

KIC 009415172

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})
009415172-01	OBS	0938.01	9.946008	131.918477	990.5	3.550	42.6	46.8	1.01	5344	3.62	100.59
009415172-02	OBS	0938.02	1.045613	131.832114	190.9	1.896	20.2	21.8	1.01	5344	1.42	2027.40
009415172-03	OBS	0938.03	5.714622	132.640934	268.7	2.574	13.0	13.5	1.01	5344	1.85	210.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009415172-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009415172-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009415172-03	OBS	PC	0.95	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.

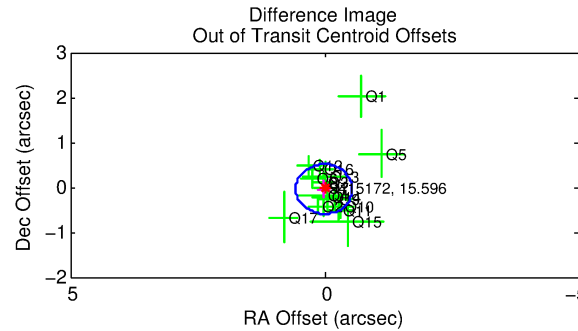
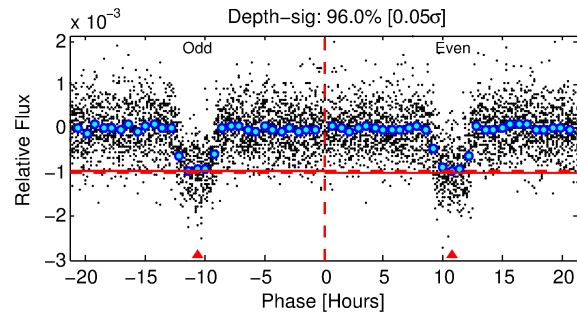
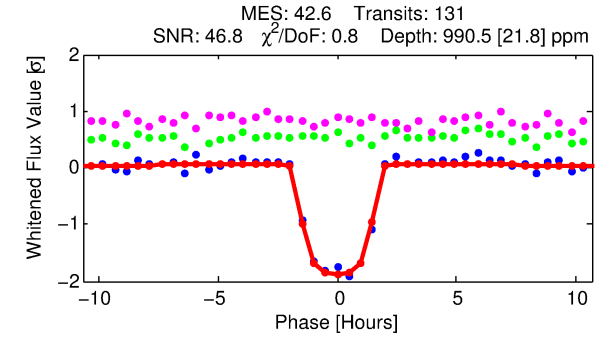
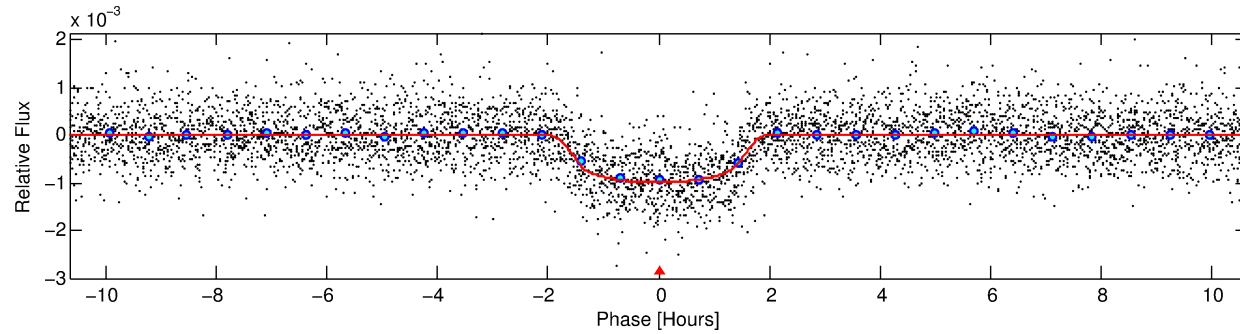
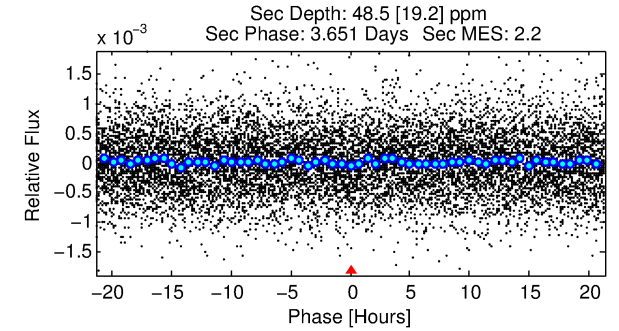
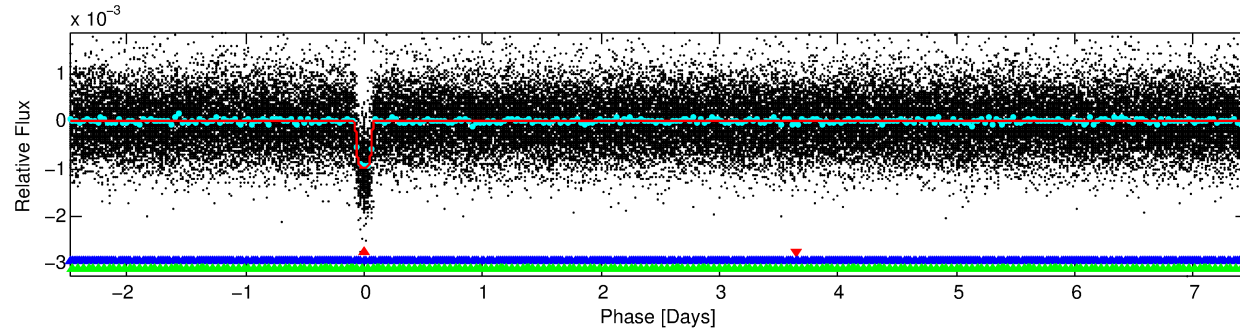
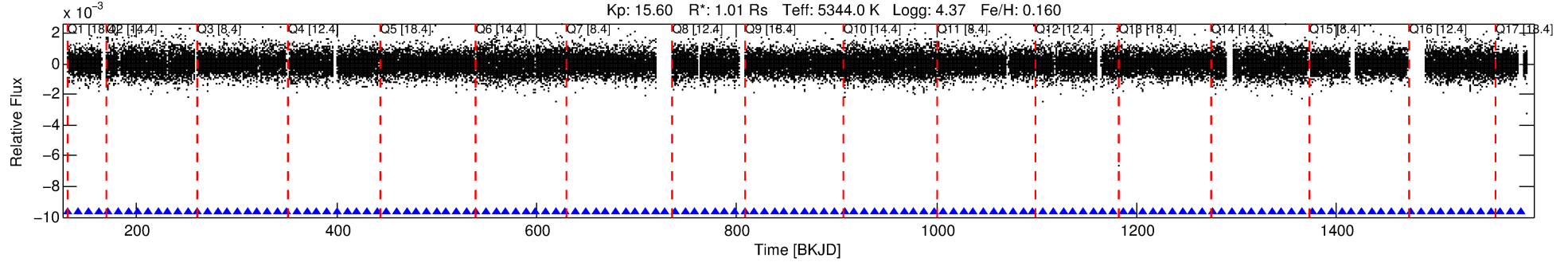
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009415172-01

No Significant Match Found

DV One-Page Summary

KIC: 9415172 Candidate: 1 of 3 Period: 9.946 d
KOI: K00938.01 Name: Kepler-255c Corr: 0.986



DV Fit Results:

Period = 9.94601 [0.00002] d
Epoch = 131.9185 [0.0017] BKJD
Rp/R* = 0.0327 [0.0036]
a/R* = 13.28 [5.69]
b = 0.83 [0.17]
Seff = 100.59 [23.21]
Teff = 808 [47] K
Rp = 3.62 [0.65] Re
a = 0.0863 [0.0119] AU
Ag = 15.18 [7.67] [1.85σ]
Teffp = 2465 [282] K [5.80σ]

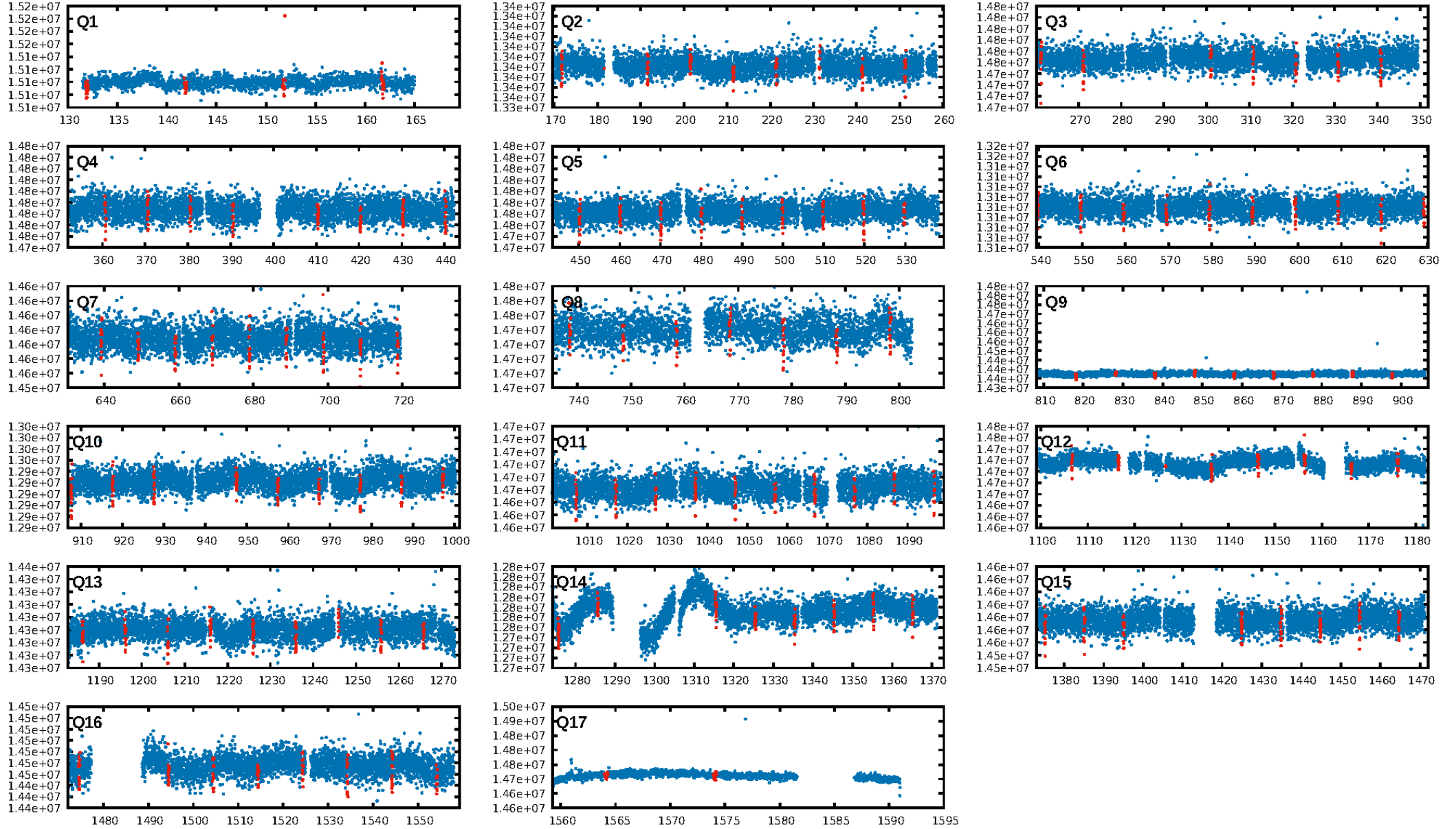
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [23.16σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [125/125]
GhostDiagnostic-chr: 10.16
Centroid-sig: 3.0%
Centroid-so: 0.079 arcsec [0.31σ]
OotOffset-rm: 0.046 arcsec [0.25σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-rm: 0.390 arcsec [2.03σ]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 0.53 [9/17]

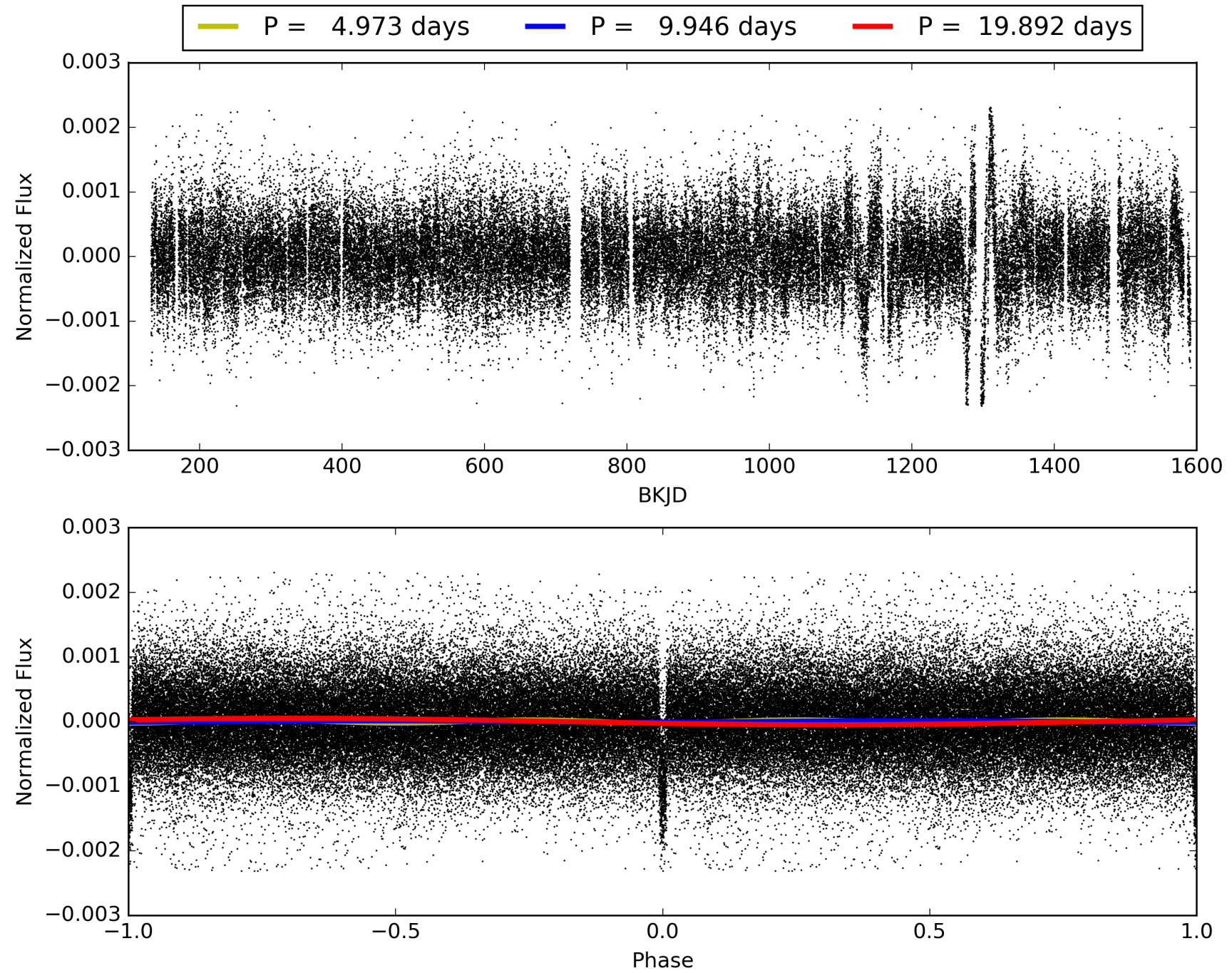
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 16:28:06 Z

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

TCE 009415172-01, PDC Light Curves

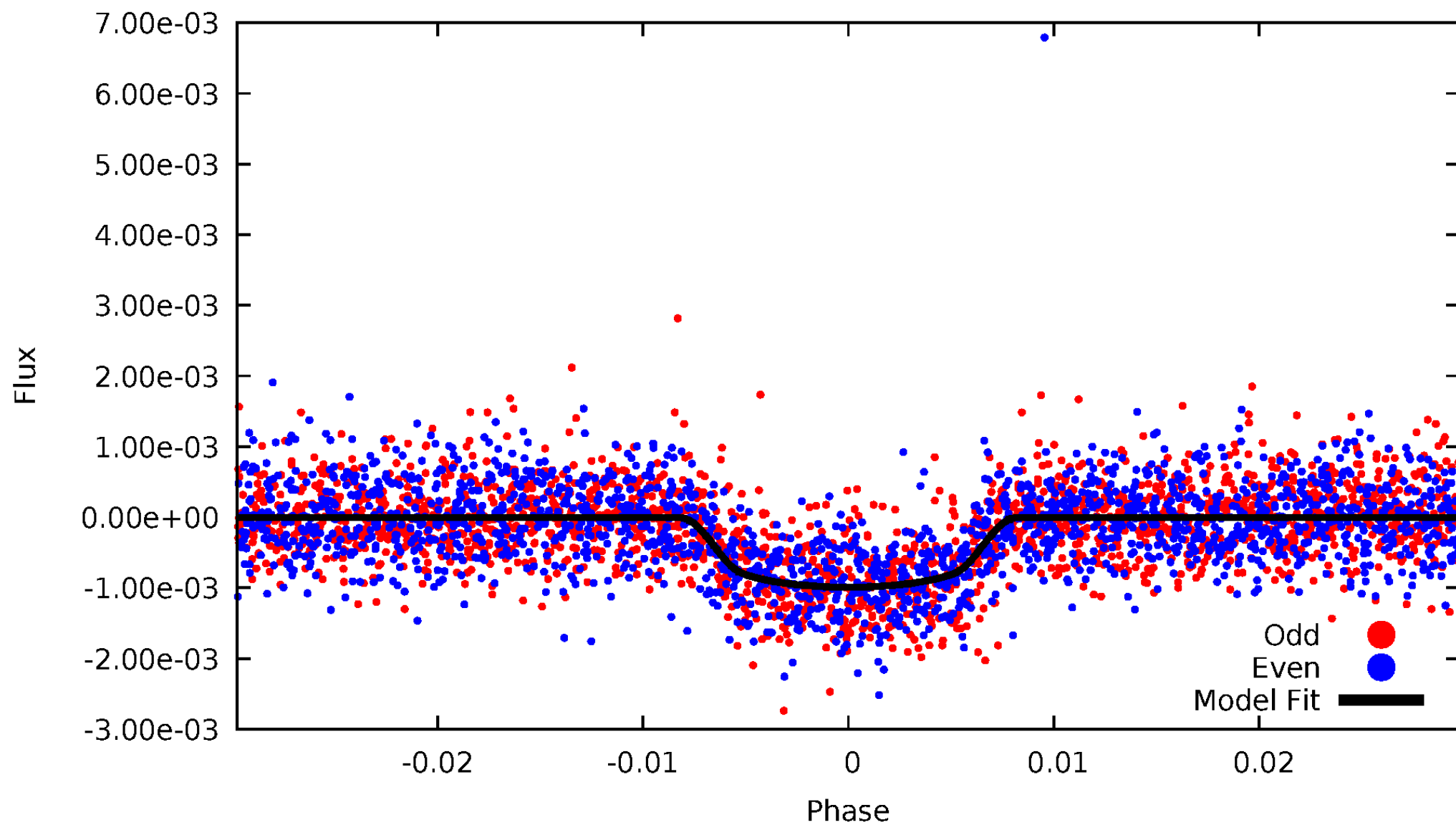


TCE 009415172-01



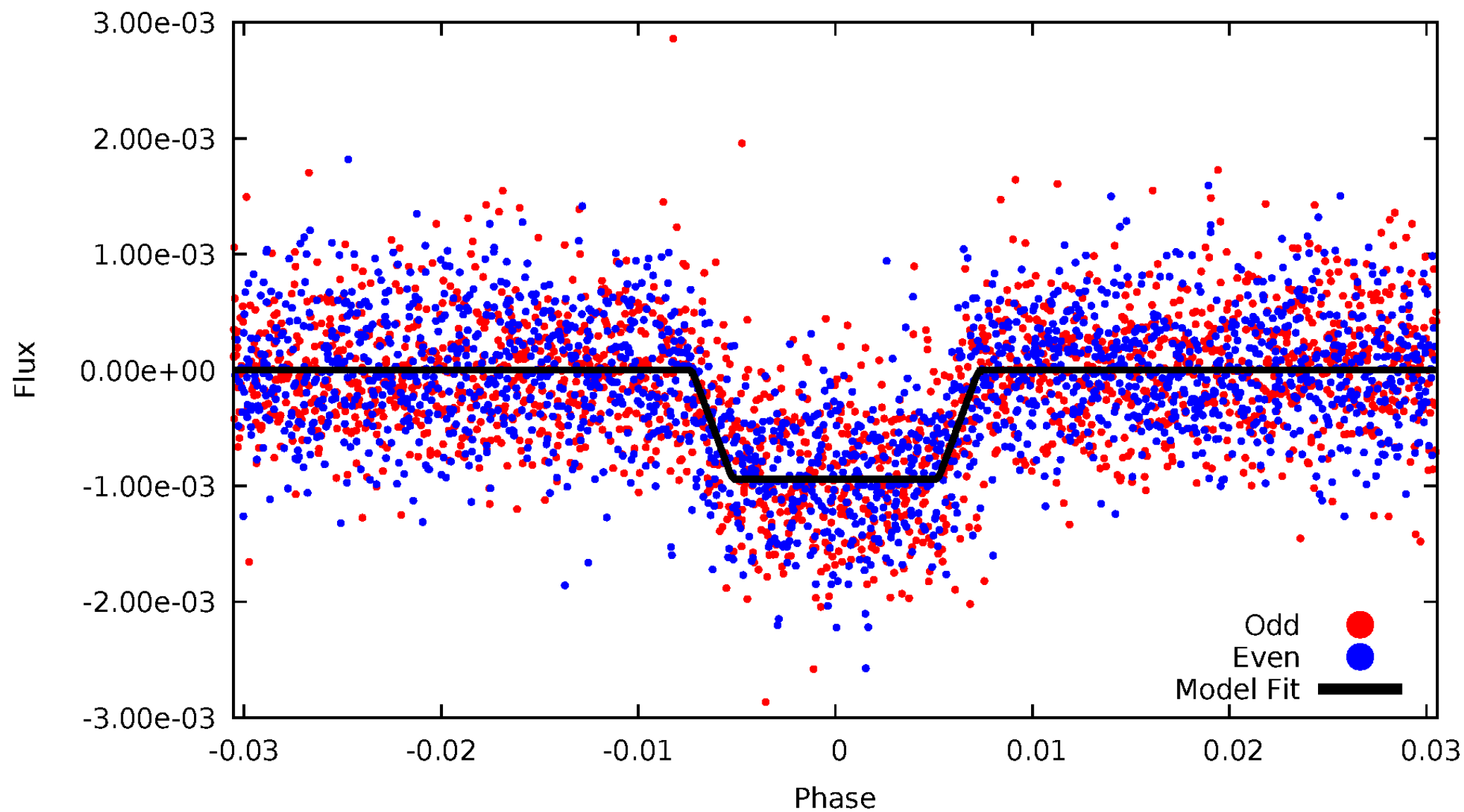
DV Odd/Even

TCE 009415172-01



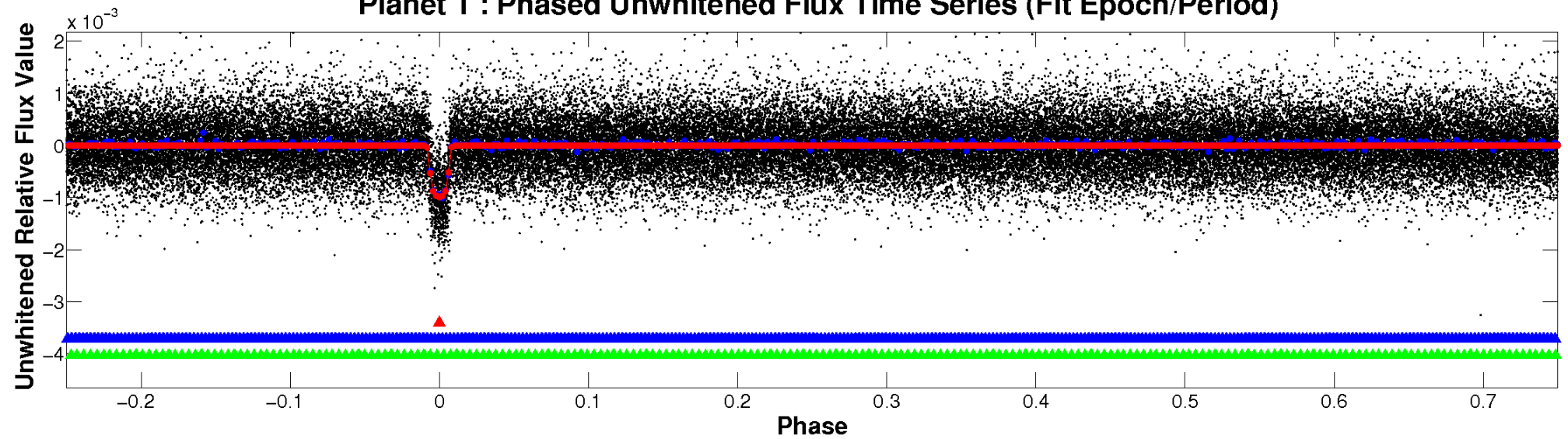
ALT Odd/Even

TCE 009415172-01

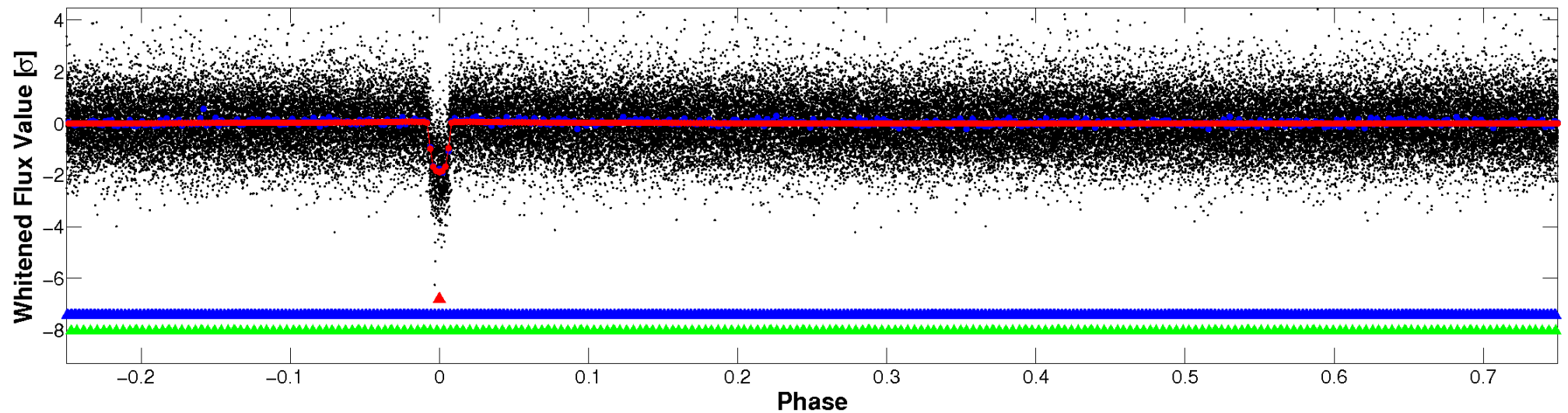


Non-Whitened Vs. Whitened Light Curve

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

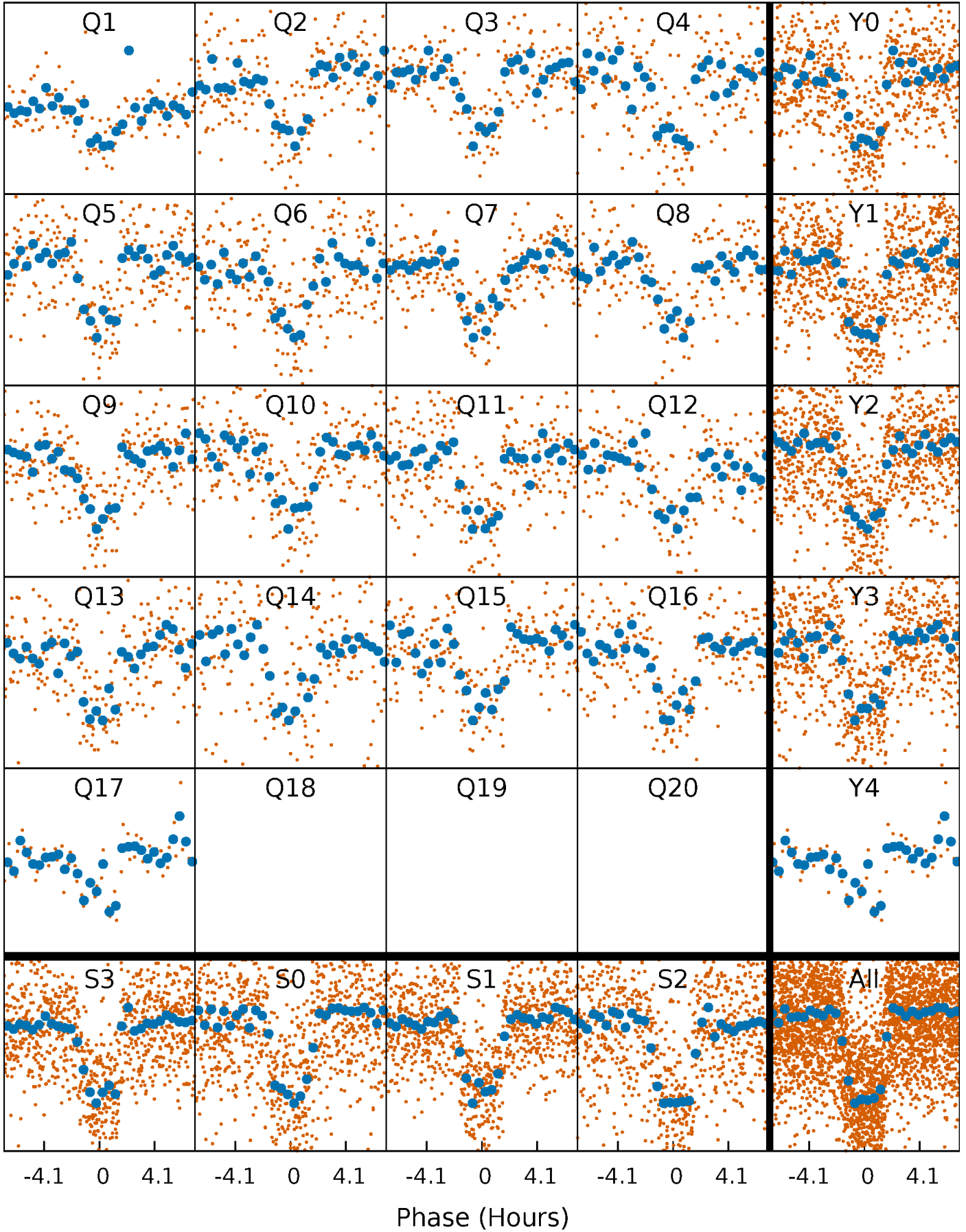


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



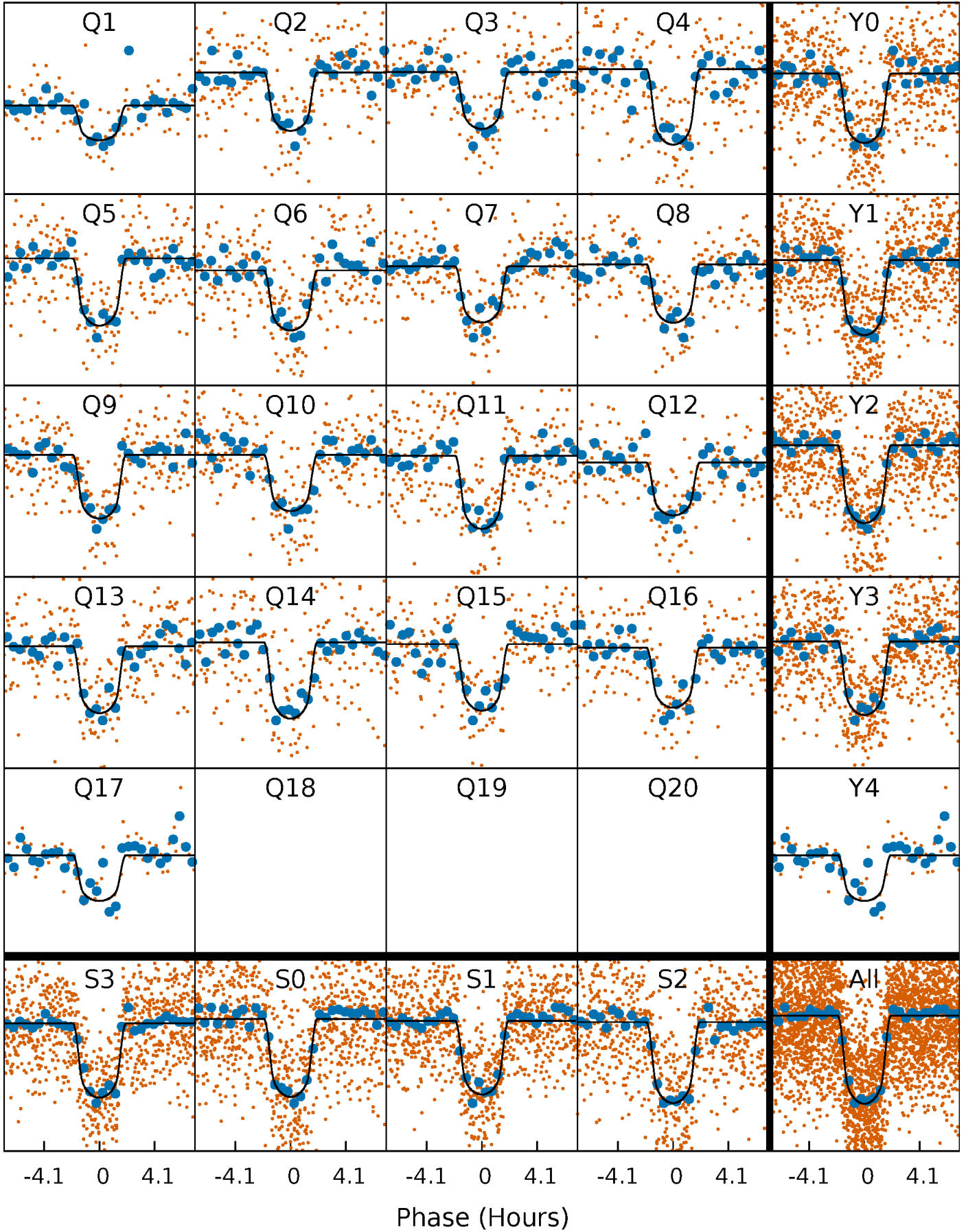
PDC Quarter-Phased Transit Curves

TCE 009415172-01 P= 9.946008 Days $T_0=131.918477$ (BKJD)



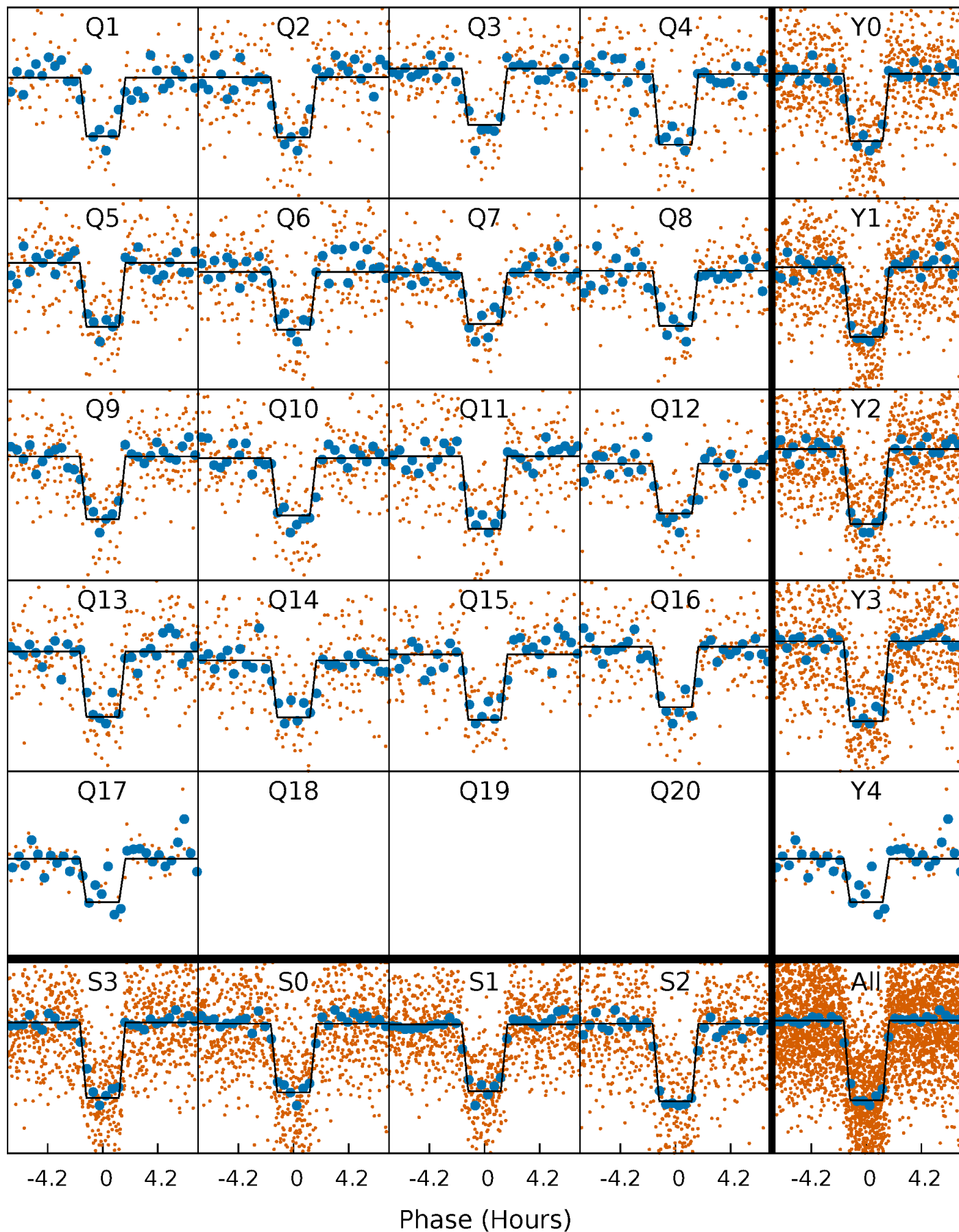
DV Quarter-Phased Transit Curves

TCE 009415172-01 P= 9.946008 Days $T_0=131.918477$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

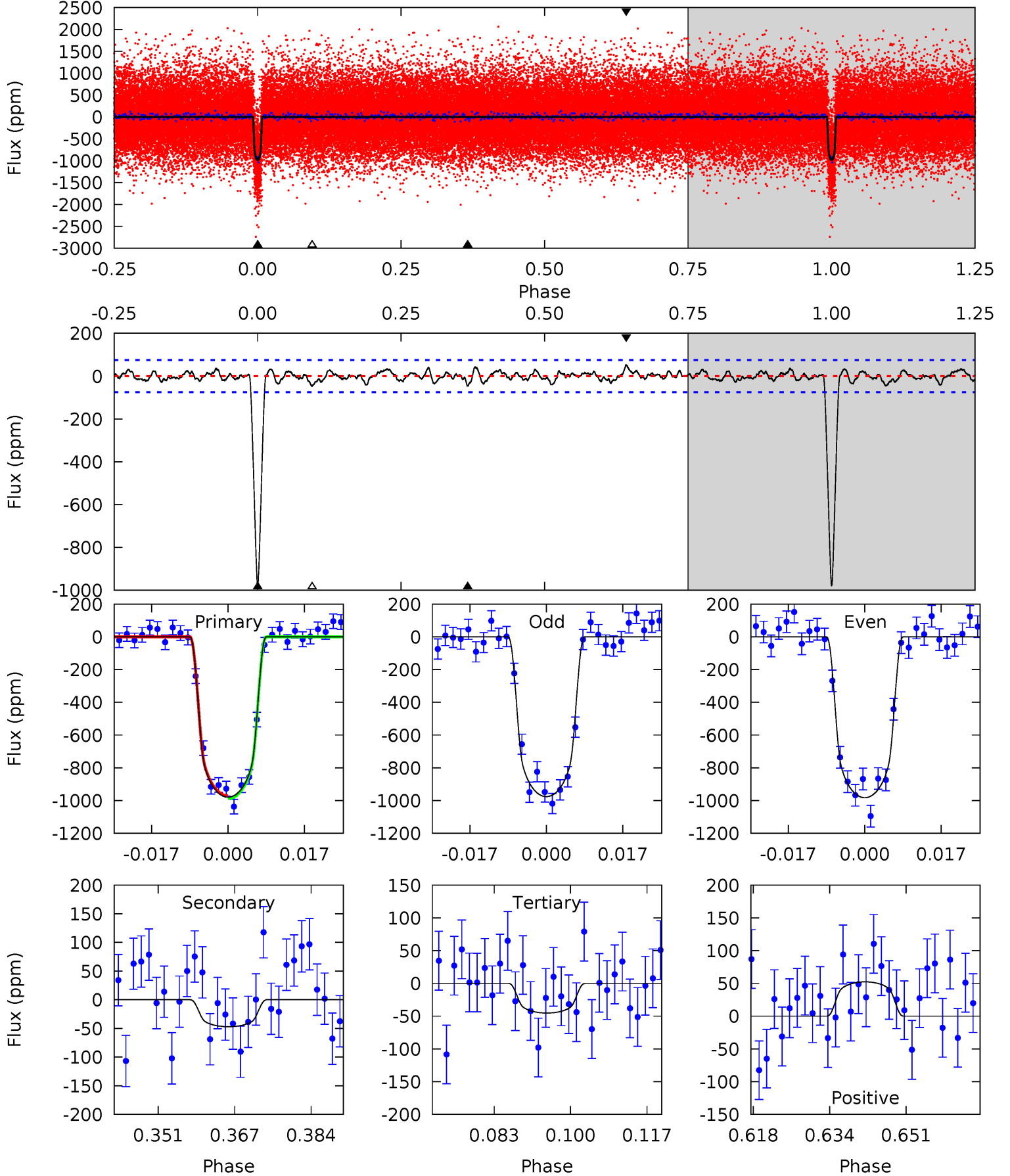
TCE 009415172-01 P= 9.945955 Days $T_0=131.923179$ (BKJD)



DV Model-Shift Uniqueness Test

009415172-01, P = 9.946008 Days, E = 121.972469 Days

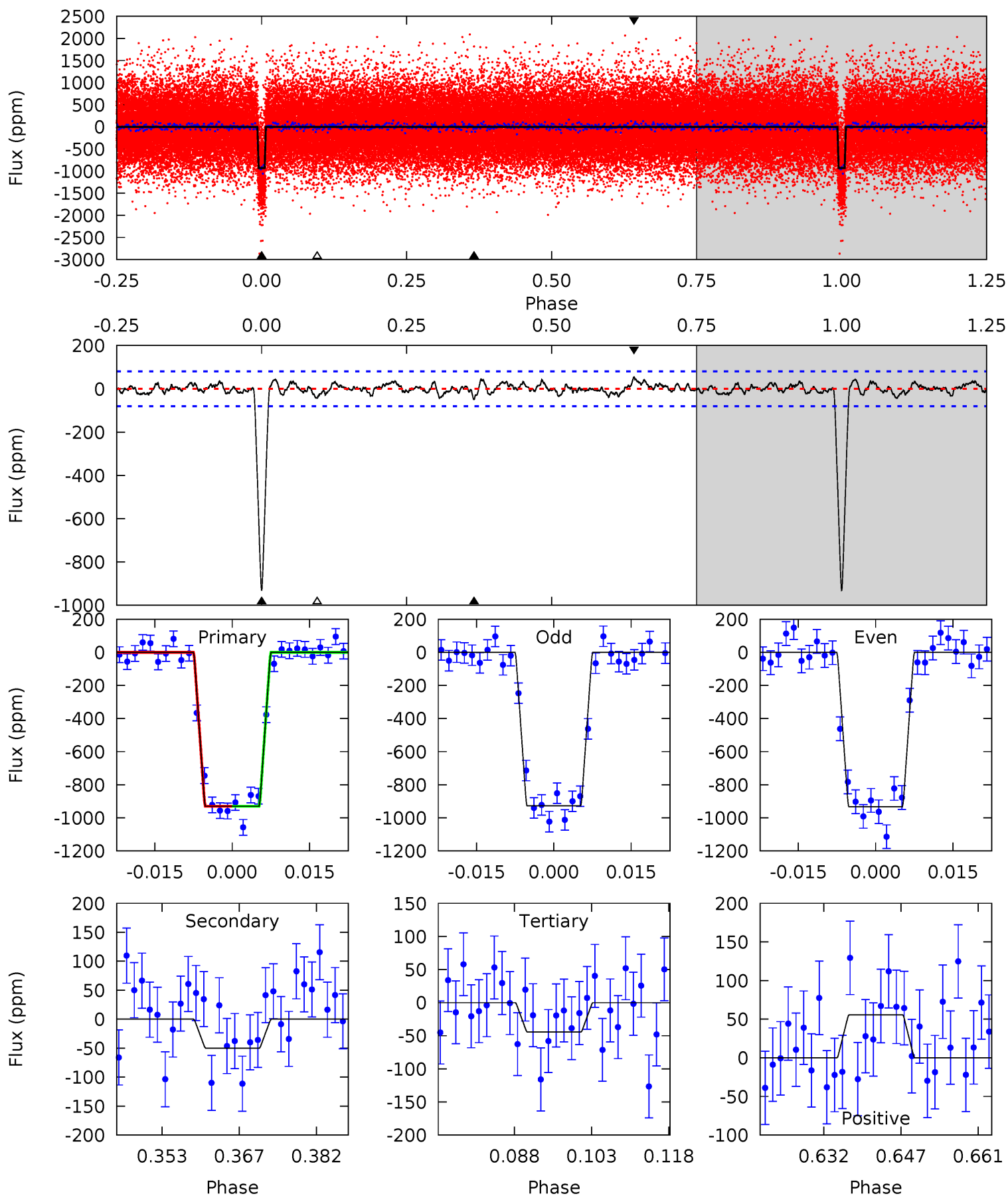
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
64.4	3.09	2.98	3.44	4.93	2.39	1.10	61.4	61.0	0.11	-0.35	0.21	1.01	0.05	0.54



Alt Model-Shift Uniqueness Test

009415172-01, P = 9.945955 Days, E = 121.977224 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
57.6	3.10	2.75	3.44	4.95	2.44	1.08	54.9	54.2	0.35	-0.35	0.13	0.99	0.06	0.03



Stellar Parameters For KIC 009415172

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5344^{+80}_{-80}	$4.365^{+0.132}_{-0.096}$	$0.160^{+0.150}_{-0.100}$	$1.013^{+0.141}_{-0.141}$	$0.867^{+0.064}_{-0.032}$	$1.175^{+0.674}_{-0.363}$
	+1%/-1%	+3%/-2%	+94%/-62%	+14%/-14%	+7%/-4%	+57%/-31%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 009415172-01 / KOI 0938.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-47 ± 15	$3.67^{+0.50}_{-0.51}$	1125^{+45}_{-44}	3058^{+172}_{-178}	15^{+7}_{-5}
Alt.	-50 ± 16	$3.38^{+0.51}_{-0.51}$	1123^{+47}_{-47}	3146^{+190}_{-180}	18^{+9}_{-7}

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

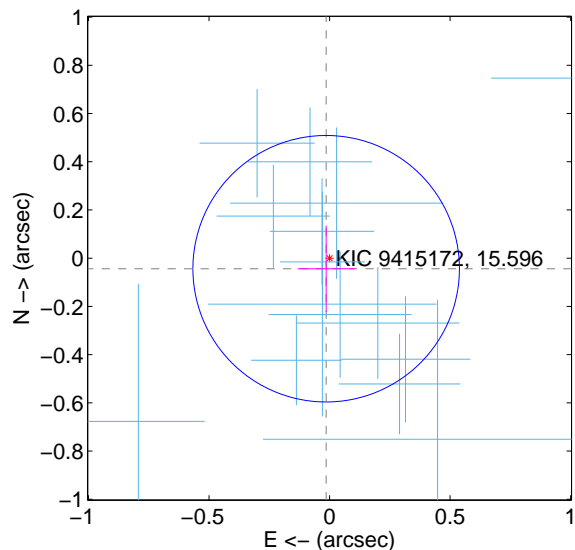
Supplemental centroid analysis for 009415172-01. Kepler magnitude: 15.60. Transit SNR 46.83

There are 16 quarters with good PRF difference image offsets

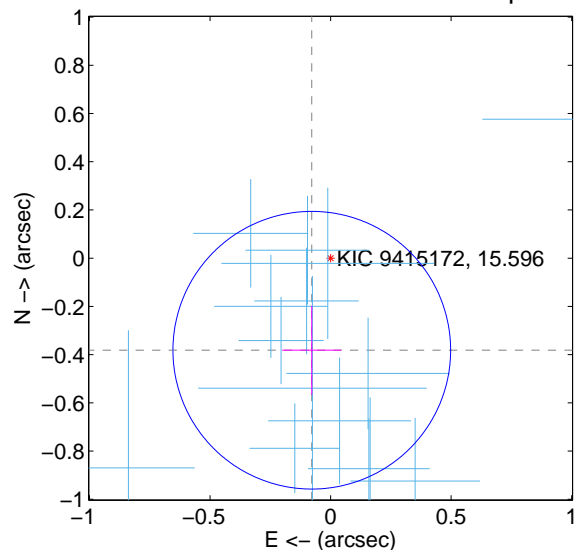
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.046 ± 0.184	0.25	0.014 ± 0.119	-0.044 ± 0.179
PRF-fit source offset from KIC position	0.390 ± 0.192	2.03	0.078 ± 0.123	-0.382 ± 0.185
photometric centroid source offset	0.08 ± 0.25	0.31	0.08 ± 0.25	0.00 ± 0.29

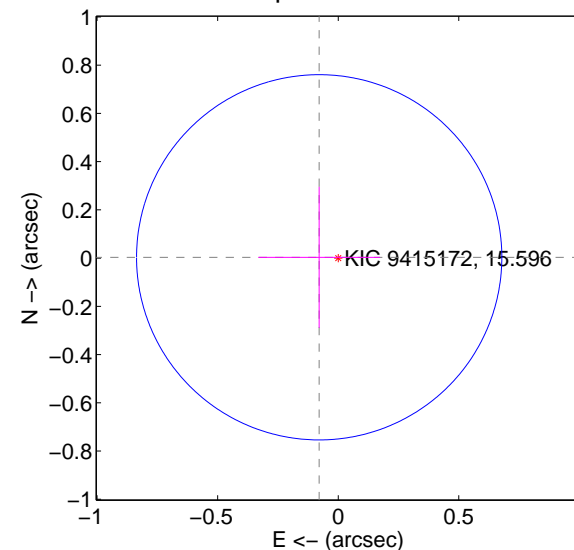
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

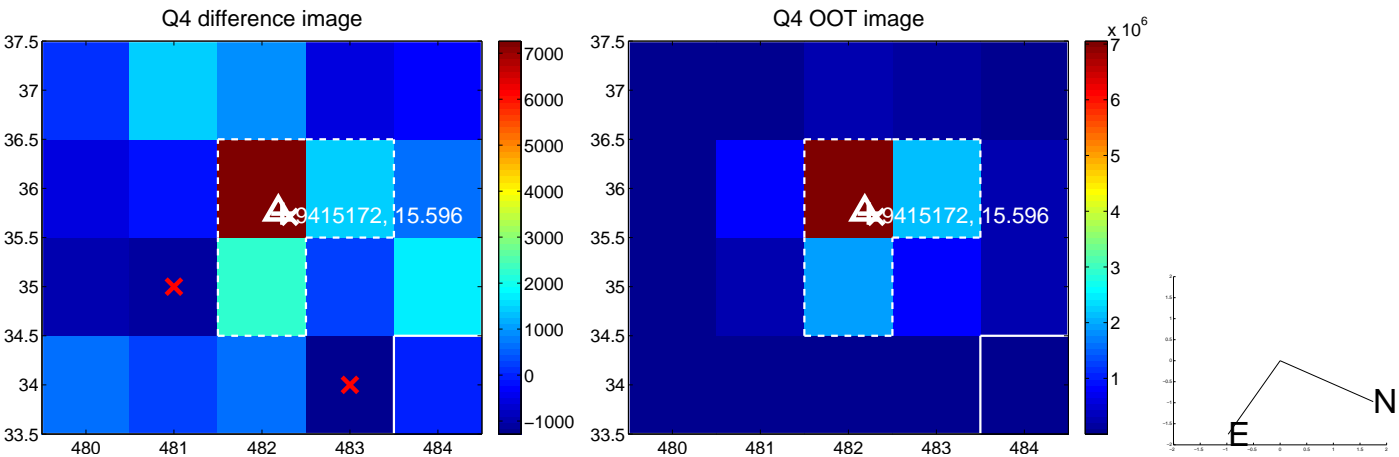
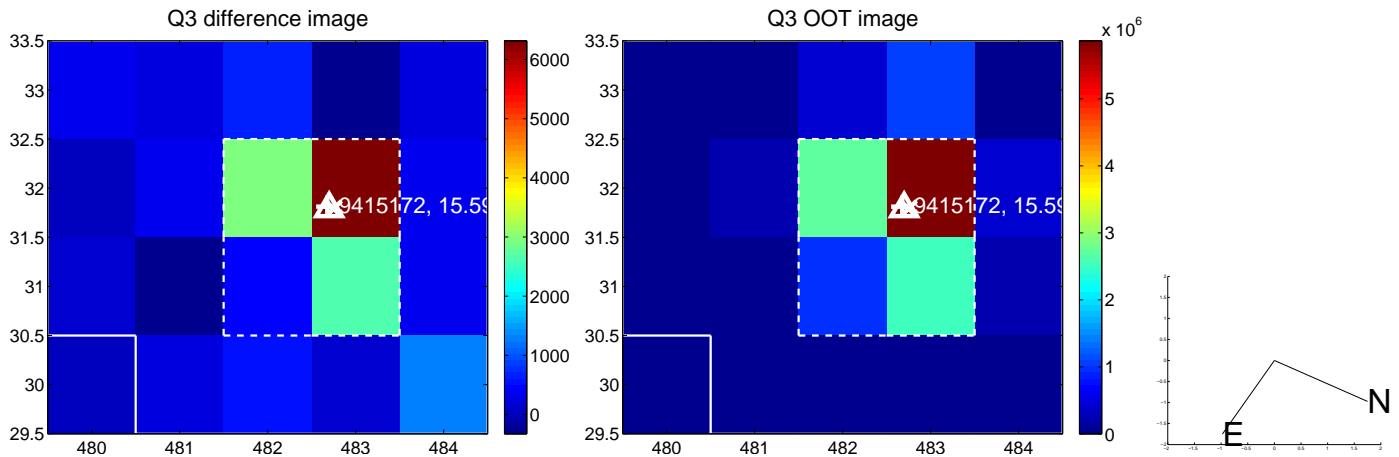
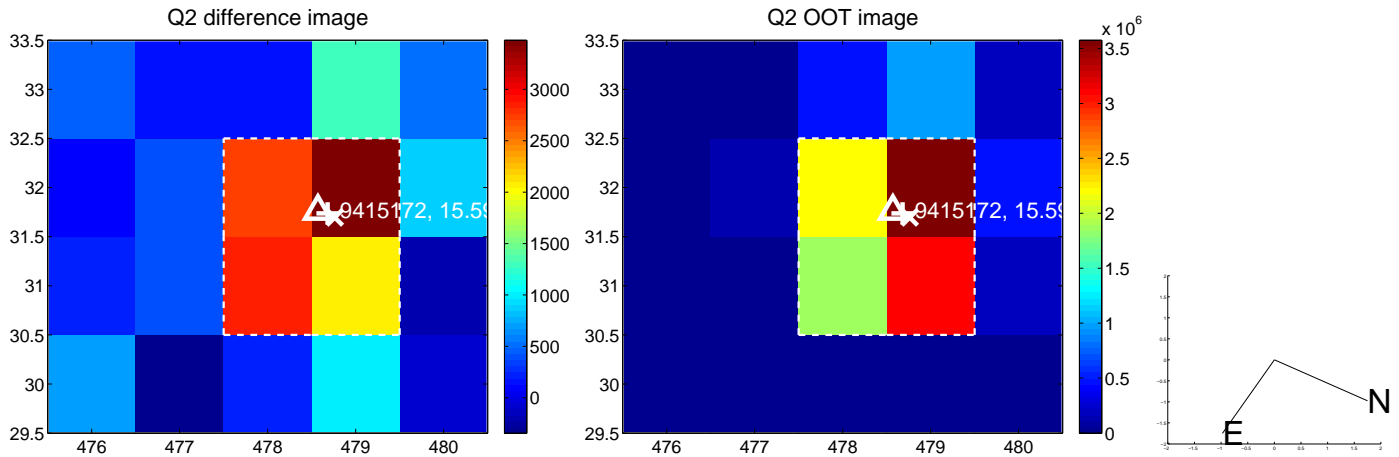
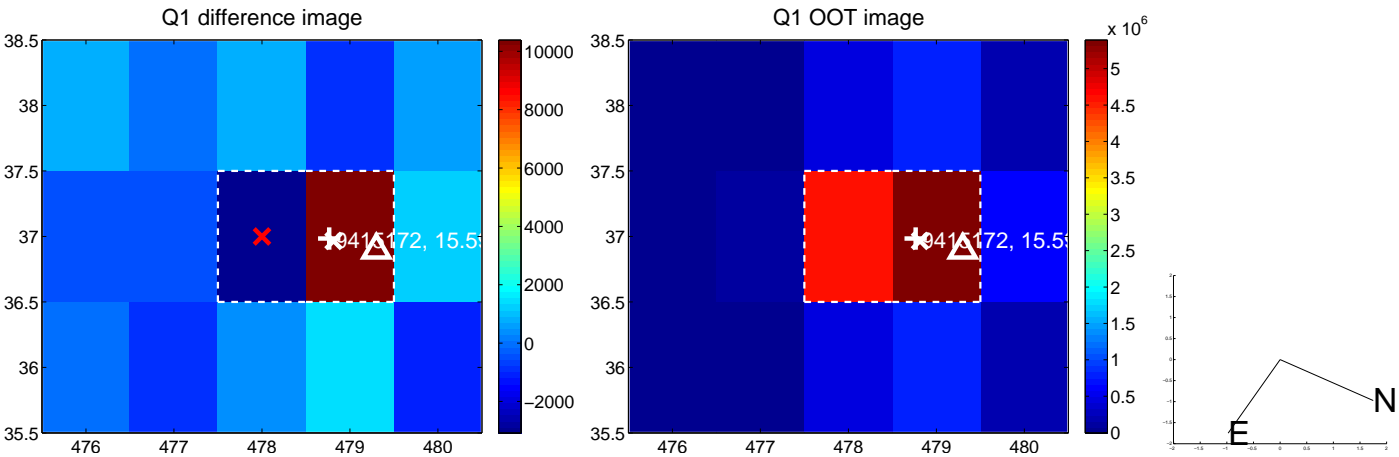


offset from photometric centroids

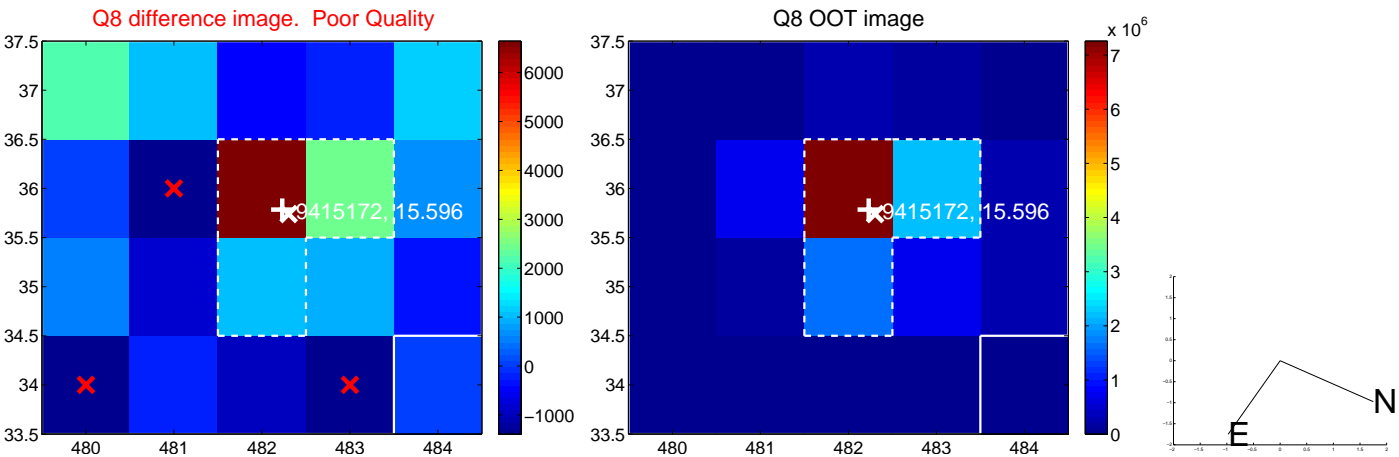
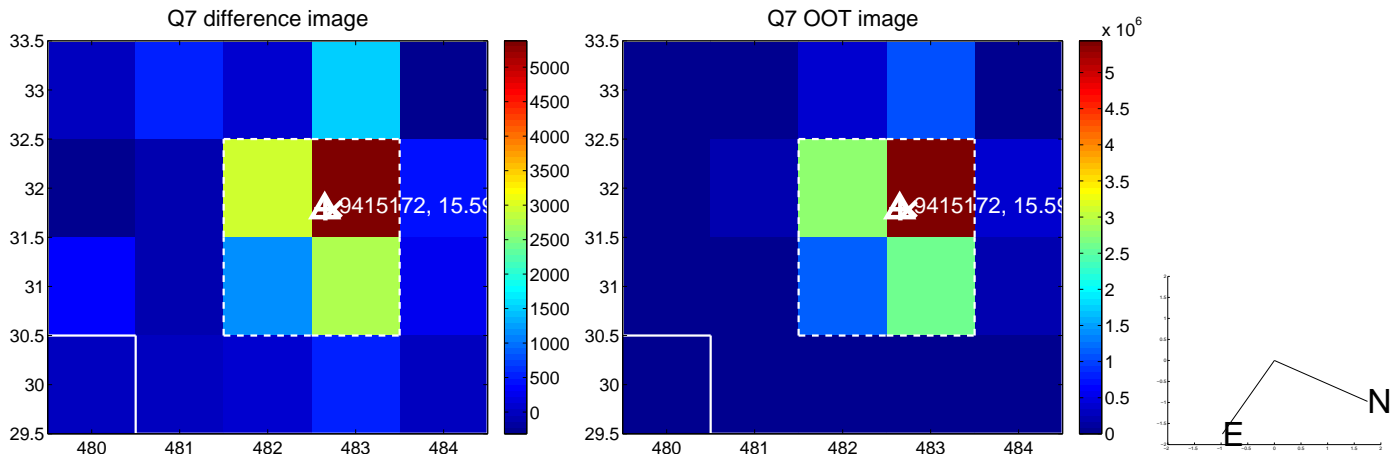
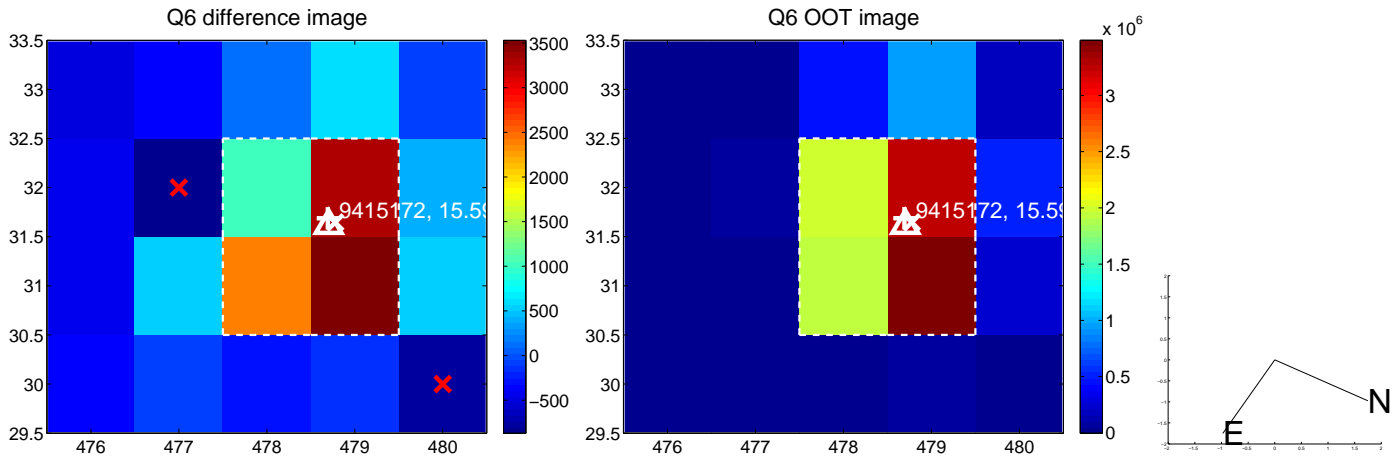
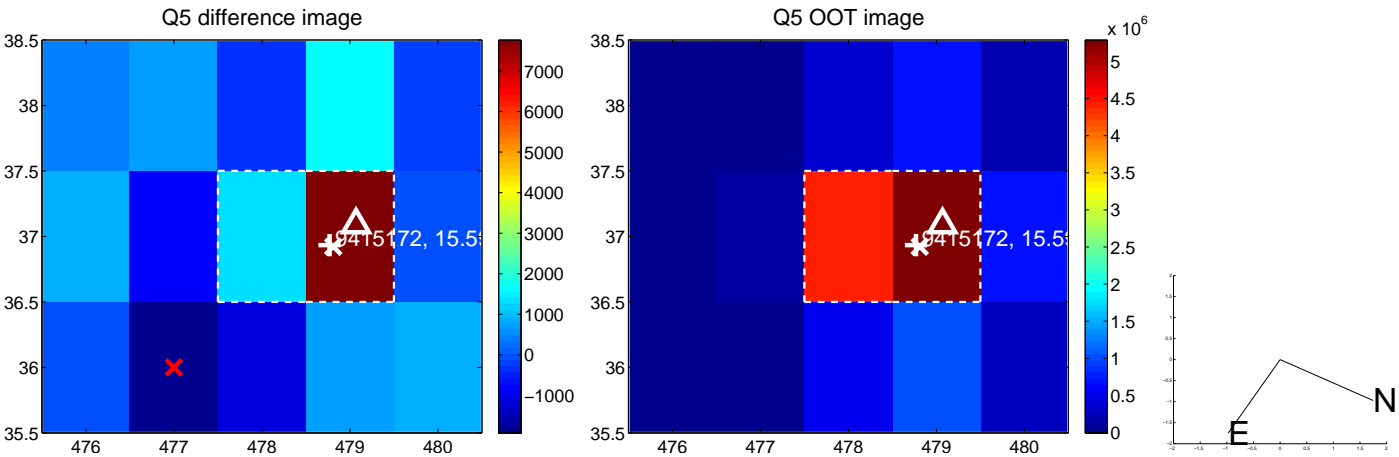


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

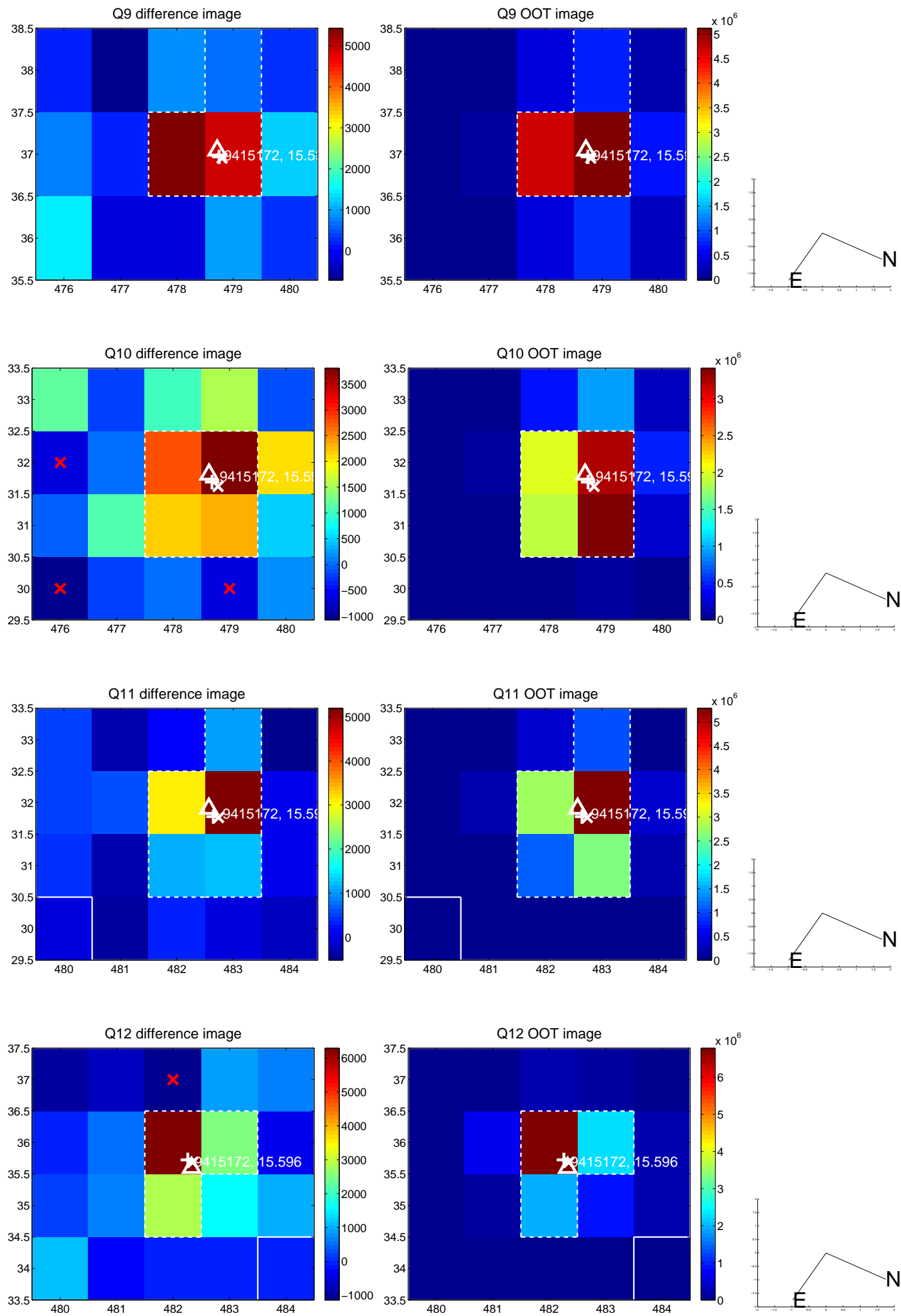
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



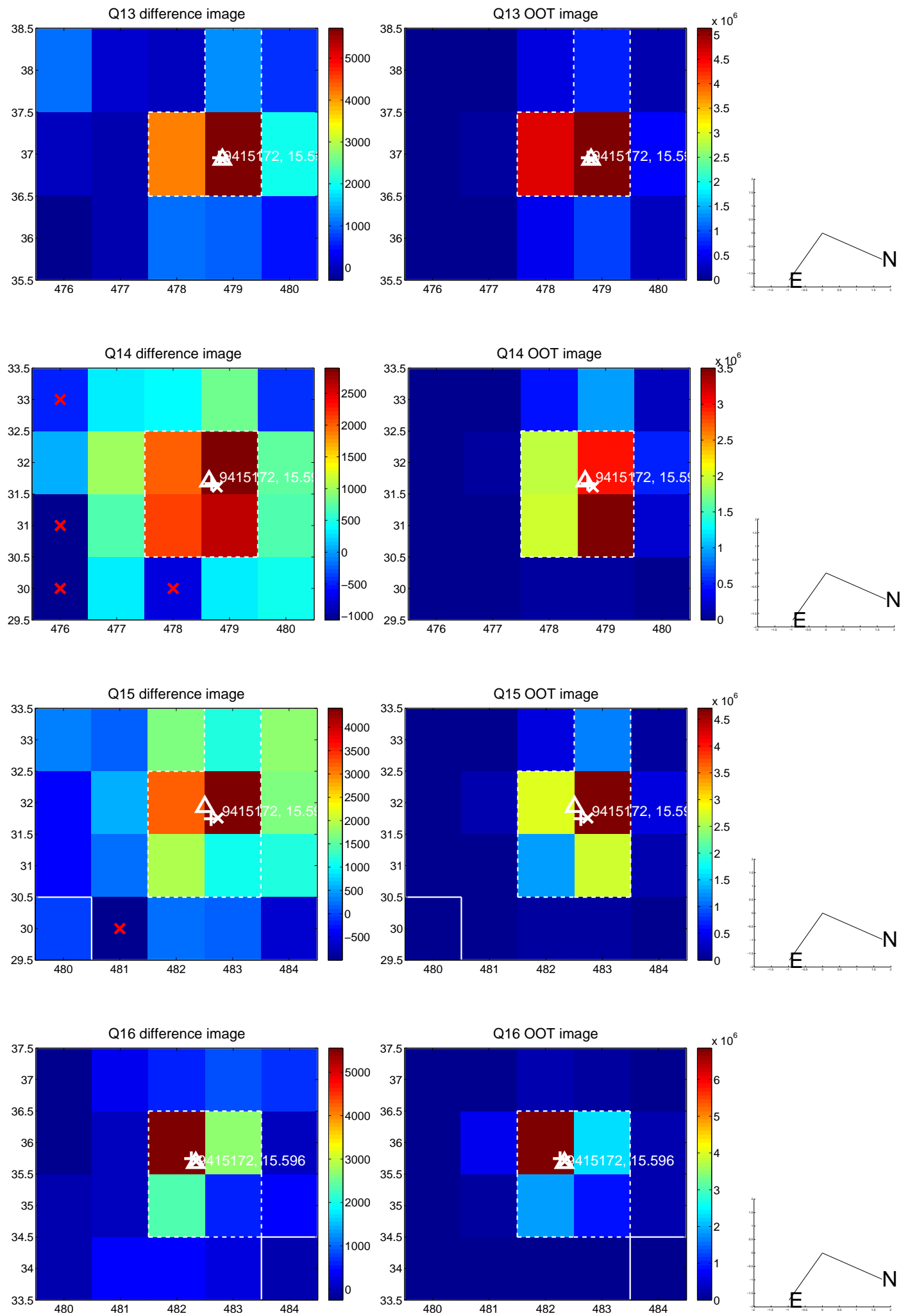
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



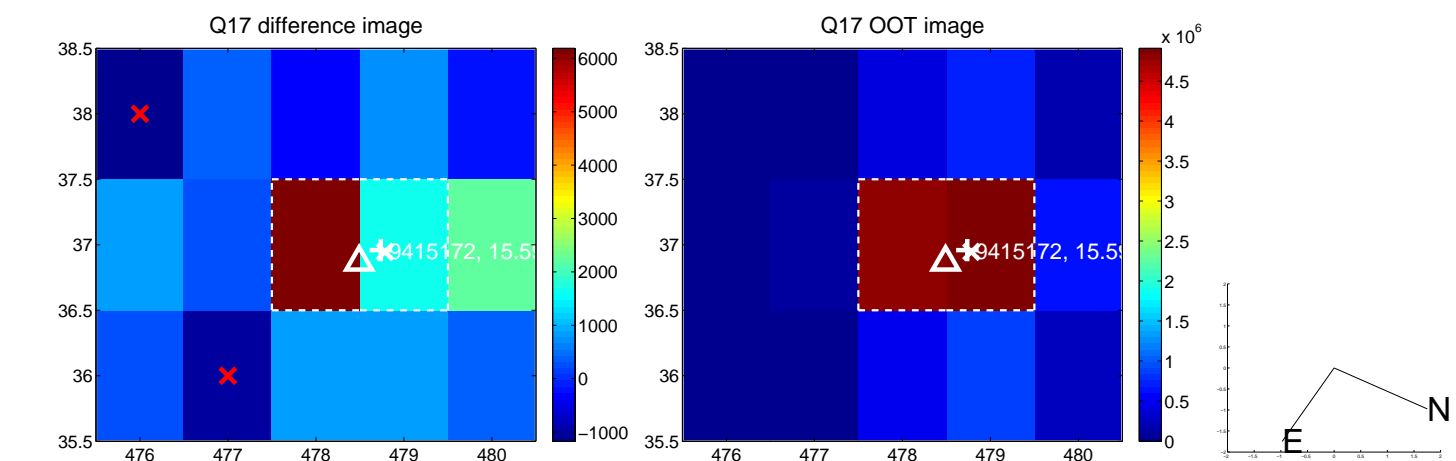
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



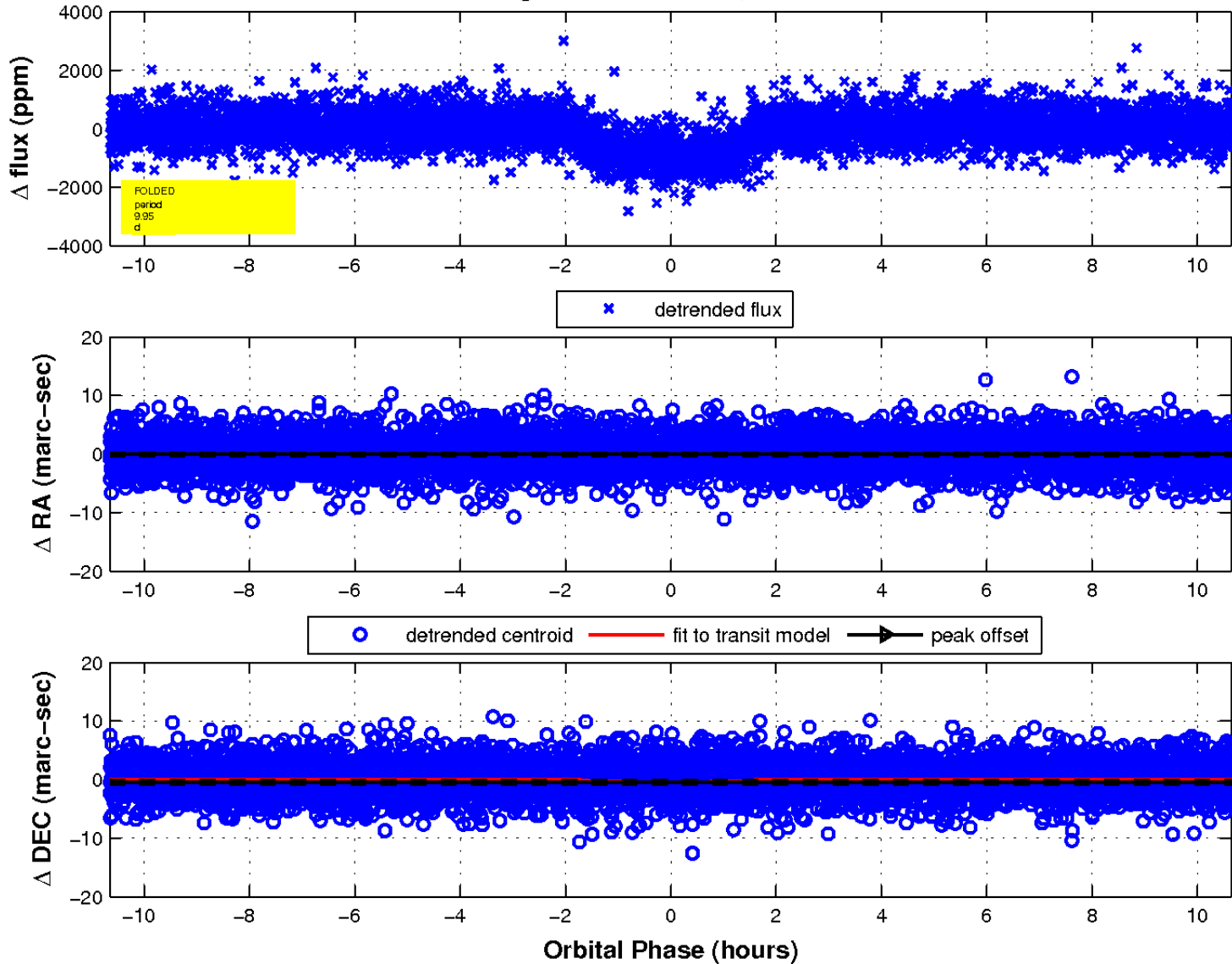
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

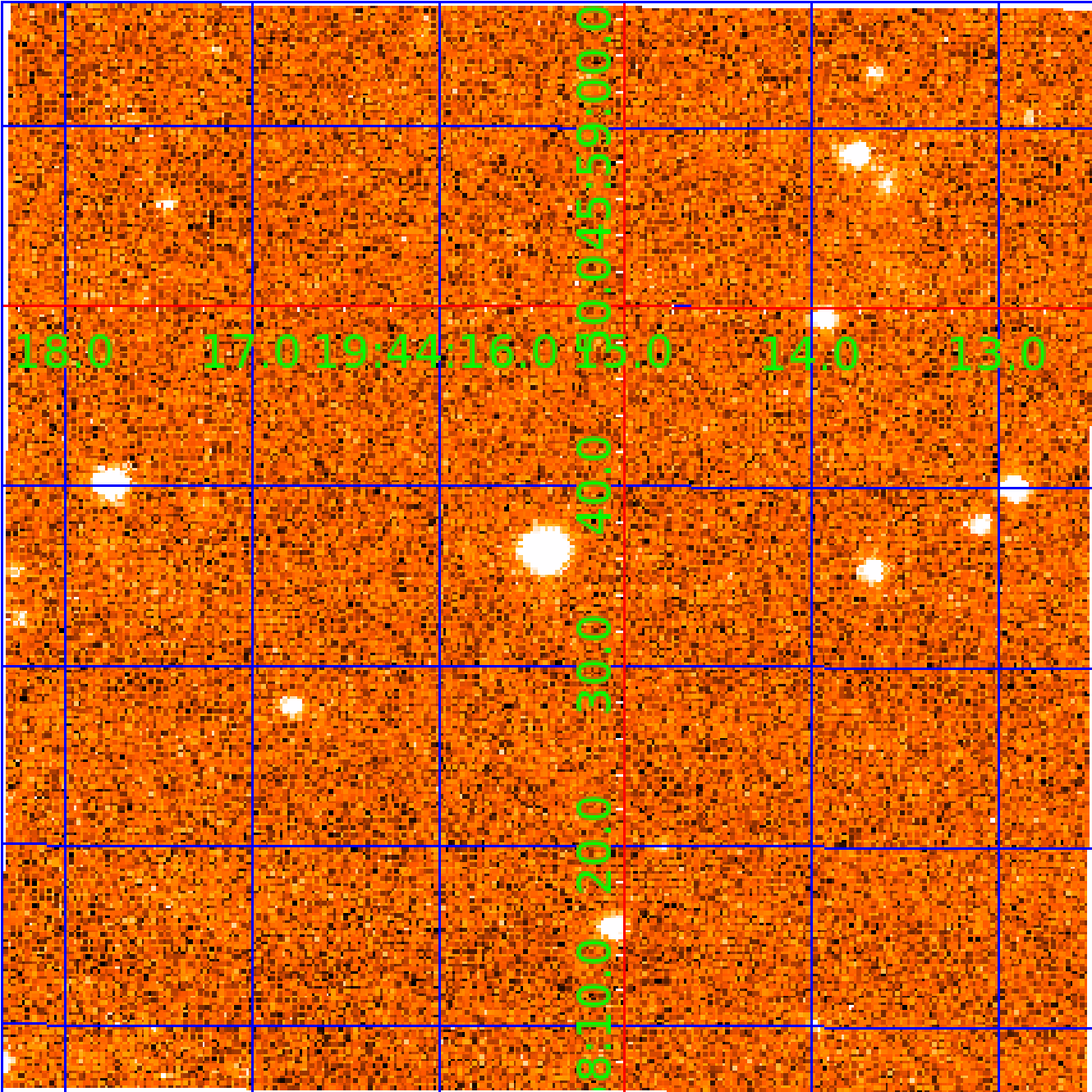


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination



KIC 009415172

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})
009415172-01	OBS	0938.01	9.946008	131.918477	990.5	3.550	42.6	46.8	1.01	5344	3.62	100.59
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009415172-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009415172-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009415172-03	OBS	PC	0.95	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.

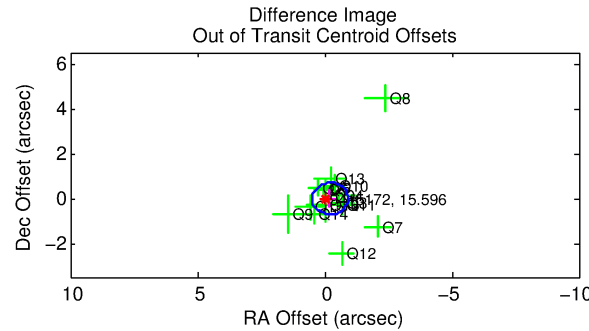
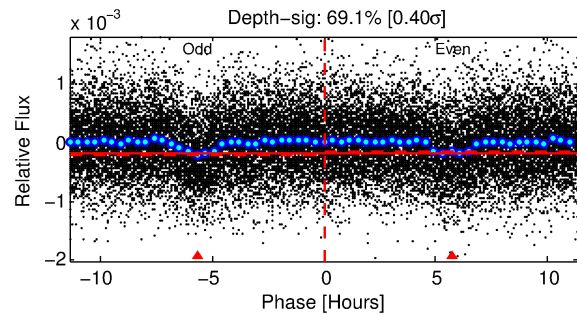
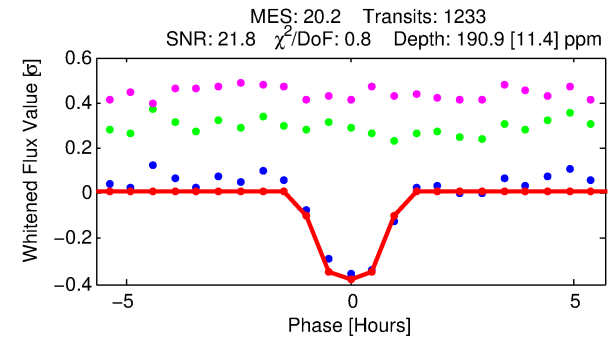
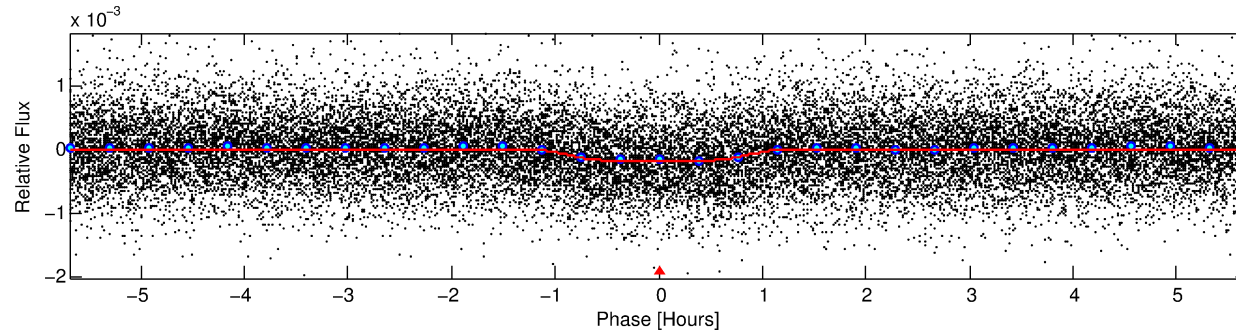
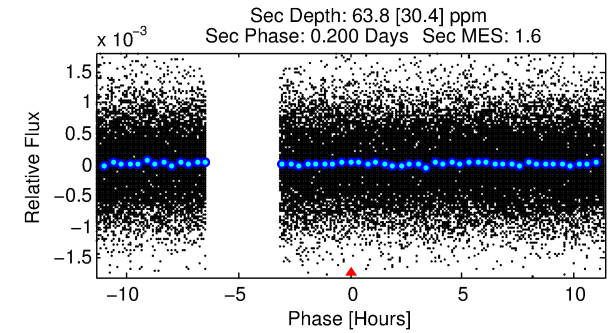
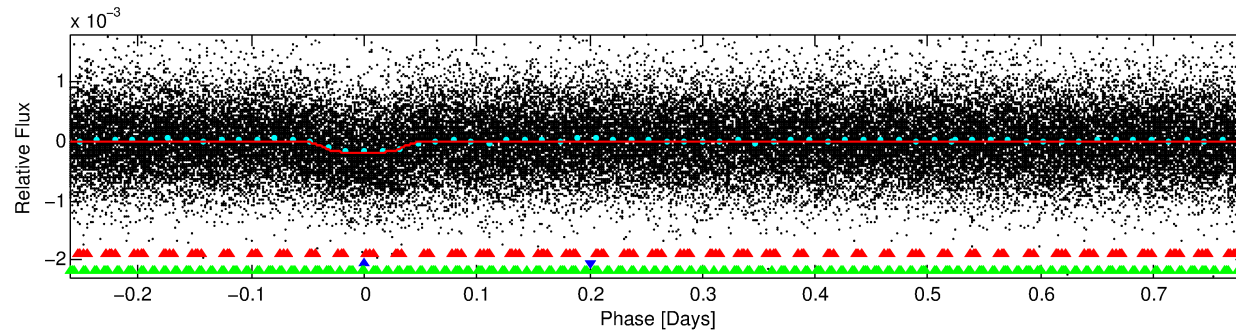
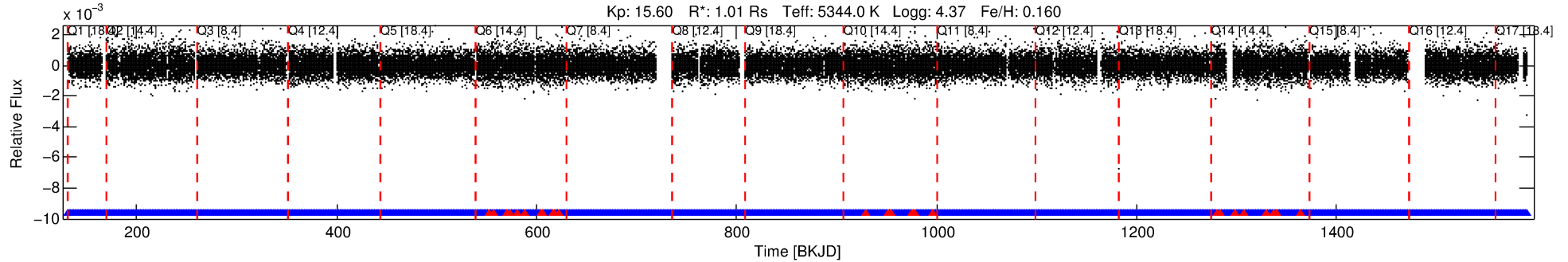
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009415172-02

No Significant Match Found

DV One-Page Summary

KIC: 9415172 Candidate: 2 of 3 Period: 1.046 d
KOI: K00938.02 Corr: 0.951



DV Fit Results:

Period = 1.04561 [0.00000] d
Epoch = 131.8321 [0.0013] BKJD
Rp/R* = 0.0128 [0.0063]
a/R* = 3.82 [6.51]
b = 0.48 [2.99]
Seff = 2027.40 [467.86]
Teff = 1711 [99] K
Rp = 1.42 [0.73] Re
a = 0.0192 [0.0026] AU
Ag = 6.47 [7.23] [0.76σ]
Teffp = 4218 [1157] K [2.16σ]

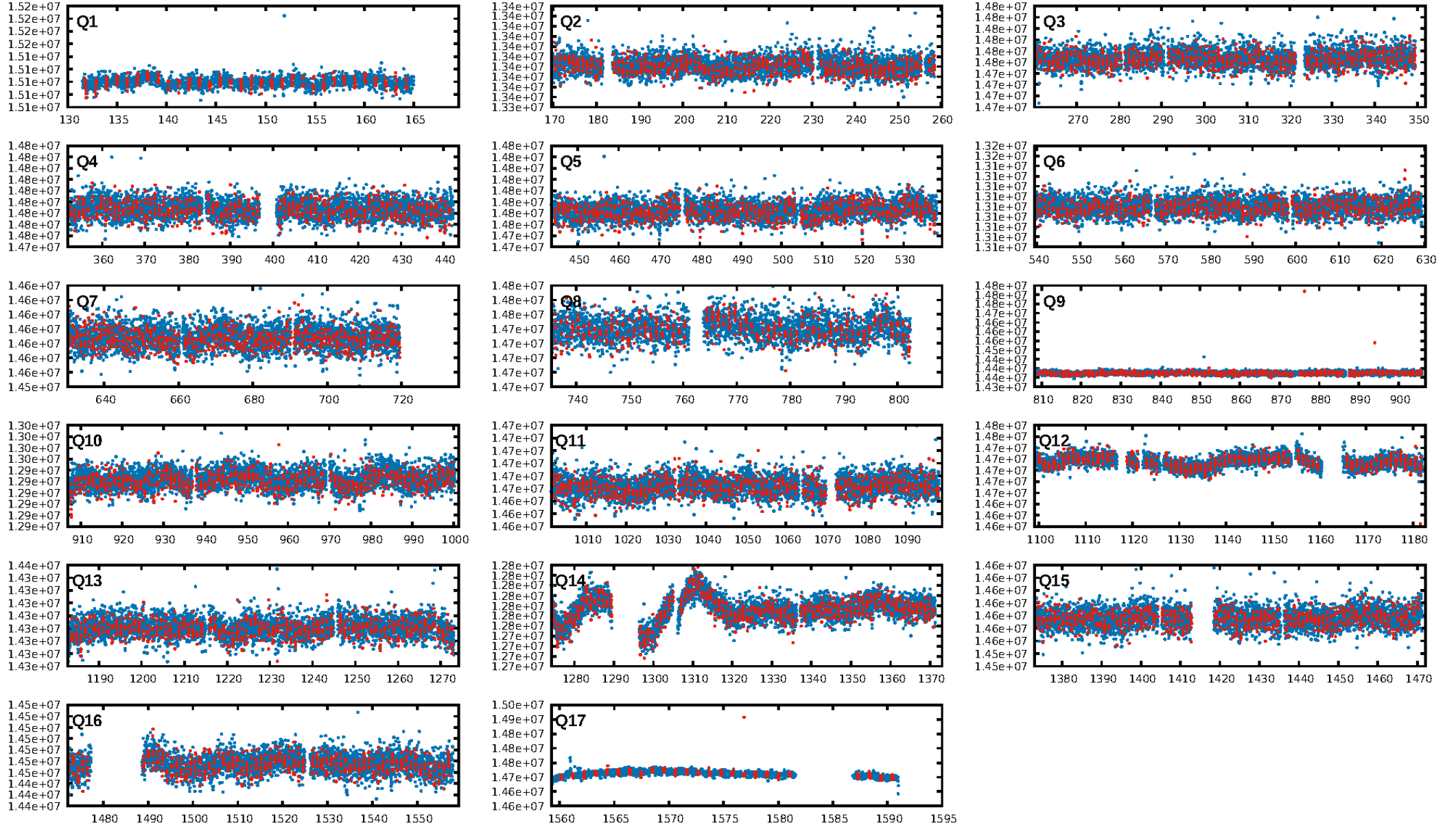
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [35.05σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.09e-87
RollingBand-fgt: 0.98 [1152/1179]
GhostDiagnostic-chr: 3.093
Centroid-sig: 6.1%
Centroid-so: 0.871 arcsec [1.54σ]
OotOffset-rm: 0.200 arcsec [0.85σ]
KicOffset-rm: 0.378 arcsec [1.21σ]
OotOffset-st: 4/4/4/3 [15]
KicOffset-st: 4/4/4/3 [15]
DiffImageQuality-fgm: 0.93 [14/15]
DiffImageOverlap-fno: 1.00 [17/17]

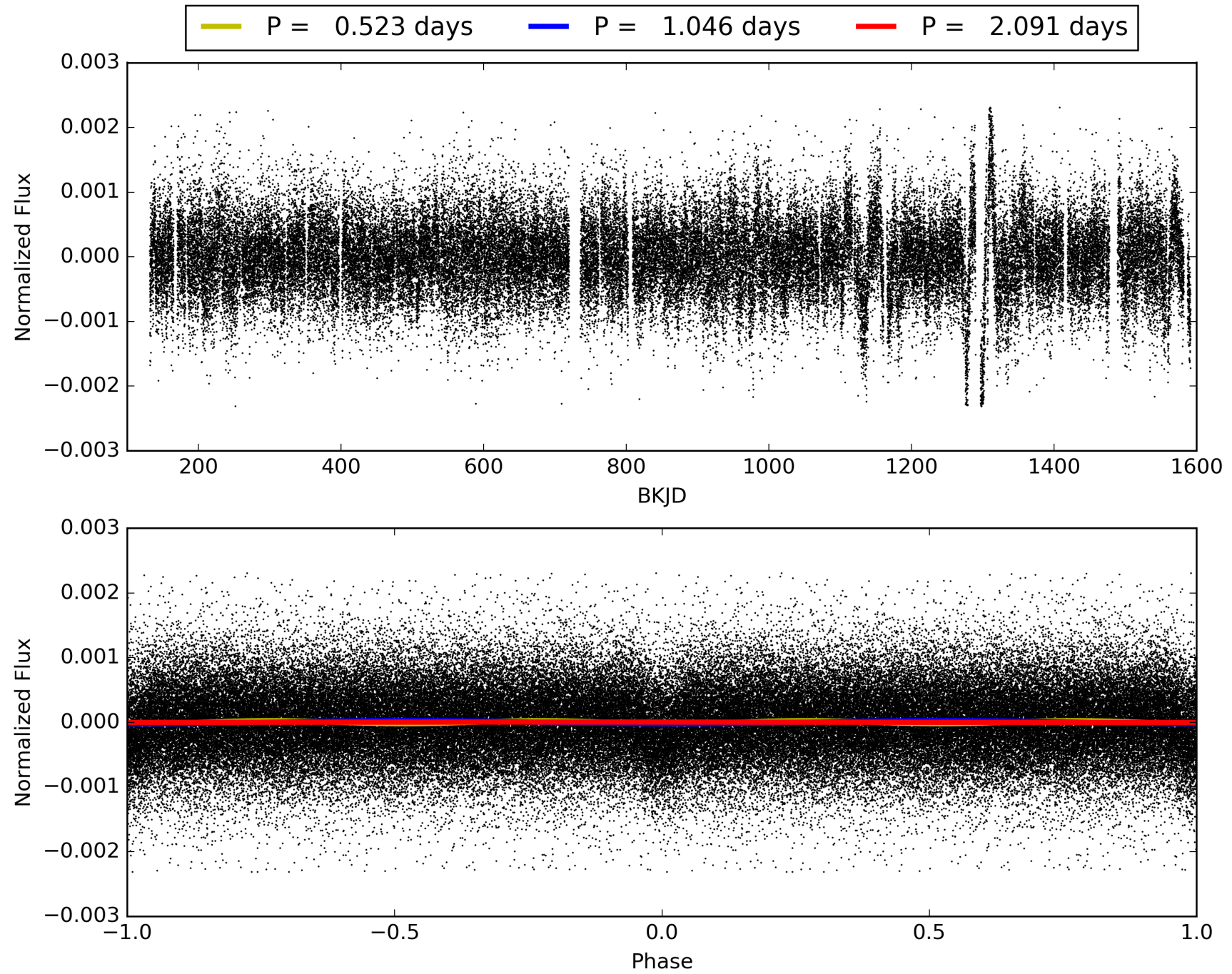
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 16:28:14 Z

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

TCE 009415172-02, PDC Light Curves

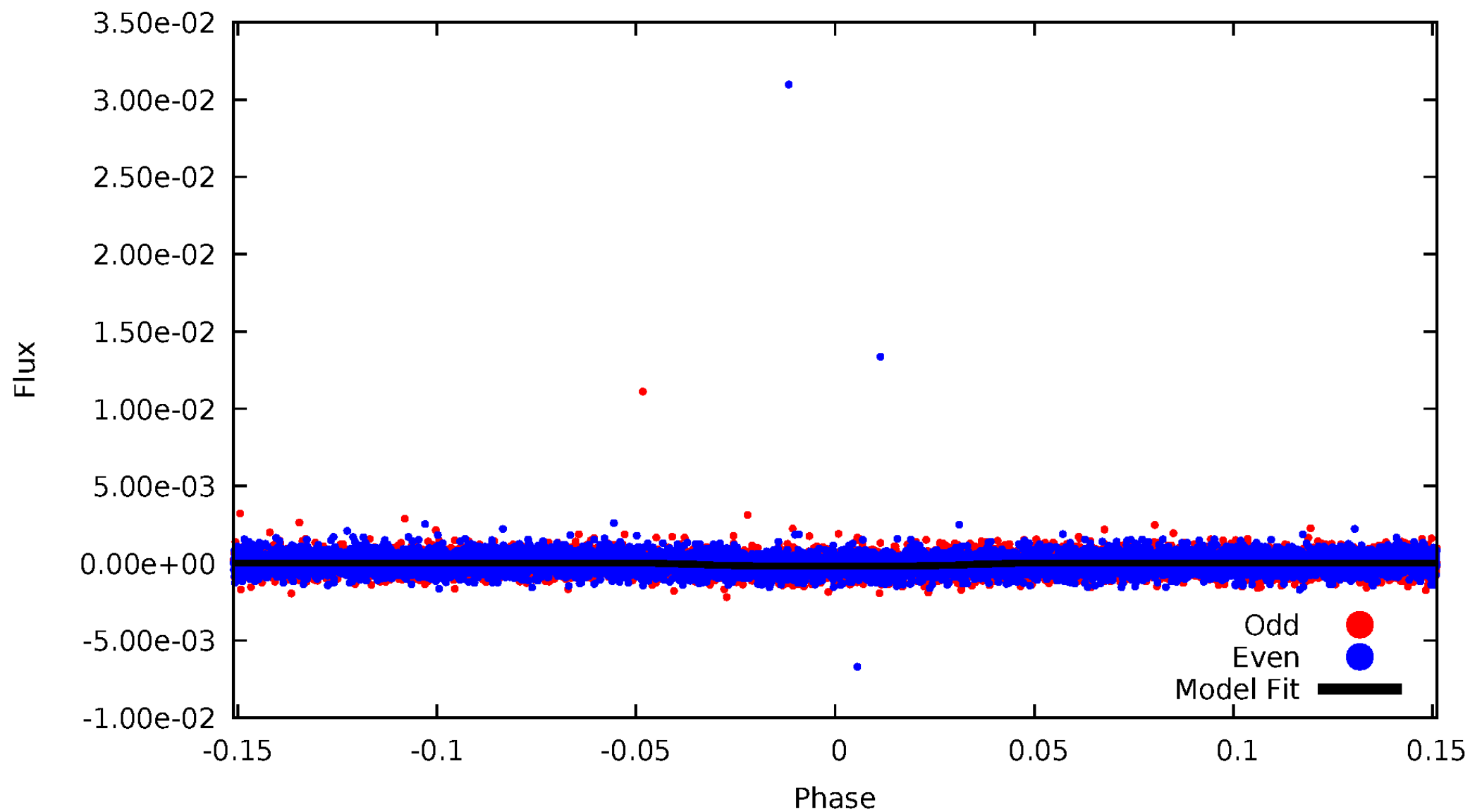


TCE 009415172-02



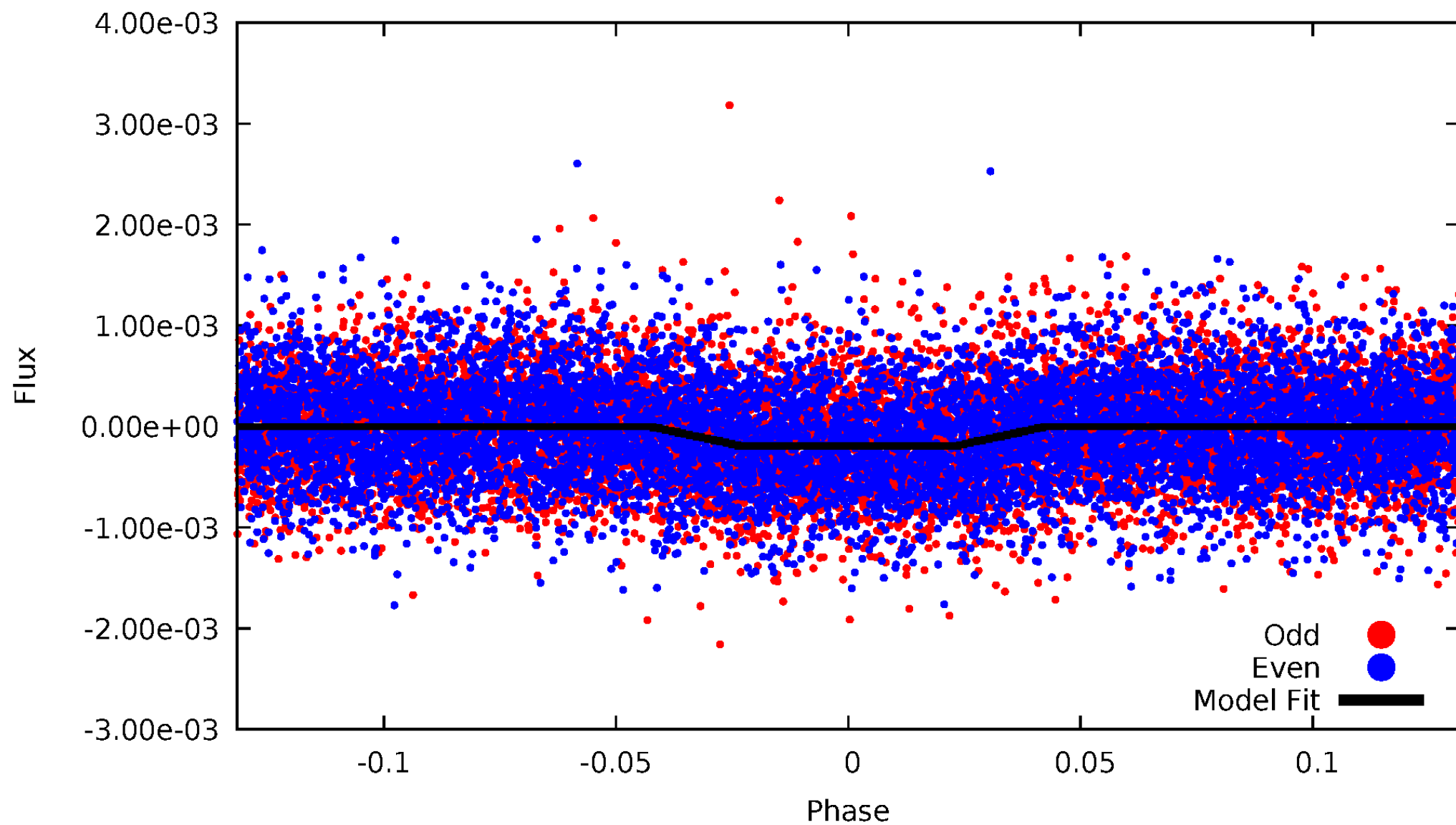
DV Odd/Even

TCE 009415172-02



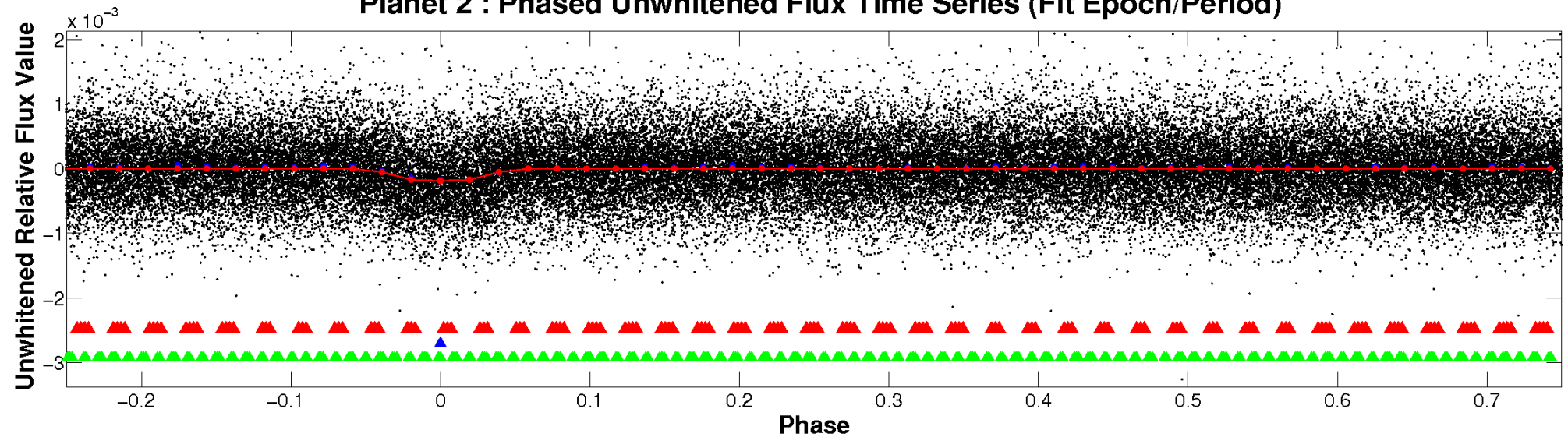
ALT Odd/Even

TCE 009415172-02

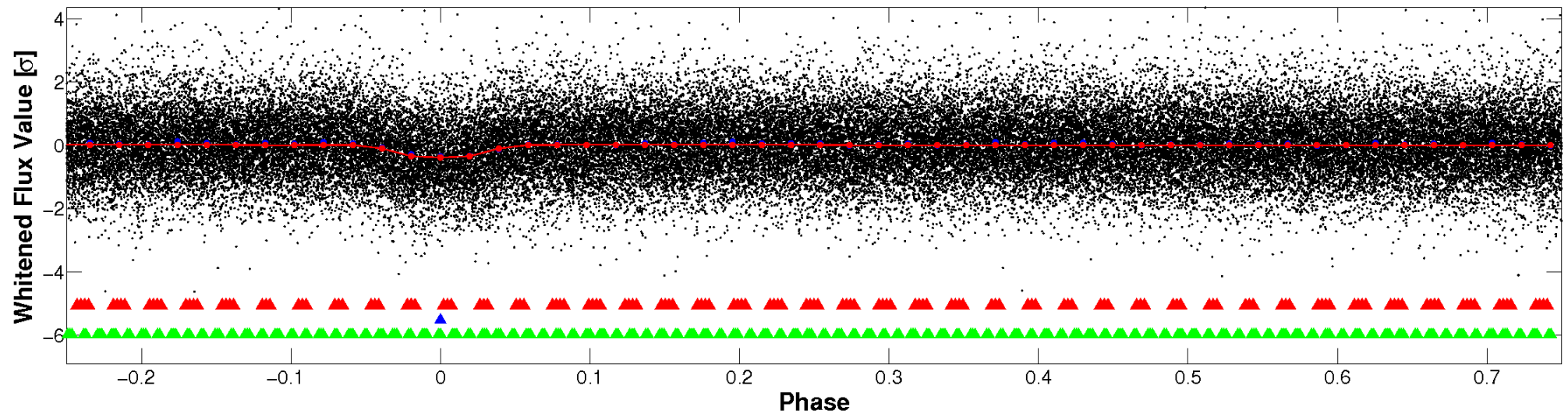


Non-Whitened Vs. Whitened Light Curve

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

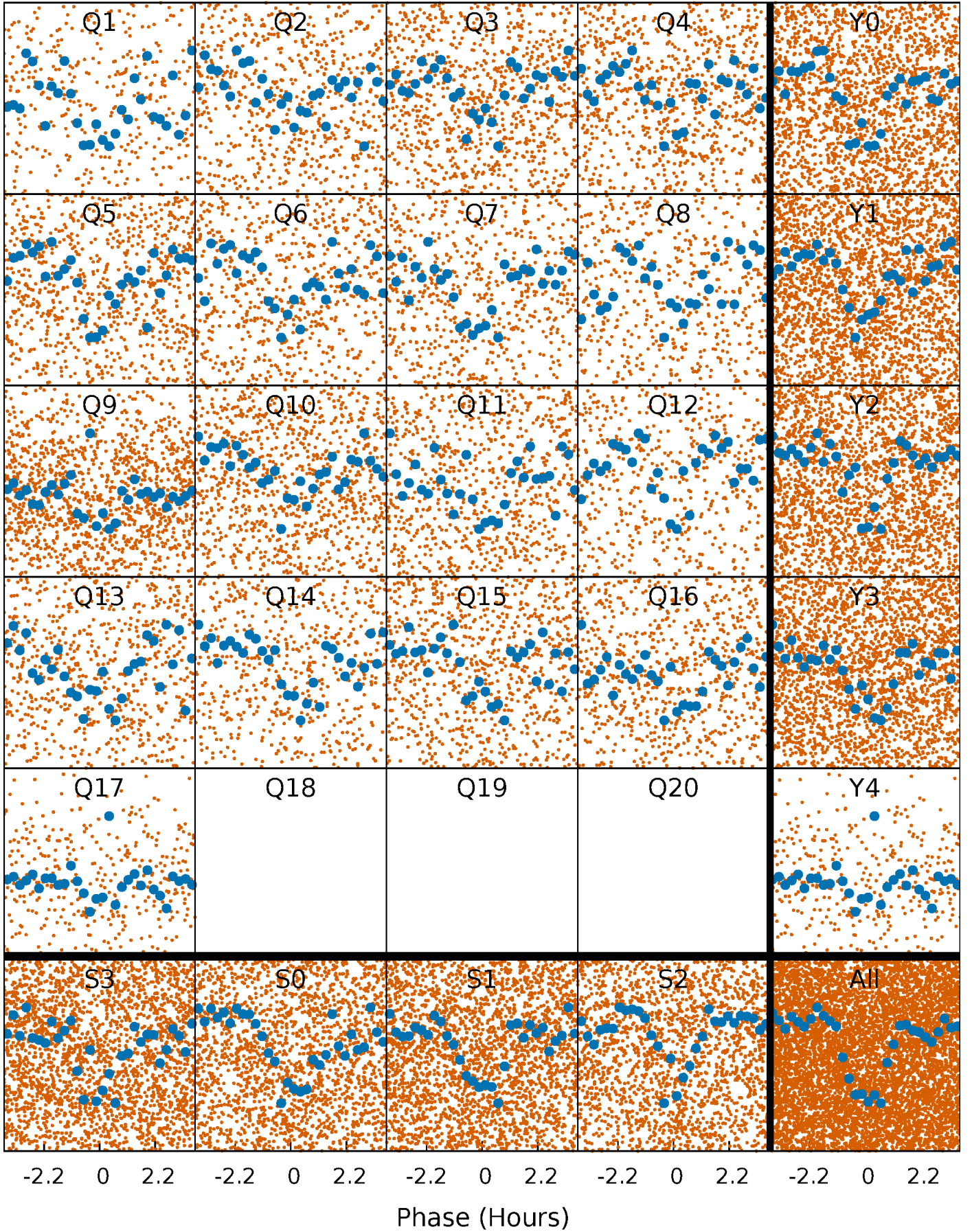


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



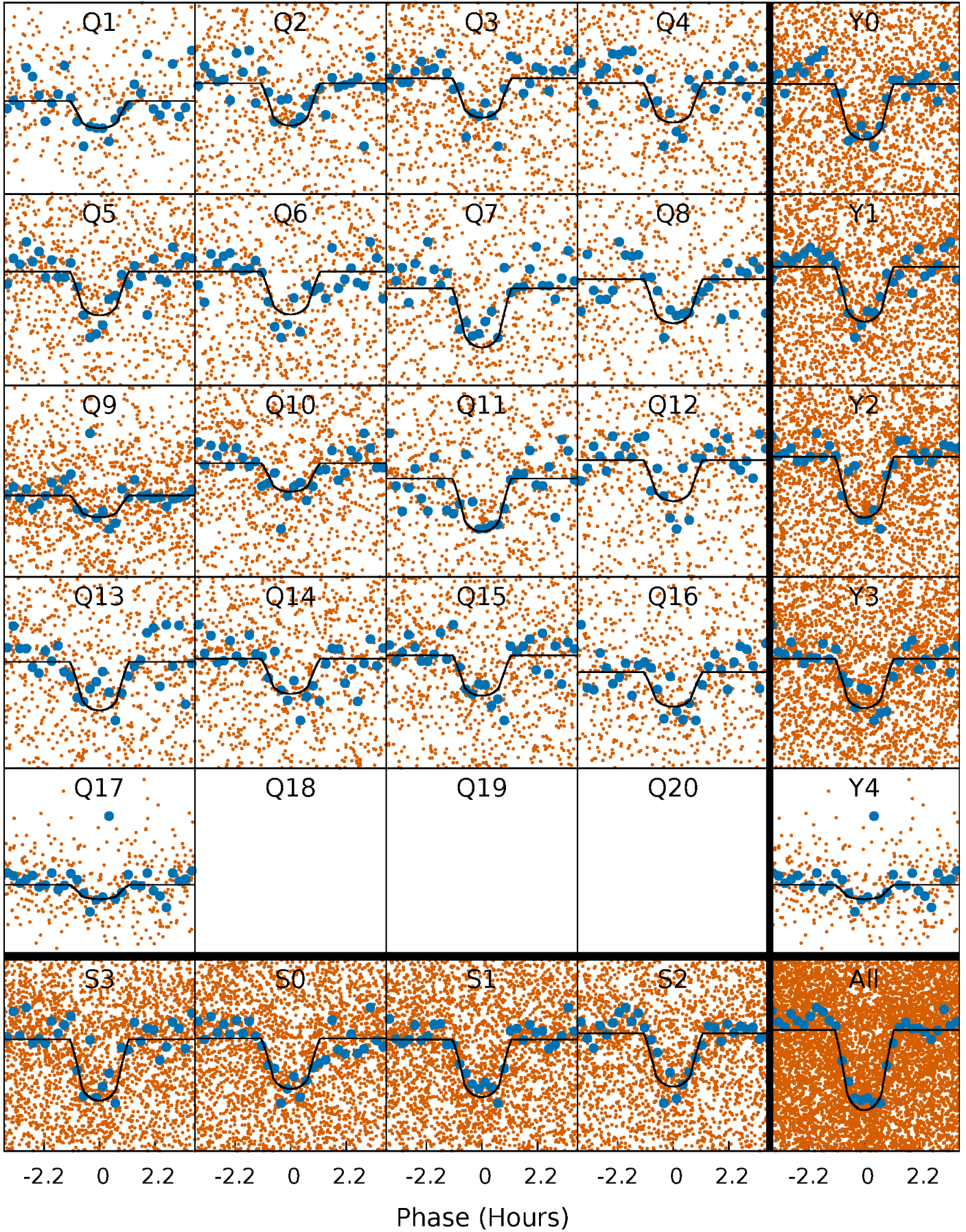
PDC Quarter-Phased Transit Curves

TCE 009415172-02 P= 1.045613 Days $T_0=131.832114$ (BKJD)



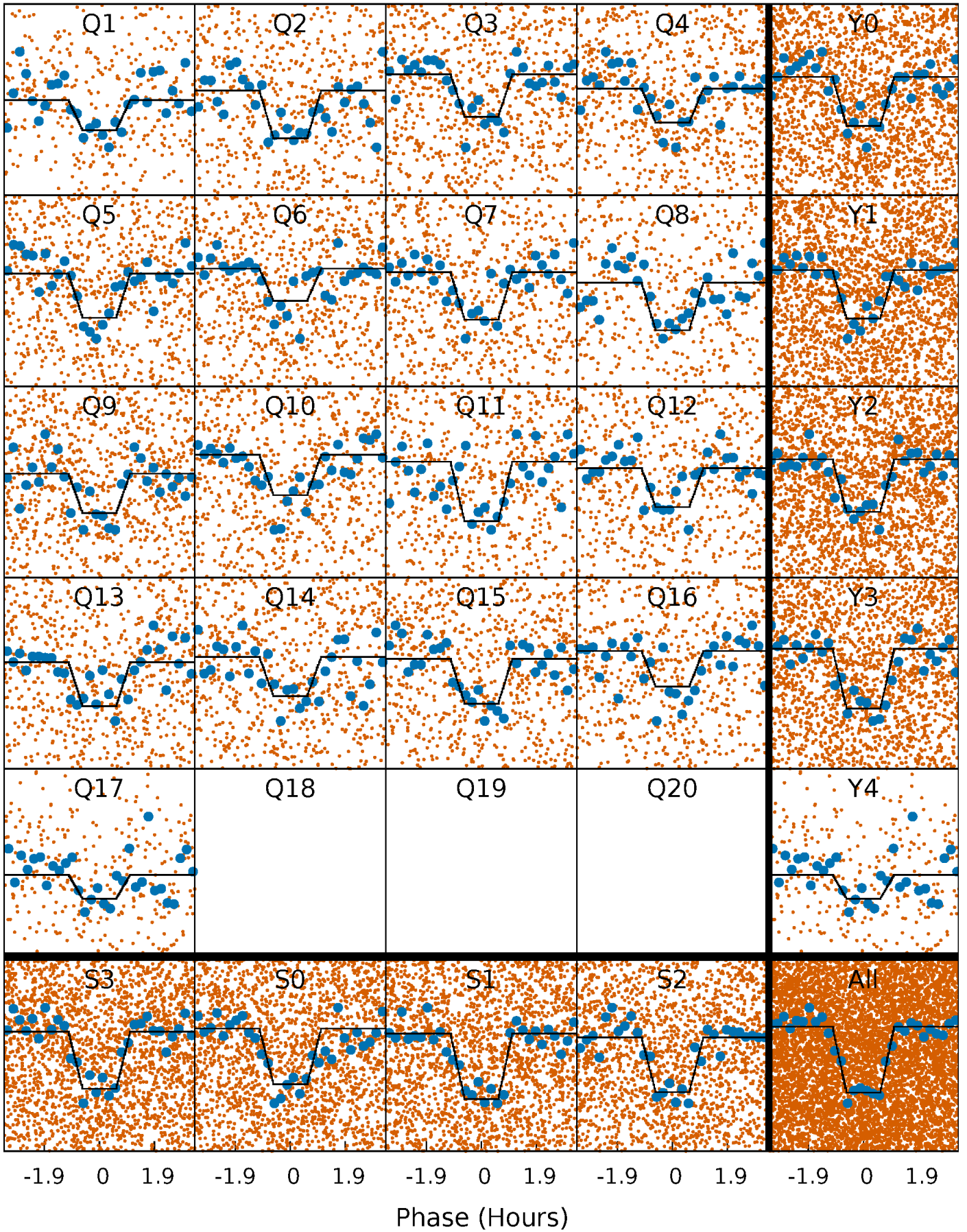
DV Quarter-Phased Transit Curves

TCE 009415172-02 P= 1.045613 Days $T_0=131.832114$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

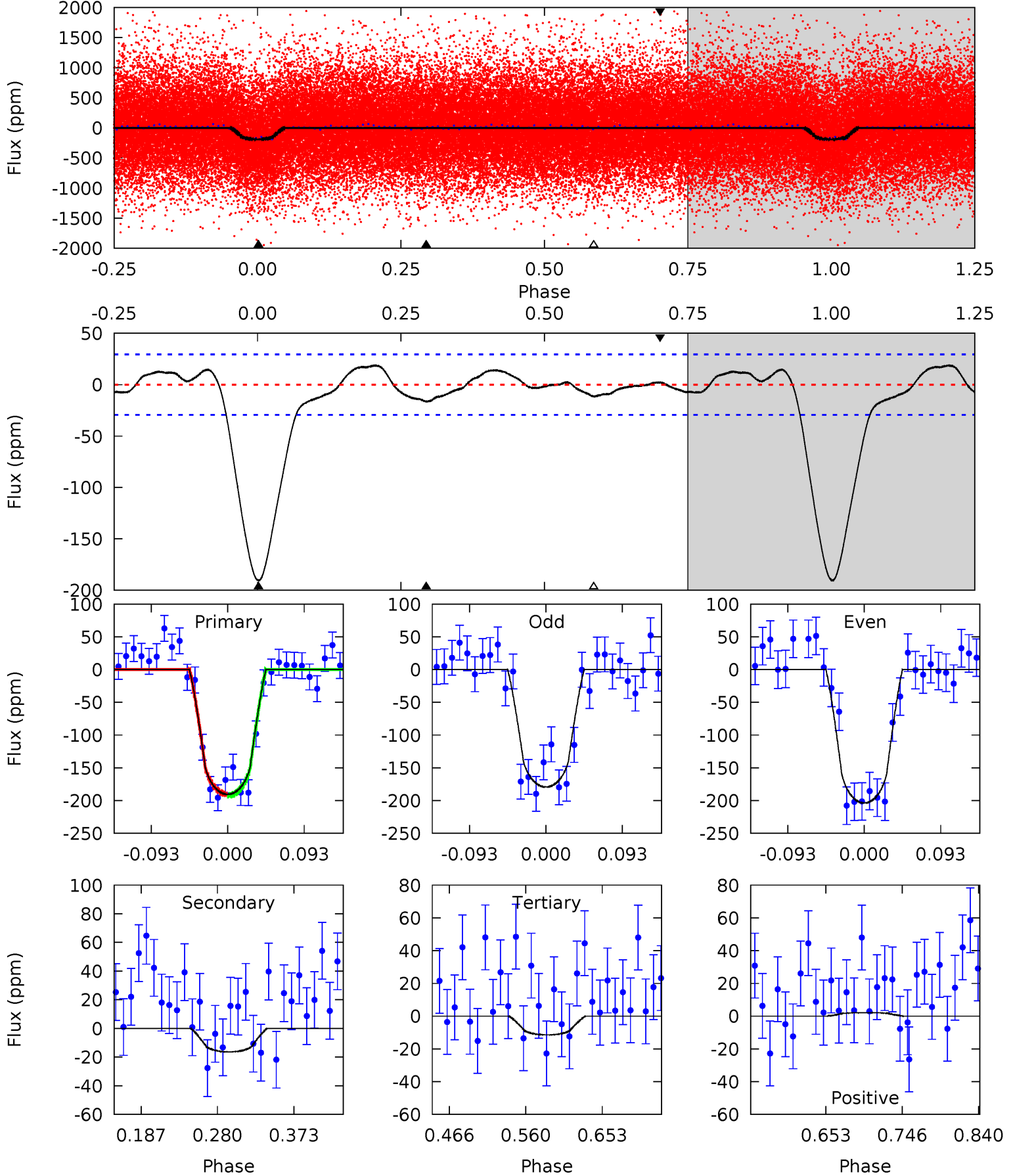
TCE 009415172-02 P= 1.045620 Days $T_0=131.829479$ (BKJD)



DV Model-Shift Uniqueness Test

009415172-02, P = 1.045613 Days, E = 130.786501 Days

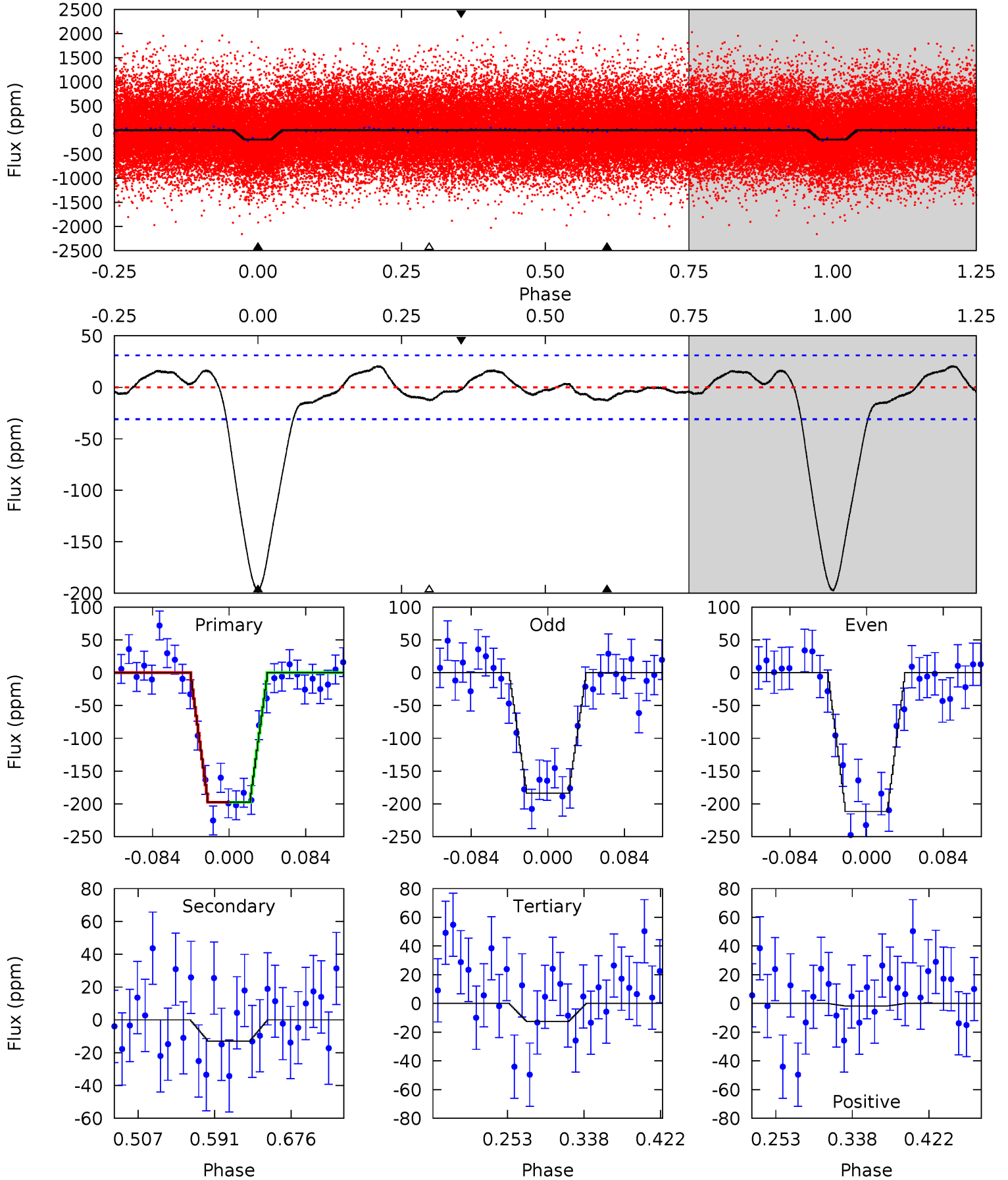
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.7	2.56	1.78	0.33	4.58	1.68	1.29	27.9	29.4	0.77	2.22	1.91	0.92	0.09	0.16



Alt Model-Shift Uniqueness Test

009415172-02, P = 1.045620 Days, E = 130.783859 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.3	1.92	1.87	-0.27	4.60	1.73	1.41	27.4	29.5	0.05	2.19	2.07	0.98	0.09	0.02



Stellar Parameters For KIC 009415172

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5344^{+80}_{-80}	$4.365^{+0.132}_{-0.096}$	$0.160^{+0.150}_{-0.100}$	$1.013^{+0.141}_{-0.141}$	$0.867^{+0.064}_{-0.032}$	$1.175^{+0.674}_{-0.363}$
	+1%/-1%	+3%/-2%	+94%/-62%	+14%/-14%	+7%/-4%	+57%/-31%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 009415172-02 / KOI 0938.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-16 ± 6	$1.41^{+0.69}_{-0.70}$	2387^{+96}_{-102}	3341^{+953}_{-606}	$1.595^{+4.657}_{-0.960}$
Alt.	-13 ± 7	$1.50^{+0.71}_{-0.65}$	2390^{+103}_{-106}	3133^{+819}_{-768}	$1.140^{+2.844}_{-0.744}$

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

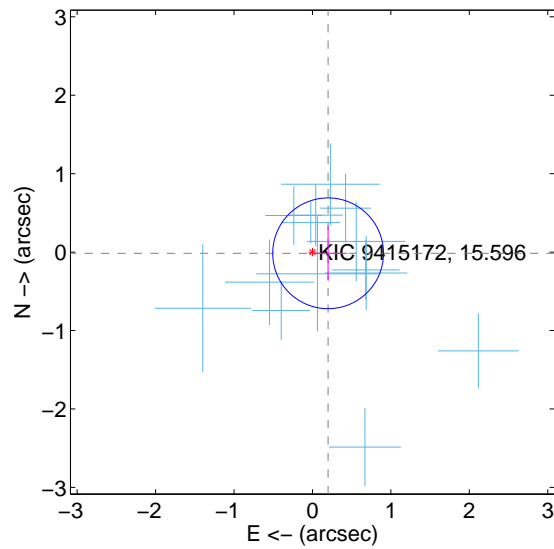
Supplemental centroid analysis for 009415172-02. Kepler magnitude: 15.60. Transit SNR 21.81

There are 14 quarters with good PRF difference image offsets

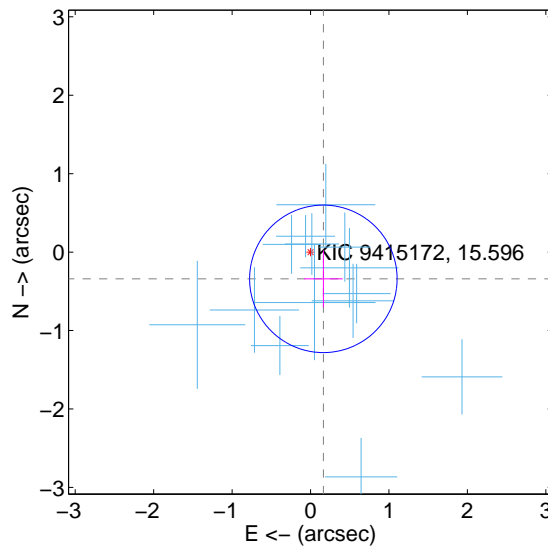
The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.200 ± 0.235	0.85	-0.200 ± 0.244	-0.015 ± 0.350
PRF-fit source offset from KIC position	0.378 ± 0.313	1.21	-0.164 ± 0.245	-0.341 ± 0.363
photometric centroid source offset	0.87 ± 0.57	1.54	0.86 ± 0.56	0.13 ± 0.65

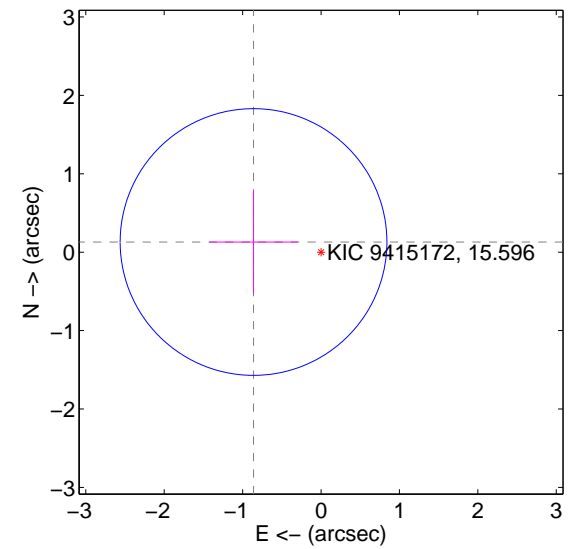
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

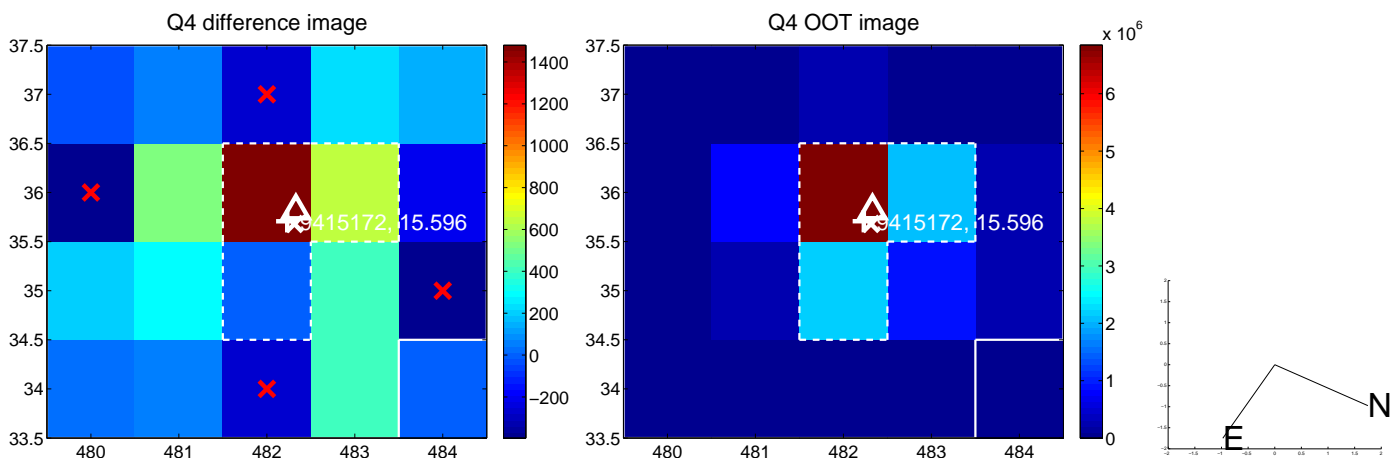
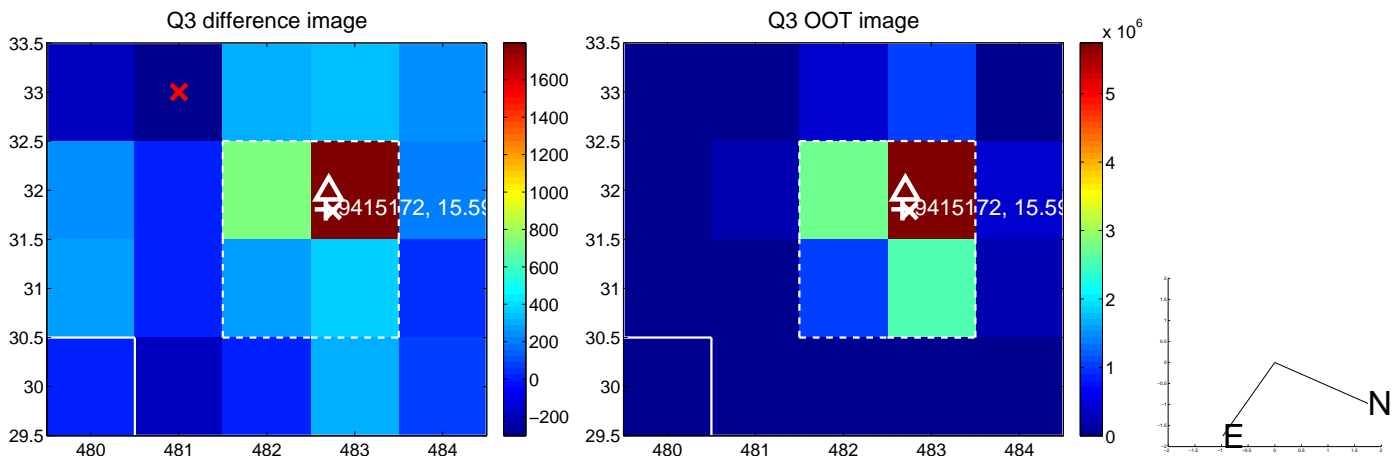
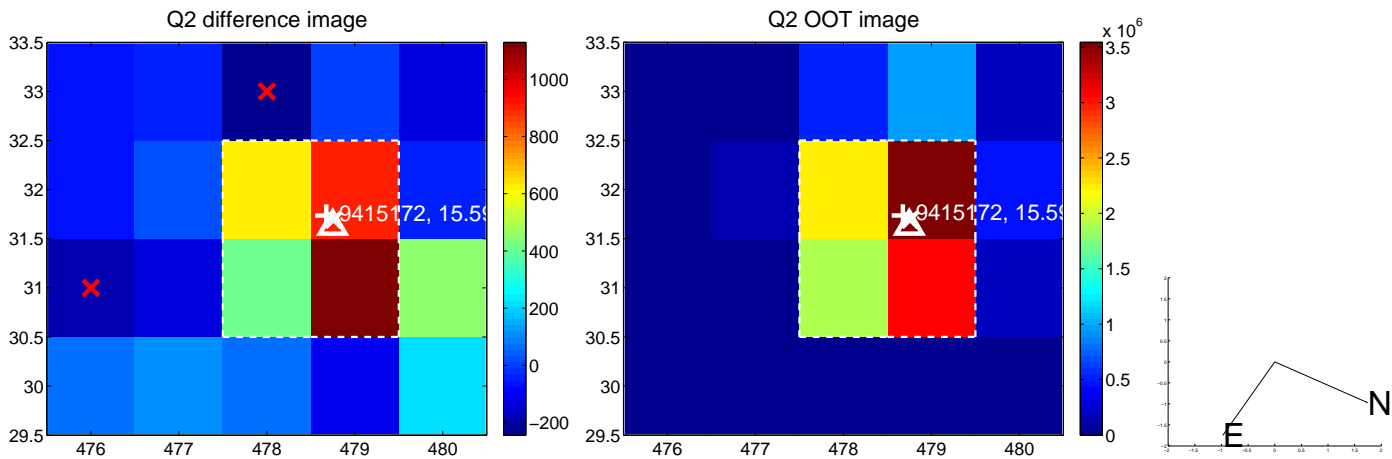
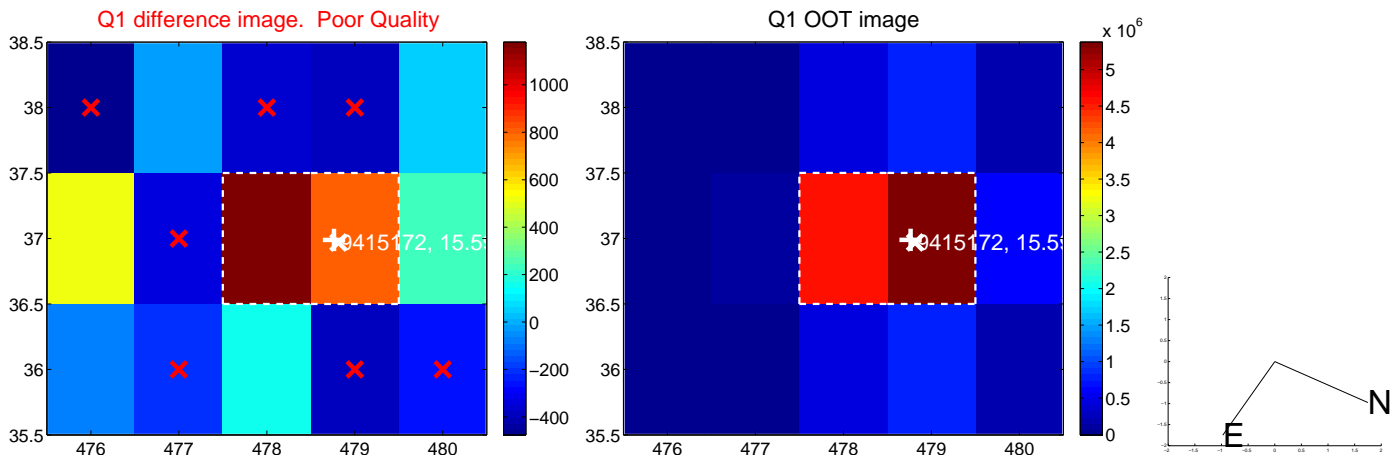


offset from photometric centroids

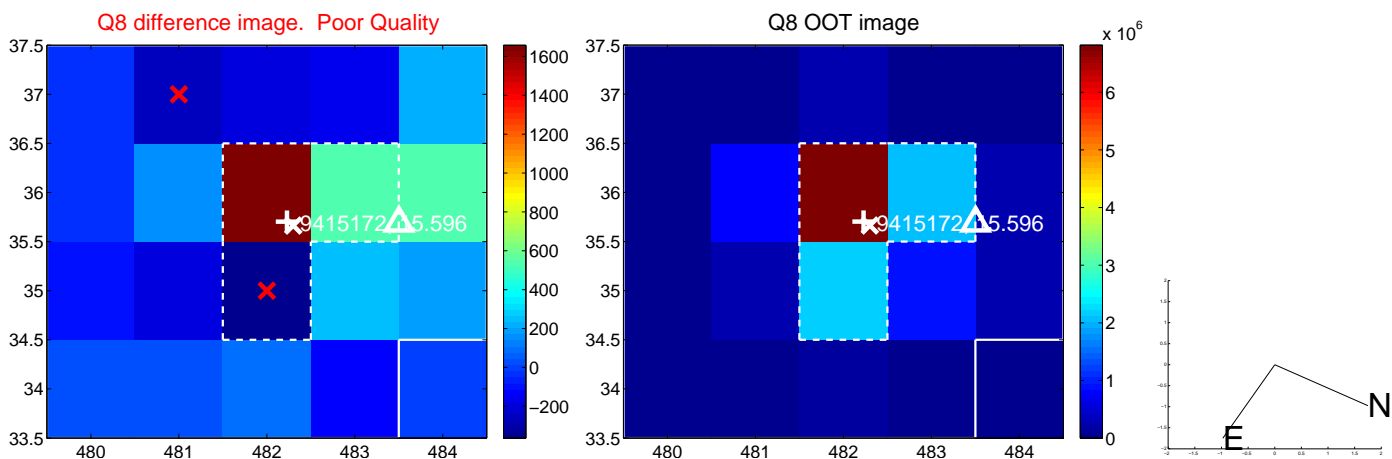
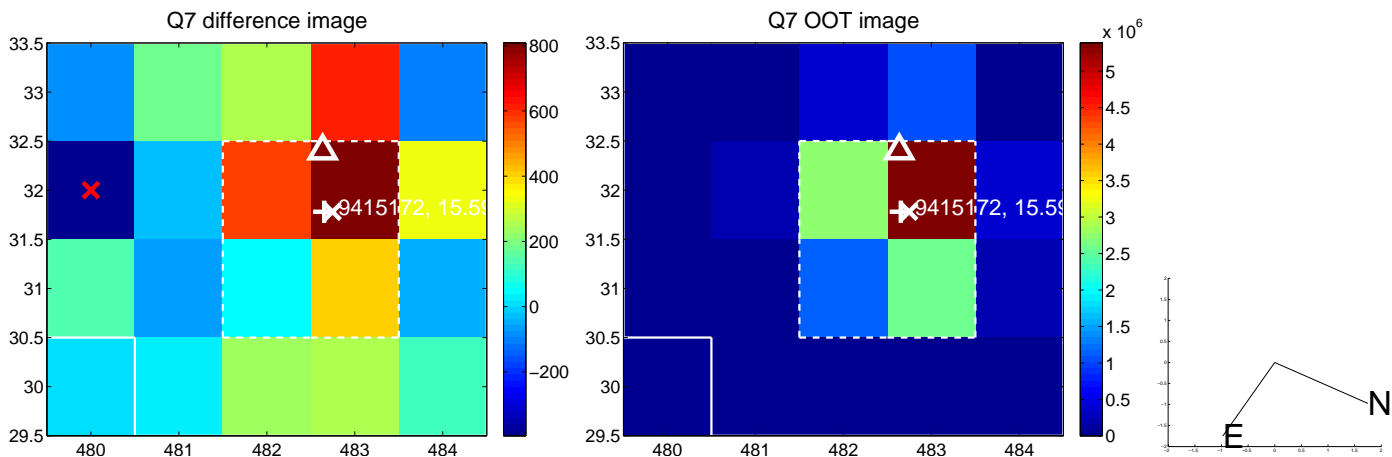
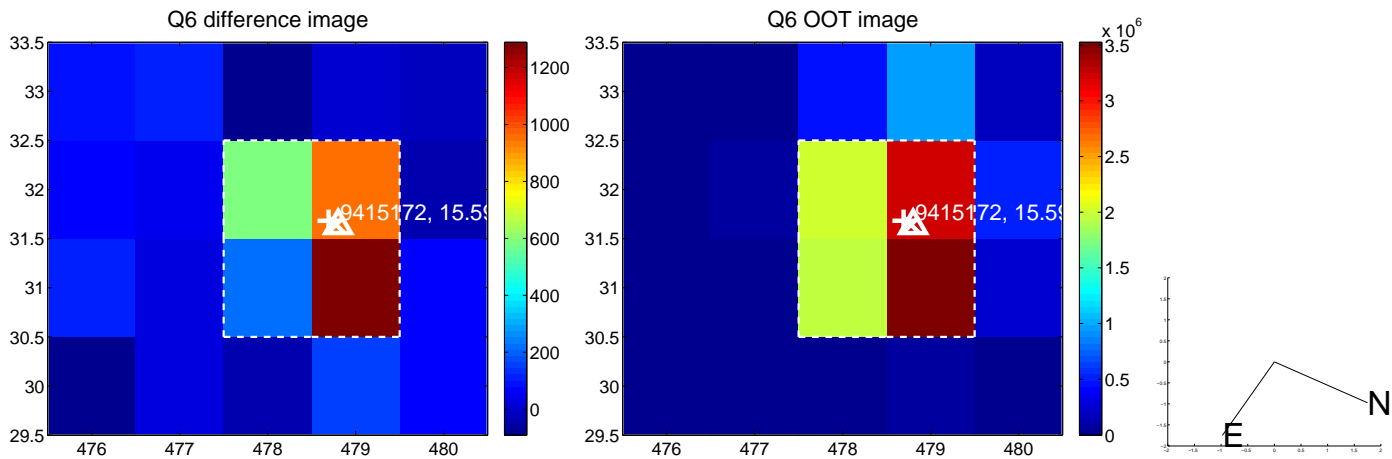
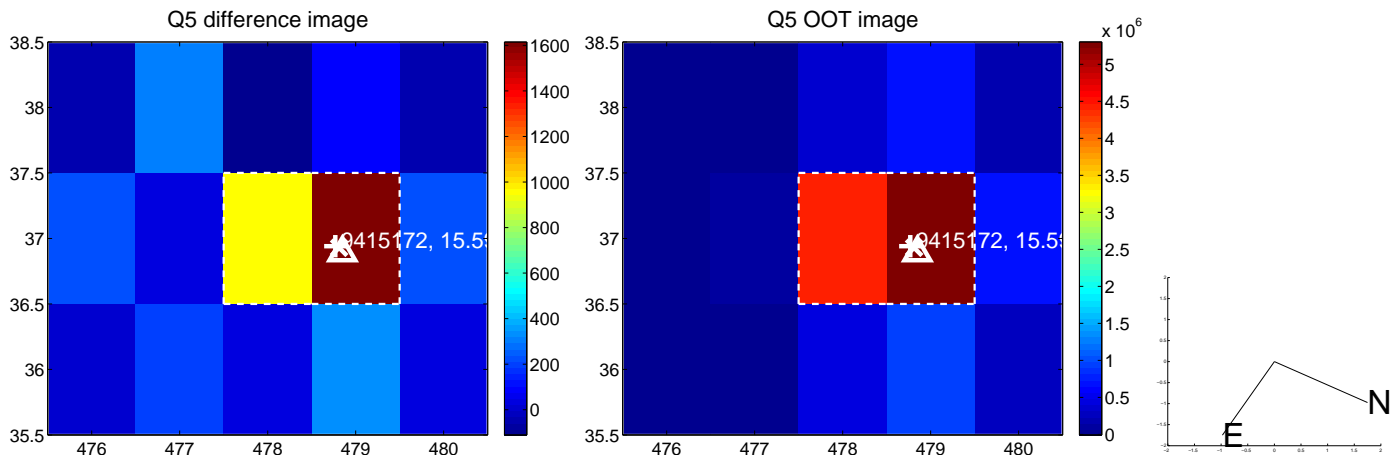


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

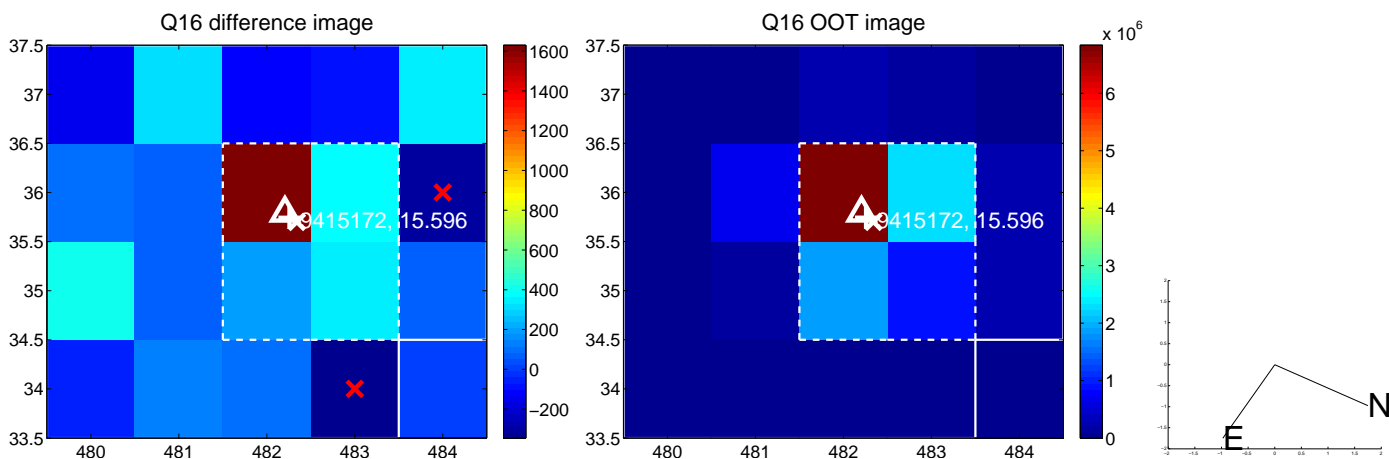
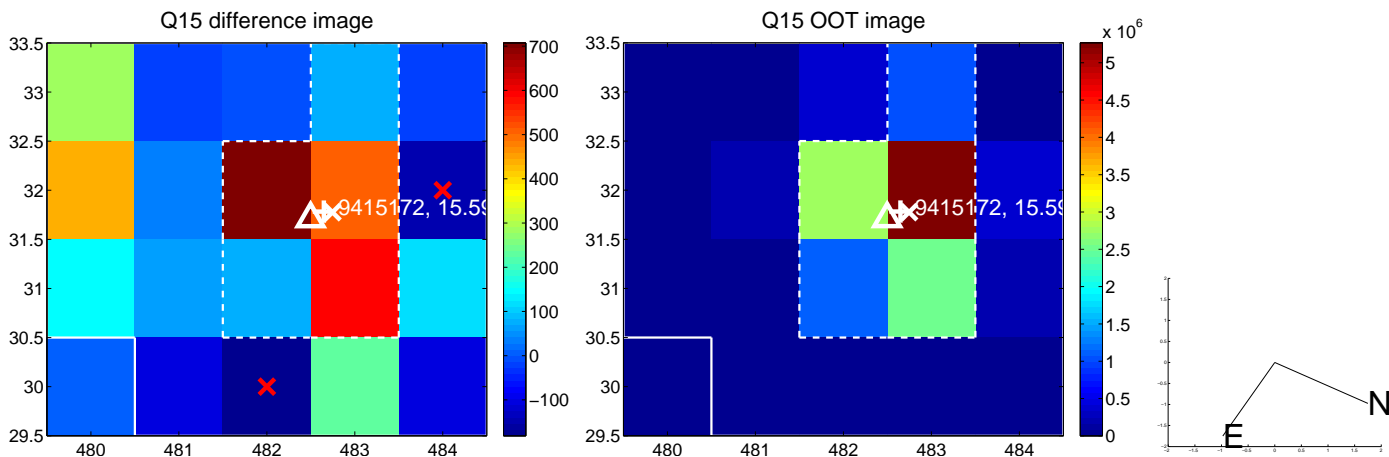
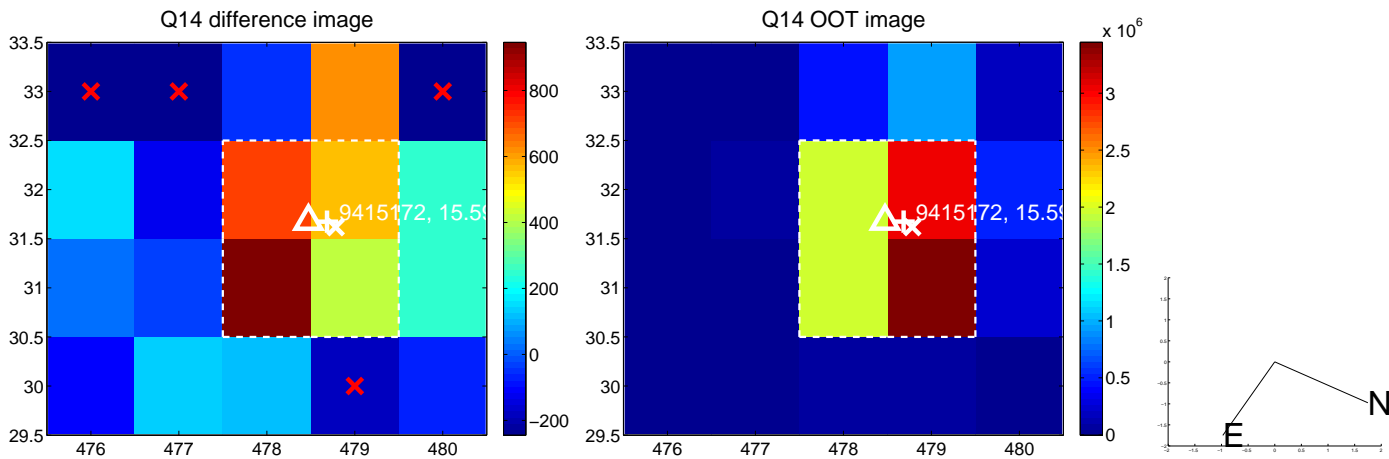
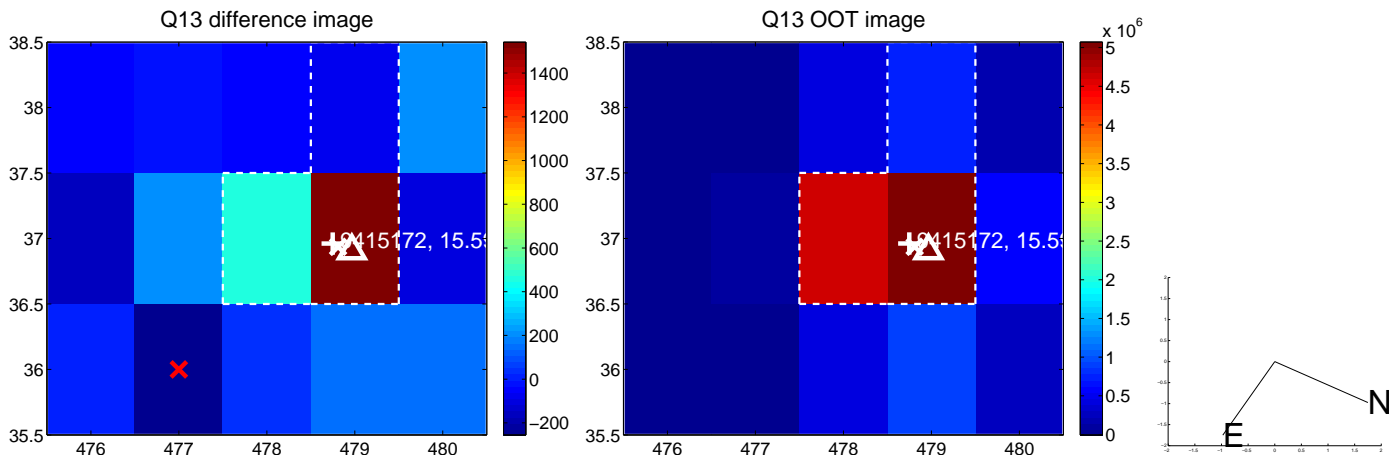
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



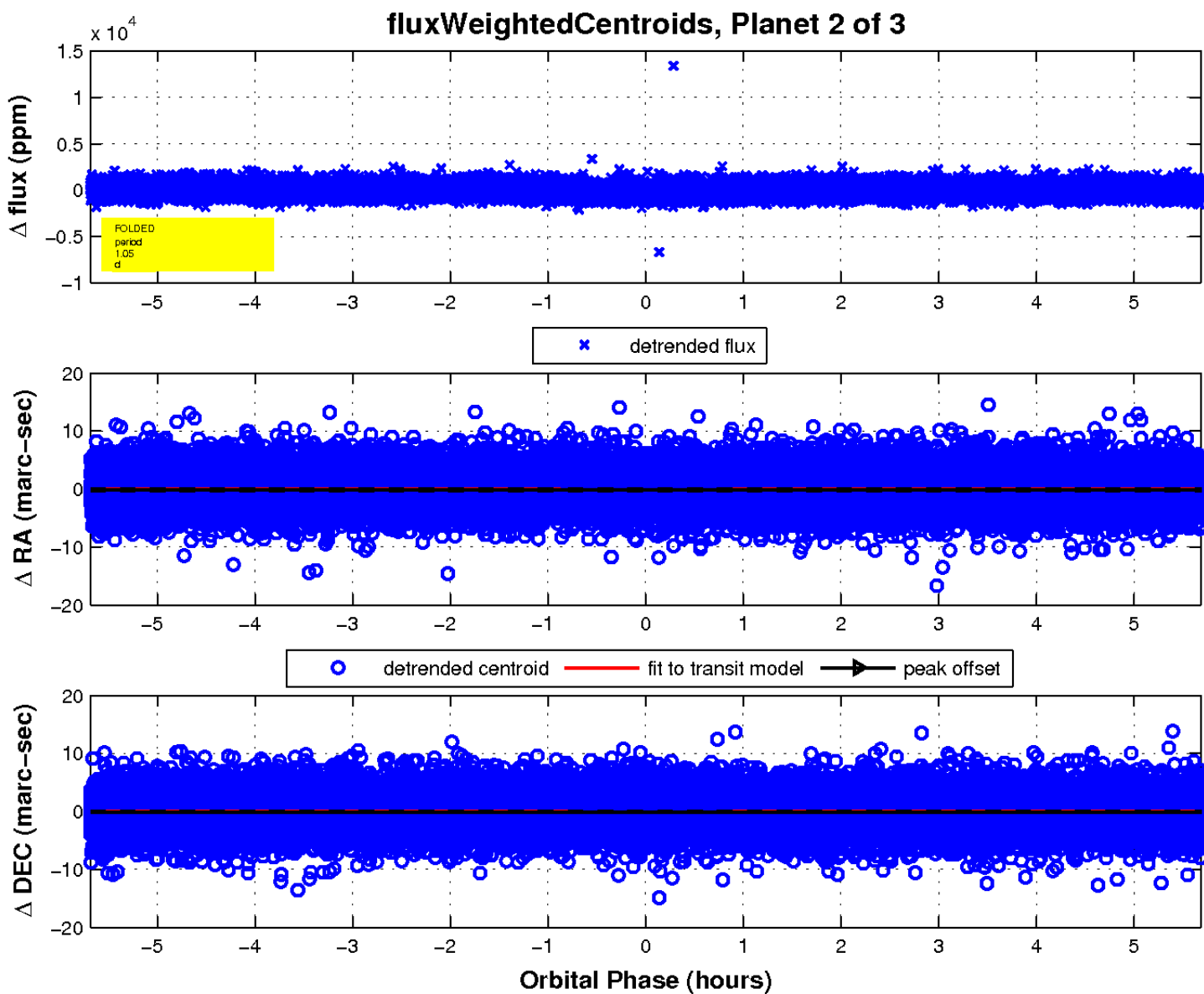
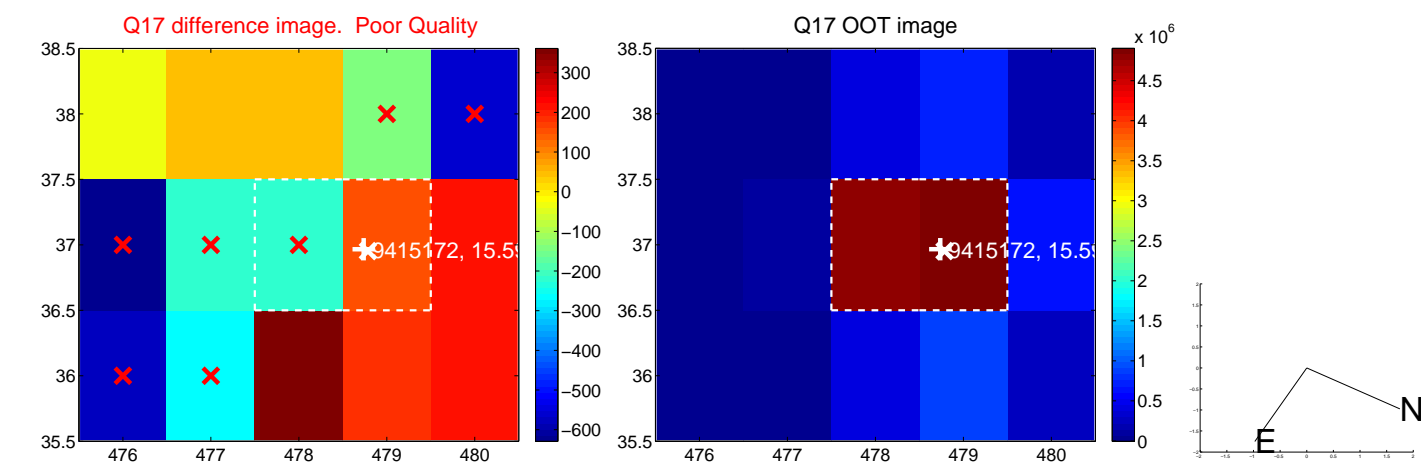
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

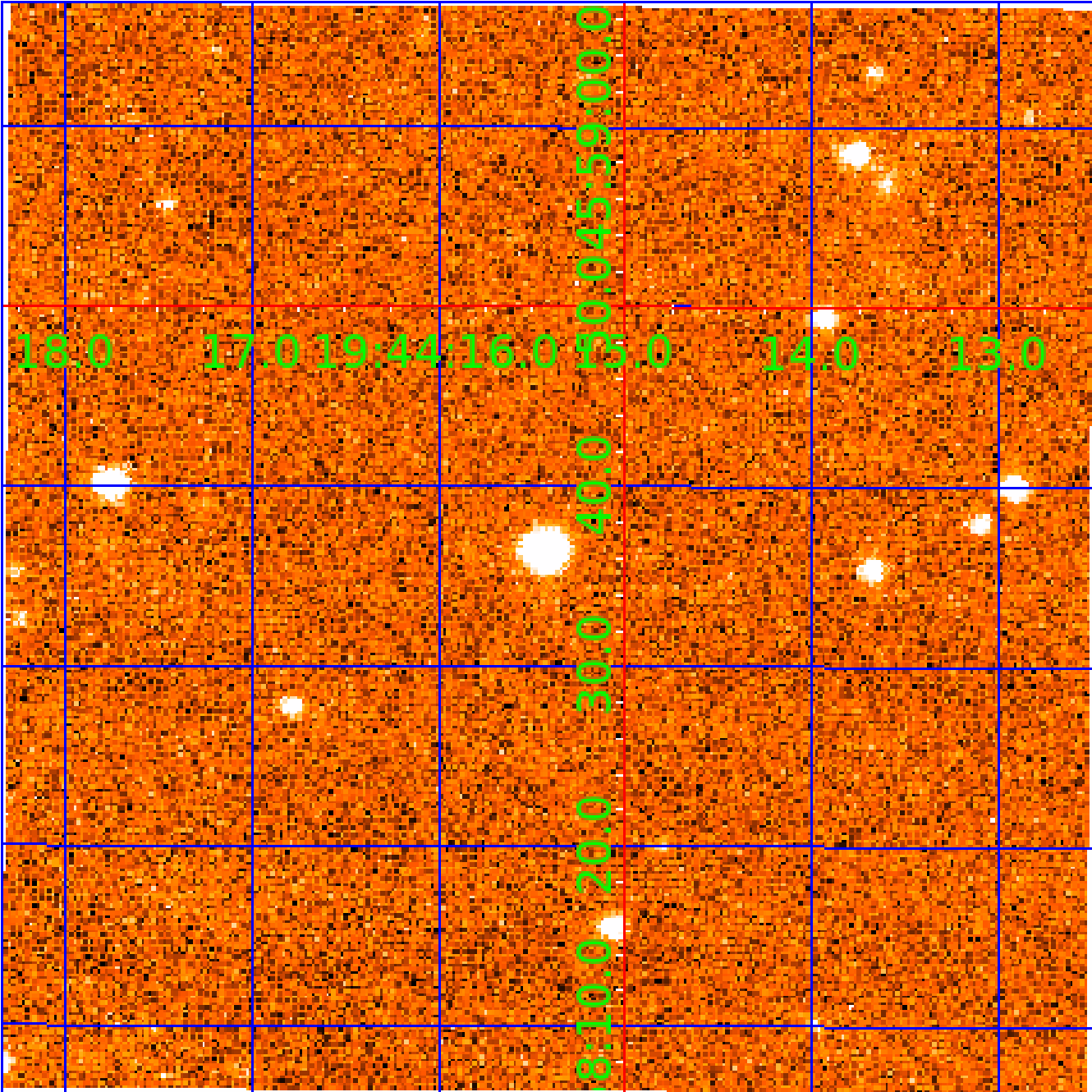


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009415172

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})
009415172-01	OBS	0938.01	9.946008	131.918477	990.5	3.550	42.6	46.8	1.01	5344	3.62	100.59
009415172-02	OBS	0938.02	1.045613	131.832114	190.9	1.896	20.2	21.8	1.01	5344	1.42	2027.40
009415172-03	OBS	0938.03	5.714622	132.640934	268.7	2.574	13.0	13.5	1.01	5344	1.85	210.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009415172-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009415172-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
009415172-03	OBS	PC	0.95	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.

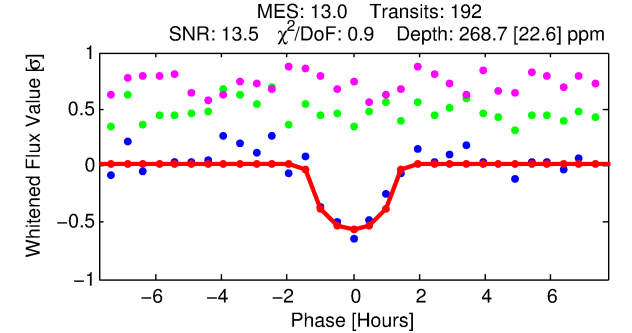
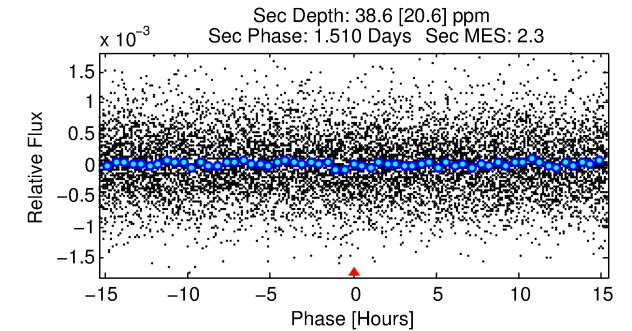
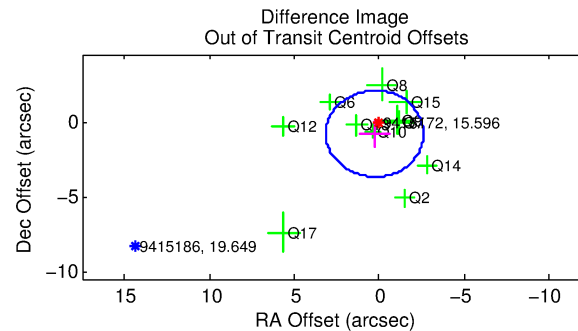
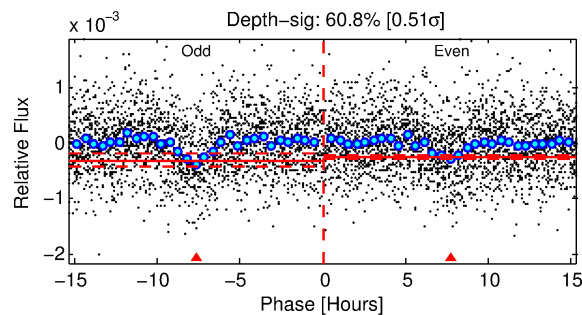
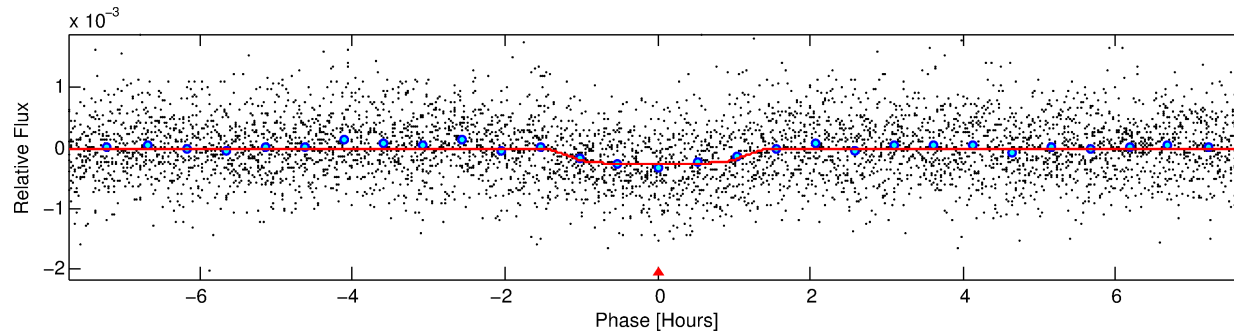
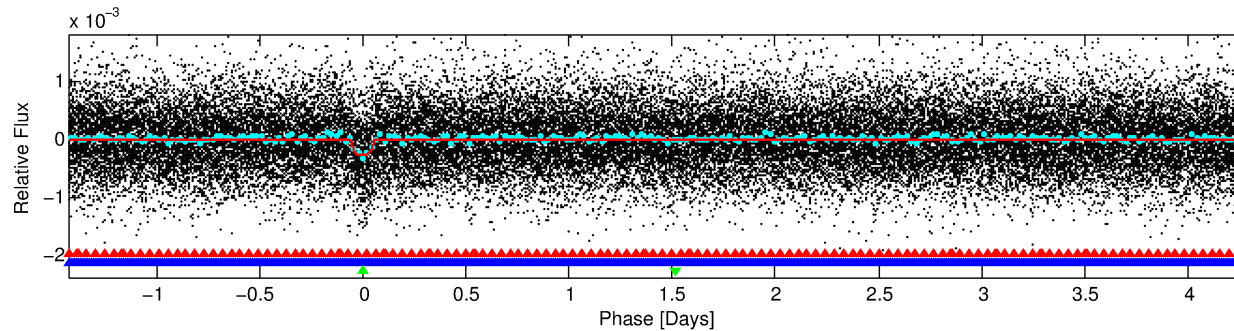
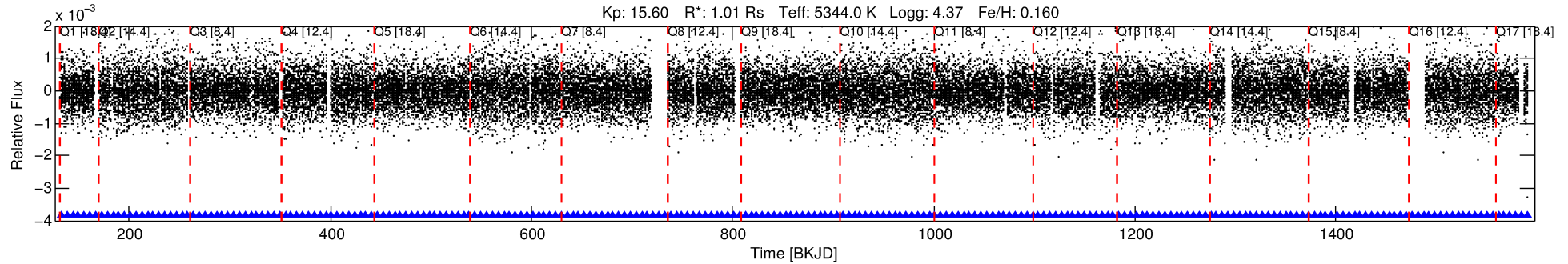
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009415172-03

No Significant Match Found

DV One-Page Summary

KIC: 9415172 Candidate: 3 of 3 Period: 5.715 d
KOI: K00938.03 Name: Kepler-255b Corr: 0.966



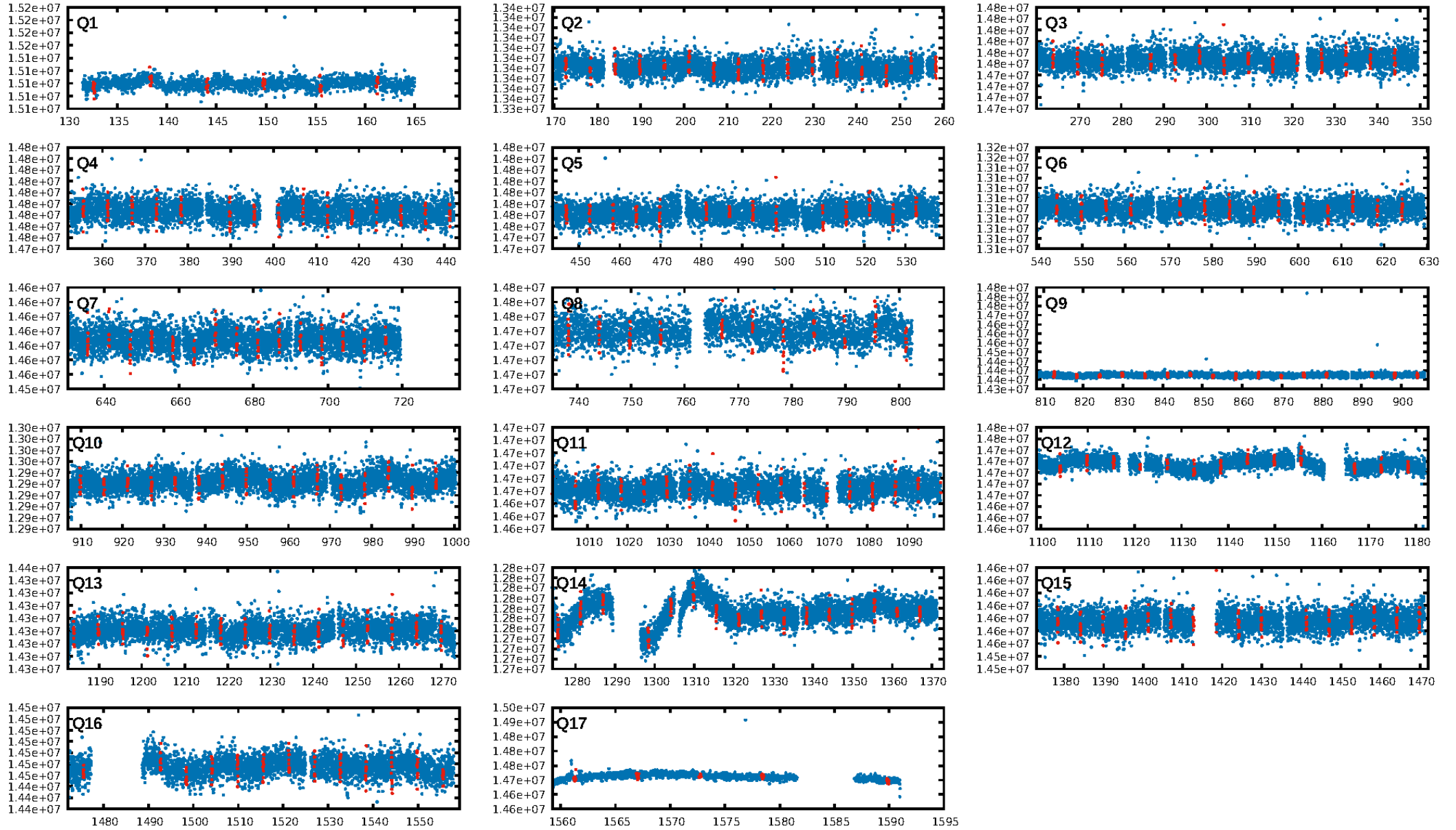
DV Fit Results:

Period = 5.71462 [0.00003] d
Epoch = 132.6409 [0.0041] BKJD
Rp/R* = 0.0167 [0.0172]
a/R* = 10.81 [42.98]
b = 0.79 [1.91]
Seff = 210.60 [48.60]
Teq = 971 [56] K
Rp = 1.85 [1.92] Re
a = 0.0597 [0.0082] AU
Ag = 22.09 [47.18] [0.45 σ]
Teffp = 3256 [1730] K [1.32 σ]

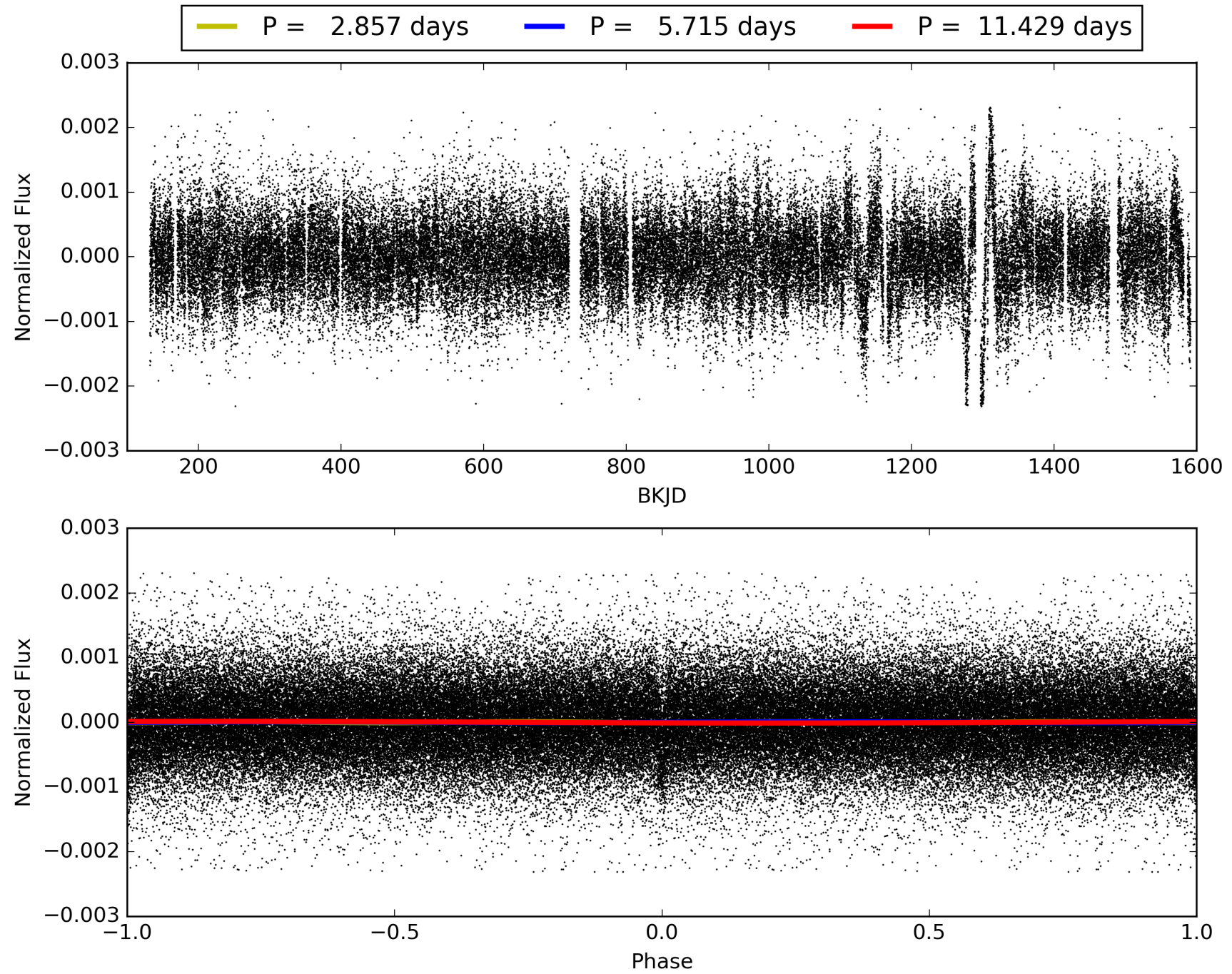
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [35.05 σ]
LongPeriod-sig: 100.0% [23.16 σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 7.02e-38
RollingBand-fgt: 1.00 [182/182]
GhostDiagnostic-chr: 2.529
Centroid-sig: 22.0%
Centroid-so: 0.824 arcsec [1.00 σ]
OotOffset-rm: 0.839 arcsec [0.87 σ]
KicOffset-rm: 1.201 arcsec [1.50 σ]
OotOffset-st: 4/2/2/3 [11]
KicOffset-st: 4/2/2/3 [11]
DiffImageQuality-fgm: 0.55 [6/11]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009415172-03, PDC Light Curves

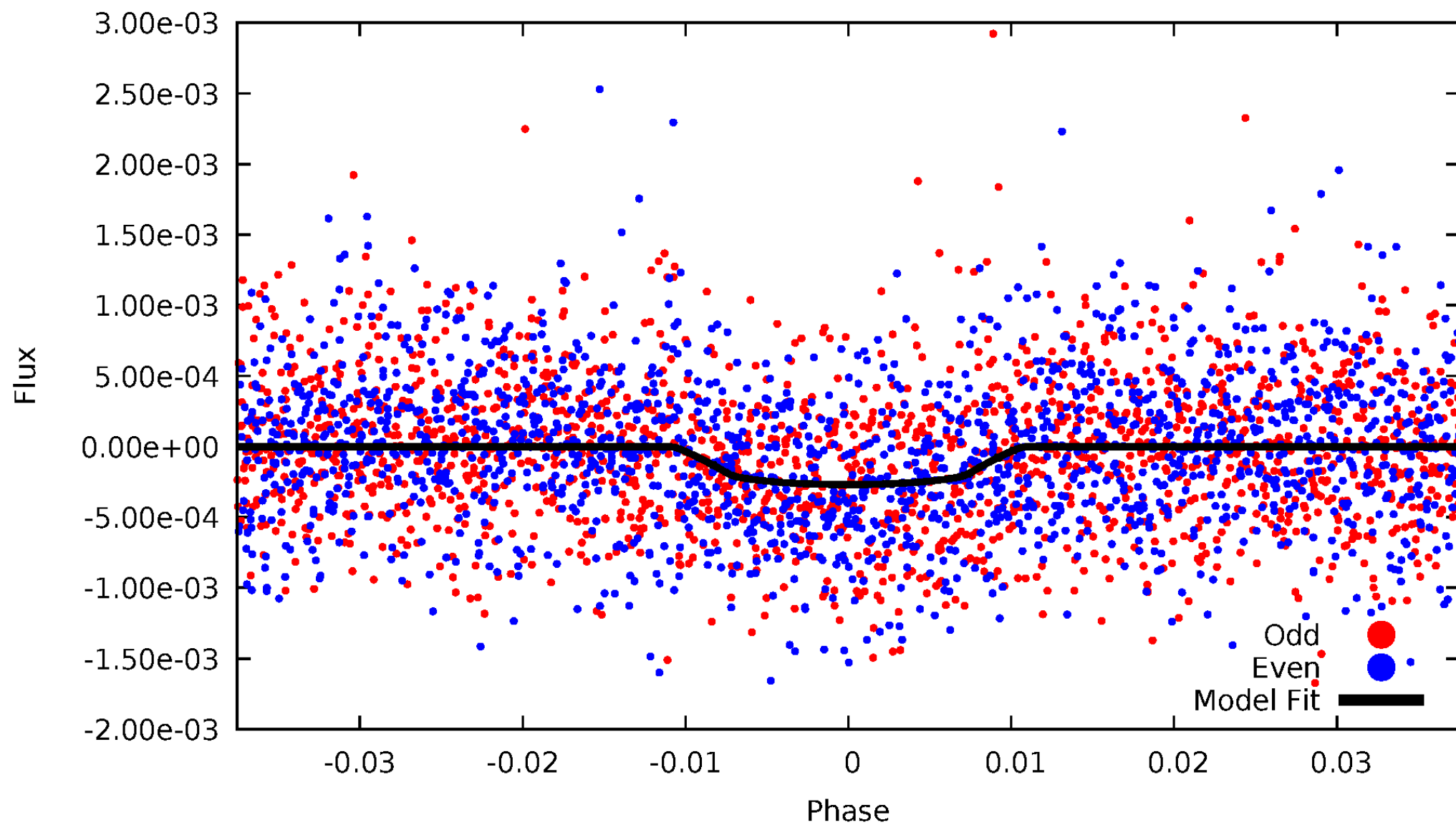


TCE 009415172-03



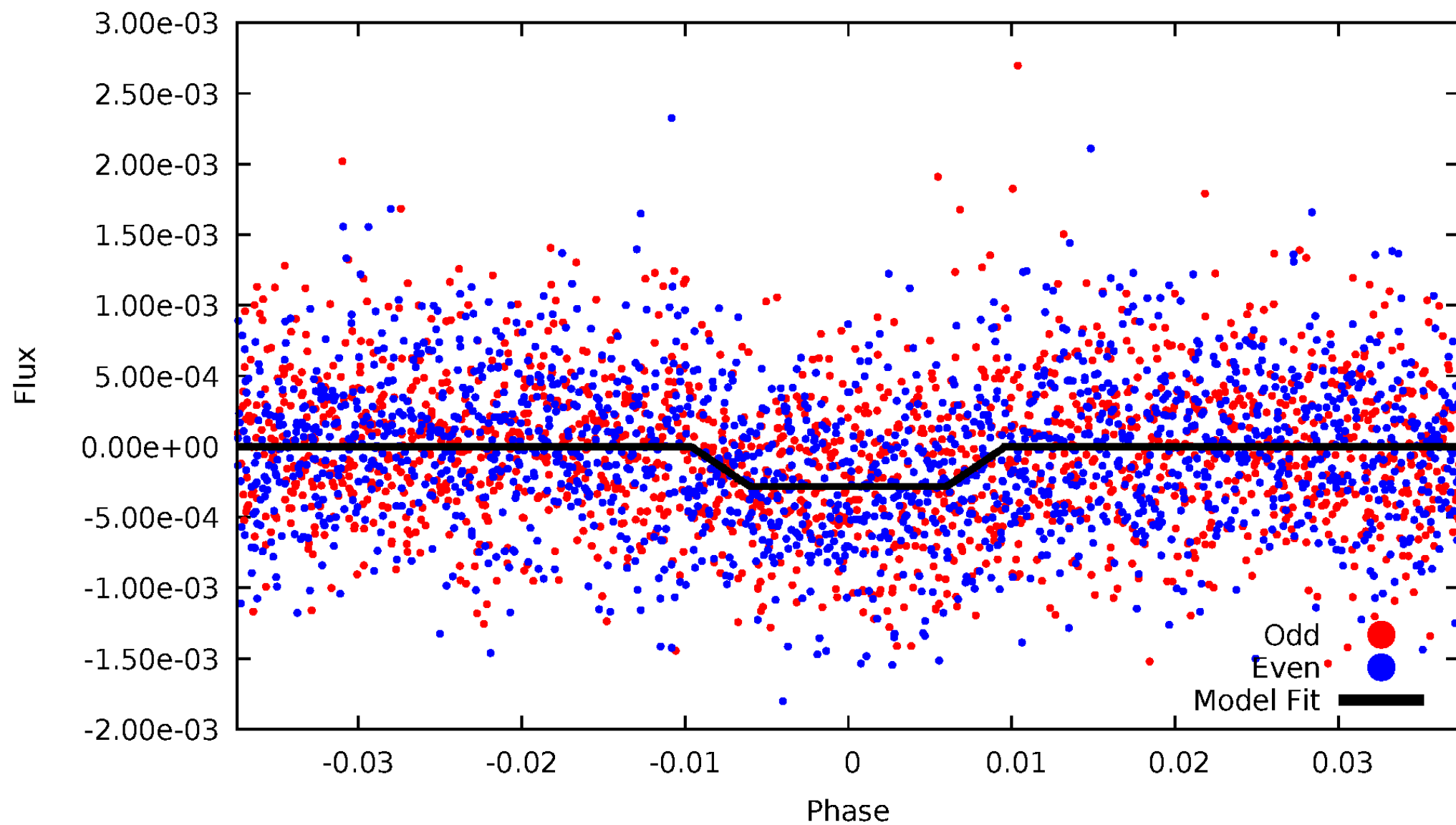
DV Odd/Even

TCE 009415172-03

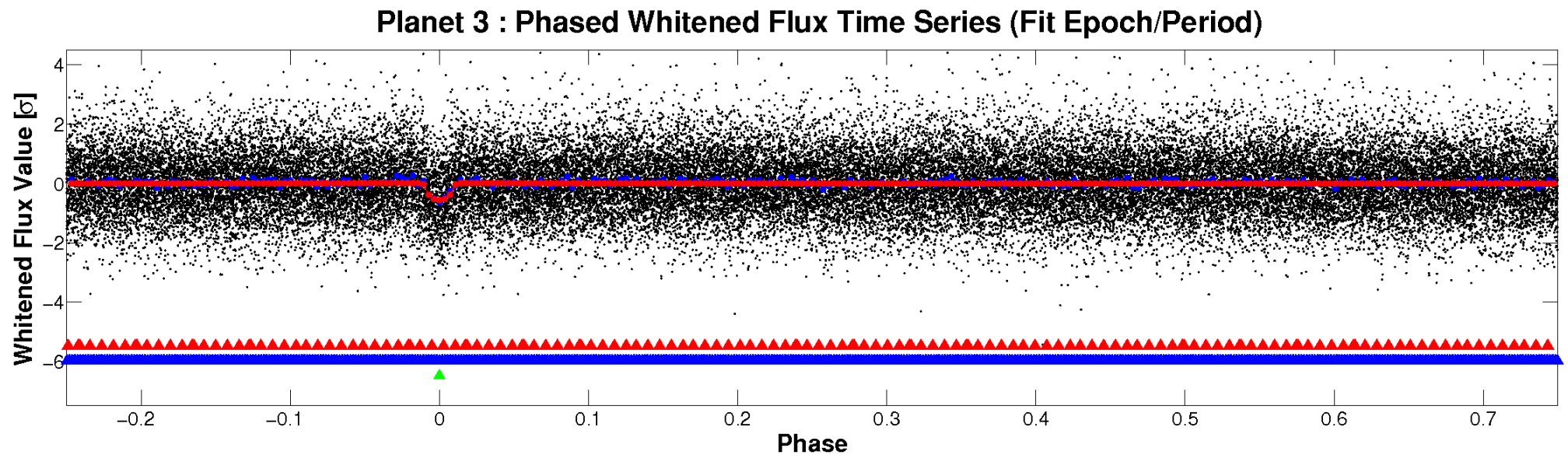
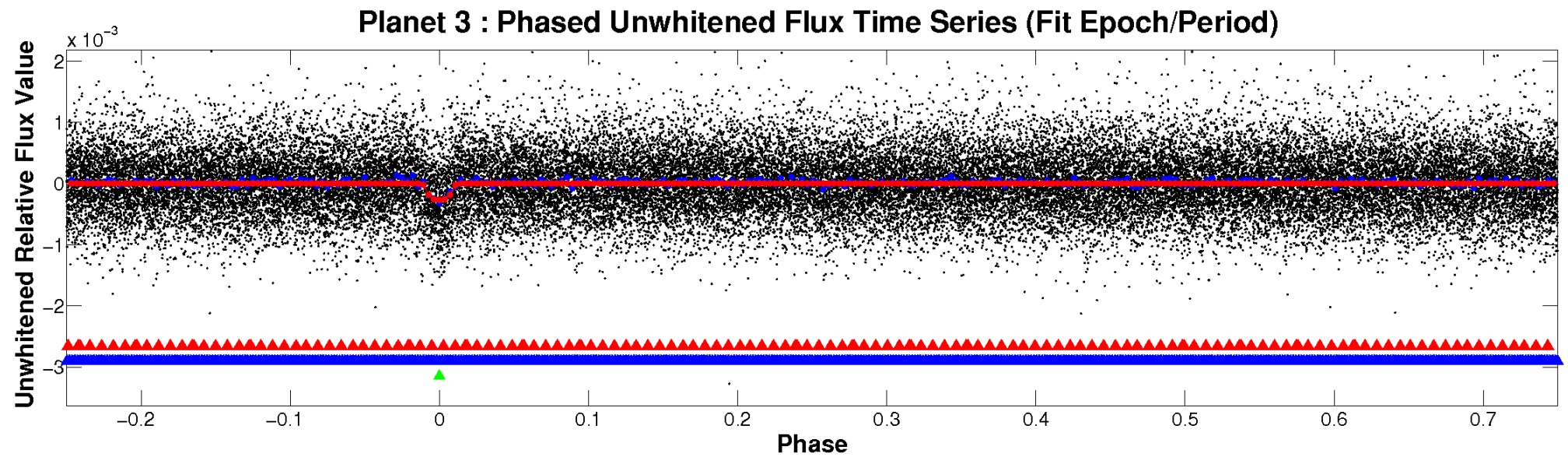


ALT Odd/Even

TCE 009415172-03

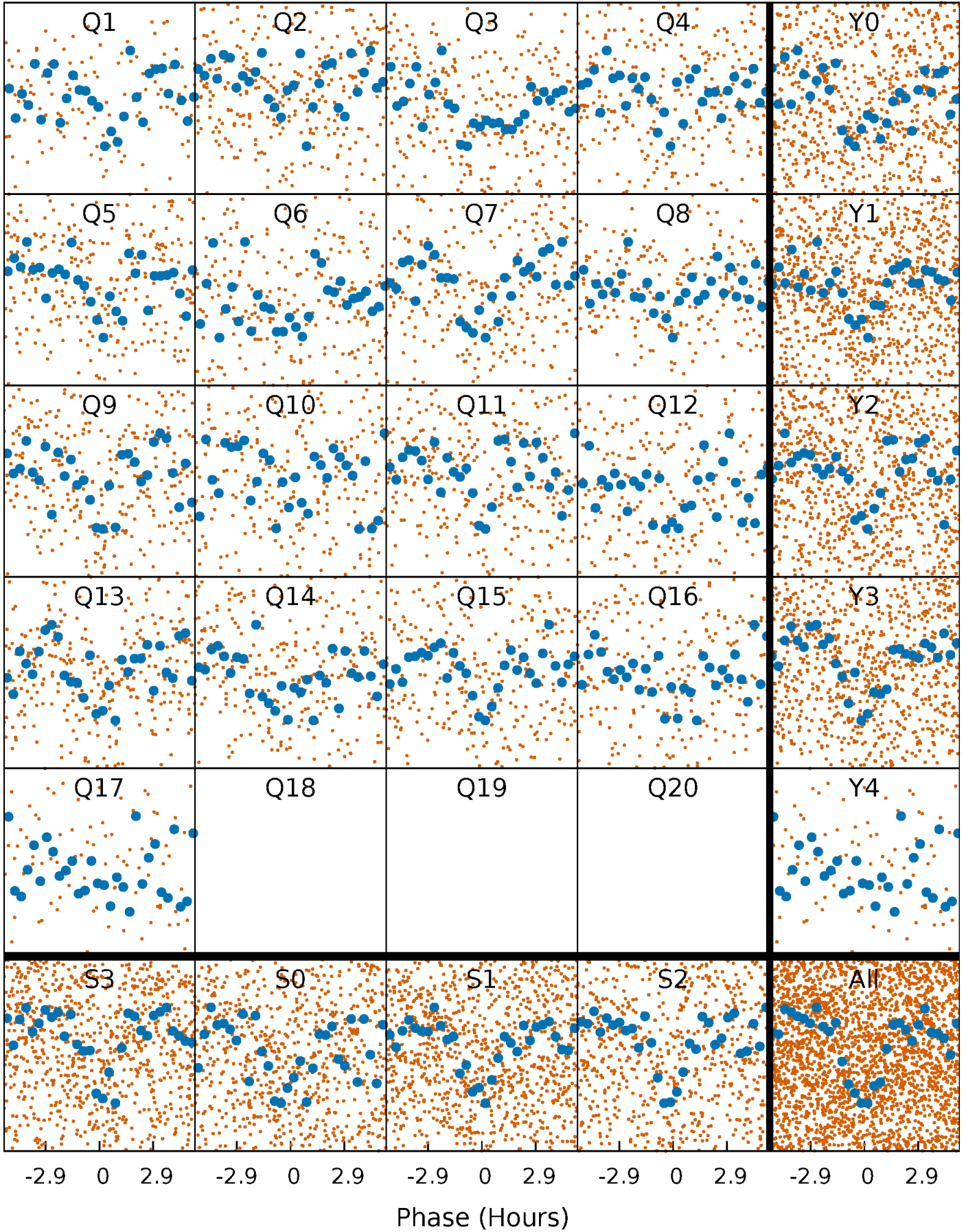


Non-Whitened Vs. Whitened Light Curve



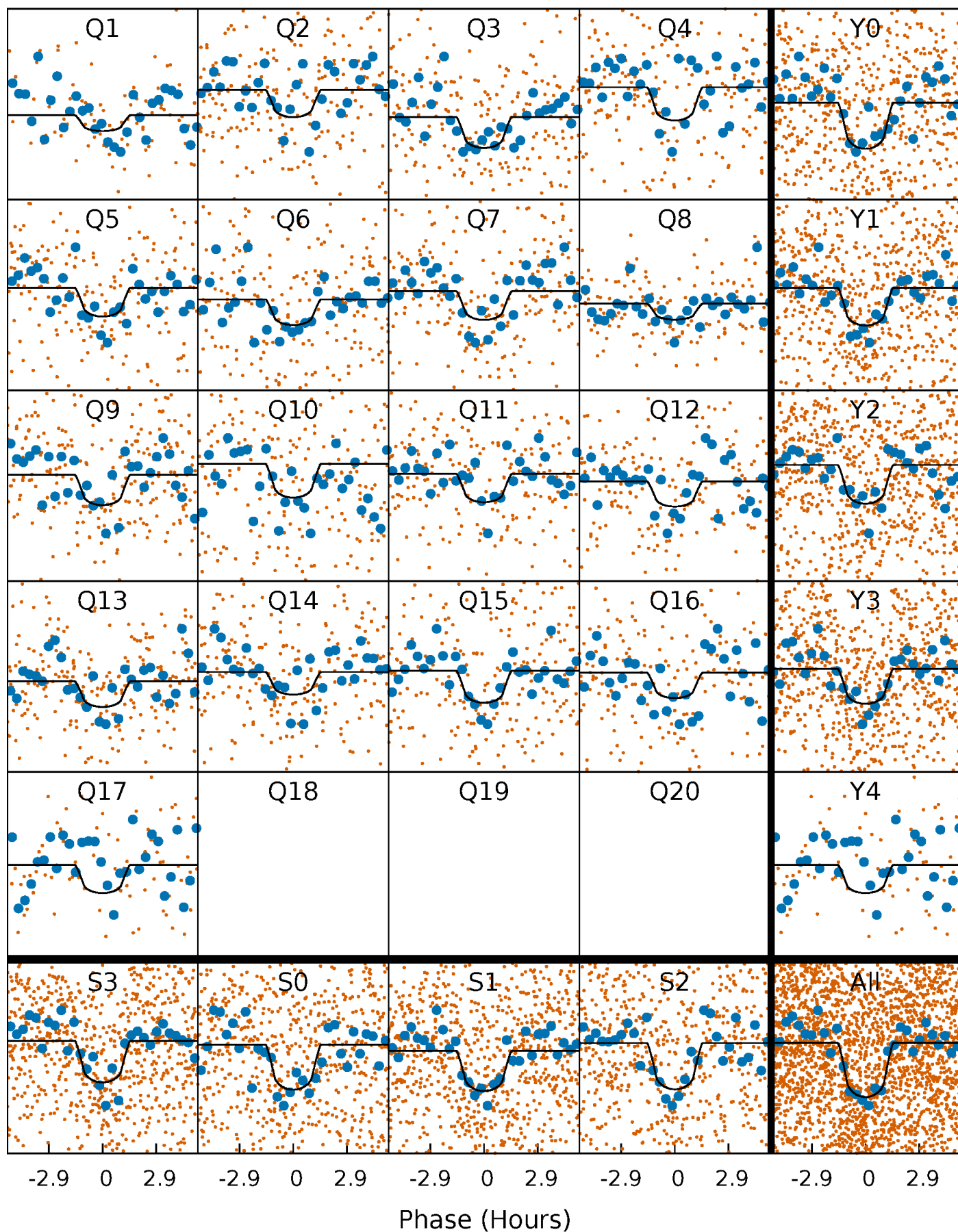
PDC Quarter-Phased Transit Curves

TCE 009415172-03 P= 5.714622 Days $T_0=132.640934$ (BKJD)



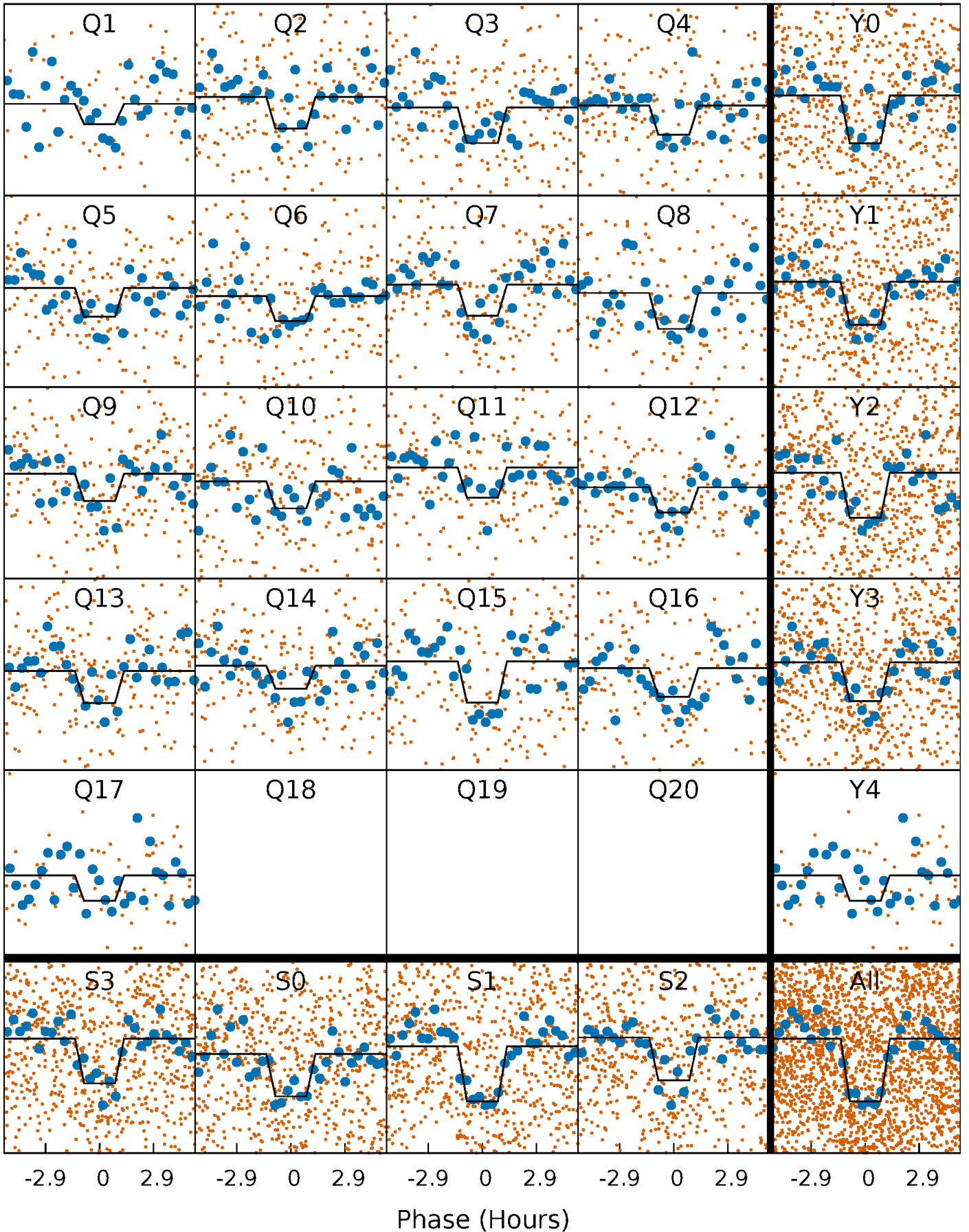
DV Quarter-Phased Transit Curves

TCE 009415172-03 P= 5.714622 Days $T_0=132.640934$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

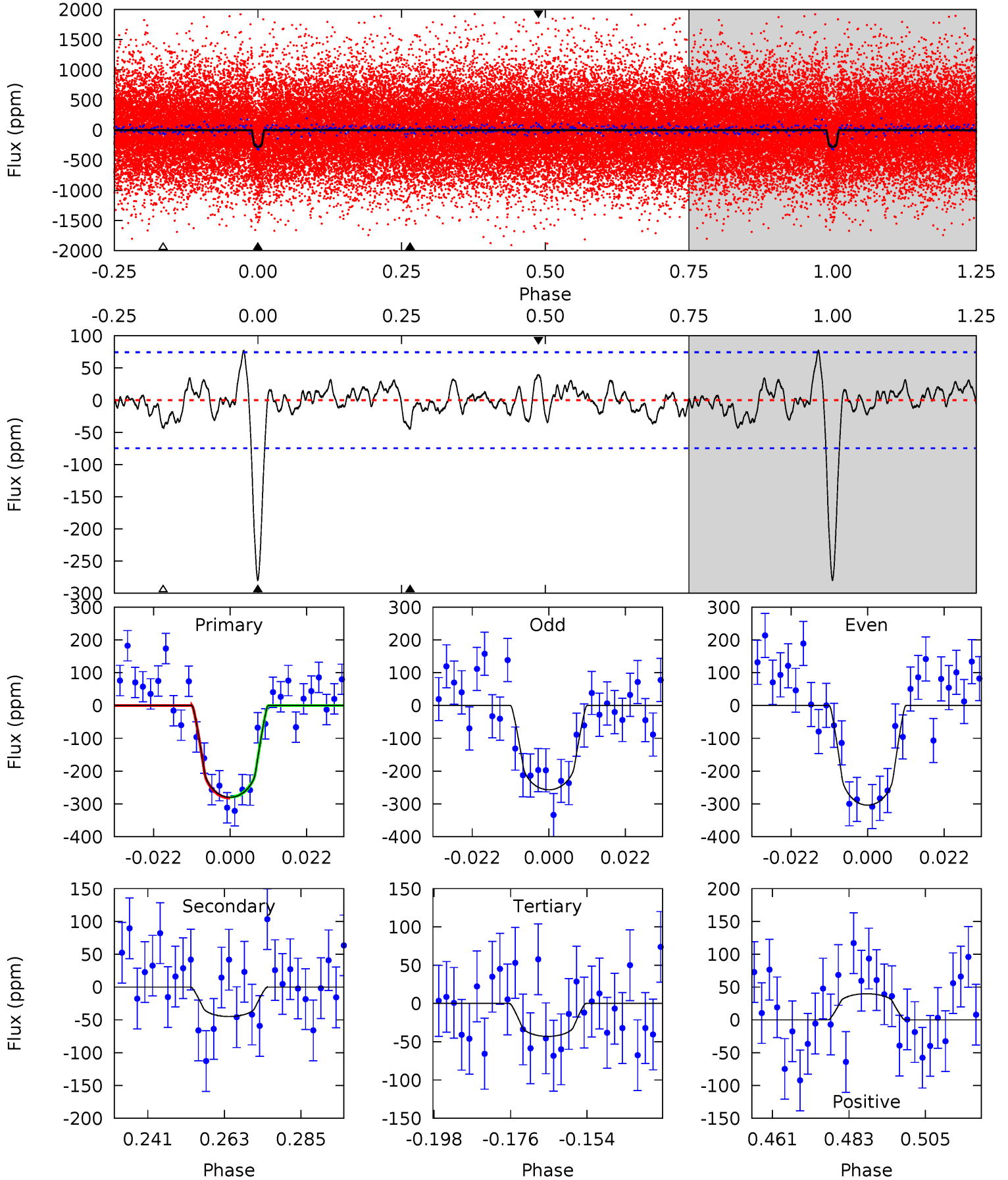
TCE 009415172-03 P= 5.714566 Days $T_0=132.644898$ (BKJD)



DV Model-Shift Uniqueness Test

009415172-03, P = 5.714622 Days, E = 126.926312 Days

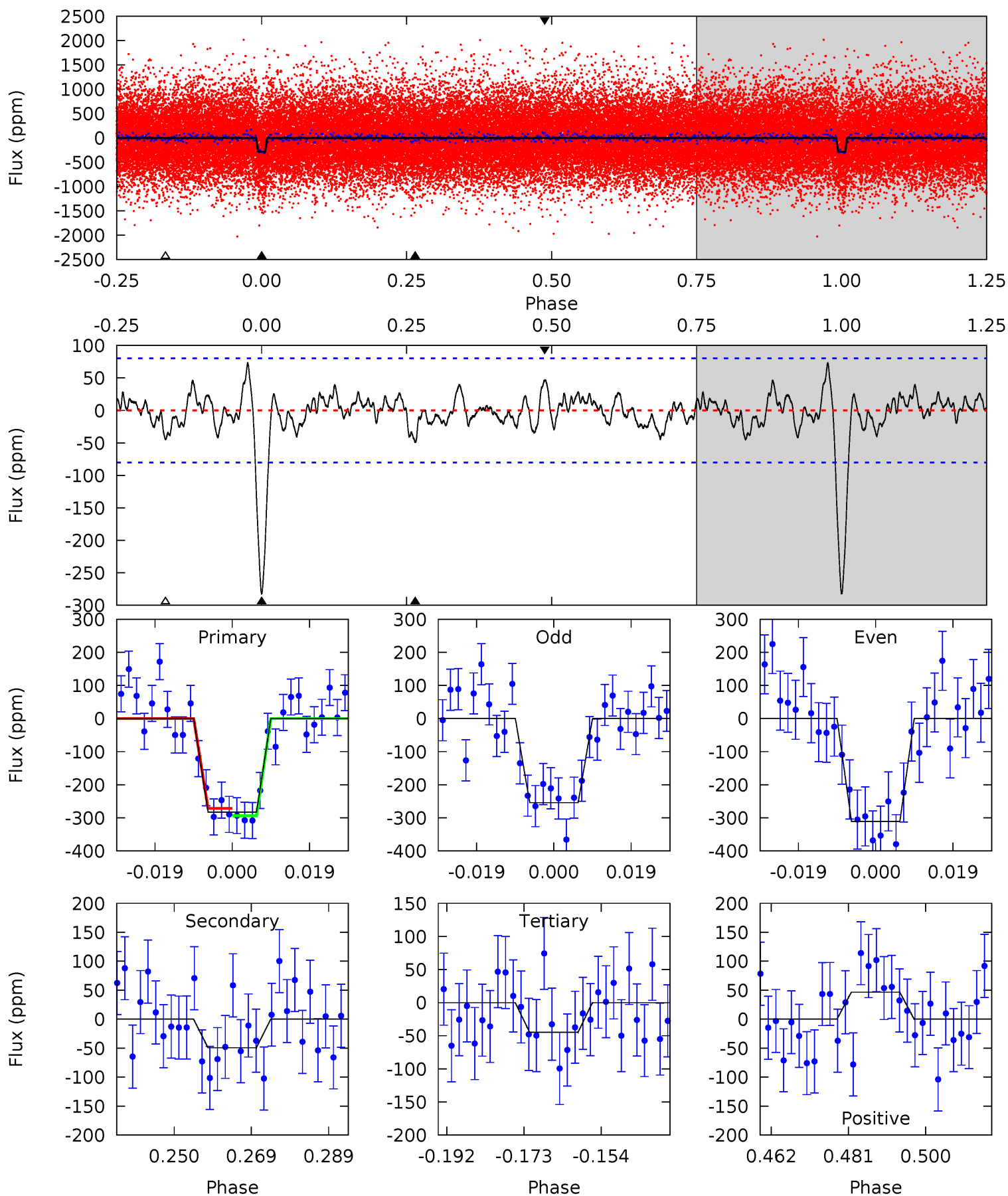
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.3	2.94	2.81	2.60	4.87	2.29	1.16	15.5	15.7	0.13	0.34	1.53	1.02	0.22	0.09



Alt Model-Shift Uniqueness Test

009415172-03, P = 5.714566 Days, E = 126.930332 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.3	3.00	2.74	2.85	4.90	2.34	1.16	14.5	14.4	0.27	0.16	1.72	1.08	0.21	0.67



Stellar Parameters For KIC 009415172

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5344^{+80}_{-80}	$4.365^{+0.132}_{-0.096}$	$0.160^{+0.150}_{-0.100}$	$1.013^{+0.141}_{-0.141}$	$0.867^{+0.064}_{-0.032}$	$1.175^{+0.674}_{-0.363}$
	+1%/-1%	+3%/-2%	+94%/-62%	+14%/-14%	+7%/-4%	+57%/-31%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 009415172-03 / KOI 0938.03

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-45 ± 15	$2.23^{+1.76}_{-1.49}$	1354^{+55}_{-57}	3503^{+1745}_{-605}	17^{+142}_{-12}
Alt.	-49 ± 16	$2.28^{+1.77}_{-1.44}$	1351^{+60}_{-54}	3517^{+1559}_{-611}	18^{+110}_{-13}

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

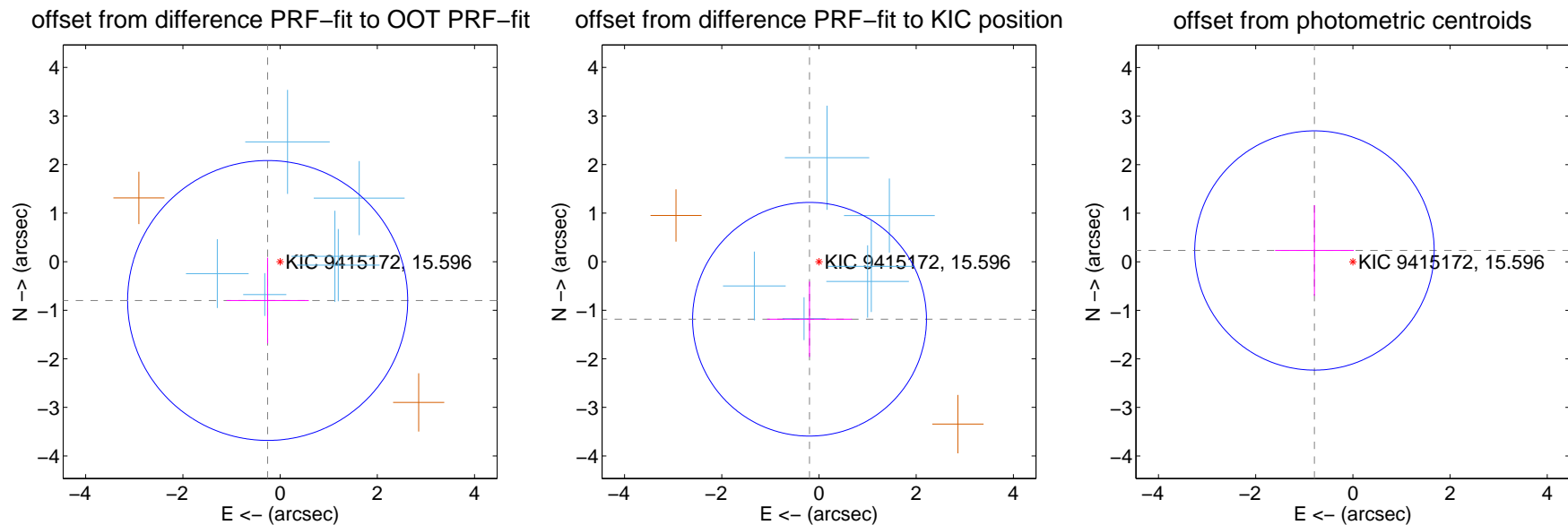
DV Centroid Data

Supplemental centroid analysis for 009415172-03. Kepler magnitude: 15.60. Transit SNR 13.49

There are 6 quarters with good PRF difference image offsets

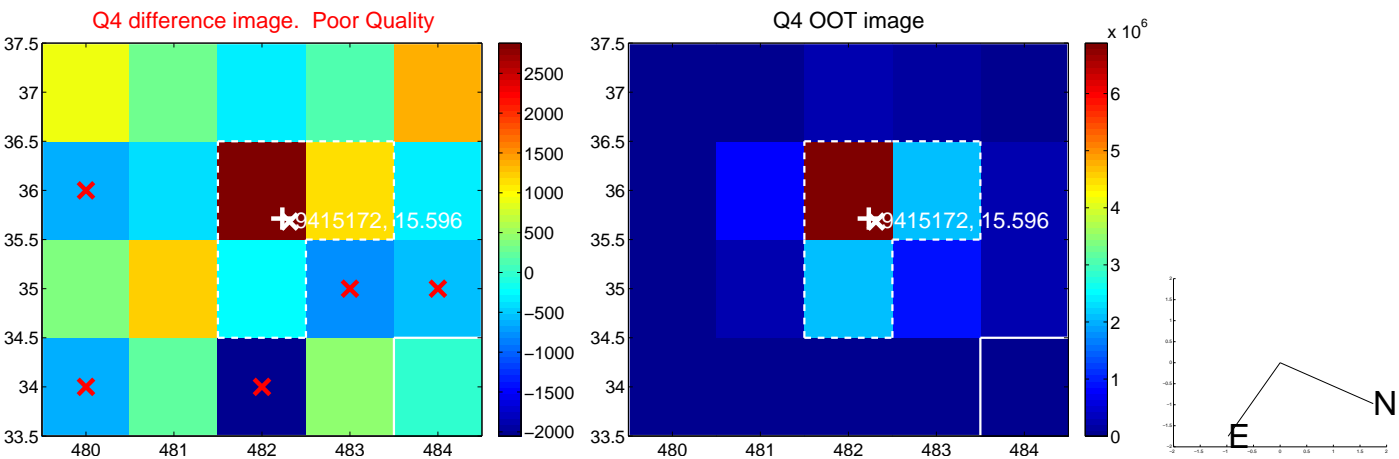
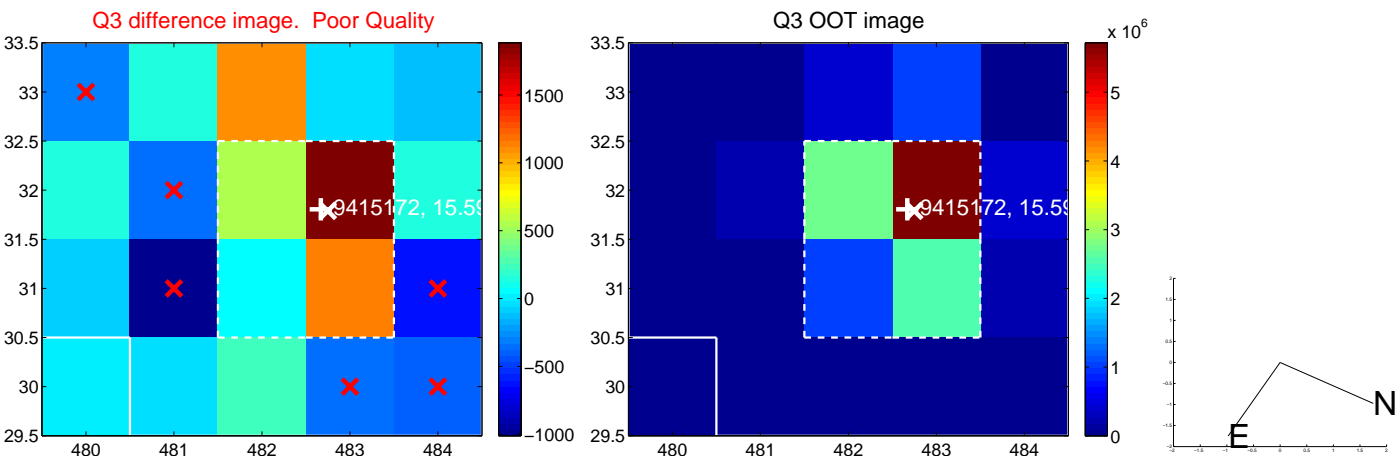
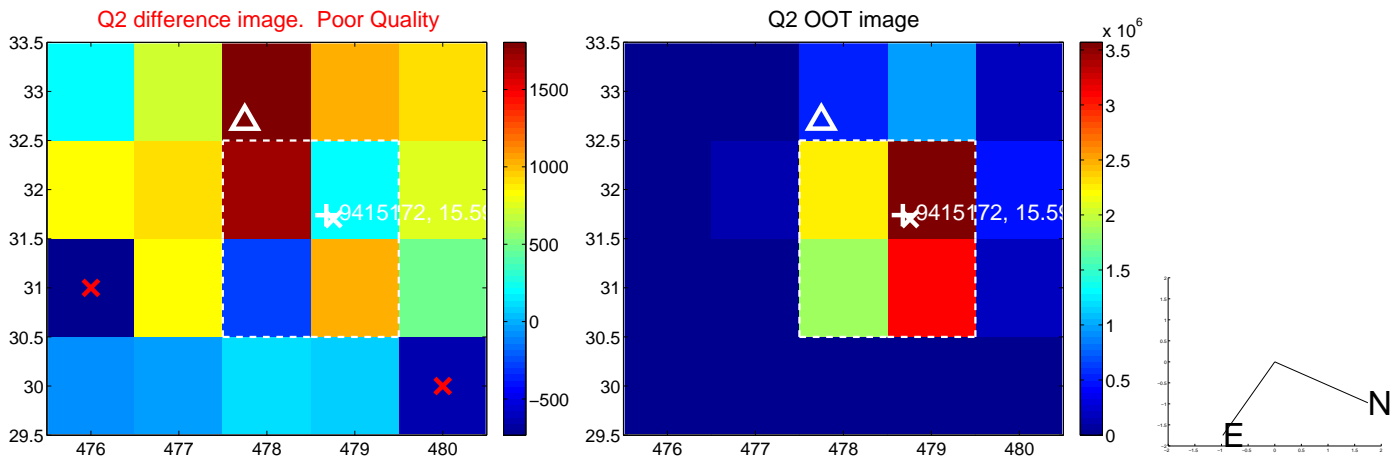
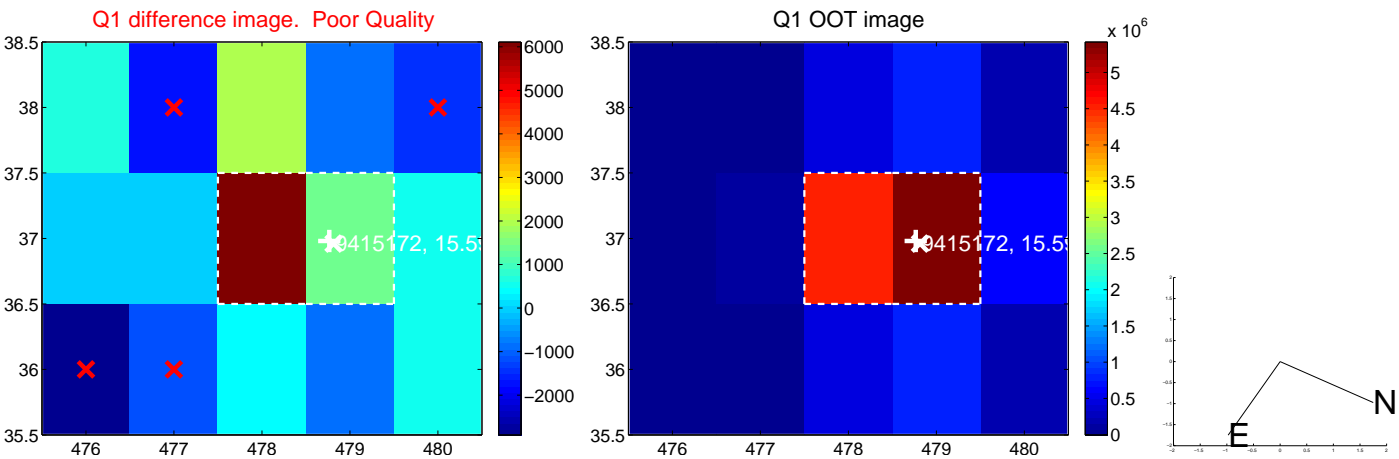
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.839 ± 0.960	0.87	0.256 ± 0.846	-0.799 ± 0.883
PRF-fit source offset from KIC position	1.201 ± 0.802	1.50	0.195 ± 0.873	-1.185 ± 0.775
photometric centroid source offset	0.82 ± 0.82	1.00	0.79 ± 0.81	0.23 ± 0.93

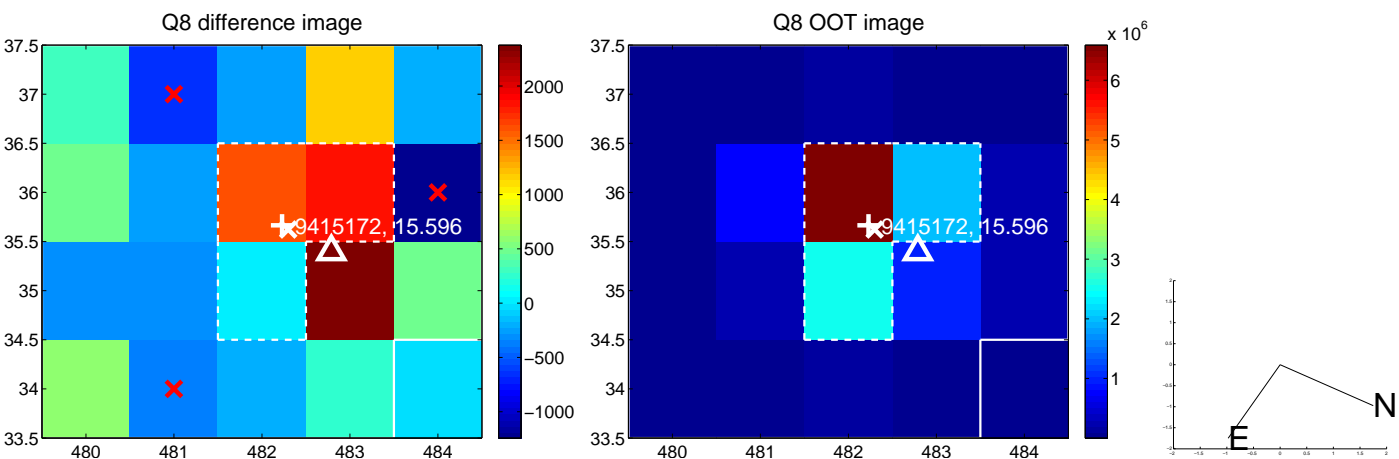
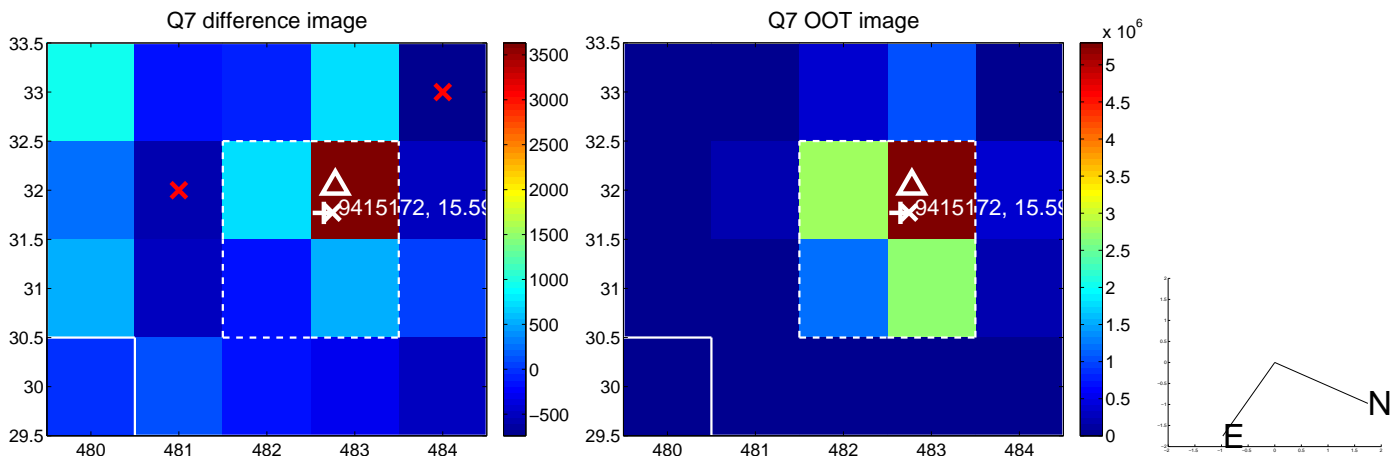
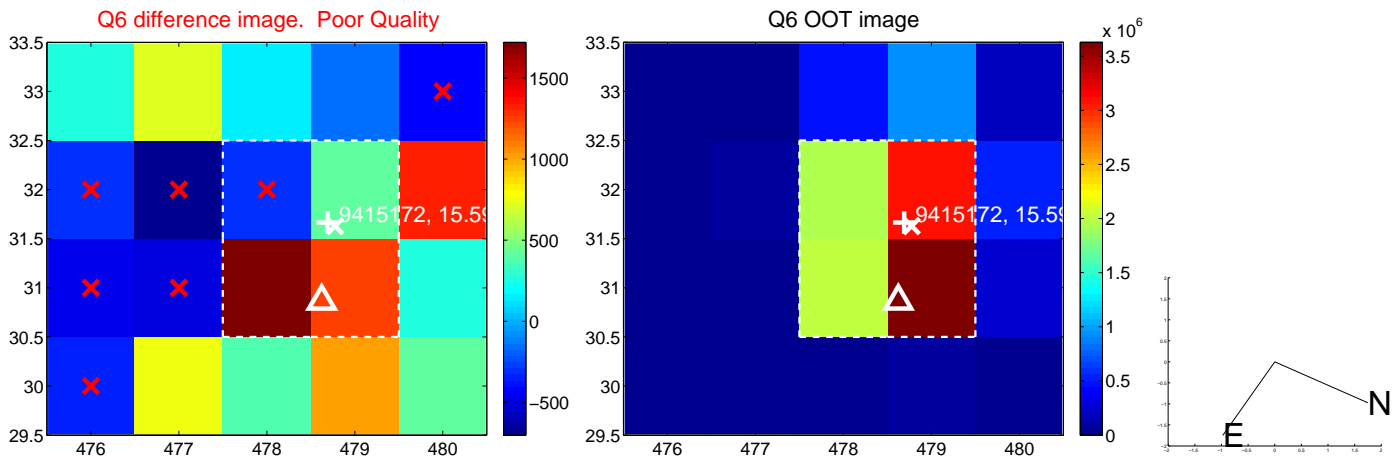
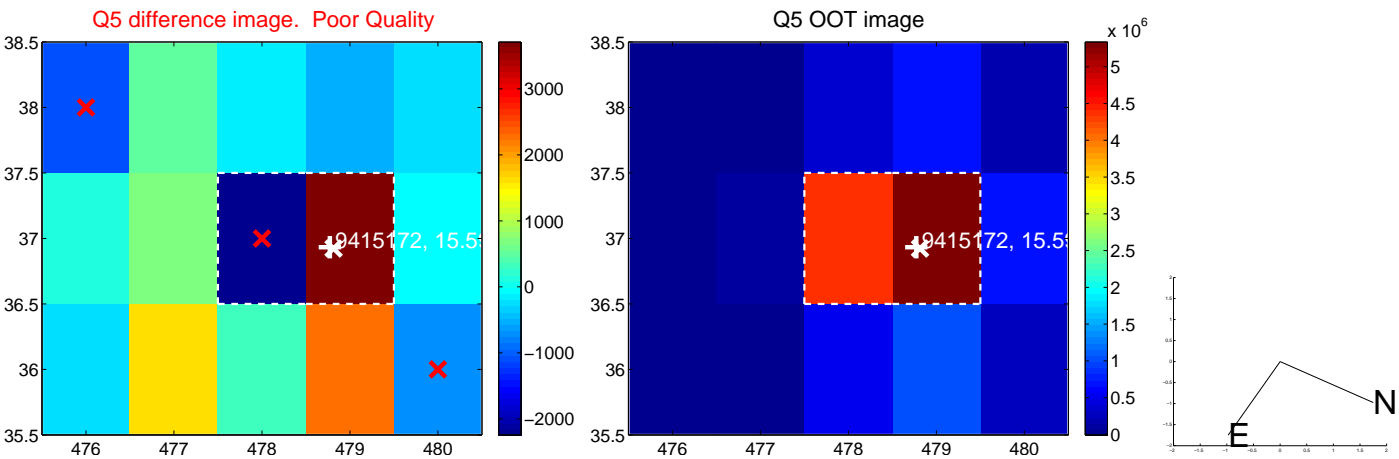


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

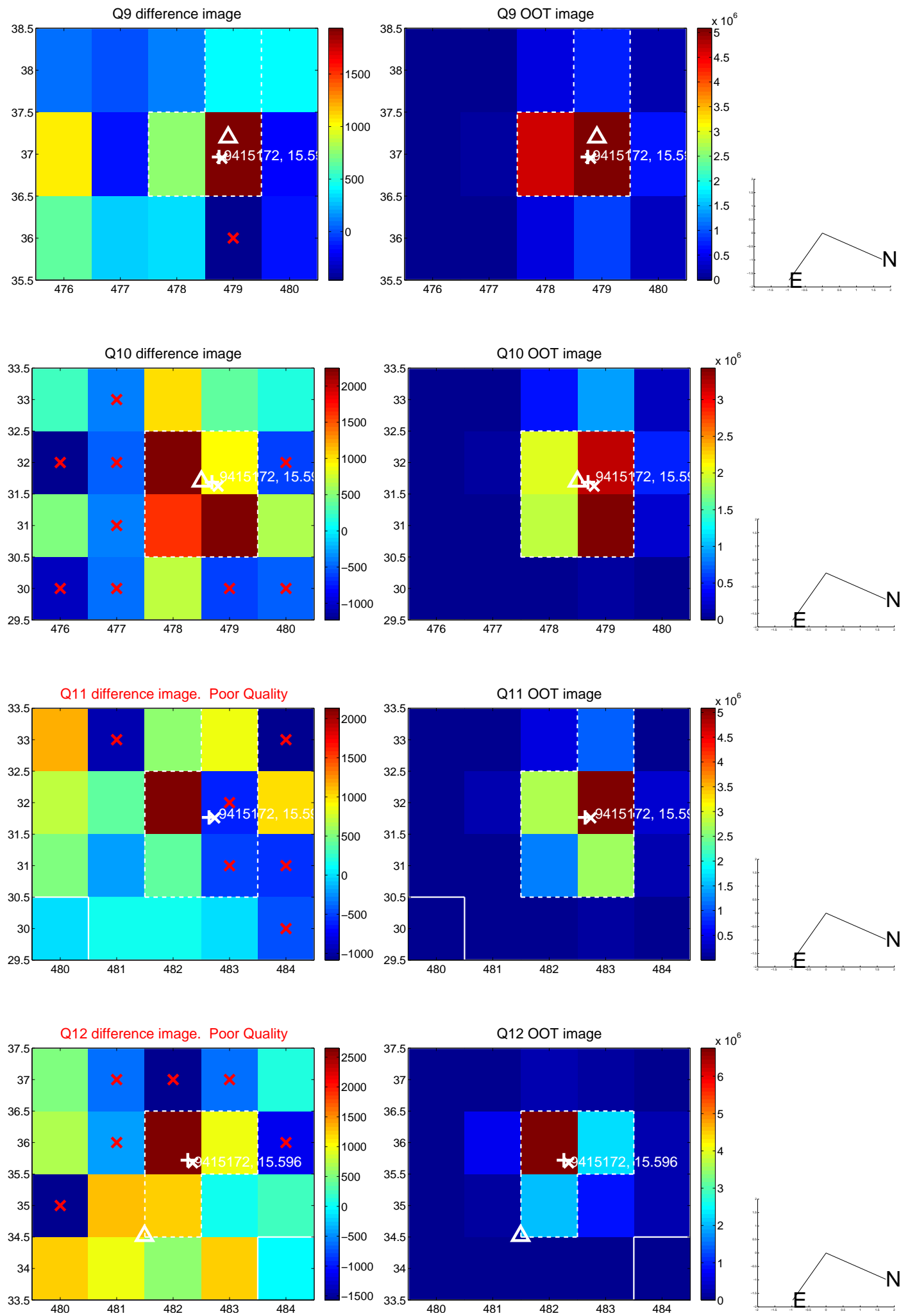
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



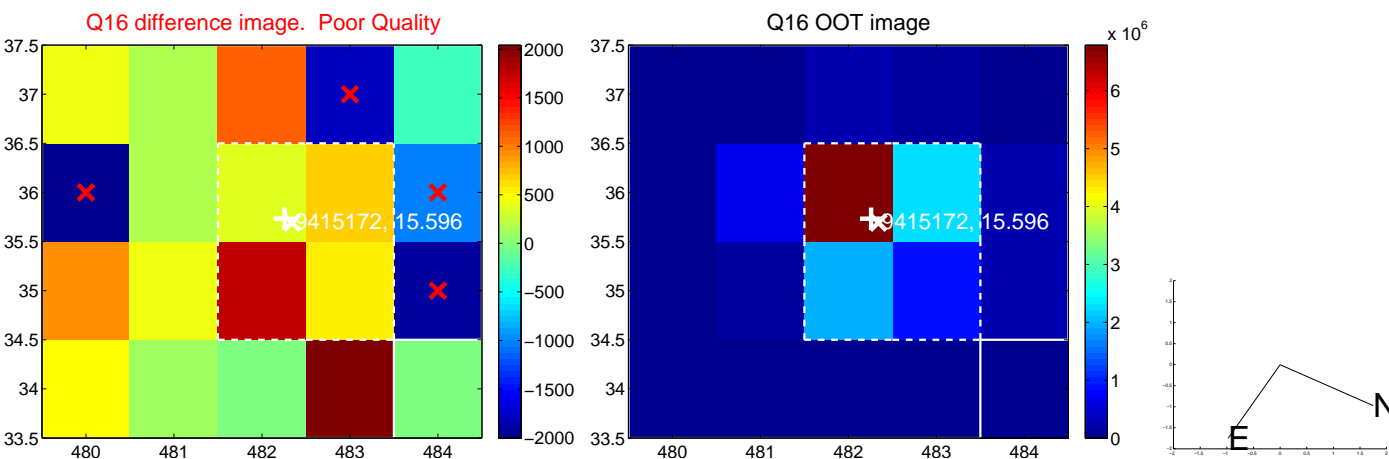
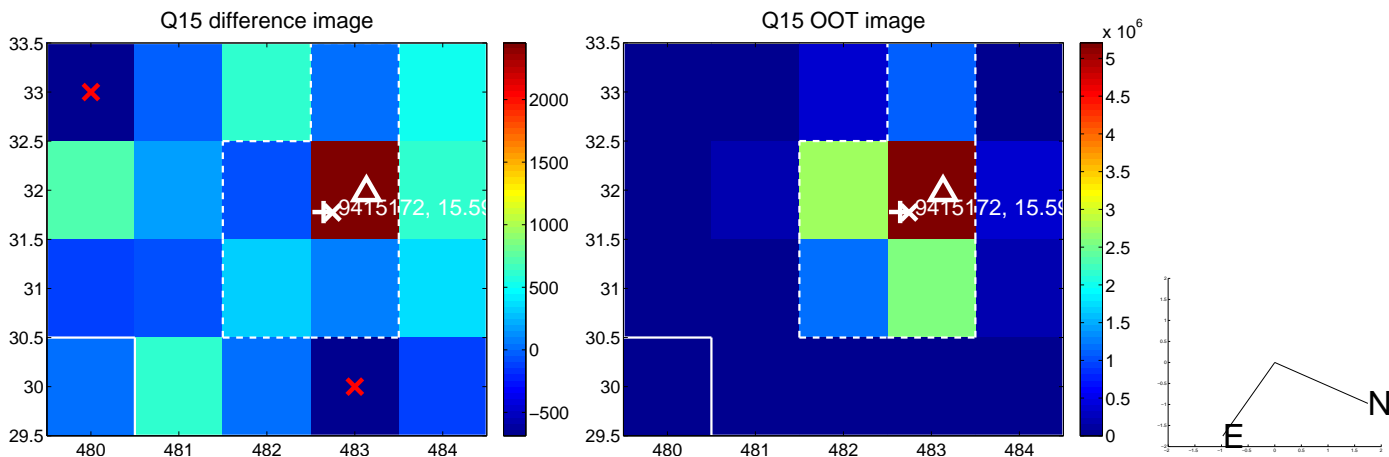
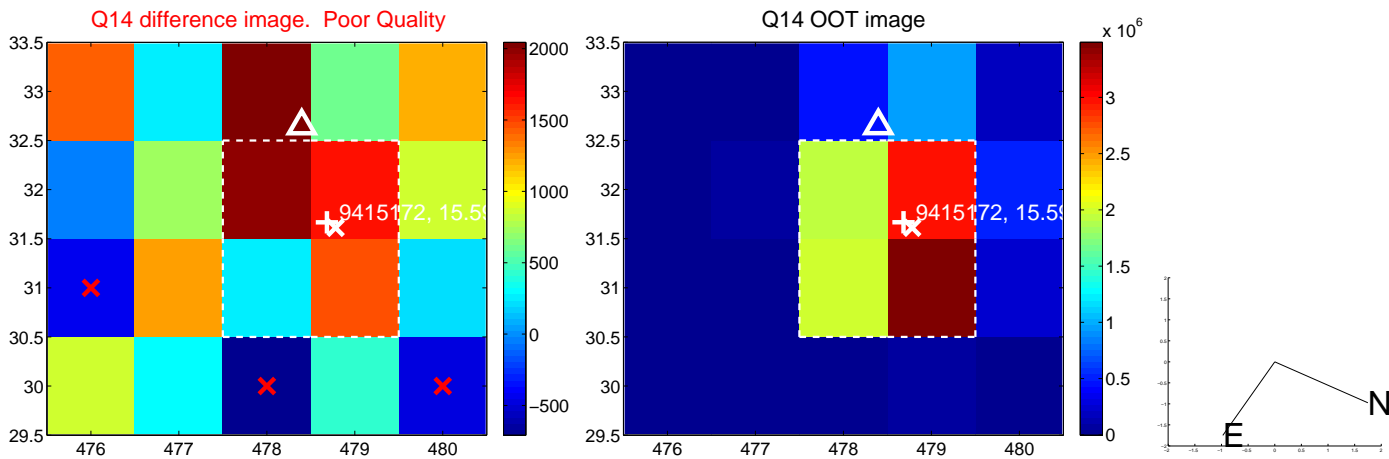
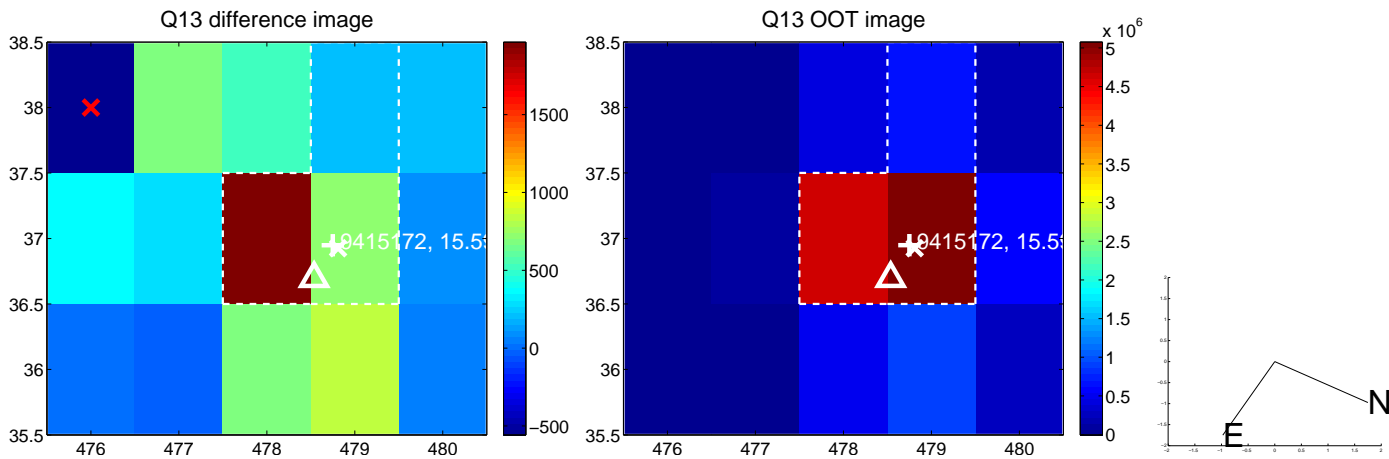
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



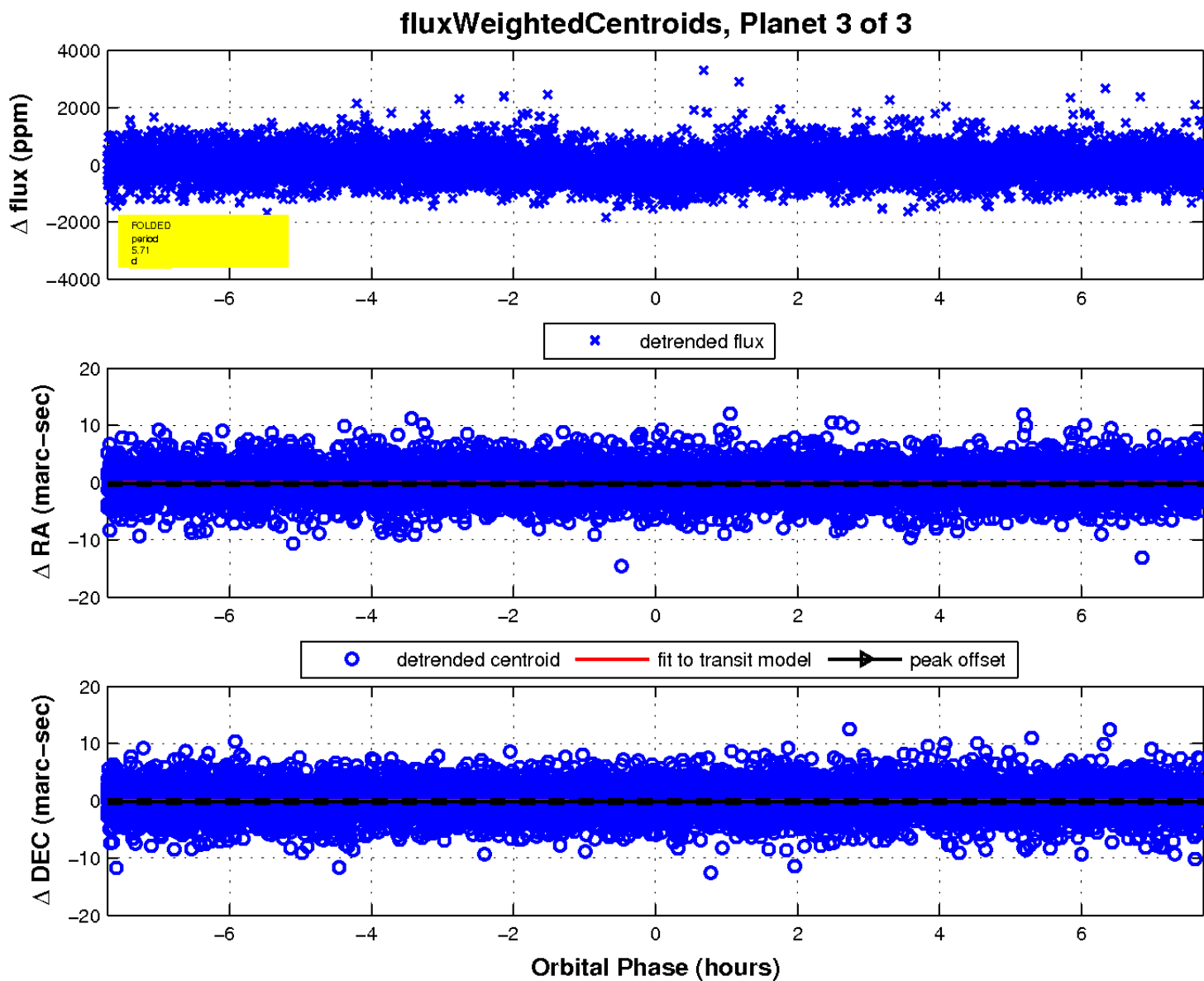
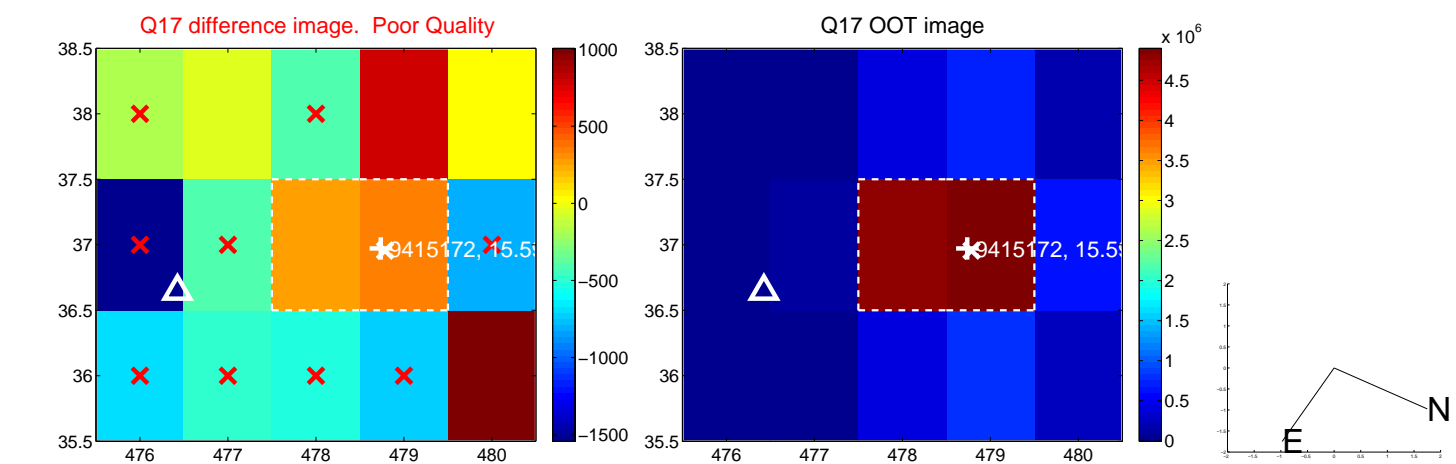
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

