

KIC 009394605

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})
009394605-01	OBS	6203.01	0.876821	132.072647	257.4	2.608	19.1	21.5	0.95	5808	1.87	3084.89
009394605-02	OBS	No	287.504076	197.549803	1385.6	5.266	16.3	5.3	0.95	5808	3.63	1.36
009394605-03	OBS	No	88.345371	163.079812	2377.7	6.653	13.2	6.1	0.95	5808	5.68	6.58
009394605-04	OBS	No	410.030727	198.378408	1712.9	2.263	12.0	7.8	0.95	5808	4.23	0.85

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009394605-01	OBS	FP	0.00	0	1	0	1	MOD_SEC_DV—CENT_FEW_DIFFS—EPHEM_MATCH
009394605-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009394605-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
009394605-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_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.

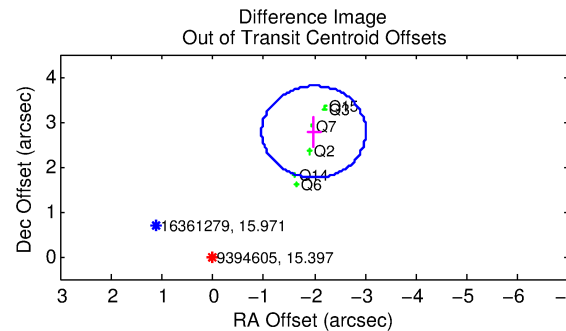
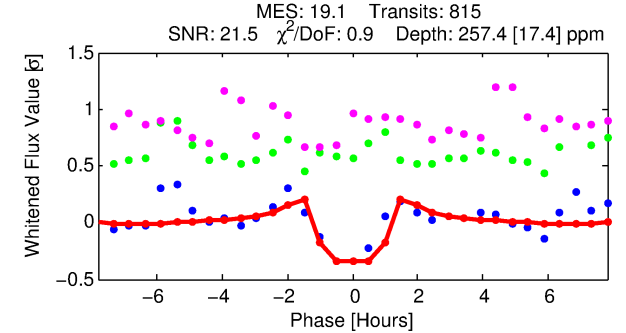
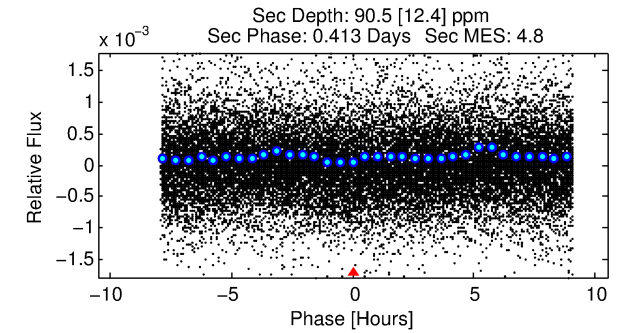
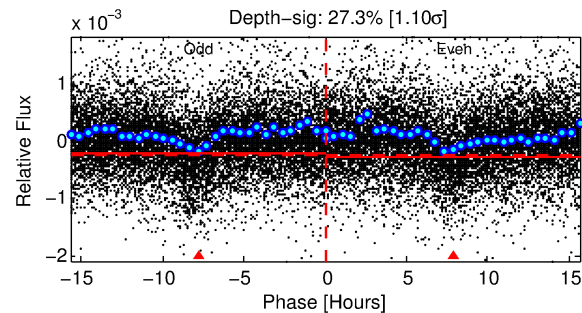
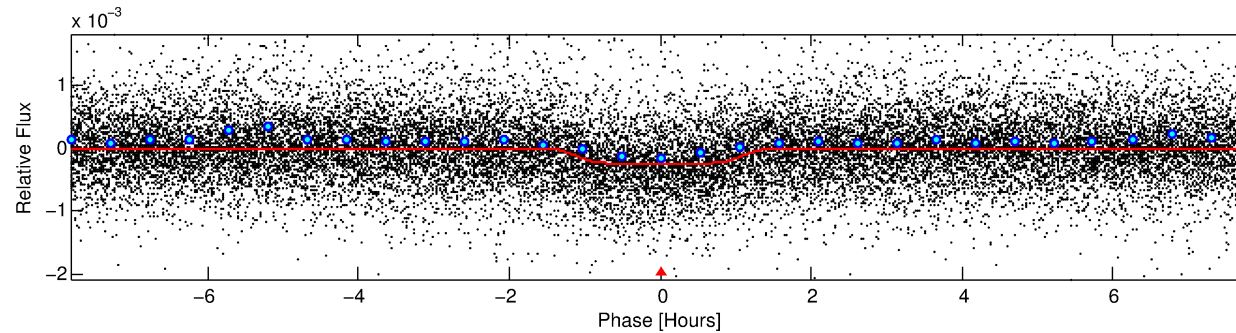
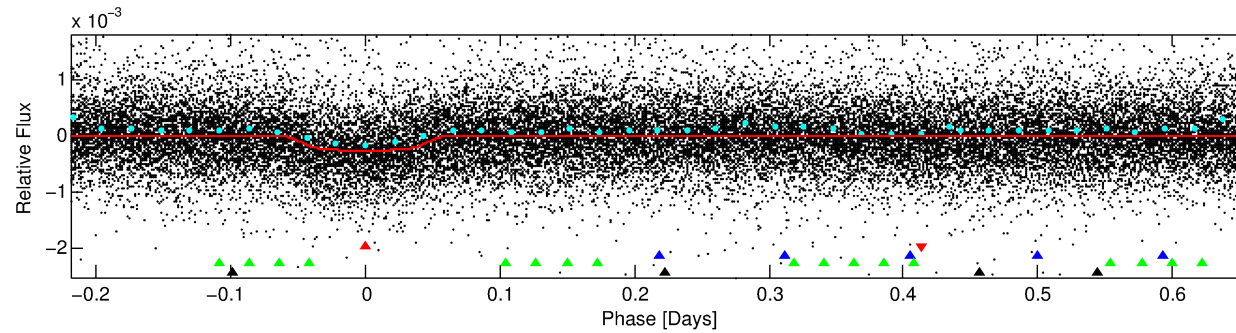
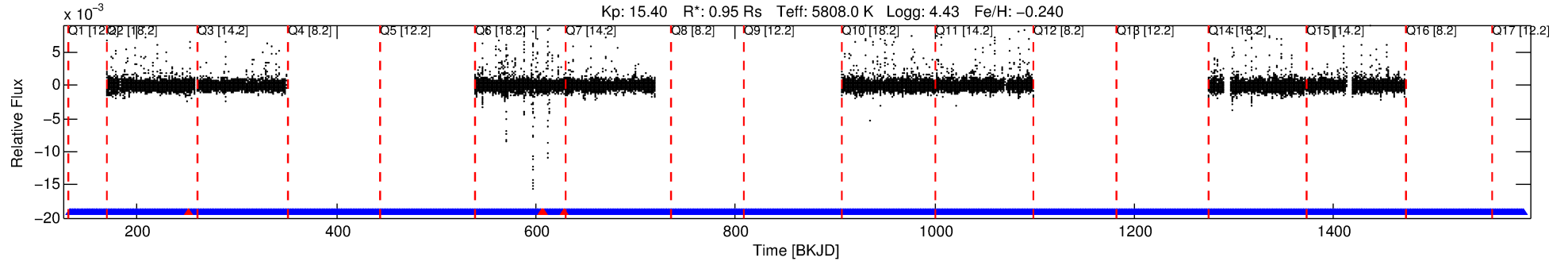
Ephemeris Match Information For 009394605-01

TCE (1)	KIC	Parent (2)	Parent KIC	P ₁ :P ₂	Dist (μ)	Δ Row	Δ Col	m ₂	m ₁	D ₂ /D ₁	Mechanism	Flag	σ_P	σ_T
009394605-01	9394605	009394601-pri	9394601	1:1	18.1	-4	-1	12.29	15.40	593.77	Direct-PRF	0	0.55	0.93

Notes: P₁:P₂ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m₂ and m₁ are the magnitudes of the parent and child. D₂/D₁ is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 9394605 Candidate: 1 of 4 Period: 0.877 d
KOI: K06203.01 Corr: 0.955



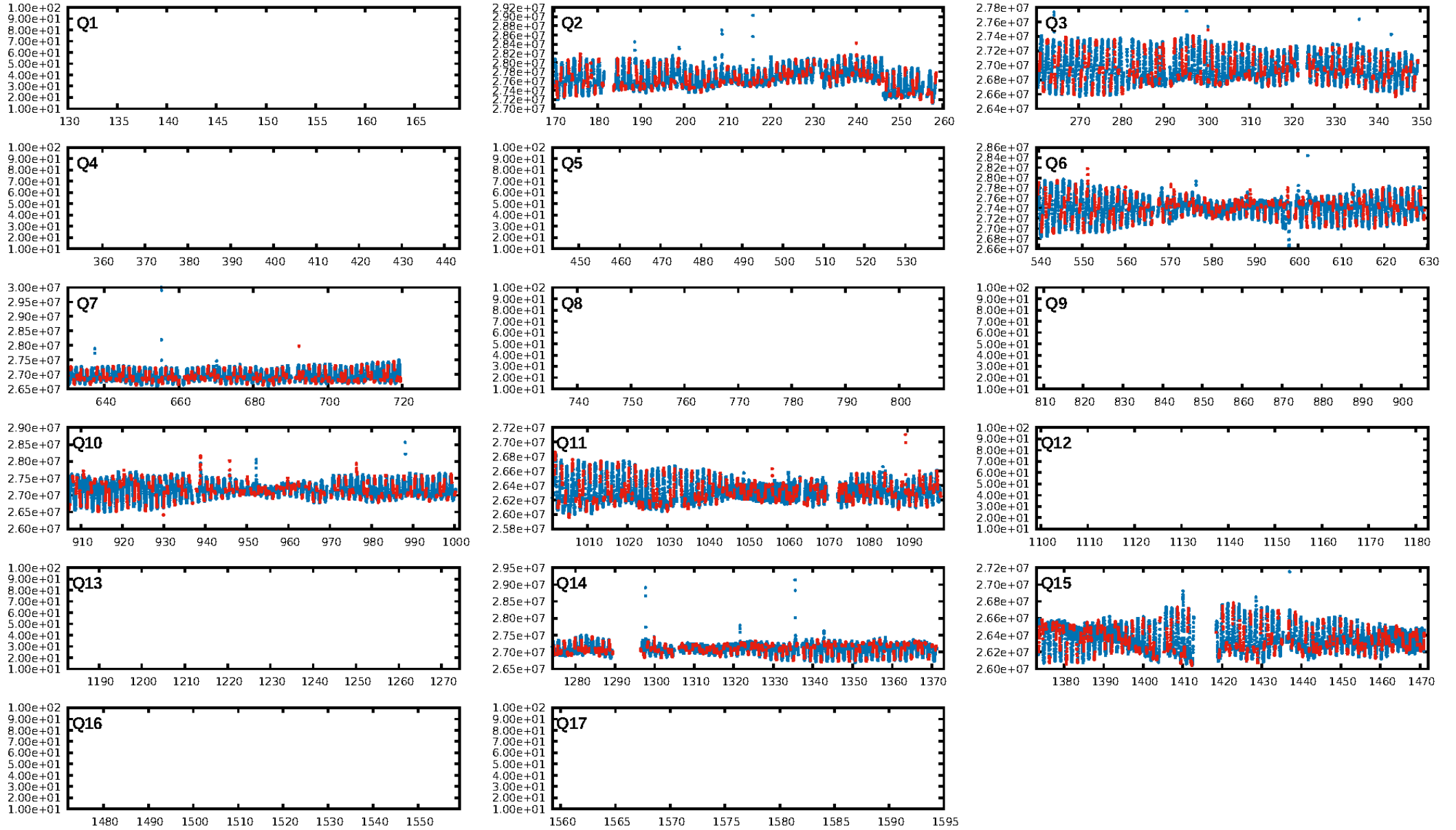
DV Fit Results:

Period = 0.87682 [0.00000] d
Epoch = 132.0726 [0.0010] BKJD
Rp/R* = 0.0180 [0.0017]
a/R* = 1.44 [0.31]
b = 0.93 [0.06]
Seff = 3084.89 [1187.50]
Teq = 1900 [183] K
Rp = 1.87 [0.58] Re
a = 0.0173 [0.0043] AU
Ag = 4.28 [1.83] [1.79 σ]
Teffp = 4225 [289] K [6.79 σ]

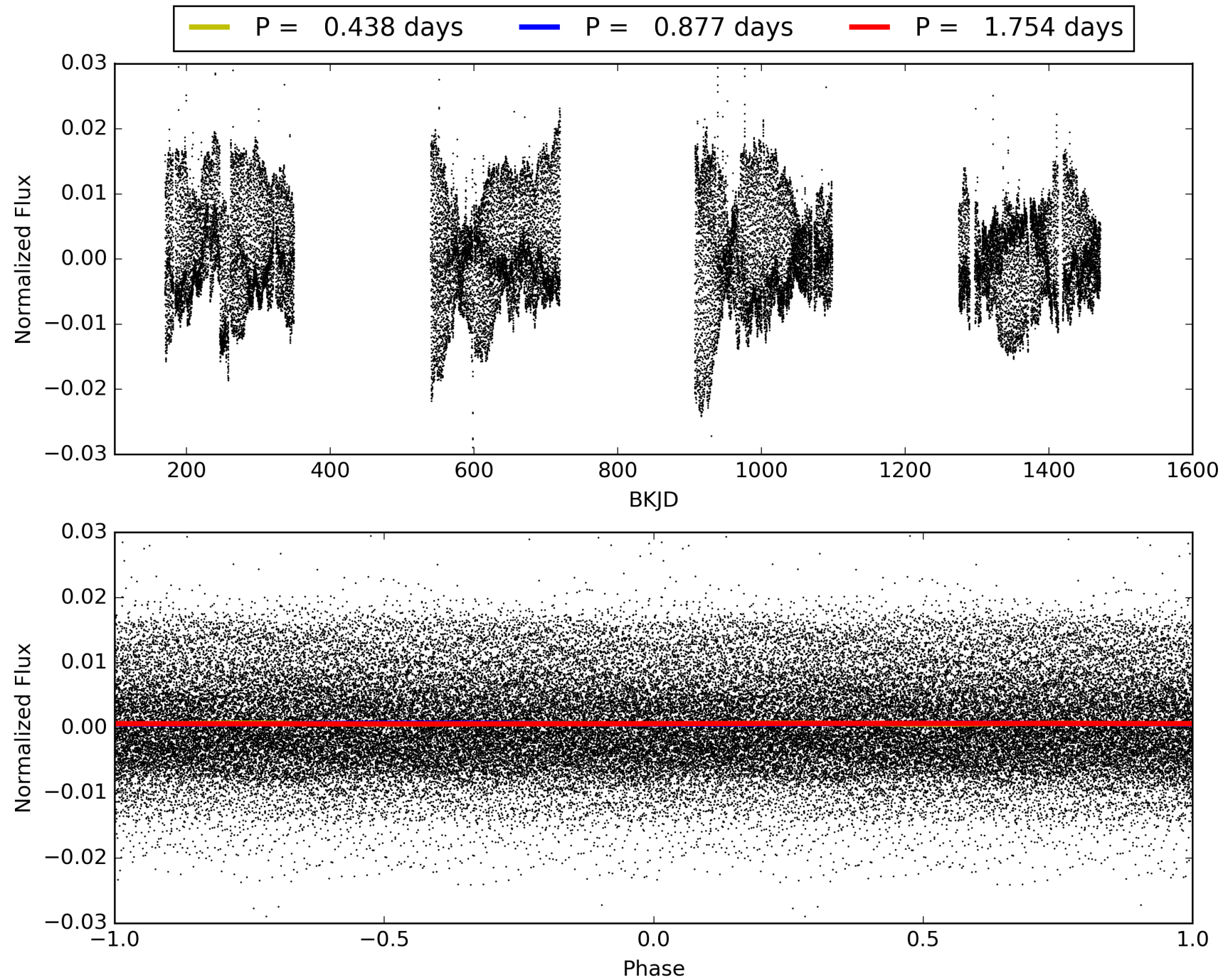
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [293.77 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.16e-60
RollingBand-fgt: 1.00 [811/815]
GhostDiagnostic-chr: -0.7357
Centroid-sig: 0.0%
Centroid-so: 5.415 arcsec [13.78 σ]
OotOffset-rm: 3.414 arcsec [10.02 σ]
KicOffset-rm: 3.421 arcsec [13.48 σ]
OotOffset-st: 3/3/0/0 [6]
KicOffset-st: 3/3/0/0 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 1.00 [8/8]

TCE 009394605-01, PDC Light Curves

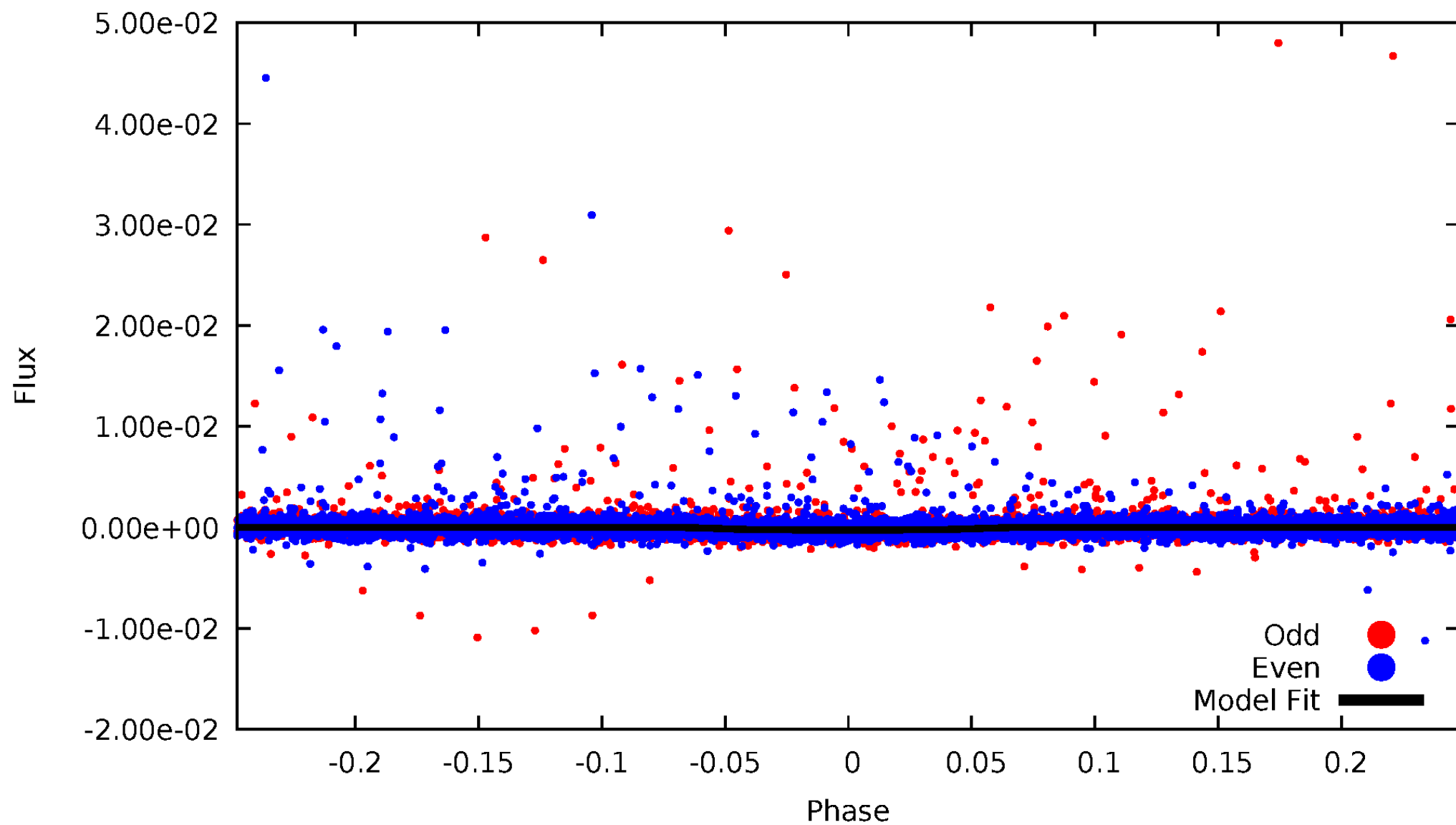


TCE 009394605-01



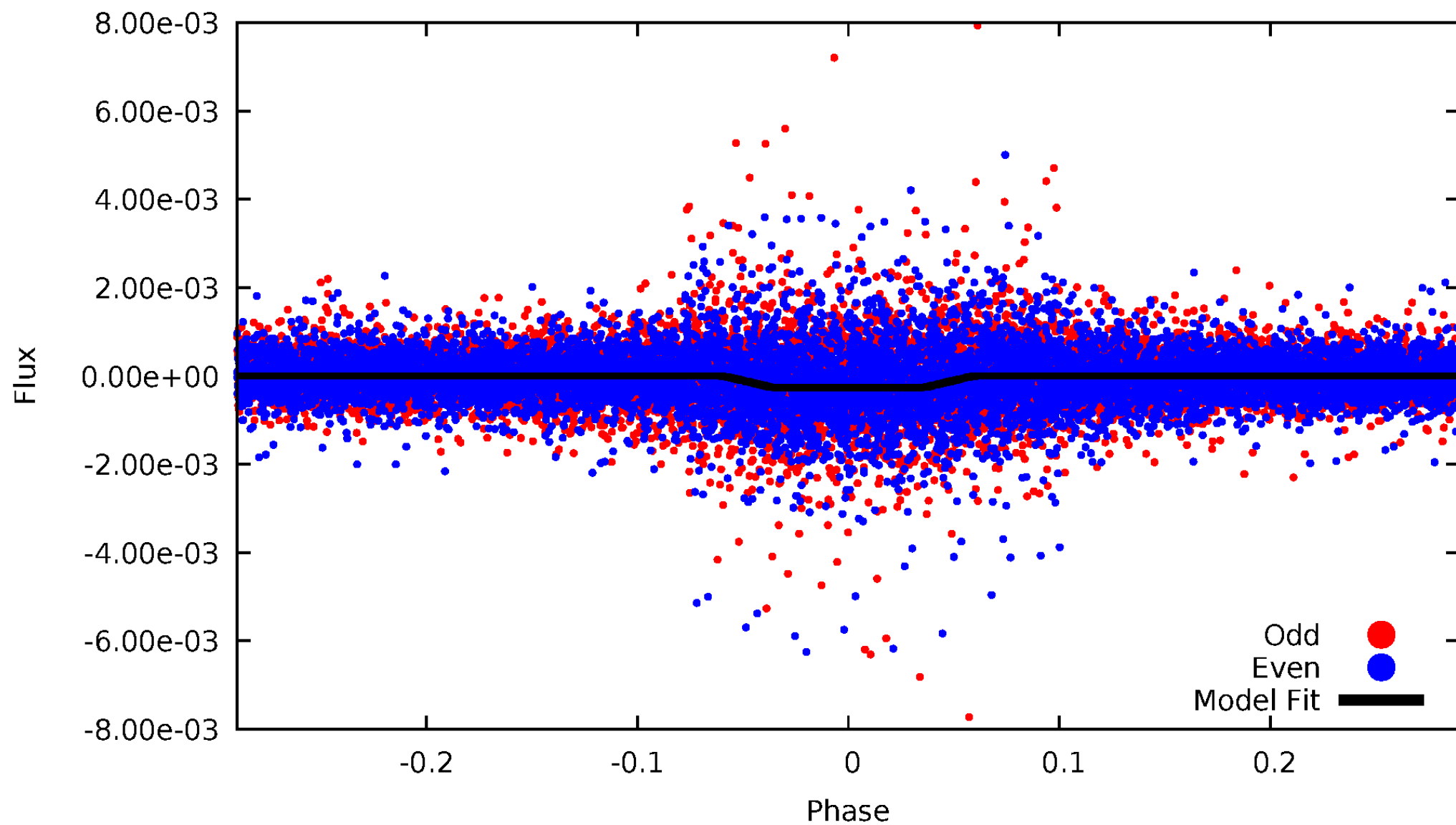
DV Odd/Even

TCE 009394605-01

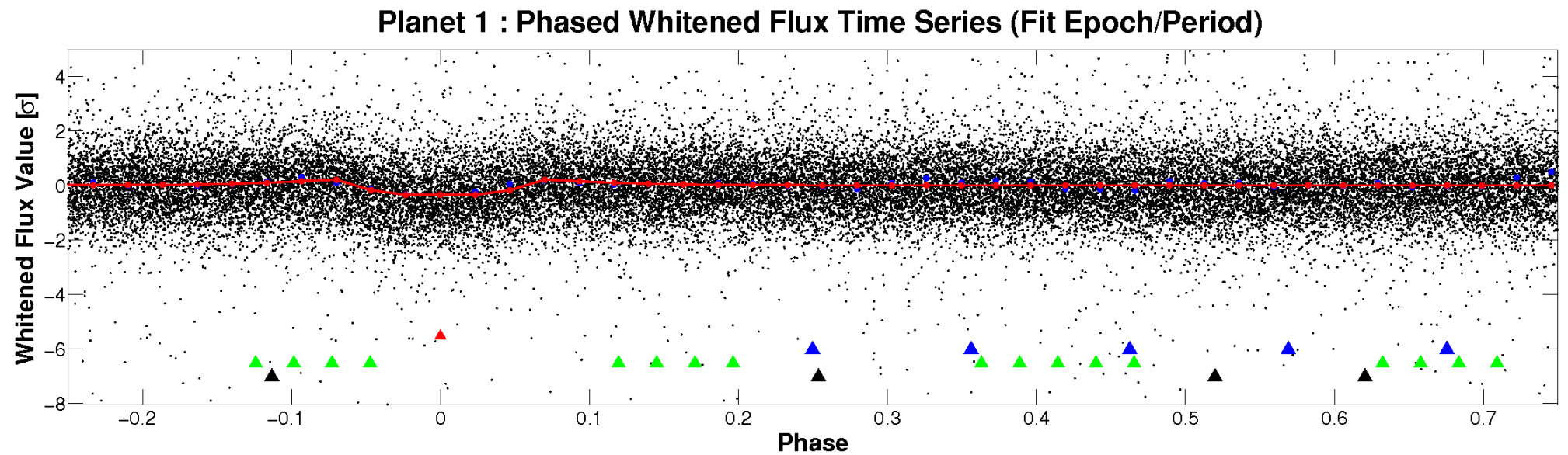
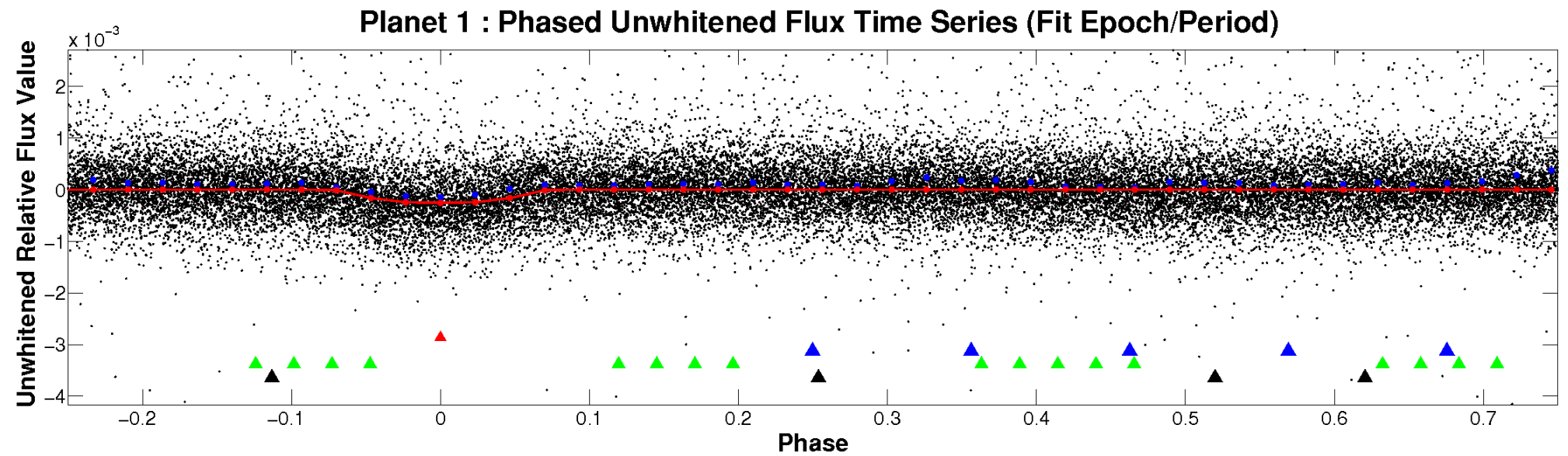


ALT Odd/Even

TCE 009394605-01

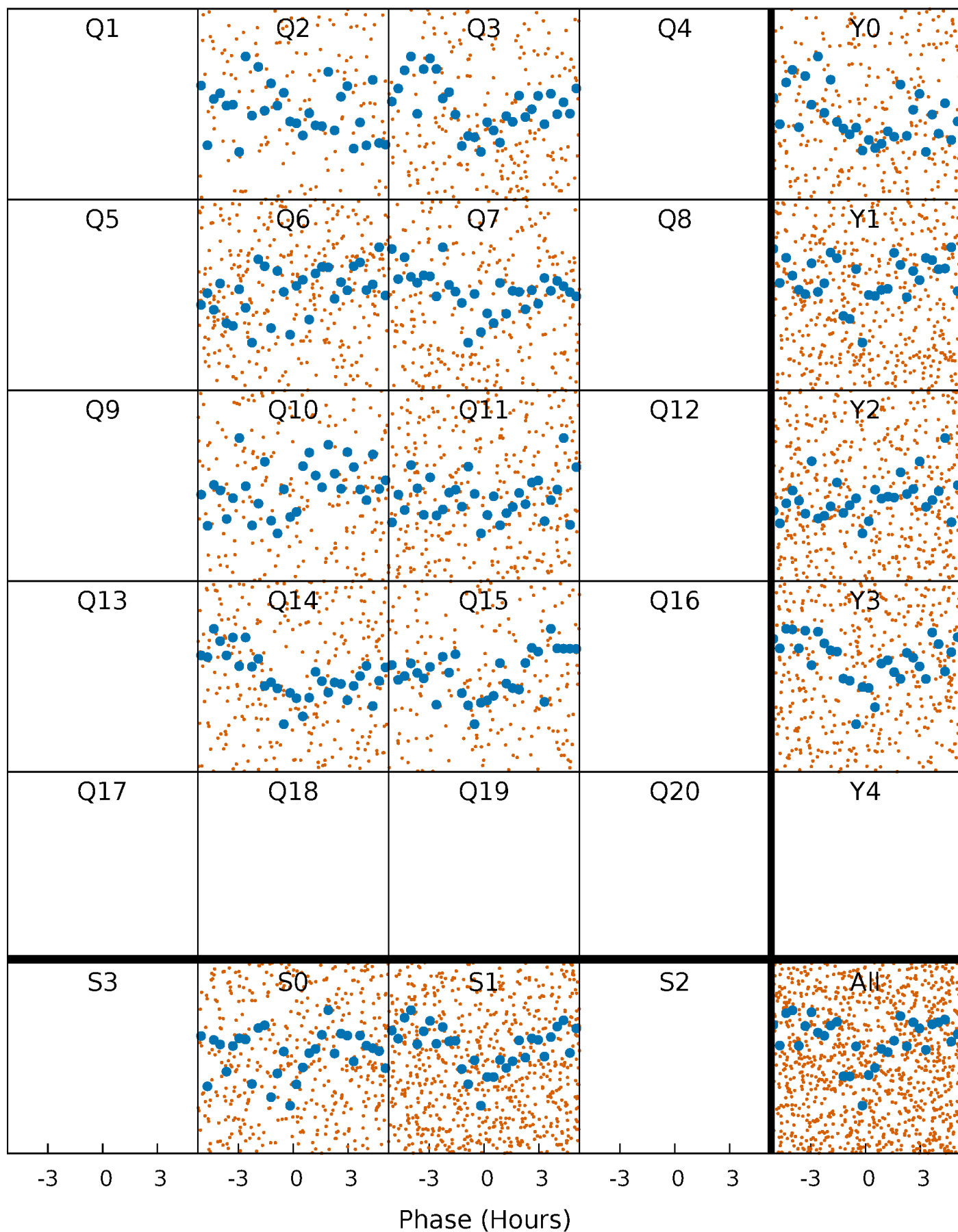


Non-Whitened Vs. Whitened Light Curve



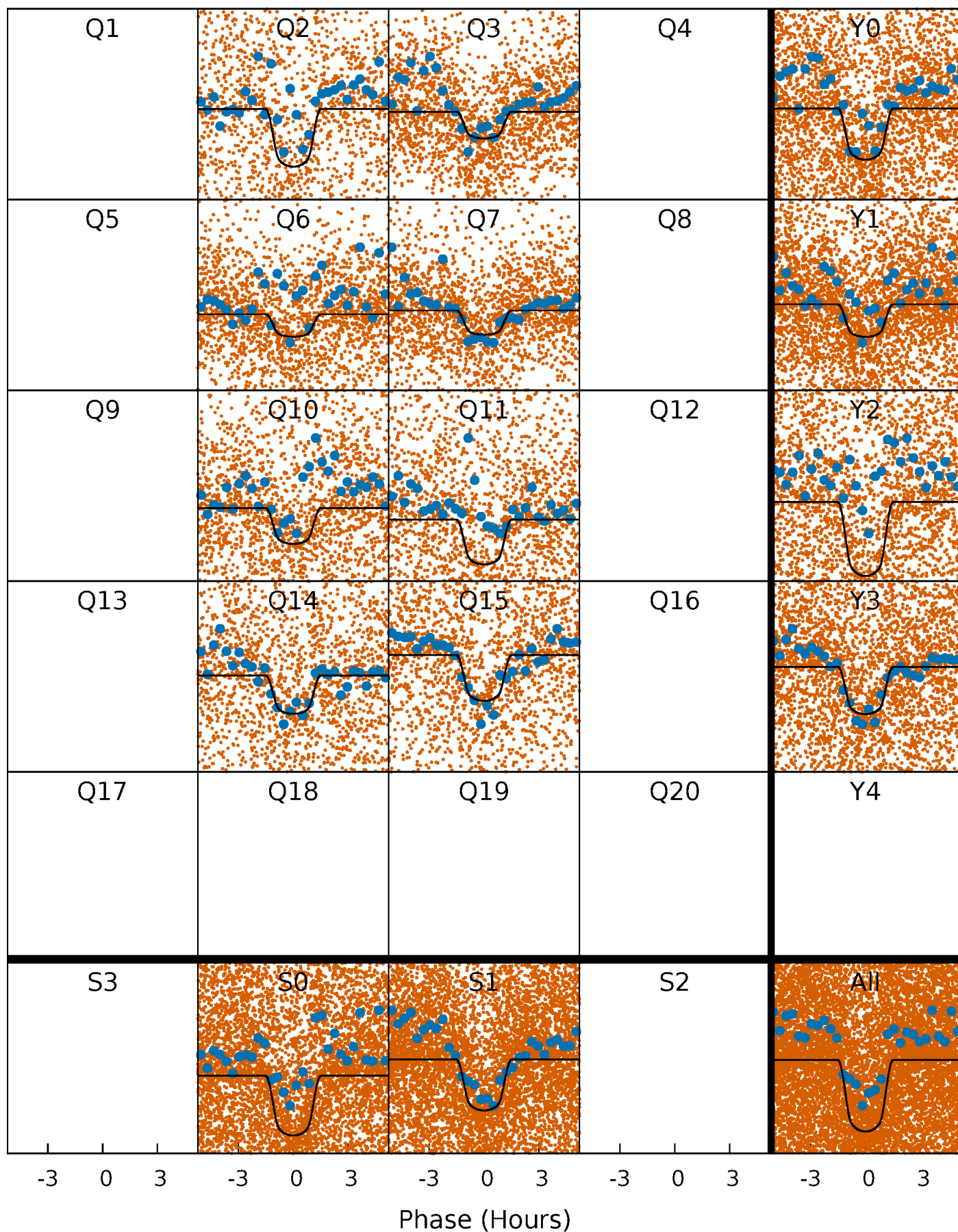
PDC Quarter-Phased Transit Curves

TCE 009394605-01 P= 0.876821 Days $T_0=132.072646$ (BKJD)



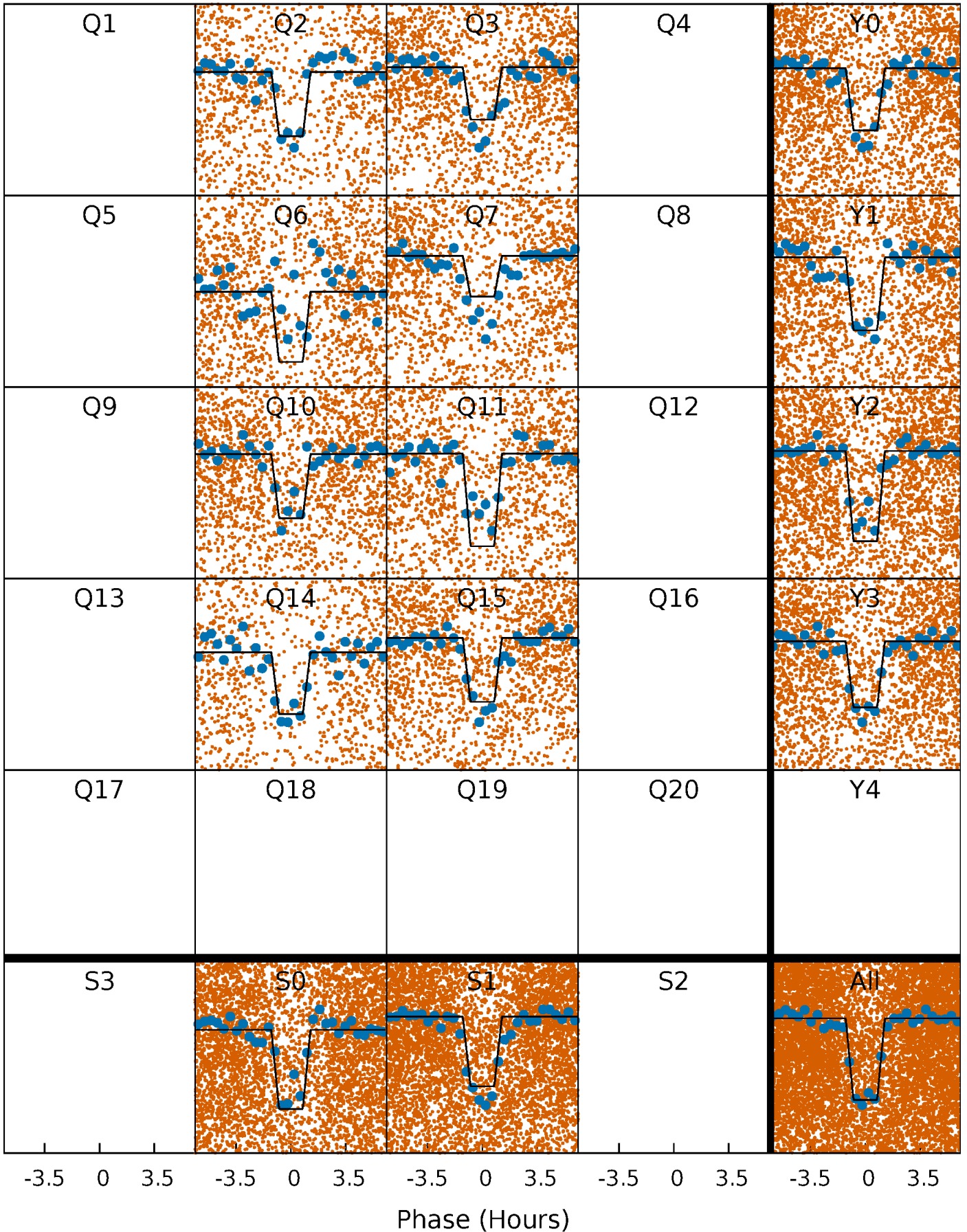
DV Quarter-Phased Transit Curves

TCE 009394605-01 P= 0.876821 Days $T_0=132.072646$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

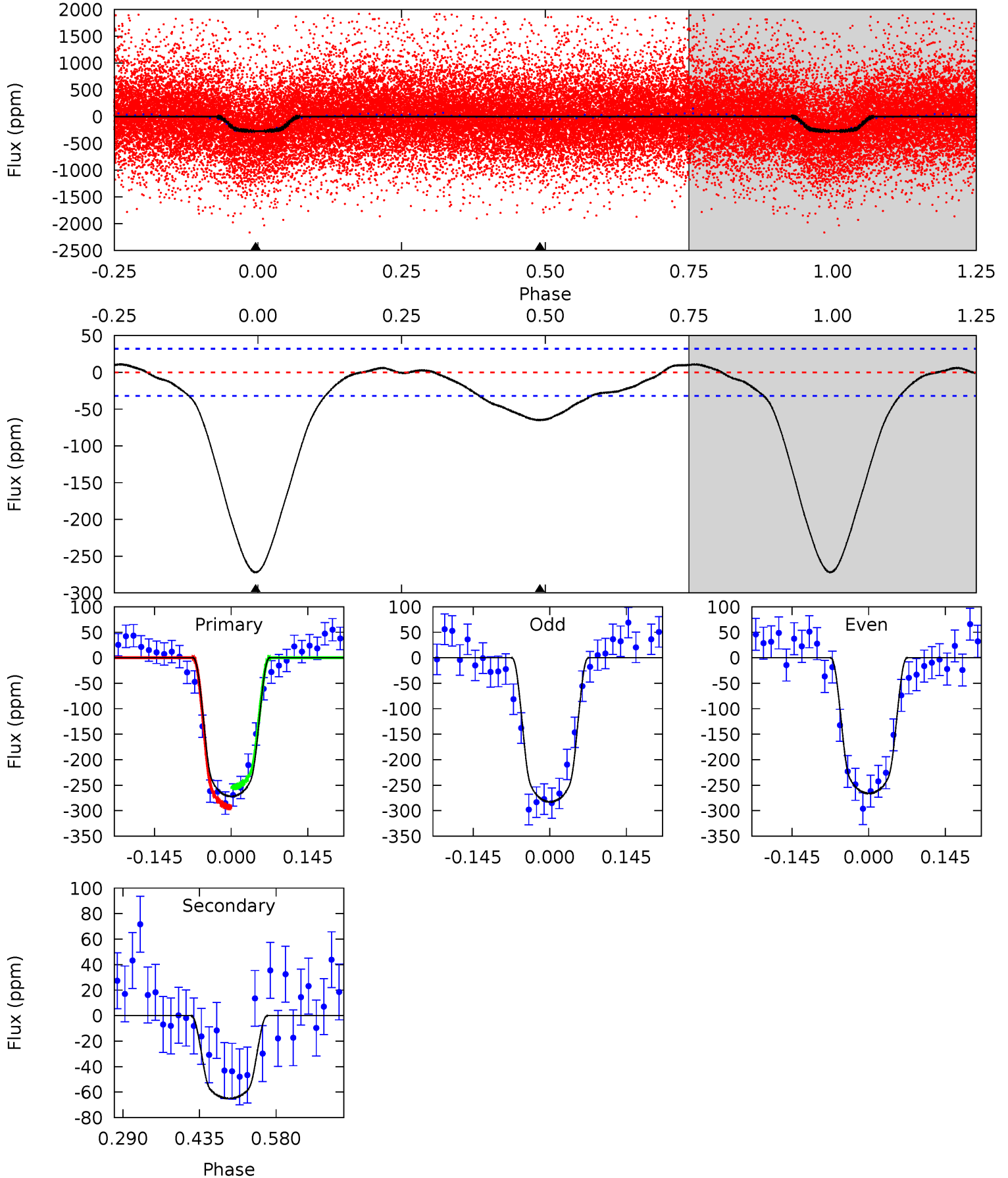
TCE 009394605-01 $P = 0.876816$ Days $T_0 = 132.074548$ (BKJD)



DV Model-Shift Uniqueness Test

009394605-01, P = 0.876821 Days, E = 132.072646 Days

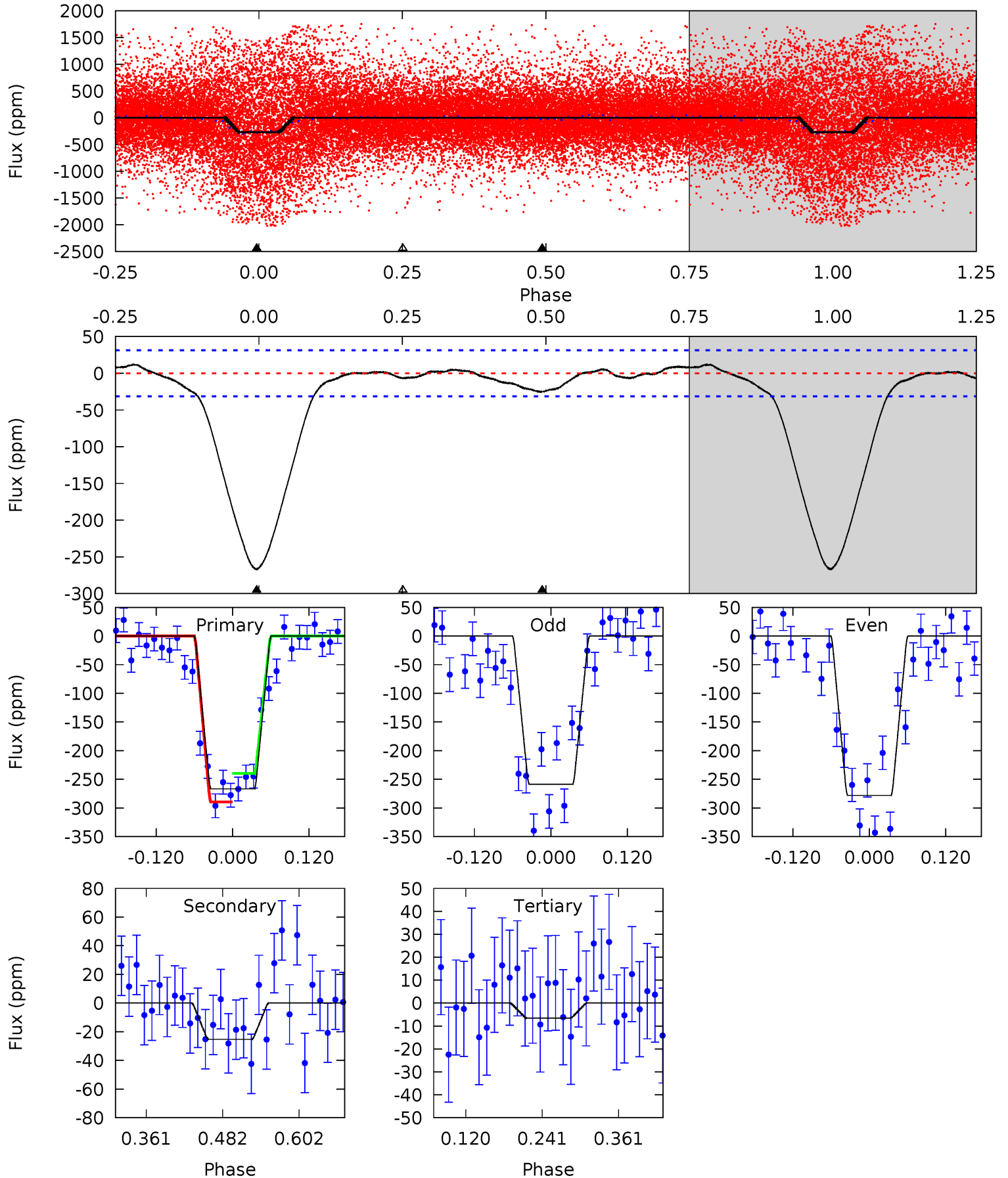
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.1	9.09	0	0	4.49	1.46	1.17	38.1	38.1	9.09	9.09	1.17	0.42	0.04	2.76



Alt Model-Shift Uniqueness Test

009394605-01, P = 0.876816 Days, E = 132.074548 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.5	3.66	0.95	0	4.53	1.55	0.90	37.5	38.5	2.70	3.66	1.41	1.03	0.04	3.63



Stellar Parameters For KIC 009394605

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5808^{+207}_{-207}	$4.434^{+0.105}_{-0.195}$	$-0.240^{+0.300}_{-0.300}$	$0.951^{+0.279}_{-0.139}$	$0.895^{+0.131}_{-0.087}$	$1.467^{+0.777}_{-0.685}$
	+4%/-4%	+2%/-4%	+125%/-125%	+29%/-15%	+15%/-10%	+53%/-47%
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 009394605-01 / KOI 6203.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-65 ± 7	$1.90^{+0.35}_{-0.25}$	2681^{+185}_{-158}	4078^{+217}_{-214}	$2.941^{+1.016}_{-0.822}$
Alt.	-25 ± 7	$1.73^{+0.32}_{-0.25}$	2694^{+183}_{-156}	3501^{+295}_{-255}	$1.364^{+0.705}_{-0.479}$

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

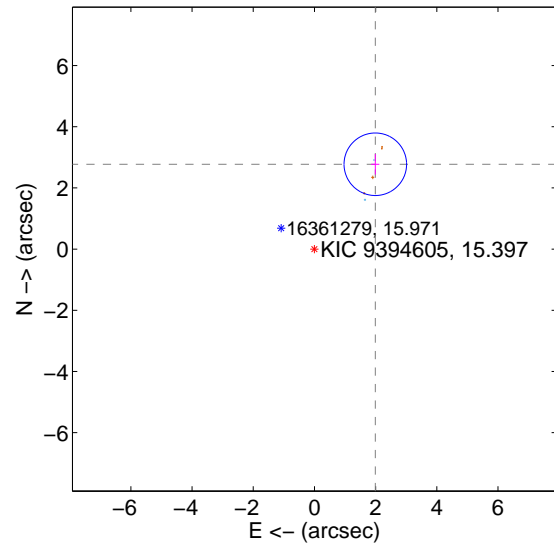
Supplemental centroid analysis for 009394605-01. Kepler magnitude: 15.40. Transit SNR 21.51

There are 2 quarters with good PRF difference image offsets

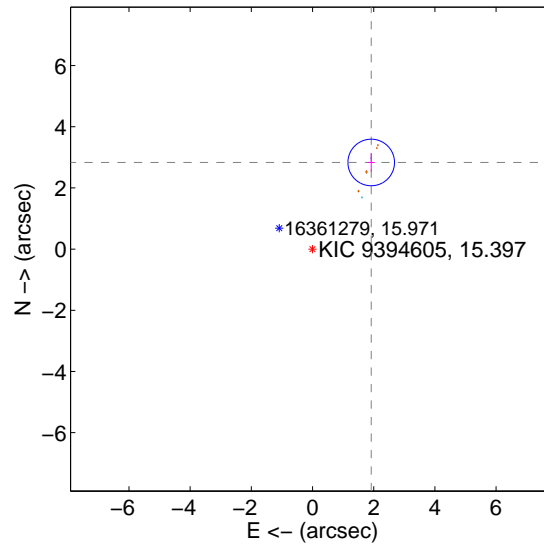
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.414 ± 0.341	10.02	-1.990 ± 0.133	2.774 ± 0.336
PRF-fit source offset from KIC position	3.421 ± 0.254	13.48	-1.919 ± 0.116	2.833 ± 0.296
photometric centroid source offset	5.41 ± 0.39	13.78	-4.85 ± 0.39	2.41 ± 0.40

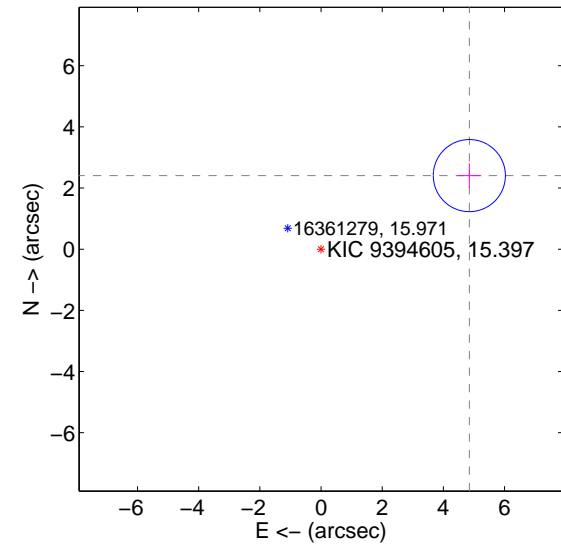
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

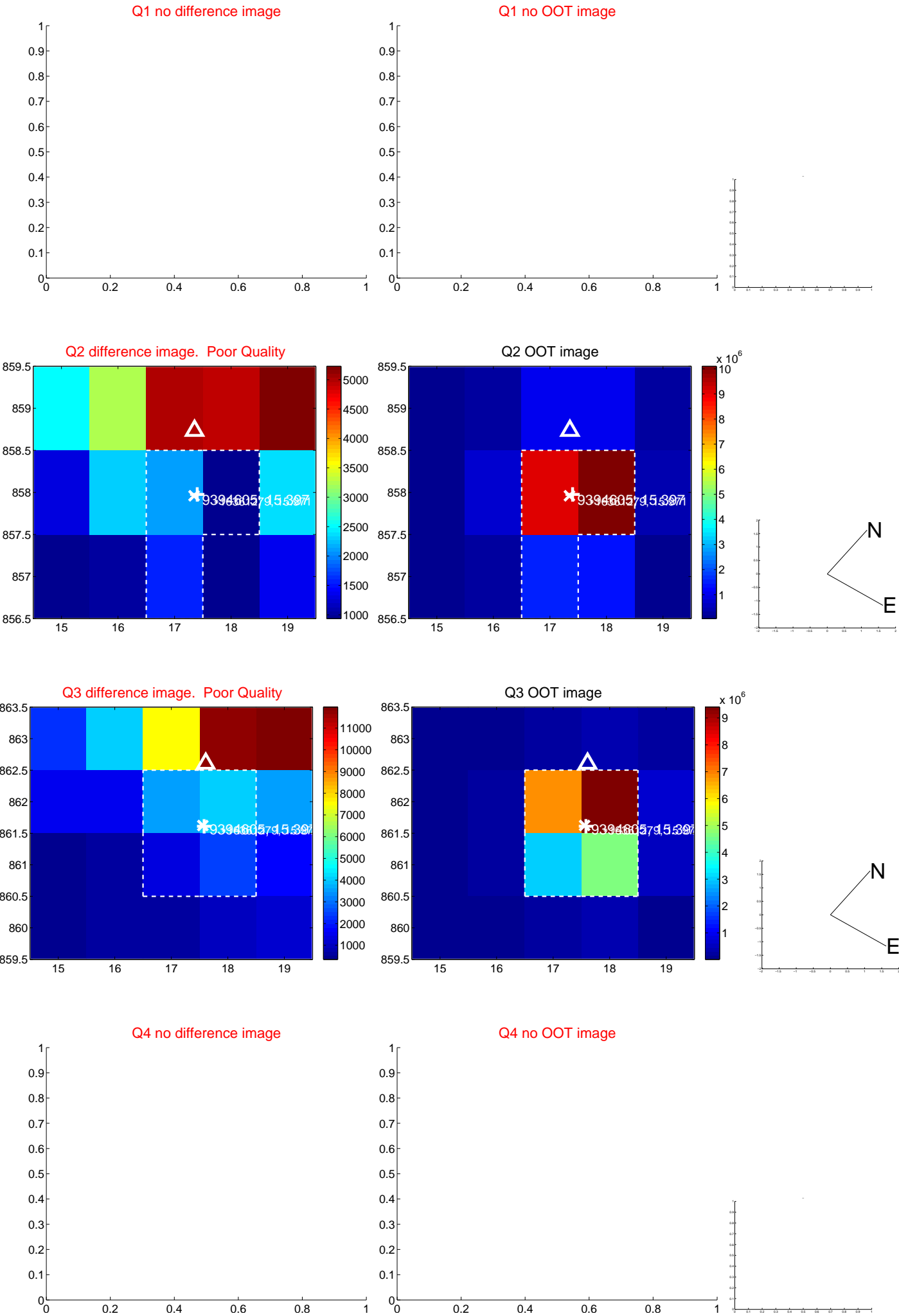


offset from photometric centroids

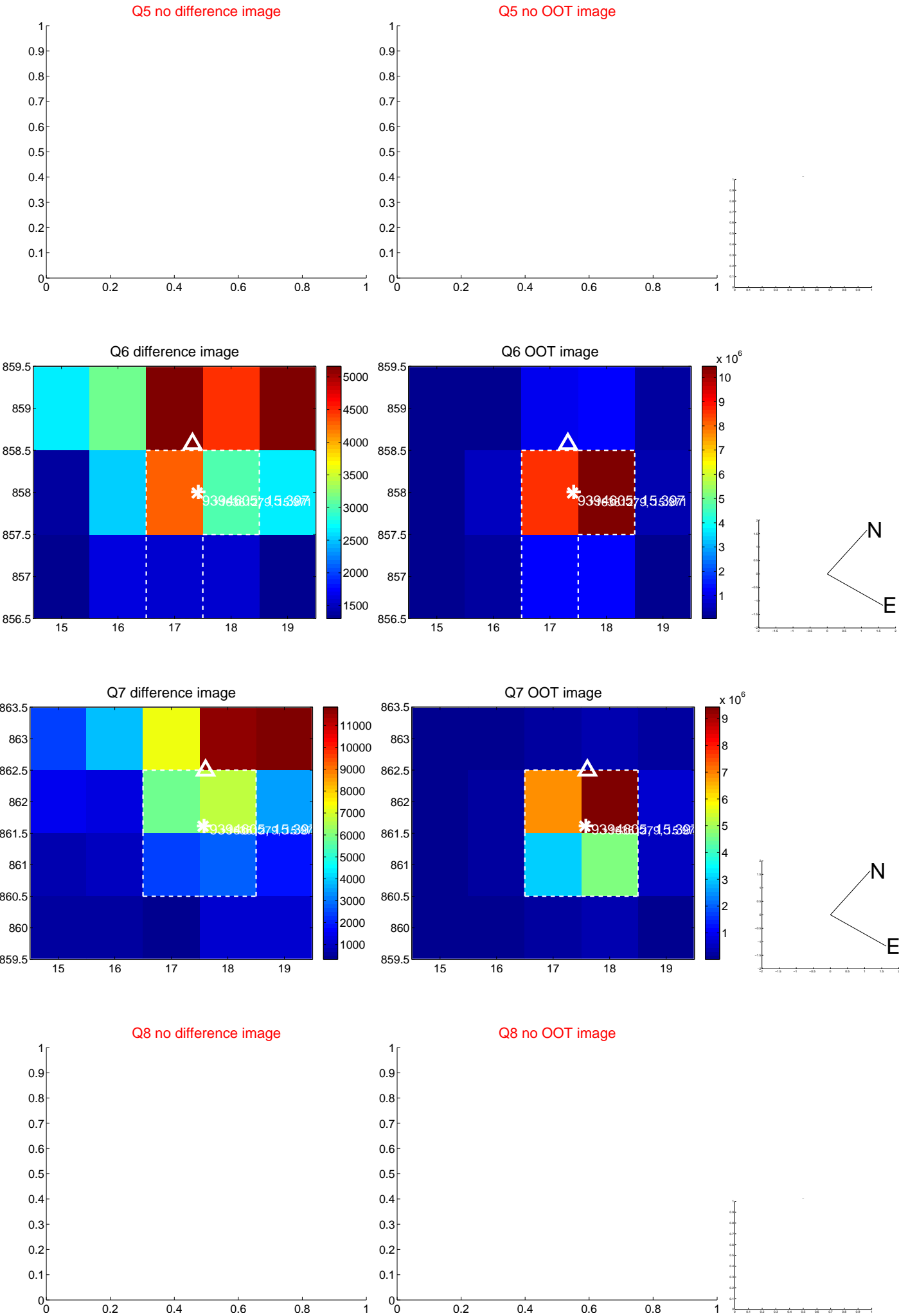


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

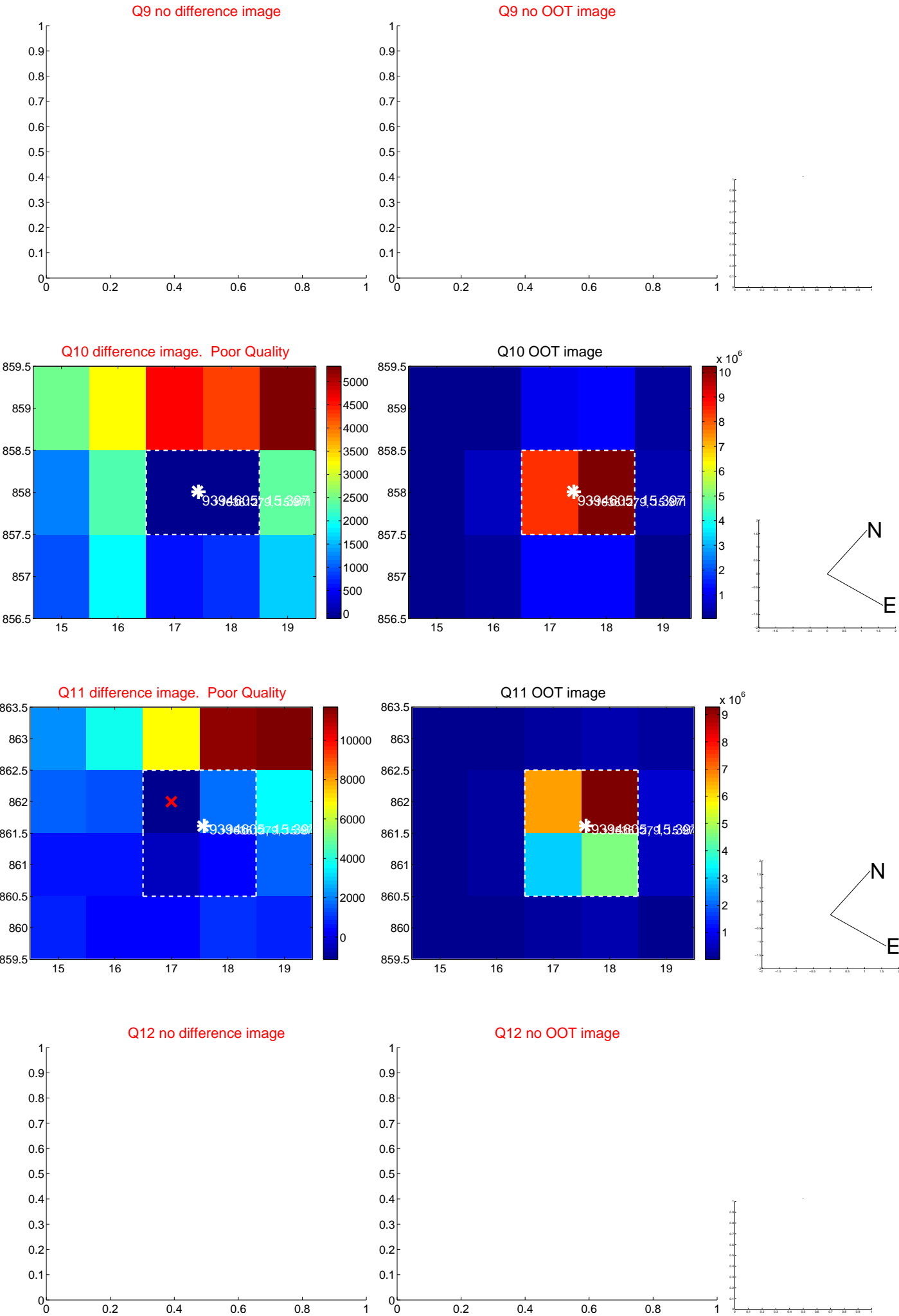
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



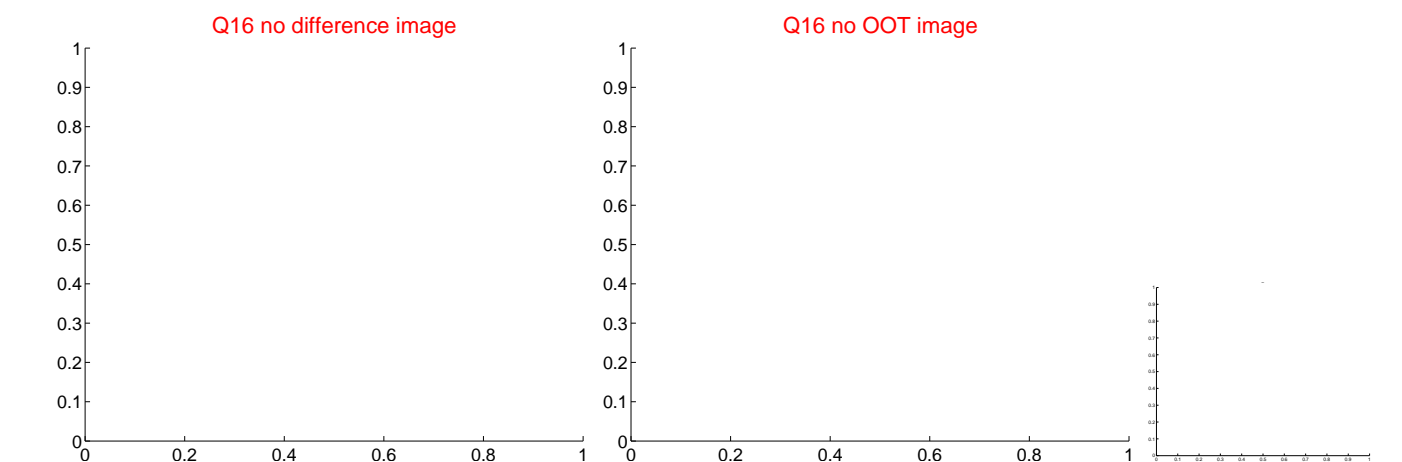
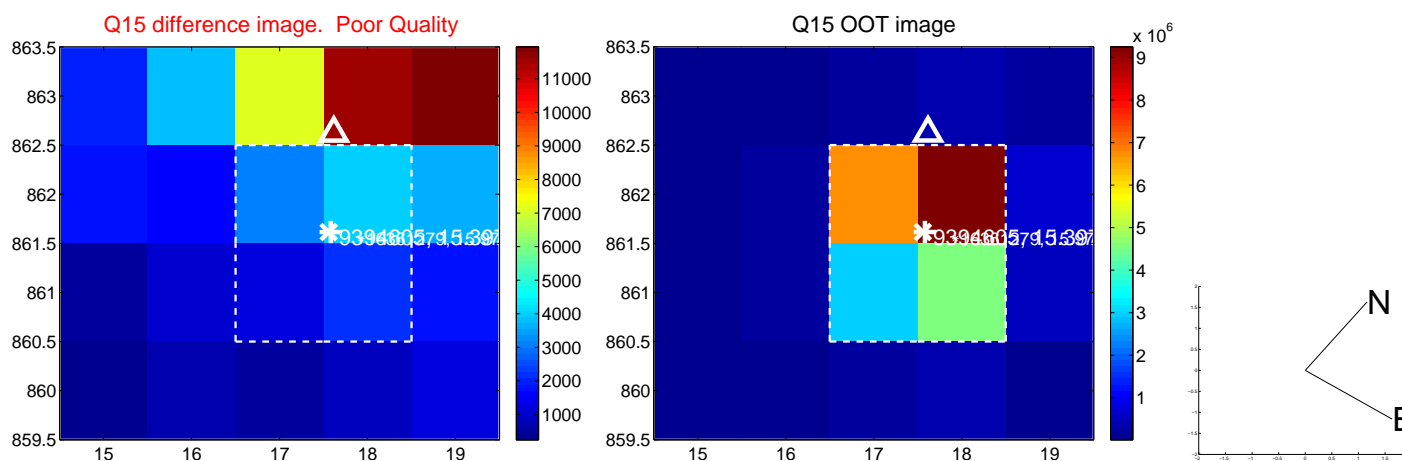
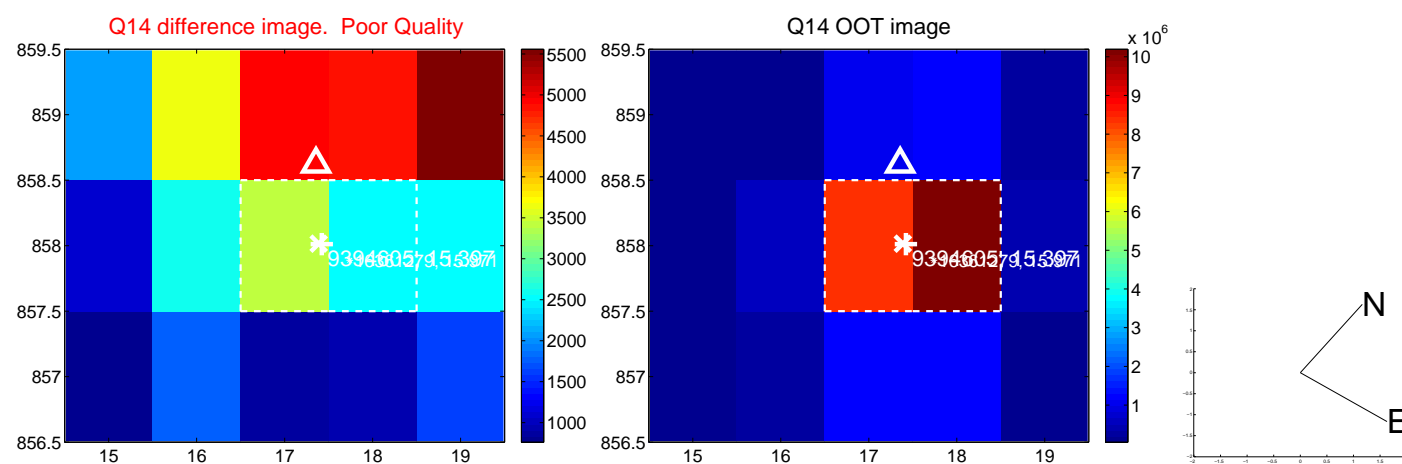
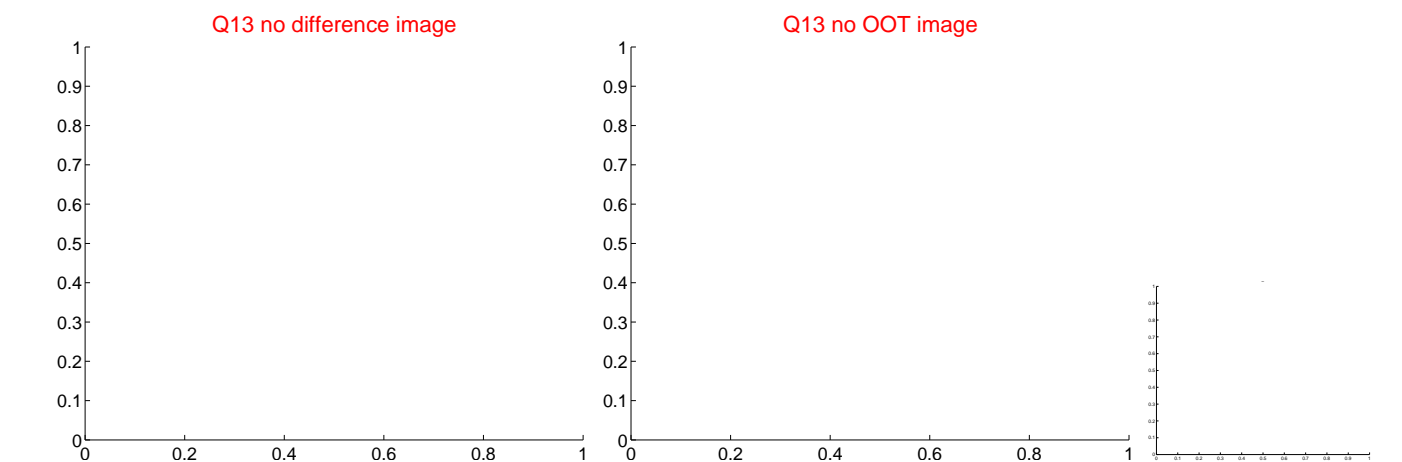
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



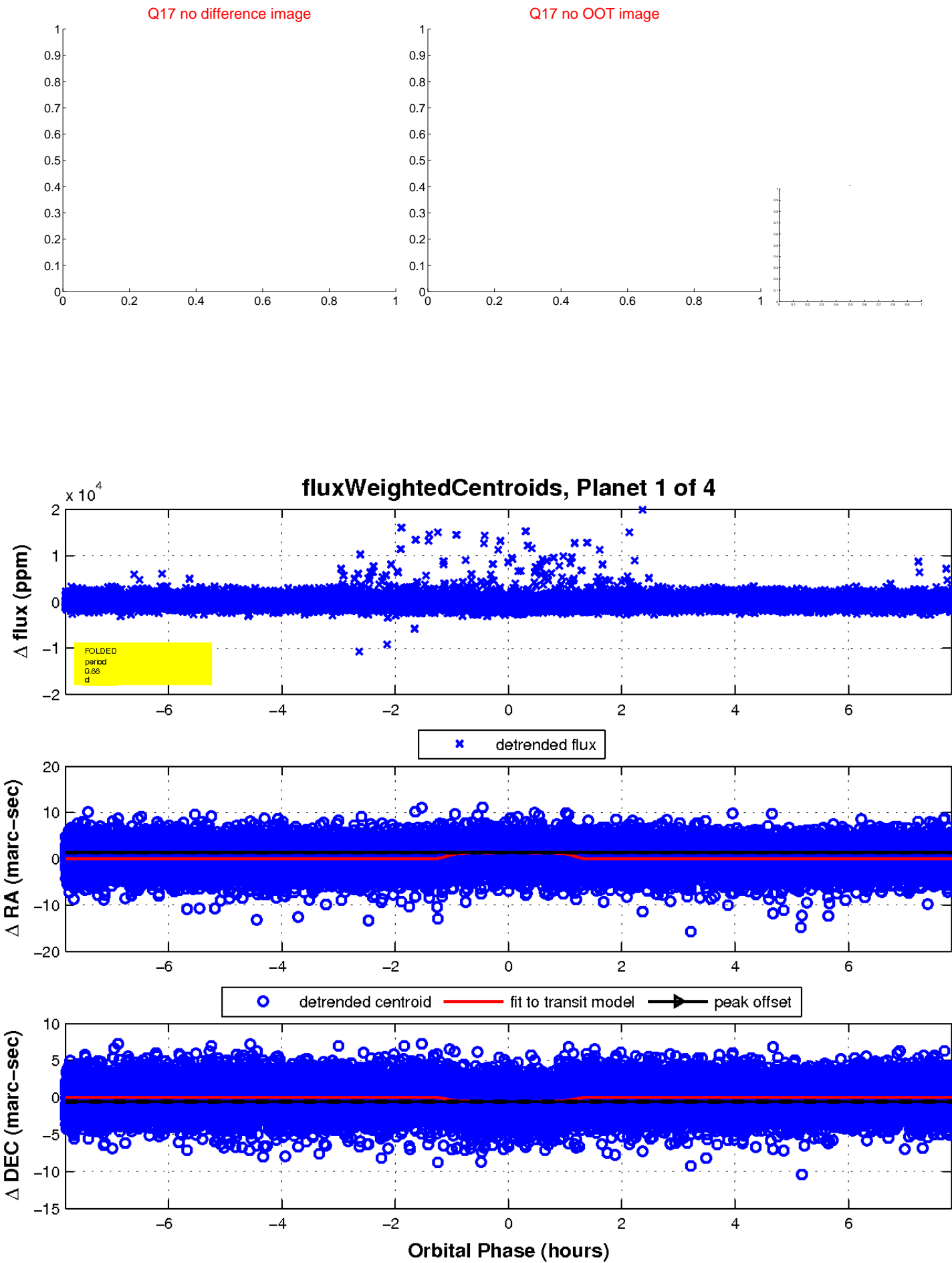
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



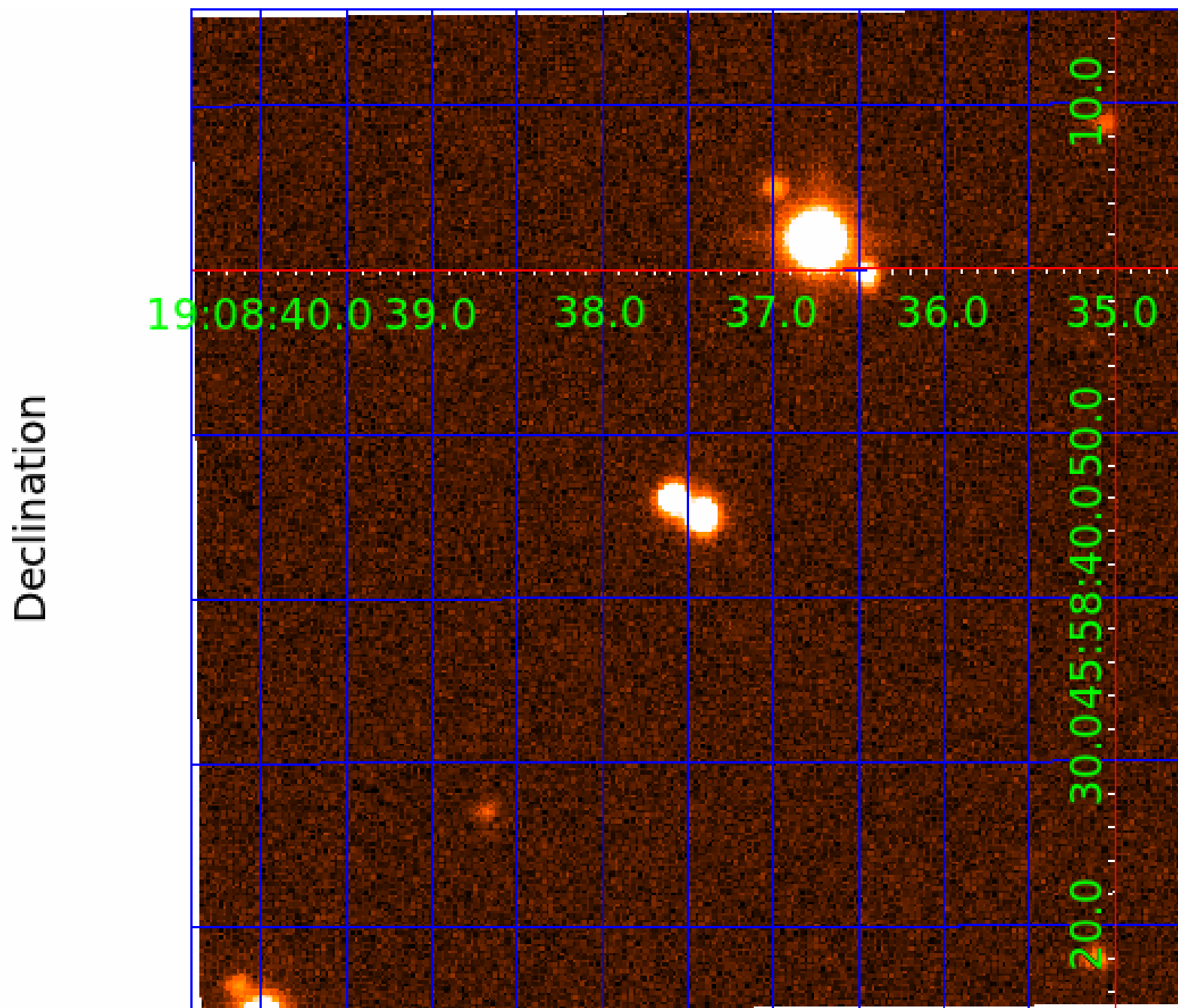
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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



UKIRT Image



KIC 009394605

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})
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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009394605-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
009394605-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_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.

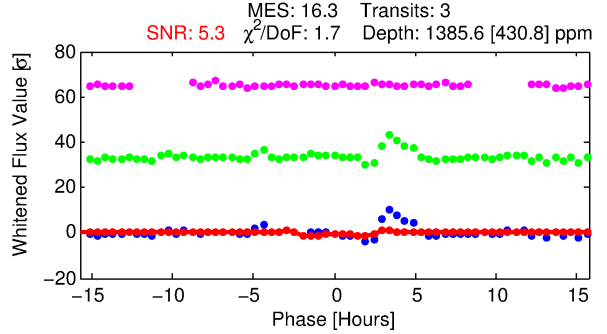
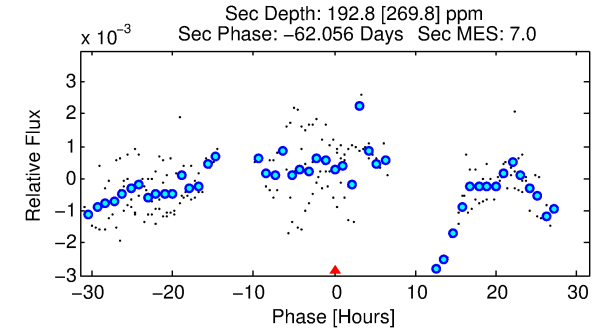
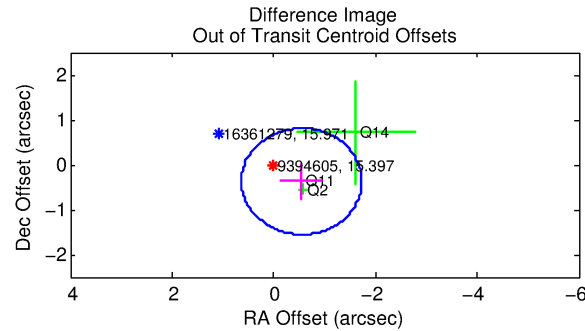
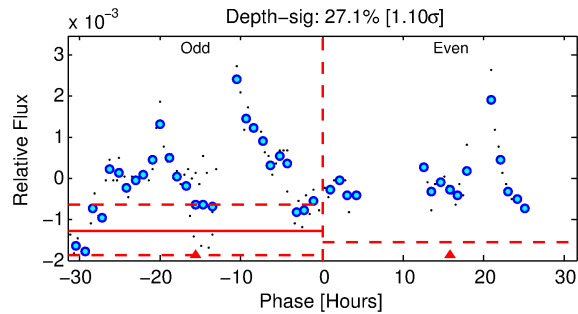
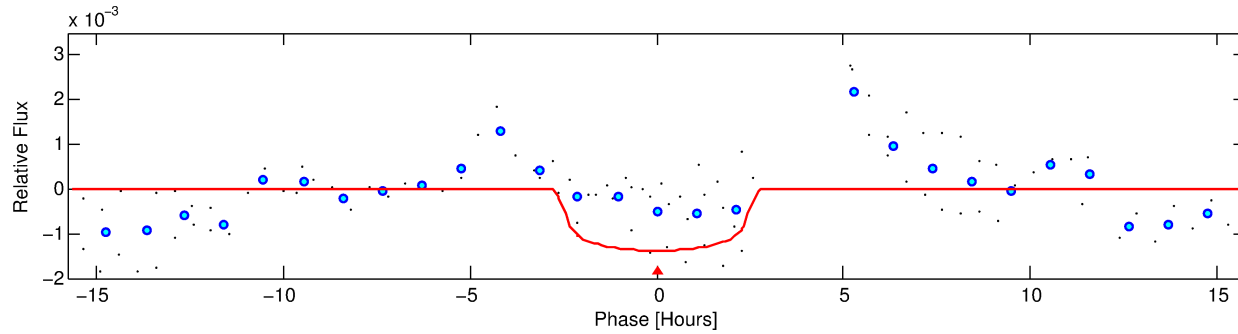
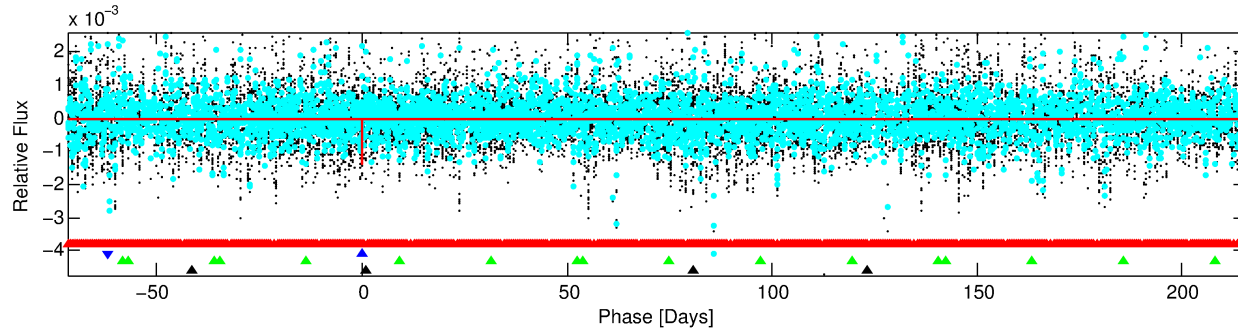
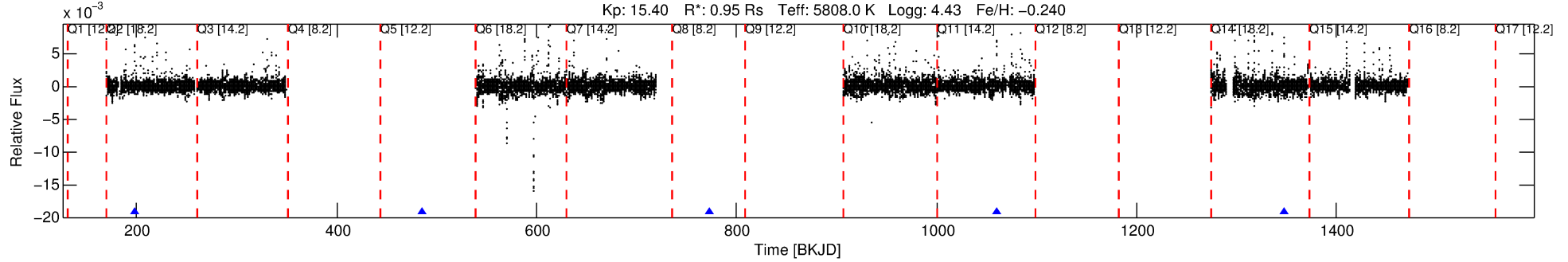
Ephemeris Match Information For 009394605-02

No Significant Match Found

DV One-Page Summary

KIC: 9394605 Candidate: 2 of 4 Period: 287.504 d
KOI: K06203 Corr: No Ephemeris Match

Kp: 15.40 R*: 0.95 Rs Teff: 5808.0 K Logg: 4.43 Fe/H: -0.240



DV Fit Results:

Period = 287.50408 [0.00461] d
Epoch = 197.5498 [0.0103] BKJD
Rp/R* = 0.0350 [0.0322]
a/R* = 375.07 [1507.56]
b = 0.51 [5.79]
Seff = 1.36 [0.53]
Teq = 276 [27] K
Rp = 3.63 [3.51] Re
a = 0.8221 [0.2025] AU
Ag = 5431.27 [12712.95] [0.43σ]
Teffp = 3658 [2119] K [1.60σ]

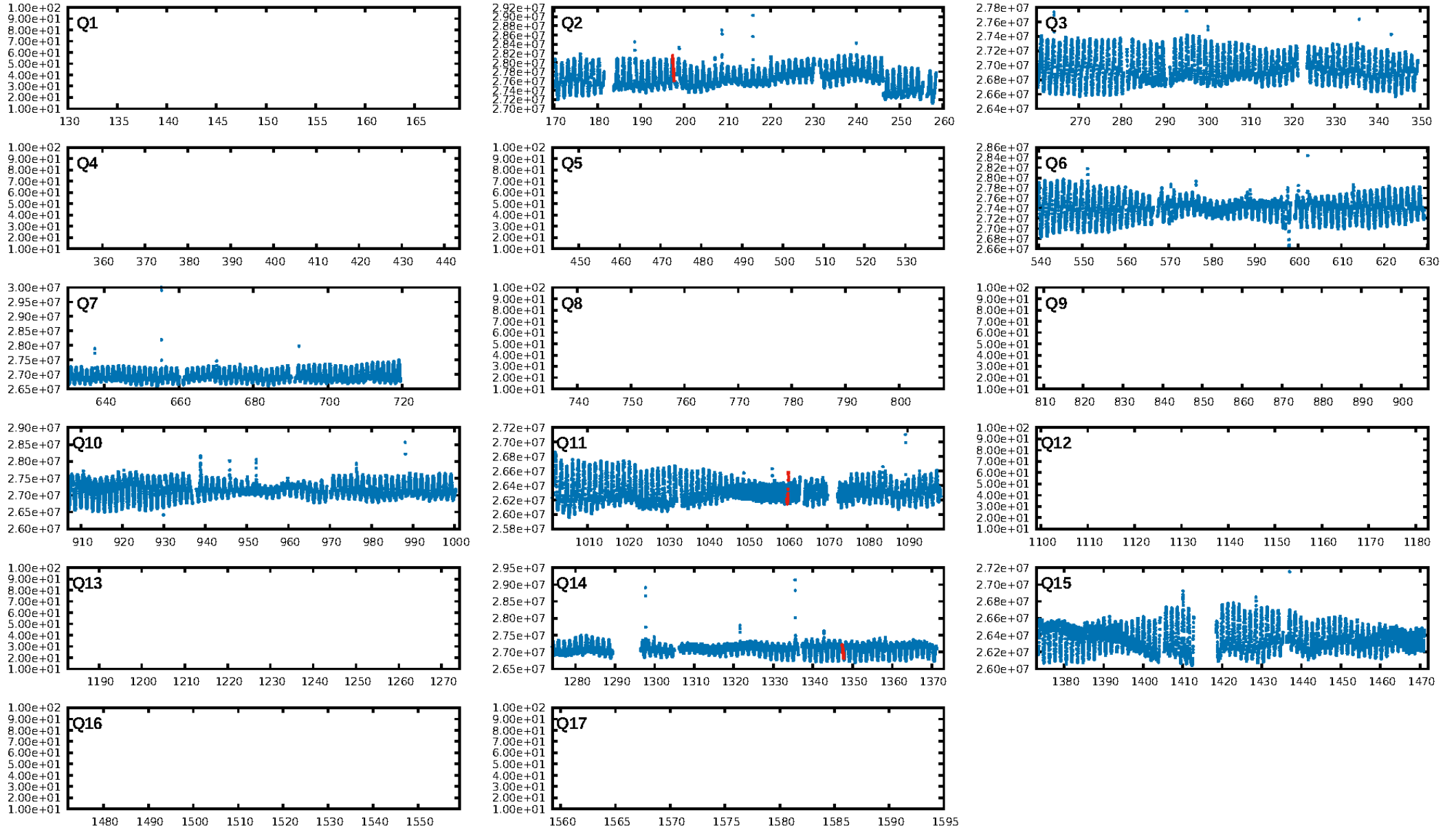
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [563.31σ]
LongPeriod-sig: 100.0% [513.02σ]
ModelChiSquare2-sig: 0.2%
ModelChiSquareGof-sig: 33.1%
Bootstrap-pfa: 5.09e-17
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.103
Centroid-sig: 15.4%
Centroid-so: 0.951 arcsec [0.80σ]
OotOffset-rm: 0.662 arcsec [1.68σ]
OotOffset-st: 2/1/0/0 [3]
KicOffset-rm: 0.554 arcsec [1.41σ]
KicOffset-st: 2/1/0/0 [3]
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DiffImageOverlap-fno: 0.00 [0/3]

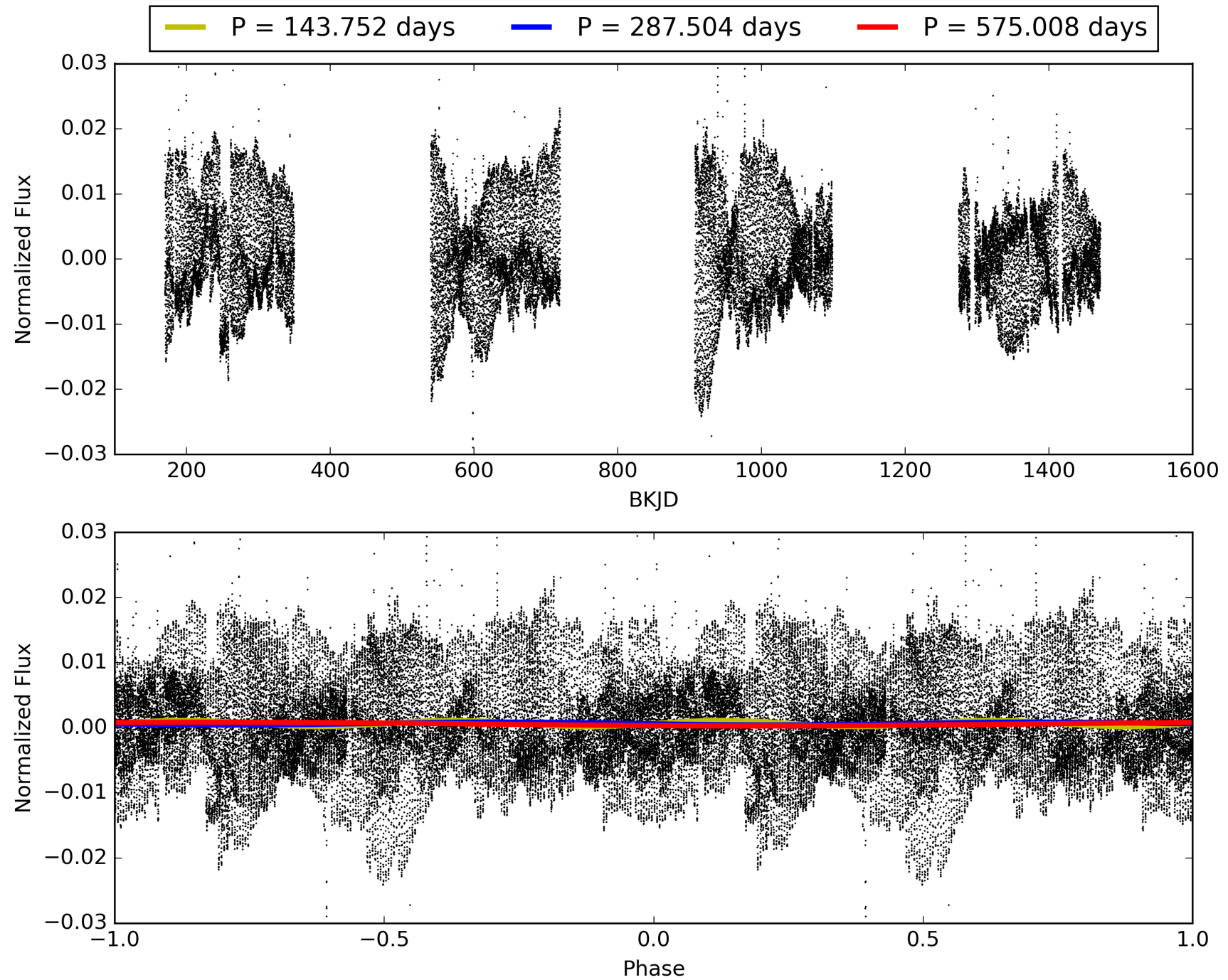
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009394605-02, PDC Light Curves

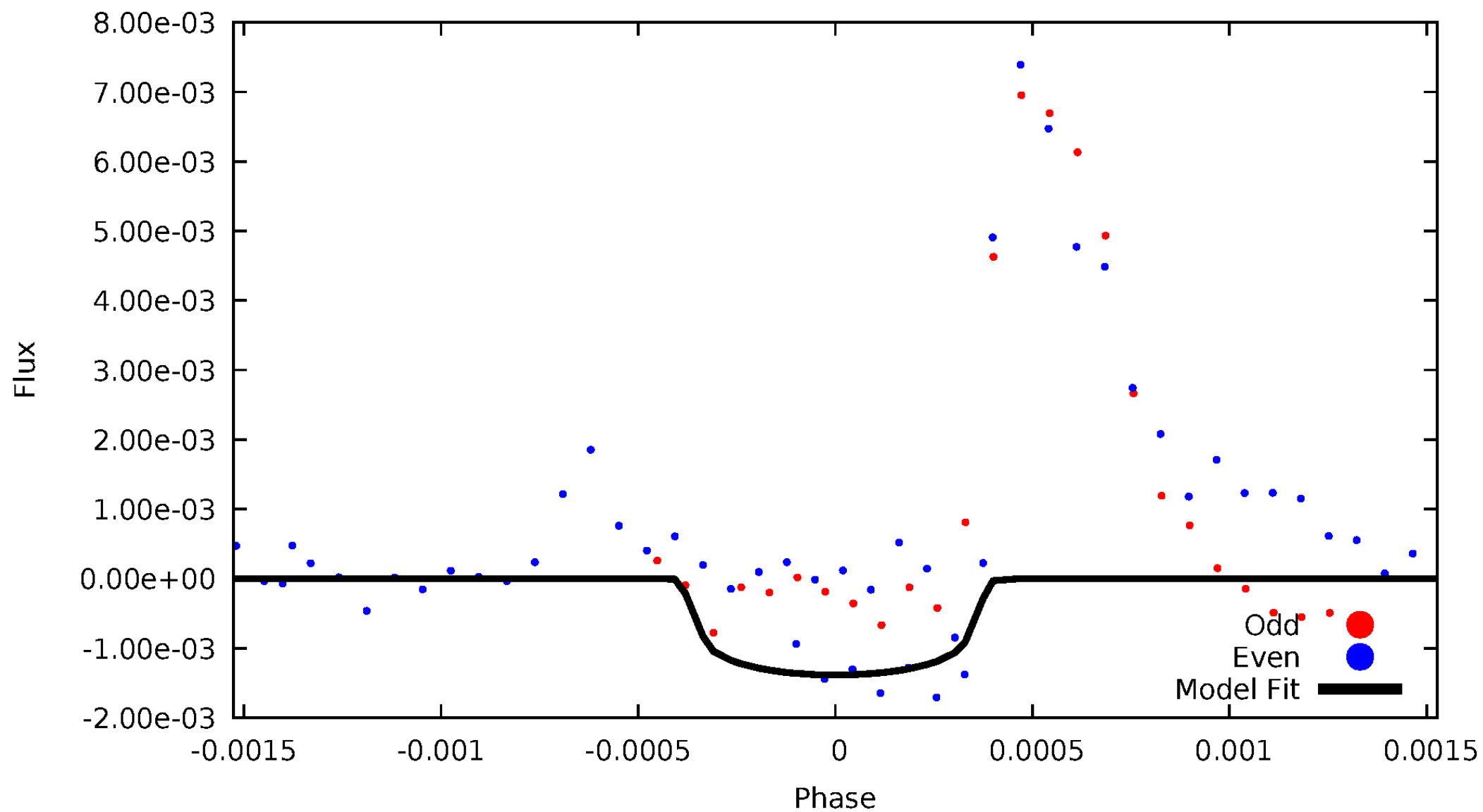


TCE 009394605-02



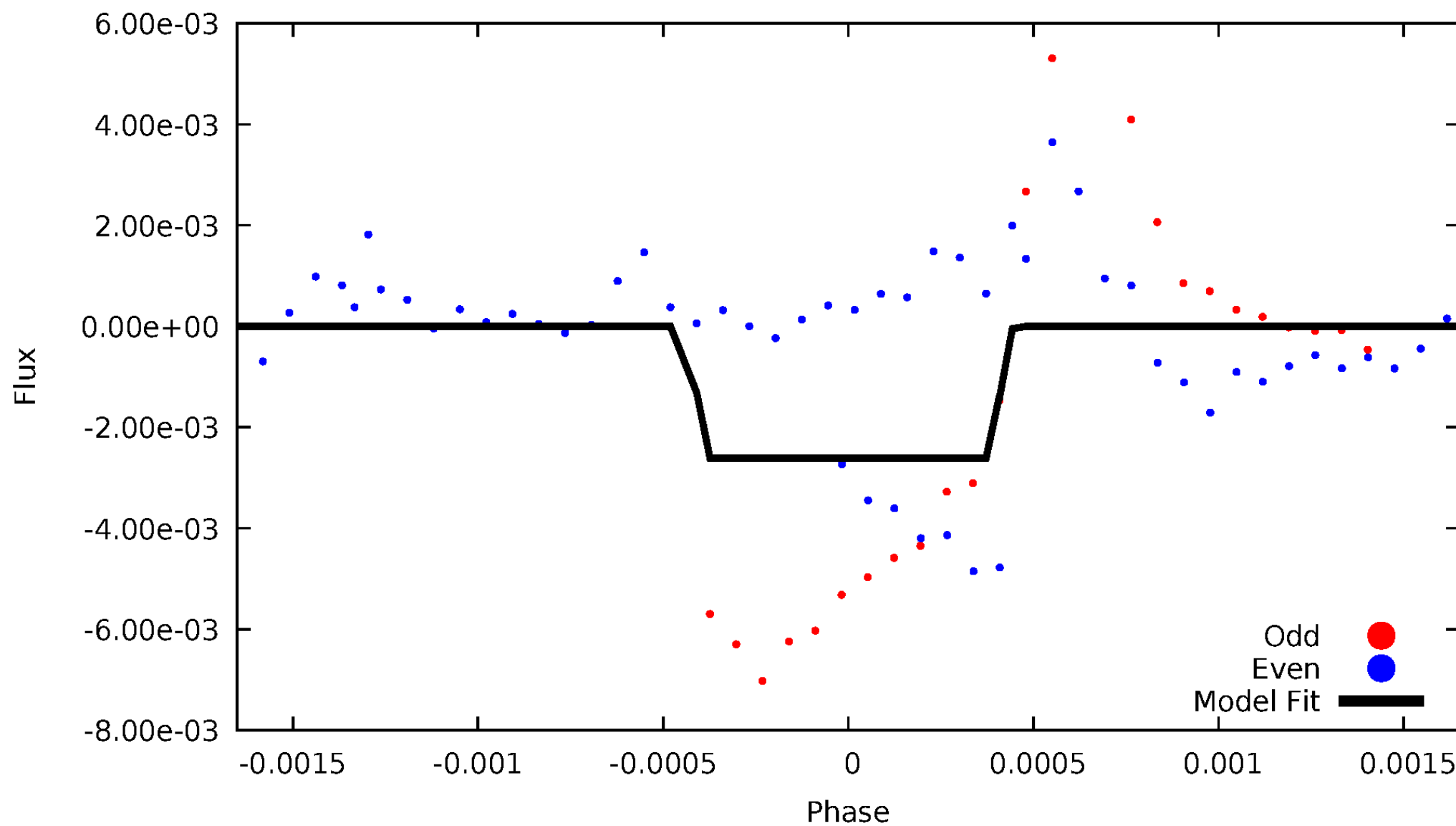
DV Odd/Even

TCE 009394605-02



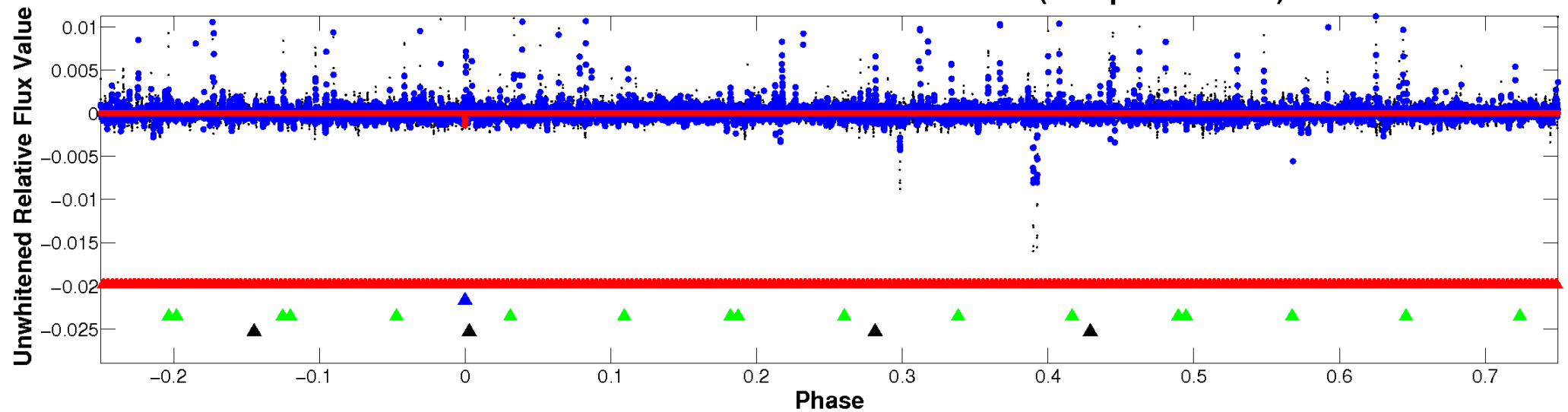
ALT Odd/Even

TCE 009394605-02

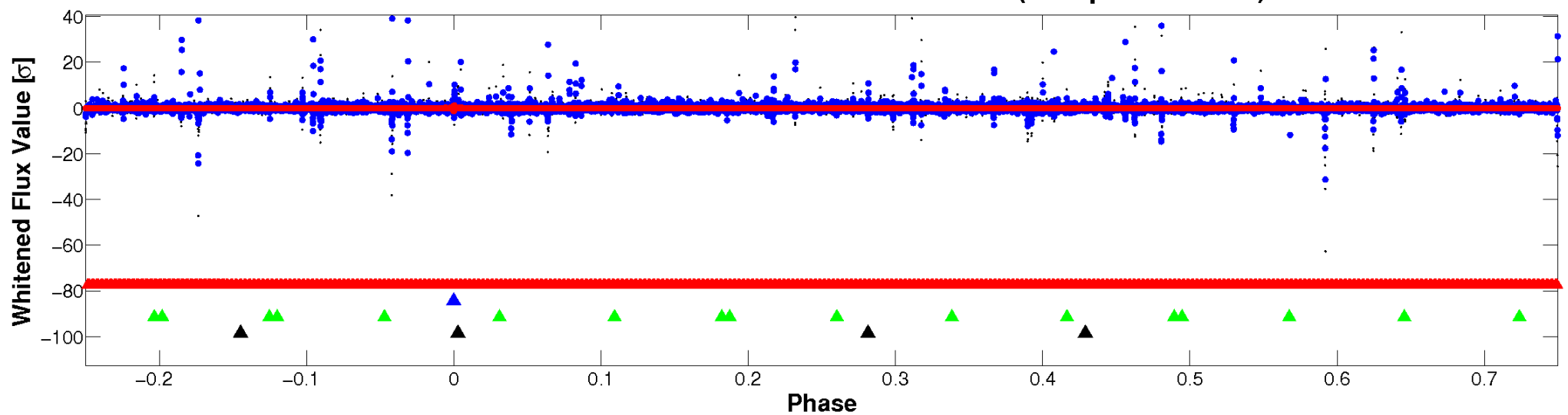


Non-Whitened Vs. Whitened Light Curve

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

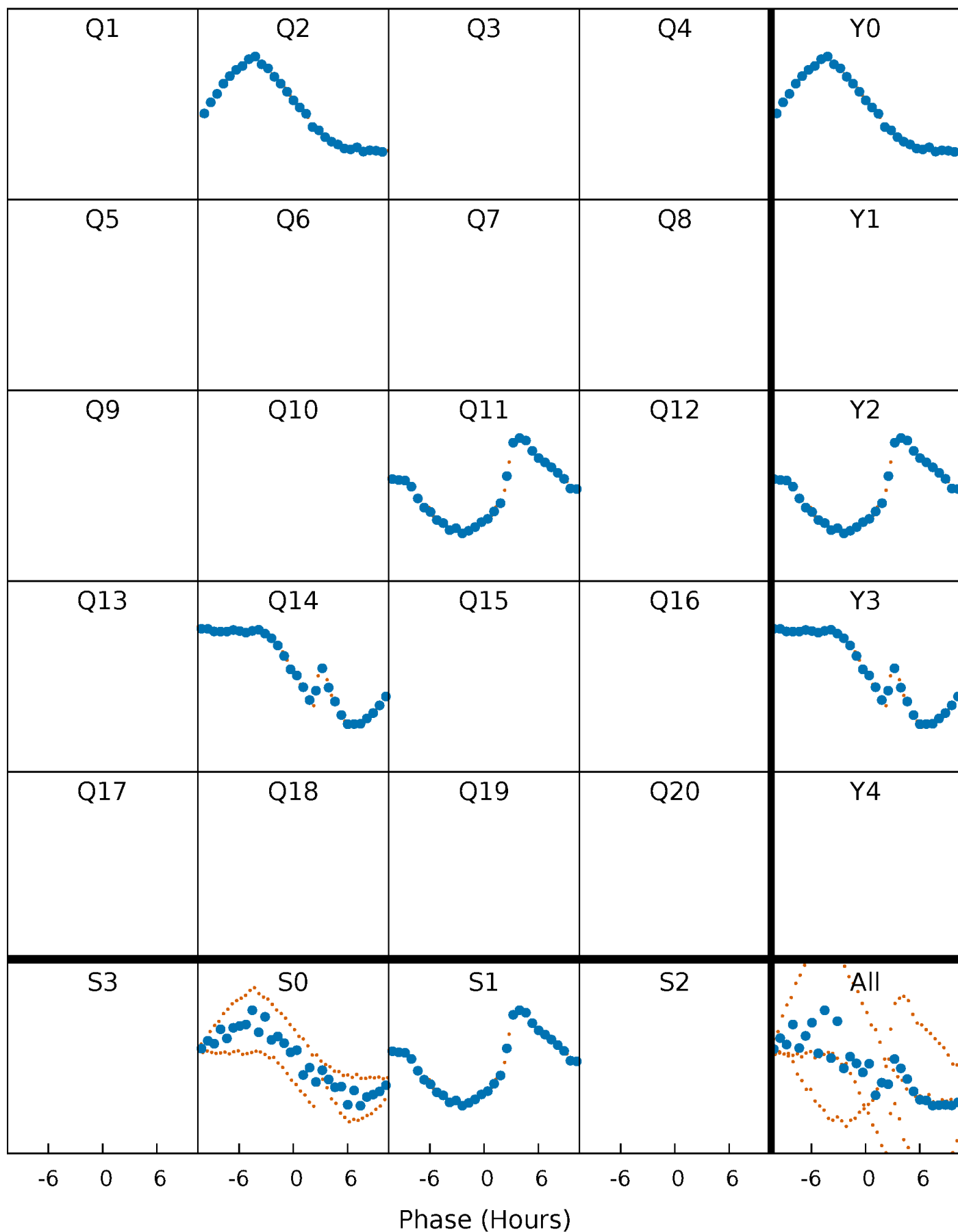


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



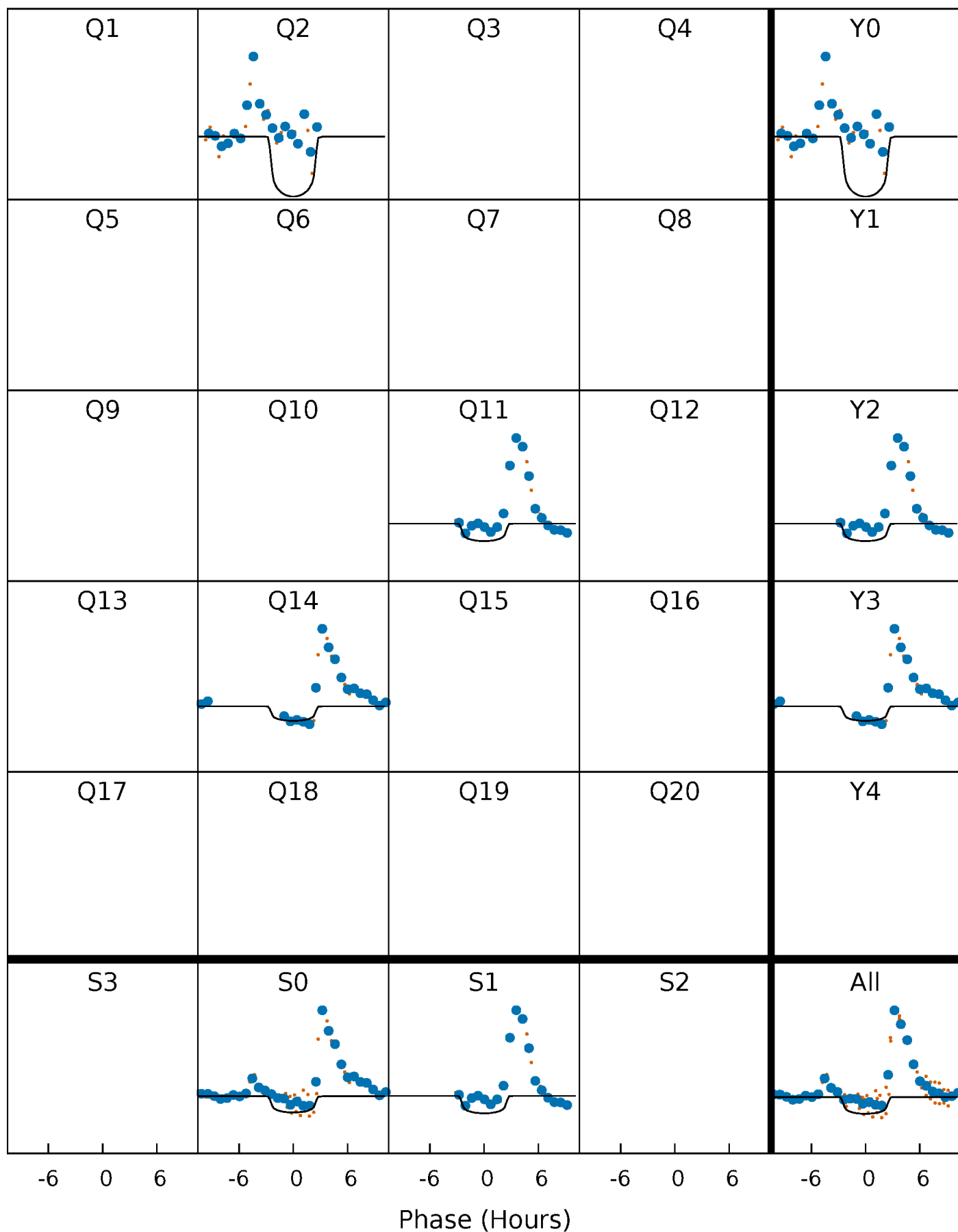
PDC Quarter-Phased Transit Curves

TCE 009394605-02 P=287.504076 Days $T_0=197.549803$ (BKJD)



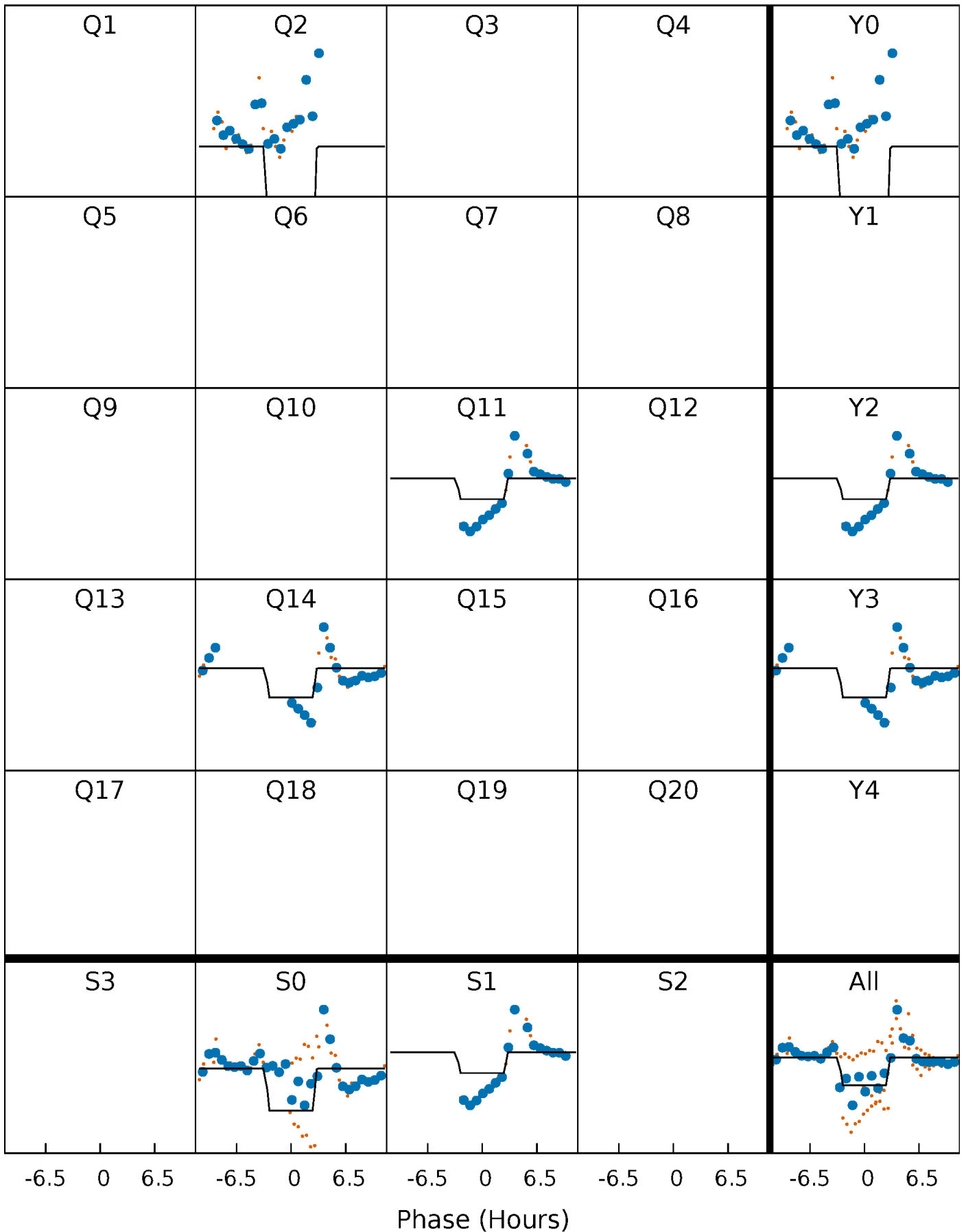
DV Quarter-Phased Transit Curves

TCE 009394605-02 P=287.504076 Days $T_0=197.549803$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

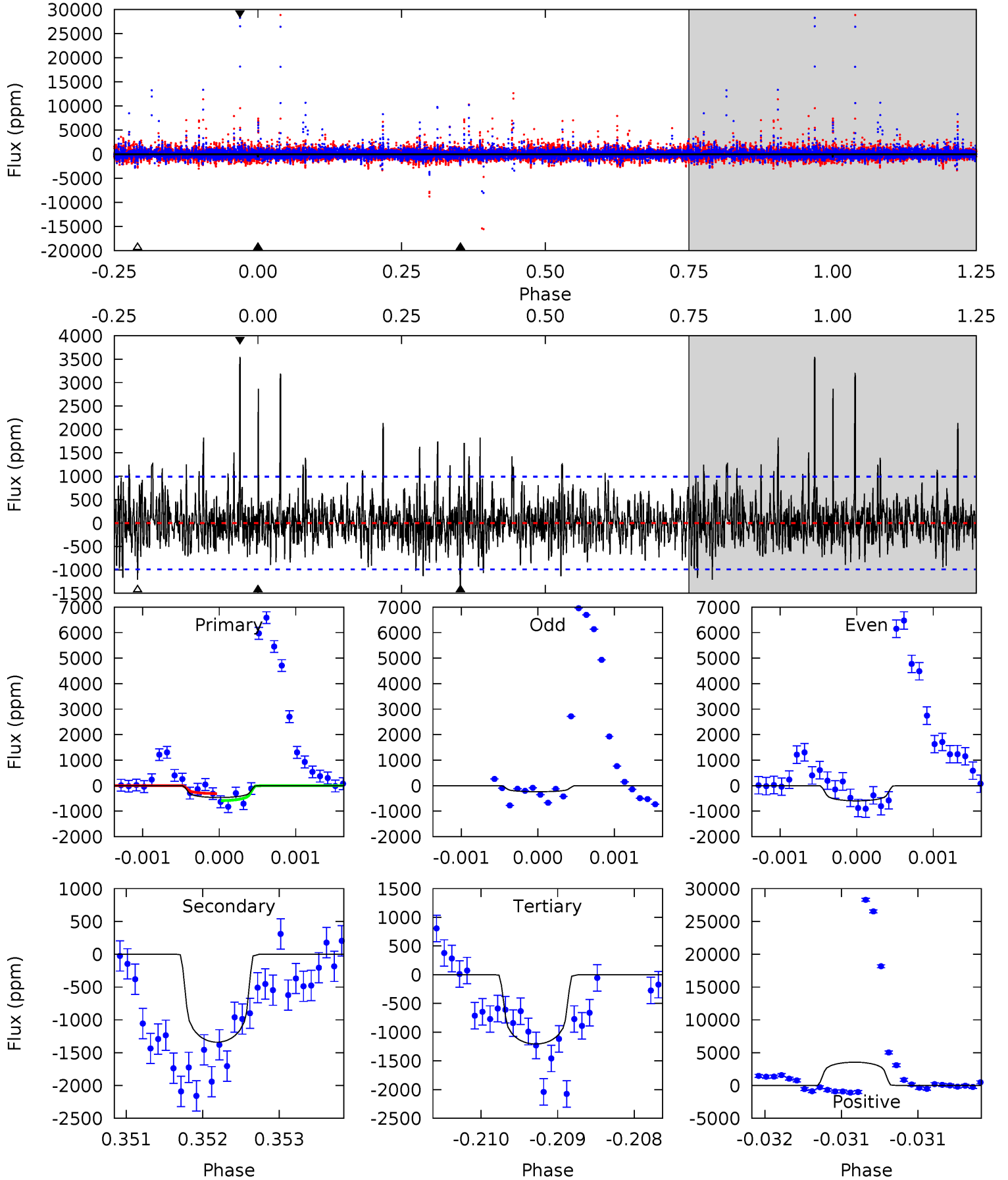
TCE 009394605-02 $P=287.503168$ Days $T_0=197.530135$ (BKJD)



DV Model-Shift Uniqueness Test

009394605-02, P = 287.504076 Days, E = 197.549803 Days

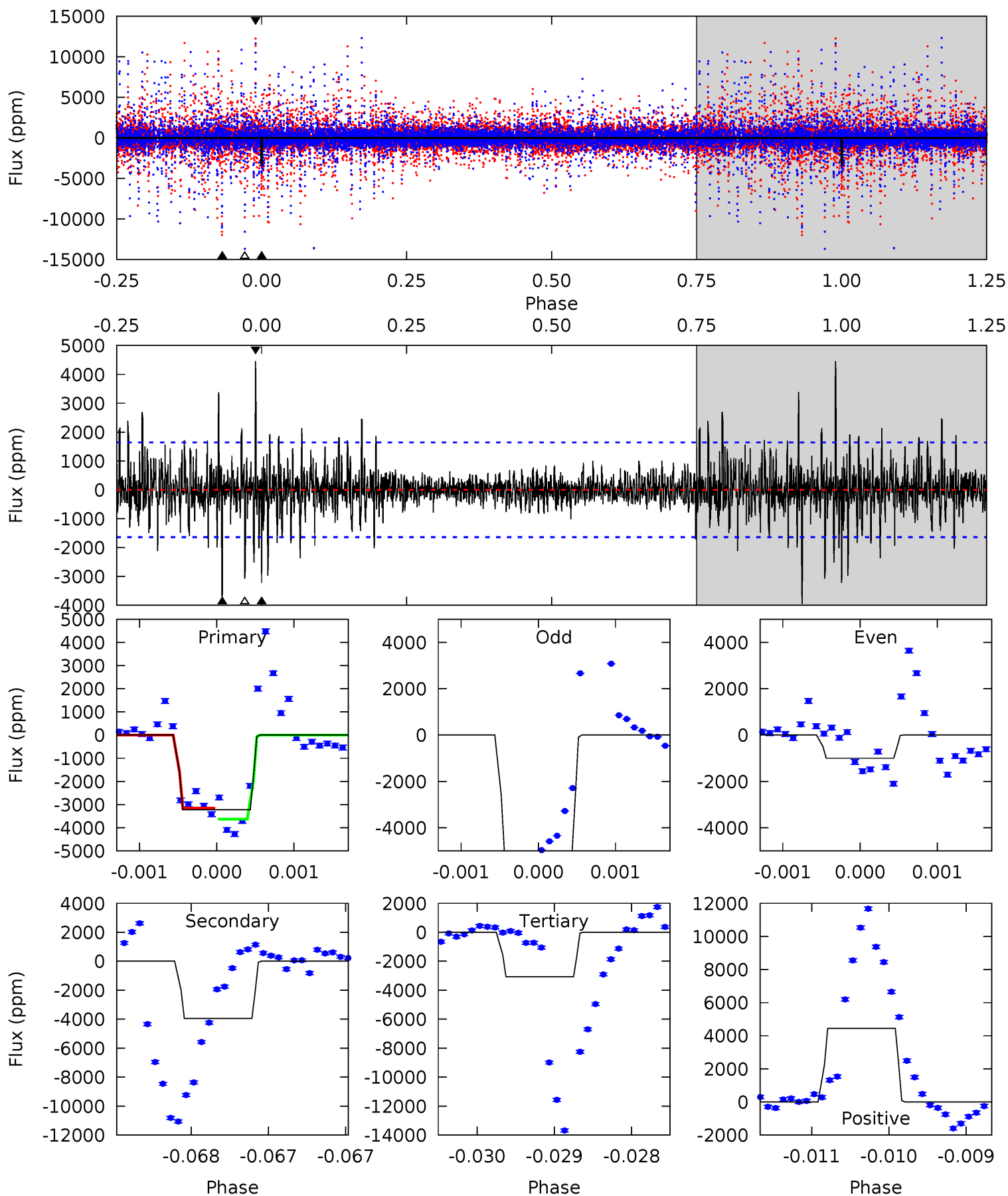
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.57	7.41	6.68	19.6	5.48	3.34	2.33	-4.11	-17.1	0.74	-12.2	0.64	2.34	0.73	0.77



Alt Model-Shift Uniqueness Test

009394605-02, P = 287.503168 Days, E = 197.530135 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	13.2	10.3	14.9	5.48	3.34	1.73	0.49	-4.12	2.94	-1.67	6.54	0.71	0.53	0.76



Stellar Parameters For KIC 009394605

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5808^{+207}_{-207}	$4.434^{+0.105}_{-0.195}$	$-0.240^{+0.300}_{-0.300}$	$0.951^{+0.279}_{-0.139}$	$0.895^{+0.131}_{-0.087}$	$1.467^{+0.777}_{-0.685}$
	+4%/-4%	+2%/-4%	+125%/-125%	+29%/-15%	+15%/-10%	+53%/-47%
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 009394605-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1340 ± 181	$4.35^{+3.36}_{-2.59}$	392^{+30}_{-23}	5554^{+3430}_{-1164}	$27066^{+131867}_{-18400}$
Alt.	-3952 ± 299	$5.76^{+3.43}_{-3.04}$	390^{+30}_{-23}	6311^{+3566}_{-1254}	$46773^{+148624}_{-29622}$

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

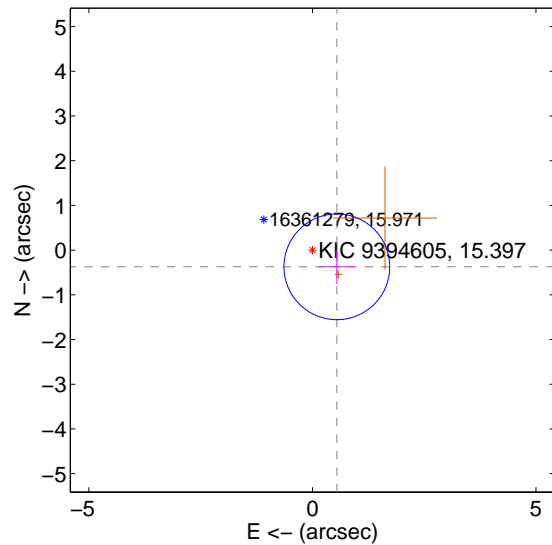
Supplemental centroid analysis for 009394605-02. Kepler magnitude: 15.40. Transit SNR 5.33

There are 1 quarters with good PRF difference image offsets

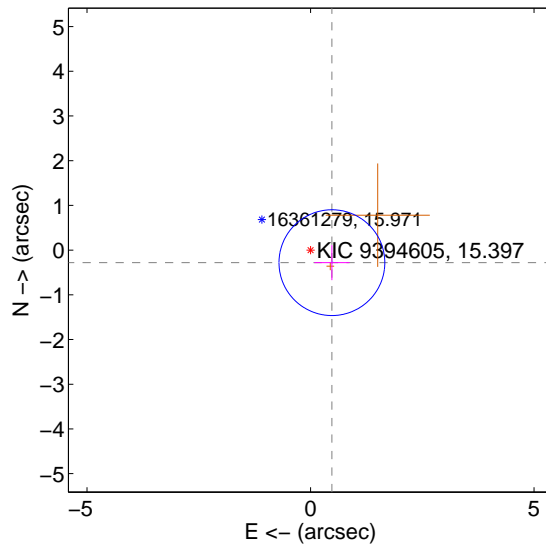
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.662 ± 0.394	1.68	-0.546 ± 0.395	-0.374 ± 0.393
PRF-fit source offset from KIC position	0.554 ± 0.394	1.41	-0.478 ± 0.395	-0.281 ± 0.393
photometric centroid source offset	0.95 ± 1.19	0.80	-0.82 ± 1.22	-0.48 ± 1.10

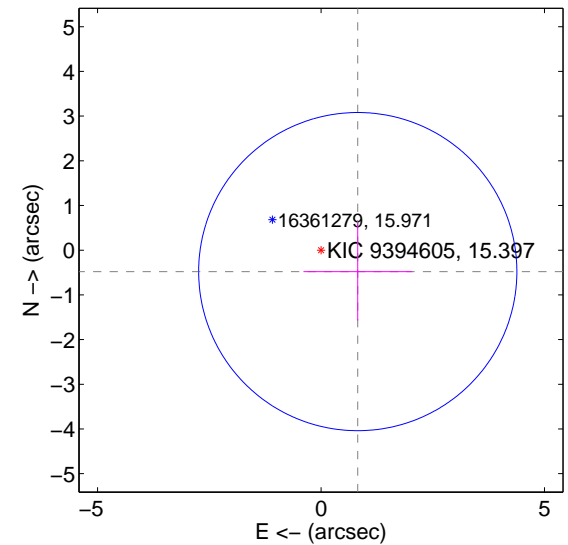
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

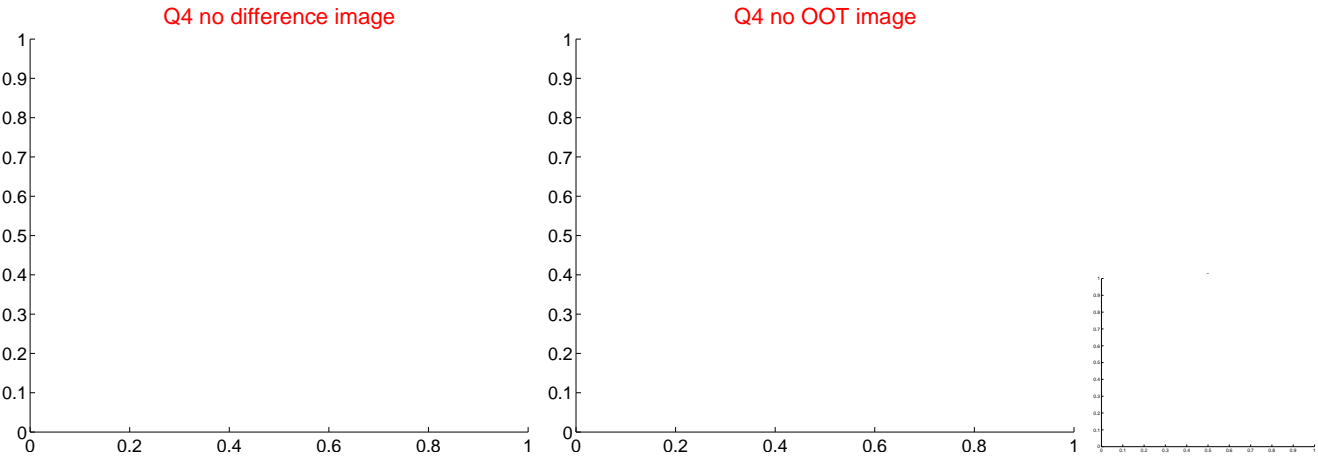
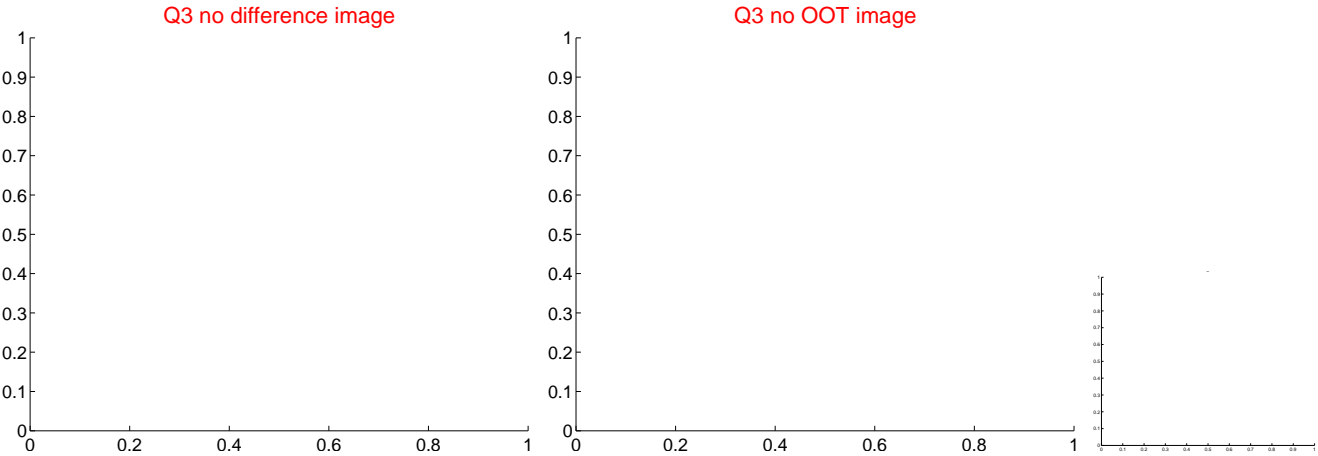
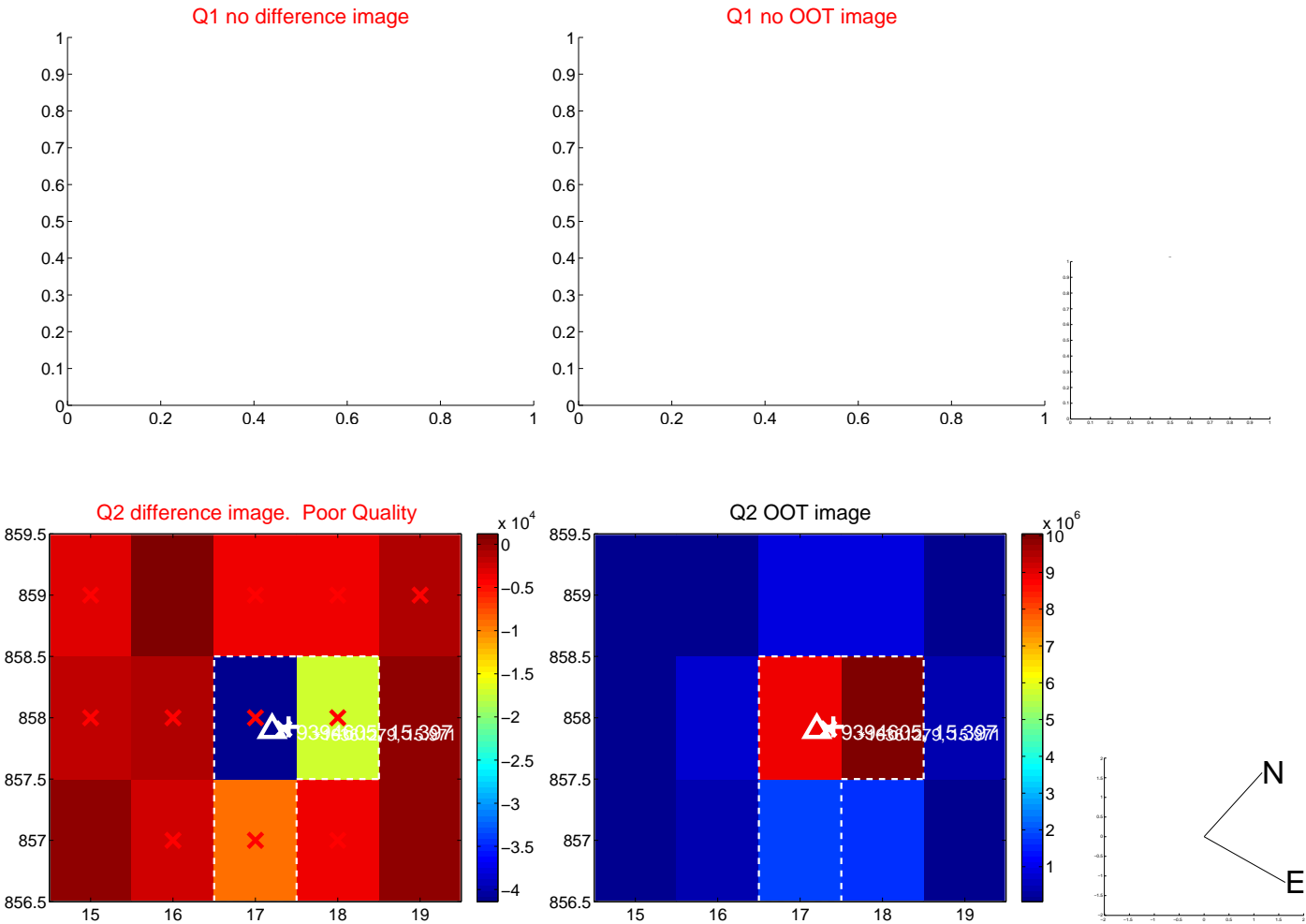


offset from photometric centroids

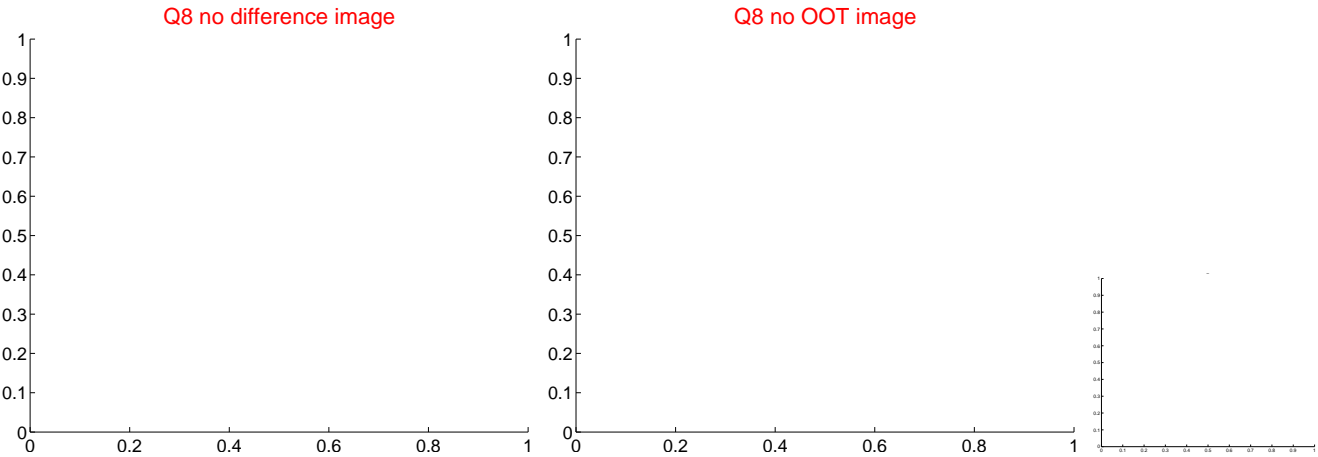
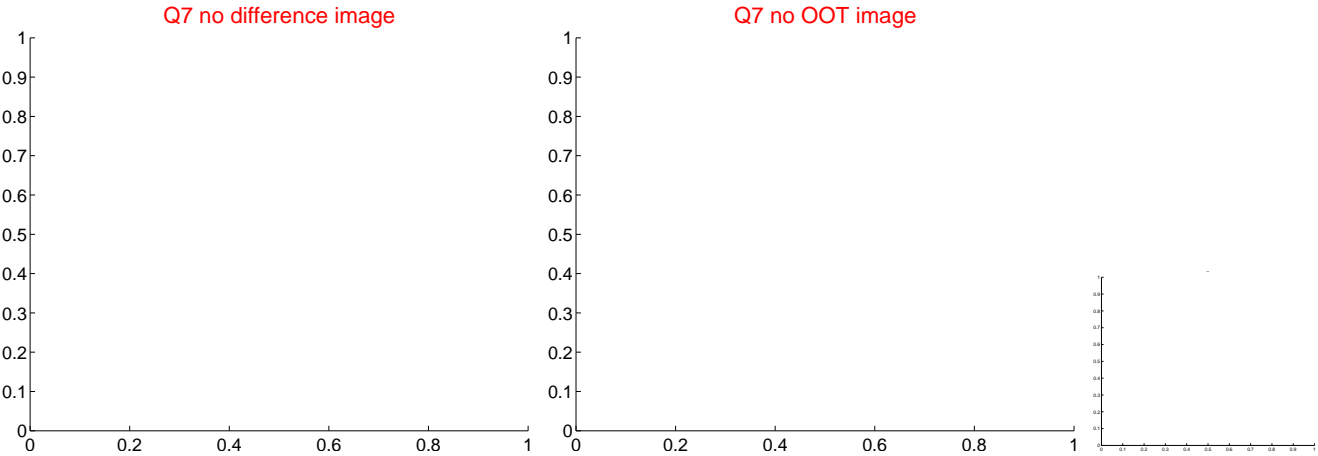
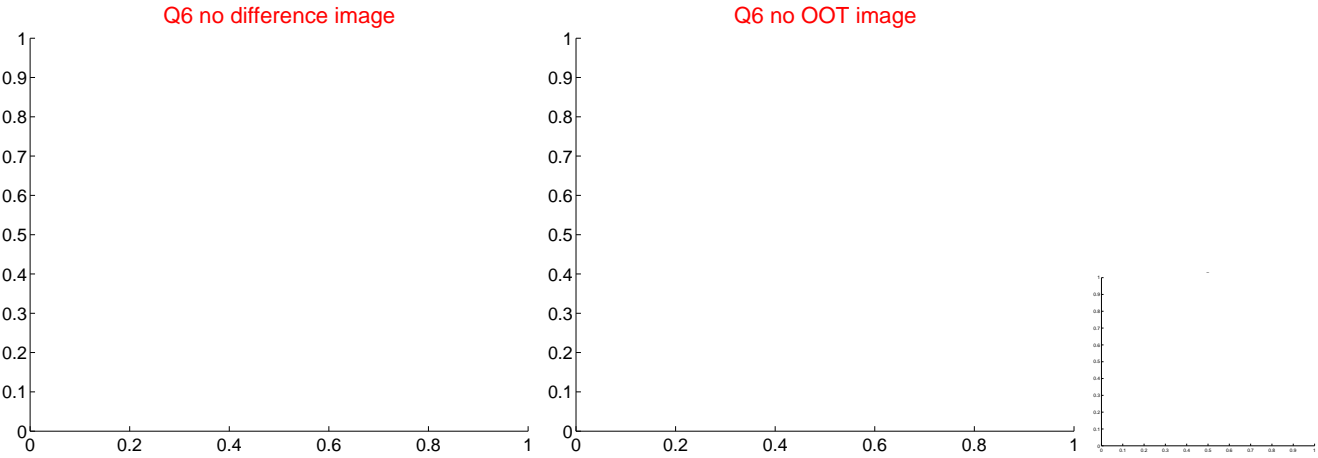
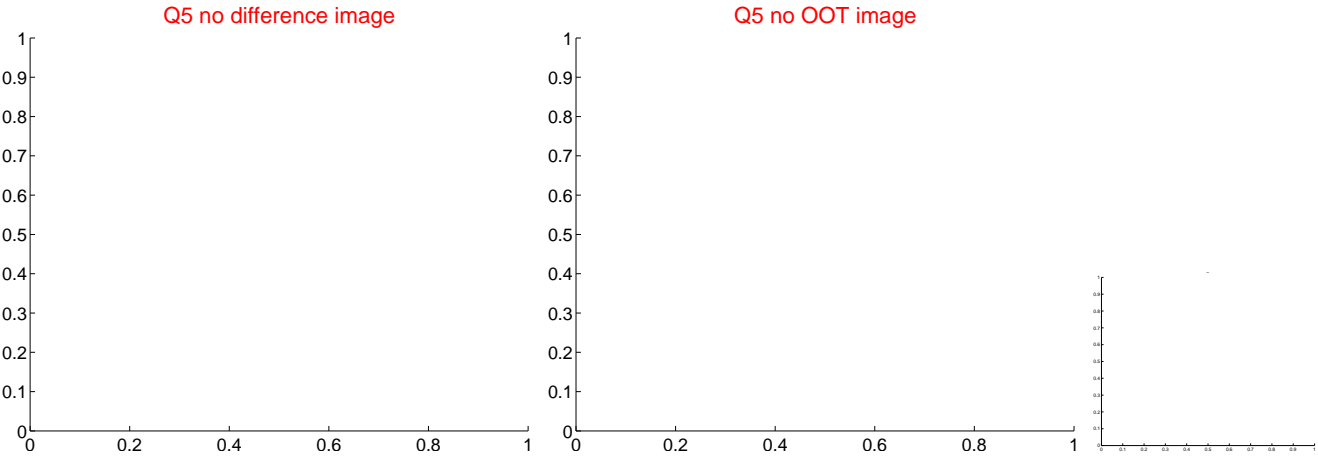


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

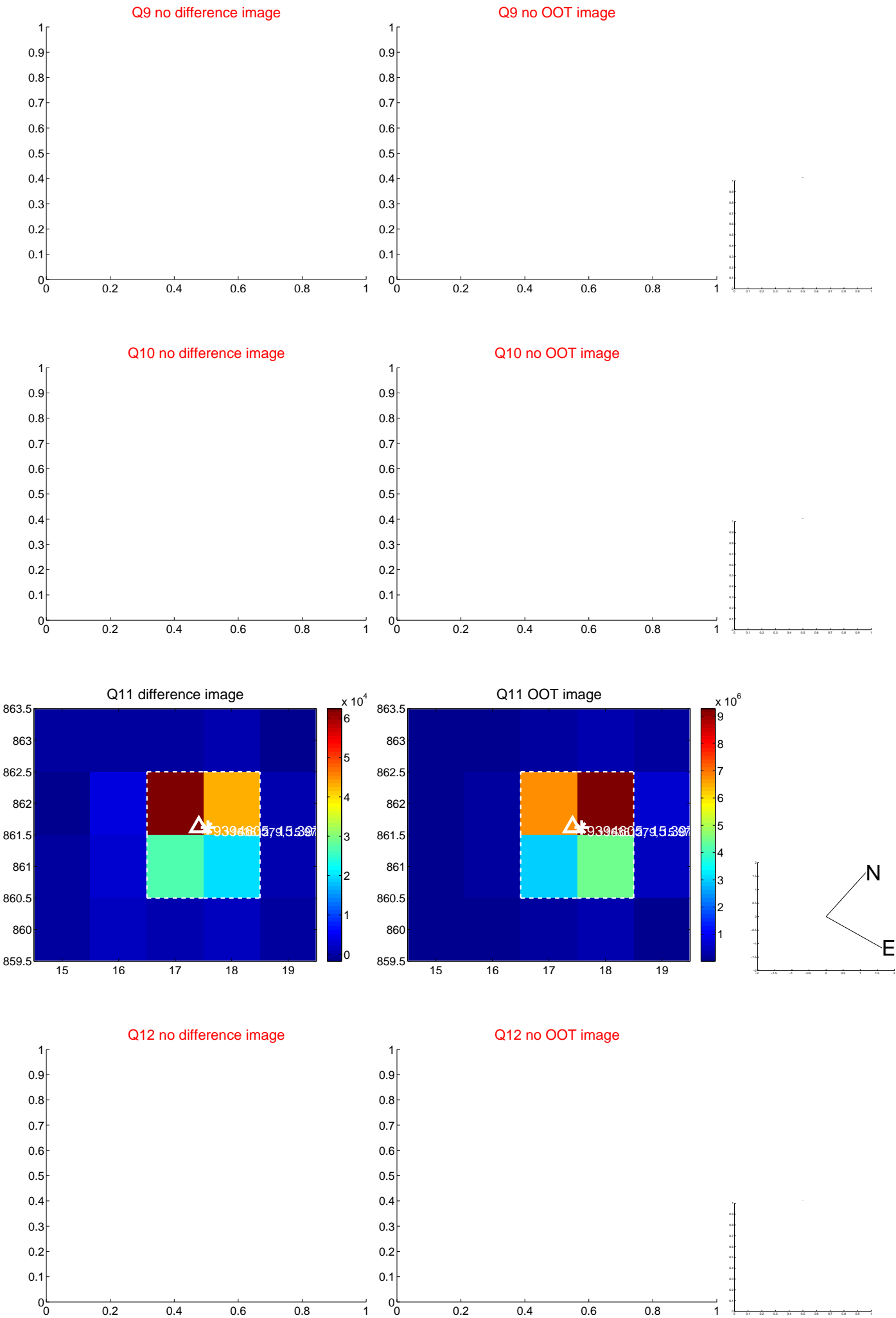
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



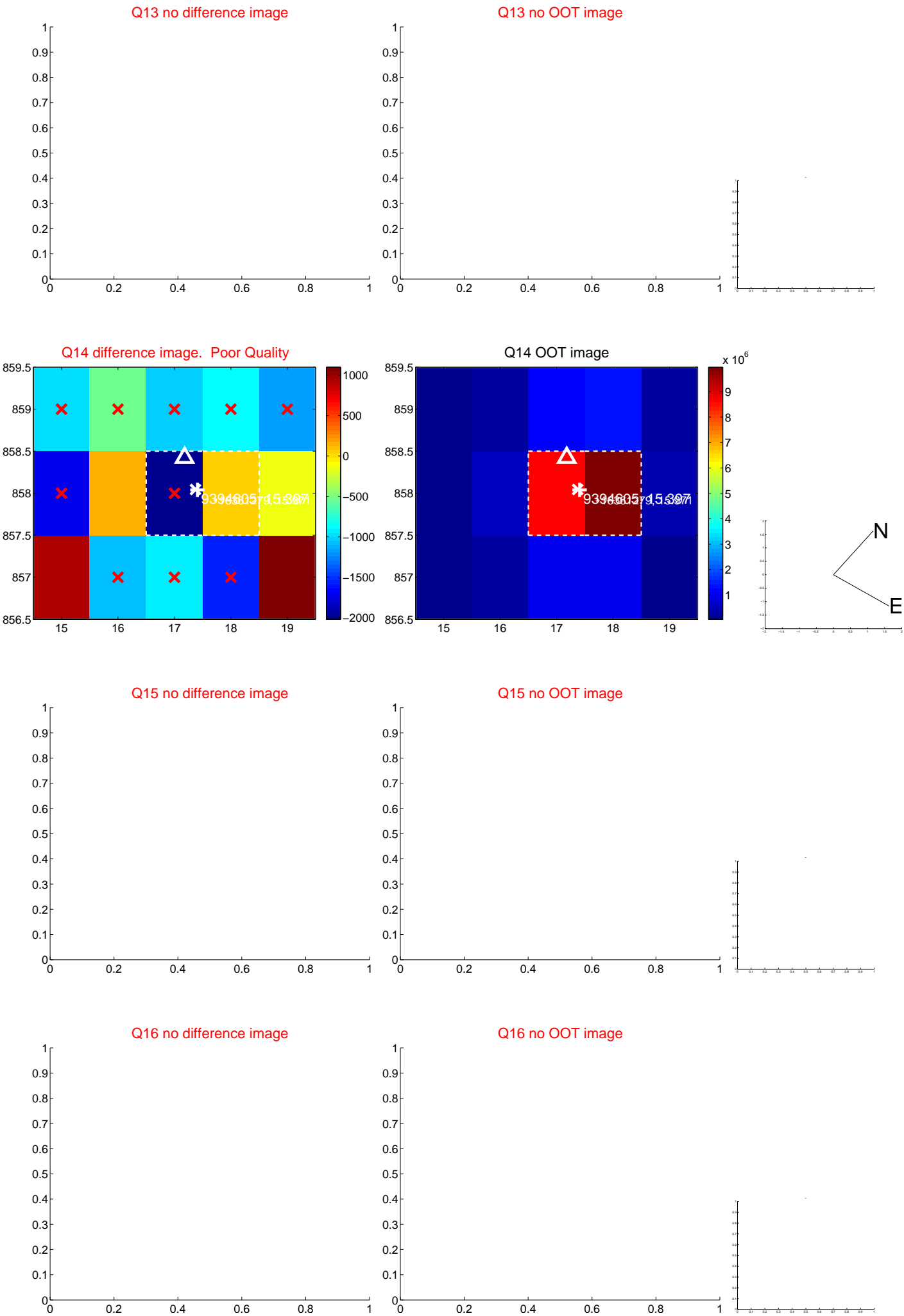
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



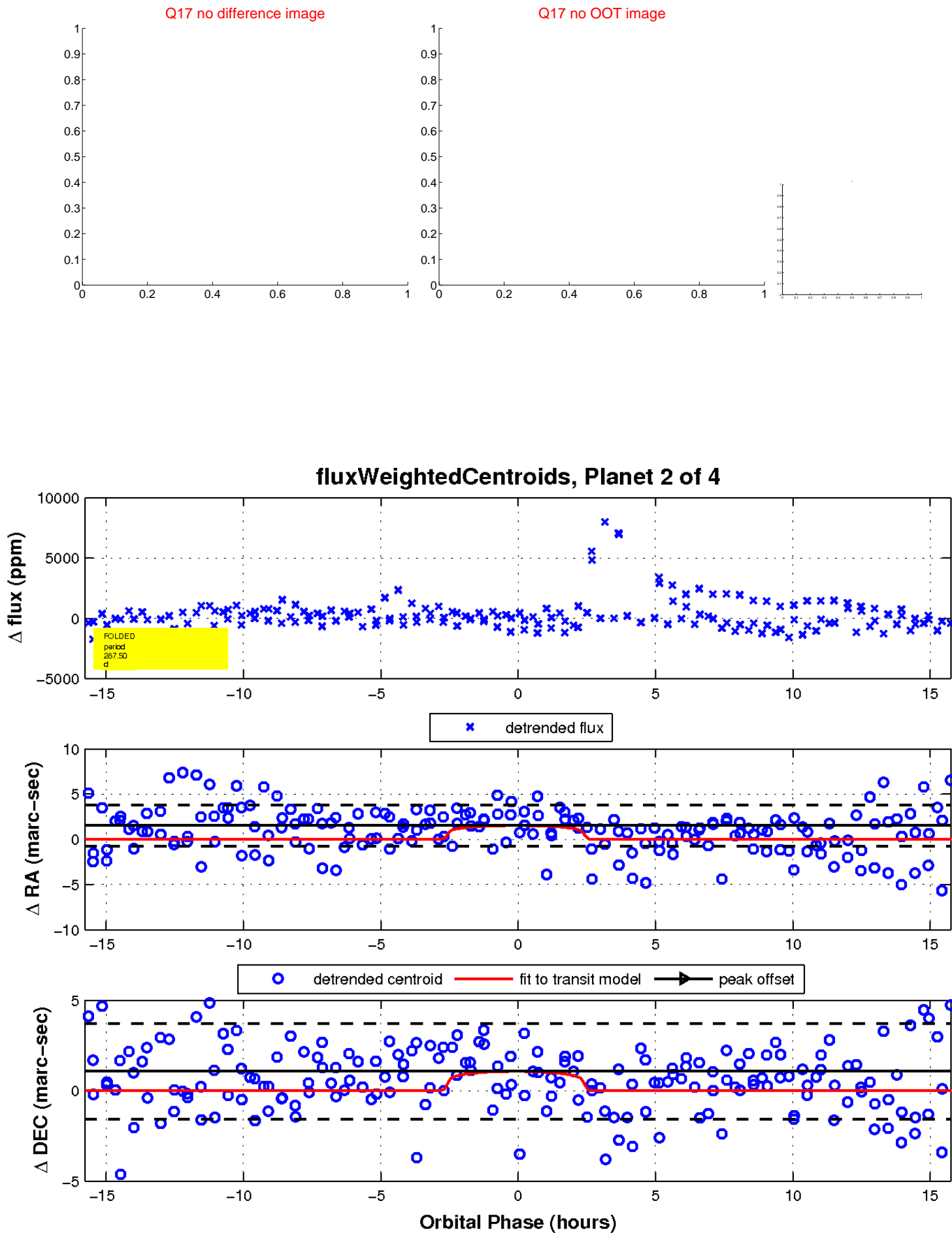
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



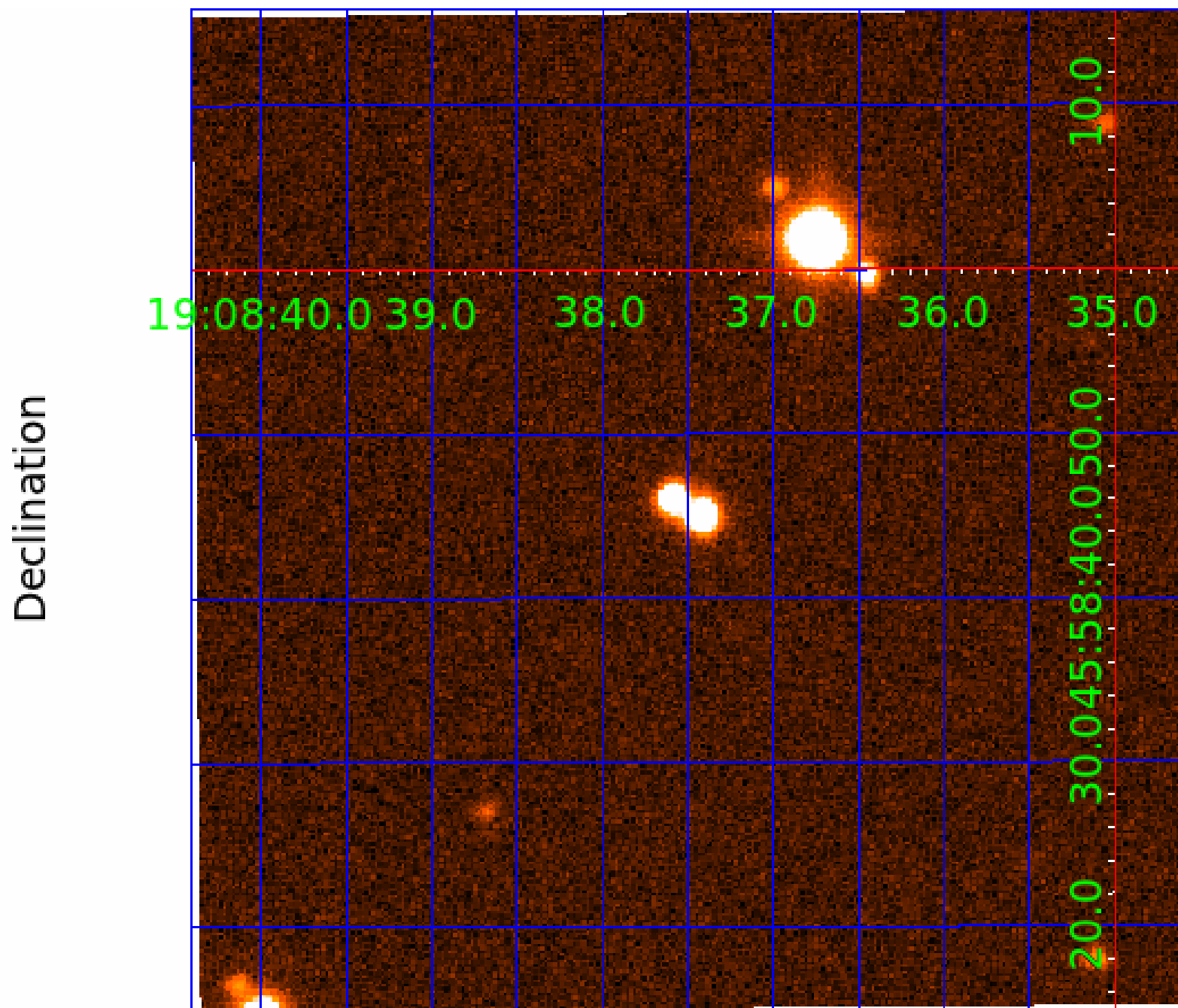
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009394605

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})
009394605-01	OBS	6203.01	0.876821	132.072647	257.4	2.608	19.1	21.5	0.95	5808	1.87	3084.89
009394605-02	OBS	No	287.504076	197.549803	1385.6	5.266	16.3	5.3	0.95	5808	3.63	1.36
009394605-03	OBS	No	88.345371	163.079812	2377.7	6.653	13.2	6.1	0.95	5808	5.68	6.58
009394605-04	OBS	No	410.030727	198.378408	1712.9	2.263	12.0	7.8	0.95	5808	4.23	0.85

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009394605-01	OBS	FP	0.00	0	1	0	1	MOD_SEC_DV—CENT_FEW_DIFFS—EPHEM_MATCH
009394605-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009394605-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
009394605-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_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.

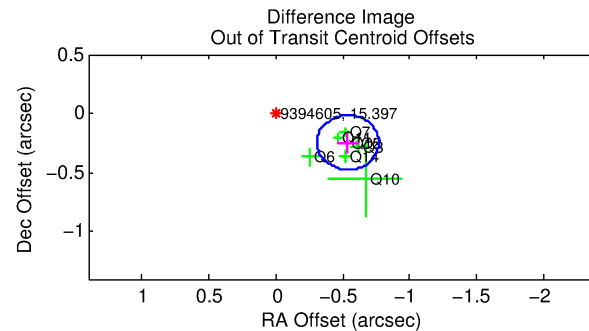
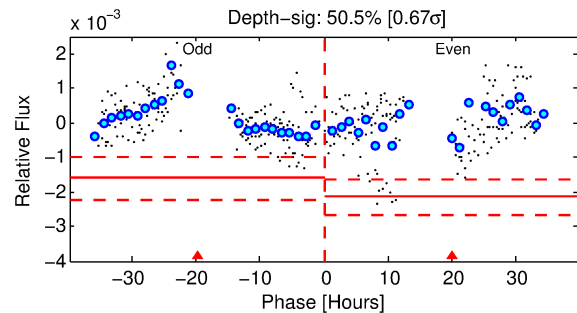
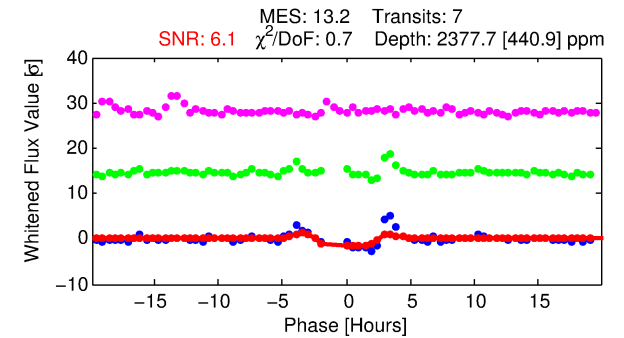
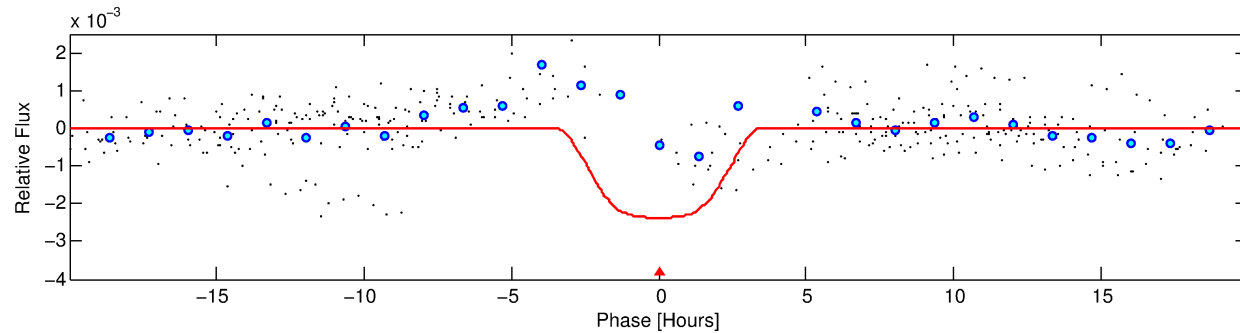
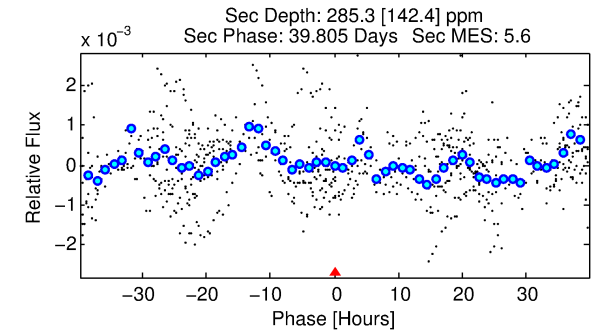
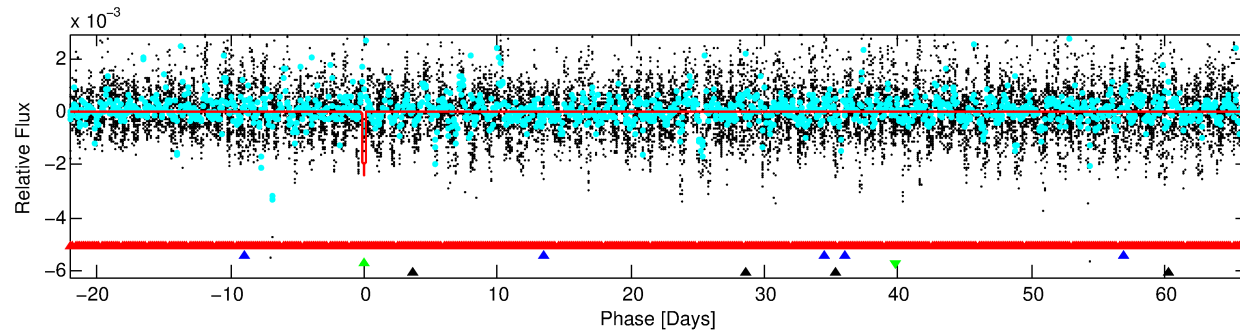
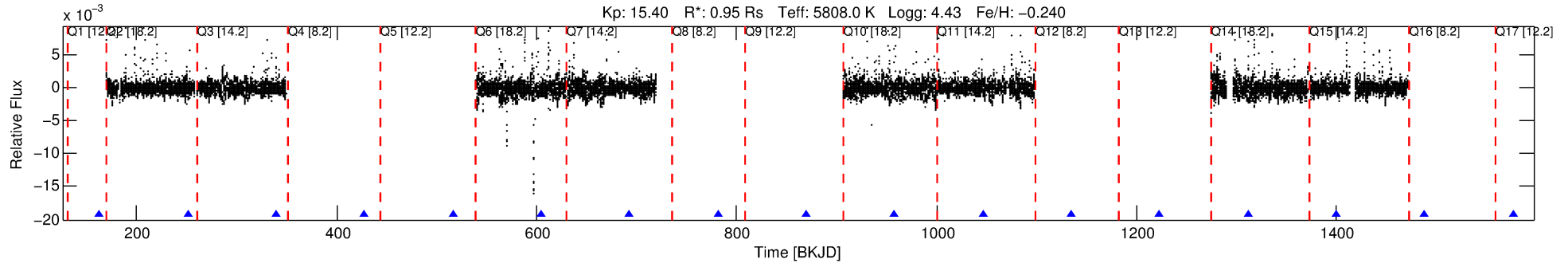
Ephemeris Match Information For 009394605-03

No Significant Match Found

DV One-Page Summary

KIC: 9394605 Candidate: 3 of 4 Period: 88.345 d

KOI: K06203 Corr: No Ephemeris Match



DV Fit Results:

Period = 88.34537 [0.00118] d
Epoch = 163.0798 [0.0091] BKJD
Rp/R* = 0.0547 [0.0061]
a/R* = 51.10 [5.97]
b = 0.93 [0.02]
Seff = 6.58 [2.53]
Teq = 408 [39] K
Rp = 5.68 [1.78] Re
a = 0.3743 [0.0922] AU
Ag = 681.39 [444.95] [1.53 σ]
Teffp = 3226 [455] K [6.16 σ]

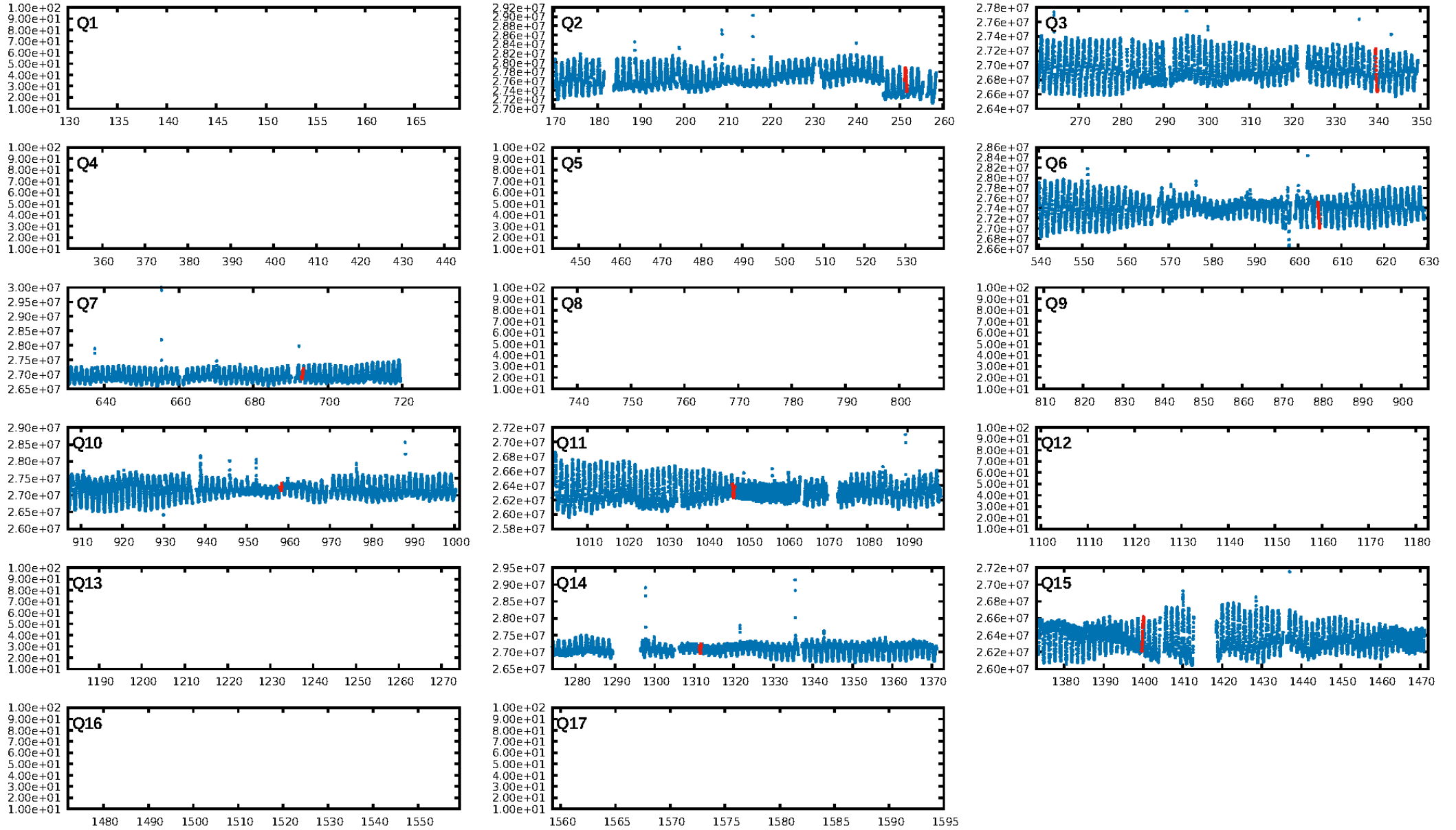
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [293.77 σ]
LongPeriod-sig: 100.0% [563.31 σ]
ModelChiSquare2-sig: 31.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 9.58e-20
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: -0.1919
Centroid-sig: 4.4%
Centroid-so: 0.287 arcsec [0.69 σ]
OotOffset-rm: 0.592 arcsec [7.69 σ]
KicOffset-rm: 0.467 arcsec [5.95 σ]
OotOffset-st: 4/4/0/0 [8]
KicOffset-st: 4/4/0/0 [8]
DiffImageQuality-fgm: 0.75 [6/8]
DiffImageOverlap-fno: 0.00 [0/8]

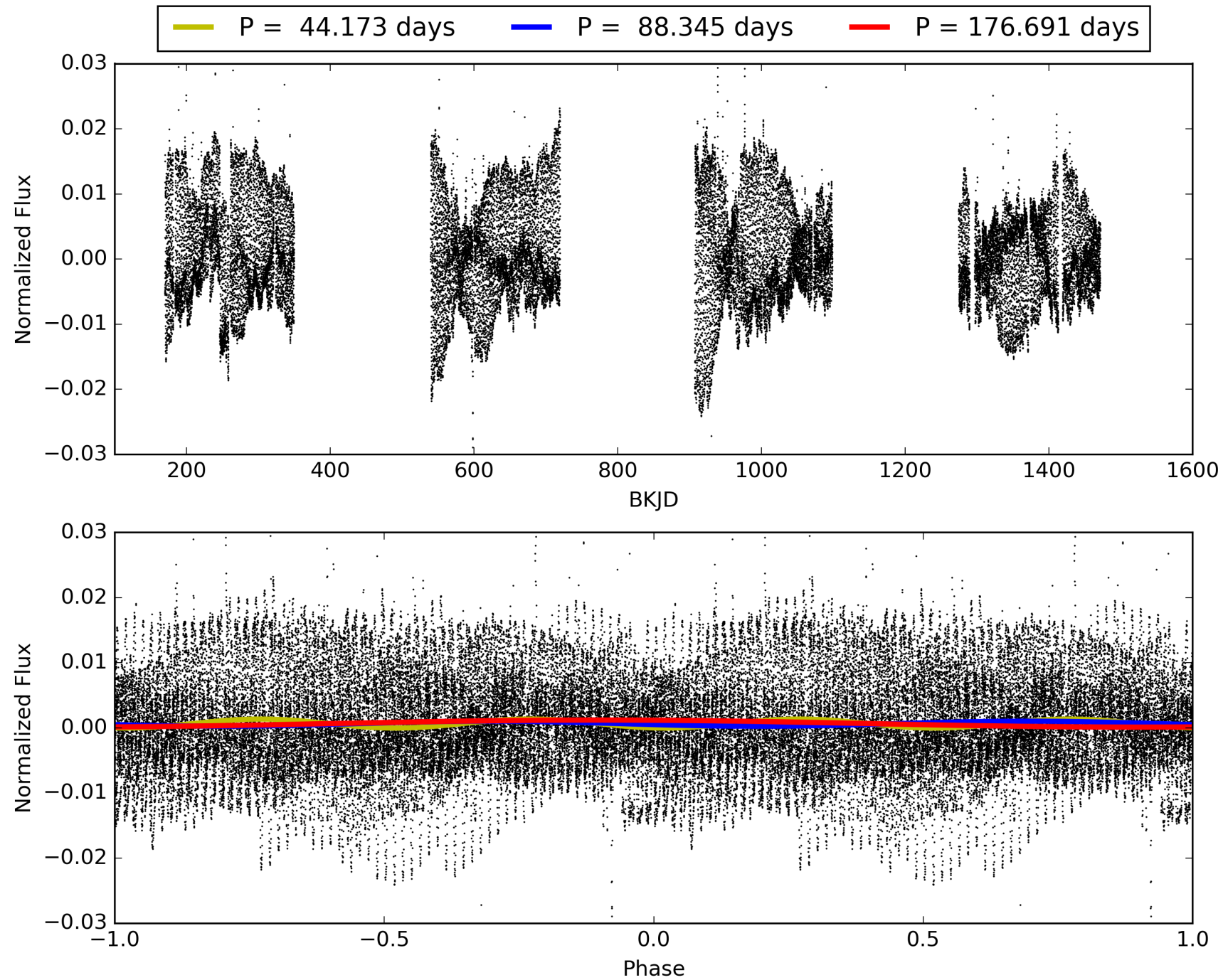
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:55:06 Z

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

TCE 009394605-03, PDC Light Curves

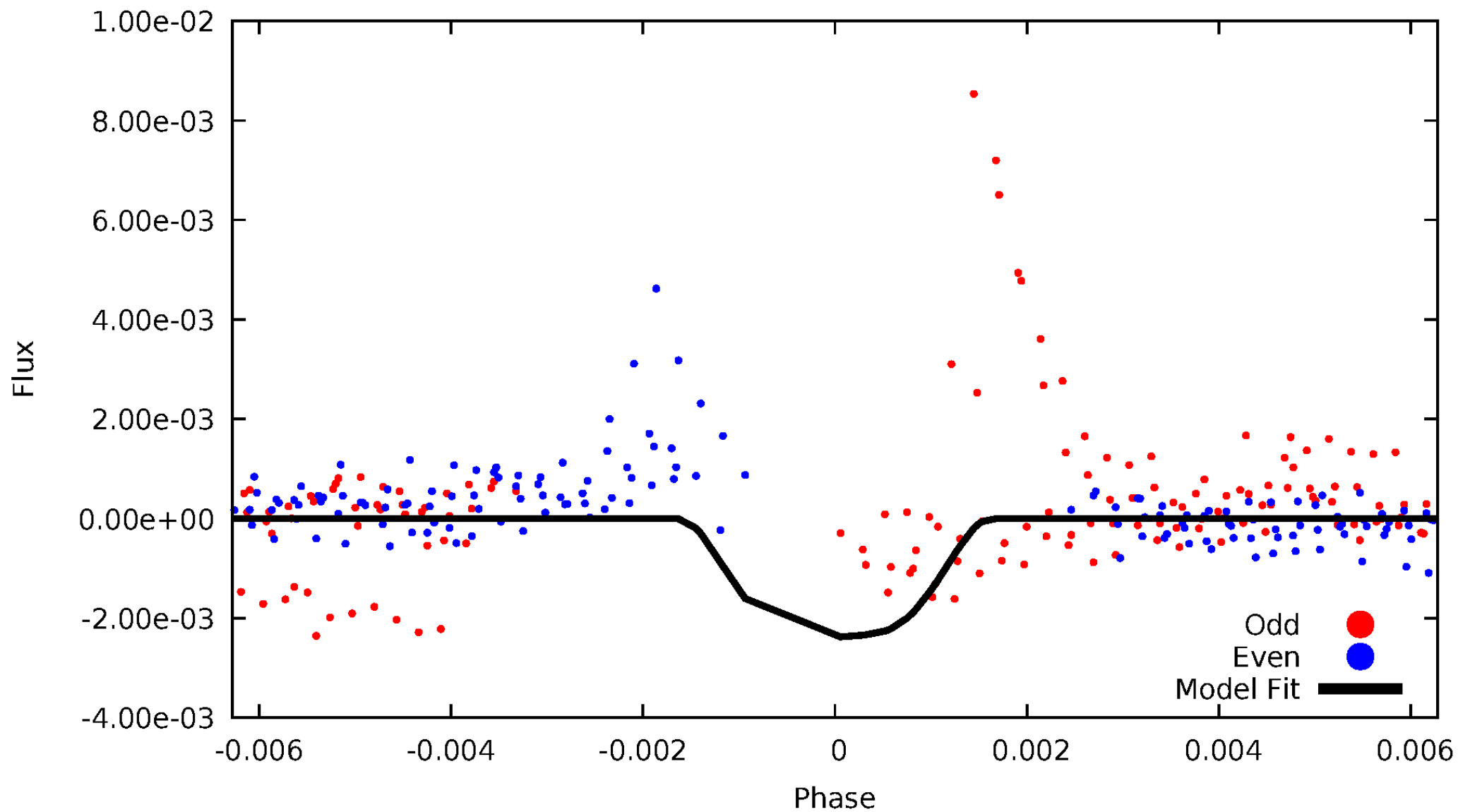


TCE 009394605-03



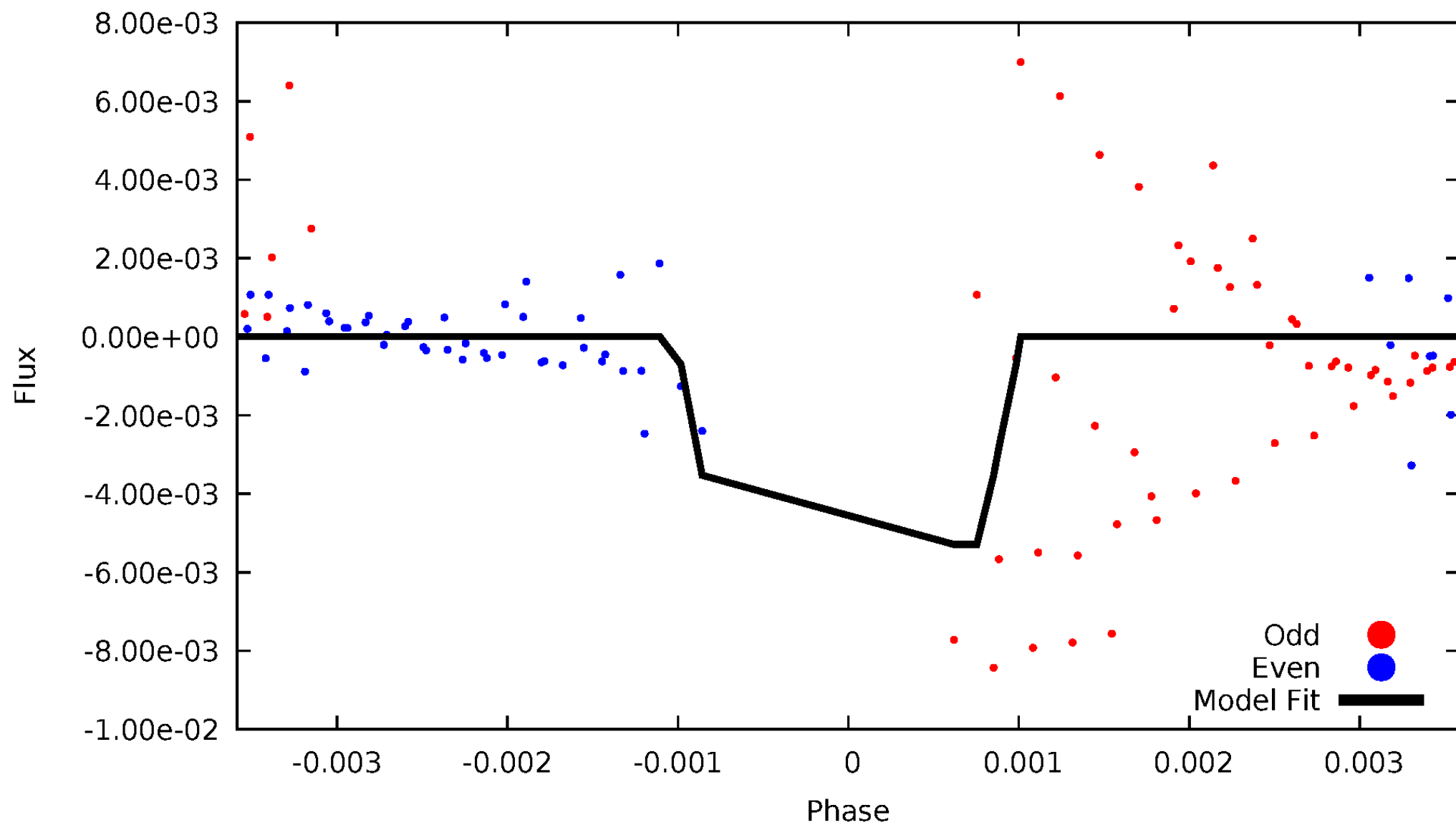
DV Odd/Even

TCE 009394605-03

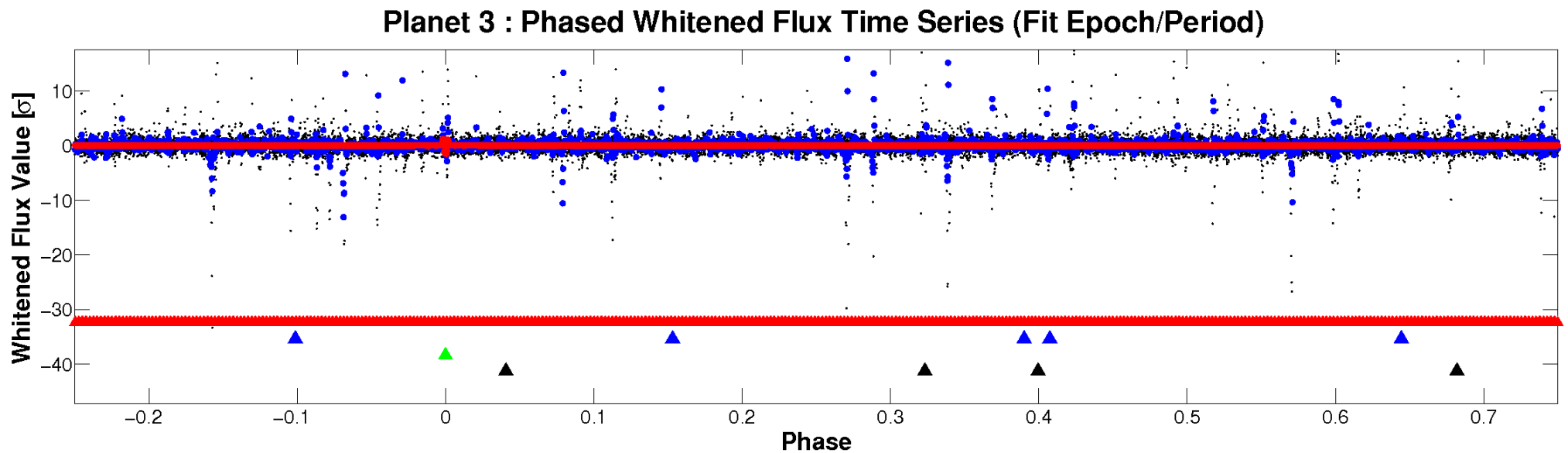
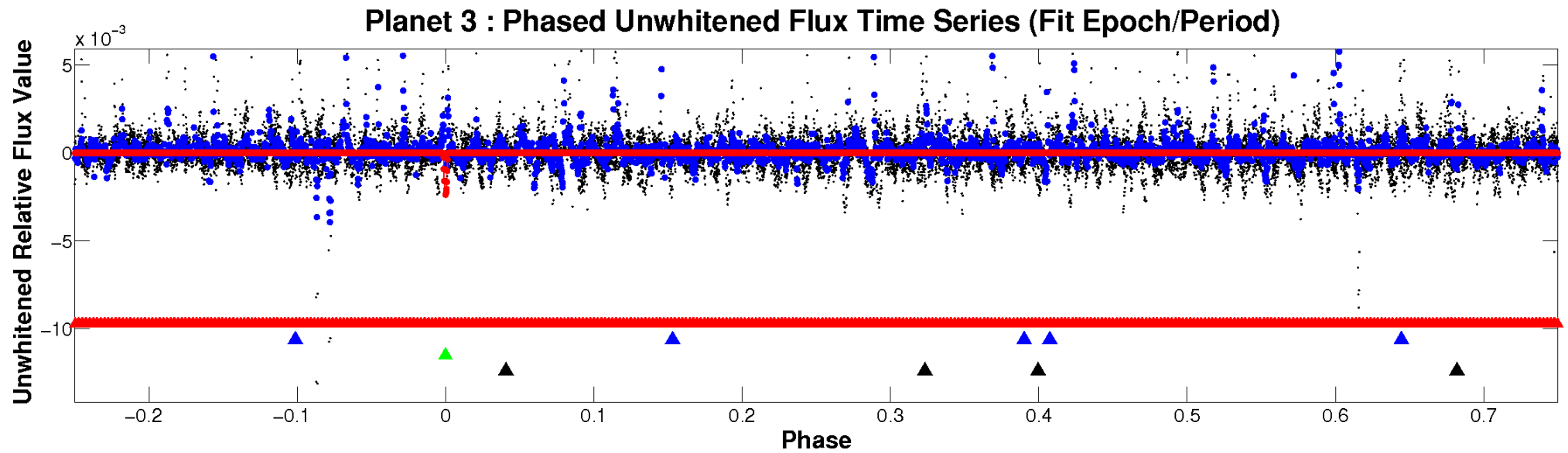


ALT Odd/Even

TCE 009394605-03

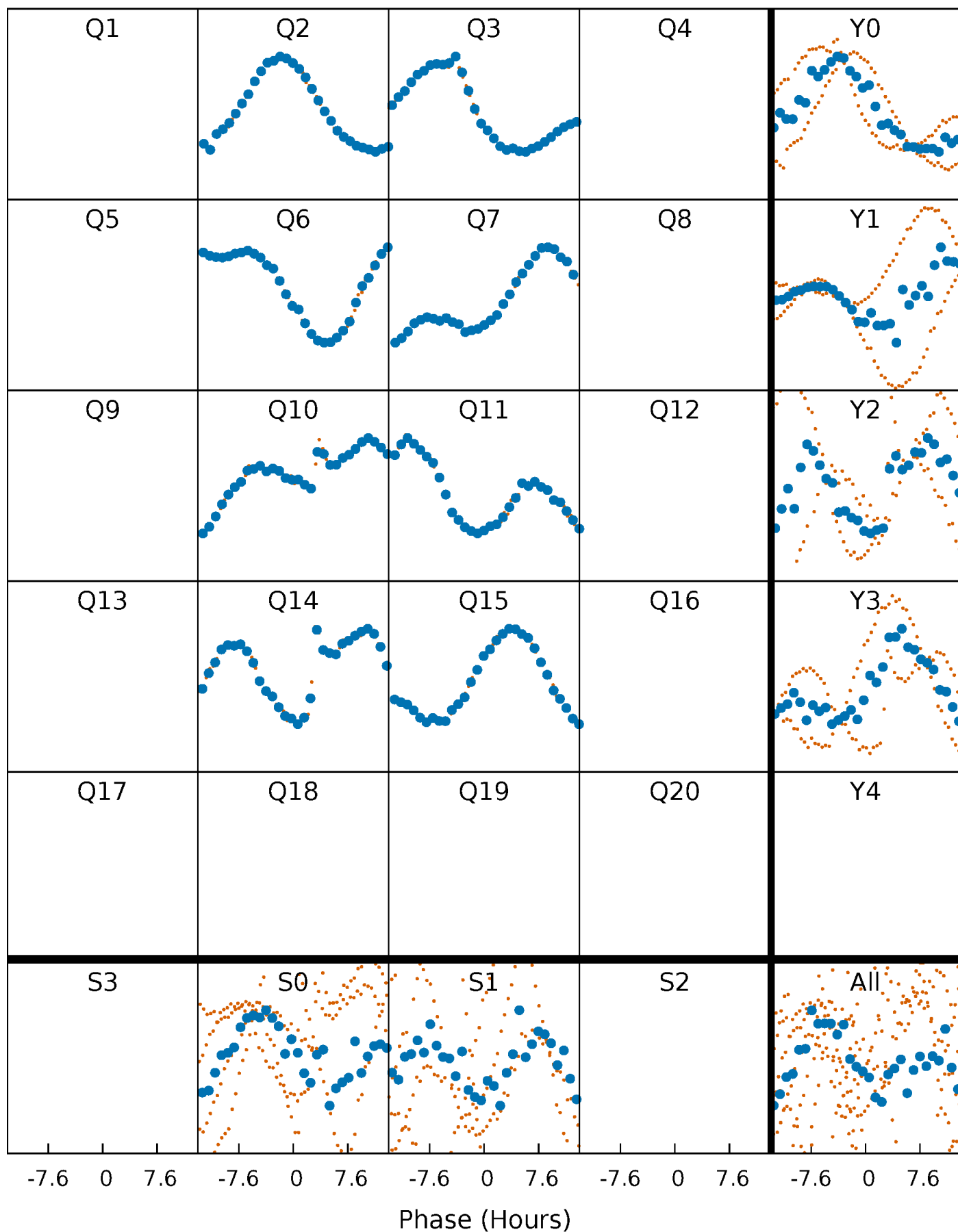


Non-Whitened Vs. Whitened Light Curve



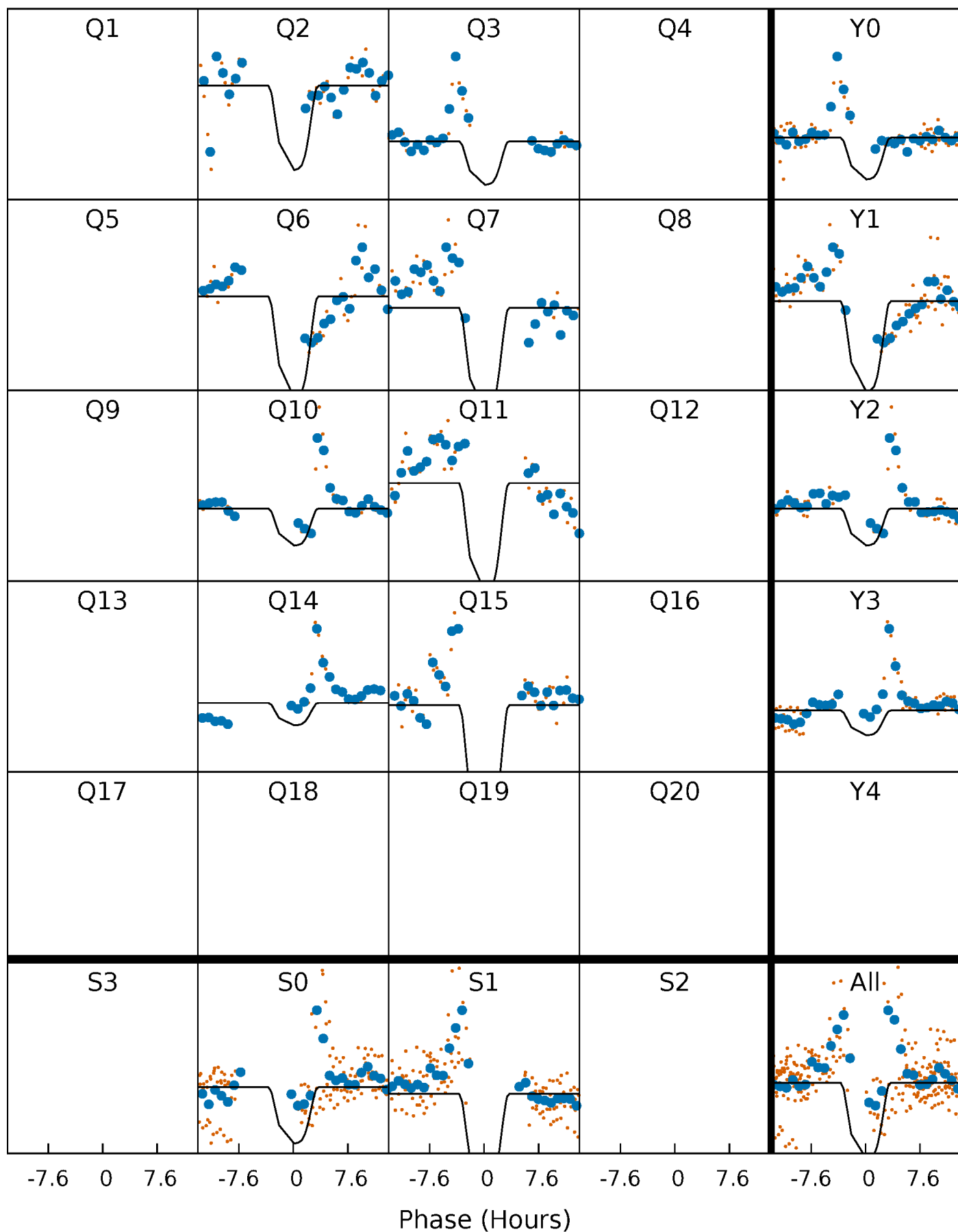
PDC Quarter-Phased Transit Curves

TCE 009394605-03 P= 88.345371 Days $T_0=163.079812$ (BKJD)



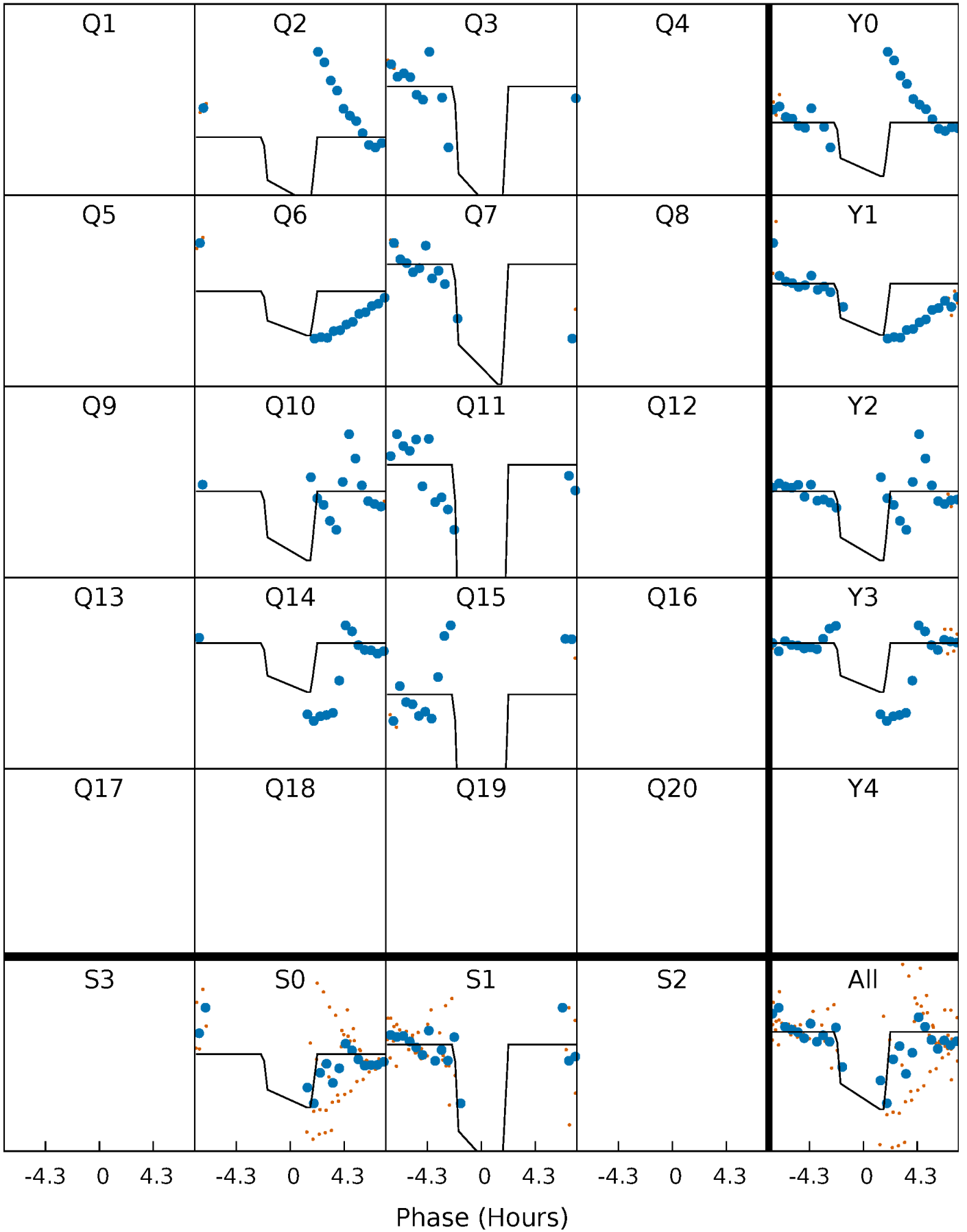
DV Quarter-Phased Transit Curves

TCE 009394605-03 $P = 88.345371$ Days $T_0 = 163.079812$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

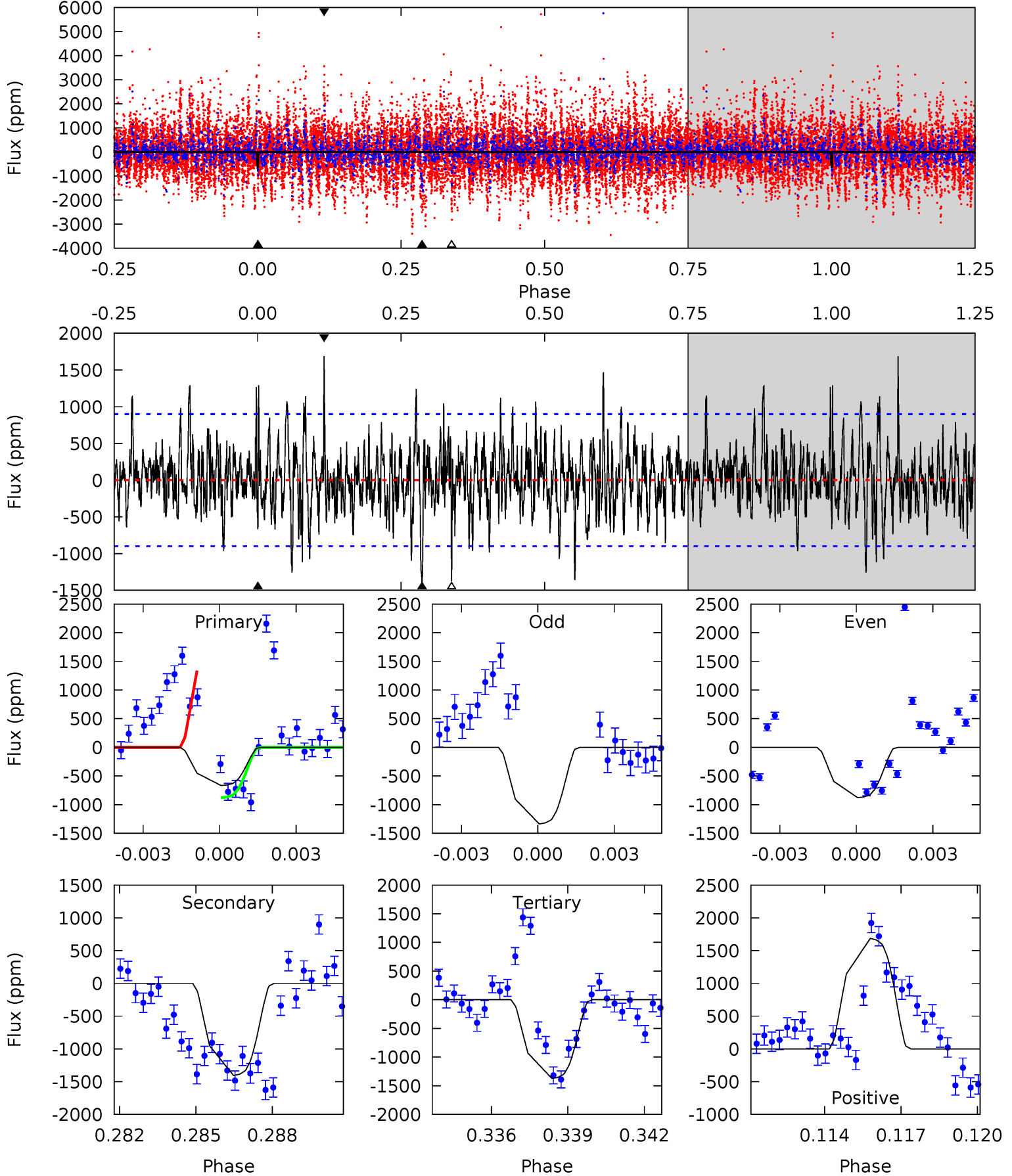
TCE 009394605-03 P= 88.342475 Days $T_0=163.067716$ (BKJD)



DV Model-Shift Uniqueness Test

009394605-03, P = 88.345371 Days, E = 163.079812 Days

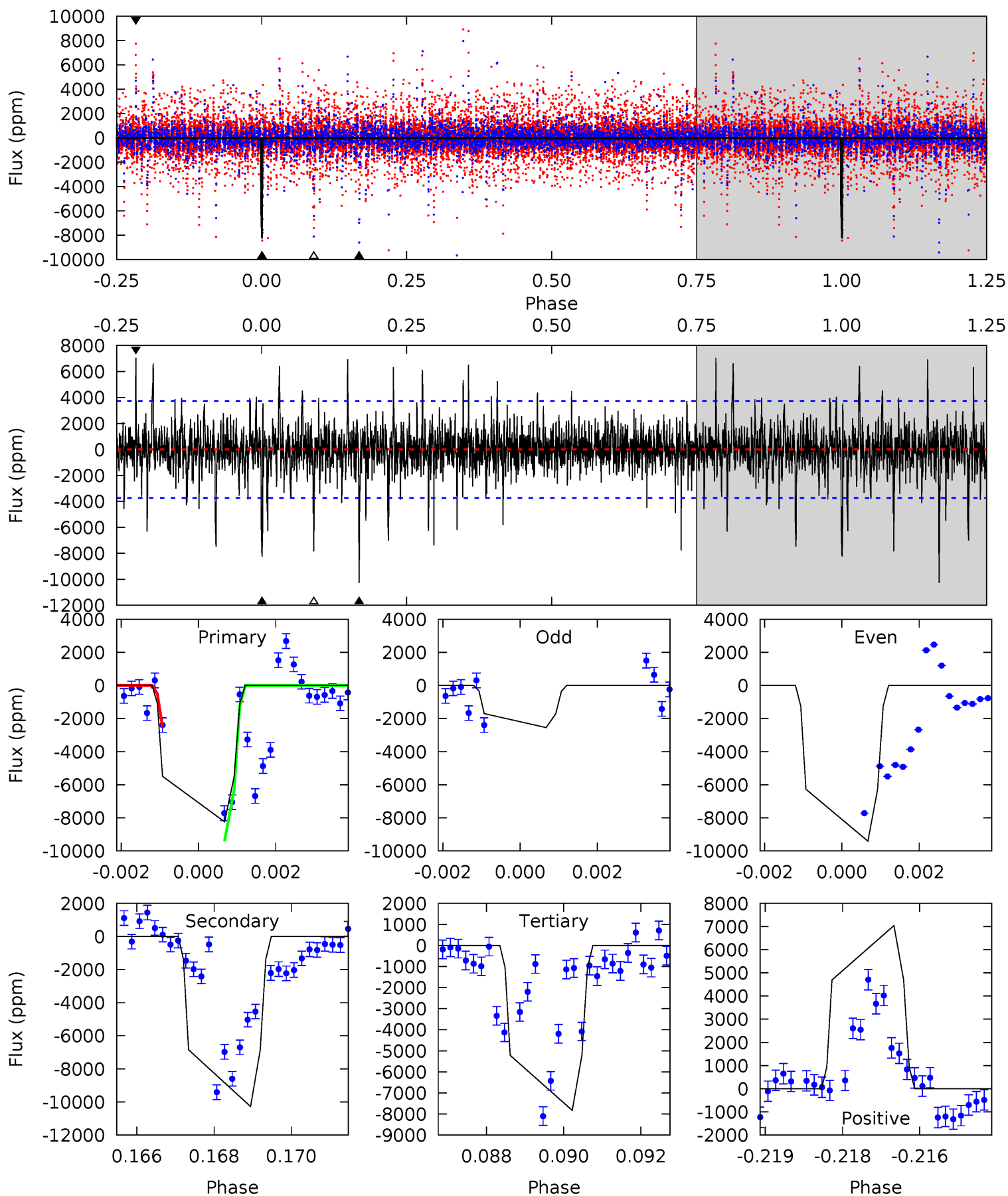
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.88	8.20	8.01	9.83	5.24	2.95	1.98	-4.12	-5.95	0.19	-1.63	1.10	0.39	0.55	1.11



Alt Model-Shift Uniqueness Test

009394605-03, P = 88.342475 Days, E = 163.067716 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	14.7	11.2	10.1	5.34	3.11	1.44	0.59	1.72	3.50	4.63	5.72	1.00	0.41	0.01



Stellar Parameters For KIC 009394605

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5808^{+207}_{-207}	$4.434^{+0.105}_{-0.195}$	$-0.240^{+0.300}_{-0.300}$	$0.951^{+0.279}_{-0.139}$	$0.895^{+0.131}_{-0.087}$	$1.467^{+0.777}_{-0.685}$
	+4%/-4%	+2%/-4%	+125%/-125%	+29%/-15%	+15%/-10%	+53%/-47%
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 009394605-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1407 ± 172	$5.88^{+1.10}_{-0.86}$	578^{+48}_{-34}	4897^{+333}_{-275}	3125^{+1302}_{-899}
Alt.	-10275 ± 699	$7.69^{+1.44}_{-0.96}$	575^{+46}_{-35}	6903^{+427}_{-442}	13567^{+4023}_{-3831}

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

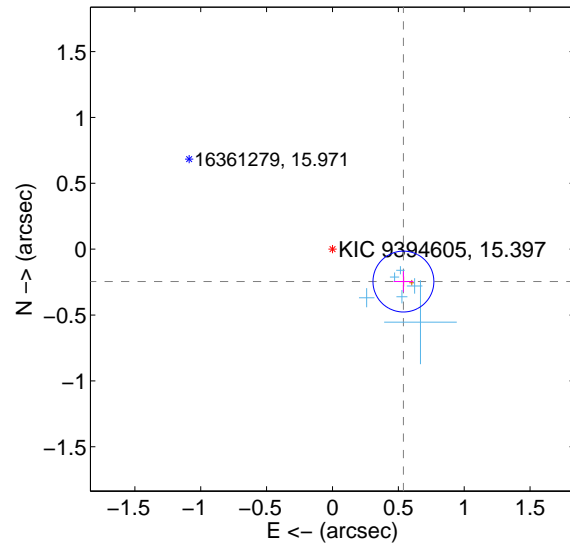
Supplemental centroid analysis for 009394605-03. Kepler magnitude: 15.40. Transit SNR 6.15

There are 6 quarters with good PRF difference image offsets

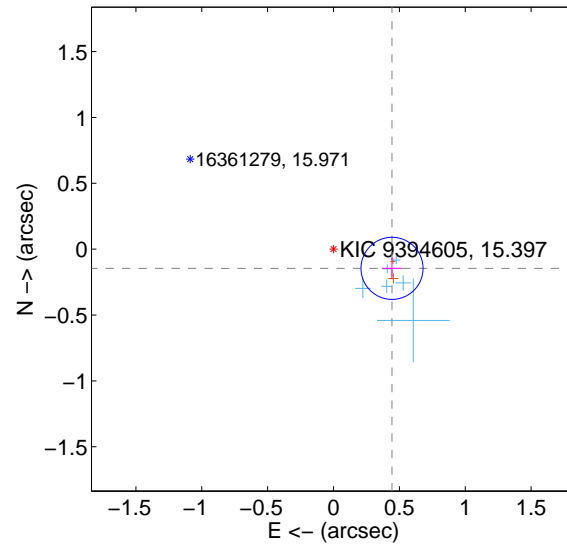
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.592 ± 0.077	7.69	-0.539 ± 0.075	-0.246 ± 0.078
PRF-fit source offset from KIC position	0.467 ± 0.079	5.95	-0.444 ± 0.077	-0.146 ± 0.083
photometric centroid source offset	0.29 ± 0.41	0.69	0.22 ± 0.42	-0.19 ± 0.41

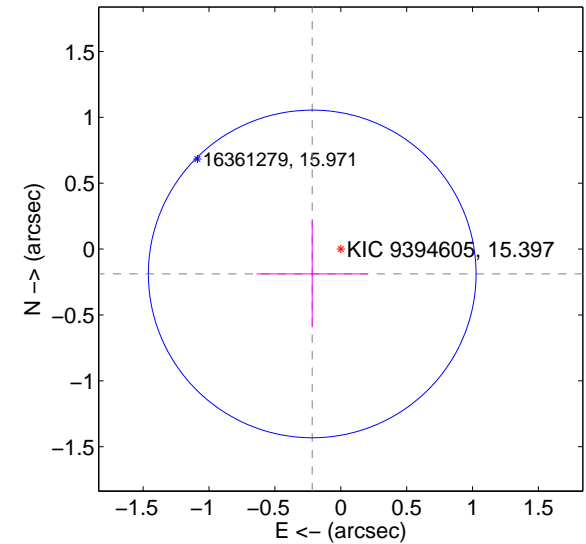
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

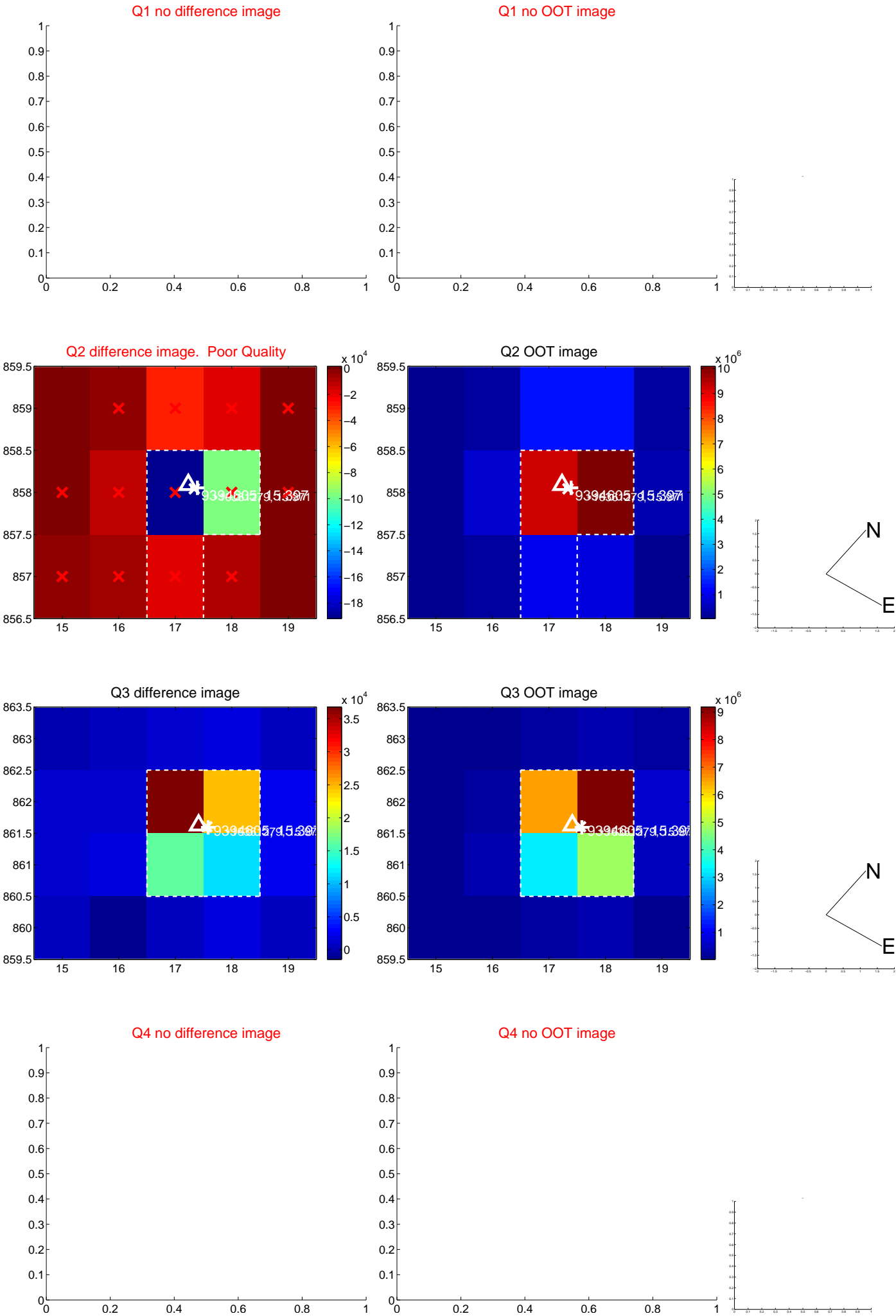


offset from photometric centroids

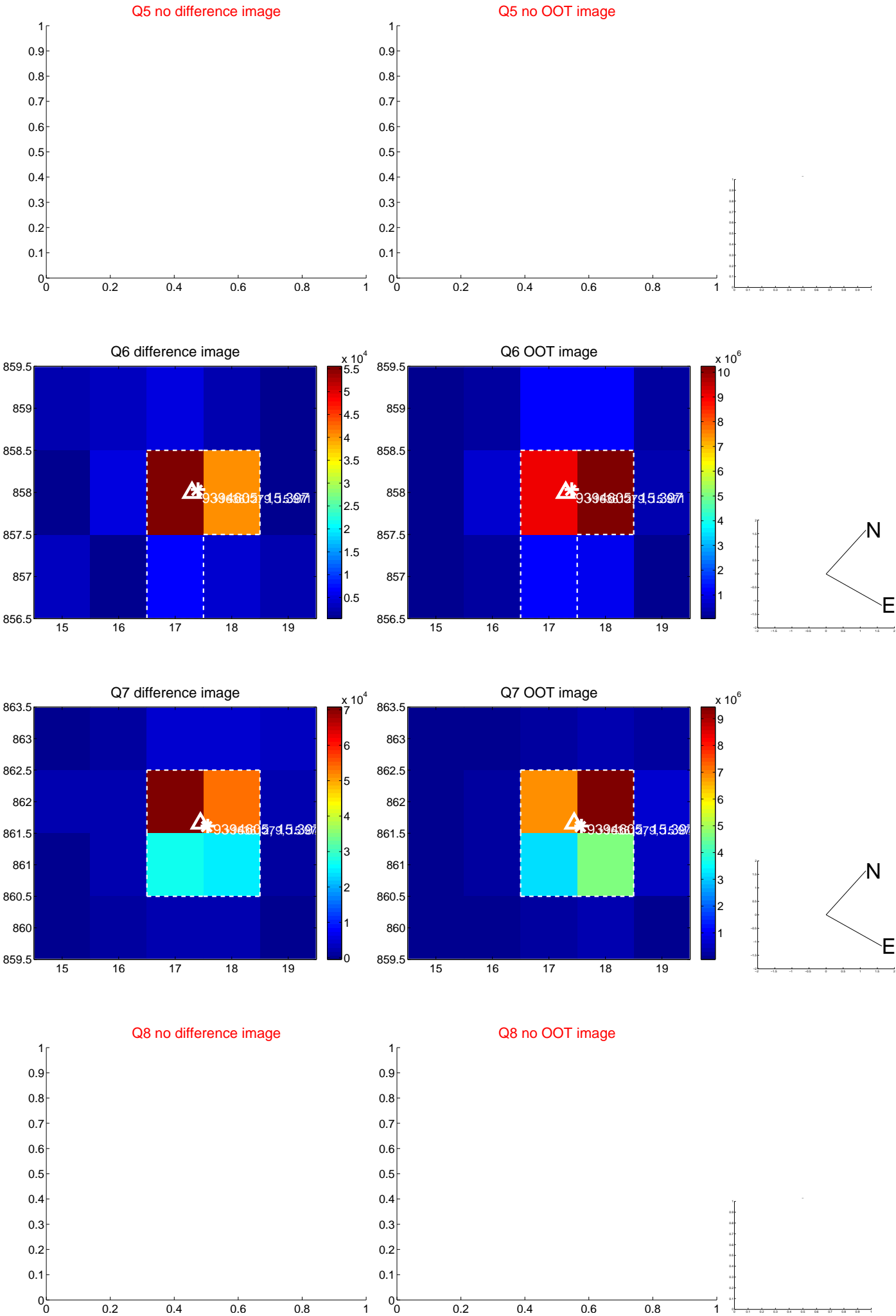


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

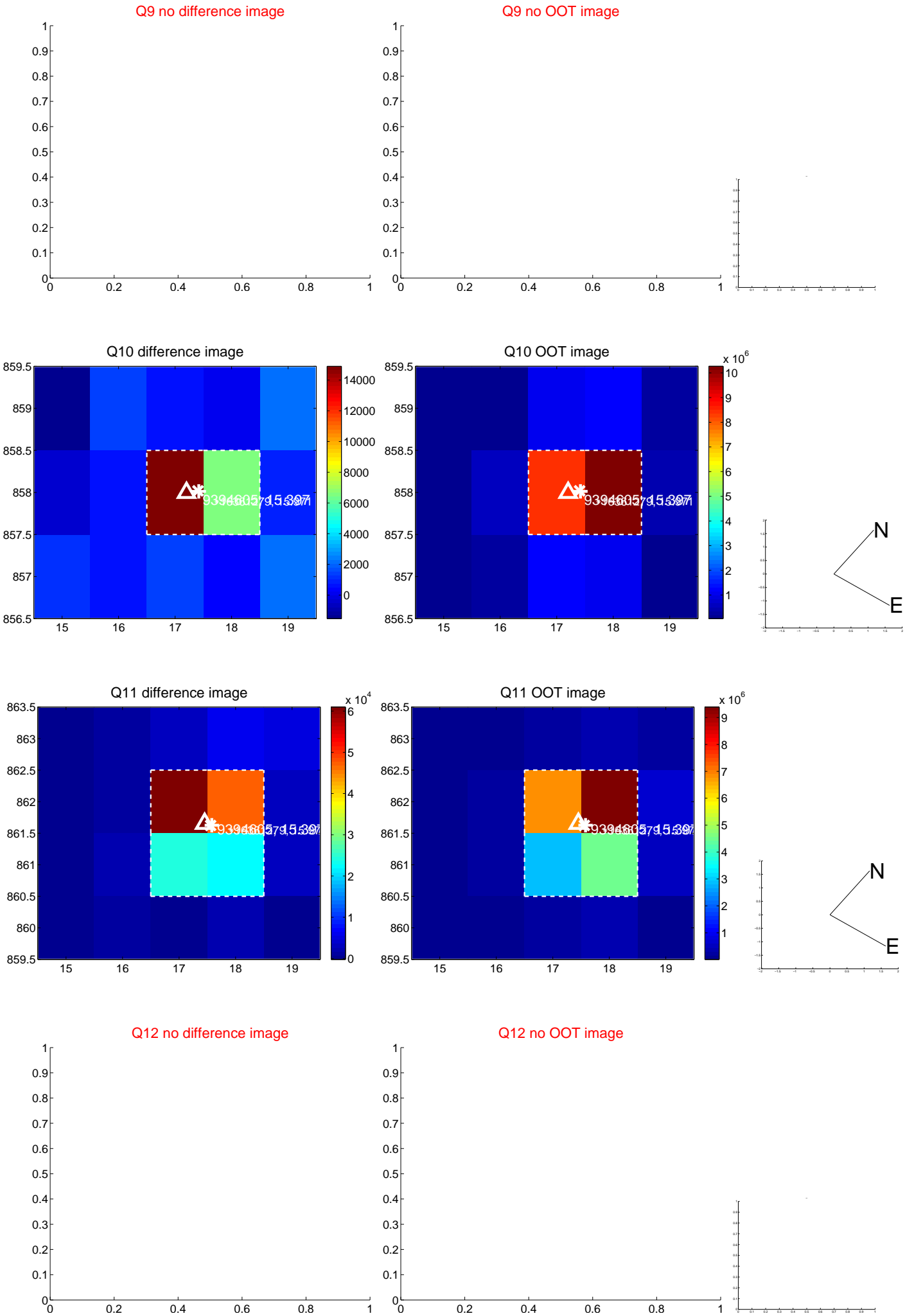
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



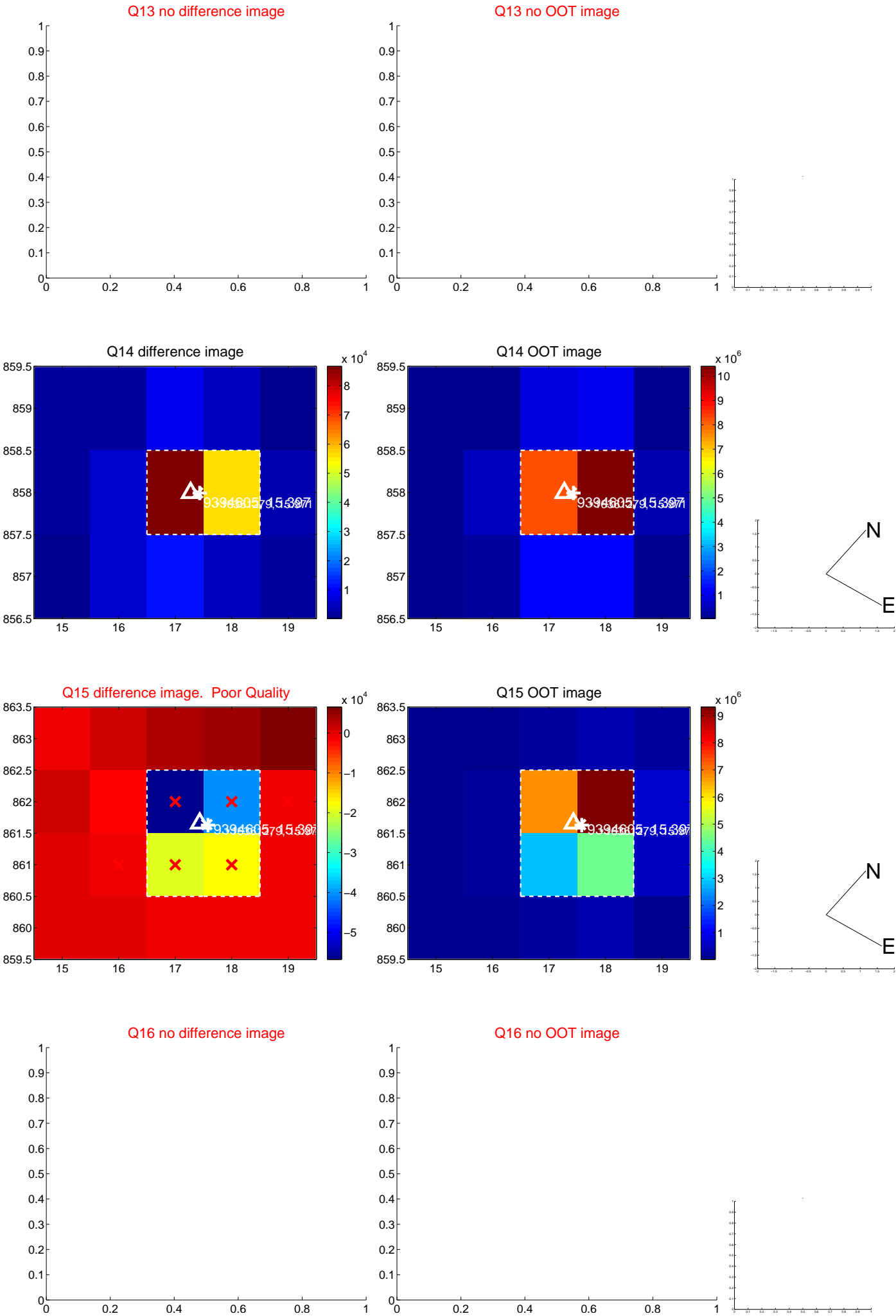
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



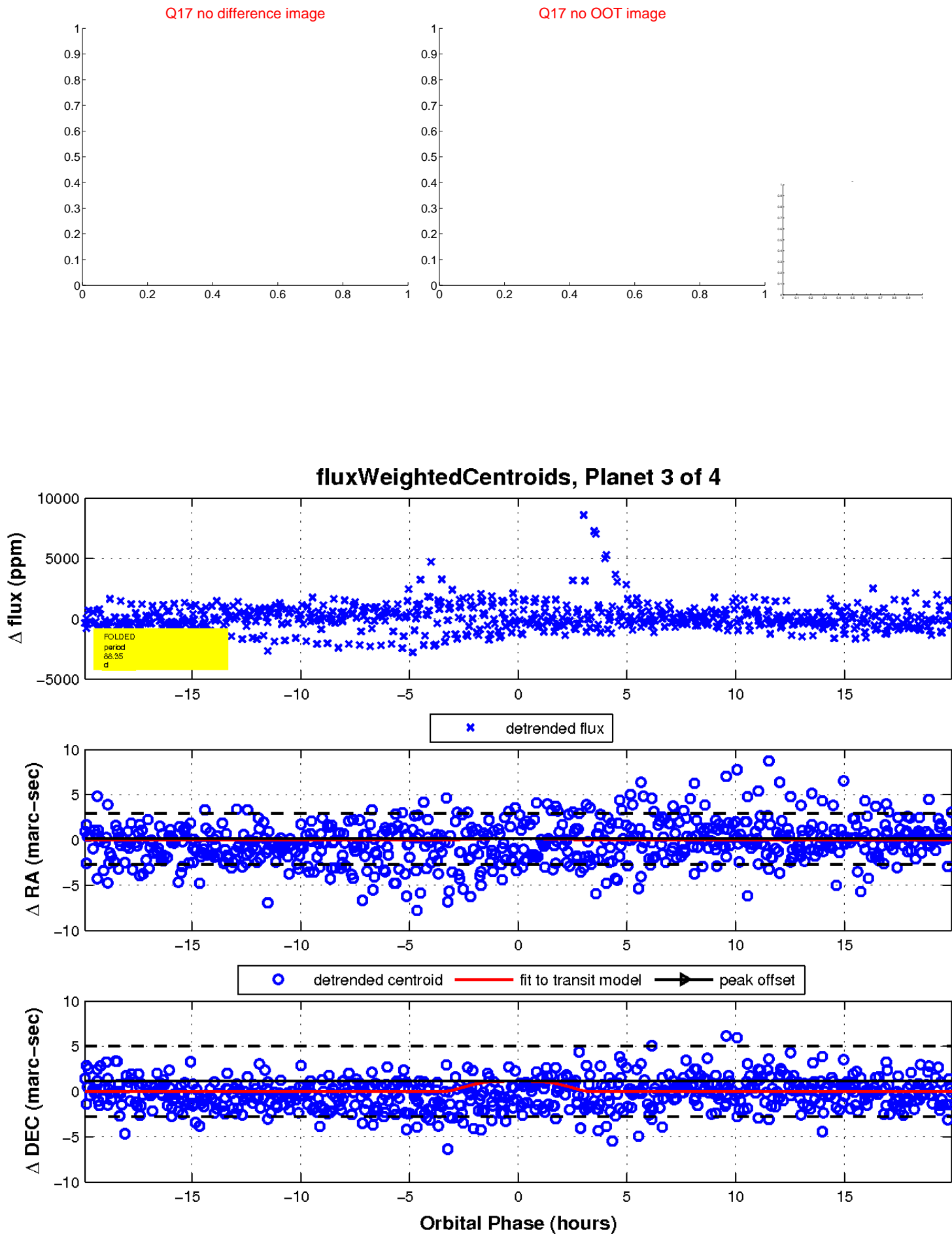
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



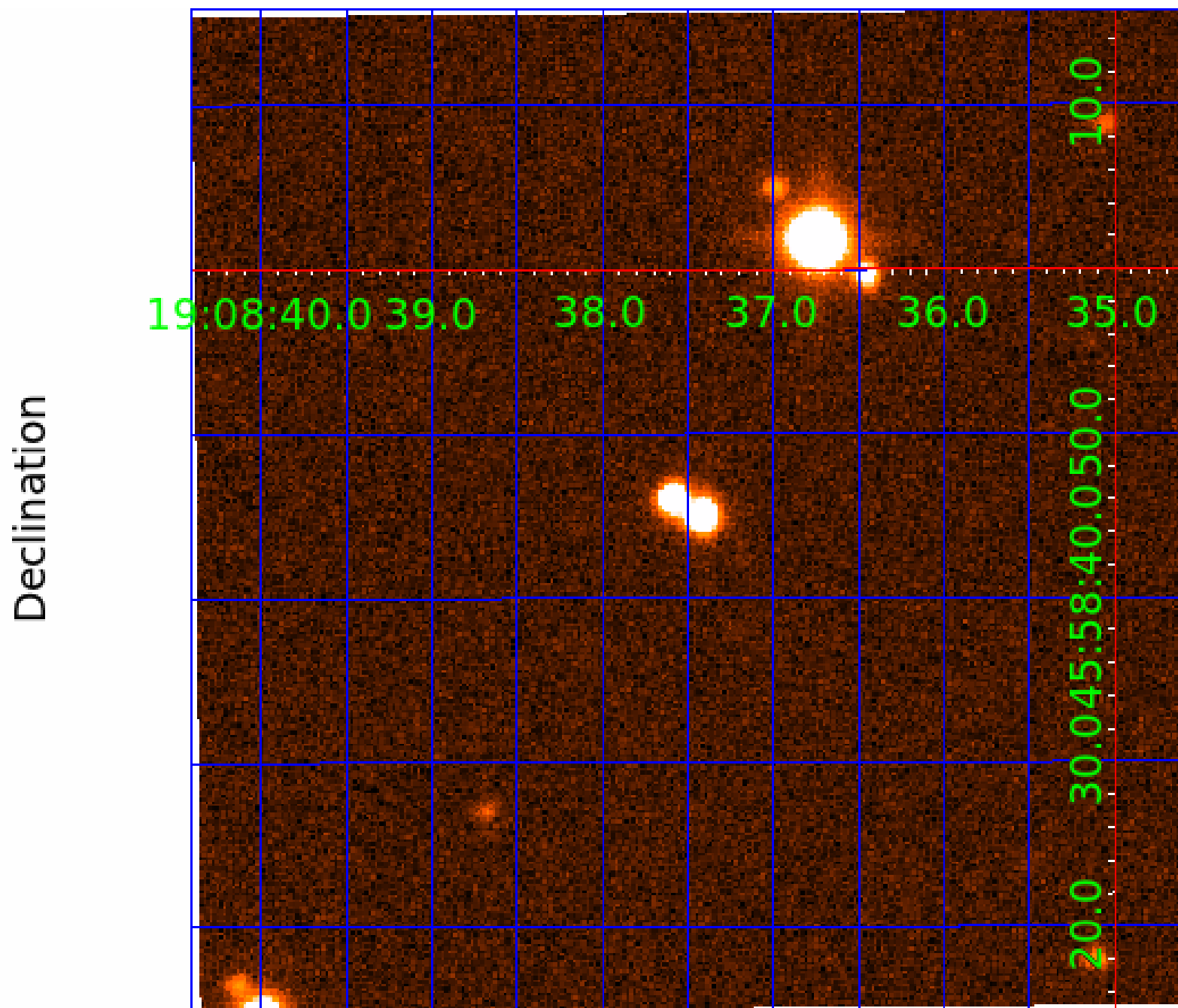
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009394605

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})
009394605-01	OBS	6203.01	0.876821	132.072647	257.4	2.608	19.1	21.5	0.95	5808	1.87	3084.89
009394605-02	OBS	No	287.504076	197.549803	1385.6	5.266	16.3	5.3	0.95	5808	3.63	1.36
009394605-03	OBS	No	88.345371	163.079812	2377.7	6.653	13.2	6.1	0.95	5808	5.68	6.58
009394605-04	OBS	No	410.030727	198.378408	1712.9	2.263	12.0	7.8	0.95	5808	4.23	0.85

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009394605-01	OBS	FP	0.00	0	1	0	1	MOD_SEC_DV—CENT_FEW_DIFFS—EPHEM_MATCH
009394605-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009394605-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
009394605-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT— MOD_TER_ALT—MOD_POS_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.

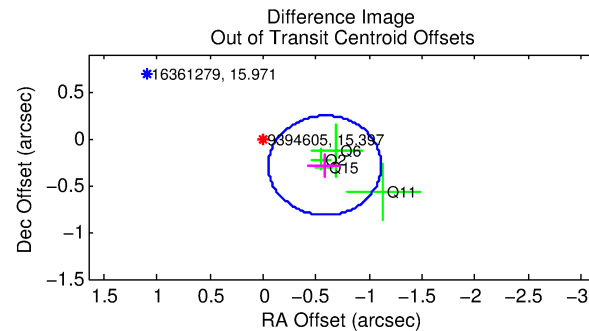
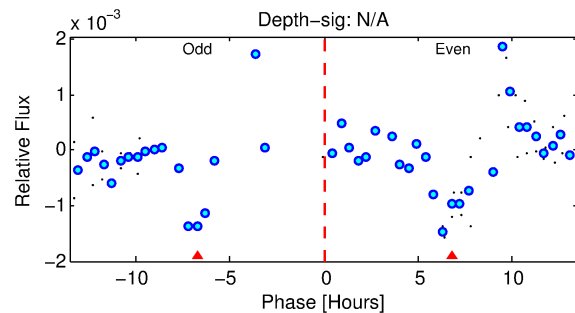
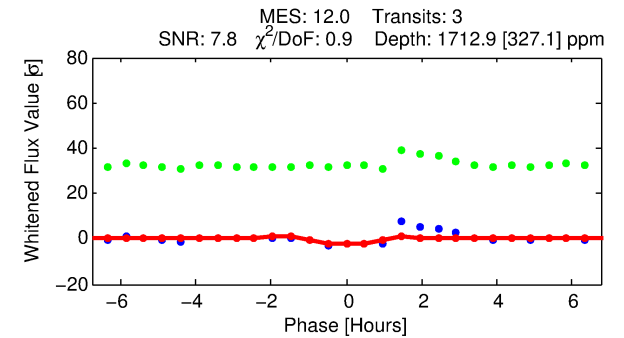
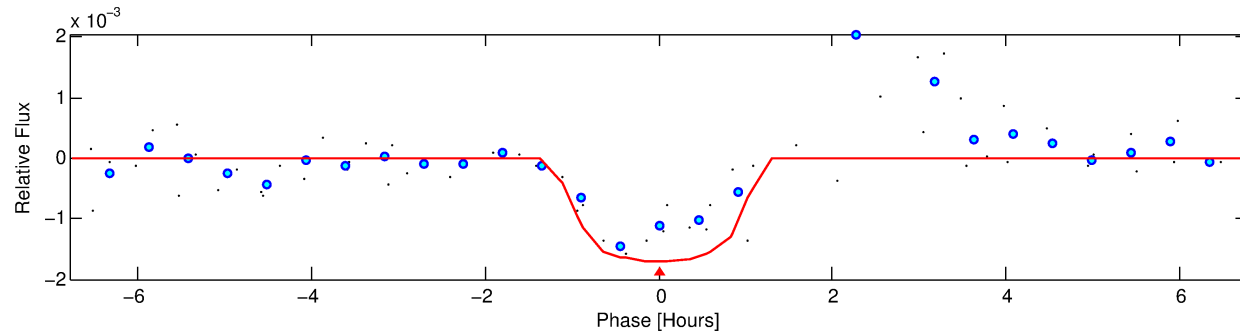
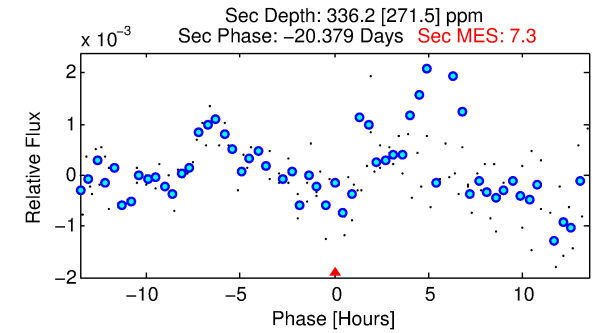
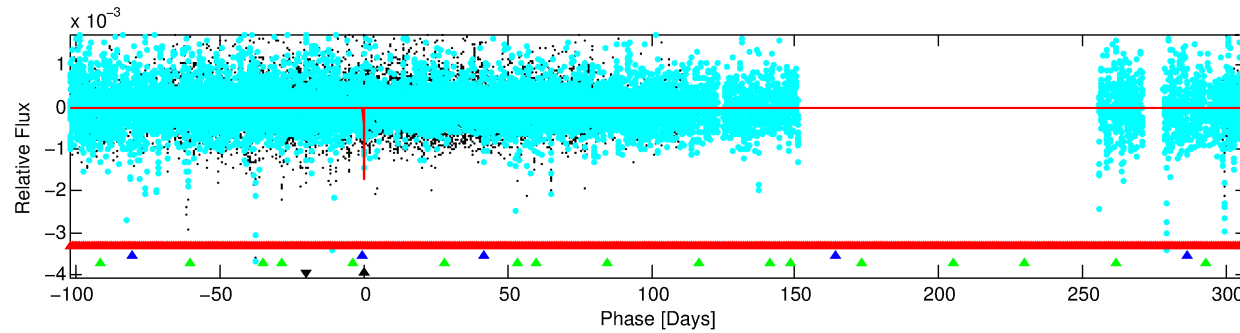
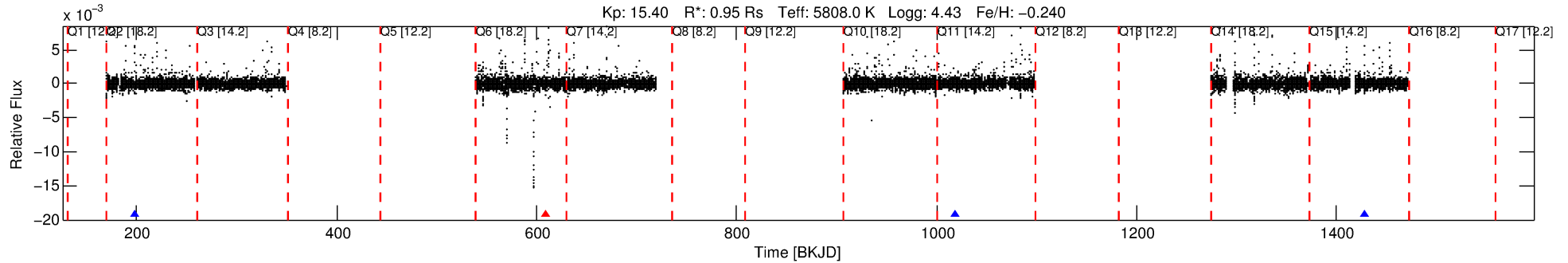
Ephemeris Match Information For 009394605-04

No Significant Match Found

DV One-Page Summary

KIC: 9394605 Candidate: 4 of 4 Period: 410.031 d
KOI: K06203 Corr: No Ephemeris Match

Kp: 15.40 R*: 0.95 Rs Teff: 5808.0 K Logg: 4.43 Fe/H: -0.240



DV Fit Results:

Period = 410.03073 [0.00317] d
Epoch = 198.3784 [0.0063] BKJD
Rp/R* = 0.0408 [0.0671]
a/R* = 1048.18 [7800.60]
b = 0.71 [5.18]
Seff = 0.85 [0.33]
Teq = 245 [24] K
Rp = 4.23 [7.08] Re
a = 1.0416 [0.2565] AU
Ag = 11209.59 [38221.38] [0.29σ]
Teffp = 3895 [3305] K [1.10σ]

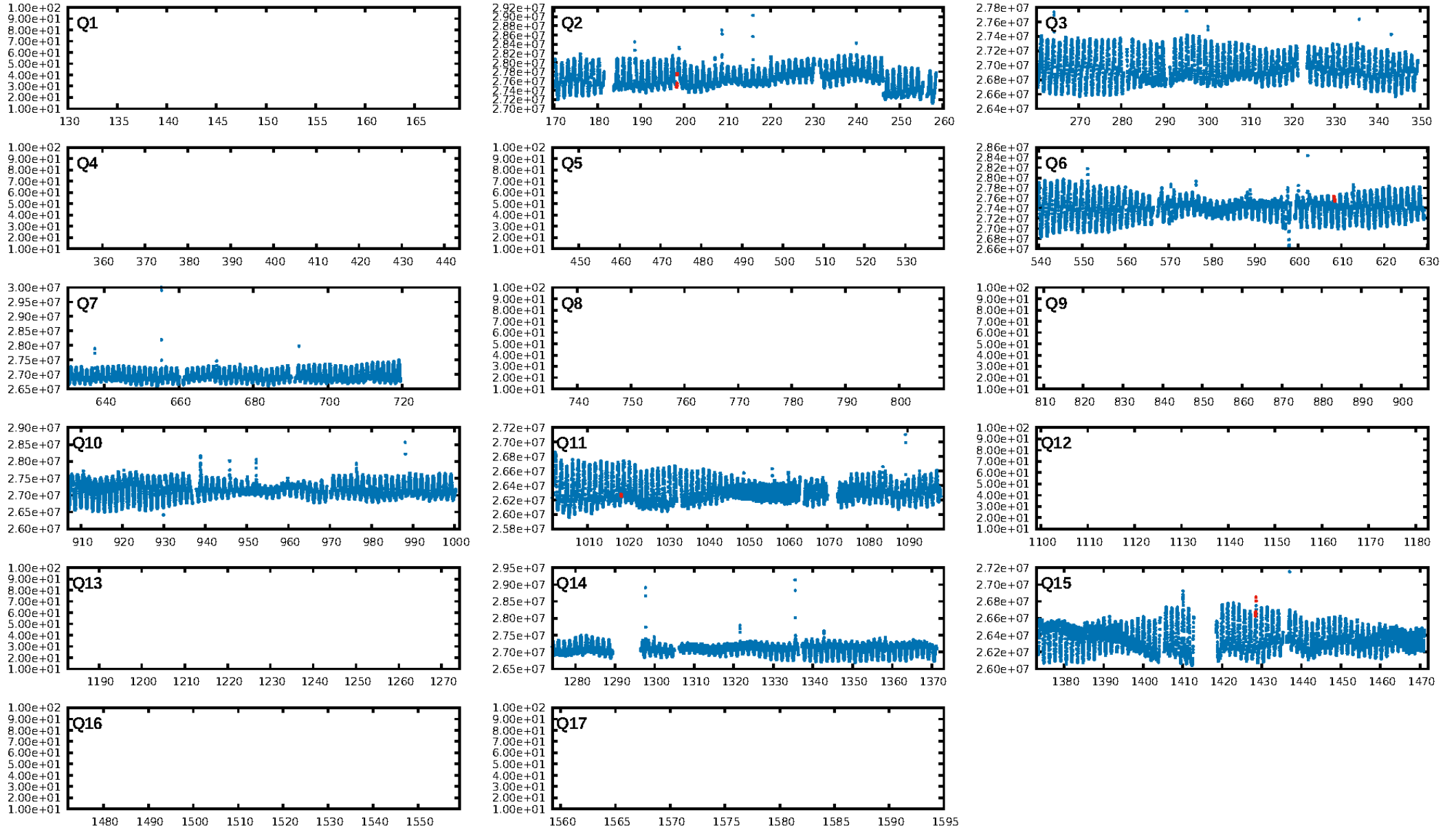
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [513.02σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 16.3%
ModelChiSquareGof-sig: 97.5%
Bootstrap-pfa: 2.01e-11
RollingBand-fgt: 0.67 [2/3]
GhostDiagnostic-chr: 0.5547
Centroid-sig: 87.9%
Centroid-so: 0.185 arcsec [0.21σ]
OotOffset-rm: 0.649 arcsec [3.66σ]
KicOffset-rm: 0.525 arcsec [3.60σ]
OotOffset-st: 2/2/0/0 [4]
KicOffset-st: 2/2/0/0 [4]
DiffImageQuality-fgm: 0.25 [1/4]
DiffImageOverlap-fno: 0.50 [2/4]

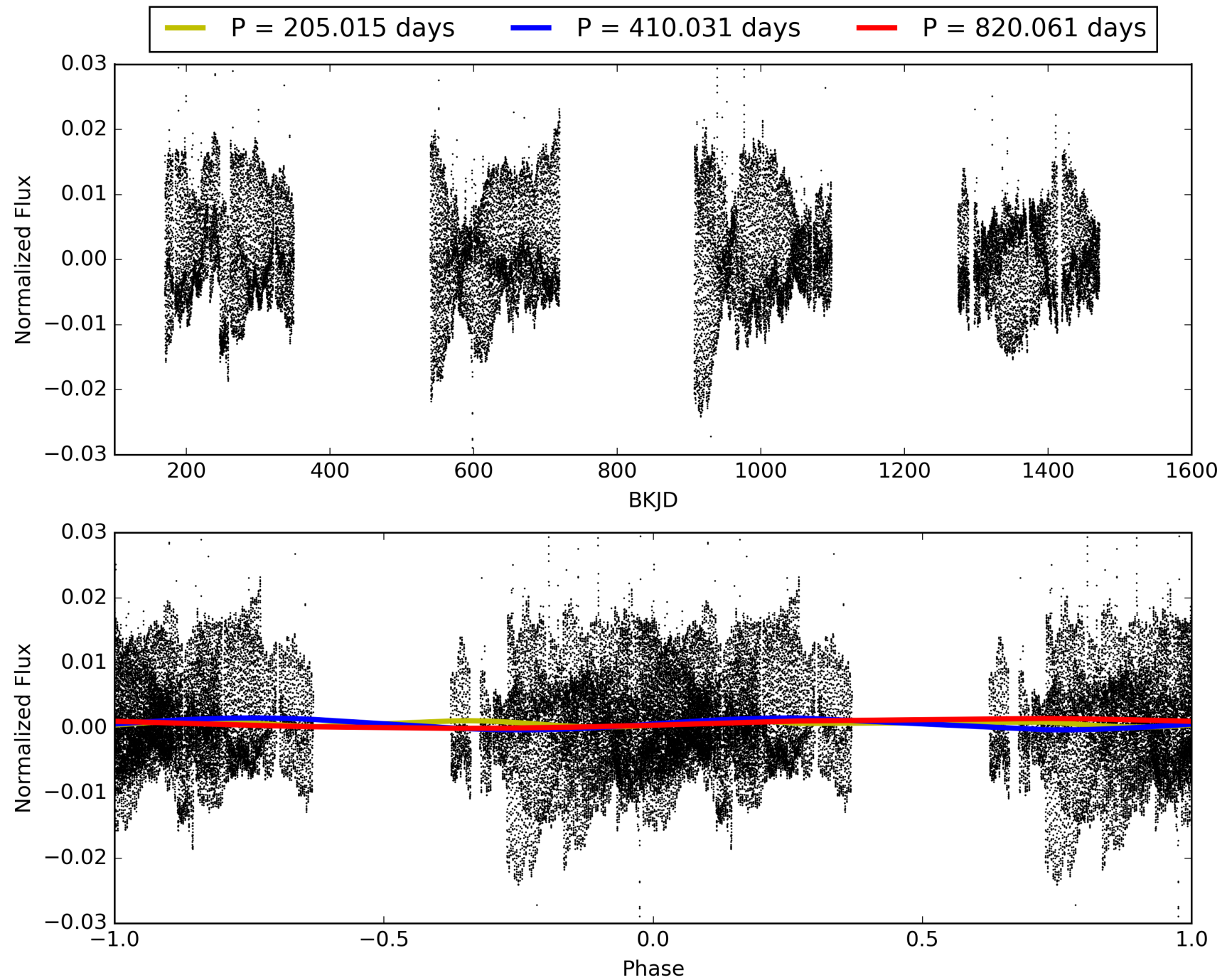
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 23:55:16 Z

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

TCE 009394605-04, PDC Light Curves

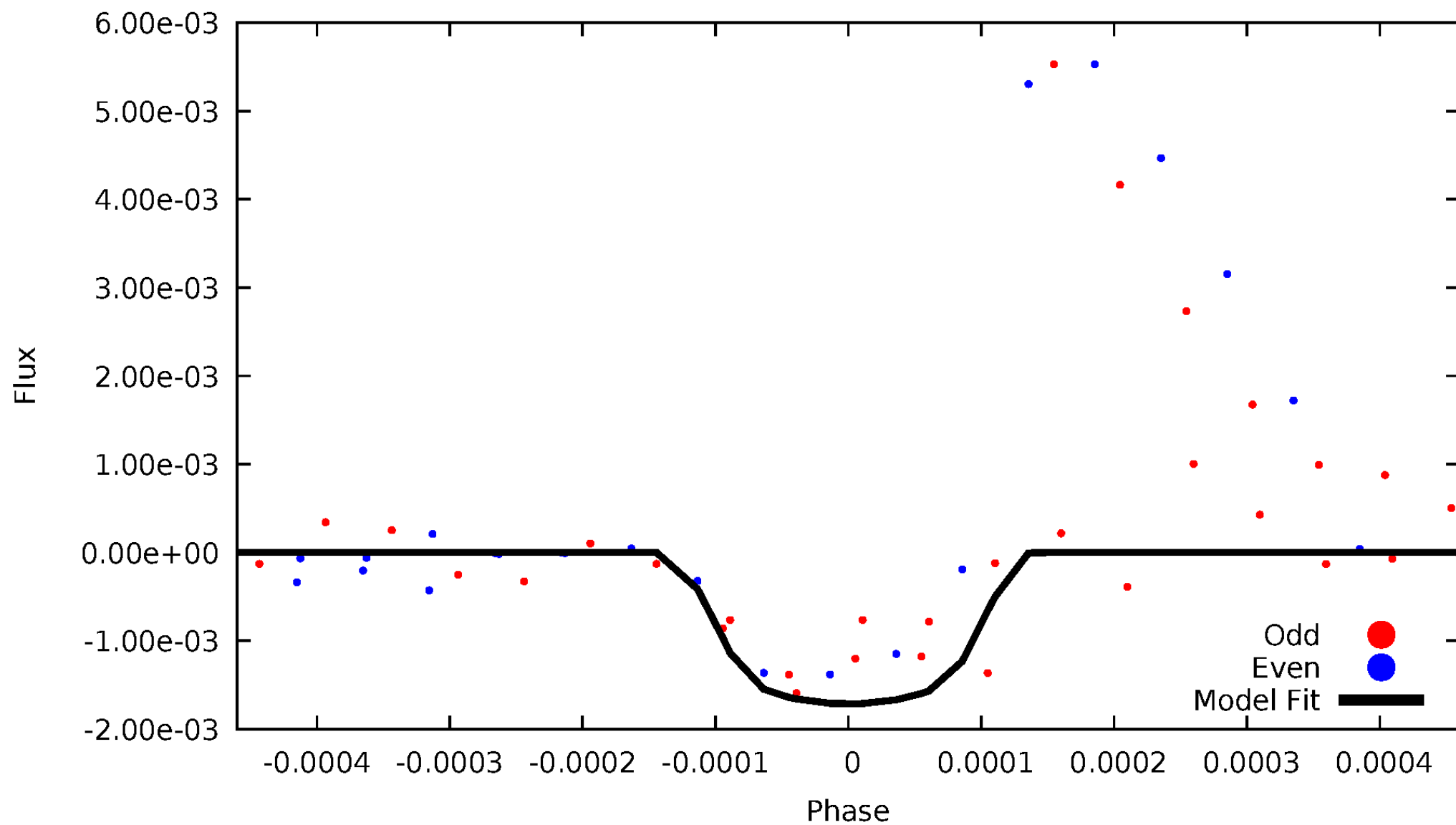


TCE 009394605-04



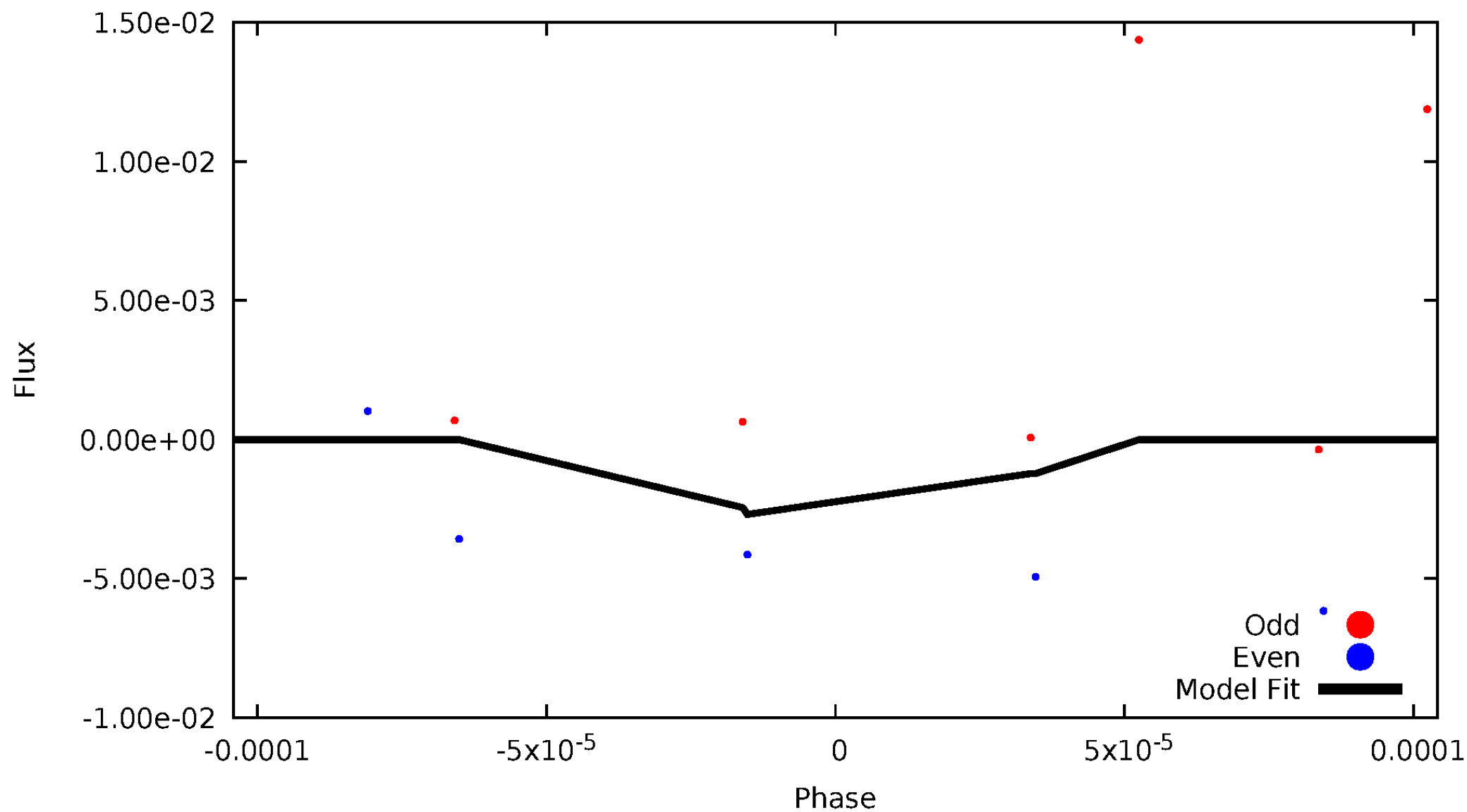
DV Odd/Even

TCE 009394605-04



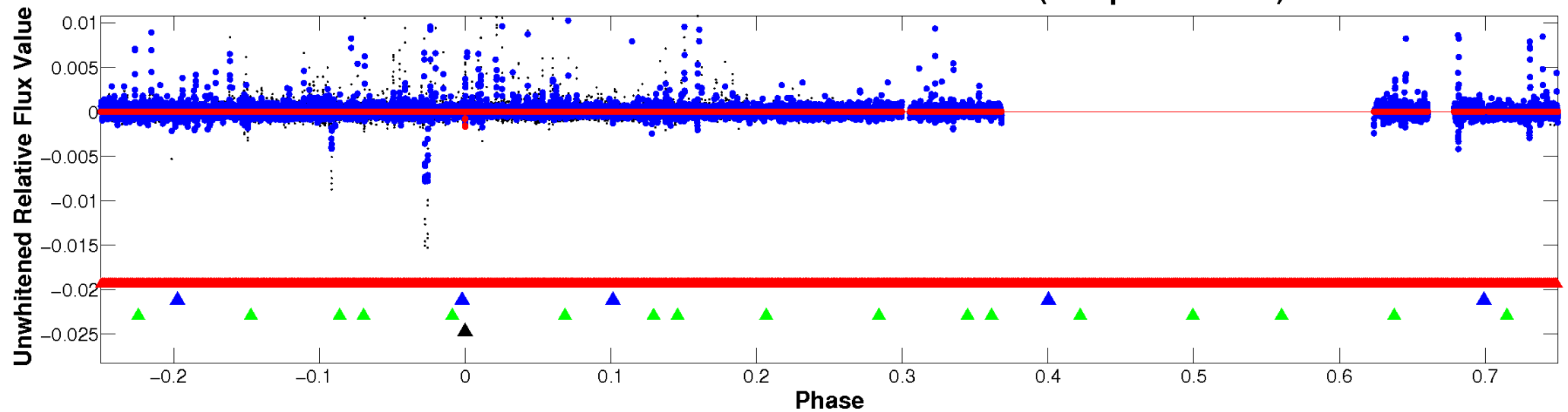
ALT Odd/Even

TCE 009394605-04

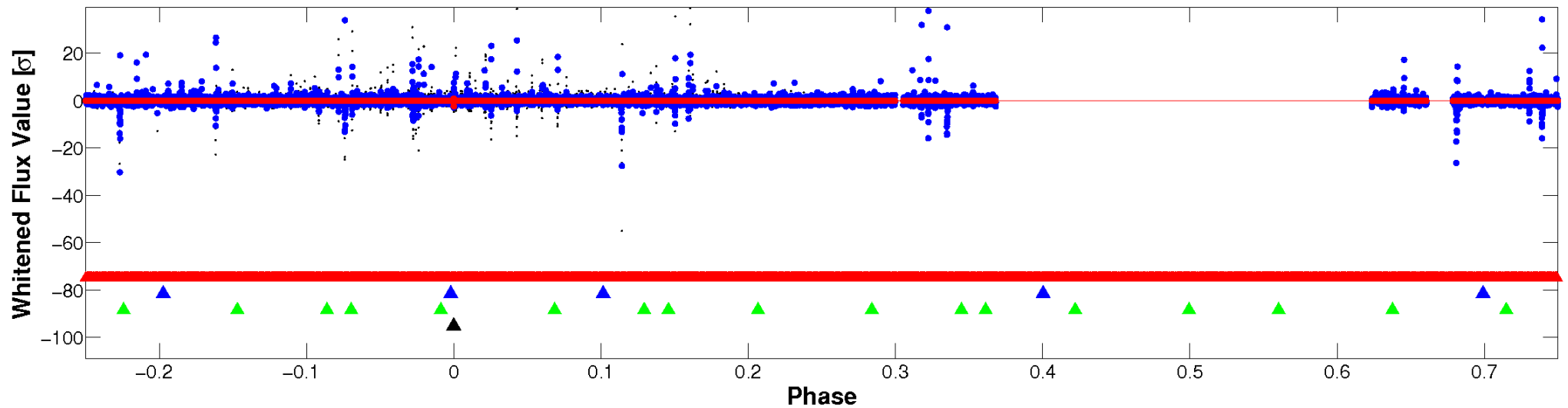


Non-Whitened Vs. Whitened Light Curve

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

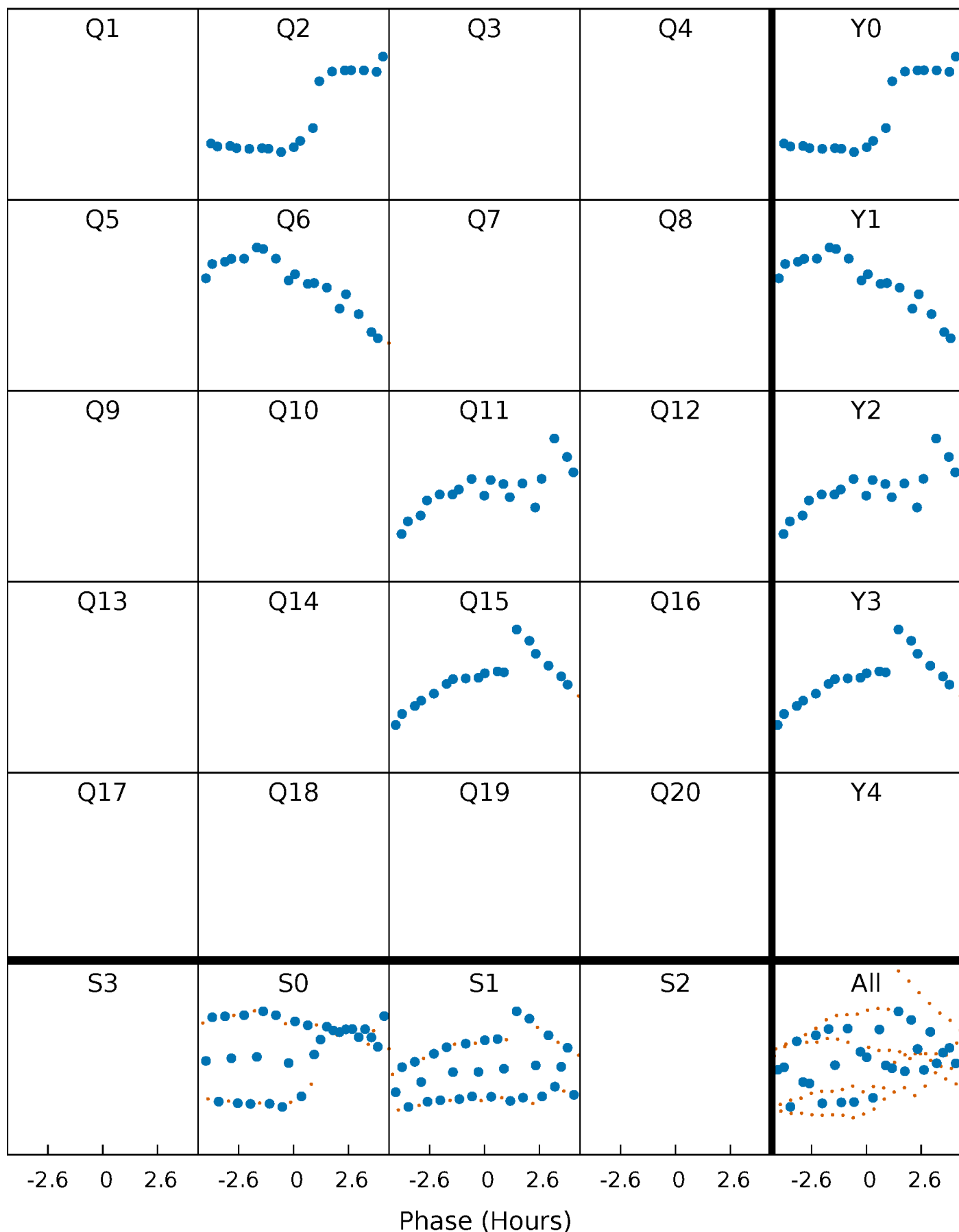


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



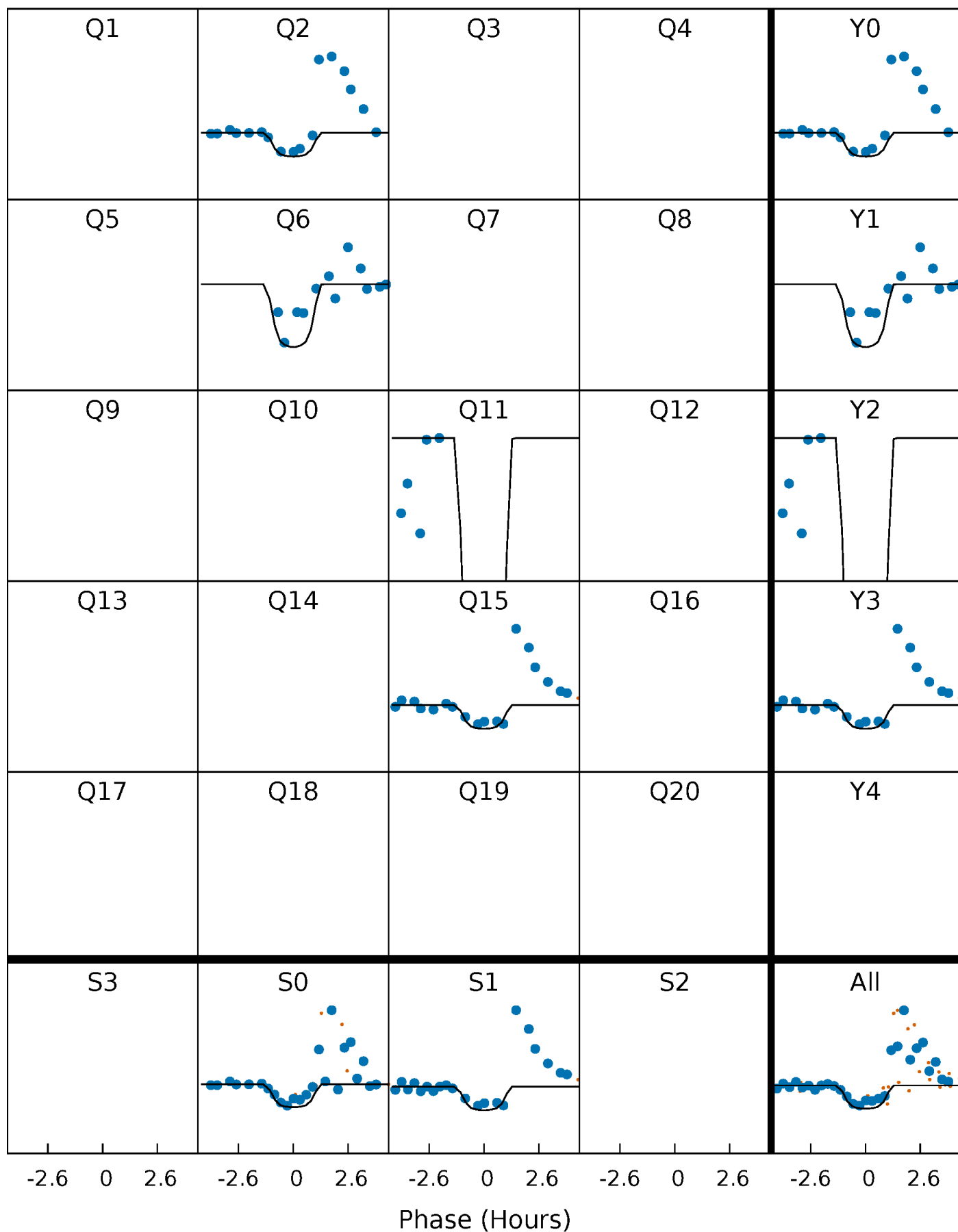
PDC Quarter-Phased Transit Curves

TCE 009394605-04 P=410.030727 Days $T_0=198.378408$ (BKJD)



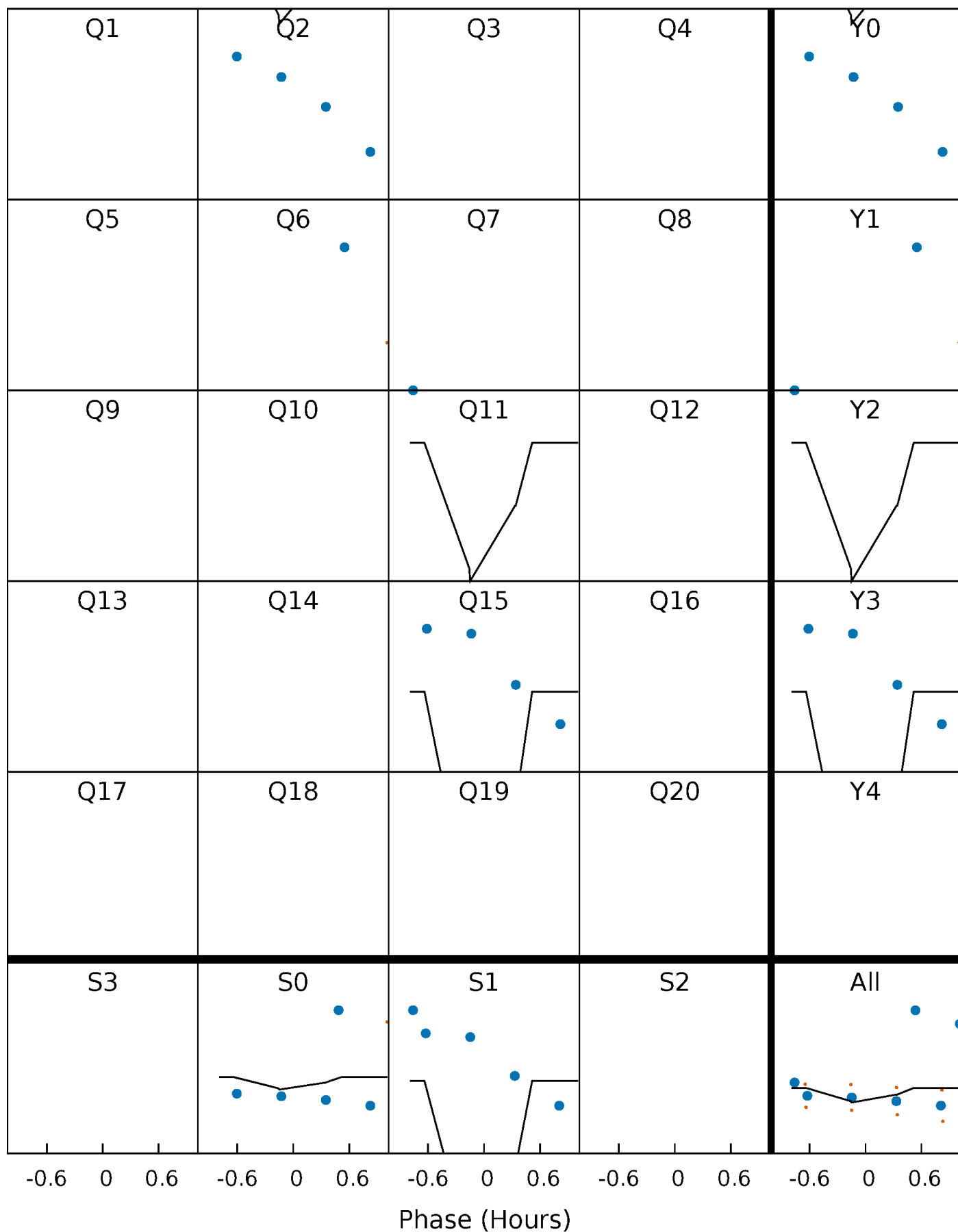
DV Quarter-Phased Transit Curves

TCE 009394605-04 P=410.030727 Days $T_0=198.378408$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

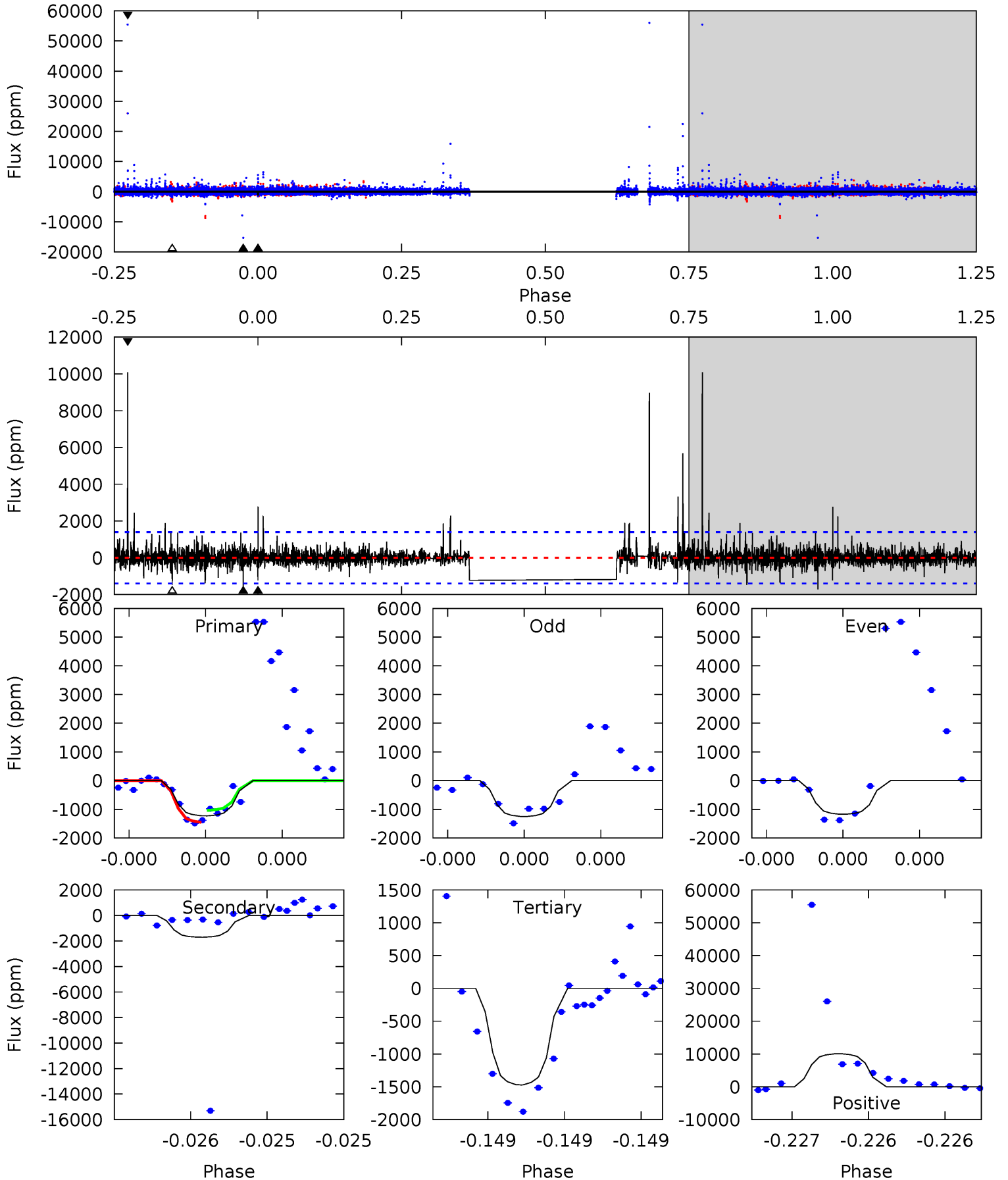
TCE 009394605-04 P=410.033437 Days $T_0=198.317690$ (BKJD)



DV Model-Shift Uniqueness Test

009394605-04, P = 410.030727 Days, E = 198.378408 Days

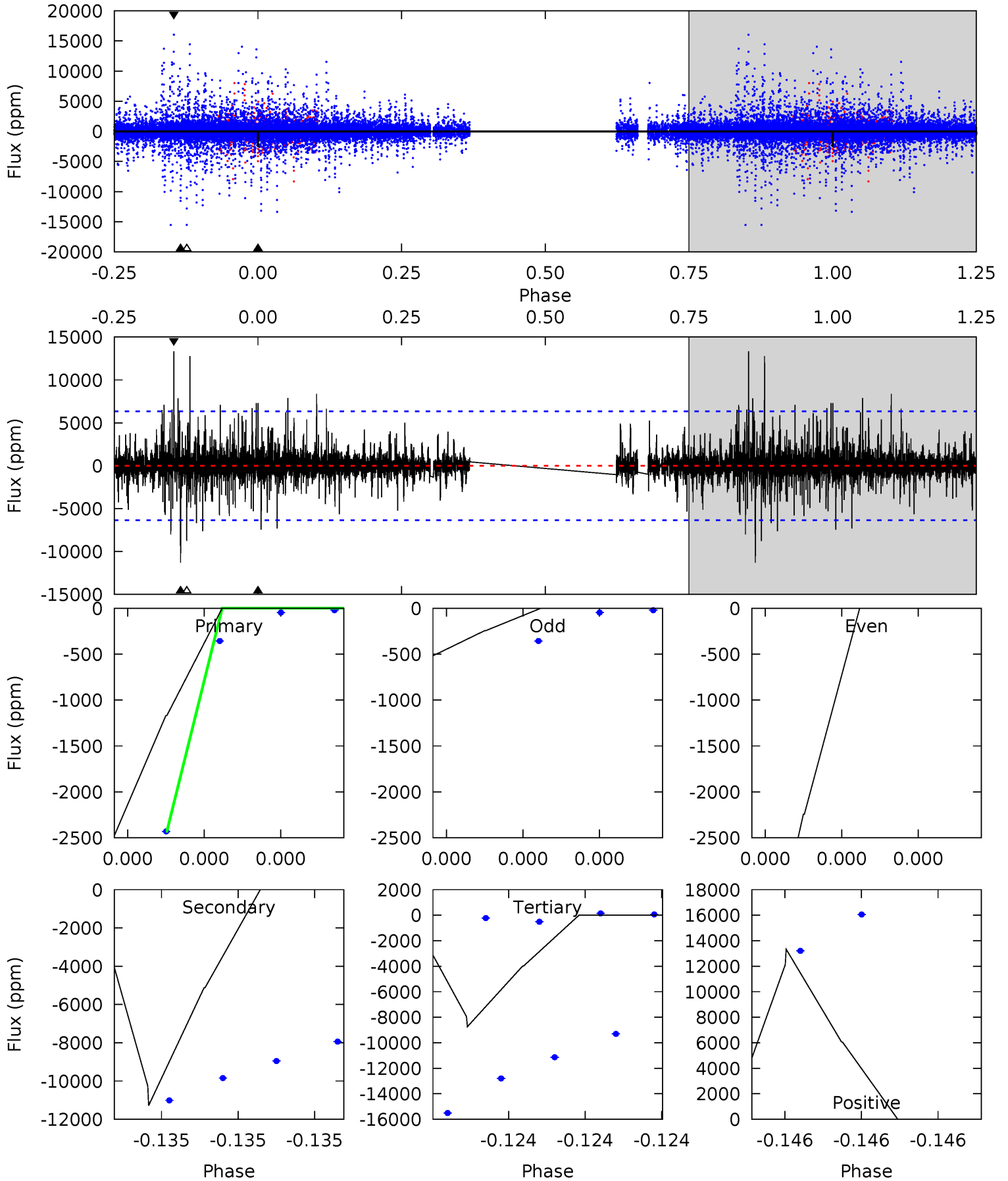
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.01	6.97	6.01	41.2	5.69	3.66	1.80	-1.00	-36.2	0.95	-34.2	0.11	1.04	0.86	0.77



Alt Model-Shift Uniqueness Test

009394605-04, P = 410.033437 Days, E = 198.317690 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.39	10.5	8.14	12.4	5.91	3.98	1.04	-5.74	-10.0	2.36	-1.91	1.74	1.00	0.54	0.00



Stellar Parameters For KIC 009394605

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5808^{+207}_{-207}	$4.434^{+0.105}_{-0.195}$	$-0.240^{+0.300}_{-0.300}$	$0.951^{+0.279}_{-0.139}$	$0.895^{+0.131}_{-0.087}$	$1.467^{+0.777}_{-0.685}$
	+4%/-4%	+2%/-4%	+125%/-125%	+29%/-15%	+15%/-10%	+53%/-47%
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 009394605-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1706 ± 245	$7.02^{+5.98}_{-4.78}$	346^{+24}_{-21}	4736^{+3820}_{-965}	$20897^{+187769}_{-14923}$
Alt.	-11278 ± 1075	$8.21^{+6.53}_{-5.46}$	345^{+27}_{-18}	6851^{+8824}_{-1652}	$101190^{+808340}_{-69817}$

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

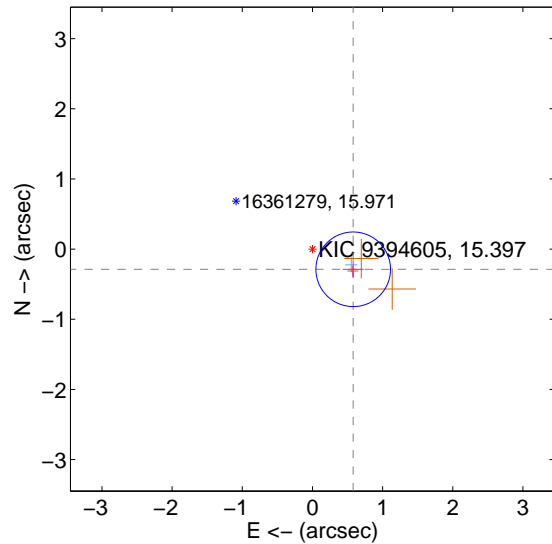
Supplemental centroid analysis for 009394605-04. Kepler magnitude: 15.40. Transit SNR 7.79

There are 1 quarters with good PRF difference image offsets

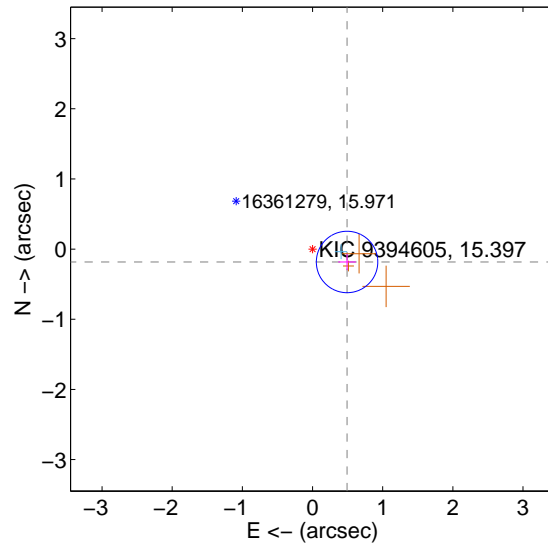
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.649 ± 0.177	3.66	-0.581 ± 0.150	-0.288 ± 0.124
PRF-fit source offset from KIC position	0.525 ± 0.146	3.60	-0.492 ± 0.126	-0.184 ± 0.115
photometric centroid source offset	0.19 ± 0.90	0.21	0.15 ± 0.90	0.10 ± 0.88

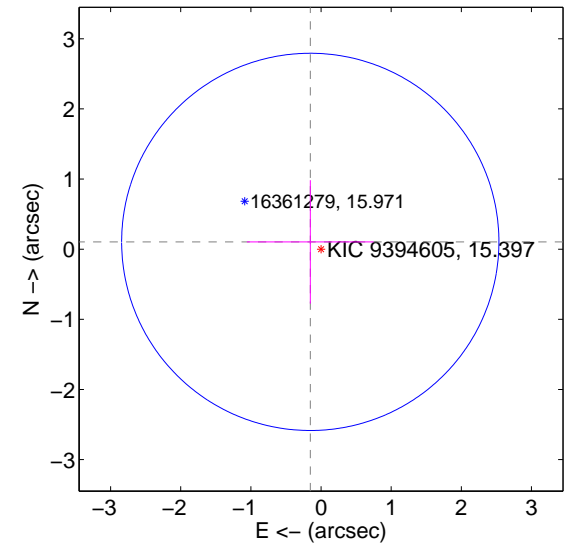
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

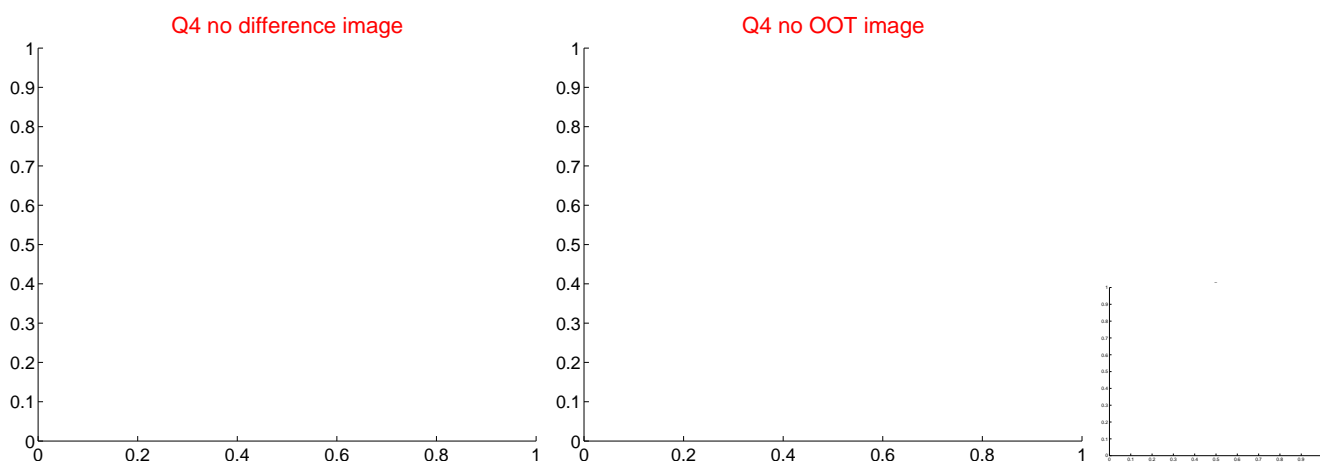
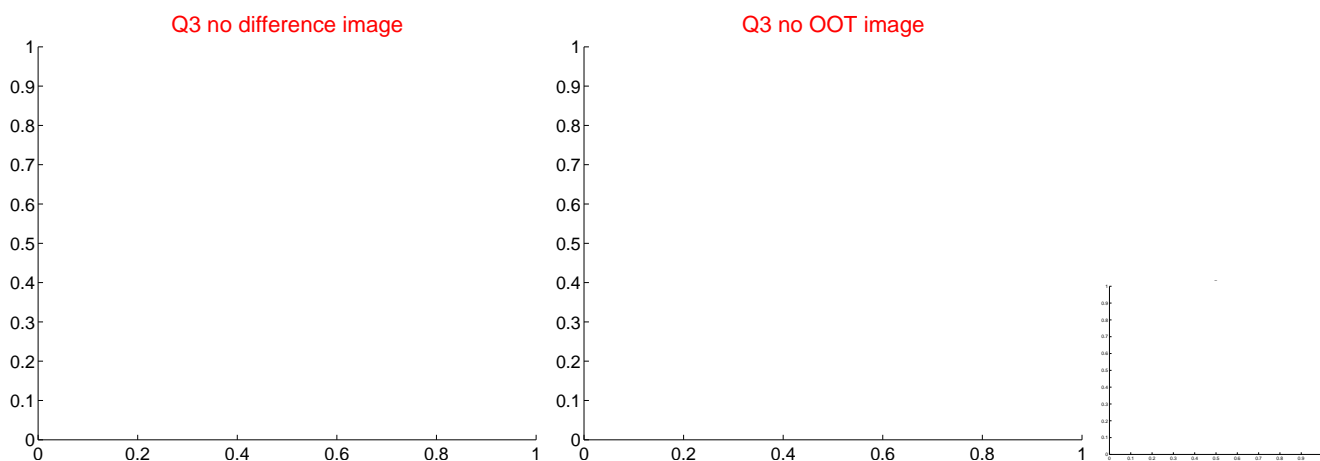
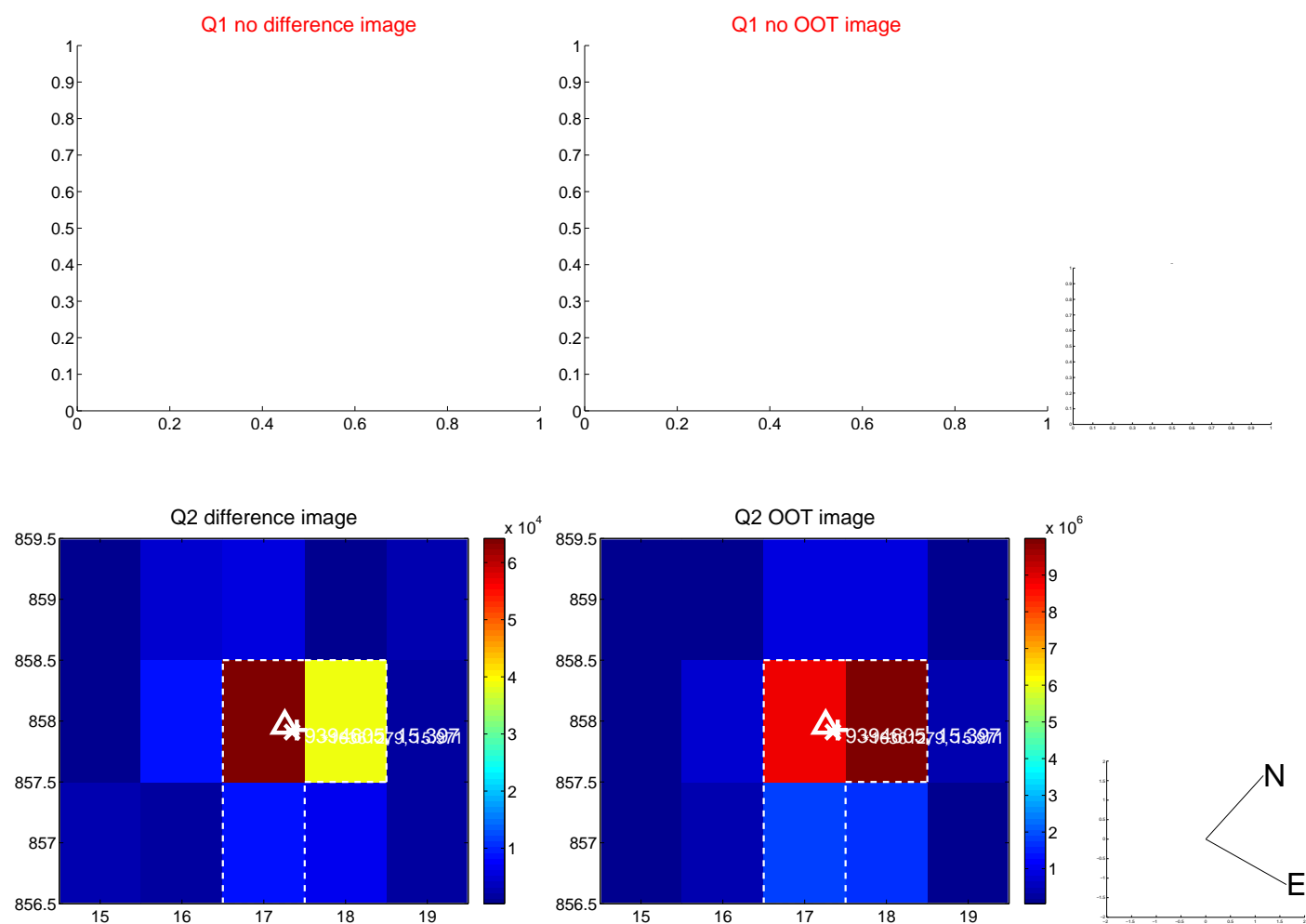


offset from photometric centroids

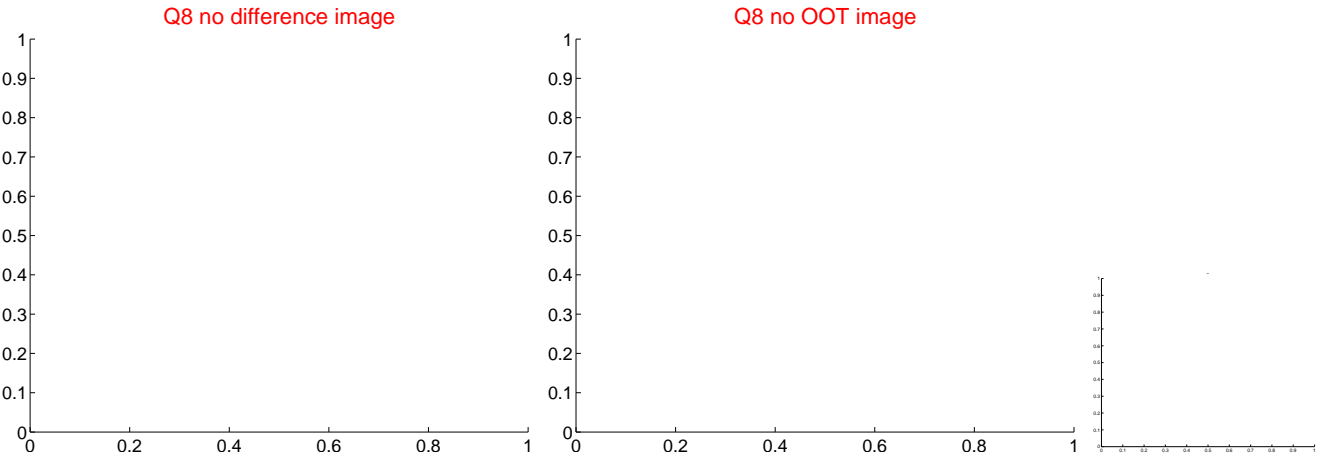
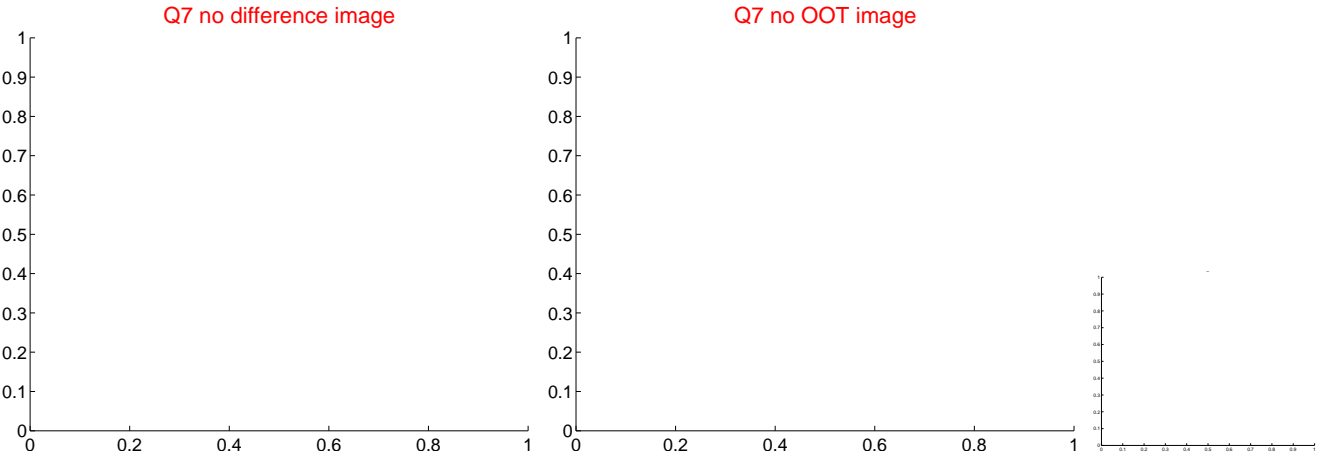
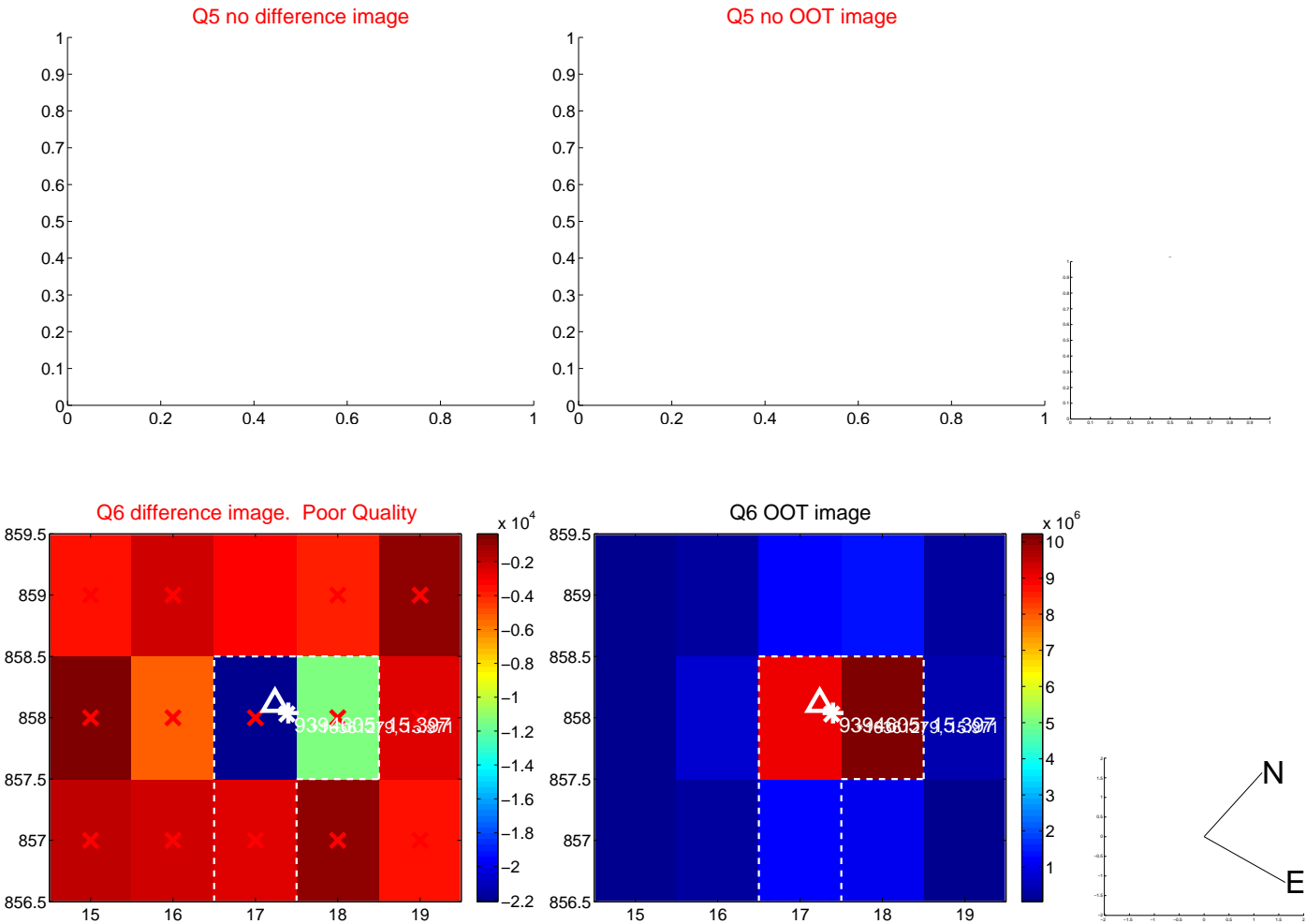


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

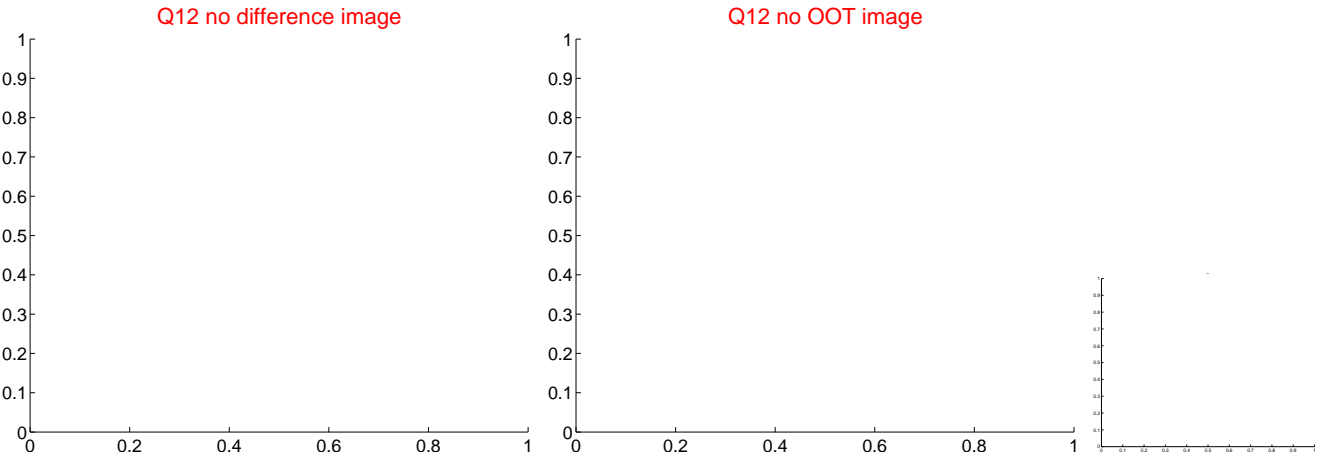
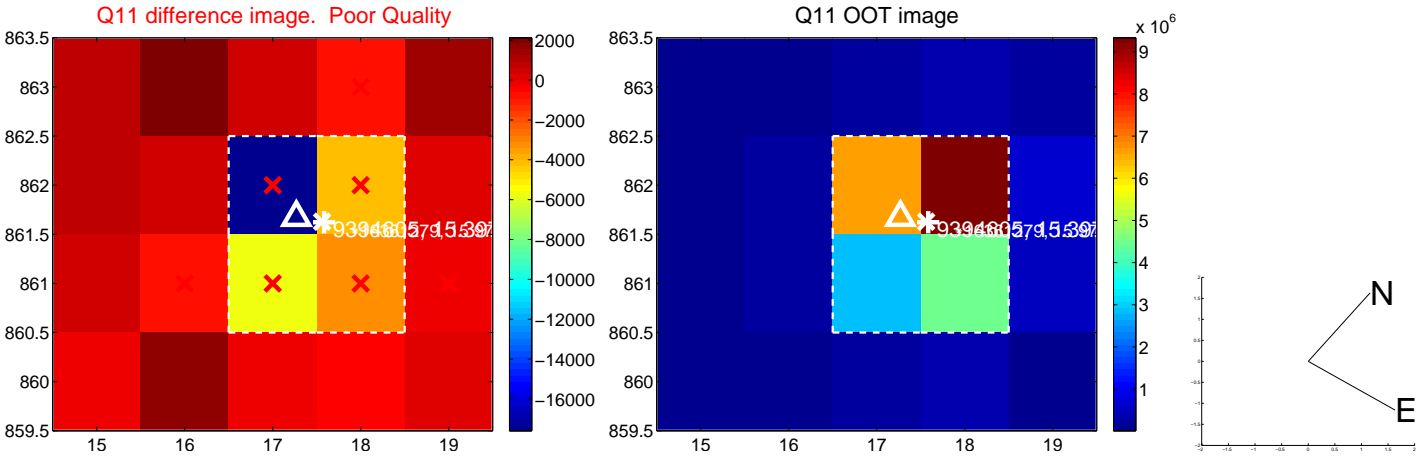
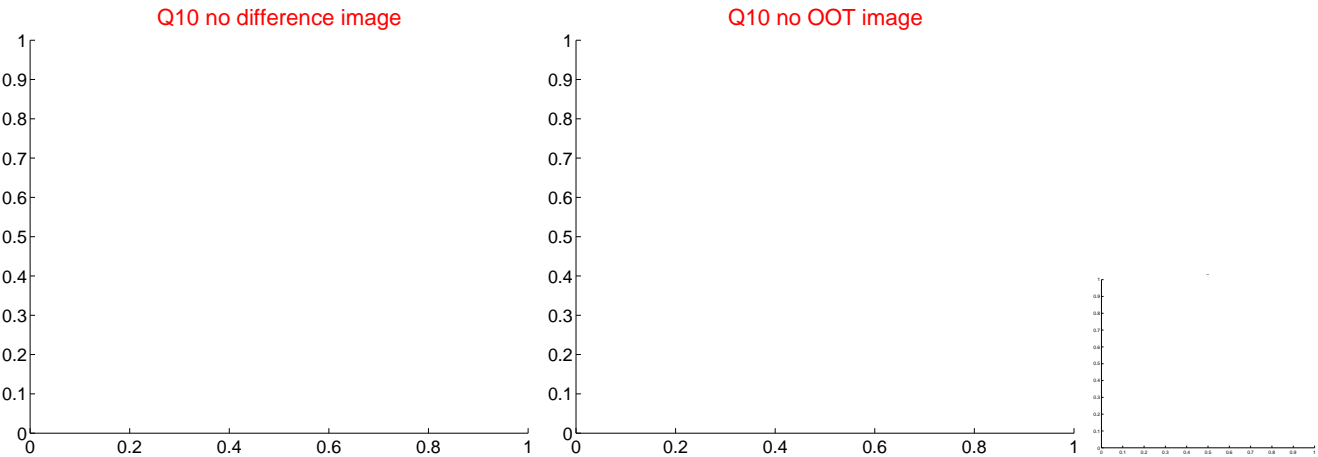
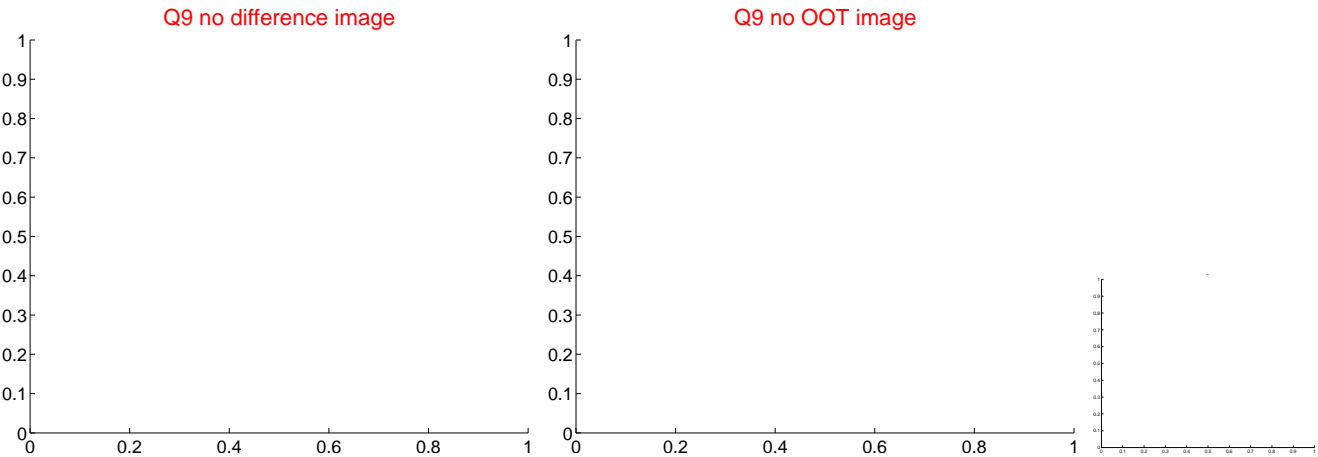
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



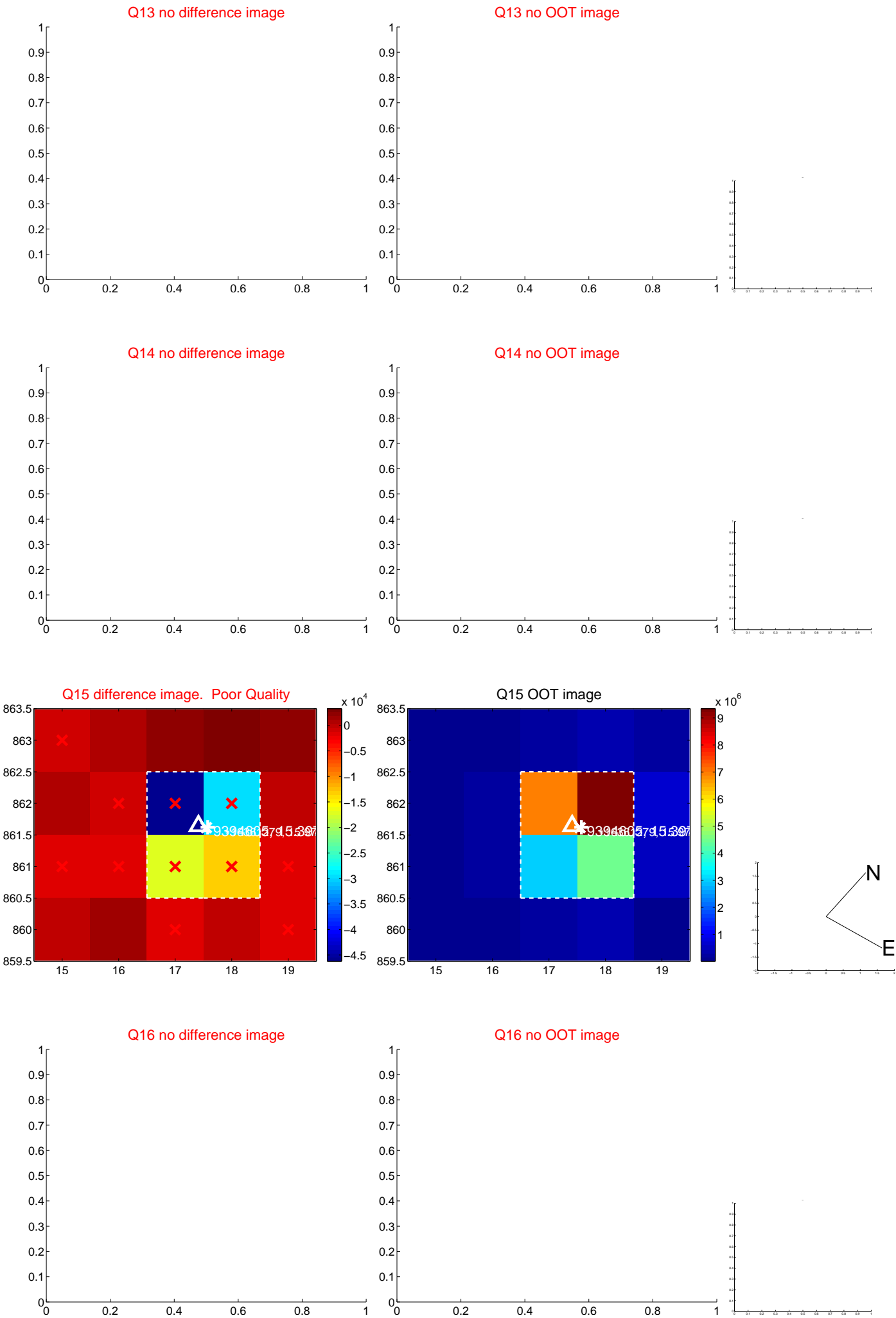
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



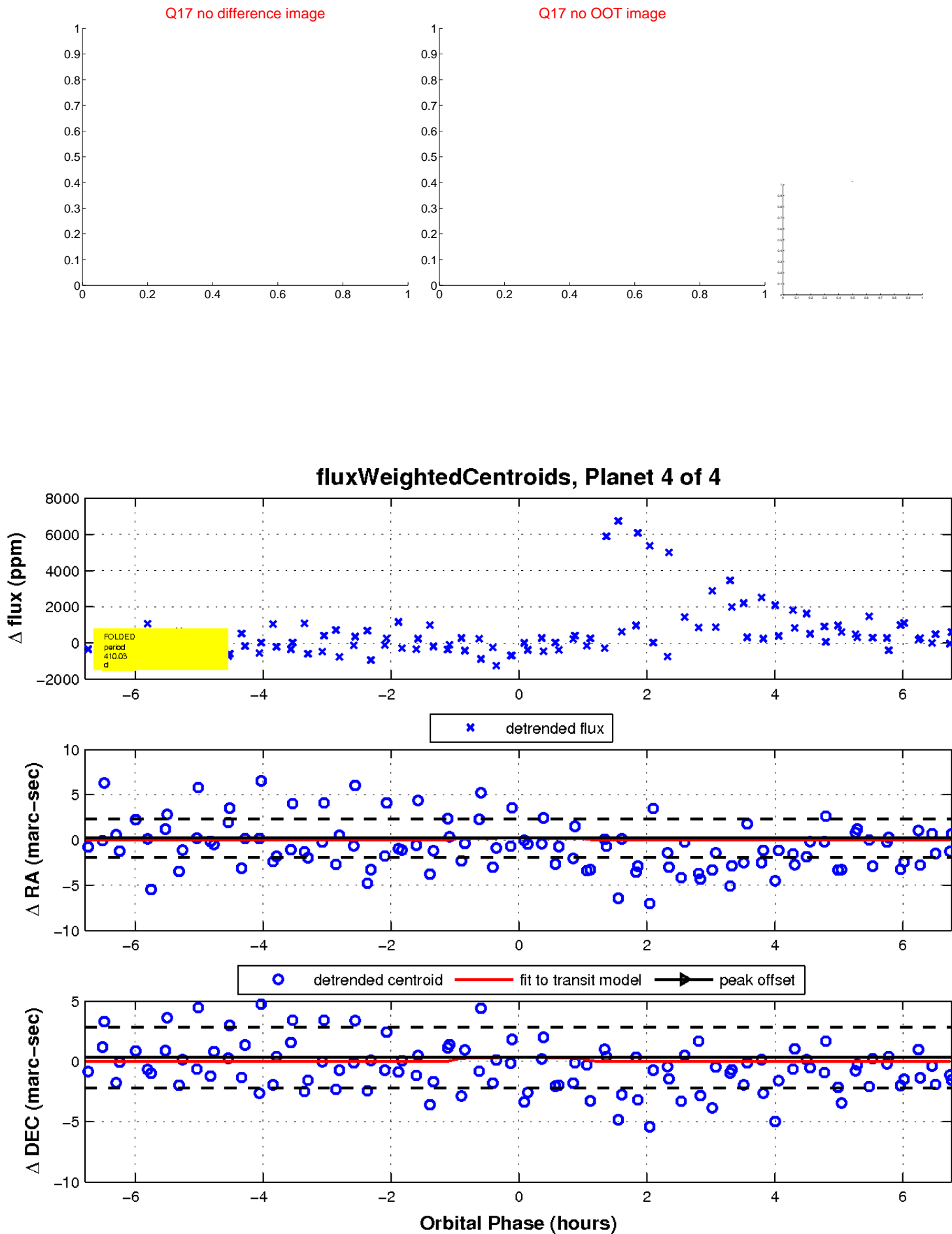
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

