

KIC 008878187

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})
008878187-01	OBS	0697.01	3.032095	132.327307	255.0	3.661	37.6	44.1	1.45	5827	2.75	1220.85
008878187-02	OBS	No	3.031406	132.903255	27.9	10.871	7.7	7.5	1.45	5827	0.79	1221.22
008878187-03	OBS	No	3.031705	132.055414	42.6	4.962	7.6	9.0	1.45	5827	1.05	1221.06
008878187-04	OBS	No	187.829507	204.981542	136.3	23.445	10.9	7.2	1.45	5827	1.81	4.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008878187-01	OBS	PC	0.95	0	0	0	0	NO_COMMENT
008878187-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—RESIDUAL_TCE—CENT_FEW_DIFFS
008878187-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—RESIDUAL_TCE—CENT_FEW_DIFFS
008878187-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—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.

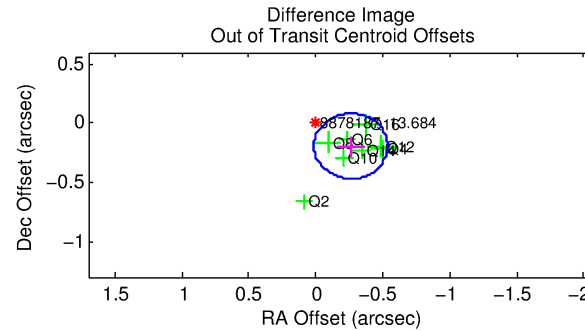
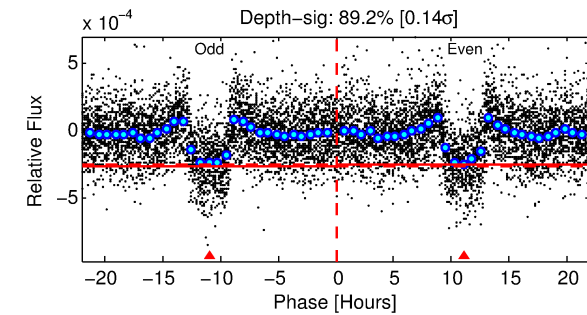
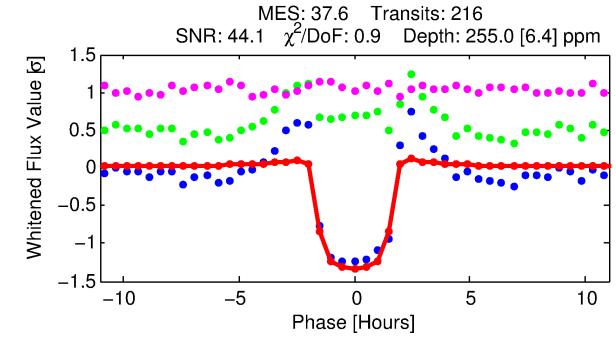
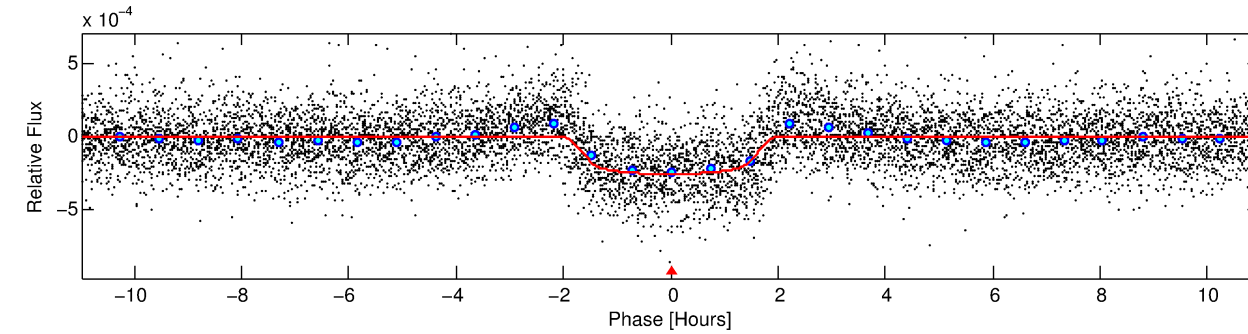
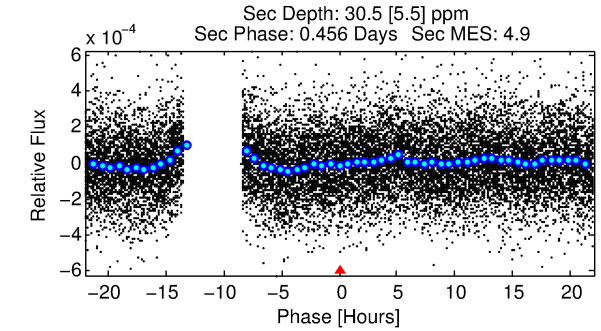
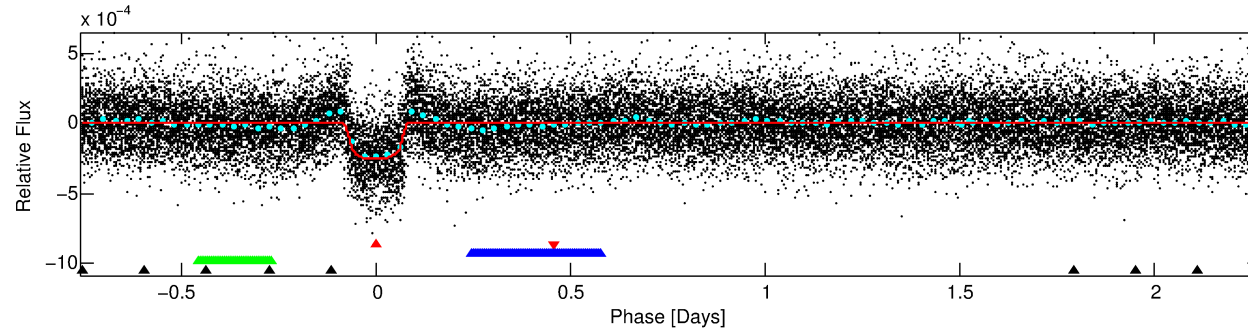
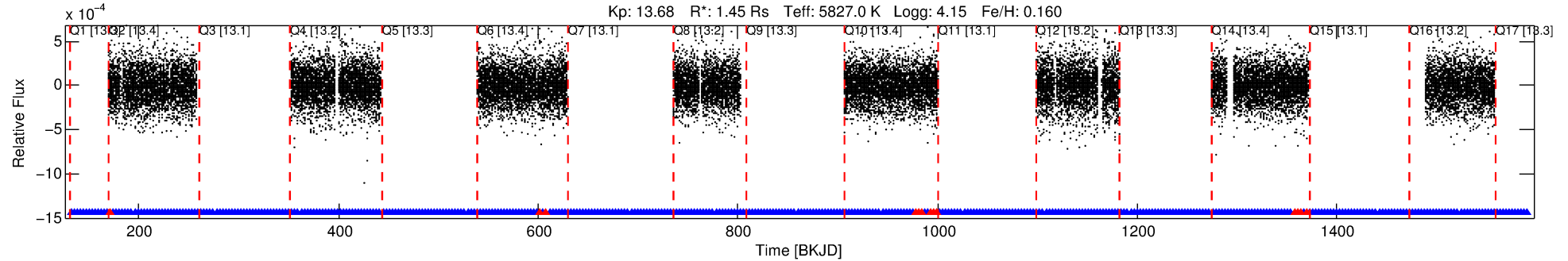
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008878187-01

No Significant Match Found

DV One-Page Summary

KIC: 8878187 Candidate: 1 of 4 Period: 3.032 d
KOI: K00697.01 Corr: 0.959



DV Fit Results:

Period = 3.03209 [0.00001] d
Epoch = 132.3273 [0.0012] BKJD
Rp/R* = 0.0174 [0.0015]
a/R* = 3.14 [1.14]
b = 0.90 [0.09]
Seff = 1220.85 [372.32]
Teff = 1507 [115] K
Rp = 2.75 [0.63] Re
a = 0.0421 [0.0081] AU
Ag = 3.94 [1.52] [1.94σ]
Teffp = 3283 [214] K [7.31σ]

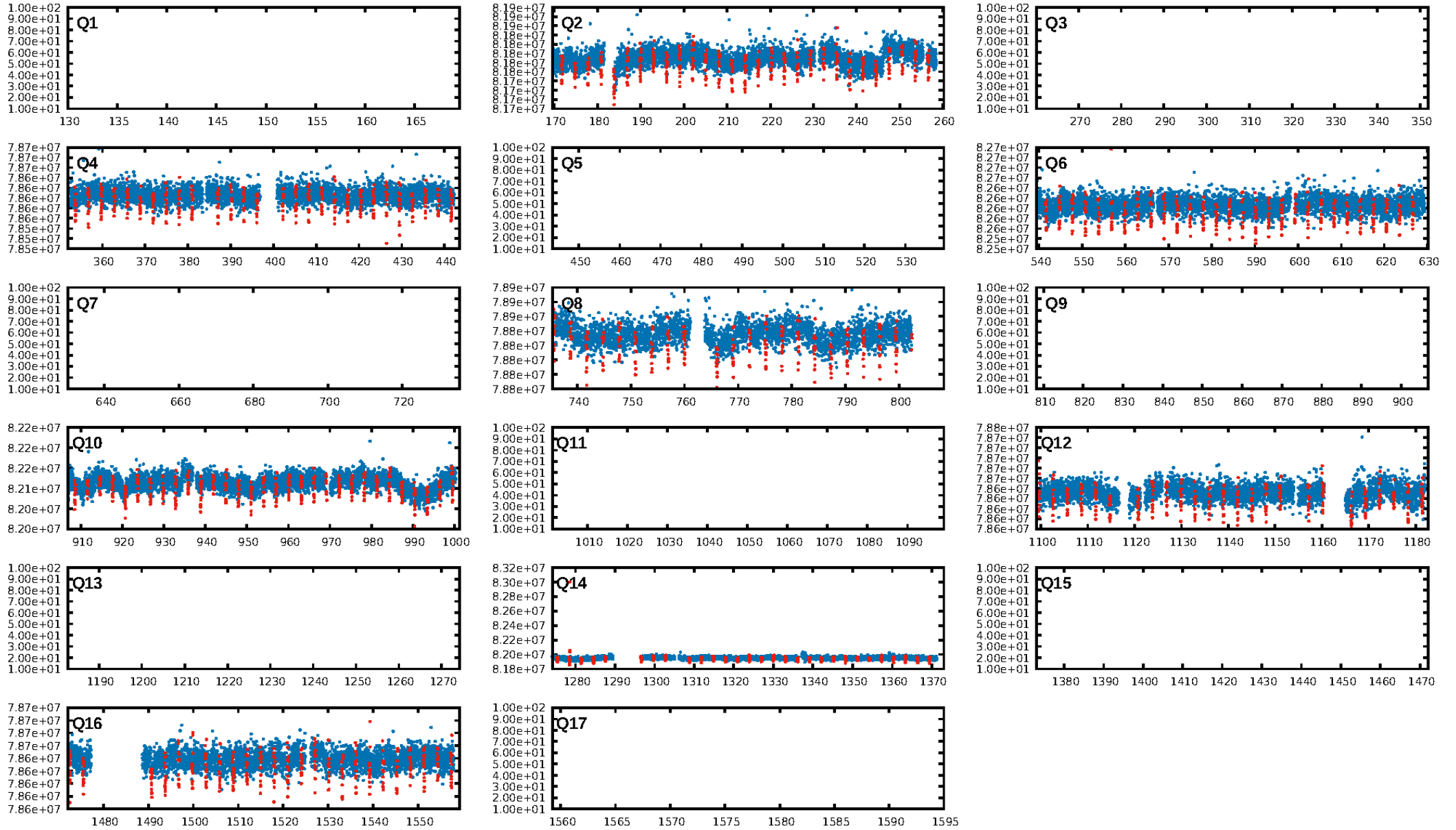
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]
LongPeriod-sig: 100.0% [186.90σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.29e-259
RollingBand-fgt: 0.94 [203/216]
GhostDiagnostic-chr: 3.773
Centroid-sig: 0.0%
Centroid-so: 0.912 arcsec [3.57σ]
OotOffset-rm: 0.325 arcsec [3.54σ]
KicOffset-rm: 0.463 arcsec [5.26σ]
OotOffset-st: 4/0/4/0 [8]
KicOffset-st: 4/0/4/0 [8]
DiffImageQuality-fgm: 1.00 [8/8]
DiffImageOverlap-fno: 0.00 [0/8]

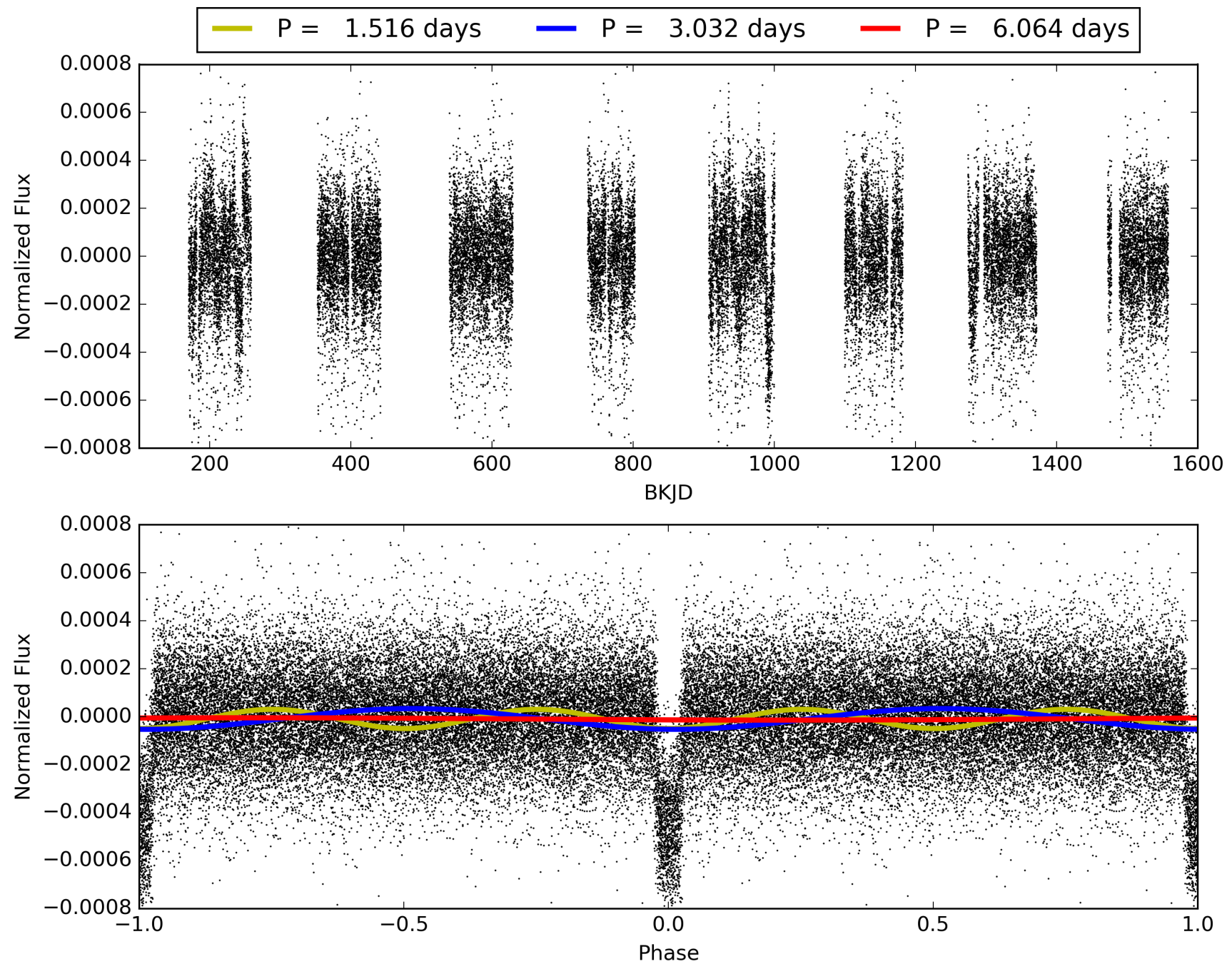
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008878187-01, PDC Light Curves

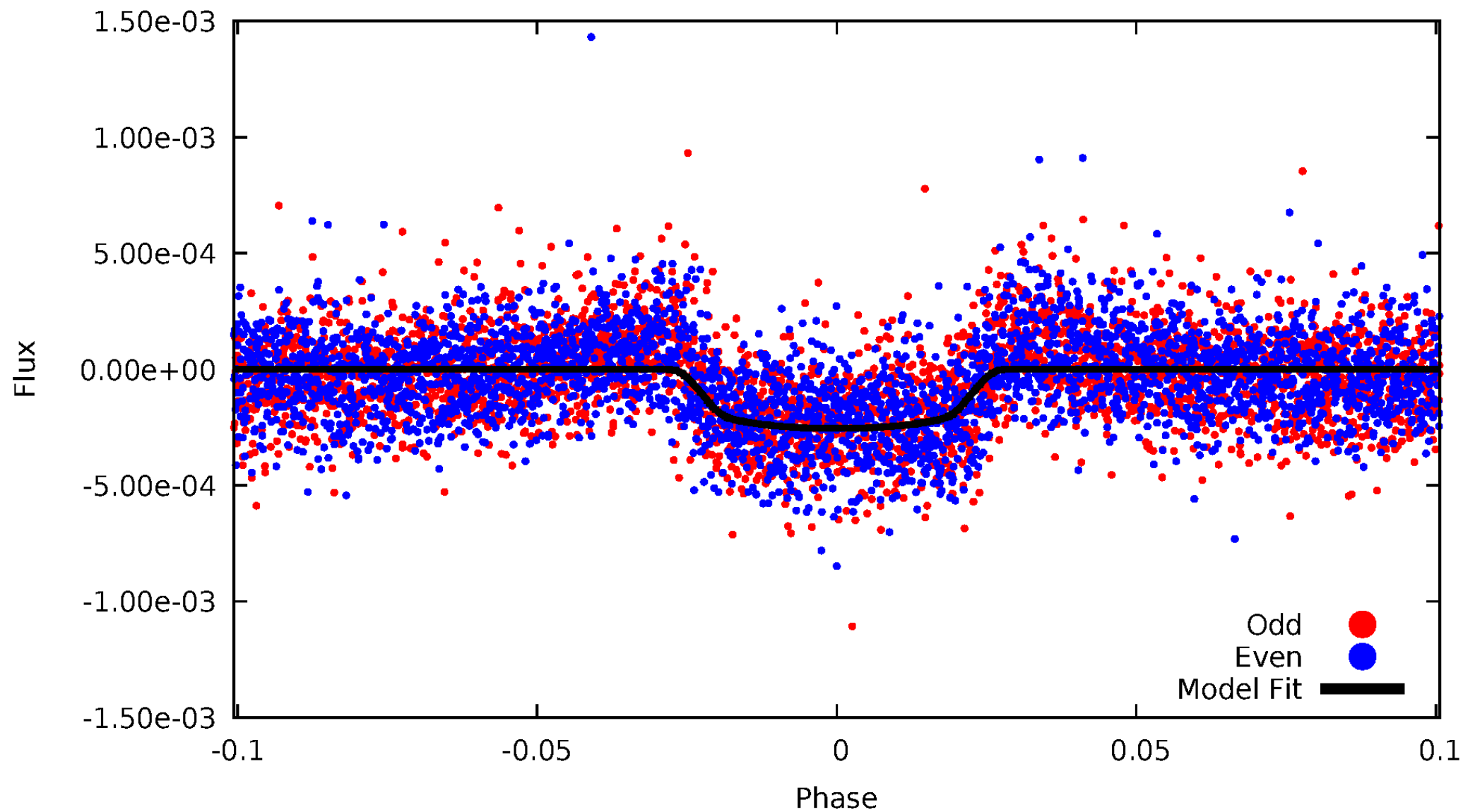


TCE 008878187-01



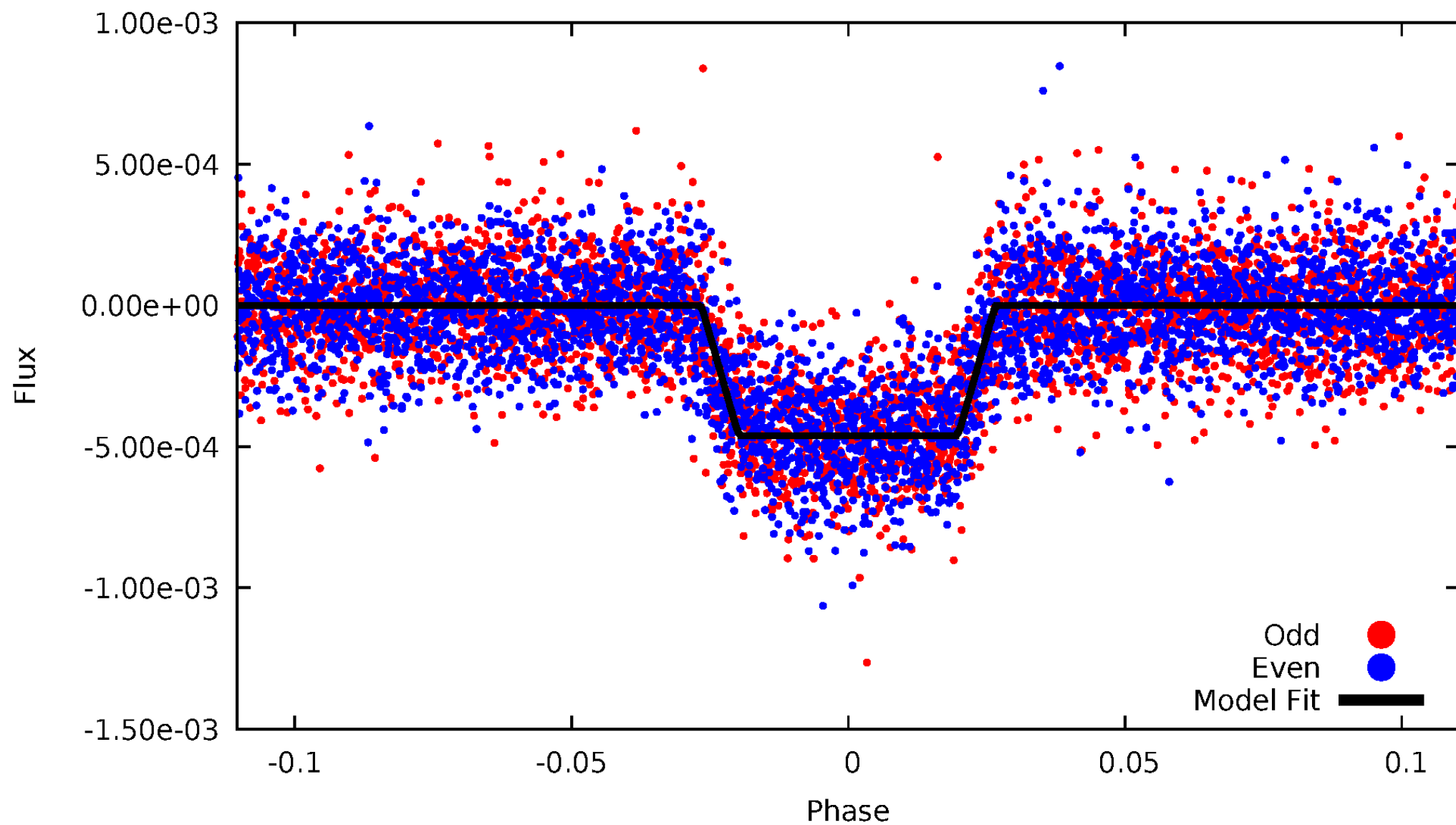
DV Odd/Even

TCE 008878187-01

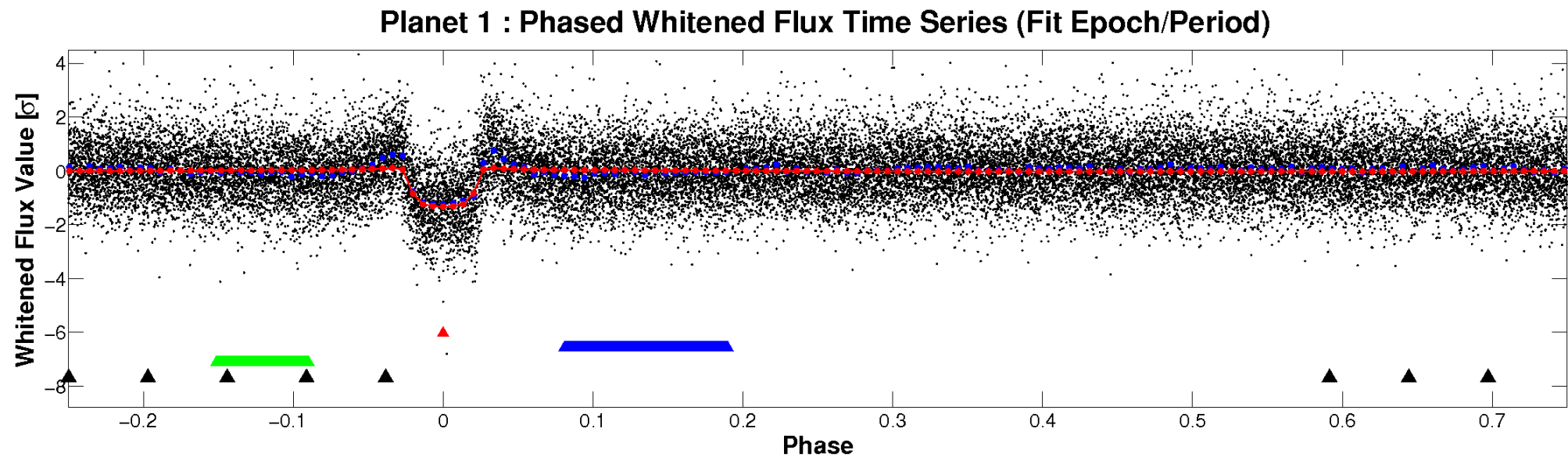
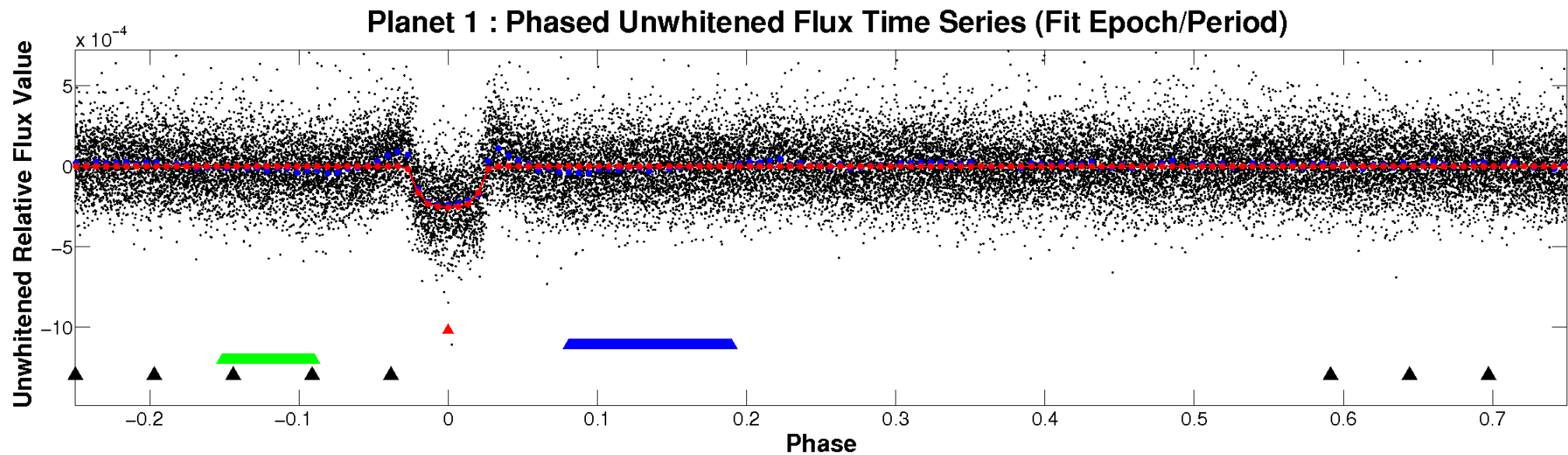


ALT Odd/Even

TCE 008878187-01

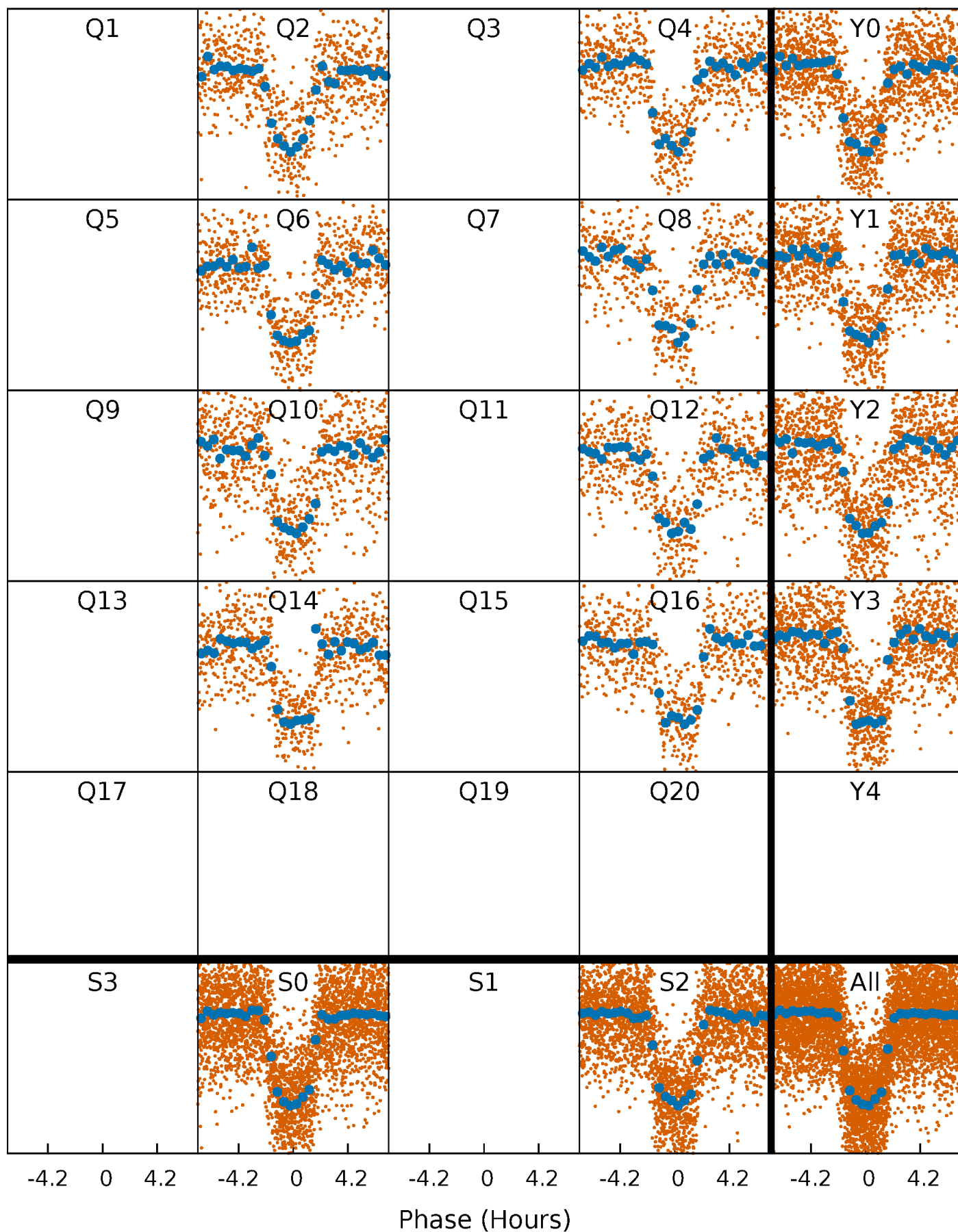


Non-Whitened Vs. Whitened Light Curve



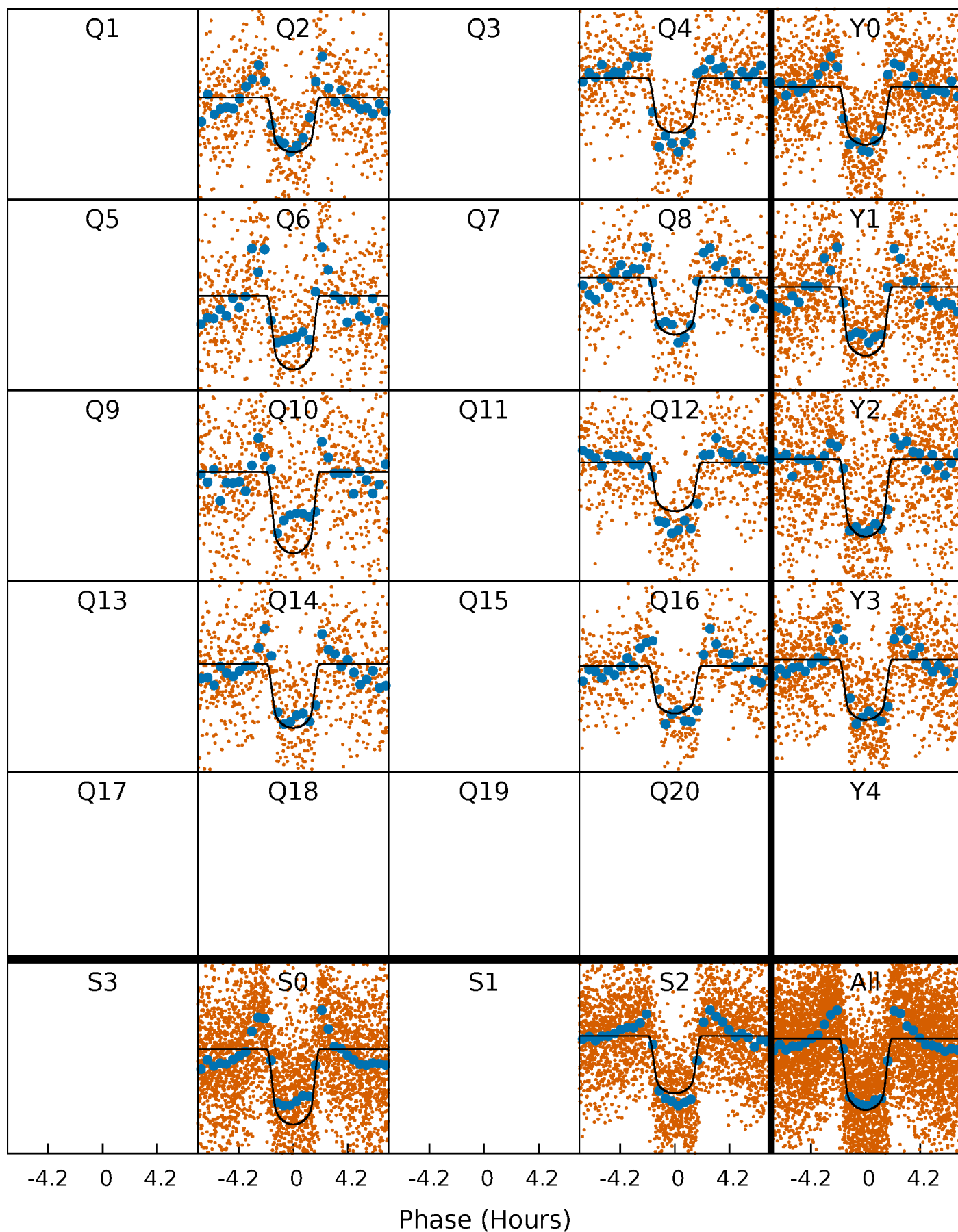
PDC Quarter-Phased Transit Curves

TCE 008878187-01 P= 3.032095 Days $T_0=132.327307$ (BKJD)



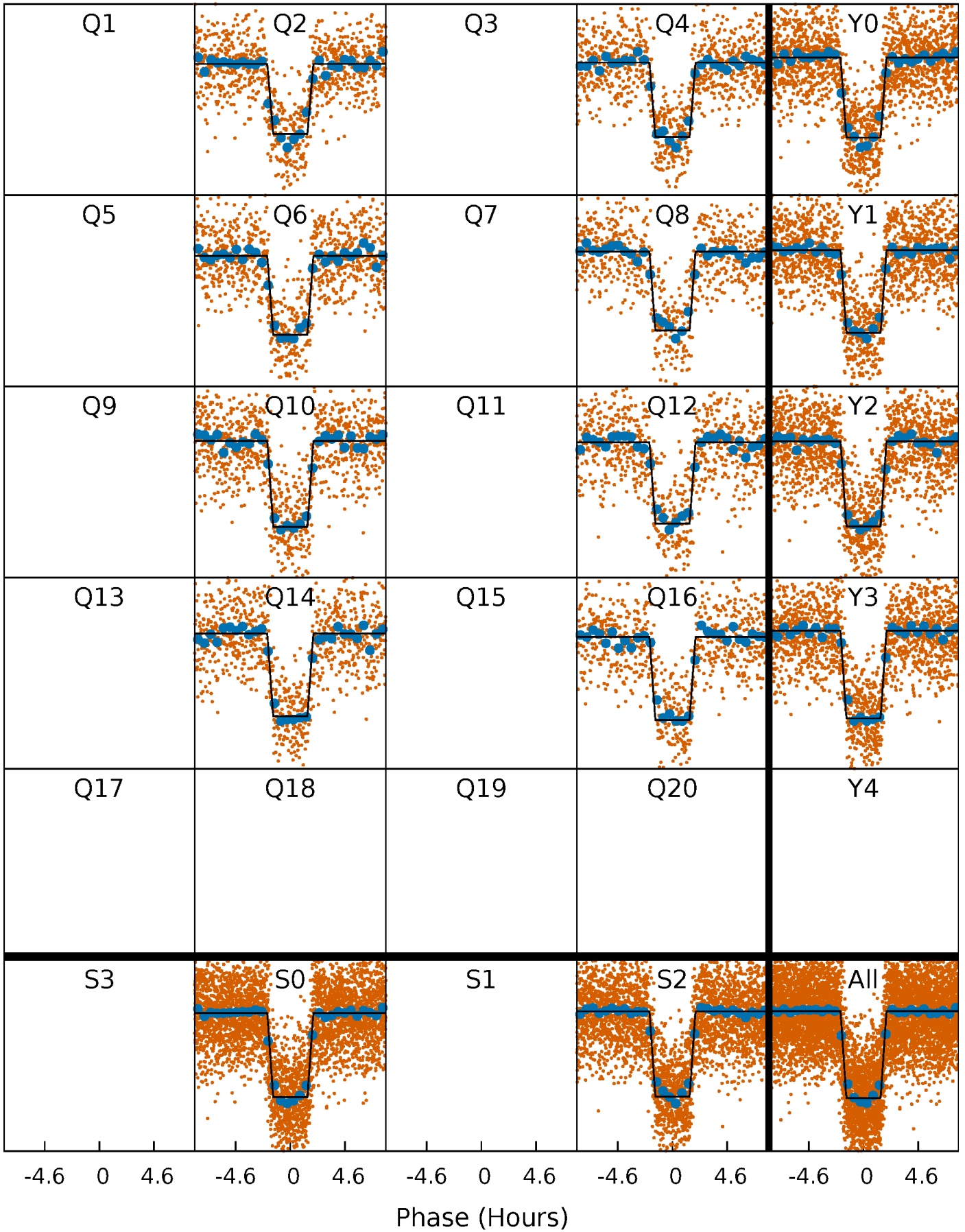
DV Quarter-Phased Transit Curves

TCE 008878187-01 P= 3.032095 Days $T_0=132.327307$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

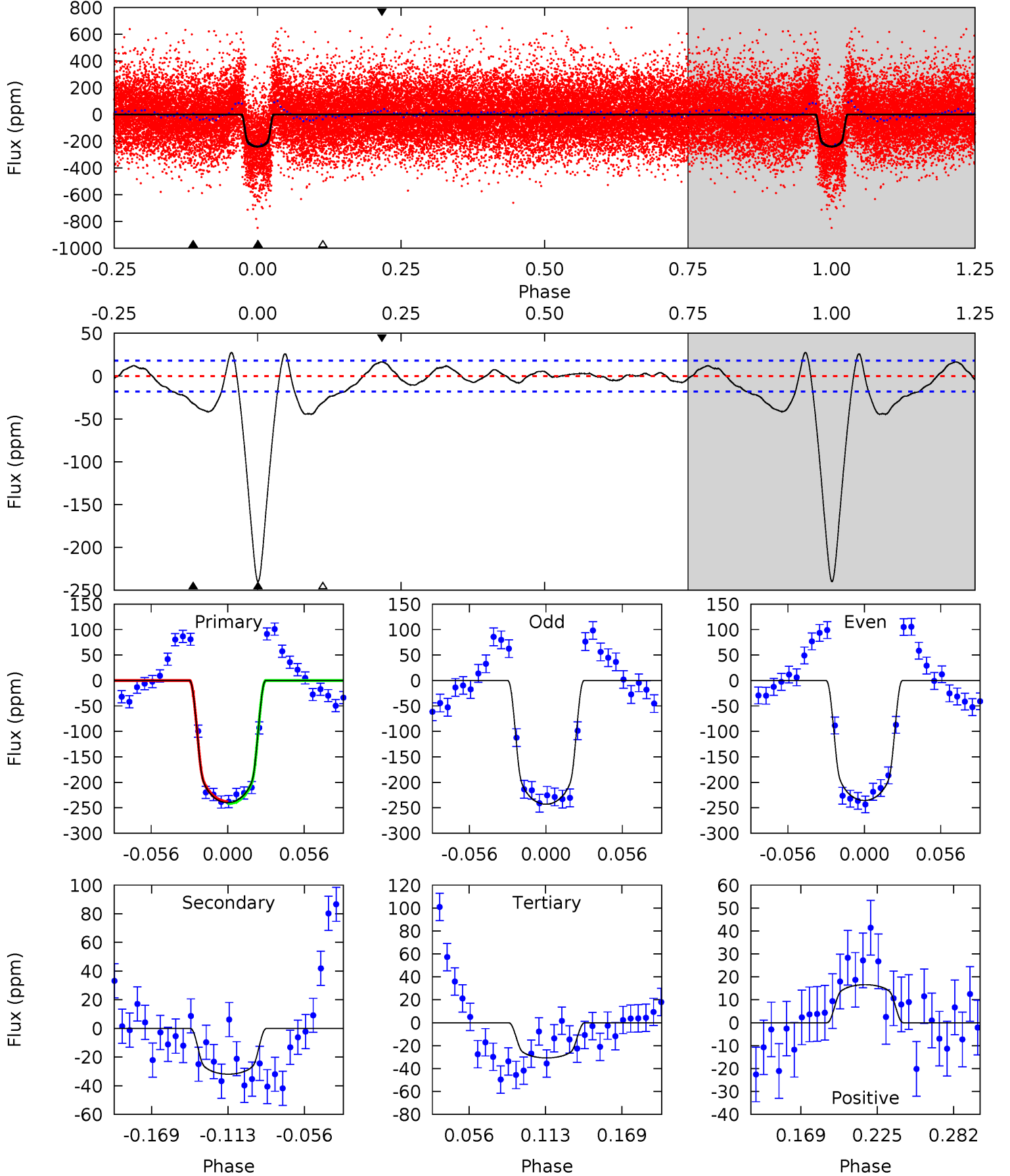
TCE 008878187-01 P= 3.032125 Days $T_0=132.322024$ (BKJD)



DV Model-Shift Uniqueness Test

008878187-01, P = 3.032095 Days, E = 132.327307 Days

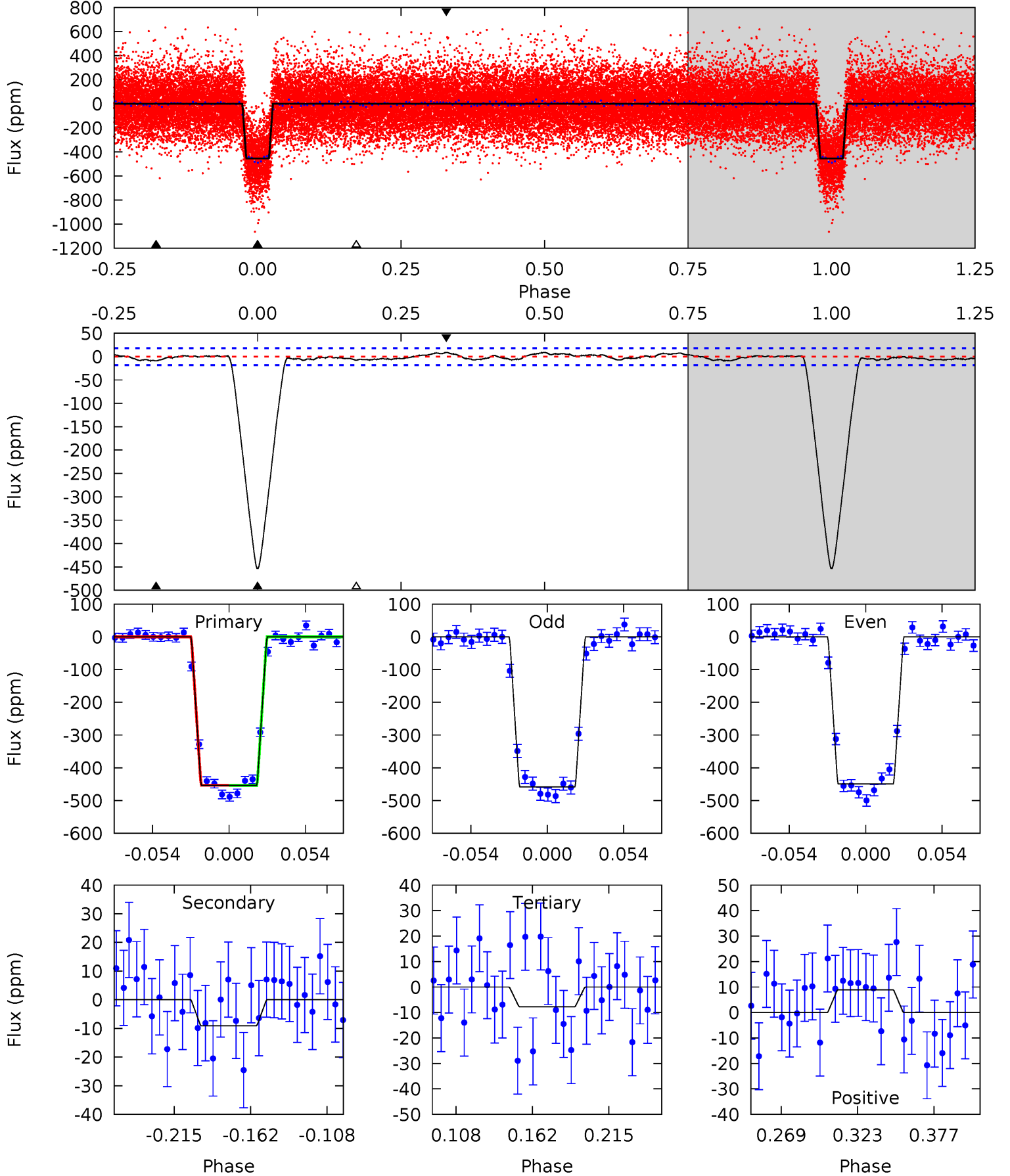
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
62.5	8.32	8.00	4.32	4.68	1.91	3.18	54.5	58.2	0.32	4.00	0.96	1.00	0.10	0.52



Alt Model-Shift Uniqueness Test

008878187-01, P = 3.032125 Days, E = 132.322024 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
117.2	2.34	2.00	2.31	4.69	1.93	1.16	115.2	114.9	0.35	0.04	1.15	1.00	0.02	0.07



Stellar Parameters For KIC 008878187

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5827^{+104}_{-115}	$4.151^{+0.168}_{-0.098}$	$0.160^{+0.150}_{-0.150}$	$1.447^{+0.232}_{-0.309}$	$1.081^{+0.115}_{-0.084}$	$0.502^{+0.427}_{-0.170}$
	+2%/-2%	+4%/-2%	+94%/-94%	+16%/-21%	+11%/-8%	+85%/-34%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 008878187-01 / KOI 0697.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-32 ± 4	$2.75^{+0.34}_{-0.35}$	2099^{+95}_{-119}	3670^{+157}_{-137}	$4.176^{+1.513}_{-0.991}$
Alt.	-9 ± 4	$3.37^{+0.40}_{-0.43}$	2093^{+109}_{-118}	2716^{+202}_{-449}	$0.795^{+0.397}_{-0.385}$

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

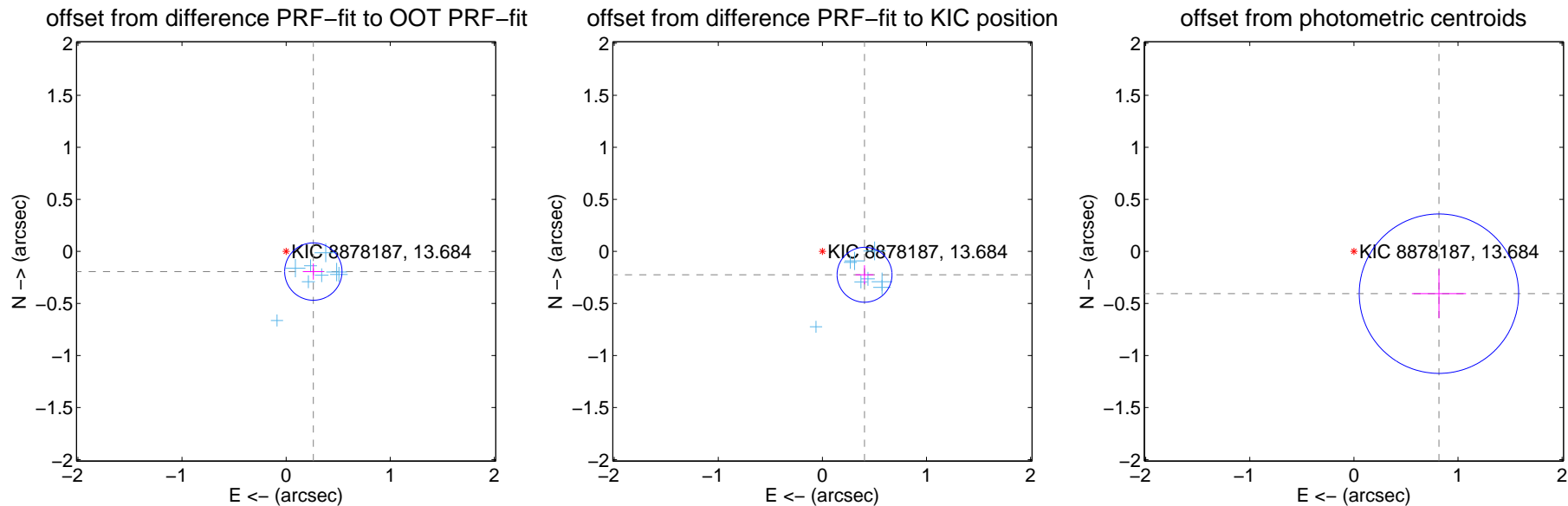
DV Centroid Data

Supplemental centroid analysis for 008878187-01. Kepler magnitude: 13.68. Transit SNR 44.12

There are 8 quarters with good PRF difference image offsets

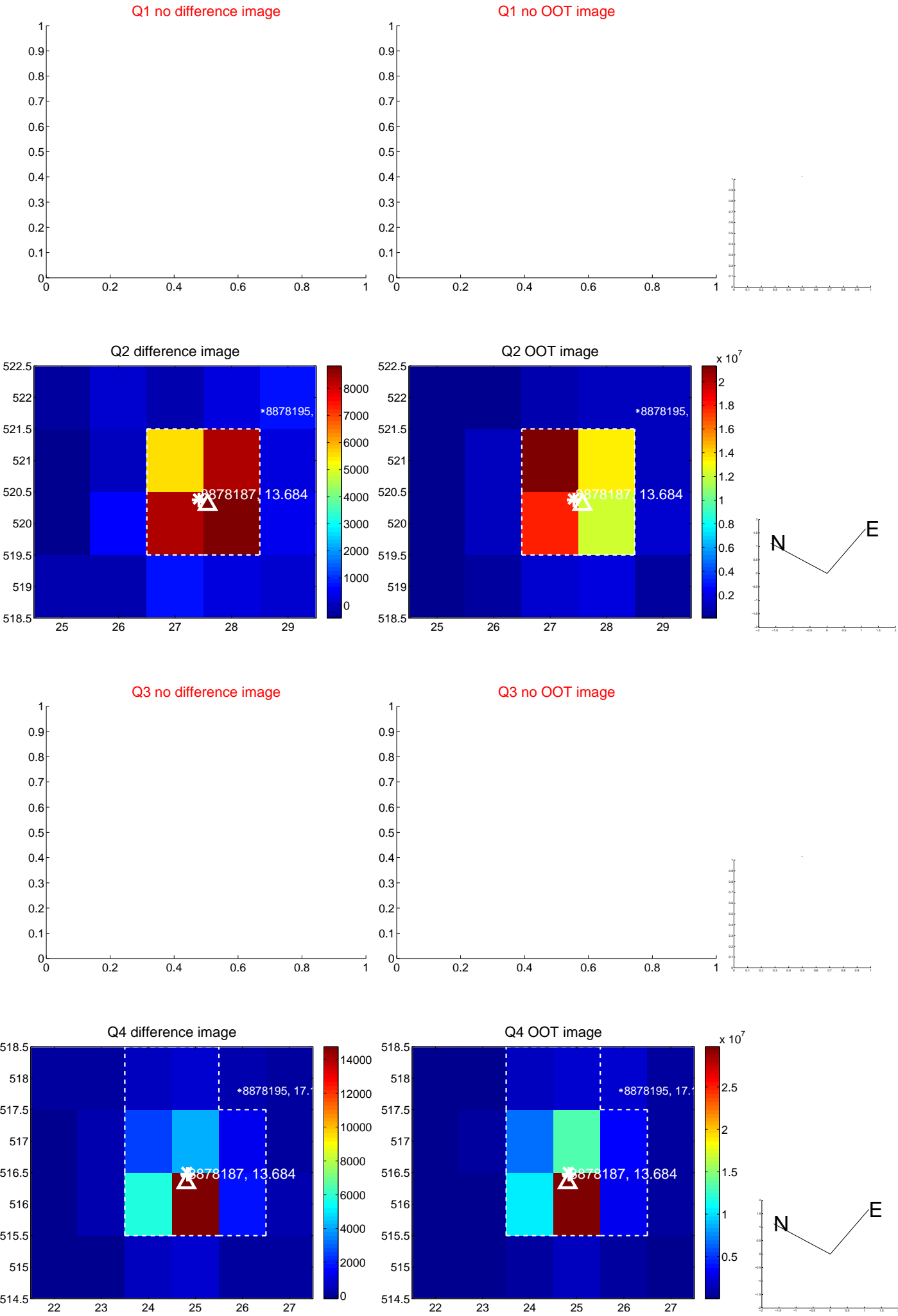
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.325 ± 0.092	3.54	-0.262 ± 0.099	-0.194 ± 0.078
PRF-fit source offset from KIC position	0.463 ± 0.088	5.26	-0.405 ± 0.087	-0.224 ± 0.091
photometric centroid source offset	0.91 ± 0.26	3.57	-0.82 ± 0.26	-0.41 ± 0.24

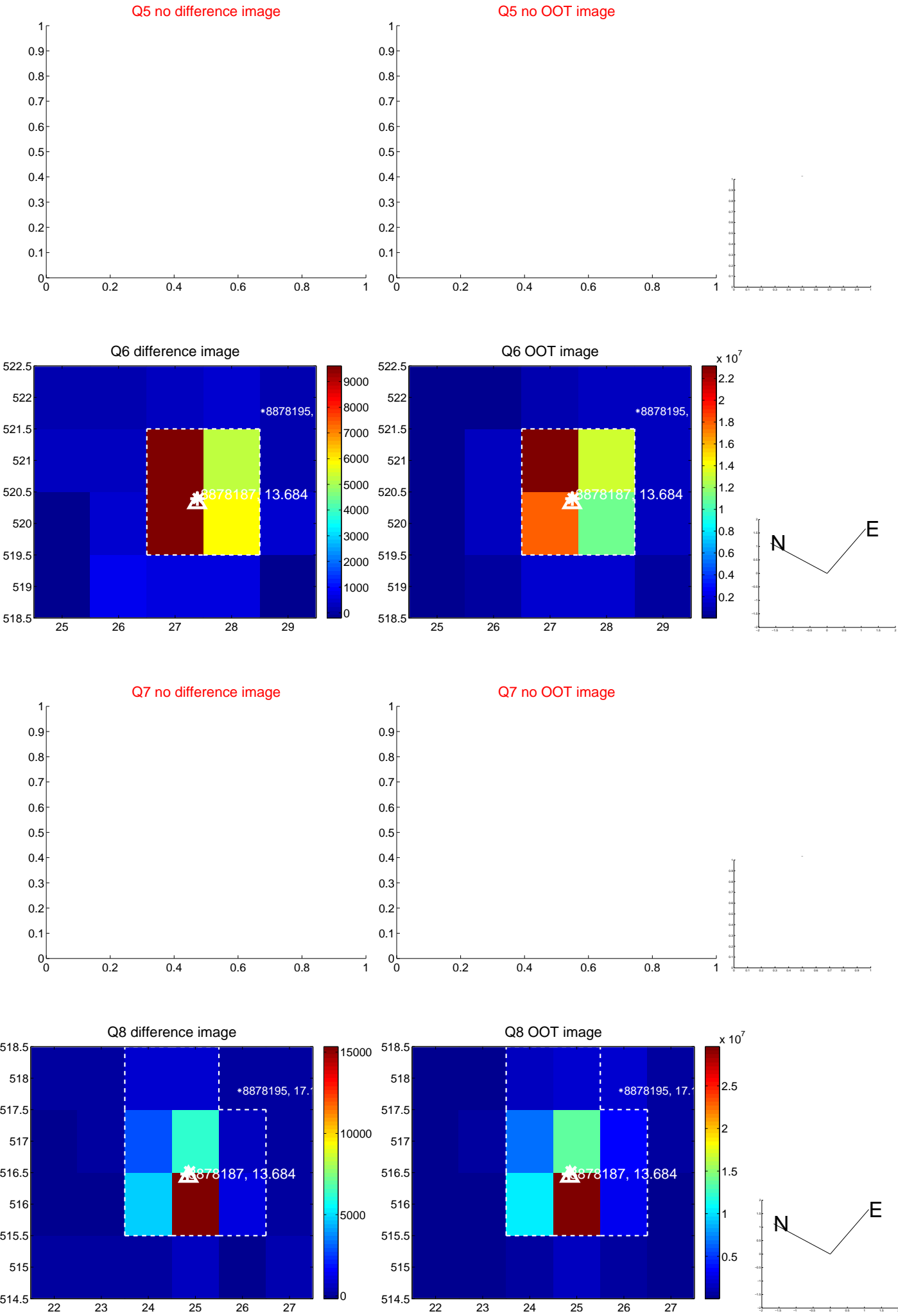


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

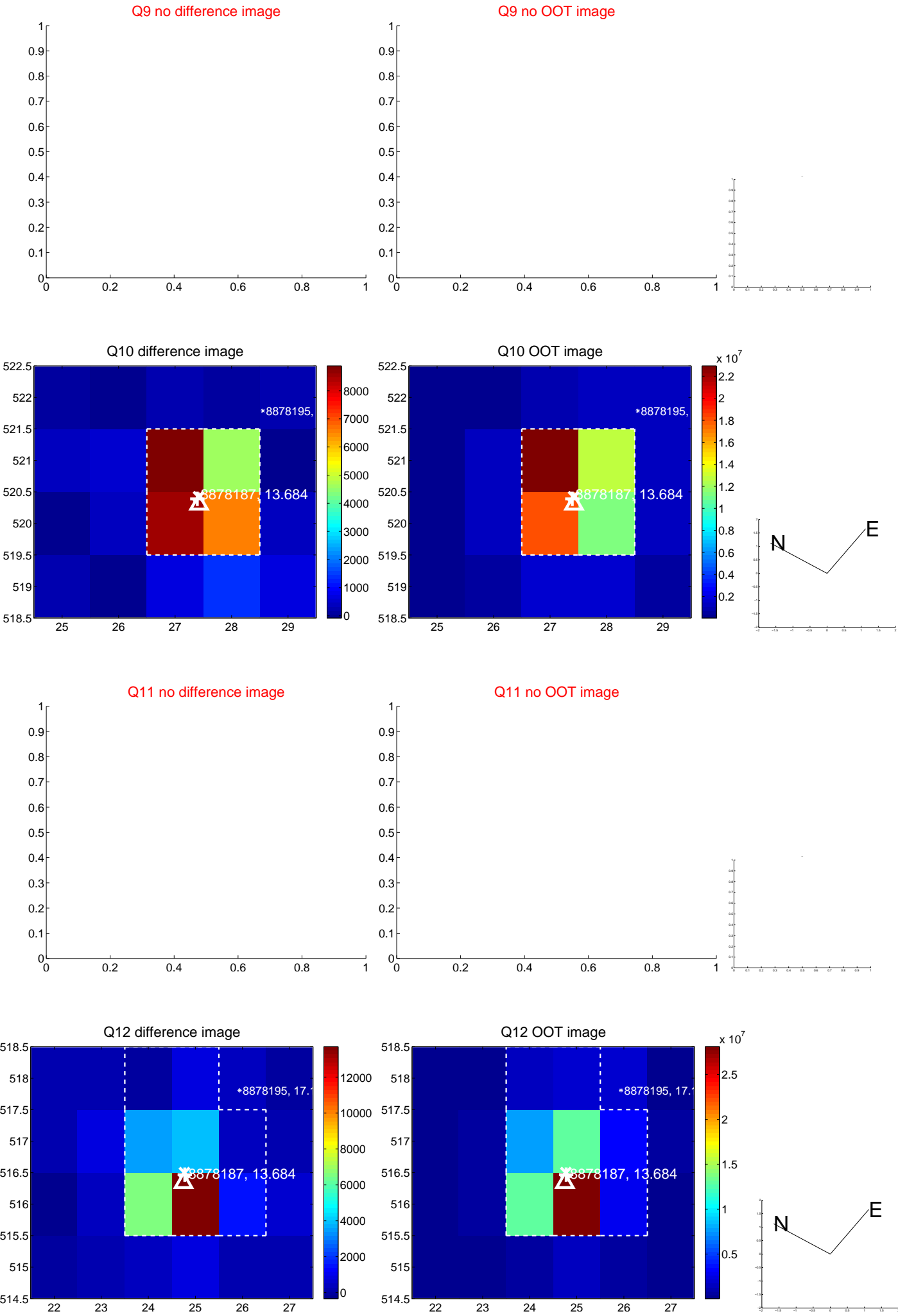
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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

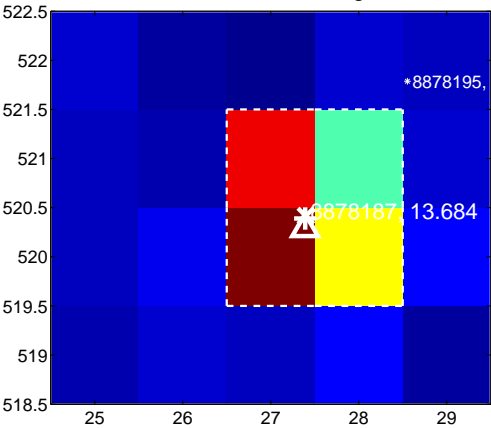
Q13 no difference image



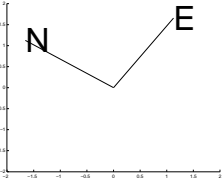
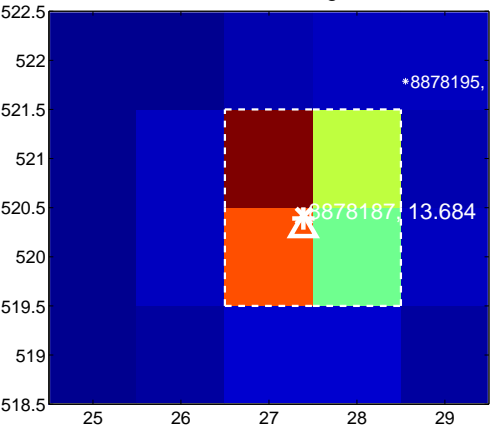
Q13 no OOT image



Q14 difference image



Q14 OOT image



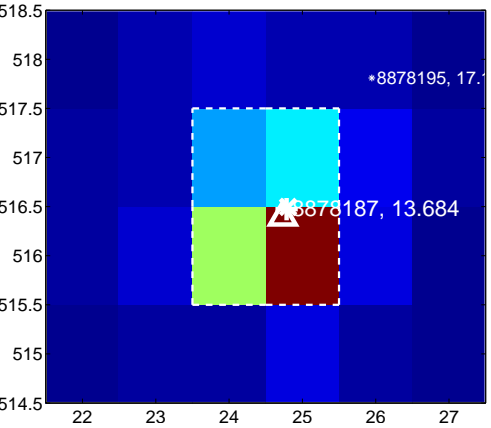
Q15 no difference image



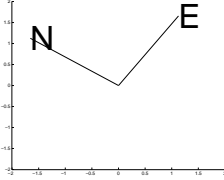
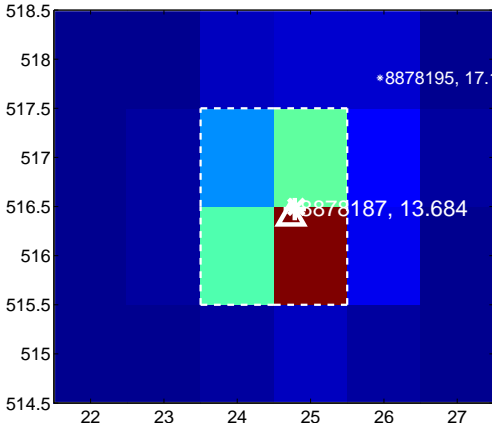
Q15 no OOT image



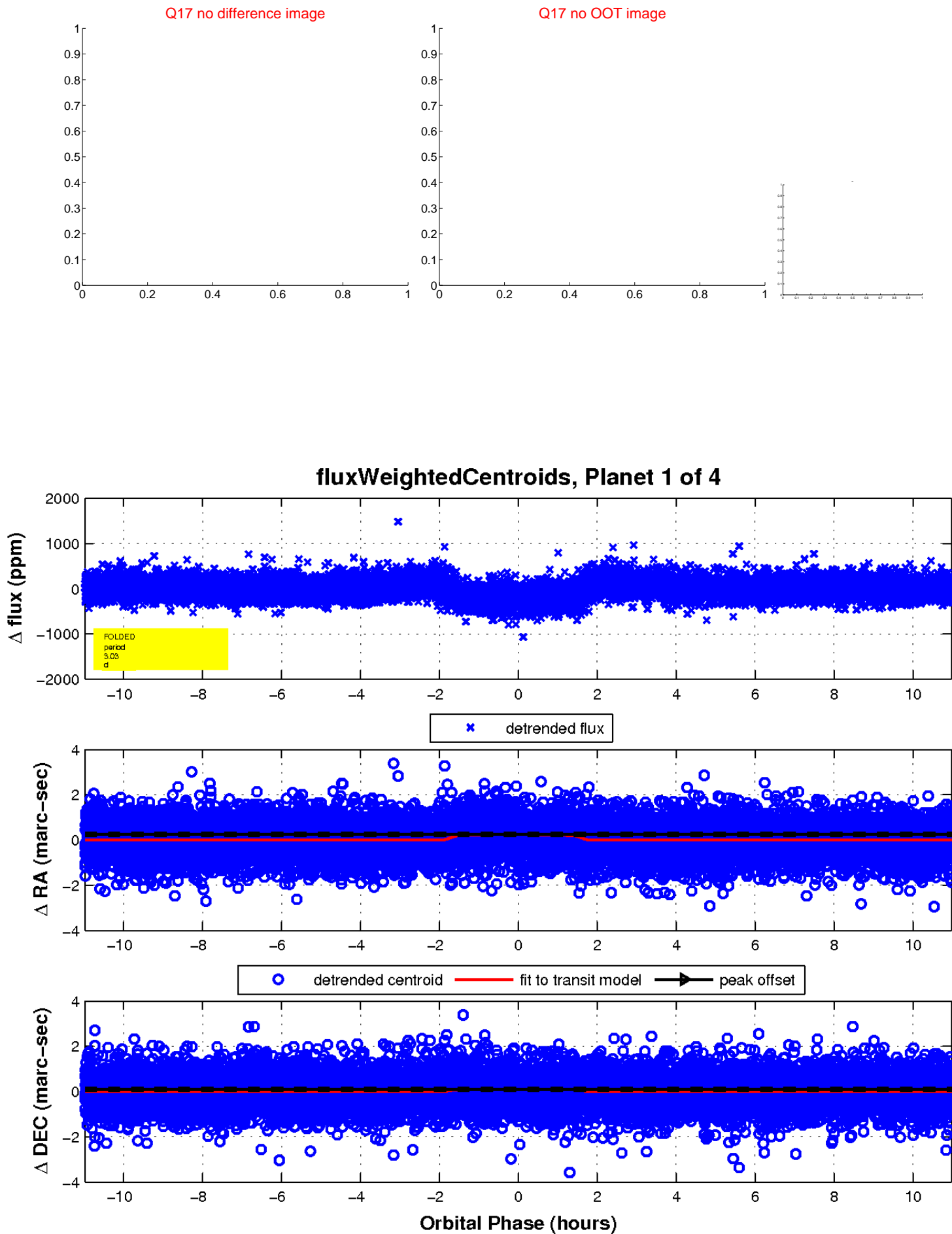
Q16 difference image



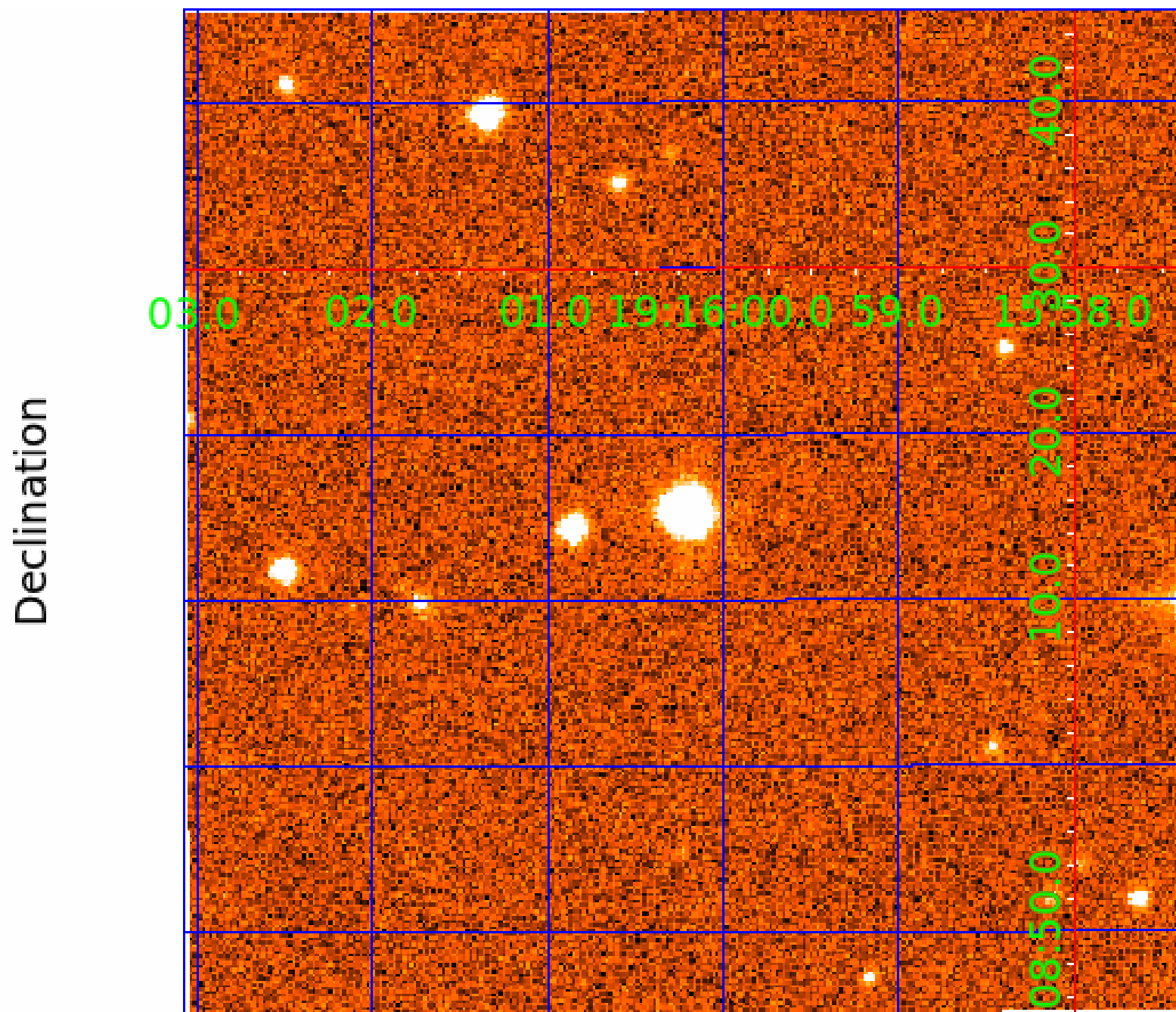
Q16 OOT image



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



UKIRT Image



KIC 008878187

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})
008878187-01	OBS	0697.01	3.032095	132.327307	255.0	3.661	37.6	44.1	1.45	5827	2.75	1220.85
008878187-02	OBS	No	3.031406	132.903255	27.9	10.871	7.7	7.5	1.45	5827	0.79	1221.22
008878187-03	OBS	No	3.031705	132.055414	42.6	4.962	7.6	9.0	1.45	5827	1.05	1221.06
008878187-04	OBS	No	187.829507	204.981542	136.3	23.445	10.9	7.2	1.45	5827	1.81	4.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008878187-01	OBS	PC	0.95	0	0	0	0	NO_COMMENT
008878187-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—RESIDUAL_TCE—CENT_FEW_DIFFS
008878187-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—RESIDUAL_TCE—CENT_FEW_DIFFS
008878187-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—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.

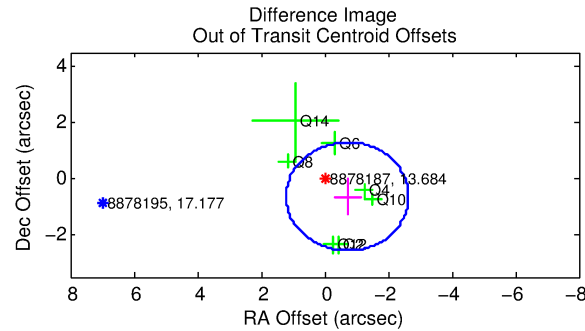
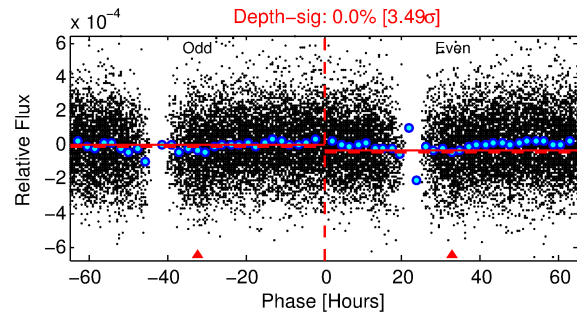
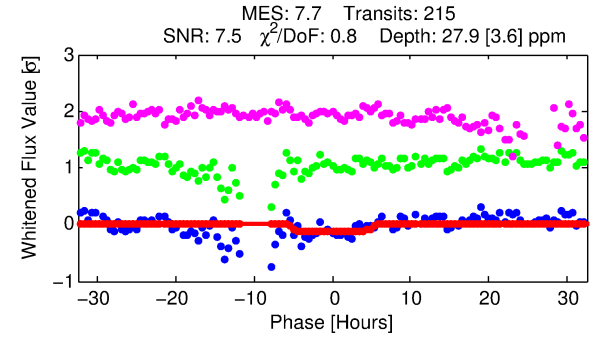
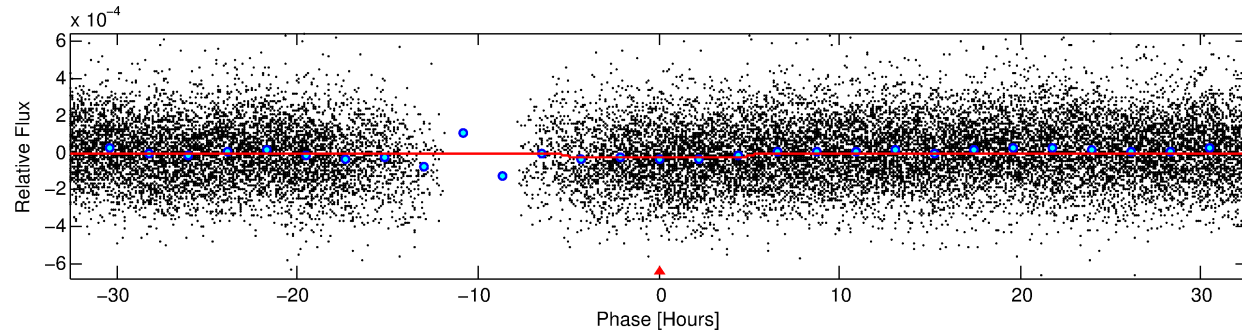
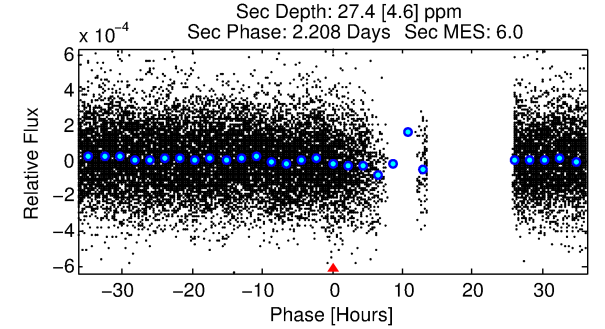
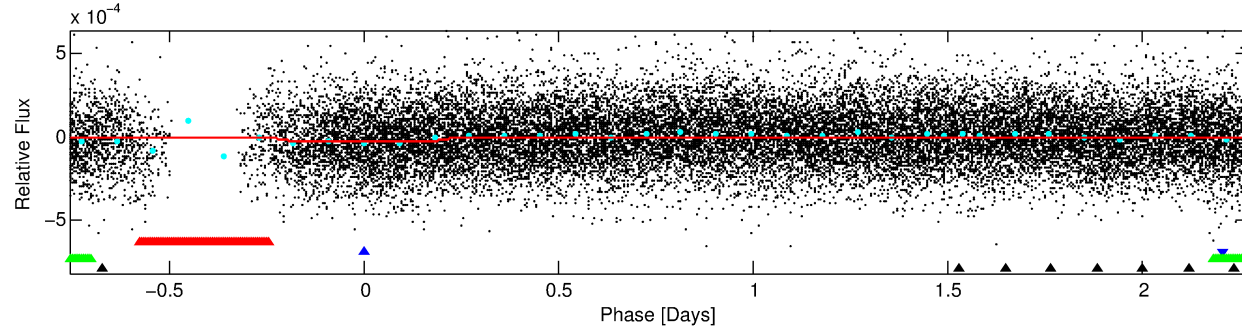
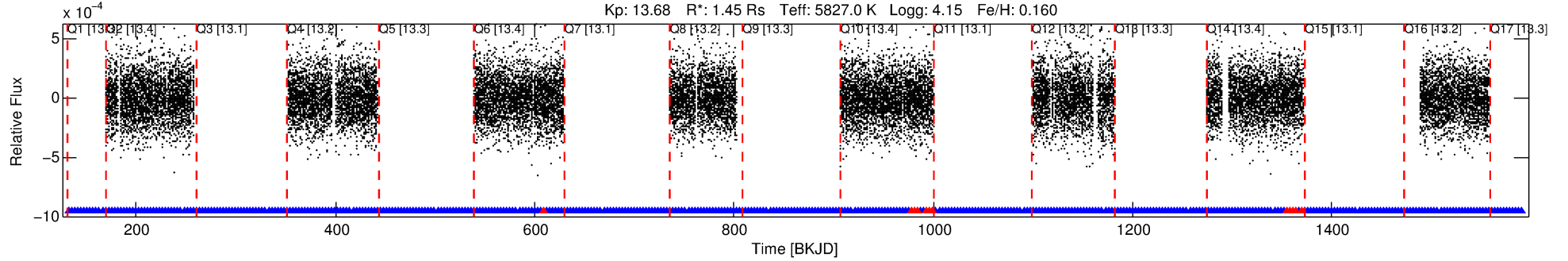
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008878187-02

No Significant Match Found

DV One-Page Summary

KIC: 8878187 Candidate: 2 of 4 Period: 3.031 d
KOI: K00697 Corr: No Ephemeris Match



DV Fit Results:

Period = 3.03141 [0.00008] d
Epoch = 132.9033 [0.0158] BKJD
Rp/R* = 0.0050 [0.0034]
a/R* = 1.90 [4.08]
b = 0.59 [3.36]
Seff = 1221.22 [372.44]
Teq = 1507 [115] K
Rp = 0.79 [0.56] Re
a = 0.0421 [0.0081] AU
Ag = 42.40 [59.23] [0.70σ]
Teffp = 5947 [2034] K [2.18σ]

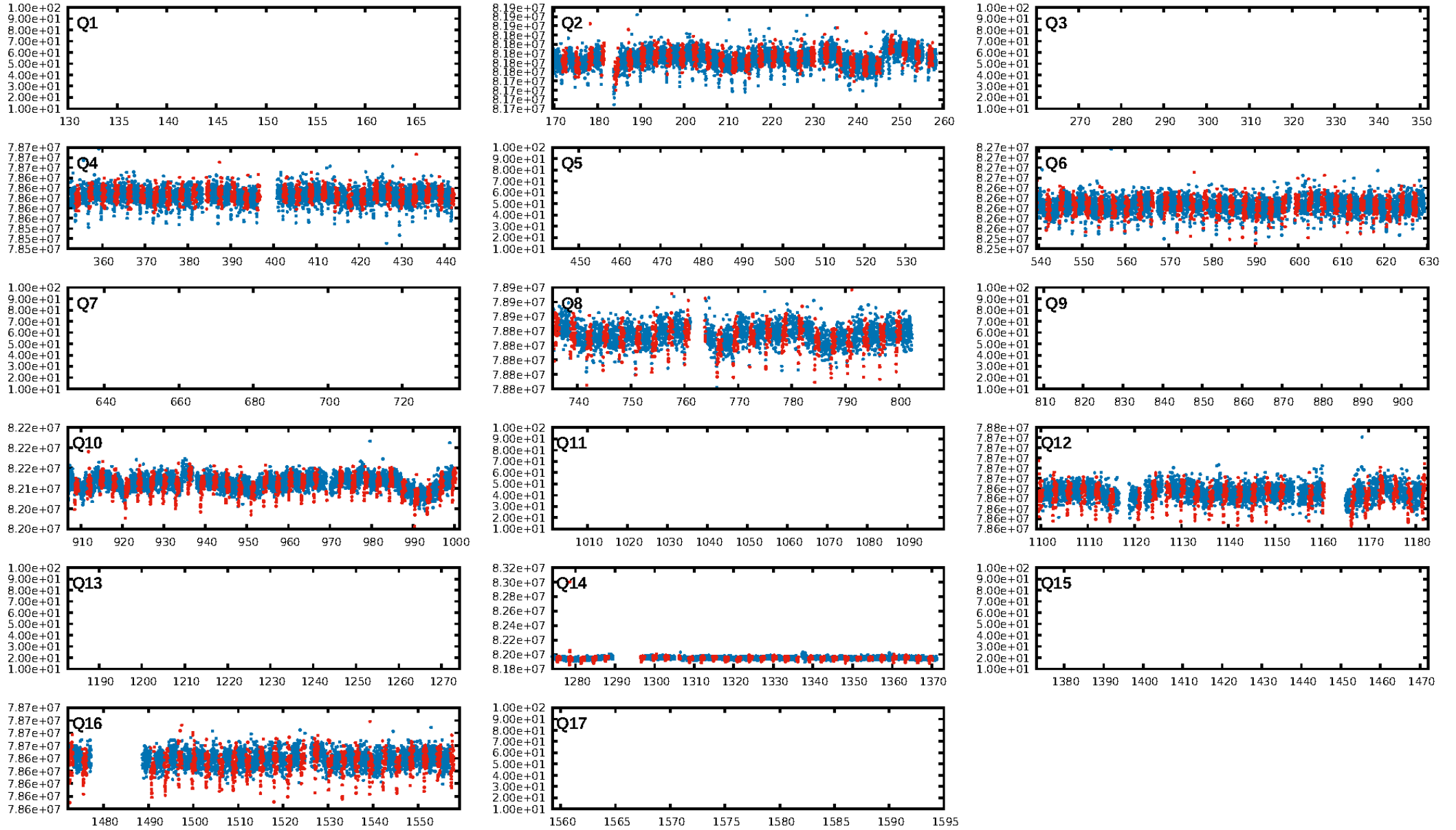
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.37e-19
RollingBand-fgt: 0.94 [203/215]
GhostDiagnostic-chr: 4.215
Centroid-sig: 56.4%
Centroid-so: 0.825 arcsec [0.59σ]
OotOffset-rm: 0.957 arcsec [1.49σ]
OotOffset-st: 4/0/3/0 [7]
KicOffset-rm: 1.020 arcsec [1.68σ]
KicOffset-st: 4/0/3/0 [7]
DiffImageQuality-fgm: 0.00 [0/7]
DiffImageOverlap-fno: 0.00 [0/8]

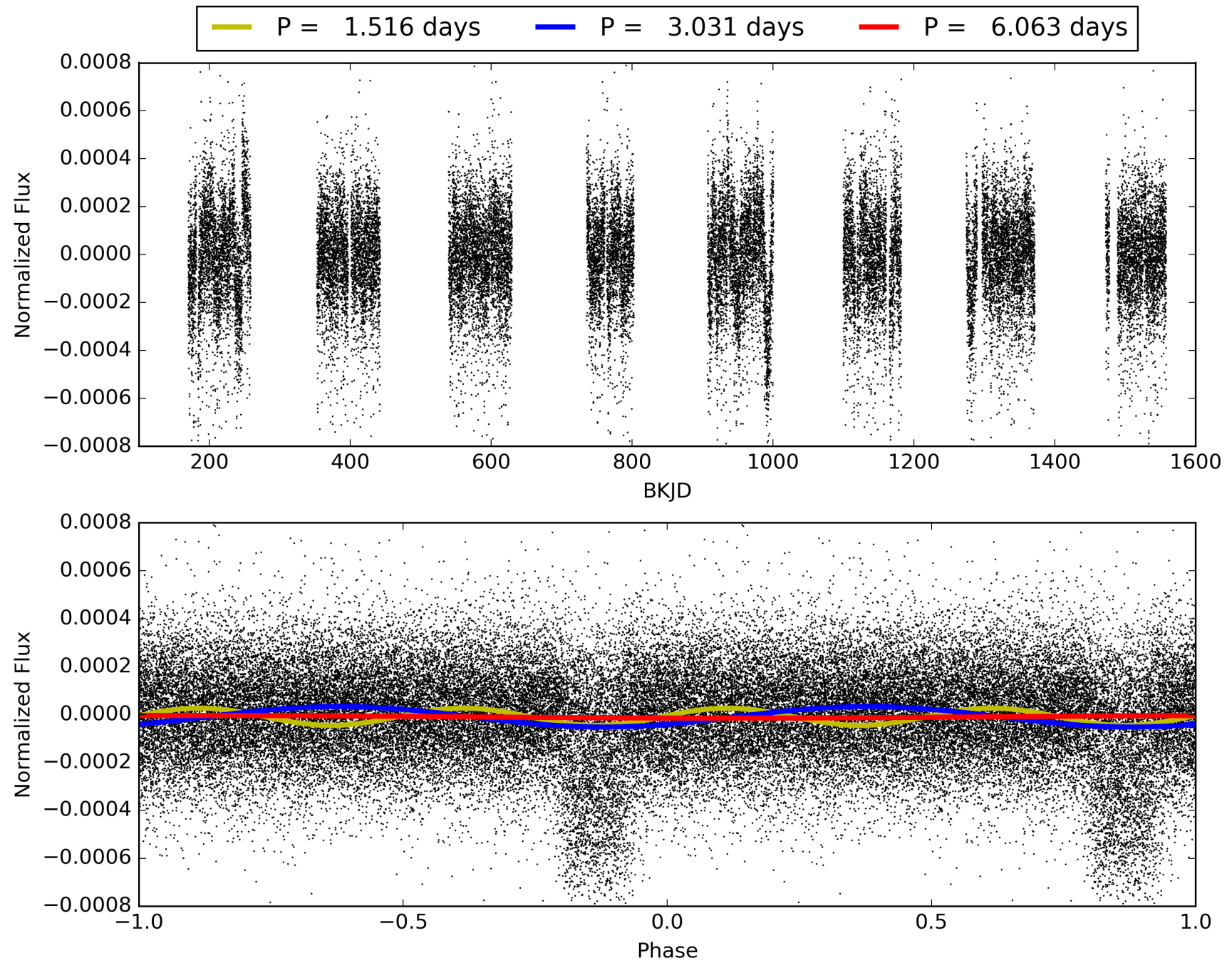
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 02:21:06 Z

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

TCE 008878187-02, PDC Light Curves

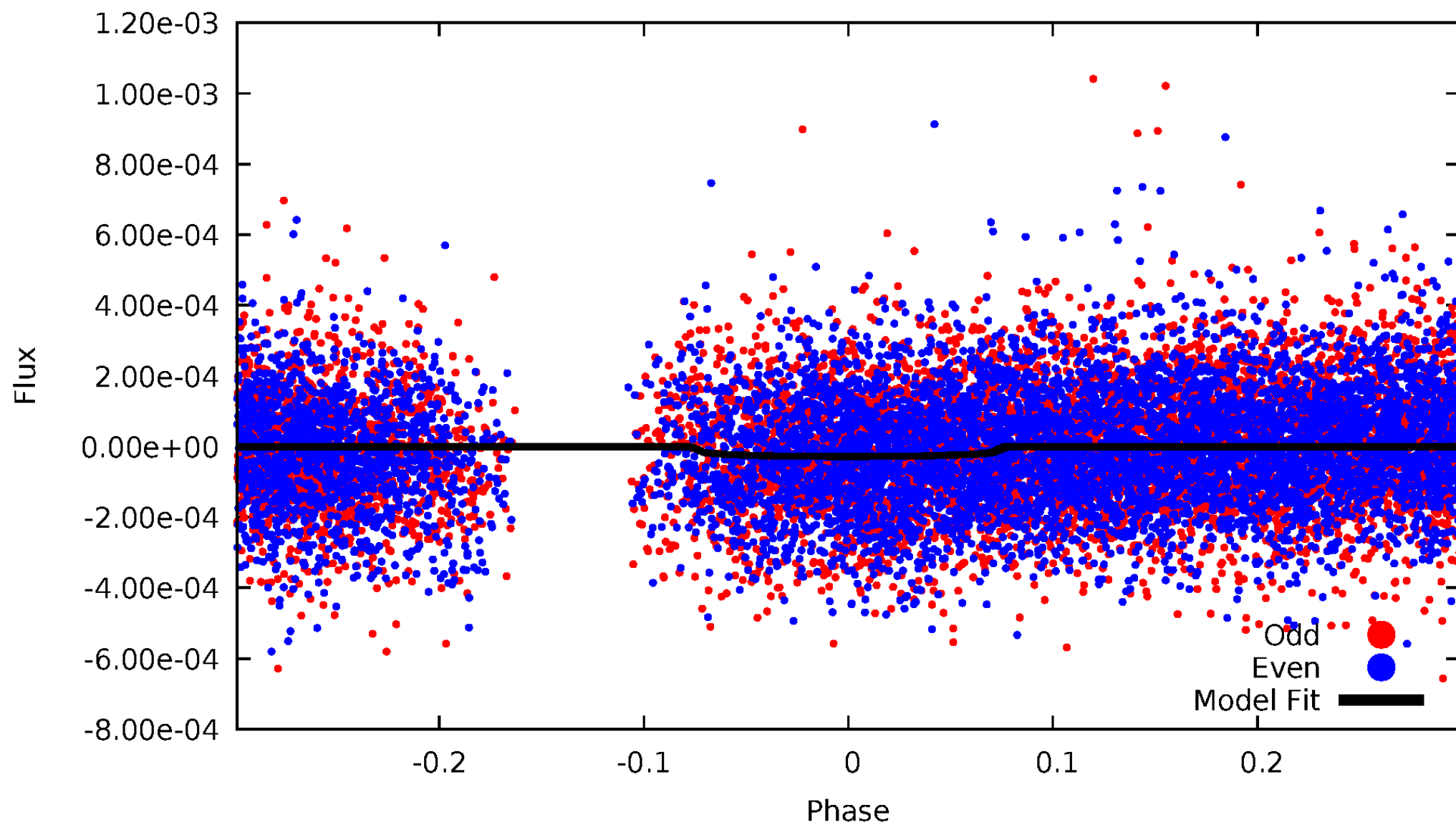


TCE 008878187-02



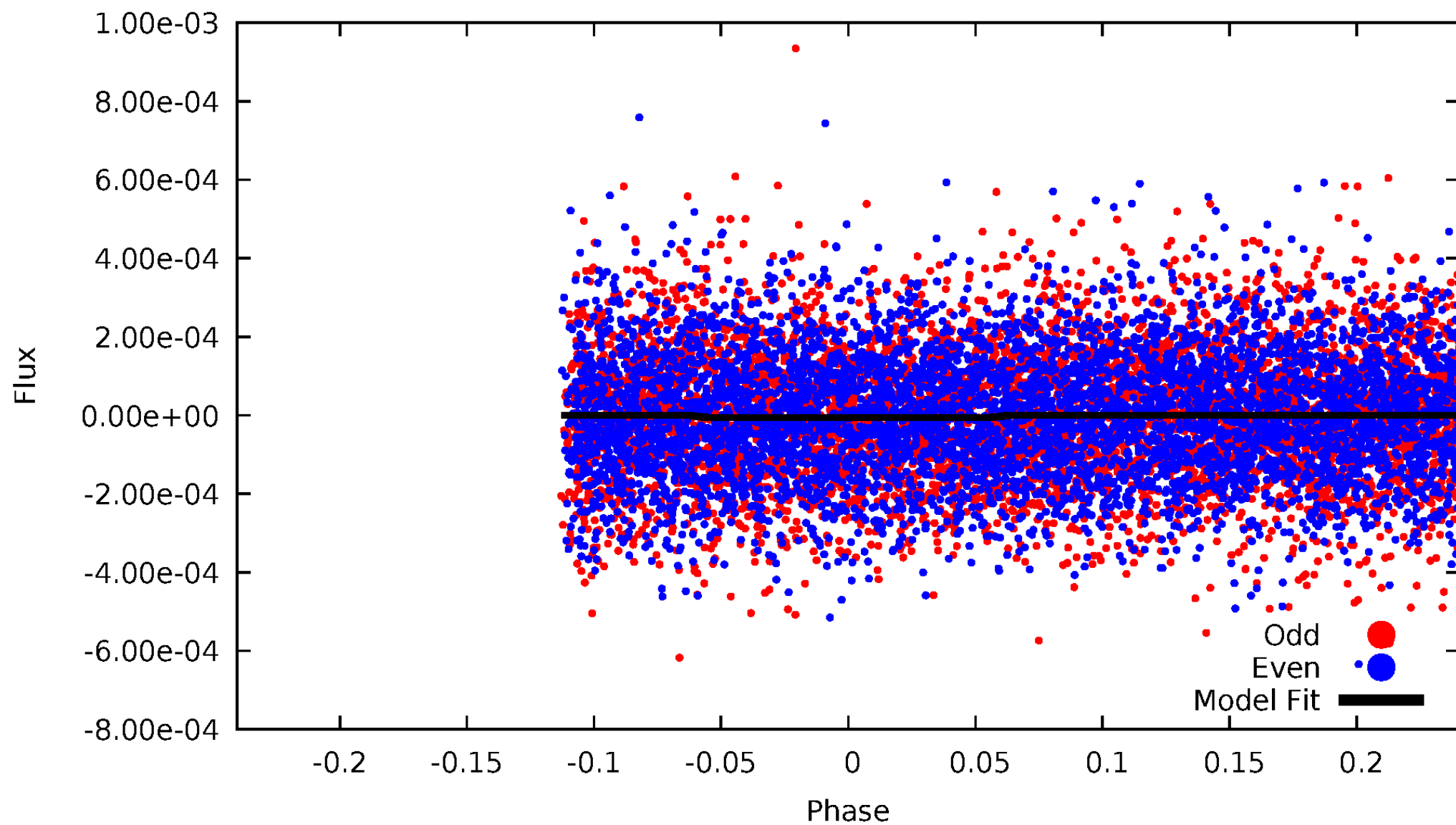
DV Odd/Even

TCE 008878187-02



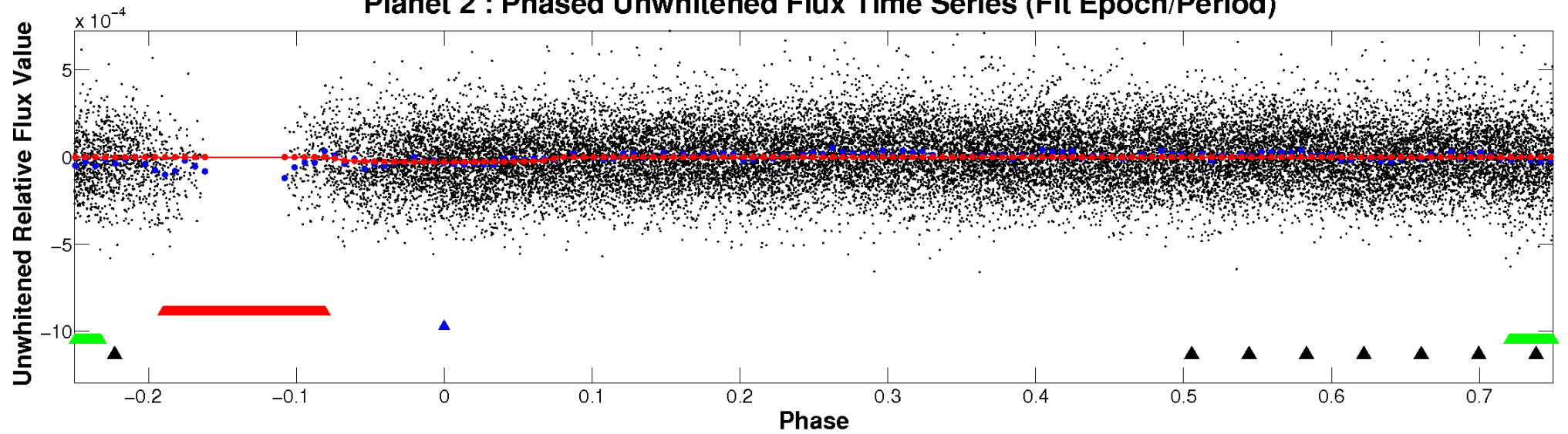
ALT Odd/Even

TCE 008878187-02

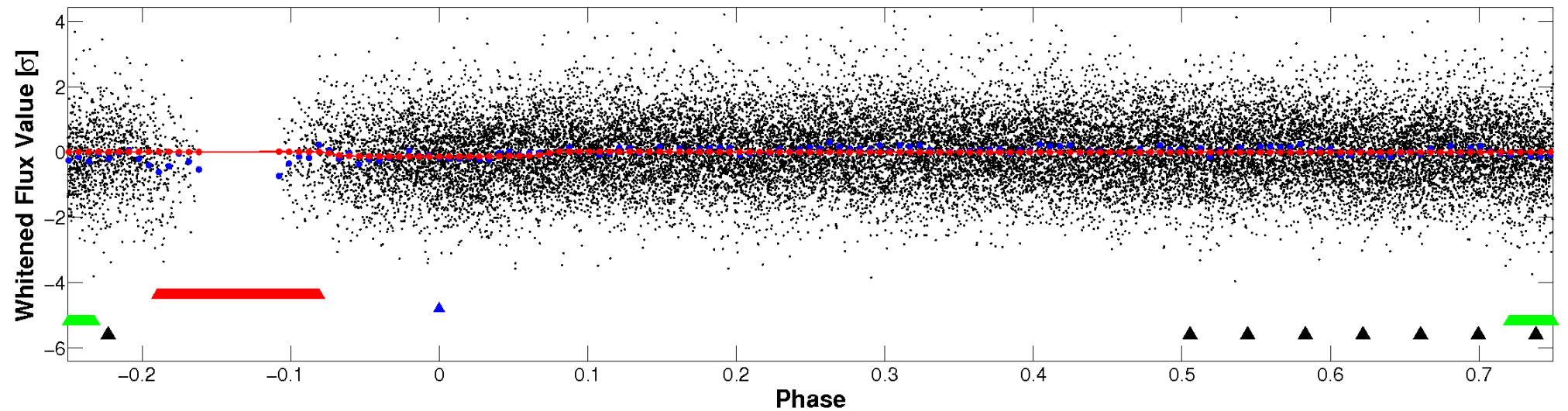


Non-Whitened Vs. Whitened Light Curve

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

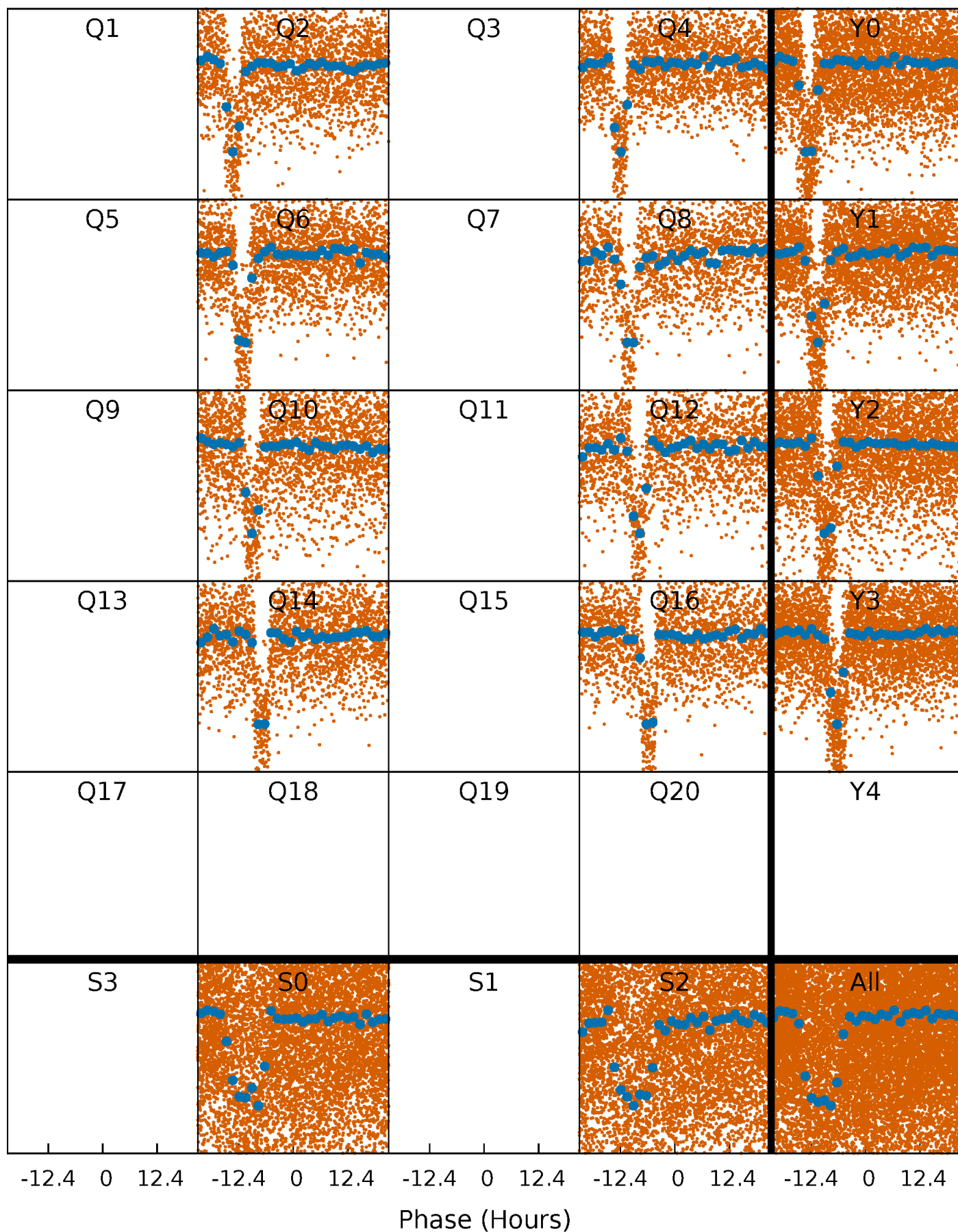


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



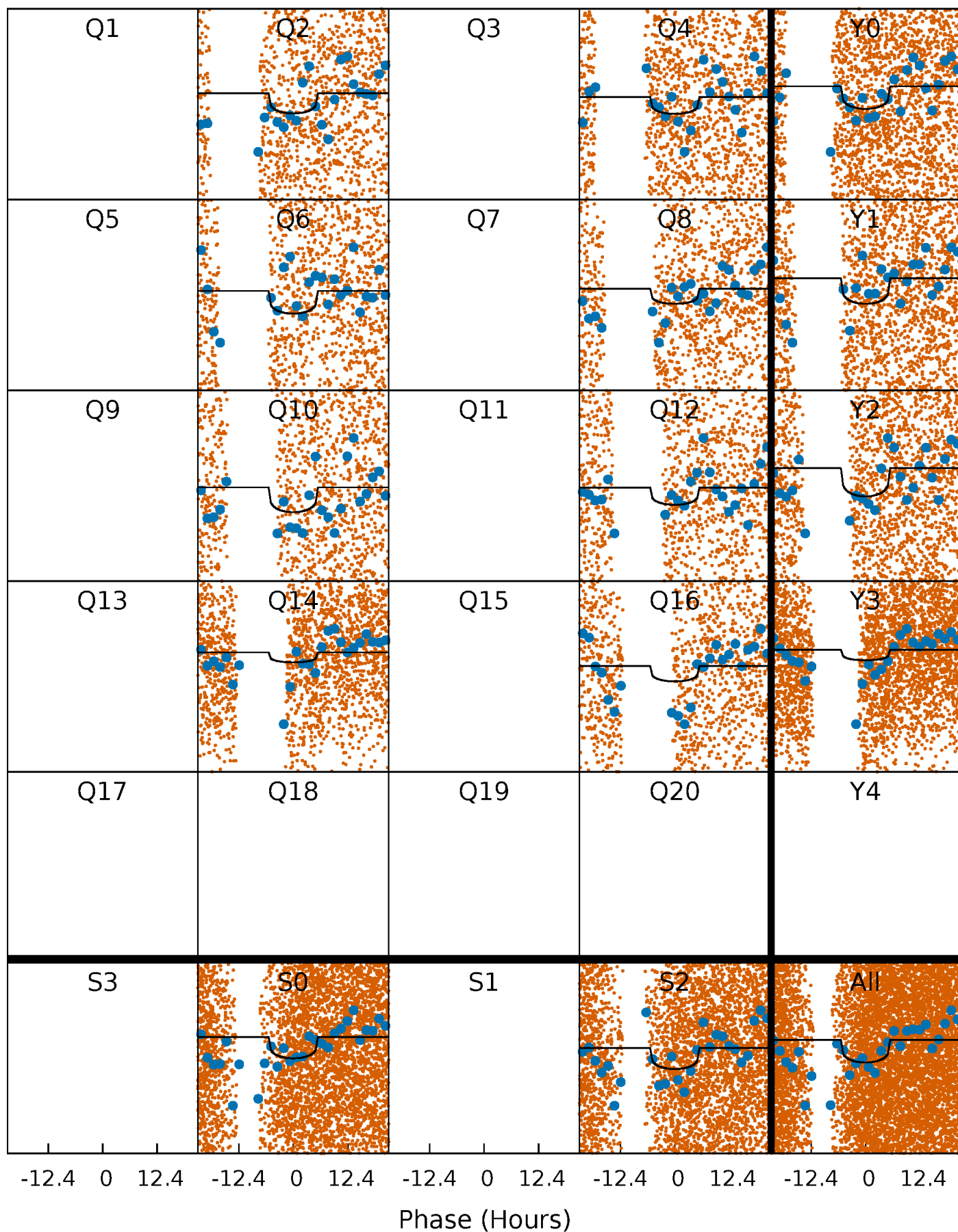
PDC Quarter-Phased Transit Curves

TCE 008878187-02 P= 3.031406 Days $T_0=132.903255$ (BKJD)



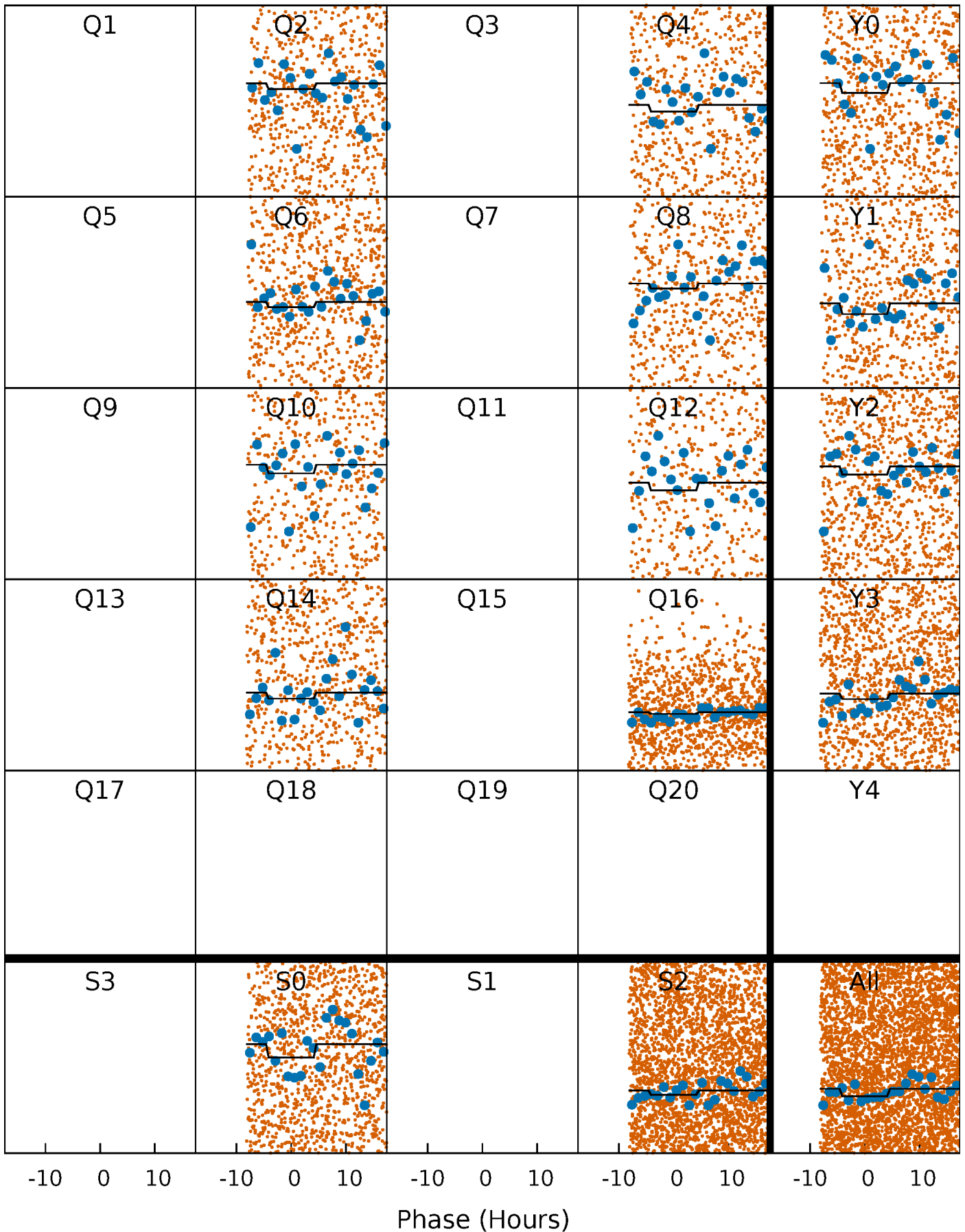
DV Quarter-Phased Transit Curves

TCE 008878187-02 P= 3.031406 Days $T_0=132.903255$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

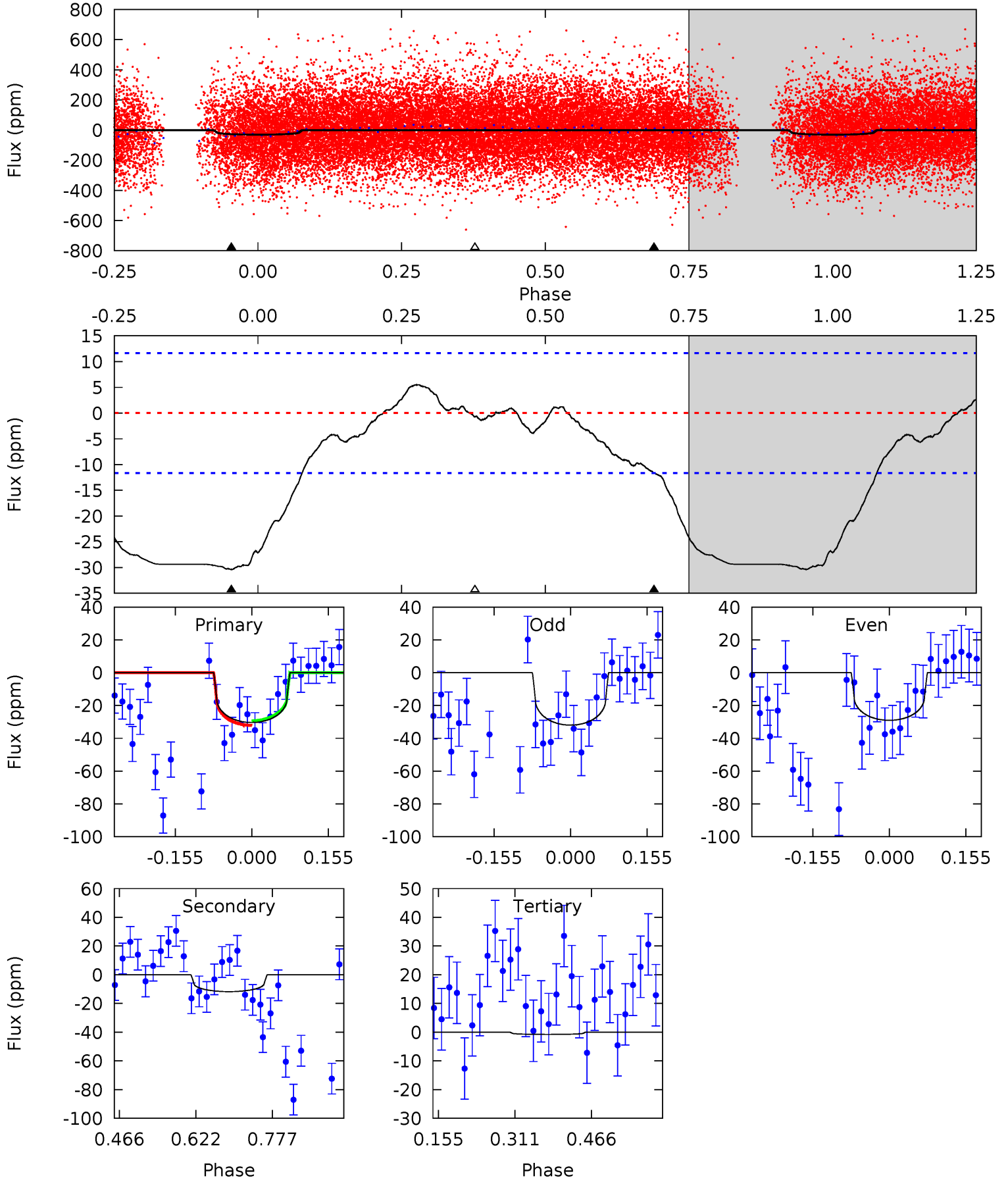
TCE 008878187-02 P= 3.032140 Days $T_0=132.887657$ (BKJD)



DV Model-Shift Uniqueness Test

008878187-02, P = 3.031406 Days, E = 132.903255 Days

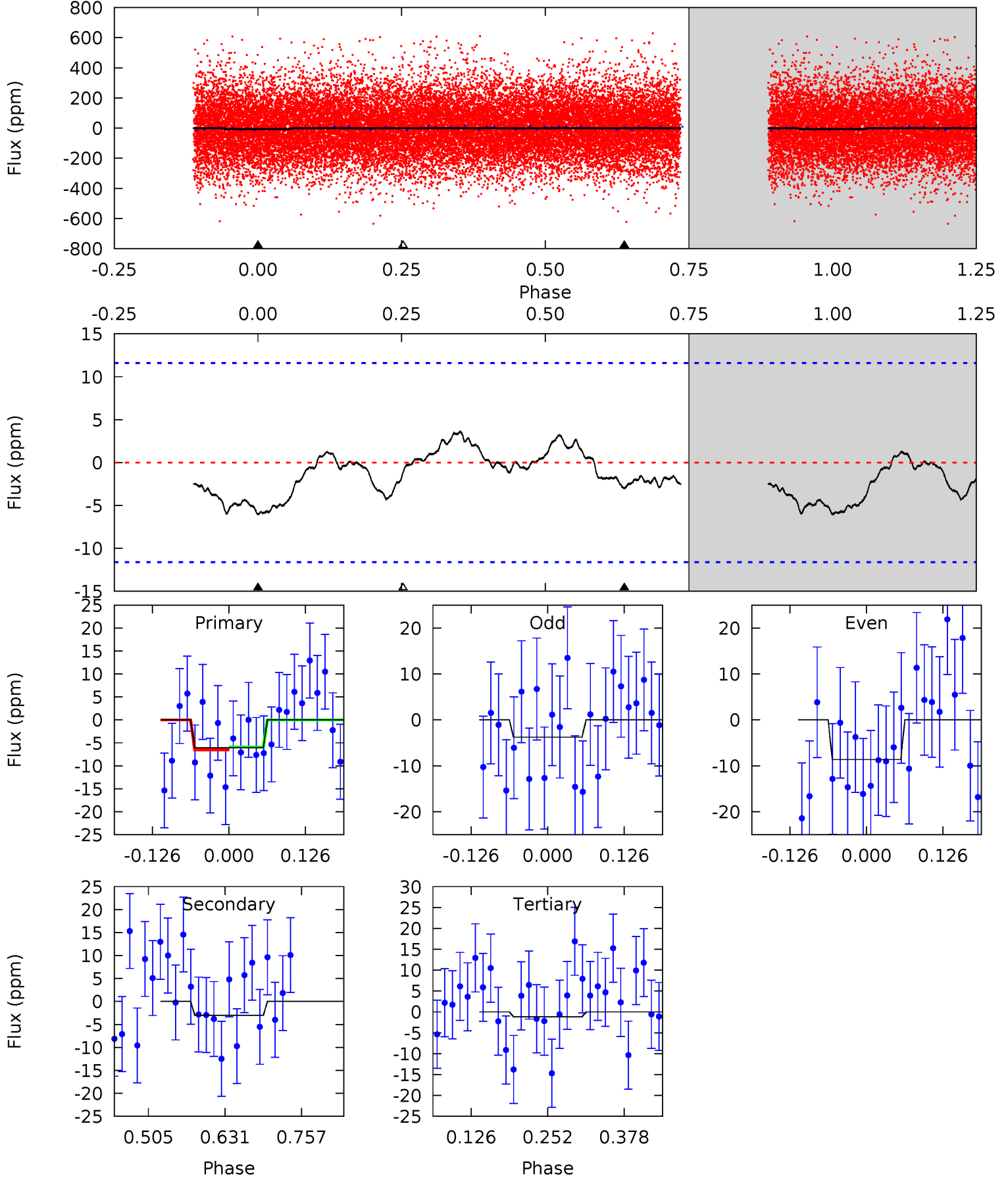
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.7	4.51	0.30	0	4.47	1.42	1.13	11.4	11.7	4.21	4.51	0.56	1.15	0.15	0.53



Alt Model-Shift Uniqueness Test

008878187-02, P = 3.032140 Days, E = 132.887657 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.35	1.17	0.45	0	4.52	1.53	0.68	1.90	2.35	0.73	1.17	0.95	1.27	0.37	0.12



Stellar Parameters For KIC 008878187

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5827^{+104}_{-115}	$4.151^{+0.168}_{-0.098}$	$0.160^{+0.150}_{-0.150}$	$1.447^{+0.232}_{-0.309}$	$1.081^{+0.115}_{-0.084}$	$0.502^{+0.427}_{-0.170}$
	+2%/-2%	+4%/-2%	+94%/-94%	+16%/-21%	+11%/-8%	+85%/-34%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 008878187-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-12 ± 3	$0.82^{+0.53}_{-0.44}$	2093^{+96}_{-116}	4702^{+2080}_{-815}	17^{+58}_{-11}
Alt.	-3 ± 3	$0.53^{+0.45}_{-0.34}$	2099^{+97}_{-127}	4252^{+2698}_{-1329}	$9.086^{+67.301}_{-8.014}$

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 $A_{obs} \gg 1.0$

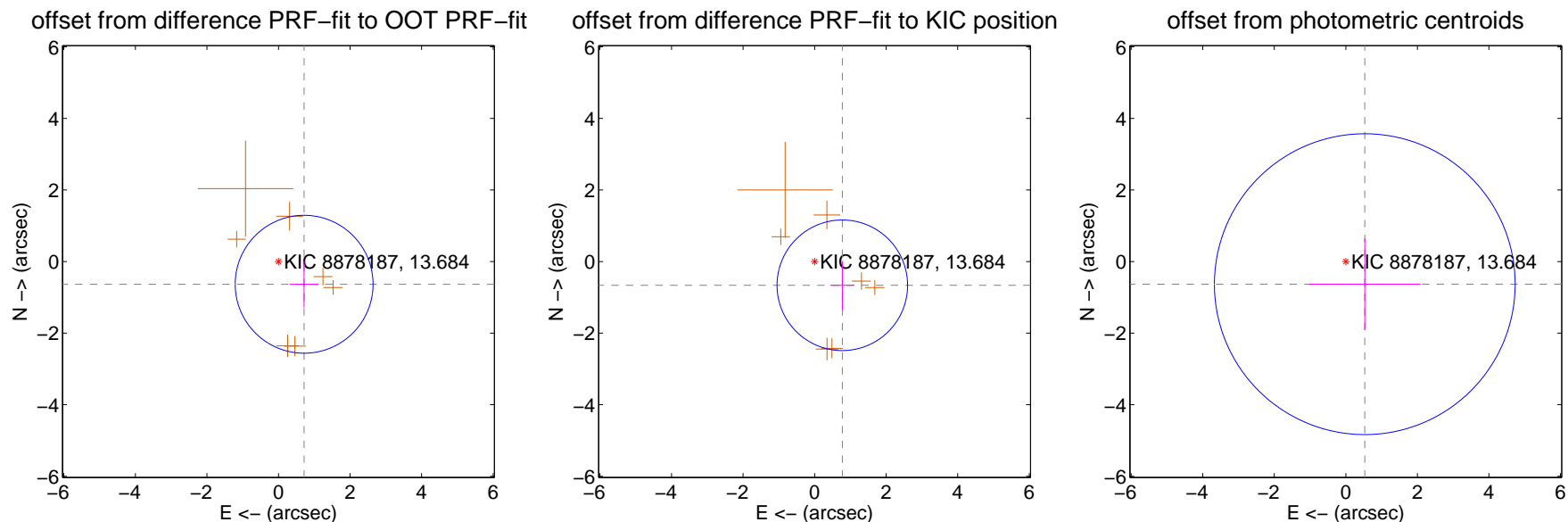
DV Centroid Data

Supplemental centroid analysis for 008878187-02. Kepler magnitude: 13.68. Transit SNR 7.54

There are 0 quarters with good PRF difference image offsets

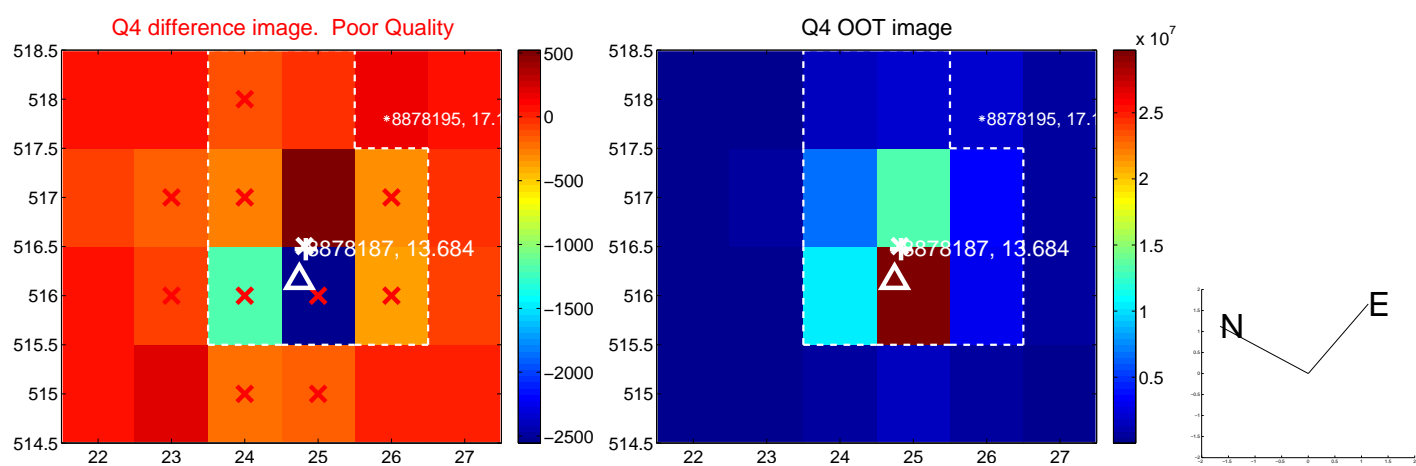
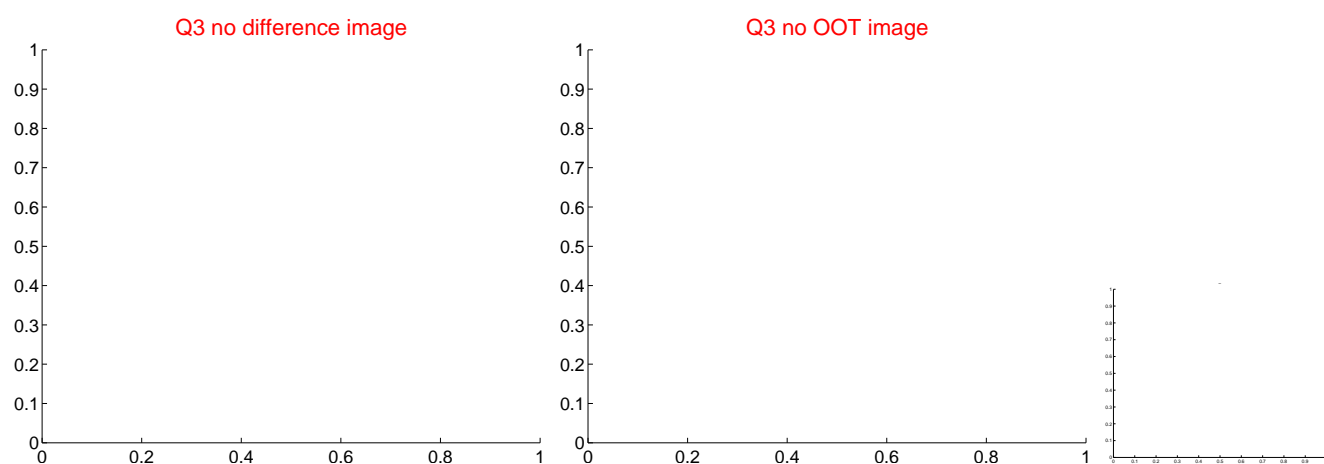
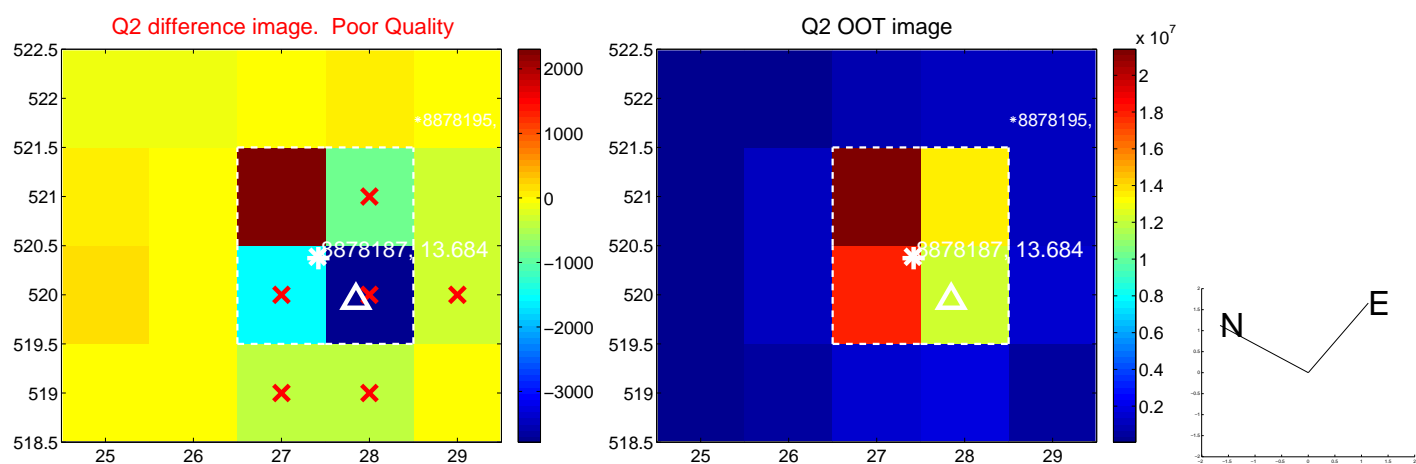
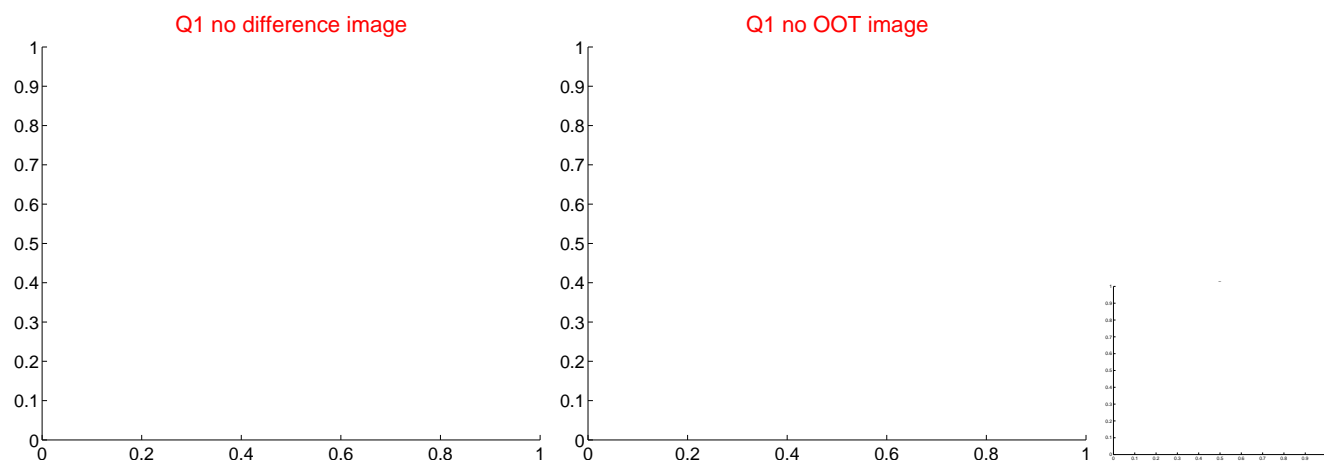
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.957 ± 0.642	1.49	-0.716 ± 0.406	-0.635 ± 0.651
PRF-fit source offset from KIC position	1.020 ± 0.608	1.68	-0.774 ± 0.341	-0.663 ± 0.680
photometric centroid source offset	0.83 ± 1.40	0.59	-0.53 ± 1.56	-0.63 ± 1.28

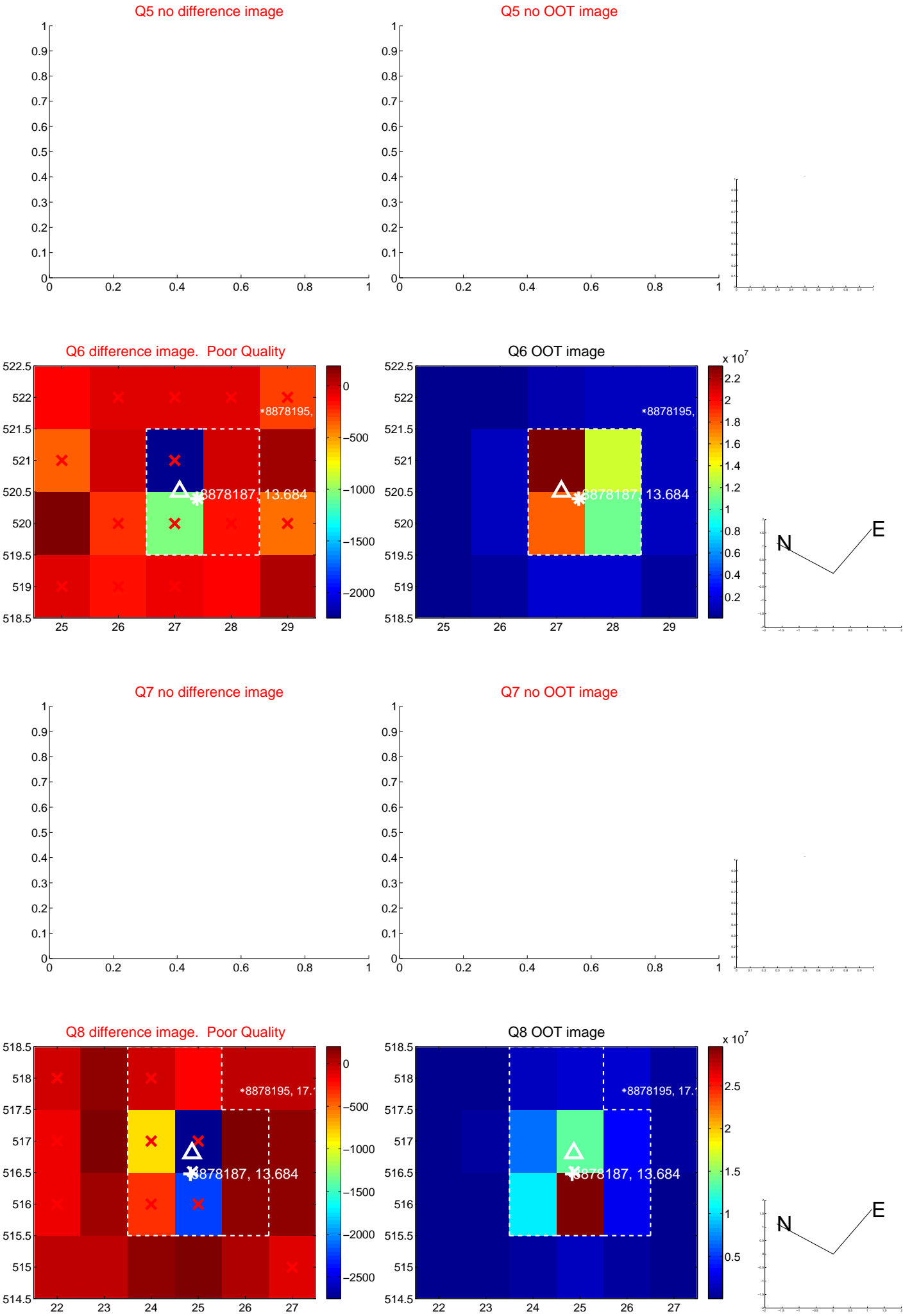


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

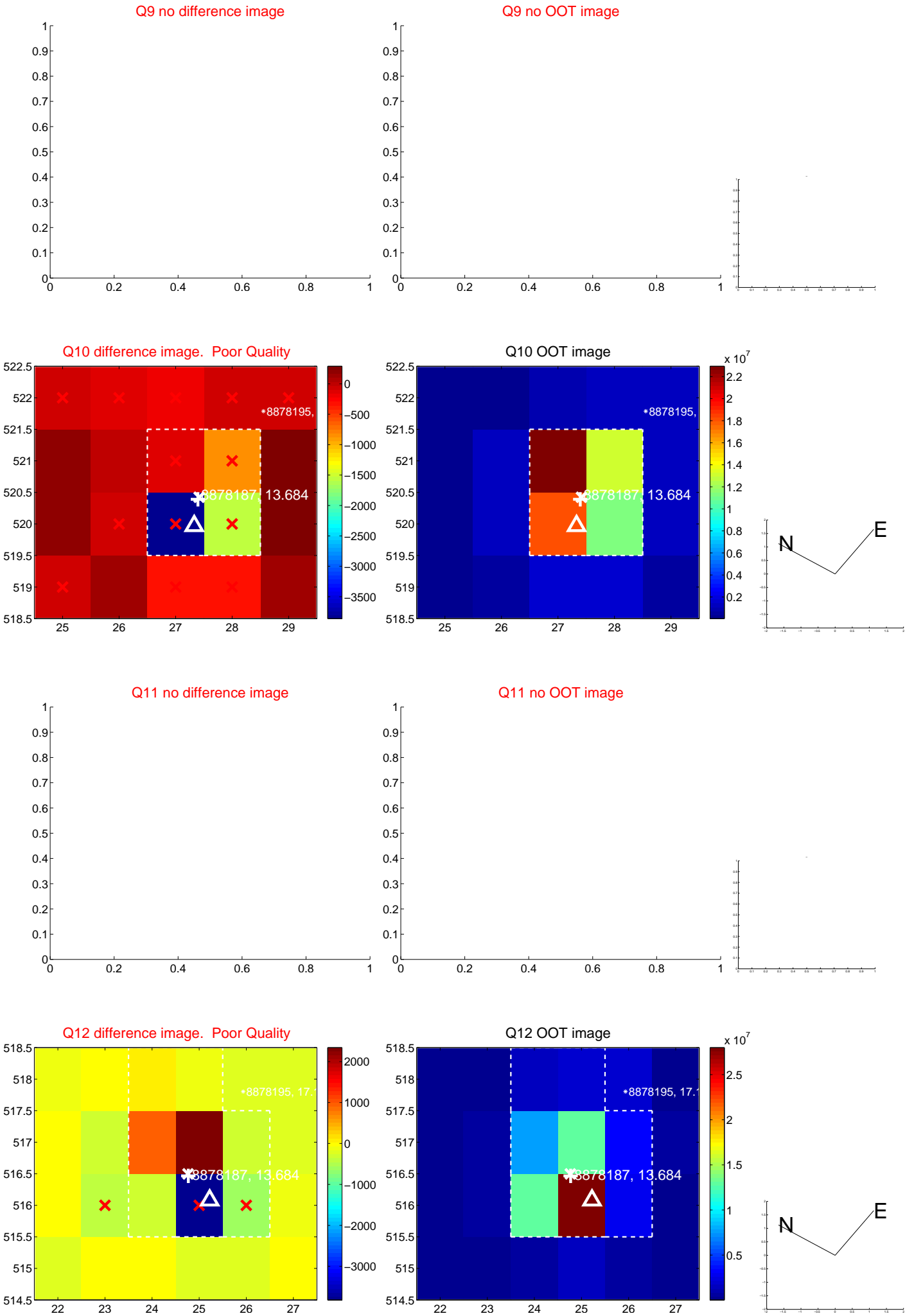
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



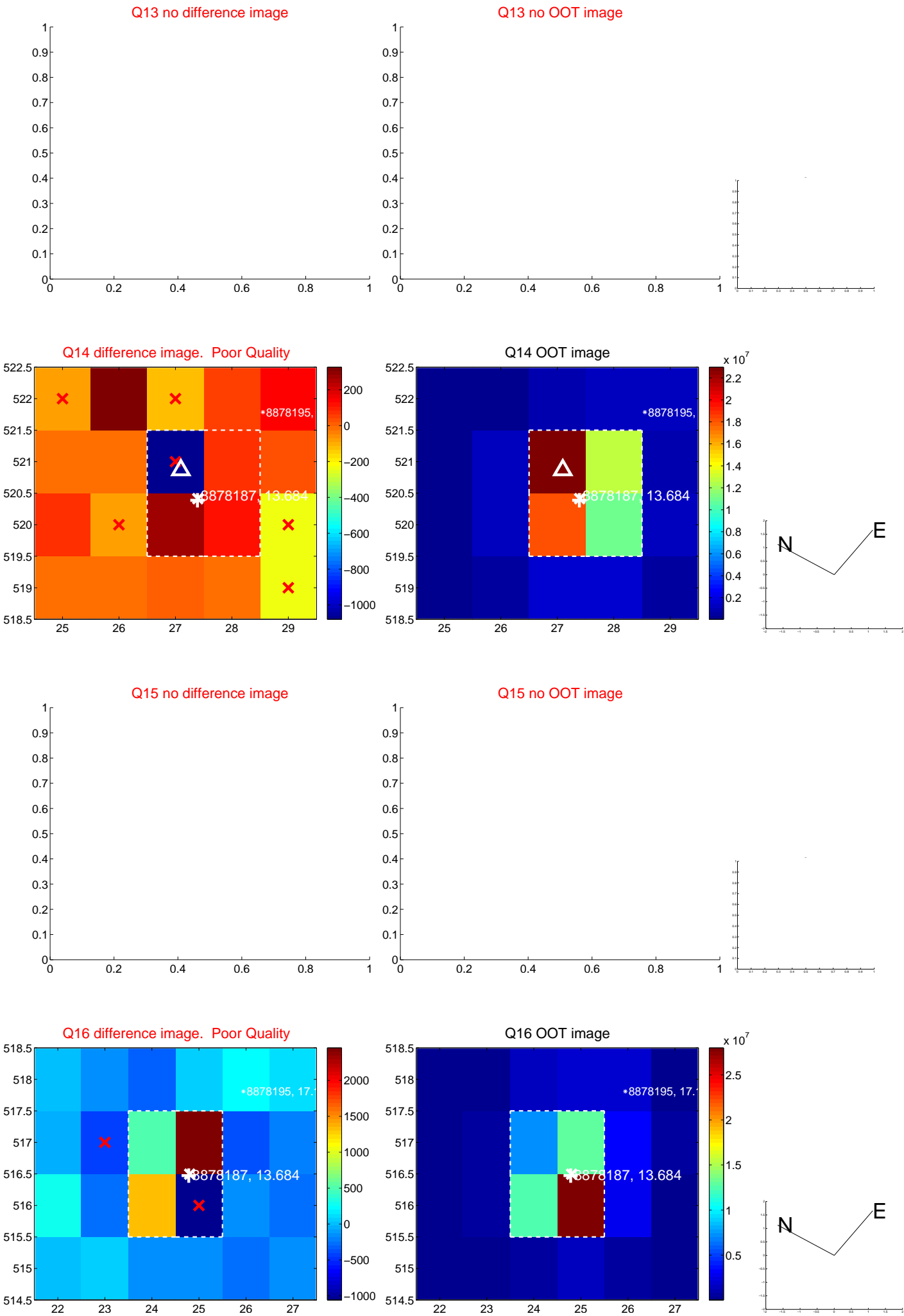
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



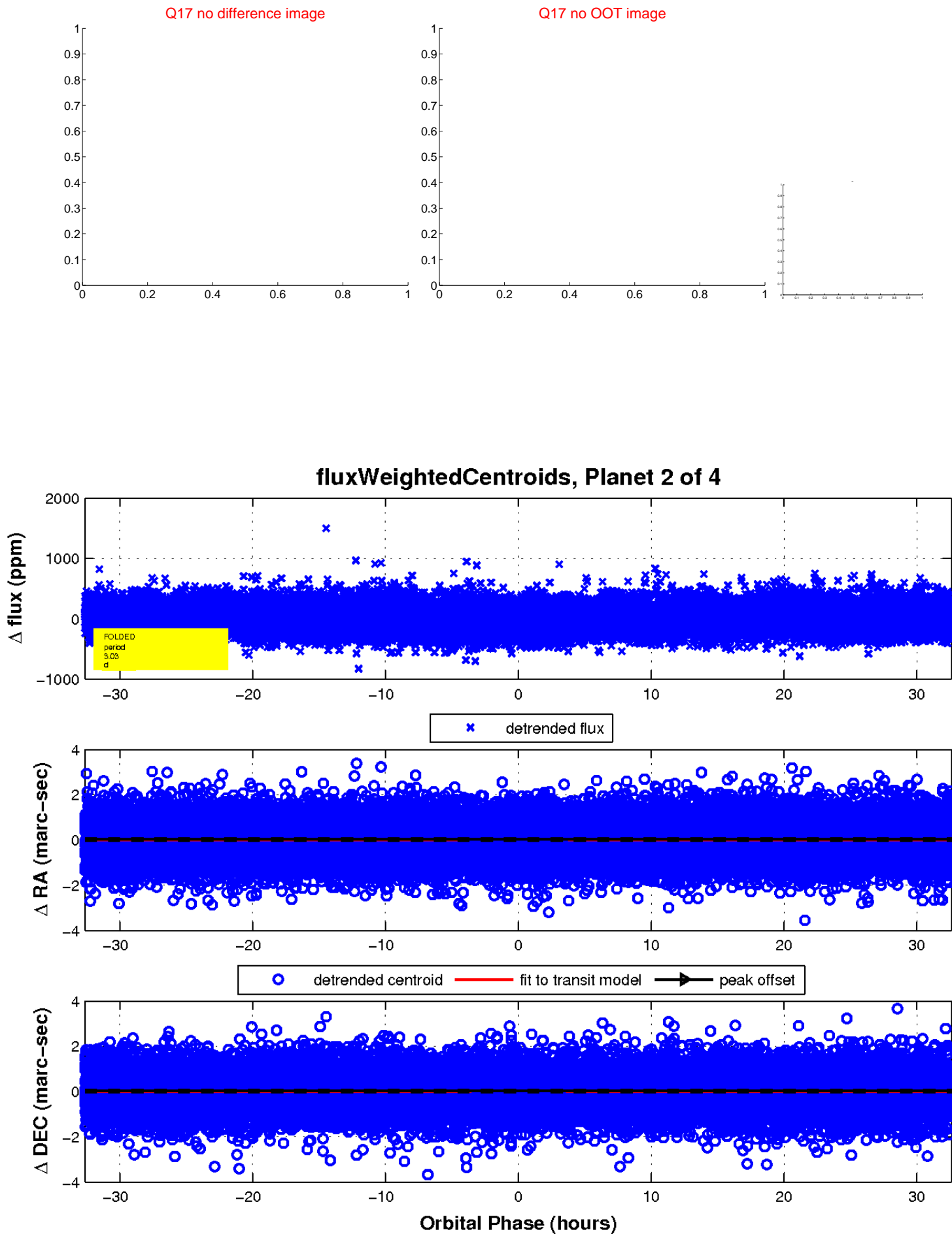
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



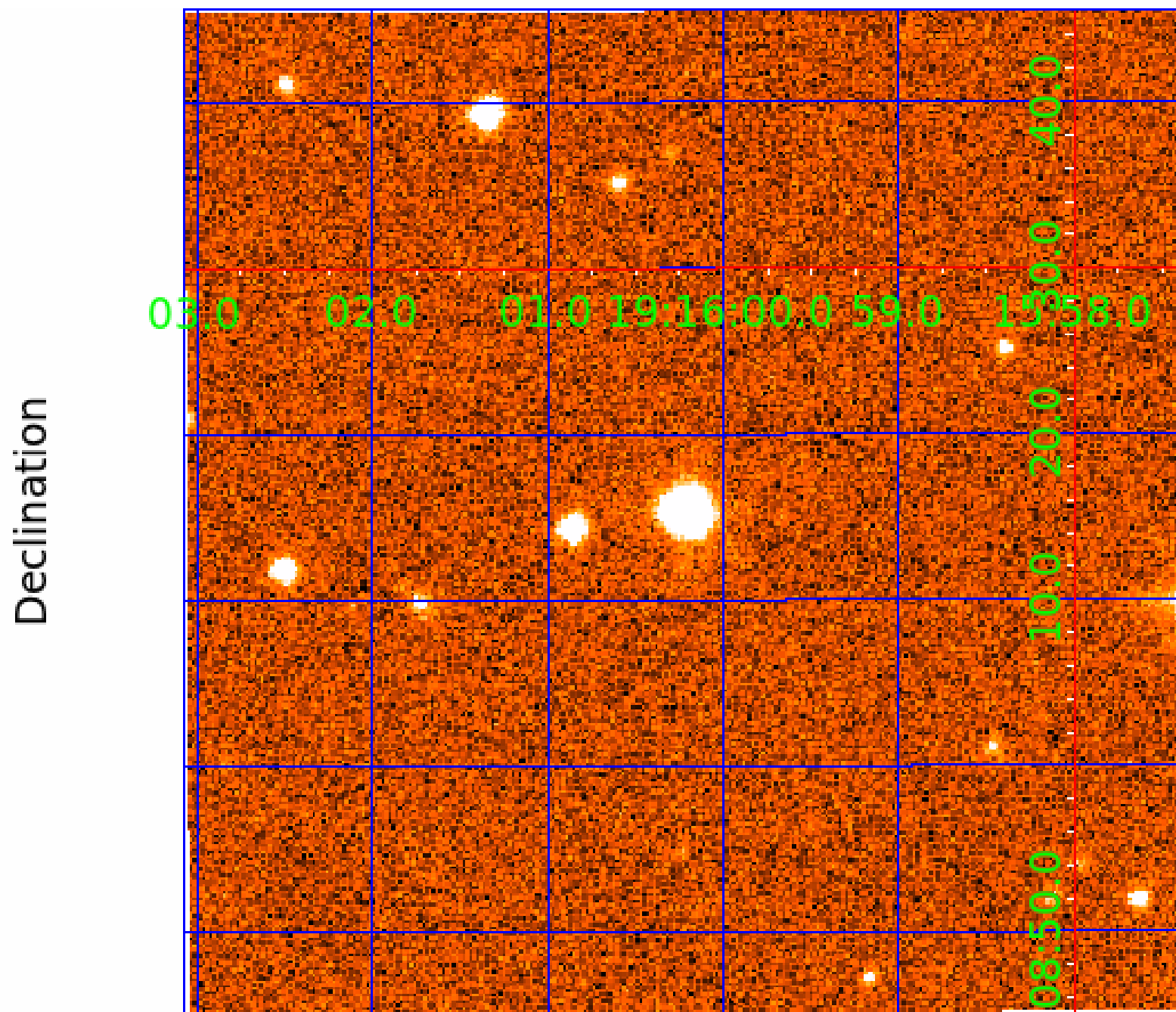
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 008878187

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})
008878187-01	OBS	0697.01	3.032095	132.327307	255.0	3.661	37.6	44.1	1.45	5827	2.75	1220.85
008878187-02	OBS	No	3.031406	132.903255	27.9	10.871	7.7	7.5	1.45	5827	0.79	1221.22
008878187-03	OBS	No	3.031705	132.055414	42.6	4.962	7.6	9.0	1.45	5827	1.05	1221.06
008878187-04	OBS	No	187.829507	204.981542	136.3	23.445	10.9	7.2	1.45	5827	1.81	4.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008878187-01	OBS	PC	0.95	0	0	0	0	NO_COMMENT
008878187-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—RESIDUAL_TCE—CENT_FEW_DIFFS
008878187-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—RESIDUAL_TCE—CENT_FEW_DIFFS
008878187-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—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.

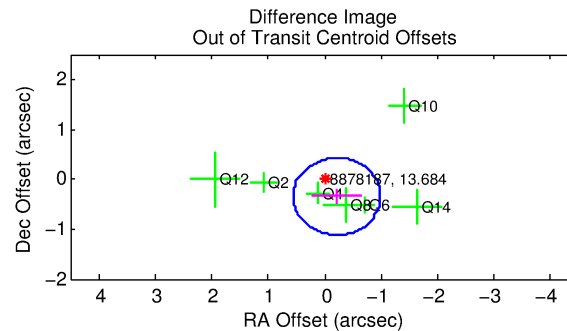
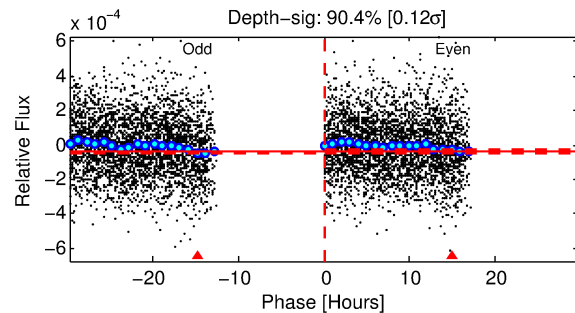
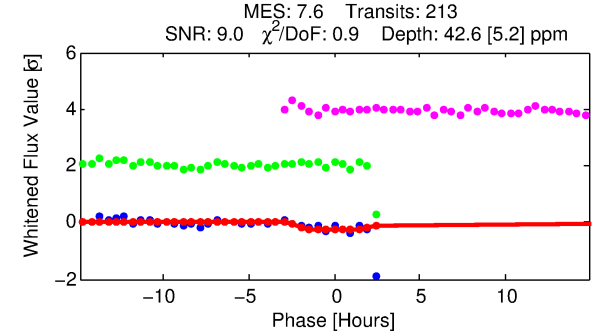
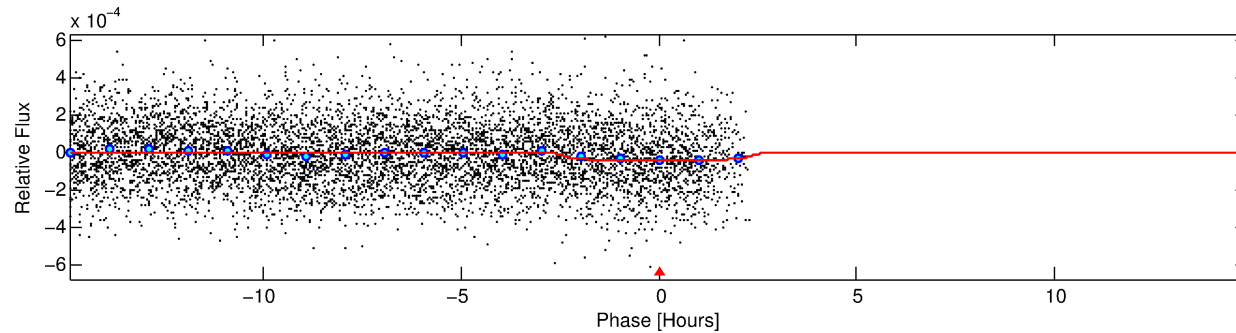
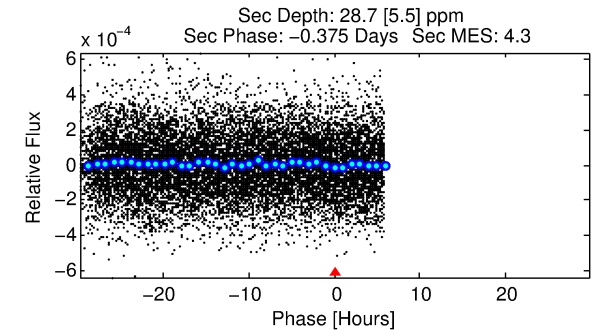
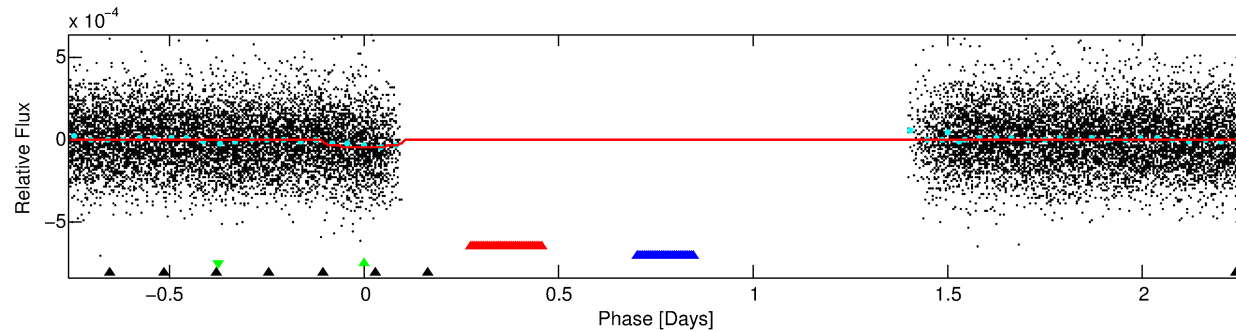
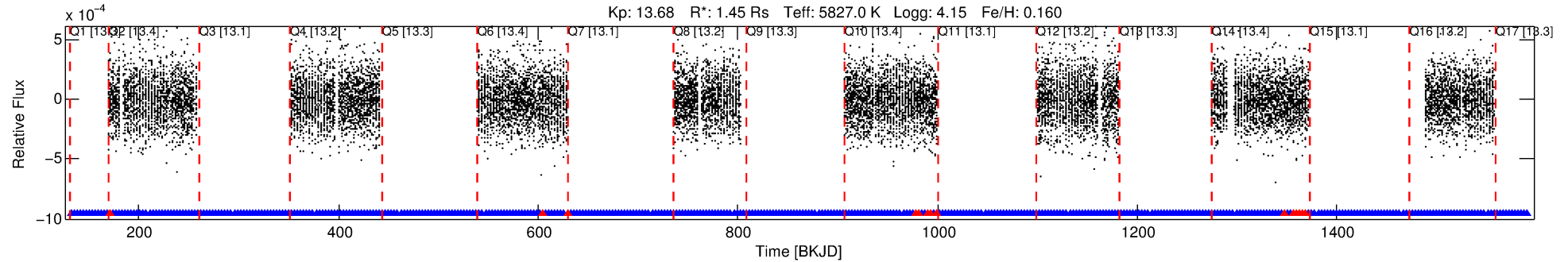
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008878187-03

No Significant Match Found

DV One-Page Summary

KIC: 8878187 Candidate: 3 of 4 Period: 3.032 d
KOI: K00697 Corr: No Ephemeris Match



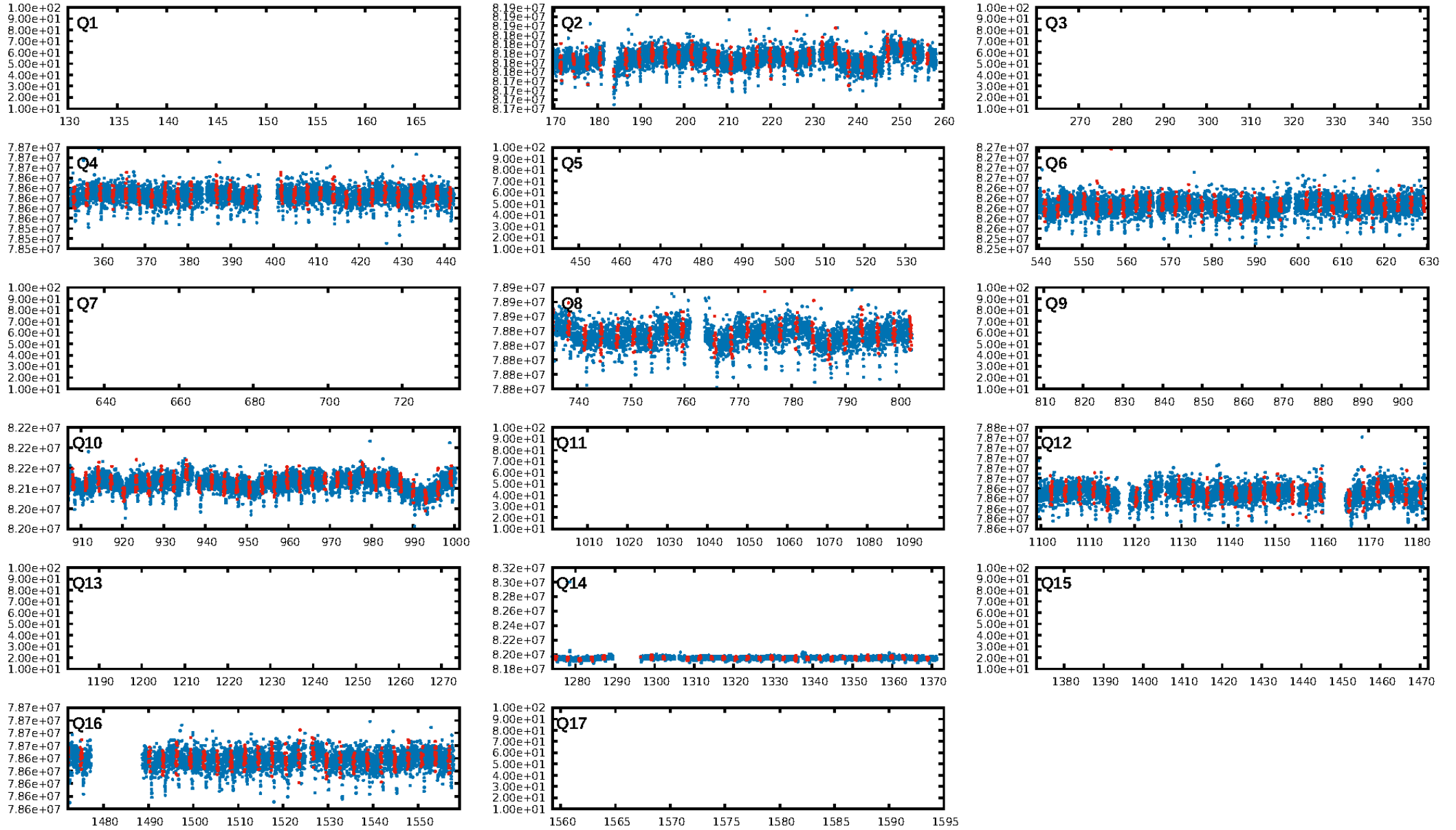
DV Fit Results:

Period = 3.03171 [0.00005] d
Epoch = 132.0554 [0.0181] BKJD
Rp/R* = 0.0066 [0.0050]
a/R* = 2.97 [8.86]
b = 0.80 [1.53]
Seff = 1221.06 [372.39]
Teff = 1507 [115] K
Rp = 1.05 [0.82] Re
a = 0.0421 [0.0081] AU
Ag = 25.41 [39.08] [0.62σ]
Teffp = 5232 [1978] K [1.88σ]

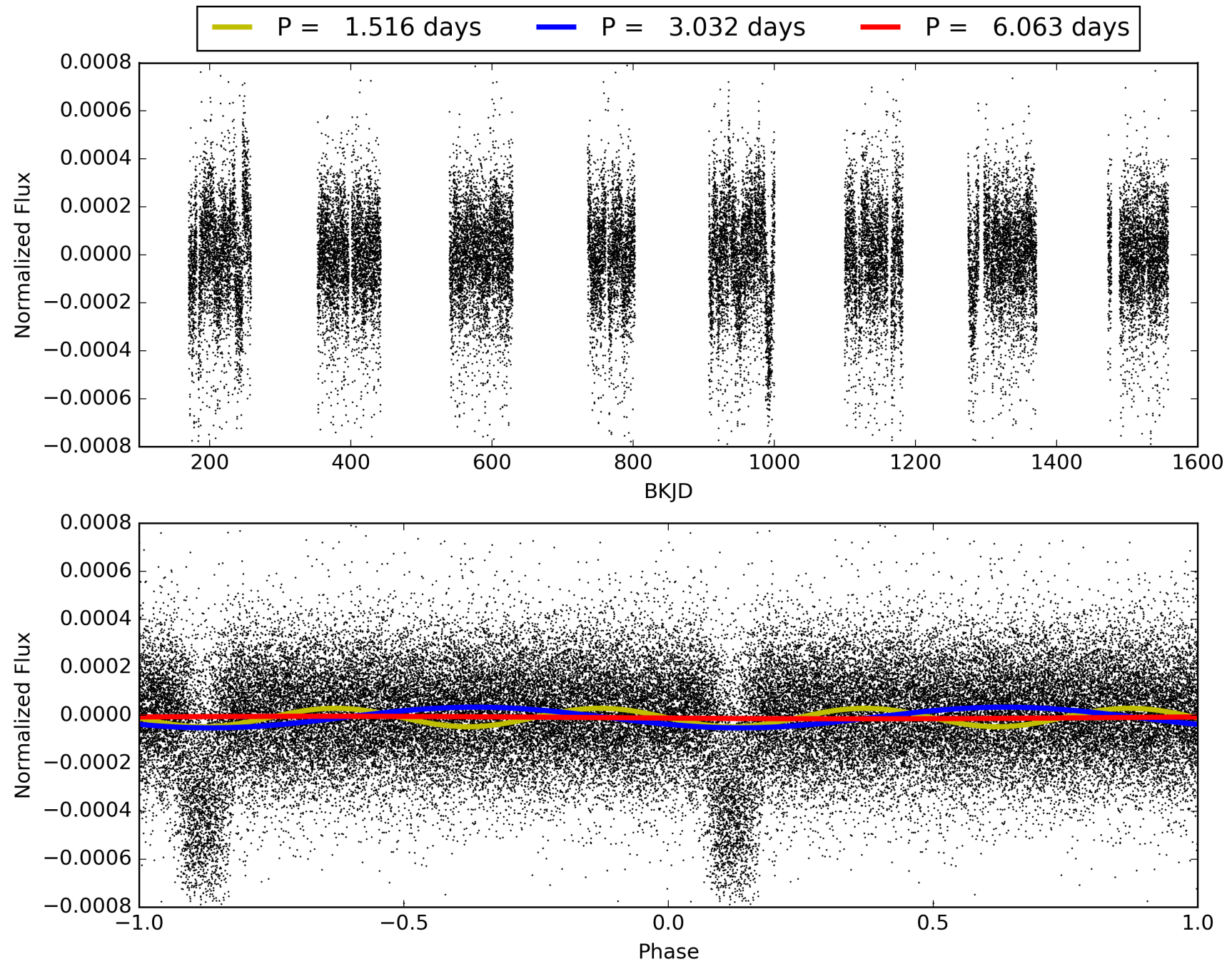
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 0.1% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.39e-16
RollingBand-fgt: 0.93 [199/213]
GhostDiagnostic-chr: -0.7755
Centroid-sig: 43.0%
Centroid-so: 1.088 arcsec [0.85σ]
OotOffset-rm: 0.409 arcsec [1.59σ]
OotOffset-st: 4/0/3/0 [7]
KicOffset-rm: 0.479 arcsec [1.54σ]
KicOffset-st: 4/0/3/0 [7]
DiffImageQuality-fgm: 0.00 [0/7]
DiffImageOverlap-fno: 0.00 [0/8]

TCE 008878187-03, PDC Light Curves

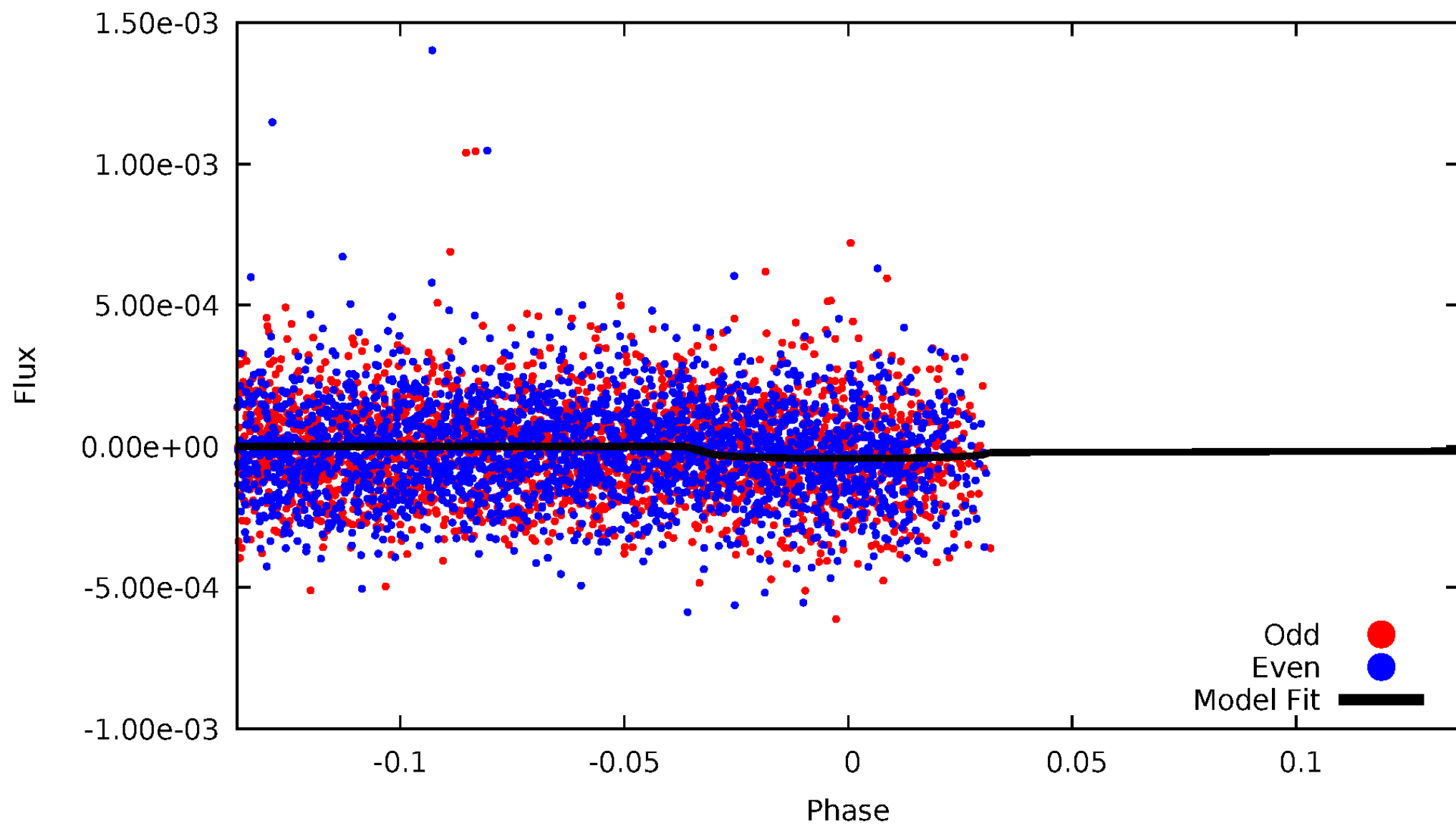


TCE 008878187-03



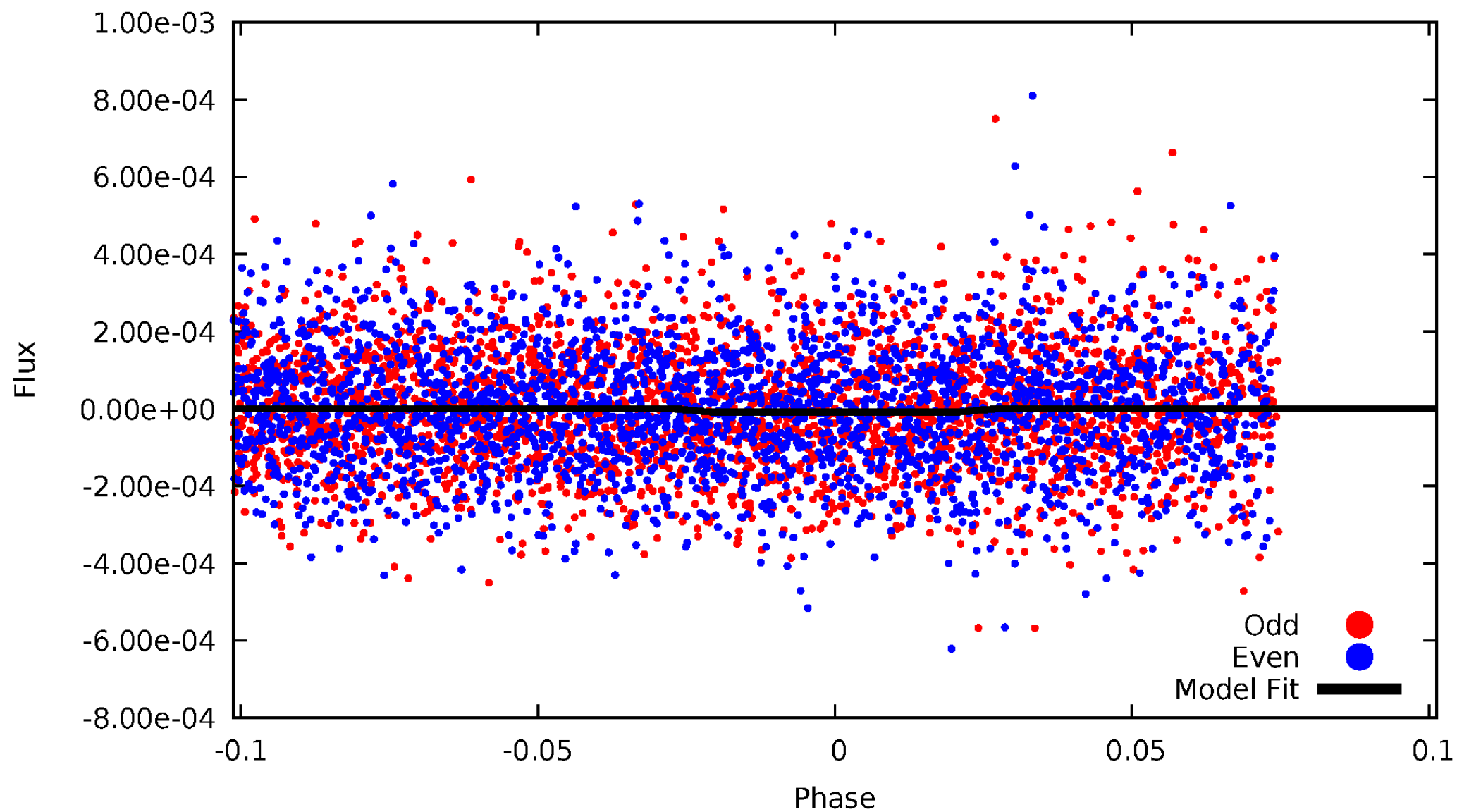
DV Odd/Even

TCE 008878187-03



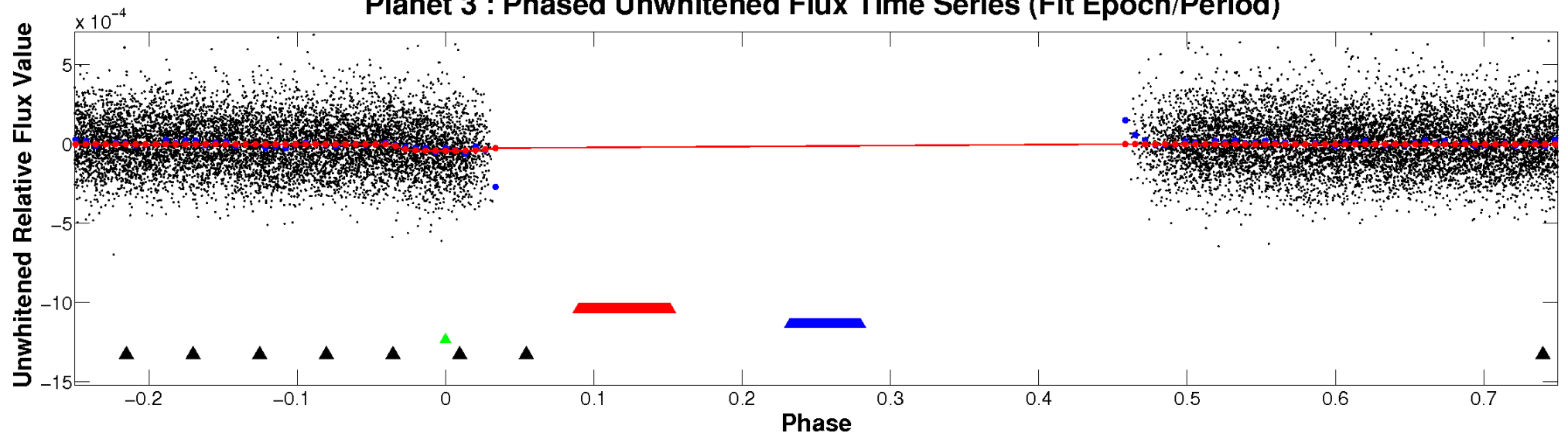
ALT Odd/Even

TCE 008878187-03

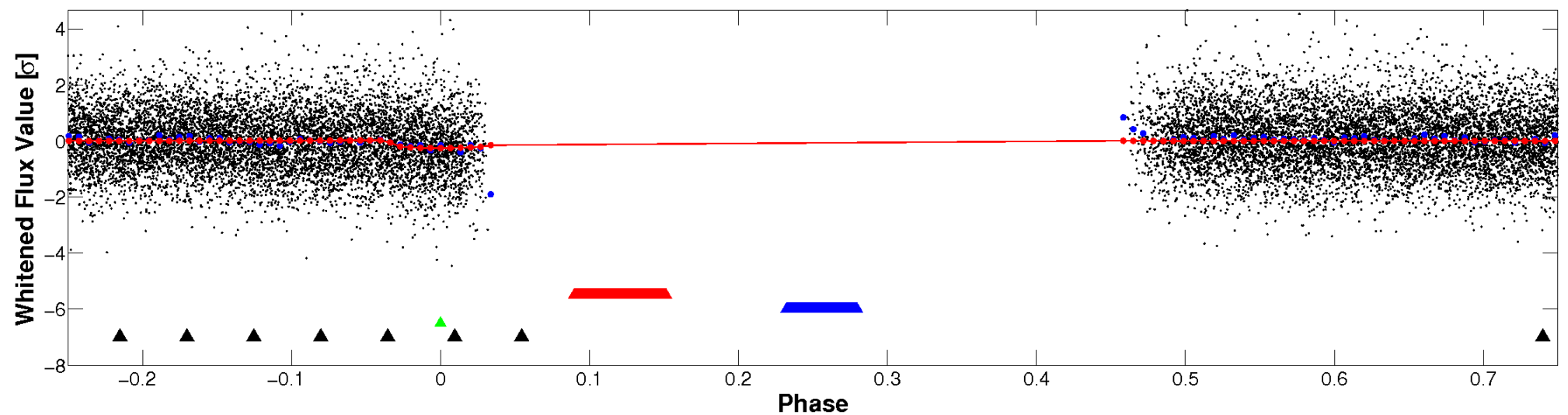


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

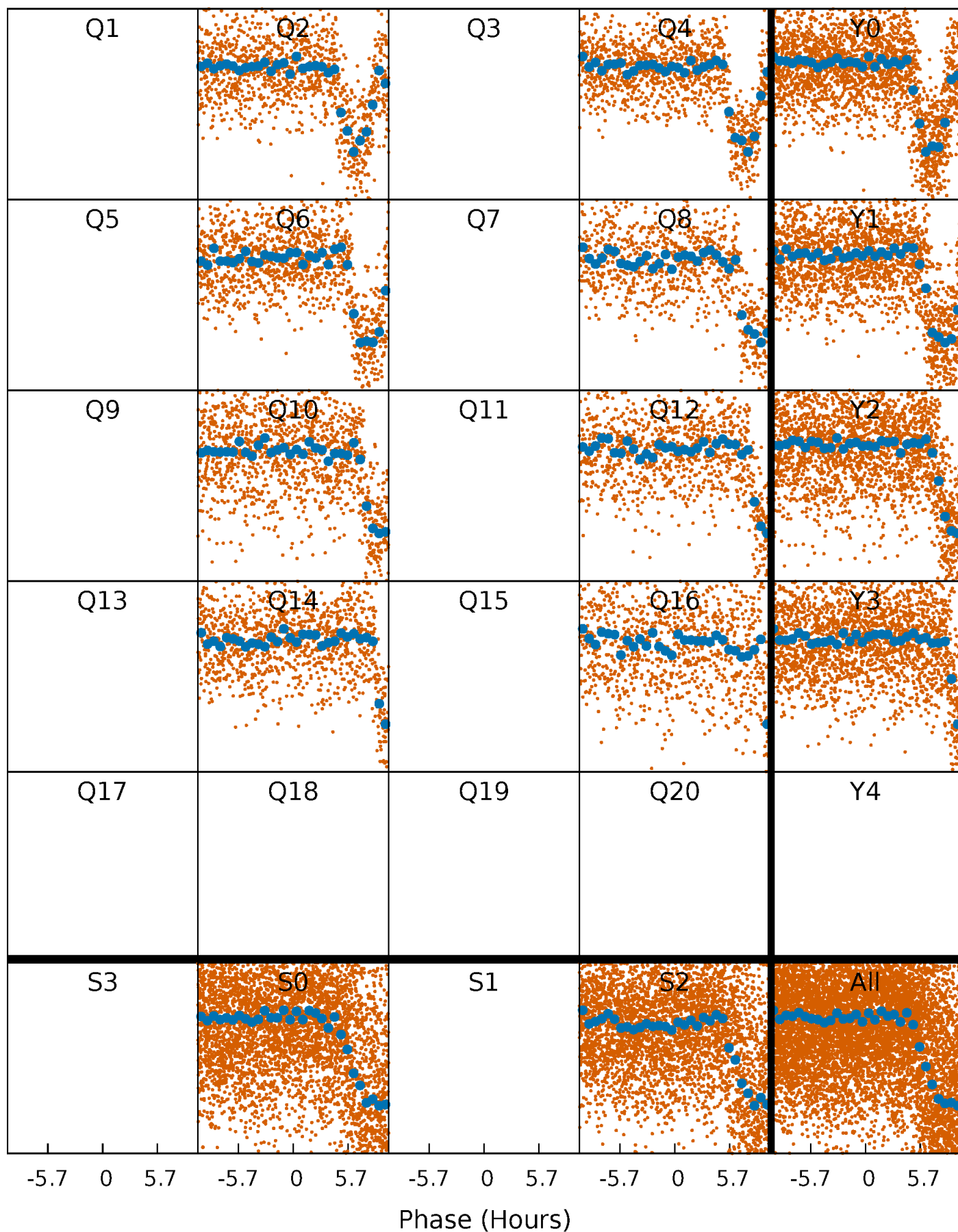


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



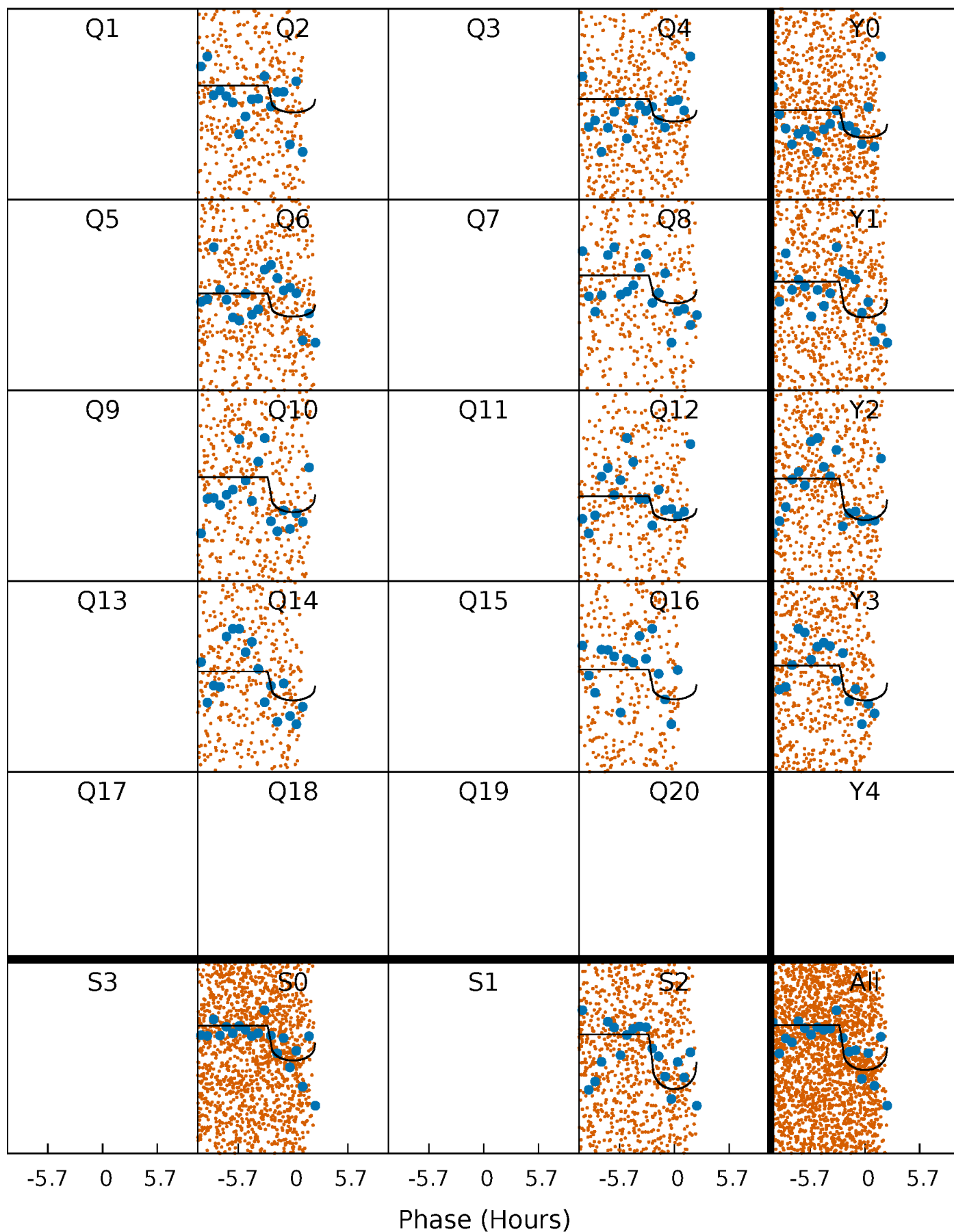
PDC Quarter-Phased Transit Curves

TCE 008878187-03 P= 3.031705 Days $T_0=132.055414$ (BKJD)



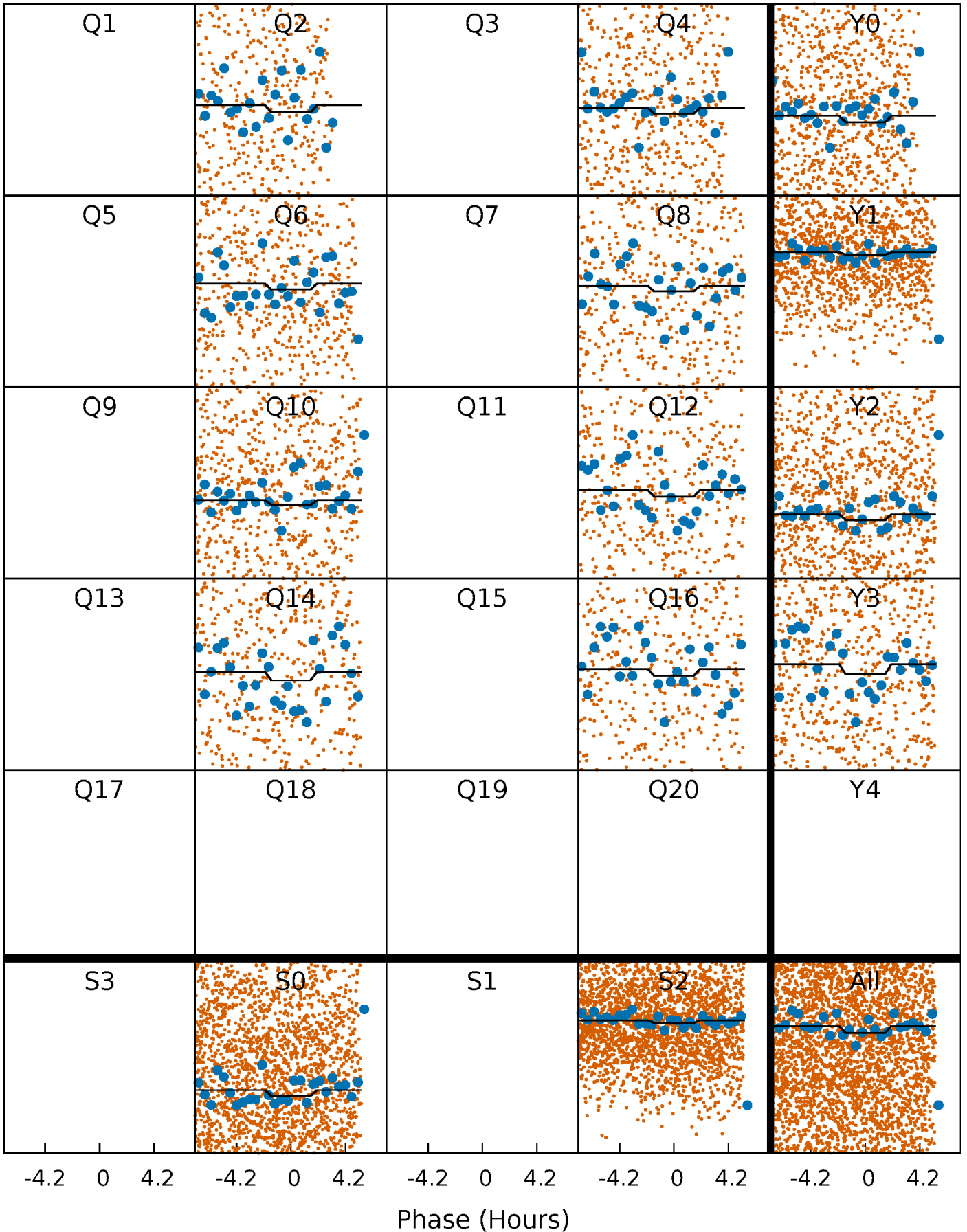
DV Quarter-Phased Transit Curves

TCE 008878187-03 P= 3.031705 Days $T_0=132.055414$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

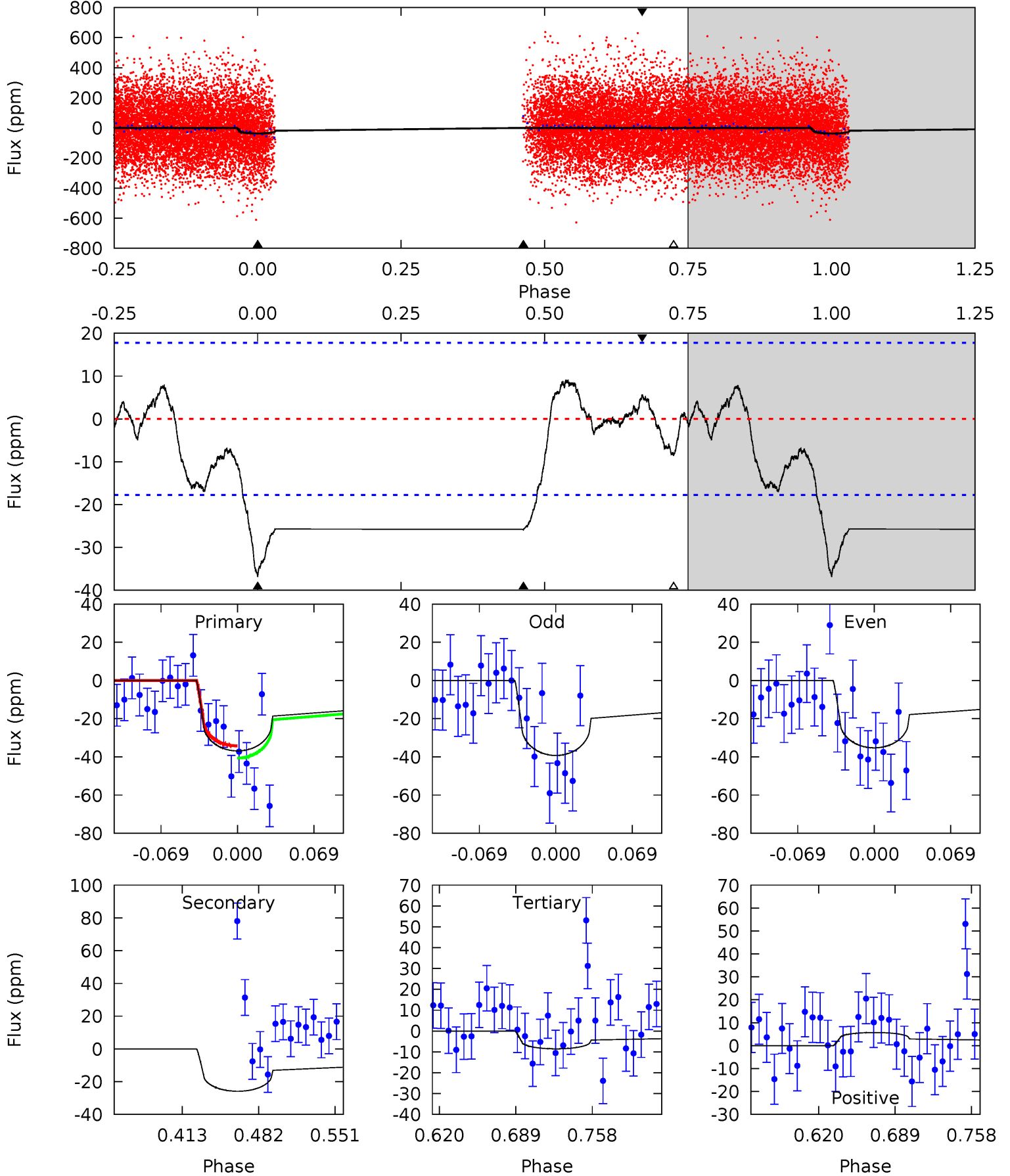
TCE 008878187-03 P= 3.031419 Days $T_0=131.983993$ (BKJD)



DV Model-Shift Uniqueness Test

008878187-03, P = 3.031705 Days, E = 132.055414 Days

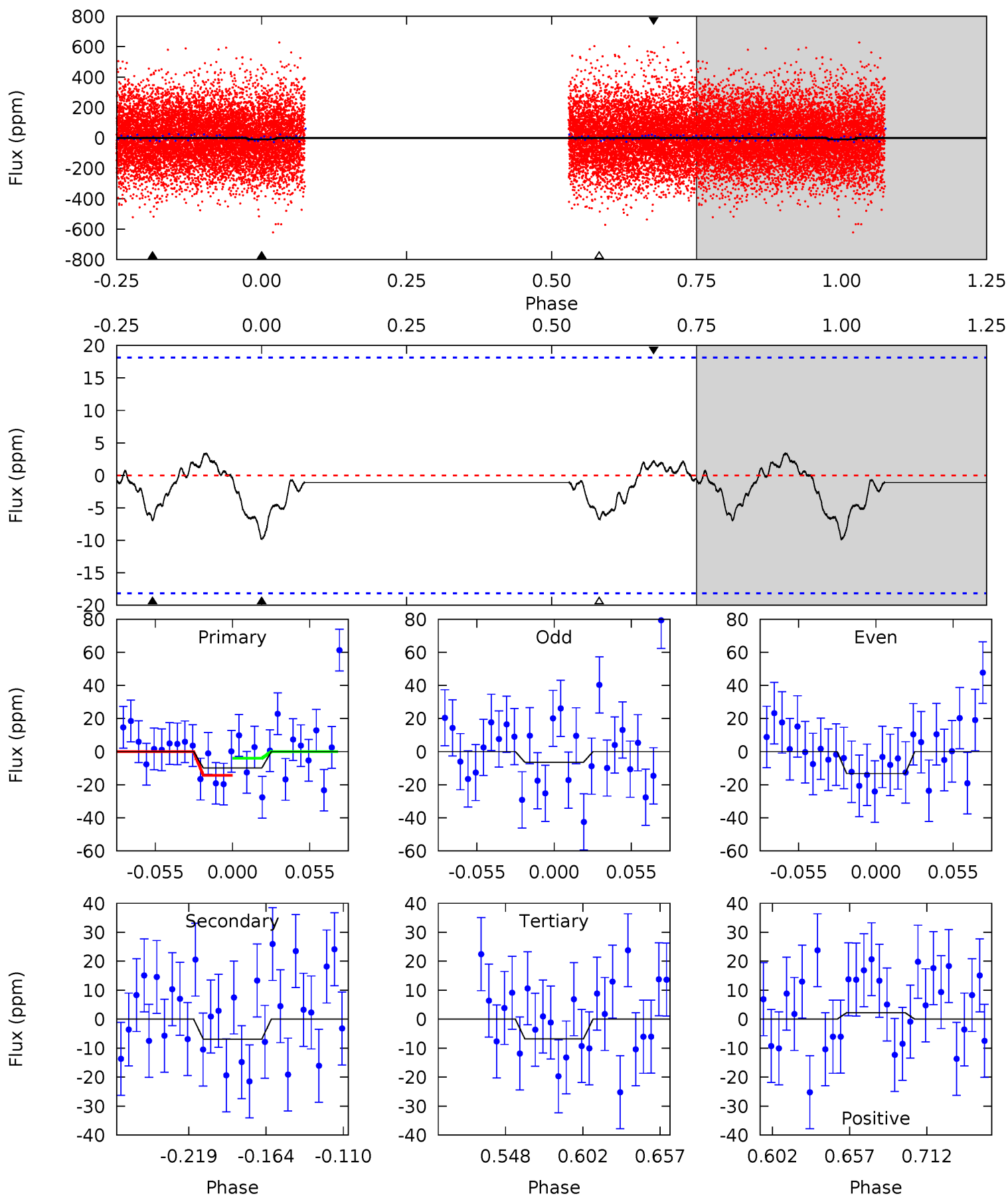
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.63	6.76	2.24	1.50	4.64	1.82	1.70	7.40	8.14	4.53	5.27	0.52	0.87	0.20	0.80



Alt Model-Shift Uniqueness Test

008878187-03, P = 3.031419 Days, E = 131.983993 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.54	1.78	1.75	0.57	4.69	1.92	0.68	0.79	1.97	0.03	1.21	0.89	0.99	0.26	1.30



Stellar Parameters For KIC 008878187

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5827^{+104}_{-115}	$4.151^{+0.168}_{-0.098}$	$0.160^{+0.150}_{-0.150}$	$1.447^{+0.232}_{-0.309}$	$1.081^{+0.115}_{-0.084}$	$0.502^{+0.427}_{-0.170}$
	+2%/-2%	+4%/-2%	+94%/-94%	+16%/-21%	+11%/-8%	+85%/-34%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 008878187-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-26 ± 4	$1.12^{+0.76}_{-0.61}$	2099^{+95}_{-126}	4964^{+2418}_{-909}	21^{+75}_{-14}
Alt.	-7 ± 4	$0.71^{+0.65}_{-0.46}$	2097^{+92}_{-118}	4446^{+3100}_{-1027}	12^{+94}_{-10}

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 $A_{obs} \gg 1.0$

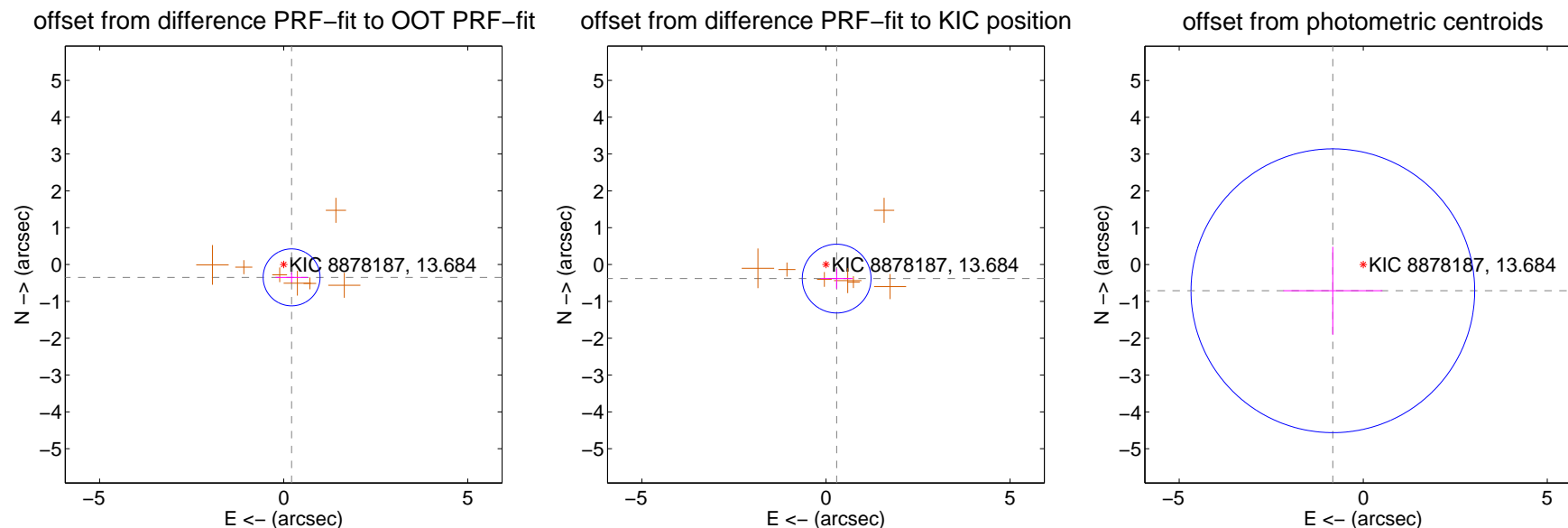
DV Centroid Data

Supplemental centroid analysis for 008878187-03. Kepler magnitude: 13.68. Transit SNR 9.03

There are 0 quarters with good PRF difference image offsets

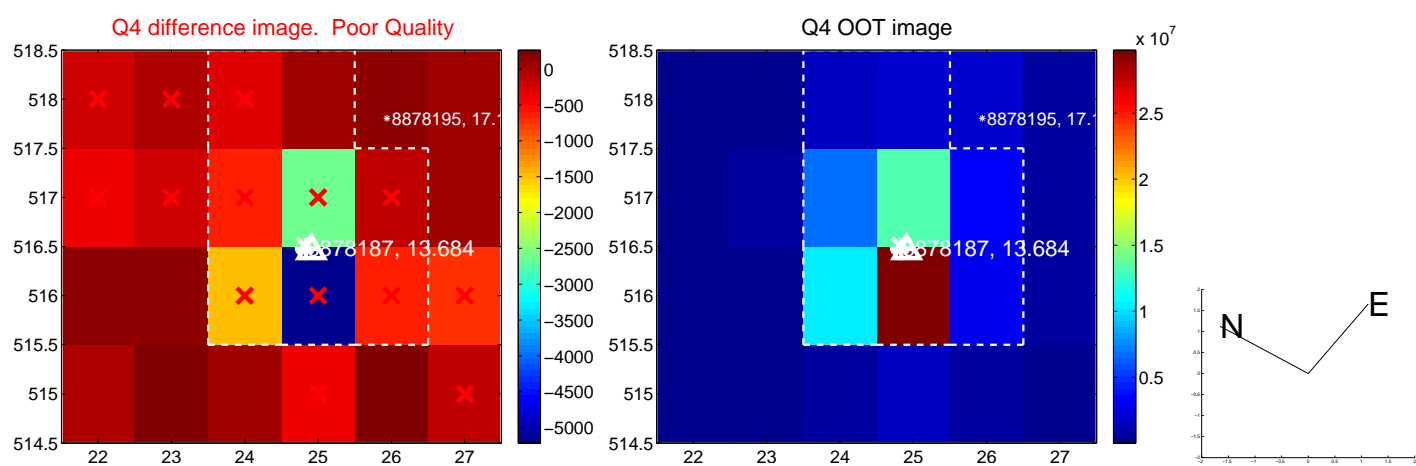
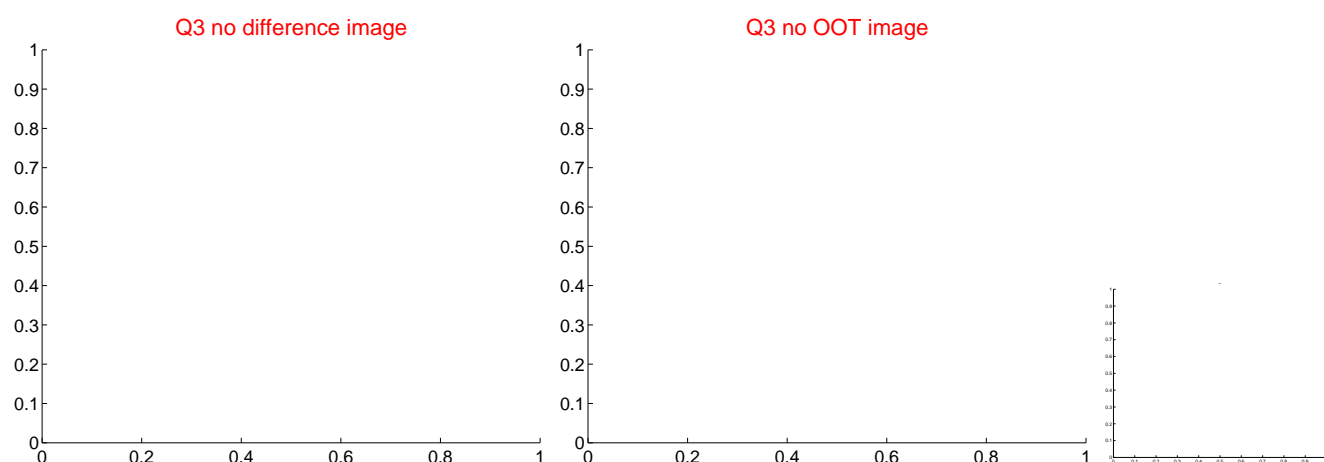
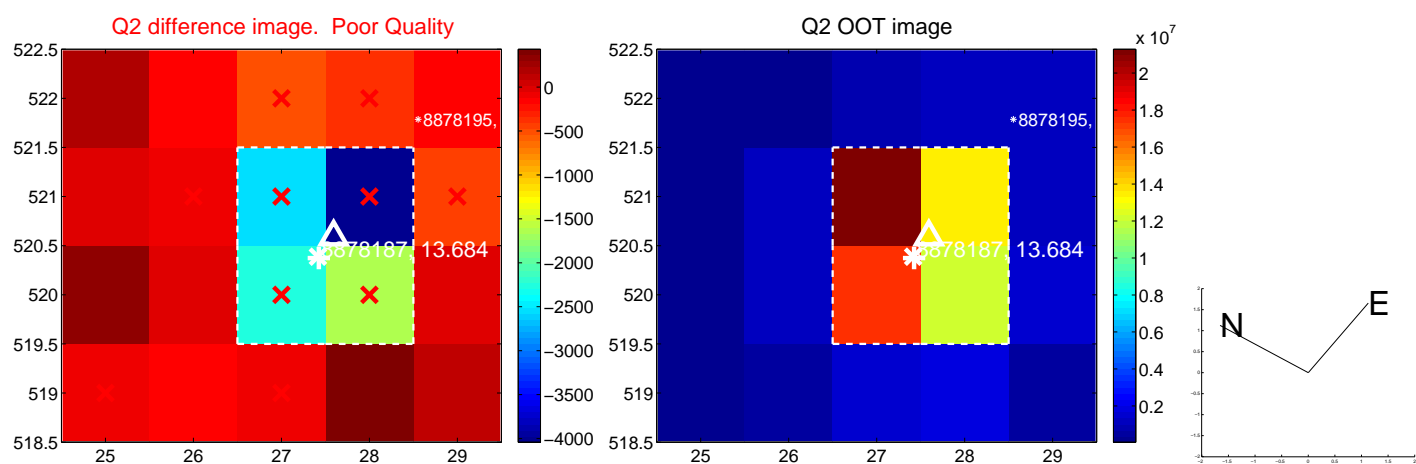
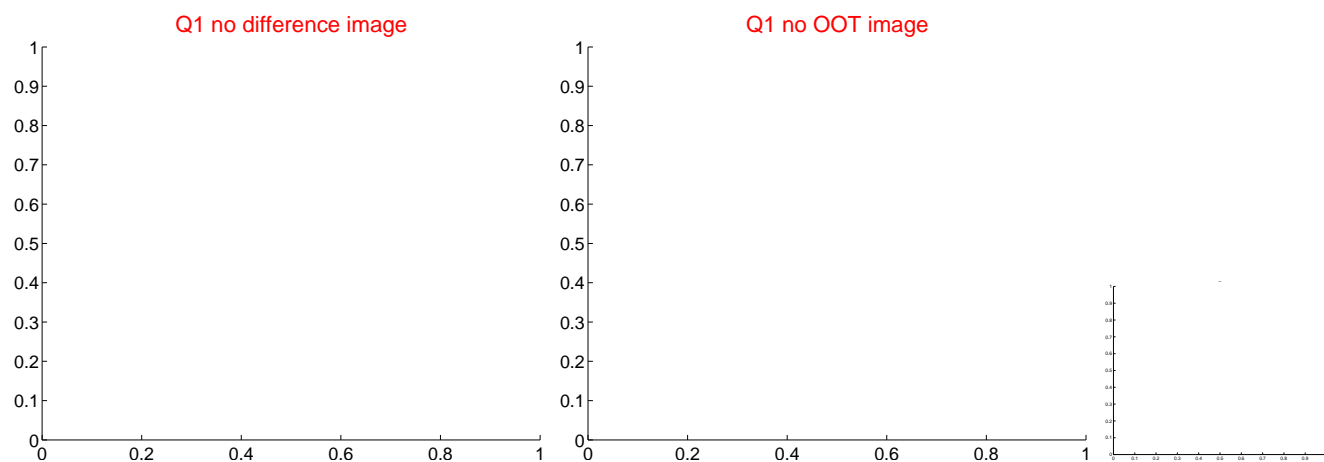
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.409 ± 0.258	1.59	-0.215 ± 0.435	-0.348 ± 0.141
PRF-fit source offset from KIC position	0.479 ± 0.311	1.54	-0.290 ± 0.434	-0.381 ± 0.271
photometric centroid source offset	1.09 ± 1.28	0.85	0.83 ± 1.35	-0.71 ± 1.19

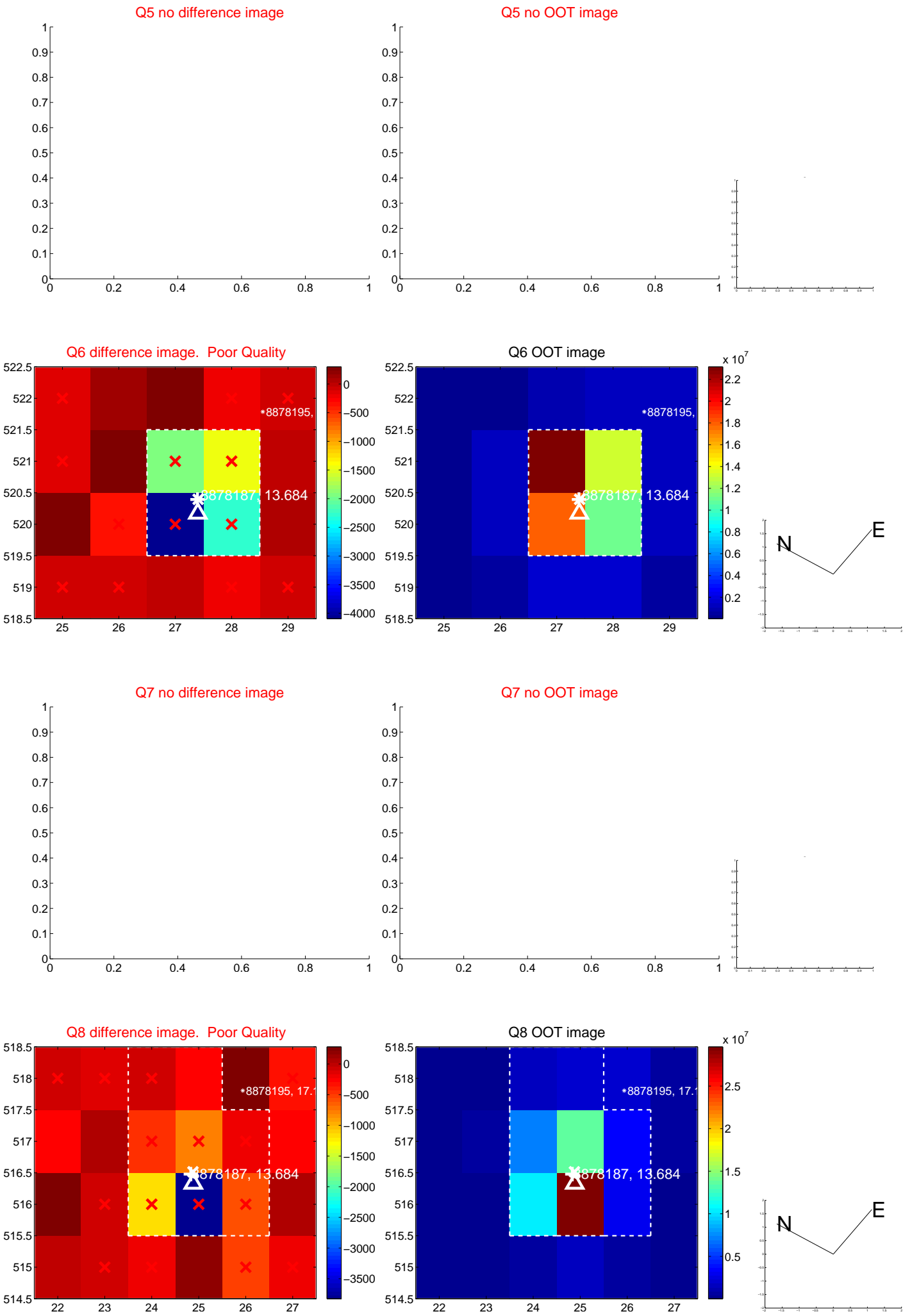


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

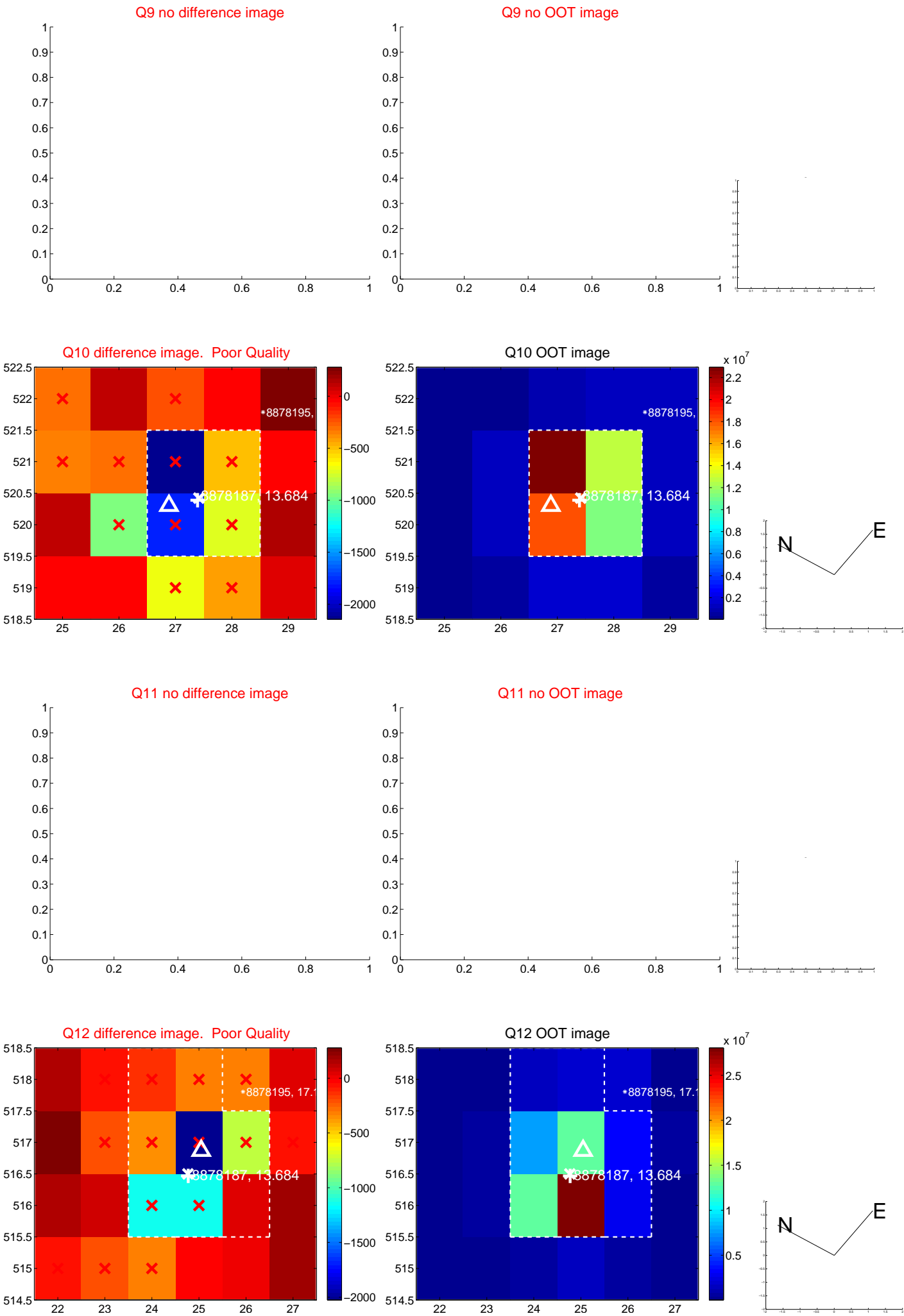
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



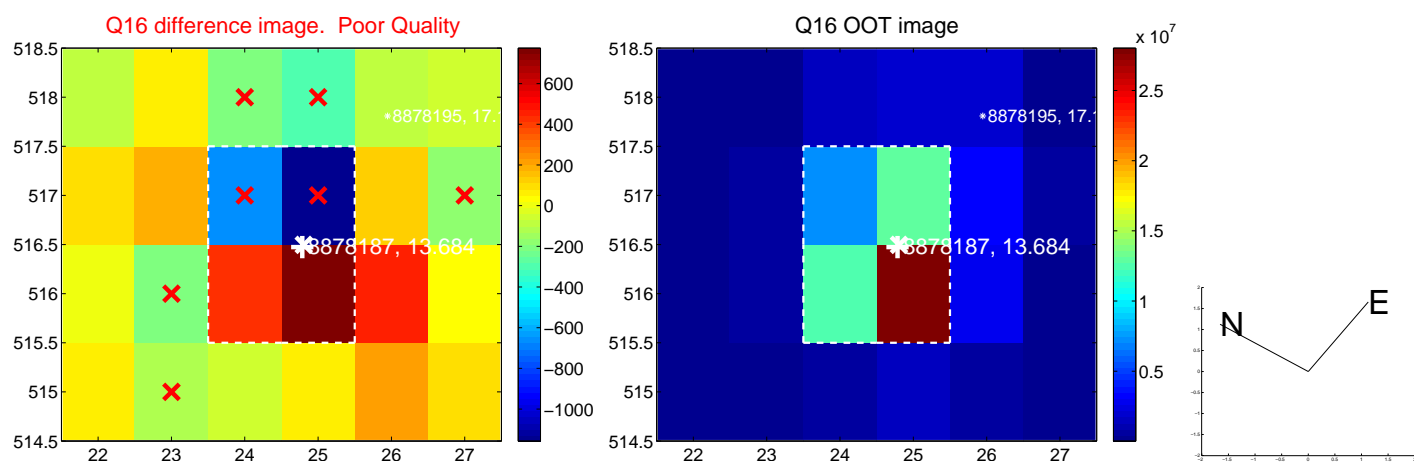
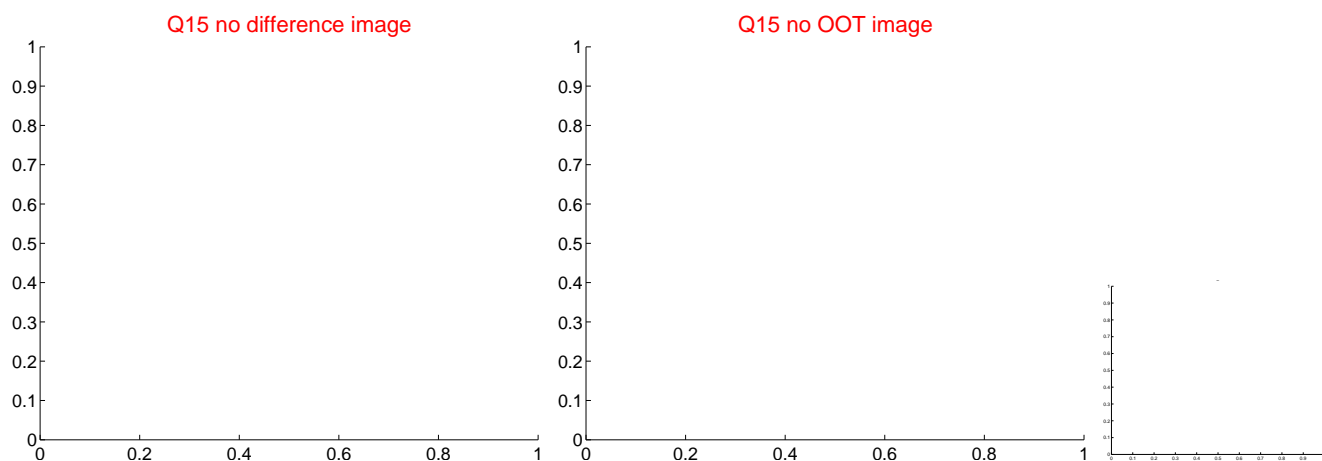
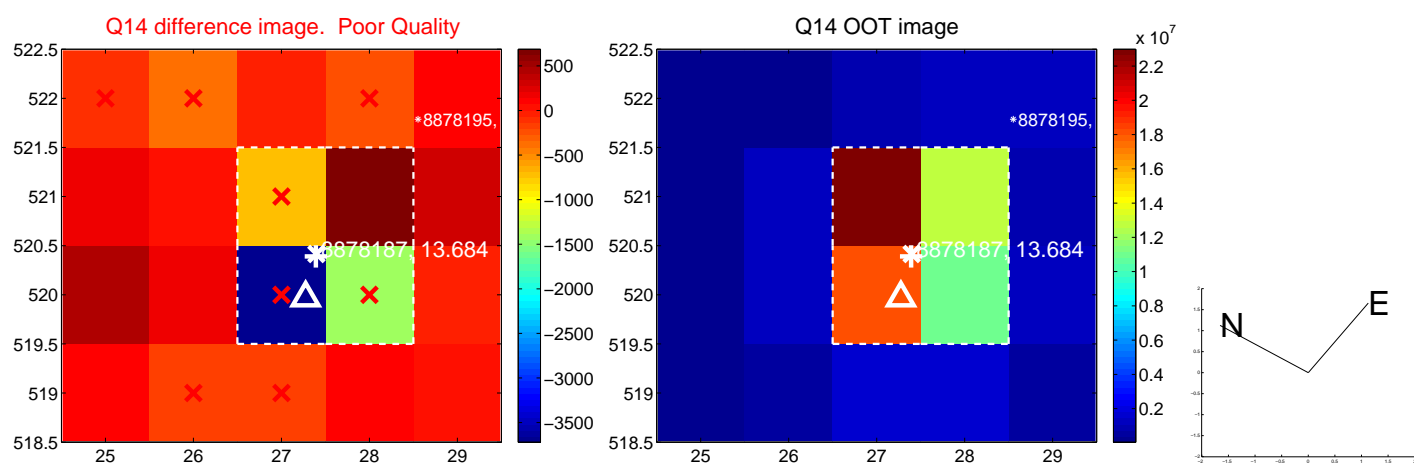
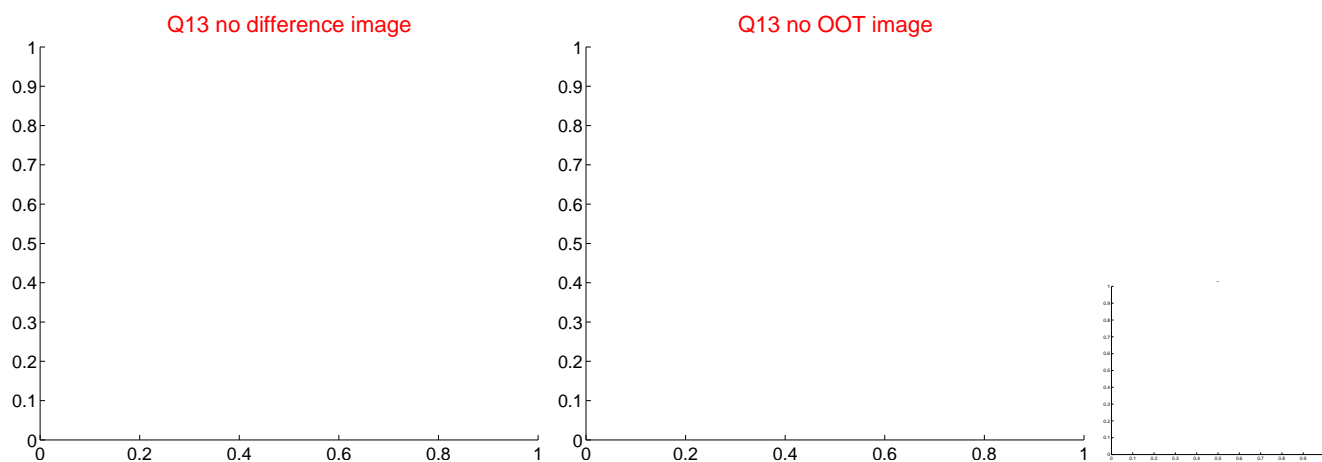
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



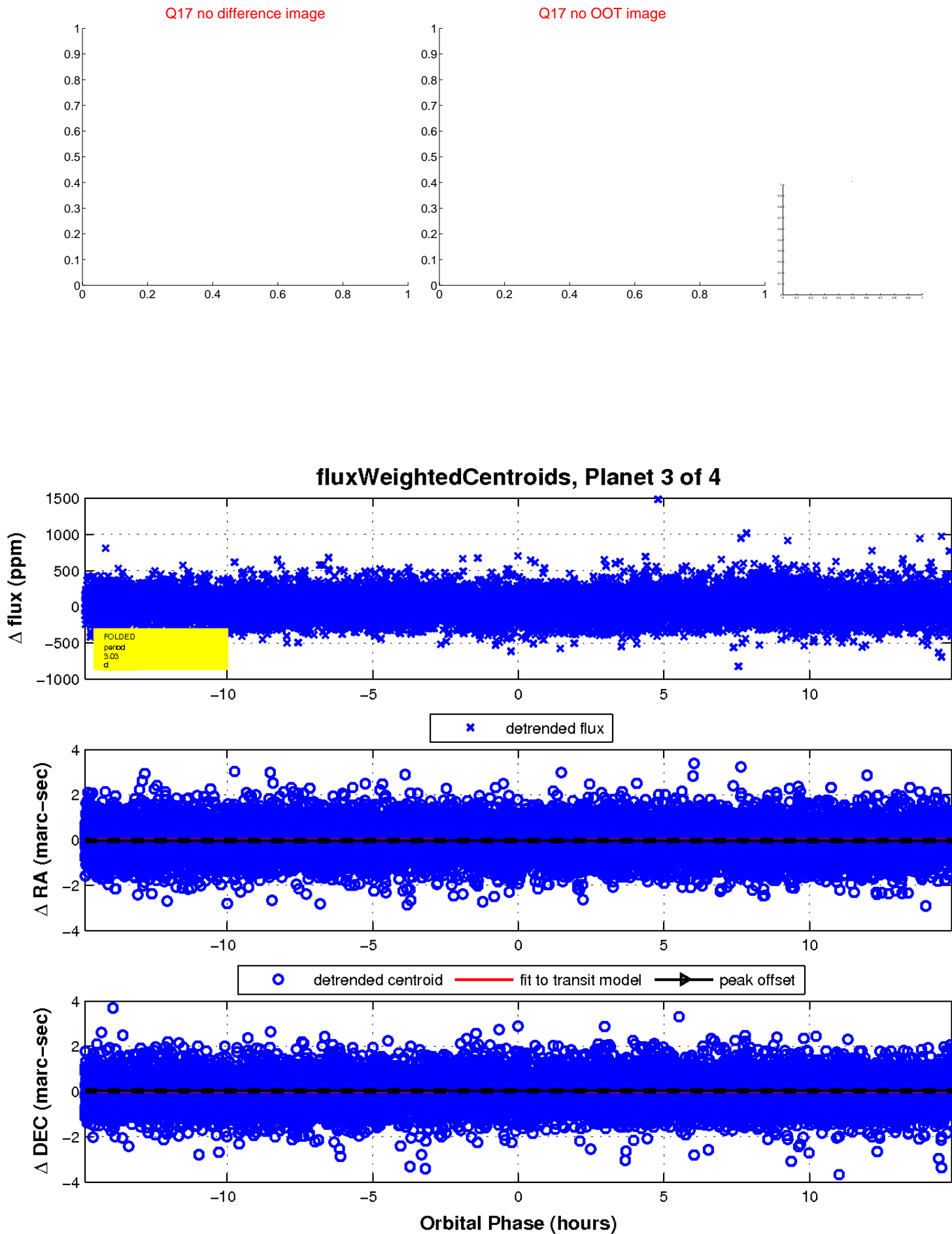
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



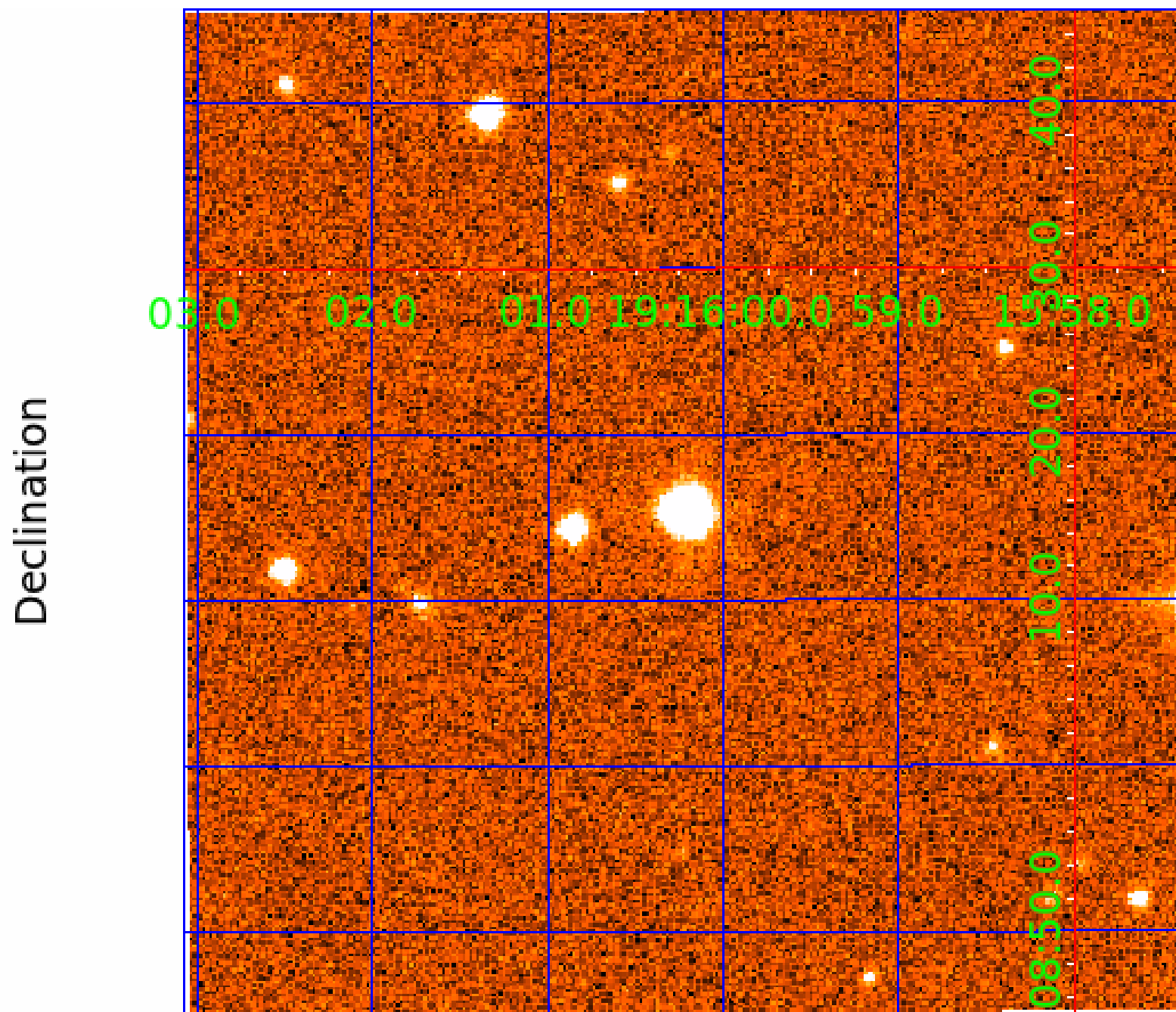
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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



UKIRT Image



KIC 008878187

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})
008878187-01	OBS	0697.01	3.032095	132.327307	255.0	3.661	37.6	44.1	1.45	5827	2.75	1220.85
008878187-02	OBS	No	3.031406	132.903255	27.9	10.871	7.7	7.5	1.45	5827	0.79	1221.22
008878187-03	OBS	No	3.031705	132.055414	42.6	4.962	7.6	9.0	1.45	5827	1.05	1221.06
008878187-04	OBS	No	187.829507	204.981542	136.3	23.445	10.9	7.2	1.45	5827	1.81	4.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008878187-01	OBS	PC	0.95	0	0	0	0	NO_COMMENT
008878187-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—RESIDUAL_TCE—CENT_FEW_DIFFS
008878187-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—RESIDUAL_TCE—CENT_FEW_DIFFS
008878187-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—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 008878187-04

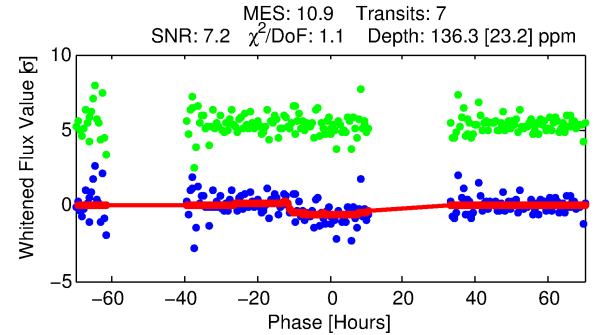
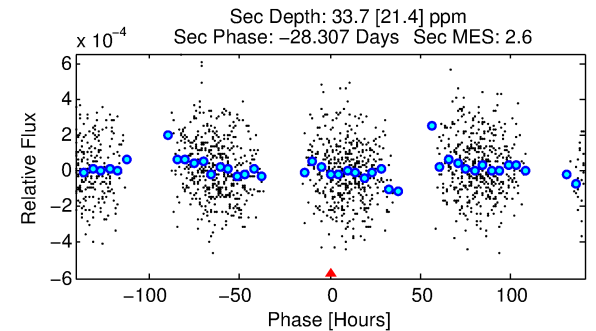
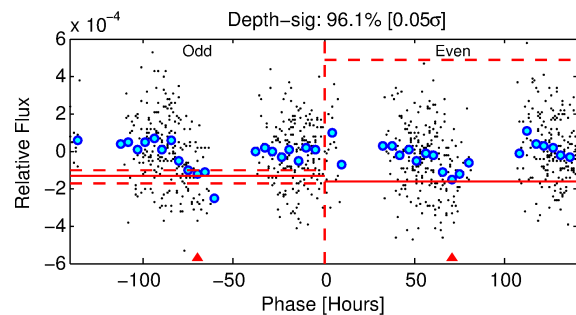
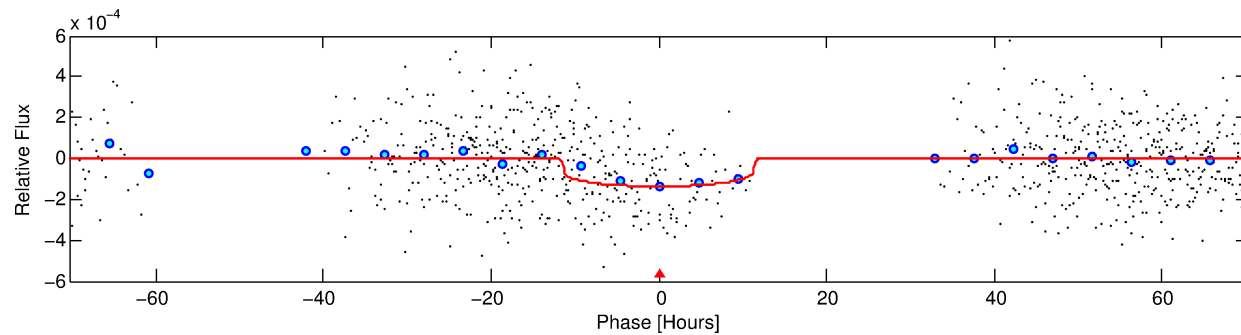
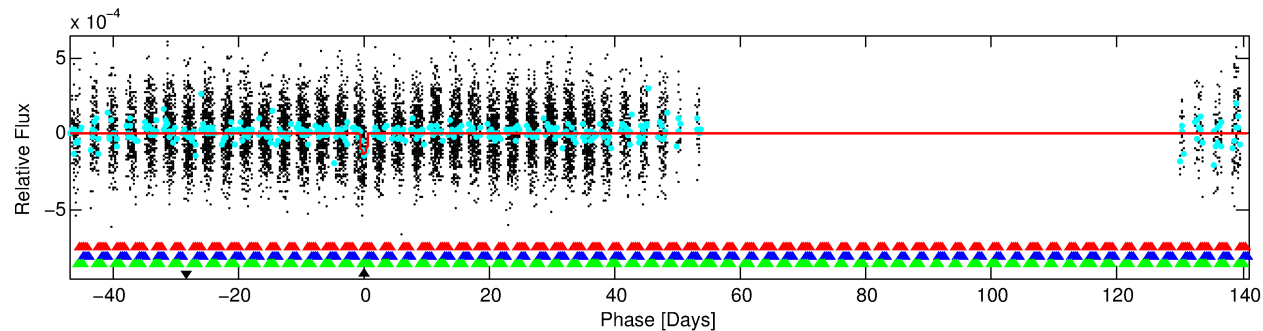
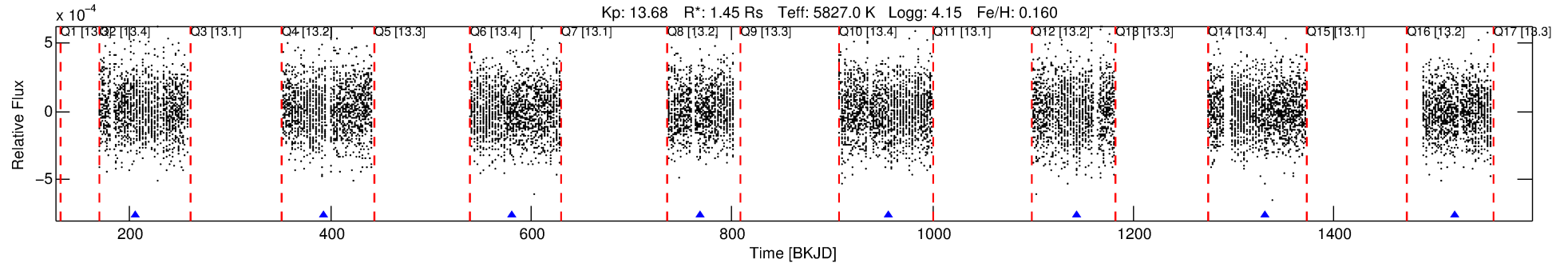
No Significant Match Found

DV One-Page Summary

KIC: 8878187 Candidate: 4 of 4 Period: 187.830 d

KOI: K00697 Corr: No Ephemeris Match

Kp: 13.68 R*: 1.45 Rs Teff: 5827.0 K Logg: 4.15 Fe/H: 0.160



DV Fit Results:

Period = 187.82951 [0.01044] d
Epoch = 204.9815 [0.1230] BKJD
Rp/R* = 0.0115 [0.0056]
a/R* = 43.82 [91.06]
b = 0.71 [1.53]
Seff = 4.98 [1.52]
Teq = 381 [29] K
Rp = 1.81 [0.96] Re
a = 0.6589 [0.1266] AU
Ag = 2454.66 [2943.48] [0.83σ]
Teffp = 4146 [1208] K [3.12σ]

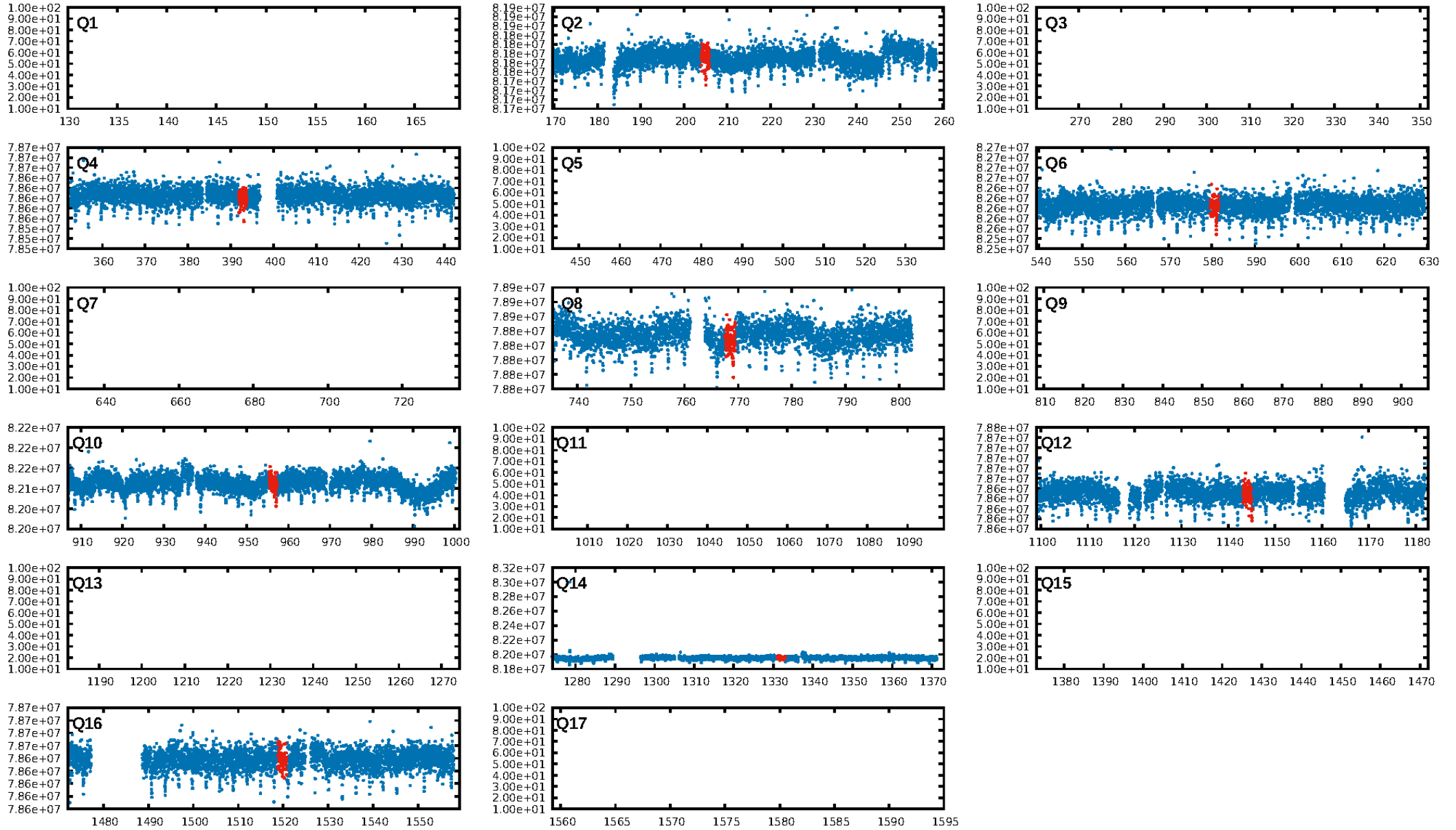
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [186.90σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 10.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.22e-17
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: 170
Centroid-sig: 47.2%
Centroid-so: 1.064 arcsec [0.79σ]
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 0.00 [0/8]

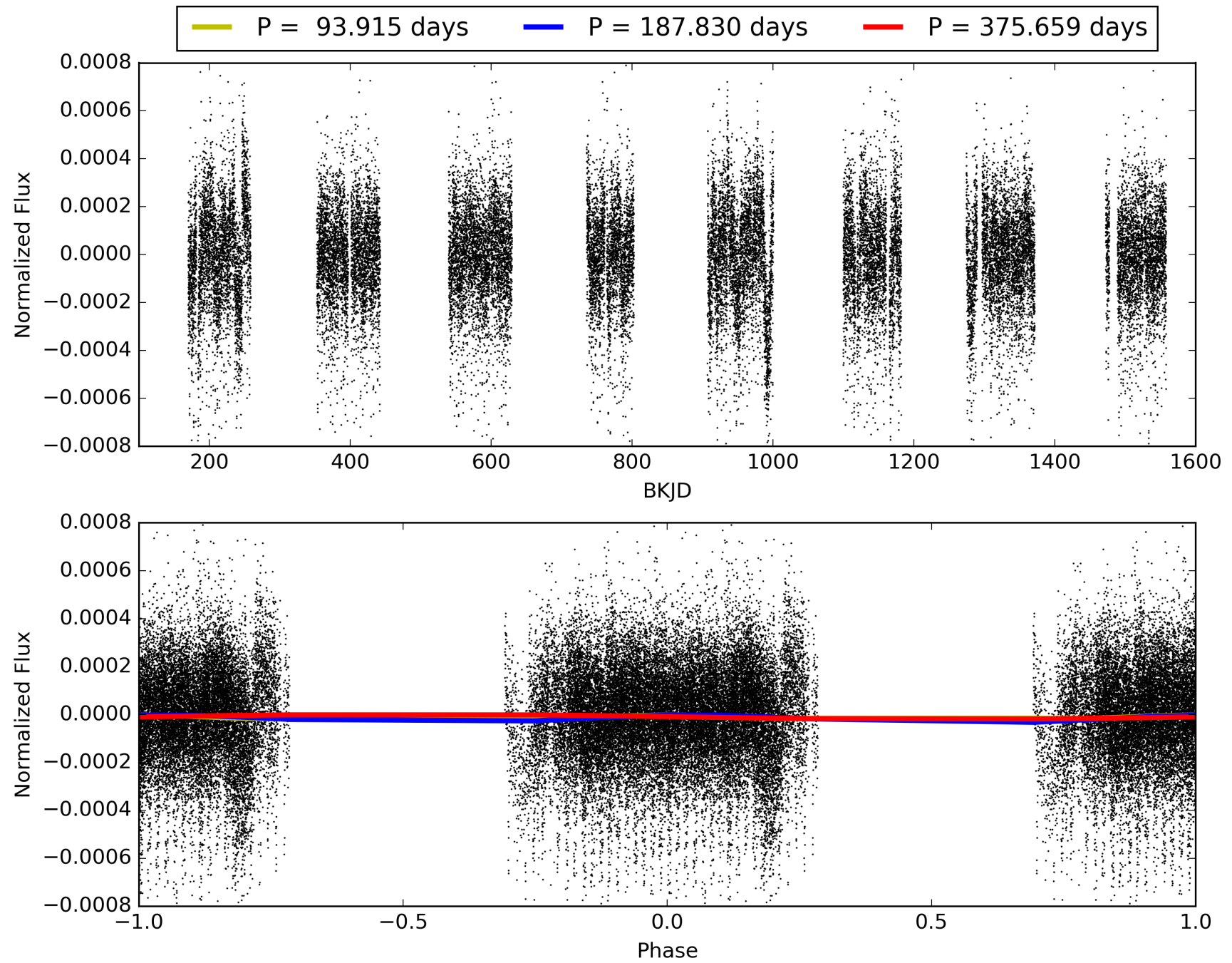
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 02:21:18 Z

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

TCE 008878187-04, PDC Light Curves

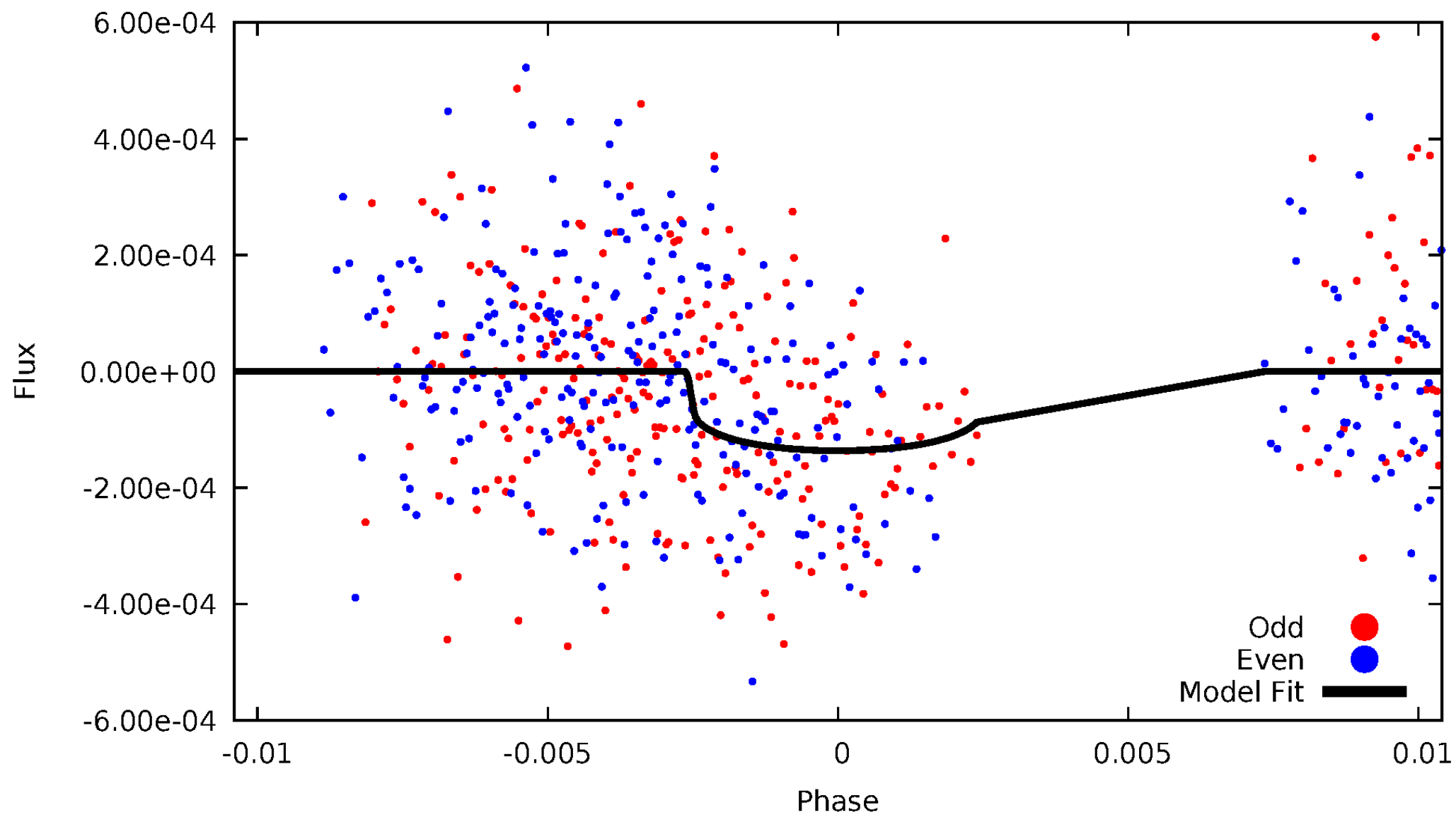


TCE 008878187-04



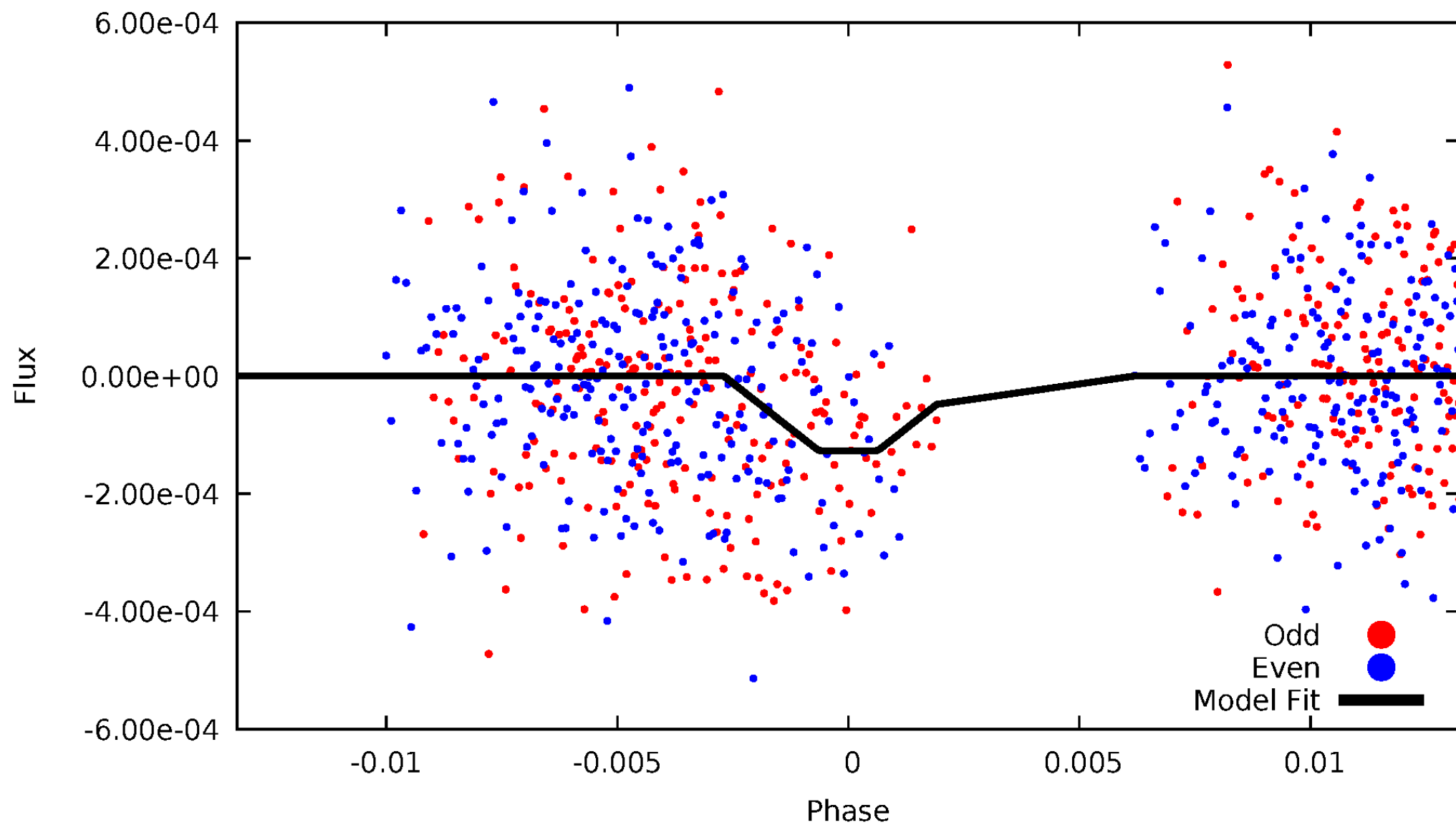
DV Odd/Even

TCE 008878187-04



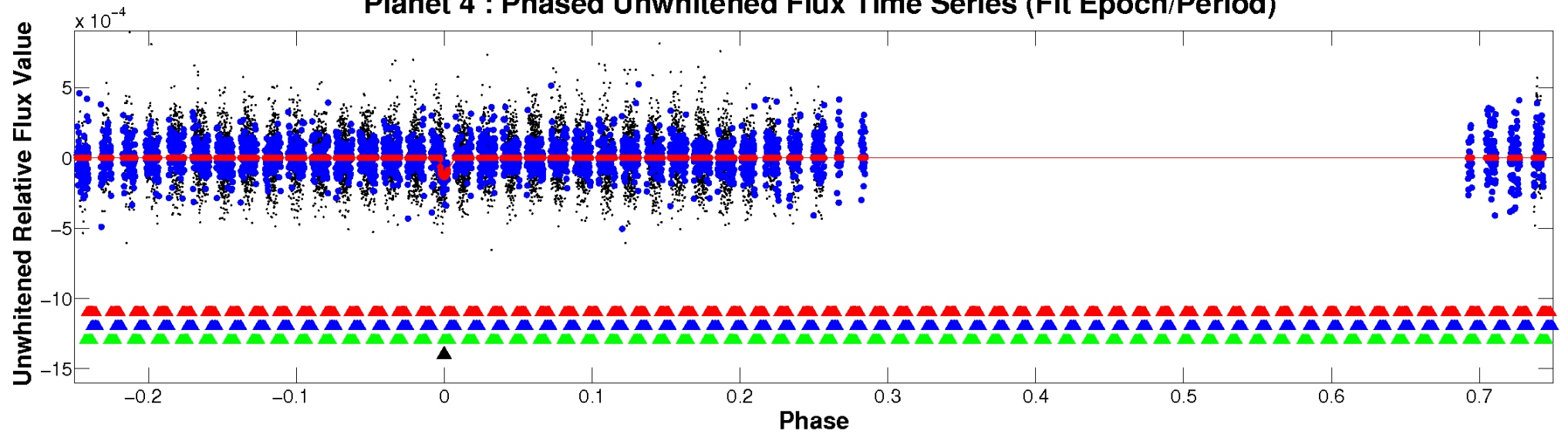
ALT Odd/Even

TCE 008878187-04

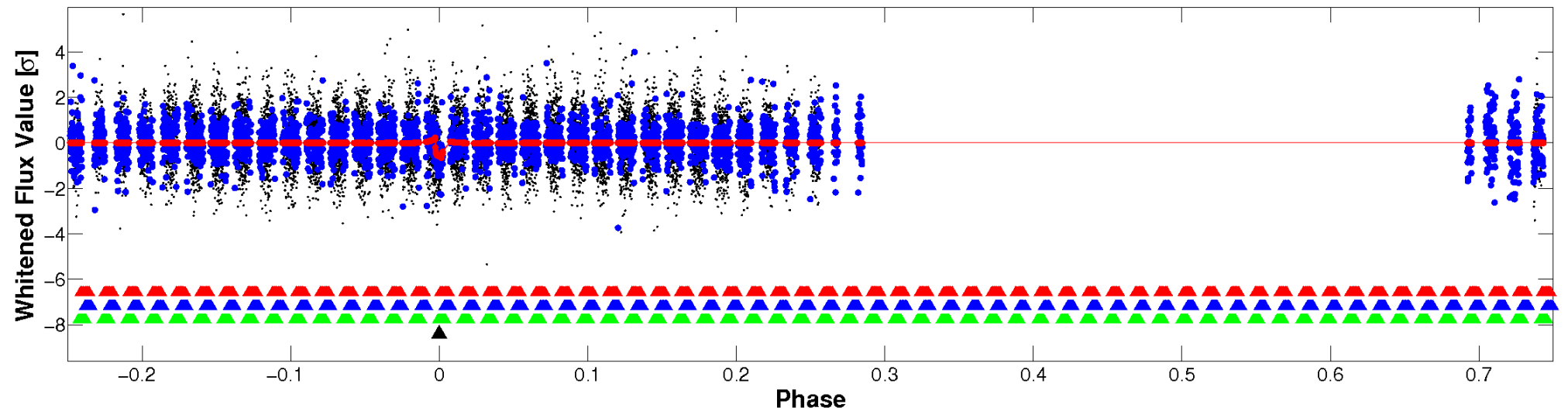


Non-Whitened Vs. Whitened Light Curve

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

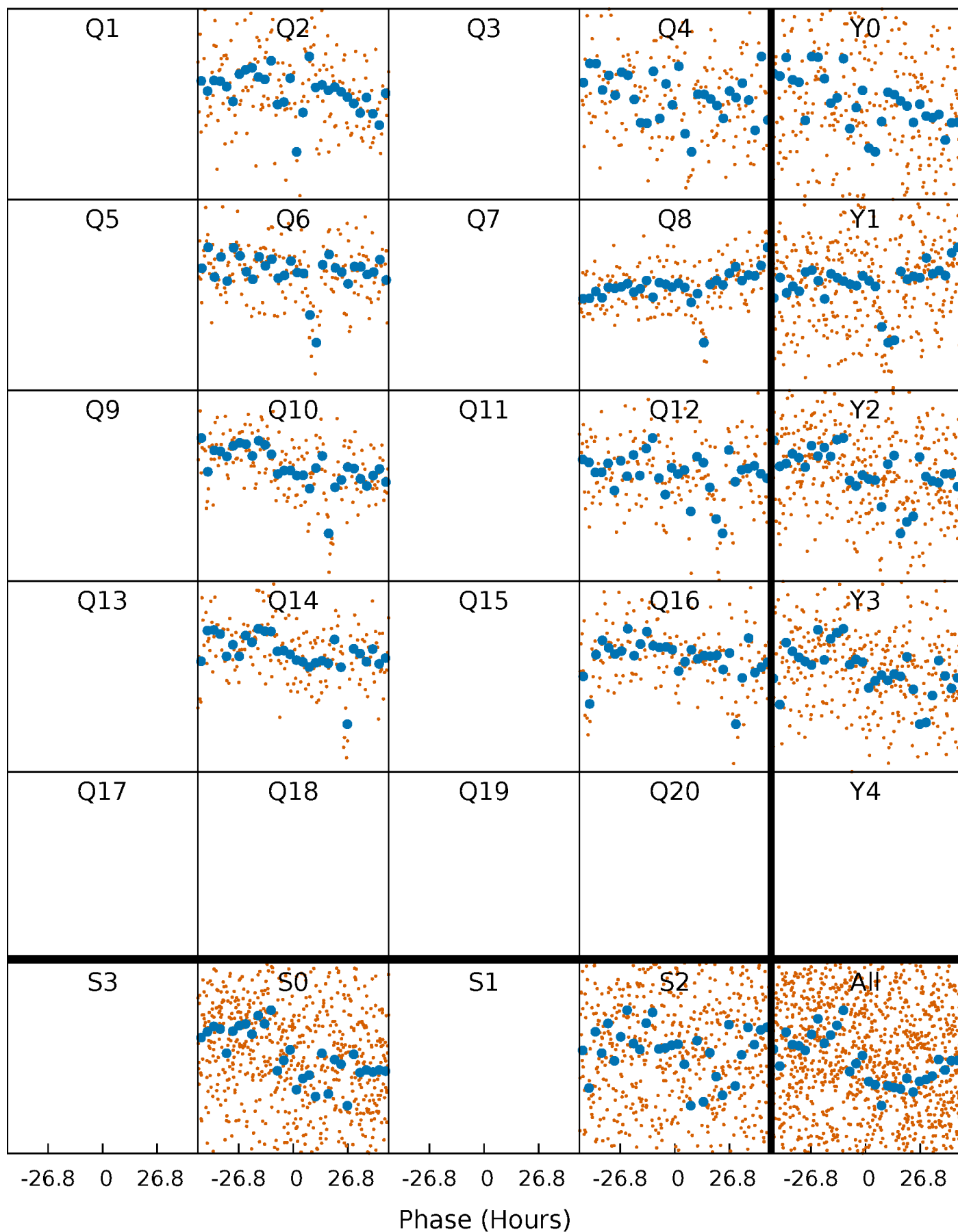


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



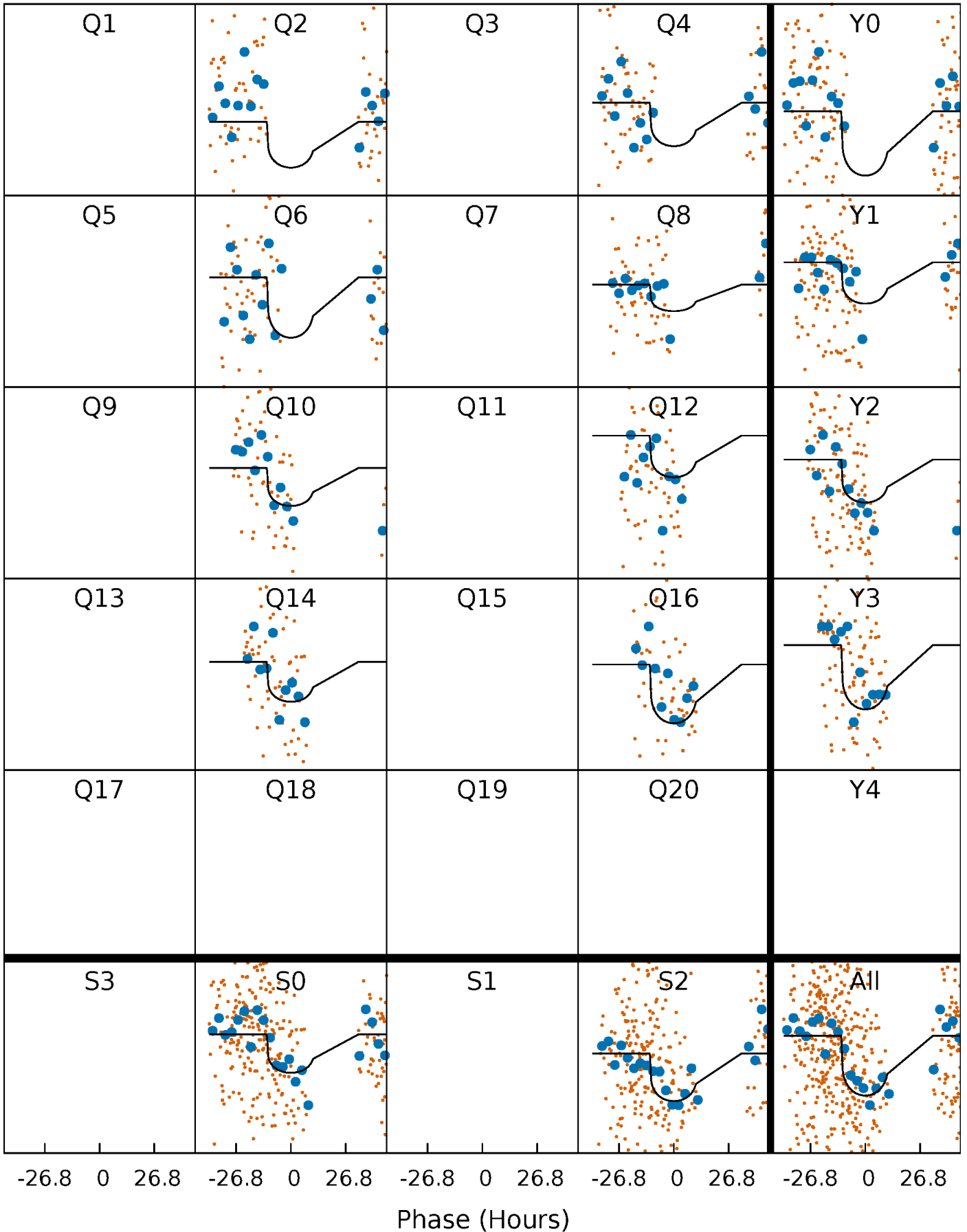
PDC Quarter-Phased Transit Curves

TCE 008878187-04 P=187.829507 Days $T_0=204.981542$ (BKJD)



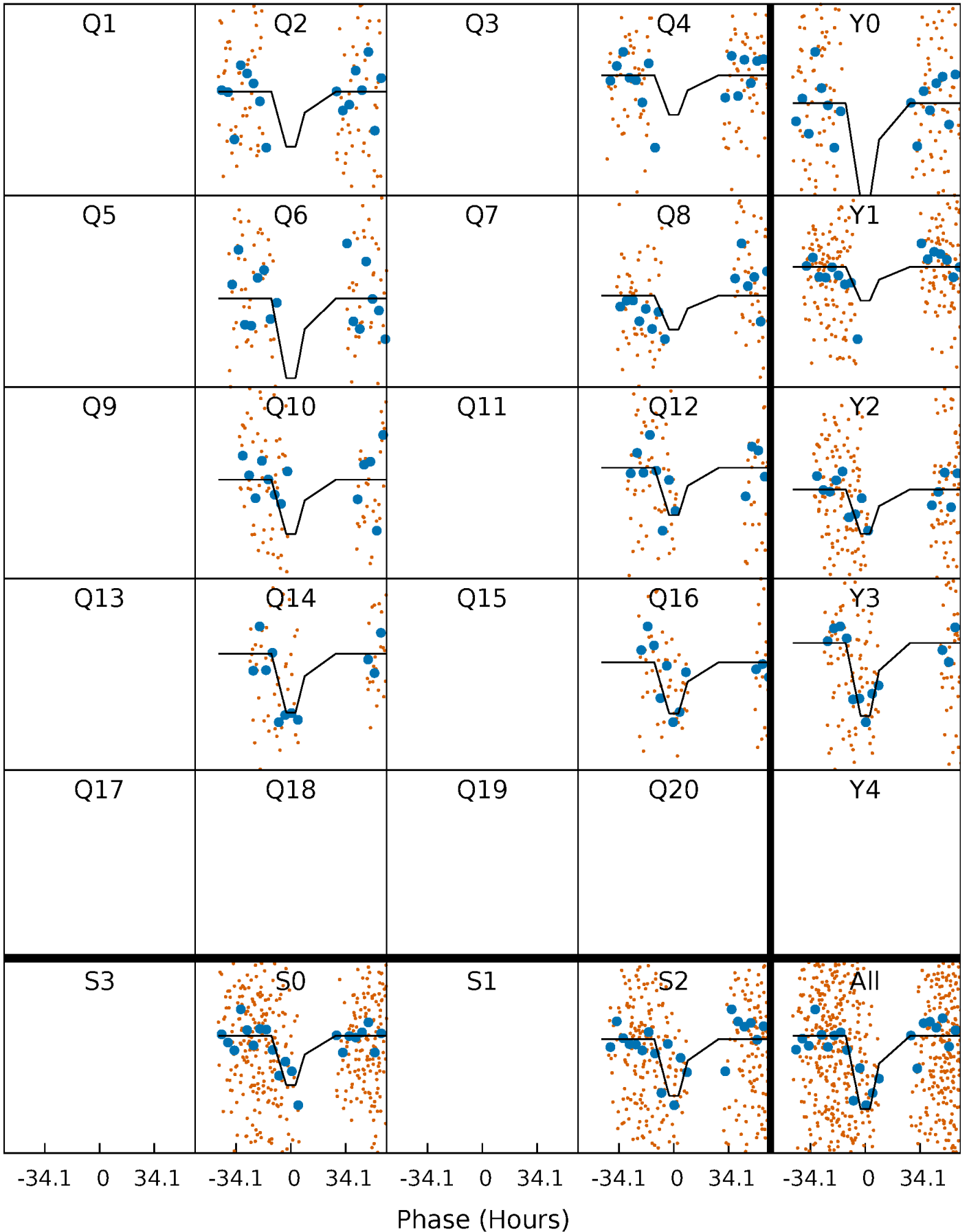
DV Quarter-Phased Transit Curves

TCE 008878187-04 $P=187.829507$ Days $T_0=204.981542$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

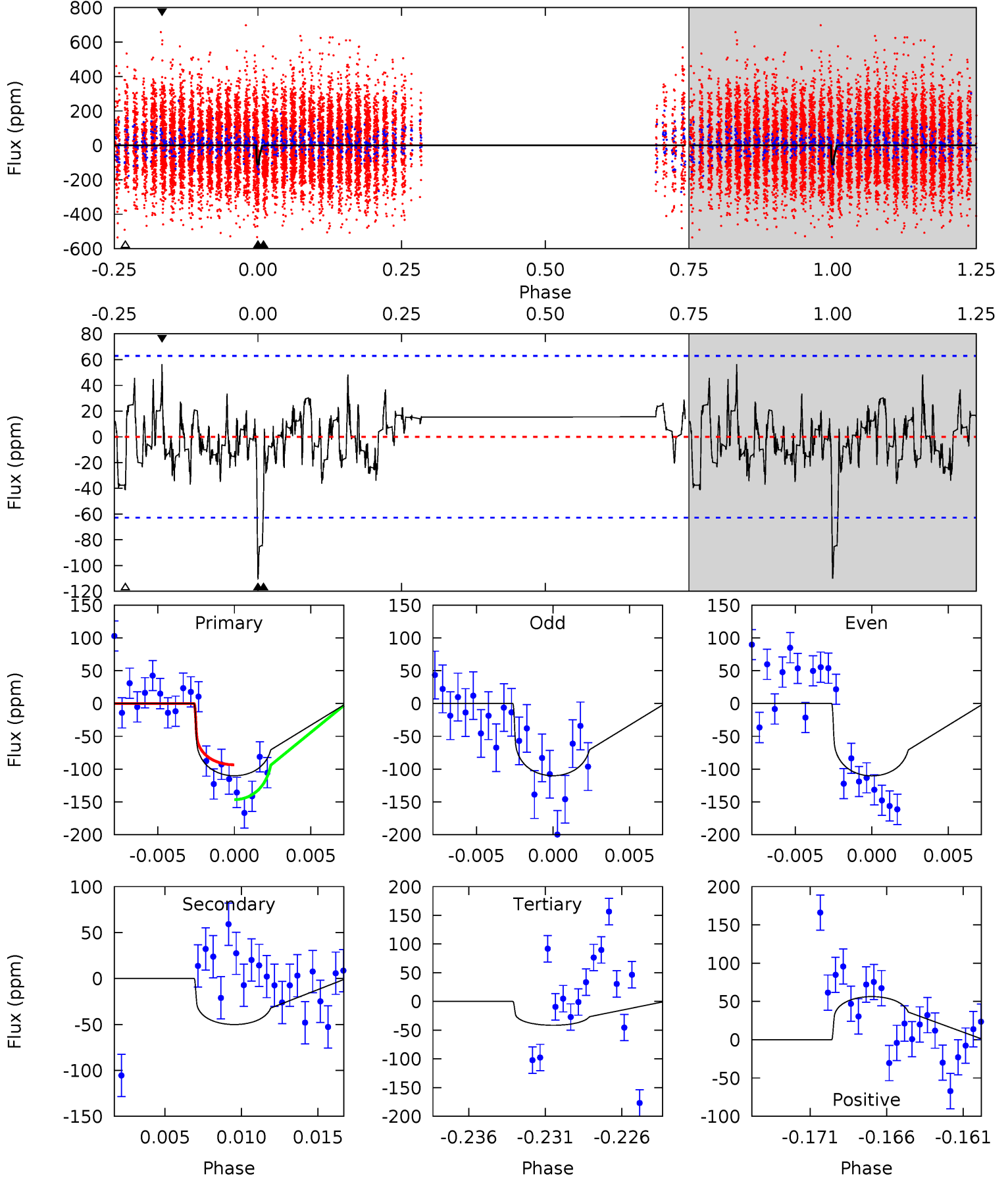
TCE 008878187-04 P=187.811661 Days $T_0=205.197365$ (BKJD)



DV Model-Shift Uniqueness Test

008878187-04, P = 187.829507 Days, E = 17.152035 Days

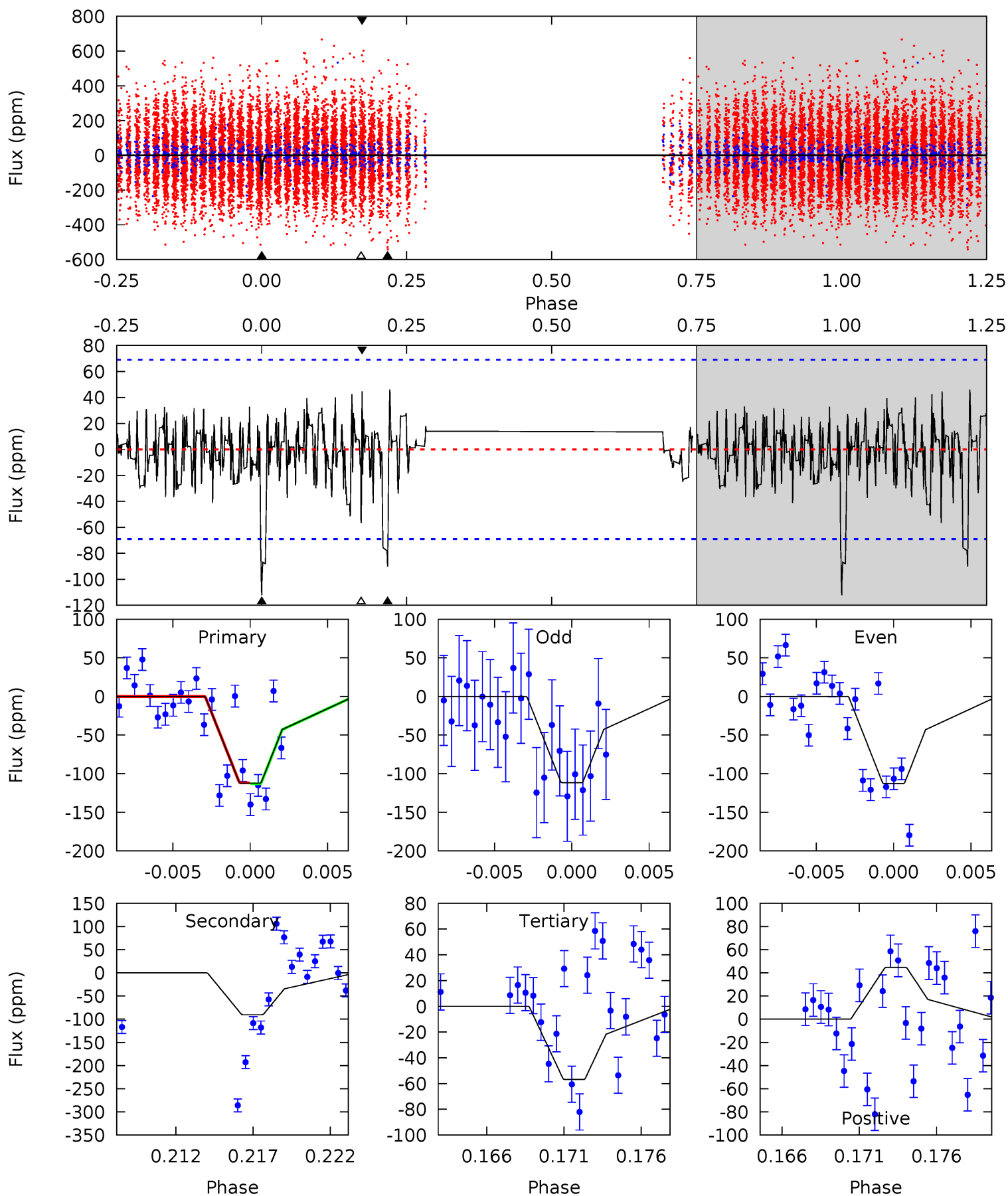
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.04	4.11	3.40	4.62	5.16	2.81	1.38	5.64	4.42	0.71	-0.51	0.01	1.21	0.34	1.94



Alt Model-Shift Uniqueness Test

008878187-04, $P = 187.811661$ Days, $E = 17.385704$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.42	6.77	4.26	3.35	5.17	2.83	1.24	4.16	5.07	2.51	3.42	0.04	1.15	0.29	0.03



Stellar Parameters For KIC 008878187

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5827^{+104}_{-115}	$4.151^{+0.168}_{-0.098}$	$0.160^{+0.150}_{-0.150}$	$1.447^{+0.232}_{-0.309}$	$1.081^{+0.115}_{-0.084}$	$0.502^{+0.427}_{-0.170}$
	+2%/-2%	+4%/-2%	+94%/-94%	+16%/-21%	+11%/-8%	+85%/-34%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 008878187-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-50 ± 12	$1.73^{+0.90}_{-0.78}$	530^{+23}_{-32}	4731^{+1519}_{-684}	3944^{+9632}_{-2323}
Alt.	-90 ± 13	$1.79^{+0.89}_{-0.80}$	529^{+22}_{-28}	5335^{+1878}_{-824}	6906^{+16093}_{-3888}

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

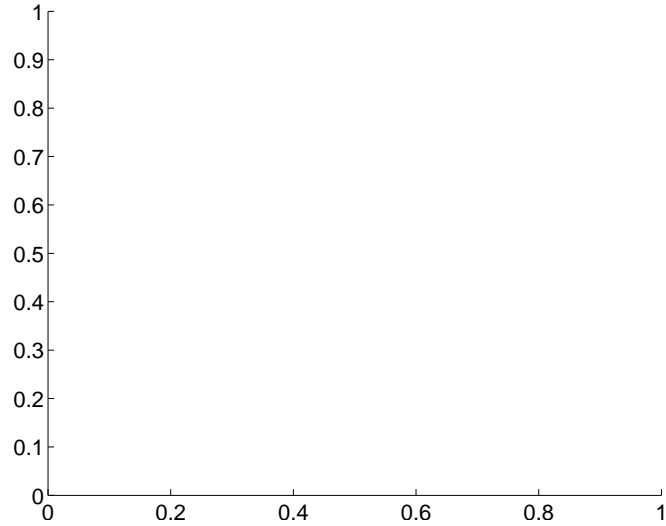
Supplemental centroid analysis for 008878187-04. Kepler magnitude: 13.68. Transit SNR 7.18

There are 0 quarters with good PRF difference image offsets

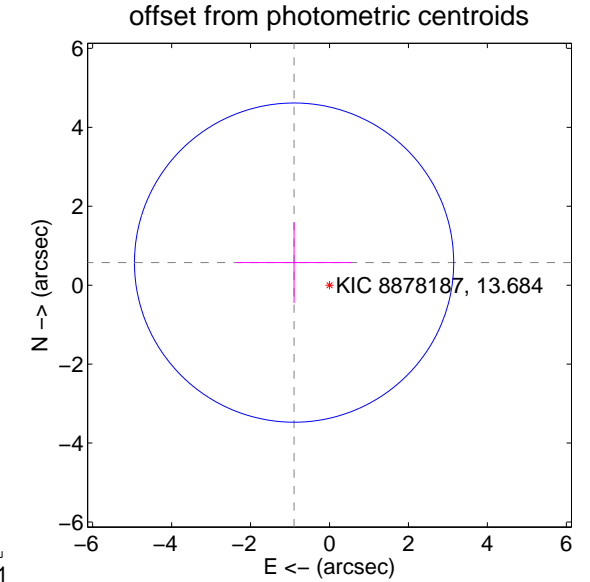
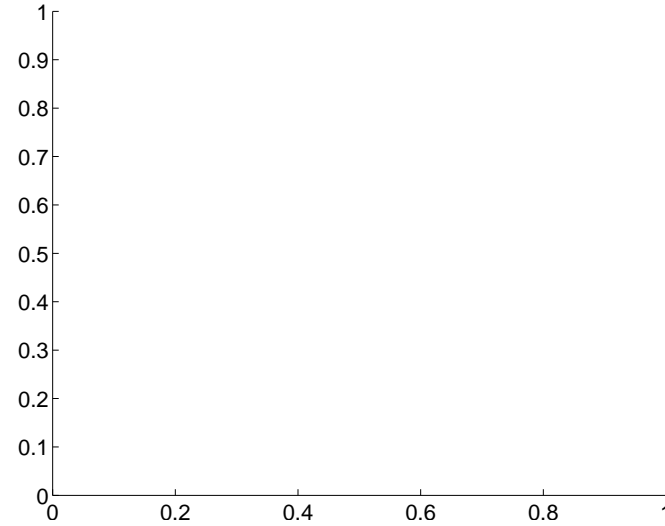
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	1.06 ± 1.35	0.79	0.90 ± 1.46	0.57 ± 1.02

There is no PRF-fit offset from OOT-fit

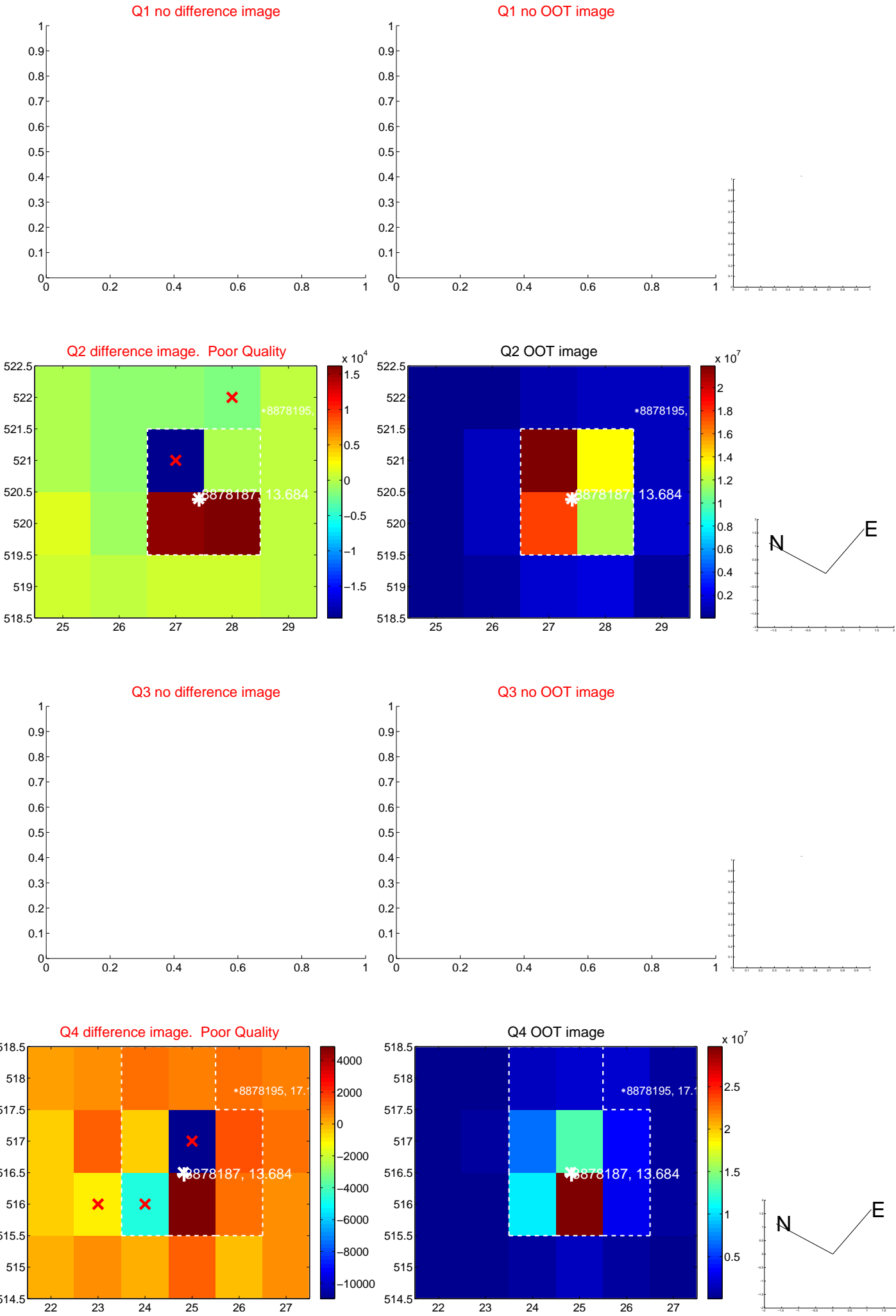


There is no PRF-fit offset from KIC

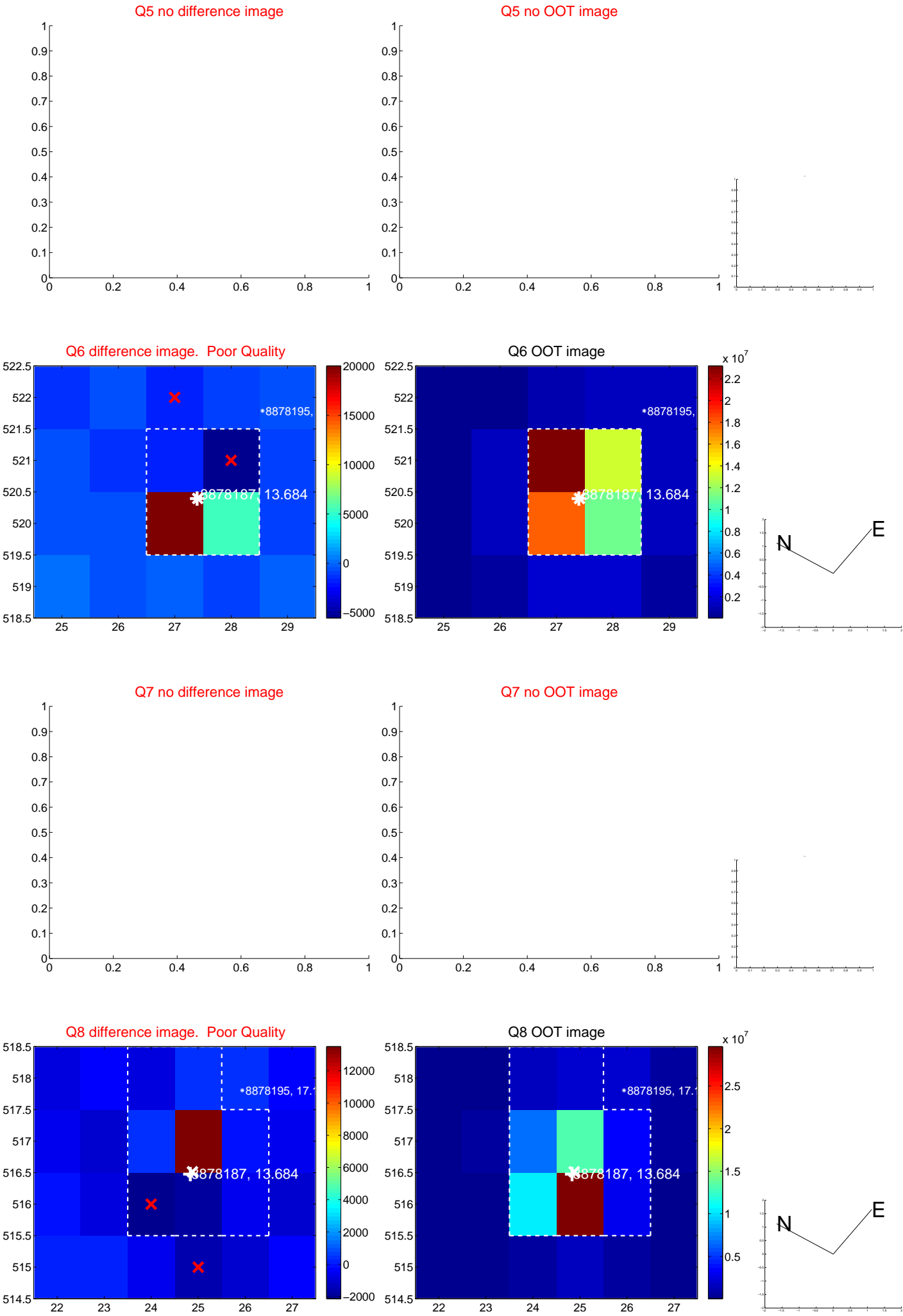


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

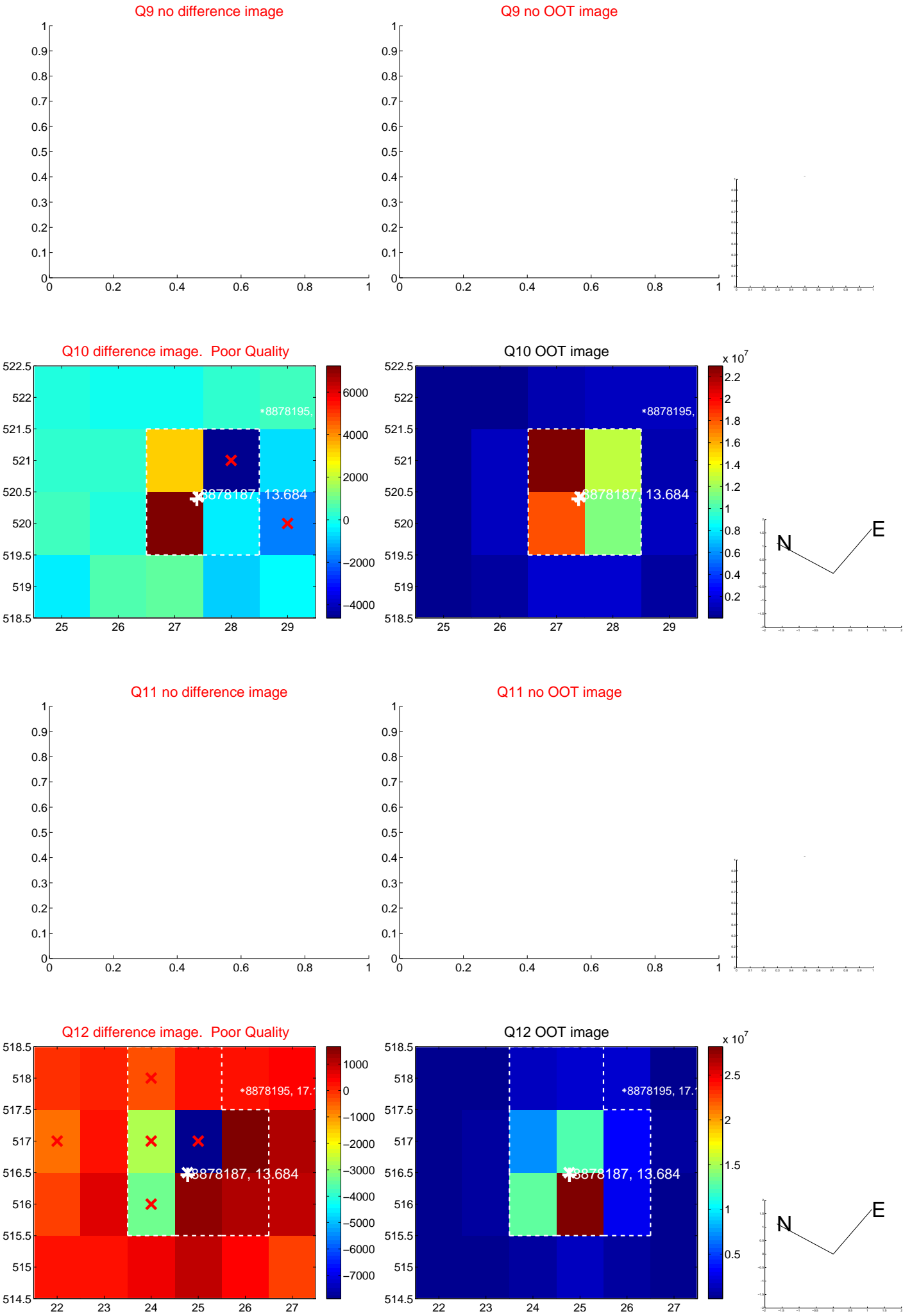
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



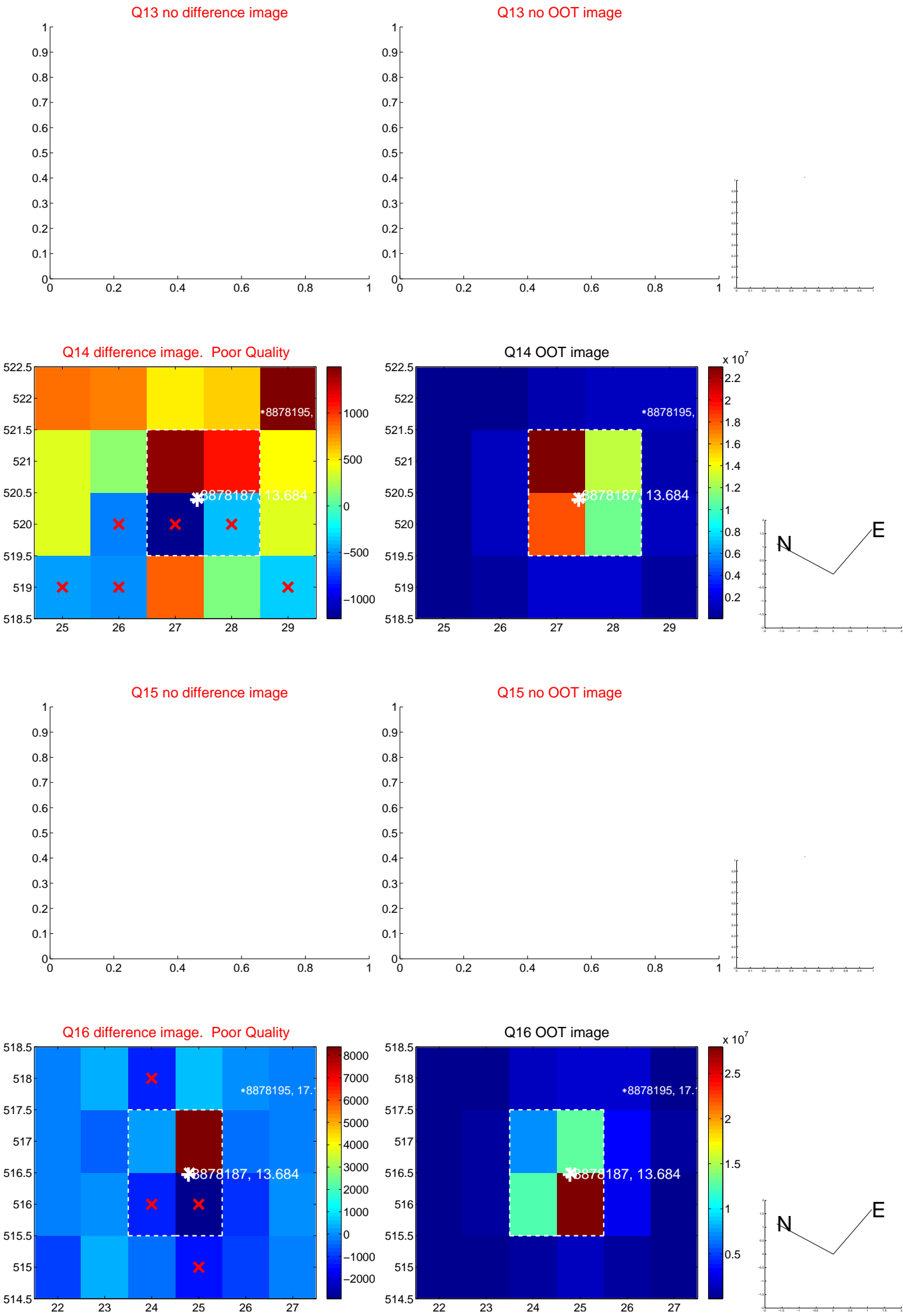
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



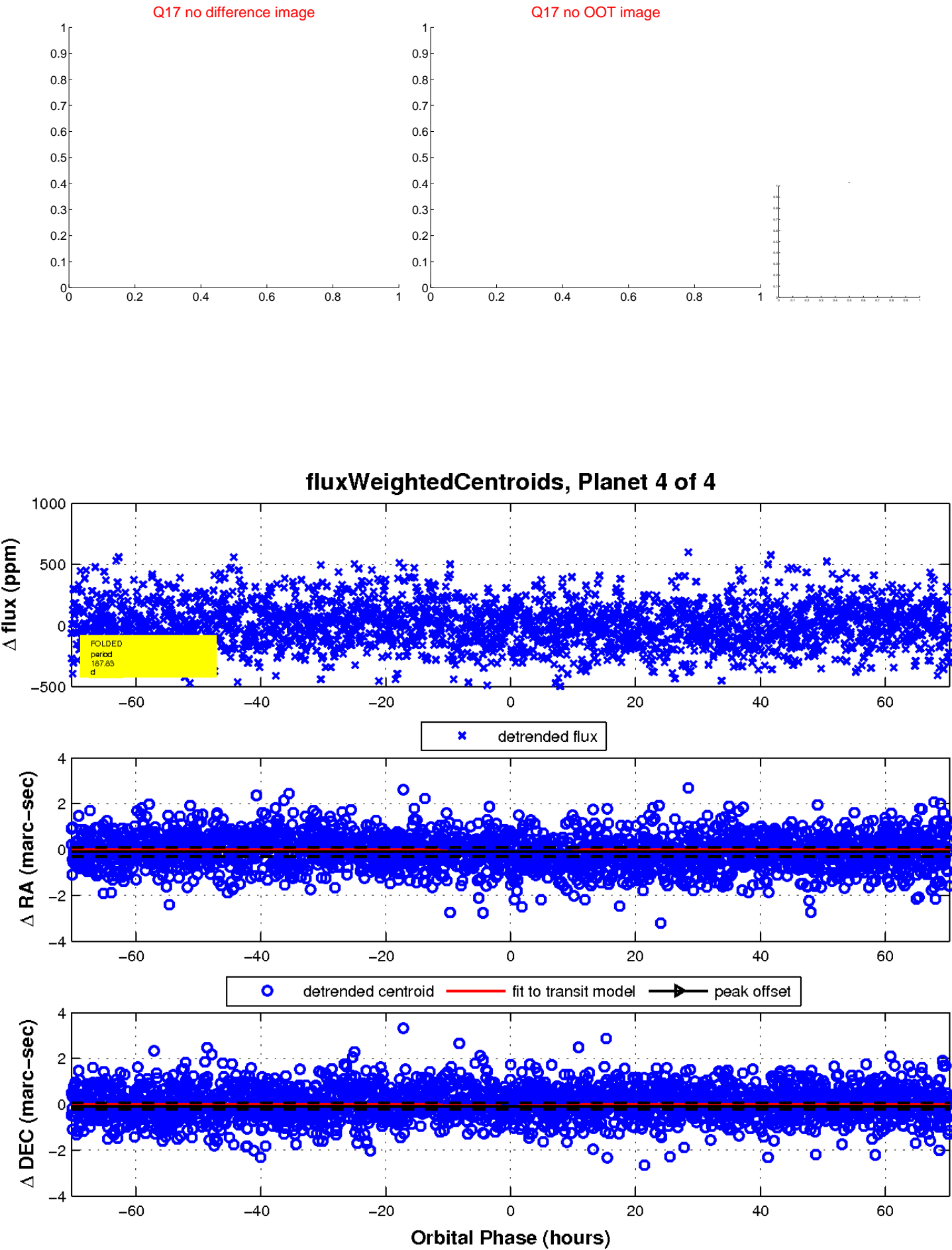
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

