

KIC 009210037

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})
009210037-01	OBS	No	1.399108	131.975215	177.9	4.678	13.1	12.5	2.47	6951	3.88	14405.57
009210037-02	OBS	No	1.381409	131.675652	383.6	16.577	10.4	24.5	2.47	6951	5.19	14652.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009210037-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009210037-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—CENT_UNRESOLVED_OFFSET

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

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

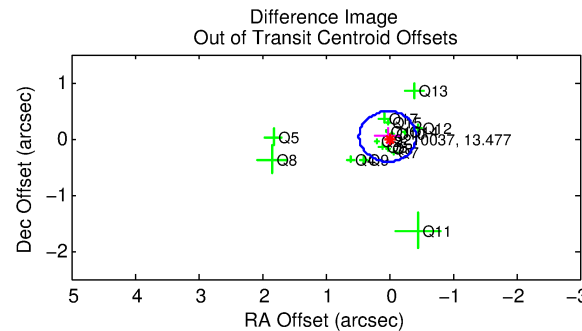
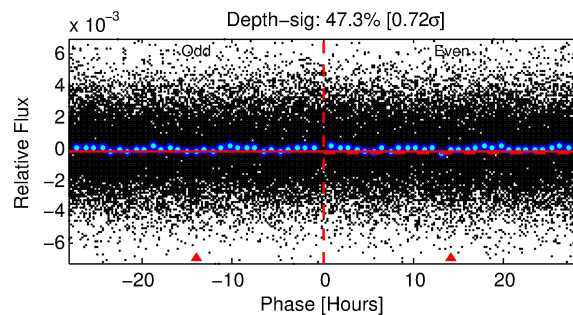
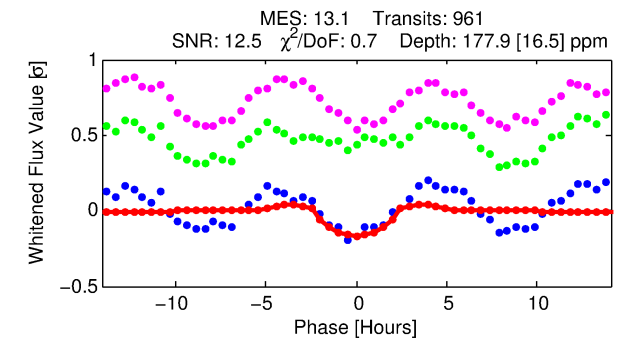
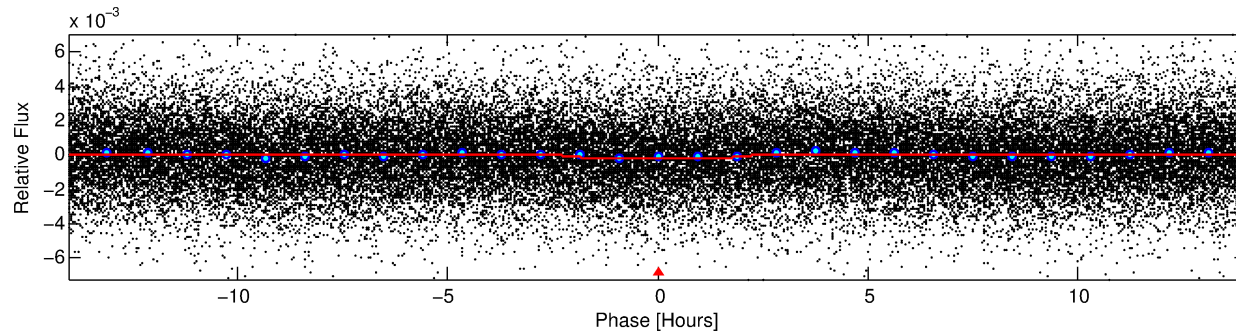
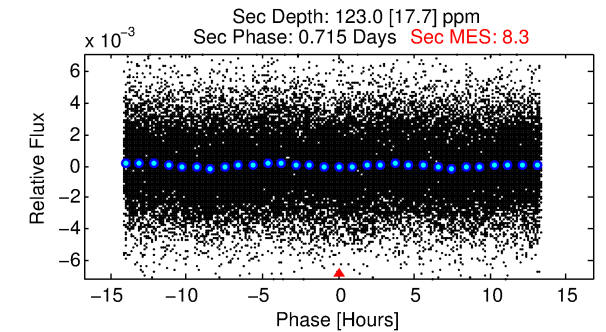
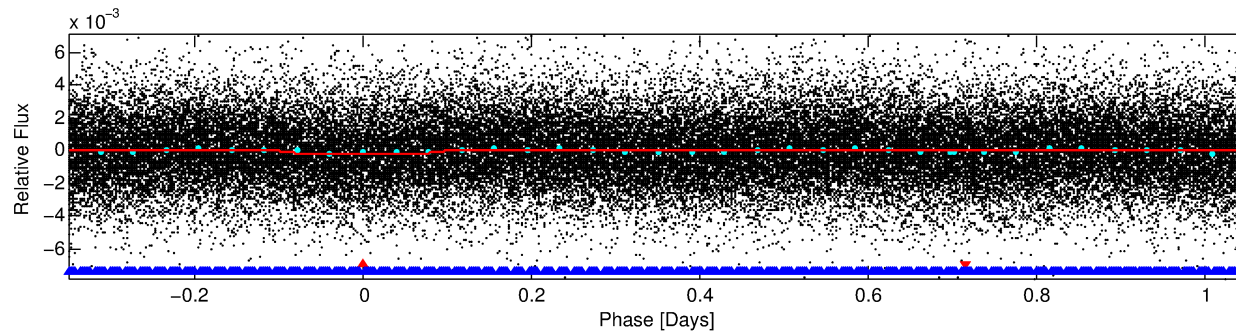
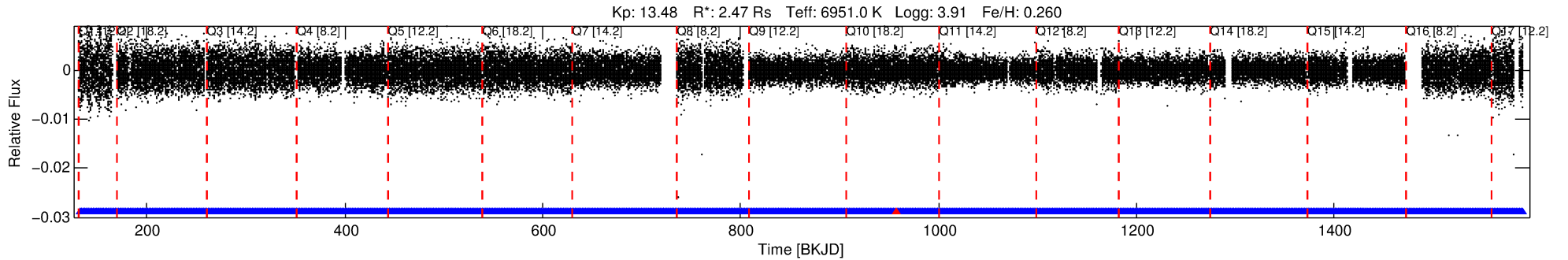
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009210037-01

No Significant Match Found

DV One-Page Summary

KIC: 9210037 Candidate: 1 of 2 Period: 1.399 d



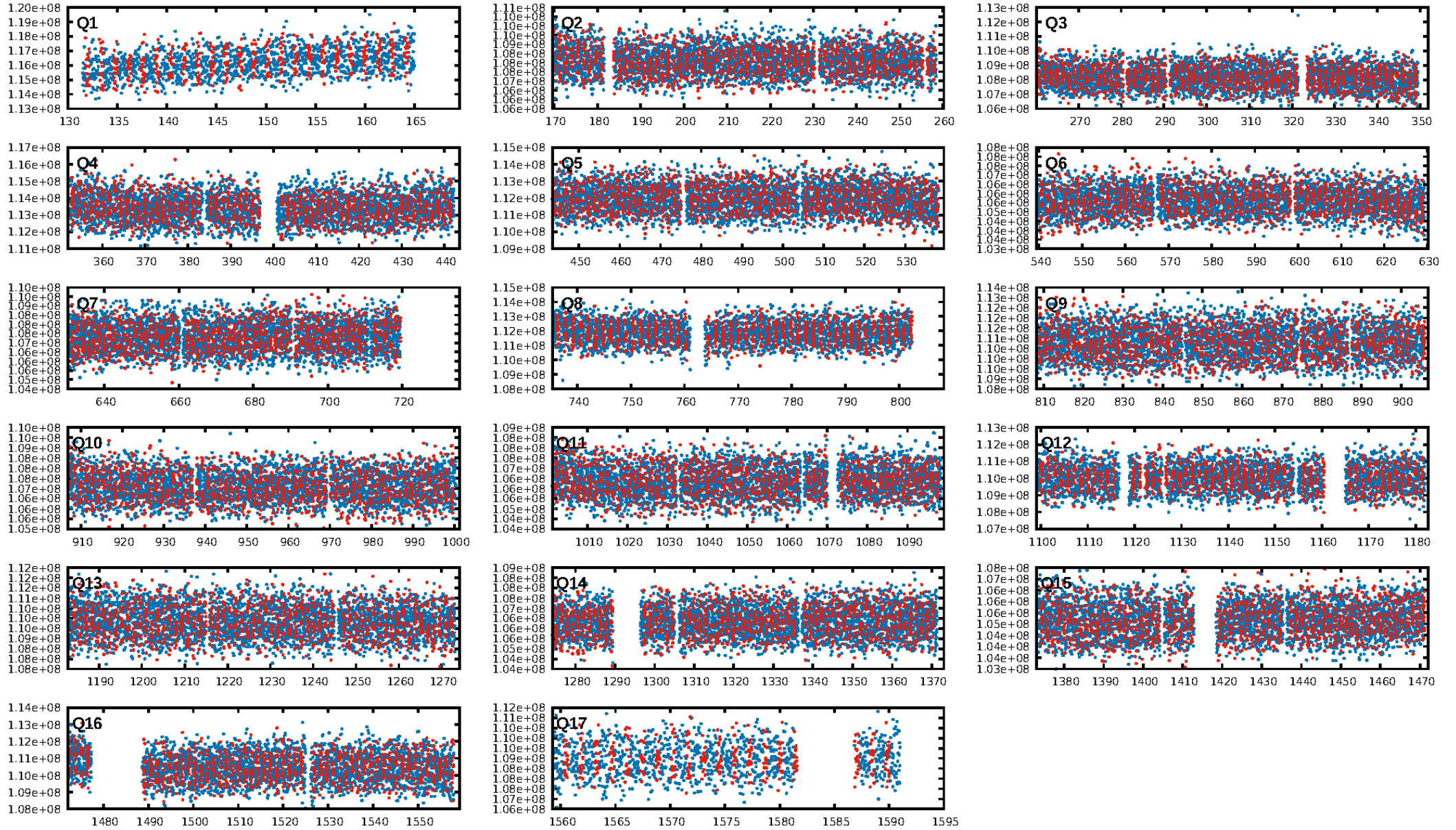
DV Fit Results:

Period = 1.39911 [0.00001] d
Epoch = 131.9752 [0.0053] BKJD
Rp/R* = 0.0144 [0.0037]
a/R* = 1.38 [1.01]
b = 0.91 [0.28]
Seff = 14405.57 [7515.19]
Teff = 2794 [364] K
Rp = 3.88 [1.71] Re
a = 0.0298 [0.0095] AU
Ag = 3.99 [2.90] [1.03σ]
Teffp = 6105 [861] K [3.54σ]

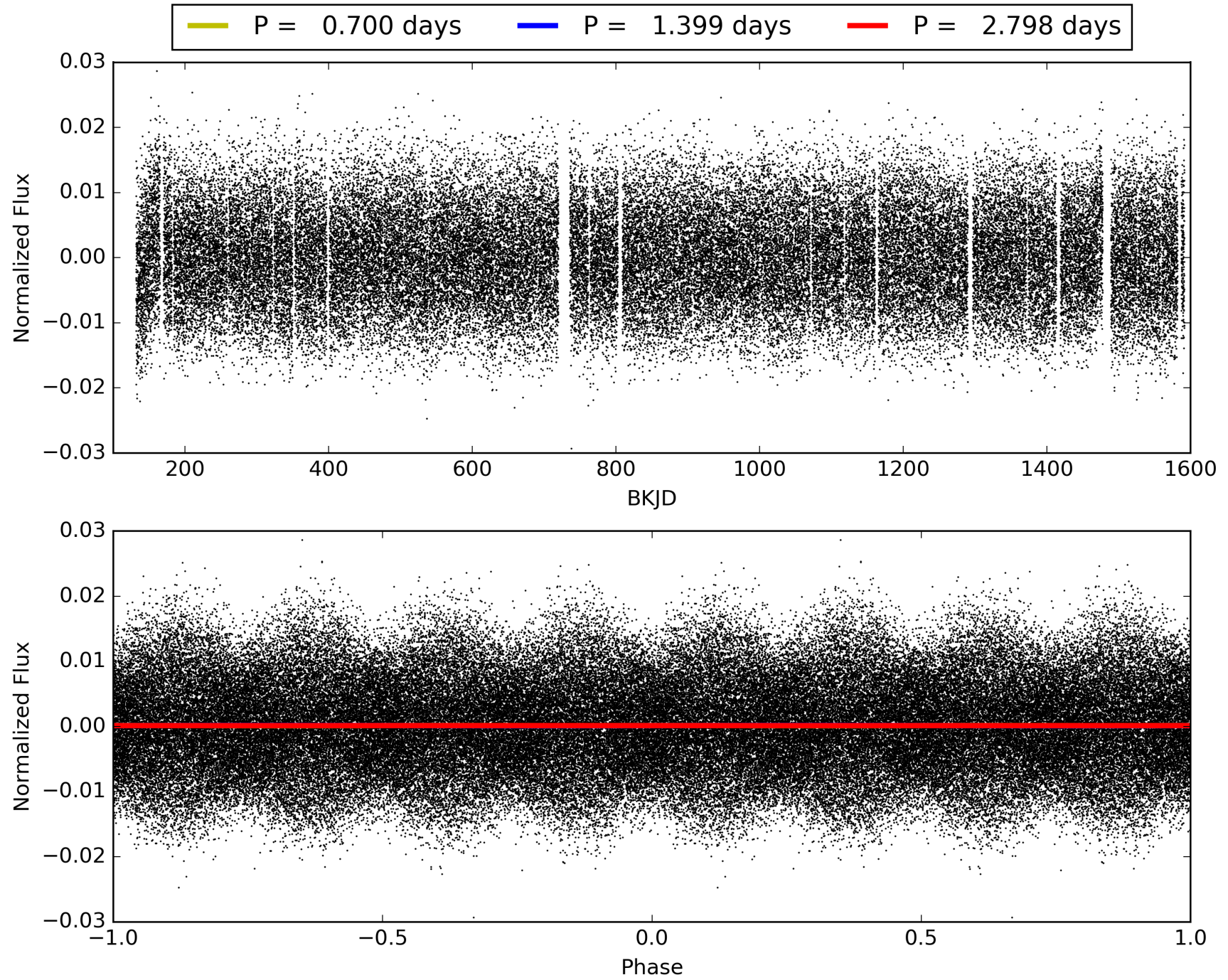
DV Diagnostic Results:

ShortPeriod-sig: 2.0% [0.02σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [917/918]
GhostDiagnostic-chr: 1.407
Centroid-sig: 0.3%
Centroid-so: 0.248 arcsec [1.97σ]
OotOffset-rm: 0.045 arcsec [0.30σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-rm: 0.136 arcsec [0.90σ]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 0.50 [8/16]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 009210037-01, PDC Light Curves

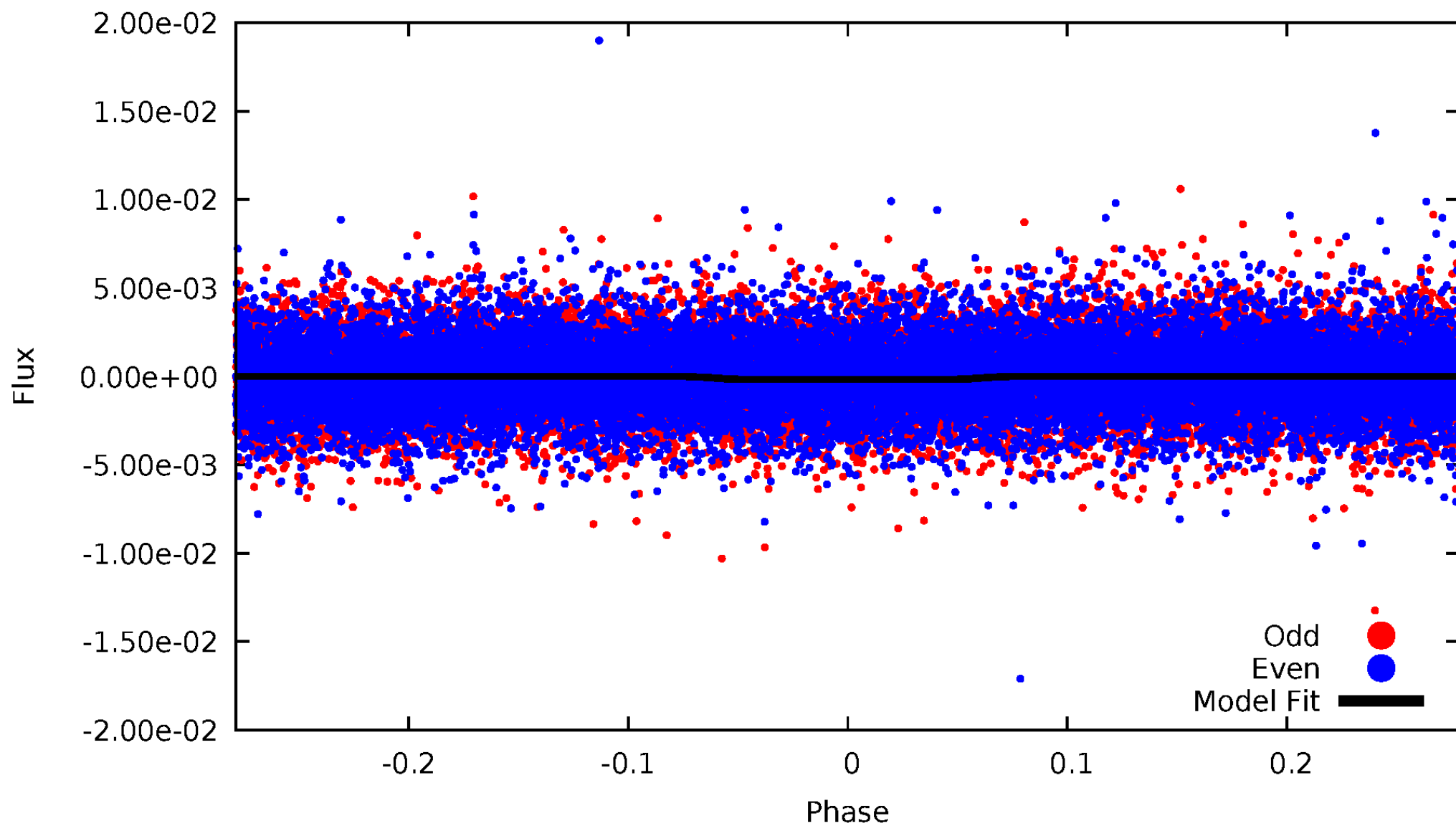


TCE 009210037-01



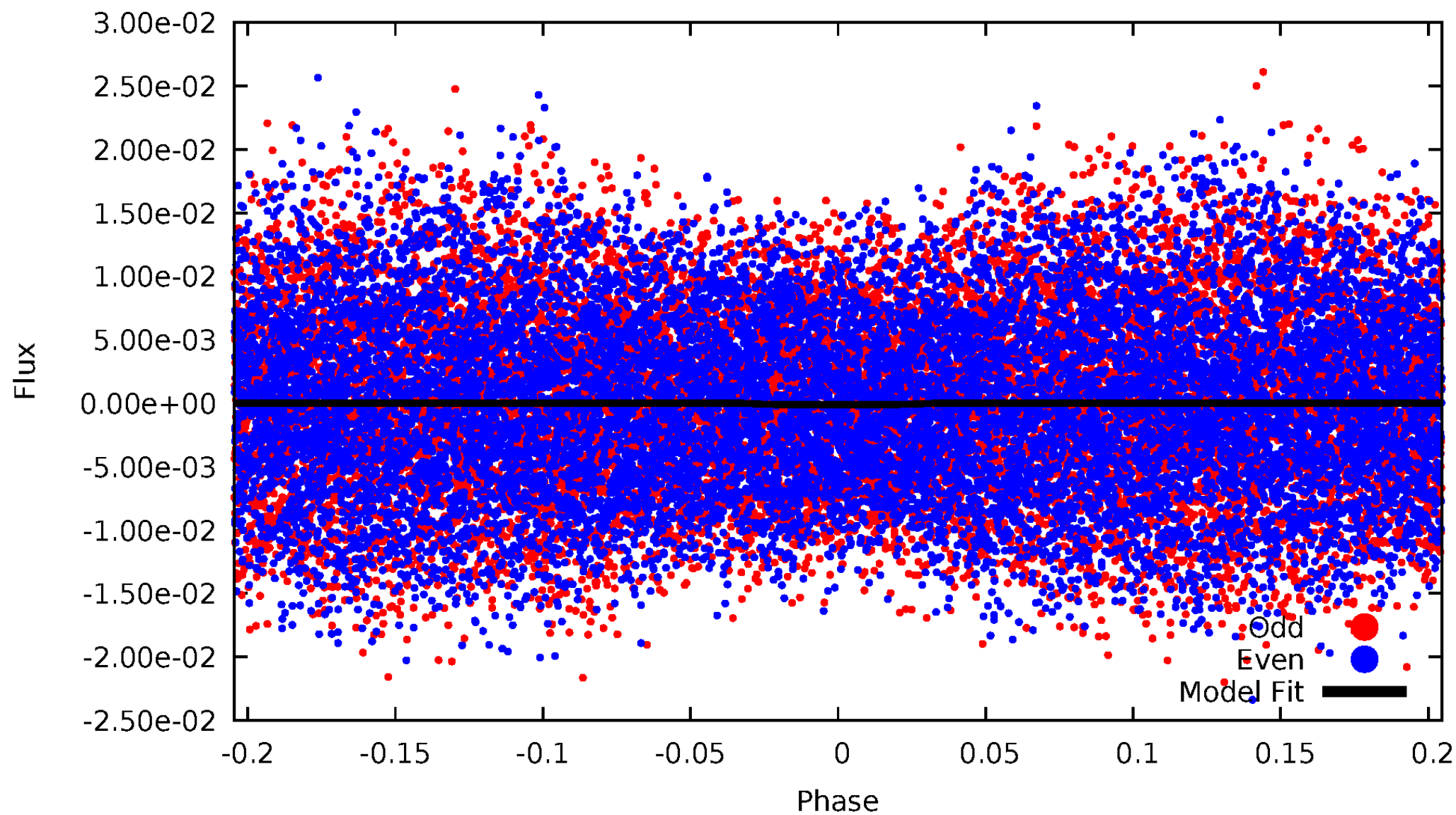
DV Odd/Even

TCE 009210037-01

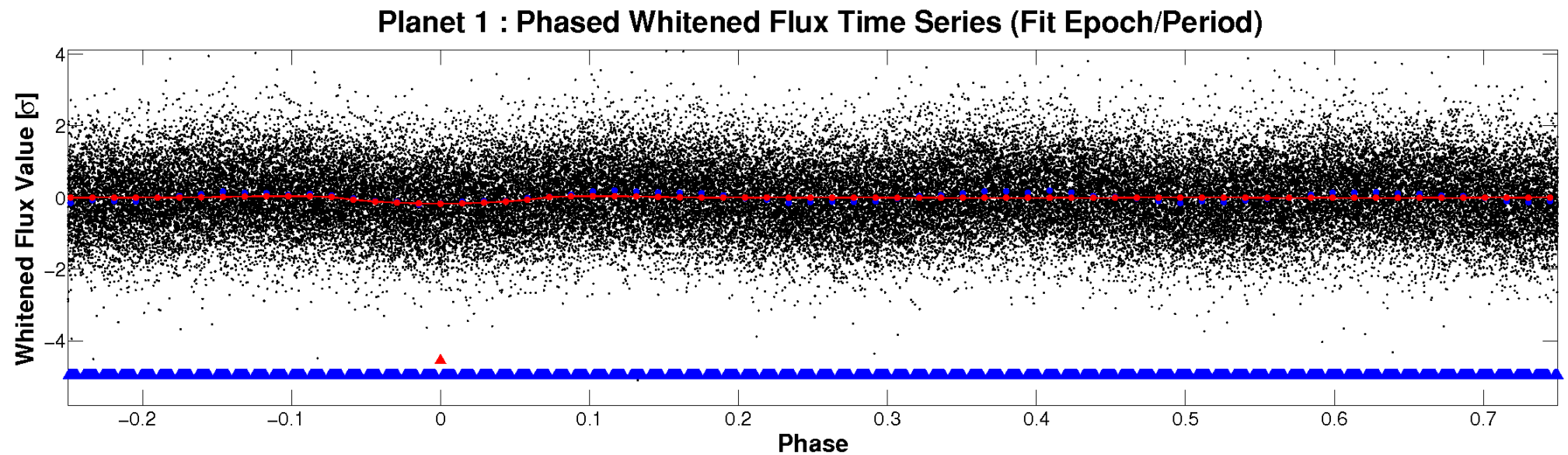
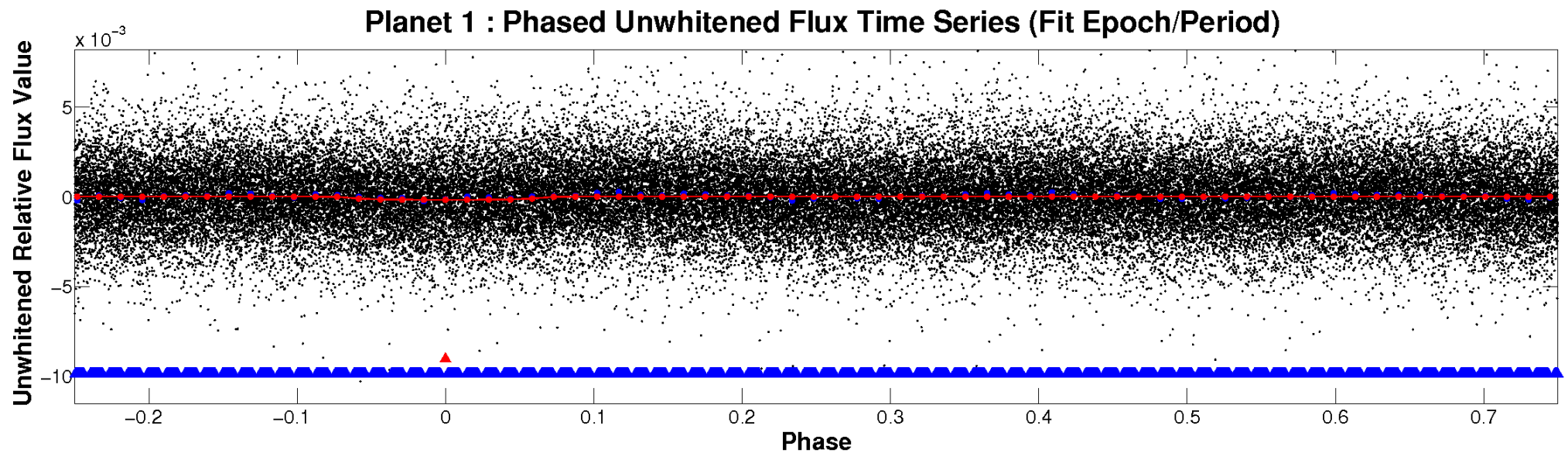


ALT Odd/Even

TCE 009210037-01

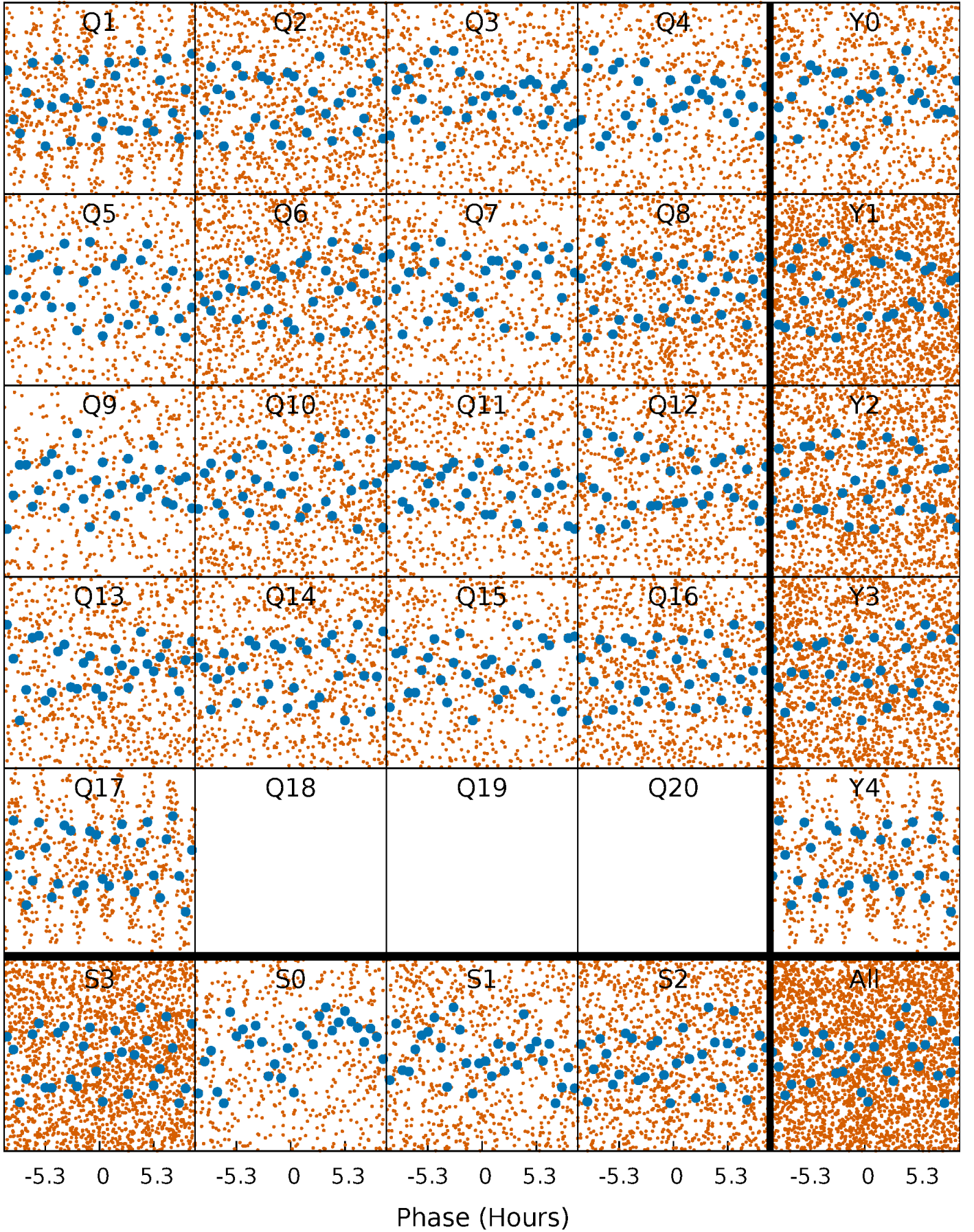


Non-Whitened Vs. Whitened Light Curve



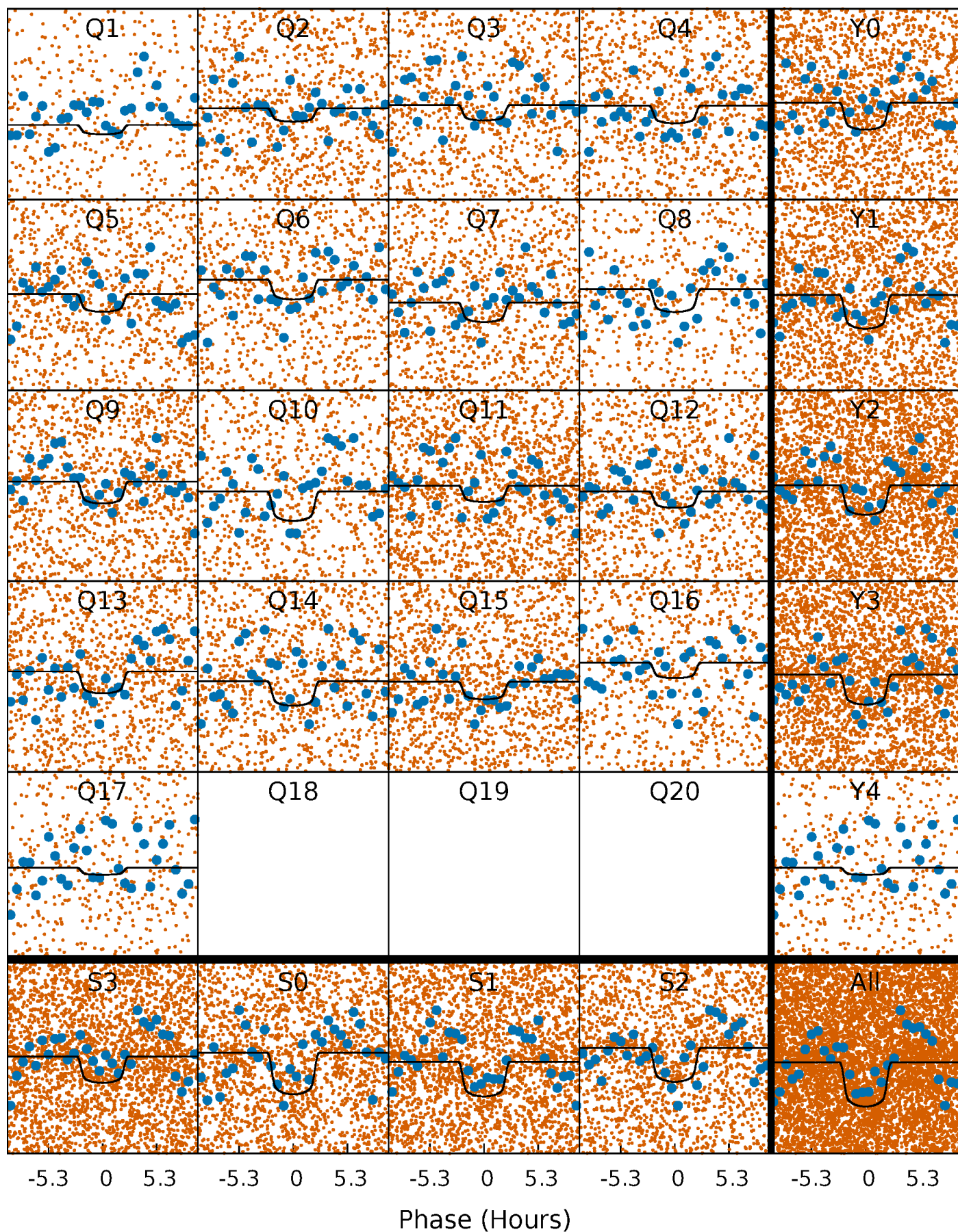
PDC Quarter-Phased Transit Curves

TCE 009210037-01 P= 1.399108 Days $T_0=131.975215$ (BKJD)



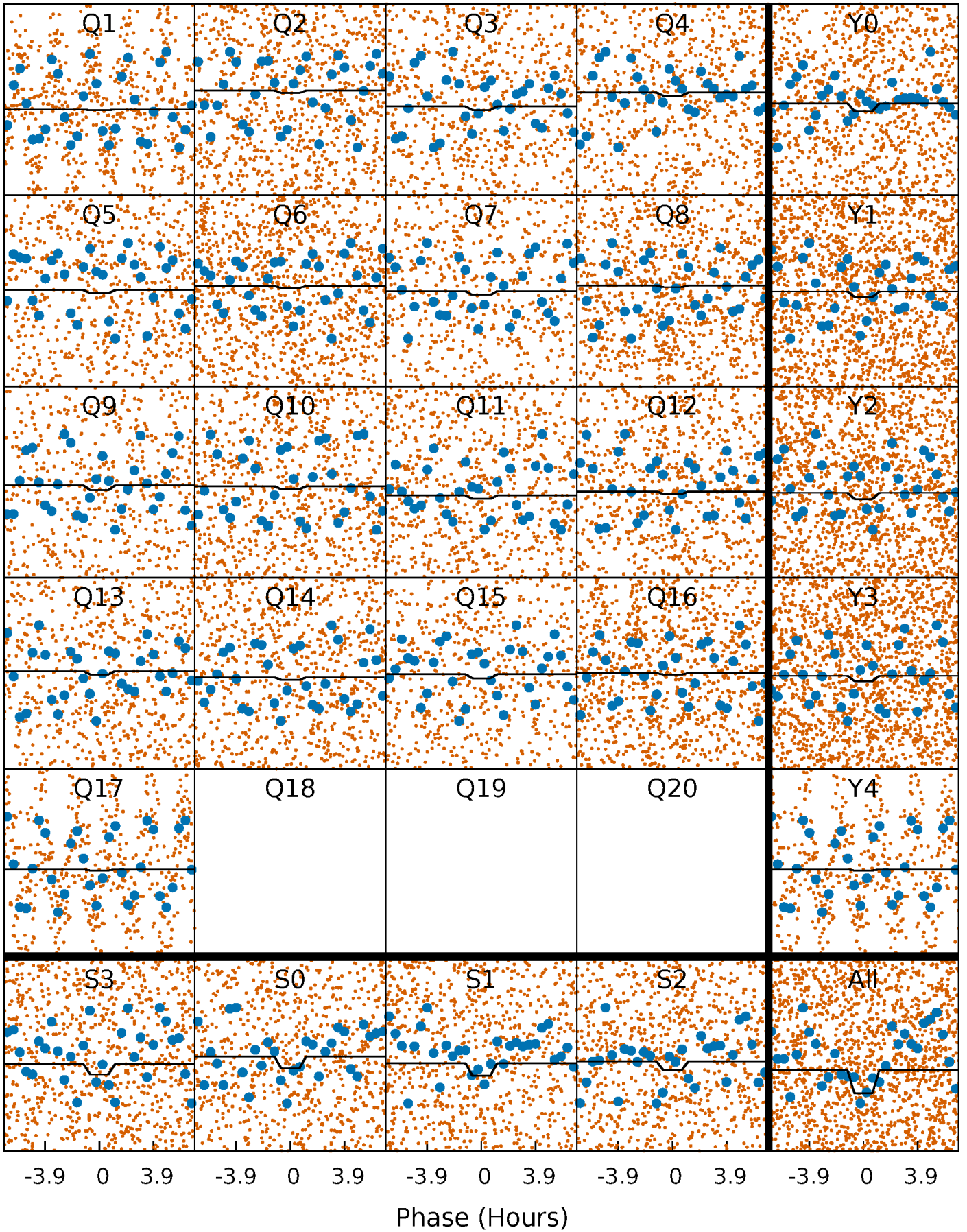
DV Quarter-Phased Transit Curves

TCE 009210037-01 P= 1.399108 Days $T_0=131.975215$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

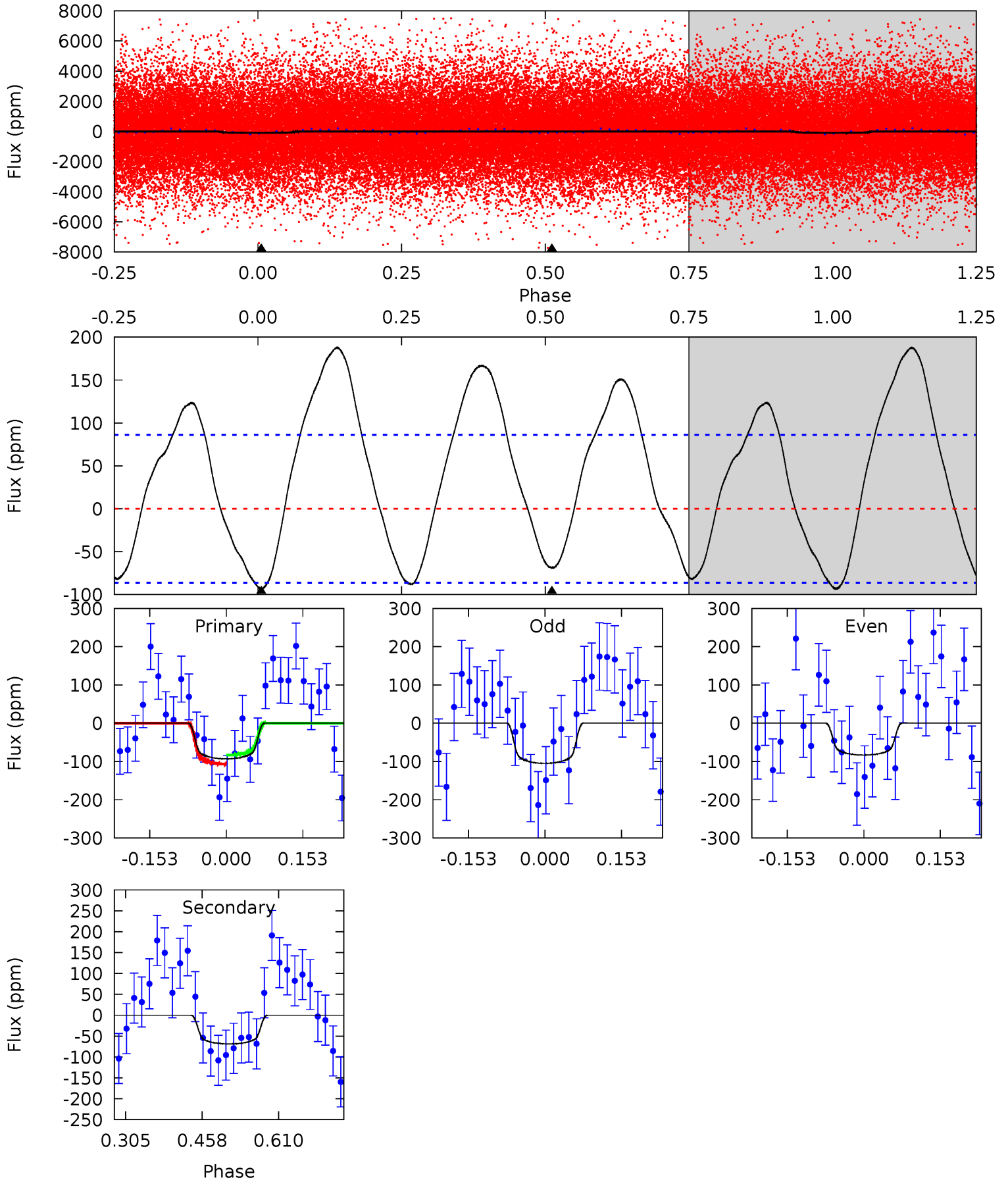
TCE 009210037-01 P= 1.399182 Days $T_0=131.940309$ (BKJD)



DV Model-Shift Uniqueness Test

009210037-01, P = 1.399108 Days, E = 130.576107 Days

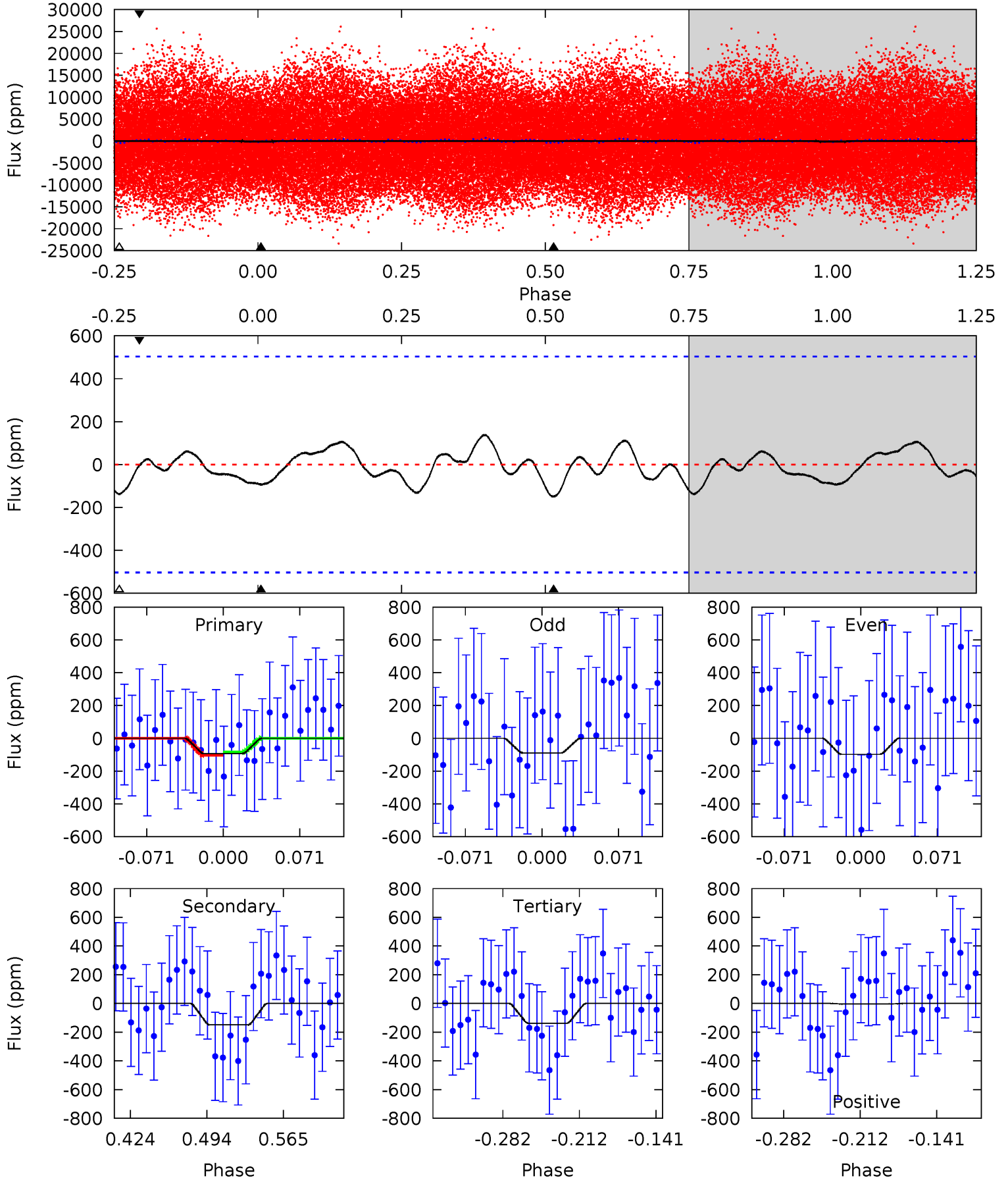
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.84	3.57	0	0	4.48	1.43	3.38	4.84	4.84	3.57	3.57	0.57	0.69	0.67	0.62



Alt Model-Shift Uniqueness Test

009210037-01, P = 1.399182 Days, E = 130.541127 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.86	1.38	1.27	-0.04	4.64	1.81	0.60	-0.41	0.90	0.10	1.41	0.04	1.19	0.48	0.08



Stellar Parameters For KIC 009210037

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6951^{+192}_{-312}	$3.907^{+0.279}_{-0.150}$	$0.260^{+0.150}_{-0.350}$	$2.471^{+0.587}_{-0.881}$	$1.796^{+0.185}_{-0.431}$	$0.168^{+0.328}_{-0.074}$
	+3%/-4%	+7%/-4%	+58%/-135%	+24%/-36%	+10%/-24%	+196%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009210037-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-69 ± 19	$3.61^{+1.24}_{-1.08}$	3829^{+269}_{-351}	5130^{+1032}_{-689}	$2.508^{+2.652}_{-1.190}$
Alt.	-149 ± 109	$2.82^{+1.21}_{-1.06}$	3838^{+323}_{-333}	7128^{+2850}_{-2311}	$7.929^{+16.293}_{-6.258}$

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 $A_{obs} \gg 1.0$

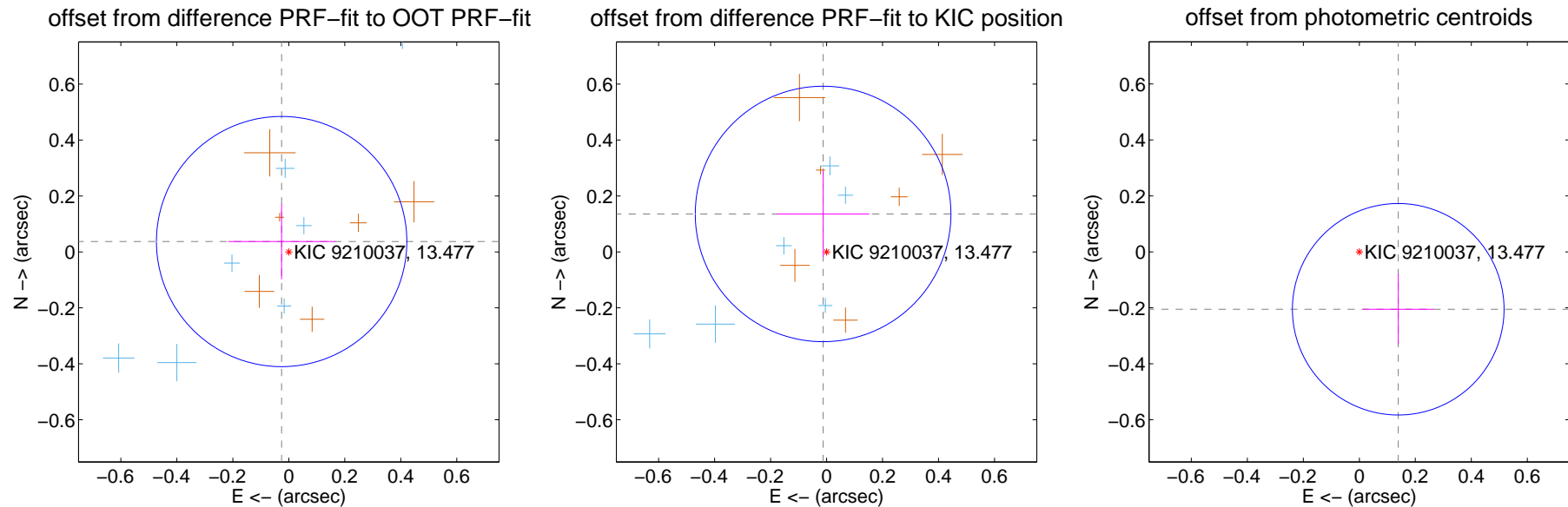
DV Centroid Data

Supplemental centroid analysis for 009210037-01. Kepler magnitude: 13.48. Transit SNR 12.48

There are 8 quarters with good PRF difference image offsets

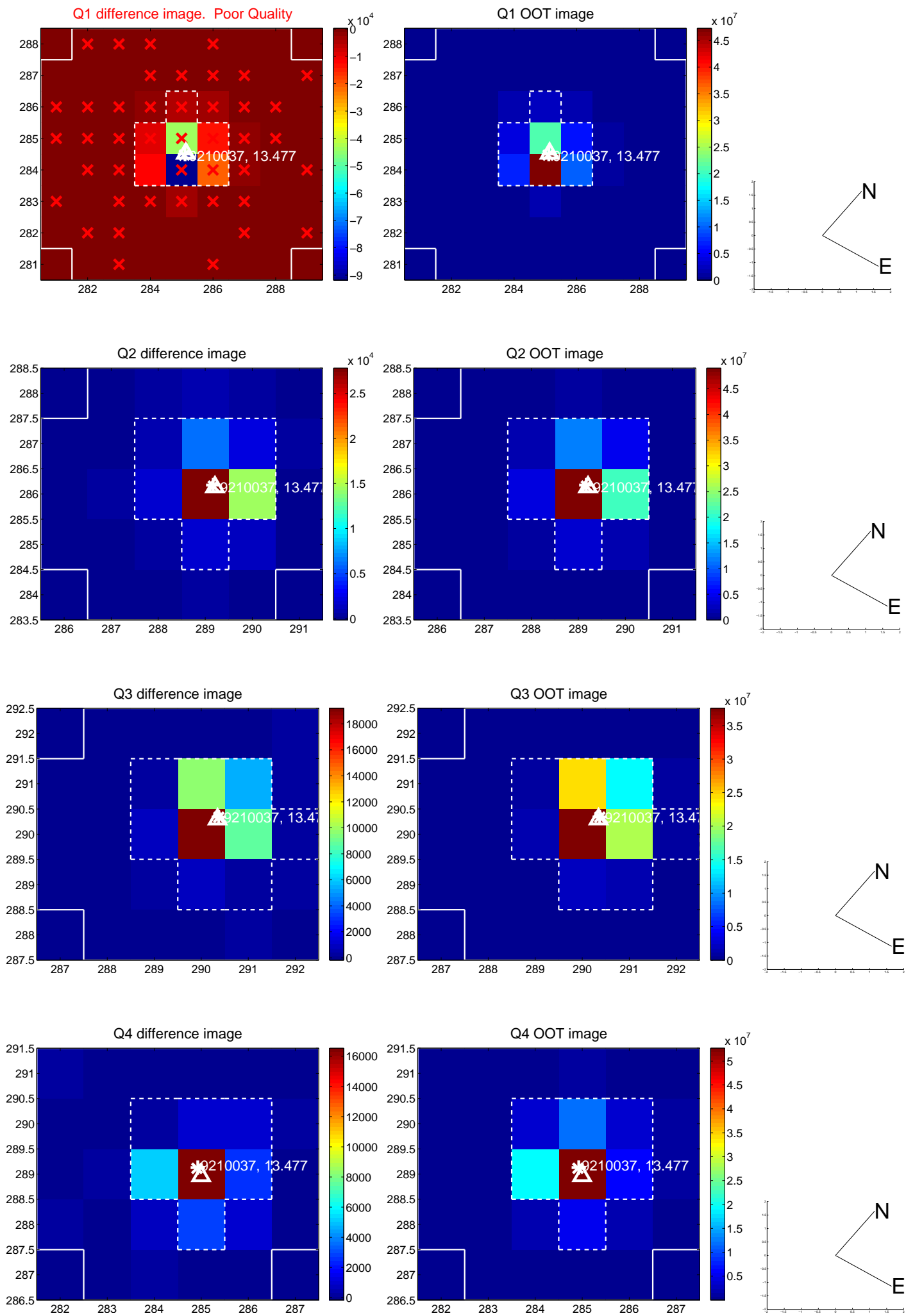
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.045 ± 0.149	0.30	0.026 ± 0.191	0.037 ± 0.135
PRF-fit source offset from KIC position	0.136 ± 0.152	0.90	0.012 ± 0.165	0.136 ± 0.154
photometric centroid source offset	0.25 ± 0.13	1.97	-0.14 ± 0.13	-0.21 ± 0.13

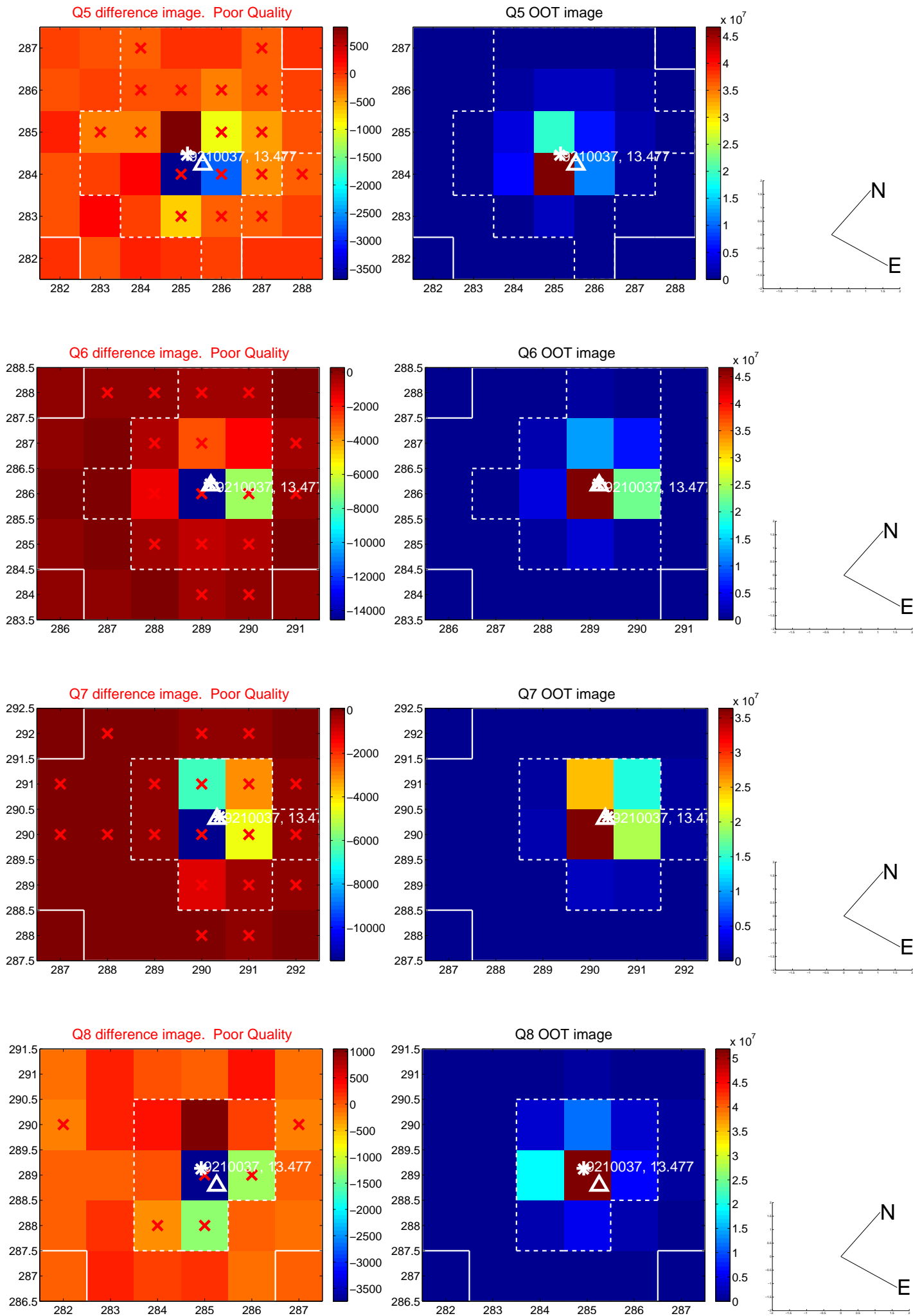


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

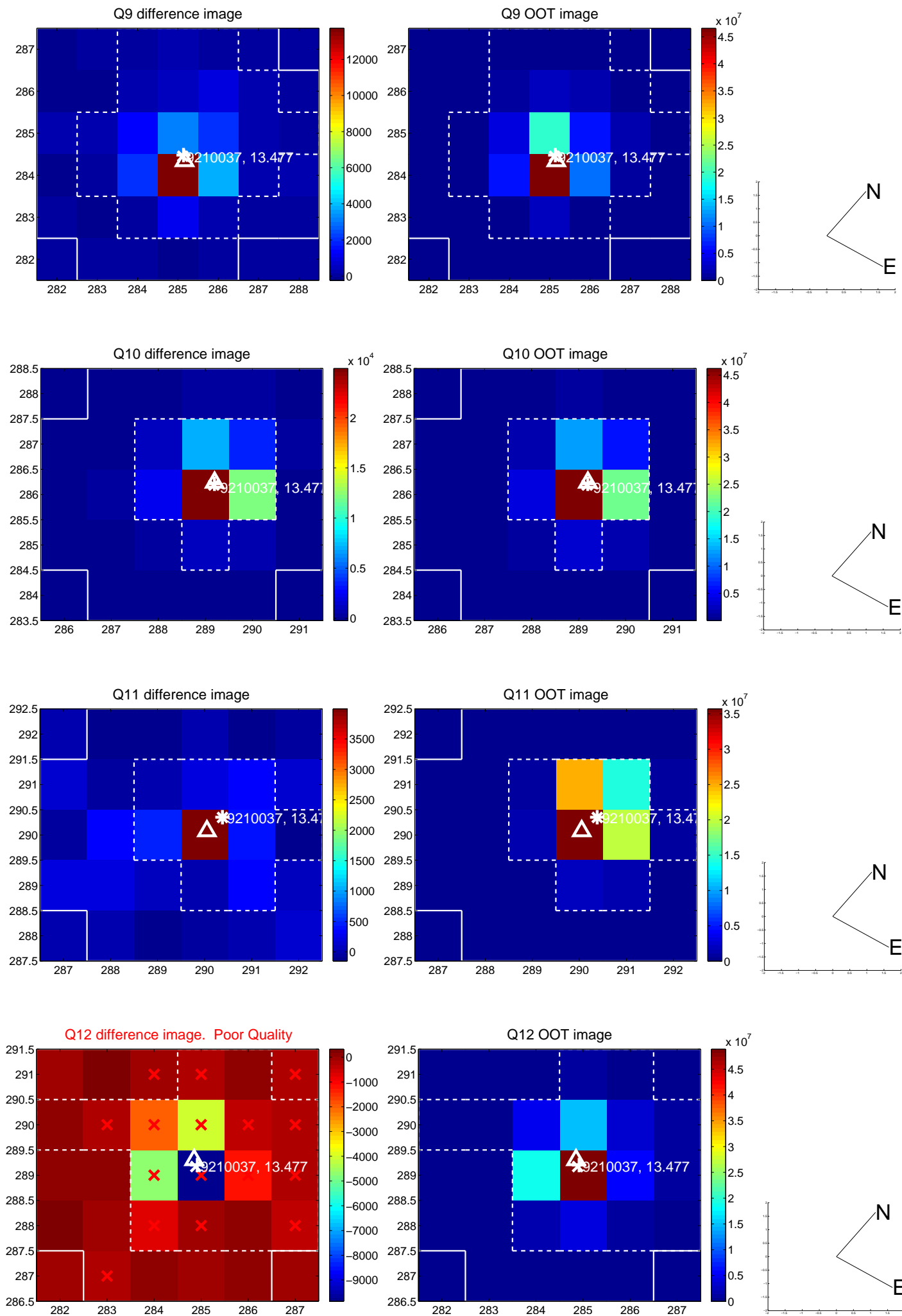
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



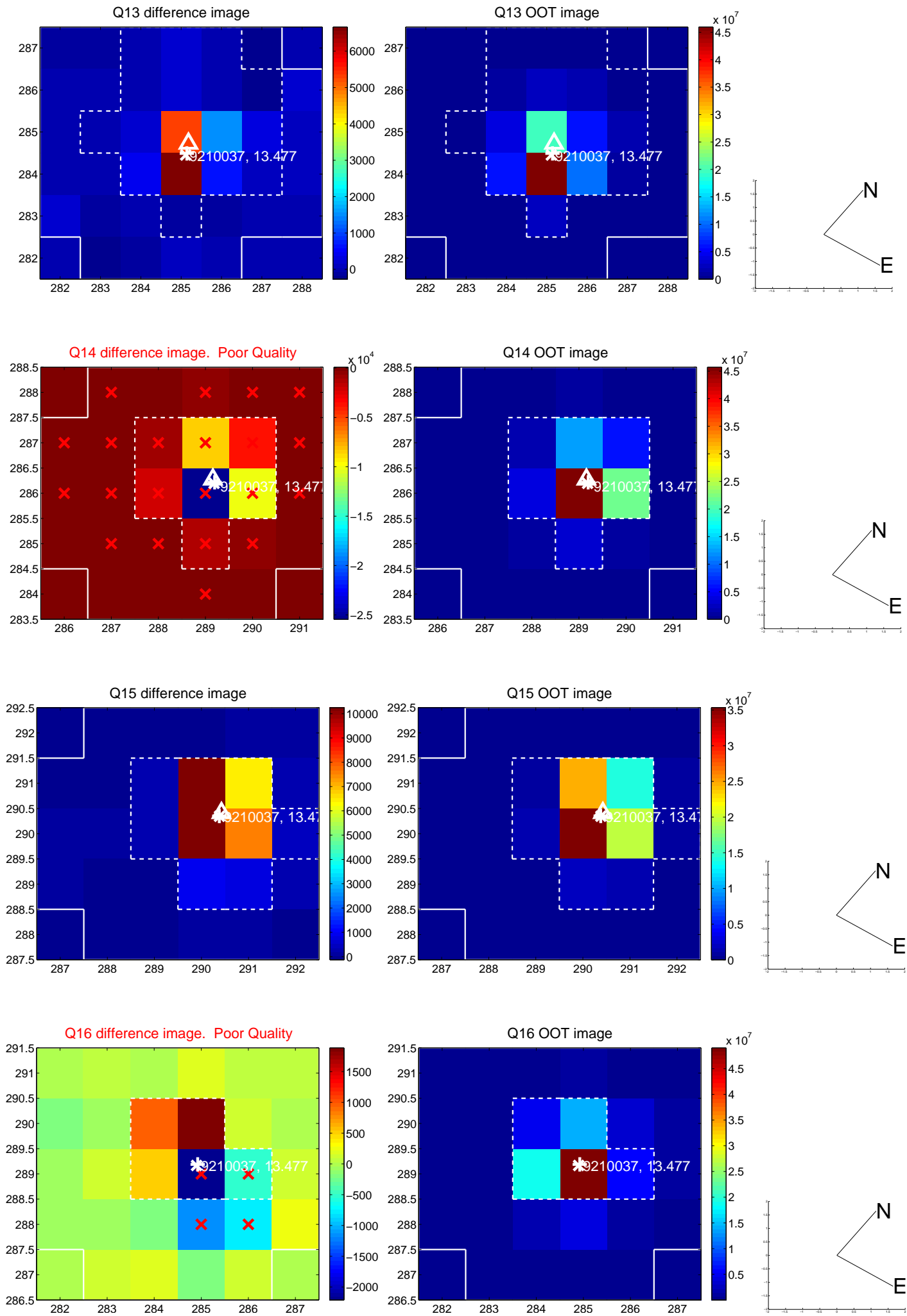
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



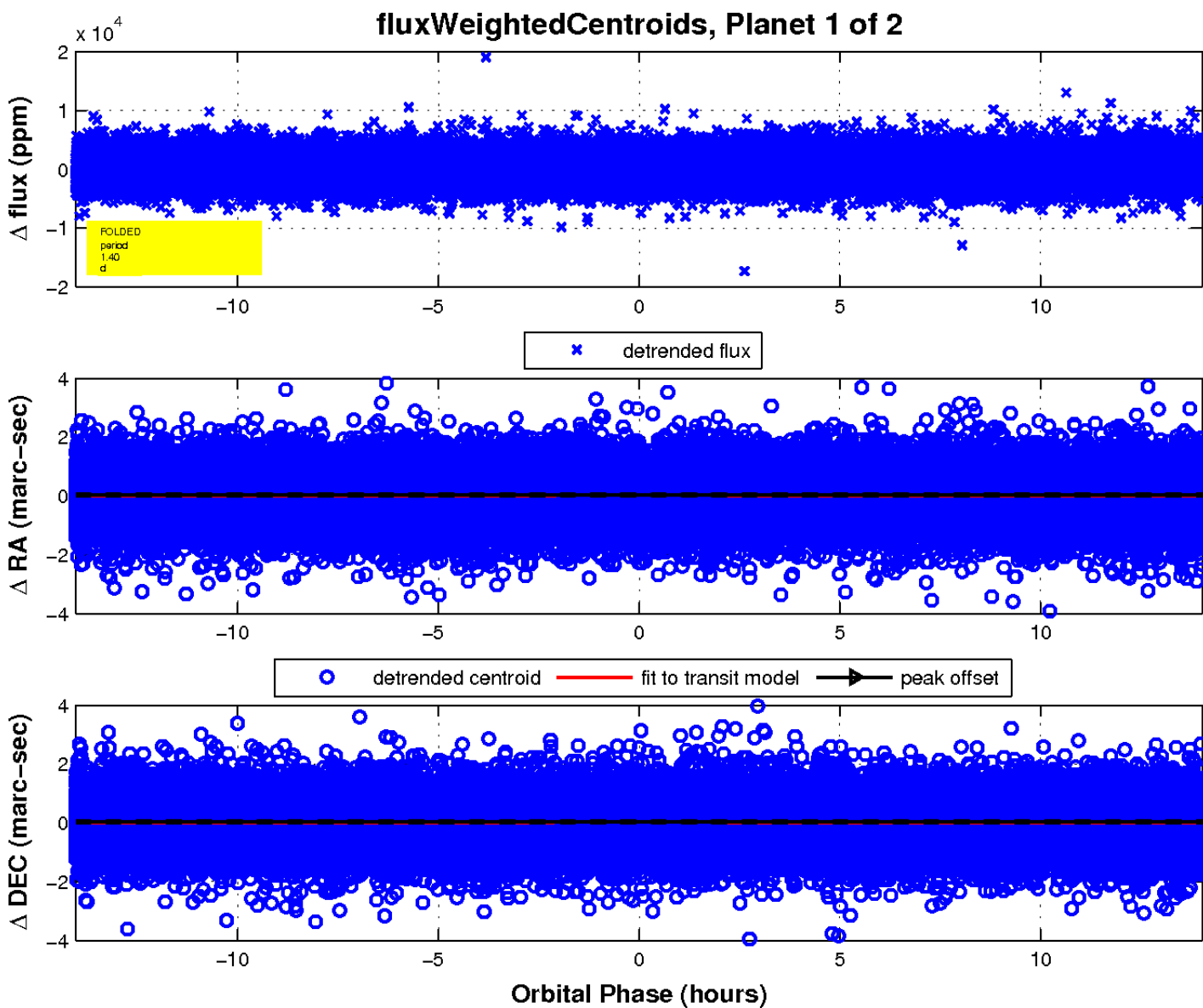
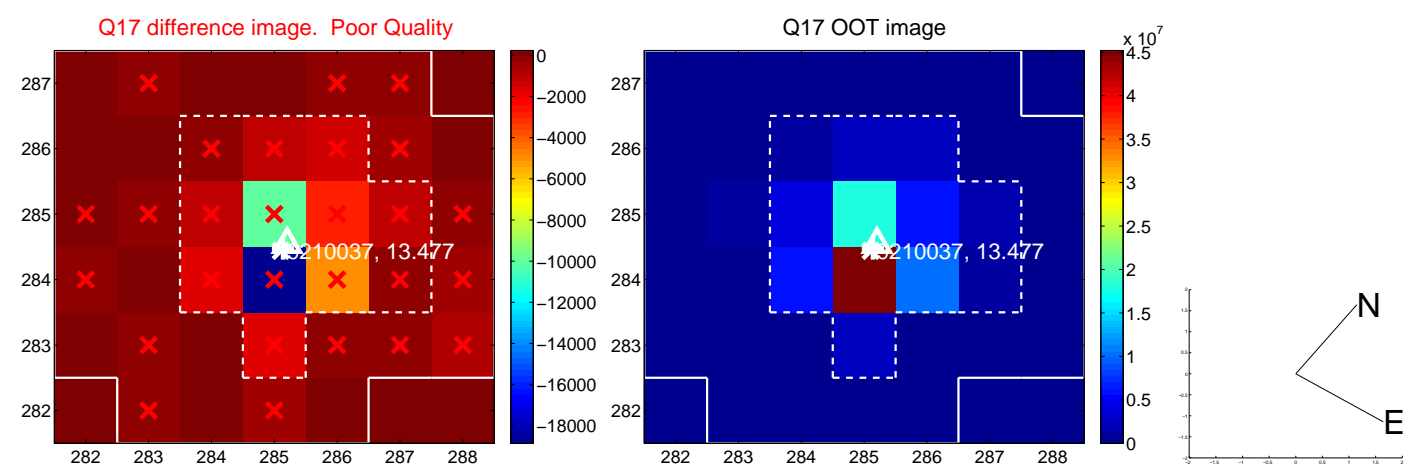
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



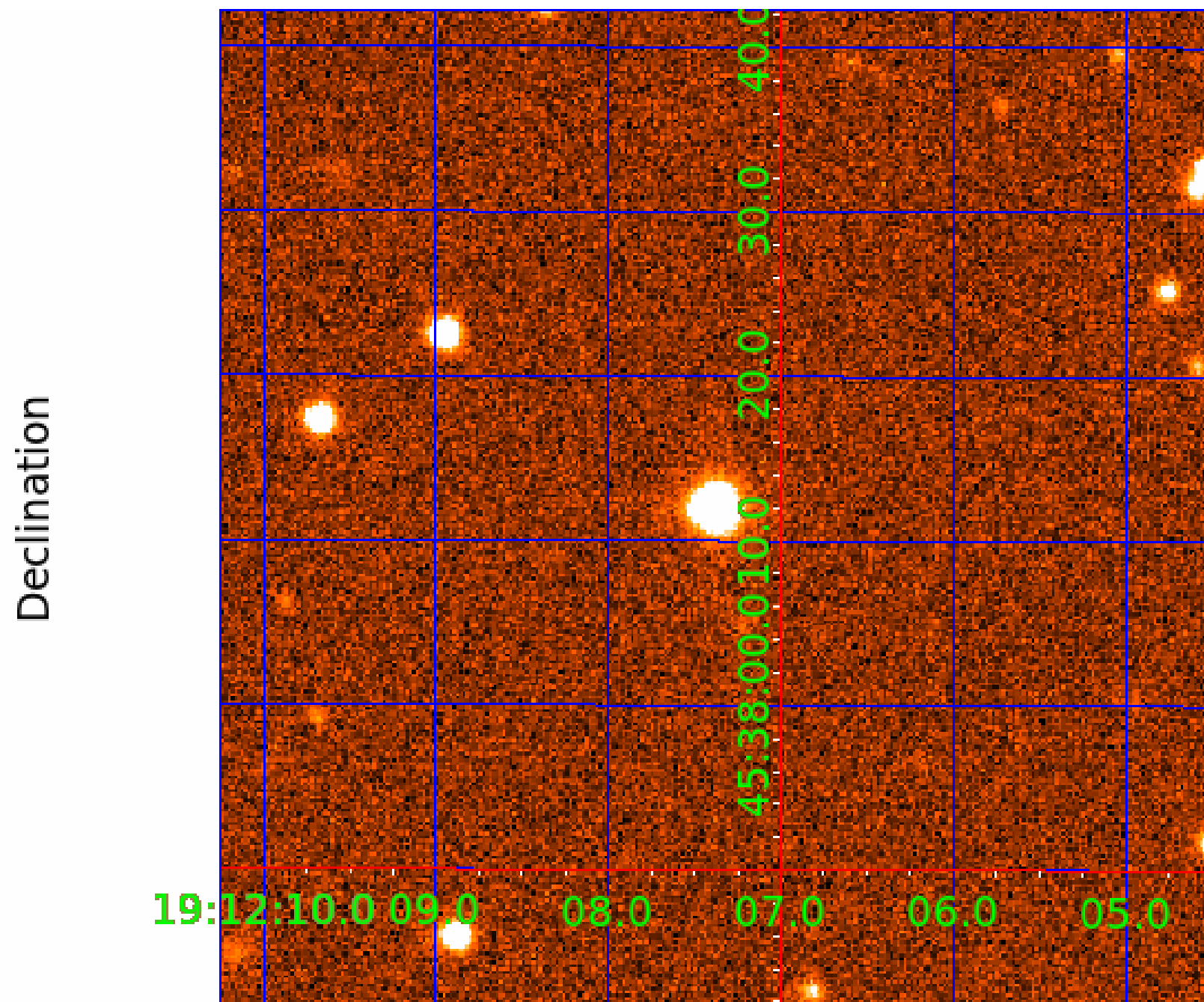
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009210037

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})
009210037-01	OBS	No	1.399108	131.975215	177.9	4.678	13.1	12.5	2.47	6951	3.88	14405.57
009210037-02	OBS	No	1.381409	131.675652	383.6	16.577	10.4	24.5	2.47	6951	5.19	14652.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009210037-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009210037-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—CENT_UNRESOLVED_OFFSET

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

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

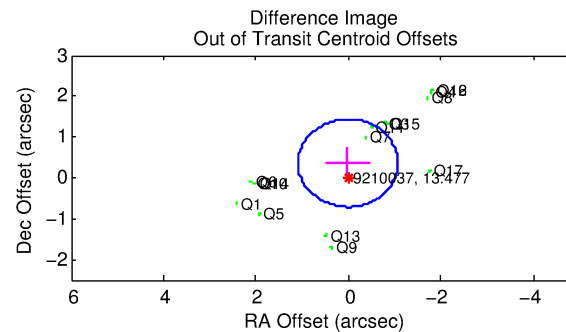
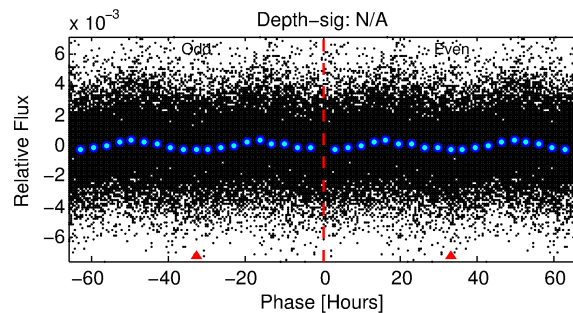
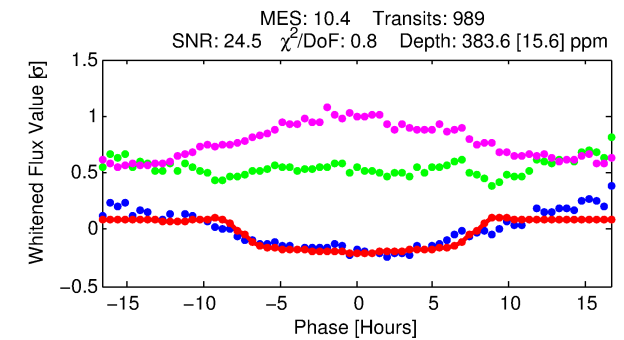
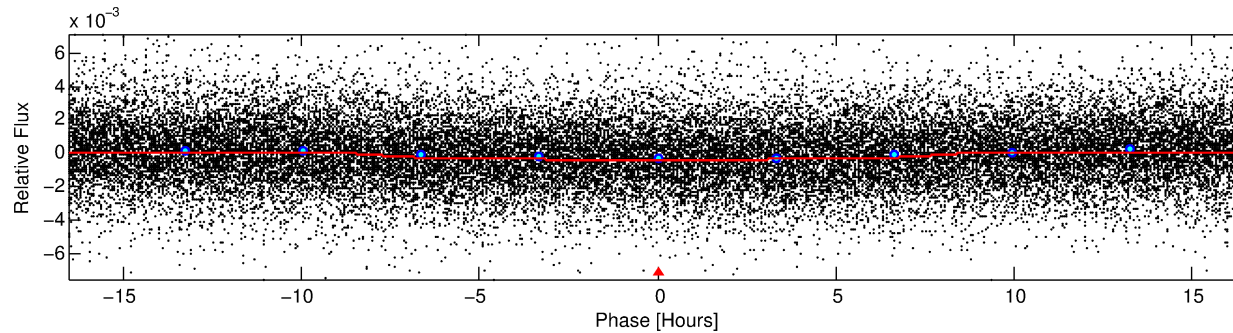
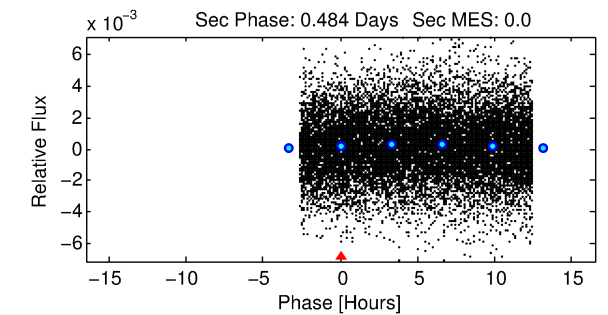
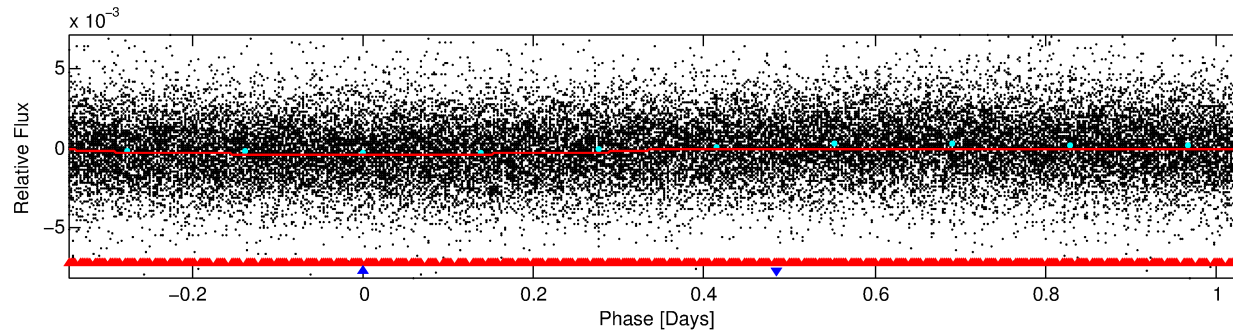
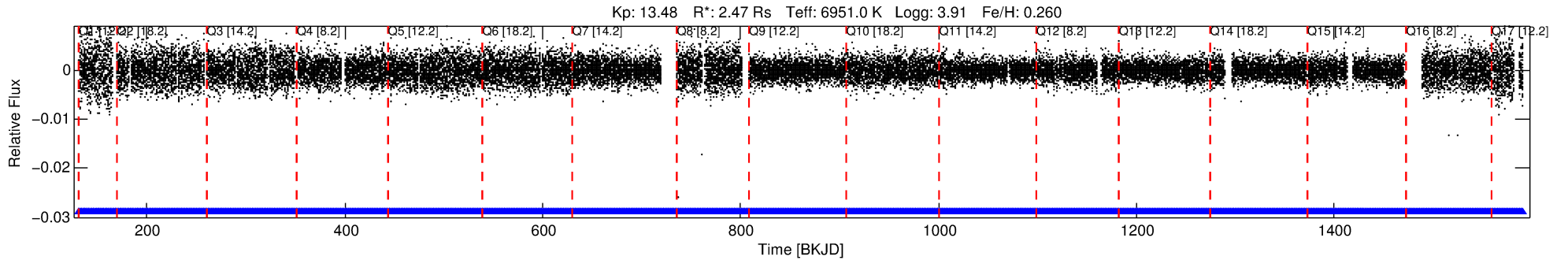
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009210037-02

No Significant Match Found

DV One-Page Summary

KIC: 9210037 Candidate: 2 of 2 Period: 1.381 d



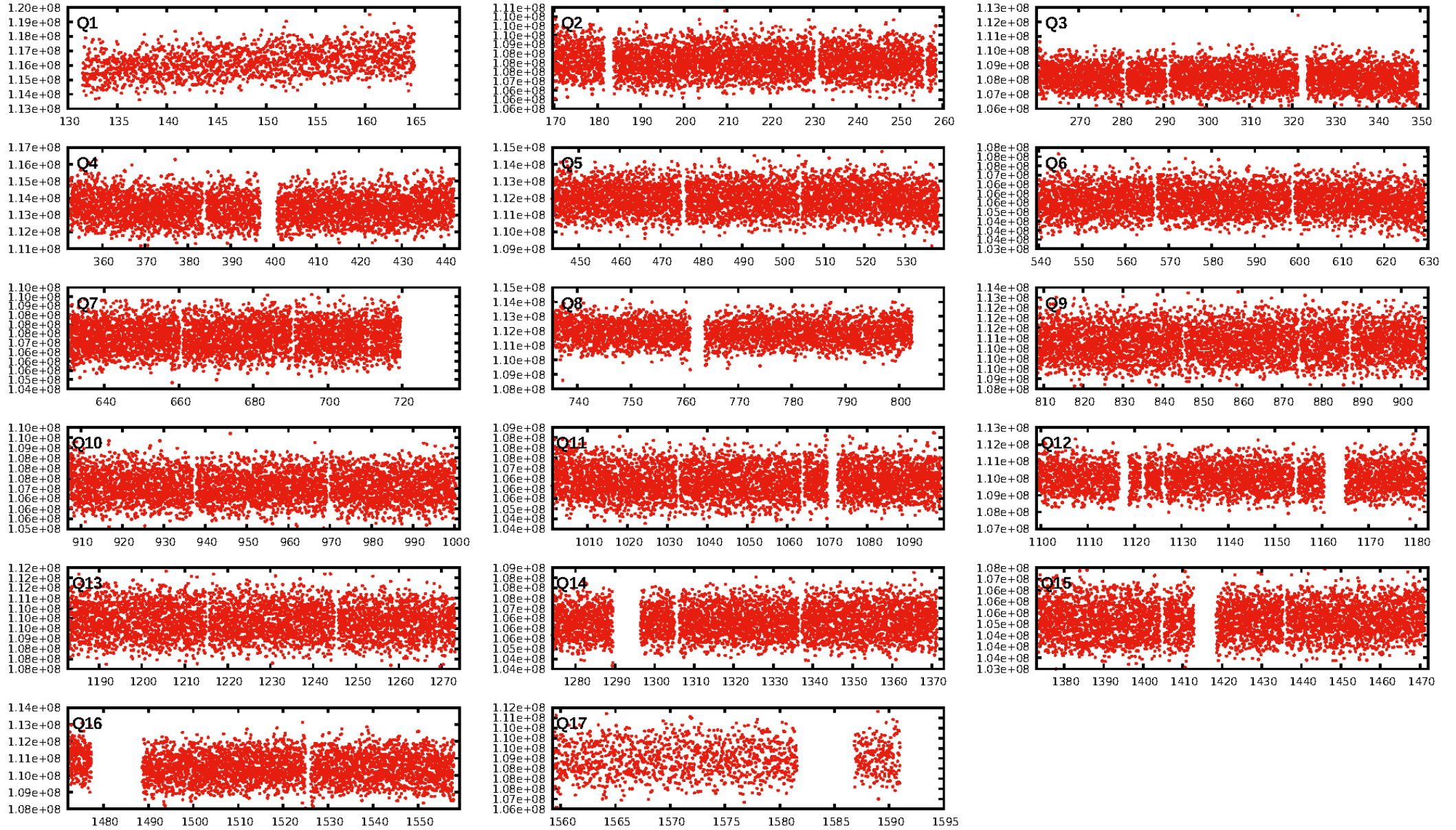
DV Fit Results:

Period = 1.38141 [0.00001] d
Epoch = 131.6757 [0.0071] BKJD
Rp/R* = 0.0193 [0.0017]
a/R* = 1.00 [0.00]
b = 0.71 [0.35]
Seff = 14652.19 [7643.85]
Teff = 2805 [366] K
Rp = 5.19 [1.90] Re
a = 0.0295 [0.0094] AU
Ag = N/A
Teffp = N/A

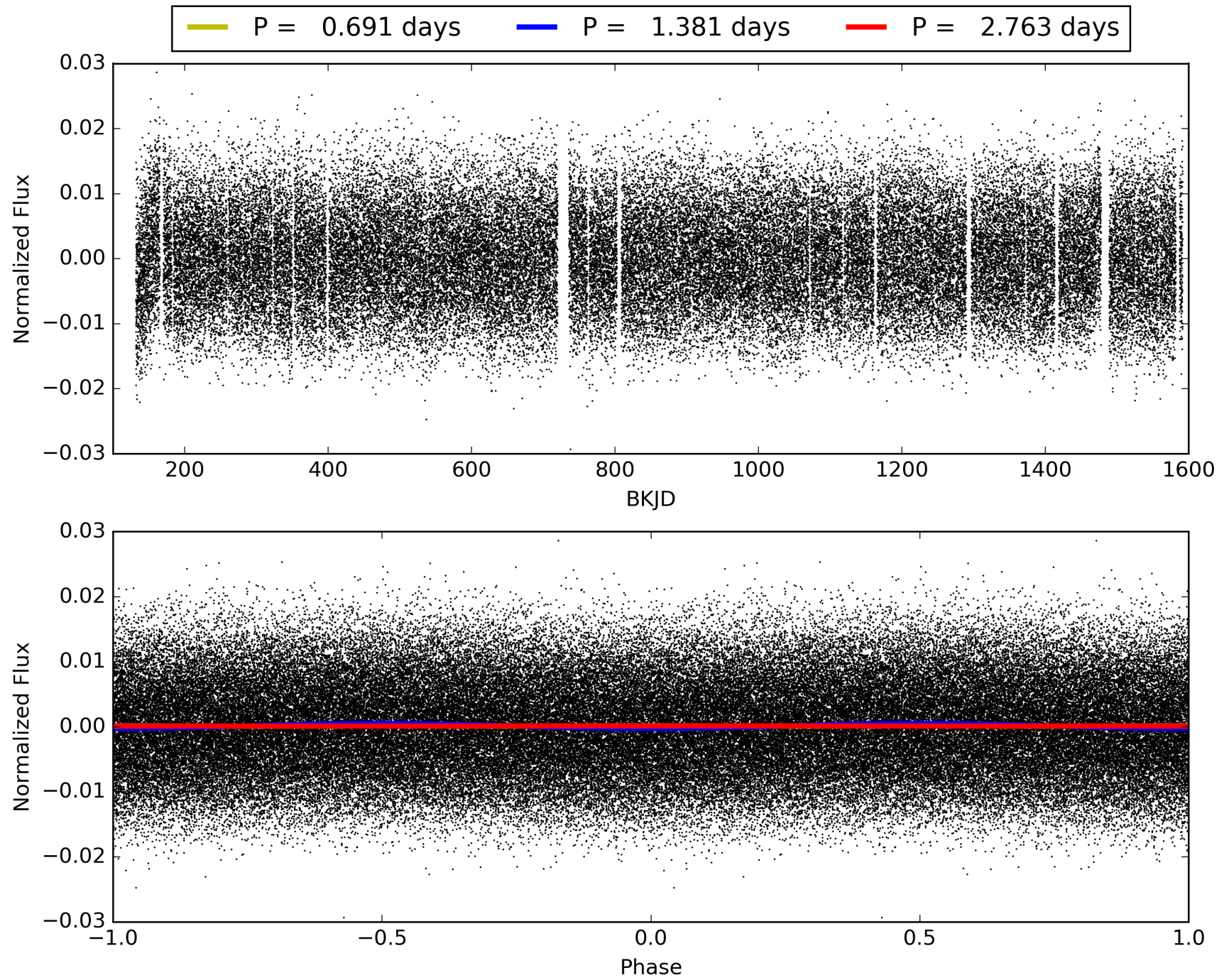
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 2.0% [0.02σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [945/945]
GhostDiagnostic-chr: 1.375
Centroid-sig: 8.4%
Centroid-so: 0.052 arcsec [1.57σ]
OotOffset-rm: 0.364 arcsec [1.01σ]
KicOffset-rm: 0.458 arcsec [1.29σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.81 [13/16]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 009210037-02, PDC Light Curves

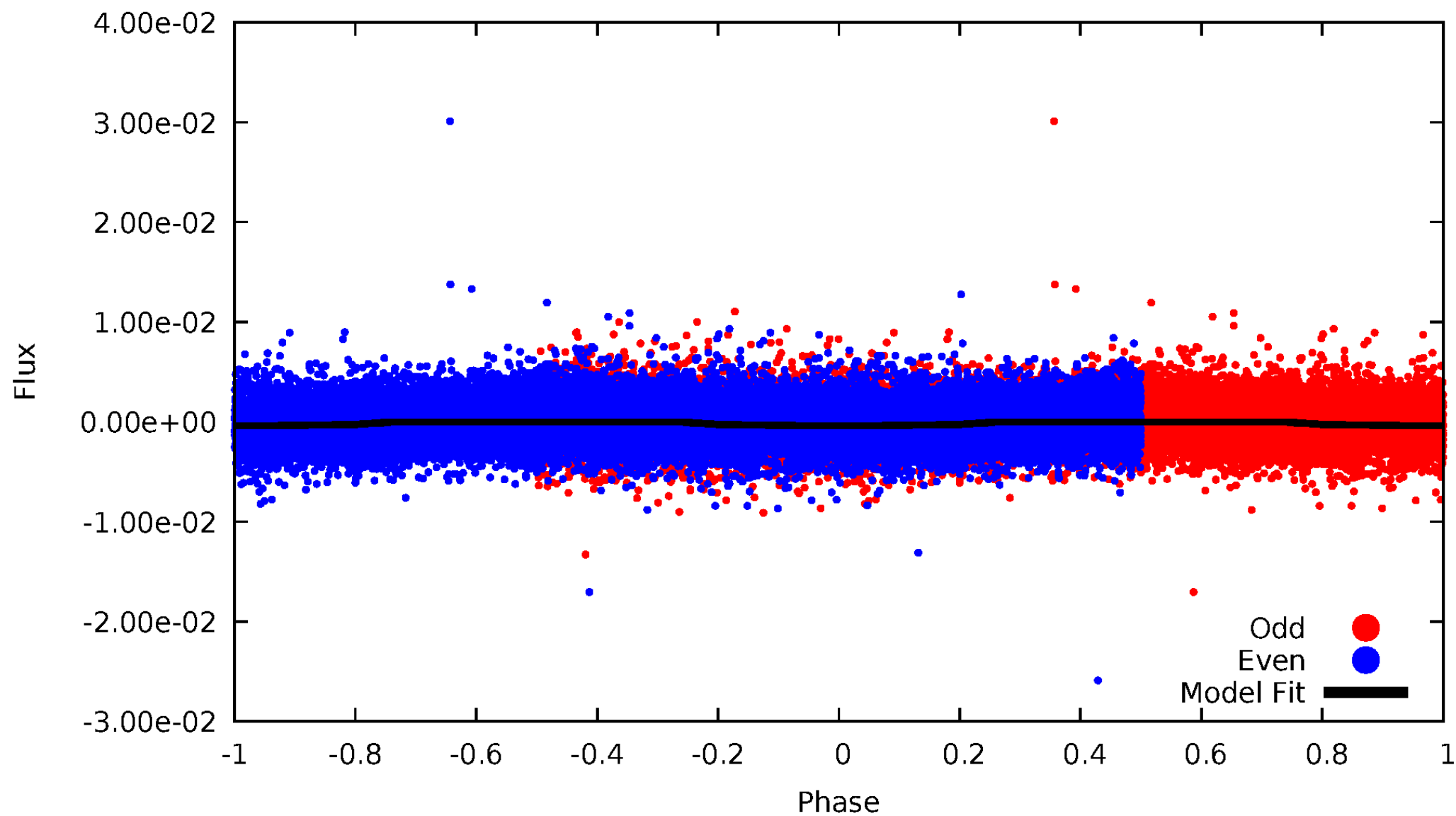


TCE 009210037-02



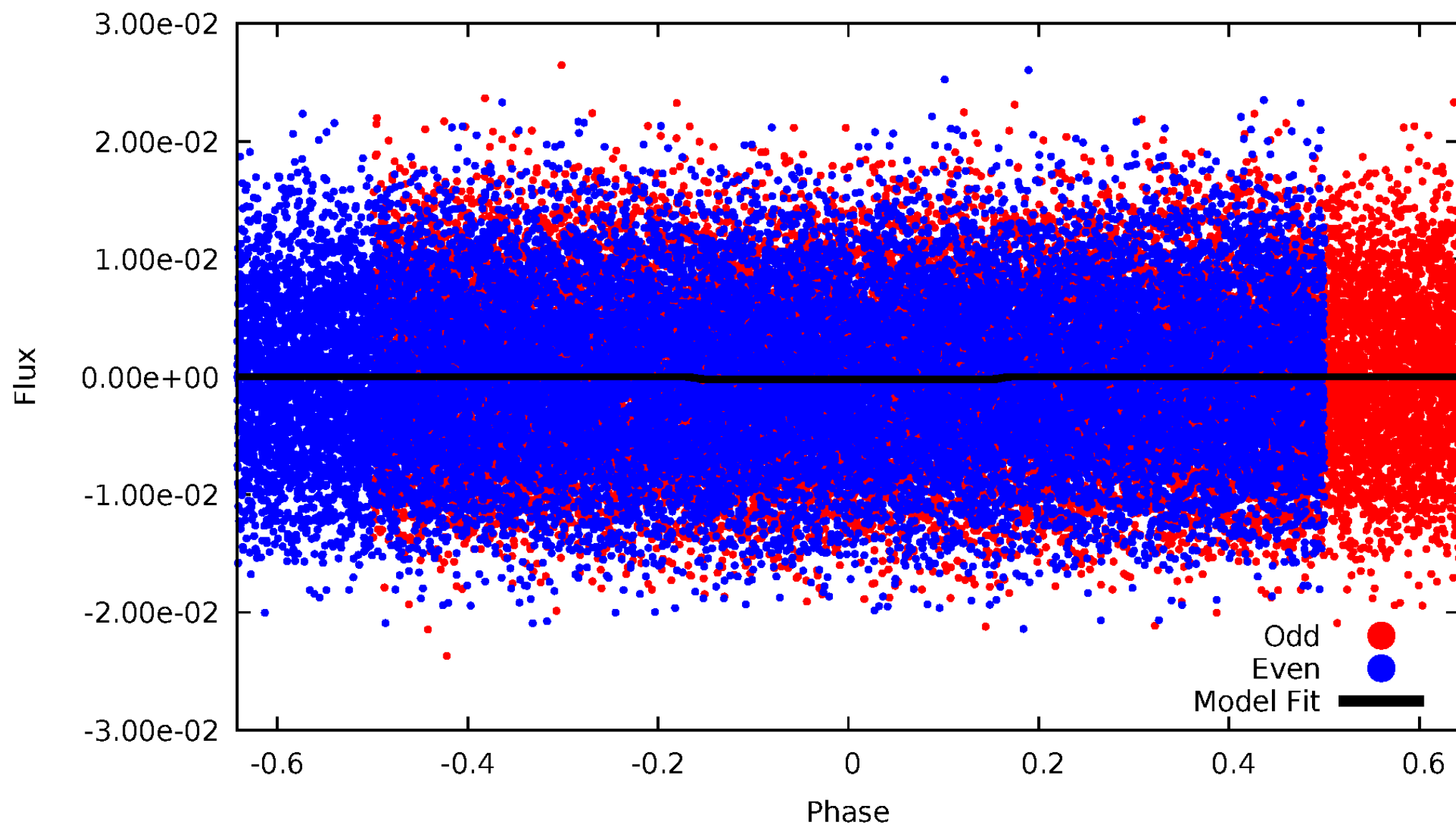
DV Odd/Even

TCE 009210037-02



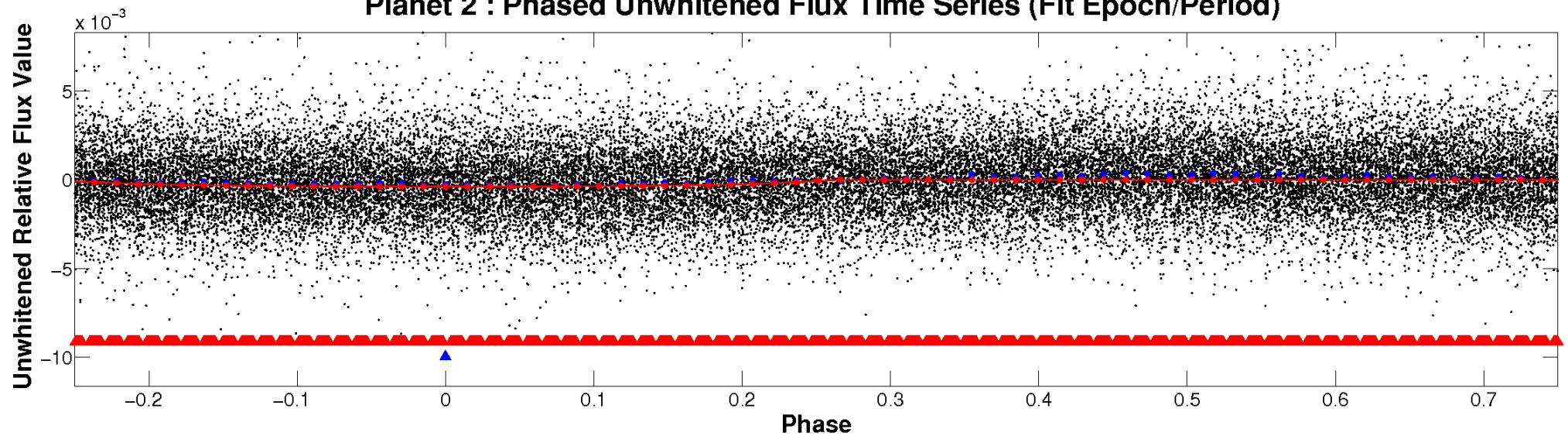
ALT Odd/Even

TCE 009210037-02

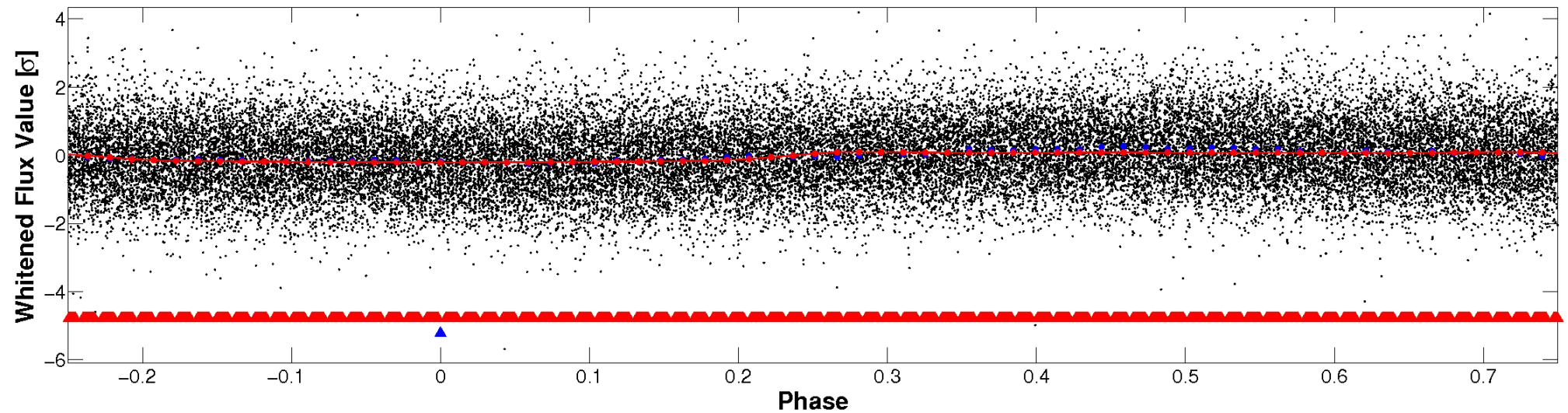


Non-Whitened Vs. Whitened Light Curve

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

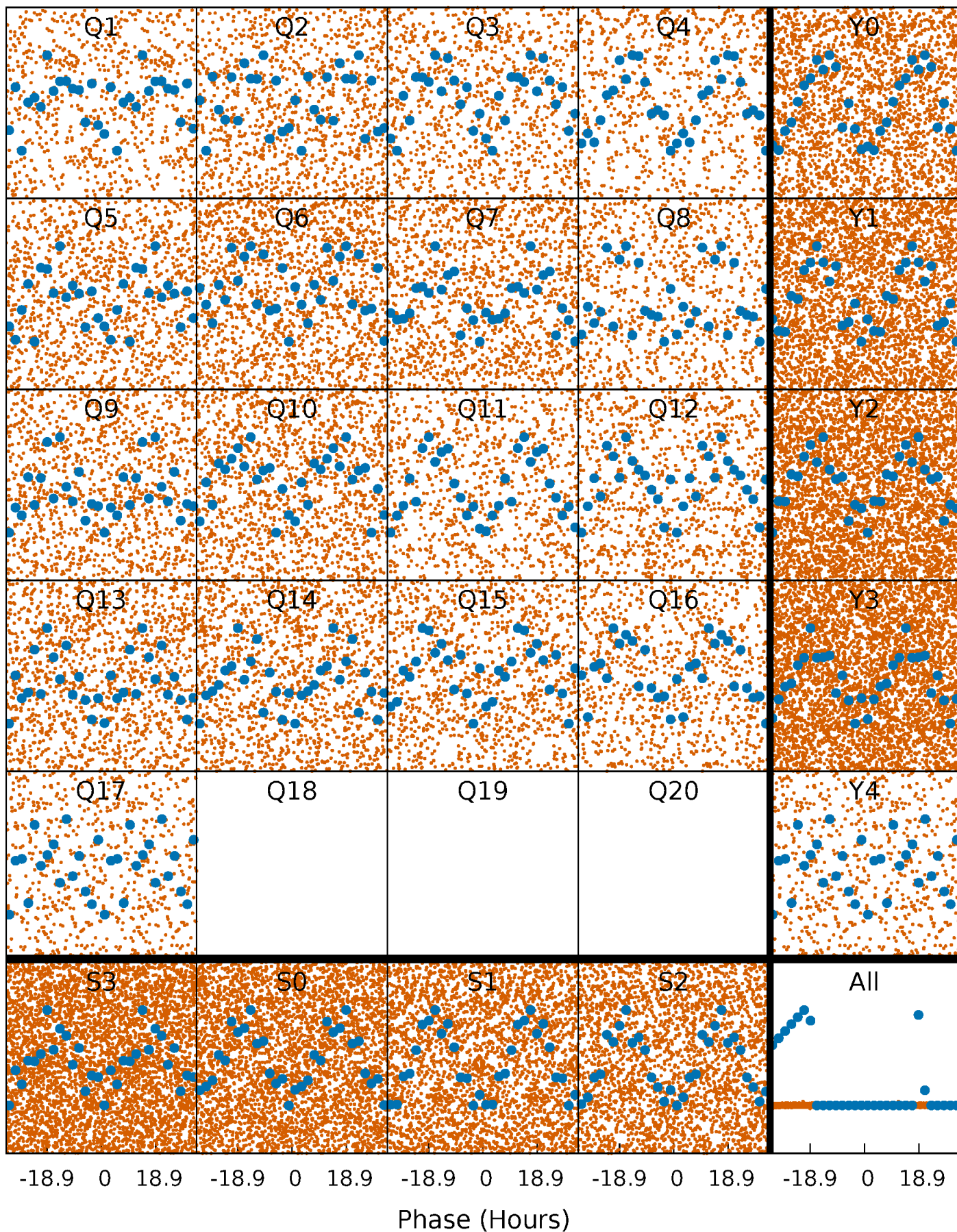


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



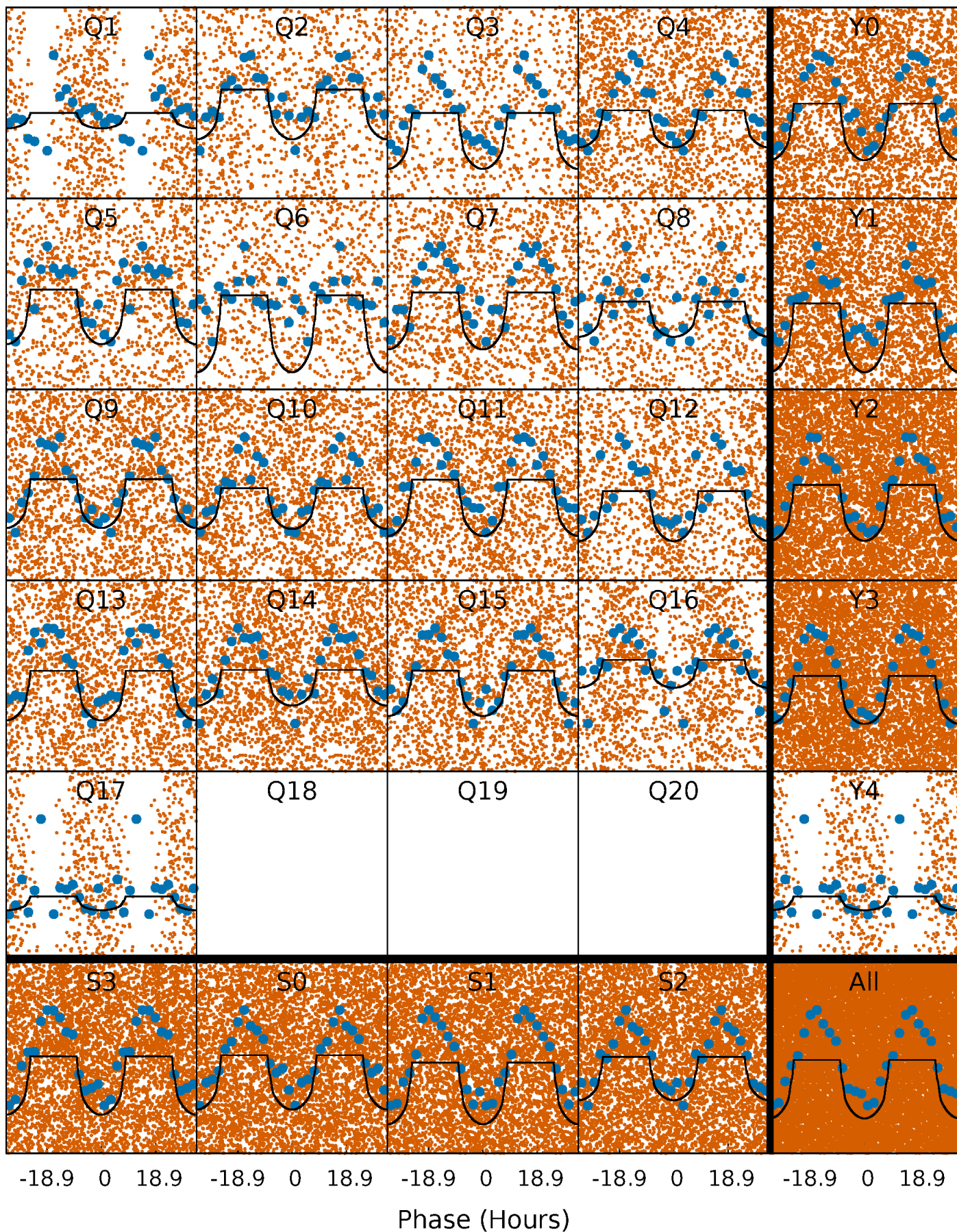
PDC Quarter-Phased Transit Curves

TCE 009210037-02 P= 1.381409 Days $T_0=131.675652$ (BKJD)



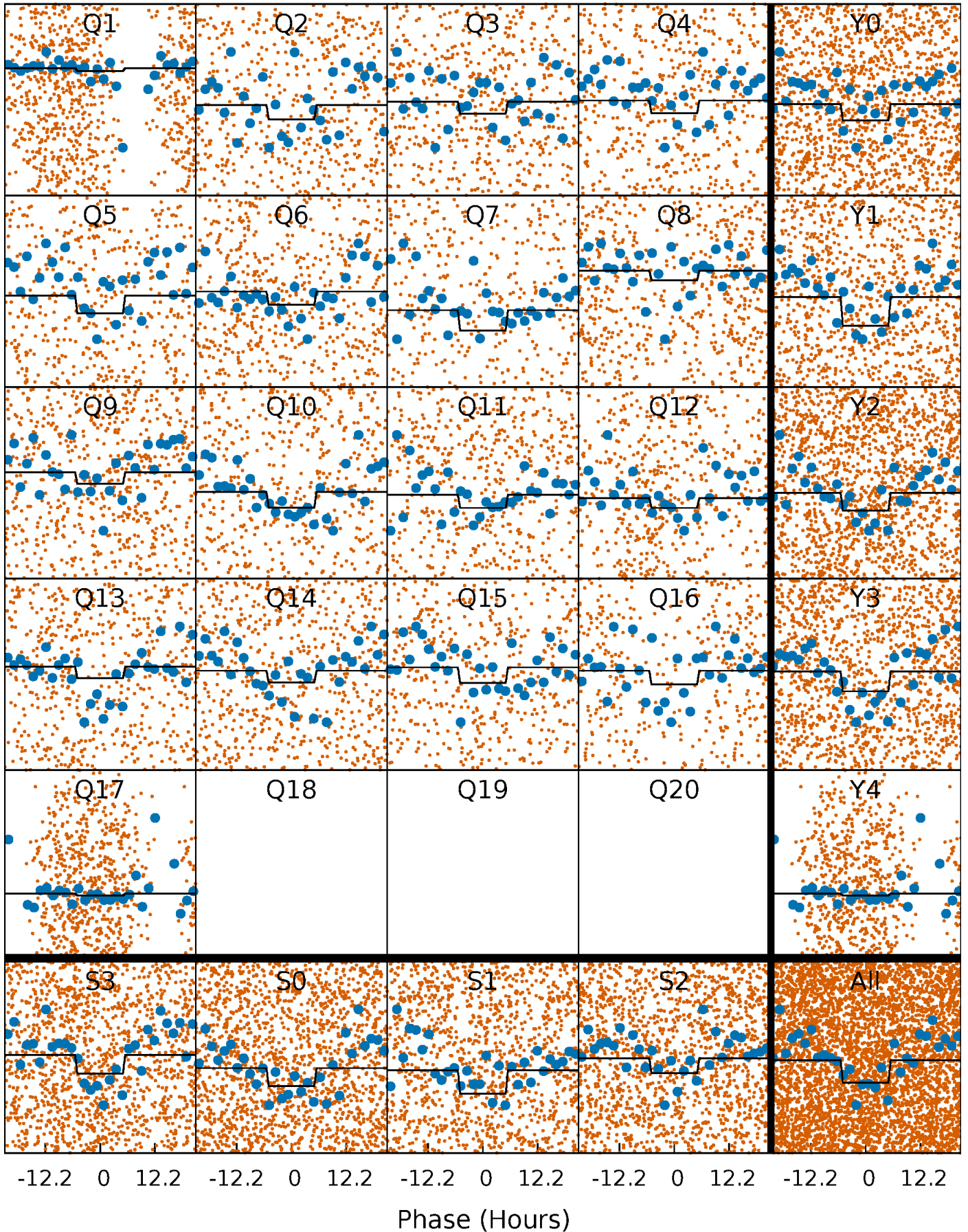
DV Quarter-Phased Transit Curves

TCE 009210037-02 P= 1.381409 Days $T_0=131.675652$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

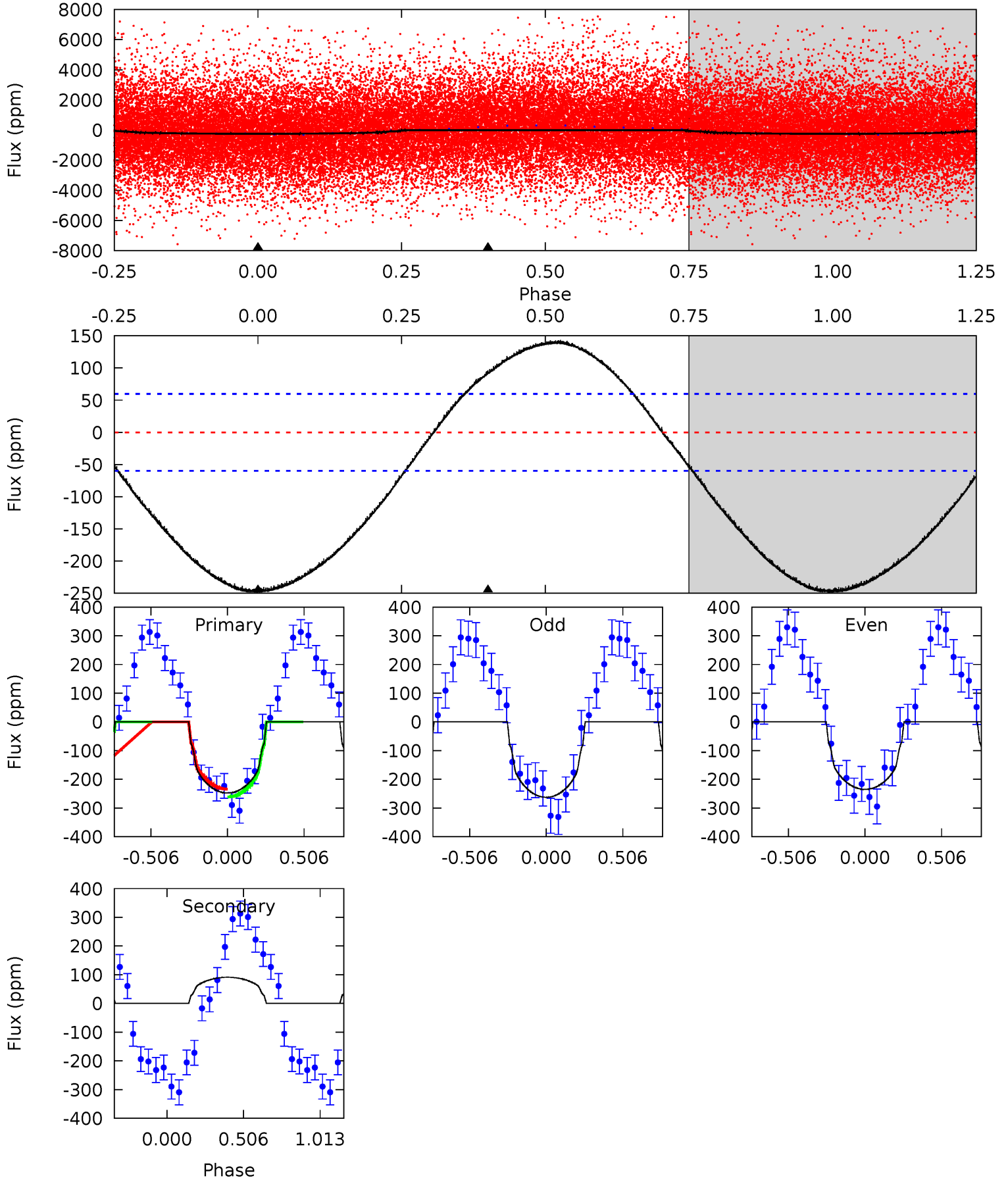
TCE 009210037-02 P= 1.381232 Days $T_0=131.857767$ (BKJD)



DV Model-Shift Uniqueness Test

009210037-02, P = 1.381409 Days, E = 130.294243 Days

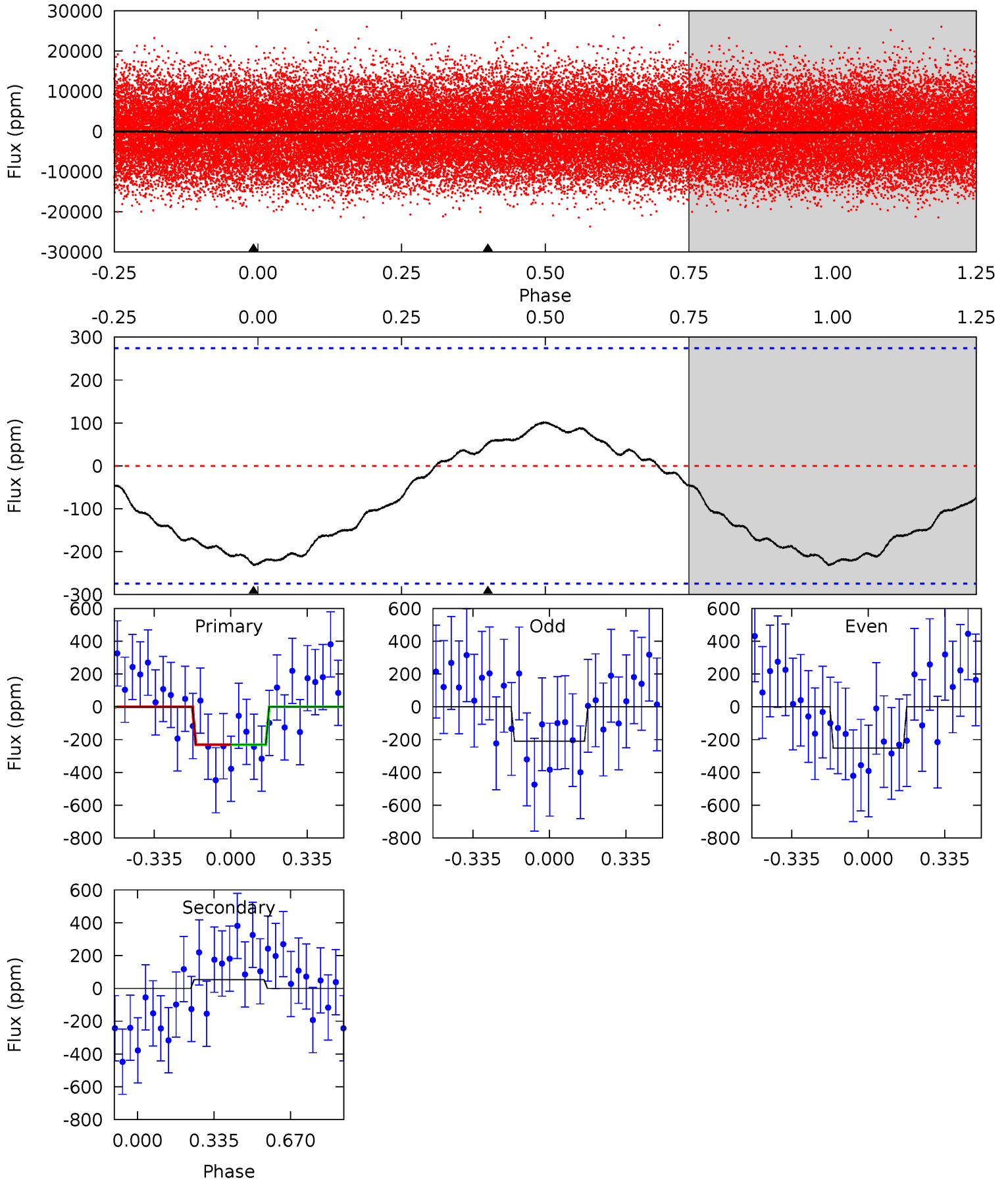
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.5	-6.43	0	0	4.21	0.66	2.34	17.5	17.5	-6.43	-6.43	0.98	1.24	0.37	0.99



Alt Model-Shift Uniqueness Test

009210037-02, P = 1.381232 Days, E = 130.476535 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.62	-0.83	0	0	4.30	0.96	0.33	3.62	3.62	-0.83	-0.83	0.33	1.89	0.30	0.00



Stellar Parameters For KIC 009210037

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6951^{+192}_{-312}	$3.907^{+0.279}_{-0.150}$	$0.260^{+0.150}_{-0.350}$	$2.471^{+0.587}_{-0.881}$	$1.796^{+0.185}_{-0.431}$	$0.168^{+0.328}_{-0.074}$
	+3%/-4%	+7%/-4%	+58%/-135%	+24%/-36%	+10%/-24%	+196%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009210037-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	91 ± 14	$5.09^{+0.99}_{-0.97}$	3876^{+298}_{-343}	-5118^{+274}_{-267}	$-1.653^{+0.499}_{-0.824}$
Alt.	53 ± 64	$3.81^{+0.78}_{-0.73}$	3865^{+303}_{-331}	-5090^{+1738}_{-1056}	$-1.757^{+1.865}_{-2.446}$

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 $A_{obs} \gg 1.0$

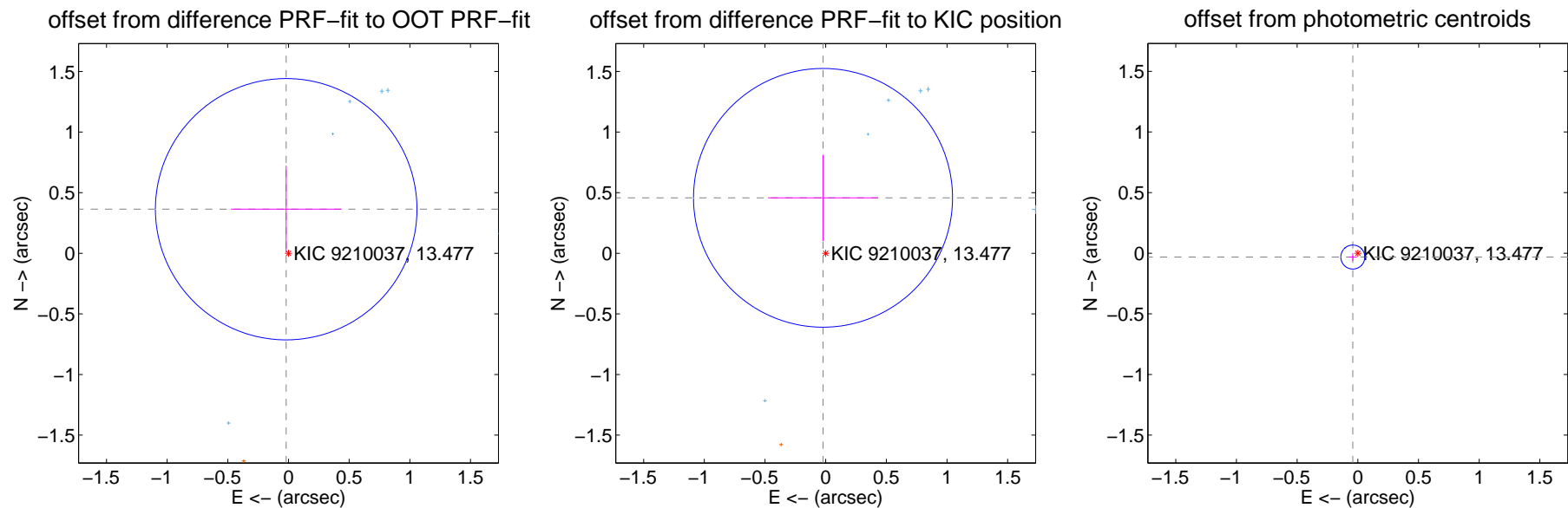
DV Centroid Data

Supplemental centroid analysis for 009210037-02. Kepler magnitude: 13.48. Transit SNR 24.54

There are 13 quarters with good PRF difference image offsets

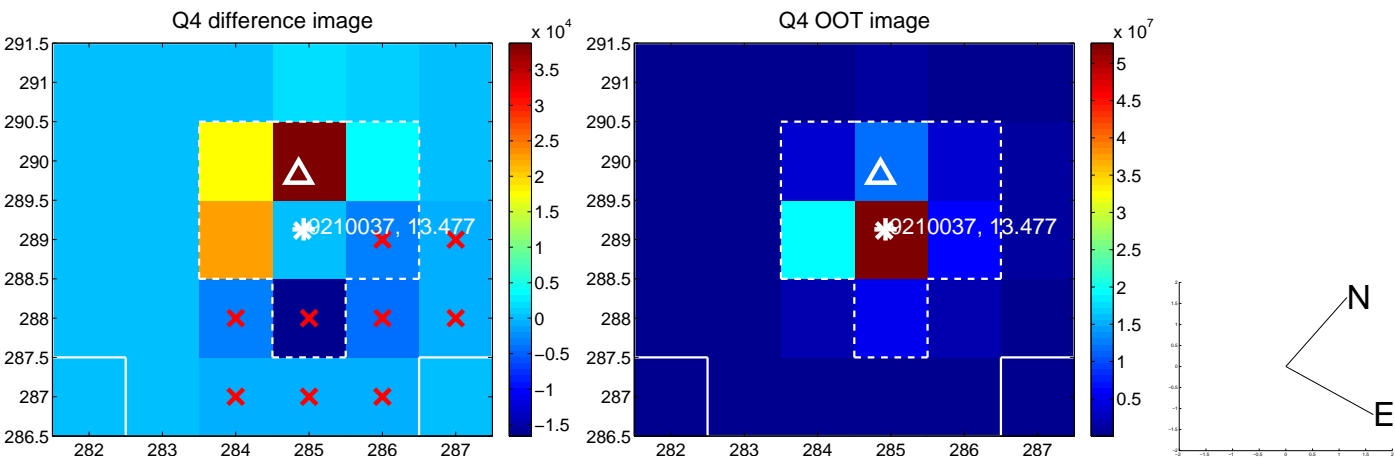
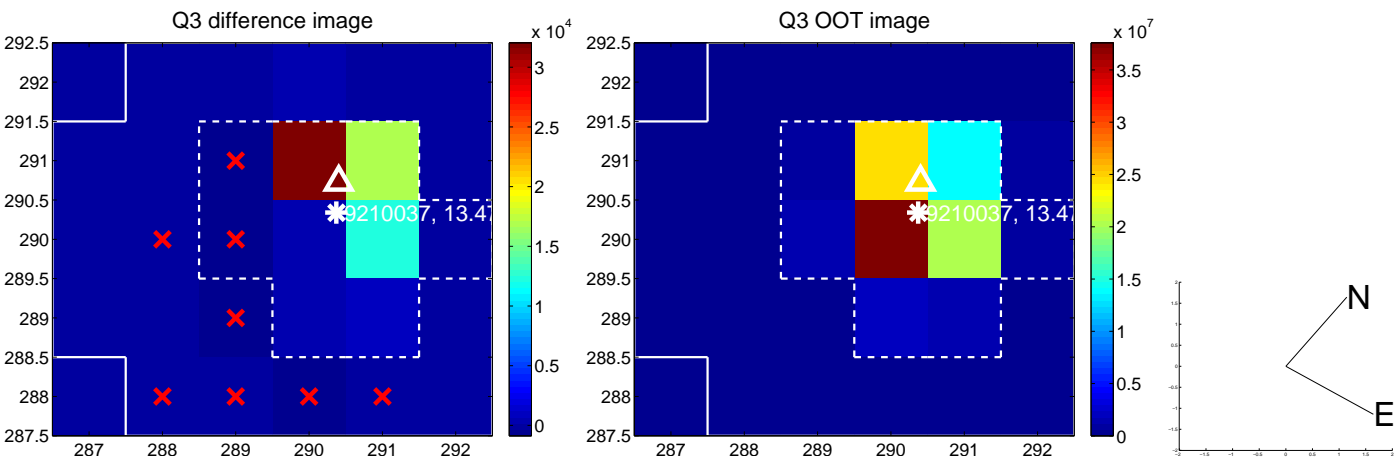
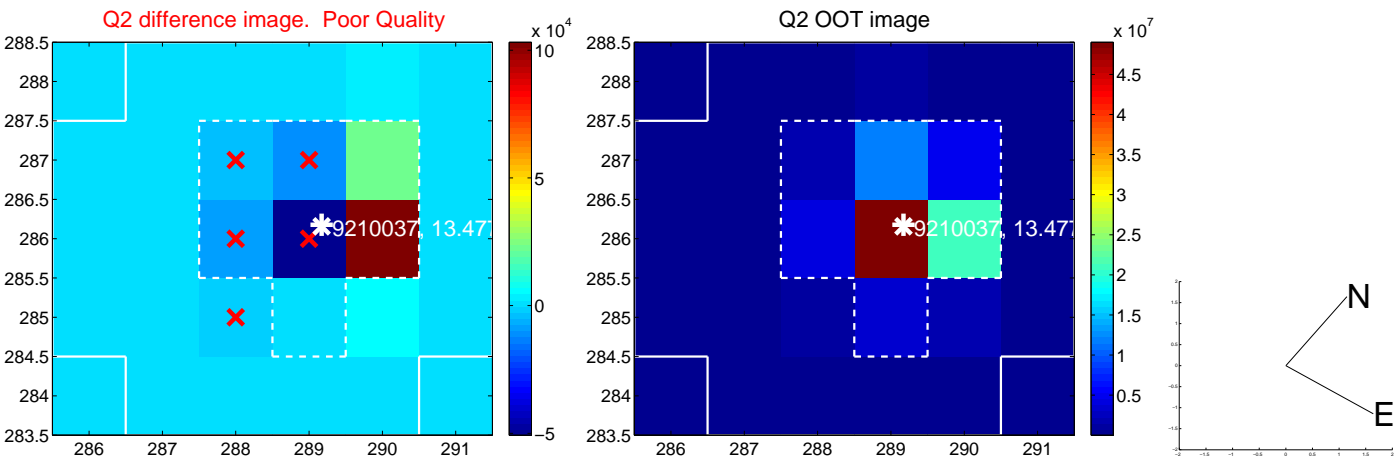
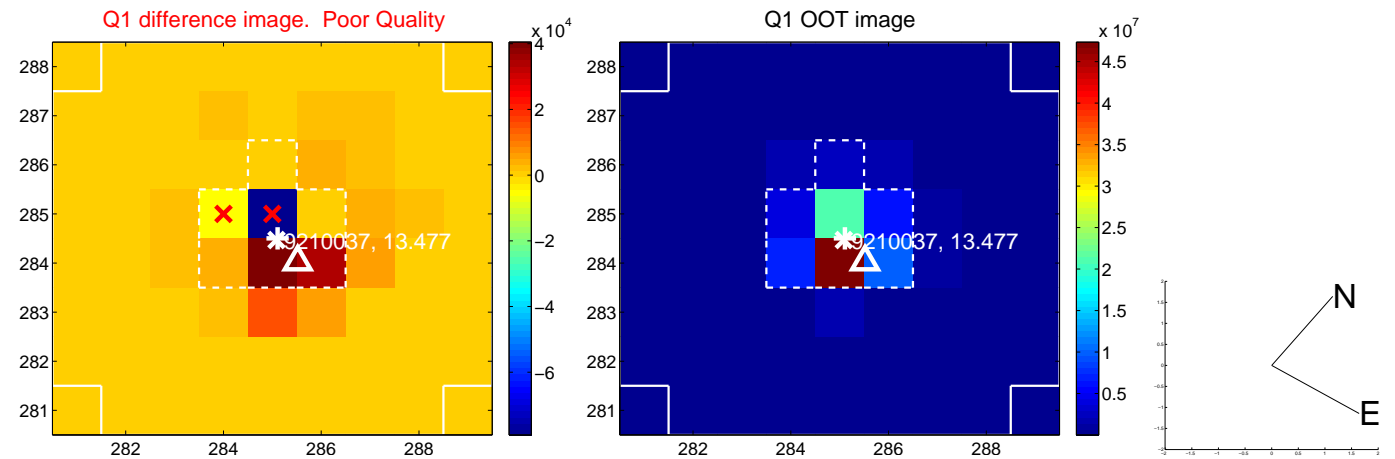
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.364 ± 0.359	1.01	0.019 ± 0.456	0.364 ± 0.359
PRF-fit source offset from KIC position	0.458 ± 0.356	1.29	0.022 ± 0.454	0.458 ± 0.355
photometric centroid source offset	0.05 ± 0.03	1.57	0.04 ± 0.03	-0.03 ± 0.03

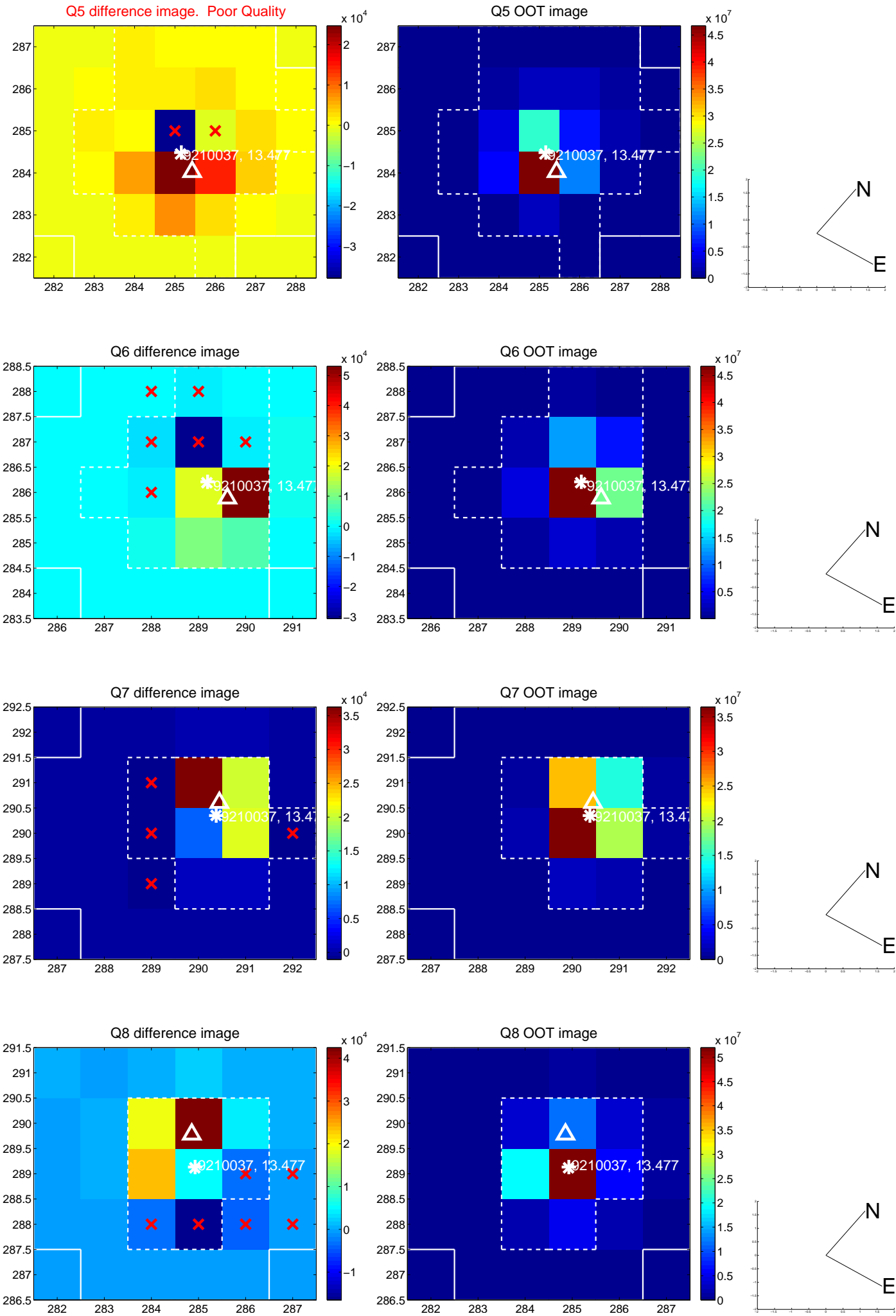


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

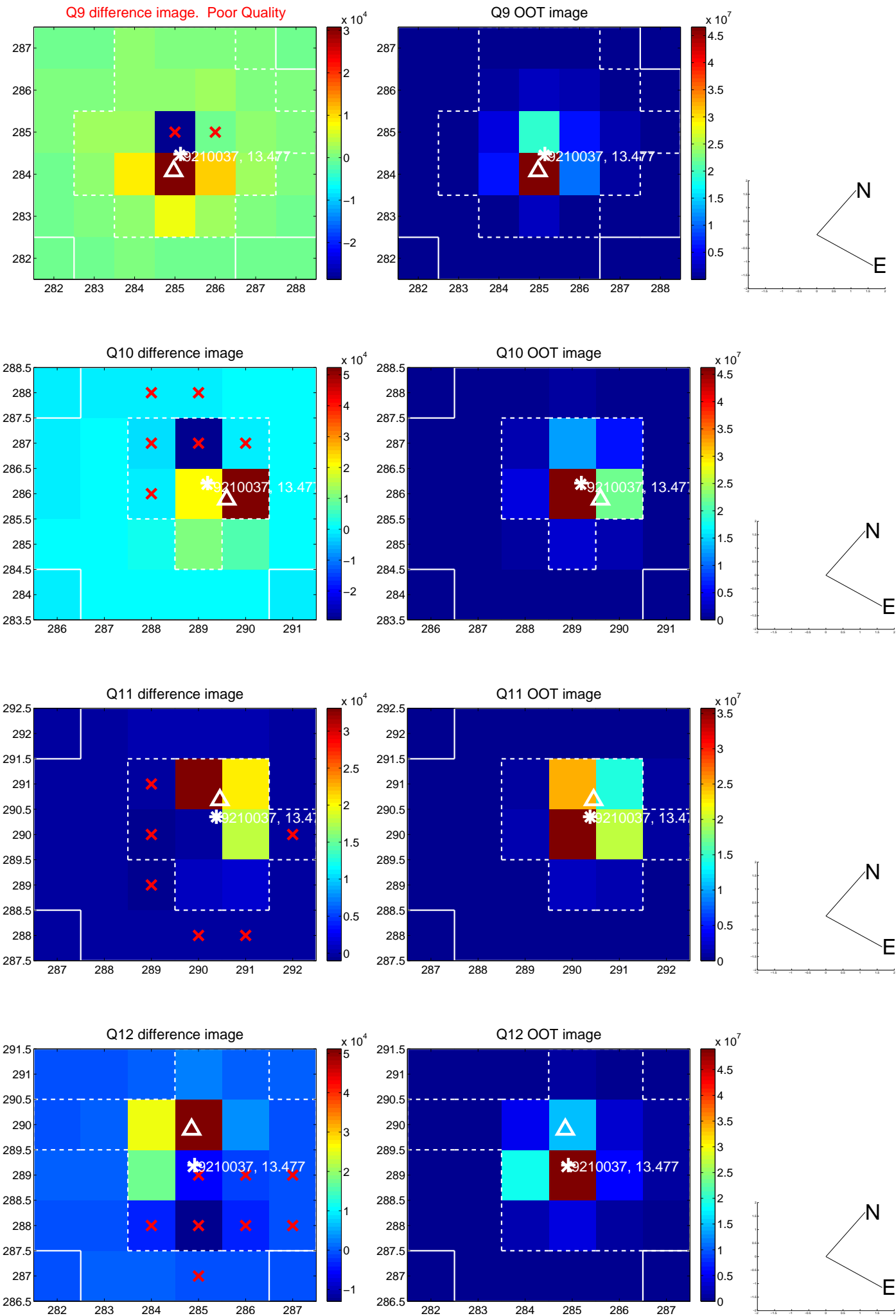
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



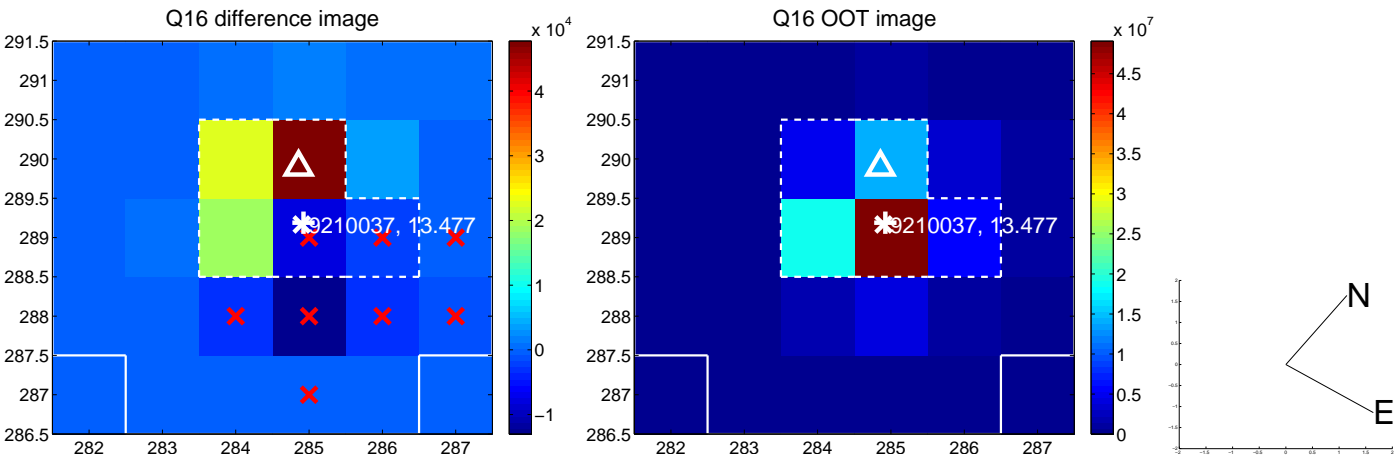
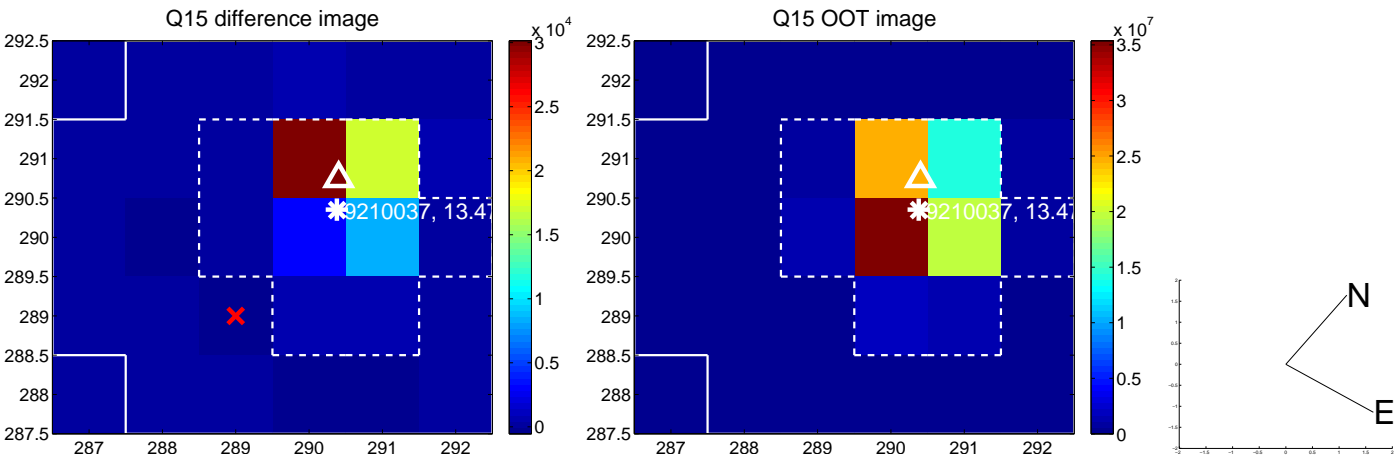
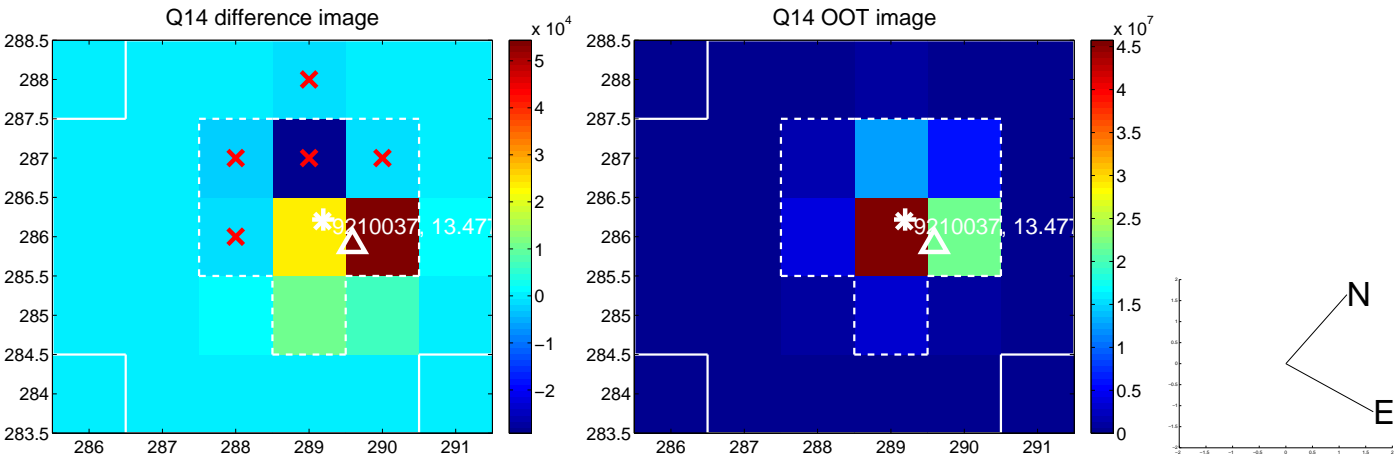
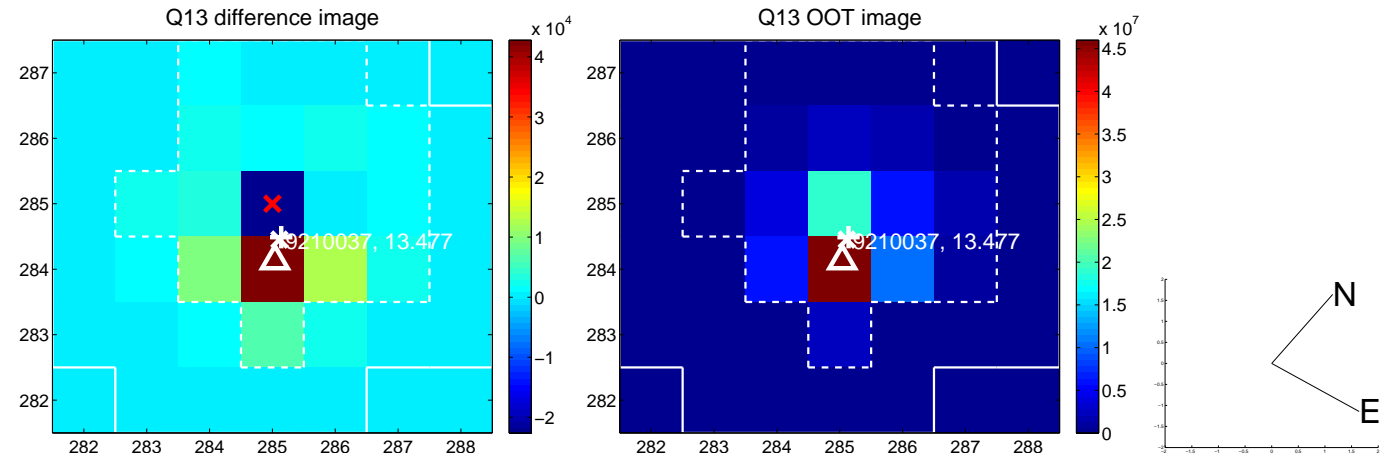
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



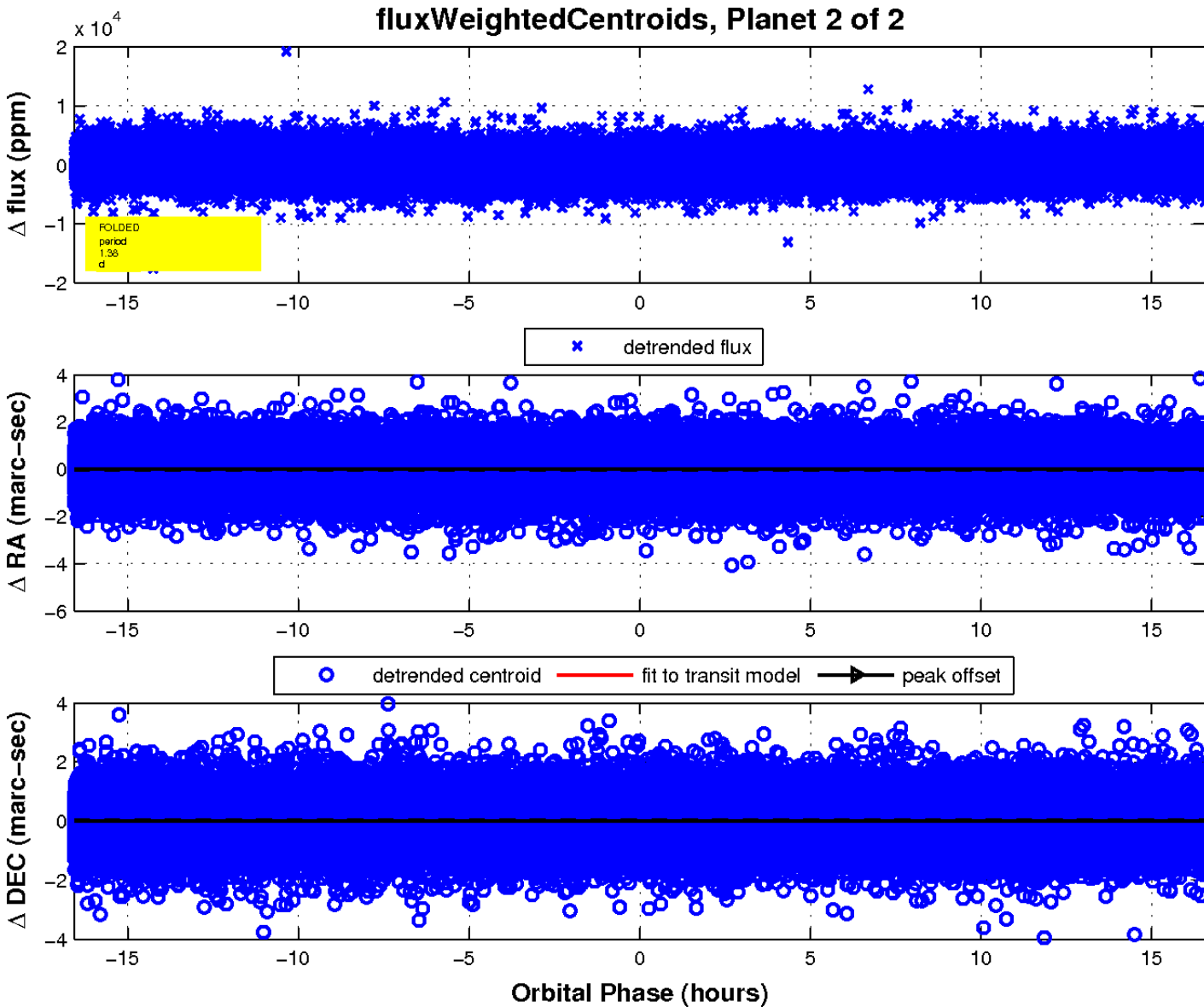
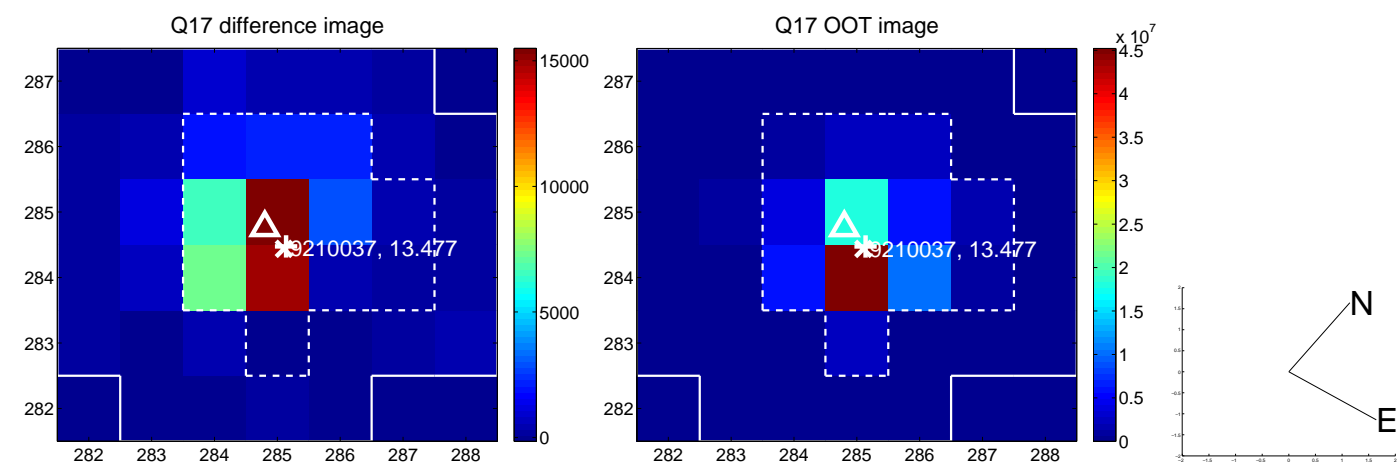
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

