

KIC 009230021

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})
009230021-01	OBS	3429.02	8.741942	135.425347	257.3	4.337	14.5	15.2	1.15	5596	2.15	172.77
009230021-02	OBS	3429.01	15.828515	144.386776	212.5	3.957	8.5	8.7	1.15	5596	2.09	78.29
009230021-03	OBS	3429.04	44.437467	162.908023	252.4	5.241	7.1	7.0	1.15	5596	2.21	19.77

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009230021-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009230021-02	OBS	PC	0.89	0	0	0	0	NO_COMMENT
009230021-03	OBS	PC	0.51	0	0	0	0	NO_COMMENT

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.

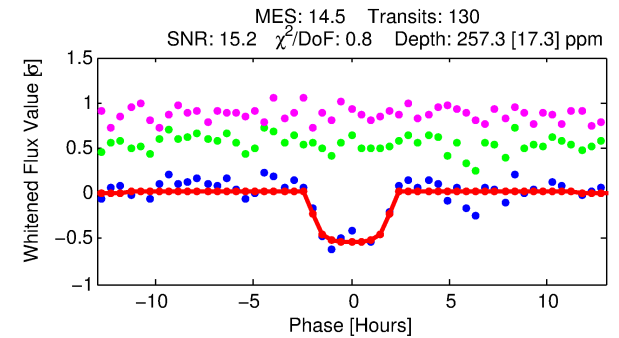
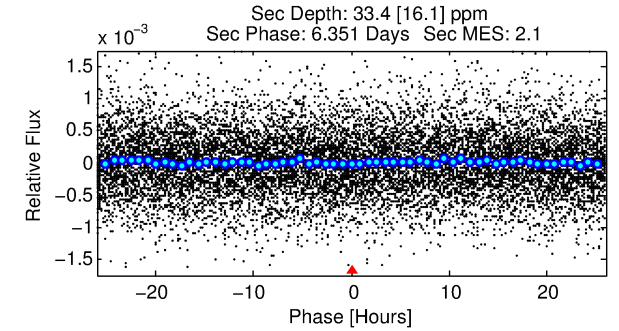
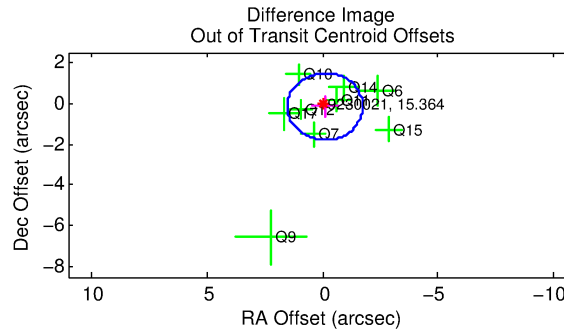
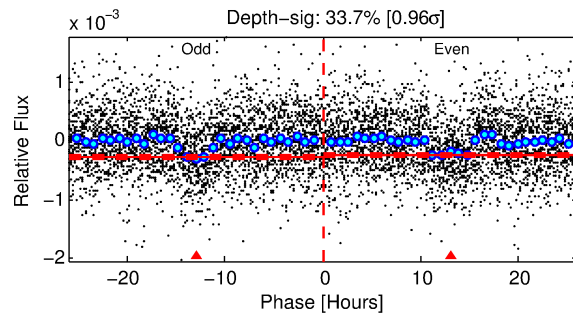
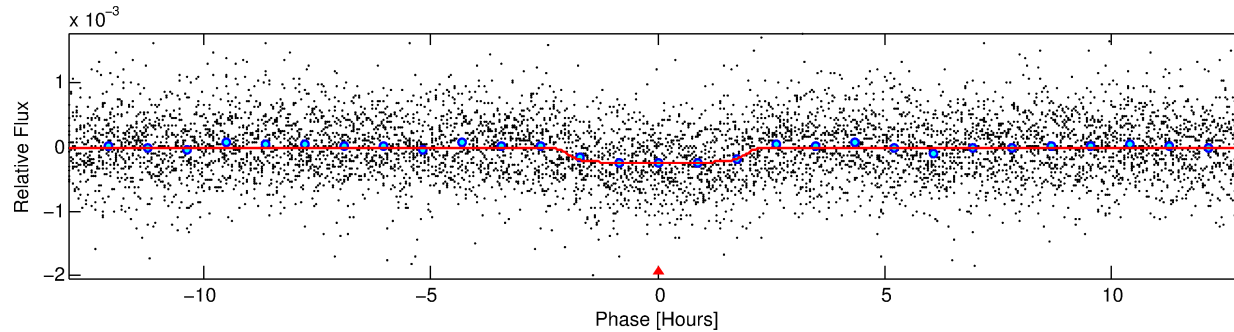
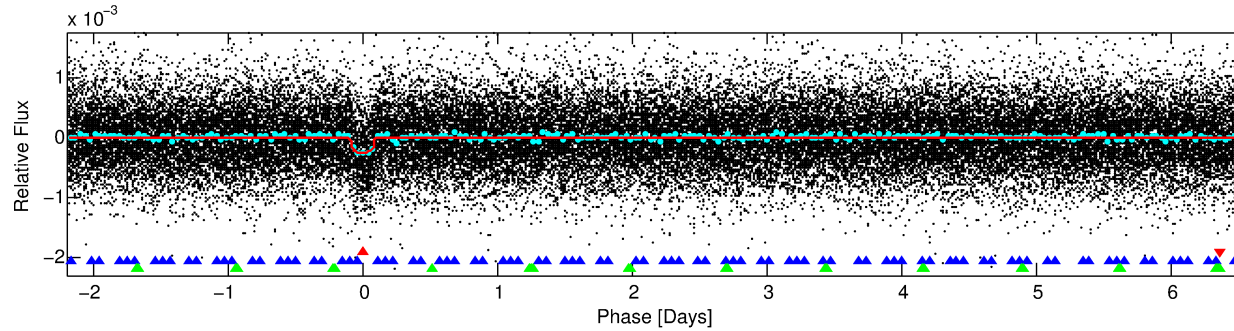
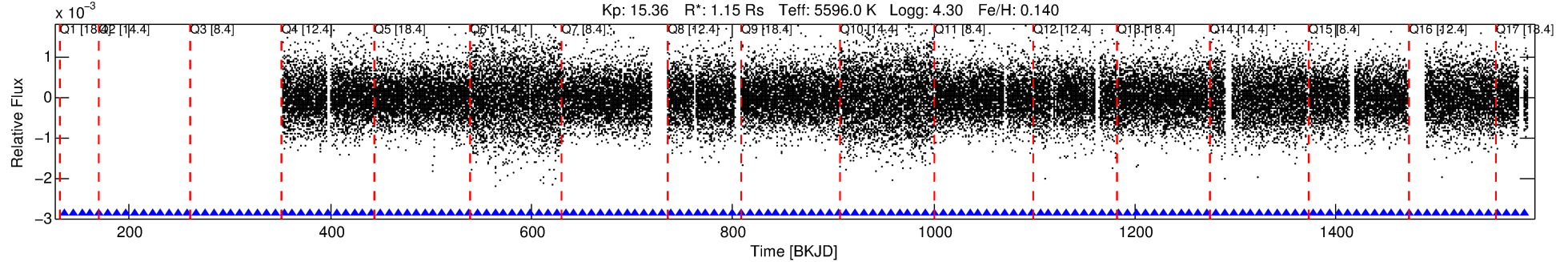
Ephemeris Match Information For 009230021-01

No Significant Match Found

DV One-Page Summary

KIC: 9230021 Candidate: 1 of 3 Period: 8.742 d
KOI: K03429.02 Corr: 0.985

Kp: 15.36 R*: 1.15 Rs Teff: 5596.0 K Logg: 4.30 Fe/H: 0.140



DV Fit Results:

Period = 8.74194 [0.00007] d
Epoch = 135.4253 [0.0067] BKJD
Rp/R* = 0.0172 [0.0064]
a/R* = 8.07 [13.13]
b = 0.87 [0.46]
Seff = 172.77 [43.17]
Teq = 924 [58] K
Rp = 2.15 [0.87] Re
a = 0.0817 [0.0123] AU
Ag = 26.57 [24.52] [1.04σ]
Teffp = 3245 [724] K [3.20σ]

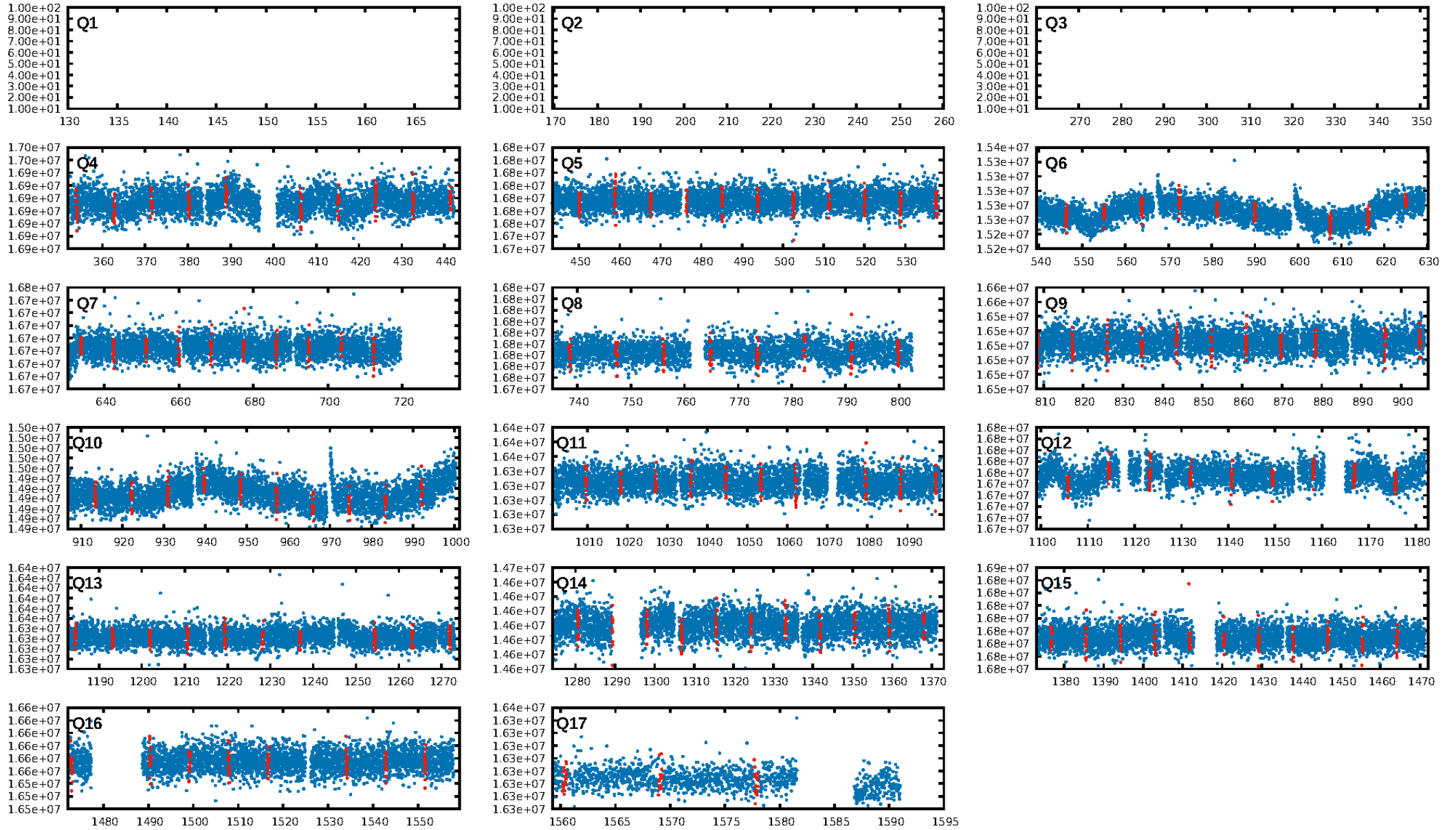
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [28.97σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.06e-47
RollingBand-fgt: 1.00 [127/127]
GhostDiagnostic-chr: 4.115
Centroid-sig: 22.1%
Centroid-so: 0.975 arcsec [1.11σ]
OotOffset-rm: 0.189 arcsec [0.35σ]
KicOffset-rm: 0.123 arcsec [0.22σ]
OotOffset-st: 3/3/1/2 [9]
KicOffset-st: 3/3/1/2 [9]
DiffImageQuality-fgm: 0.56 [5/9]
DiffImageOverlap-fno: 1.00 [14/14]

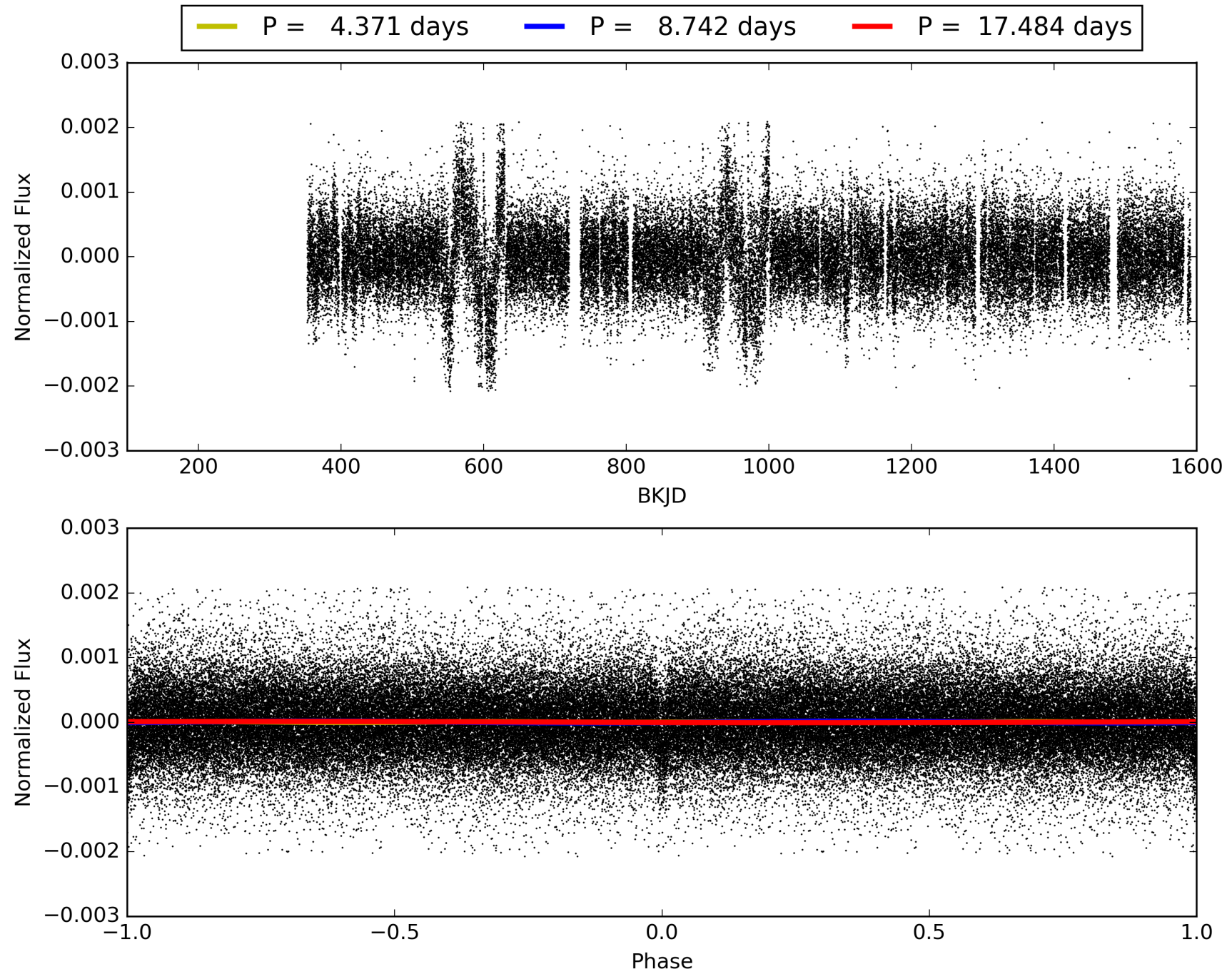
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:49:31 Z

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

TCE 009230021-01, PDC Light Curves

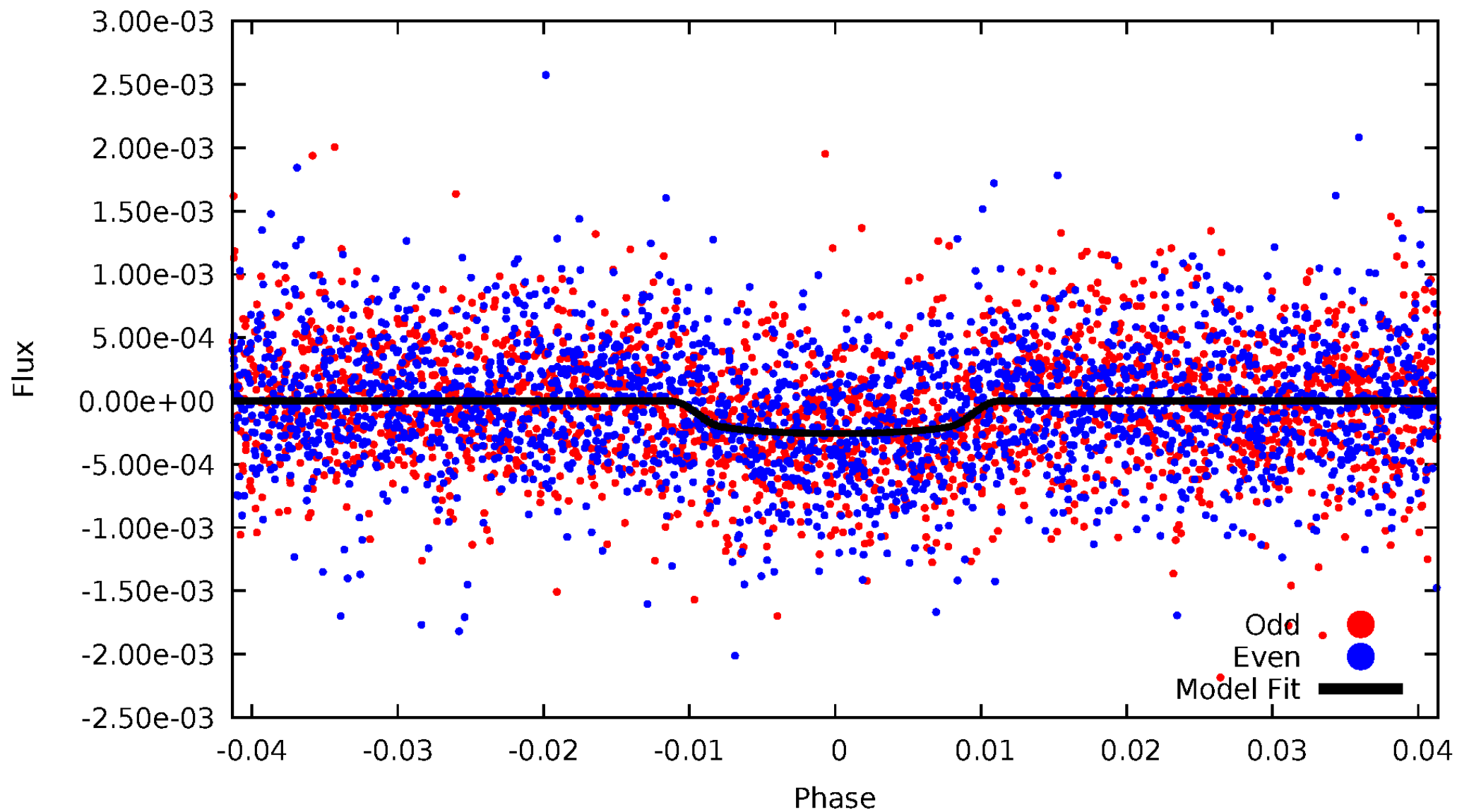


TCE 009230021-01



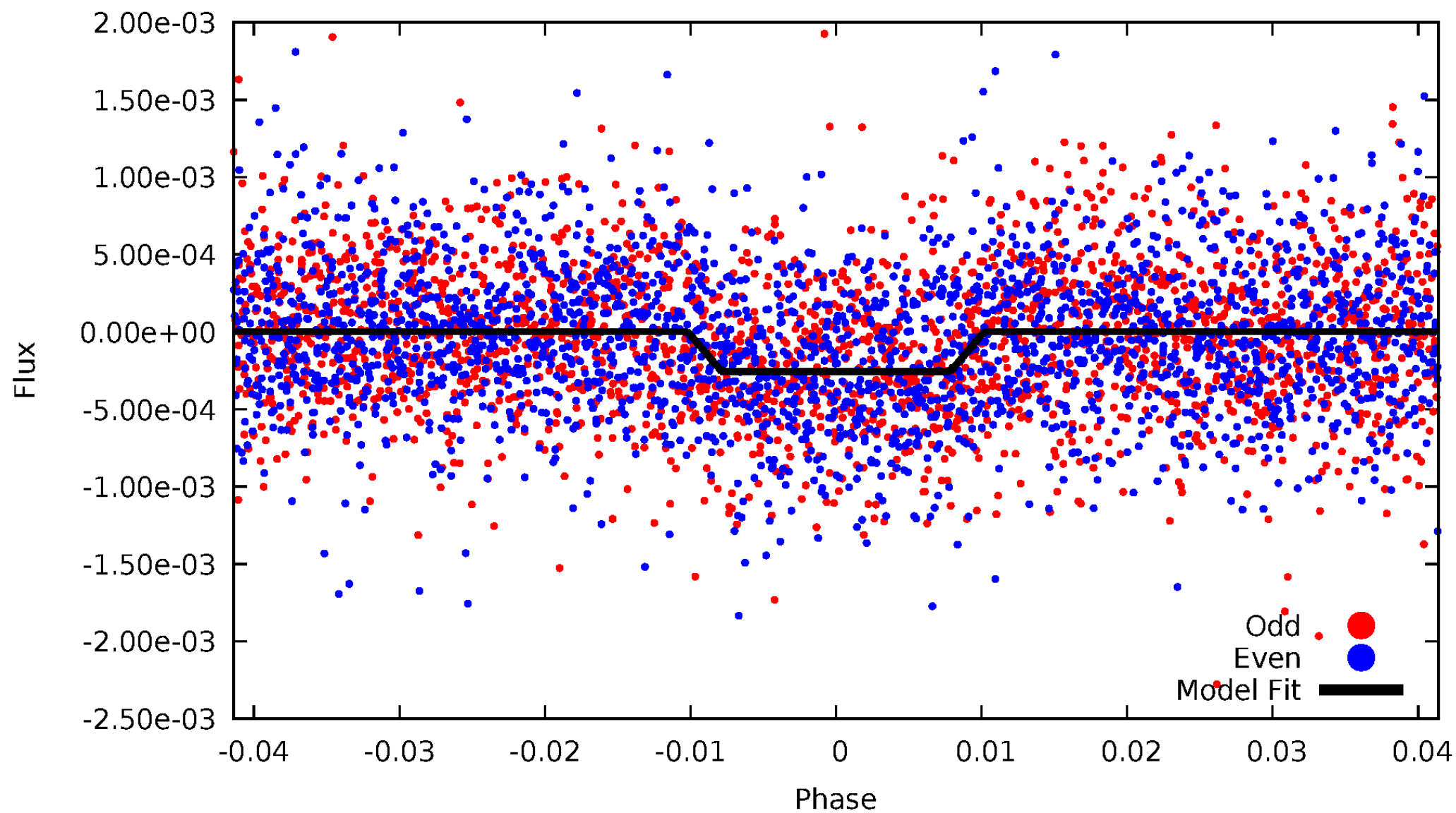
DV Odd/Even

TCE 009230021-01



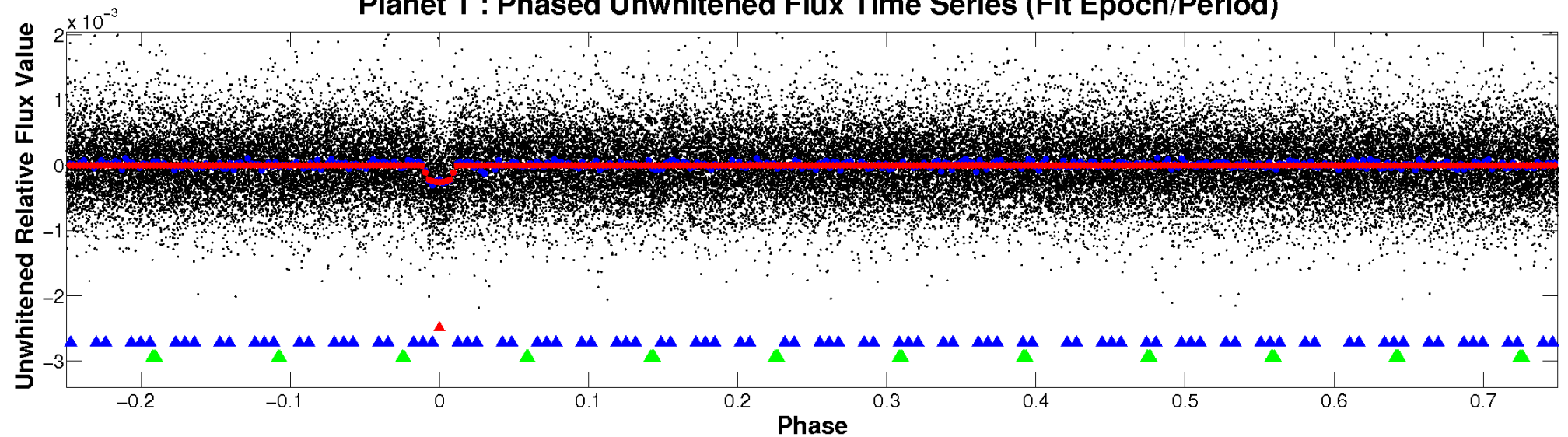
ALT Odd/Even

TCE 009230021-01

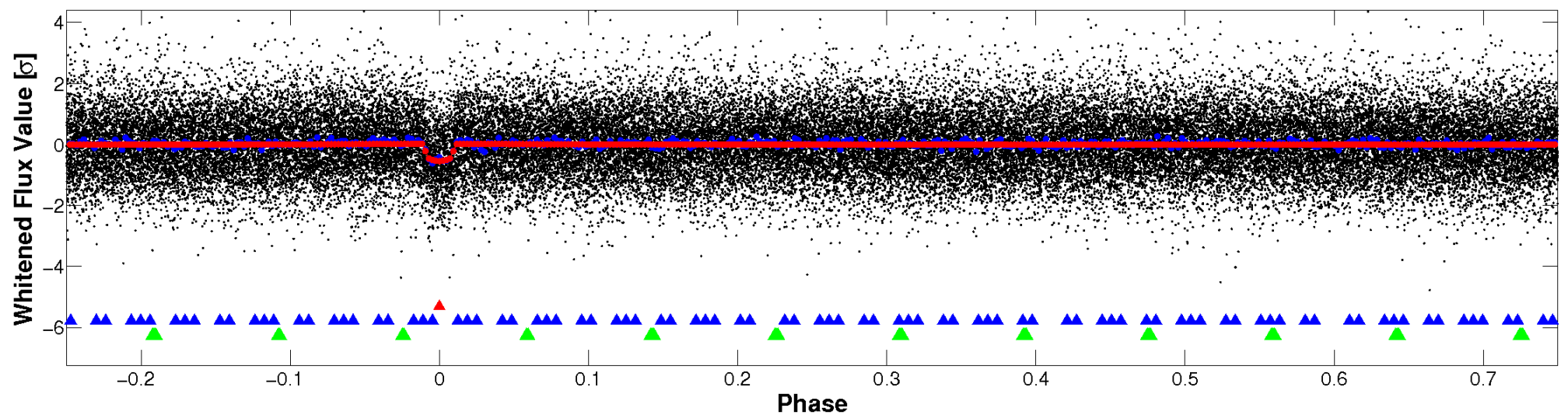


Non-Whitened Vs. Whitened Light Curve

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

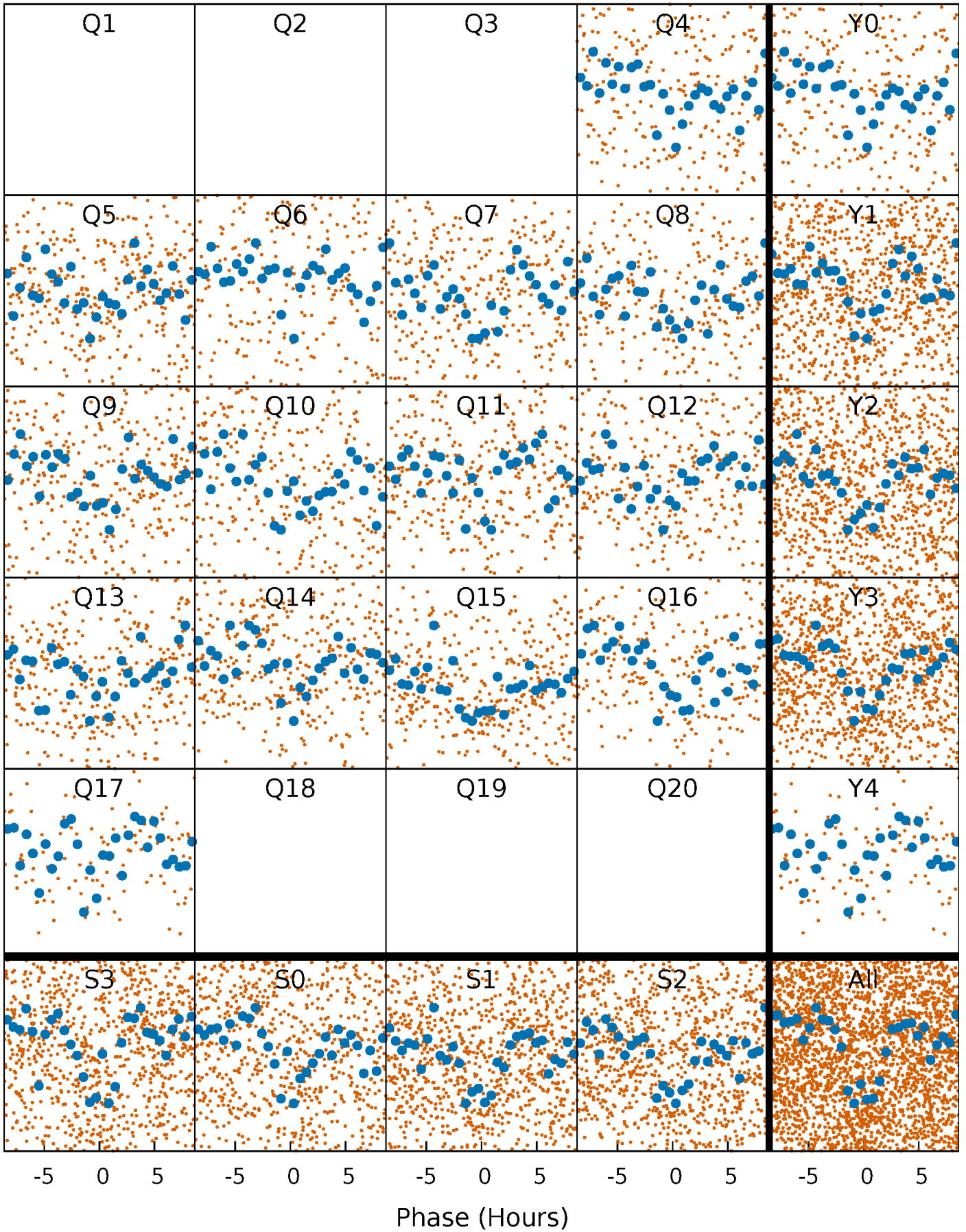


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



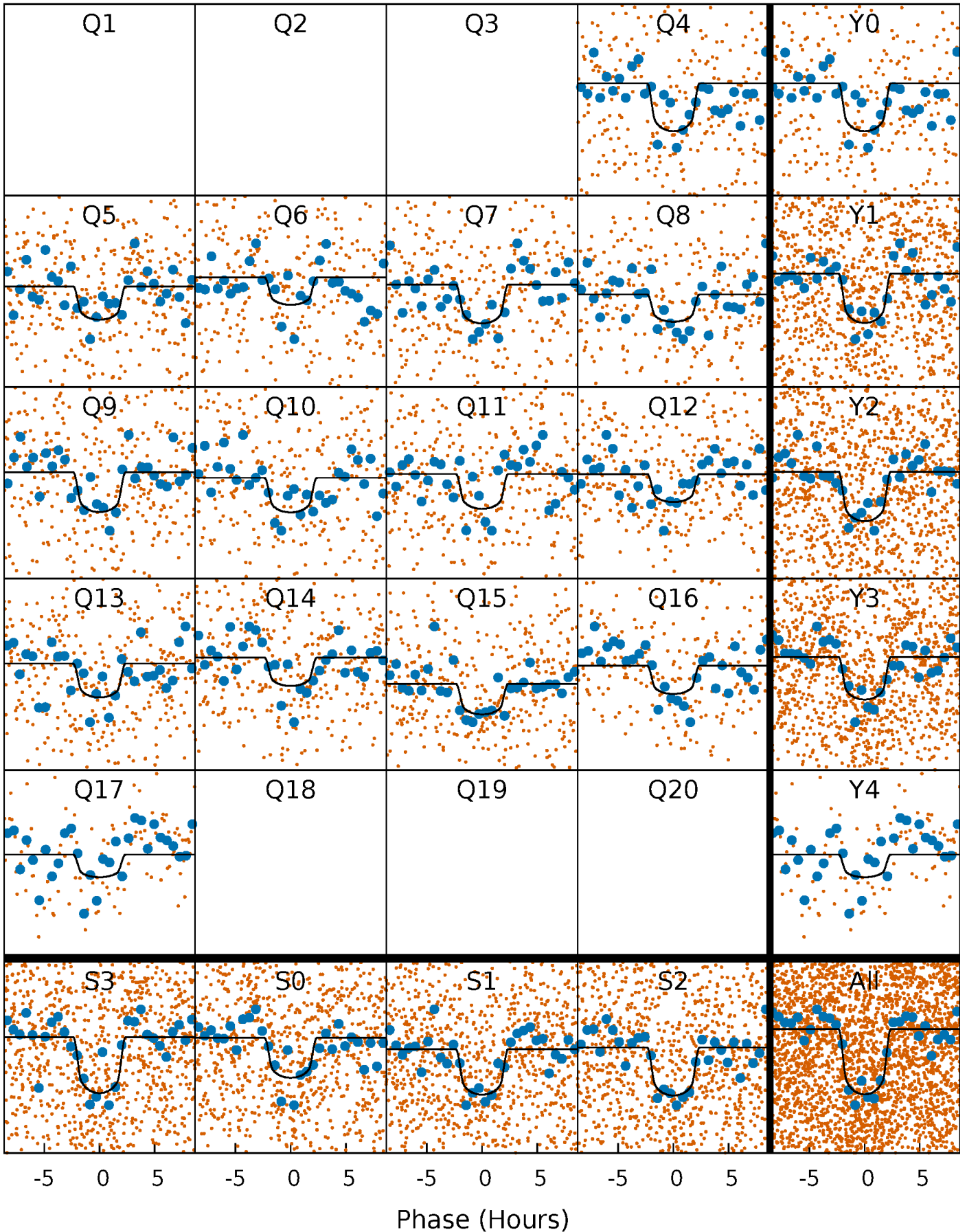
PDC Quarter-Phased Transit Curves

TCE 009230021-01 P= 8.741942 Days $T_0=135.425347$ (BKJD)



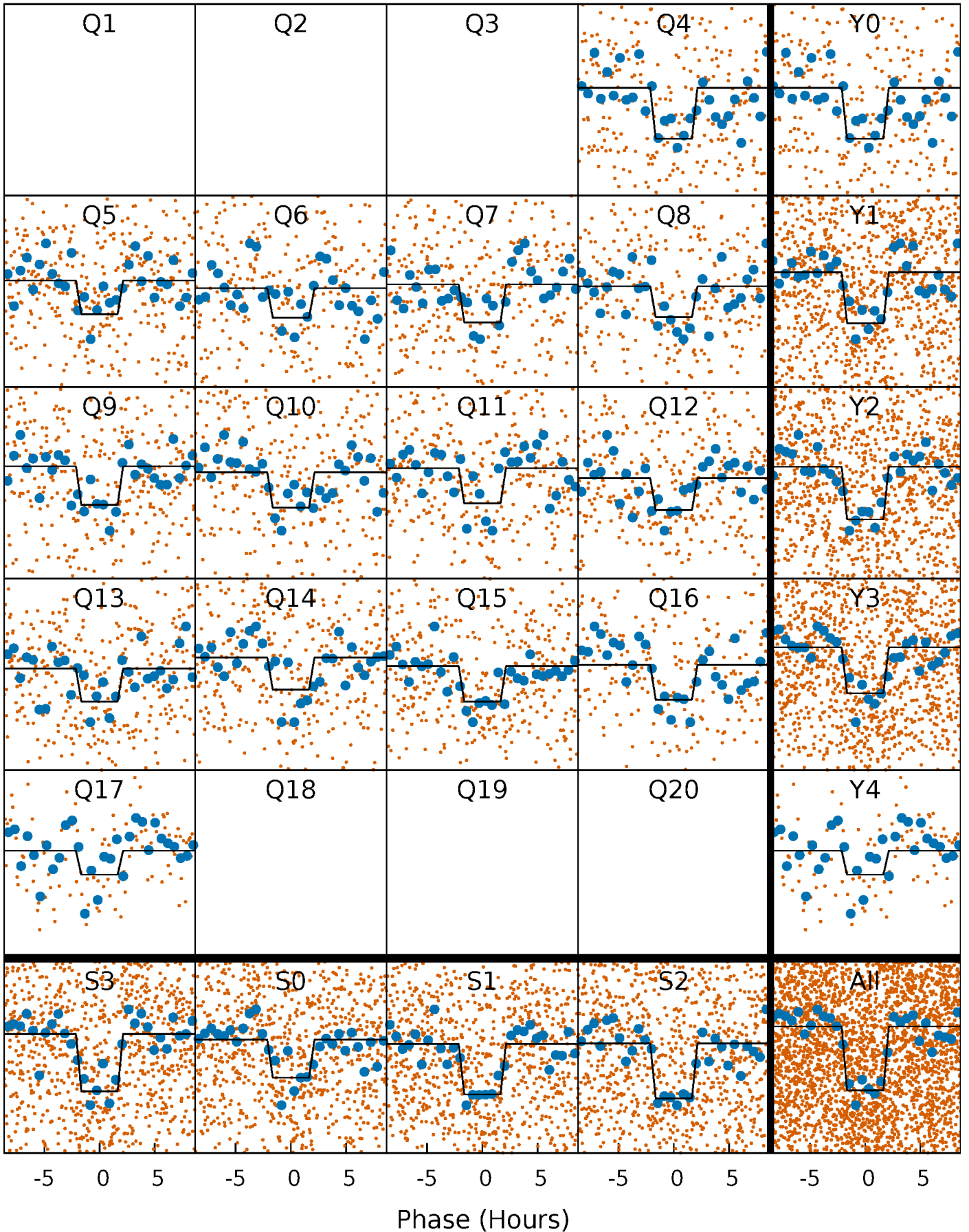
DV Quarter-Phased Transit Curves

TCE 009230021-01 P= 8.741942 Days $T_0=135.425347$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

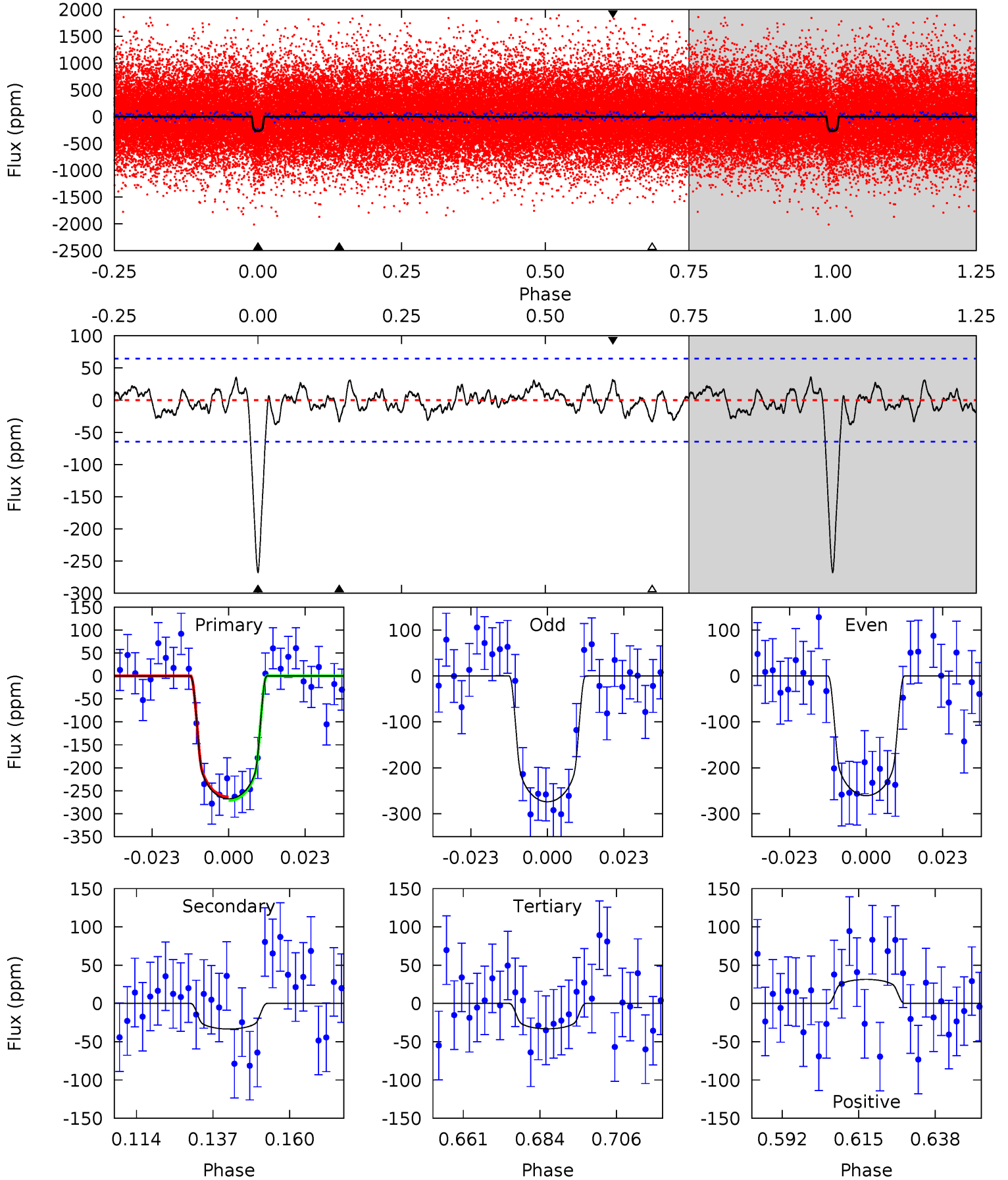
TCE 009230021-01 P= 8.741895 Days $T_0=135.429886$ (BKJD)



DV Model-Shift Uniqueness Test

009230021-01, P = 8.741942 Days, E = 135.425347 Days

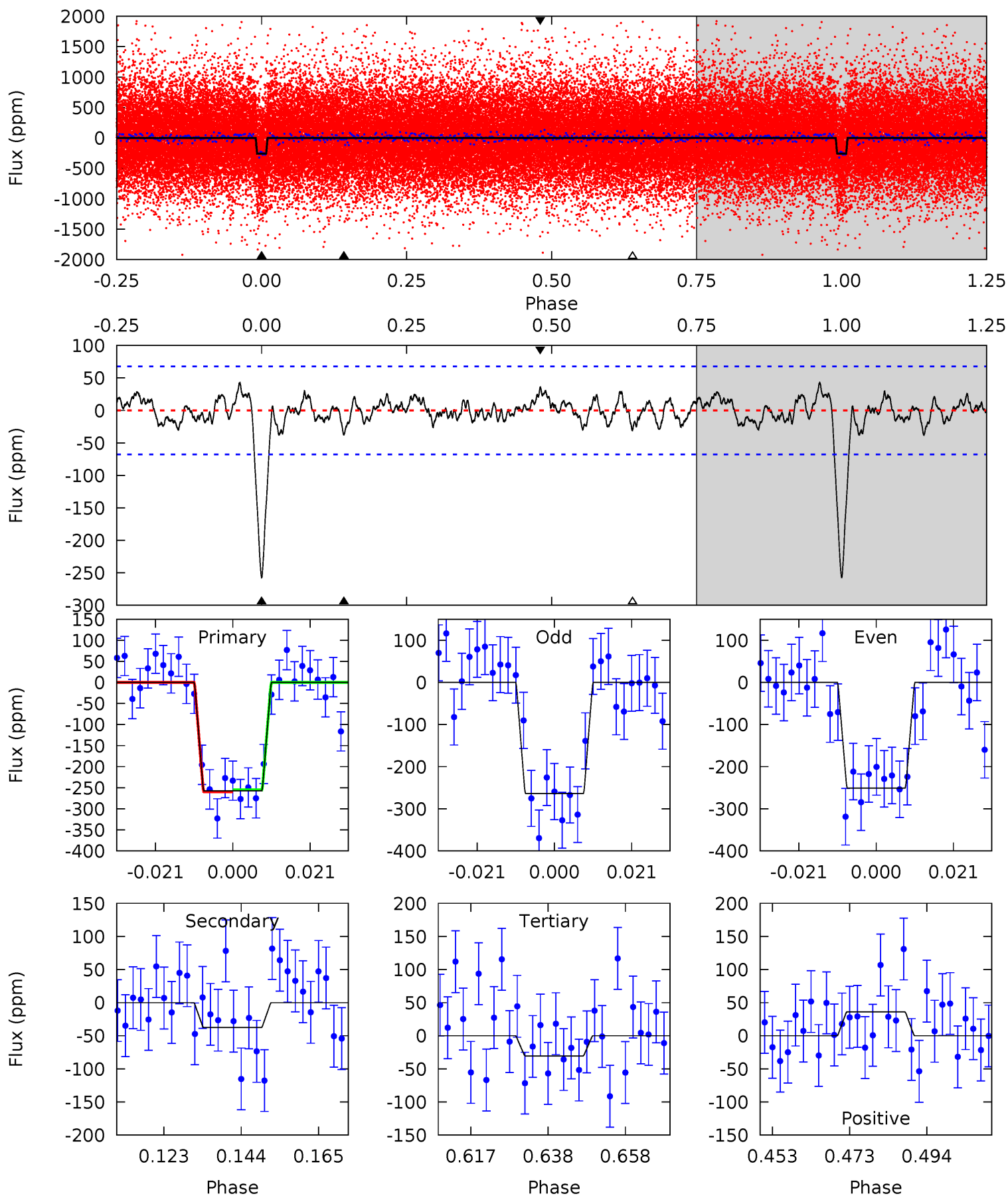
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.2	2.52	2.50	2.37	4.87	2.28	1.05	17.7	17.8	0.02	0.15	0.50	1.03	0.12	0.27



Alt Model-Shift Uniqueness Test

009230021-01, P = 8.741895 Days, E = 135.429886 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.6	2.71	2.20	2.60	4.89	2.32	1.04	16.4	16.0	0.51	0.11	0.47	1.02	0.14	0.16



Stellar Parameters For KIC 009230021

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5596^{+83}_{-75}	$4.298^{+0.143}_{-0.104}$	$0.140^{+0.150}_{-0.150}$	$1.145^{+0.178}_{-0.178}$	$0.950^{+0.070}_{-0.052}$	$0.891^{+0.620}_{-0.292}$
	+1%/-1%	+3%/-2%	+107%/-107%	+16%/-16%	+7%/-5%	+70%/-33%
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 009230021-01 / KOI 3429.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-33 ± 13	$2.11^{+0.79}_{-0.79}$	1291^{+52}_{-58}	3659^{+686}_{-467}	27^{+44}_{-16}
Alt.	-38 ± 14	$2.00^{+0.83}_{-0.78}$	1291^{+53}_{-55}	3796^{+794}_{-472}	34^{+61}_{-20}

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 $A_{obs} \gg 1.0$

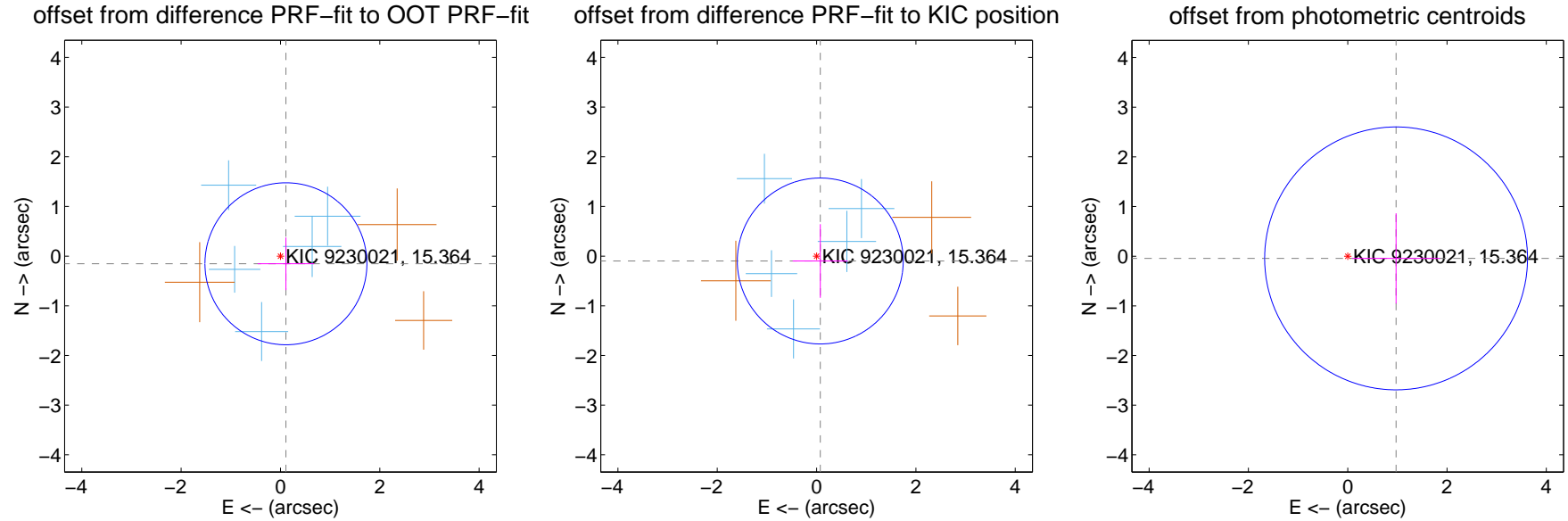
DV Centroid Data

Supplemental centroid analysis for 009230021-01. Kepler magnitude: 15.36. Transit SNR 15.20

There are 5 quarters with good PRF difference image offsets

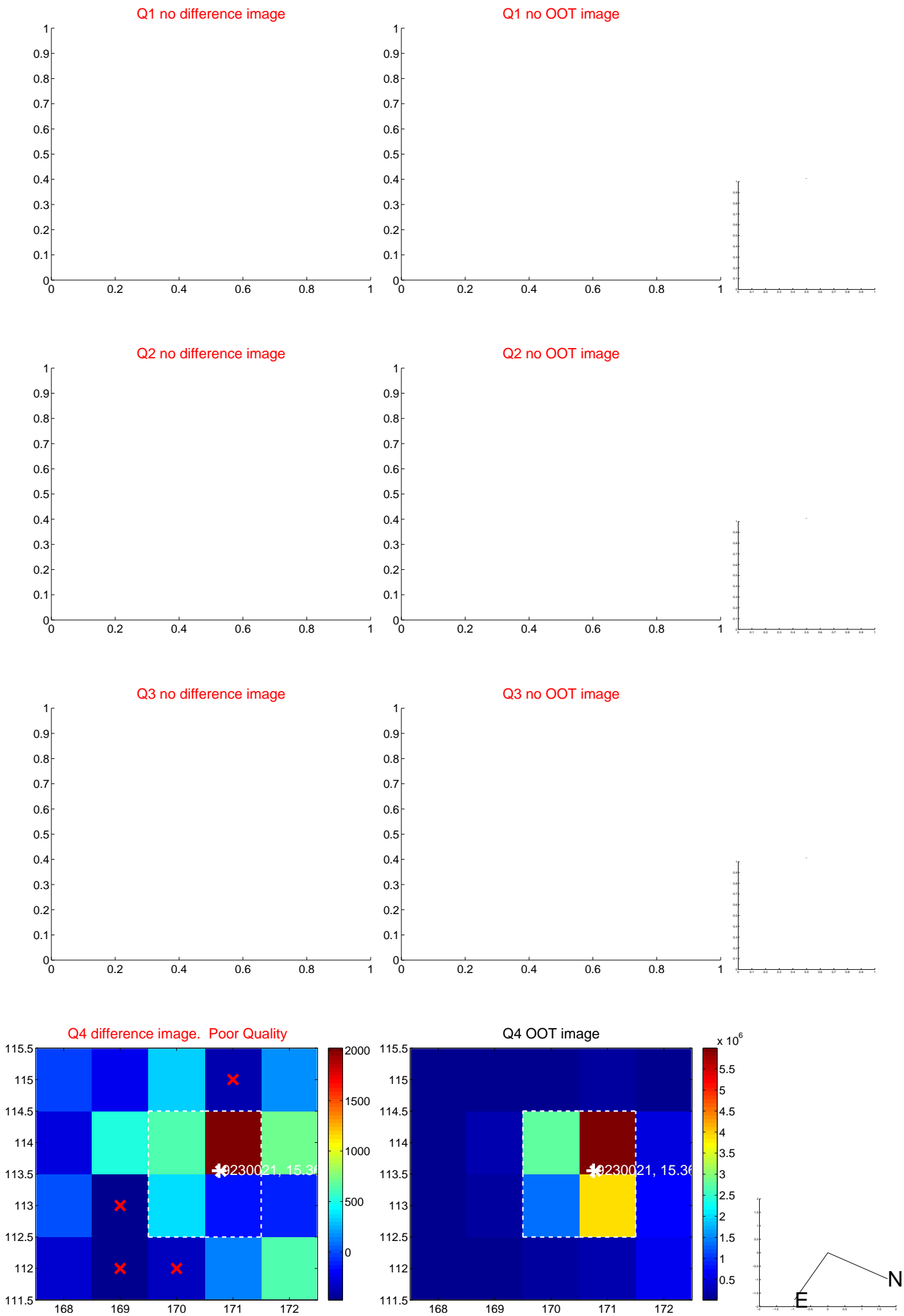
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.189 ± 0.544	0.35	-0.110 ± 0.569	-0.154 ± 0.530
PRF-fit source offset from KIC position	0.123 ± 0.557	0.22	-0.074 ± 0.554	-0.098 ± 0.741
photometric centroid source offset	0.98 ± 0.88	1.11	-0.97 ± 0.88	-0.04 ± 0.91

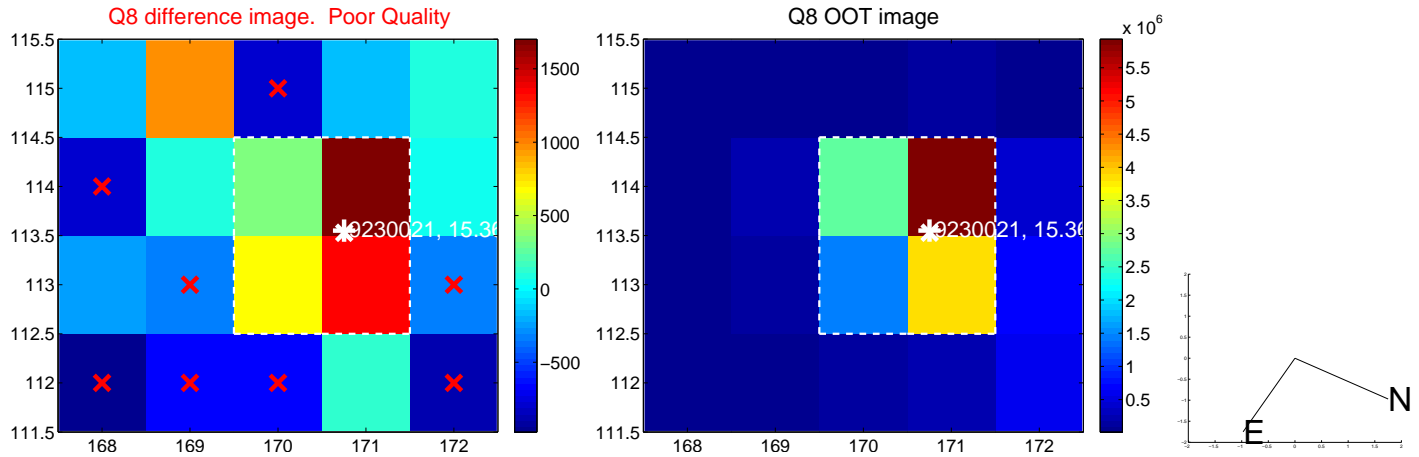
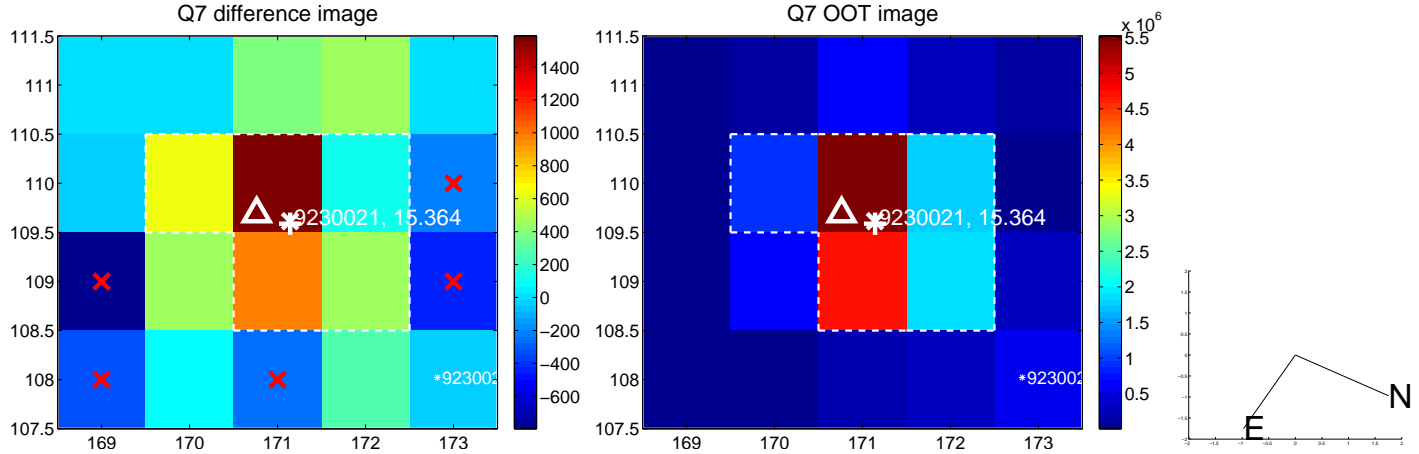
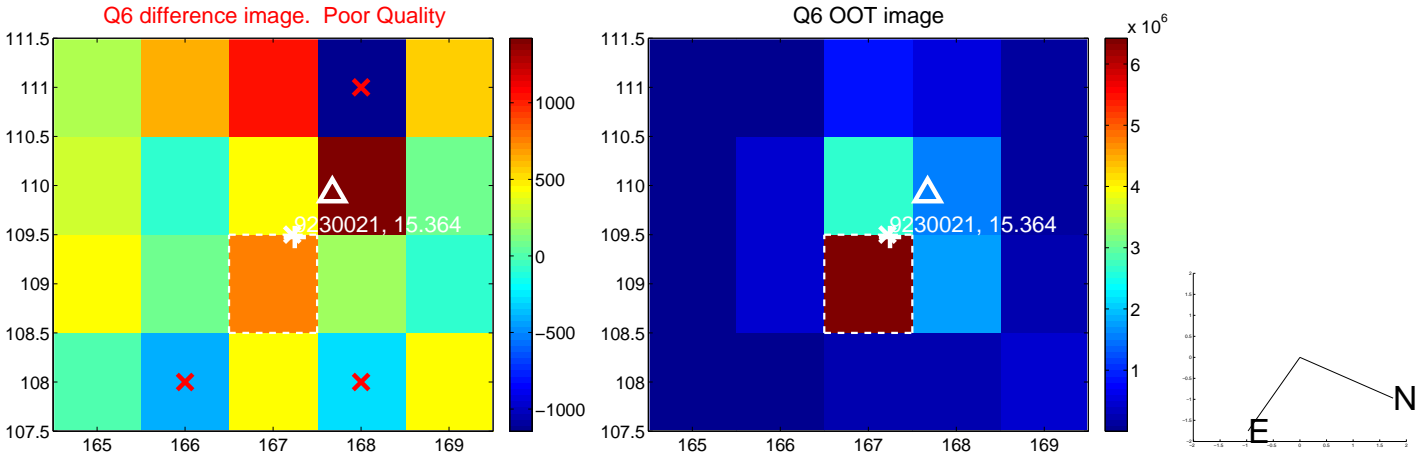
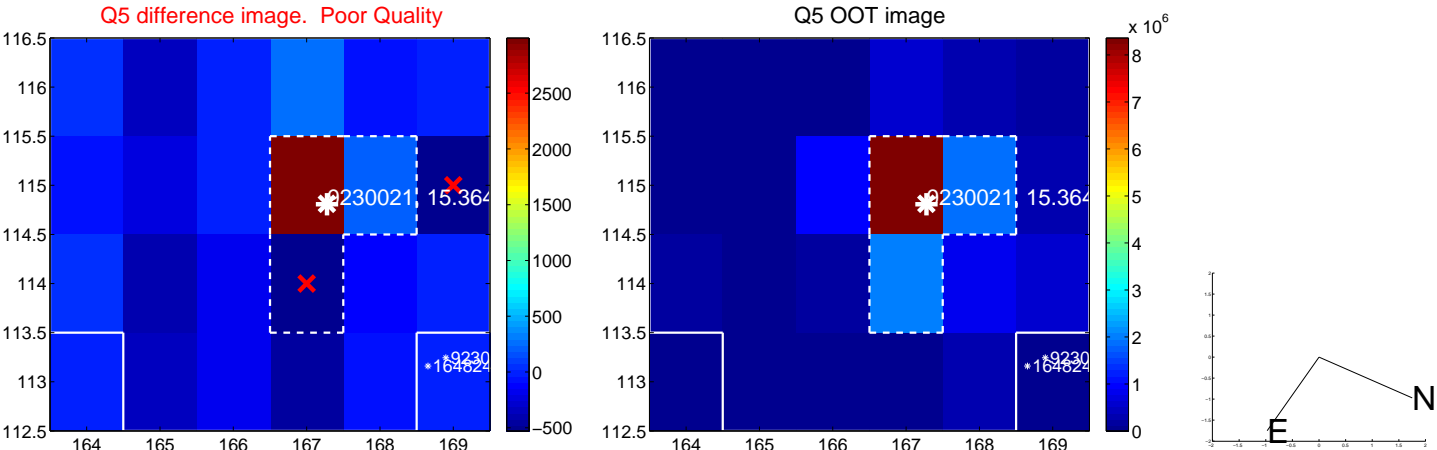


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

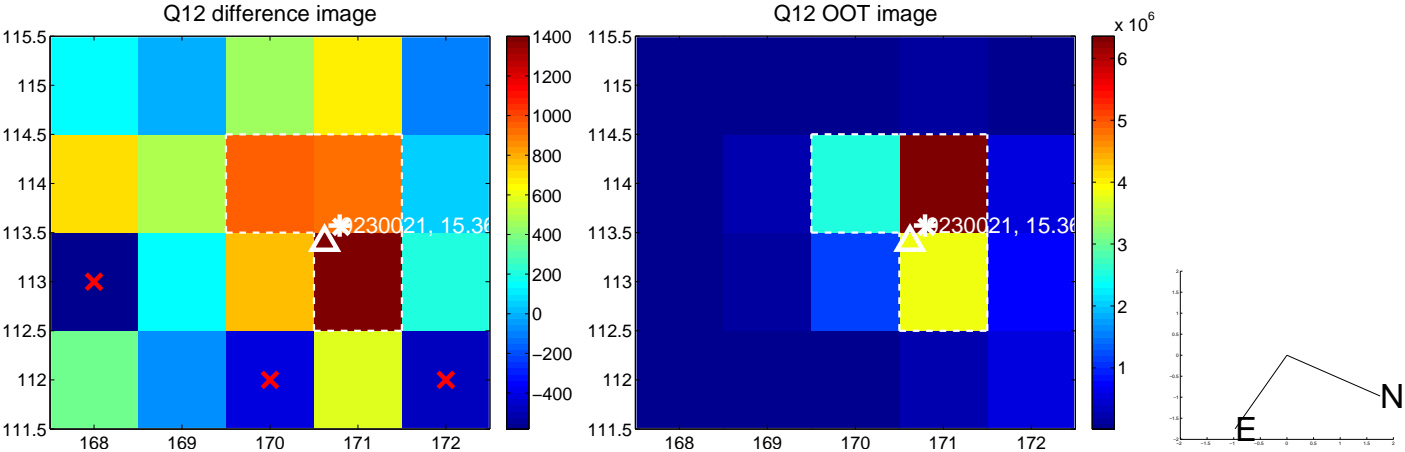
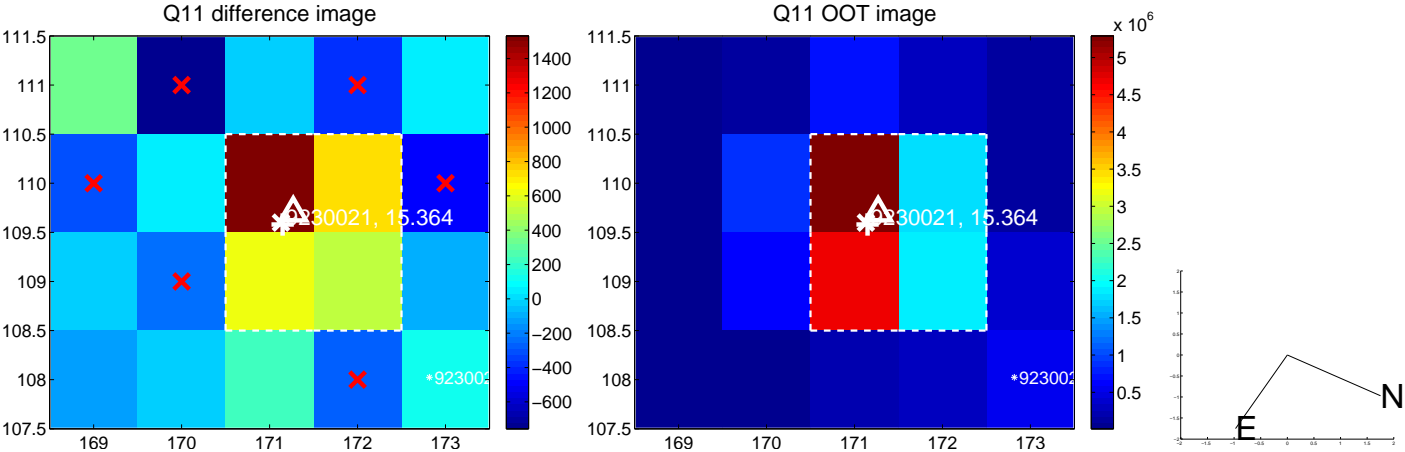
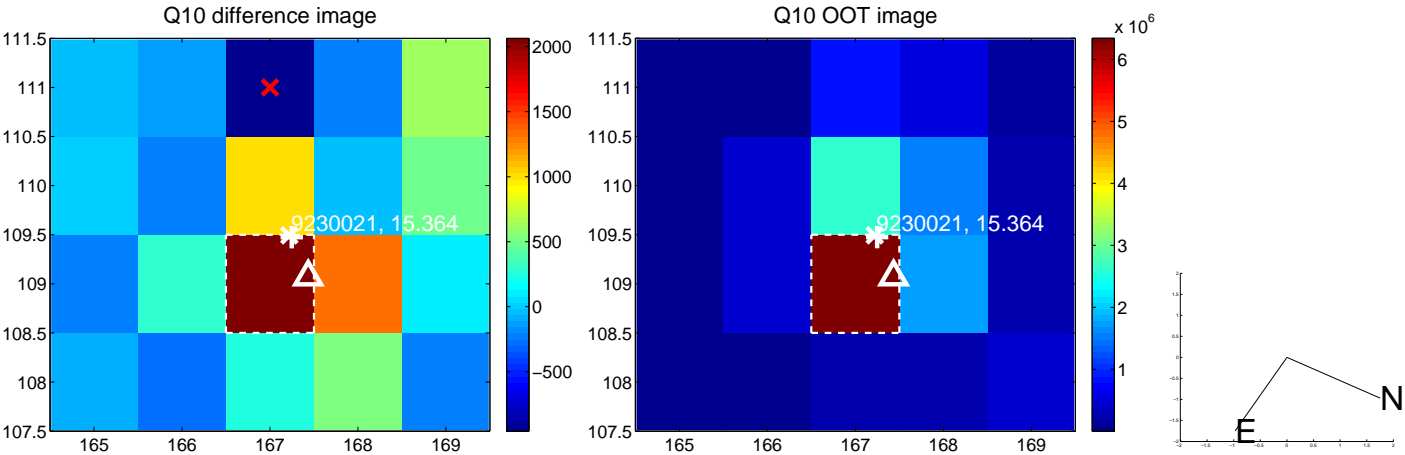
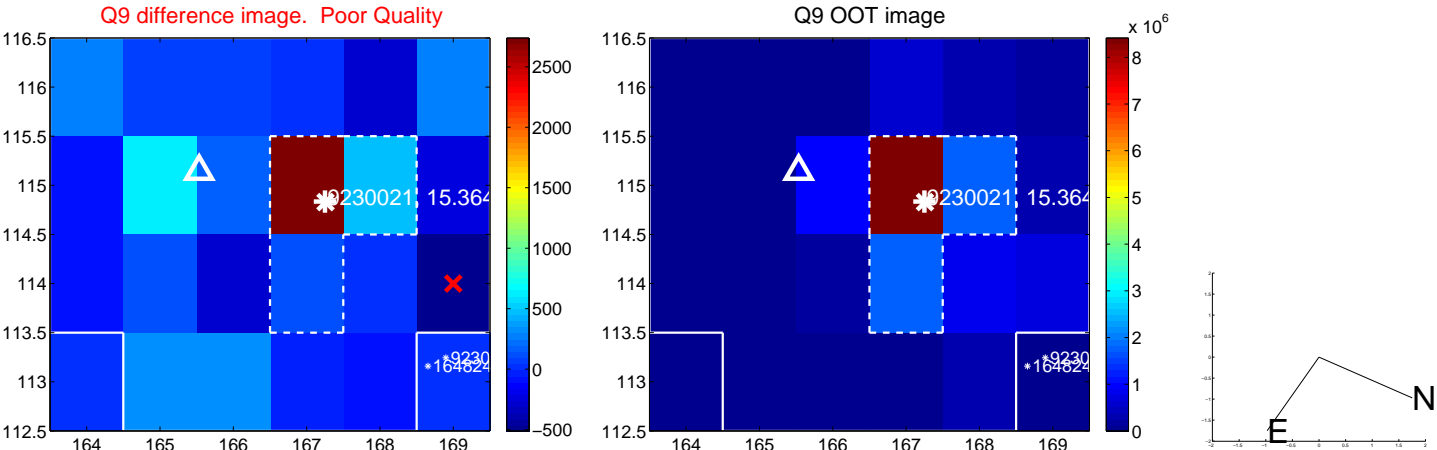
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



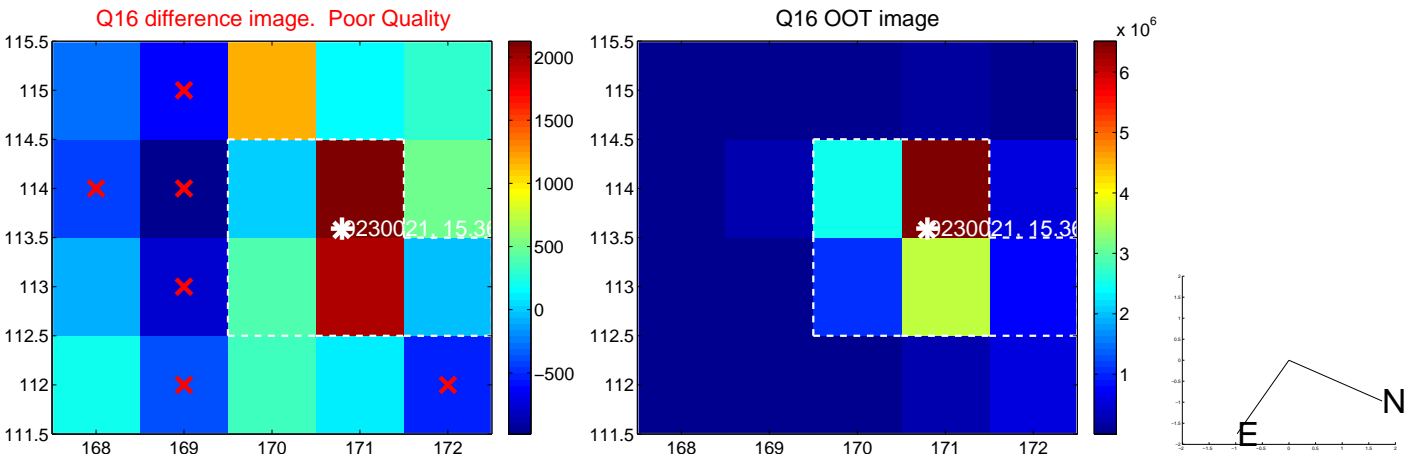
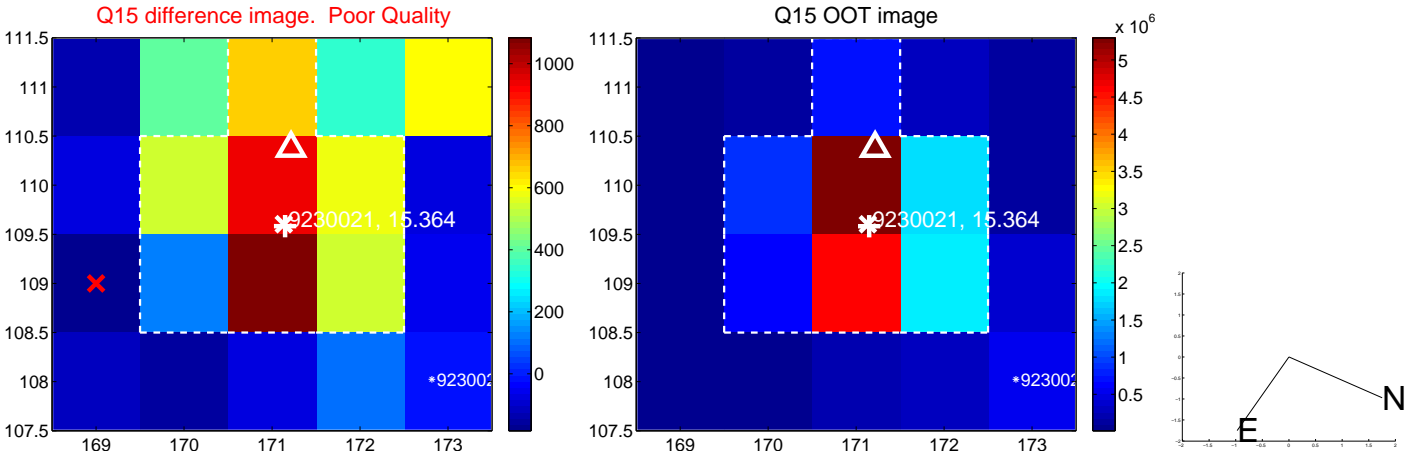
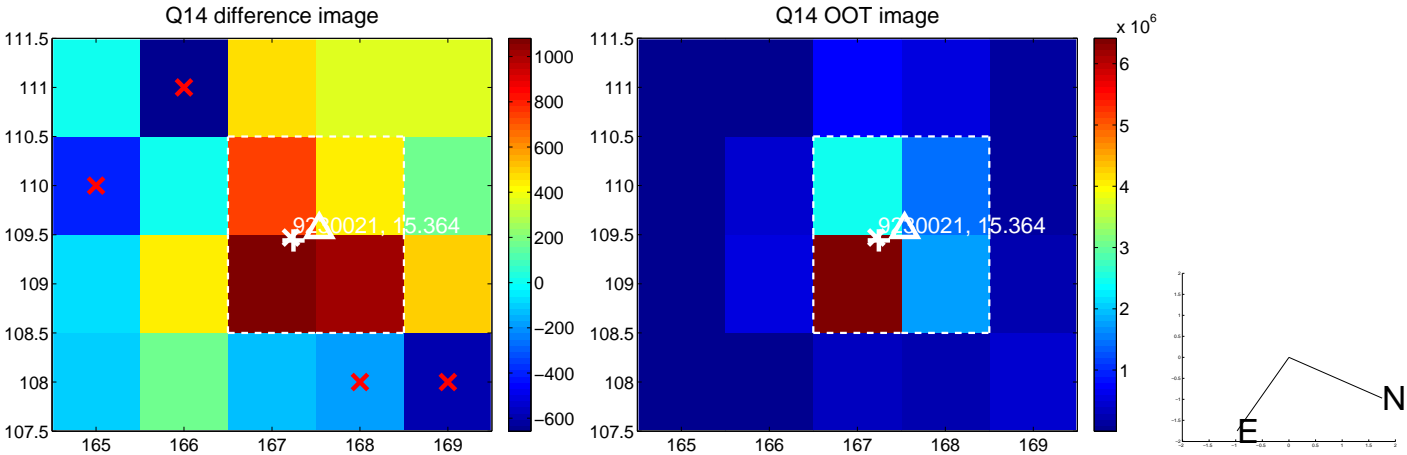
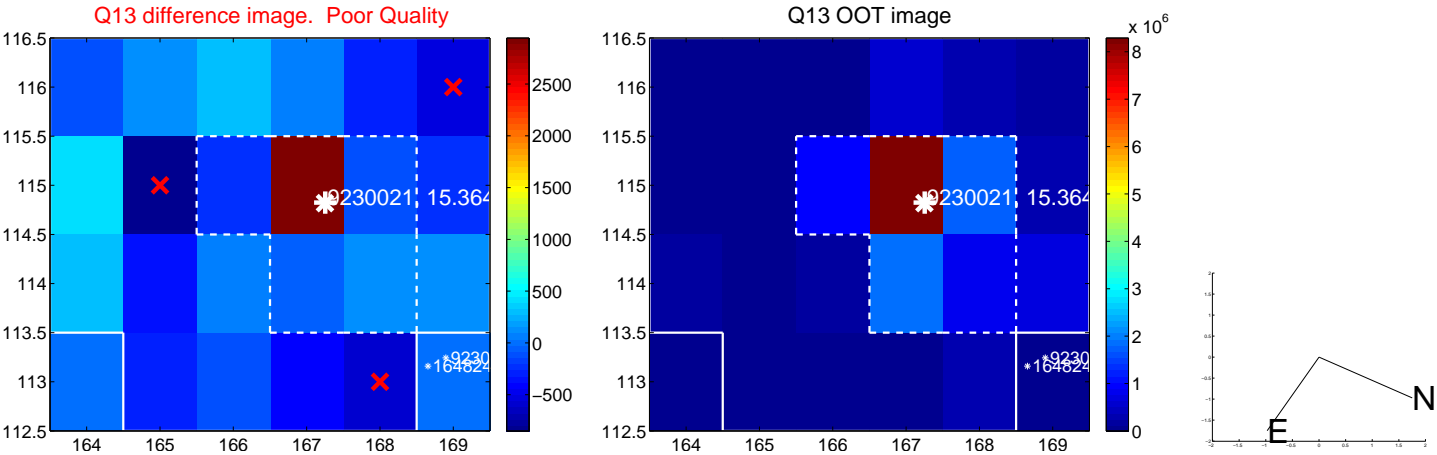
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



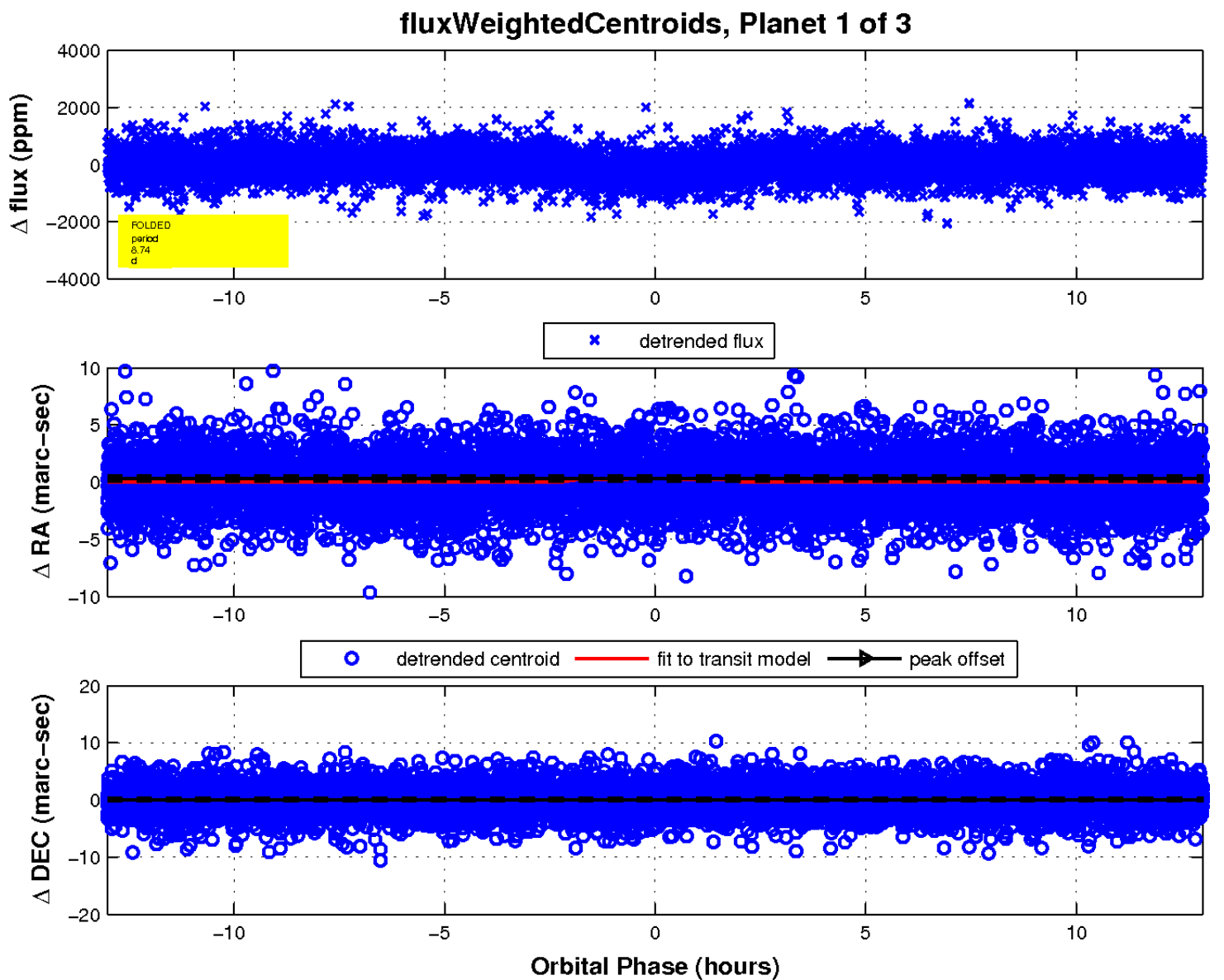
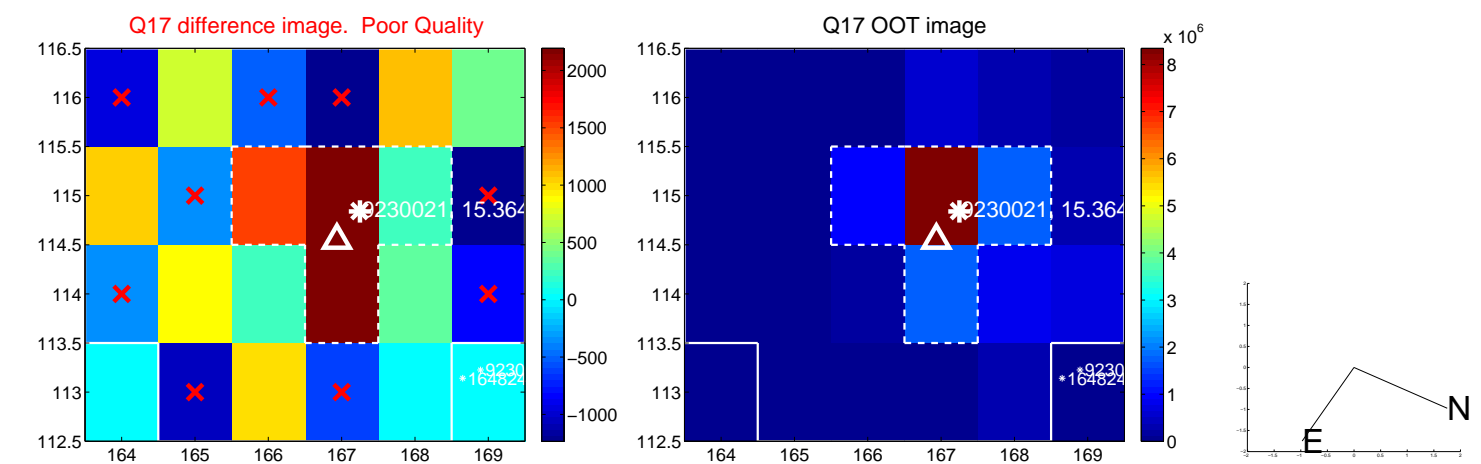
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

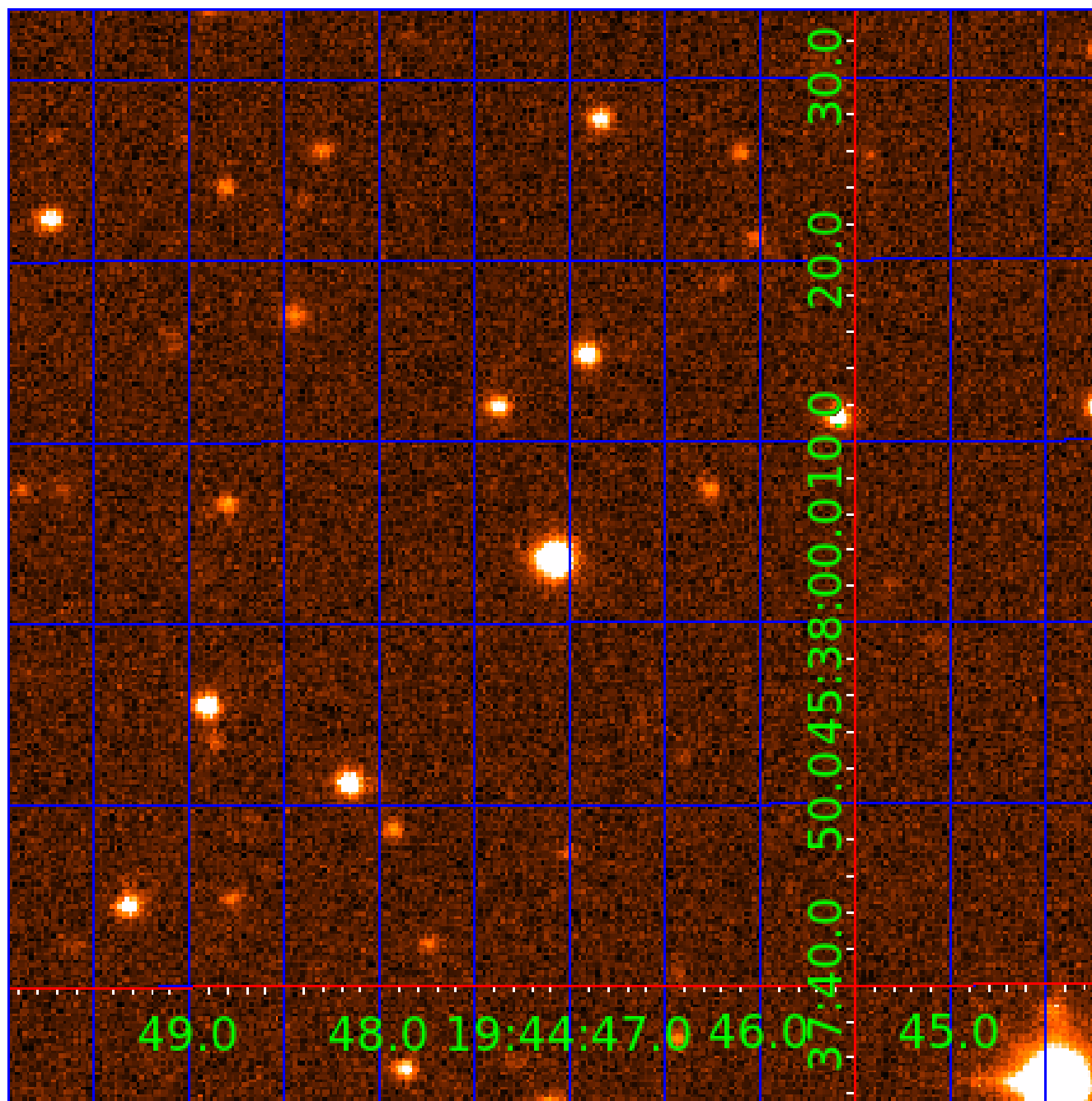


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009230021

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})
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Robovetter Results

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009230021-02	OBS	PC	0.89	0	0	0	0	NO_COMMENT
009230021-03	OBS	PC	0.51	0	0	0	0	NO_COMMENT

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.

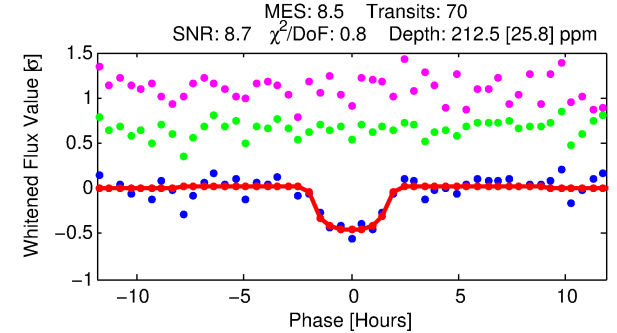
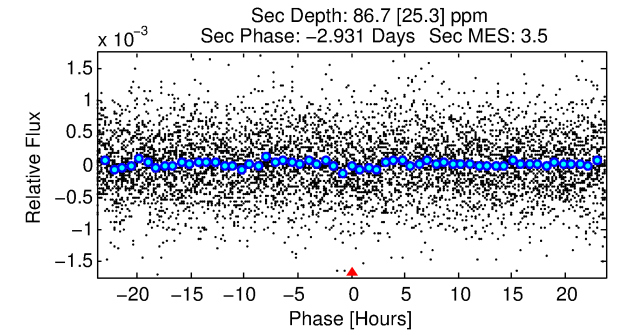
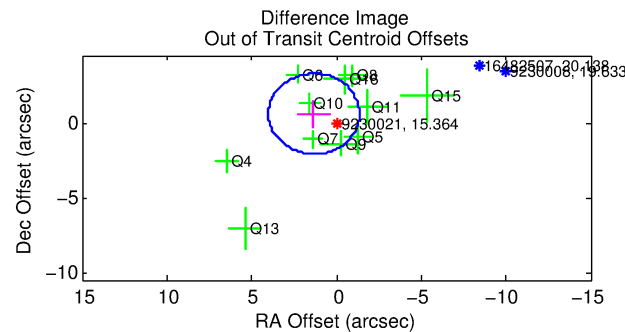
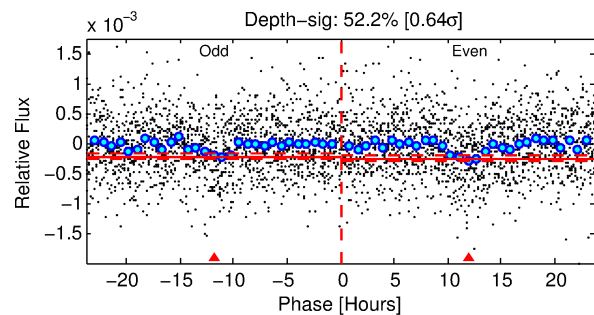
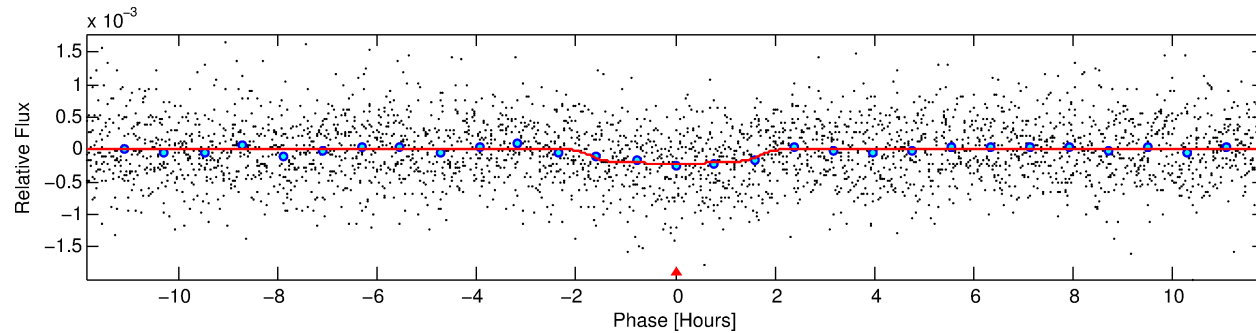
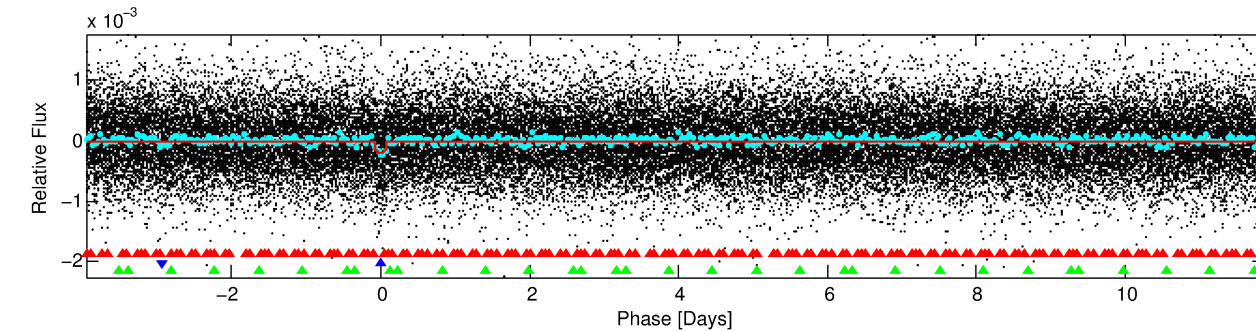
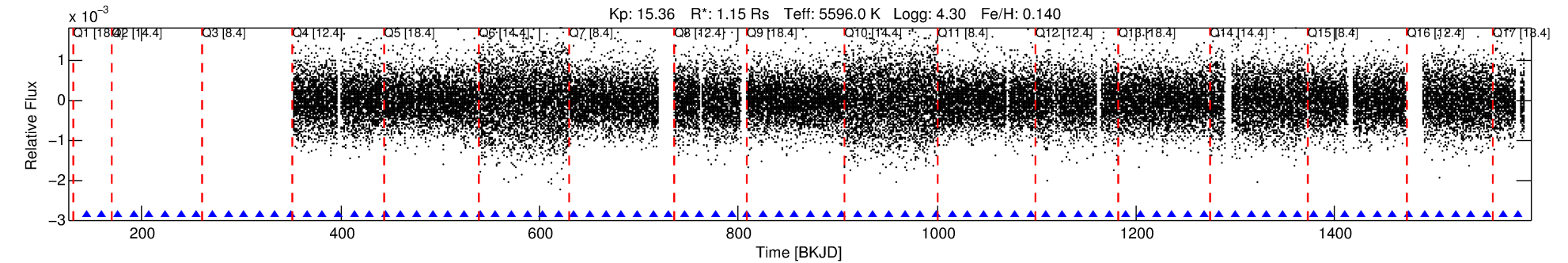
Ephemeris Match Information For 009230021-02

No Significant Match Found

DV One-Page Summary

KIC: 9230021 Candidate: 2 of 3 Period: 15.829 d

KOI: K03429.01 Corr: 0.843



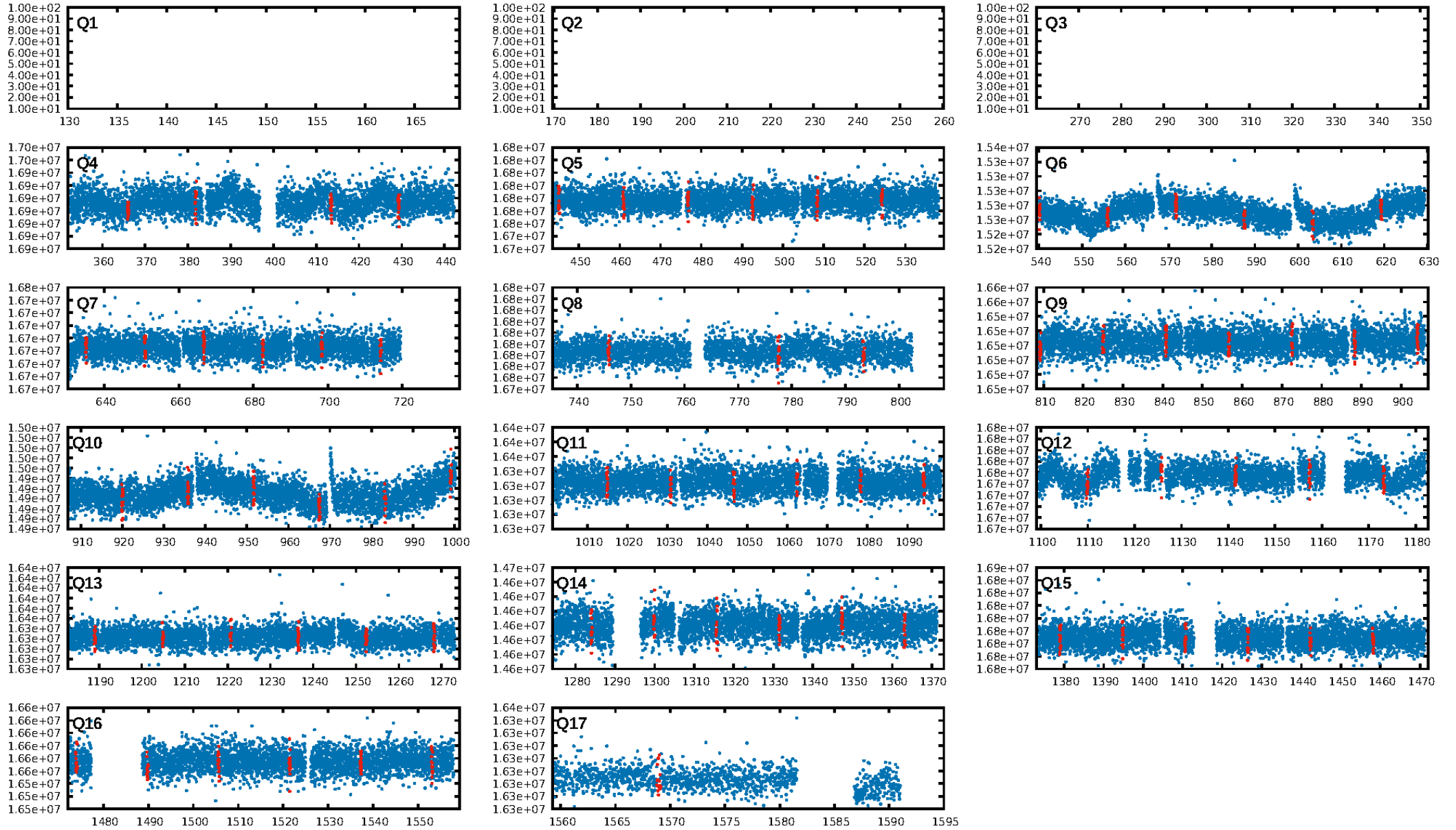
DV Fit Results:

Period = 15.82852 [0.00024] d
Epoch = 144.3868 [0.0133] BKJD
 R_p/R^* = 0.0167 [0.0045]
 a/R^* = 12.26 [14.97]
 b = 0.93 [0.17]
 S_{eff} = 78.29 [19.56]
 T_{eq} = 758 [47] K
 R_p = 2.09 [0.65] R_e
 a = 0.1213 [0.0183] AU
 A_g = 161.19 [106.60] [1.50 σ]
 T_{eff} = 4179 [646] K [5.28 σ]

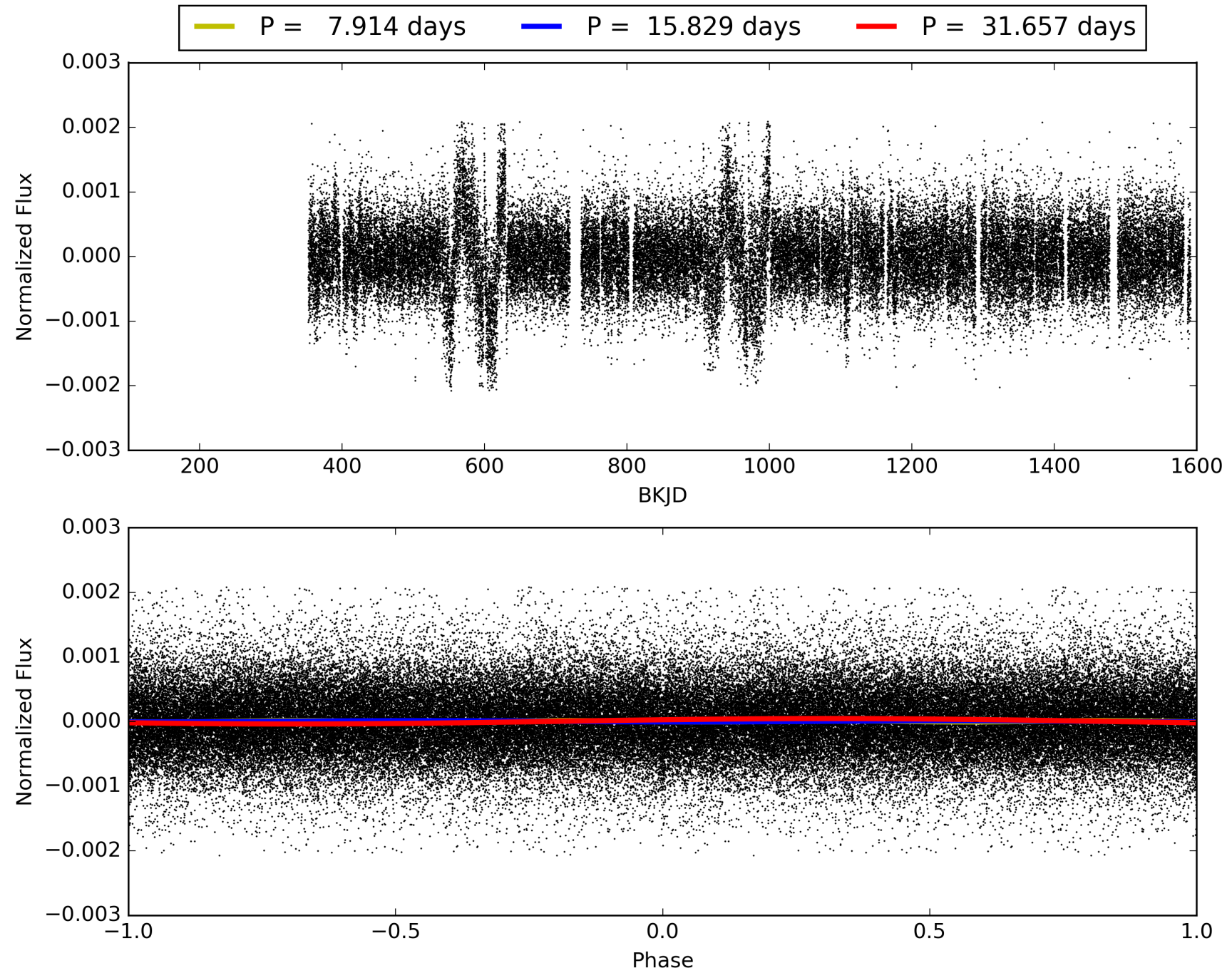
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [28.97 σ]
LongPeriod-sig: 100.0% [104.55 σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.43e-17
RollingBand-fgt: 1.00 [70/70]
GhostDiagnostic-chr: 1.911
Centroid-sig: 0.4%
Centroid-so: 3.267 arcsec [2.12 σ]
OotOffset-rm: 1.462 arcsec [1.63 σ]
KicOffset-rm: 1.498 arcsec [1.66 σ]
OotOffset-st: 2/3/3/3 [11]
KicOffset-st: 2/3/3/3 [11]
DiffImageQuality-fgm: 0.27 [3/11]
DiffImageOverlap-fno: 0.93 [13/14]

TCE 009230021-02, PDC Light Curves

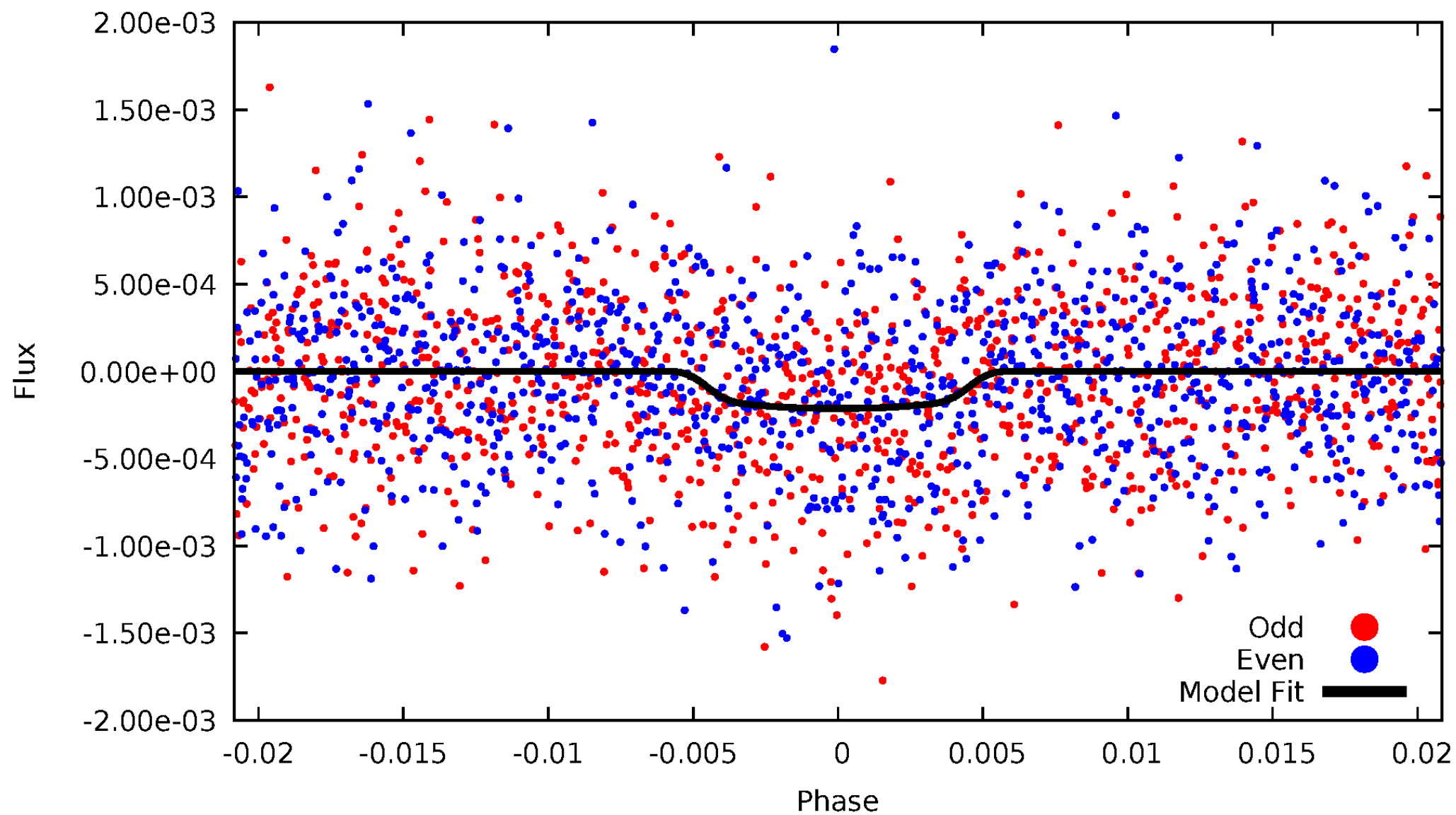


TCE 009230021-02



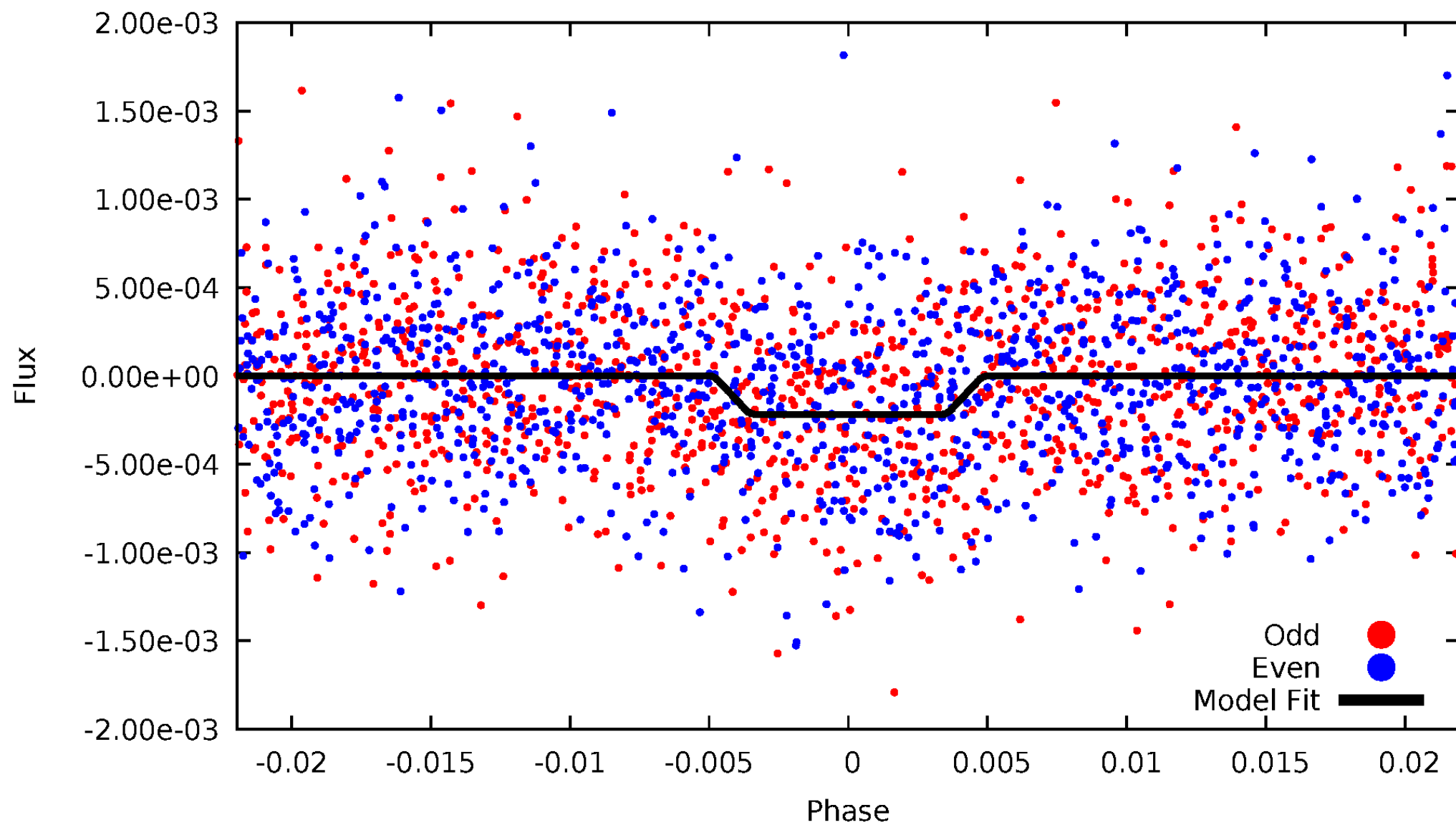
DV Odd/Even

TCE 009230021-02



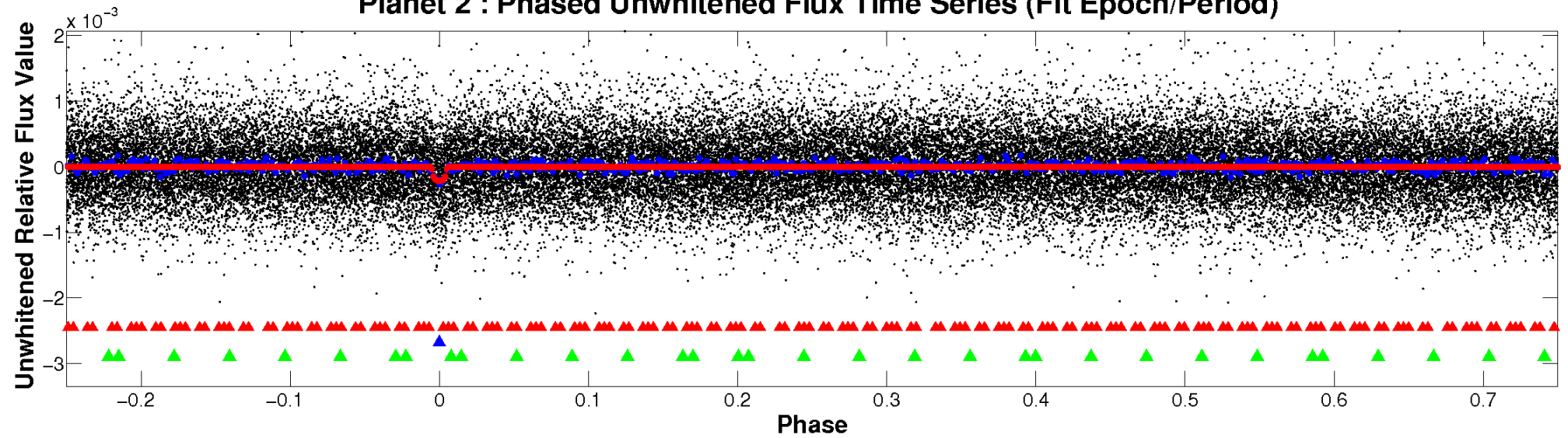
ALT Odd/Even

TCE 009230021-02

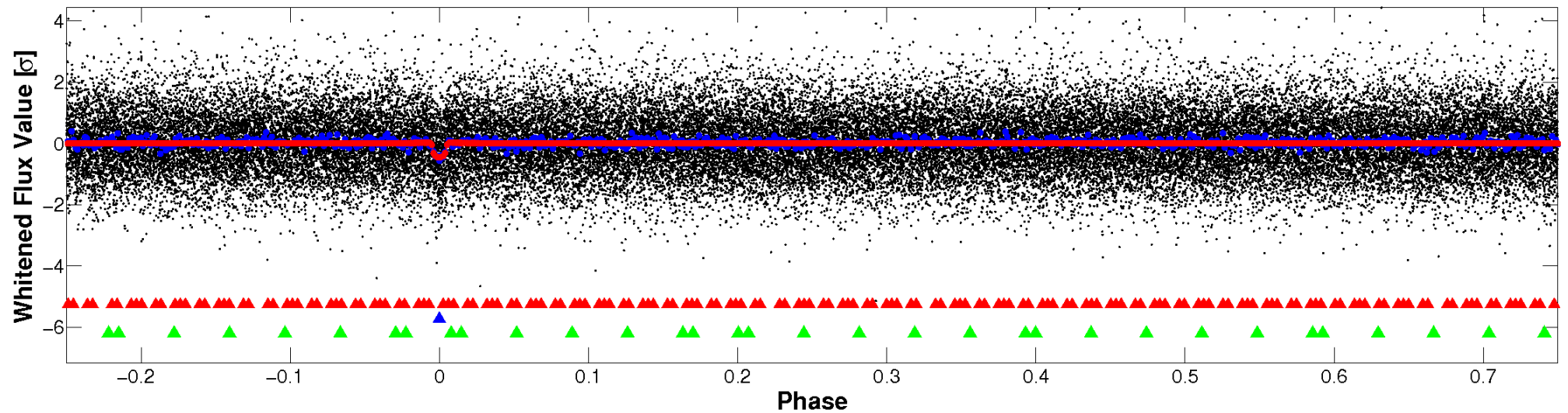


Non-Whitened Vs. Whitened Light Curve

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

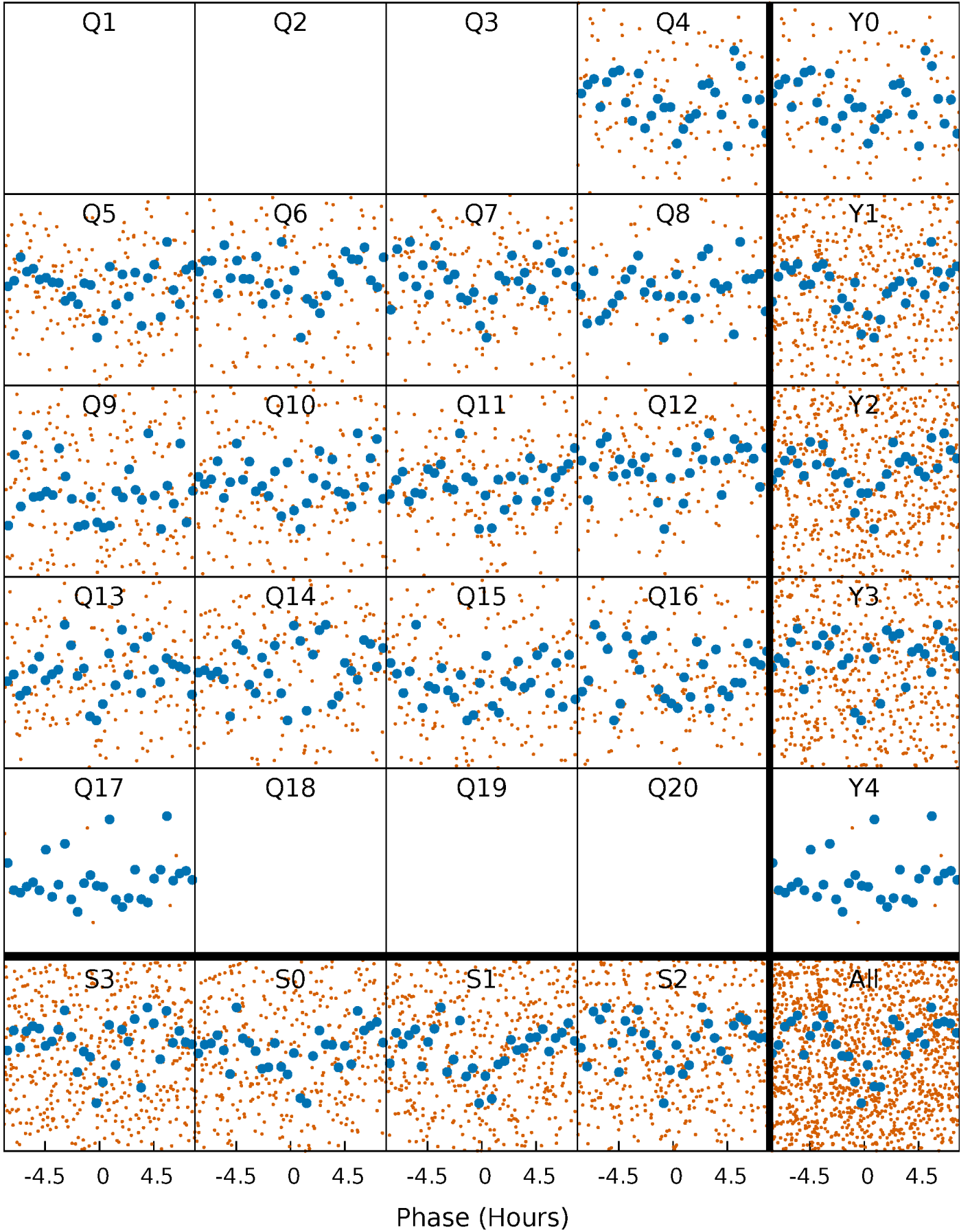


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



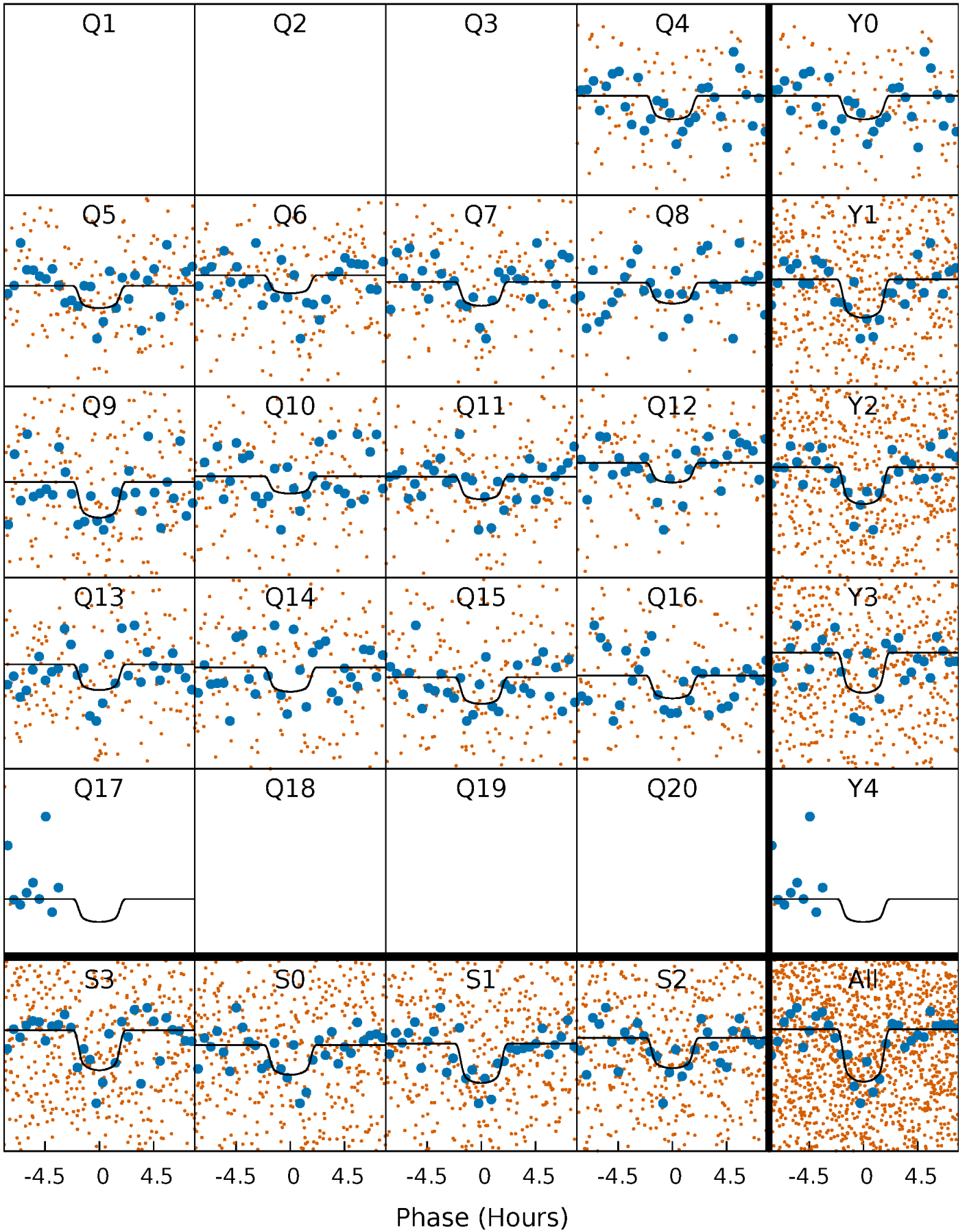
PDC Quarter-Phased Transit Curves

TCE 009230021-02 P= 15.828515 Days $T_0=144.386776$ (BKJD)



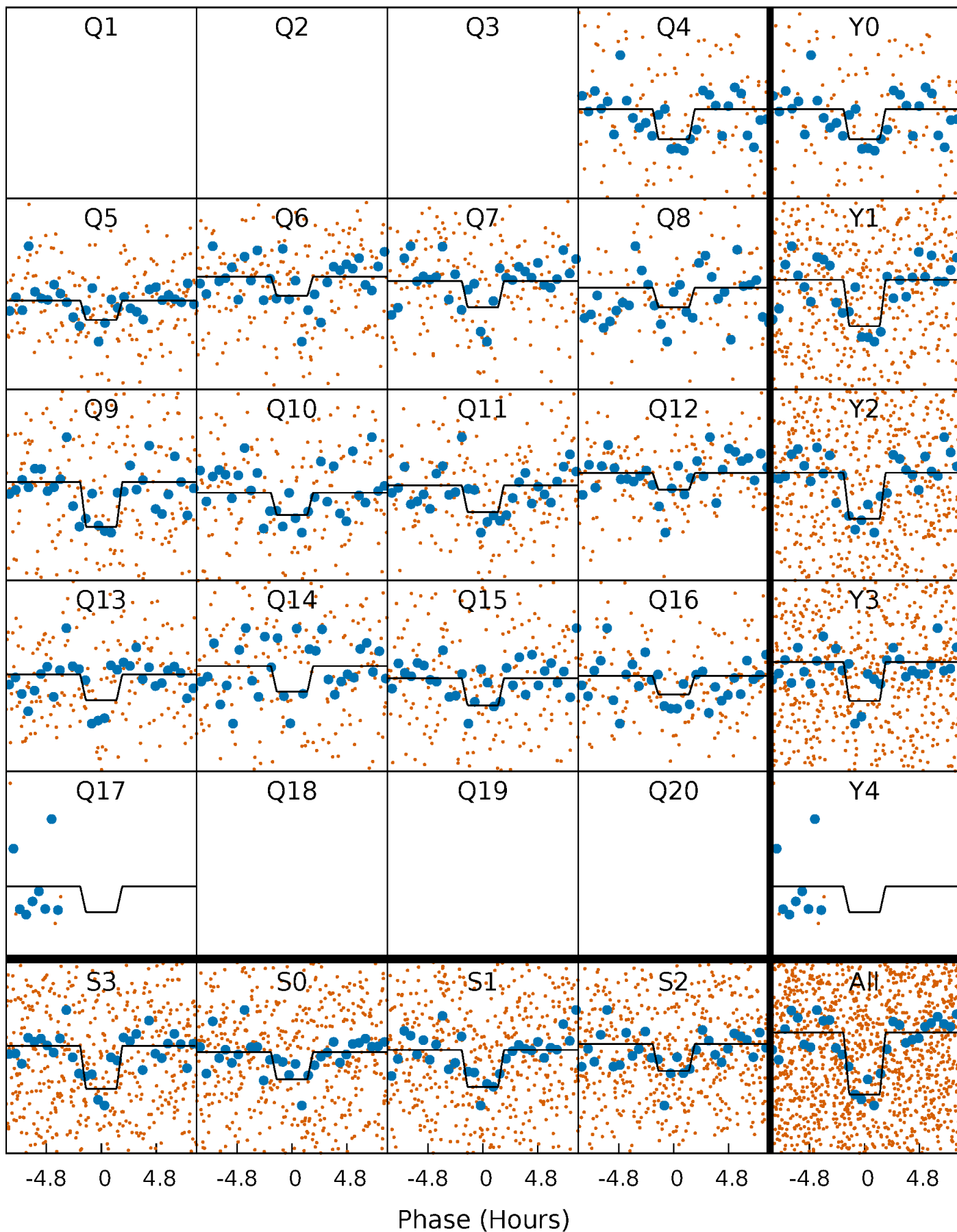
DV Quarter-Phased Transit Curves

TCE 009230021-02 P= 15.828515 Days $T_0=144.386776$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

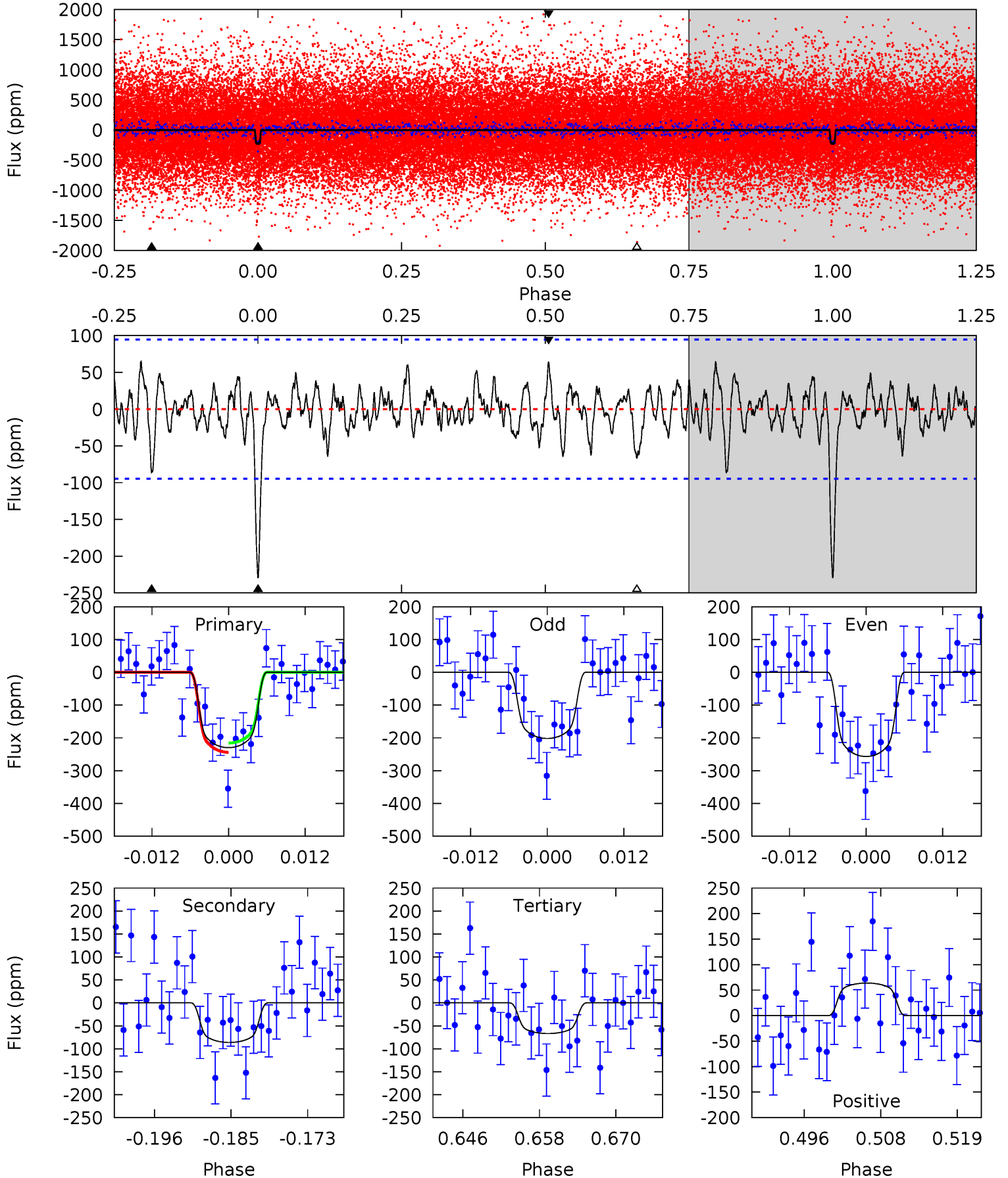
TCE 009230021-02 P= 15.828600 Days $T_0=144.382823$ (BKJD)



DV Model-Shift Uniqueness Test

009230021-02, $P = 15.828515$ Days, $E = 144.386776$ Days

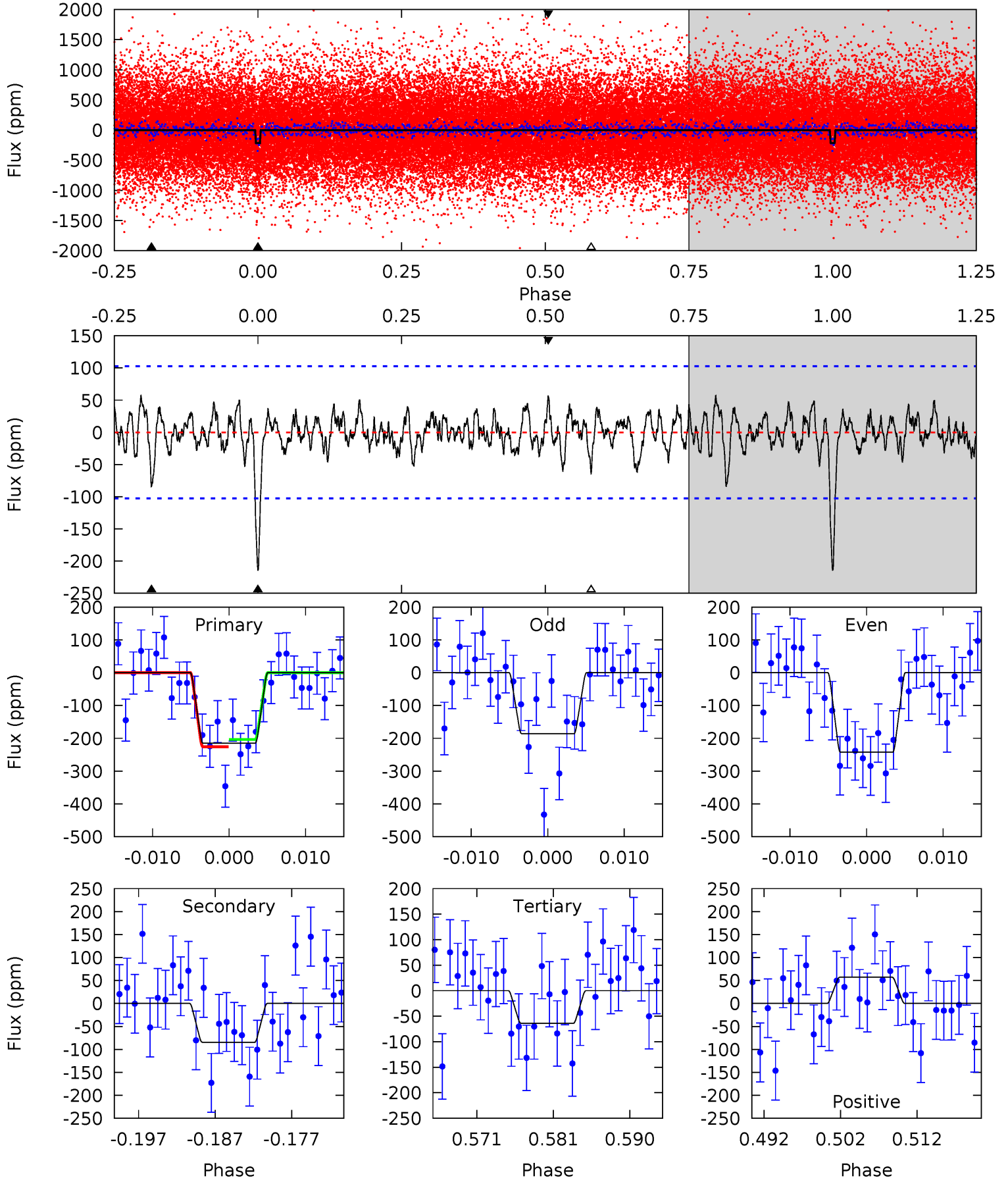
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	4.55	3.53	3.37	5.00	2.53	1.23	8.61	8.76	1.03	1.18	1.46	0.94	0.22	0.75



Alt Model-Shift Uniqueness Test

009230021-02, $P = 15.828600$ Days, $E = 144.382823$ 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	4.14	3.13	2.80	5.03	2.58	1.05	7.39	7.71	1.01	1.34	1.38	0.98	0.21	0.54



Stellar Parameters For KIC 009230021

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5596^{+83}_{-75}	$4.298^{+0.143}_{-0.104}$	$0.140^{+0.150}_{-0.150}$	$1.145^{+0.178}_{-0.178}$	$0.950^{+0.070}_{-0.052}$	$0.891^{+0.620}_{-0.292}$
	+1%/-1%	+3%/-2%	+107%/-107%	+16%/-16%	+7%/-5%	+70%/-33%
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 009230021-02 / KOI 3429.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-86 ± 19	$2.03^{+0.61}_{-0.59}$	1058^{+43}_{-51}	4365^{+660}_{-405}	164^{+173}_{-71}
Alt.	-84 ± 20	$1.83^{+0.58}_{-0.59}$	1058^{+43}_{-49}	4563^{+811}_{-489}	199^{+245}_{-91}

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

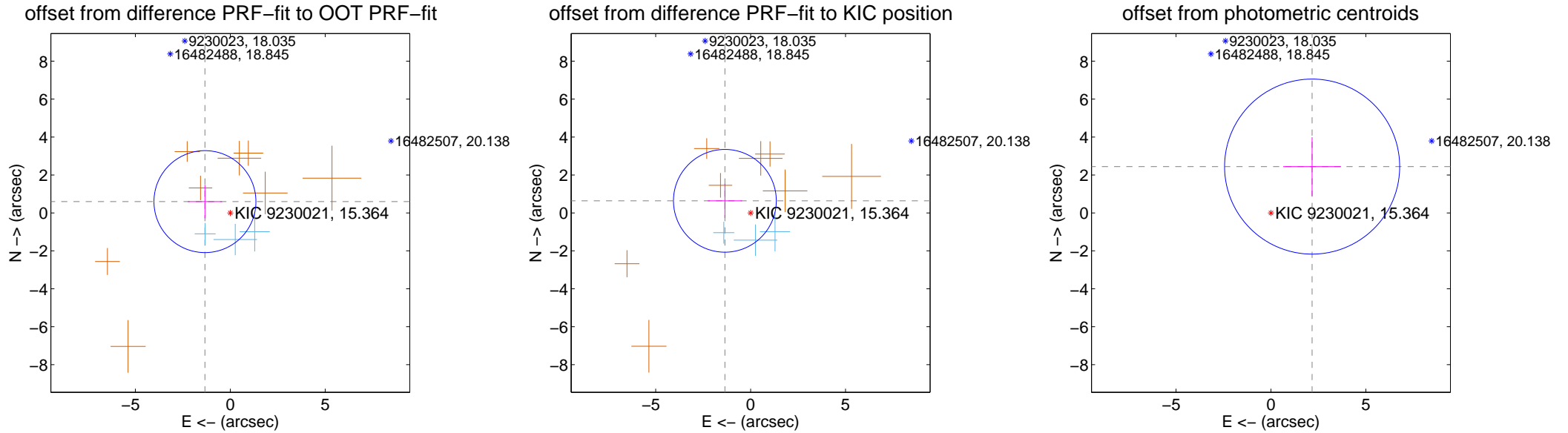
DV Centroid Data

Supplemental centroid analysis for 009230021-02. Kepler magnitude: 15.36. Transit SNR 8.72

There are 3 quarters with good PRF difference image offsets

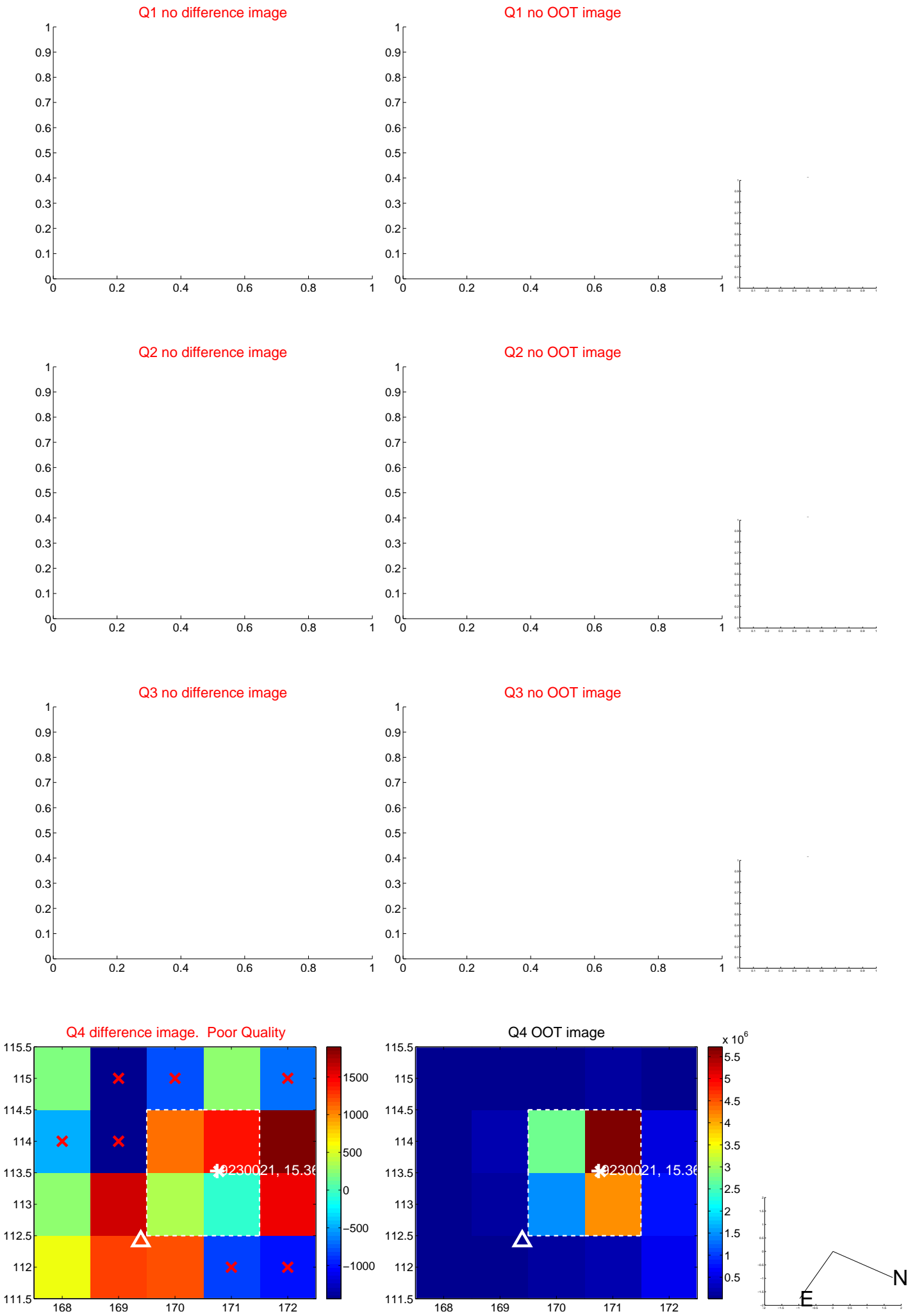
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.462 ± 0.895	1.63	1.335 ± 0.898	0.595 ± 0.882
PRF-fit source offset from KIC position	1.498 ± 0.903	1.66	1.355 ± 0.904	0.638 ± 0.898
photometric centroid source offset	3.27 ± 1.54	2.12	-2.17 ± 1.52	2.44 ± 1.55

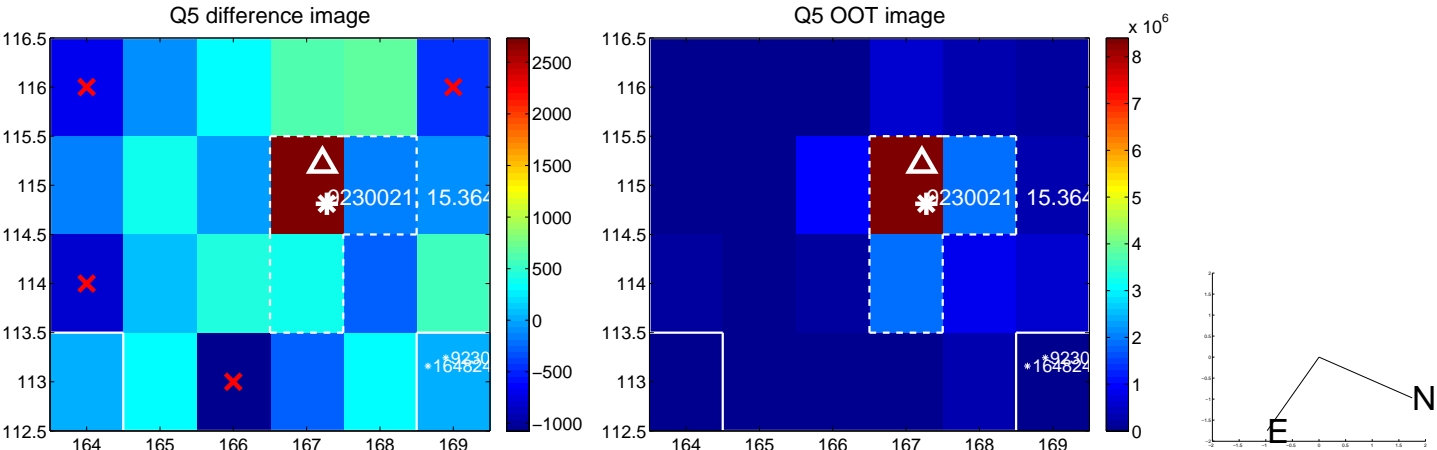


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

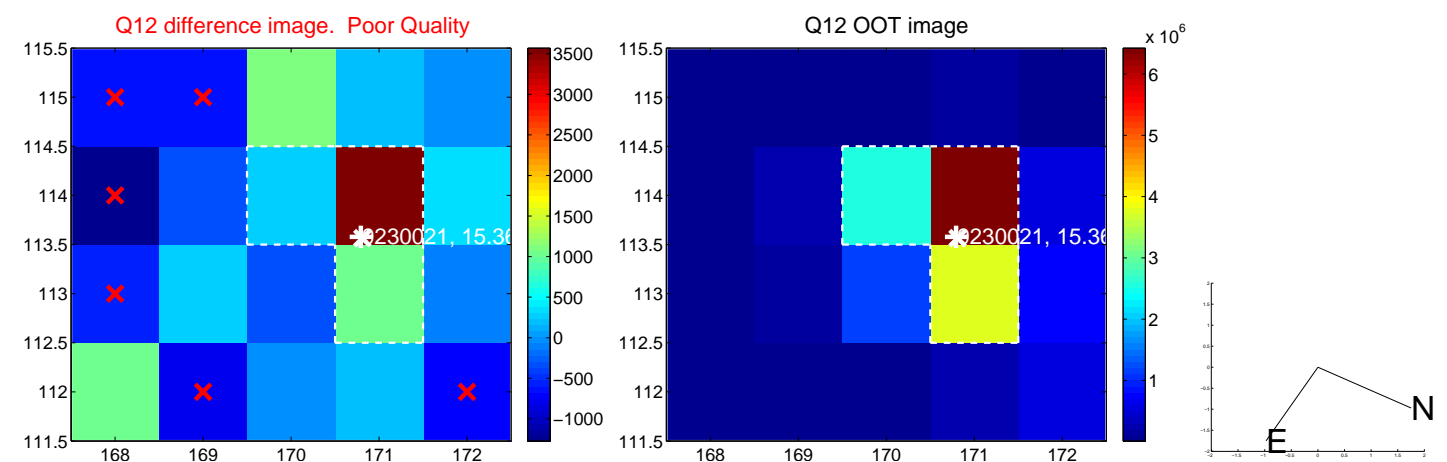
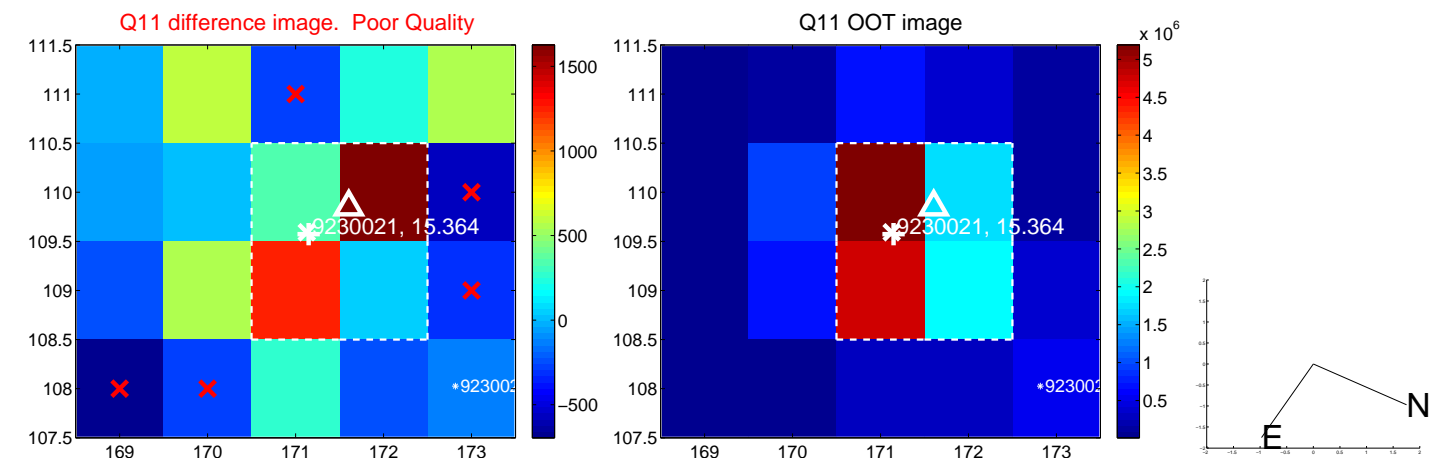
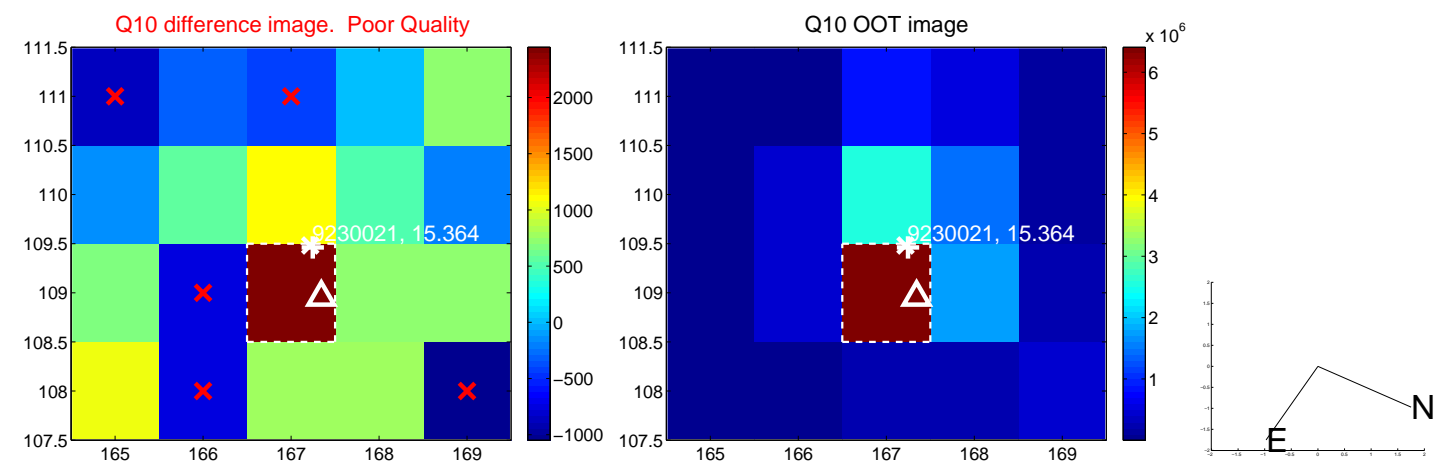
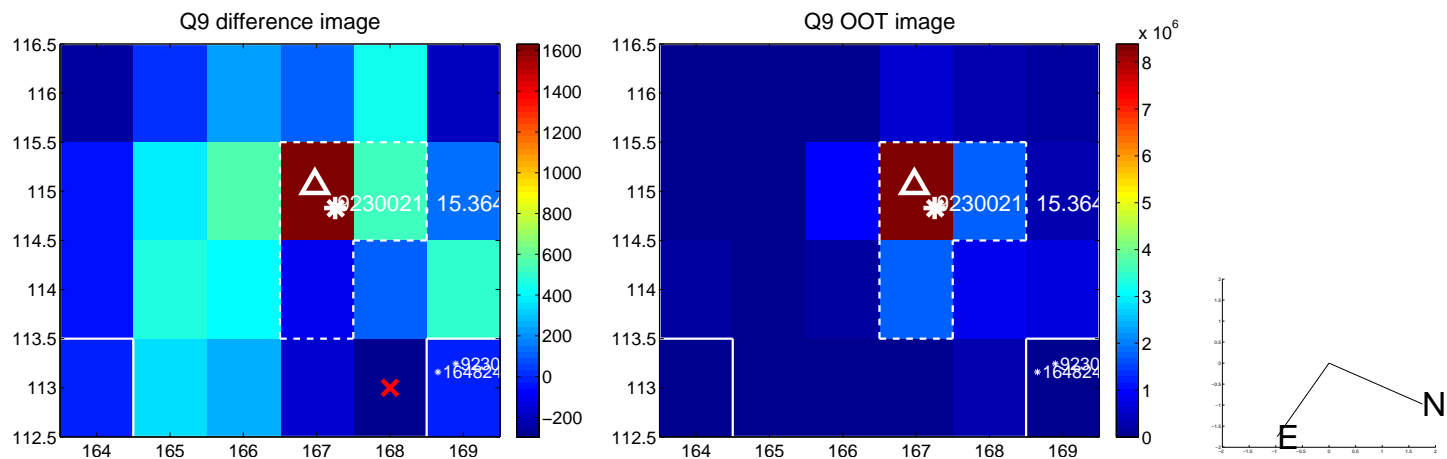
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



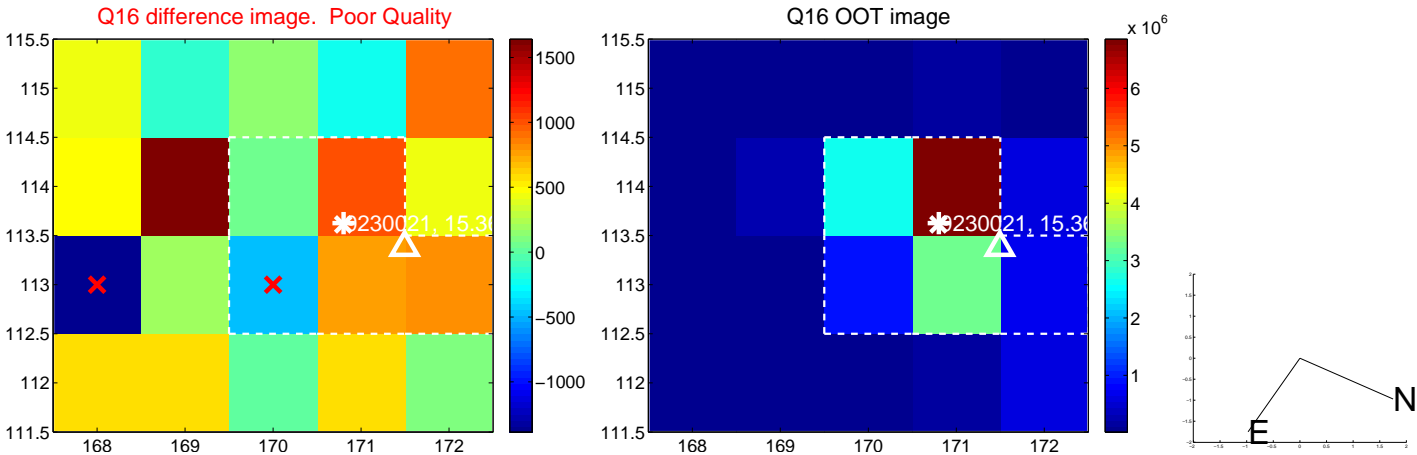
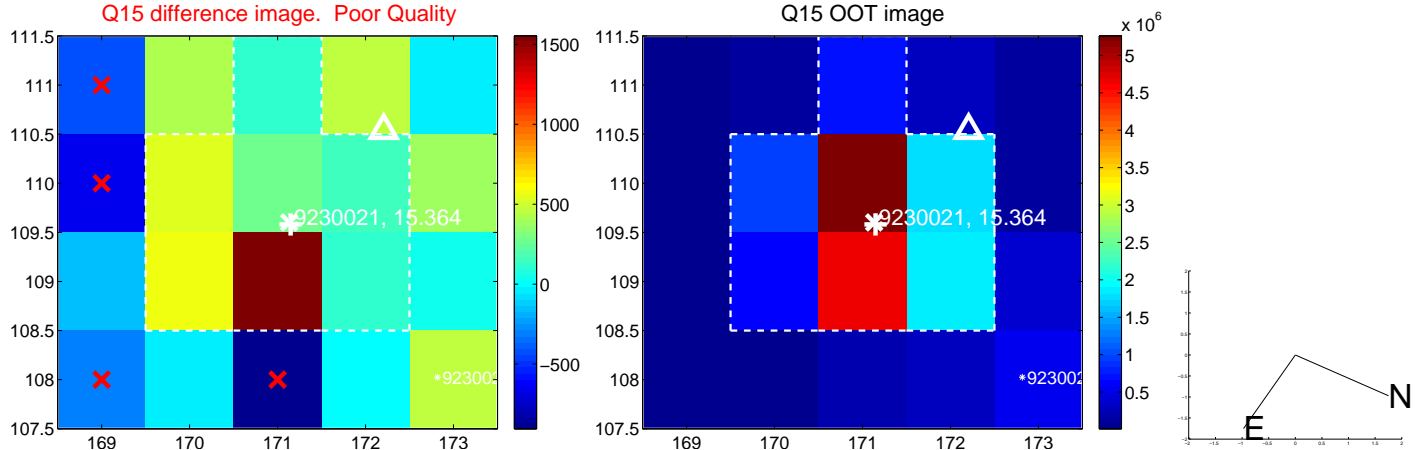
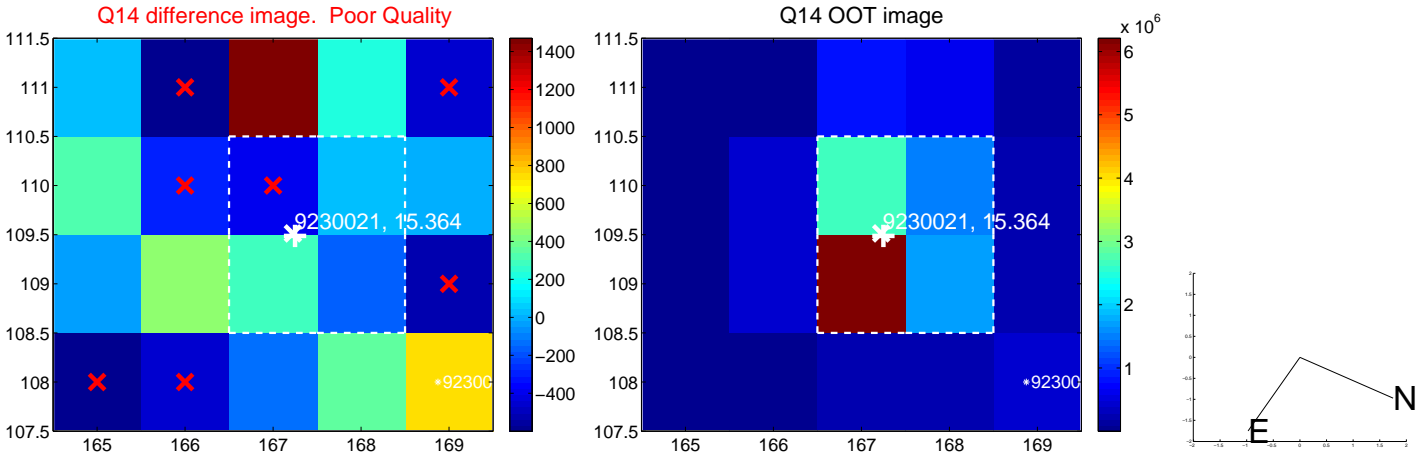
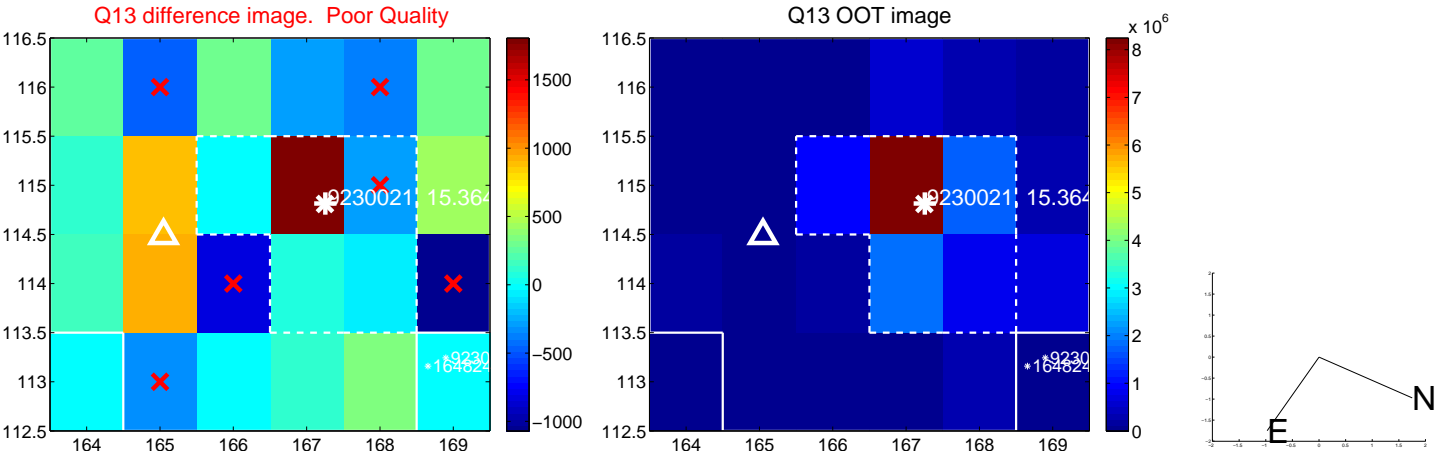
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



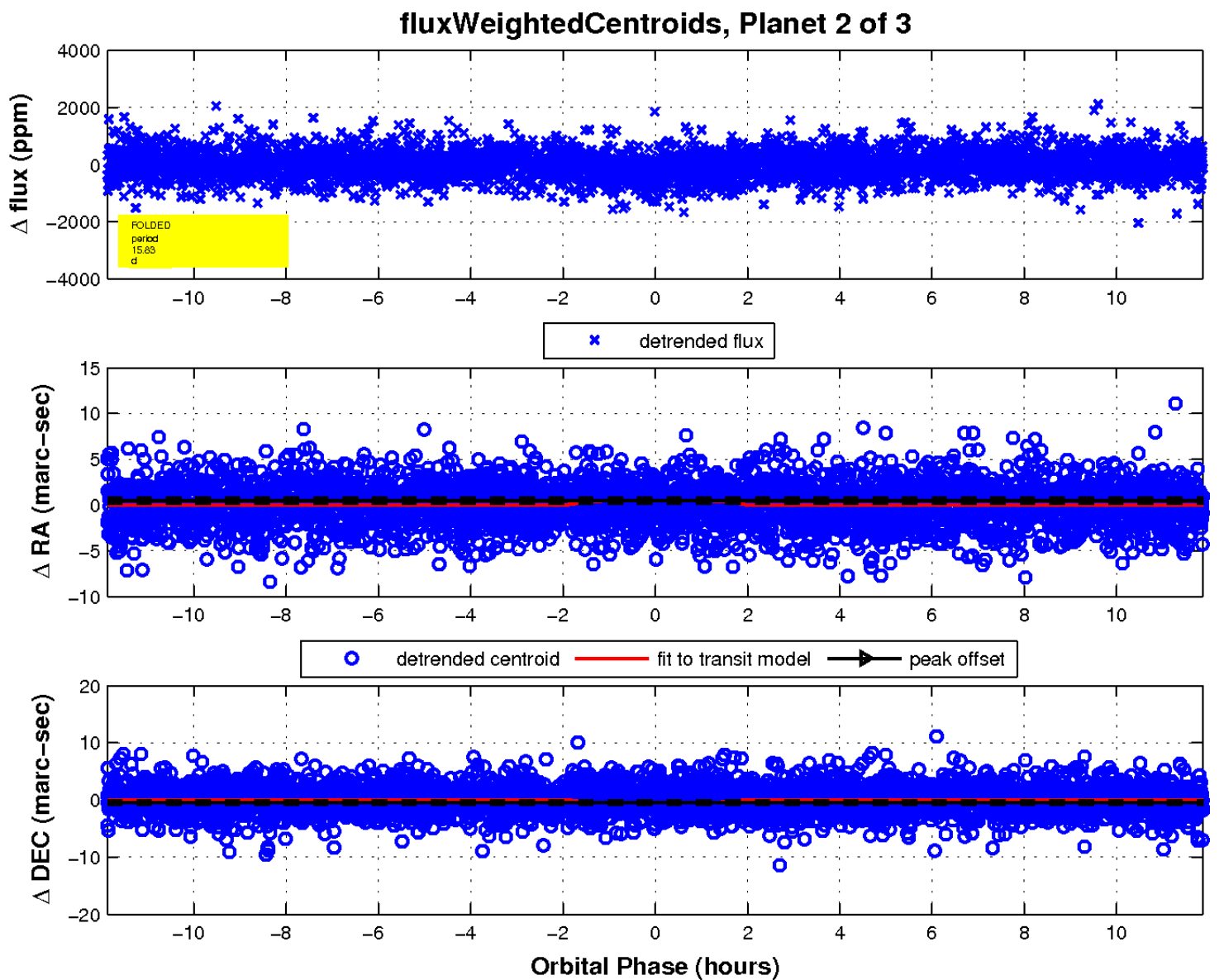
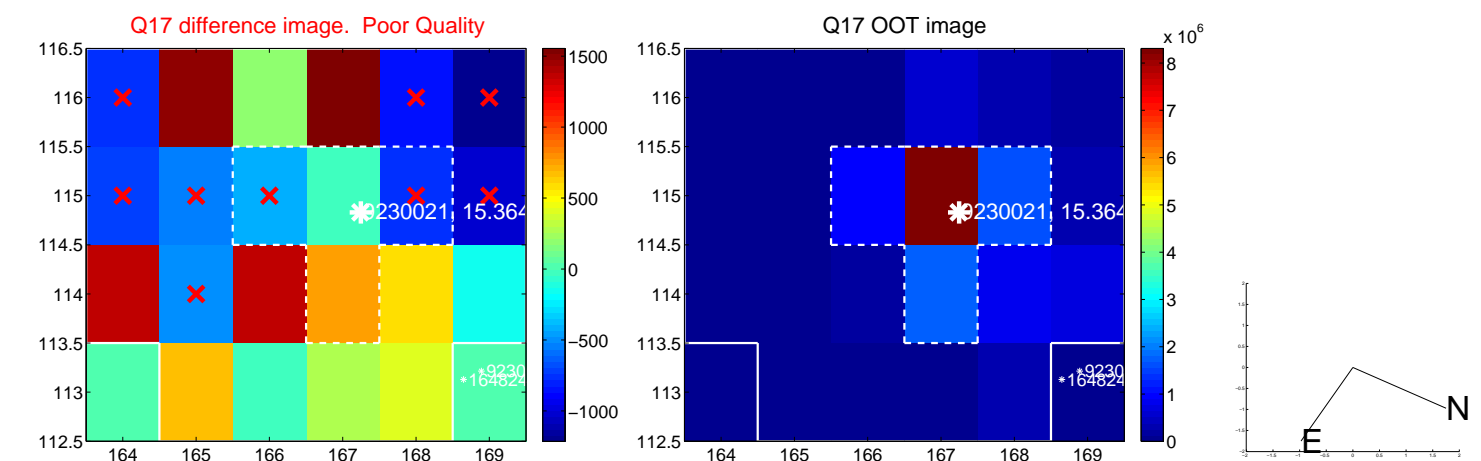
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

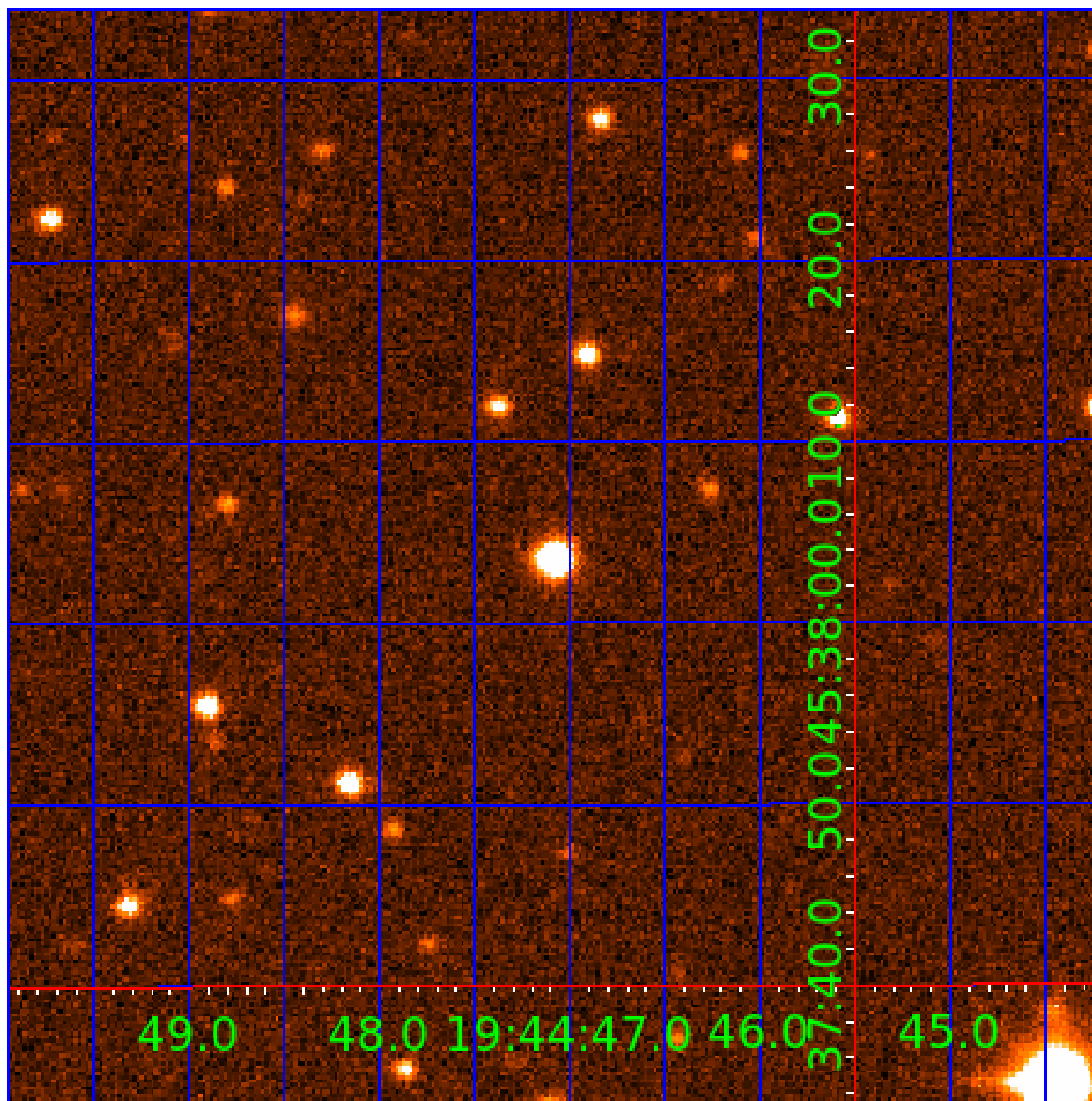


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009230021

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})
009230021-01	OBS	3429.02	8.741942	135.425347	257.3	4.337	14.5	15.2	1.15	5596	2.15	172.77
009230021-02	OBS	3429.01	15.828515	144.386776	212.5	3.957	8.5	8.7	1.15	5596	2.09	78.29
009230021-03	OBS	3429.04	44.437467	162.908023	252.4	5.241	7.1	7.0	1.15	5596	2.21	19.77

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009230021-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009230021-02	OBS	PC	0.89	0	0	0	0	NO_COMMENT
009230021-03	OBS	PC	0.51	0	0	0	0	NO_COMMENT

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

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

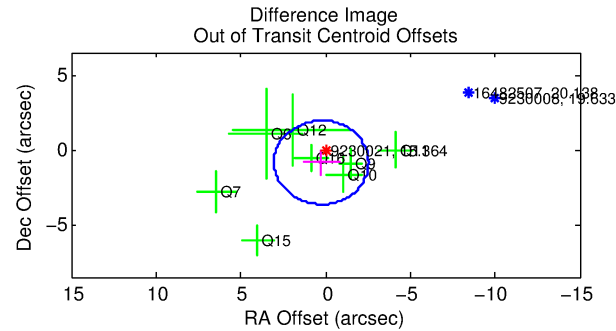
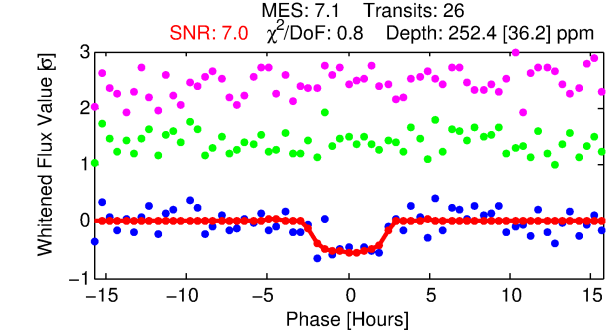
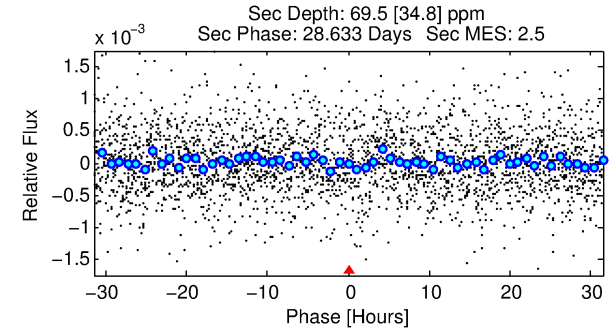
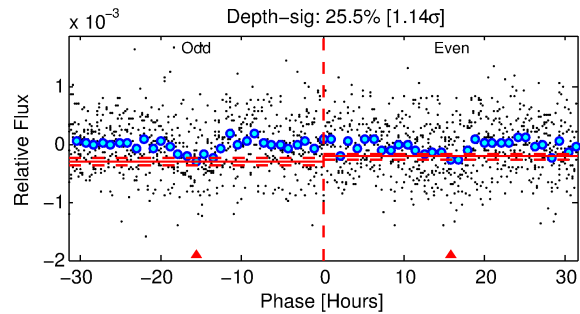
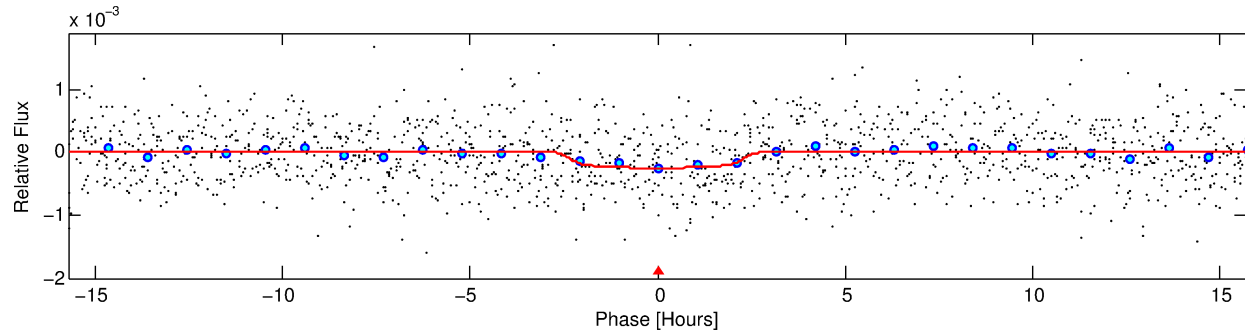
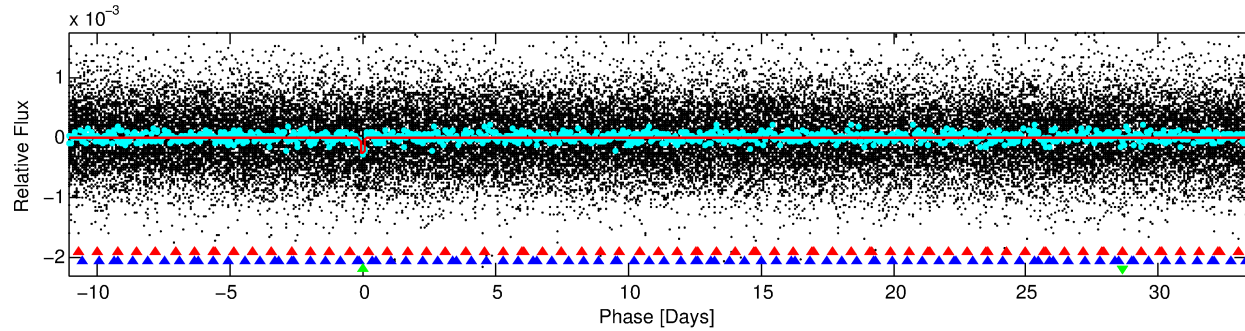
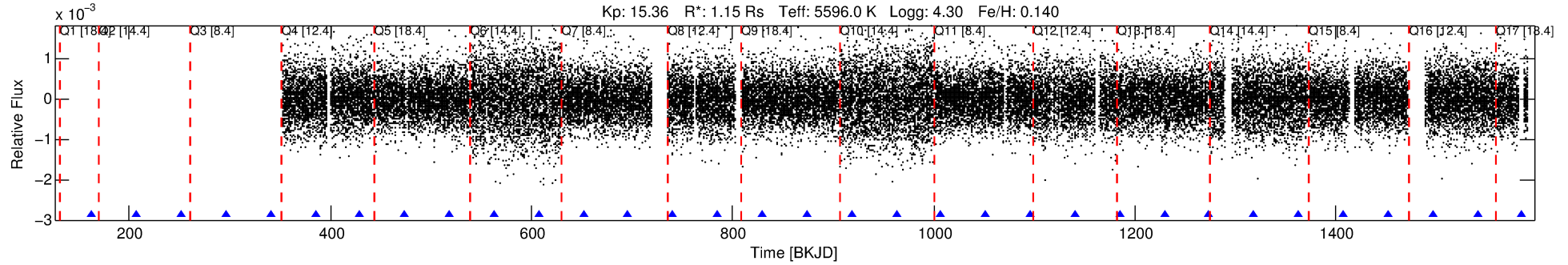
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009230021-03

No Significant Match Found

DV One-Page Summary

KIC: 9230021 Candidate: 3 of 3 Period: 44.437 d
KOI: K03429 Corr: No Ephemeris Match



DV Fit Results:

Period = 44.43747 [0.00100] d
Epoch = 162.9080 [0.0198] BKJD
Rp/R* = 0.0177 [0.0067]
a/R* = 29.26 [49.28]
b = 0.91 [0.32]
Seff = 19.77 [4.94]
Teq = 538 [34] K
Rp = 2.21 [0.90] Re
a = 0.2414 [0.0364] AU
Ag = 457.91 [429.86] [1.06 σ]
Teffp = 3845 [874] K [3.78 σ]

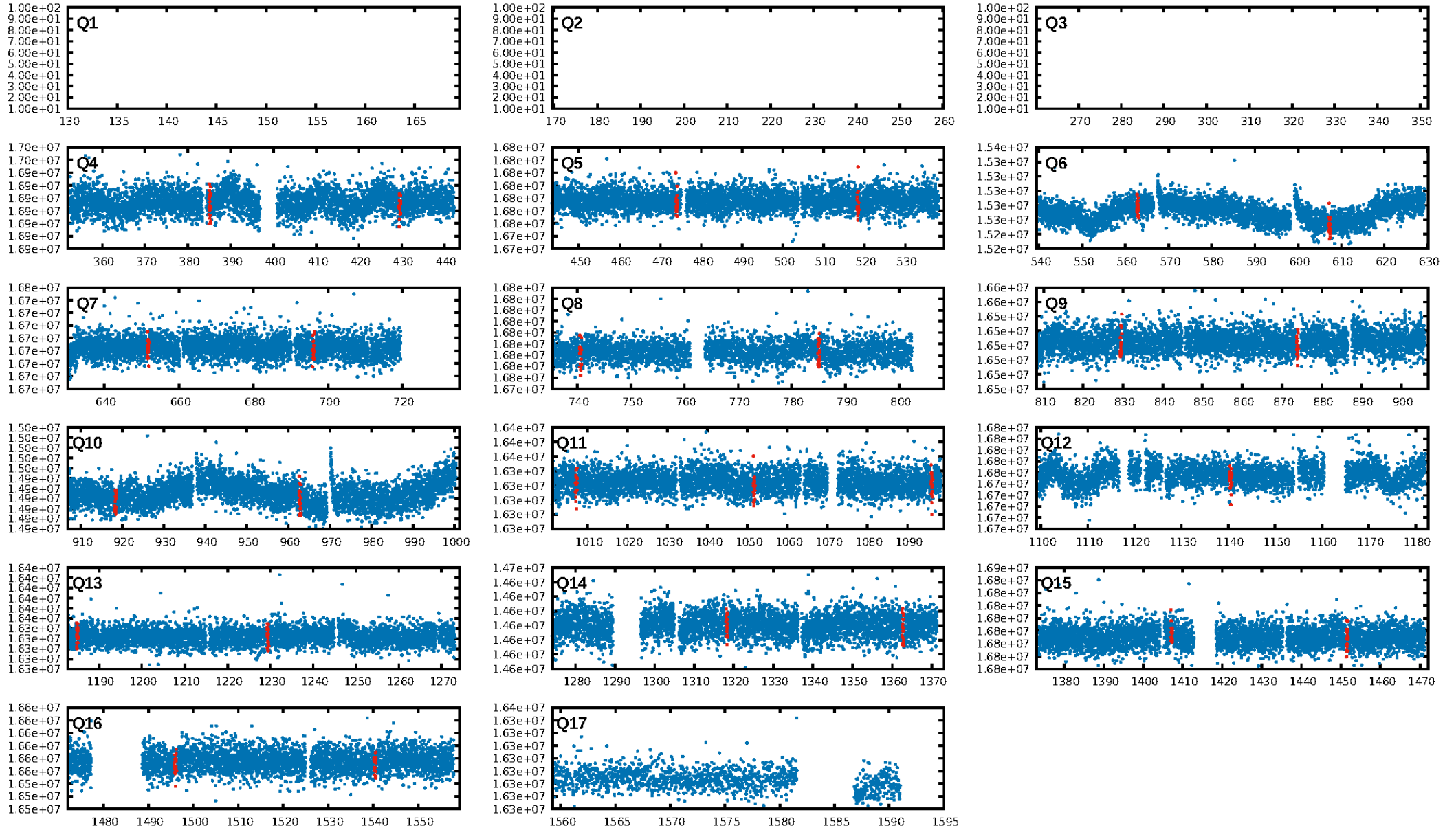
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [104.55 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 92.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.47e-12
RollingBand-fgt: 1.00 [26/26]
GhostDiagnostic-chr: -16.76
Centroid-sig: 1.2%
Centroid-so: 3.501 arcsec [1.91 σ]
OotOffset-rm: 0.893 arcsec [0.96 σ]
KicOffset-rm: 0.869 arcsec [0.86 σ]
OotOffset-st: 2/3/2/1 [8]
KicOffset-st: 2/3/2/1 [8]
DiffImageQuality-fgm: 0.25 [2/8]
DiffImageOverlap-fno: 0.85 [11/13]

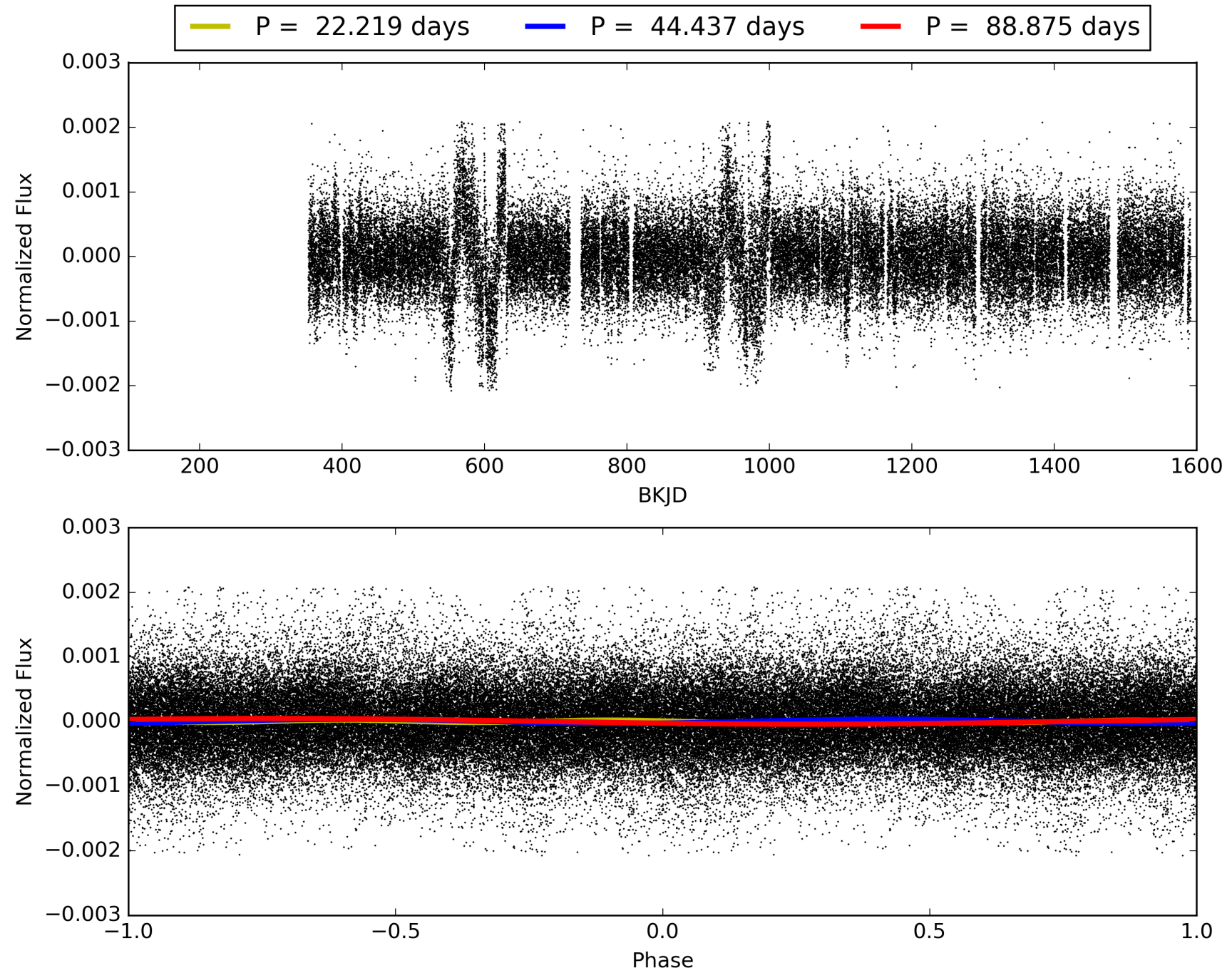
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:49:43 Z

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

TCE 009230021-03, PDC Light Curves

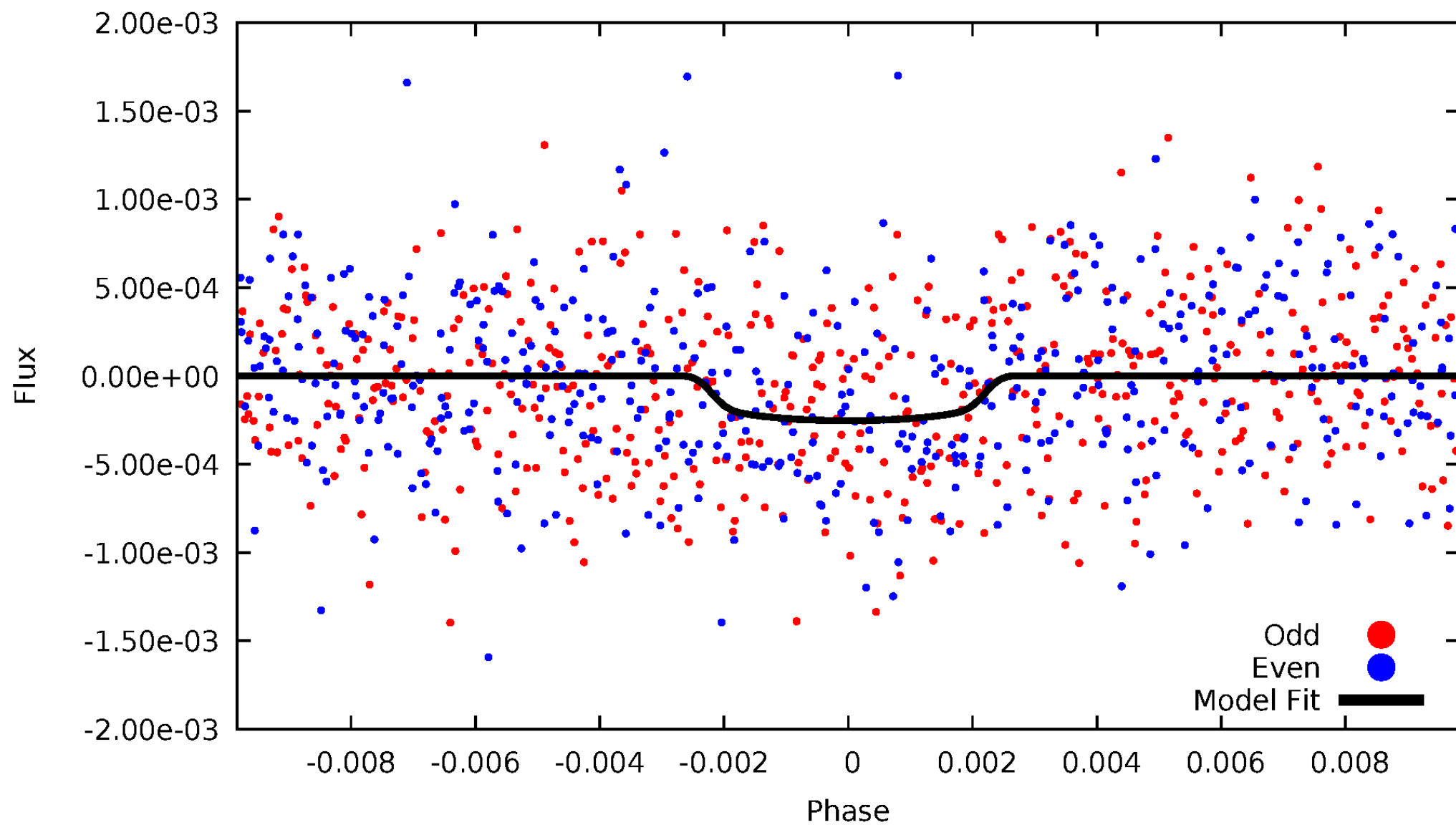


TCE 009230021-03



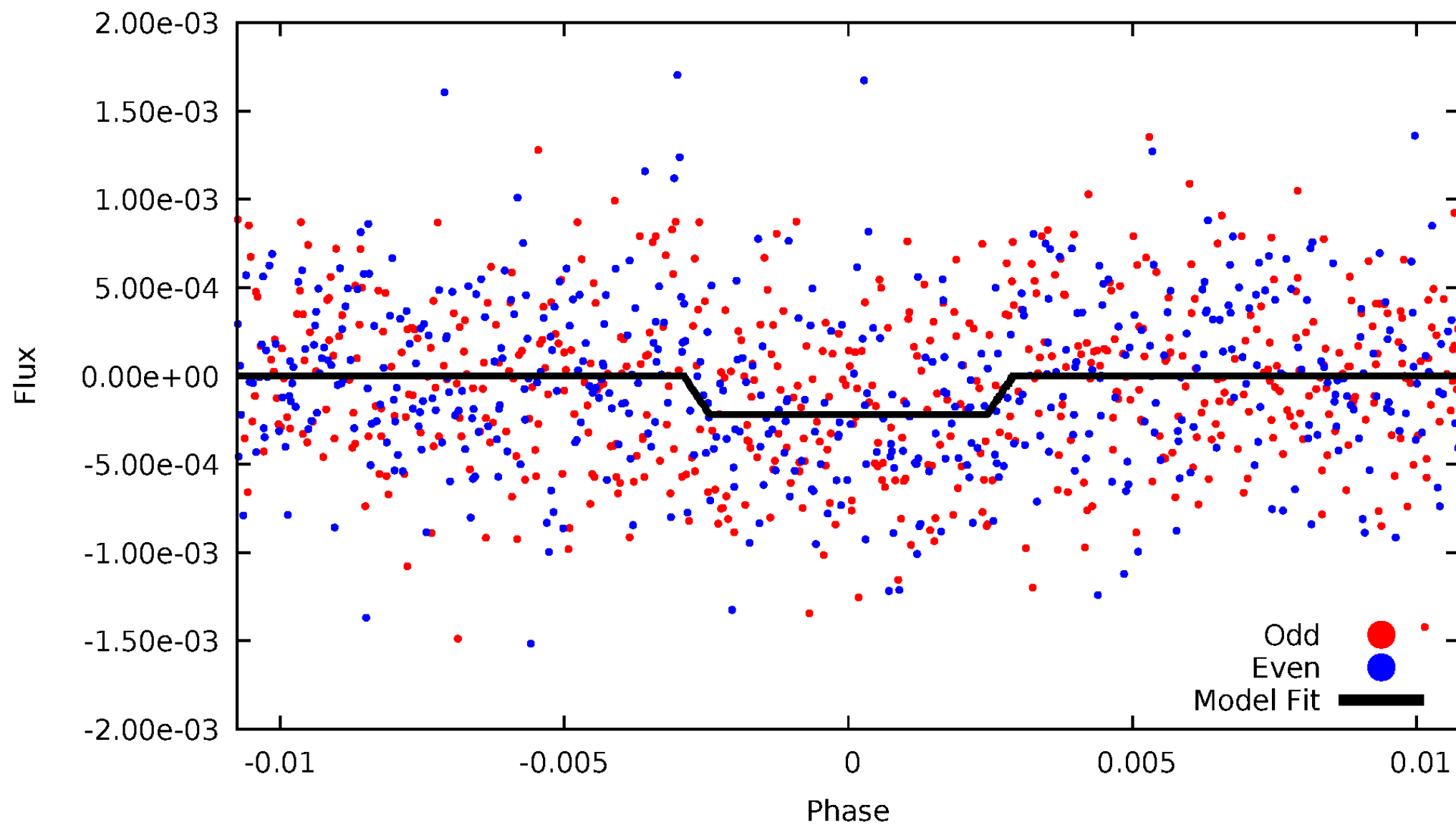
DV Odd/Even

TCE 009230021-03

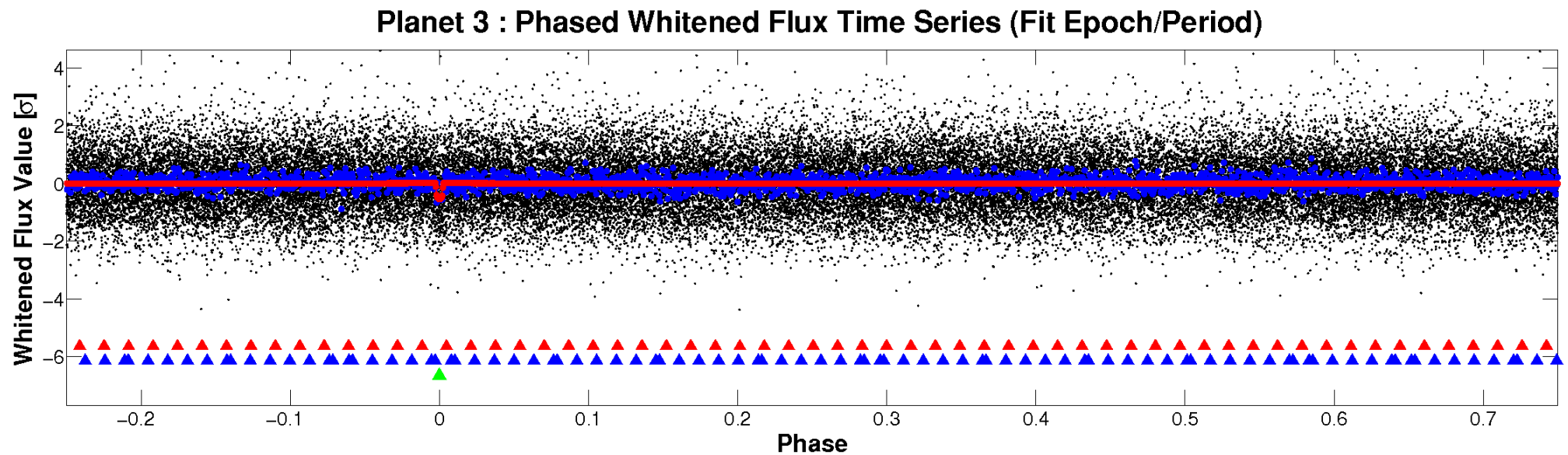
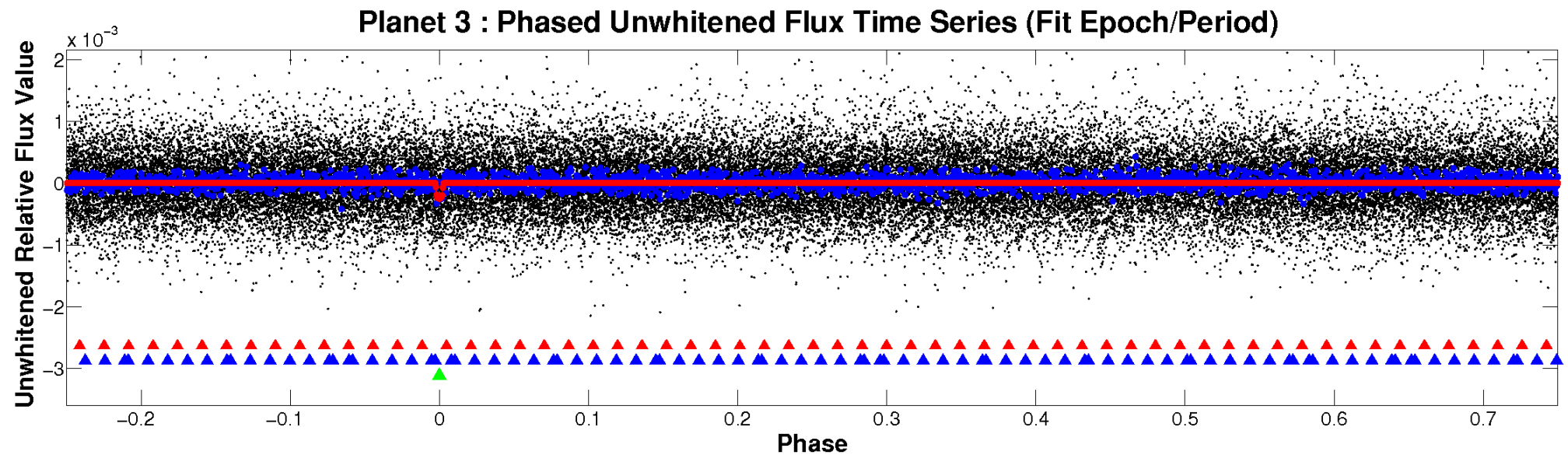


ALT Odd/Even

TCE 009230021-03

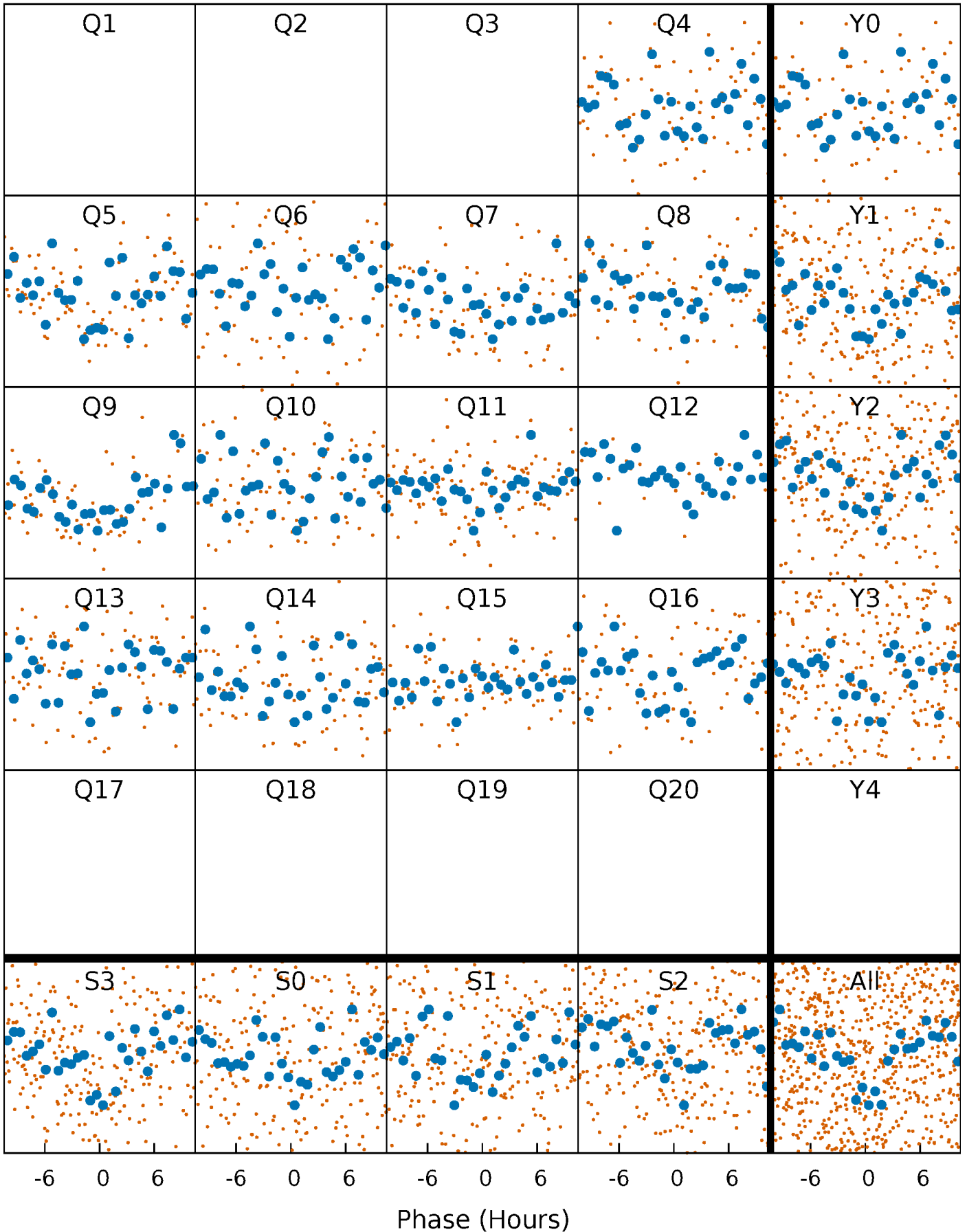


Non-Whitened Vs. Whitened Light Curve



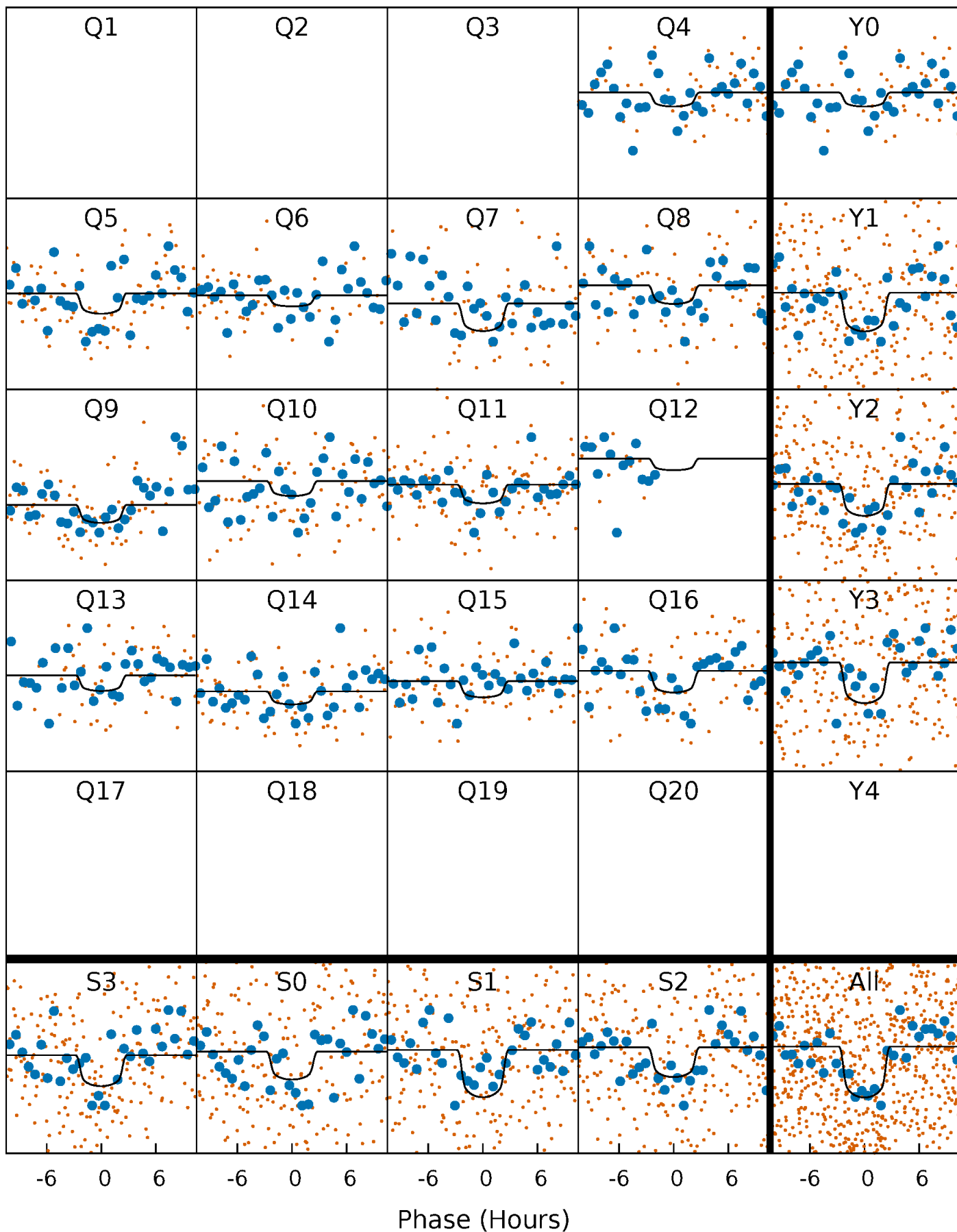
PDC Quarter-Phased Transit Curves

TCE 009230021-03 P= 44.437467 Days $T_0=162.908023$ (BKJD)



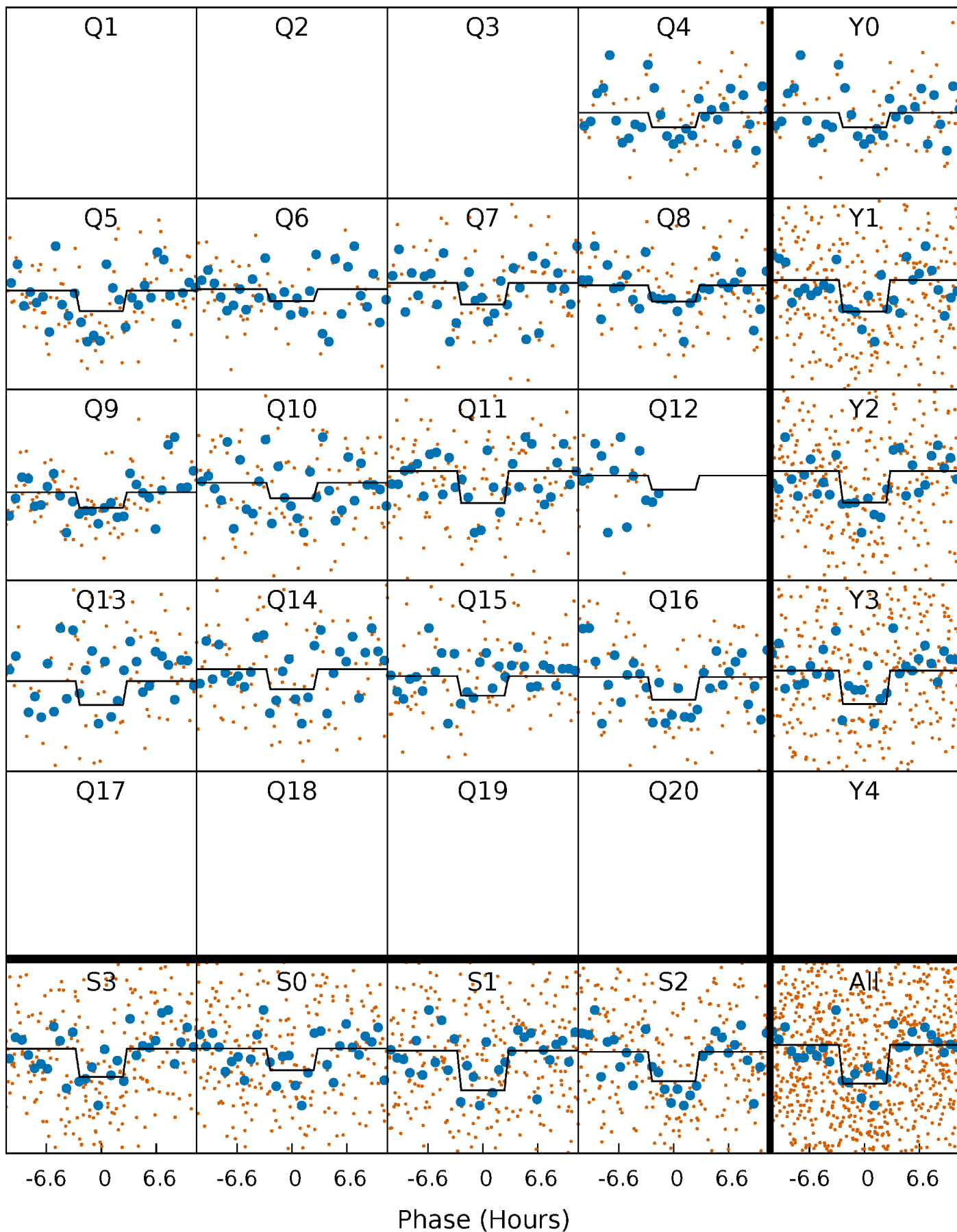
DV Quarter-Phased Transit Curves

TCE 009230021-03 P= 44.437467 Days $T_0=162.908023$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

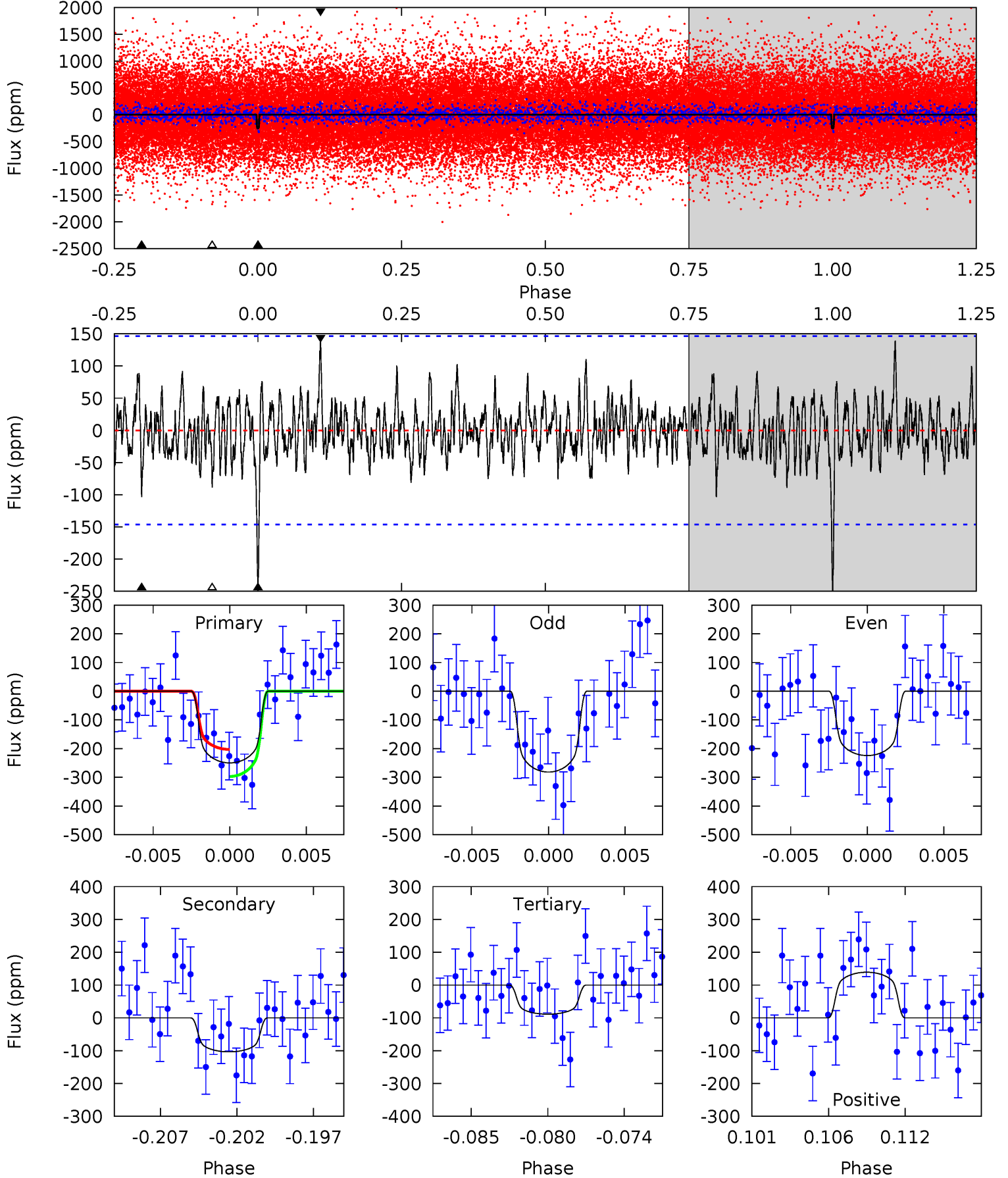
TCE 009230021-03 P= 44.435186 Days $T_0=162.949361$ (BKJD)



DV Model-Shift Uniqueness Test

009230021-03, P = 44.437467 Days, E = 162.908023 Days

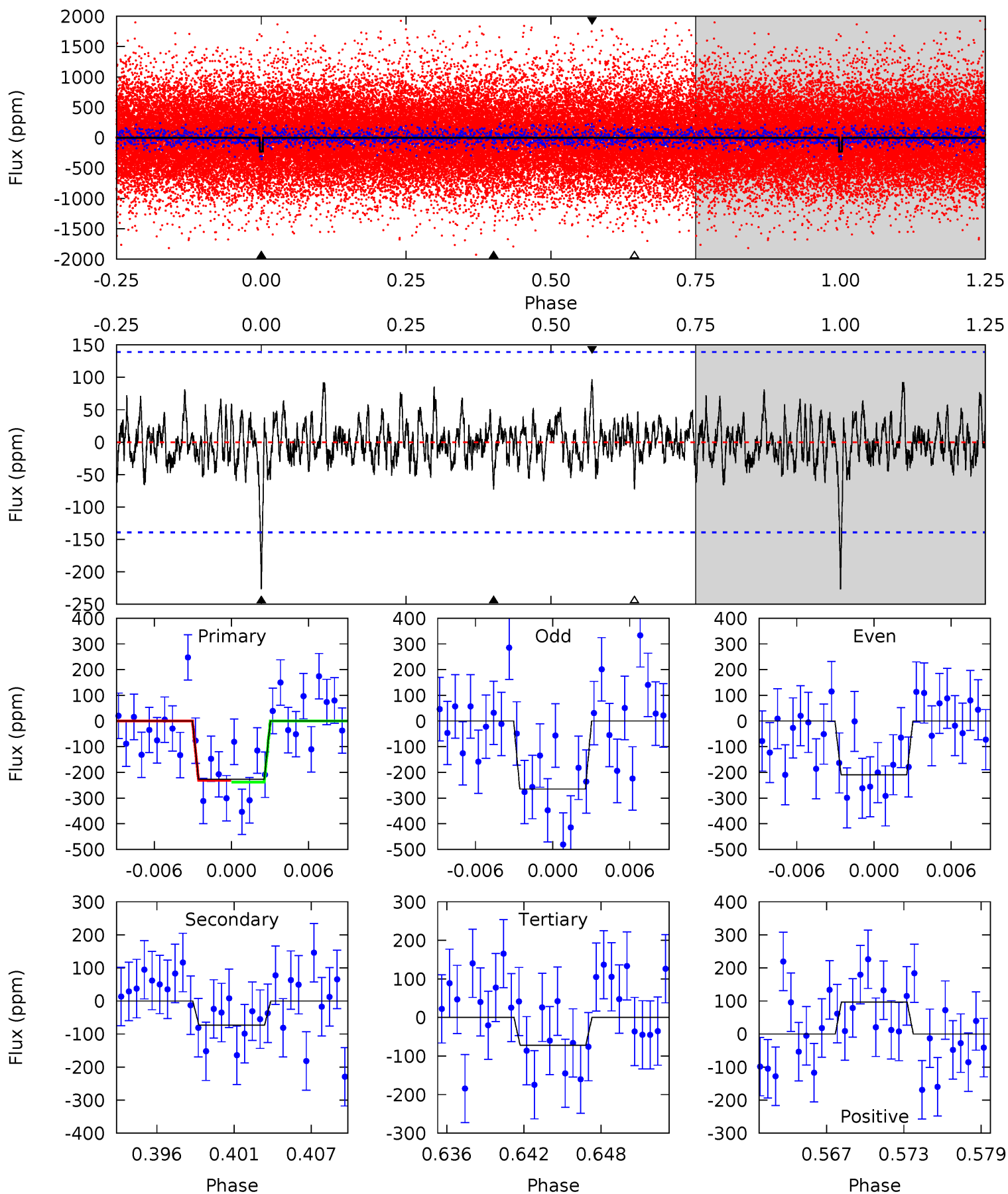
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.79	3.64	3.13	4.89	5.15	2.79	1.19	5.66	3.90	0.52	-1.25	1.01	0.91	0.36	1.66



Alt Model-Shift Uniqueness Test

009230021-03, P = 44.435186 Days, E = 162.949361 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.39	2.70	2.65	3.57	5.13	2.76	0.99	5.74	4.82	0.05	-0.87	1.02	0.96	0.30	0.13



Stellar Parameters For KIC 009230021

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5596^{+83}_{-75}	$4.298^{+0.143}_{-0.104}$	$0.140^{+0.150}_{-0.150}$	$1.145^{+0.178}_{-0.178}$	$0.950^{+0.070}_{-0.052}$	$0.891^{+0.620}_{-0.292}$
	+1%/-1%	+3%/-2%	+107%/-107%	+16%/-16%	+7%/-5%	+70%/-33%
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 009230021-03 / KOI 3429.04

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-104±28	$2.16^{+0.88}_{-0.82}$	749^{+34}_{-36}	4445^{+1019}_{-560}	704^{+1236}_{-371}
Alt.	-73±27	$1.84^{+0.85}_{-0.85}$	748^{+32}_{-34}	4413^{+1340}_{-644}	672^{+1787}_{-385}

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 $A_{obs} \gg 1.0$

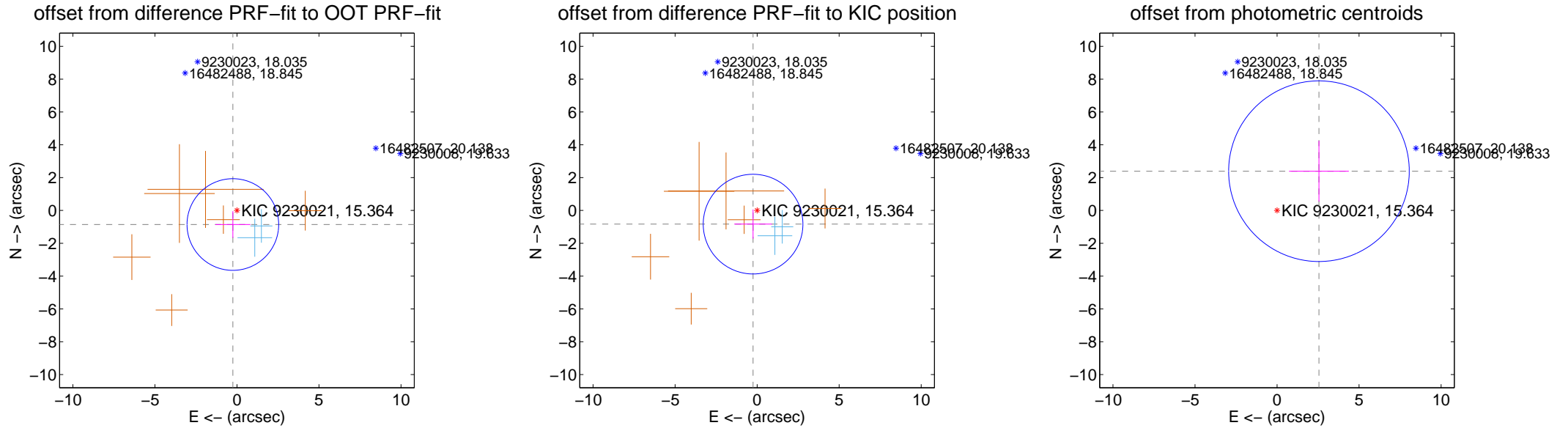
DV Centroid Data

Supplemental centroid analysis for 009230021-03. Kepler magnitude: 15.36. Transit SNR 7.03

There are 2 quarters with good PRF difference image offsets

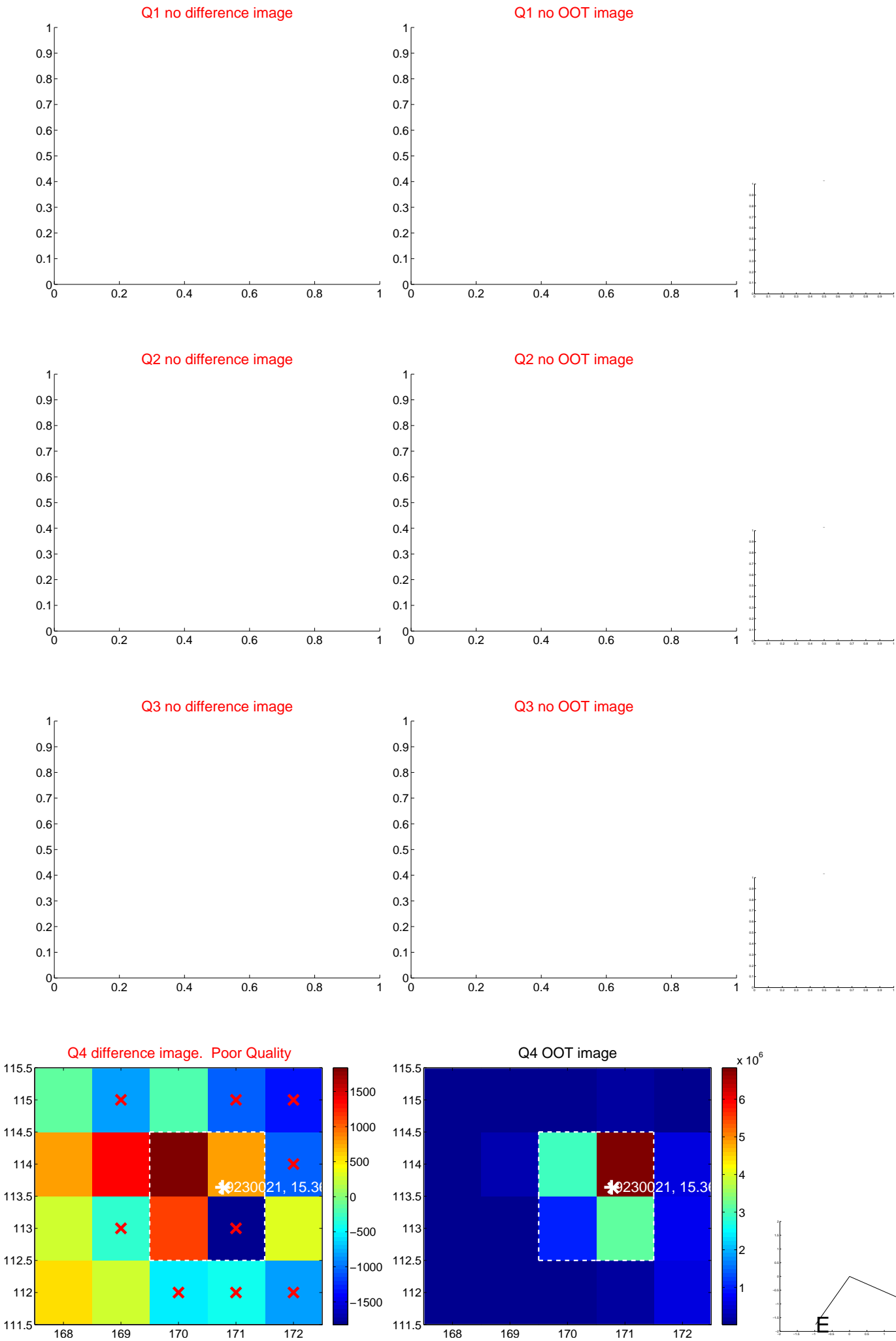
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.893 ± 0.931	0.96	0.250 ± 1.072	-0.857 ± 0.811
PRF-fit source offset from KIC position	0.869 ± 1.013	0.86	0.248 ± 1.149	-0.833 ± 0.890
photometric centroid source offset	3.50 ± 1.84	1.91	-2.56 ± 1.82	2.39 ± 1.85

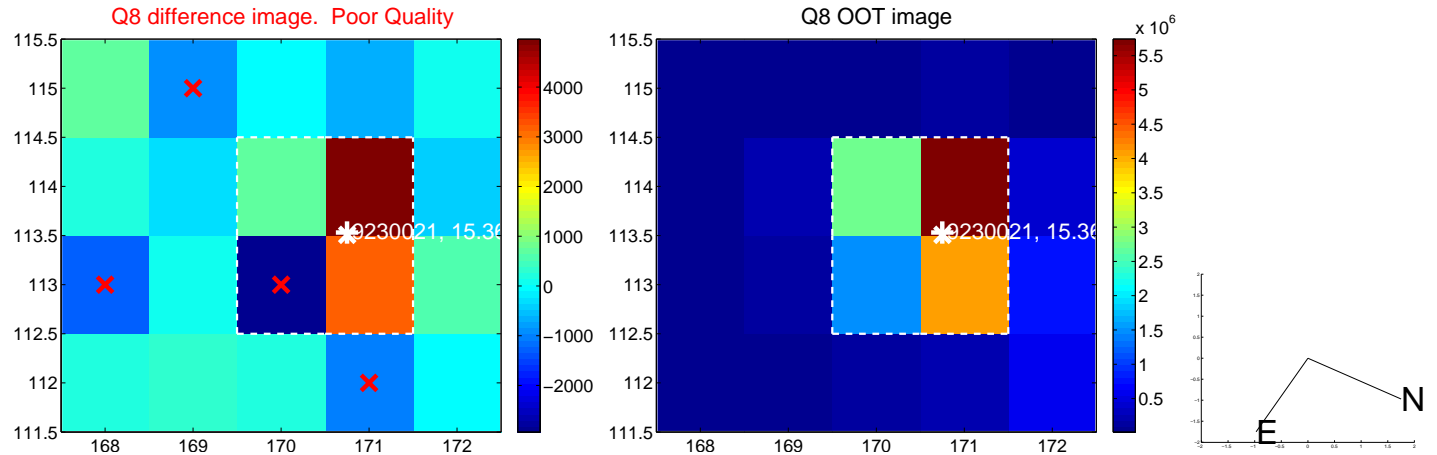
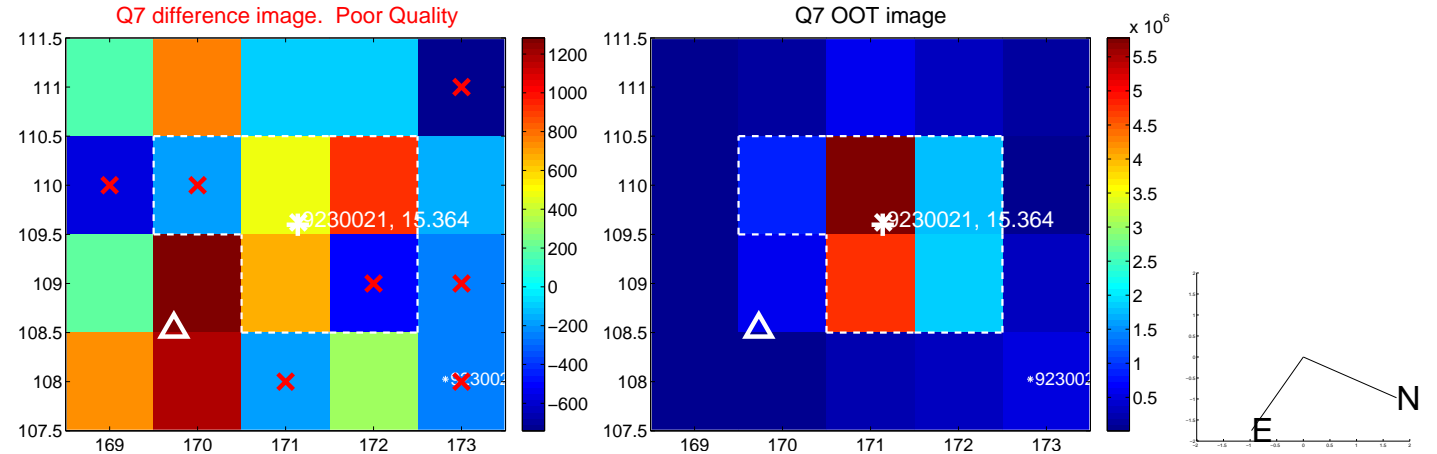
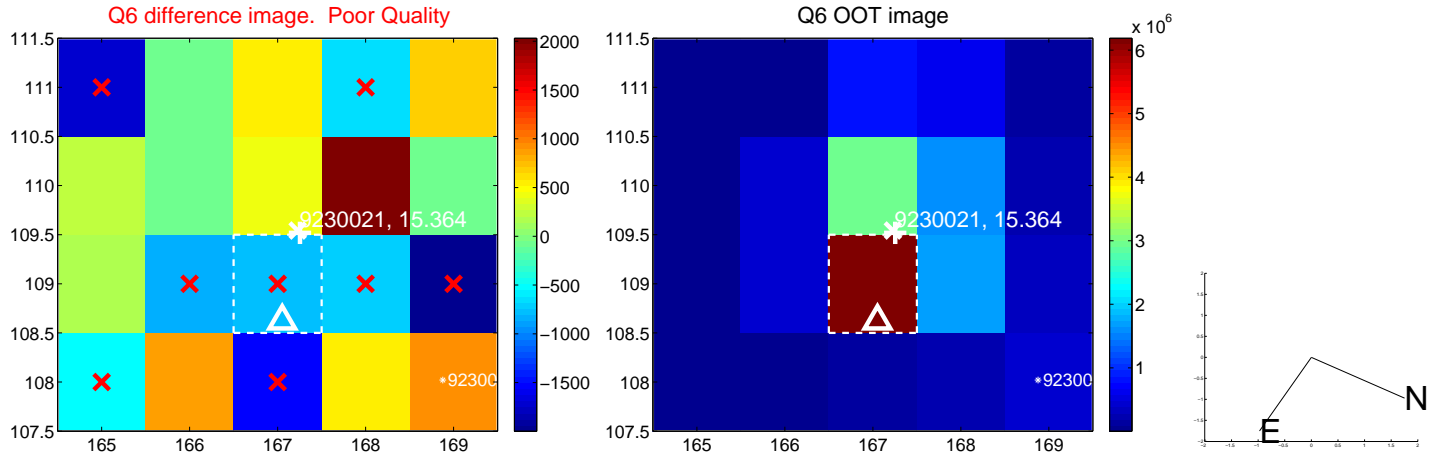
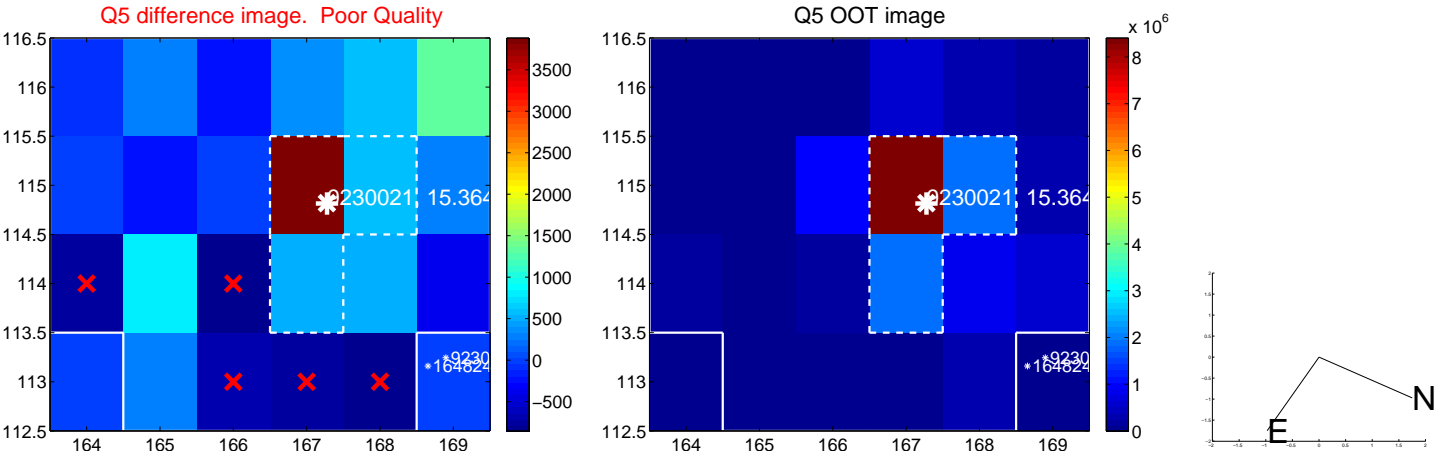


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

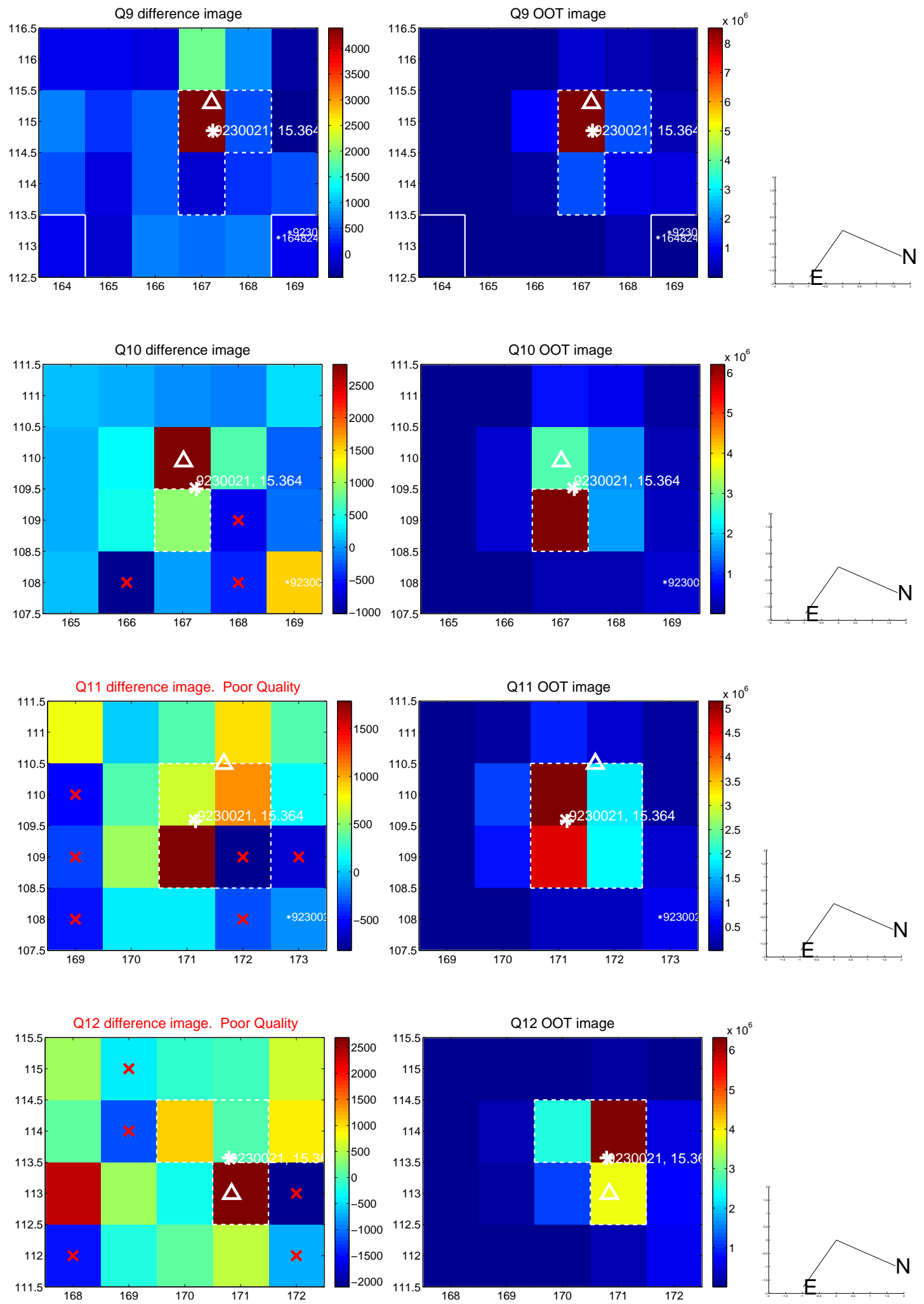
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



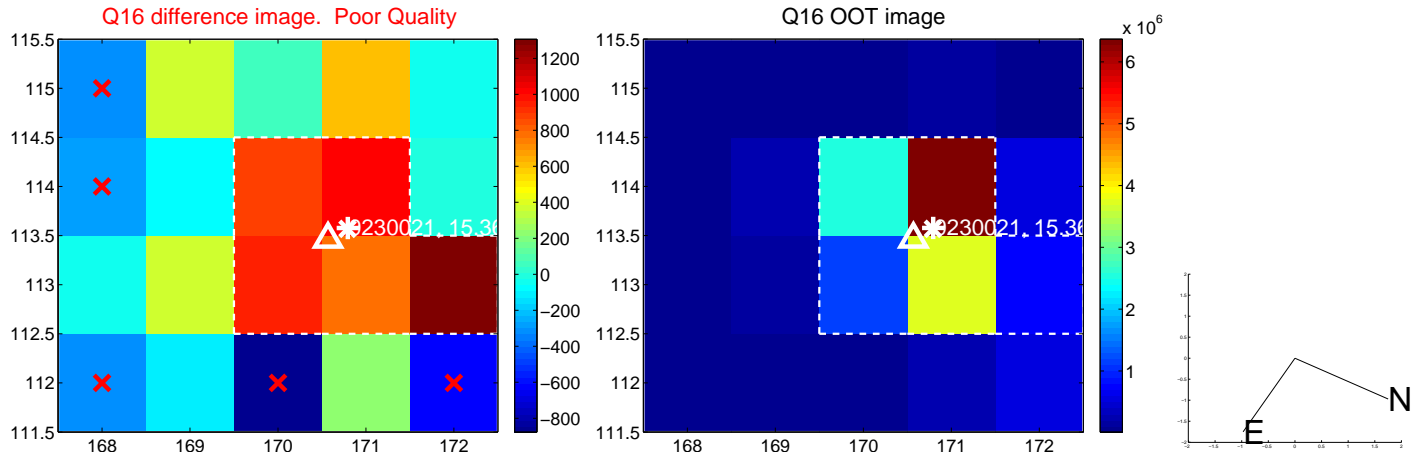
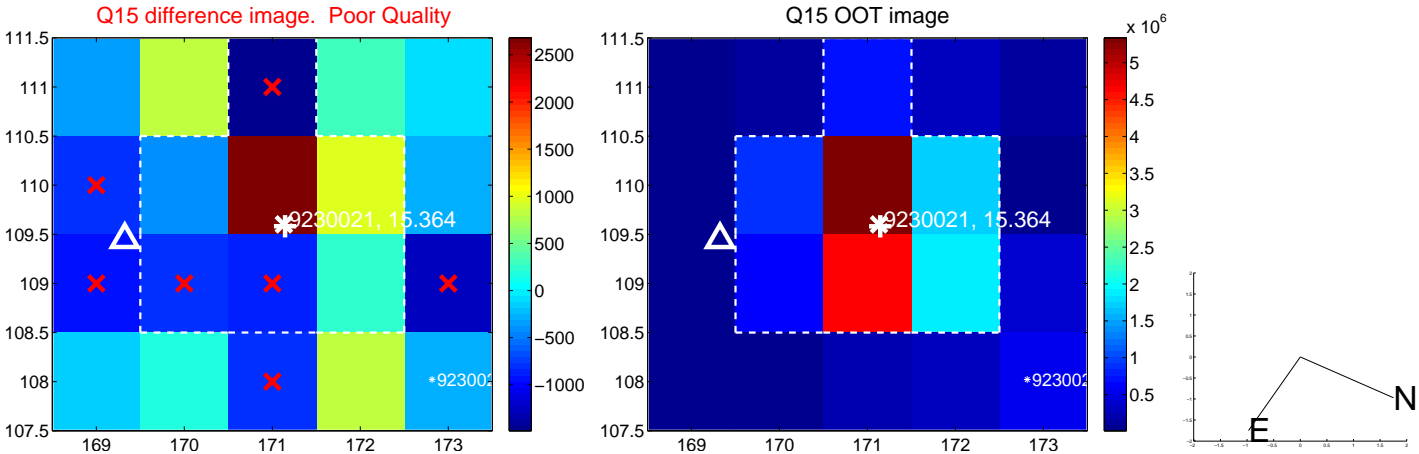
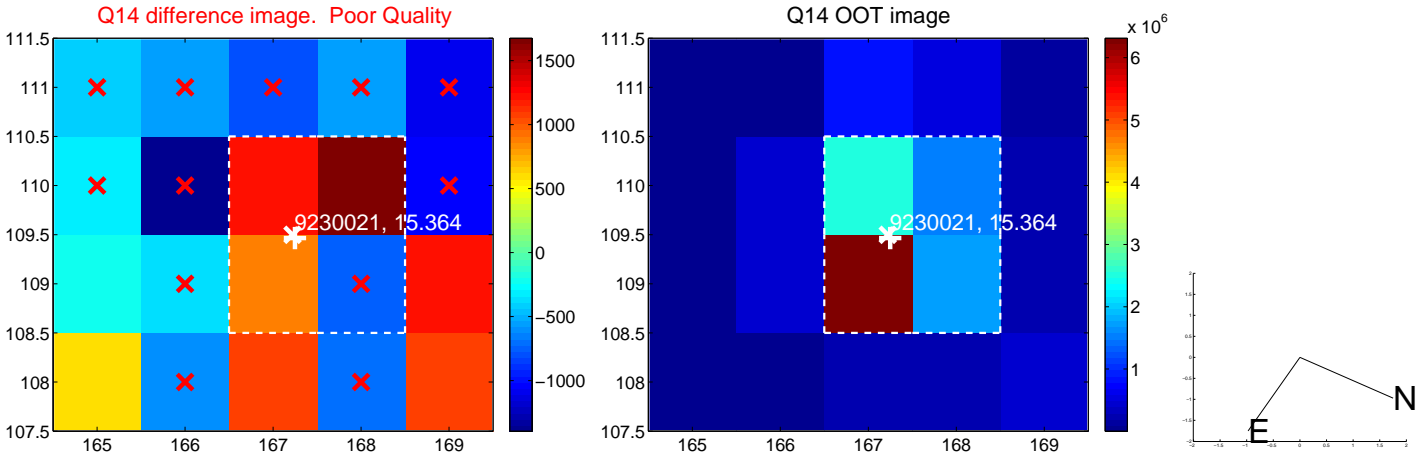
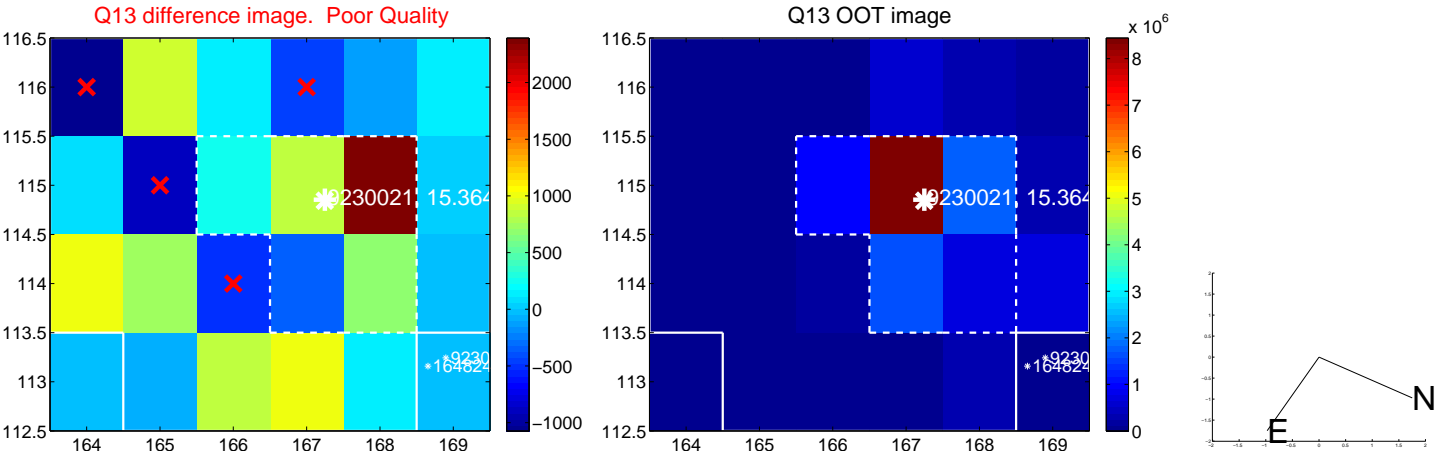
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



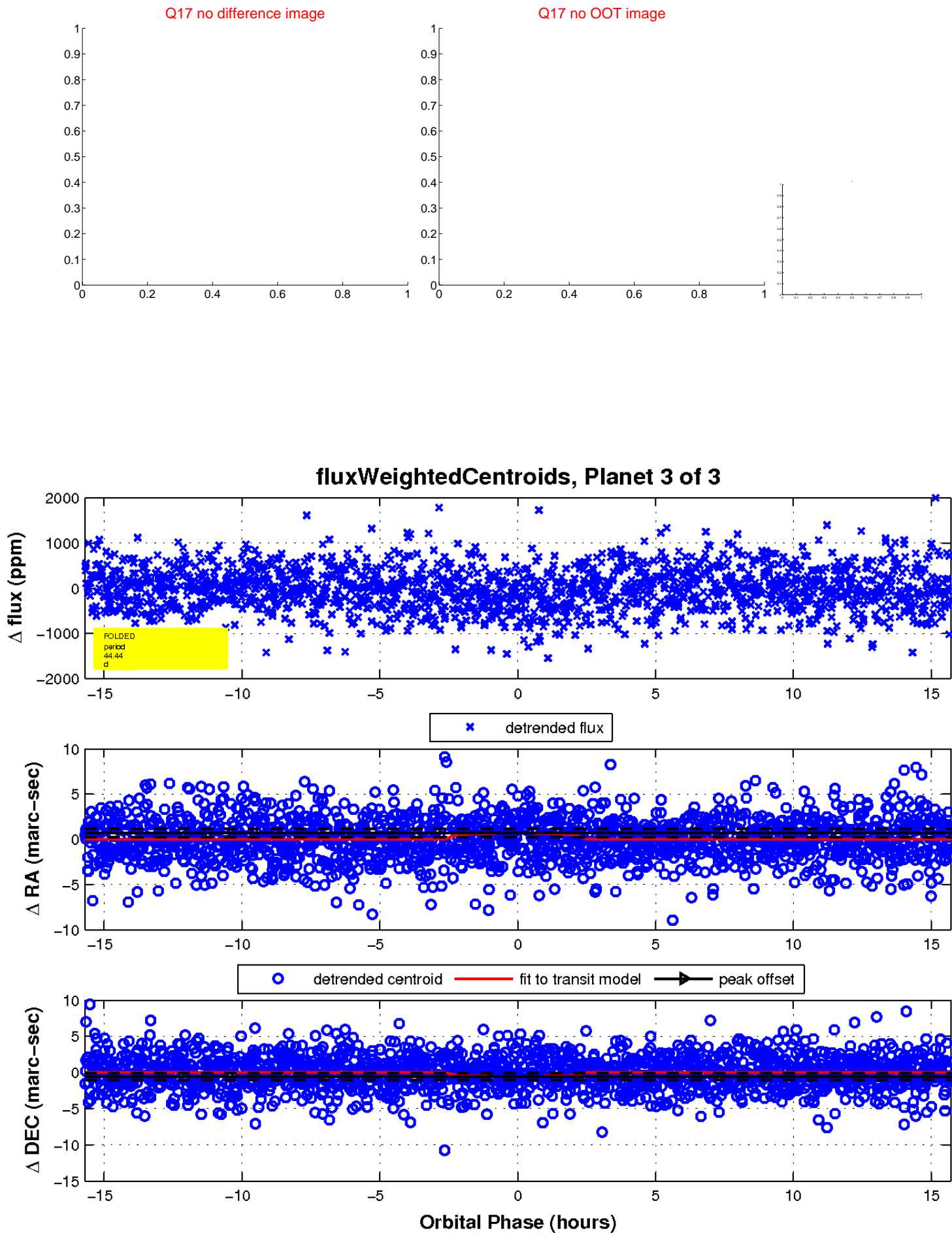
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

