

KIC 009343888

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})
009343888-01	OBS	No	1.976853	131.918629	52.0	4.922	8.2	10.5	2.36	7438	2.04	12277.67
009343888-02	OBS	No	0.991079	131.970114	90.3	1.785	14.7	15.2	2.36	7438	2.60	30827.42
009343888-03	OBS	No	0.991102	131.786791	96.0	1.858	12.8	16.0	2.36	7438	2.48	30826.45
009343888-04	OBS	No	0.988522	132.285632	60.0	3.241	9.3	11.8	2.36	7438	2.11	30933.79
009343888-05	OBS	No	1.977145	132.832364	270.0	3.500	8.8	-1.0	2.36	7438	3.93	12275.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009343888-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009343888-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009343888-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
009343888-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
009343888-05	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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

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

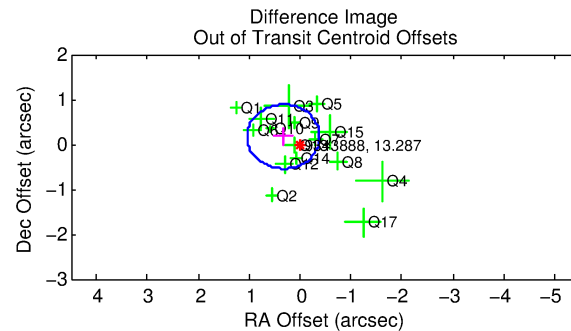
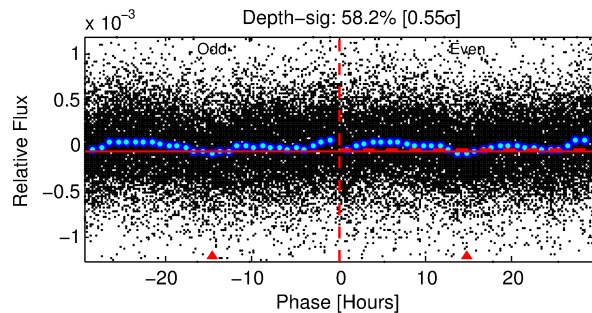
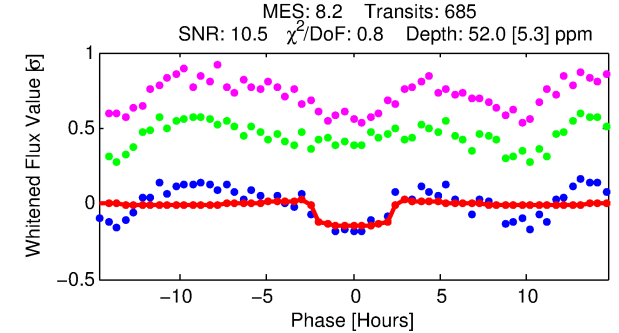
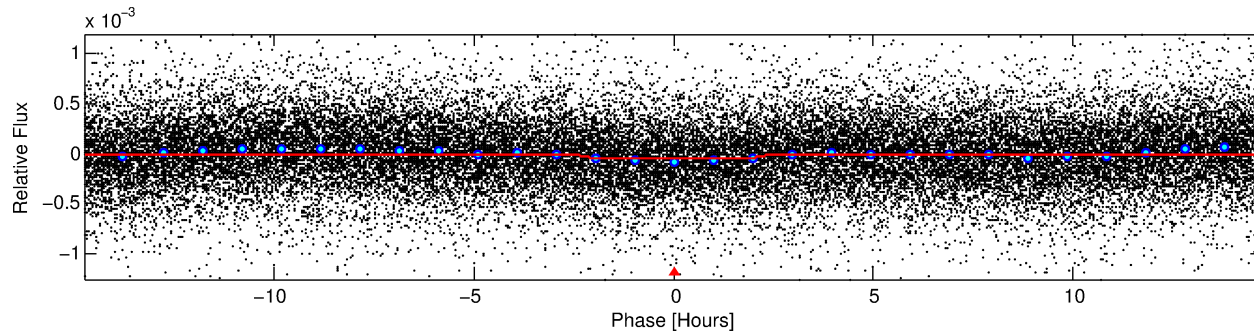
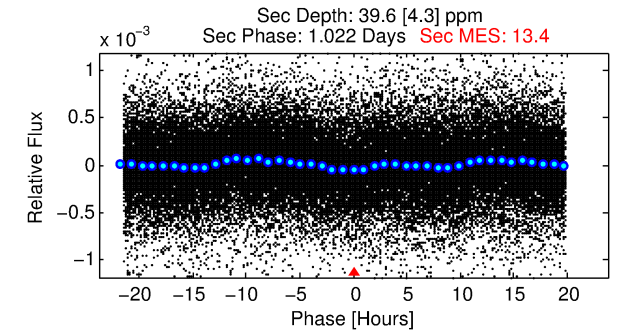
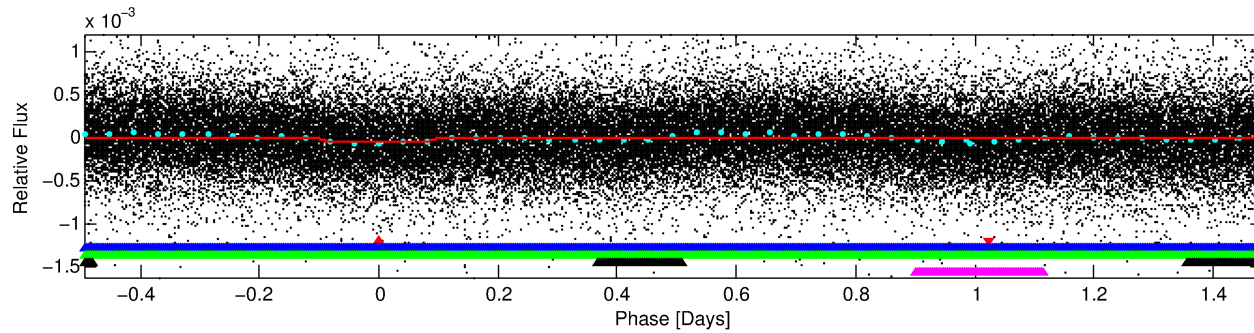
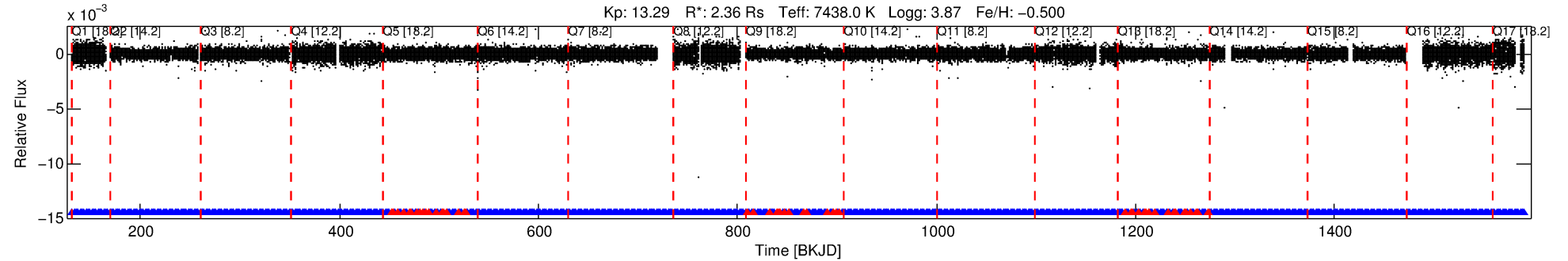
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009343888-01

No Significant Match Found

DV One-Page Summary

KIC: 9343888 Candidate: 1 of 5 Period: 1.977 d



DV Fit Results:

Period = 1.97685 [0.00002] d
Epoch = 131.9186 [0.0046] BKJD
Rp/R* = 0.0079 [0.0015]
a/R* = 1.47 [0.93]
b = 0.94 [0.14]
Seff = 12277.67 [8479.46]
Teq = 2684 [463] K
Rp = 2.04 [0.90] Re
a = 0.0352 [0.0144] AU
Ag = 6.49 [5.01] [1.09 σ]
Teffp = 6623 [695] K [4.72 σ]

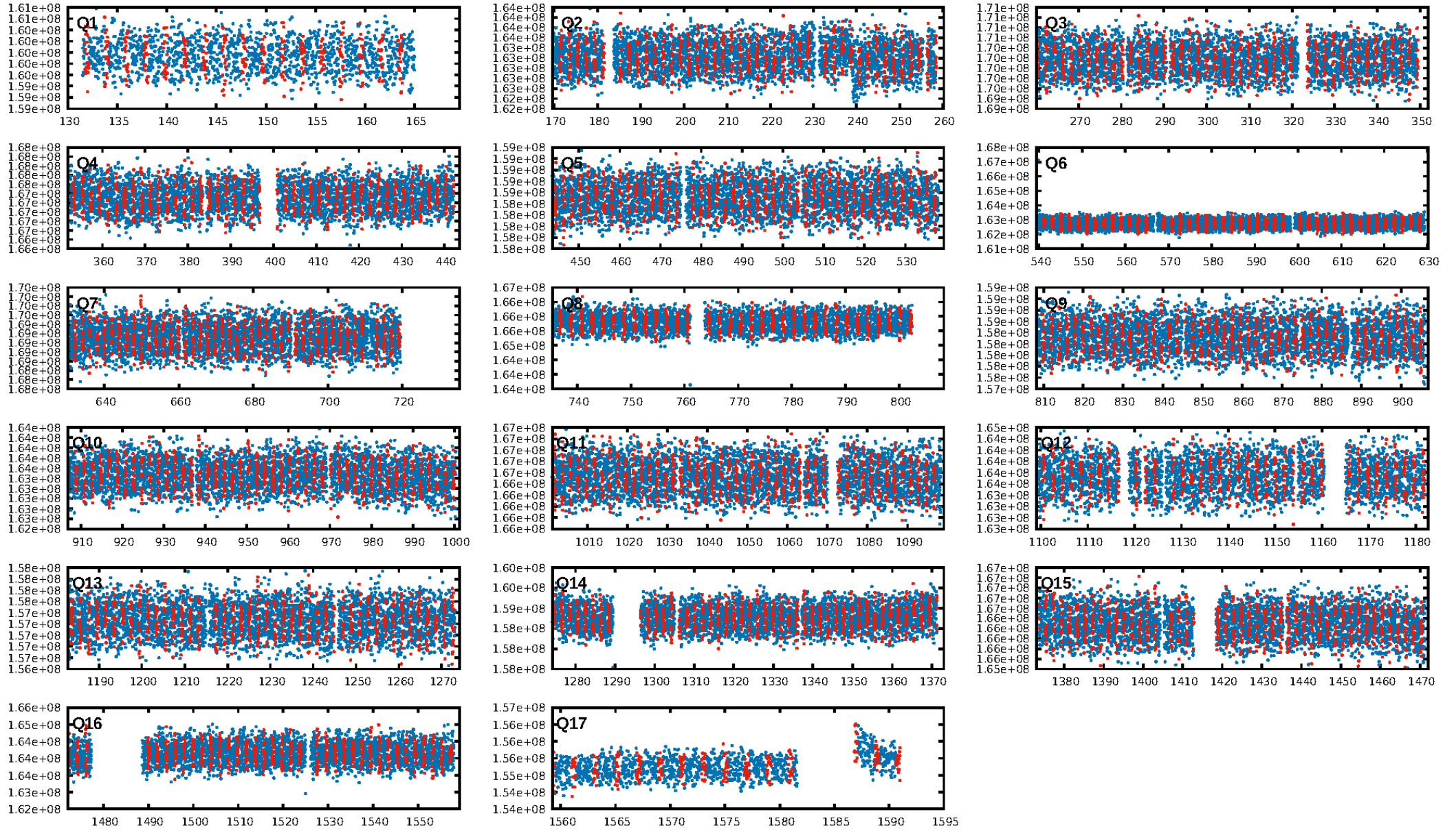
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.50 σ]
LongPeriod-sig: 0.1% [0.00 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.92 [604/653]
GhostDiagnostic-chr: 1.593
Centroid-sig: 39.0%
Centroid-so: 0.291 arcsec [0.75 σ]
OotOffset-rm: 0.368 arcsec [1.55 σ]
KicOffset-rm: 0.364 arcsec [1.46 σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 0.00 [0/17]

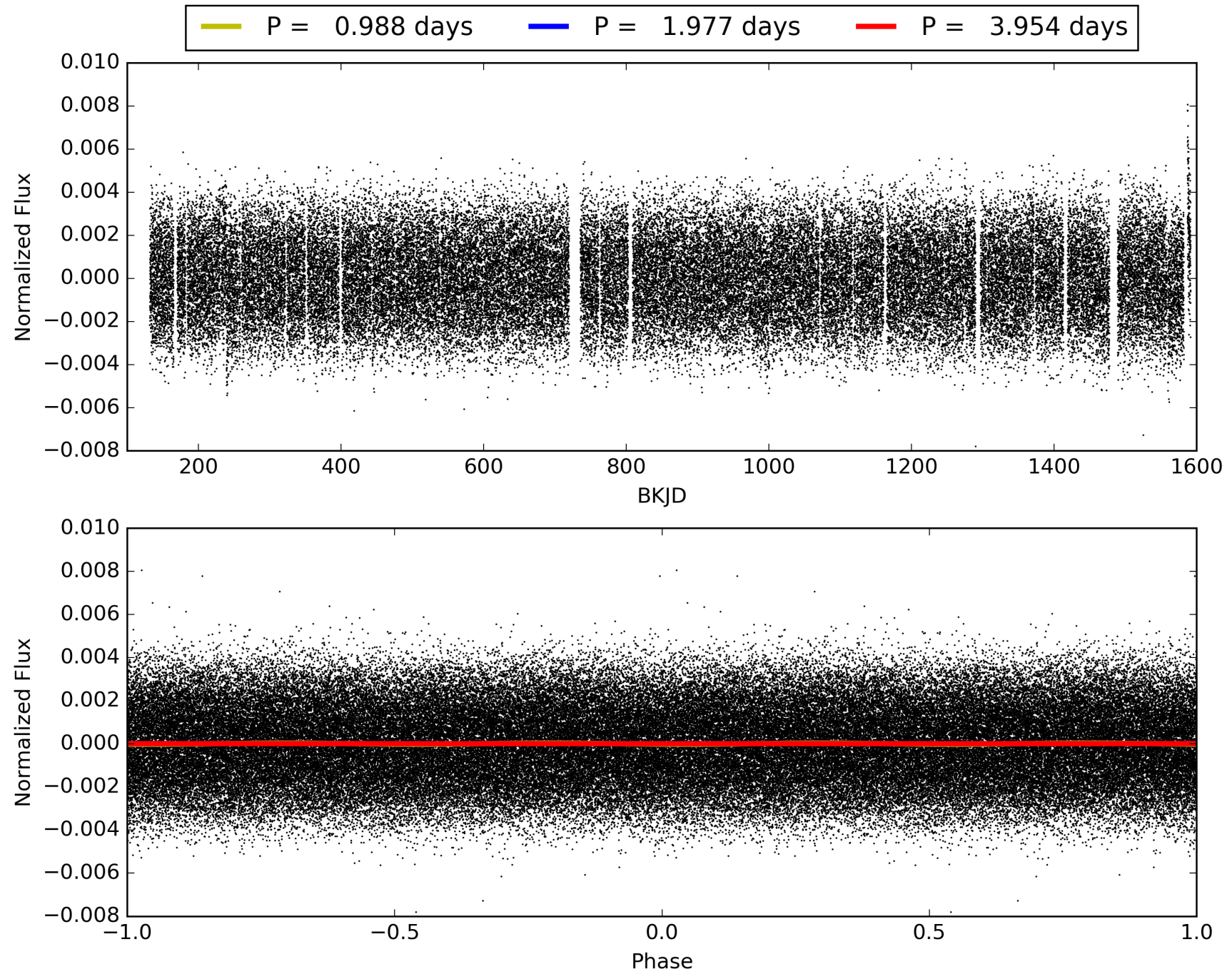
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:34:37 Z

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

TCE 009343888-01, PDC Light Curves

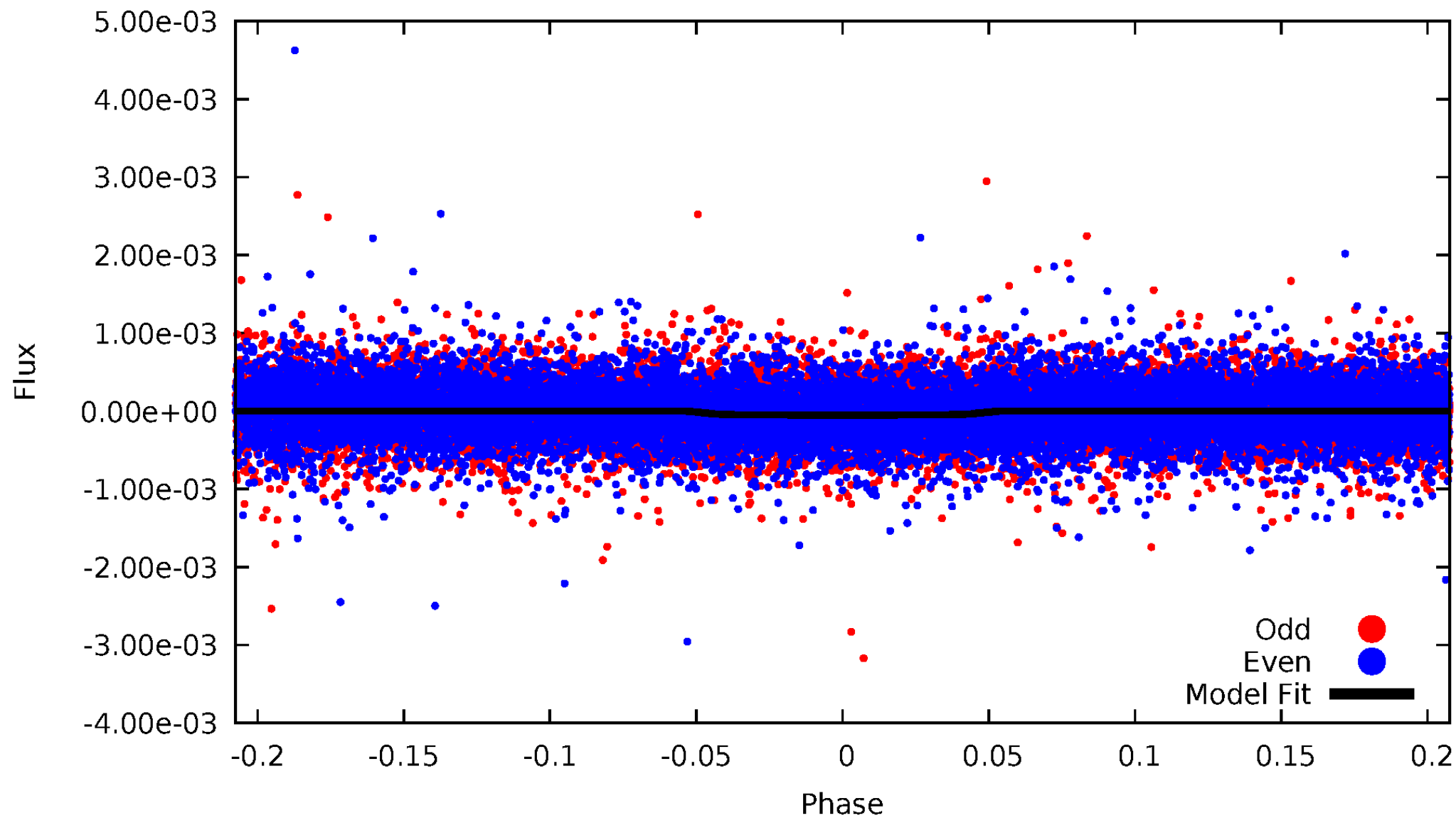


TCE 009343888-01



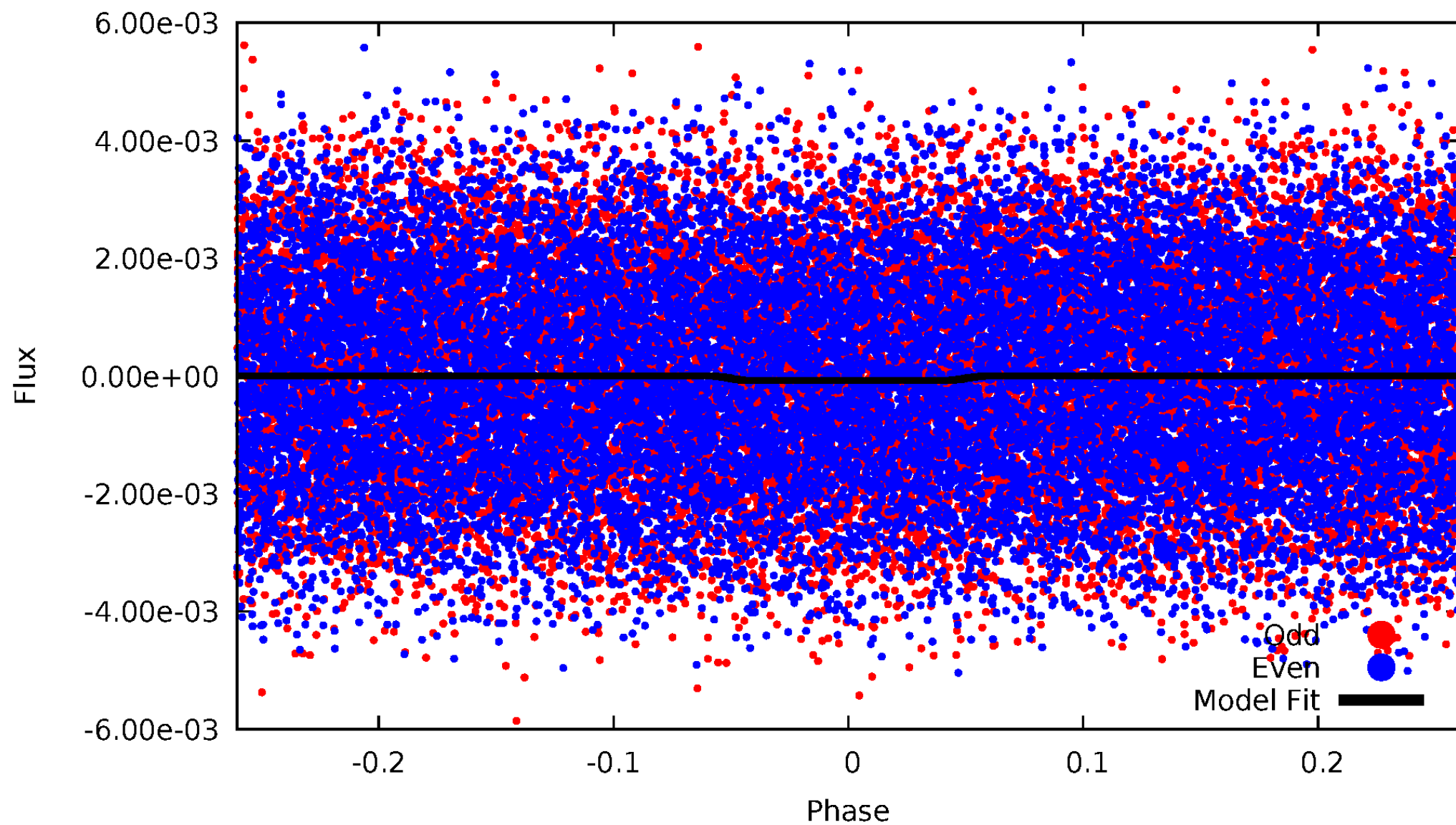
DV Odd/Even

TCE 009343888-01

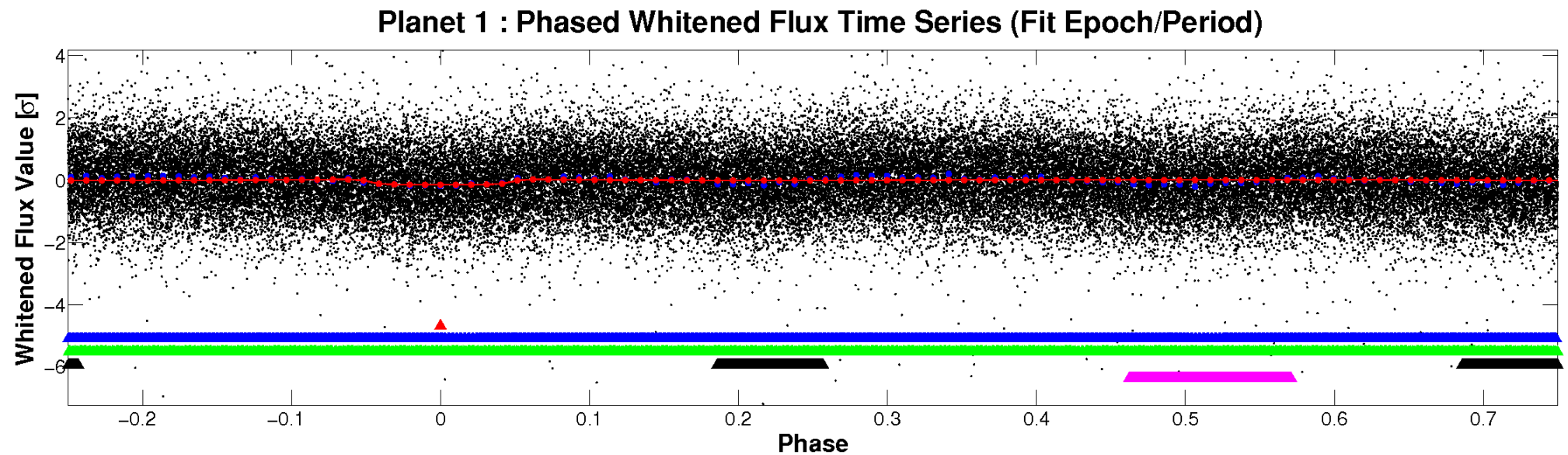
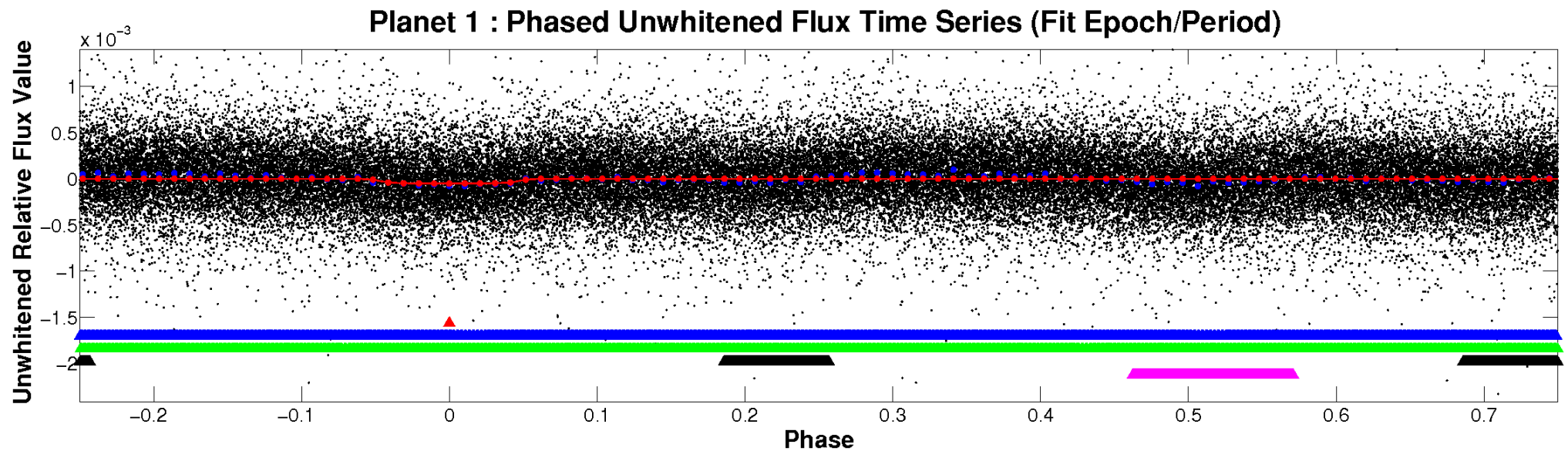


ALT Odd/Even

TCE 009343888-01

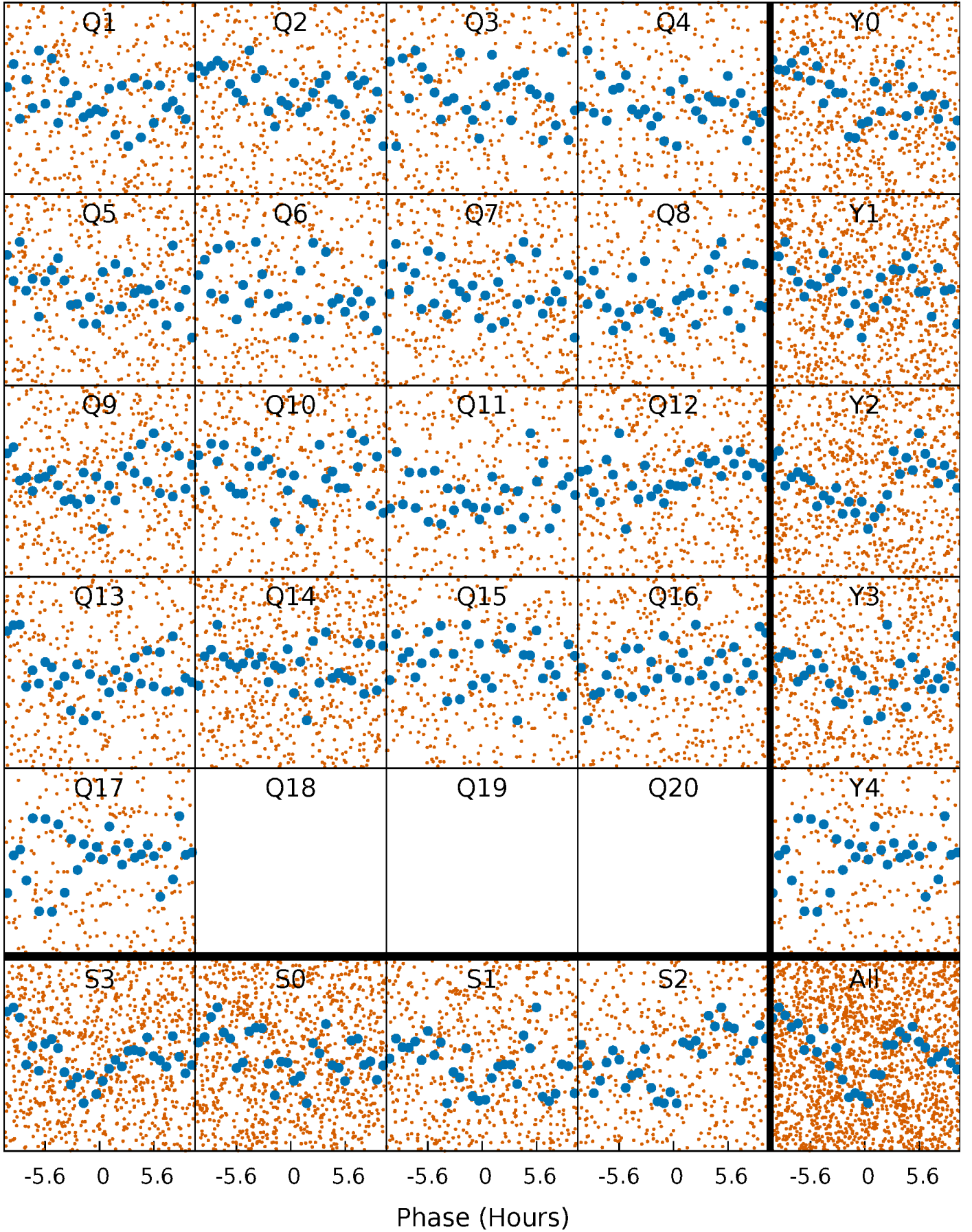


Non-Whitened Vs. Whitened Light Curve



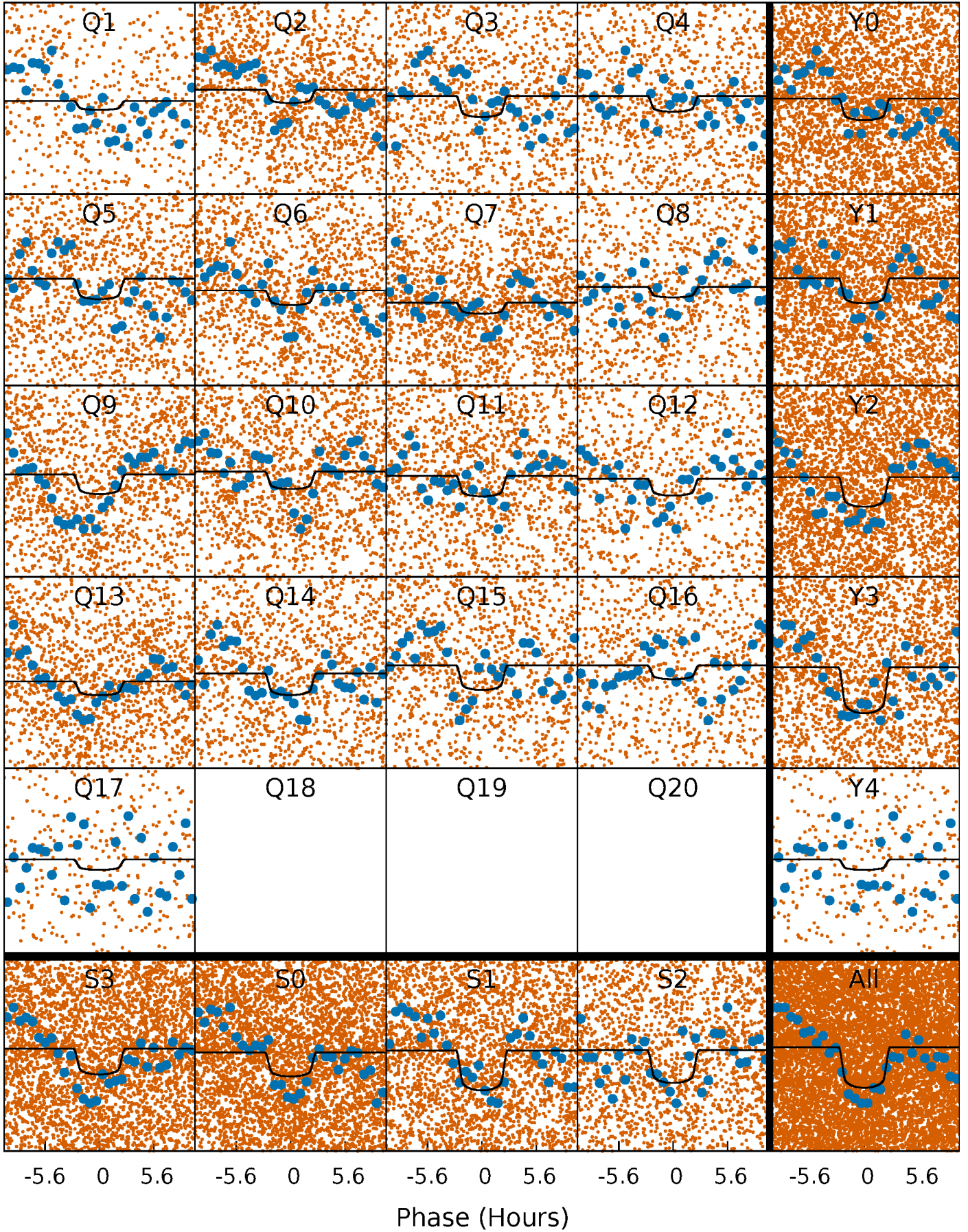
PDC Quarter-Phased Transit Curves

TCE 009343888-01 P= 1.976853 Days $T_0=131.918629$ (BKJD)



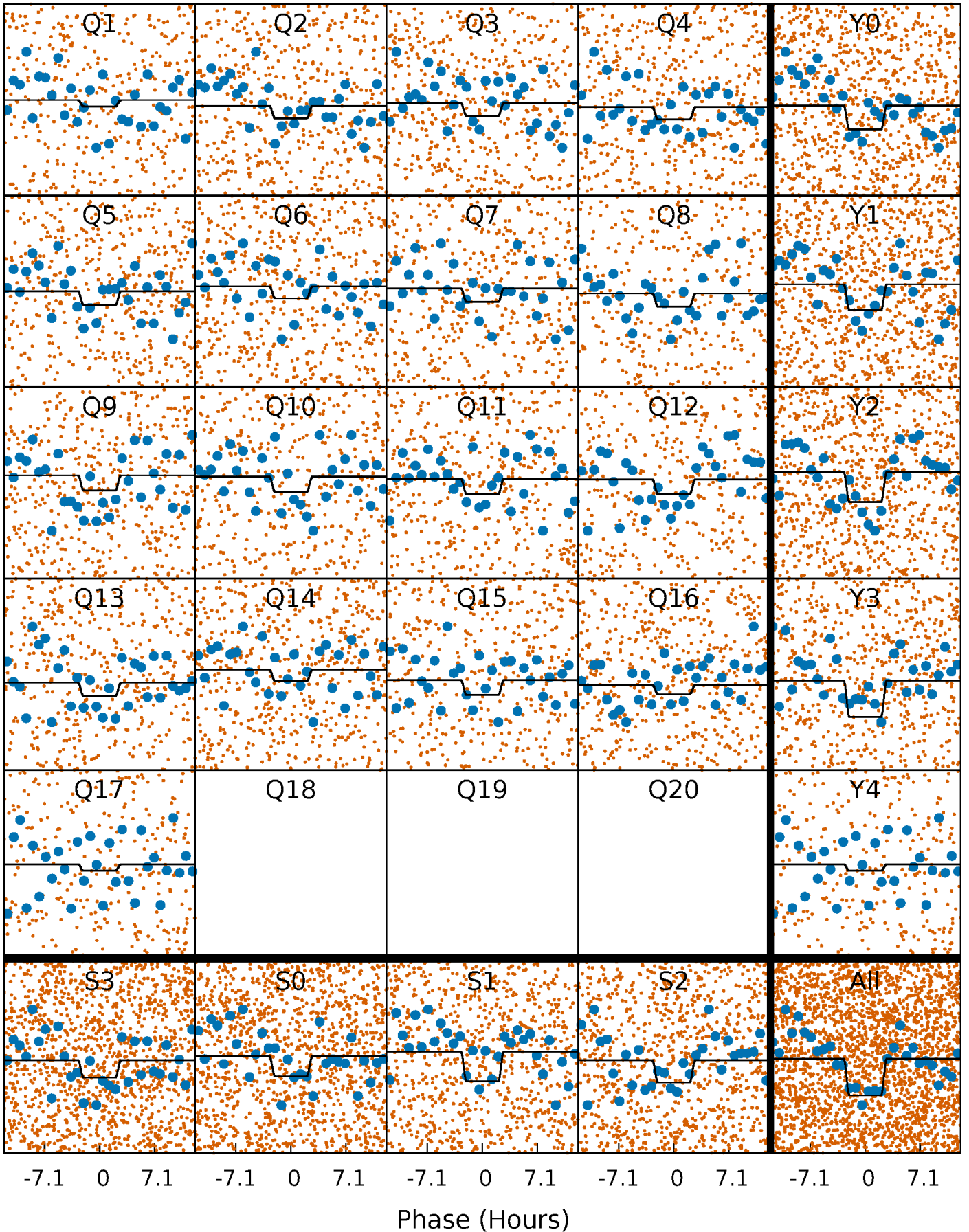
DV Quarter-Phased Transit Curves

TCE 009343888-01 P= 1.976853 Days $T_0=131.918629$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

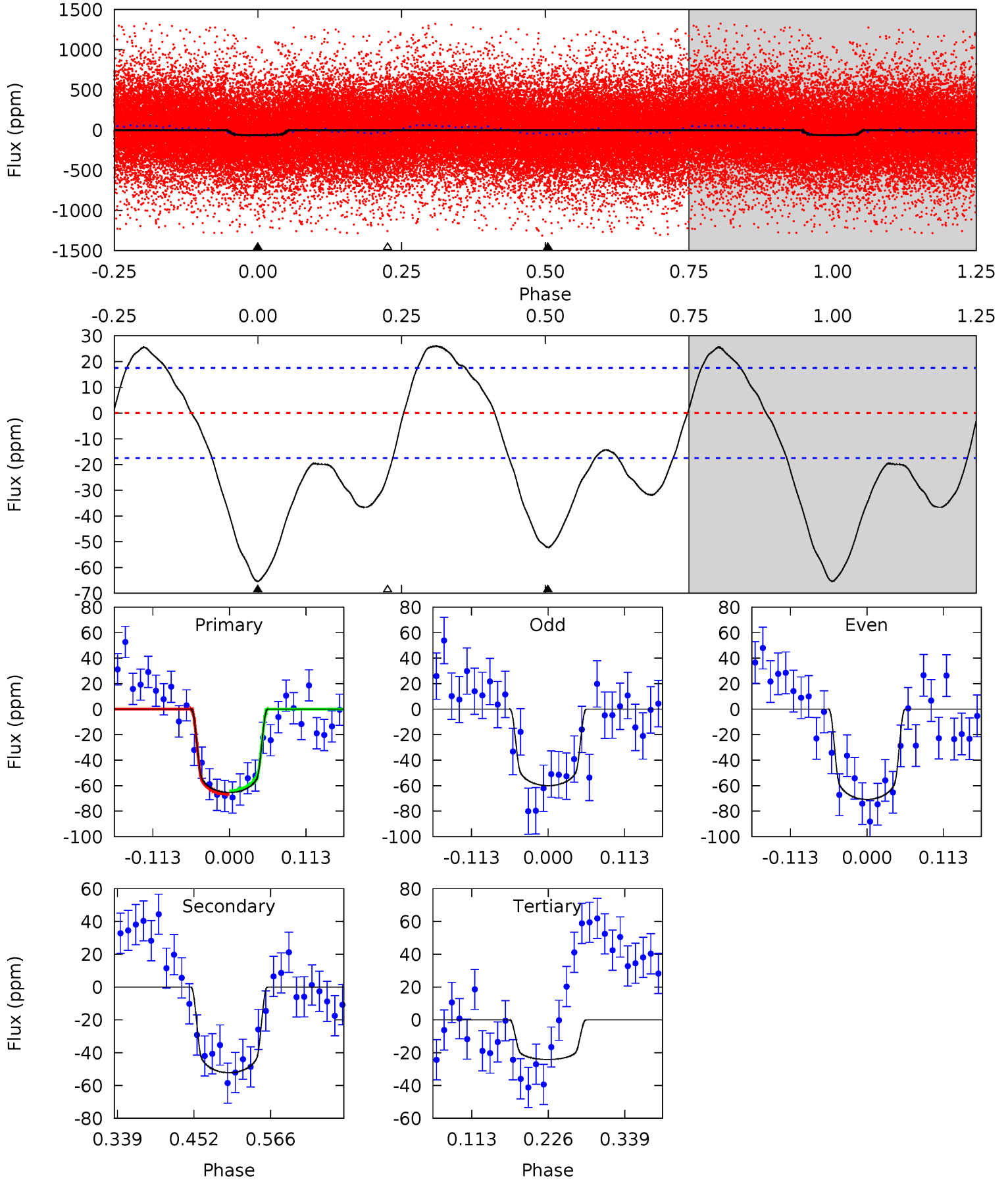
TCE 009343888-01 P= 1.976753 Days $T_0=131.934614$ (BKJD)



DV Model-Shift Uniqueness Test

009343888-01, P = 1.976853 Days, E = 129.941776 Days

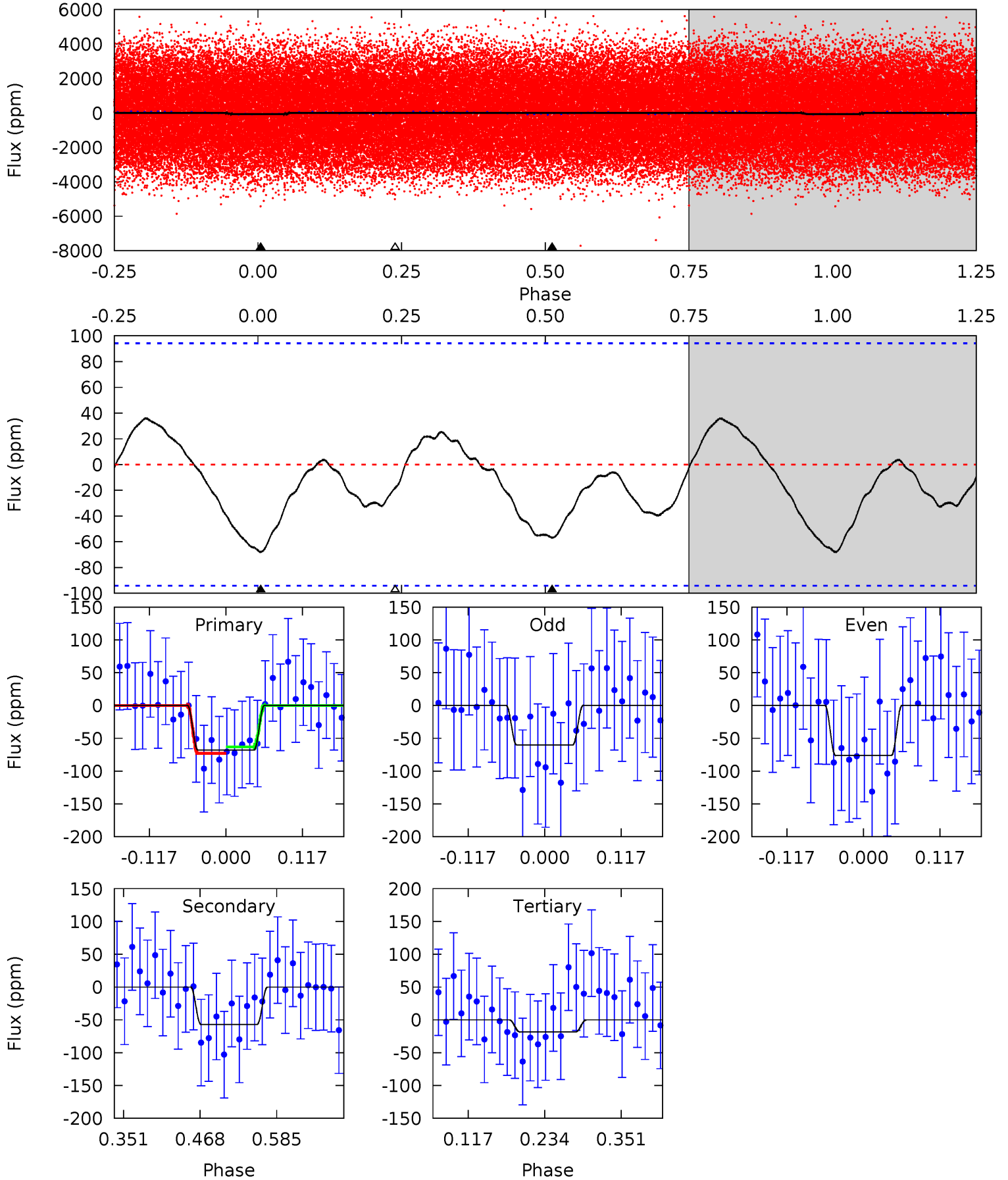
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.9	13.5	6.27	0	4.54	1.58	5.75	10.7	16.9	7.27	13.5	1.41	0.96	0.28	0.34



Alt Model-Shift Uniqueness Test

009343888-01, P = 1.976753 Days, E = 129.957861 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.27	2.74	0.88	0	4.53	1.57	1.11	2.39	3.27	1.86	2.74	0.38	1.09	0.35	0.24



Stellar Parameters For KIC 009343888

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7438^{+233}_{-311}	$3.867^{+0.400}_{-0.100}$	$-0.500^{+0.250}_{-0.300}$	$2.358^{+0.511}_{-0.949}$	$1.492^{+0.209}_{-0.313}$	$0.160^{+0.519}_{-0.063}$
	+3%/-4%	+10%/-3%	+50%/-60%	+22%/-40%	+14%/-21%	+323%/-39%
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 009343888-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-52 ± 4	$1.89^{+0.53}_{-0.50}$	3648^{+250}_{-393}	6934^{+979}_{-635}	10^{+8}_{-4}
Alt.	-57 ± 21	$2.02^{+0.54}_{-0.53}$	3646^{+279}_{-403}	6864^{+1202}_{-972}	$9.296^{+8.775}_{-4.295}$

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

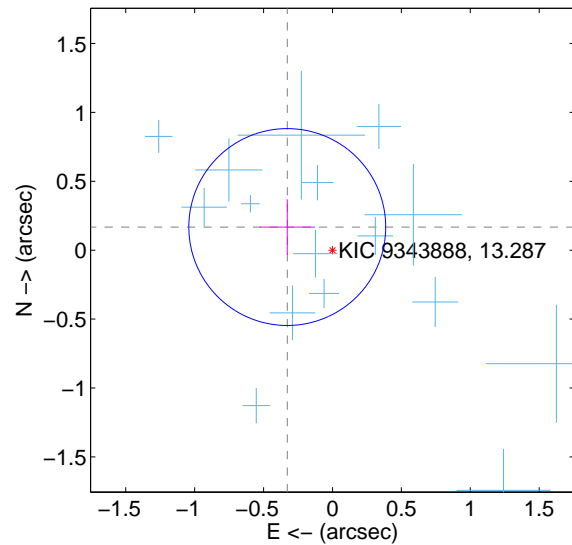
Supplemental centroid analysis for 009343888-01. Kepler magnitude: 13.29. Transit SNR 10.53

There are 16 quarters with good PRF difference image offsets

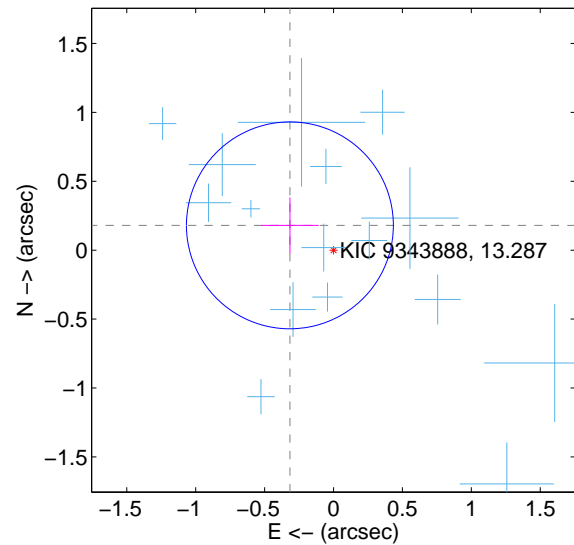
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.368 ± 0.238	1.55	0.328 ± 0.201	0.168 ± 0.201
PRF-fit source offset from KIC position	0.364 ± 0.250	1.46	0.316 ± 0.208	0.180 ± 0.203
photometric centroid source offset	0.29 ± 0.39	0.75	0.25 ± 0.39	-0.14 ± 0.40

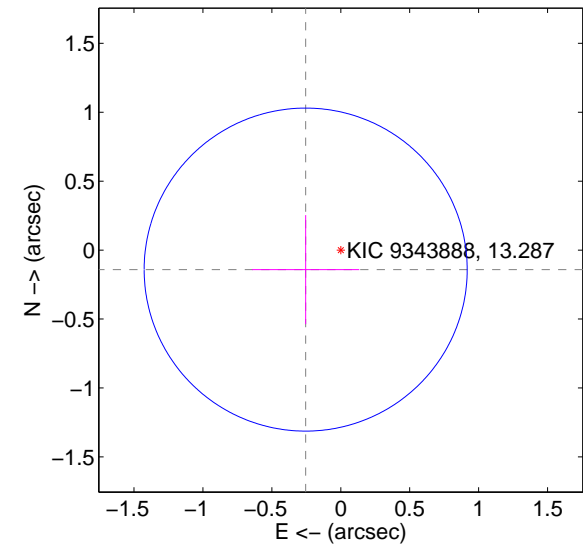
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

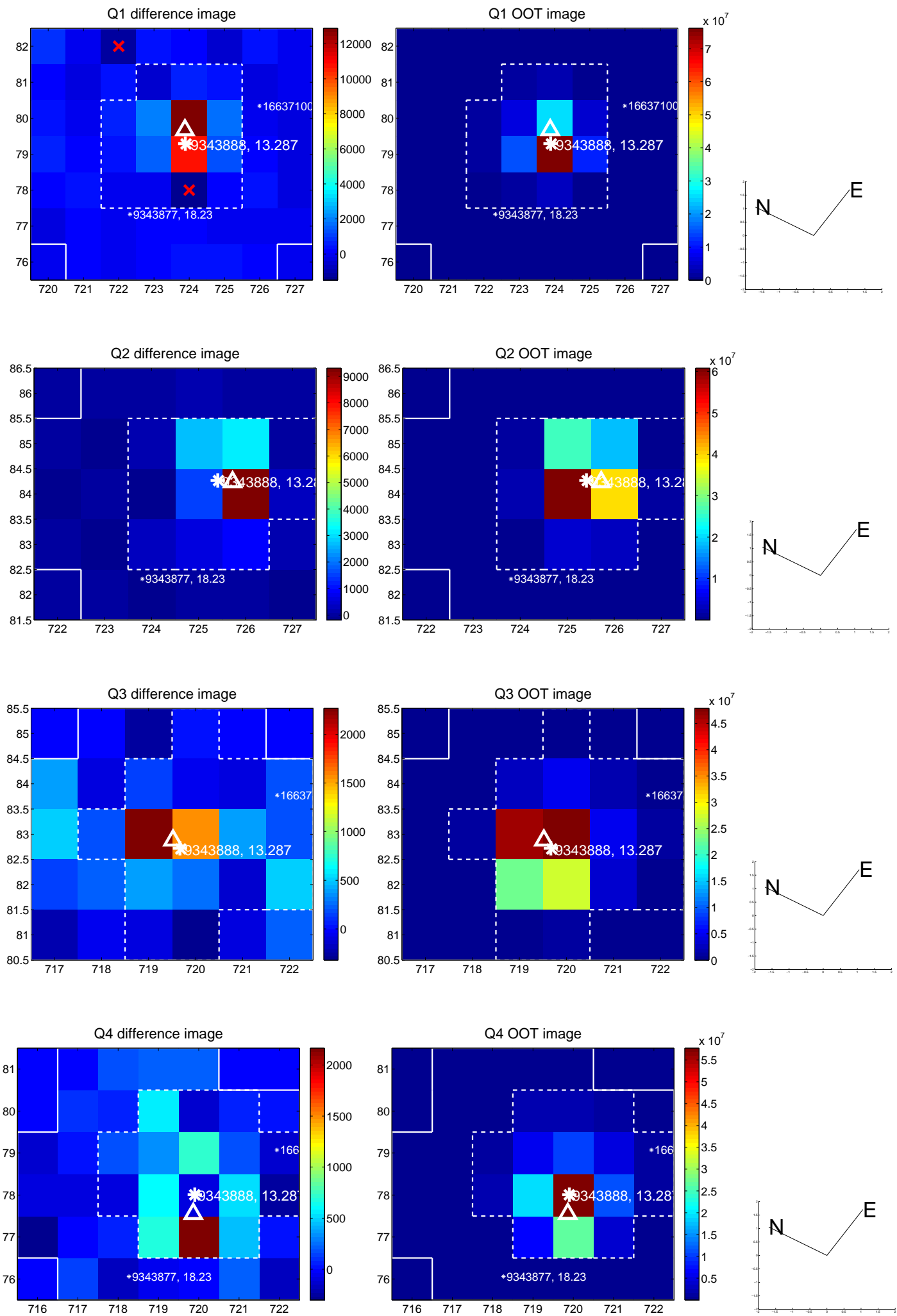


offset from photometric centroids

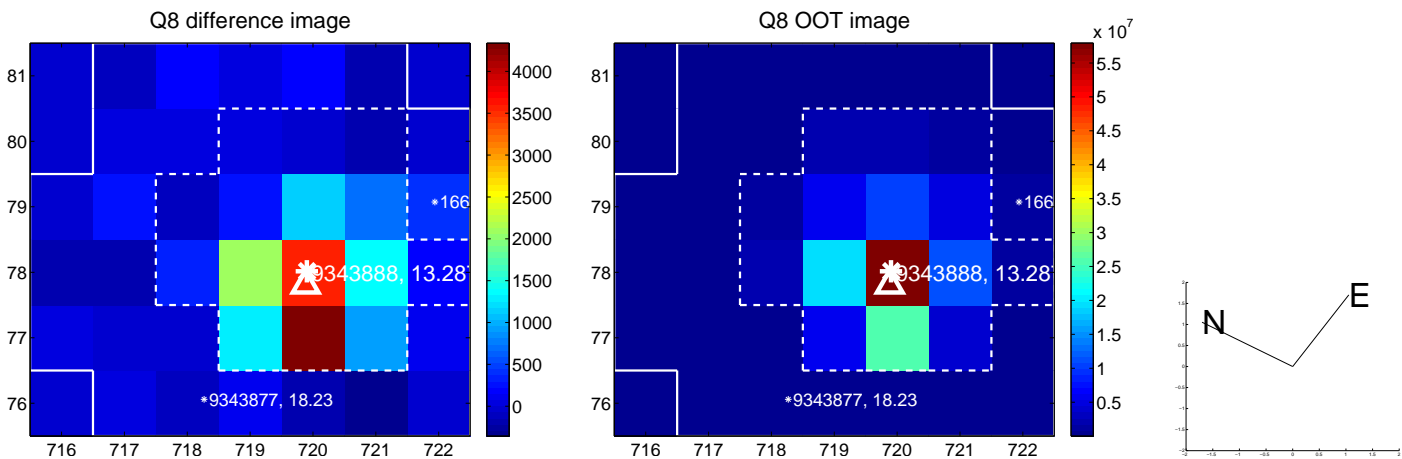
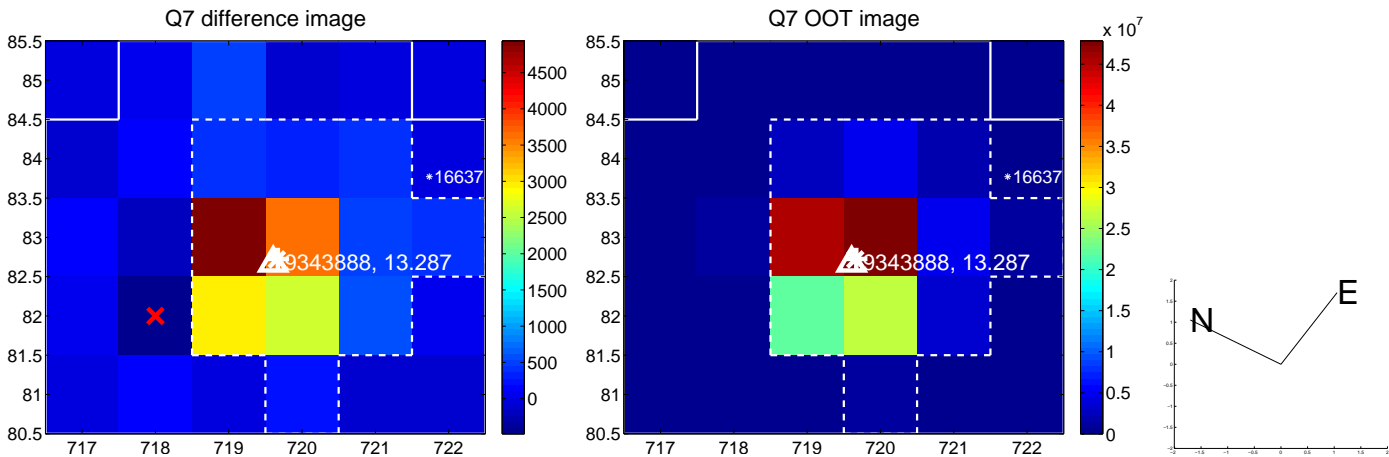
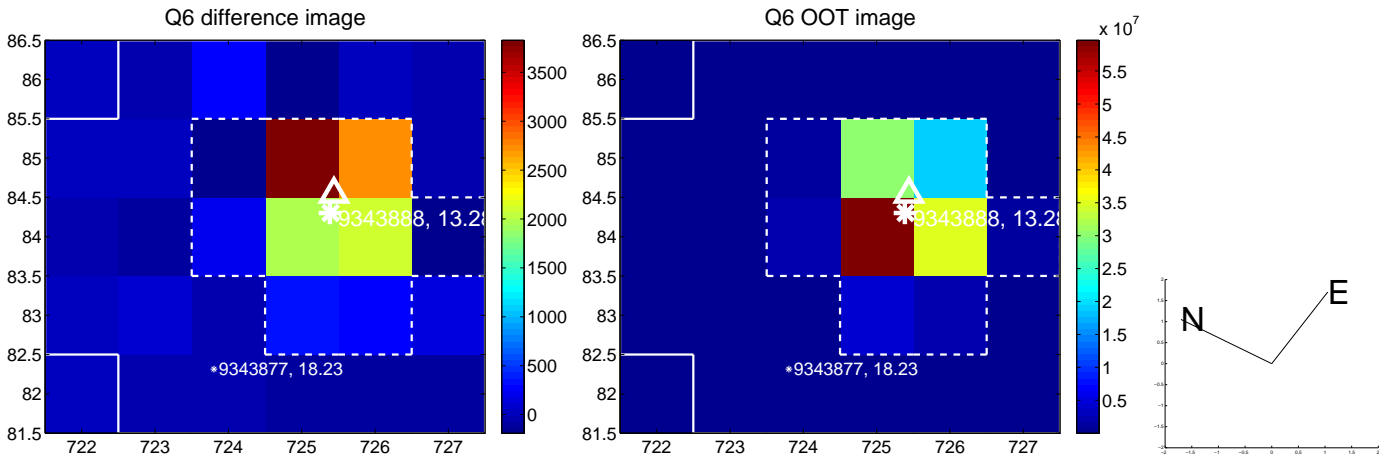
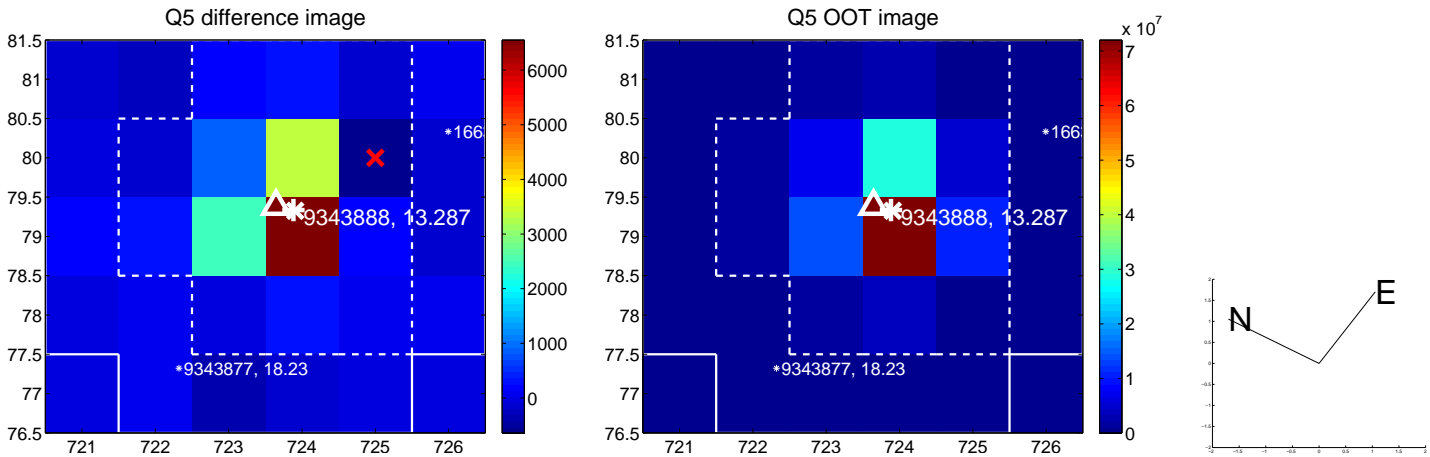


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

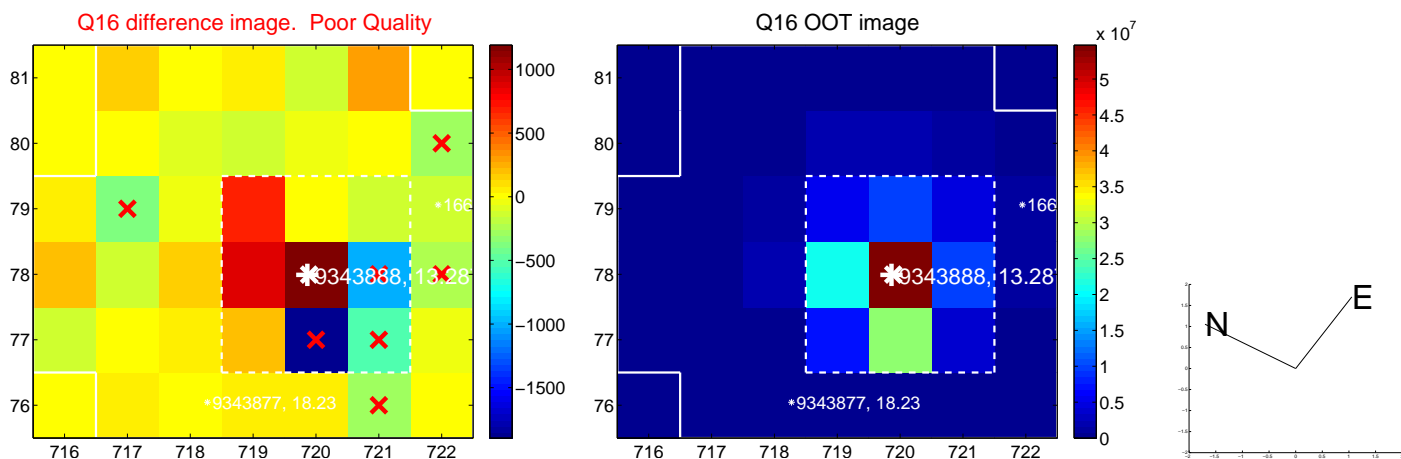
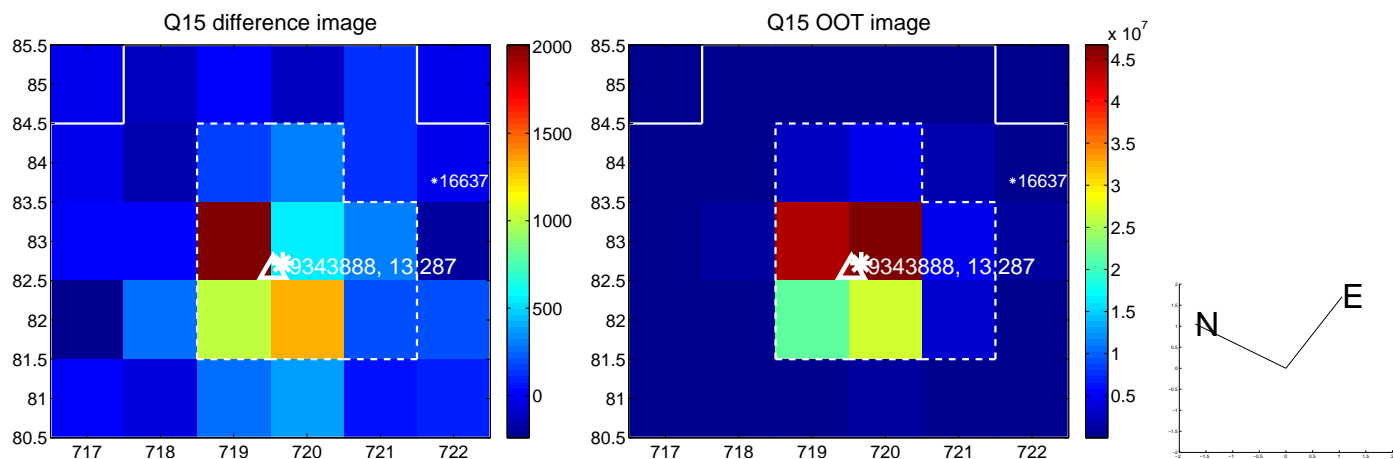
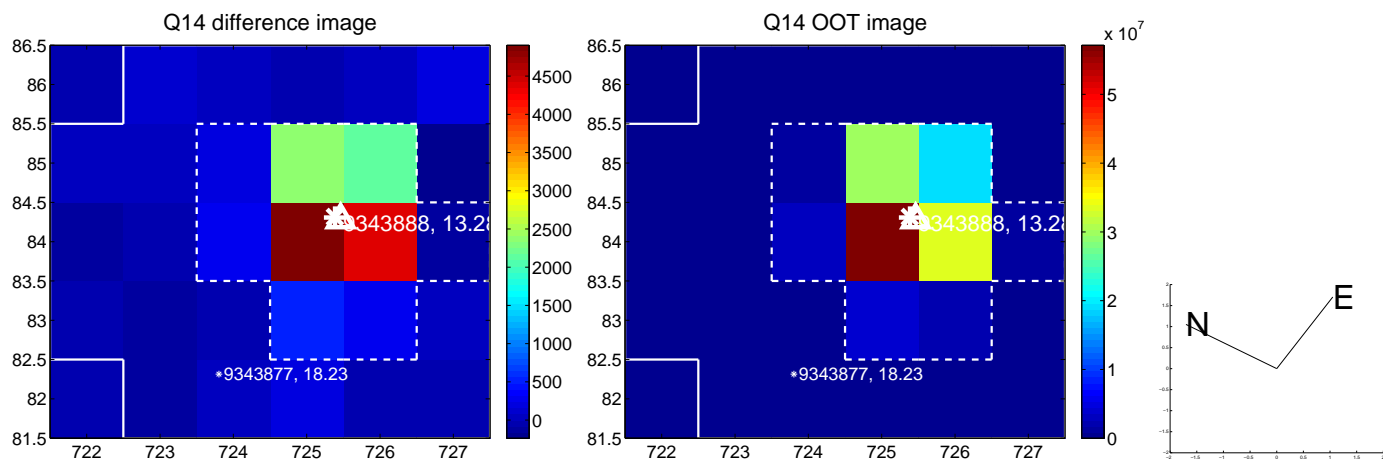
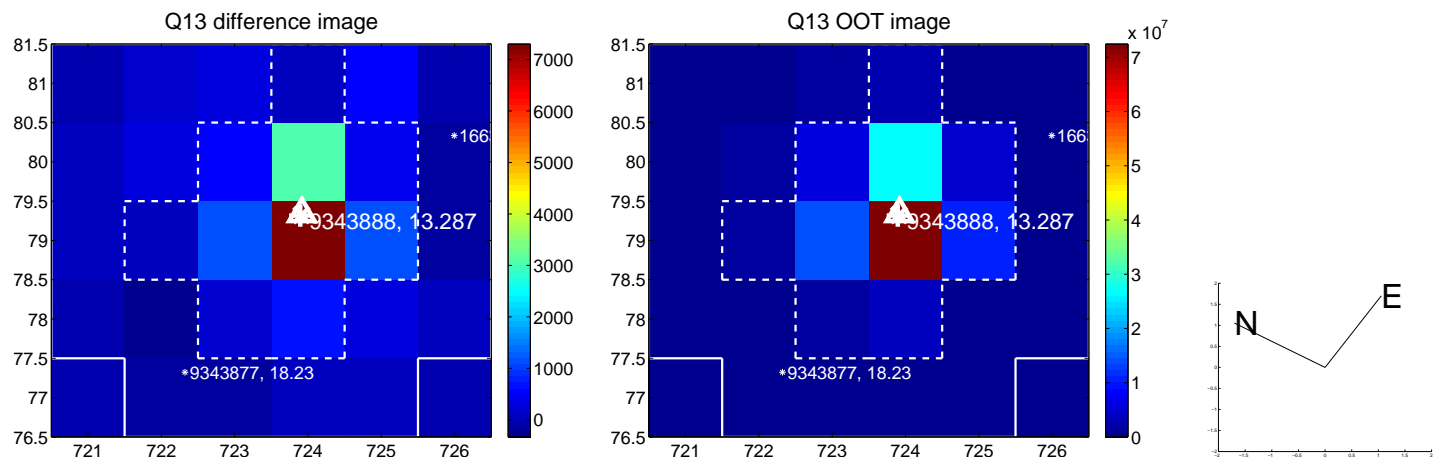
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



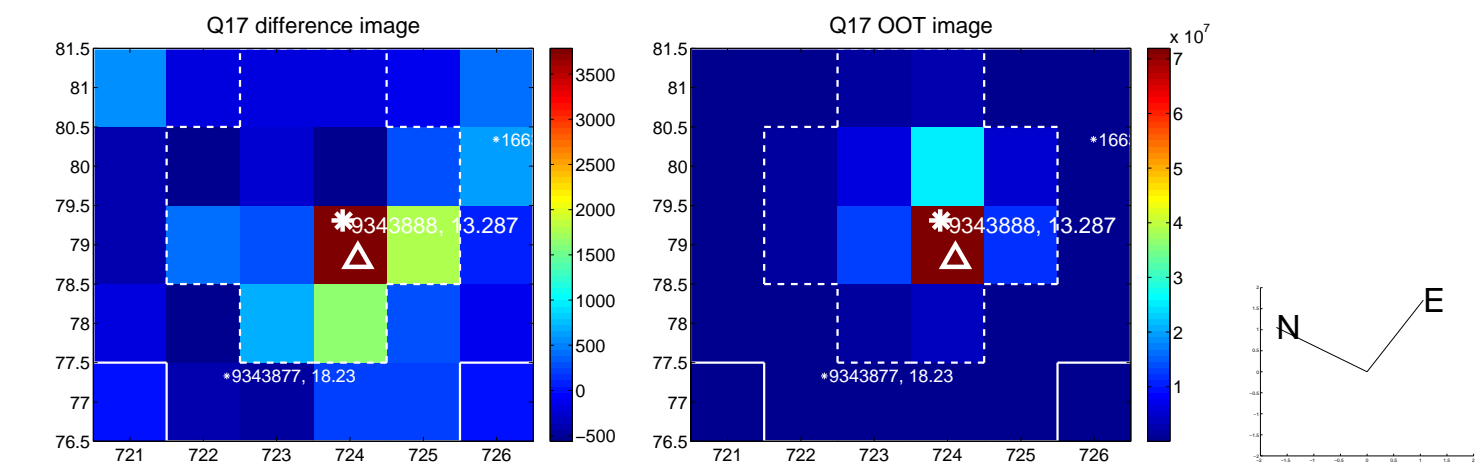
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



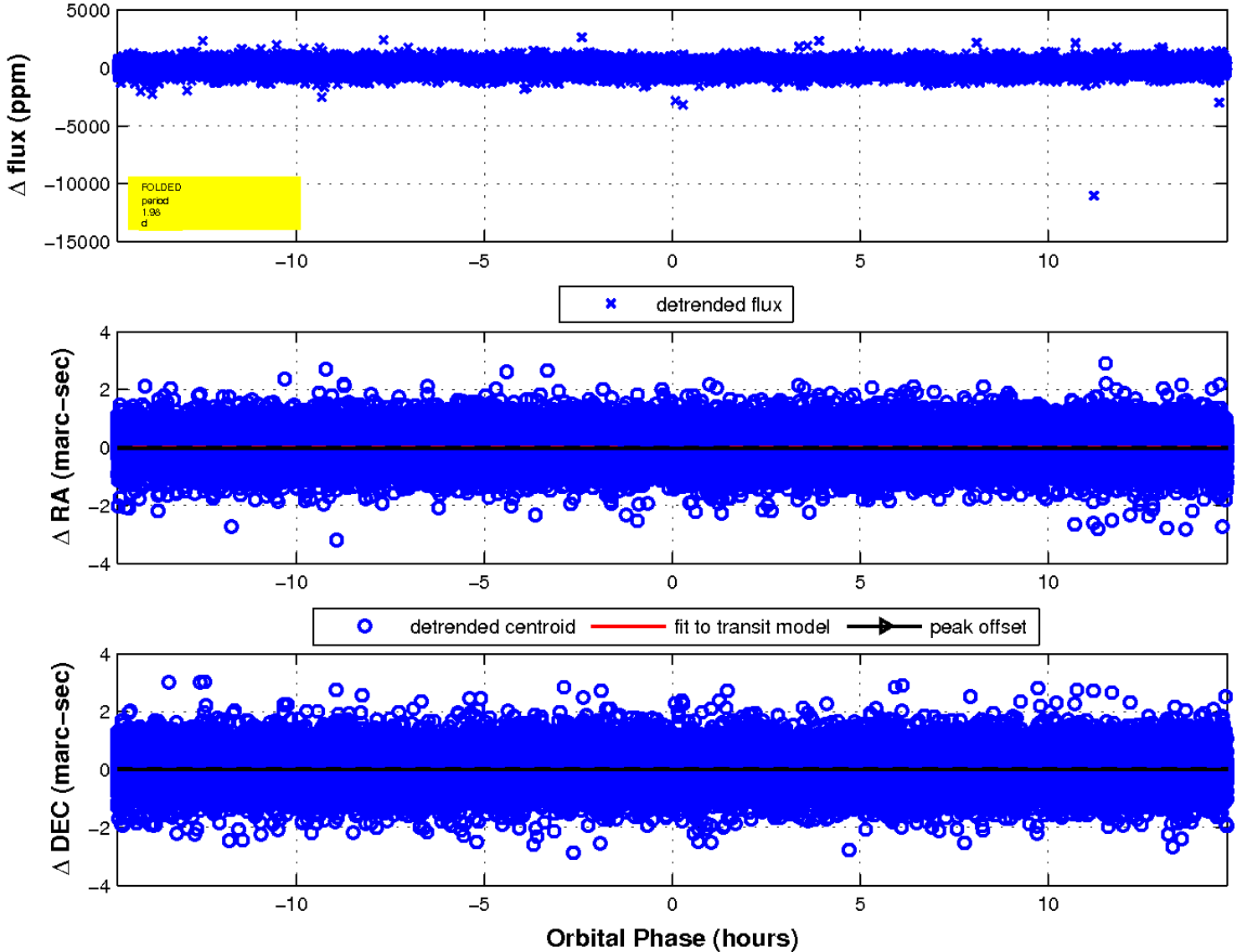
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

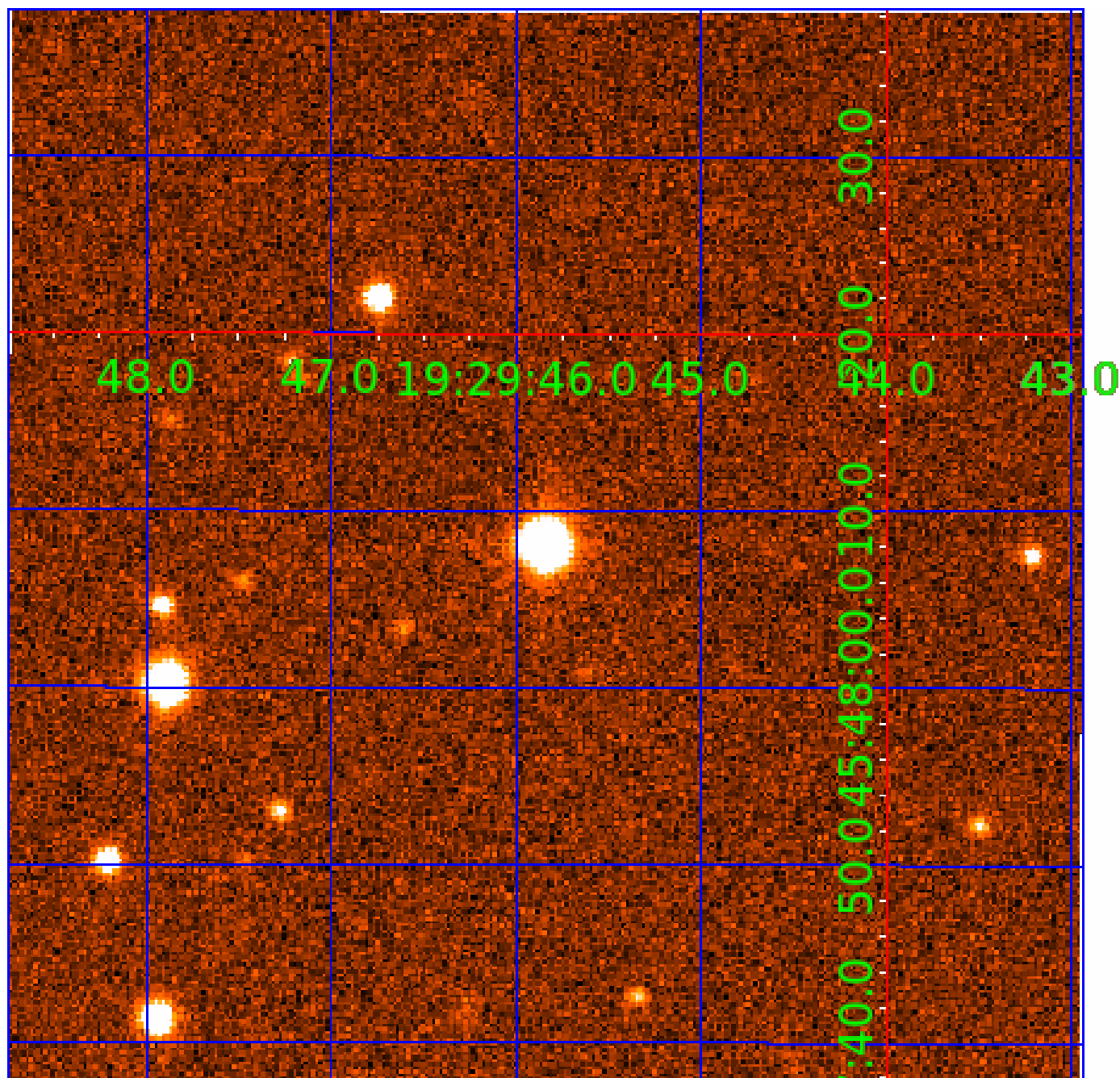


fluxWeightedCentroids, Planet 1 of 5



UKIRT Image

Declination



KIC 009343888

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})
009343888-01	OBS	No	1.976853	131.918629	52.0	4.922	8.2	10.5	2.36	7438	2.04	12277.67
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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009343888-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009343888-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
009343888-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
009343888-05	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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

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

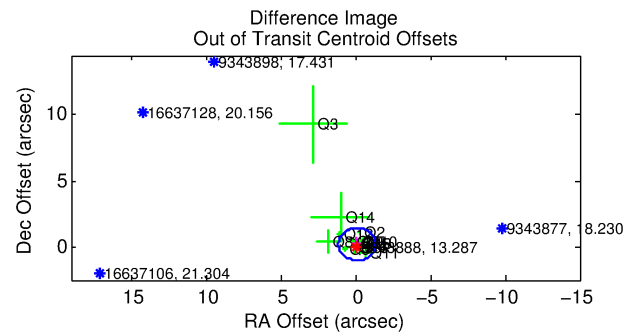
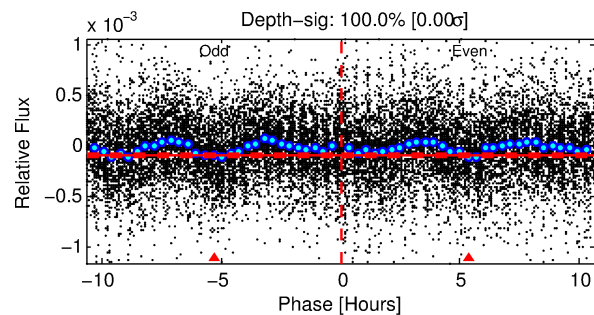
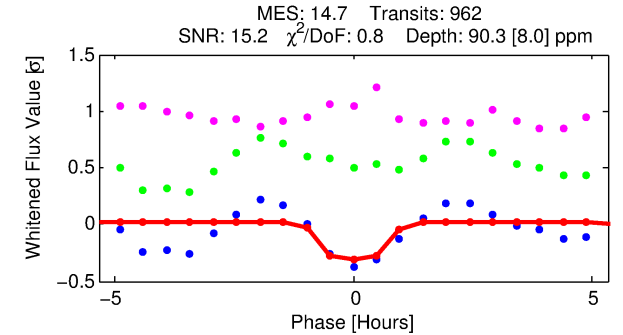
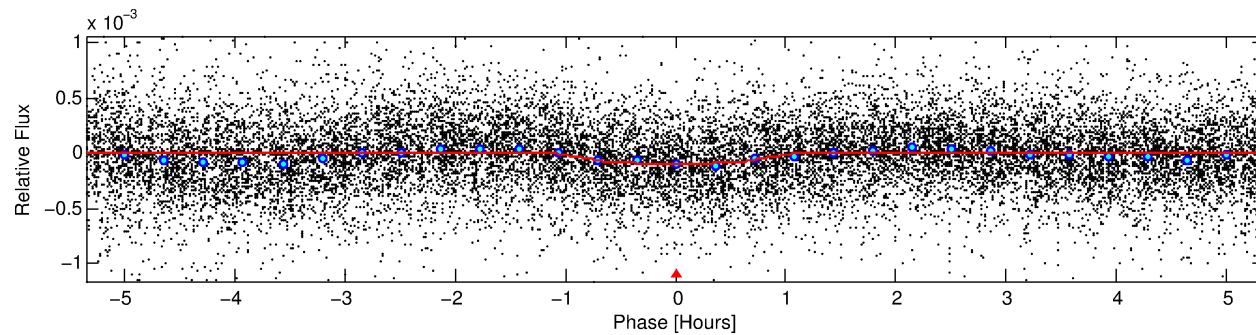
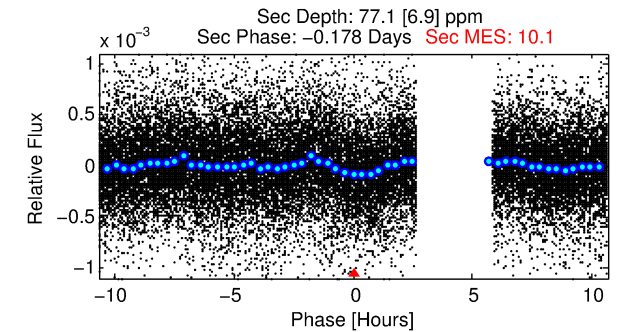
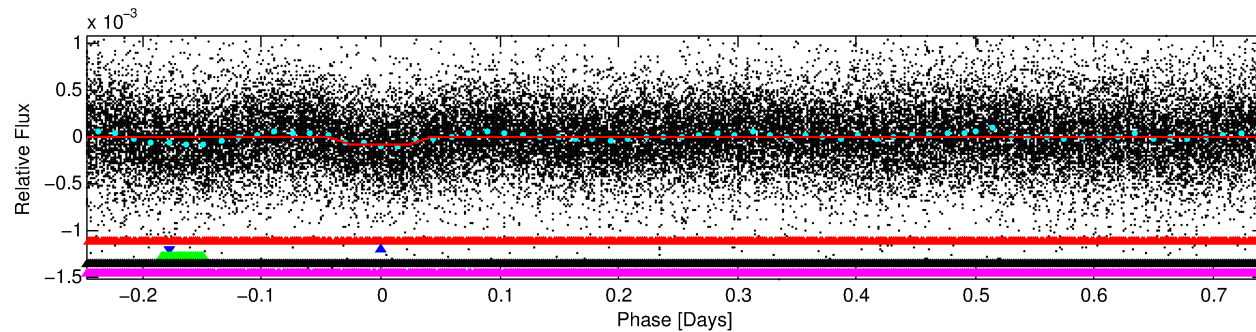
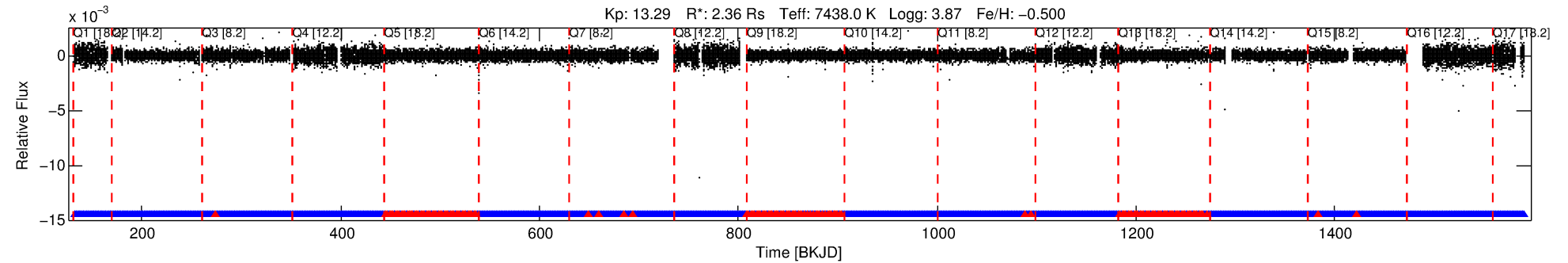
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009343888-02

No Significant Match Found

DV One-Page Summary

KIC: 9343888 Candidate: 2 of 5 Period: 0.991 d



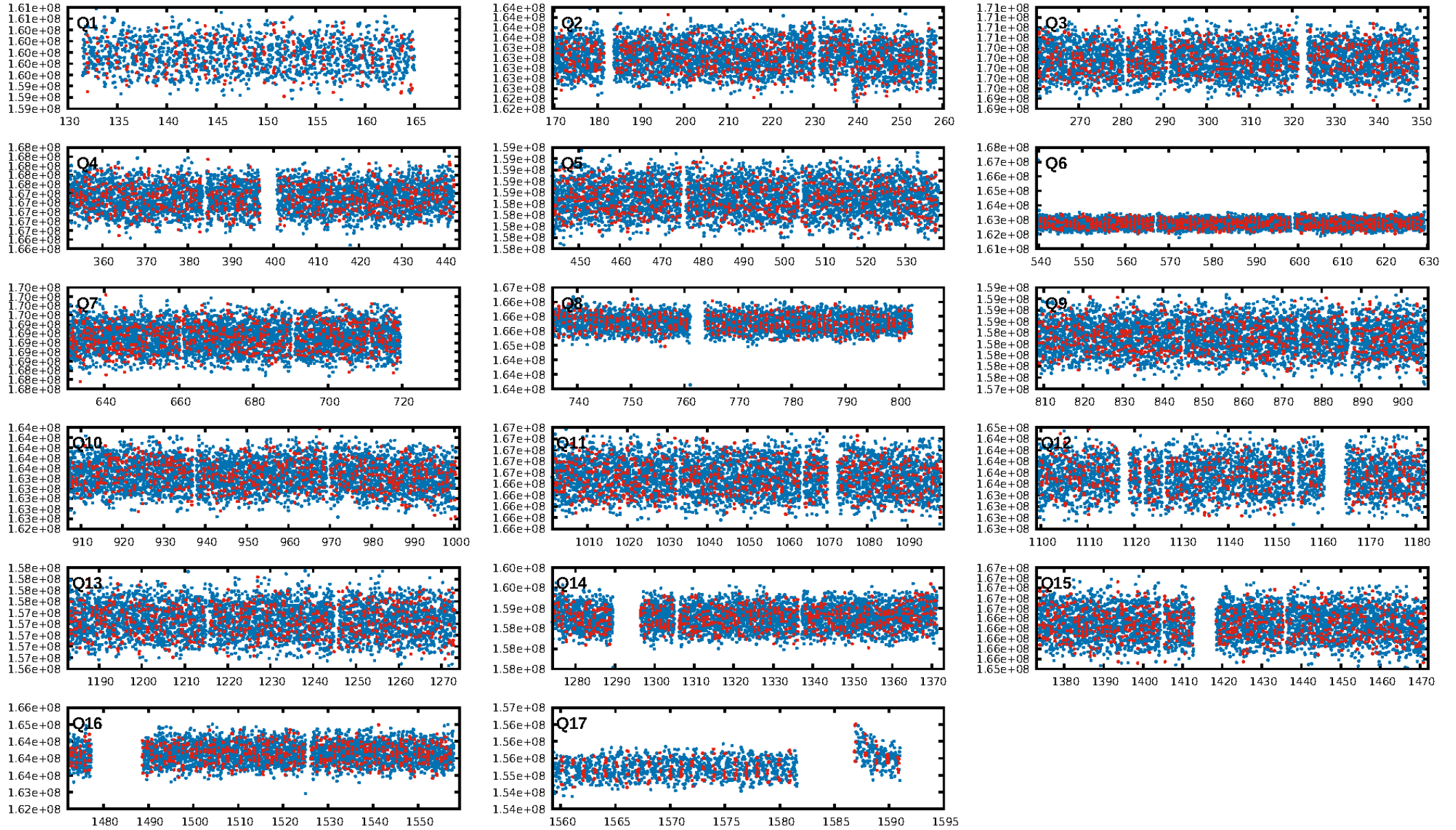
DV Fit Results:

Period = 0.99108 [0.00001] d
Epoch = 131.9701 [0.0015] BKJD
Rp/R* = 0.0101 [0.0028]
a/R* = 2.16 [3.07]
b = 0.90 [0.39]
Seff = 30827.42 [21290.67]
Teff = 3379 [583] K
Rp = 2.60 [1.28] Re
a = 0.0222 [0.0091] AU
Ag = 3.11 [2.74] [0.77σ]
Teffp = 6938 [1031] K [3.00σ]

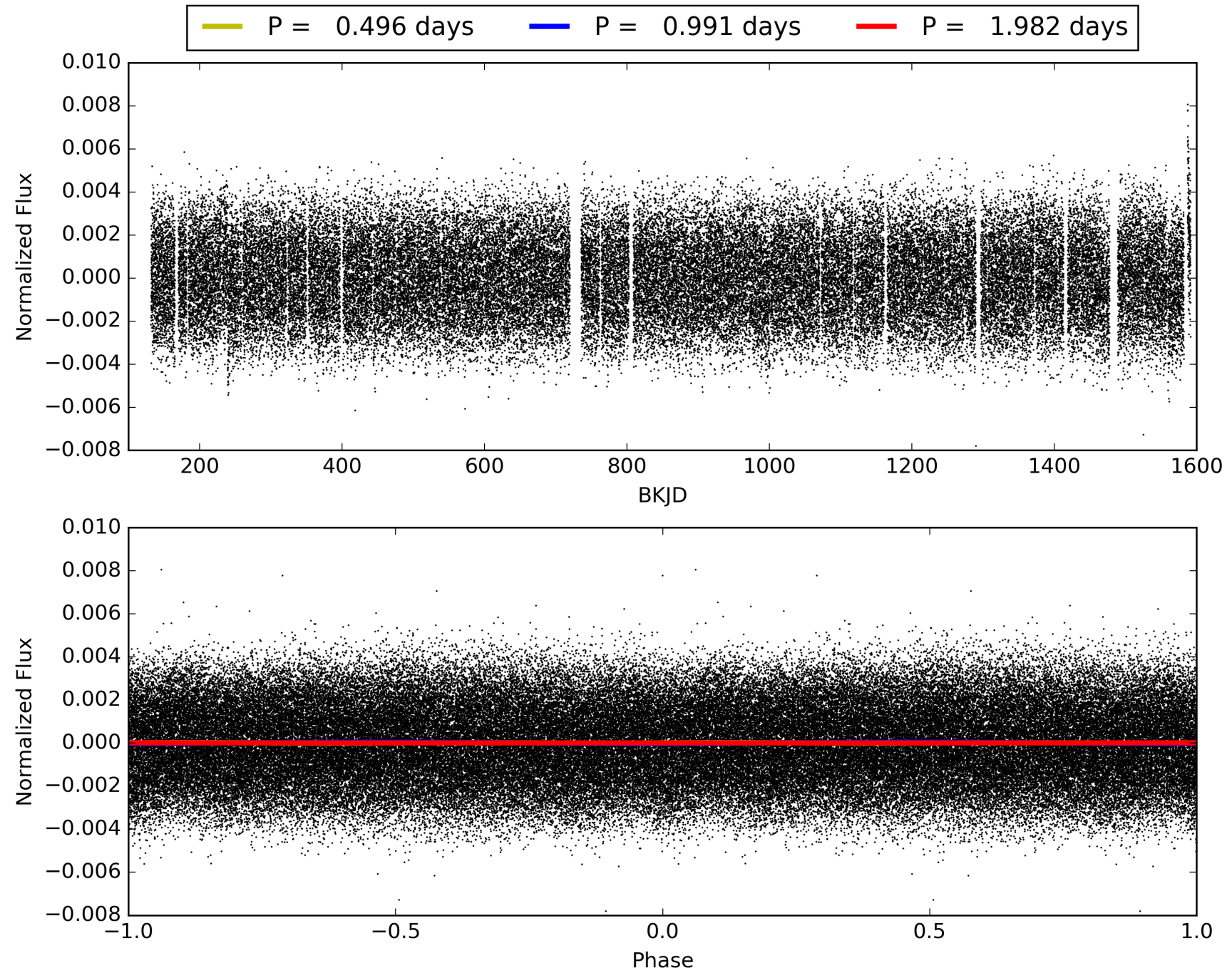
DV Diagnostic Results:

ShortPeriod-sig: 1.3% [0.02σ]
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.84 [786/932]
GhostDiagnostic-chr: 2.192
Centroid-sig: 62.2%
Centroid-so: 0.104 arcsec [0.41σ]
OotOffset-rm: 0.227 arcsec [0.55σ]
KicOffset-rm: 0.279 arcsec [0.67σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.82 [14/17]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 009343888-02, PDC Light Curves

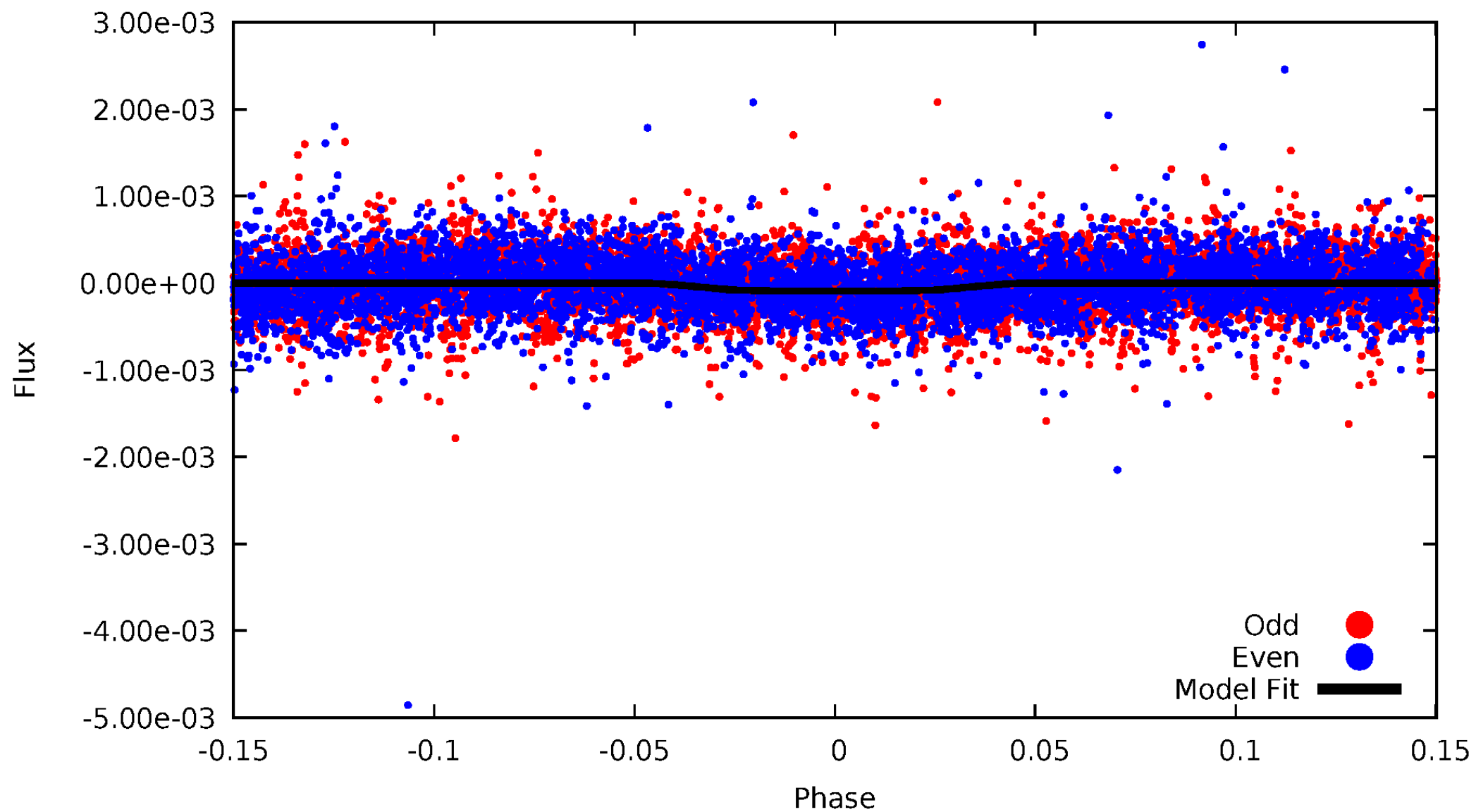


TCE 009343888-02



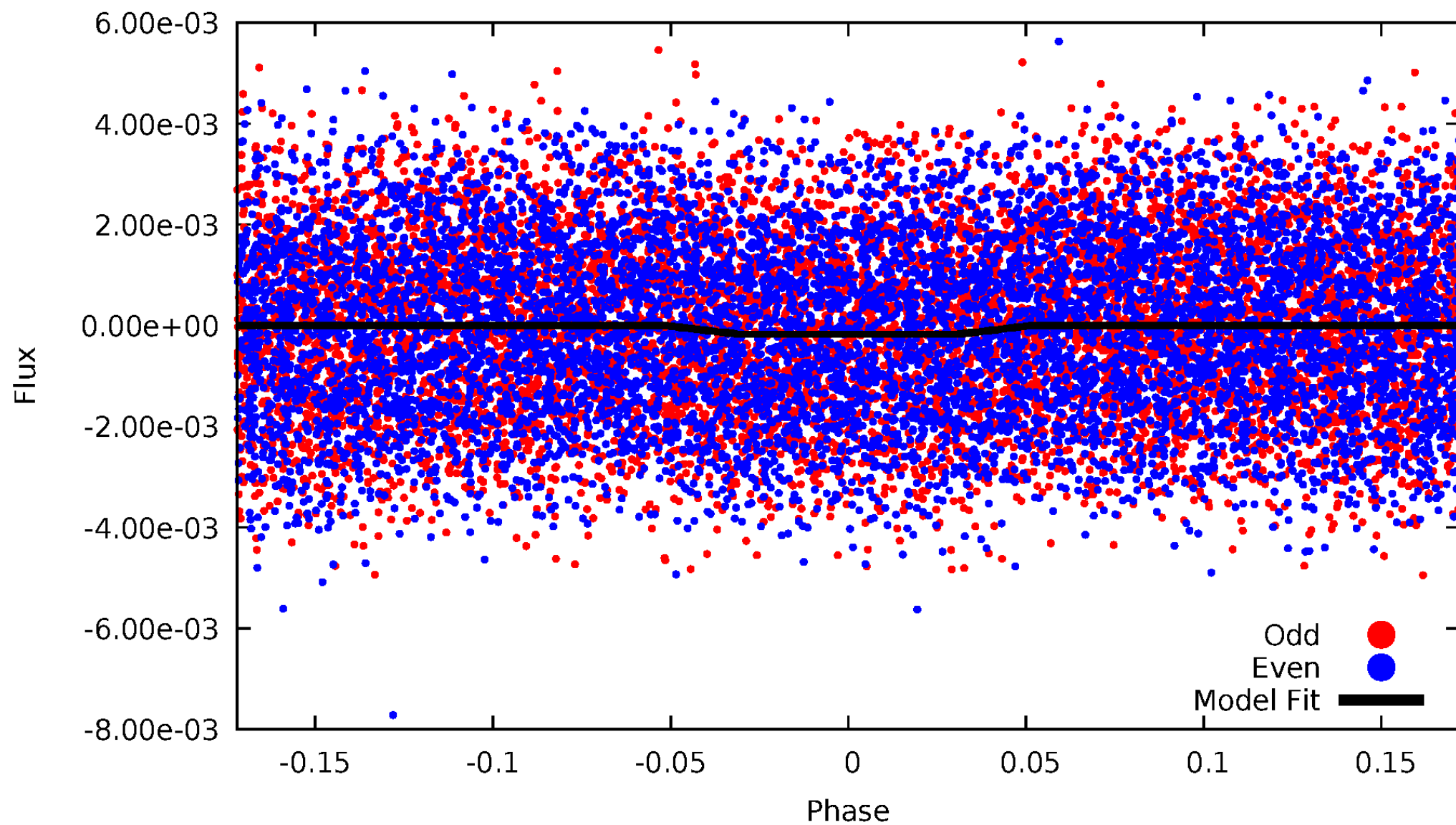
DV Odd/Even

TCE 009343888-02



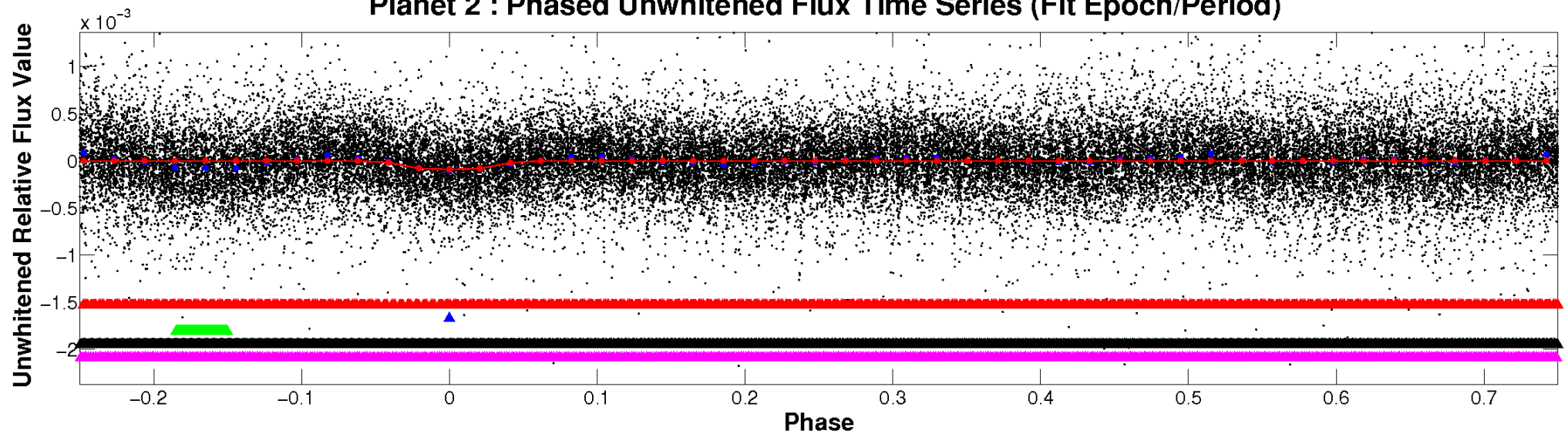
ALT Odd/Even

TCE 009343888-02

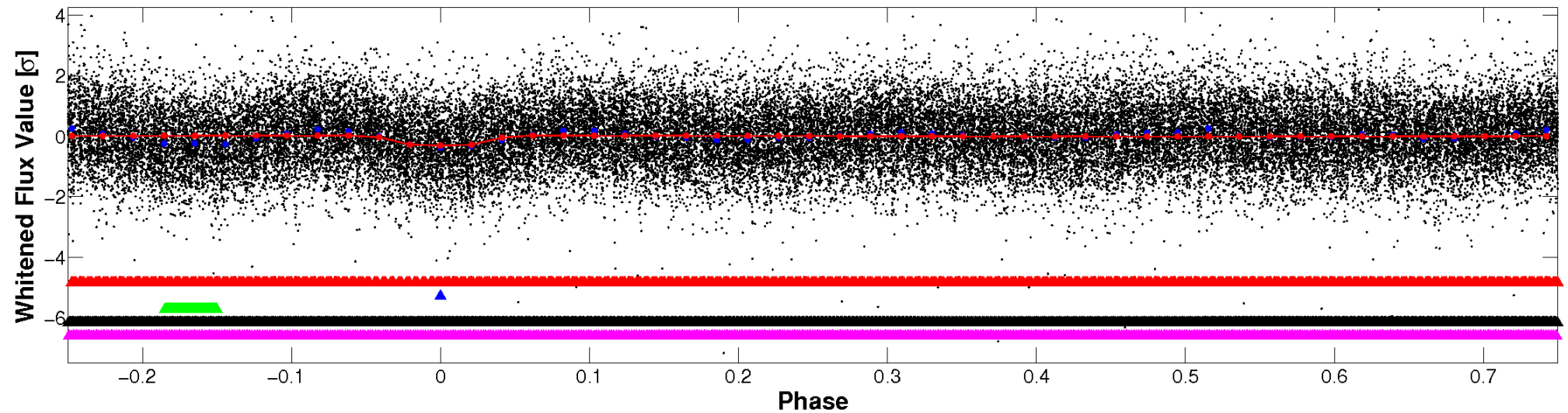


Non-Whitened Vs. Whitened Light Curve

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

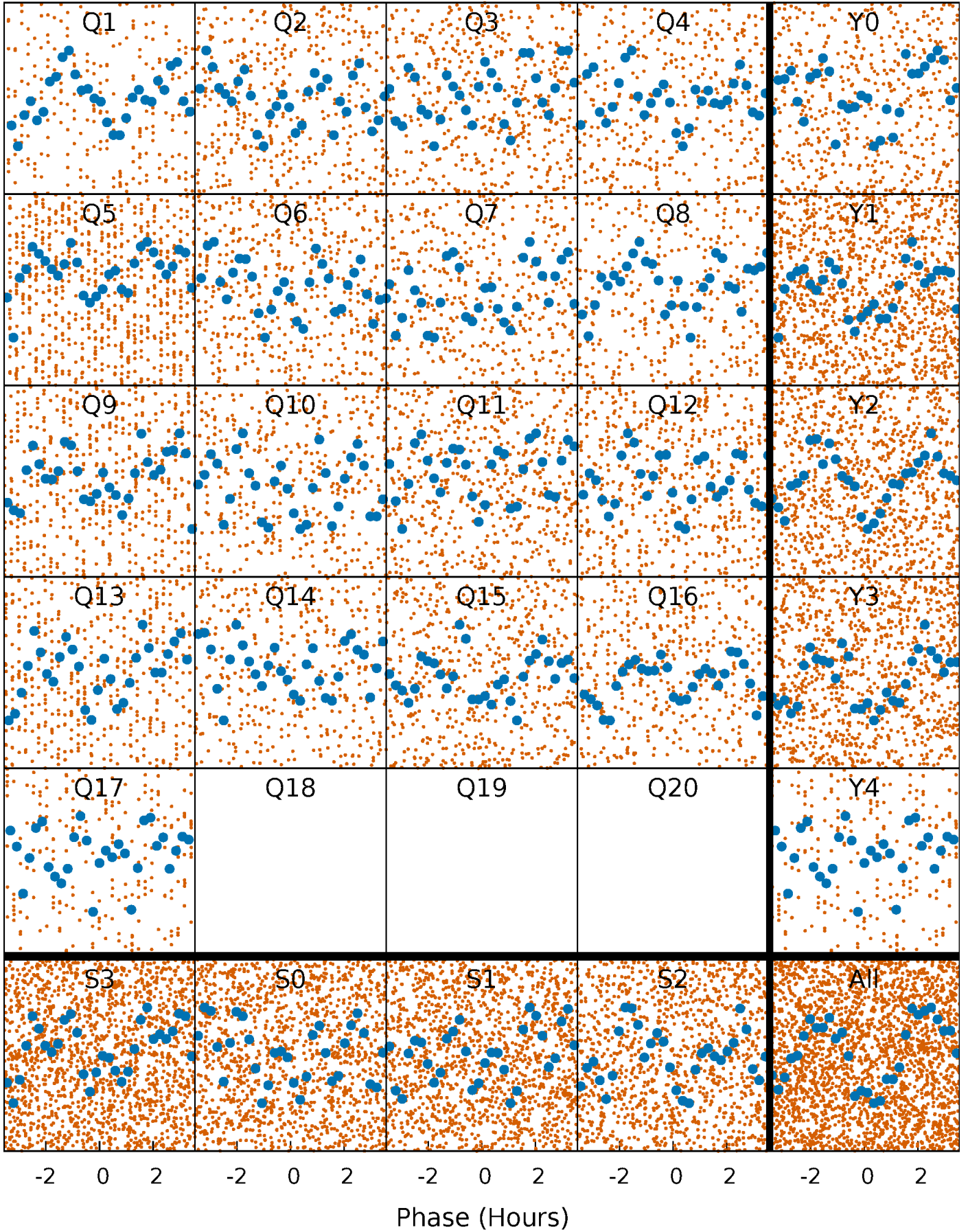


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



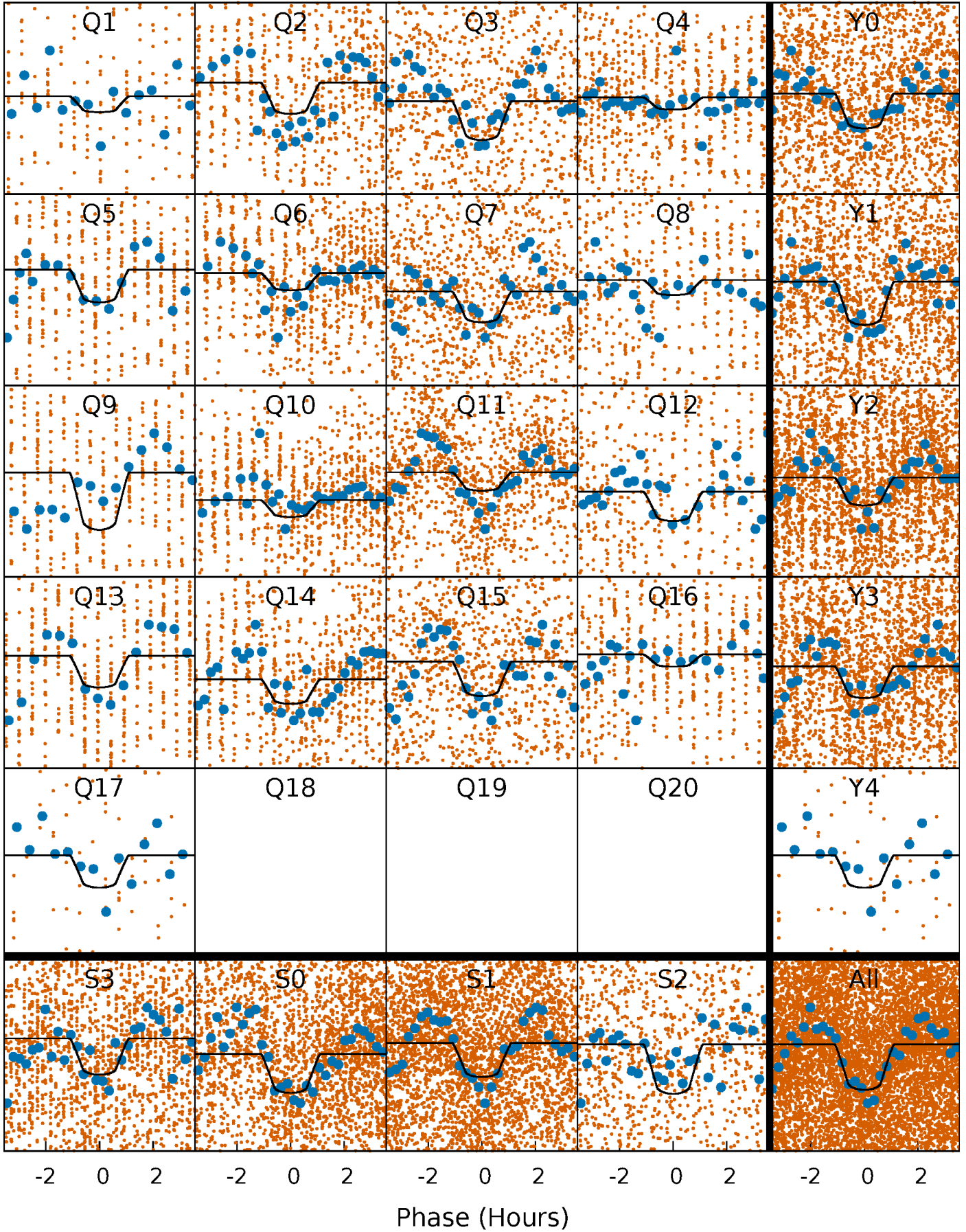
PDC Quarter-Phased Transit Curves

TCE 009343888-02 P= 0.991079 Days $T_0=131.970114$ (BKJD)



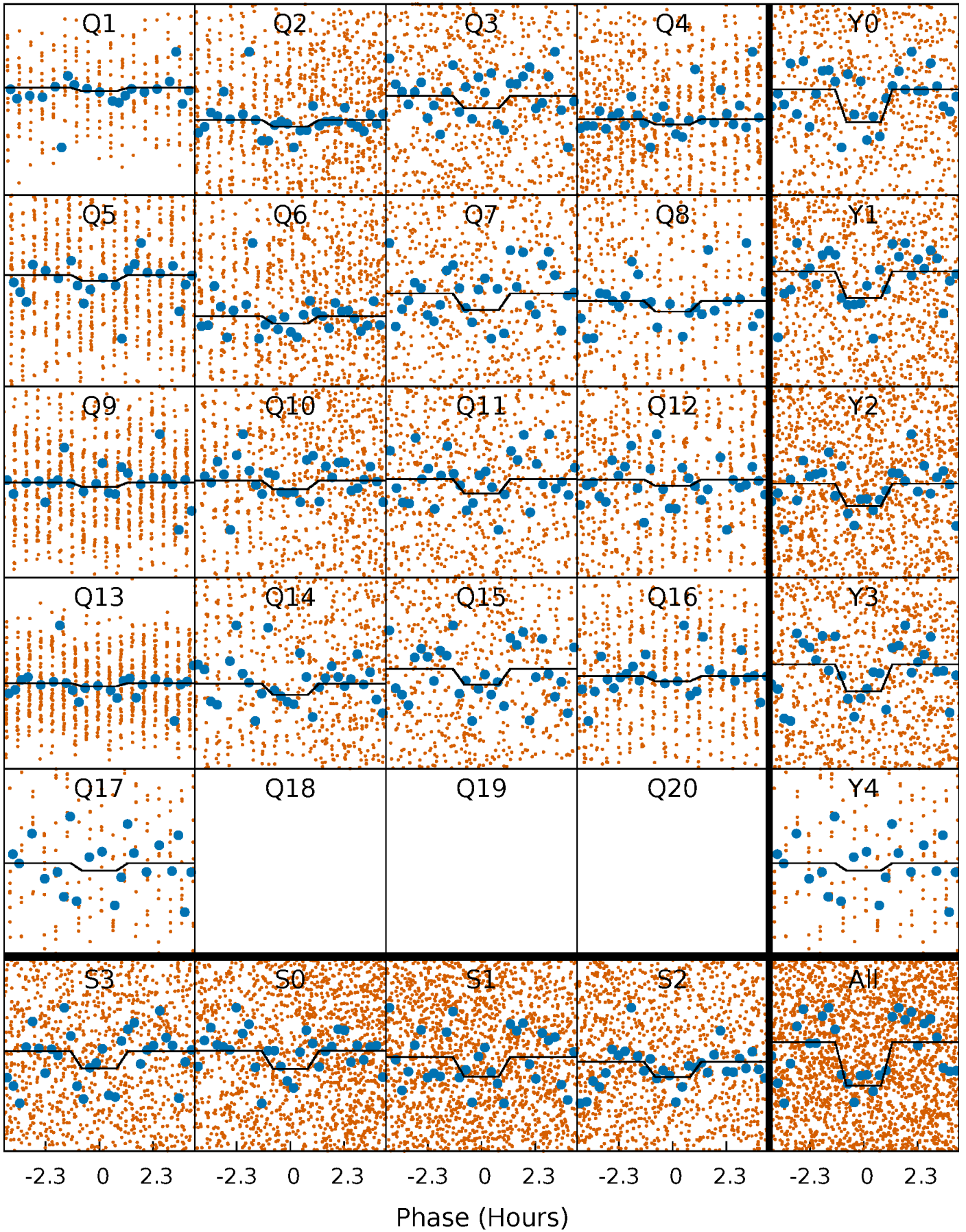
DV Quarter-Phased Transit Curves

TCE 009343888-02 $P = 0.991079$ Days $T_0 = 131.970114$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

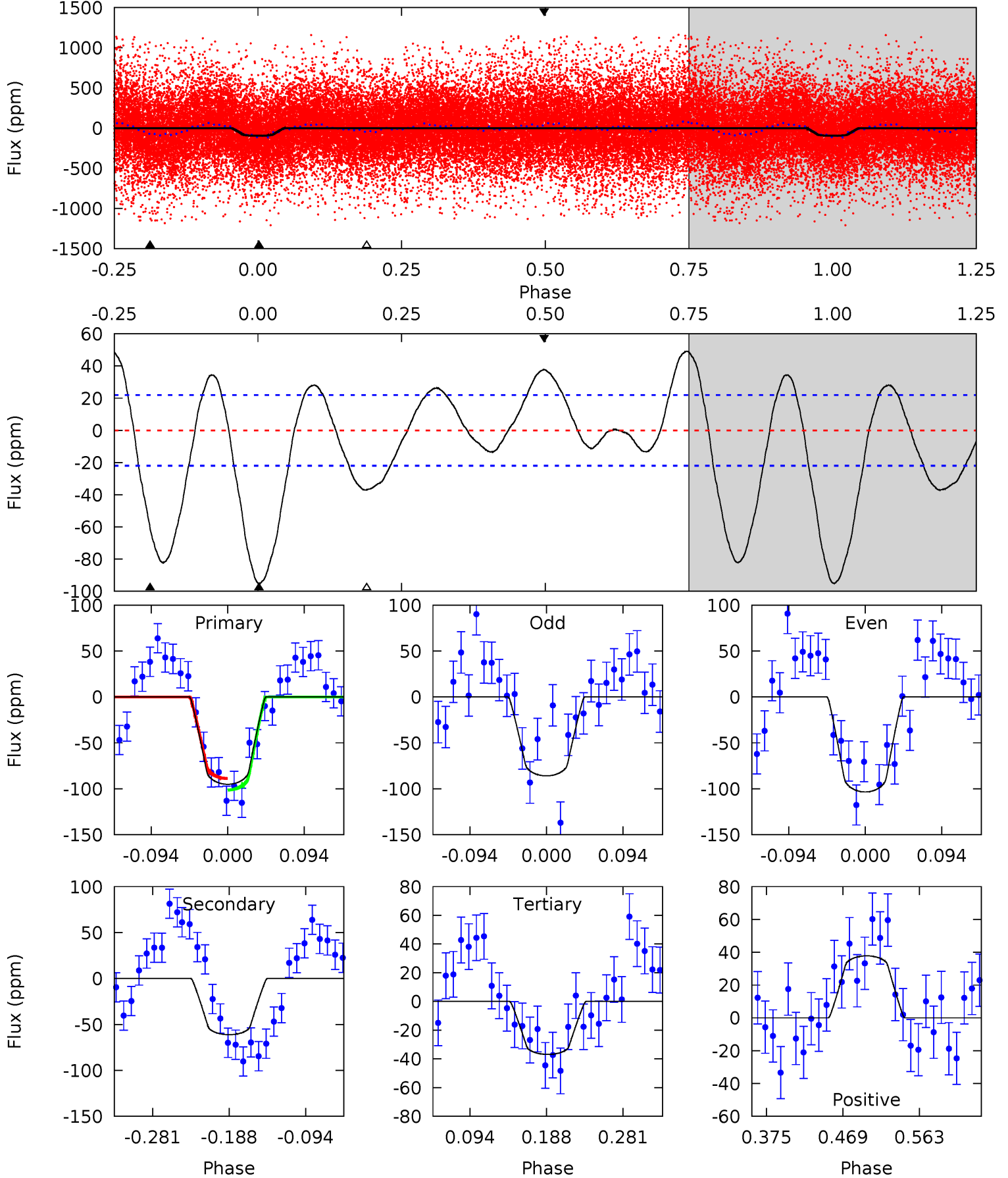
TCE 009343888-02 P= 0.991096 Days $T_0=131.971344$ (BKJD)



DV Model-Shift Uniqueness Test

009343888-02, P = 0.991079 Days, E = 130.979035 Days

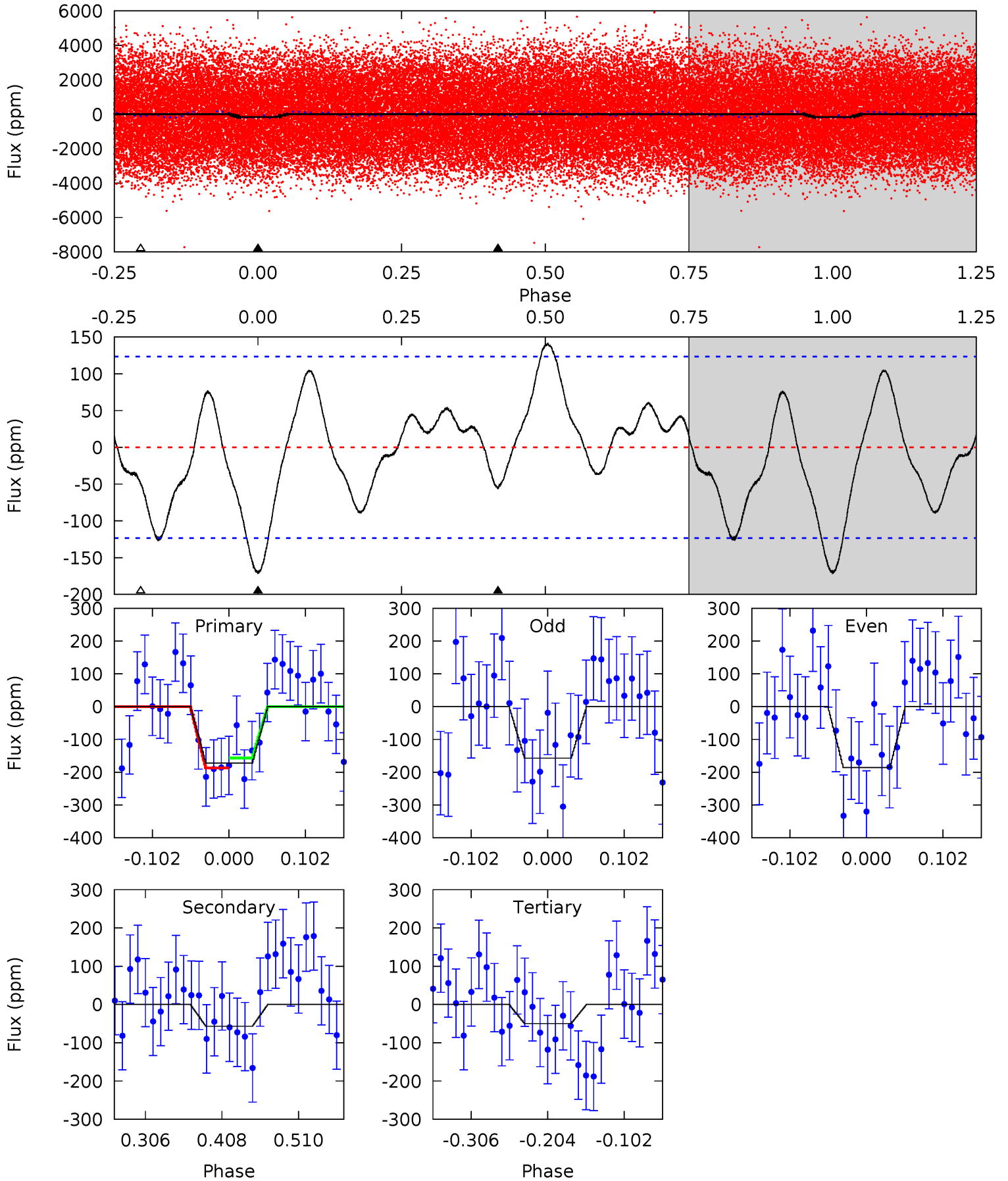
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.8	12.7	7.67	7.86	4.58	1.68	4.29	12.1	11.9	5.05	4.86	1.83	0.91	0.34	1.32



Alt Model-Shift Uniqueness Test

009343888-02, P = 0.991096 Days, E = 130.980248 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.35	2.10	1.85	0	4.56	1.63	1.81	4.50	6.35	0.25	2.10	0.53	0.84	0.45	0.56



Stellar Parameters For KIC 009343888

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7438^{+233}_{-311}	$3.867^{+0.400}_{-0.100}$	$-0.500^{+0.250}_{-0.300}$	$2.358^{+0.511}_{-0.949}$	$1.492^{+0.209}_{-0.313}$	$0.160^{+0.519}_{-0.063}$
	+3%/-4%	+10%/-3%	+50%/-60%	+22%/-40%	+14%/-21%	+323%/-39%
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 009343888-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-61 ± 5	$2.42^{+0.83}_{-0.87}$	4549^{+355}_{-495}	6180^{+1419}_{-807}	$2.753^{+3.992}_{-1.158}$
Alt.	-57 ± 27	$3.10^{+0.94}_{-0.94}$	4582^{+353}_{-482}	5304^{+1053}_{-1112}	$1.575^{+1.973}_{-0.895}$

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 $A_{obs} \gg 1.0$

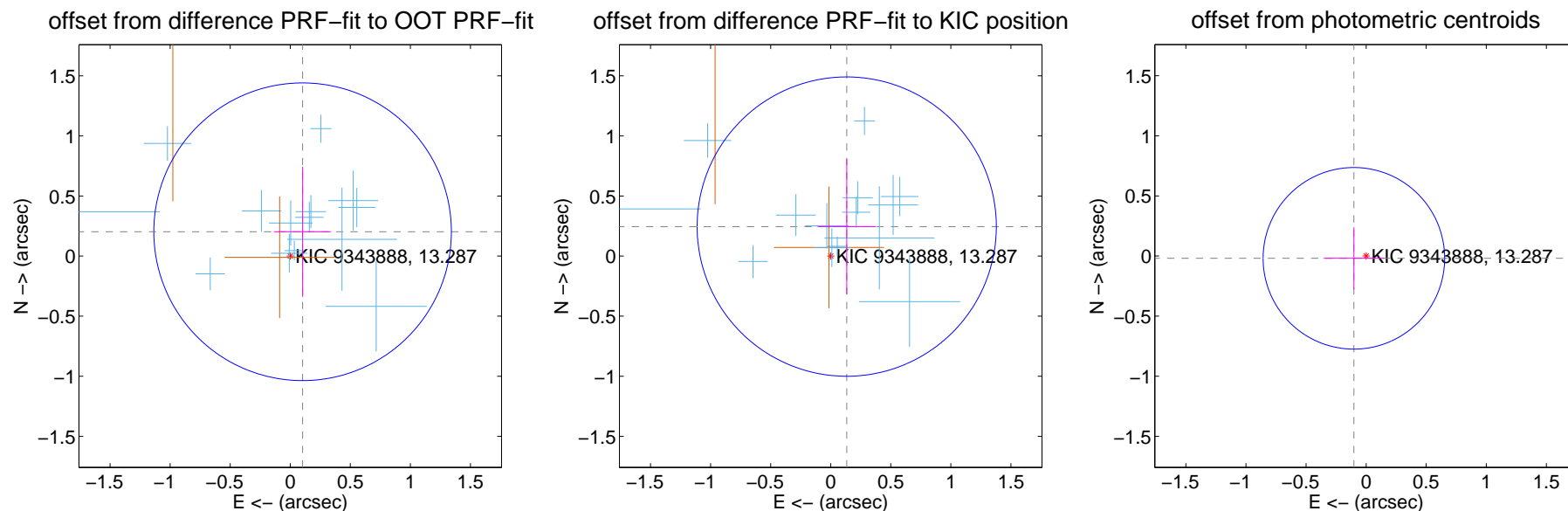
DV Centroid Data

Supplemental centroid analysis for 009343888-02. Kepler magnitude: 13.29. Transit SNR 15.23

There are 14 quarters with good PRF difference image offsets

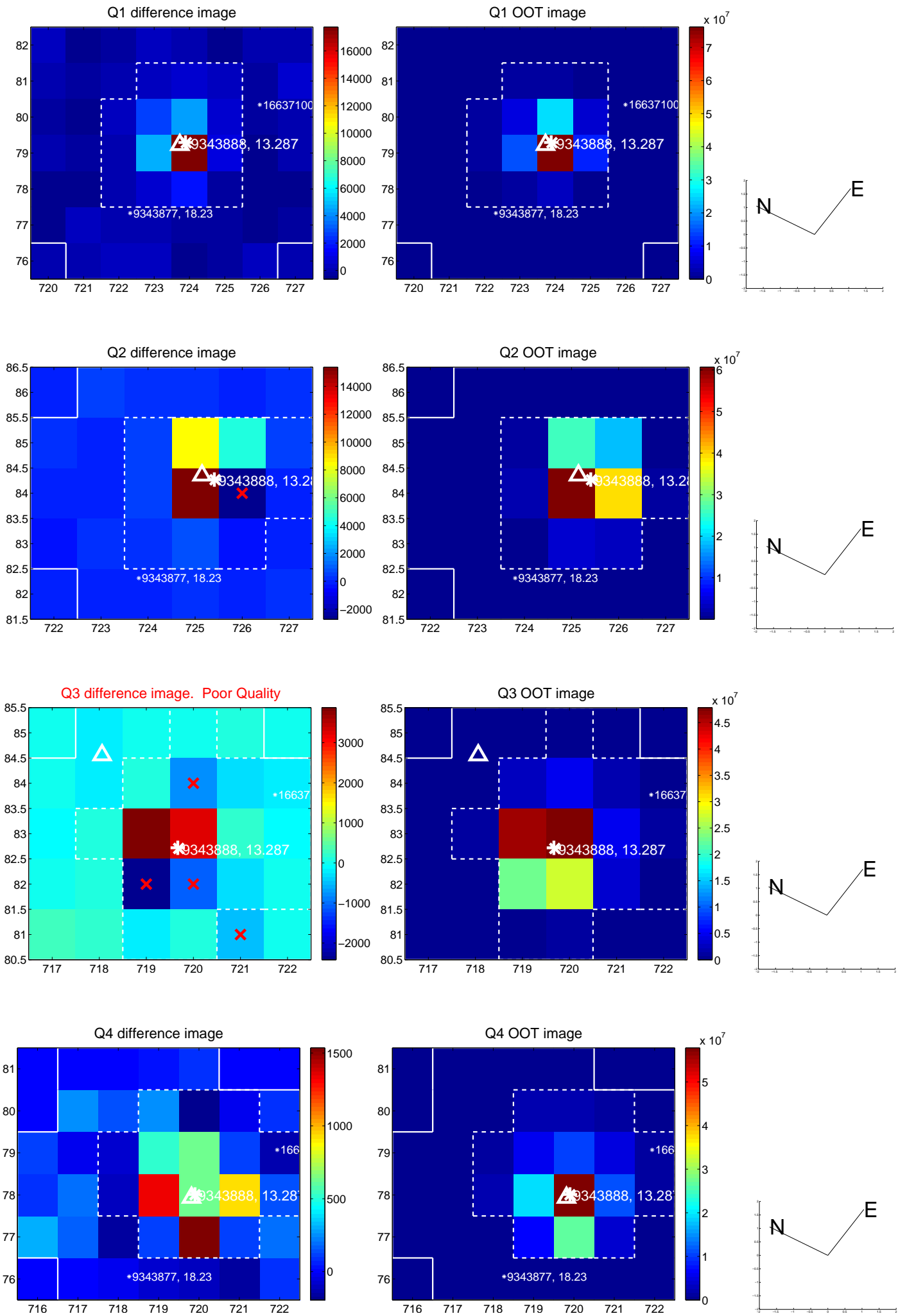
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.227 ± 0.413	0.55	-0.103 ± 0.237	0.202 ± 0.541
PRF-fit source offset from KIC position	0.279 ± 0.415	0.67	-0.133 ± 0.243	0.245 ± 0.563
photometric centroid source offset	0.10 ± 0.25	0.41	0.10 ± 0.25	-0.02 ± 0.26

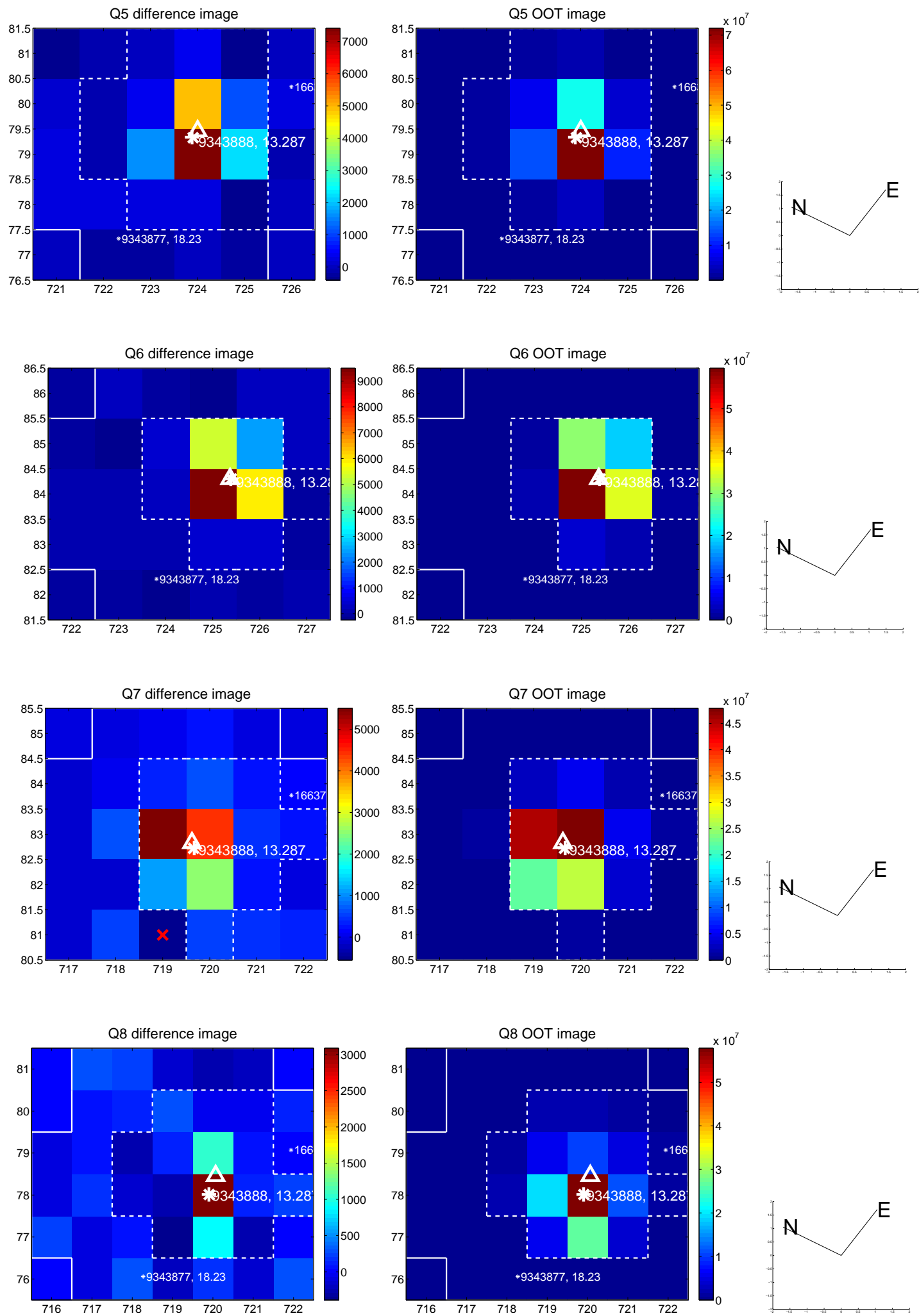


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

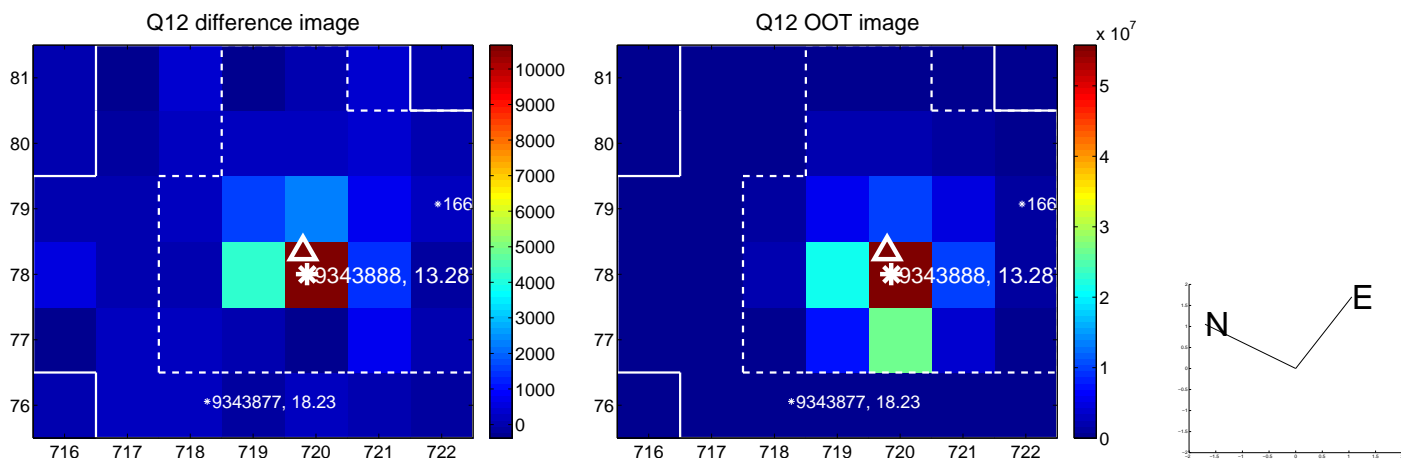
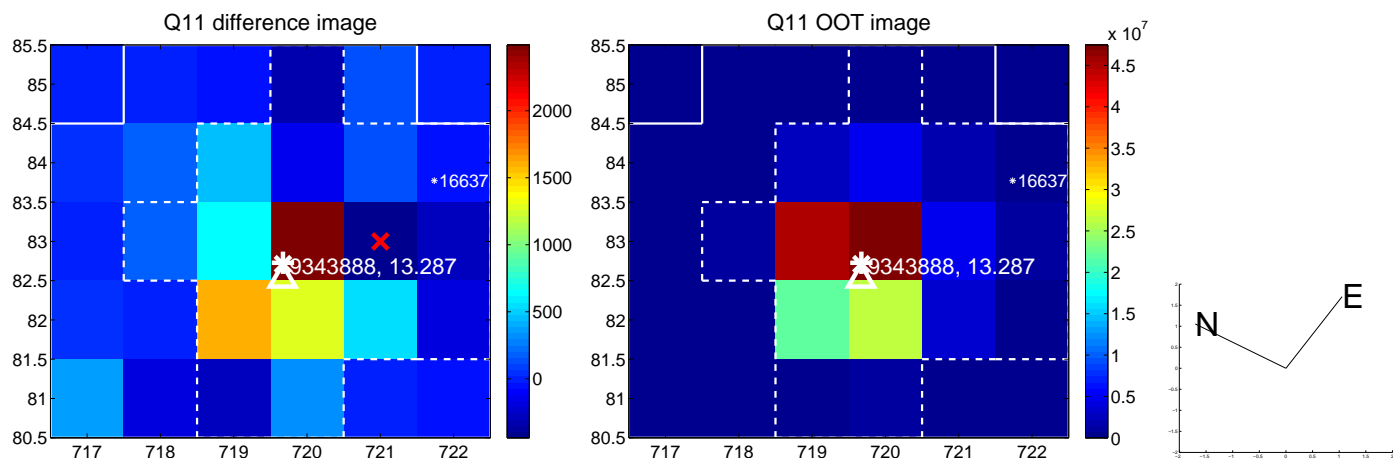
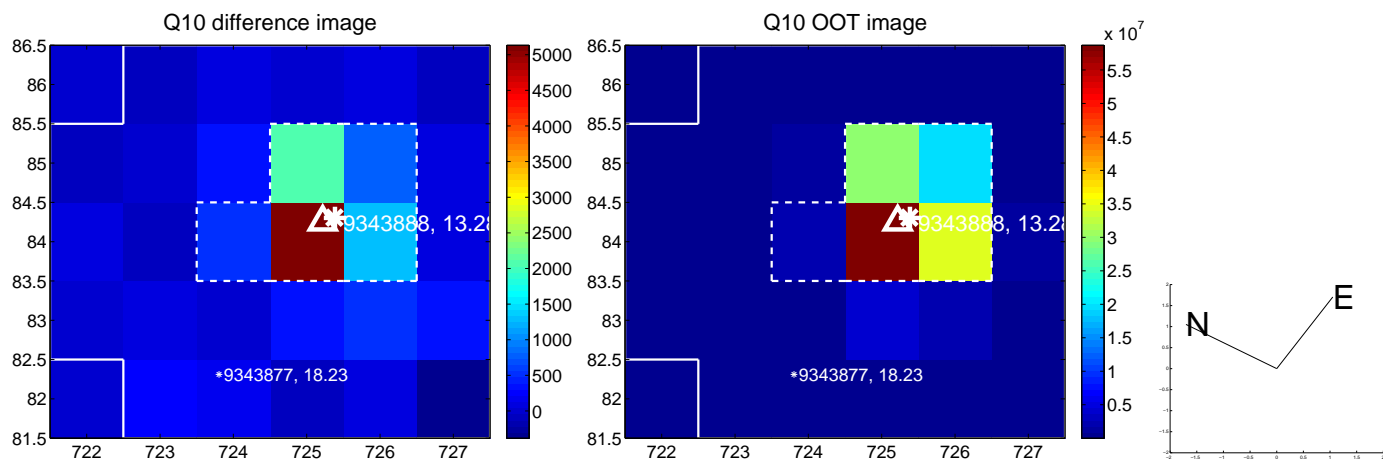
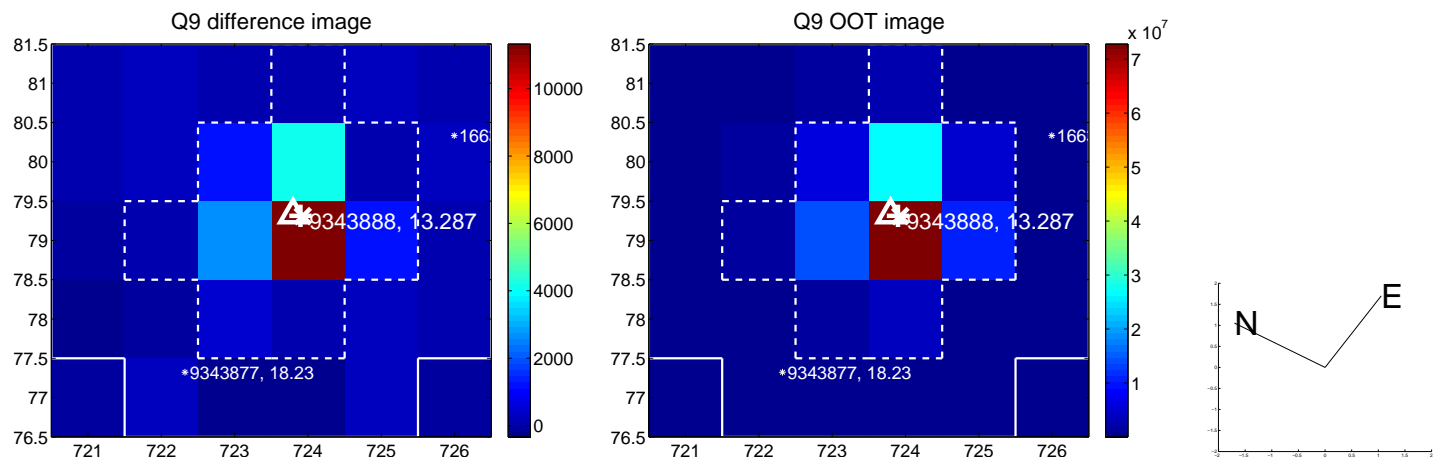
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



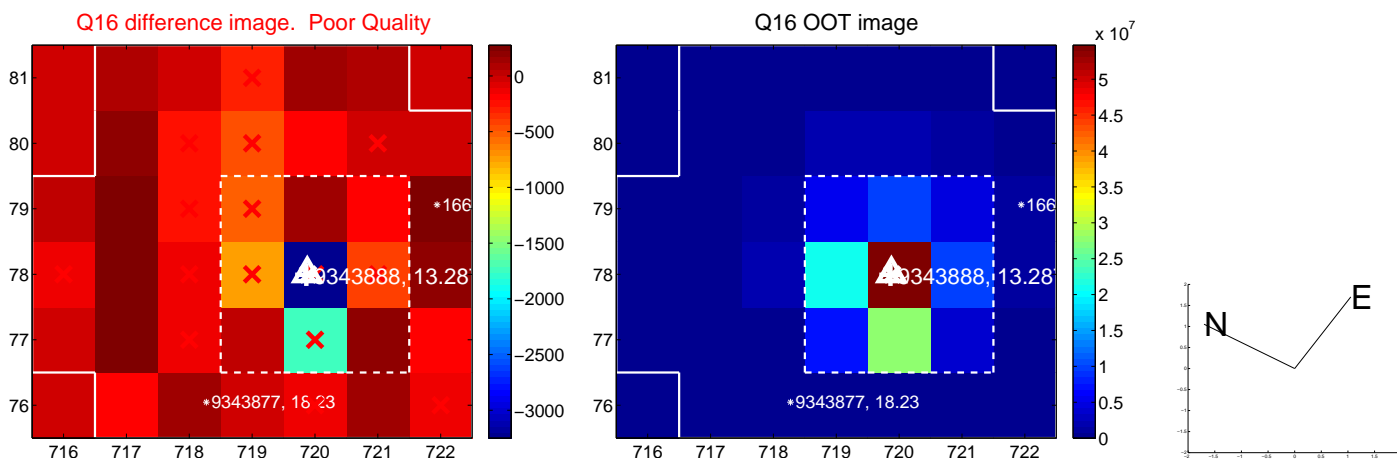
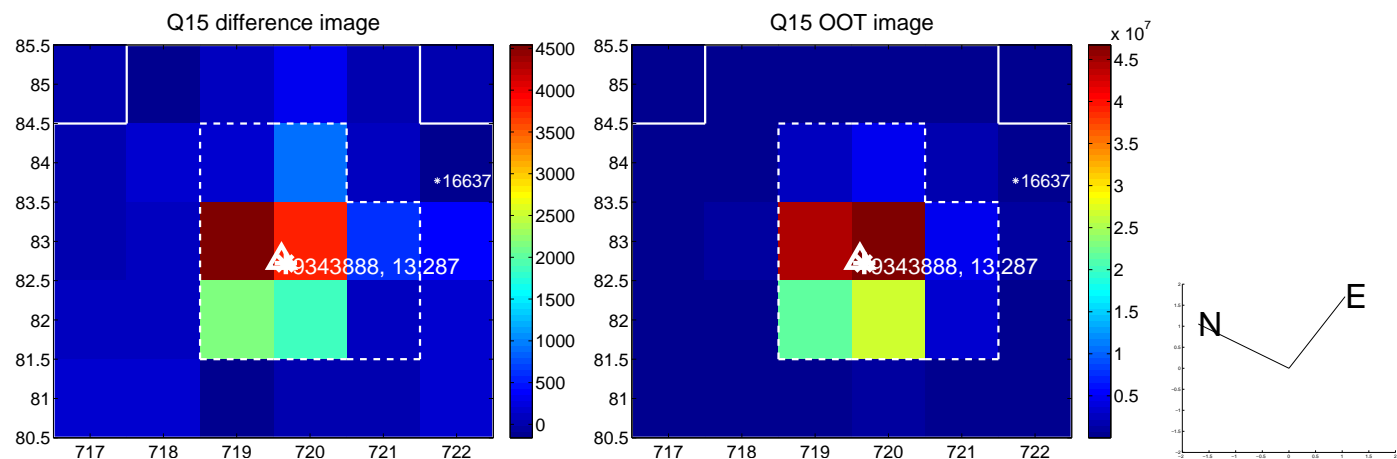
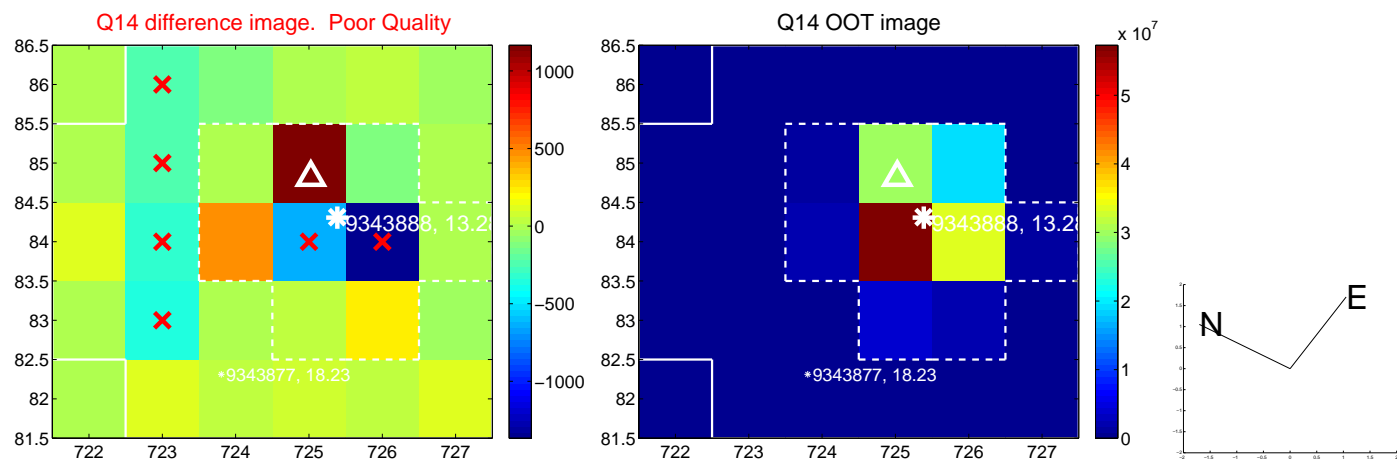
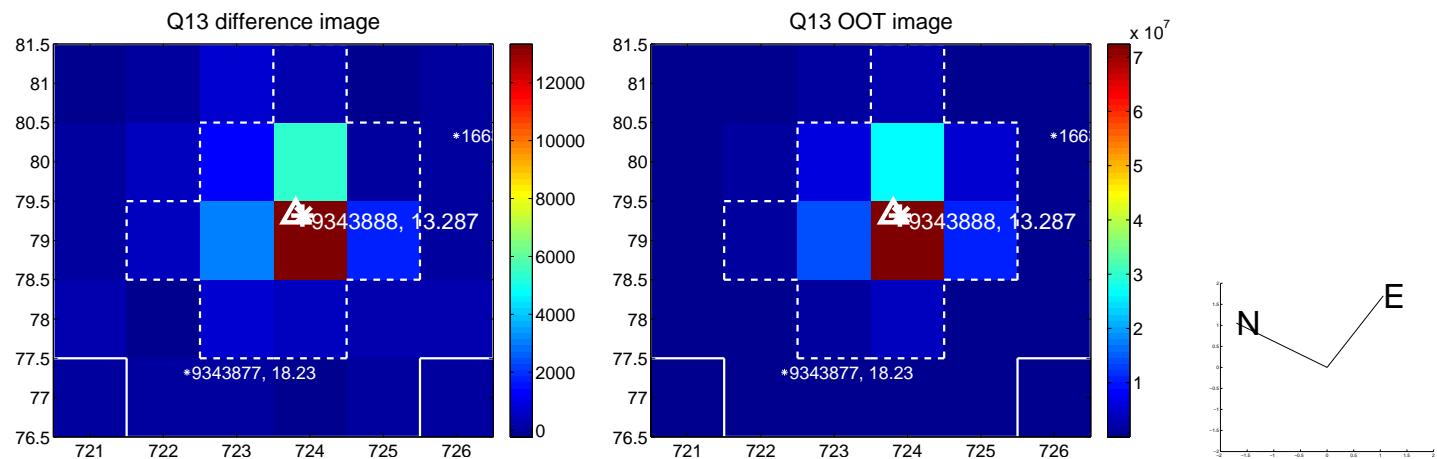
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



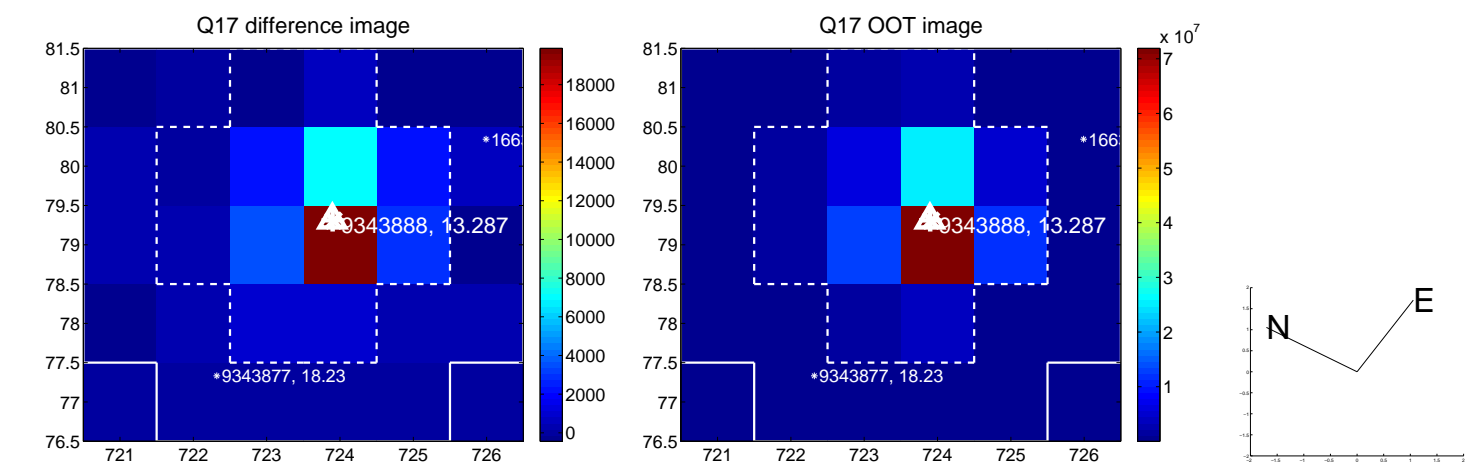
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



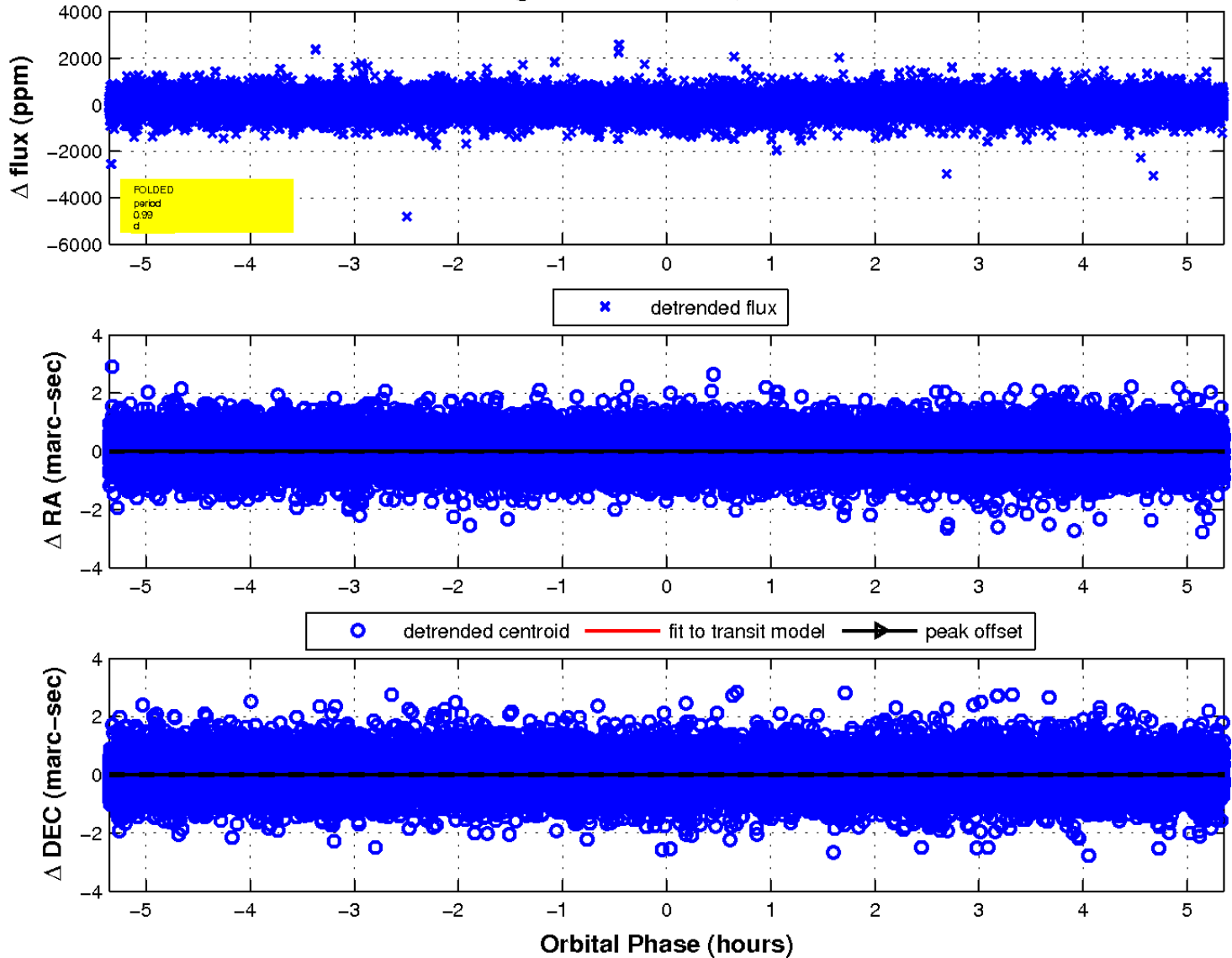
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

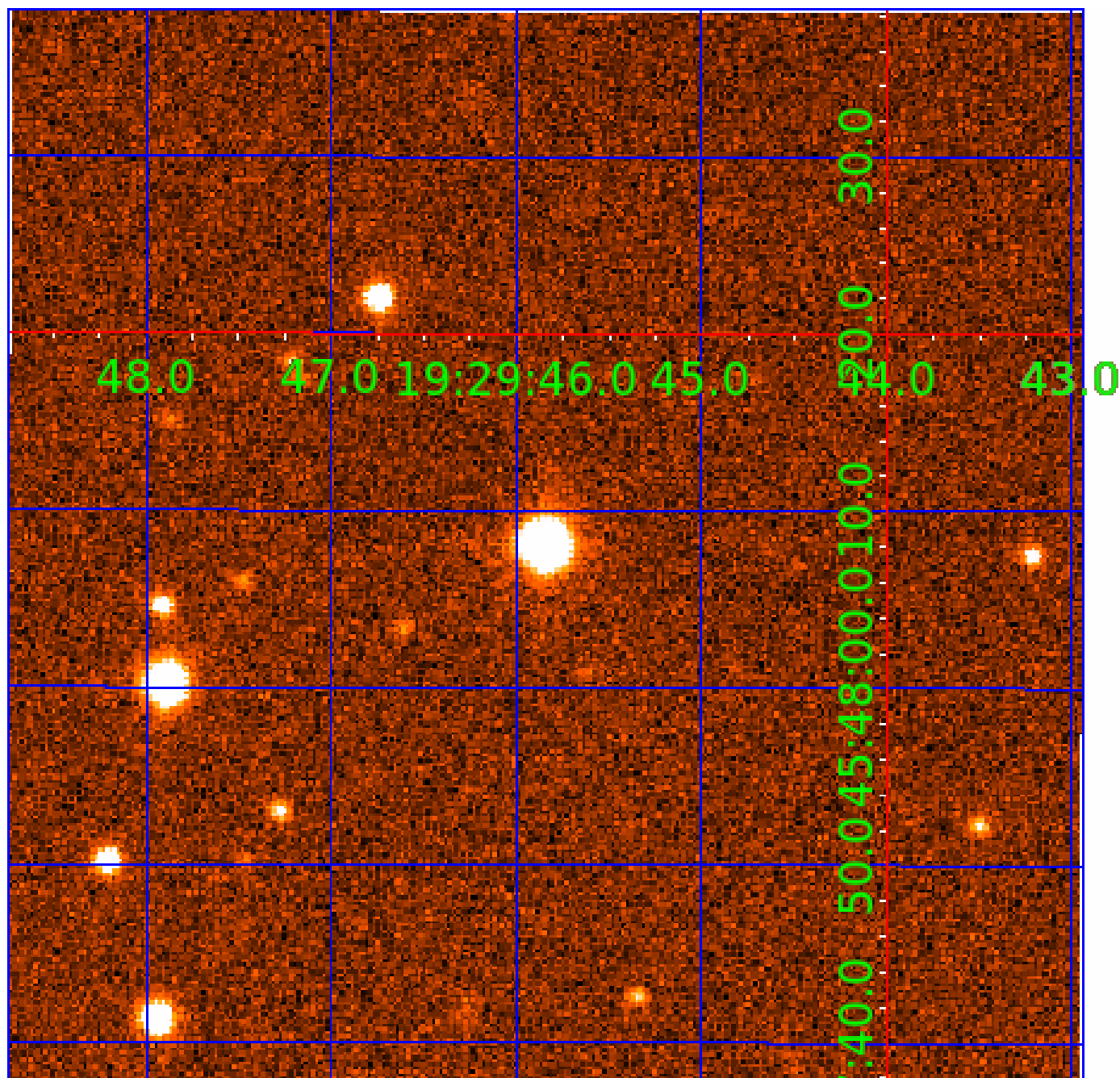


fluxWeightedCentroids, Planet 2 of 5



UKIRT Image

Declination



KIC 009343888

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})
009343888-01	OBS	No	1.976853	131.918629	52.0	4.922	8.2	10.5	2.36	7438	2.04	12277.67
009343888-02	OBS	No	0.991079	131.970114	90.3	1.785	14.7	15.2	2.36	7438	2.60	30827.42
009343888-03	OBS	No	0.991102	131.786791	96.0	1.858	12.8	16.0	2.36	7438	2.48	30826.45
009343888-04	OBS	No	0.988522	132.285632	60.0	3.241	9.3	11.8	2.36	7438	2.11	30933.79
009343888-05	OBS	No	1.977145	132.832364	270.0	3.500	8.8	-1.0	2.36	7438	3.93	12275.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009343888-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009343888-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009343888-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
009343888-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
009343888-05	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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

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

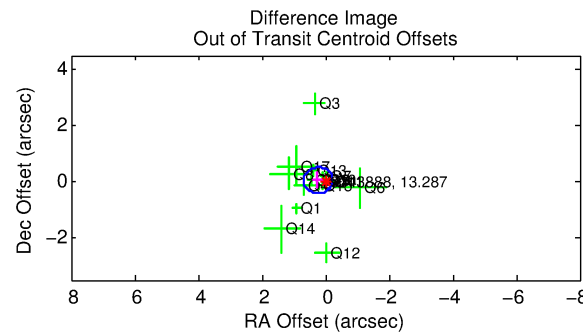
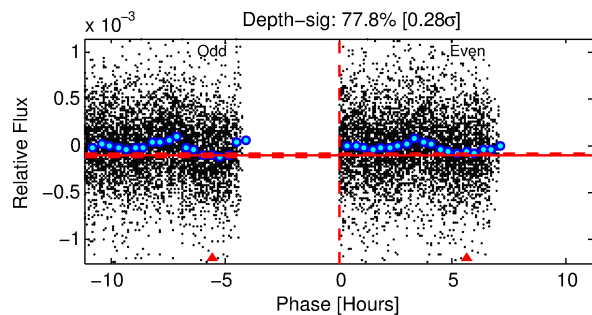
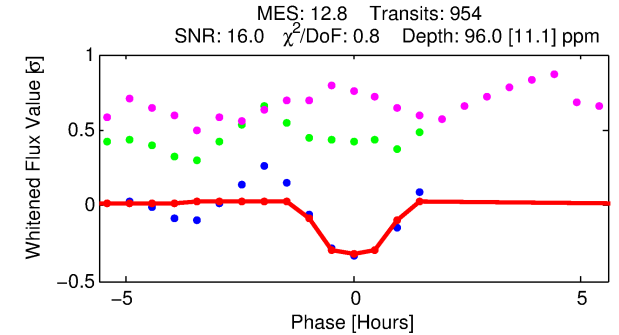
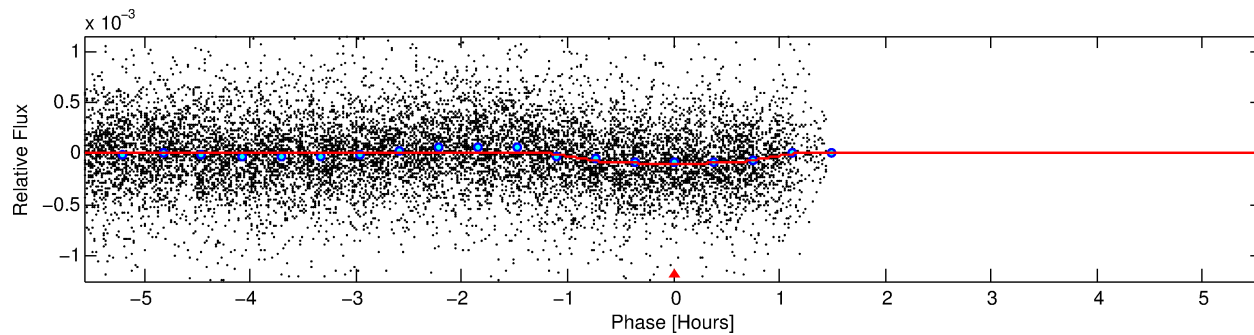
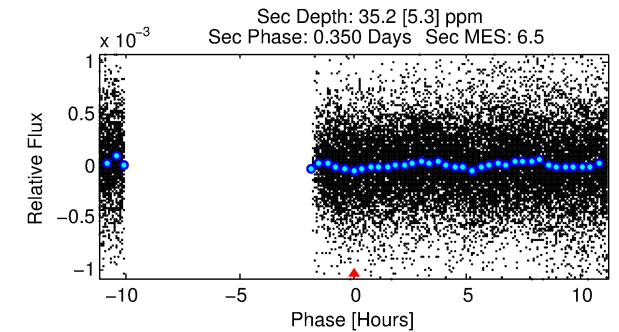
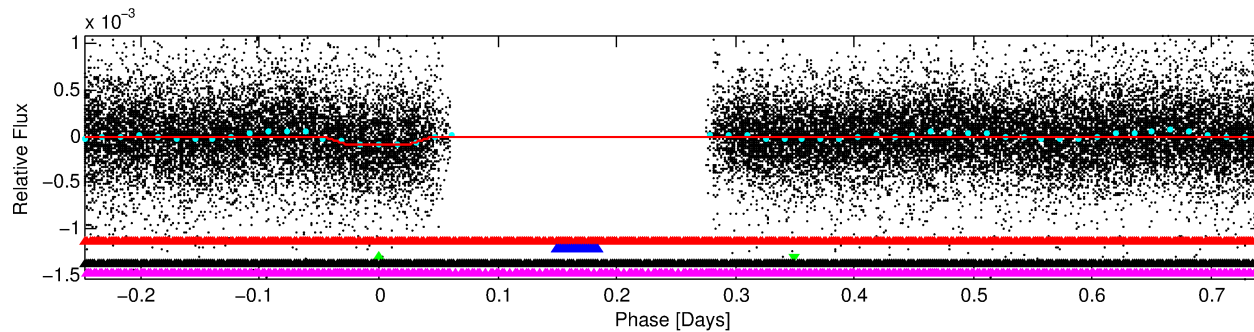
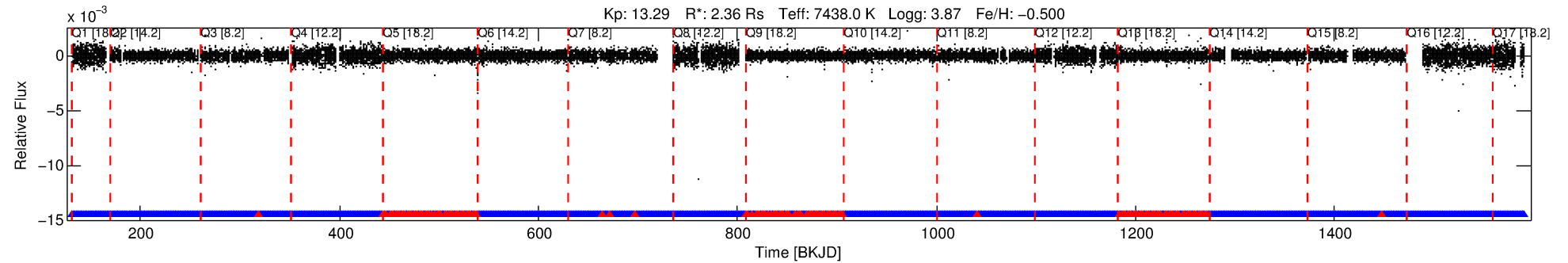
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009343888-03

No Significant Match Found

DV One-Page Summary

KIC: 9343888 Candidate: 3 of 5 Period: 0.991 d



DV Fit Results:

Period = 0.99110 [0.00001] d
Epoch = 131.7868 [0.0019] BKJD
Rp/R* = 0.0096 [0.0020]
a/R* = 3.10 [3.57]
b = 0.69 [0.97]
Seff = 30826.45 [21290.00]
Teq = 3379 [583] K
Rp = 2.48 [1.13] Re
a = 0.0222 [0.0091] AU
Ag = 1.56 [1.26] [0.45 σ]
Teffp = 5839 [700] K [2.70 σ]

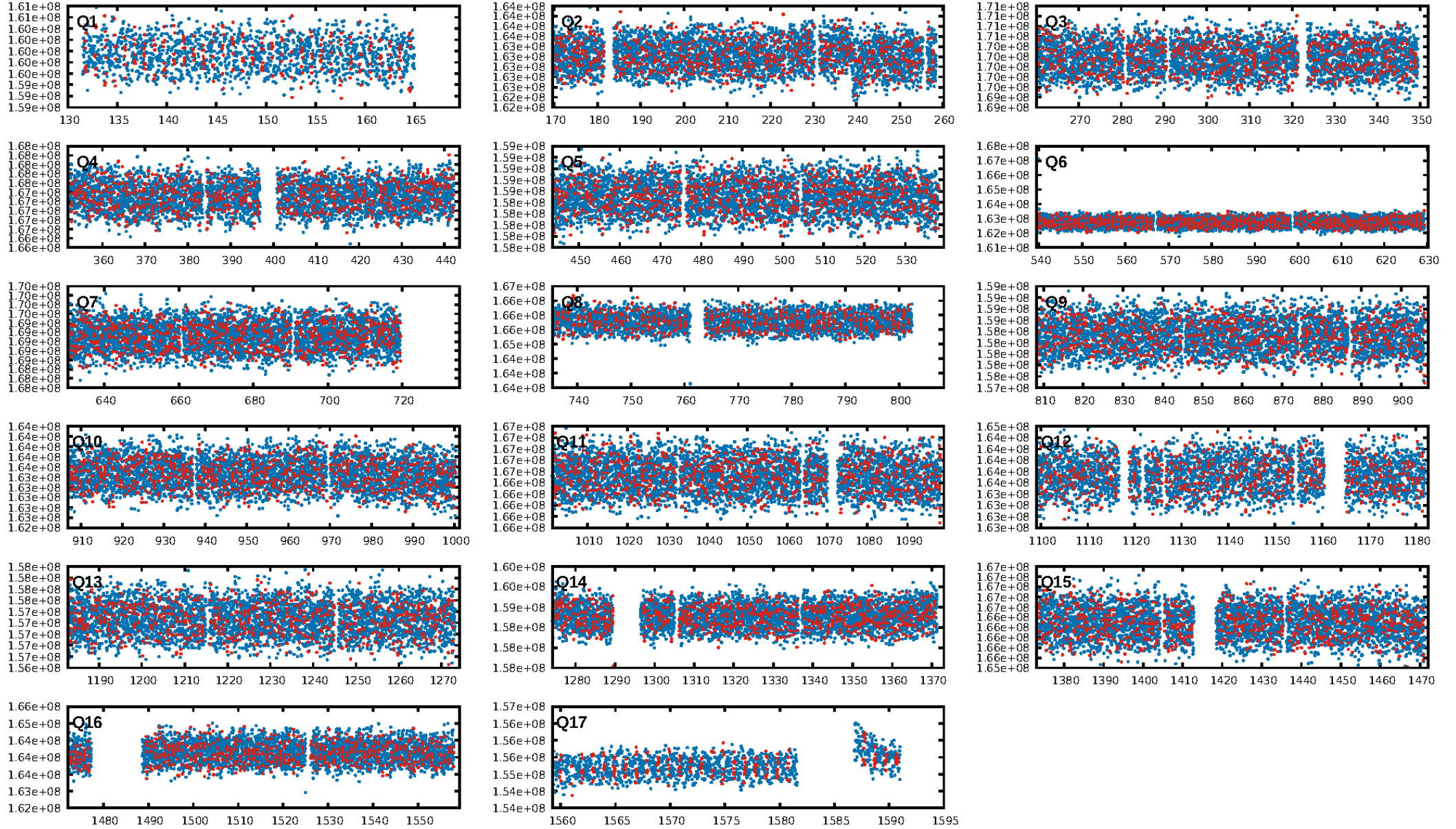
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: 100.0% [4.50 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.85 [786/924]
GhostDiagnostic-chr: 9.39
Centroid-sig: 28.6%
Centroid-so: 0.337 arcsec [1.46 σ]
OotOffset-rm: 0.247 arcsec [1.62 σ]
KicOffset-rm: 0.259 arcsec [1.42 σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.88 [14/16]
DiffImageOverlap-fno: 0.00 [0/17]

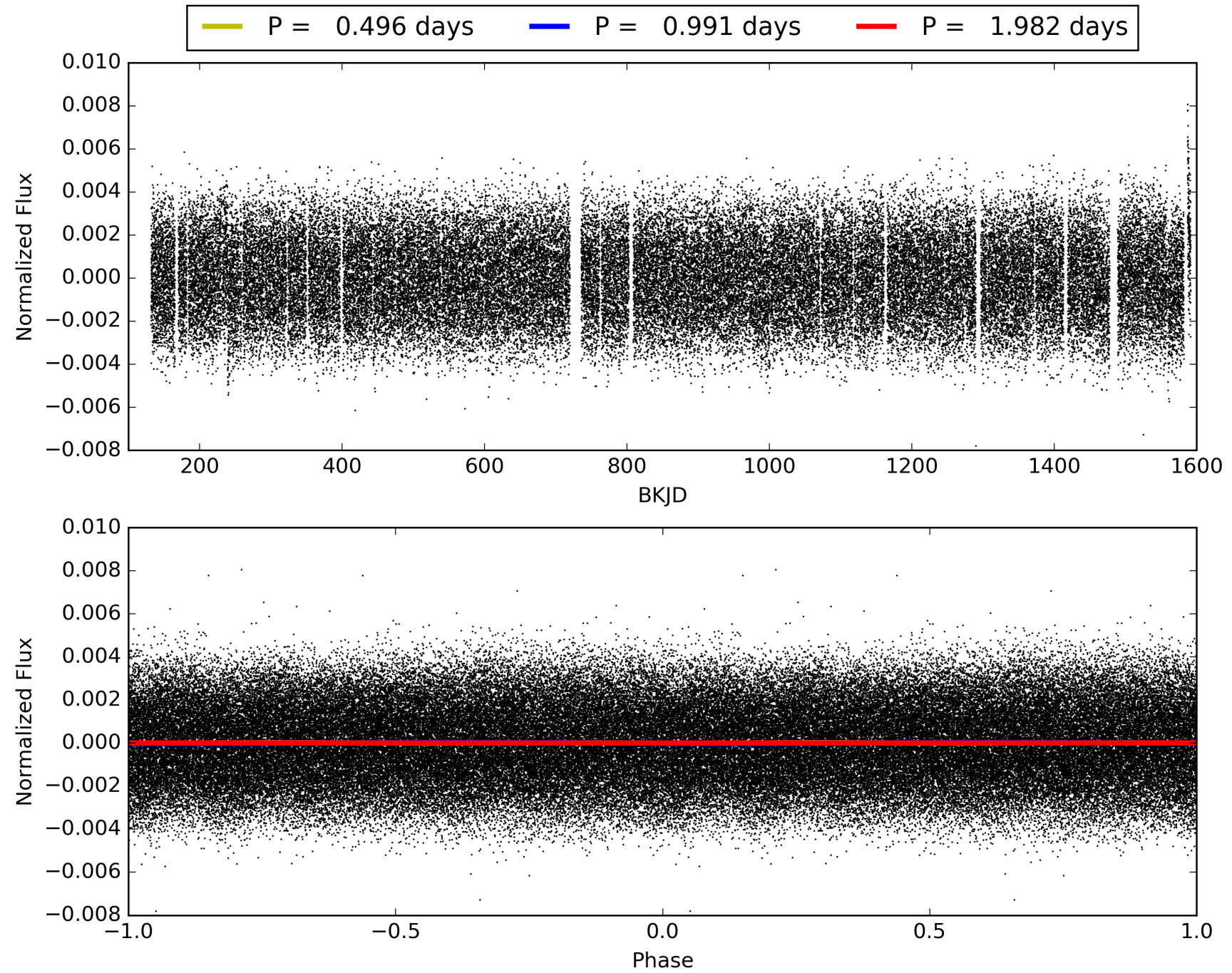
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 22:34:56 Z

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

TCE 009343888-03, PDC Light Curves

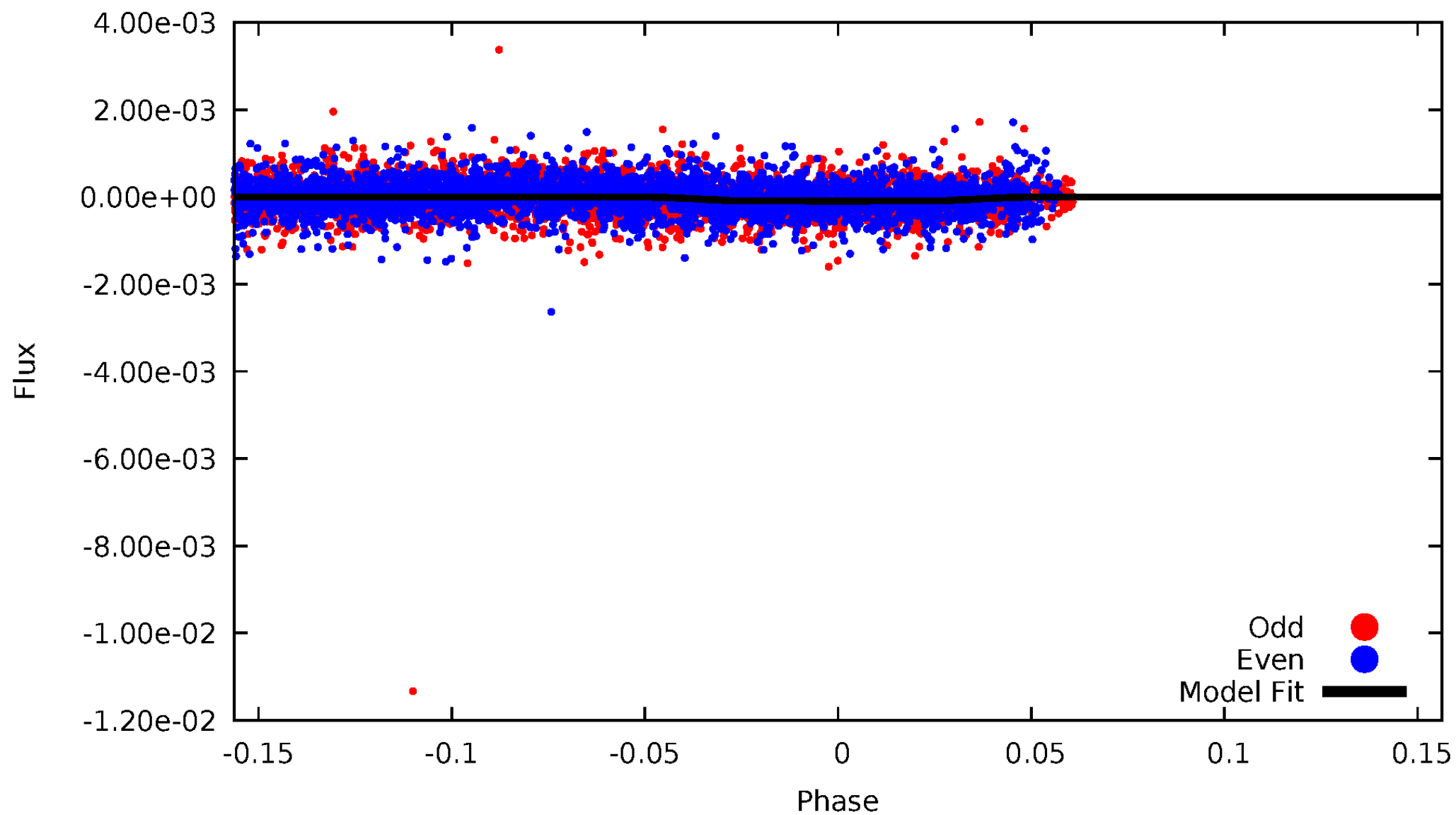


TCE 009343888-03



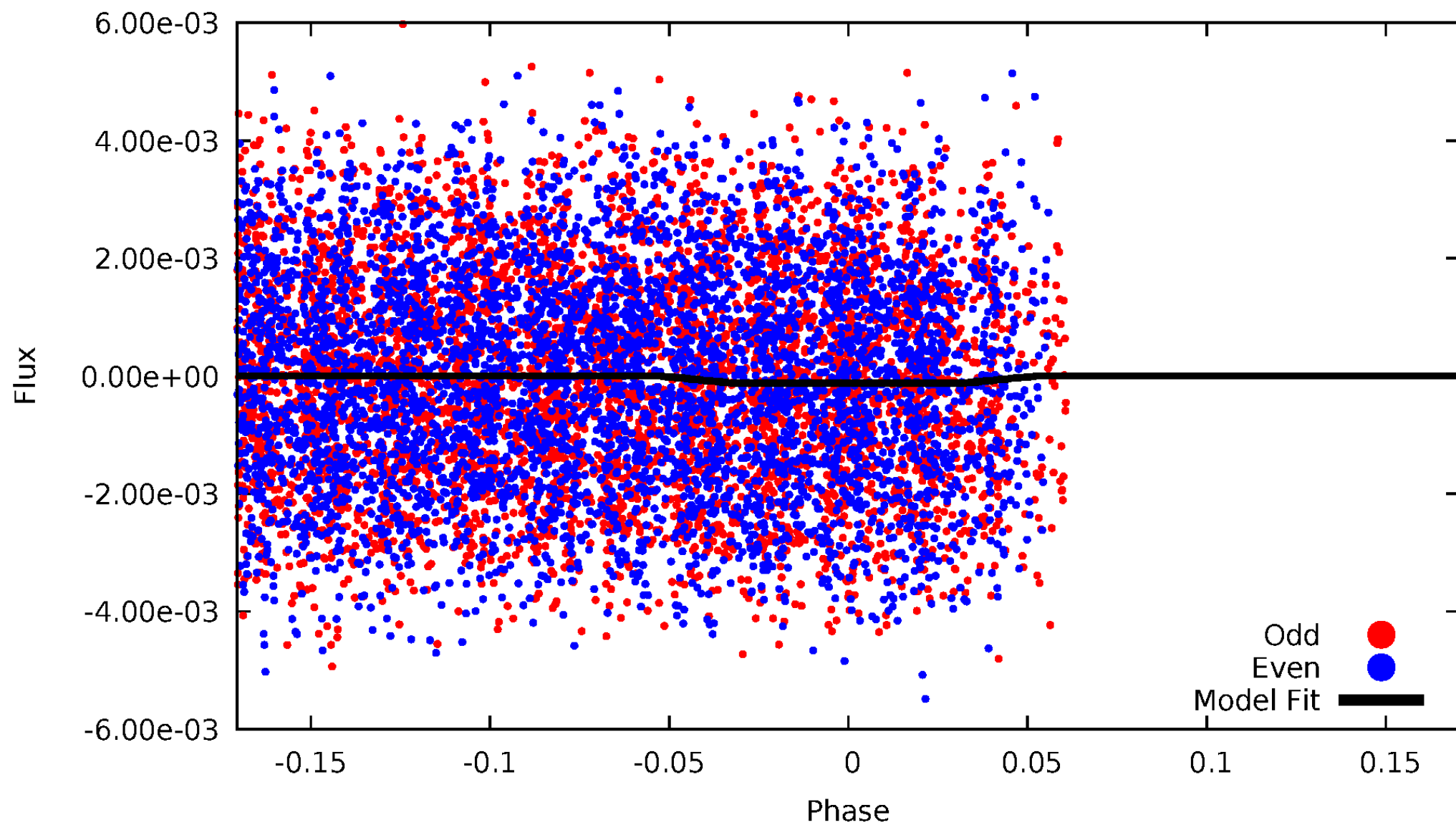
DV Odd/Even

TCE 009343888-03

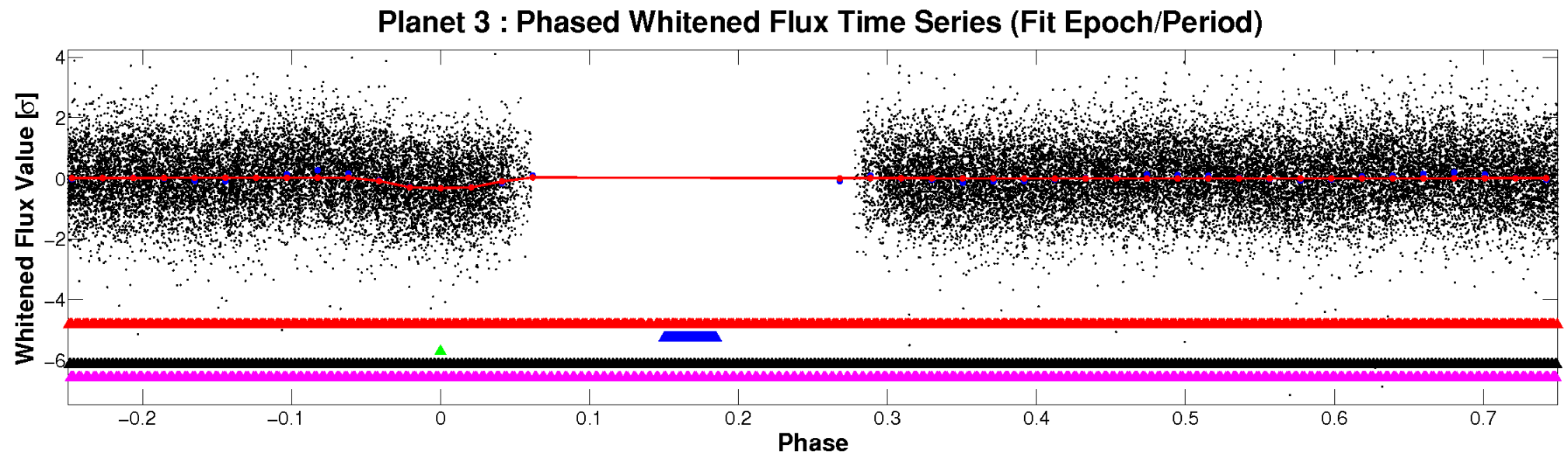
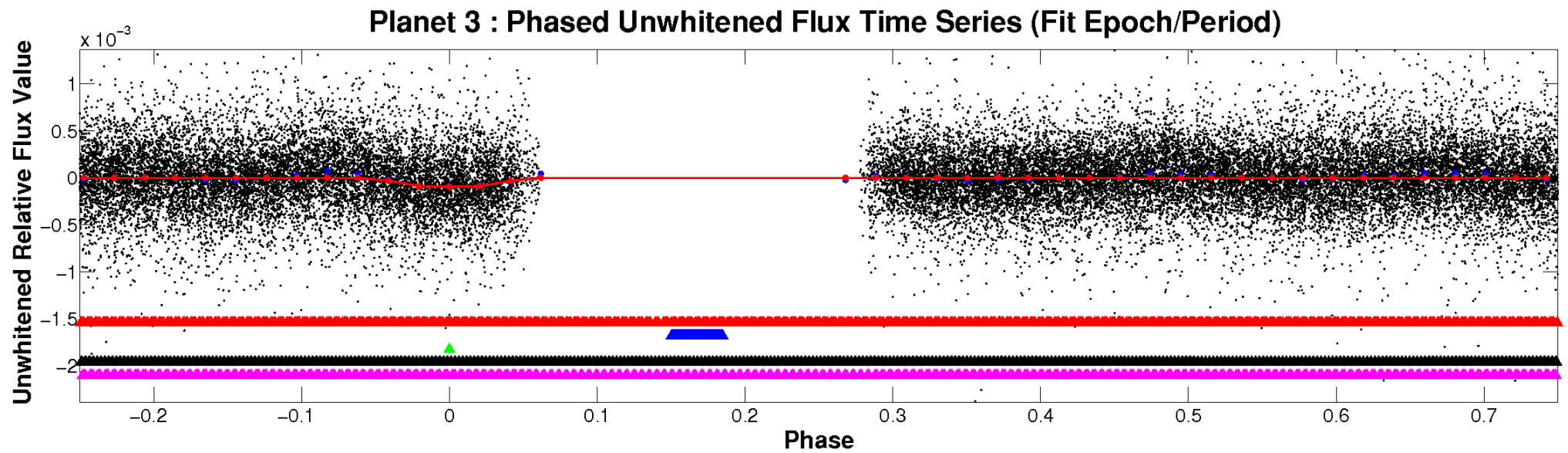


ALT Odd/Even

TCE 009343888-03

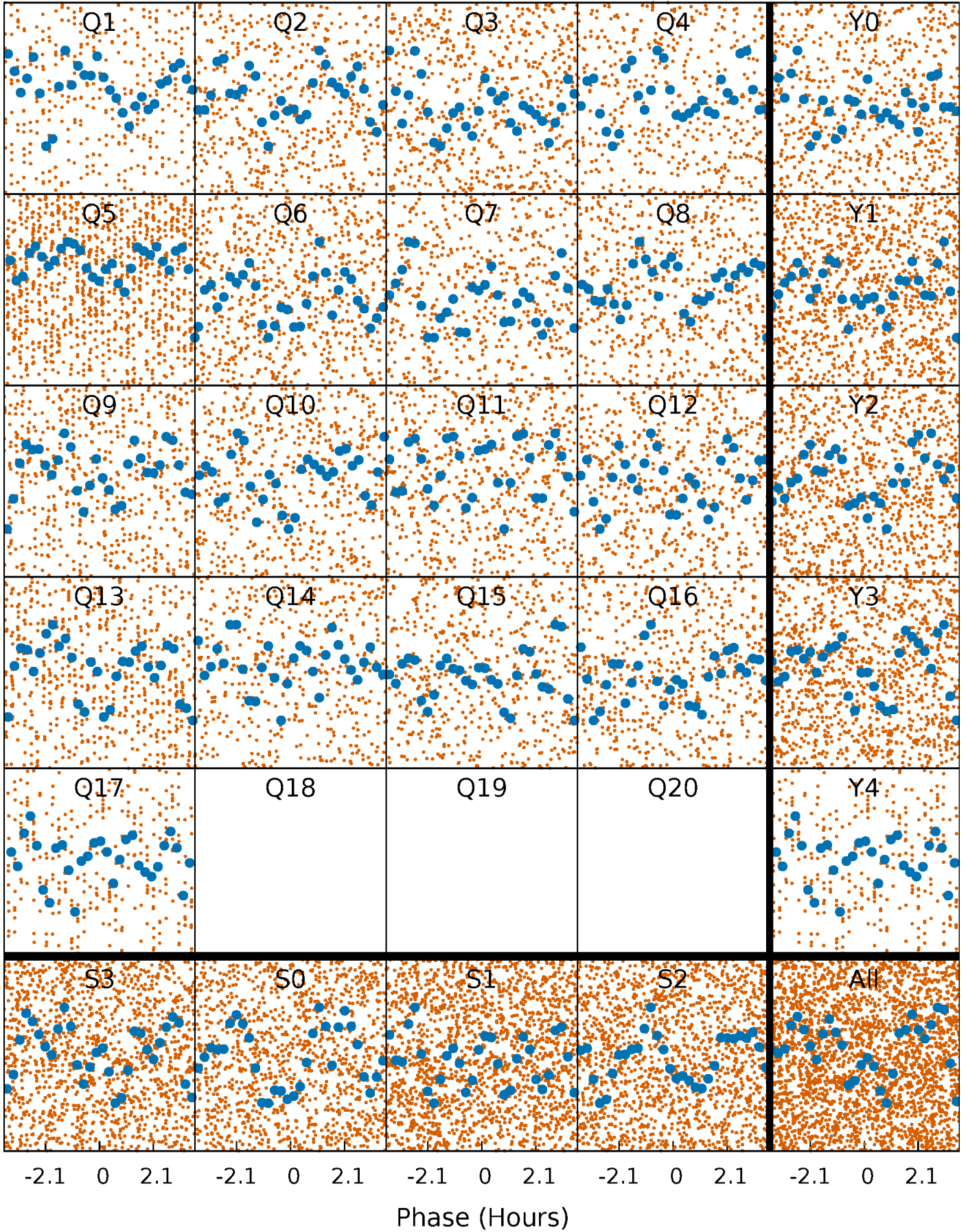


Non-Whitened Vs. Whitened Light Curve



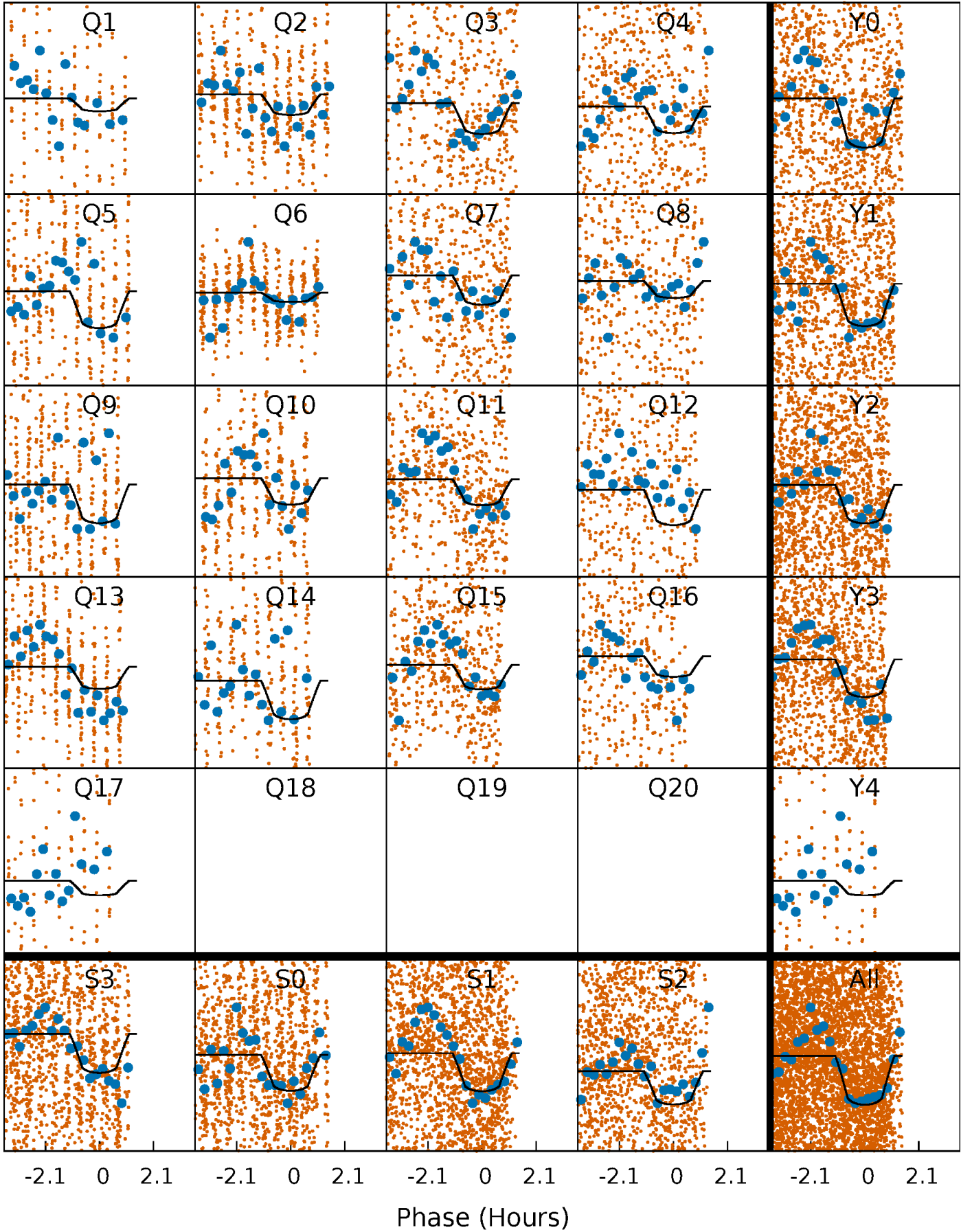
PDC Quarter-Phased Transit Curves

TCE 009343888-03 P= 0.991102 Days $T_0=131.786791$ (BKJD)



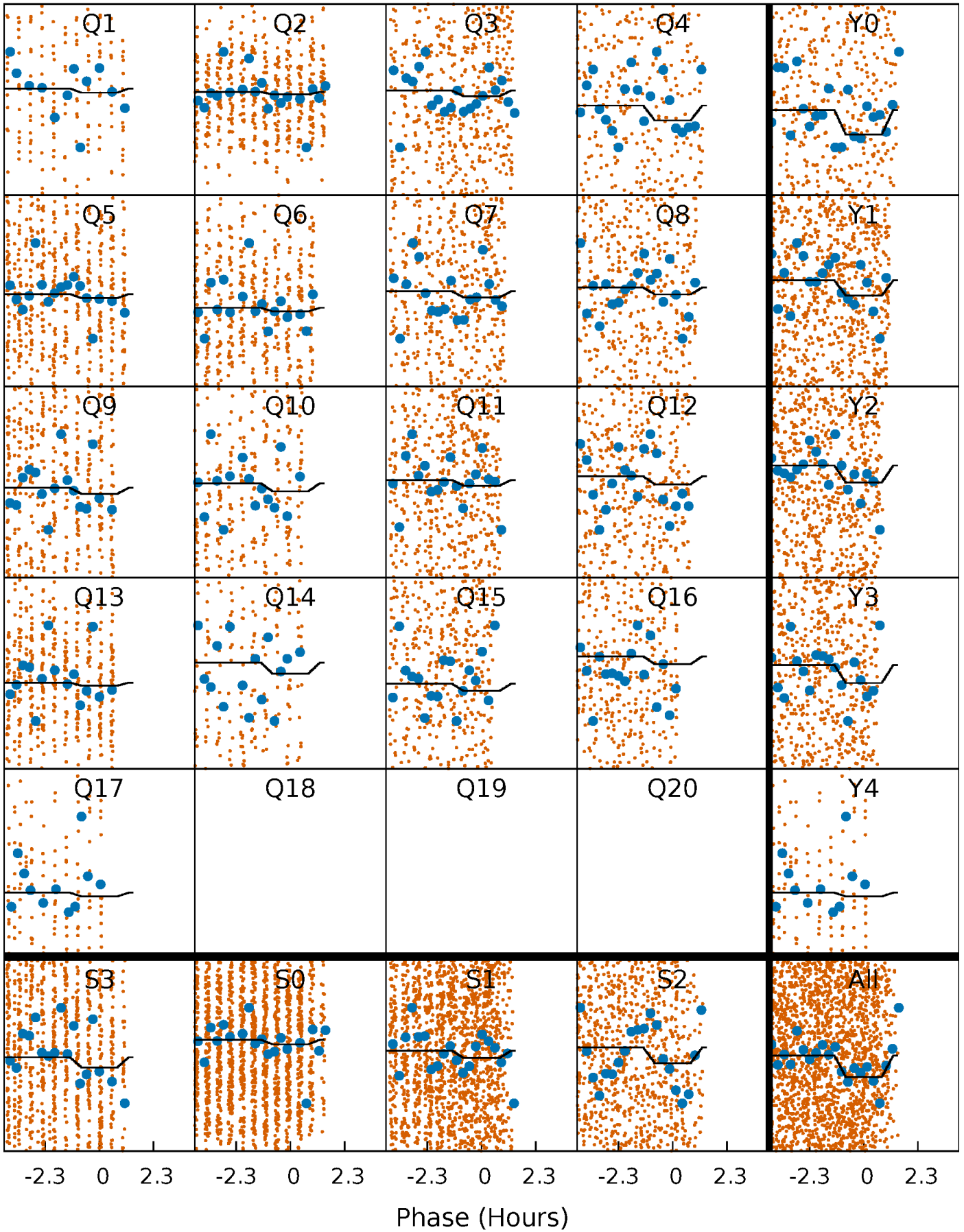
DV Quarter-Phased Transit Curves

TCE 009343888-03 P= 0.991102 Days $T_0=131.786791$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

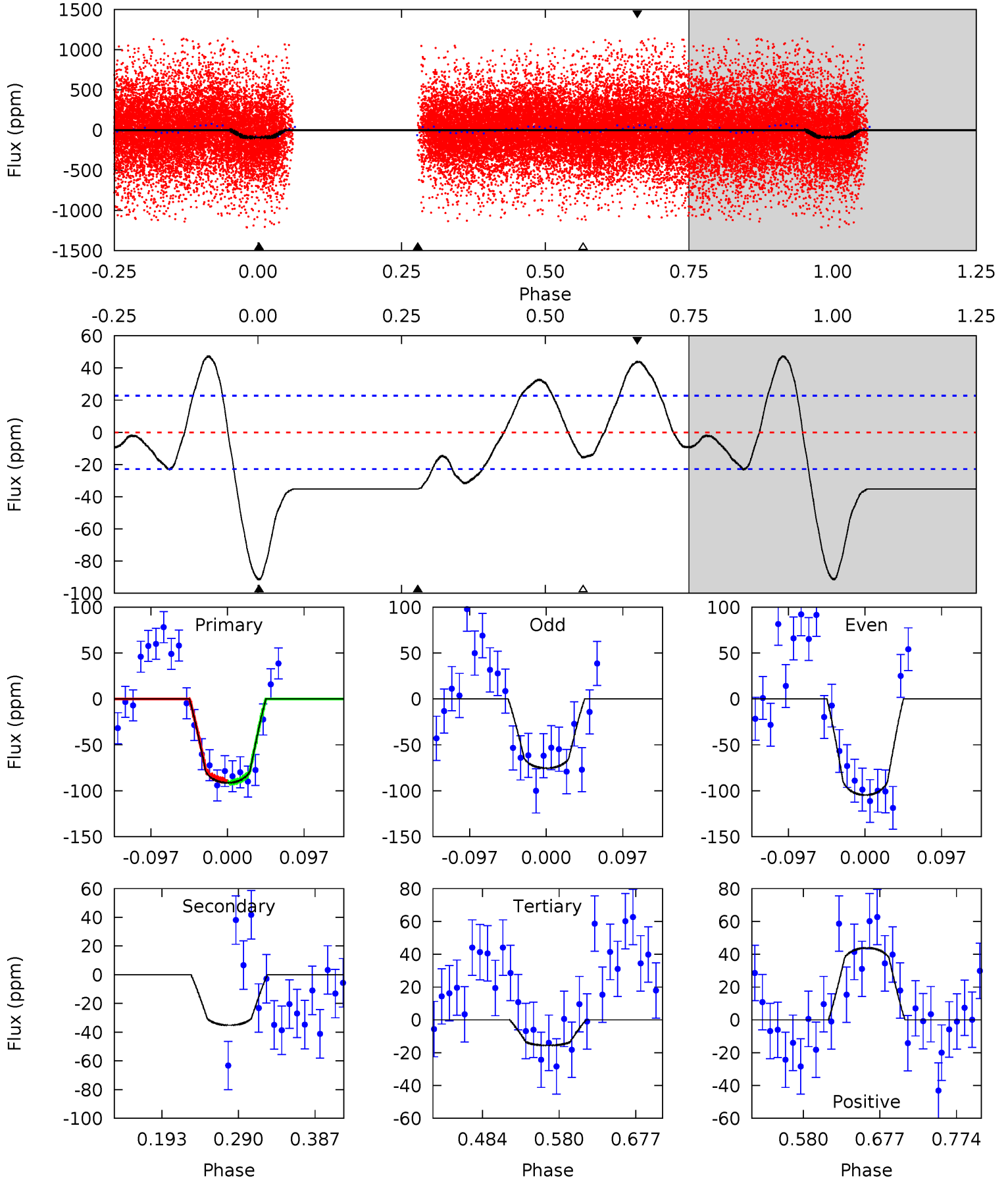
TCE 009343888-03 P= 0.991112 Days $T_0=131.786356$ (BKJD)



DV Model-Shift Uniqueness Test

009343888-03, P = 0.991102 Days, E = 130.795689 Days

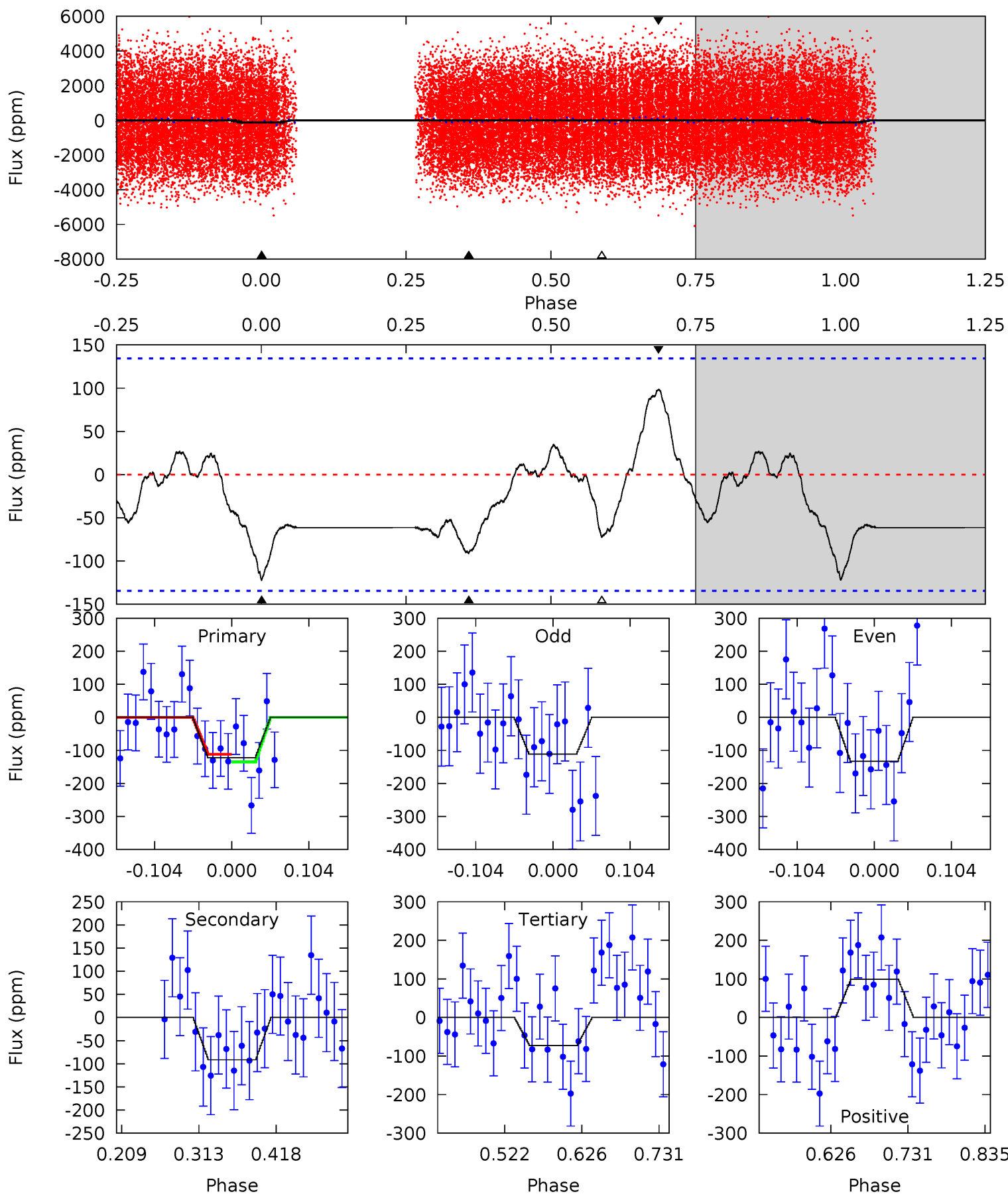
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.3	7.04	3.12	8.78	4.57	1.66	4.00	15.2	9.52	3.92	-1.74	2.94	1.05	0.34	0.23



Alt Model-Shift Uniqueness Test

009343888-03, P = 0.991112 Days, E = 130.795244 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.14	3.10	2.47	3.36	4.56	1.62	1.31	1.67	0.79	0.63	-0.26	0.36	1.08	0.45	0.39



Stellar Parameters For KIC 009343888

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7438^{+233}_{-311}	$3.867^{+0.400}_{-0.100}$	$-0.500^{+0.250}_{-0.300}$	$2.358^{+0.511}_{-0.949}$	$1.492^{+0.209}_{-0.313}$	$0.160^{+0.519}_{-0.063}$
	+3%/-4%	+10%/-3%	+50%/-60%	+22%/-40%	+14%/-21%	+323%/-39%
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 009343888-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-35 ± 5	$2.27^{+0.66}_{-0.65}$	4560^{+354}_{-522}	5480^{+937}_{-605}	$1.873^{+1.783}_{-0.784}$
Alt.	-91 ± 29	$2.65^{+0.73}_{-0.68}$	4554^{+347}_{-473}	6619^{+1056}_{-905}	$3.532^{+3.306}_{-1.556}$

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 $A_{obs} \gg 1.0$

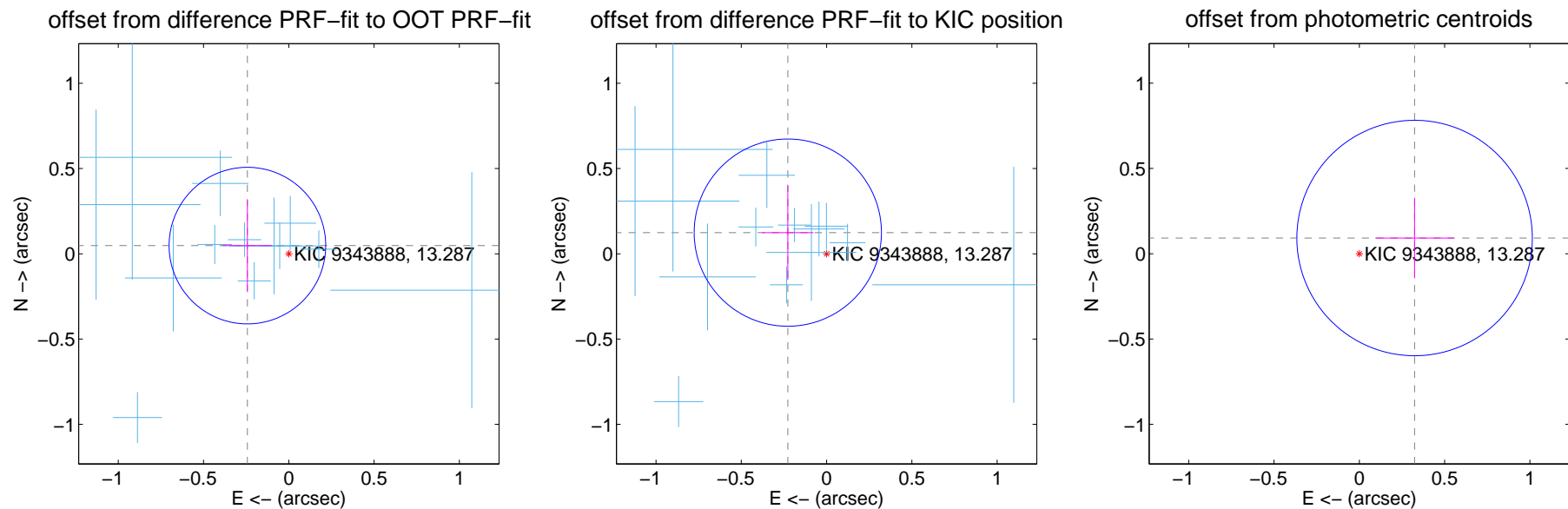
DV Centroid Data

Supplemental centroid analysis for 009343888-03. Kepler magnitude: 13.29. Transit SNR 15.97

There are 14 quarters with good PRF difference image offsets

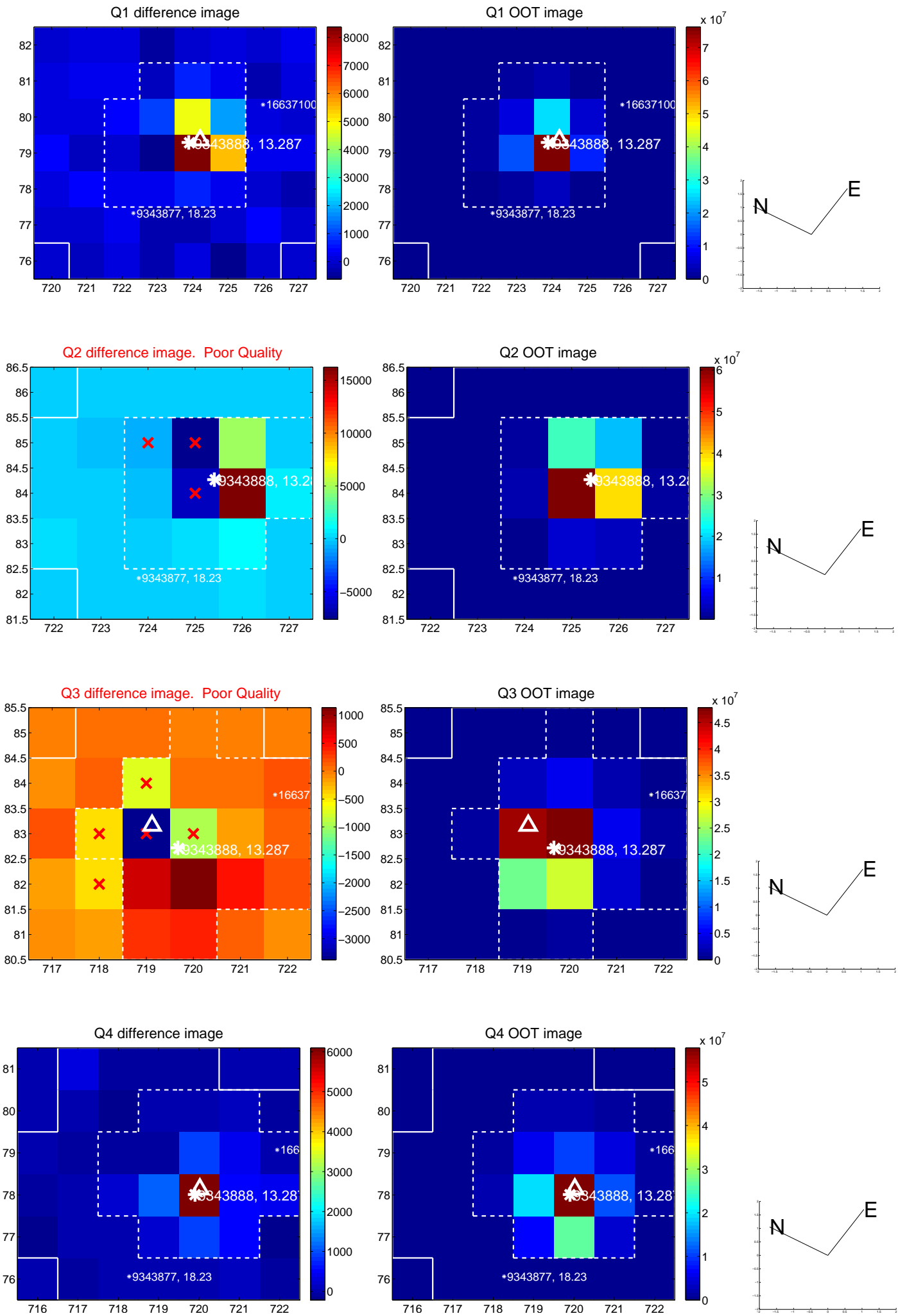
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.247 ± 0.153	1.62	0.243 ± 0.146	0.048 ± 0.267
PRF-fit source offset from KIC position	0.259 ± 0.183	1.42	0.227 ± 0.150	0.124 ± 0.277
photometric centroid source offset	0.34 ± 0.23	1.46	-0.32 ± 0.23	0.09 ± 0.24

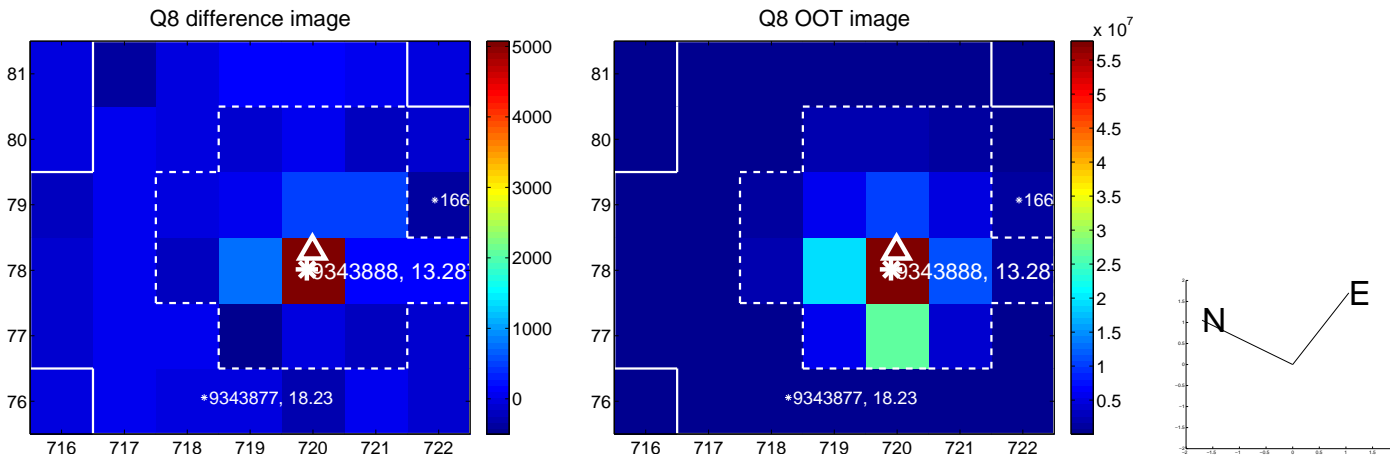
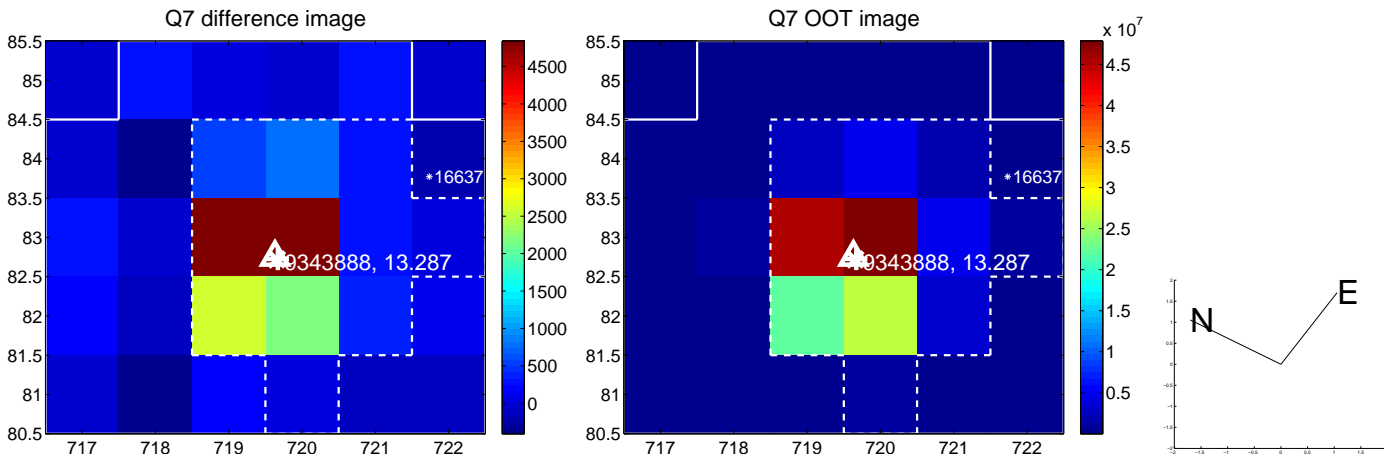
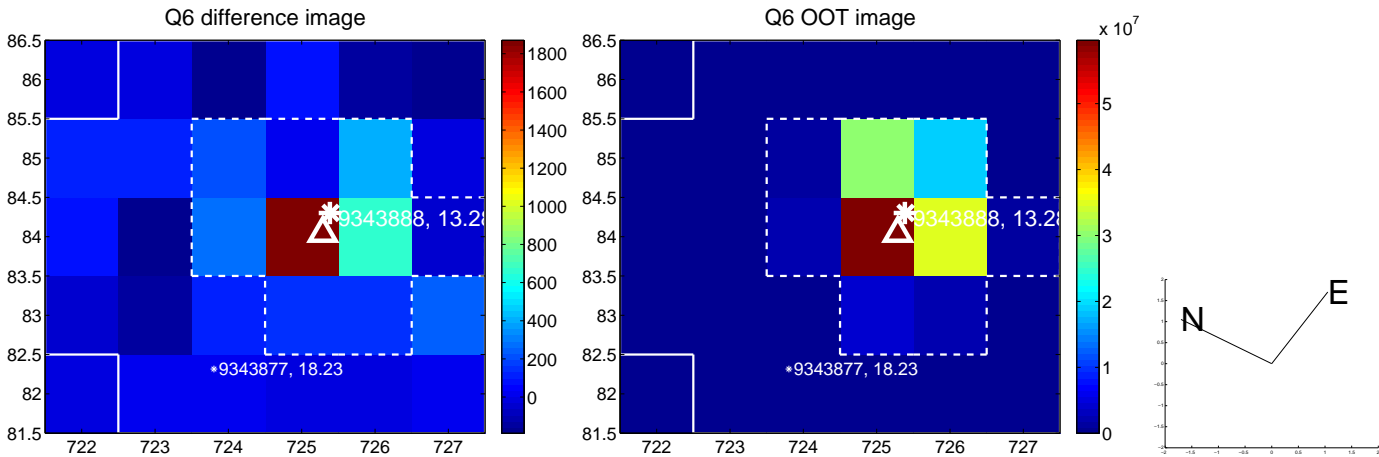
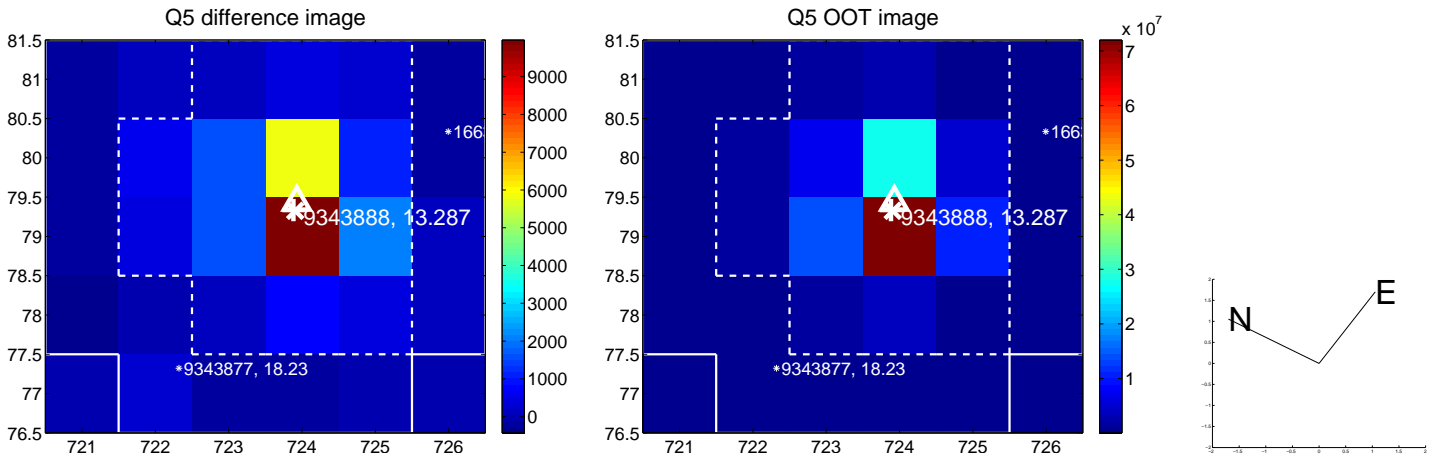


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

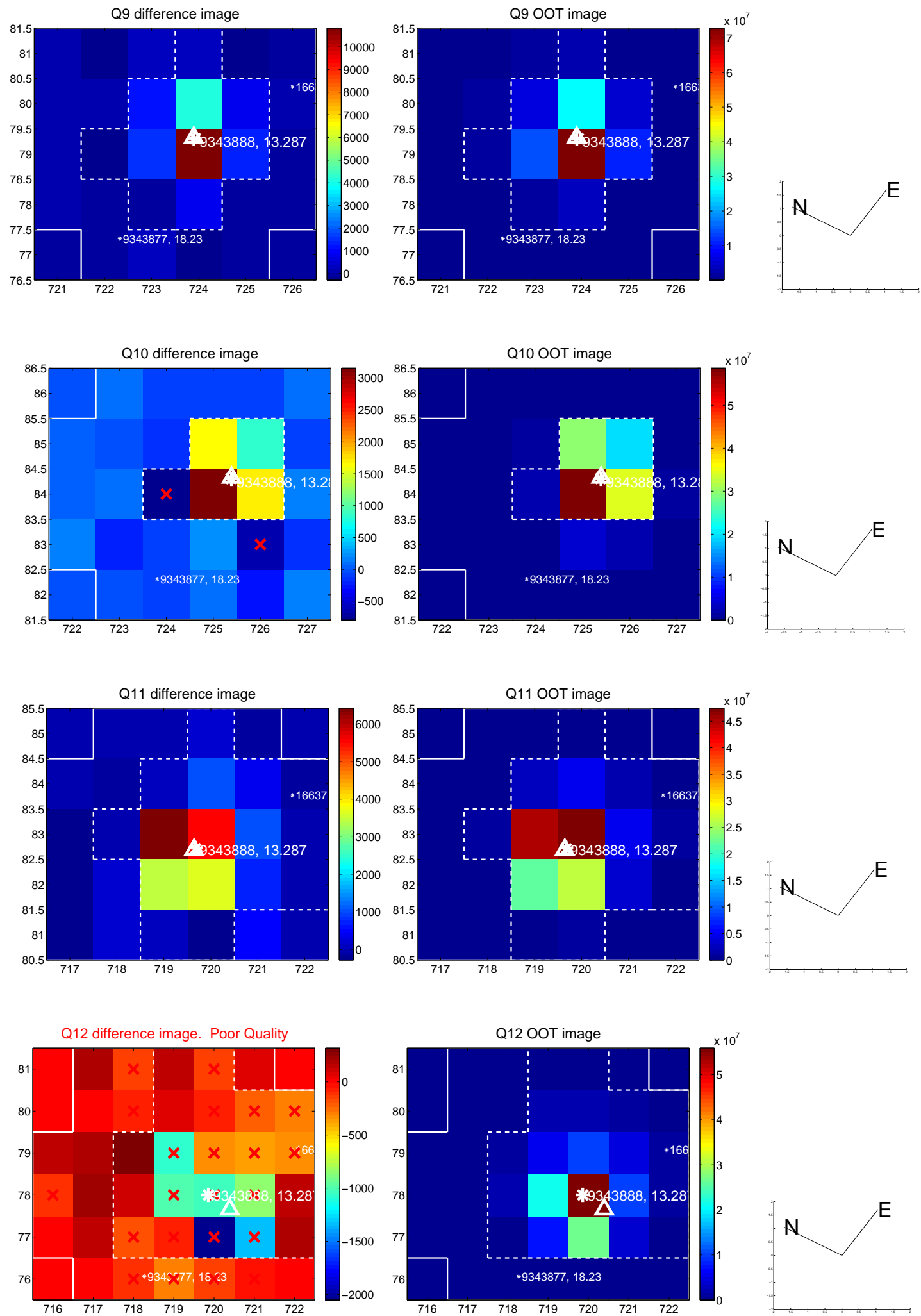
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



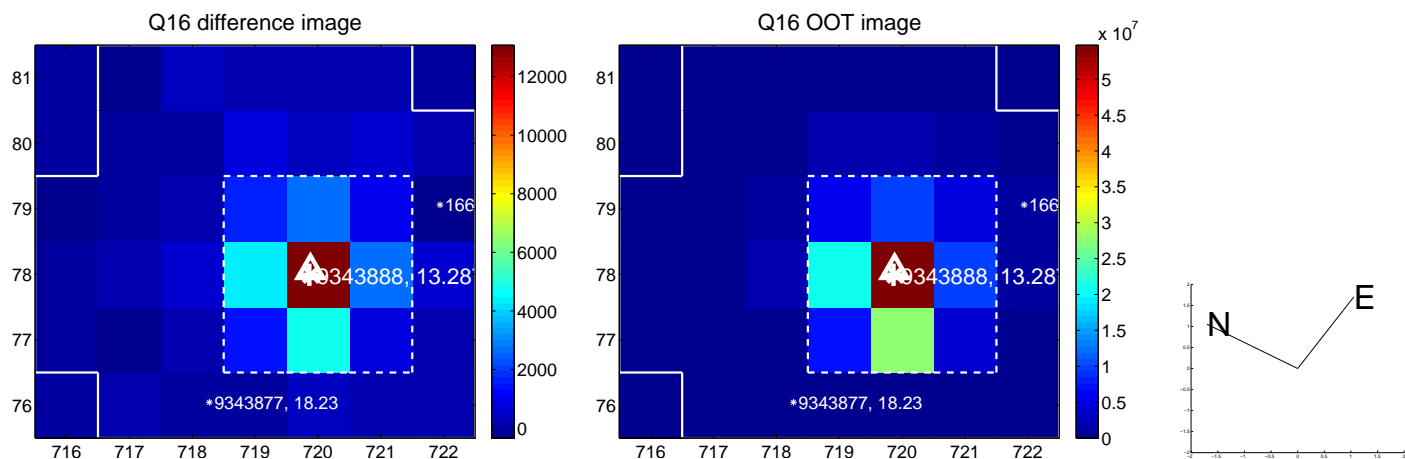
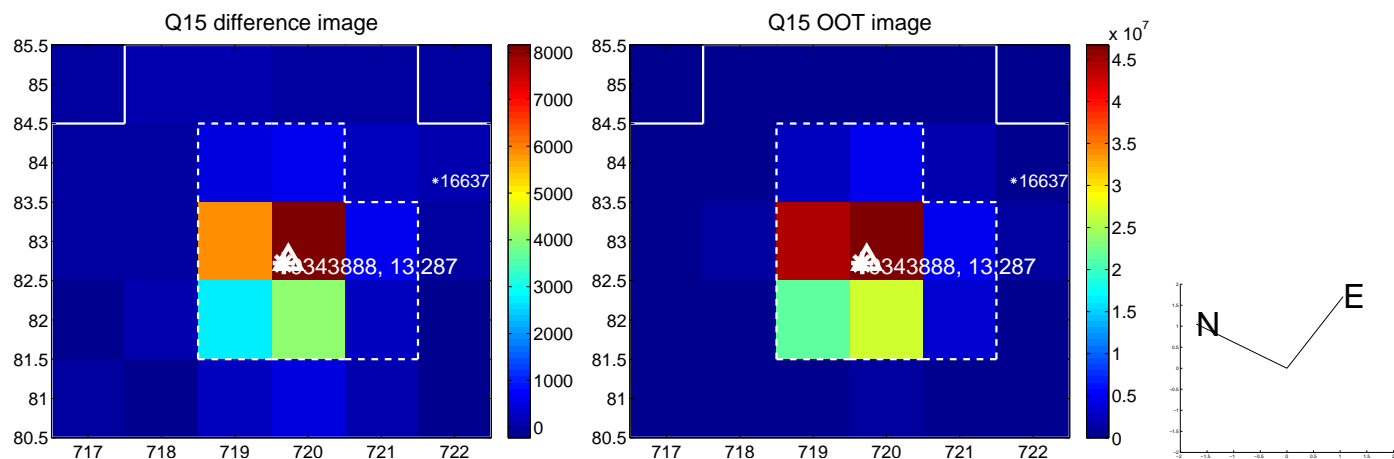
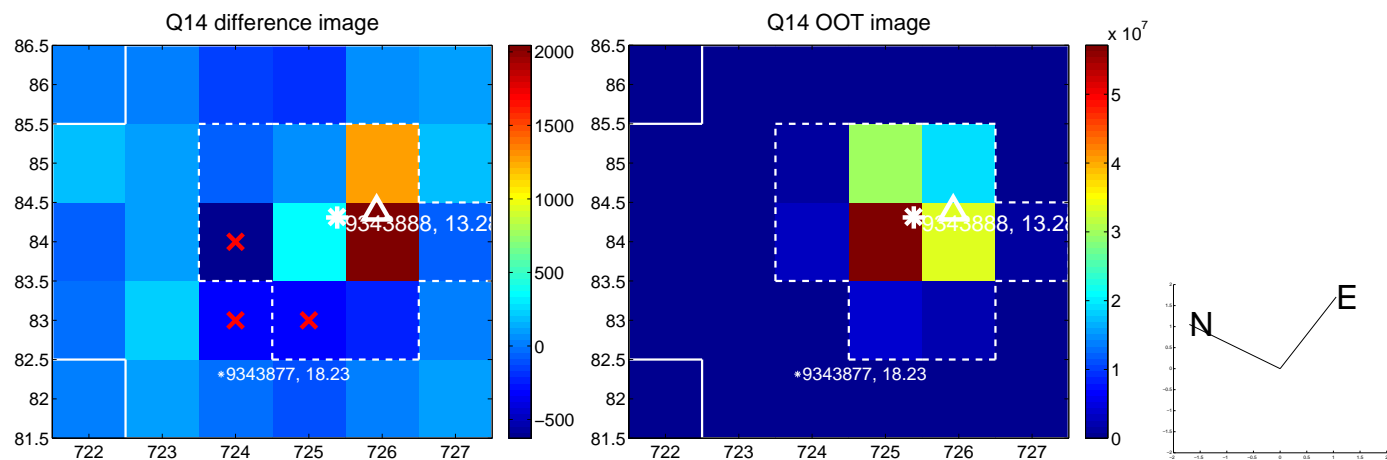
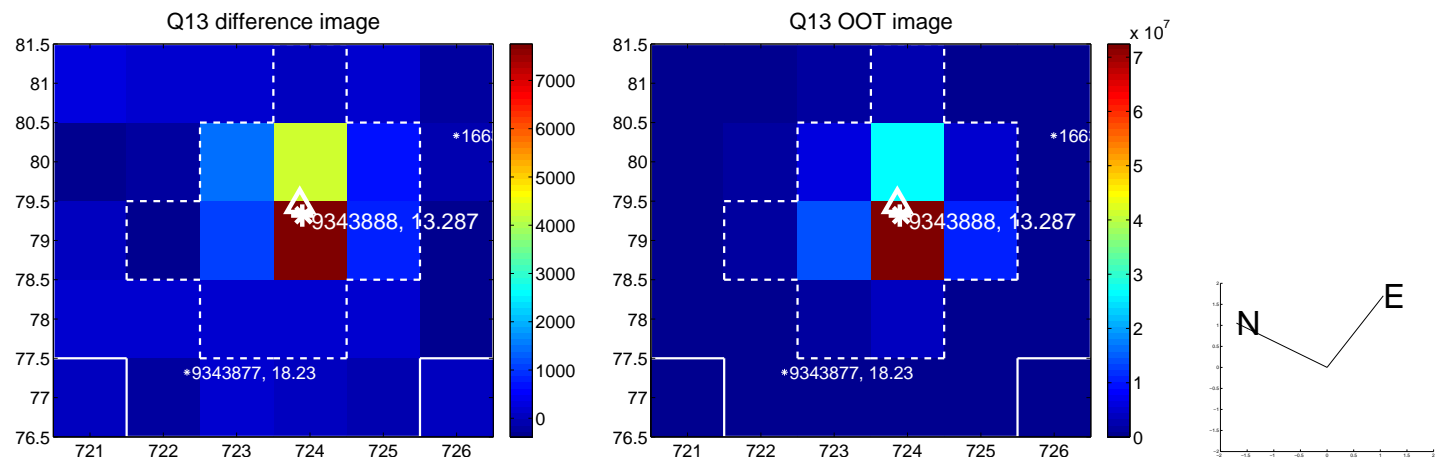
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



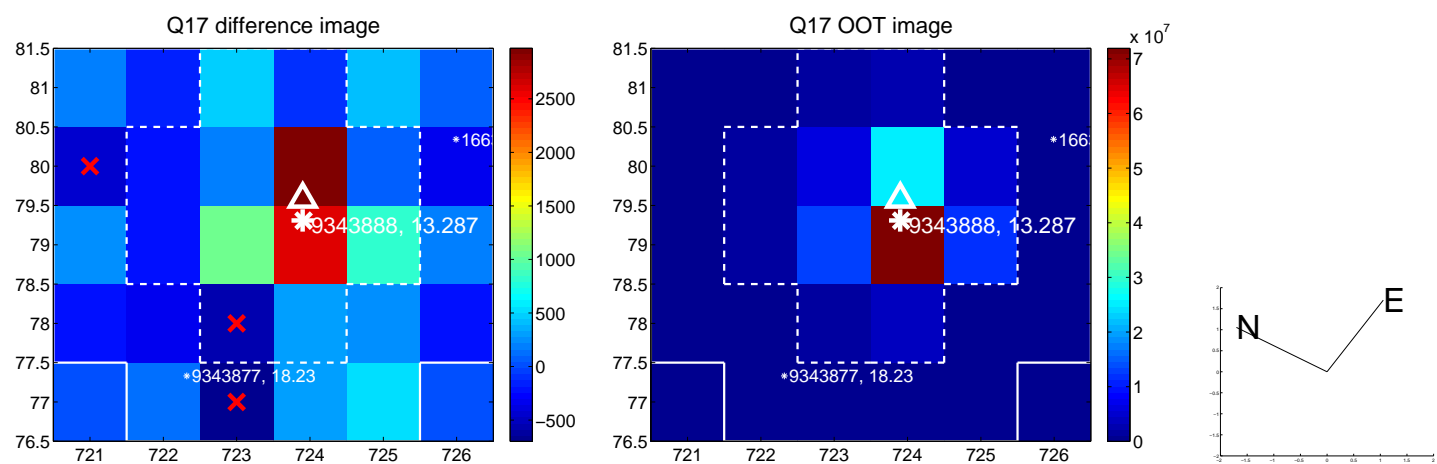
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



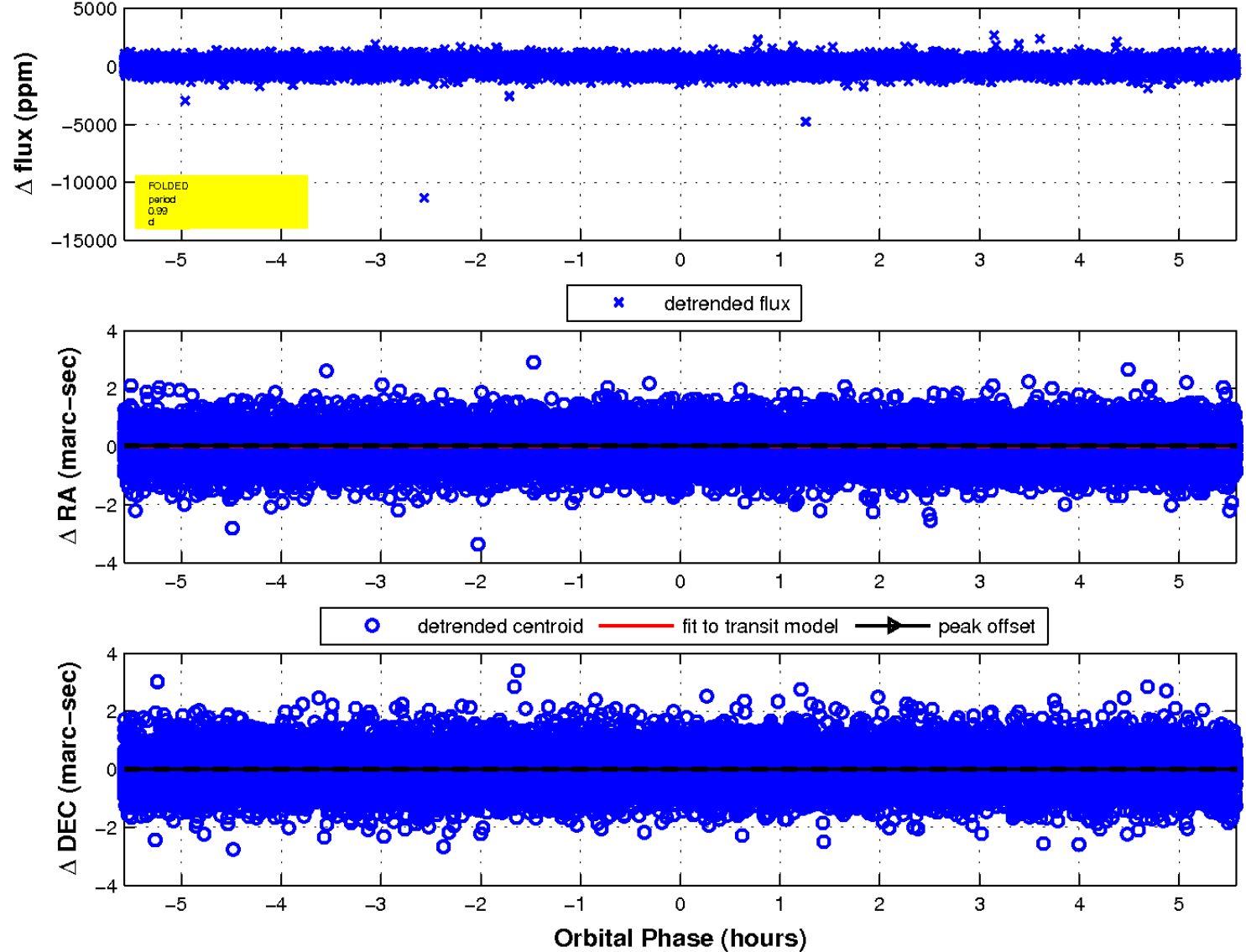
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

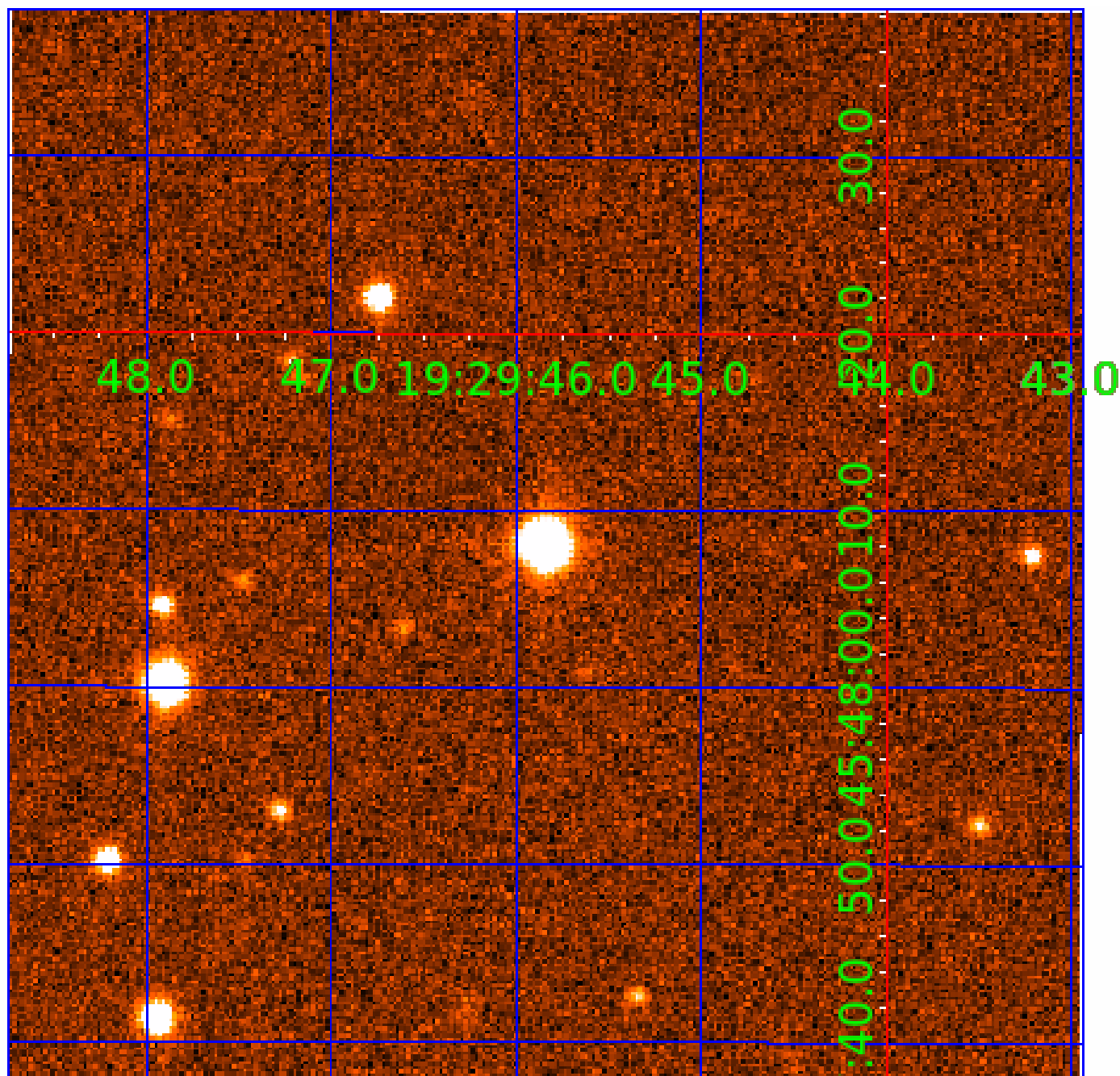


fluxWeightedCentroids, Planet 3 of 5



UKIRT Image

Declination



KIC 009343888

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})
009343888-01	OBS	No	1.976853	131.918629	52.0	4.922	8.2	10.5	2.36	7438	2.04	12277.67
009343888-02	OBS	No	0.991079	131.970114	90.3	1.785	14.7	15.2	2.36	7438	2.60	30827.42
009343888-03	OBS	No	0.991102	131.786791	96.0	1.858	12.8	16.0	2.36	7438	2.48	30826.45
009343888-04	OBS	No	0.988522	132.285632	60.0	3.241	9.3	11.8	2.36	7438	2.11	30933.79
009343888-05	OBS	No	1.977145	132.832364	270.0	3.500	8.8	-1.0	2.36	7438	3.93	12275.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009343888-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009343888-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009343888-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
009343888-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
009343888-05	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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

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

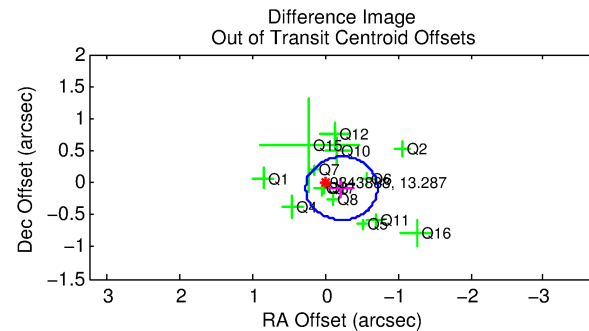
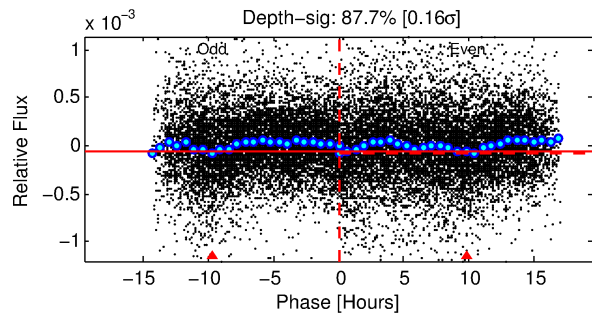
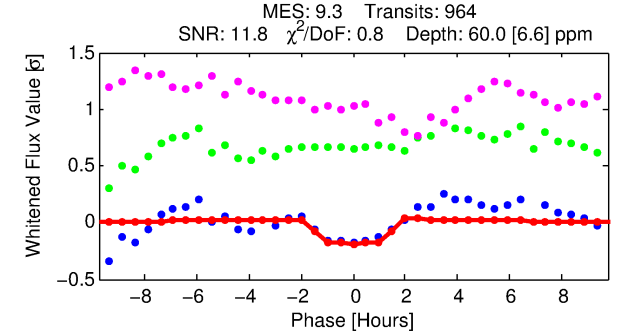
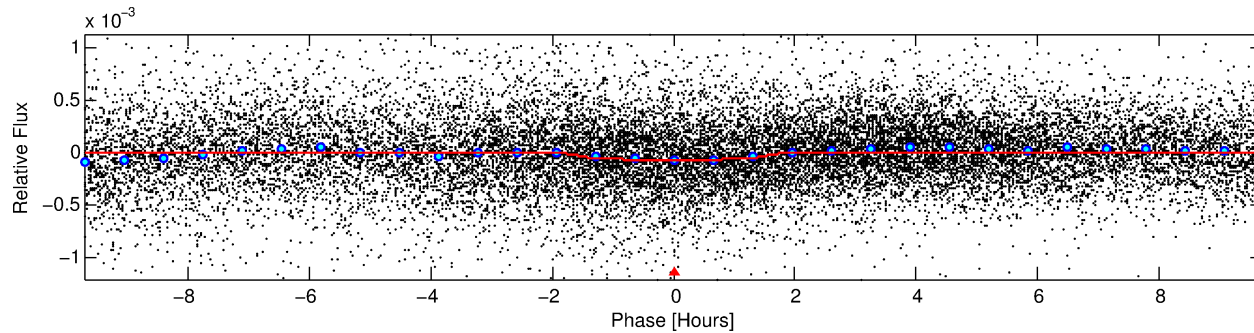
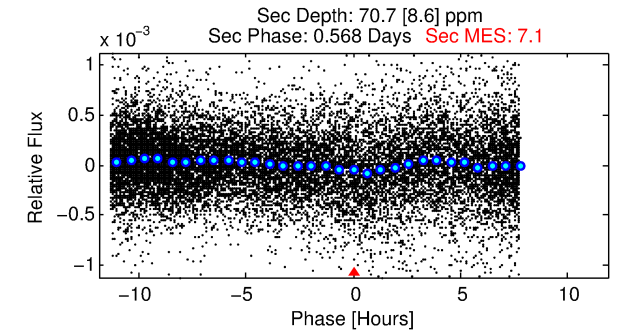
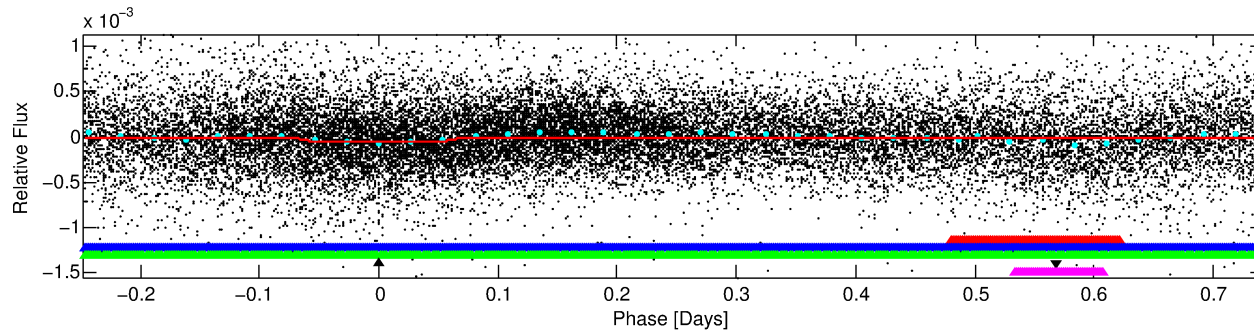
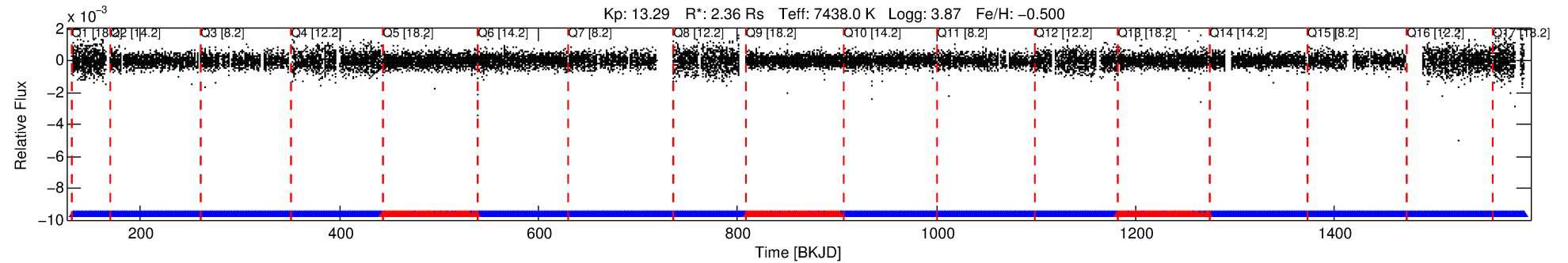
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009343888-04

No Significant Match Found

DV One-Page Summary

KIC: 9343888 Candidate: 4 of 5 Period: 0.989 d



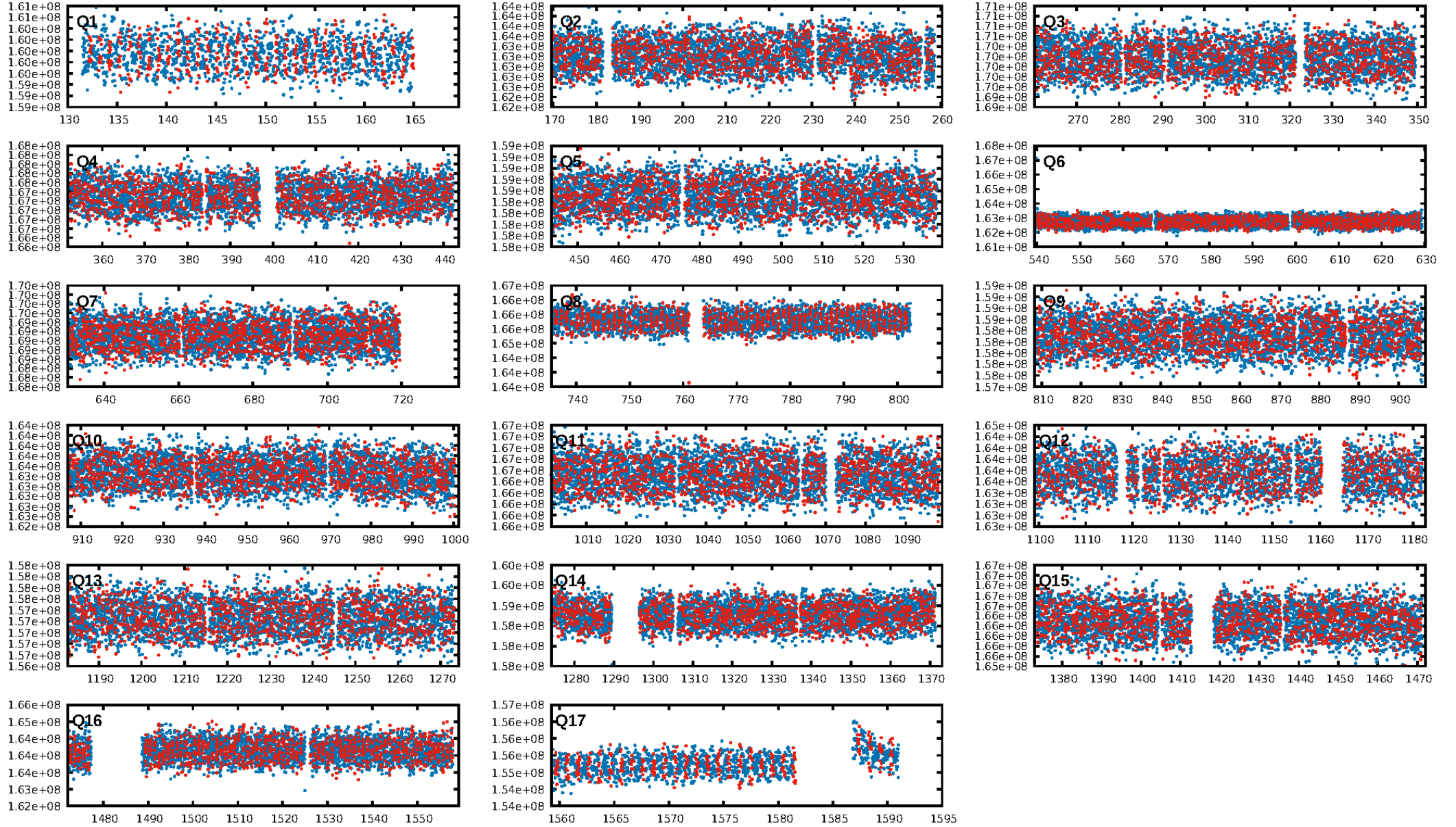
DV Fit Results:

Period = 0.98852 [0.00001] d
Epoch = 132.2856 [0.0031] BKJD
Rp/R* = 0.0082 [0.0031]
a/R* = 1.42 [1.71]
b = 0.90 [0.52]
Seff = 30933.79 [21364.13]
Teq = 3382 [584] K
Rp = 2.11 [1.16] Re
a = 0.0222 [0.0091] AU
Ag = 4.30 [4.34] [0.76σ]
Teffp = 7529 [1456] K [2.64σ]

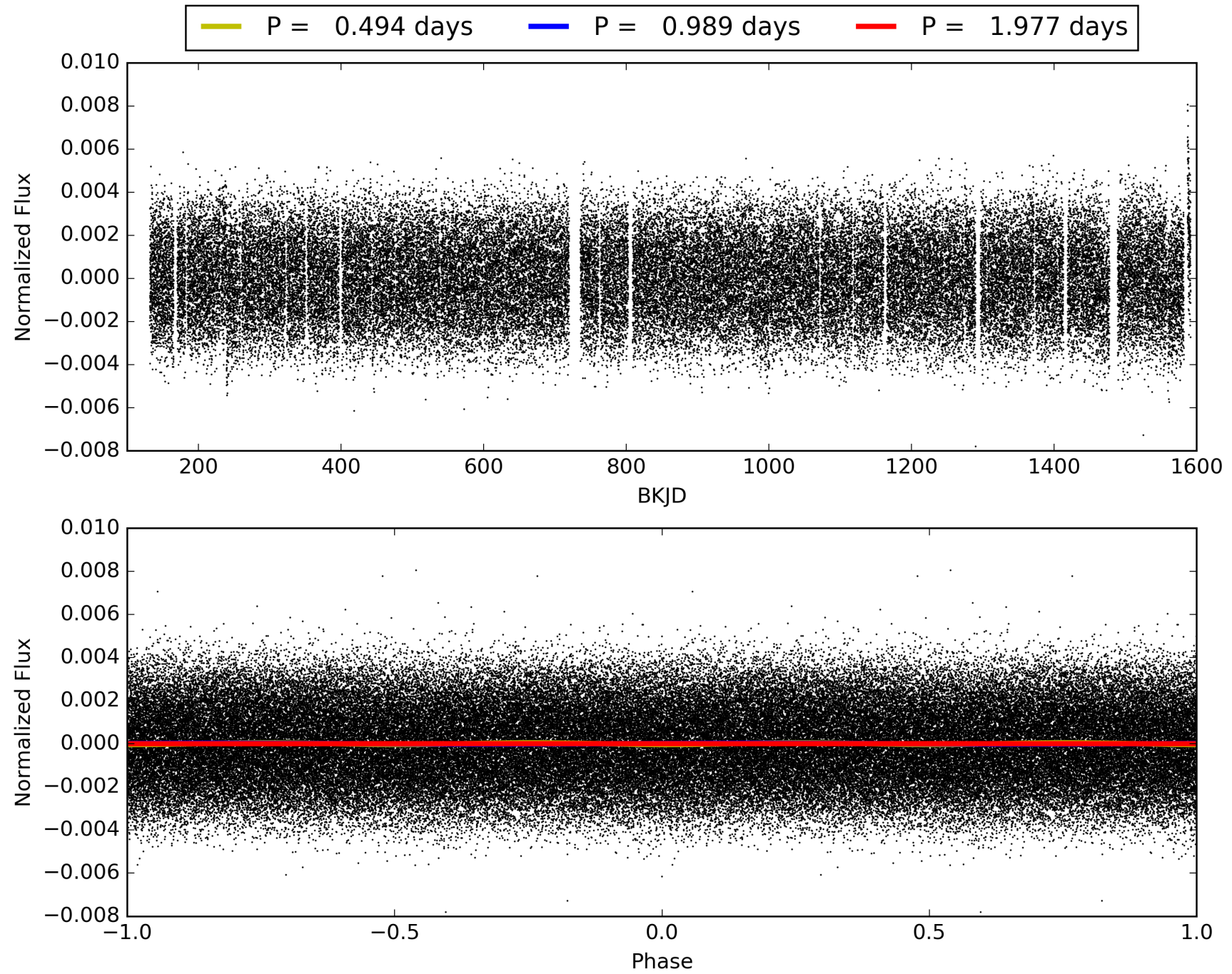
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 1.3% [0.02σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.75 [679/903]
GhostDiagnostic-chr: 3.85
Centroid-sig: 1.8%
Centroid-so: 0.431 arcsec [1.51σ]
OotOffset-rm: 0.241 arcsec [1.47σ]
KicOffset-rm: 0.230 arcsec [1.35σ]
OotOffset-st: 3/4/4/3 [14]
KicOffset-st: 3/4/4/3 [14]
DiffImageQuality-fgm: 0.86 [12/14]
DiffImageOverlap-fno: 0.12 [2/17]

TCE 009343888-04, PDC Light Curves

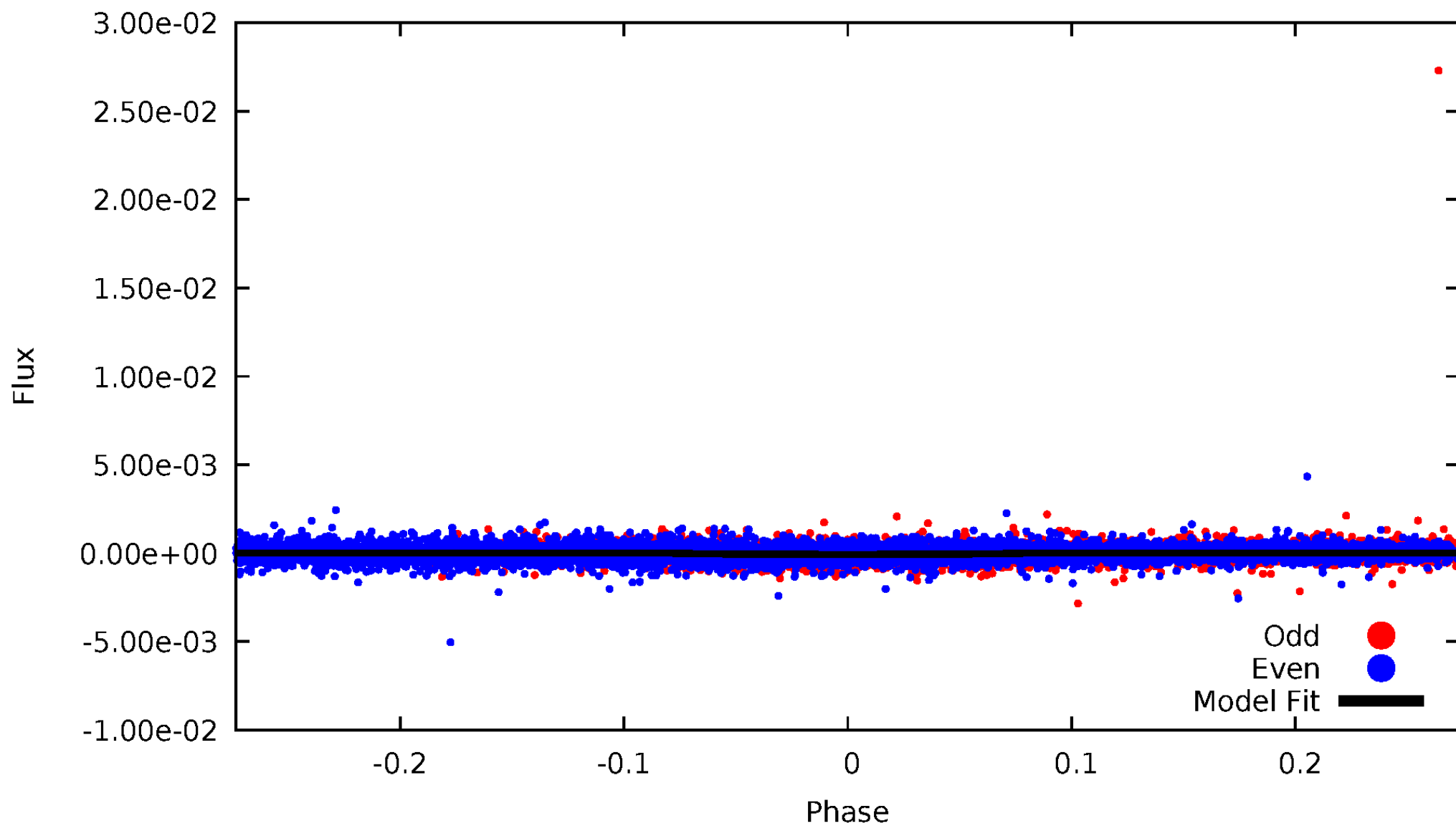


TCE 009343888-04



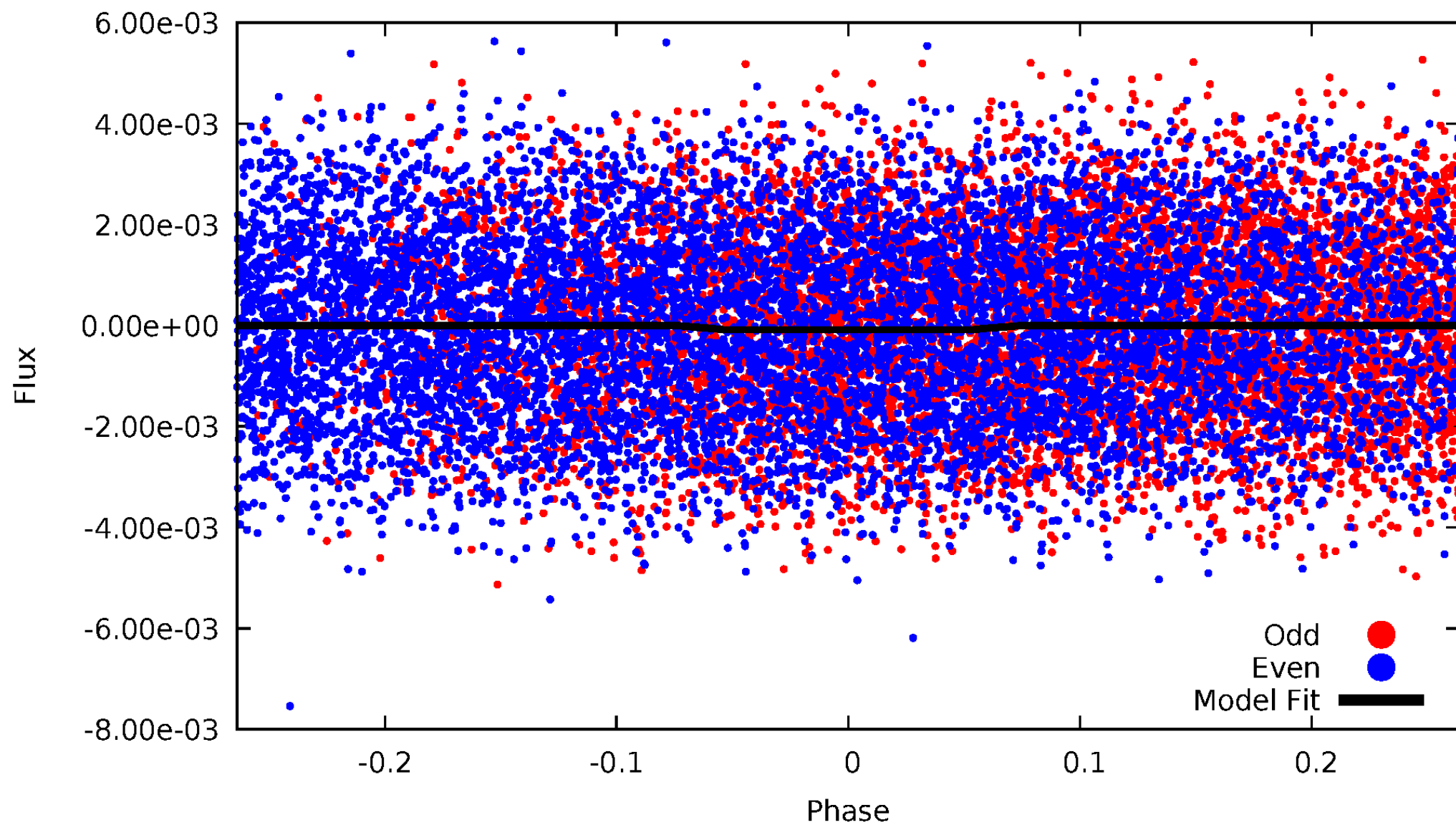
DV Odd/Even

TCE 009343888-04



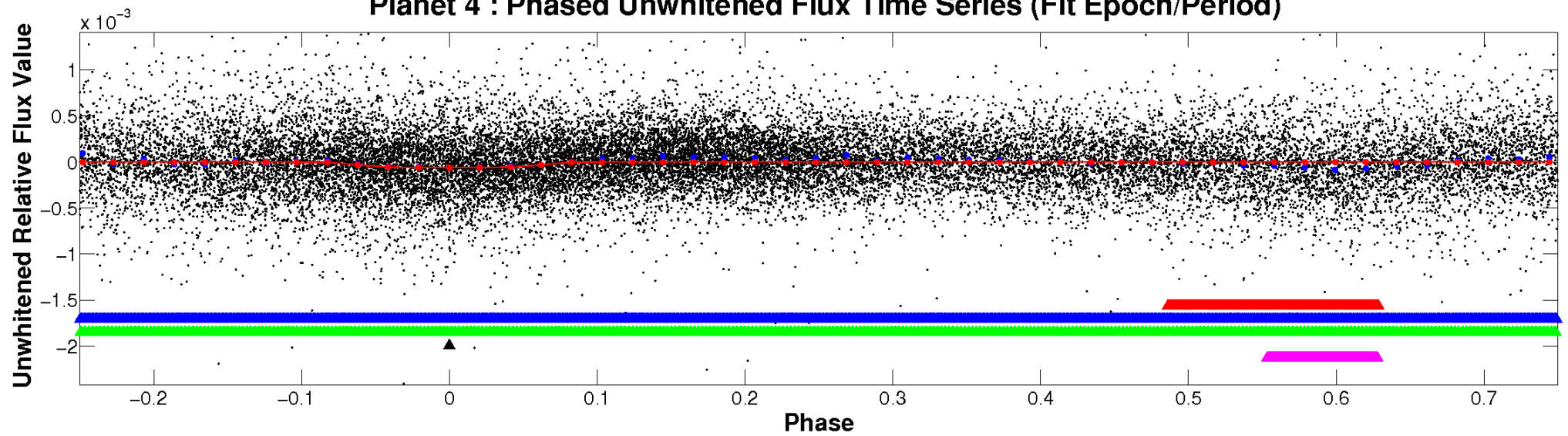
ALT Odd/Even

TCE 009343888-04

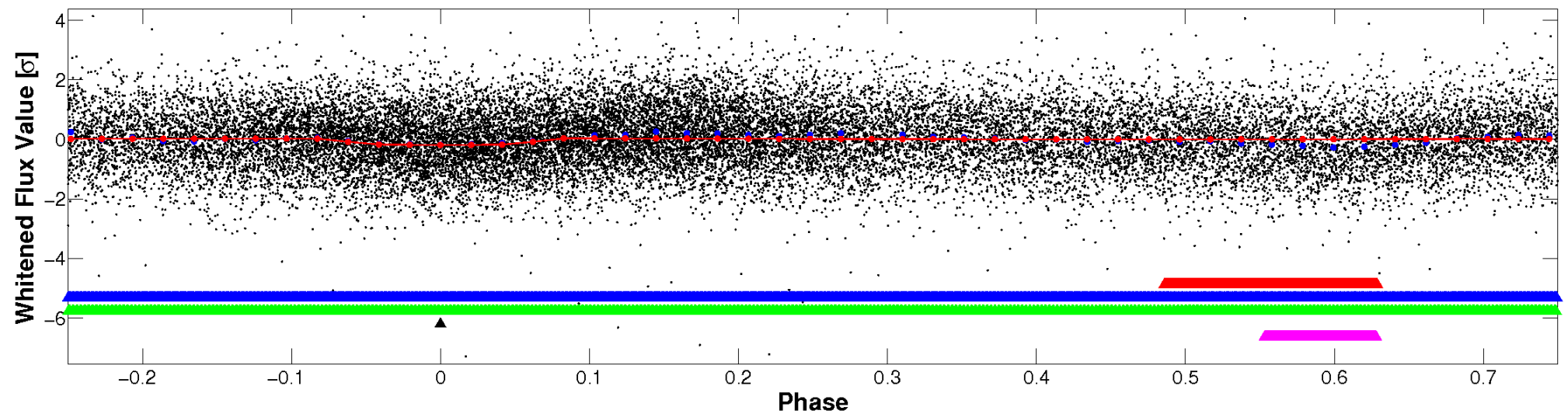


Non-Whitened Vs. Whitened Light Curve

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

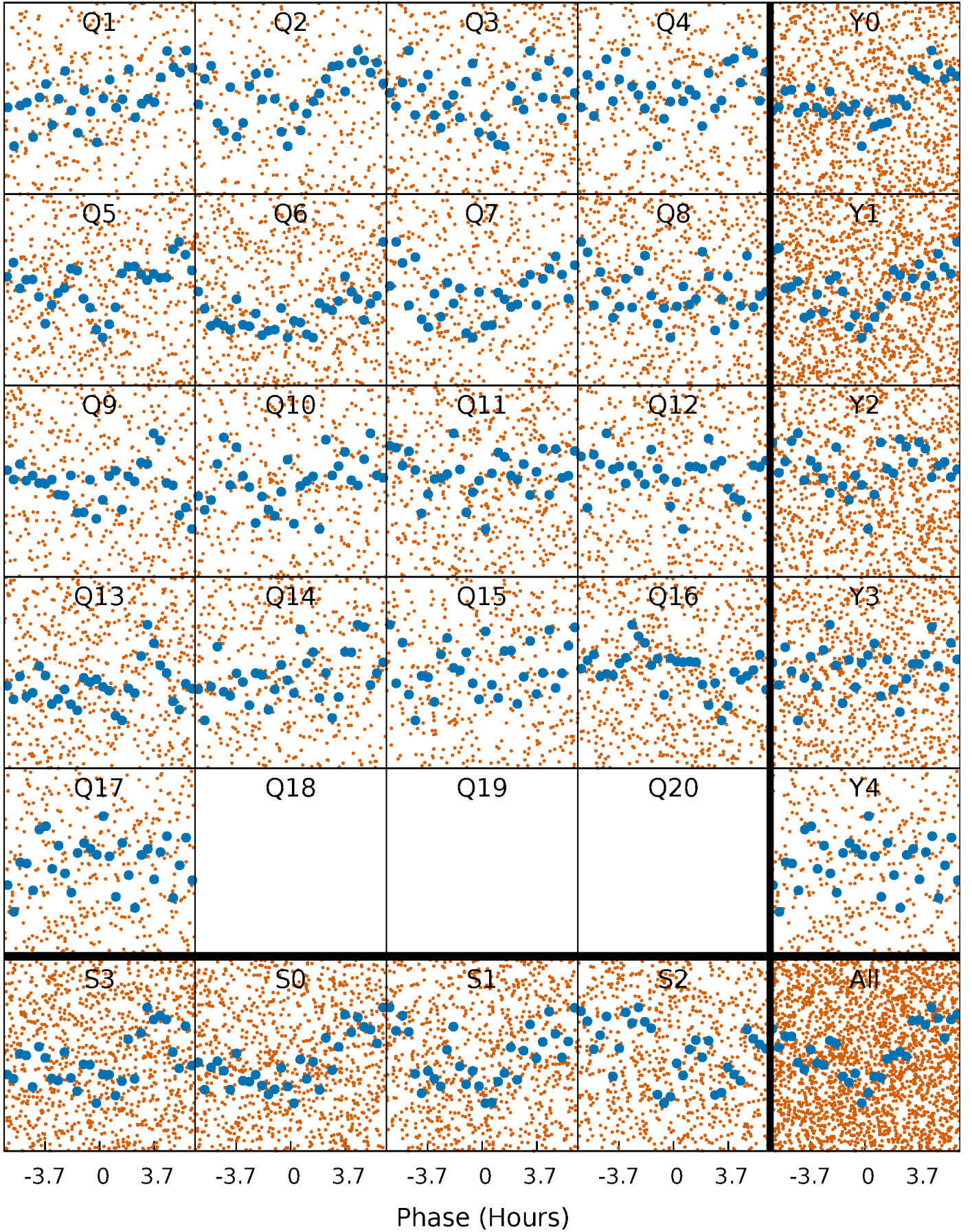


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



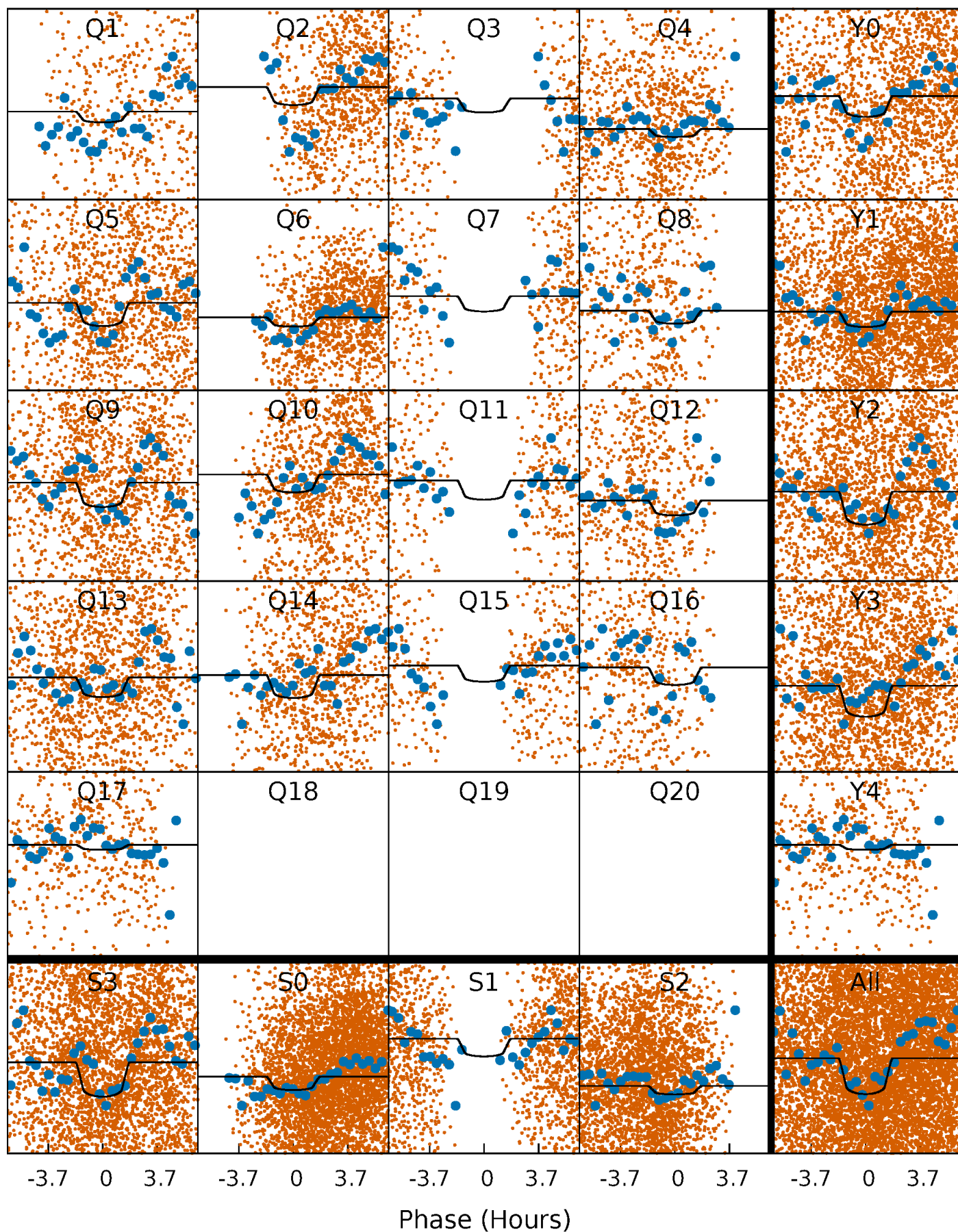
PDC Quarter-Phased Transit Curves

TCE 009343888-04 $P = 0.988522$ Days $T_0 = 132.285632$ (BKJD)



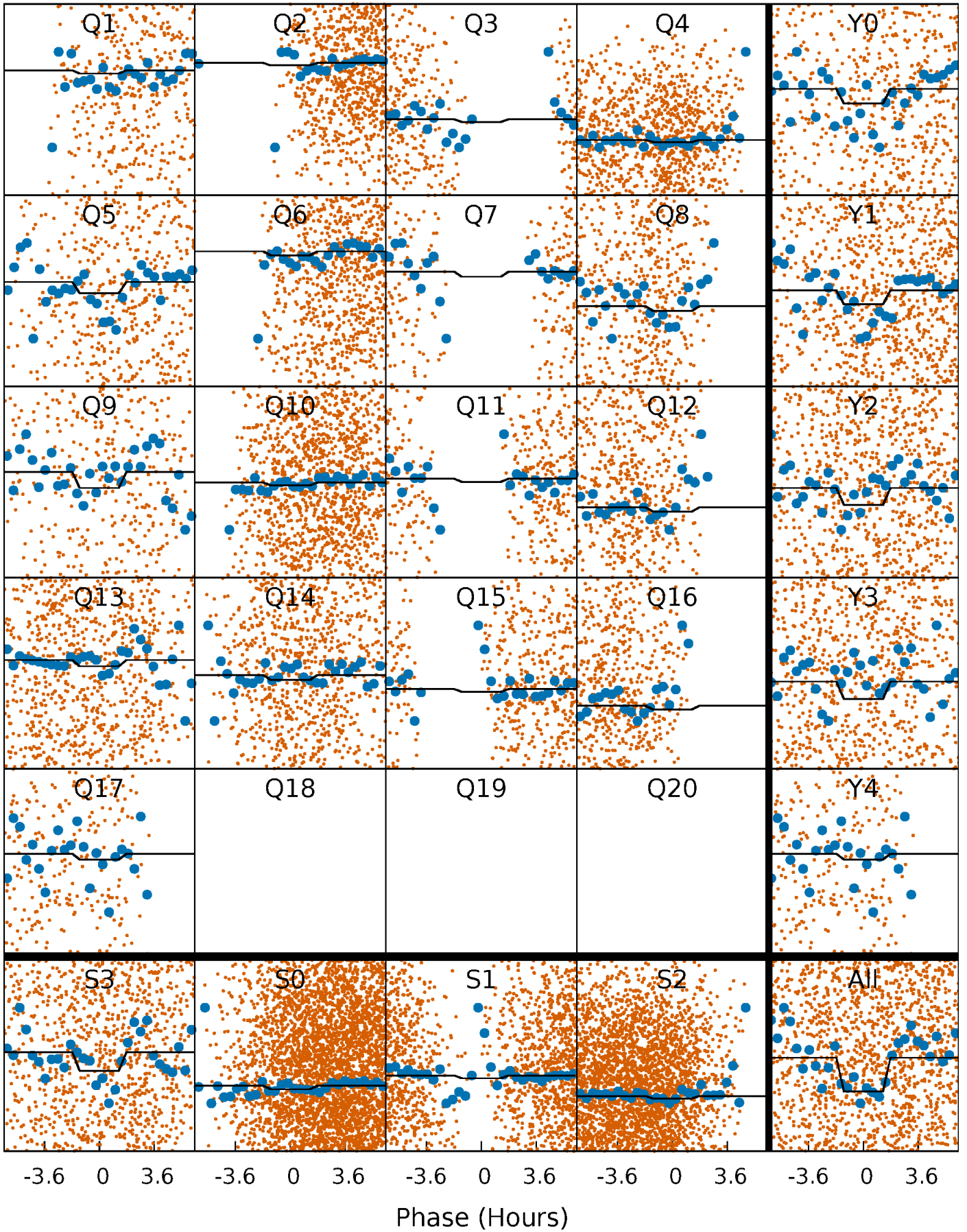
DV Quarter-Phased Transit Curves

TCE 009343888-04 P= 0.988522 Days $T_0=132.285632$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

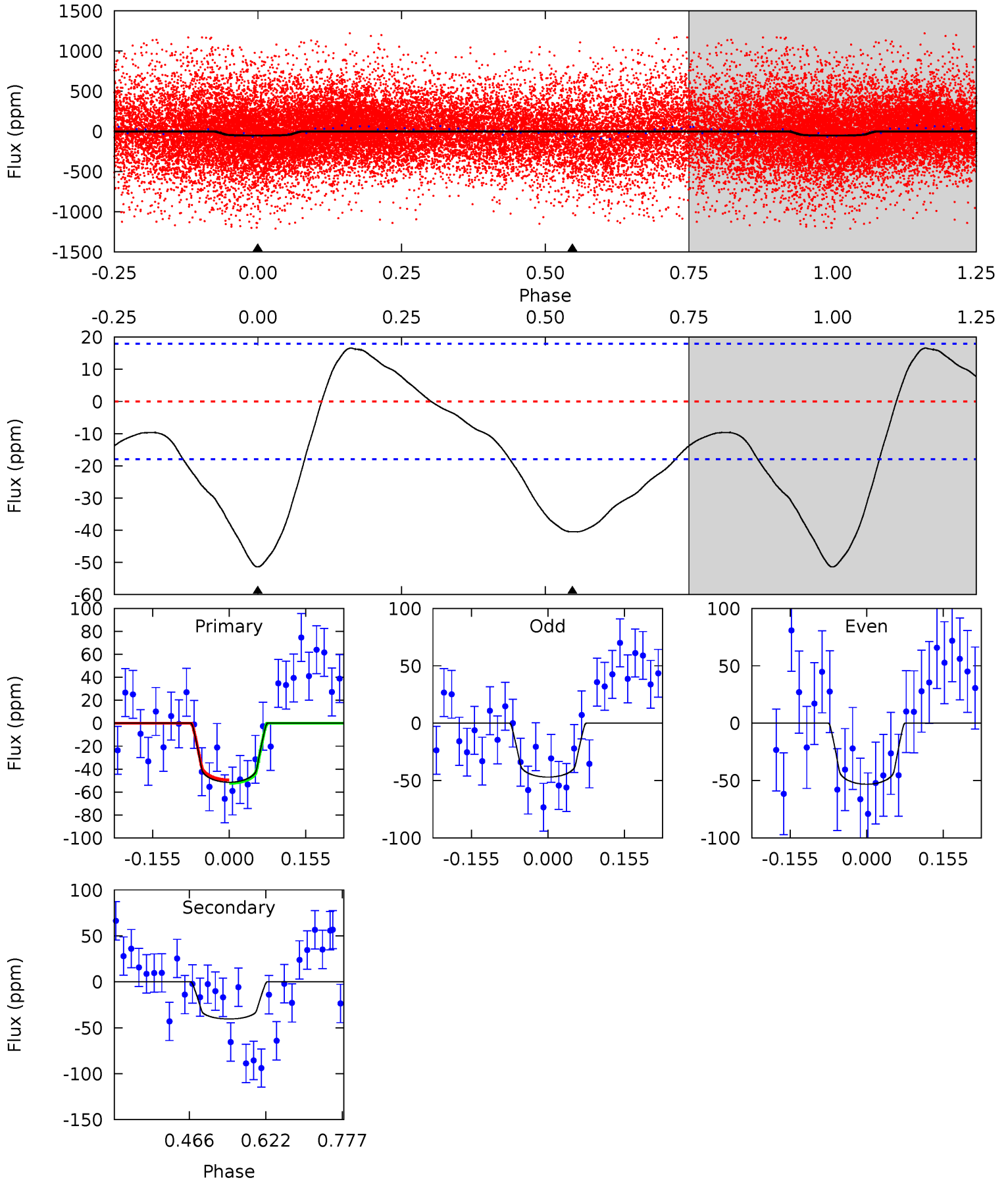
TCE 009343888-04 P= 0.988603 Days $T_0=132.234188$ (BKJD)



DV Model-Shift Uniqueness Test

009343888-04, P = 0.988522 Days, E = 131.297110 Days

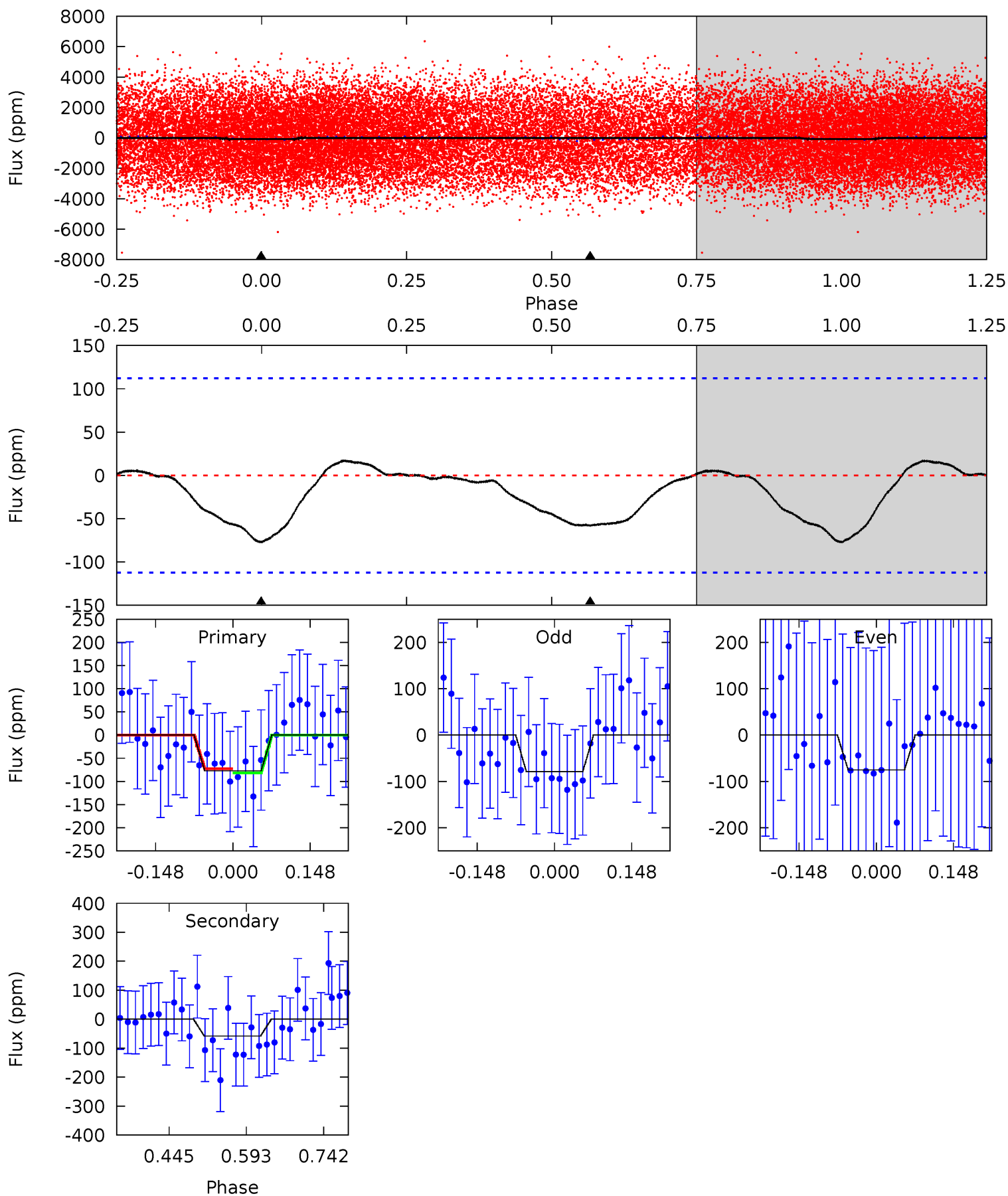
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	10.1	0	0	4.47	1.42	2.85	12.8	12.8	10.1	10.1	0.78	0.93	0.24	0.34



Alt Model-Shift Uniqueness Test

009343888-04, P = 0.988603 Days, E = 131.245585 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.08	2.32	0	0	4.48	1.45	0.27	3.08	3.08	2.32	2.32	0.08	0.89	0.18	0.18



Stellar Parameters For KIC 009343888

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7438^{+233}_{-311}	$3.867^{+0.400}_{-0.100}$	$-0.500^{+0.250}_{-0.300}$	$2.358^{+0.511}_{-0.949}$	$1.492^{+0.209}_{-0.313}$	$0.160^{+0.519}_{-0.063}$
	+3%/-4%	+10%/-3%	+50%/-60%	+22%/-40%	+14%/-21%	+323%/-39%
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 009343888-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-40 ± 4	$1.93^{+0.92}_{-0.77}$	4600^{+315}_{-526}	6247^{+2041}_{-1112}	$2.971^{+4.644}_{-1.586}$
Alt.	-58 ± 25	$2.06^{+0.90}_{-0.80}$	4559^{+364}_{-464}	6560^{+2375}_{-1359}	$3.502^{+5.850}_{-2.001}$

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 $A_{obs} \gg 1.0$

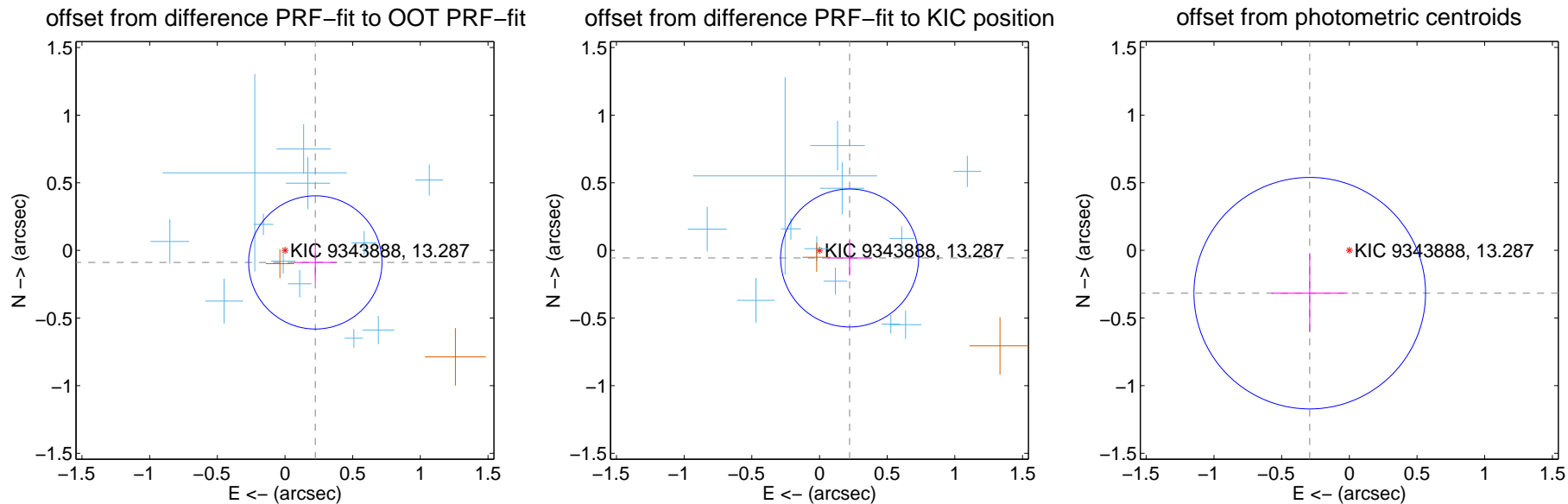
DV Centroid Data

Supplemental centroid analysis for 009343888-04. Kepler magnitude: 13.29. Transit SNR 11.79

There are 12 quarters with good PRF difference image offsets

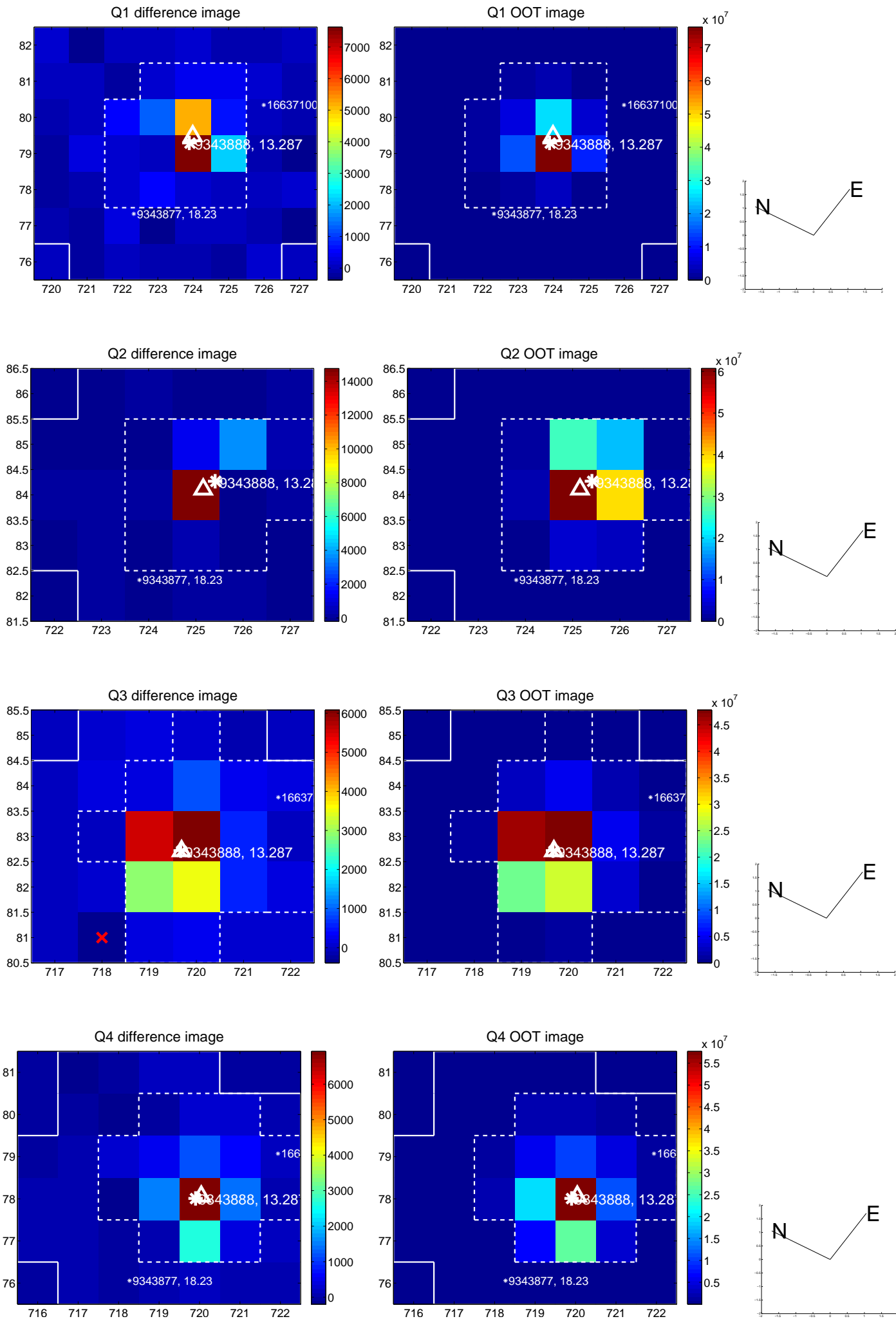
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.241 ± 0.164	1.47	-0.224 ± 0.157	-0.089 ± 0.139
PRF-fit source offset from KIC position	0.230 ± 0.170	1.35	-0.223 ± 0.164	-0.056 ± 0.130
photometric centroid source offset	0.43 ± 0.29	1.51	0.29 ± 0.28	-0.32 ± 0.29

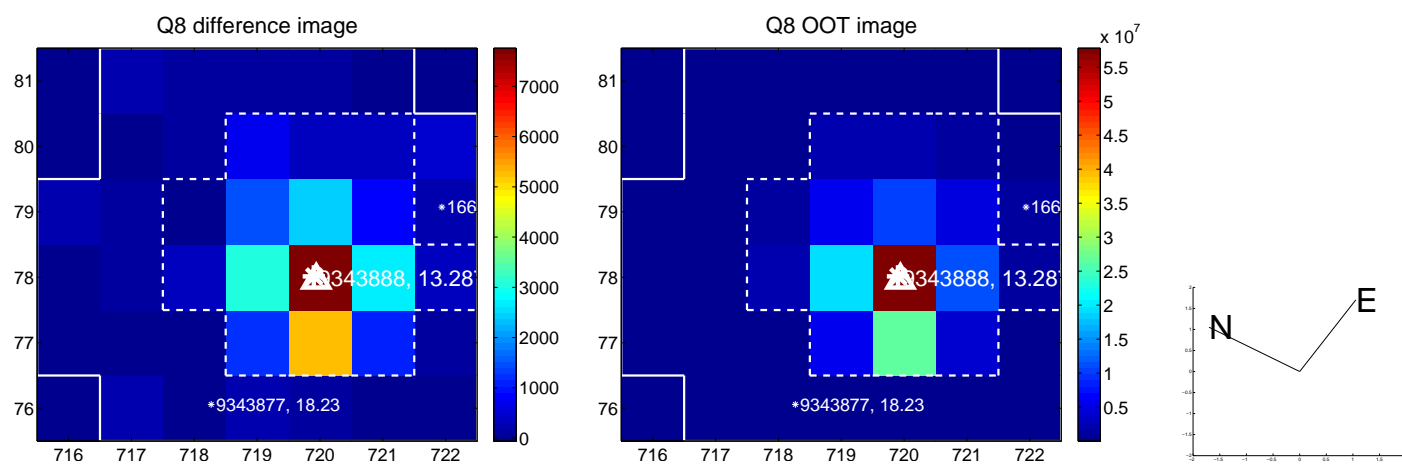
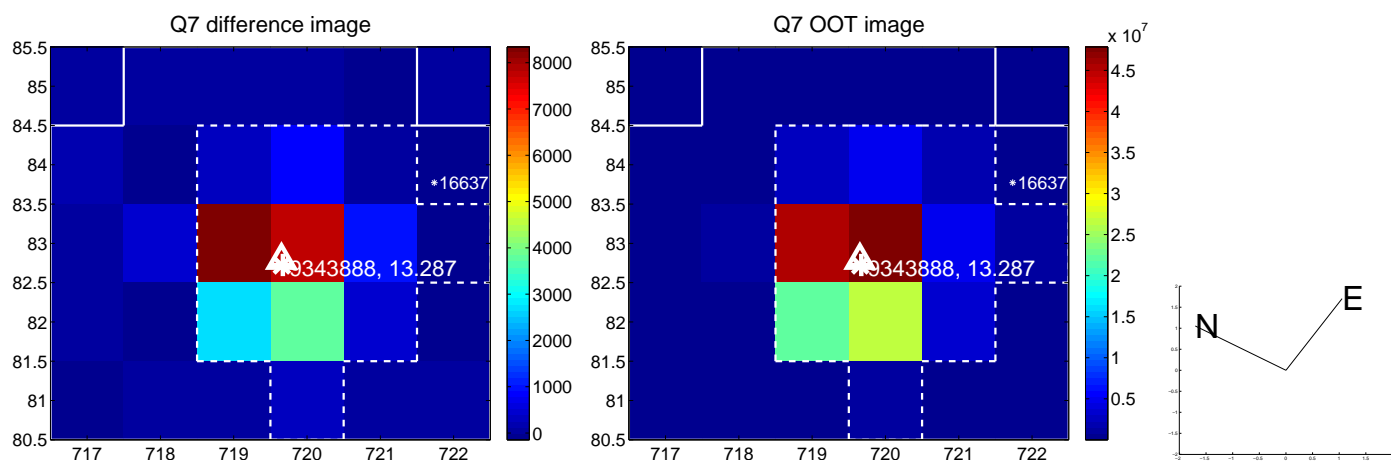
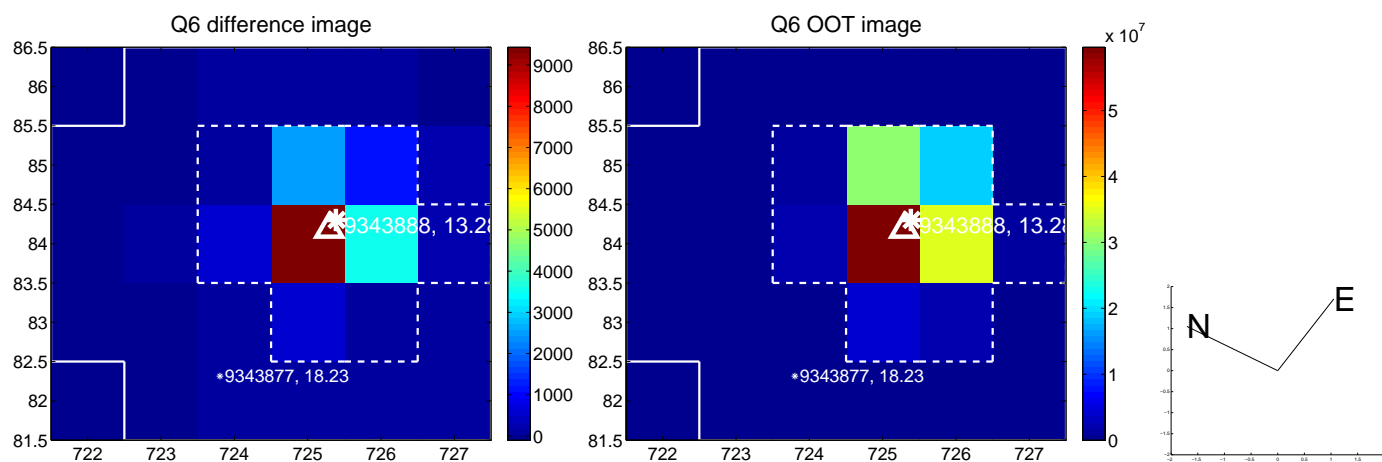
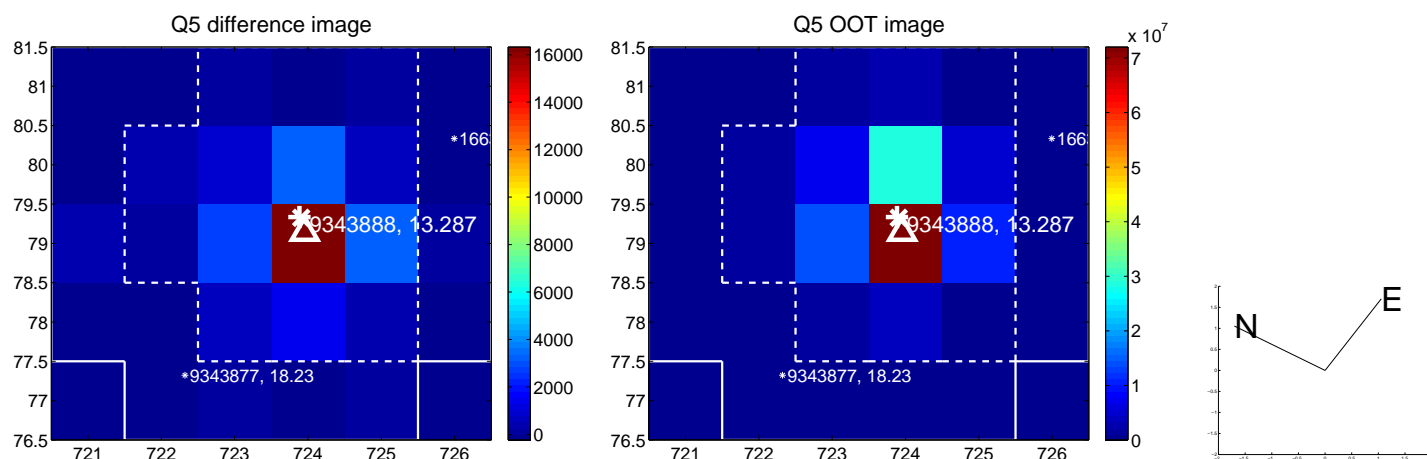


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

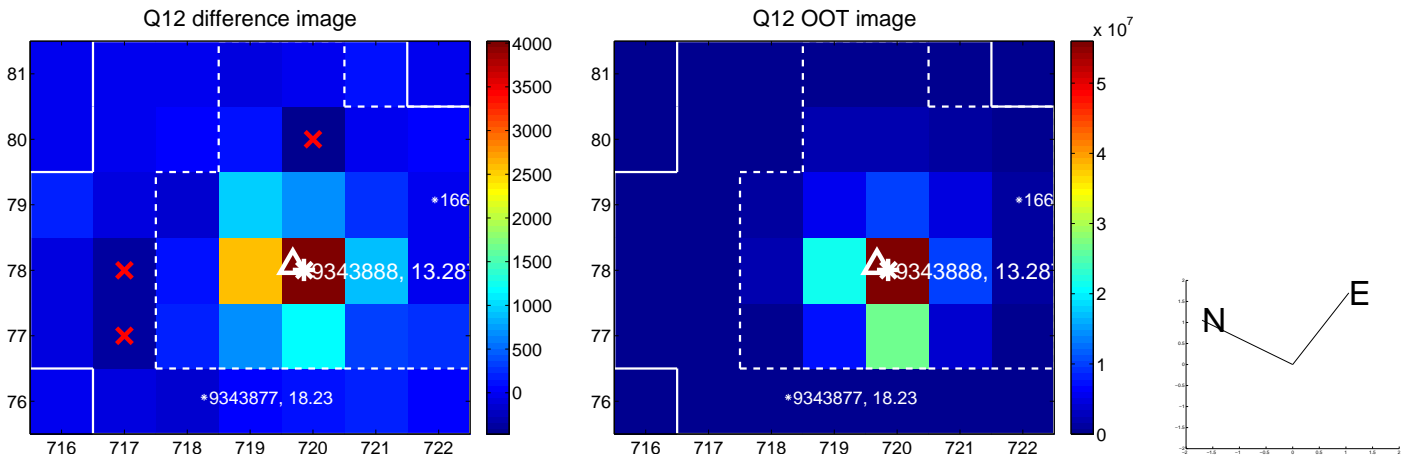
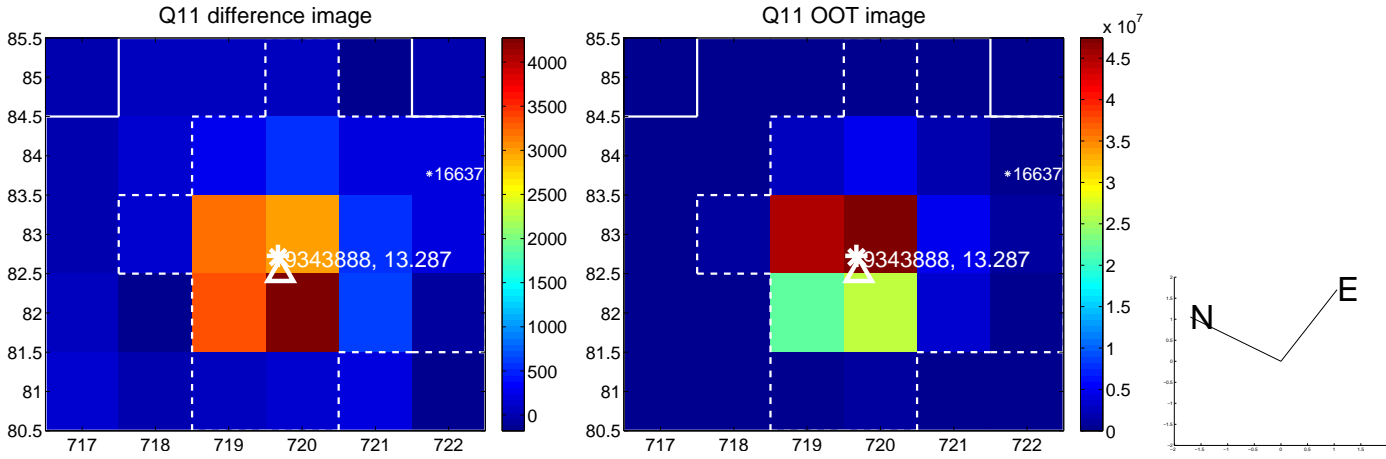
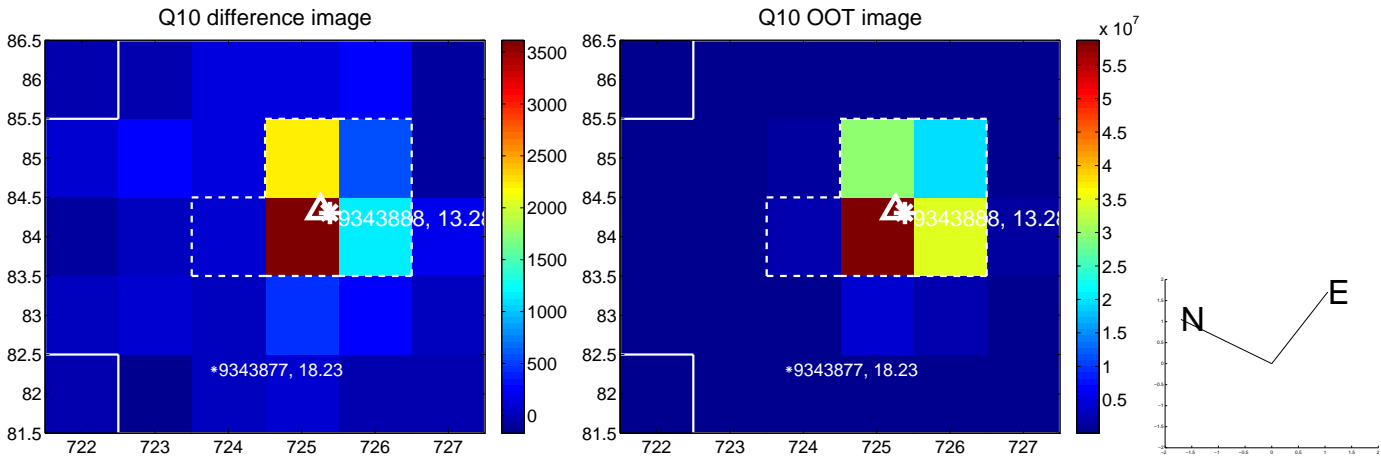
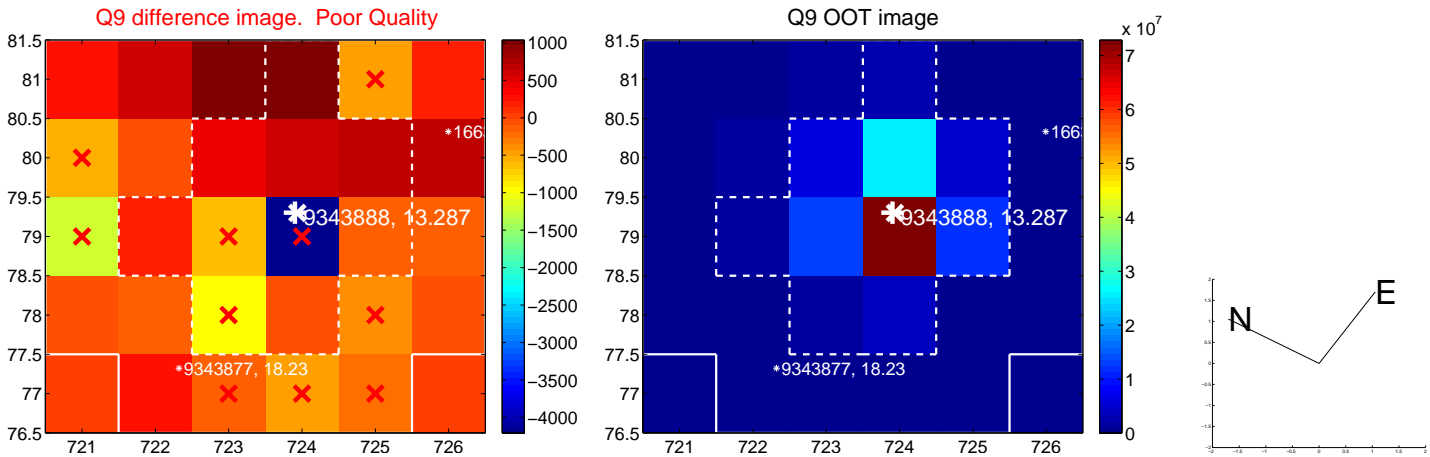
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



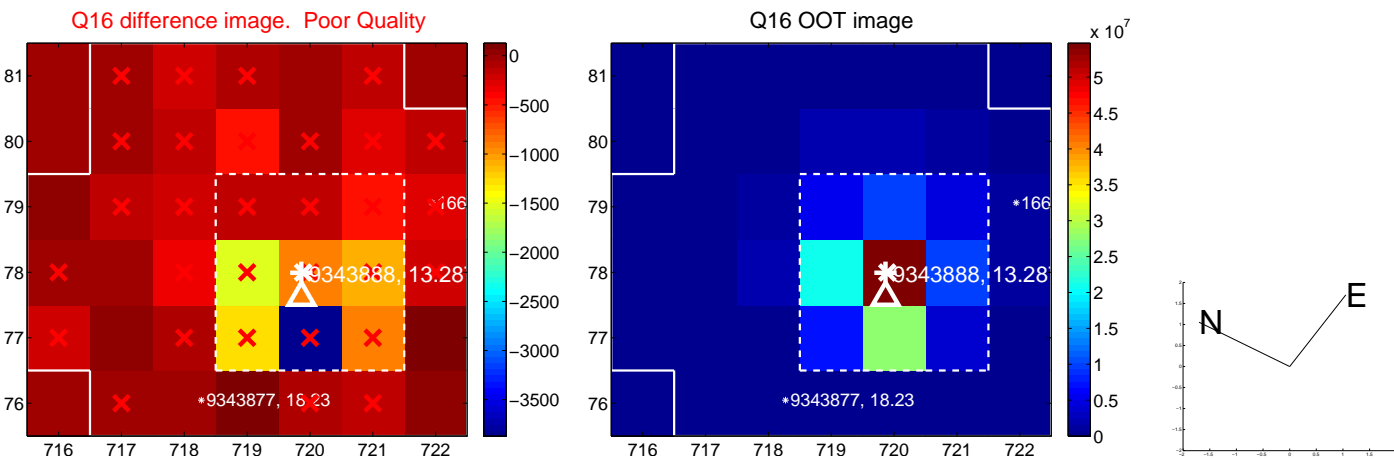
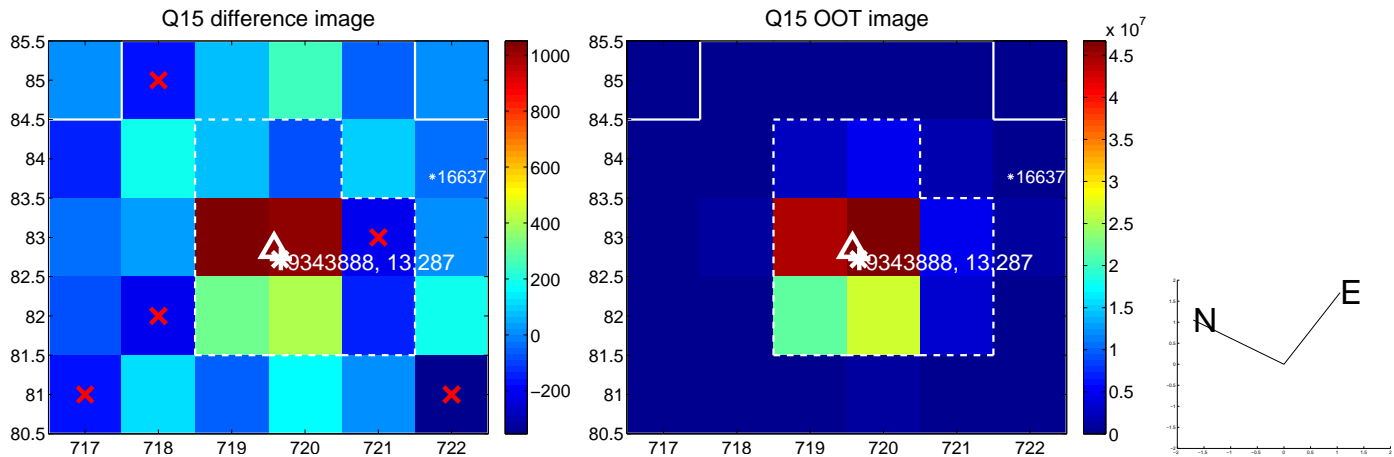
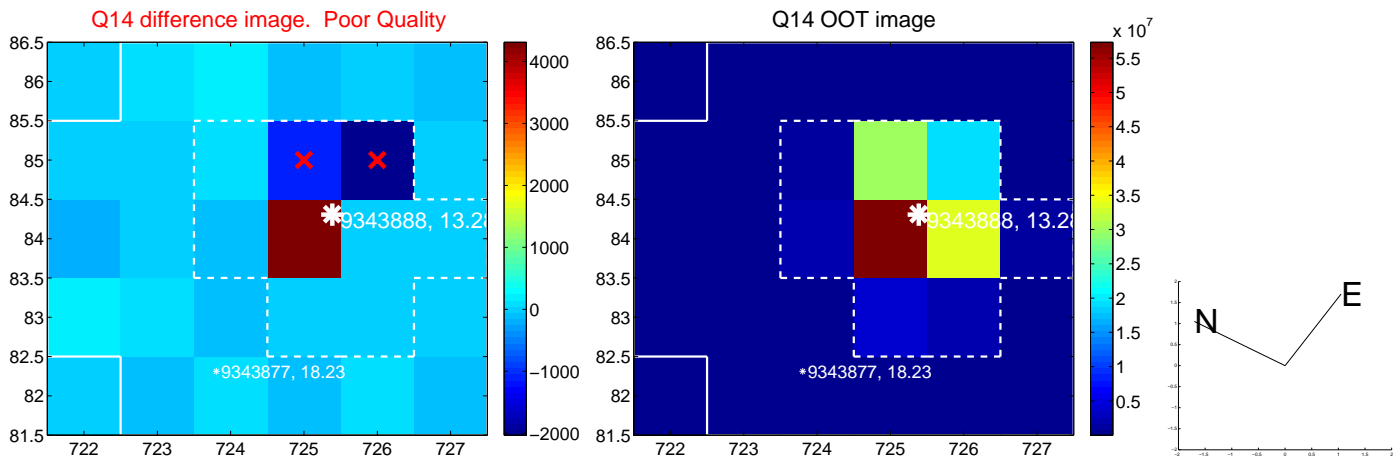
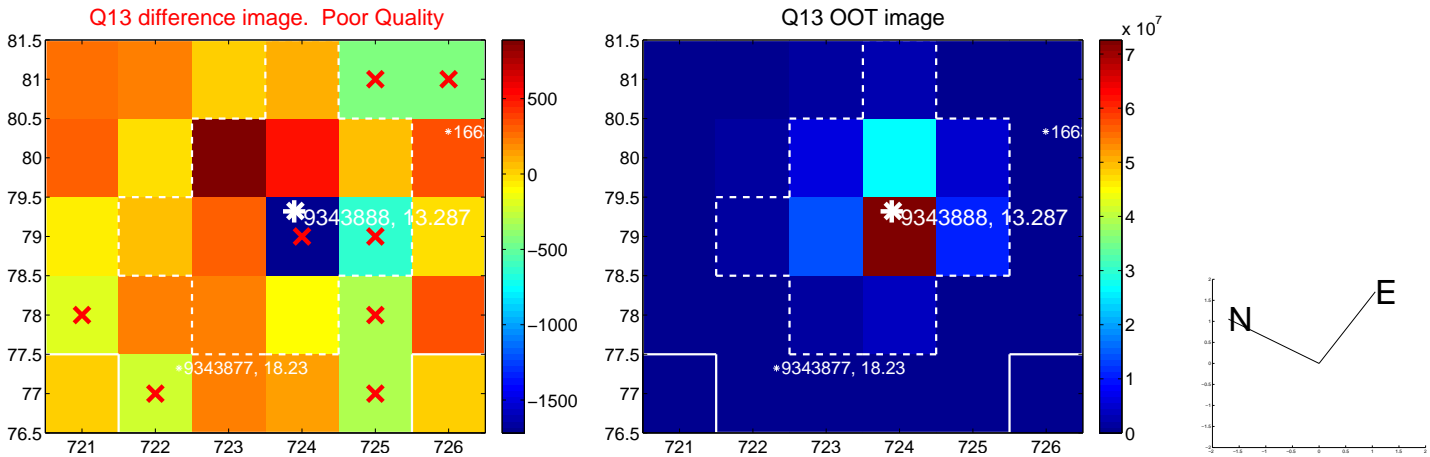
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



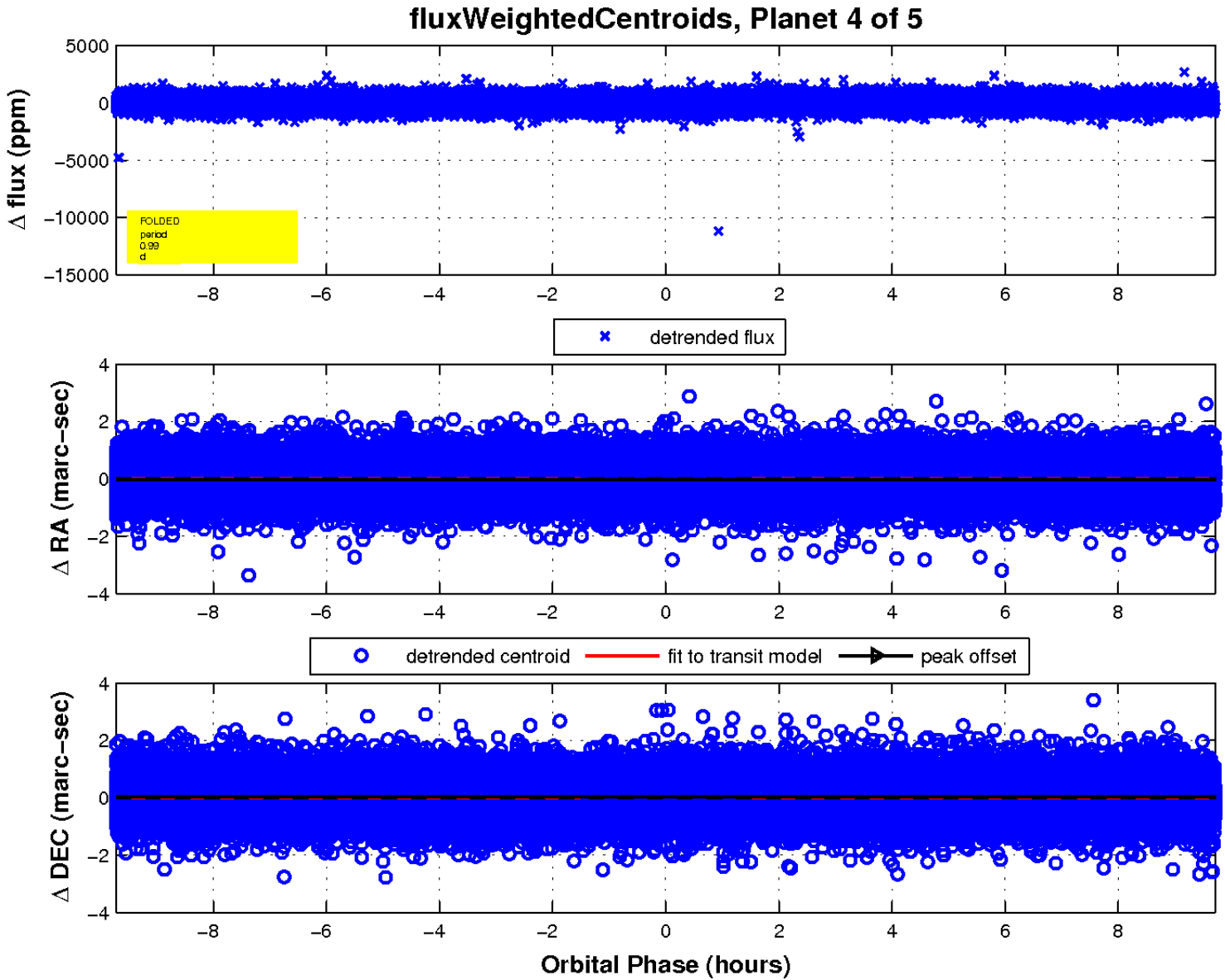
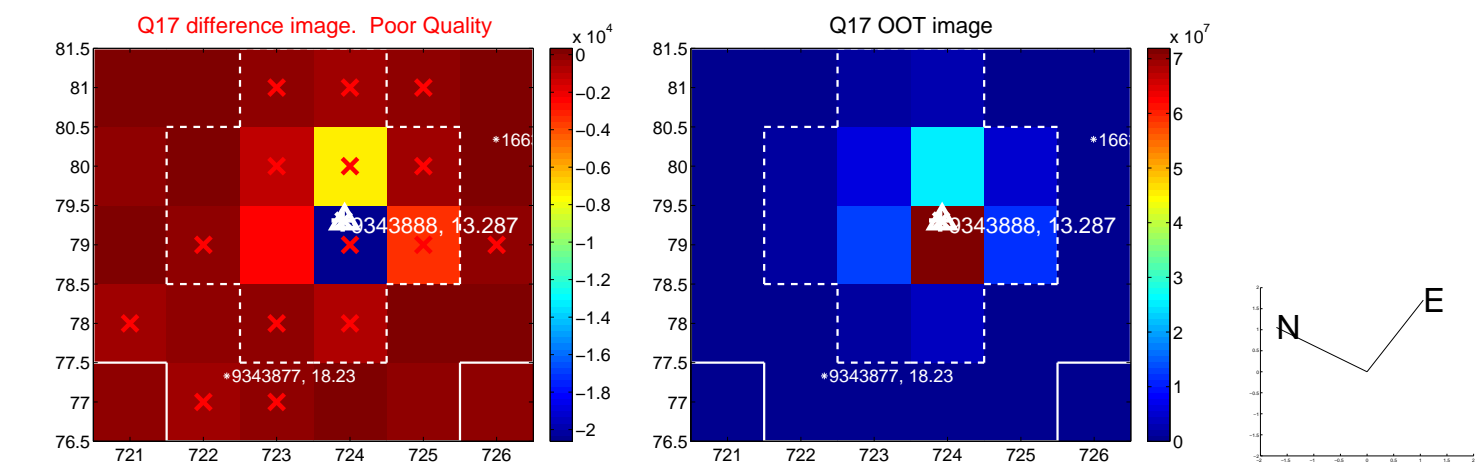
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

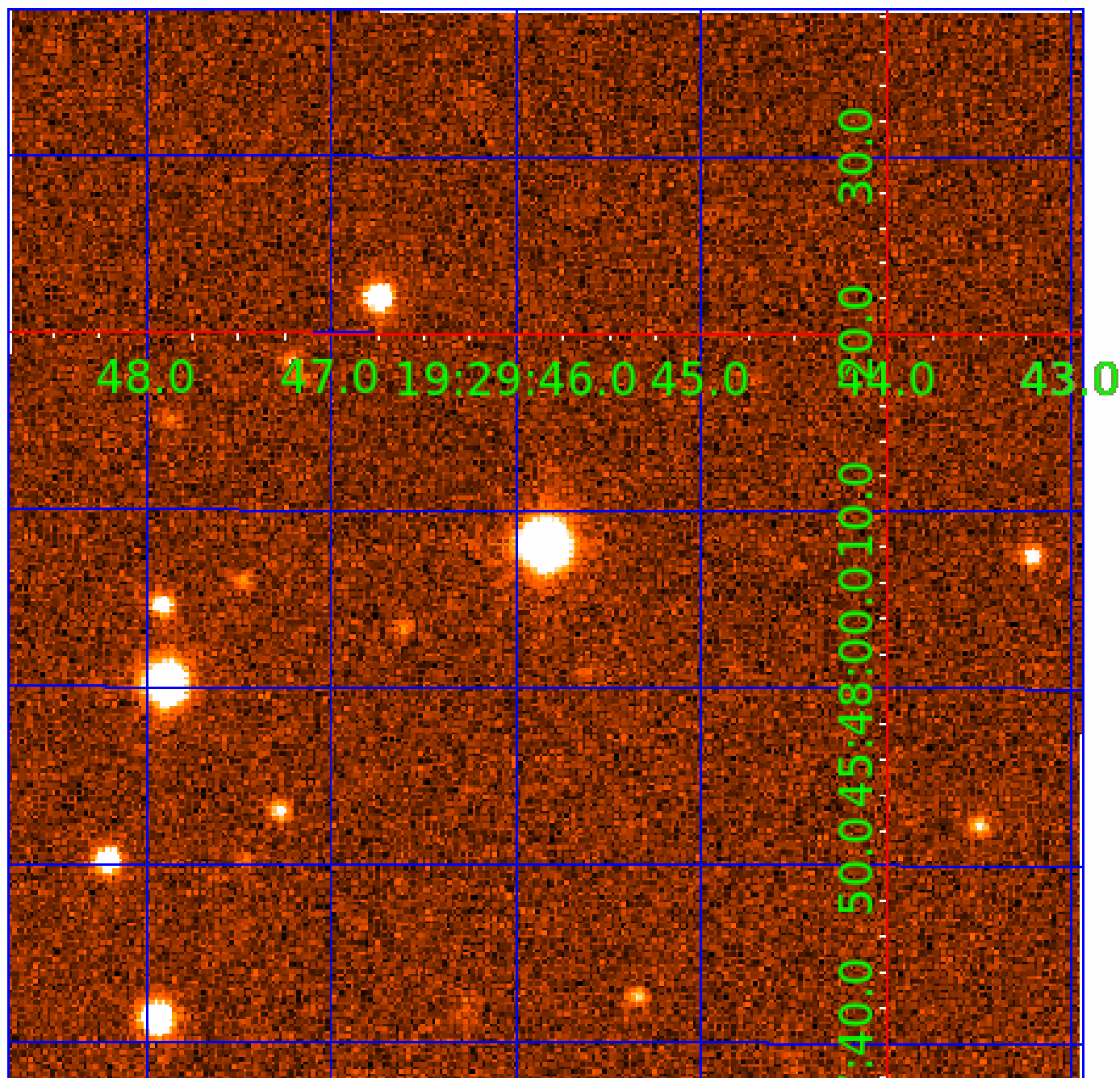


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009343888

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})
009343888-01	OBS	No	1.976853	131.918629	52.0	4.922	8.2	10.5	2.36	7438	2.04	12277.67
009343888-02	OBS	No	0.991079	131.970114	90.3	1.785	14.7	15.2	2.36	7438	2.60	30827.42
009343888-03	OBS	No	0.991102	131.786791	96.0	1.858	12.8	16.0	2.36	7438	2.48	30826.45
009343888-04	OBS	No	0.988522	132.285632	60.0	3.241	9.3	11.8	2.36	7438	2.11	30933.79
009343888-05	OBS	No	1.977145	132.832364	270.0	3.500	8.8	-1.0	2.36	7438	3.93	12275.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009343888-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009343888-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
009343888-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD
009343888-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD
009343888-05	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS

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.

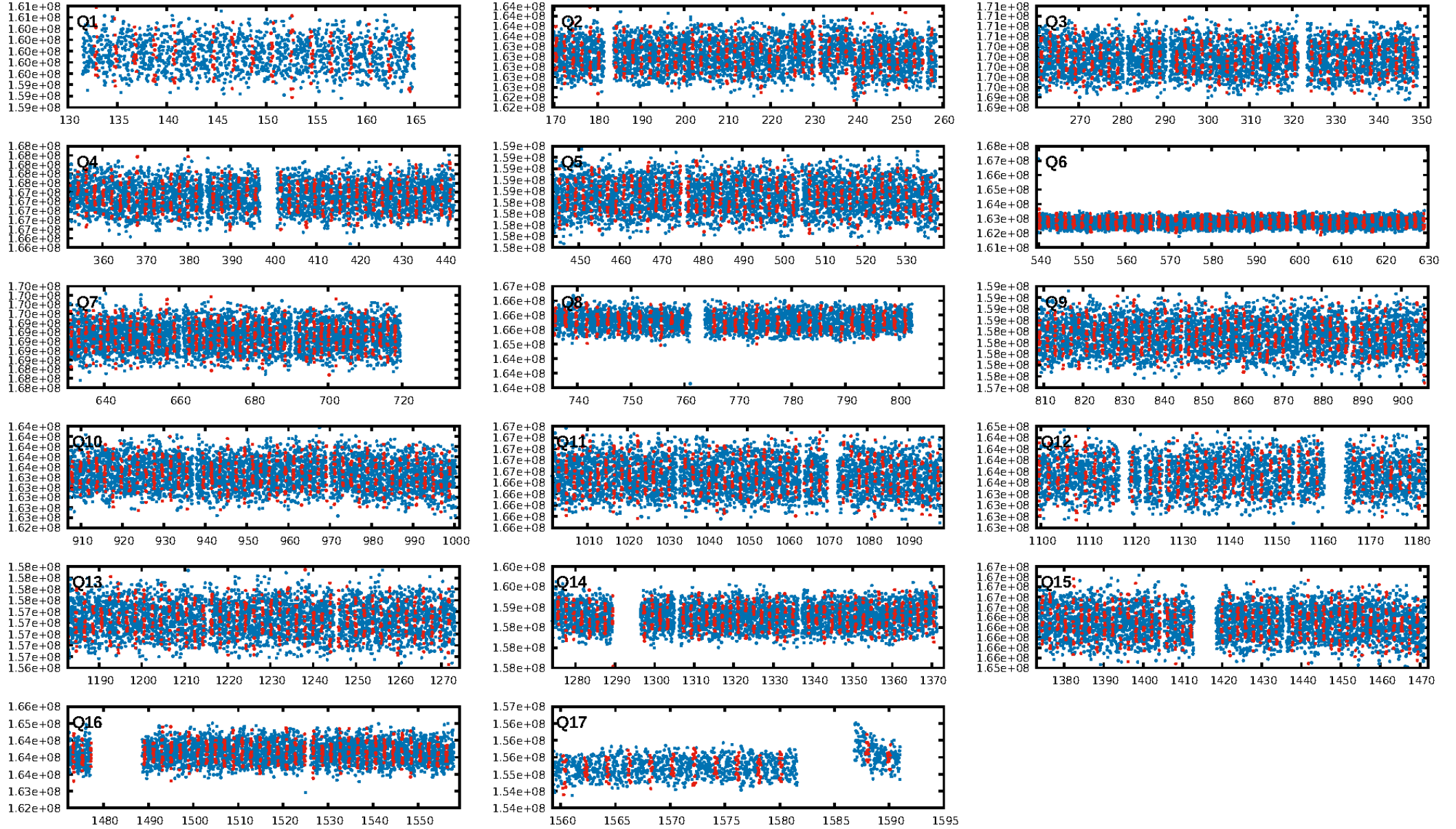
Ephemeris Match Information For 009343888-05

No Significant Match Found

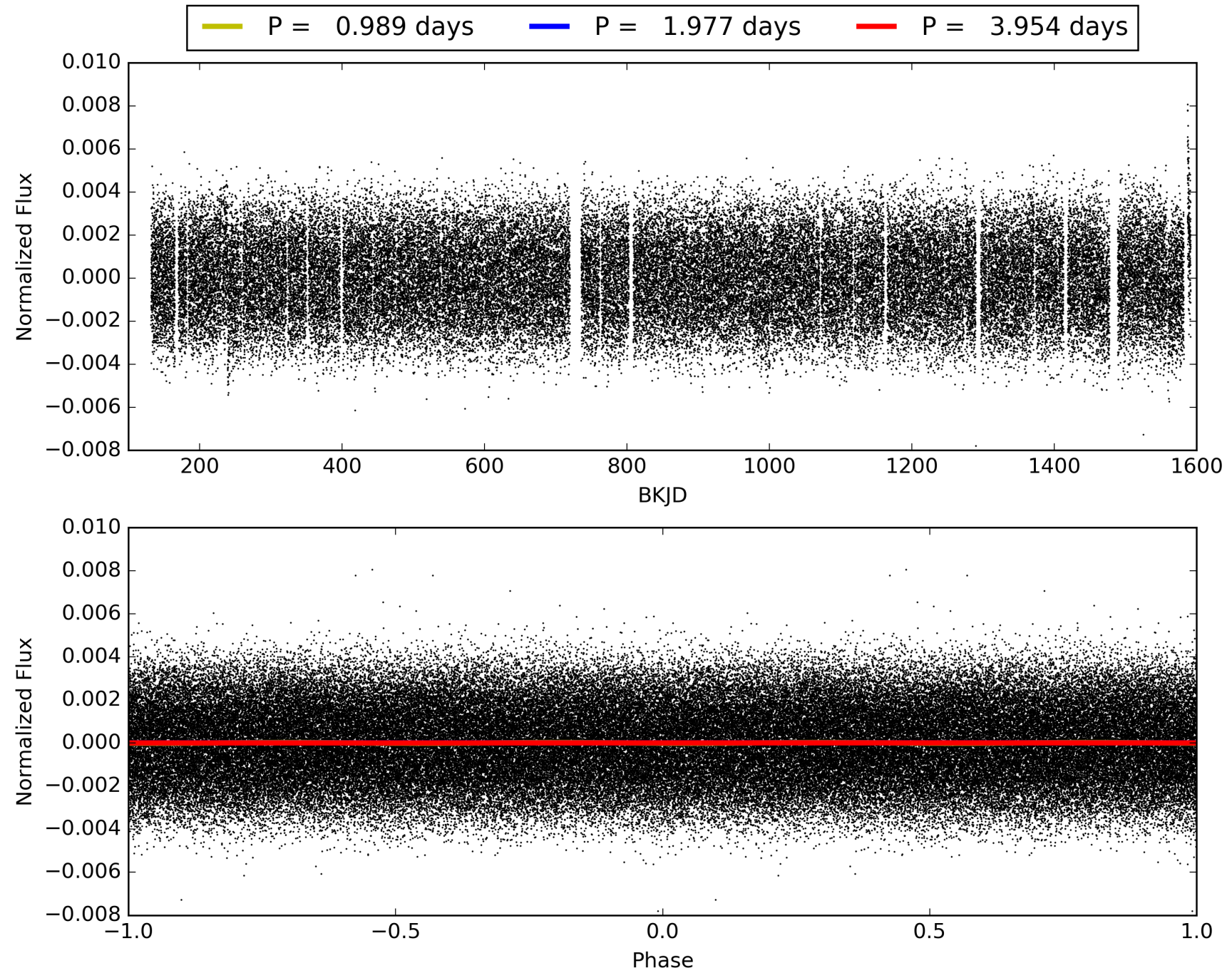
KIC: 9343888 Candidate: 5 of 5 Period: 1.977 d



TCE 009343888-05, PDC Light Curves

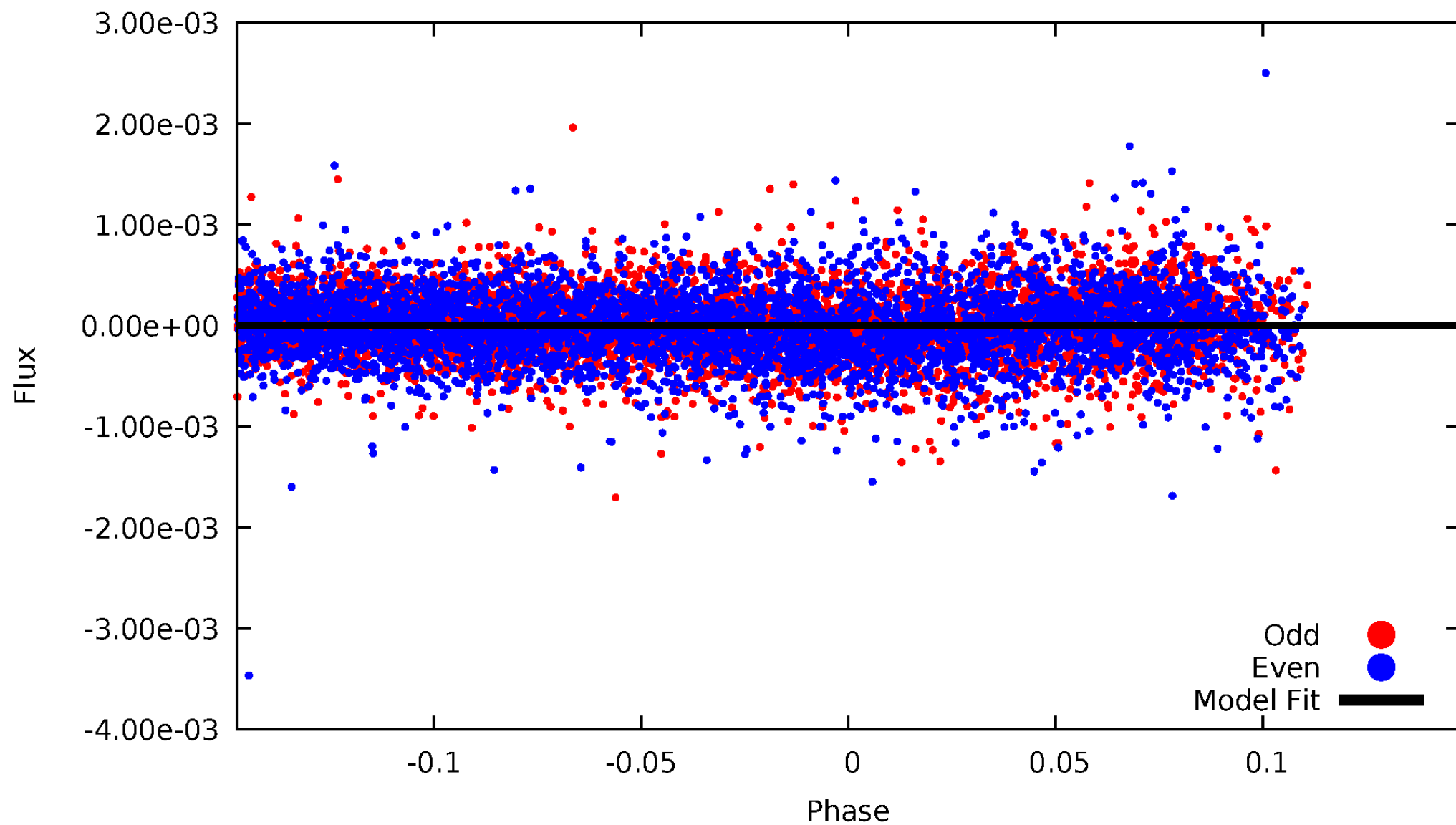


TCE 009343888-05



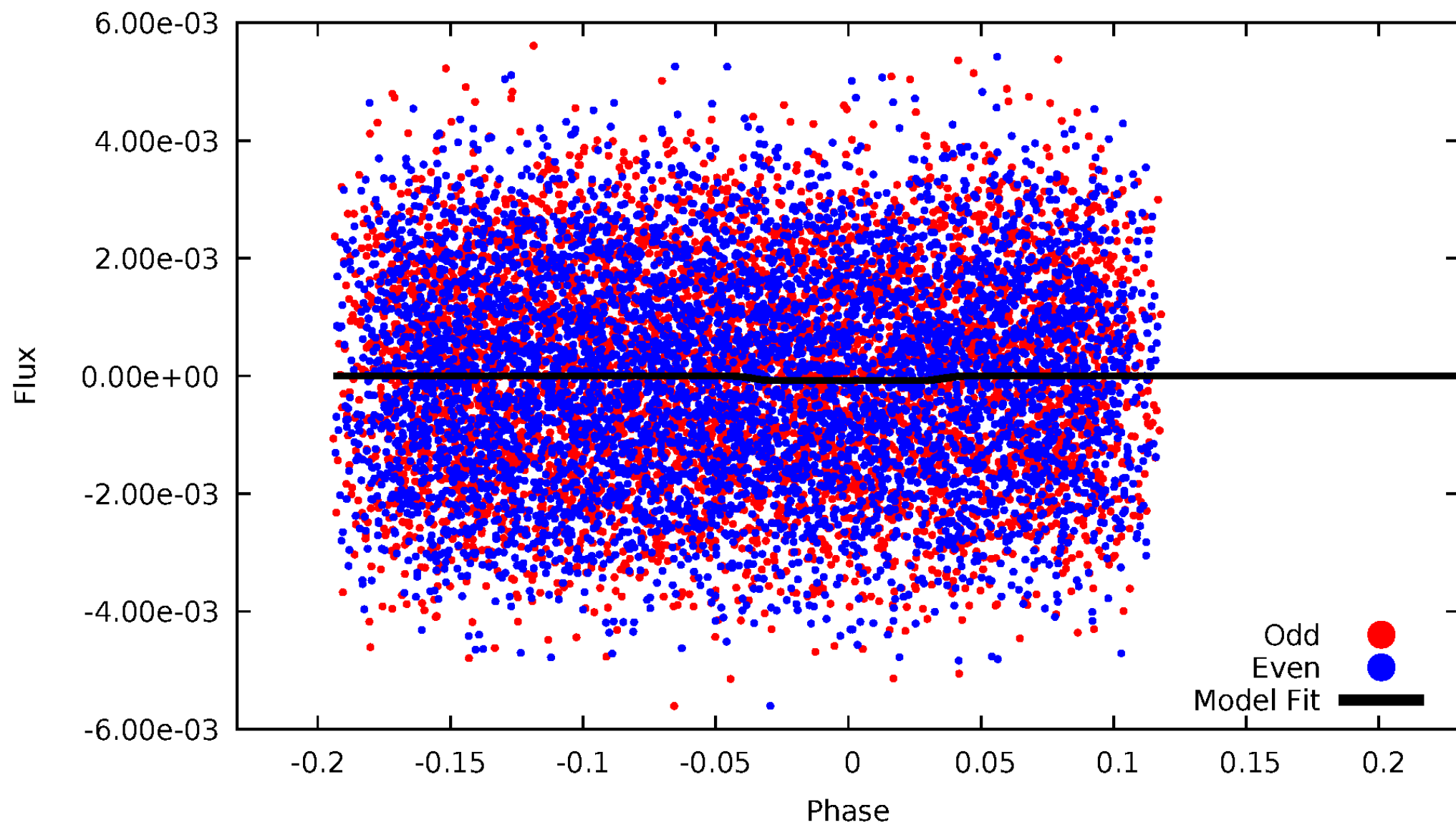
DV Odd/Even

TCE 009343888-05

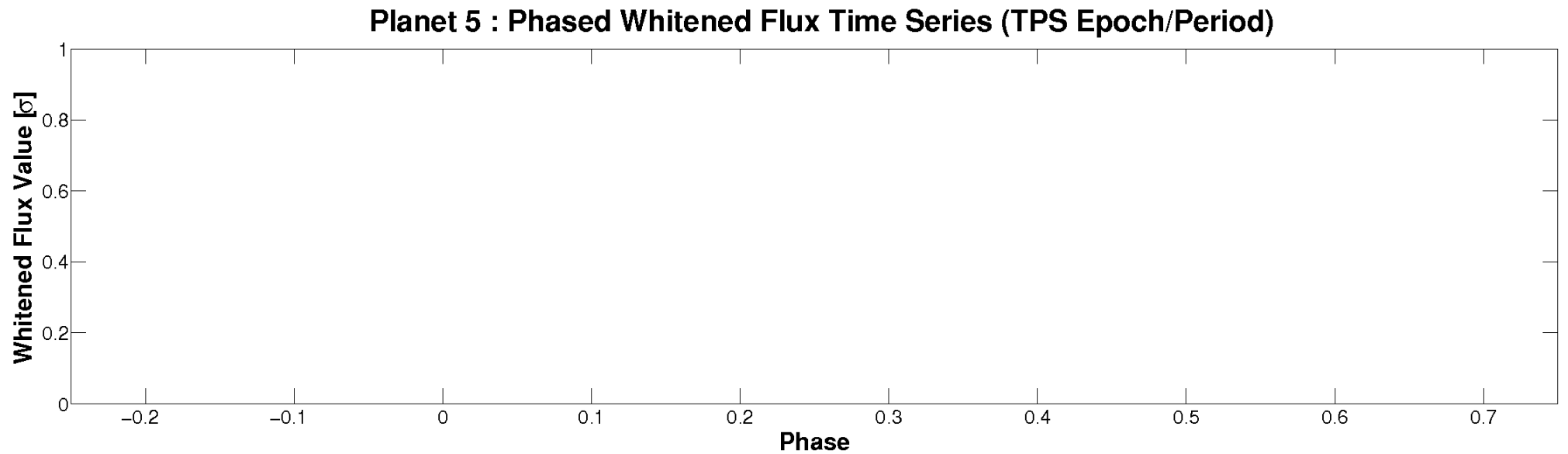
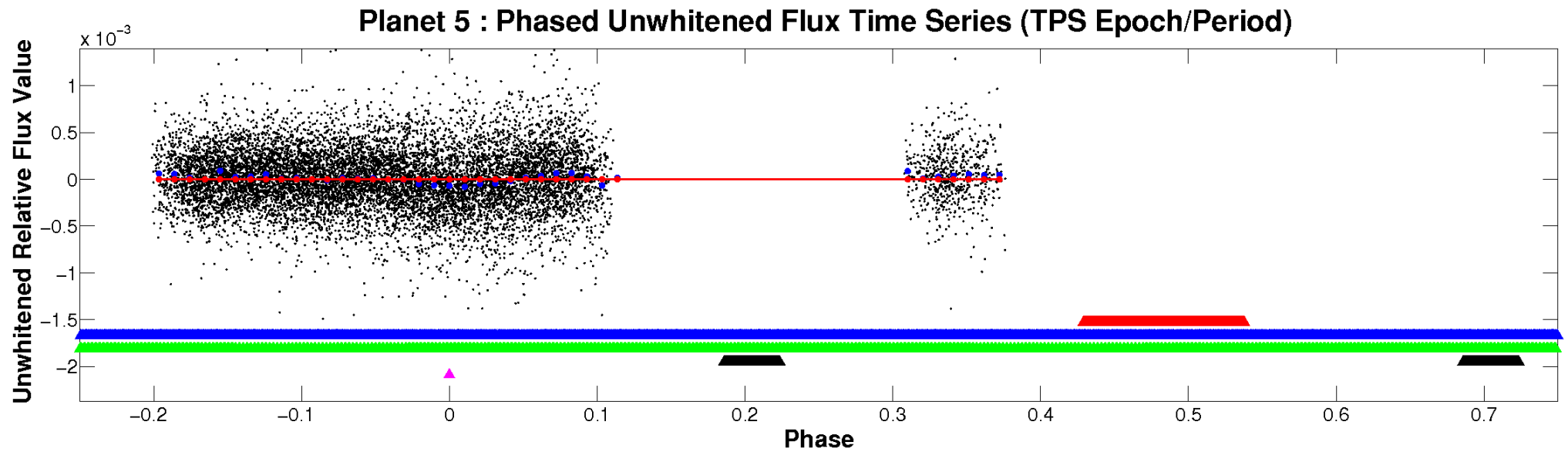


ALT Odd/Even

TCE 009343888-05

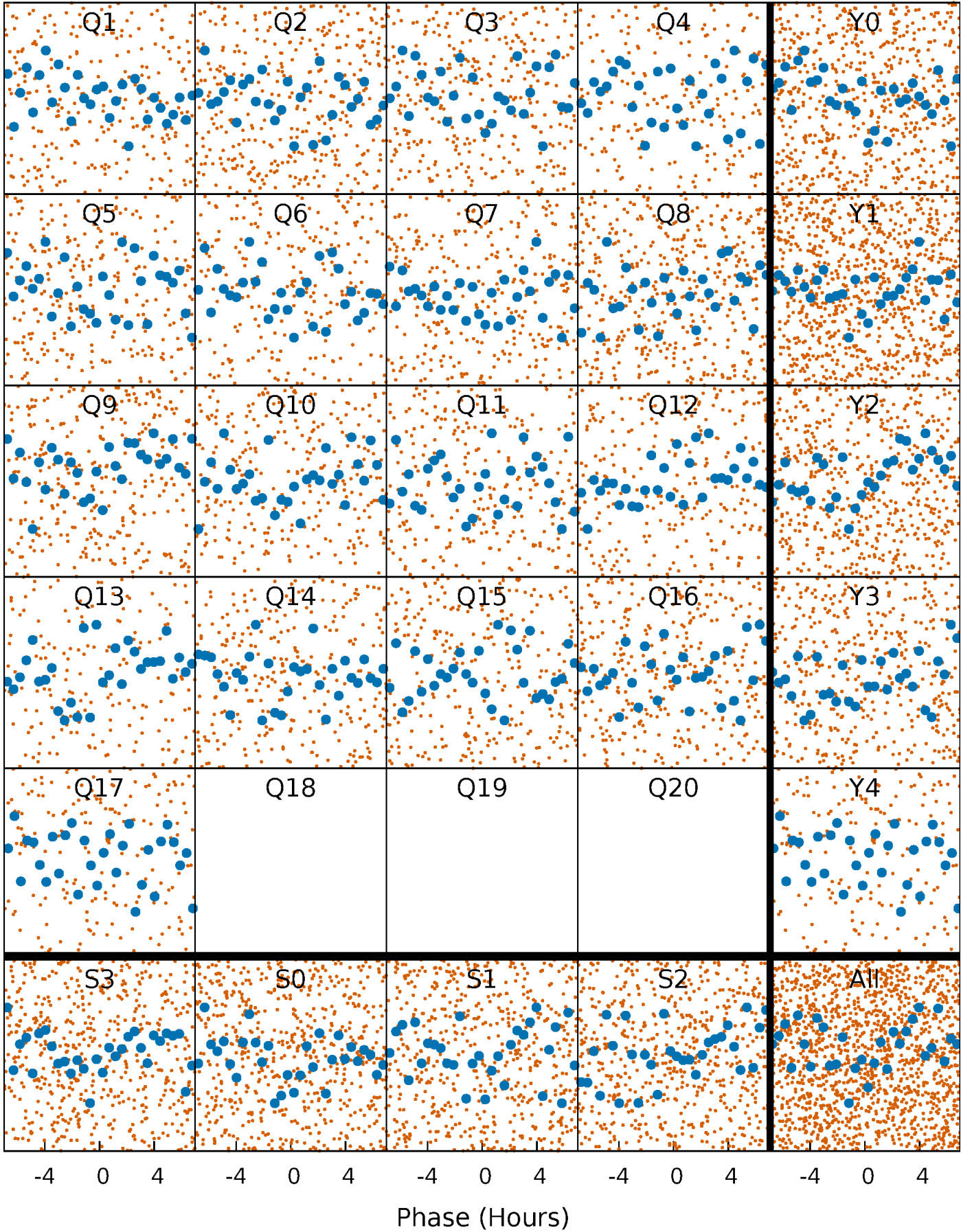


Non-Whitened Vs. Whitened Light Curve



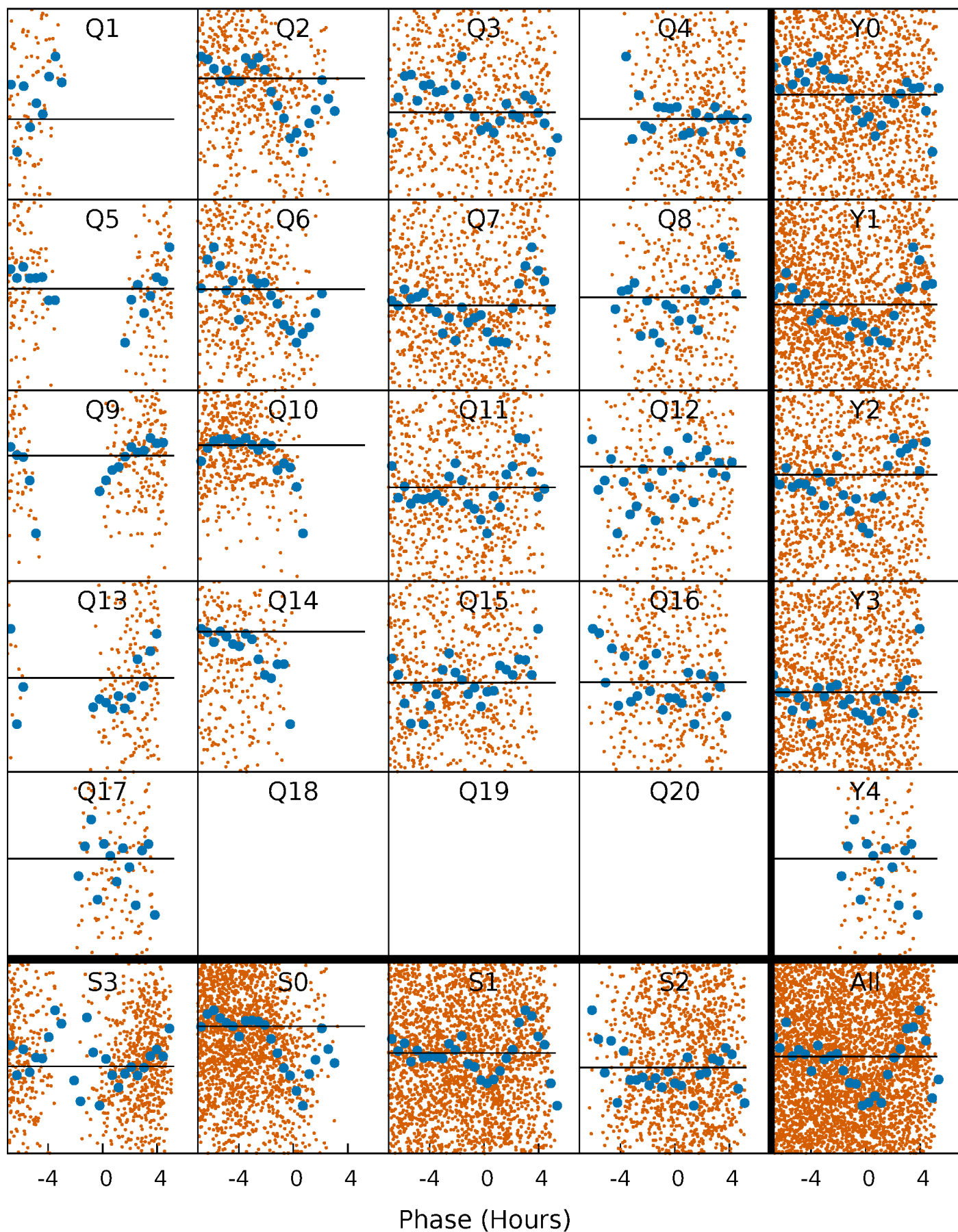
PDC Quarter-Phased Transit Curves

TCE 009343888-05 $P = 1.977145$ Days $T_0 = 132.832364$ (BKJD)



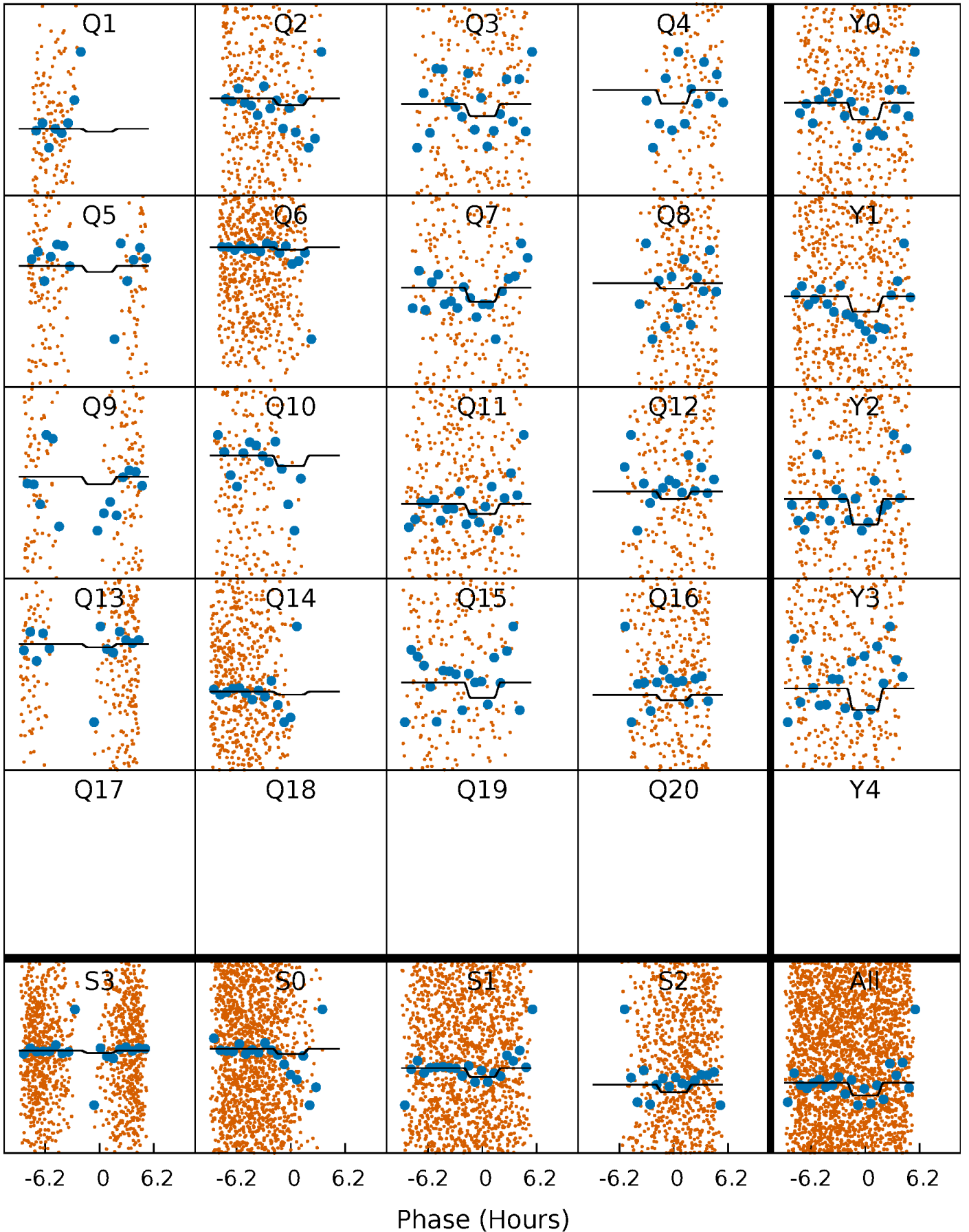
DV Quarter-Phased Transit Curves

TCE 009343888-05 $P = 1.977145$ Days $T_0 = 132.832364$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

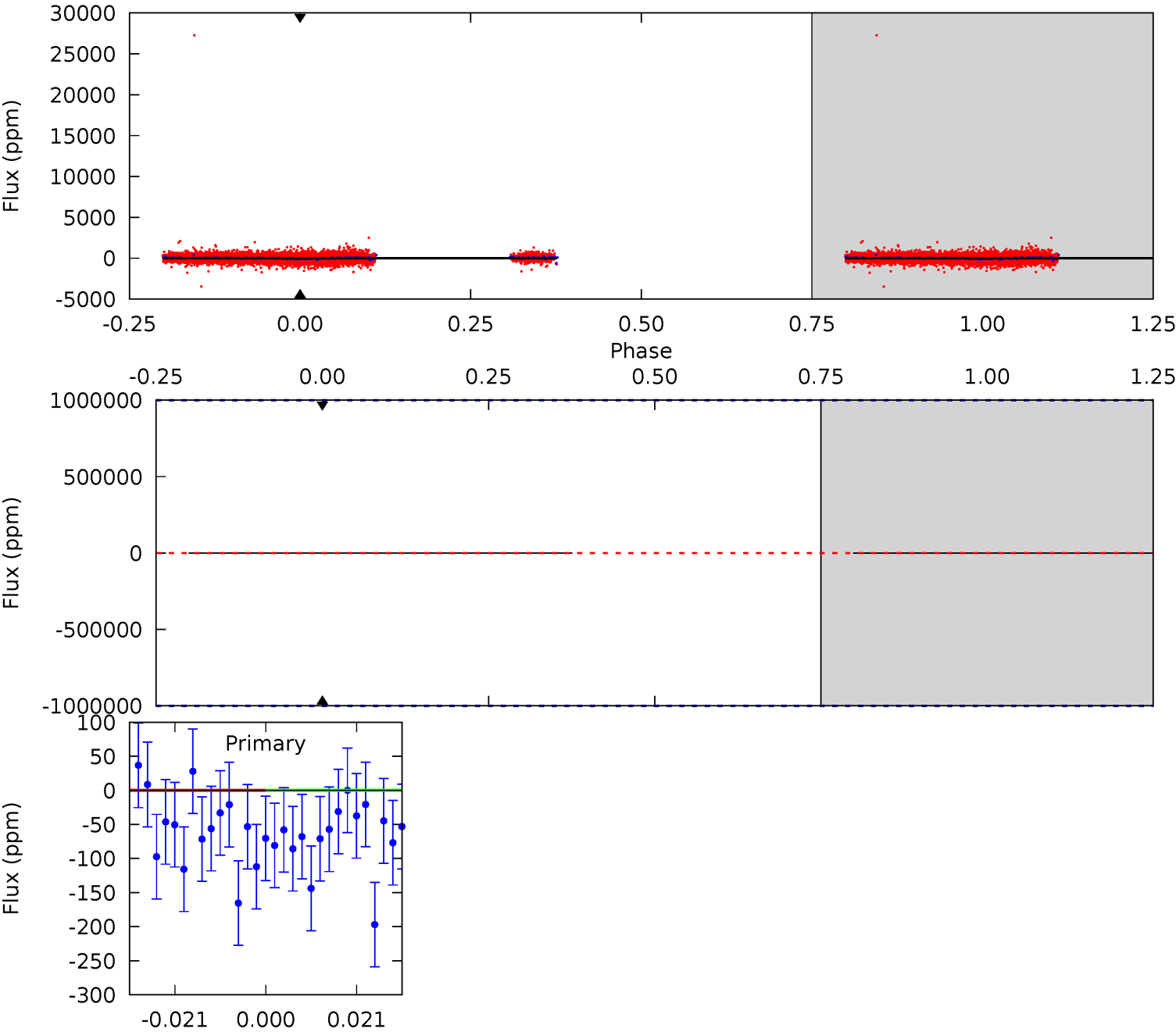
TCE 009343888-05 P= 1.977145 Days $T_0=132.818399$ (BKJD)



DV Model-Shift Uniqueness Test

009343888-05, P = 1.977145 Days, E = 130.855219 Days

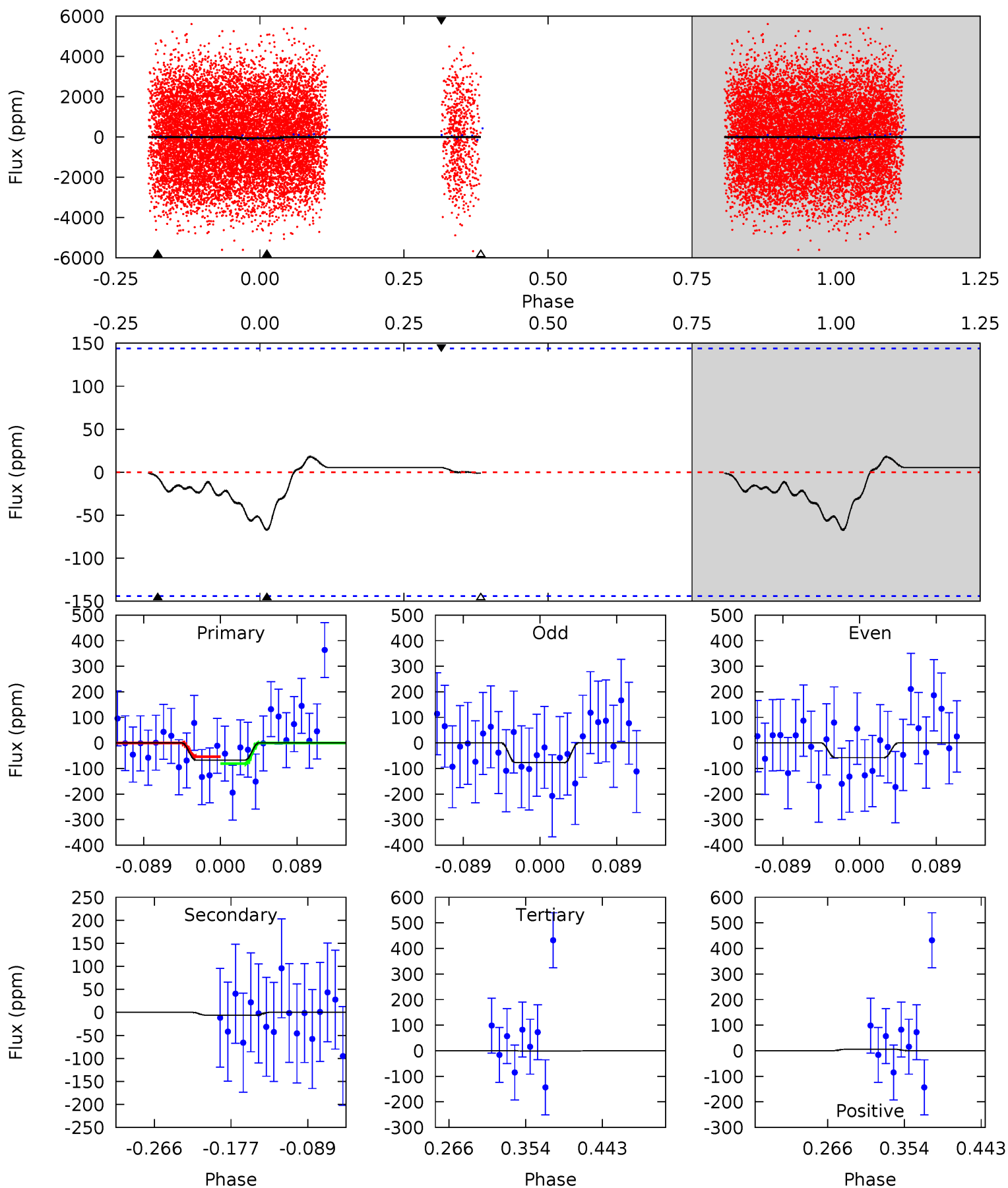
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009343888-05, P = 1.977145 Days, E = 130.841254 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.14	0.20	0.04	0.17	4.59	1.70	0.35	2.10	1.97	0.17	0.03	0.31	1.66	0.21	0.43



Stellar Parameters For KIC 009343888

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7438^{+233}_{-311}	$3.867^{+0.400}_{-0.100}$	$-0.500^{+0.250}_{-0.300}$	$2.358^{+0.511}_{-0.949}$	$1.492^{+0.209}_{-0.313}$	$0.160^{+0.519}_{-0.063}$
	+3%/-4%	+10%/-3%	+50%/-60%	+22%/-40%	+14%/-21%	+323%/-39%
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 009343888-05 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$17.51^{+18.89}_{-12.09}$	3629^{+263}_{-382}	5619^{+37045}_{-41403}	$4.019^{+487.476}_{-366.323}$
Alt.	-6 ± 31	$16.15^{+18.22}_{-11.96}$	3625^{+288}_{-395}	-3392^{+856}_{-284}	$0.010^{+0.250}_{-0.087}$

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 $A_{obs} \gg 1.0$

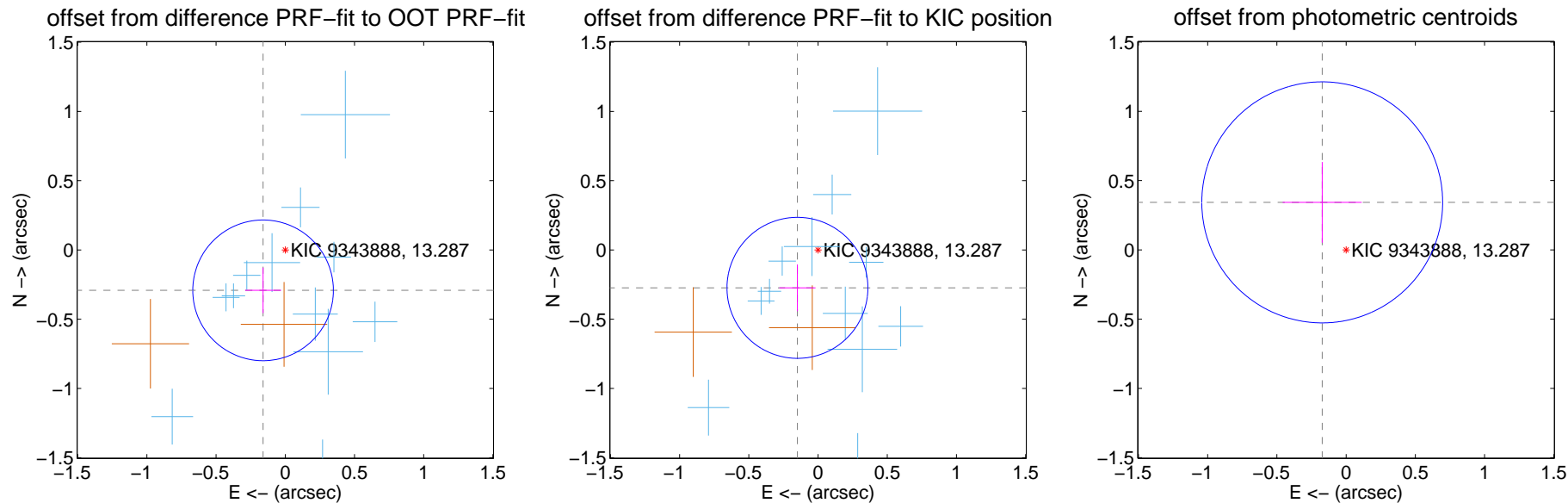
DV Centroid Data

Supplemental centroid analysis for 009343888-05. Kepler magnitude: 13.29. Transit SNR -1.00

There are 12 quarters with good PRF difference image offsets

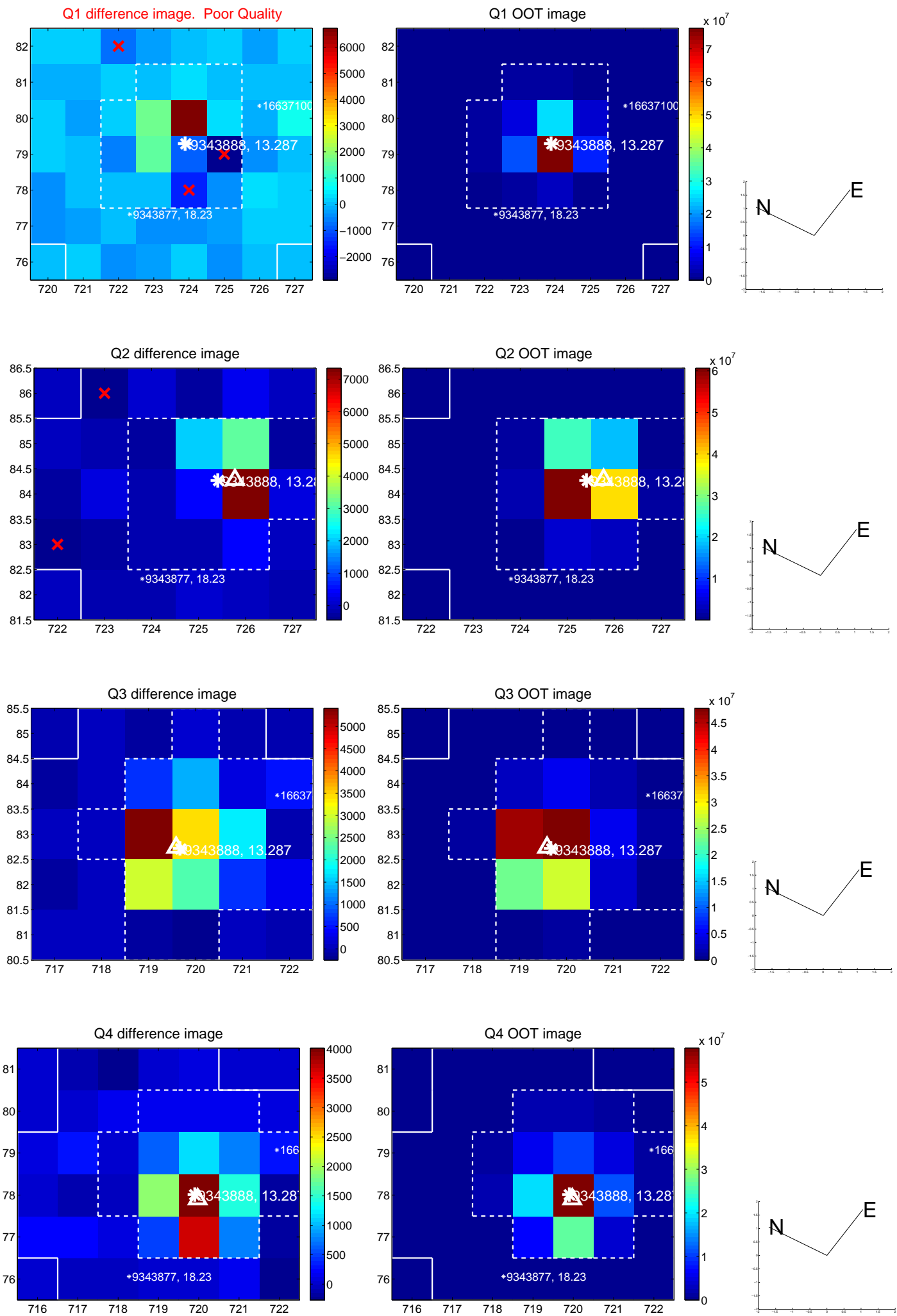
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.333 ± 0.169	1.97	0.160 ± 0.129	-0.292 ± 0.164
PRF-fit source offset from KIC position	0.312 ± 0.170	1.84	0.149 ± 0.131	-0.274 ± 0.169
photometric centroid source offset	0.38 ± 0.29	1.32	0.17 ± 0.29	0.34 ± 0.29

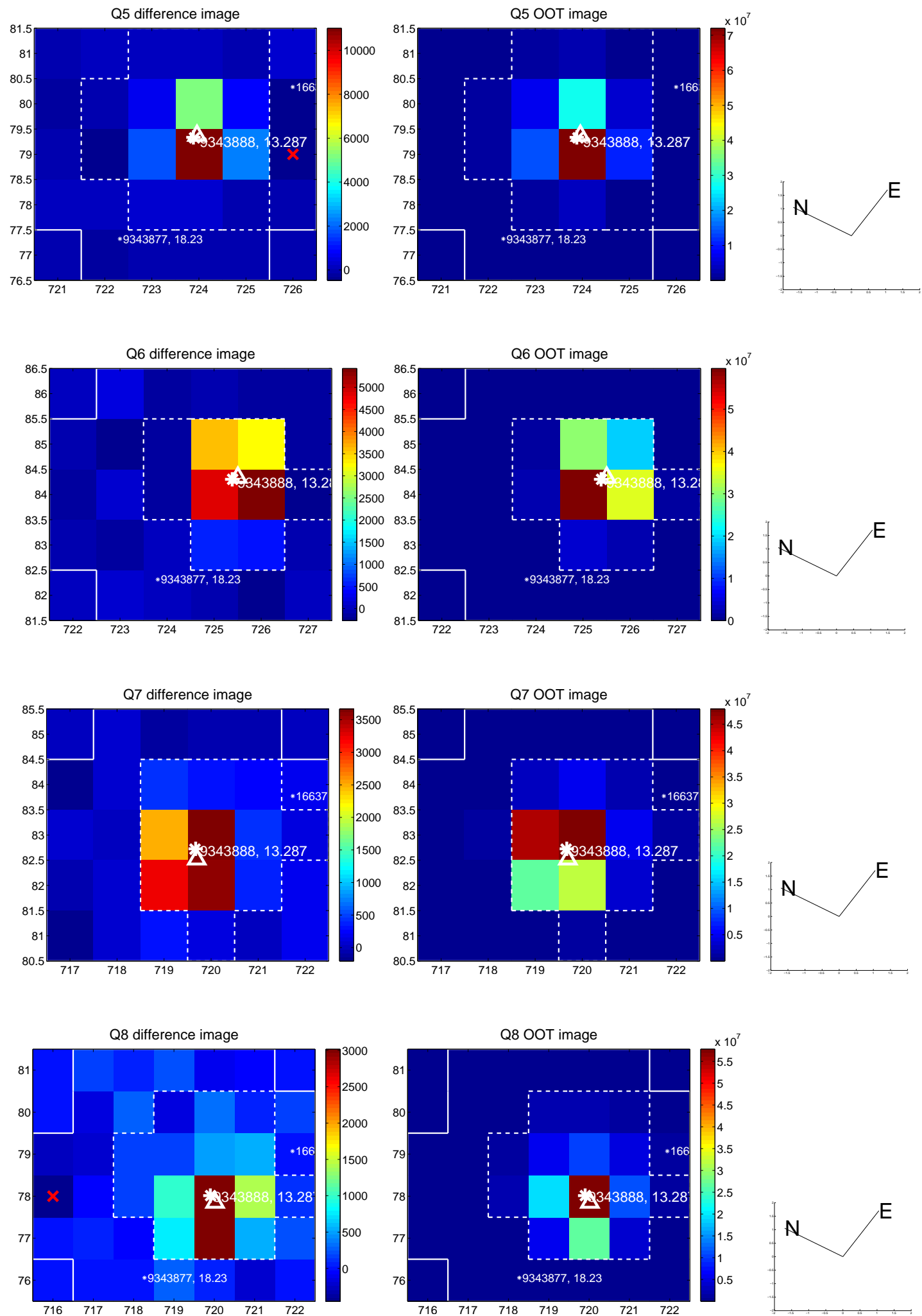


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

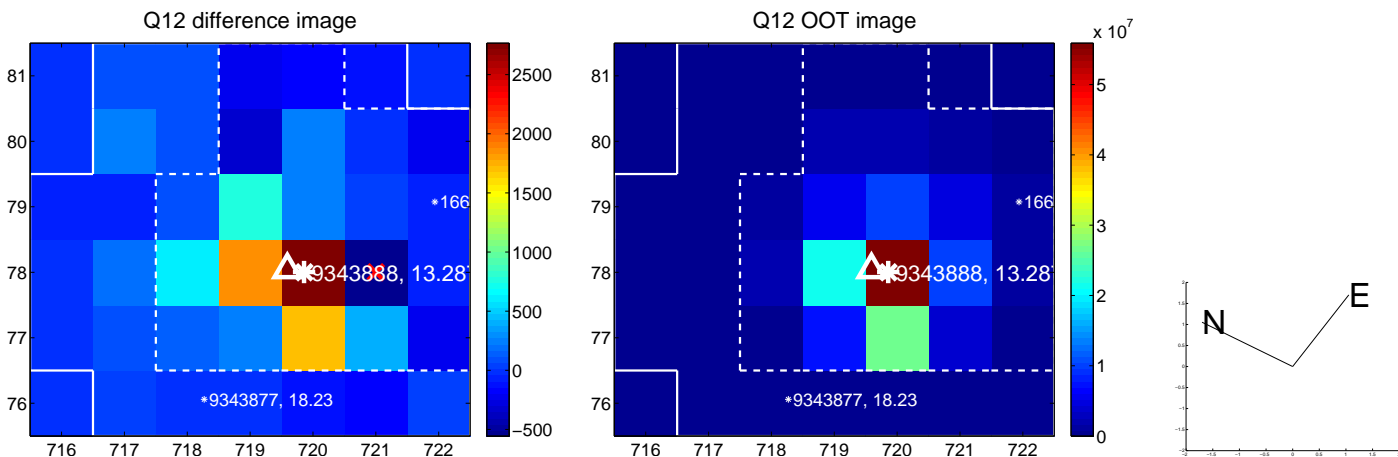
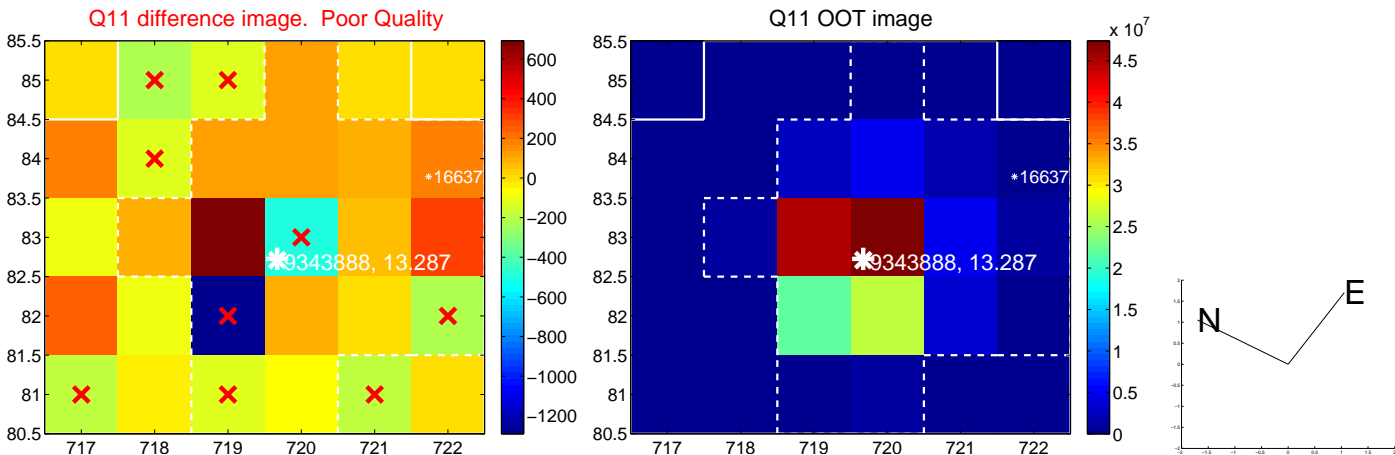
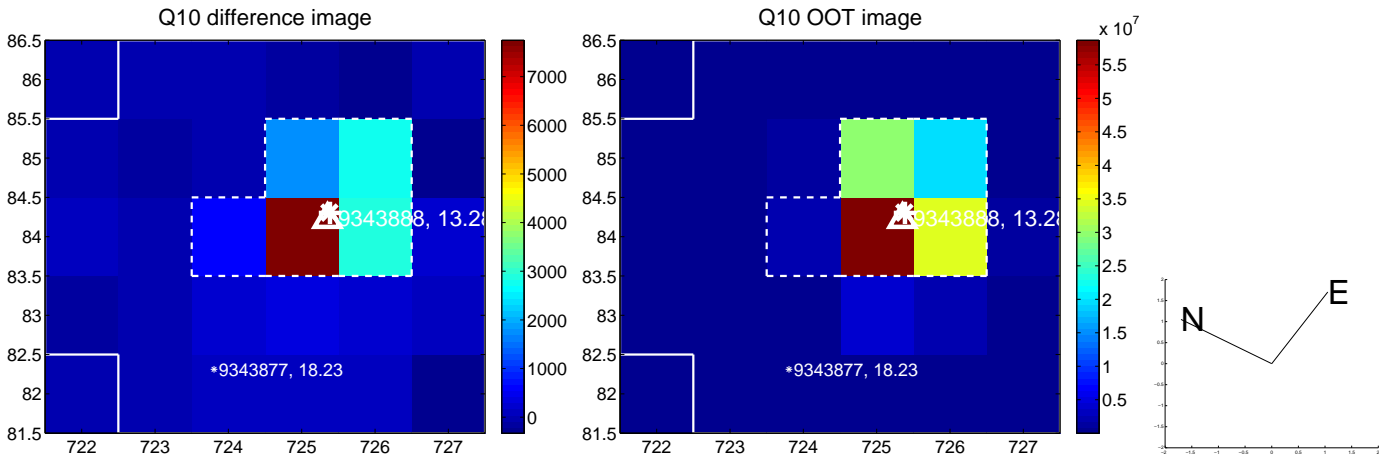
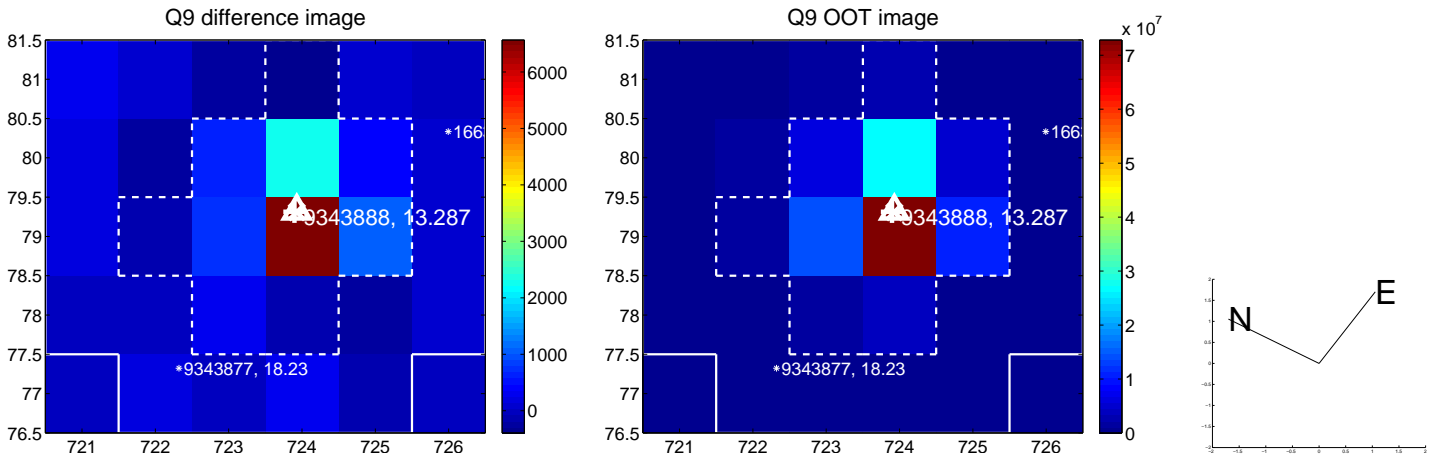
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



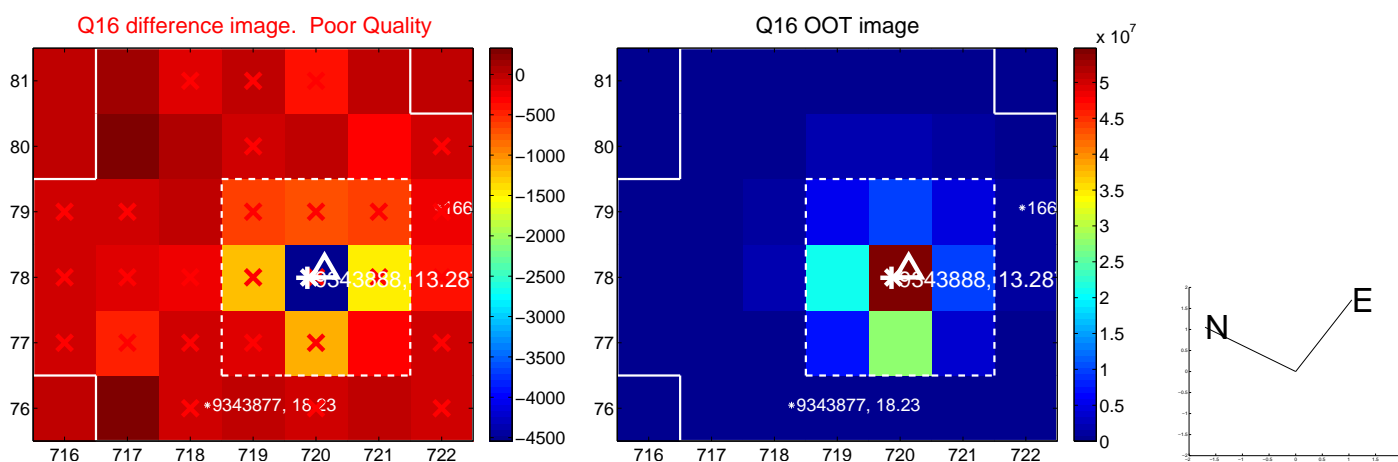
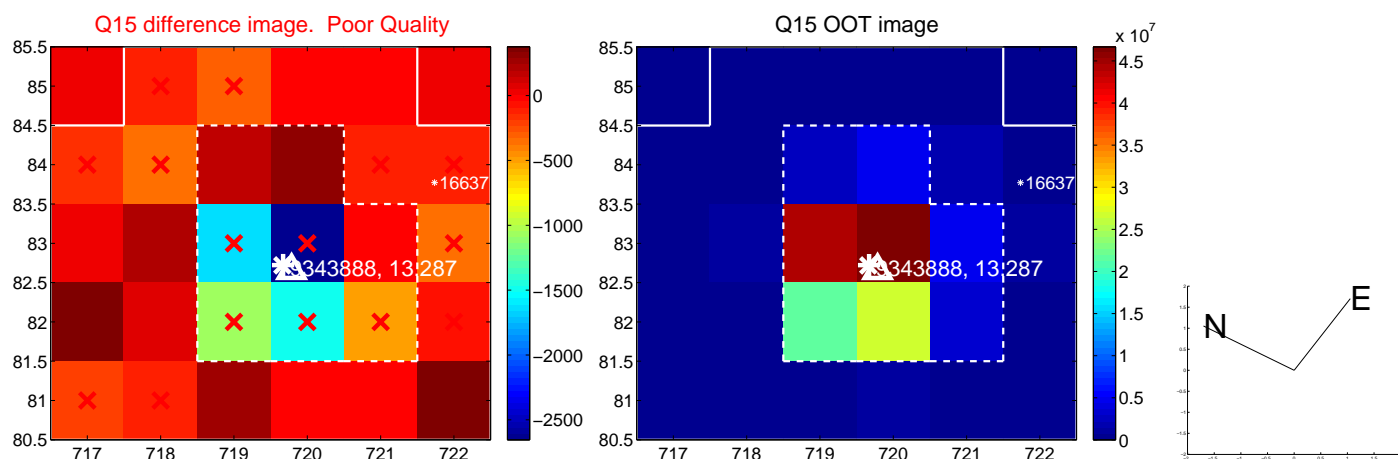
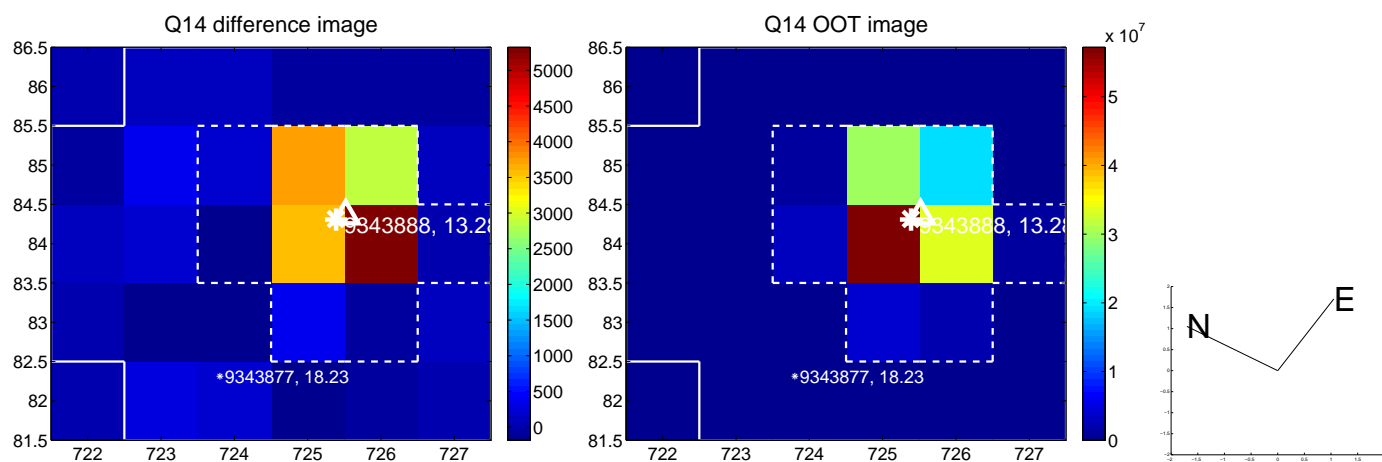
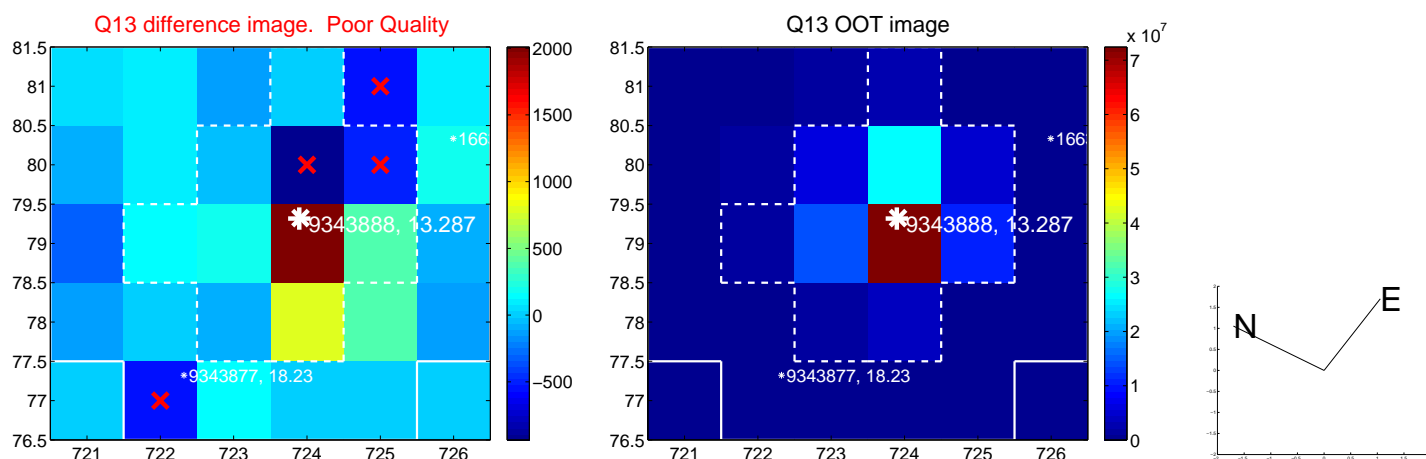
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



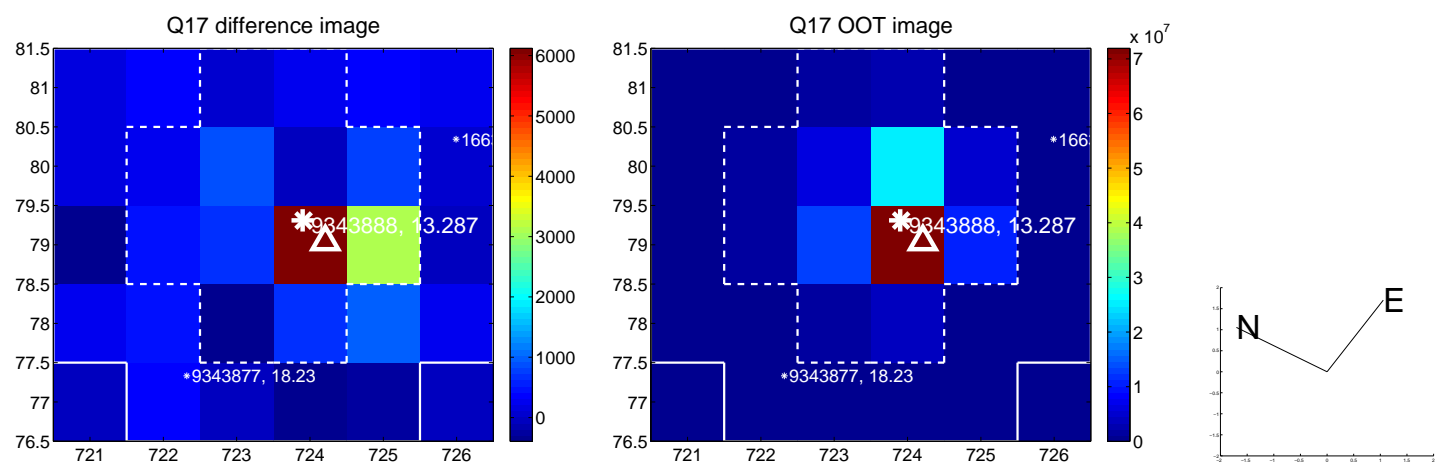
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



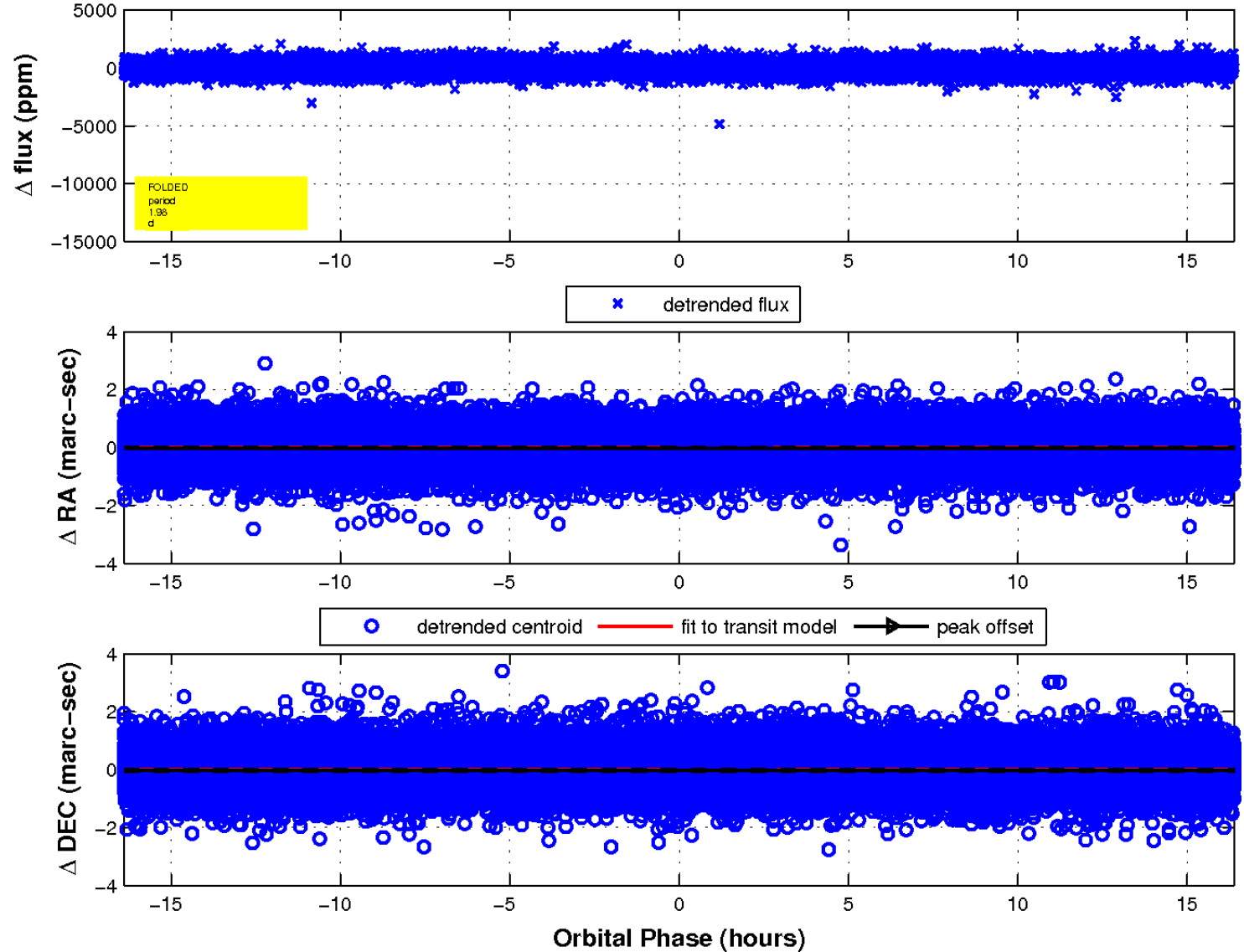
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 5 of 5



UKIRT Image

Declination

