

KIC 009109743

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})
009109743-01	OBS	No	0.650073	131.824000	24.4	1.629	9.7	7.6	1.97	6428	1.14	24070.79
009109743-02	OBS	No	0.650071	132.145026	13.4	4.552	8.8	6.9	1.97	6428	0.73	24070.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009109743-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009109743-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

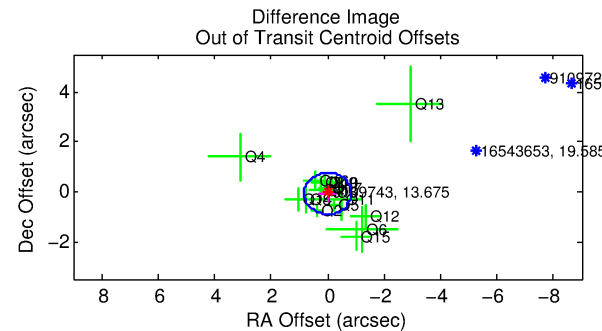
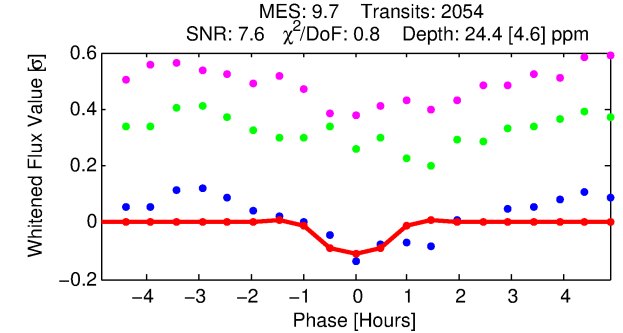
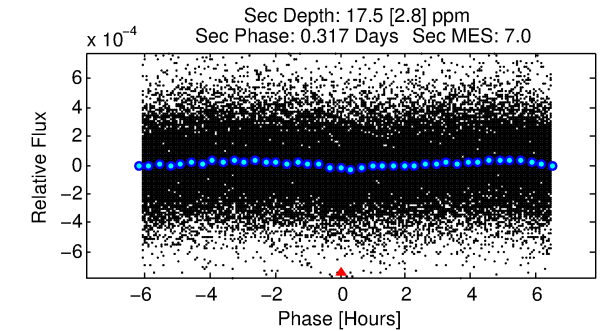
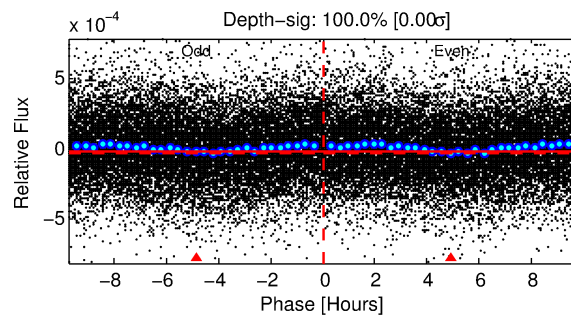
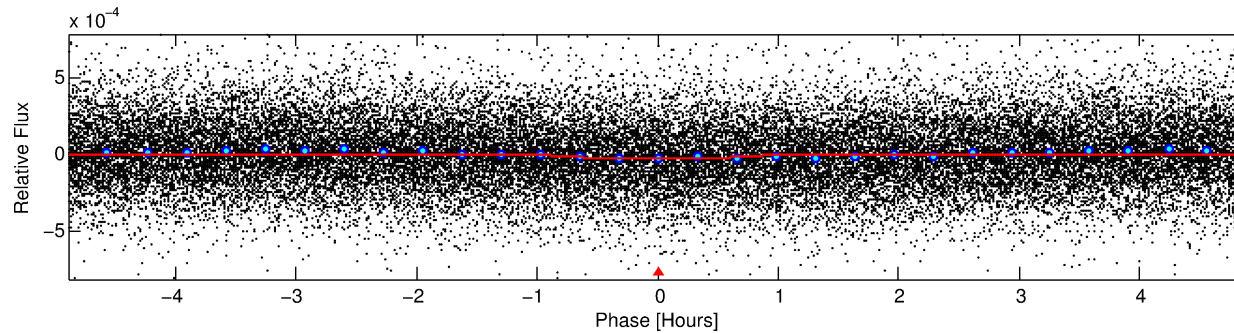
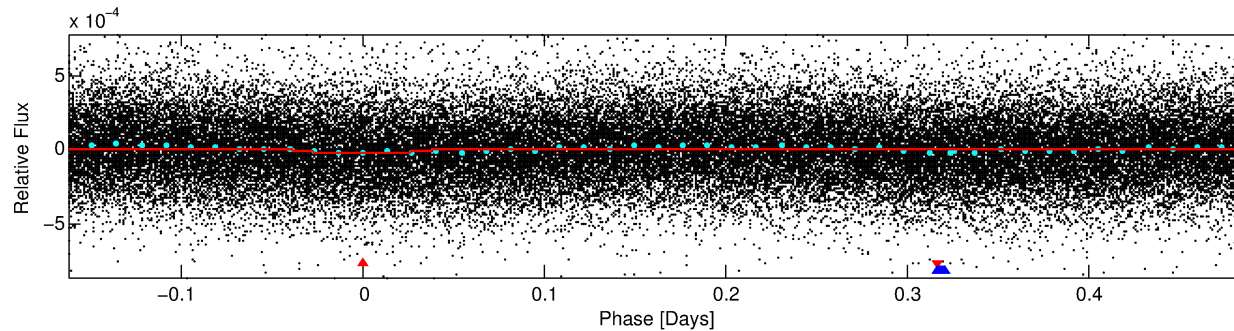
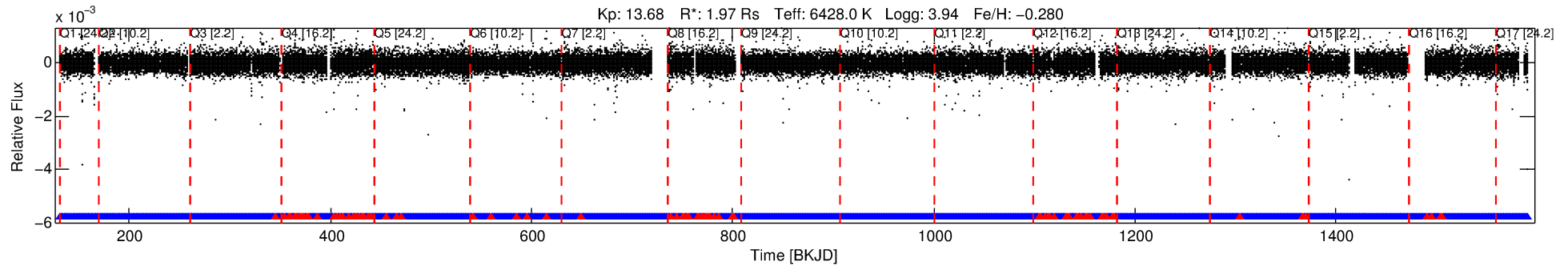
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009109743-01

No Significant Match Found

DV One-Page Summary

KIC: 9109743 Candidate: 1 of 2 Period: 0.650 d



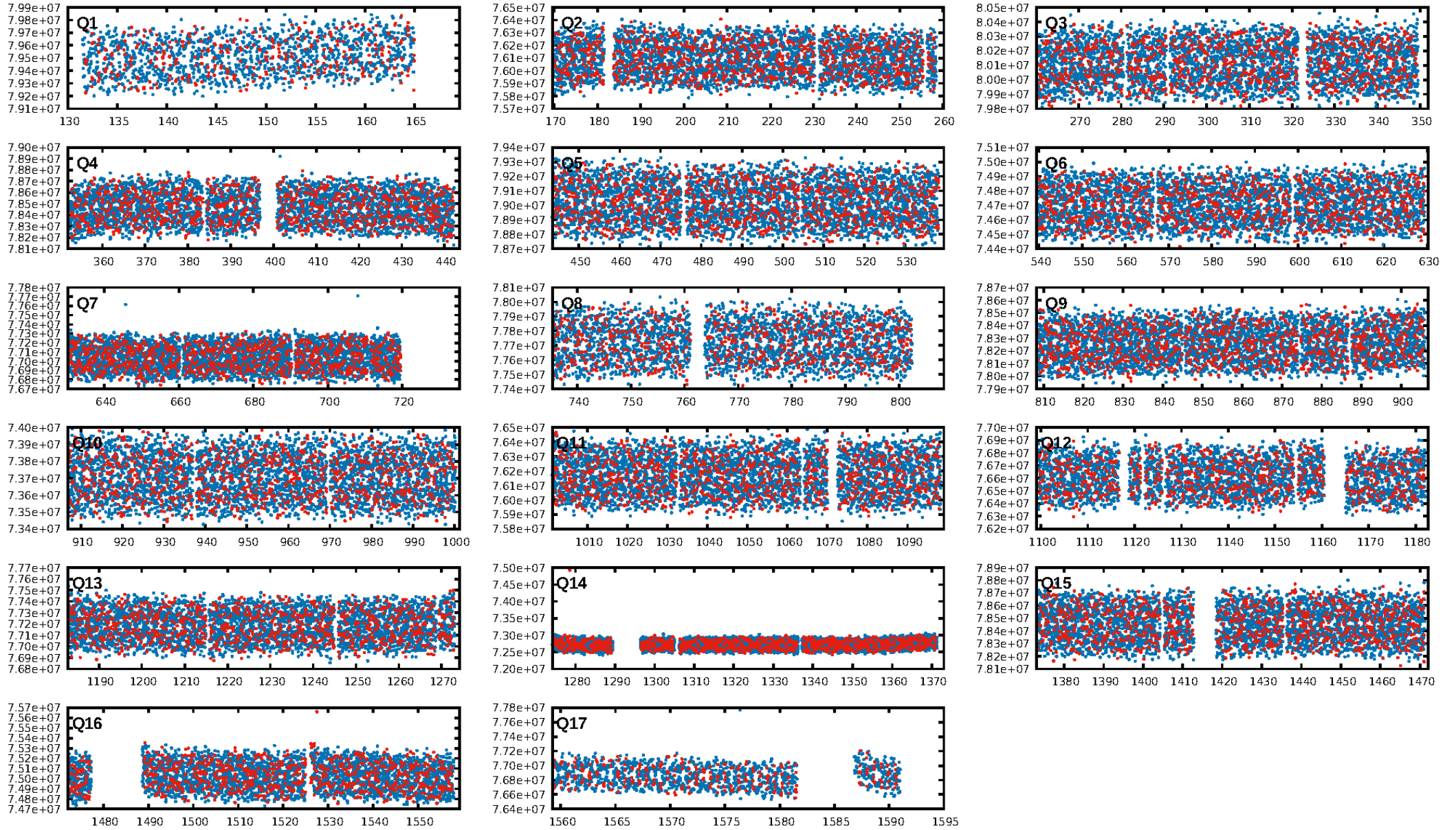
DV Fit Results:

Period = 0.65007 [0.00001] d
Epoch = 131.8240 [0.0031] BKJD
Rp/R* = 0.0053 [0.0021]
a/R* = 1.66 [2.30]
b = 0.90 [0.47]
Seff = 24070.79 [16342.63]
Teq = 3176 [539] K
Rp = 1.14 [0.64] Re
a = 0.0157 [0.0064] AU
Ag = 1.82 [1.88] [0.44σ]
Teffp = 5706 [1144] K [2.00σ]

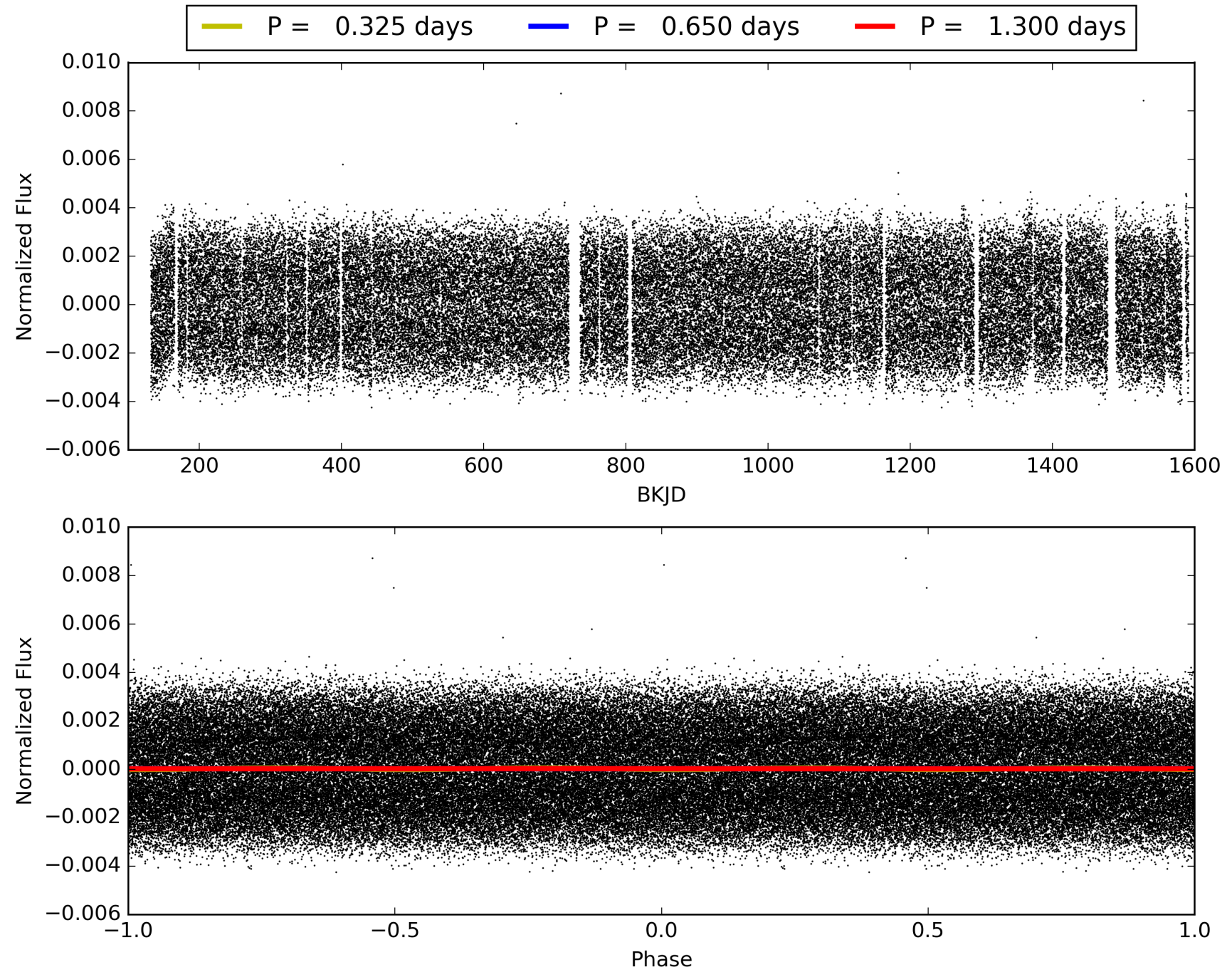
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.96 [1876/1961]
GhostDiagnostic-chr: 2.091
Centroid-sig: 61.2%
Centroid-so: 0.842 arcsec [0.59σ]
OotOffset-rm: 0.073 arcsec [0.26σ]
KicOffset-rm: 0.086 arcsec [0.29σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.59 [10/17]
DiffImageOverlap-fno: 0.35 [6/17]

TCE 009109743-01, PDC Light Curves

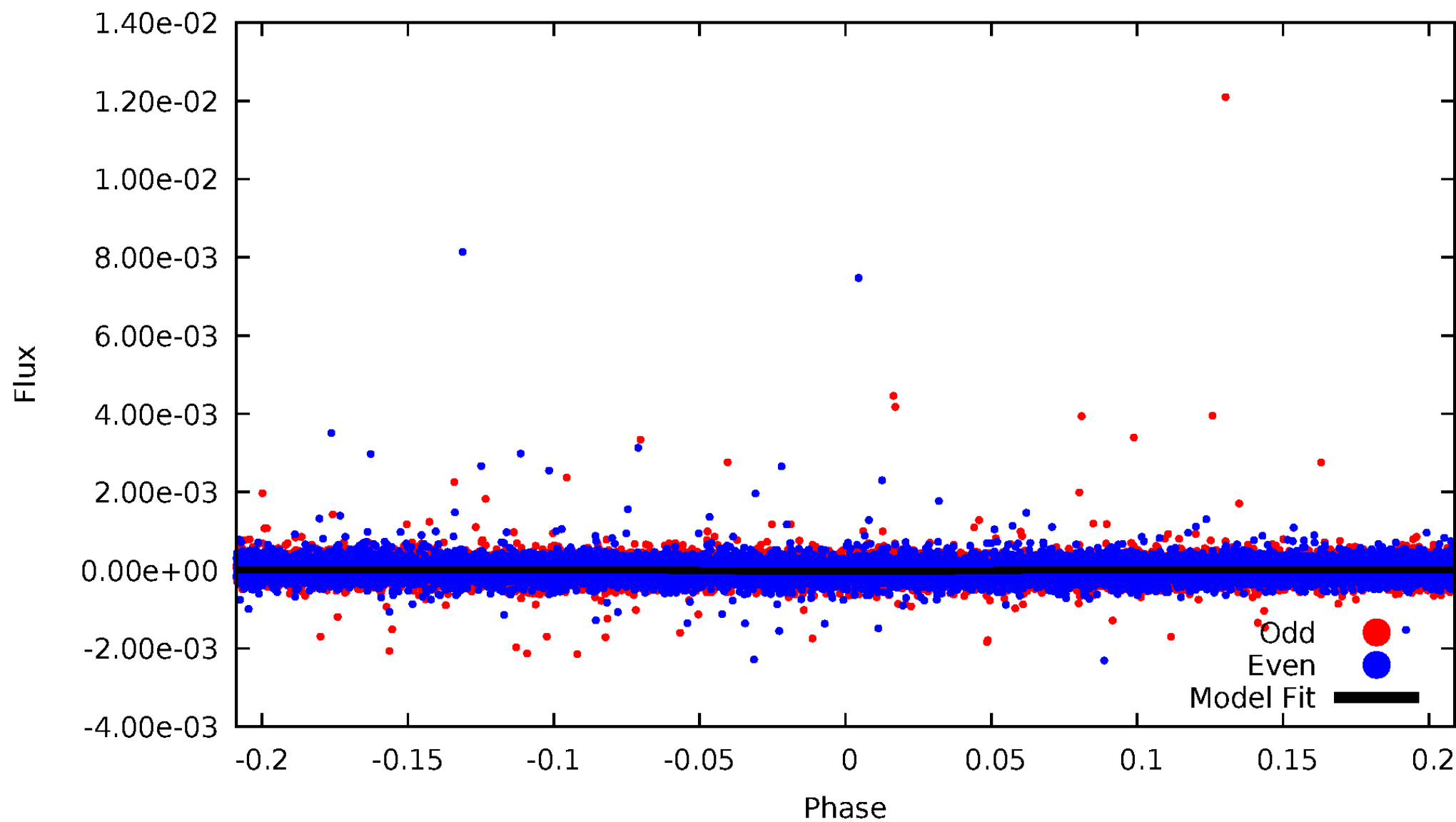


TCE 009109743-01



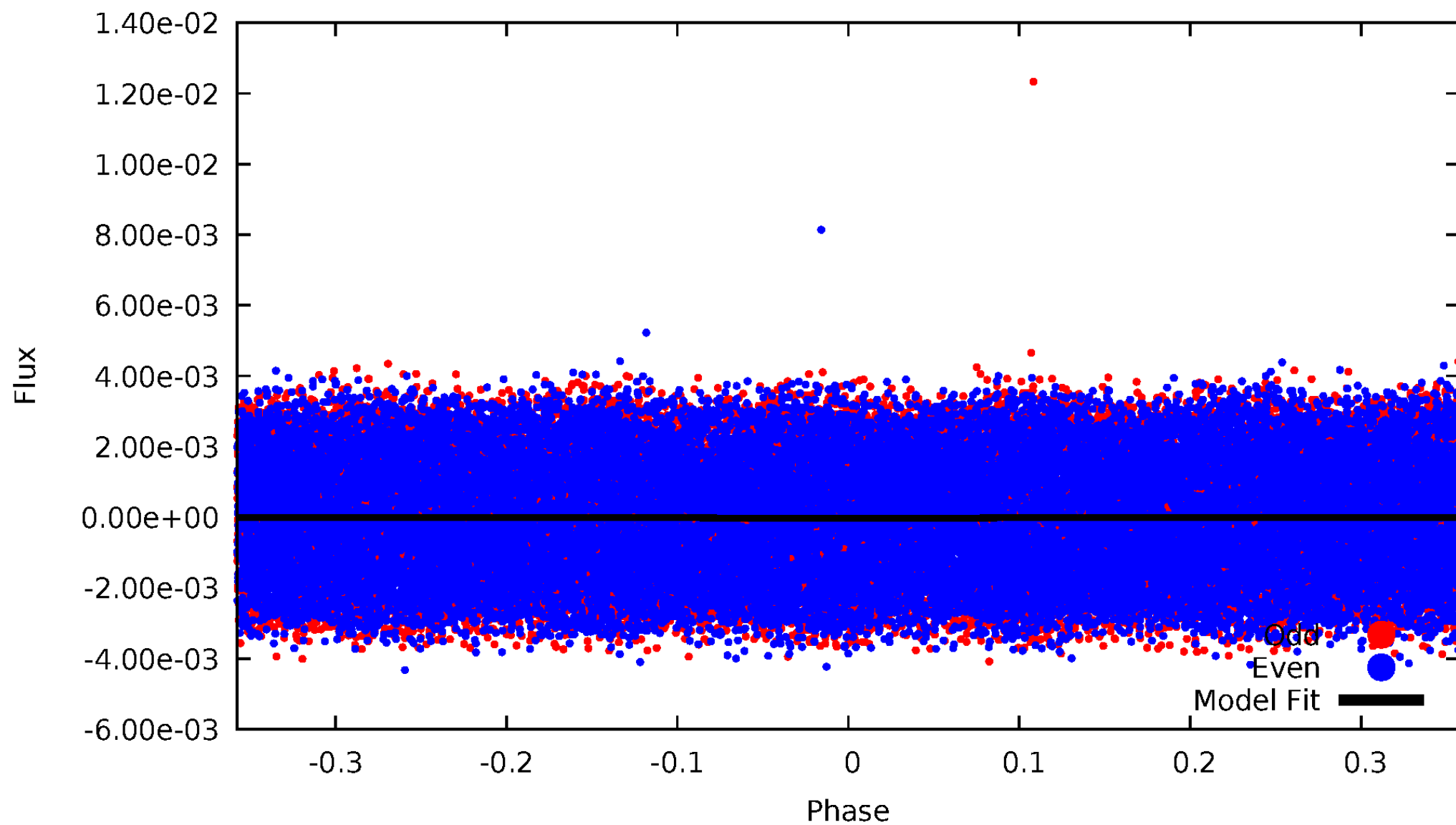
DV Odd/Even

TCE 009109743-01



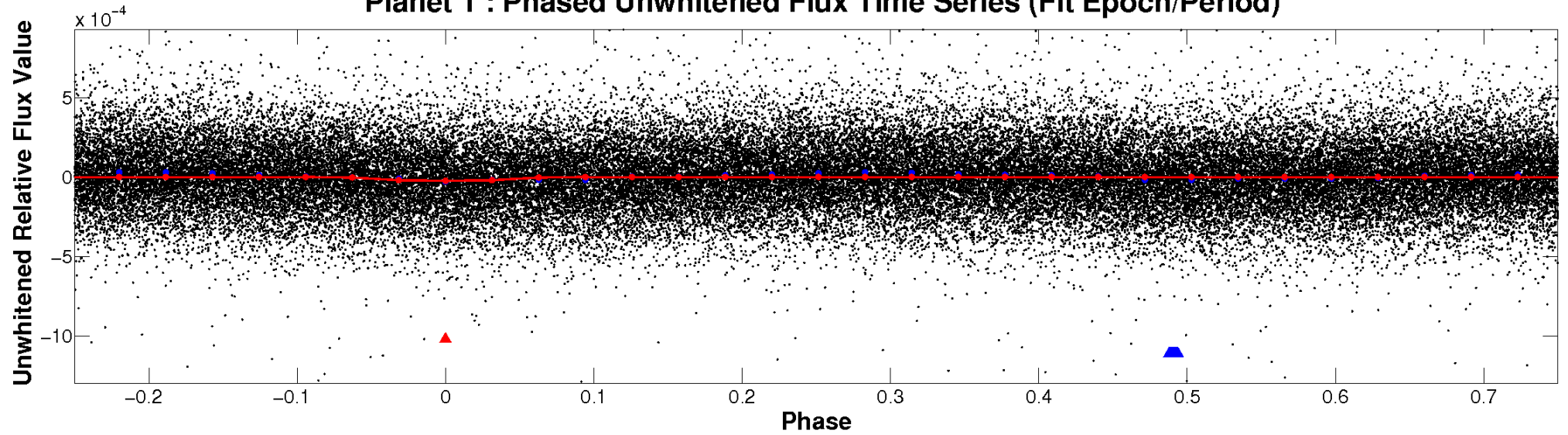
ALT Odd/Even

TCE 009109743-01

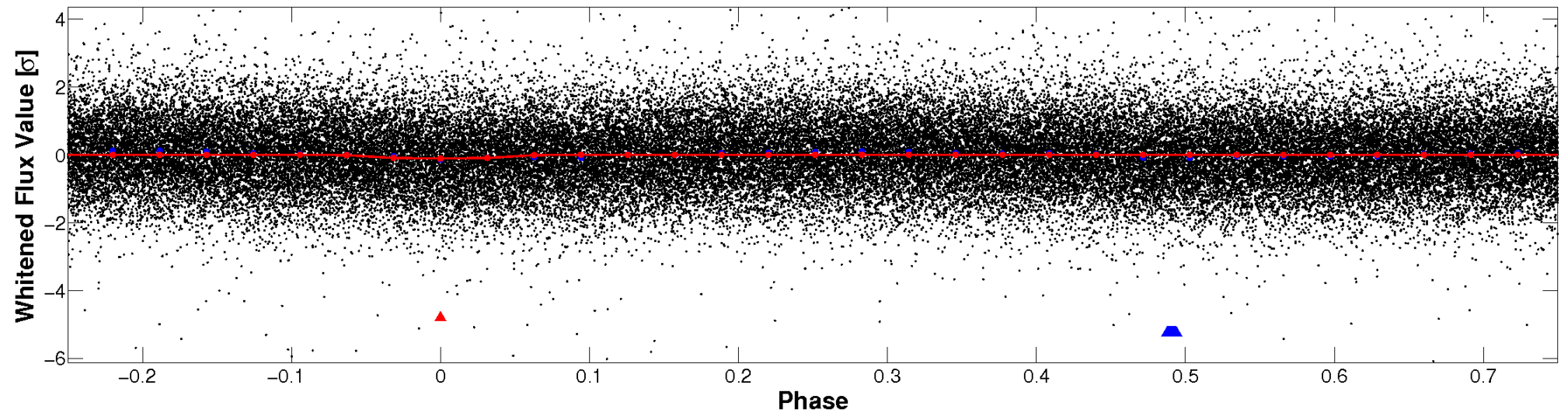


Non-Whitened Vs. Whitened Light Curve

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

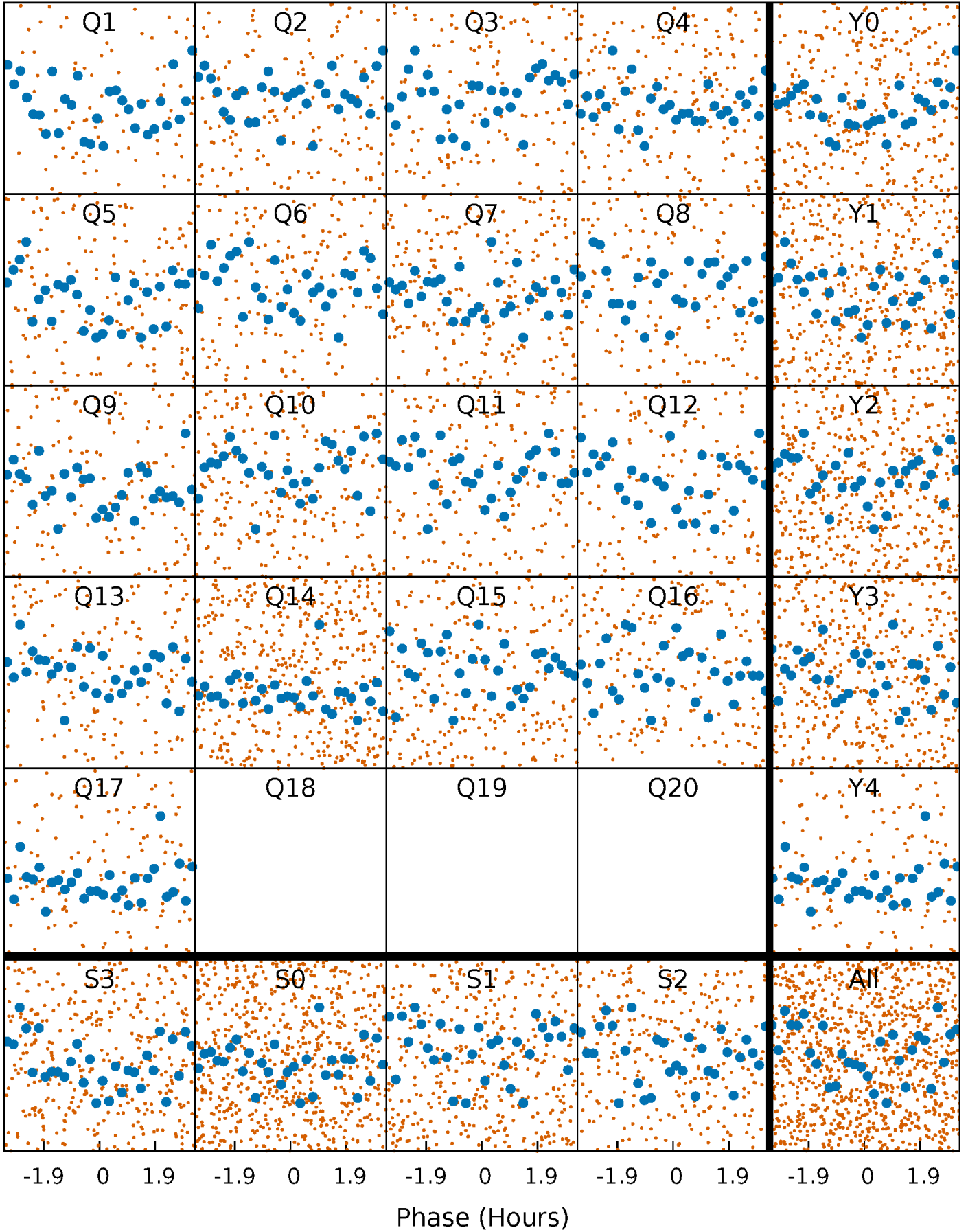


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



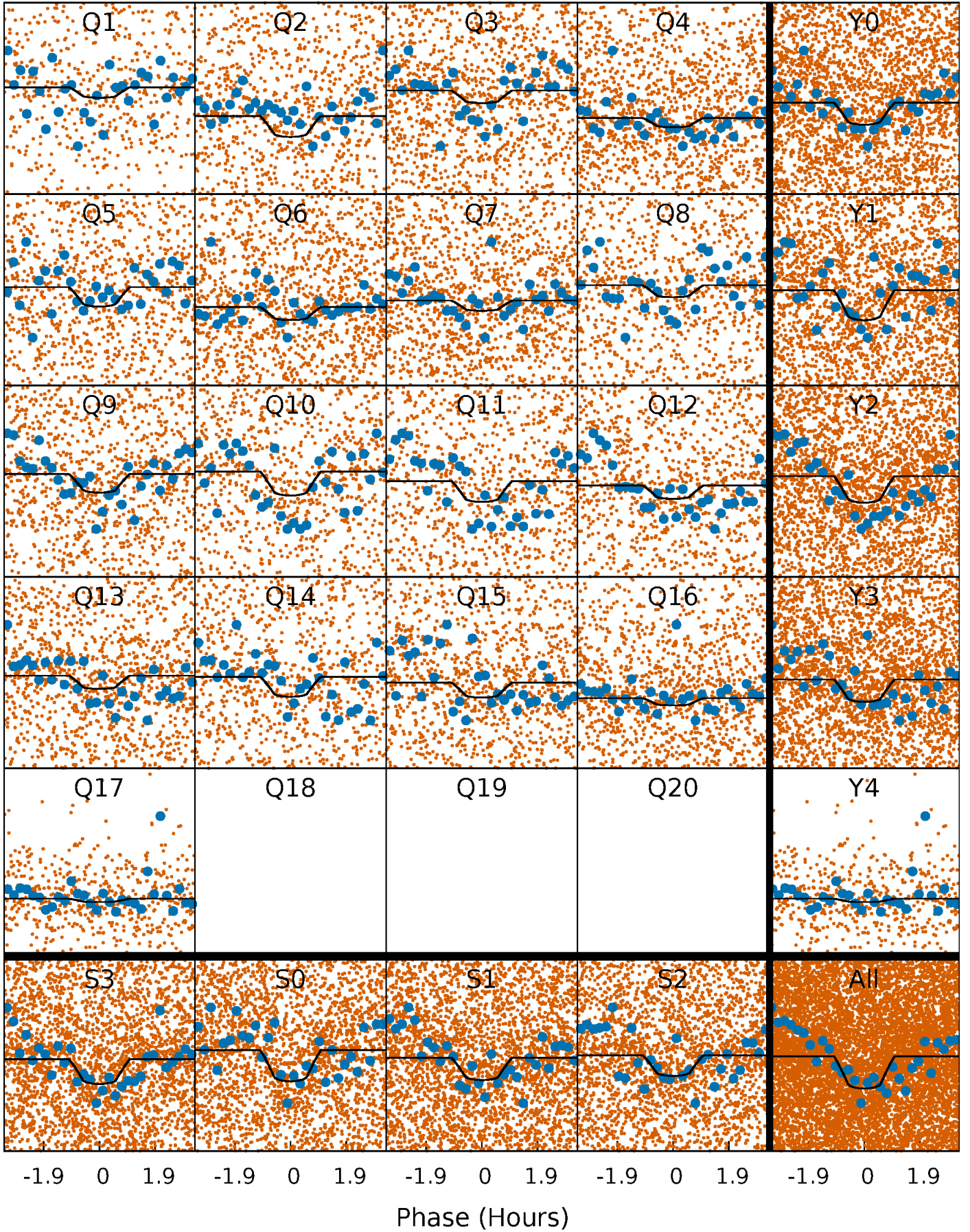
PDC Quarter-Phased Transit Curves

TCE 009109743-01 P= 0.650073 Days $T_0=131.824000$ (BKJD)



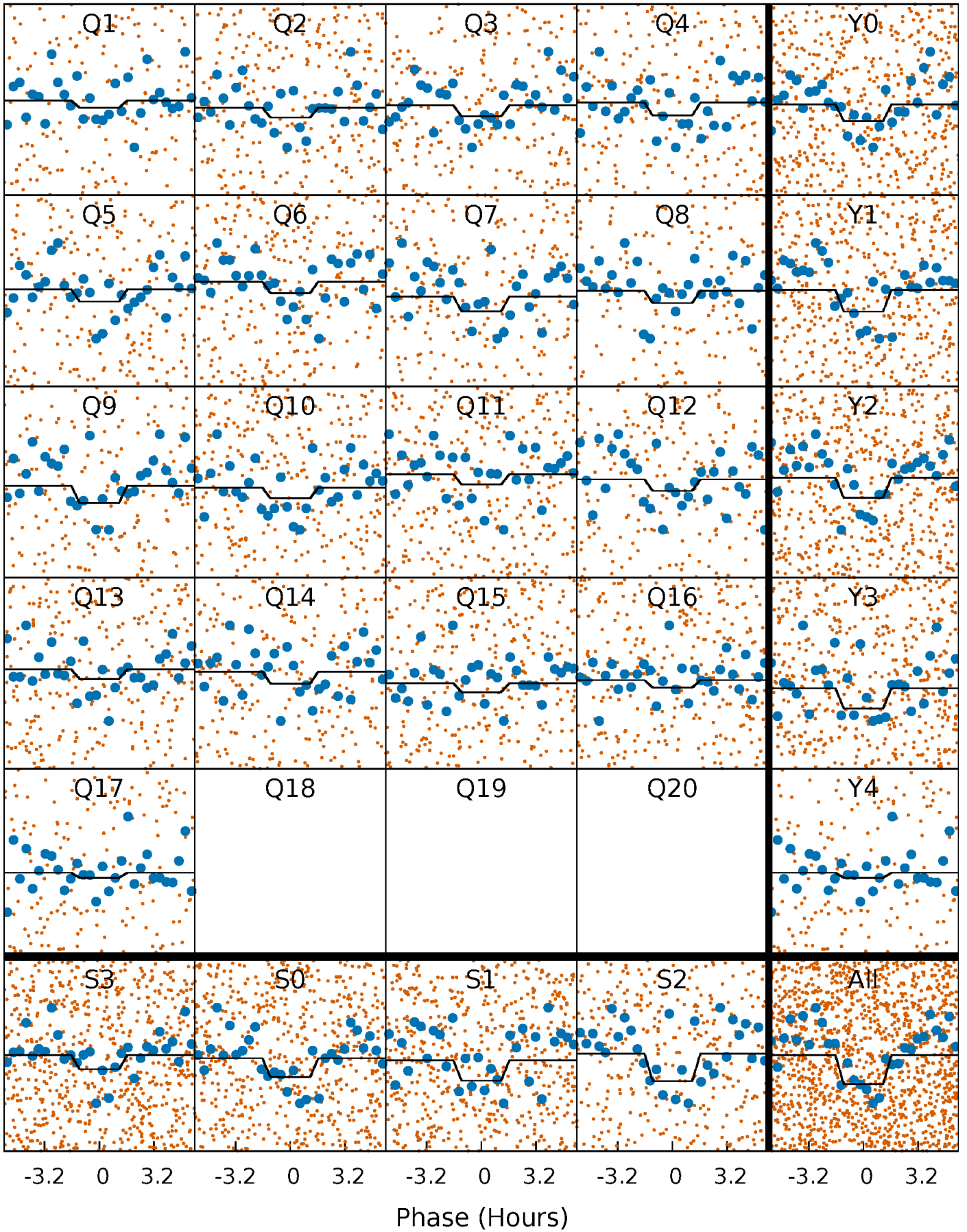
DV Quarter-Phased Transit Curves

TCE 009109743-01 P= 0.650073 Days $T_0=131.824000$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

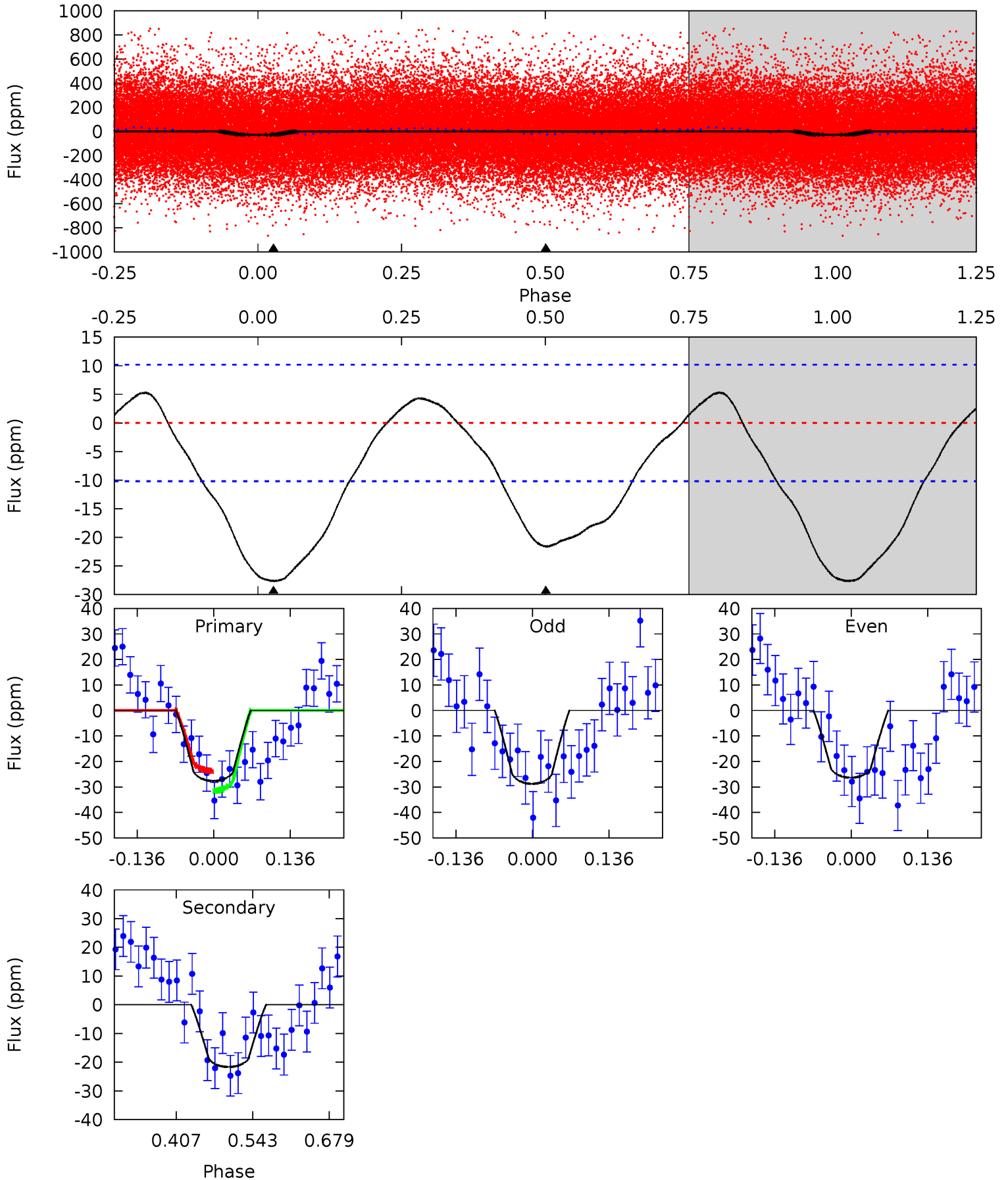
TCE 009109743-01 P= 0.650085 Days $T_0=131.810415$ (BKJD)



DV Model-Shift Uniqueness Test

009109743-01, P = 0.650073 Days, E = 131.173927 Days

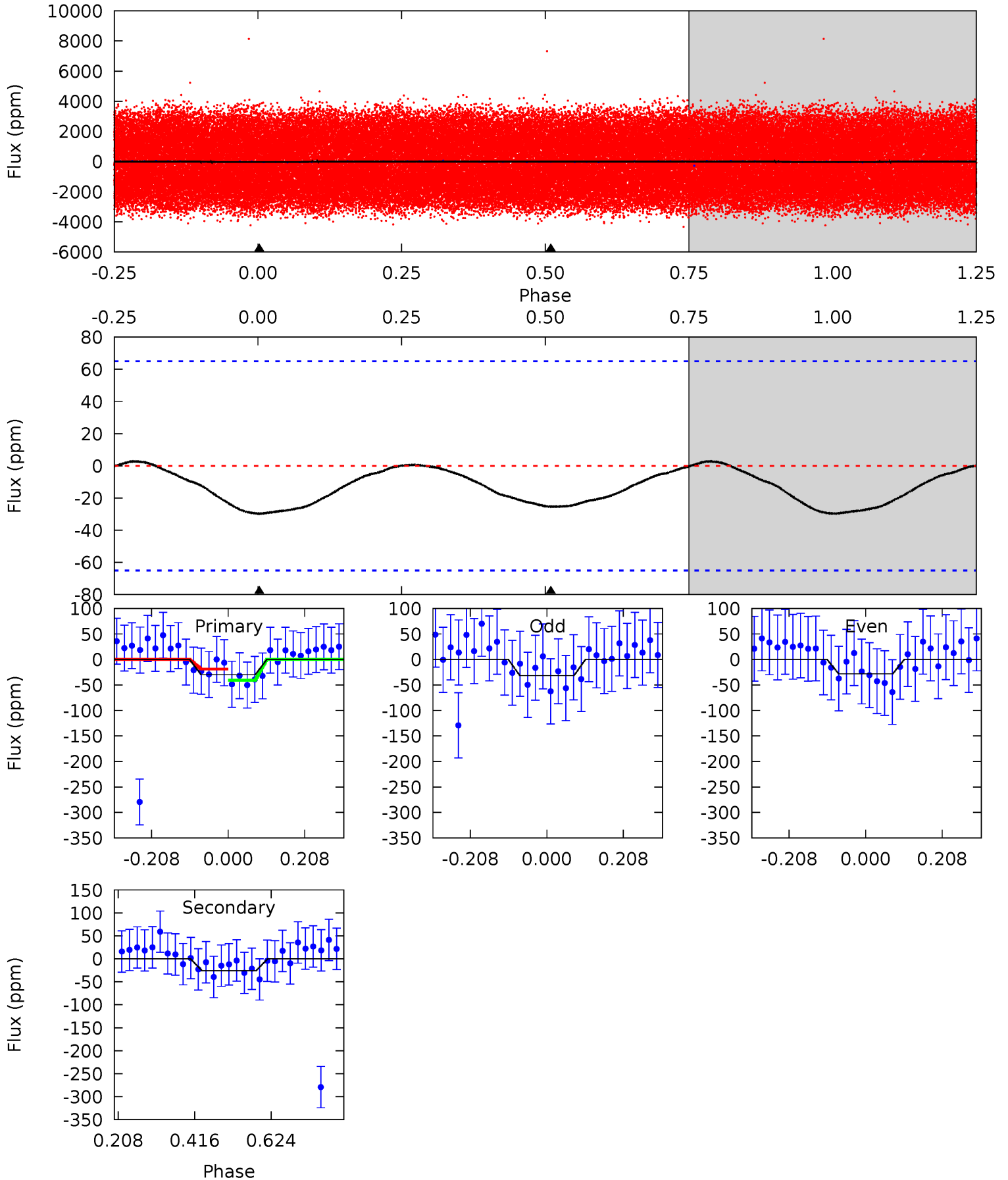
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	9.57	0	0	4.50	1.49	2.01	12.2	12.2	9.57	9.57	0.54	0.78	0.16	1.74



Alt Model-Shift Uniqueness Test

009109743-01, P = 0.650085 Days, E = 131.160330 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.02	1.74	0	0	4.41	1.26	0.12	2.02	2.02	1.74	1.74	0.12	0.92	0.09	0.74



Stellar Parameters For KIC 009109743

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6428^{+175}_{-214}	$3.935^{+0.397}_{-0.132}$	$-0.280^{+0.250}_{-0.300}$	$1.965^{+0.527}_{-0.790}$	$1.212^{+0.201}_{-0.221}$	$0.225^{+0.740}_{-0.098}$
	+3%/-3%	+10%/-3%	+89%/-107%	+27%/-40%	+17%/-18%	+329%/-44%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009109743-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-22 ± 2	$1.05^{+0.50}_{-0.45}$	4363^{+338}_{-491}	5915^{+1805}_{-1040}	$2.710^{+5.160}_{-1.497}$
Alt.	-26 ± 15	$1.04^{+0.50}_{-0.41}$	4316^{+340}_{-456}	6000^{+2029}_{-1508}	$2.995^{+5.730}_{-2.026}$

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 $A_{obs} \gg 1.0$

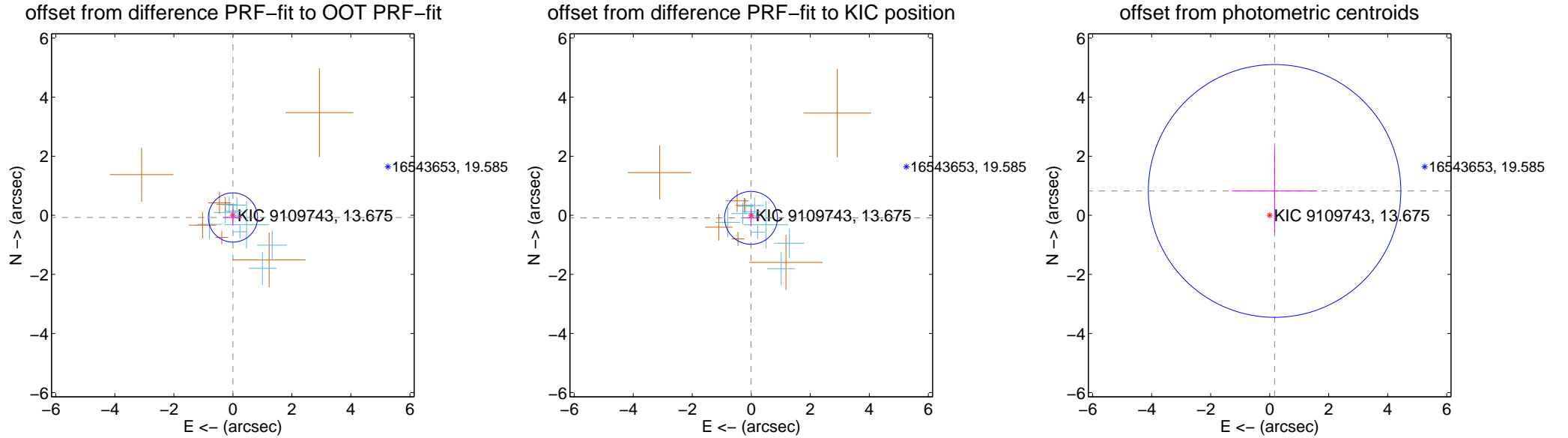
DV Centroid Data

Supplemental centroid analysis for 009109743-01. Kepler magnitude: 13.68. Transit SNR 7.59

There are 10 quarters with good PRF difference image offsets

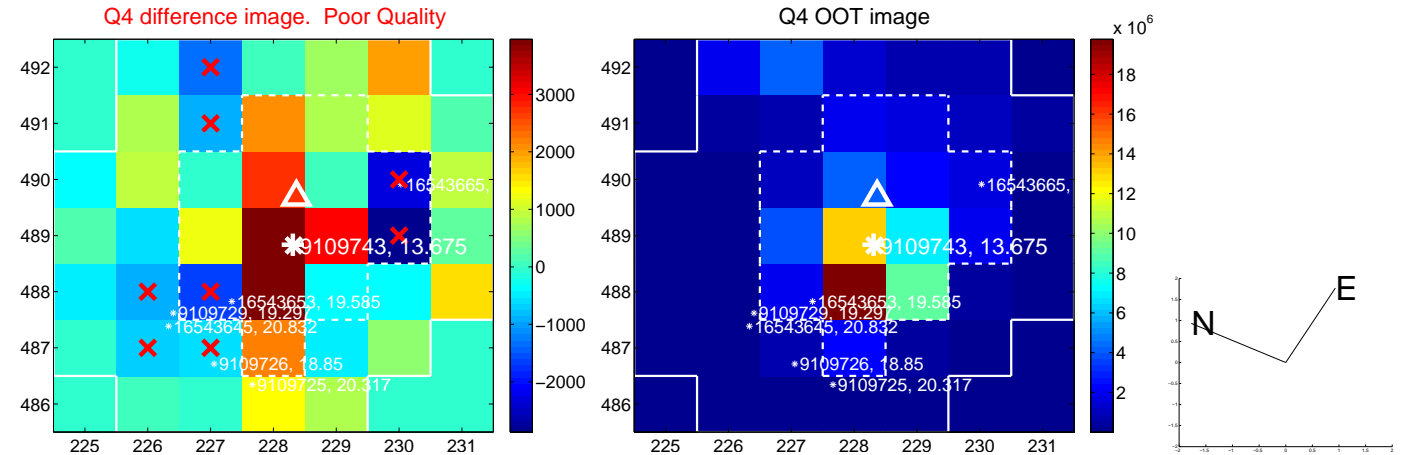
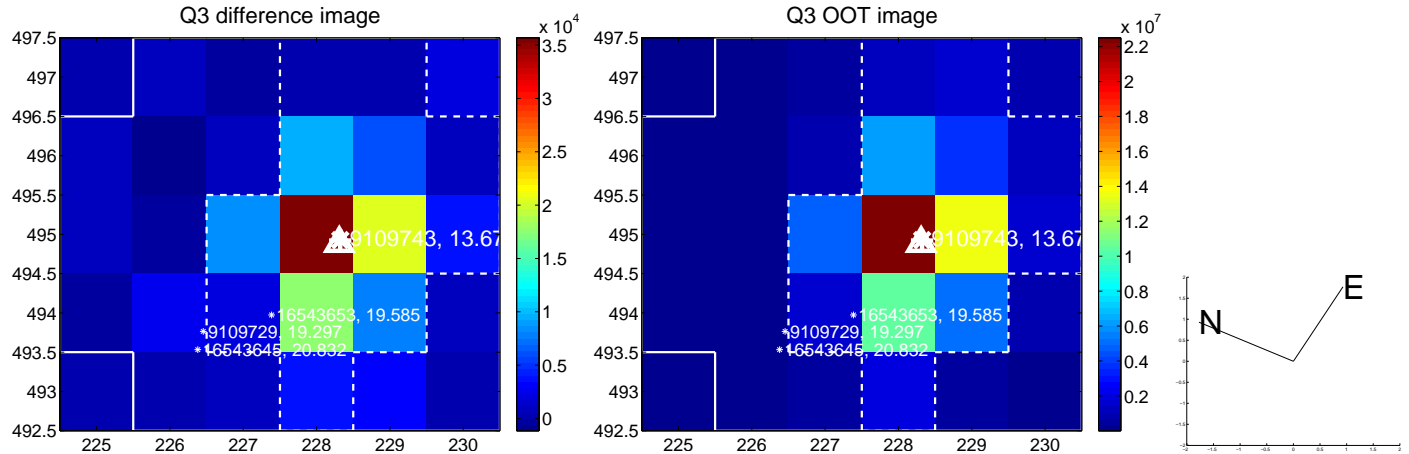
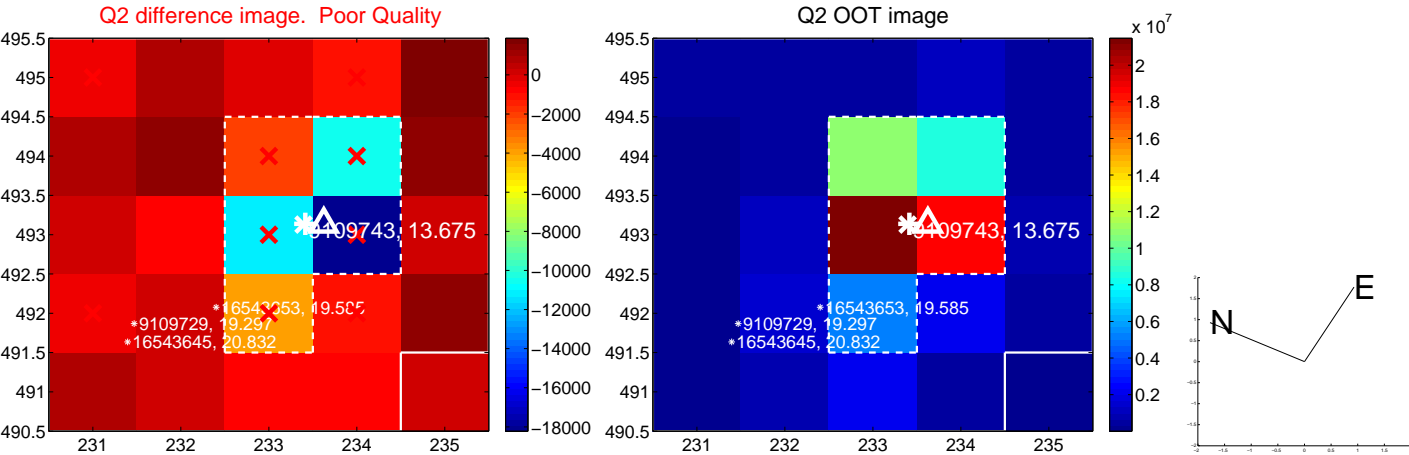
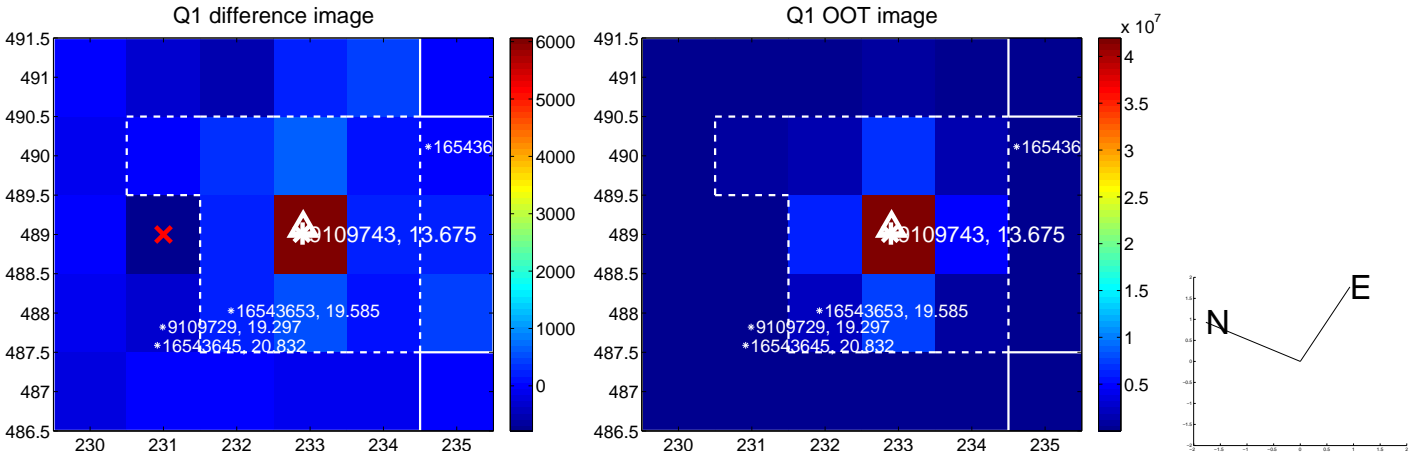
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.073 ± 0.278	0.26	-0.003 ± 0.311	-0.073 ± 0.279
PRF-fit source offset from KIC position	0.086 ± 0.298	0.29	0.009 ± 0.284	-0.086 ± 0.295
photometric centroid source offset	0.84 ± 1.43	0.59	-0.17 ± 1.44	0.83 ± 1.43

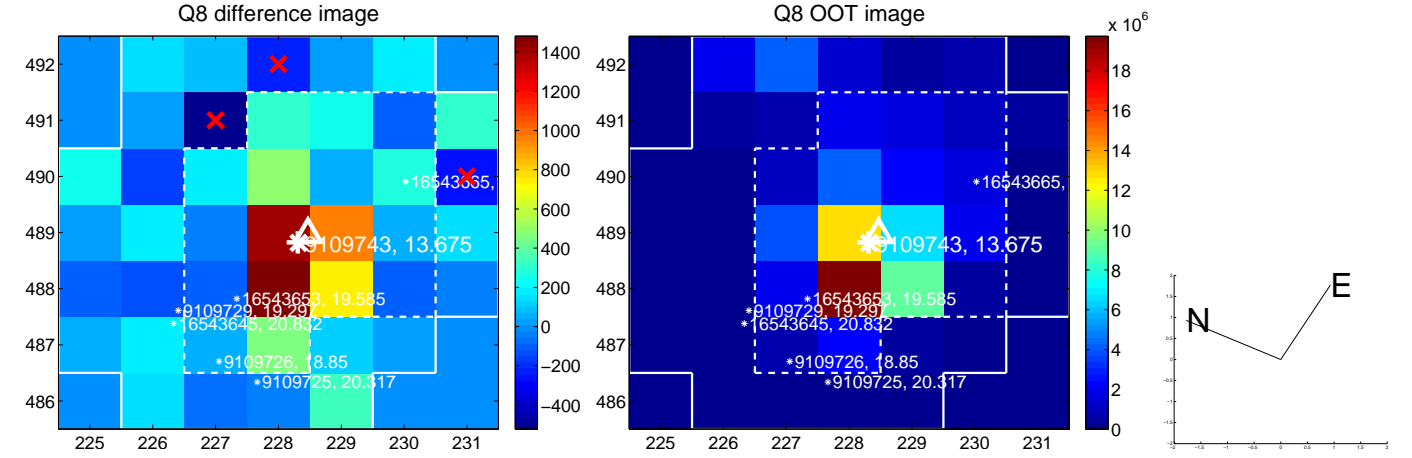
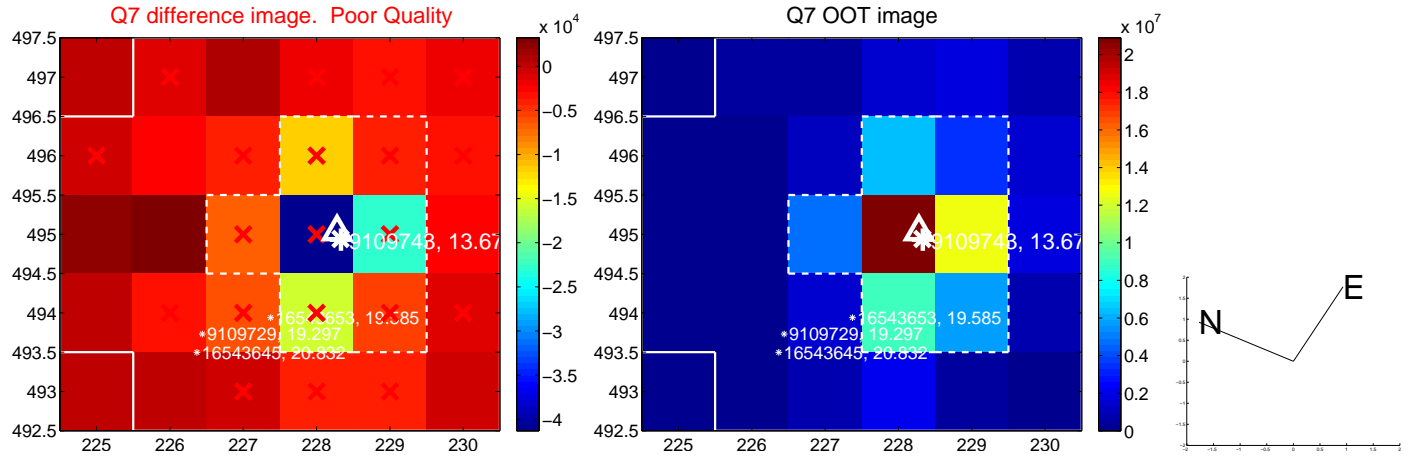
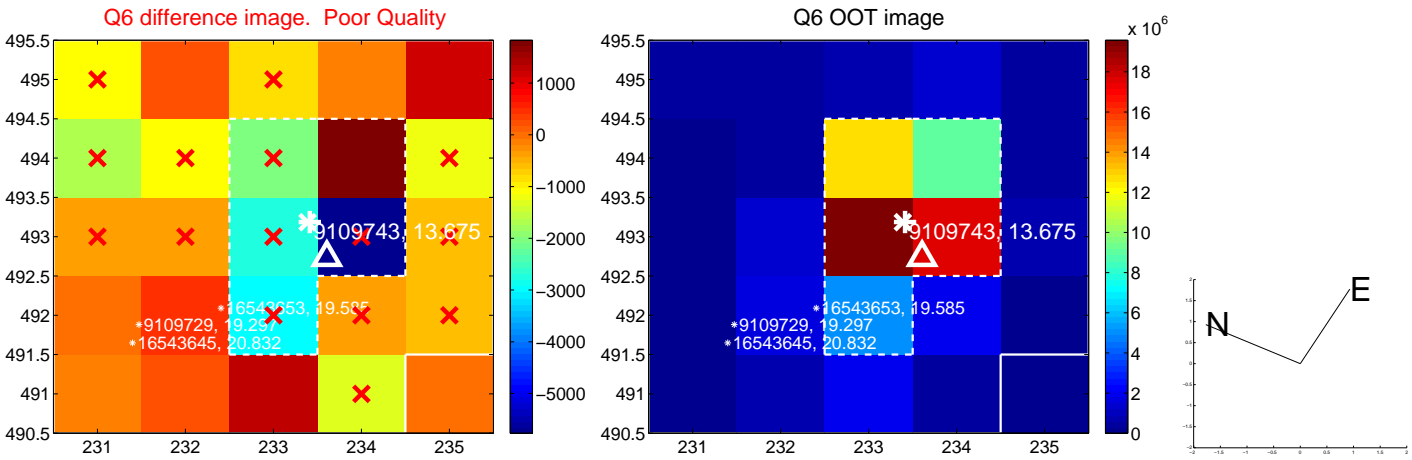
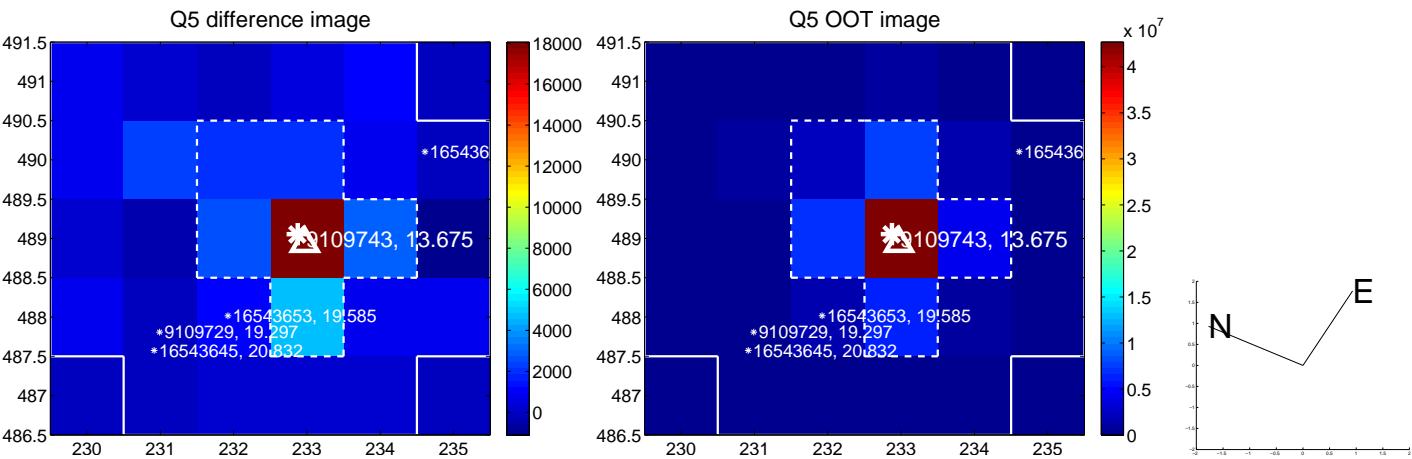


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

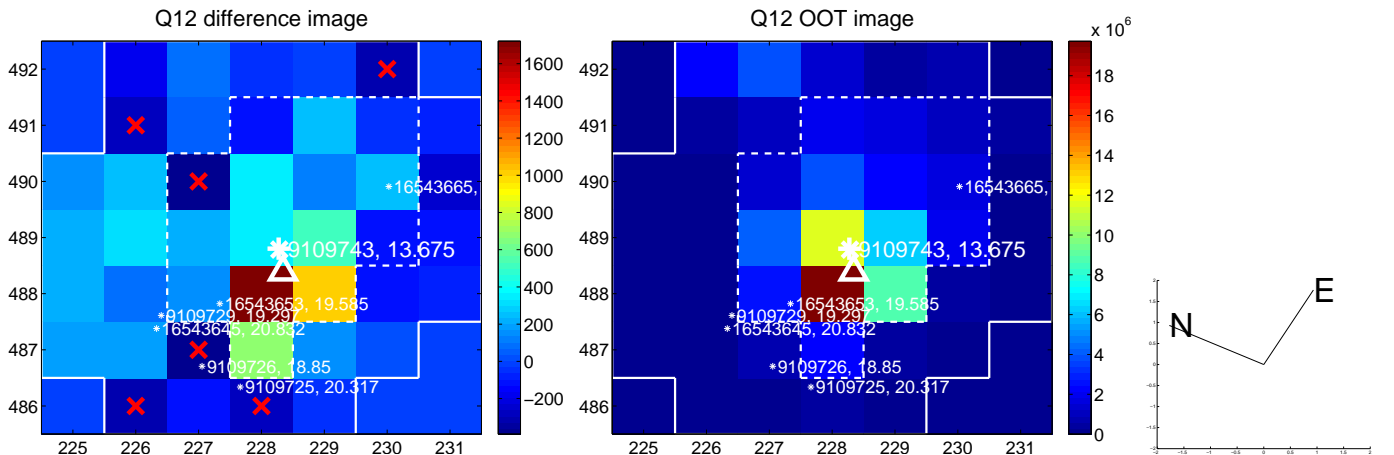
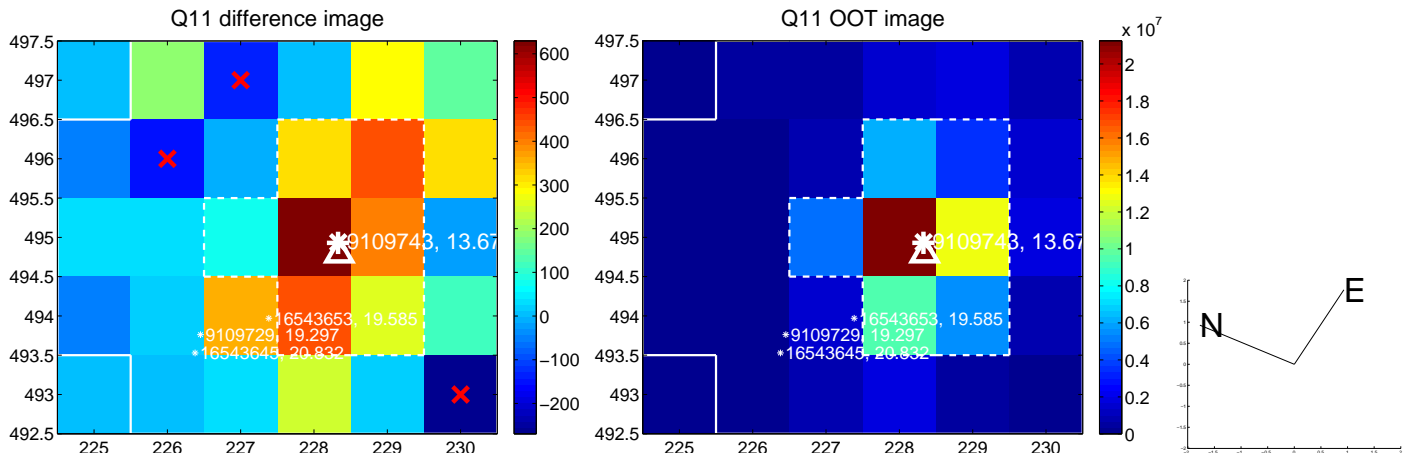
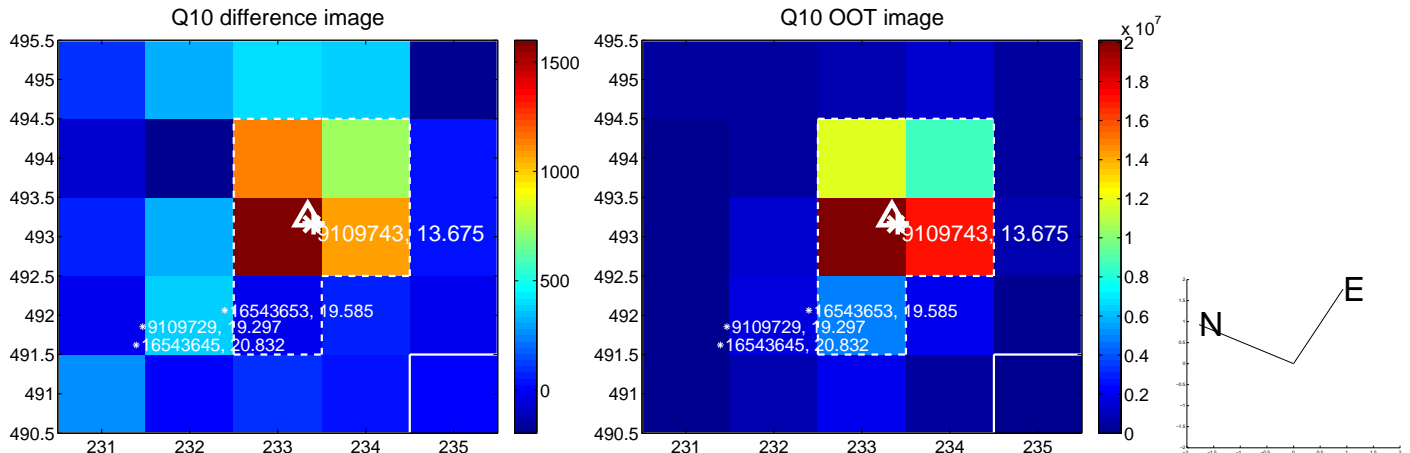
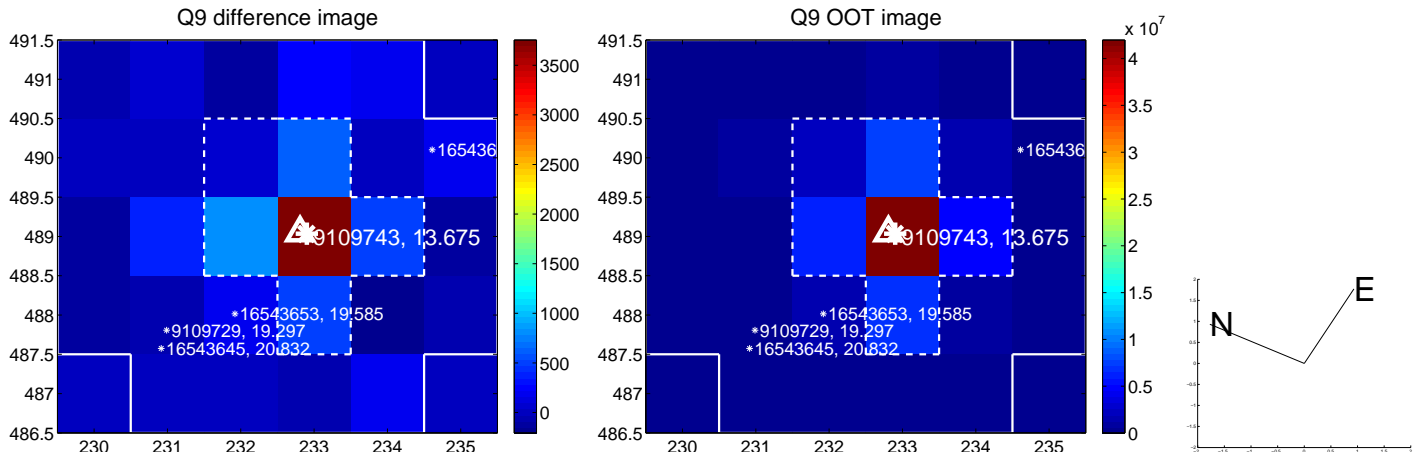
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



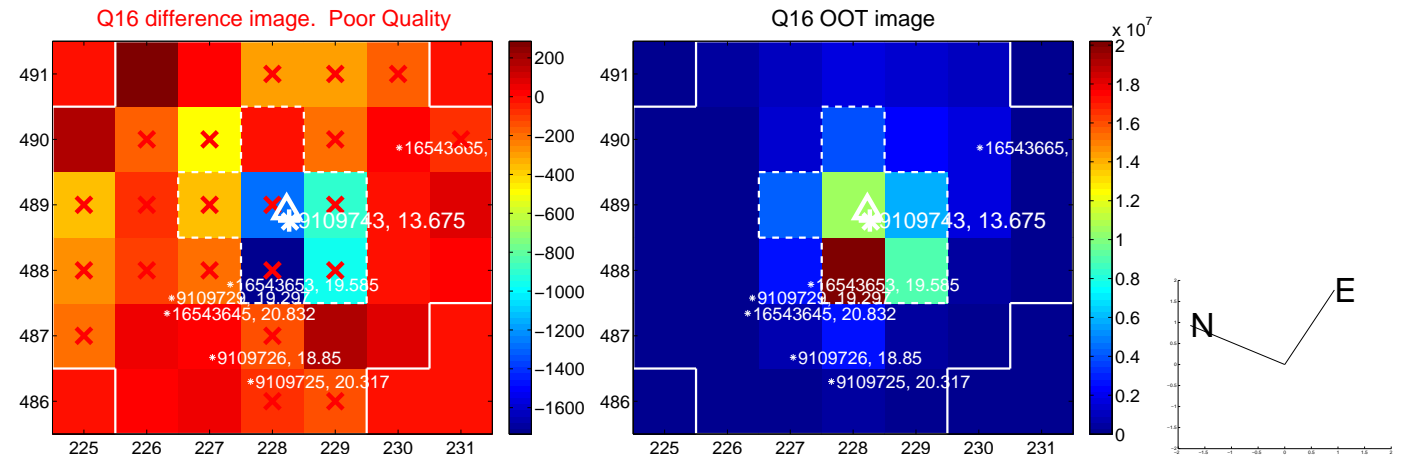
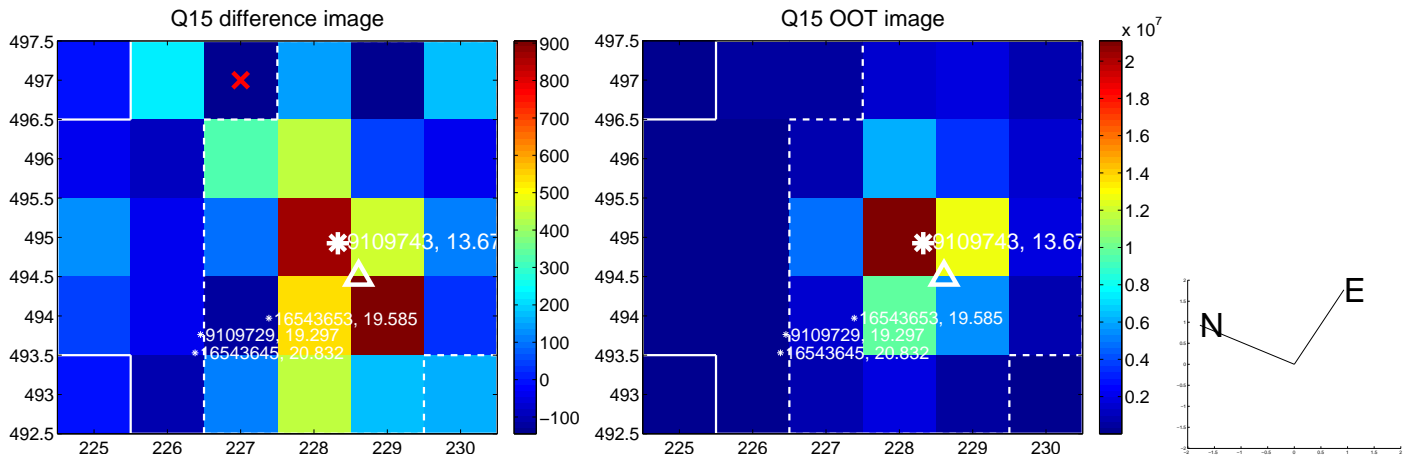
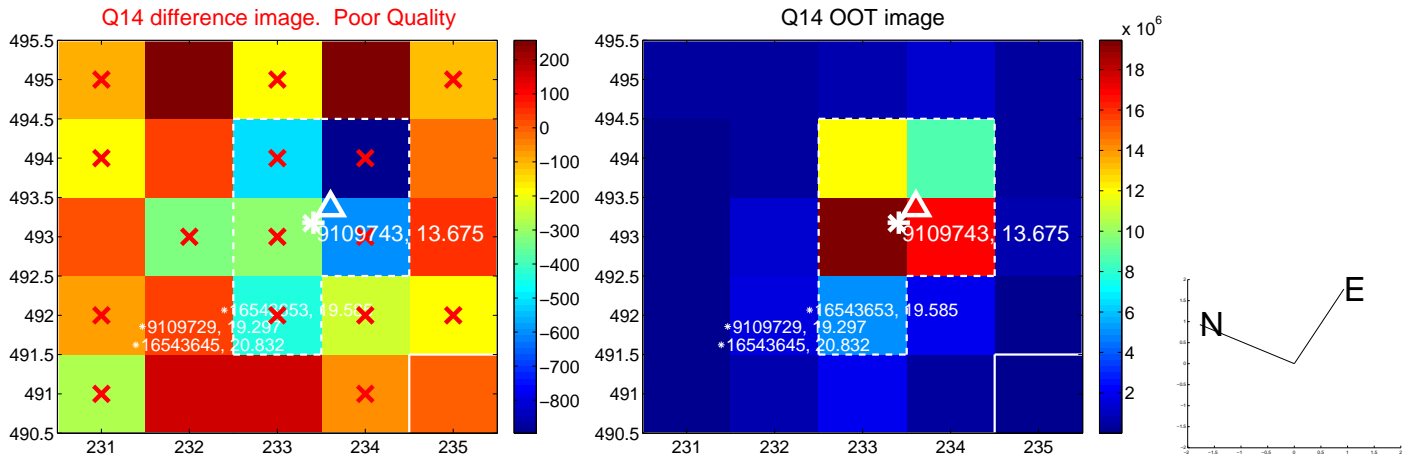
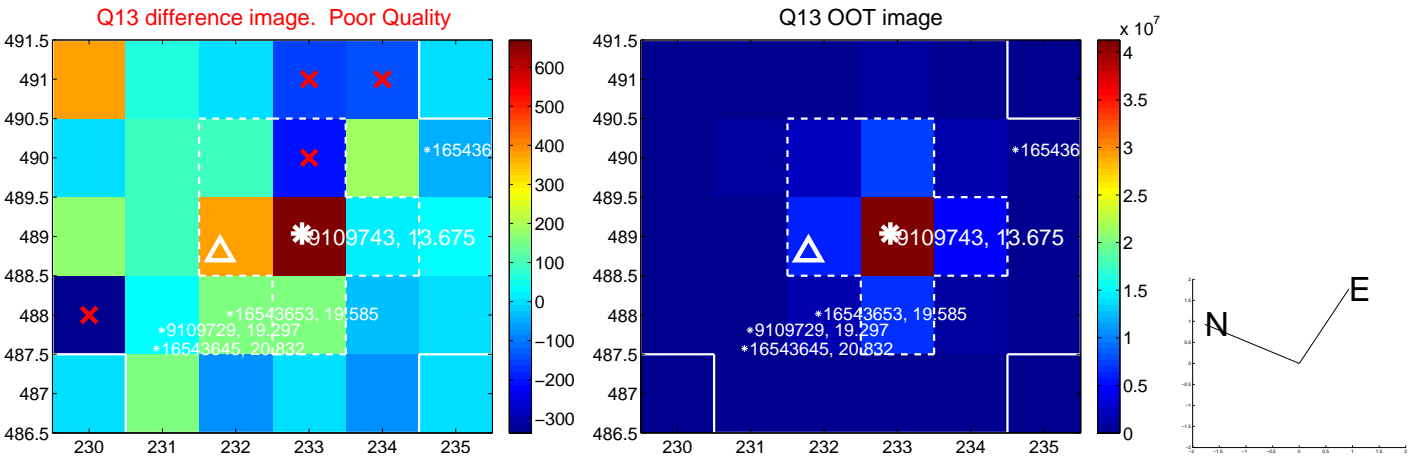
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

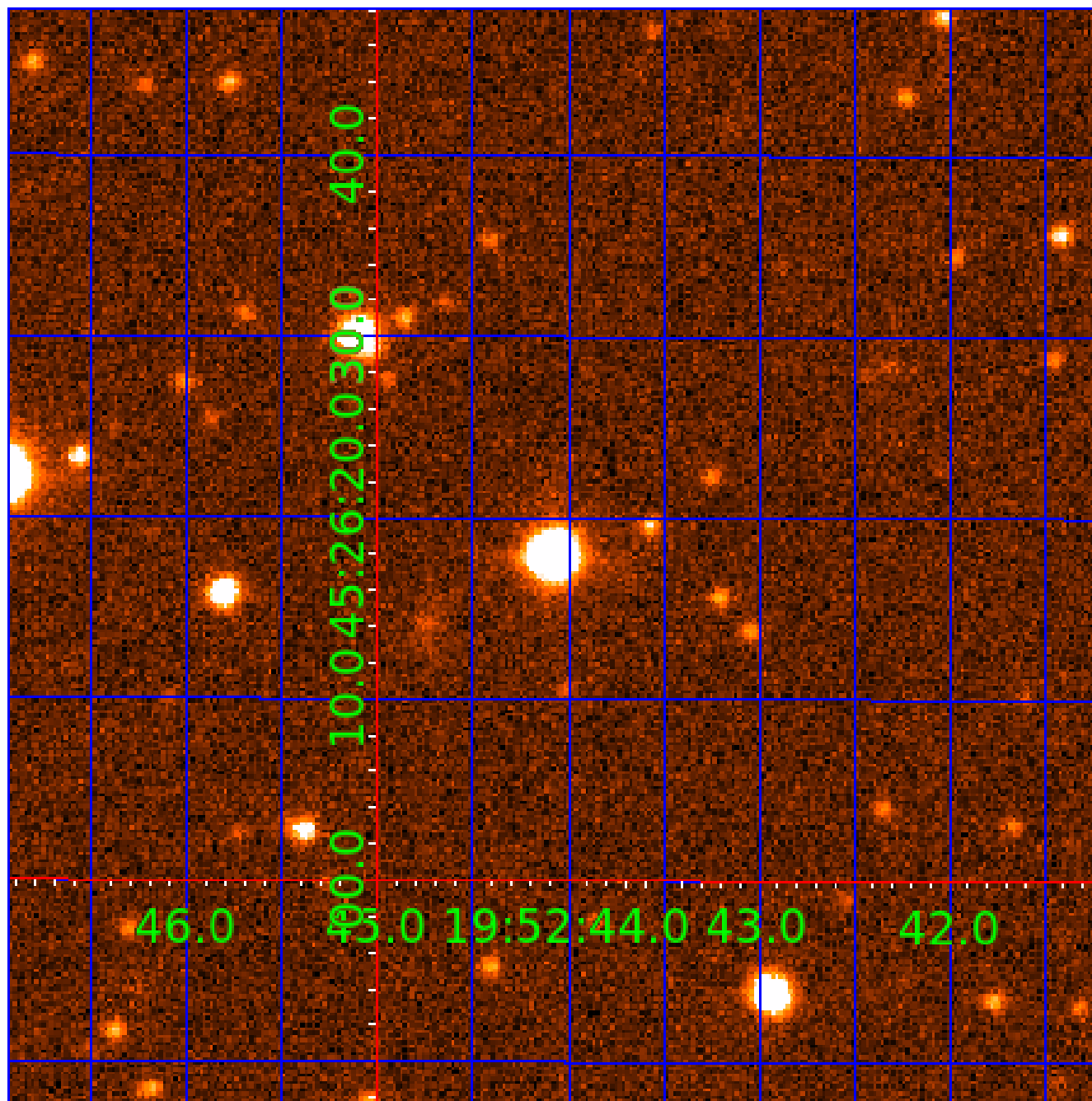


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009109743

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})
009109743-01	OBS	No	0.650073	131.824000	24.4	1.629	9.7	7.6	1.97	6428	1.14	24070.79
009109743-02	OBS	No	0.650071	132.145026	13.4	4.552	8.8	6.9	1.97	6428	0.73	24070.88

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009109743-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009109743-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFS

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

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

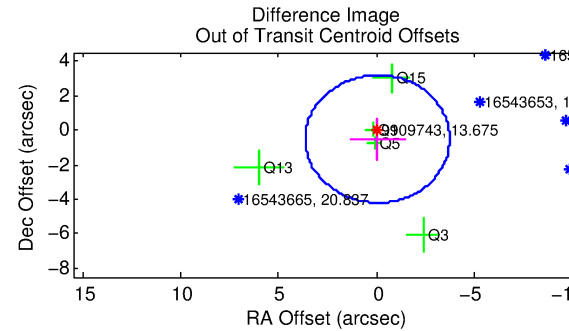
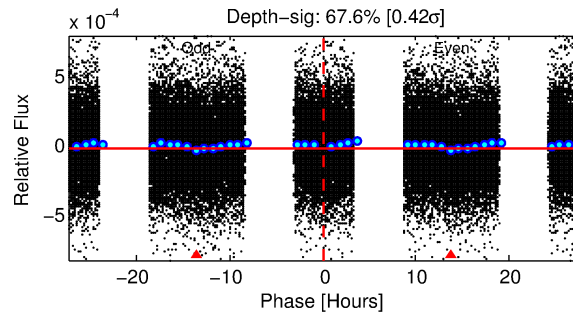
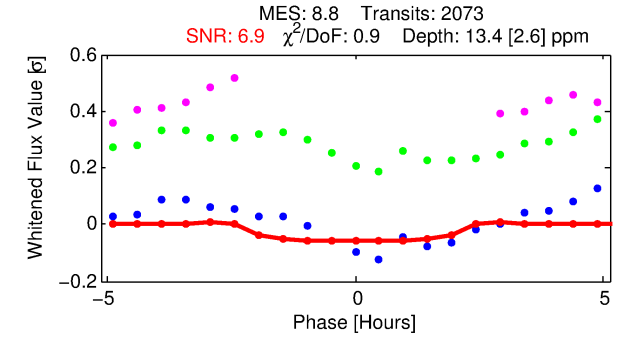
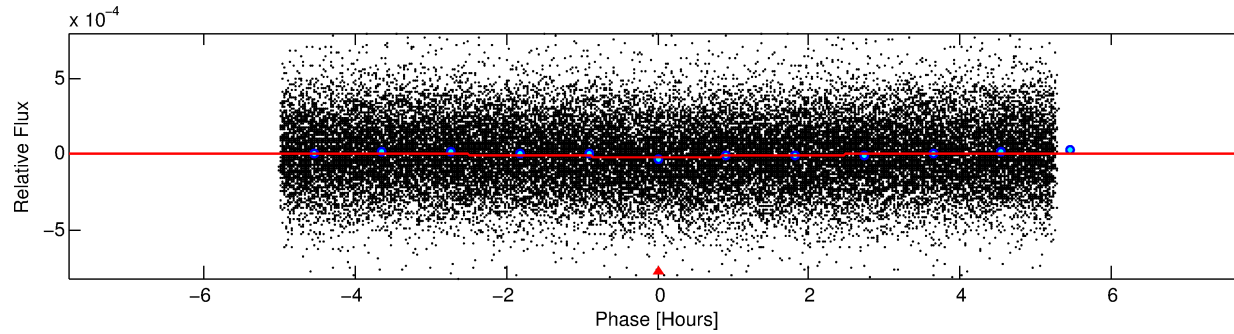
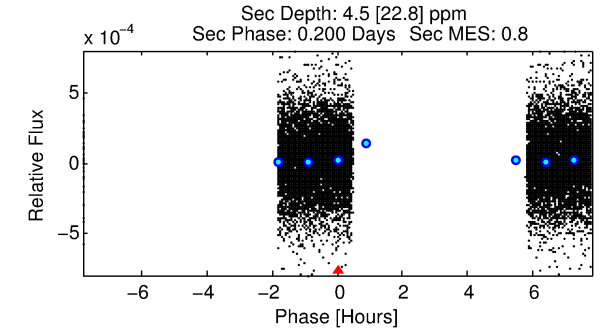
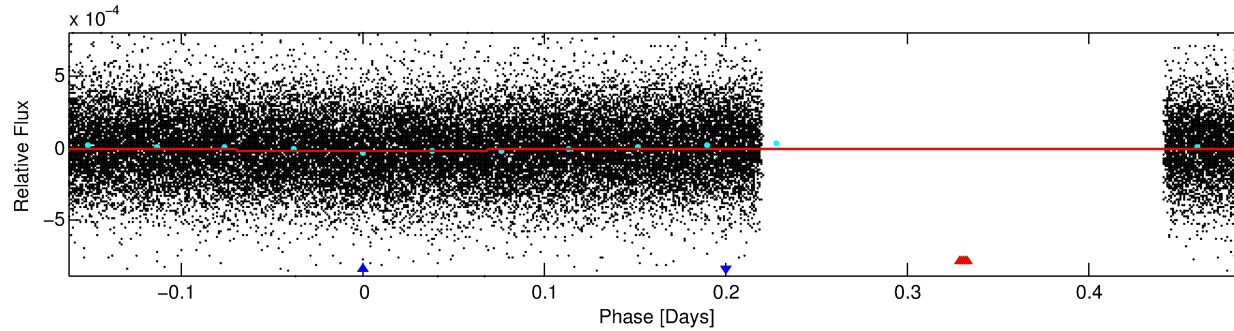
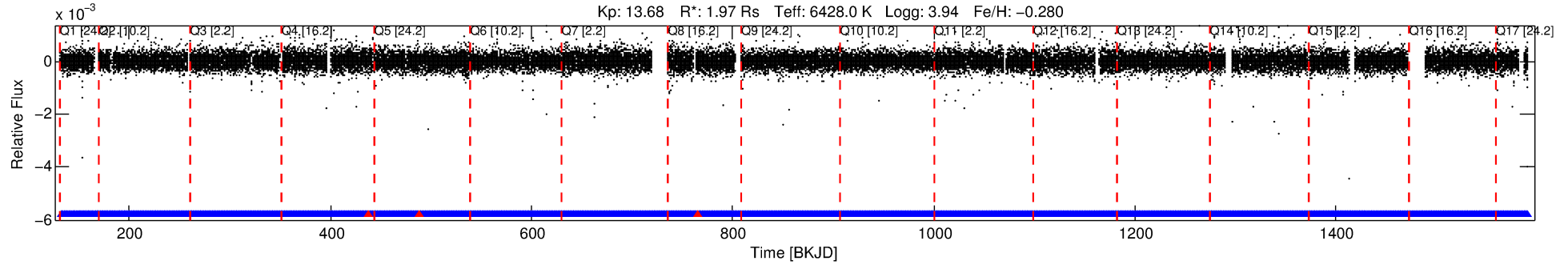
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009109743-02

No Significant Match Found

DV One-Page Summary

KIC: 9109743 Candidate: 2 of 2 Period: 0.650 d



DV Fit Results:

Period = 0.65007 [0.00002] d
Epoch = 132.1450 [0.0072] BKJD
Rp/R* = 0.0034 [0.0041]
a/R* = 1.23 [2.69]
b = 0.38 [14.59]
Seff = 24070.88 [16342.69]
Teq = 3176 [539] K
Rp = 0.73 [0.94] Re
a = 0.0157 [0.0064] AU
Ag = 1.13 [6.38] [0.02σ]
Teffp = 5061 [7107] K [0.26σ]

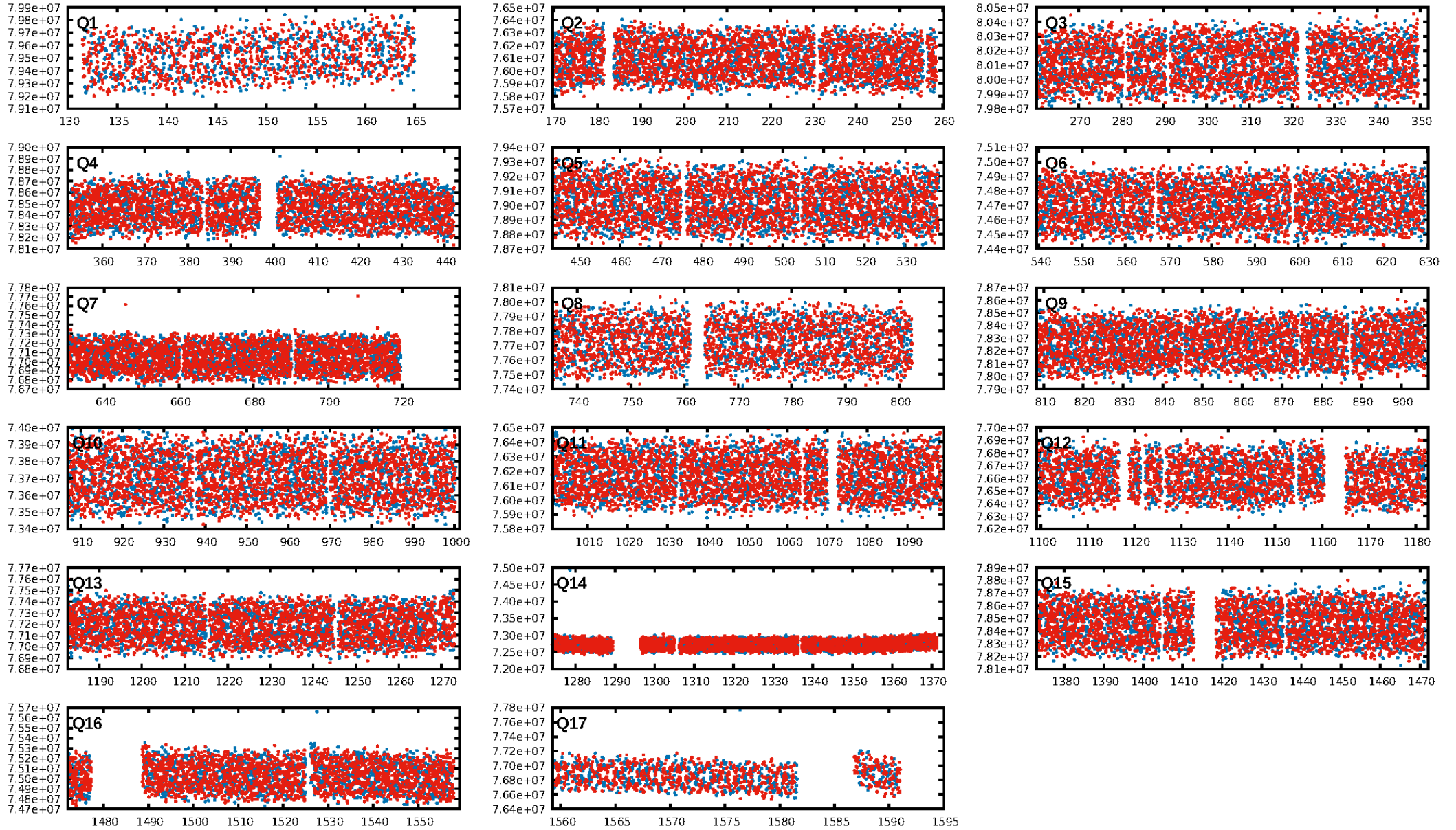
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1977/1980]
GhostDiagnostic-chr: 2.572
Centroid-sig: 1.0%
Centroid-so: 2.619 arcsec [1.66σ]
OotOffset-rm: 0.516 arcsec [0.42σ]
KicOffset-rm: 0.533 arcsec [0.37σ]
OotOffset-st: 0/2/0/3 [5]
KicOffset-st: 0/2/0/3 [5]
DiffImageQuality-fgm: 0.40 [2/5]
DiffImageOverlap-fno: 0.00 [0/17]

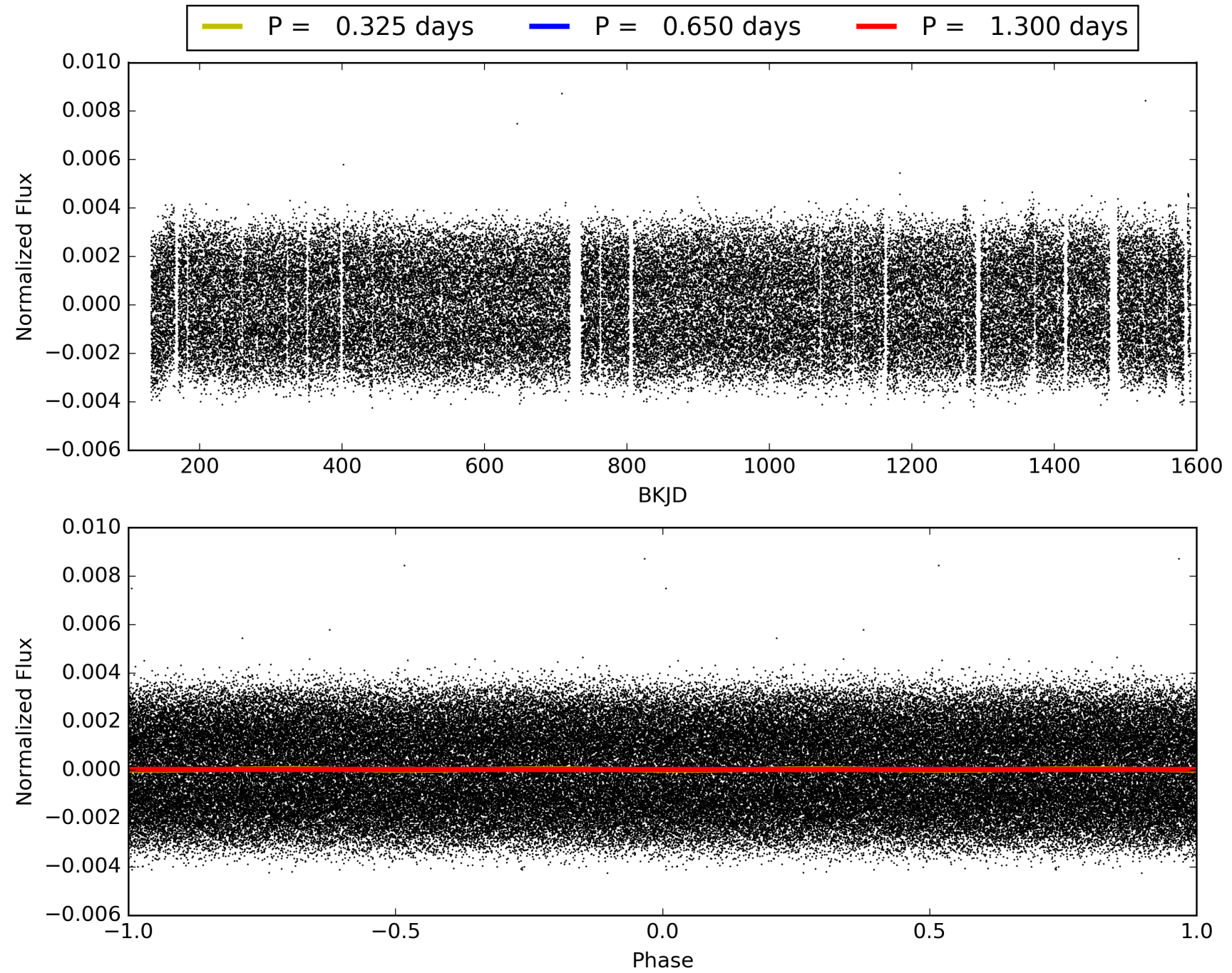
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 12:14:34 Z

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

TCE 009109743-02, PDC Light Curves

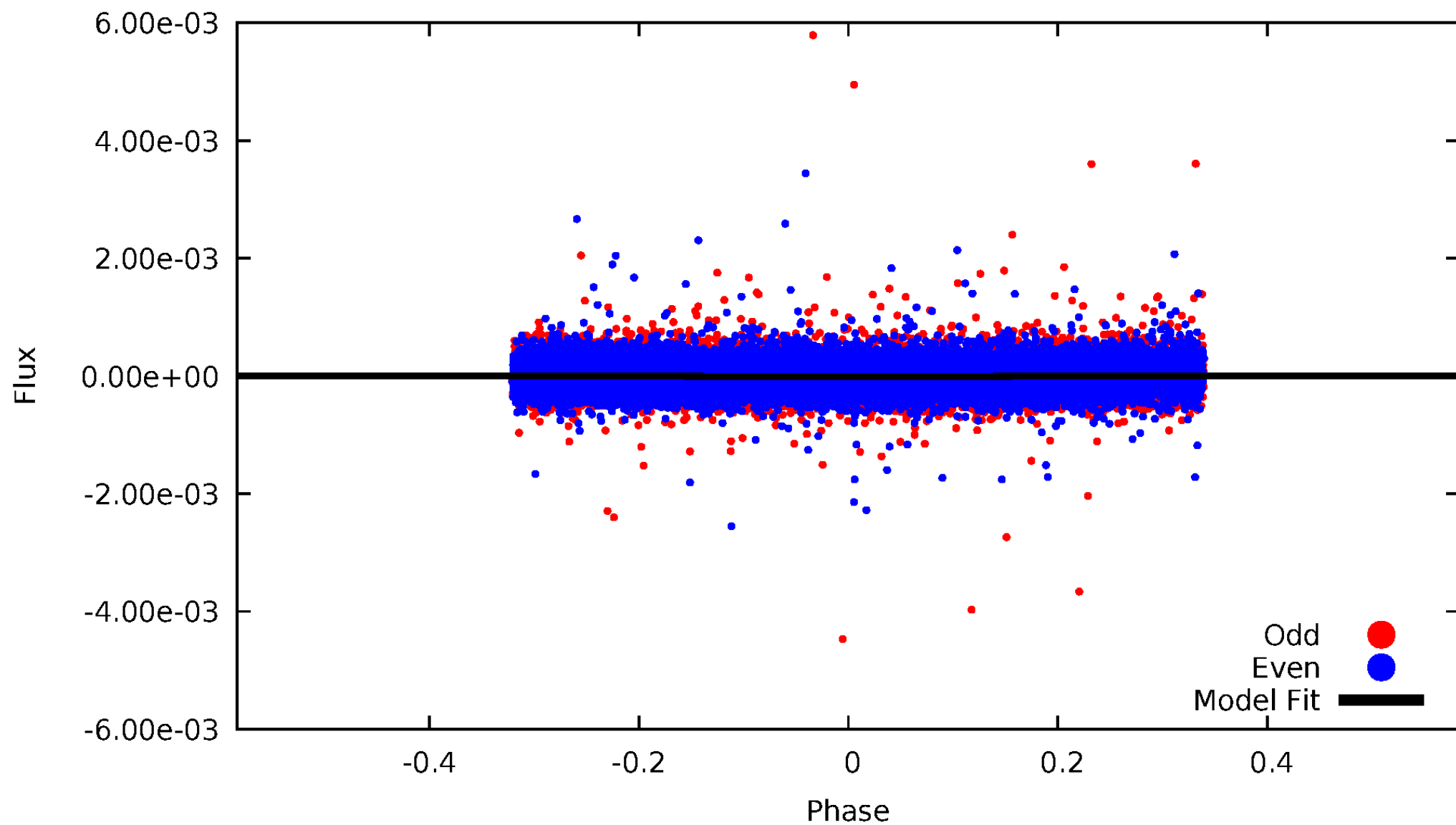


TCE 009109743-02



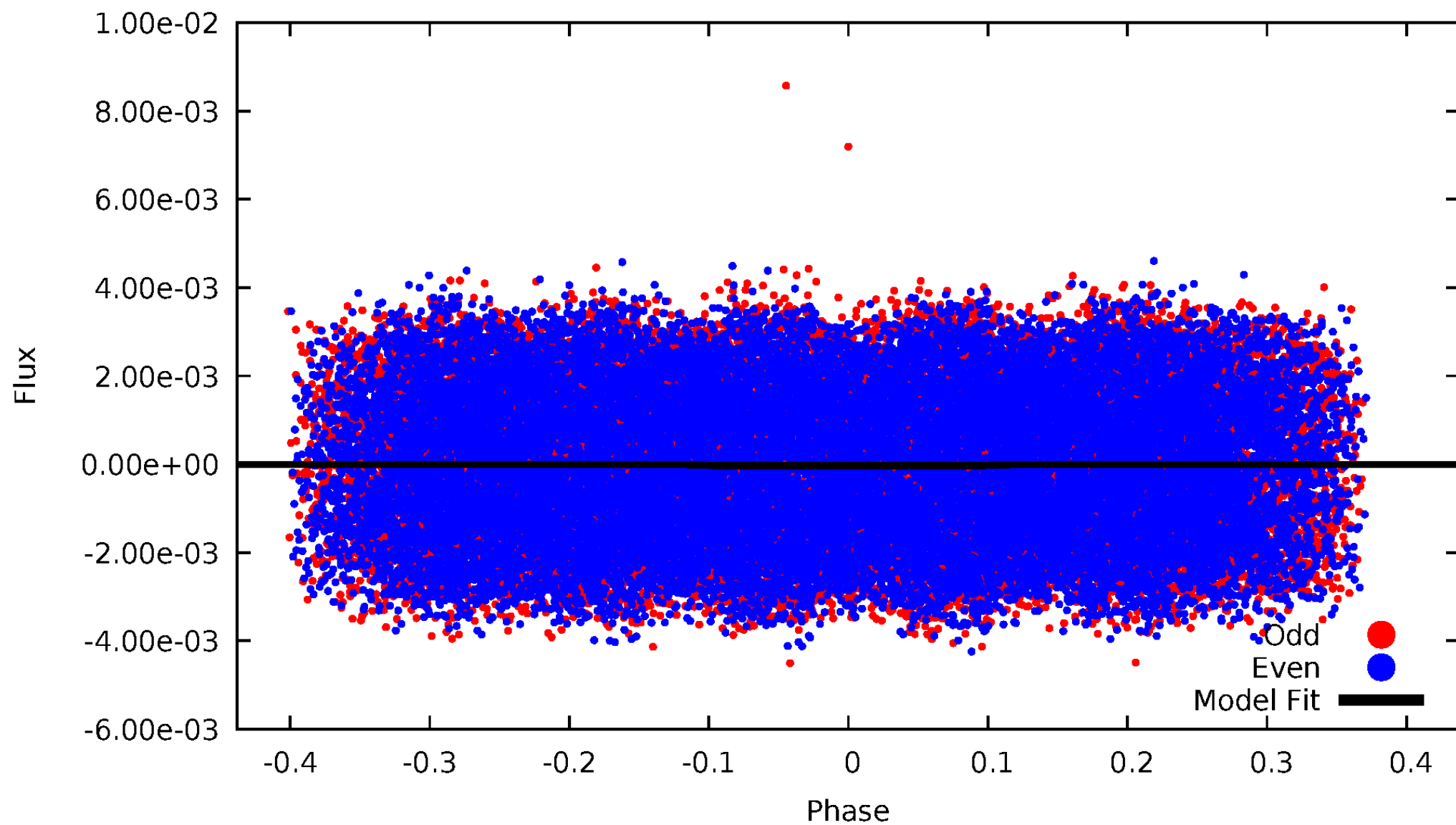
DV Odd/Even

TCE 009109743-02



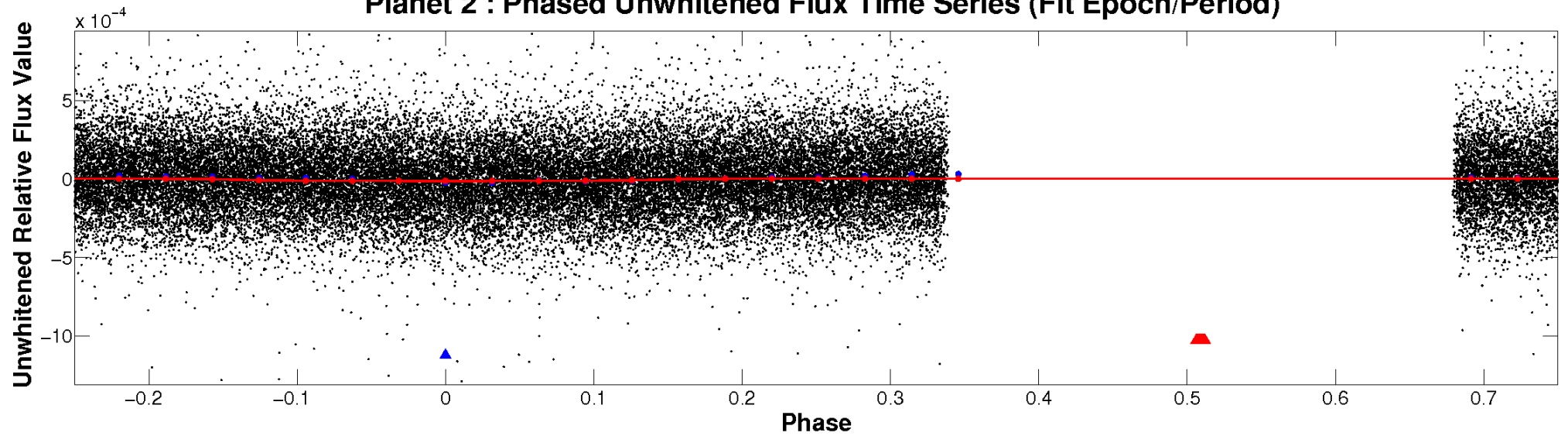
ALT Odd/Even

TCE 009109743-02

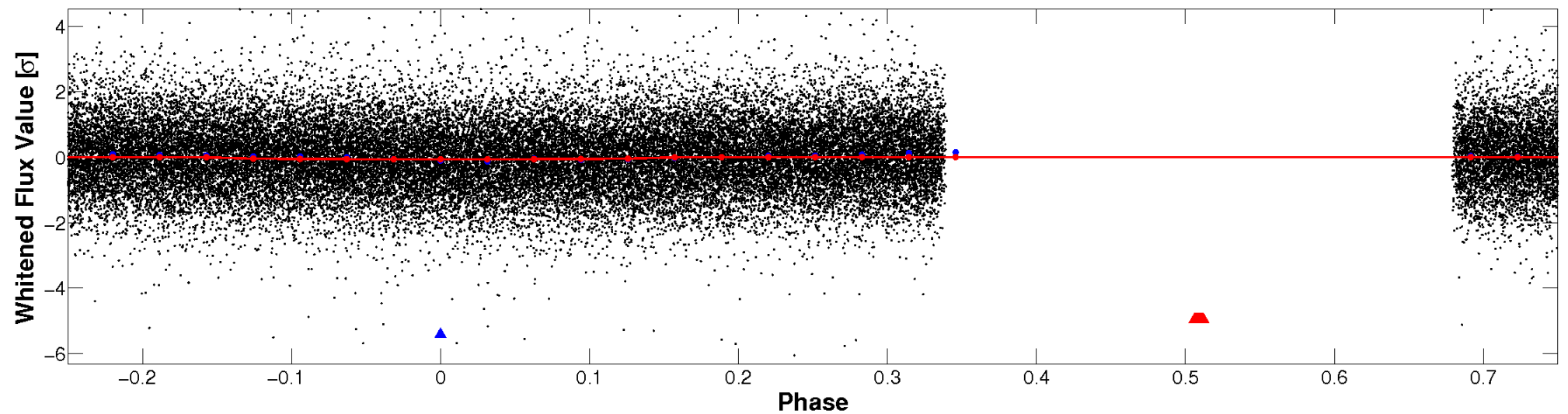


Non-Whitened Vs. Whitened Light Curve

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

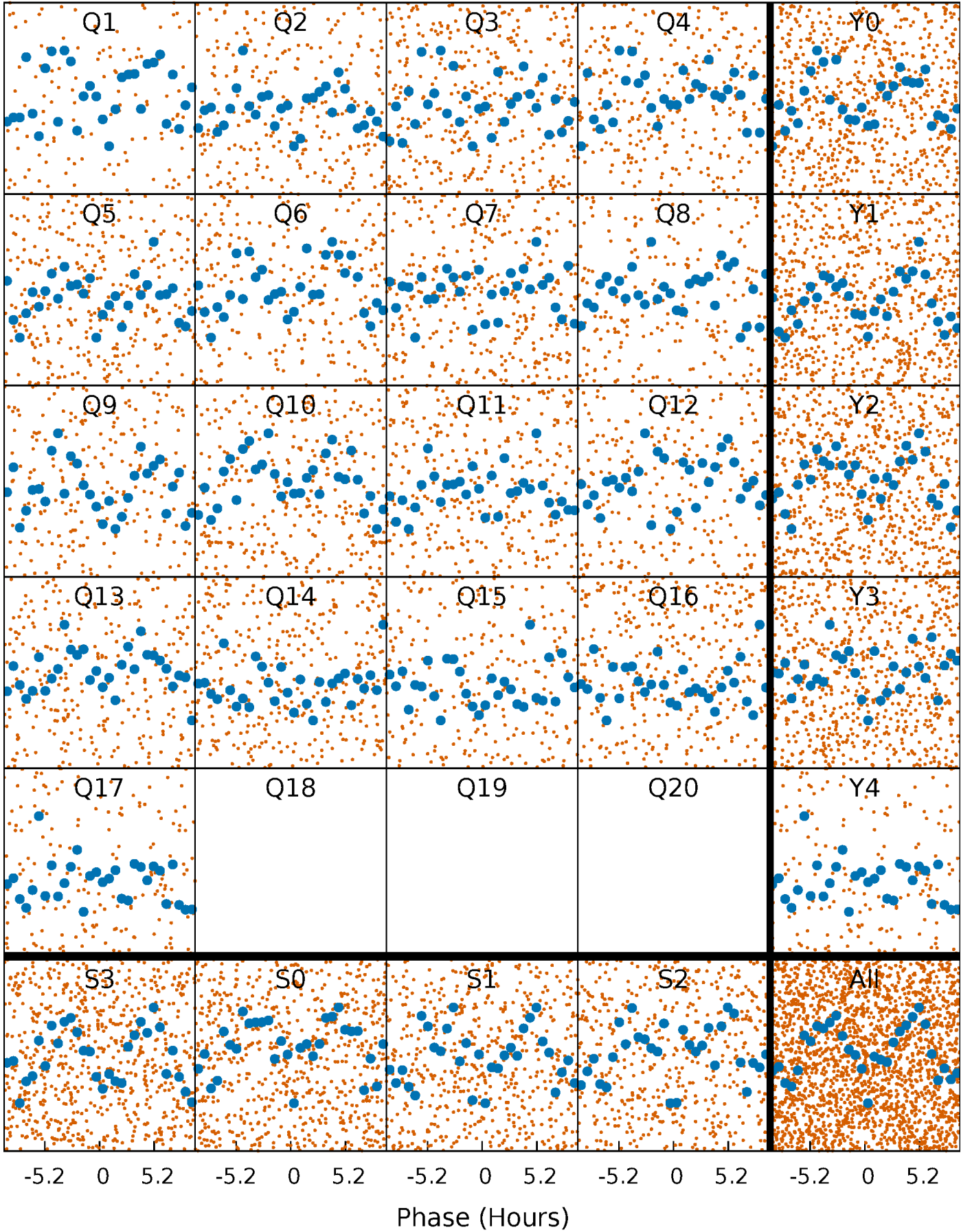


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



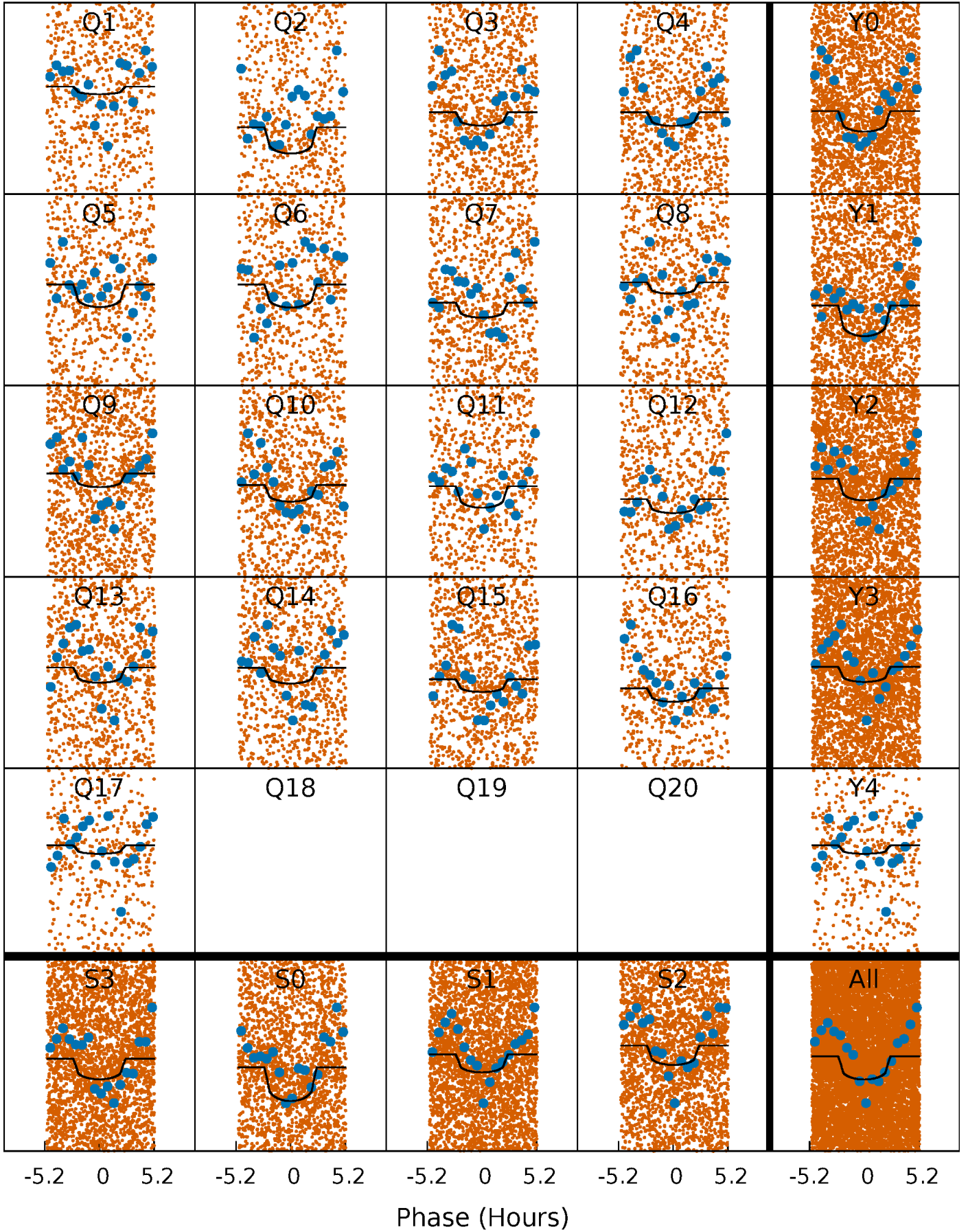
PDC Quarter-Phased Transit Curves

TCE 009109743-02 $P = 0.650071$ Days $T_0 = 132.145026$ (BKJD)



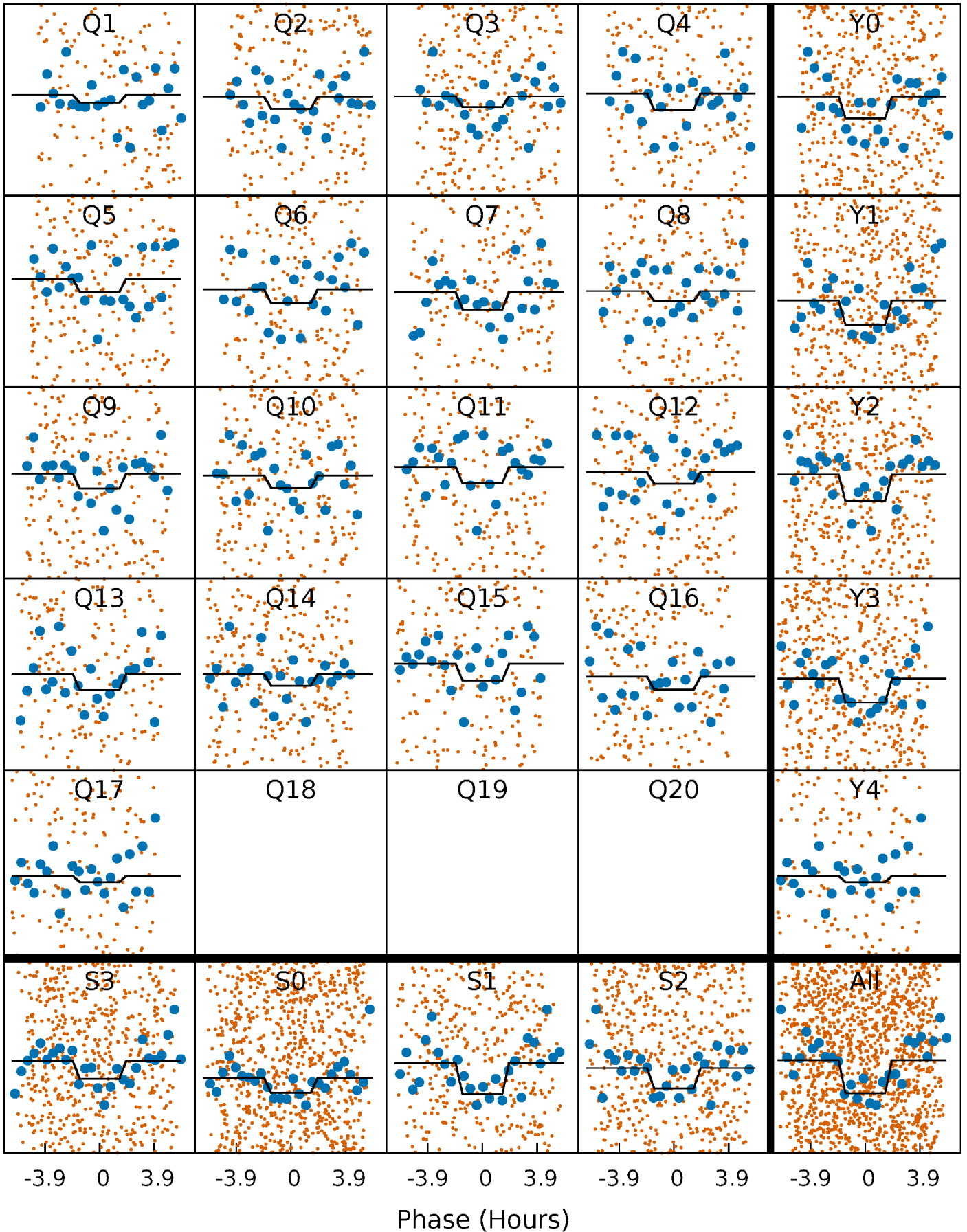
DV Quarter-Phased Transit Curves

TCE 009109743-02 P= 0.650071 Days $T_0=132.145026$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

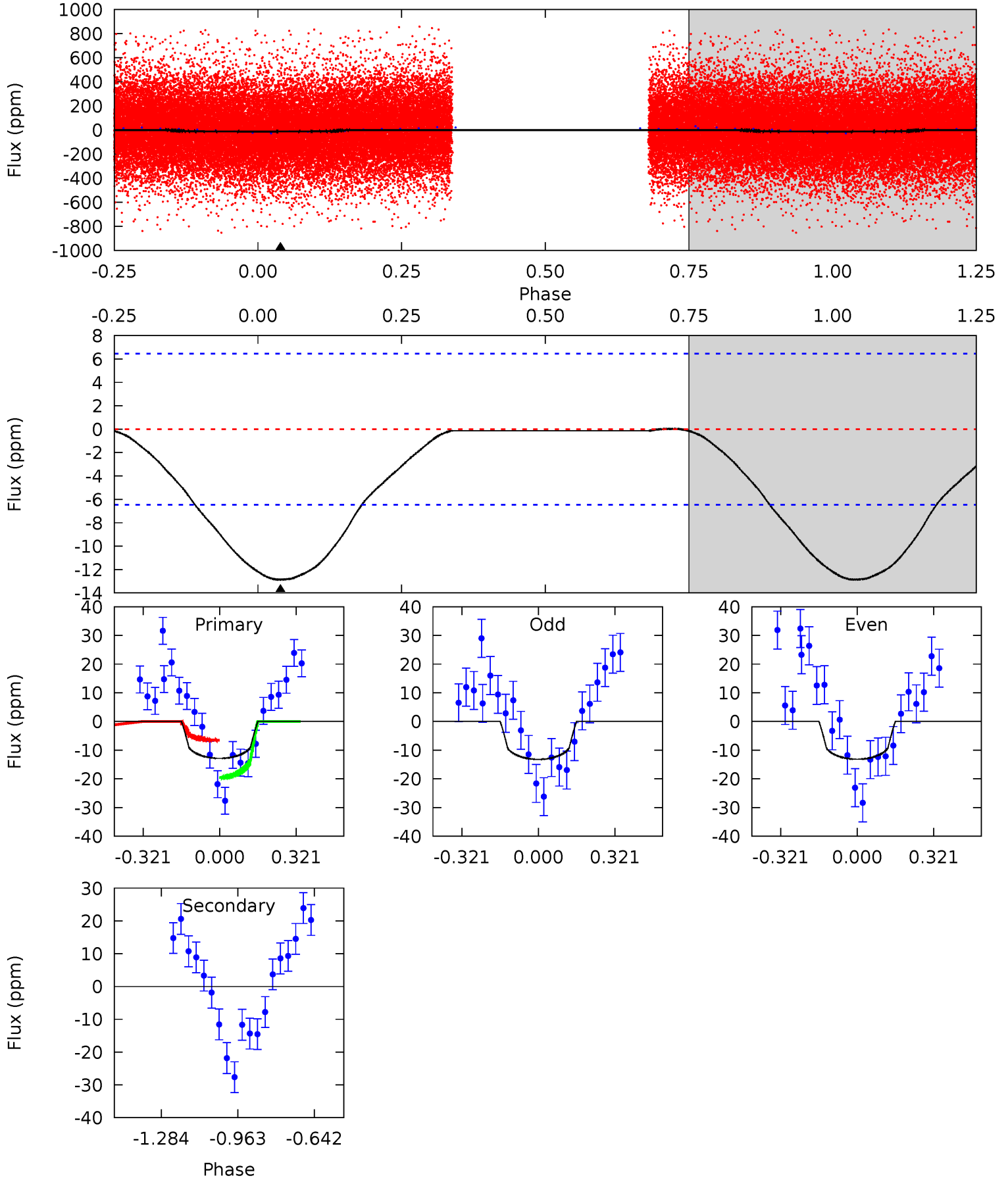
TCE 009109743-02 P= 0.650107 Days $T_0=132.119805$ (BKJD)



DV Model-Shift Uniqueness Test

009109743-02, P = 0.650071 Days, E = 131.494955 Days

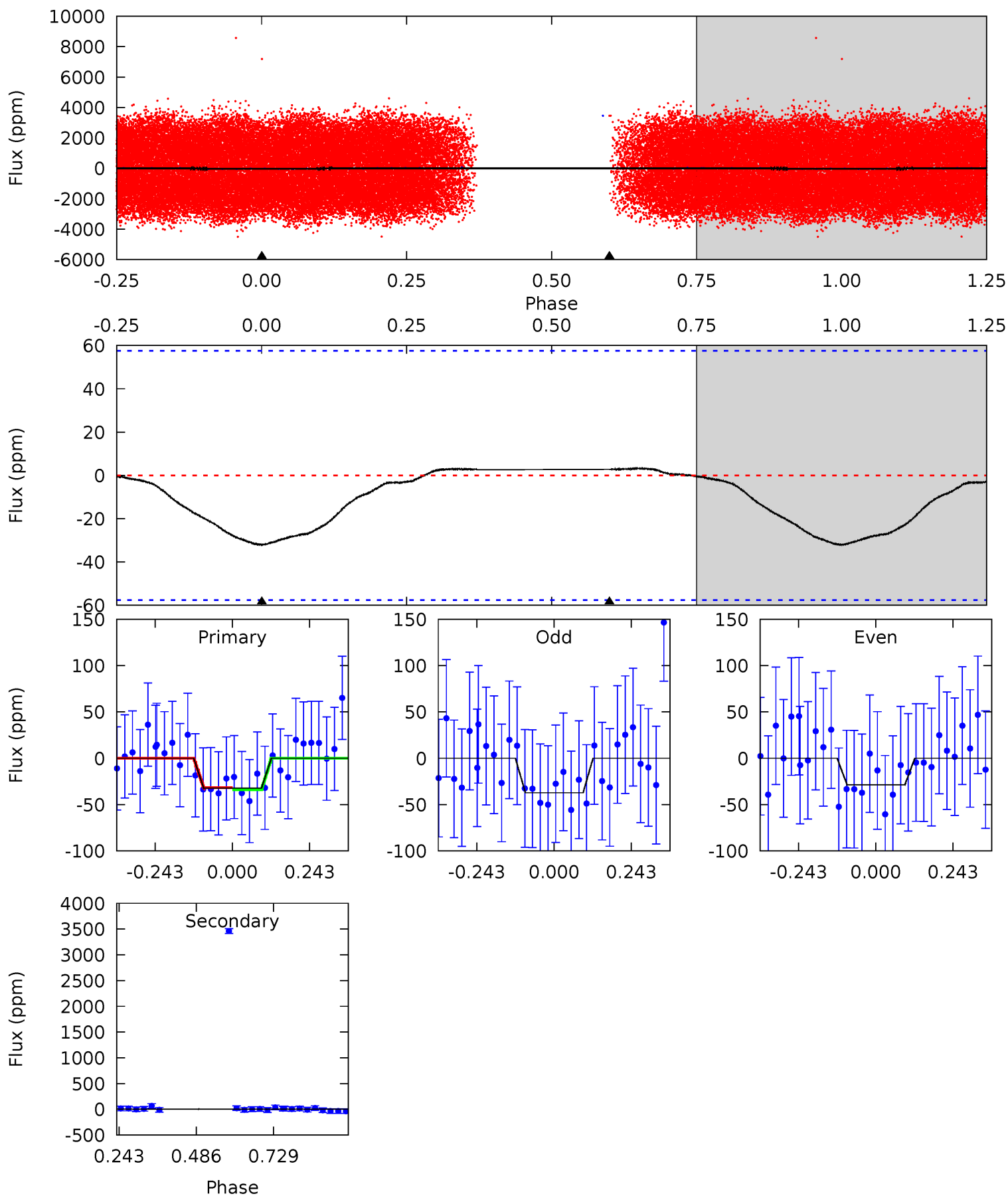
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.59	0	0	0	4.31	0.99	0.04	8.59	8.59	0	0	0.01	0.78	0.00	4.30



Alt Model-Shift Uniqueness Test

009109743-02, P = 0.650107 Days, E = 131.469698 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.45	-0.21	0	0	4.37	1.17	0.17	2.45	2.45	-0.21	-0.21	0.32	0.74	0.10	0.09



Stellar Parameters For KIC 009109743

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6428^{+175}_{-214}	$3.935^{+0.397}_{-0.132}$	$-0.280^{+0.250}_{-0.300}$	$1.965^{+0.527}_{-0.790}$	$1.212^{+0.201}_{-0.221}$	$0.225^{+0.740}_{-0.098}$
	+3%/-3%	+10%/-3%	+89%/-107%	+27%/-40%	+17%/-18%	+329%/-44%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009109743-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1	$0.88^{+0.76}_{-0.55}$	4333^{+333}_{-488}	-3833^{+7105}_{-647}	$0.011^{+0.419}_{-0.364}$
Alt.	3 ± 13	$1.19^{+0.92}_{-0.70}$	4330^{+331}_{-439}	-4227^{+8791}_{-1821}	$-0.185^{+1.235}_{-2.231}$

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 $A_{obs} \gg 1.0$

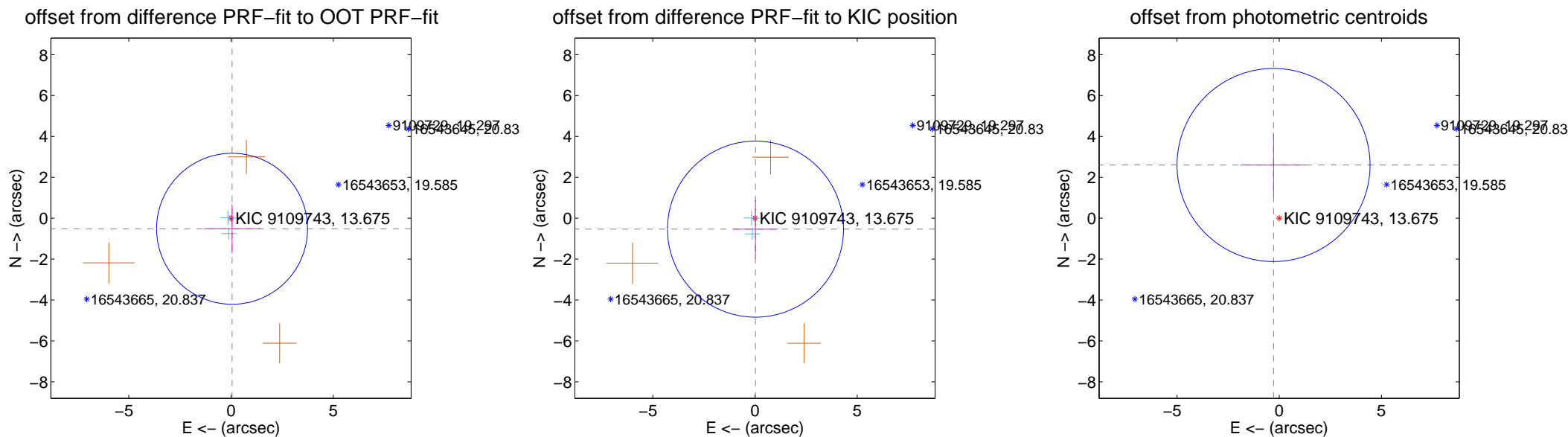
DV Centroid Data

Supplemental centroid analysis for 009109743-02. Kepler magnitude: 13.68. Transit SNR 6.93

There are 2 quarters with good PRF difference image offsets

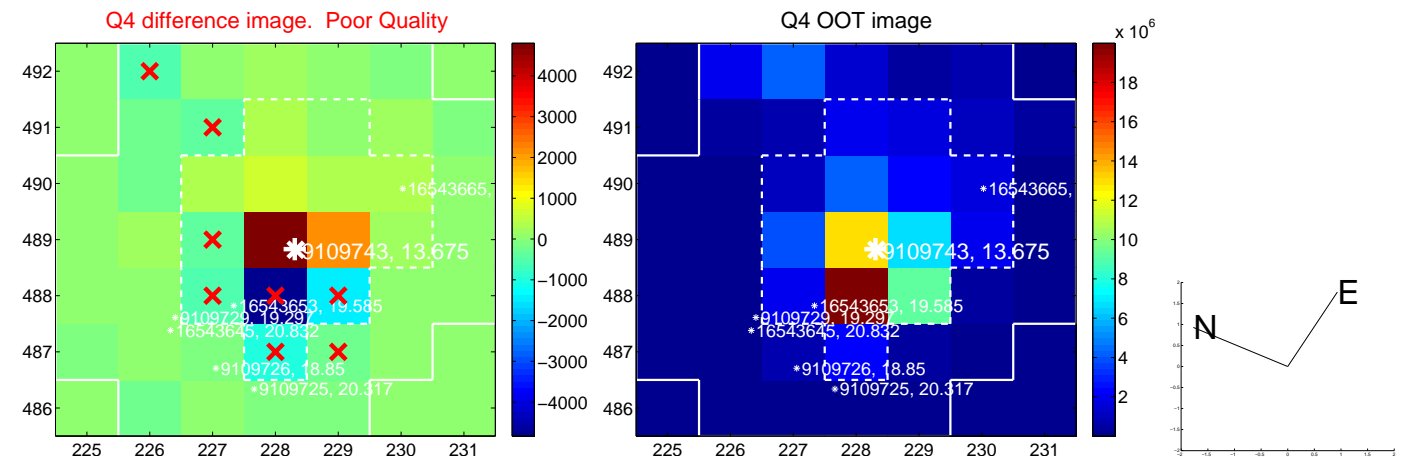
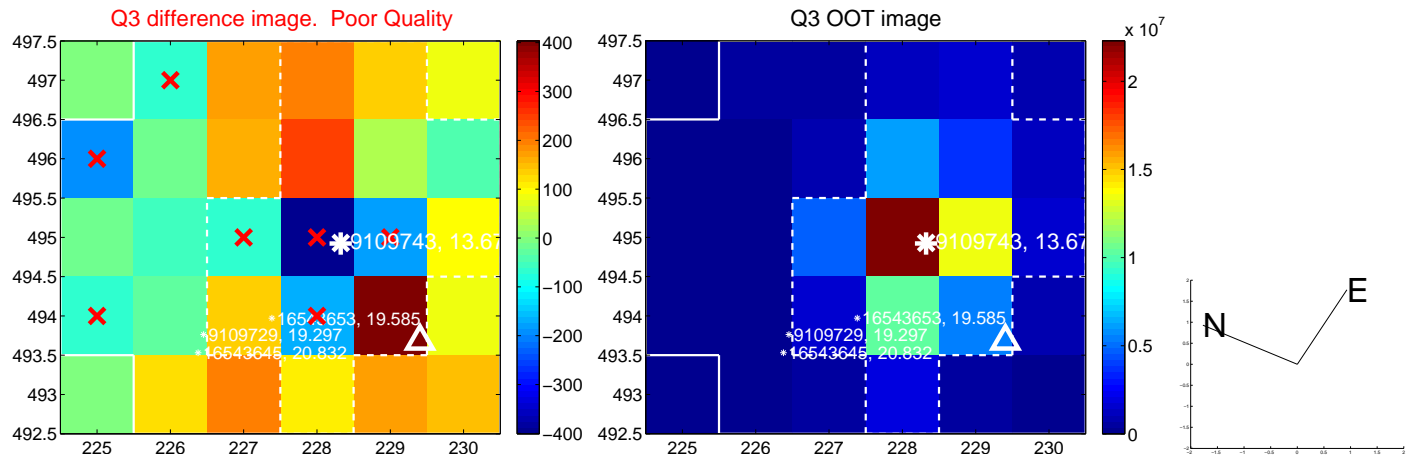
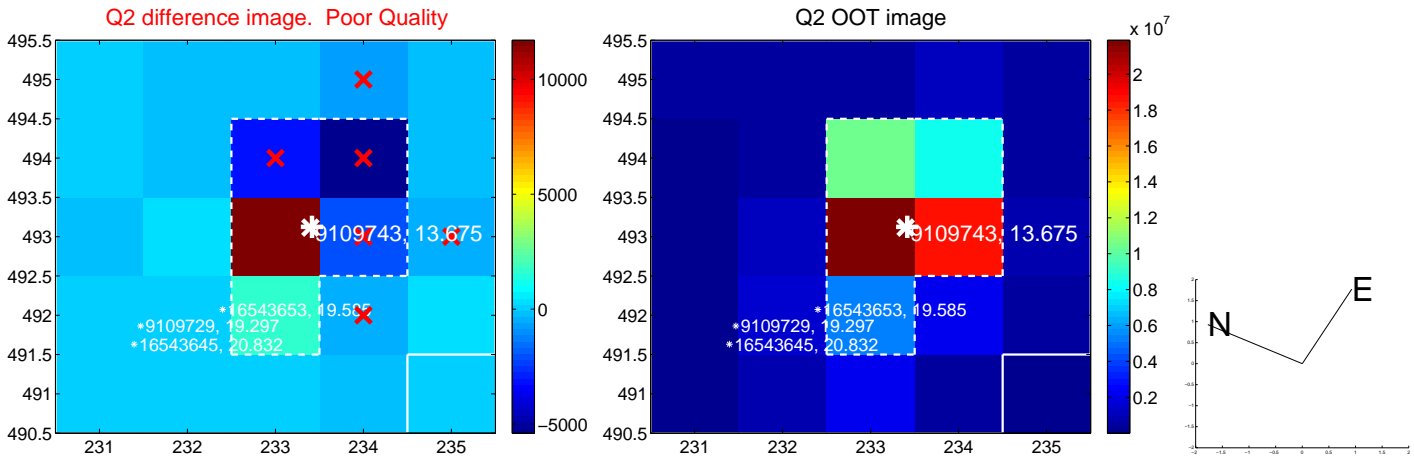
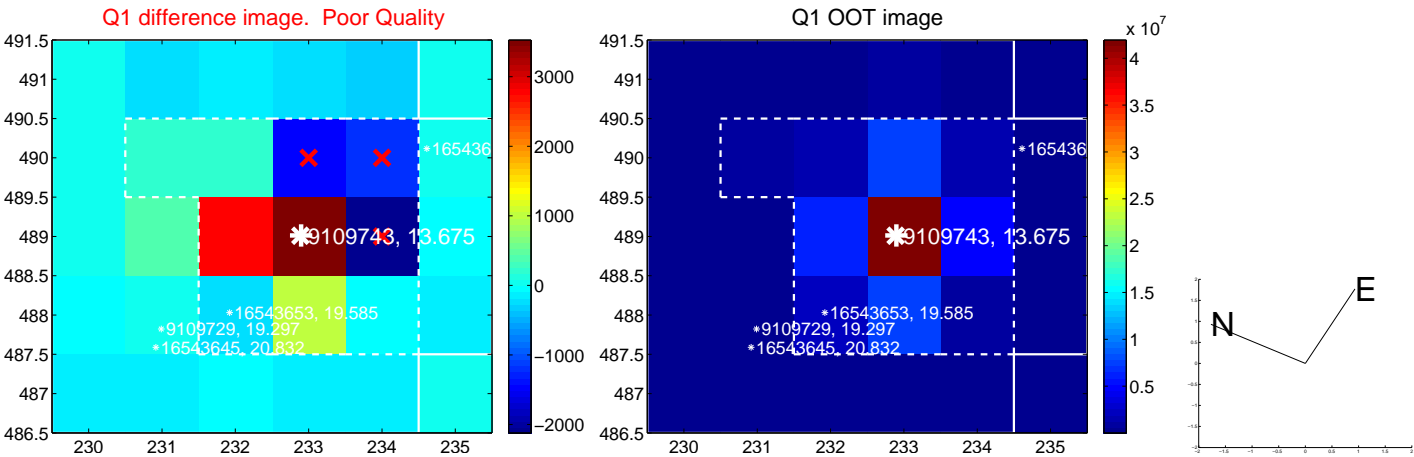
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.516 ± 1.230	0.42	-0.050 ± 1.391	-0.514 ± 1.199
PRF-fit source offset from KIC position	0.533 ± 1.435	0.37	-0.024 ± 1.102	-0.532 ± 1.432
photometric centroid source offset	2.62 ± 1.57	1.66	0.28 ± 1.62	2.60 ± 1.57

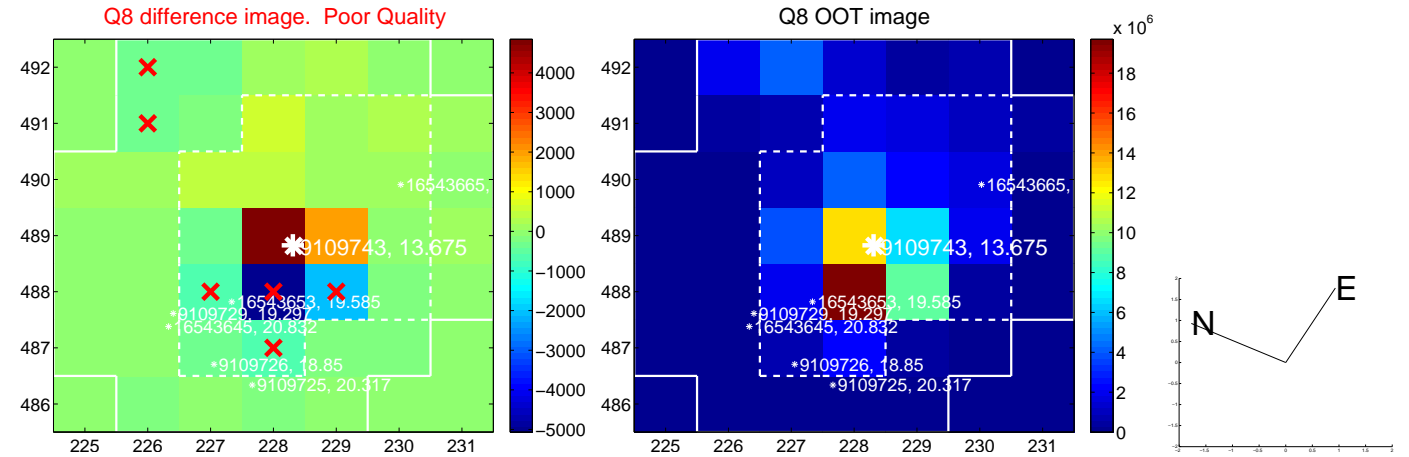
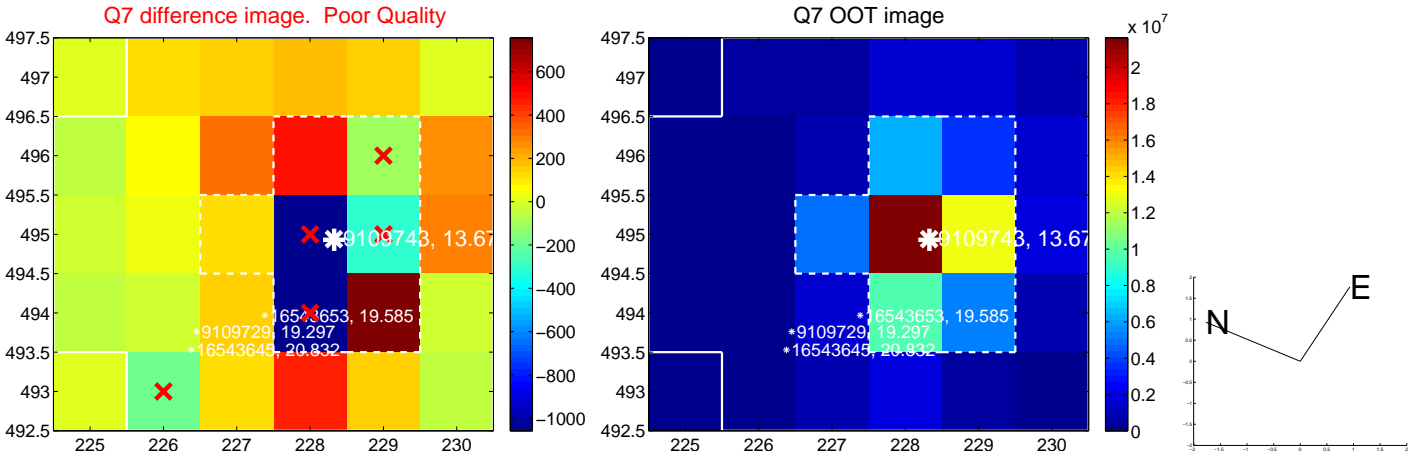
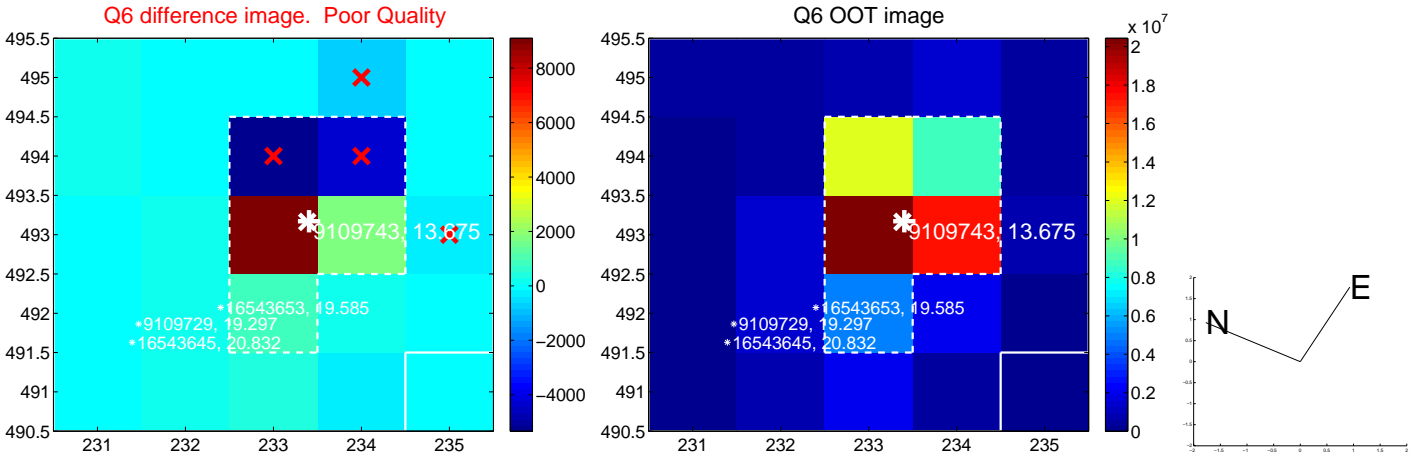
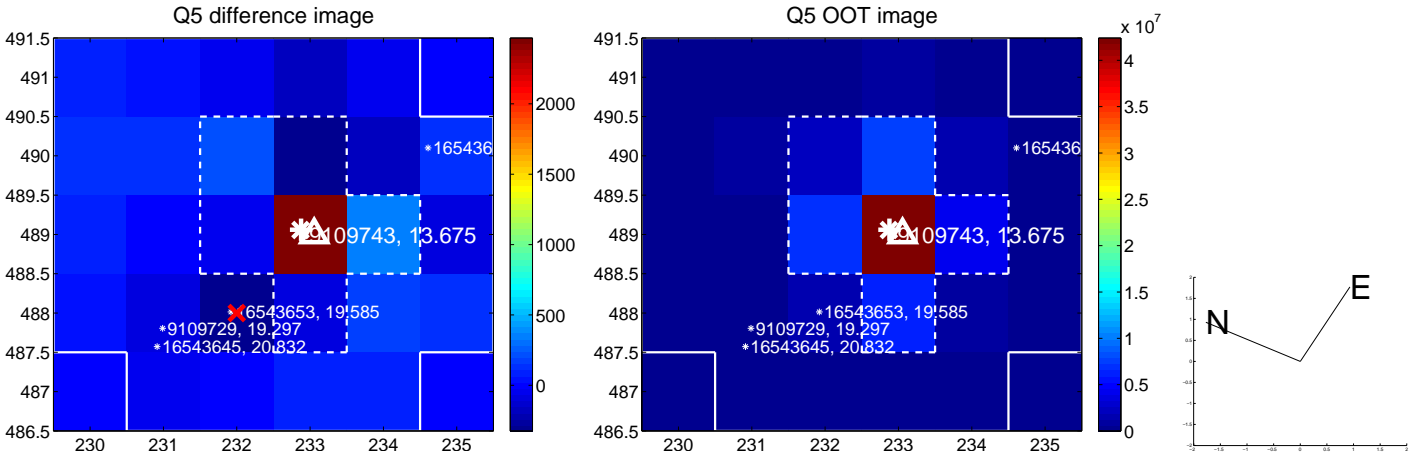


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

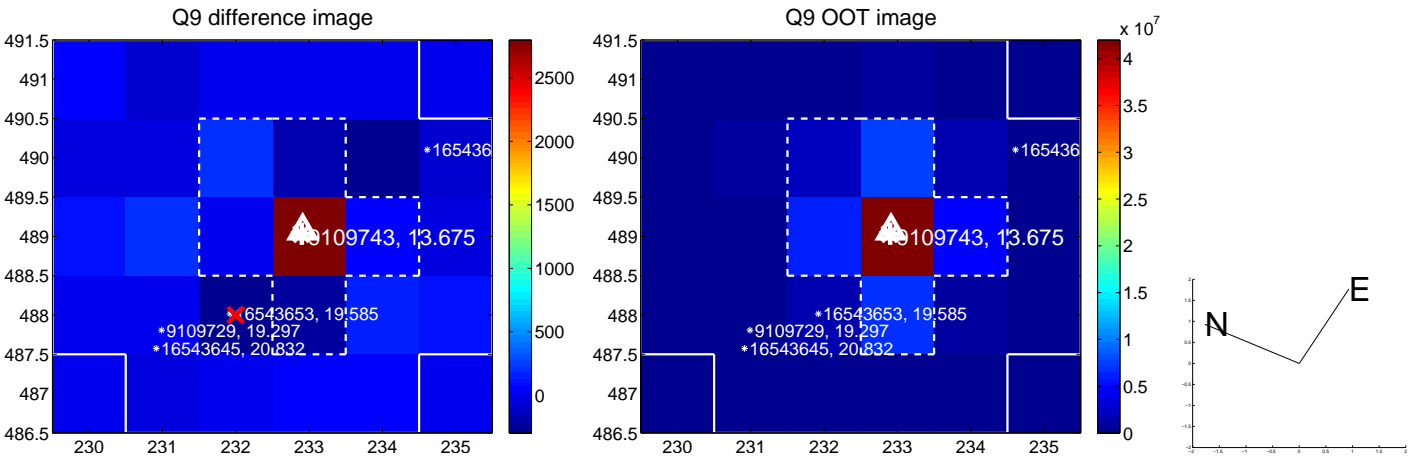
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



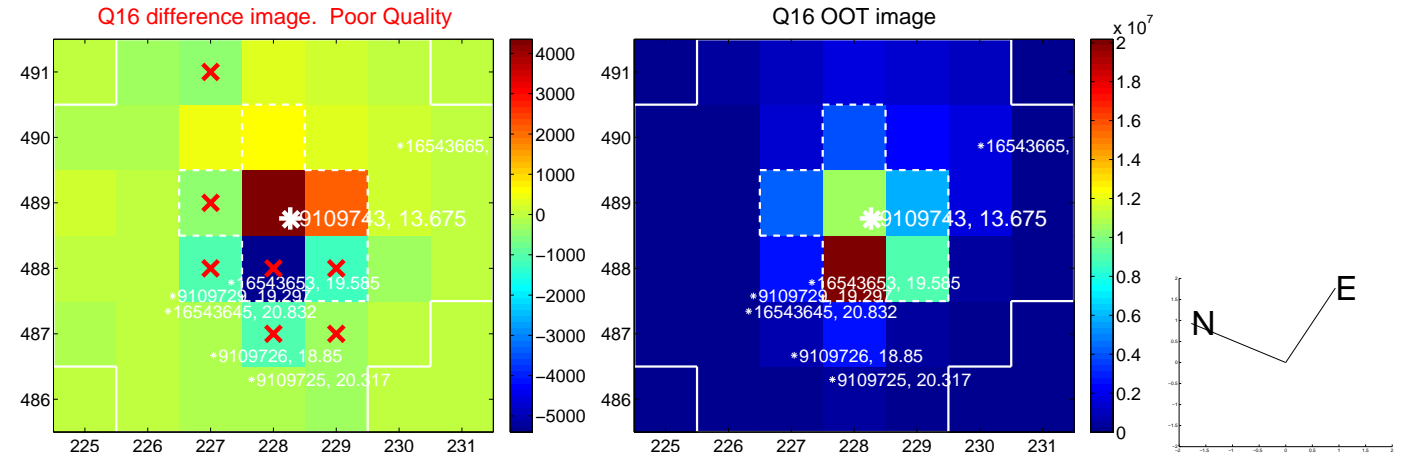
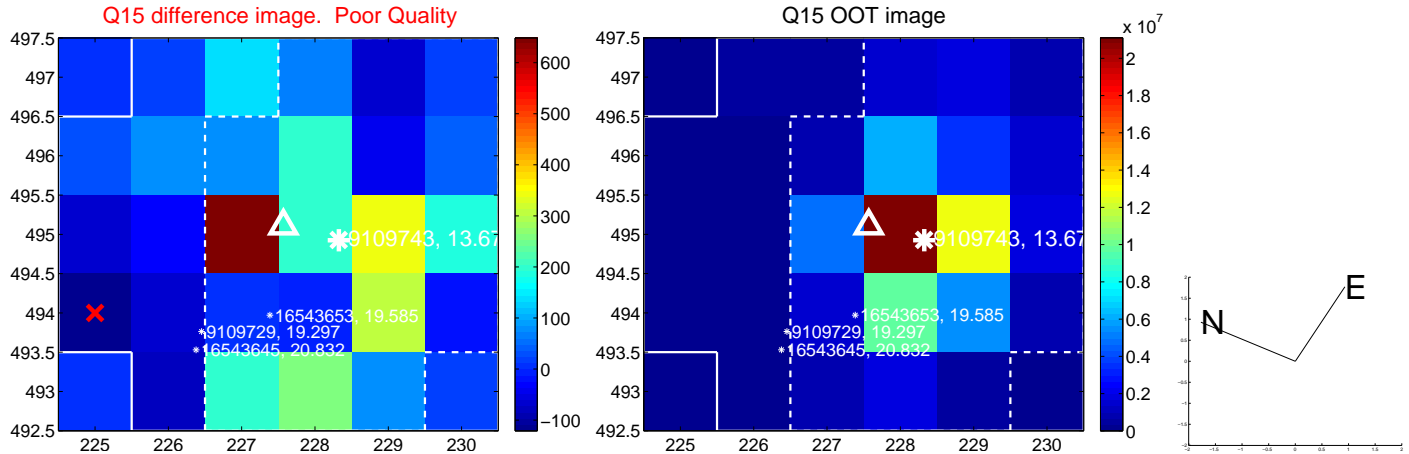
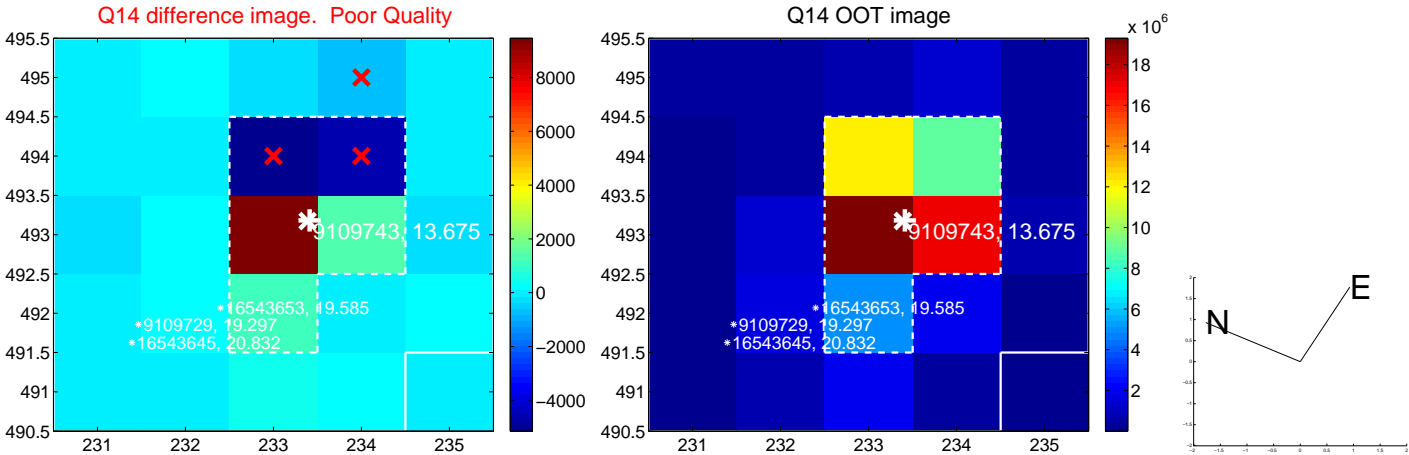
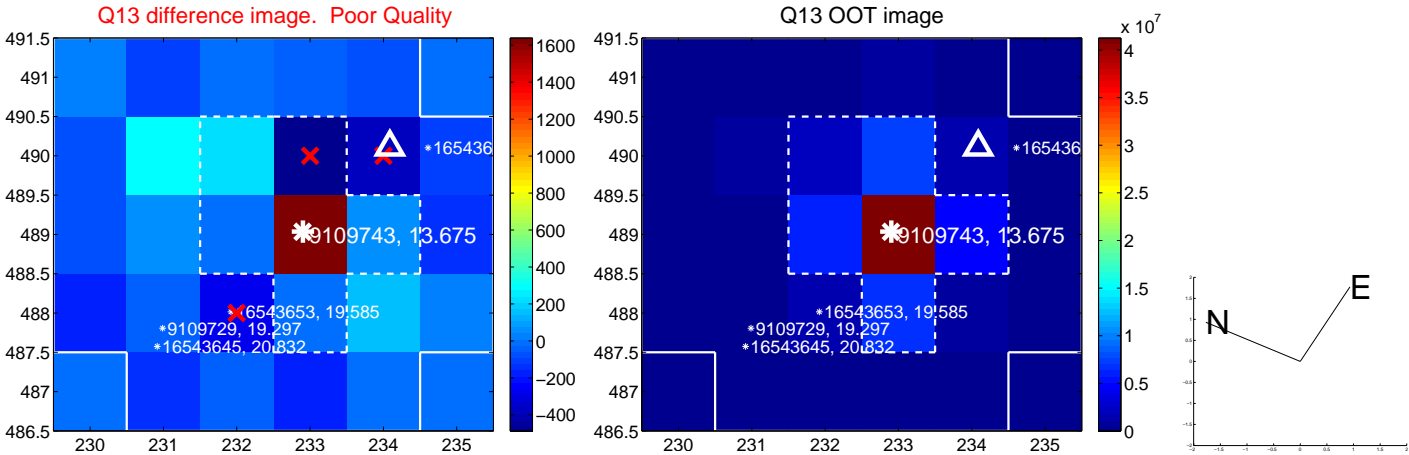
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

