

KIC 009634821

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})
009634821-01	OBS	2037.01	73.757838	183.722998	1960.2	2.828	29.9	29.0	0.93	5029	4.62	4.67
009634821-02	OBS	2037.02	5.477140	133.765894	565.6	1.503	22.8	26.4	0.93	5029	2.73	149.65
009634821-03	OBS	2037.03	8.562686	132.505869	606.3	1.546	18.7	22.5	0.93	5029	2.84	82.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009634821-01	OBS	PC	0.98	0	0	0	0	CENT_KIC_POS
009634821-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009634821-03	OBS	PC	1.00	0	0	0	0	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 009634821-01

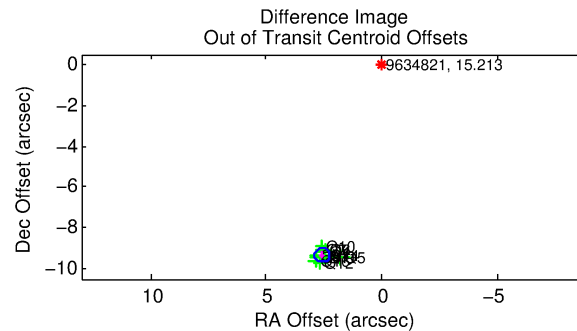
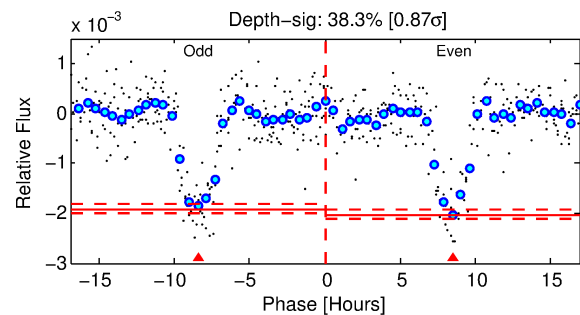
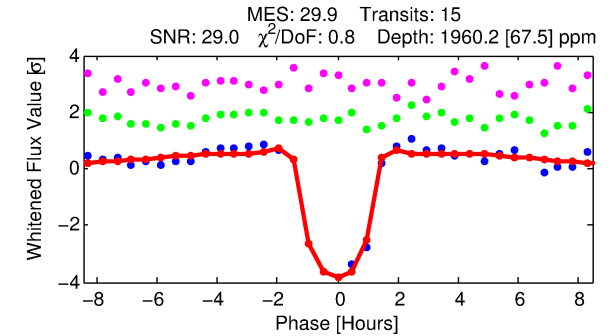
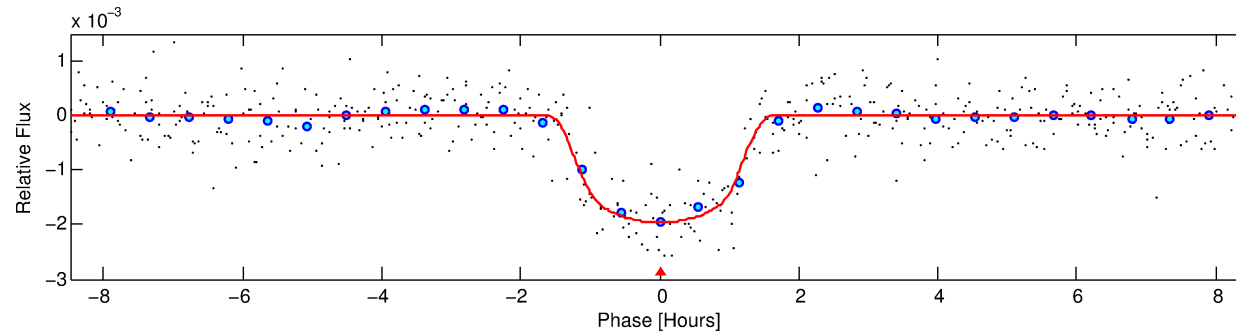
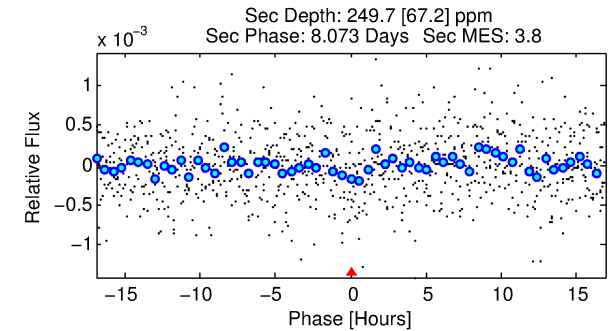
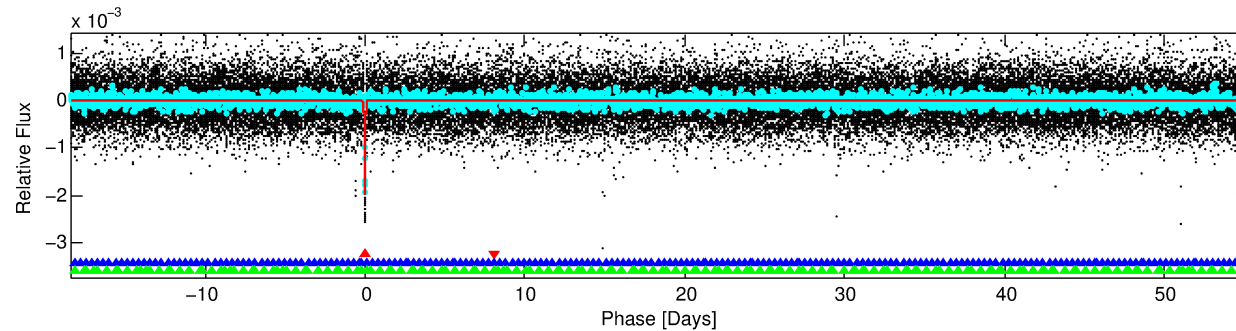
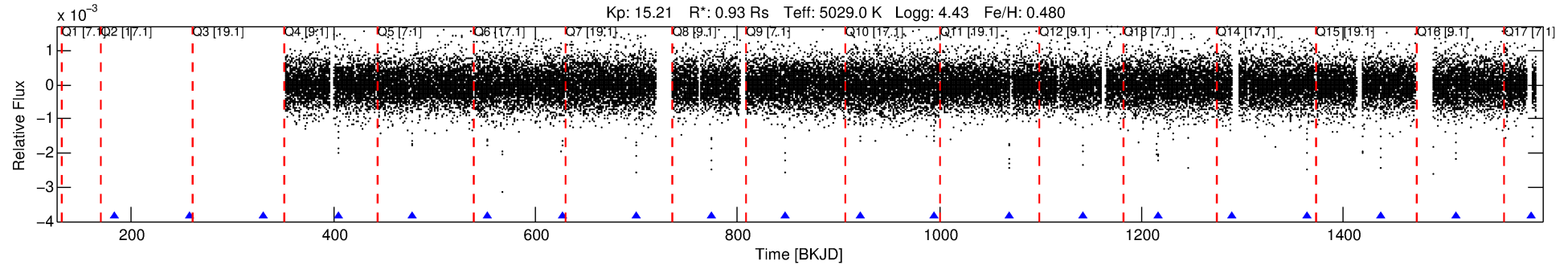
No Significant Match Found

DV One-Page Summary

KIC: 9634821 Candidate: 1 of 3 Period: 73.758 d

KOI: K02037.01 Corr: 0.988

Kp: 15.21 R*: 0.93 Rs Teff: 5029.0 K Logg: 4.43 Fe/H: 0.480



DV Fit Results:

Period = 73.75784 [0.00022] d
Epoch = 183.7230 [0.0024] BKJD
Rp/R* = 0.0455 [0.0085]
a/R* = 135.08 [84.58]
b = 0.80 [0.30]
Seff = 4.67 [3.46]
Teq = 375 [70] K
Rp = 4.62 [2.54] Re
a = 0.3258 [0.1531] AU
Ag = 683.63 [587.68] [1.16σ]
Teff = 2964 [360] K [7.0σ]

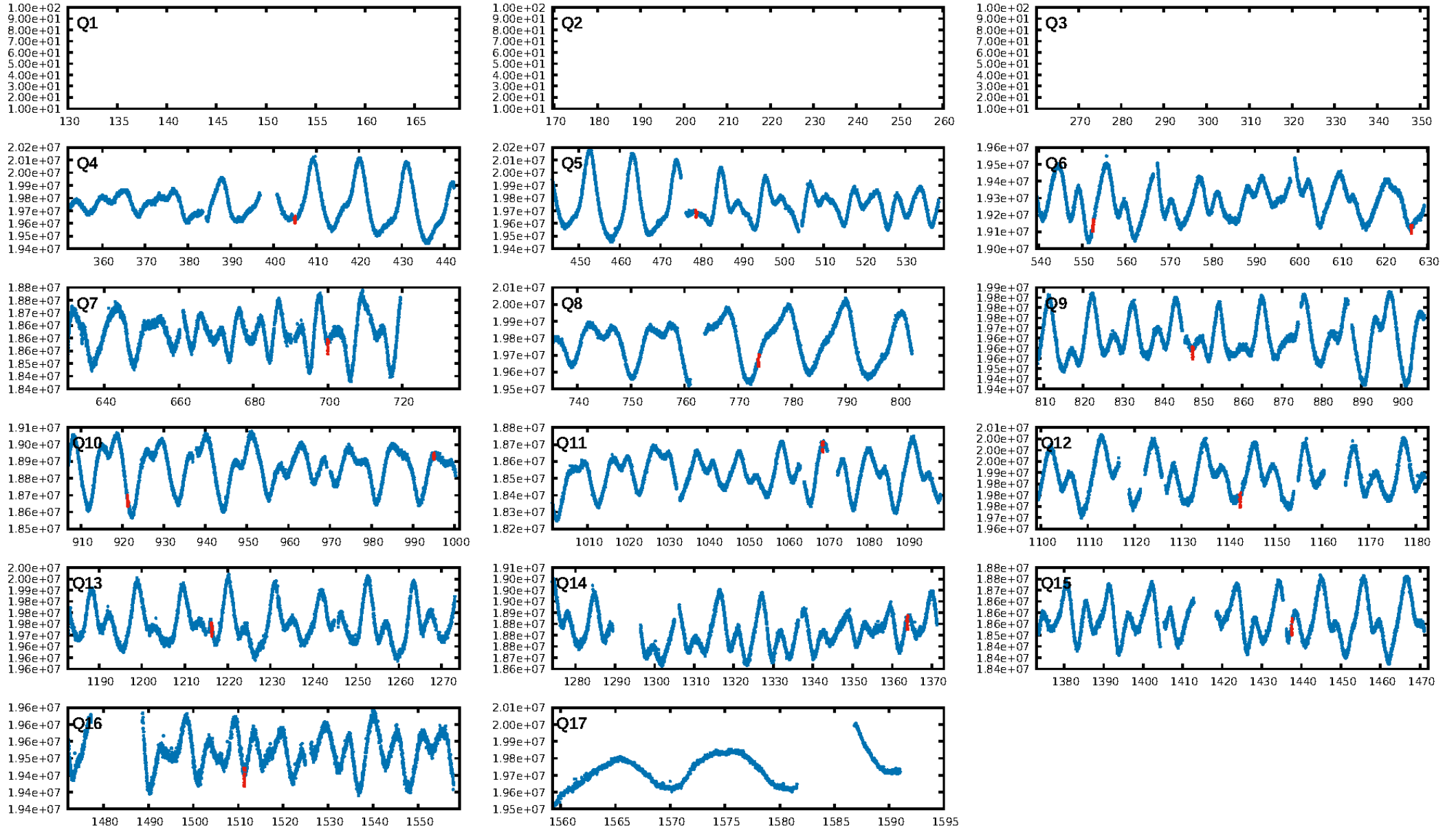
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [485.51σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 56.4%
ModelChiSquareGoF-sig: 100.0%
Bootstrap-pfa: 1.48e-135
RollingBand-fgt: 1.00 [15/15]
GhostDiagnostic-chr: 5.609
Centroid-sig: 0.0%
Centroid-so: 1.603 arcsec [4.08σ]
OotOffset-rm: 9.680 arcsec [86.78σ]
KicOffset-rm: 0.339 arcsec [2.72σ]
OotOffset-st: 3/2/4/2 [11]
KicOffset-st: 3/2/4/2 [11]
DiffImageQuality-fgm: 1.00 [11/11]
DiffImageOverlap-fno: 0.67 [8/12]

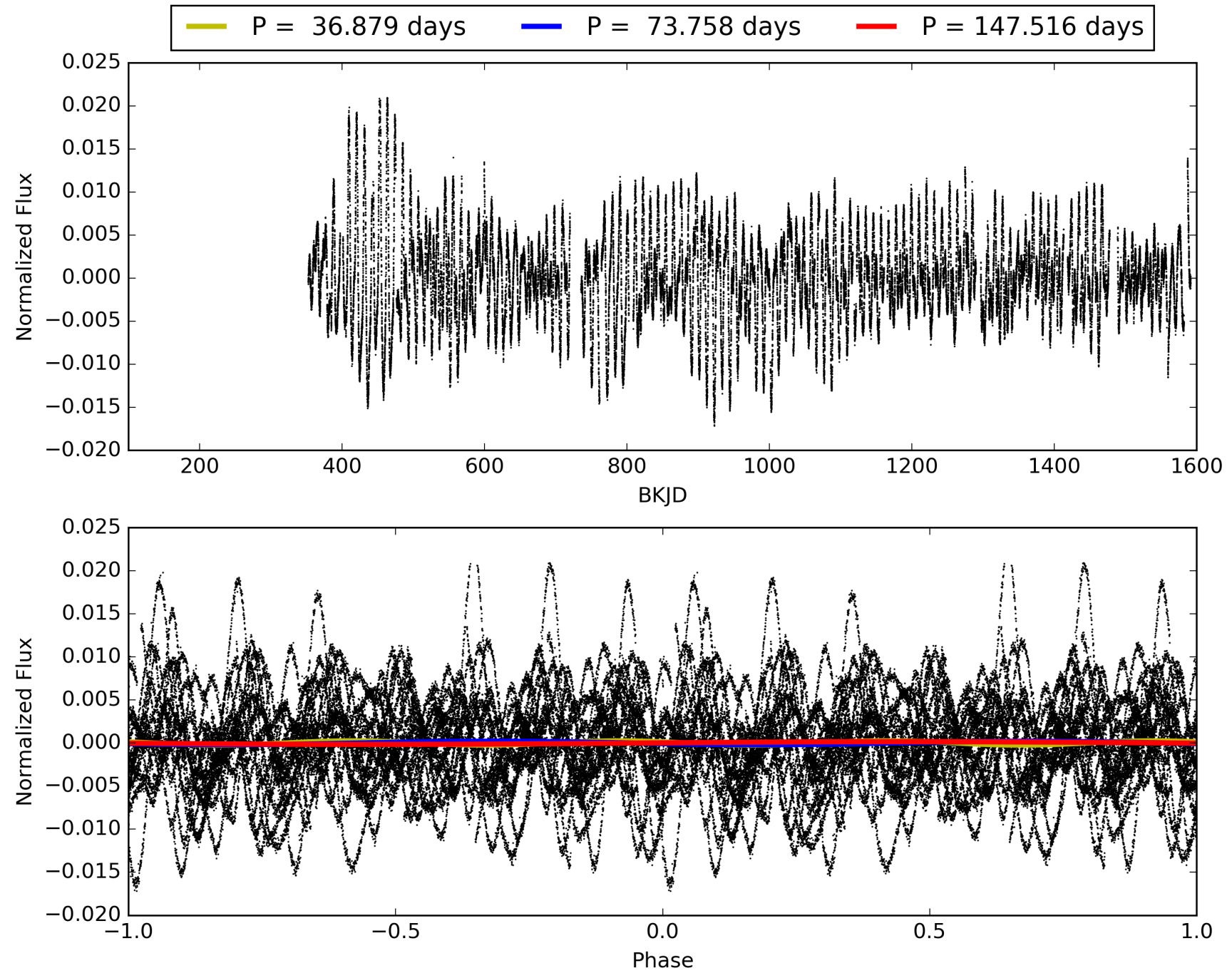
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:30:24 Z

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

TCE 009634821-01, PDC Light Curves

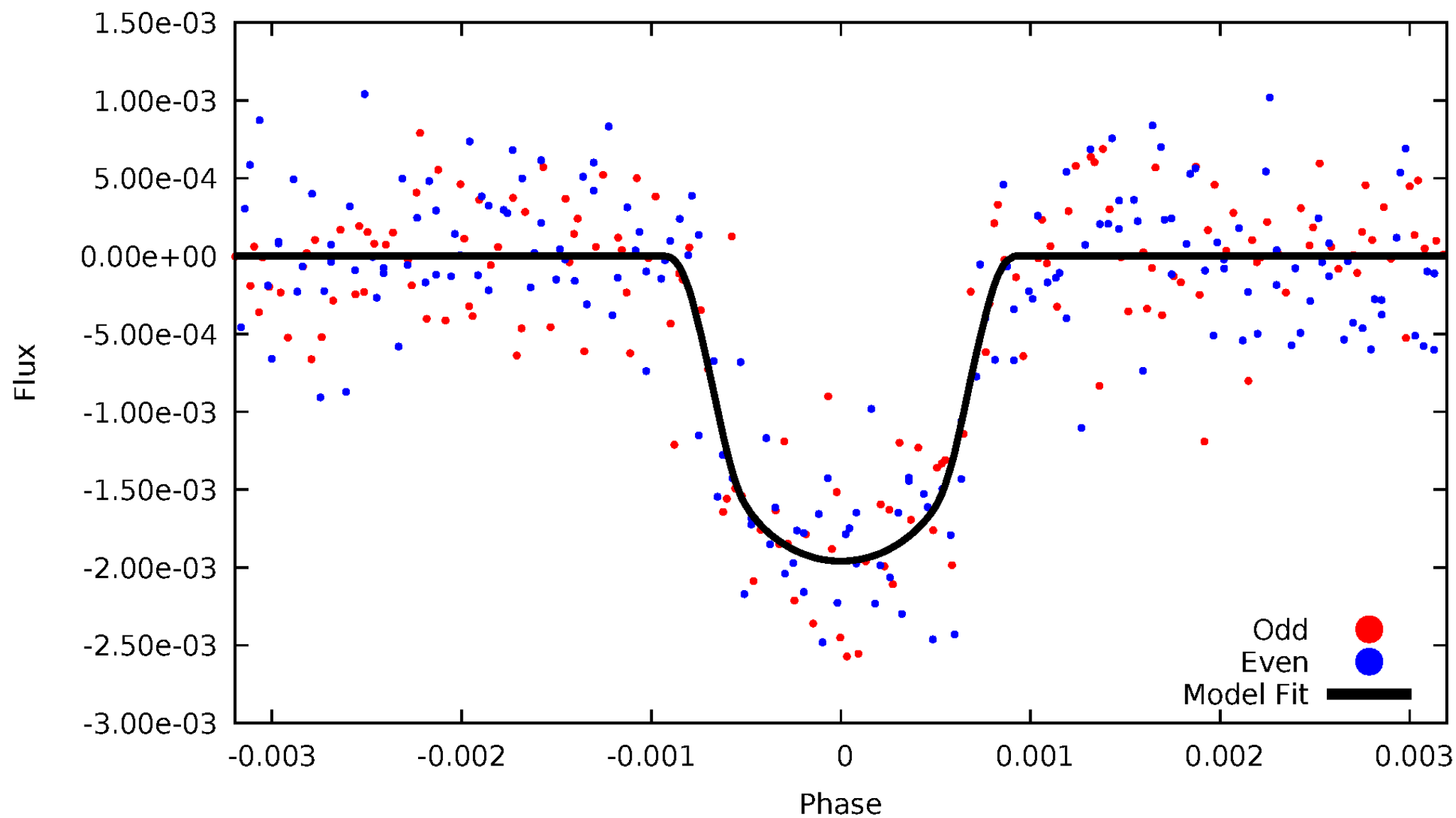


TCE 009634821-01



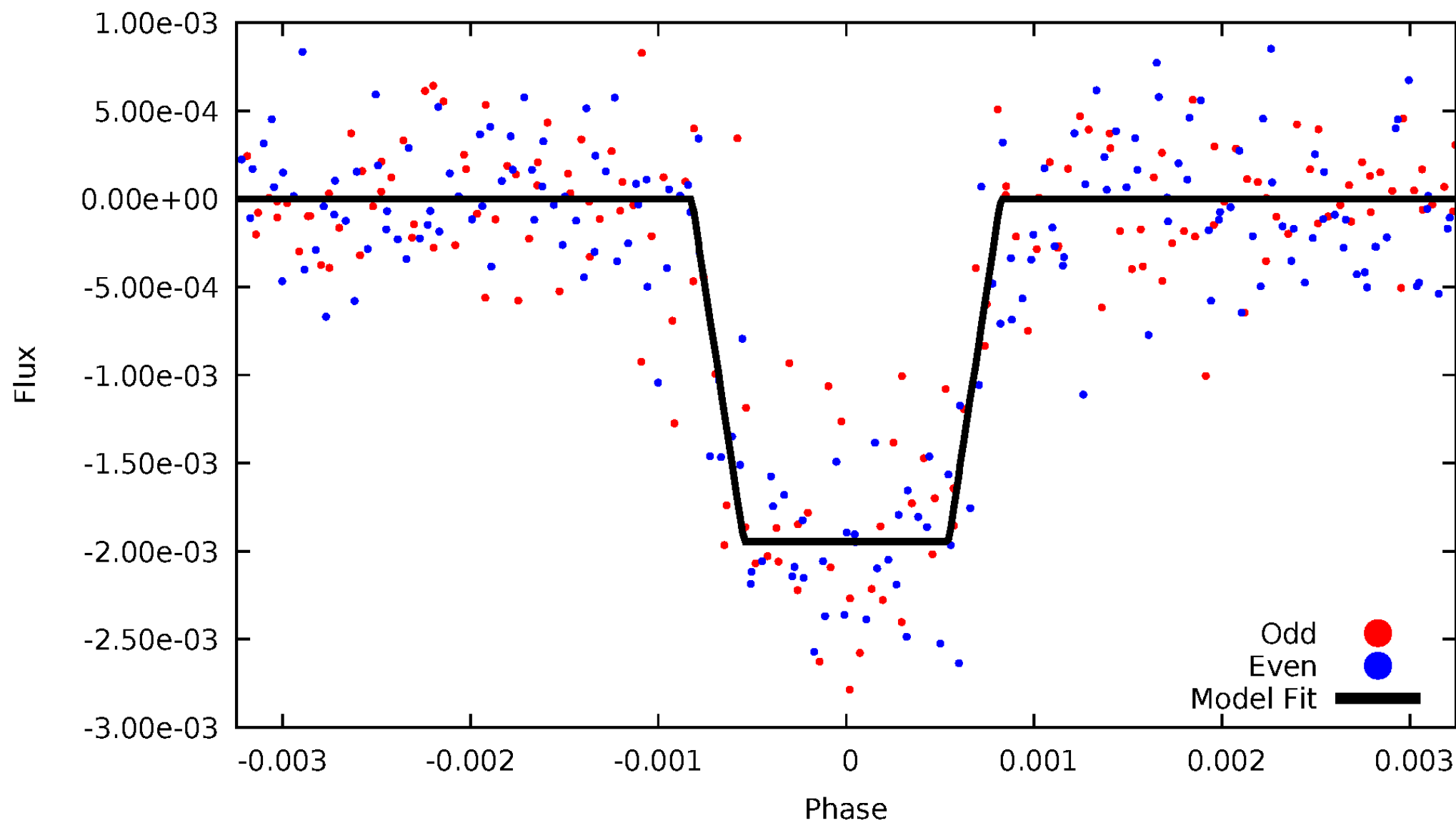
DV Odd/Even

TCE 009634821-01



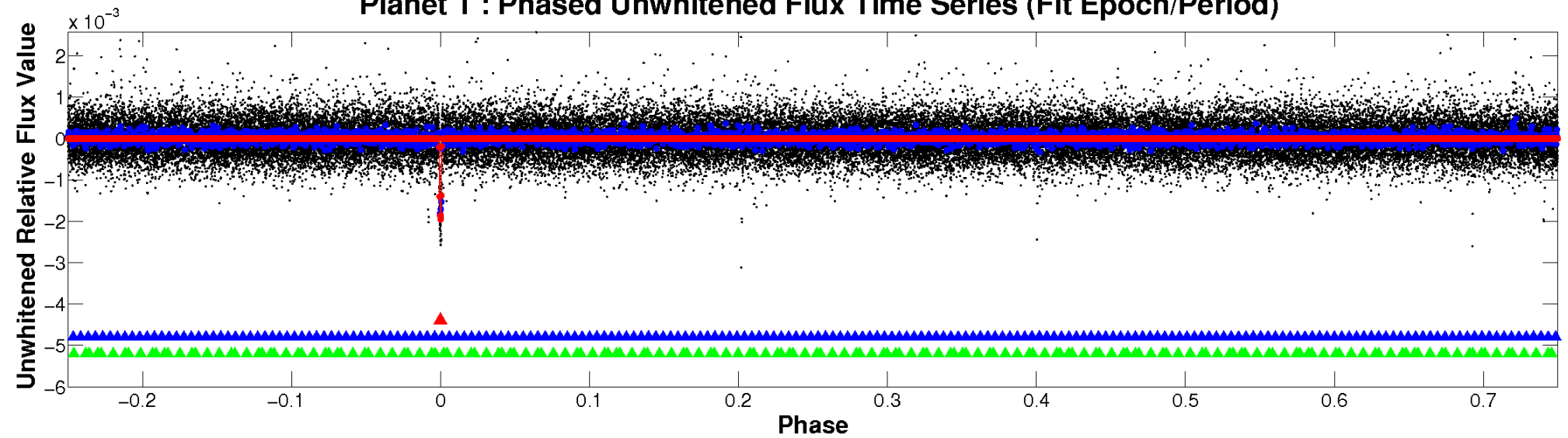
ALT Odd/Even

TCE 009634821-01

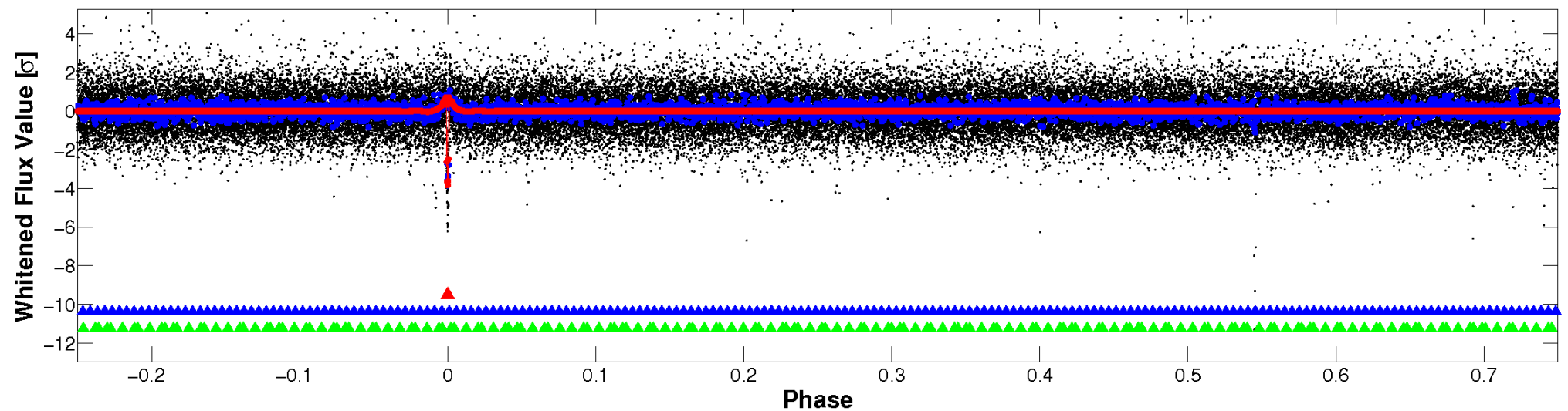


Non-Whitened Vs. Whitened Light Curve

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

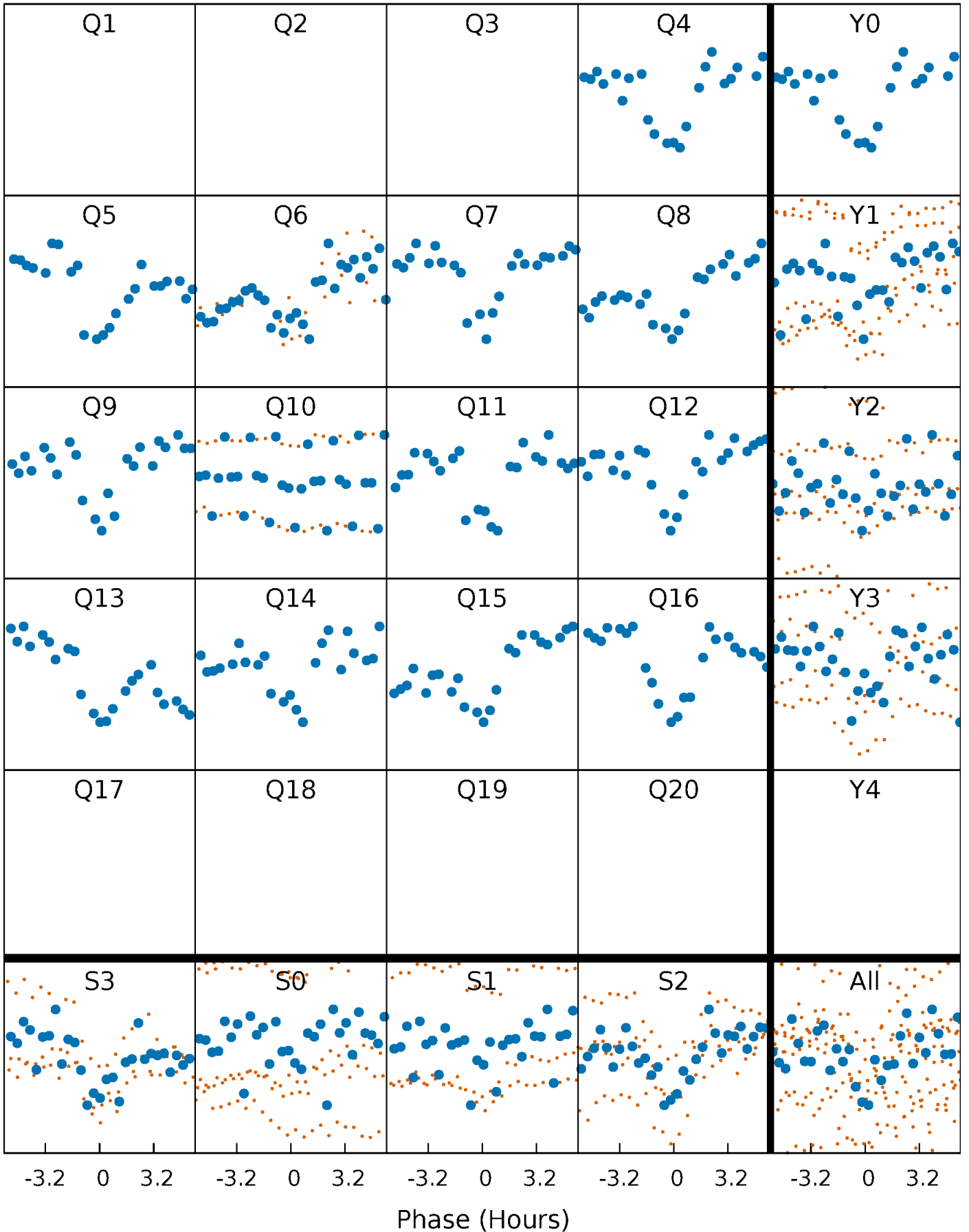


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



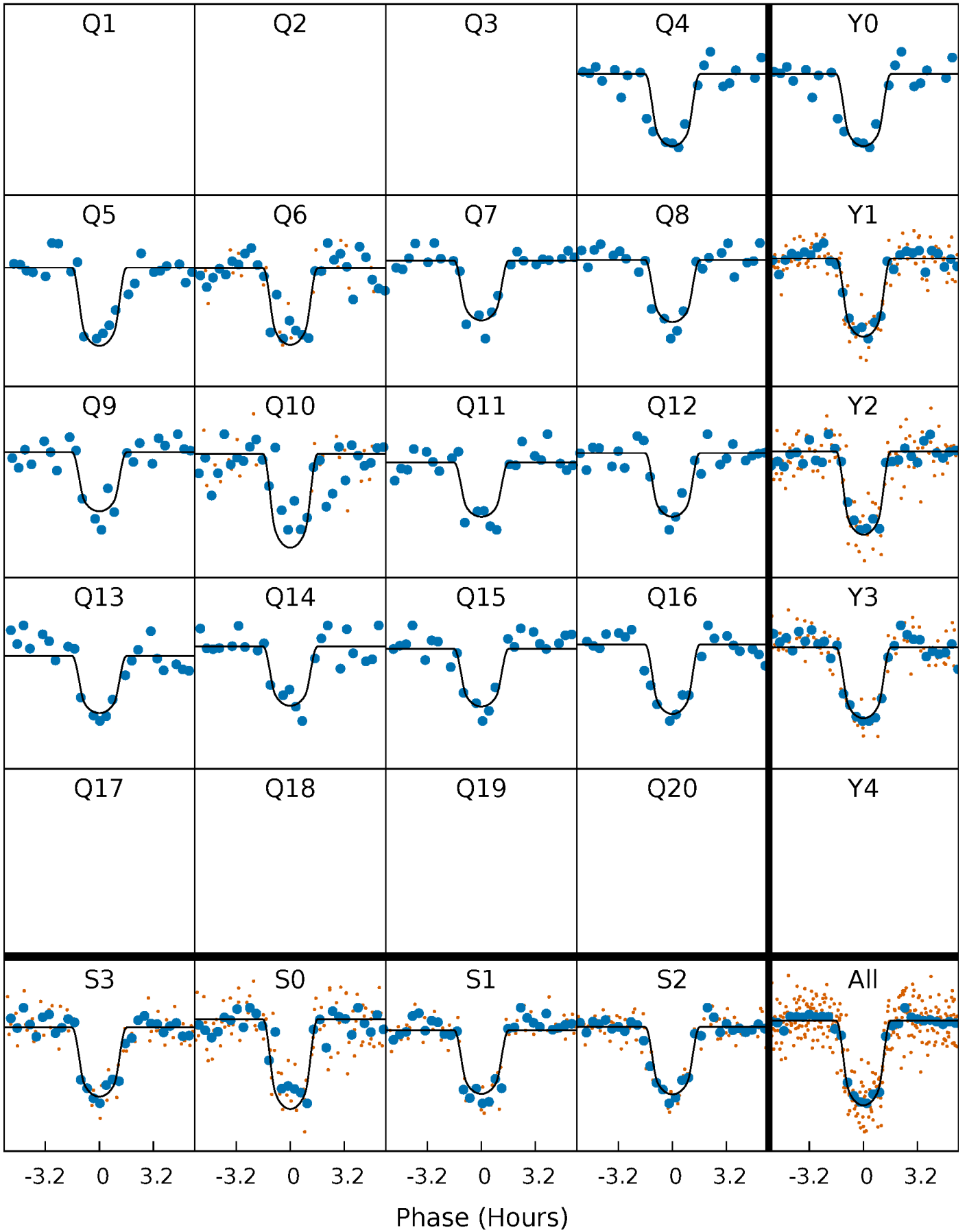
PDC Quarter-Phased Transit Curves

TCE 009634821-01 P= 73.757838 Days $T_0=183.722998$ (BKJD)



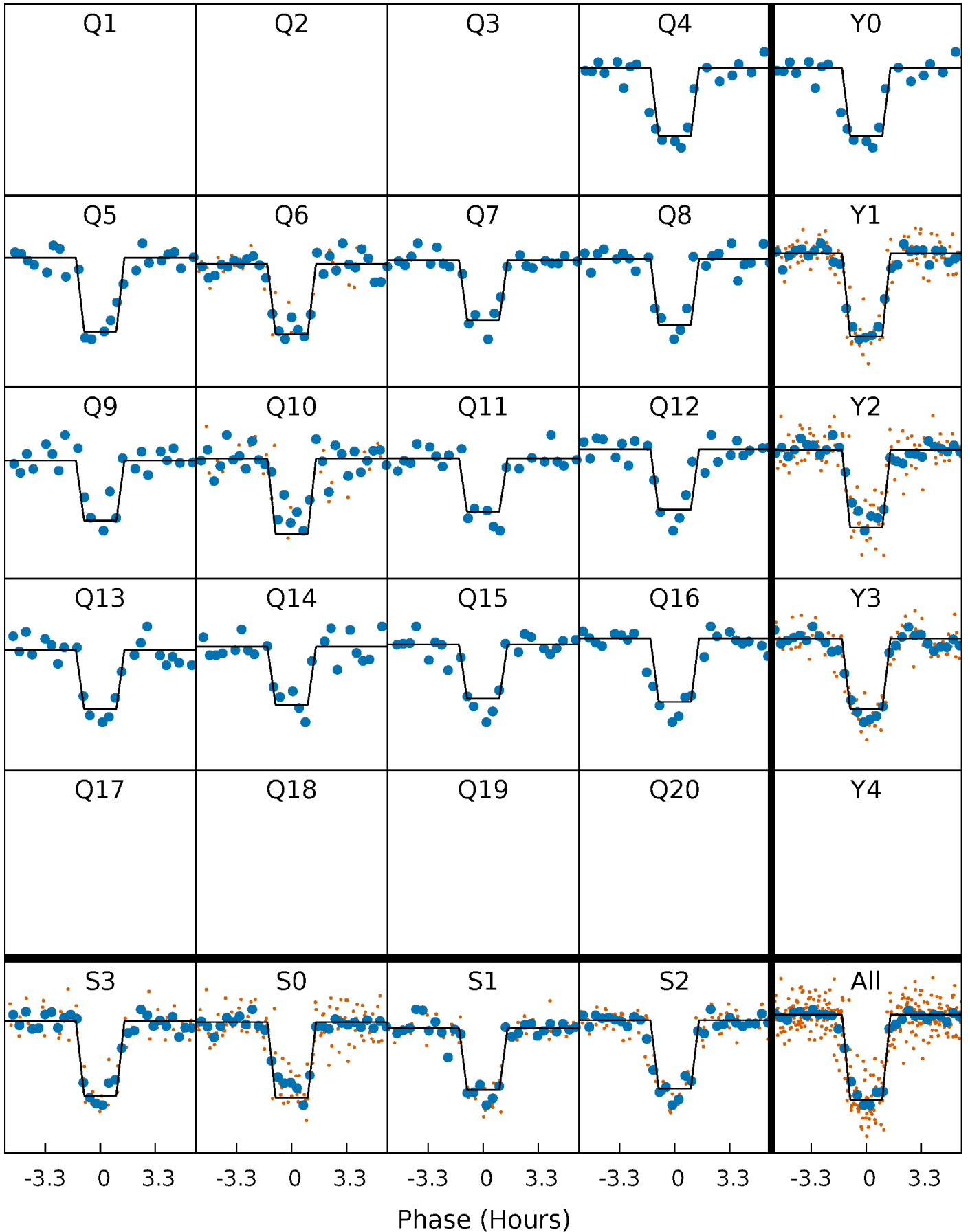
DV Quarter-Phased Transit Curves

TCE 009634821-01 P= 73.757838 Days $T_0=183.722998$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

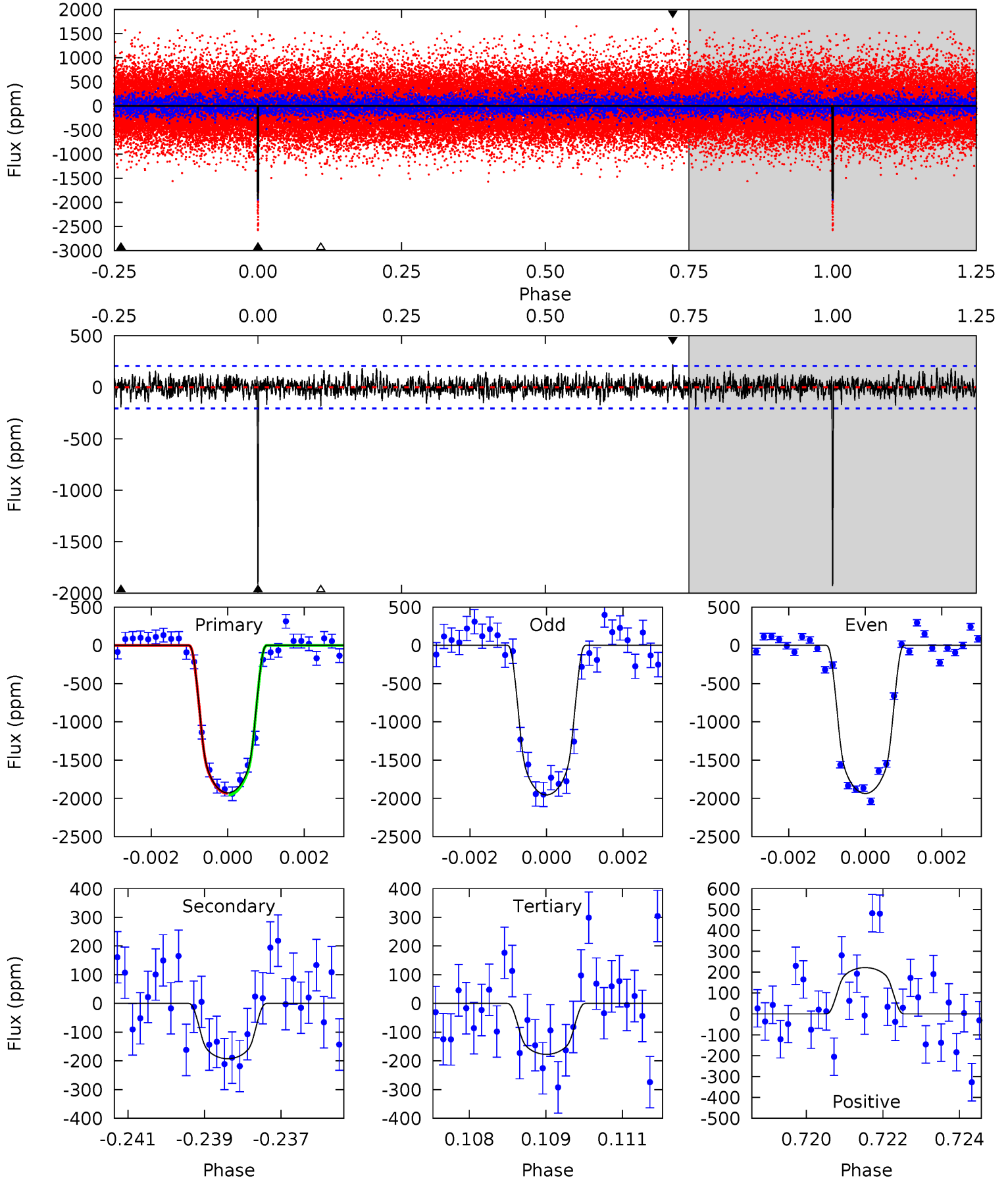
TCE 009634821-01 P= 73.757542 Days $T_0=183.726521$ (BKJD)



DV Model-Shift Uniqueness Test

009634821-01, $P = 73.757838$ Days, $E = 183.722998$ Days

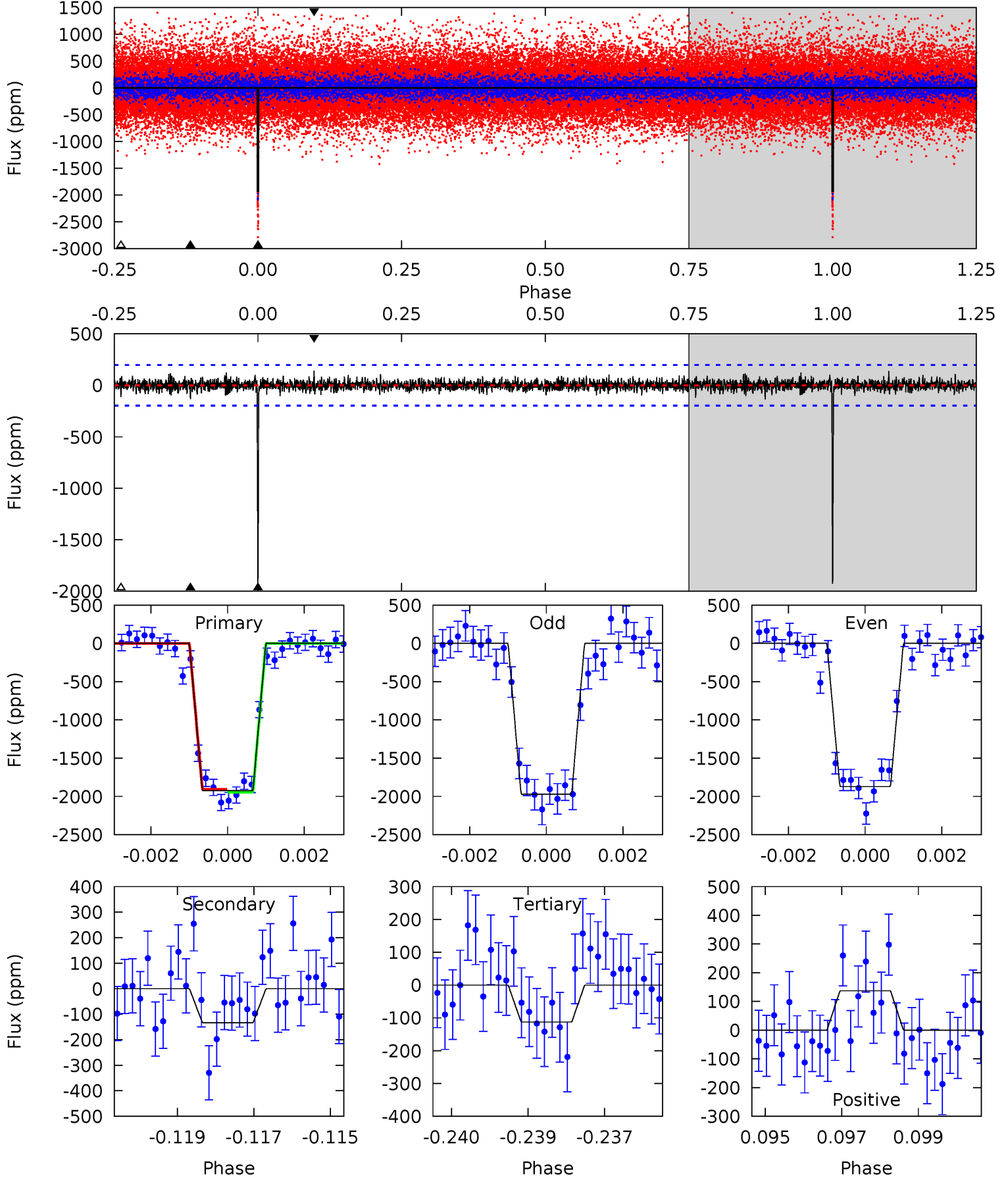
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
49.9	4.99	4.59	5.74	5.34	3.12	1.42	45.4	44.2	0.40	-0.76	0.25	0.97	0.10	0.31



Alt Model-Shift Uniqueness Test

009634821-01, $P = 73.757542$ Days, $E = 183.726521$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
52.4	3.63	3.07	3.73	5.36	3.15	0.86	49.3	48.6	0.57	-0.09	1.36	0.99	0.07	0.54



Stellar Parameters For KIC 009634821

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5029^{+192}_{-174}	$4.429^{+0.130}_{-0.416}$	$0.480^{+0.050}_{-0.250}$	$0.930^{+0.481}_{-0.144}$	$0.847^{+0.068}_{-0.049}$	$1.485^{+0.860}_{-1.111}$
	+4%/-3%	+3%/-9%	+10%/-52%	+52%/-15%	+8%/-6%	+58%/-75%
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 009634821-01 / KOI 2037.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-192 ± 39	$4.94^{+1.54}_{-1.13}$	538^{+84}_{-40}	3296^{+261}_{-209}	453^{+325}_{-195}
Alt.	-134 ± 37	$4.79^{+1.56}_{-1.15}$	539^{+66}_{-39}	3137^{+280}_{-217}	326^{+278}_{-161}

T_{max} = Theoretical Maximum Planetary Temperature

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

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

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

DV Centroid Data

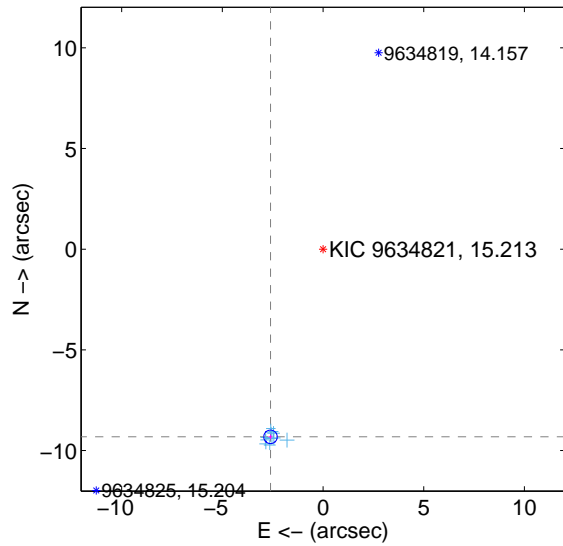
Supplemental centroid analysis for 009634821-01. Kepler magnitude: 15.21. Transit SNR 28.99

There are 11 quarters with good PRF difference image offsets

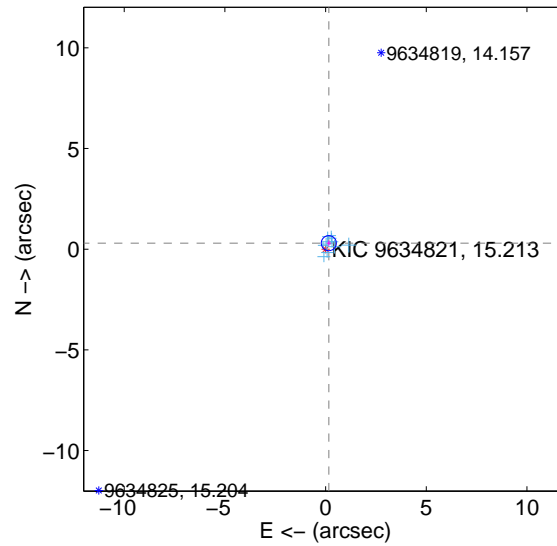
The OOT PRF centroid is offset from the target star catalog position by about 9.70 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.680 ± 0.112	86.78	2.610 ± 0.098	-9.322 ± 0.113
PRF-fit source offset from KIC position	0.339 ± 0.124	2.72	-0.160 ± 0.101	0.299 ± 0.130
photometric centroid source offset	1.60 ± 0.39	4.08	-0.13 ± 0.24	1.60 ± 0.39

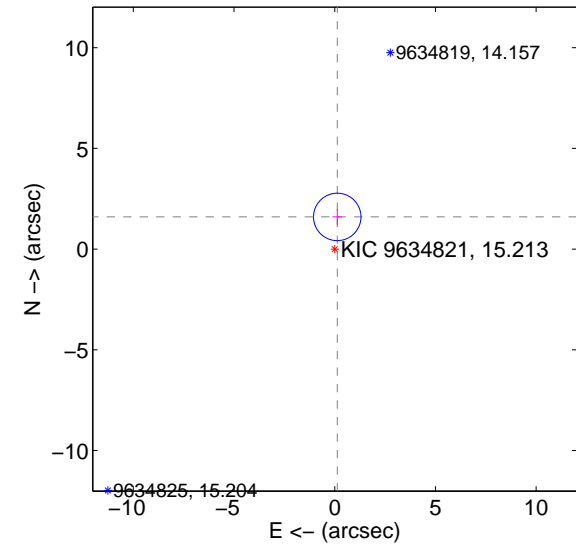
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

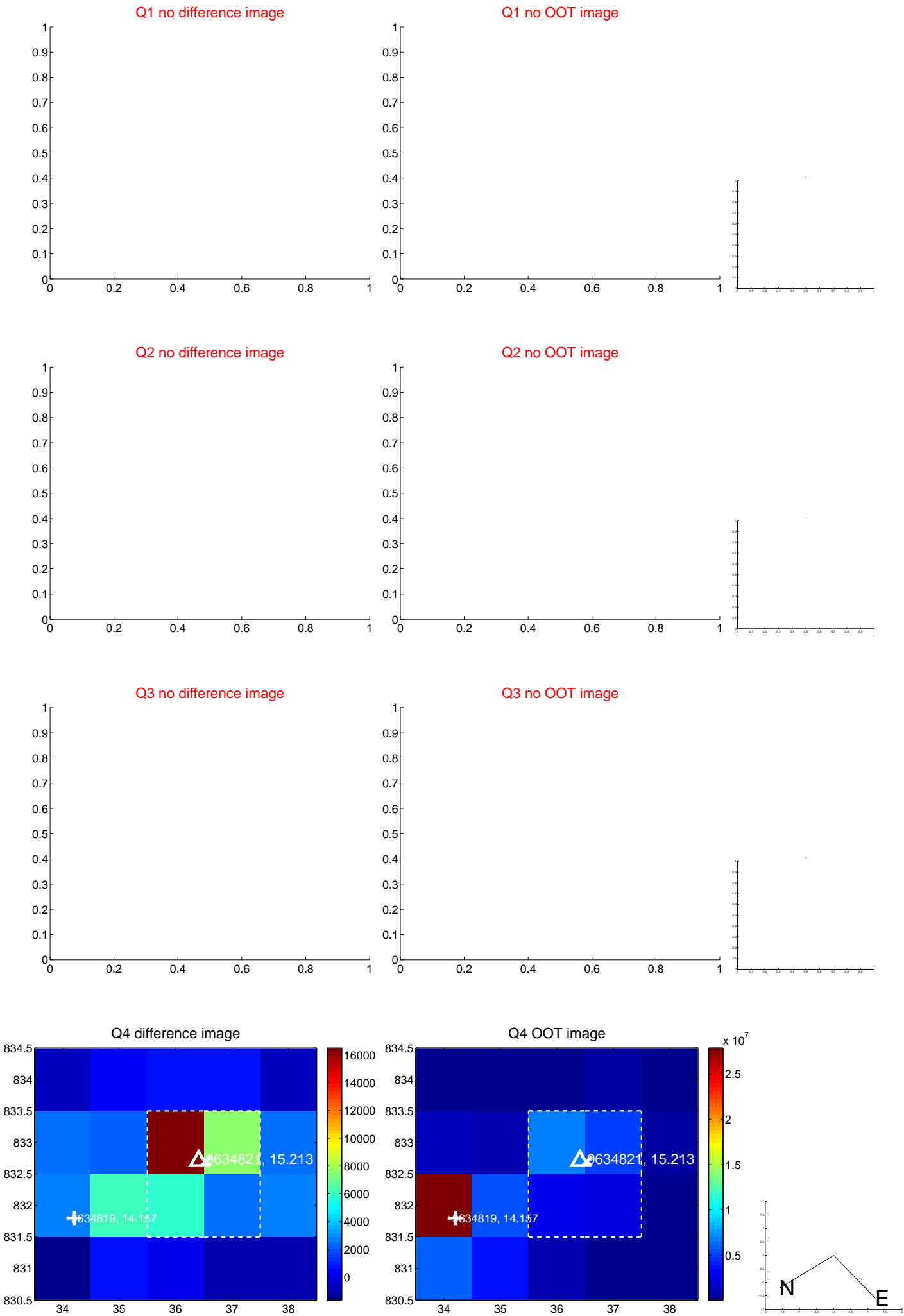


offset from photometric centroids

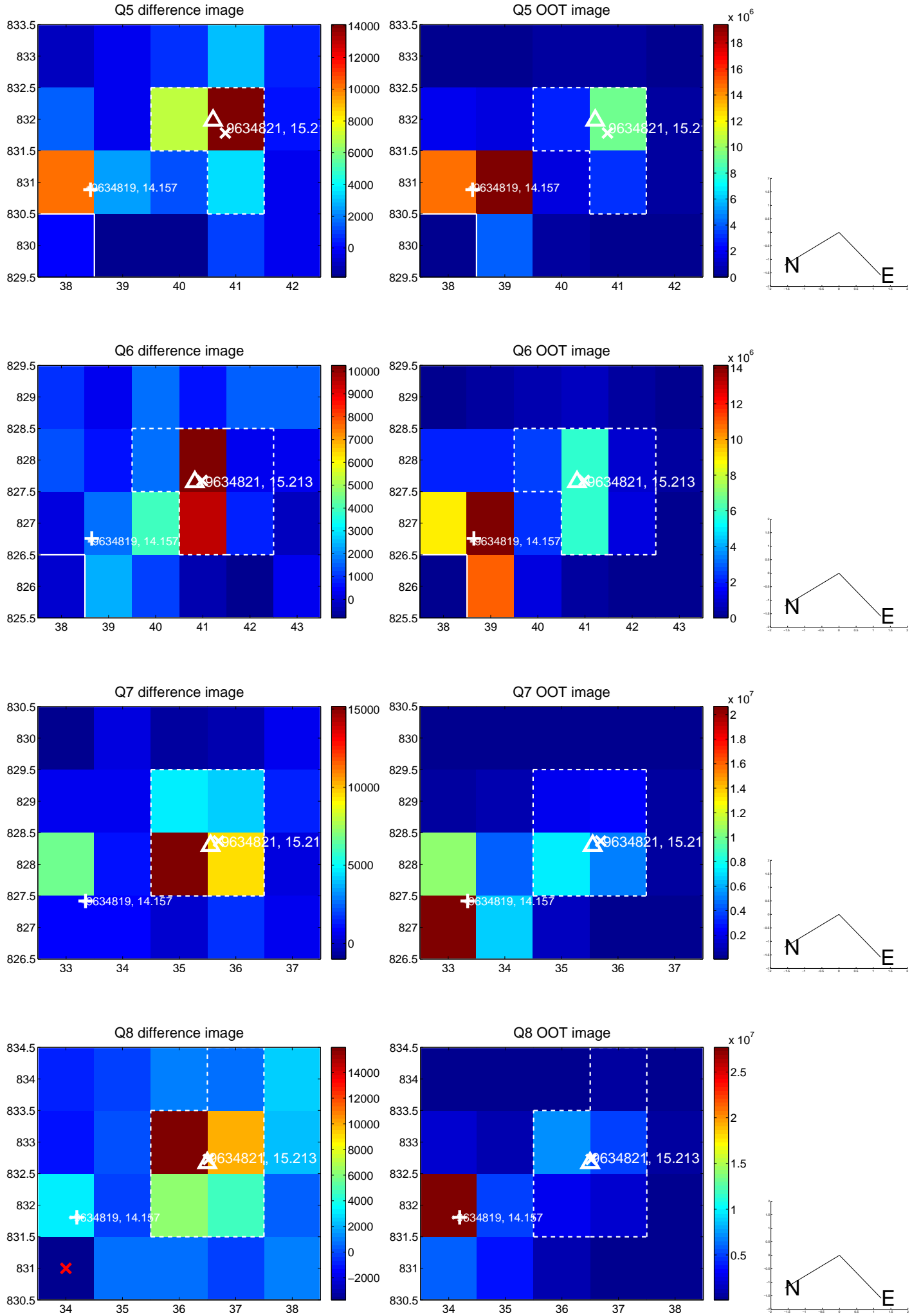


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

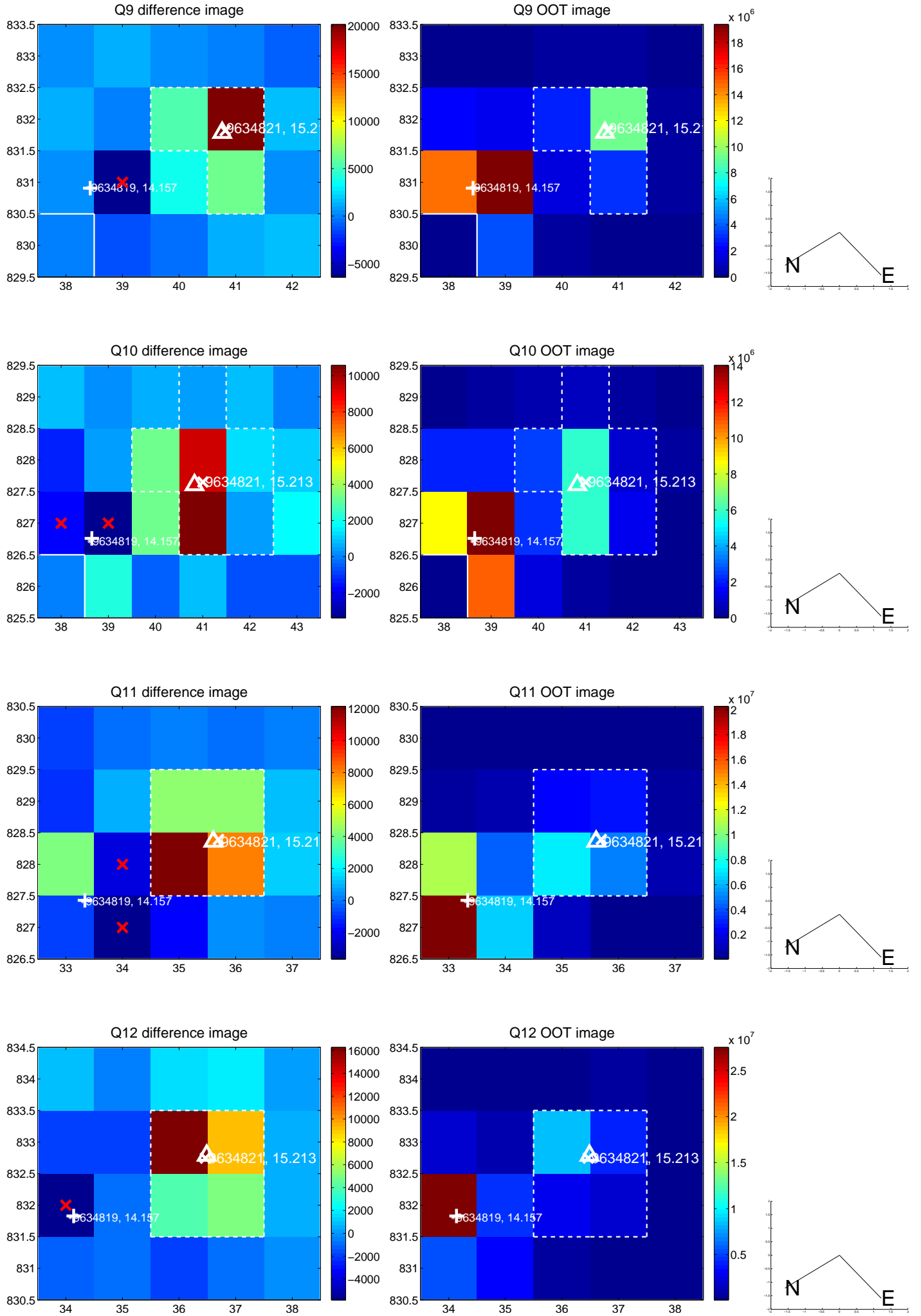
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



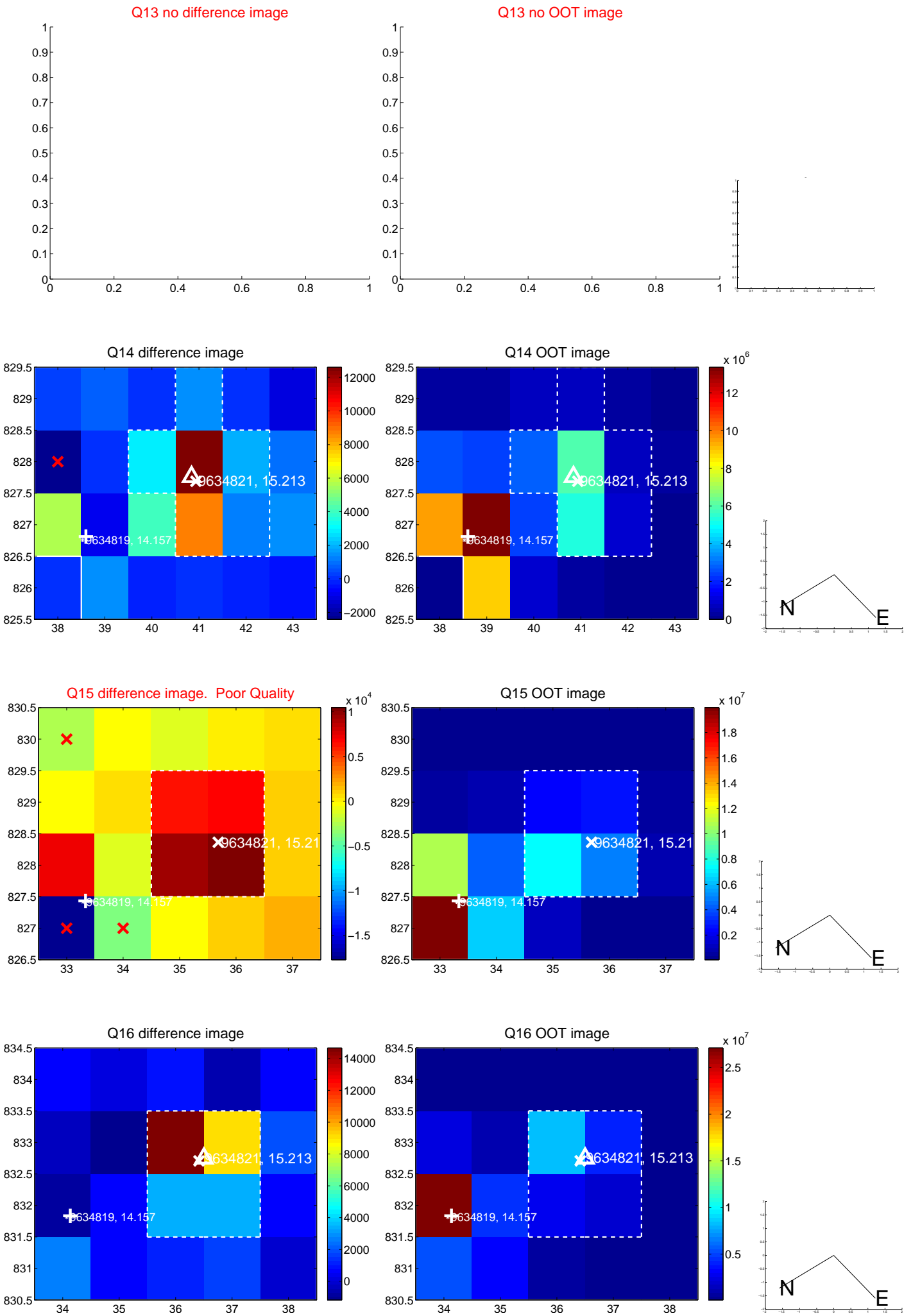
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



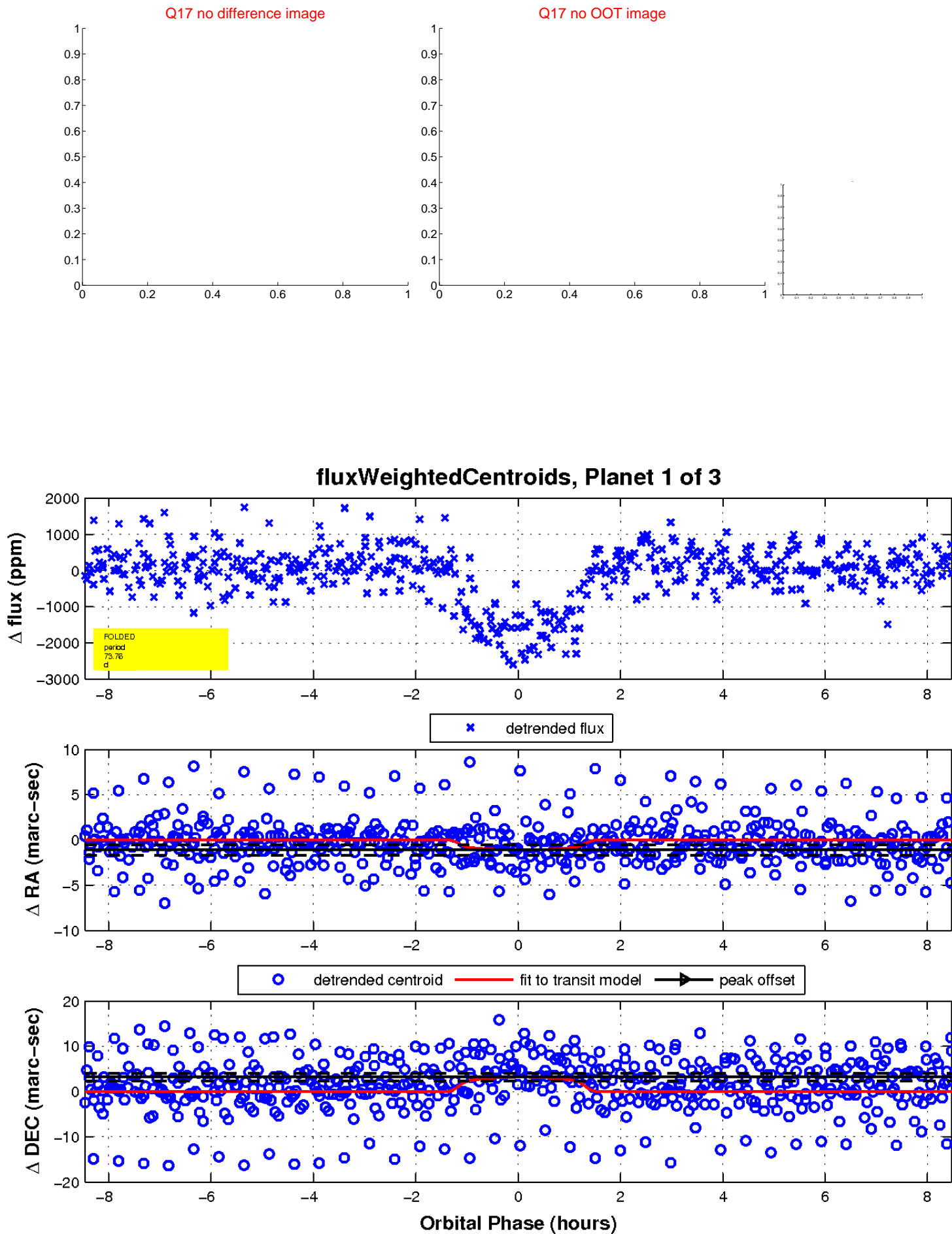
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

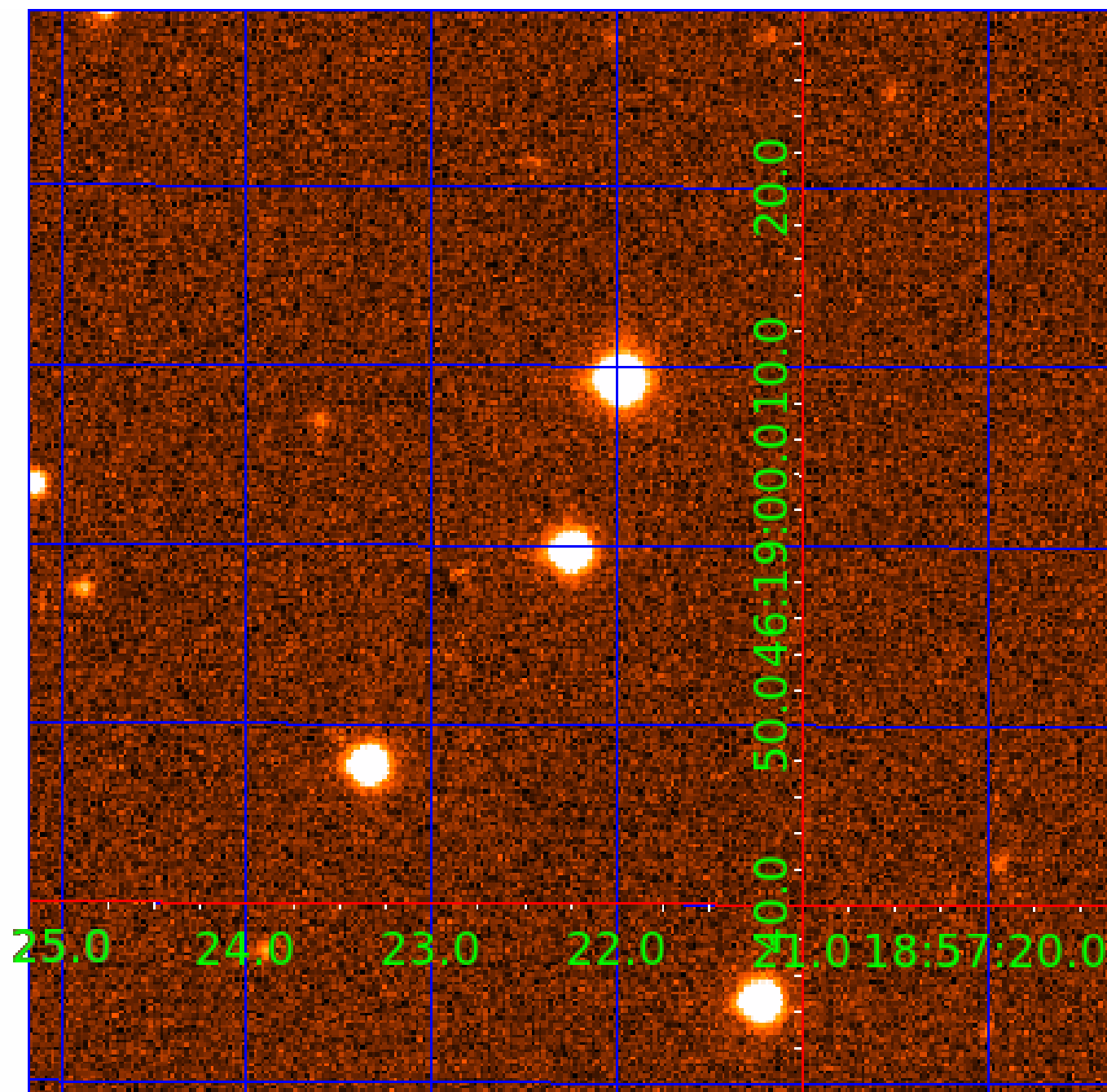


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009634821

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})
009634821-01	OBS	2037.01	73.757838	183.722998	1960.2	2.828	29.9	29.0	0.93	5029	4.62	4.67
009634821-02	OBS	2037.02	5.477140	133.765894	565.6	1.503	22.8	26.4	0.93	5029	2.73	149.65
009634821-03	OBS	2037.03	8.562686	132.505869	606.3	1.546	18.7	22.5	0.93	5029	2.84	82.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009634821-01	OBS	PC	0.98	0	0	0	0	CENT_KIC_POS
009634821-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009634821-03	OBS	PC	1.00	0	0	0	0	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.

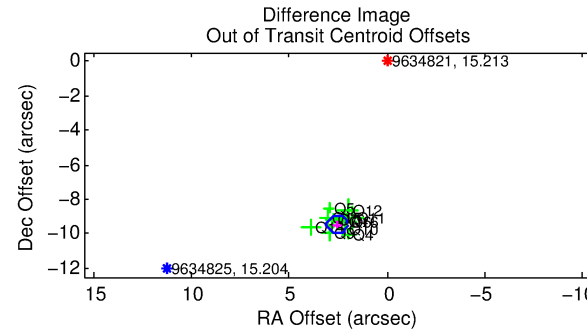
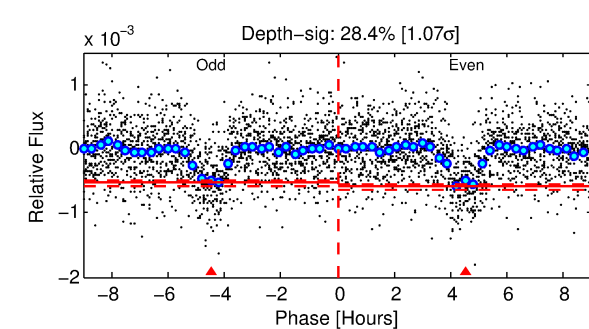
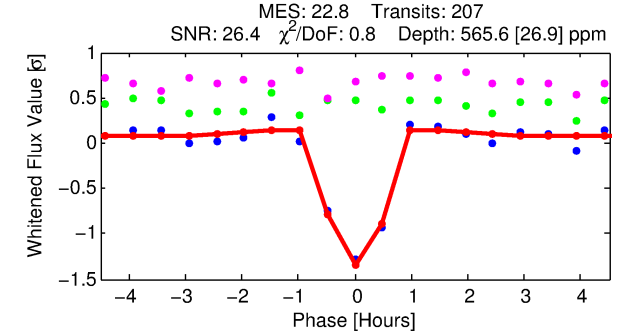
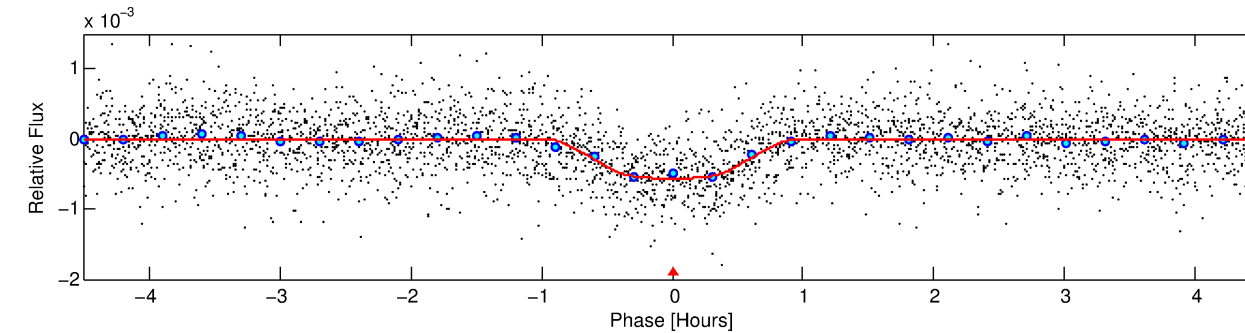
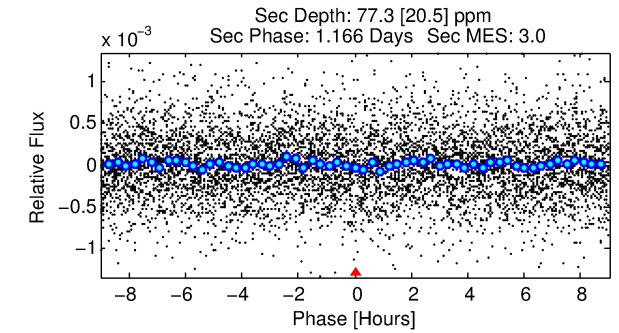
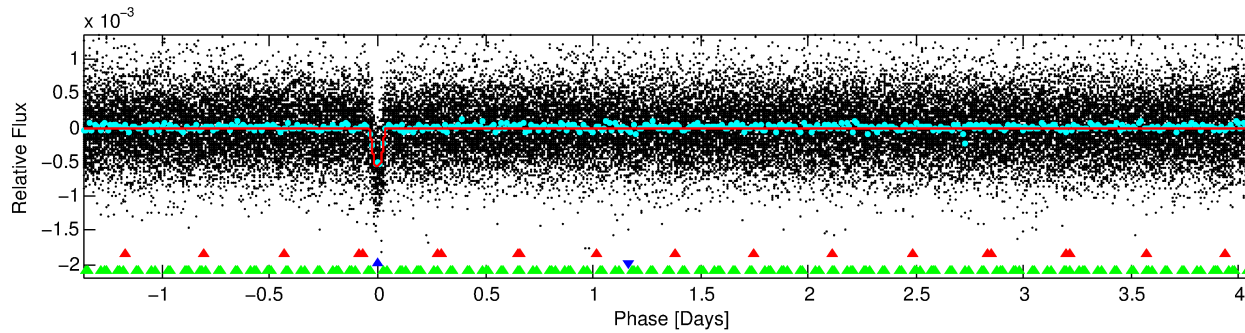
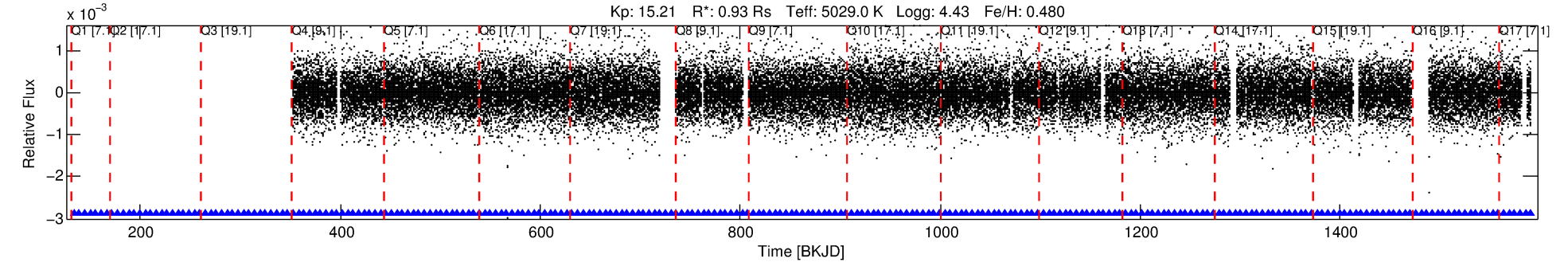
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009634821-02

No Significant Match Found

DV One-Page Summary

KIC: 9634821 Candidate: 2 of 3 Period: 5.477 d
KOI: K02037.02 Corr: 0.964



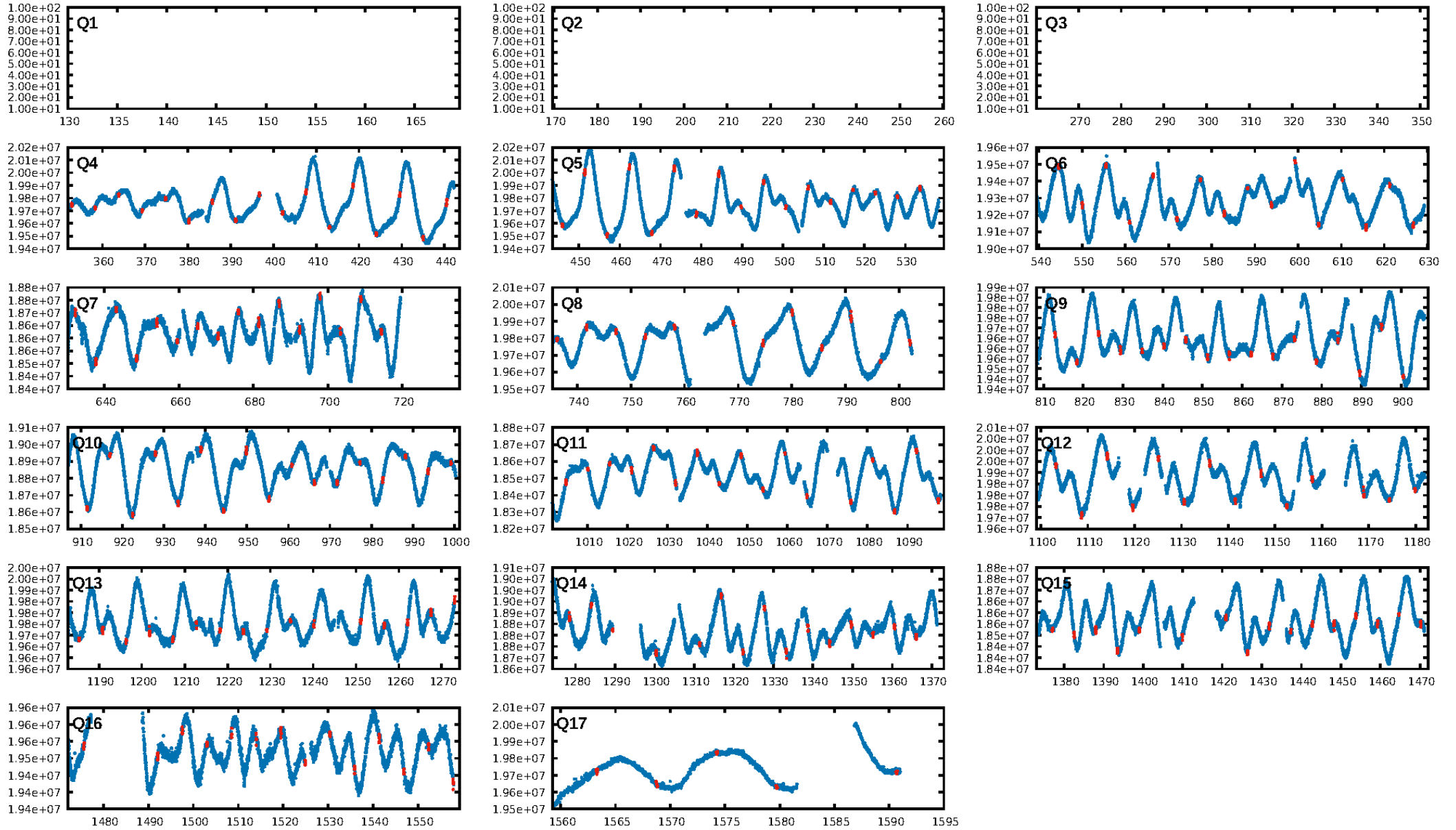
DV Fit Results:

Period = 5.47714 [0.00001] d
Epoch = 133.7659 [0.0012] BKJD
Rp/R* = 0.0269 [0.0061]
a/R* = 13.59 [11.49]
b = 0.90 [0.18]
Seff = 149.65 [110.98]
Teq = 892 [165] K
Rp = 2.73 [1.54] Re
a = 0.0576 [0.0270] AU
Ag = 18.85 [16.88] [1.06σ]
Teffp = 2873 [392] K [4.65σ]

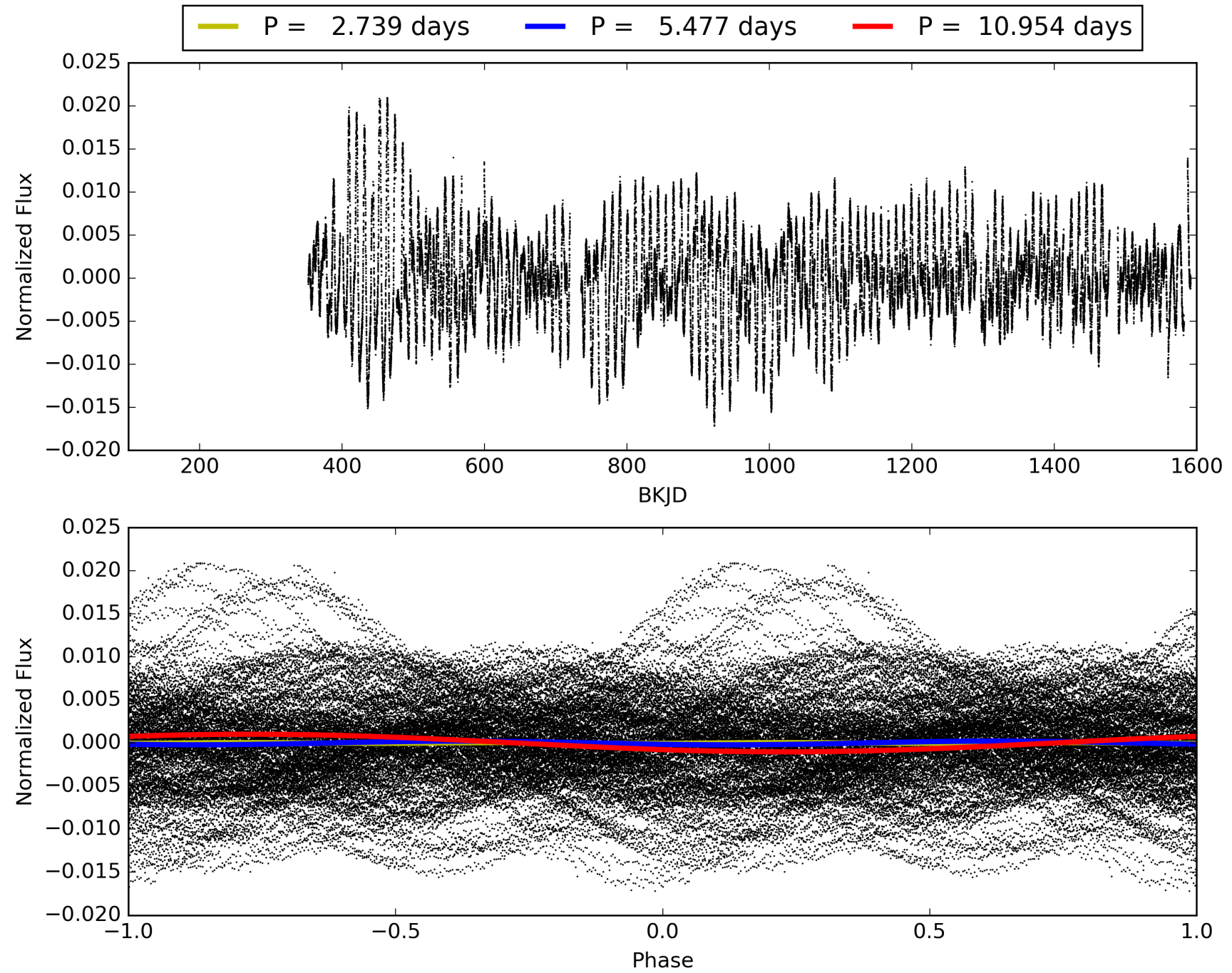
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [34.34σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.31e-109
RollingBand-fgt: 1.00 [202/202]
GhostDiagnostic-chr: 3.754
Centroid-sig: 0.0%
Centroid-so: 0.678 arcsec [1.67σ]
OotOffset-rm: 9.812 arcsec [55.74σ]
KicOffset-rm: 0.294 arcsec [1.55σ]
OotOffset-st: 3/3/3/2 [11]
KicOffset-st: 3/3/3/2 [11]
DiffImageQuality-fgm: 0.91 [10/11]
DiffImageOverlap-fno: 1.00 [14/14]

TCE 009634821-02, PDC Light Curves

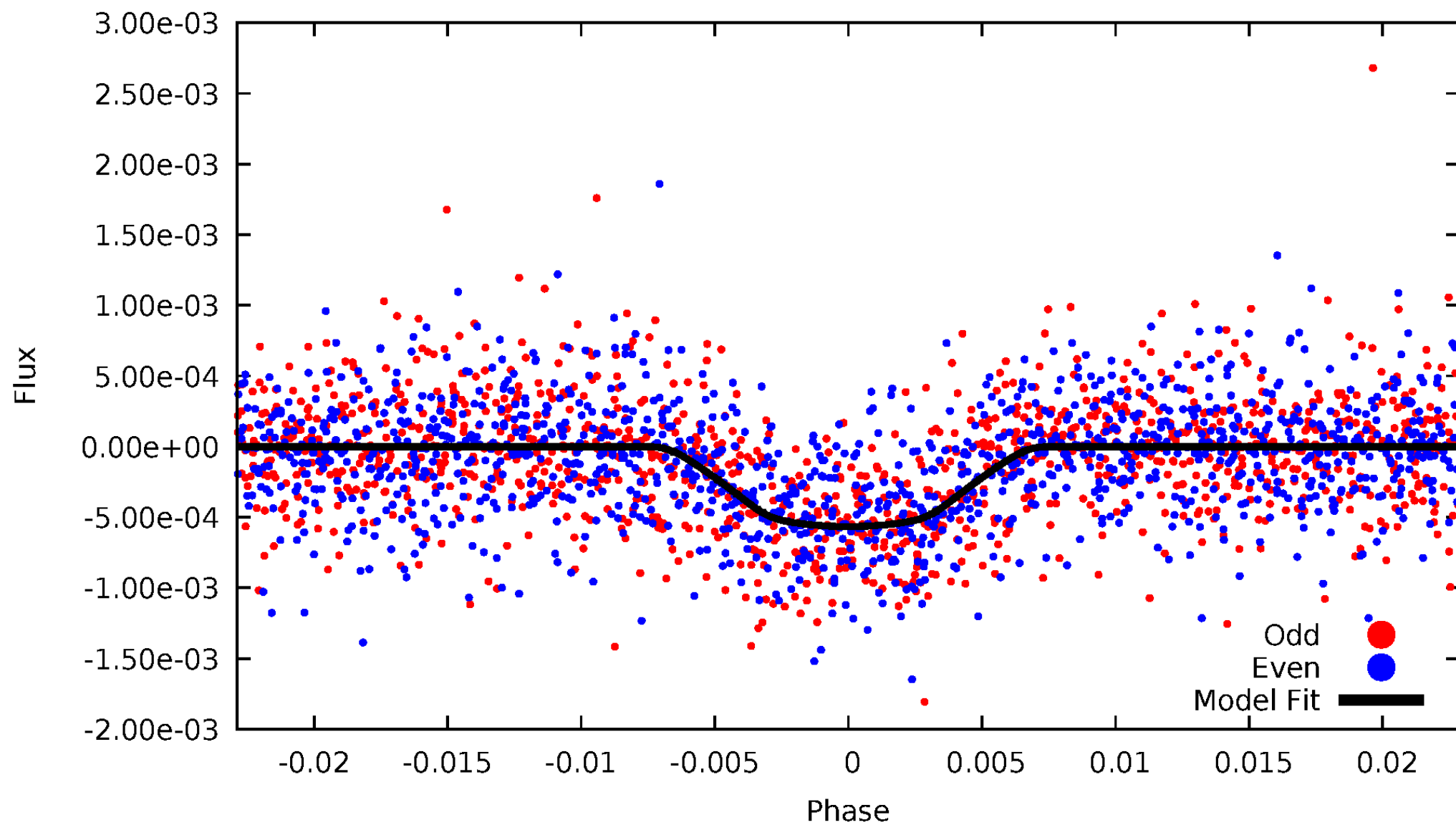


TCE 009634821-02



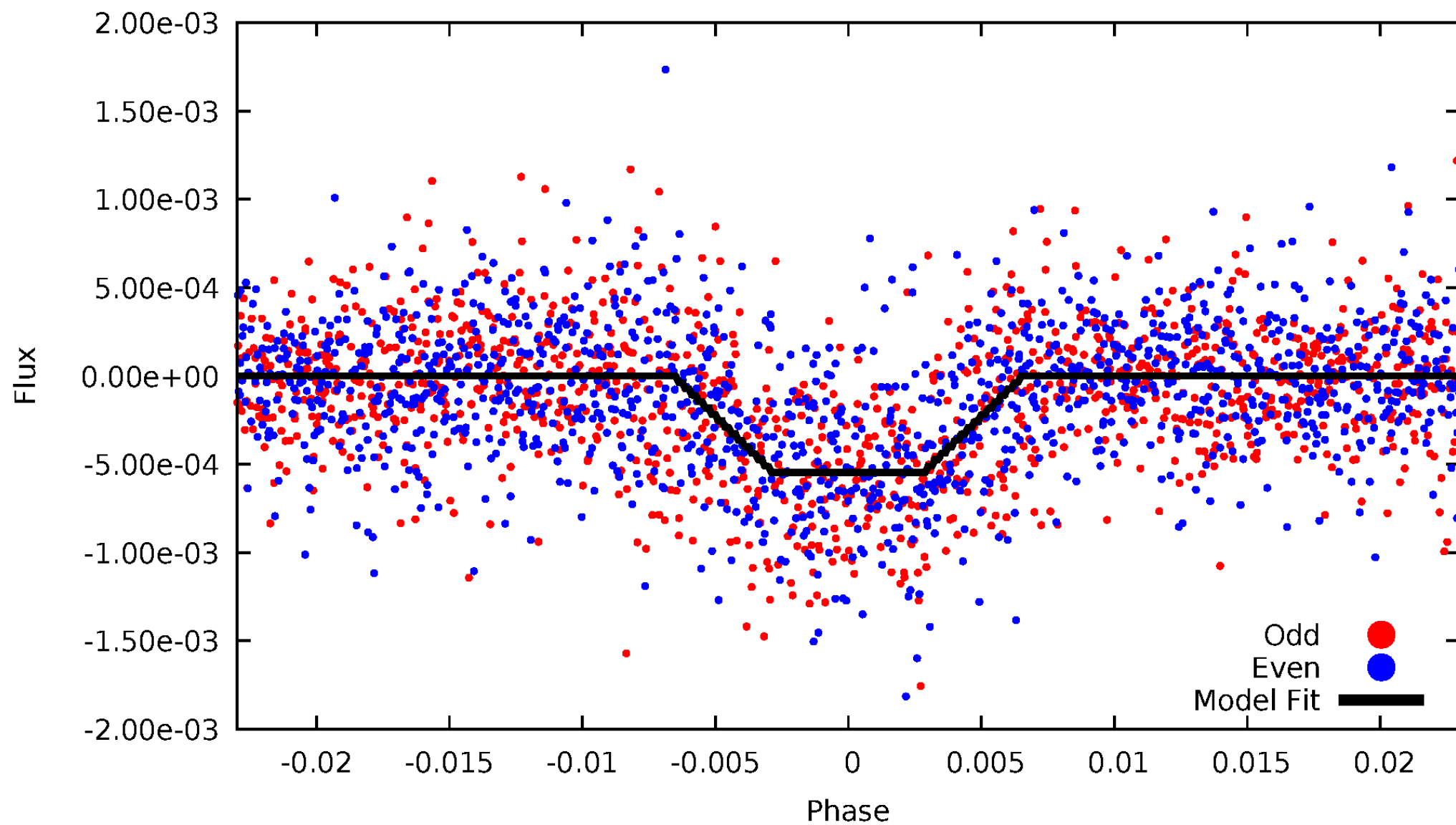
DV Odd/Even

TCE 009634821-02



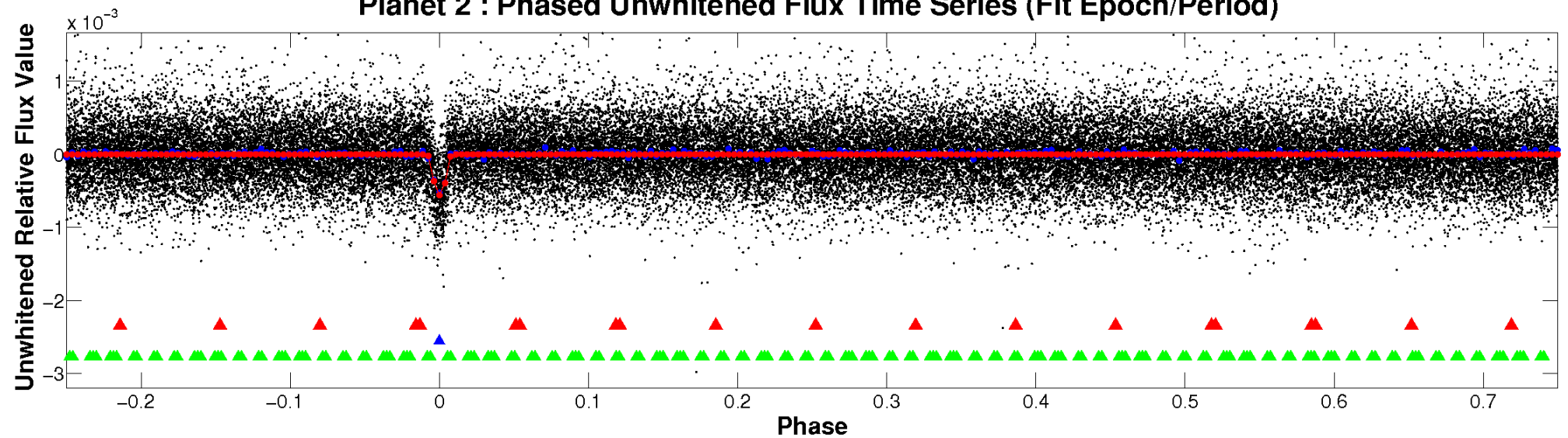
ALT Odd/Even

TCE 009634821-02

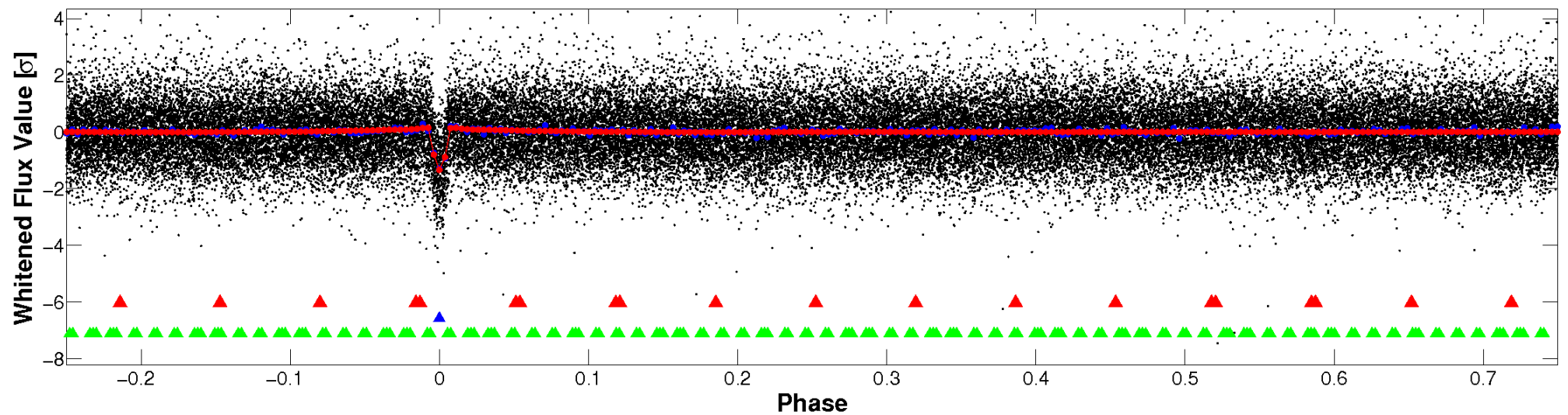


Non-Whitened Vs. Whitened Light Curve

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

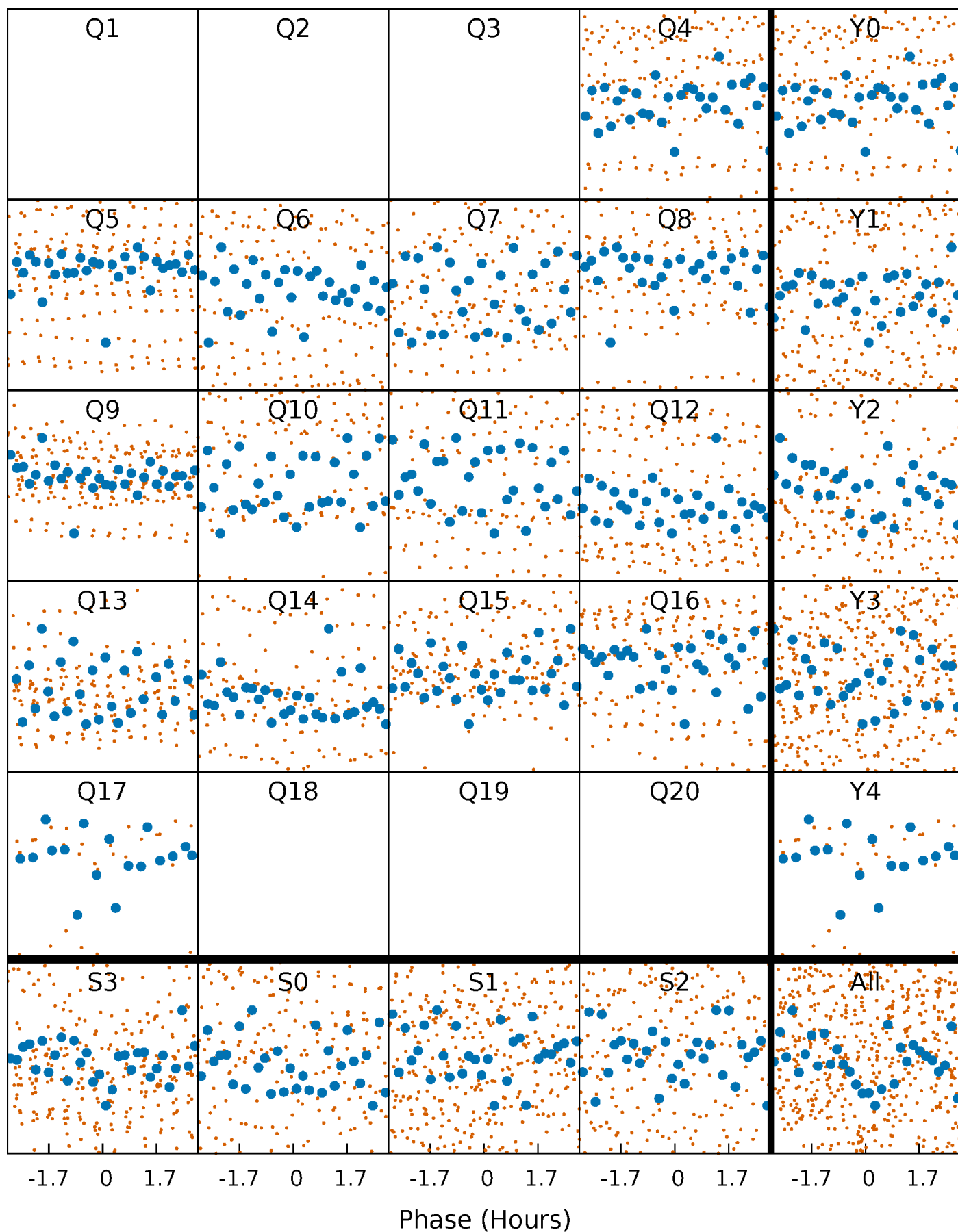


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



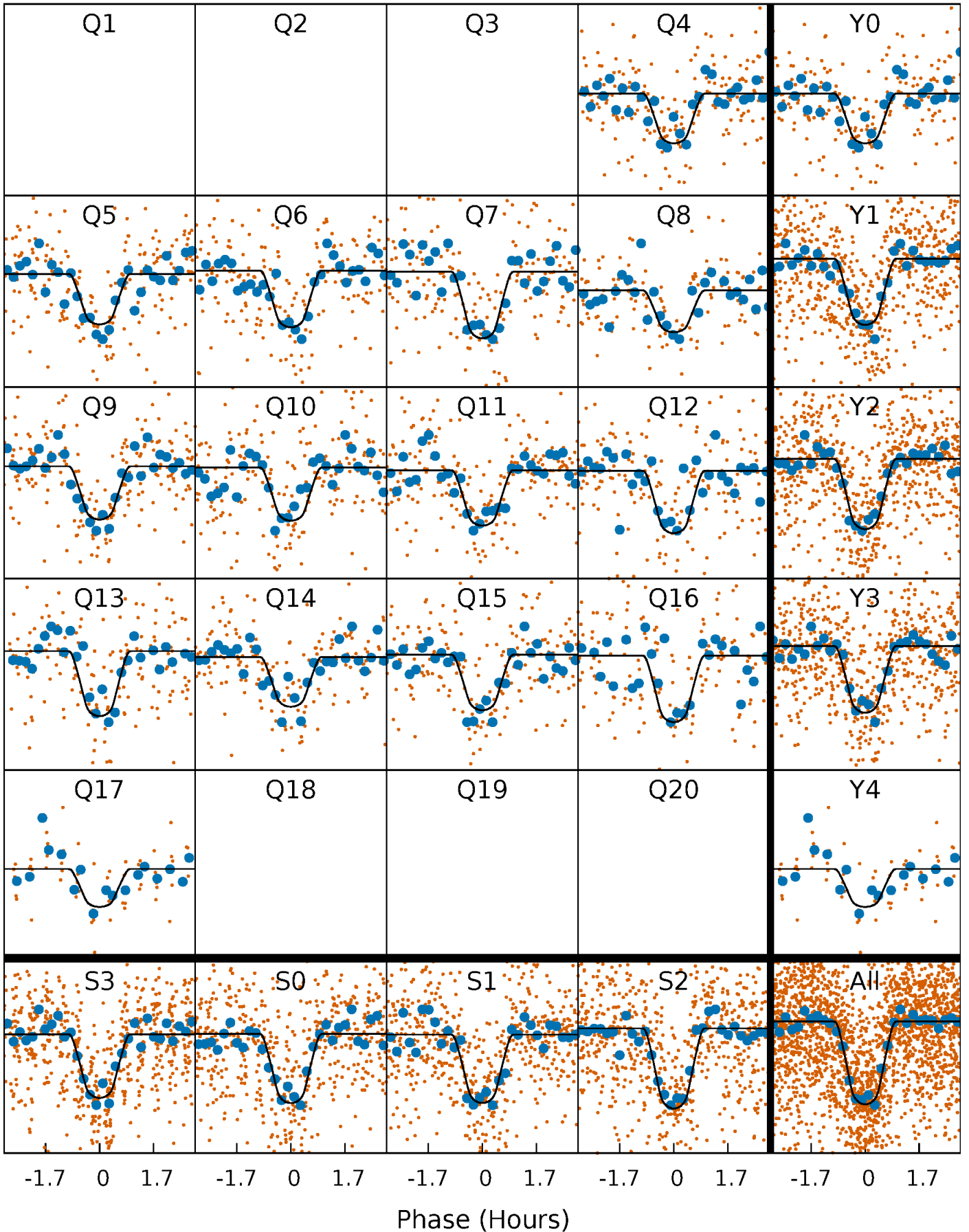
PDC Quarter-Phased Transit Curves

TCE 009634821-02 P= 5.477140 Days $T_0=133.765894$ (BKJD)



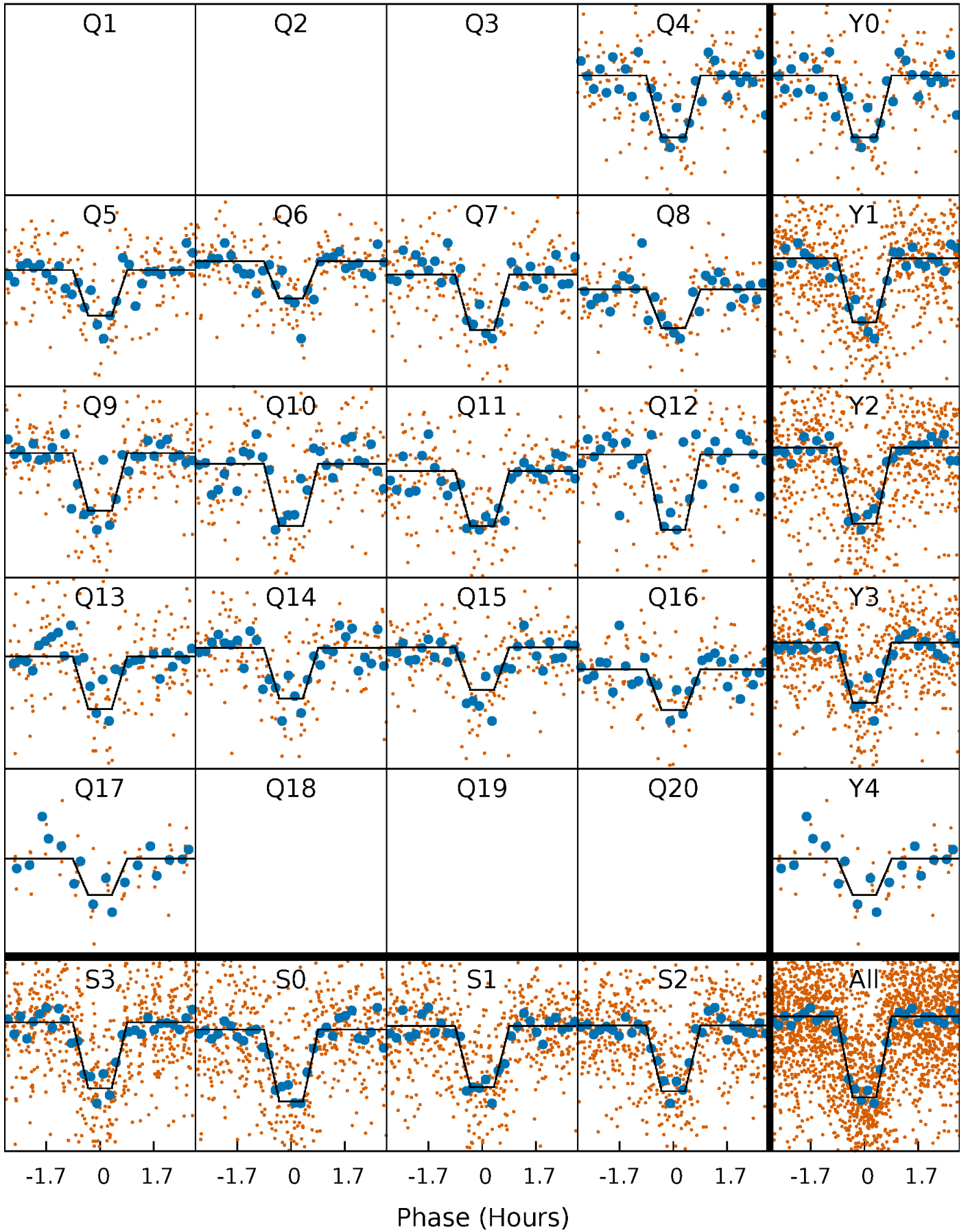
DV Quarter-Phased Transit Curves

TCE 009634821-02 $P = 5.477140$ Days $T_0 = 133.765894$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

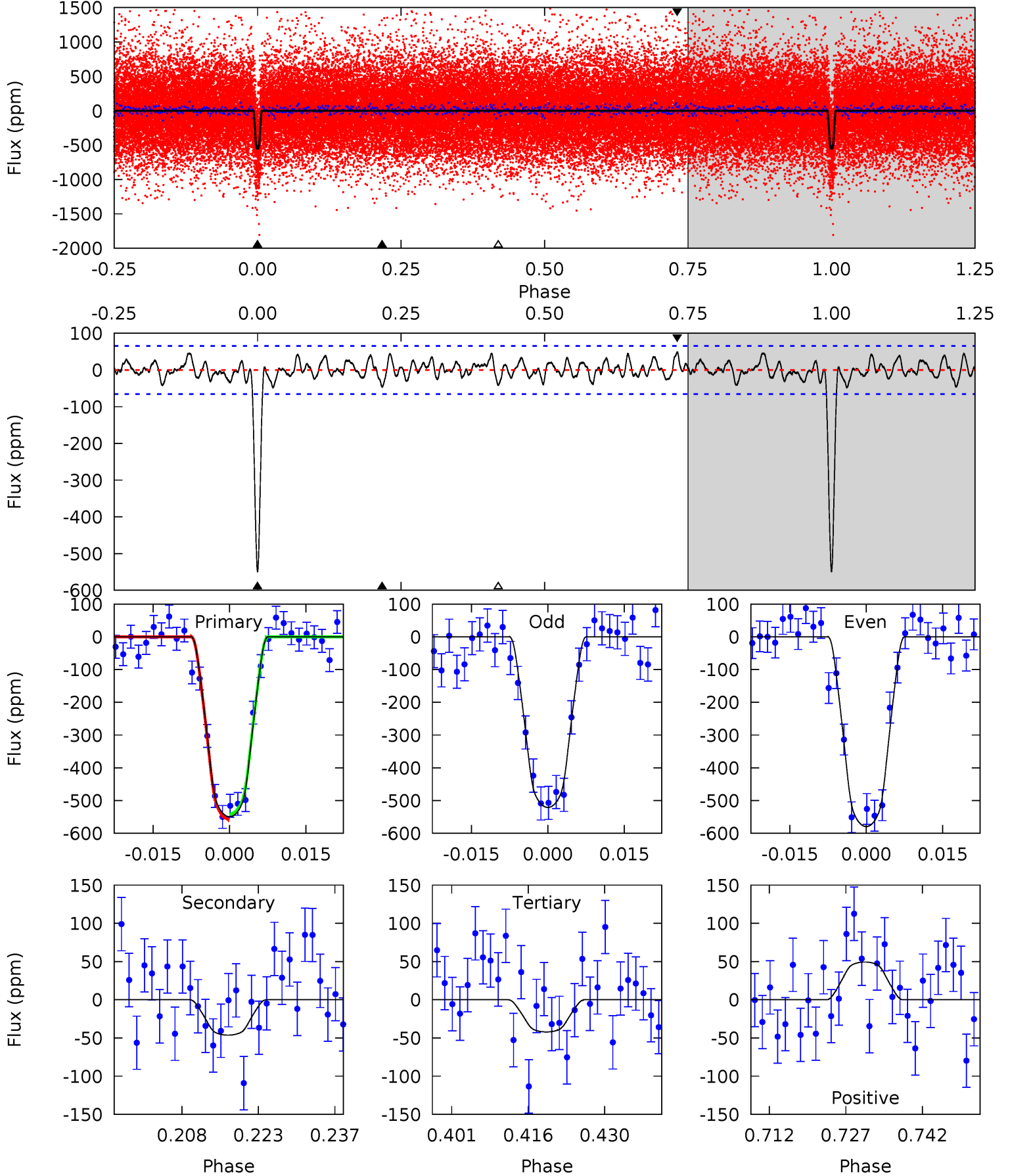
TCE 009634821-02 P= 5.477158 Days $T_0=133.762544$ (BKJD)



DV Model-Shift Uniqueness Test

009634821-02, P = 5.477140 Days, E = 133.765894 Days

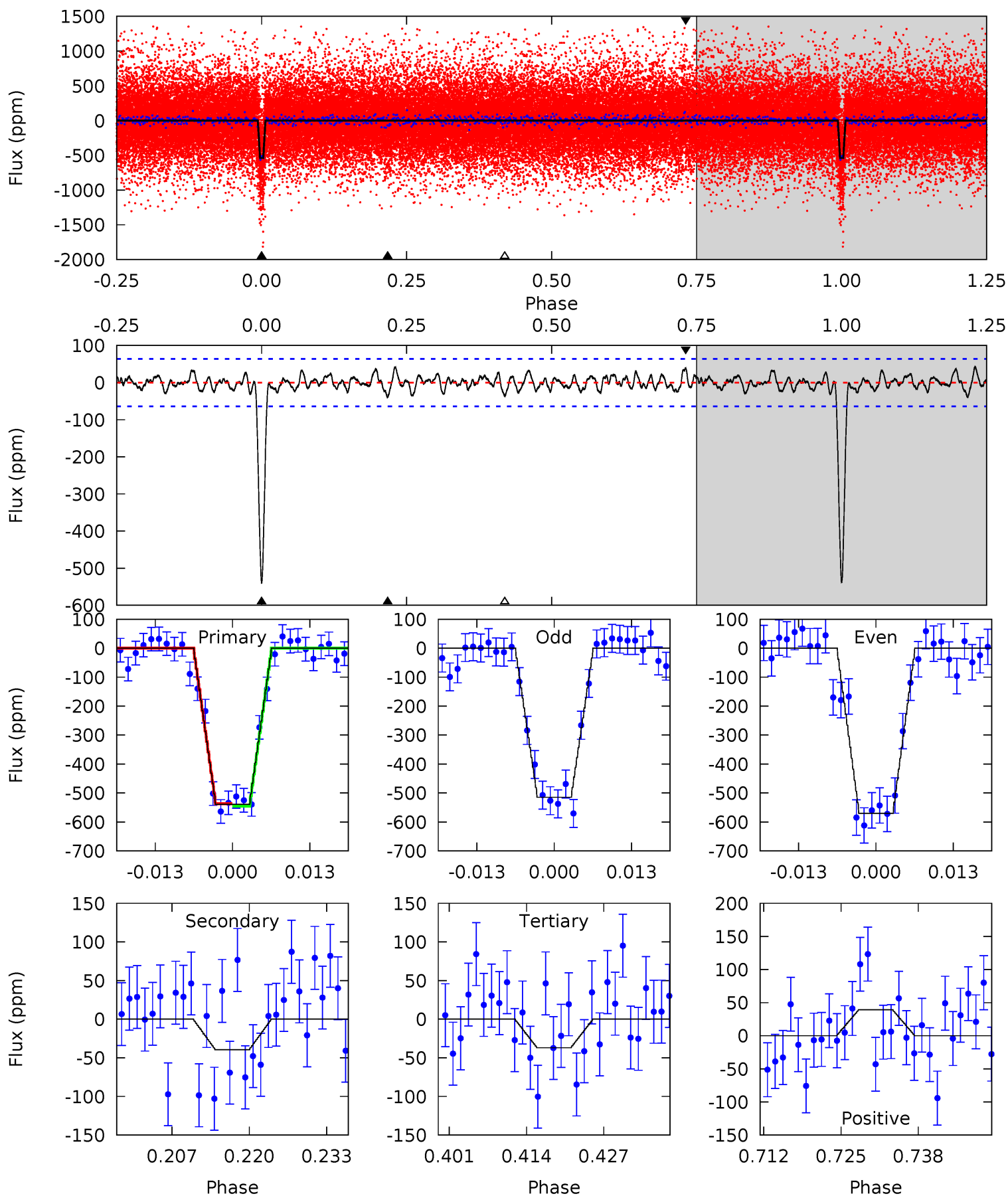
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
41.6	3.51	3.19	3.74	4.95	2.44	1.38	38.4	37.9	0.32	-0.23	2.23	0.98	0.08	0.61



Alt Model-Shift Uniqueness Test

009634821-02, P = 5.477158 Days, E = 133.762544 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
42.0	3.09	2.88	3.06	4.98	2.49	1.12	39.1	38.9	0.21	0.03	2.15	0.96	0.07	0.36



Stellar Parameters For KIC 009634821

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5029^{+192}_{-174}	$4.429^{+0.130}_{-0.416}$	$0.480^{+0.050}_{-0.250}$	$0.930^{+0.481}_{-0.144}$	$0.847^{+0.068}_{-0.049}$	$1.485^{+0.860}_{-1.111}$
	+4%/-3%	+3%/-9%	+10%/-52%	+52%/-15%	+8%/-6%	+58%/-75%
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 009634821-02 / KOI 2037.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-46 ± 13	$2.91^{+0.98}_{-0.74}$	1274^{+172}_{-88}	3093^{+332}_{-239}	$9.566^{+8.540}_{-4.547}$
Alt.	-40 ± 13	$2.57^{+1.07}_{-0.78}$	1283^{+185}_{-99}	3138^{+364}_{-281}	10^{+13}_{-5}

T_{max} = Theoretical Maximum Planetary Temperature

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

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

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

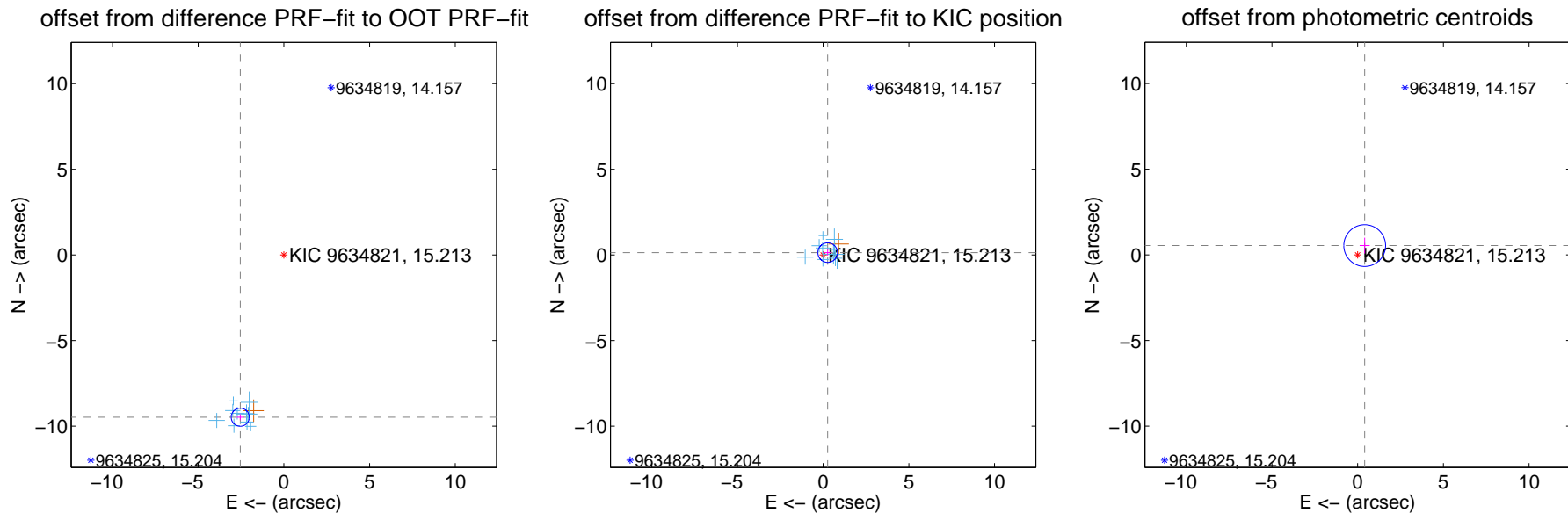
DV Centroid Data

Supplemental centroid analysis for 009634821-02. Kepler magnitude: 15.21. Transit SNR 26.42

There are 10 quarters with good PRF difference image offsets

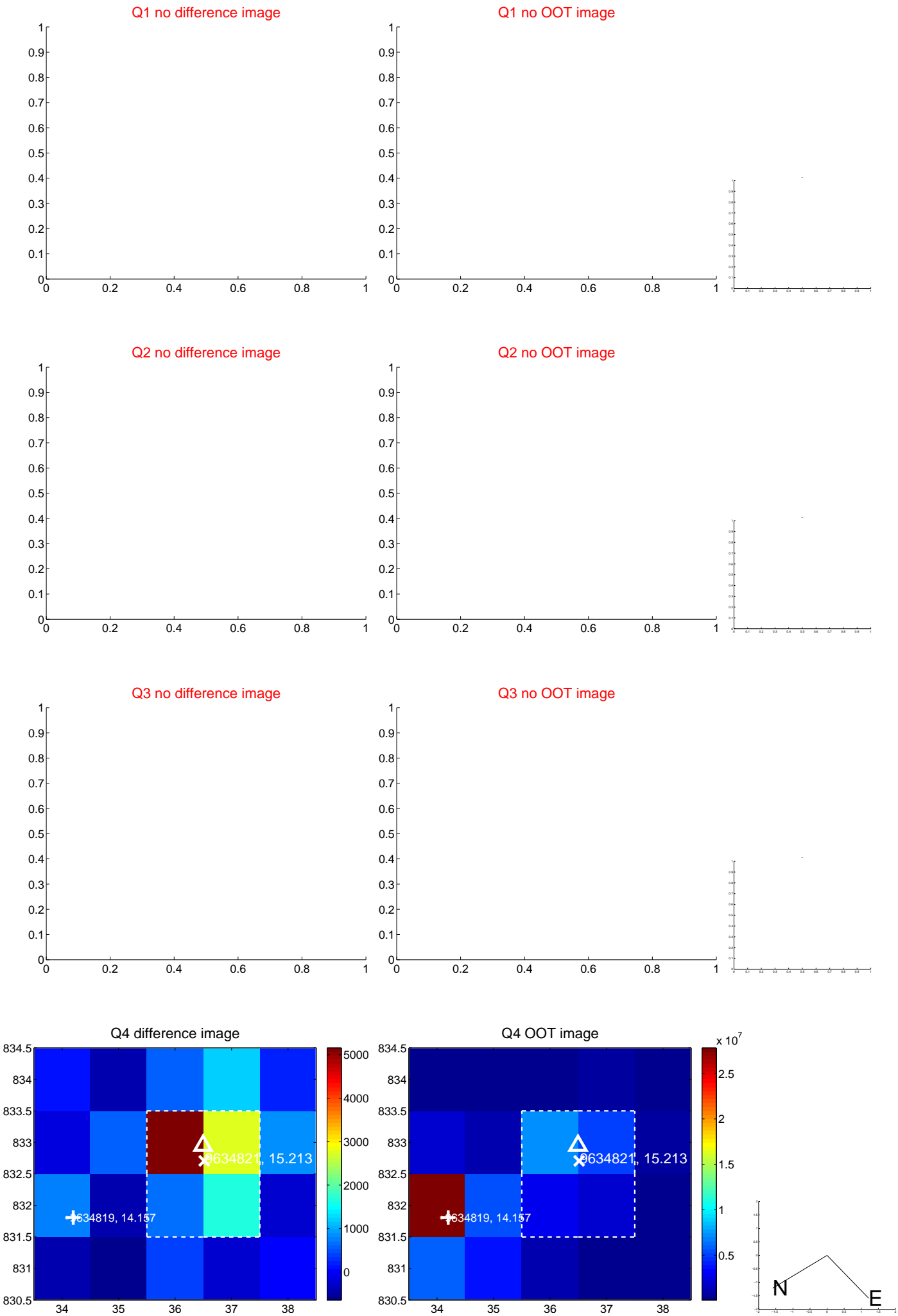
The OOT PRF centroid is offset from the target star catalog position by about 9.73 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.812 \pm 0.176	55.74	2.548 \pm 0.209	-9.476 \pm 0.173
PRF-fit source offset from KIC position	0.294 \pm 0.190	1.55	-0.262 \pm 0.191	0.134 \pm 0.172
photometric centroid source offset	0.68 \pm 0.41	1.67	-0.41 \pm 0.29	0.54 \pm 0.46

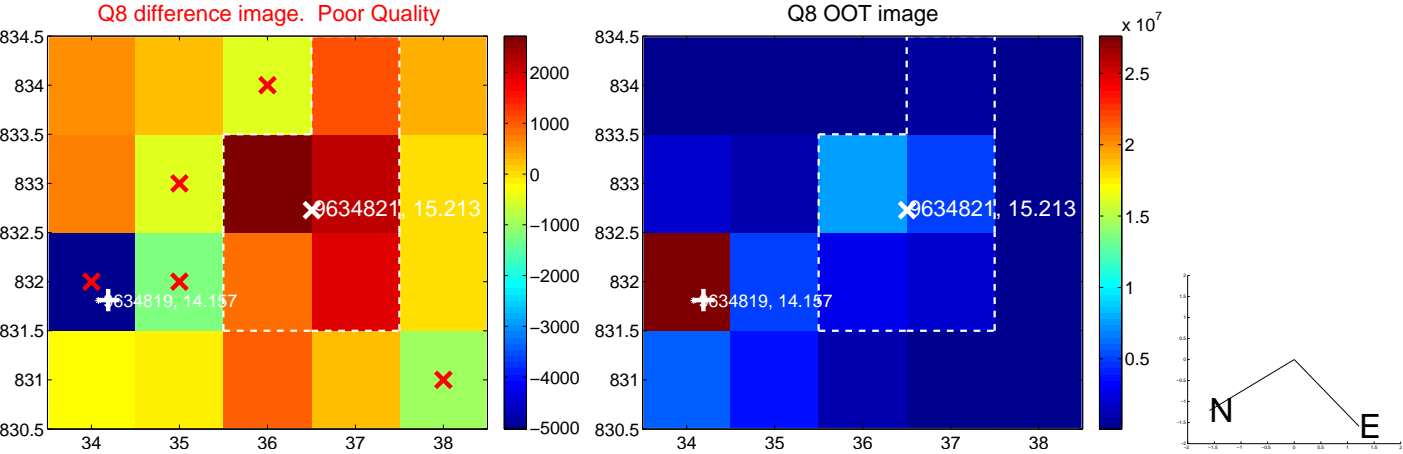
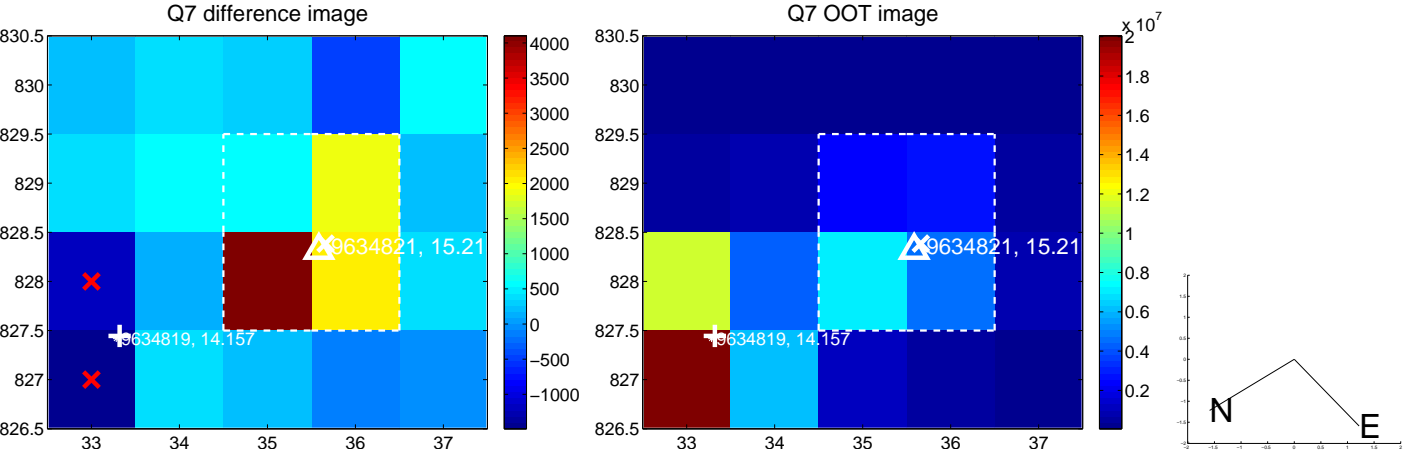
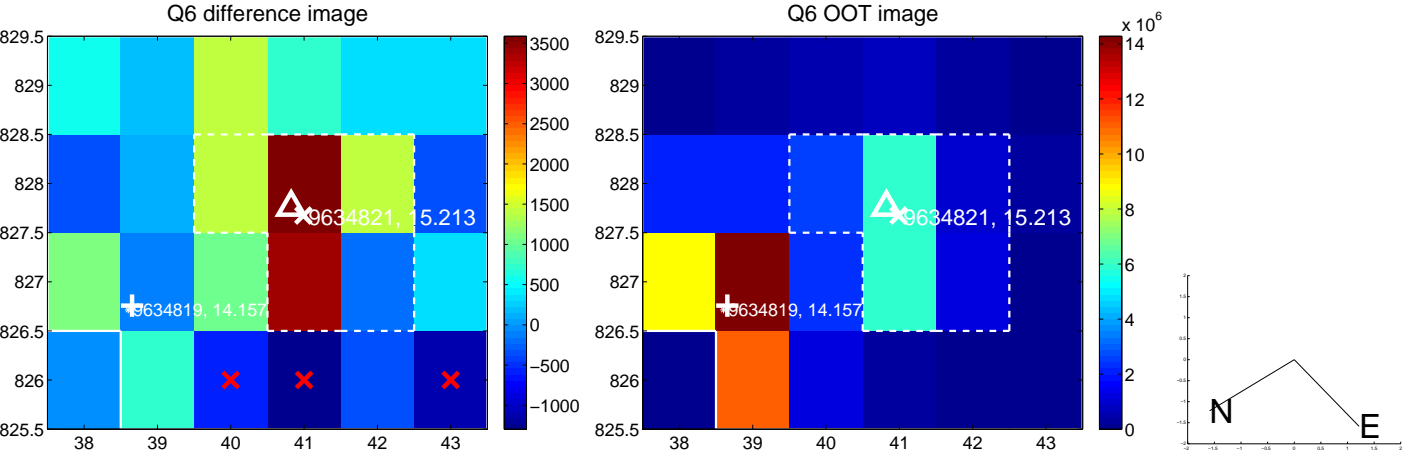
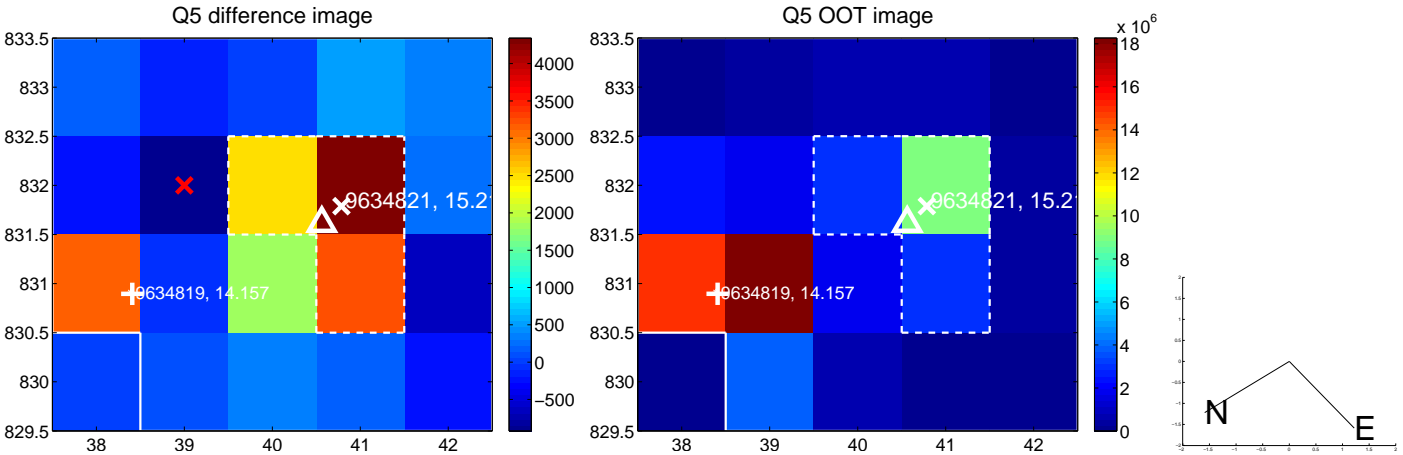


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

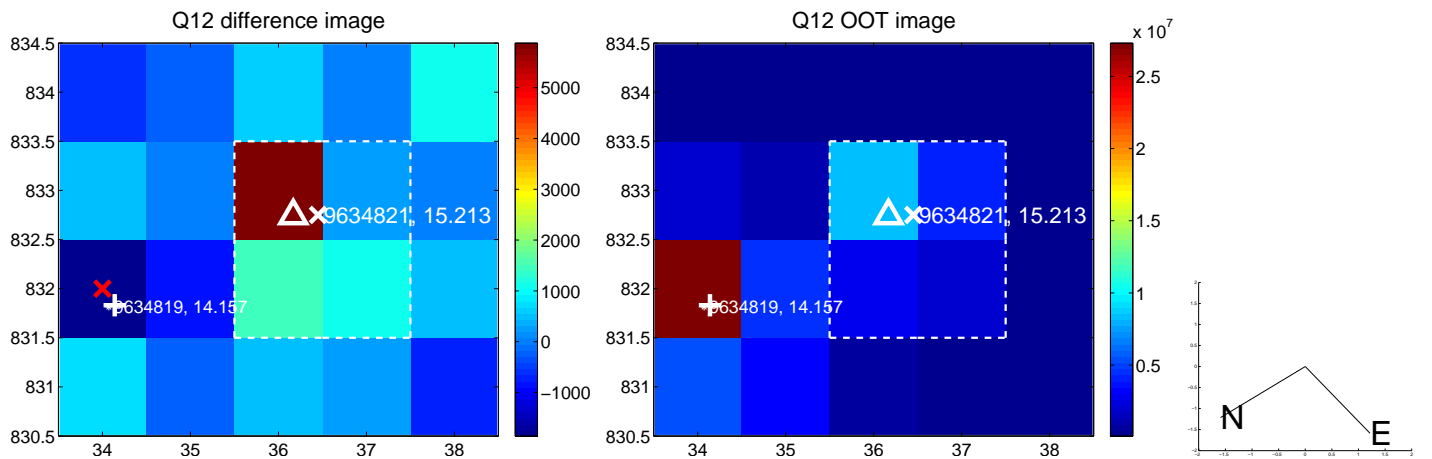
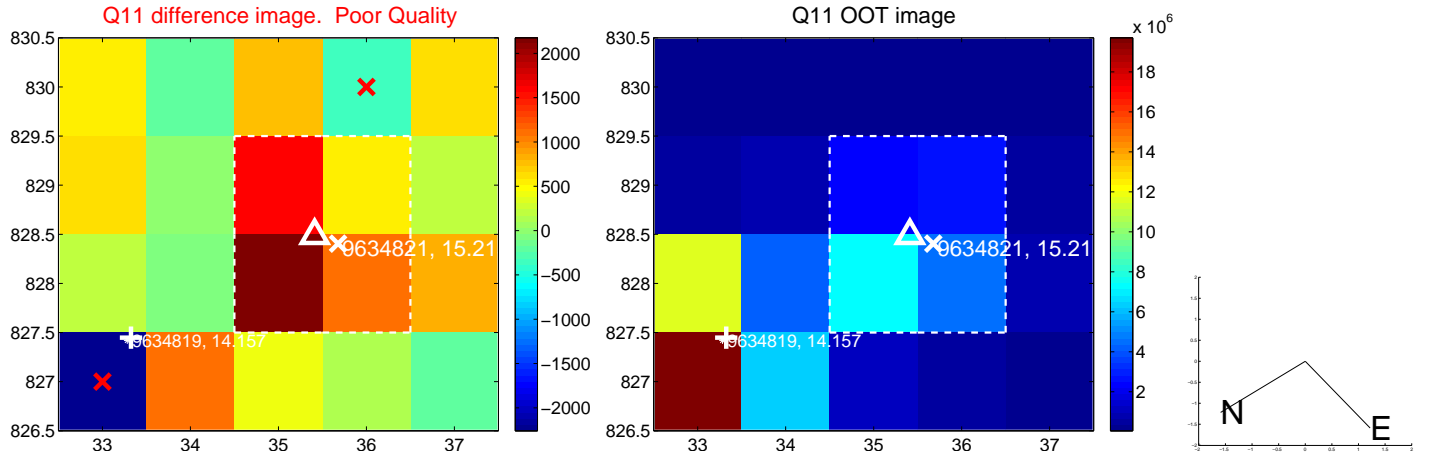
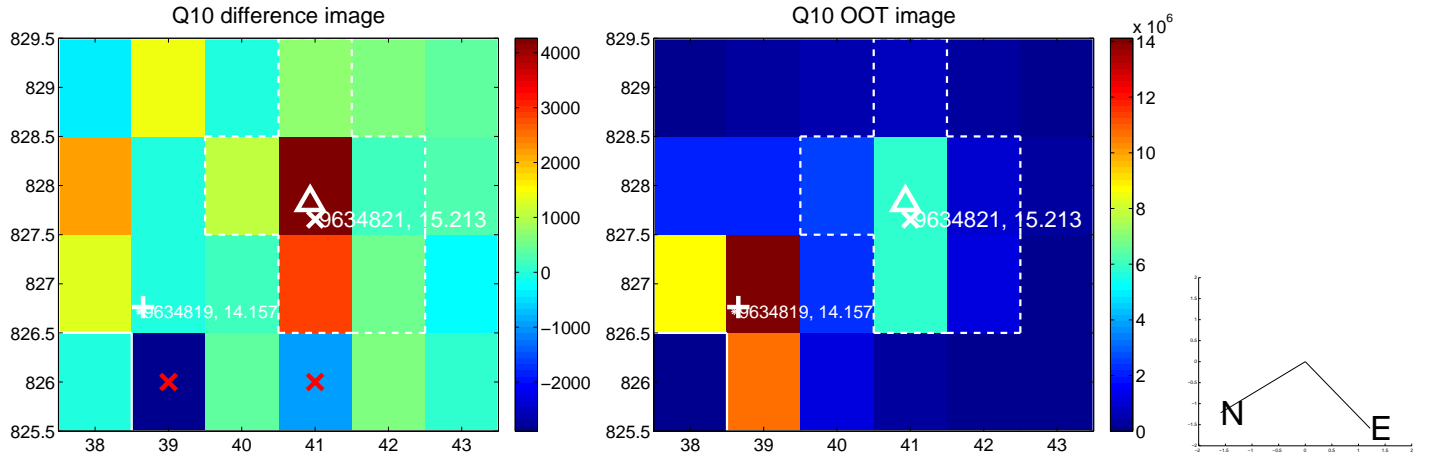
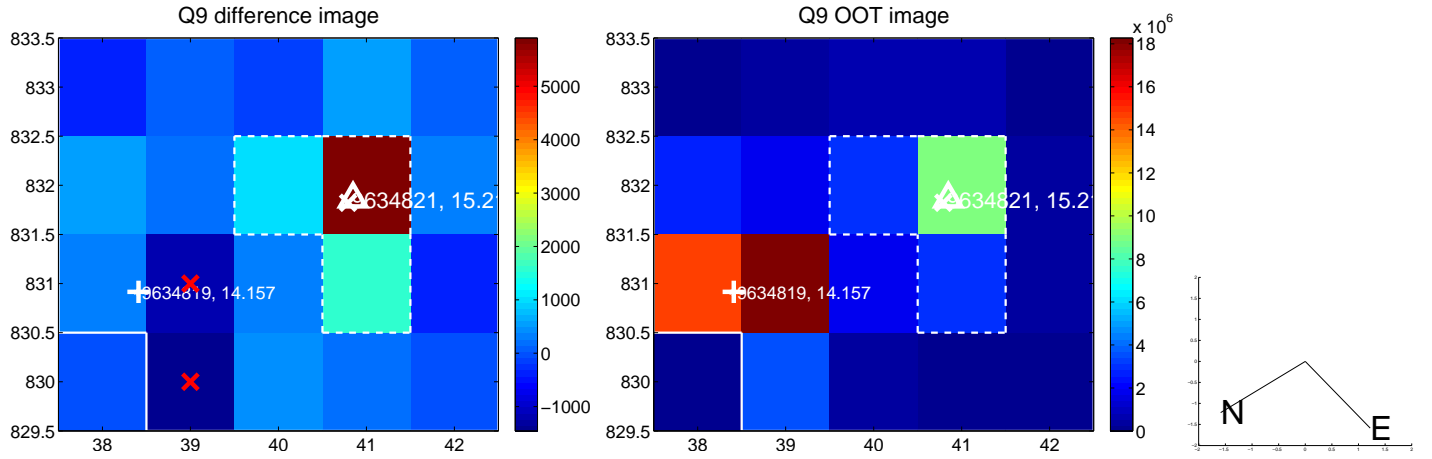
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



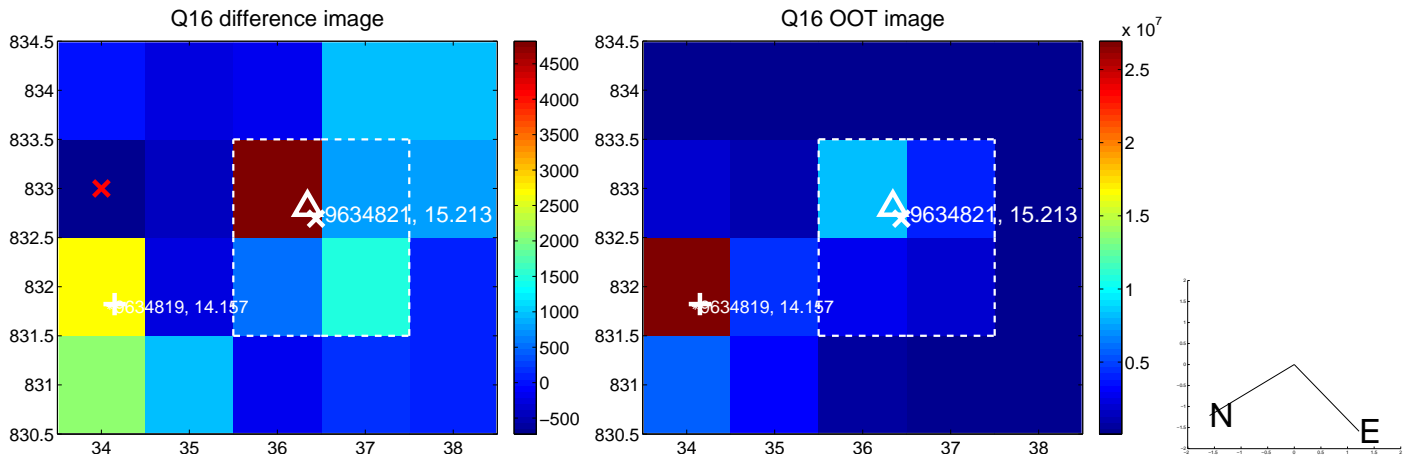
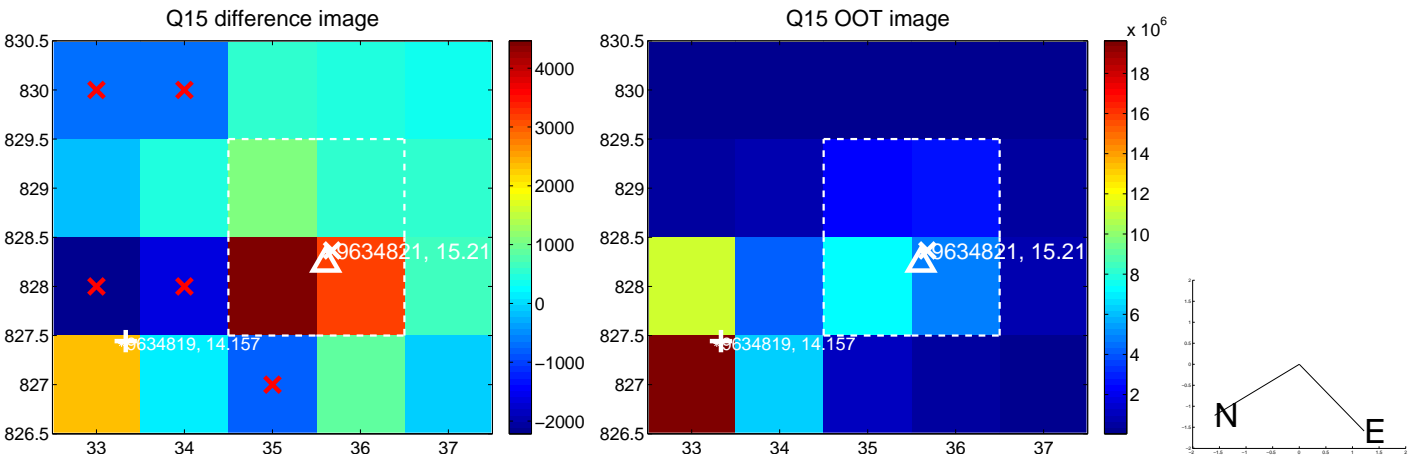
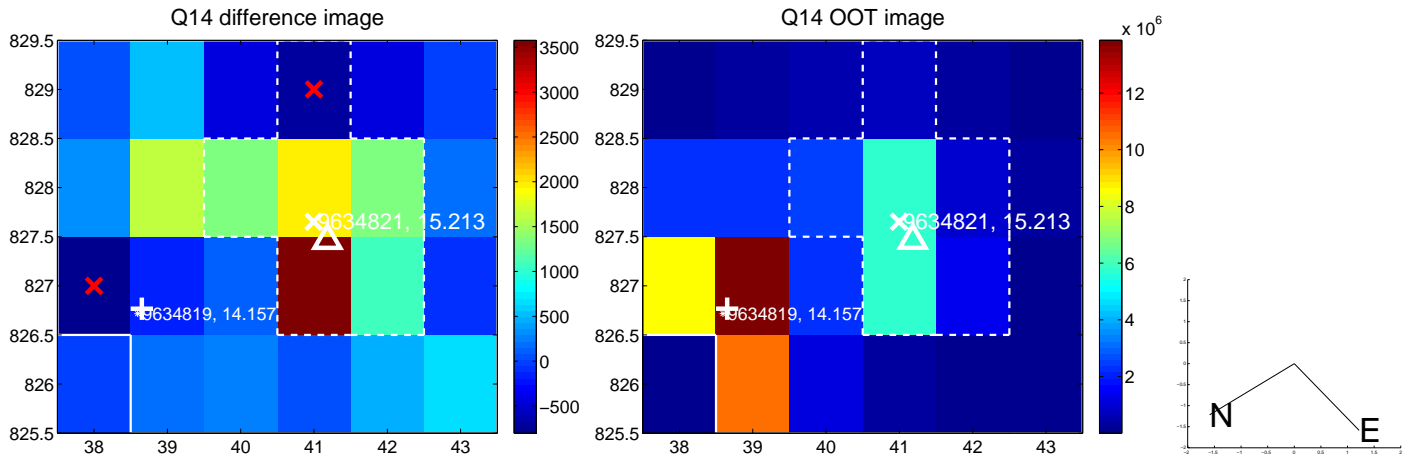
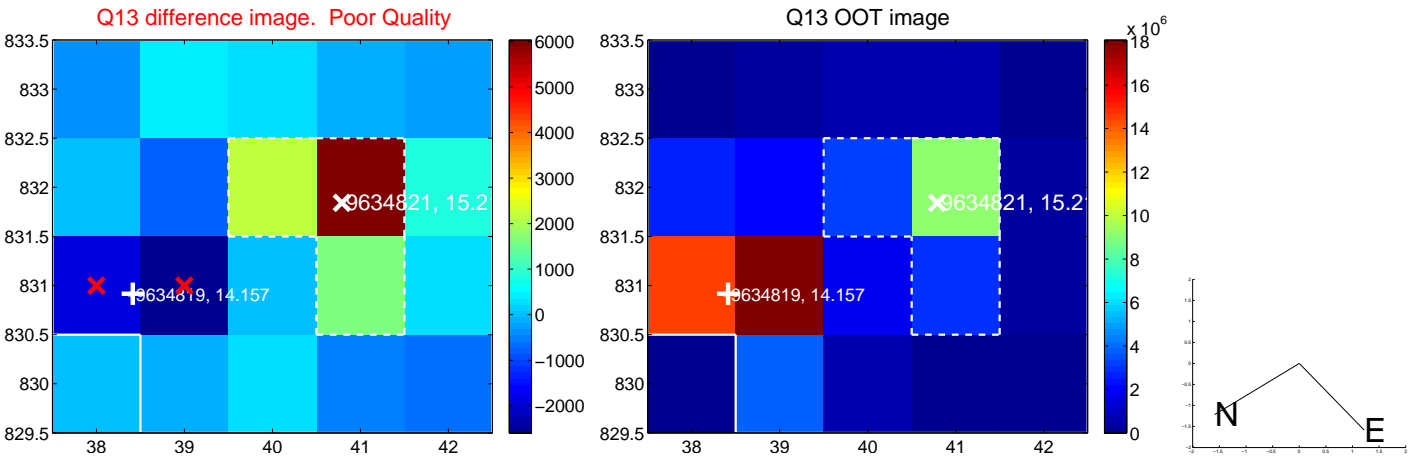
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



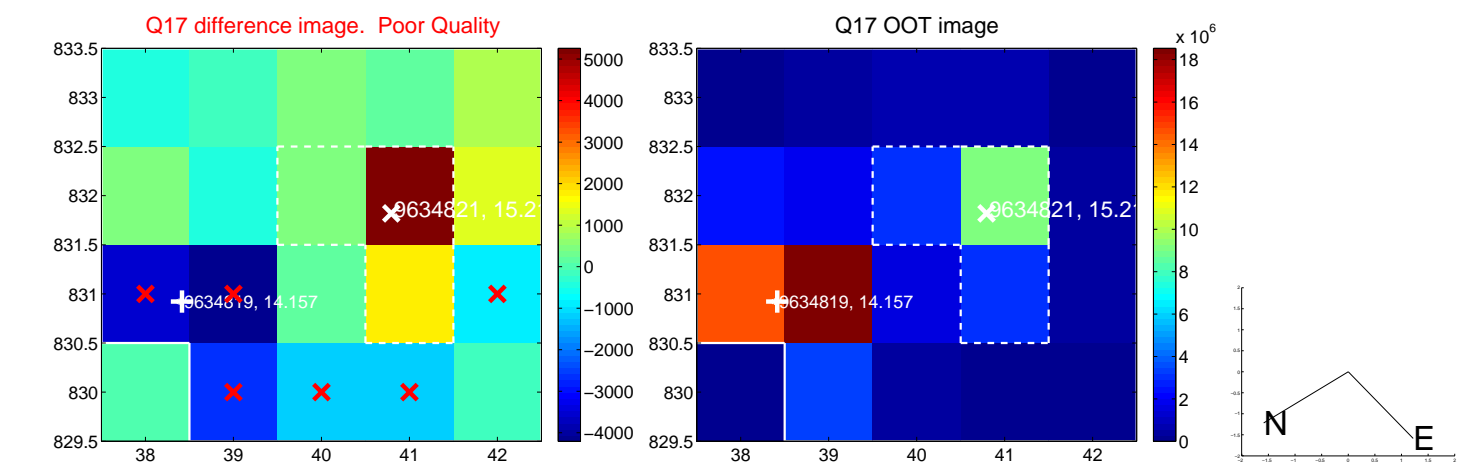
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



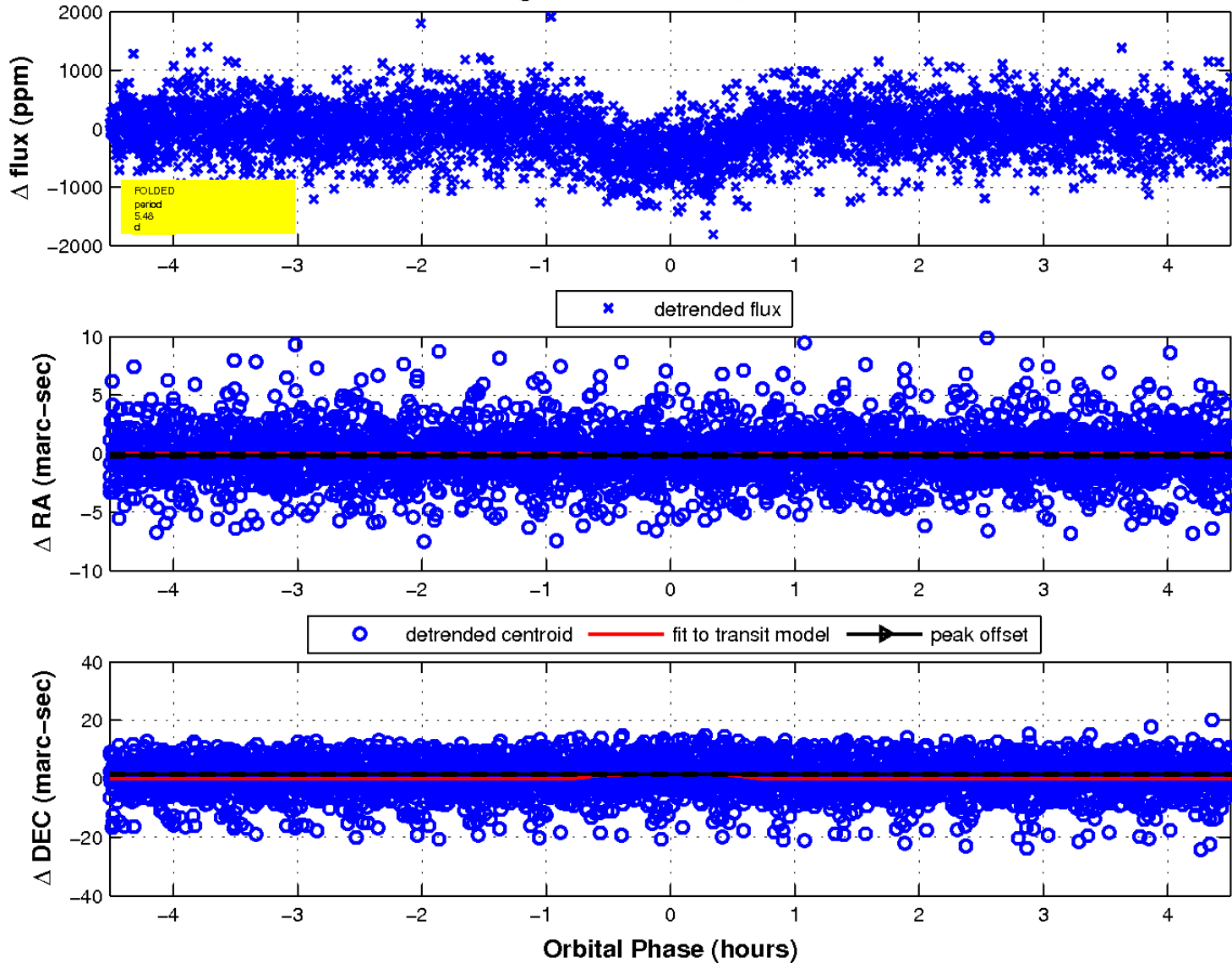
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

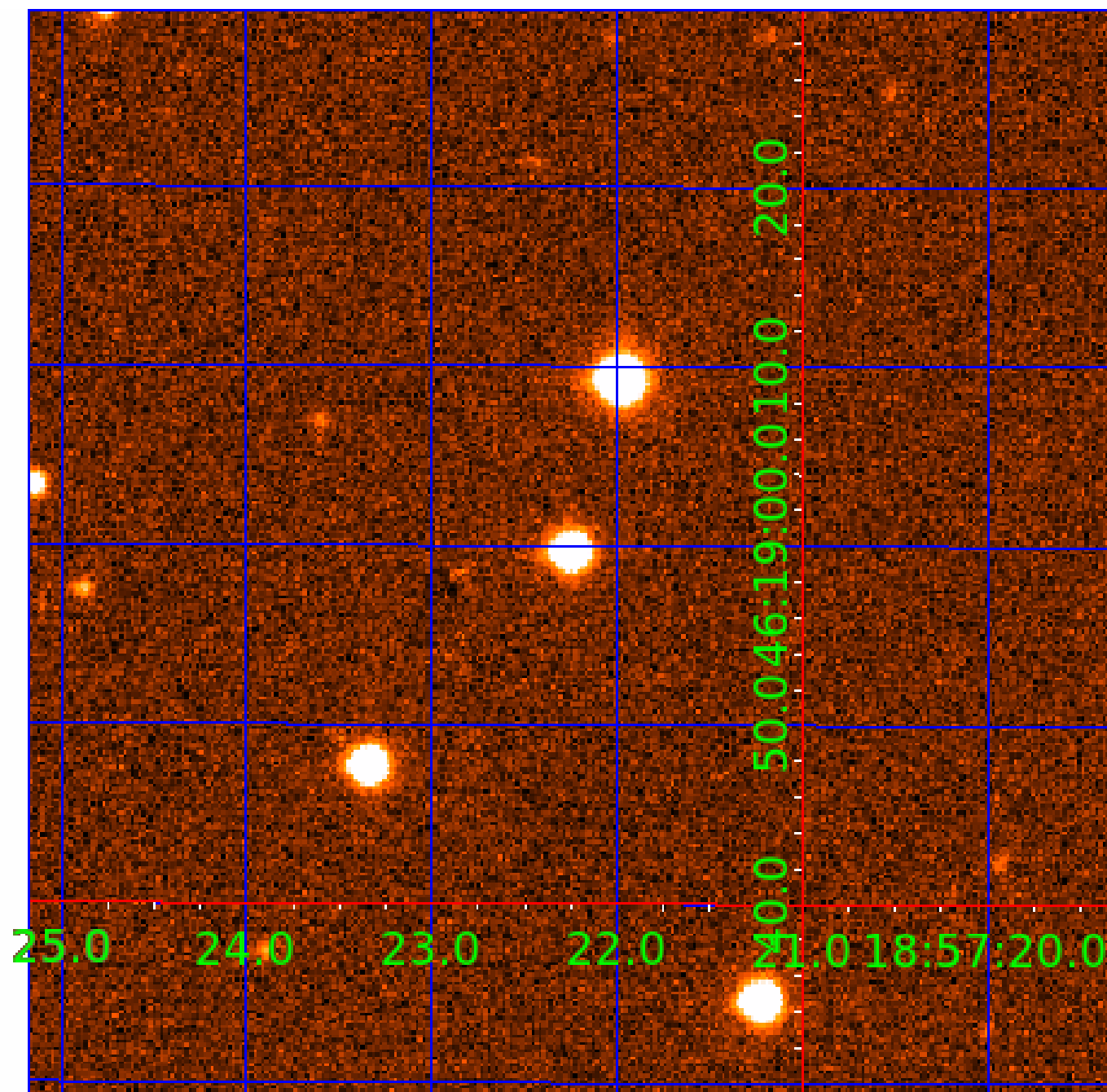


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



KIC 009634821

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})
009634821-01	OBS	2037.01	73.757838	183.722998	1960.2	2.828	29.9	29.0	0.93	5029	4.62	4.67
009634821-02	OBS	2037.02	5.477140	133.765894	565.6	1.503	22.8	26.4	0.93	5029	2.73	149.65
009634821-03	OBS	2037.03	8.562686	132.505869	606.3	1.546	18.7	22.5	0.93	5029	2.84	82.48

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009634821-01	OBS	PC	0.98	0	0	0	0	CENT_KIC_POS
009634821-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009634821-03	OBS	PC	1.00	0	0	0	0	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.

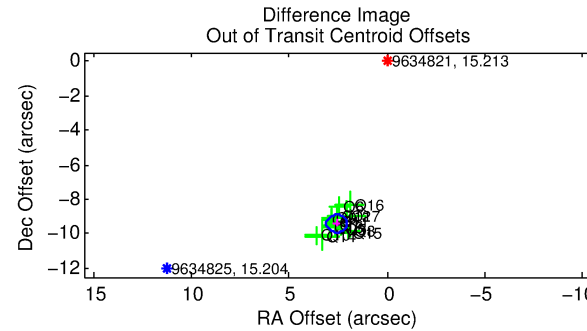
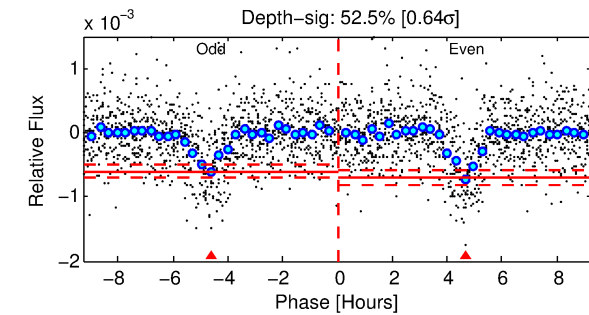
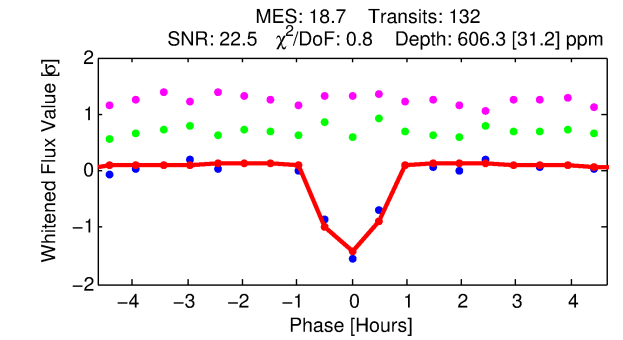
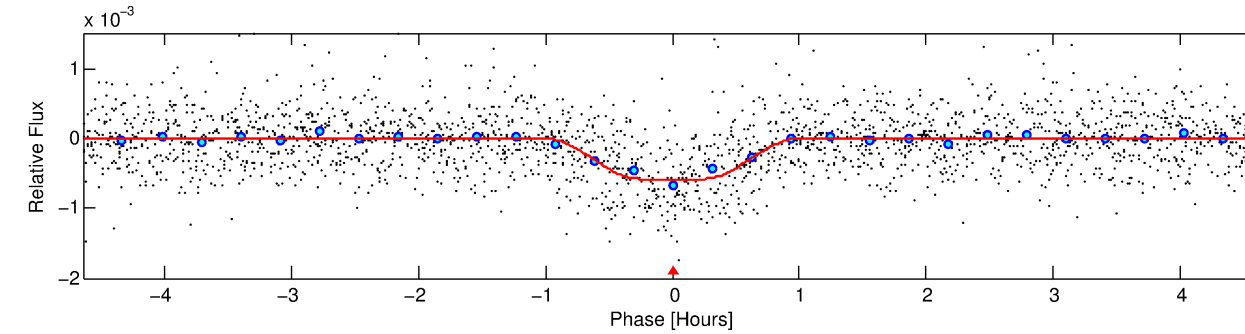
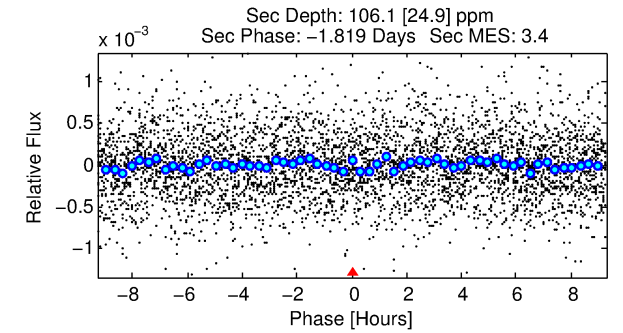
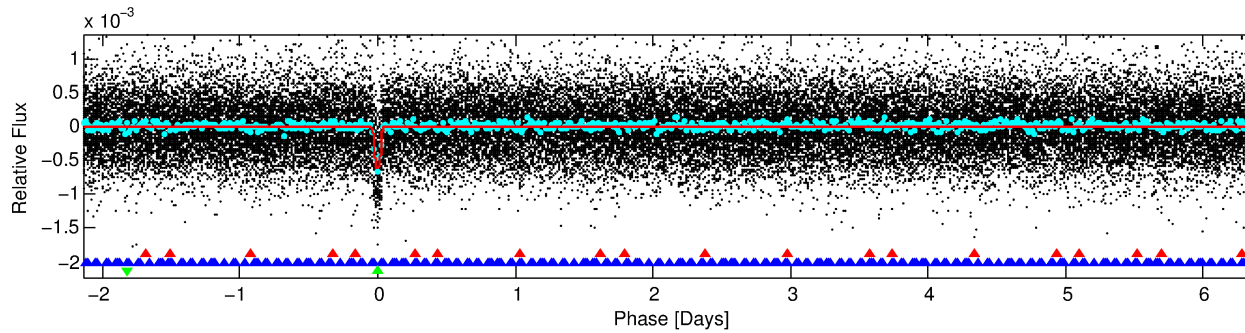
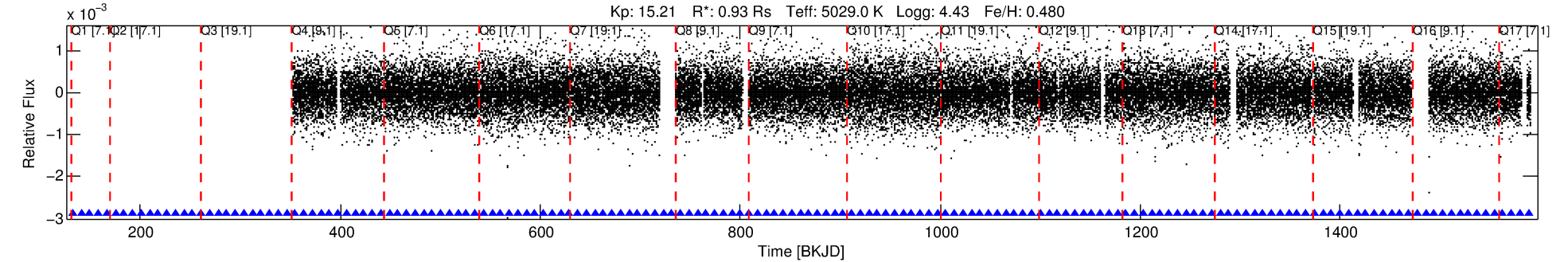
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009634821-03

No Significant Match Found

DV One-Page Summary

KIC: 9634821 Candidate: 3 of 3 Period: 8.563 d
KOI: K02037.03 Corr: 0.969



DV Fit Results:

Period = 8.56269 [0.00002] d
Epoch = 132.5059 [0.0018] BKJD
Rp/R* = 0.0280 [0.0069]
a/R* = 20.55 [19.02]
b = 0.91 [0.19]
Seff = 82.48 [61.17]
Teq = 768 [142] K
Rp = 2.84 [1.63] Re
a = 0.0775 [0.0364] AU
Ag = 43.55 [39.58] [1.08σ]
Teffp = 3052 [433] K [5.01σ]

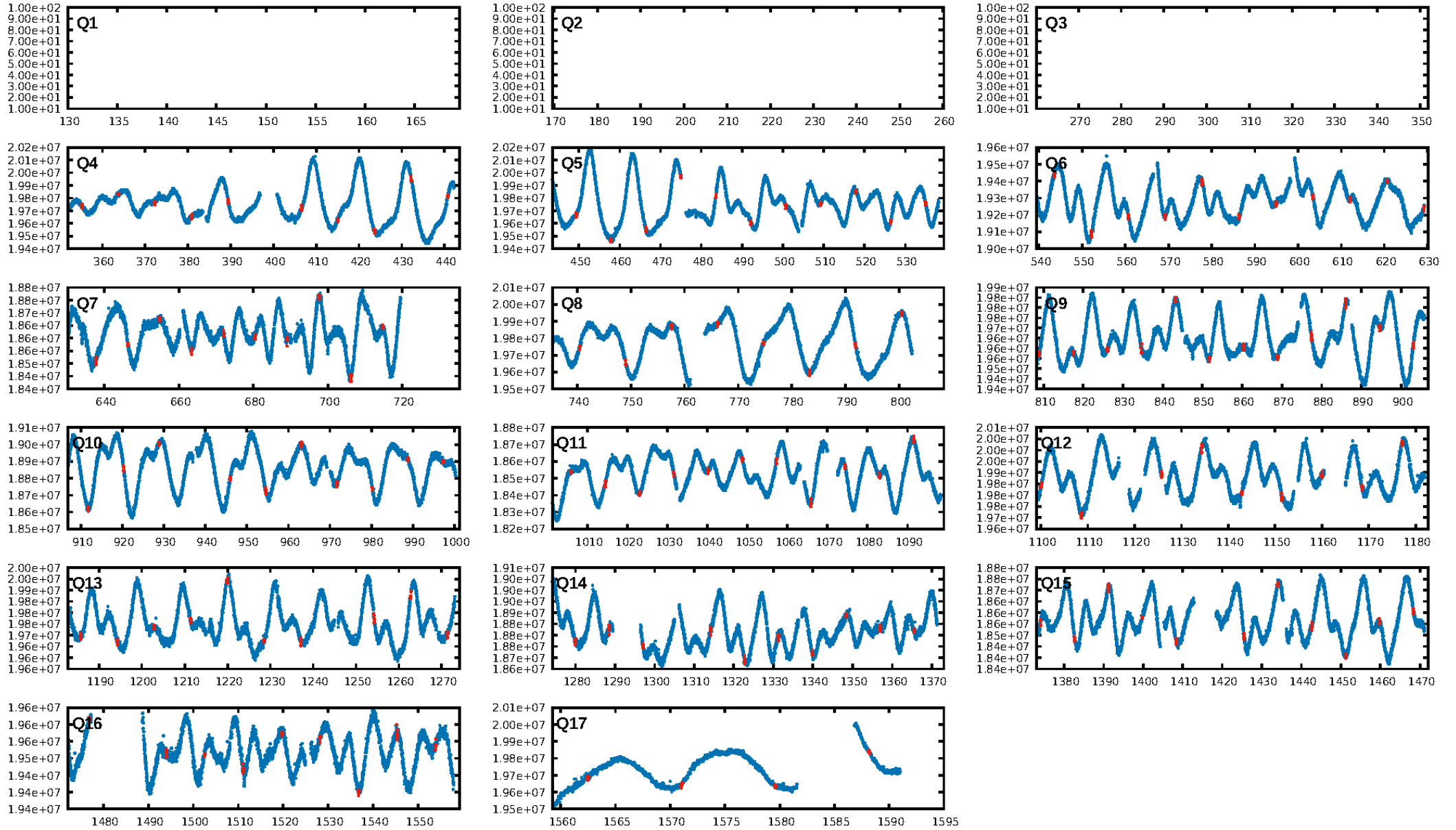
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [34.34σ]
LongPeriod-sig: 100.0% [485.51σ]
ModelChiSquare2-sig: 98.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.49e-74
RollingBand-fgt: 1.00 [128/128]
GhostDiagnostic-chr: 1.75
Centroid-sig: 9.3%
Centroid-so: 2.710 arcsec [5.30σ]
OotOffset-rm: 9.755 arcsec [57.23σ]
KicOffset-rm: 0.278 arcsec [1.60σ]
OotOffset-st: 3/3/4/4 [14]
KicOffset-st: 3/3/4/4 [14]
DiffImageQuality-fgm: 0.71 [10/14]
DiffImageOverlap-fno: 1.00 [14/14]

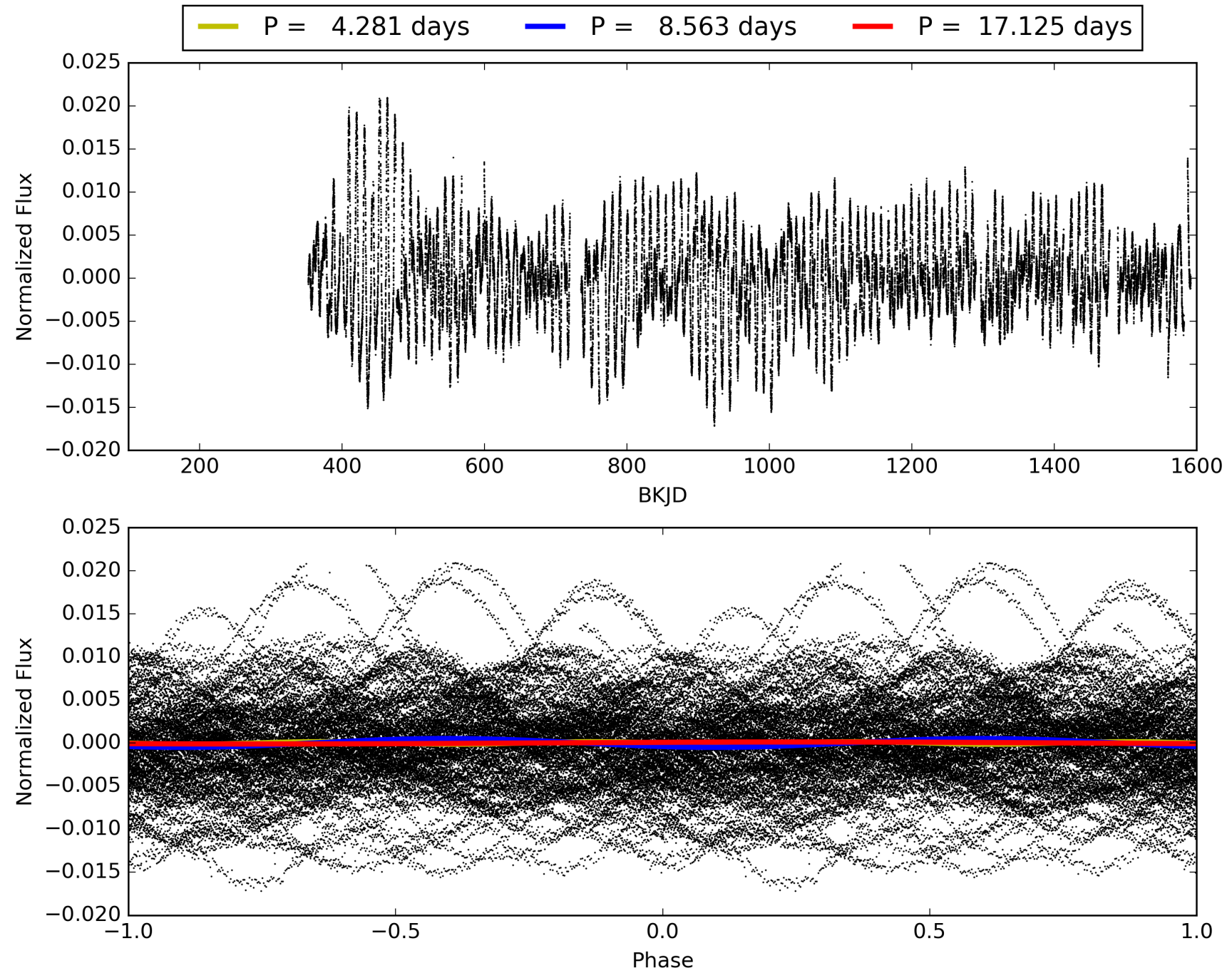
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:30:36 Z

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

TCE 009634821-03, PDC Light Curves

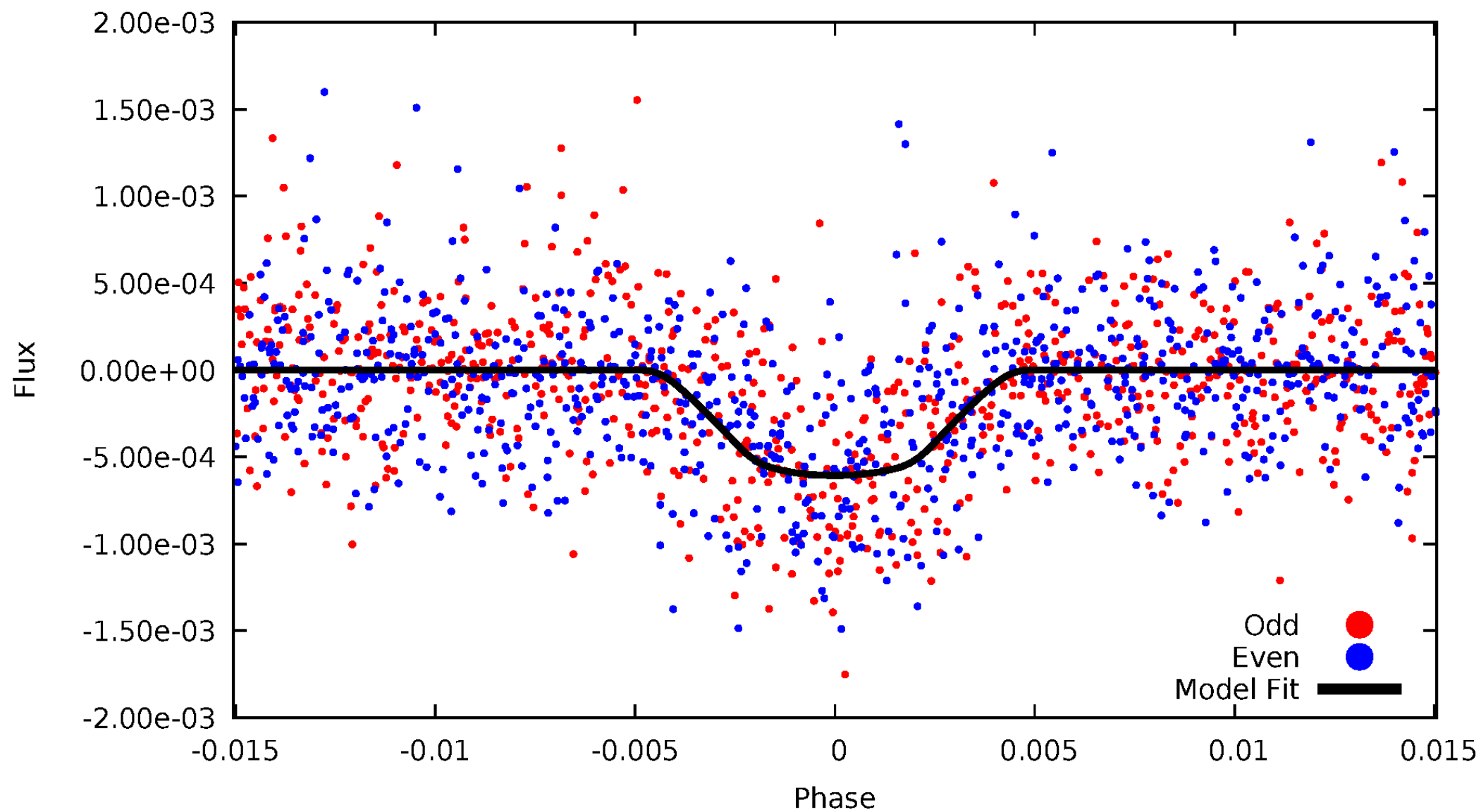


TCE 009634821-03



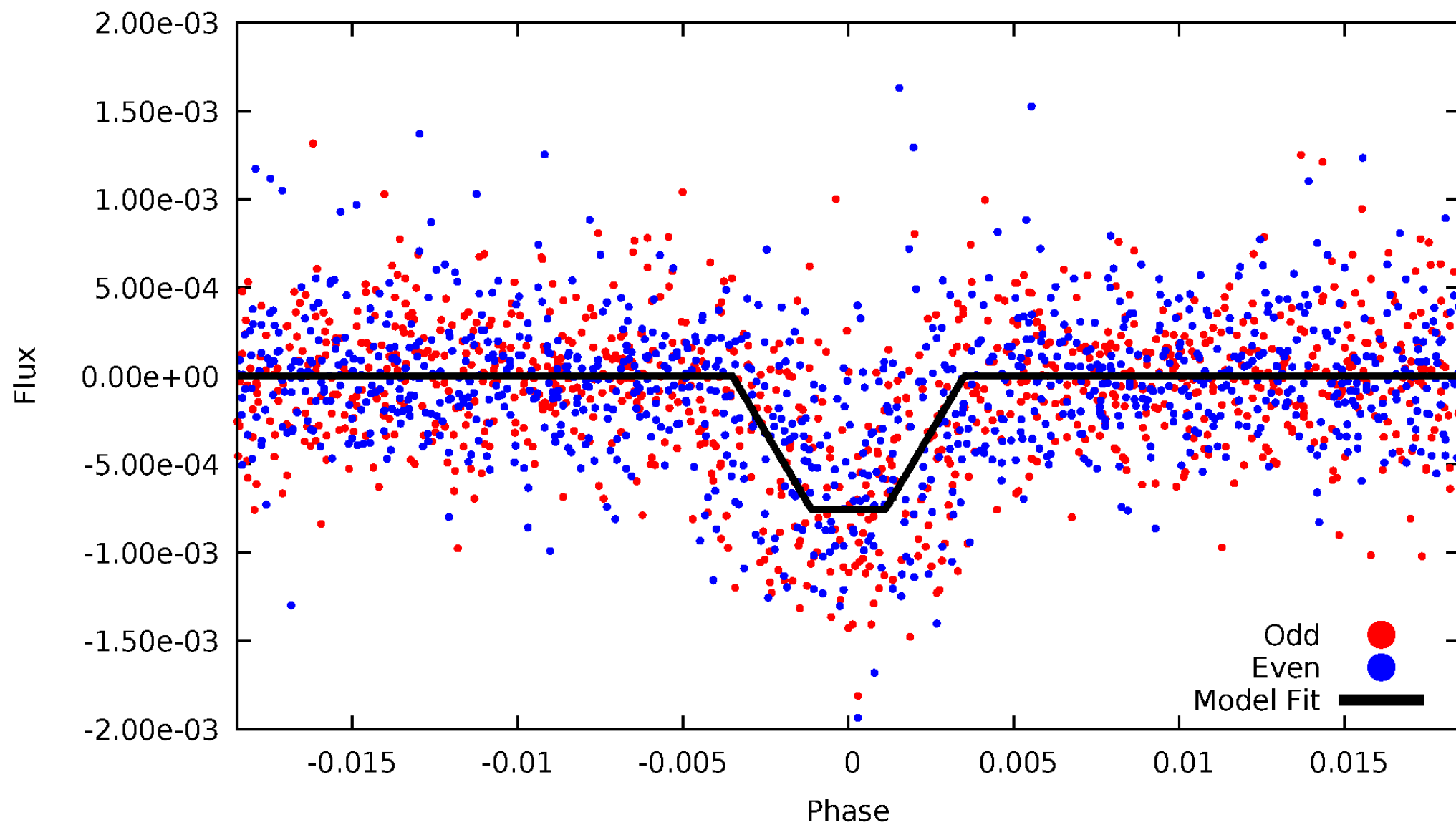
DV Odd/Even

TCE 009634821-03



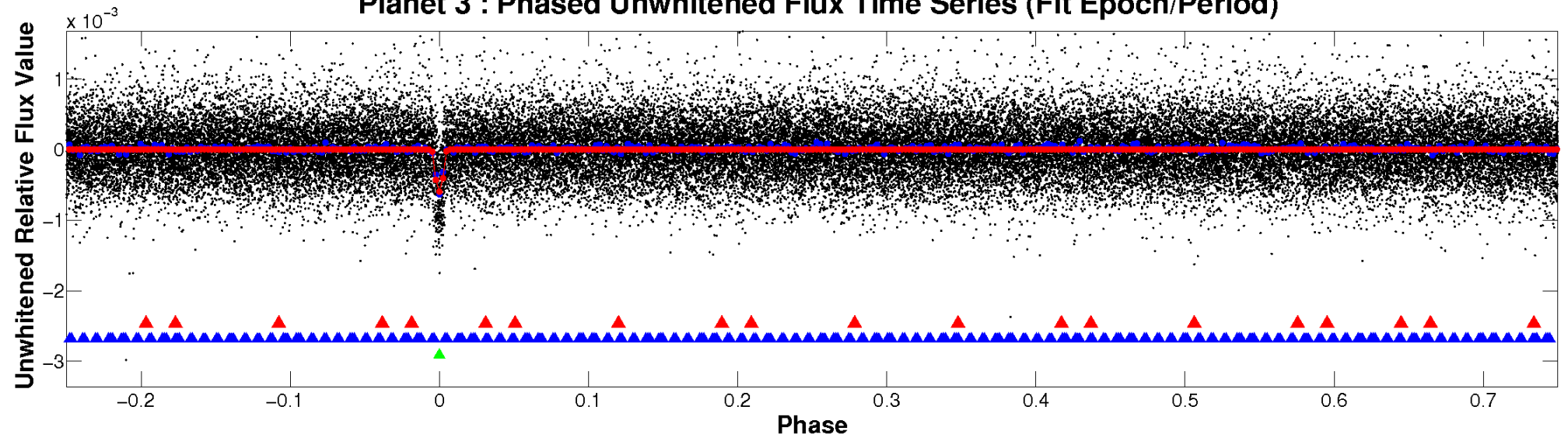
ALT Odd/Even

TCE 009634821-03

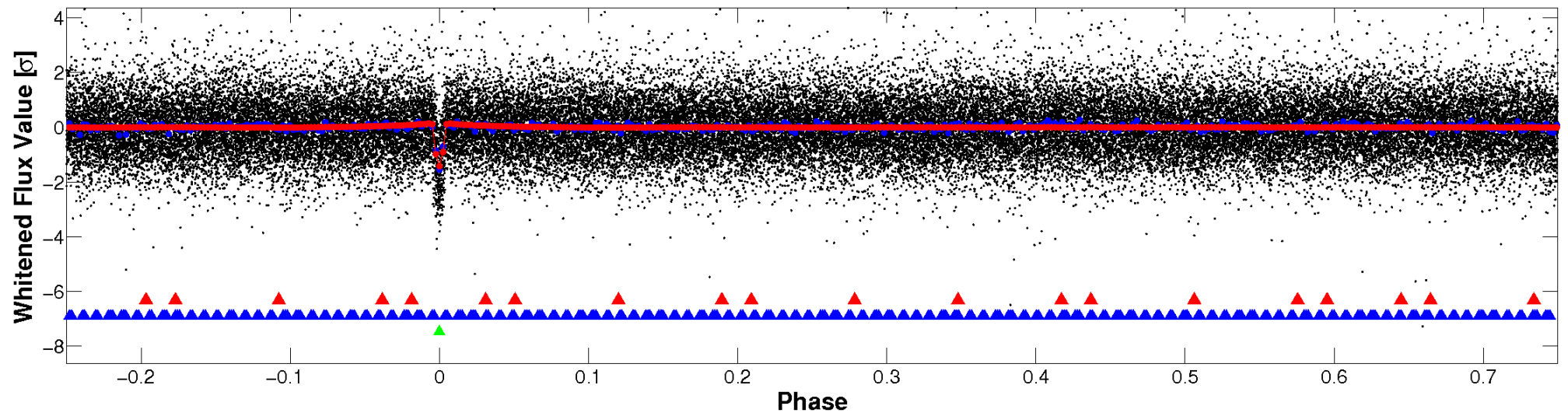


Non-Whitened Vs. Whitened Light Curve

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

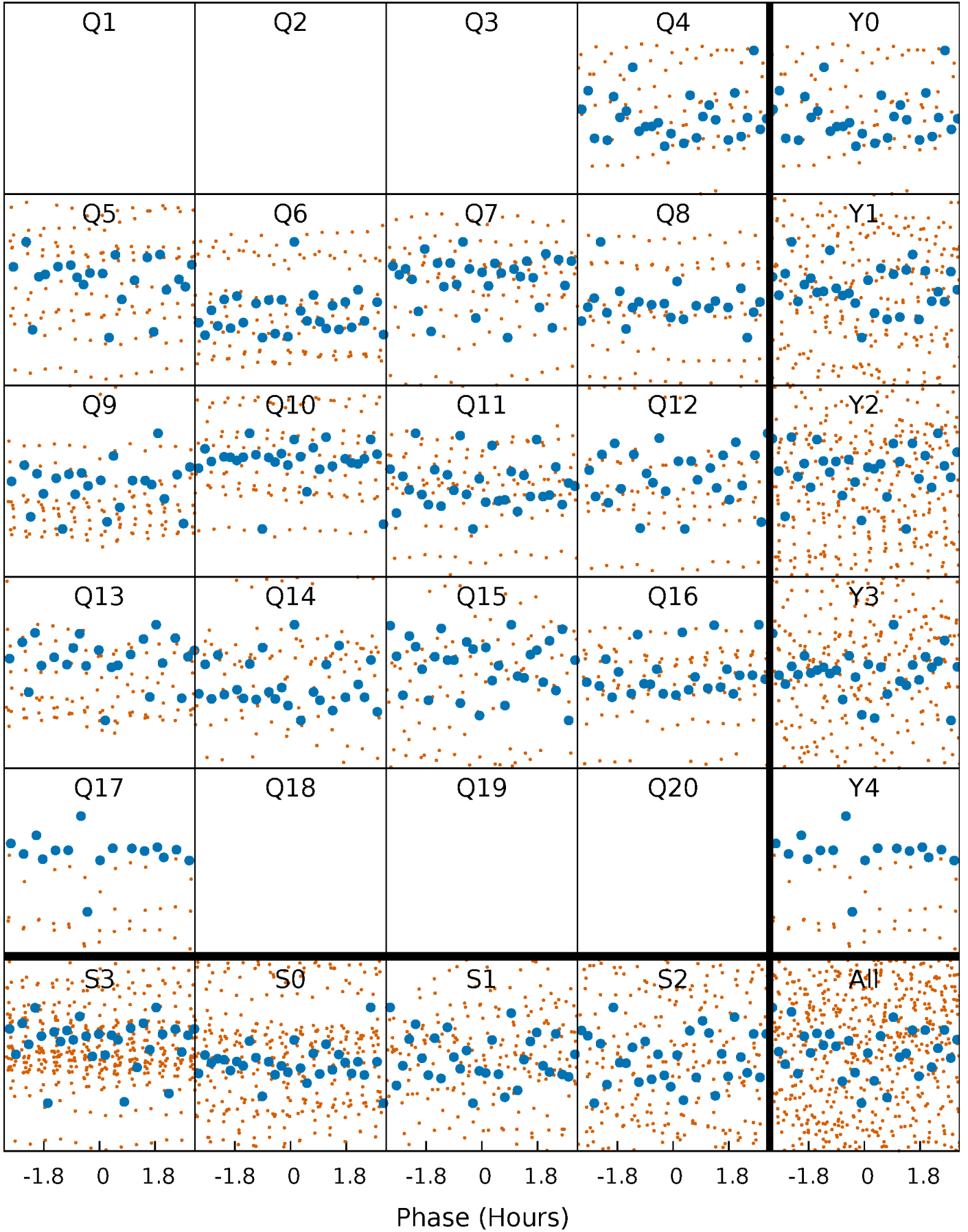


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



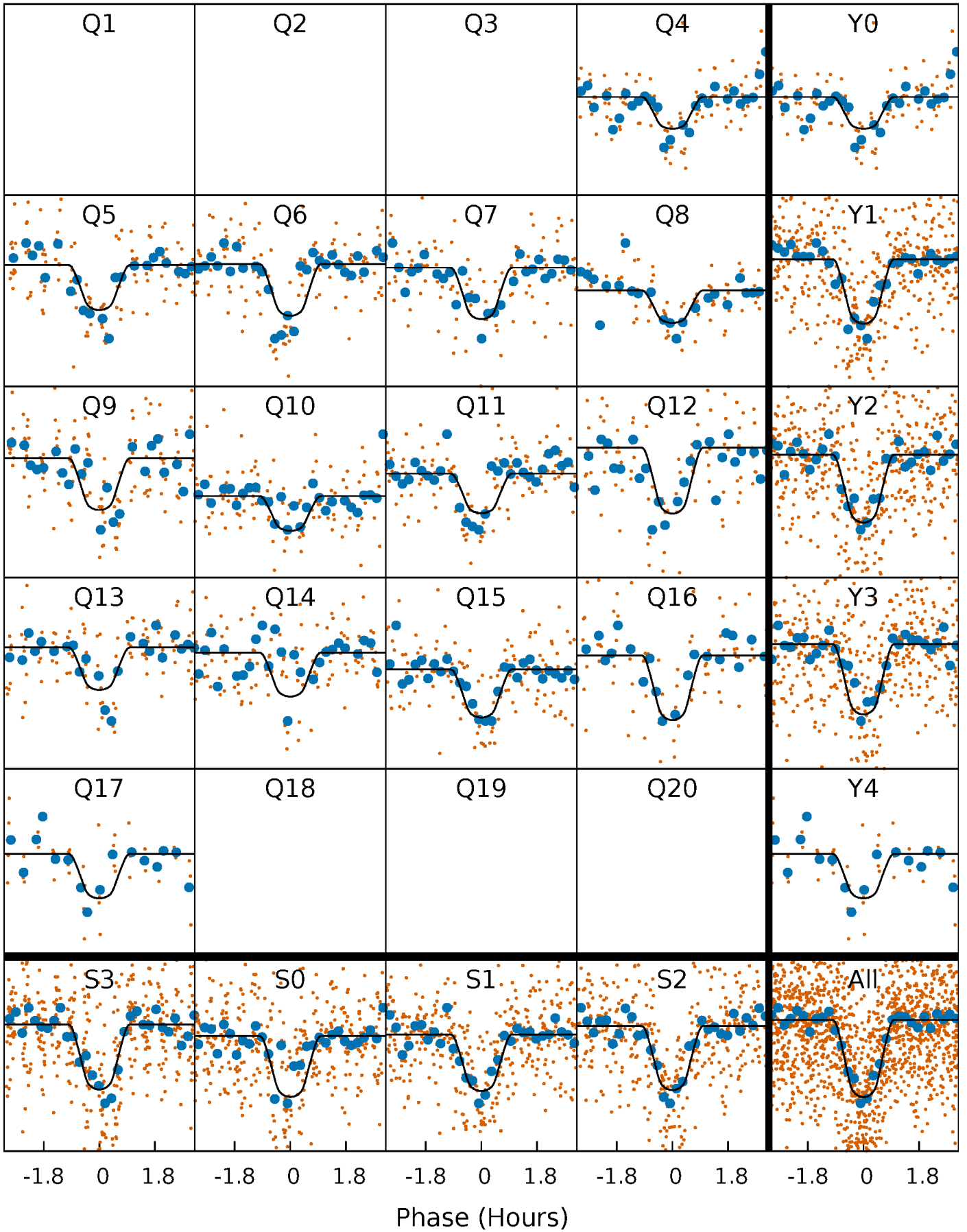
PDC Quarter-Phased Transit Curves

TCE 009634821-03 P= 8.562686 Days $T_0=132.505869$ (BKJD)



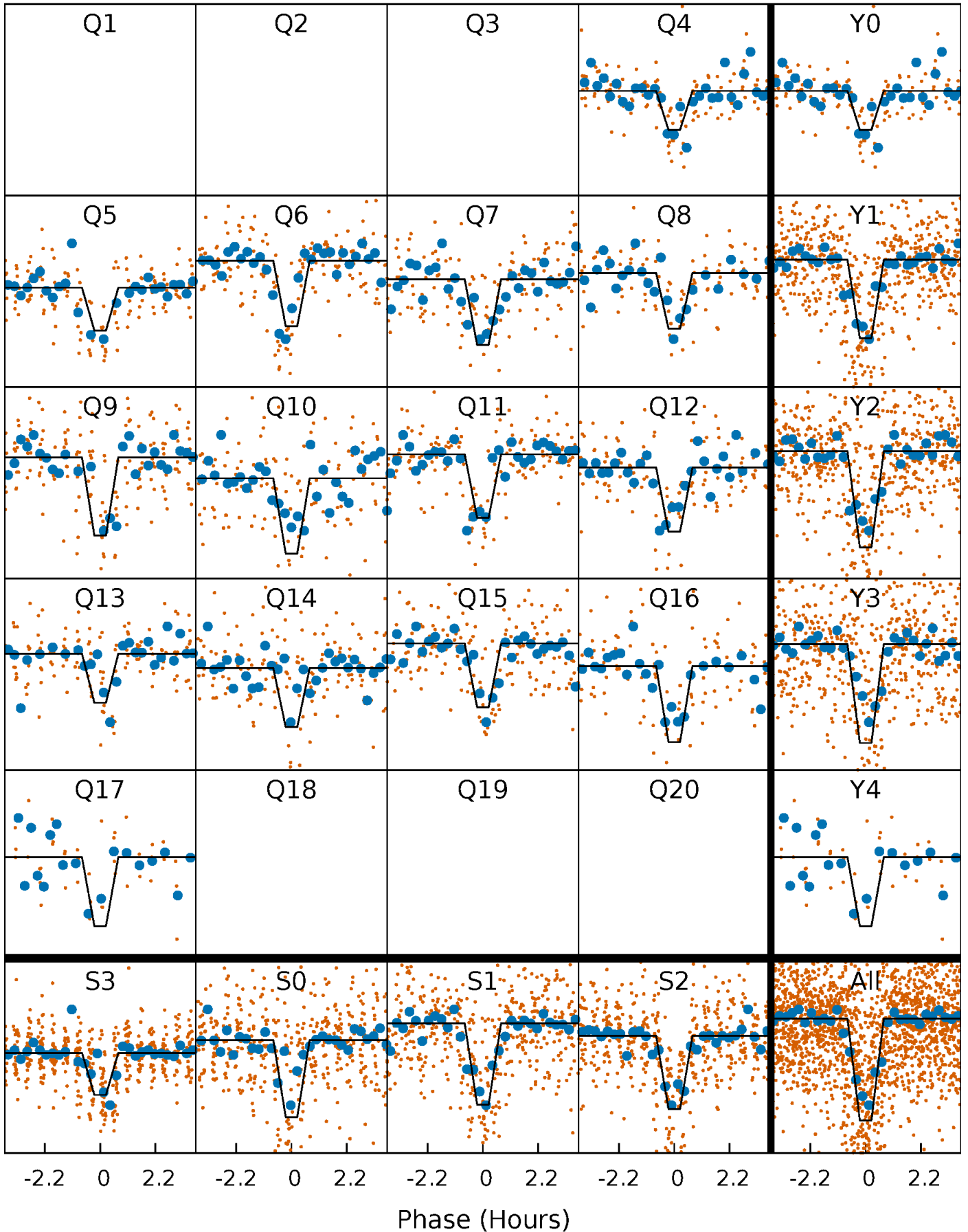
DV Quarter-Phased Transit Curves

TCE 009634821-03 P= 8.562686 Days $T_0=132.505869$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

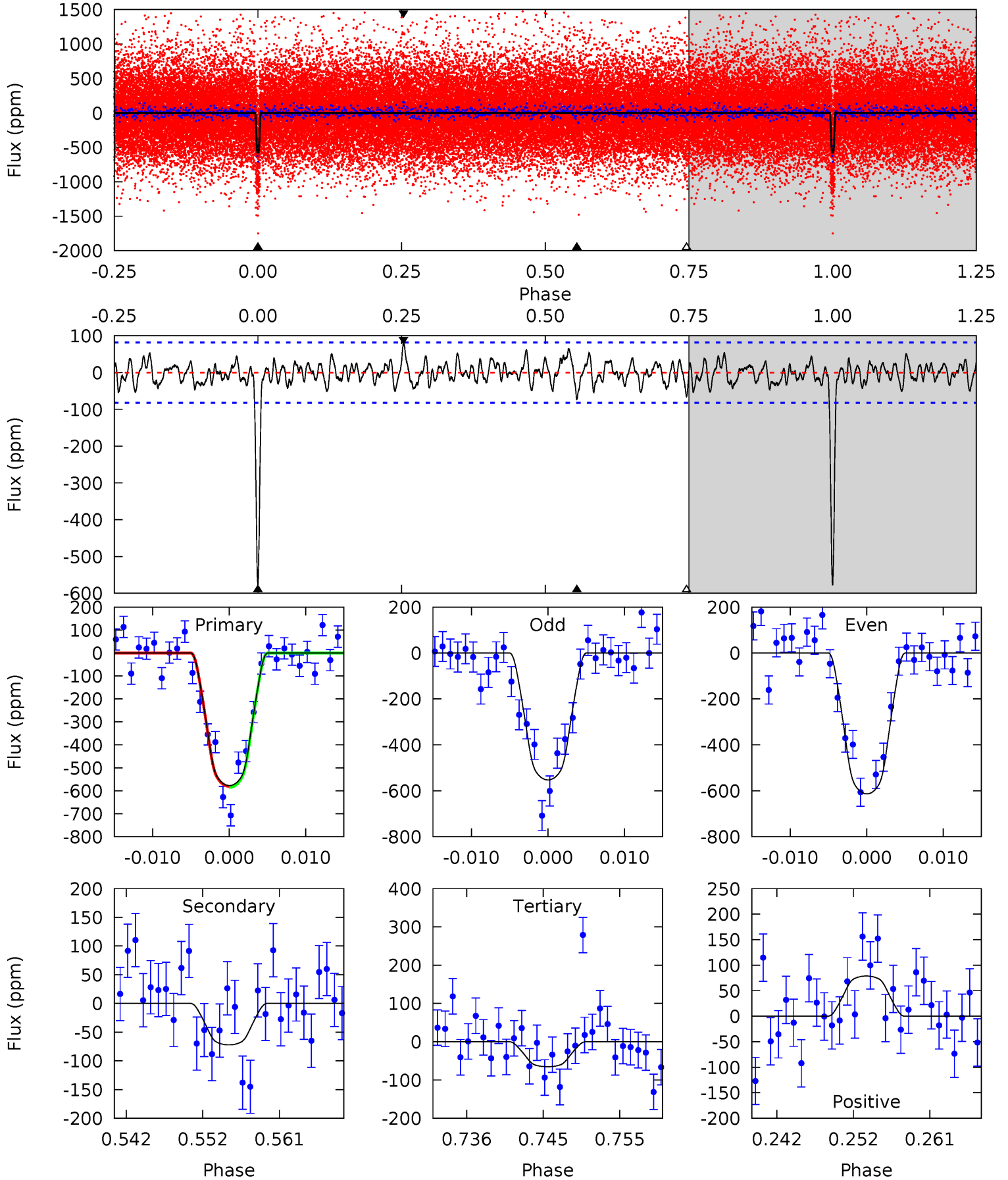
TCE 009634821-03 P= 8.562657 Days $T_0=132.507351$ (BKJD)



DV Model-Shift Uniqueness Test

009634821-03, P = 8.562686 Days, E = 132.505869 Days

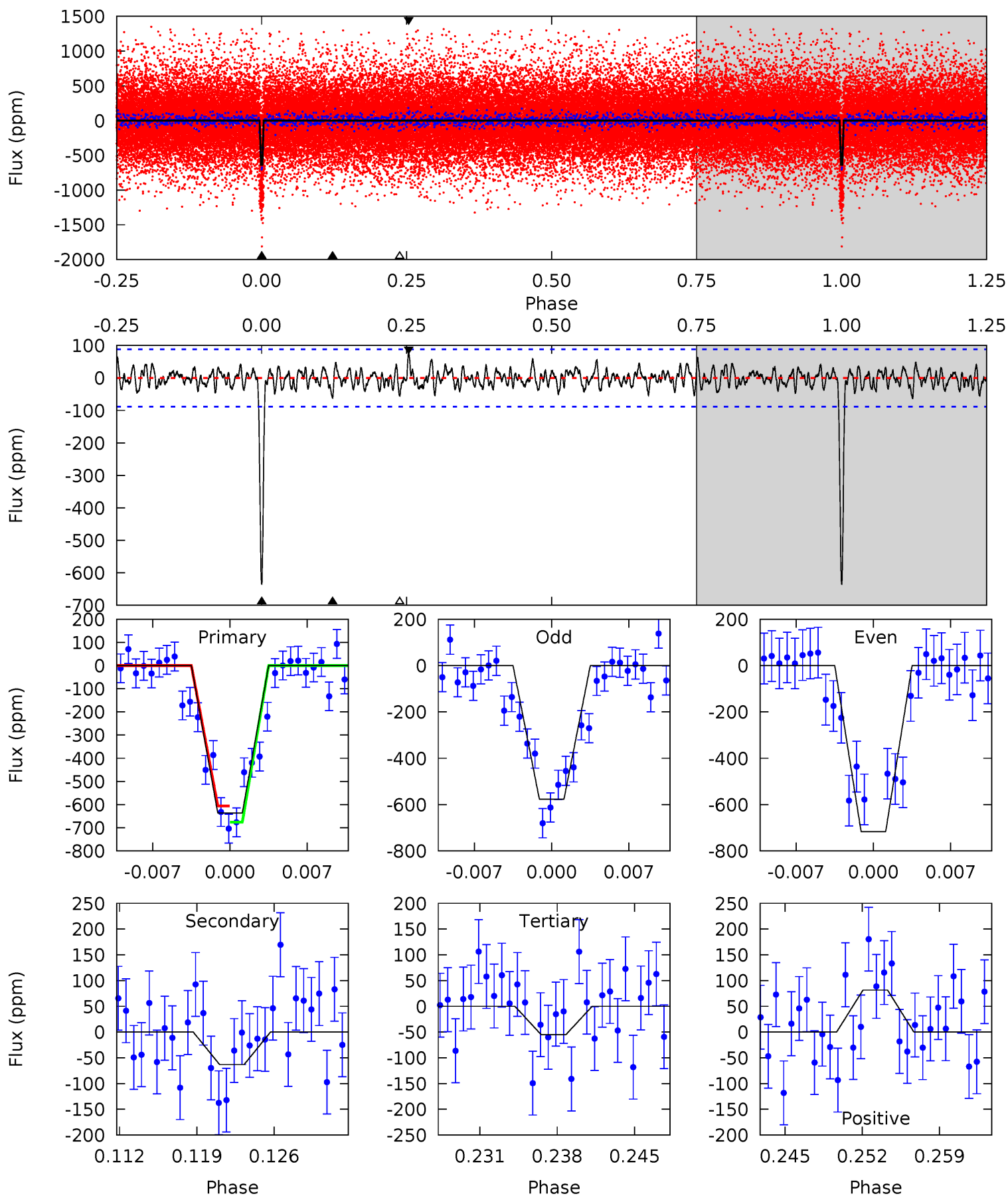
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.4	4.42	4.00	4.83	5.03	2.59	1.47	31.4	30.6	0.42	-0.40	1.86	0.92	0.12	0.14



Alt Model-Shift Uniqueness Test

009634821-03, P = 8.562657 Days, E = 132.507351 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.7	3.63	3.19	4.70	5.09	2.70	1.22	33.5	32.0	0.45	-1.06	4.04	0.97	0.11	2.03



Stellar Parameters For KIC 009634821

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5029^{+192}_{-174}	$4.429^{+0.130}_{-0.416}$	$0.480^{+0.050}_{-0.250}$	$0.930^{+0.481}_{-0.144}$	$0.847^{+0.068}_{-0.049}$	$1.485^{+0.860}_{-1.111}$
	+4%/-3%	+3%/-9%	+10%/-52%	+52%/-15%	+8%/-6%	+58%/-75%
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 009634821-03 / KOI 2037.03

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-72 ± 16	$3.09^{+1.00}_{-0.90}$	1105^{+146}_{-75}	3322^{+308}_{-282}	26^{+26}_{-12}
Alt.	-63 ± 17	$2.98^{+1.04}_{-0.81}$	1104^{+146}_{-82}	3222^{+344}_{-238}	23^{+23}_{-11}

T_{max} = Theoretical Maximum Planetary Temperature

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

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

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

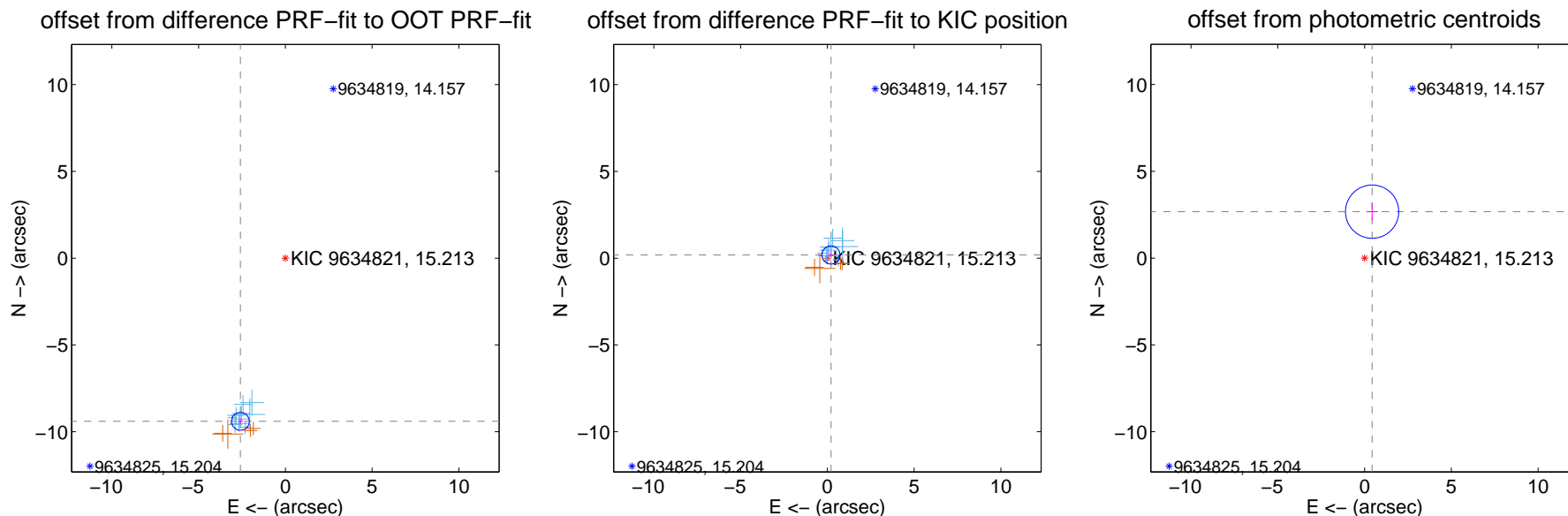
DV Centroid Data

Supplemental centroid analysis for 009634821-03. Kepler magnitude: 15.21. Transit SNR 22.51

There are 10 quarters with good PRF difference image offsets

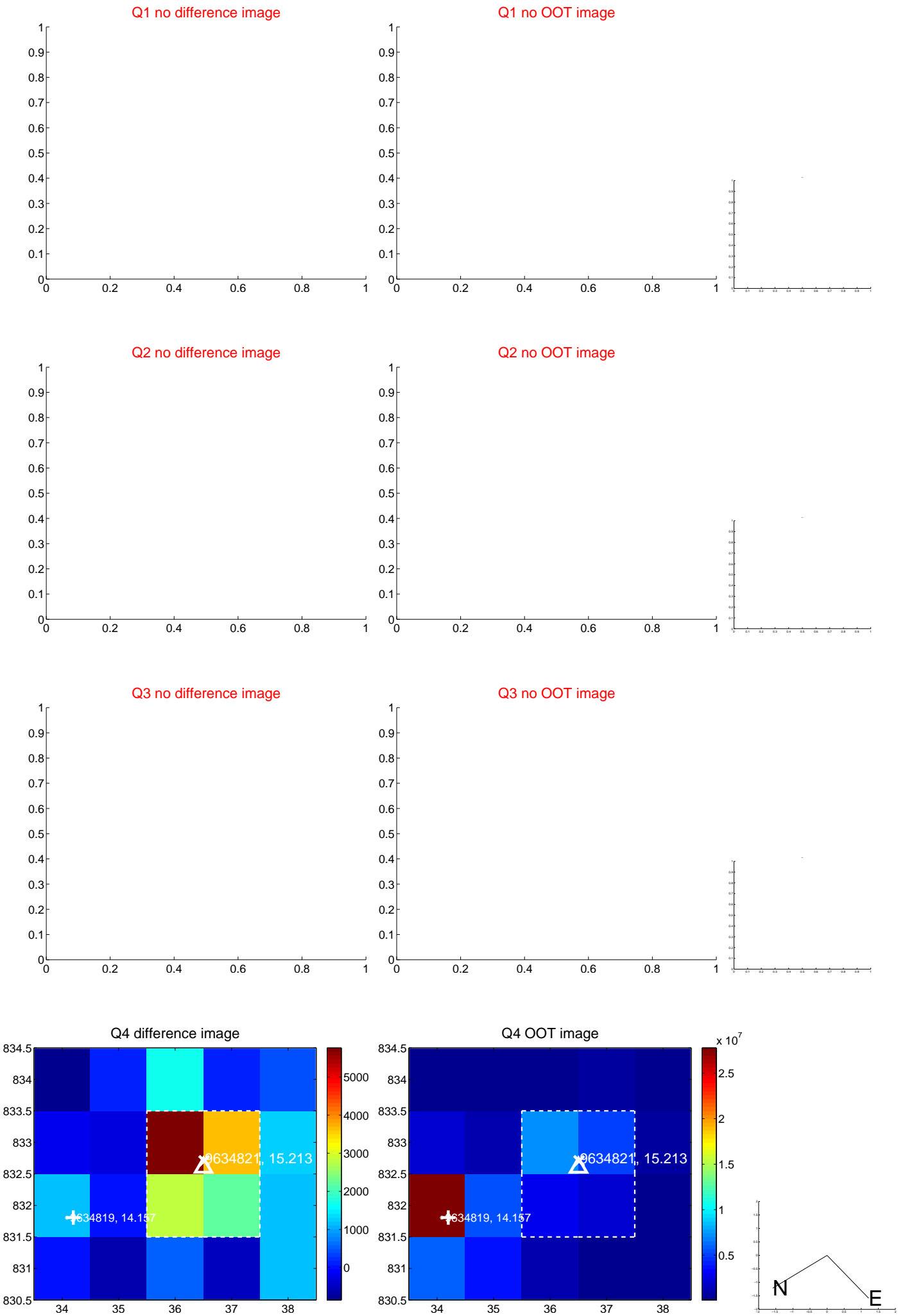
The OOT PRF centroid is offset from the target star catalog position by about 10.11 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.755 ± 0.170	57.23	2.592 ± 0.155	-9.404 ± 0.159
PRF-fit source offset from KIC position	0.278 ± 0.174	1.60	-0.210 ± 0.147	0.181 ± 0.159
photometric centroid source offset	2.71 ± 0.51	5.30	-0.44 ± 0.33	2.67 ± 0.52

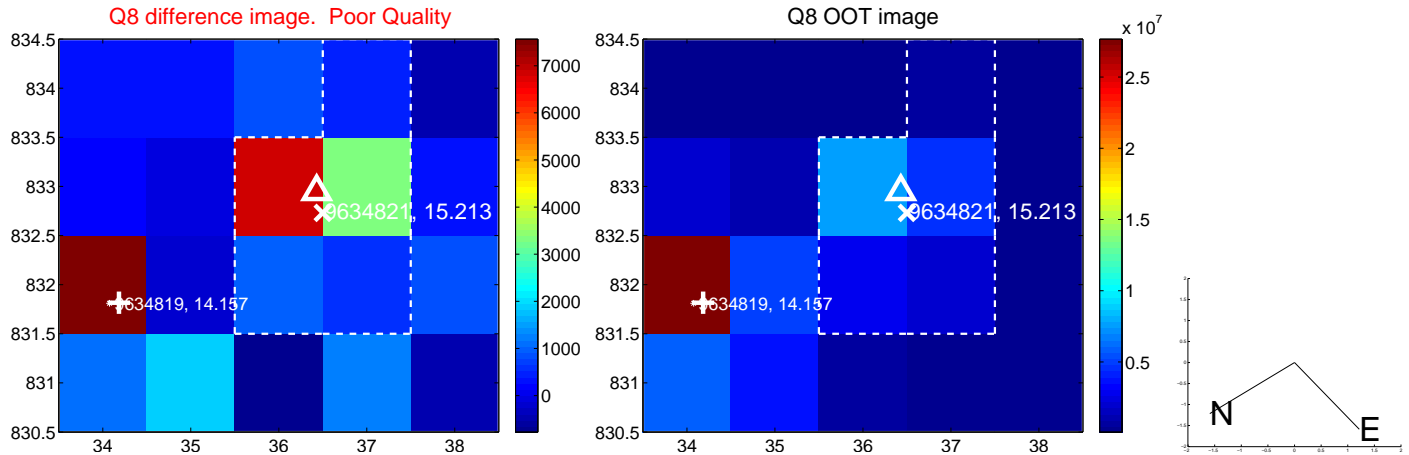
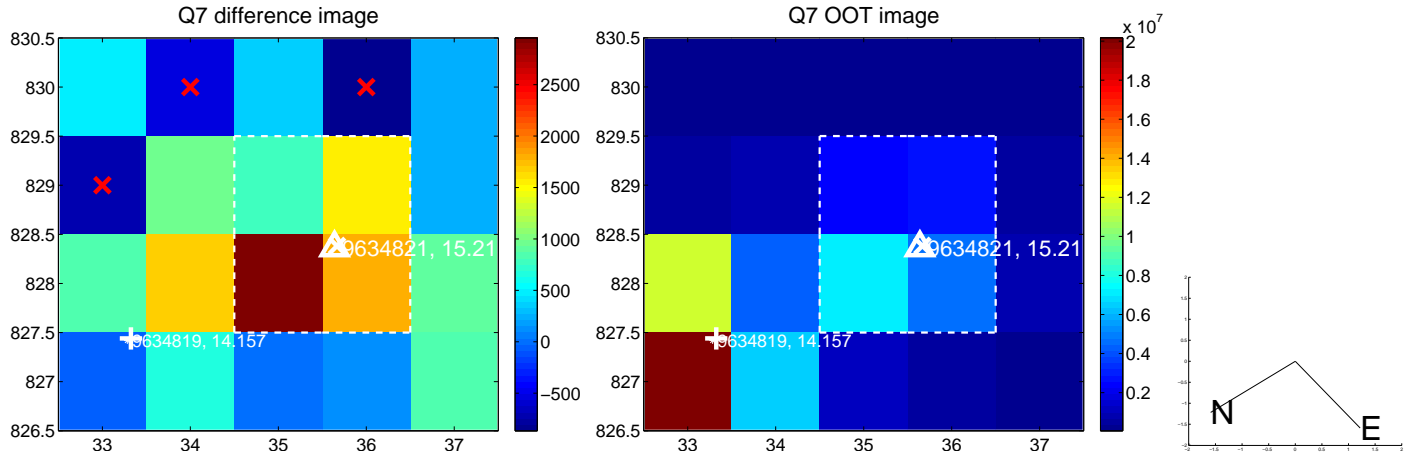
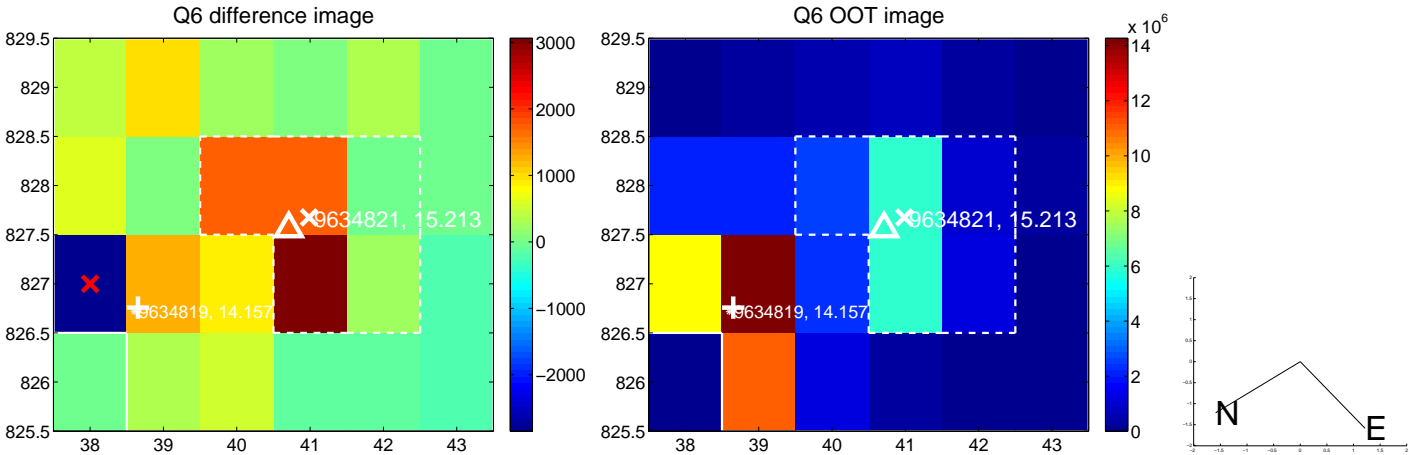
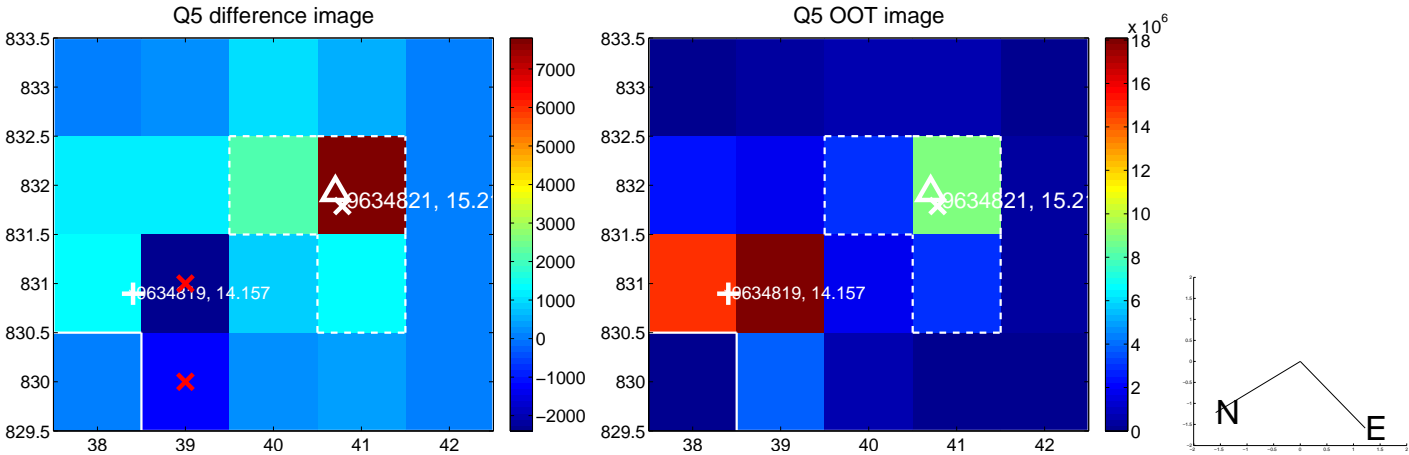


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

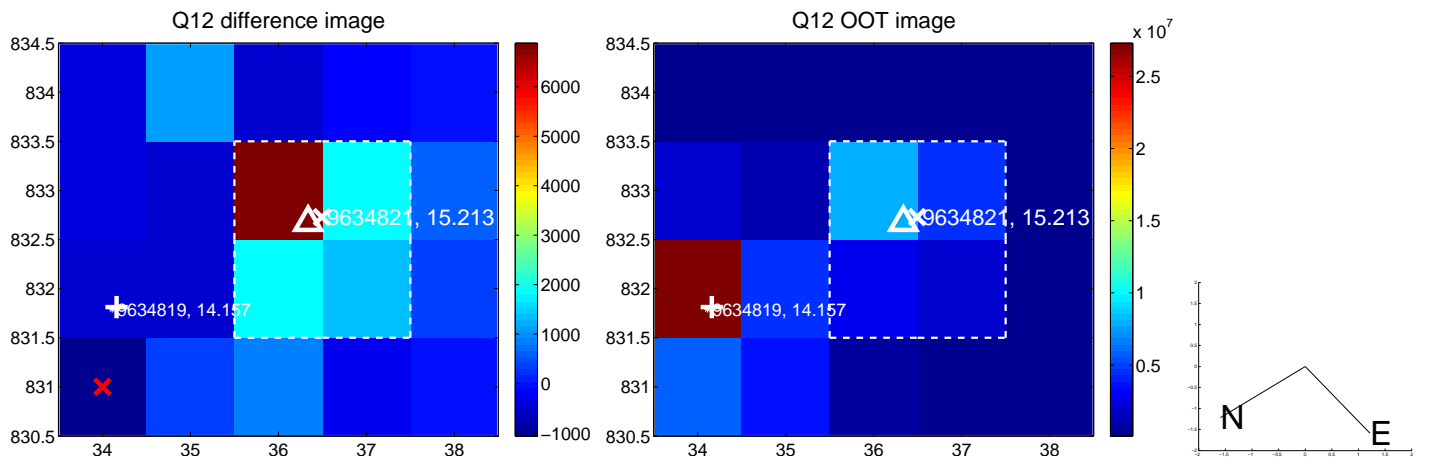
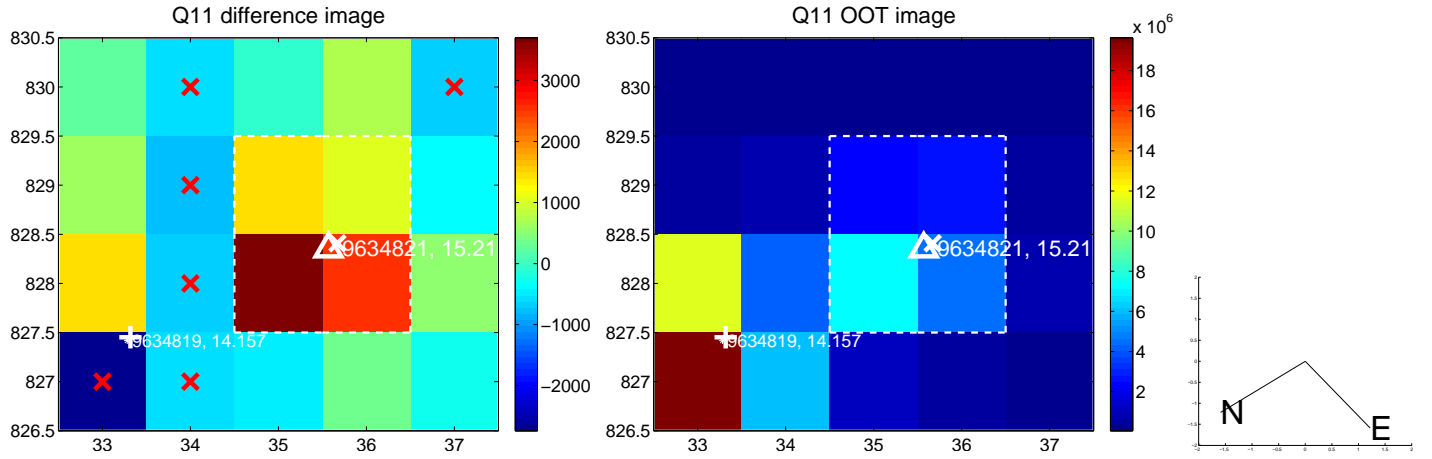
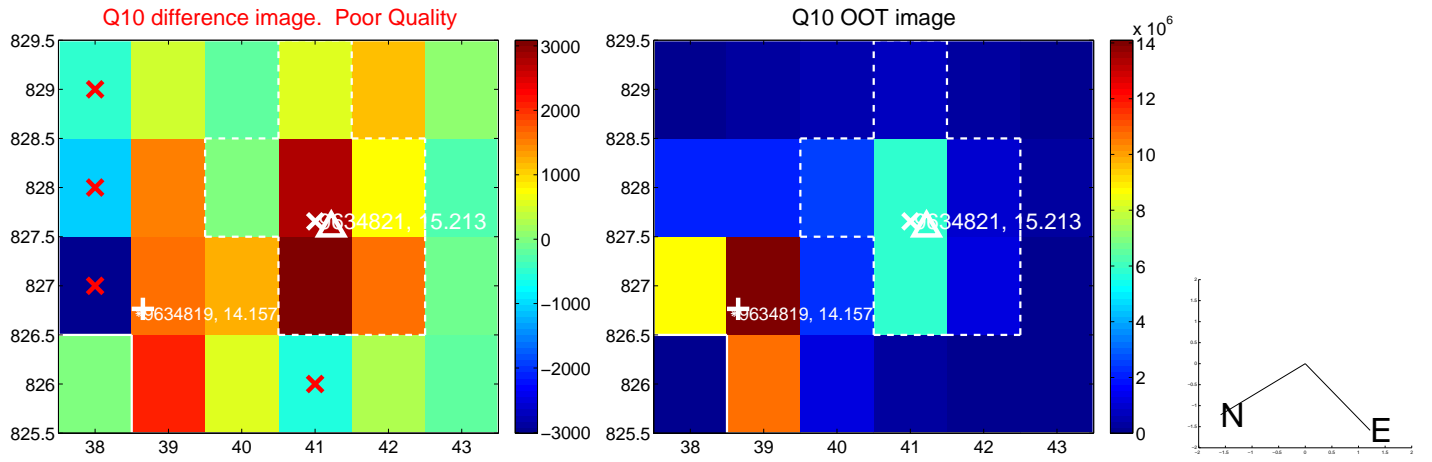
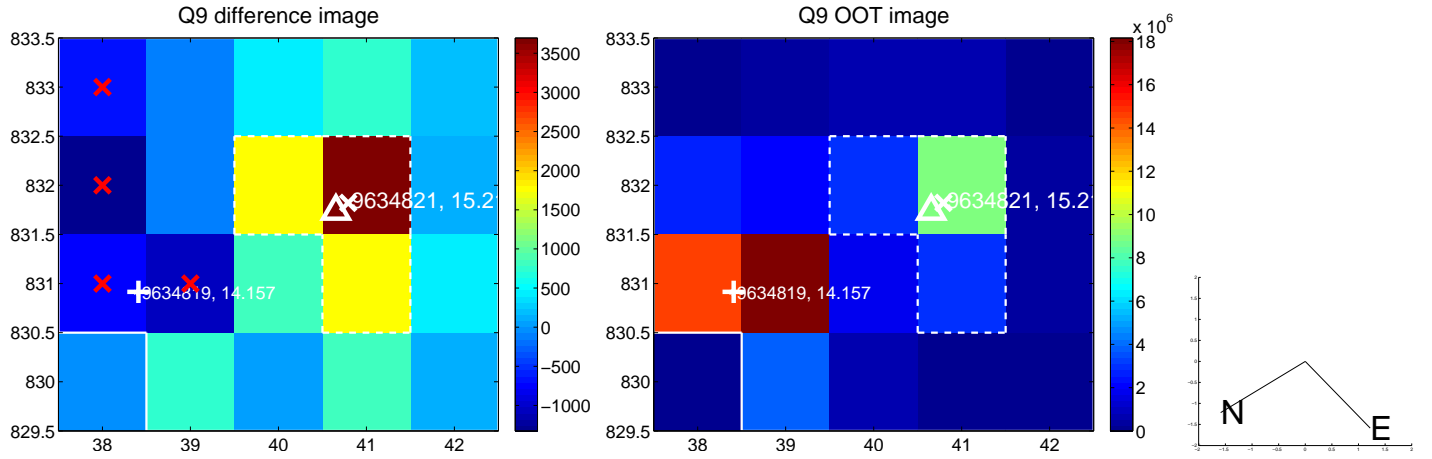
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



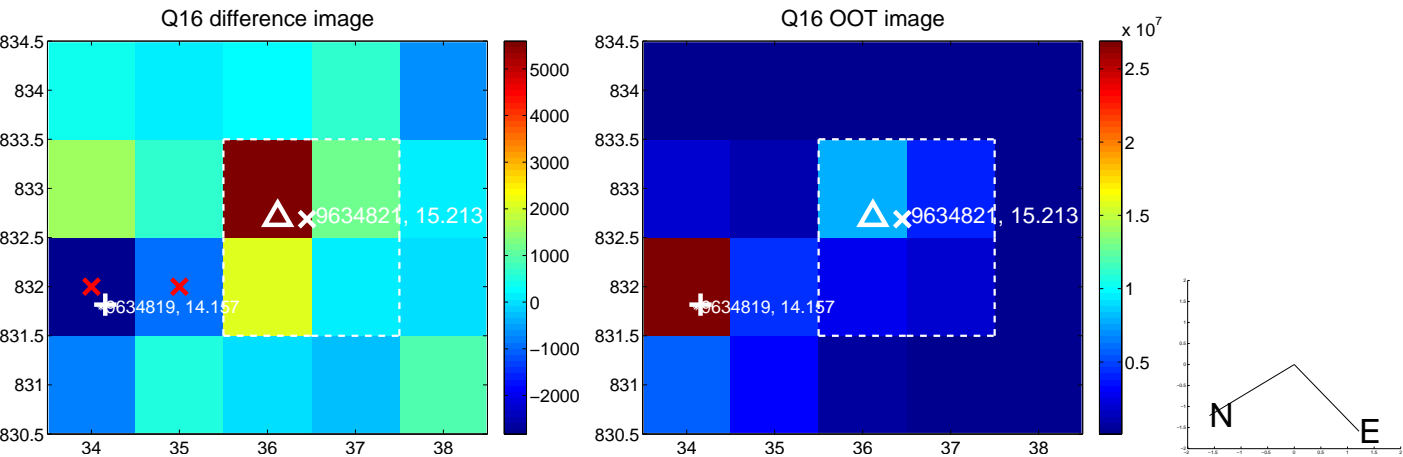
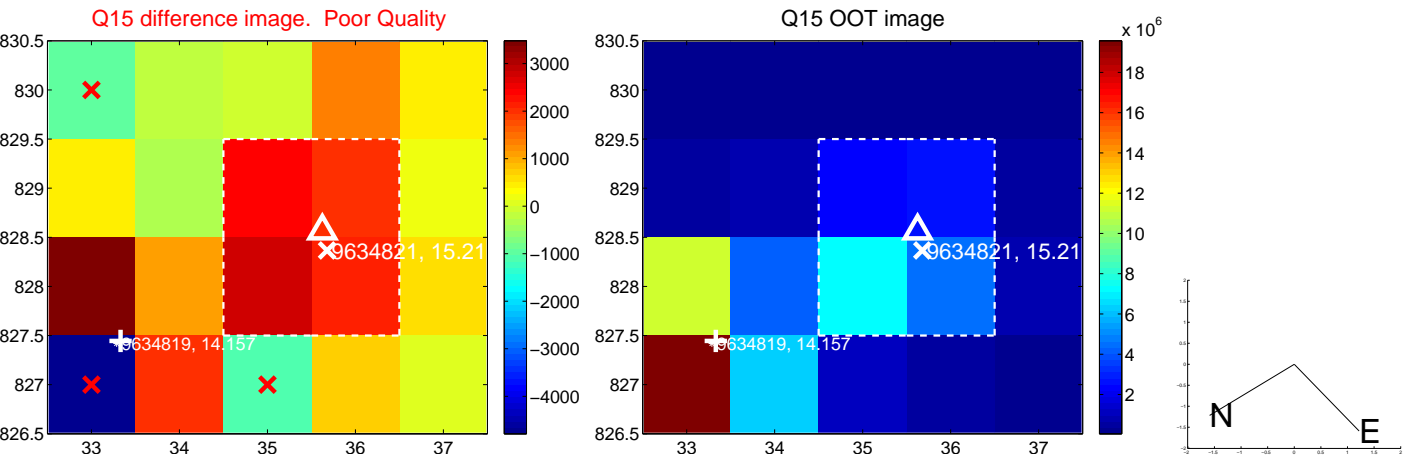
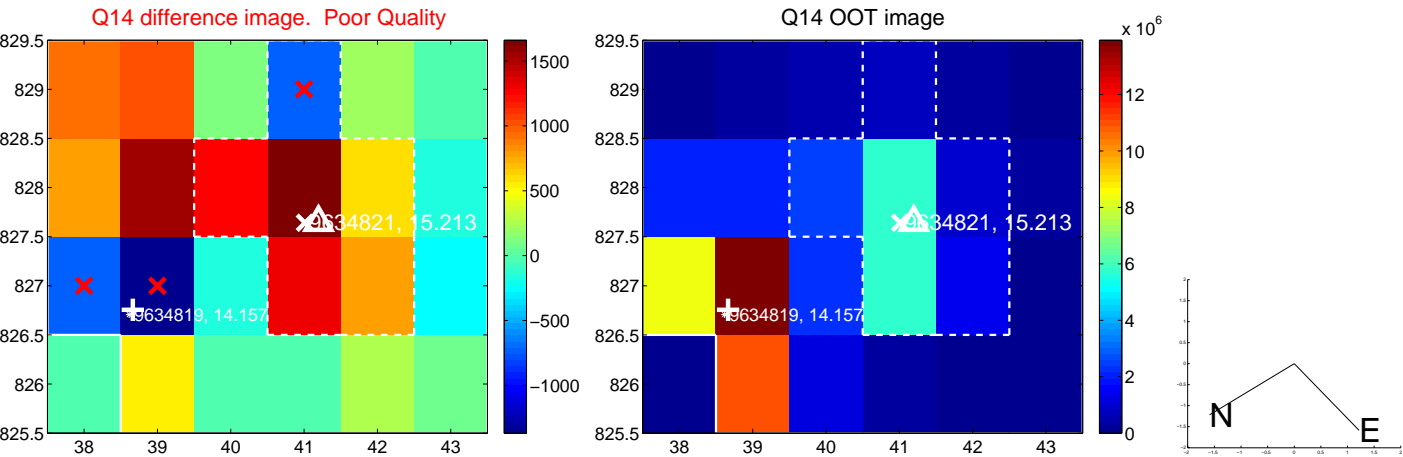
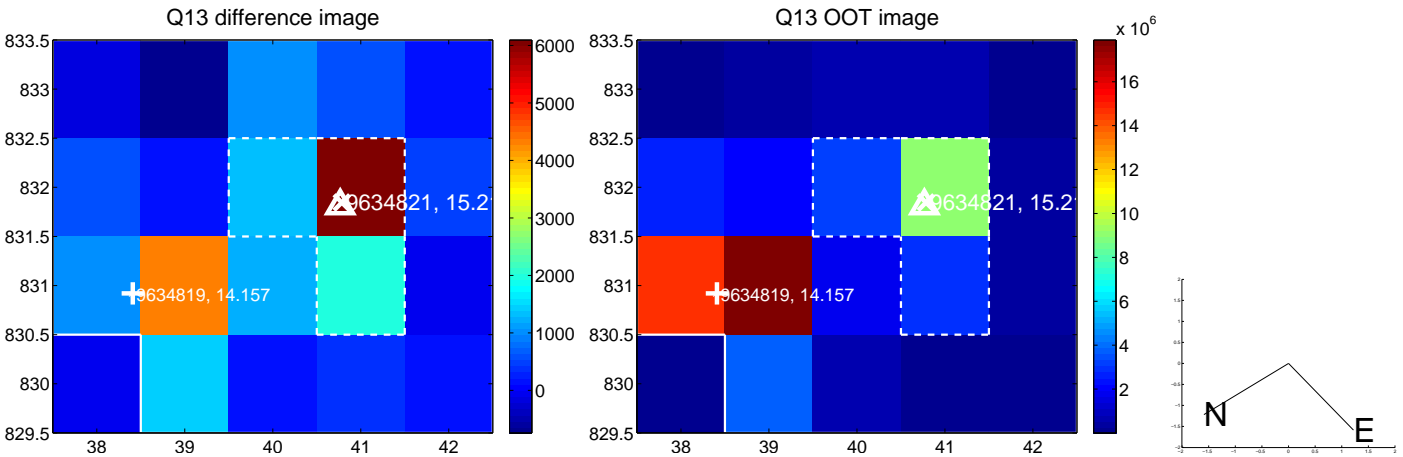
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



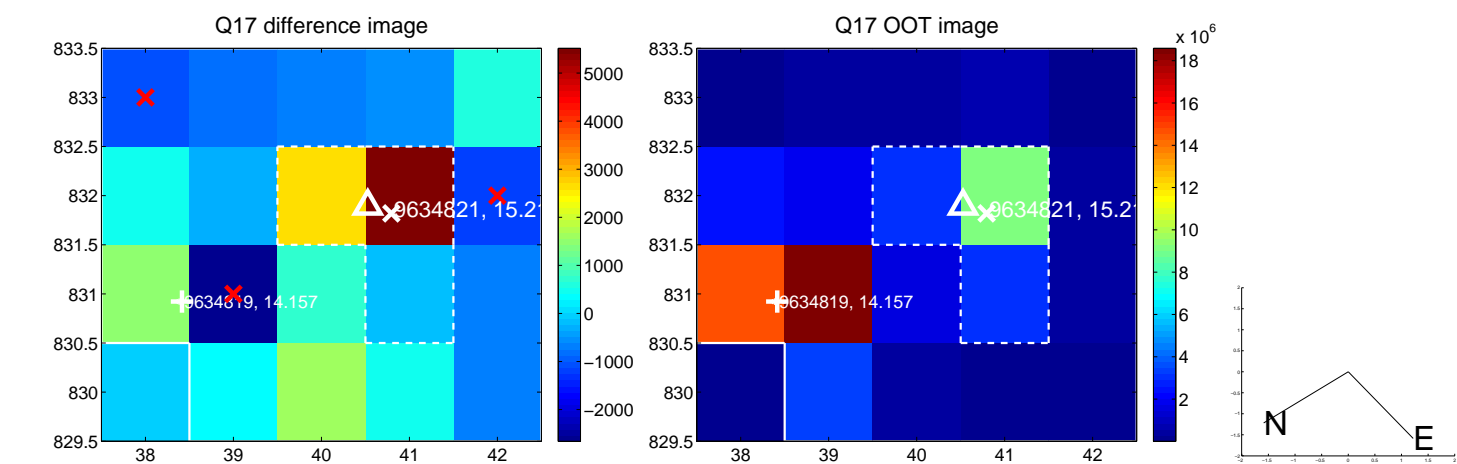
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



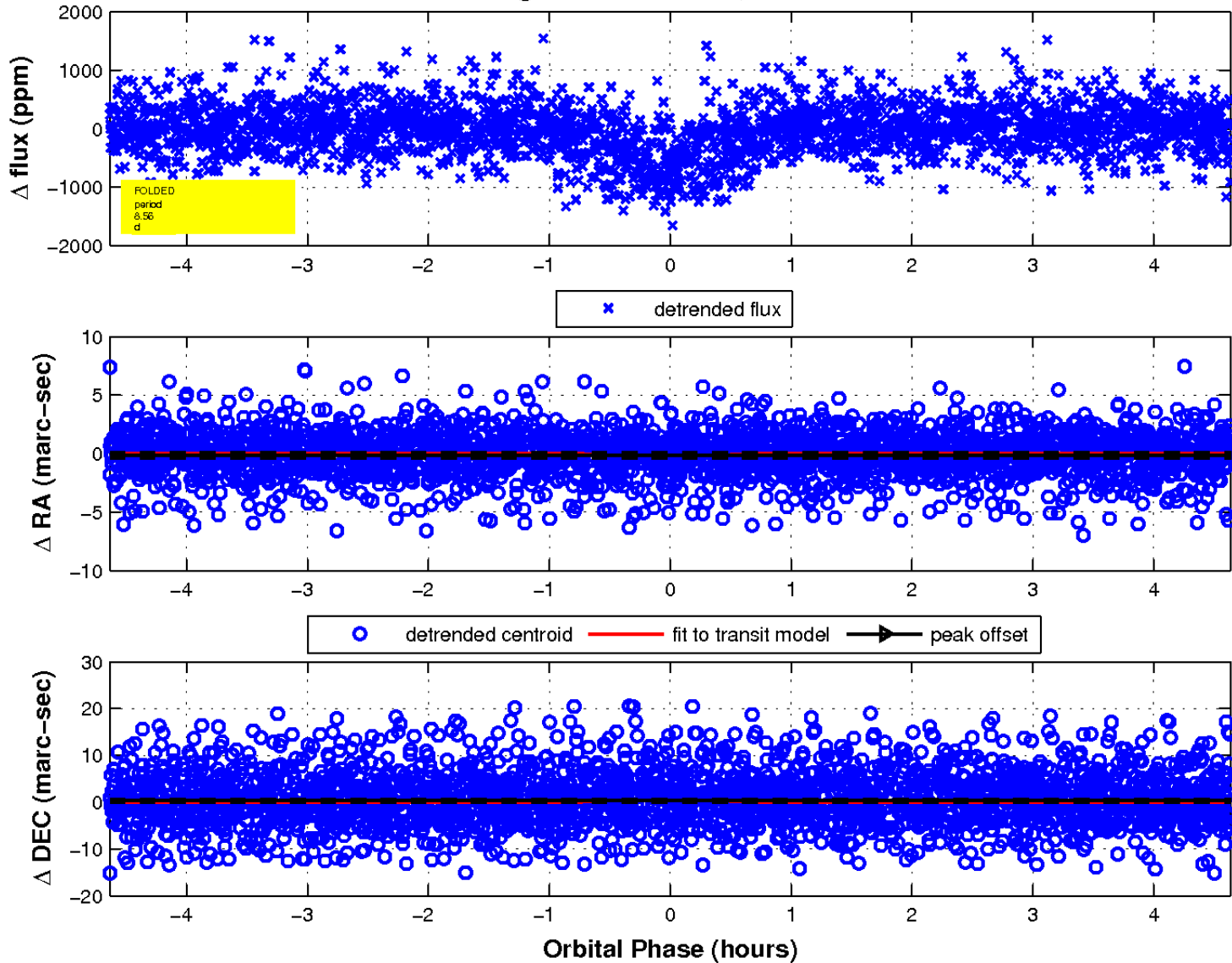
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

Declination

