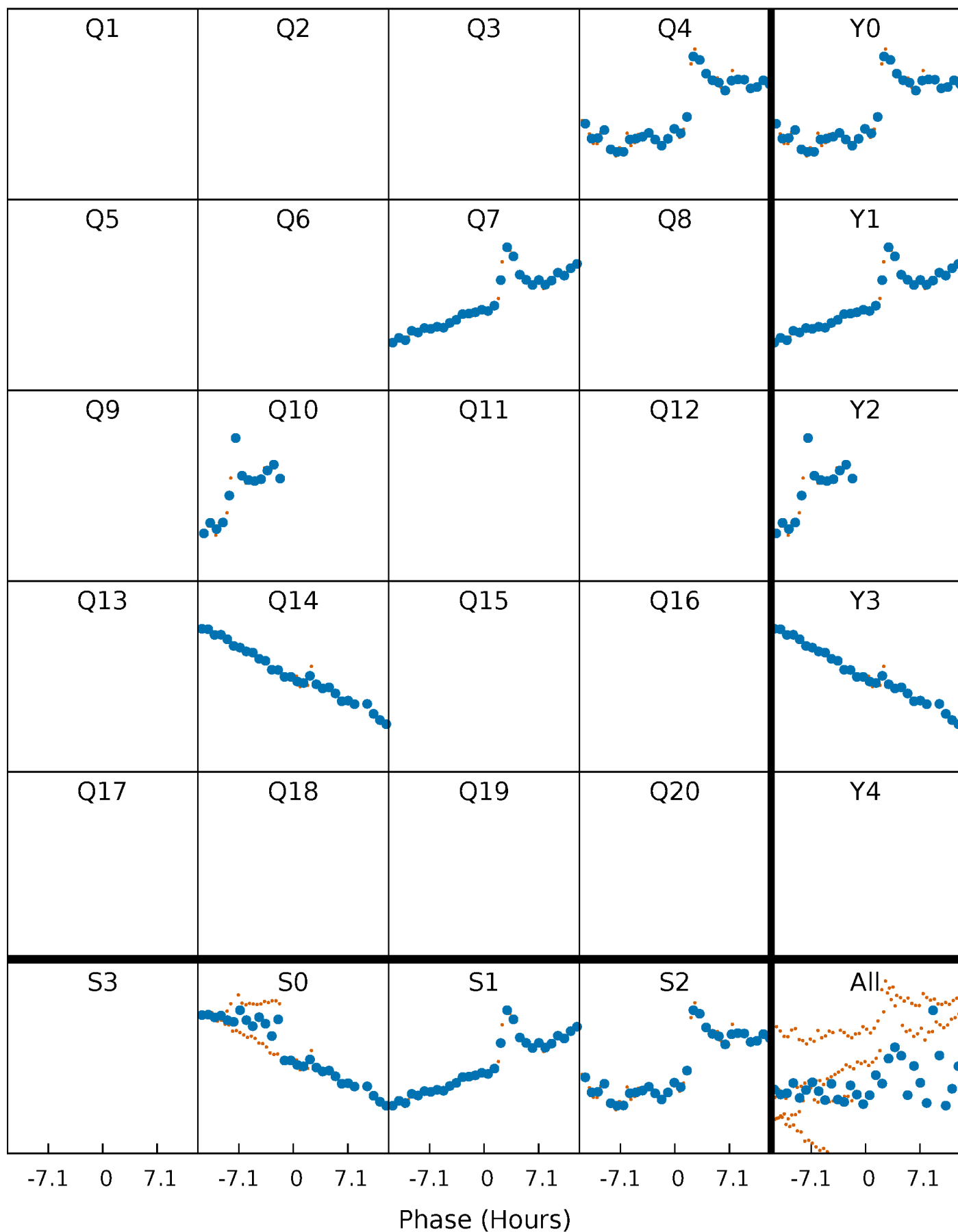


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



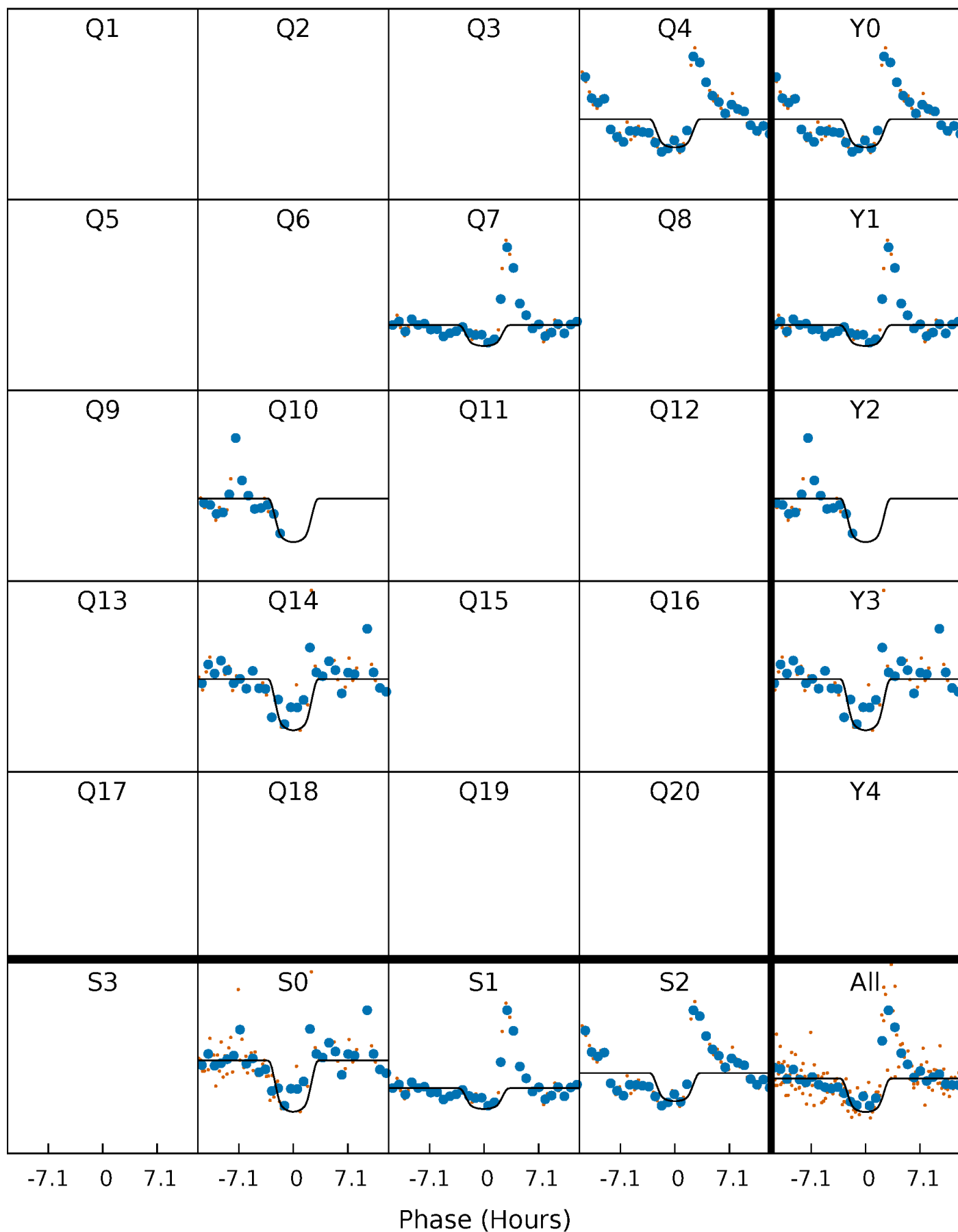
PDC Quarter-Phased Transit Curves

TCE 004142890-04 $P=322.392681$ Days $T_0=355.557359$ (BKJD)



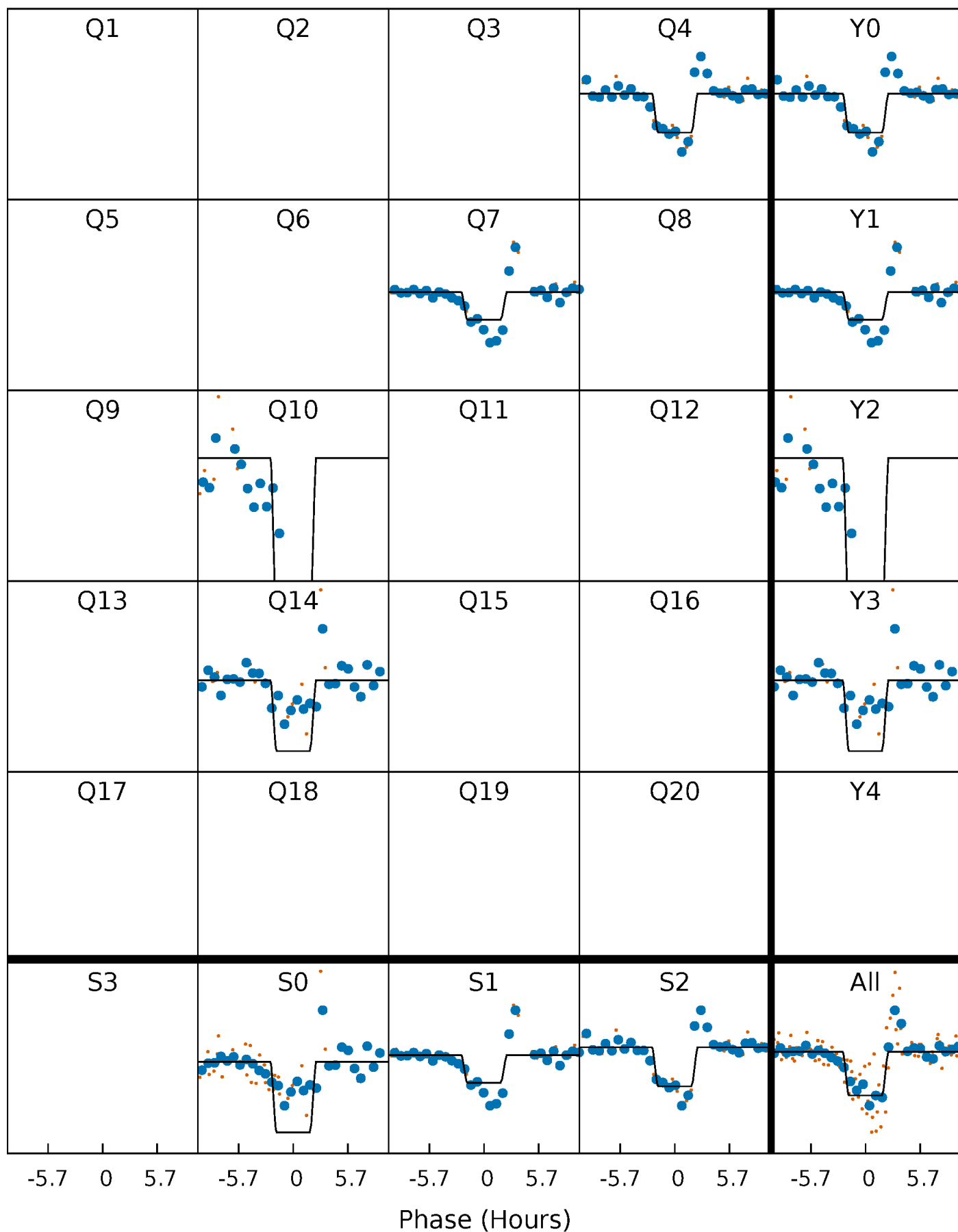
DV Quarter-Phased Transit Curves

TCE 004142890-04 $P=322.392681$ Days $T_0=355.557359$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

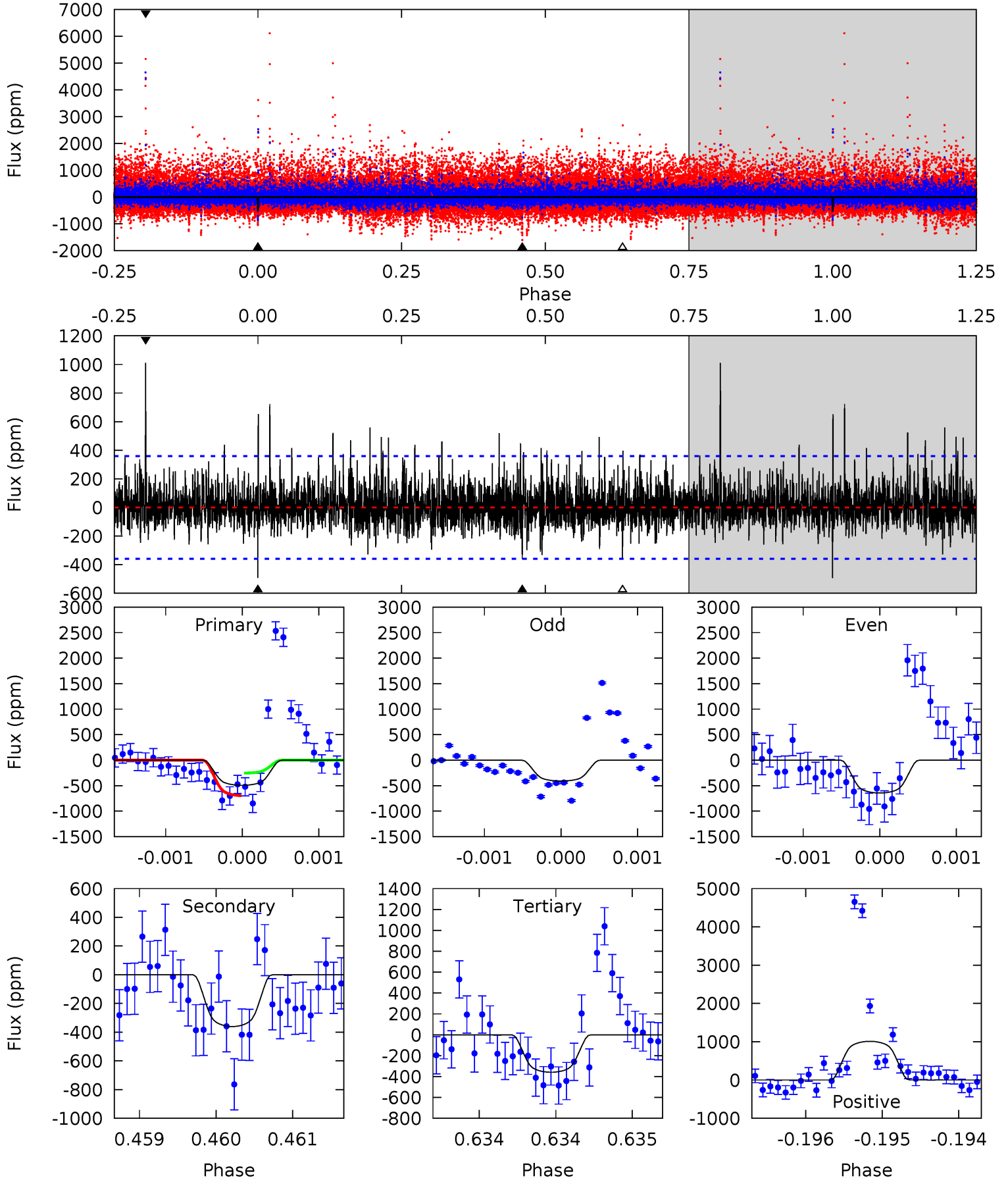
TCE 004142890-04 $P=322.387087$ Days $T_0=355.553842$ (BKJD)



DV Model-Shift Uniqueness Test

004142890-04, P = 322.392681 Days, E = 33.164678 Days

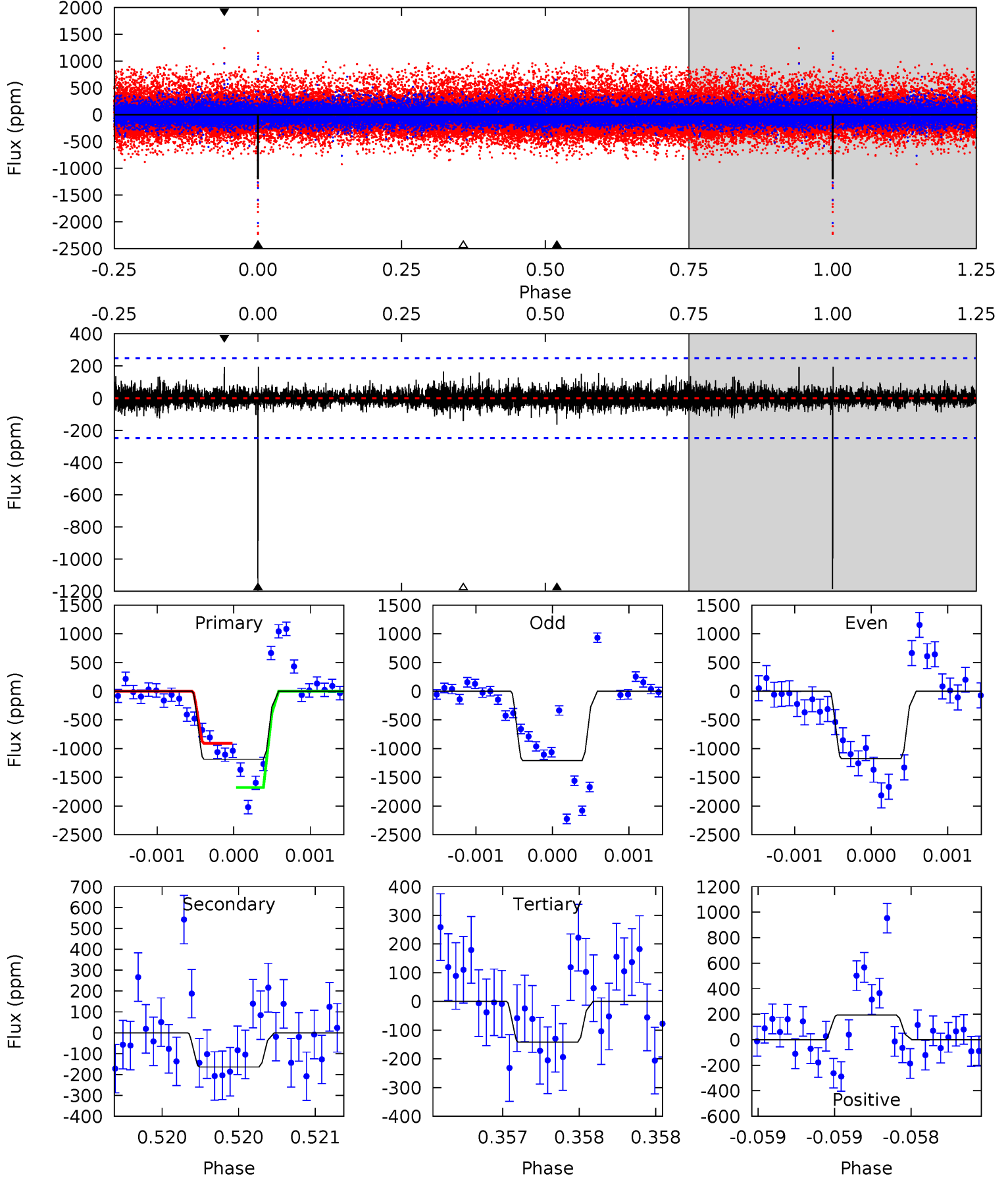
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.53 | 5.51 | 5.48 | 15.4 | 5.49 | 3.34 | 1.68 | 2.05 | -7.91 | 0.03 | -9.93 | 1.48 | 1.03 | 0.67 | 3.33 |



Alt Model-Shift Uniqueness Test

004142890-04, P = 322.387087 Days, E = 33.166755 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 26.6 | 3.66 | 3.18 | 4.33 | 5.55 | 3.45 | 0.73 | 23.4 | 22.2 | 0.49 | -0.66 | 0.37 | 1.09 | 0.14 | 8.32 |



Stellar Parameters For KIC 004142890

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 3683^{+117}_{-147} | $4.688^{+0.080}_{-0.020}$ | $0.560^{+0.050}_{-0.300}$ | $0.563^{+0.030}_{-0.083}$ | $0.564^{+0.036}_{-0.072}$ | $4.449^{+1.718}_{-0.458}$ |
| | +3%/-4% | +2%/-0% | +9%/-54% | +5%/-15% | +6%/-13% | +39%/-10% |
| Source | KIC0 | 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 004142890-04 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|----------------------|--------------------------|
| DV | -361 ± 65 | $2.12^{+0.30}_{-0.33}$ | 193^{+8}_{-9} | 3029^{+188}_{-155} | 25729^{+10347}_{-7755} |
| Alt. | -164 ± 45 | $2.08^{+0.30}_{-0.28}$ | 193^{+7}_{-9} | 2730^{+154}_{-143} | 11952^{+5162}_{-3806} |

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

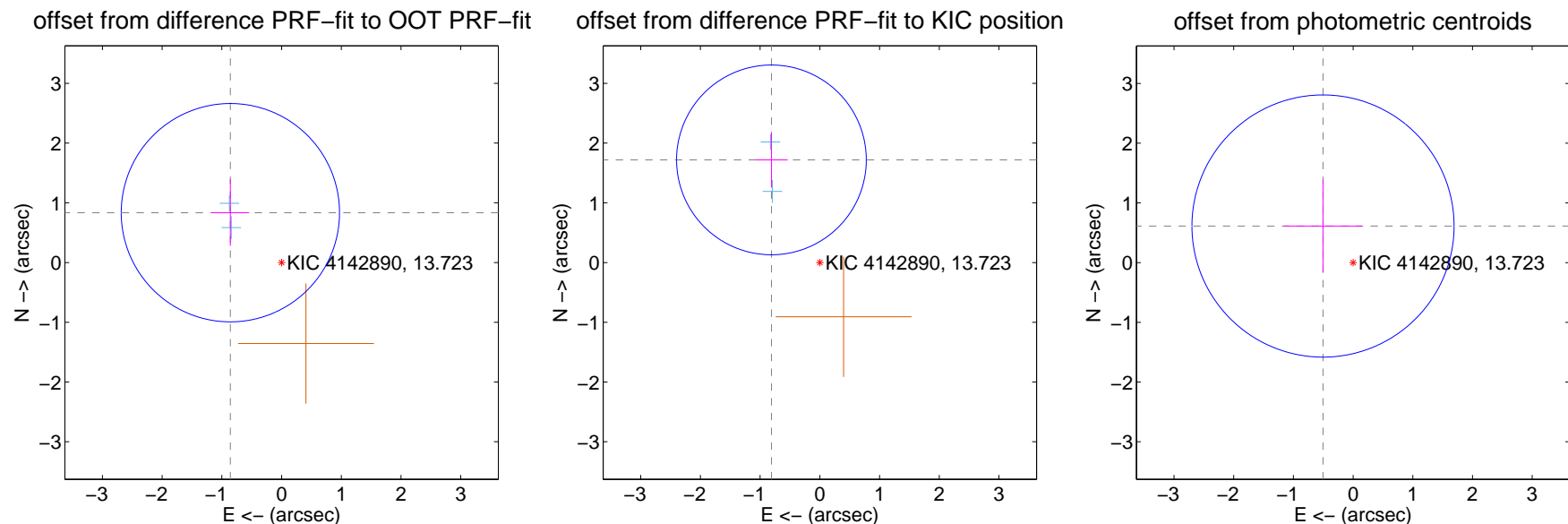
DV Centroid Data

Supplemental centroid analysis for 004142890-04. Kepler magnitude: 13.72. Transit SNR 7.21

There are 2 quarters with good PRF difference image offsets

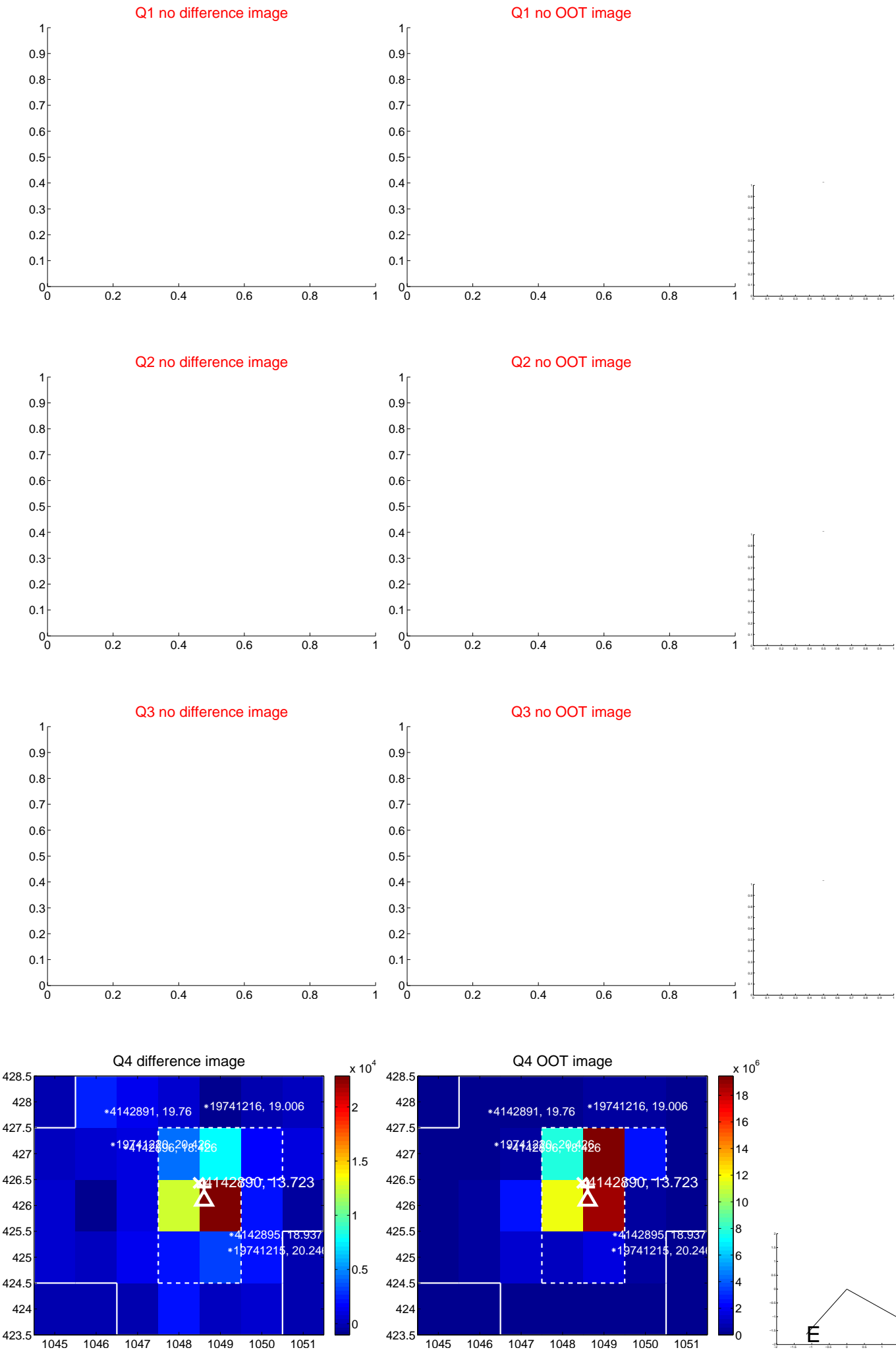
The direct PRF centroid is offset from the target star catalog position by about 1.03 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|-------------------------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 1.196 ± 0.609 | 1.96 | 0.857 ± 0.316 | 0.835 ± 0.557 |
| PRF-fit source offset from KIC position | 1.900 ± 0.529 | 3.59 | 0.811 ± 0.272 | 1.718 ± 0.464 |
| photometric centroid source offset | 0.79 ± 0.73 | 1.08 | 0.50 ± 0.65 | 0.61 ± 0.78 |

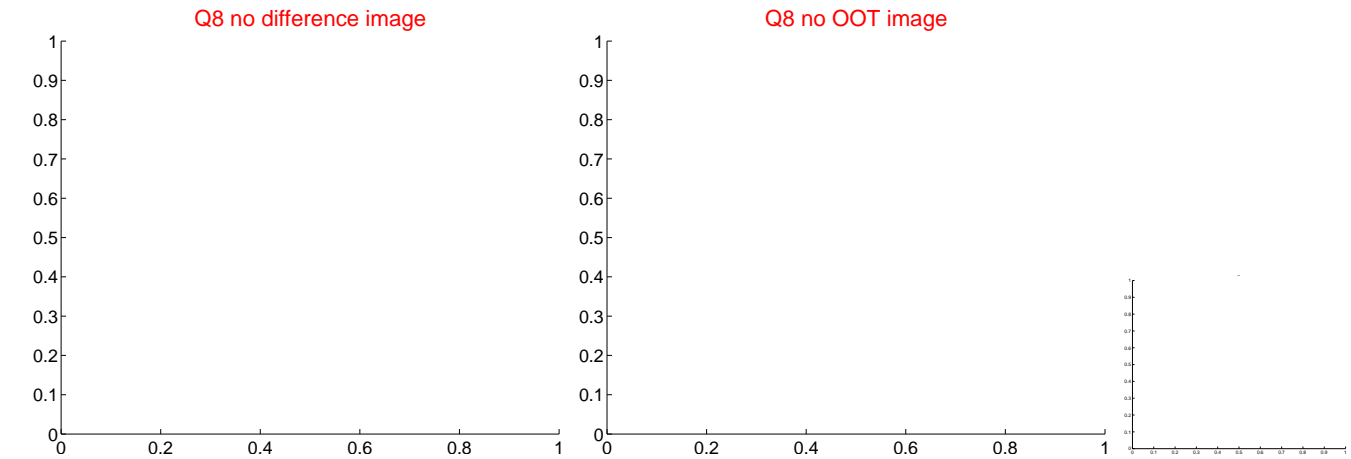
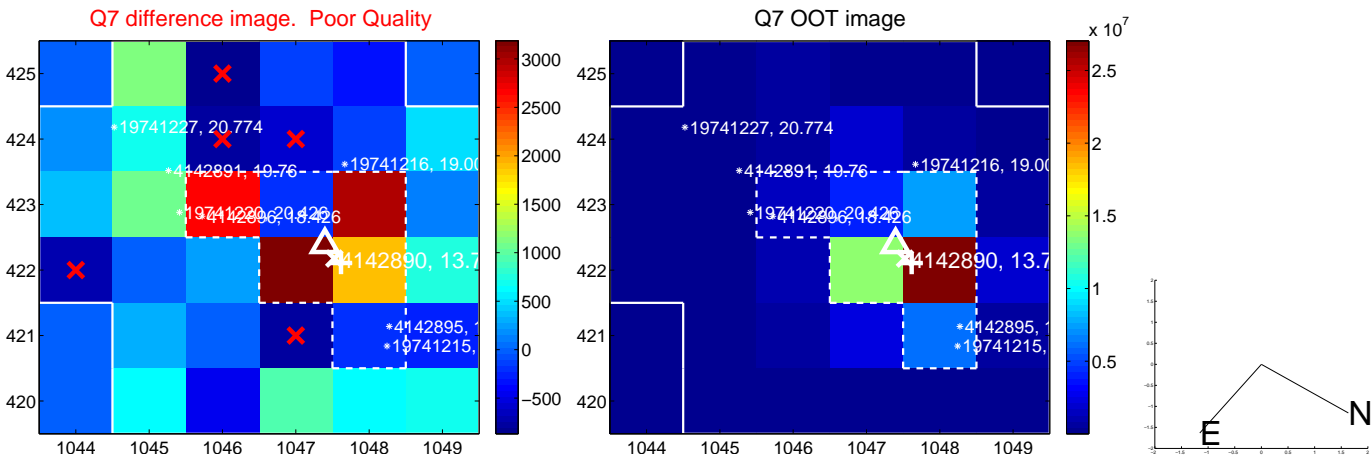
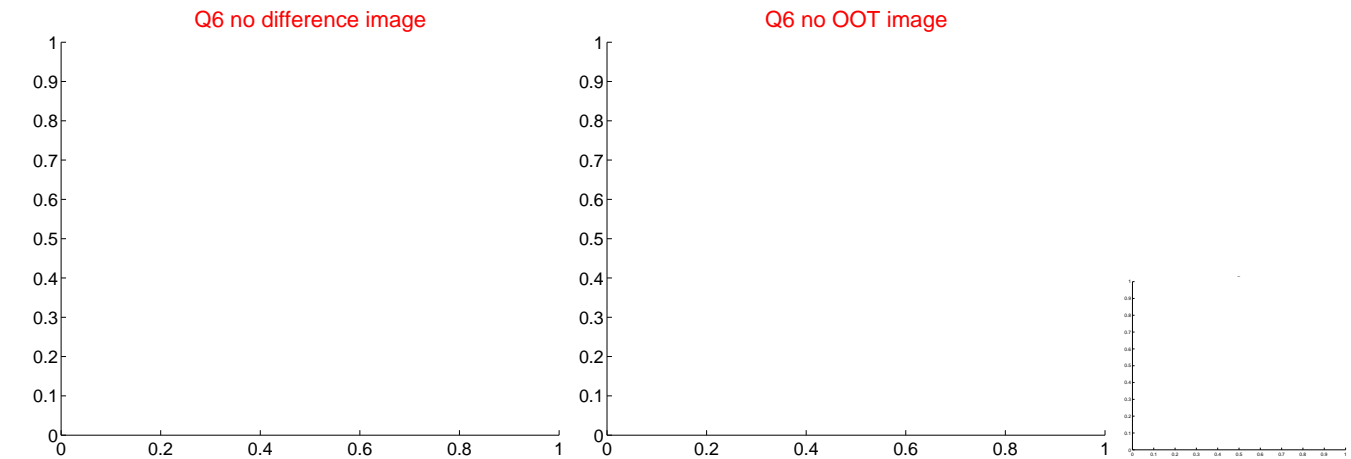
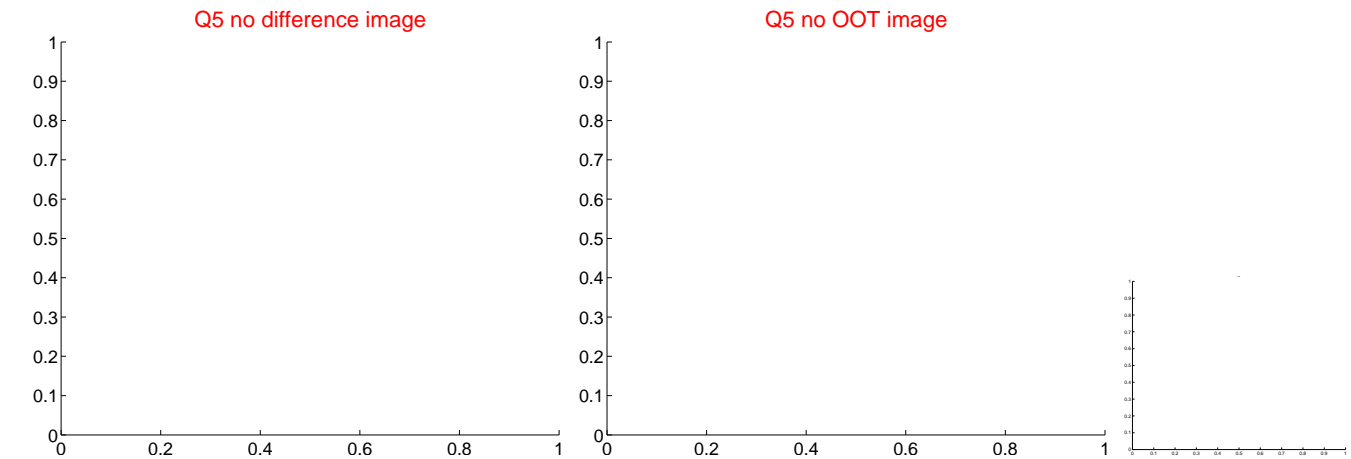


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

white ×: 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.

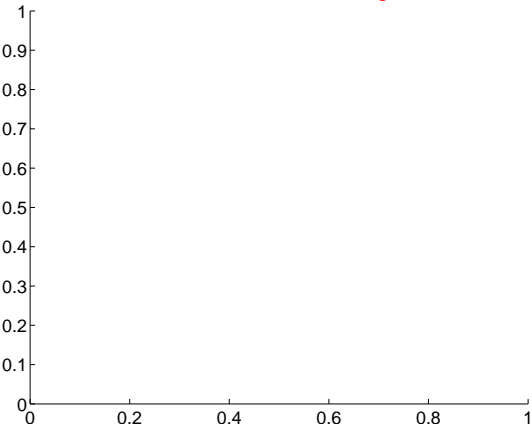


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

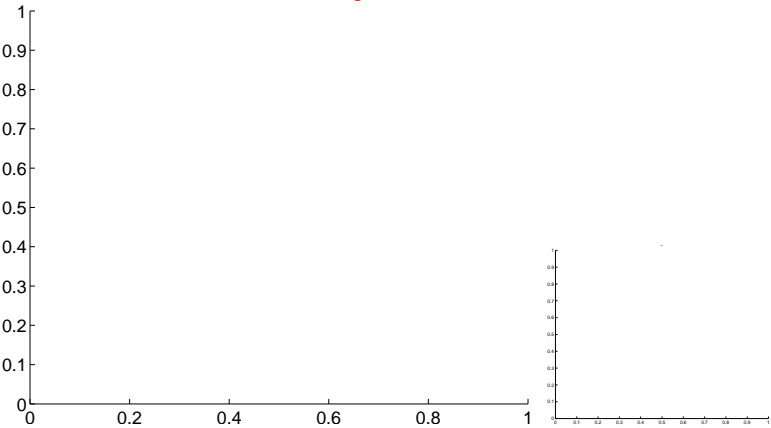


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

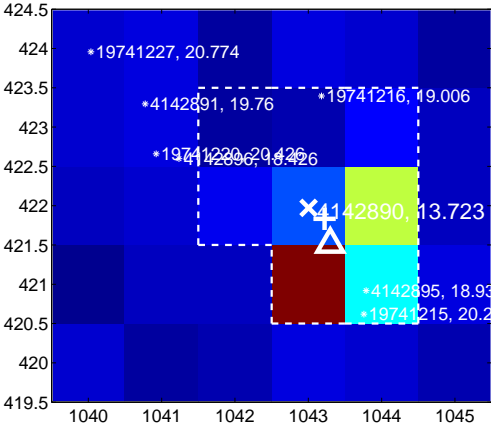
Q13 no difference image



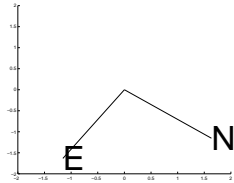
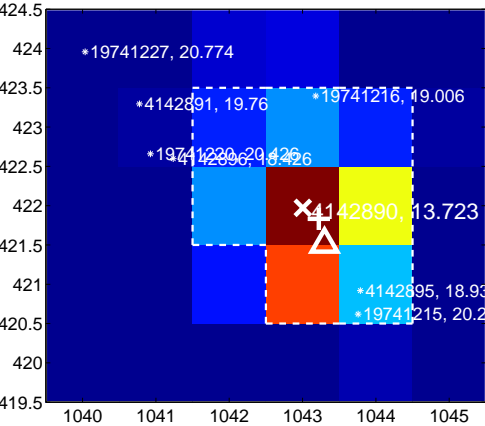
Q13 no OOT image



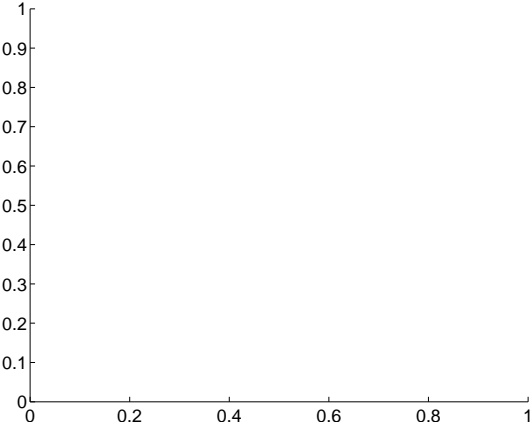
Q14 difference image



Q14 OOT image



Q15 no difference image



Q15 no OOT image



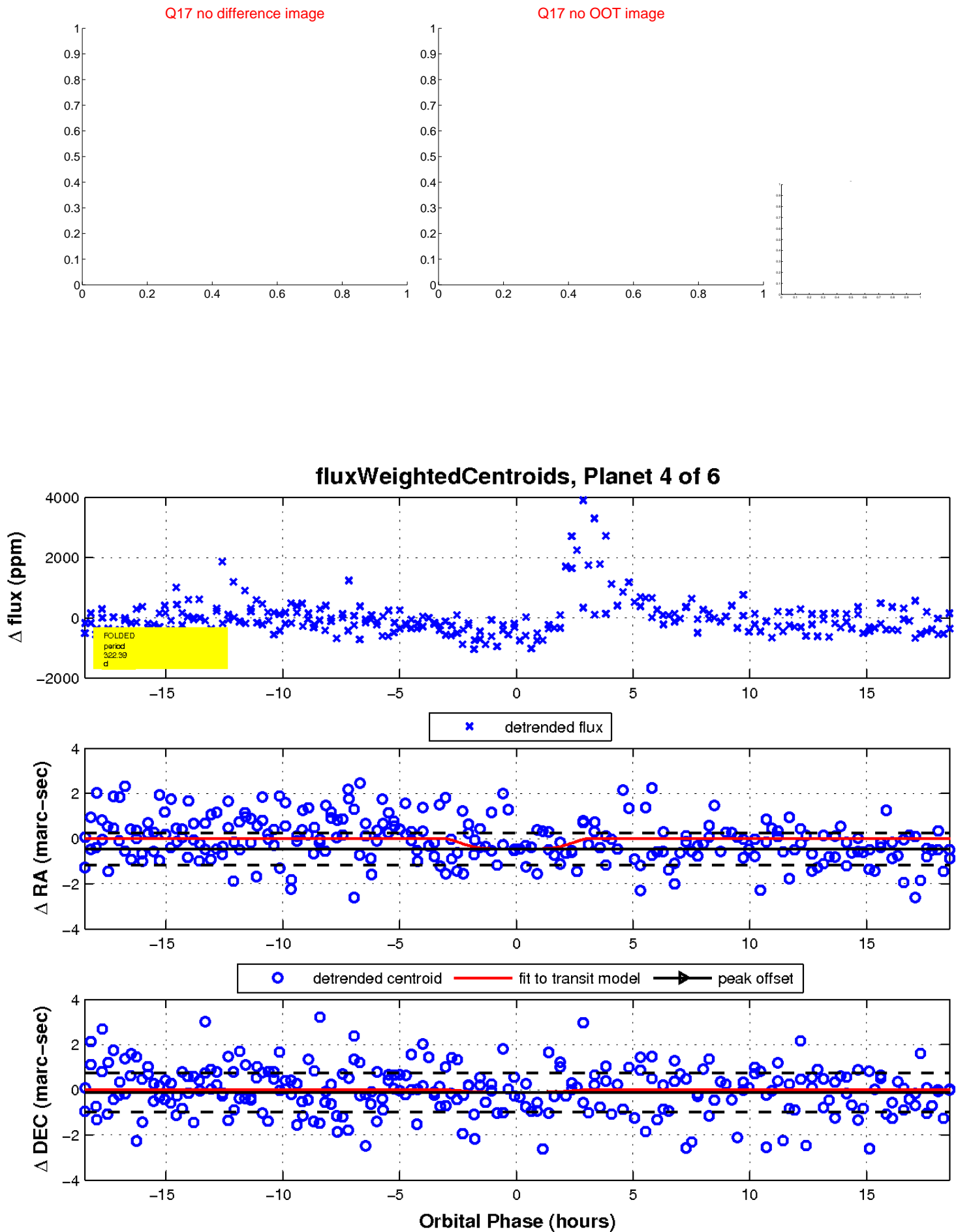
Q16 no difference image



Q16 no OOT image

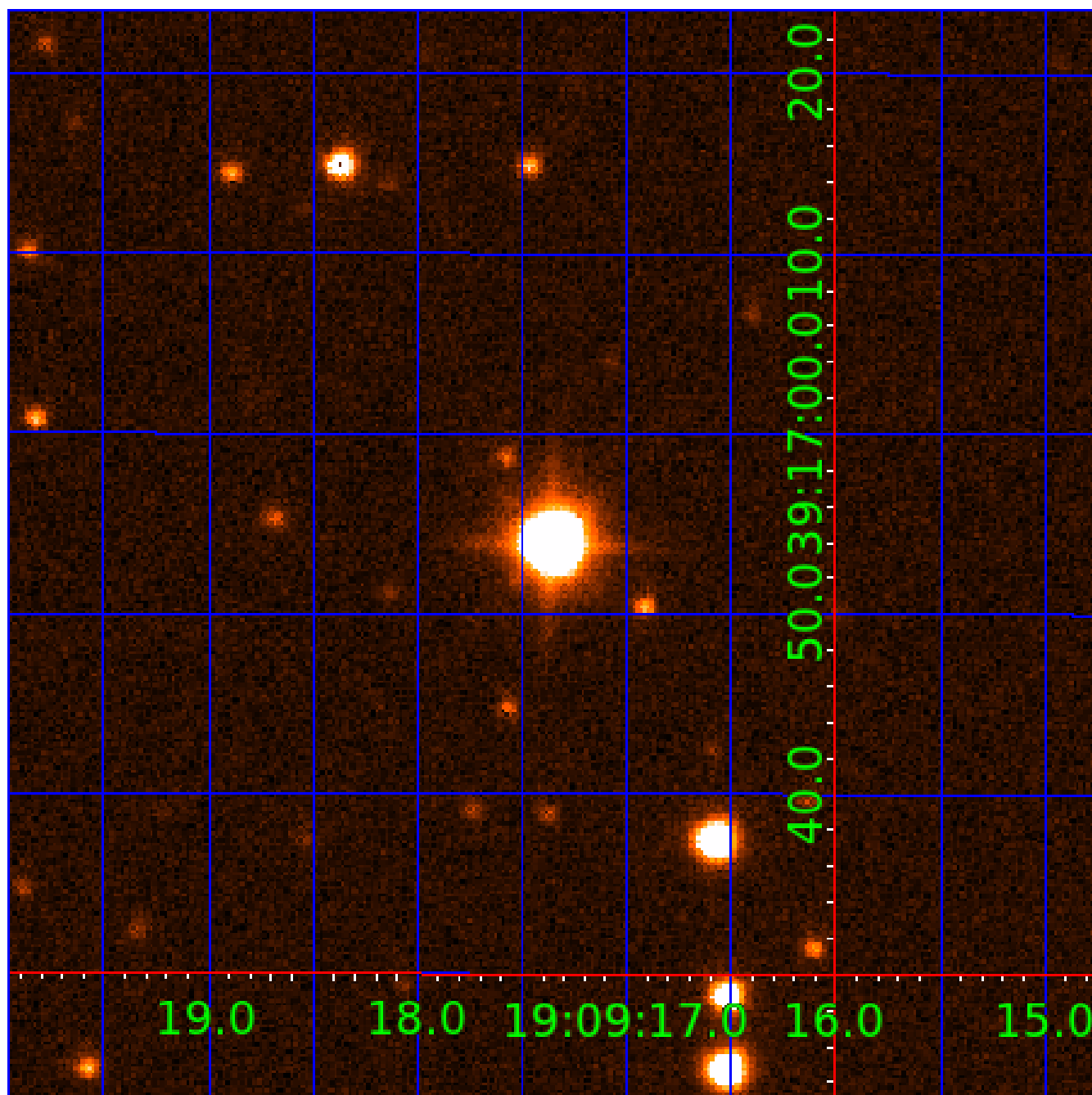


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004142890

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 004142890-01 | OBS | No | 533.492090 | 241.820037 | 1263.6 | 3.005 | 14.1 | 8.3 | 0.56 | 3683 | 2.24 | 0.05 |
| 004142890-02 | OBS | No | 325.435129 | 367.547618 | 869.1 | 5.548 | 11.6 | 7.4 | 0.56 | 3683 | 1.79 | 0.09 |
| 004142890-03 | OBS | No | 313.437790 | 176.431613 | 1336.2 | 4.578 | 12.0 | 7.5 | 0.56 | 3683 | 3.50 | 0.09 |
| 004142890-04 | OBS | No | 322.392681 | 355.557359 | 882.5 | 6.223 | 11.0 | 7.2 | 0.56 | 3683 | 2.17 | 0.09 |
| 004142890-05 | OBS | No | 362.308167 | 331.601435 | 891.7 | 5.840 | 9.5 | 7.2 | 0.56 | 3683 | 1.76 | 0.08 |
| 004142890-06 | OBS | No | 525.072046 | 391.984959 | 887.5 | 4.002 | 11.4 | 5.6 | 0.56 | 3683 | 1.81 | 0.05 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004142890-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST |
| 004142890-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—HALO_GHOST |
| 004142890-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |
| 004142890-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV |
| 004142890-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_KIC_POS |
| 004142890-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |

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

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

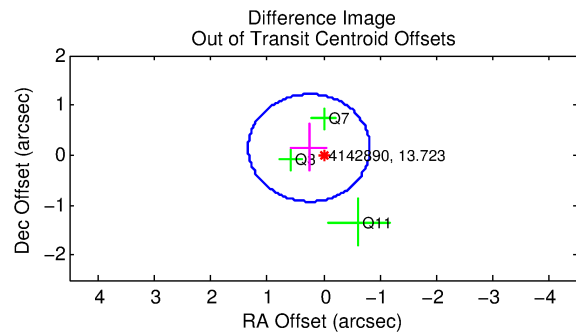
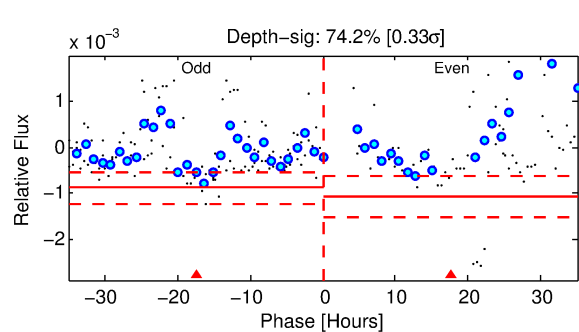
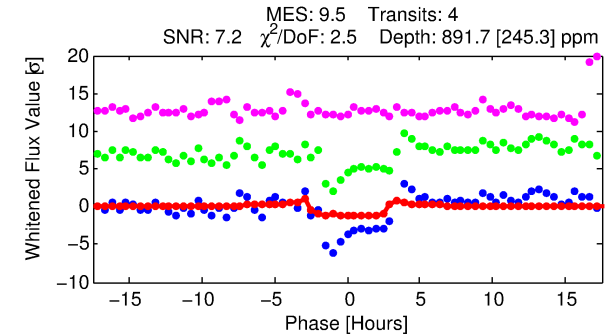
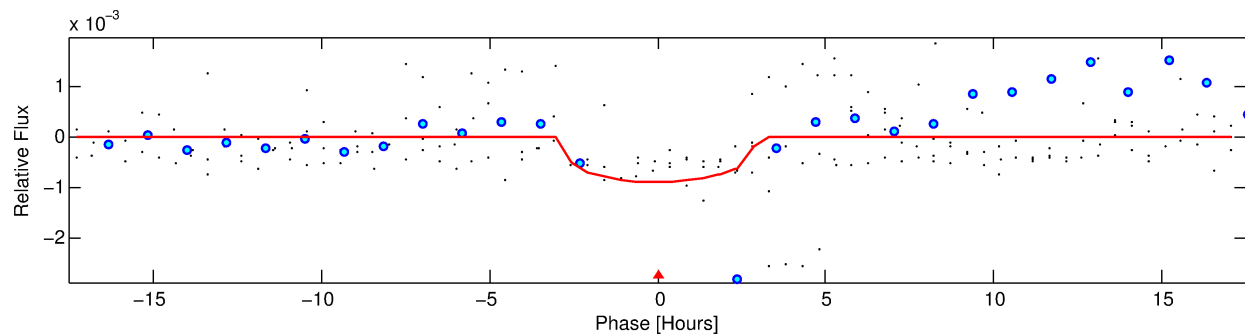
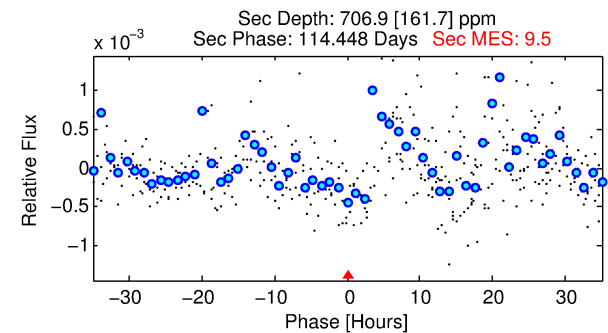
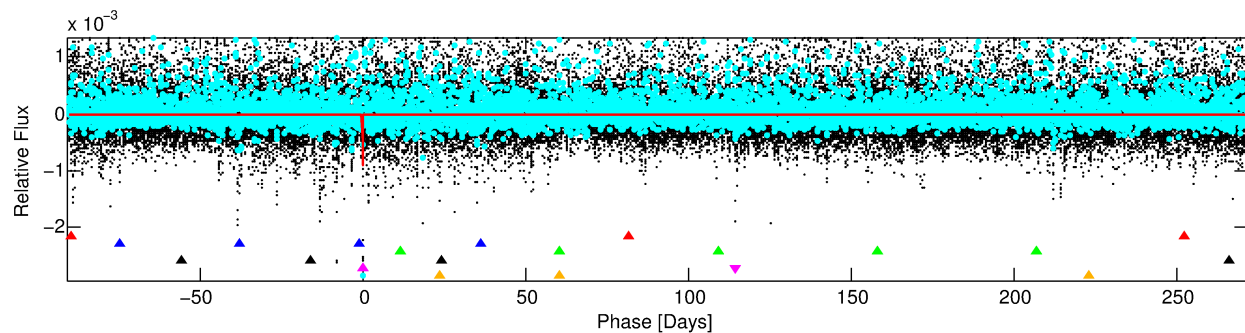
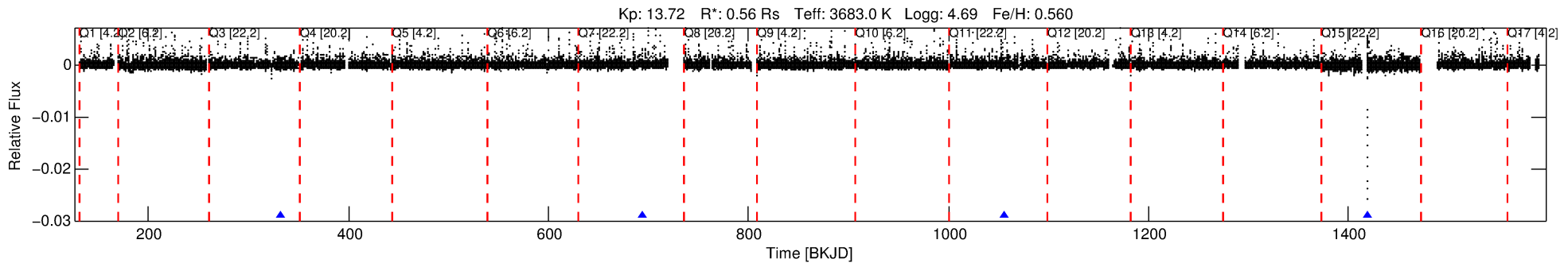
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004142890-05

No Significant Match Found

DV One-Page Summary

KIC: 4142890 Candidate: 5 of 6 Period: 362.308 d



DV Fit Results:

Period = 362.30817 [0.01188] d
Epoch = 331.6014 [0.0160] BKJD
Rp/R* = 0.0286 [0.0355]
a/R* = 380.00 [1545.07]
b = 0.64 [3.75]
Seff = 0.08 [0.02]
Teq = 134 [8] K
Rp = 1.76 [2.20] Re
a = 0.8218 [0.0952] AU
Ag = 85031.99 [212528.60] [0.40σ]
Teffp = 3551 [2219] K [1.54σ]

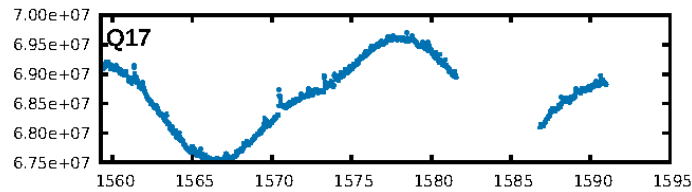
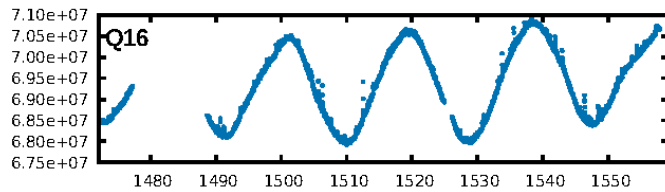
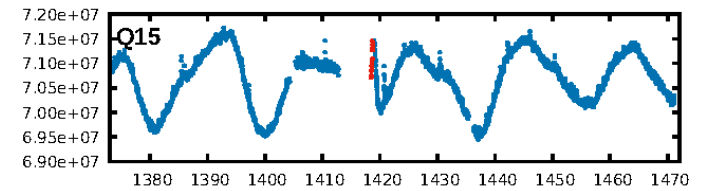
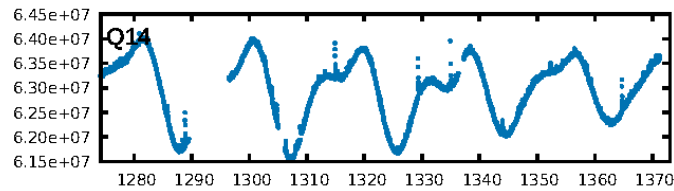
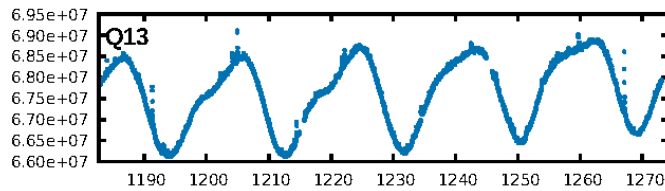
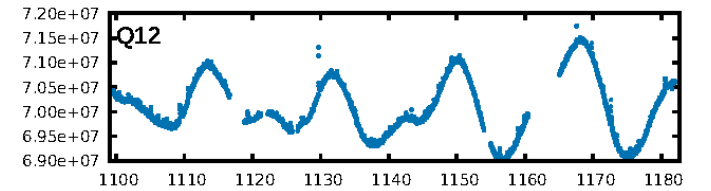
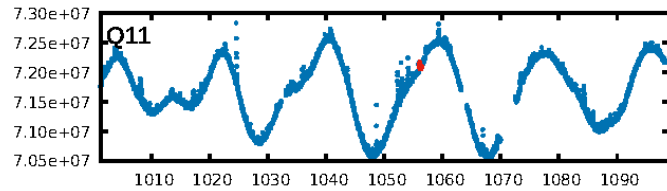
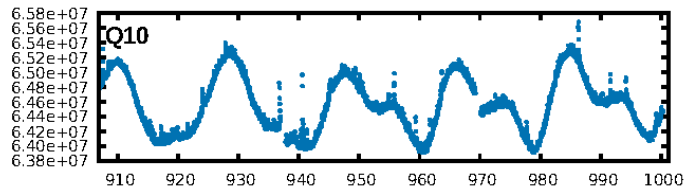
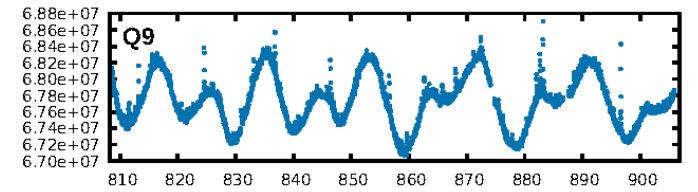
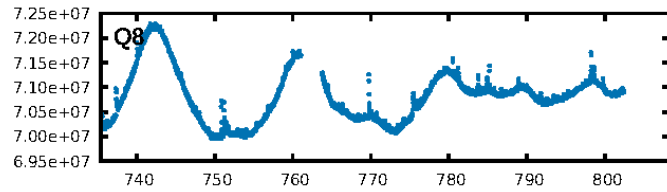
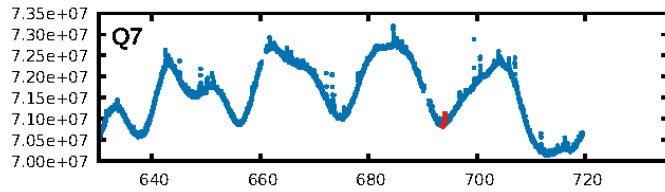
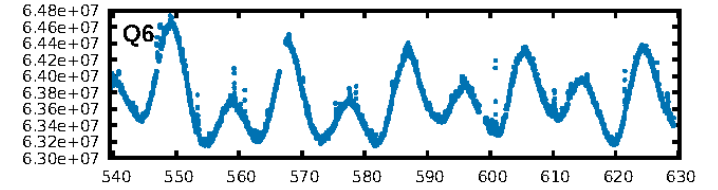
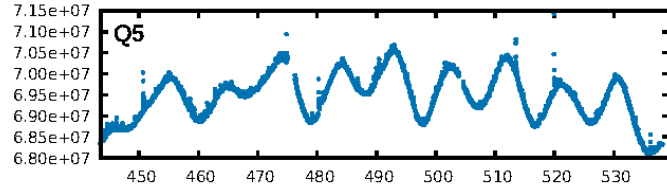
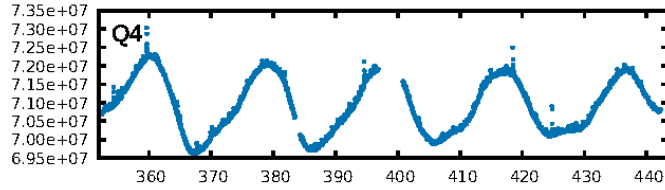
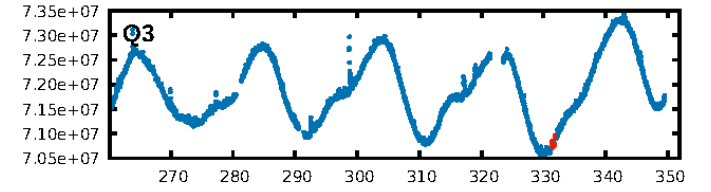
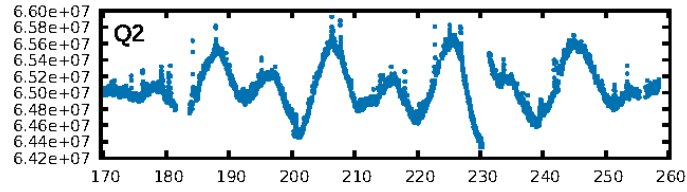
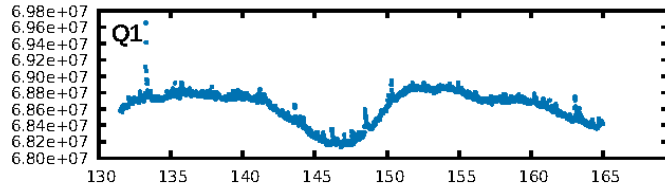
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [109.87σ]
LongPeriod-sig: 100.0% [551.76σ]
ModelChiSquare2-sig: 13.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.9461
Centroid-sig: 67.8%
Centroid-so: 0.786 arcsec [1.07σ]
OotOffset-rm: 0.295 arcsec [0.82σ]
KicOffset-rm: 0.659 arcsec [1.29σ]
OotOffset-st: 0/3/0/0 [3]
KicOffset-st: 0/3/0/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

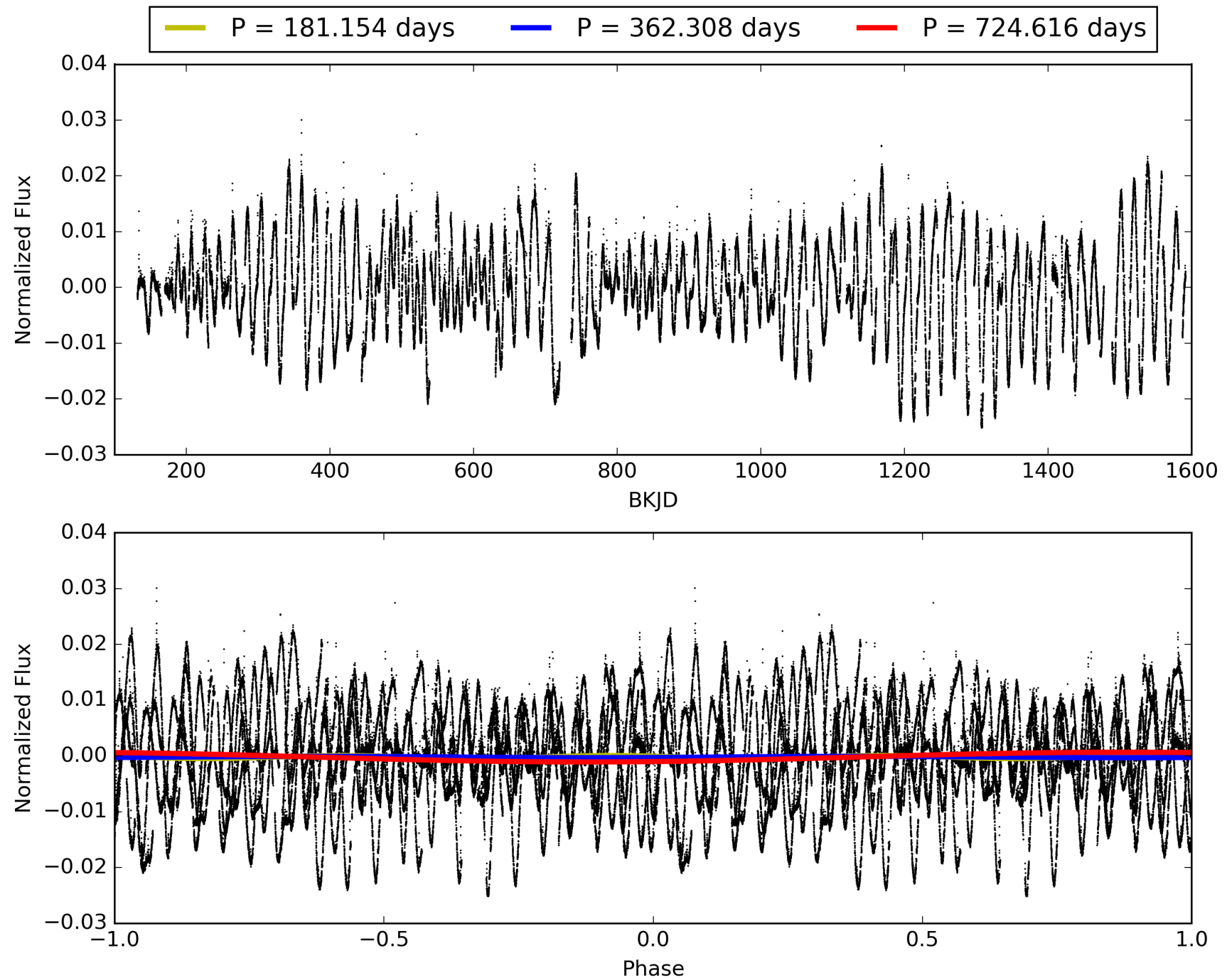
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:30:04 Z

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

TCE 004142890-05, PDC Light Curves

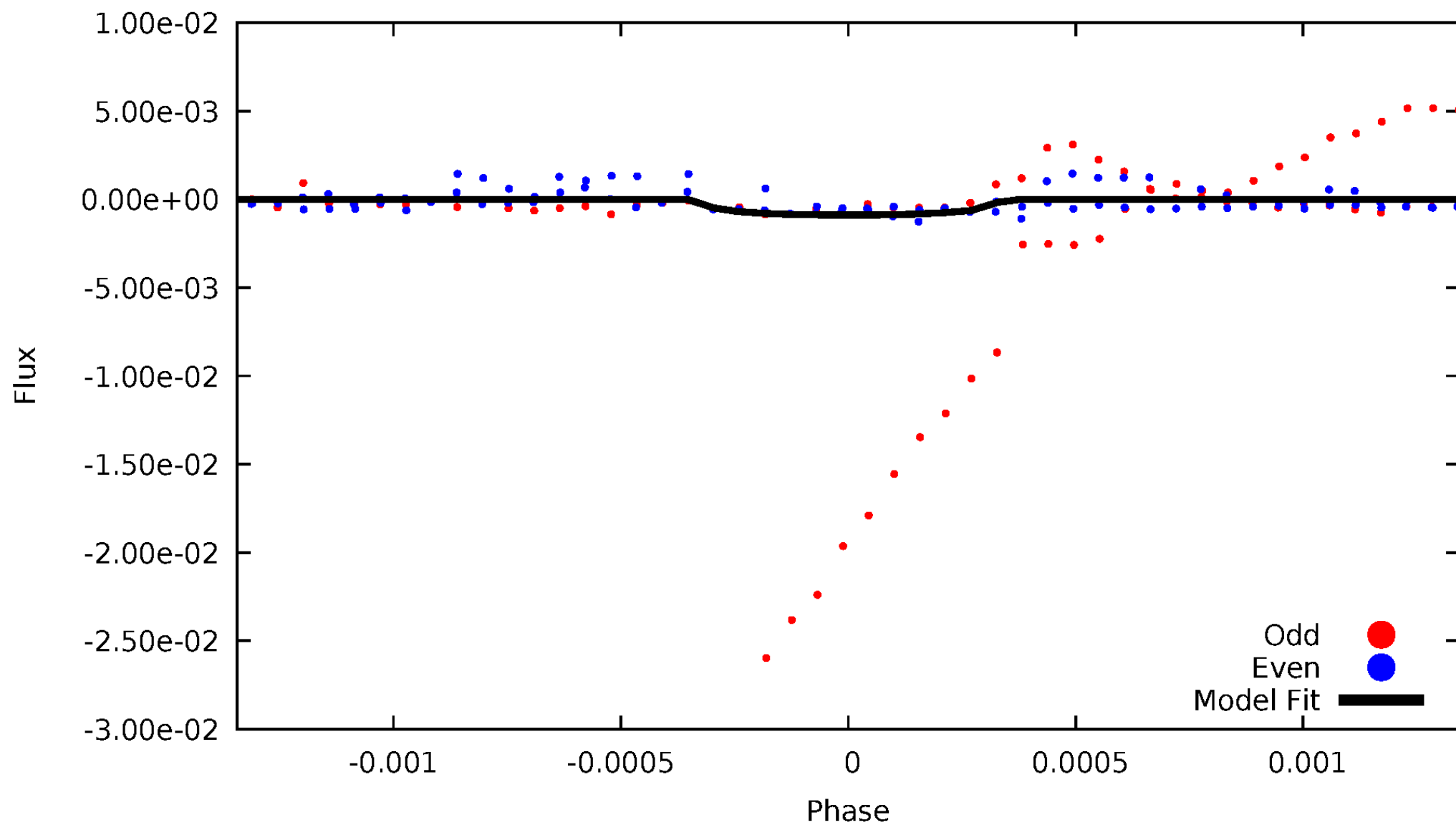


TCE 004142890-05



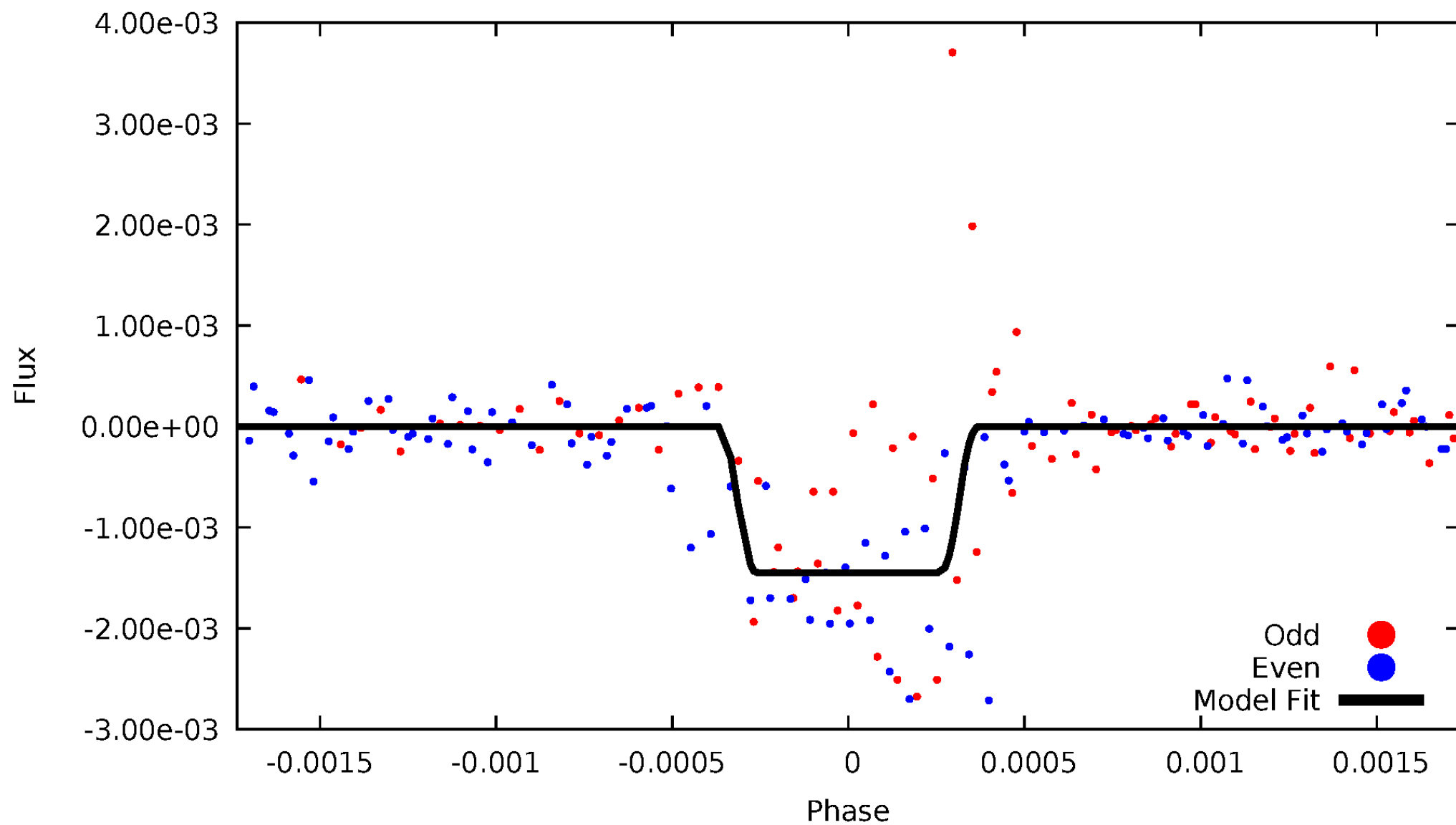
DV Odd/Even

TCE 004142890-05



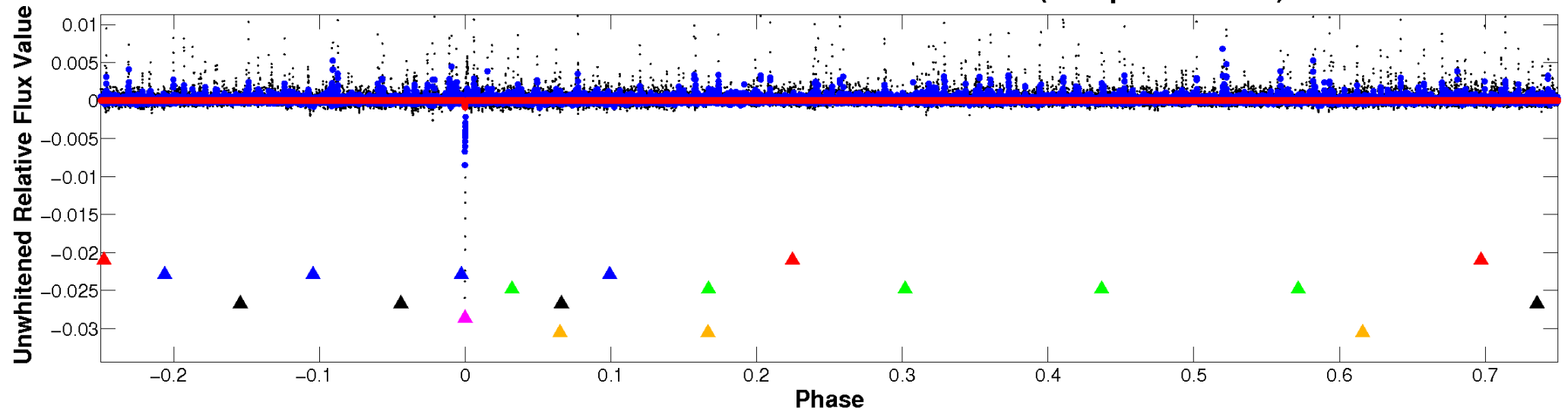
ALT Odd/Even

TCE 004142890-05

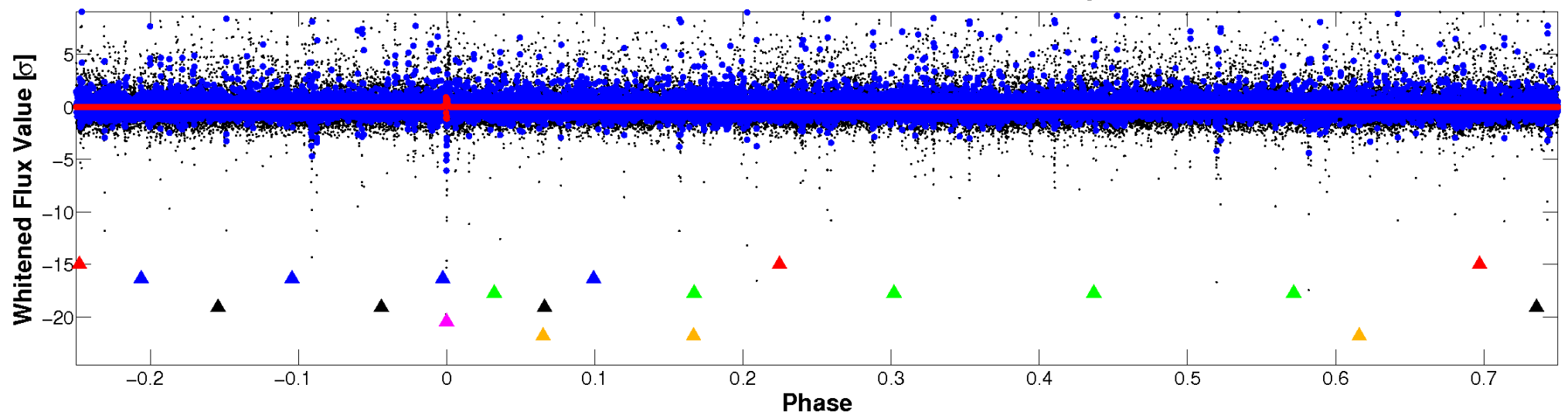


Non-Whitened Vs. Whitened Light Curve

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

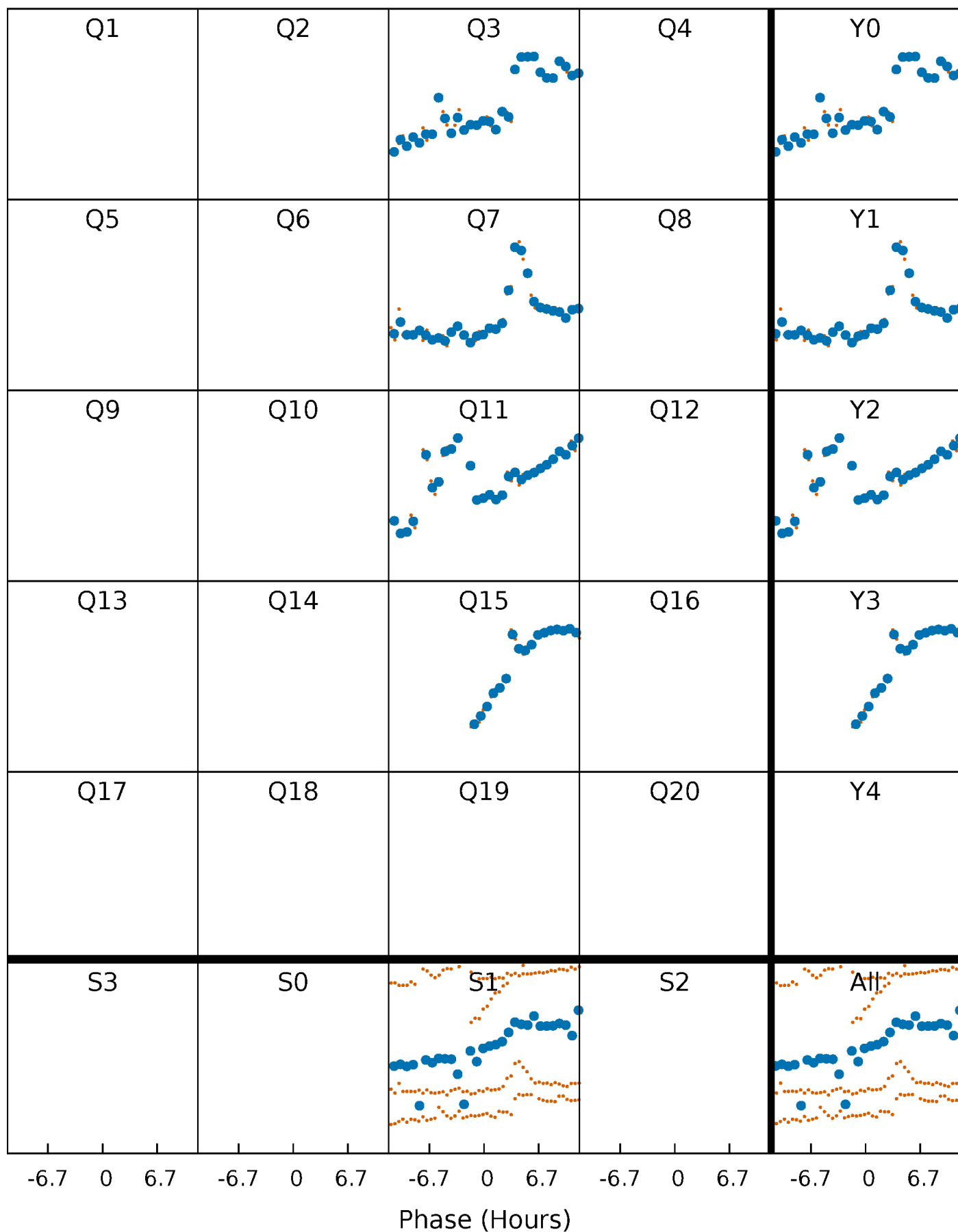


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



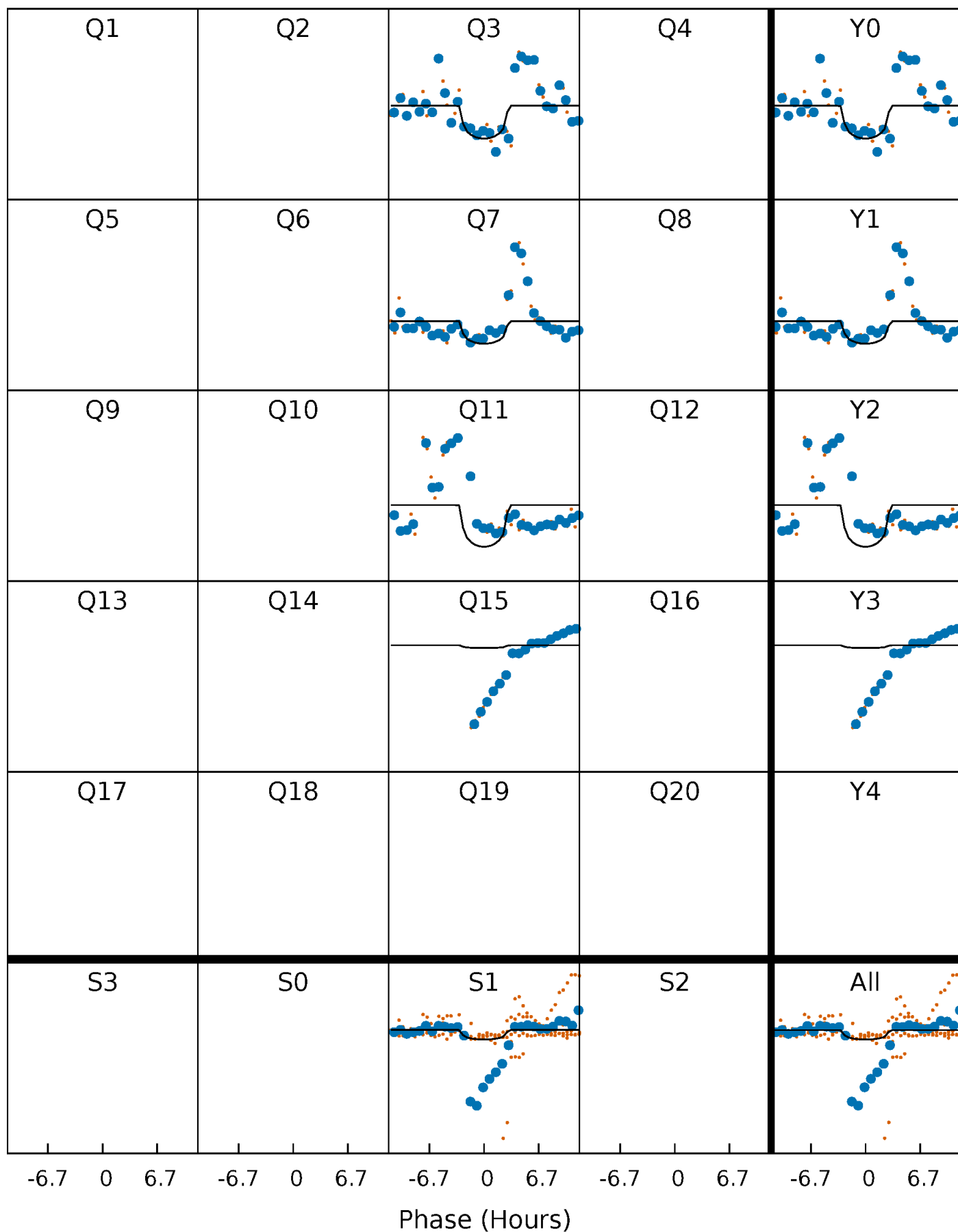
PDC Quarter-Phased Transit Curves

TCE 004142890-05 $P=362.308168$ Days $T_0=331.601435$ (BKJD)



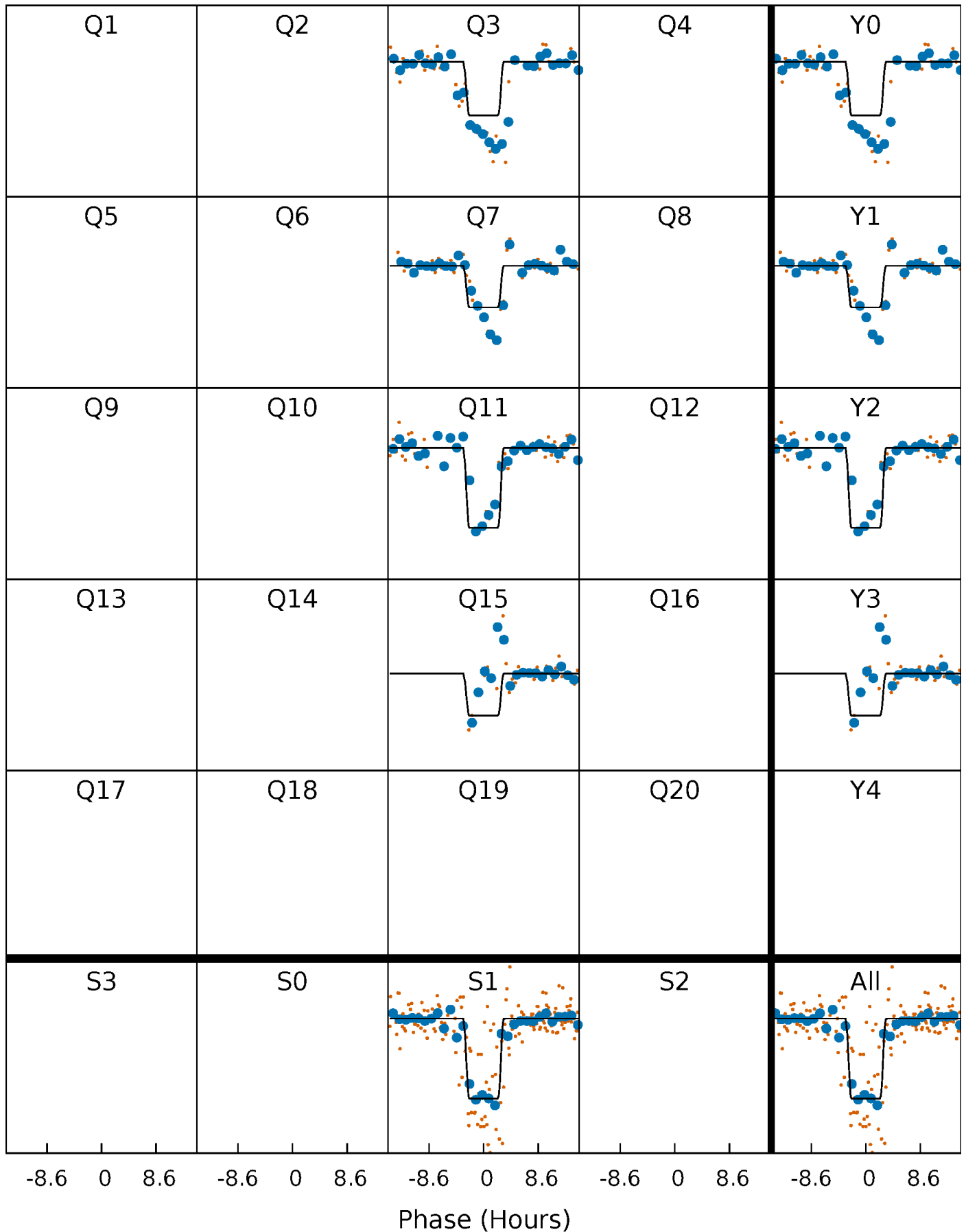
DV Quarter-Phased Transit Curves

TCE 004142890-05 $P=362.308168$ Days $T_0=331.601435$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

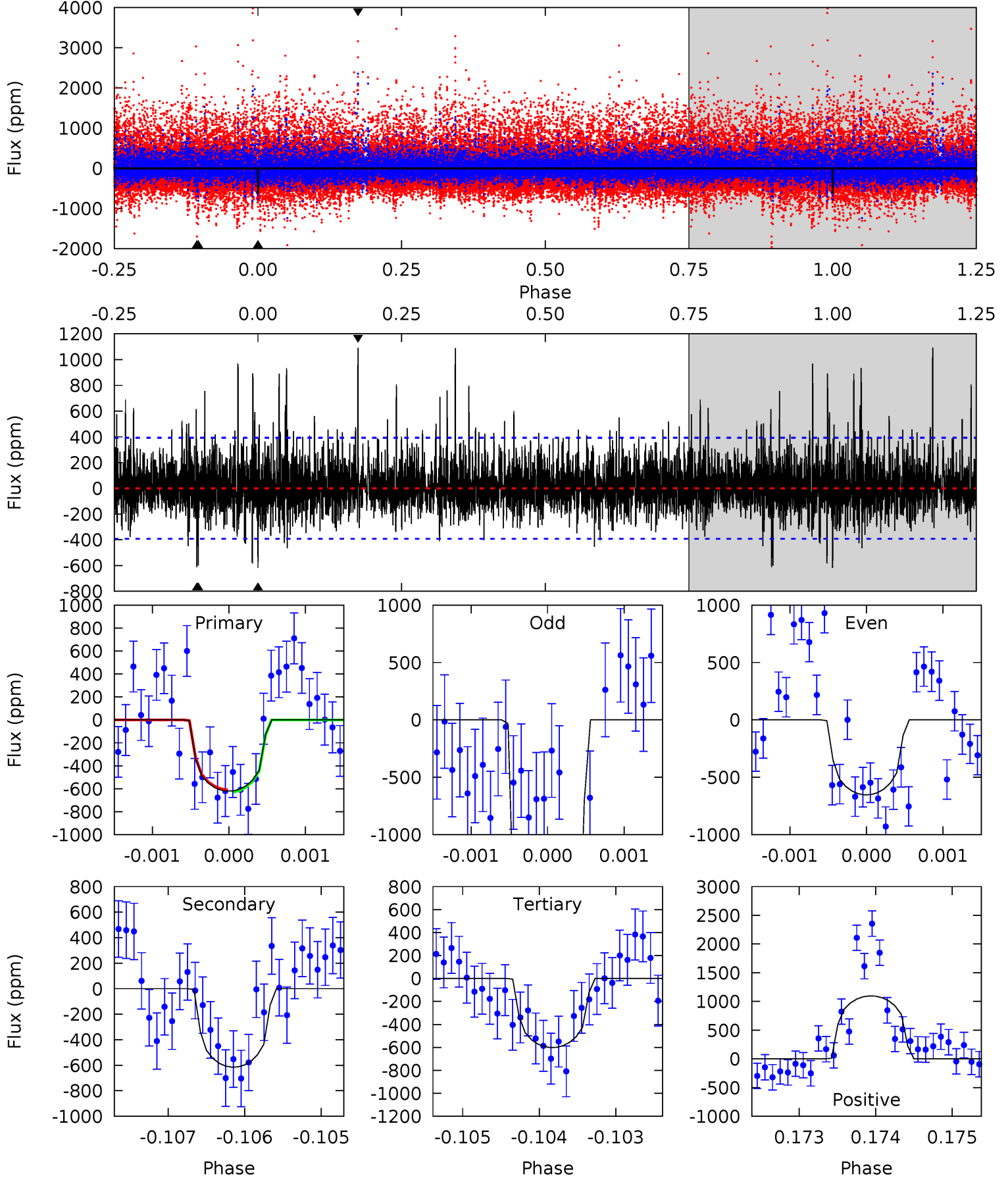
TCE 004142890-05 $P=362.321075$ Days $T_0=331.594423$ (BKJD)



DV Model-Shift Uniqueness Test

004142890-05, P = 362.308168 Days, E = 331.601435 Days

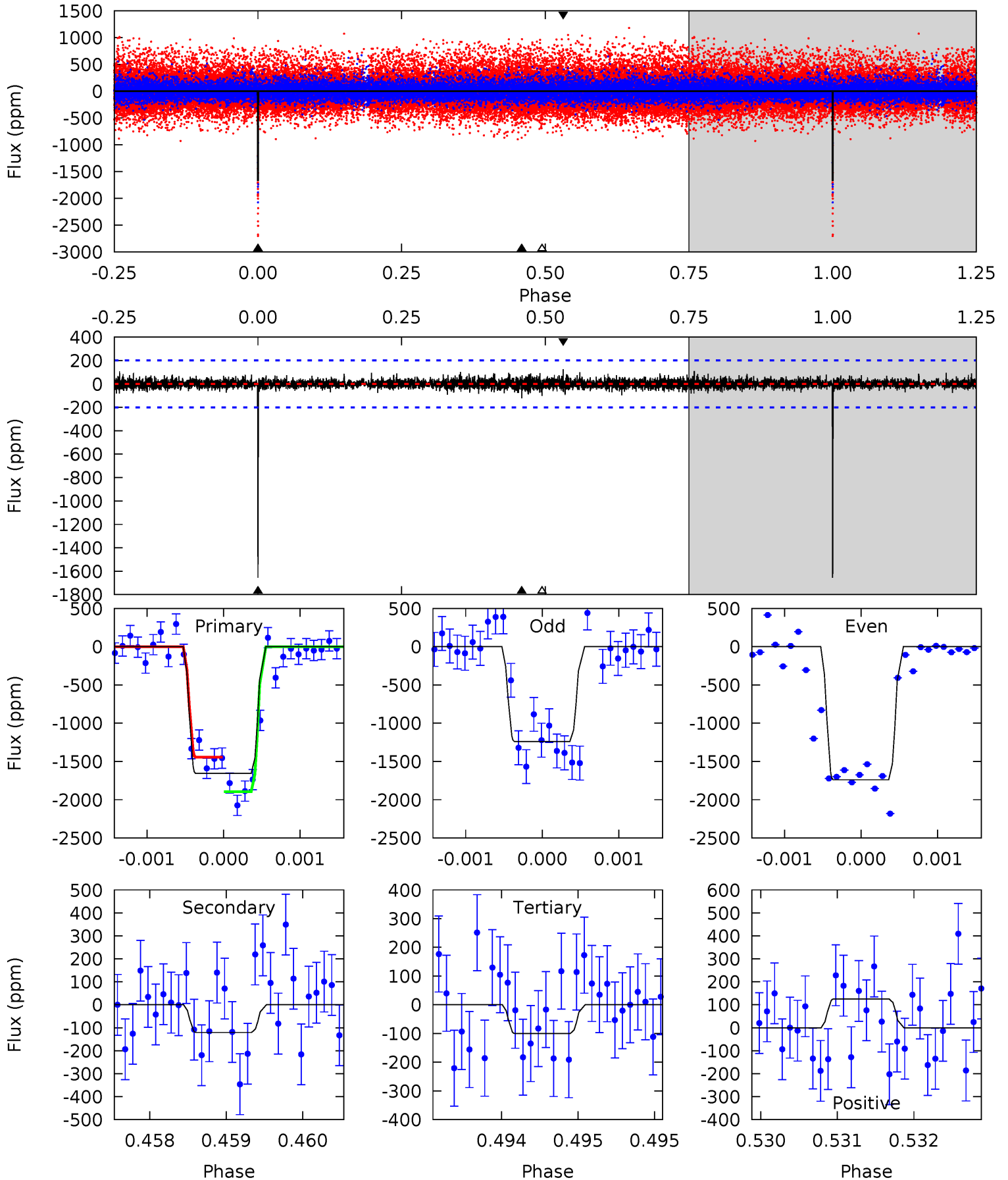
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|-----|
| 8.68 | 8.61 | 8.42 | 15.4 | 5.52 | 3.40 | 2.19 | 0.26 | -6.67 | 0.19 | -6.74 | 15.9 | 7.65 | 0.64 | 0 |



Alt Model-Shift Uniqueness Test

004142890-05, P = 362.321075 Days, E = 331.594423 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 45.3 | 3.30 | 2.74 | 3.43 | 5.51 | 3.39 | 0.62 | 42.6 | 41.9 | 0.56 | -0.13 | 7.01 | 0.92 | 0.07 | 6.21 |



Stellar Parameters For KIC 004142890

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 3683^{+117}_{-147} | $4.688^{+0.080}_{-0.020}$ | $0.560^{+0.050}_{-0.300}$ | $0.563^{+0.030}_{-0.083}$ | $0.564^{+0.036}_{-0.072}$ | $4.449^{+1.718}_{-0.458}$ |
| | +3%/-4% | +2%/-0% | +9%/-54% | +5%/-15% | +6%/-13% | +39%/-10% |
| Source | KIC0 | 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 004142890-05 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|-----------------------|----------------------------|
| DV | -612 ± 71 | $2.21^{+1.90}_{-1.40}$ | 185^{+7}_{-9} | 3236^{+1303}_{-516} | $46648^{+305504}_{-33124}$ |
| Alt. | -121 ± 37 | $2.59^{+1.98}_{-1.57}$ | 186^{+7}_{-8} | 2491^{+750}_{-336} | 6346^{+38517}_{-4363} |

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

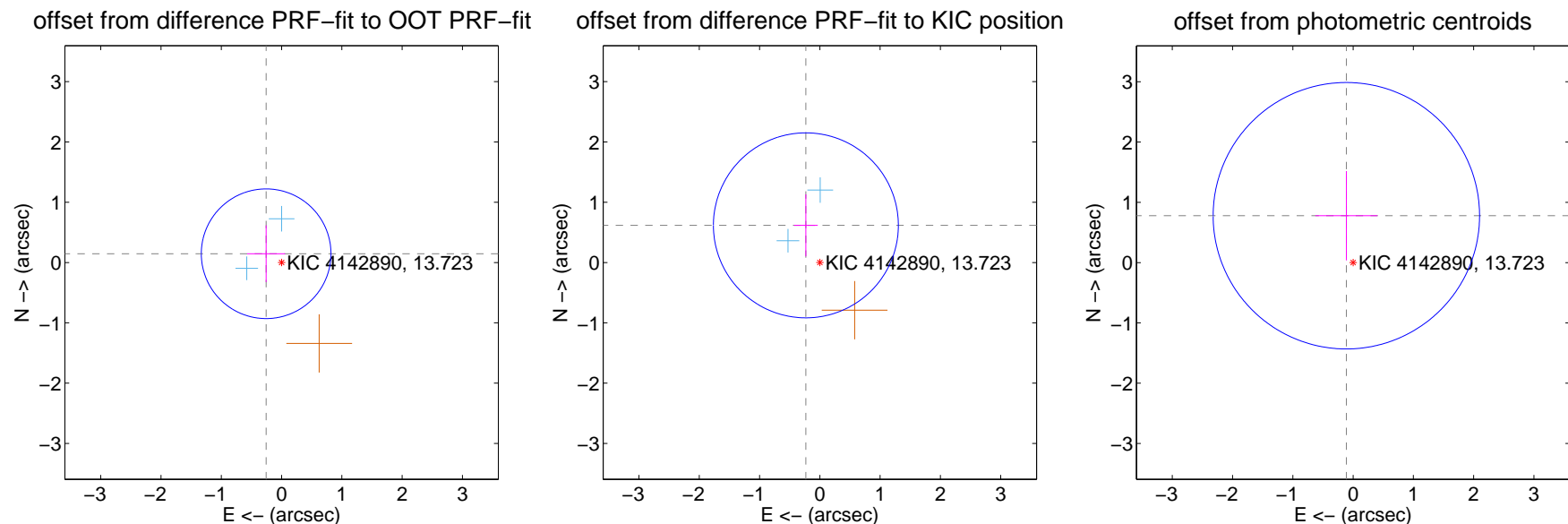
DV Centroid Data

Supplemental centroid analysis for 004142890-05. Kepler magnitude: 13.72. Transit SNR 7.17

There are 2 quarters with good PRF difference image offsets

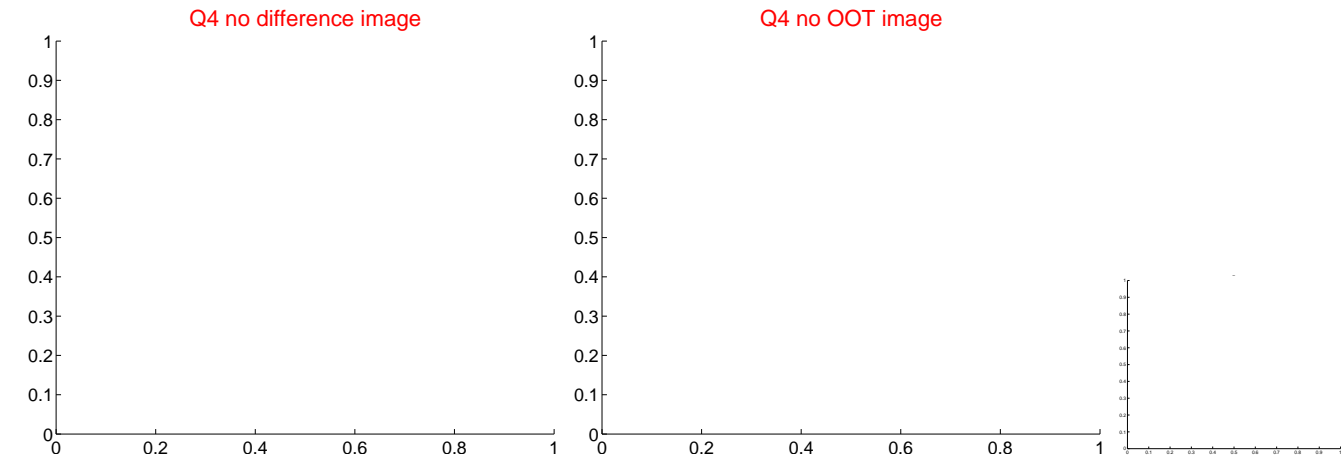
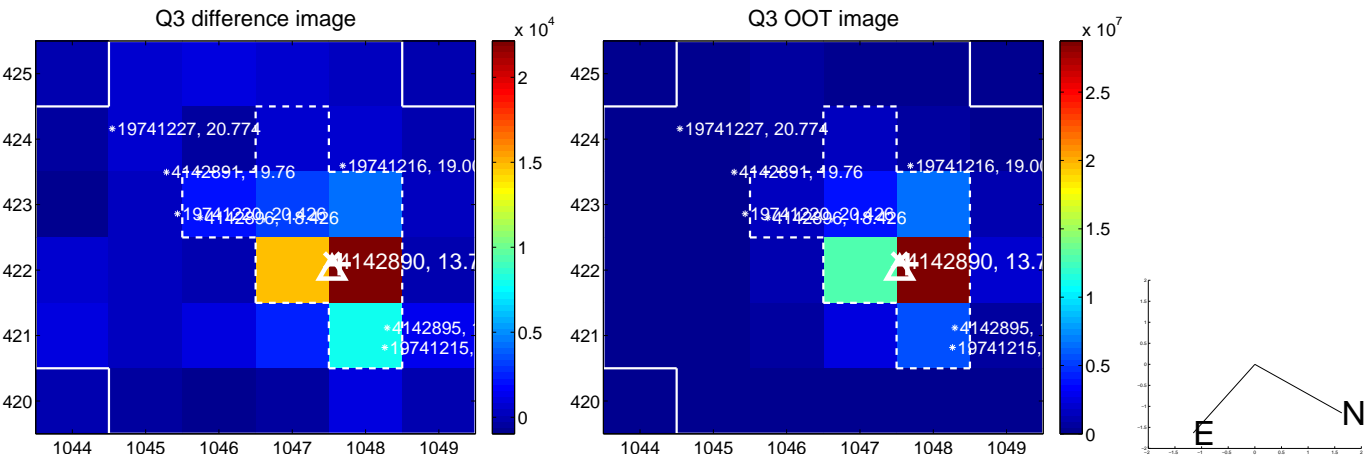
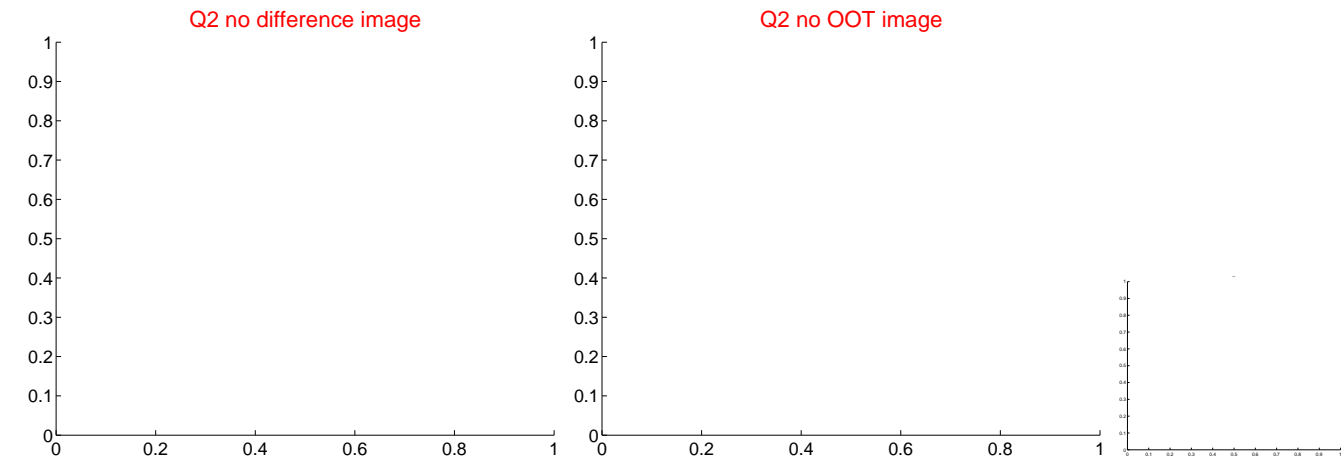
The direct PRF centroid is offset from the target star catalog position by about 0.55 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|-------------------|-------------------|
| PRF-fit source offset from OOT | 0.295 ± 0.358 | 0.82 | 0.256 ± 0.314 | 0.146 ± 0.470 |
| PRF-fit source offset from KIC position | 0.659 ± 0.511 | 1.29 | 0.232 ± 0.196 | 0.617 ± 0.514 |
| photometric centroid source offset | 0.79 ± 0.74 | 1.07 | 0.11 ± 0.52 | 0.78 ± 0.74 |

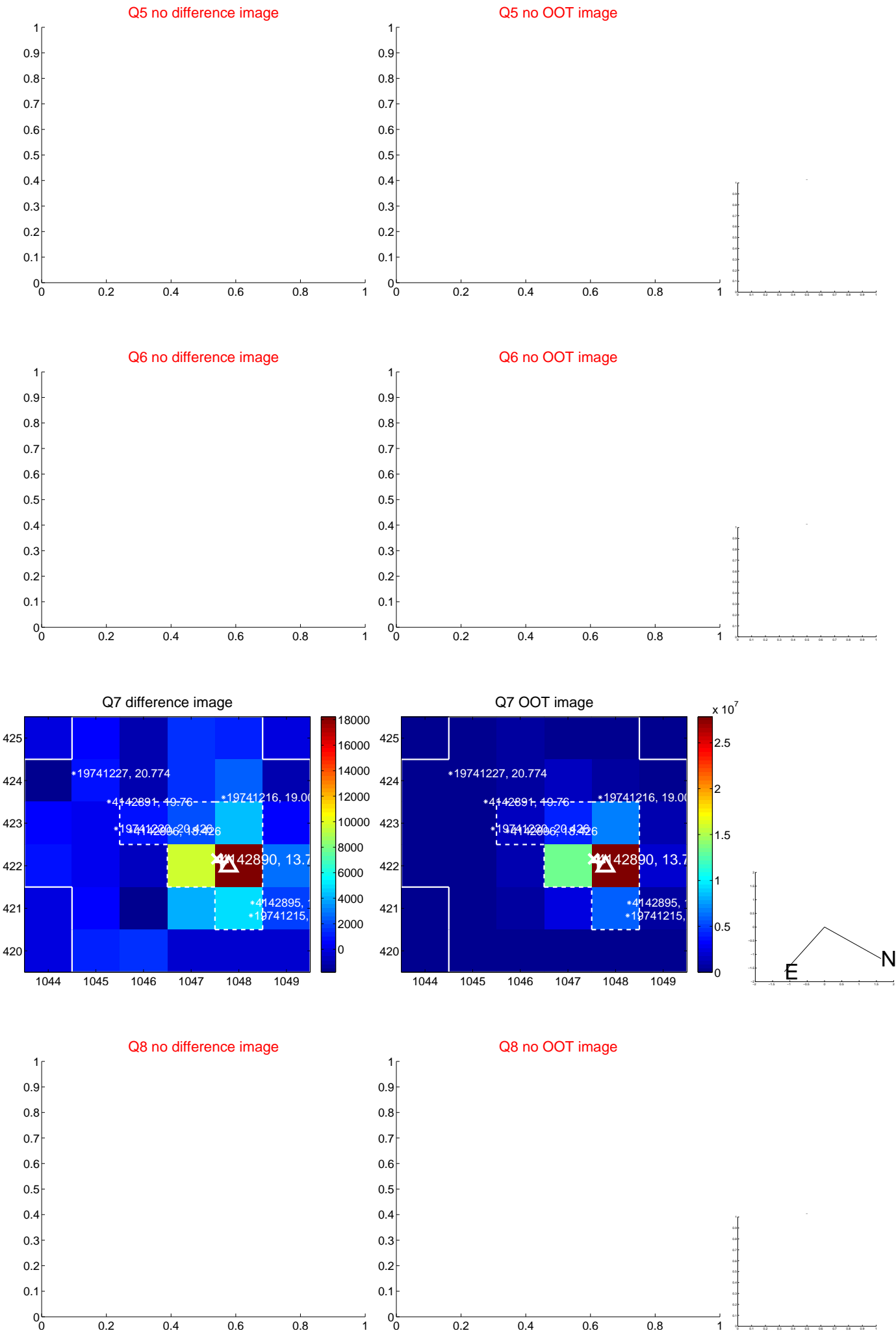


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

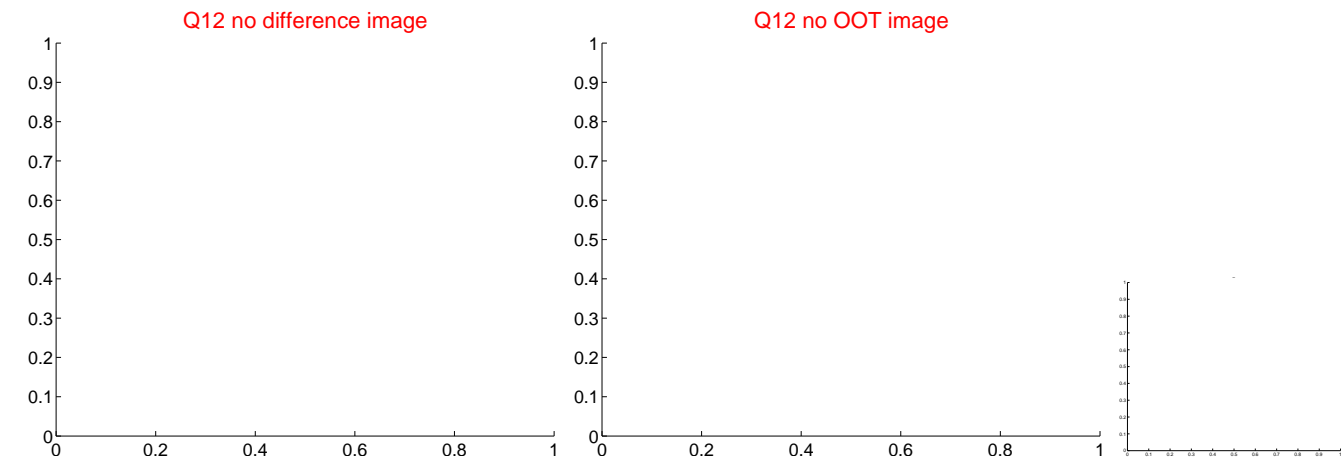
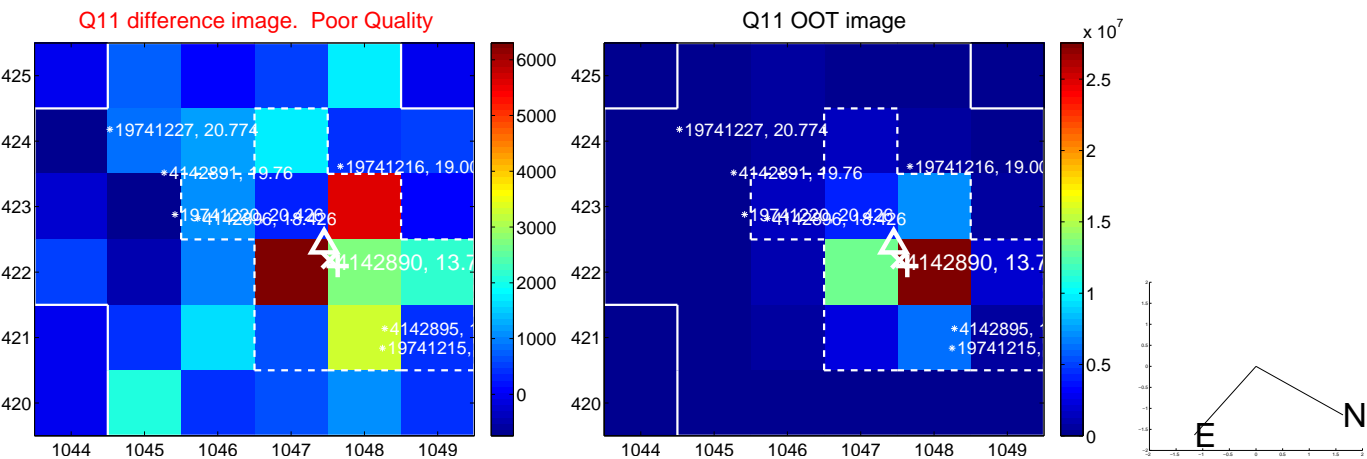
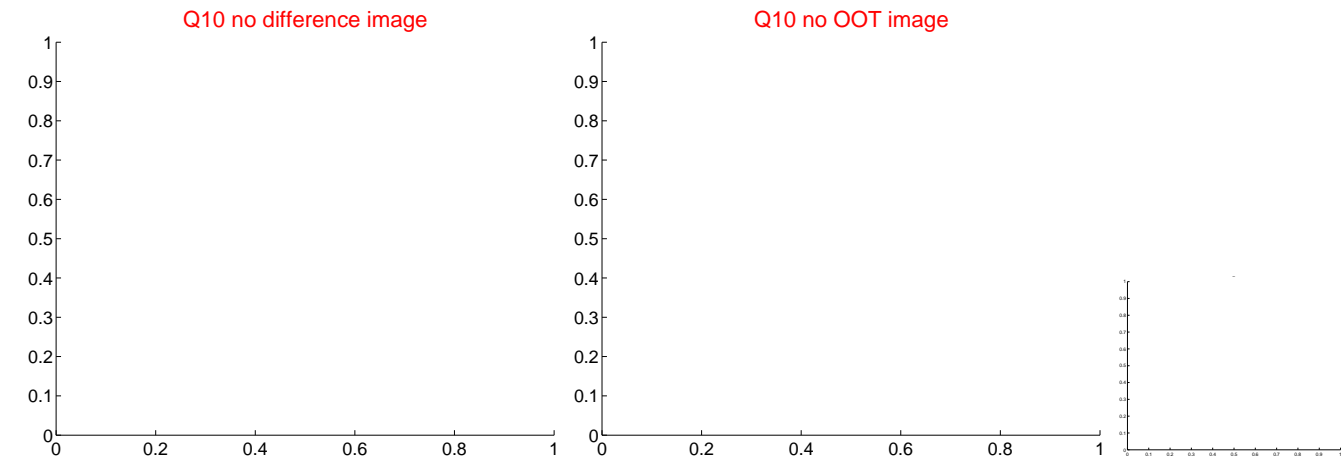
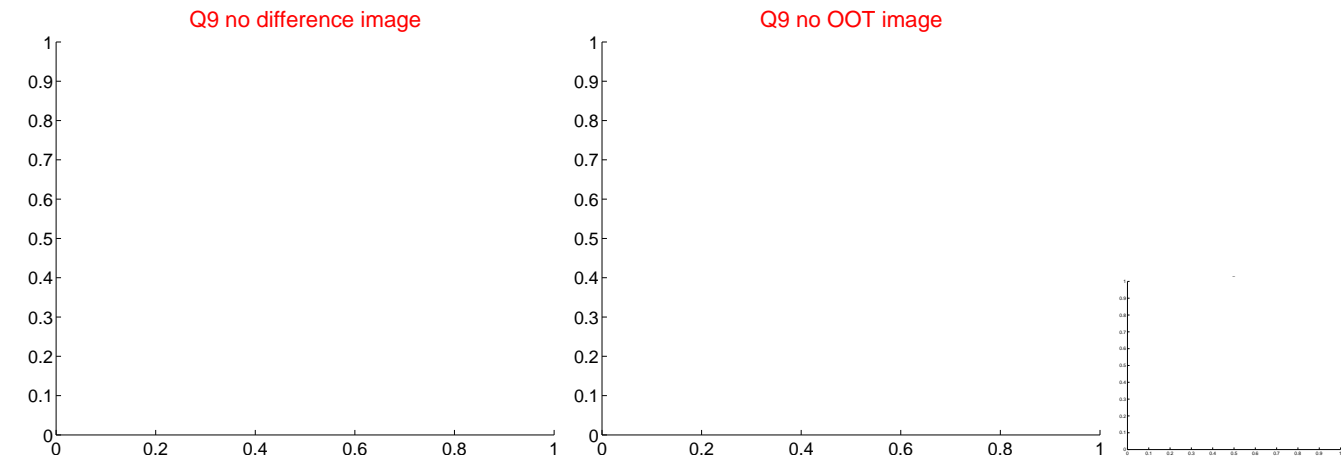
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



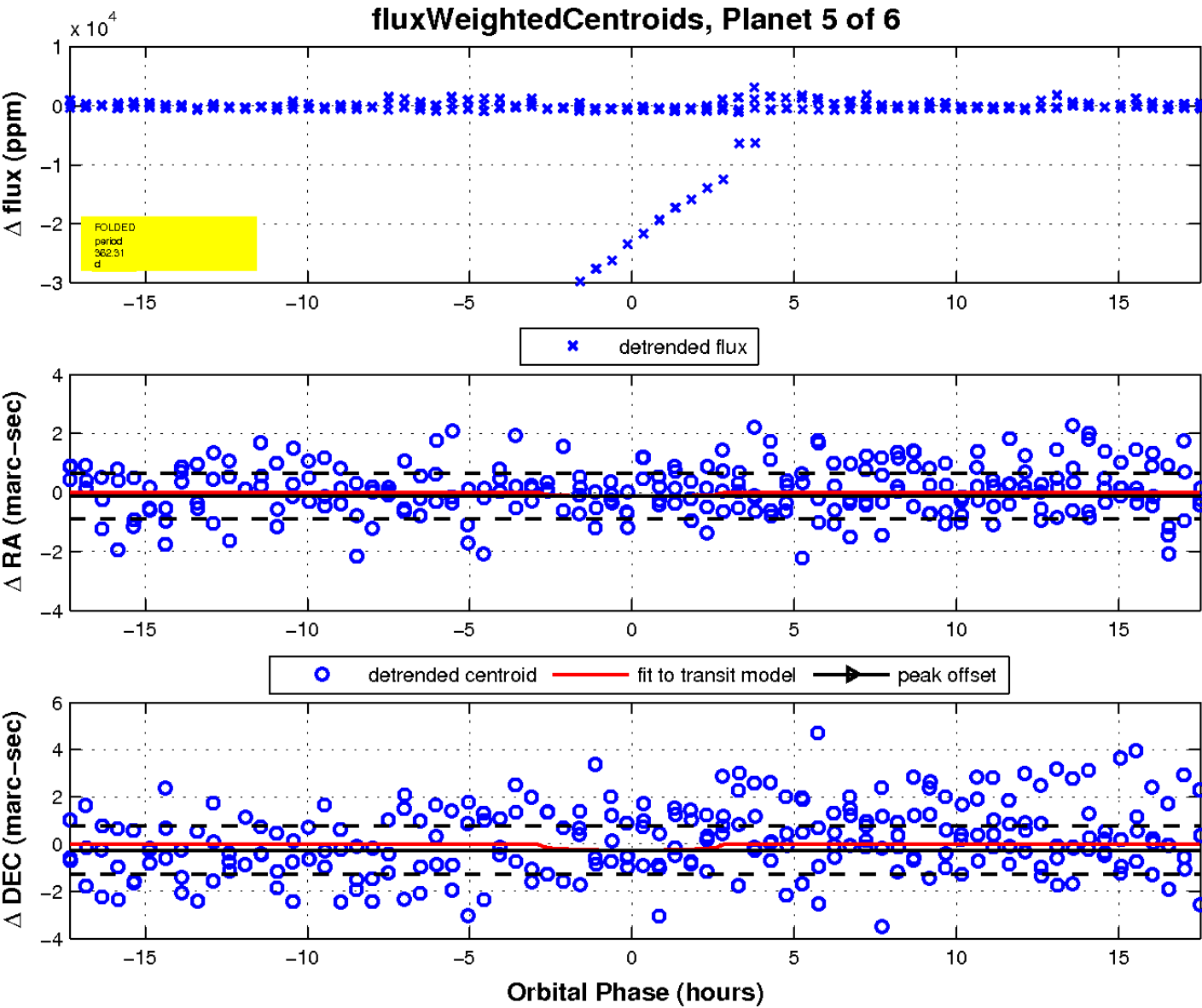
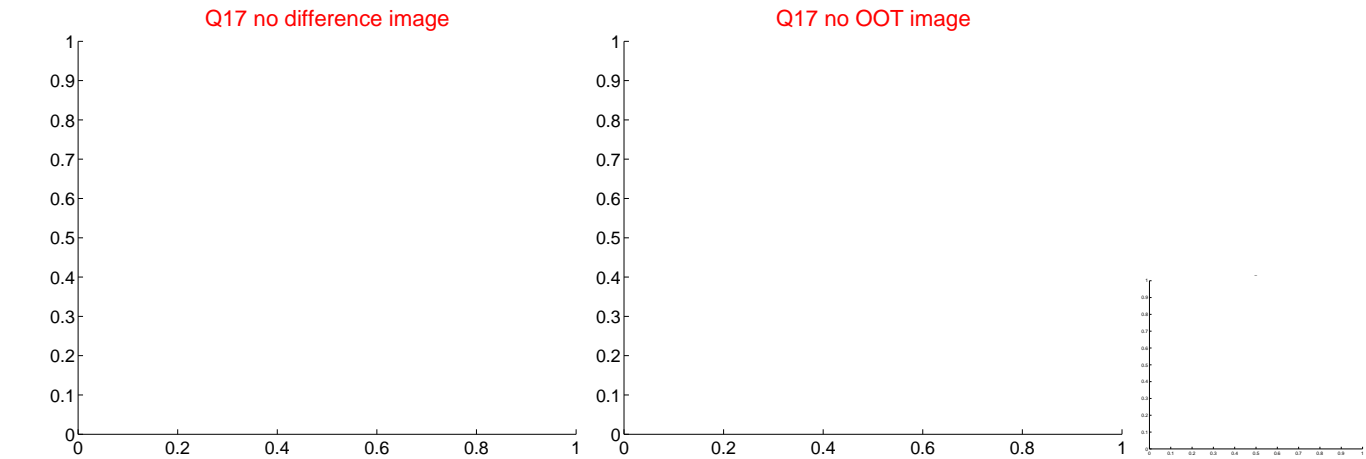
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

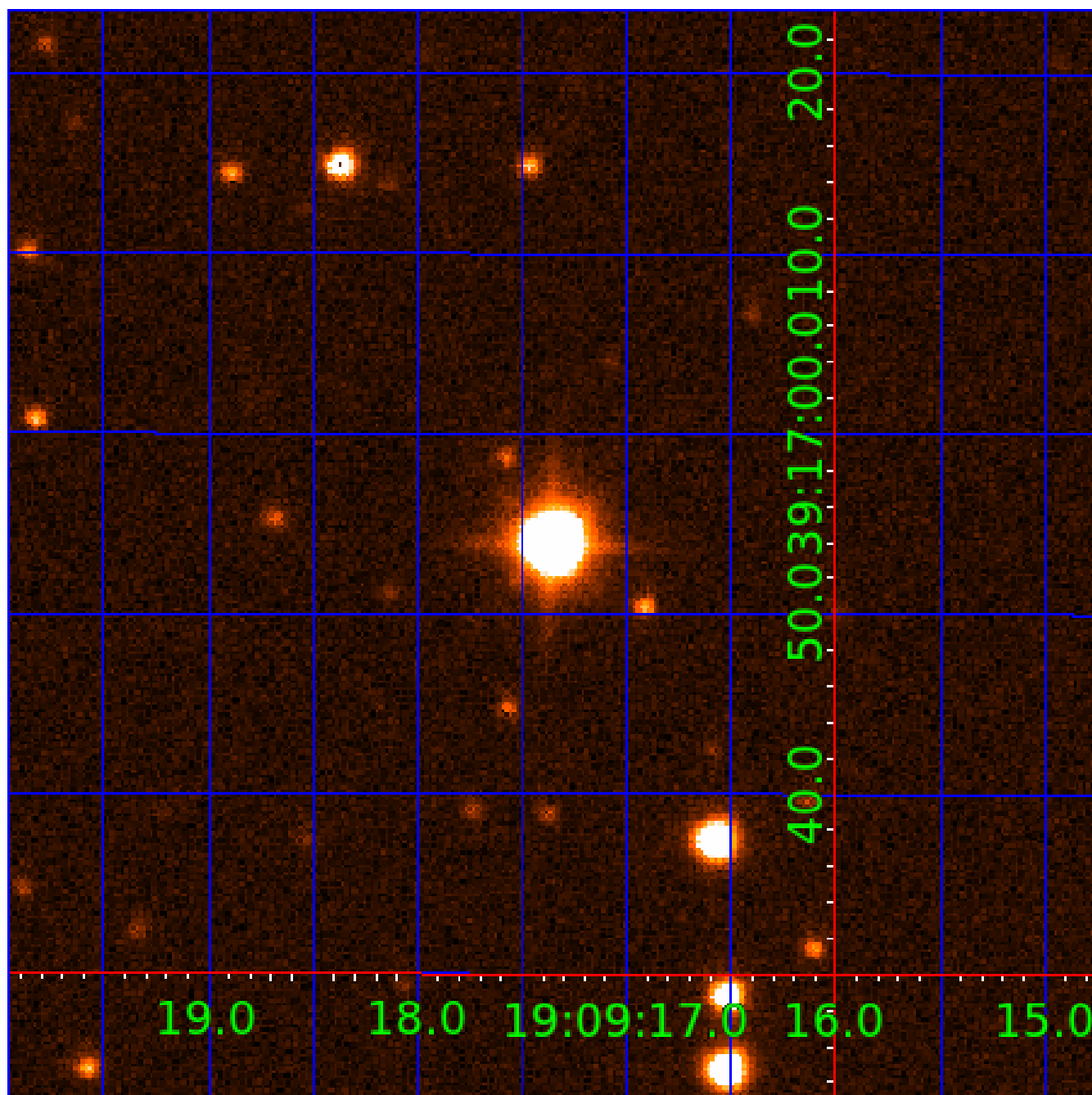


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004142890

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}) |
|--------------|----------|------|---------------|--------------|-------------|------------------|------|-----|-----------------------------|-----------------|------------------------|------------------------|
| 004142890-01 | OBS | No | 533.492090 | 241.820037 | 1263.6 | 3.005 | 14.1 | 8.3 | 0.56 | 3683 | 2.24 | 0.05 |
| 004142890-02 | OBS | No | 325.435129 | 367.547618 | 869.1 | 5.548 | 11.6 | 7.4 | 0.56 | 3683 | 1.79 | 0.09 |
| 004142890-03 | OBS | No | 313.437790 | 176.431613 | 1336.2 | 4.578 | 12.0 | 7.5 | 0.56 | 3683 | 3.50 | 0.09 |
| 004142890-04 | OBS | No | 322.392681 | 355.557359 | 882.5 | 6.223 | 11.0 | 7.2 | 0.56 | 3683 | 2.17 | 0.09 |
| 004142890-05 | OBS | No | 362.308167 | 331.601435 | 891.7 | 5.840 | 9.5 | 7.2 | 0.56 | 3683 | 1.76 | 0.08 |
| 004142890-06 | OBS | No | 525.072046 | 391.984959 | 887.5 | 4.002 | 11.4 | 5.6 | 0.56 | 3683 | 1.81 | 0.05 |

Robovetter Results

| TCE | Run Type | Disp | Score | N | S | C | E | Comments |
|--------------|----------|------|-------|---|---|---|---|--|
| 004142890-01 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST |
| 004142890-02 | OBS | FP | 0.00 | 1 | 0 | 1 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—HALO_GHOST |
| 004142890-03 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |
| 004142890-04 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV |
| 004142890-05 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_KIC_POS |
| 004142890-06 | OBS | FP | 0.00 | 1 | 0 | 0 | 0 | INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_KIC_POS |

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

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

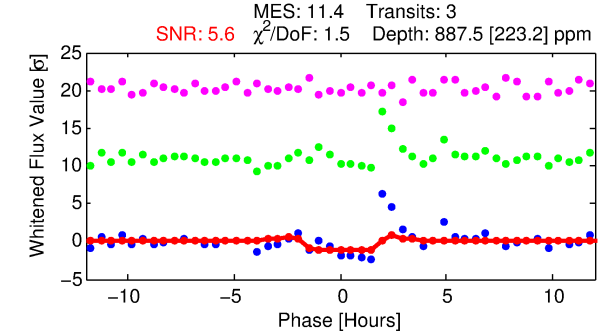
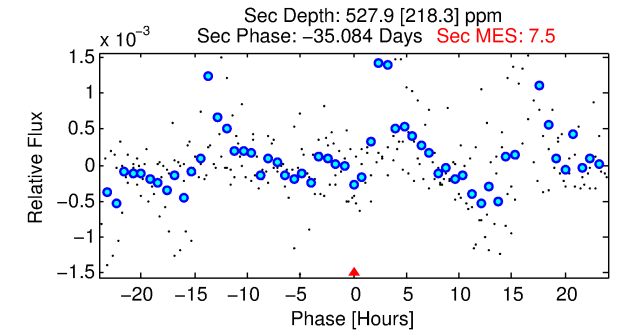
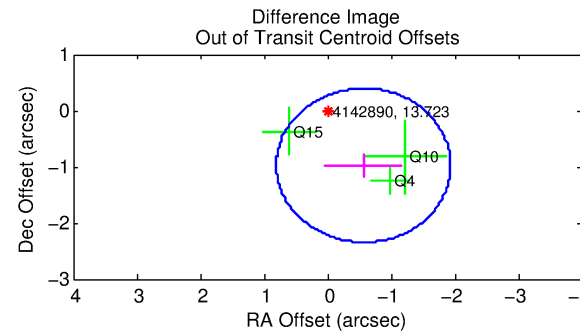
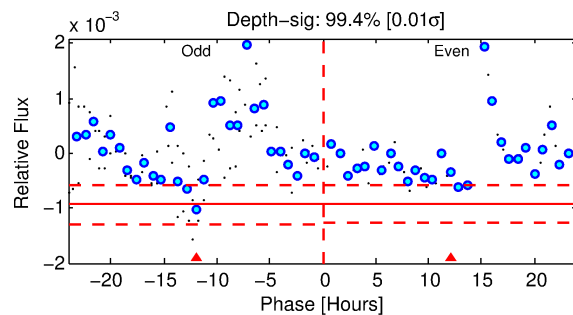
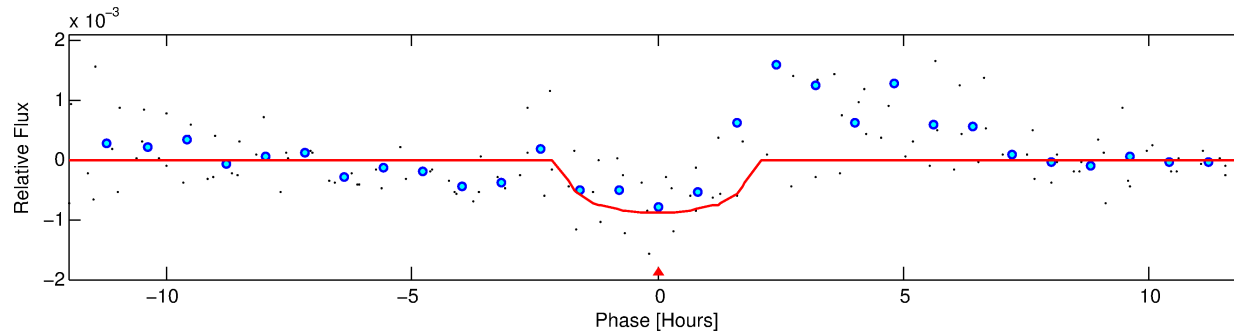
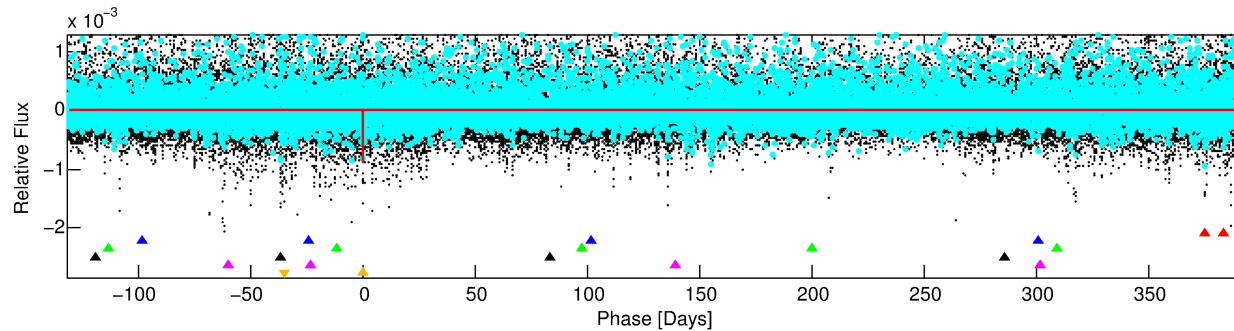
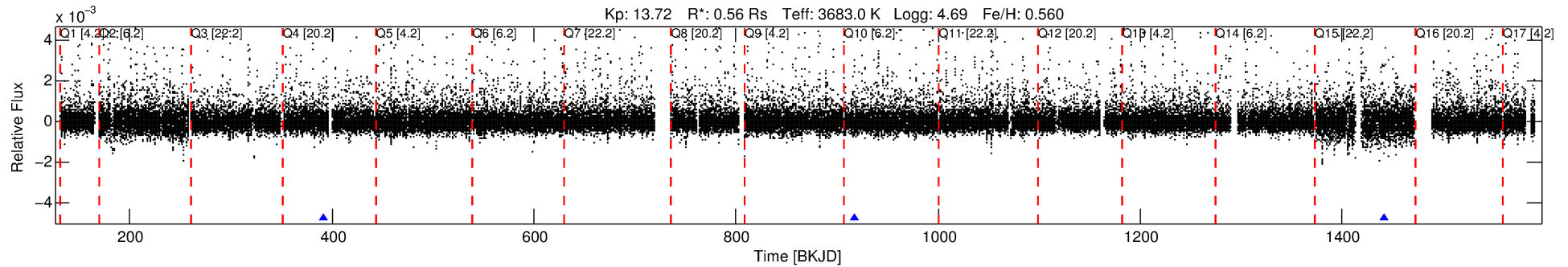
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004142890-06

No Significant Match Found

DV One-Page Summary

KIC: 4142890 Candidate: 6 of 6 Period: 525.072 d



DV Fit Results:

Period = 525.07205 [0.00842] d
Epoch = 391.9850 [0.0103] BKJD
Rp/R* = 0.0295 [0.0359]
a/R* = 735.40 [2955.02]
b = 0.72 [2.72]
Seff = 0.05 [0.01]
Teq = 119 [7] K
Rp = 1.81 [2.22] Re
a = 1.0524 [0.1220] AU
Ag = 98210.81 [243023.12] [0.40 σ]
Teffp = 3253 [2012] K [1.56 σ]

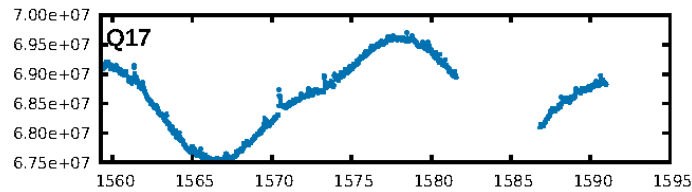
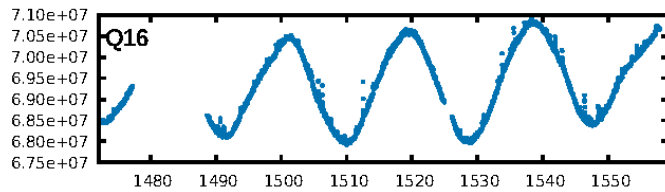
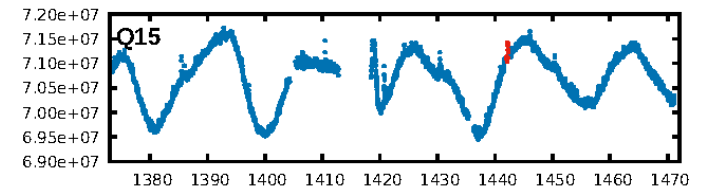
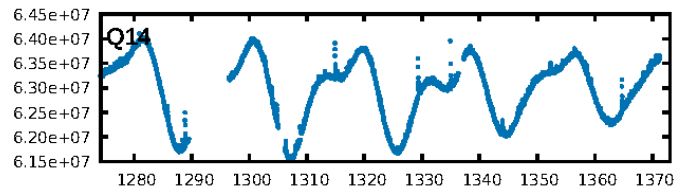
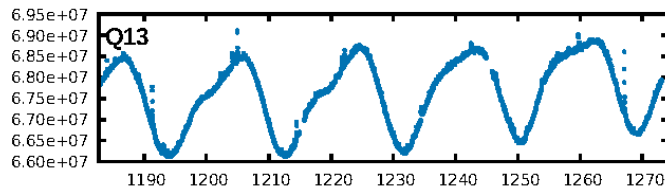
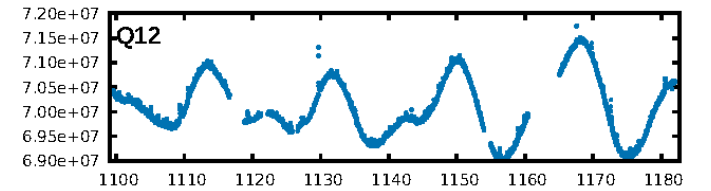
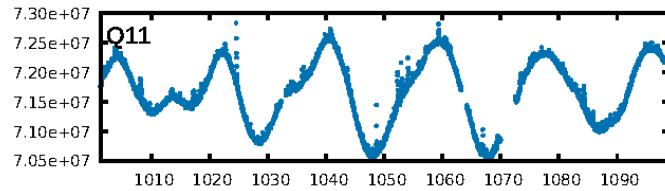
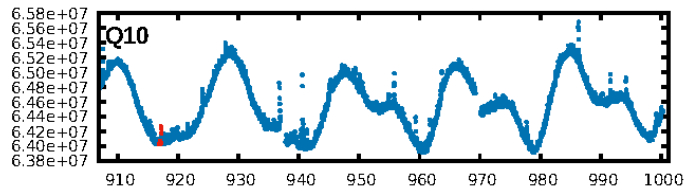
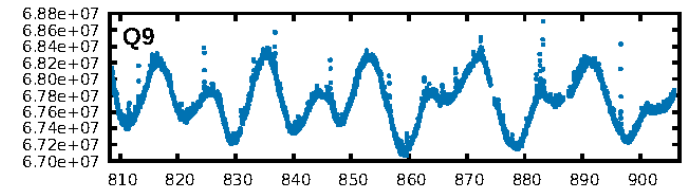
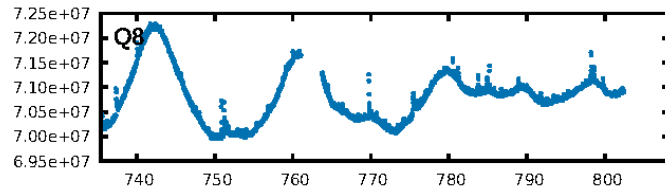
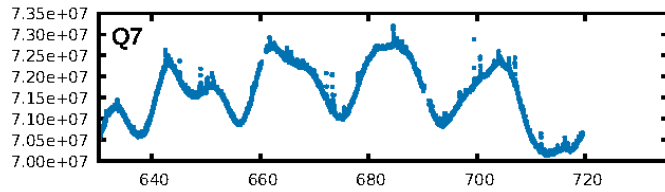
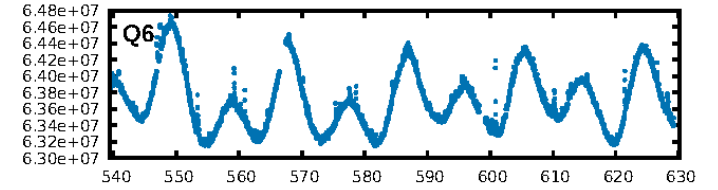
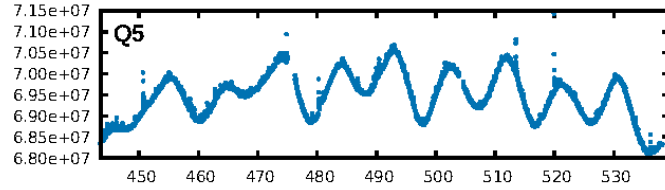
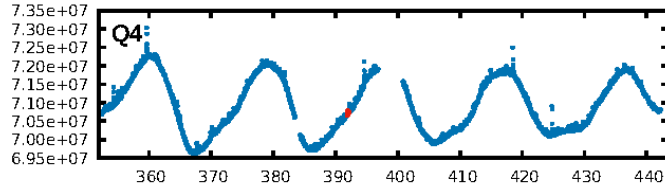
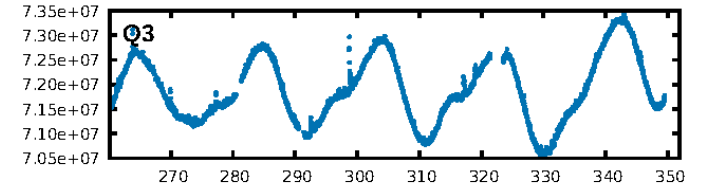
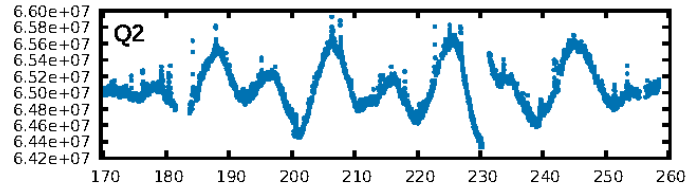
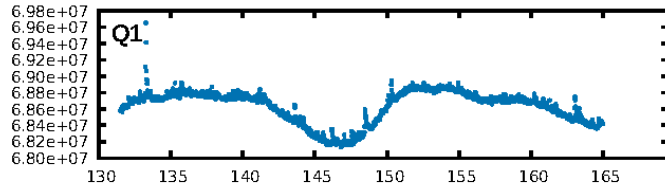
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [551.76 σ]
LongPeriod-sig: 100.0% [40.38 σ]
ModelChiSquare2-sig: 11.8%
ModelChiSquareGof-sig: 28.7%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -6.471
Centroid-sig: 9.7%
Centroid-so: 0.545 arcsec [0.68 σ]
OotOffset-rm: 1.129 arcsec [2.47 σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-rm: 0.617 arcsec [1.08 σ]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

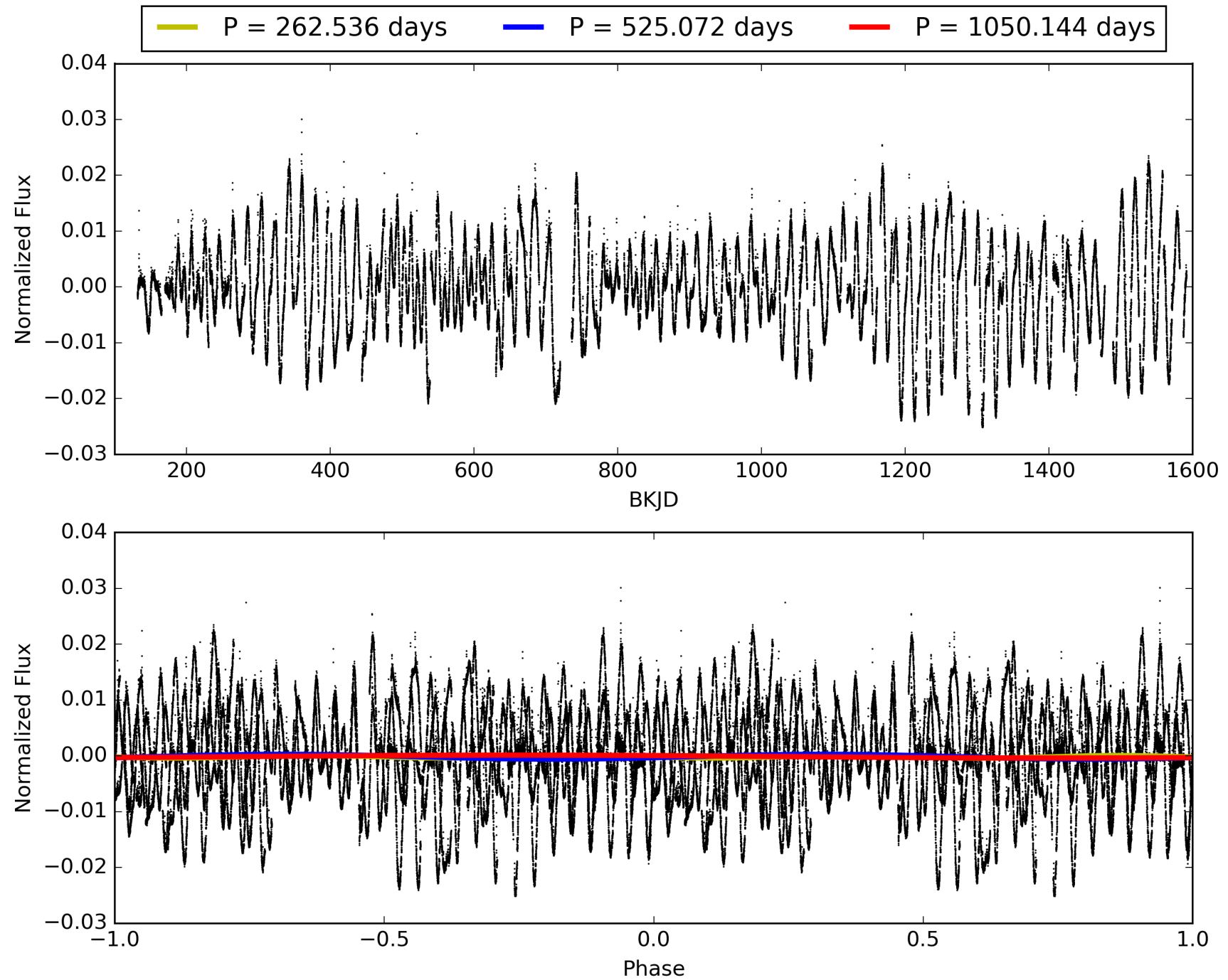
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:30:22 Z

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

TCE 004142890-06, PDC Light Curves

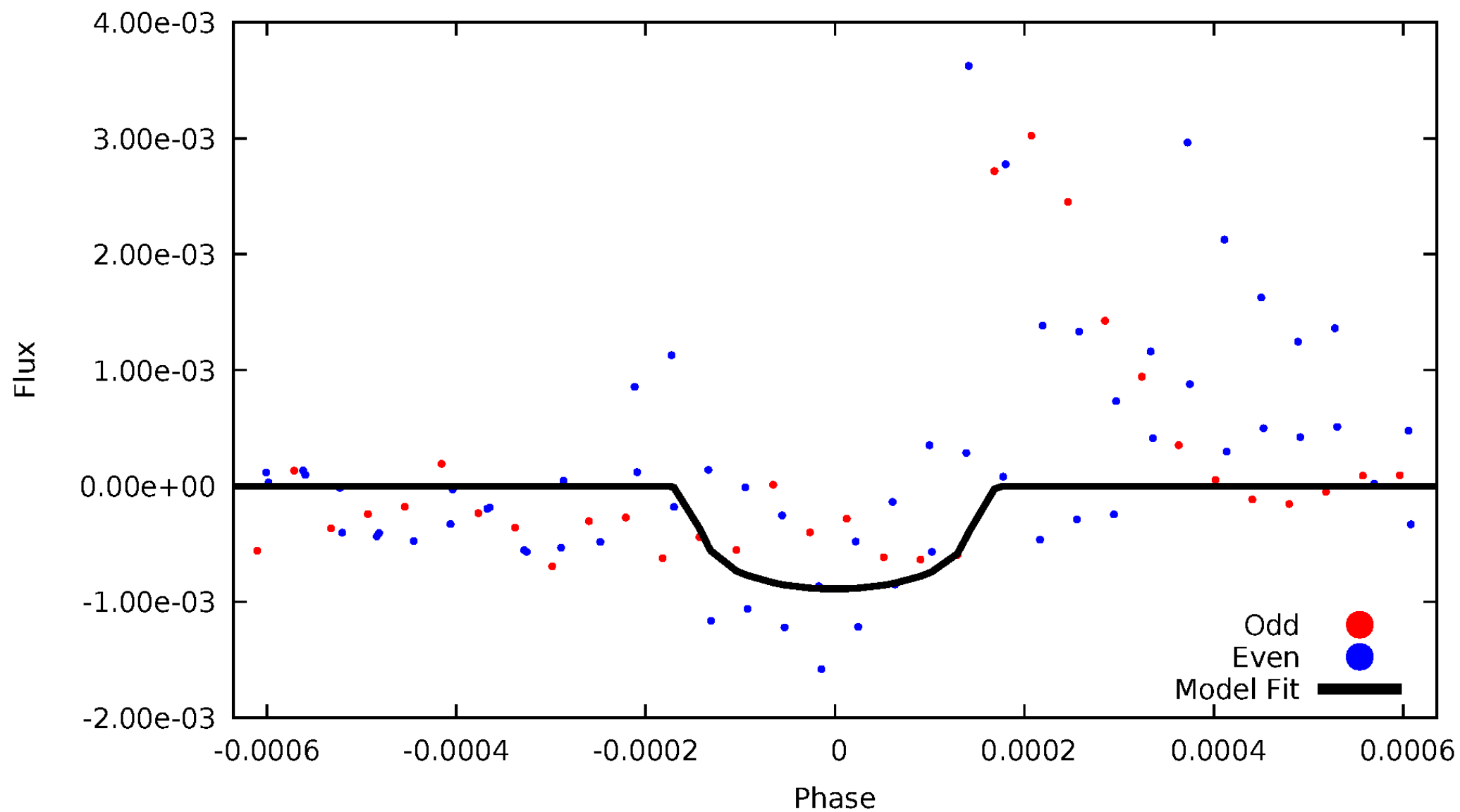


TCE 004142890-06



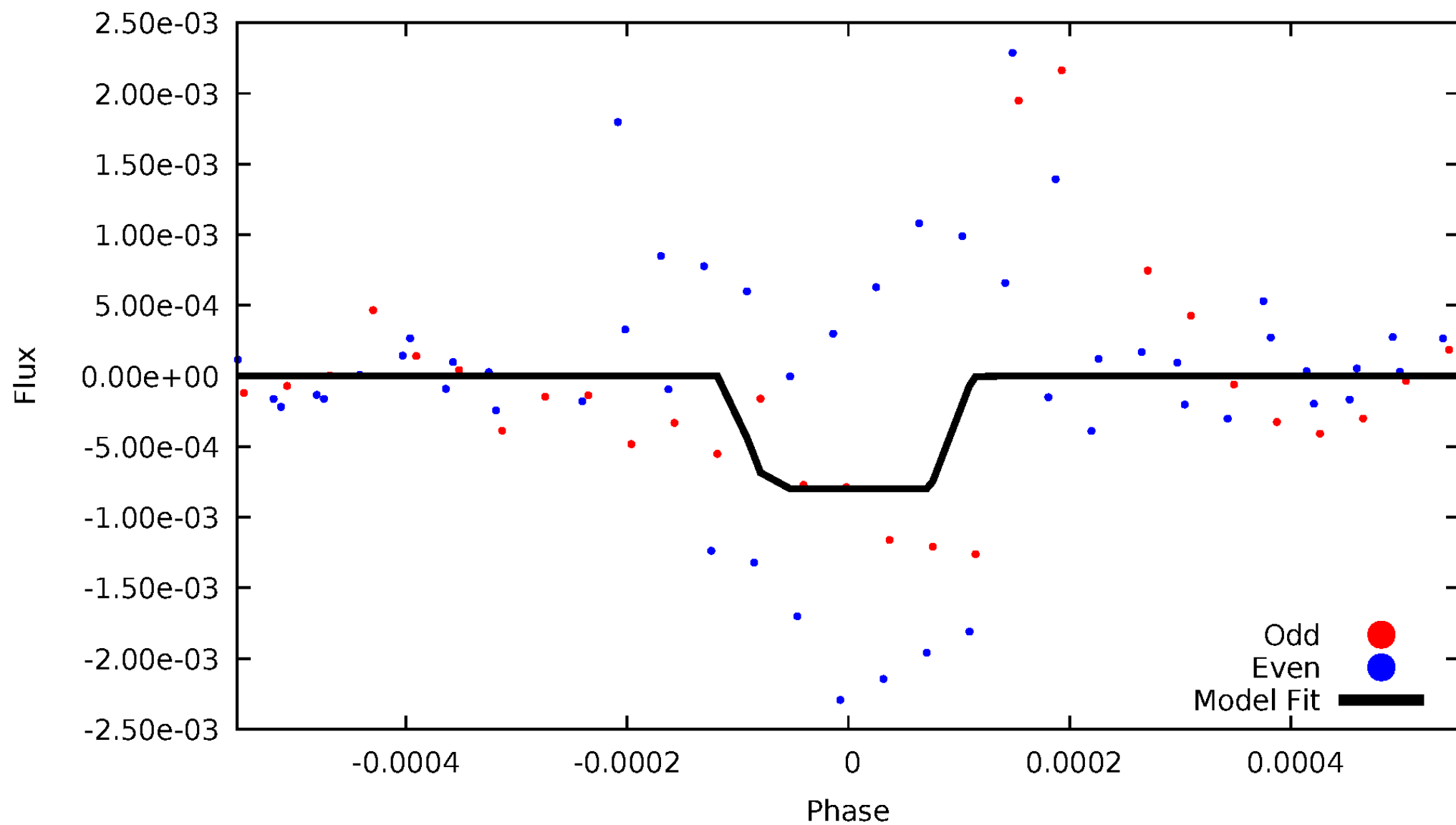
DV Odd/Even

TCE 004142890-06



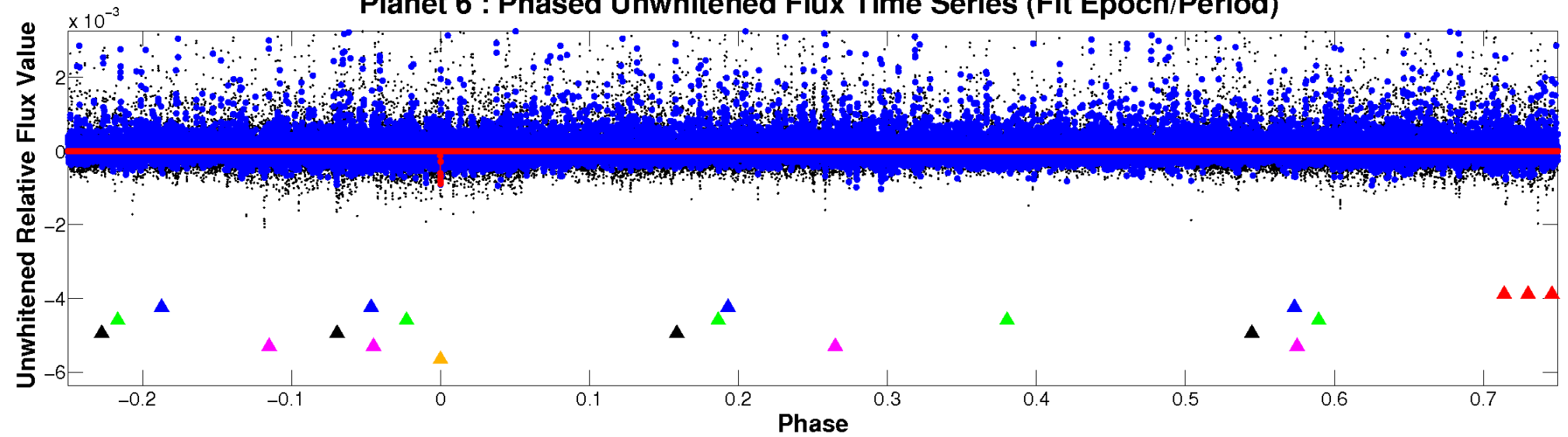
ALT Odd/Even

TCE 004142890-06

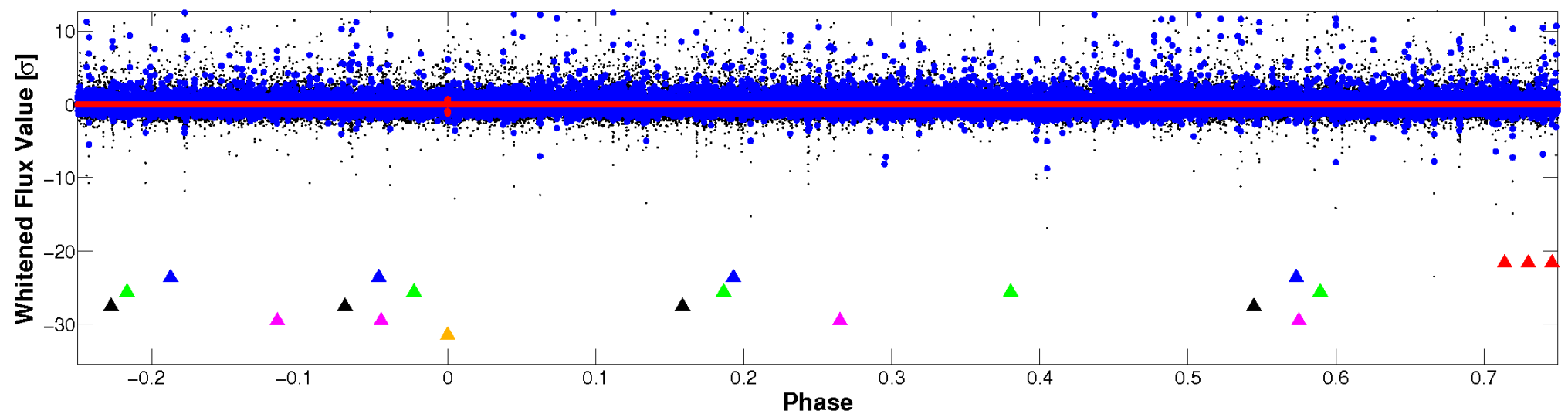


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

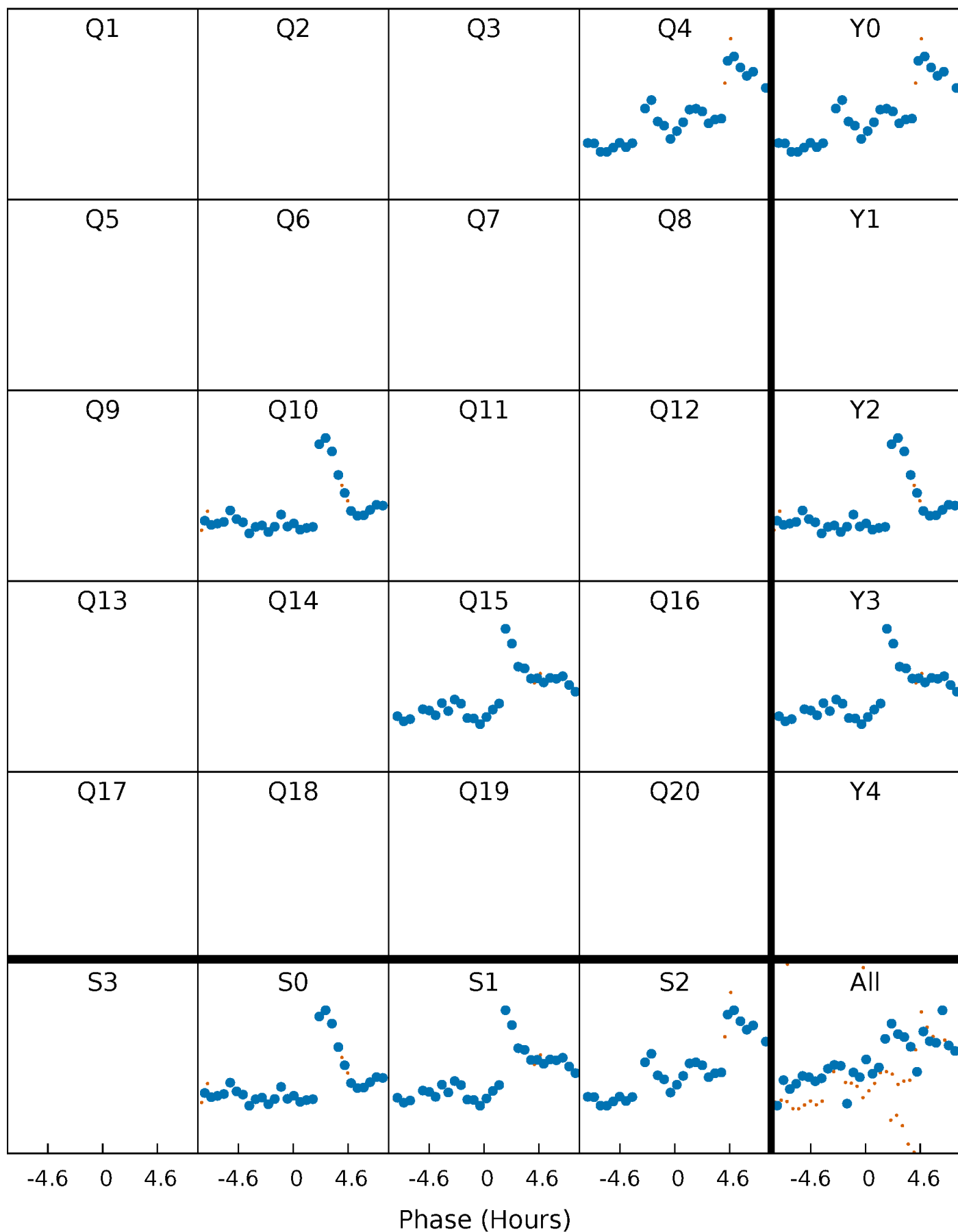


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



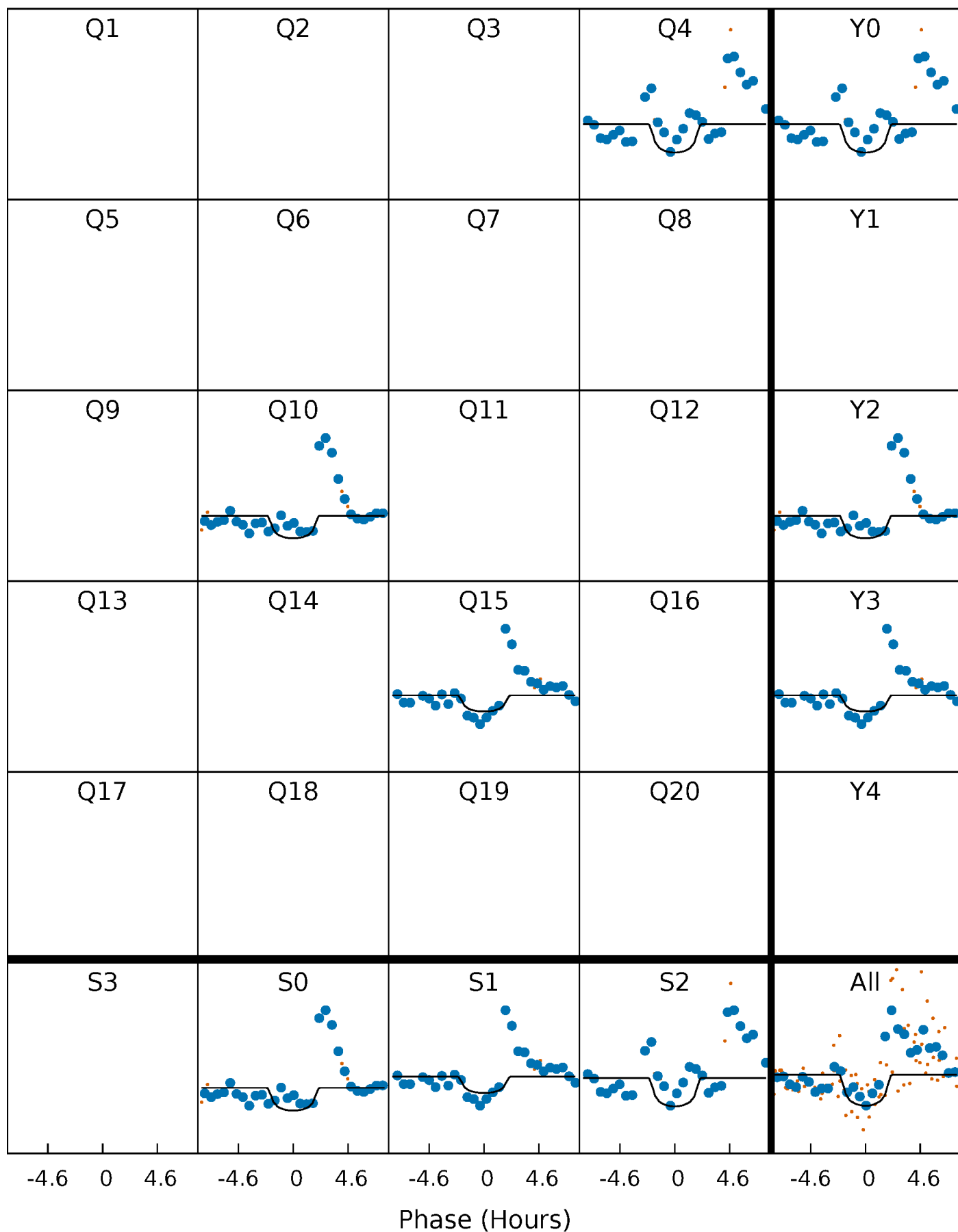
PDC Quarter-Phased Transit Curves

TCE 004142890-06 $P=525.072046$ Days $T_0=391.984959$ (BKJD)



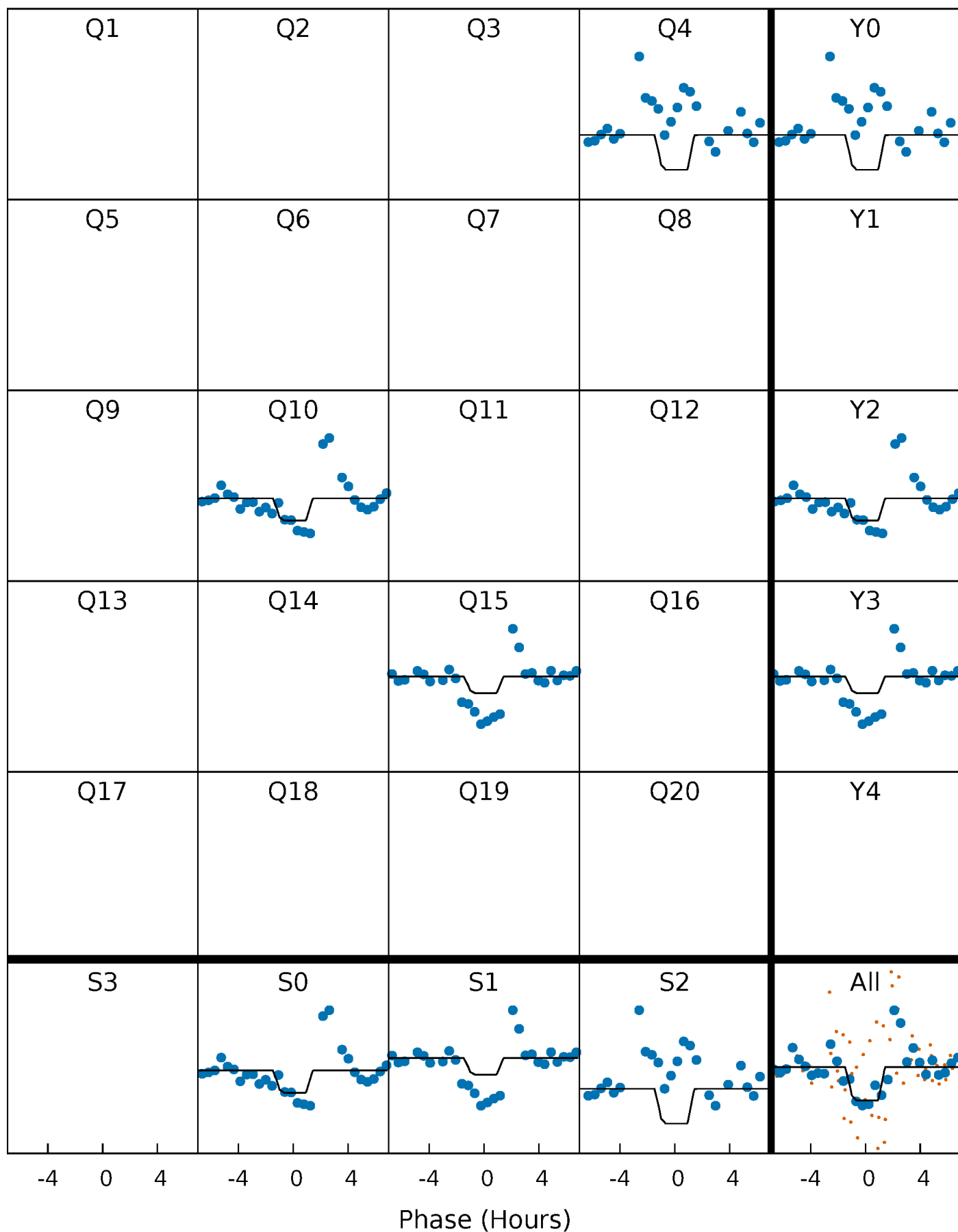
DV Quarter-Phased Transit Curves

TCE 004142890-06 $P=525.072046$ Days $T_0=391.984959$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

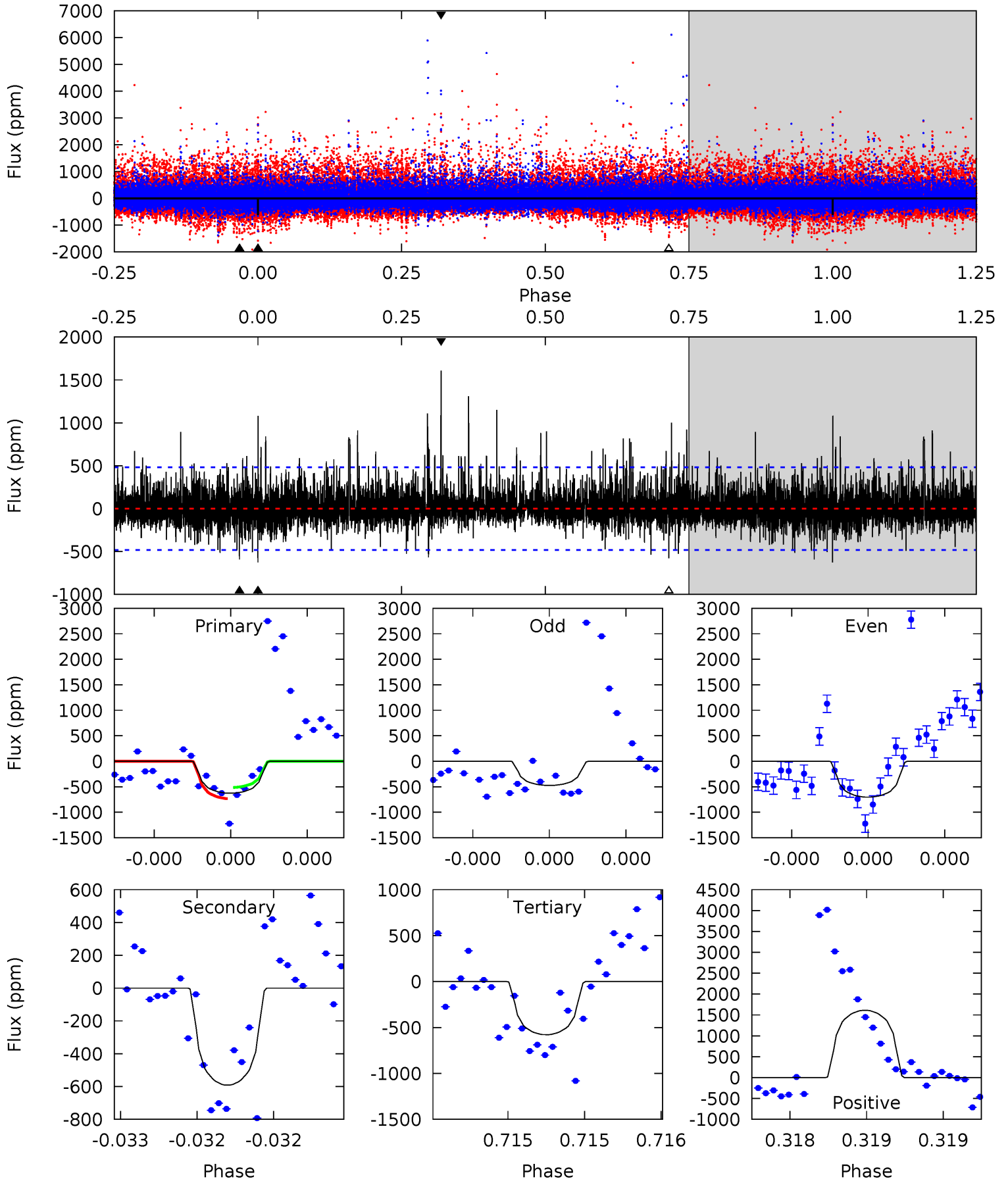
TCE 004142890-06 P=525.060758 Days $T_0=392.003687$ (BKJD)



DV Model-Shift Uniqueness Test

004142890-06, P = 525.072046 Days, E = 391.984959 Days

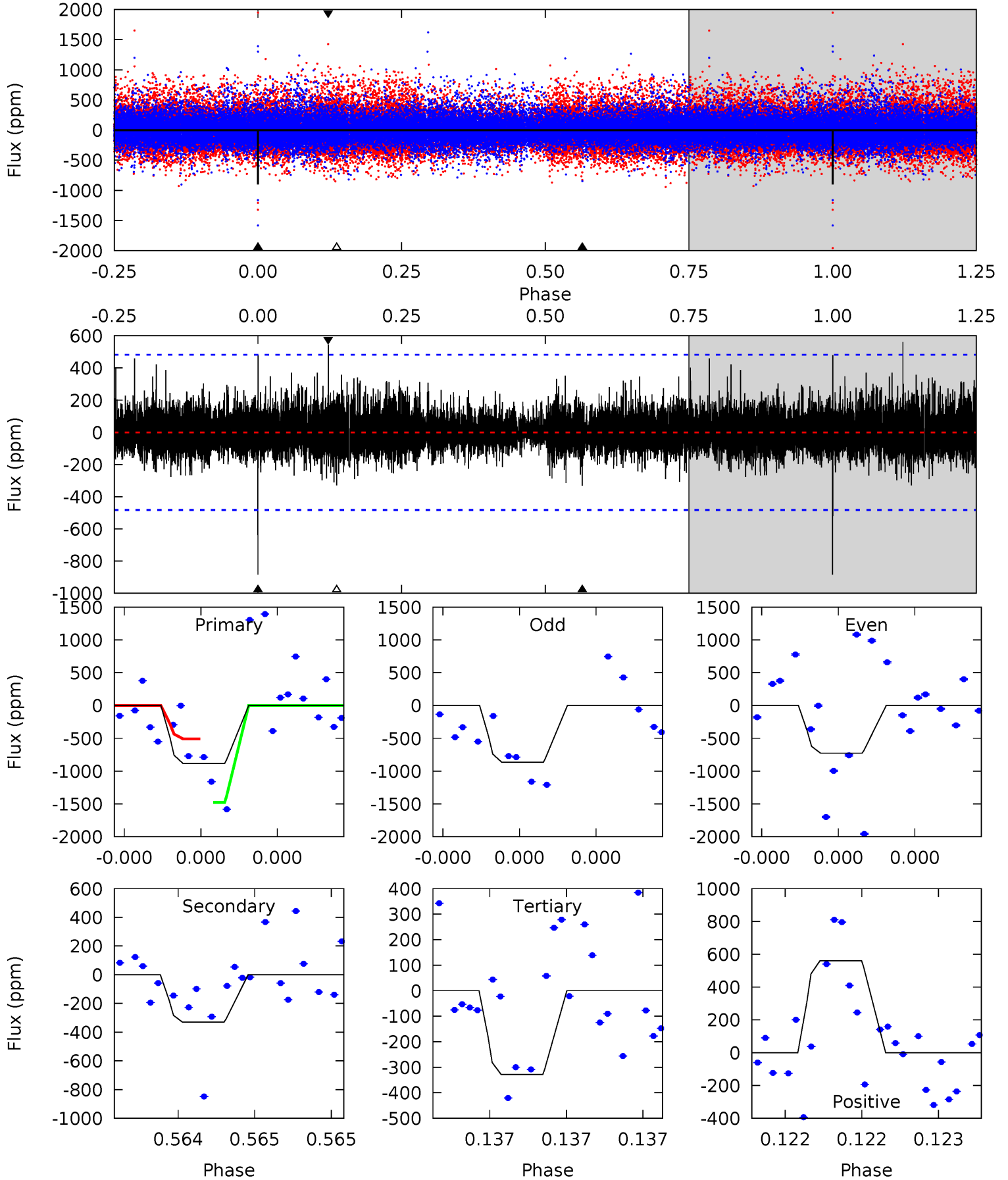
| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 7.32 | 6.91 | 6.76 | 18.8 | 5.63 | 3.57 | 1.93 | 0.56 | -11.5 | 0.15 | -11.9 | 0.93 | 1.11 | 0.72 | 1.29 |



Alt Model-Shift Uniqueness Test

004142890-06, P = 525.060758 Days, E = 392.003687 Days

| Pri | Sec | Ter | Pos | FA ₁ | FA ₂ | F _{Red} | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM | Shape | TAT |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 10.5 | 3.91 | 3.89 | 6.64 | 5.71 | 3.69 | 0.89 | 6.59 | 3.84 | 0.02 | -2.73 | 1.09 | 0.89 | 0.39 | 5.70 |



Stellar Parameters For KIC 004142890

| | $T_{\text{eff}} (K)$ | $\log(g)$ | $[\text{Fe}/\text{H}]$ | $R (R_{\odot})$ | $M (M_{\odot})$ | $p_{\star} (\text{g}\cdot\text{cm}^{-3})$ |
|--------|----------------------|---------------------------|---------------------------|---------------------------|---------------------------|---|
| | 3683^{+117}_{-147} | $4.688^{+0.080}_{-0.020}$ | $0.560^{+0.050}_{-0.300}$ | $0.563^{+0.030}_{-0.083}$ | $0.564^{+0.036}_{-0.072}$ | $4.449^{+1.718}_{-0.458}$ |
| | +3%/-4% | +2%/-0% | +9%/-54% | +5%/-15% | +6%/-13% | +39%/-10% |
| Source | KIC0 | 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 004142890-06 / KOI

| Detrend | Depth (ppm) | $R_p (R_{\oplus})$ | $T_{\text{max}} (K)$ | $T_{\text{obs}} (K)$ | A_{obs} |
|---------|---------------|------------------------|----------------------|-----------------------|----------------------------|
| DV | -591 ± 86 | $2.34^{+1.83}_{-1.51}$ | 164^{+7}_{-8} | 3173^{+1348}_{-478} | $64646^{+468030}_{-42987}$ |
| Alt. | -330 ± 84 | $2.31^{+1.97}_{-1.54}$ | 164^{+6}_{-7} | 2915^{+1283}_{-432} | $37165^{+333512}_{-26850}$ |

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

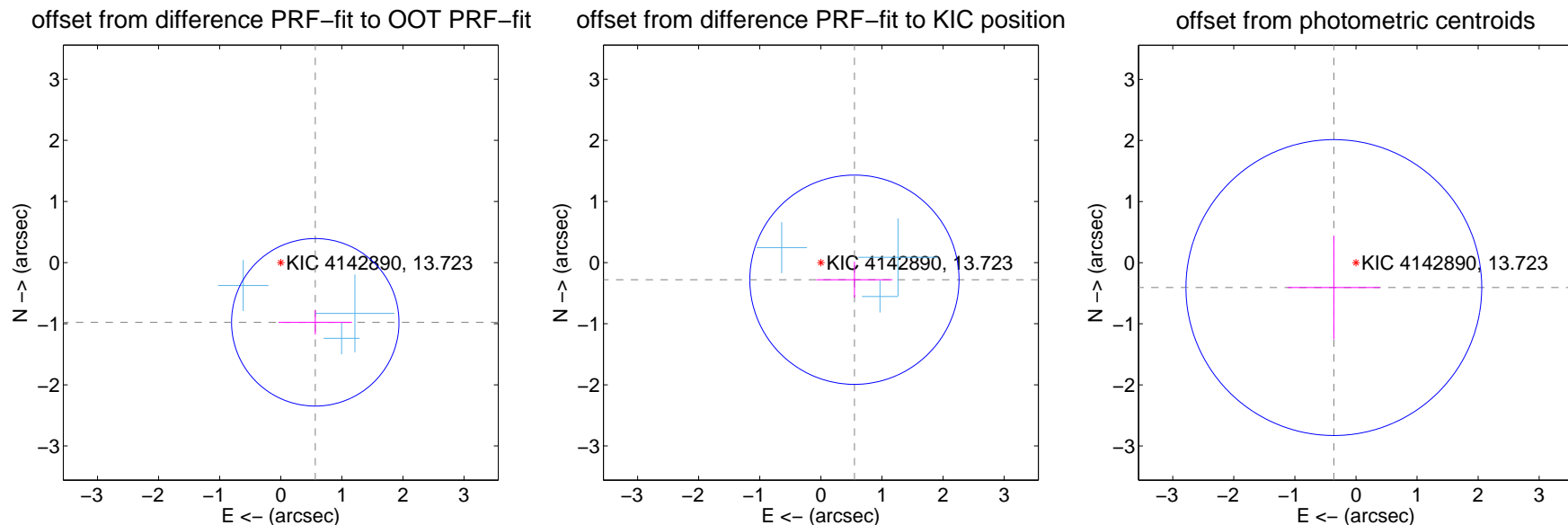
DV Centroid Data

Supplemental centroid analysis for 004142890-06. Kepler magnitude: 13.72. Transit SNR 5.59

There are 3 quarters with good PRF difference image offsets

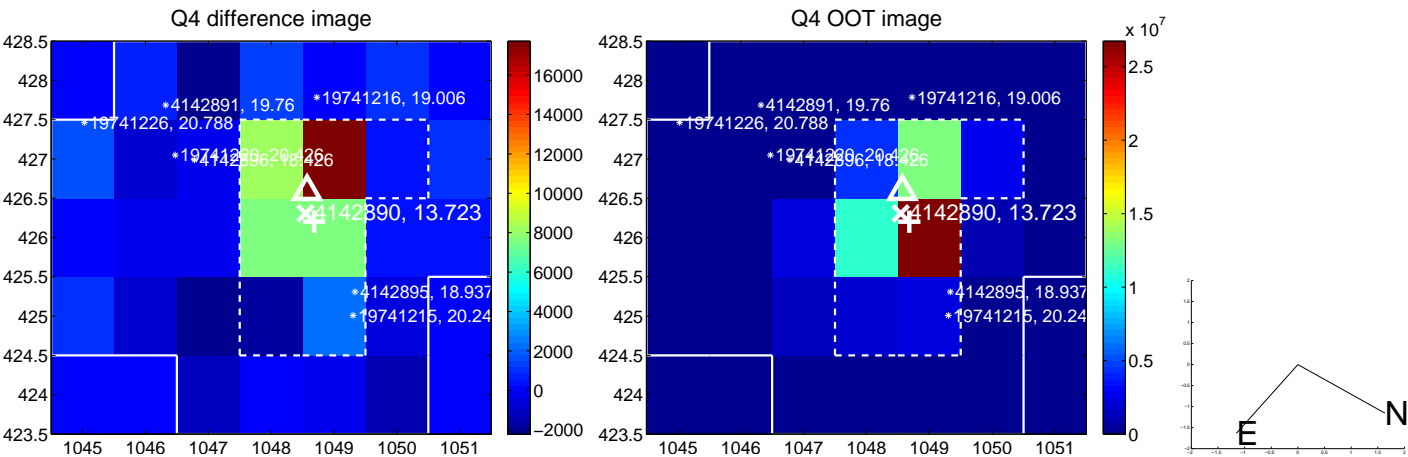
The direct PRF centroid is offset from the target star catalog position by about 0.62 arcsec

| | Distance in arcsec | Distance / σ | Δ RA | Δ Dec |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT | 1.129 ± 0.457 | 2.47 | -0.565 ± 0.602 | -0.977 ± 0.199 |
| PRF-fit source offset from KIC position | 0.617 ± 0.571 | 1.08 | -0.549 ± 0.623 | -0.280 ± 0.294 |
| photometric centroid source offset | 0.55 ± 0.81 | 0.68 | 0.36 ± 0.76 | -0.41 ± 0.85 |



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

white ×: 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.

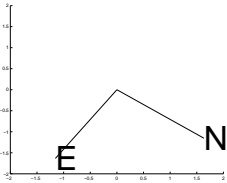
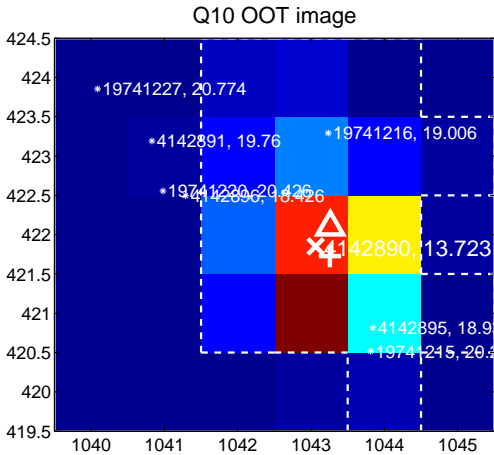
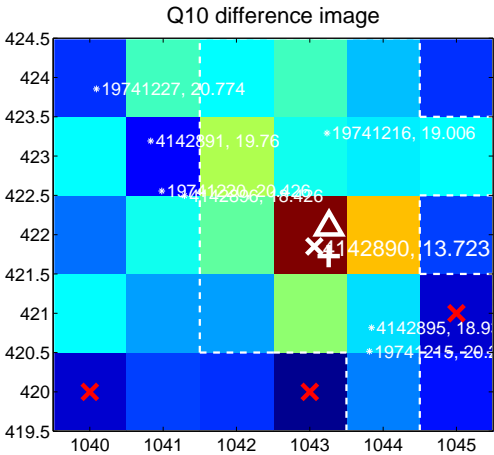


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

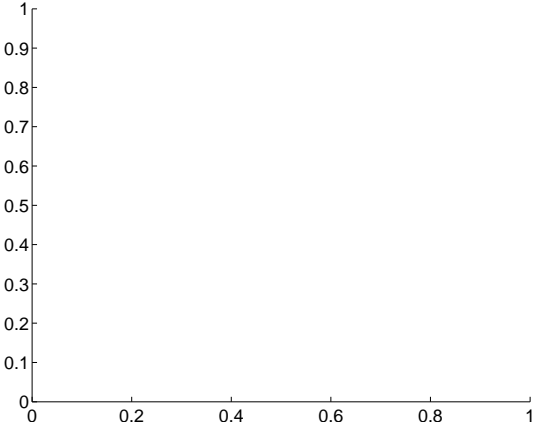
Q9 no difference image



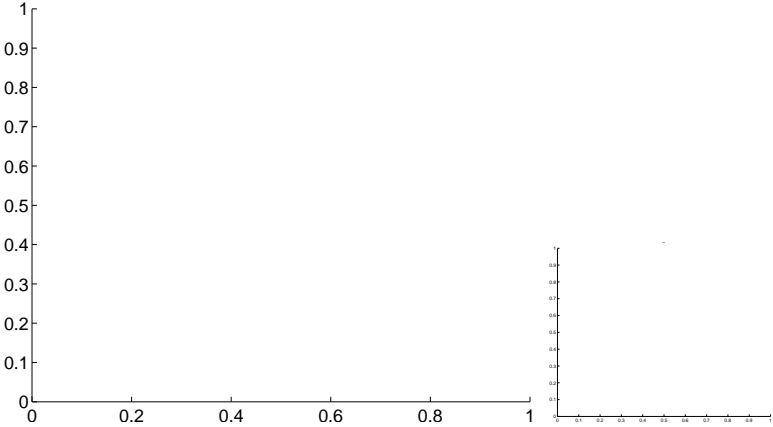
Q9 no OOT image



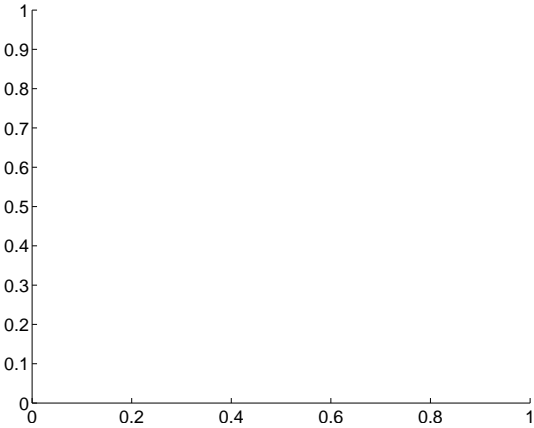
Q11 no difference image



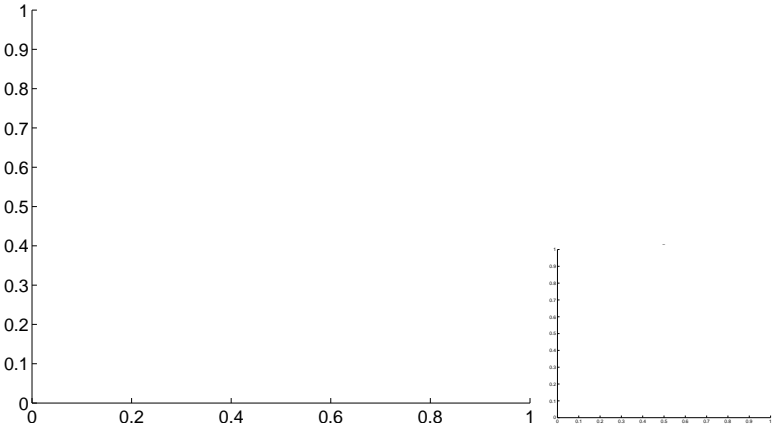
Q11 no OOT image



Q12 no difference image

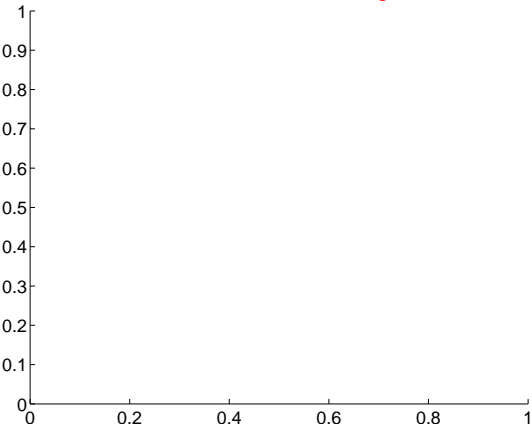


Q12 no OOT image

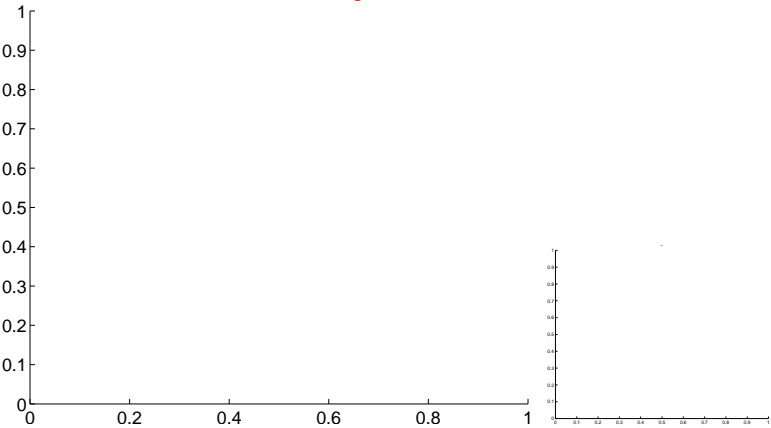


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

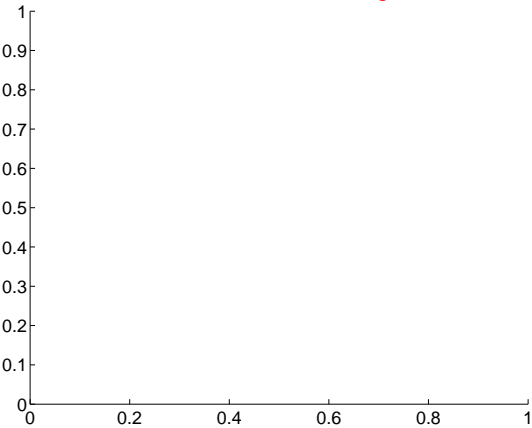
Q13 no difference image



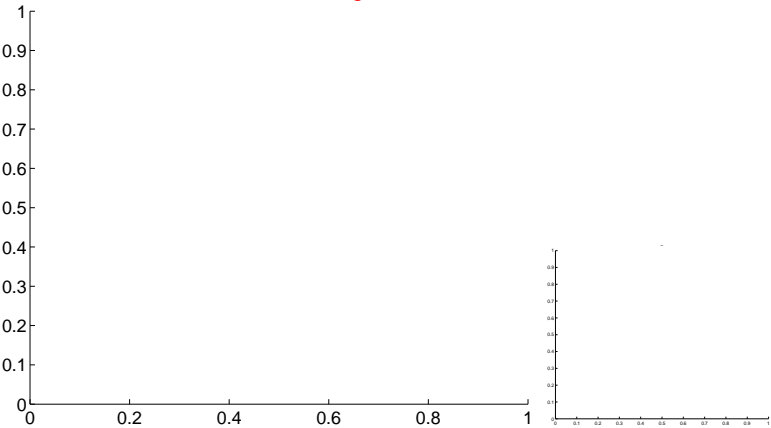
Q13 no OOT image



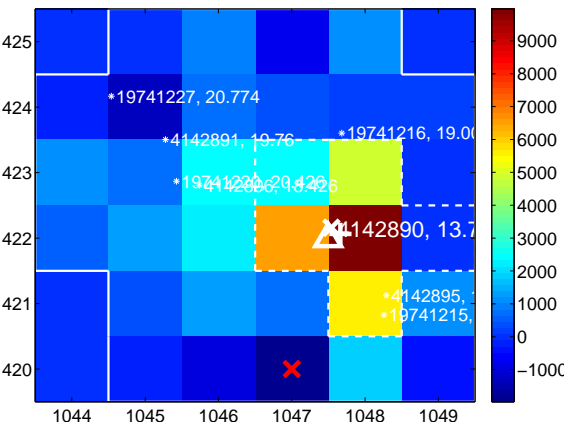
Q14 no difference image



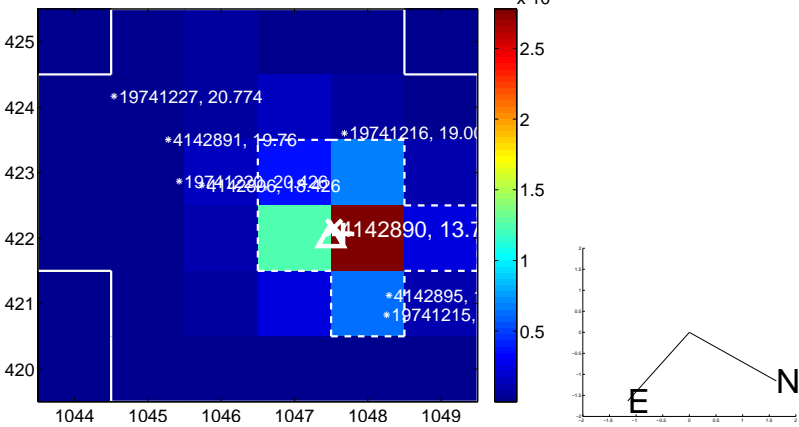
Q14 no OOT image



Q15 difference image



Q15 OOT image



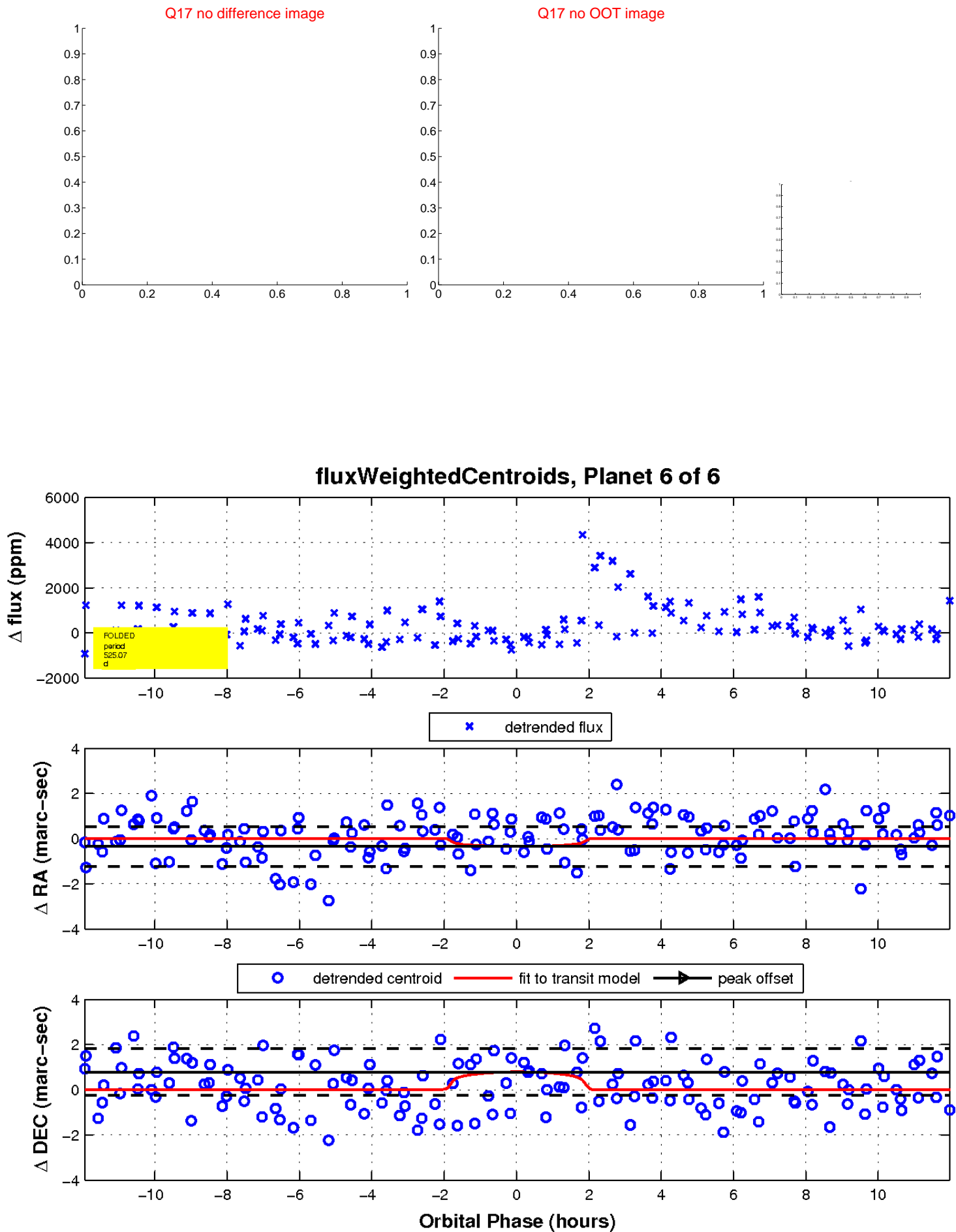
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

