

KIC 009883606

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})
009883606-01	OBS	4383.01	4.341914	134.193681	71.6	2.618	10.5	11.2	1.09	6164	1.09	553.42
009883606-02	OBS	4383.02	2.583970	131.795525	46.2	2.337	8.6	8.8	1.09	6164	0.84	1105.55

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009883606-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009883606-02	OBS	PC	0.88	0	0	0	0	NO_COMMENT

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

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

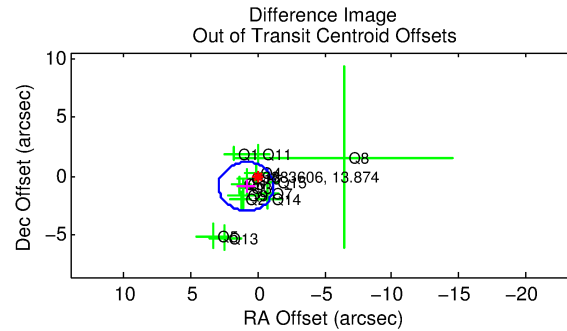
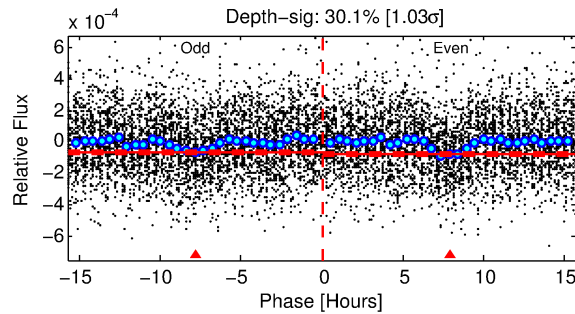
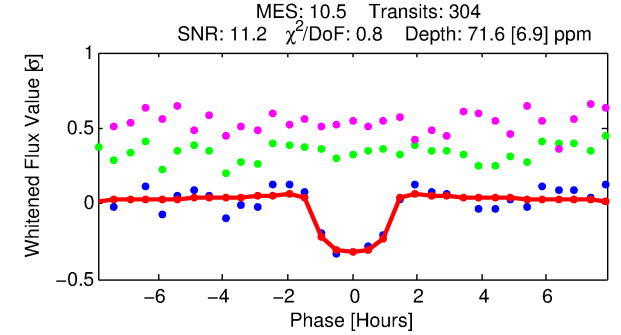
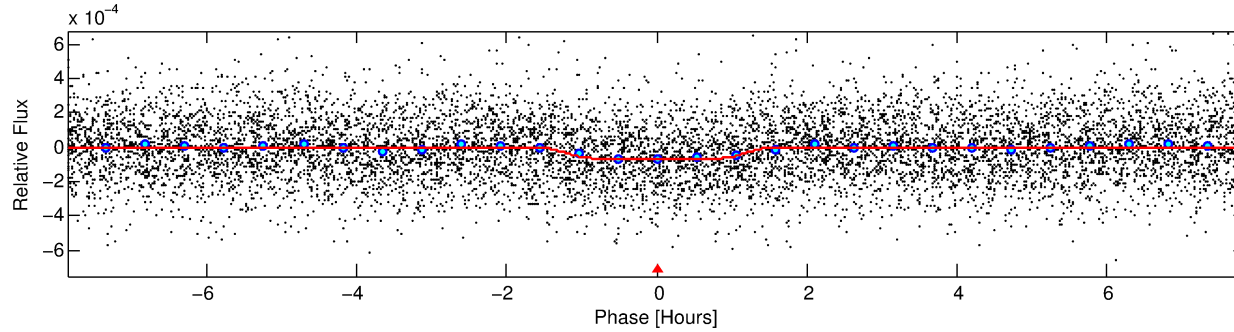
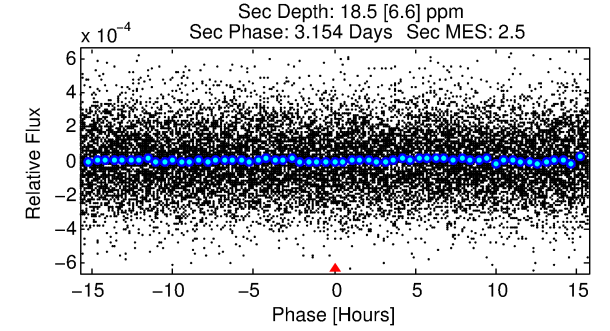
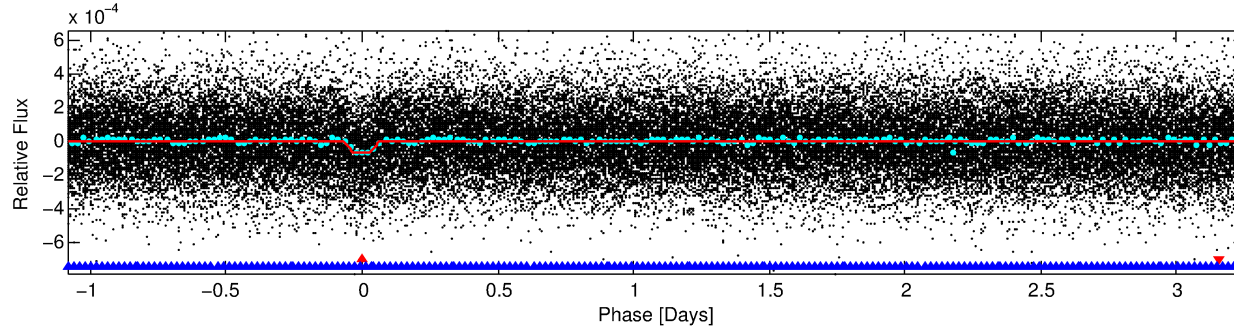
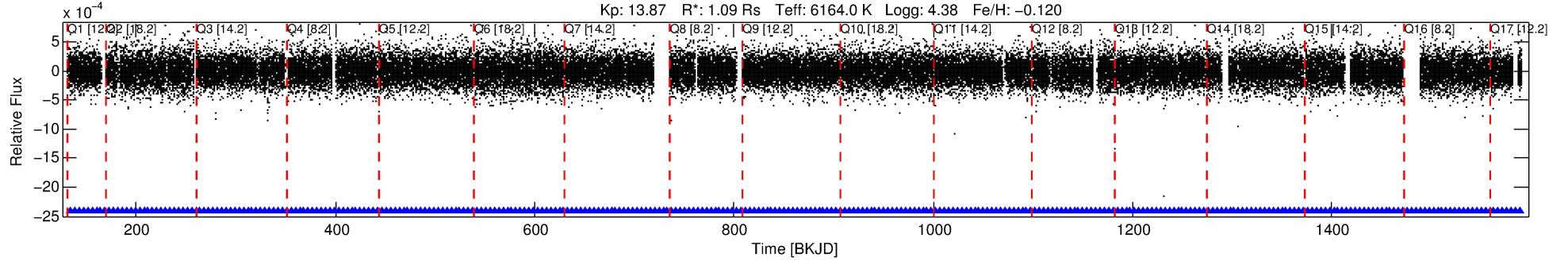
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009883606-01

No Significant Match Found

DV One-Page Summary

KIC: 9883606 Candidate: 1 of 2 Period: 4.342 d
KOI: K04383.01 Corr: 0.965



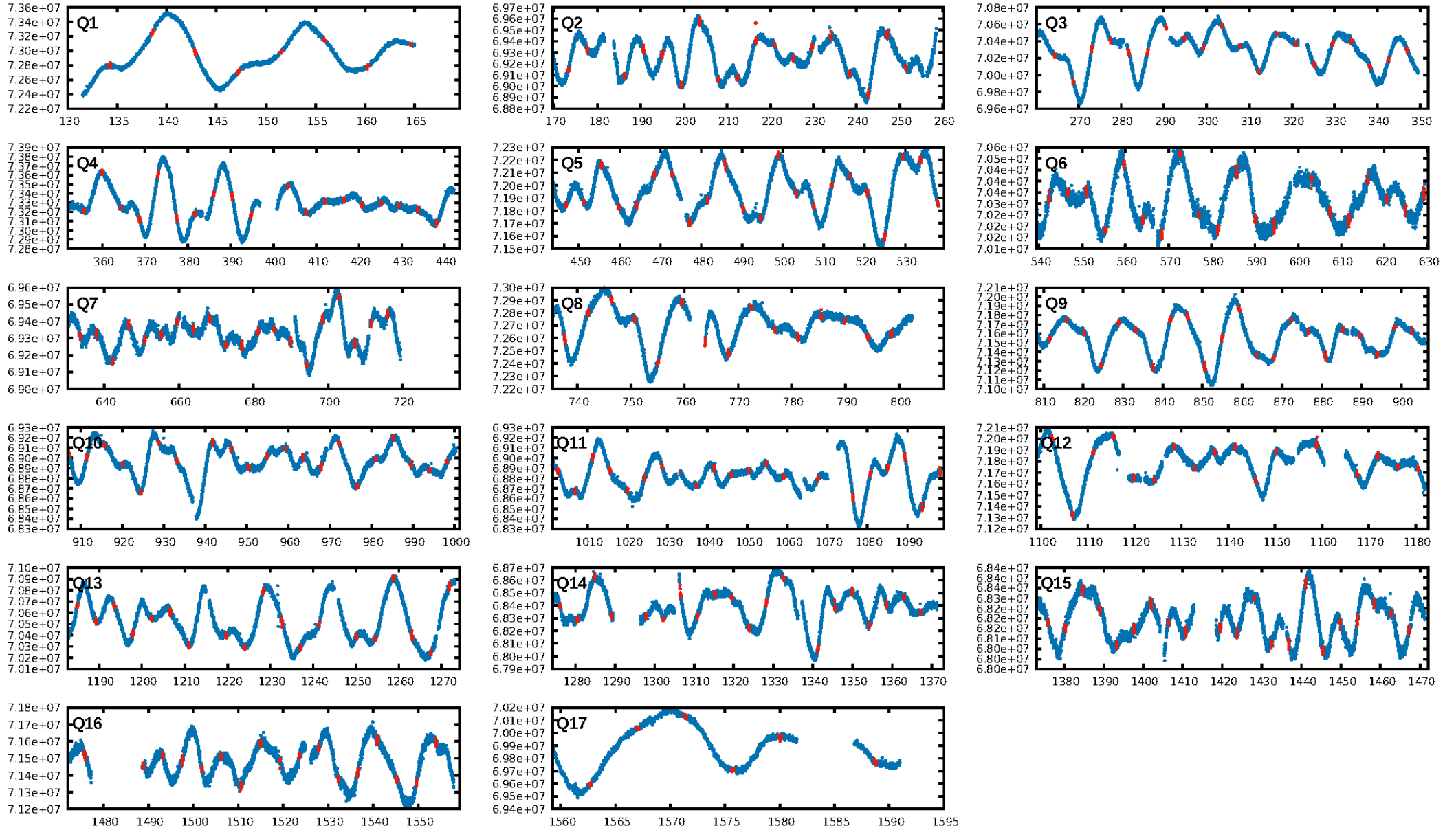
DV Fit Results:

Period = 4.34191 [0.00002] d
Epoch = 134.1937 [0.0034] BKJD
Rp/R* = 0.0091 [0.0039]
a/R* = 5.79 [12.90]
b = 0.90 [0.48]
Seff = 553.42 [228.26]
Teq = 1237 [128] K
Rp = 1.09 [0.58] Re
a = 0.0527 [0.0141] AU
Ag = 23.93 [24.01] [0.96σ]
Teffp = 4229 [990] K [3.00σ]

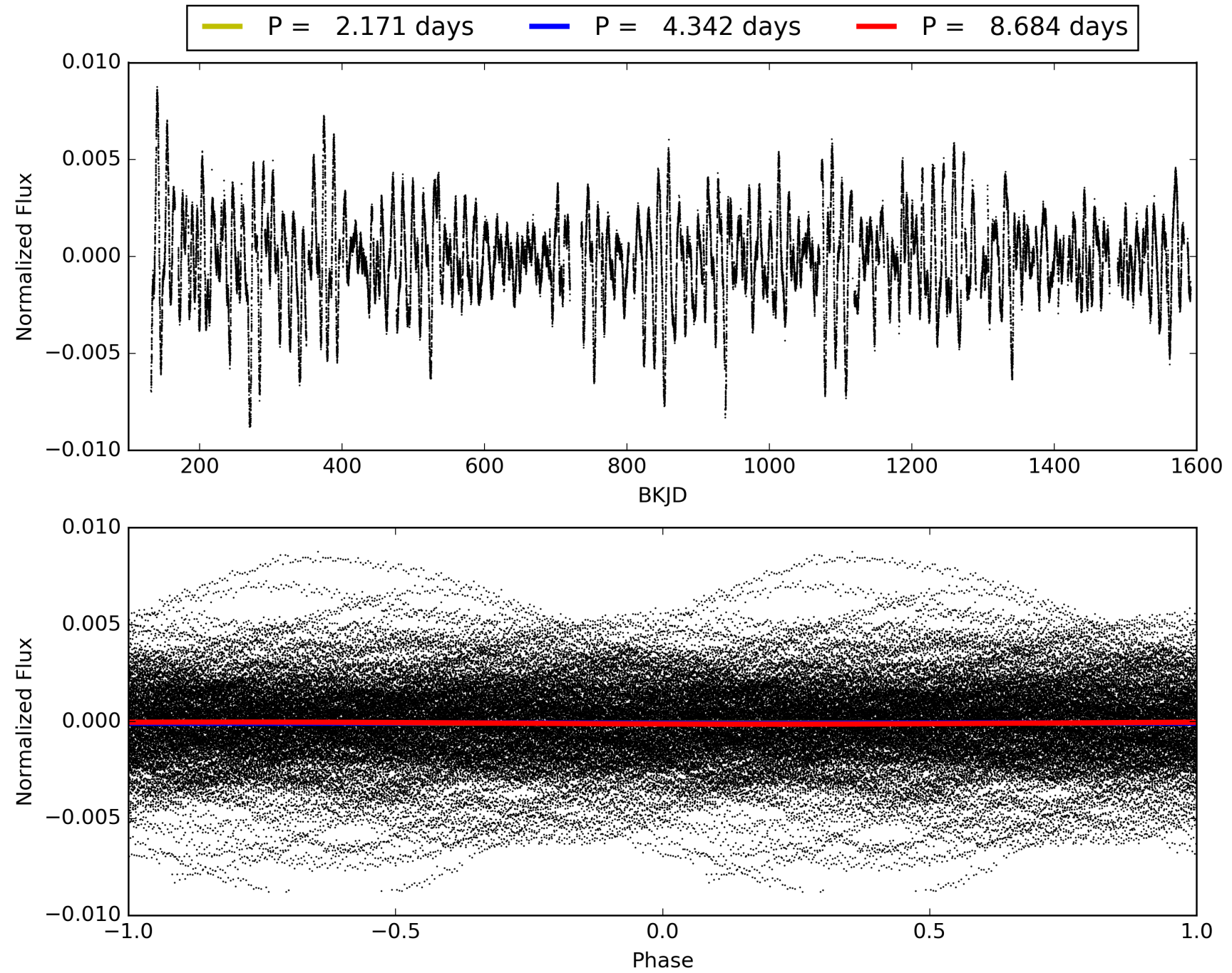
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.02σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: 4.90e-25
RollingBand-fgt: 1.00 [290/290]
GhostDiagnostic-chr: -43.03
Centroid-sig: 15.2%
Centroid-so: 1.360 arcsec [1.37σ]
OotOffset-rm: 1.204 arcsec [1.76σ]
KicOffset-rm: 1.267 arcsec [1.76σ]
OotOffset-st: 3/4/3/5 [15]
KicOffset-st: 3/4/3/5 [15]
DiffImageQuality-fgm: 0.73 [11/15]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009883606-01, PDC Light Curves

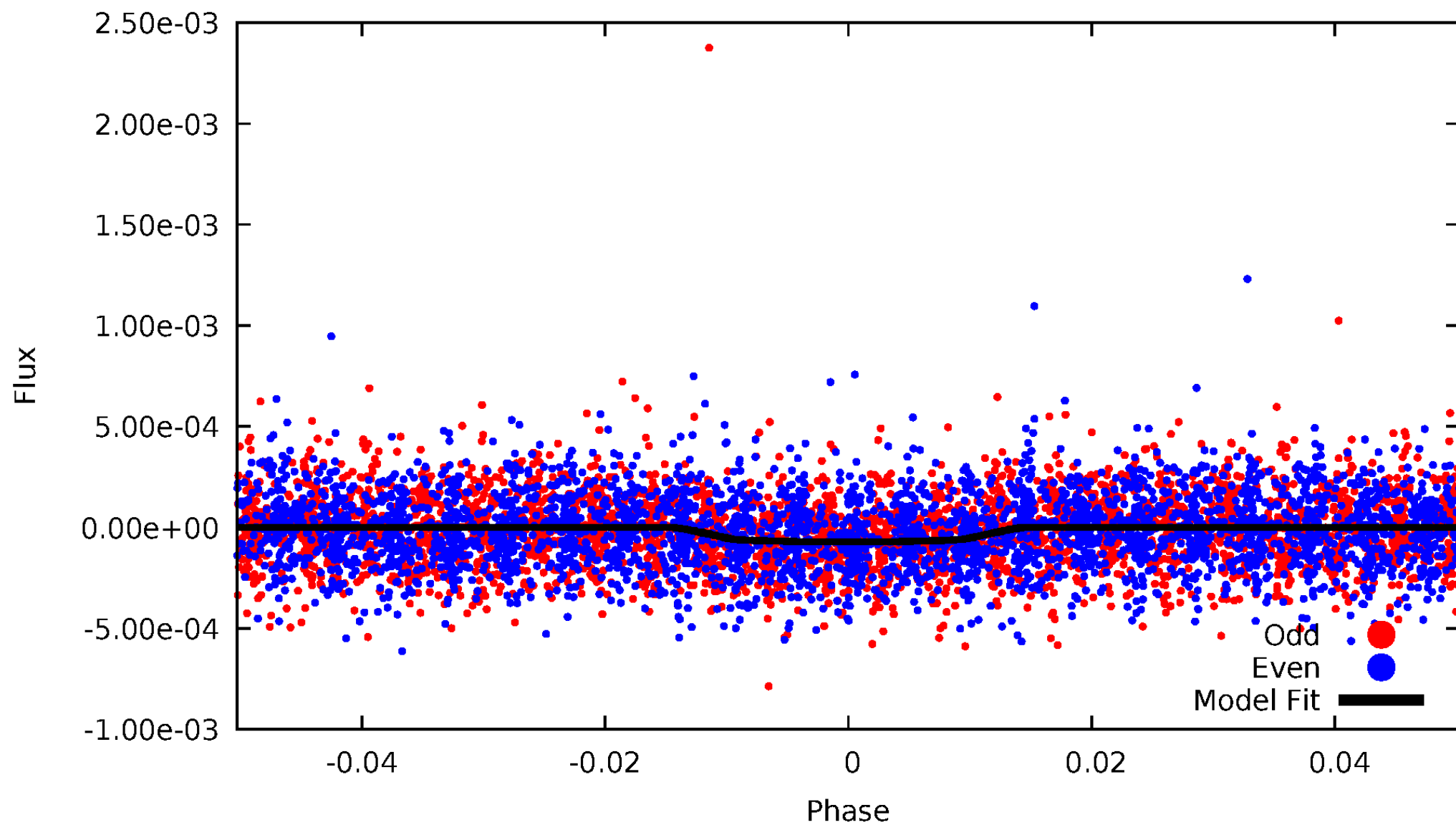


TCE 009883606-01



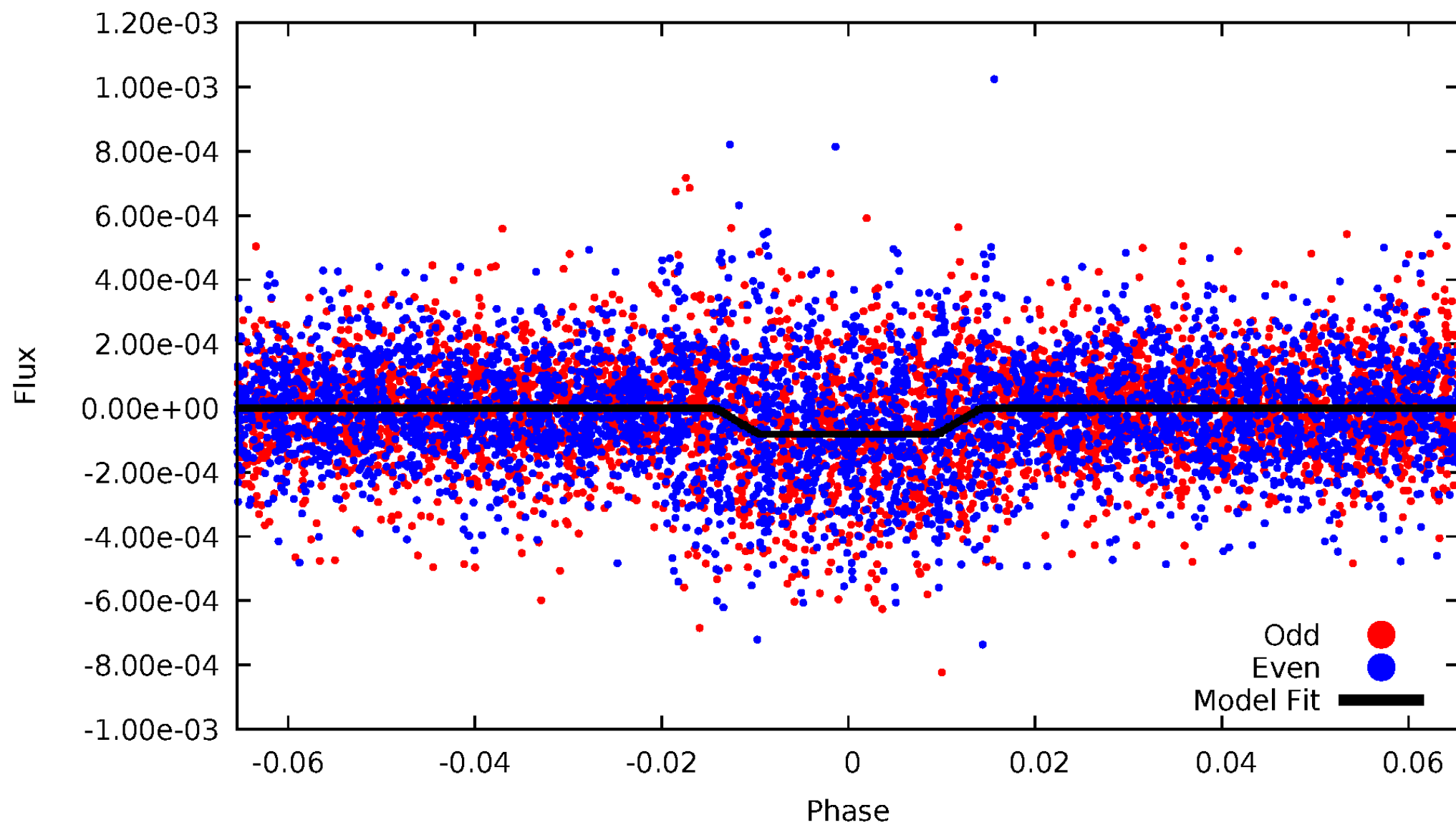
DV Odd/Even

TCE 009883606-01



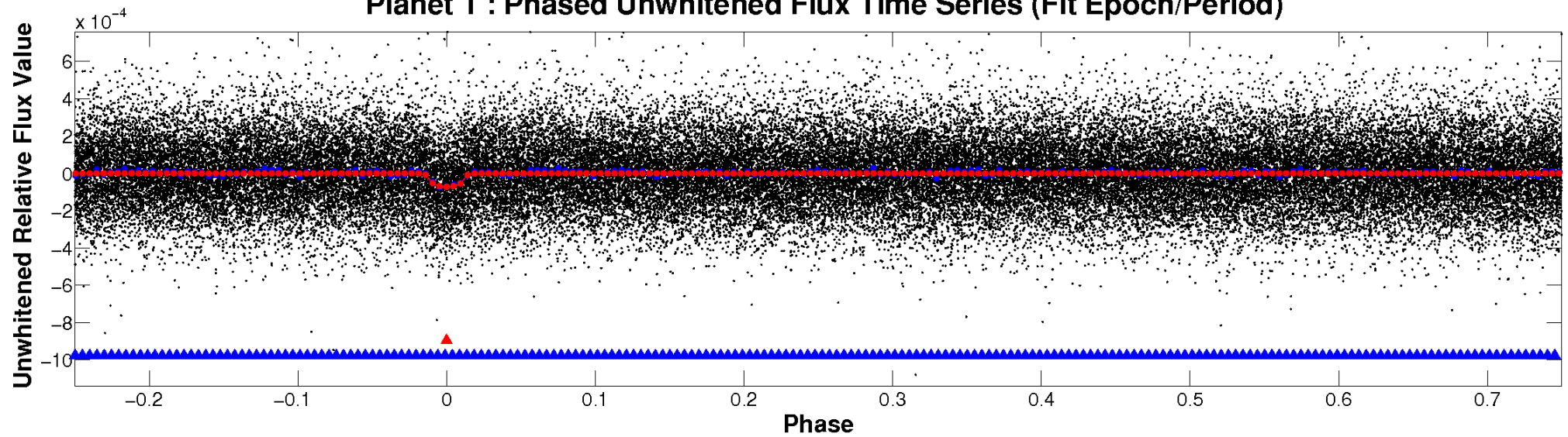
ALT Odd/Even

TCE 009883606-01

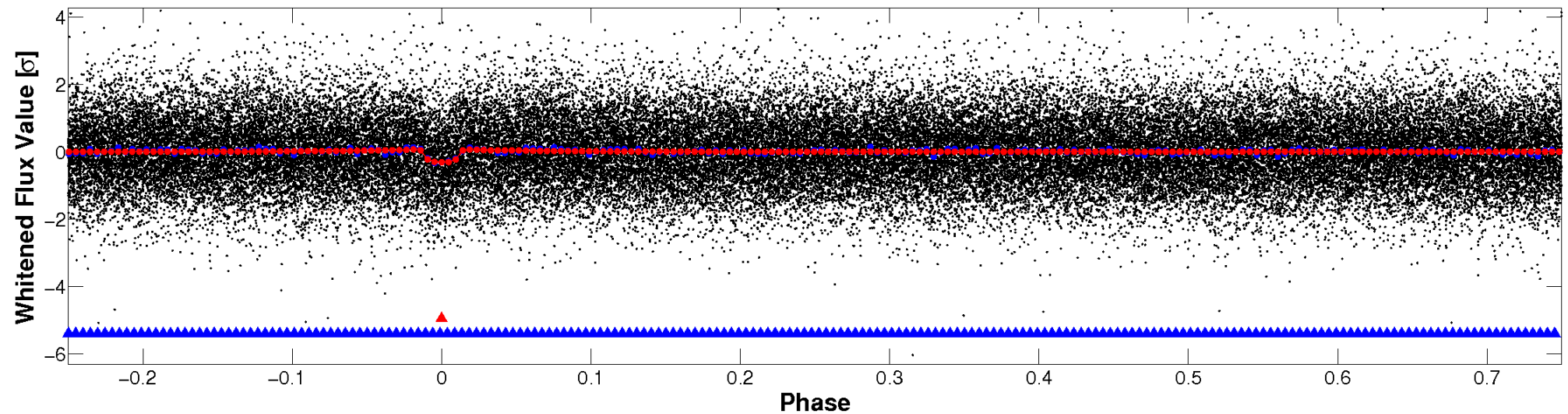


Non-Whitened Vs. Whitened Light Curve

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

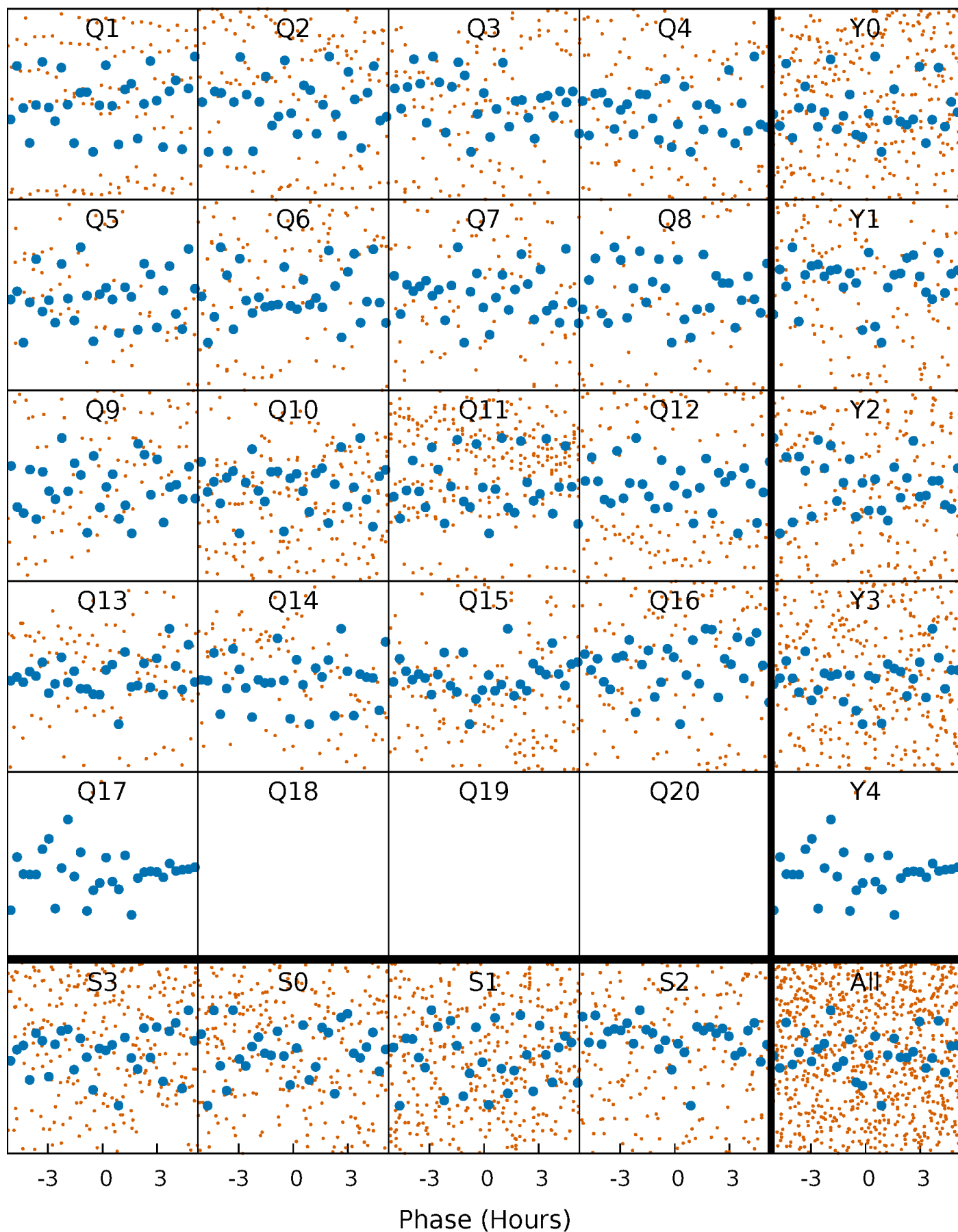


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



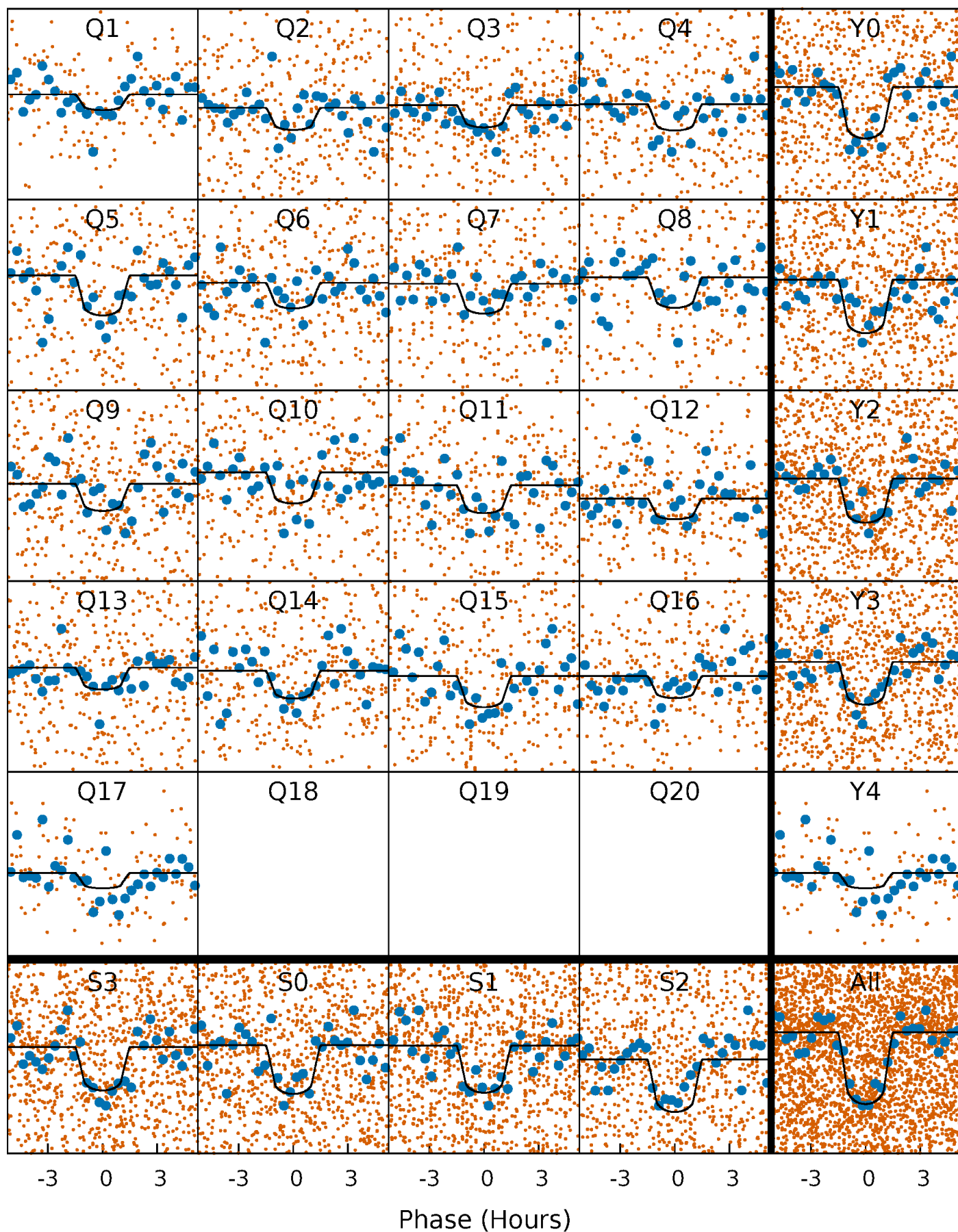
PDC Quarter-Phased Transit Curves

TCE 009883606-01 P= 4.341914 Days $T_0=134.193681$ (BKJD)



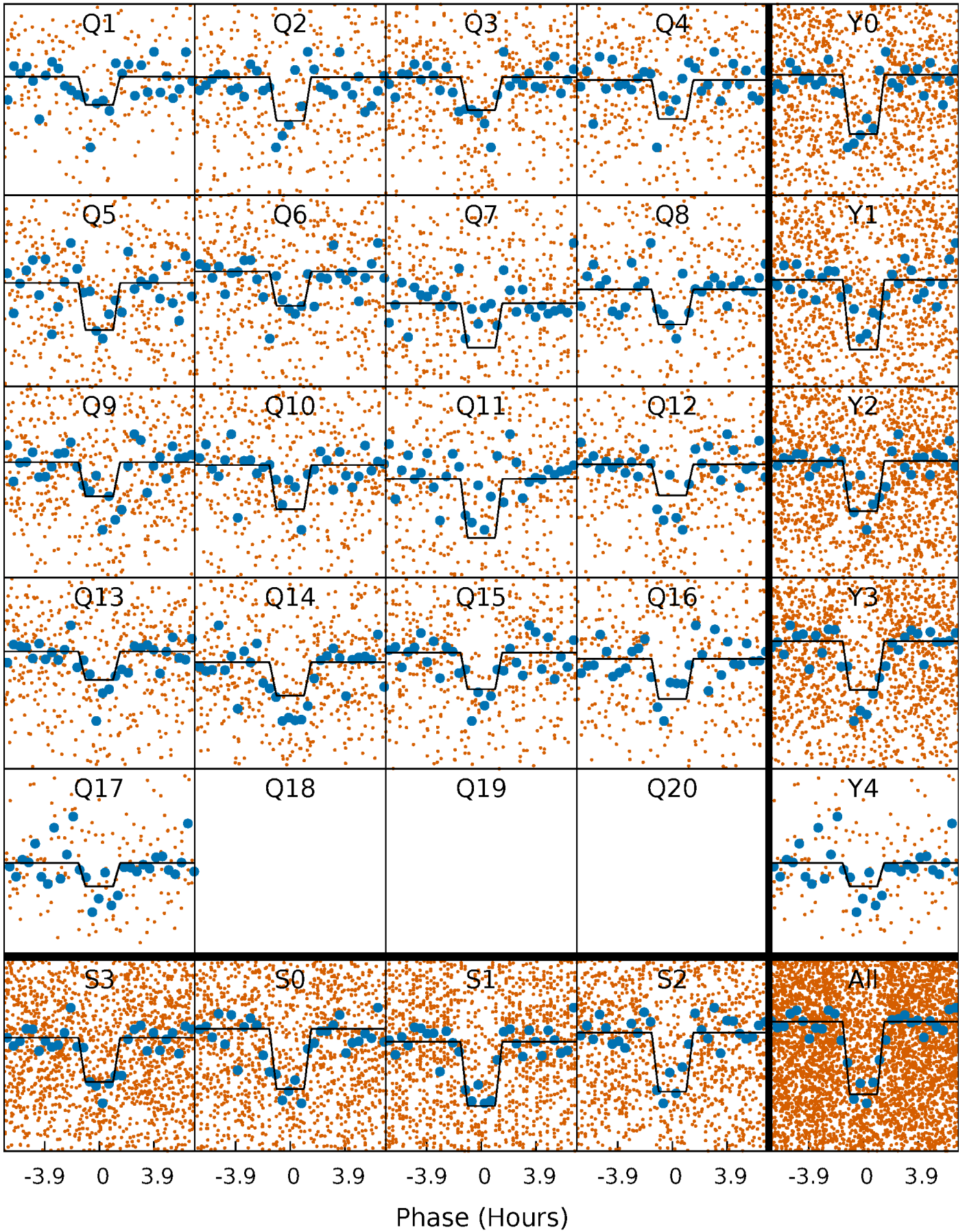
DV Quarter-Phased Transit Curves

TCE 009883606-01 P= 4.341914 Days $T_0=134.193681$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

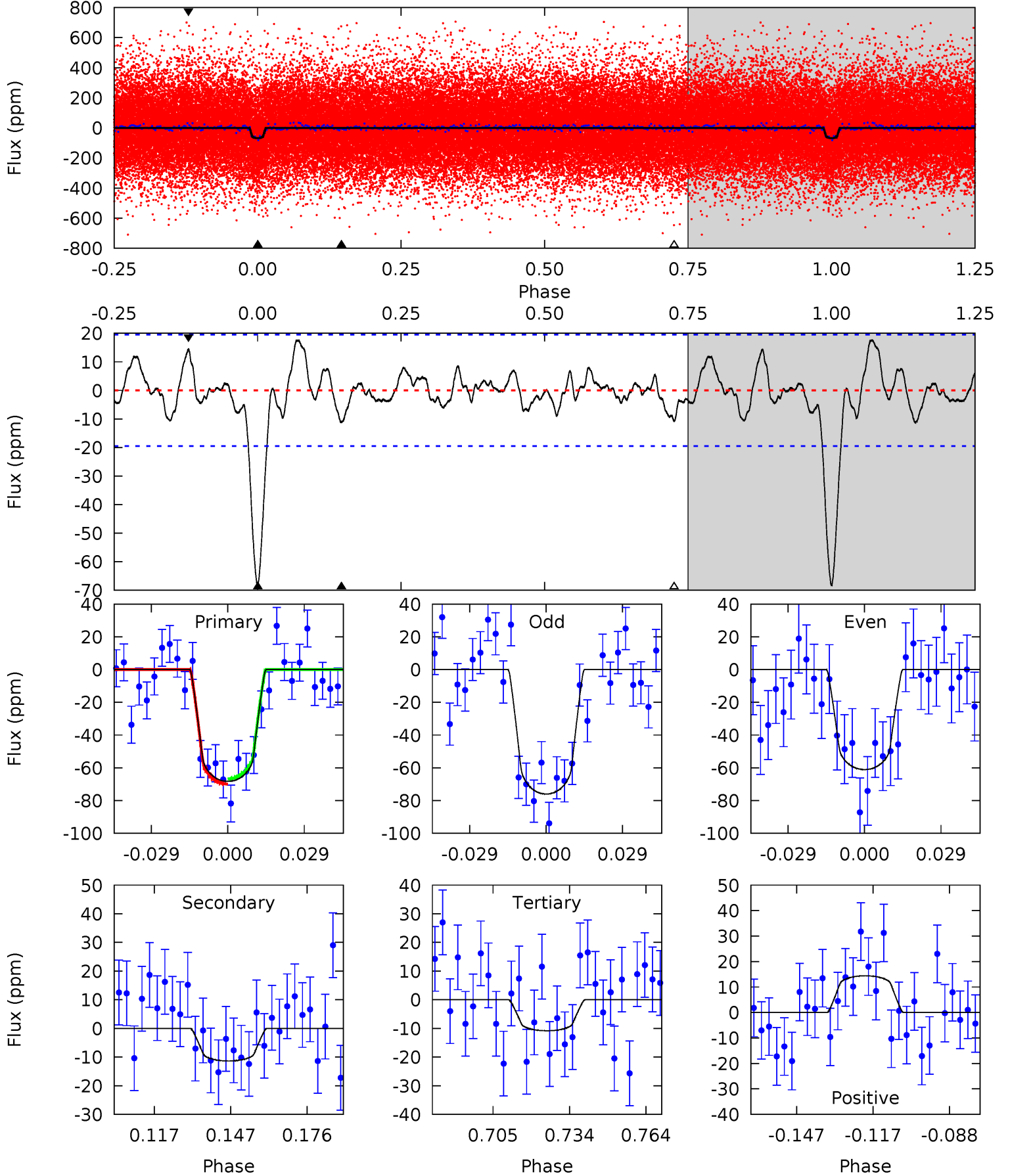
TCE 009883606-01 P= 4.341898 Days $T_0=134.196096$ (BKJD)



DV Model-Shift Uniqueness Test

009883606-01, P = 4.341914 Days, E = 129.851767 Days

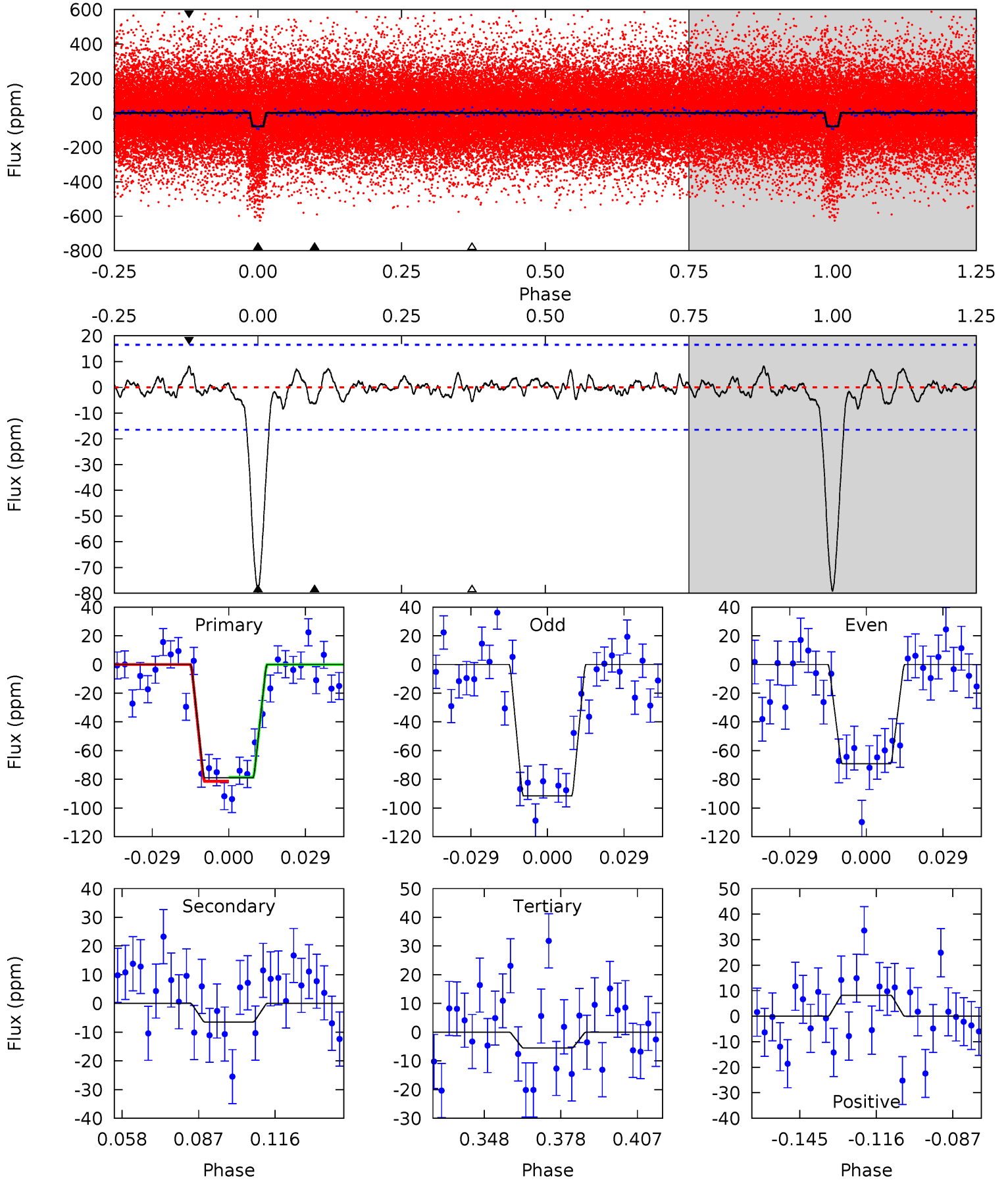
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.9	2.80	2.67	3.56	4.82	2.18	1.30	14.2	13.3	0.13	-0.75	1.85	1.04	0.20	0.39



Alt Model-Shift Uniqueness Test

009883606-01, P = 4.341898 Days, E = 129.854198 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.0	1.89	1.61	2.40	4.82	2.18	0.72	21.4	20.6	0.27	-0.51	3.28	0.94	0.09	0.41



Stellar Parameters For KIC 009883606

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6164^{+165}_{-220}	$4.378^{+0.090}_{-0.210}$	$-0.120^{+0.250}_{-0.300}$	$1.090^{+0.350}_{-0.150}$	$1.032^{+0.167}_{-0.111}$	$1.123^{+0.521}_{-0.565}$
	+3%/-4%	+2%/-5%	+208%/-250%	+32%/-14%	+16%/-11%	+46%/-50%
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 009883606-01 / KOI 4383.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-11 ± 4	$1.13^{+0.51}_{-0.47}$	1746^{+153}_{-94}	4021^{+990}_{-541}	13^{+27}_{-8}
Alt.	-6 ± 3	$1.15^{+0.52}_{-0.50}$	1750^{+133}_{-104}	3635^{+762}_{-581}	$7.604^{+14.898}_{-5.142}$

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

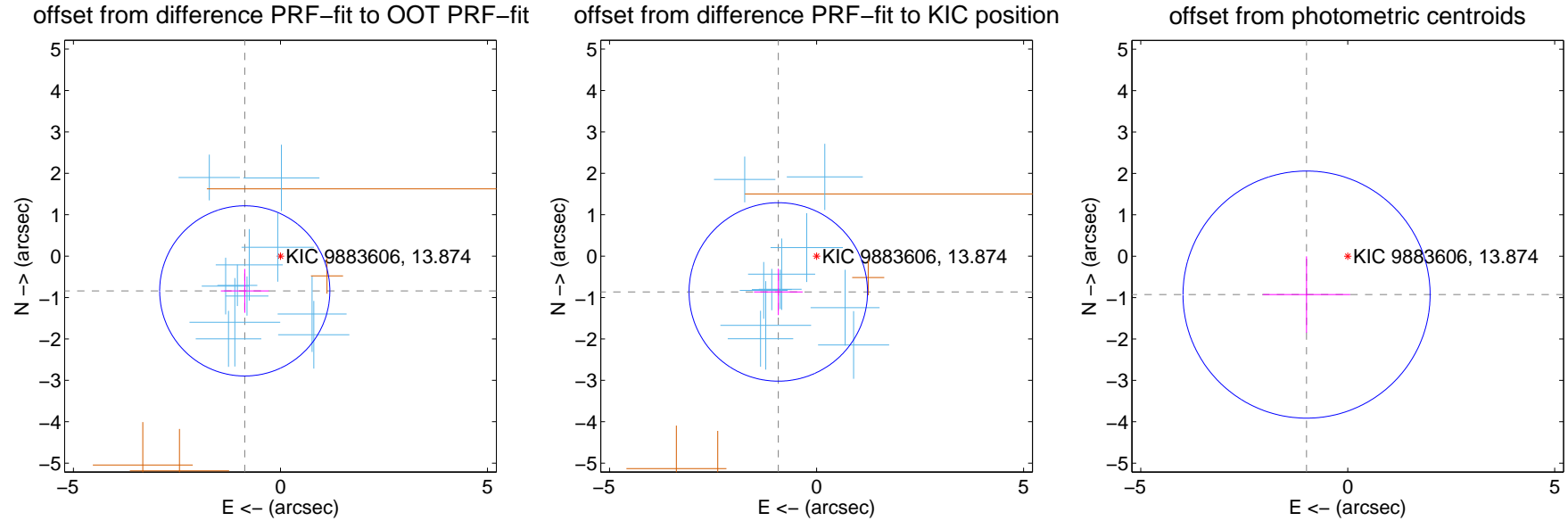
DV Centroid Data

Supplemental centroid analysis for 009883606-01. Kepler magnitude: 13.87. Transit SNR 11.16

There are 11 quarters with good PRF difference image offsets

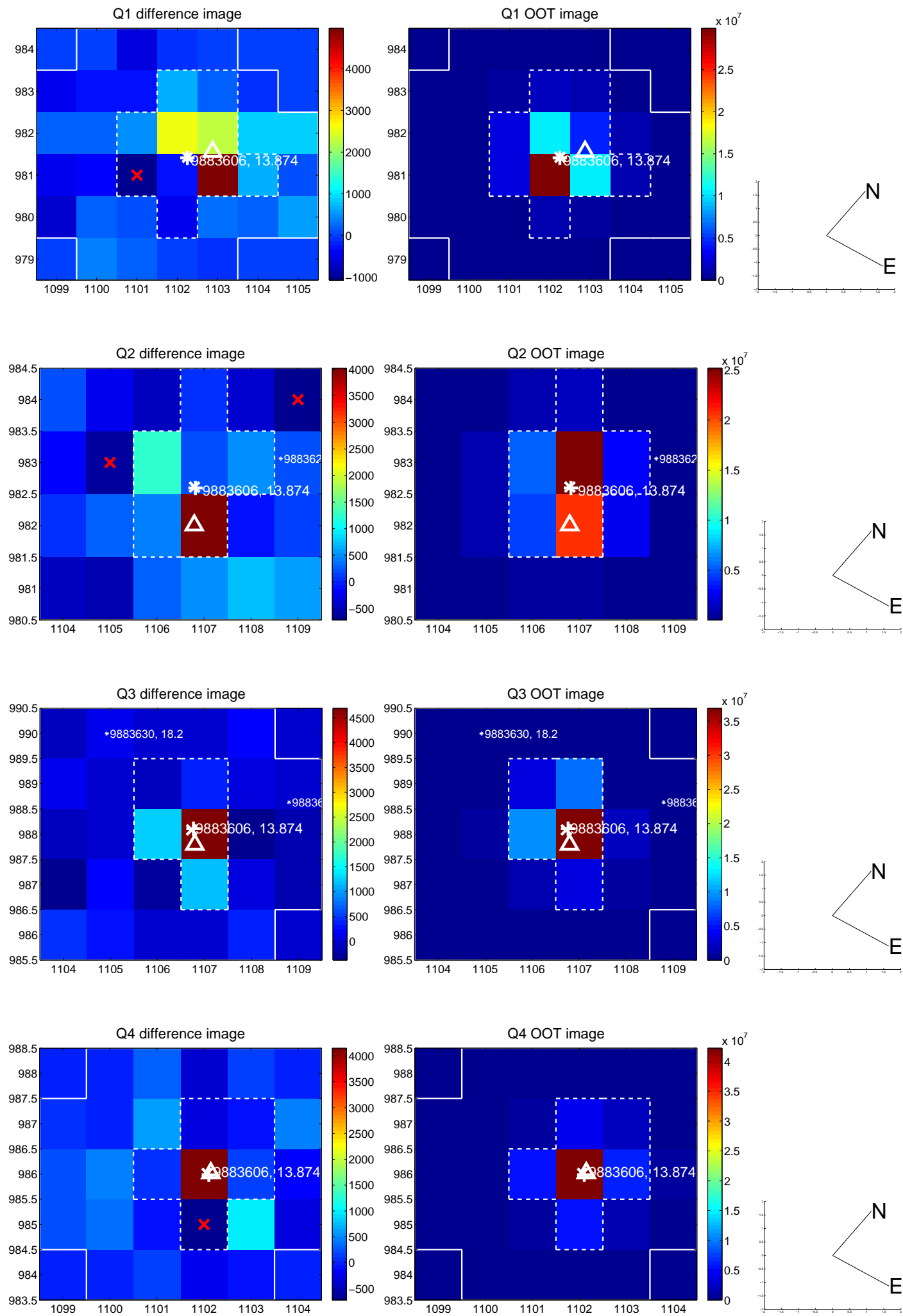
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.204 ± 0.685	1.76	0.862 ± 0.578	-0.840 ± 0.529
PRF-fit source offset from KIC position	1.267 ± 0.718	1.76	0.925 ± 0.588	-0.865 ± 0.561
photometric centroid source offset	1.36 ± 1.00	1.37	0.99 ± 1.05	-0.93 ± 0.92

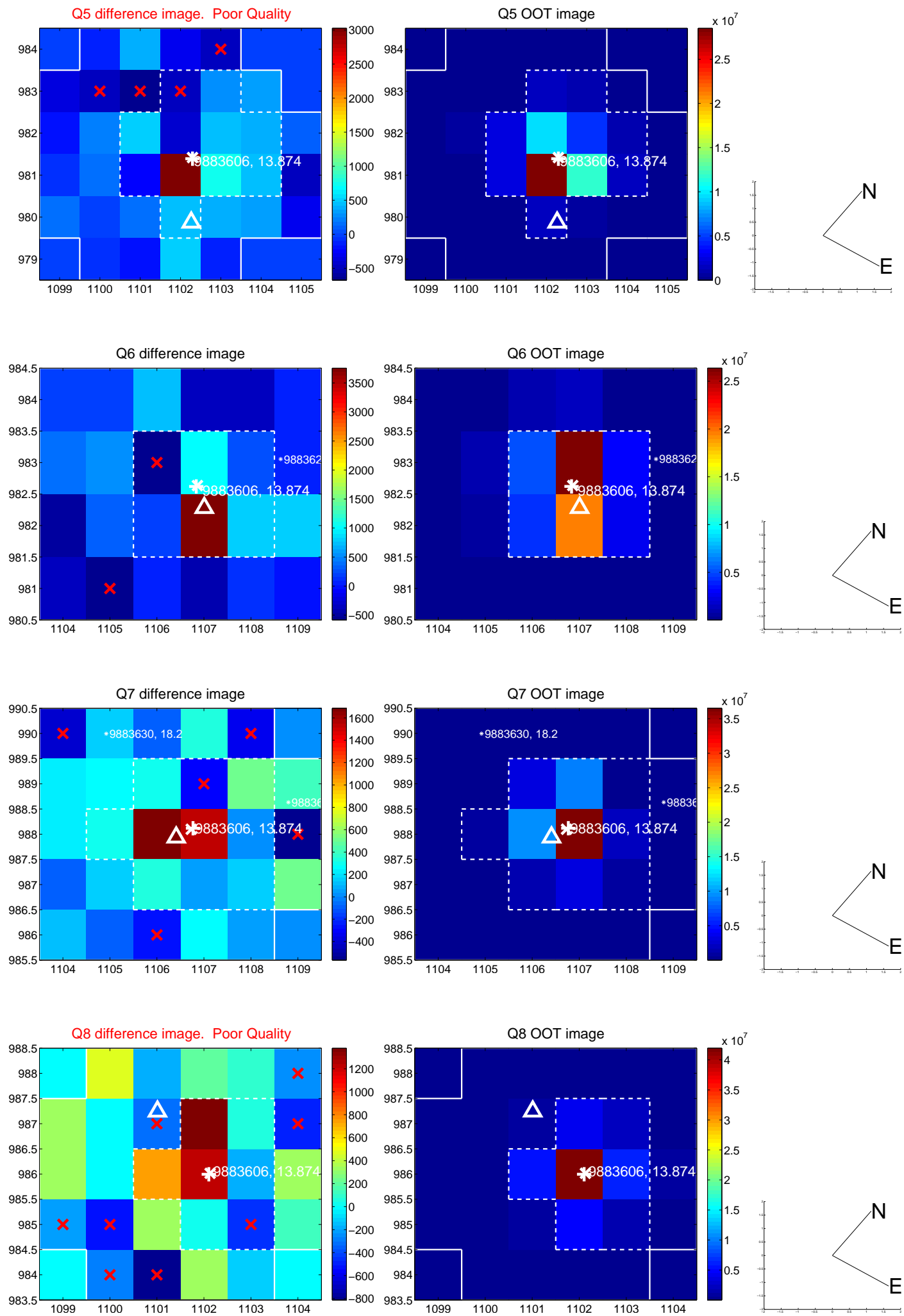


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

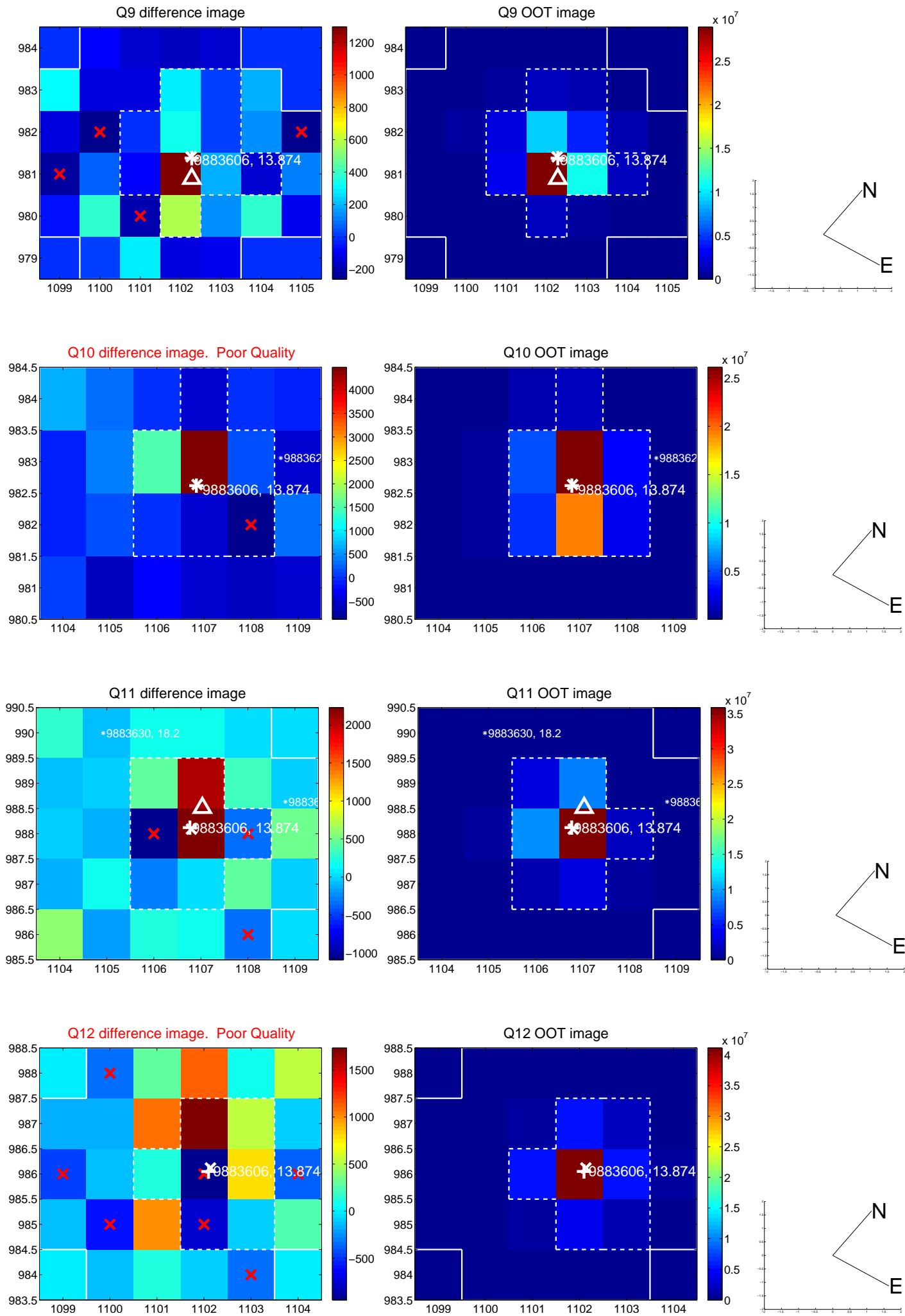
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



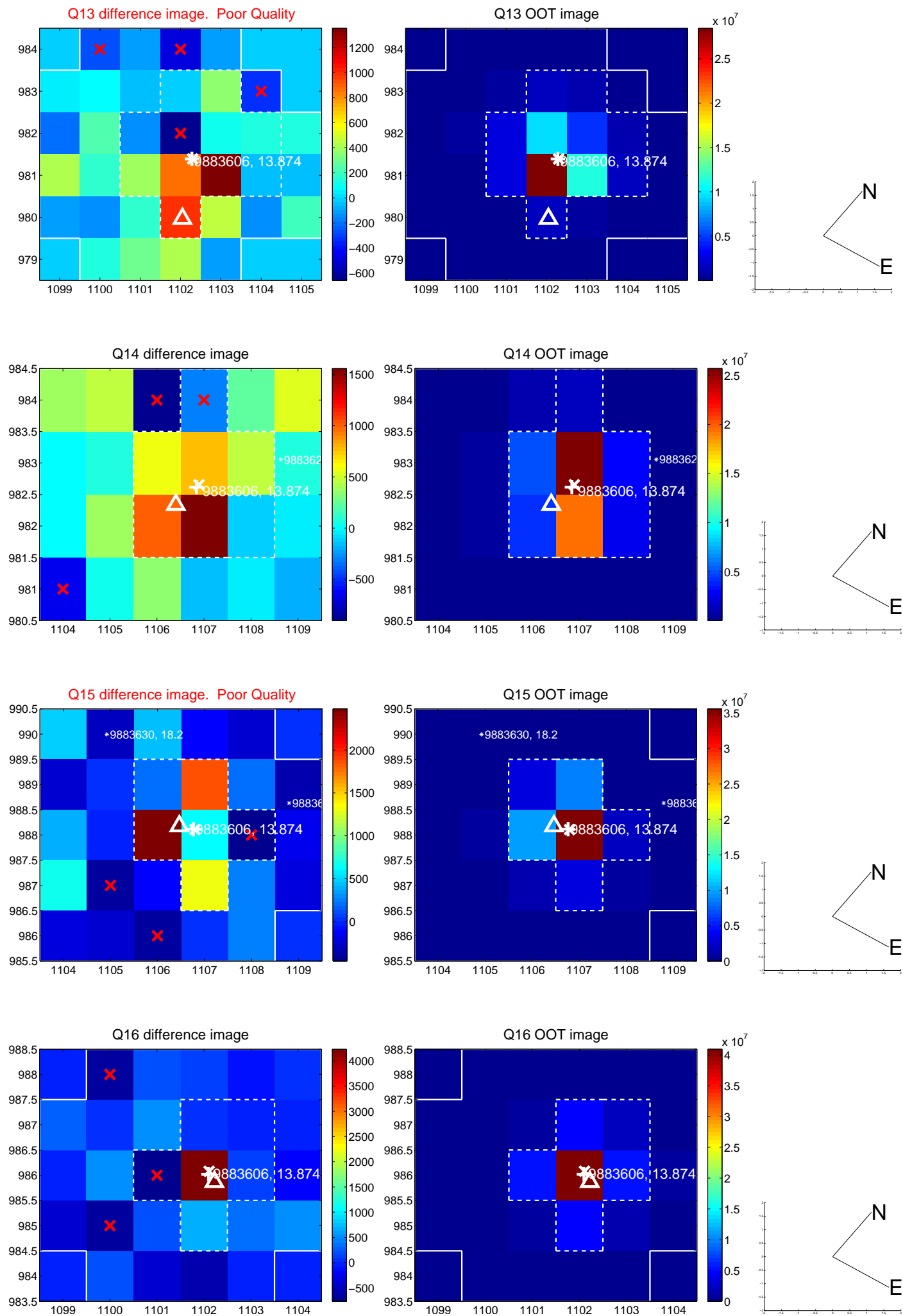
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



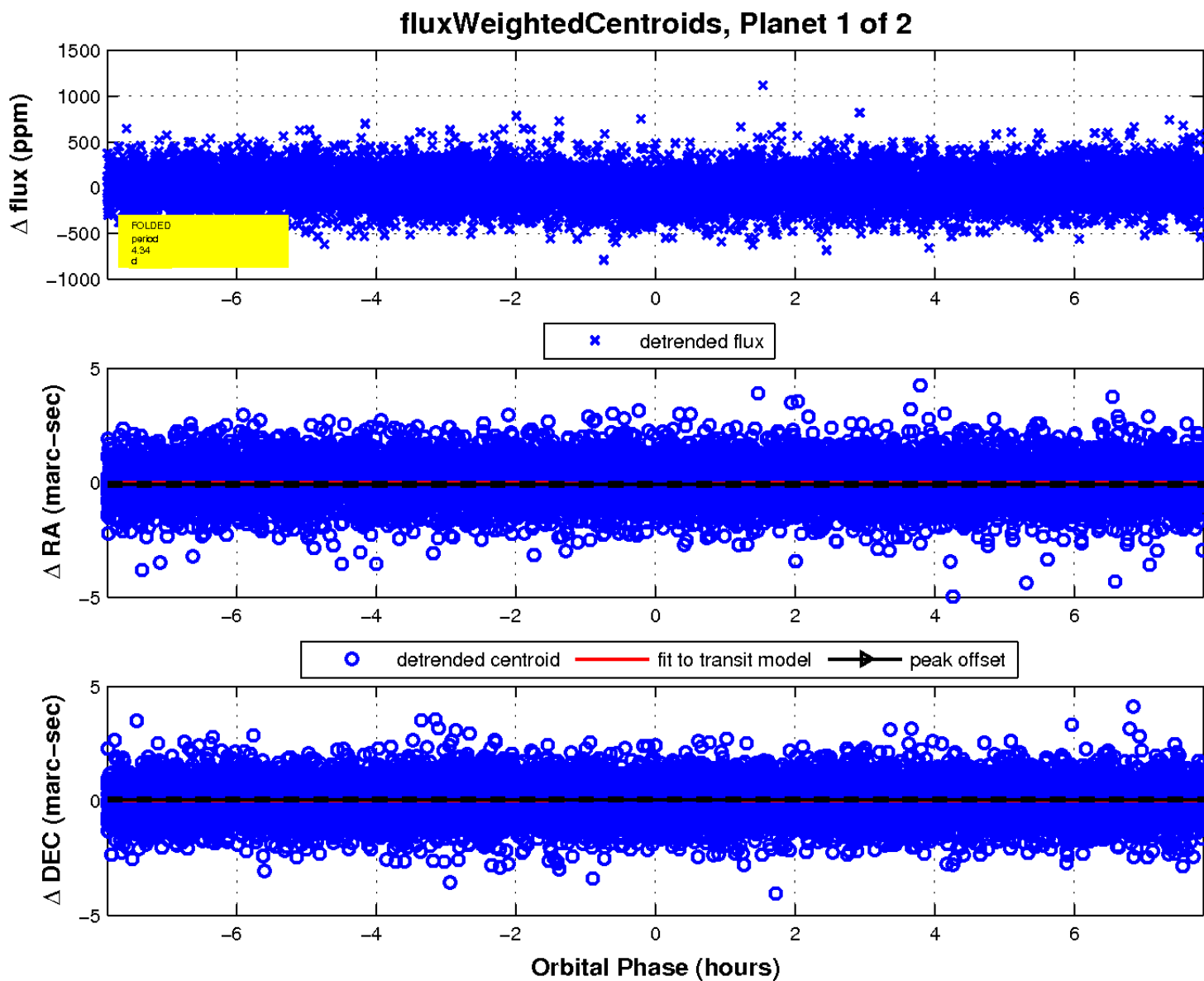
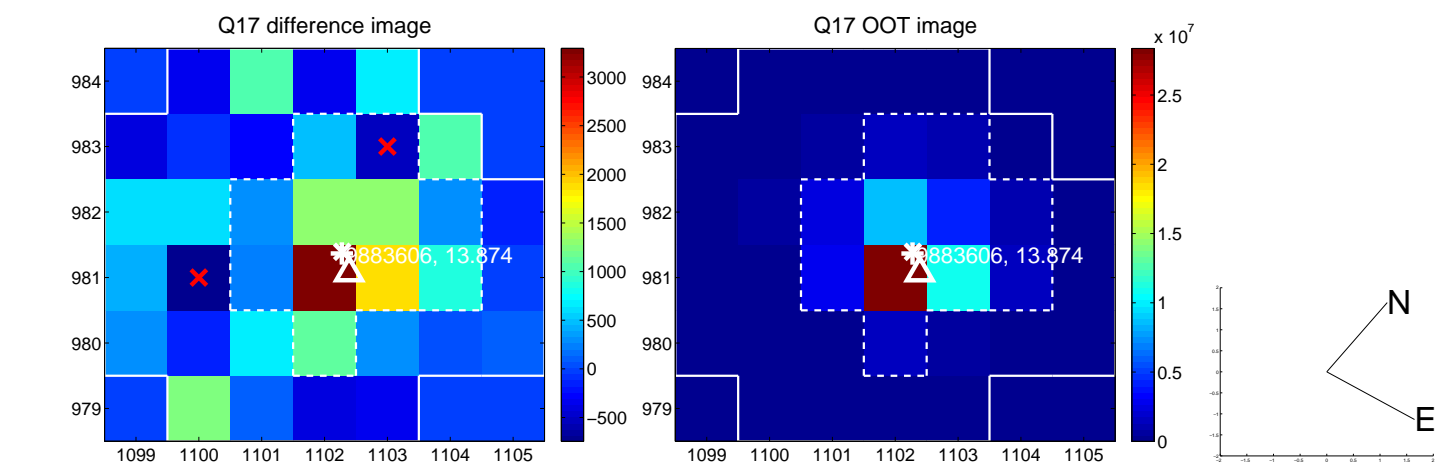
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

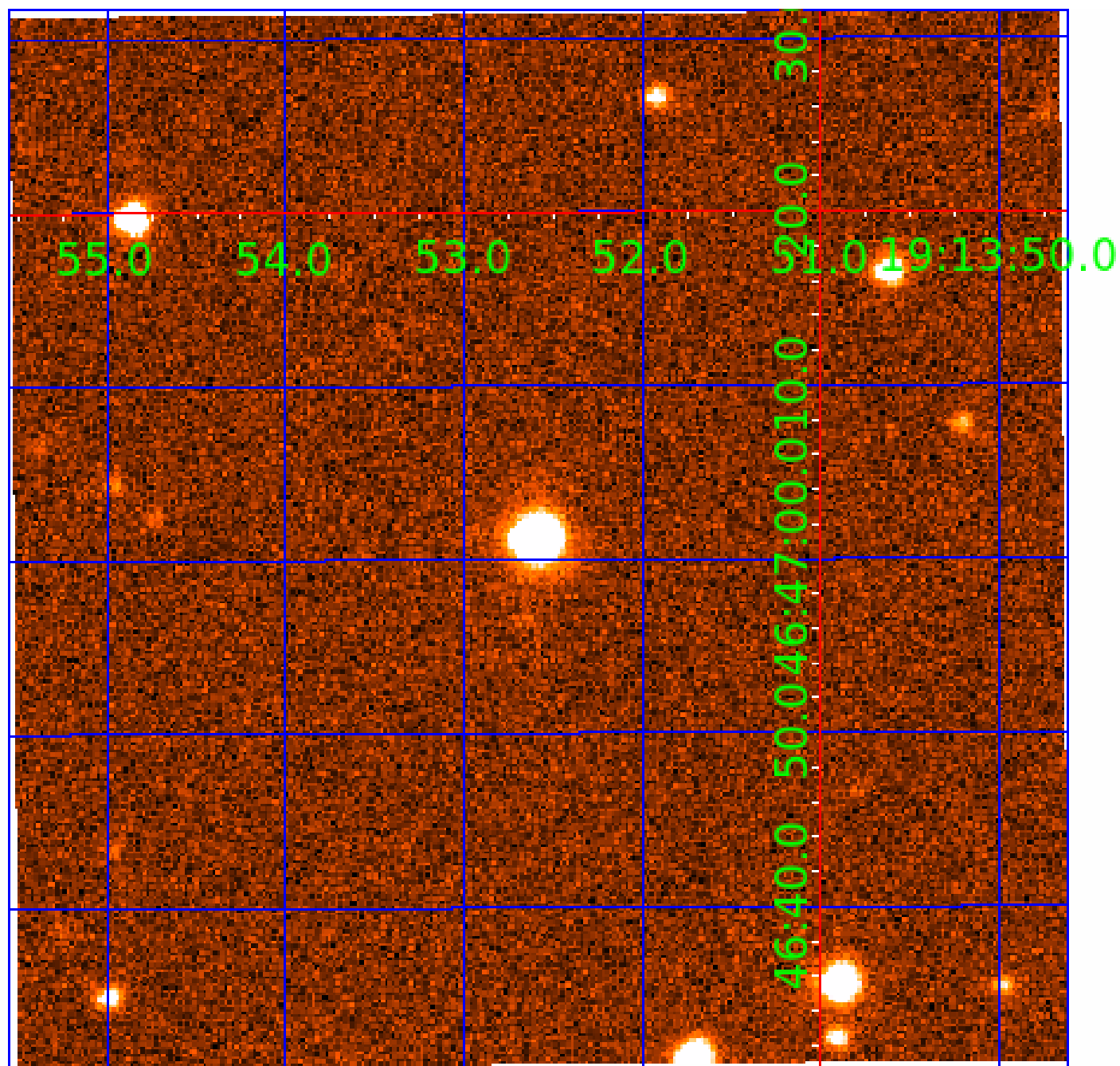


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009883606

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})
009883606-01	OBS	4383.01	4.341914	134.193681	71.6	2.618	10.5	11.2	1.09	6164	1.09	553.42
009883606-02	OBS	4383.02	2.583970	131.795525	46.2	2.337	8.6	8.8	1.09	6164	0.84	1105.55

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009883606-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009883606-02	OBS	PC	0.88	0	0	0	0	NO_COMMENT

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

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

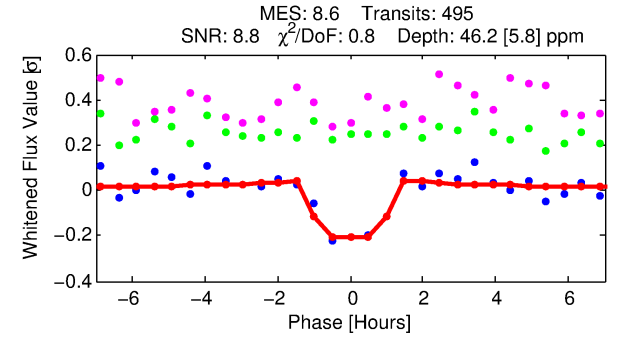
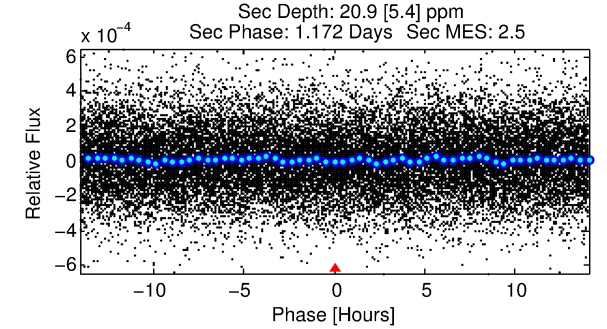
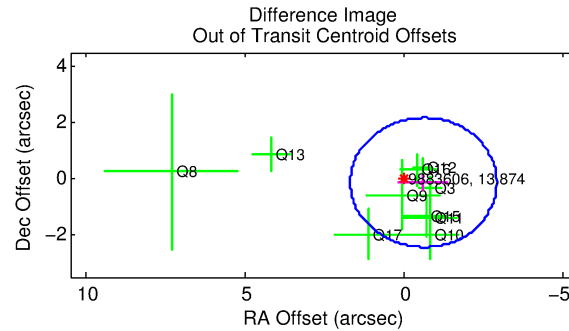
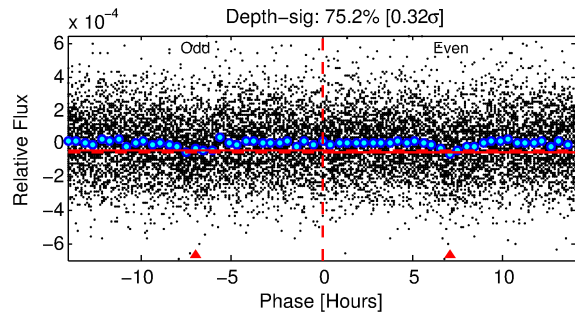
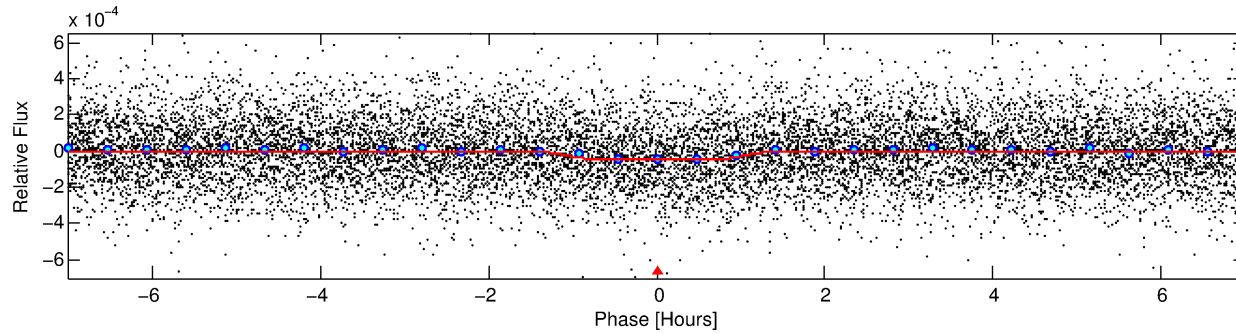
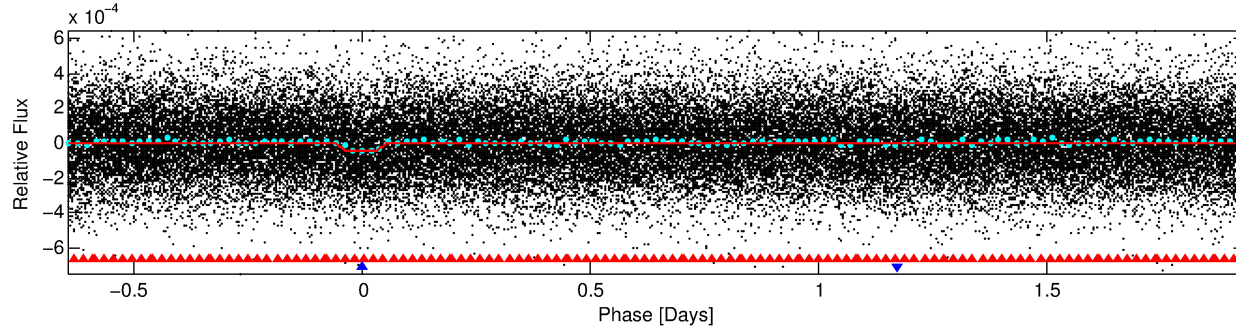
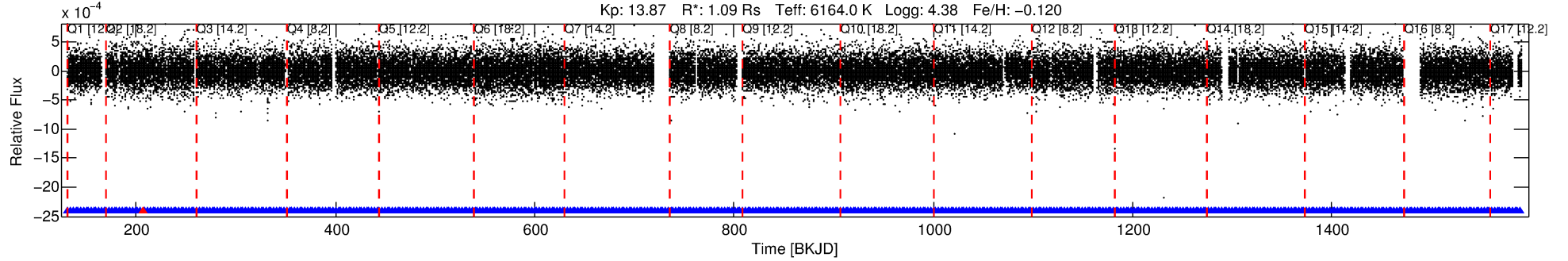
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009883606-02

No Significant Match Found

DV One-Page Summary

KIC: 9883606 Candidate: 2 of 2 Period: 2.584 d
KOI: K04383.02 Corr: 0.986



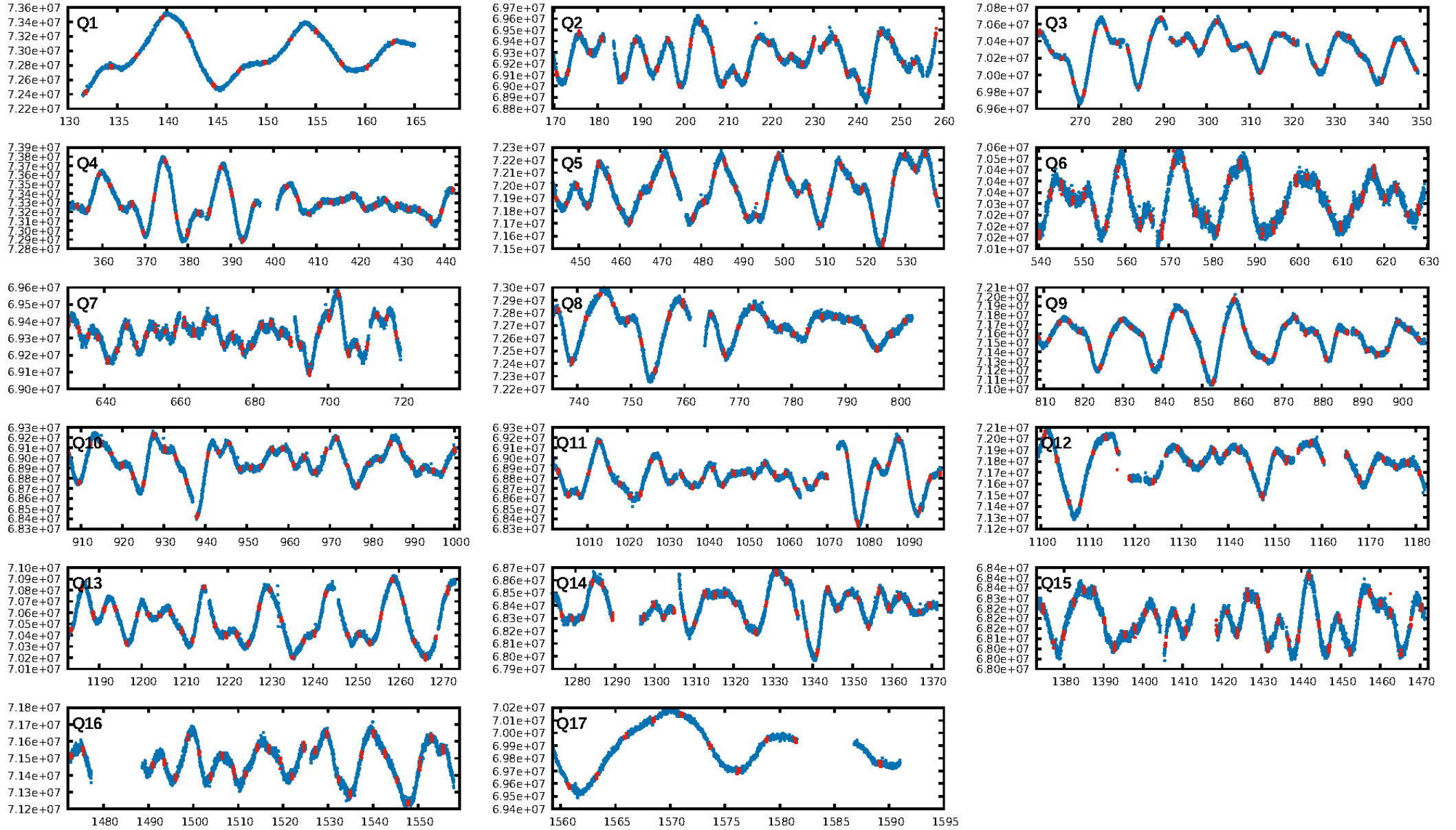
DV Fit Results:

Period = 2.58397 [0.00002] d
Epoch = 131.7955 [0.0036] BKJD
Rp/R* = 0.0071 [0.0035]
a/R* = 4.64 [11.23]
b = 0.85 [0.84]
Seff = 1105.55 [456.00]
Teff = 1470 [152] K
Rp = 0.84 [0.49] Re
a = 0.0373 [0.0100] AU
Ag = 22.52 [24.35] [0.88 σ]
Teffp = 4952 [1262] K [2.74 σ]

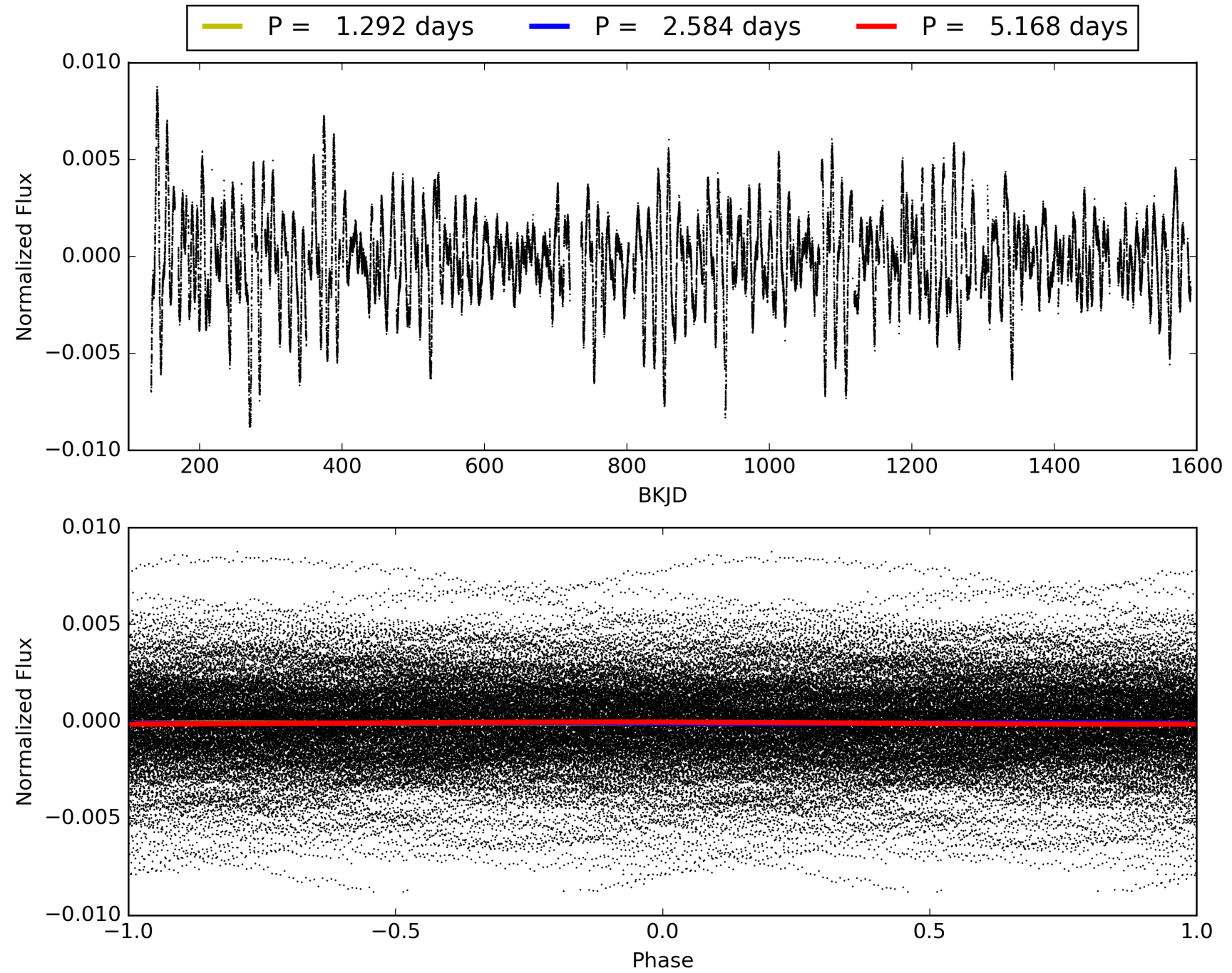
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [12.02 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.77e-17
RollingBand-fgt: 1.00 [473/474]
GhostDiagnostic-chr: 0.5479
Centroid-sig: 1.7%
Centroid-so: 2.061 arcsec [1.75 σ]
OotOffset-rm: 0.629 arcsec [0.82 σ]
KicOffset-rm: 0.639 arcsec [0.75 σ]
OotOffset-st: 1/3/3/3 [10]
KicOffset-st: 1/3/3/3 [10]
DiffImageQuality-fgm: 0.70 [7/10]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009883606-02, PDC Light Curves

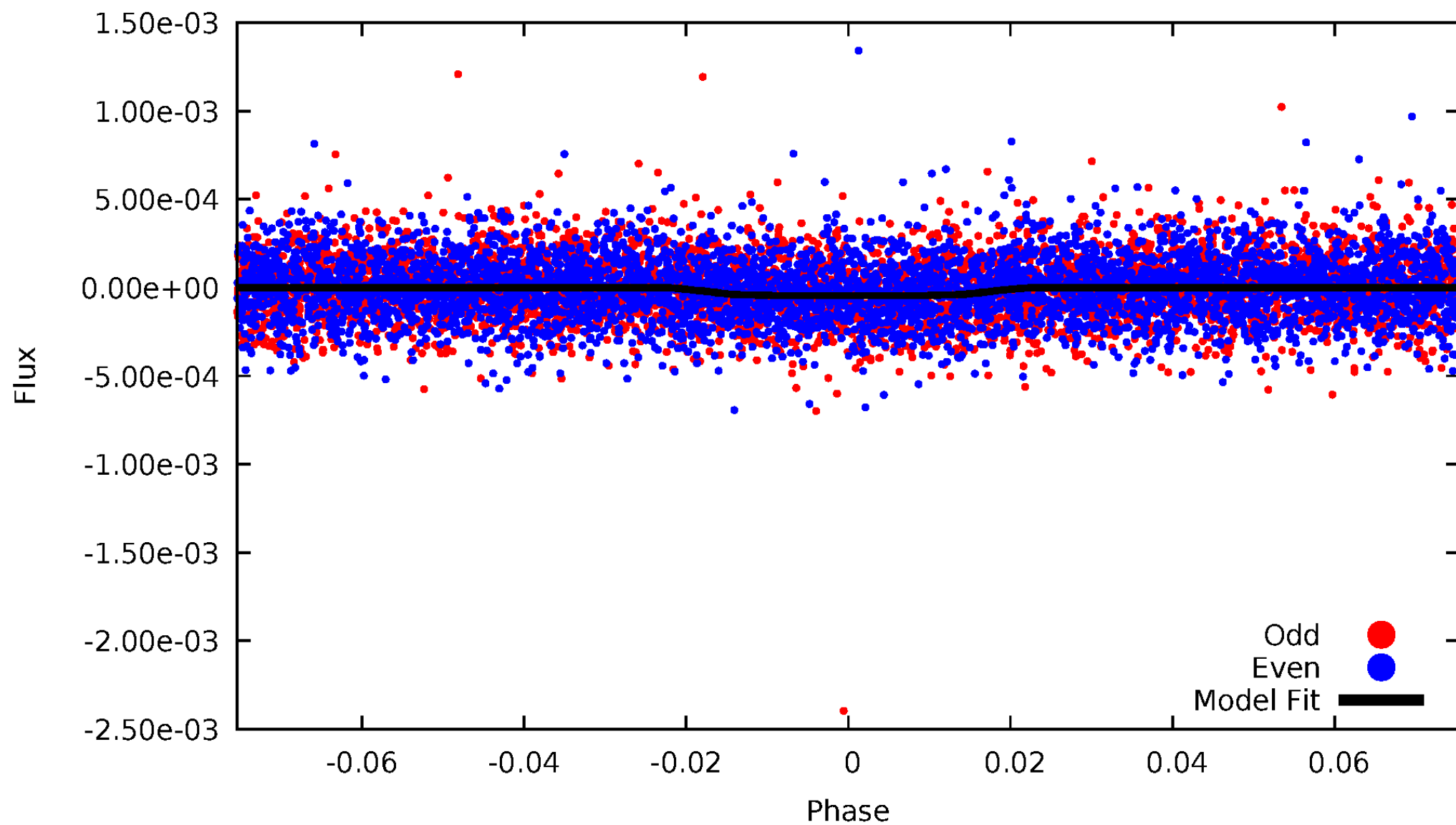


TCE 009883606-02



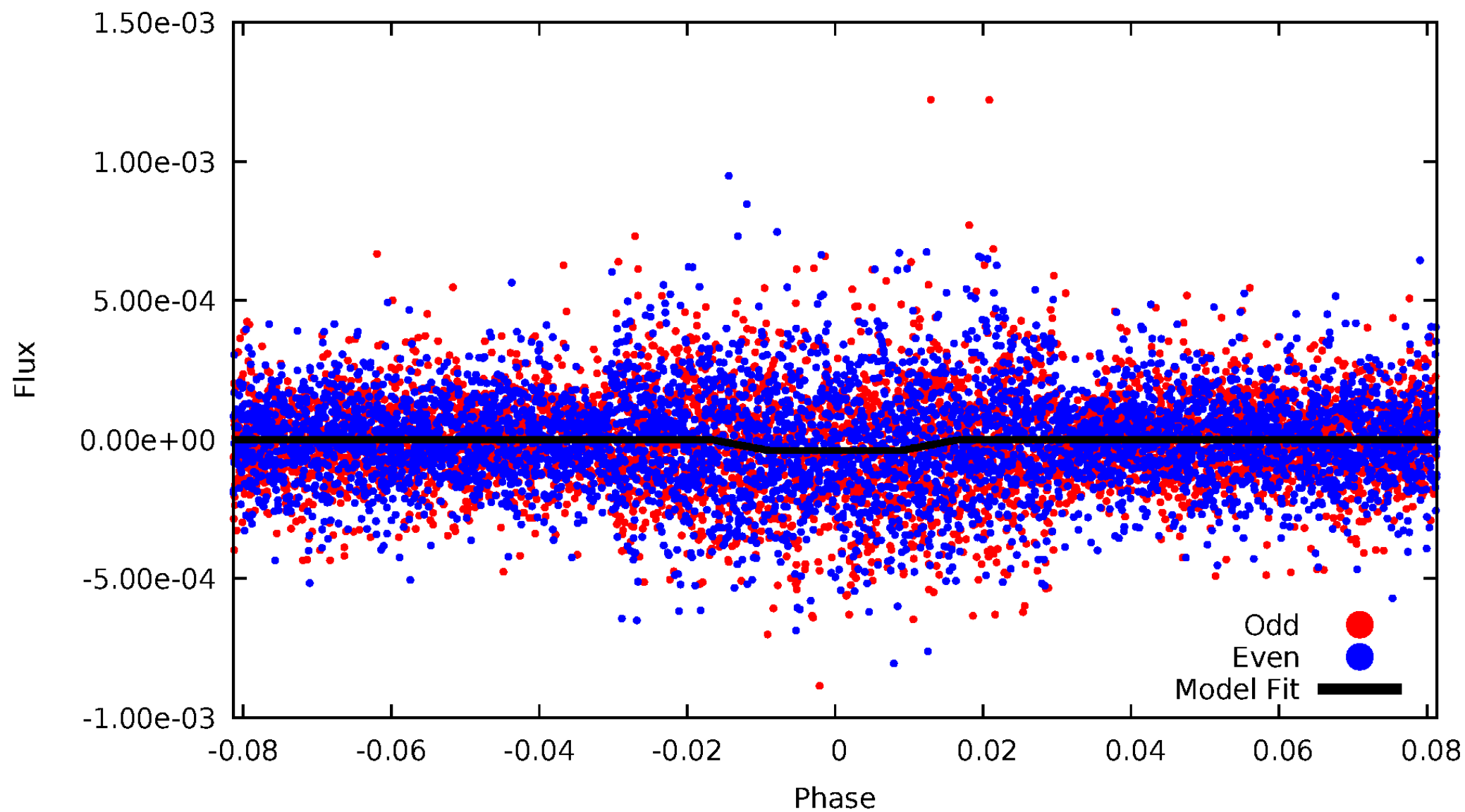
DV Odd/Even

TCE 009883606-02



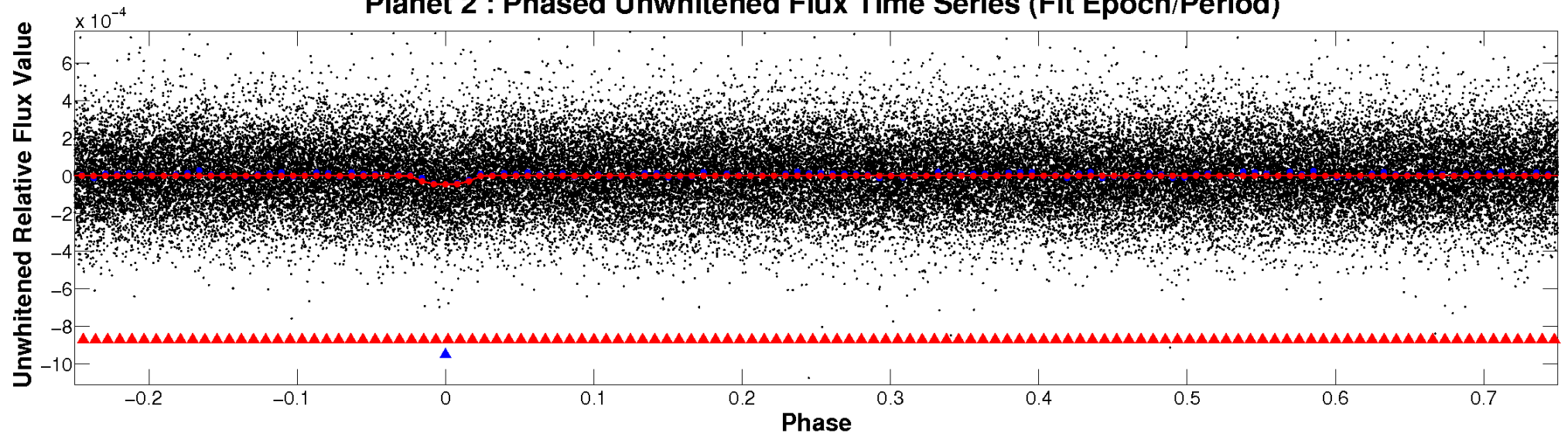
ALT Odd/Even

TCE 009883606-02

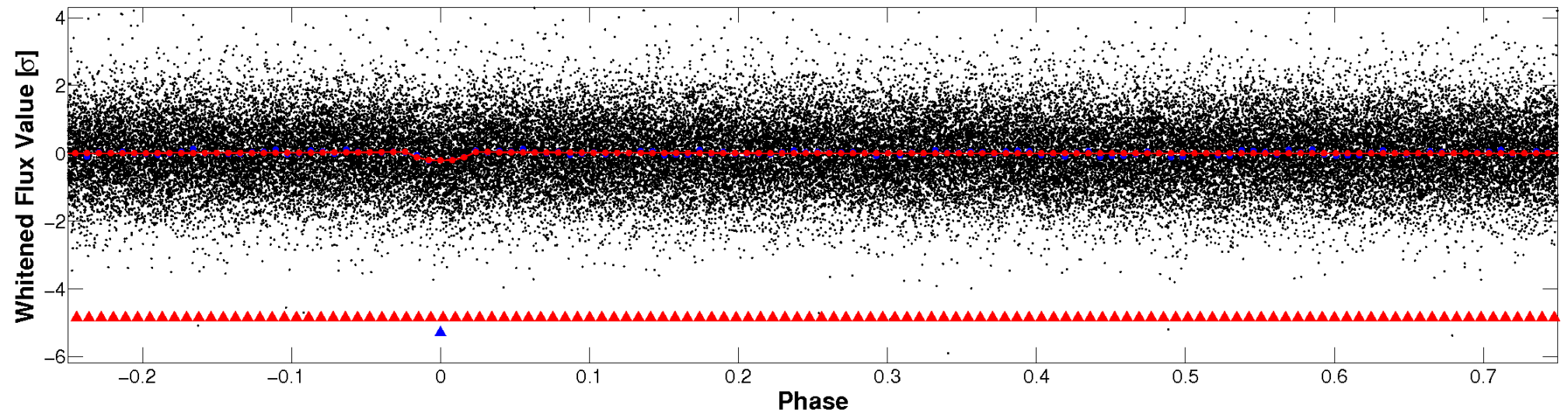


Non-Whitened Vs. Whitened Light Curve

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

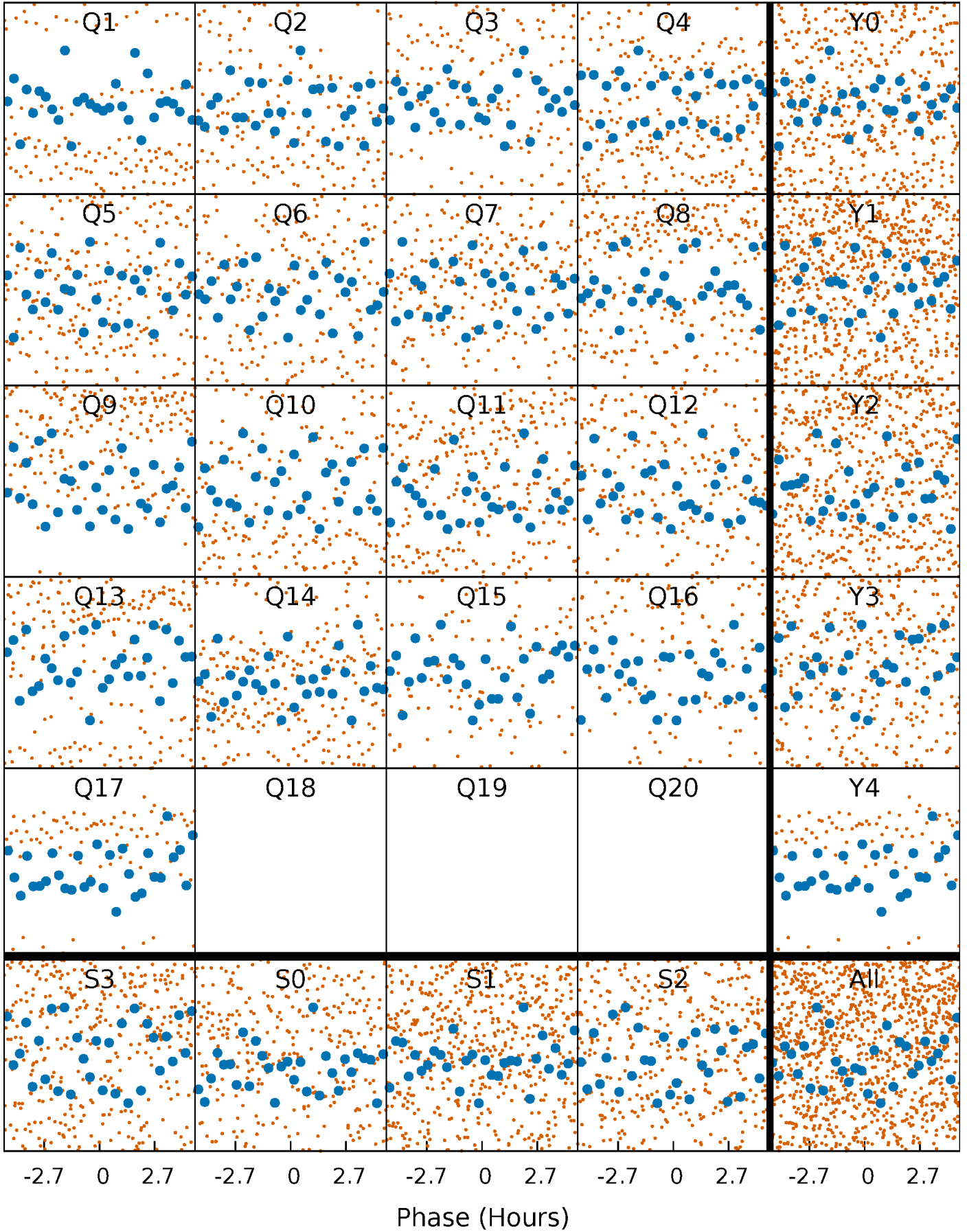


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



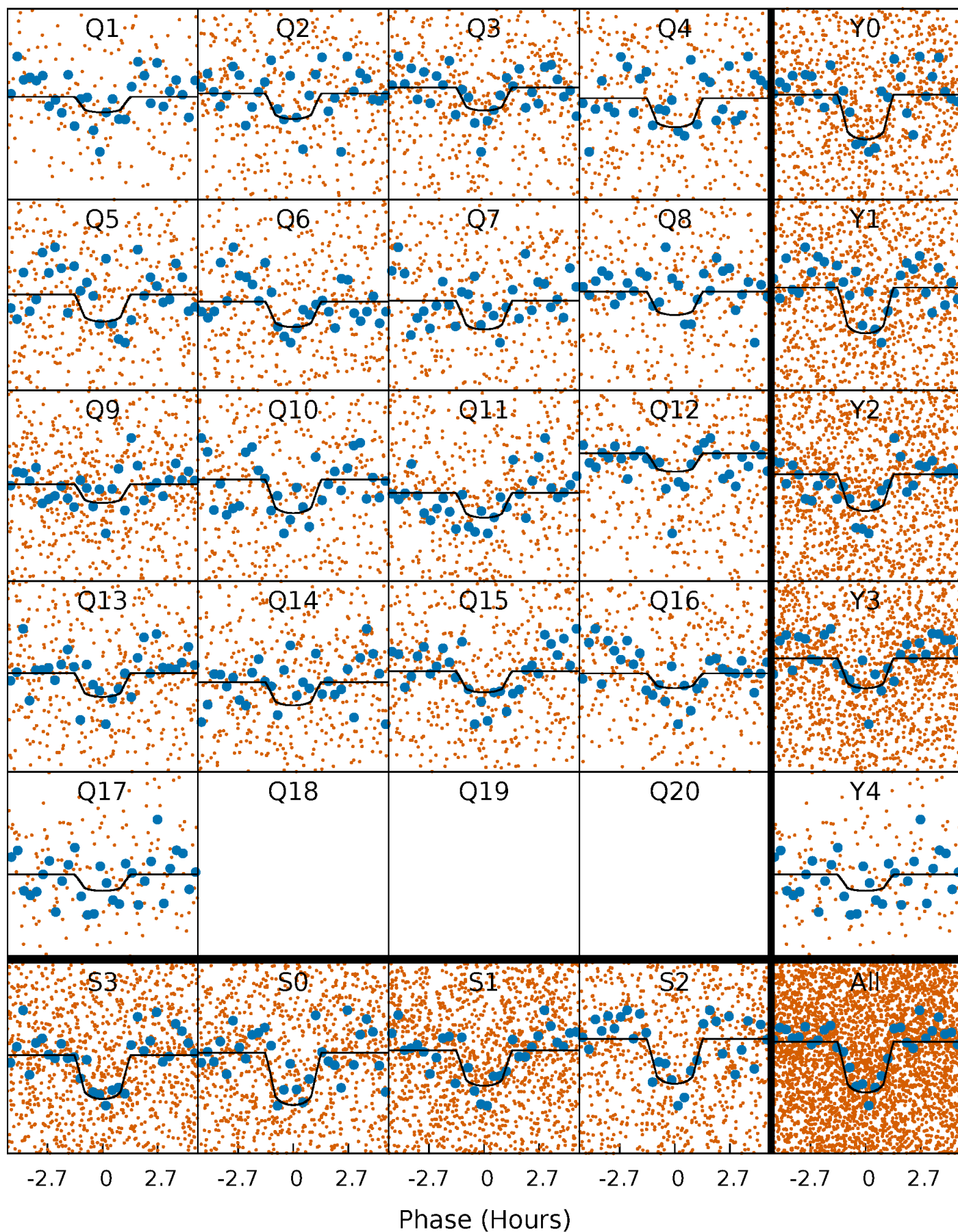
PDC Quarter-Phased Transit Curves

TCE 009883606-02 P= 2.583970 Days $T_0=131.795525$ (BKJD)



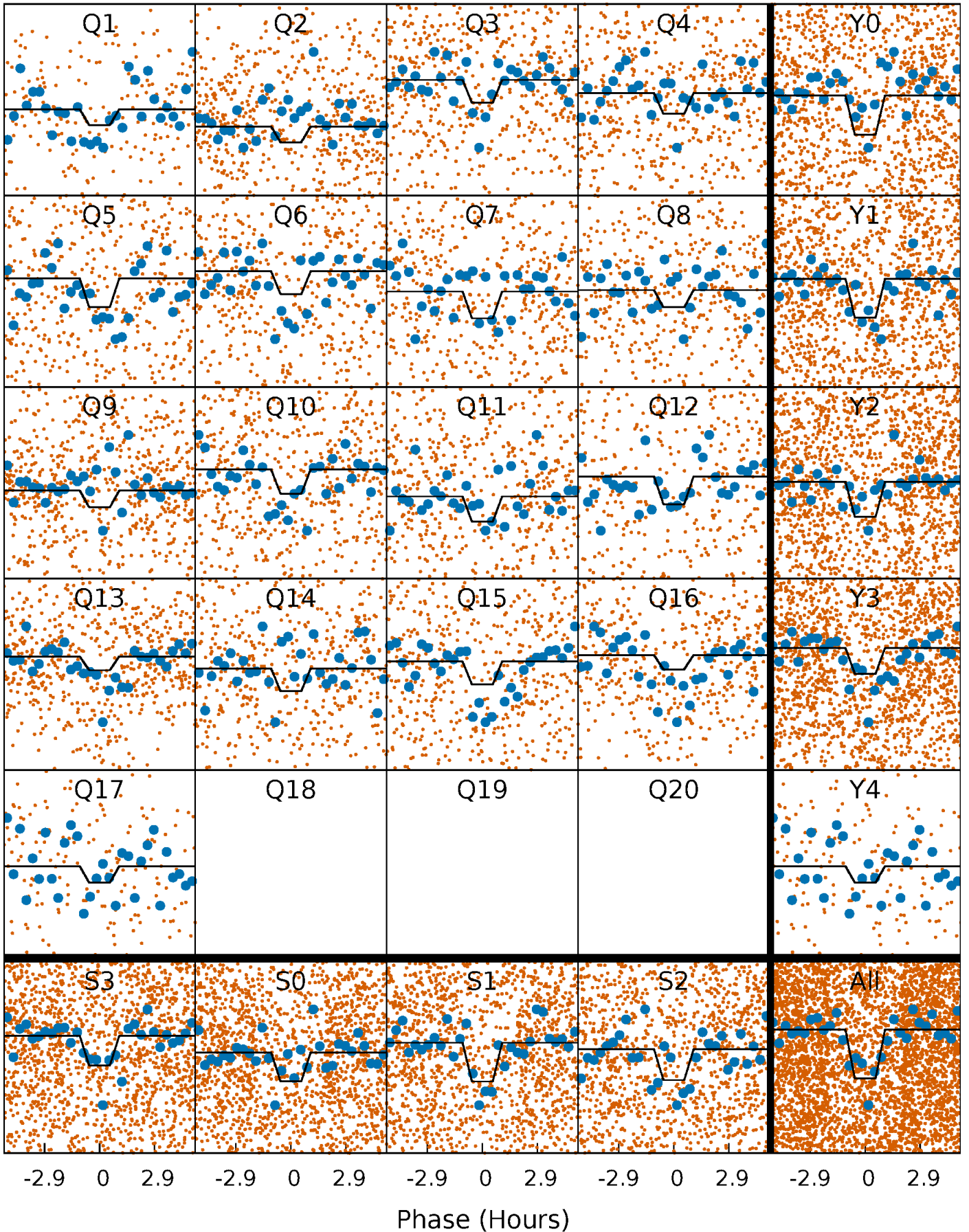
DV Quarter-Phased Transit Curves

TCE 009883606-02 P= 2.583970 Days $T_0=131.795525$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

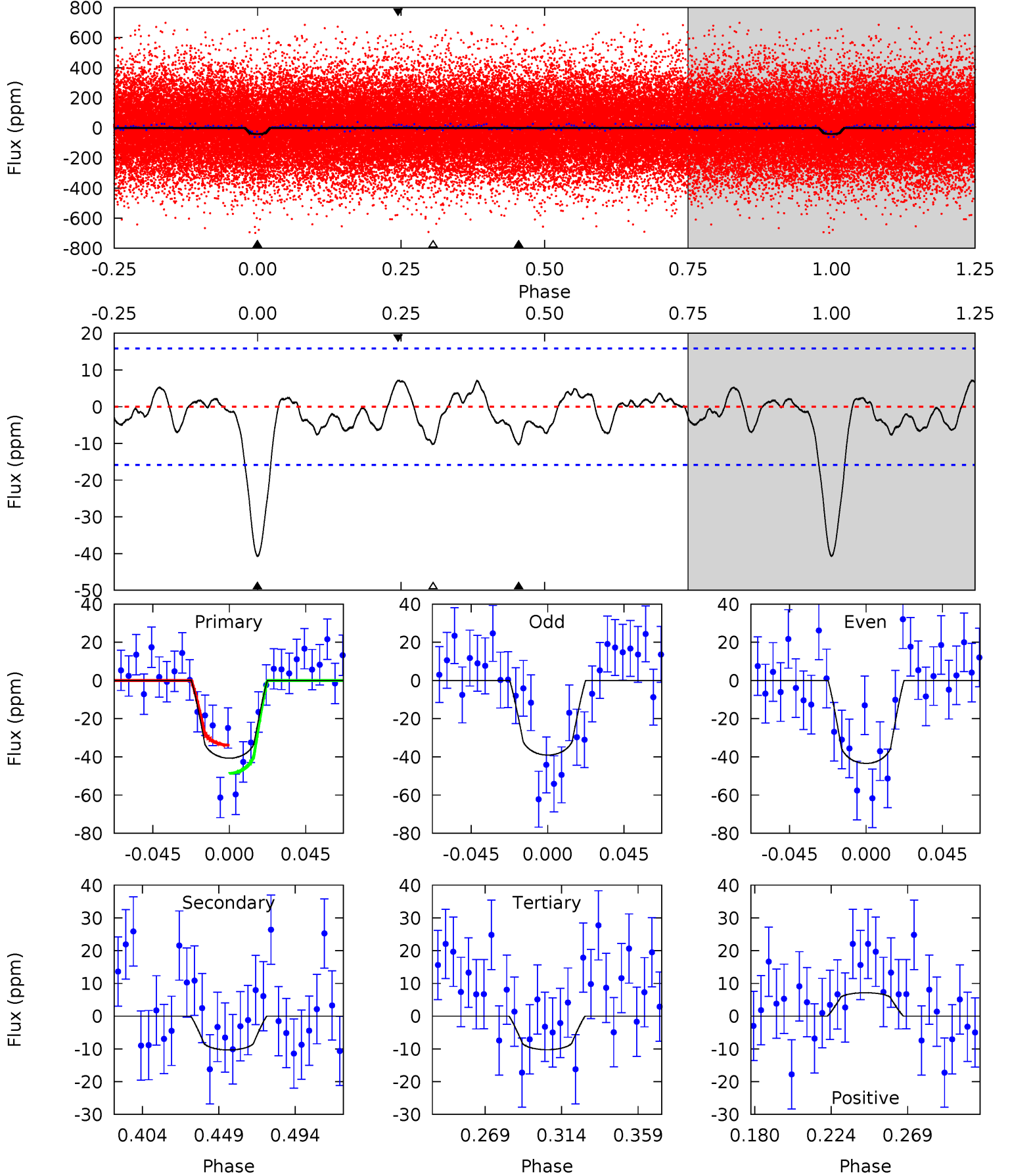
TCE 009883606-02 P= 2.583956 Days $T_0=131.799598$ (BKJD)



DV Model-Shift Uniqueness Test

009883606-02, P = 2.583970 Days, E = 129.211555 Days

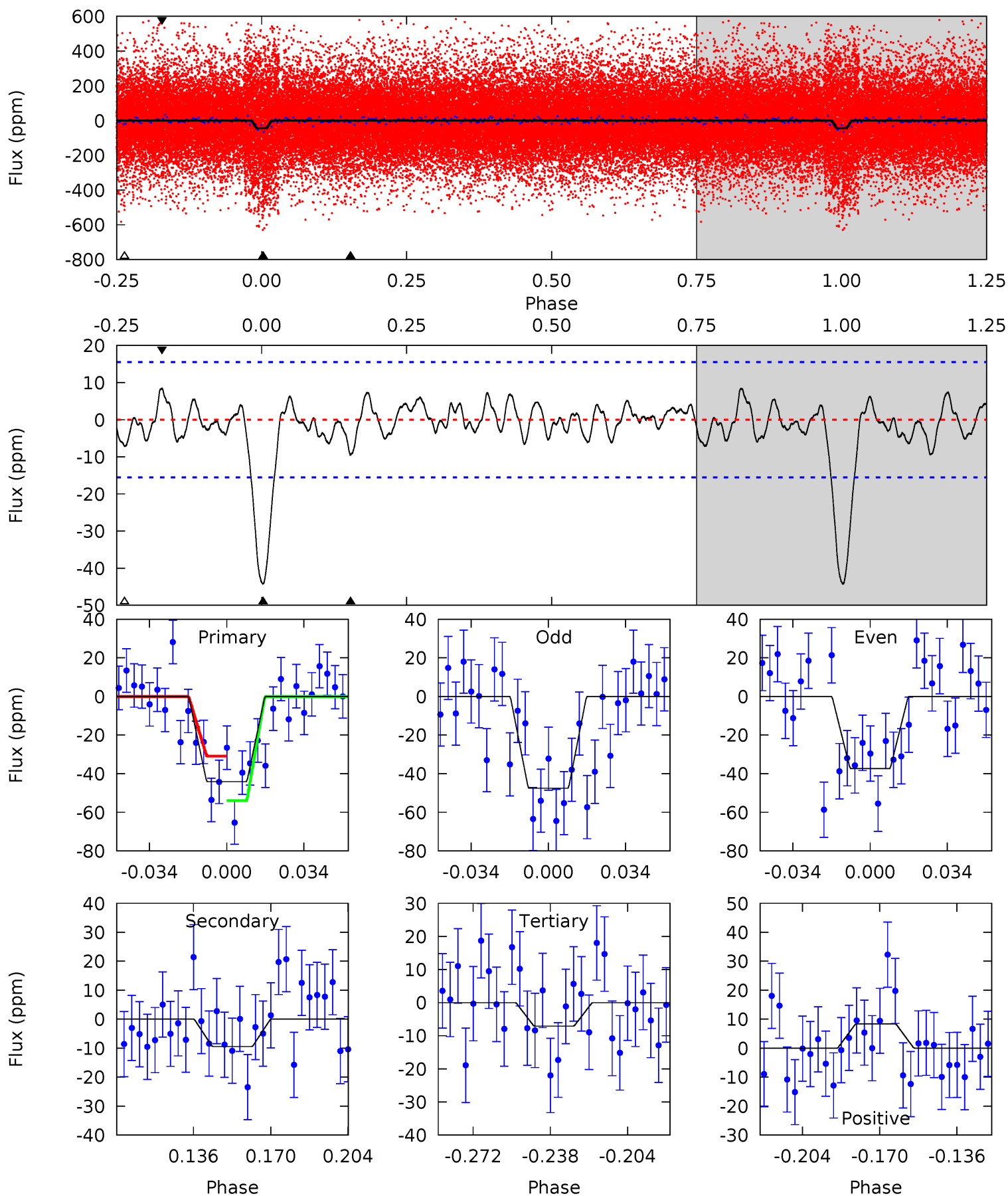
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	3.08	3.06	2.13	4.73	2.01	1.13	9.08	10.0	0.02	0.95	0.65	0.97	0.15	2.20



Alt Model-Shift Uniqueness Test

009883606-02, P = 2.583956 Days, E = 129.215642 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.6	2.91	2.18	2.59	4.79	2.12	1.03	11.4	11.0	0.73	0.32	1.58	1.19	0.16	3.55



Stellar Parameters For KIC 009883606

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6164^{+165}_{-220}	$4.378^{+0.090}_{-0.210}$	$-0.120^{+0.250}_{-0.300}$	$1.090^{+0.350}_{-0.150}$	$1.032^{+0.167}_{-0.111}$	$1.123^{+0.521}_{-0.565}$
	+3%/-4%	+2%/-5%	+208%/-250%	+32%/-14%	+16%/-11%	+46%/-50%
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 009883606-02 / KOI 4383.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-10 ± 3	$0.87^{+0.45}_{-0.38}$	2072^{+144}_{-113}	4334^{+1291}_{-692}	10^{+25}_{-6}
Alt.	-9 ± 3	$0.80^{+0.45}_{-0.41}$	2076^{+161}_{-112}	4350^{+1620}_{-672}	11^{+34}_{-7}

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 $A_{obs} \gg 1.0$

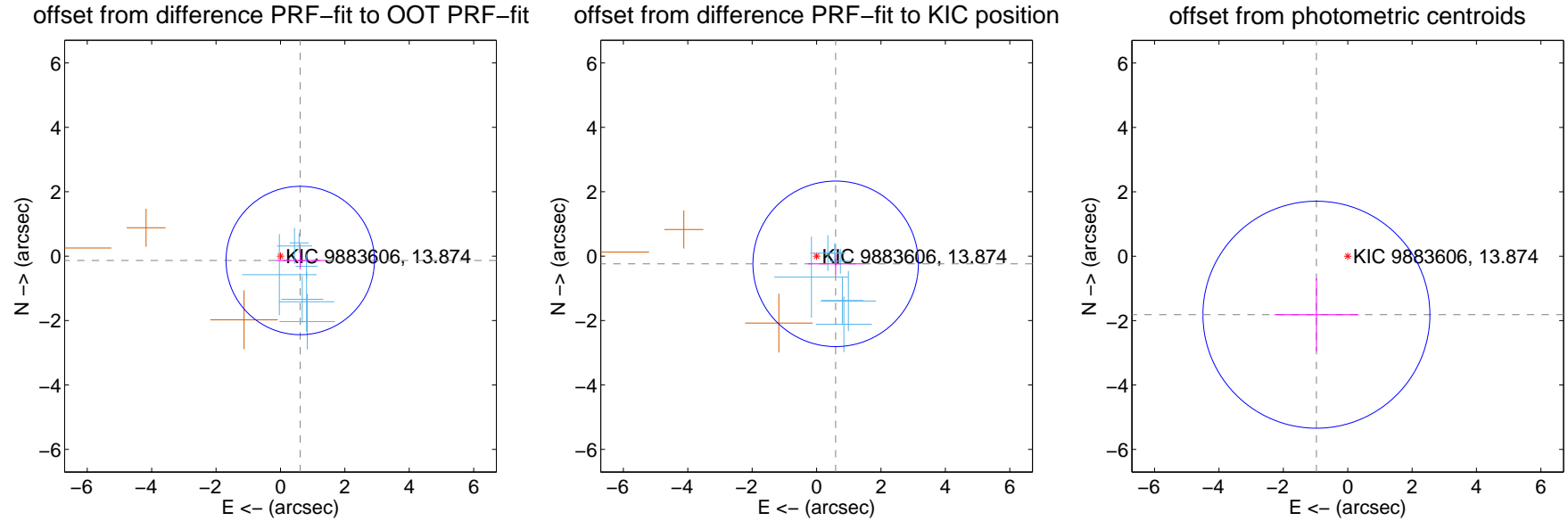
DV Centroid Data

Supplemental centroid analysis for 009883606-02. Kepler magnitude: 13.87. Transit SNR 8.79

There are 7 quarters with good PRF difference image offsets

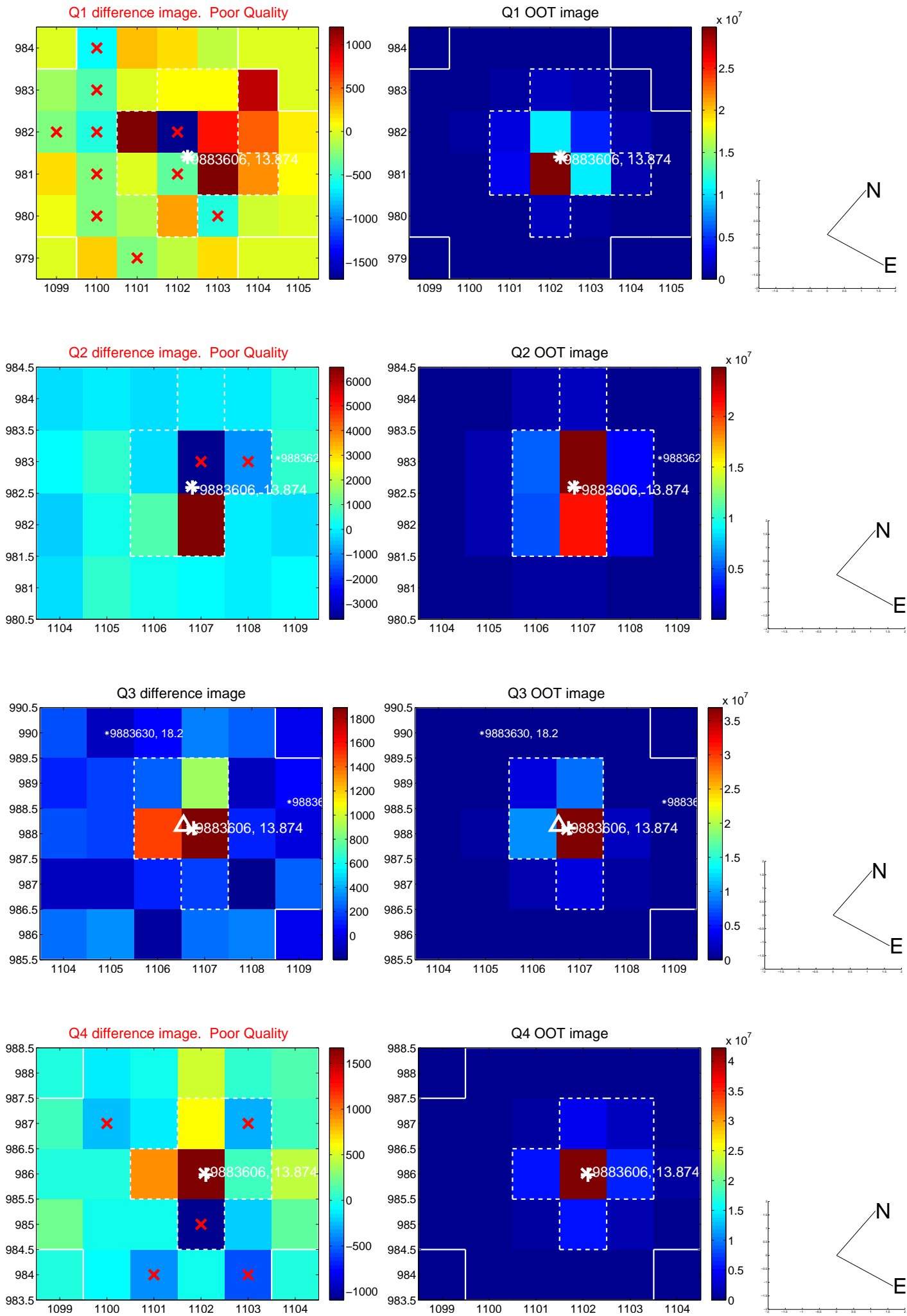
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.629 ± 0.768	0.82	-0.614 ± 0.762	-0.136 ± 0.275
PRF-fit source offset from KIC position	0.639 ± 0.856	0.75	-0.593 ± 0.858	-0.239 ± 0.309
photometric centroid source offset	2.06 ± 1.17	1.75	0.97 ± 1.30	-1.82 ± 1.14

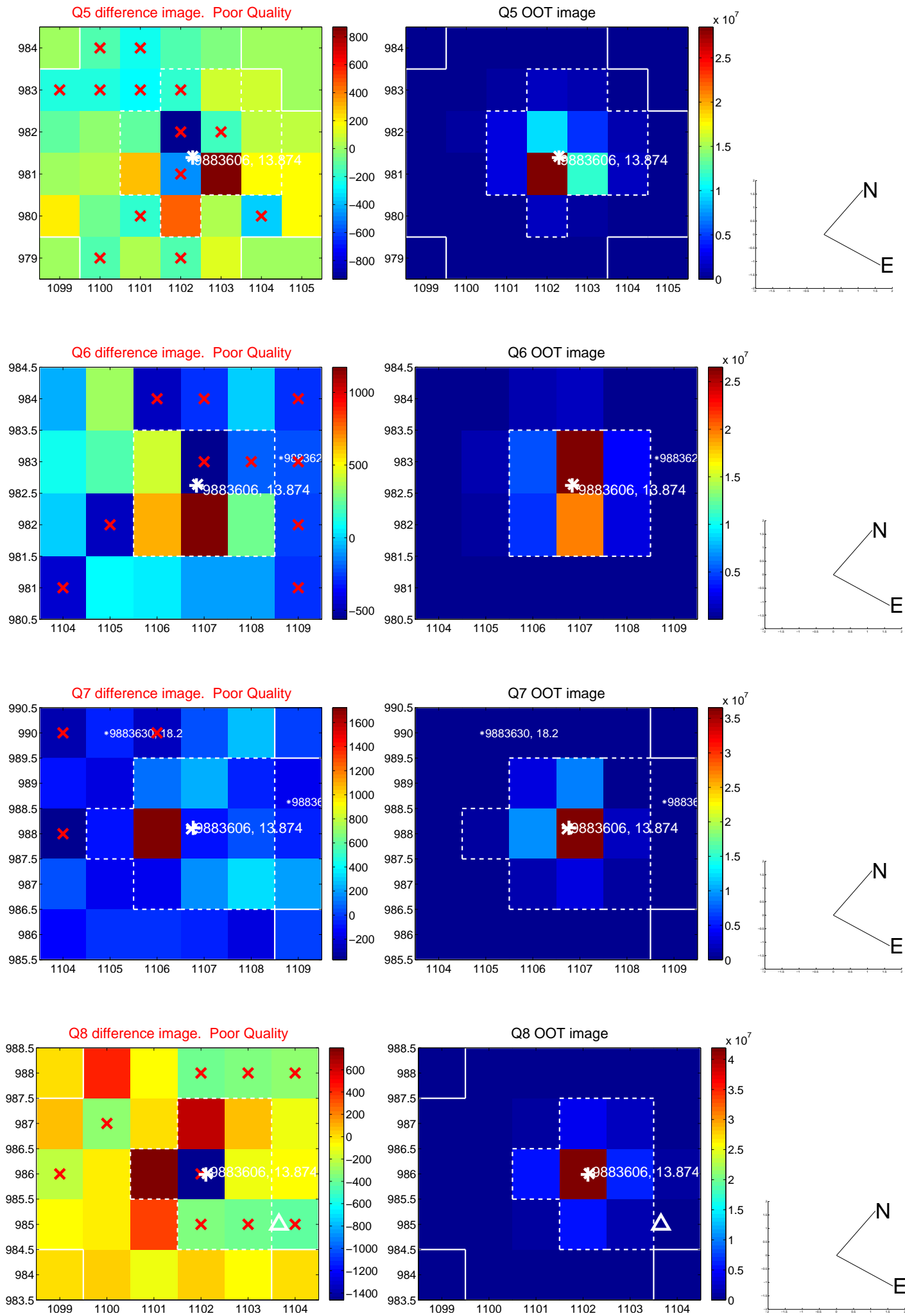


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

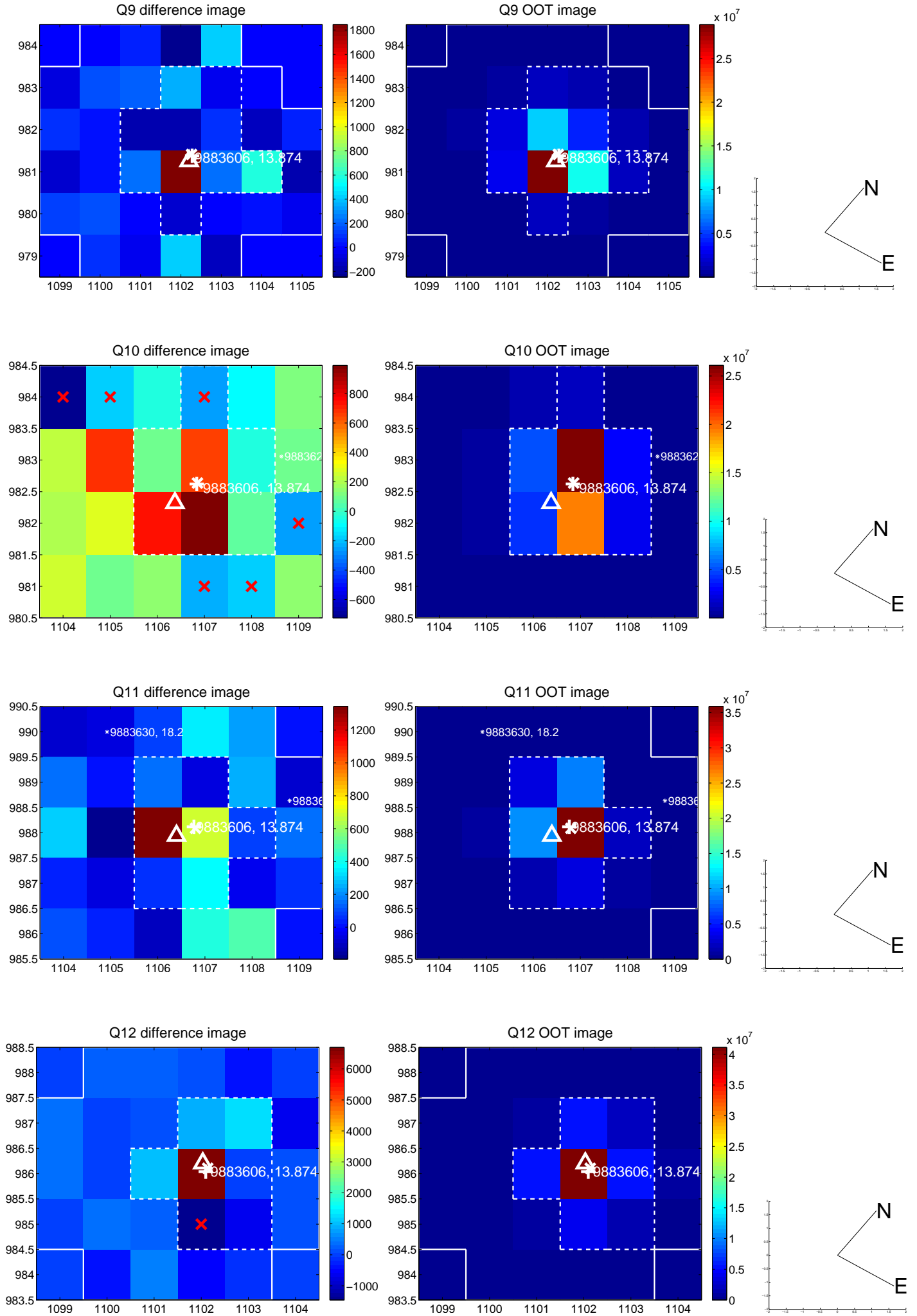
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



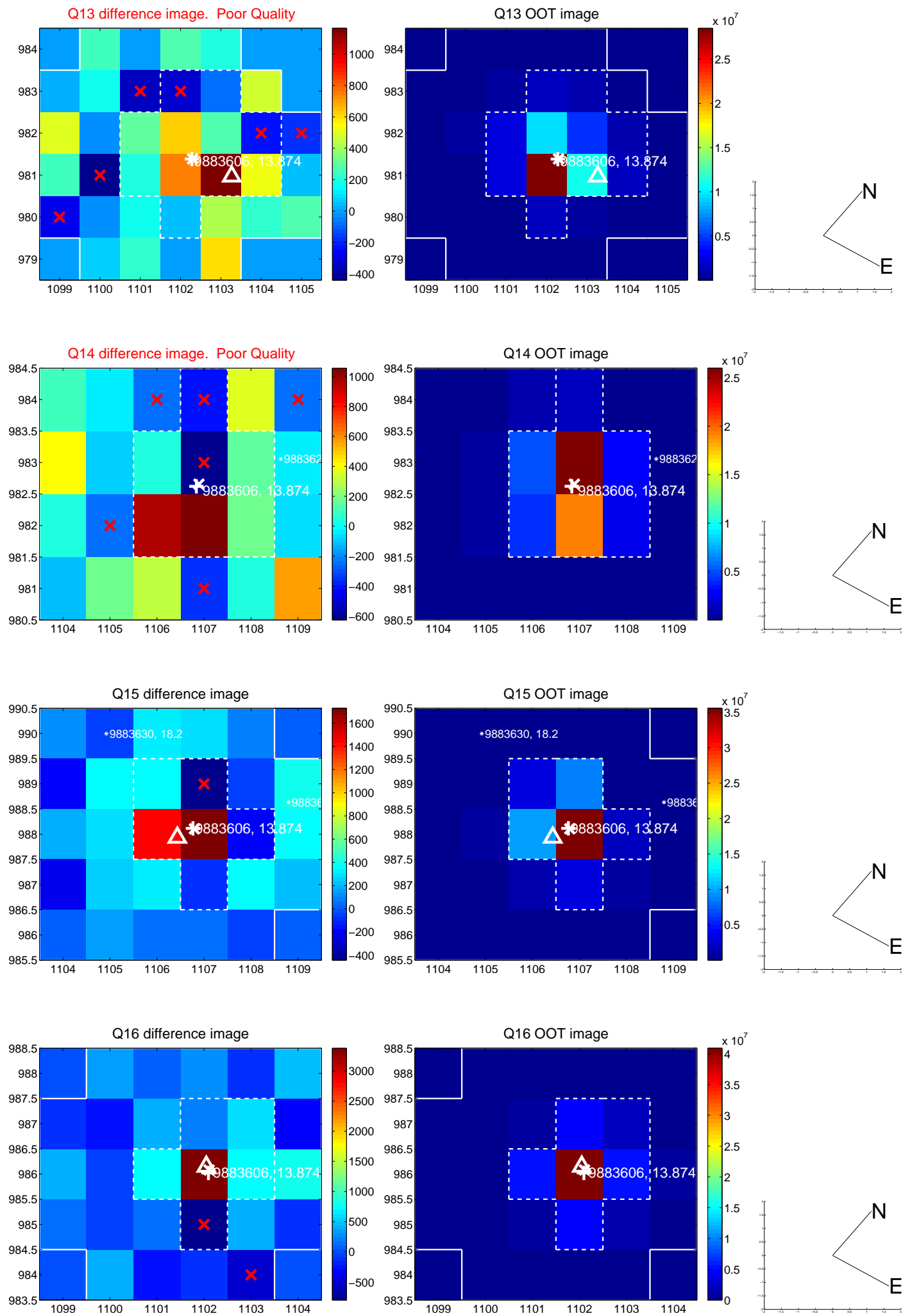
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



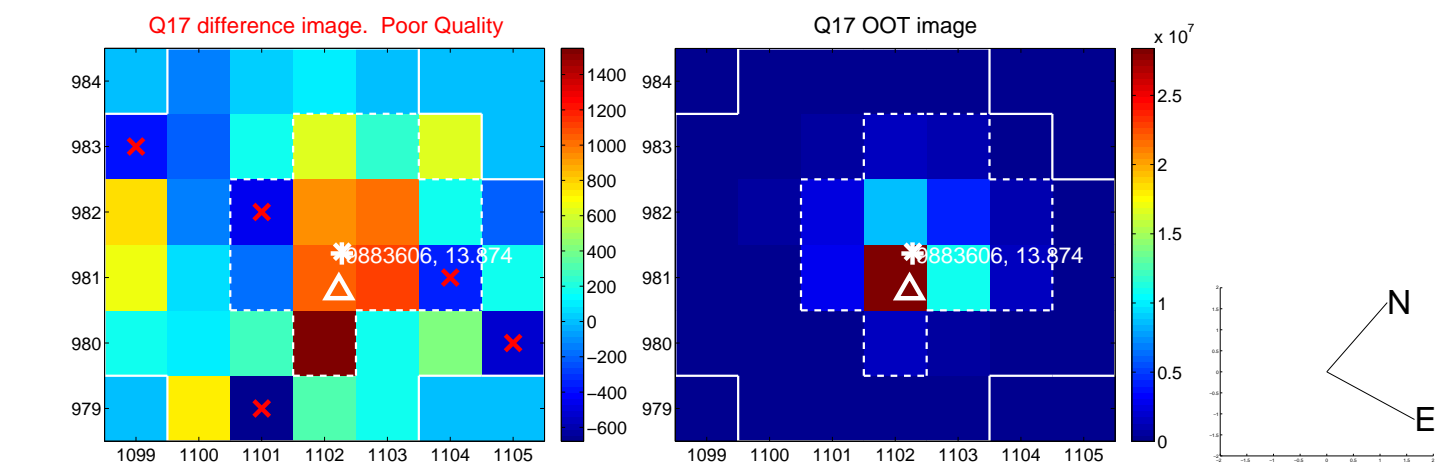
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



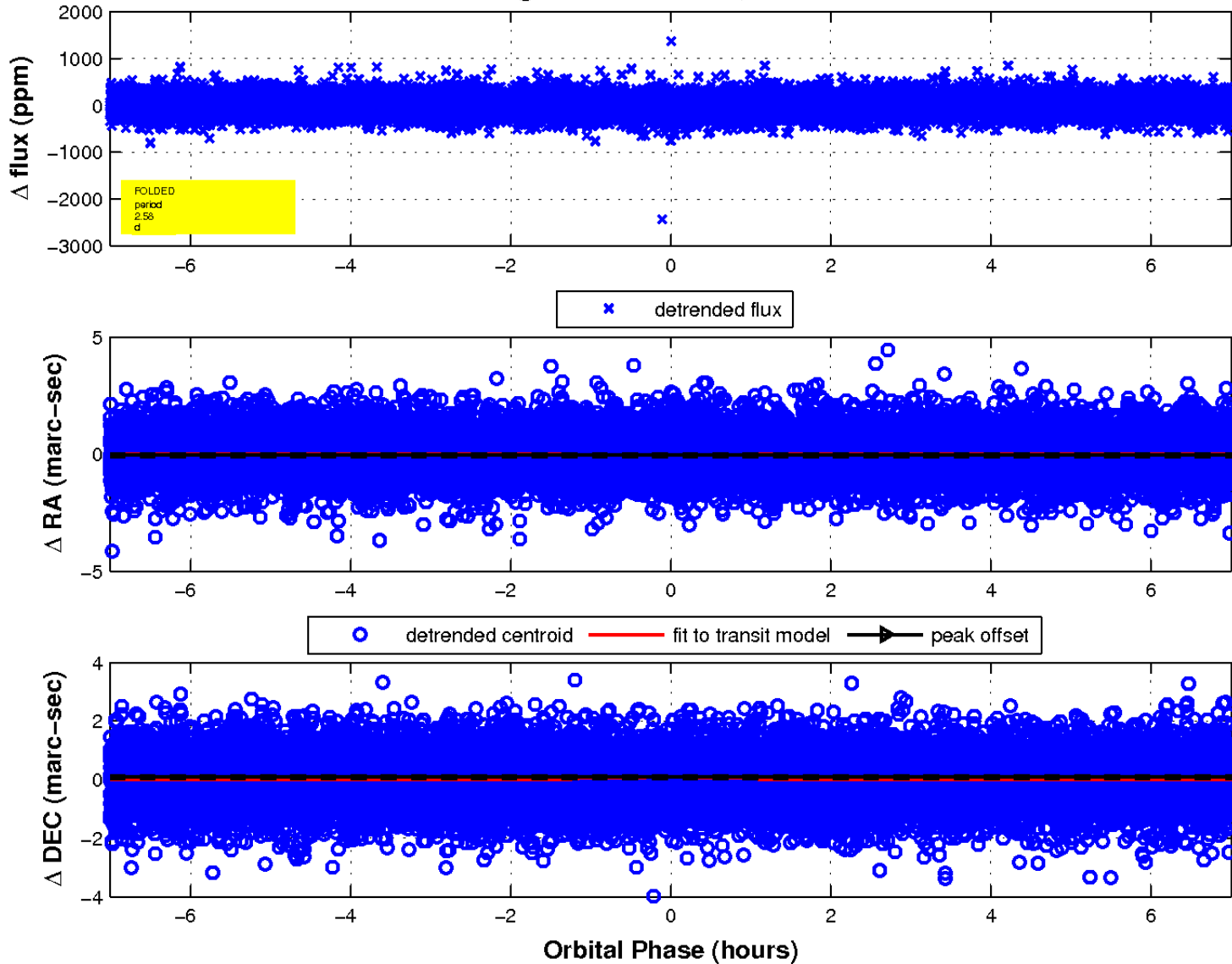
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

