

KIC 009943441

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})
009943441-01	OBS	No	0.730372	131.713189	10.5	1.227	8.6	3.7	3.65	7773	1.40	109216.87
009943441-02	OBS	No	42.988070	139.230809	193.0	1.527	7.4	9.2	3.65	7773	5.96	477.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009943441-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009943441-02	OBS	FP	0.02	1	0	0	0	INDIV_TRANS_RUBBLE—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.

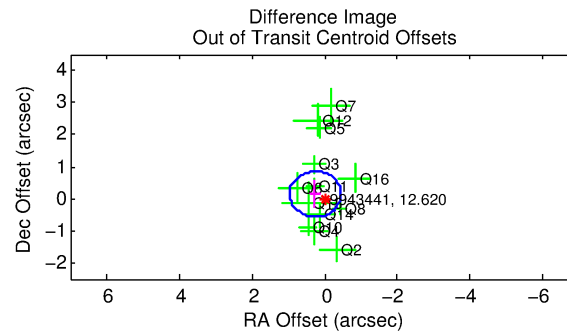
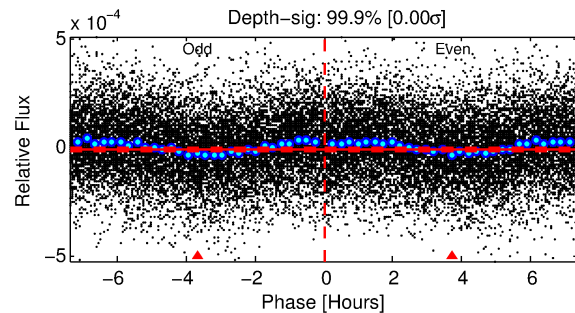
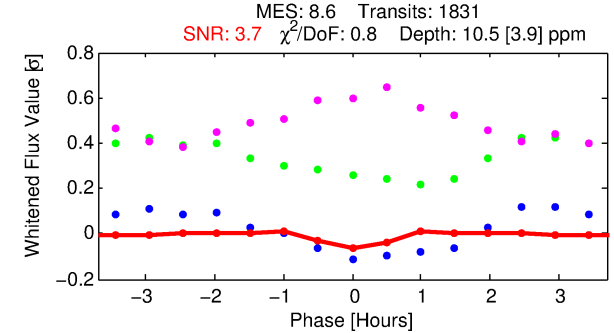
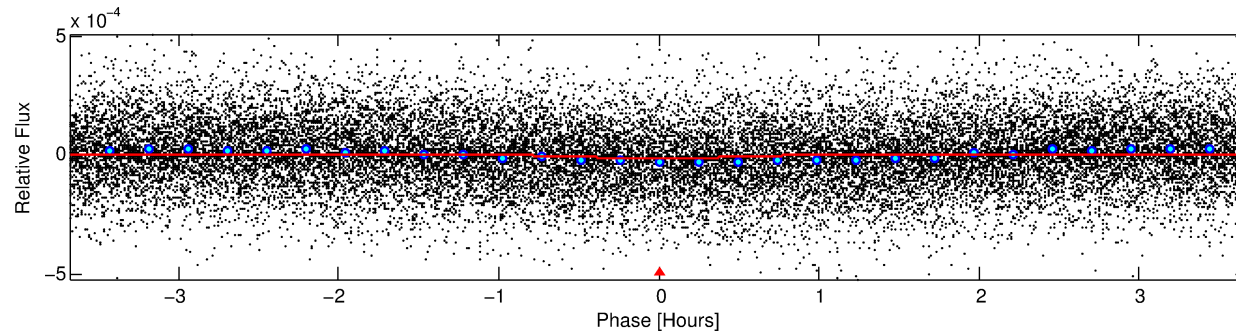
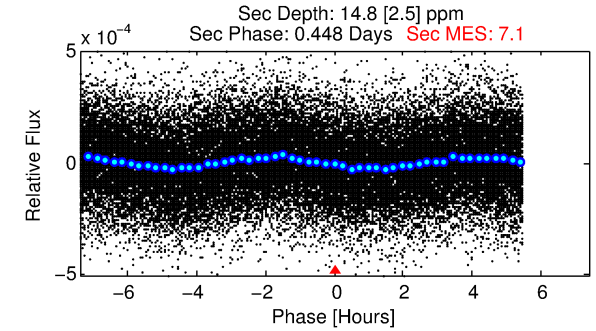
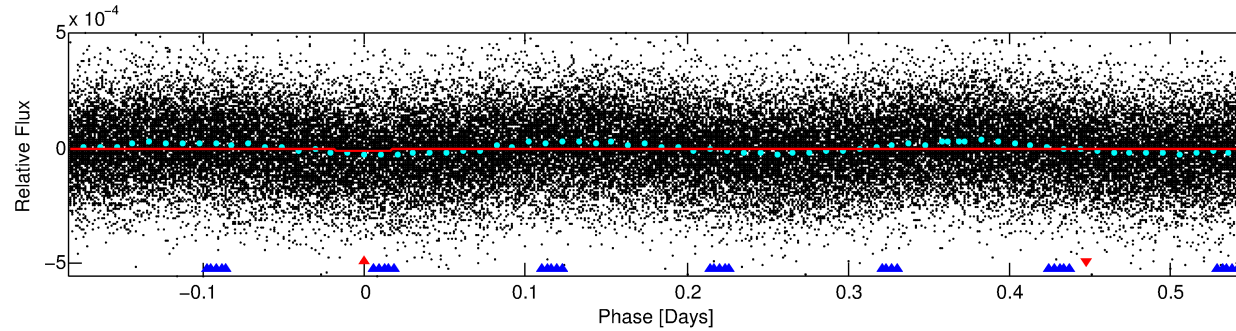
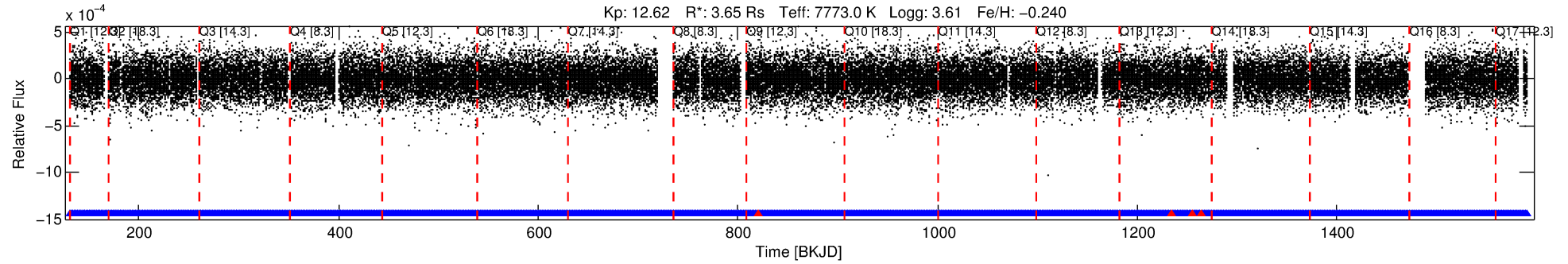
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009943441-01

No Significant Match Found

DV One-Page Summary

KIC: 9943441 Candidate: 1 of 2 Period: 0.730 d



DV Fit Results:

Period = 0.73037 [0.00003] d
Epoch = 131.7132 [0.0044] BKJD
Rp/R* = 0.0035 [0.0012]
a/R* = 2.22 [2.99]
b = 0.90 [0.36]
Seff = 109216.87 [99838.17]
Teq = 4636 [1059] K
Rp = 1.40 [0.87] Re
a = 0.0200 [0.0108] AU
Ag = 1.67 [1.91] [0.35σ]
Teffp = 8151 [1482] K [1.93σ]

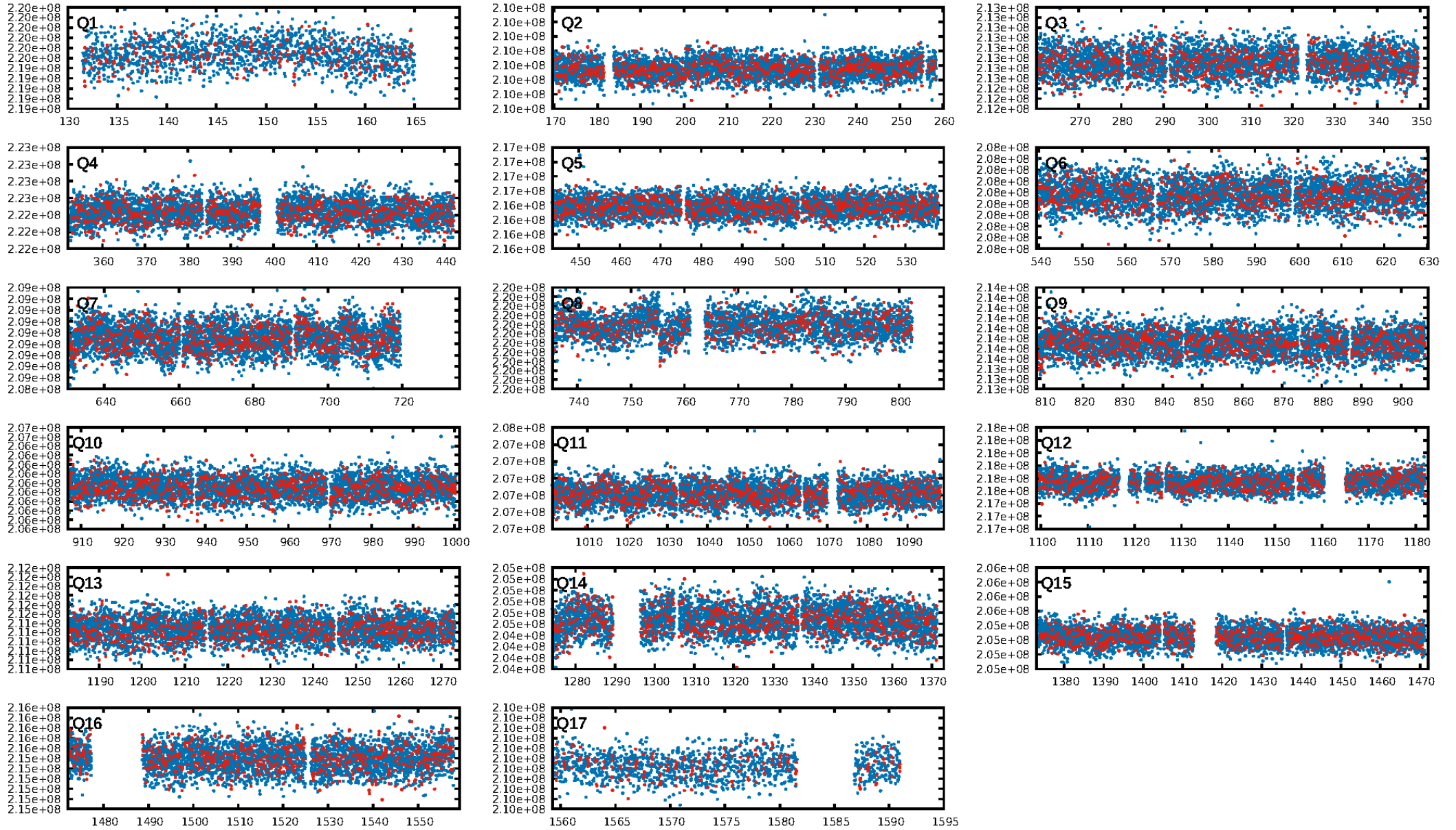
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [517.72σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.47e-14
RollingBand-fgt: 1.00 [1744/1748]
GhostDiagnostic-chr: 2.892
Centroid-sig: 10.3%
Centroid-so: 2.510 arcsec [1.36σ]
OotOffset-rm: 0.296 arcsec [1.25σ]
KicOffset-rm: 0.262 arcsec [1.87σ]
OotOffset-st: 4/3/4/2 [13]
KicOffset-st: 4/3/4/2 [13]
DiffImageQuality-fgm: 1.00 [13/13]
DiffImageOverlap-fno: 1.00 [17/17]

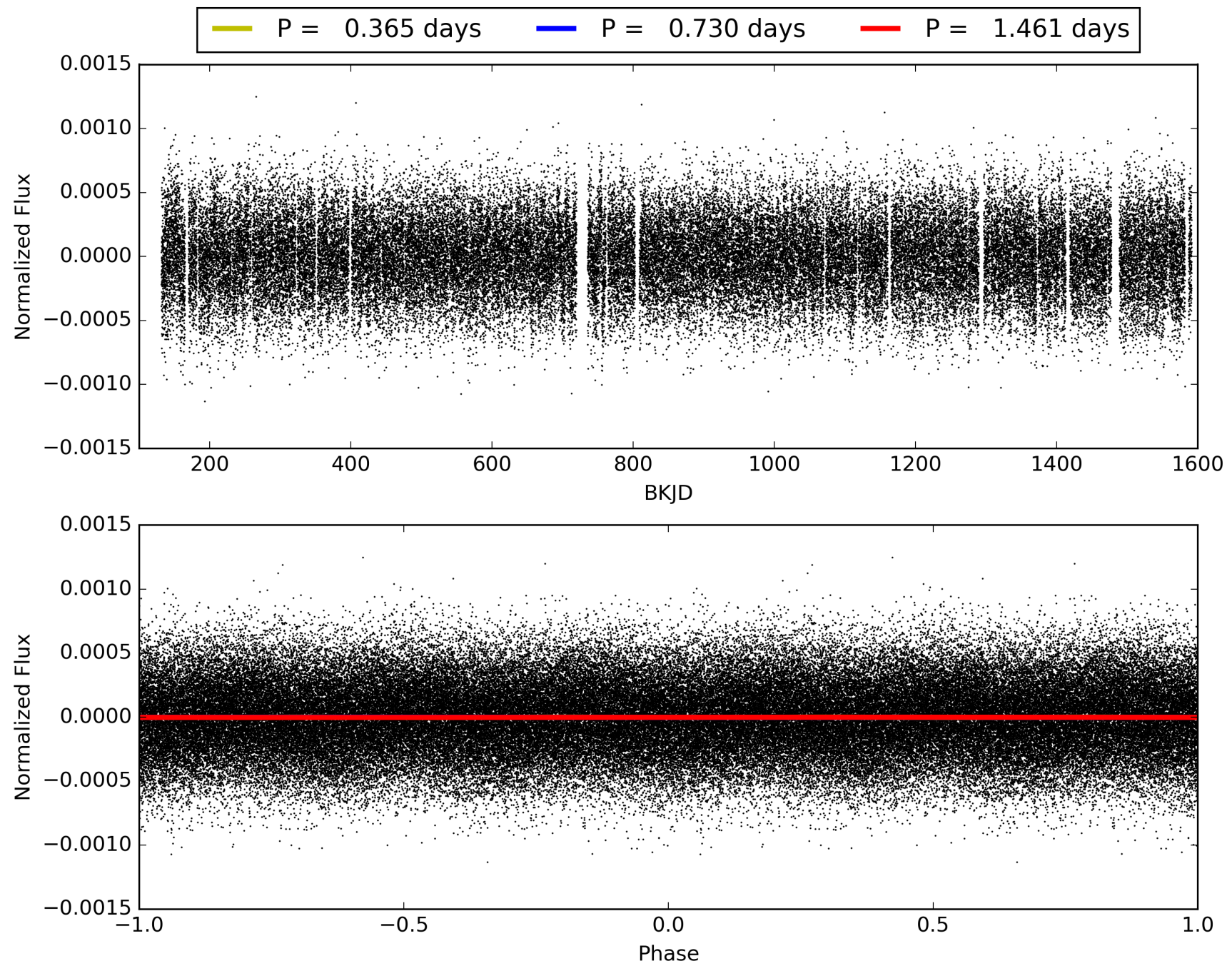
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:52:24 Z

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

TCE 009943441-01, PDC Light Curves

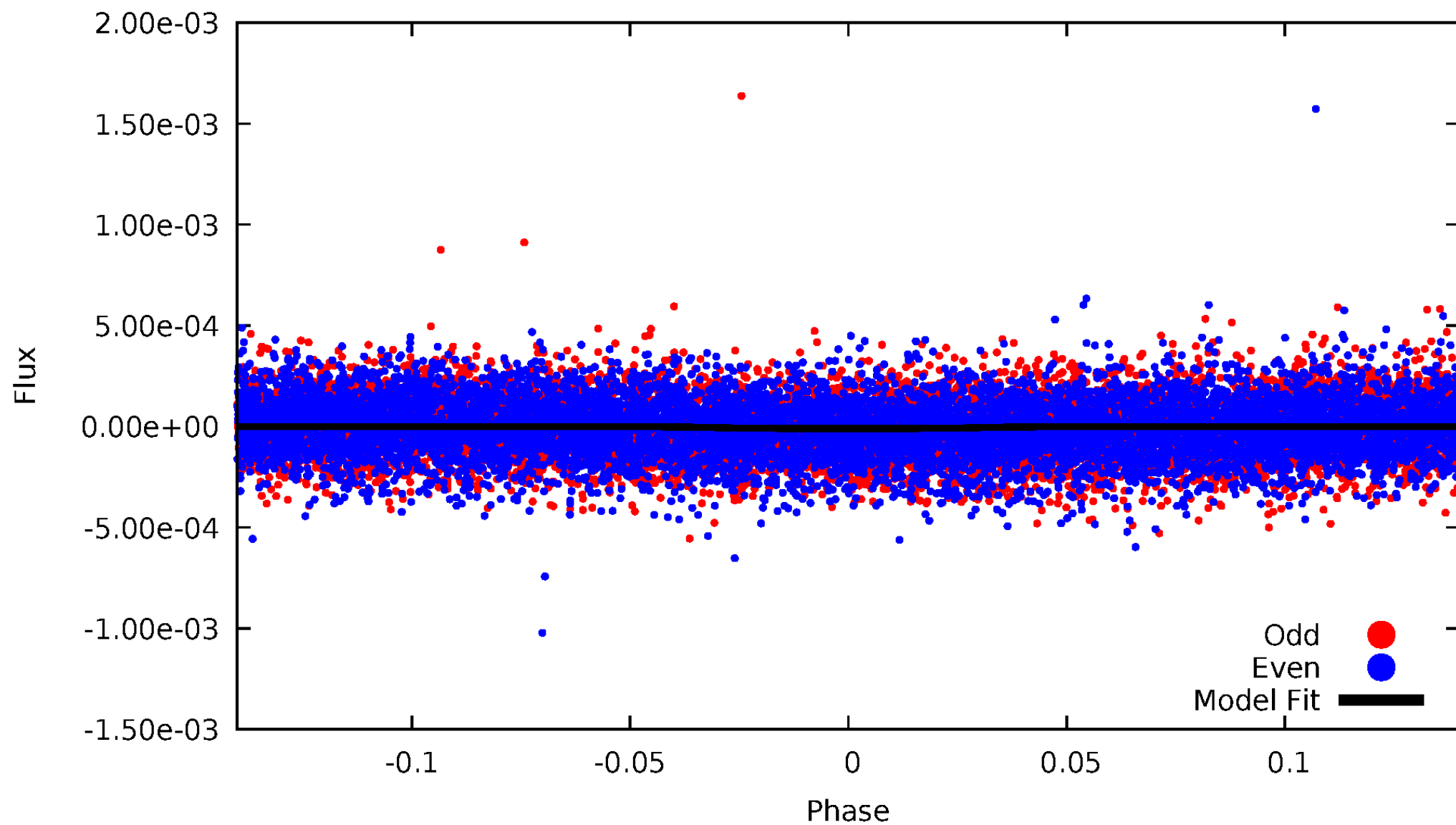


TCE 009943441-01



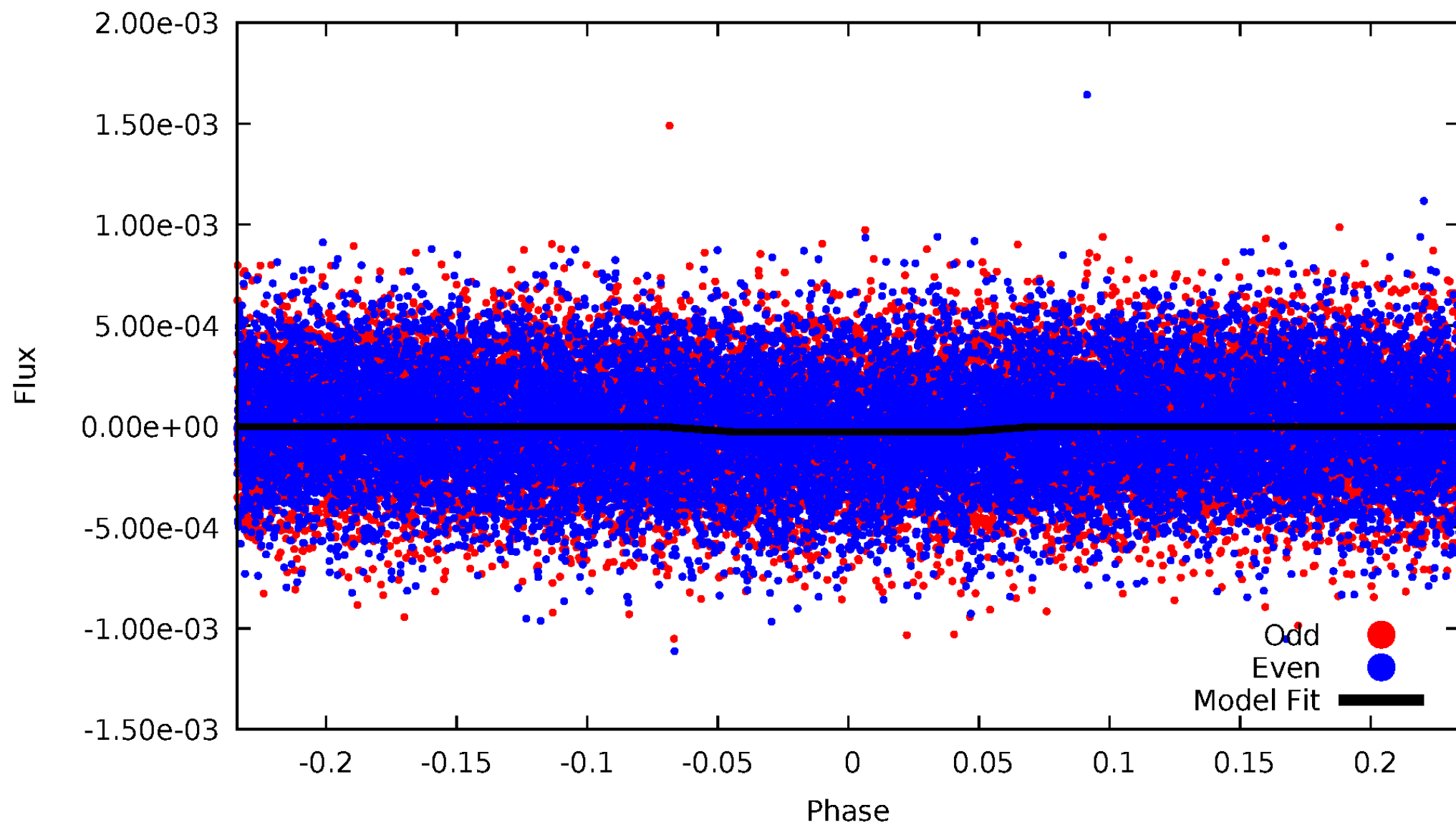
DV Odd/Even

TCE 009943441-01



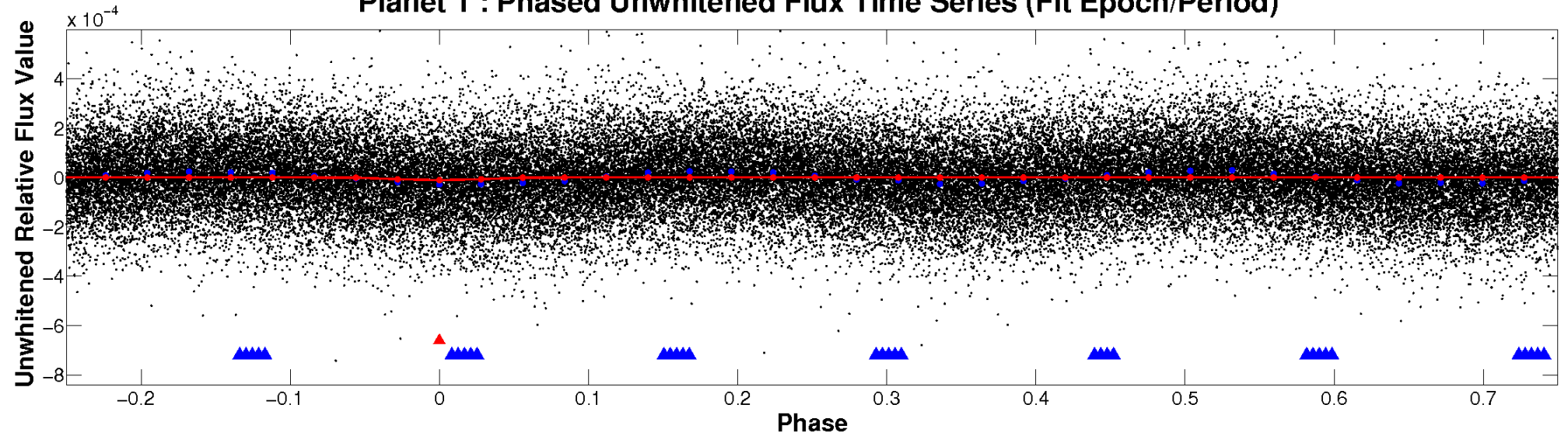
ALT Odd/Even

TCE 009943441-01

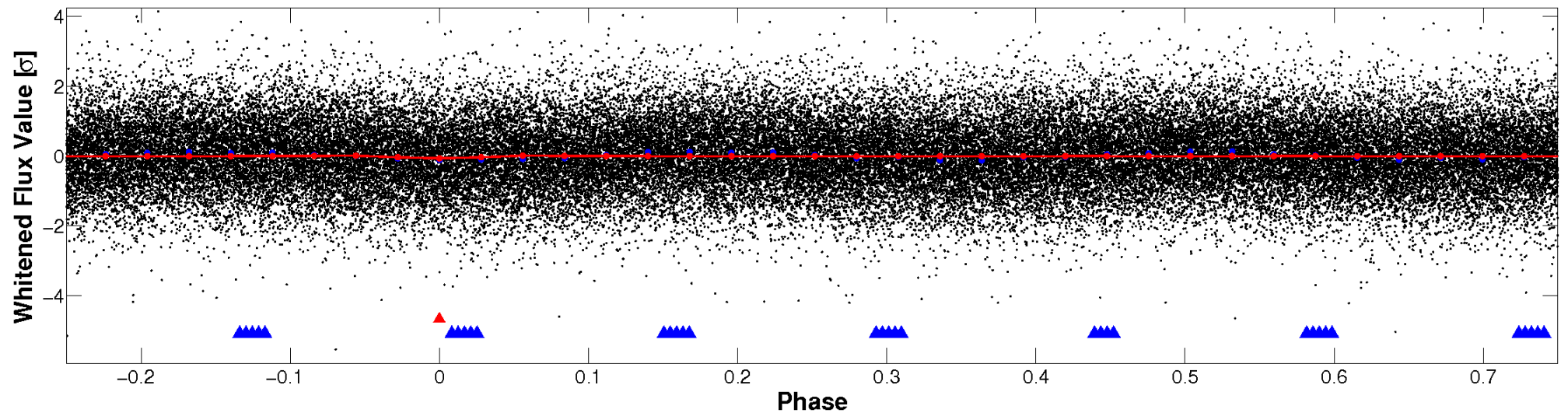


Non-Whitened Vs. Whitened Light Curve

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

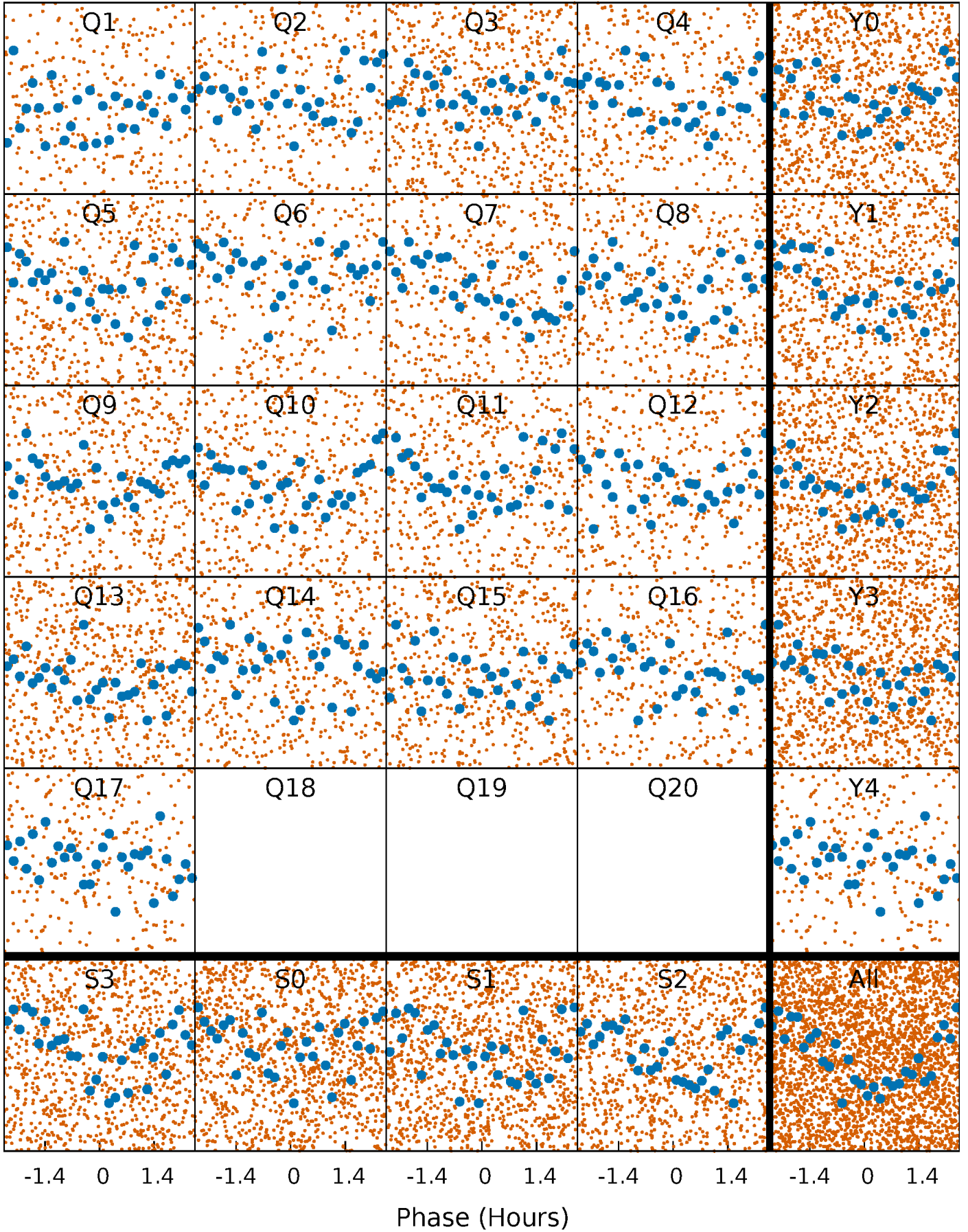


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



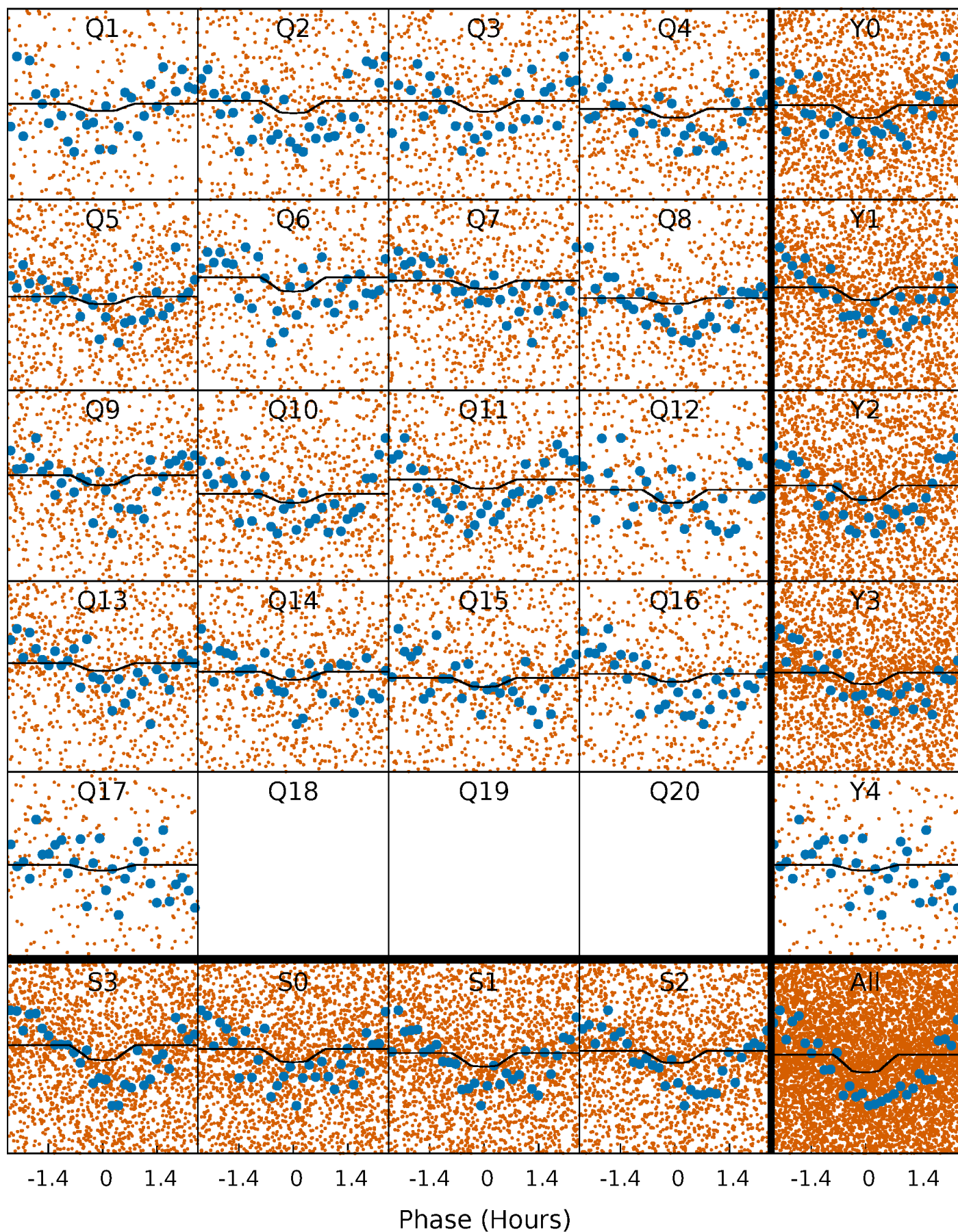
PDC Quarter-Phased Transit Curves

TCE 009943441-01 P= 0.730372 Days $T_0=131.713189$ (BKJD)



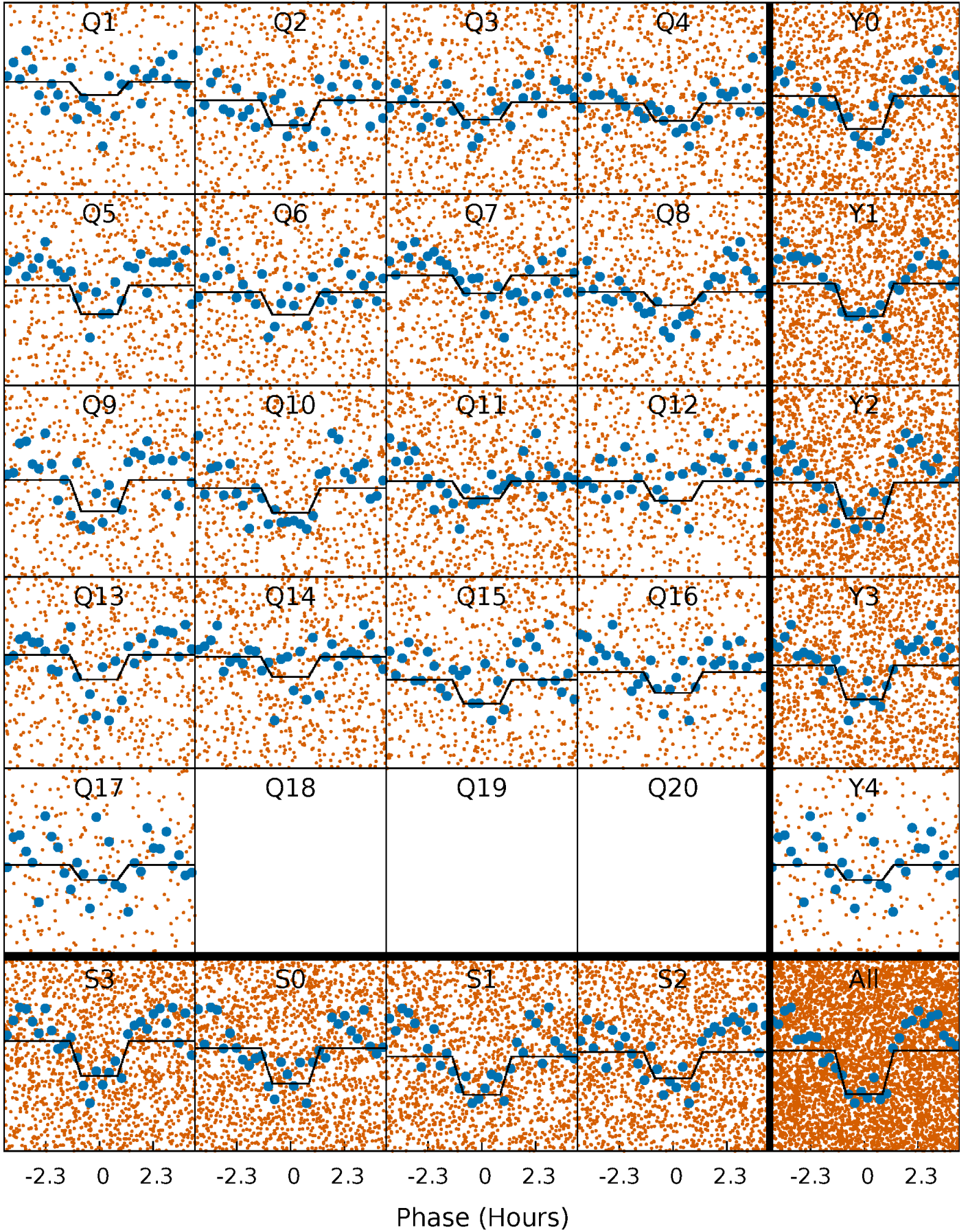
DV Quarter-Phased Transit Curves

TCE 009943441-01 P= 0.730372 Days $T_0=131.713189$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

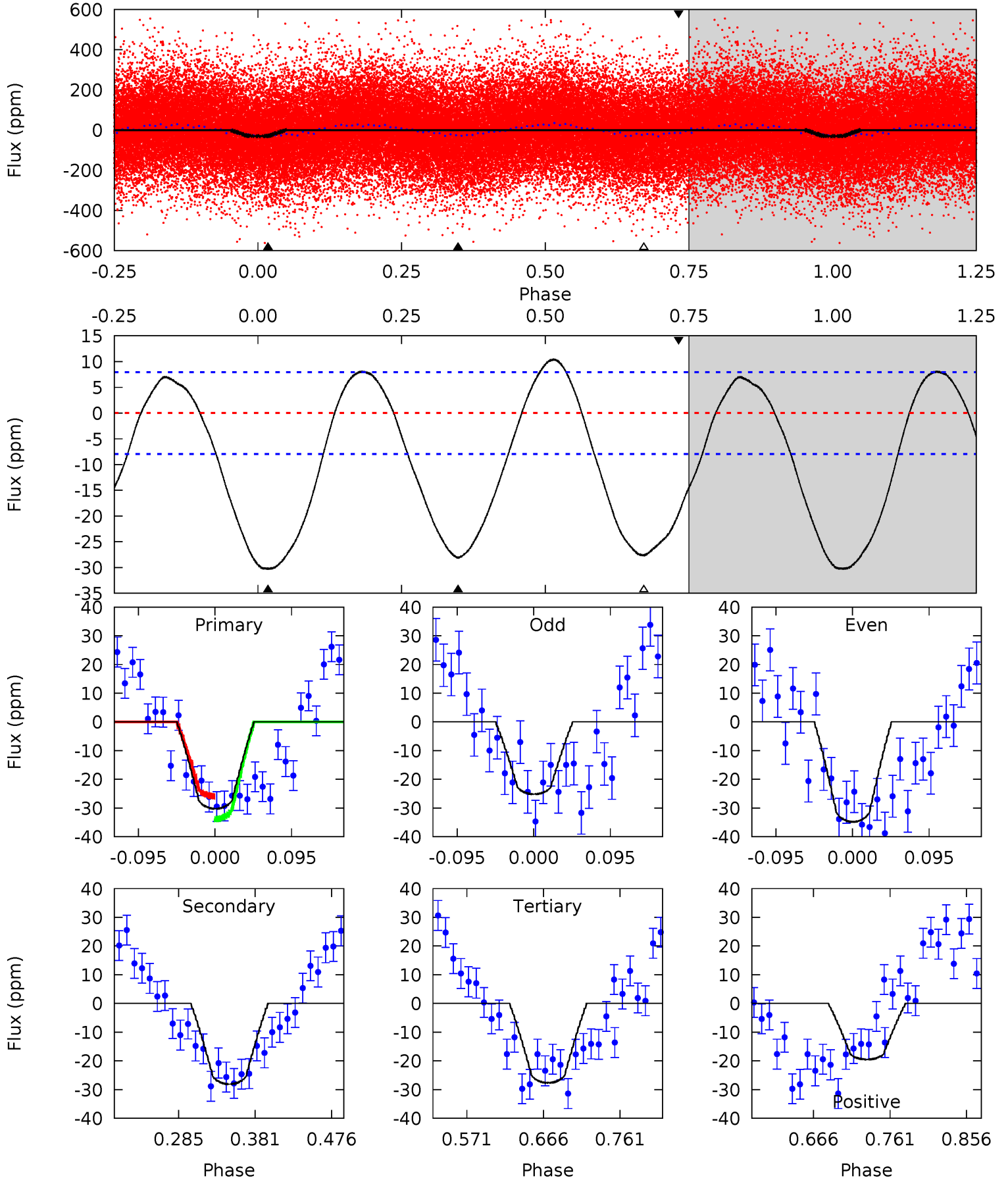
TCE 009943441-01 P= 0.730392 Days $T_0=131.716094$ (BKJD)



DV Model-Shift Uniqueness Test

009943441-01, P = 0.730372 Days, E = 130.982817 Days

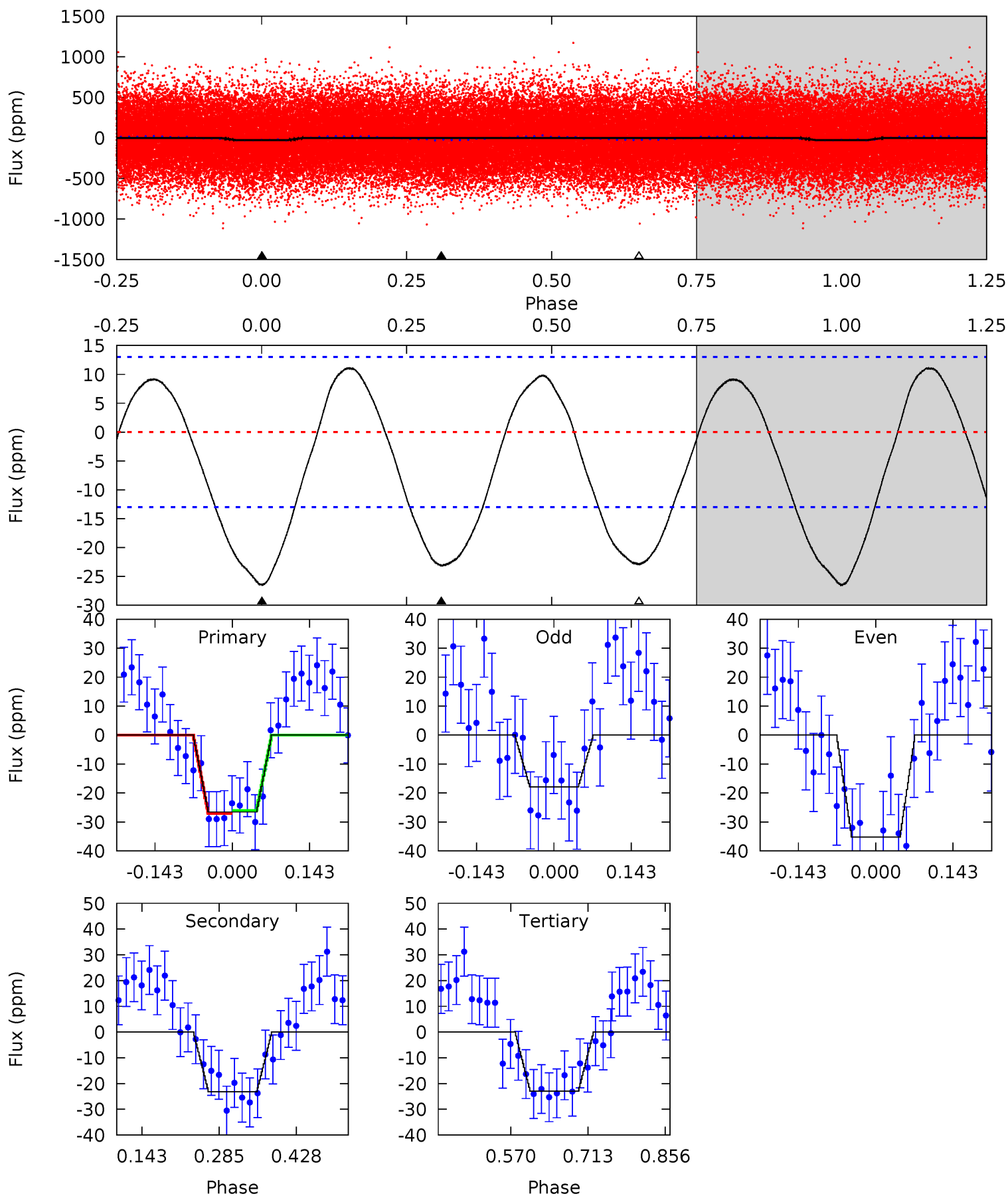
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.4	16.2	15.9	-11.2	4.58	1.67	6.87	1.50	28.7	0.25	27.4	2.77	1.12	0.26	2.26



Alt Model-Shift Uniqueness Test

009943441-01, P = 0.730392 Days, E = 130.985702 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.17	8.02	7.93	0	4.49	1.47	4.17	1.24	9.17	0.09	8.02	2.98	1.28	0.30	0.18



Stellar Parameters For KIC 009943441

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7773^{+217}_{-326}	$3.613^{+0.540}_{-0.060}$	$-0.240^{+0.200}_{-0.300}$	$3.653^{+0.634}_{-1.901}$	$1.995^{+0.226}_{-0.528}$	$0.058^{+0.372}_{-0.016}$
	+3%/-4%	+15%/-2%	+83%/-125%	+17%/-52%	+11%/-26%	+645%/-28%
Source	KIC0	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 009943441-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-28 ± 2	$1.25^{+0.49}_{-0.52}$	6139^{+478}_{-811}	9731^{+4146}_{-1906}	$3.911^{+7.506}_{-1.905}$
Alt.	-23 ± 3	$1.73^{+0.64}_{-0.58}$	6119^{+508}_{-964}	7035^{+1376}_{-1096}	$1.687^{+2.045}_{-0.793}$

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

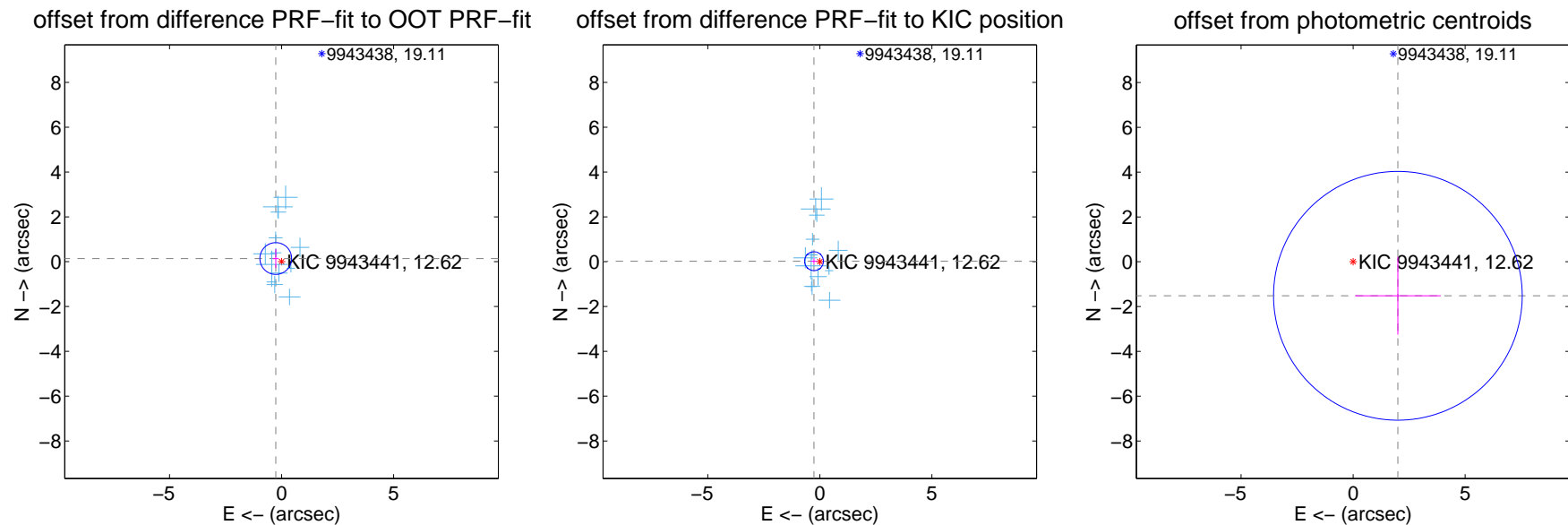
DV Centroid Data

Supplemental centroid analysis for 009943441-01. Kepler magnitude: 12.62. Transit SNR 3.67

There are 13 quarters with good PRF difference image offsets

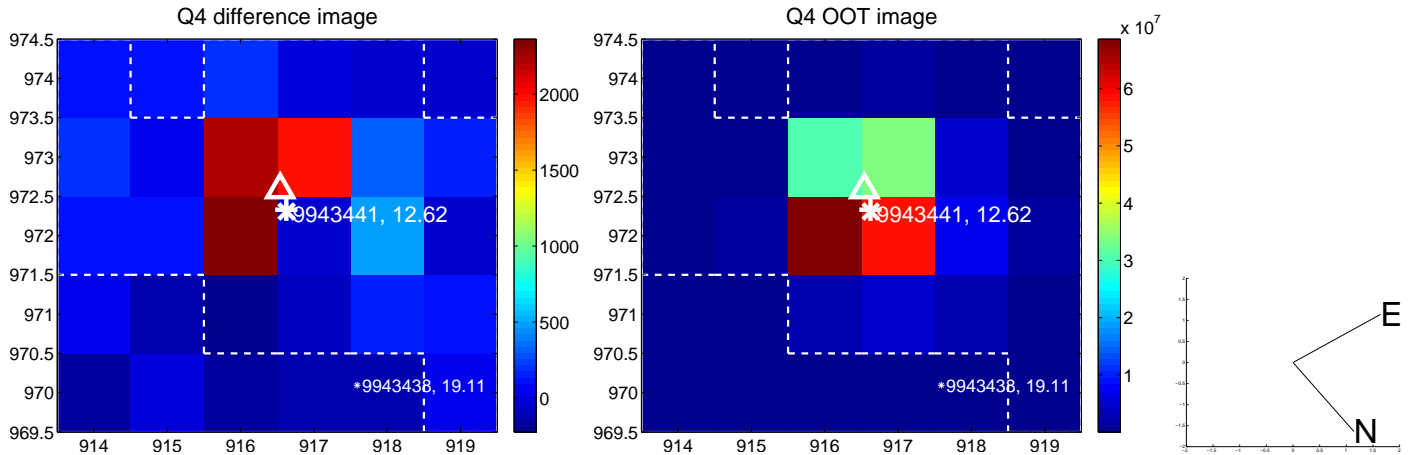
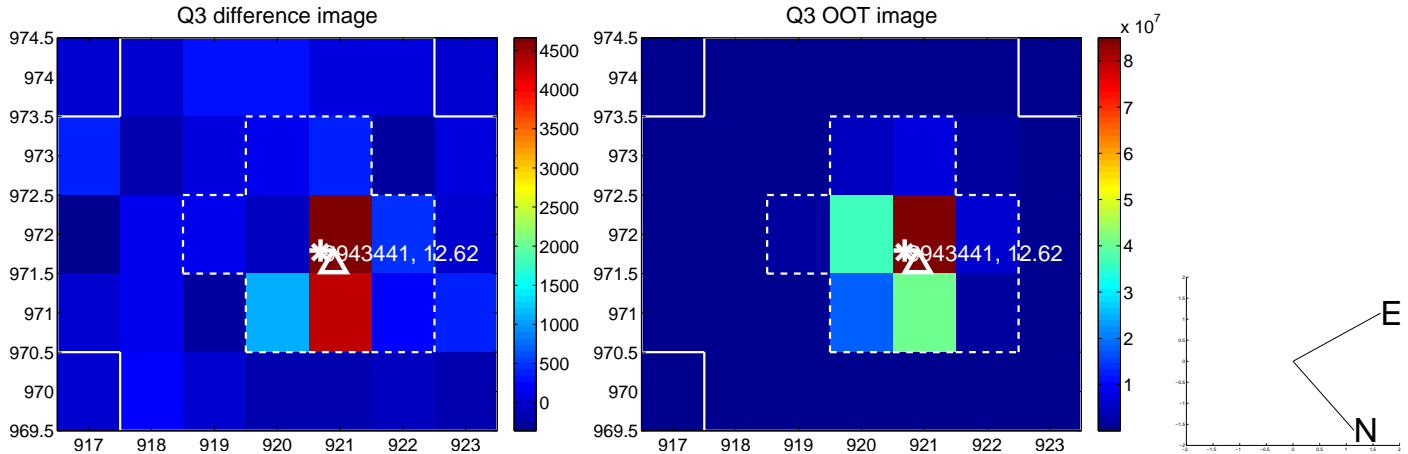
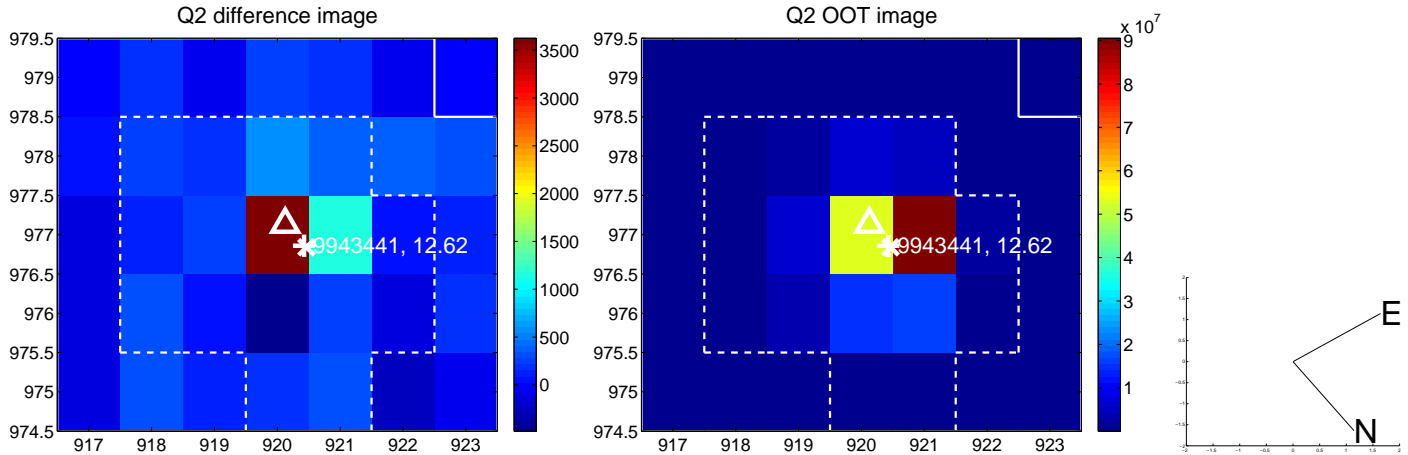
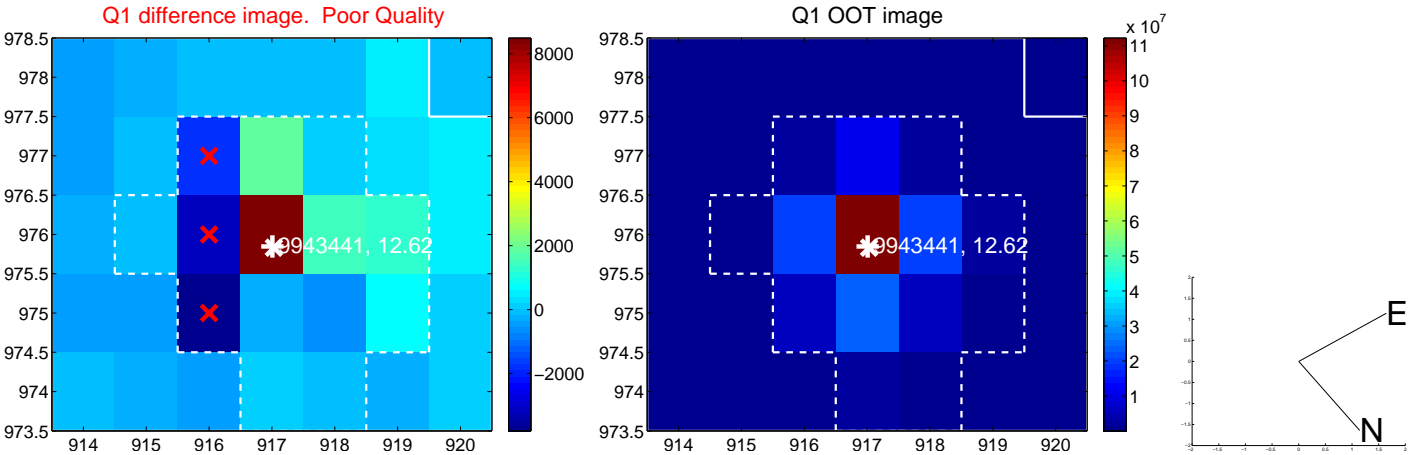
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.296 ± 0.236	1.25	0.259 ± 0.133	0.142 ± 0.423
PRF-fit source offset from KIC position	0.262 ± 0.140	1.87	0.261 ± 0.140	0.023 ± 0.129
photometric centroid source offset	2.51 ± 1.85	1.36	-2.00 ± 1.91	-1.52 ± 1.74

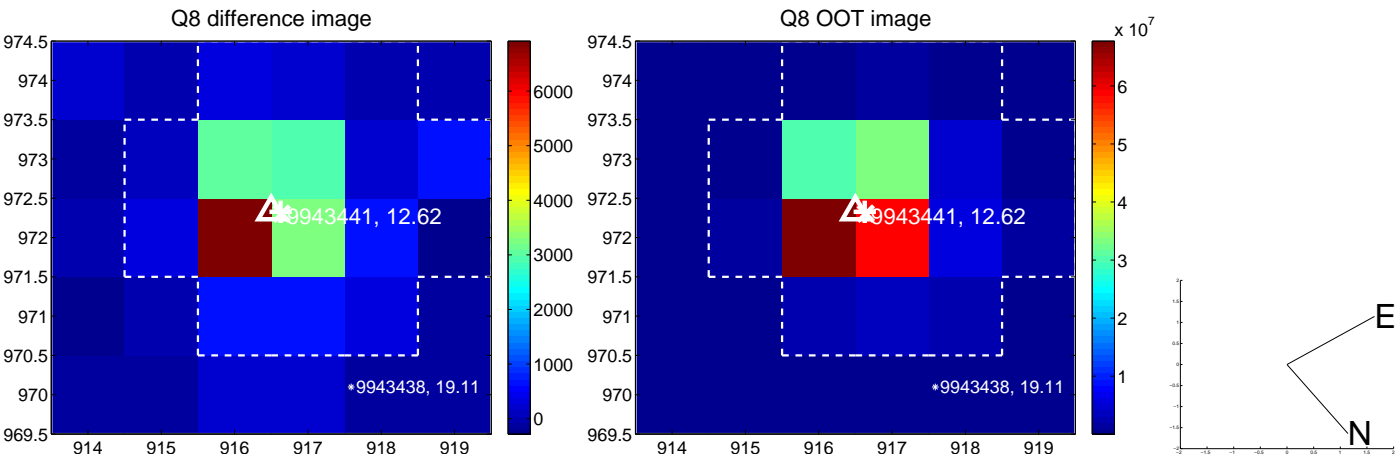
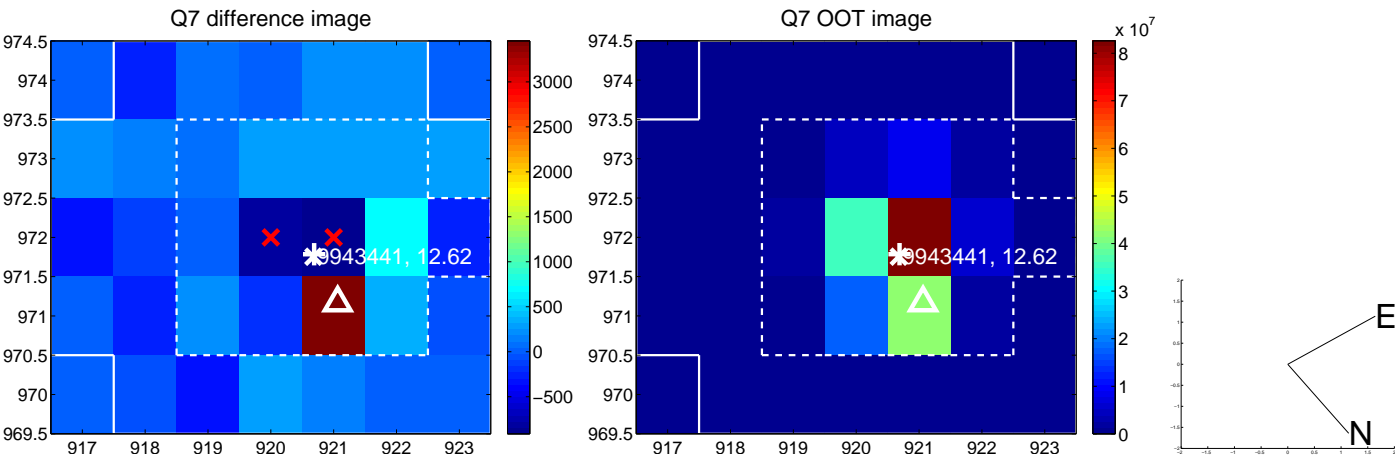
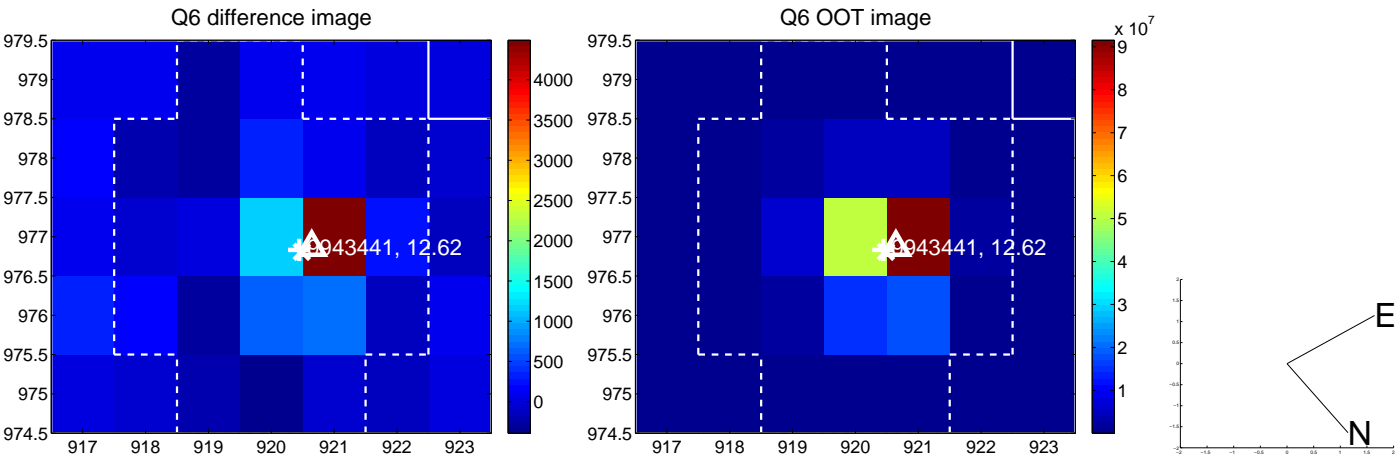
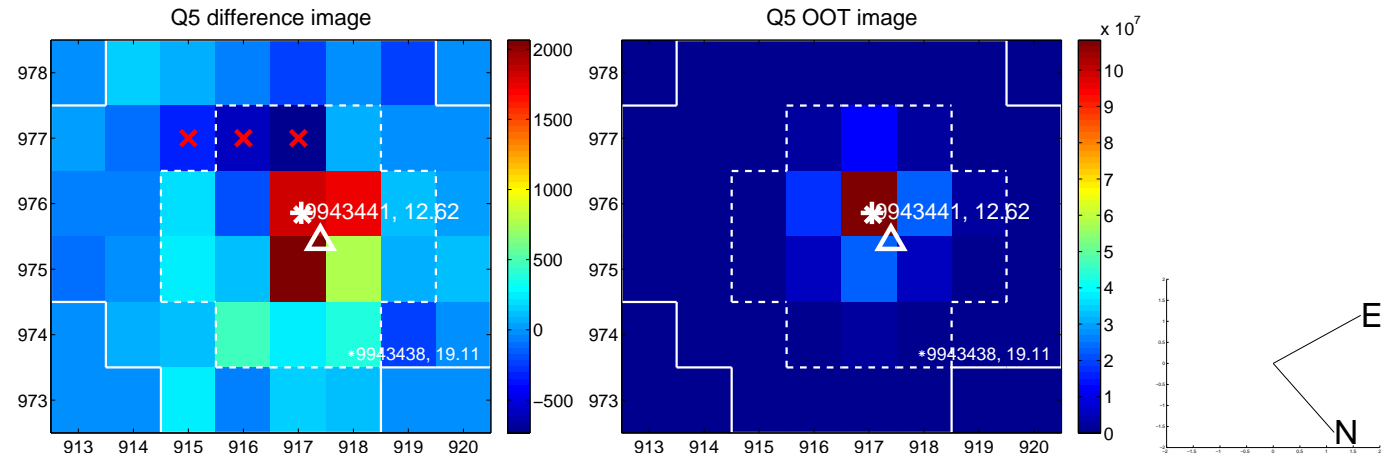


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

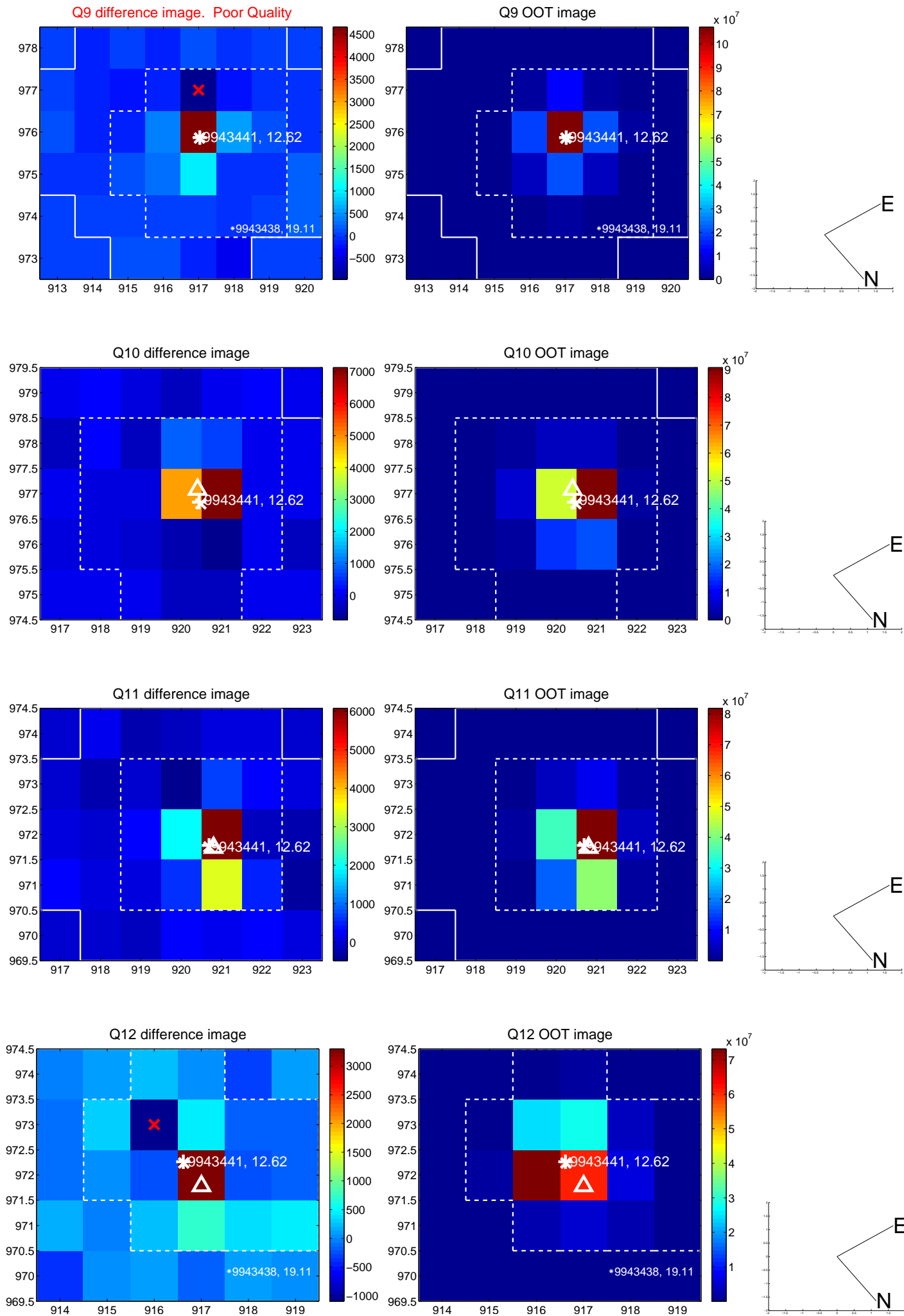
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



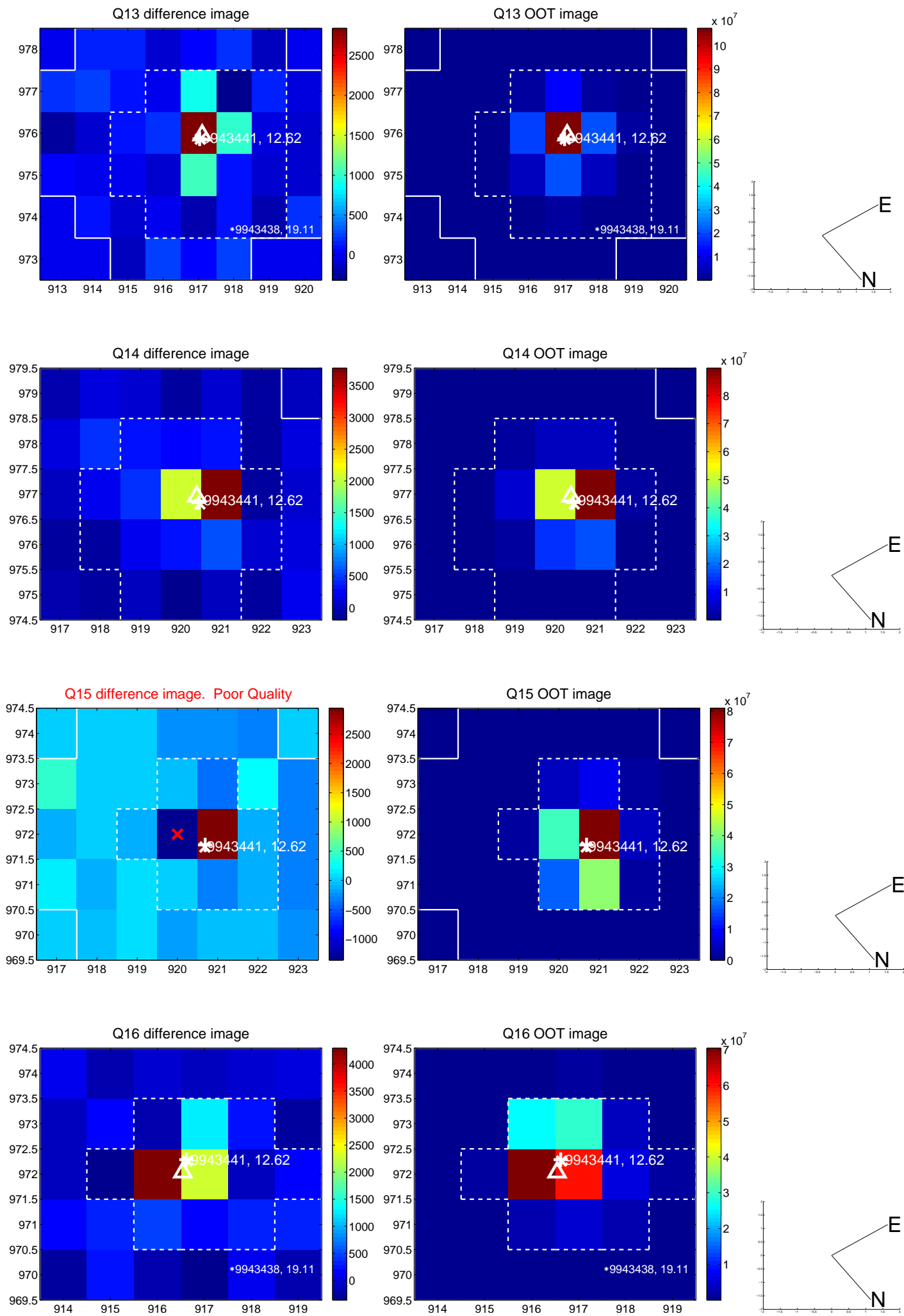
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



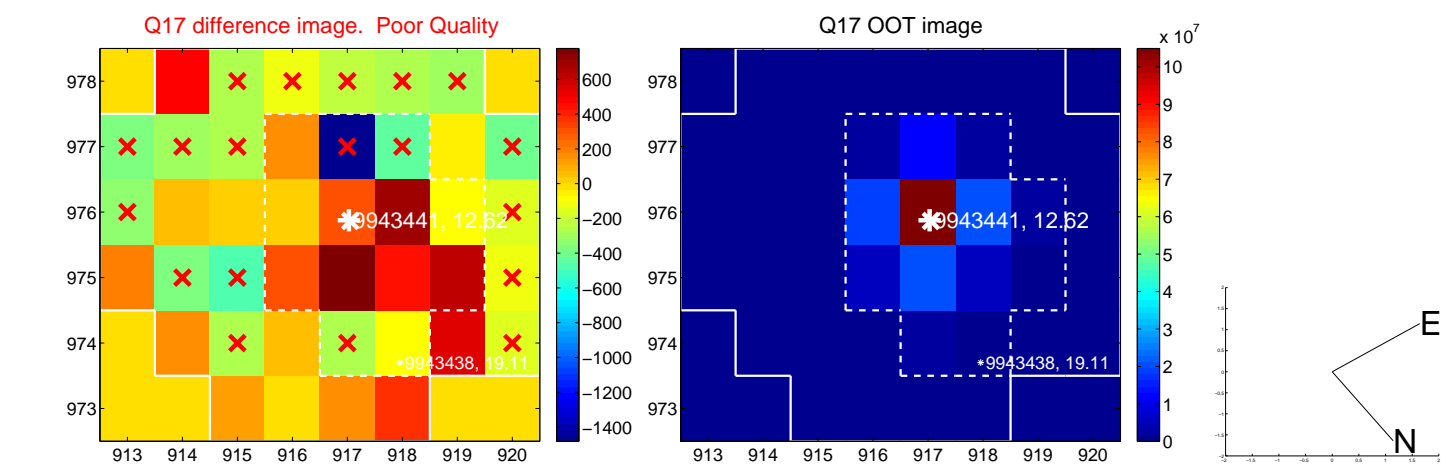
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



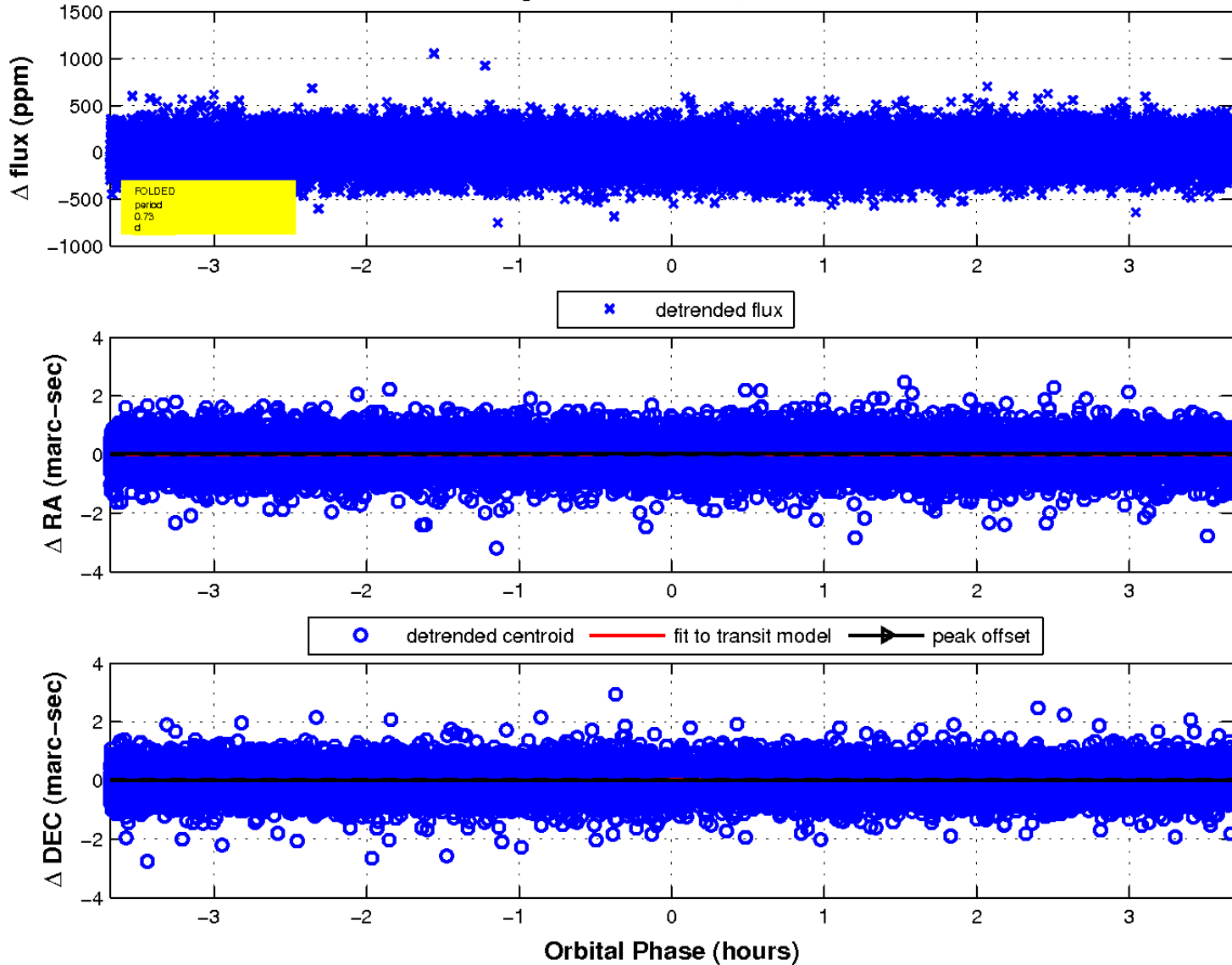
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

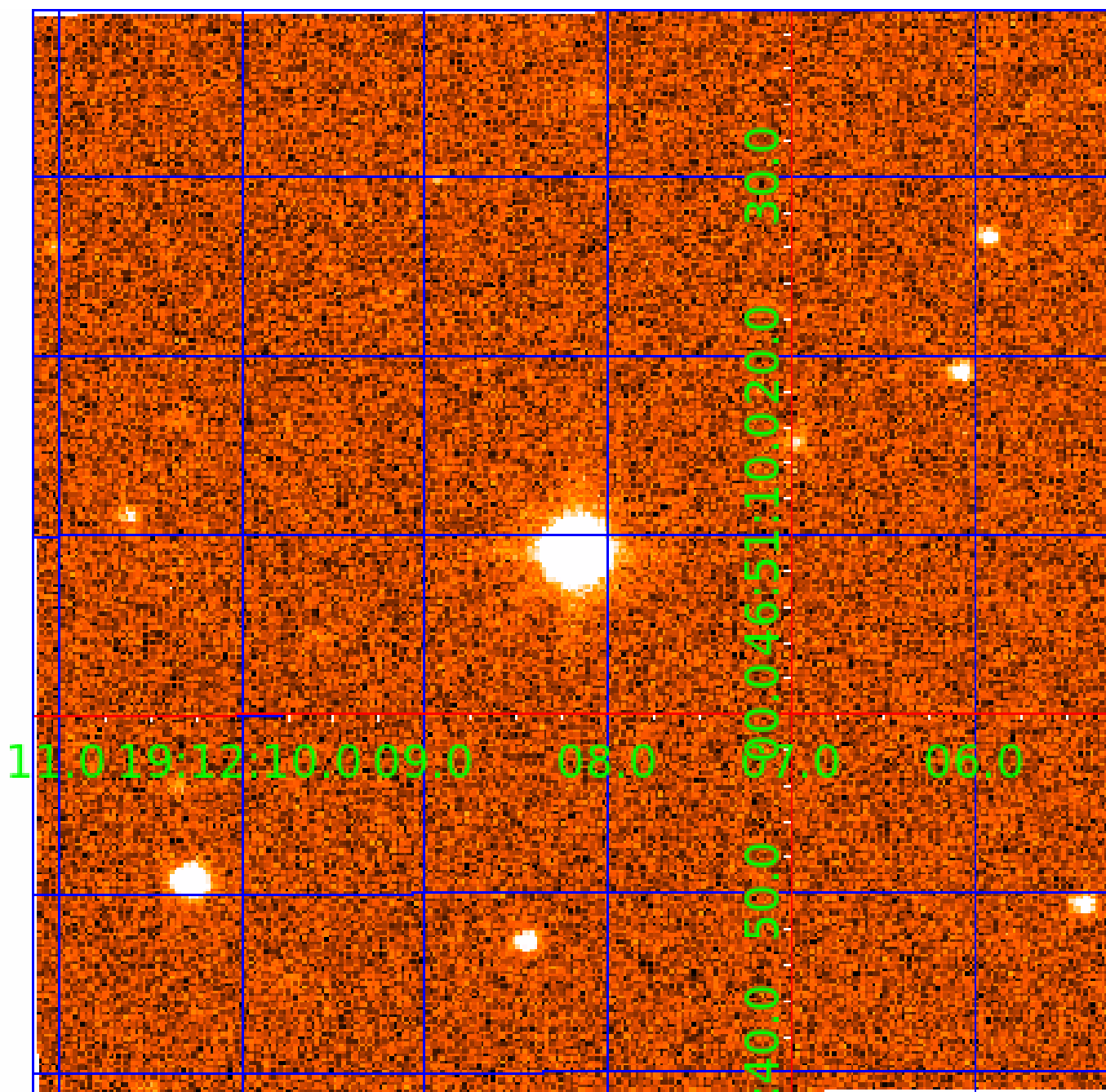


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009943441

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})
009943441-01	OBS	No	0.730372	131.713189	10.5	1.227	8.6	3.7	3.65	7773	1.40	109216.87
009943441-02	OBS	No	42.988070	139.230809	193.0	1.527	7.4	9.2	3.65	7773	5.96	477.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009943441-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009943441-02	OBS	FP	0.02	1	0	0	0	INDIV_TRANS_RUBBLE—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.

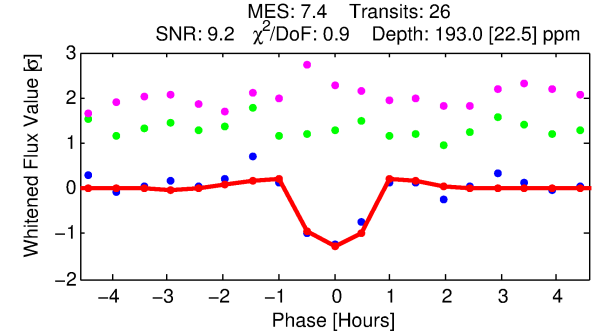
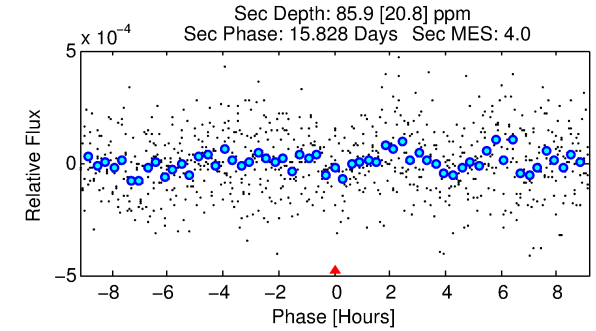
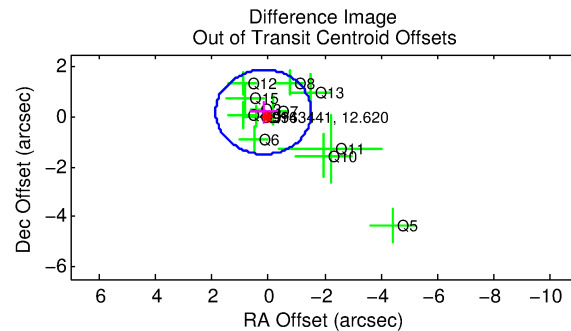
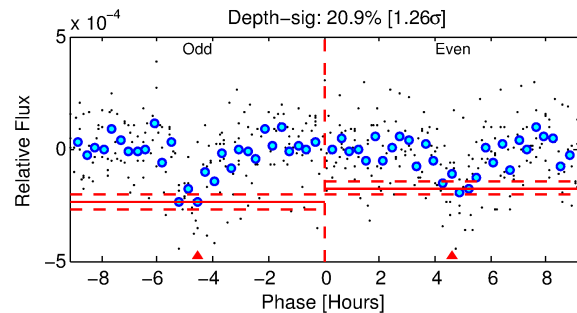
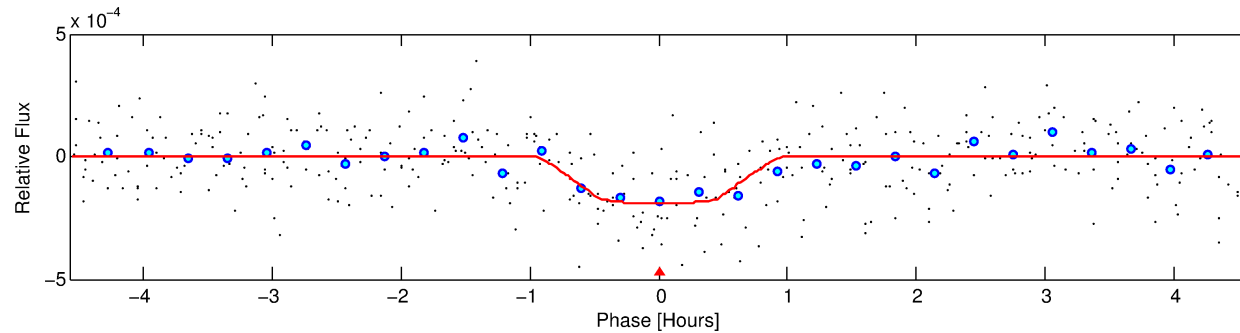
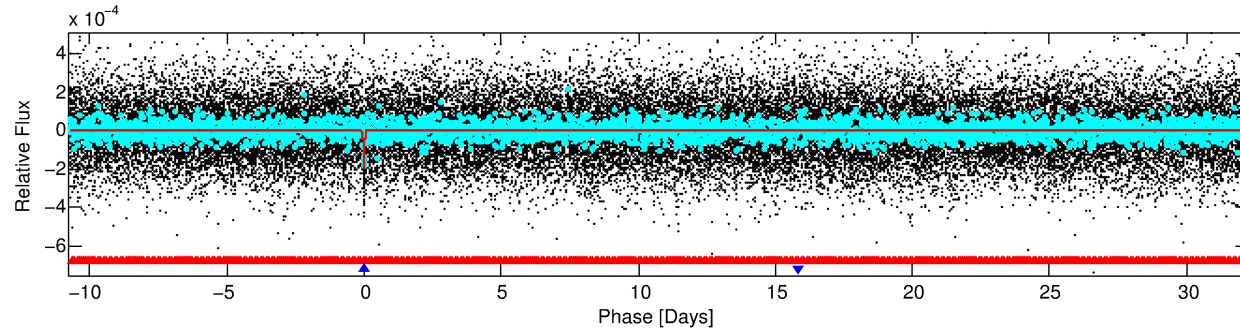
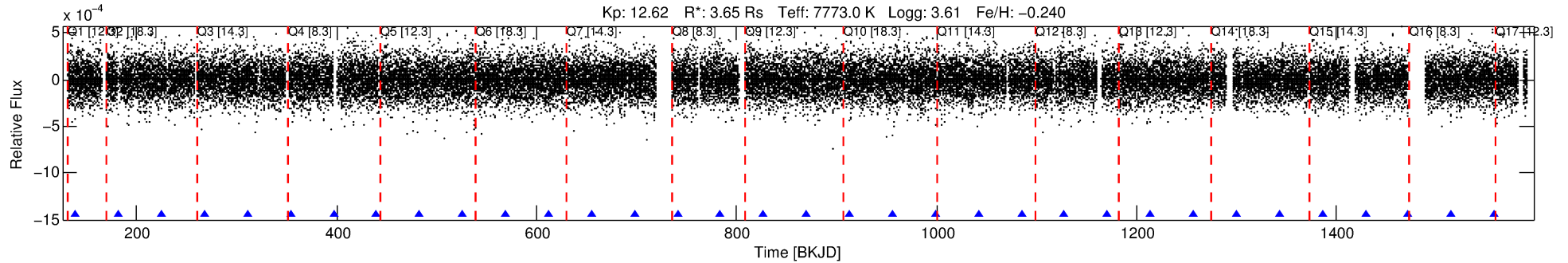
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009943441-02

No Significant Match Found

DV One-Page Summary

KIC: 9943441 Candidate: 2 of 2 Period: 42.988 d



DV Fit Results:

Period = 42.98807 [0.00021] d
Epoch = 139.2308 [0.0039] BKJD
Rp/R* = 0.0149 [0.0089]
a/R* = 101.34 [339.79]
b = 0.90 [0.73]
Seff = 477.04 [436.07]
Teq = 1192 [272] K
Rp = 5.96 [4.70] Re
a = 0.3025 [0.1635] AU
Ag = 121.74 [183.52] [0.66 σ]
Teffp = 6120 [1870] K [2.61 σ]

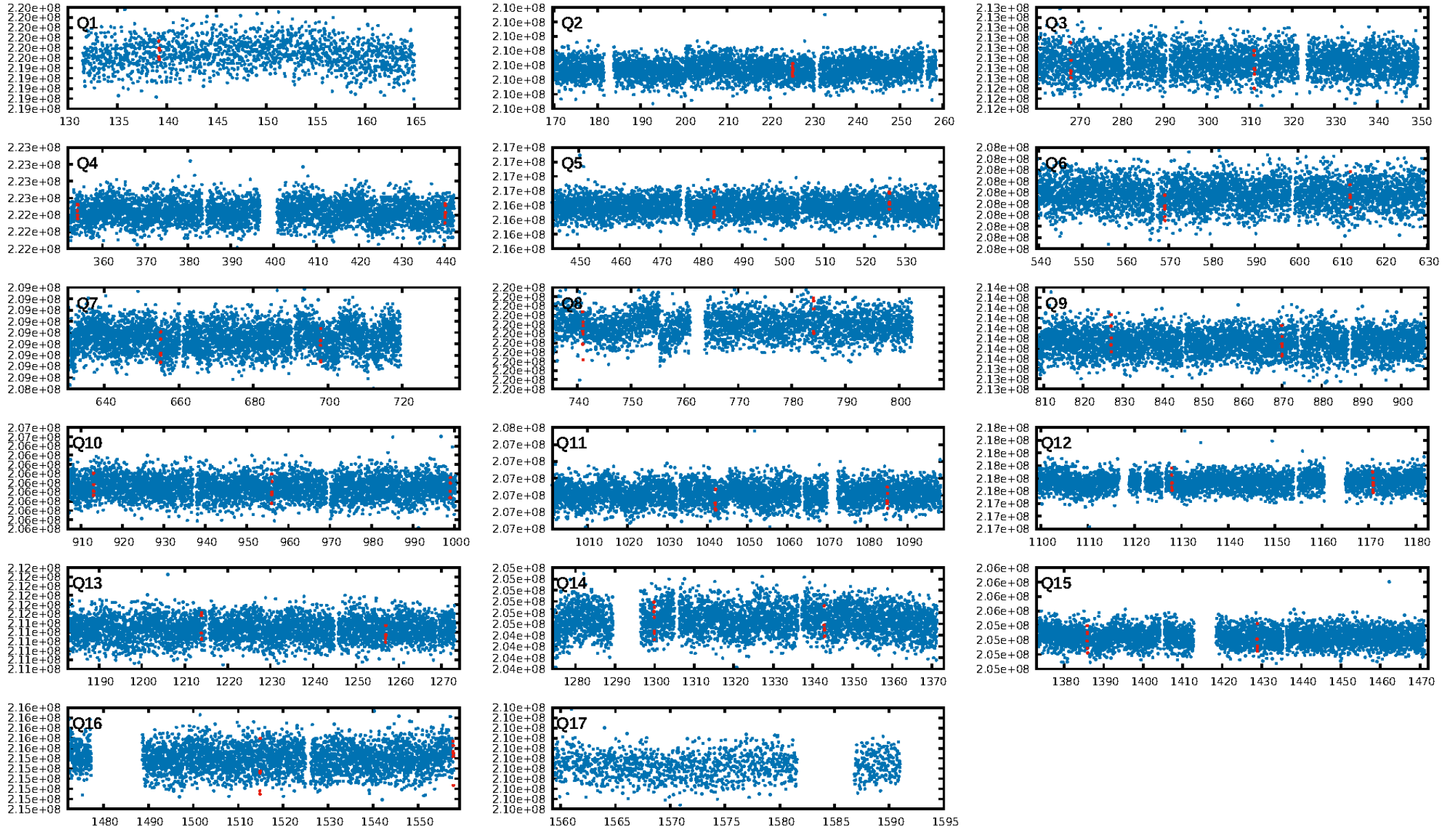
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [517.72 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 85.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.73e-11
RollingBand-fgt: 1.00 [25/25]
GhostDiagnostic-chr: -2.109
Centroid-sig: 24.5%
Centroid-so: 0.781 arcsec [1.10 σ]
OotOffset-rm: 0.248 arcsec [0.44 σ]
KicOffset-rm: 0.203 arcsec [0.37 σ]
OotOffset-st: 2/4/4/3 [13]
KicOffset-st: 2/4/4/3 [13]
DiffImageQuality-fgm: 0.77 [10/13]
DiffImageOverlap-fno: 0.31 [5/16]

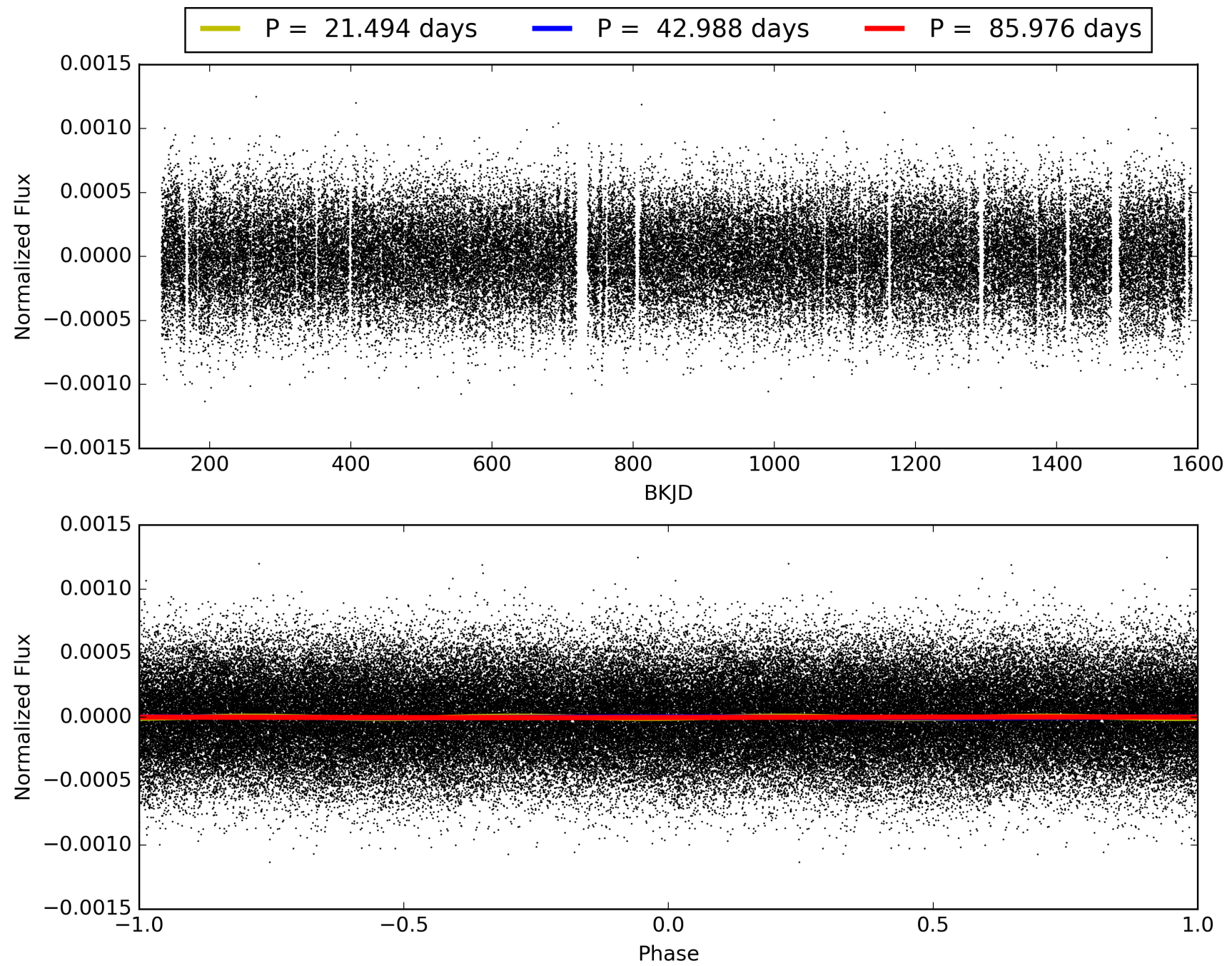
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009943441-02, PDC Light Curves

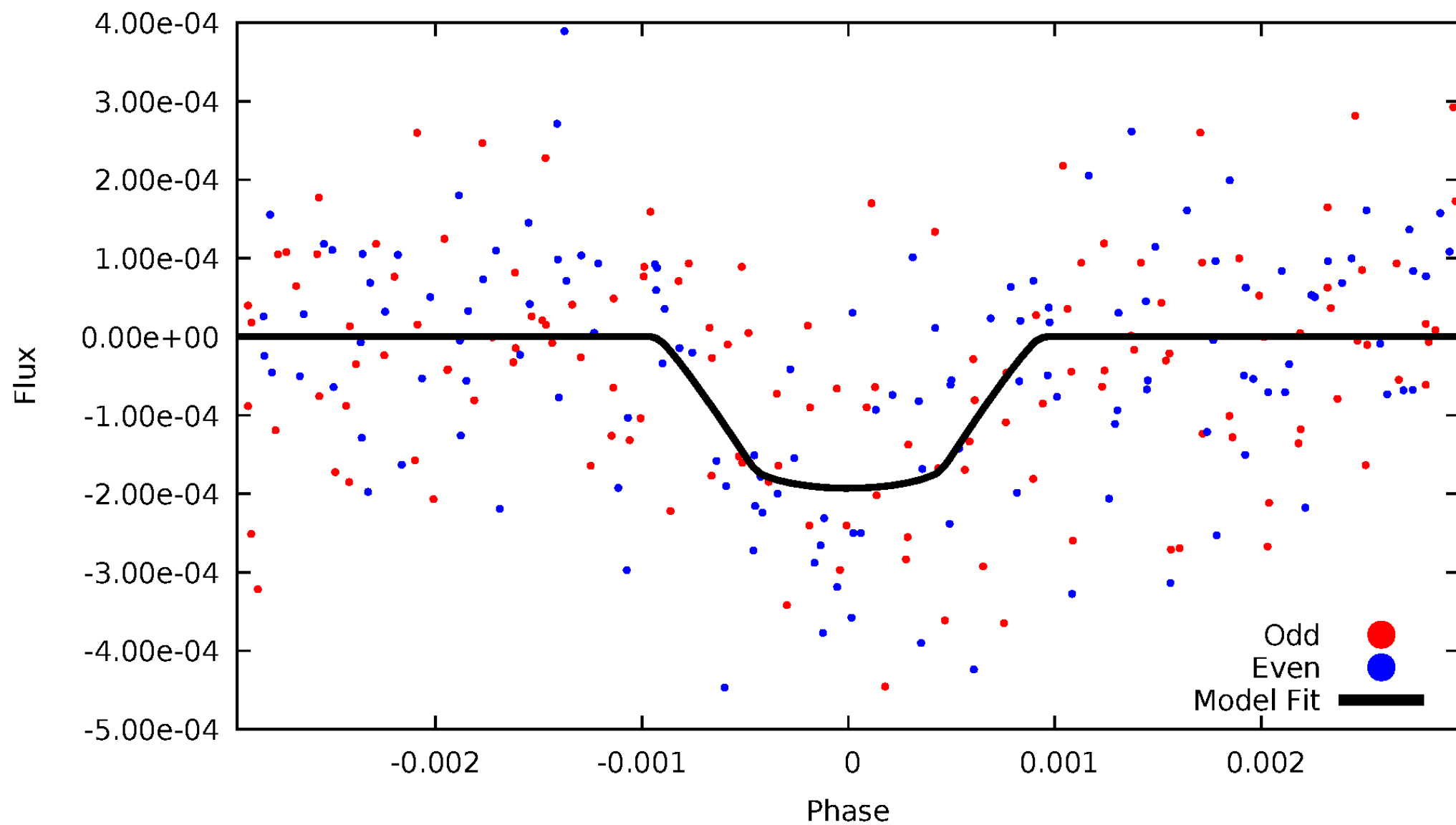


TCE 009943441-02



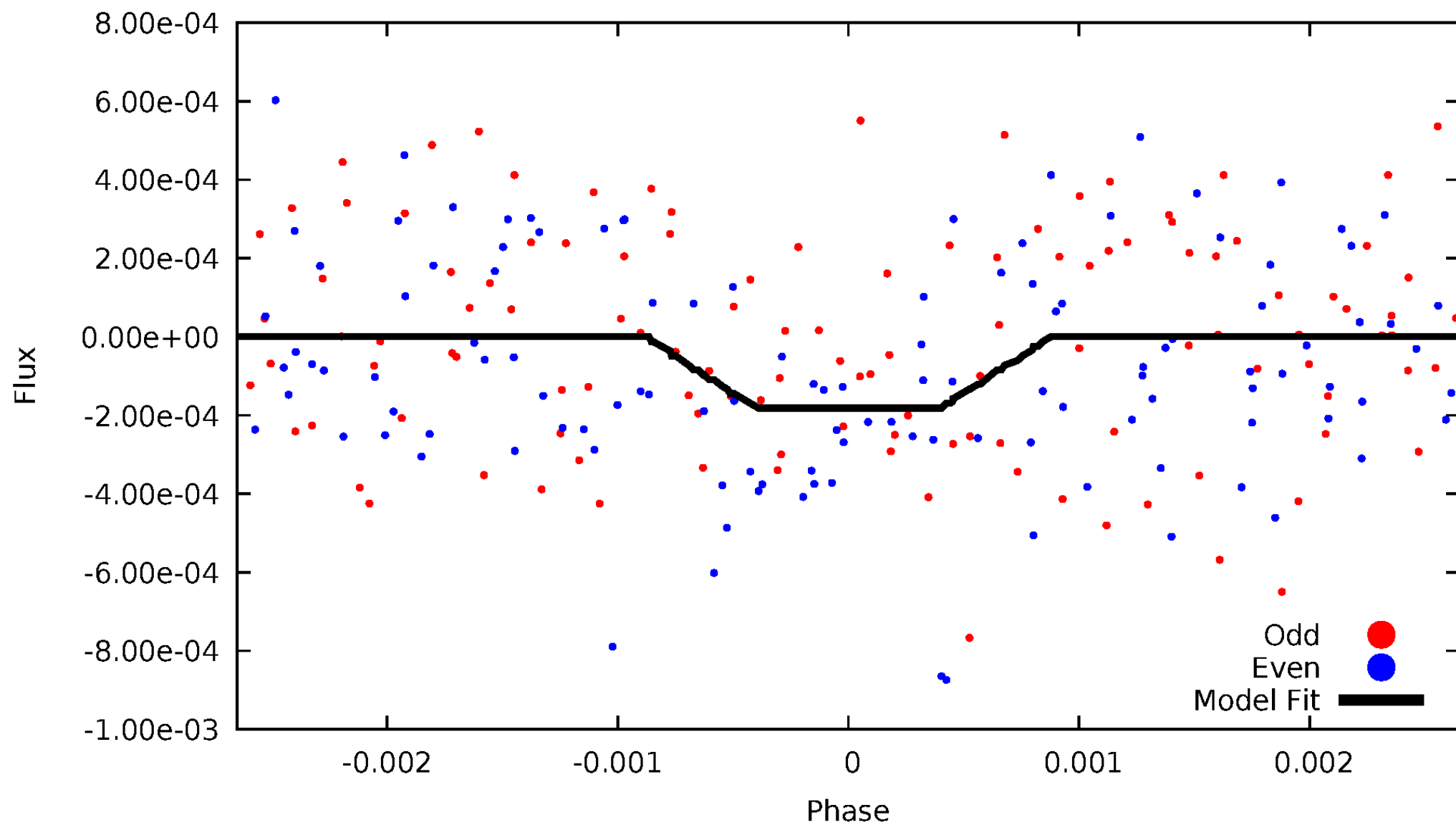
DV Odd/Even

TCE 009943441-02



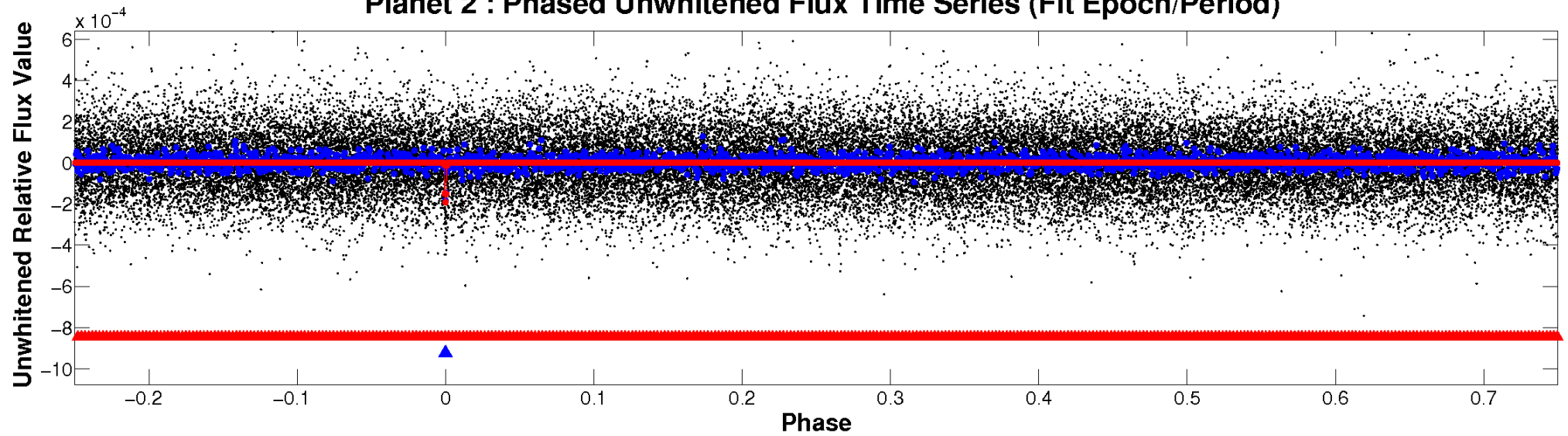
ALT Odd/Even

TCE 009943441-02

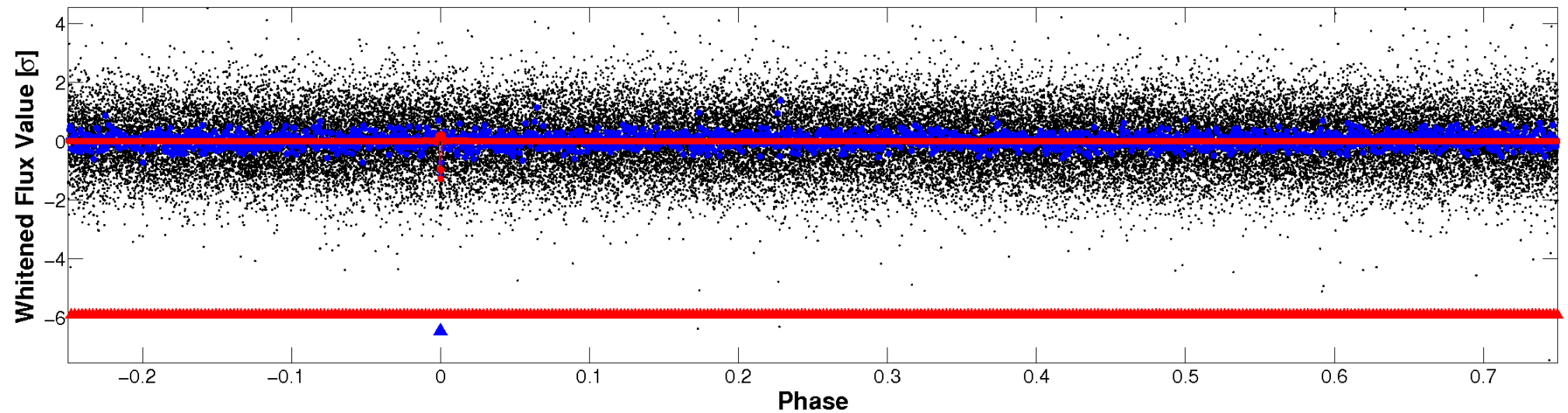


Non-Whitened Vs. Whitened Light Curve

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

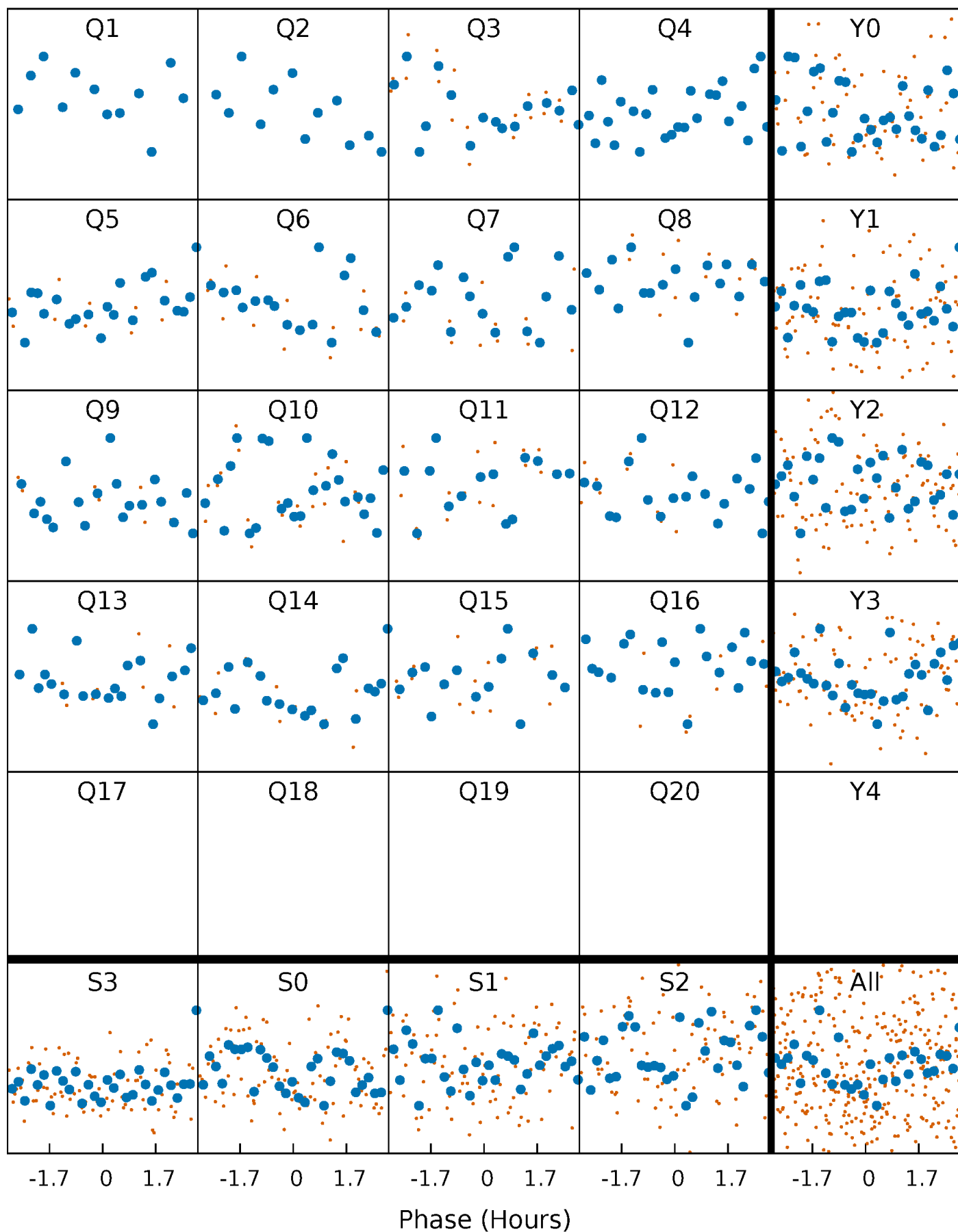


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



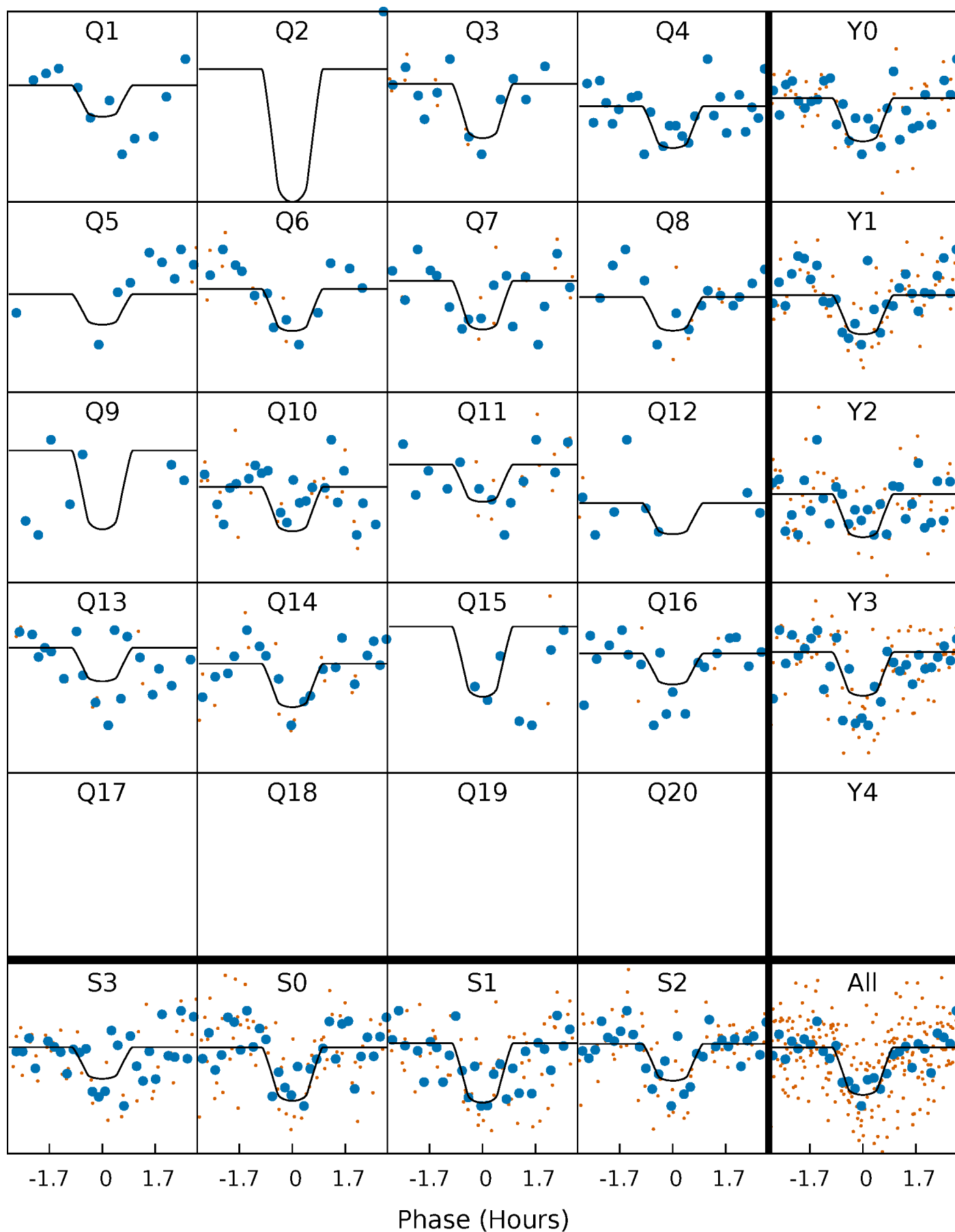
PDC Quarter-Phased Transit Curves

TCE 009943441-02 P= 42.988070 Days $T_0=139.230809$ (BKJD)



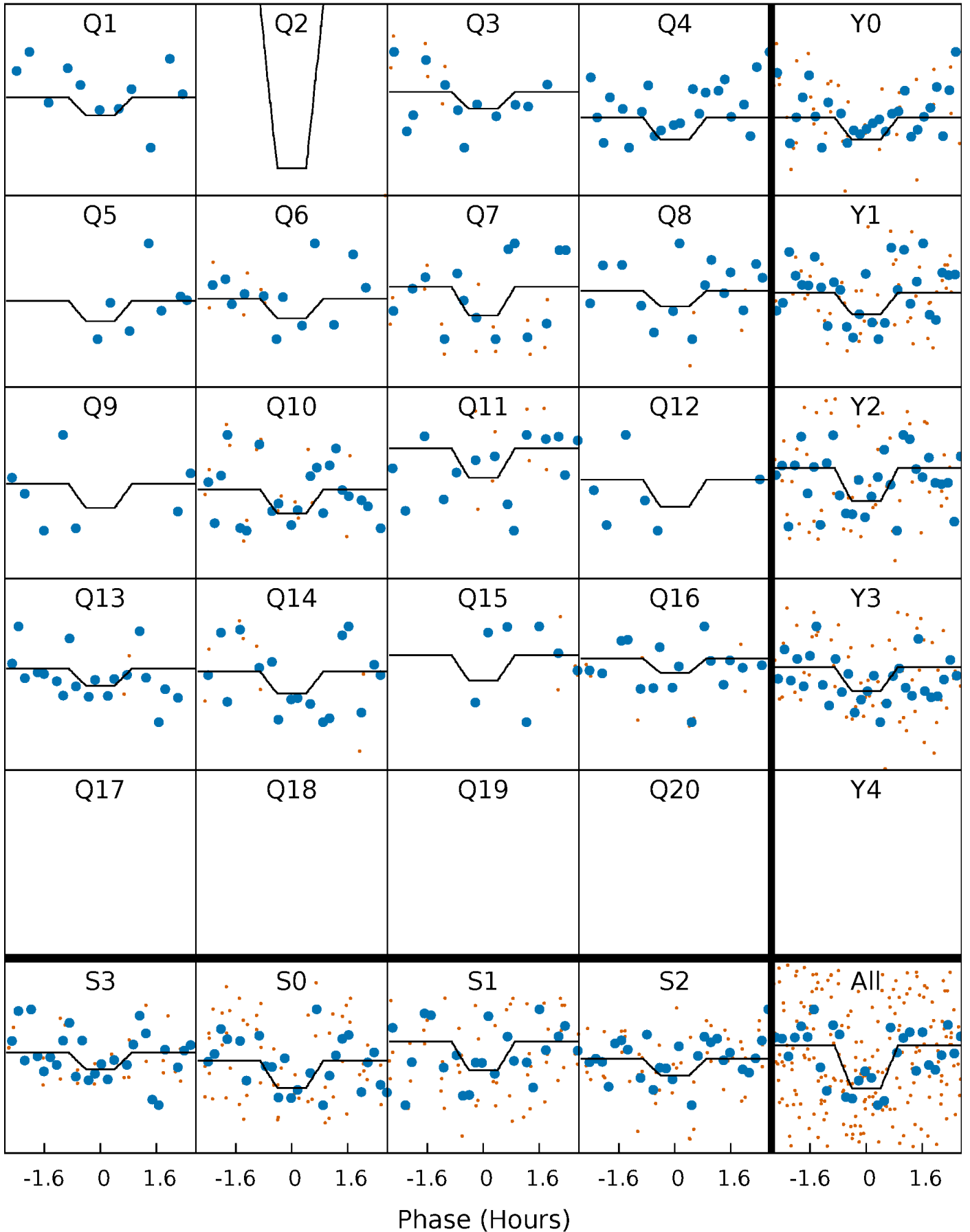
DV Quarter-Phased Transit Curves

TCE 009943441-02 P= 42.988070 Days $T_0=139.230809$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

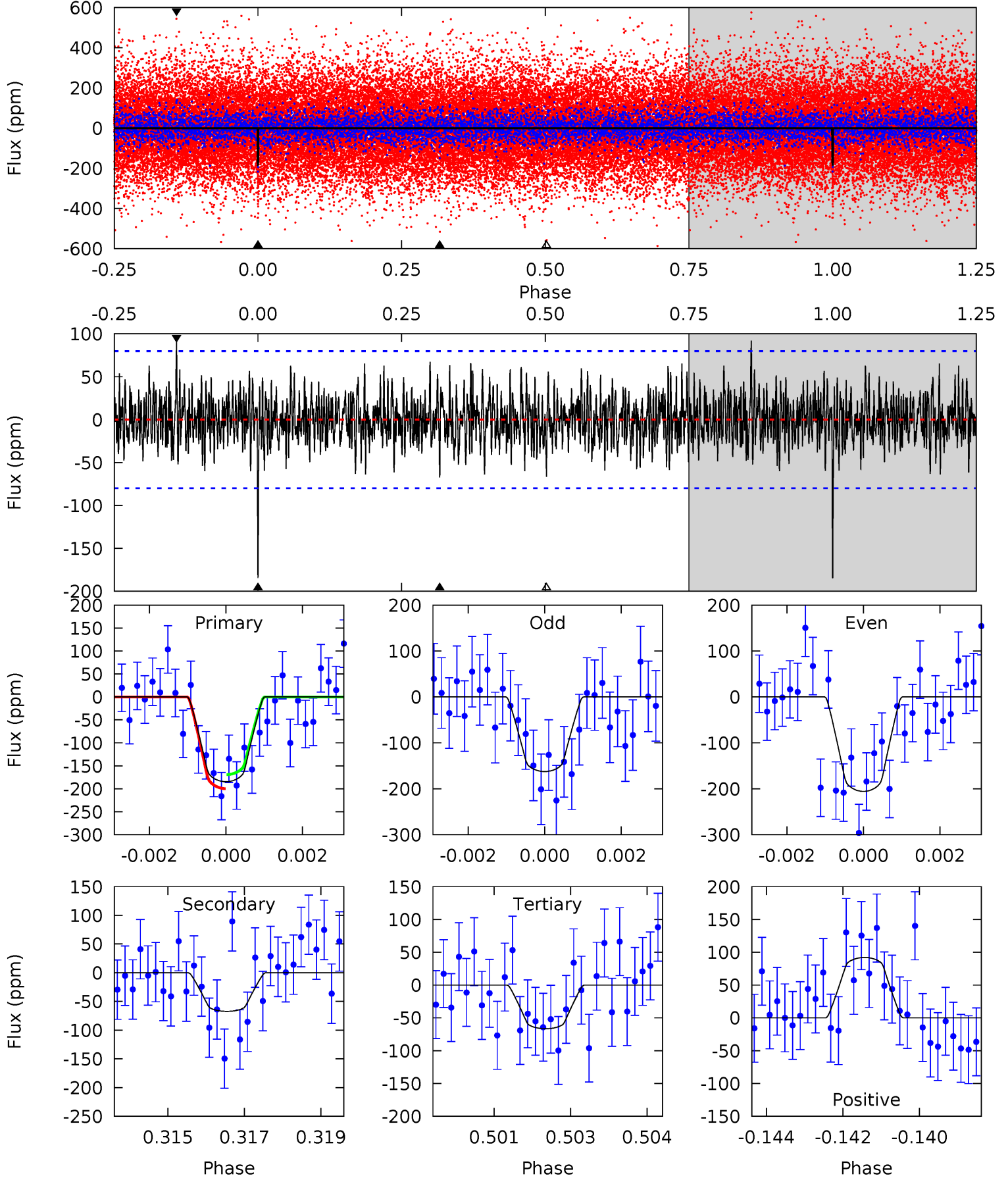
TCE 009943441-02 P= 42.987789 Days $T_0=139.237573$ (BKJD)



DV Model-Shift Uniqueness Test

009943441-02, P = 42.988070 Days, E = 96.242739 Days

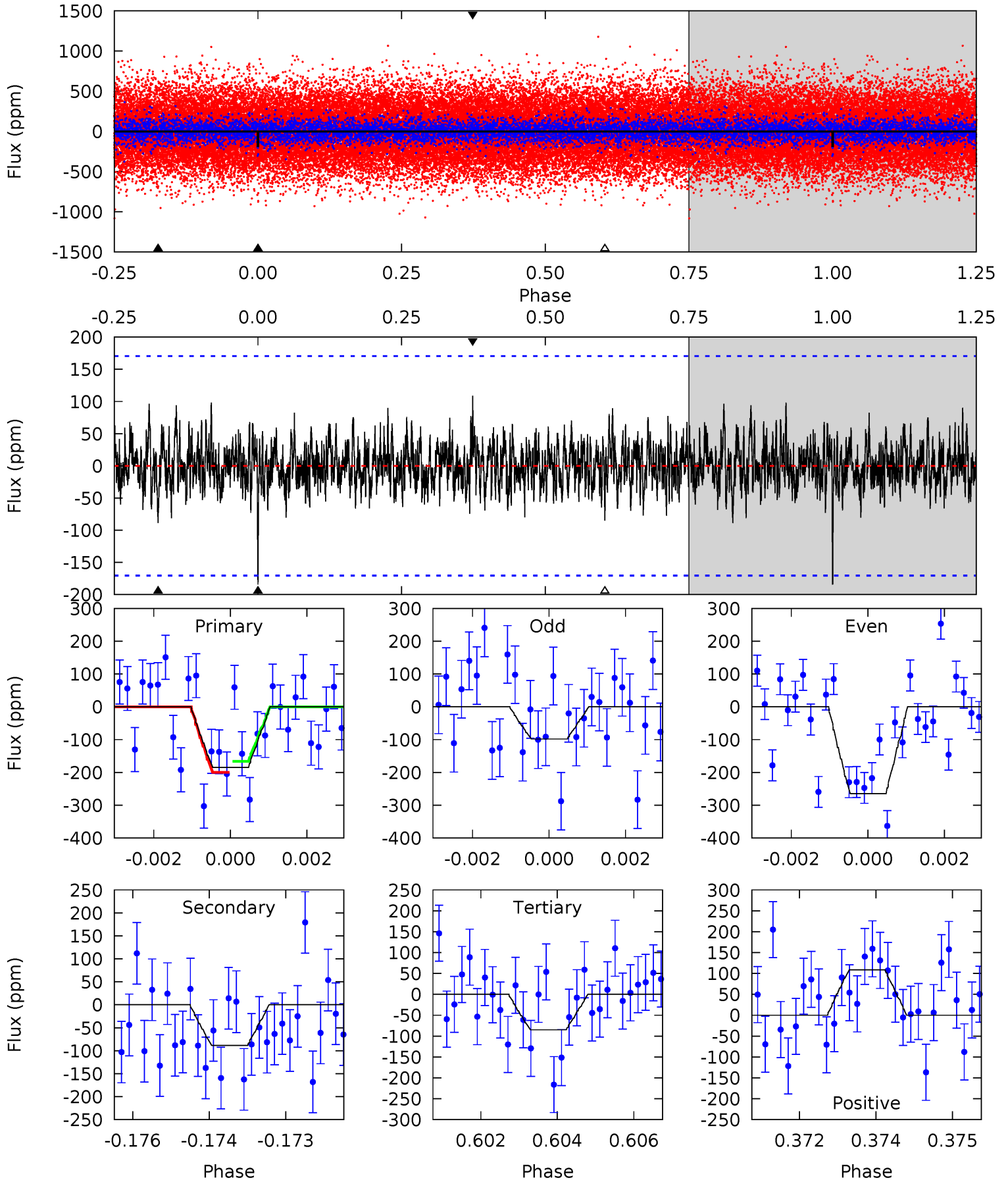
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	4.50	4.45	6.15	5.34	3.11	1.54	7.89	6.19	0.05	-1.66	1.45	1.01	0.33	1.02



Alt Model-Shift Uniqueness Test

009943441-02, P = 42.987789 Days, E = 96.249784 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.79	2.79	2.67	3.41	5.36	3.14	0.91	3.12	2.38	0.12	-0.62	2.62	1.03	0.37	0.53



Stellar Parameters For KIC 009943441

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7773^{+217}_{-326}	$3.613^{+0.540}_{-0.060}$	$-0.240^{+0.200}_{-0.300}$	$3.653^{+0.634}_{-1.901}$	$1.995^{+0.226}_{-0.528}$	$0.058^{+0.372}_{-0.016}$
	+3%/-4%	+15%/-2%	+83%/-125%	+17%/-52%	+11%/-26%	+645%/-28%
Source	KIC0	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 009943441-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-67 ± 15	$5.03^{+3.52}_{-2.83}$	1577^{+122}_{-220}	5532^{+2929}_{-943}	125^{+537}_{-80}
Alt.	-89 ± 32	$4.69^{+3.12}_{-2.63}$	1567^{+125}_{-209}	6162^{+3408}_{-1305}	194^{+823}_{-130}

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 $A_{obs} \gg 1.0$

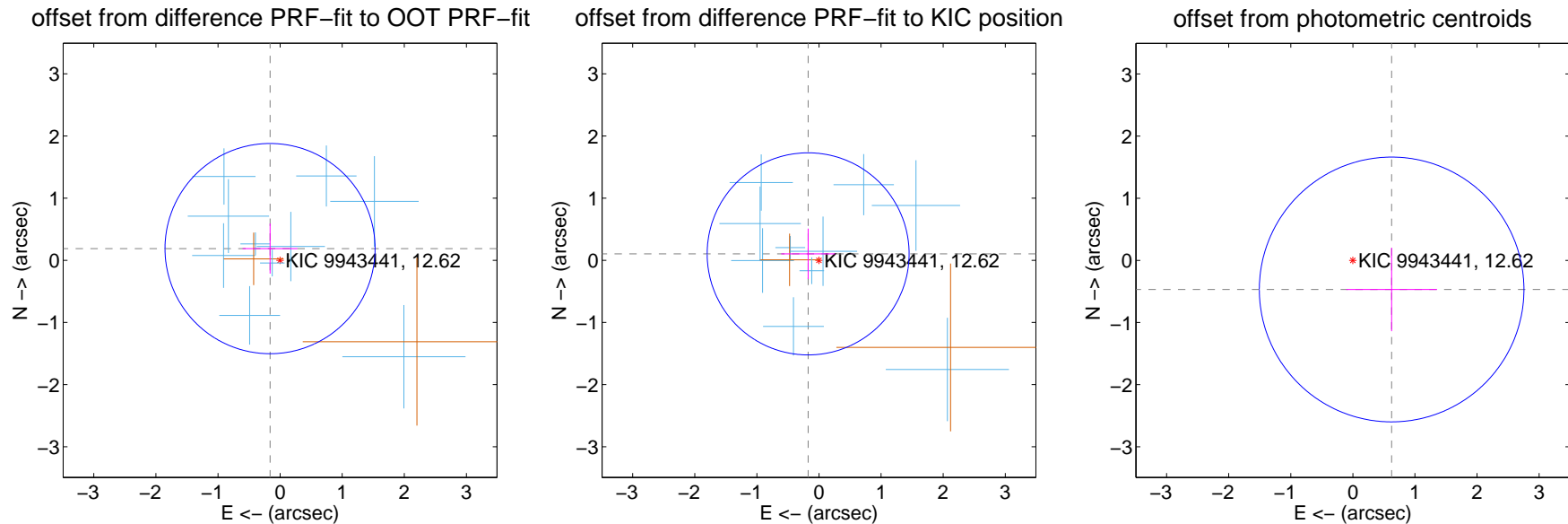
DV Centroid Data

Supplemental centroid analysis for 009943441-02. Kepler magnitude: 12.62. Transit SNR 9.24

There are 10 quarters with good PRF difference image offsets

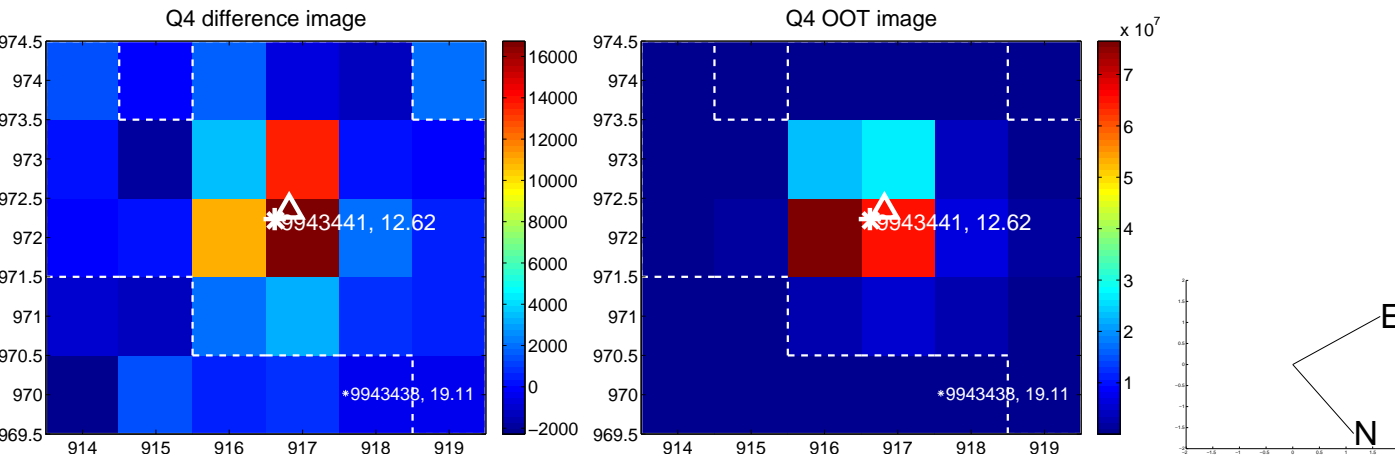
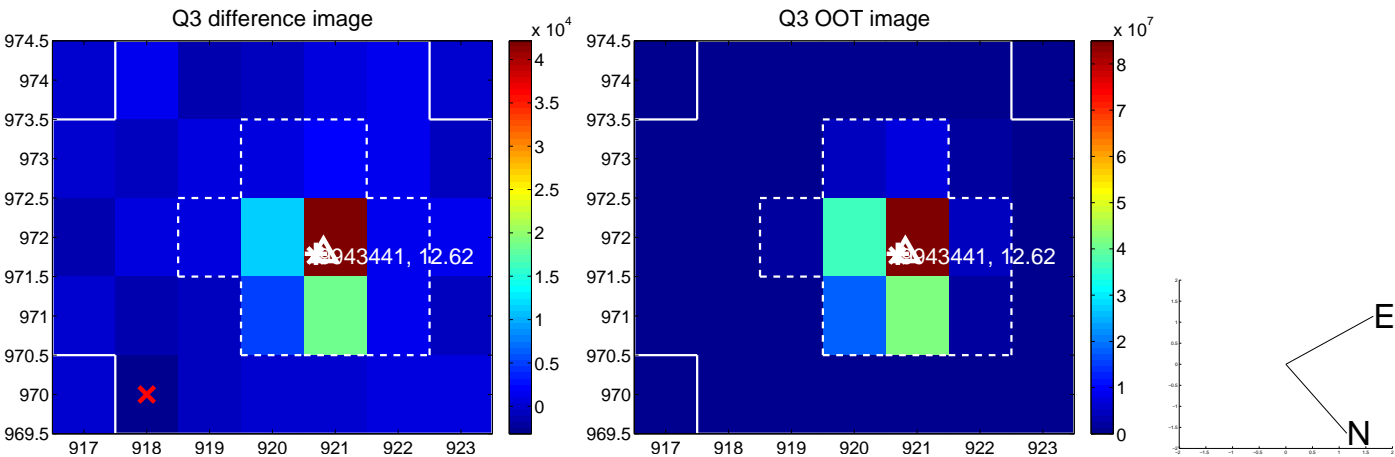
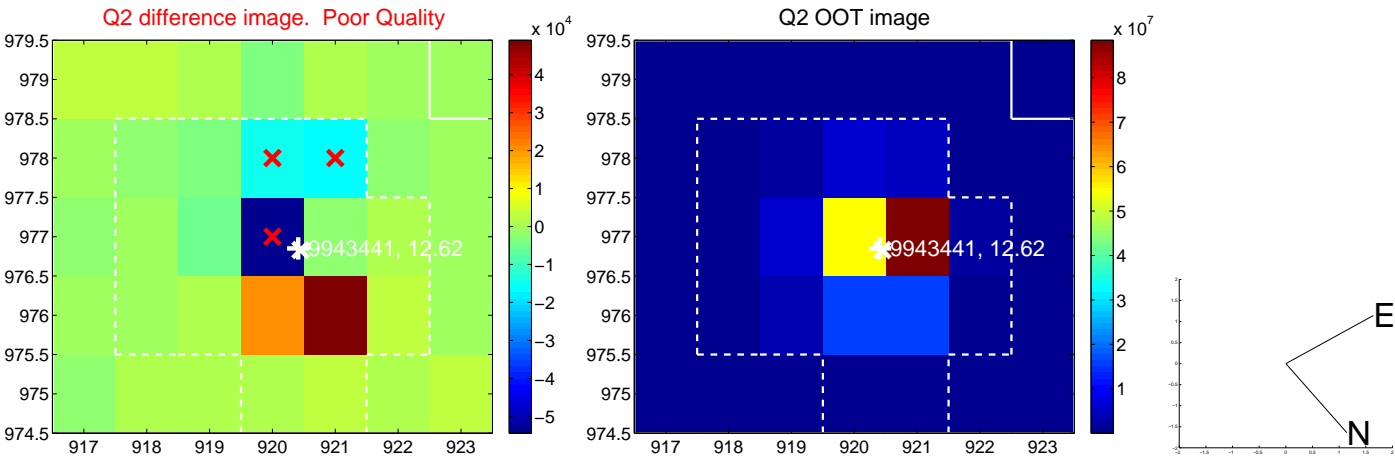
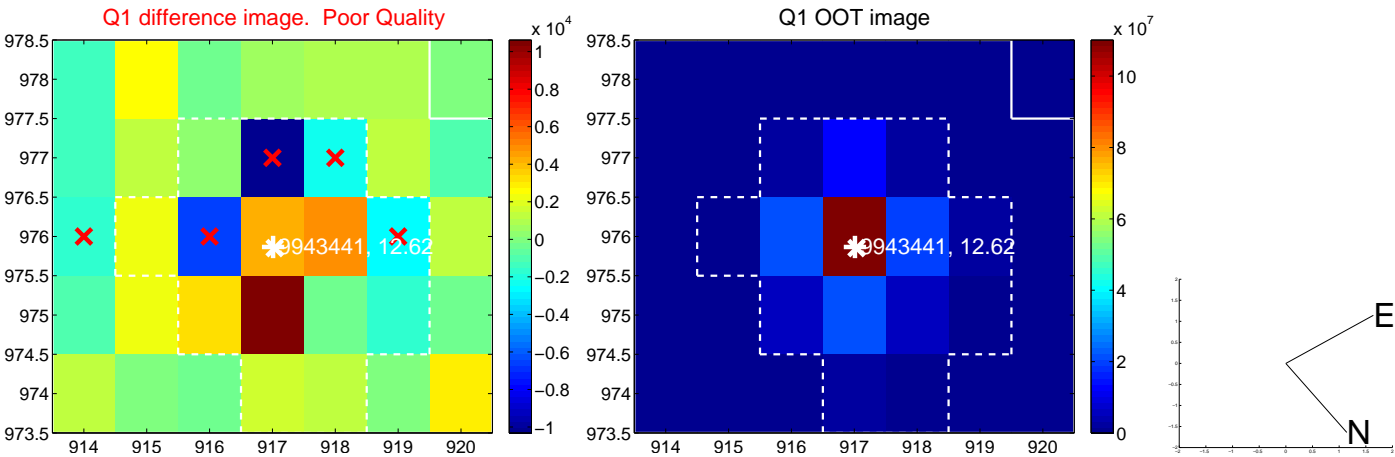
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.248 ± 0.564	0.44	0.162 ± 0.443	0.188 ± 0.403
PRF-fit source offset from KIC position	0.203 ± 0.542	0.37	0.175 ± 0.433	0.103 ± 0.406
photometric centroid source offset	0.78 ± 0.71	1.10	-0.62 ± 0.73	-0.47 ± 0.67

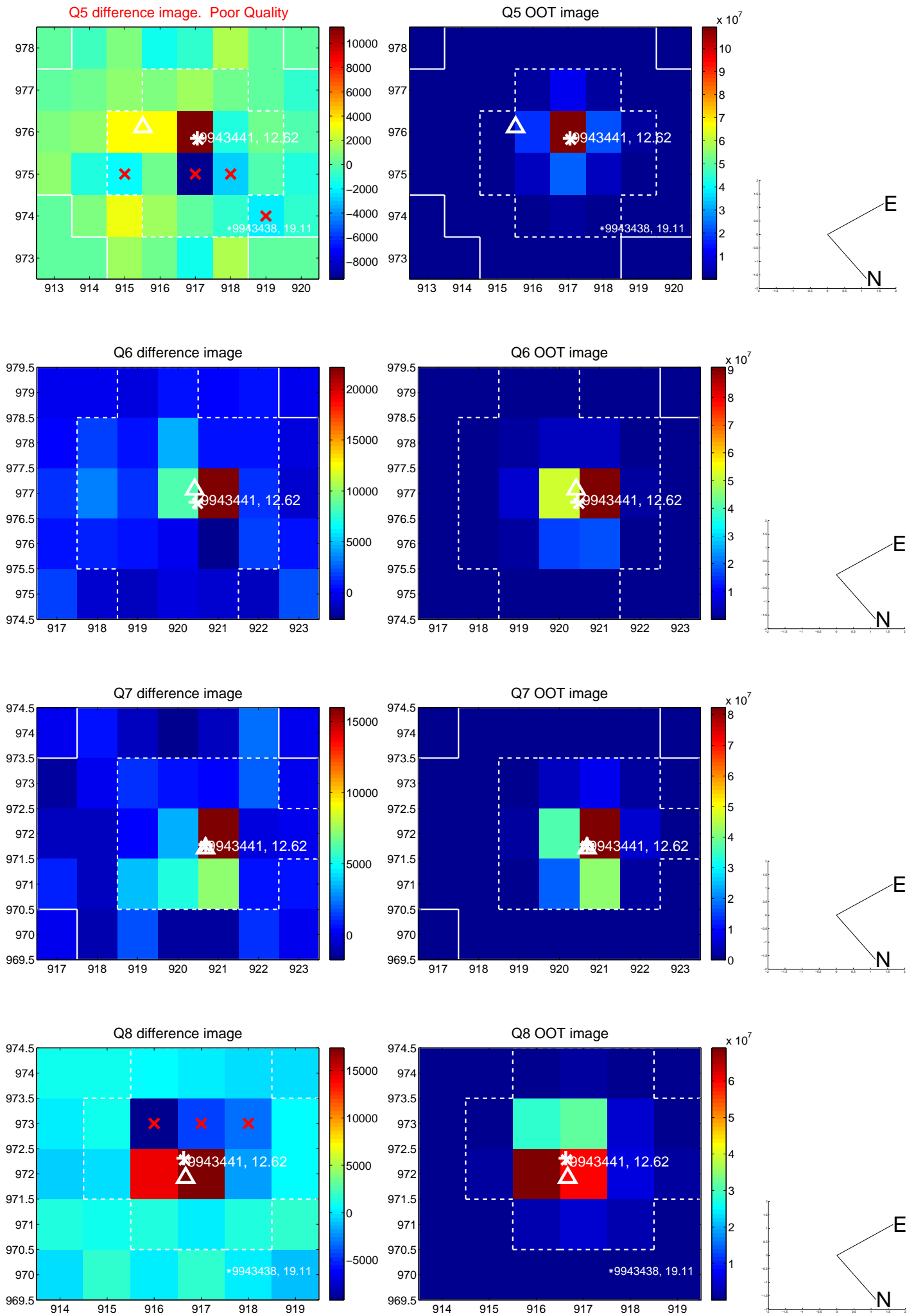


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

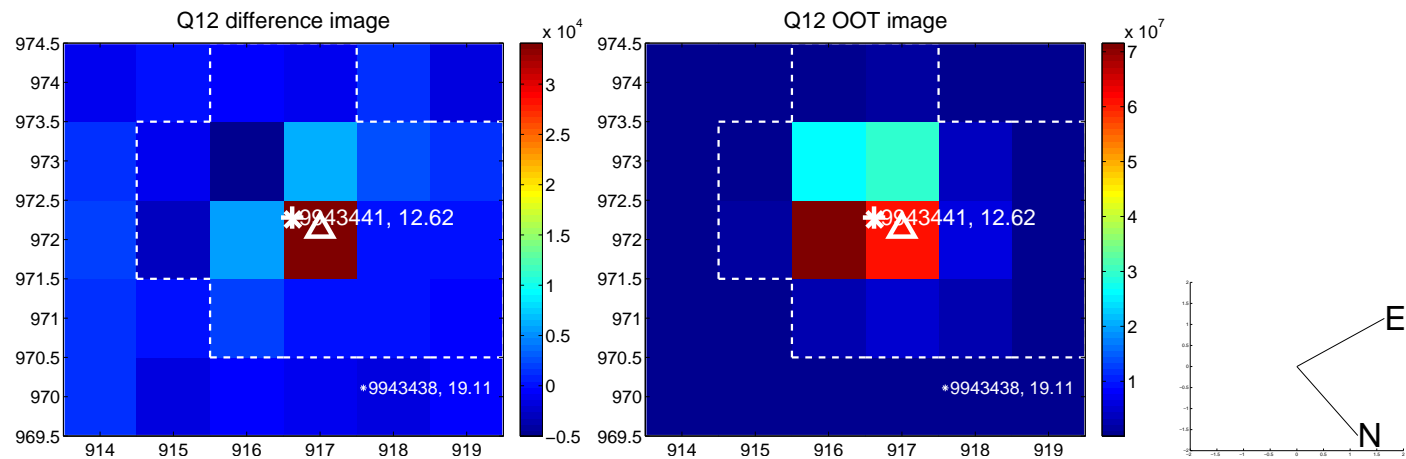
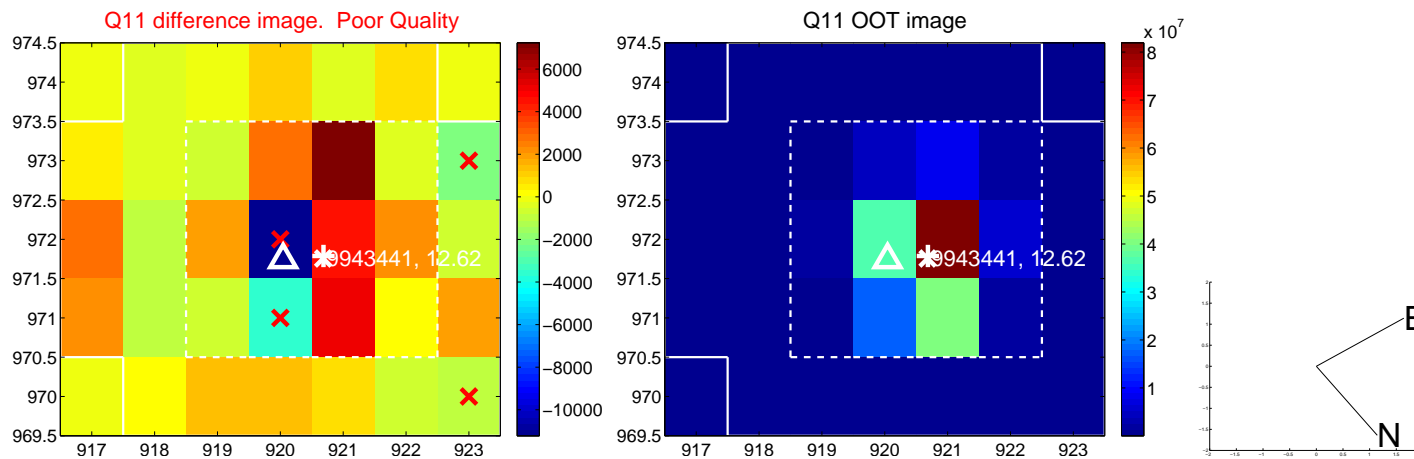
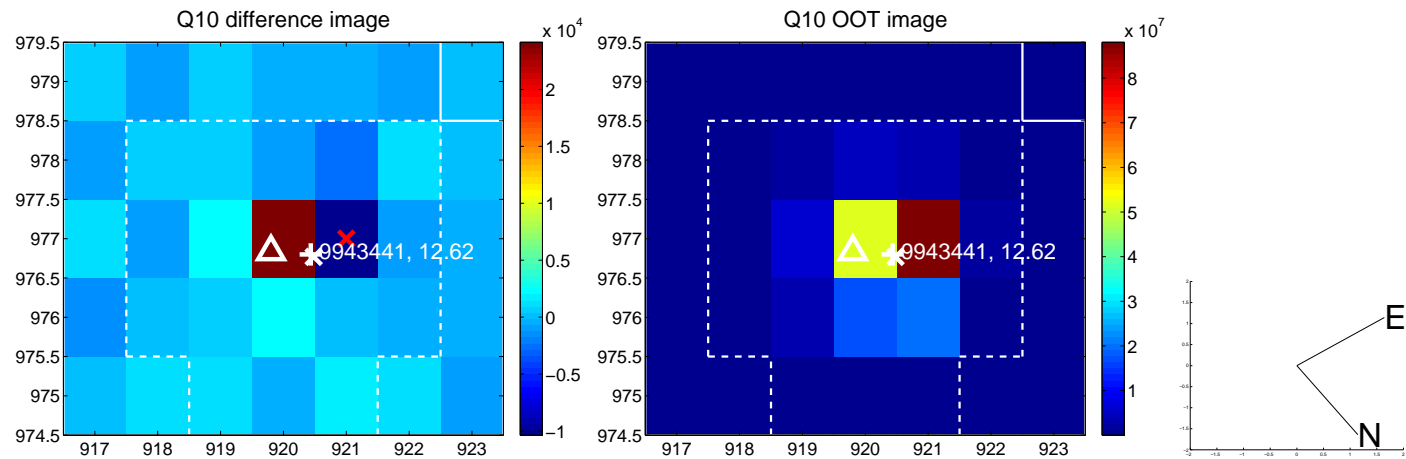
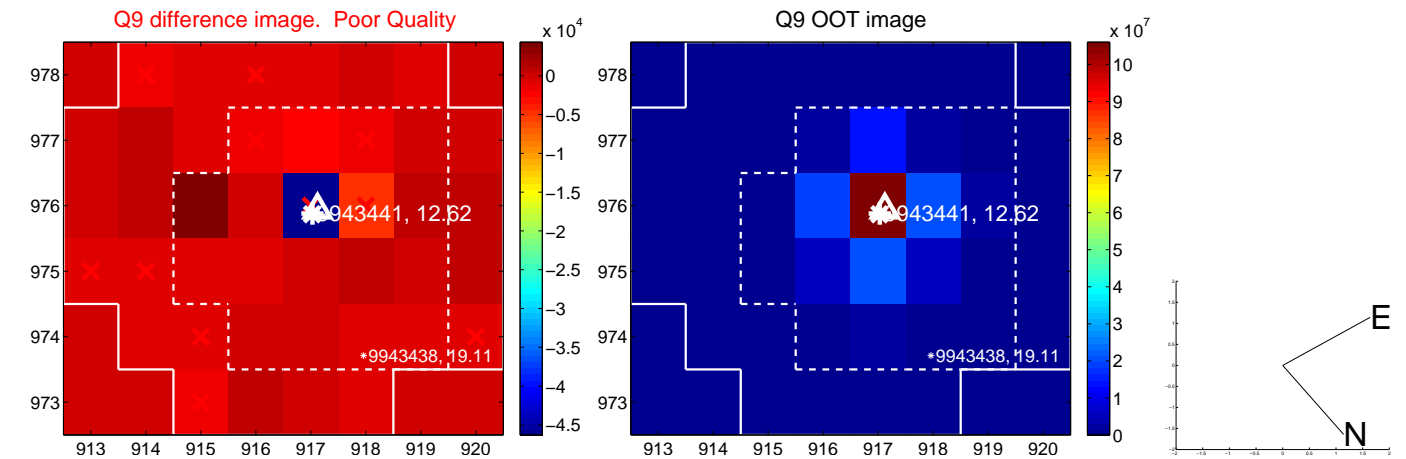
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



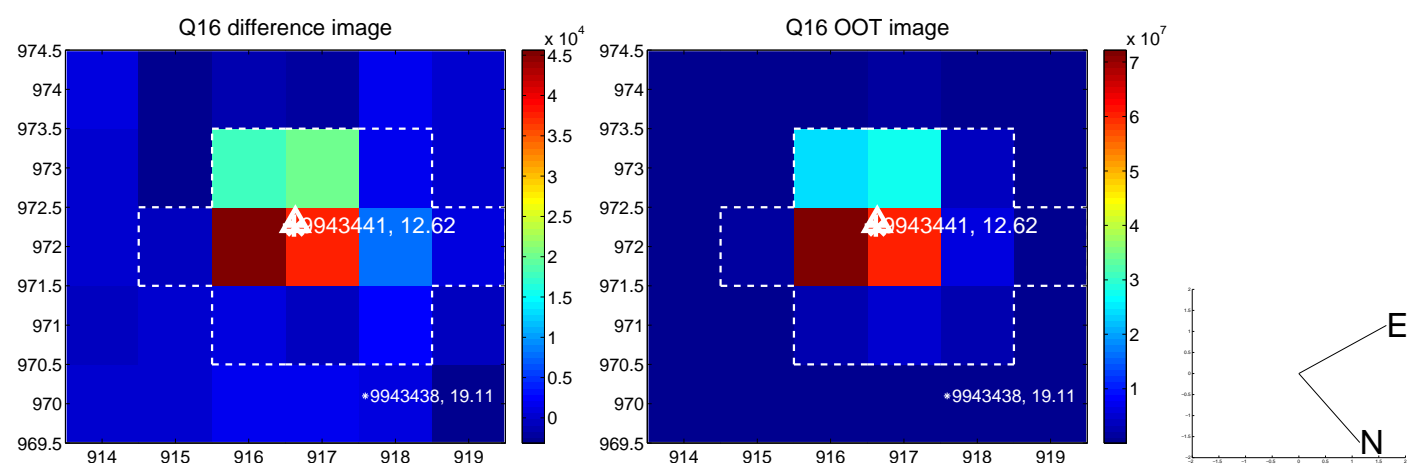
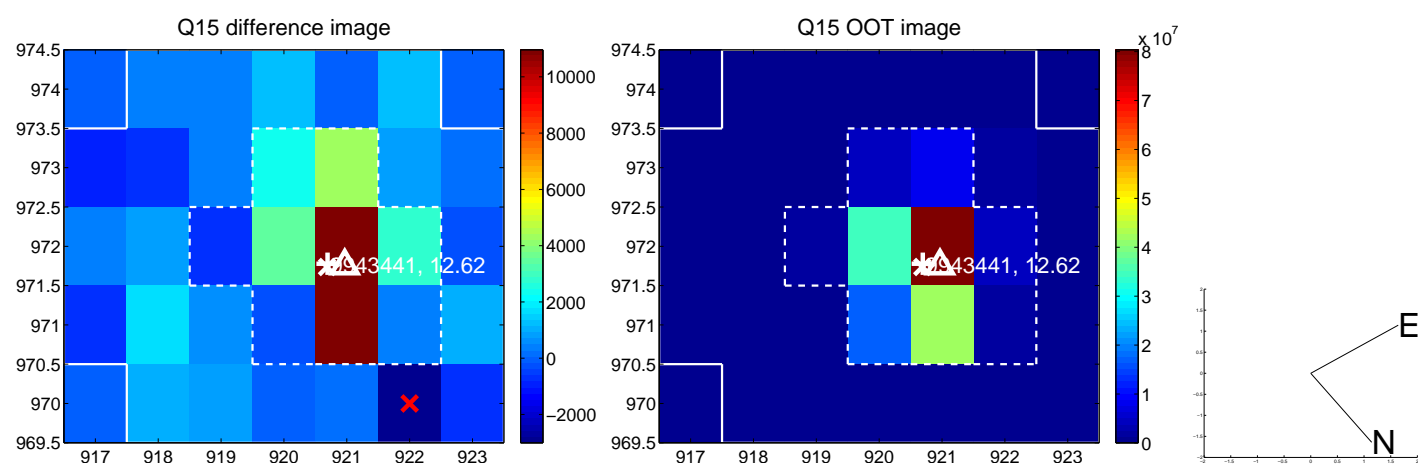
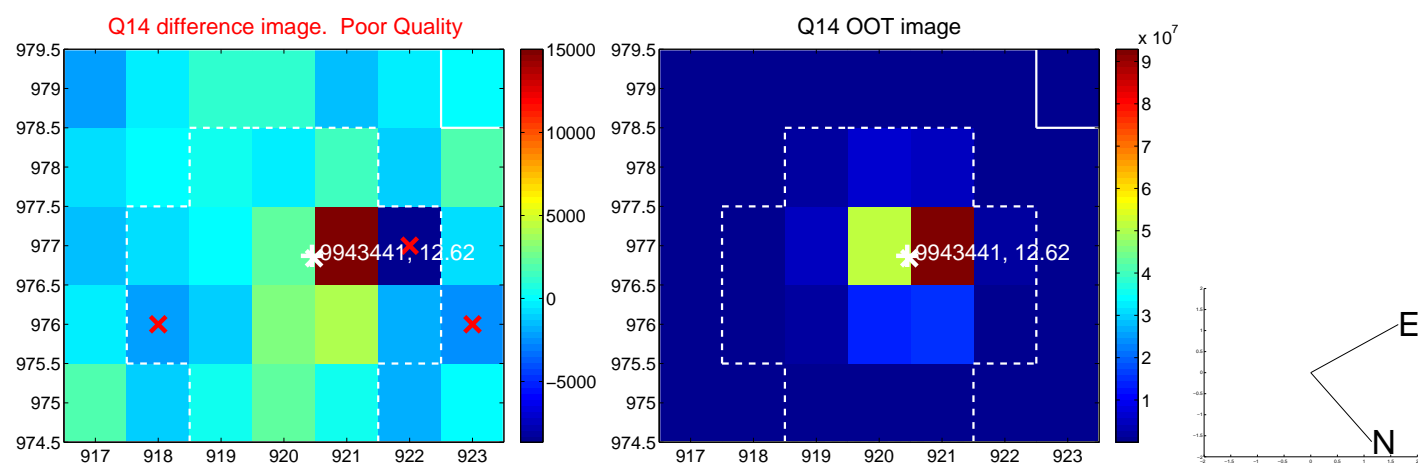
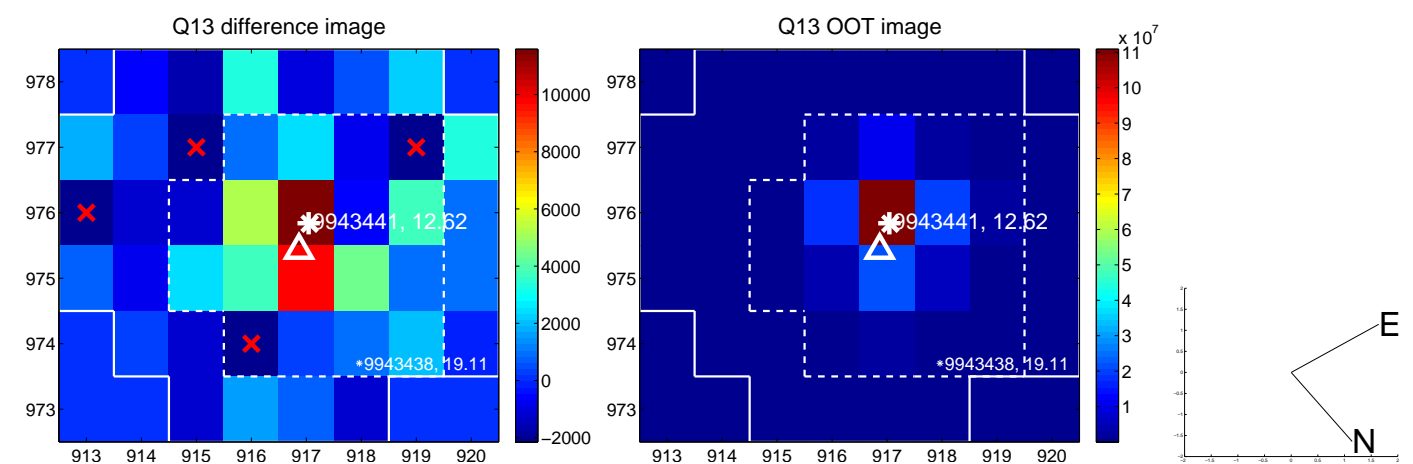
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



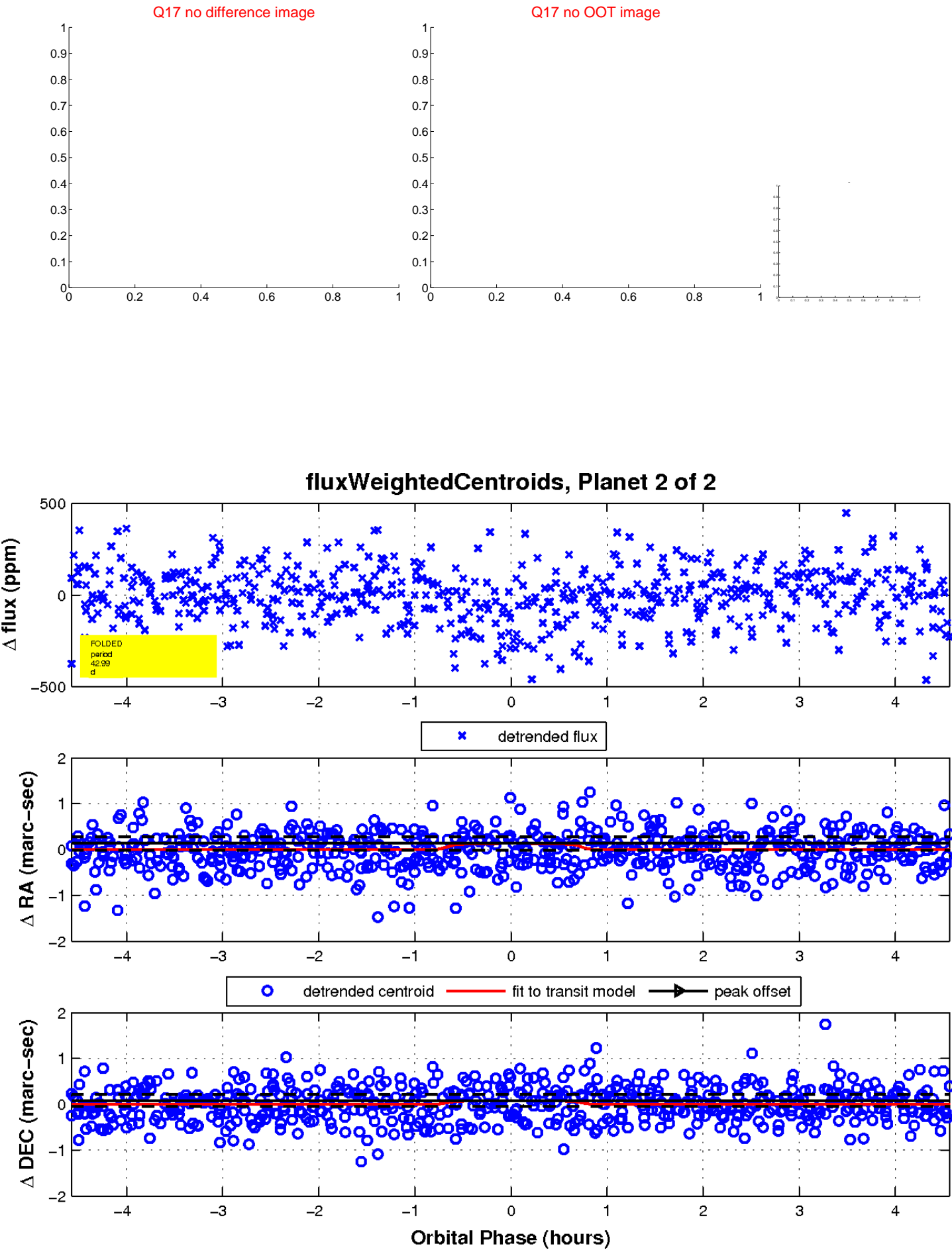
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UKIRT Image

Declination

