

KIC 009936518

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})
009936518-01	OBS	No	1.495179	131.991885	433.7	5.411	13.1	11.1	1.62	7207	4.83	7300.15
009936518-02	OBS	No	2.240053	131.877423	121.3	16.732	8.5	4.2	1.62	7207	1.83	4258.38
009936518-04	OBS	No	24.727747	153.534209	2703.8	1.840	9.8	10.4	1.62	7207	9.75	173.25
009936518-05	OBS	No	19.074897	143.290272	2663.9	2.006	8.5	9.0	1.62	7207	12.65	244.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009936518-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009936518-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV
009936518-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009936518-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

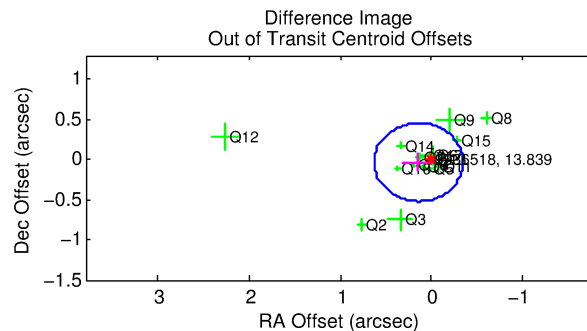
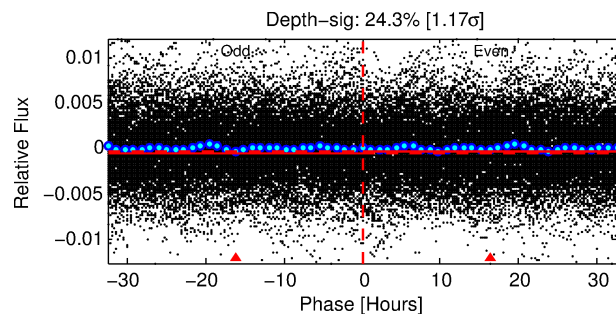
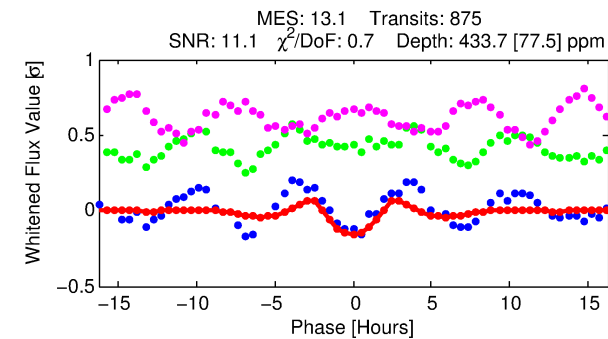
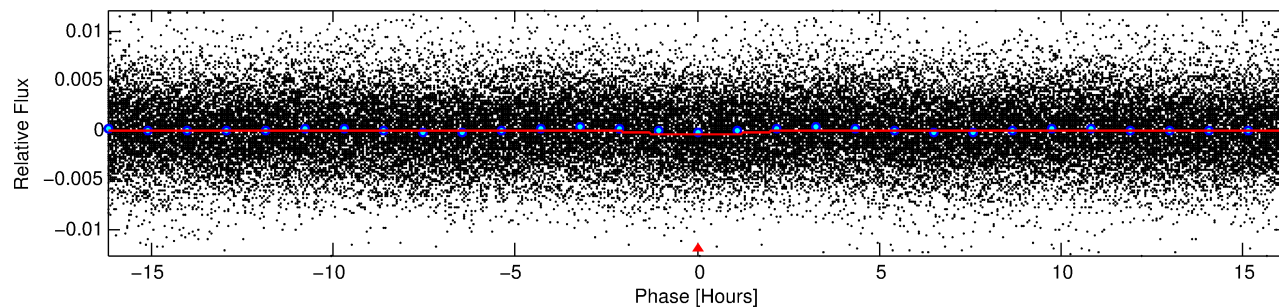
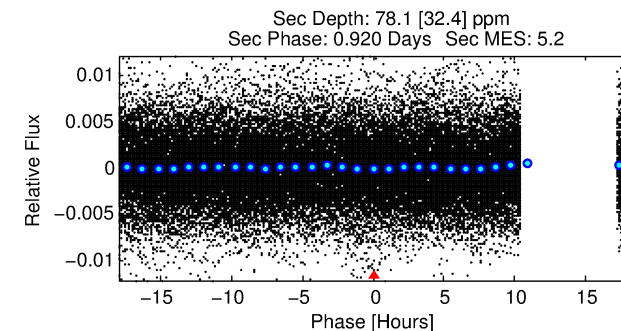
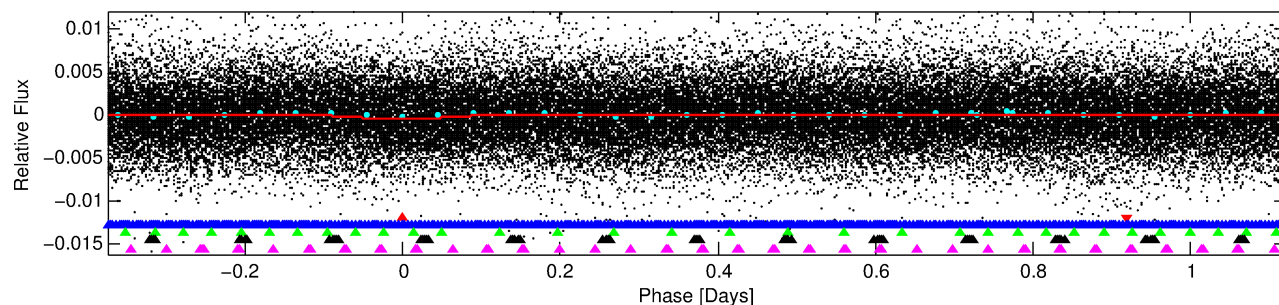
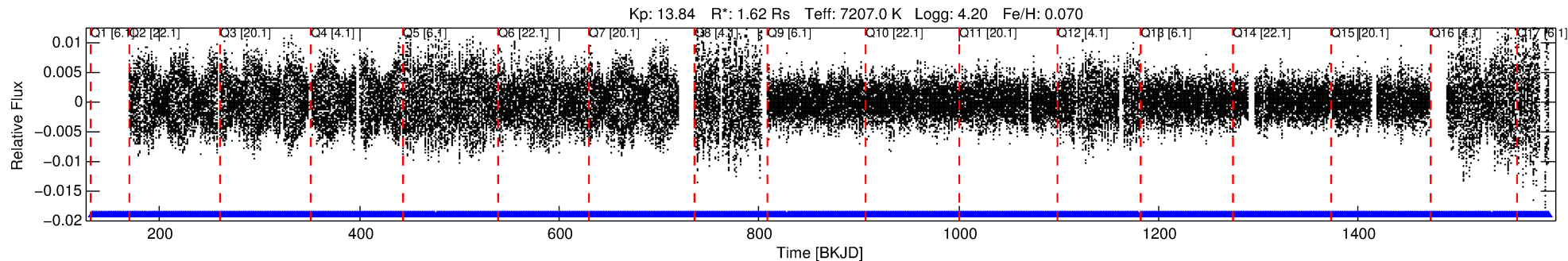
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009936518-01

No Significant Match Found

DV One-Page Summary

KIC: 9936518 Candidate: 1 of 5 Period: 1.495 d



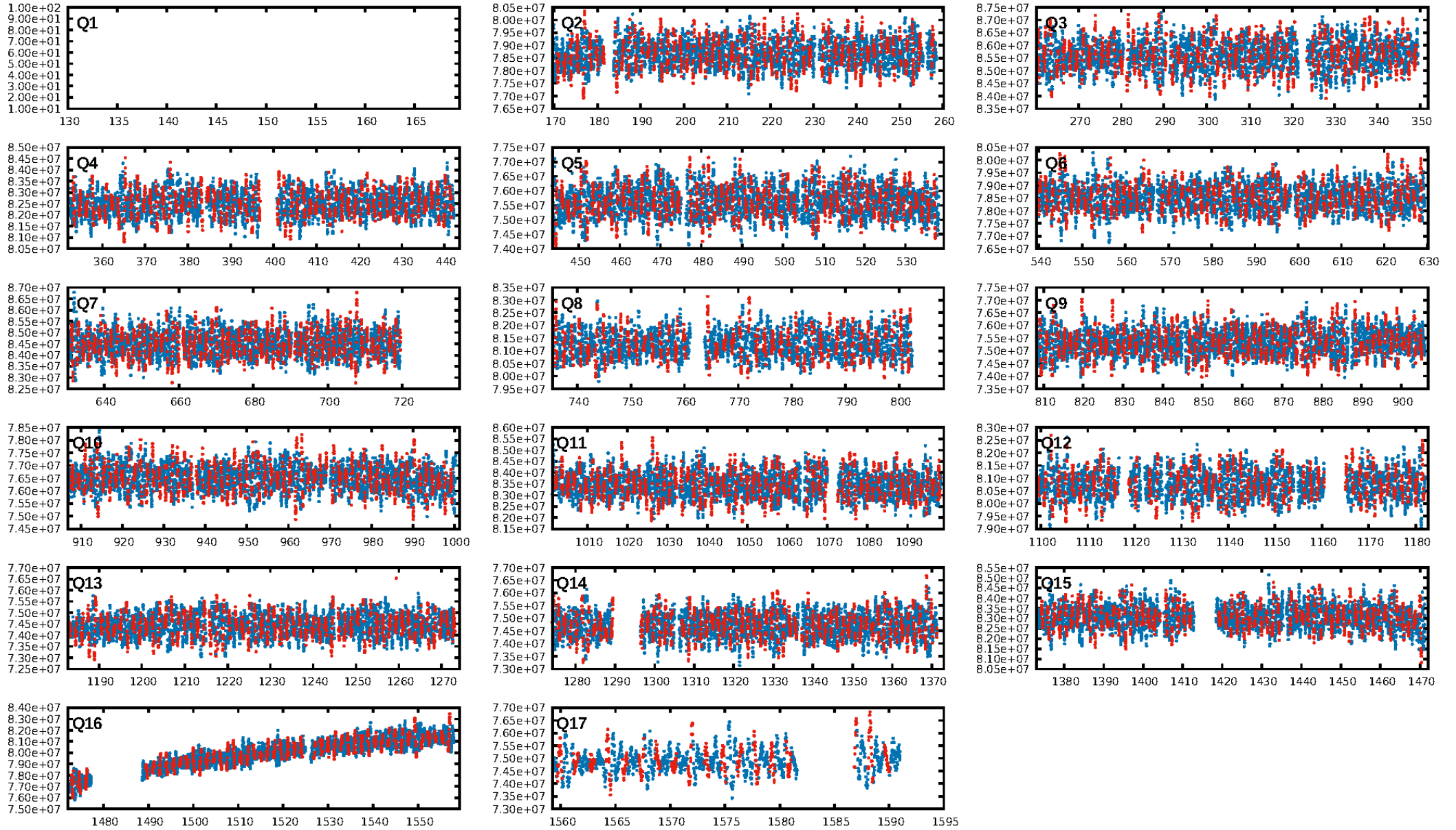
DV Fit Results:

Period = 1.49518 [0.00001] d
Epoch = 131.9919 [0.0049] BKJD
Rp/R* = 0.0273 [0.0117]
a/R* = 1.18 [0.06]
b = 0.98 [0.03]
Seff = 7300.15 [3217.20]
Teq = 2357 [260] K
Rp = 4.83 [2.67] Re
a = 0.0295 [0.0083] AU
Ag = 1.60 [1.65] [0.36σ]
Teff = 4098 [996] K [1.69σ]

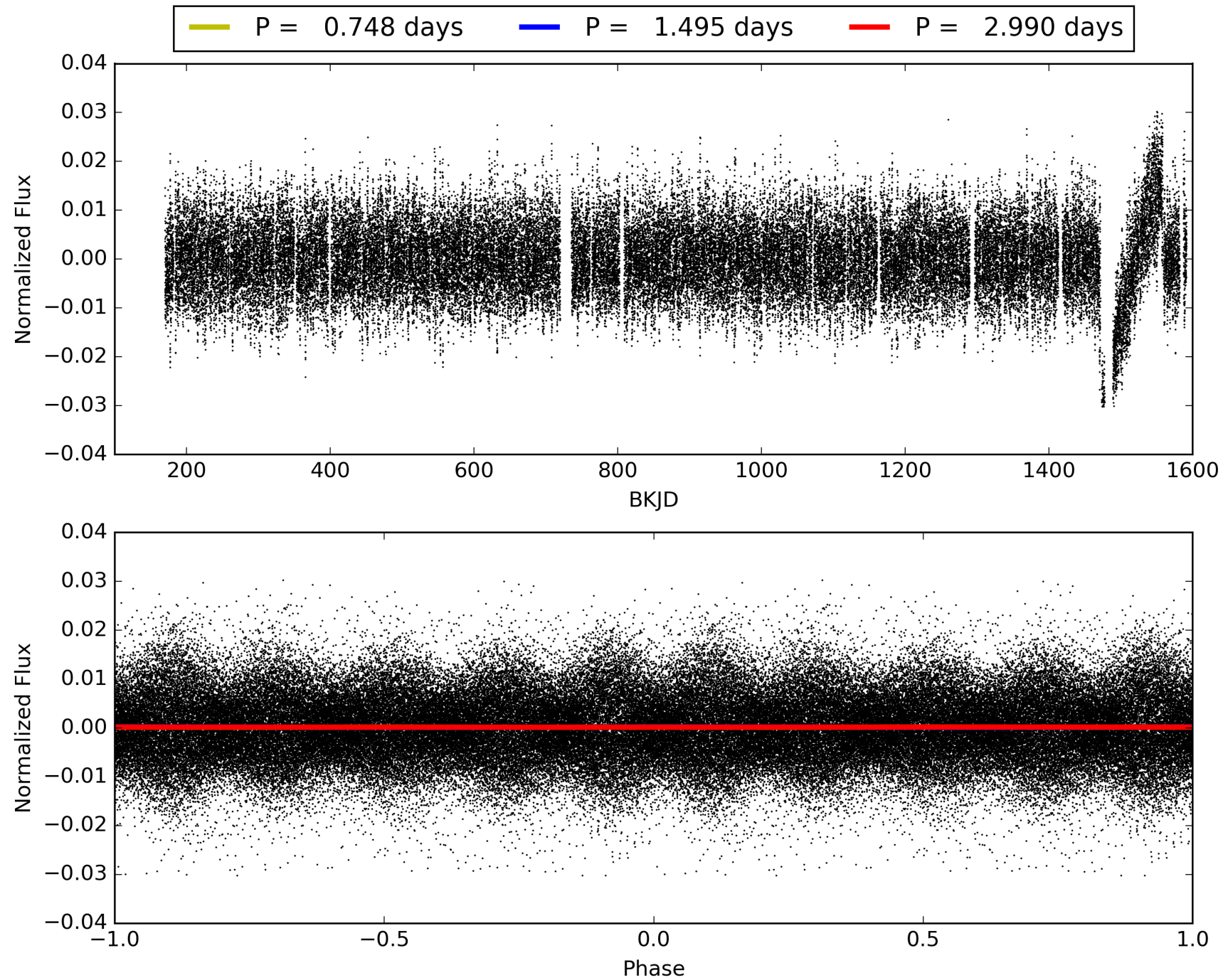
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 69.1% [1.02σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.36e-03
RollingBand-fgt: 1.00 [857/857]
GhostDiagnostic-chr: 0.7946
Centroid-sig: 14.6%
Centroid-so: 0.114 arcsec [1.41σ]
OotOffset-rm: 0.143 arcsec [0.88σ]
KicOffset-rm: 0.235 arcsec [1.43σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.62 [10/16]
DiffImageOverlap-fno: 0.94 [15/16]

TCE 009936518-01, PDC Light Curves

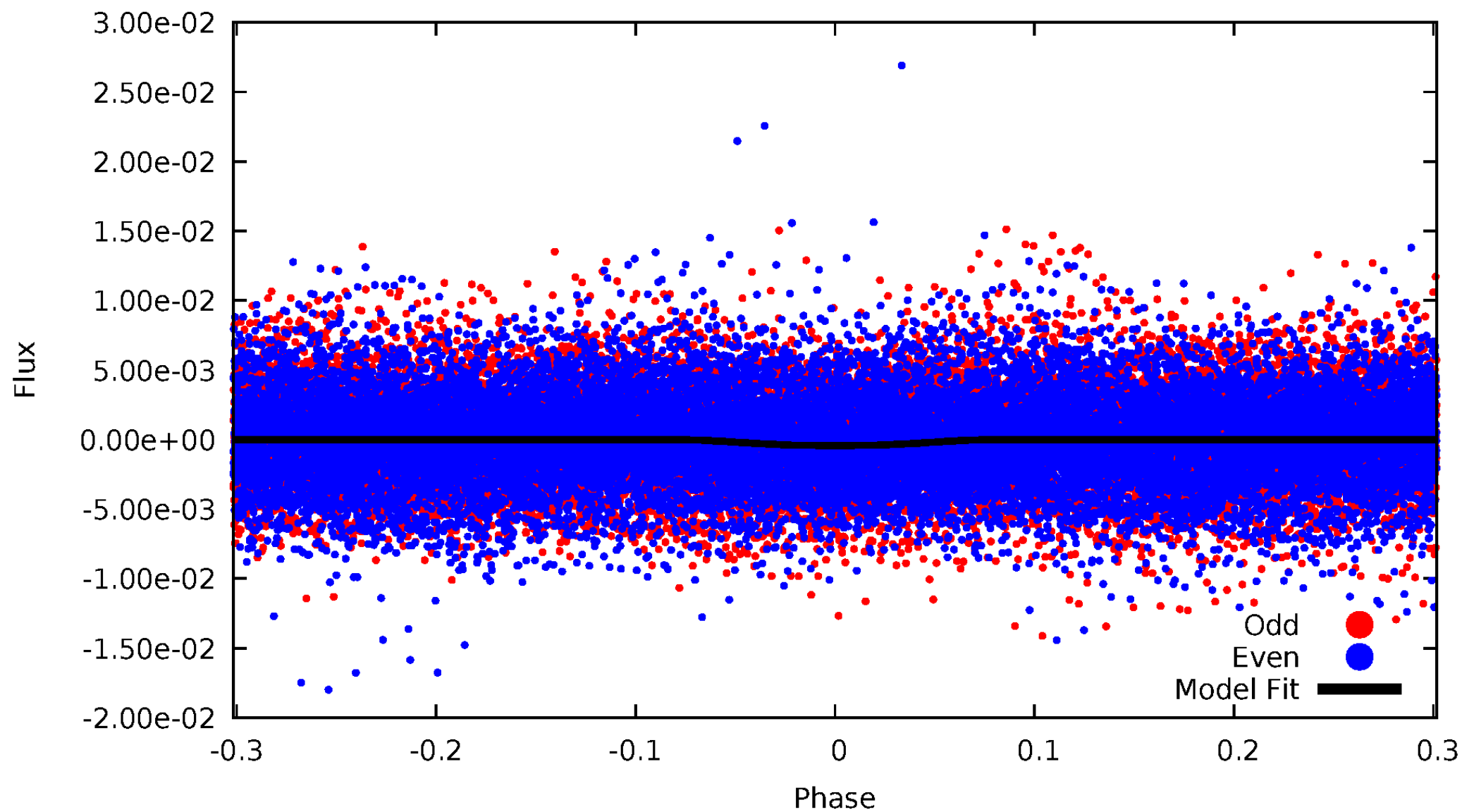


TCE 009936518-01



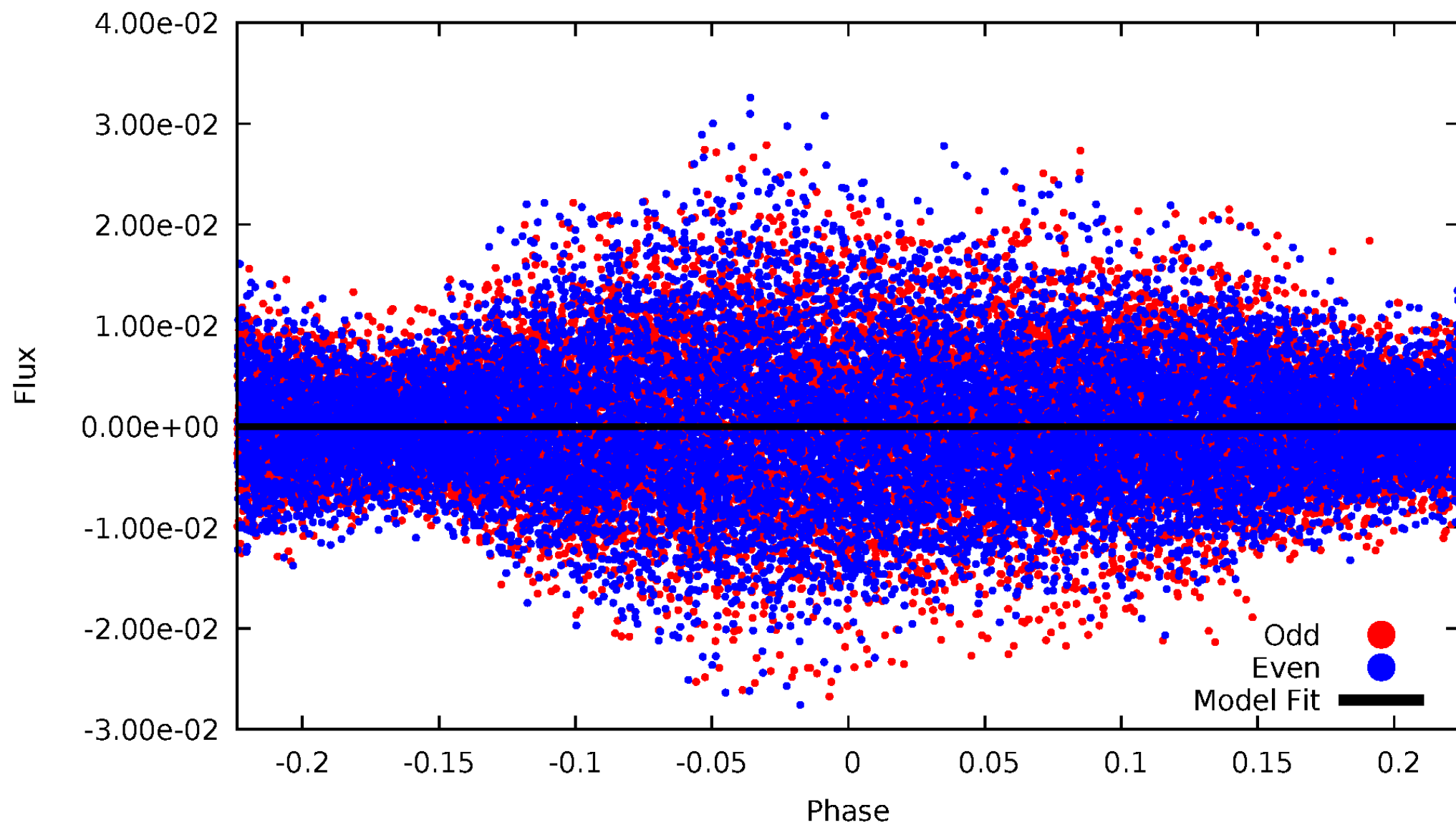
DV Odd/Even

TCE 009936518-01



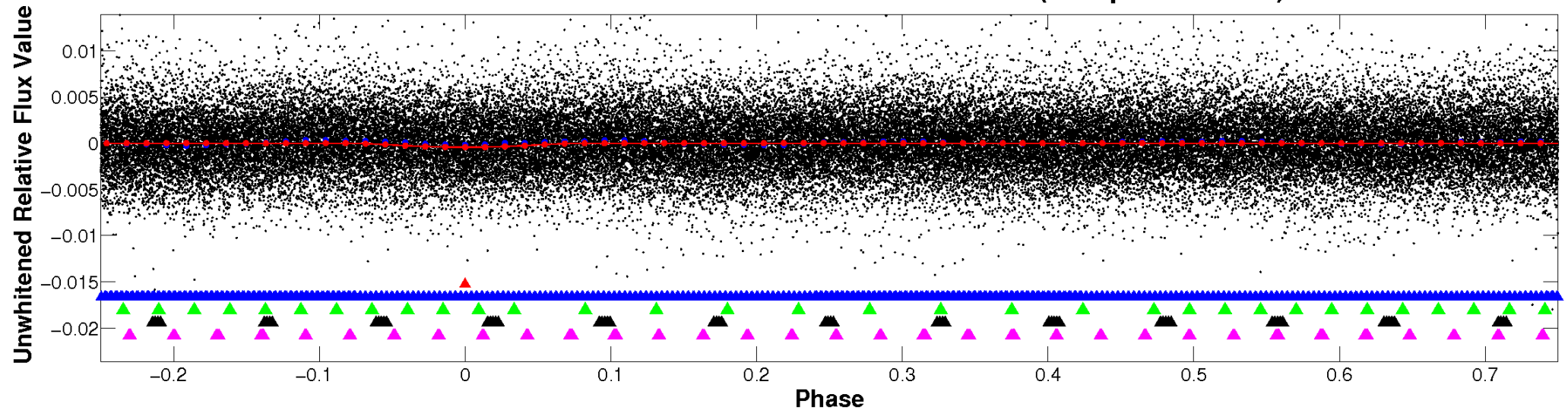
ALT Odd/Even

TCE 009936518-01

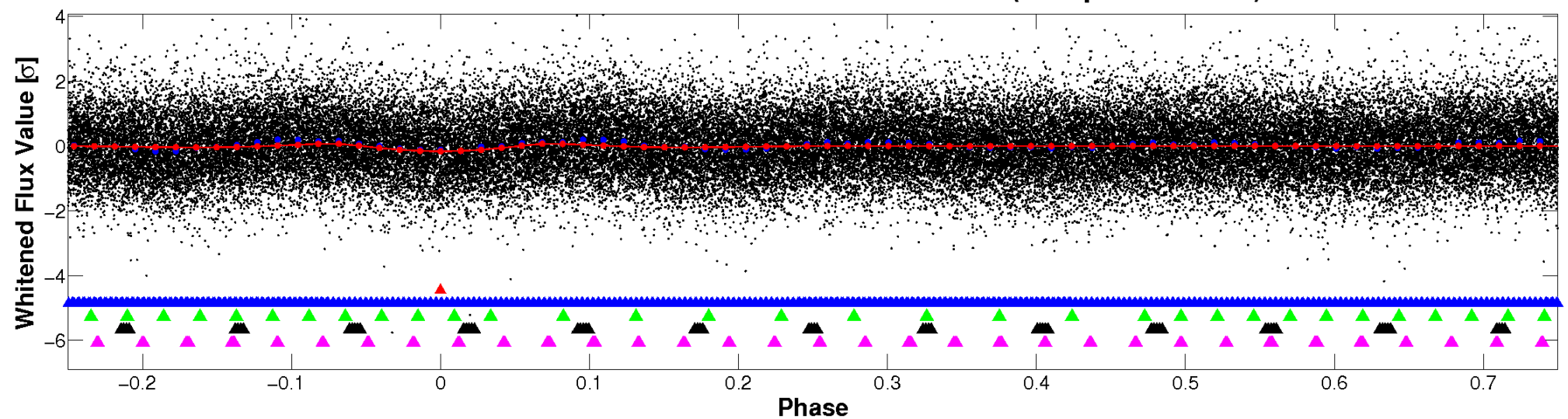


Non-Whitened Vs. Whitened Light Curve

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

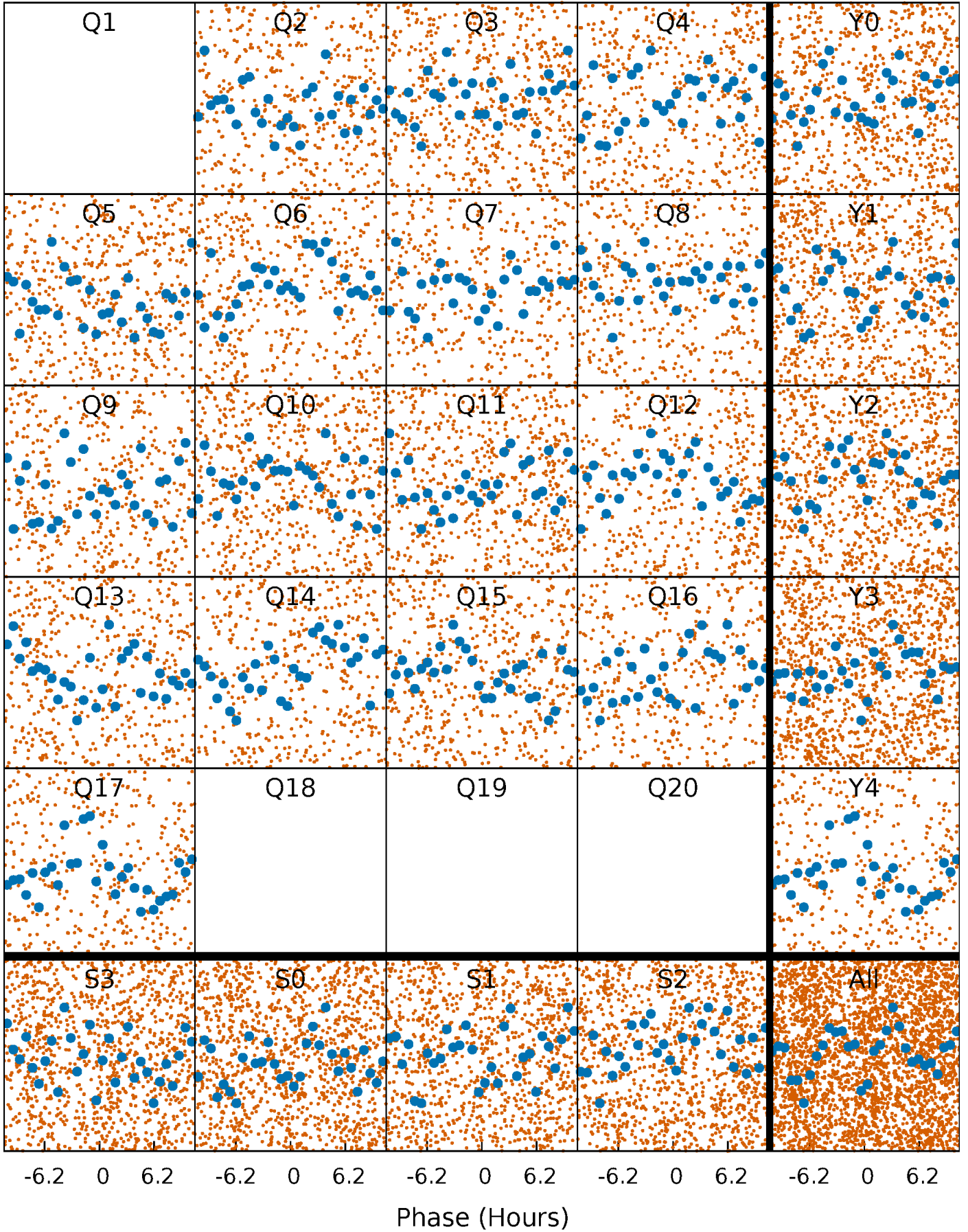


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



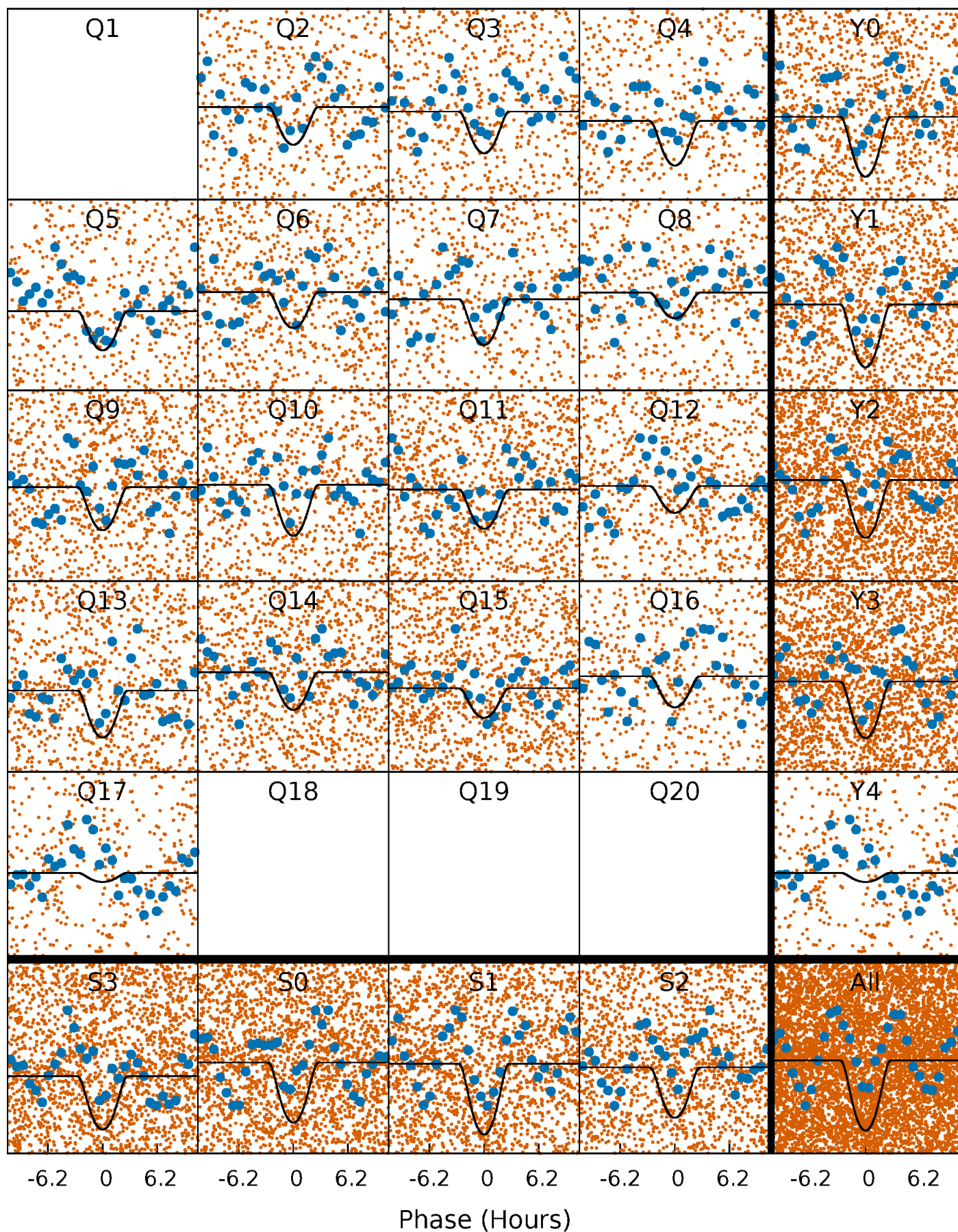
PDC Quarter-Phased Transit Curves

TCE 009936518-01 P= 1.495179 Days $T_0=131.991885$ (BKJD)



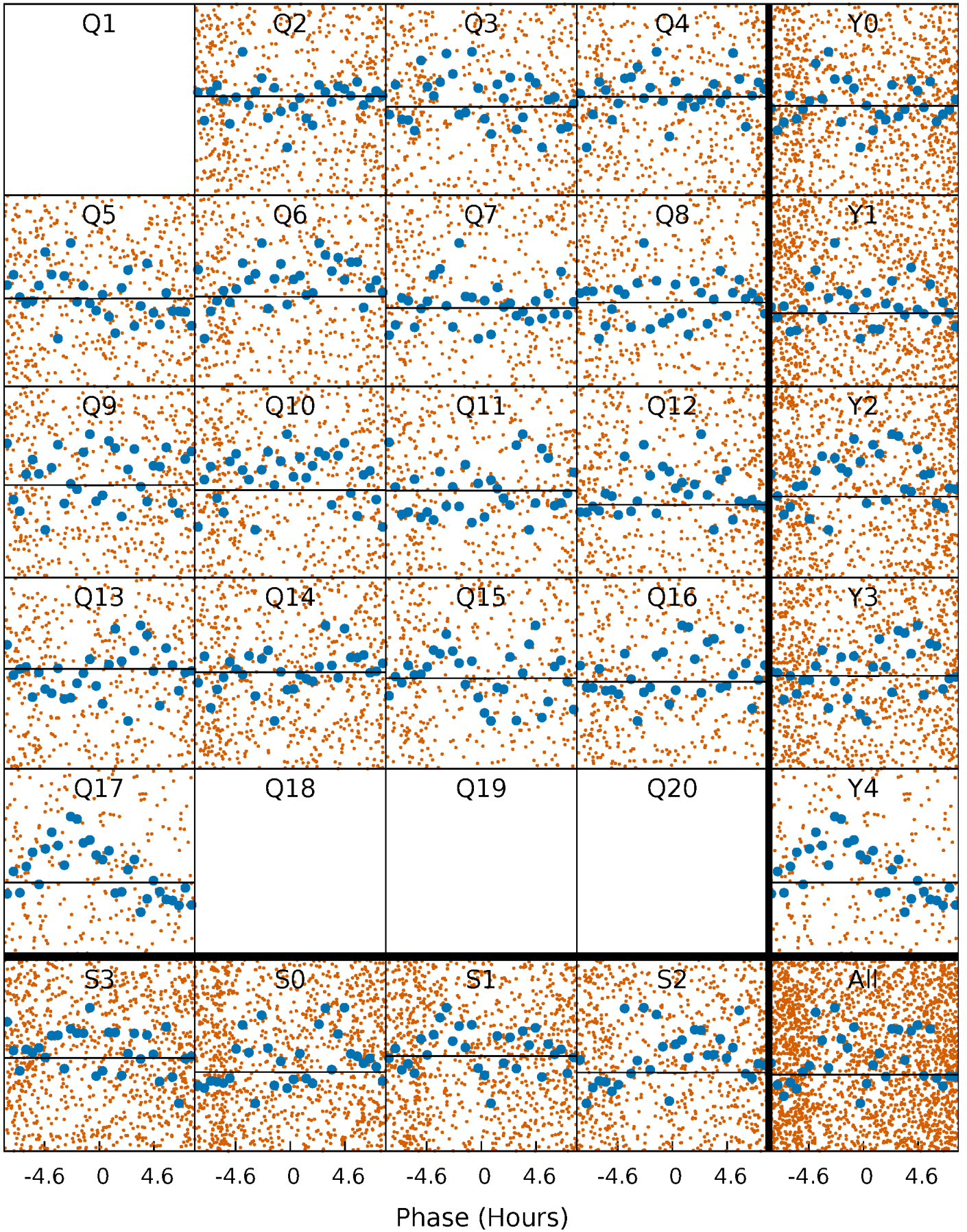
DV Quarter-Phased Transit Curves

TCE 009936518-01 P= 1.495179 Days $T_0=131.991885$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

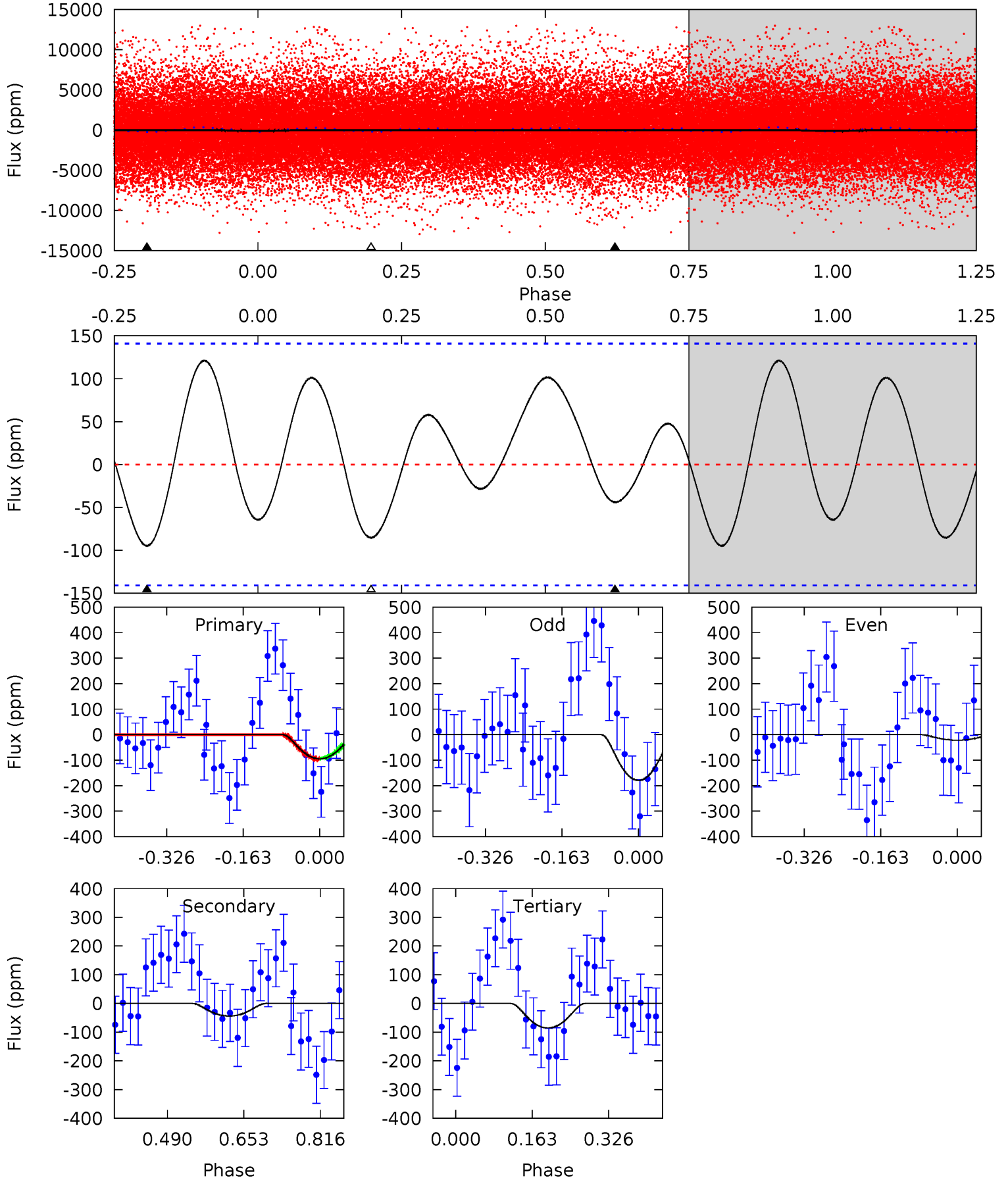
TCE 009936518-01 P= 1.495240 Days $T_0=131.943296$ (BKJD)



DV Model-Shift Uniqueness Test

009936518-01, P = 1.495179 Days, E = 131.991885 Days

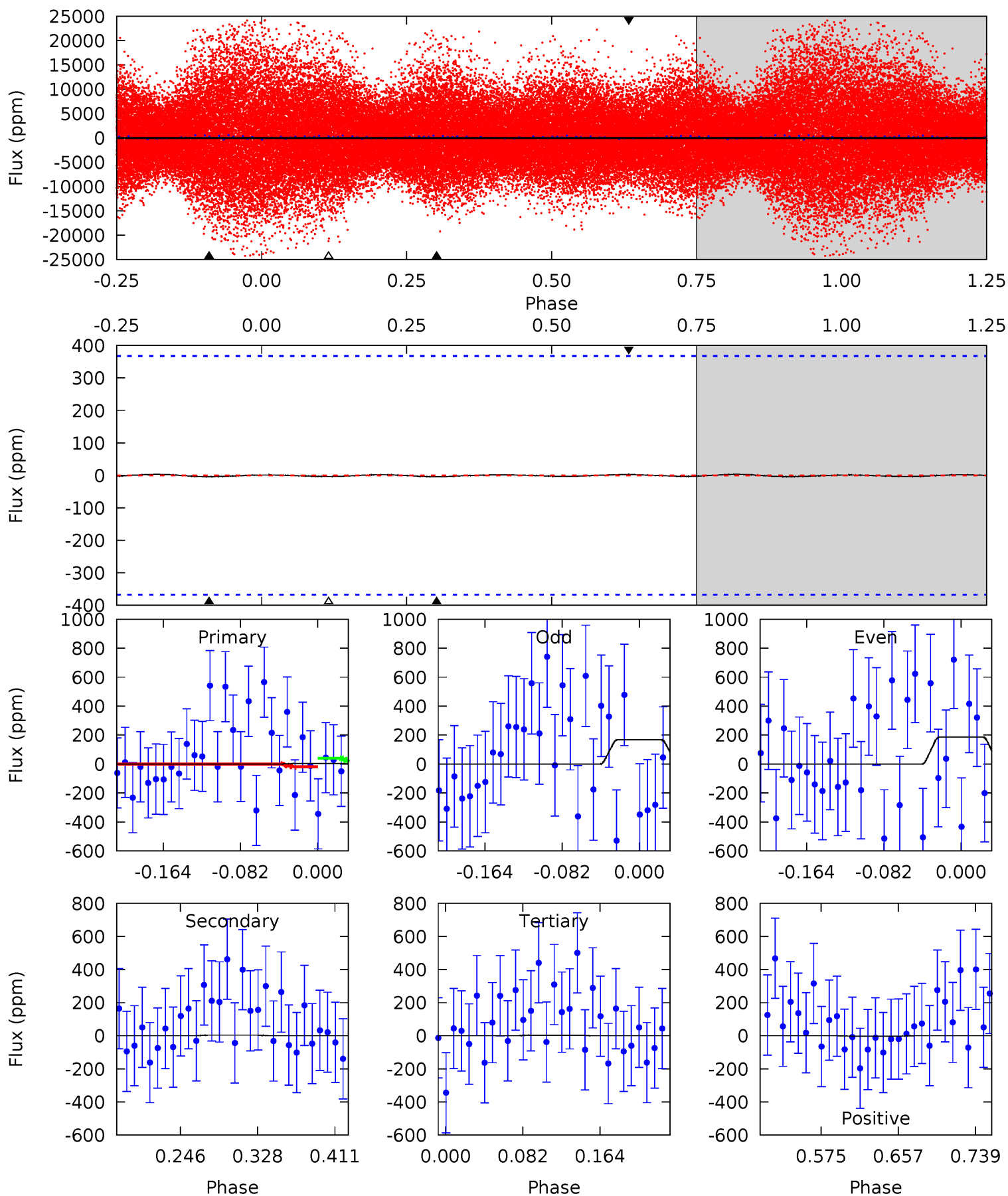
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.00	1.39	2.70	0	4.46	1.39	1.65	0.30	3.00	-1.31	1.39	2.48	0.67	0.56	0.06



Alt Model-Shift Uniqueness Test

009936518-01, P = 1.495240 Days, E = 131.943296 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.05	0.05	0.04	0.03	4.61	1.74	0.02	0.00	0.02	0.01	0.02	0.11	0.12	0.46	0.12



Stellar Parameters For KIC 009936518

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7207^{+200}_{-343}	$4.203^{+0.090}_{-0.210}$	$0.070^{+0.200}_{-0.350}$	$1.620^{+0.565}_{-0.242}$	$1.528^{+0.211}_{-0.233}$	$0.506^{+0.244}_{-0.259}$
	+3%/-5%	+2%/-5%	+286%/-500%	+35%/-15%	+14%/-15%	+48%/-51%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009936518-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-44 ± 32	$4.88^{+2.76}_{-2.07}$	3338^{+240}_{-211}	3462^{+1111}_{-6449}	$0.720^{+1.765}_{-0.564}$
Alt.	-4 ± 80	$1.56^{+1.67}_{-1.13}$	3337^{+255}_{-201}	3612^{+6473}_{-11822}	$0.802^{+36.699}_{-23.516}$

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 $A_{obs} \gg 1.0$

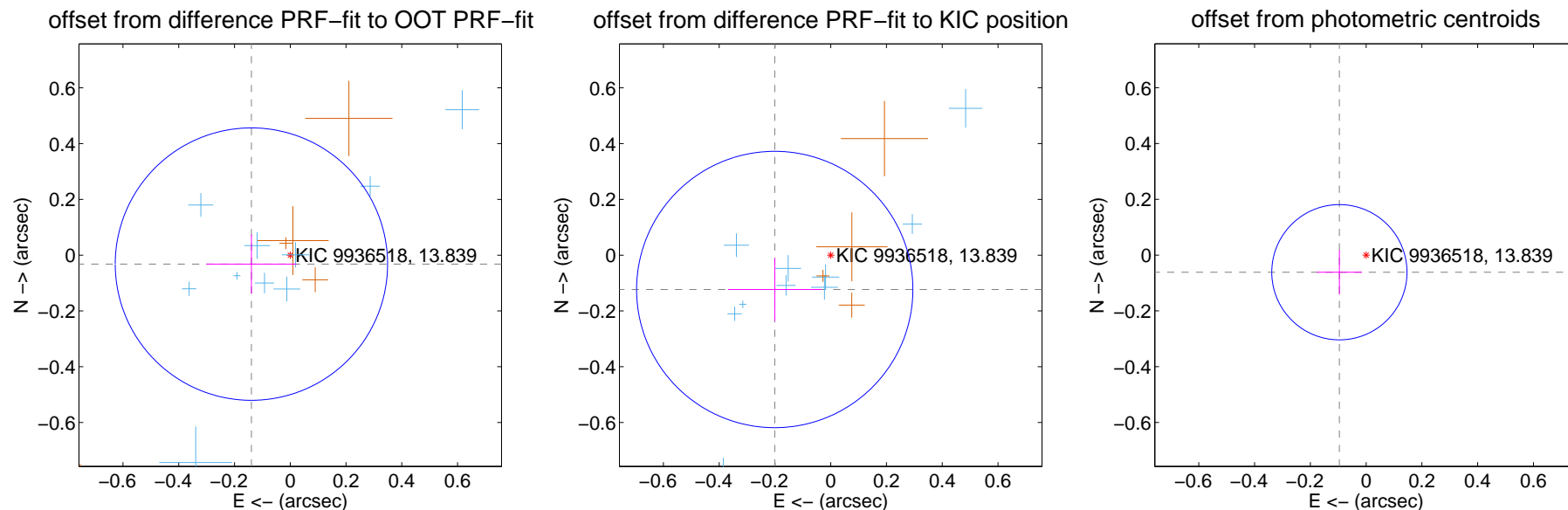
DV Centroid Data

Supplemental centroid analysis for 009936518-01. Kepler magnitude: 13.84. Transit SNR 11.12

There are 10 quarters with good PRF difference image offsets

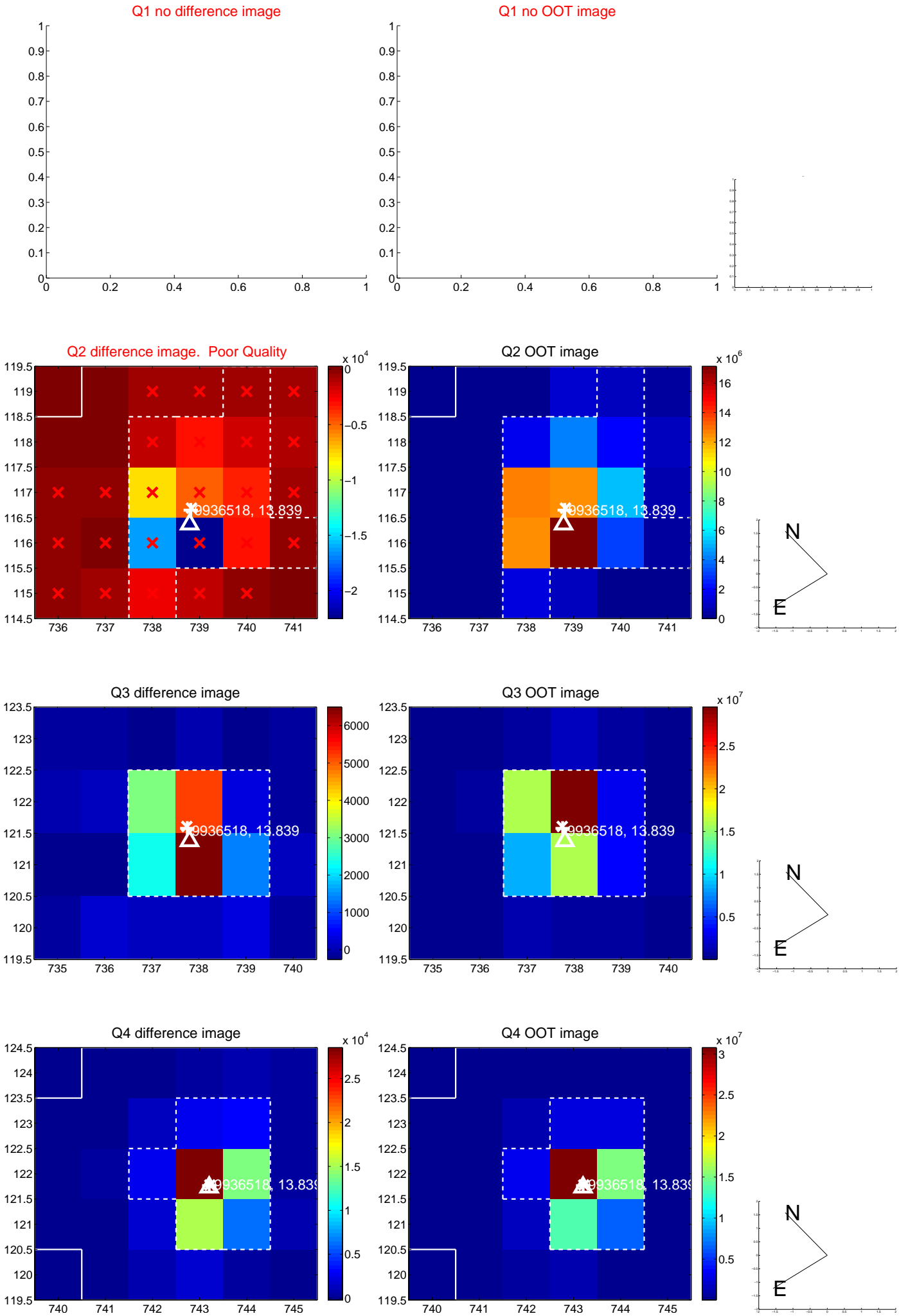
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.143 ± 0.163	0.88	0.139 ± 0.162	-0.032 ± 0.106
PRF-fit source offset from KIC position	0.235 ± 0.165	1.43	0.201 ± 0.167	-0.123 ± 0.113
photometric centroid source offset	0.11 ± 0.08	1.41	0.10 ± 0.08	-0.06 ± 0.08

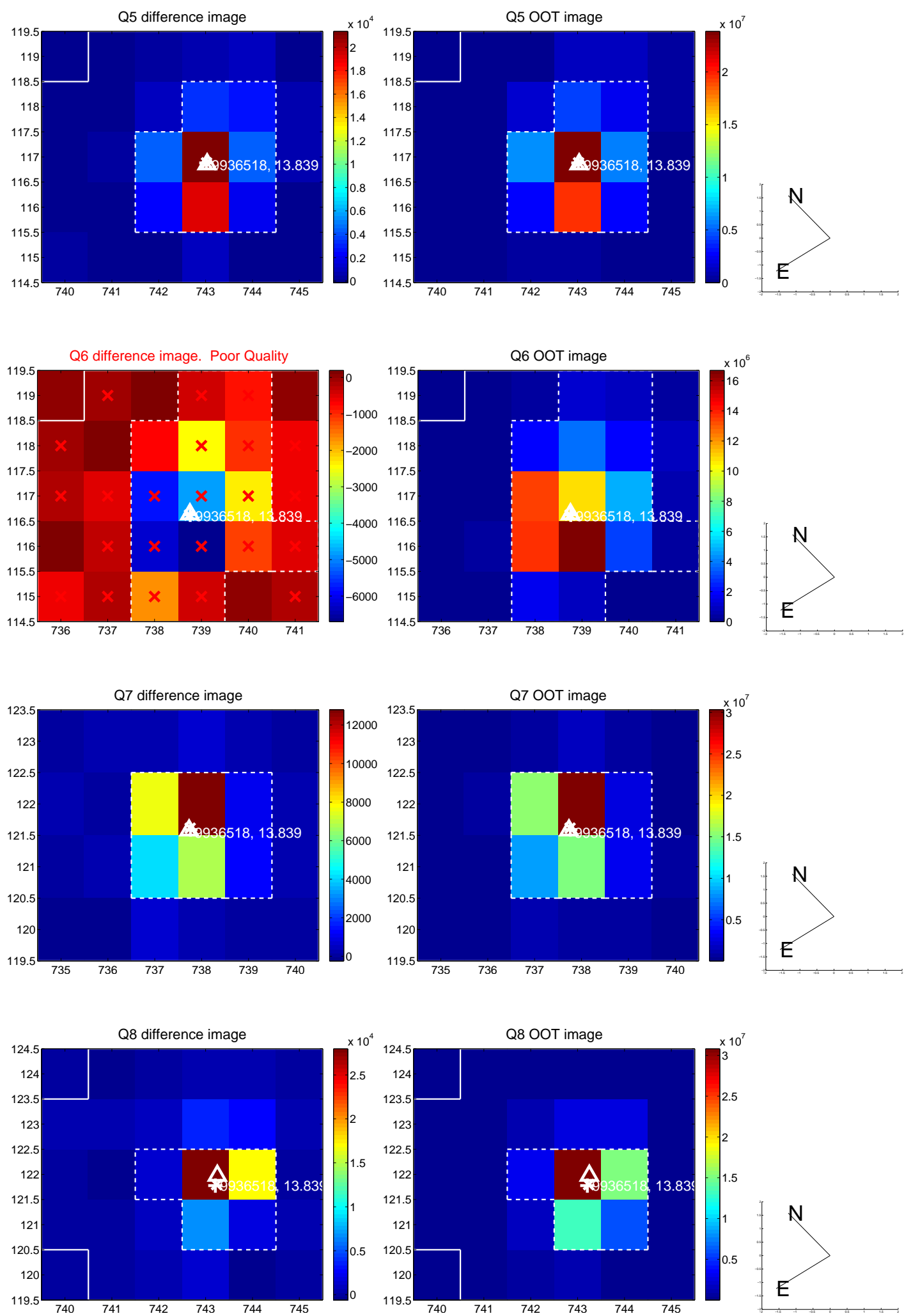


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

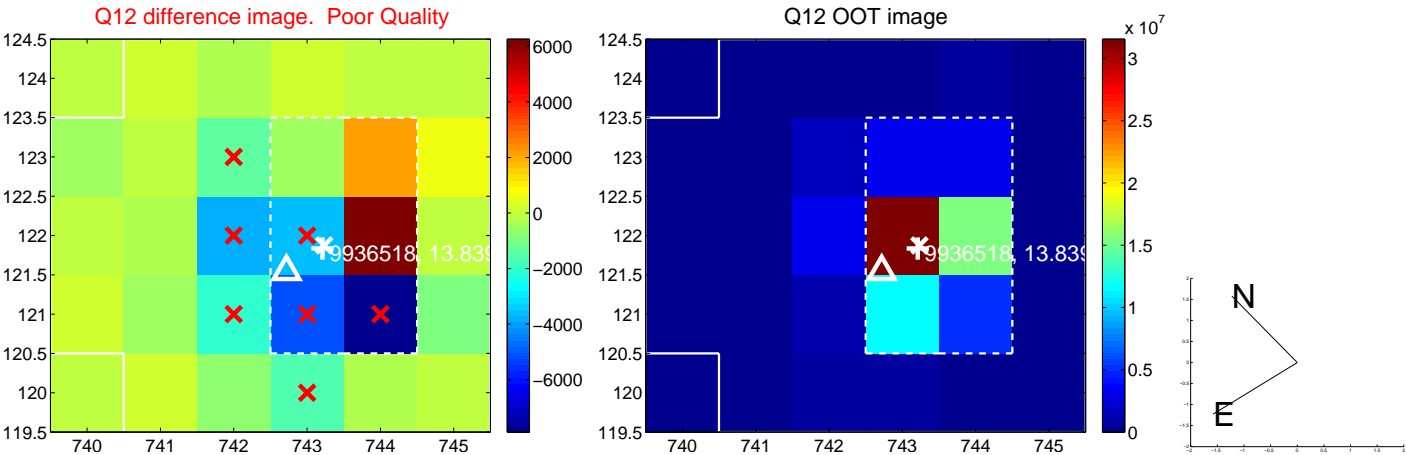
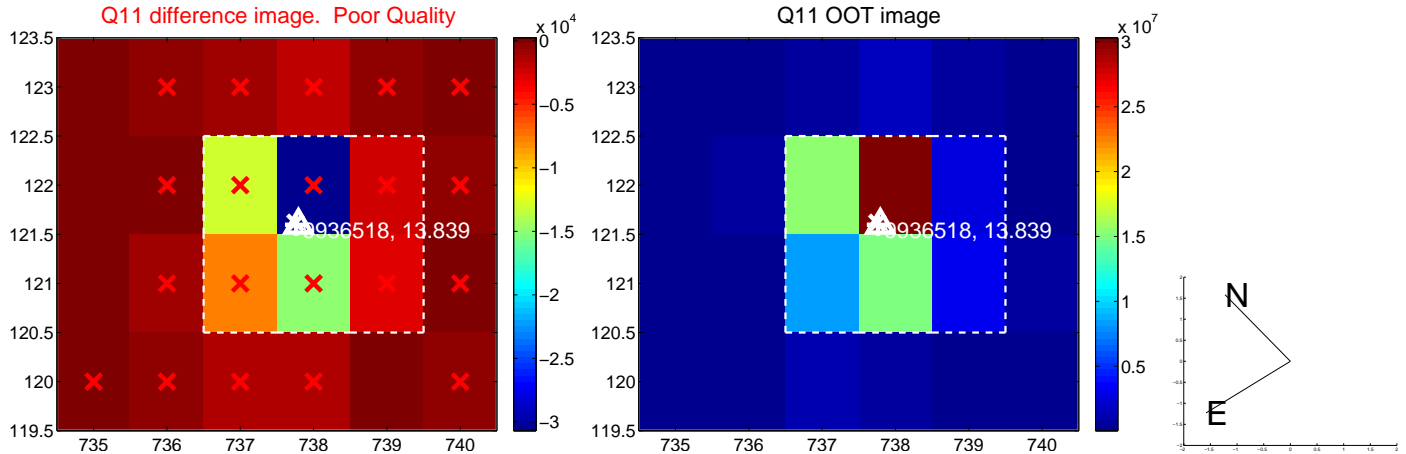
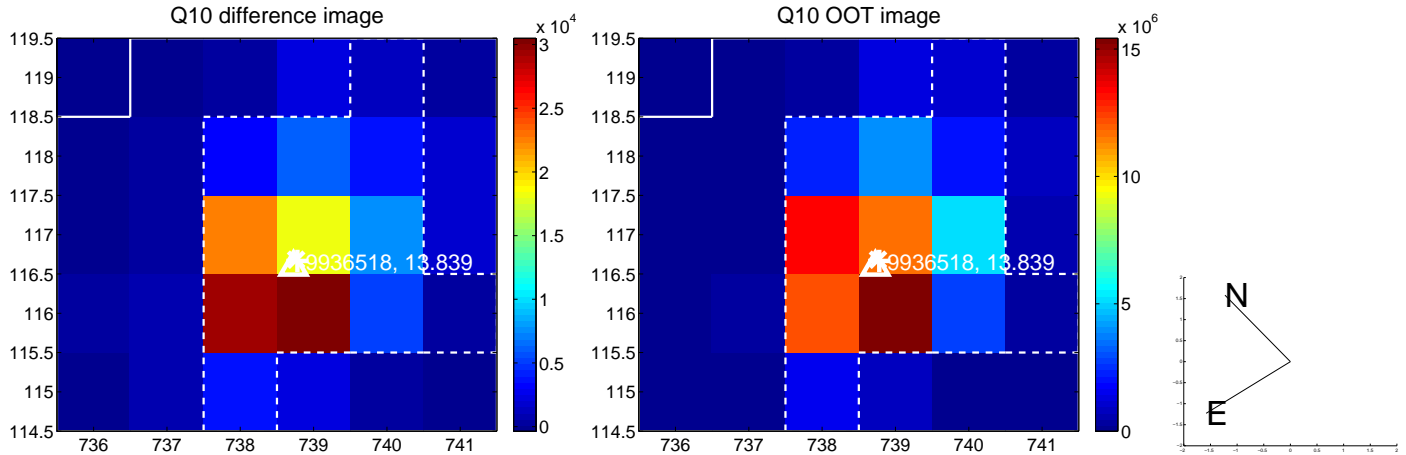
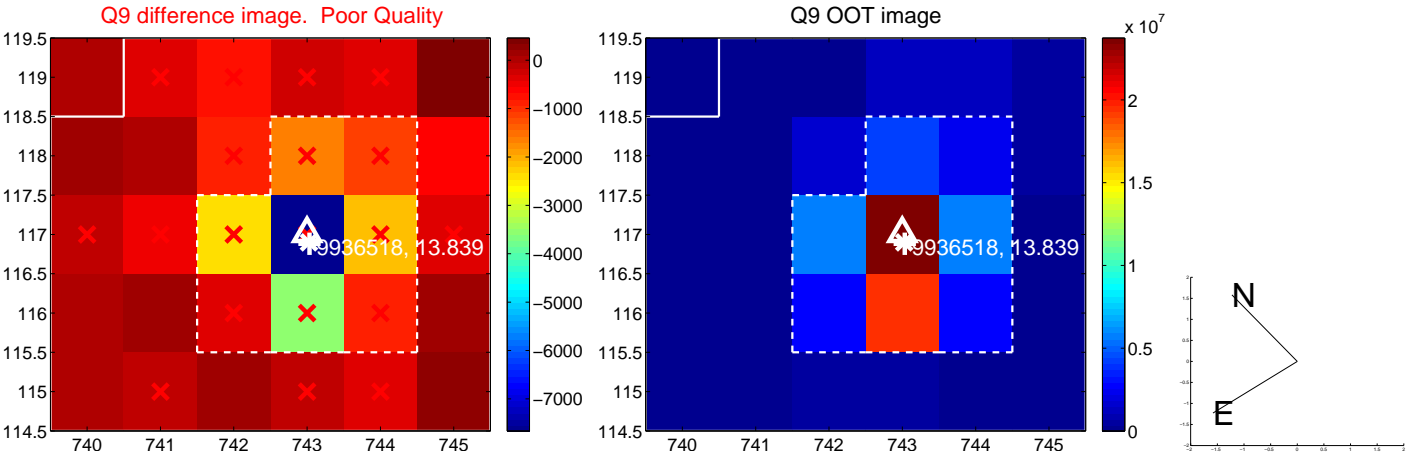
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



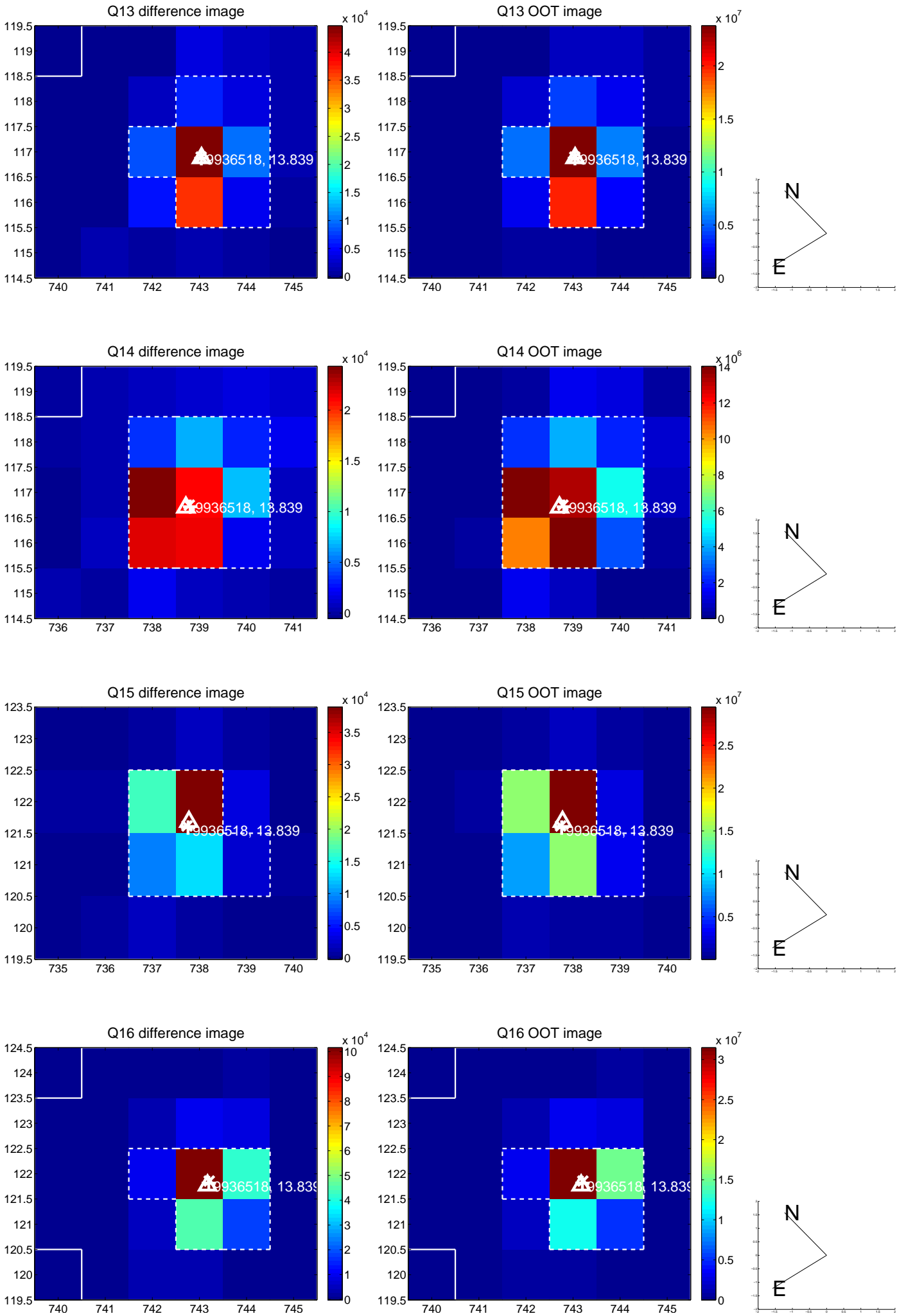
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



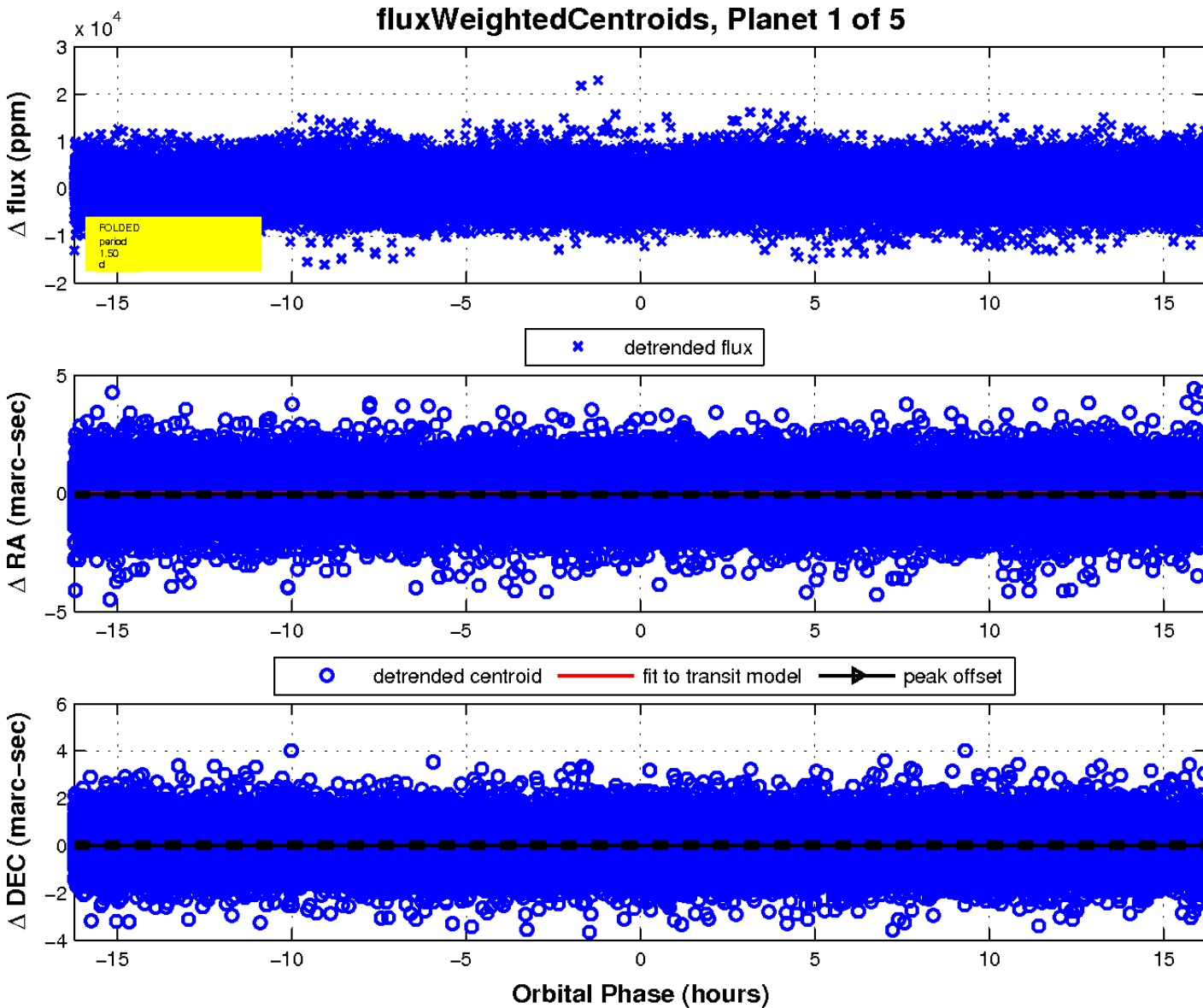
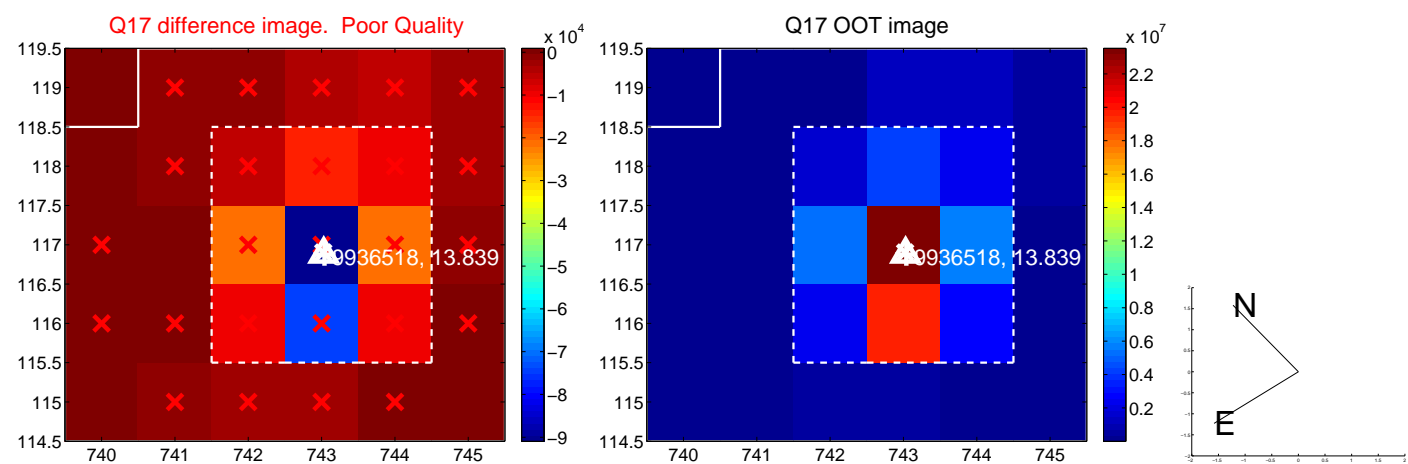
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

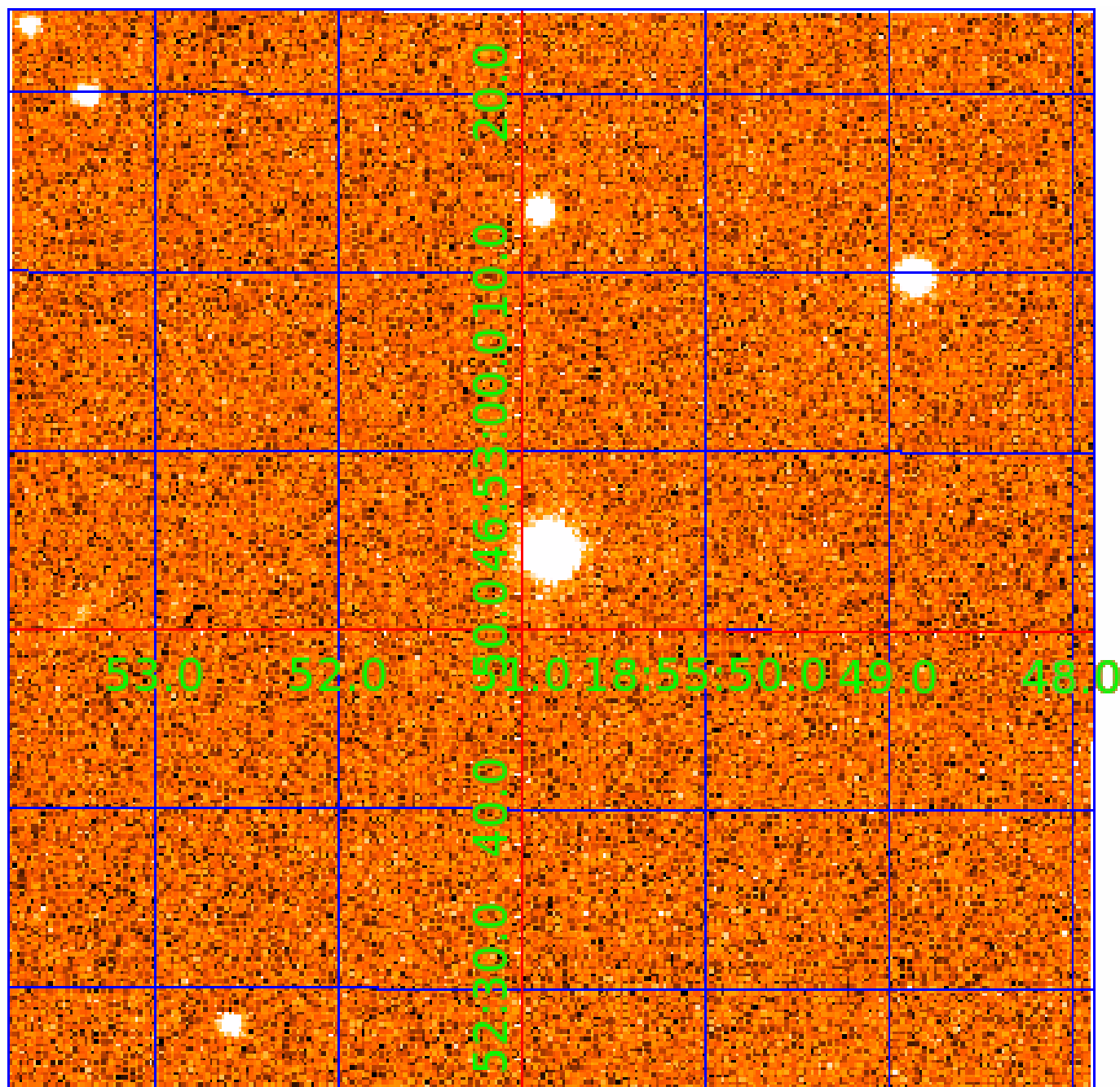


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009936518

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})
009936518-01	OBS	No	1.495179	131.991885	433.7	5.411	13.1	11.1	1.62	7207	4.83	7300.15
009936518-02	OBS	No	2.240053	131.877423	121.3	16.732	8.5	4.2	1.62	7207	1.83	4258.38
009936518-04	OBS	No	24.727747	153.534209	2703.8	1.840	9.8	10.4	1.62	7207	9.75	173.25
009936518-05	OBS	No	19.074897	143.290272	2663.9	2.006	8.5	9.0	1.62	7207	12.65	244.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009936518-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009936518-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV
009936518-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009936518-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

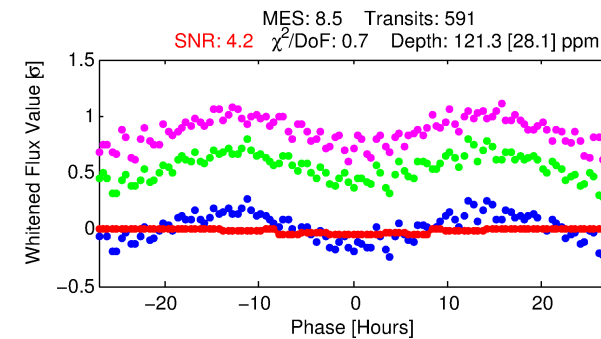
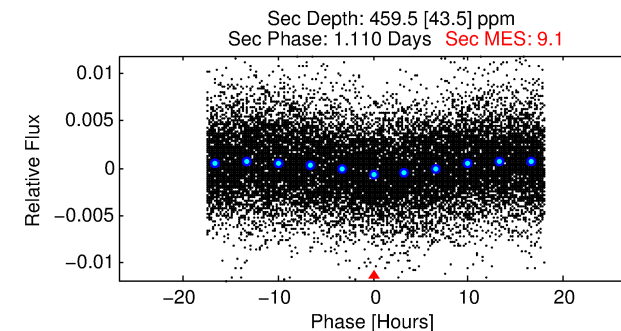
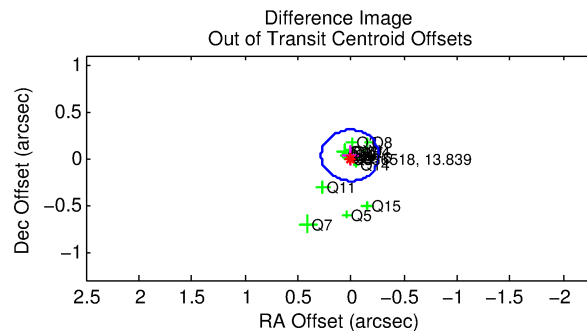
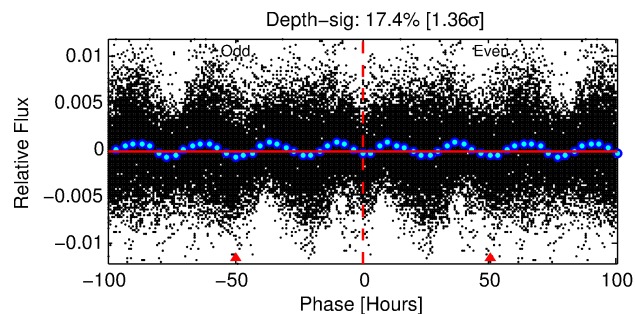
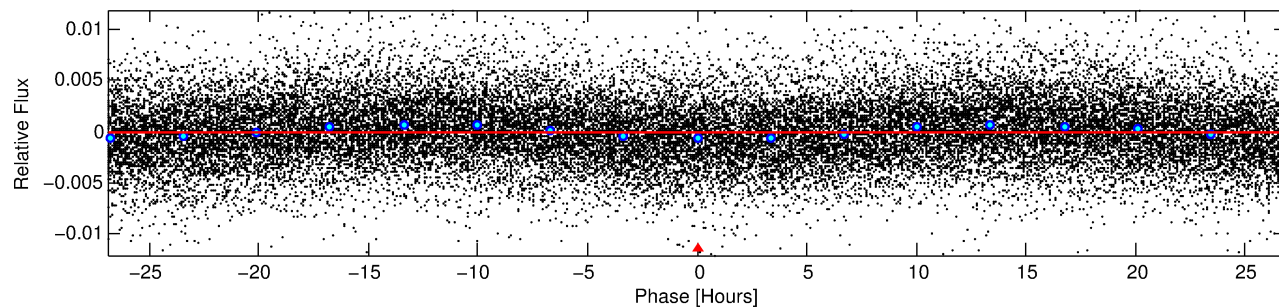
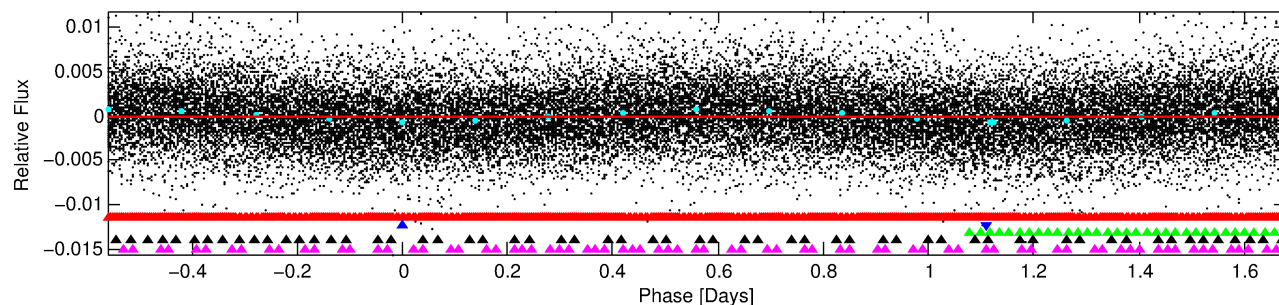
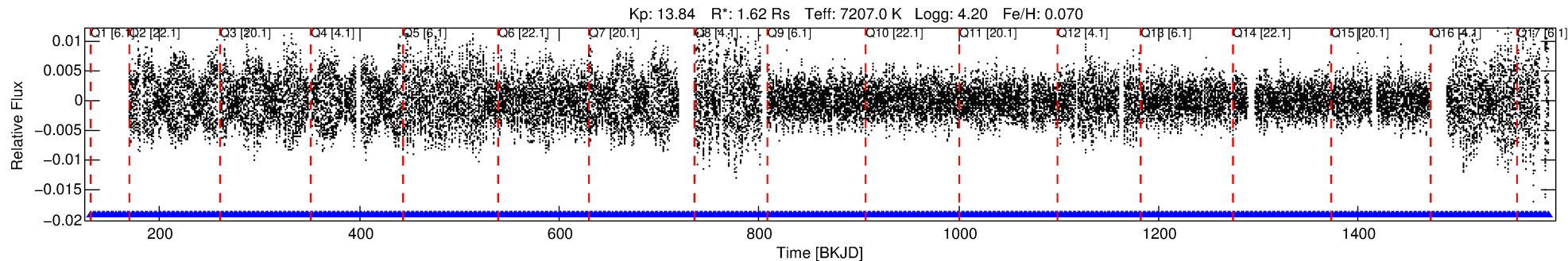
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009936518-02

No Significant Match Found

DV One-Page Summary

KIC: 9936518 Candidate: 2 of 5 Period: 2.240 d



DV Fit Results:

Period = 2.24005 [0.00007] d
Epoch = 131.8774 [0.0156] BKJD
Rp/R* = 0.0104 [0.0106]
a/R* = 1.19 [2.13]
b = 0.39 [13.36]
Seff = 4258.38 [1876.68]
Teq = 2060 [227] K
Rp = 1.83 [1.98] Re
a = 0.0386 [0.0109] AU
Ag = 112.27 [234.43] [0.47 σ]
Teff = 10367 [5336] K [1.56 σ]

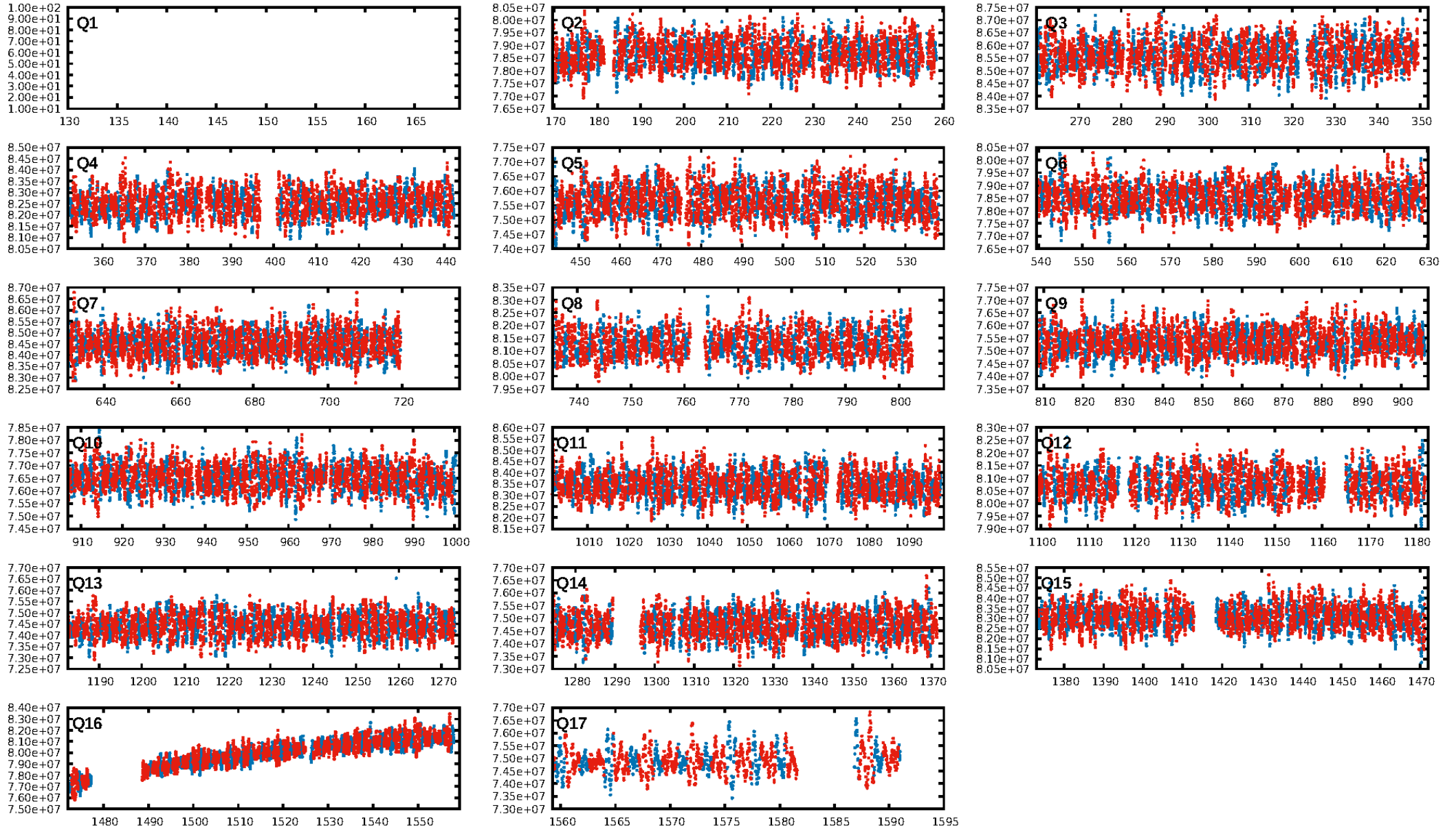
DV Diagnostic Results:

ShortPeriod-sig: 69.1% [1.02 σ]
LongPeriod-sig: 100.0% [23.98 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 7.33e-18
RollingBand-fgt: 1.00 [579/579]
GhostDiagnostic-chr: -13.49
Centroid-sig: 0.0%
Centroid-so: 0.464 arcsec [3.06 σ]
OotOffset-rm: 0.031 arcsec [0.34 σ]
KicOffset-rm: 0.049 arcsec [0.51 σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.88 [14/16]
DiffImageOverlap-fno: 0.00 [0/16]

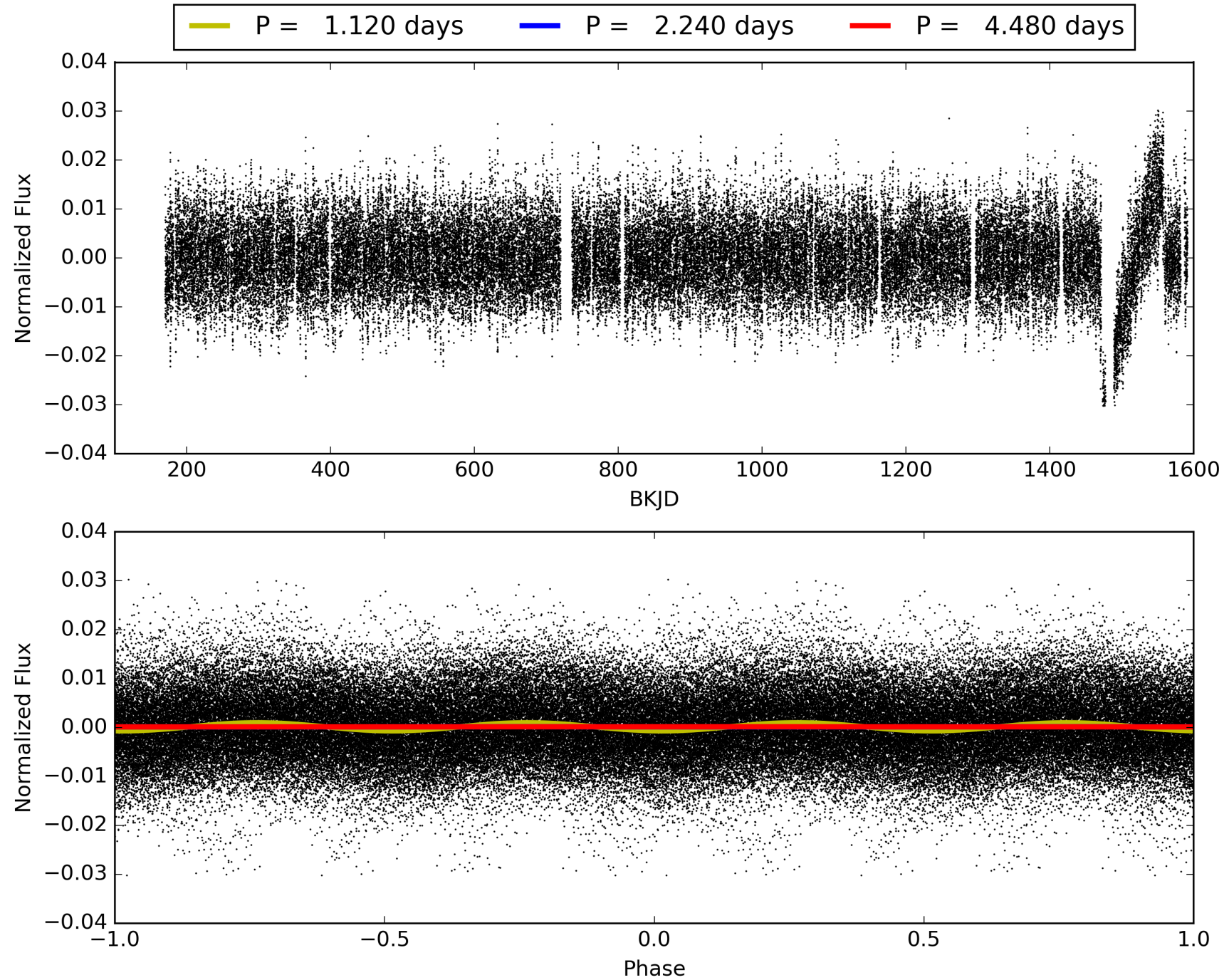
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:29:16 Z

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

TCE 009936518-02, PDC Light Curves

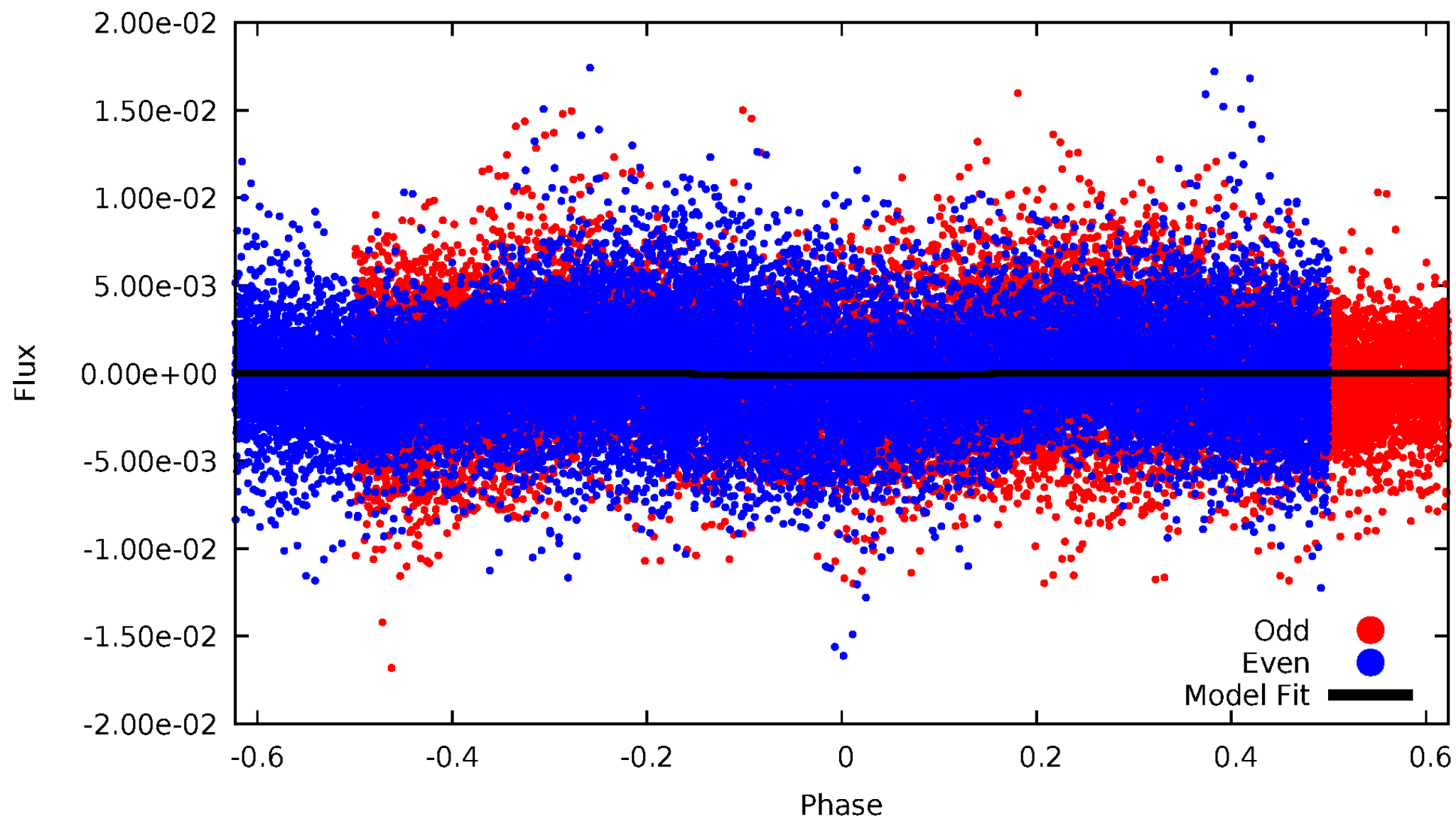


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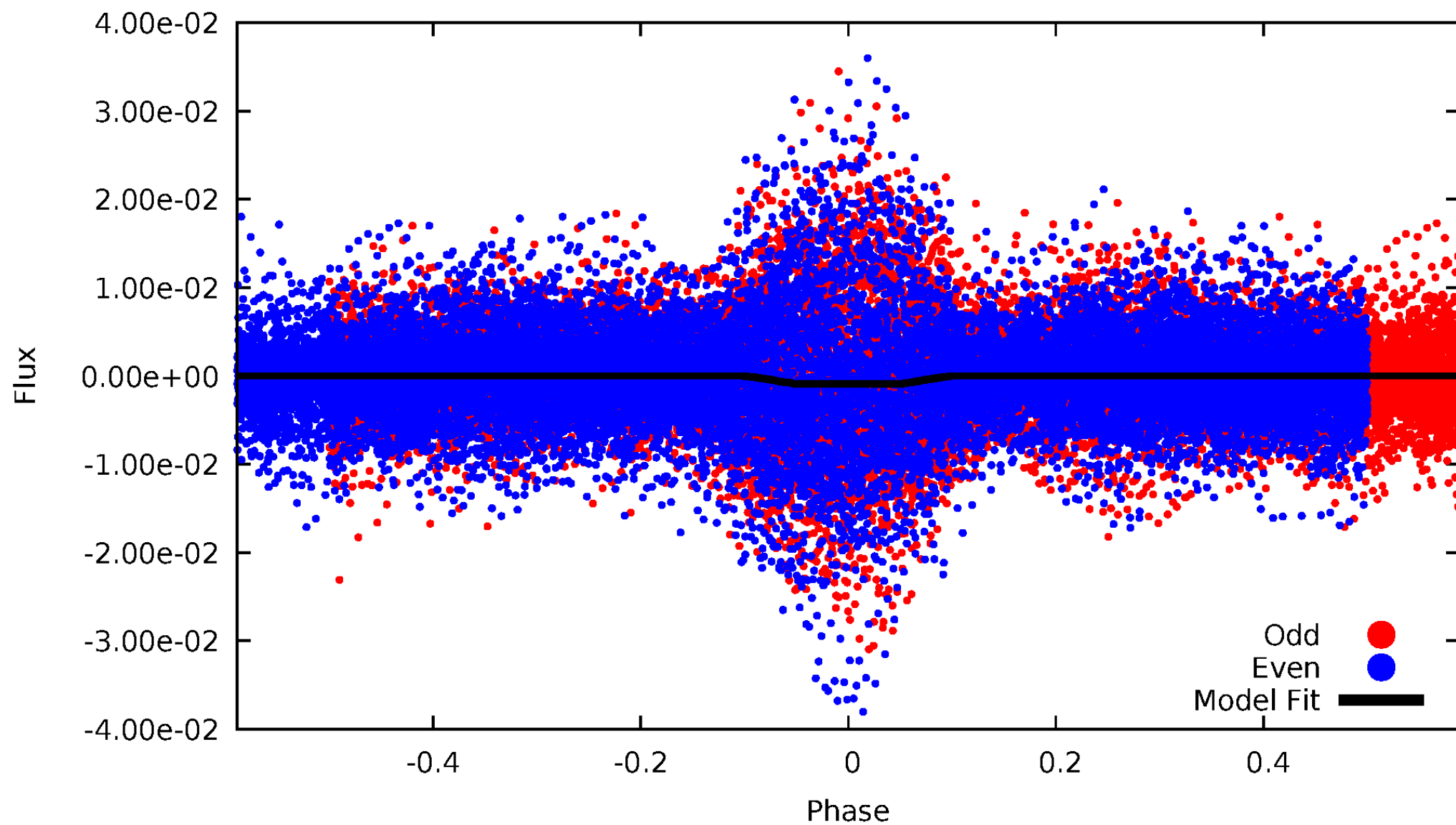
DV Odd/Even

TCE 009936518-02



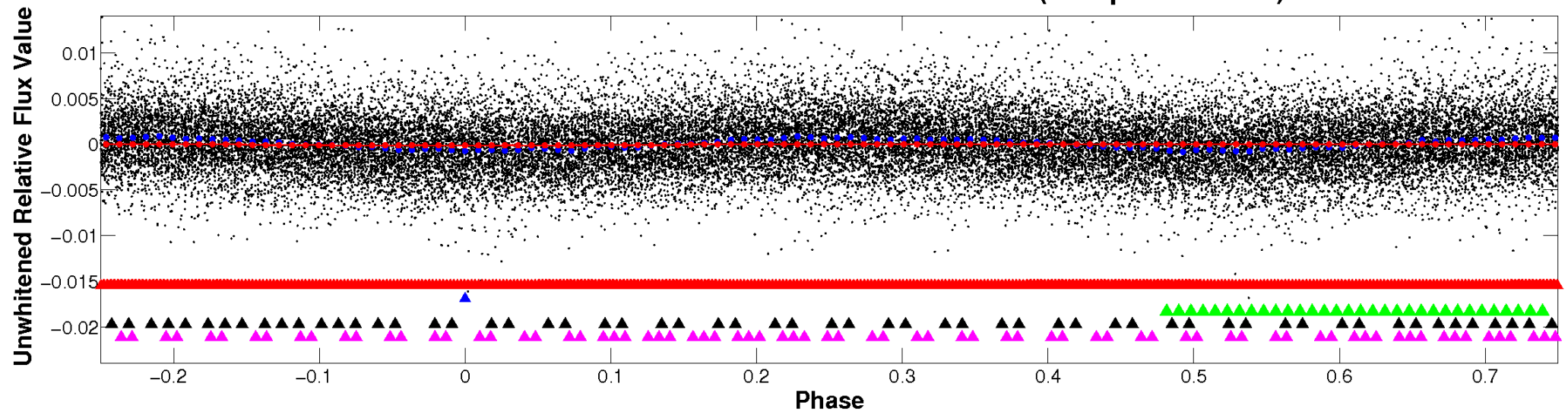
ALT Odd/Even

TCE 009936518-02

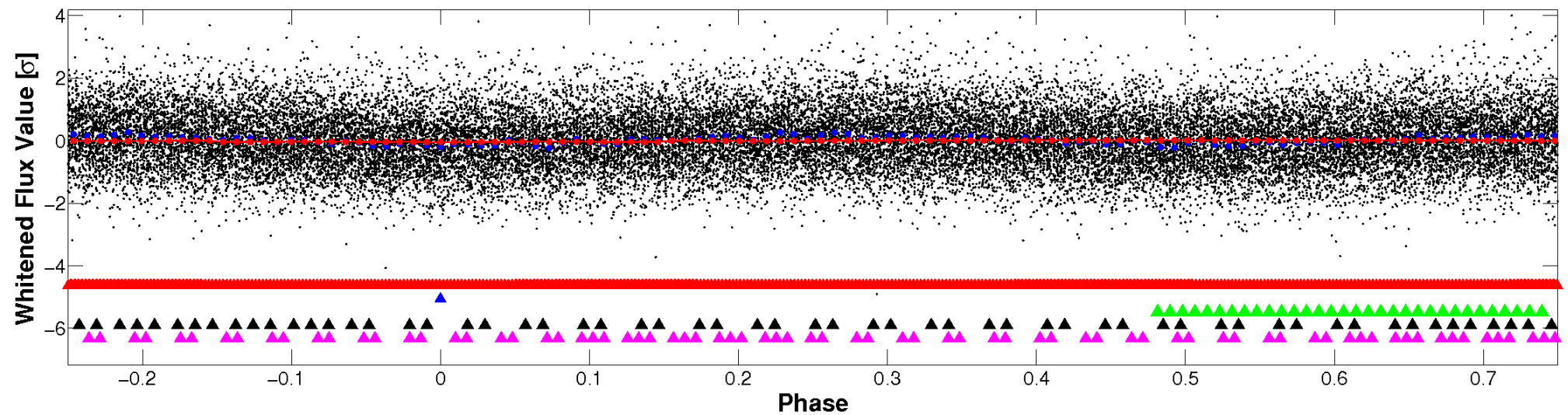


Non-Whitened Vs. Whitened Light Curve

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

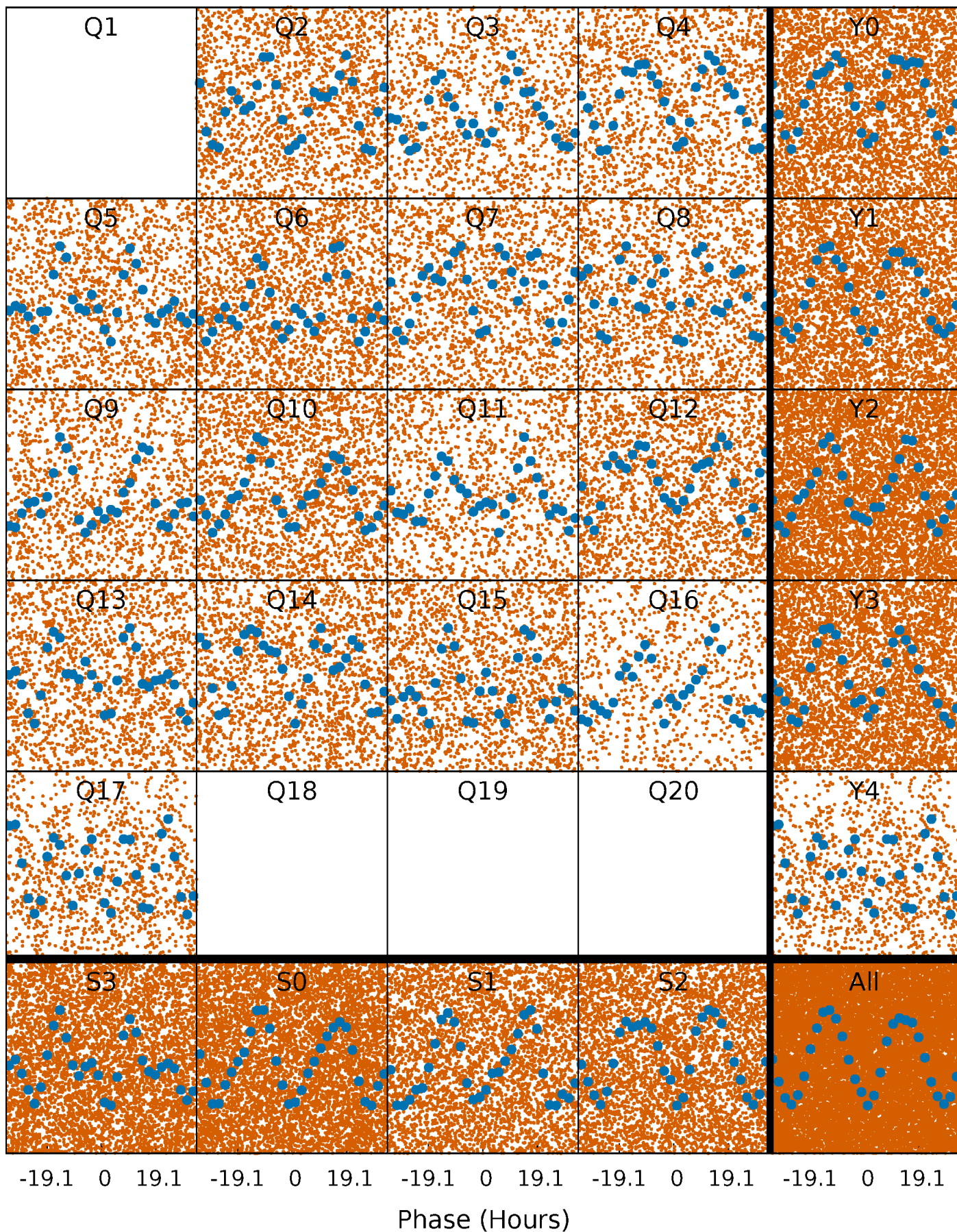


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



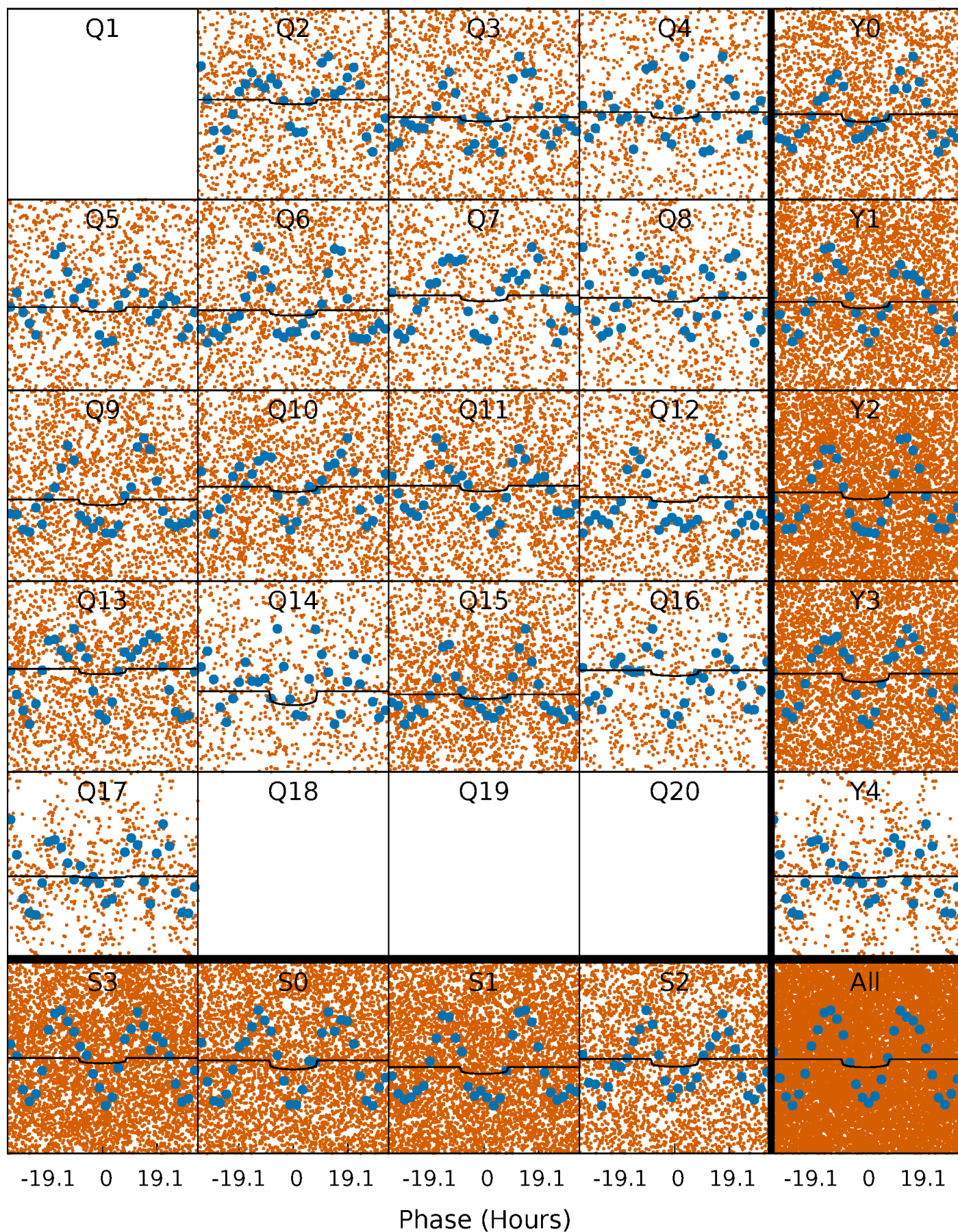
PDC Quarter-Phased Transit Curves

TCE 009936518-02 P= 2.240053 Days $T_0=131.877423$ (BKJD)



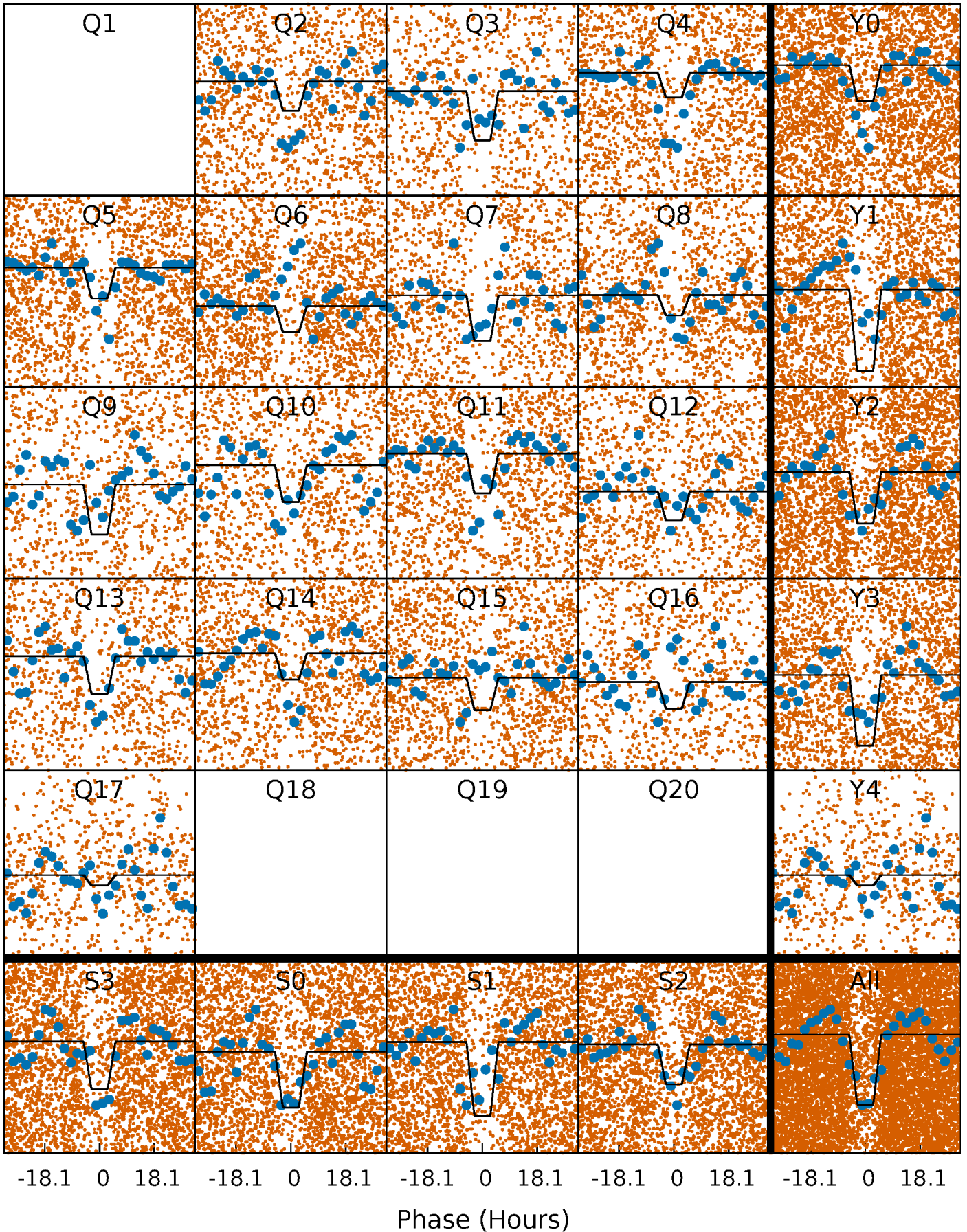
DV Quarter-Phased Transit Curves

TCE 009936518-02 P= 2.240053 Days $T_0=131.877423$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

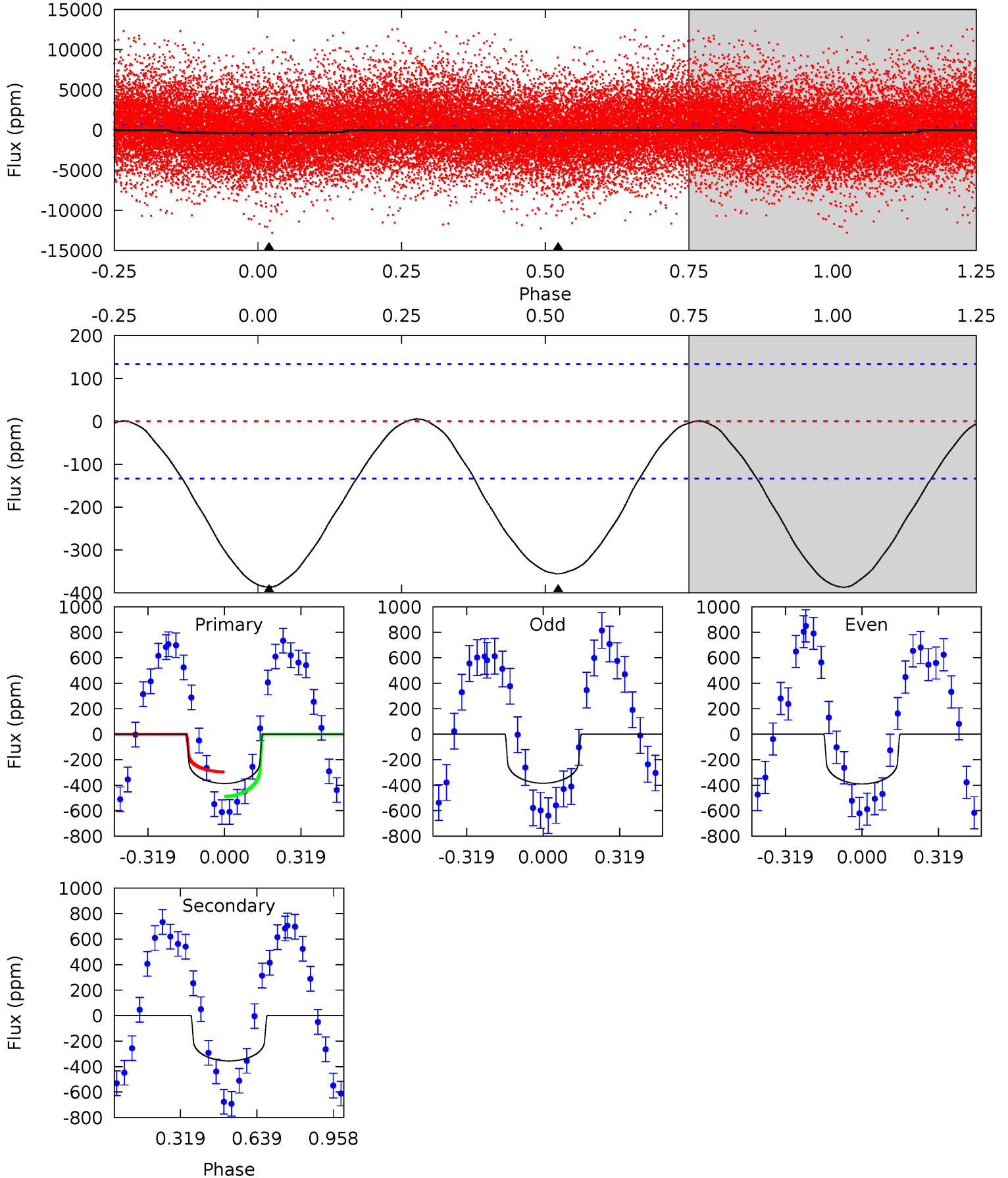
TCE 009936518-02 P= 2.240032 Days $T_0=131.932559$ (BKJD)



DV Model-Shift Uniqueness Test

009936518-02, P = 2.240053 Days, E = 131.877423 Days

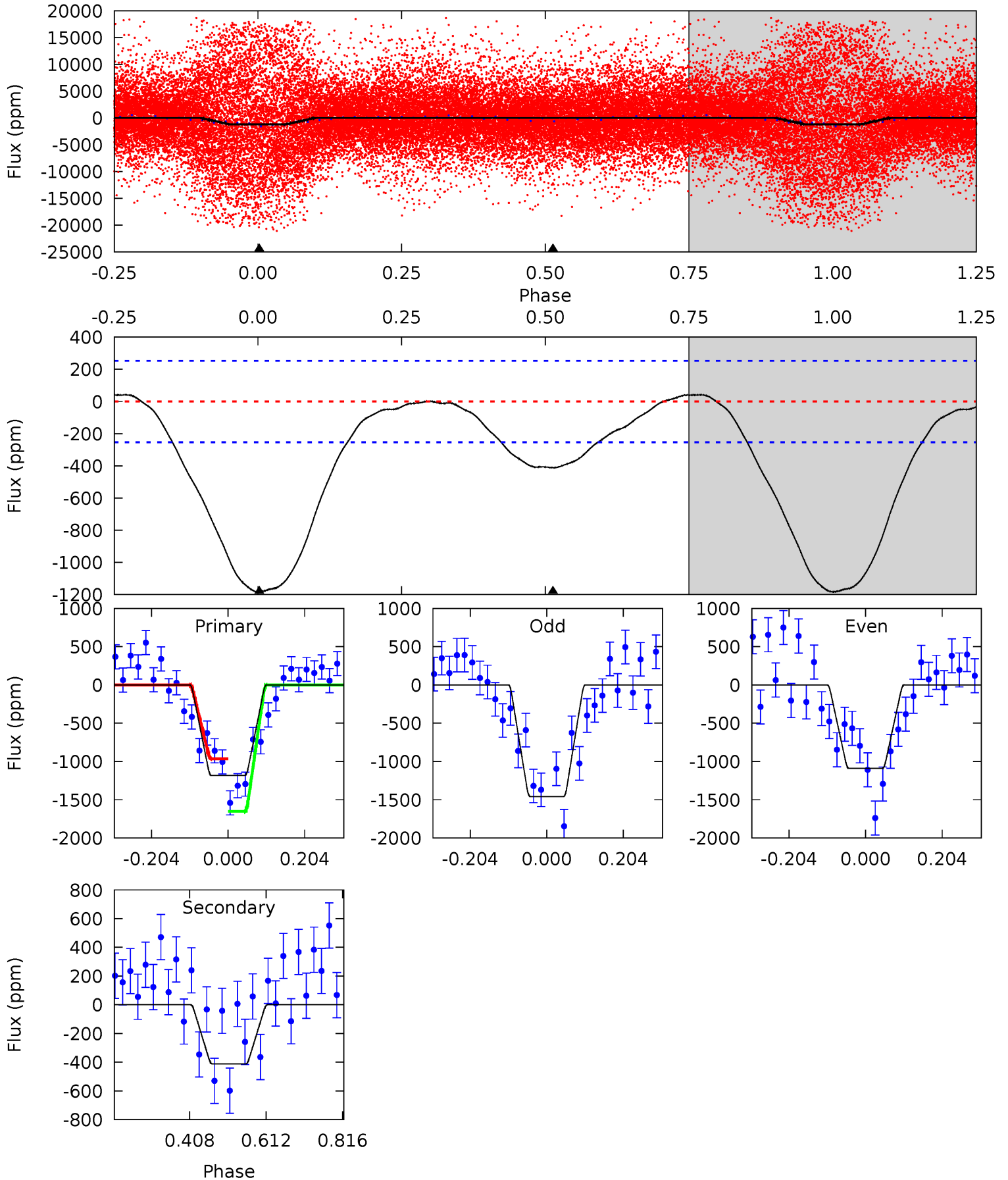
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	11.5	0	0	4.31	1.00	0.14	12.5	12.5	11.5	11.5	0.09	0.76	0.01	3.24



Alt Model-Shift Uniqueness Test

009936518-02, P = 2.240032 Days, E = 131.932559 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.6	7.18	0	0	4.41	1.27	0.59	20.6	20.6	7.18	7.18	3.17	1.40	0.03	6.02



Stellar Parameters For KIC 009936518

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7207^{+200}_{-343}	$4.203^{+0.090}_{-0.210}$	$0.070^{+0.200}_{-0.350}$	$1.620^{+0.565}_{-0.242}$	$1.528^{+0.211}_{-0.233}$	$0.506^{+0.244}_{-0.259}$
	+3%/-5%	+2%/-5%	+286%/-500%	+35%/-15%	+14%/-15%	+48%/-51%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009936518-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-355 ± 31	$2.25^{+1.84}_{-1.39}$	2906^{+229}_{-175}	9300^{+13253}_{-2662}	58^{+323}_{-41}
Alt.	-412 ± 57	$5.54^{+2.25}_{-1.93}$	2905^{+247}_{-178}	5766^{+1422}_{-749}	11^{+14}_{-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 $A_{obs} \gg 1.0$

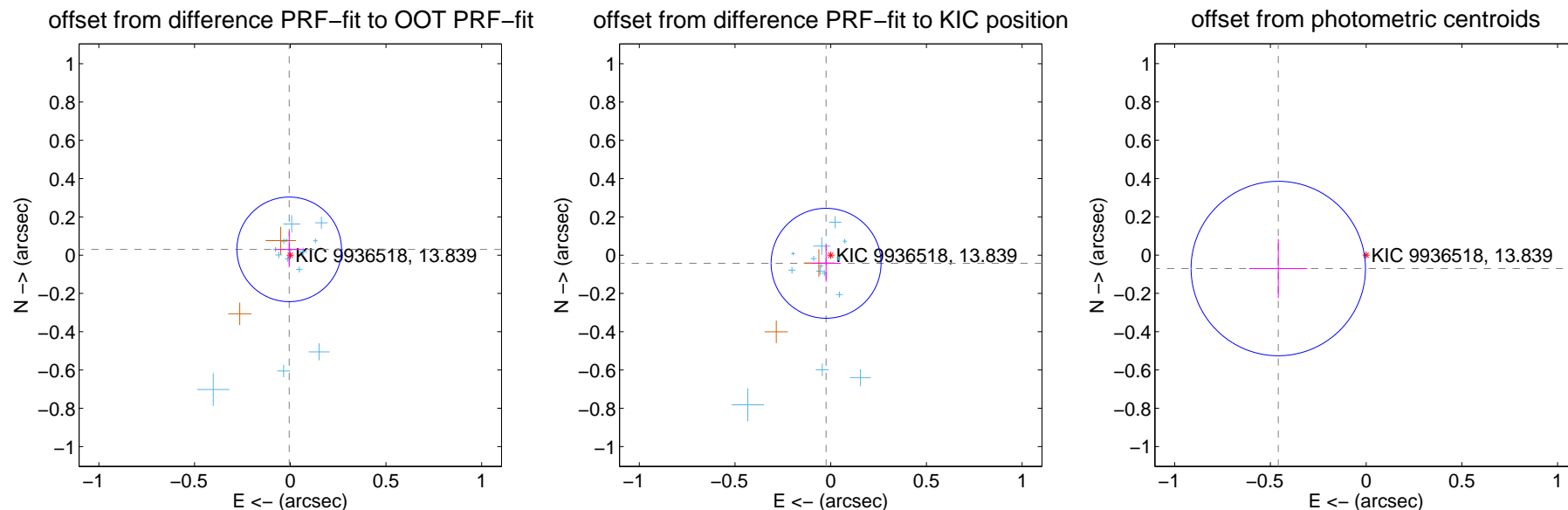
DV Centroid Data

Supplemental centroid analysis for 009936518-02. Kepler magnitude: 13.84. Transit SNR 4.16

There are 14 quarters with good PRF difference image offsets

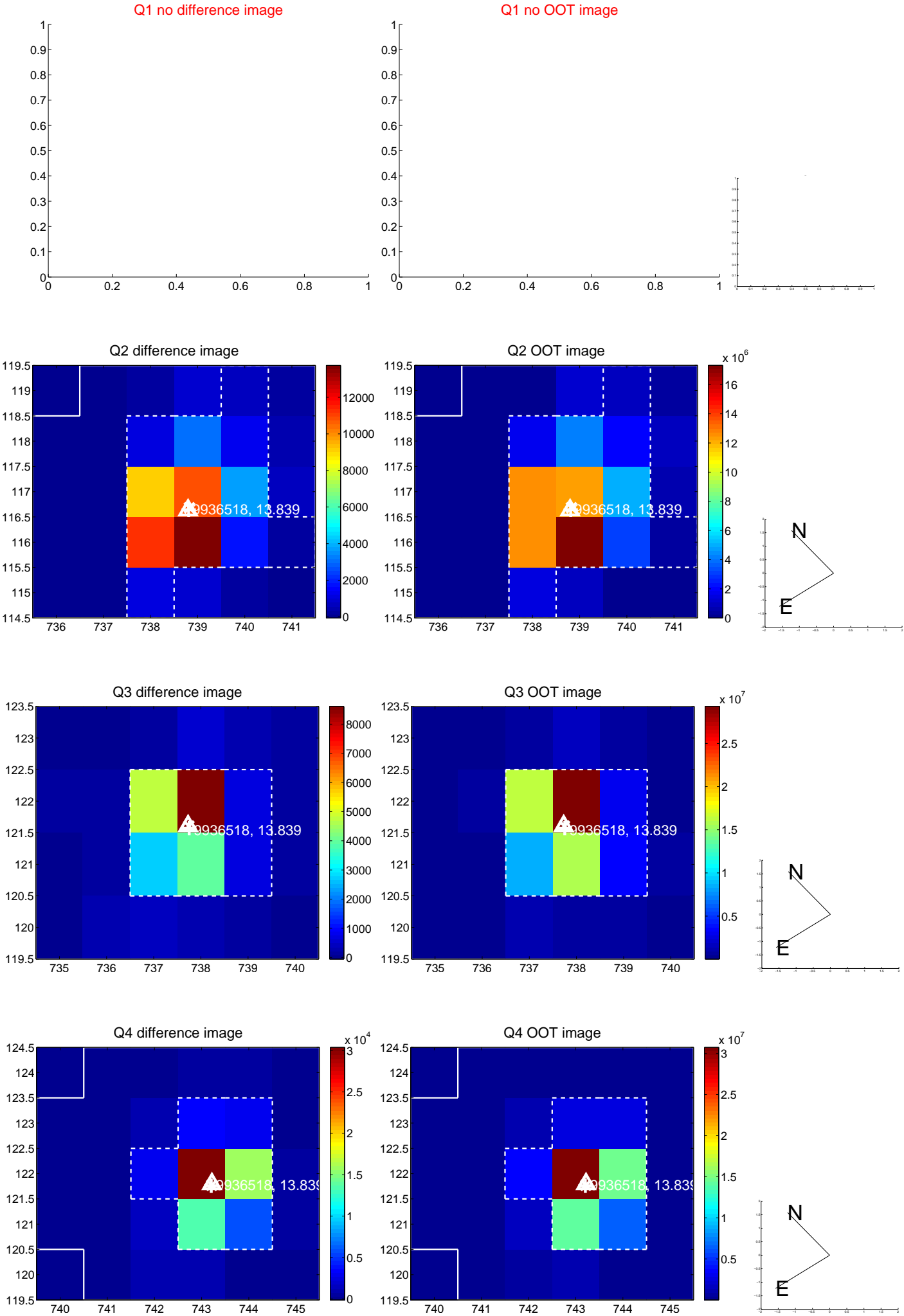
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.031 ± 0.091	0.34	0.006 ± 0.075	0.030 ± 0.094
PRF-fit source offset from KIC position	0.049 ± 0.096	0.51	0.024 ± 0.075	-0.042 ± 0.097
photometric centroid source offset	0.46 ± 0.15	3.06	0.46 ± 0.15	-0.07 ± 0.15

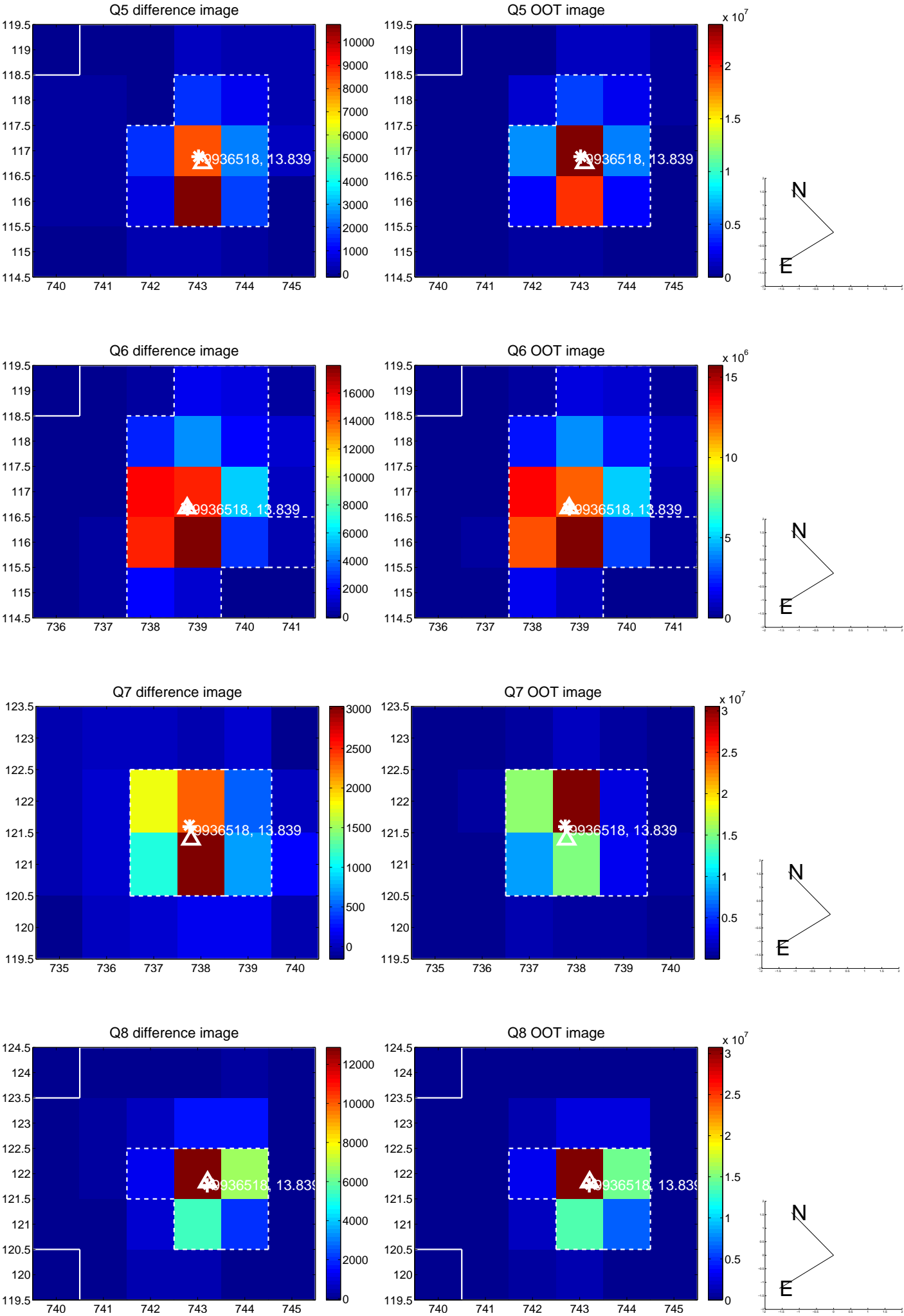


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

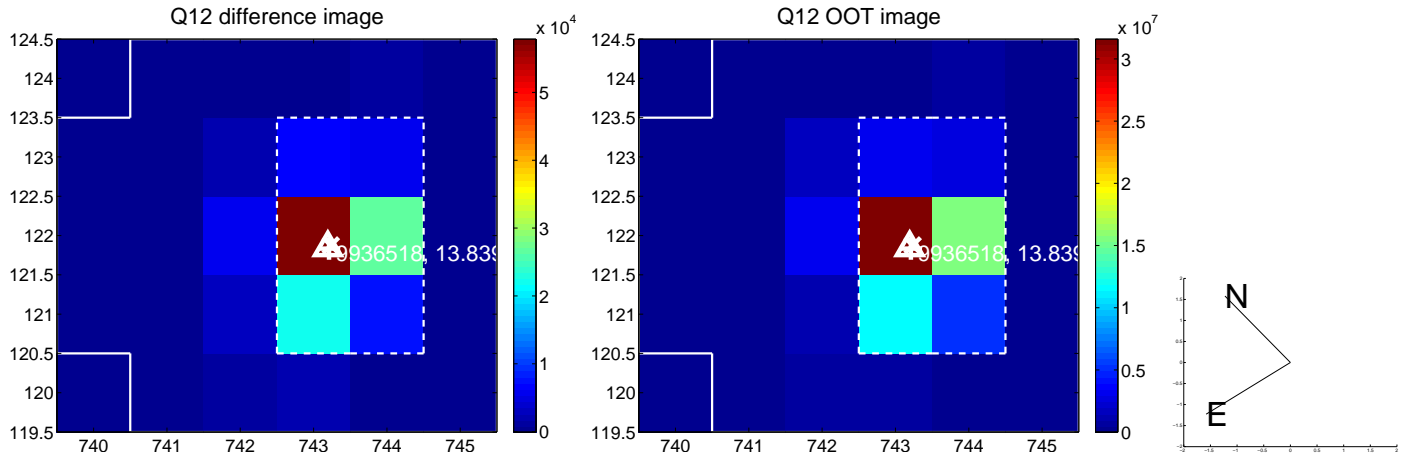
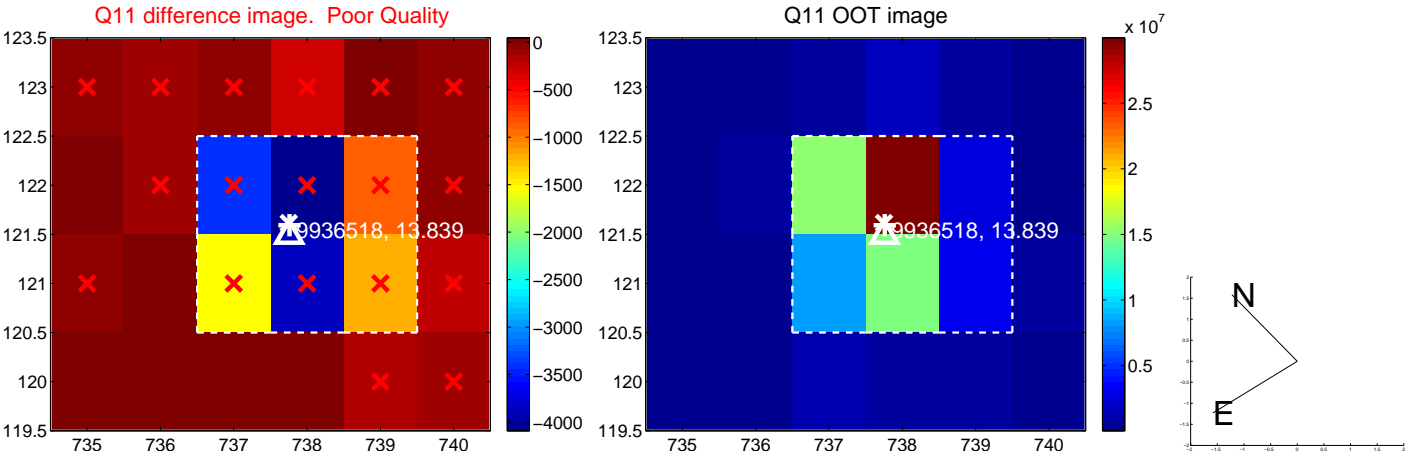
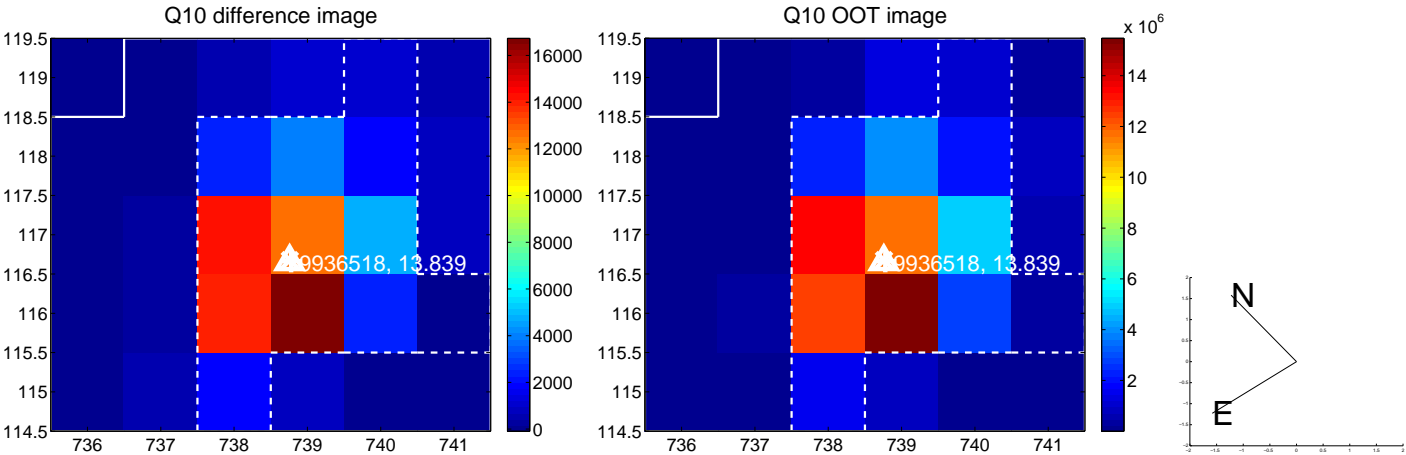
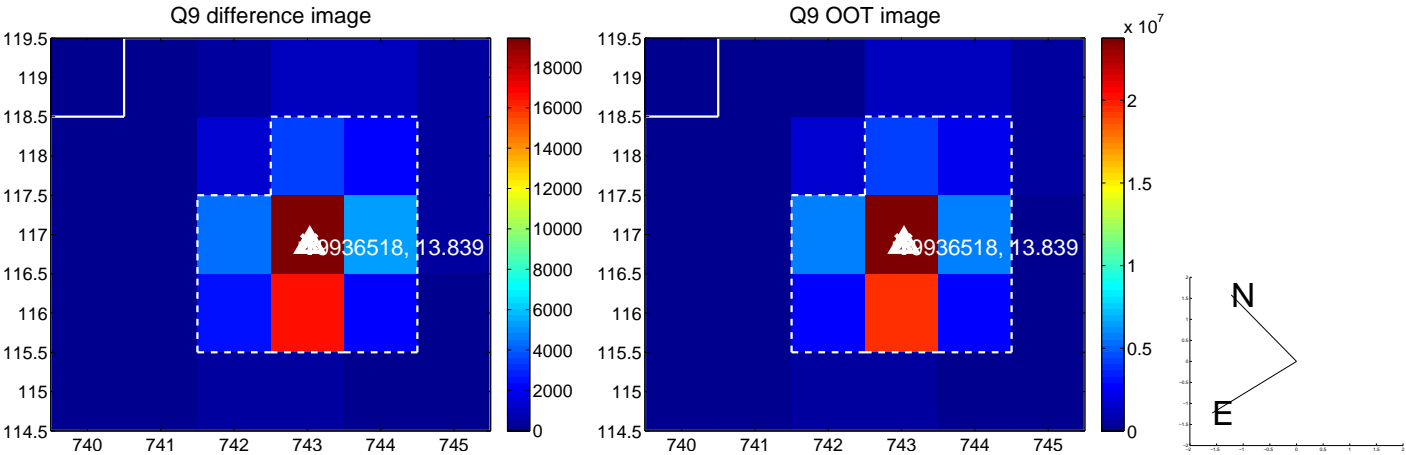
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



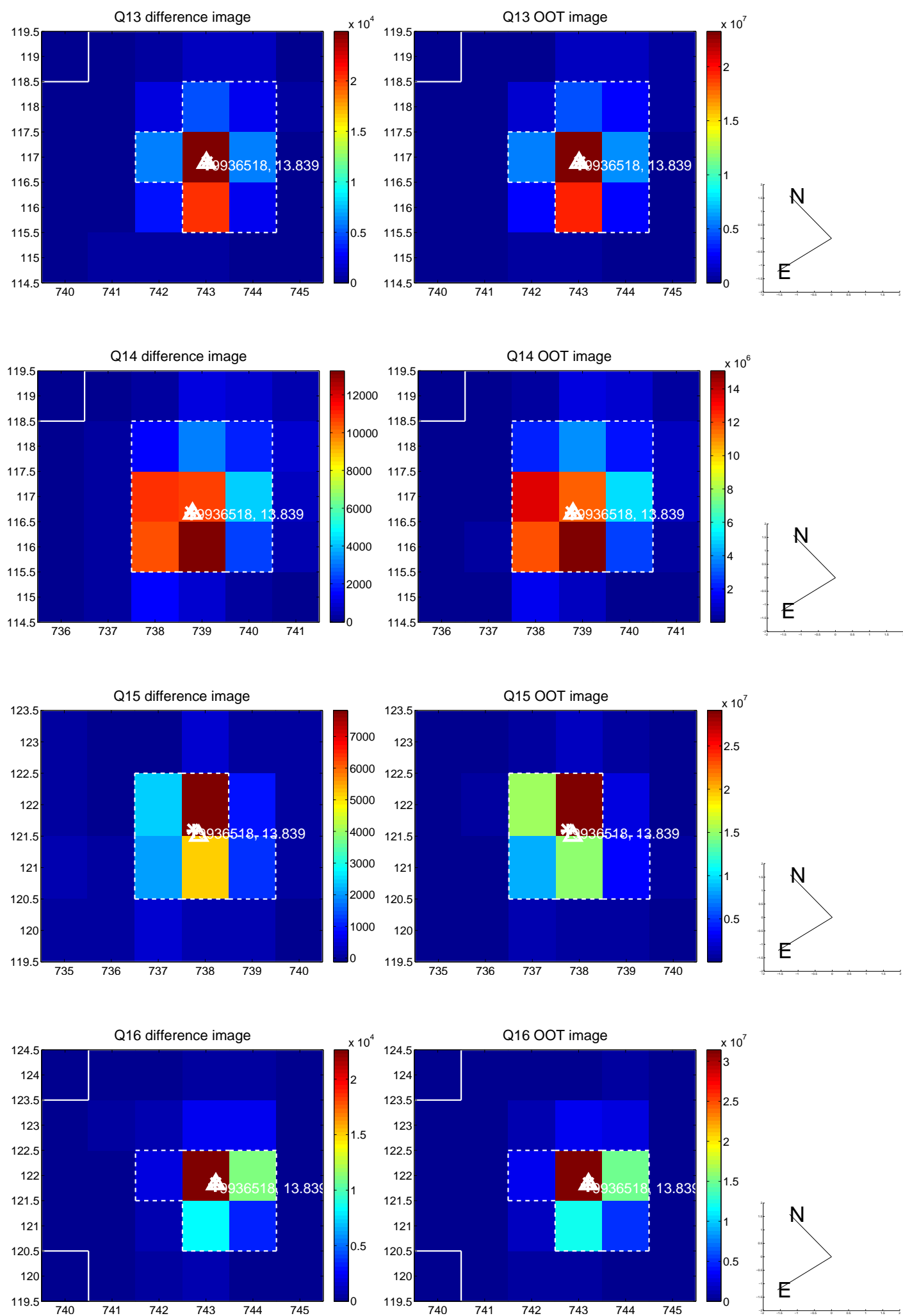
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



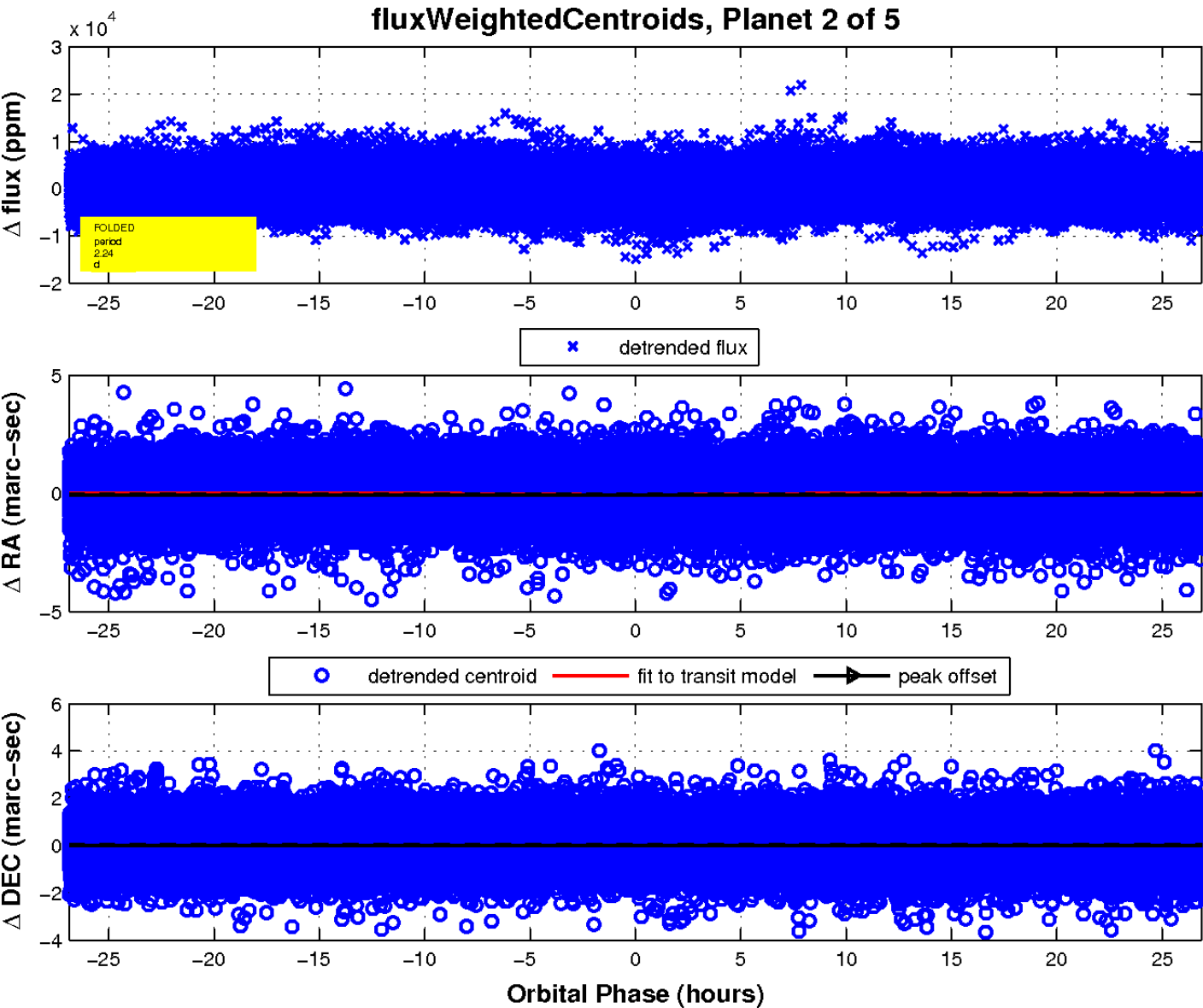
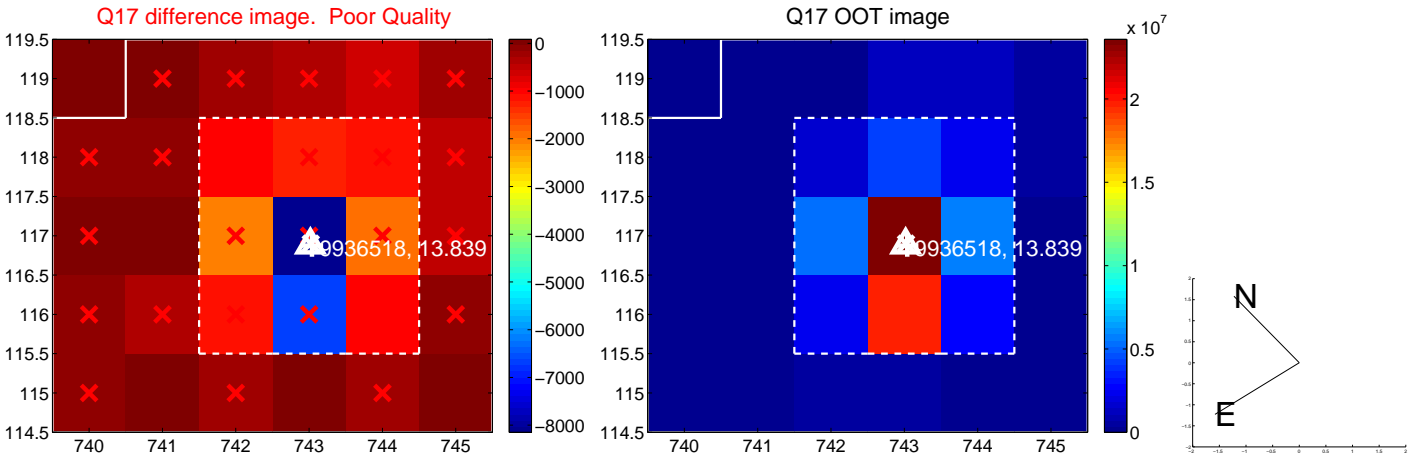
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

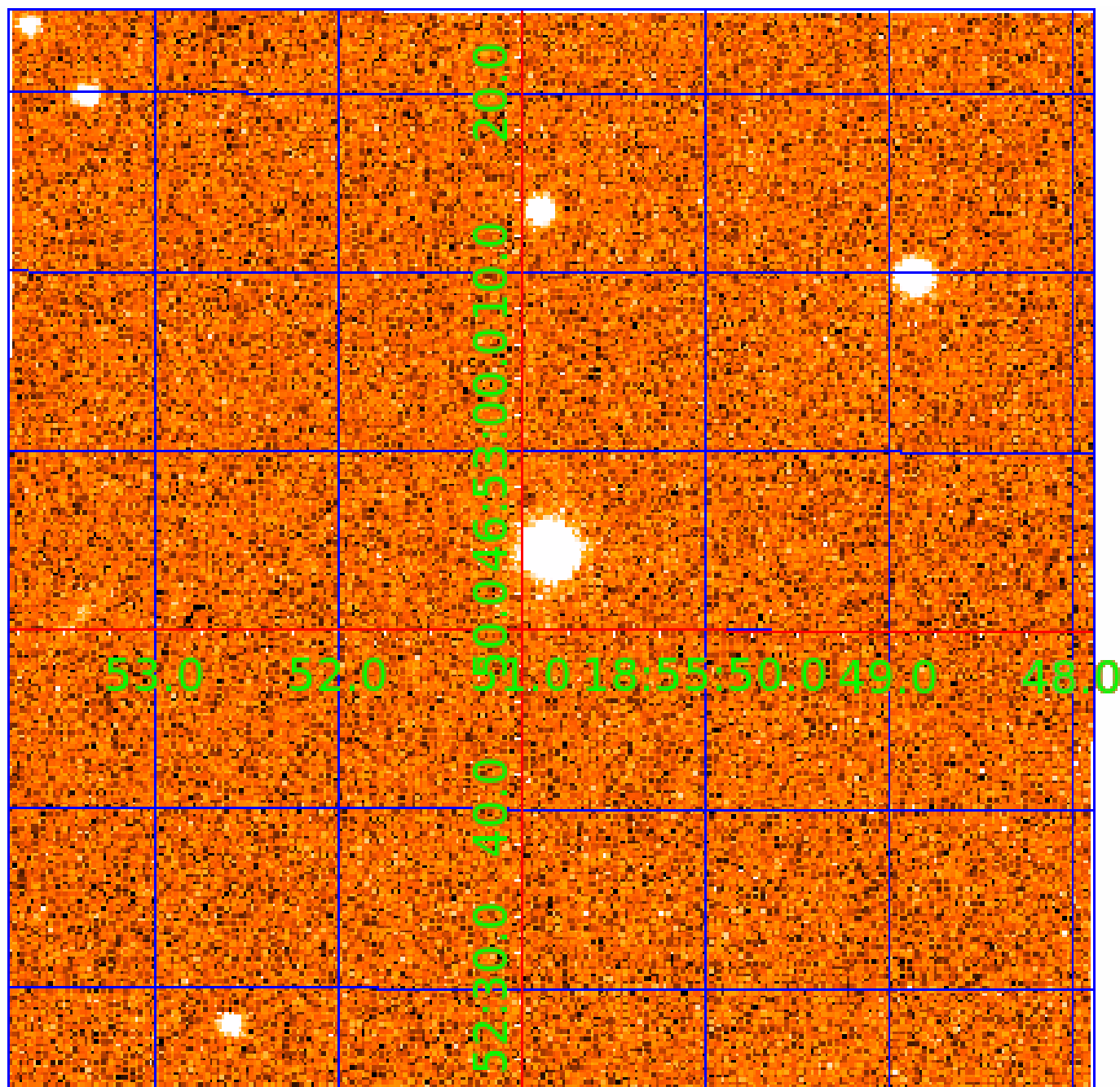


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009936518

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})
009936518-01	OBS	No	1.495179	131.991885	433.7	5.411	13.1	11.1	1.62	7207	4.83	7300.15
009936518-02	OBS	No	2.240053	131.877423	121.3	16.732	8.5	4.2	1.62	7207	1.83	4258.38
009936518-04	OBS	No	24.727747	153.534209	2703.8	1.840	9.8	10.4	1.62	7207	9.75	173.25
009936518-05	OBS	No	19.074897	143.290272	2663.9	2.006	8.5	9.0	1.62	7207	12.65	244.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009936518-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009936518-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV
009936518-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009936518-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

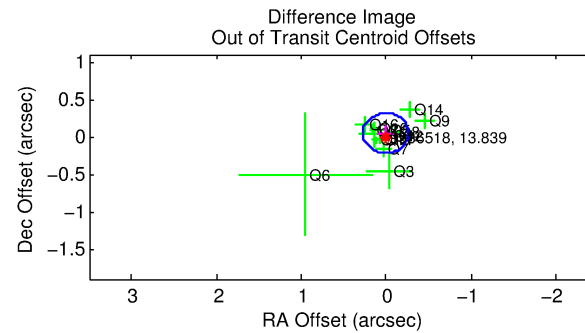
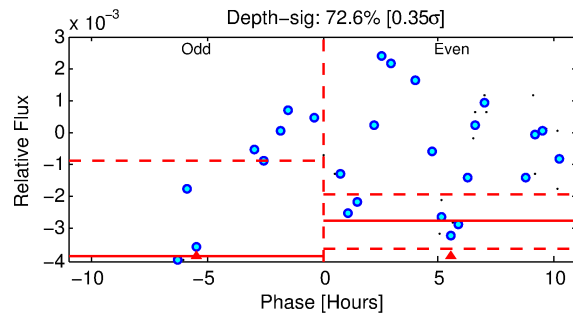
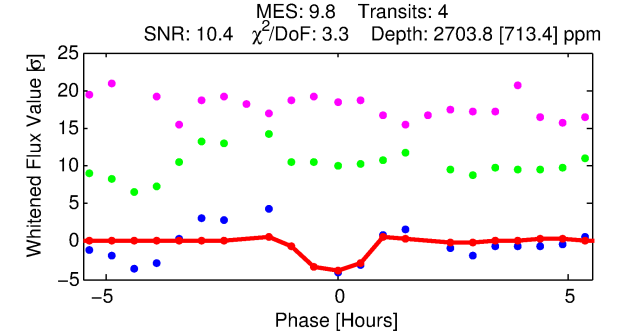
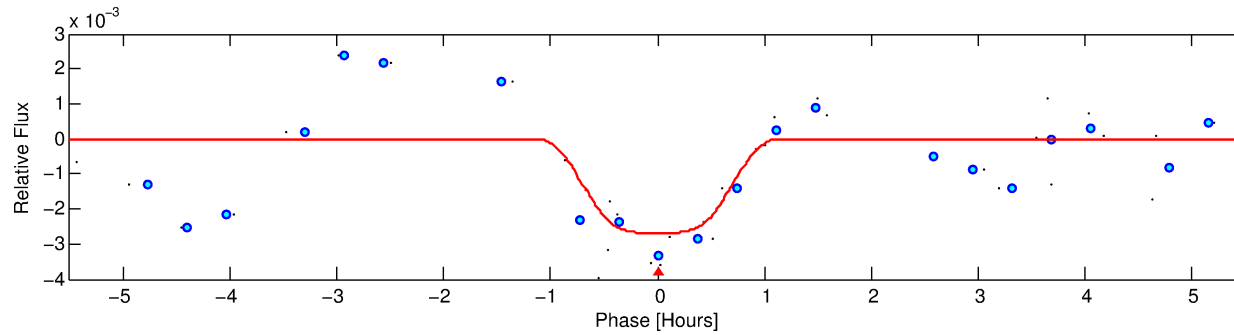
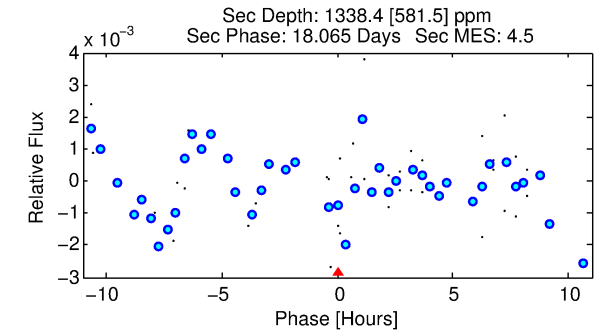
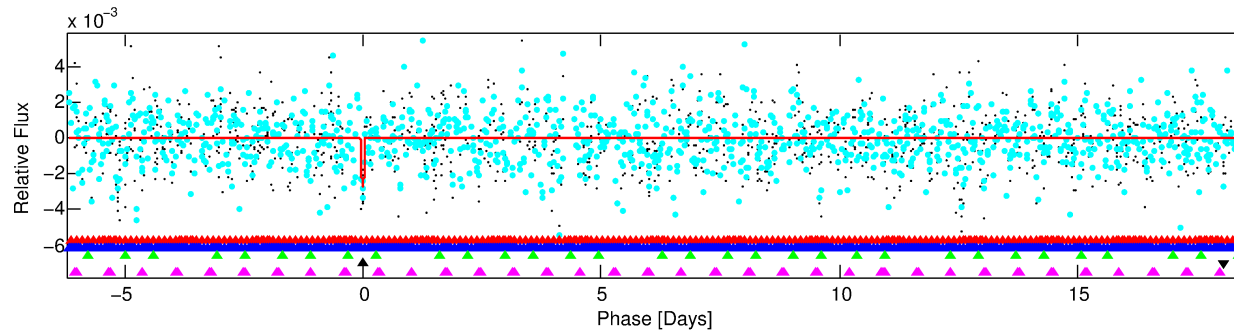
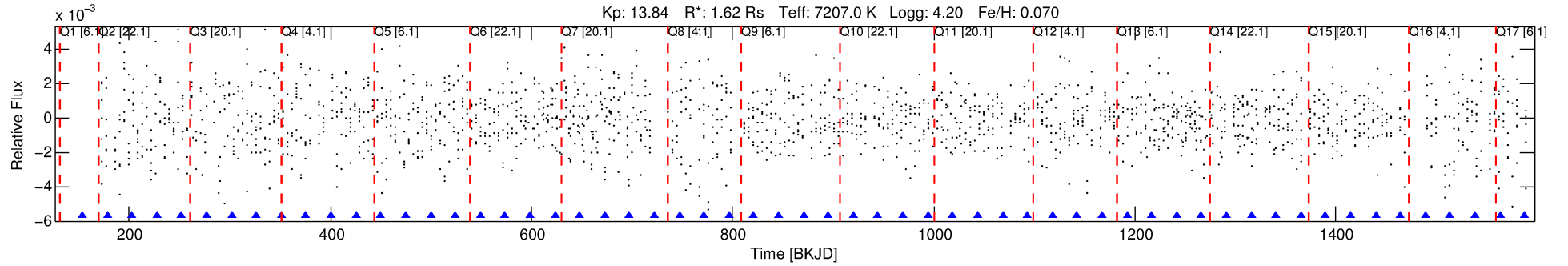
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009936518-04

No Significant Match Found

DV One-Page Summary

KIC: 9936518 Candidate: 4 of 5 Period: 24.728 d



DV Fit Results:

Period = 24.72775 [0.00040] d
Epoch = 153.5342 [0.0148] BKJD
Rp/R* = 0.0552 [0.0177]
a/R* = 58.16 [83.95]
b = 0.89 [0.33]
Seff = 173.25 [76.35]
Teq = 925 [102] K
Rp = 9.75 [4.62] Re
a = 0.1914 [0.0541] AU
Ag = 283.52 [246.59] [1.15σ]
Teffp = 5869 [1169] K [4.21σ]

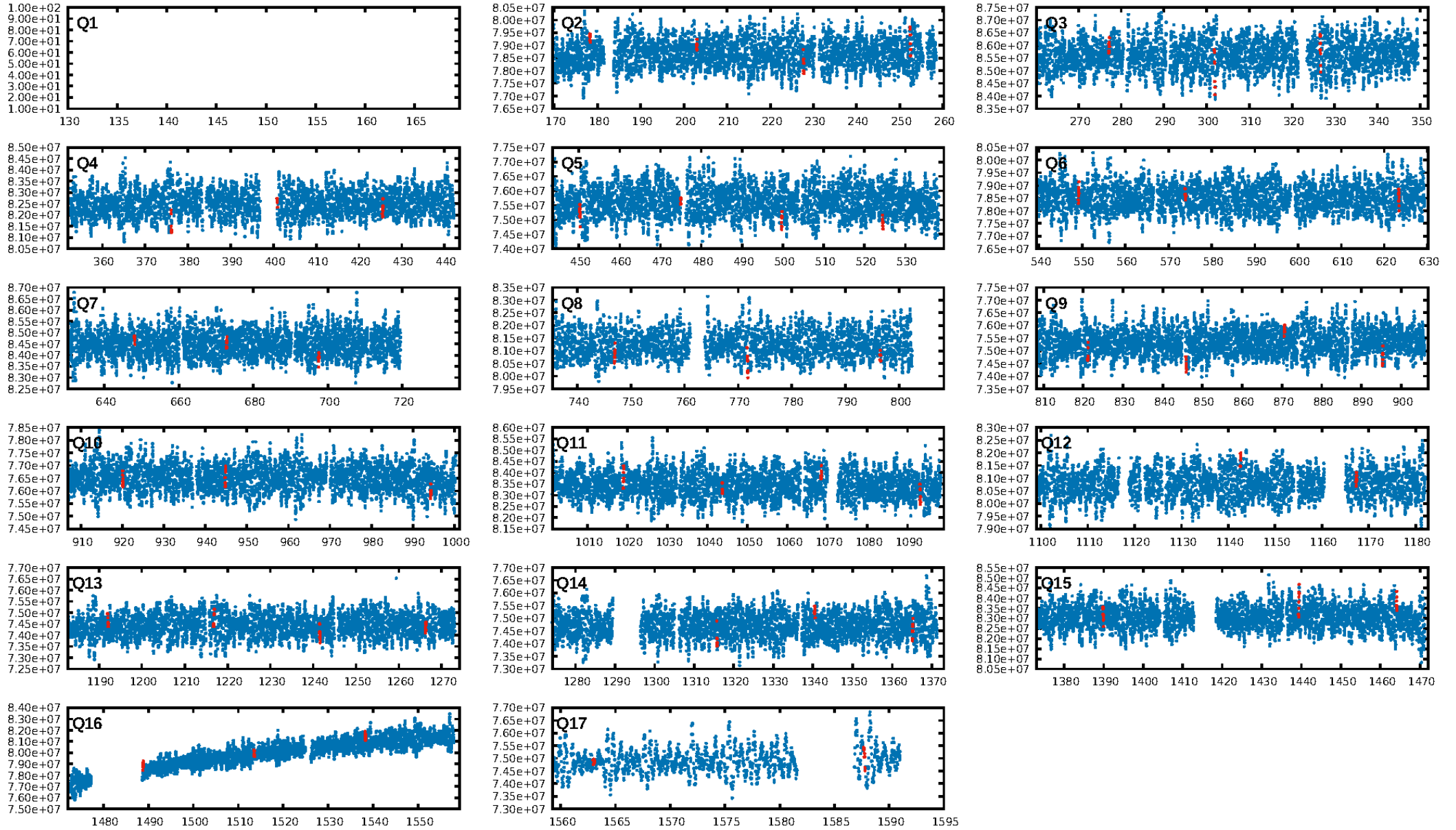
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [49.85σ]
LongPeriod-sig: 100.0% [159.93σ]
ModelChiSquare2-sig: 9.0%
ModelChiSquareGof-sig: 89.7%
Bootstrap-pfa: 3.71e-04
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 4.111
Centroid-sig: 51.0%
Centroid-so: 0.104 arcsec [1.41σ]
OotOffset-rm: 0.048 arcsec [0.53σ]
KicOffset-rm: 0.057 arcsec [0.58σ]
OotOffset-st: 4/4/4/3 [15]
KicOffset-st: 4/4/4/3 [15]
DiffImageQuality-fgm: 0.47 [7/15]
DiffImageOverlap-fno: 0.38 [6/16]

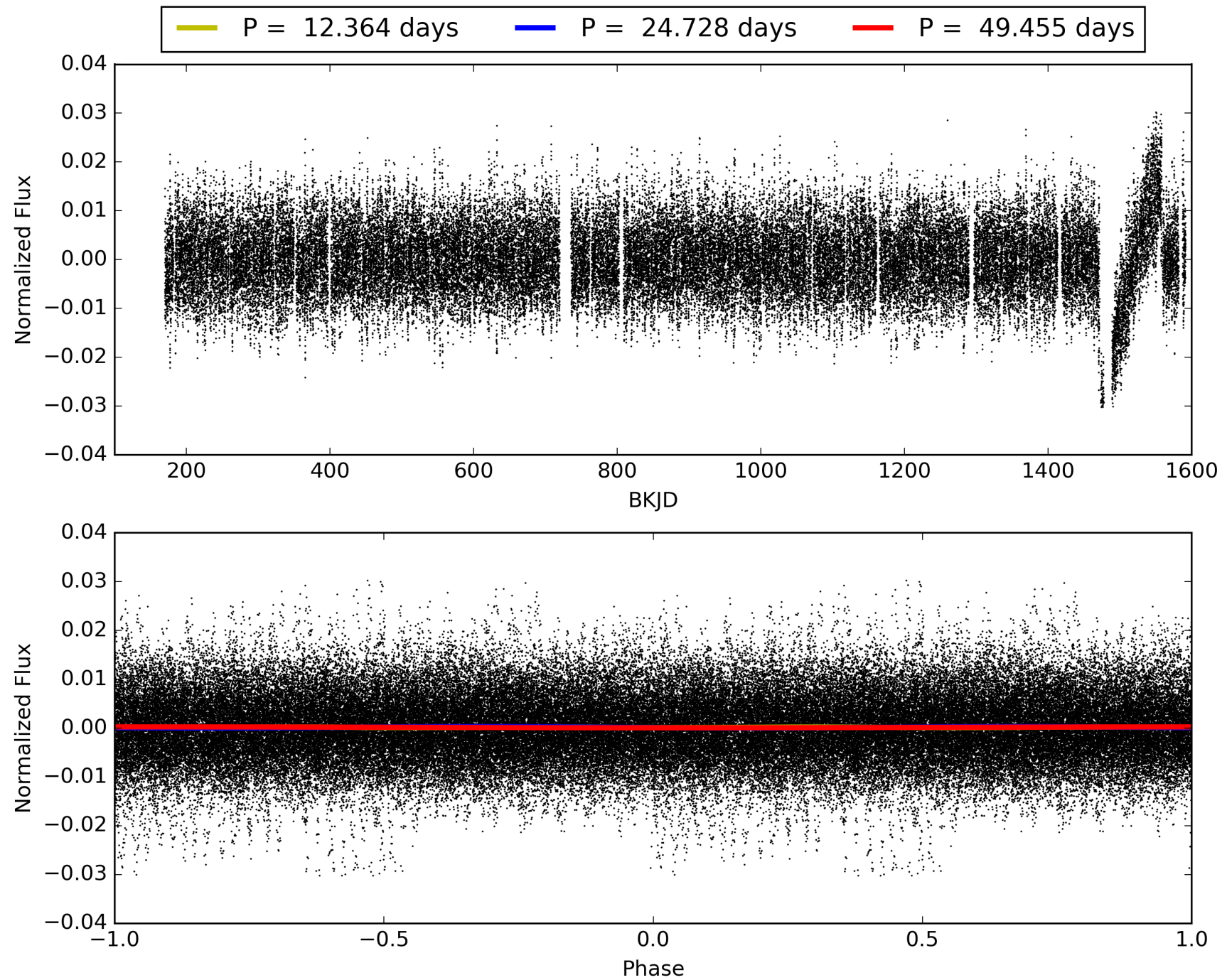
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:29:26 Z

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

TCE 009936518-04, PDC Light Curves

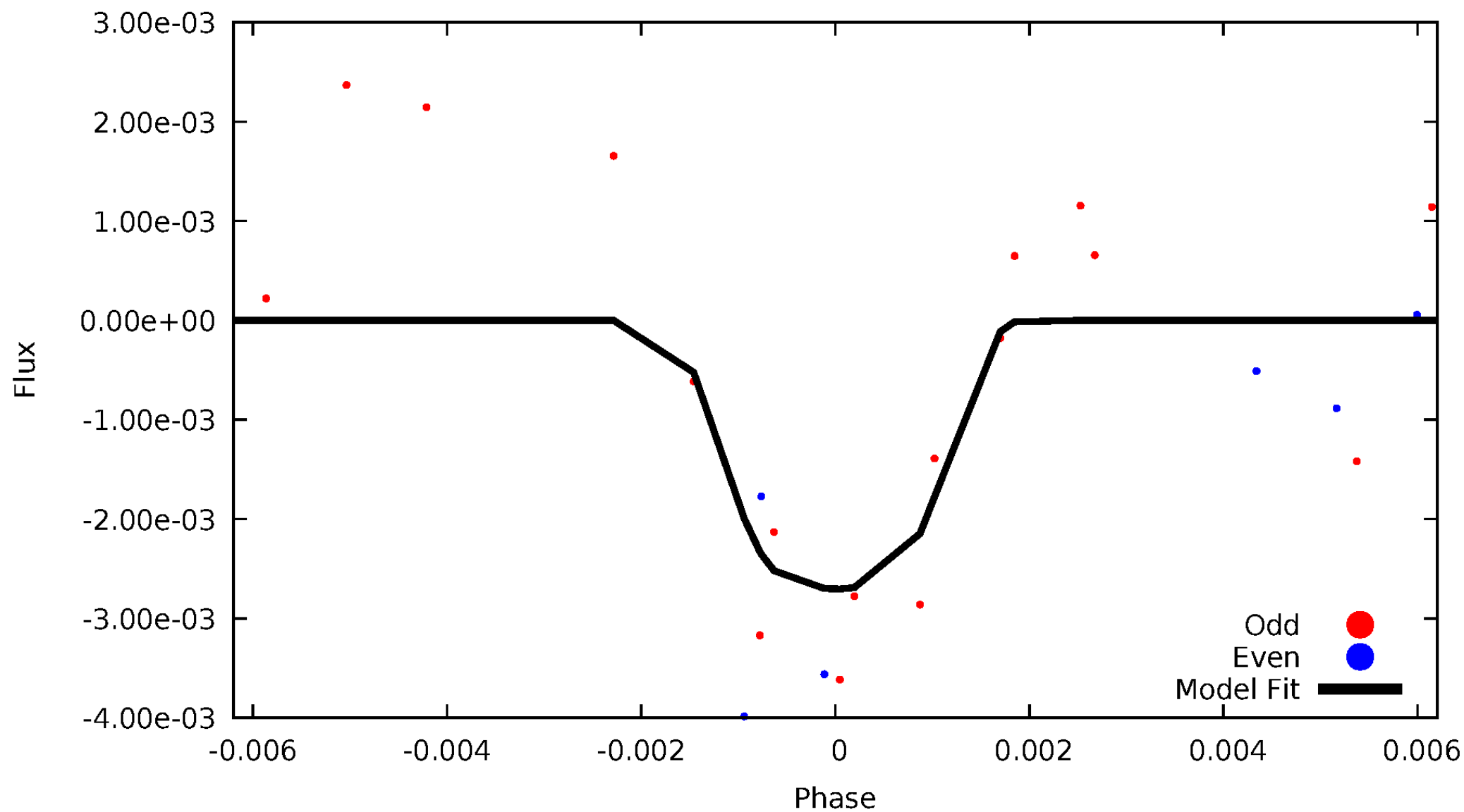


TCE 009936518-04



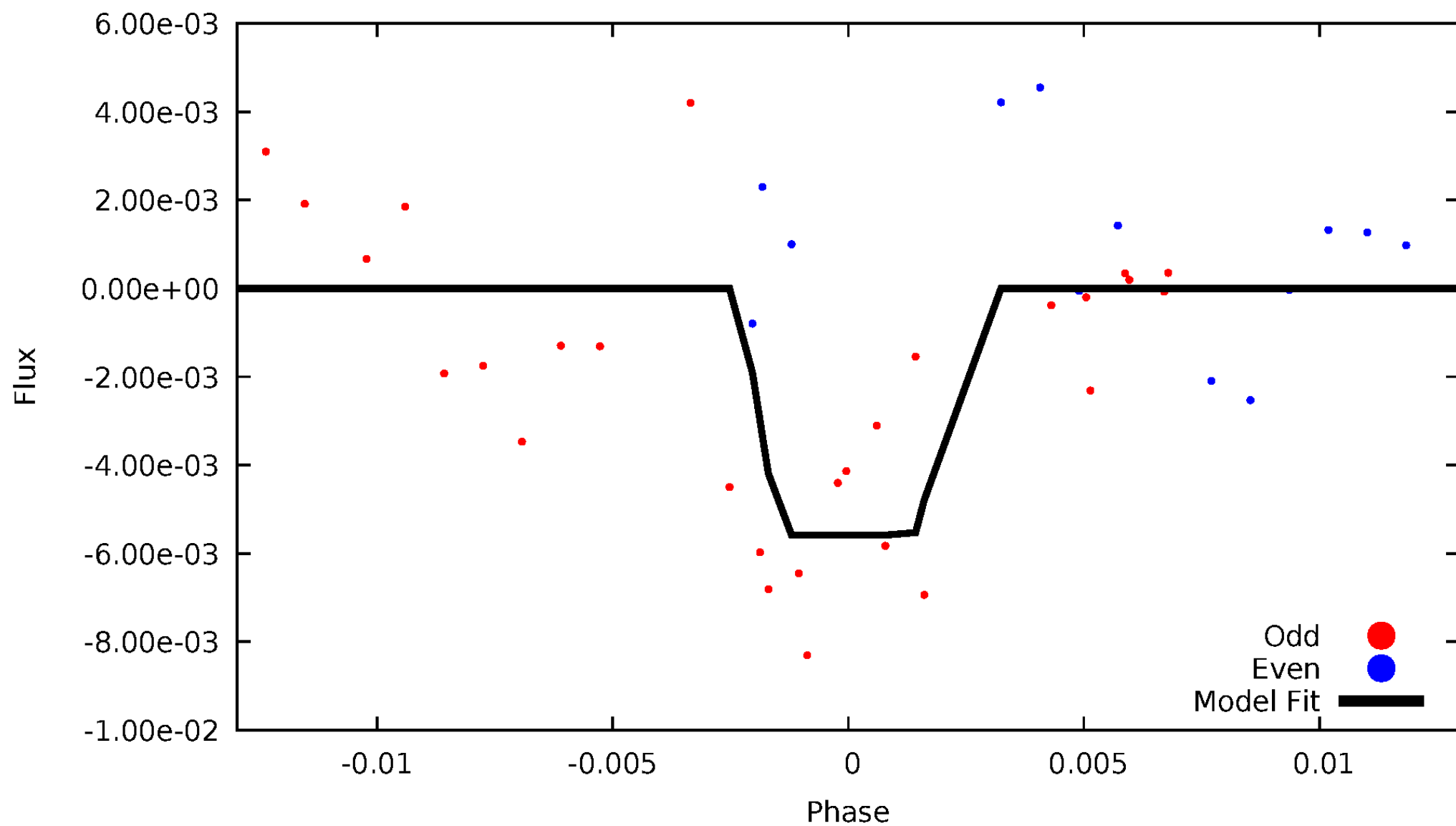
DV Odd/Even

TCE 009936518-04



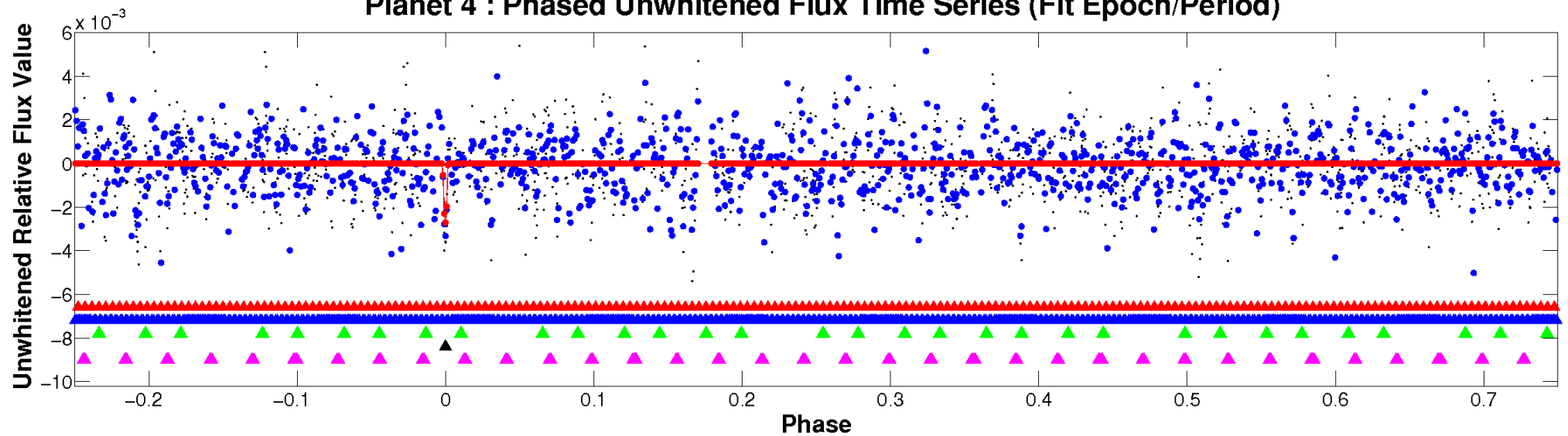
ALT Odd/Even

TCE 009936518-04

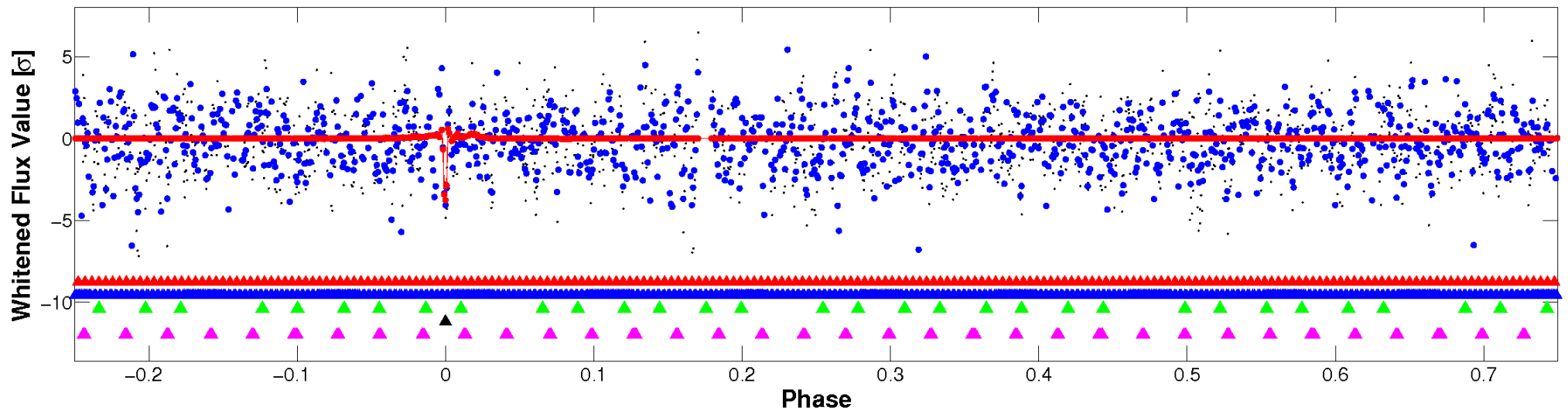


Non-Whitened Vs. Whitened Light Curve

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

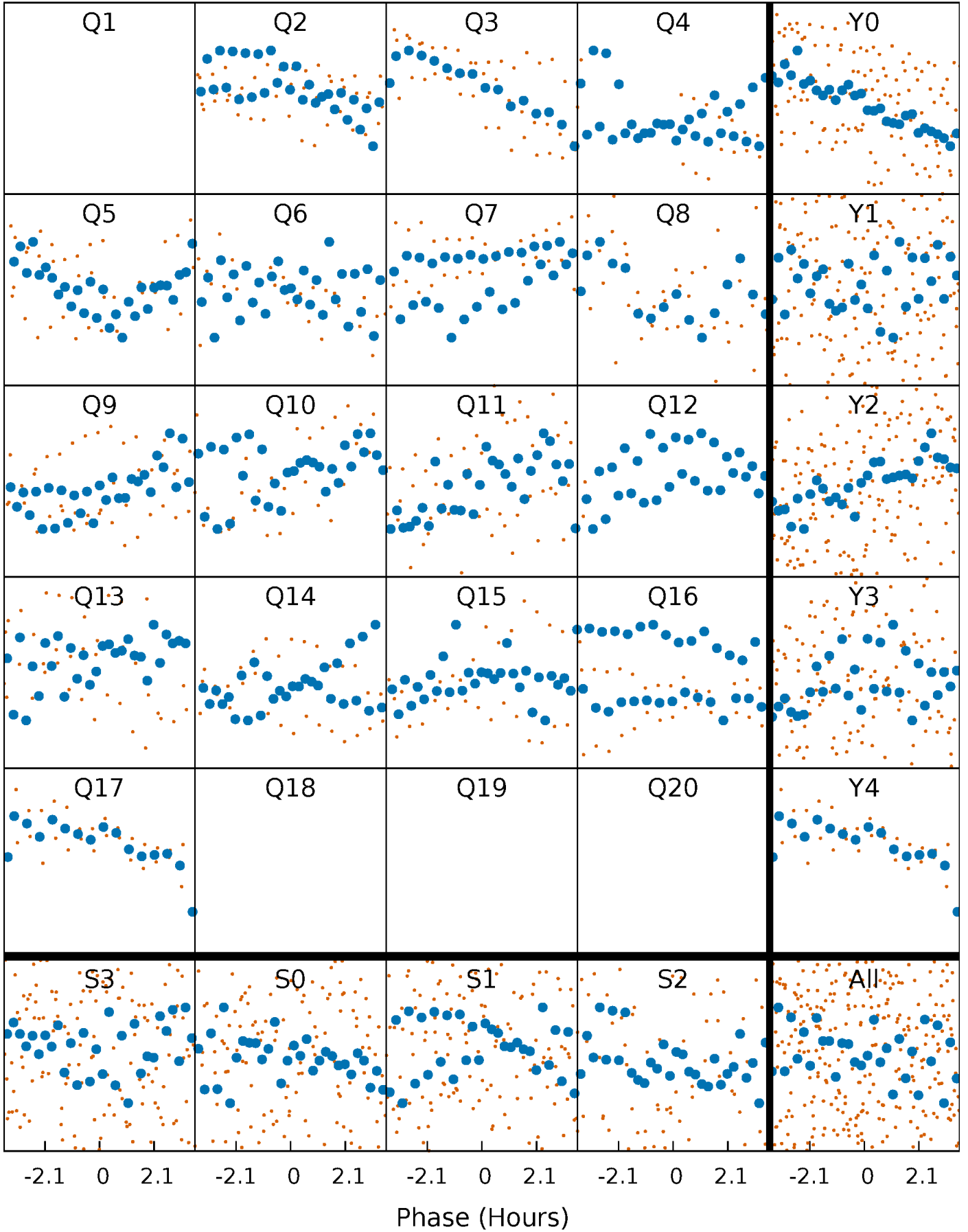


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



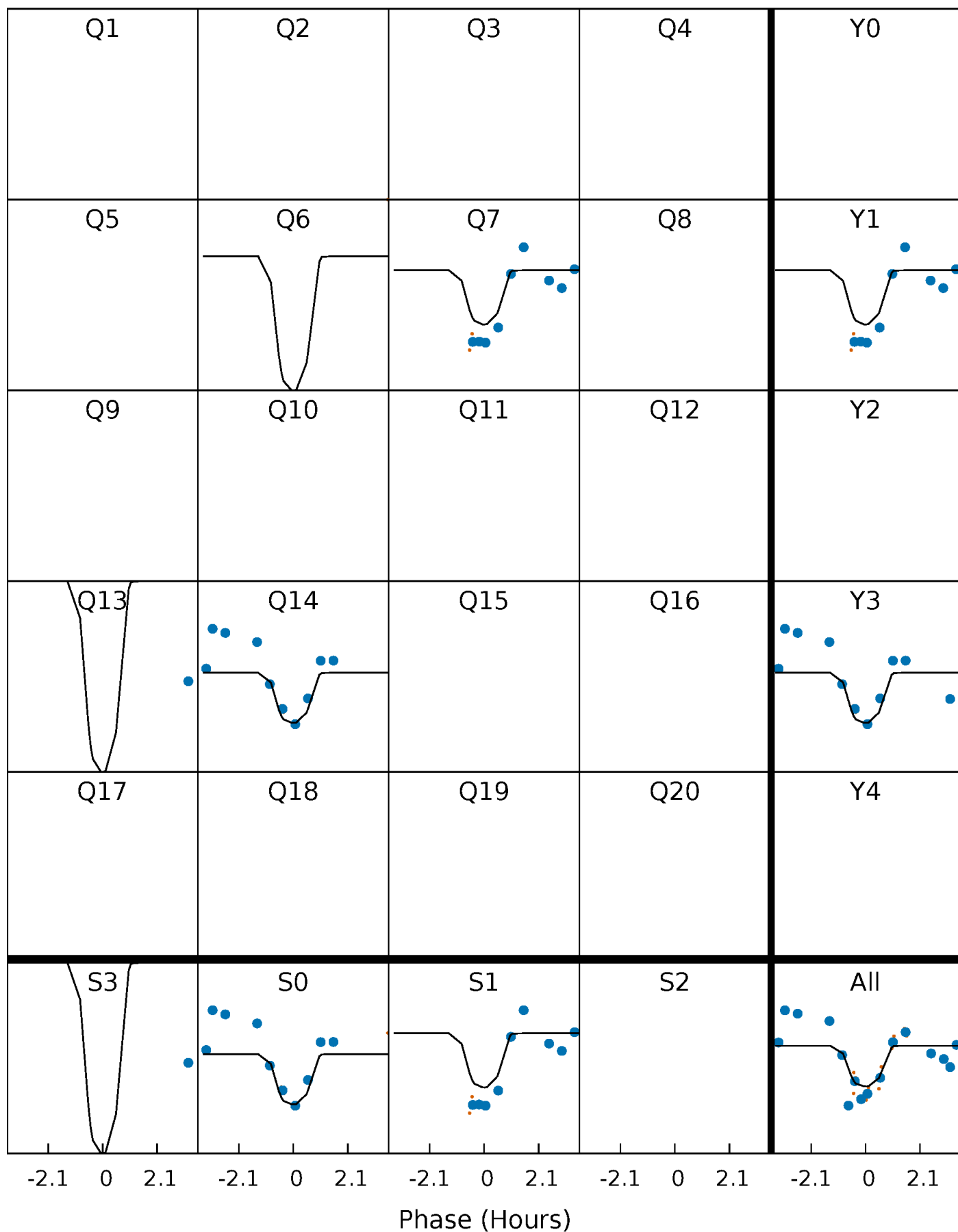
PDC Quarter-Phased Transit Curves

TCE 009936518-04 P= 24.727747 Days $T_0=153.534209$ (BKJD)



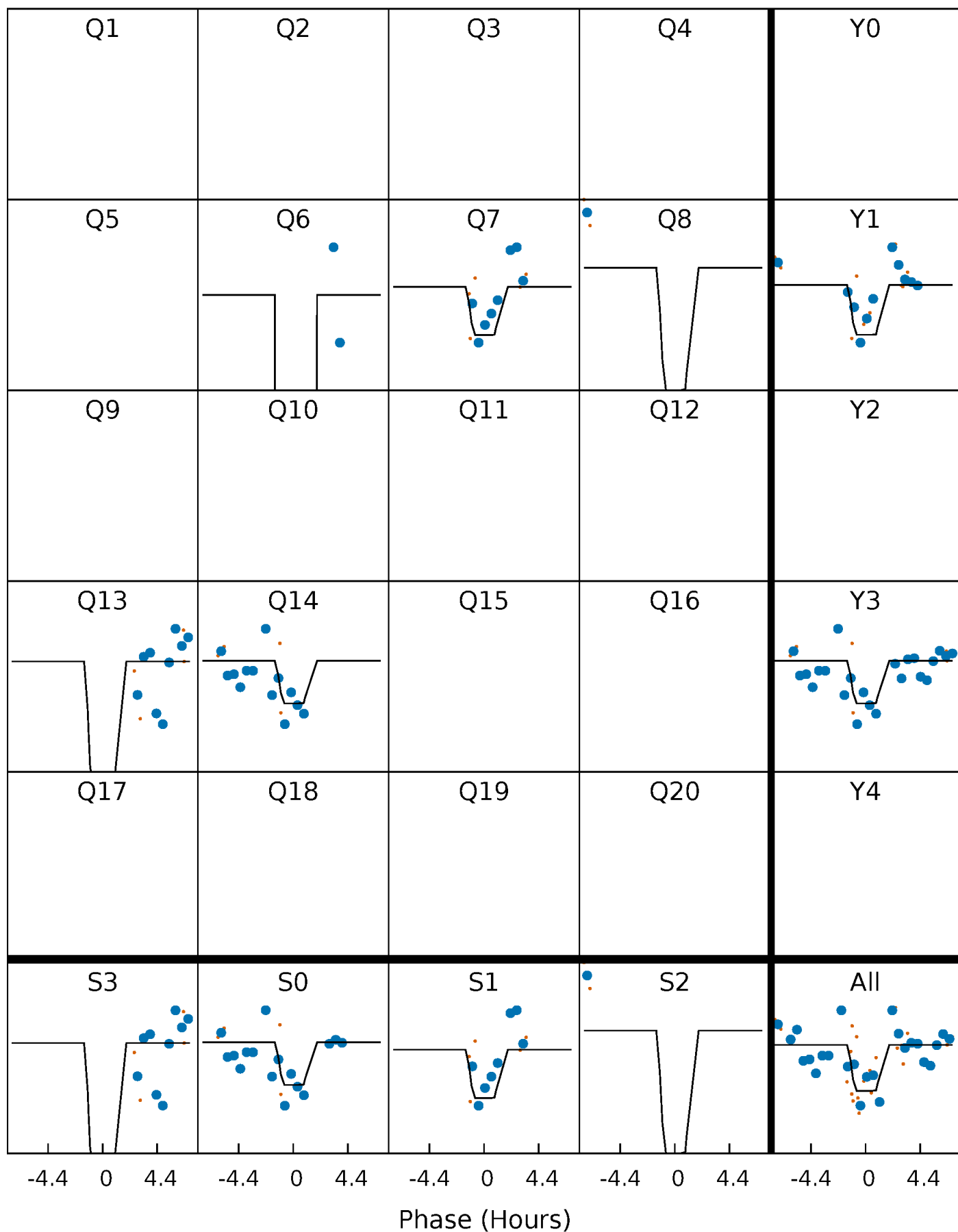
DV Quarter-Phased Transit Curves

TCE 009936518-04 P= 24.727747 Days $T_0=153.534209$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

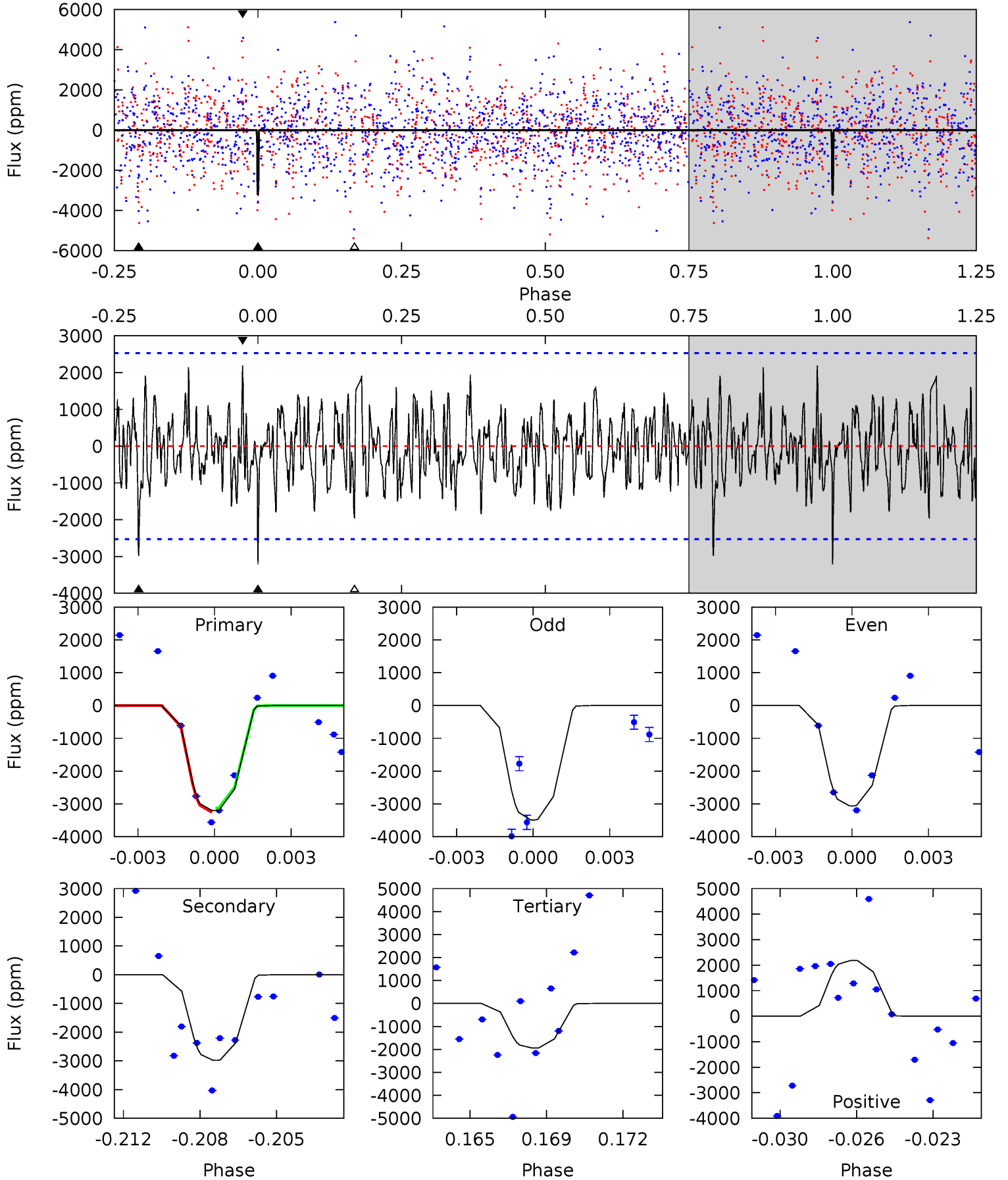
TCE 009936518-04 P= 24.727716 Days $T_0=153.561946$ (BKJD)



DV Model-Shift Uniqueness Test

009936518-04, P = 24.727747 Days, E = 153.534209 Days

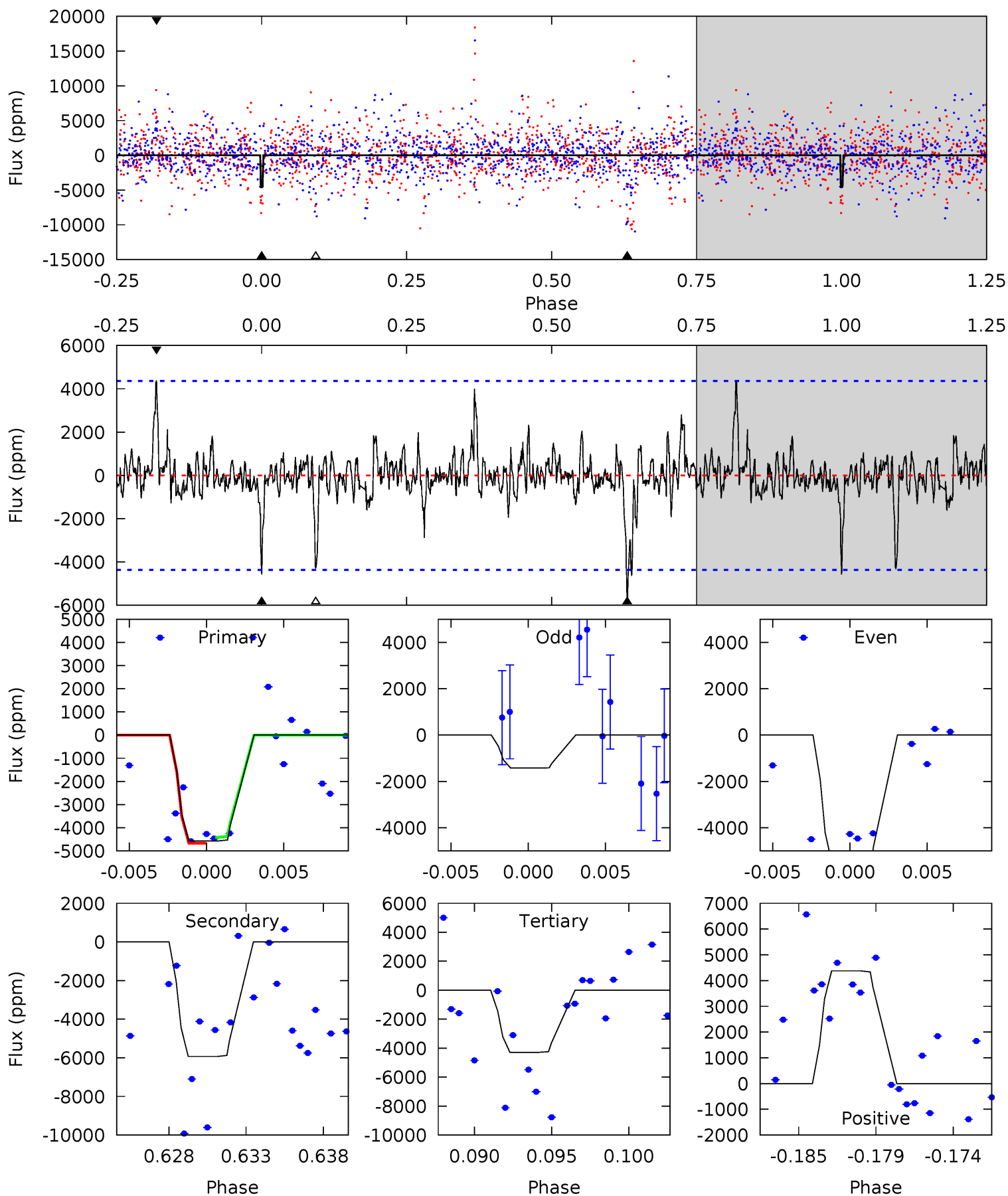
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.63	6.17	4.02	4.52	5.23	2.94	1.57	2.62	2.11	2.15	1.64	0.41	0.95	0.41	0.13



Alt Model-Shift Uniqueness Test

009936518-04, P = 24.727716 Days, E = 153.561946 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.40	7.00	5.06	5.16	5.15	2.79	1.04	0.34	0.23	1.94	1.84	1.80	0.80	0.42	0.14



Stellar Parameters For KIC 009936518

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7207^{+200}_{-343}	$4.203^{+0.090}_{-0.210}$	$0.070^{+0.200}_{-0.350}$	$1.620^{+0.565}_{-0.242}$	$1.528^{+0.211}_{-0.233}$	$0.506^{+0.244}_{-0.259}$
	+3%/-5%	+2%/-5%	+286%/-500%	+35%/-15%	+14%/-15%	+48%/-51%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009936518-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-2982 ± 483	$10.10^{+3.62}_{-3.13}$	1309^{+100}_{-80}	7082^{+1951}_{-998}	575^{+681}_{-266}
Alt.	-5933 ± 847	$13.43^{+3.85}_{-3.66}$	1304^{+102}_{-75}	7339^{+1425}_{-911}	656^{+508}_{-278}

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 $A_{obs} \gg 1.0$

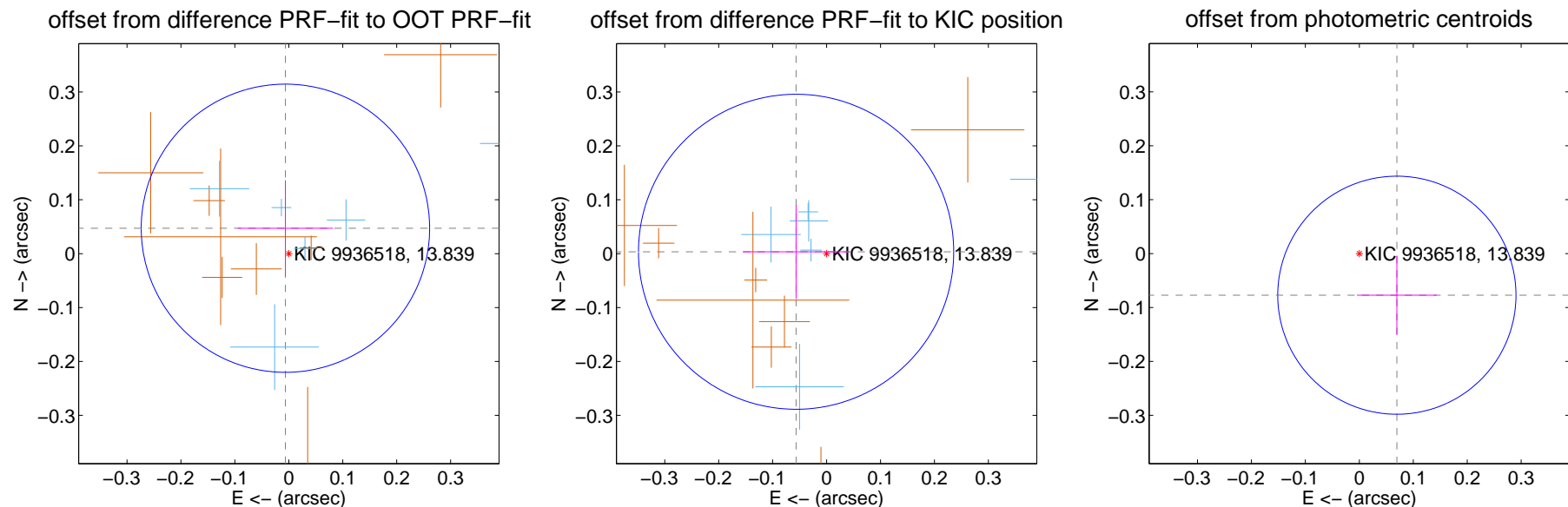
DV Centroid Data

Supplemental centroid analysis for 009936518-04. Kepler magnitude: 13.84. Transit SNR 10.39

There are 7 quarters with good PRF difference image offsets

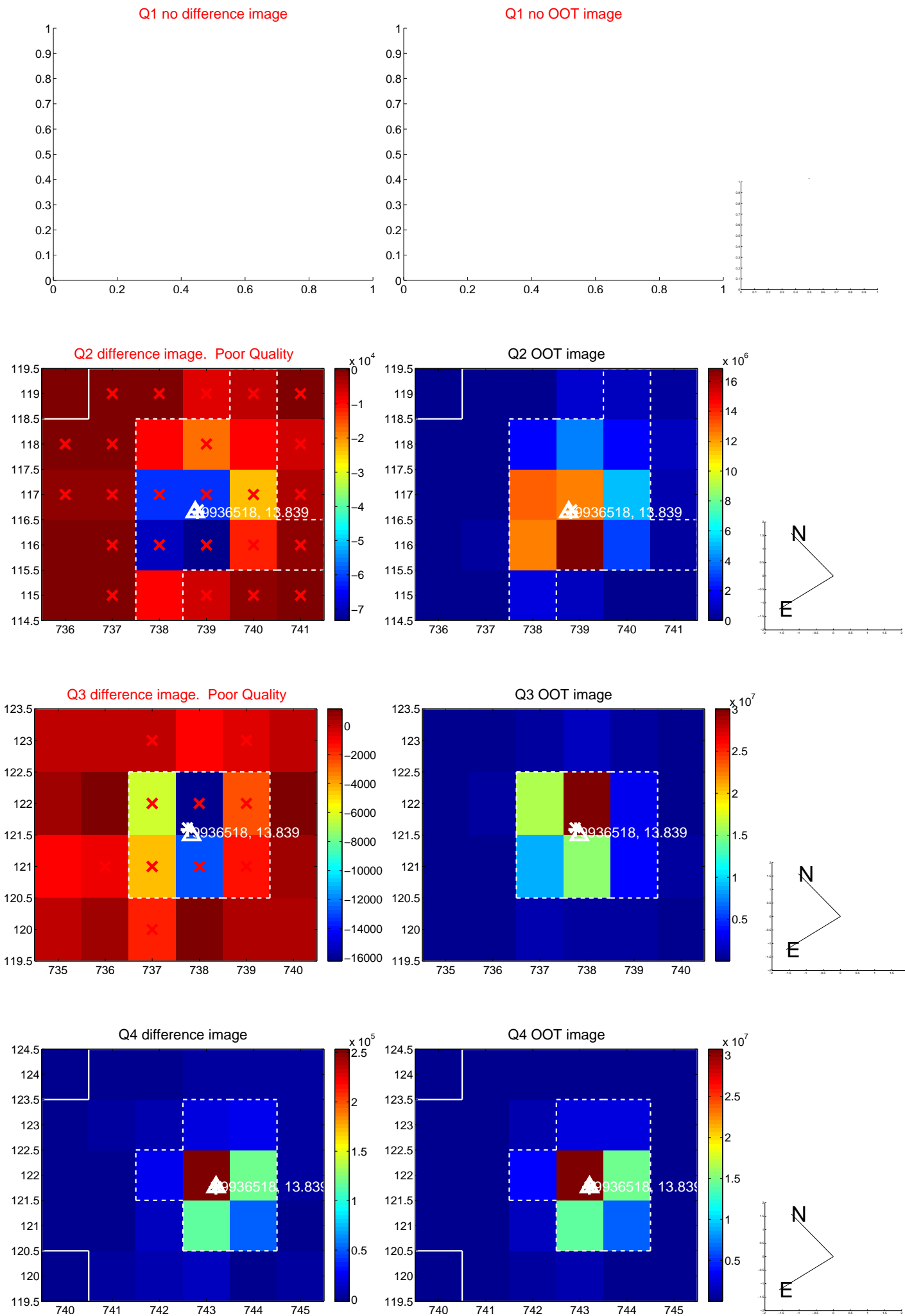
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.048 ± 0.089	0.53	0.006 ± 0.089	0.047 ± 0.089
PRF-fit source offset from KIC position	0.057 ± 0.097	0.58	0.057 ± 0.099	0.004 ± 0.087
photometric centroid source offset	0.10 ± 0.07	1.41	-0.07 ± 0.07	-0.08 ± 0.07

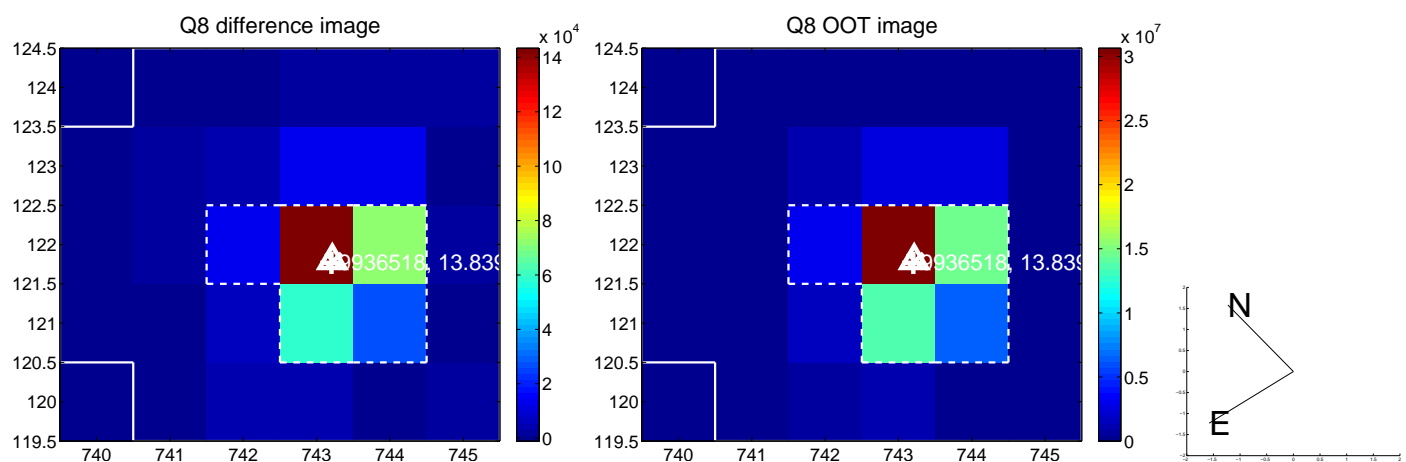
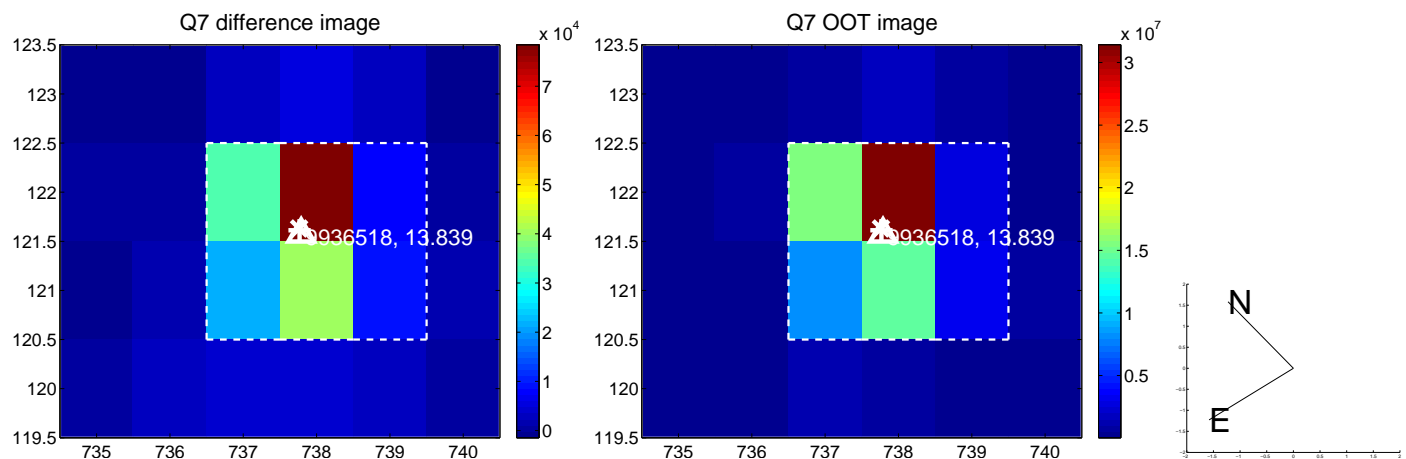
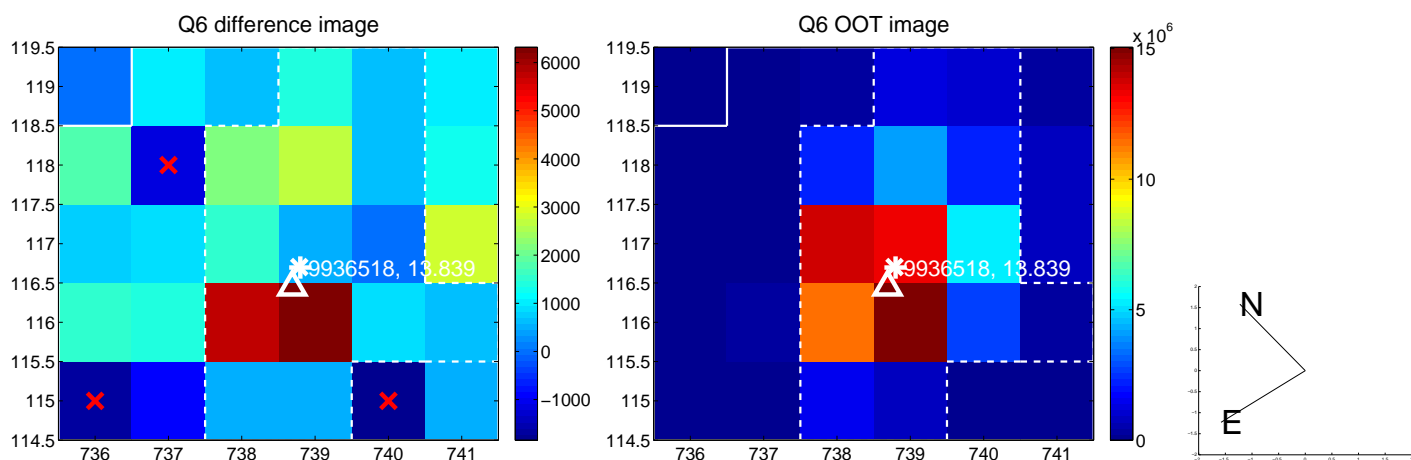
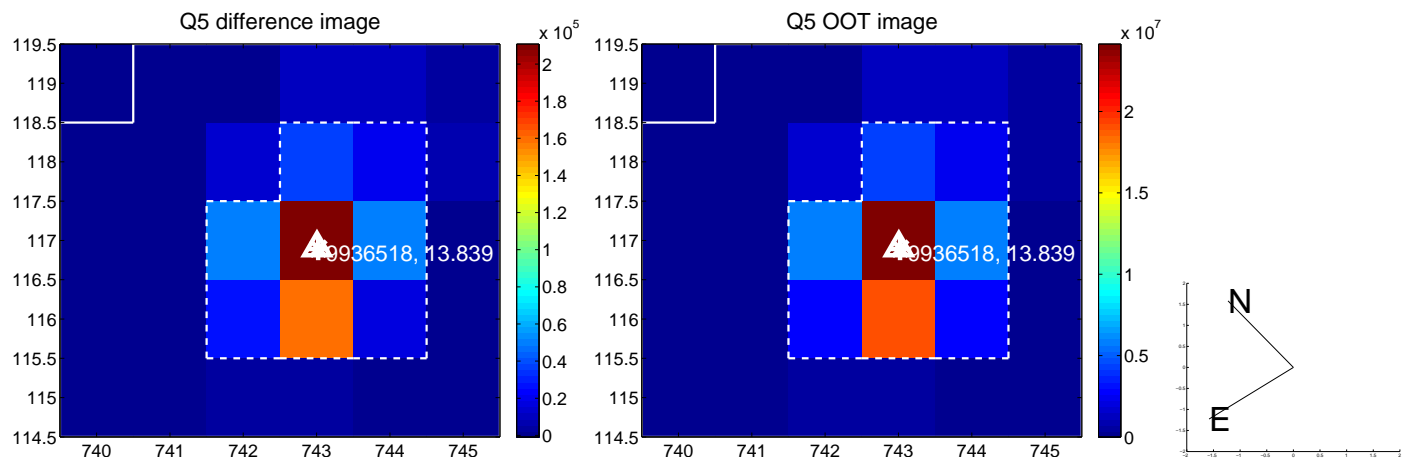


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

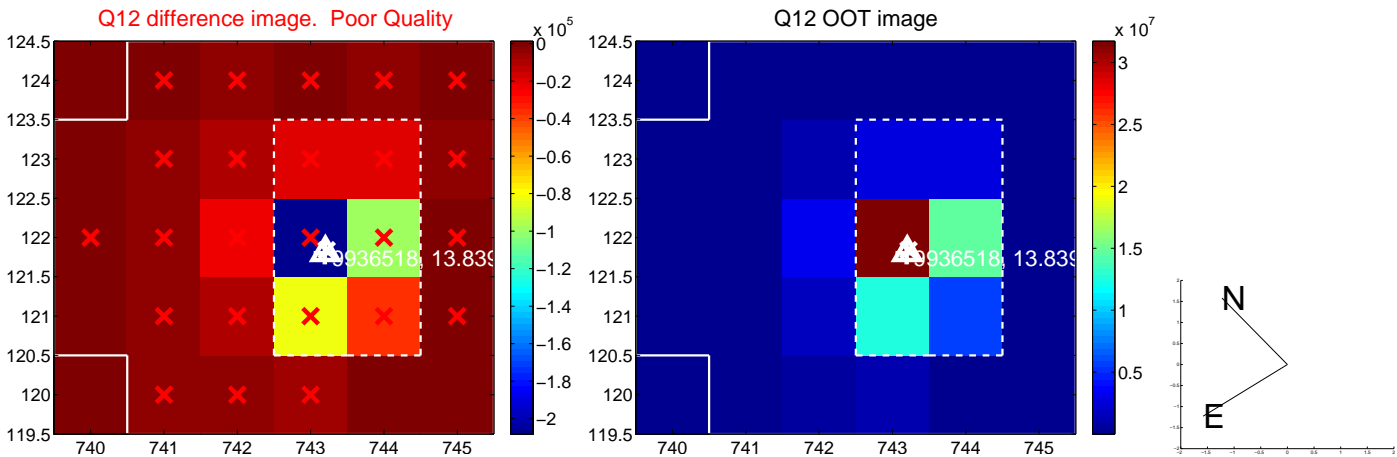
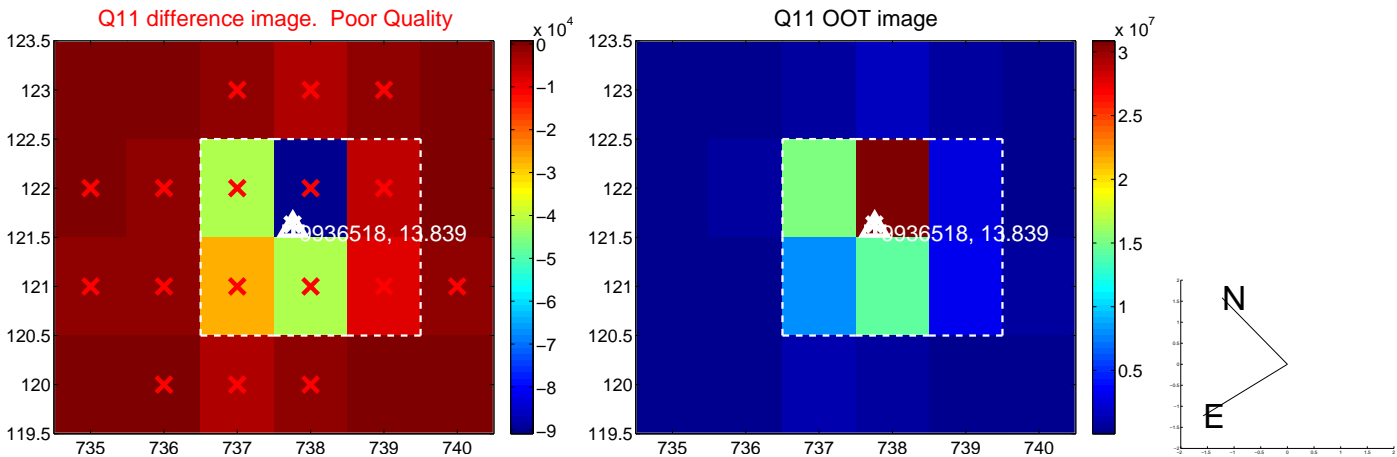
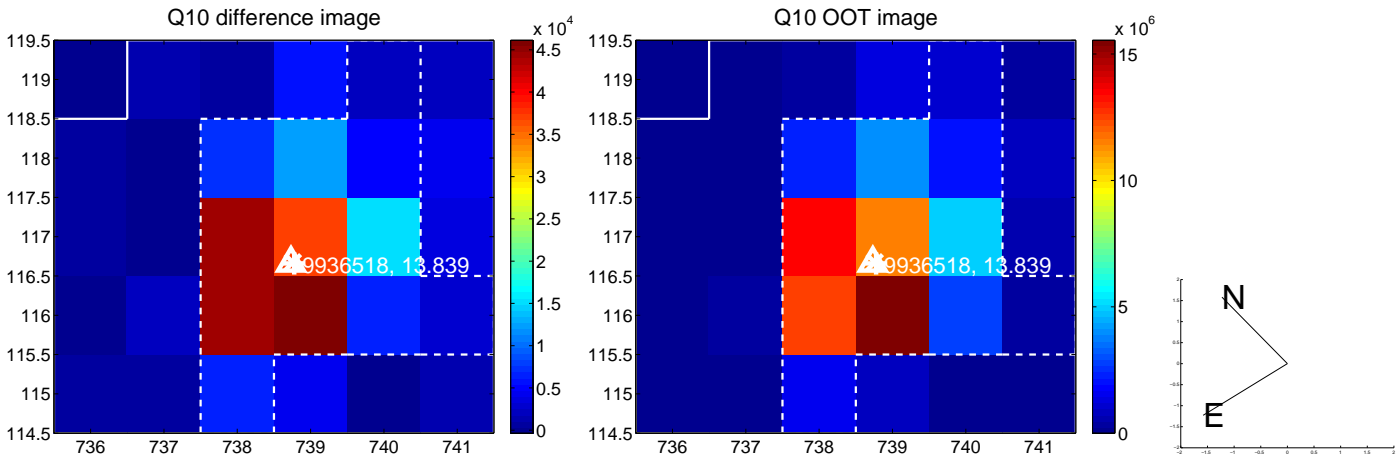
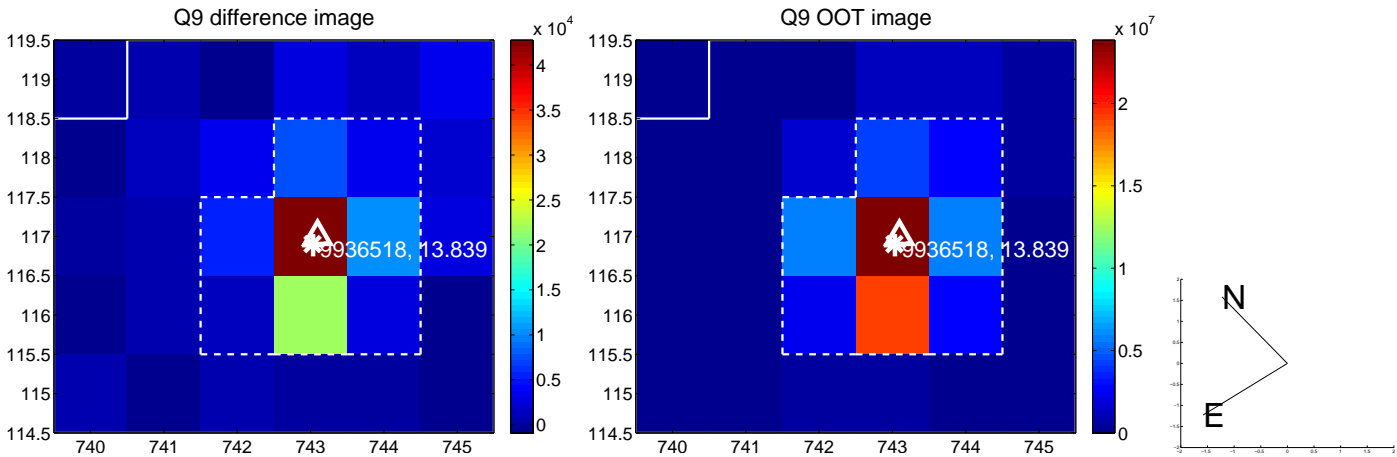
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



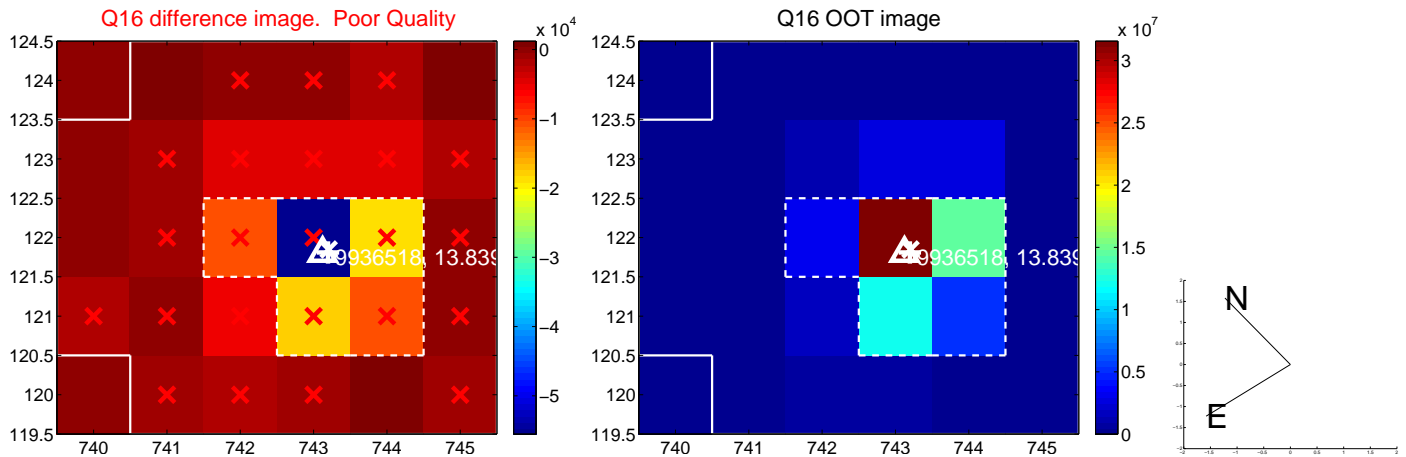
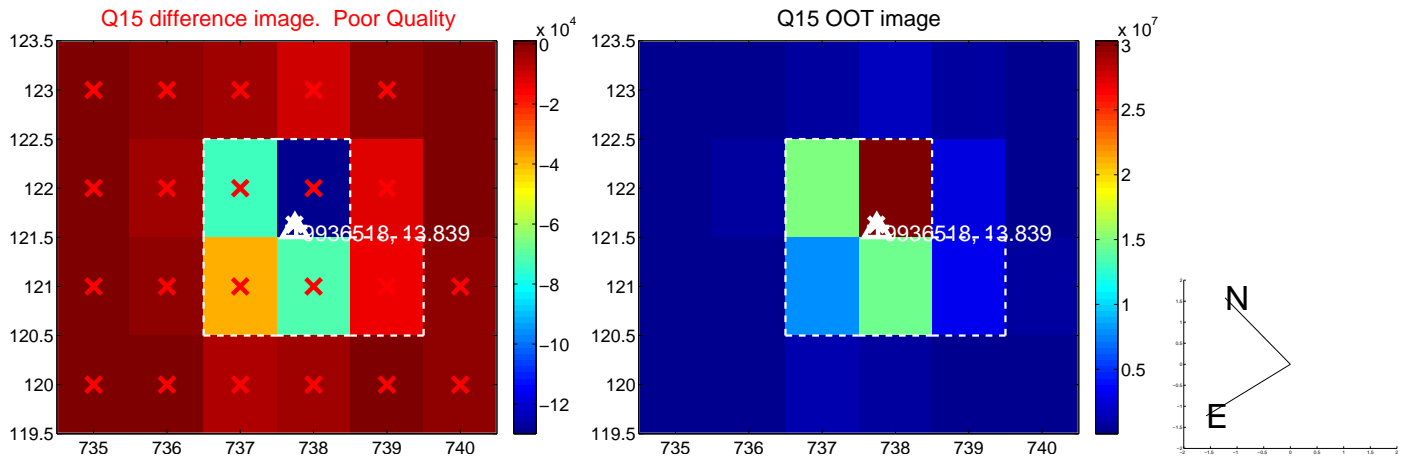
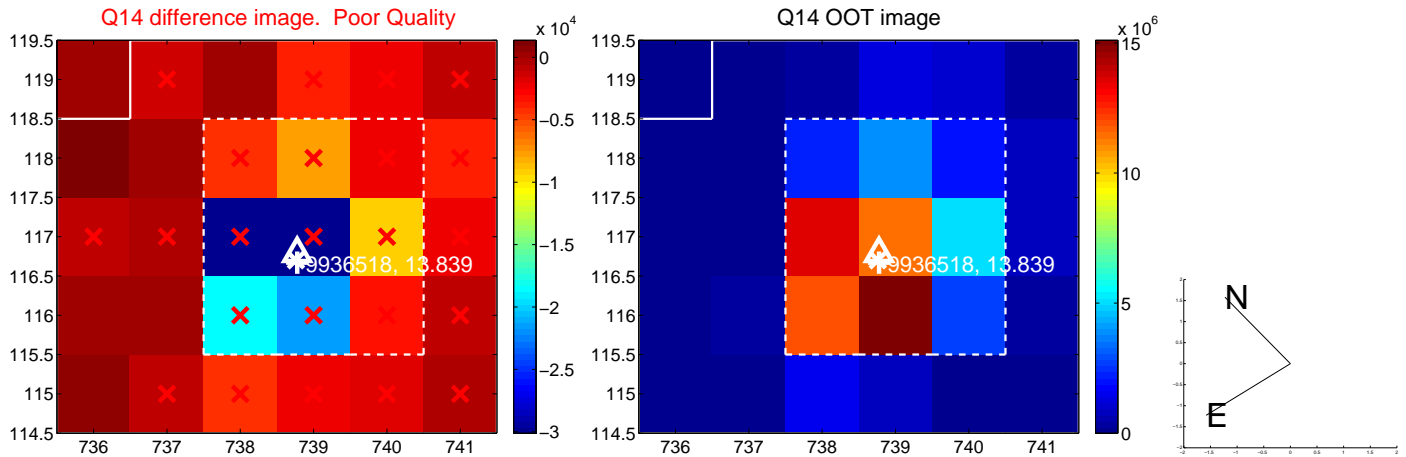
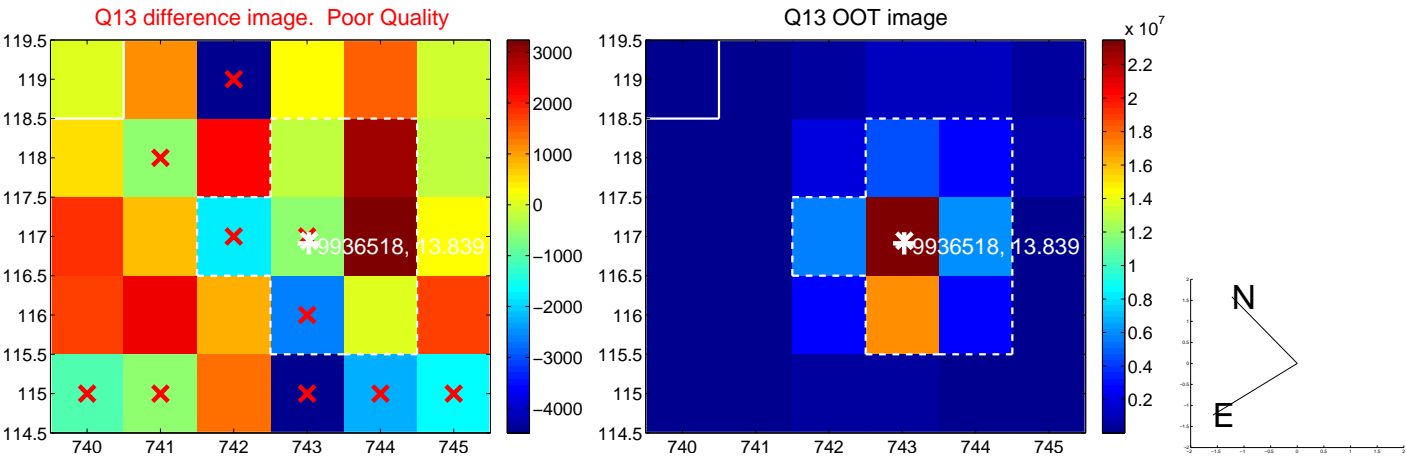
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



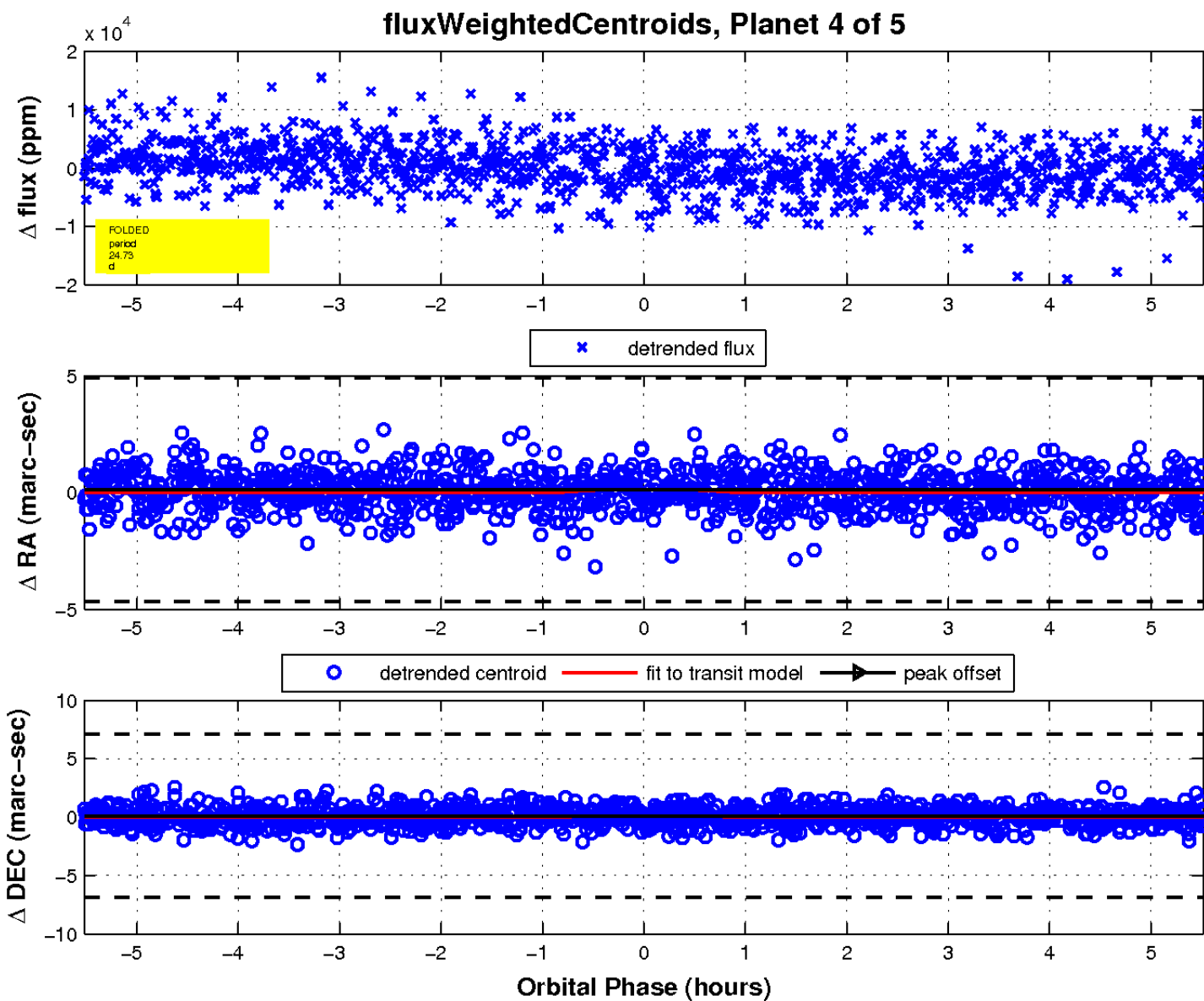
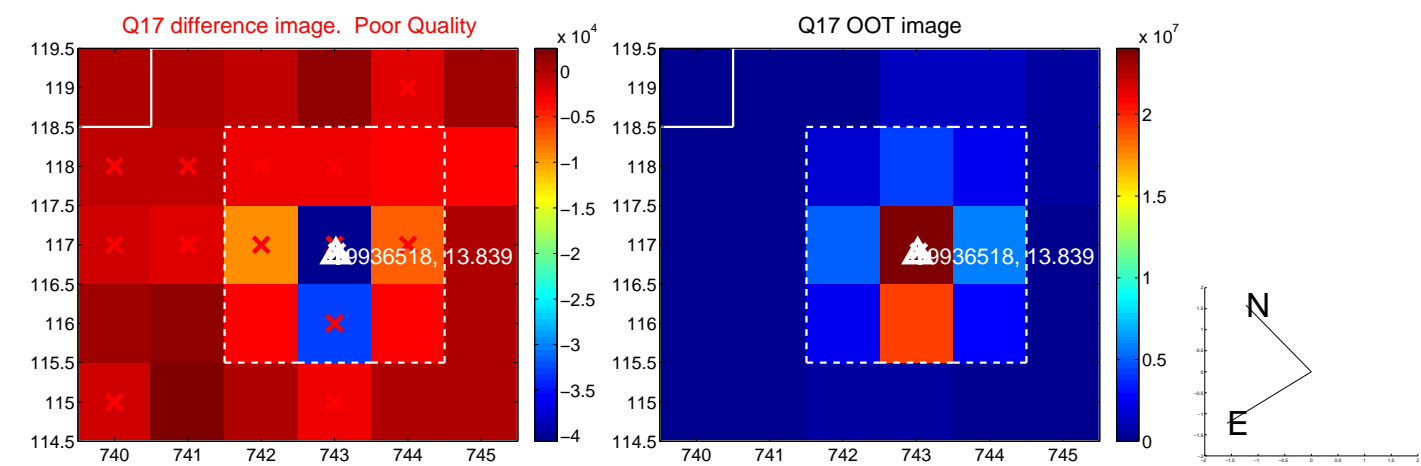
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

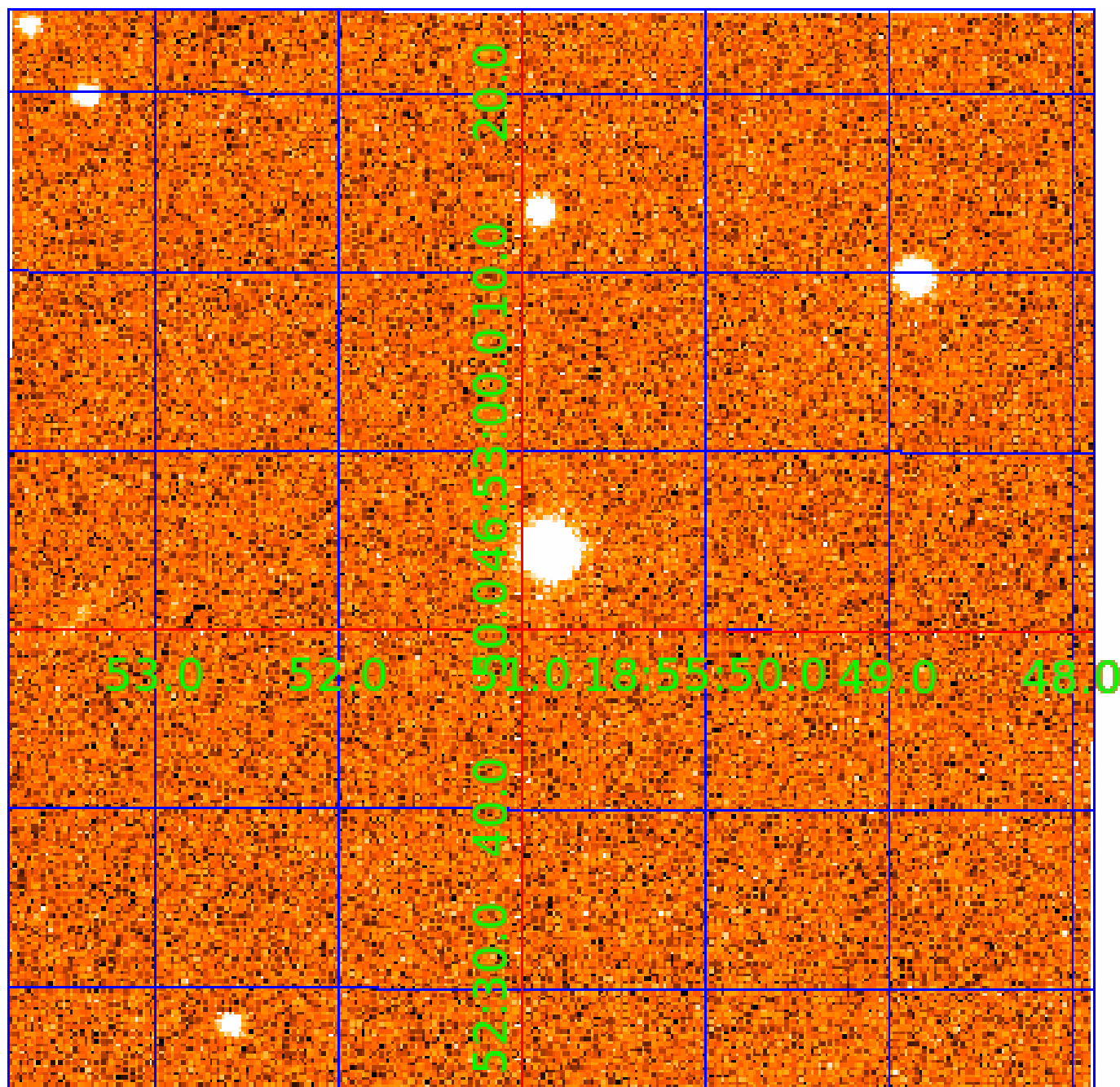


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009936518

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})
009936518-01	OBS	No	1.495179	131.991885	433.7	5.411	13.1	11.1	1.62	7207	4.83	7300.15
009936518-02	OBS	No	2.240053	131.877423	121.3	16.732	8.5	4.2	1.62	7207	1.83	4258.38
009936518-04	OBS	No	24.727747	153.534209	2703.8	1.840	9.8	10.4	1.62	7207	9.75	173.25
009936518-05	OBS	No	19.074897	143.290272	2663.9	2.006	8.5	9.0	1.62	7207	12.65	244.89

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009936518-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009936518-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV
009936518-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009936518-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT

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

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

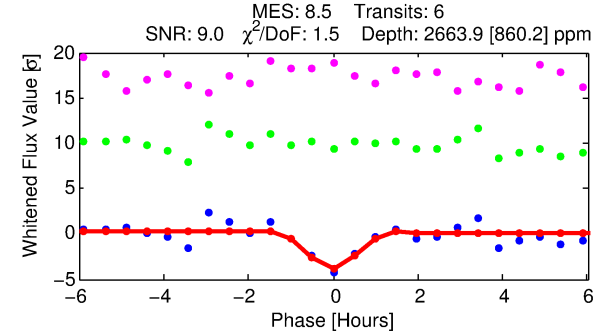
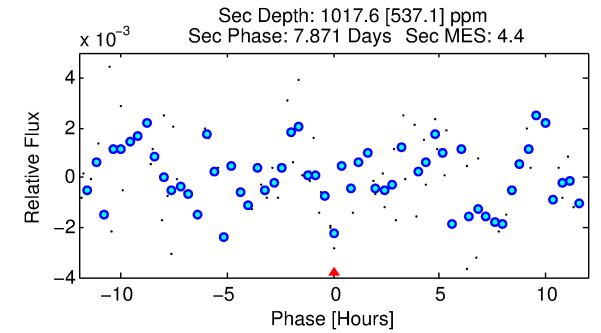
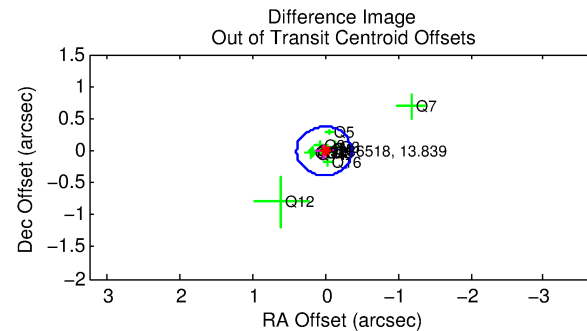
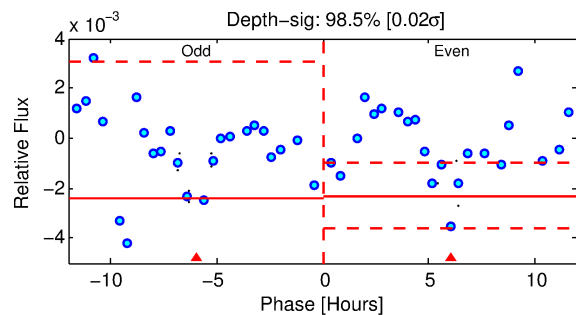
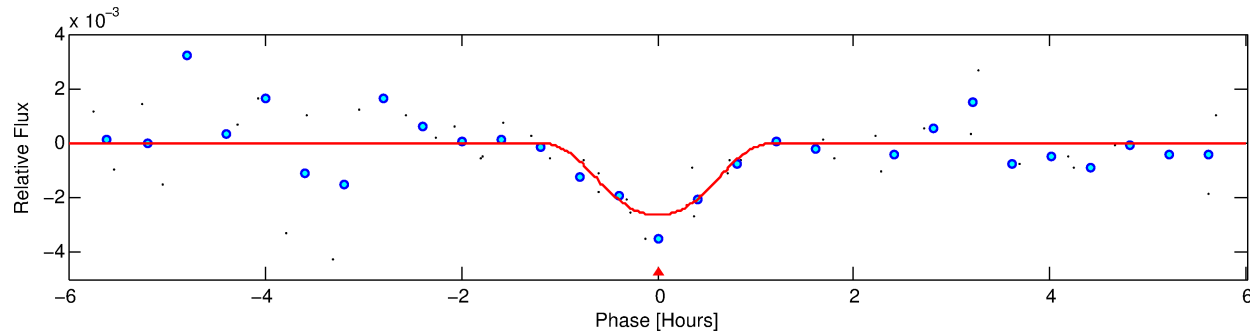
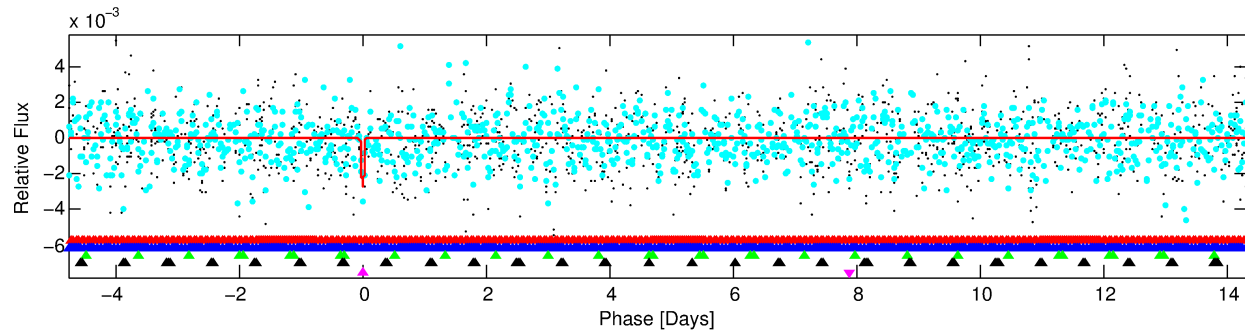
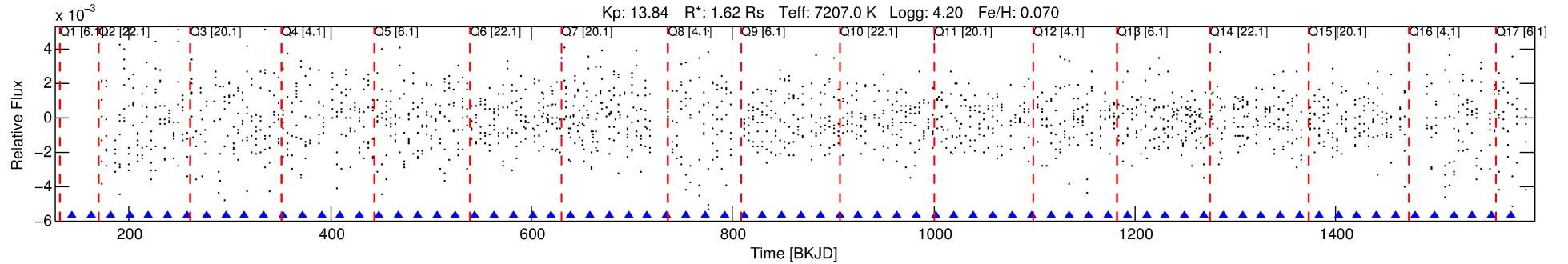
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009936518-05

No Significant Match Found

DV One-Page Summary

KIC: 9936518 Candidate: 5 of 5 Period: 19.075 d



DV Fit Results:

Period = 19.07490 [0.00024] d
Epoch = 143.2903 [0.0103] BKJD
Rp/R* = 0.0715 [0.4733]
a/R* = 32.22 [67.80]
b = 0.98 [0.84]
Seff = 244.89 [107.92]
Teq = 1009 [111] K
Rp = 12.65 [83.78] Re
a = 0.1609 [0.0455] AU
Ag = 90.66 [1201.10] [0.07σ]
Teffp = 4812 [15933] K [0.24σ]

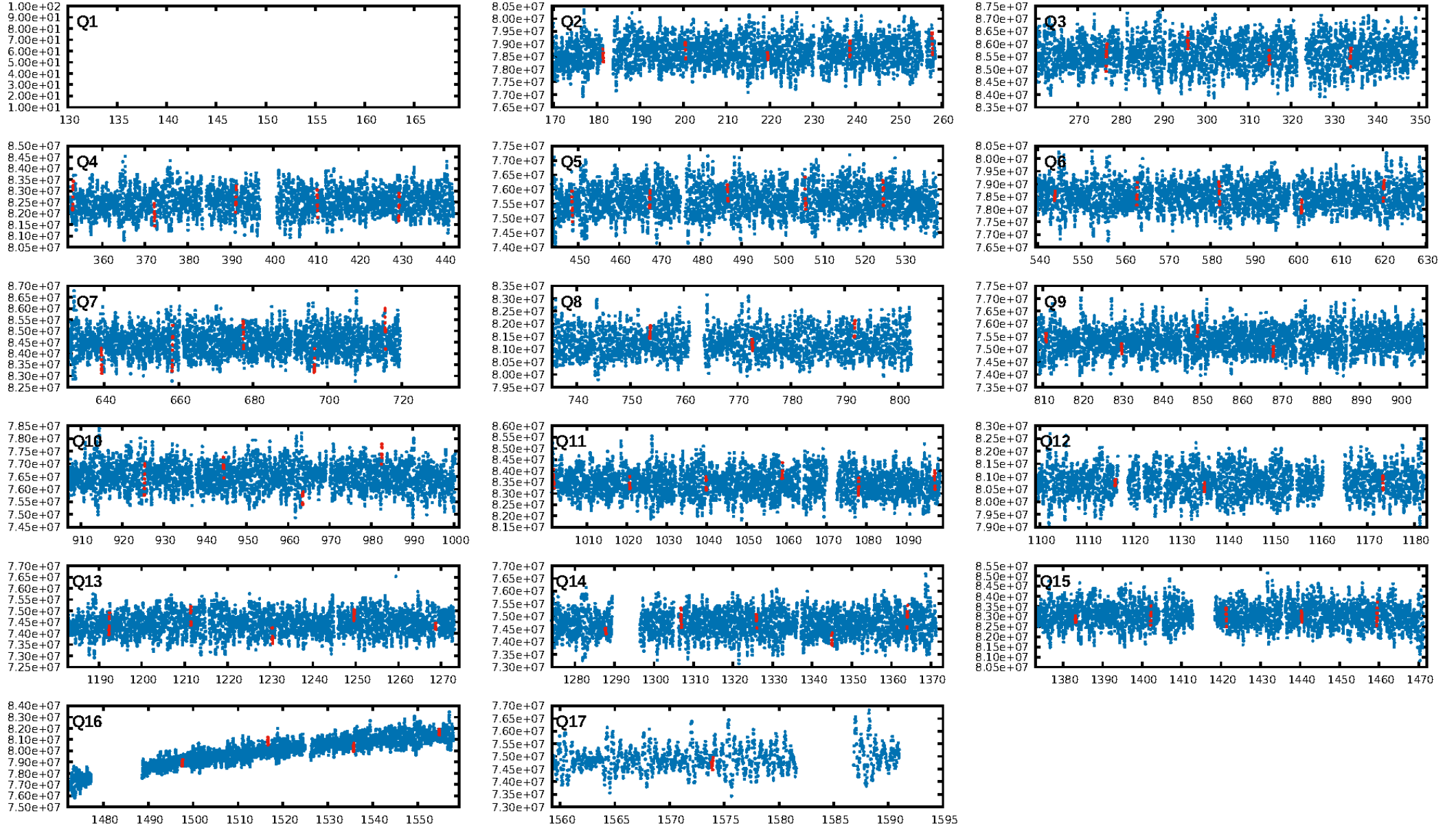
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [23.98σ]
LongPeriod-sig: 100.0% [49.85σ]
ModelChiSquare2-sig: 51.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.62e-03
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 2.03
Centroid-sig: 38.1%
Centroid-so: 0.049 arcsec [0.69σ]
OotOffset-rm: 0.017 arcsec [0.14σ]
OotOffset-st: 3/3/4/4 [14]
KicOffset-rm: 0.102 arcsec [0.74σ]
KicOffset-st: 3/3/4/4 [14]
DiffImageQuality-fgm: 0.79 [11/14]
DiffImageOverlap-fno: 0.75 [12/16]

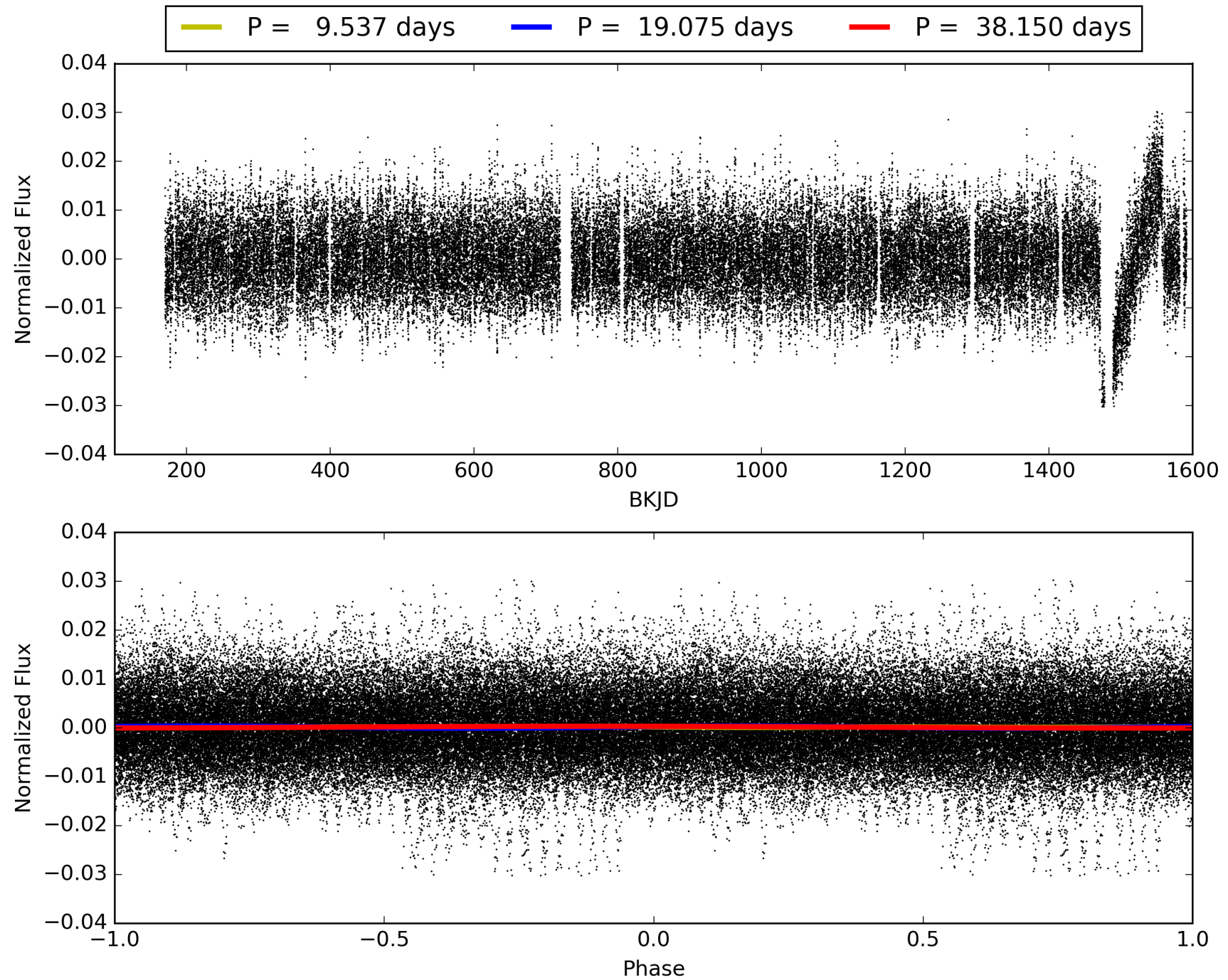
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:29:29 Z

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

TCE 009936518-05, PDC Light Curves

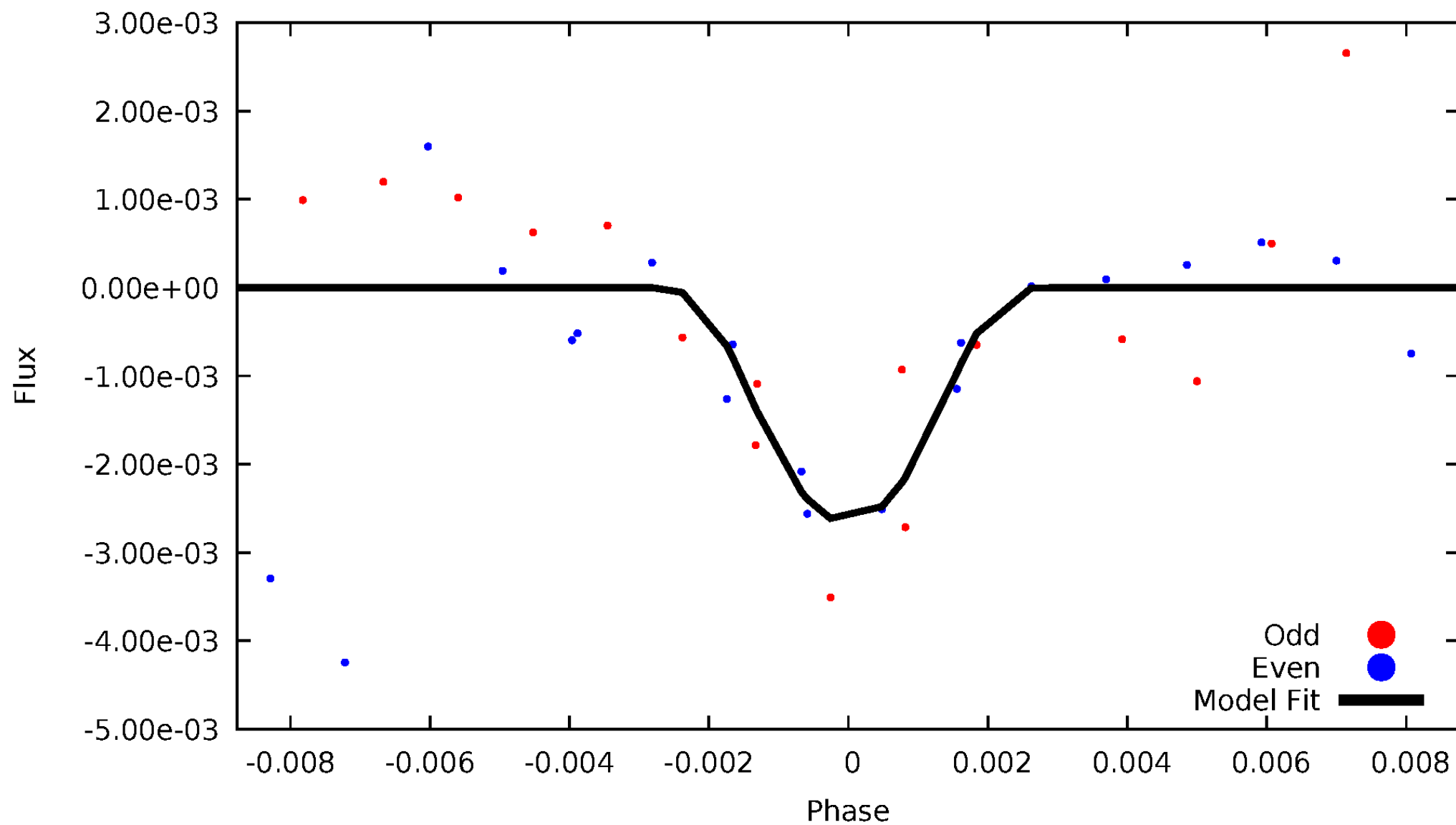


TCE 009936518-05



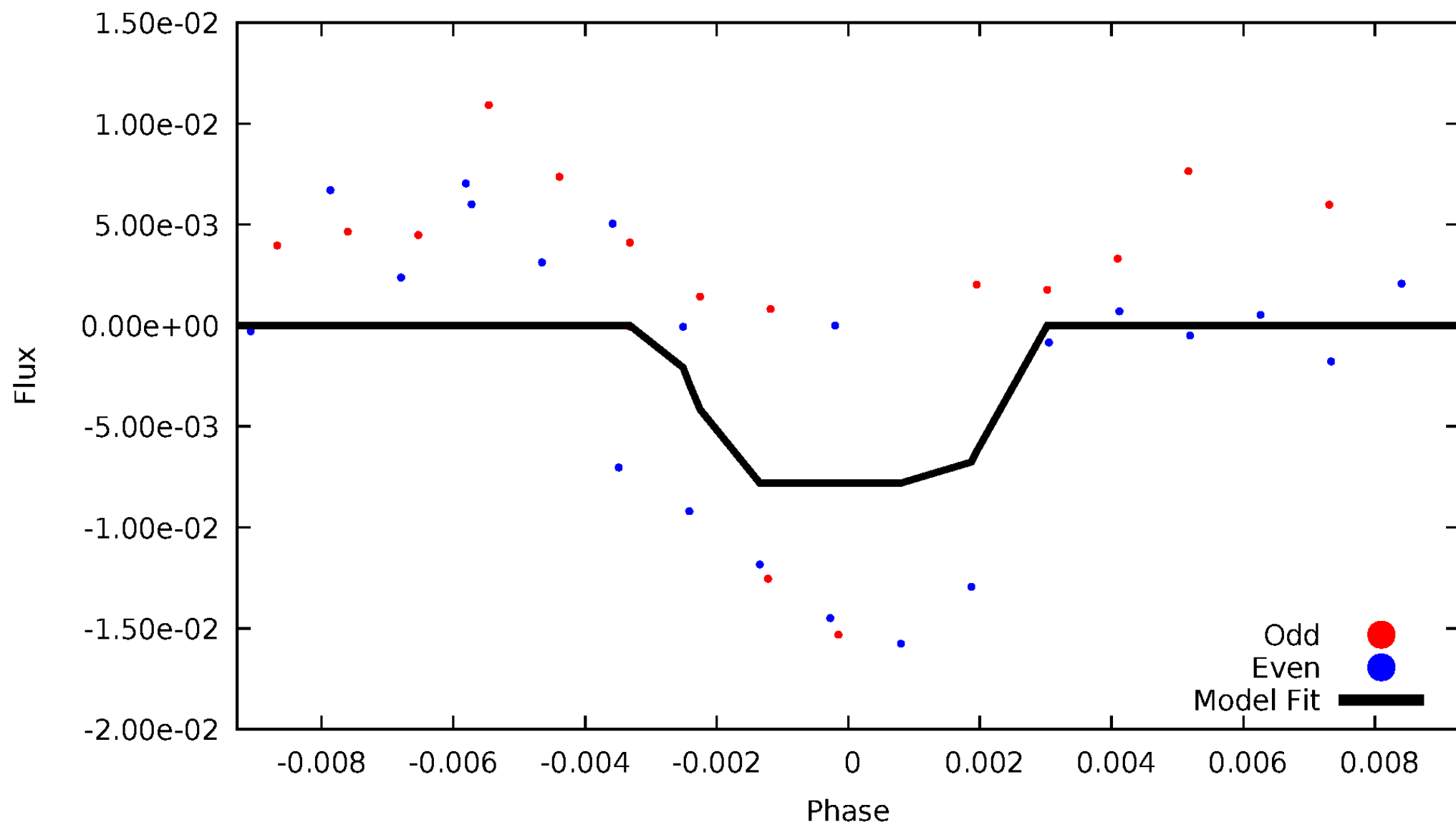
DV Odd/Even

TCE 009936518-05



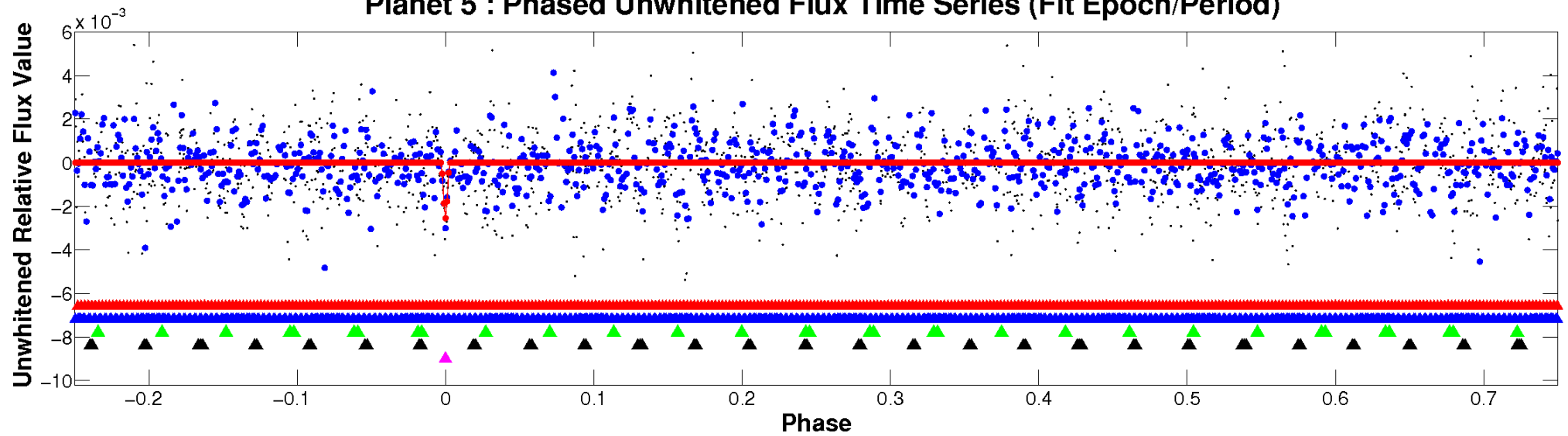
ALT Odd/Even

TCE 009936518-05

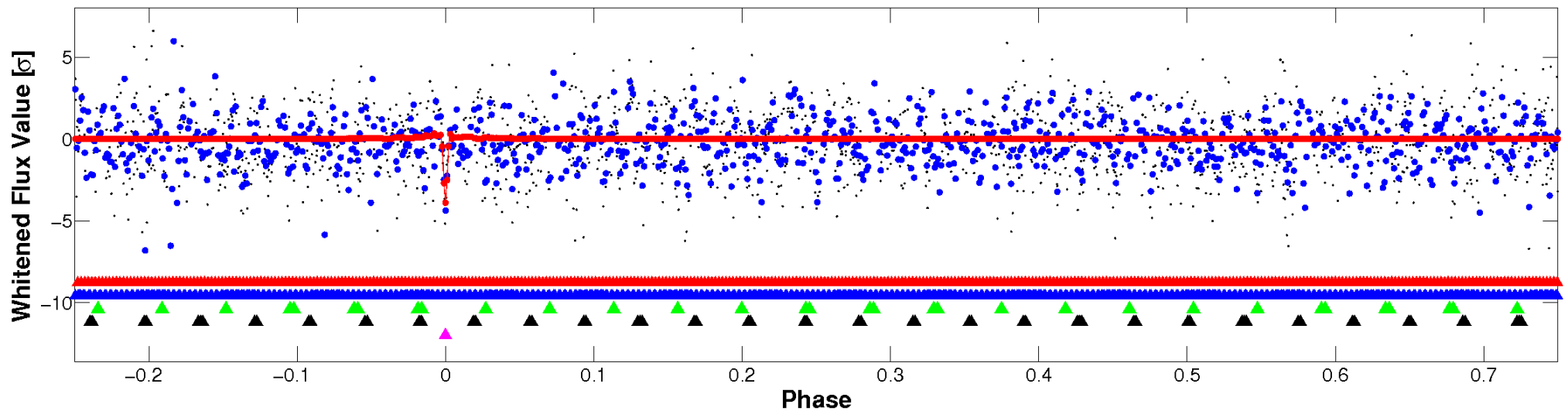


Non-Whitened Vs. Whitened Light Curve

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

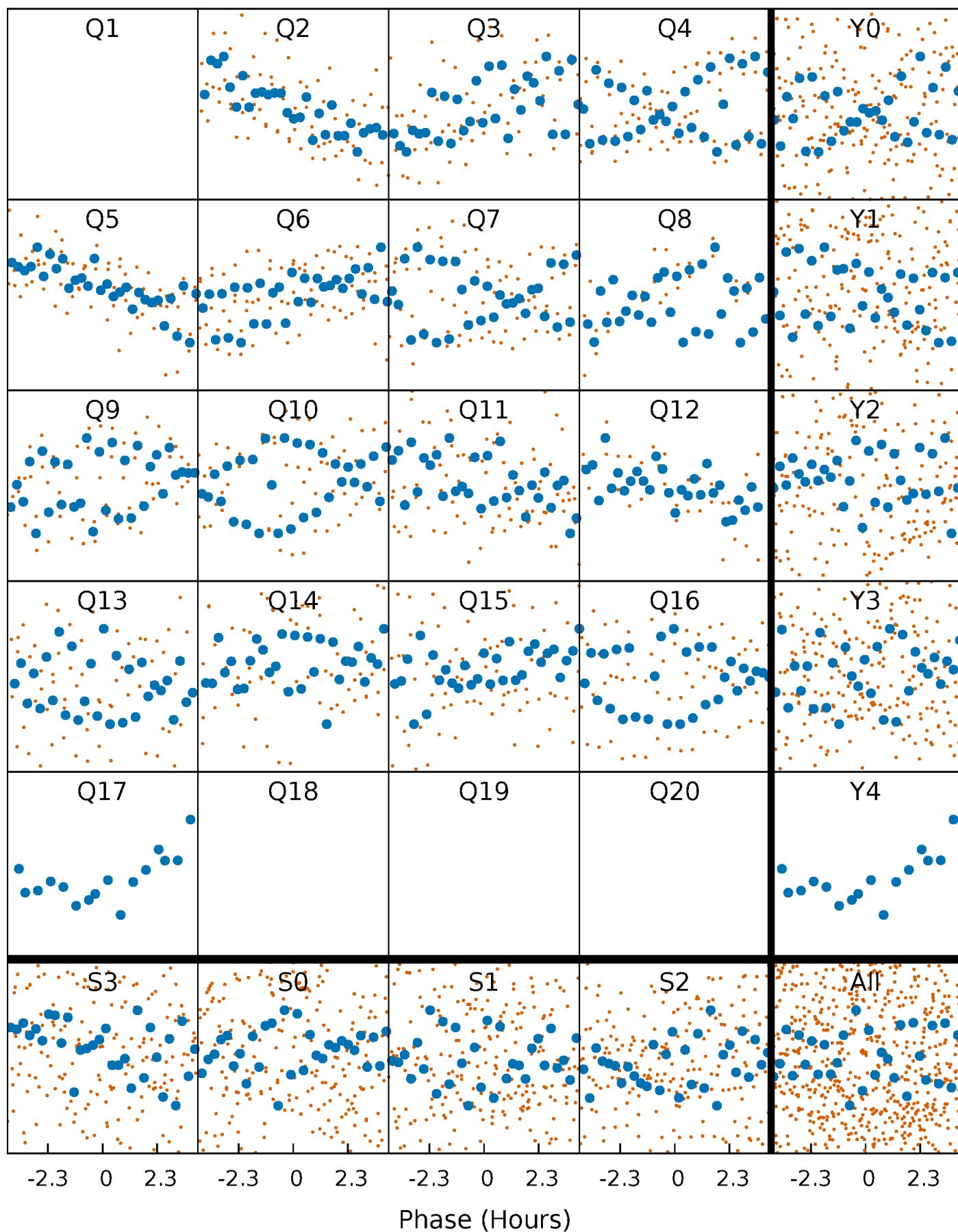


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



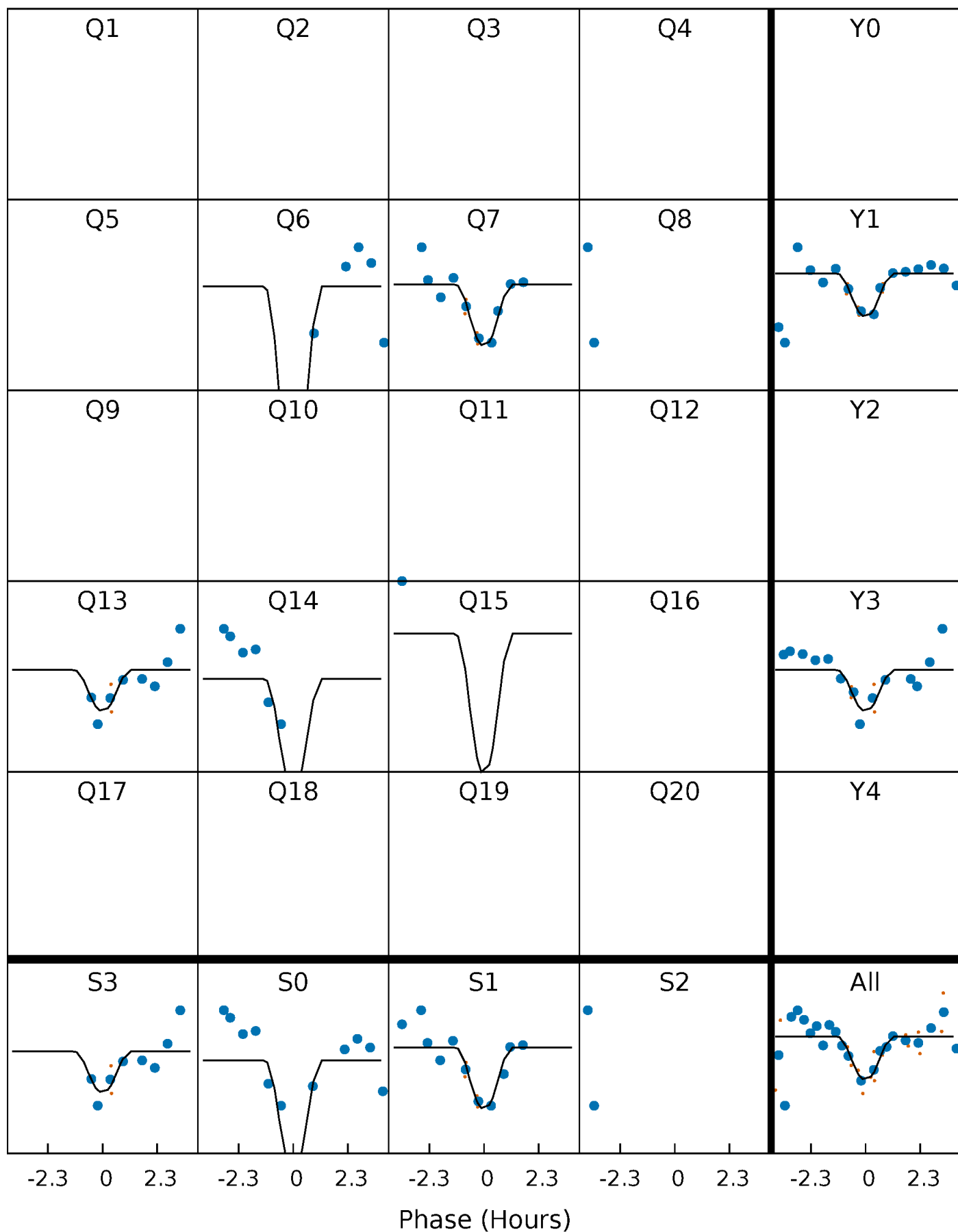
PDC Quarter-Phased Transit Curves

TCE 009936518-05 P= 19.074897 Days $T_0=143.290272$ (BKJD)



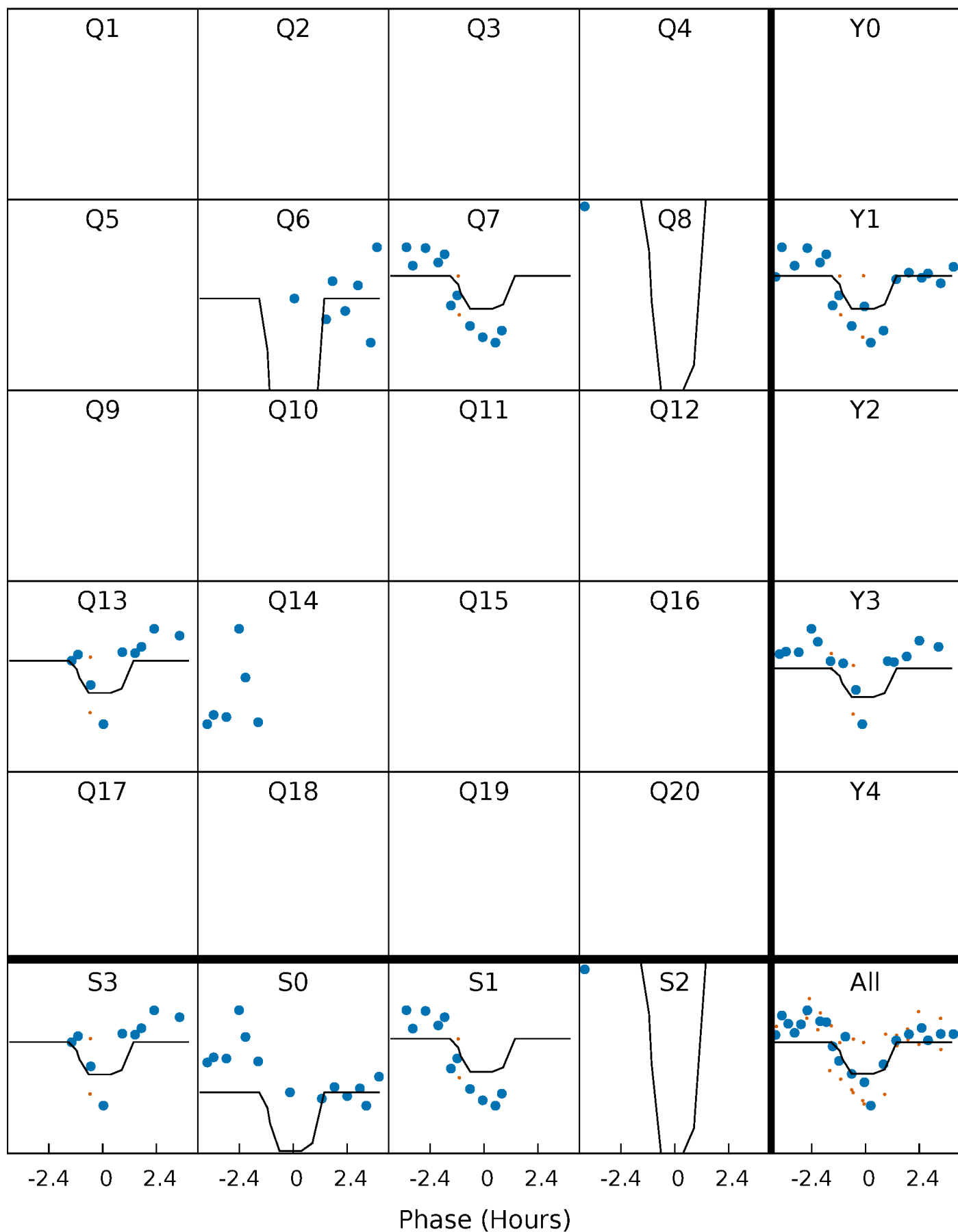
DV Quarter-Phased Transit Curves

TCE 009936518-05 P= 19.074897 Days $T_0=143.290272$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

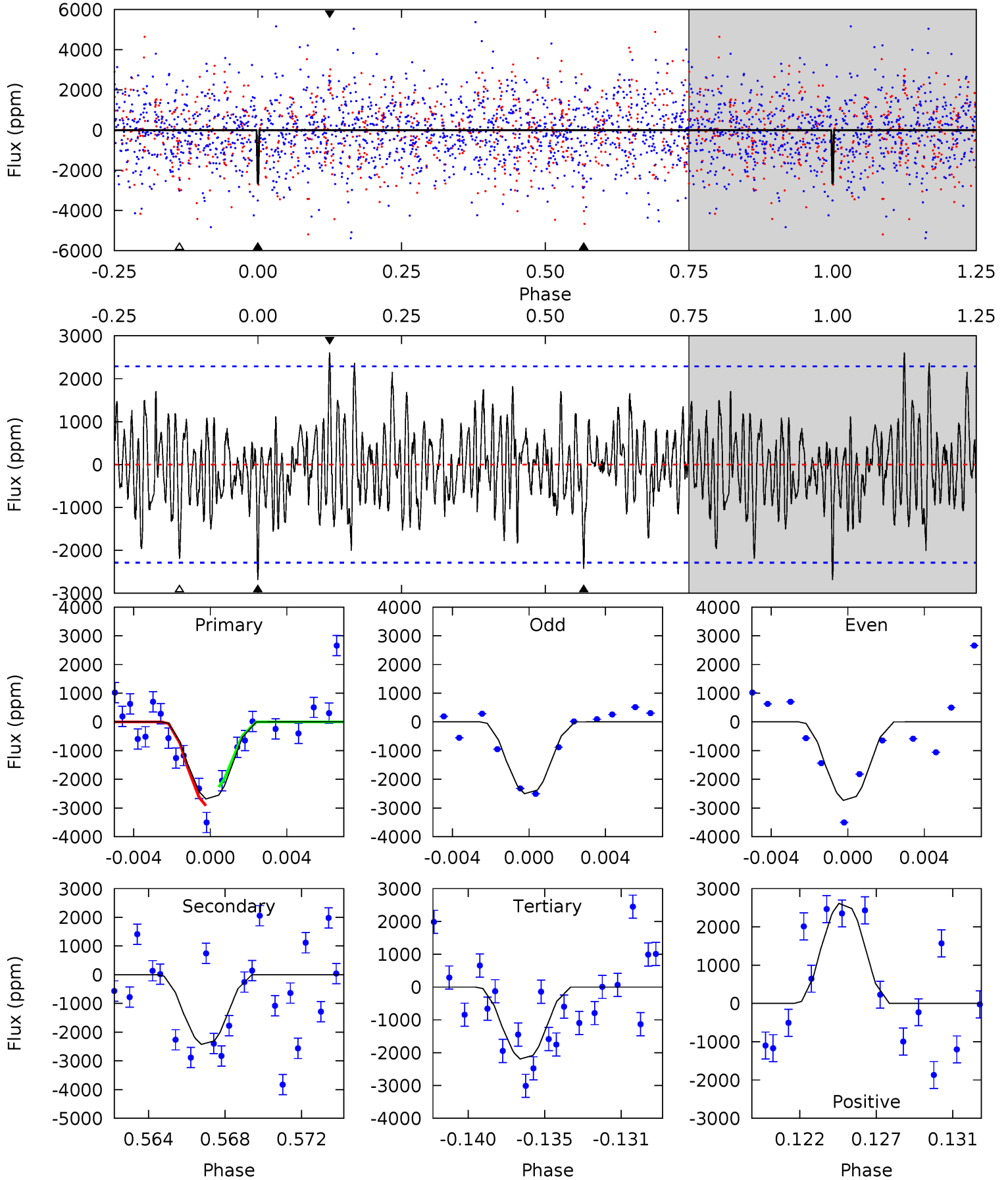
TCE 009936518-05 $P = 19.074996$ Days $T_0 = 143.322579$ (BKJD)



DV Model-Shift Uniqueness Test

009936518-05, $P = 19.074897$ Days, $E = 143.290272$ Days

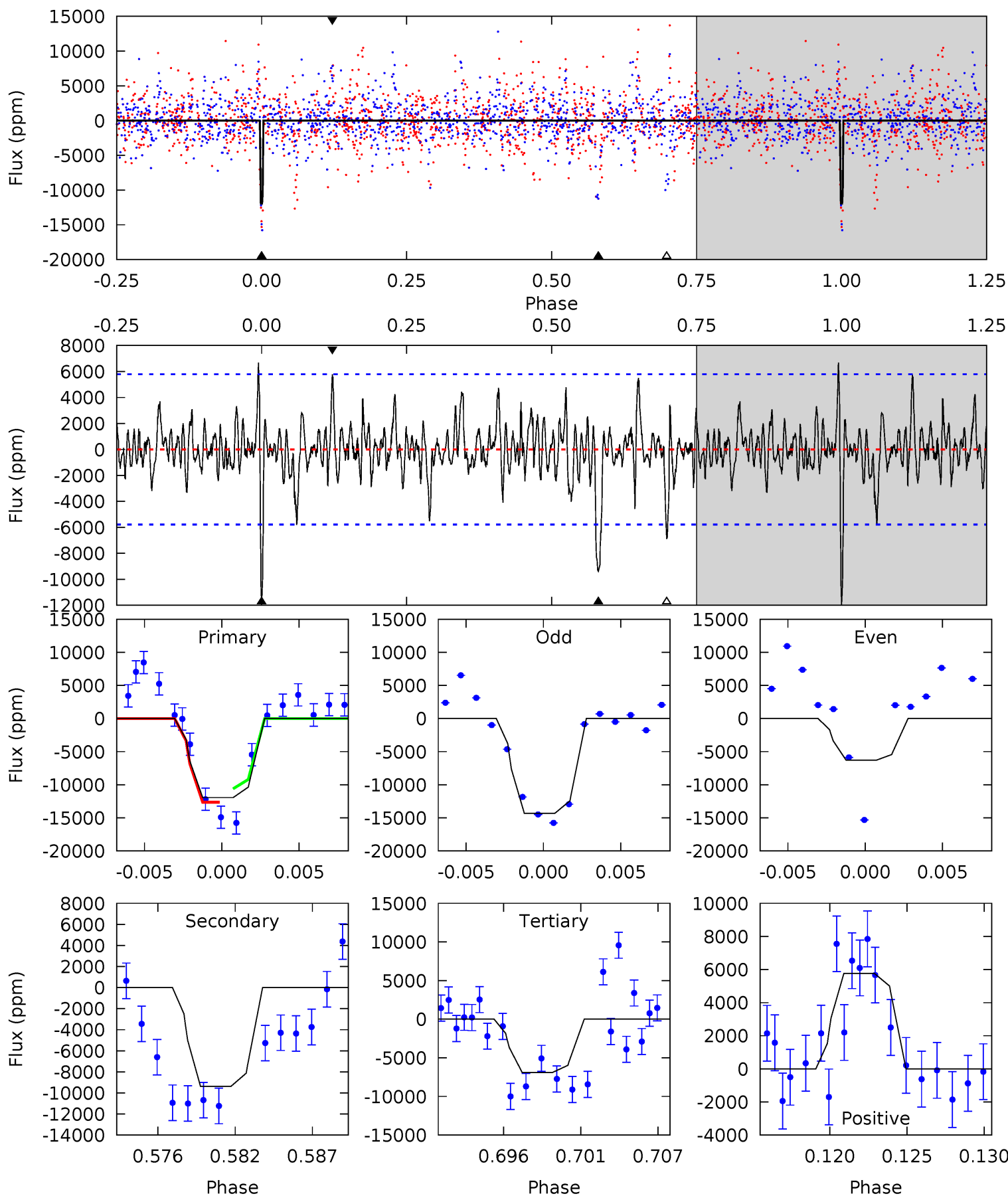
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.09	5.50	4.97	5.92	5.18	2.85	1.72	1.12	0.17	0.53	-0.42	0.26	0.94	0.49	0.74



Alt Model-Shift Uniqueness Test

009936518-05, P = 19.074996 Days, E = 143.322579 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	8.33	6.13	5.13	5.14	2.78	1.44	4.49	5.49	2.20	3.20	3.75	0.65	0.36	0.88



Stellar Parameters For KIC 009936518

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7207^{+200}_{-343}	$4.203^{+0.090}_{-0.210}$	$0.070^{+0.200}_{-0.350}$	$1.620^{+0.565}_{-0.242}$	$1.528^{+0.211}_{-0.233}$	$0.506^{+0.244}_{-0.259}$
	+3%/-5%	+2%/-5%	+286%/-500%	+35%/-15%	+14%/-15%	+48%/-51%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009936518-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-2426 ± 441	$61.89^{+66.44}_{-41.03}$	1423^{+113}_{-92}	3225^{+1652}_{-607}	$8.036^{+73.703}_{-5.969}$
Alt.	-9374 ± 1125	$64.56^{+64.62}_{-43.90}$	1423^{+108}_{-85}	4030^{+2429}_{-848}	32^{+250}_{-24}

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 $A_{obs} \gg 1.0$

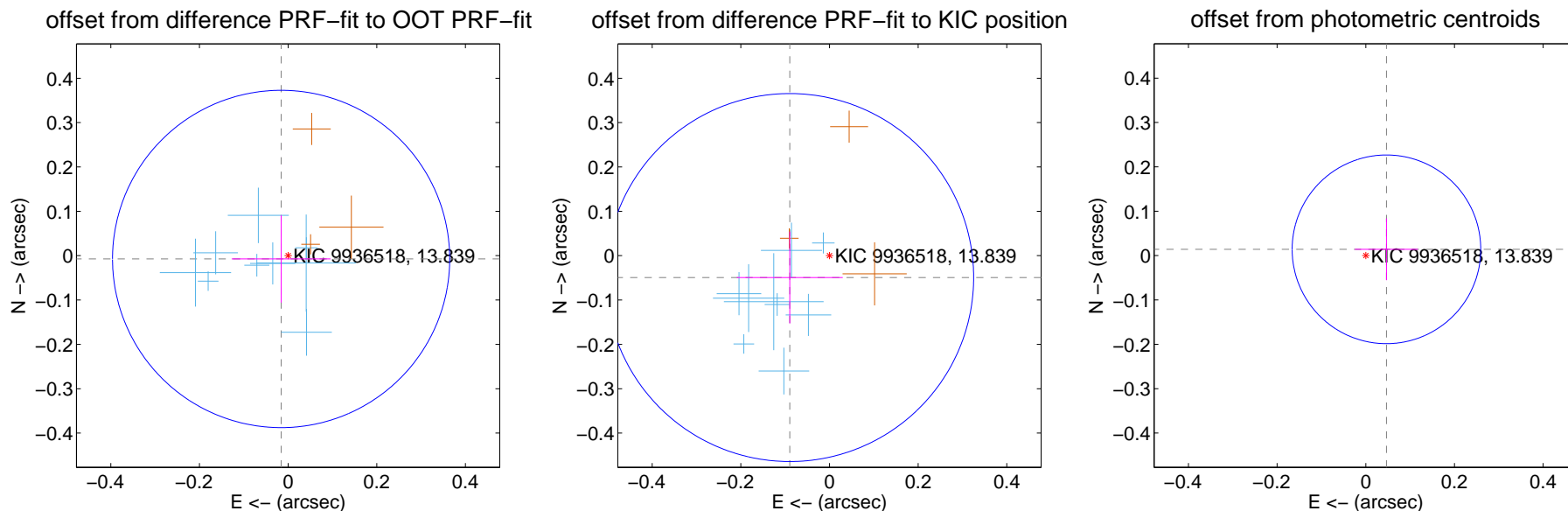
DV Centroid Data

Supplemental centroid analysis for 009936518-05. Kepler magnitude: 13.84. Transit SNR 8.99

There are 11 quarters with good PRF difference image offsets

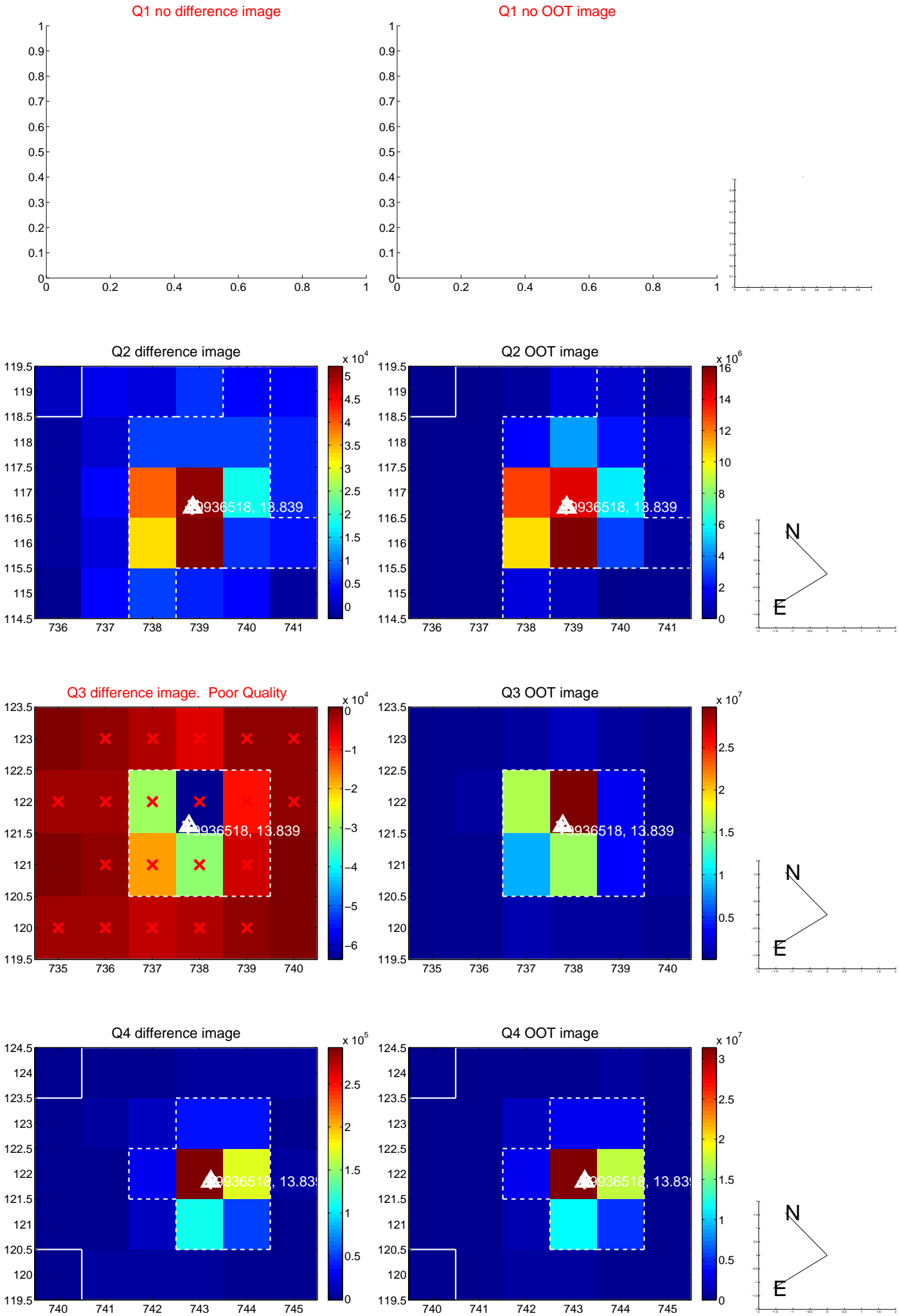
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.017 ± 0.127	0.14	0.016 ± 0.112	-0.007 ± 0.098
PRF-fit source offset from KIC position	0.102 ± 0.138	0.74	0.090 ± 0.119	-0.049 ± 0.103
photometric centroid source offset	0.05 ± 0.07	0.69	-0.05 ± 0.07	0.01 ± 0.07

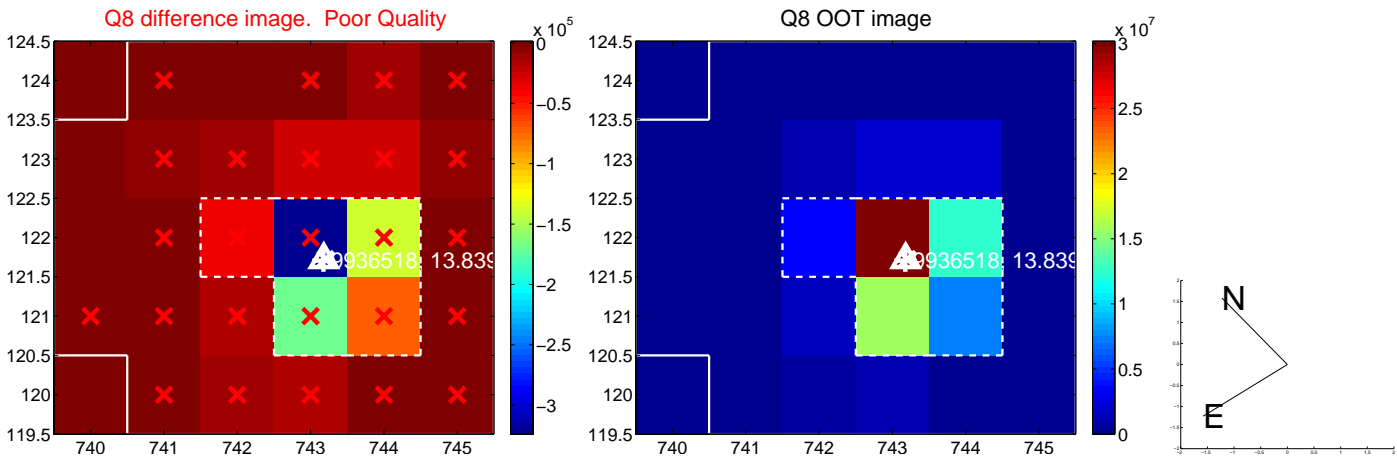
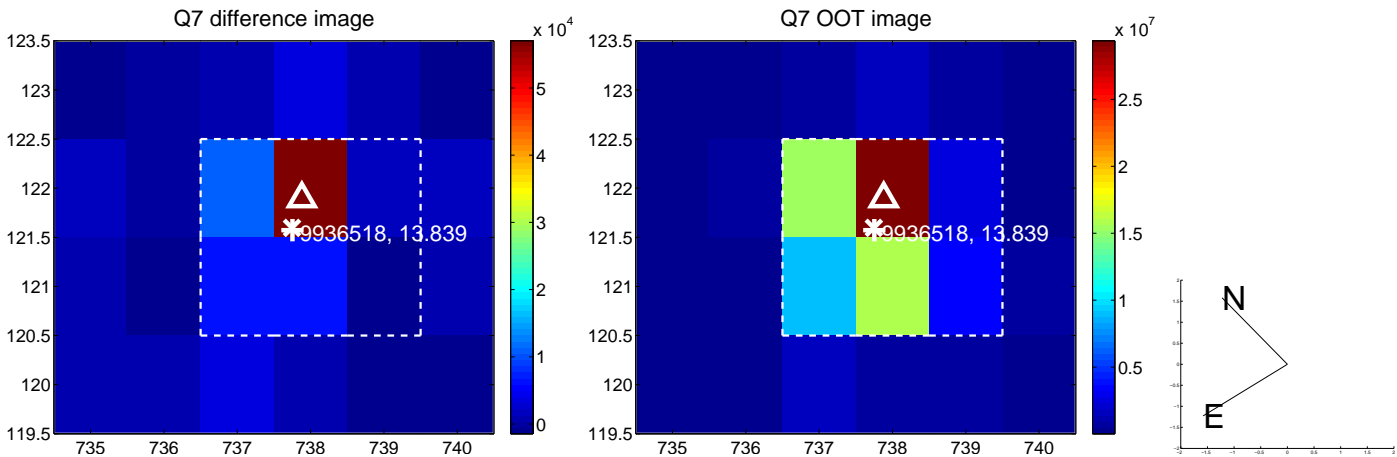
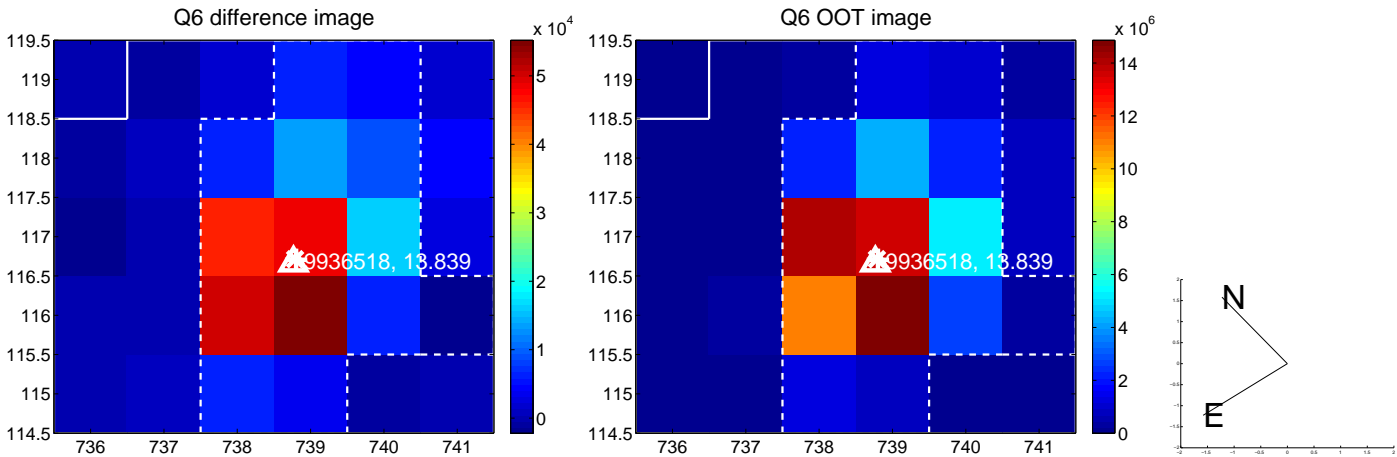
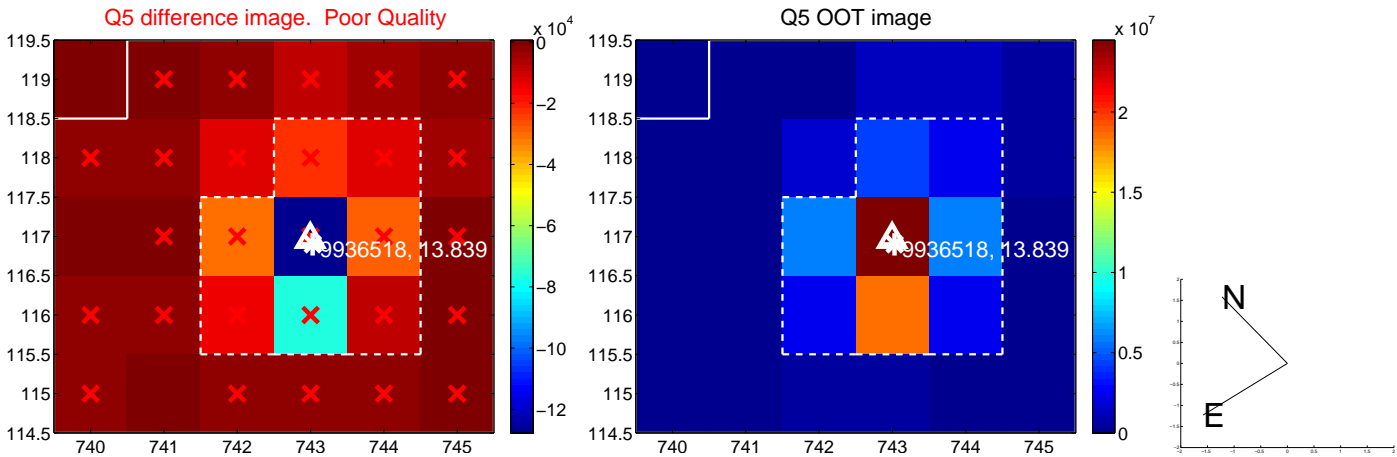


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

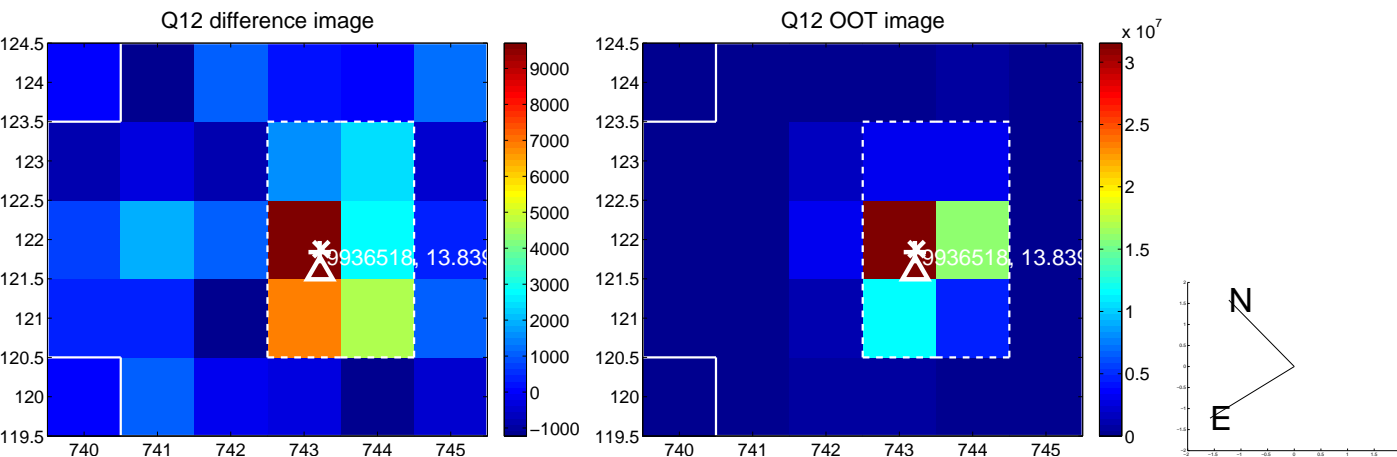
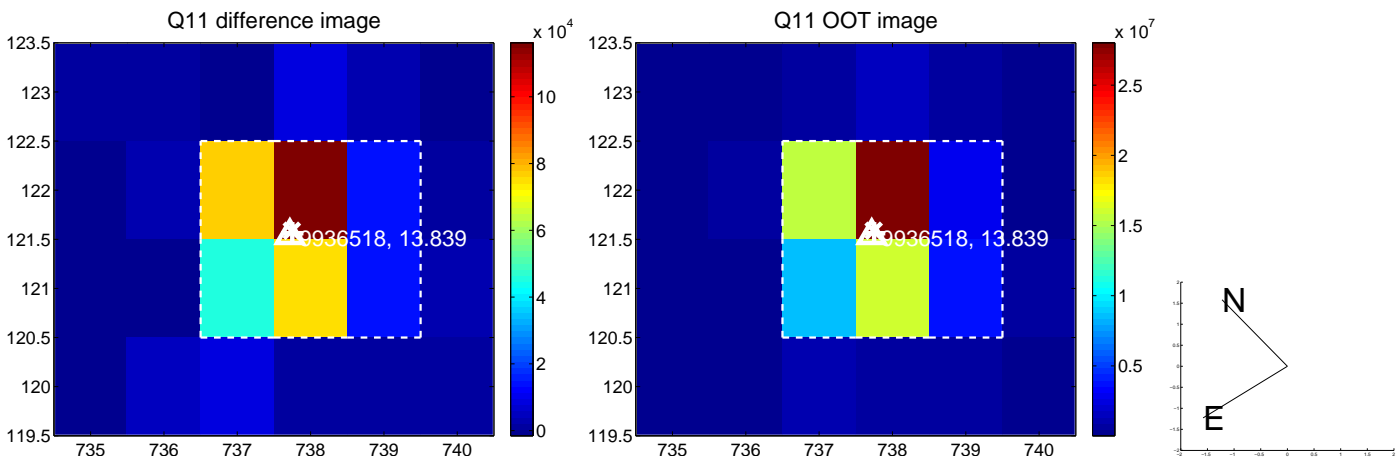
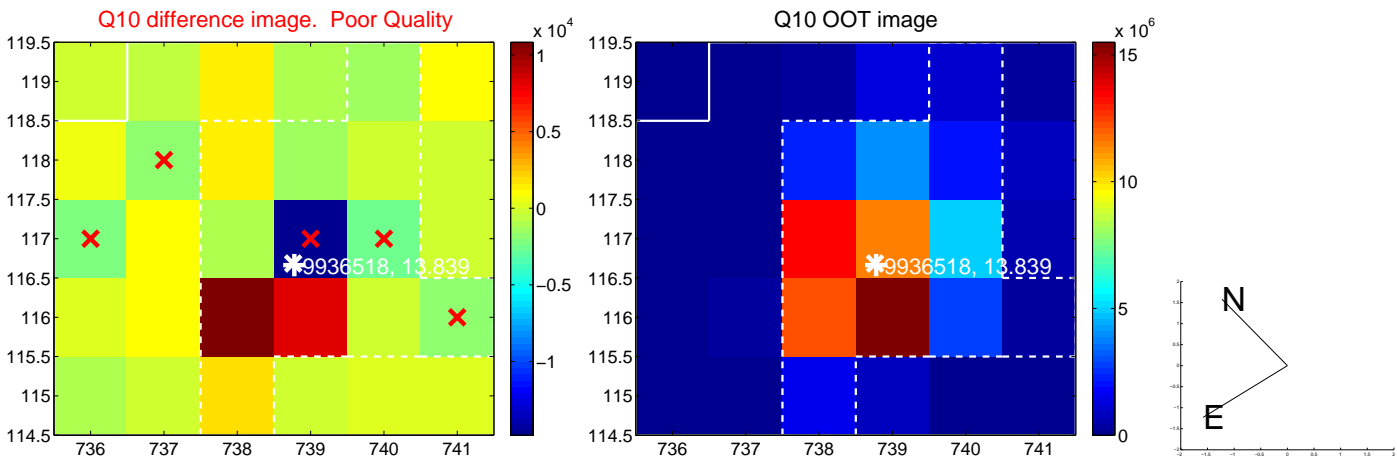
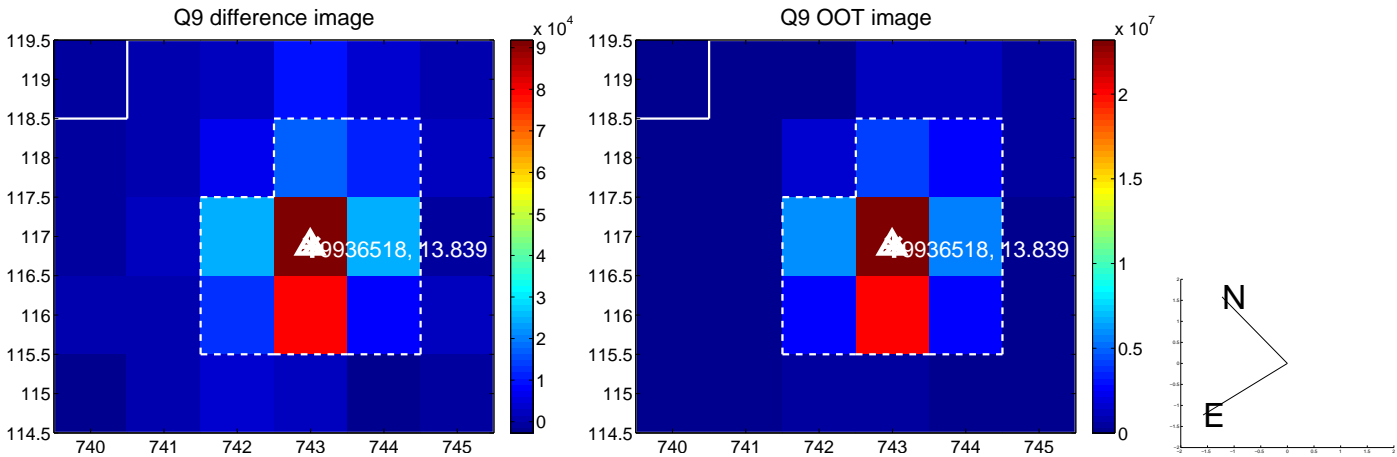
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



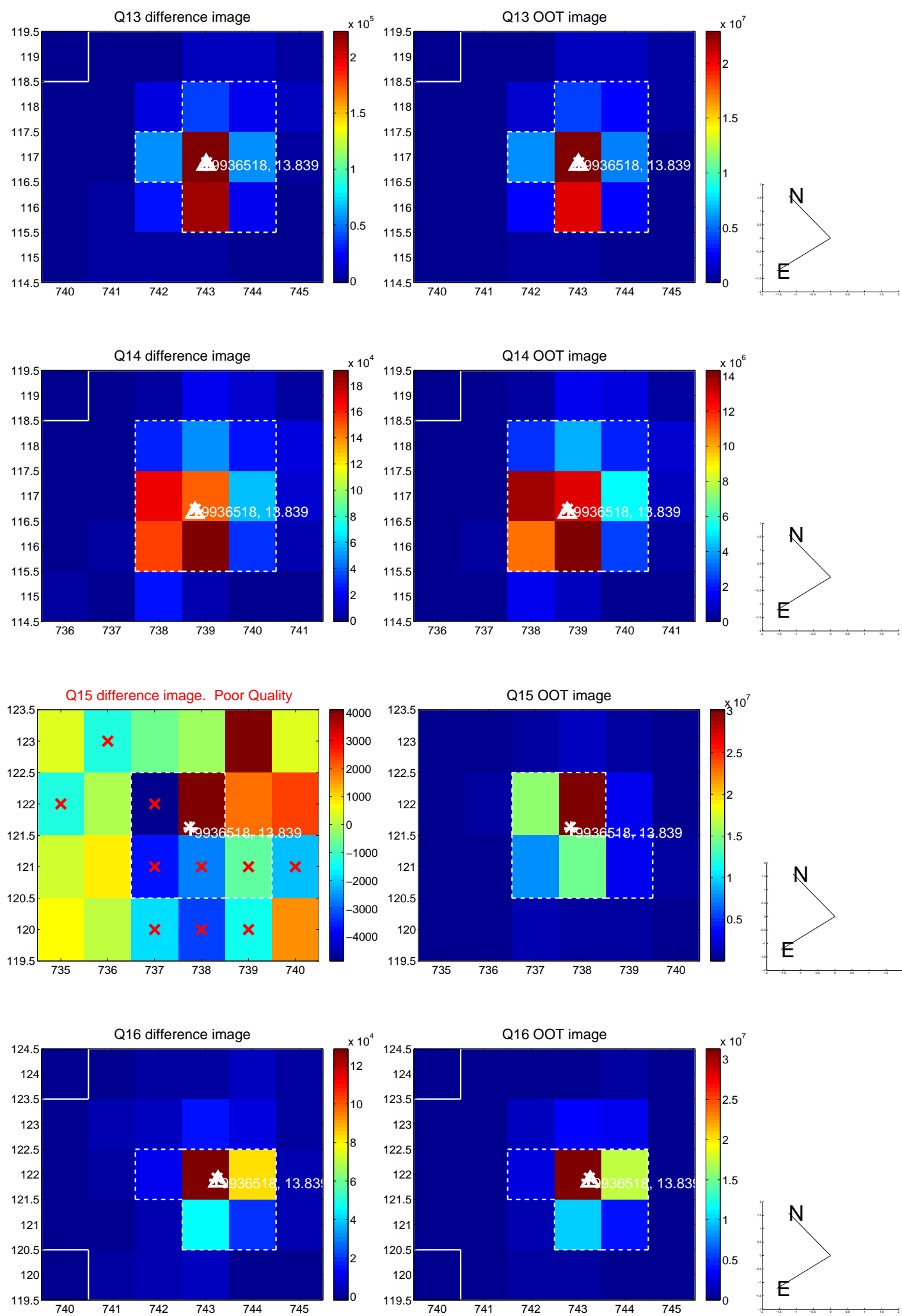
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

