

KIC 009716523

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})
009716523-01	OBS	No	0.851171	132.052266	102.1	2.757	8.5	5.7	2.84	7004	3.37	37457.84
009716523-02	OBS	No	2.206382	133.482283	499.4	6.155	8.6	11.2	2.84	7004	12.12	10519.40
009716523-04	OBS	No	107.649091	147.871614	413.3	2.000	9.7	-1.0	2.84	7004	5.86	59.00
009716523-05	OBS	No	149.315132	272.799286	3600.4	3.792	8.5	9.1	2.84	7004	30.83	38.14
009716523-06	OBS	No	69.441327	161.272587	635.7	2.755	8.6	2.4	2.84	7004	7.92	105.86
009716523-07	OBS	No	573.699442	196.486309	202.0	5.000	8.2	-1.0	2.84	7004	4.09	6.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
009716523-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
009716523-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009716523-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_ZUMA—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_KIC_POS
009716523-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS—HALO_GHOST
009716523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

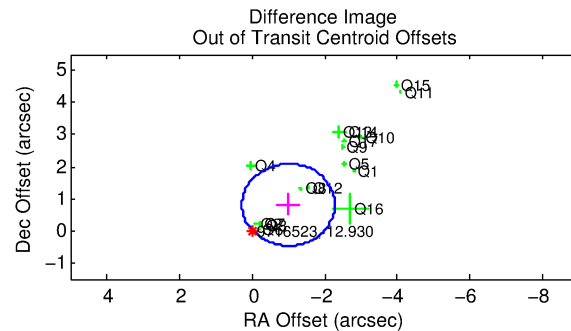
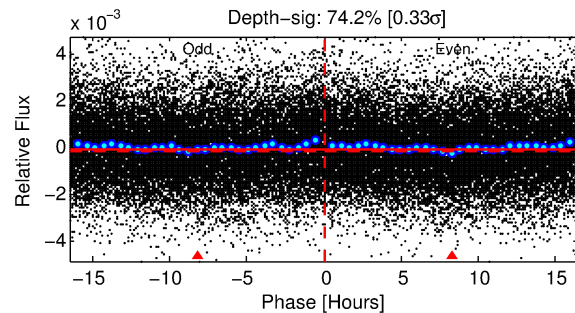
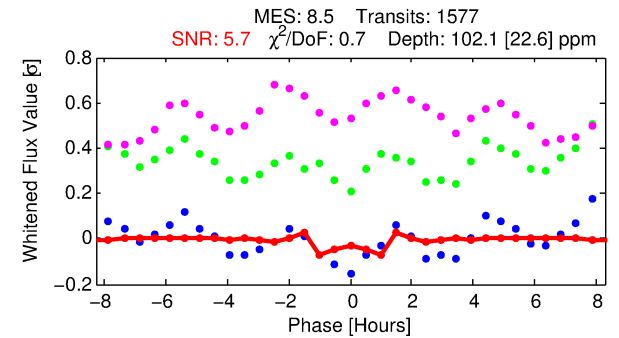
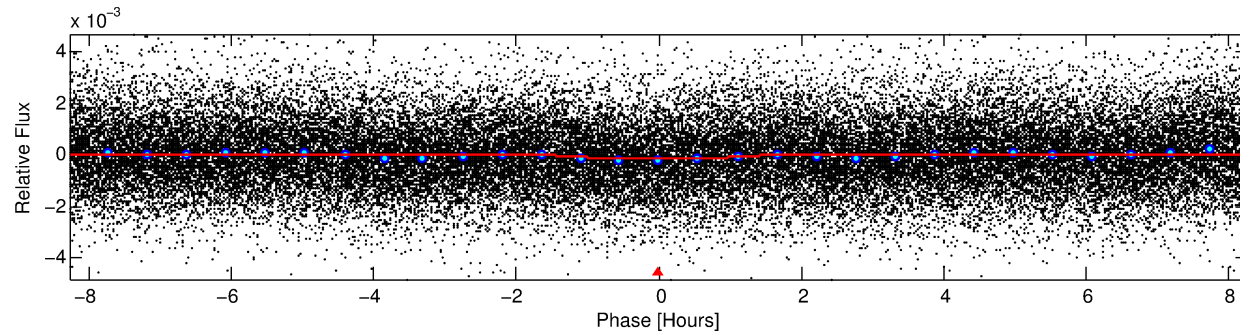
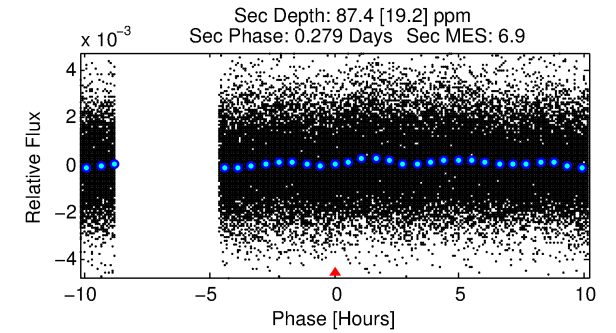
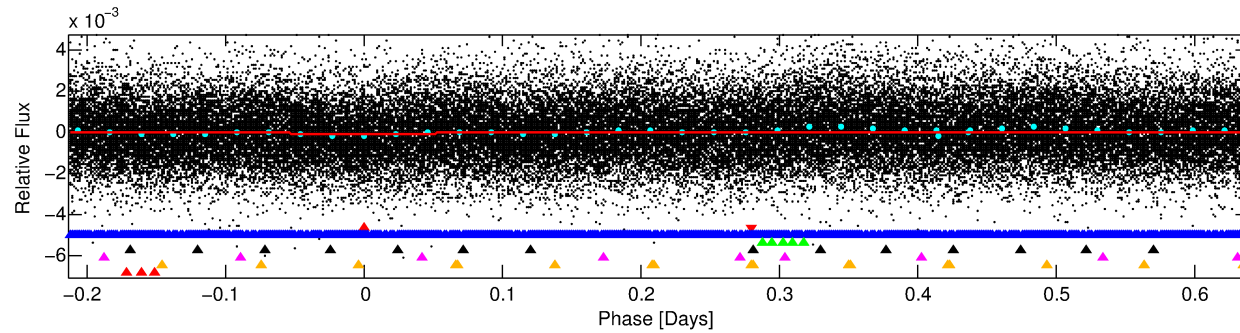
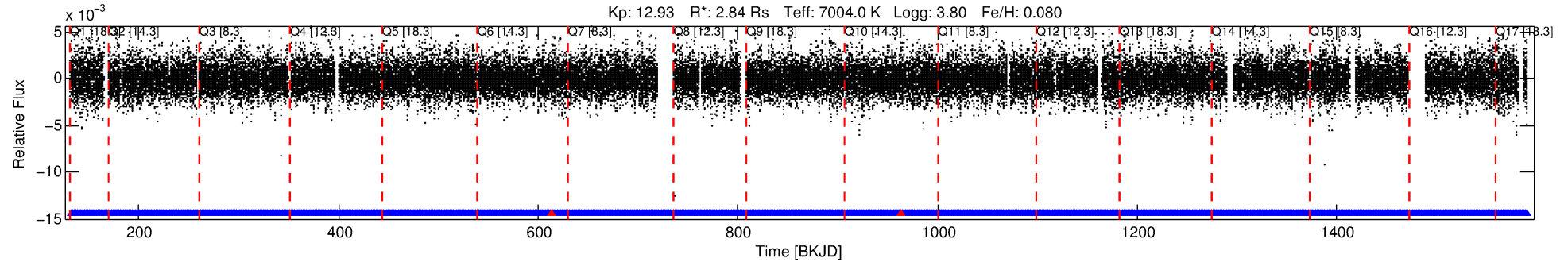
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716523-01

No Significant Match Found

DV One-Page Summary

KIC: 9716523 Candidate: 1 of 7 Period: 0.851 d



DV Fit Results:

Period = 0.85117 [0.00002] d
Epoch = 132.0523 [0.0021] BKJD
Rp/R* = 0.0109 [0.0030]
a/R* = 1.40 [0.97]
b = 0.91 [0.26]
Seff = 37457.84 [25110.34]
Teq = 3547 [595] K
Rp = 3.37 [1.74] Re
a = 0.0216 [0.0088] AU
Ag = 1.97 [1.72] [0.56σ]
Teffp = 6495 [1000] K [2.53σ]

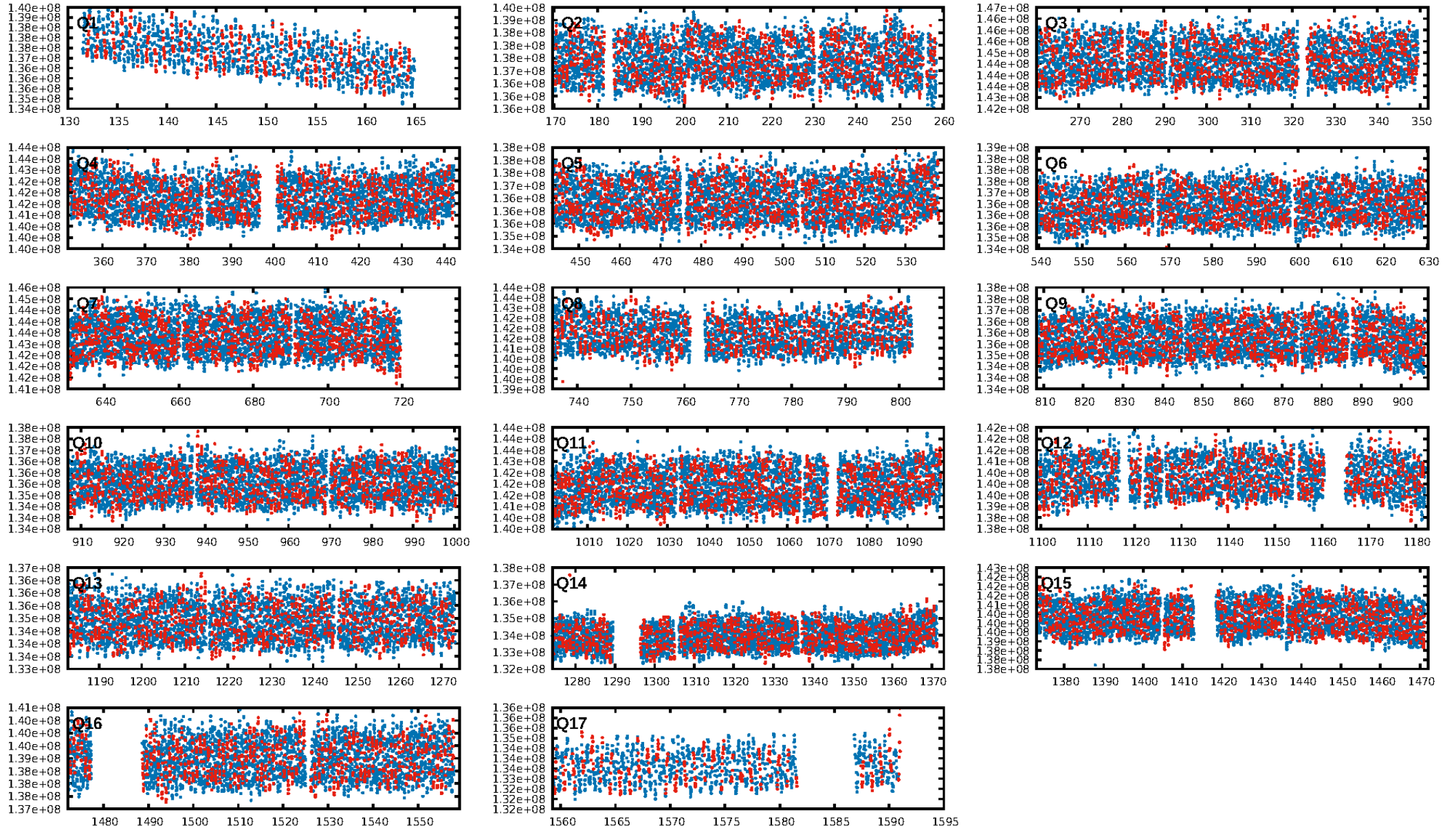
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [4.82σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1504/1506]
GhostDiagnostic-chr: 2.07
Centroid-sig: 0.0%
Centroid-so: 2.495 arcsec [3.85σ]
OotOffset-rm: 1.288 arcsec [3.02σ]
KicOffset-rm: 0.129 arcsec [0.85σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.59 [10/17]
DiffImageOverlap-fno: 1.00 [17/17]

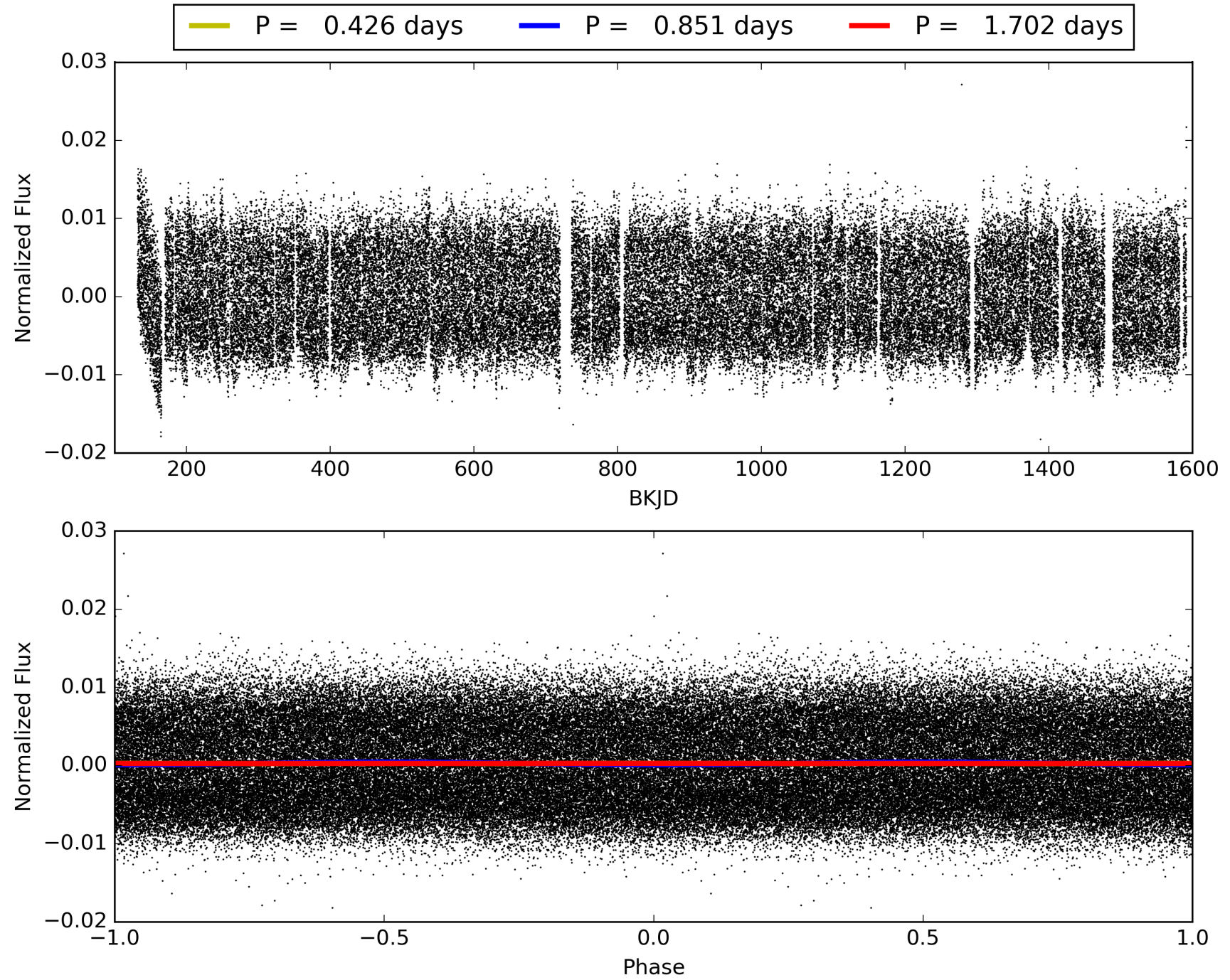
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009716523-01, PDC Light Curves

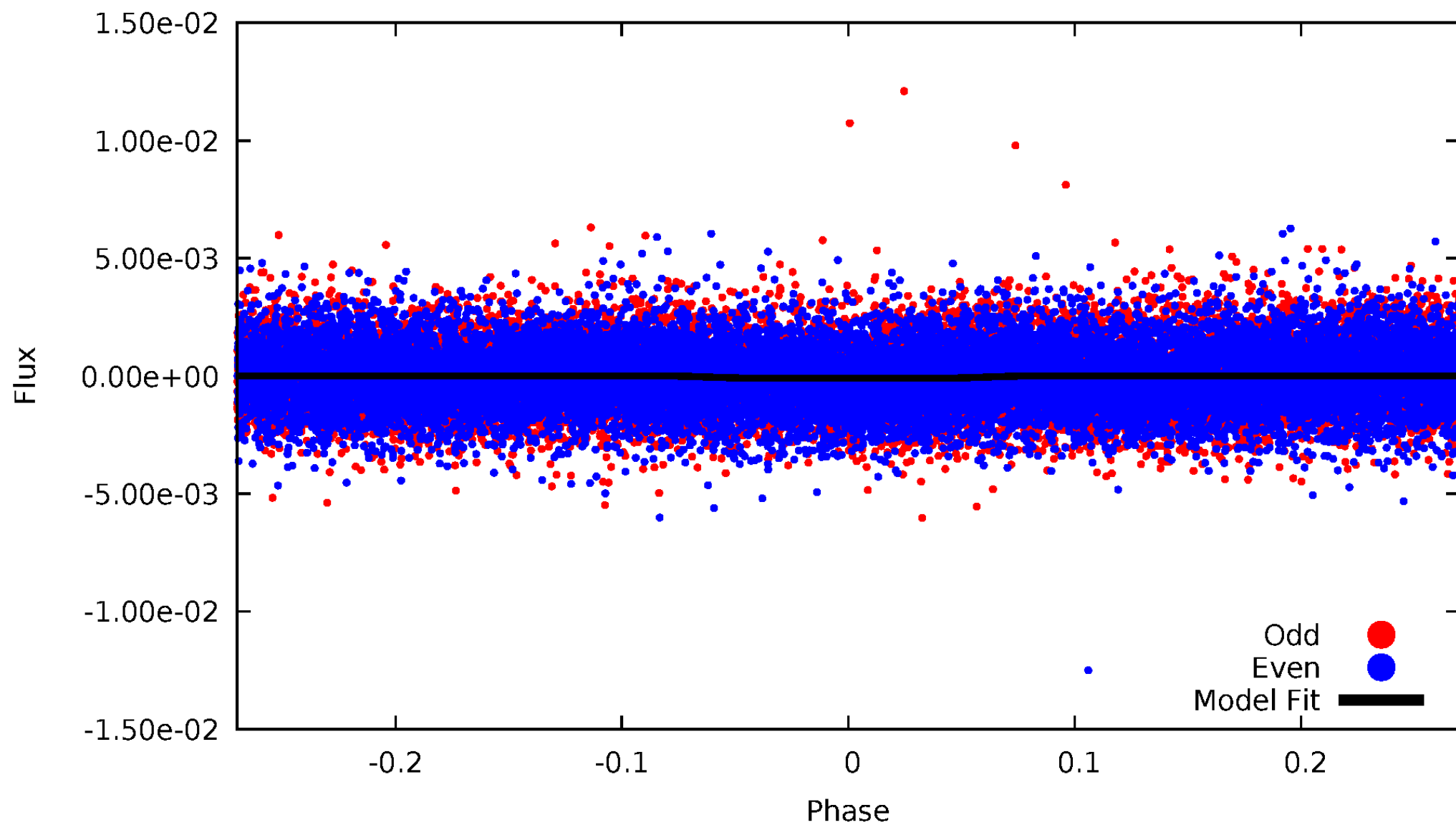


TCE 009716523-01



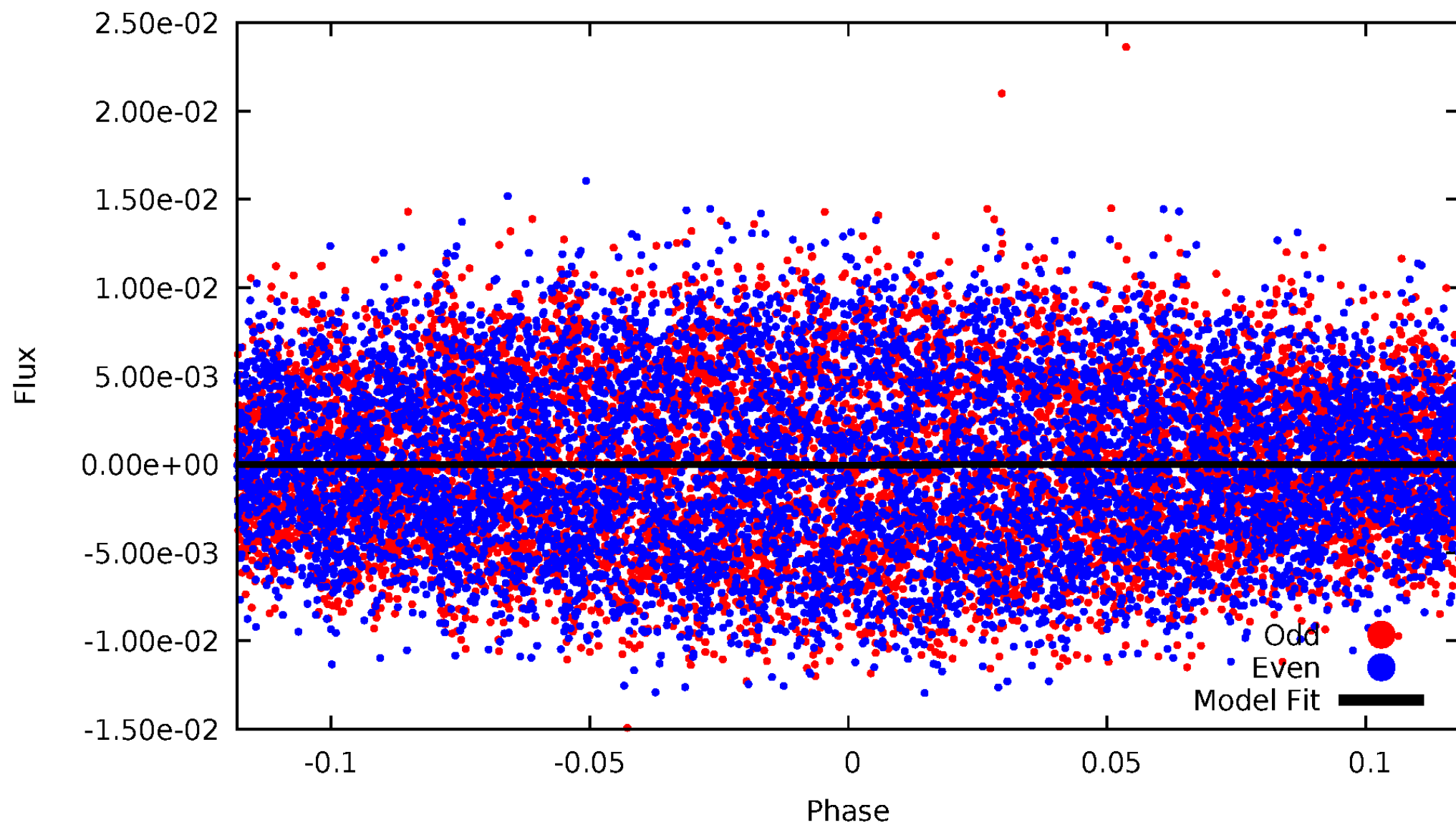
DV Odd/Even

TCE 009716523-01

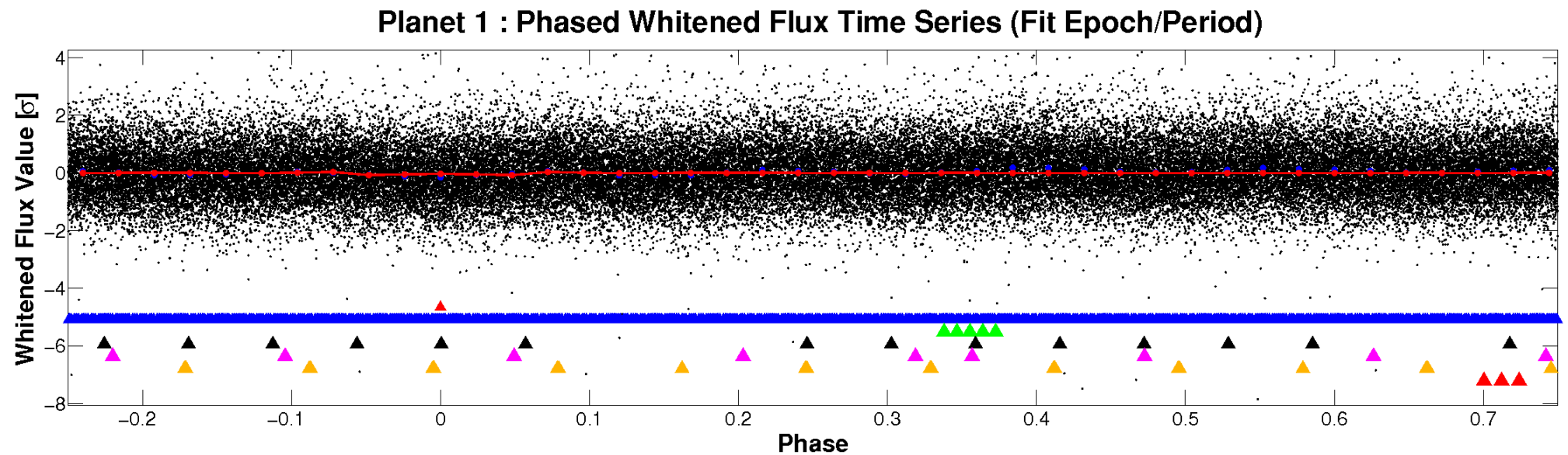
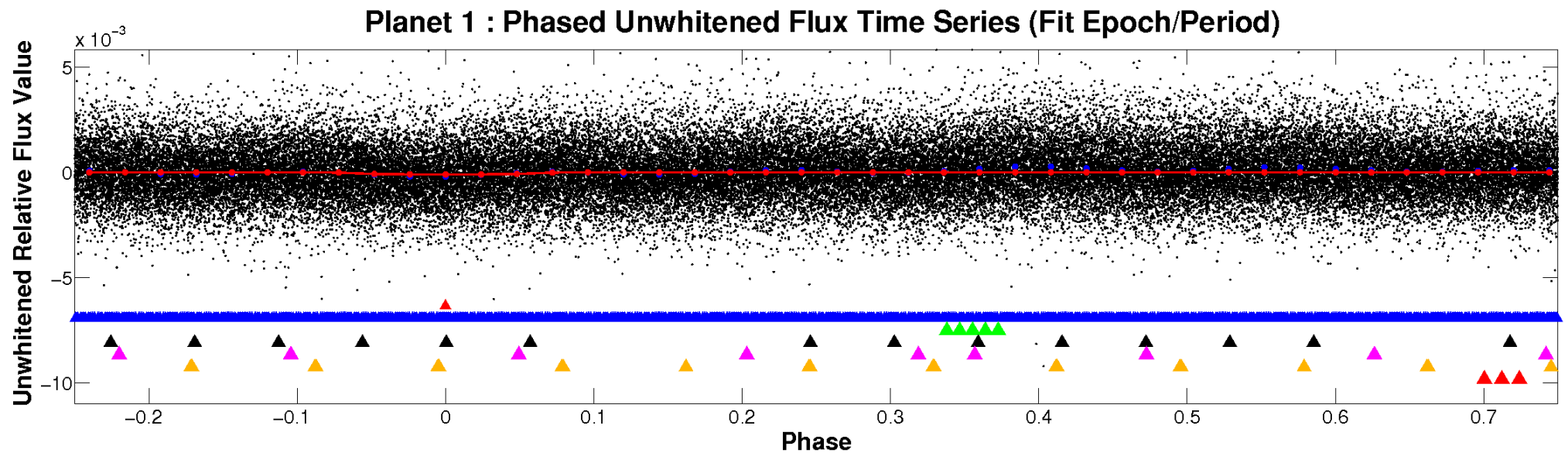


ALT Odd/Even

TCE 009716523-01

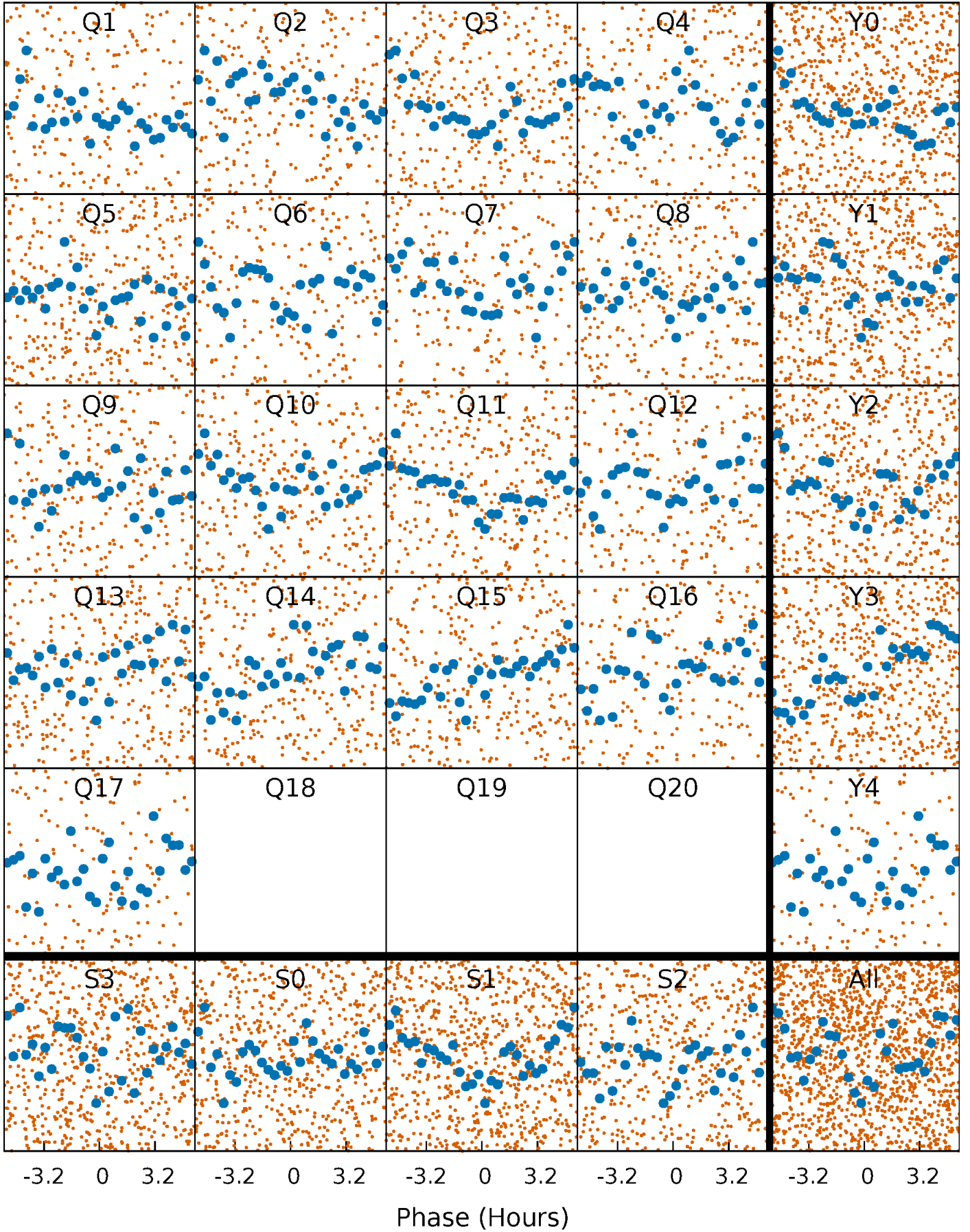


Non-Whitened Vs. Whitened Light Curve



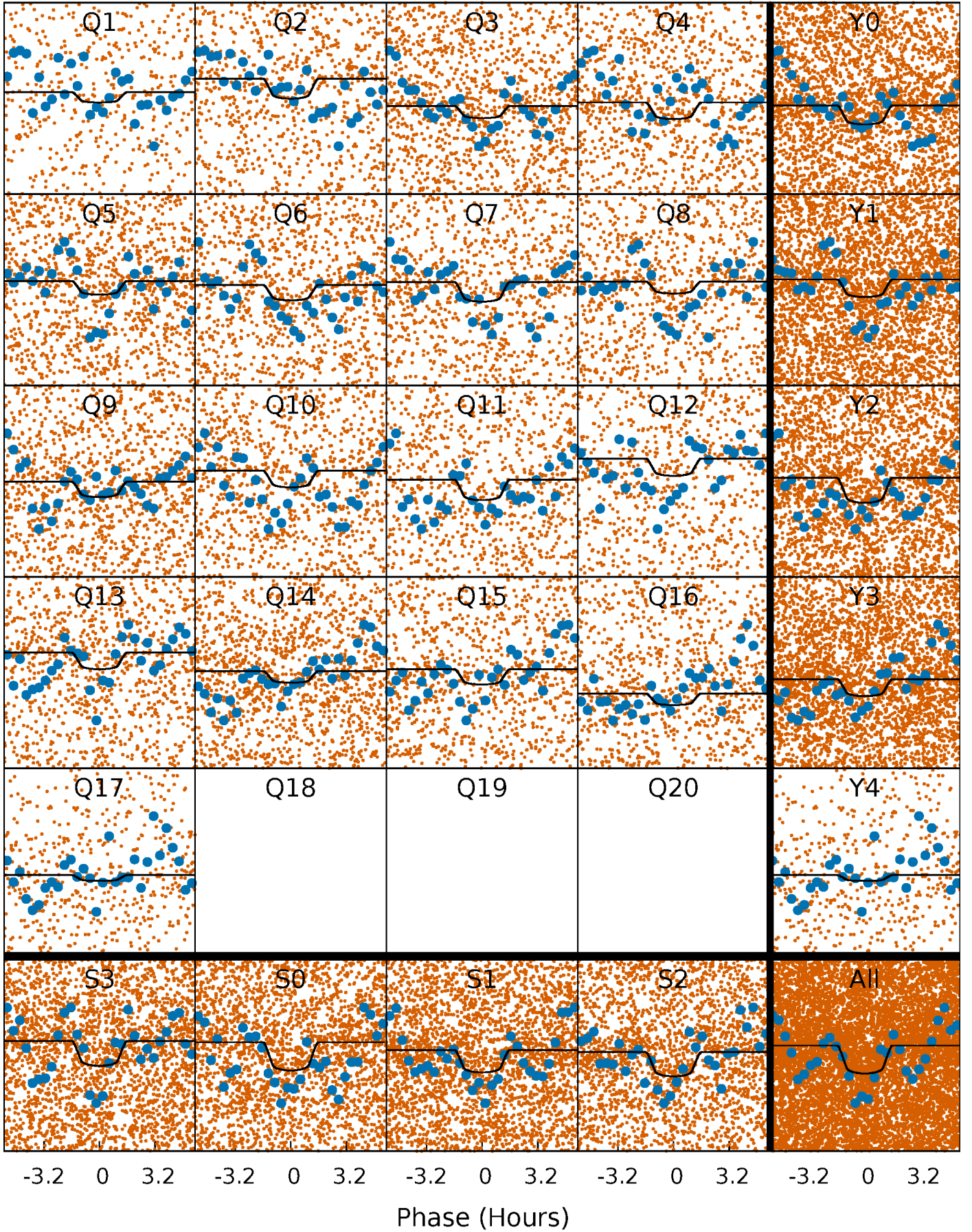
PDC Quarter-Phased Transit Curves

TCE 009716523-01 P= 0.851171 Days $T_0=132.052266$ (BKJD)



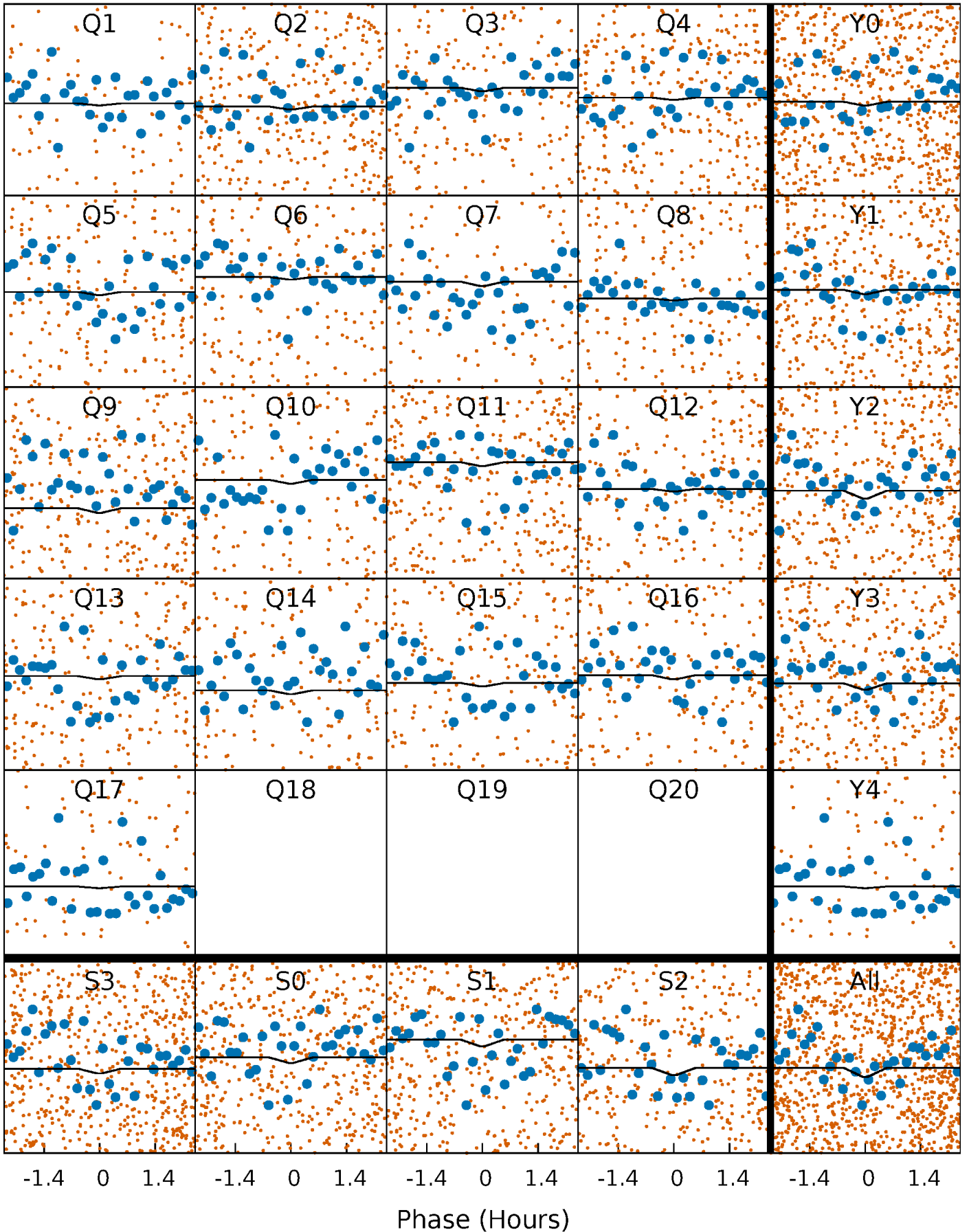
DV Quarter-Phased Transit Curves

TCE 009716523-01 P= 0.851171 Days $T_0=132.052266$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

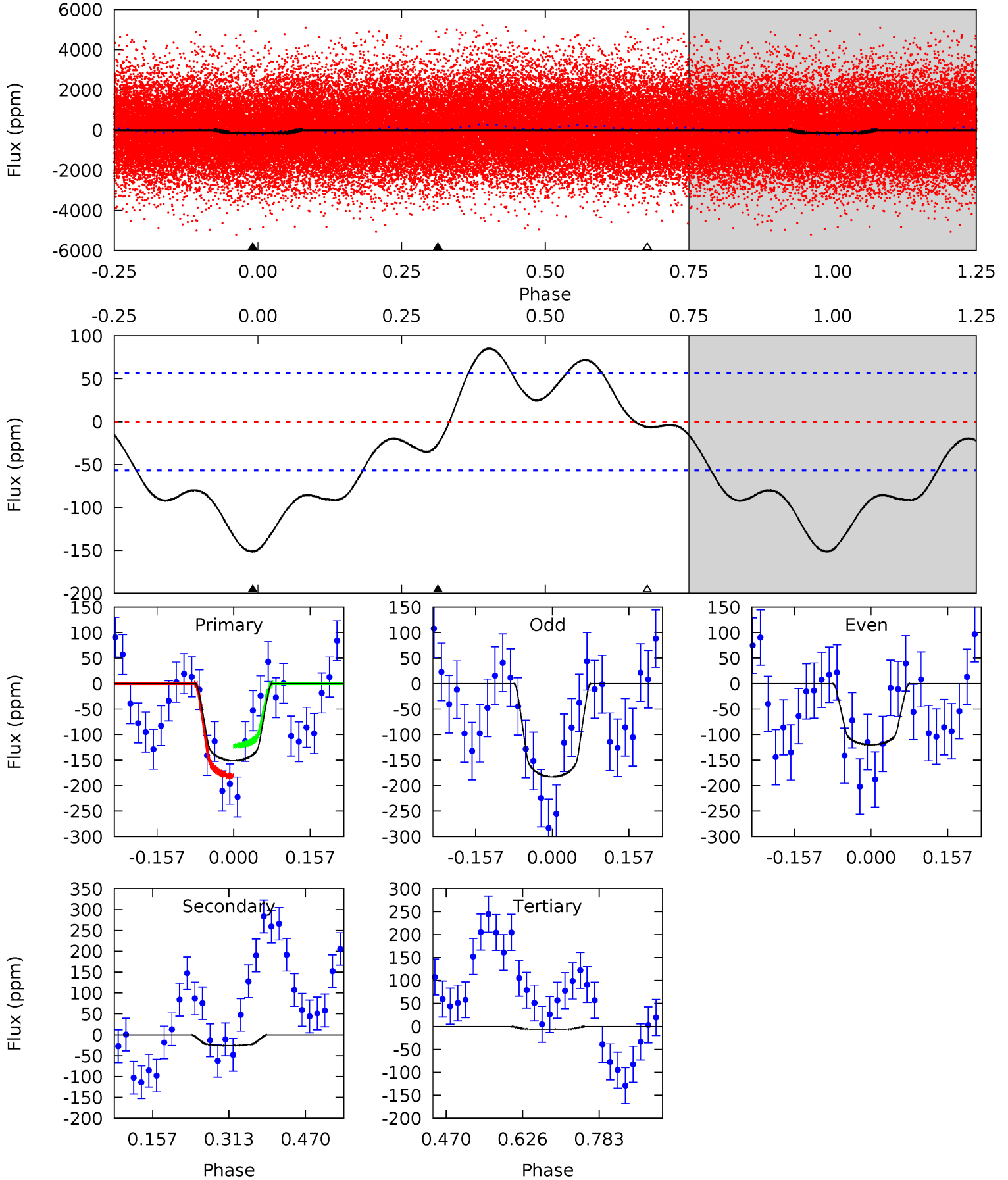
TCE 009716523-01 P= 0.851159 Days $T_0=132.048976$ (BKJD)



DV Model-Shift Uniqueness Test

009716523-01, P = 0.851171 Days, E = 131.201095 Days

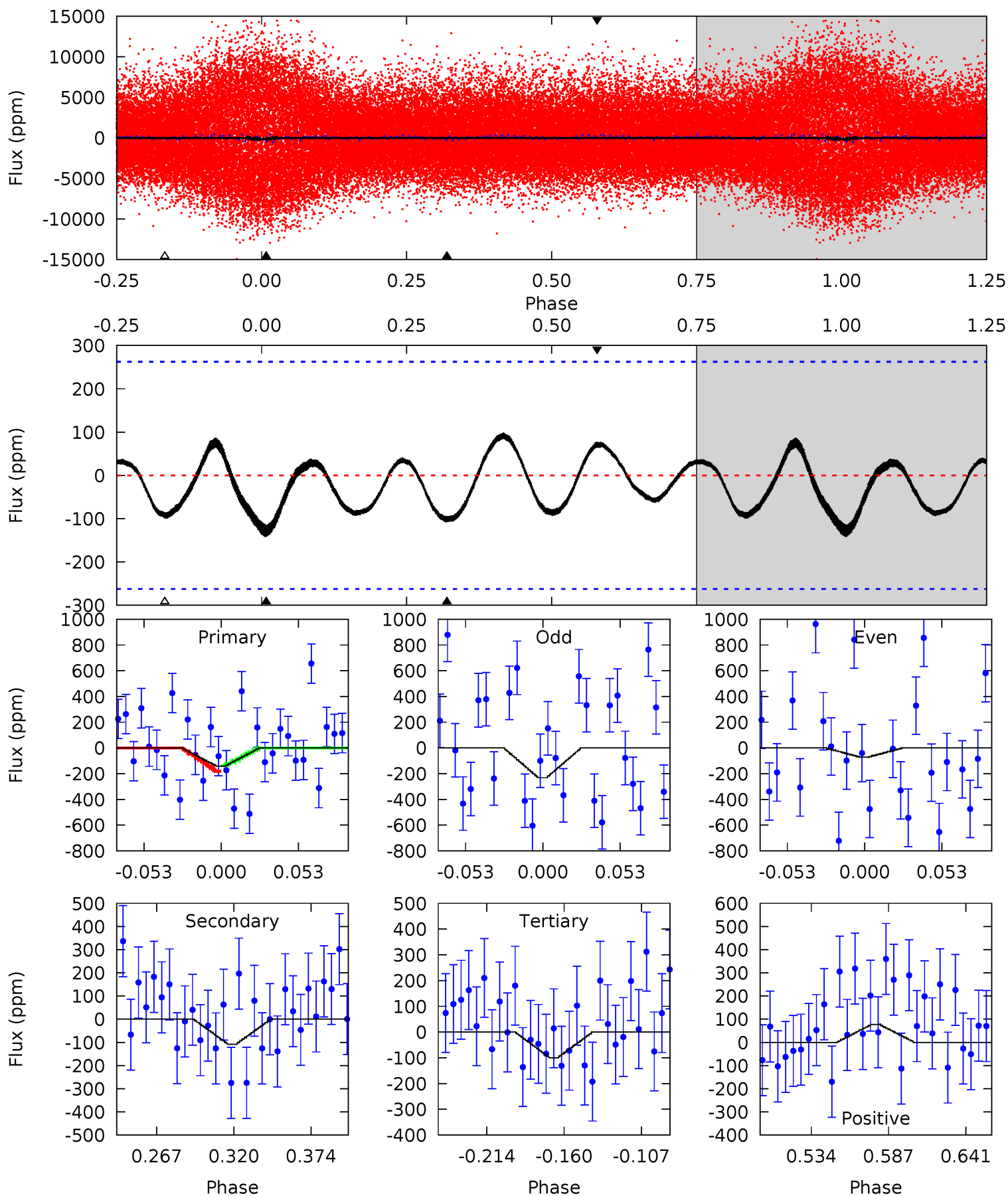
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.9	2.05	0.50	0	4.47	1.42	3.70	11.4	11.9	1.55	2.05	2.46	1.02	0.36	2.35



Alt Model-Shift Uniqueness Test

009716523-01, P = 0.851159 Days, E = 131.197817 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	1.93	1.78	1.39	4.69	1.93	0.93	0.76	1.15	0.15	0.54	1.43	0.37	0.41	0.38



Stellar Parameters For KIC 009716523

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7004^{+195}_{-318}	$3.797^{+0.375}_{-0.125}$	$0.080^{+0.200}_{-0.350}$	$2.844^{+0.533}_{-1.244}$	$1.848^{+0.164}_{-0.460}$	$0.113^{+0.357}_{-0.043}$
	+3%/-5%	+10%/-3%	+250%/-438%	+19%/-44%	+9%/-25%	+315%/-38%
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 009716523-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-26 ± 13	$3.16^{+1.08}_{-1.06}$	4835^{+366}_{-535}	4249^{+1050}_{-7308}	$0.637^{+0.881}_{-0.380}$
Alt.	-108 ± 56	$2.08^{+1.01}_{-0.86}$	4819^{+346}_{-528}	8249^{+4162}_{-2193}	$5.751^{+12.045}_{-3.735}$

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 $A_{obs} \gg 1.0$

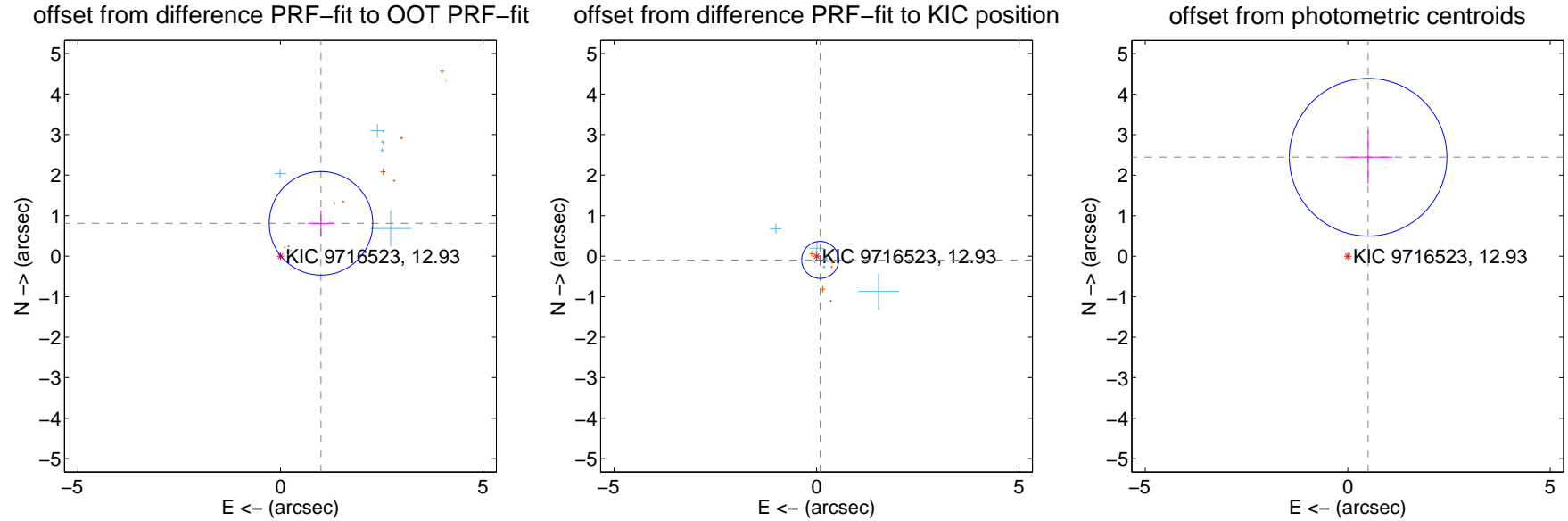
DV Centroid Data

Supplemental centroid analysis for 009716523-01. Kepler magnitude: 12.93. Transit SNR 5.71

There are 10 quarters with good PRF difference image offsets

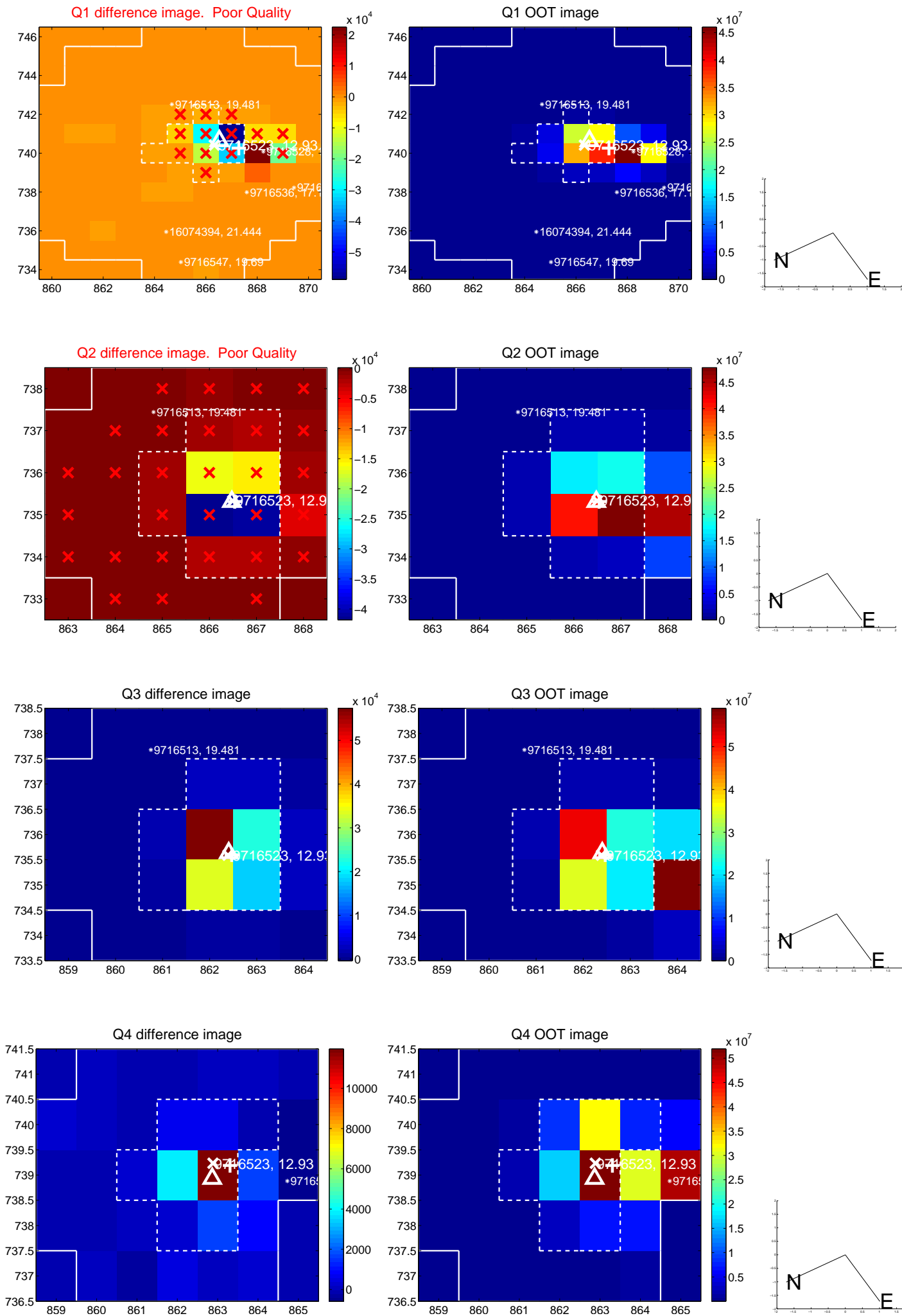
The OOT PRF centroid is offset from the target star catalog position by about 3.68 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.288 ± 0.426	3.02	-1.001 ± 0.319	0.810 ± 0.324
PRF-fit source offset from KIC position	0.129 ± 0.152	0.85	-0.089 ± 0.132	-0.094 ± 0.117
photometric centroid source offset	2.50 ± 0.65	3.85	-0.50 ± 0.61	2.44 ± 0.65

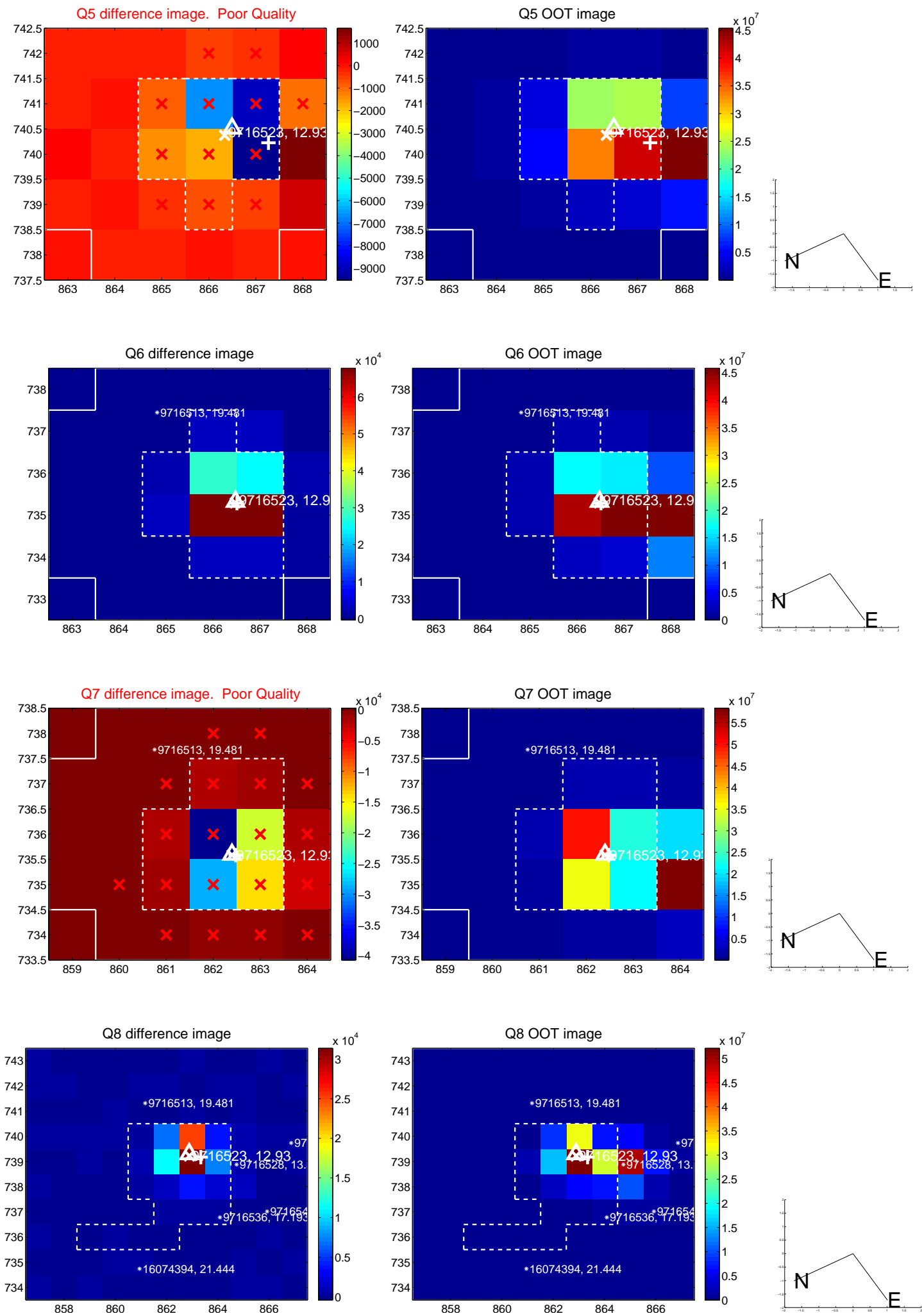


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

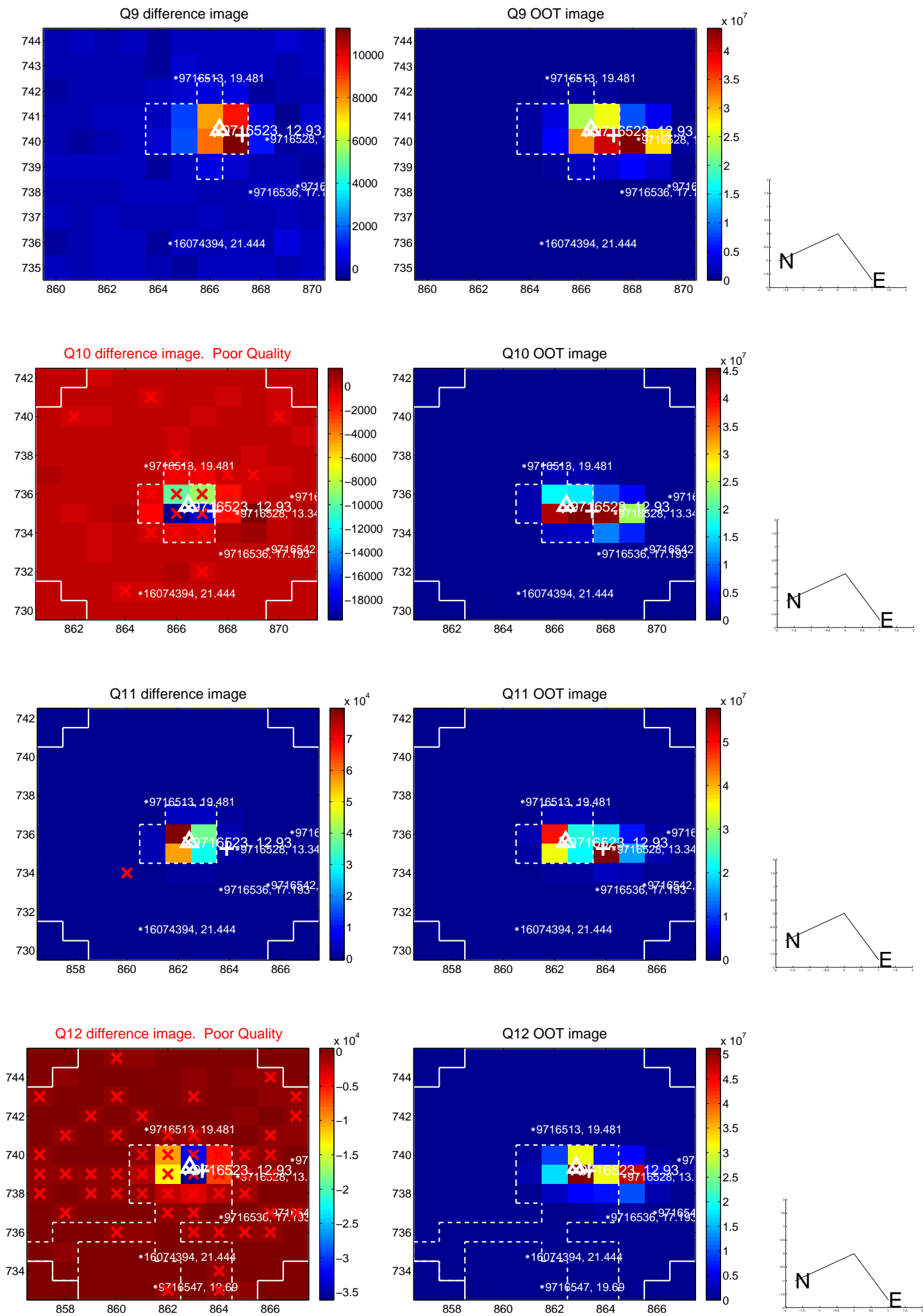
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



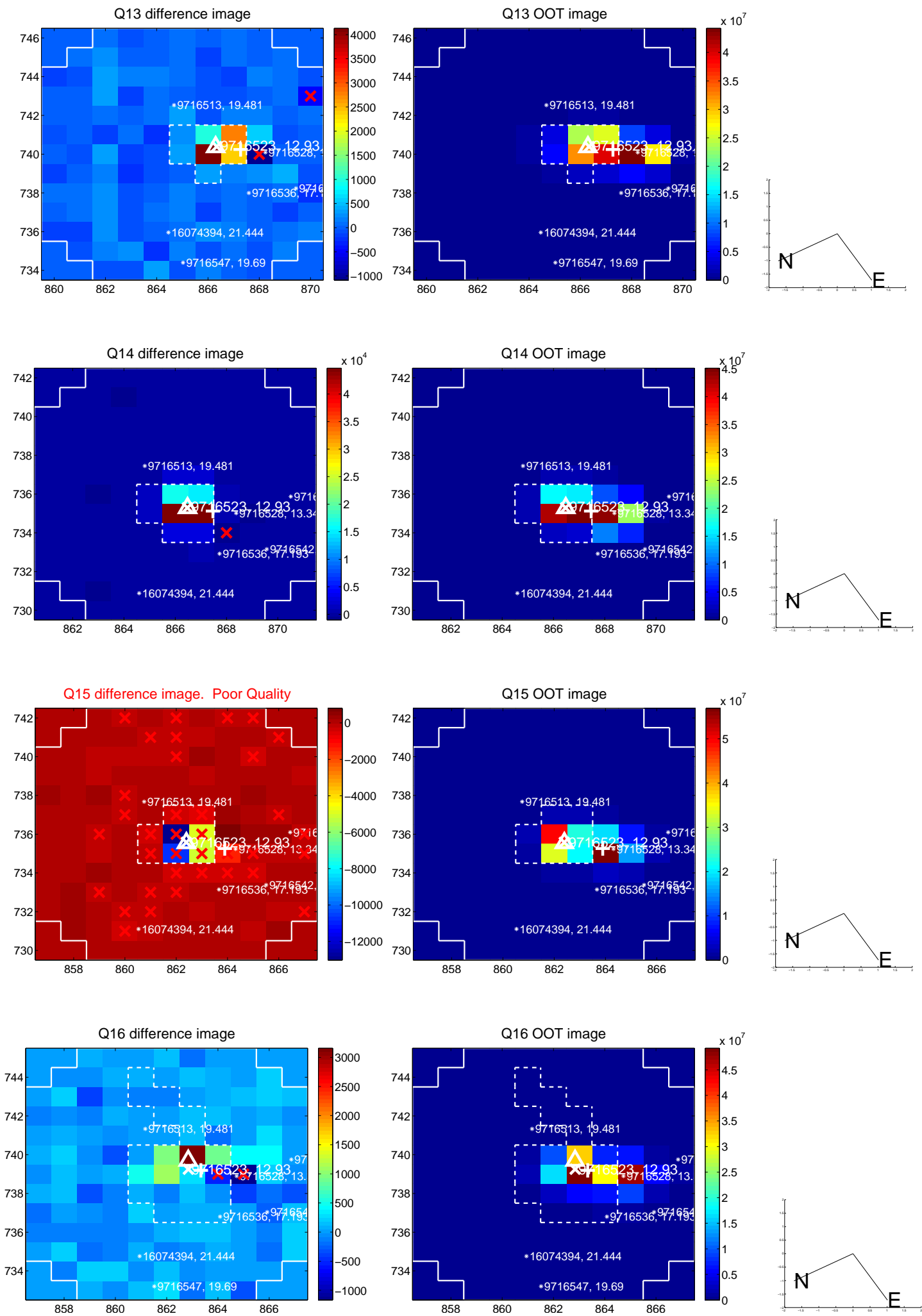
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



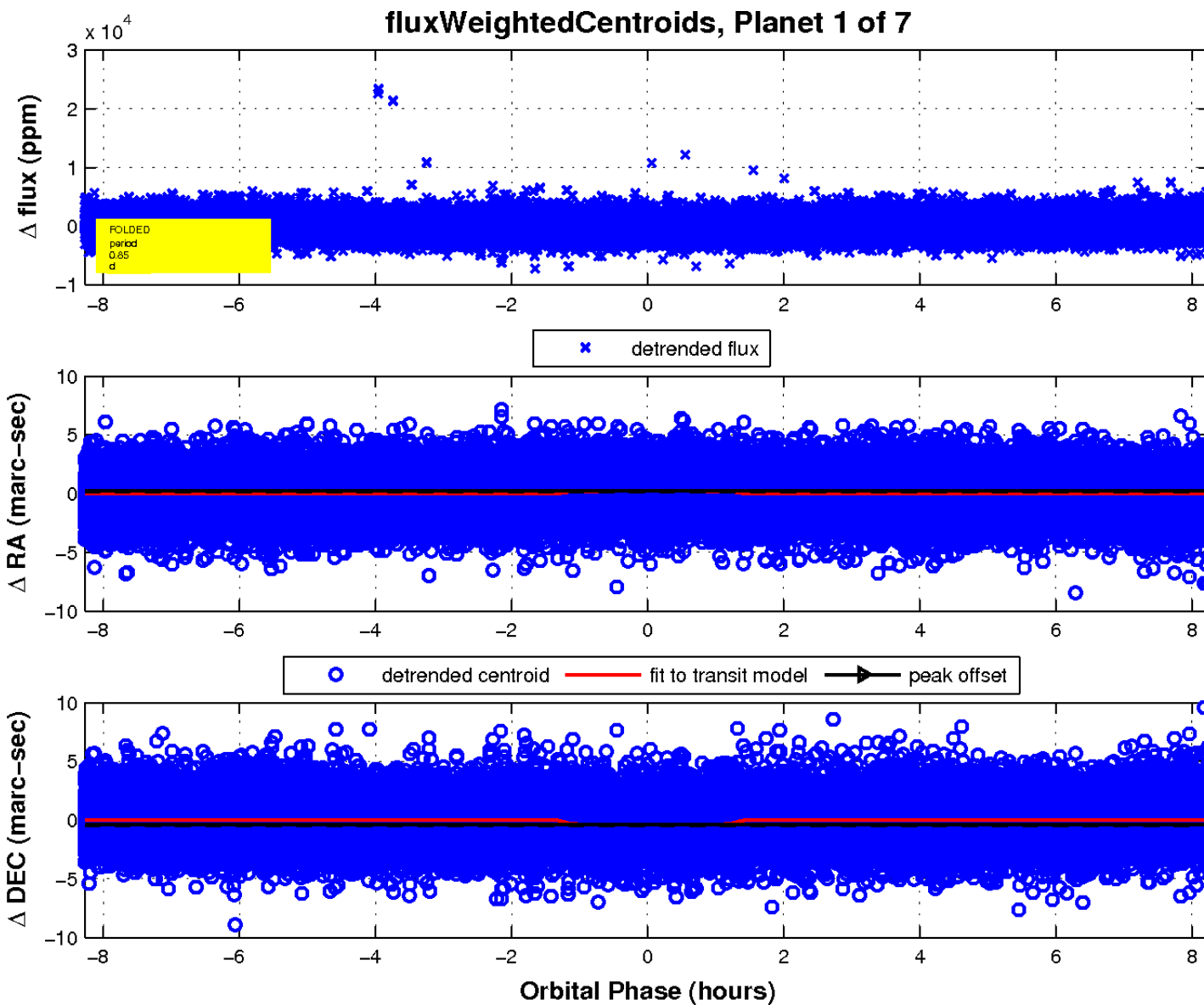
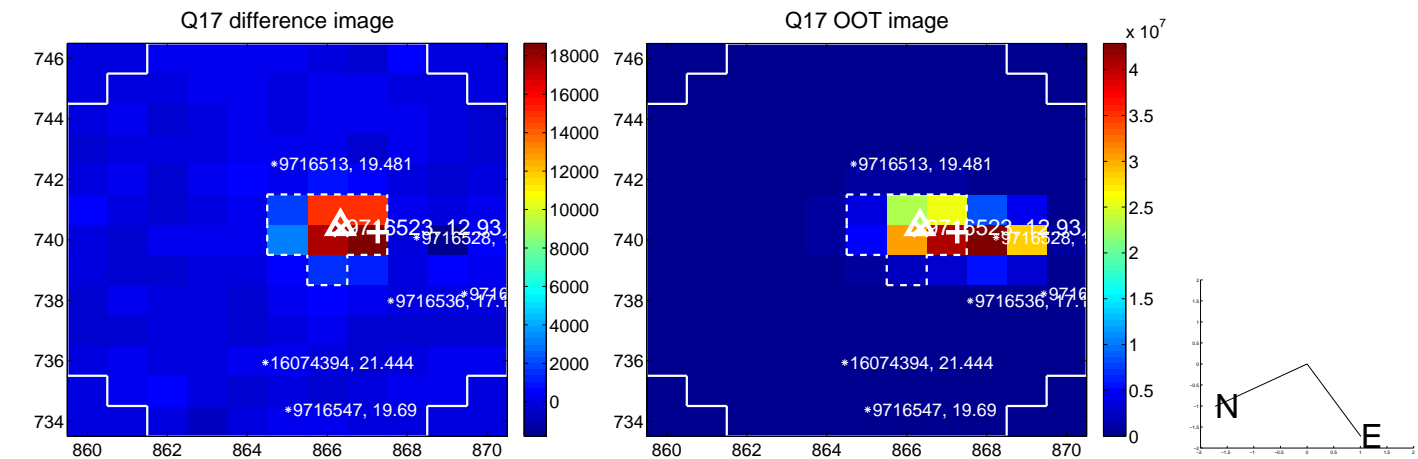
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

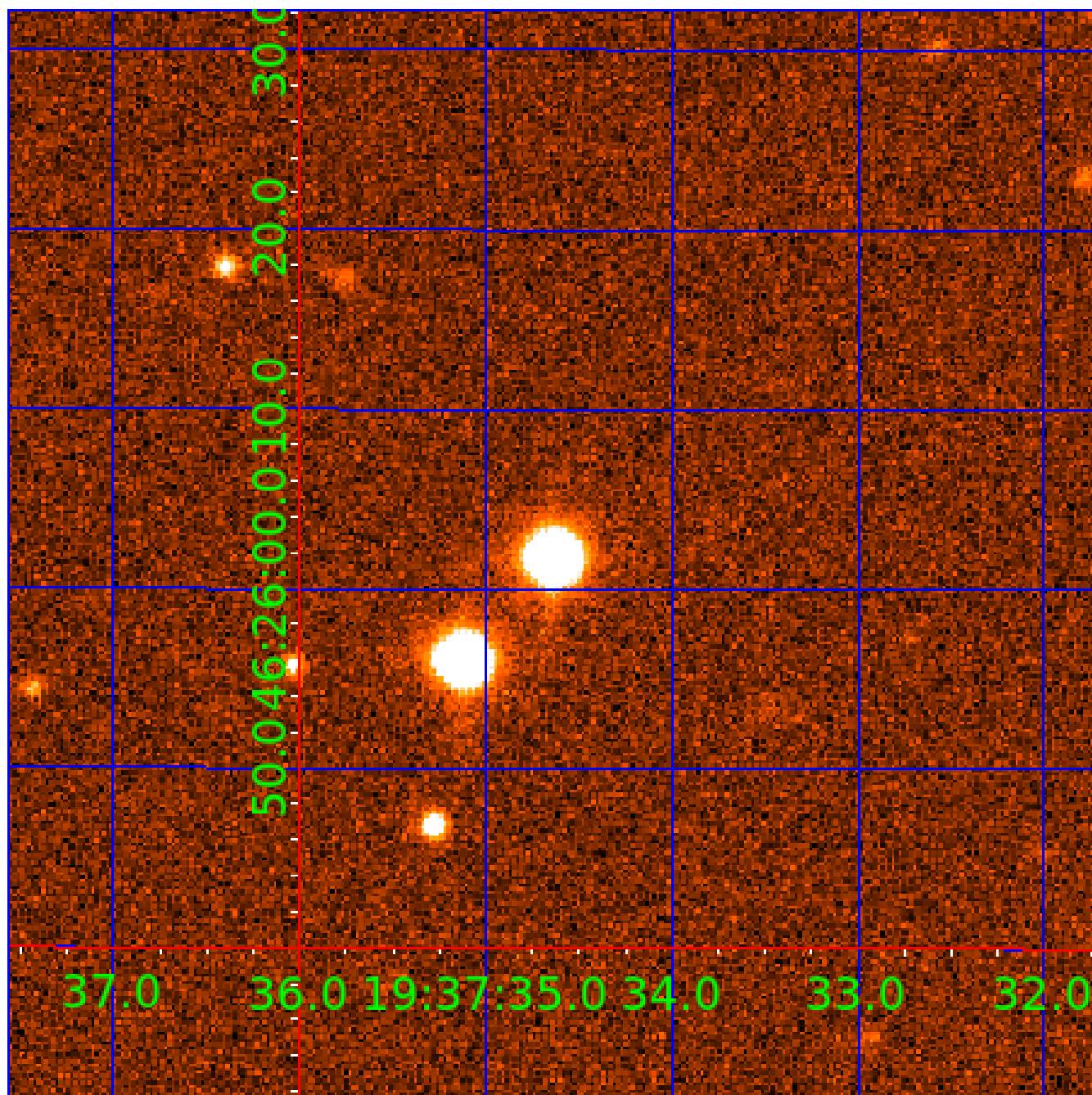


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009716523

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})
009716523-01	OBS	No	0.851171	132.052266	102.1	2.757	8.5	5.7	2.84	7004	3.37	37457.84
009716523-02	OBS	No	2.206382	133.482283	499.4	6.155	8.6	11.2	2.84	7004	12.12	10519.40
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
009716523-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
009716523-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009716523-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_ZUMA—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_KIC_POS
009716523-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS—HALO_GHOST
009716523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

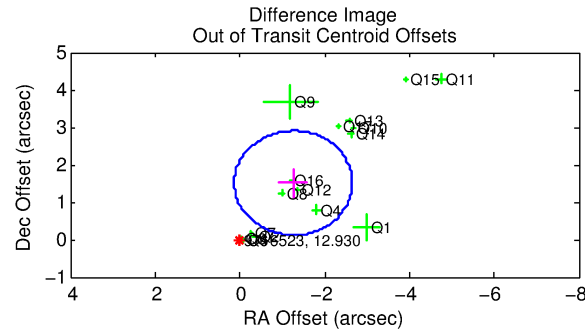
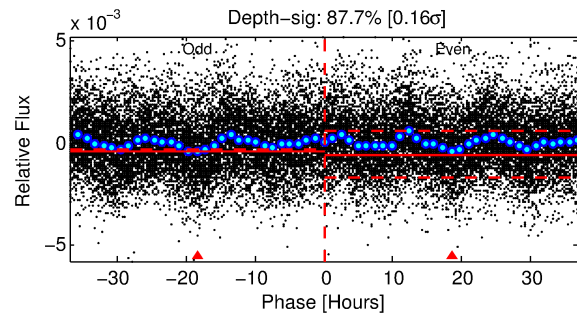
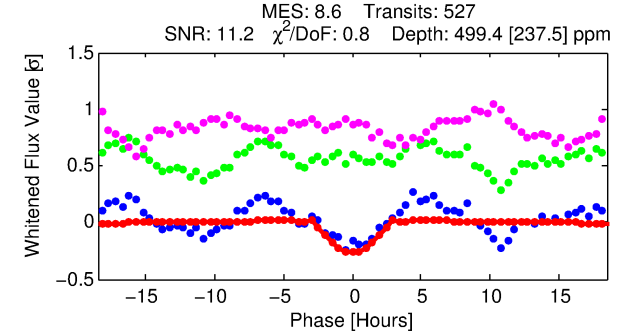
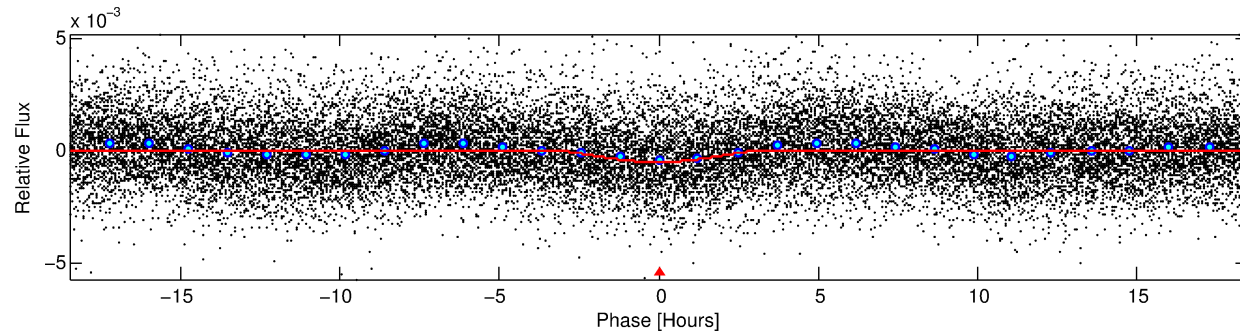
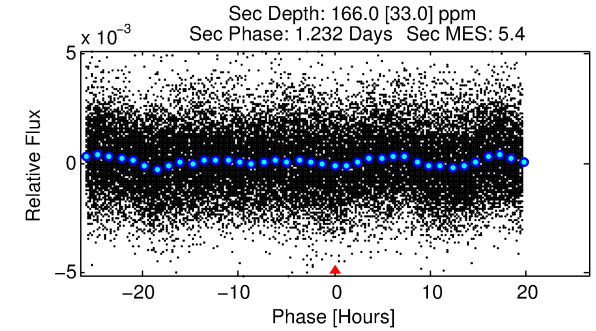
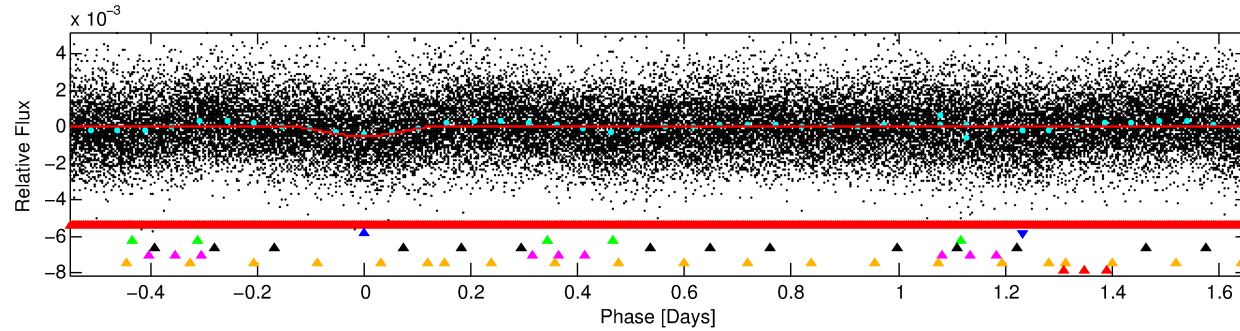
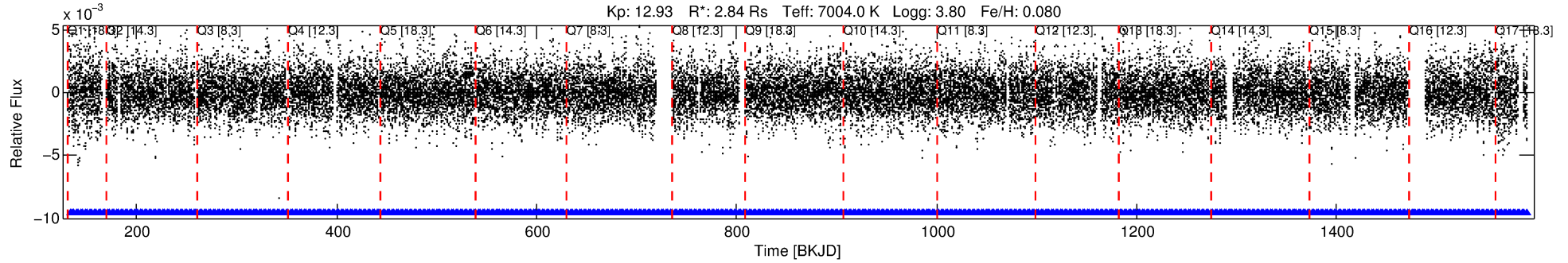
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716523-02

No Significant Match Found

DV One-Page Summary

KIC: 9716523 Candidate: 2 of 7 Period: 2.206 d



DV Fit Results:

Period = 2.20638 [0.00003] d
Epoch = 133.4823 [0.0085] BKJD
Rp/R* = 0.0391 [0.0671]
a/R* = 1.27 [0.13]
b = 1.00 [0.08]
Seff = 10519.40 [7051.82]
Teff = 2582 [433] K
Rp = 12.12 [21.48] Re
a = 0.0407 [0.0167] AU
Ag = 1.03 [3.61] [0.01σ]
Teffp = 4023 [3464] K [0.41σ]

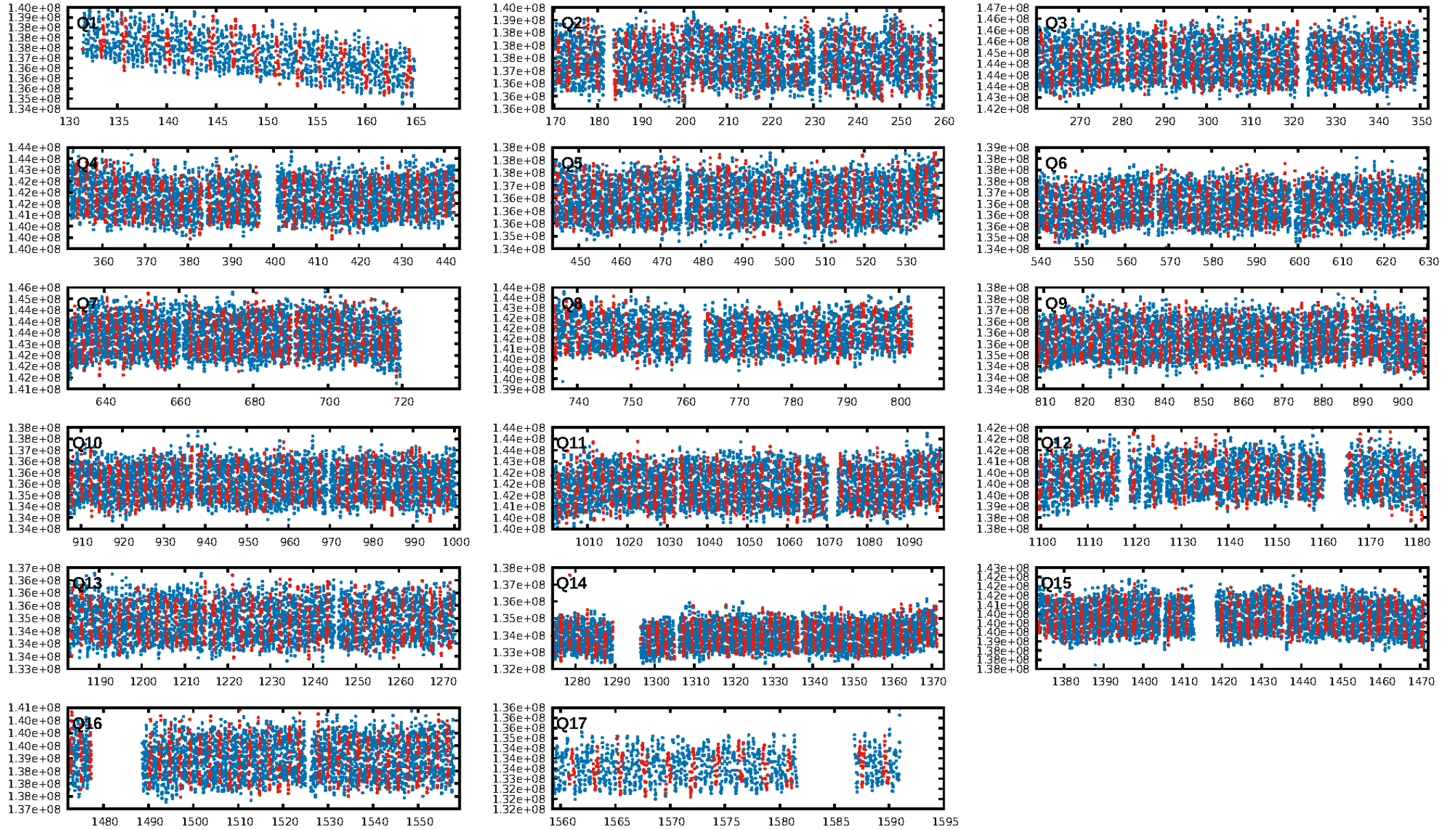
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.82σ]
LongPeriod-sig: 100.0% [239.28σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGo-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [505/505]
GhostDiagnostic-chr: 0.974
Centroid-sig: 0.0%
Centroid-so: 1.079 arcsec [4.66σ]
OotOffset-rm: 1.968 arcsec [4.24σ]
KicOffset-rm: 0.101 arcsec [0.56σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.44 [7/16]
DiffImageOverlap-fno: 0.00 [0/17]

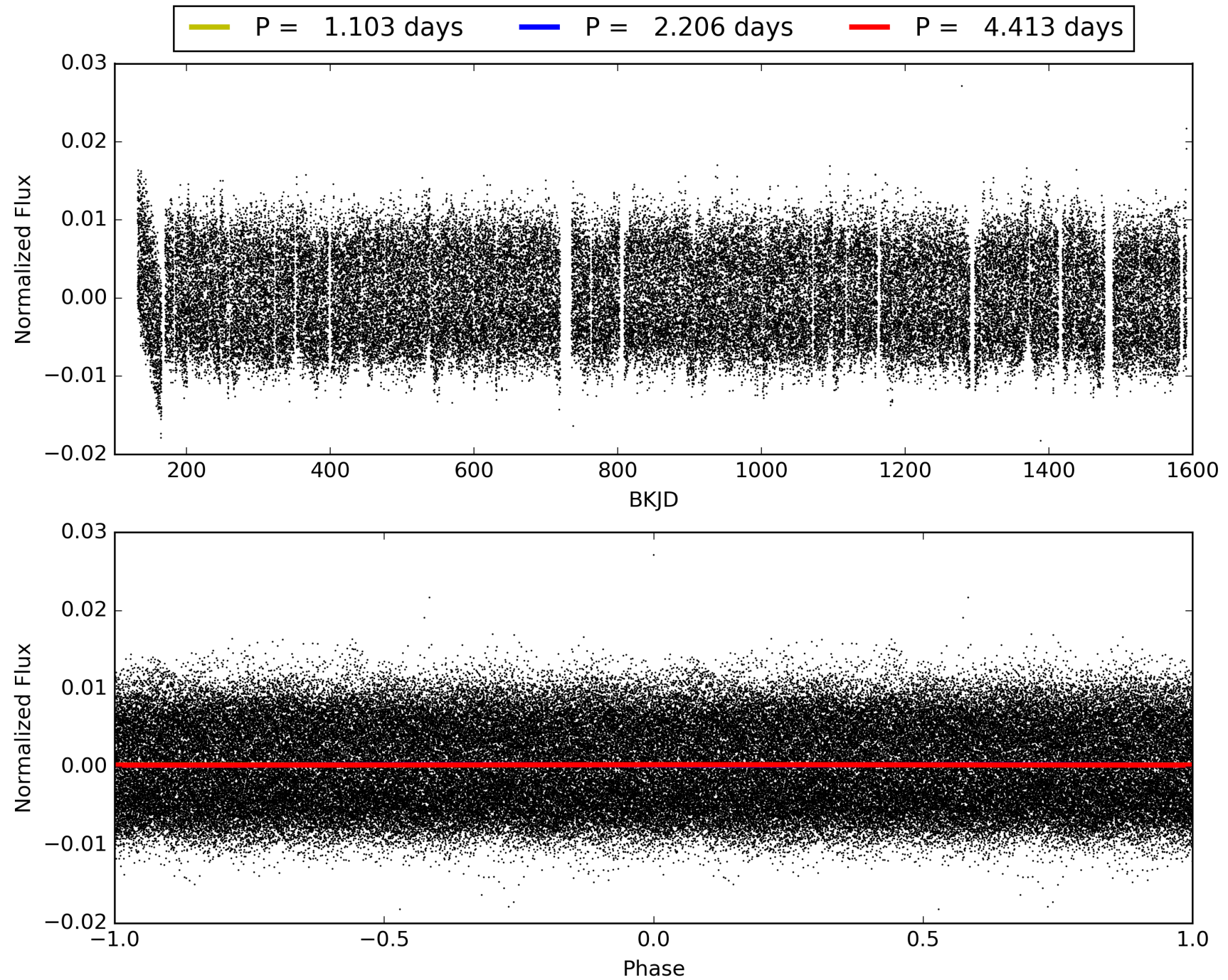
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:07:07 Z

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

TCE 009716523-02, PDC Light Curves

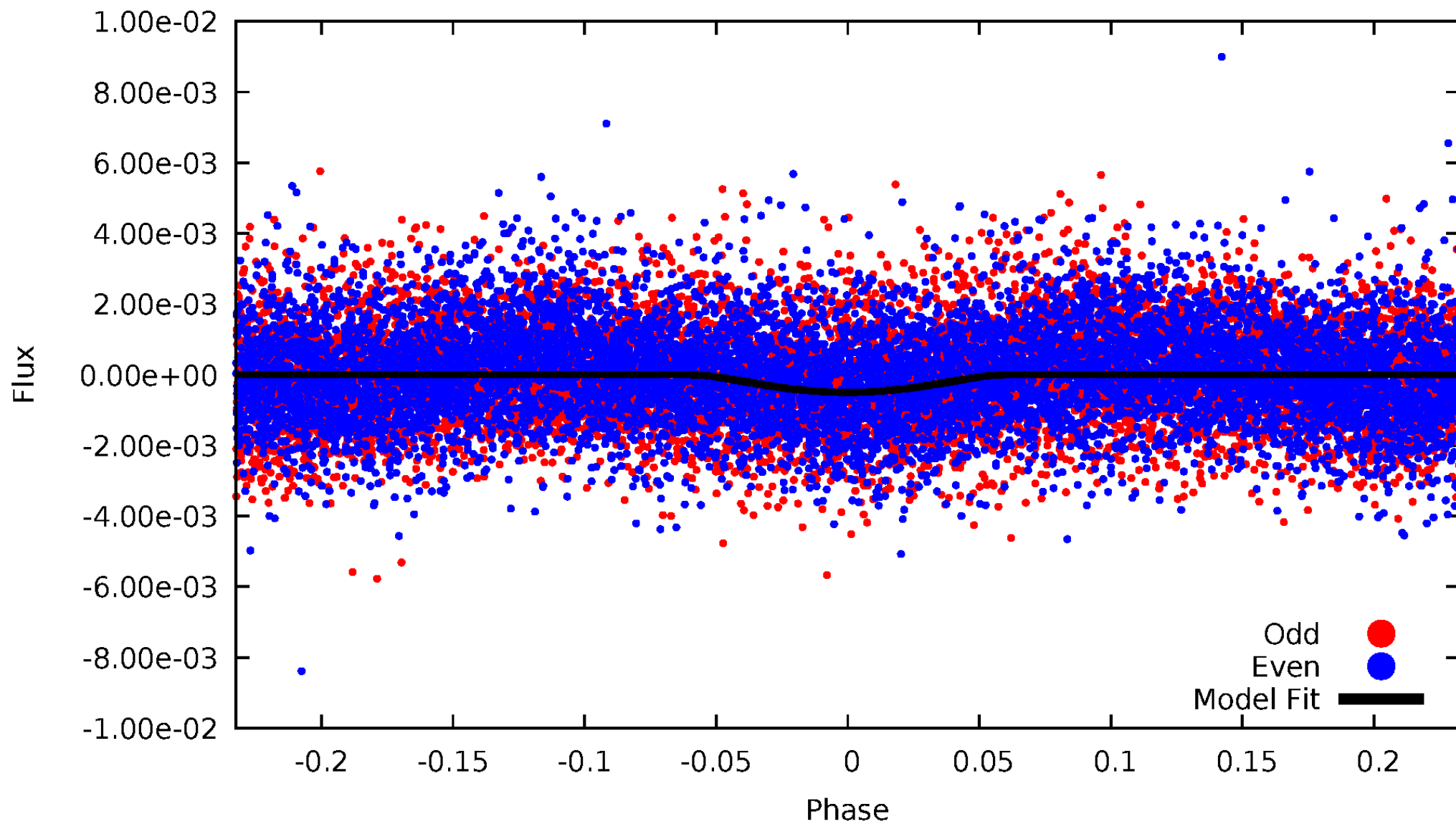


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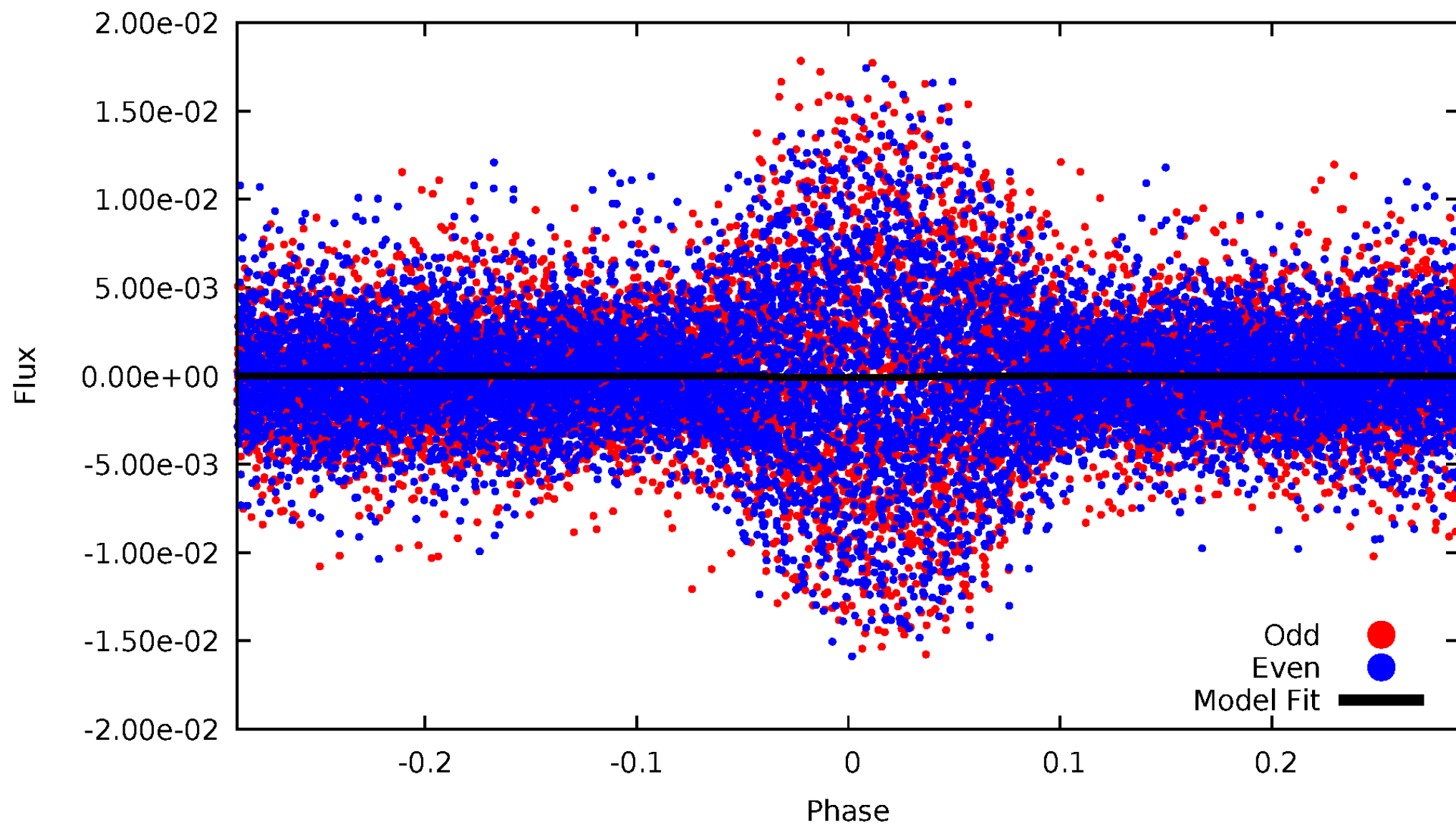
DV Odd/Even

TCE 009716523-02



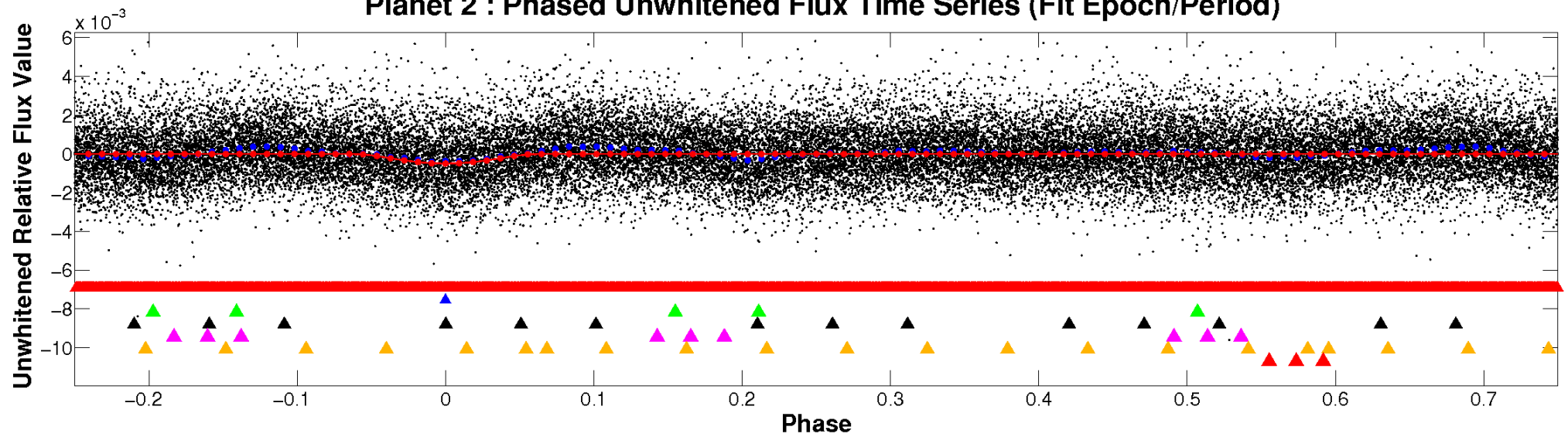
ALT Odd/Even

TCE 009716523-02

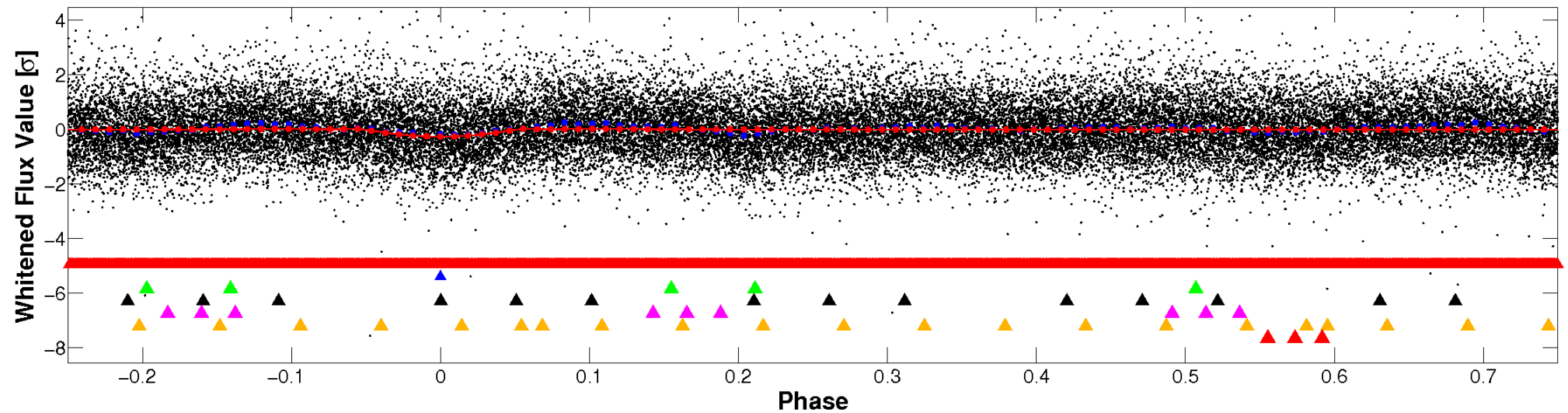


Non-Whitened Vs. Whitened Light Curve

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

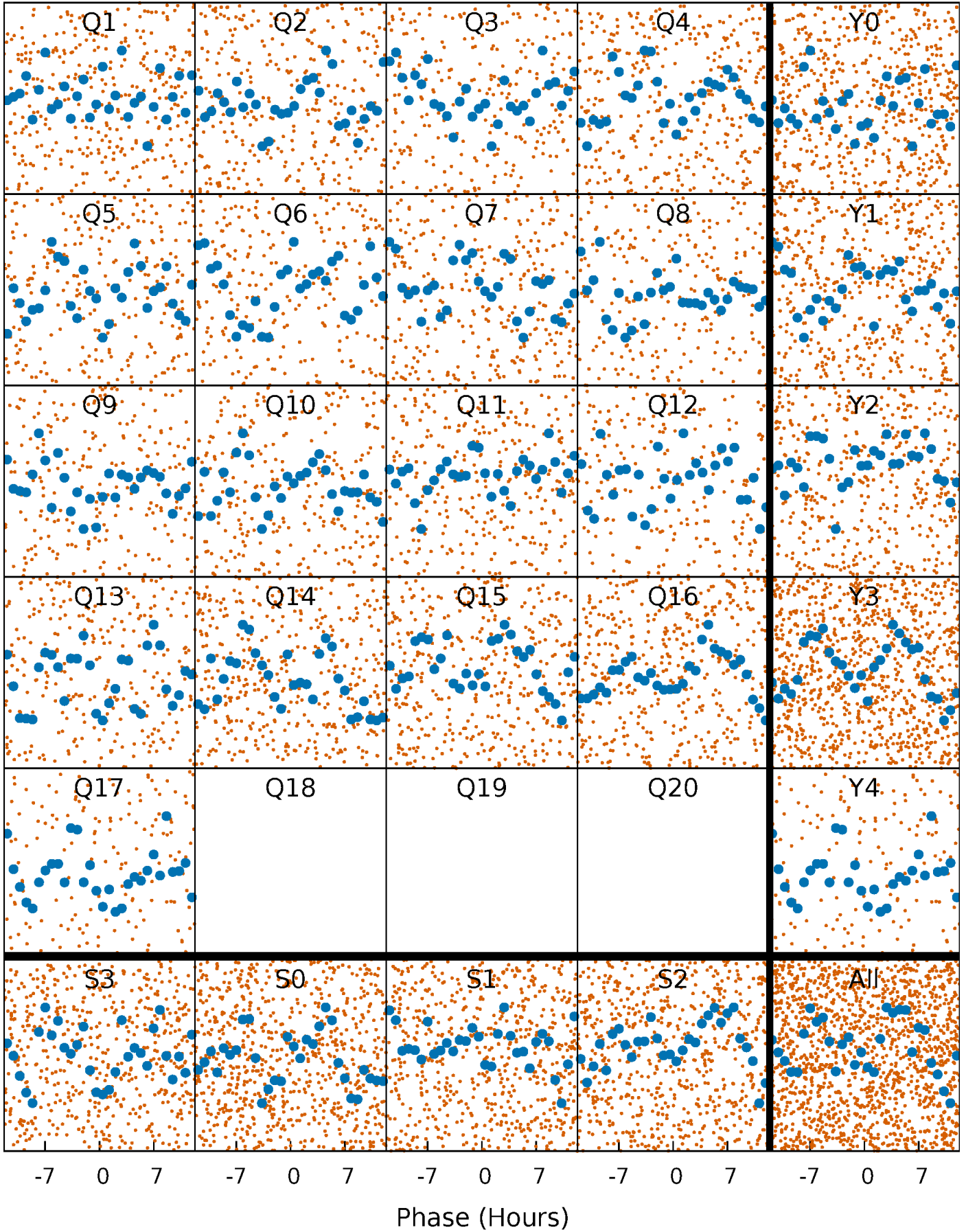


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



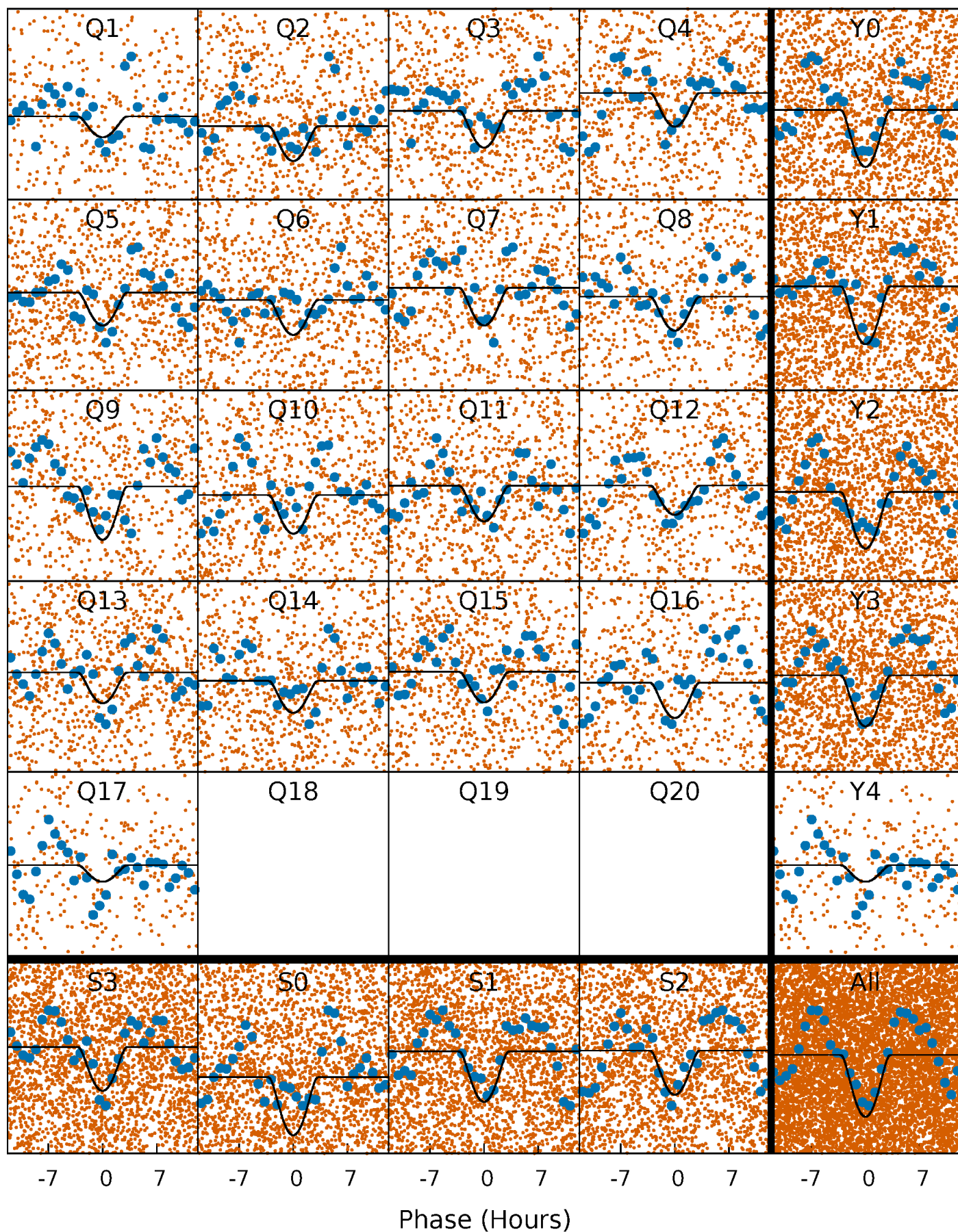
PDC Quarter-Phased Transit Curves

TCE 009716523-02 P= 2.206382 Days $T_0=133.482283$ (BKJD)



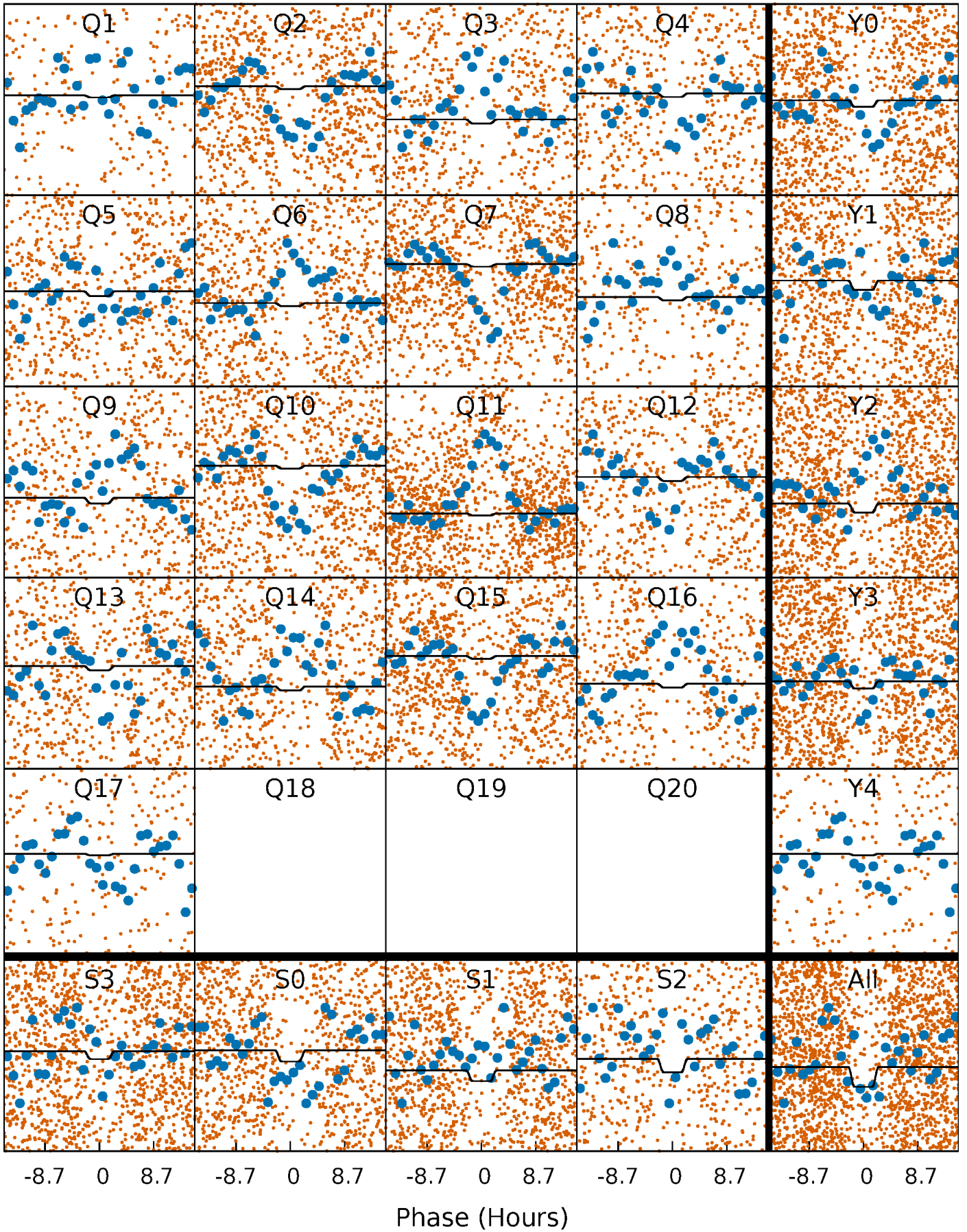
DV Quarter-Phased Transit Curves

TCE 009716523-02 P= 2.206382 Days $T_0=133.482283$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

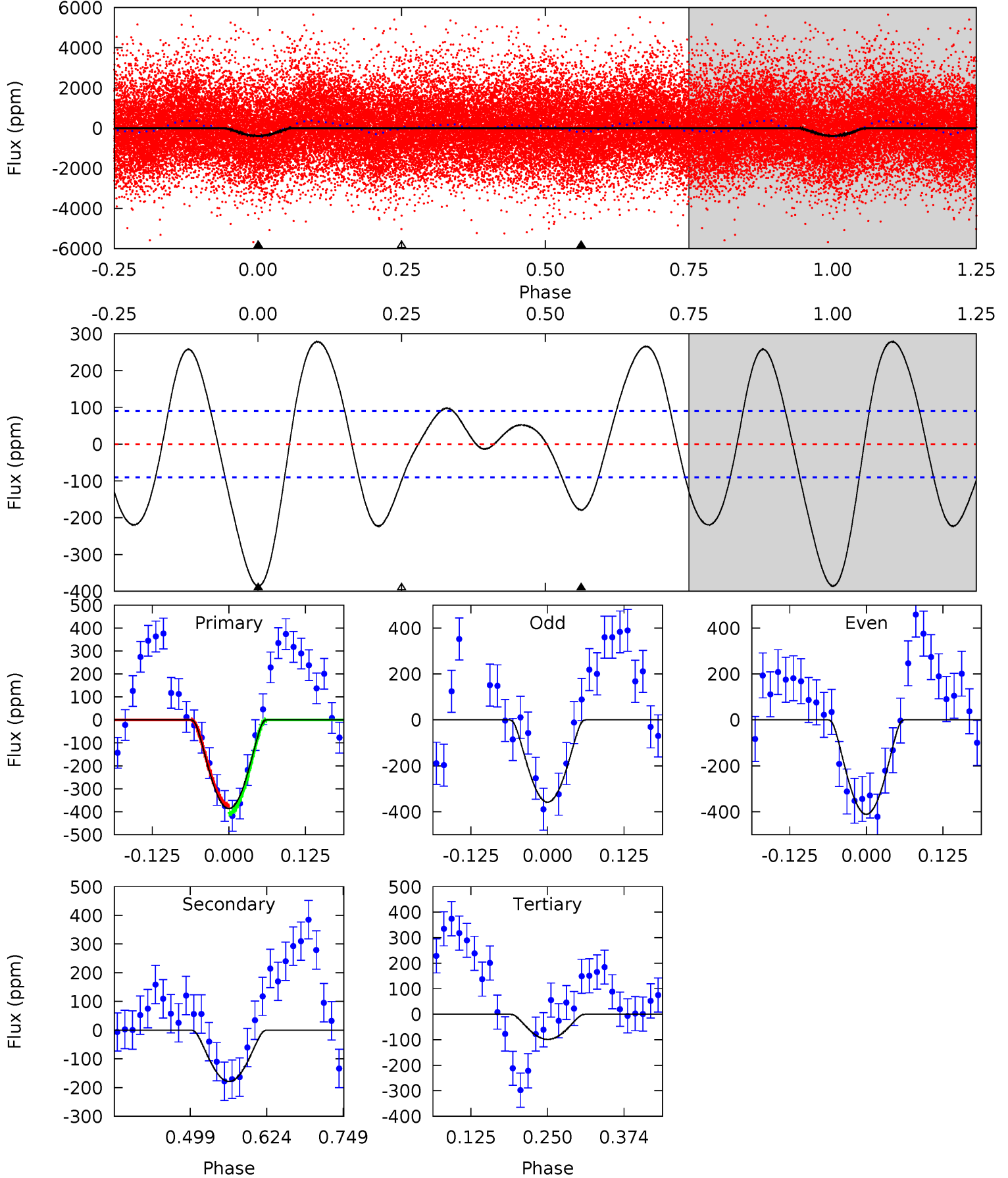
TCE 009716523-02 P= 2.206408 Days $T_0=133.439021$ (BKJD)



DV Model-Shift Uniqueness Test

009716523-02, P = 2.206382 Days, E = 131.275901 Days

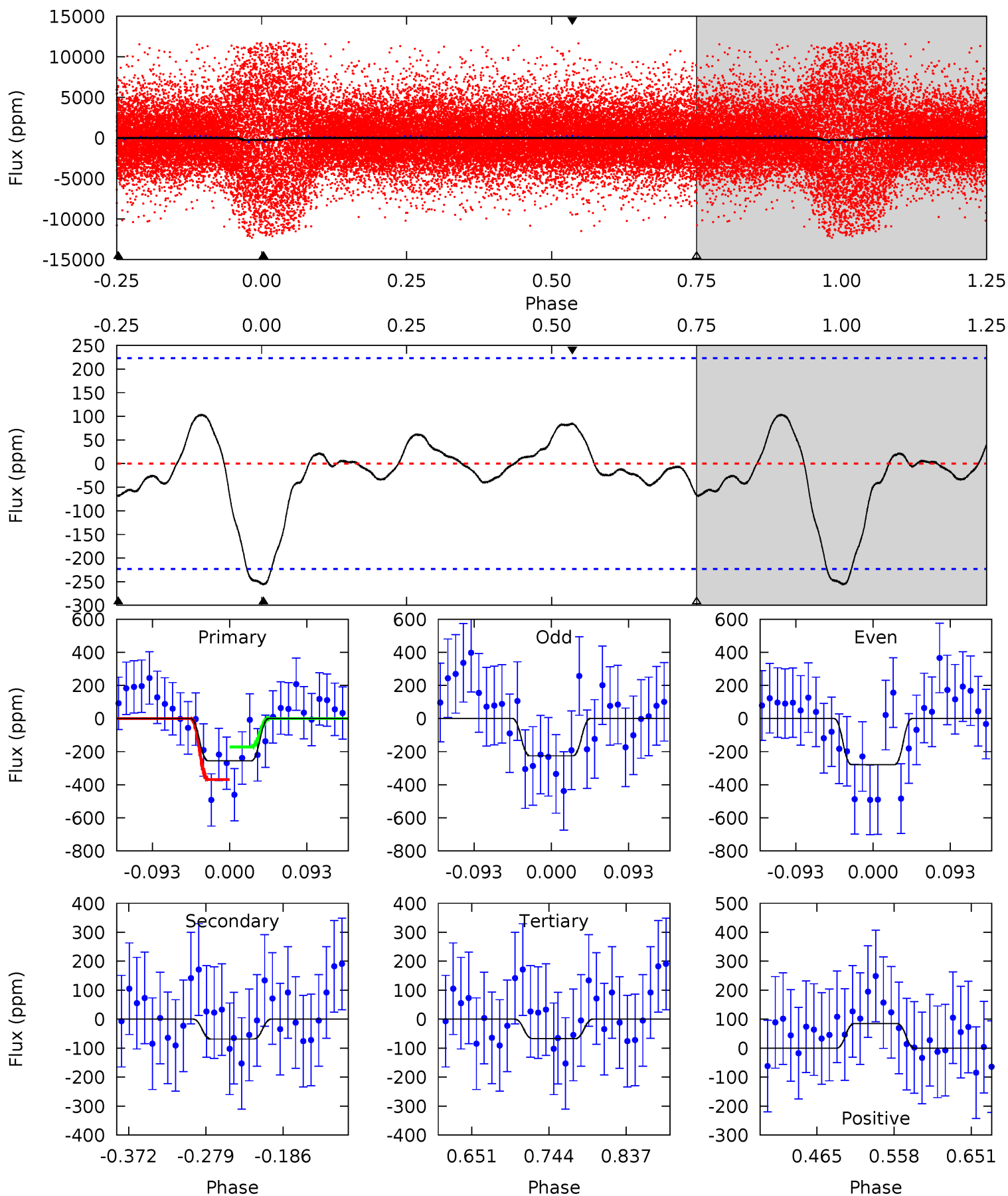
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.3	8.94	4.93	0	4.52	1.54	6.61	14.4	19.3	4.01	8.94	1.31	0.23	0.42	0.89



Alt Model-Shift Uniqueness Test

009716523-02, P = 2.206408 Days, E = 131.232613 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.25	1.41	1.37	1.73	4.58	1.68	0.79	3.88	3.51	0.04	-0.33	0.53	-1.22	0.29	0



Stellar Parameters For KIC 009716523

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7004^{+195}_{-318}	$3.797^{+0.375}_{-0.125}$	$0.080^{+0.200}_{-0.350}$	$2.844^{+0.533}_{-1.244}$	$1.848^{+0.164}_{-0.460}$	$0.113^{+0.357}_{-0.043}$
	+3%/-5%	+10%/-3%	+250%/-438%	+19%/-44%	+9%/-25%	+315%/-38%
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 009716523-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-179 ± 20	$18.25^{+16.10}_{-12.32}$	3534^{+261}_{-390}	3083^{+2201}_{-6183}	$0.492^{+3.757}_{-0.354}$
Alt.	-68 ± 49	$13.92^{+15.15}_{-9.70}$	3535^{+281}_{-367}	-2529^{+7575}_{-852}	$0.254^{+2.766}_{-0.217}$

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

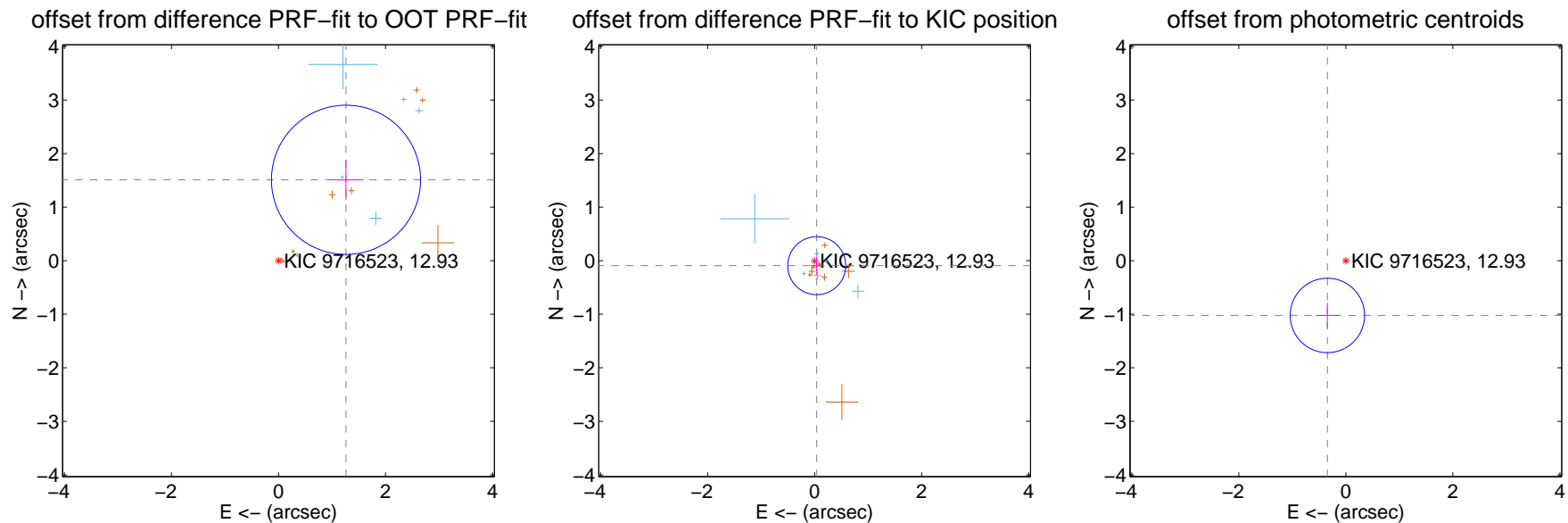
DV Centroid Data

Supplemental centroid analysis for 009716523-02. Kepler magnitude: 12.93. Transit SNR 11.24

There are 7 quarters with good PRF difference image offsets

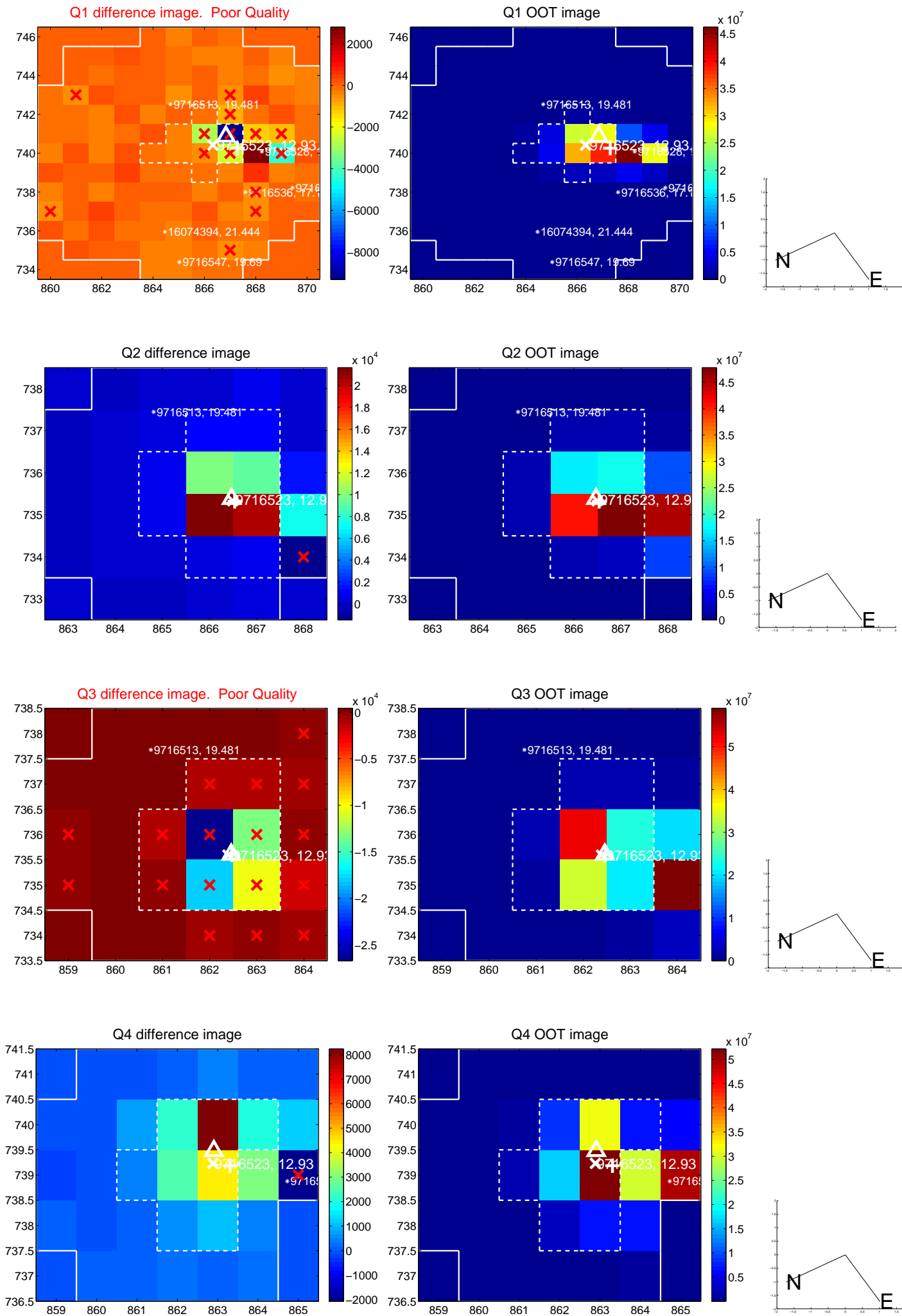
The OOT PRF centroid is offset from the target star catalog position by about 3.68 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.968 ± 0.464	4.24	-1.261 ± 0.326	1.510 ± 0.373
PRF-fit source offset from KIC position	0.101 ± 0.180	0.56	-0.039 ± 0.108	-0.093 ± 0.174
photometric centroid source offset	1.08 ± 0.23	4.66	0.34 ± 0.22	-1.02 ± 0.23

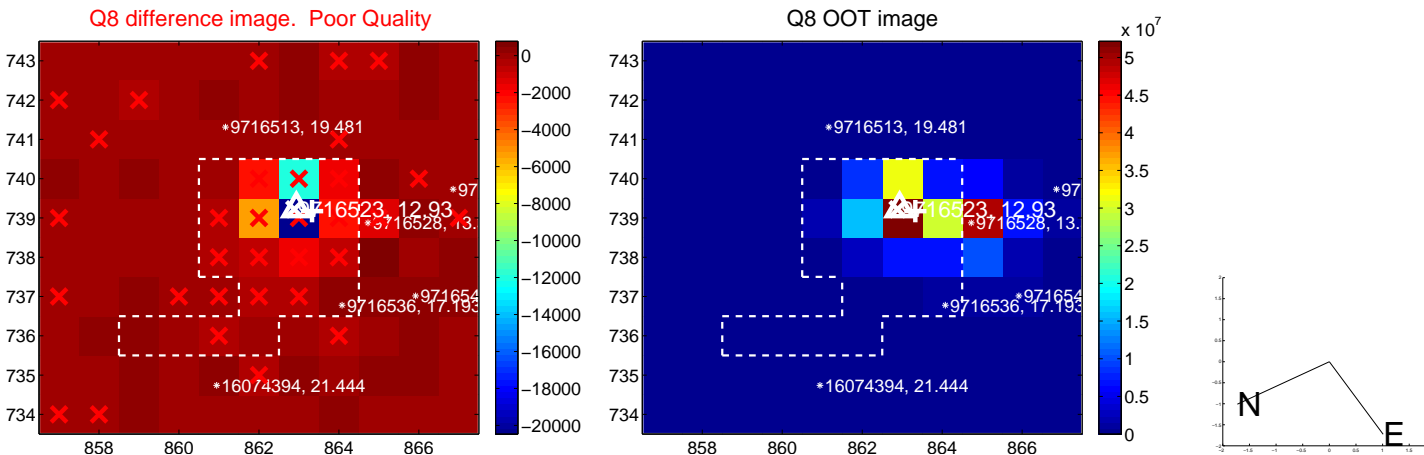
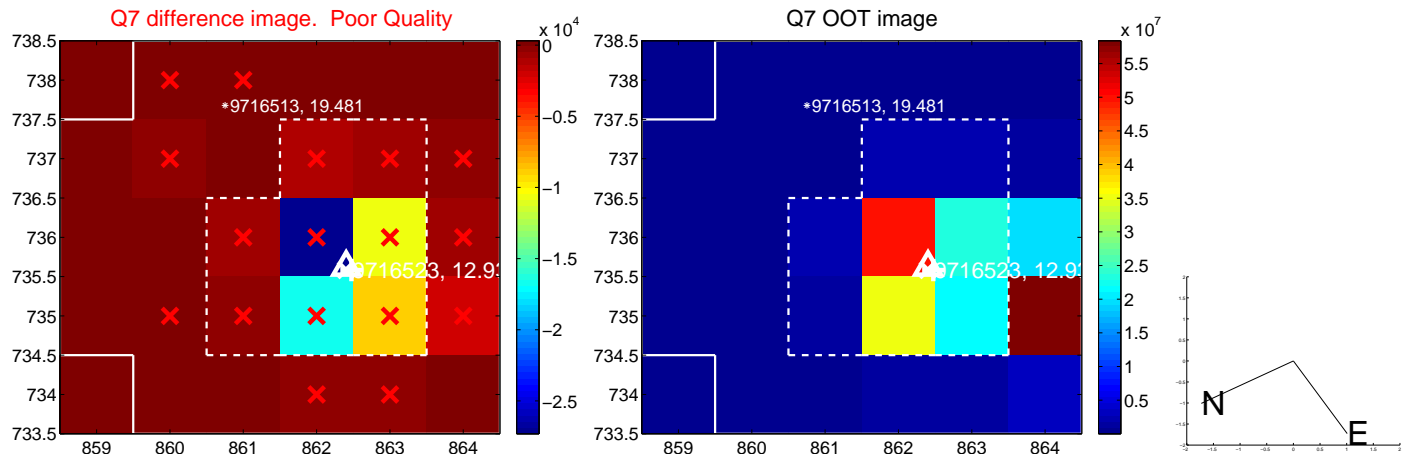
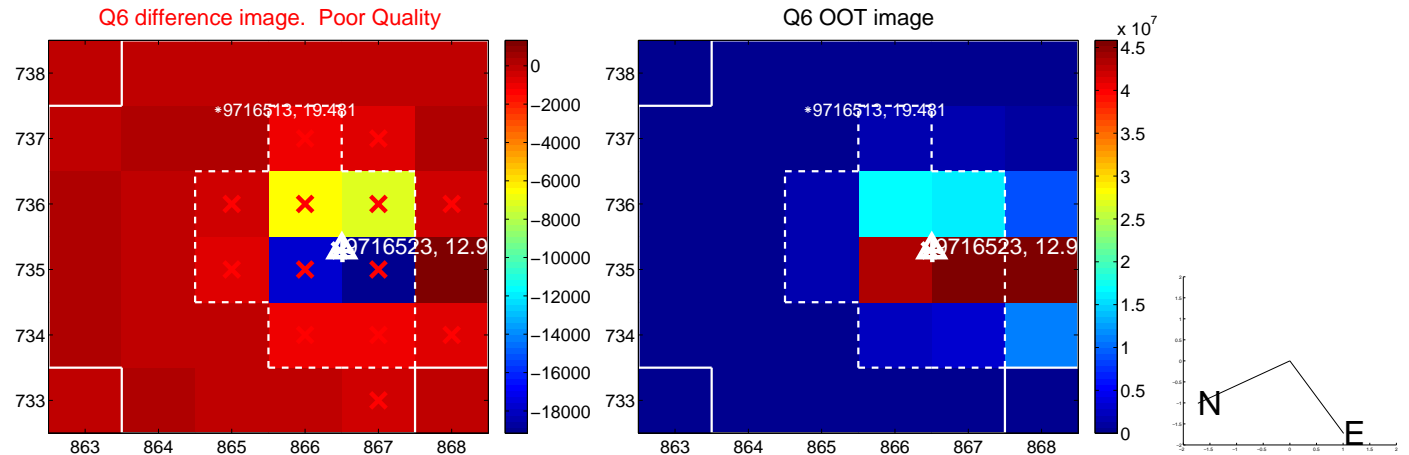
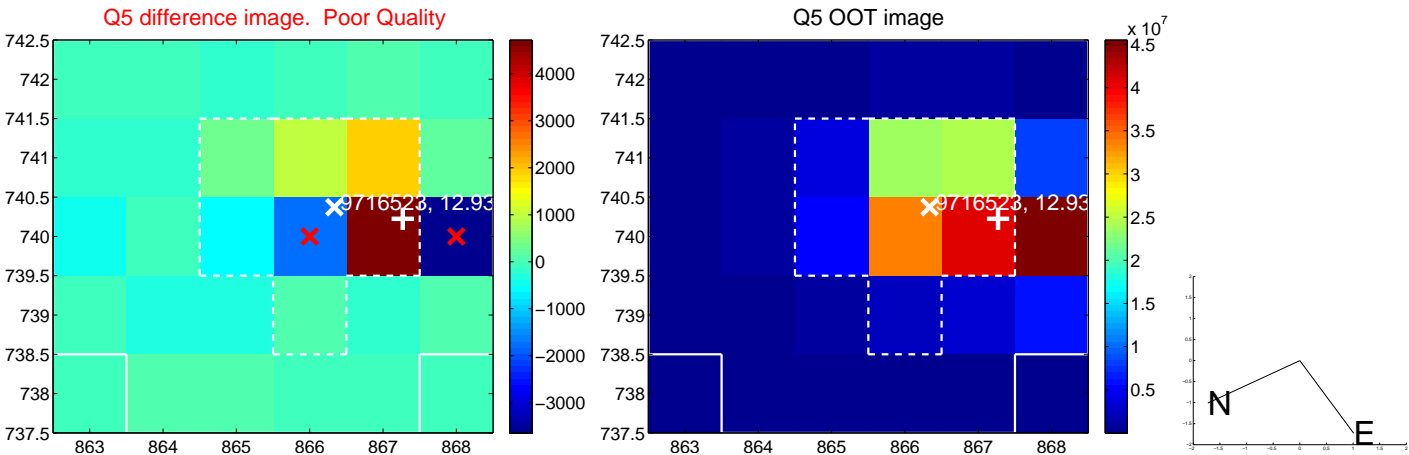


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

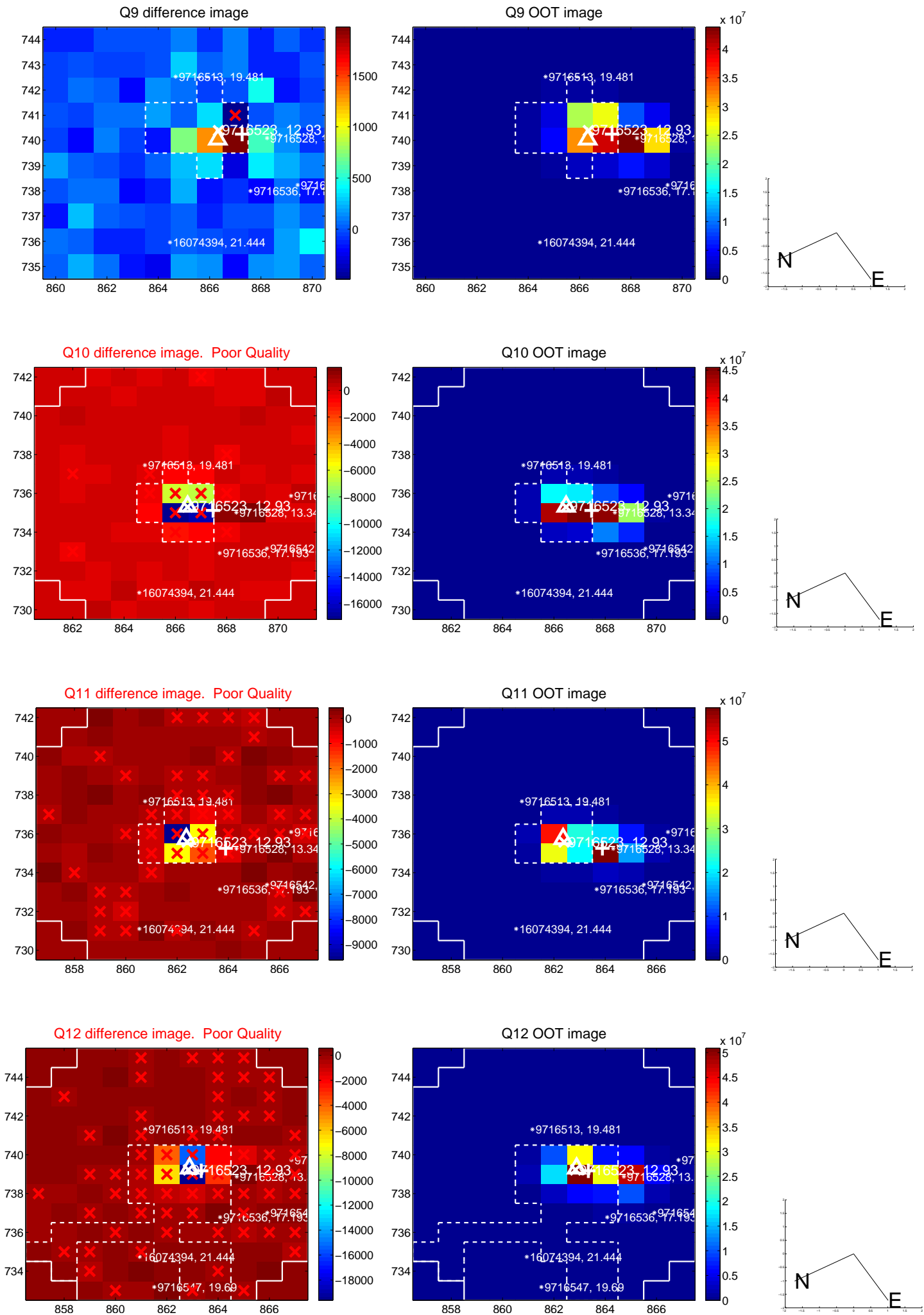
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



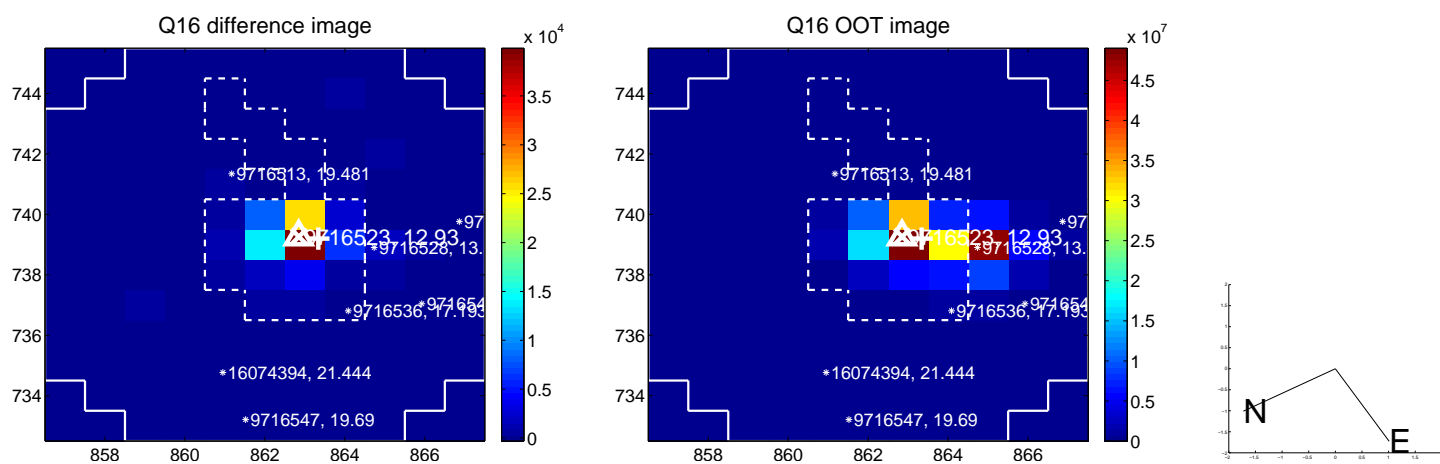
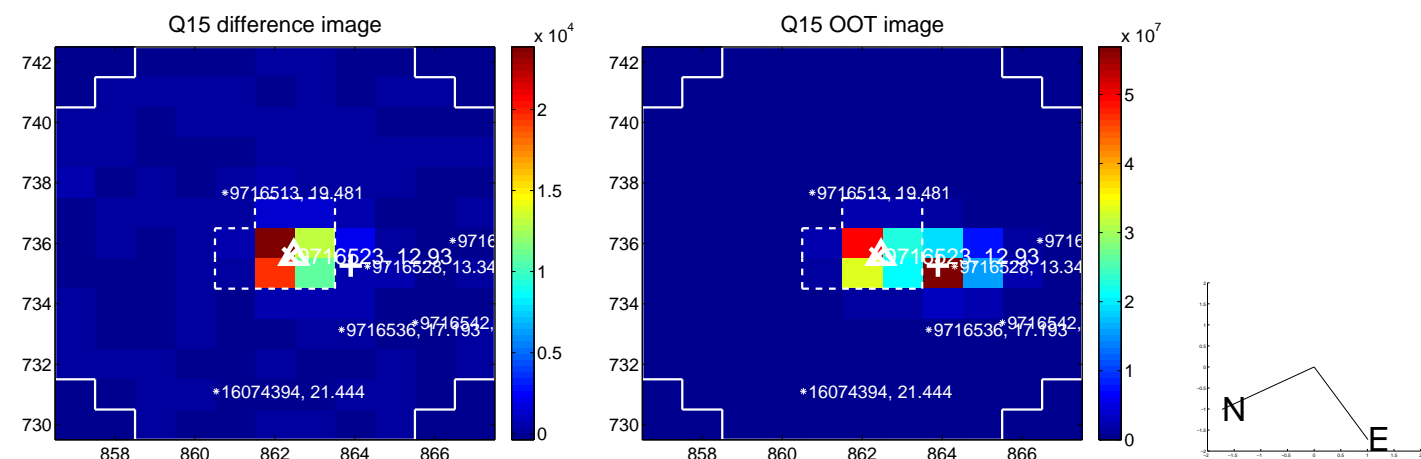
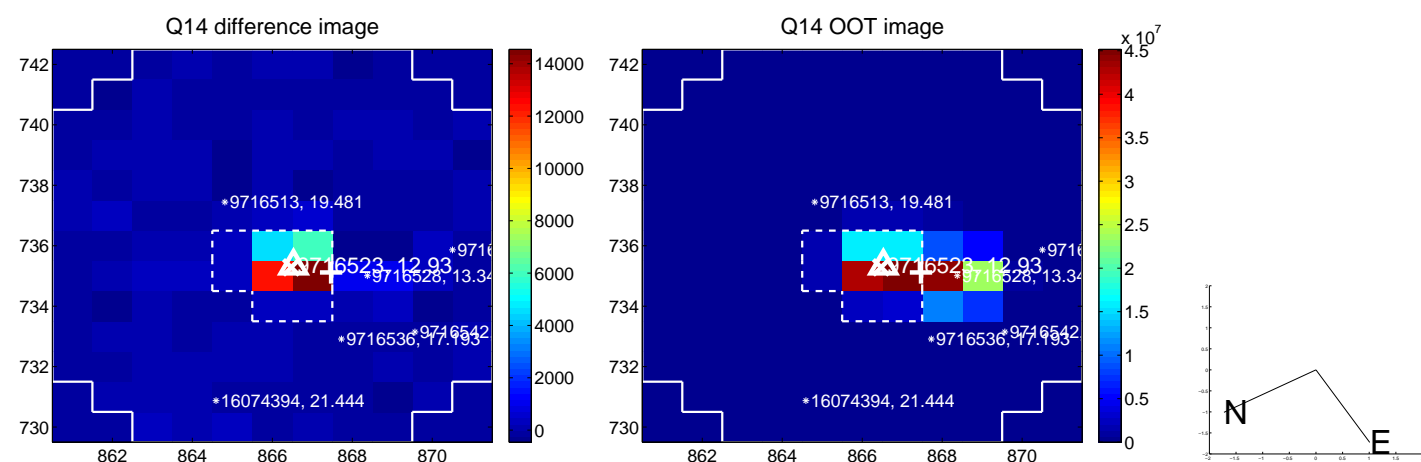
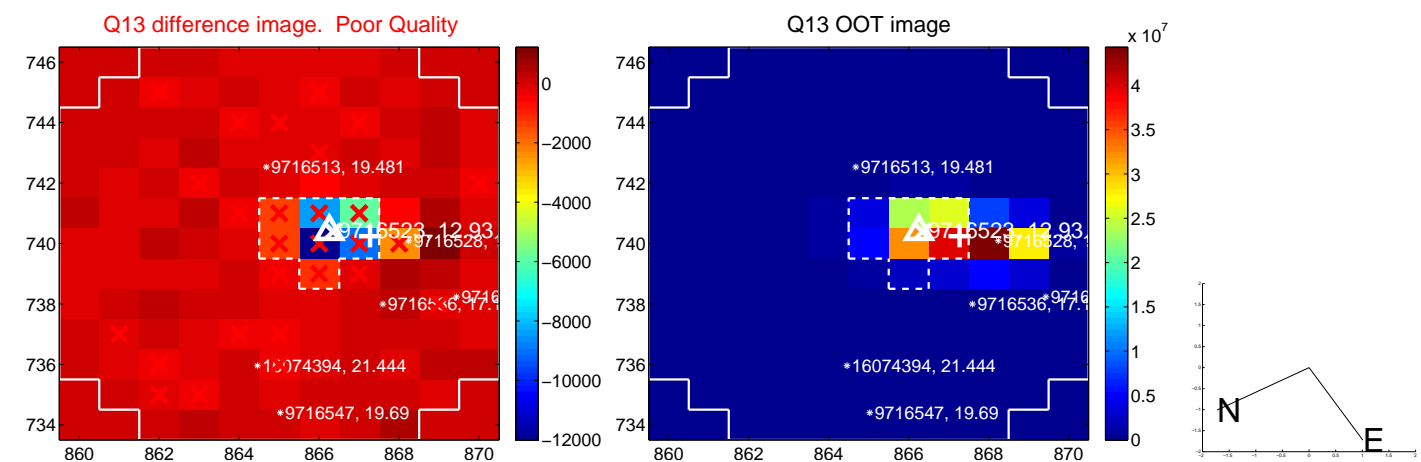
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



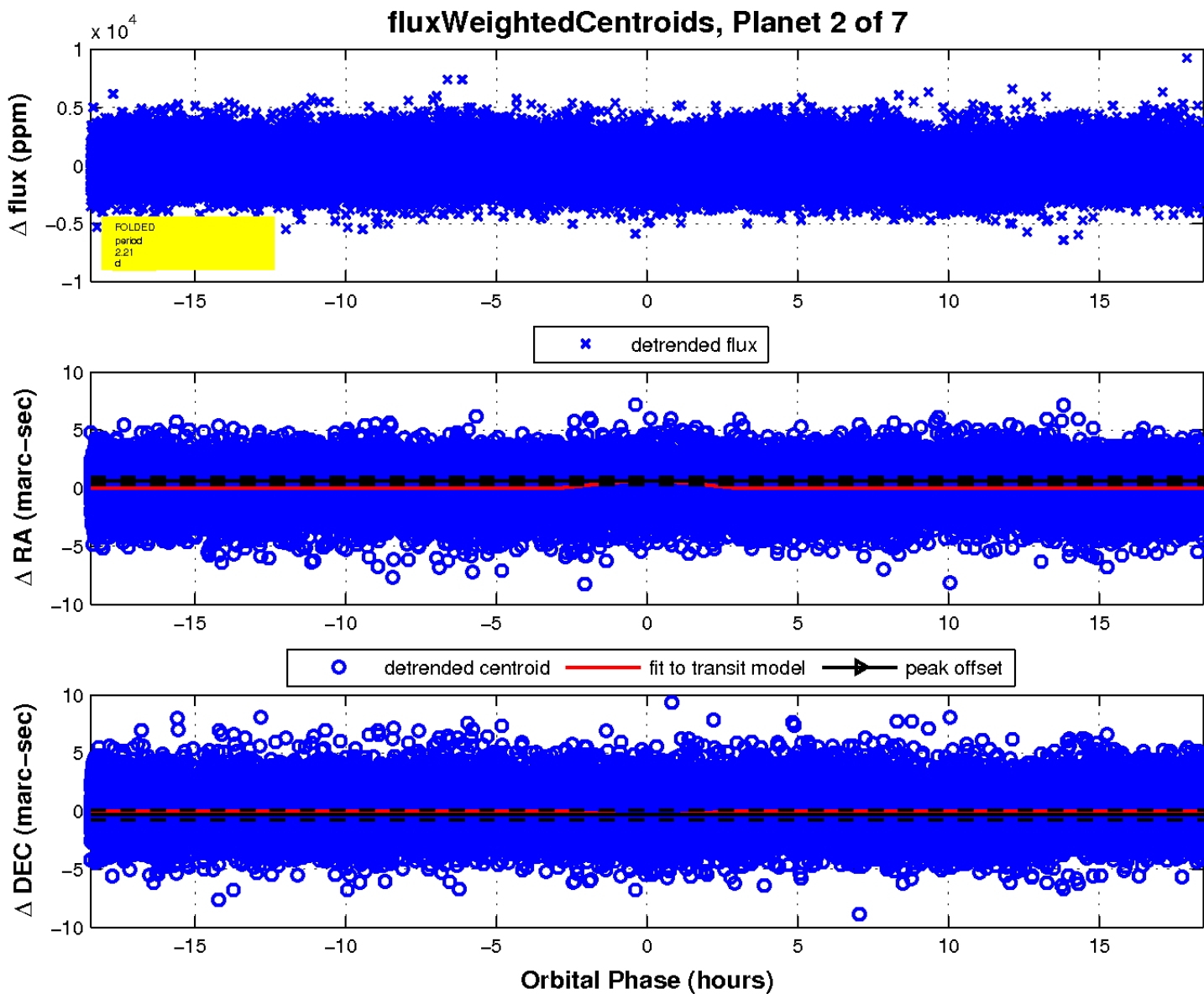
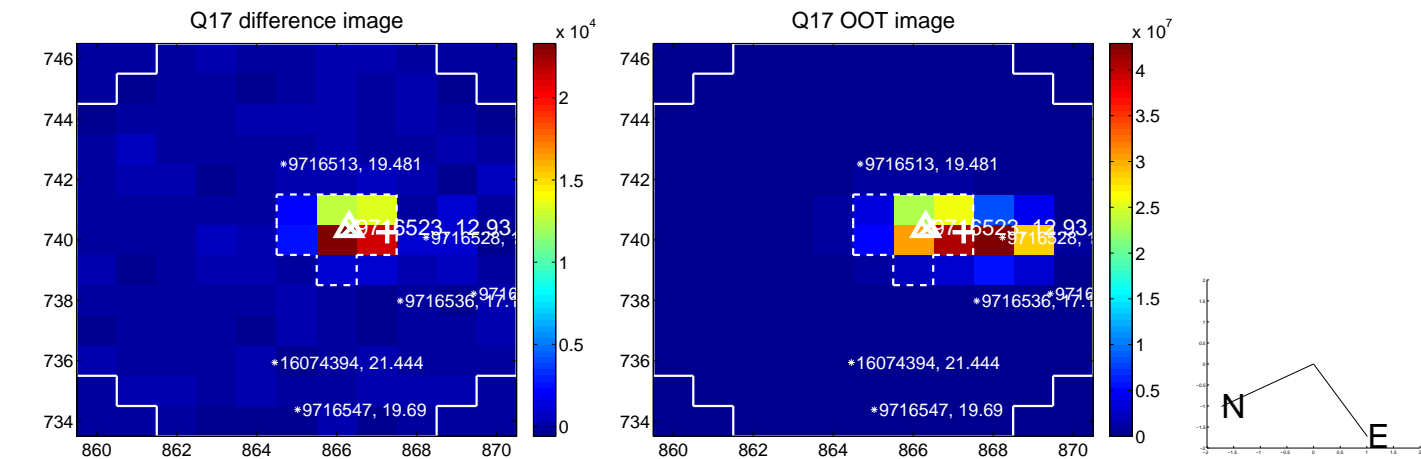
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

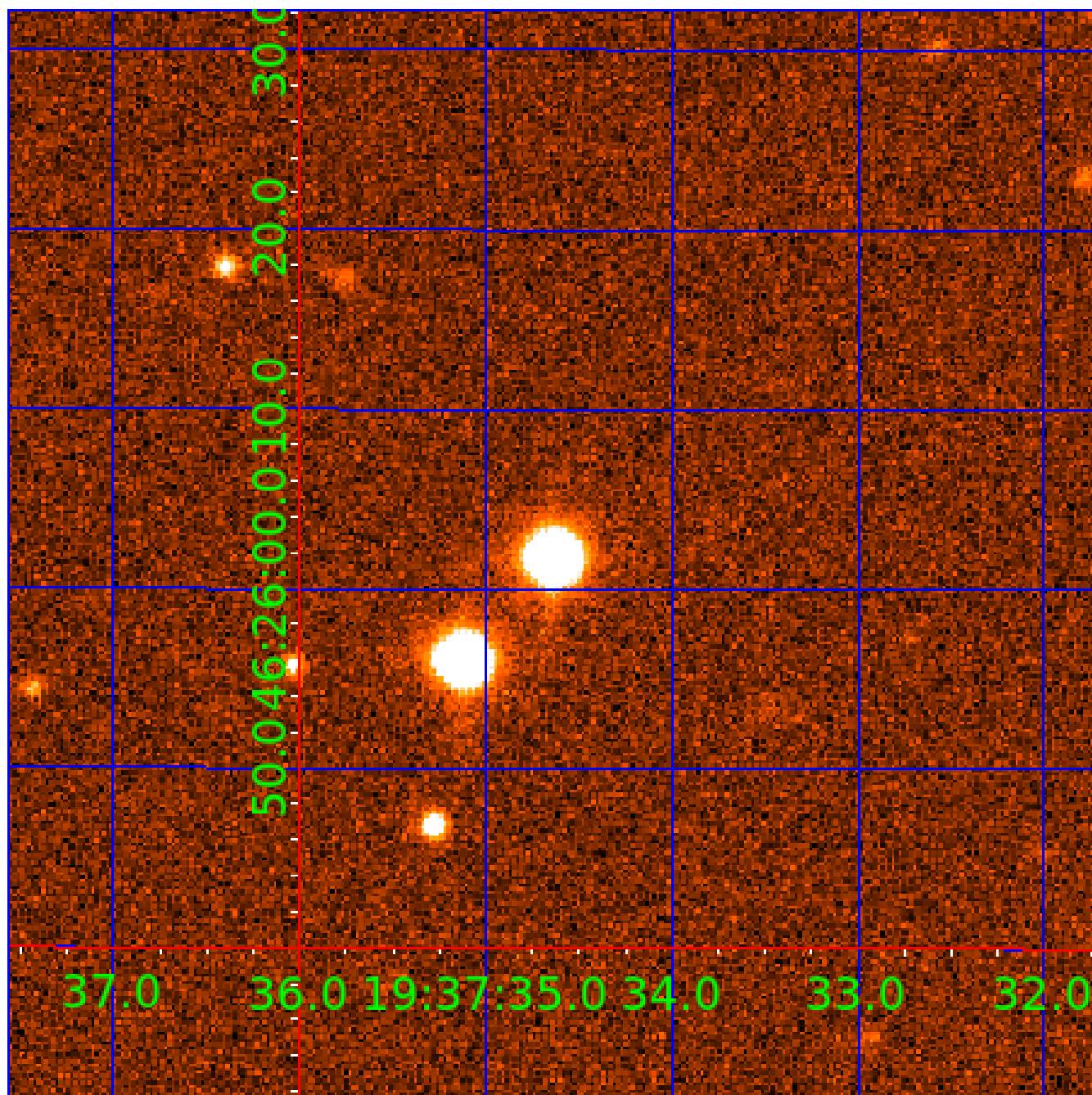


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009716523

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})
009716523-01	OBS	No	0.851171	132.052266	102.1	2.757	8.5	5.7	2.84	7004	3.37	37457.84
009716523-02	OBS	No	2.206382	133.482283	499.4	6.155	8.6	11.2	2.84	7004	12.12	10519.40
009716523-04	OBS	No	107.649091	147.871614	413.3	2.000	9.7	-1.0	2.84	7004	5.86	59.00
009716523-05	OBS	No	149.315132	272.799286	3600.4	3.792	8.5	9.1	2.84	7004	30.83	38.14
009716523-06	OBS	No	69.441327	161.272587	635.7	2.755	8.6	2.4	2.84	7004	7.92	105.86
009716523-07	OBS	No	573.699442	196.486309	202.0	5.000	8.2	-1.0	2.84	7004	4.09	6.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
009716523-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
009716523-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009716523-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_ZUMA—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_KIC_POS
009716523-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS—HALO_GHOST
009716523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

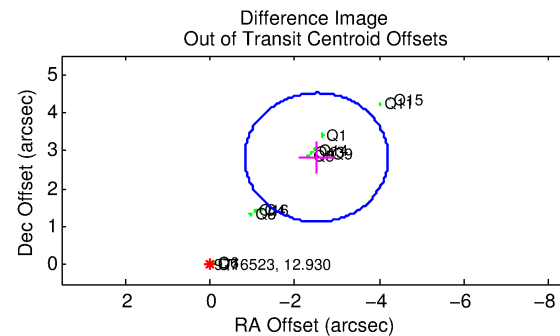
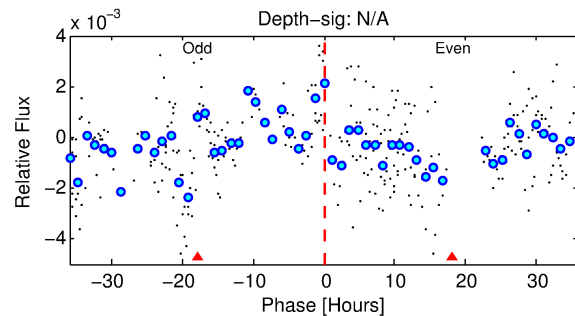
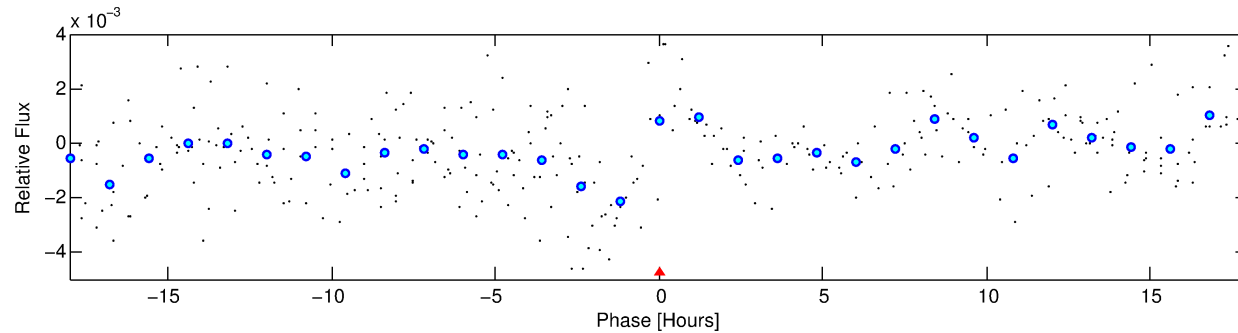
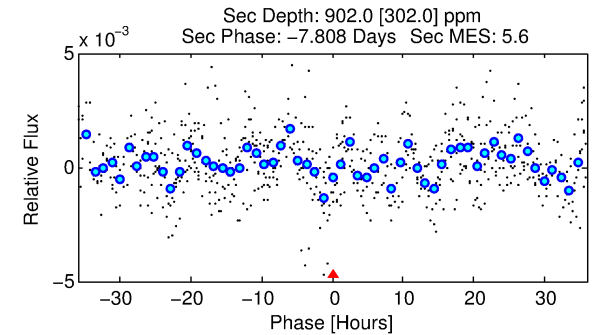
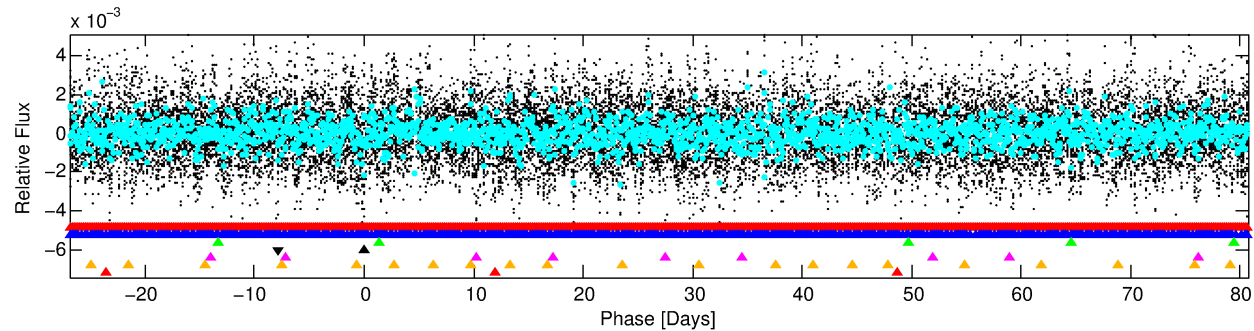
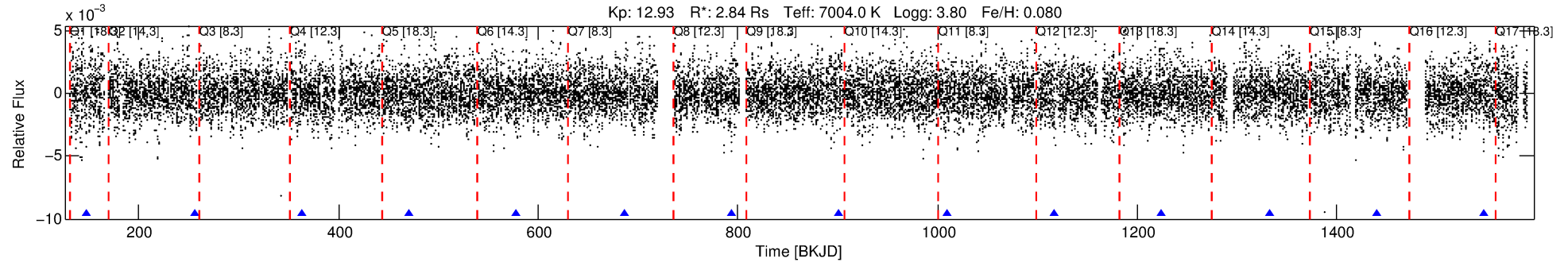
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716523-04

No Significant Match Found

DV One-Page Summary

KIC: 9716523 Candidate: 4 of 7 Period: 107.649 d



TPS TCE Results:

Period = 107.64909 d
Epoch = 147.8716 BKJD

DV fit results are unavailable

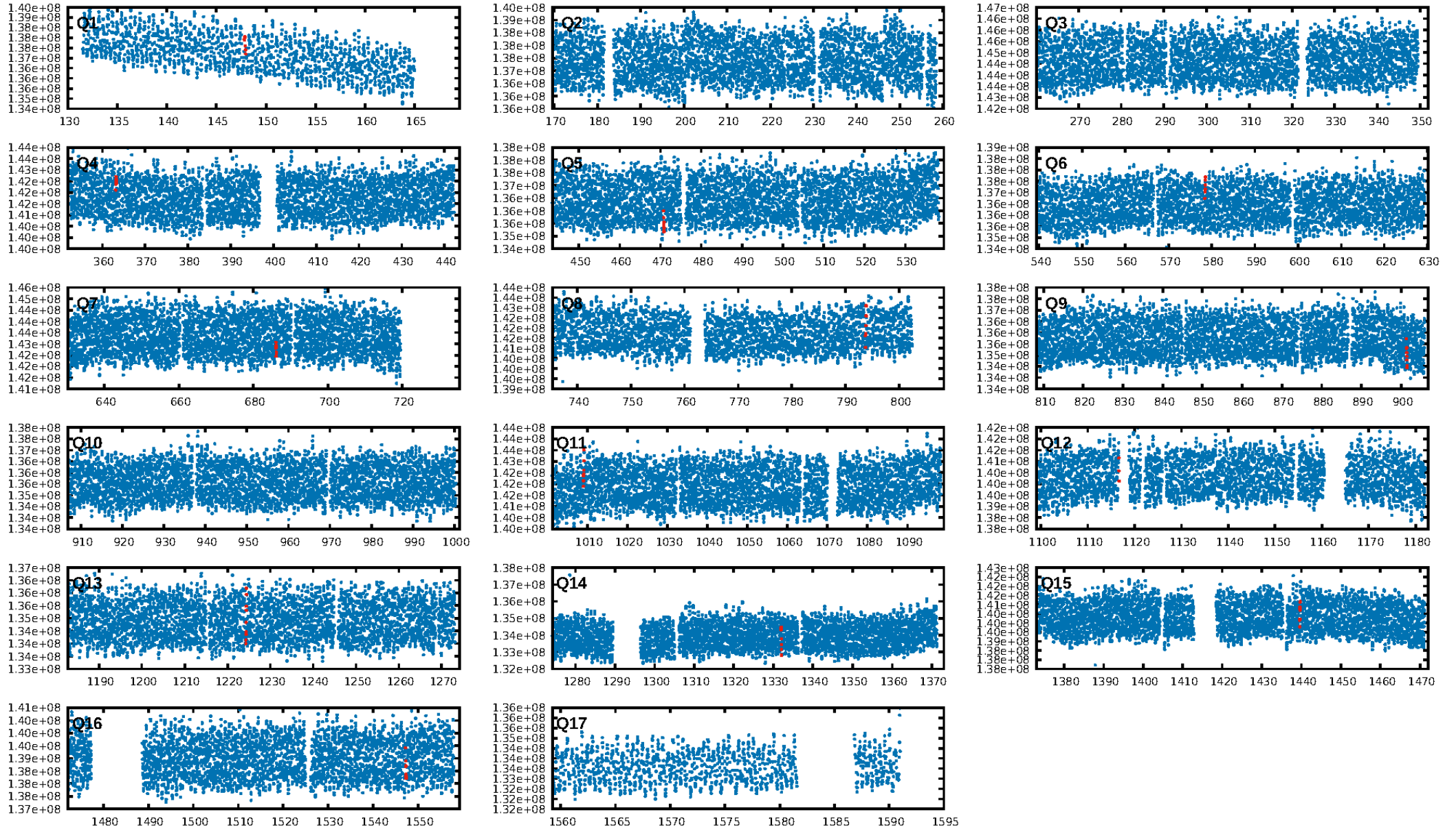
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [269.36σ]
LongPeriod-sig: 100.0% [233.26σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [8/8]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: 3.783 arcsec [6.70σ]
KicOffset-rm: 0.077 arcsec [1.00σ]
OotOffset-st: 2/3/3/4 [12]
KicOffset-st: 2/3/3/4 [12]
DiffImageQuality-fgm: 0.42 [5/12]
DiffImageOverlap-fno: 0.00 [0/12]

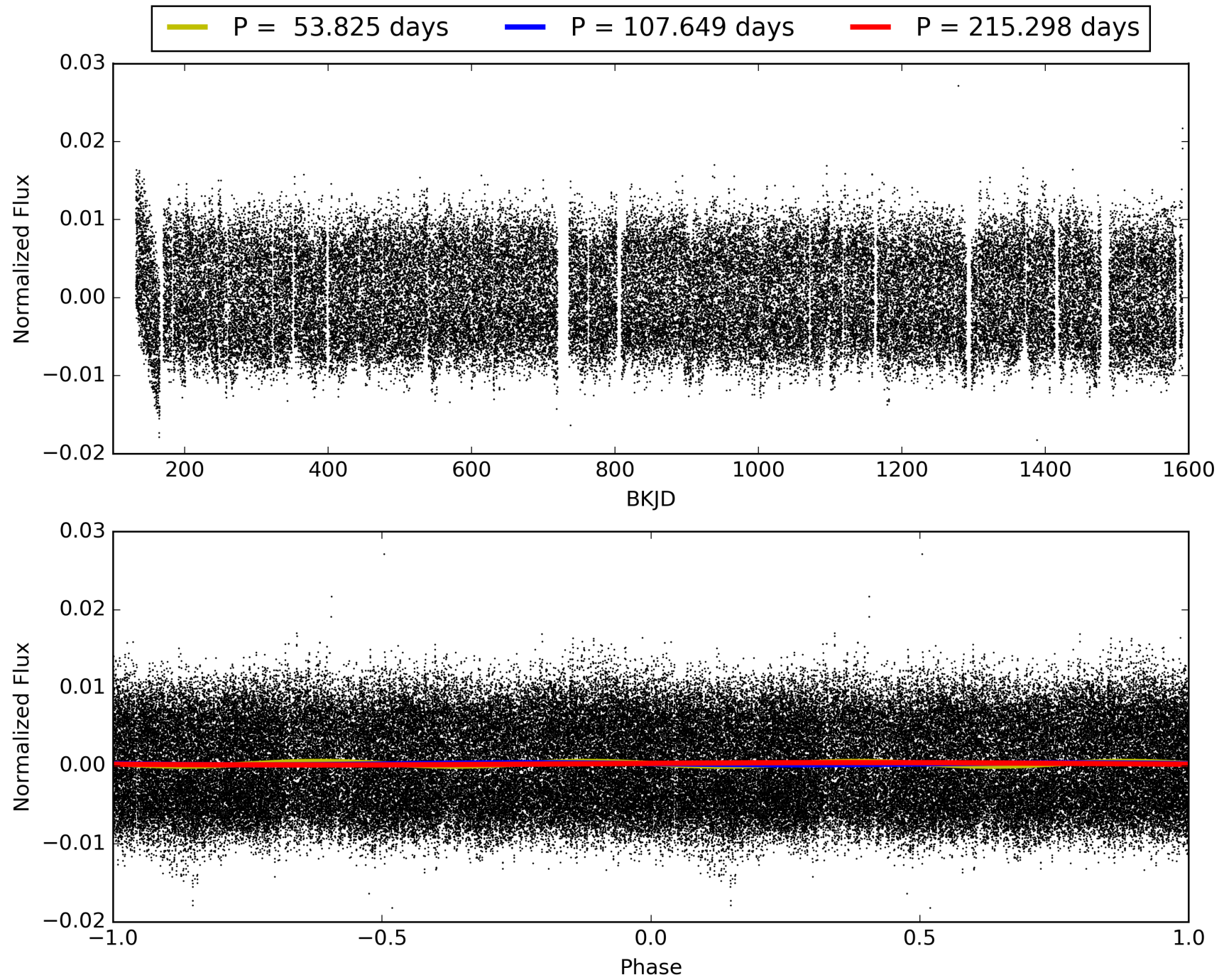
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:07:21 Z

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

TCE 009716523-04, PDC Light Curves

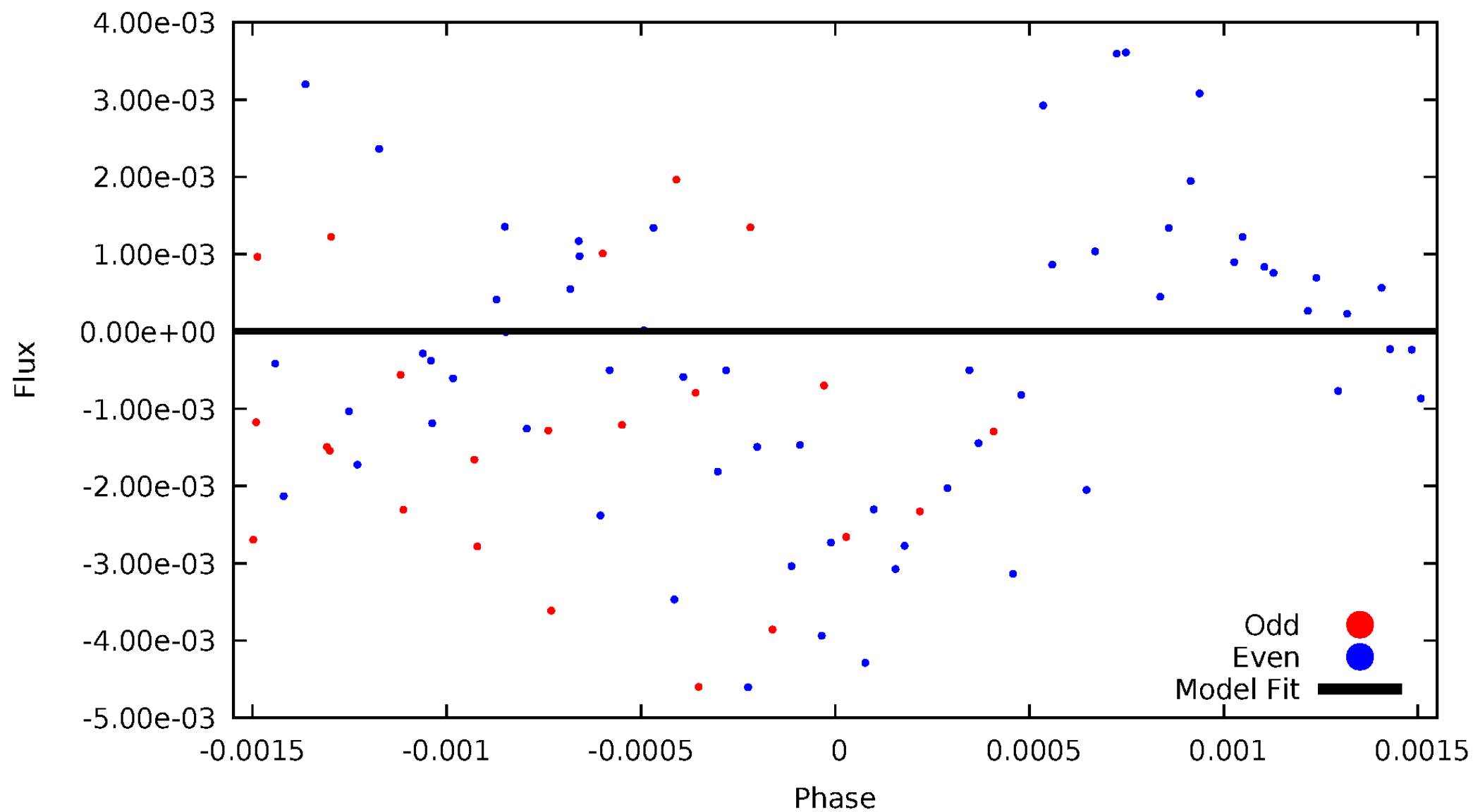


TCE 009716523-04



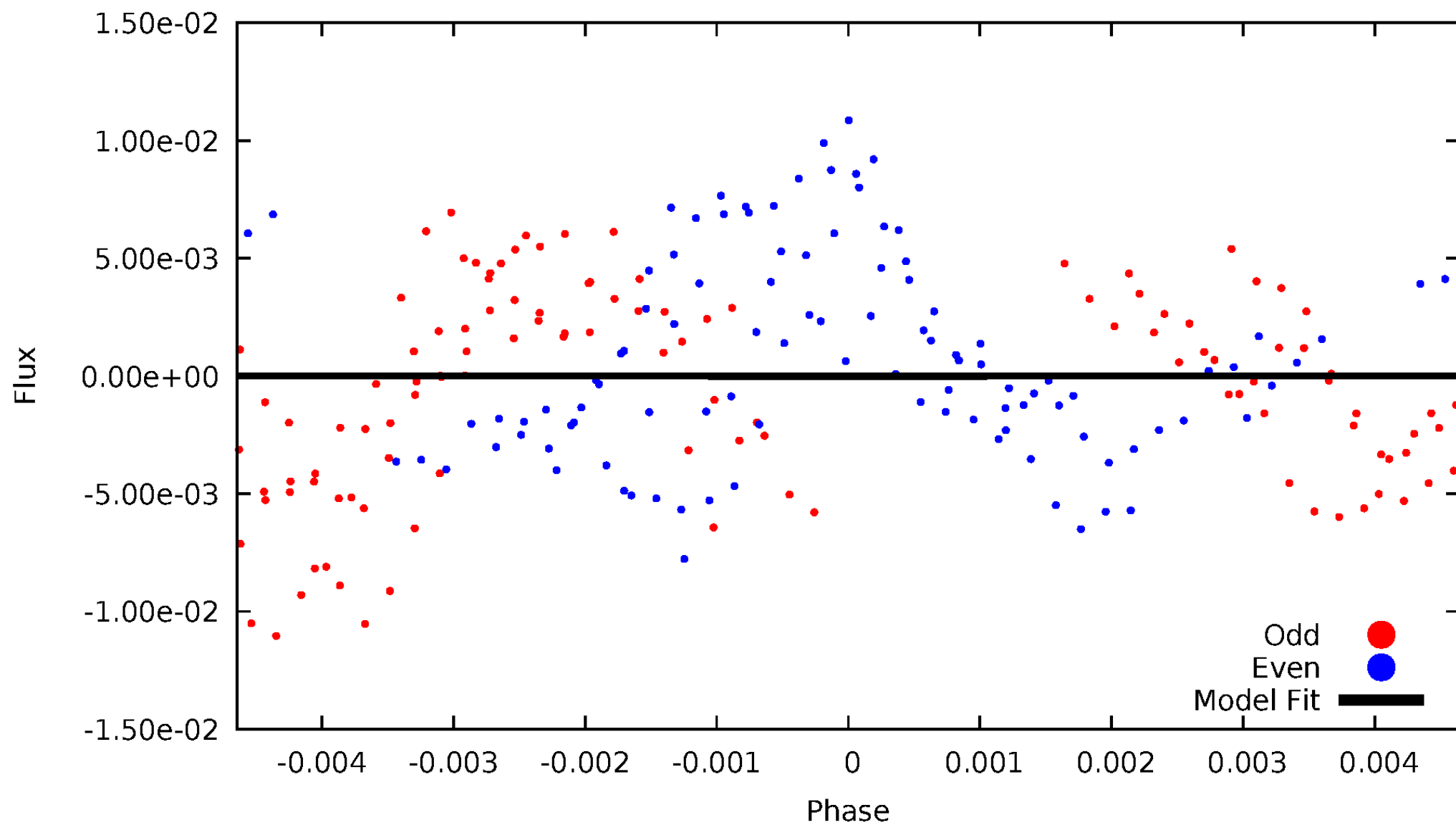
DV Odd/Even

TCE 009716523-04



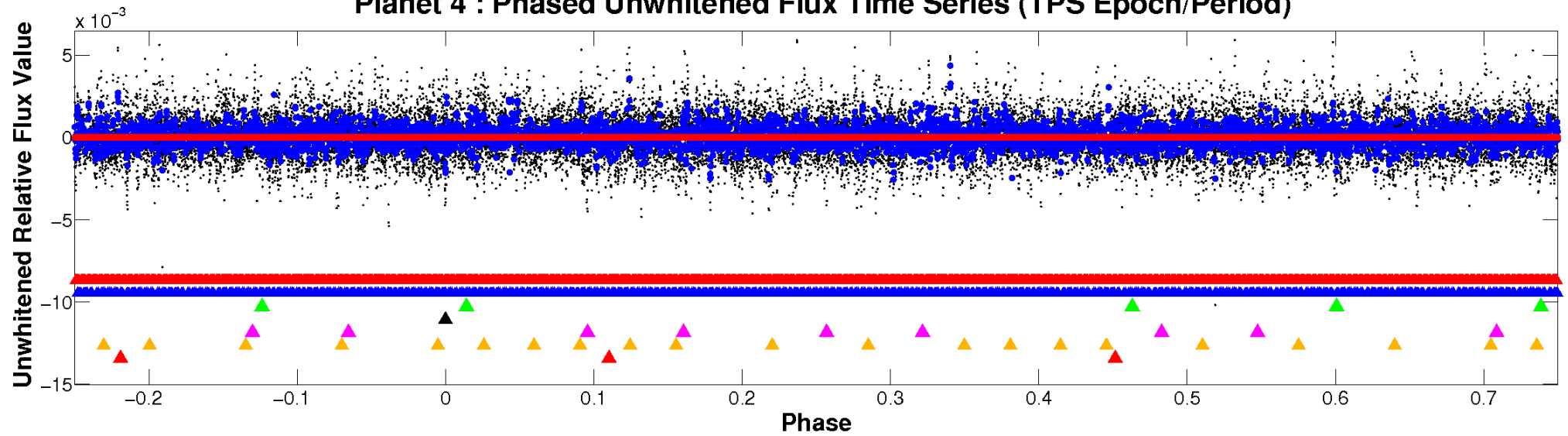
ALT Odd/Even

TCE 009716523-04

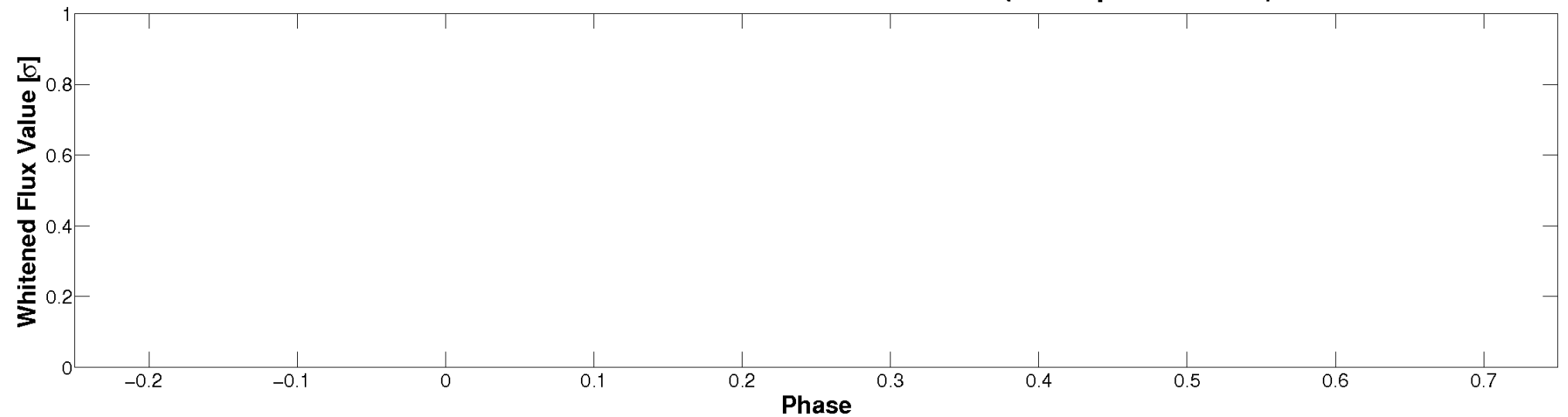


Non-Whitened Vs. Whitened Light Curve

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

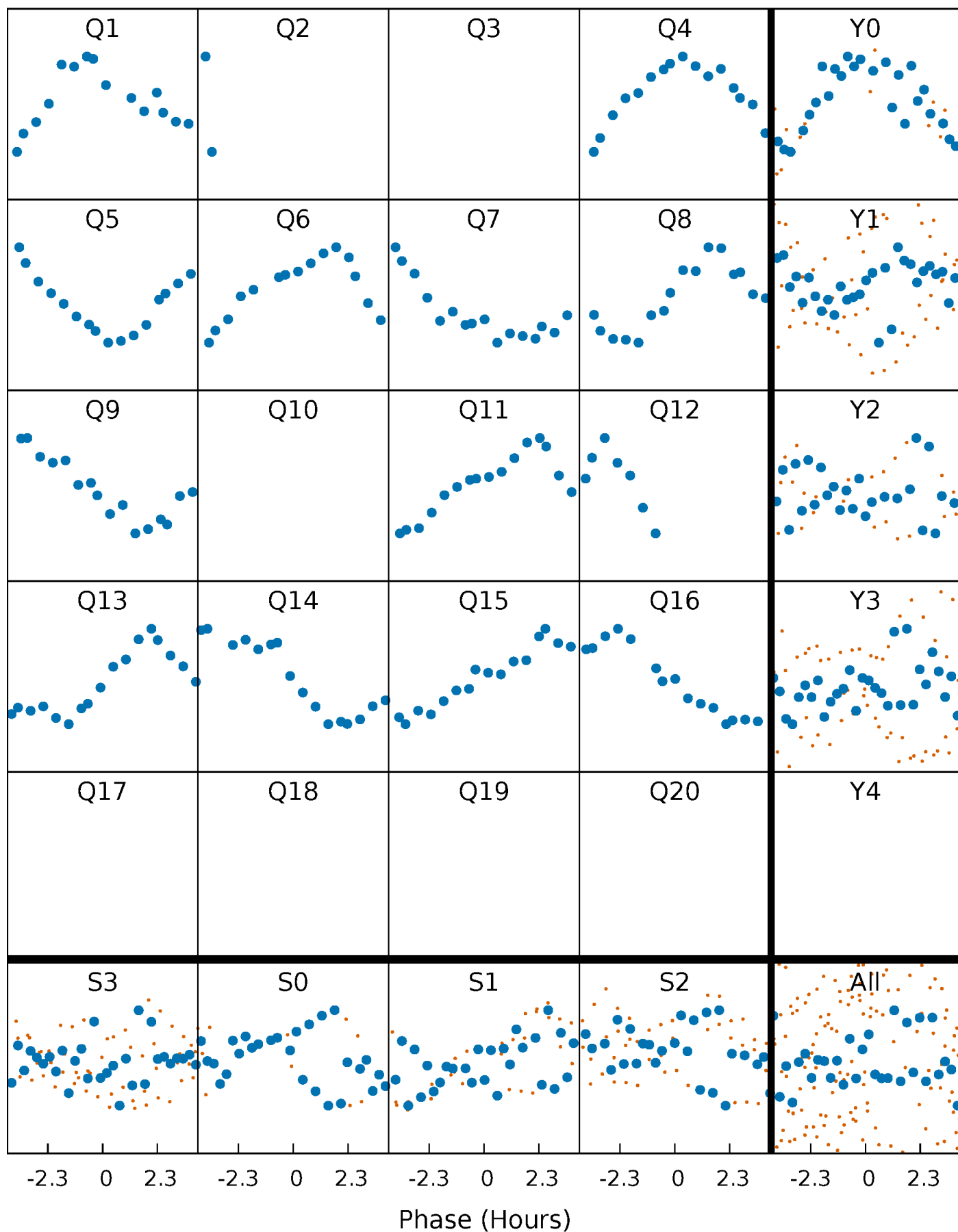


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



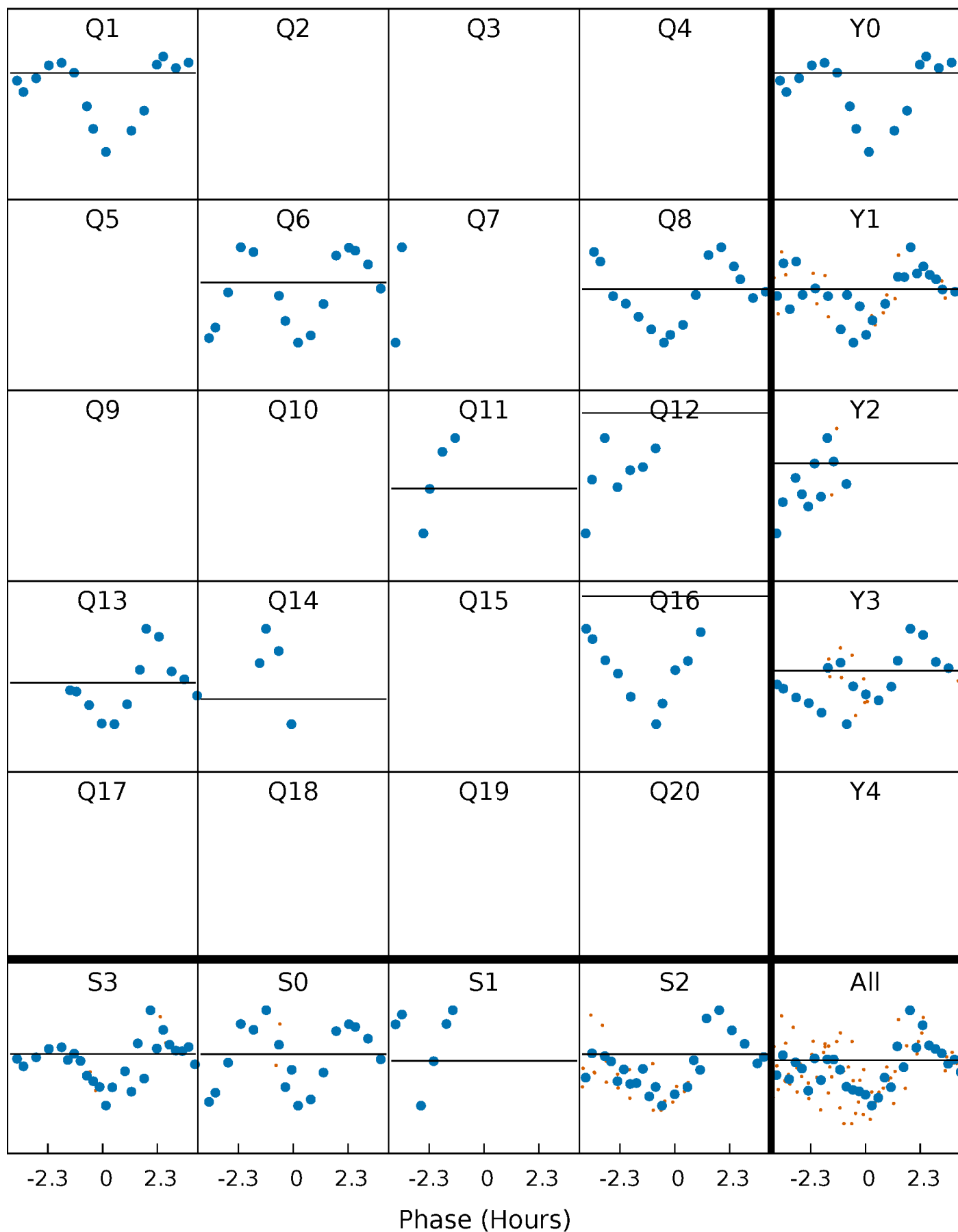
PDC Quarter-Phased Transit Curves

TCE 009716523-04 P=107.649091 Days $T_0=147.871614$ (BKJD)



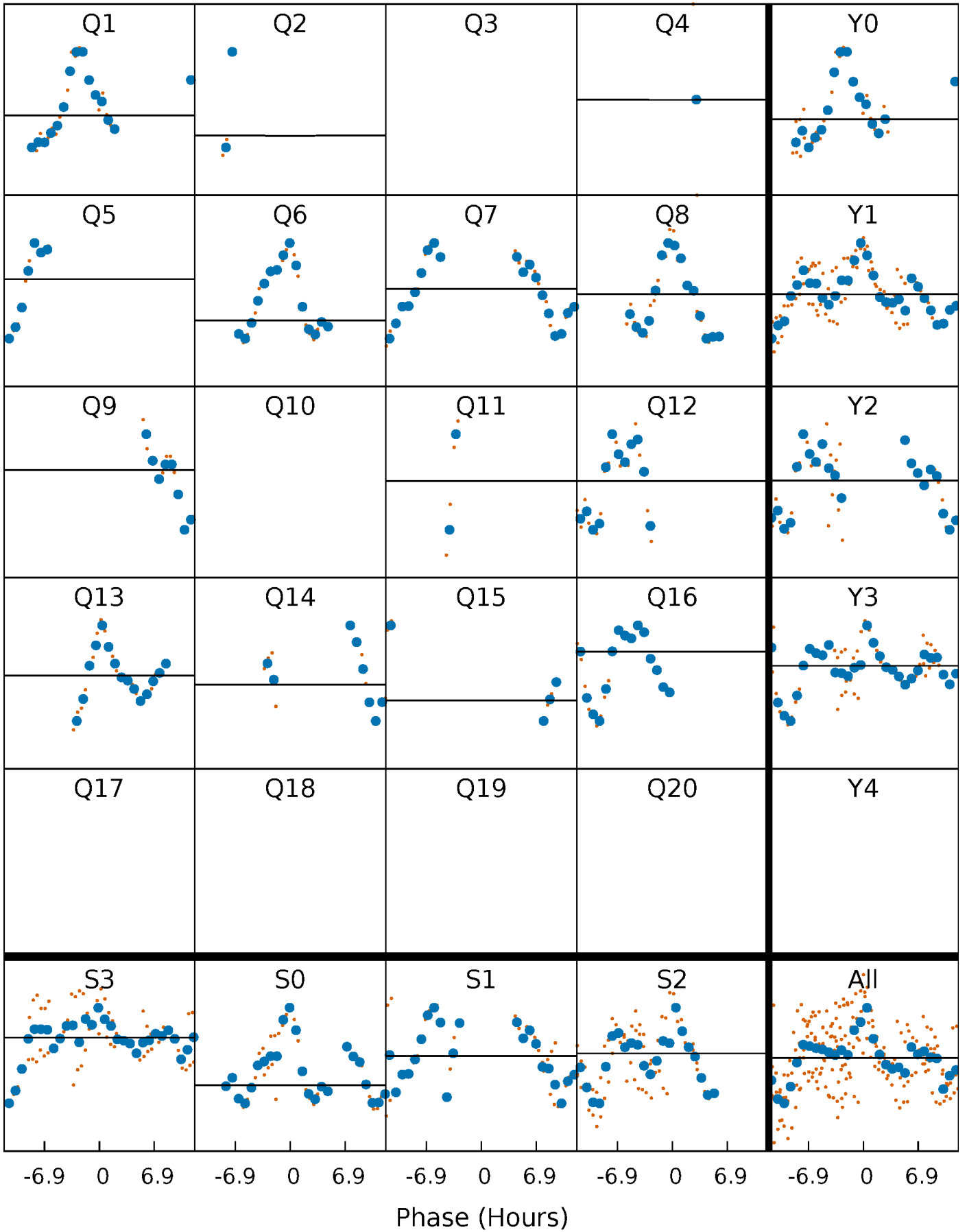
DV Quarter-Phased Transit Curves

TCE 009716523-04 P=107.649091 Days $T_0=147.871614$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

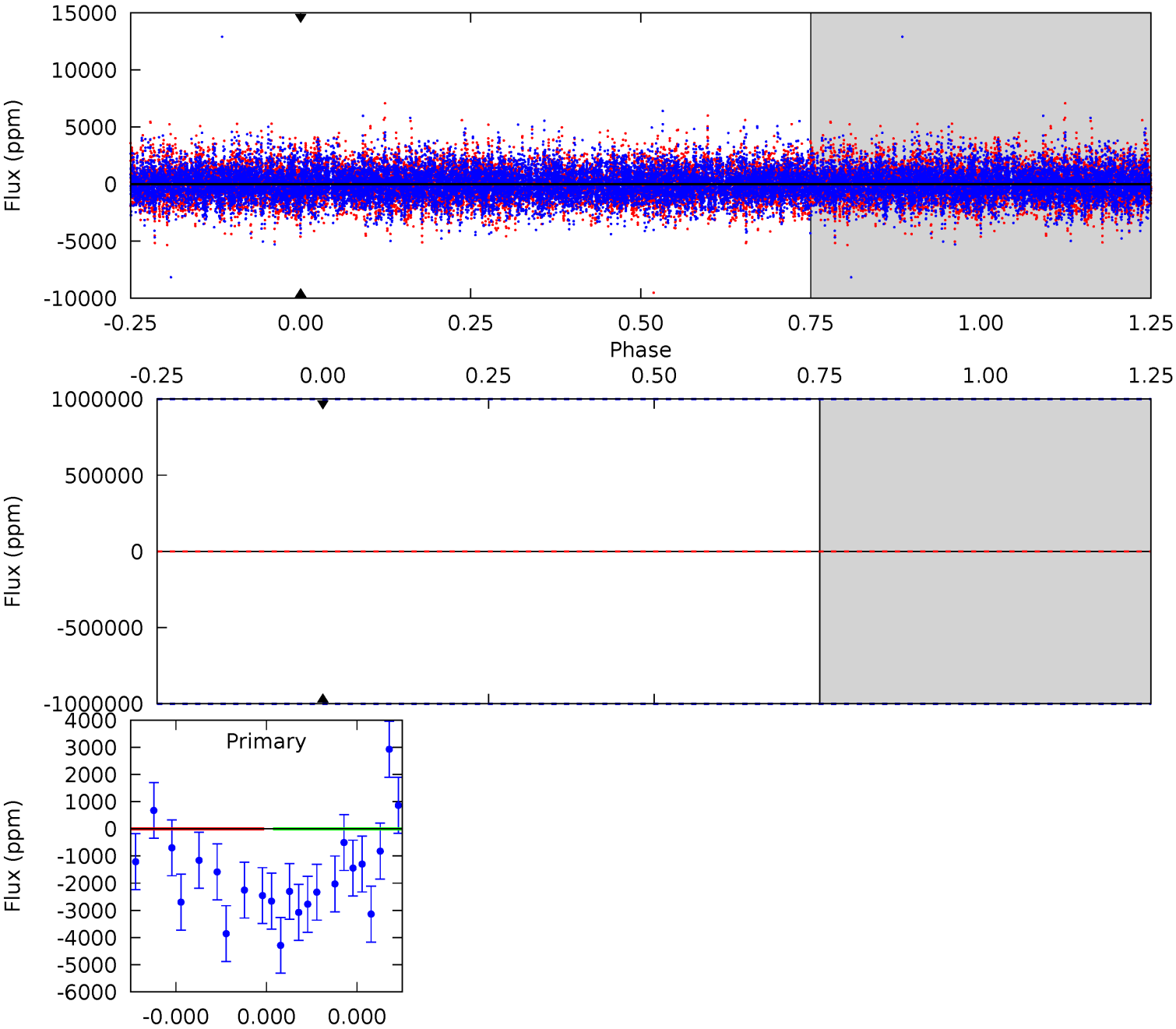
TCE 009716523-04 P=107.649091 Days $T_0=147.943300$ (BKJD)



DV Model-Shift Uniqueness Test

009716523-04, P = 107.649091 Days, E = 40.222523 Days

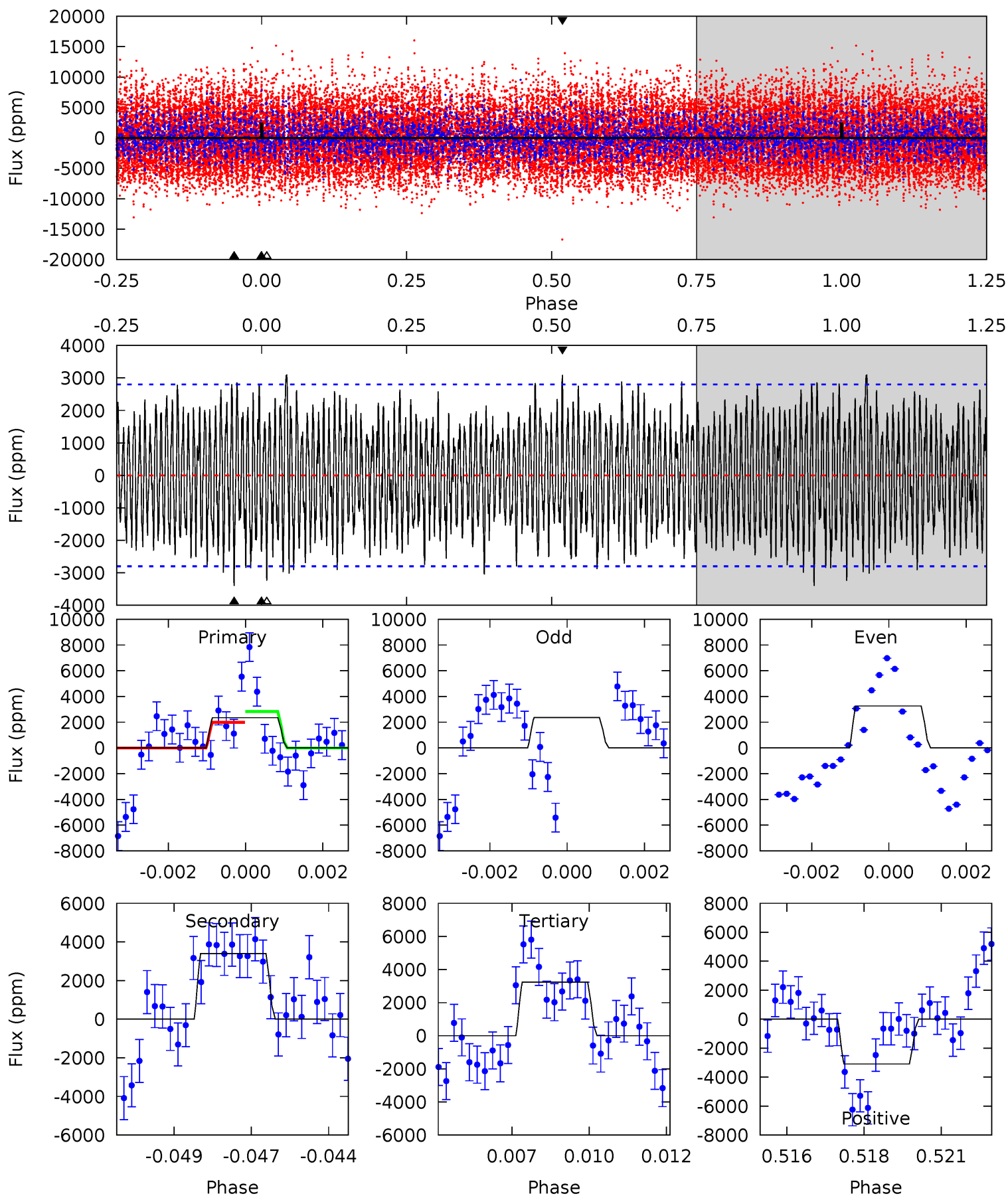
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009716523-04, P = 107.649091 Days, E = 40.294209 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.44	6.41	6.12	5.85	5.29	3.03	2.58	-1.69	-1.41	0.29	0.57	0.63	0.45	0.48	0.80



Stellar Parameters For KIC 009716523

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7004^{+195}_{-318}	$3.797^{+0.375}_{-0.125}$	$0.080^{+0.200}_{-0.350}$	$2.844^{+0.533}_{-1.244}$	$1.848^{+0.164}_{-0.460}$	$0.113^{+0.357}_{-0.043}$
	+3%/-5%	+10%/-3%	+250%/-438%	+19%/-44%	+9%/-25%	+315%/-38%
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 009716523-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$21.55^{+23.23}_{-14.55}$	962^{+73}_{-103}	4520^{+32195}_{-31539}	305^{+73403}_{-47040}
Alt.	-3395 ± 529	$19.56^{+21.77}_{-13.27}$	967^{+69}_{-103}	6413^{+7521}_{-1889}	1493^{+12652}_{-1185}

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 $A_{obs} \gg 1.0$

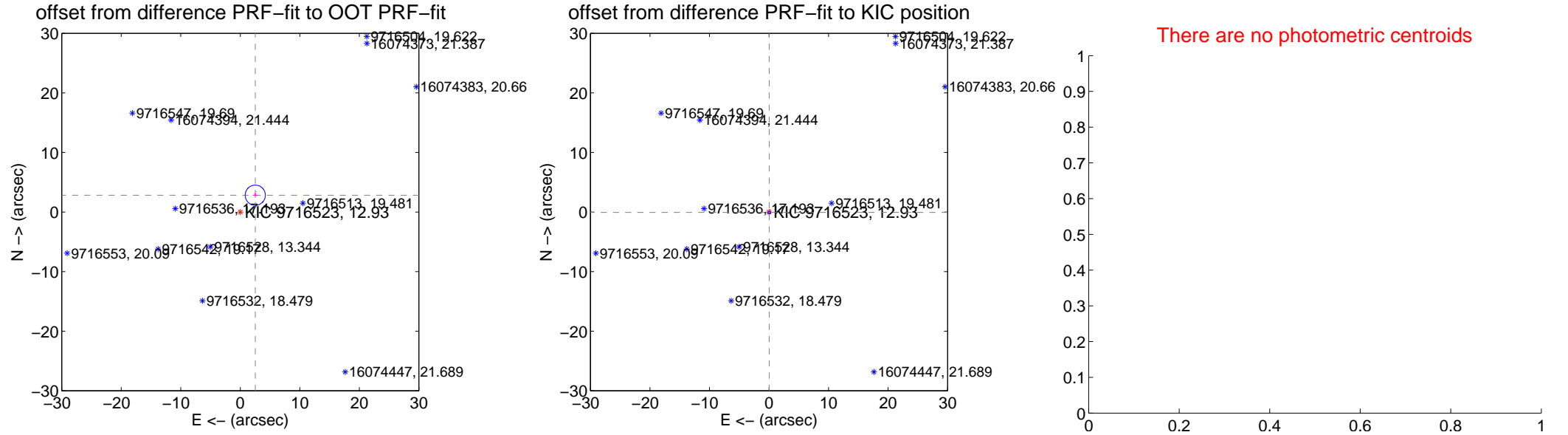
DV Centroid Data

Supplemental centroid analysis for 009716523-04. Kepler magnitude: 12.93. Transit SNR -1.00

There are 5 quarters with good PRF difference image offsets

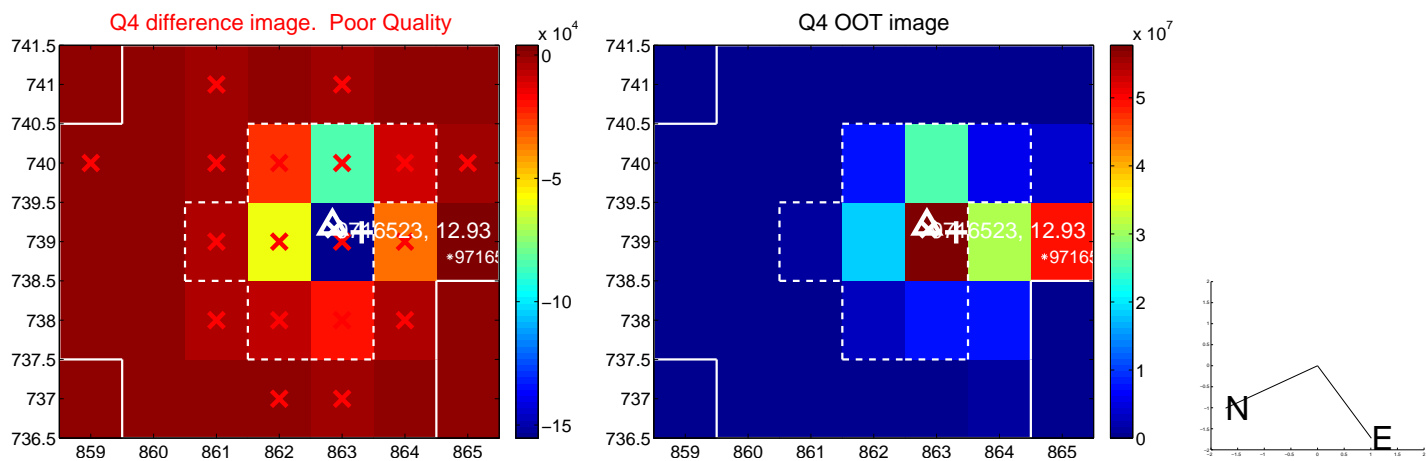
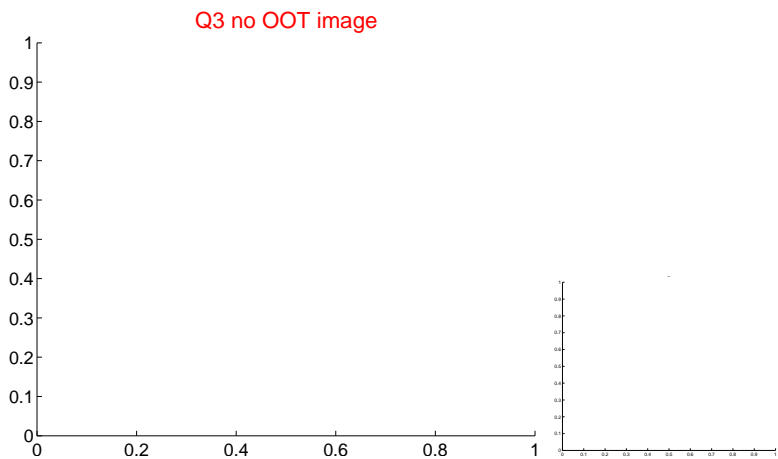
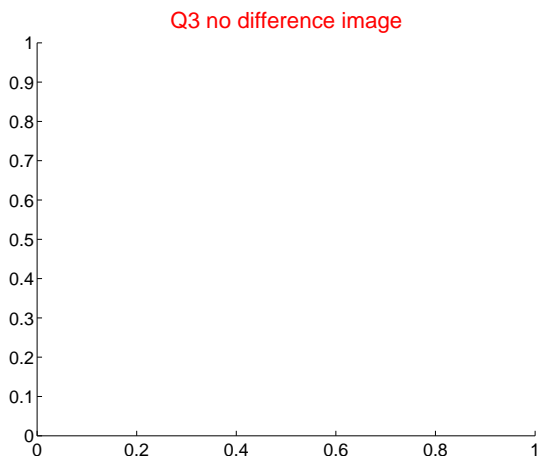
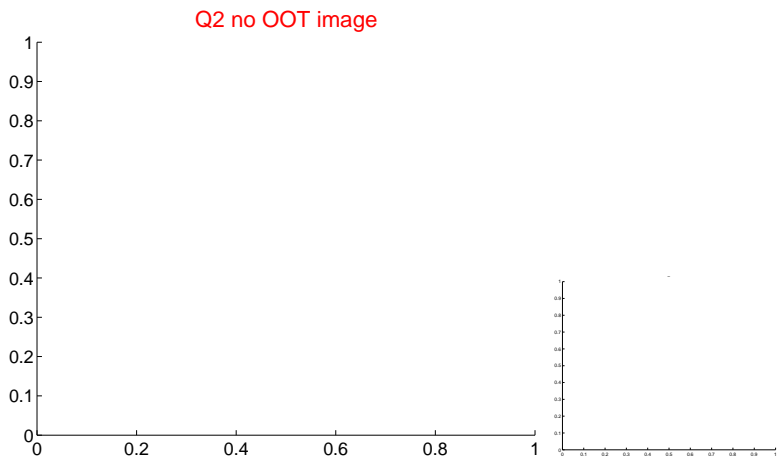
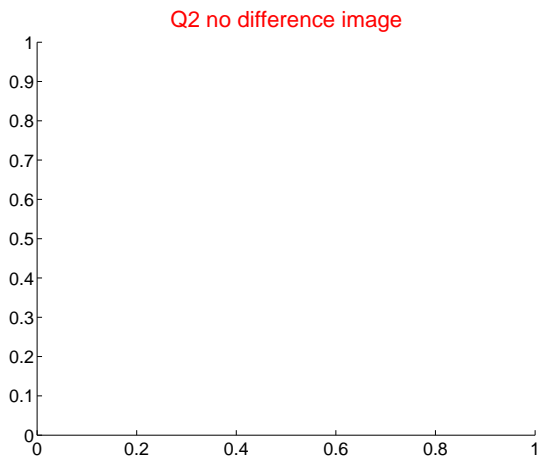
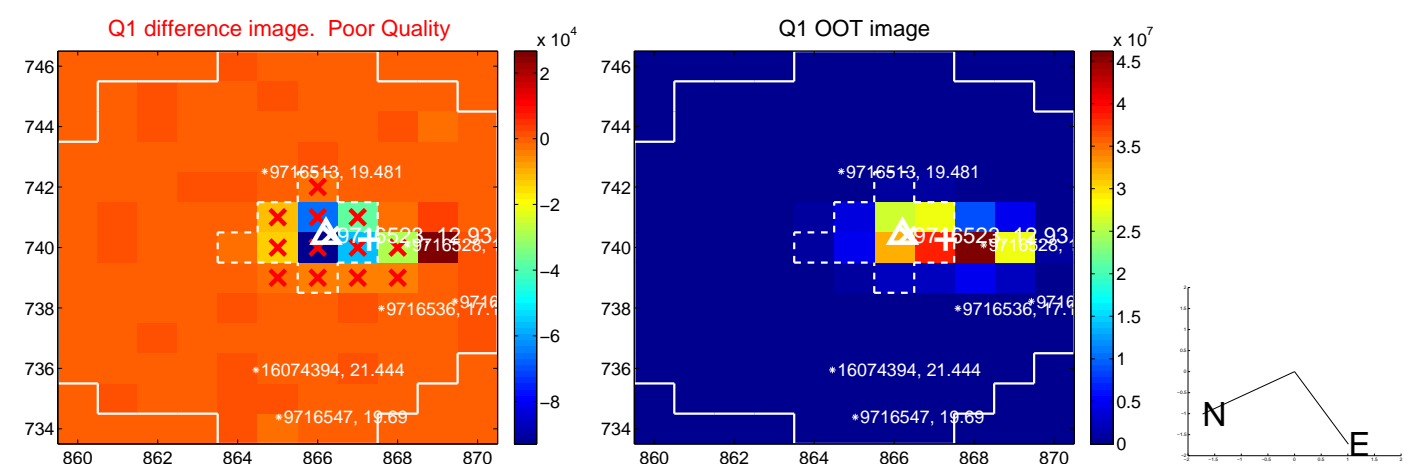
The direct PRF centroid is offset from the target star catalog position by about 1.82 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.783 ± 0.565	6.70	-2.518 ± 0.393	2.823 ± 0.414
PRF-fit source offset from KIC position	0.077 ± 0.078	1.00	-0.036 ± 0.073	-0.068 ± 0.079
photometric centroid source offset	—	—	—	—

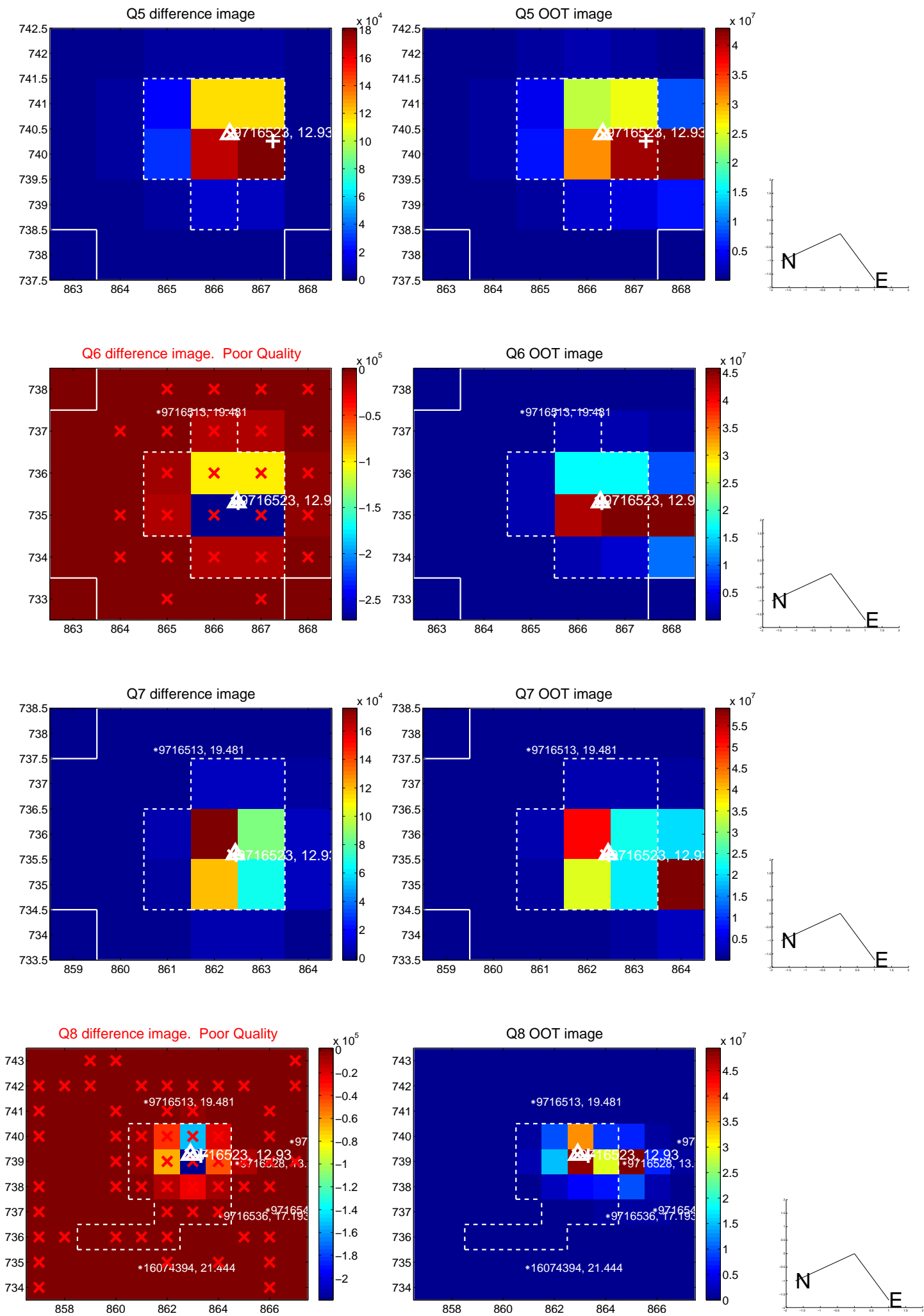


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

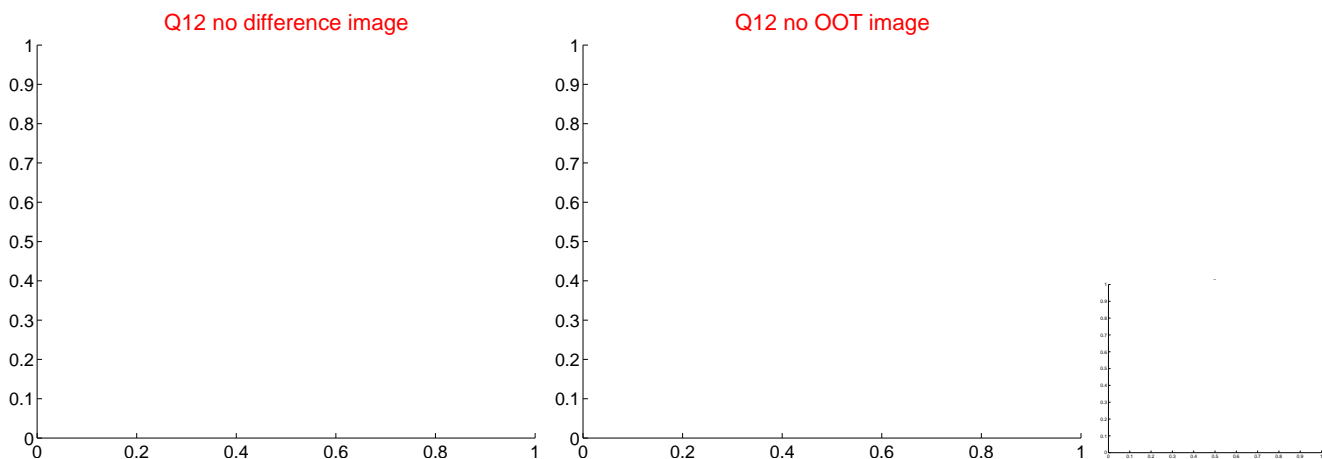
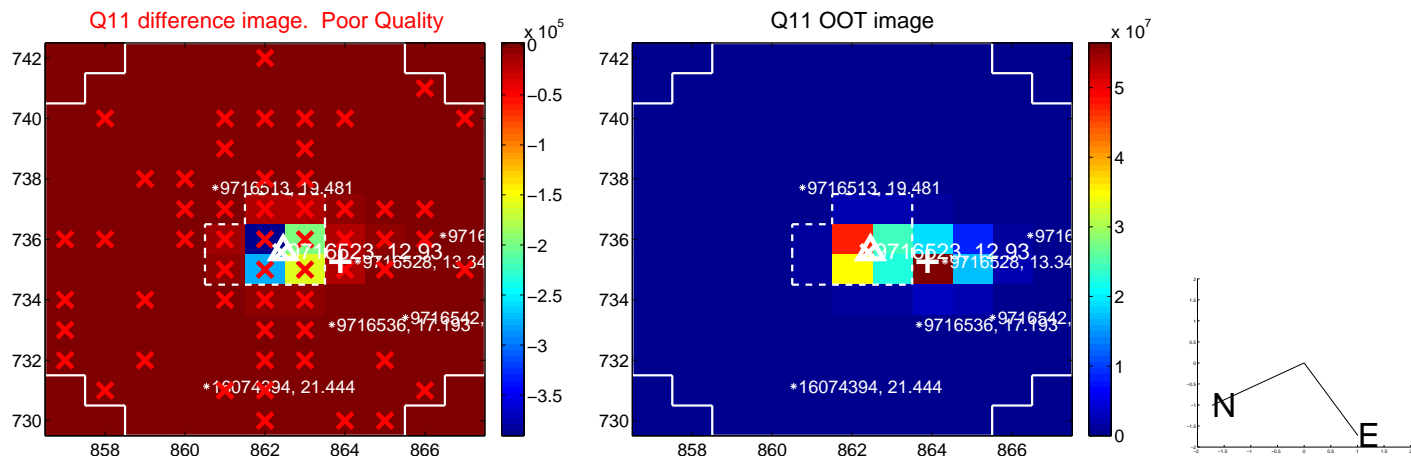
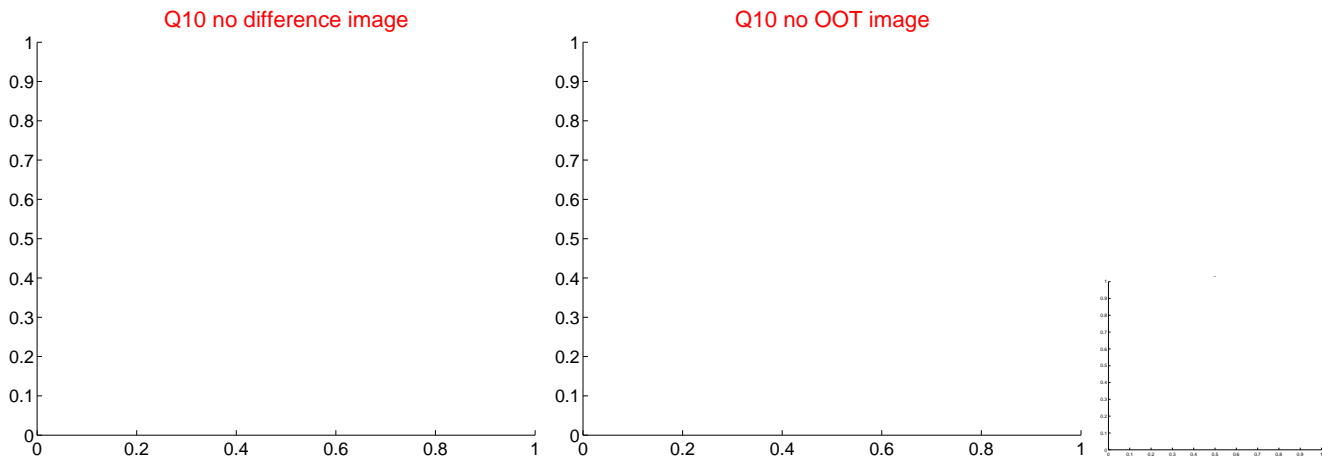
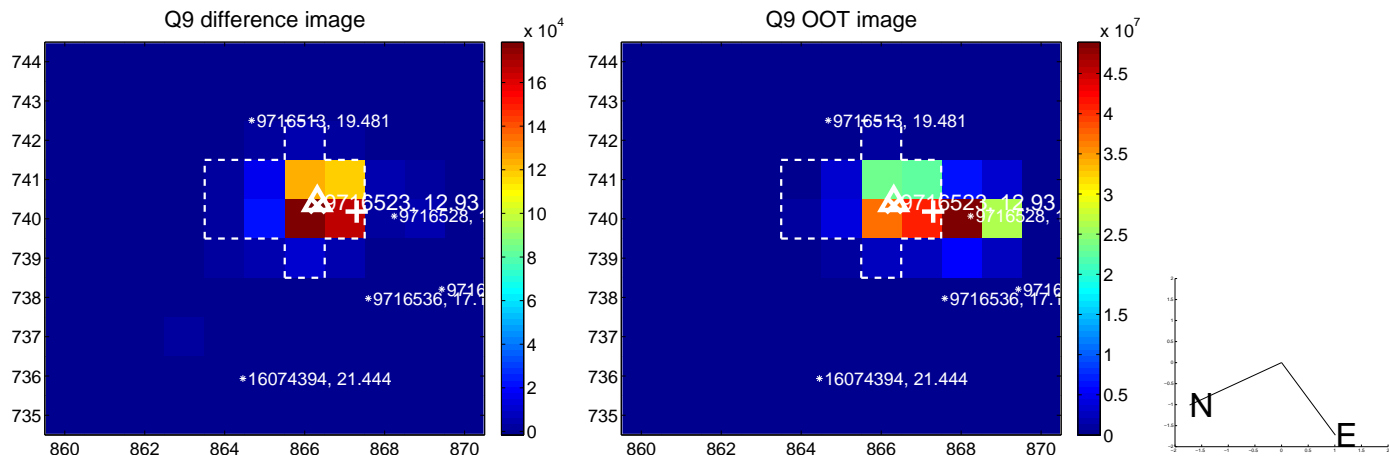
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



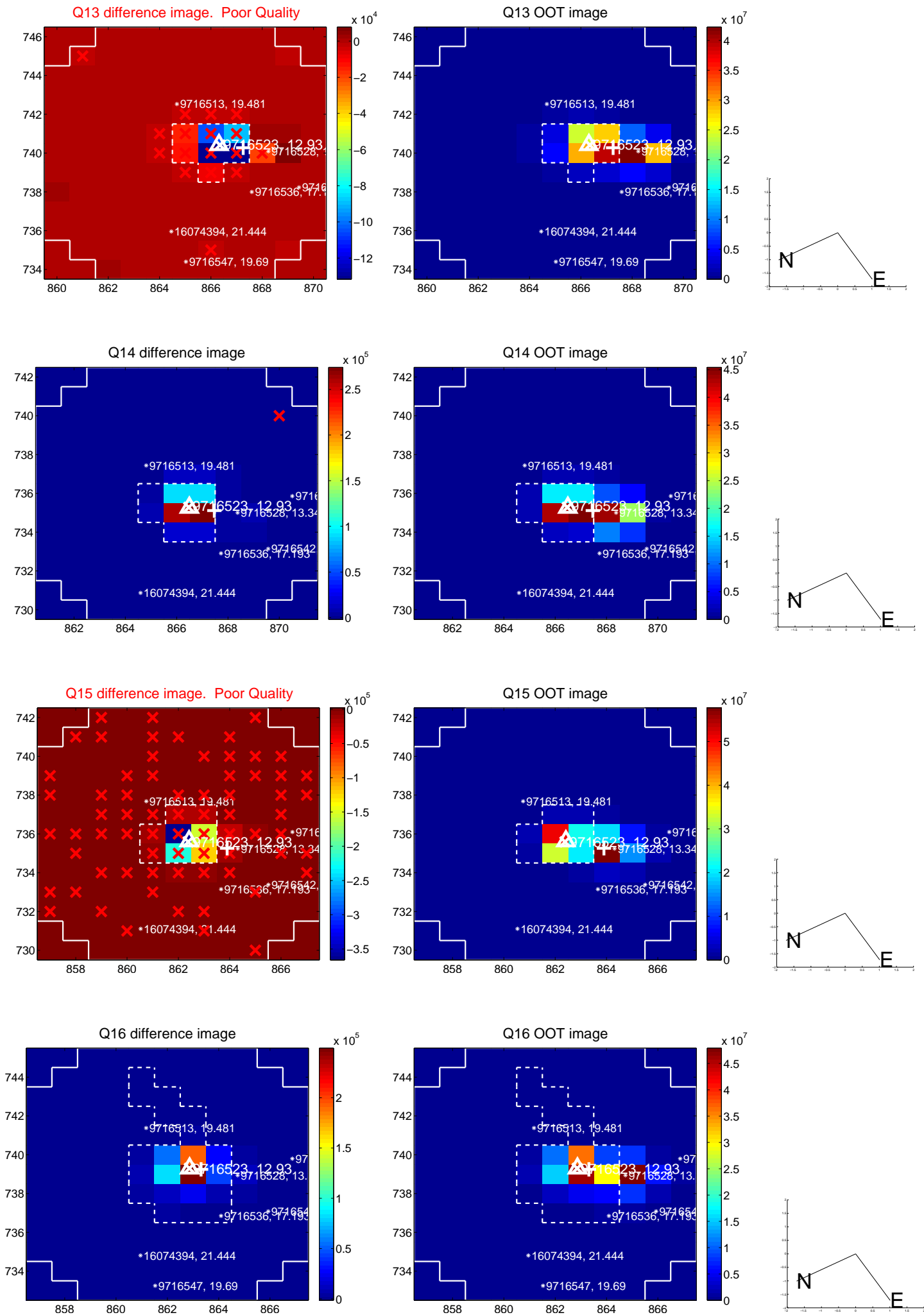
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



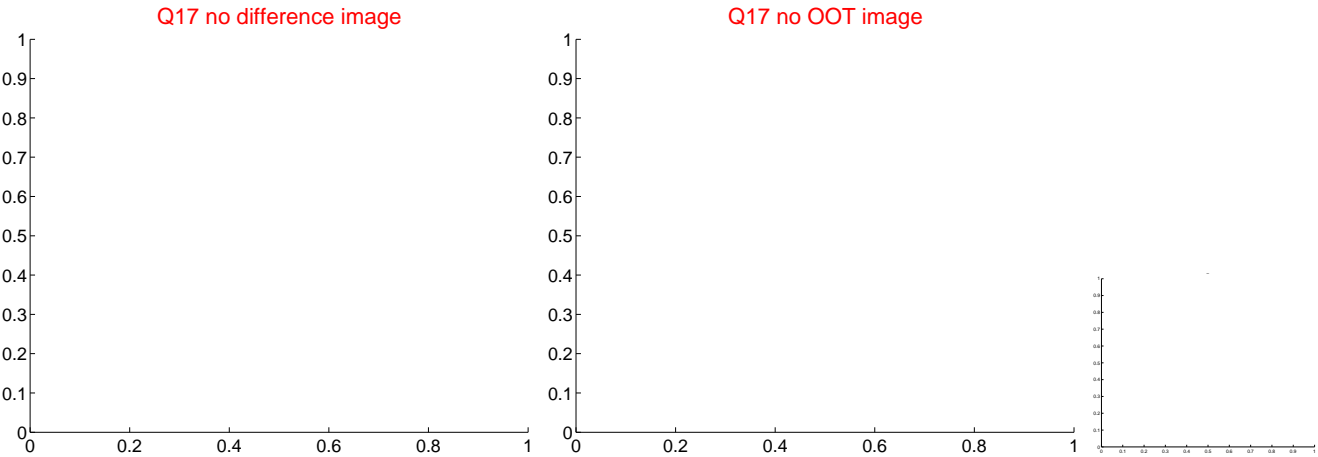
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



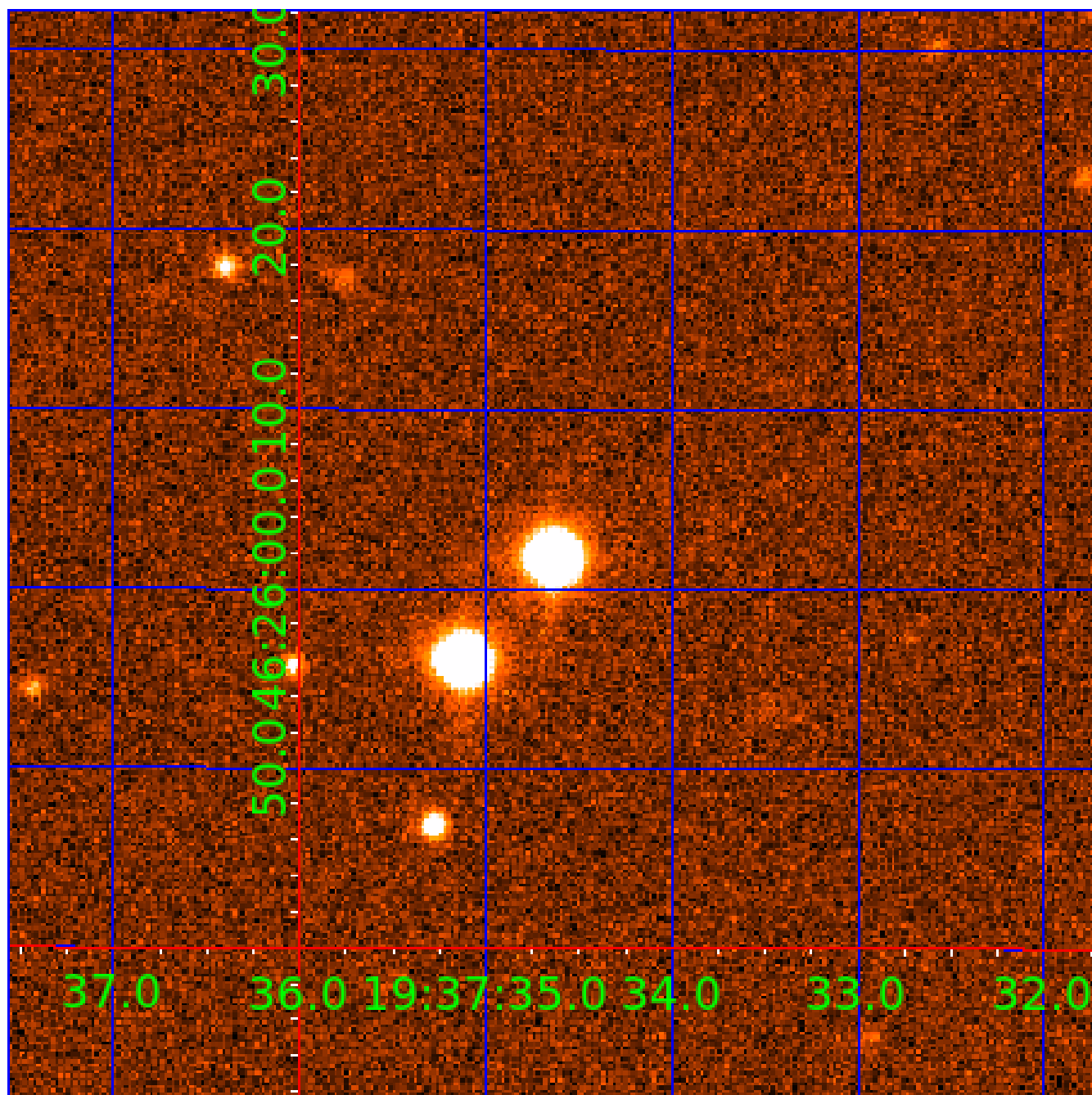
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



KIC 009716523

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})
009716523-01	OBS	No	0.851171	132.052266	102.1	2.757	8.5	5.7	2.84	7004	3.37	37457.84
009716523-02	OBS	No	2.206382	133.482283	499.4	6.155	8.6	11.2	2.84	7004	12.12	10519.40
009716523-04	OBS	No	107.649091	147.871614	413.3	2.000	9.7	-1.0	2.84	7004	5.86	59.00
009716523-05	OBS	No	149.315132	272.799286	3600.4	3.792	8.5	9.1	2.84	7004	30.83	38.14
009716523-06	OBS	No	69.441327	161.272587	635.7	2.755	8.6	2.4	2.84	7004	7.92	105.86
009716523-07	OBS	No	573.699442	196.486309	202.0	5.000	8.2	-1.0	2.84	7004	4.09	6.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
009716523-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
009716523-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009716523-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_ZUMA—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_KIC_POS
009716523-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS—HALO_GHOST
009716523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

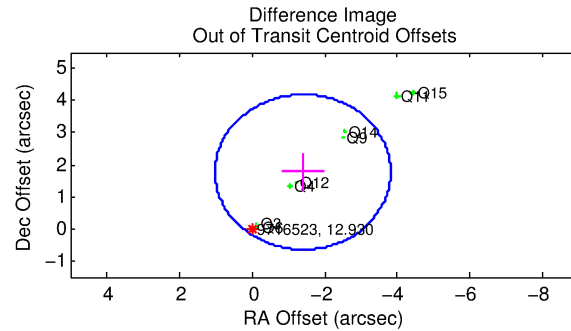
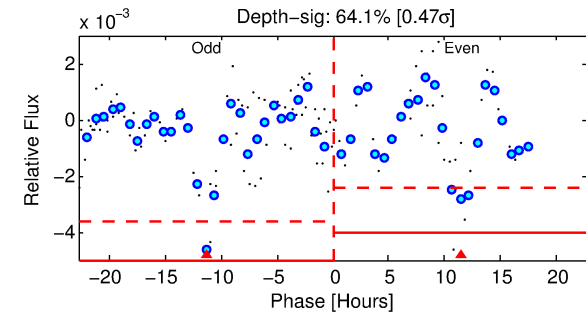
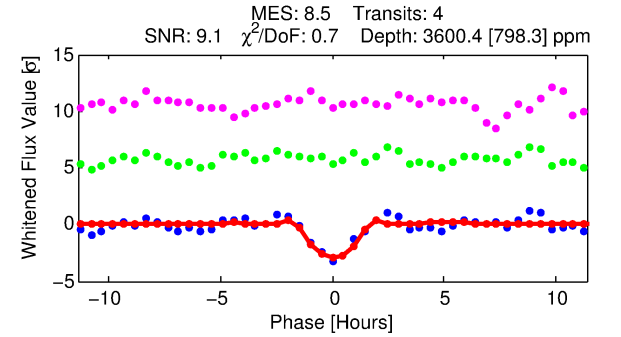
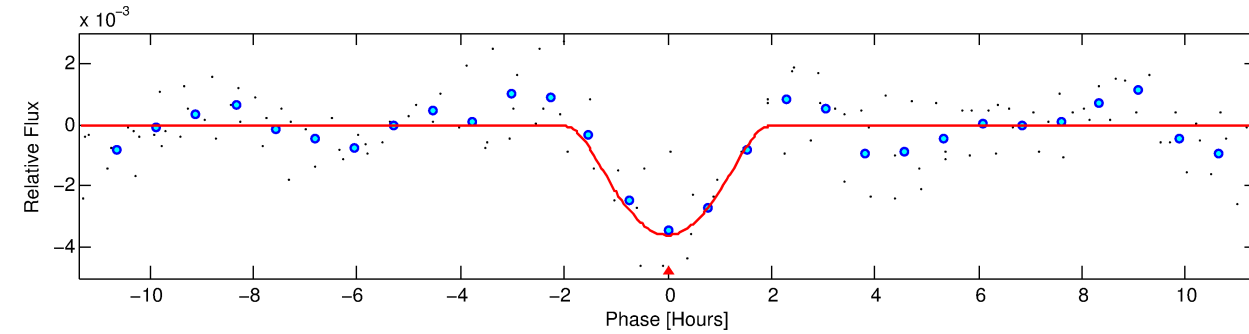
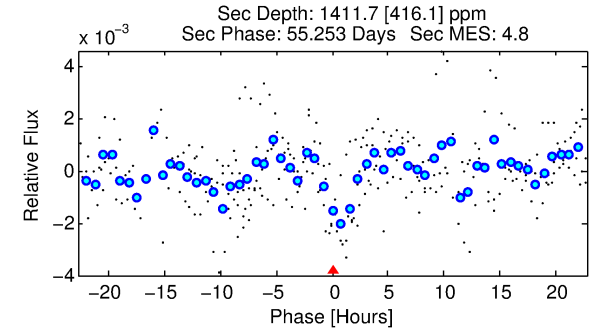
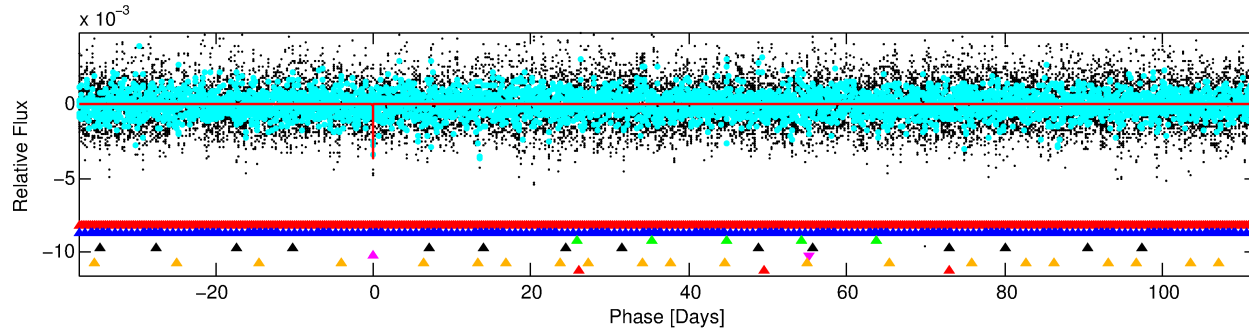
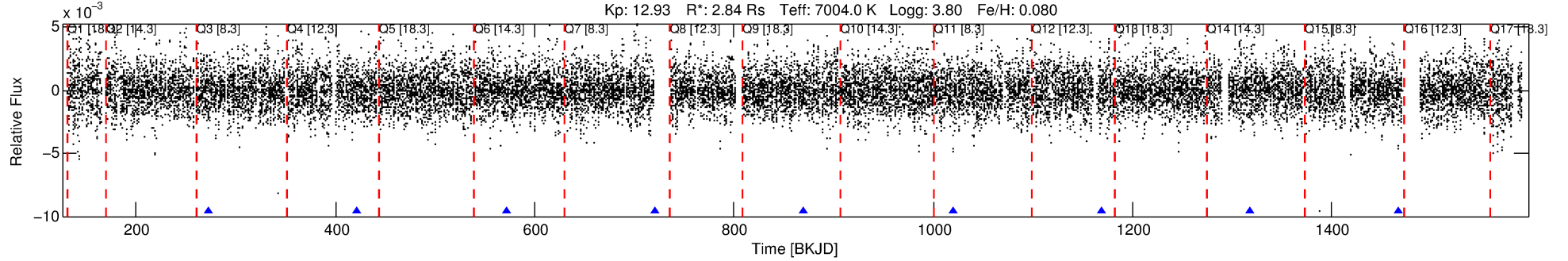
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716523-05

No Significant Match Found

DV One-Page Summary

KIC: 9716523 Candidate: 5 of 7 Period: 149.315 d



DV Fit Results:

Period = 149.31513 [0.00160] d
Epoch = 272.7993 [0.0096] BKJD
Rp/R* = 0.0993 [0.2663]
a/R* = 137.47 [75.75]
b = 1.00 [0.37]
Seff = 38.14 [25.57]
Teq = 634 [106] K
Rp = 30.83 [83.75] Re
a = 0.6762 [0.2770] AU
Ag = 373.67 [2021.41] [0.18 σ]
Teffp = 4308 [5787] K [0.63 σ]

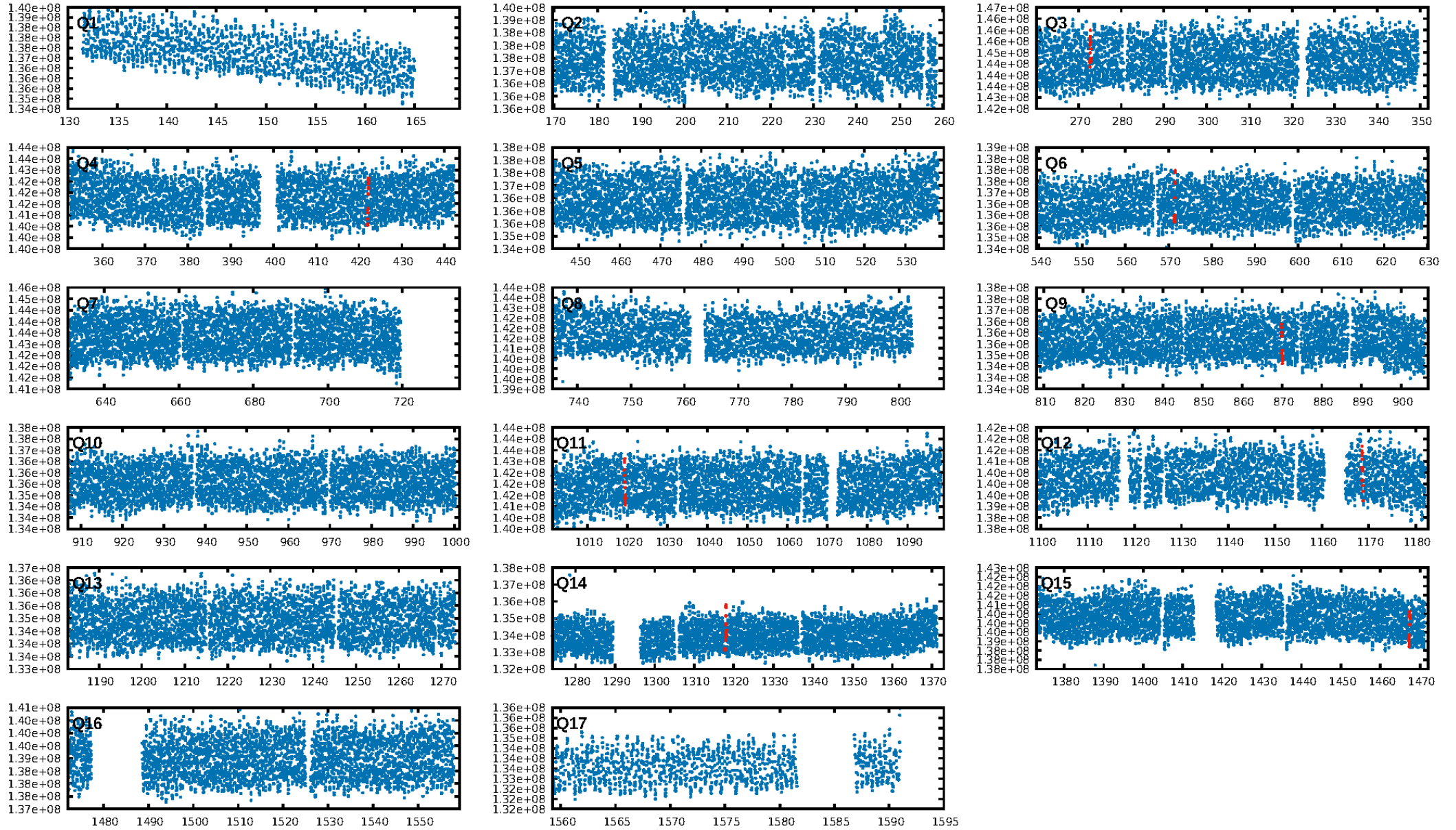
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [233.26 σ]
LongPeriod-sig: 100.0% [668.25 σ]
ModelChiSquare2-sig: 18.6%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 97.03
Centroid-sig: 97.1%
Centroid-so: 2.335 arcsec [6.99 σ]
OotOffset-rm: 2.254 arcsec [2.80 σ]
KicOffset-rm: 0.074 arcsec [0.89 σ]
OotOffset-st: 2/3/2/1 [8]
KicOffset-st: 2/3/2/1 [8]
DiffImageQuality-fgm: 0.38 [3/8]
DiffImageOverlap-fno: 0.00 [0/8]

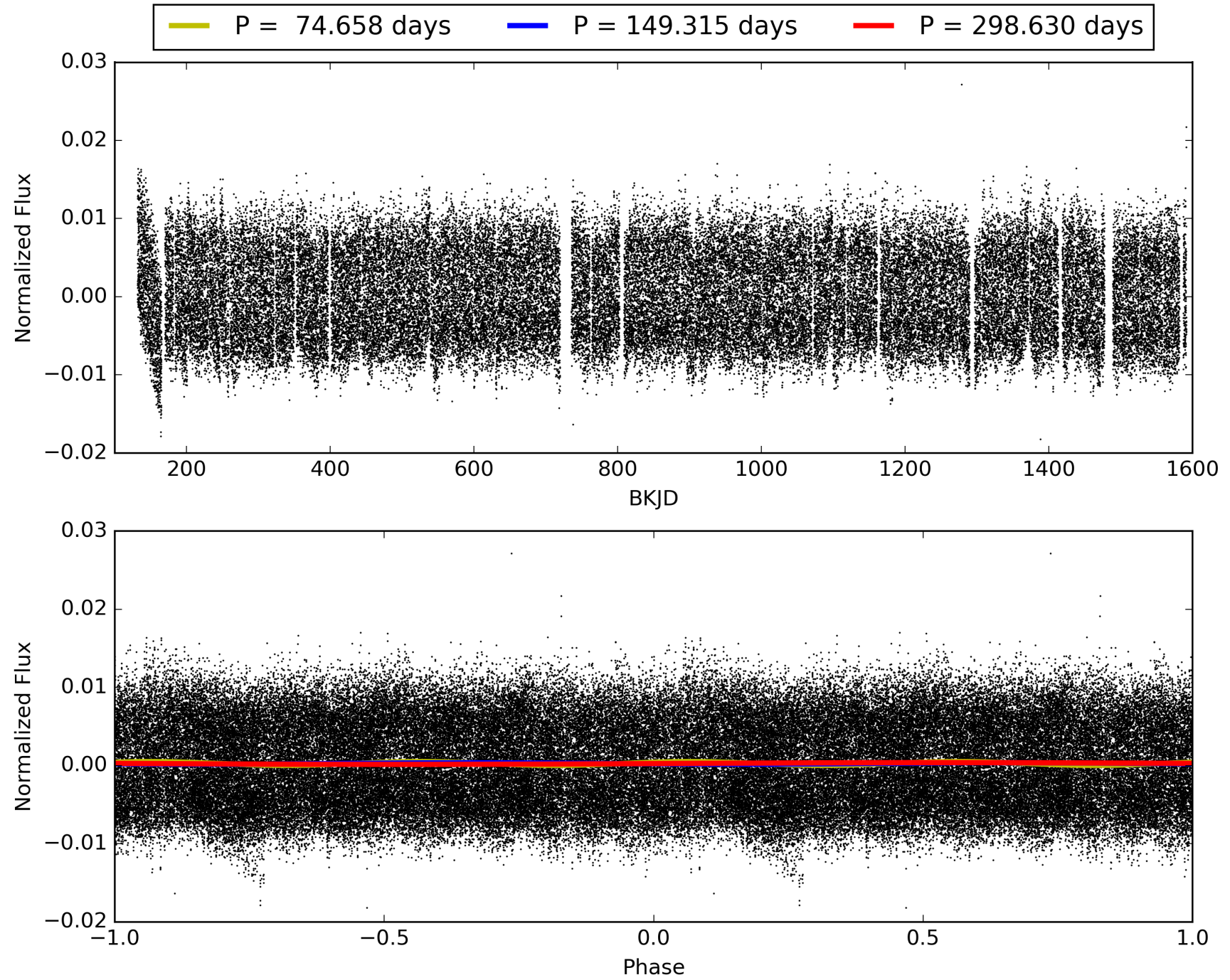
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:07:27 Z

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

TCE 009716523-05, PDC Light Curves

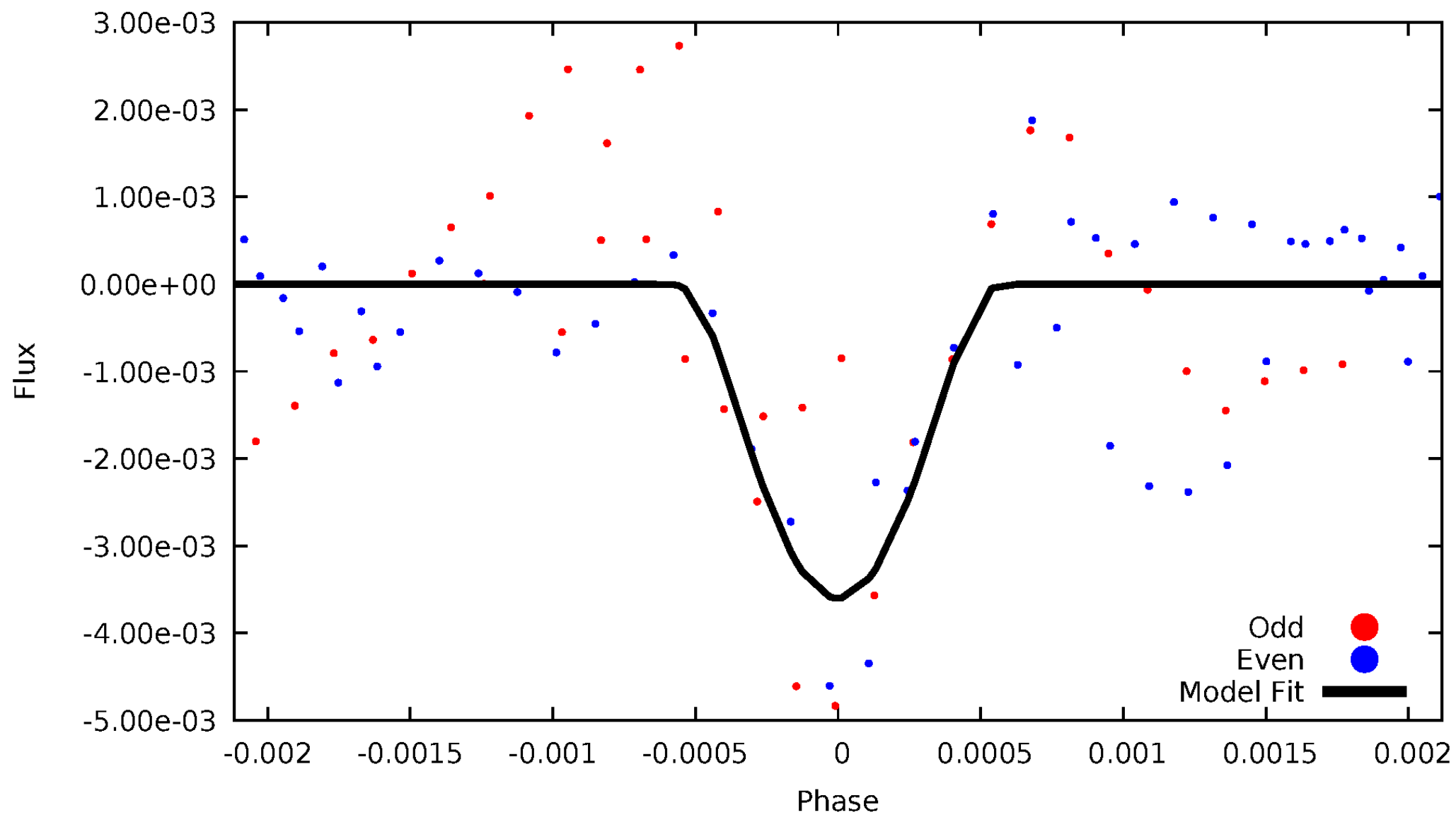


TCE 009716523-05



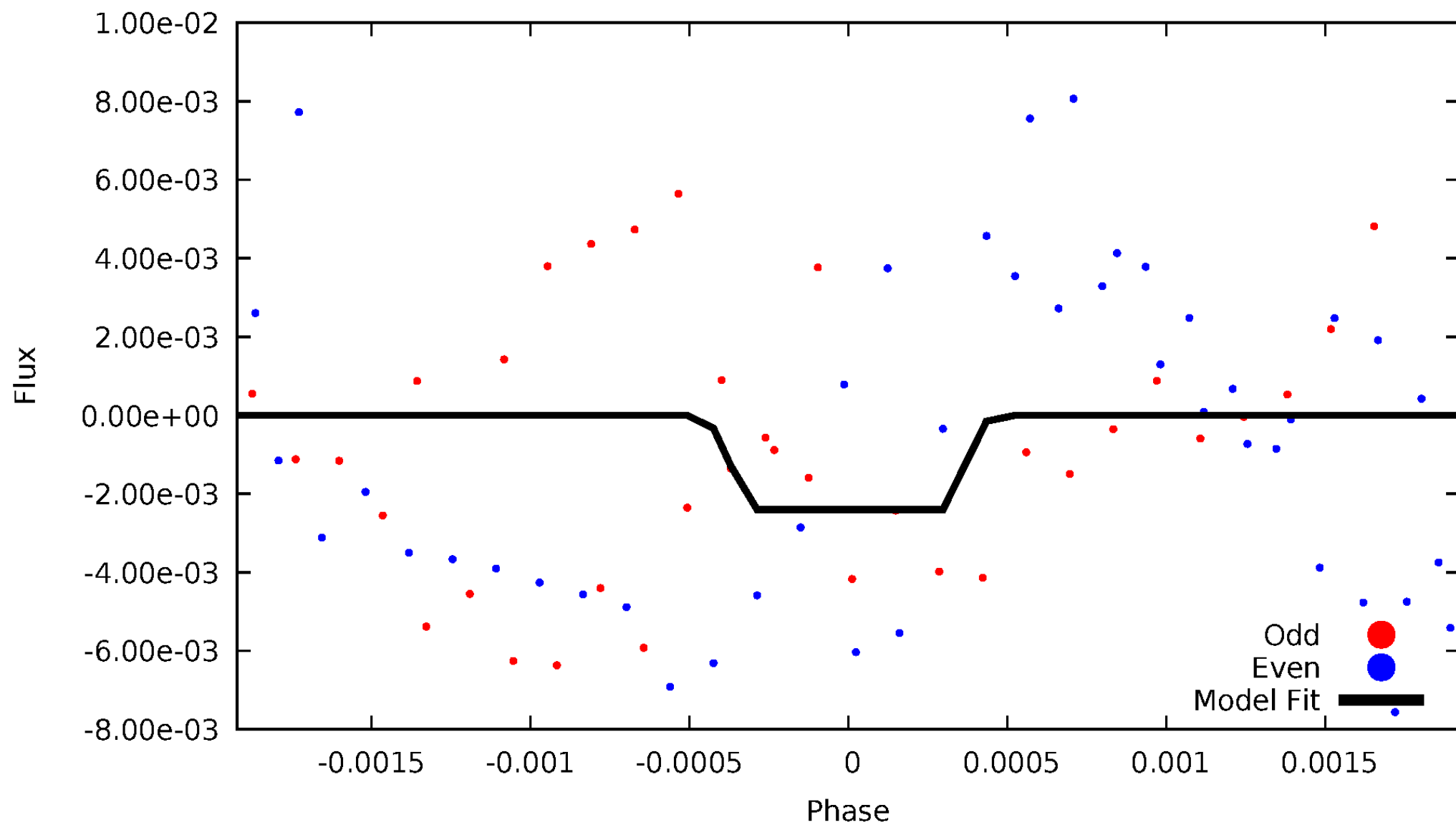
DV Odd/Even

TCE 009716523-05



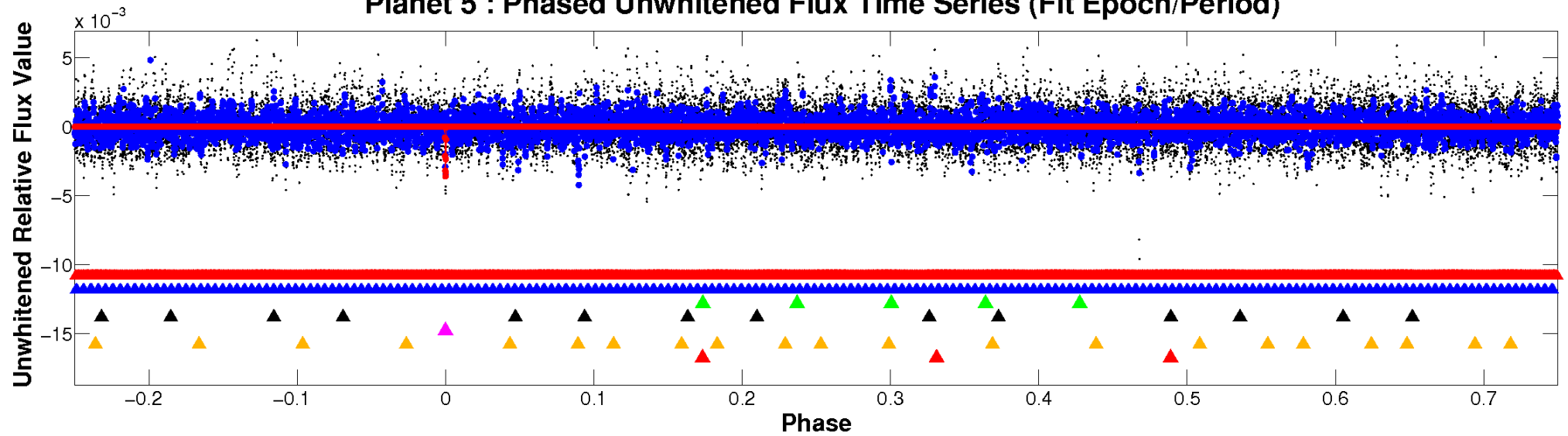
ALT Odd/Even

TCE 009716523-05

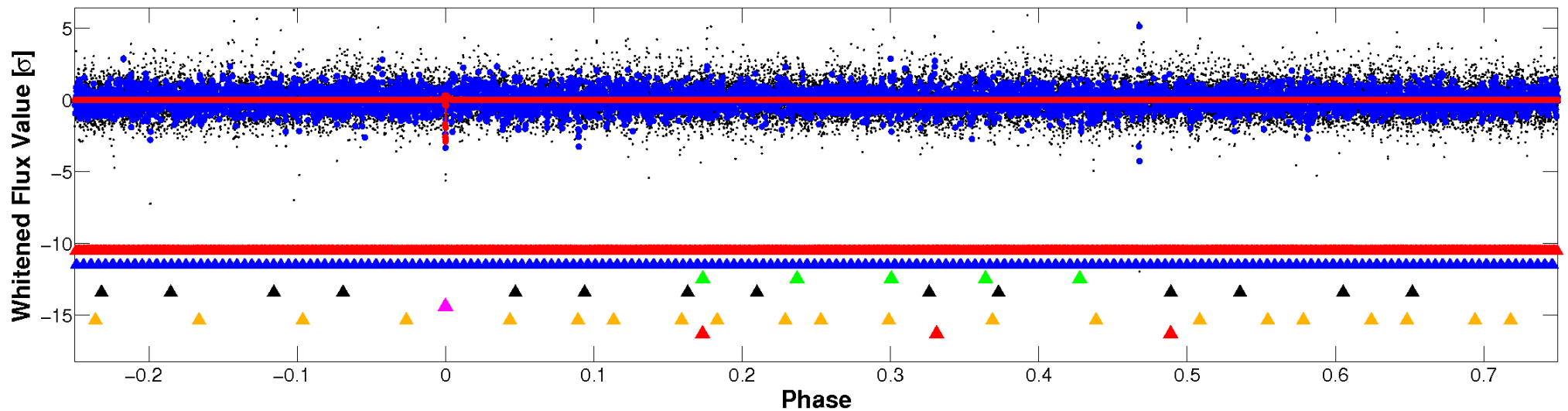


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

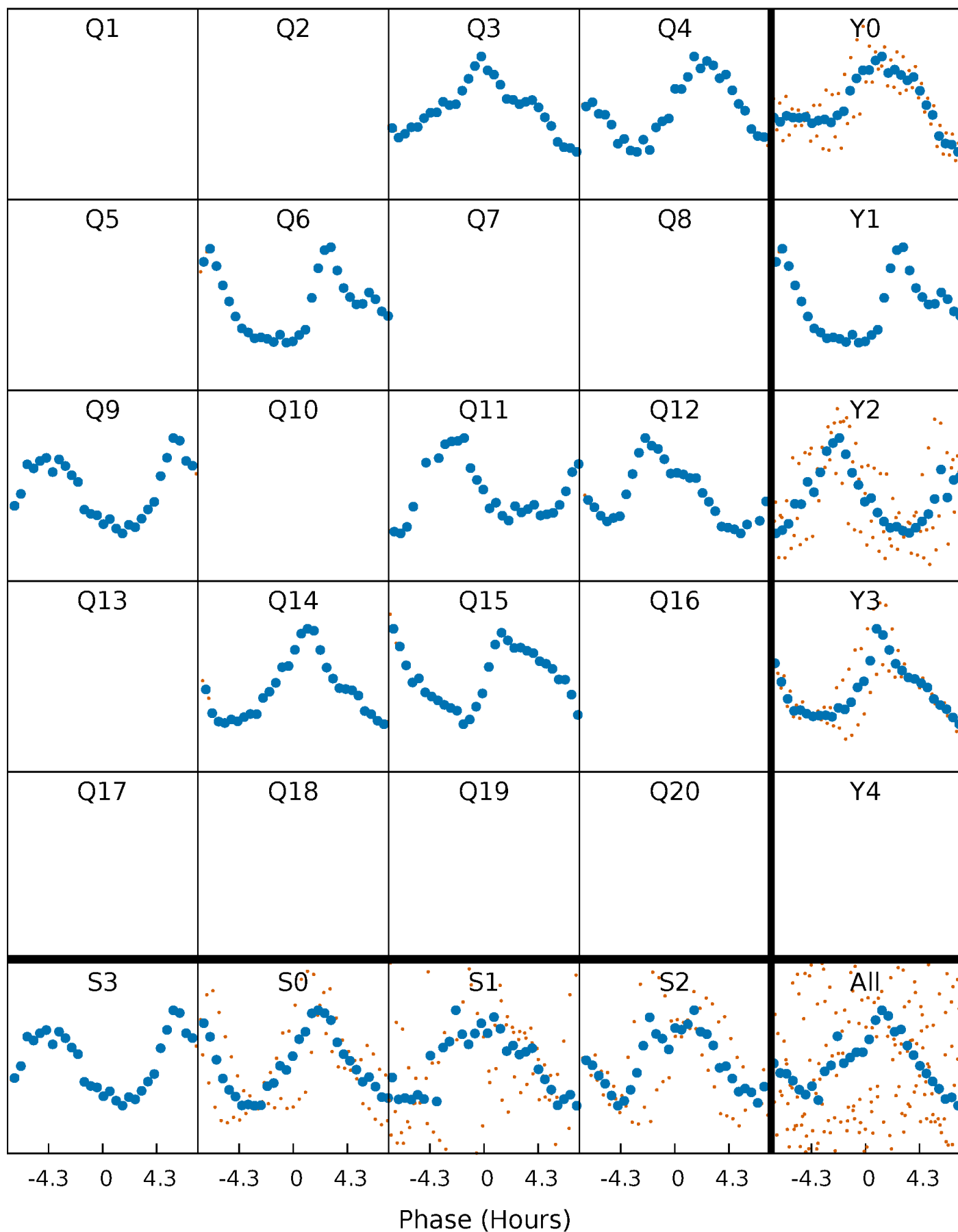


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



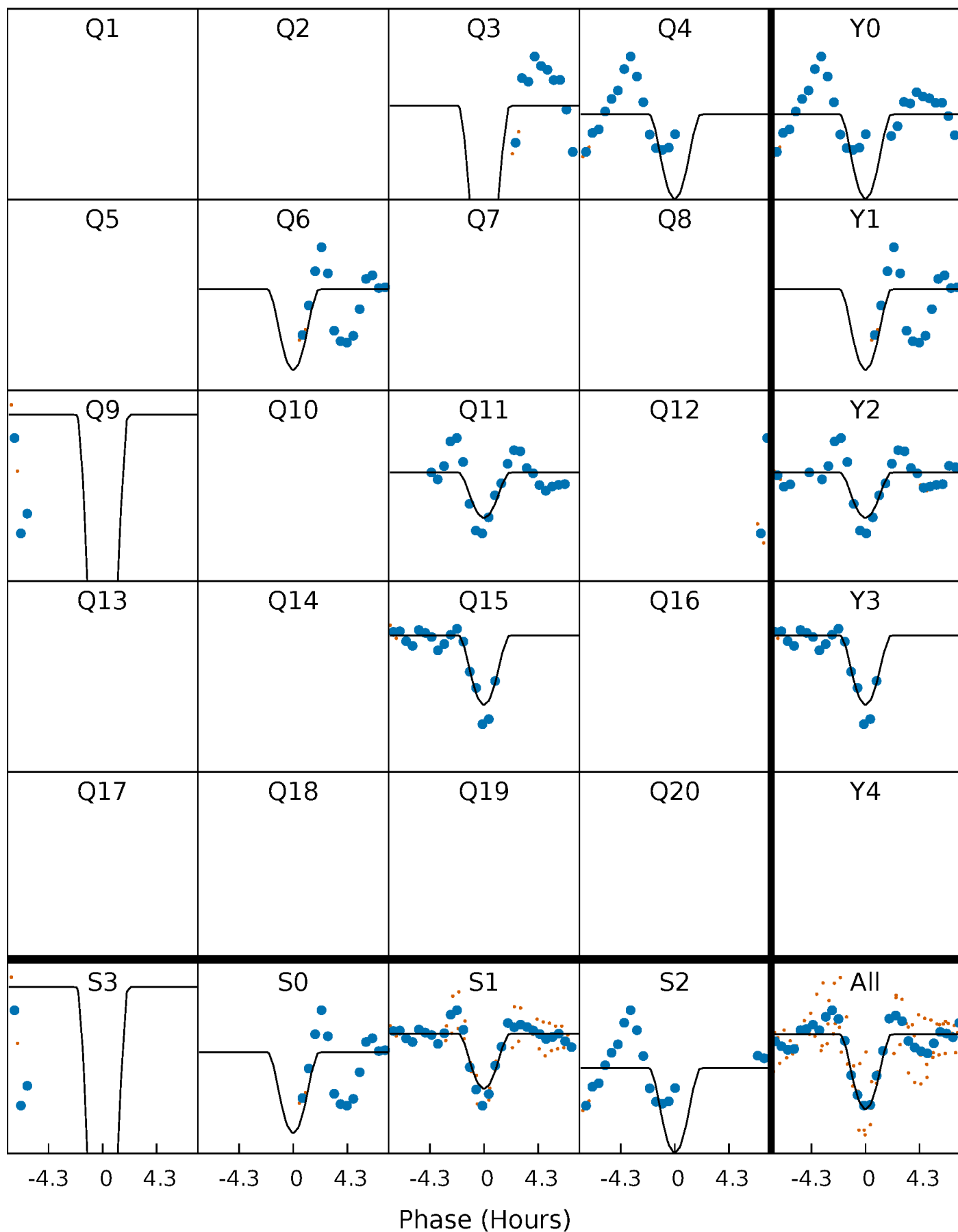
PDC Quarter-Phased Transit Curves

TCE 009716523-05 P=149.315132 Days $T_0=272.799286$ (BKJD)



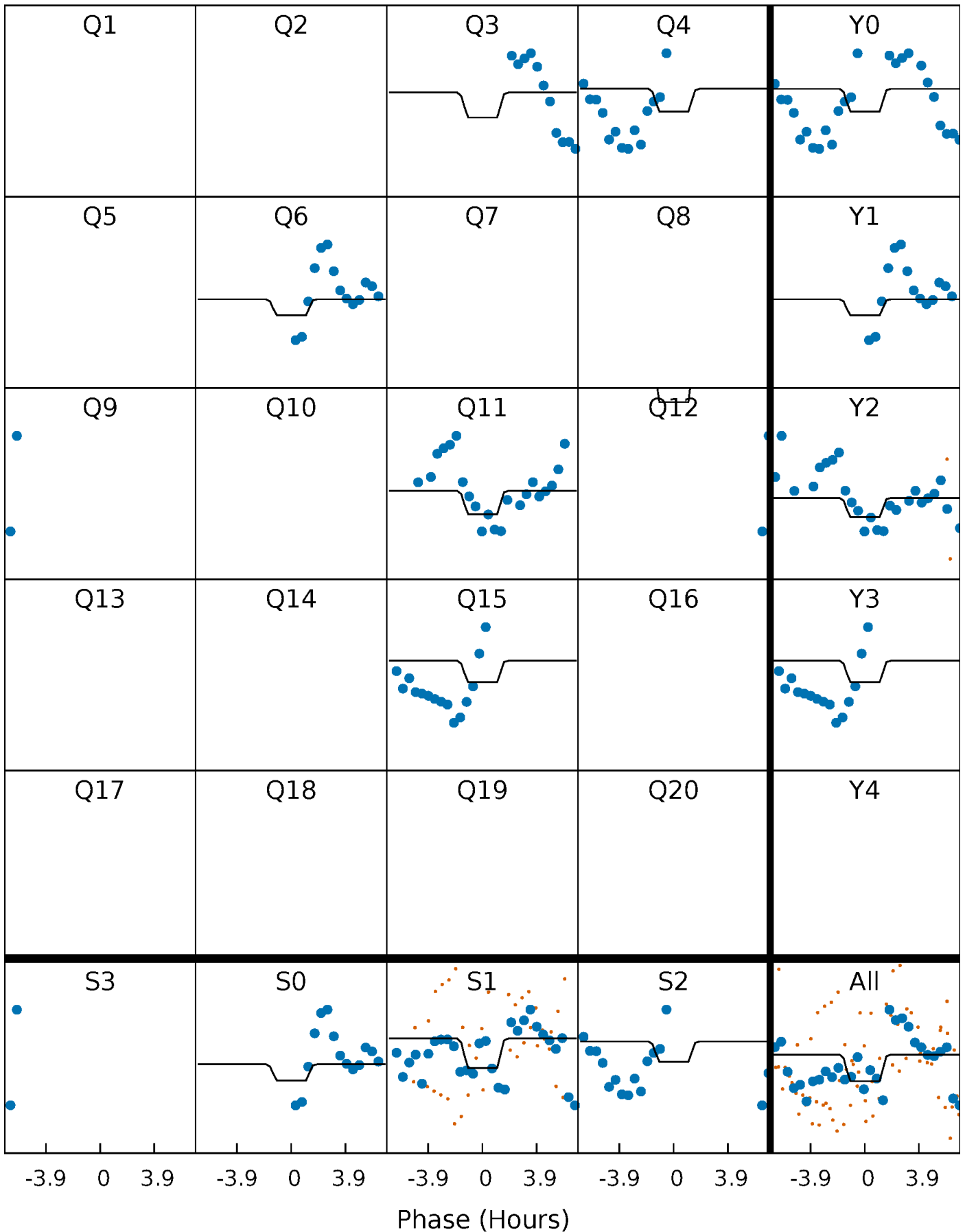
DV Quarter-Phased Transit Curves

TCE 009716523-05 P=149.315132 Days $T_0=272.799286$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

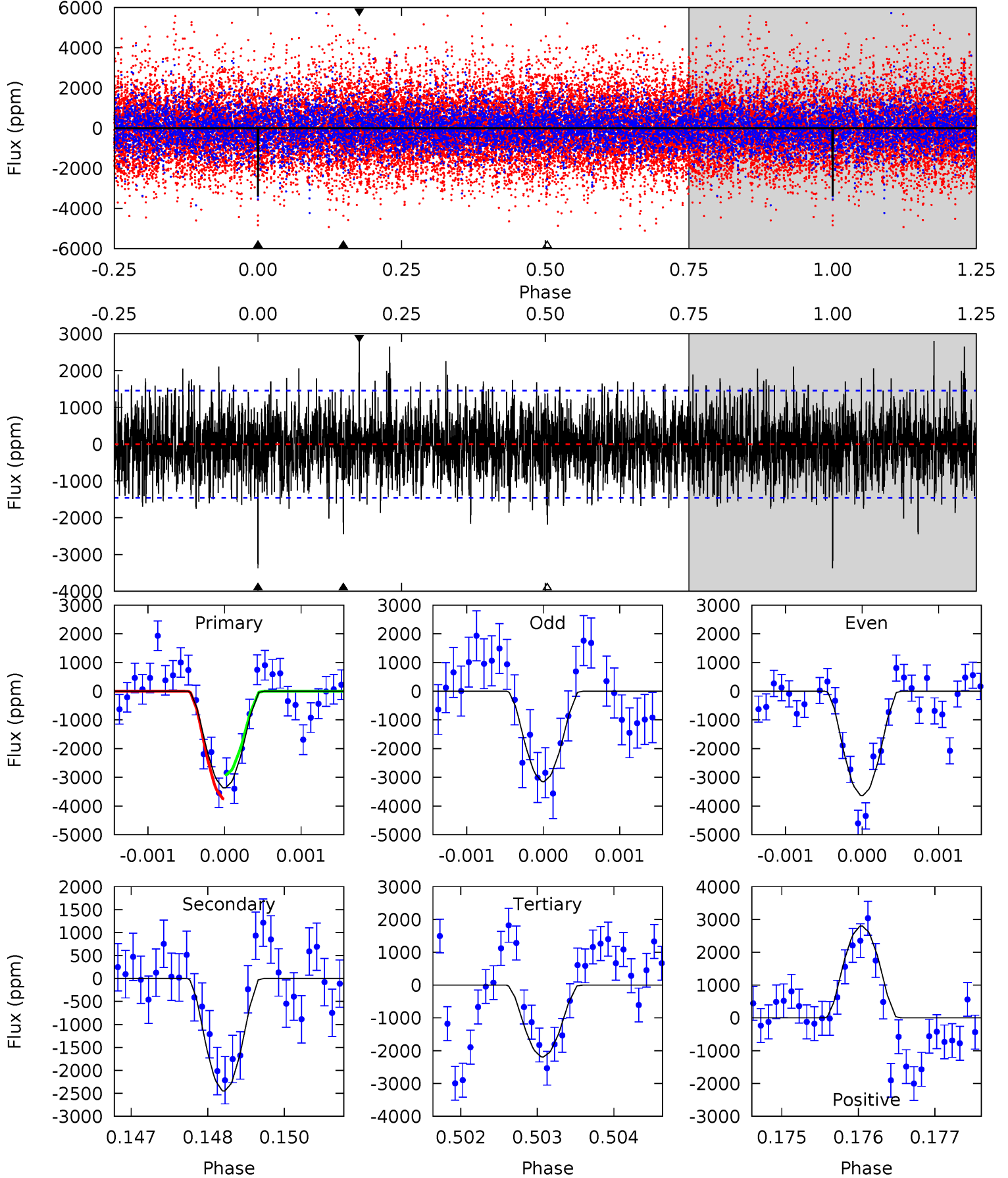
TCE 009716523-05 P=149.315417 Days $T_0=272.815025$ (BKJD)



DV Model-Shift Uniqueness Test

009716523-05, P = 149.315132 Days, E = 123.484154 Days

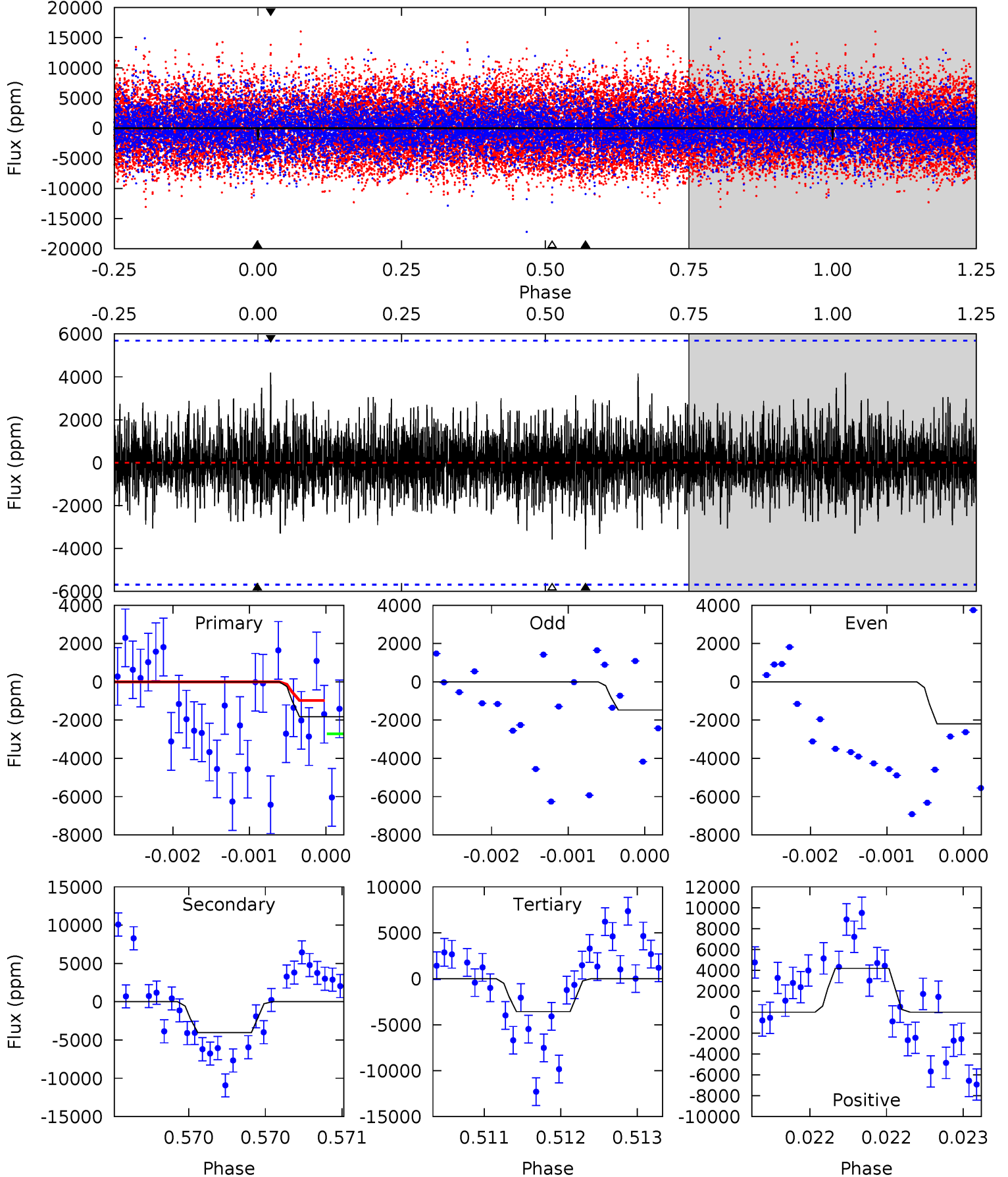
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.5	9.11	8.15	10.4	5.42	3.24	2.40	4.40	2.13	0.97	-1.30	0.89	0.93	0.45	1.52



Alt Model-Shift Uniqueness Test

009716523-05, P = 149.315417 Days, E = 123.499608 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.76	3.89	3.45	4.04	5.48	3.34	0.99	-1.69	-2.28	0.44	-0.16	0.36	0.92	0.51	0.84



Stellar Parameters For KIC 009716523

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7004^{+195}_{-318}	$3.797^{+0.375}_{-0.125}$	$0.080^{+0.200}_{-0.350}$	$2.844^{+0.533}_{-1.244}$	$1.848^{+0.164}_{-0.460}$	$0.113^{+0.357}_{-0.043}$
	+3%/-5%	+10%/-3%	+250%/-438%	+19%/-44%	+9%/-25%	+315%/-38%
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 009716523-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-2450 ± 269	$66.19^{+68.26}_{-47.38}$	865^{+65}_{-99}	3639^{+2262}_{-698}	138^{+1559}_{-105}
Alt.	-4027 ± 1036	$55.45^{+63.93}_{-38.48}$	860^{+66}_{-92}	4166^{+2908}_{-908}	310^{+3127}_{-242}

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

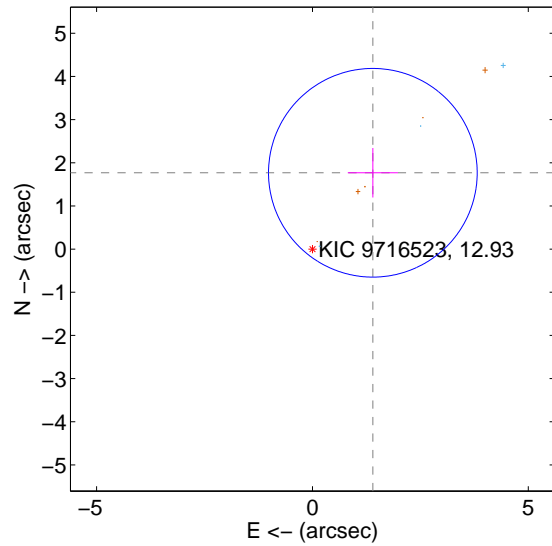
Supplemental centroid analysis for 009716523-05. Kepler magnitude: 12.93. Transit SNR 9.07

There are 3 quarters with good PRF difference image offsets

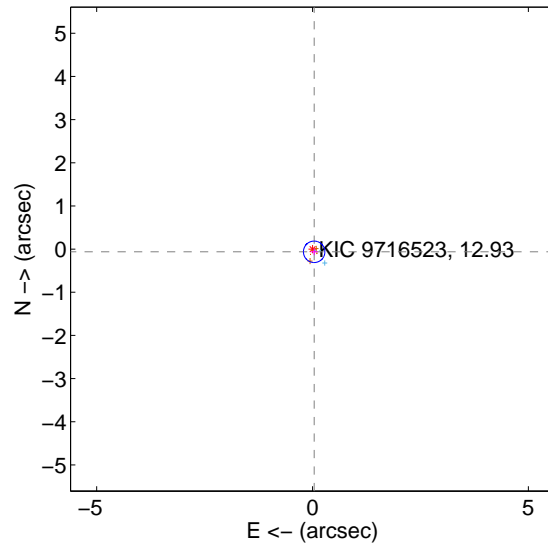
The OOT PRF centroid is offset from the target star catalog position by about 6.17 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.254 ± 0.805	2.80	-1.399 ± 0.581	1.768 ± 0.572
PRF-fit source offset from KIC position	0.074 ± 0.083	0.89	-0.038 ± 0.079	-0.063 ± 0.079
photometric centroid source offset	2.34 ± 0.33	6.99	1.57 ± 0.32	-1.73 ± 0.34

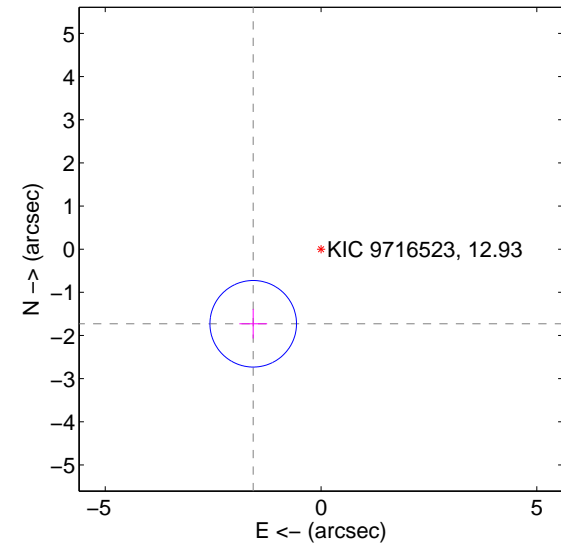
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

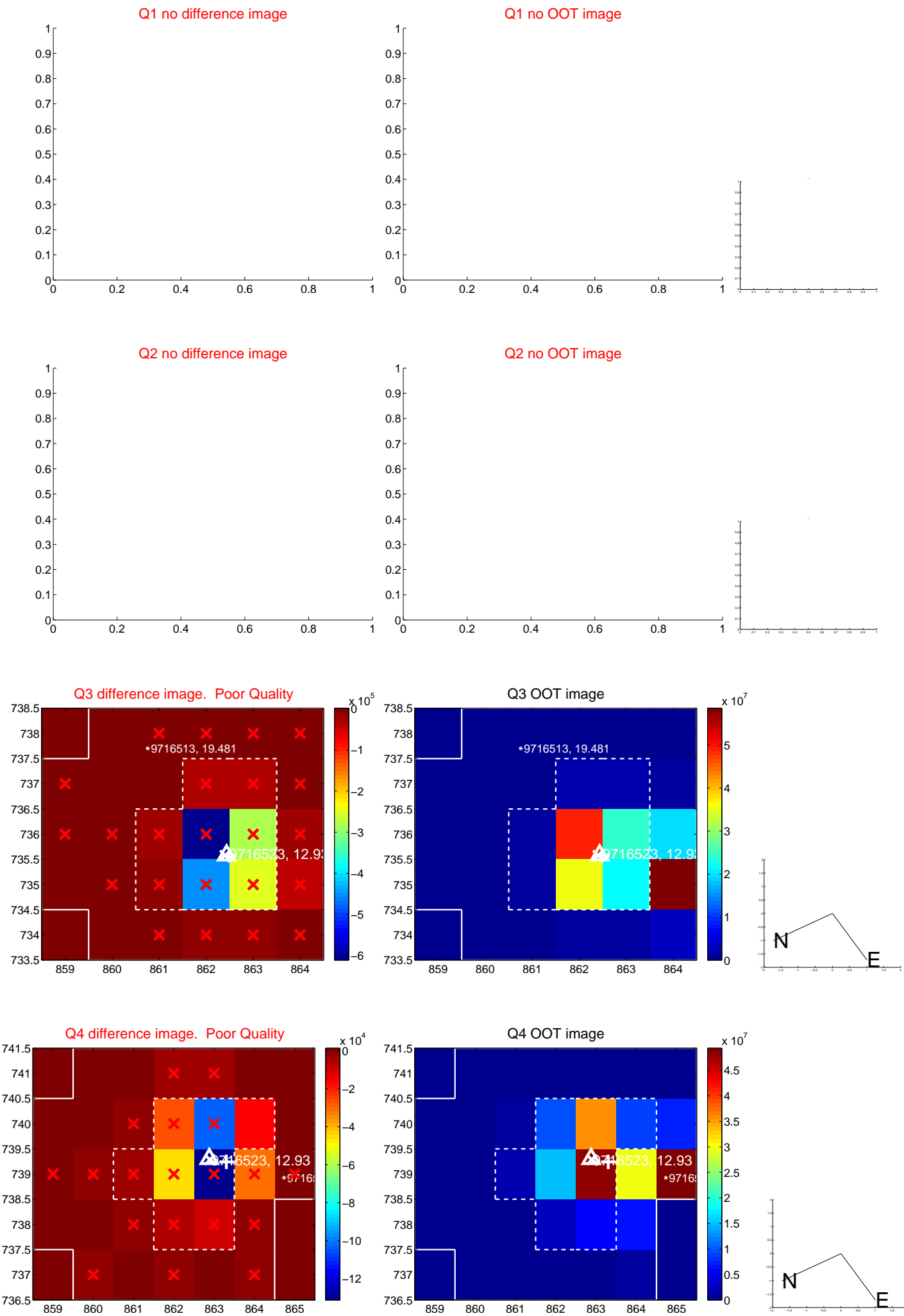


offset from photometric centroids

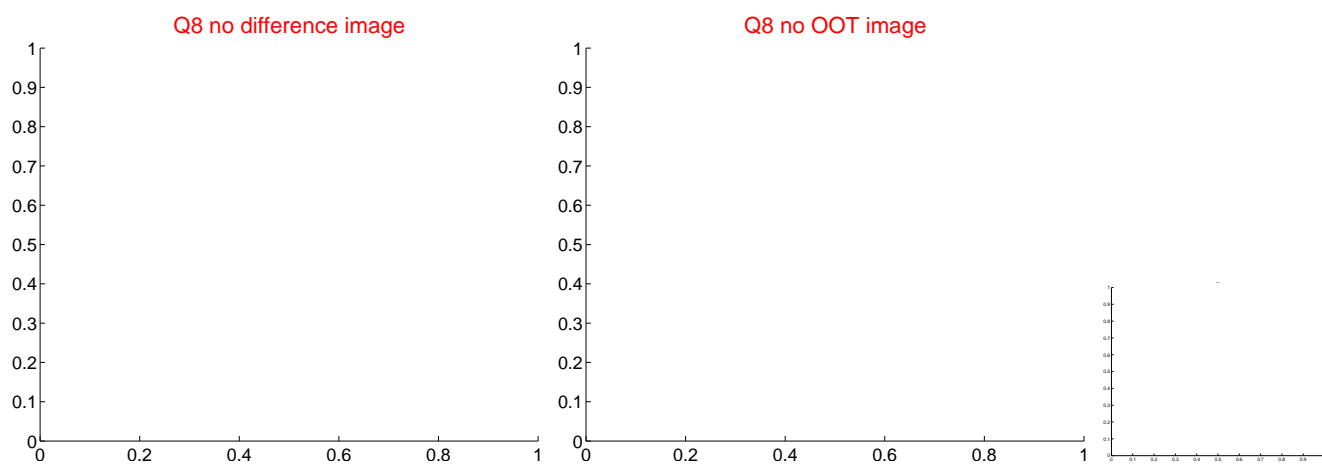
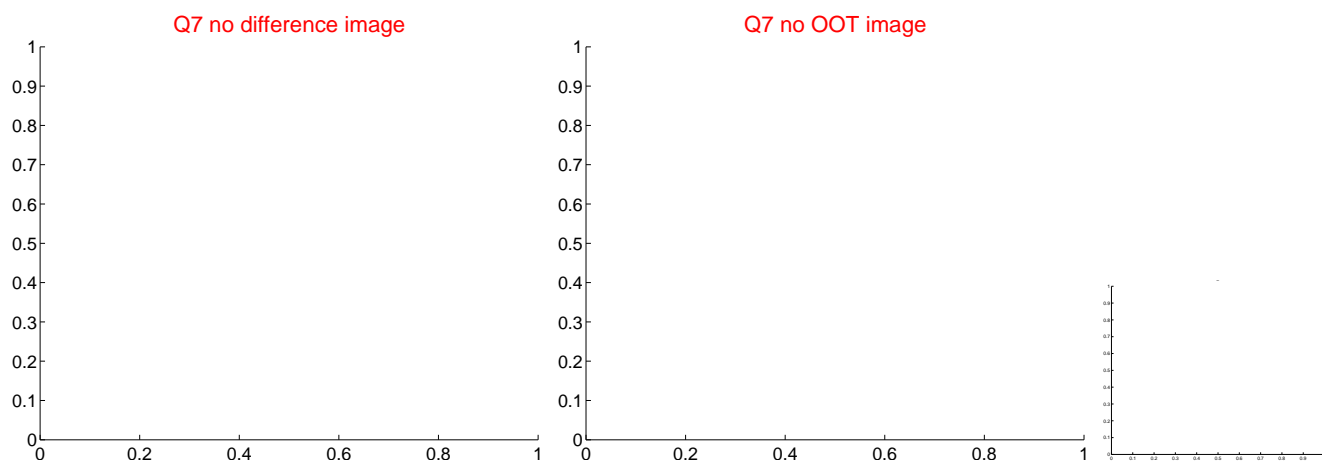
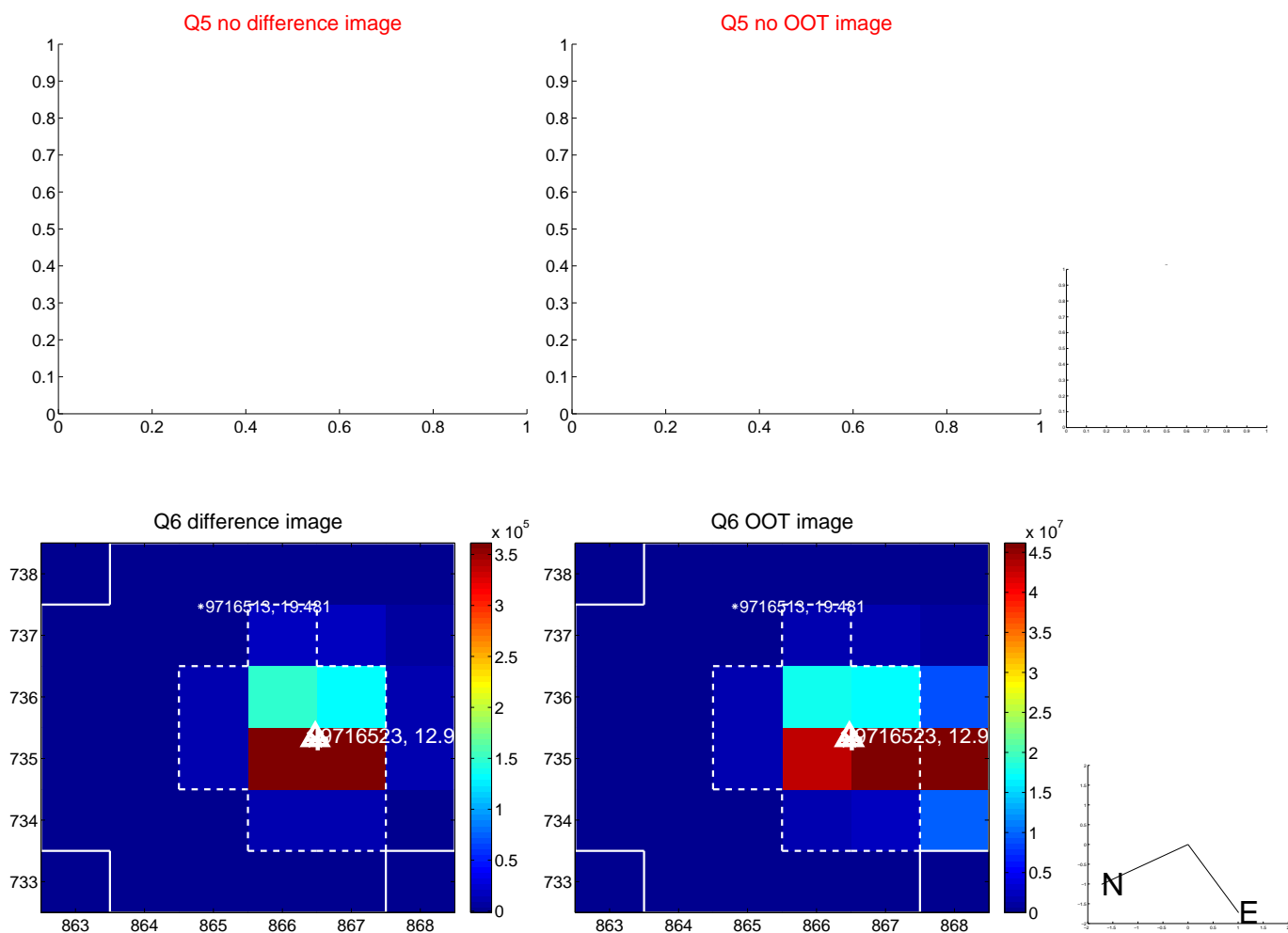


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

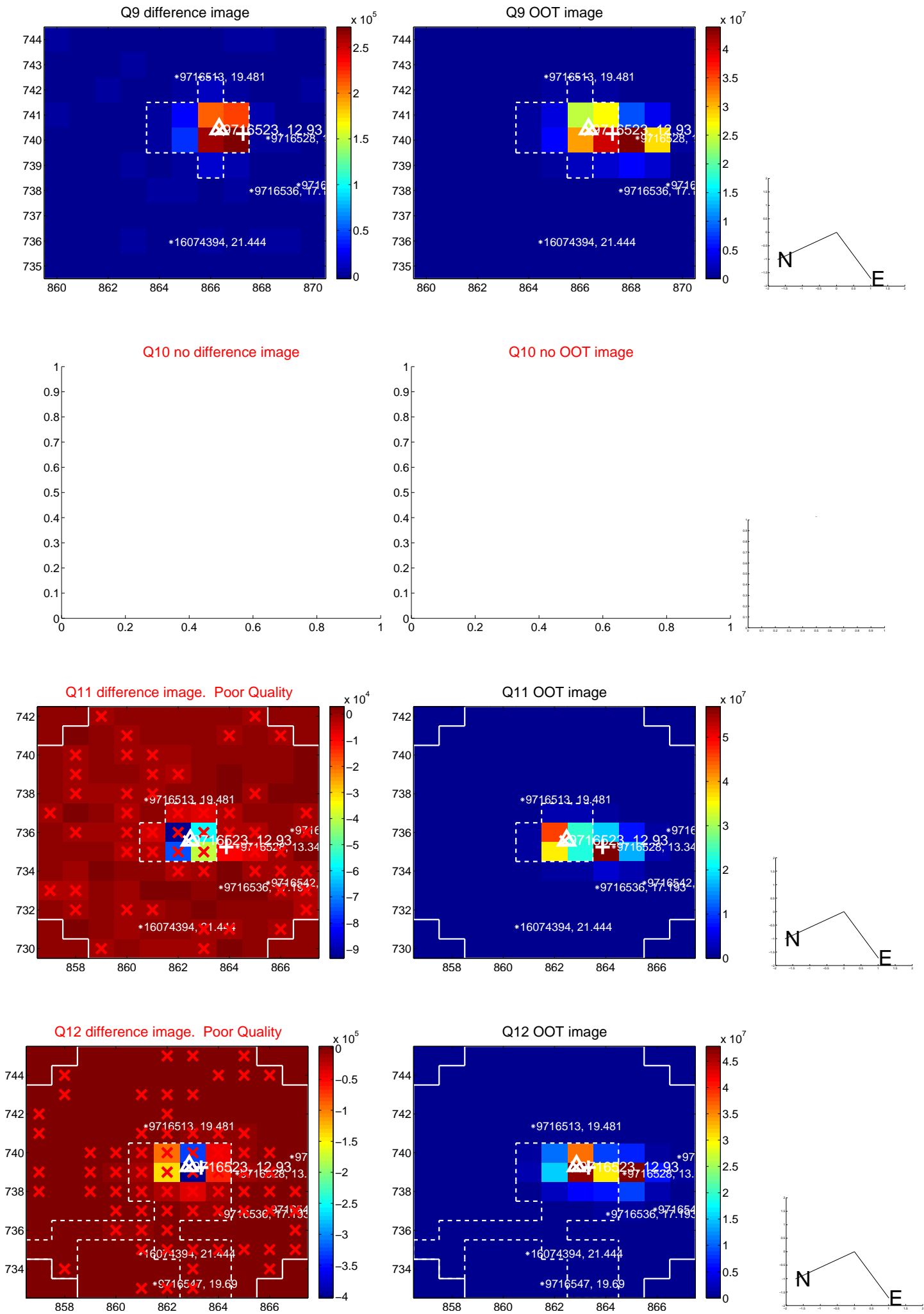
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



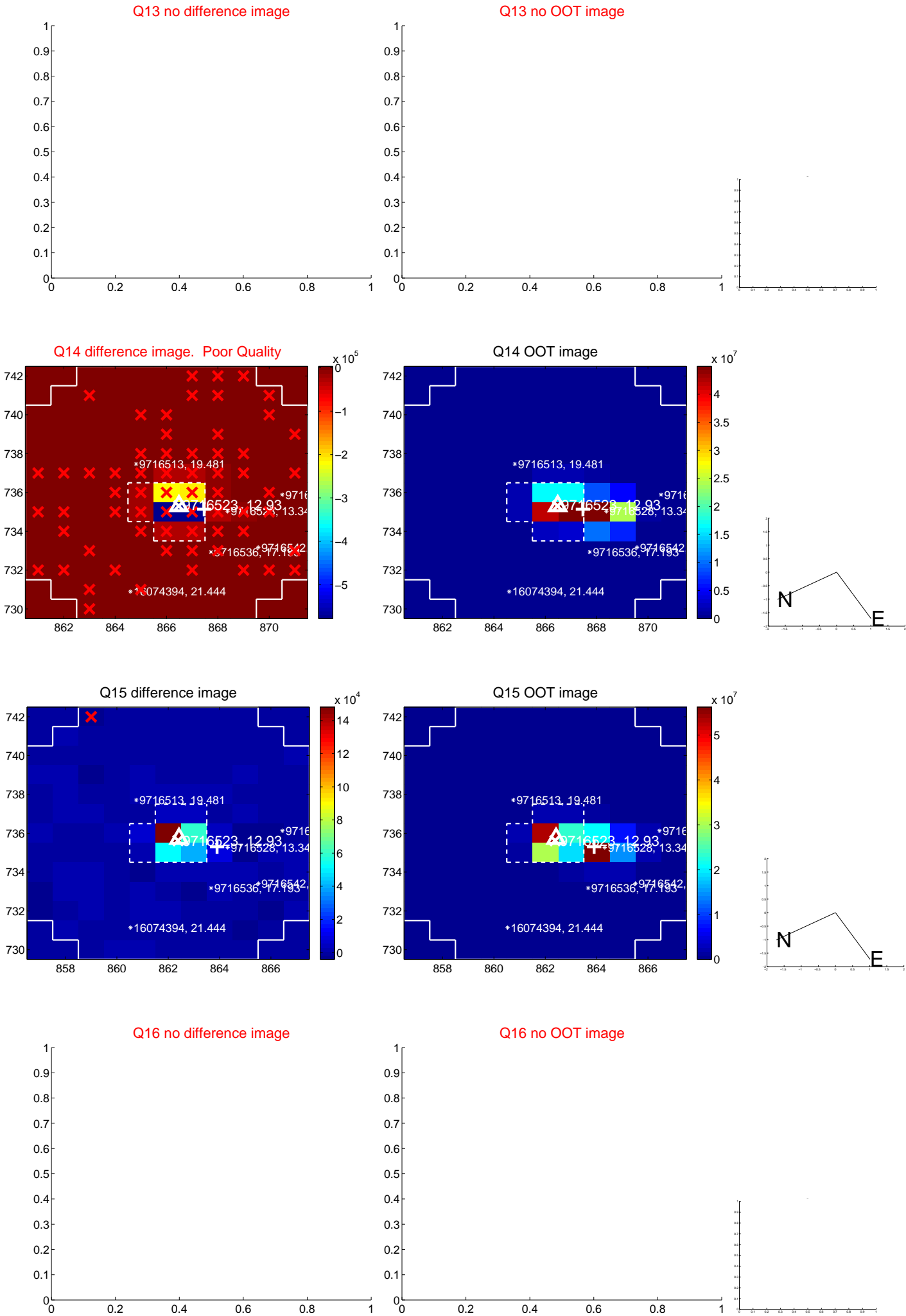
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



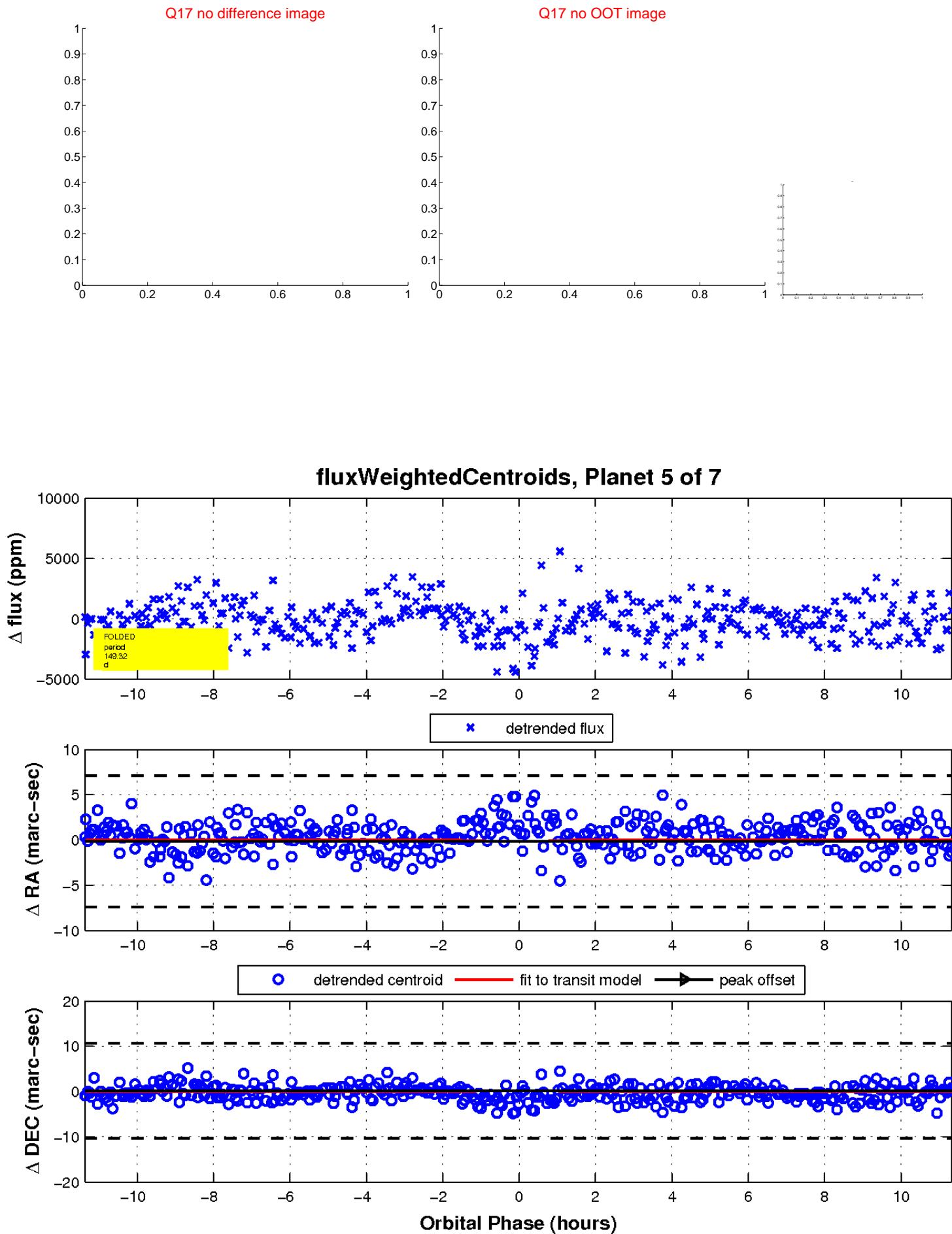
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

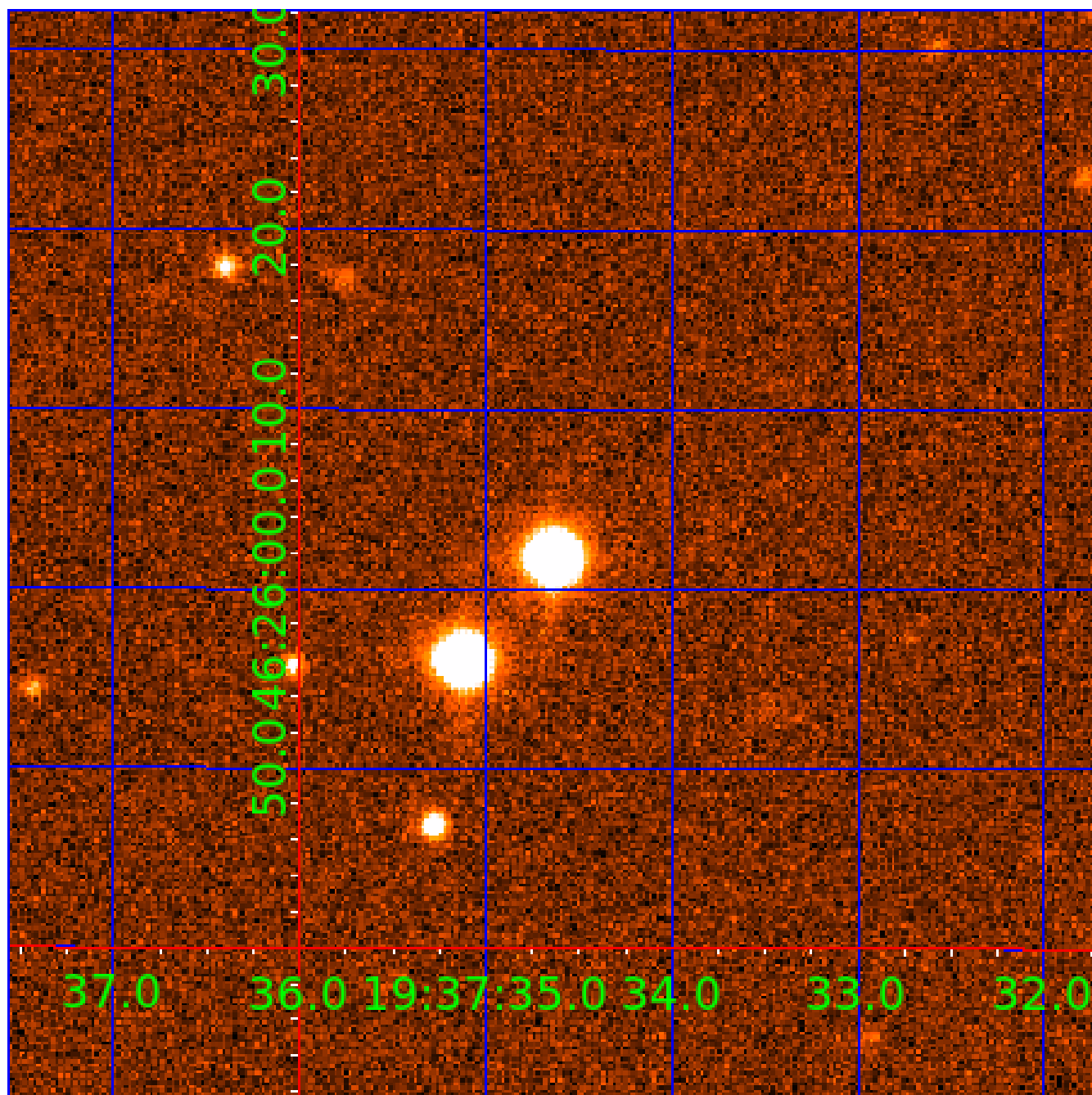


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009716523

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})
009716523-01	OBS	No	0.851171	132.052266	102.1	2.757	8.5	5.7	2.84	7004	3.37	37457.84
009716523-02	OBS	No	2.206382	133.482283	499.4	6.155	8.6	11.2	2.84	7004	12.12	10519.40
009716523-04	OBS	No	107.649091	147.871614	413.3	2.000	9.7	-1.0	2.84	7004	5.86	59.00
009716523-05	OBS	No	149.315132	272.799286	3600.4	3.792	8.5	9.1	2.84	7004	30.83	38.14
009716523-06	OBS	No	69.441327	161.272587	635.7	2.755	8.6	2.4	2.84	7004	7.92	105.86
009716523-07	OBS	No	573.699442	196.486309	202.0	5.000	8.2	-1.0	2.84	7004	4.09	6.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
009716523-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
009716523-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009716523-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_ZUMA—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_KIC_POS
009716523-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS—HALO_GHOST
009716523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

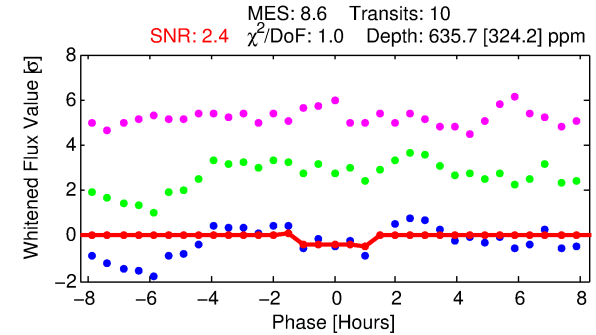
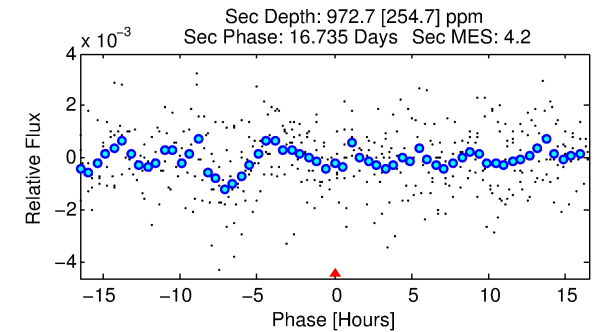
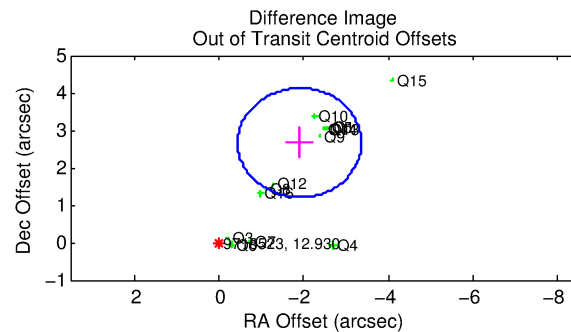
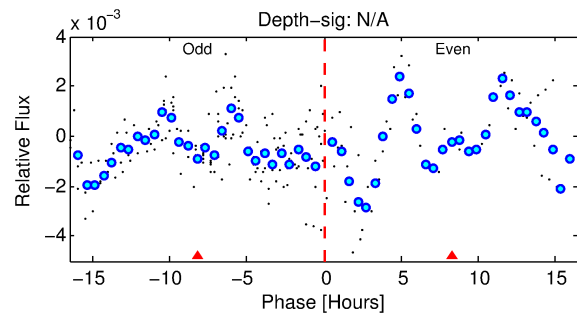
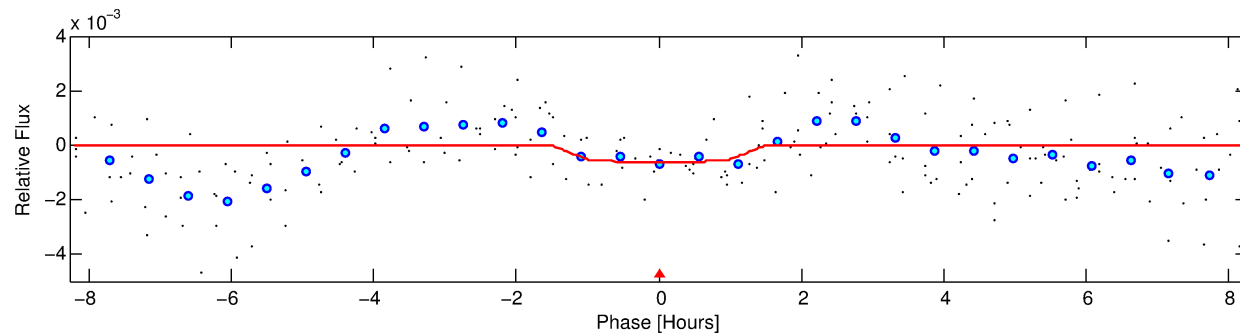
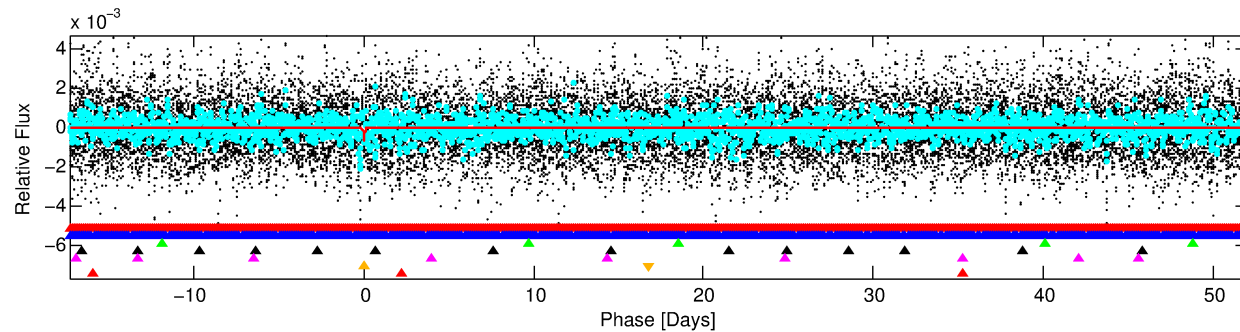
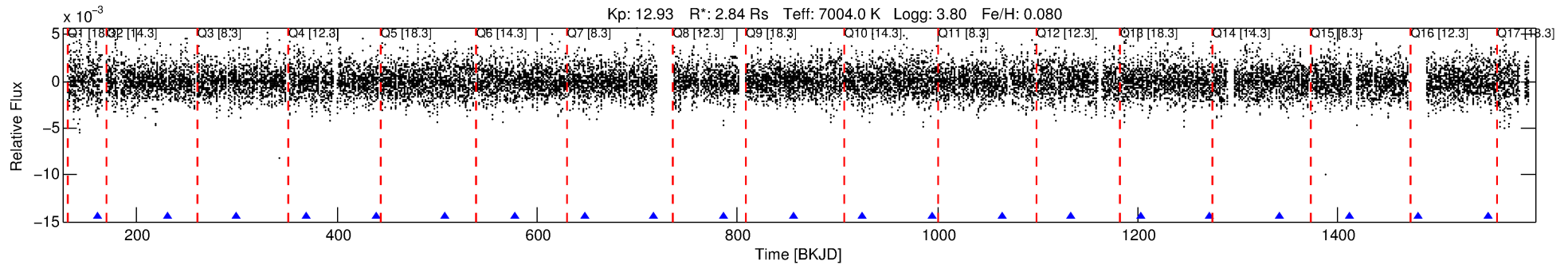
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716523-06

No Significant Match Found

DV One-Page Summary

KIC: 9716523 Candidate: 6 of 7 Period: 69.441 d



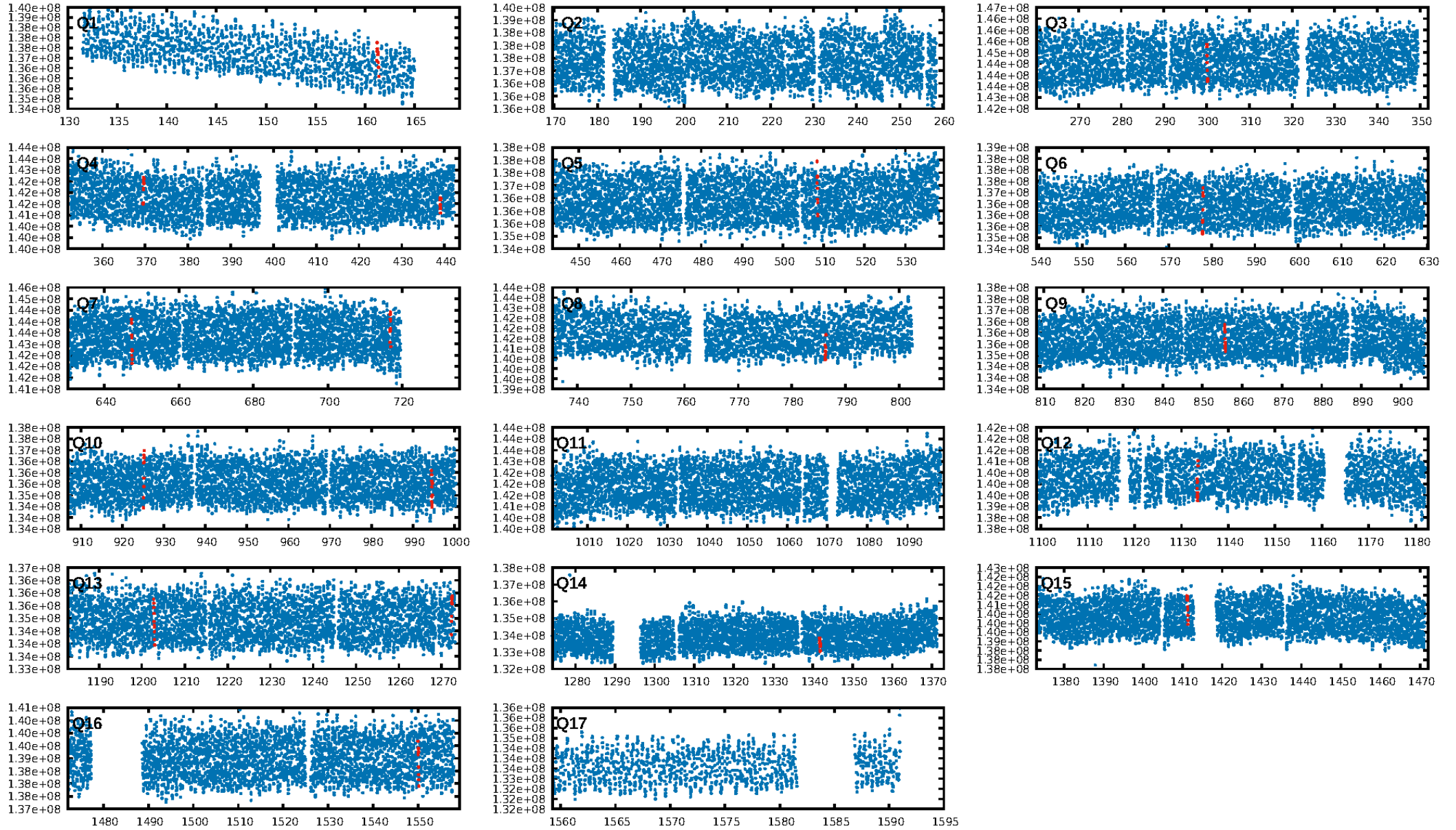
DV Fit Results:

Period = 69.44133 [0.00174] d
Epoch = 161.2726 [0.0167] BKJD
Rp/R* = 0.0255 [0.0344]
a/R* = 123.50 [923.82]
b = 0.80 [3.41]
Seff = 105.86 [70.97]
Teq = 818 [137] K
Rp = 7.92 [11.23] Re
a = 0.4059 [0.1663] AU
Ag = 1407.06 [3923.73] [0.36σ]
Teffp = 7745 [5265] K [1.32σ]

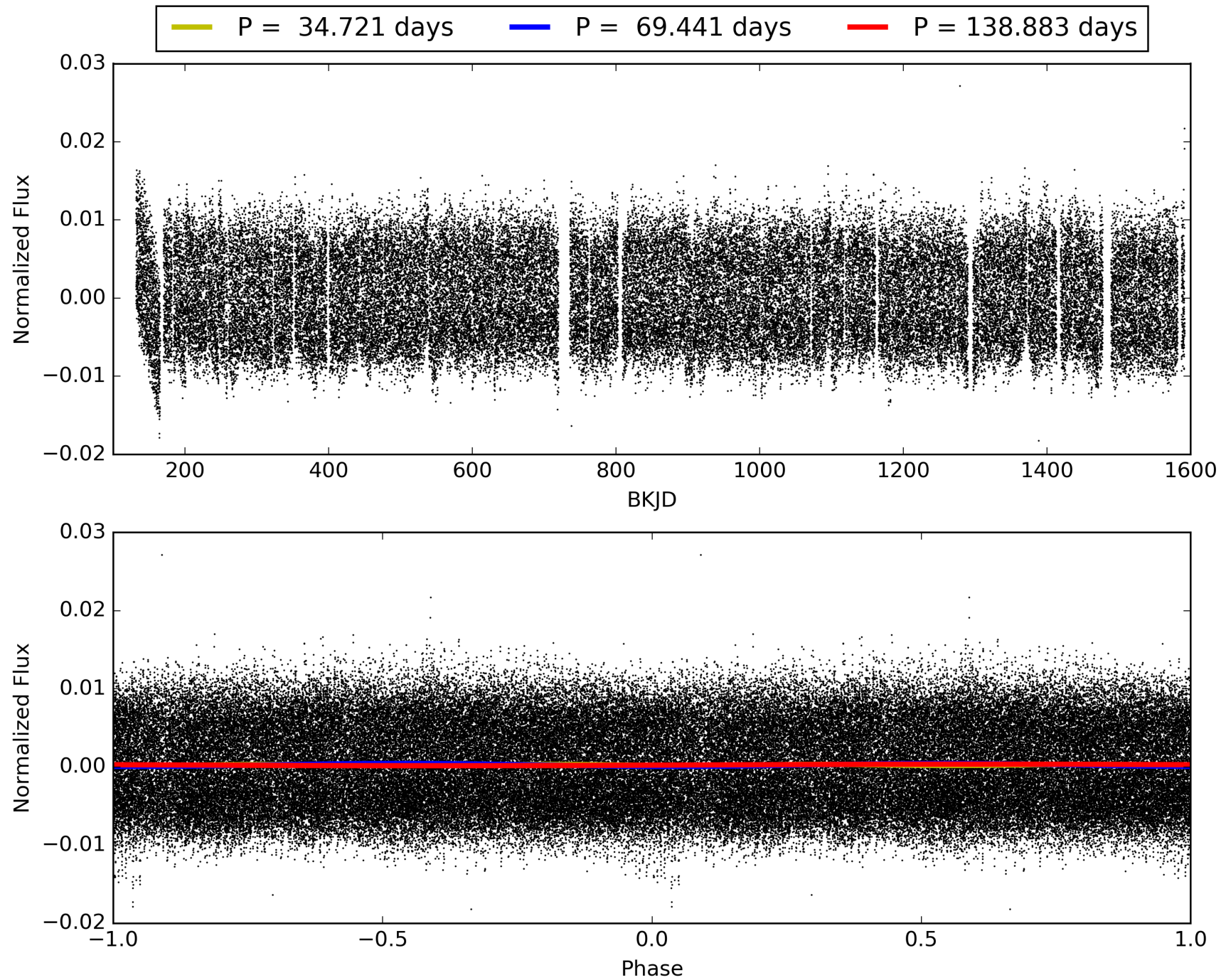
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [239.28σ]
LongPeriod-sig: 100.0% [269.36σ]
ModelChiSquare2-sig: 91.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: 0.06318
Centroid-sig: 53.2%
Centroid-so: 1.758 arcsec [1.75σ]
OotOffset-rm: 3.277 arcsec [6.74σ]
OotOffset-st: 3/3/4/4 [14]
KicOffset-rm: 0.060 arcsec [0.35σ]
KicOffset-st: 3/3/4/4 [14]
DiffImageQuality-fgm: 0.57 [8/14]
DiffImageOverlap-fno: 0.14 [2/14]

TCE 009716523-06, PDC Light Curves

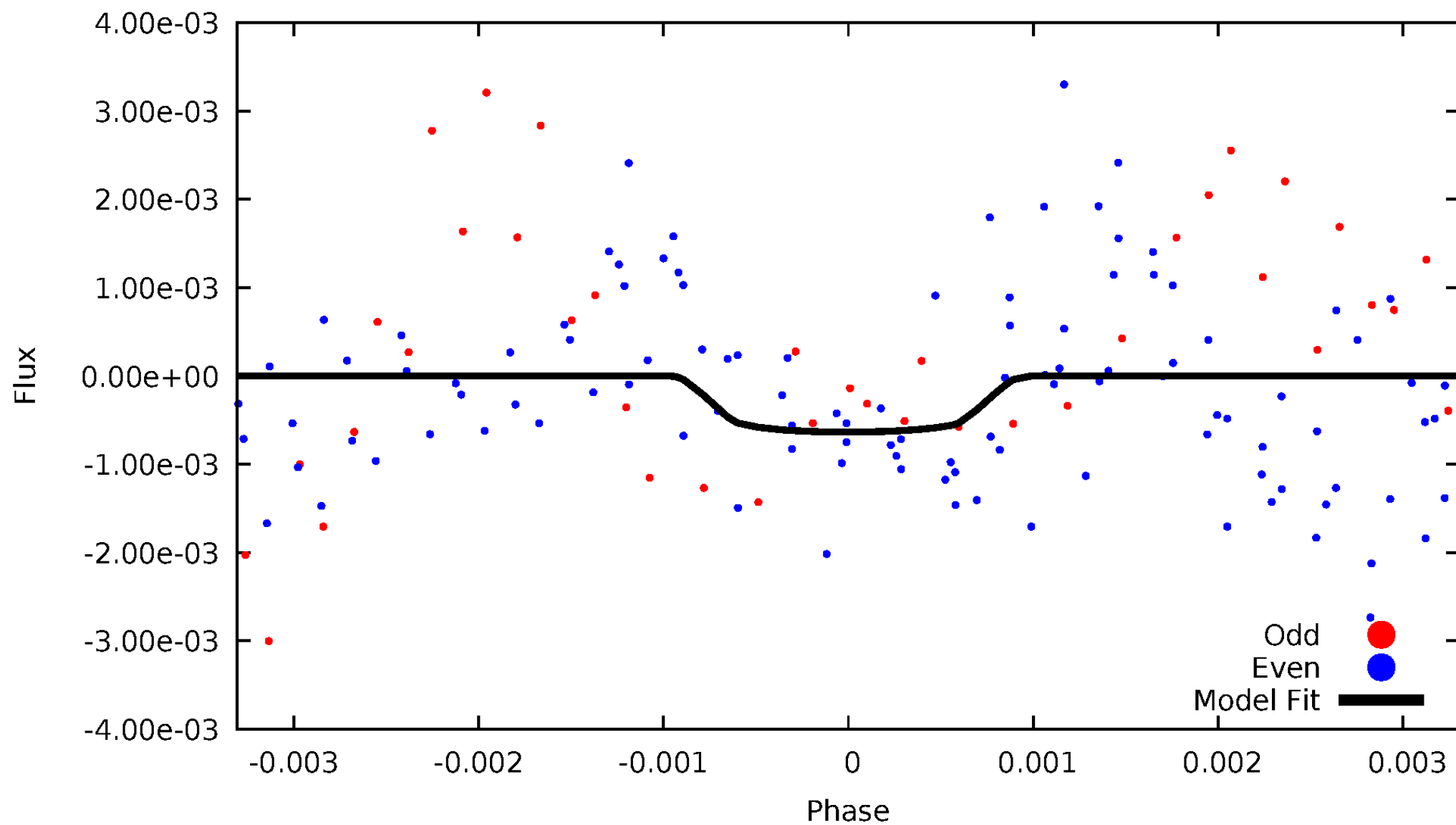


TCE 009716523-06



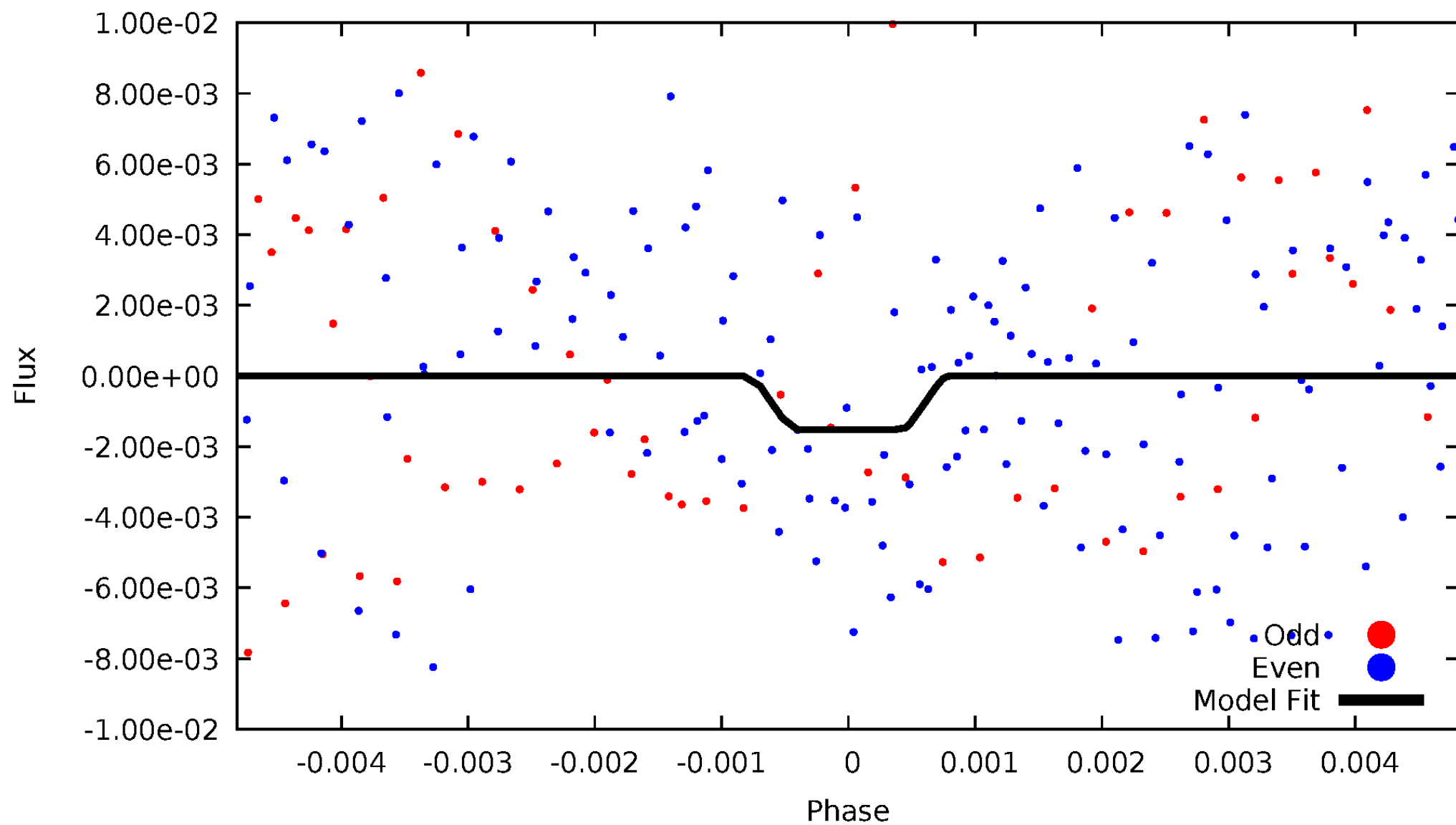
DV Odd/Even

TCE 009716523-06



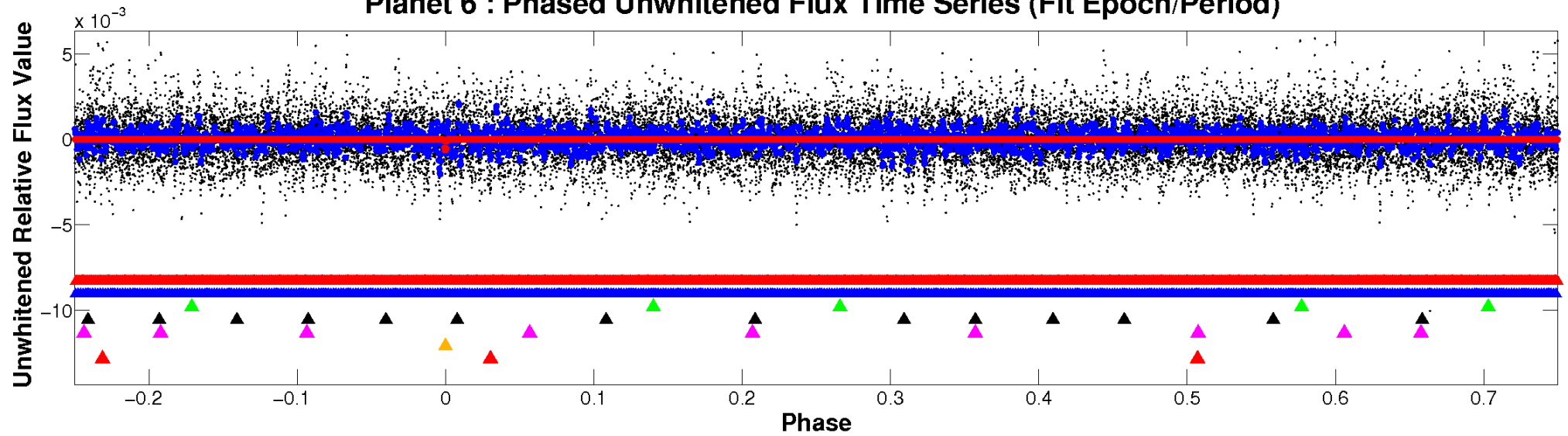
ALT Odd/Even

TCE 009716523-06

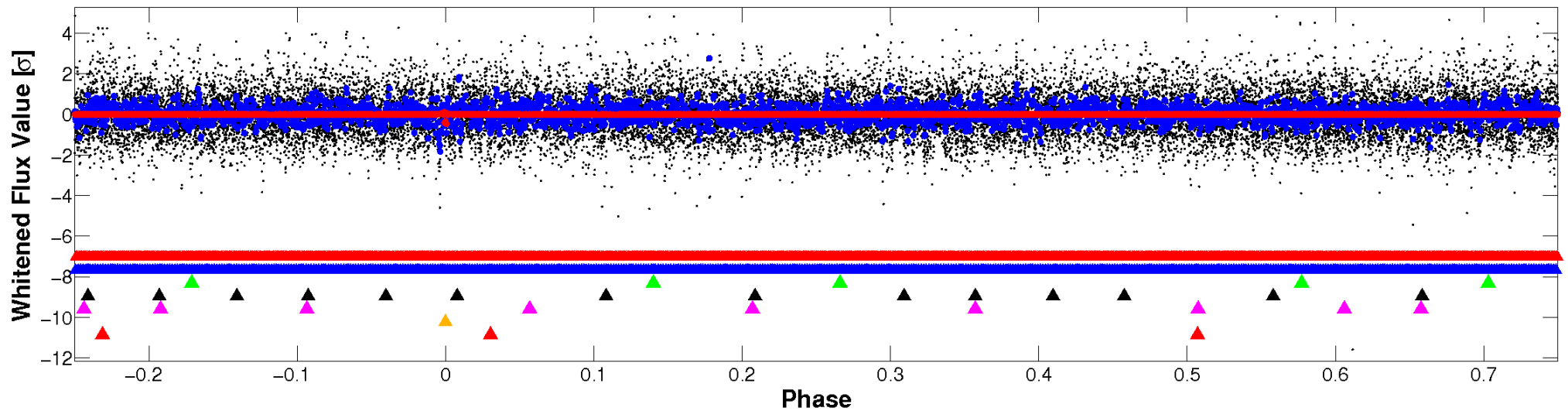


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

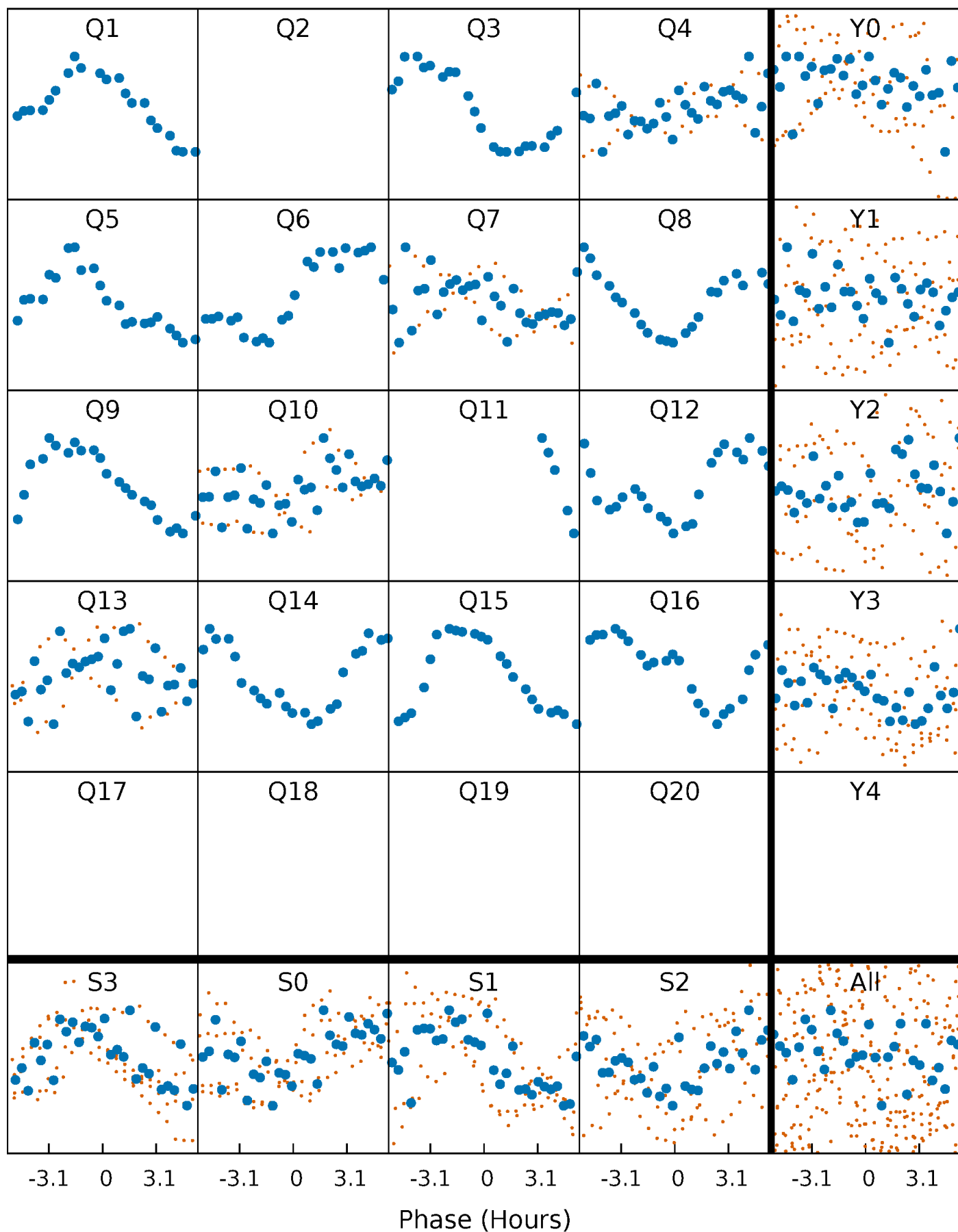


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



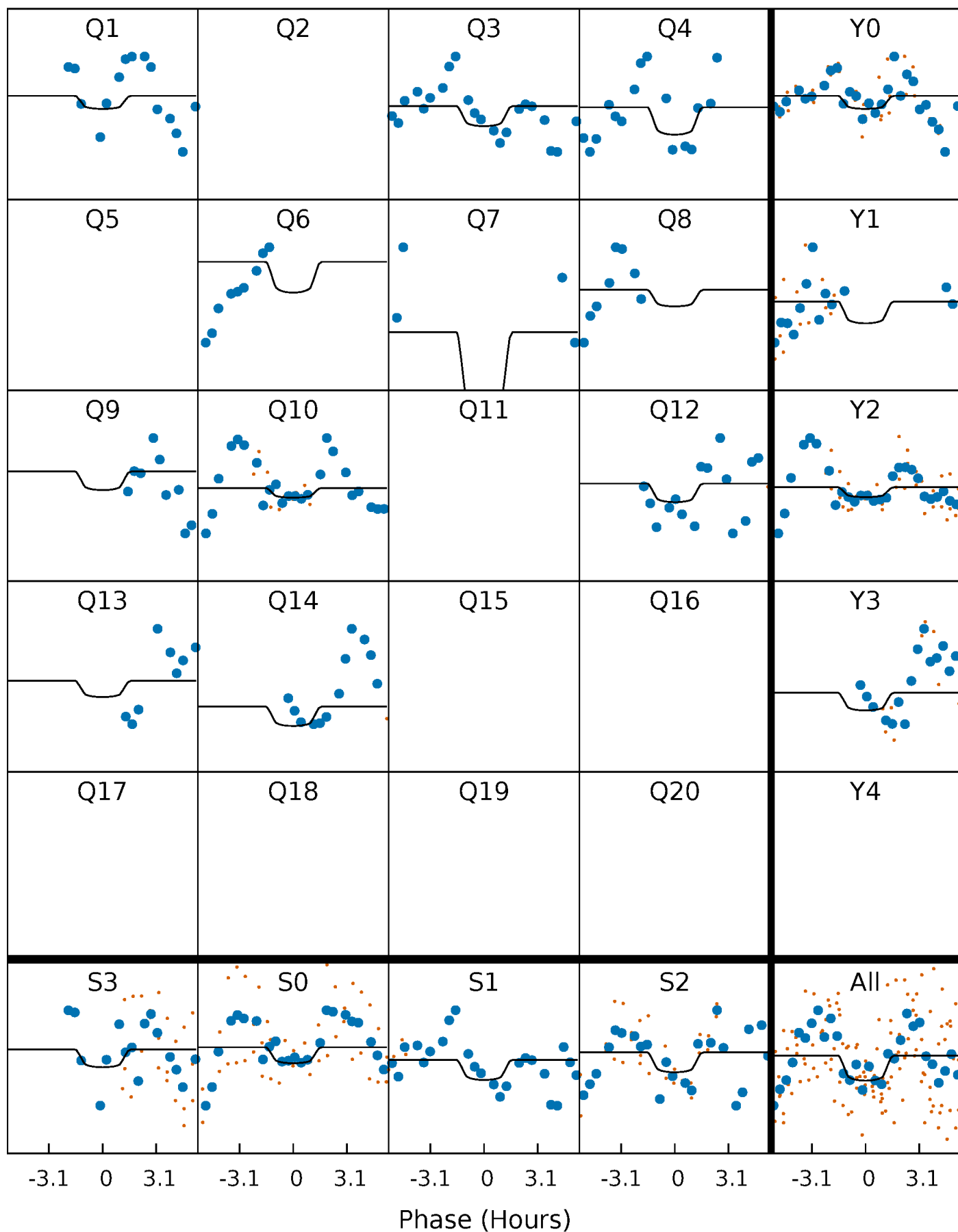
PDC Quarter-Phased Transit Curves

TCE 009716523-06 P= 69.441327 Days $T_0=161.272587$ (BKJD)



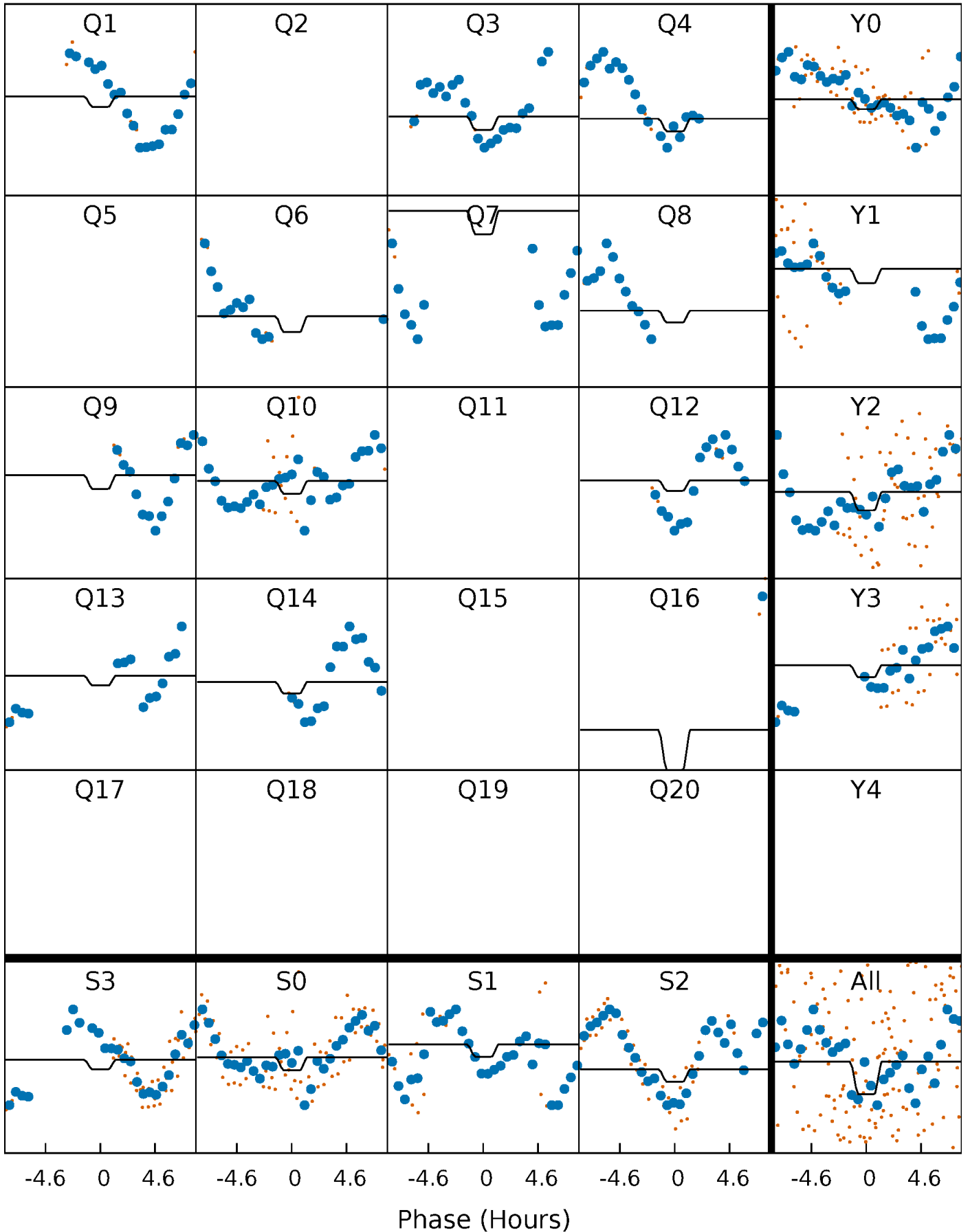
DV Quarter-Phased Transit Curves

TCE 009716523-06 P= 69.441327 Days $T_0=161.272587$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

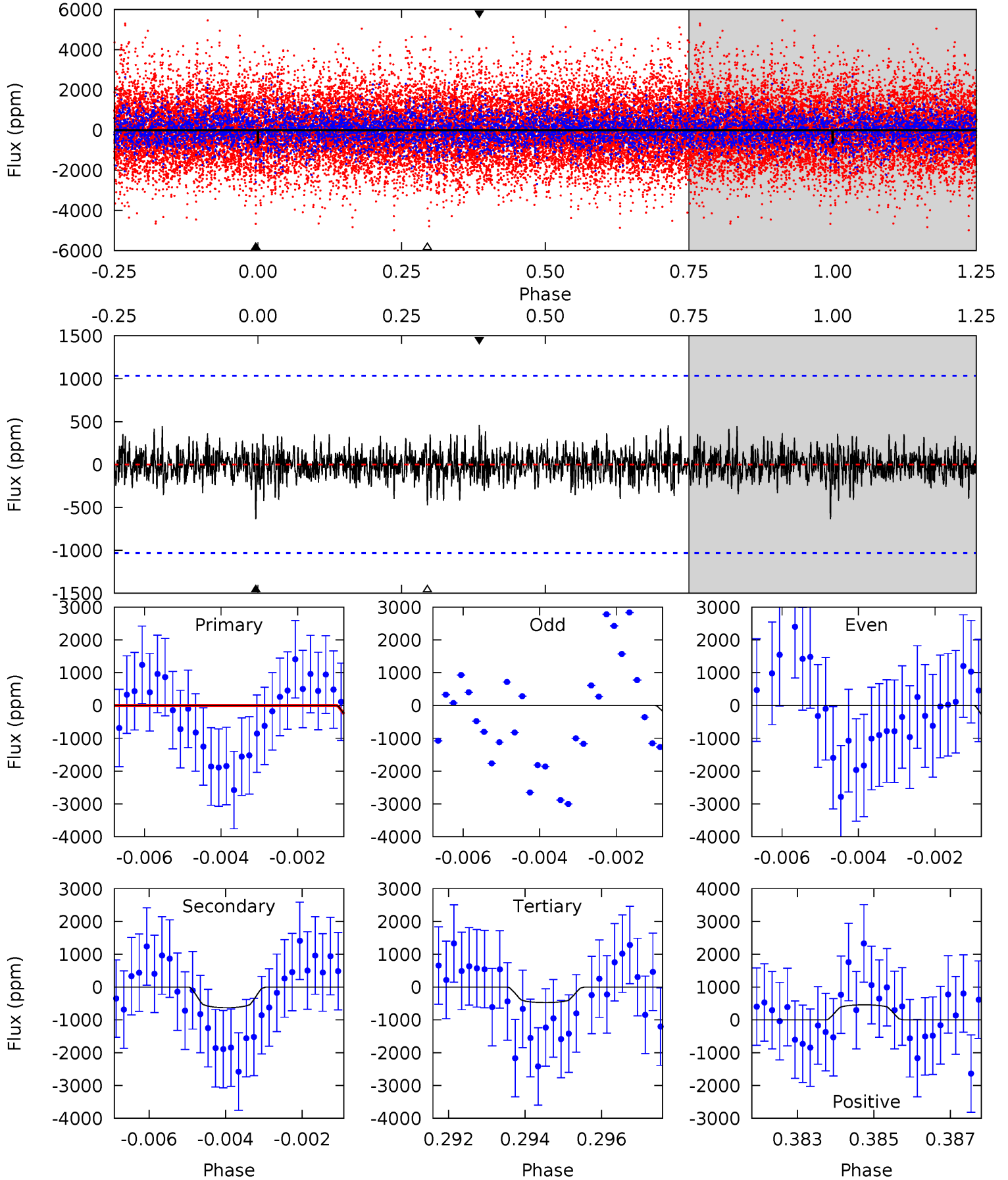
TCE 009716523-06 P= 69.439087 Days $T_0=161.300455$ (BKJD)



DV Model-Shift Uniqueness Test

009716523-06, P = 69.441327 Days, E = 91.831260 Days

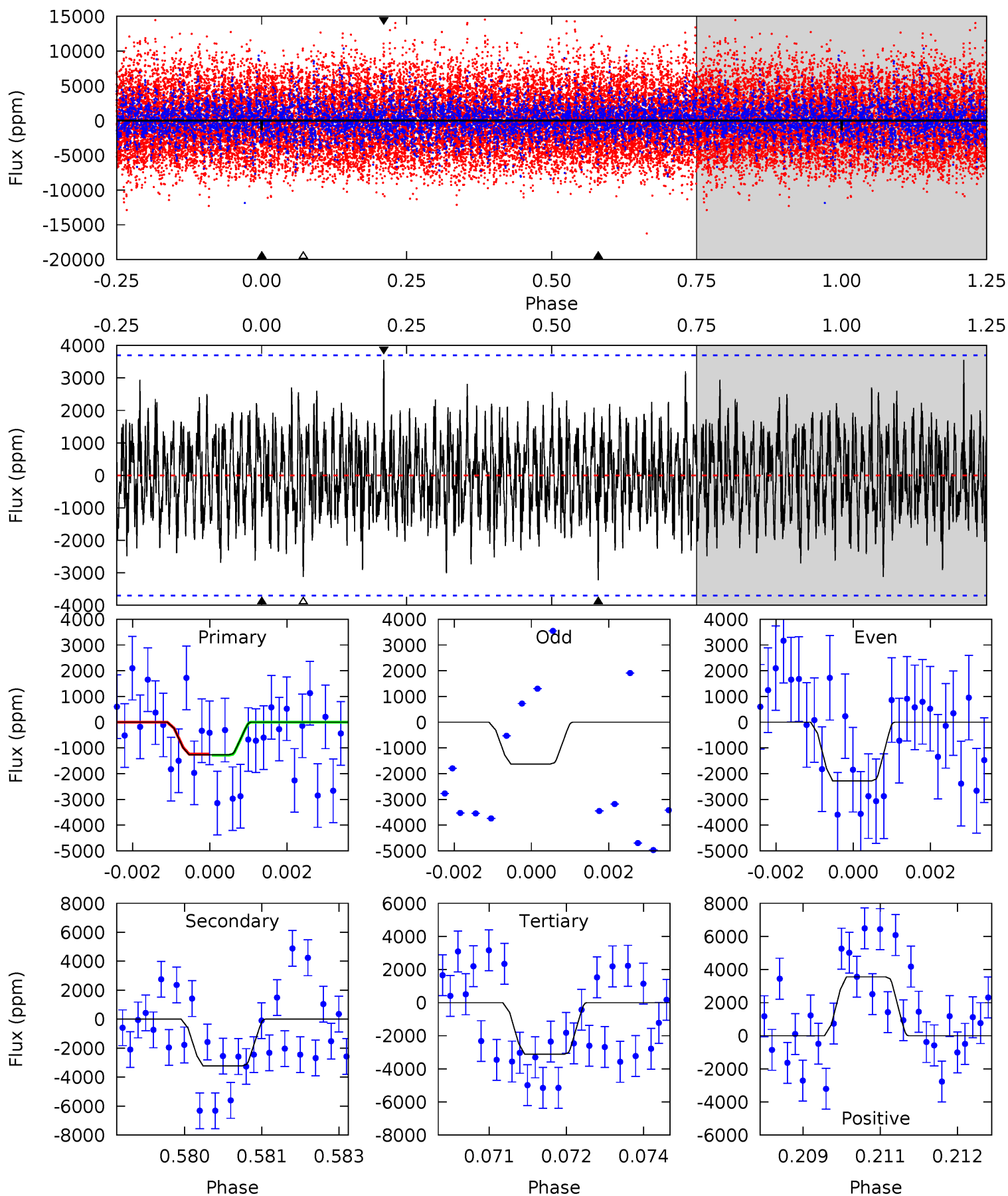
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.28	3.25	2.45	2.37	5.33	3.10	0.69	0.84	0.92	0.81	0.89	0.57	1.01	0.42	0.06



Alt Model-Shift Uniqueness Test

009716523-06, P = 69.439087 Days, E = 91.861368 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.84	4.69	4.54	5.17	5.38	3.17	1.53	-2.70	-3.33	0.15	-0.48	0.40	0.53	0.52	0.03



Stellar Parameters For KIC 009716523

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7004^{+195}_{-318}	$3.797^{+0.375}_{-0.125}$	$0.080^{+0.200}_{-0.350}$	$2.844^{+0.533}_{-1.244}$	$1.848^{+0.164}_{-0.460}$	$0.113^{+0.357}_{-0.043}$
	+3%/-5%	+10%/-3%	+250%/-438%	+19%/-44%	+9%/-25%	+315%/-38%
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 009716523-06 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-630 ± 194	$9.81^{+9.64}_{-6.64}$	1111^{+91}_{-125}	5884^{+5784}_{-1482}	586^{+4905}_{-443}
Alt.	-3223 ± 688	$12.63^{+10.25}_{-8.08}$	1119^{+81}_{-123}	8033^{+10259}_{-2154}	1778^{+11896}_{-1231}

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 $A_{obs} \gg 1.0$

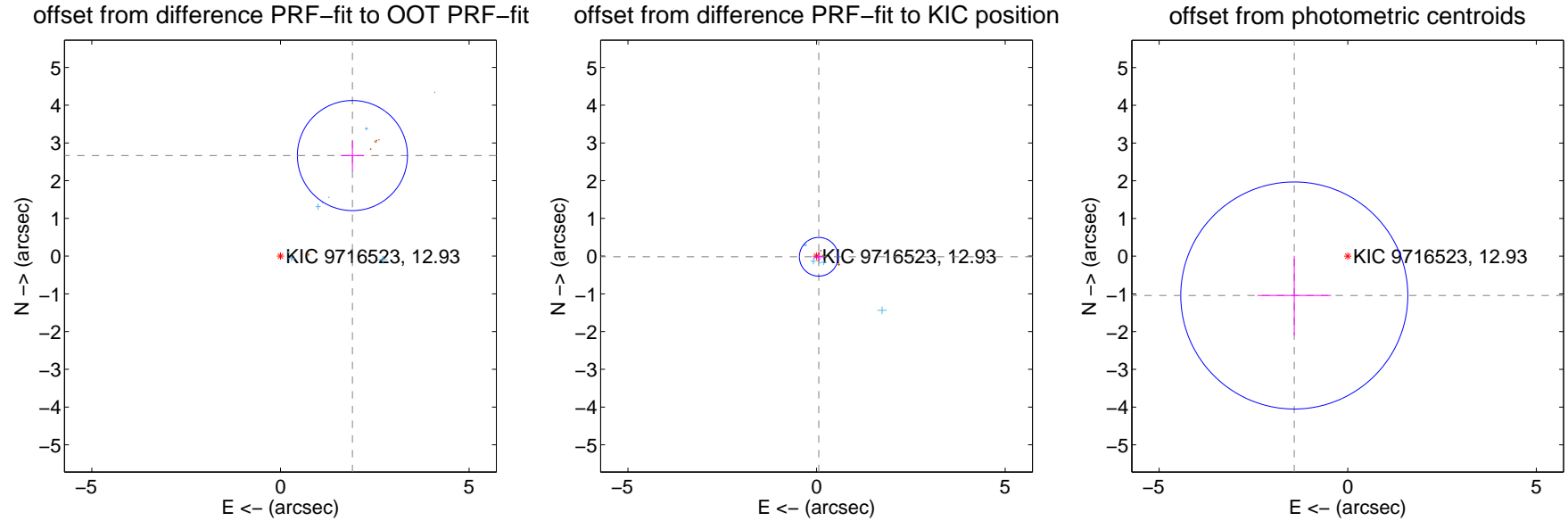
DV Centroid Data

Supplemental centroid analysis for 009716523-06. Kepler magnitude: 12.93. Transit SNR 2.38

There are 8 quarters with good PRF difference image offsets

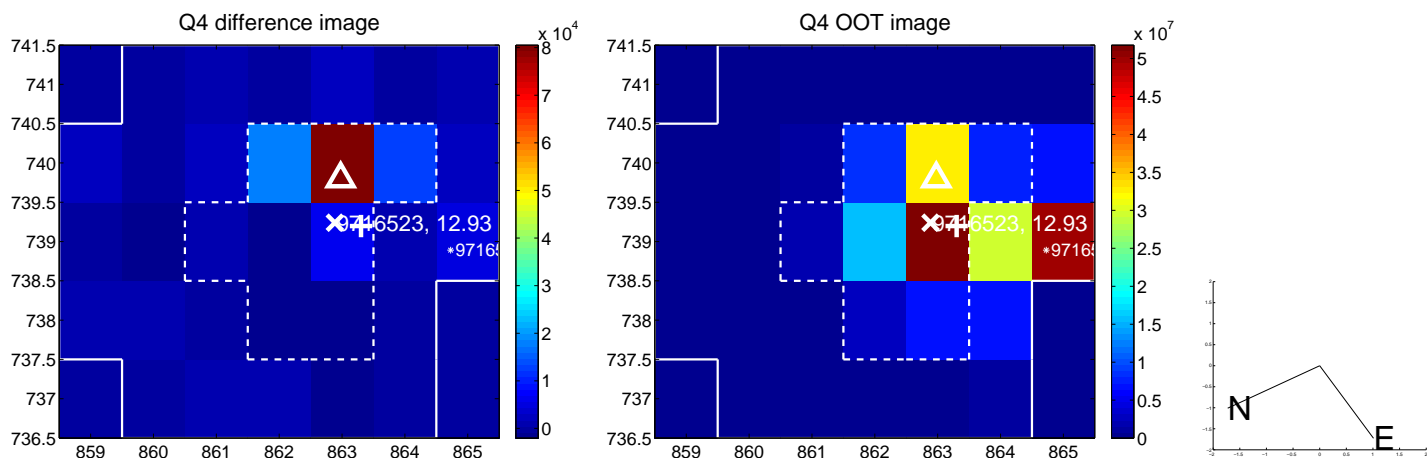
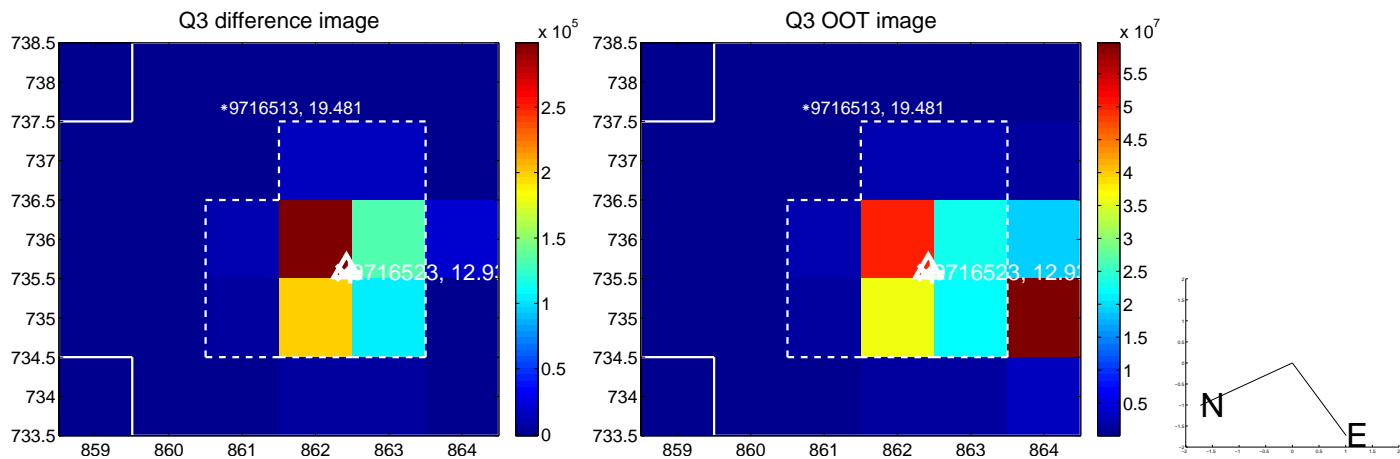
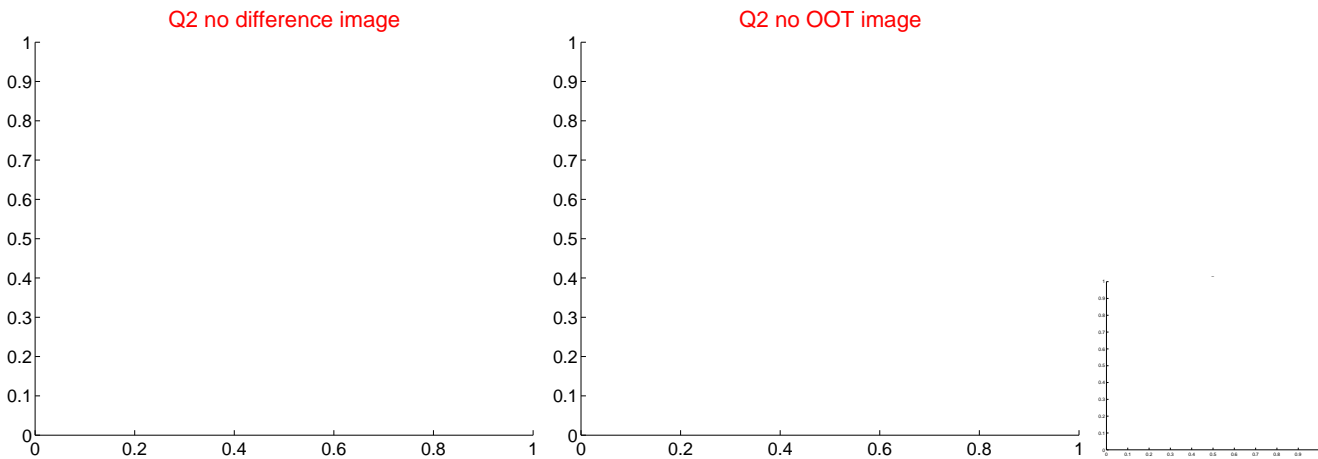
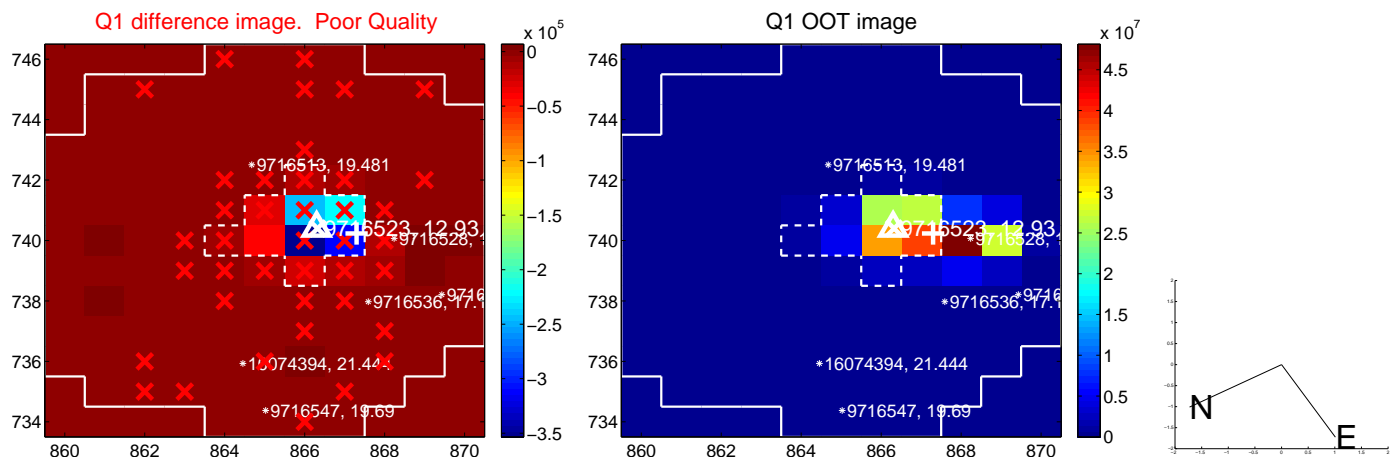
The direct PRF centroid is offset from the target star catalog position by about 1.81 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.277 ± 0.486	6.74	-1.908 ± 0.311	2.665 ± 0.411
PRF-fit source offset from KIC position	0.060 ± 0.171	0.35	-0.058 ± 0.149	-0.017 ± 0.128
photometric centroid source offset	1.76 ± 1.00	1.75	1.42 ± 0.98	-1.04 ± 1.05

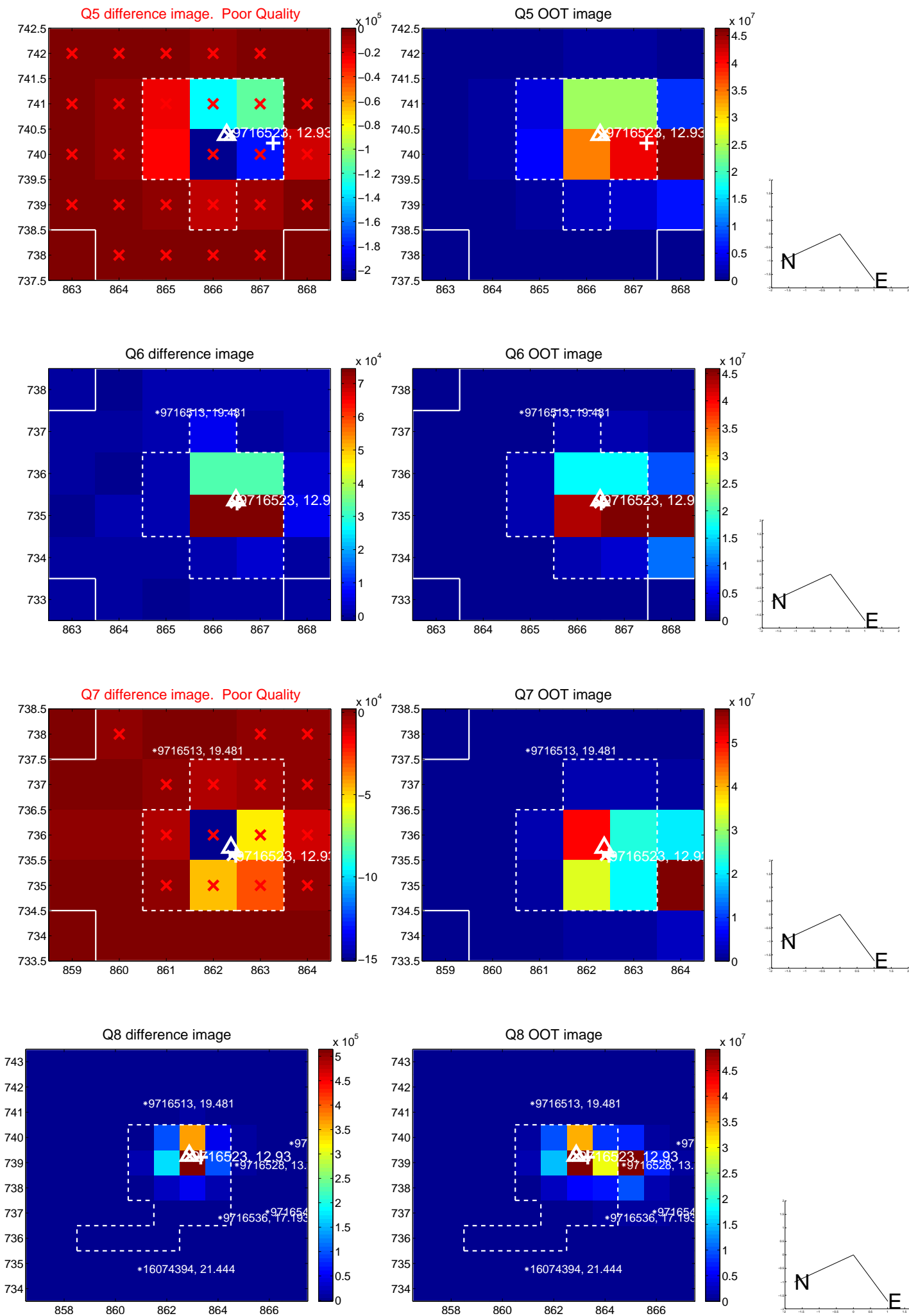


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

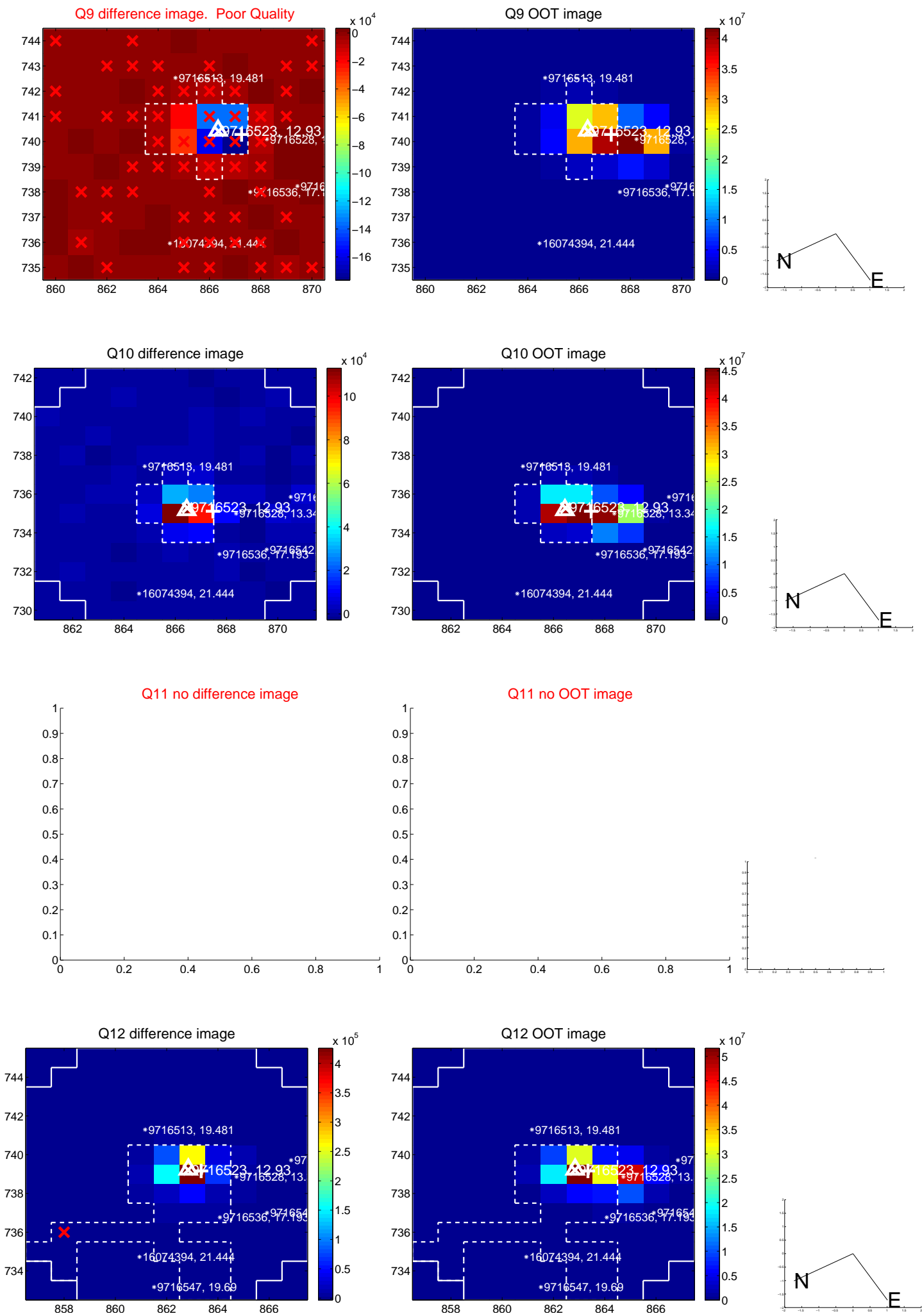
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



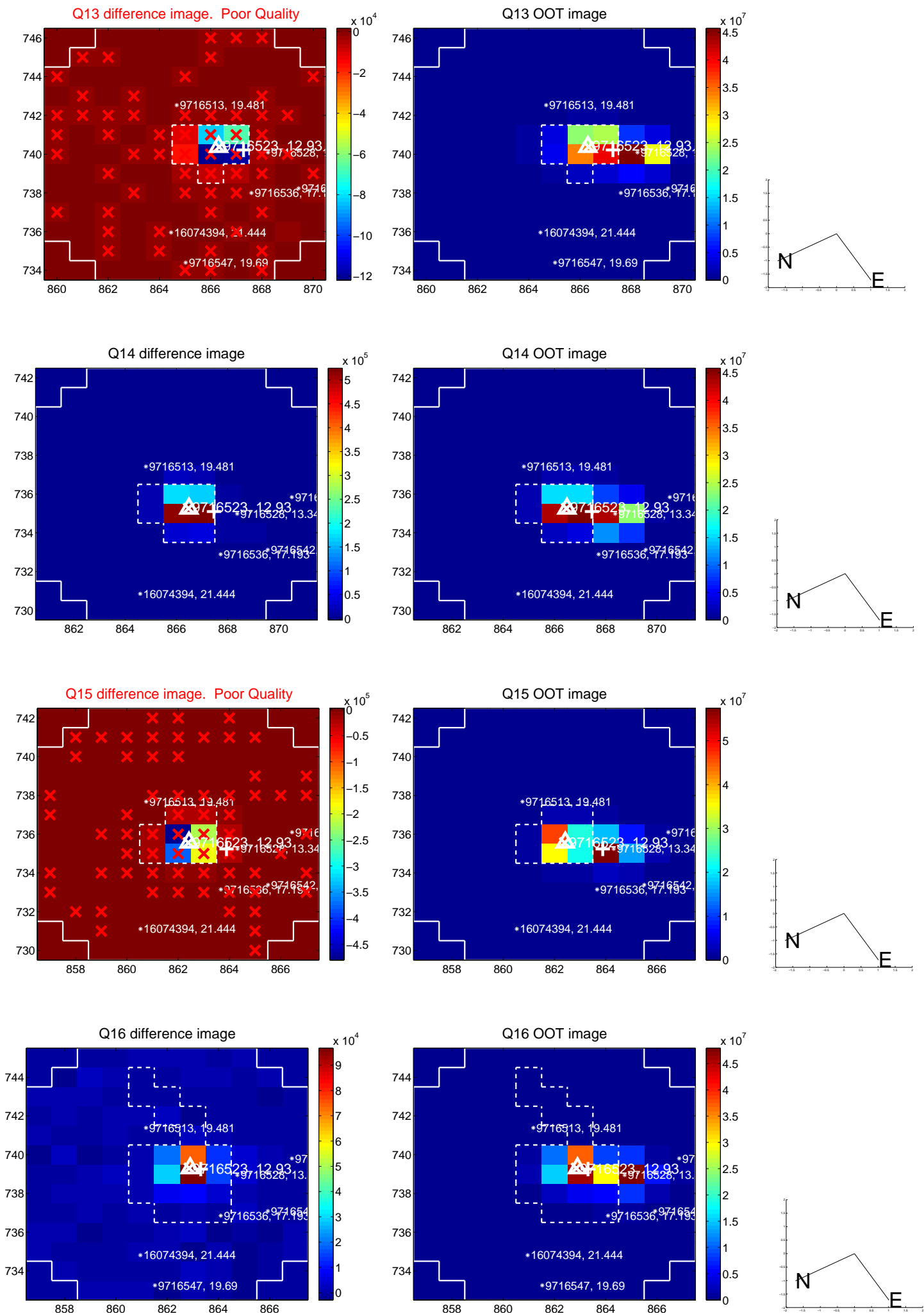
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



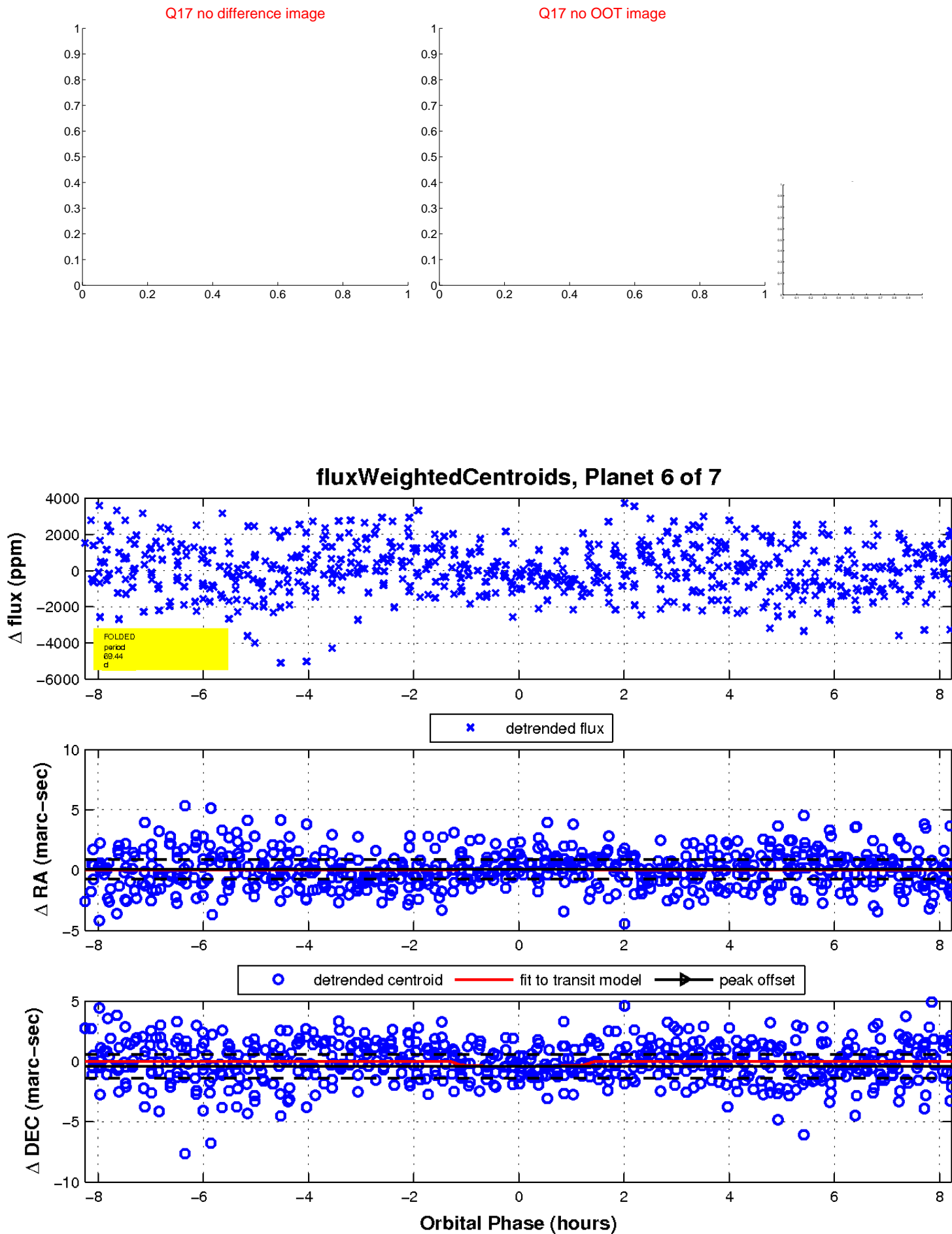
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

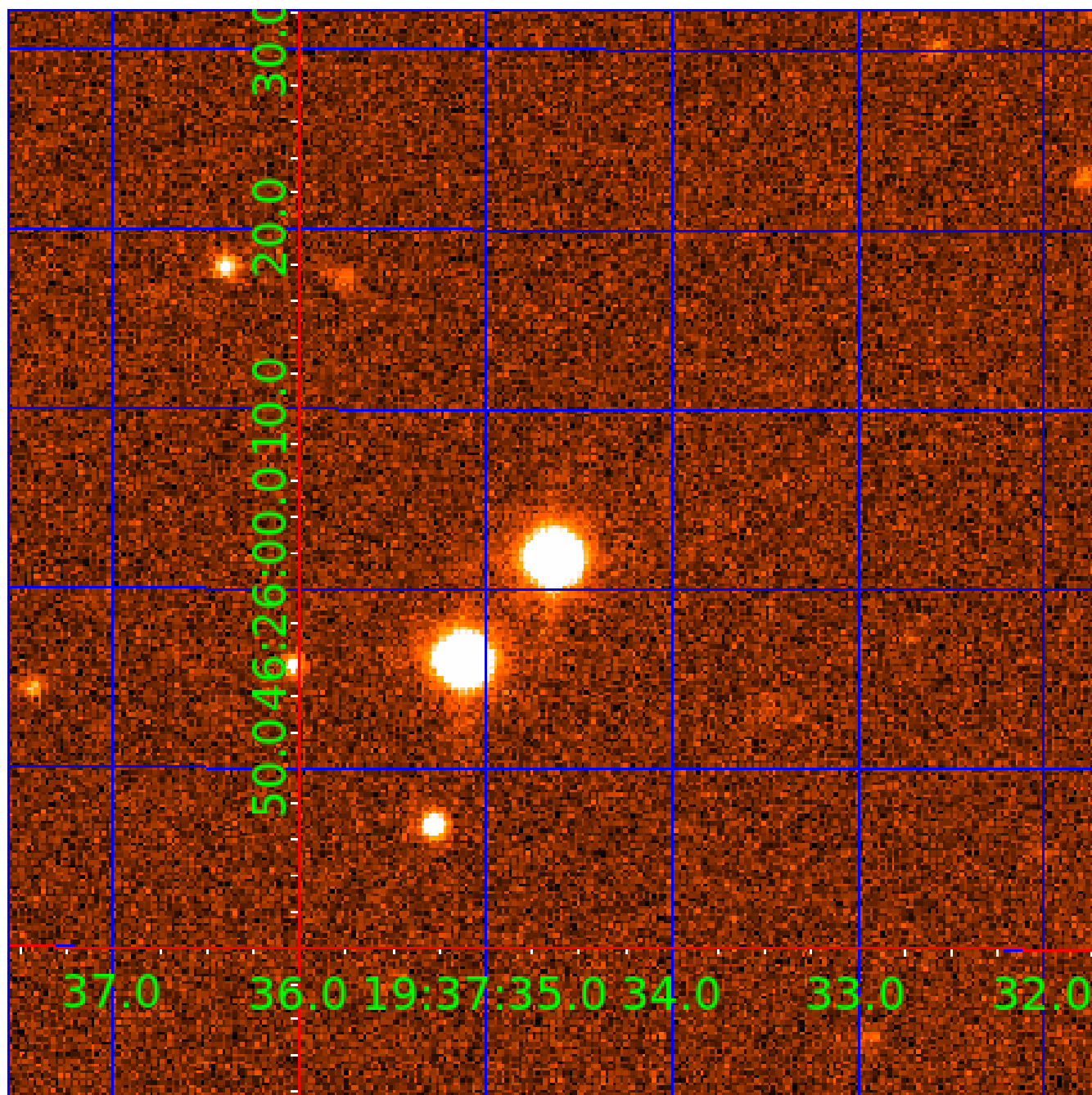


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009716523

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})
009716523-01	OBS	No	0.851171	132.052266	102.1	2.757	8.5	5.7	2.84	7004	3.37	37457.84
009716523-02	OBS	No	2.206382	133.482283	499.4	6.155	8.6	11.2	2.84	7004	12.12	10519.40
009716523-04	OBS	No	107.649091	147.871614	413.3	2.000	9.7	-1.0	2.84	7004	5.86	59.00
009716523-05	OBS	No	149.315132	272.799286	3600.4	3.792	8.5	9.1	2.84	7004	30.83	38.14
009716523-06	OBS	No	69.441327	161.272587	635.7	2.755	8.6	2.4	2.84	7004	7.92	105.86
009716523-07	OBS	No	573.699442	196.486309	202.0	5.000	8.2	-1.0	2.84	7004	4.09	6.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009716523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_KIC_POS
009716523-02	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
009716523-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS
009716523-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_ZUMA—TRANS_GAPPED—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_KIC_POS
009716523-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_KIC_POS—HALO_GHOST
009716523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

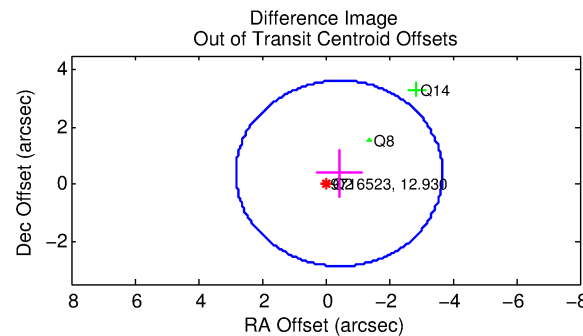
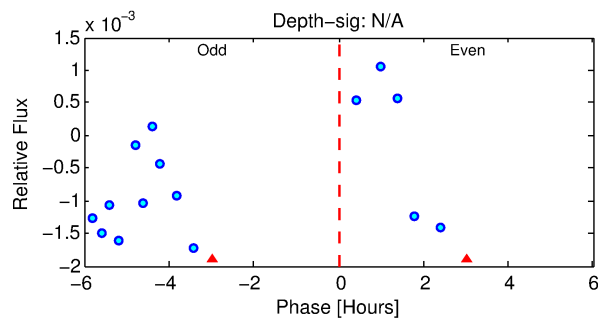
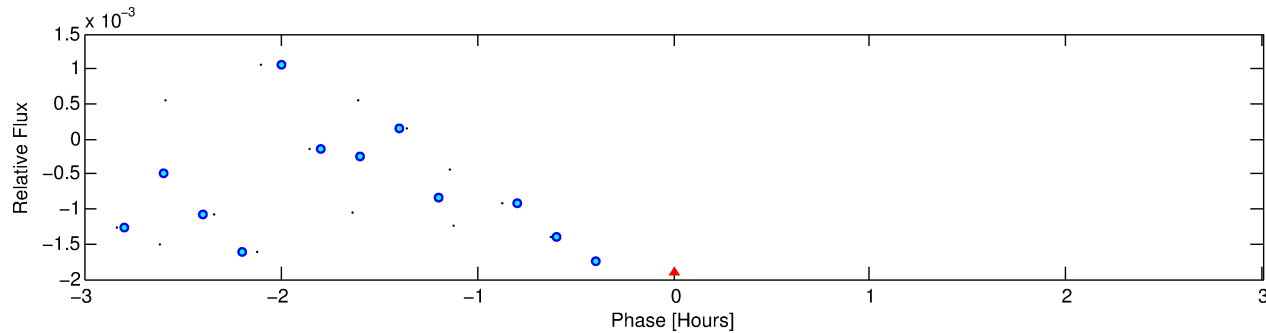
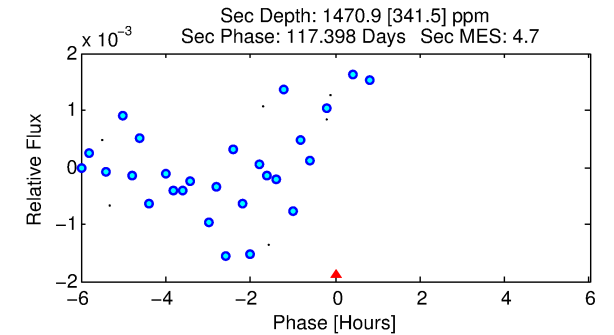
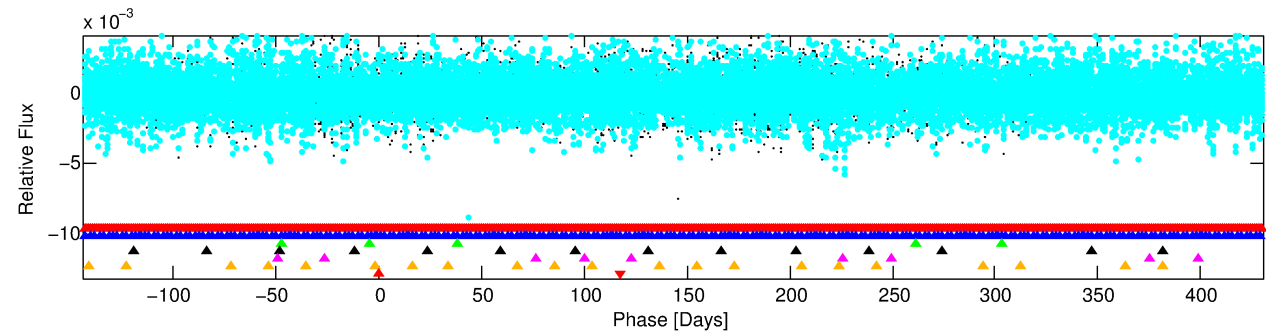
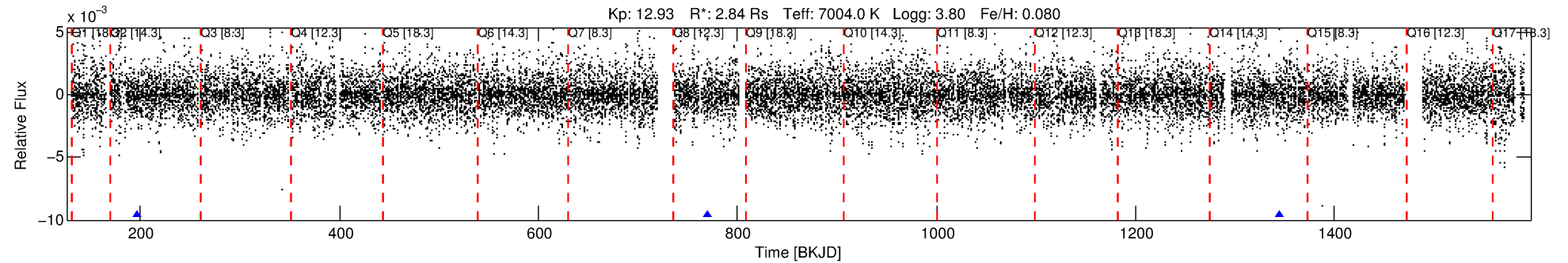
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009716523-07

No Significant Match Found

DV One-Page Summary

KIC: 9716523 Candidate: 7 of 7 Period: 573.699 d



TPS TCE Results:

Period = 573.69944 d
Epoch = 196.4863 BKJD

DV fit results are unavailable

DV Diagnostic Results:

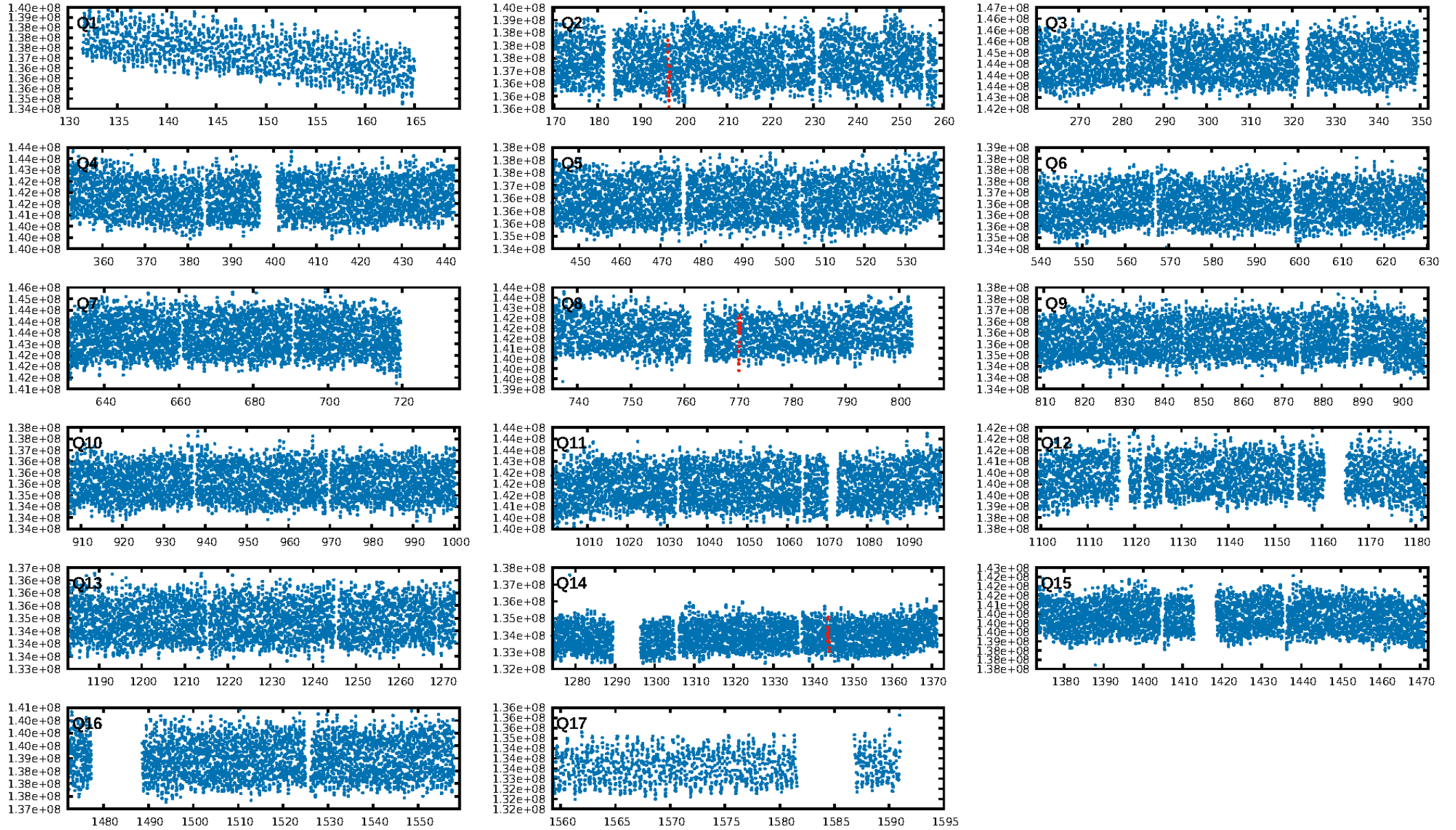
ShortPeriod-sig: 100.0% [970.35σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -7.832

Centroid-sig: 53.0%
Centroid-so: 2.240 arcsec [34.03σ]
OotOffset-rm: 0.573 arcsec [0.53σ]
KicOffset-rm: 0.054 arcsec [0.49σ]
OotOffset-st: 2/0/1/0 [3]
KicOffset-st: 2/0/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/3]

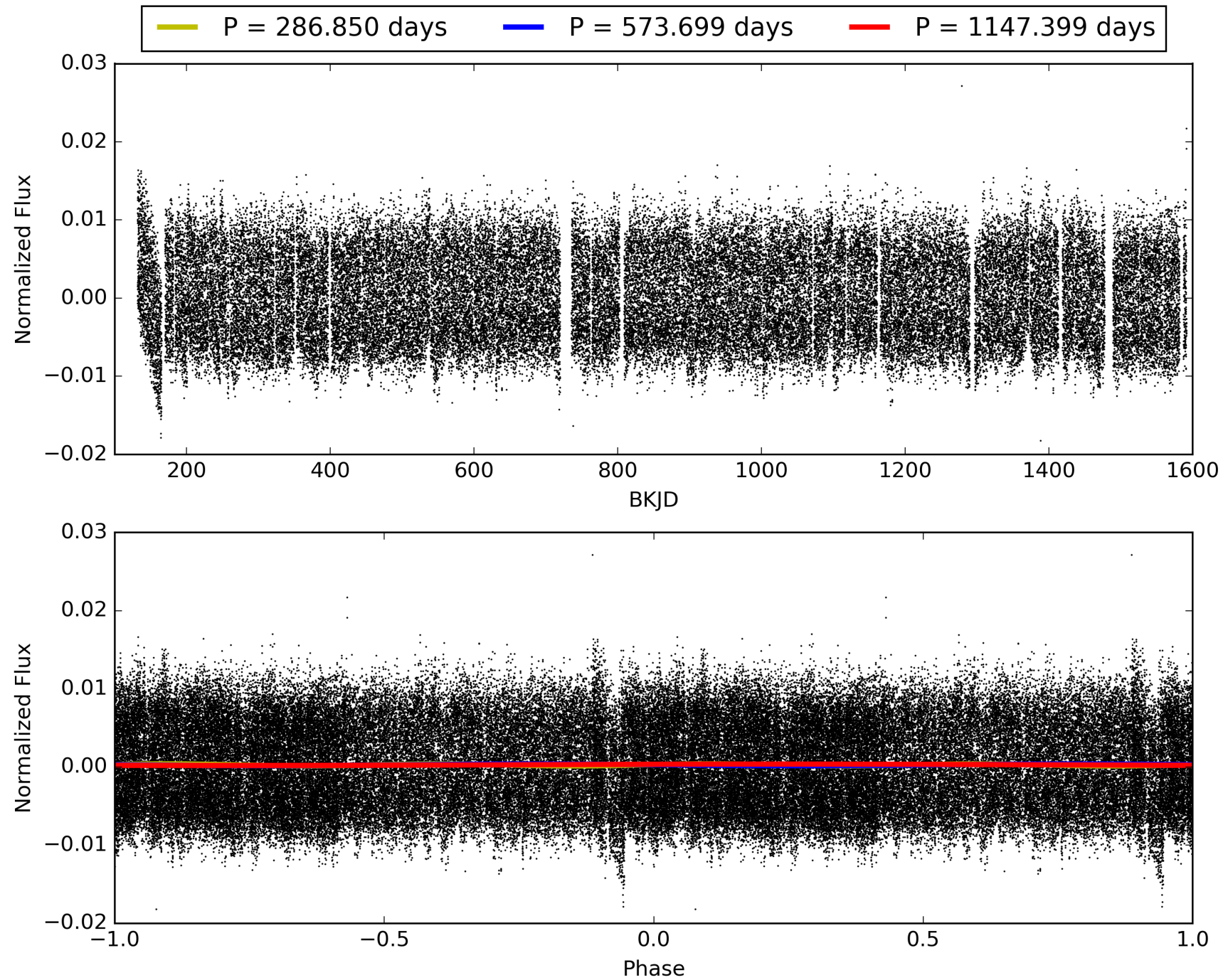
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:07:58 Z

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

TCE 009716523-07, PDC Light Curves

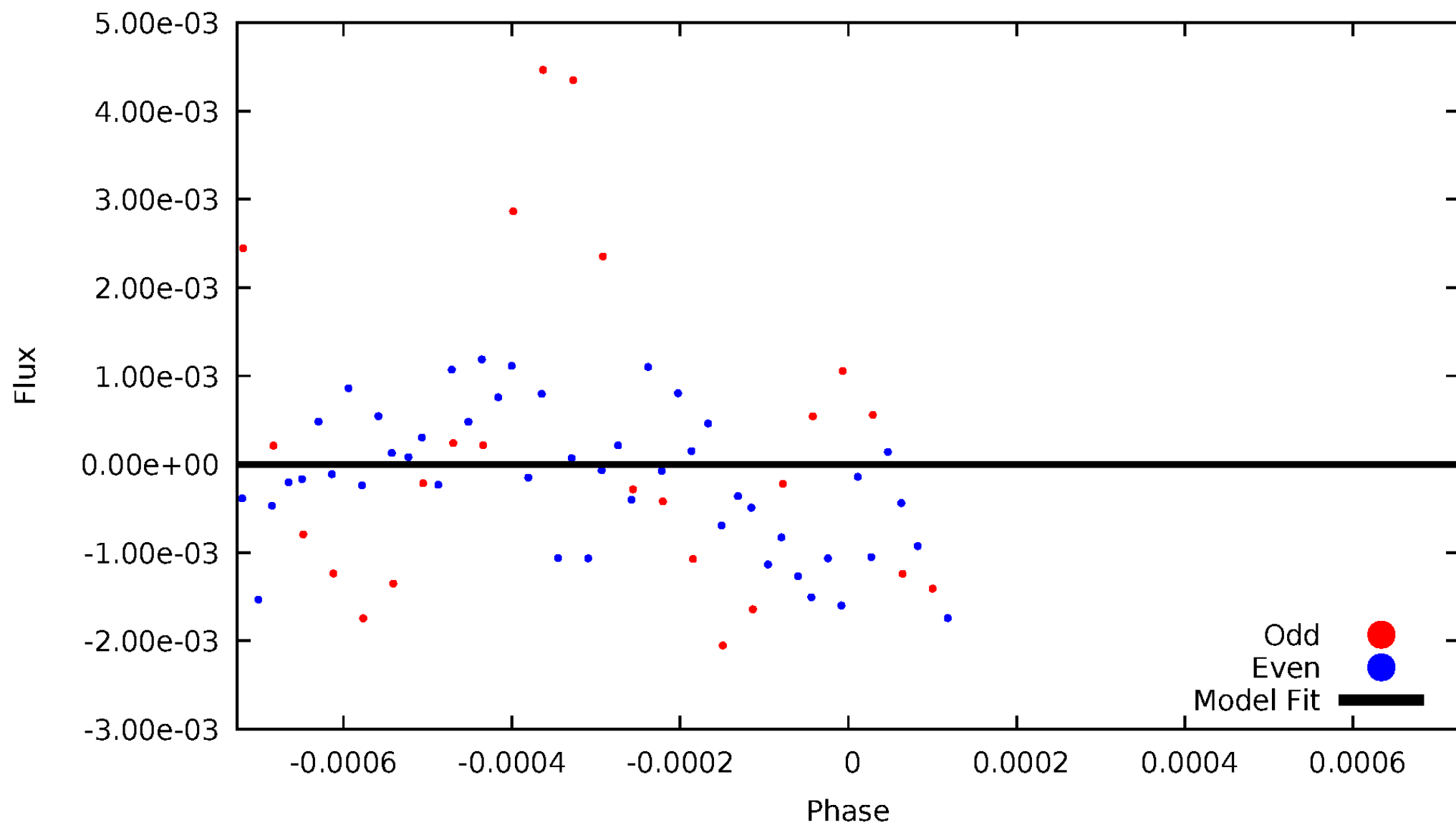


TCE 009716523-07



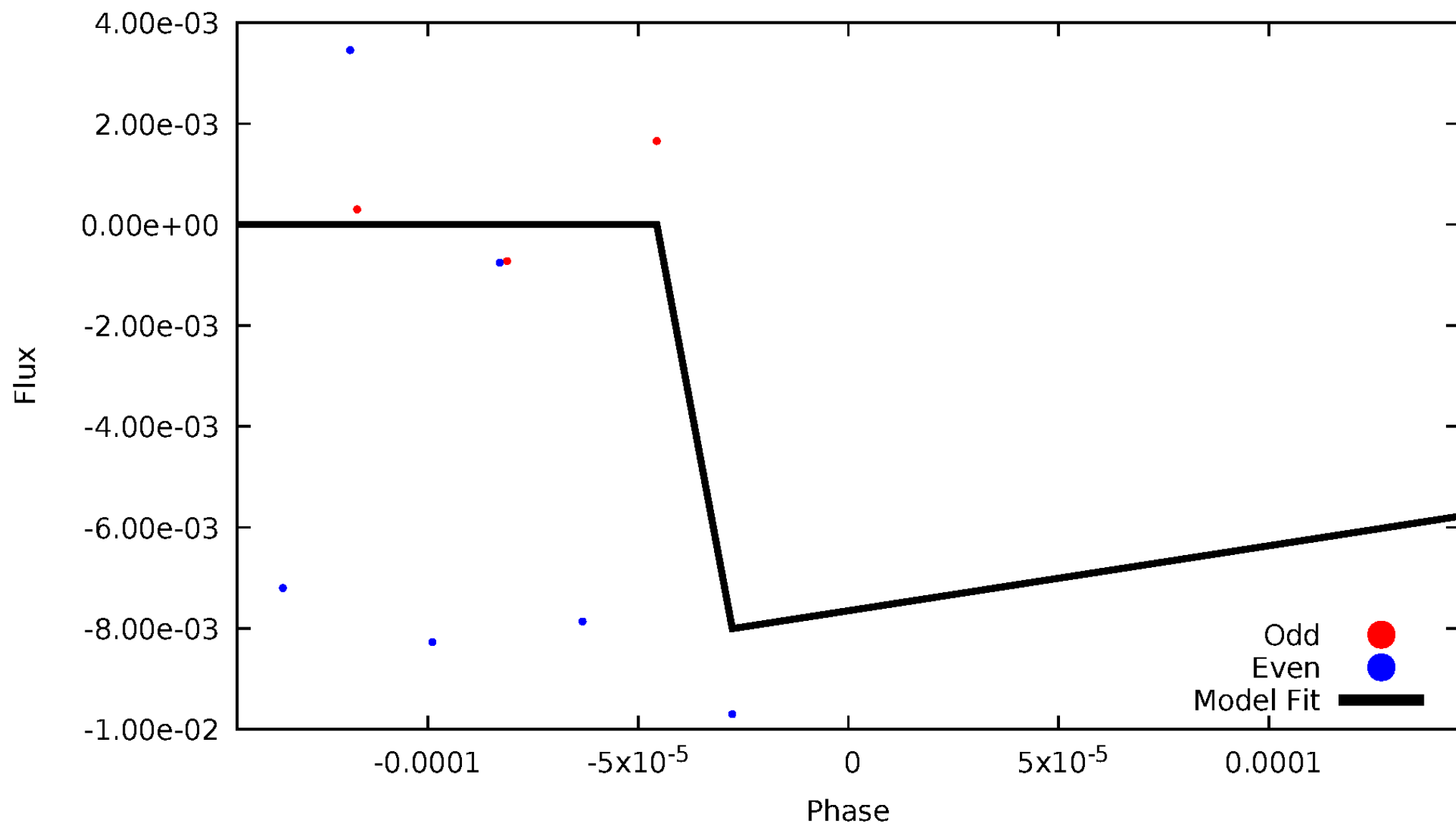
DV Odd/Even

TCE 009716523-07

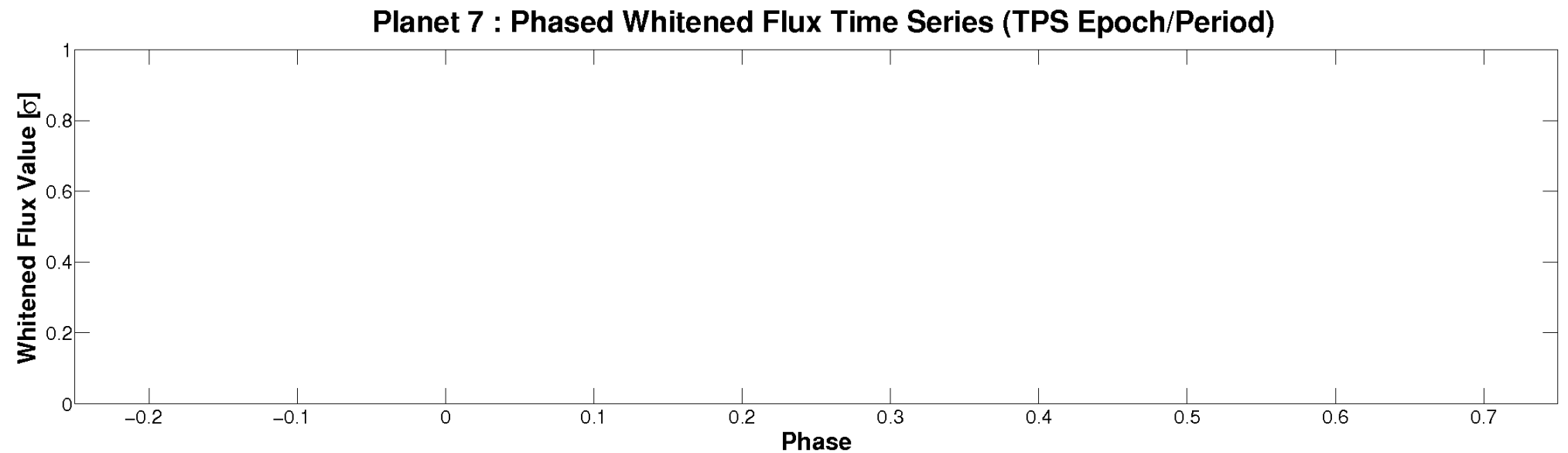
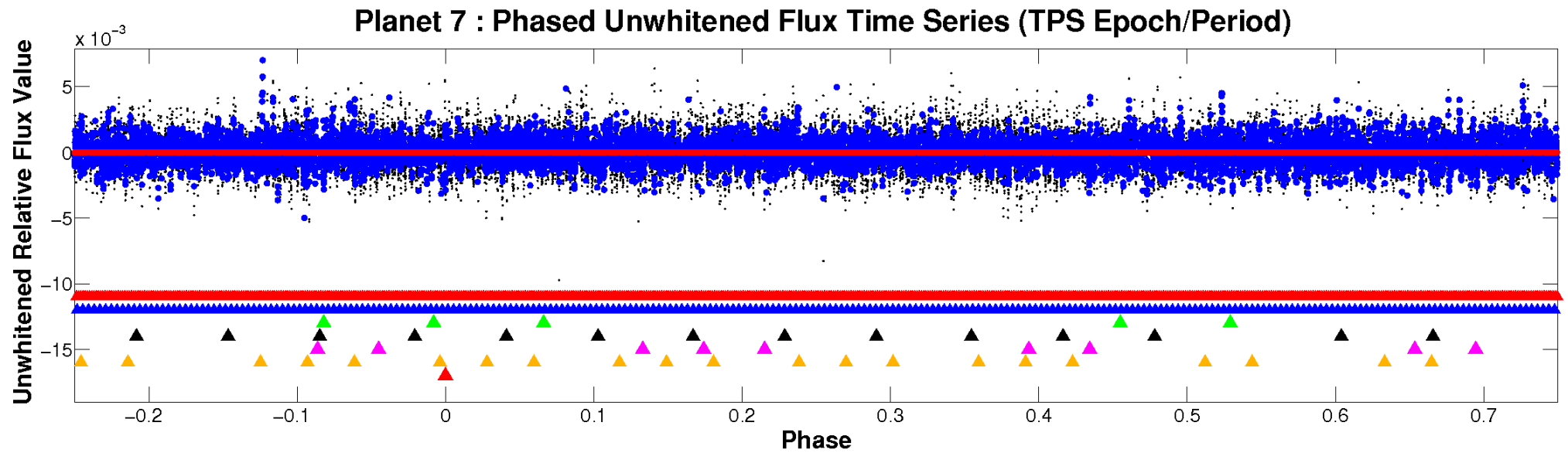


ALT Odd/Even

TCE 009716523-07

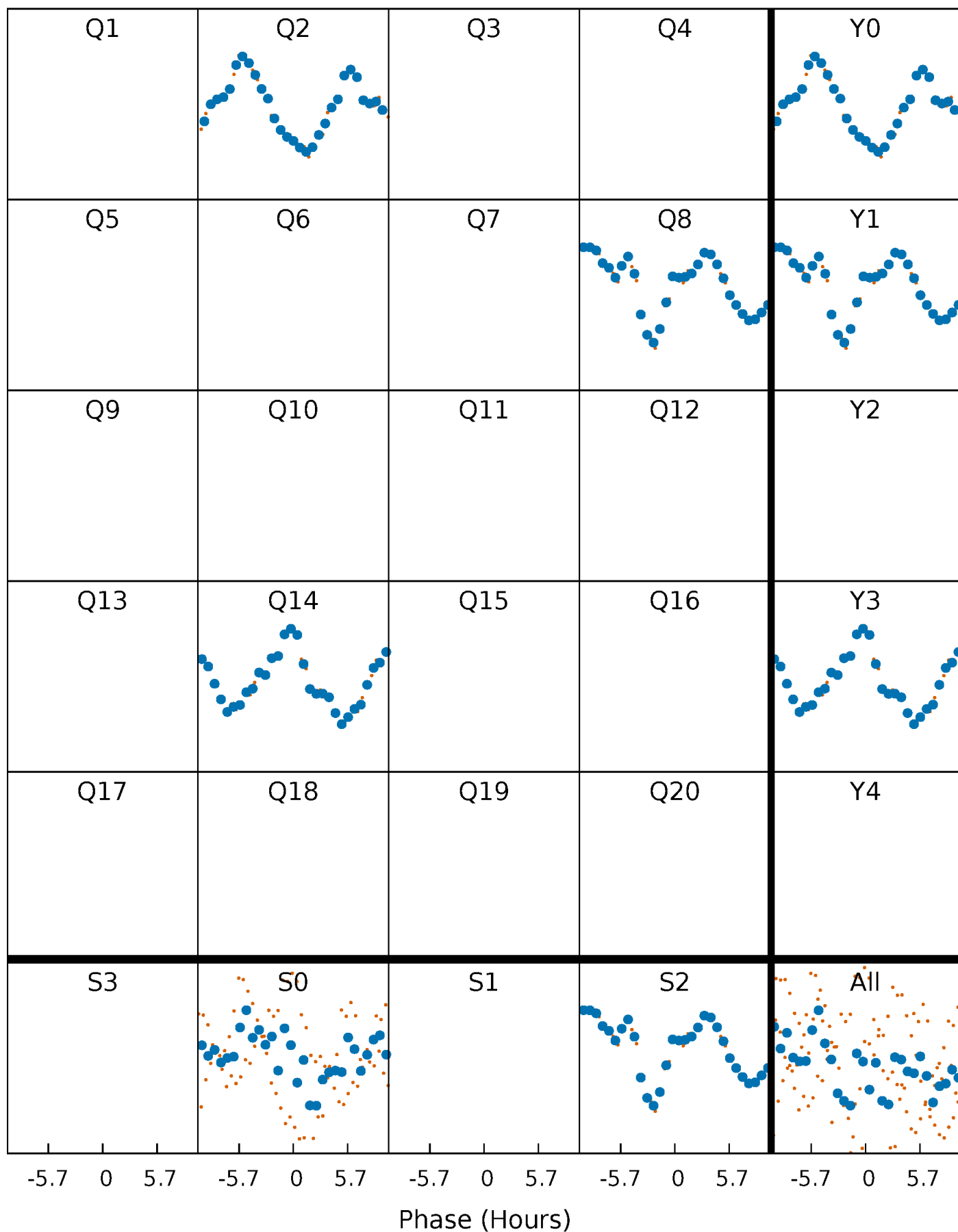


Non-Whitened Vs. Whitened Light Curve



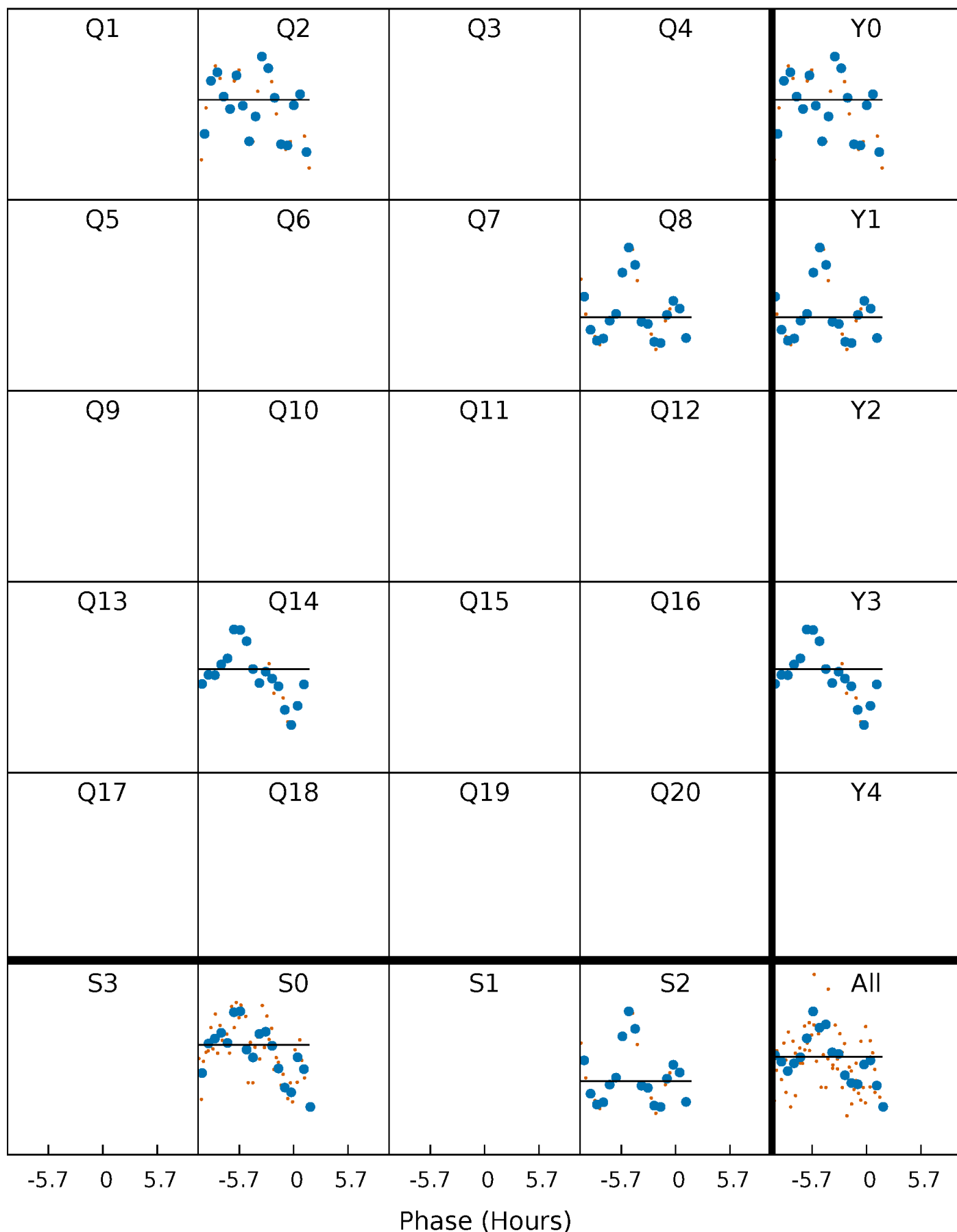
PDC Quarter-Phased Transit Curves

TCE 009716523-07 P=573.699442 Days $T_0=196.486309$ (BKJD)



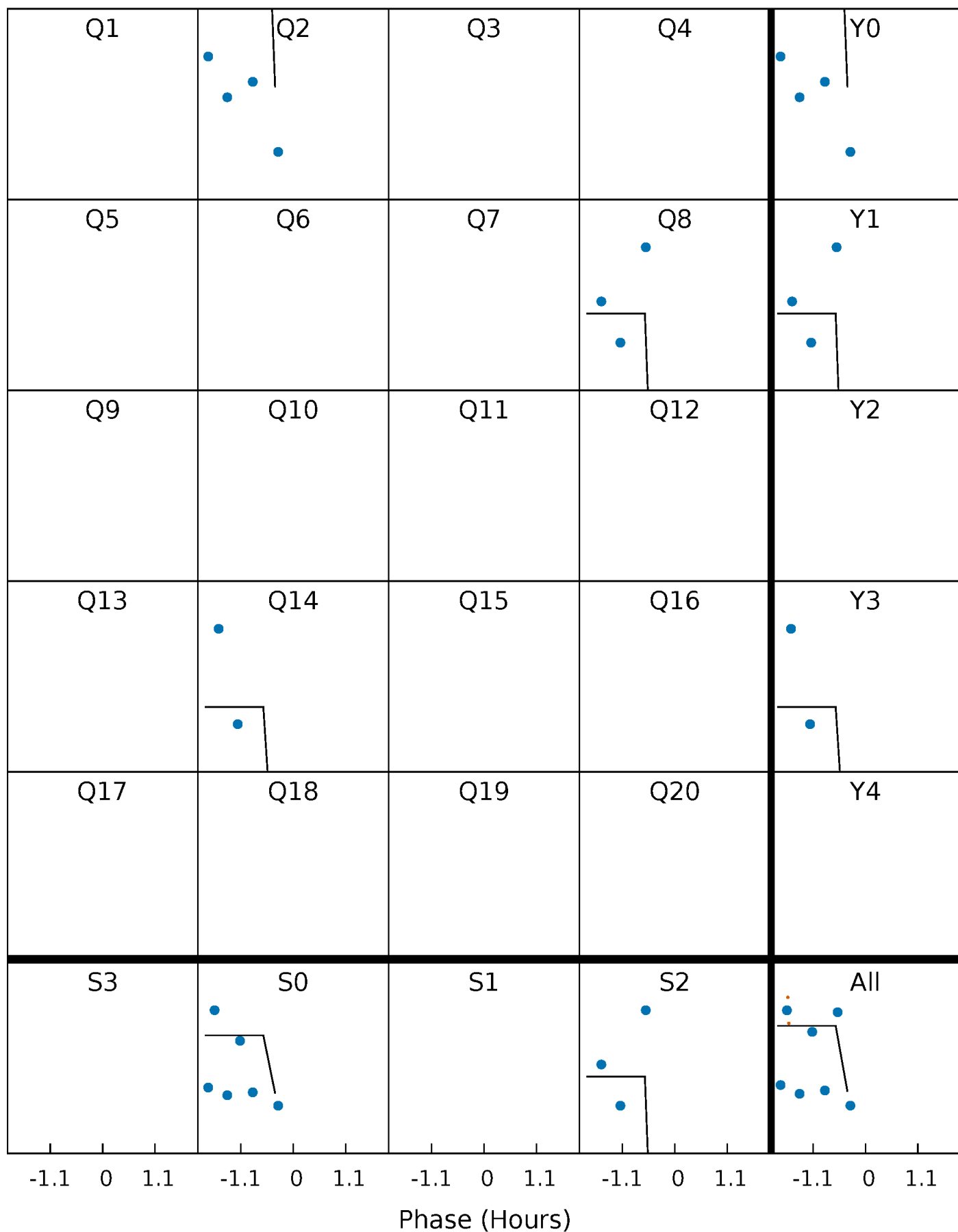
DV Quarter-Phased Transit Curves

TCE 009716523-07 P=573.699442 Days $T_0=196.486309$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

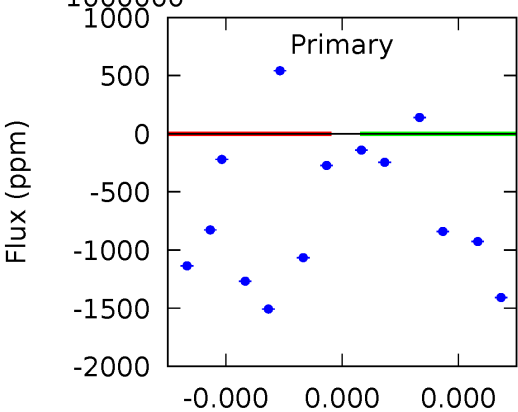
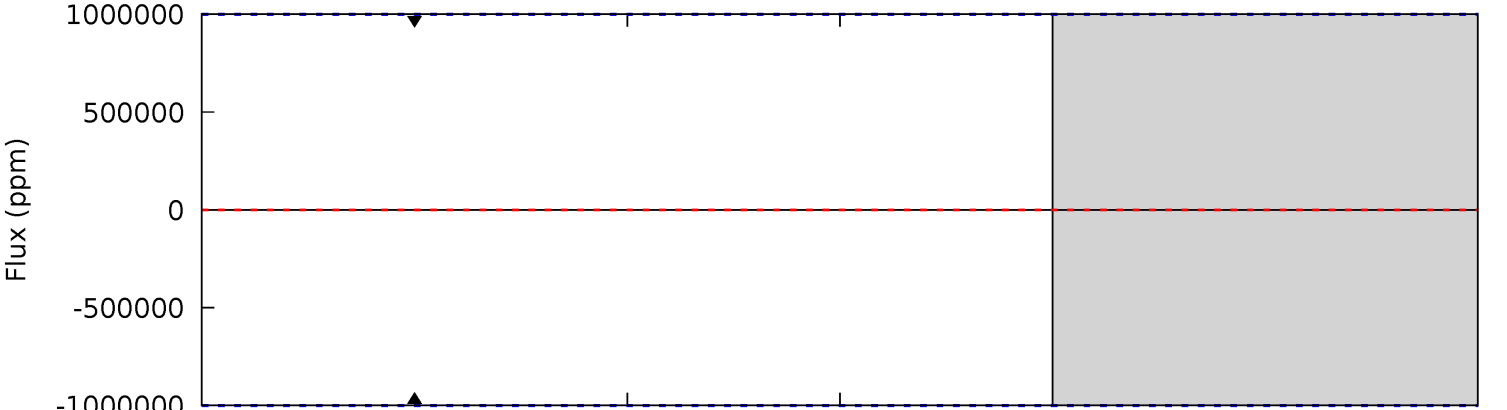
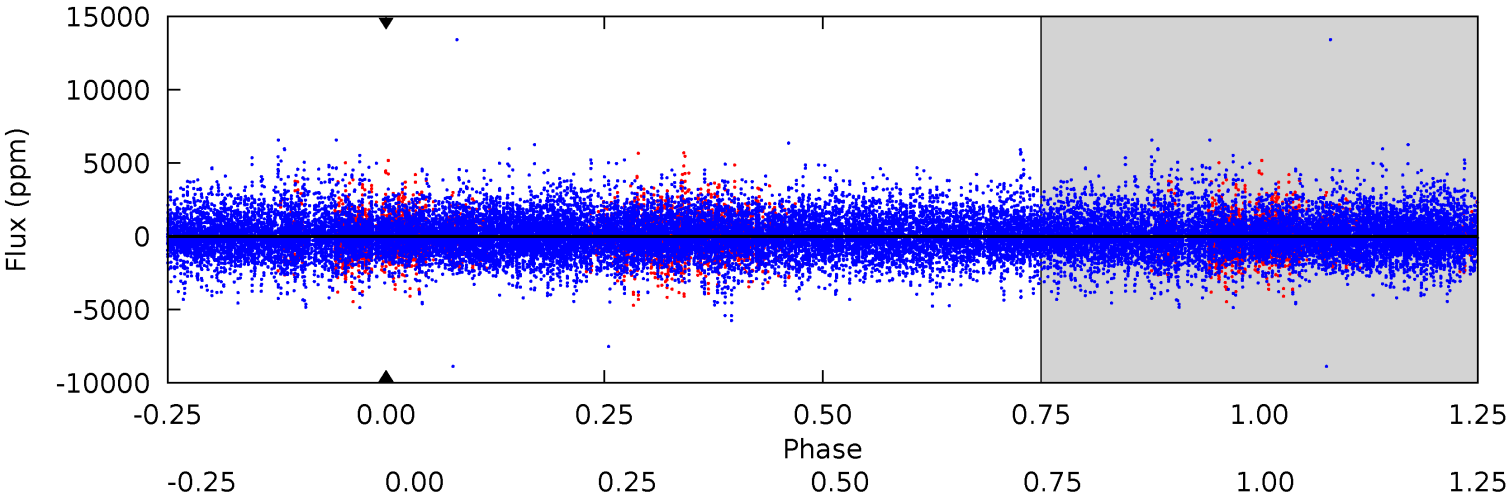
TCE 009716523-07 P=573.699442 Days $T_0=196.569929$ (BKJD)



DV Model-Shift Uniqueness Test

009716523-07, P = 573.699442 Days, E = 196.486309 Days

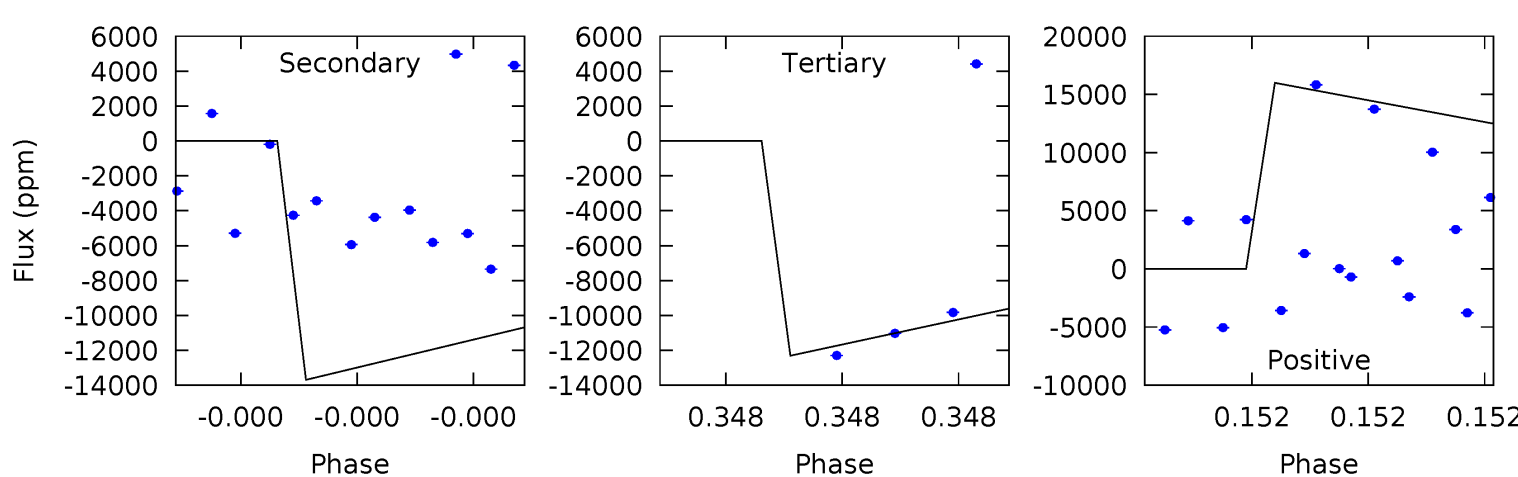
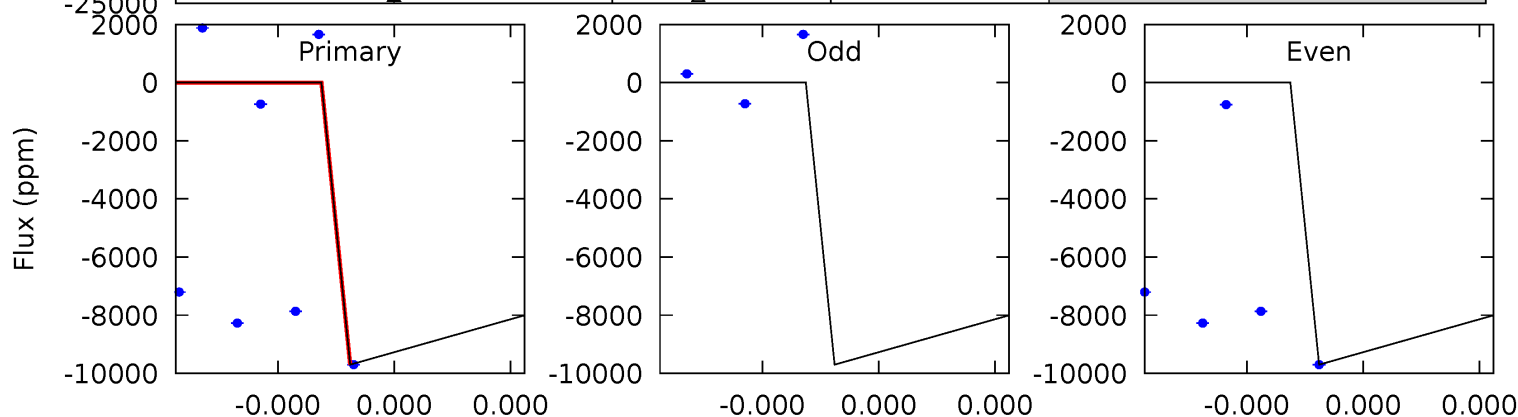
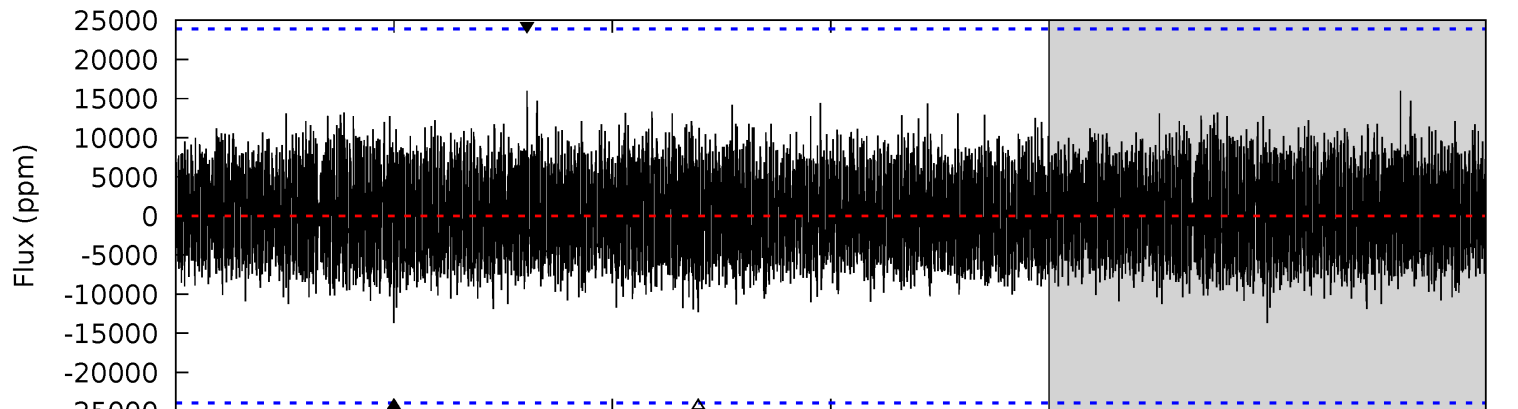
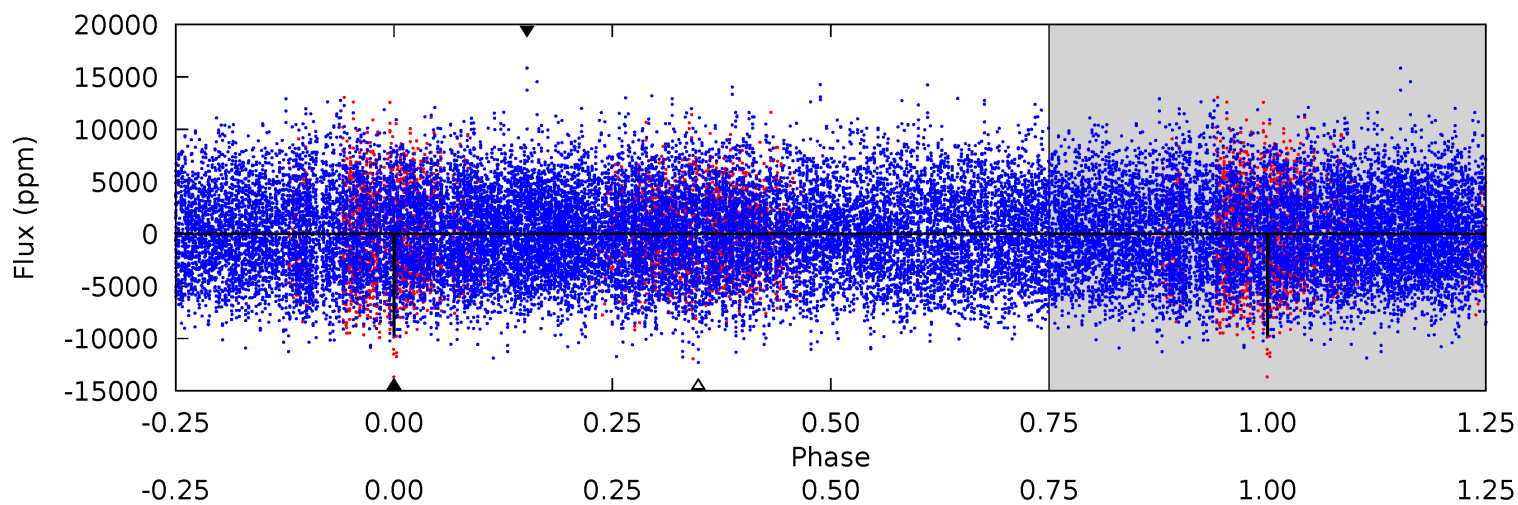
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009716523-07, P = 573.699442 Days, E = 196.569929 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.40	3.38	3.04	3.95	5.90	3.97	1.01	-0.64	-1.55	0.34	-0.57	0	0	0.54	0



Stellar Parameters For KIC 009716523

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7004^{+195}_{-318}	$3.797^{+0.375}_{-0.125}$	$0.080^{+0.200}_{-0.350}$	$2.844^{+0.533}_{-1.244}$	$1.848^{+0.164}_{-0.460}$	$0.113^{+0.357}_{-0.043}$
	+3%/-5%	+10%/-3%	+250%/-438%	+19%/-44%	+9%/-25%	+315%/-38%
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 009716523-07 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$19.79^{+23.65}_{-13.93}$	552^{+42}_{-57}	5578^{+34339}_{-40810}	$7739^{+655269}_{-703210}$
Alt.	-13687 ± 4051	$52.79^{+32.81}_{-26.14}$	555^{+41}_{-63}	5489^{+2318}_{-987}	7031^{+22422}_{-4500}

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 $A_{obs} \gg 1.0$

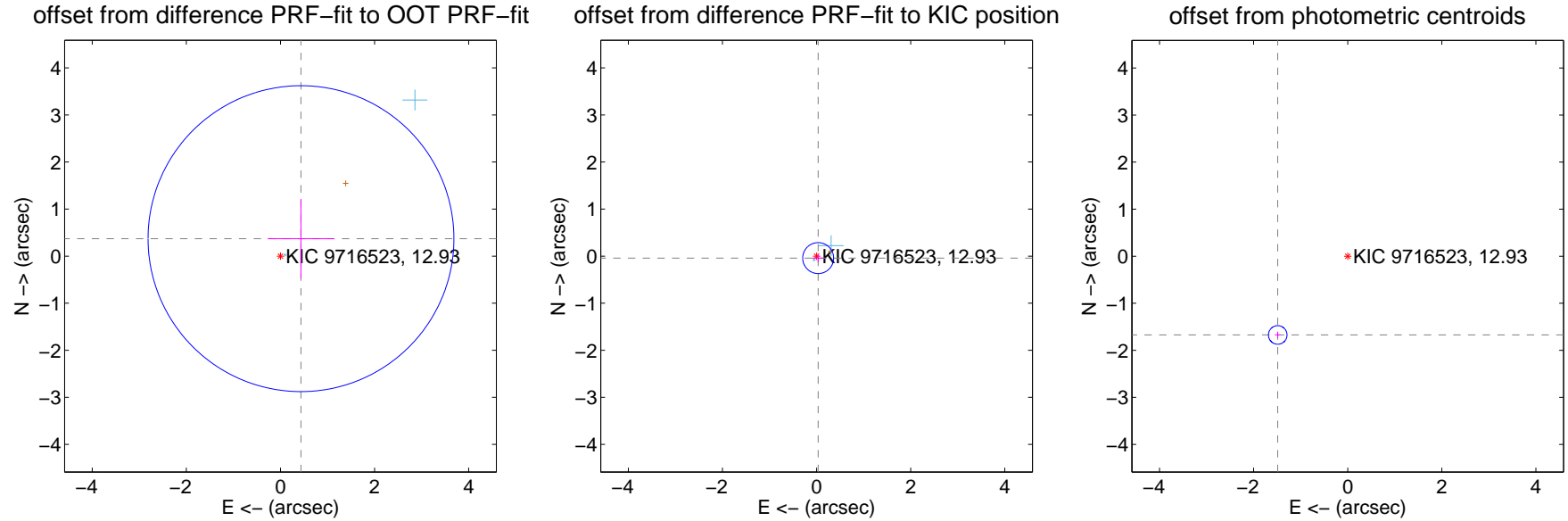
DV Centroid Data

Supplemental centroid analysis for 009716523-07. Kepler magnitude: 12.93. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

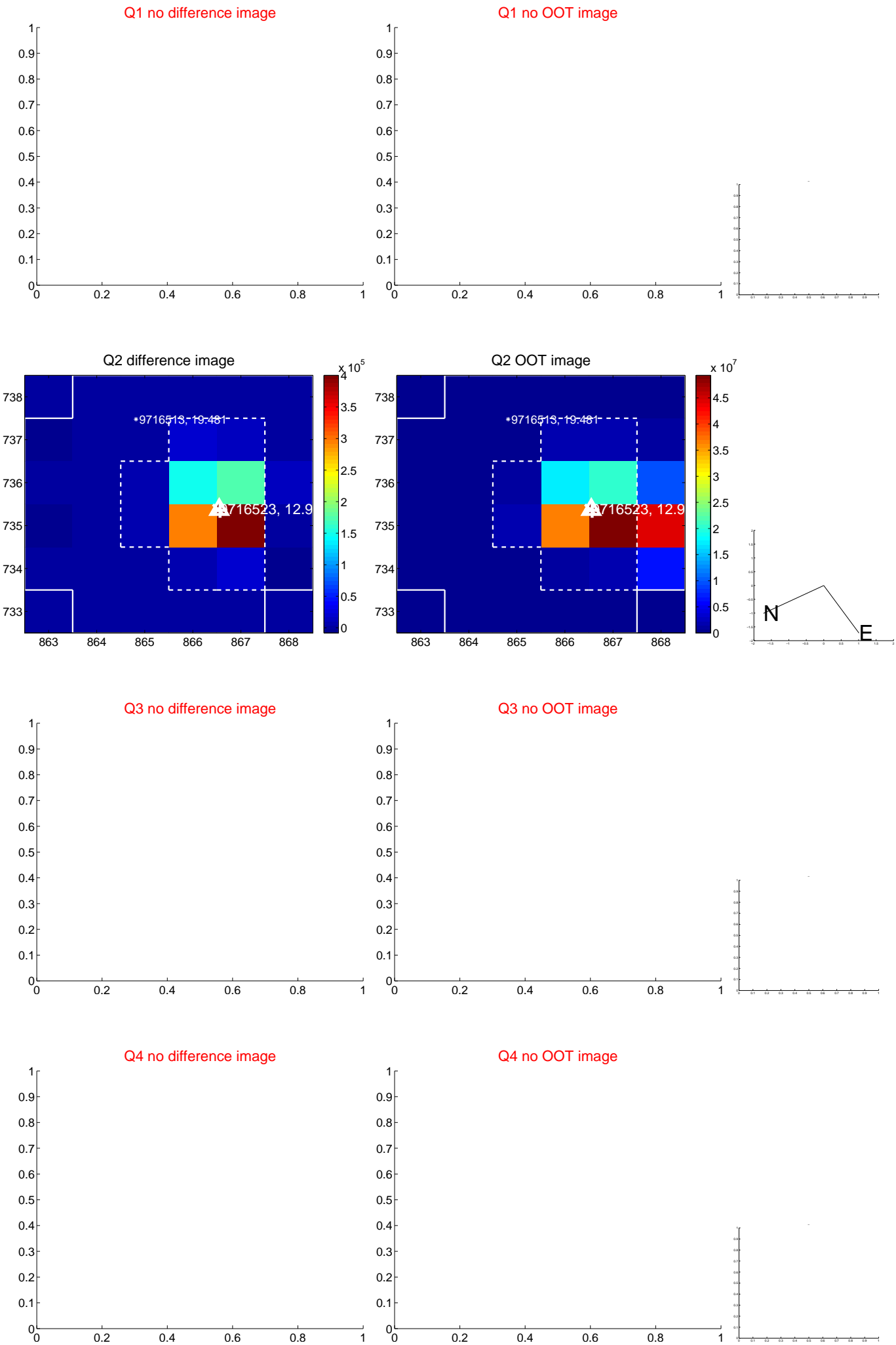
The OOT PRF centroid is offset from the target star catalog position by about 4.01 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.573 ± 1.084	0.53	-0.436 ± 0.708	0.371 ± 0.844
PRF-fit source offset from KIC position	0.054 ± 0.110	0.49	-0.034 ± 0.133	-0.042 ± 0.091
photometric centroid source offset	2.24 ± 0.07	34.03	1.49 ± 0.06	-1.67 ± 0.07



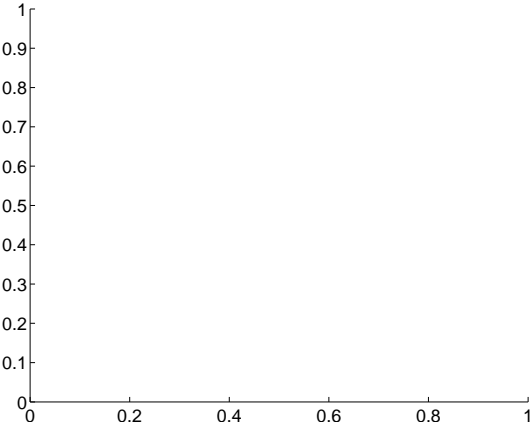
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

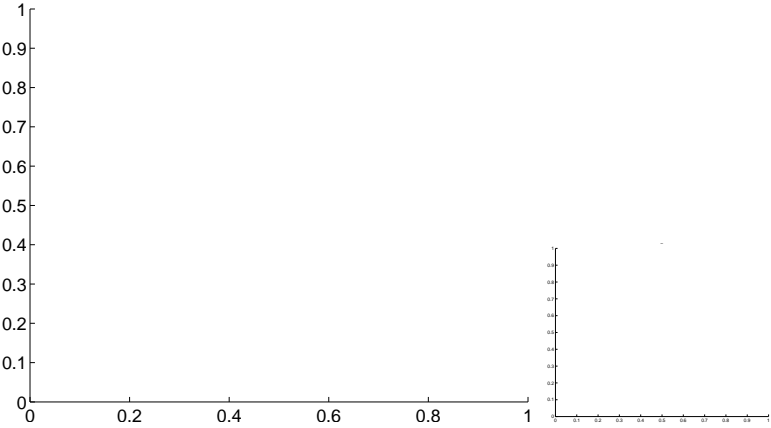


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

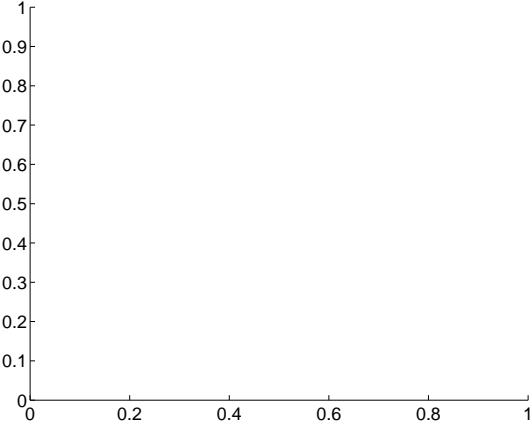
Q5 no difference image



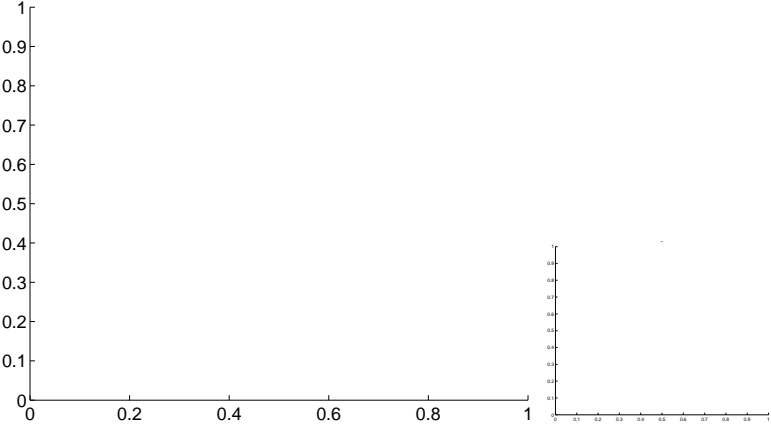
Q5 no OOT image



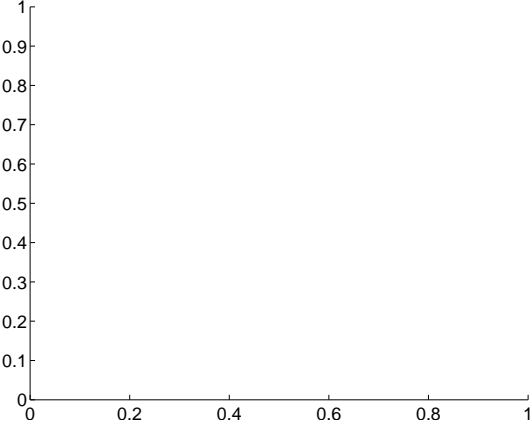
Q6 no difference image



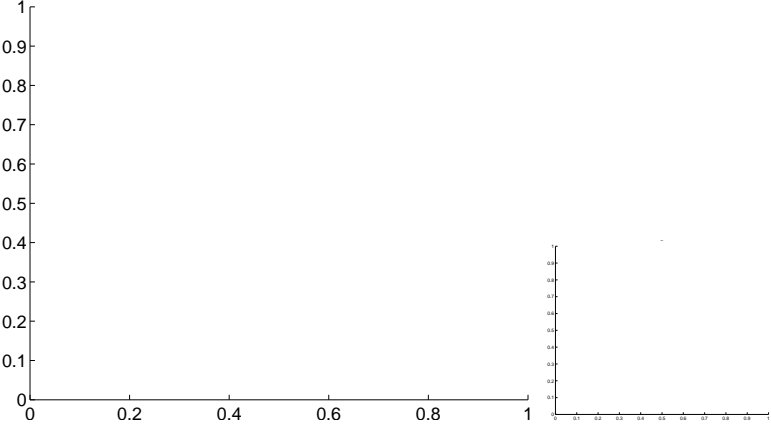
Q6 no OOT image



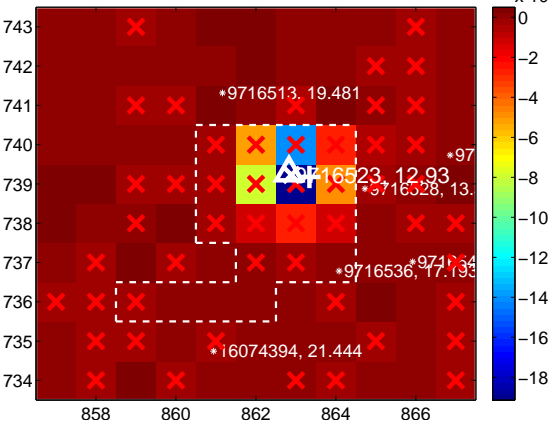
Q7 no difference image



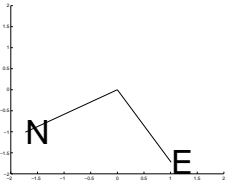
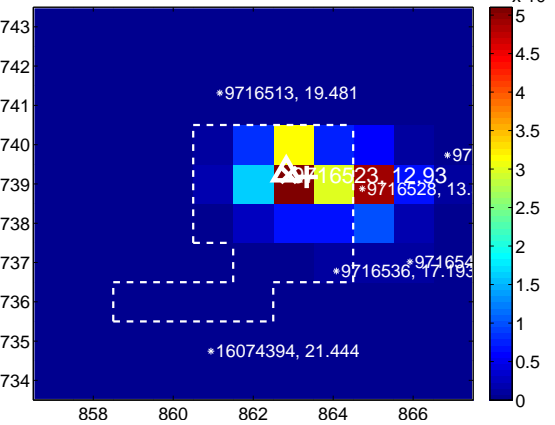
Q7 no OOT image



Q8 difference image. Poor Quality



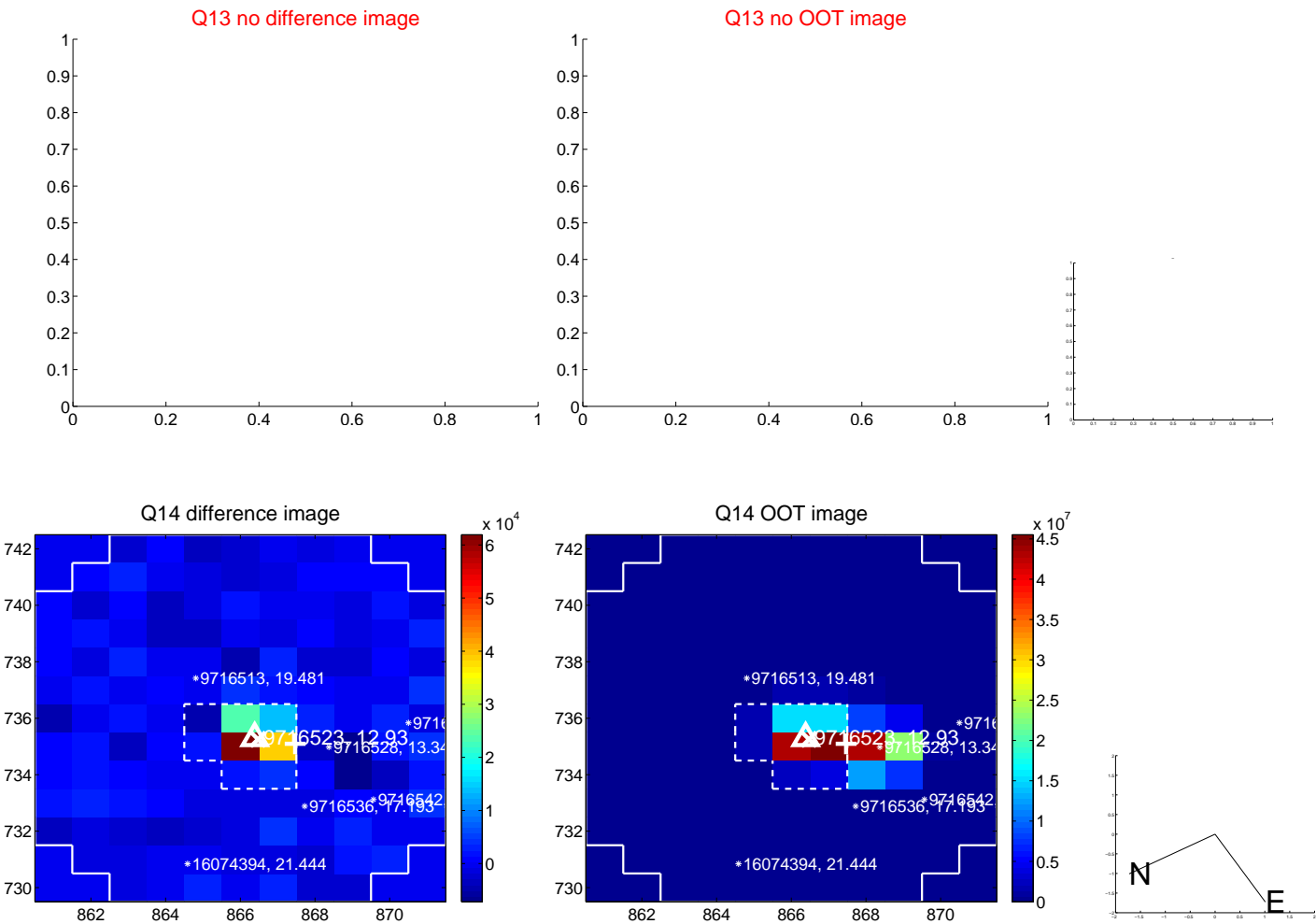
Q8 OOT image



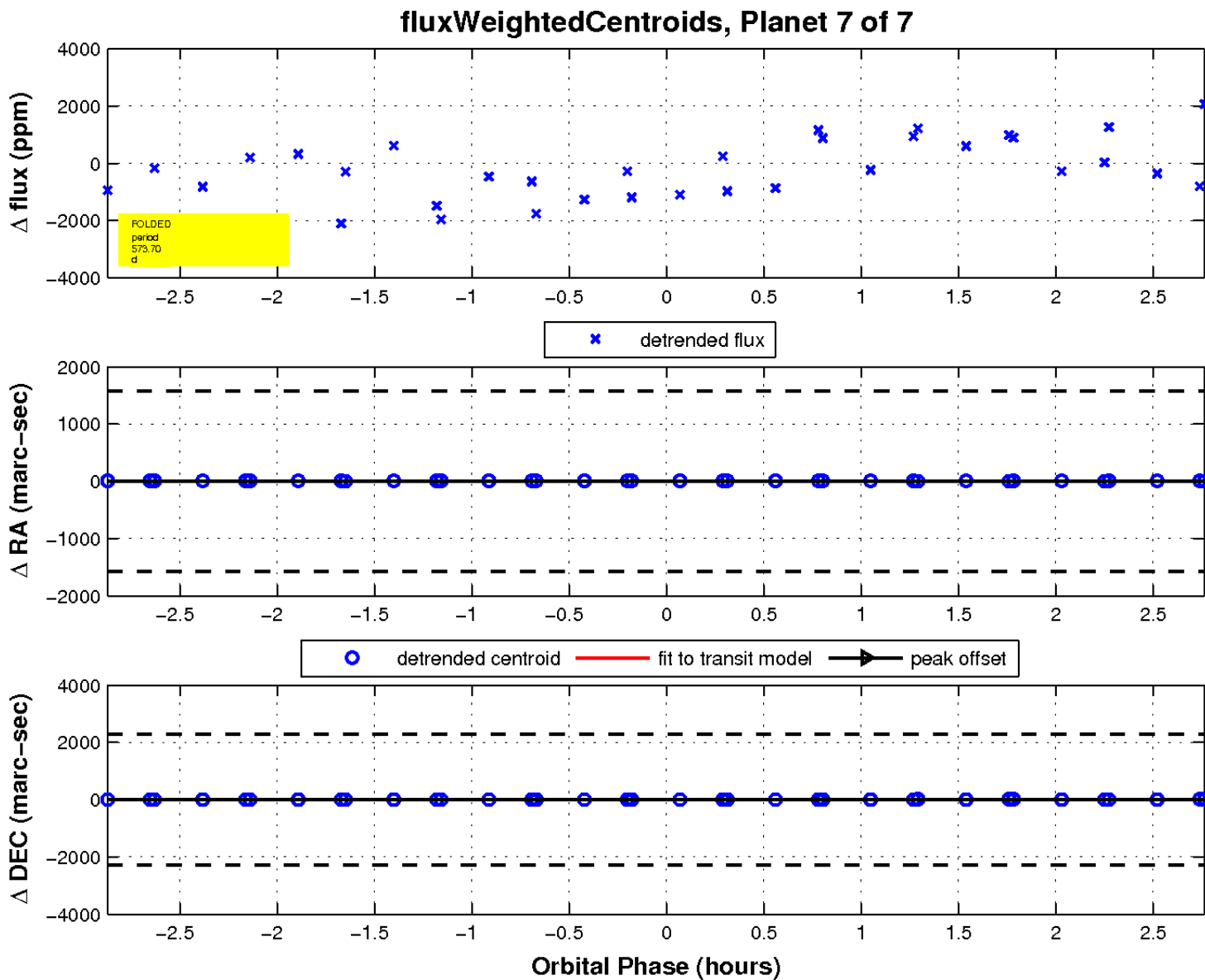
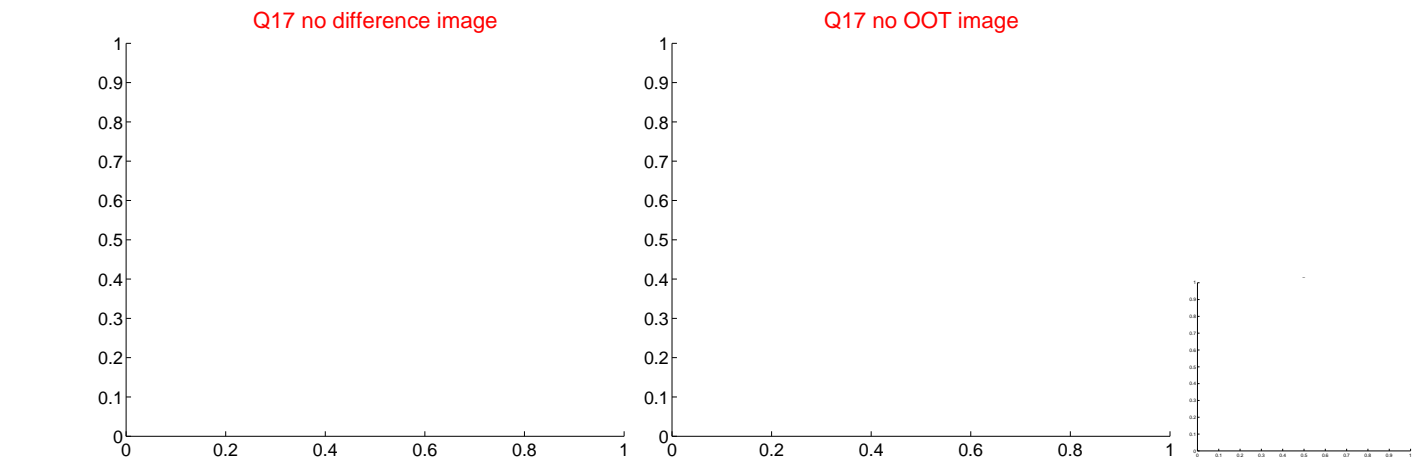
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

