

KIC 012117276

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})
012117276-01	OBS	No	0.663328	132.134685	17.1	4.486	10.1	8.1	2.16	7340	0.92	39695.86
012117276-02	OBS	No	63.653712	141.110860	301.2	3.701	10.3	9.9	2.16	7340	4.42	90.36
012117276-03	OBS	No	18.793425	137.540377	182.7	1.692	9.7	10.0	2.16	7340	3.44	459.60
012117276-04	OBS	No	48.060553	147.976866	285.1	1.190	8.5	7.7	2.16	7340	3.71	131.42

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012117276-01	OBS	FP	0.00	1	0	0	0	LPP_DV
012117276-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
012117276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
012117276-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

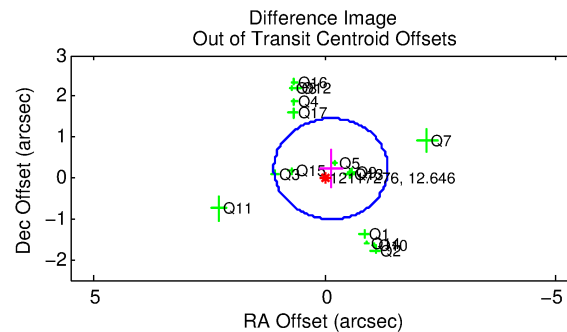
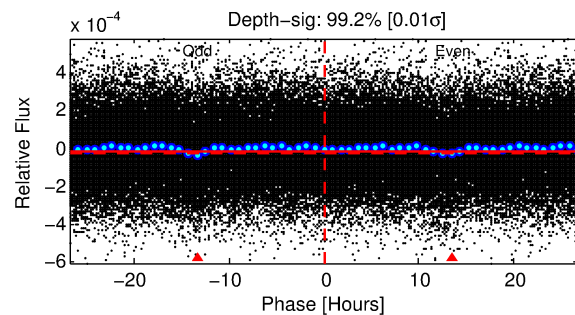
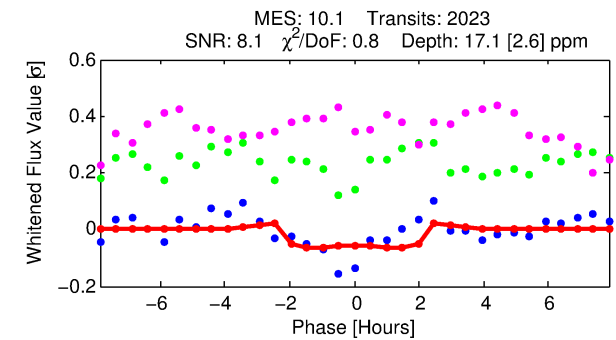
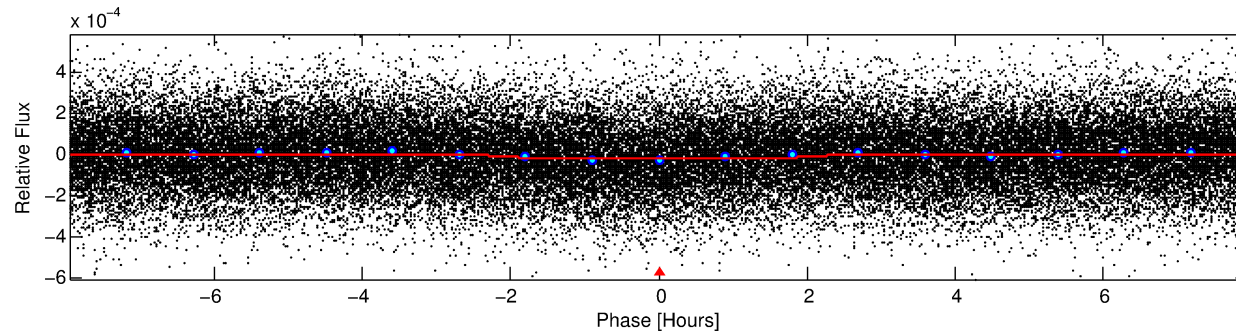
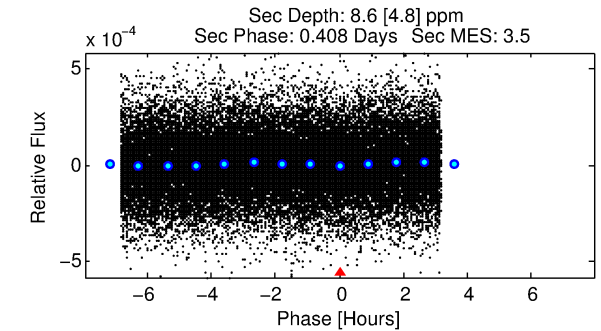
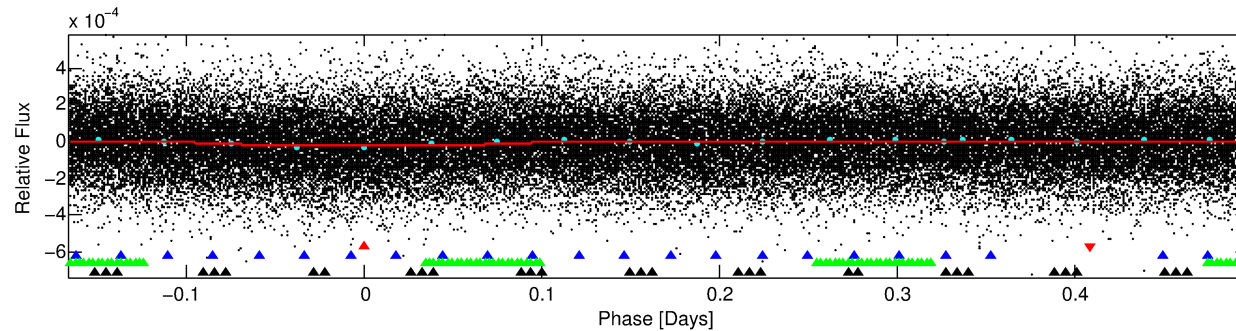
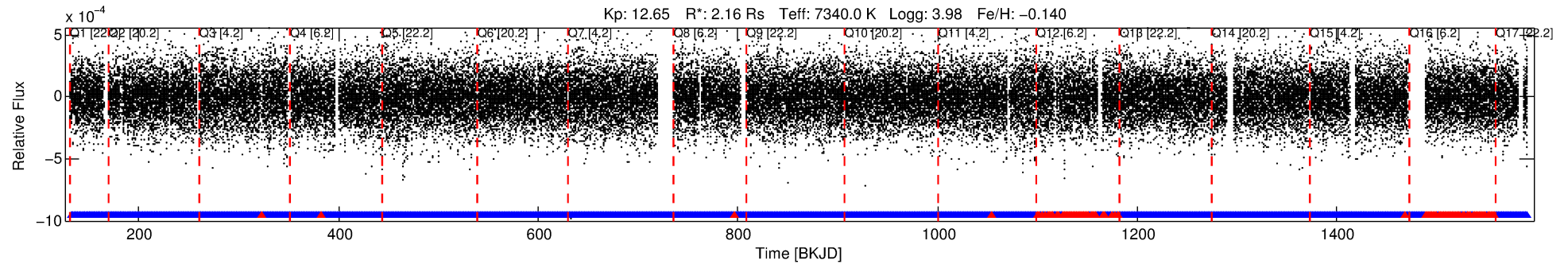
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012117276-01

No Significant Match Found

DV One-Page Summary

KIC: 12117276 Candidate: 1 of 4 Period: 0.663 d



DV Fit Results:

Period = 0.66333 [0.00001] d
Epoch = 132.1347 [0.0035] BKJD
Rp/R* = 0.0039 [0.0020]
a/R* = 1.25 [1.26]
b = 0.44 [5.30]
Seff = 39695.87 [11506.21]
Teff = 3599 [261] K
Rp = 0.92 [0.51] Re
a = 0.0175 [0.0033] AU
Ag = 1.71 [2.04] [0.35σ]
Teffp = 6364 [1842] K [1.49σ]

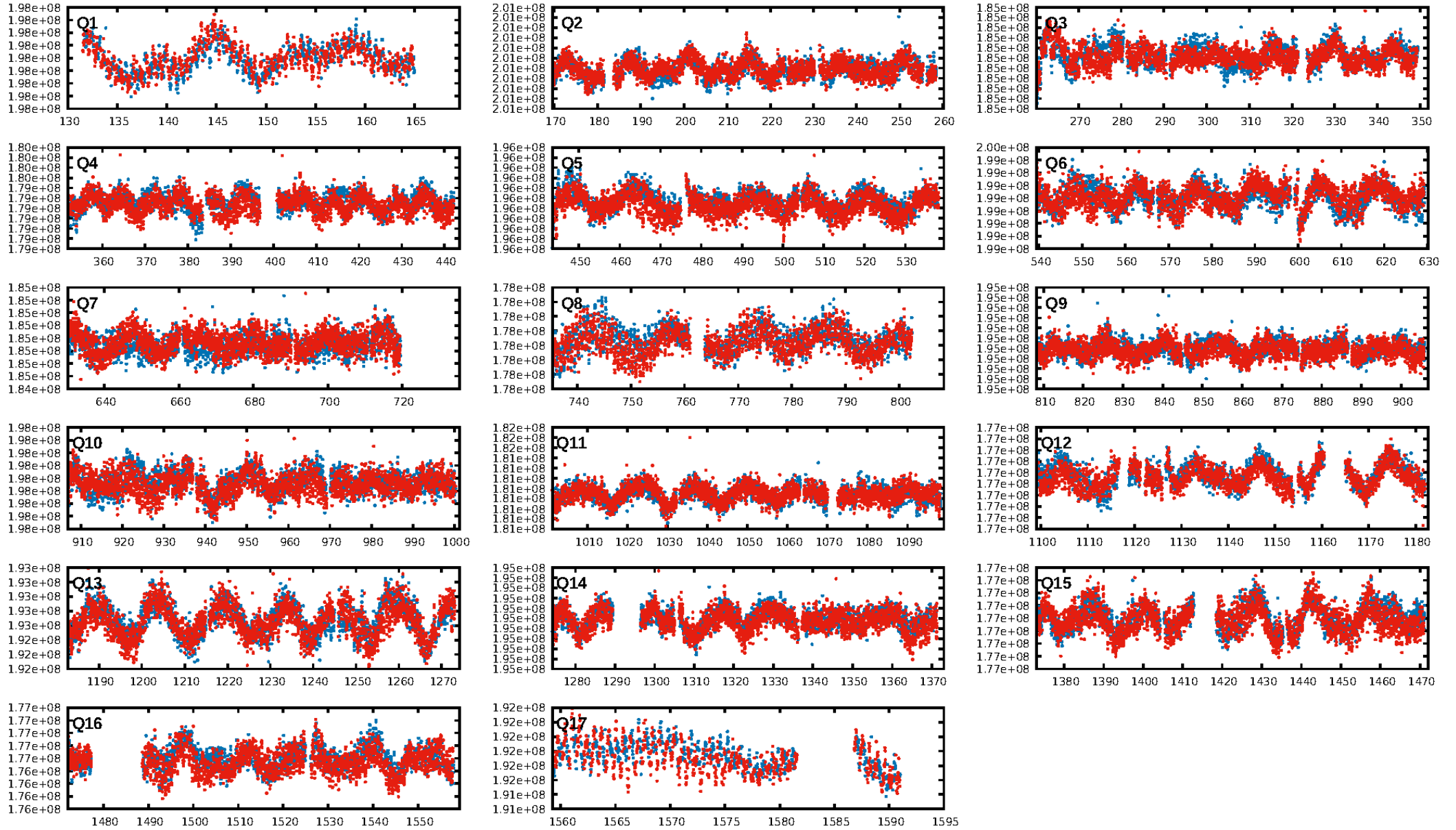
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [90.76σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.45e-17
RollingBand-fgt: 0.93 [1798/1931]
GhostDiagnostic-chr: 0.6604
Centroid-sig: 0.0%
Centroid-so: 2.290 arcsec [2.97σ]
OotOffset-rm: 0.261 arcsec [0.63σ]
KicOffset-rm: 0.245 arcsec [0.94σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.88 [14/16]
DiffImageOverlap-fno: 1.00 [17/17]

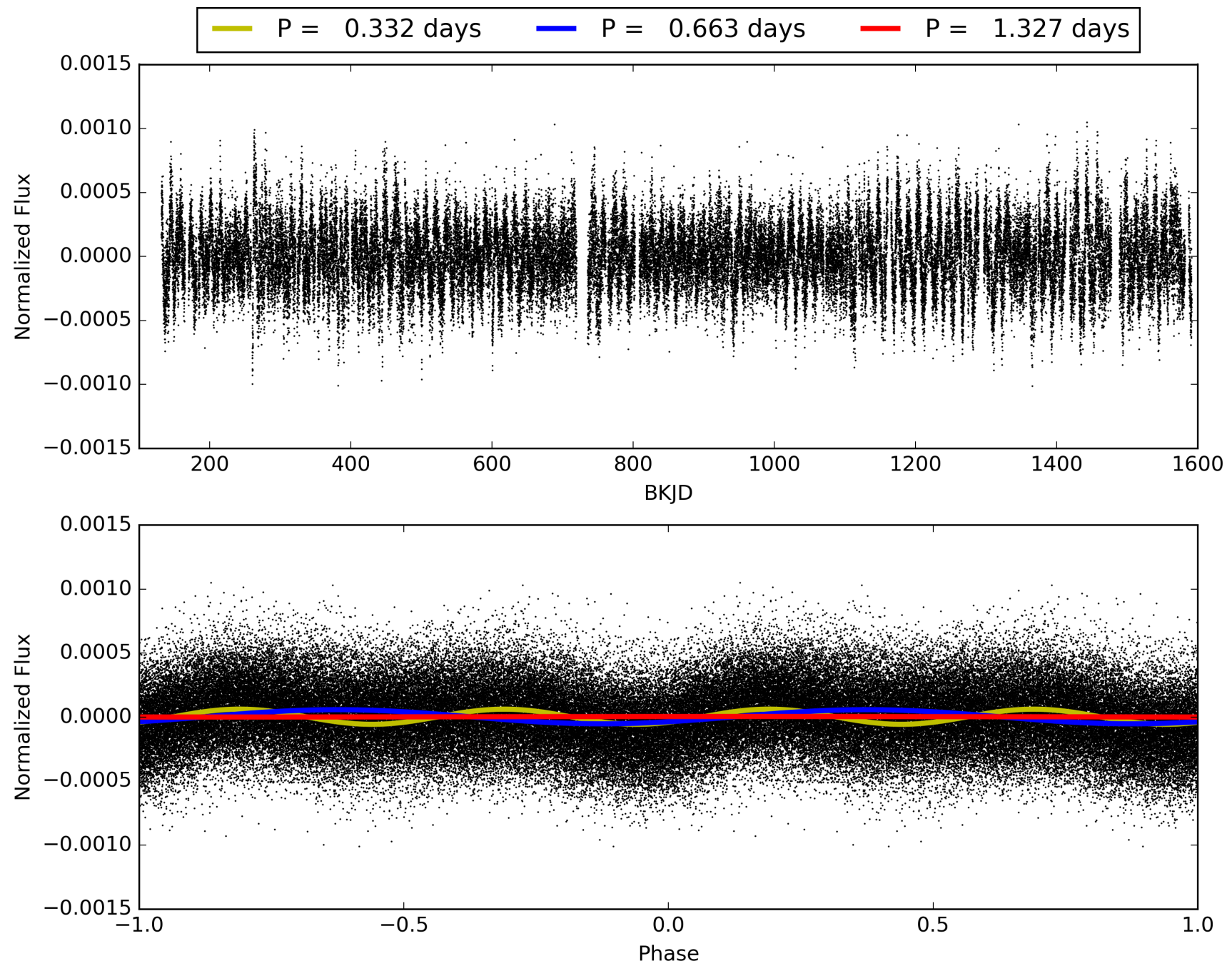
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:01:03 Z

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

TCE 012117276-01, PDC Light Curves

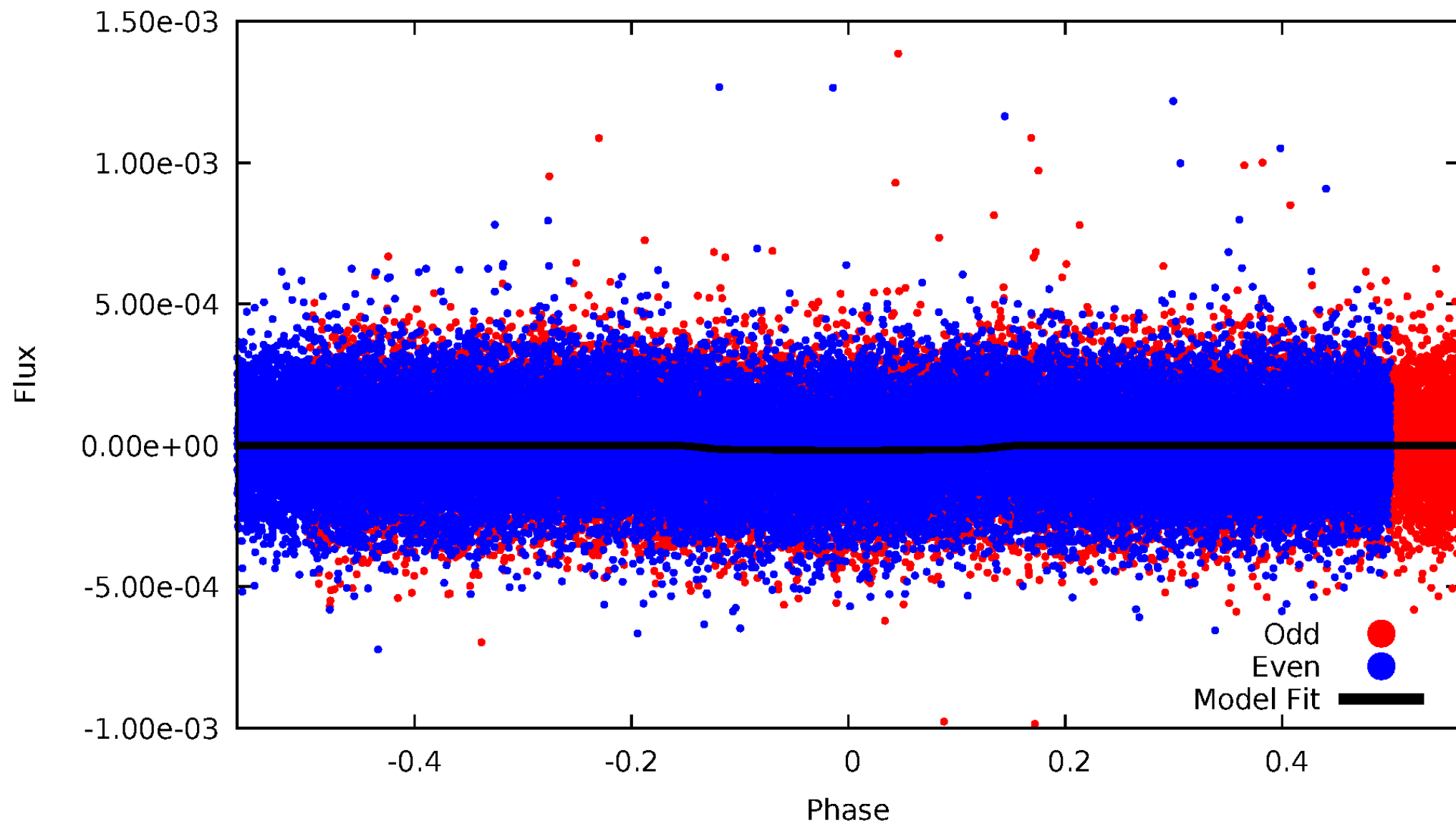


TCE 012117276-01



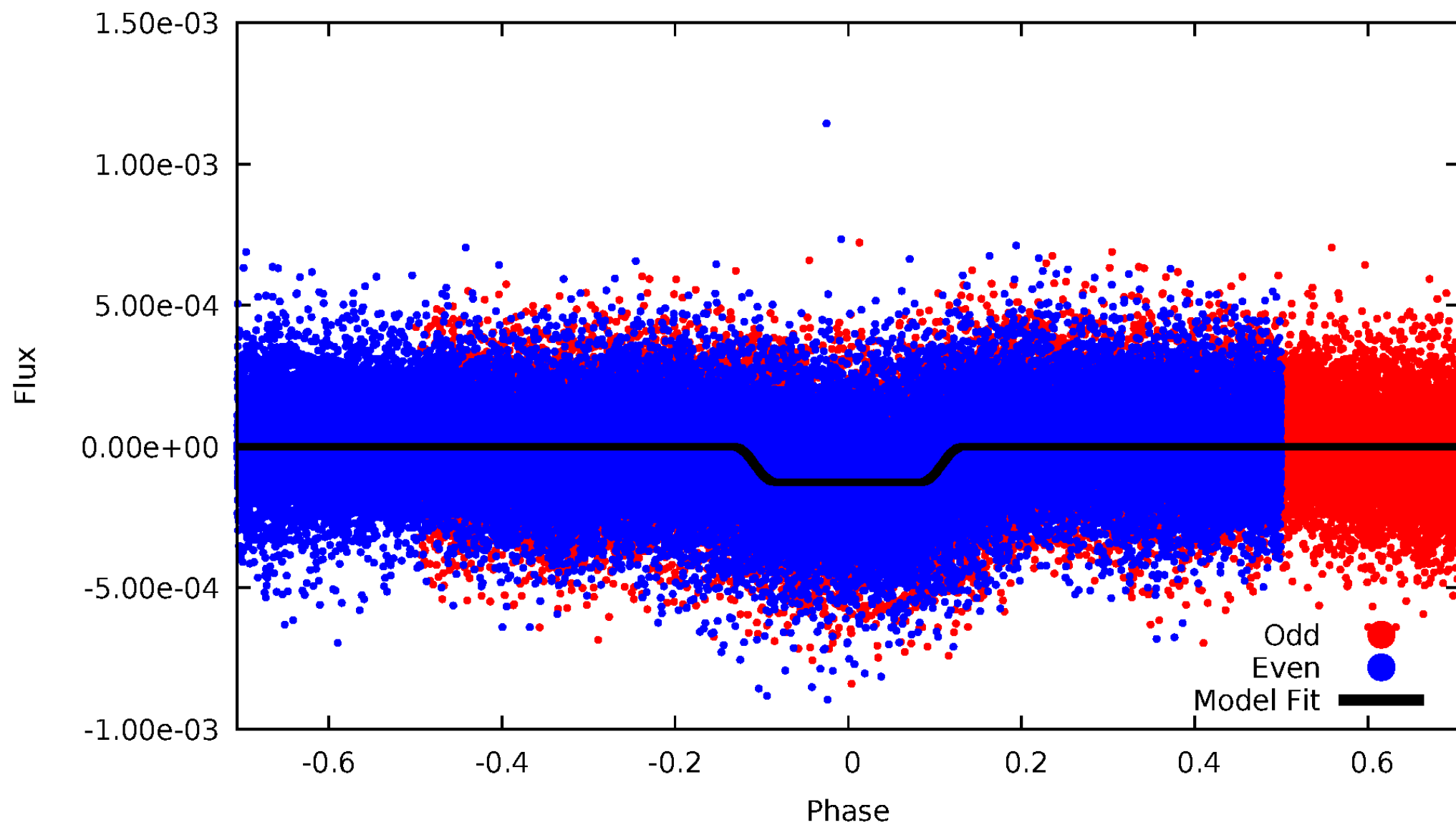
DV Odd/Even

TCE 012117276-01



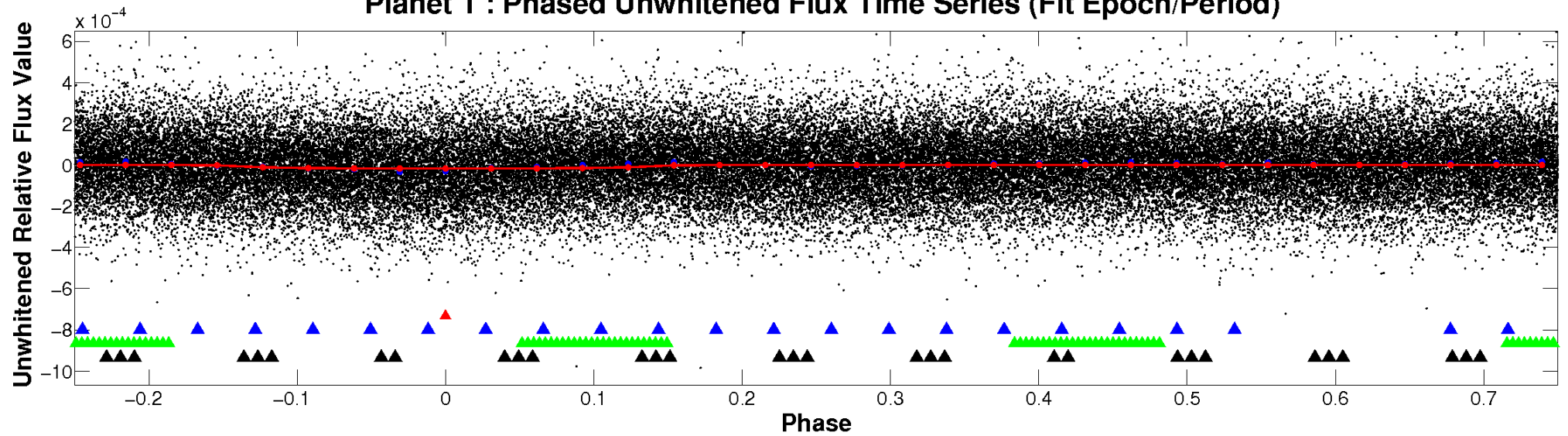
ALT Odd/Even

TCE 012117276-01

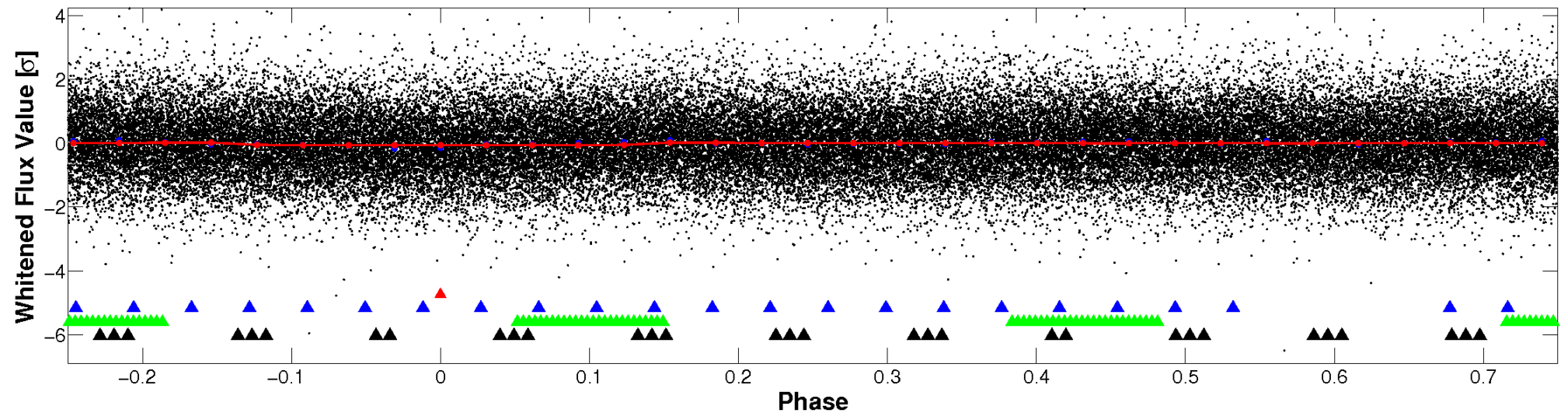


Non-Whitened Vs. Whitened Light Curve

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

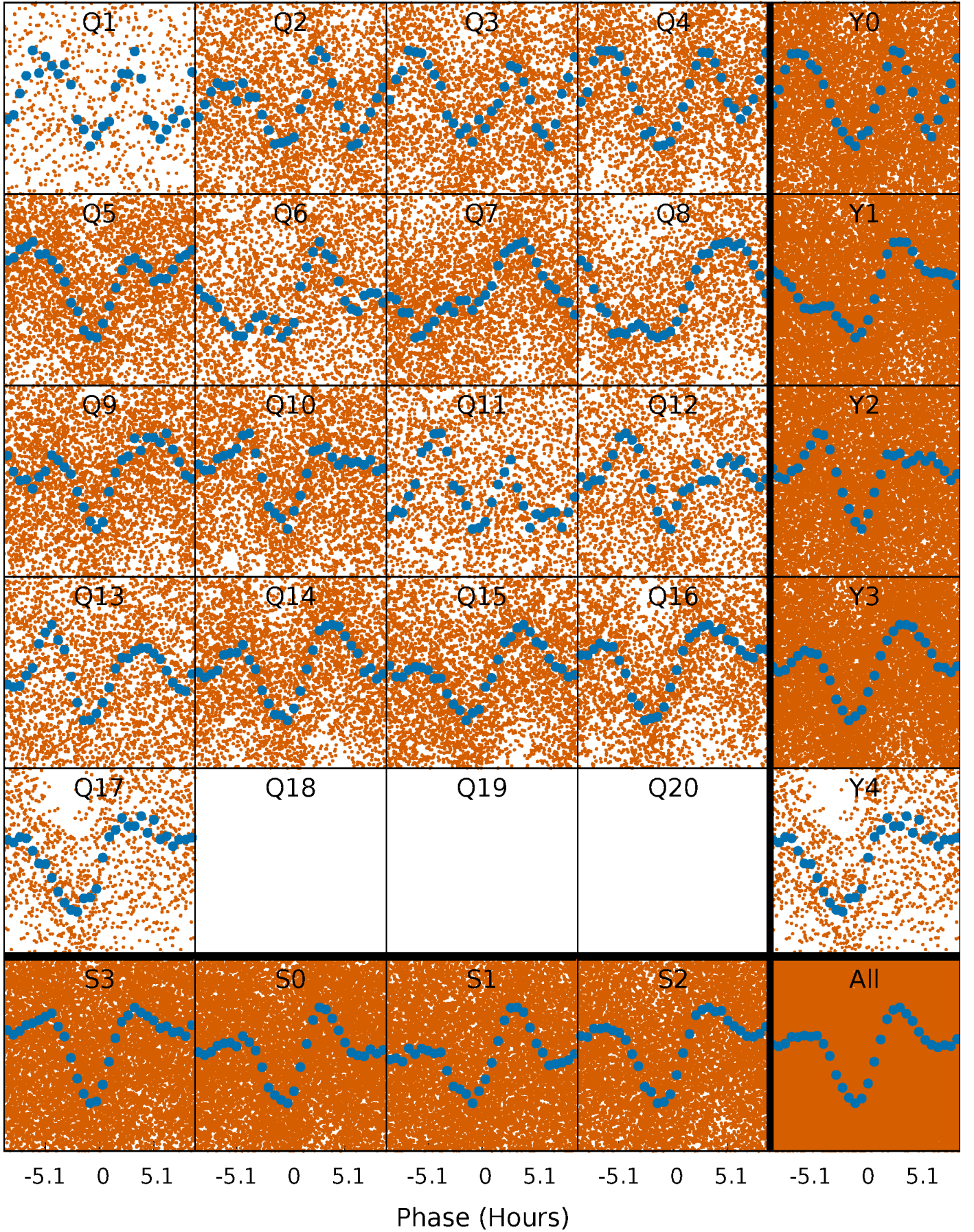


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



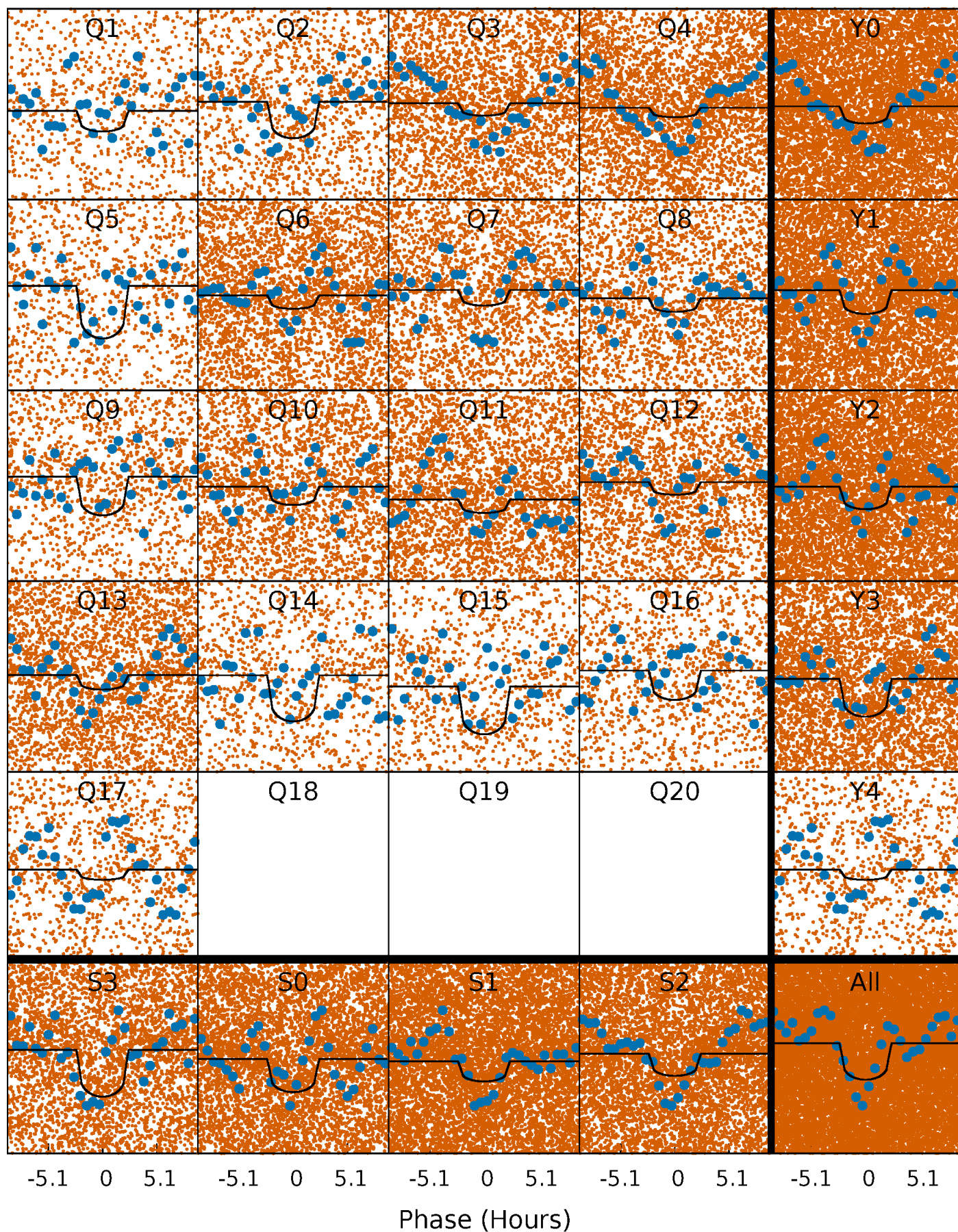
PDC Quarter-Phased Transit Curves

TCE 012117276-01 P= 0.663328 Days $T_0=132.134685$ (BKJD)



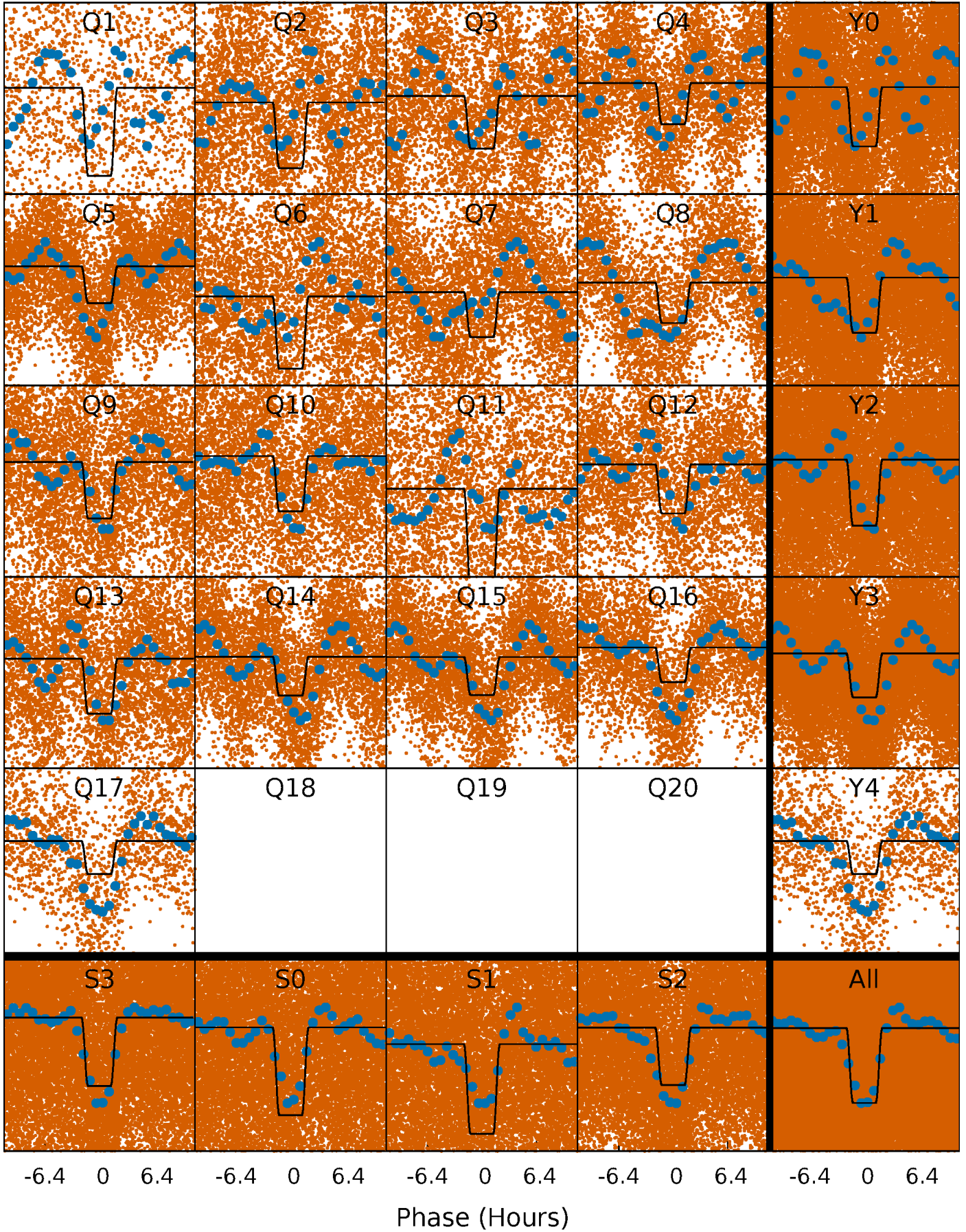
DV Quarter-Phased Transit Curves

TCE 012117276-01 P= 0.663328 Days $T_0=132.134685$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

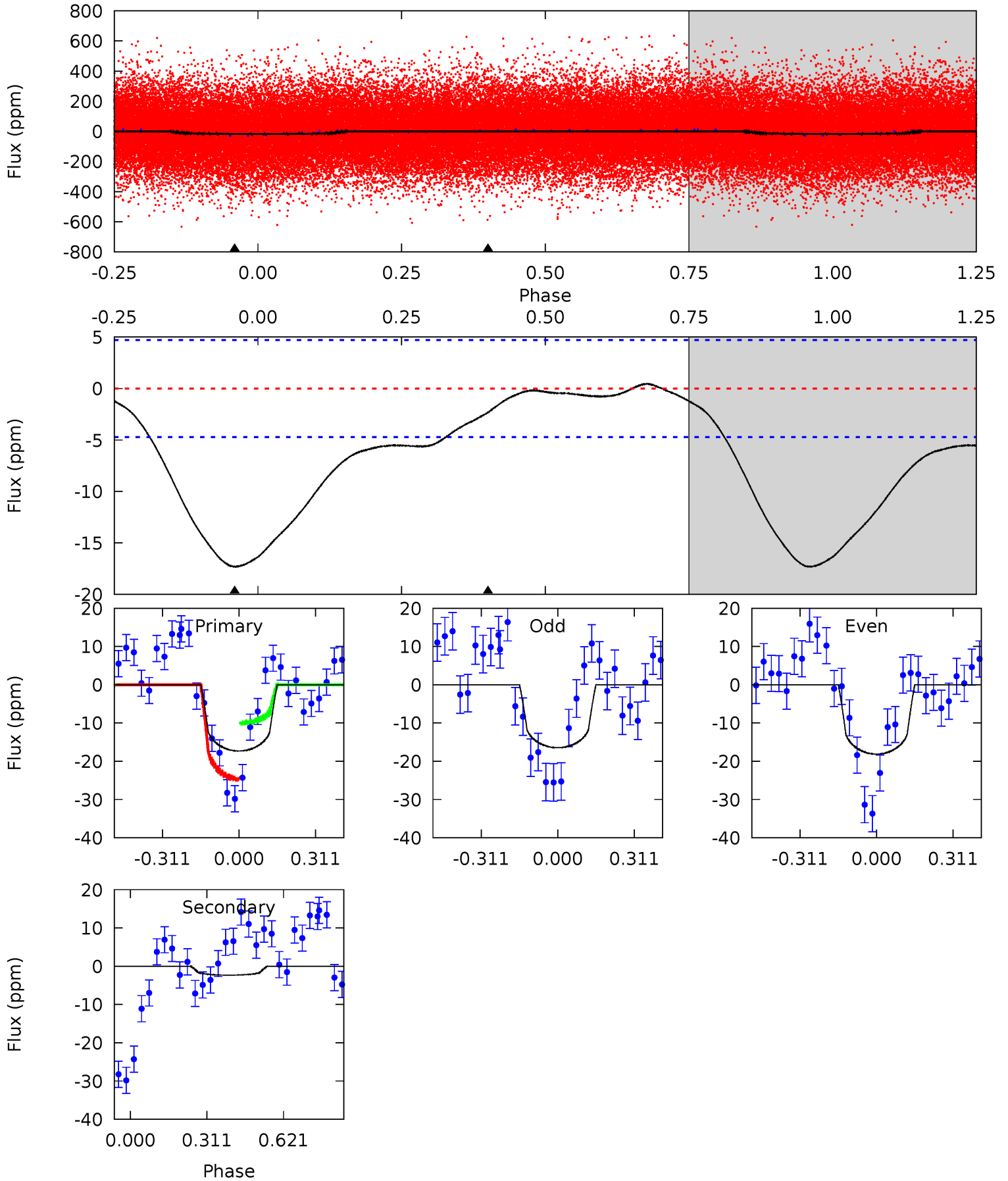
TCE 012117276-01 P= 0.663271 Days $T_0=132.159785$ (BKJD)



DV Model-Shift Uniqueness Test

012117276-01, P = 0.663328 Days, E = 131.471357 Days

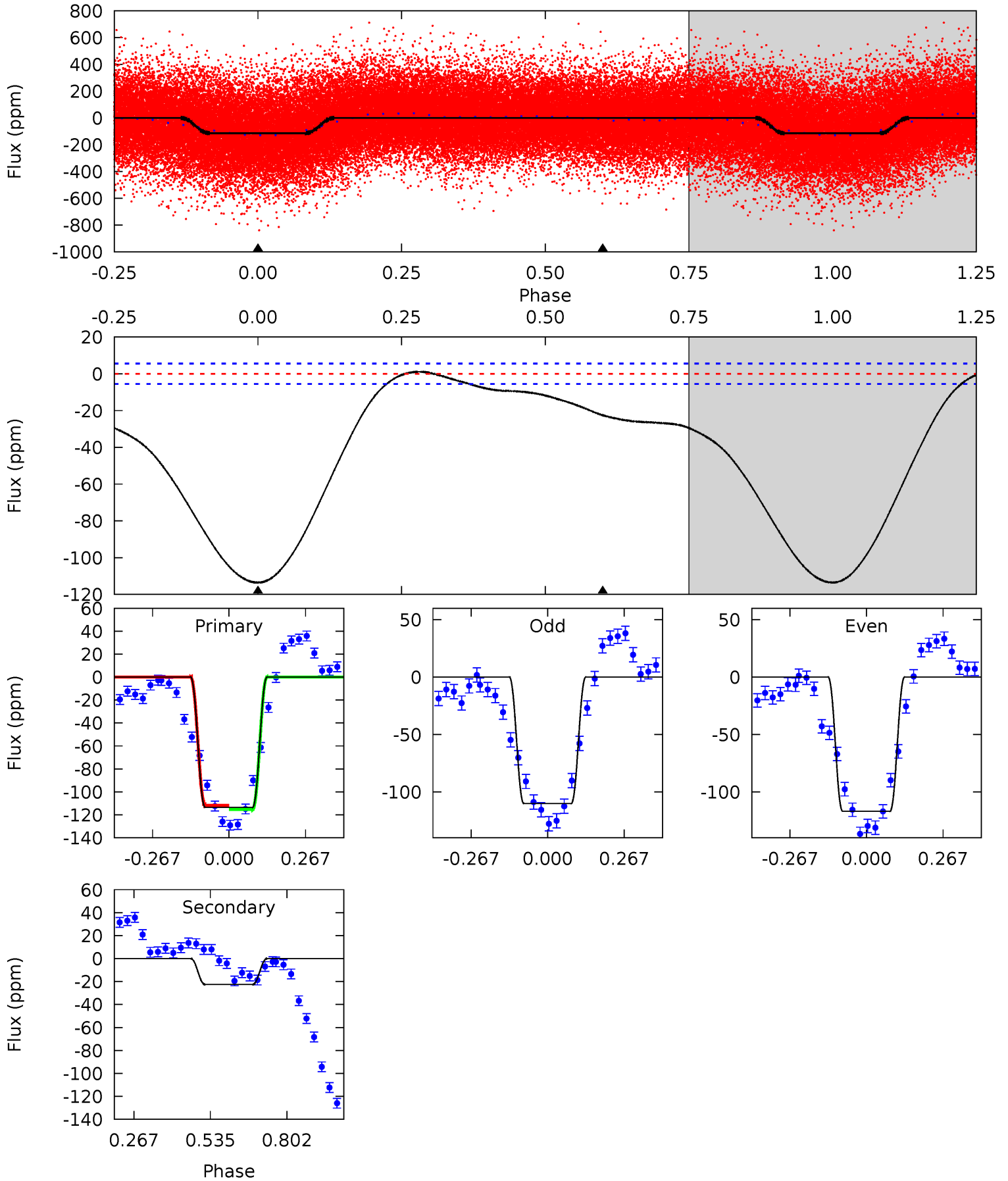
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.9	2.14	0	0	4.32	1.01	0.31	15.9	15.9	2.14	2.14	0.76	1.05	0.03	6.82



Alt Model-Shift Uniqueness Test

012117276-01, P = 0.663271 Days, E = 131.496514 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
89.1	17.7	0	0	4.35	1.11	1.19	89.1	89.1	17.7	17.7	2.62	1.04	0.01	1.46



Stellar Parameters For KIC 012117276

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7340^{+73}_{-80}	$3.979^{+0.162}_{-0.108}$	$-0.140^{+0.150}_{-0.150}$	$2.163^{+0.378}_{-0.462}$	$1.623^{+0.144}_{-0.160}$	$0.226^{+0.191}_{-0.076}$
	+1%/-1%	+4%/-3%	+107%/-107%	+17%/-21%	+9%/-10%	+85%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 012117276-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2 ± 1	$0.91^{+0.51}_{-0.43}$	5002^{+225}_{-255}	3826^{+2074}_{-7618}	$0.456^{+1.197}_{-0.298}$
Alt.	-23 ± 1	$2.58^{+0.57}_{-0.52}$	5017^{+241}_{-253}	4199^{+614}_{-715}	$0.571^{+0.325}_{-0.188}$

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 $A_{obs} \gg 1.0$

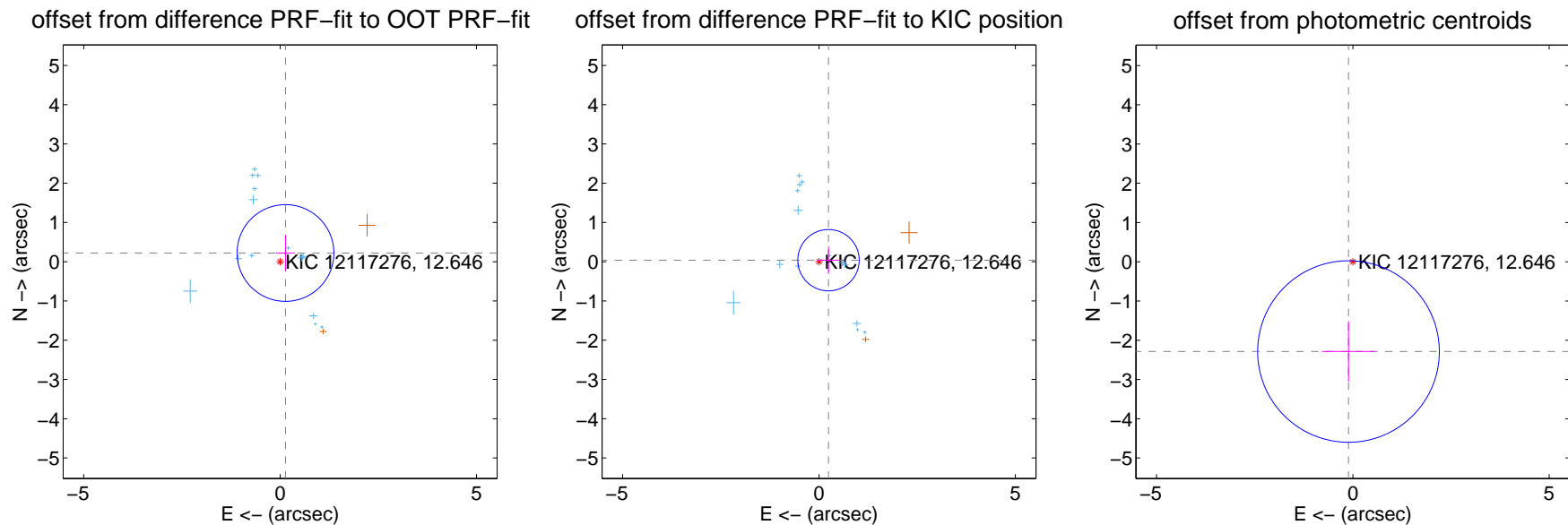
DV Centroid Data

Supplemental centroid analysis for 012117276-01. Kepler magnitude: 12.65. Transit SNR 8.15

There are 14 quarters with good PRF difference image offsets

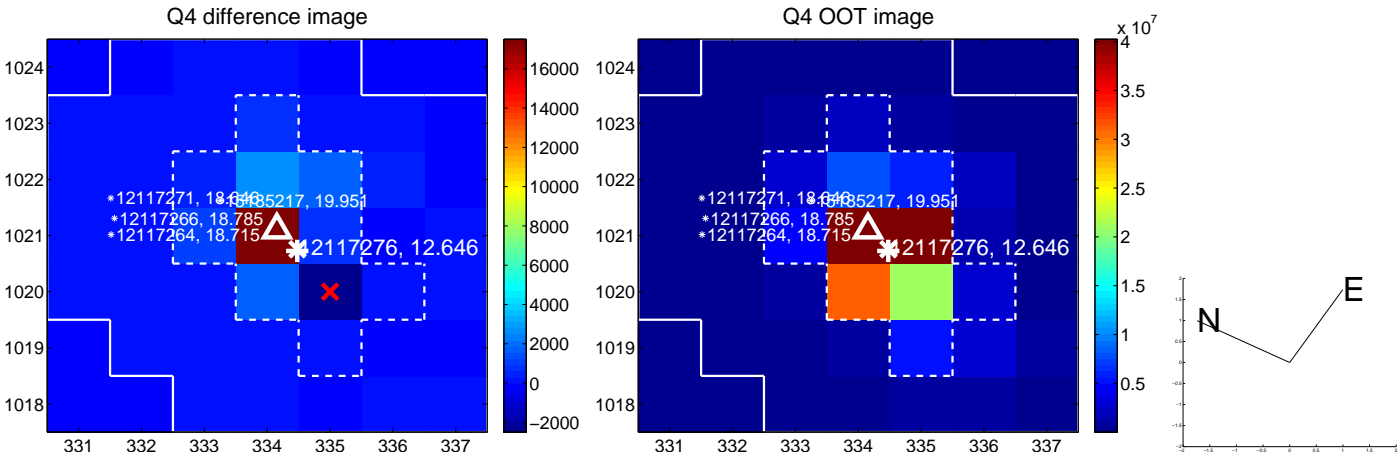
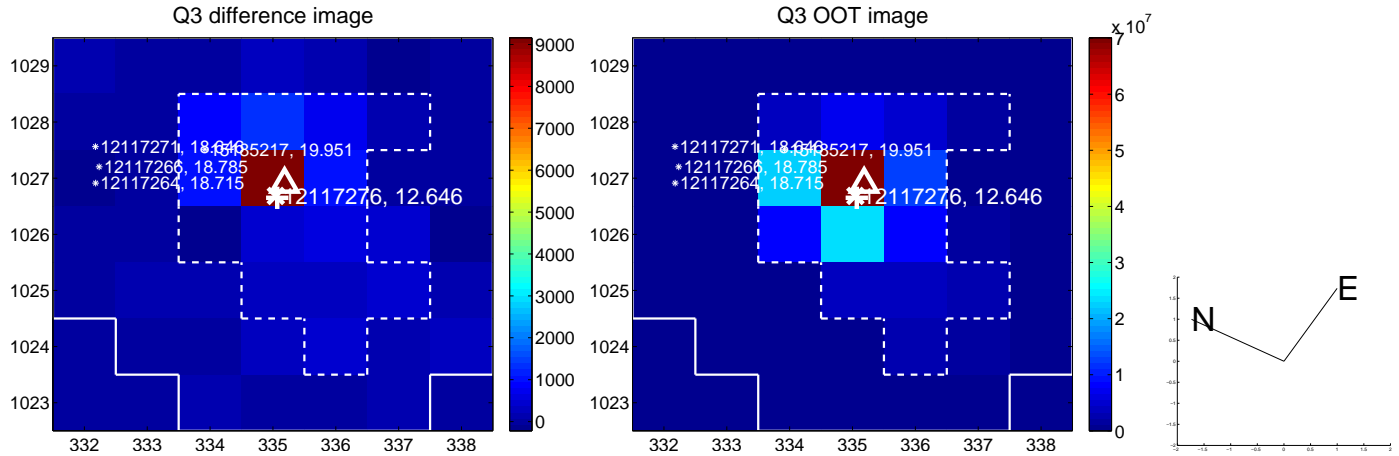
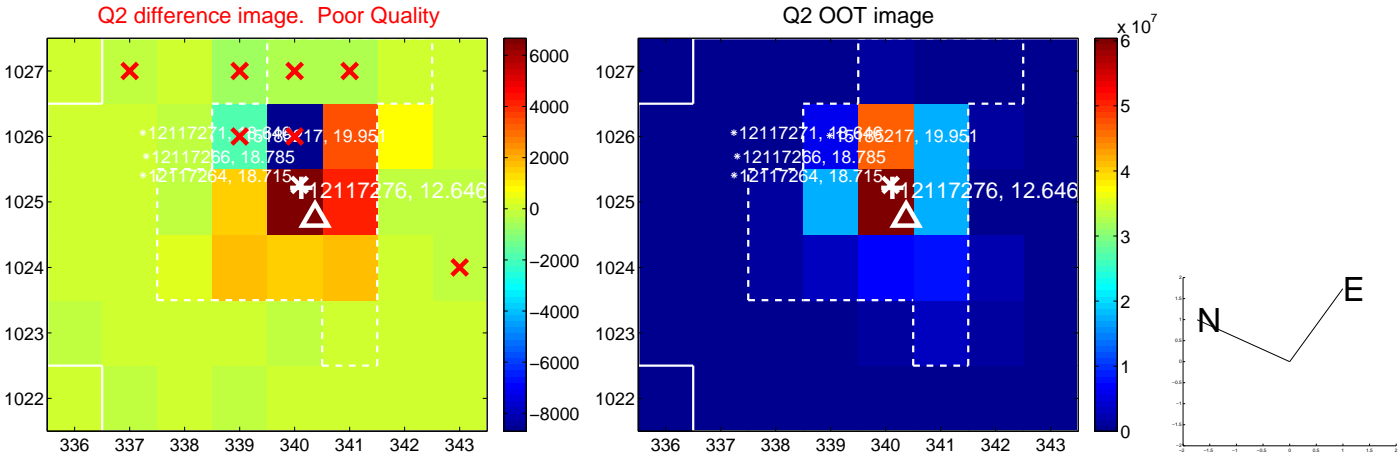
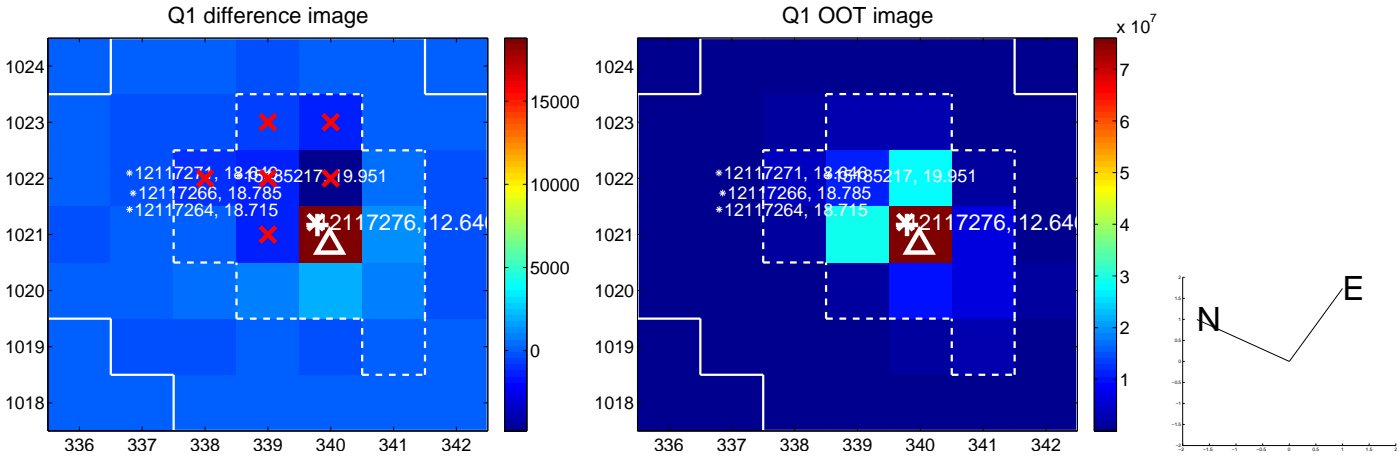
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.261 ± 0.411	0.63	-0.137 ± 0.239	0.222 ± 0.460
PRF-fit source offset from KIC position	0.245 ± 0.260	0.94	-0.242 ± 0.277	0.038 ± 0.350
photometric centroid source offset	2.29 ± 0.77	2.97	0.11 ± 0.68	-2.29 ± 0.77

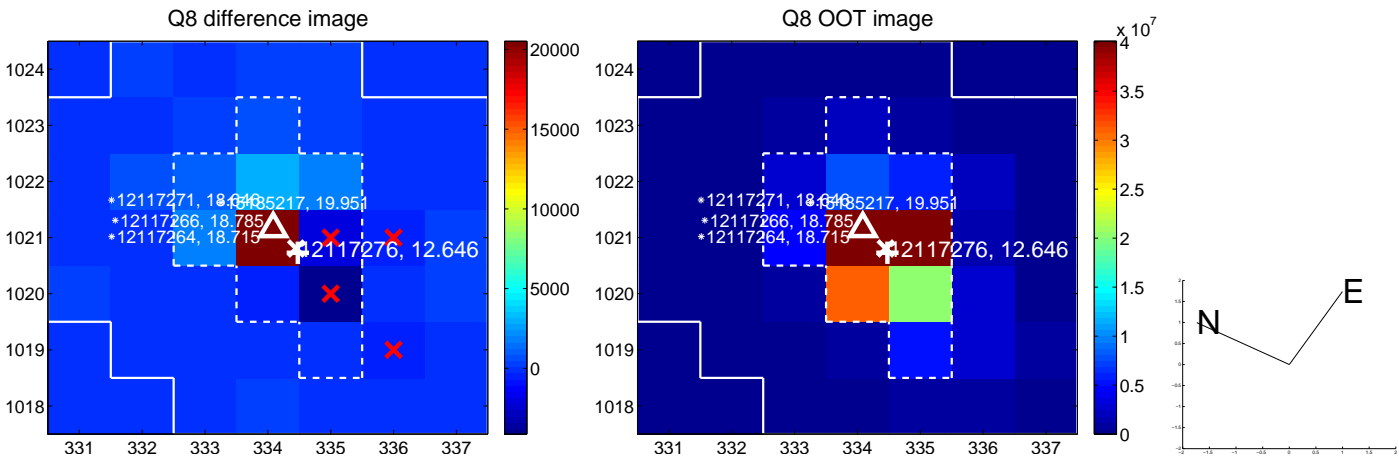
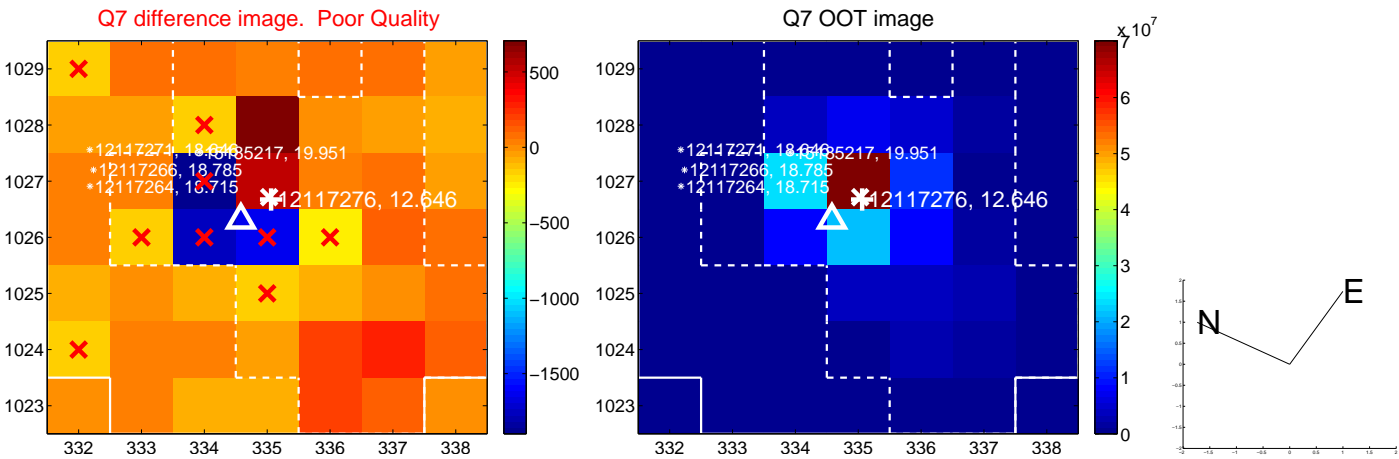
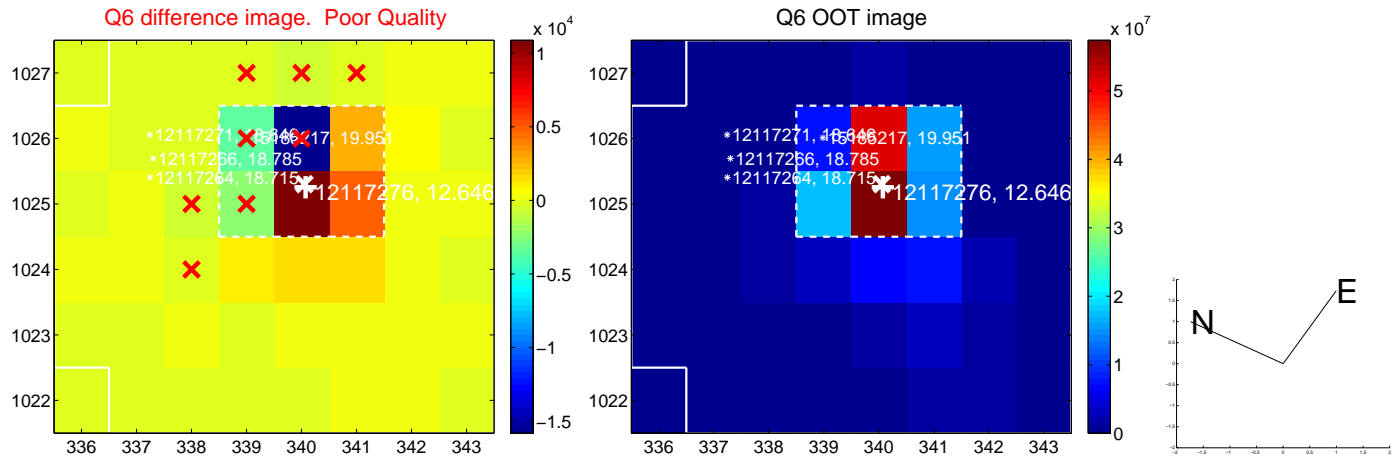
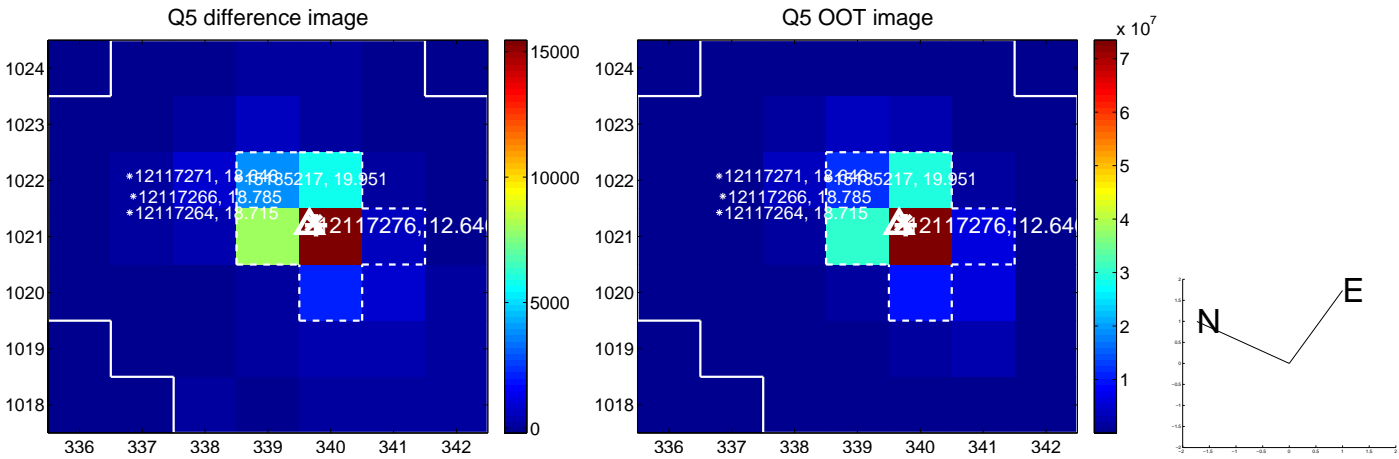


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

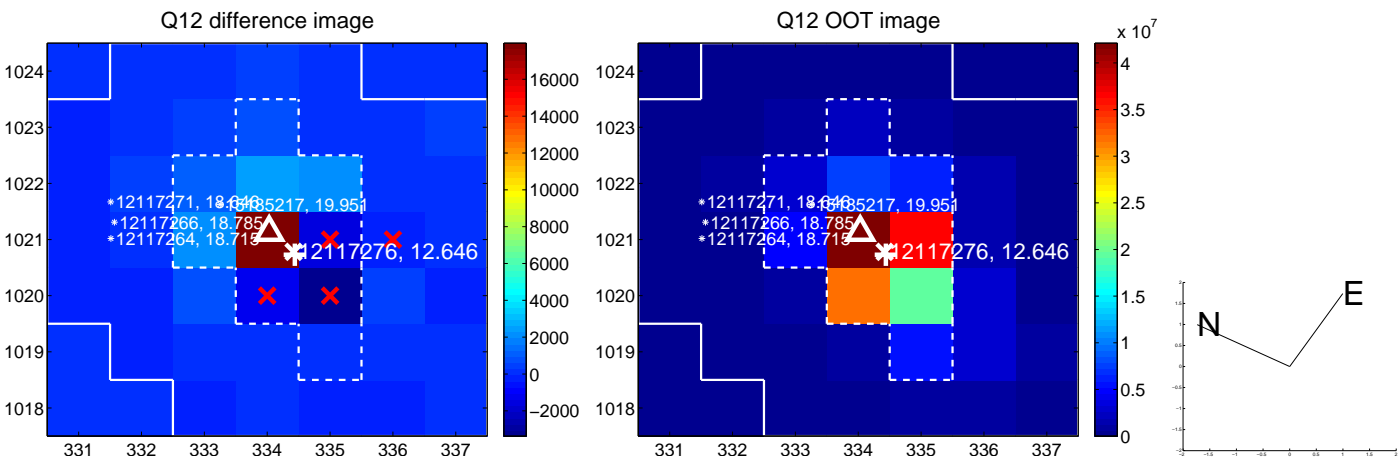
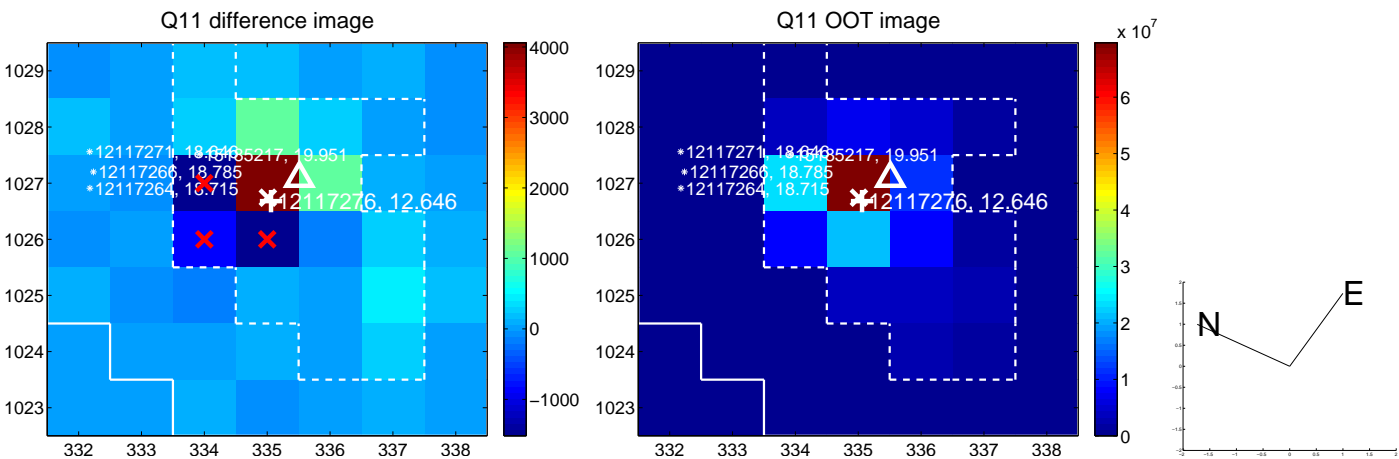
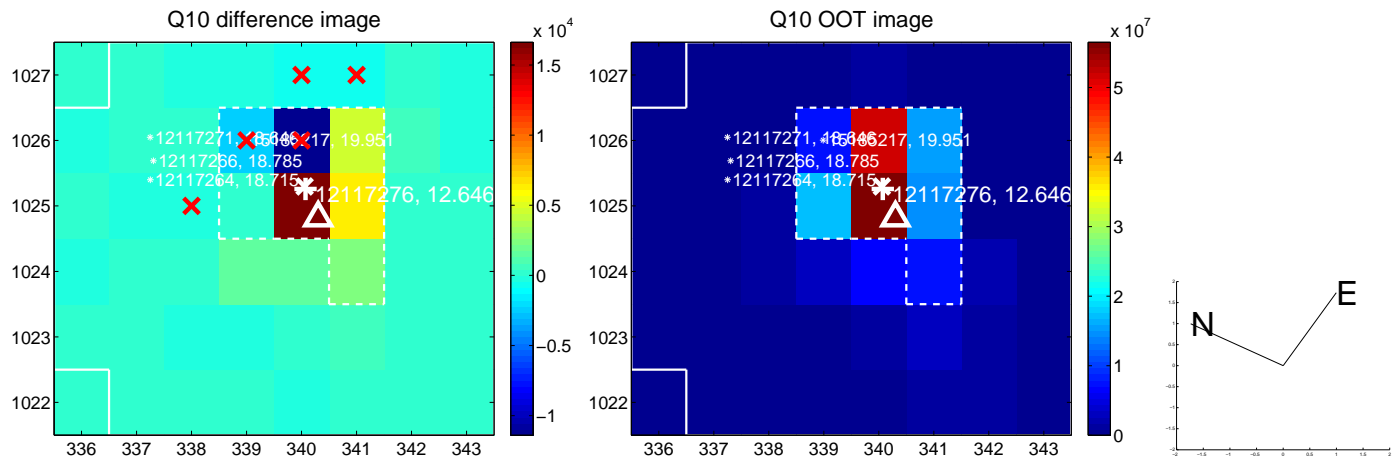
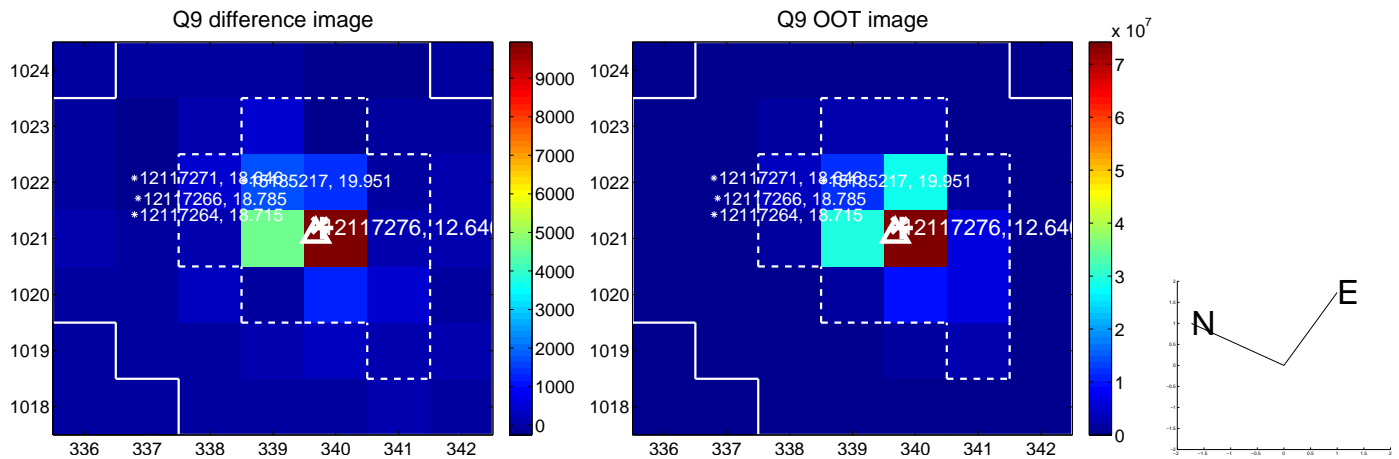
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



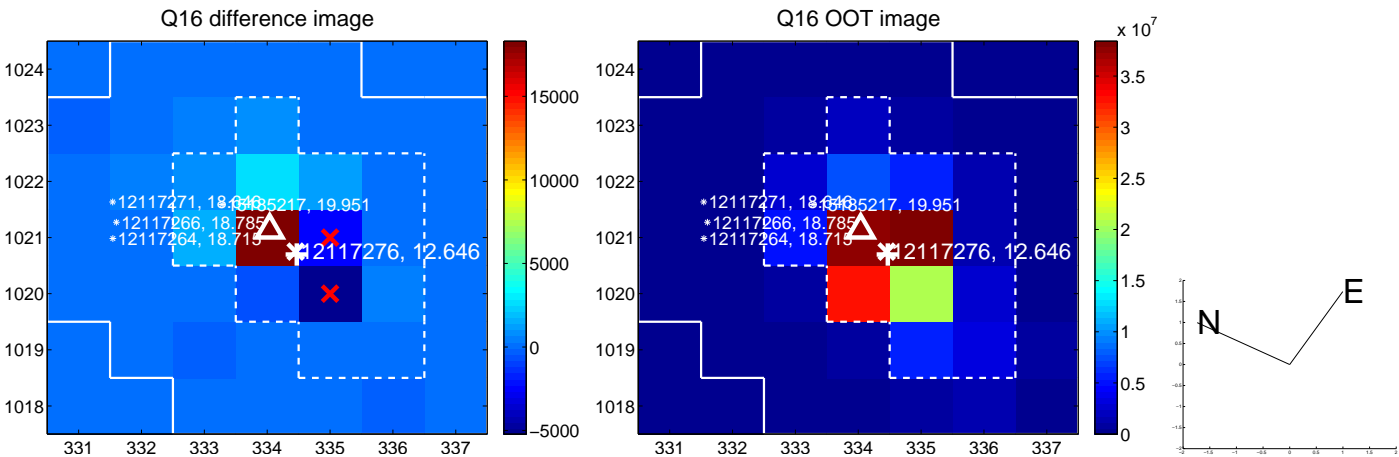
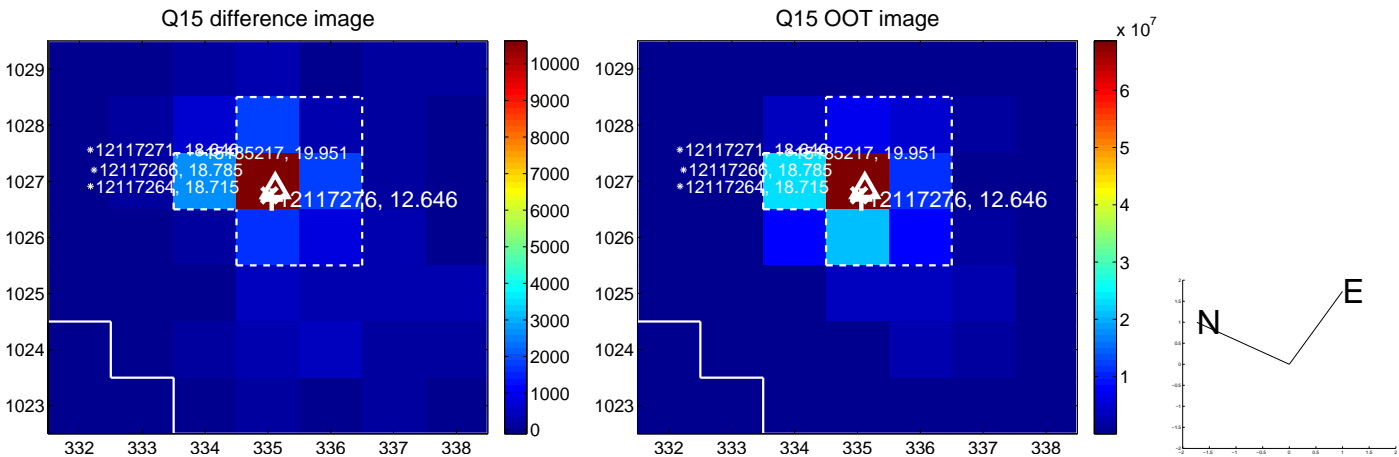
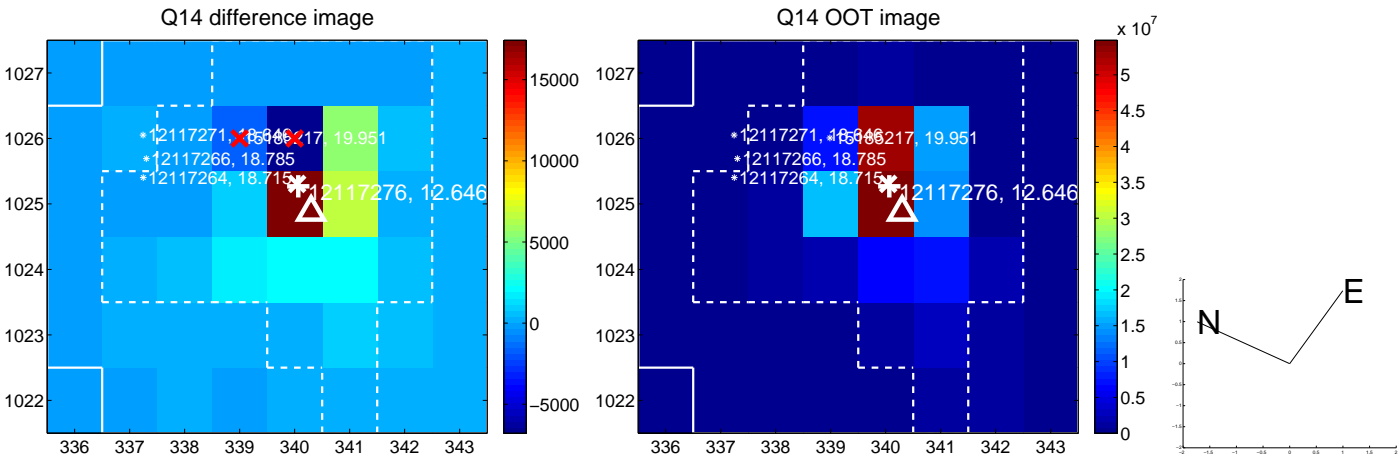
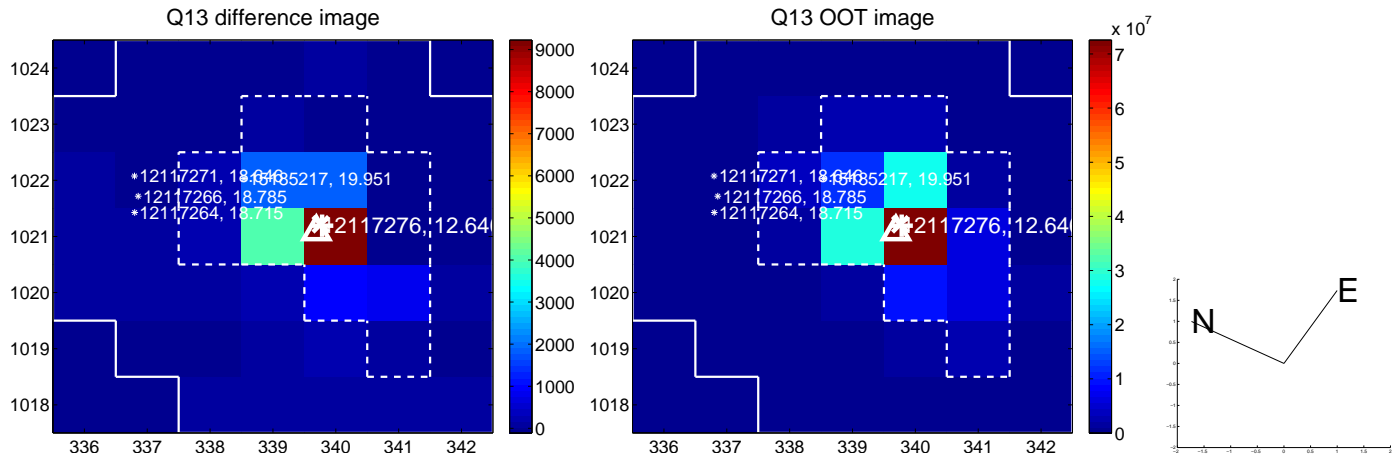
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



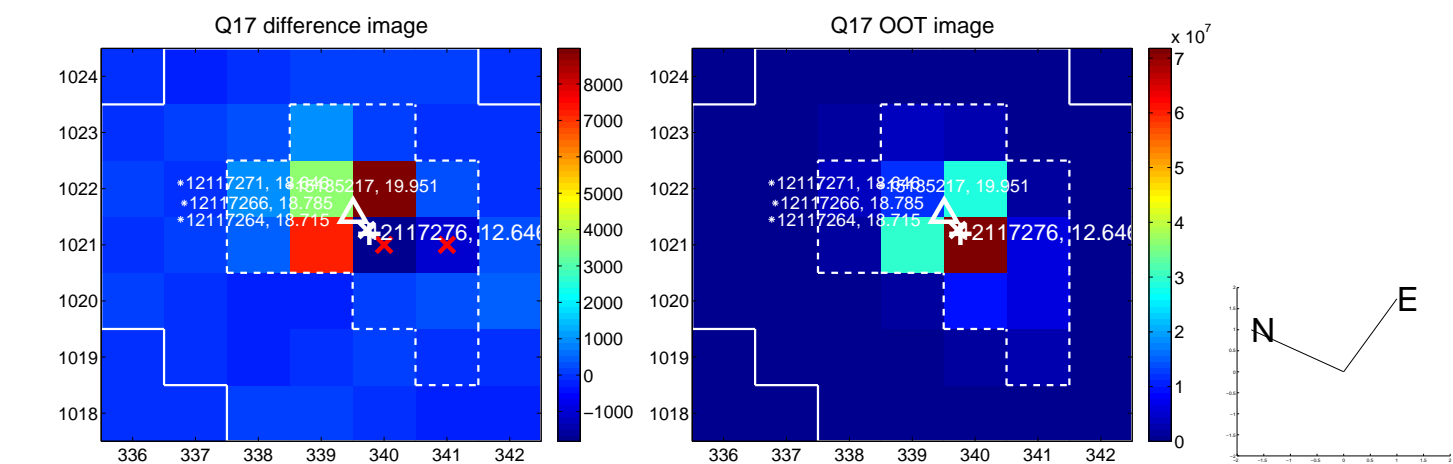
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



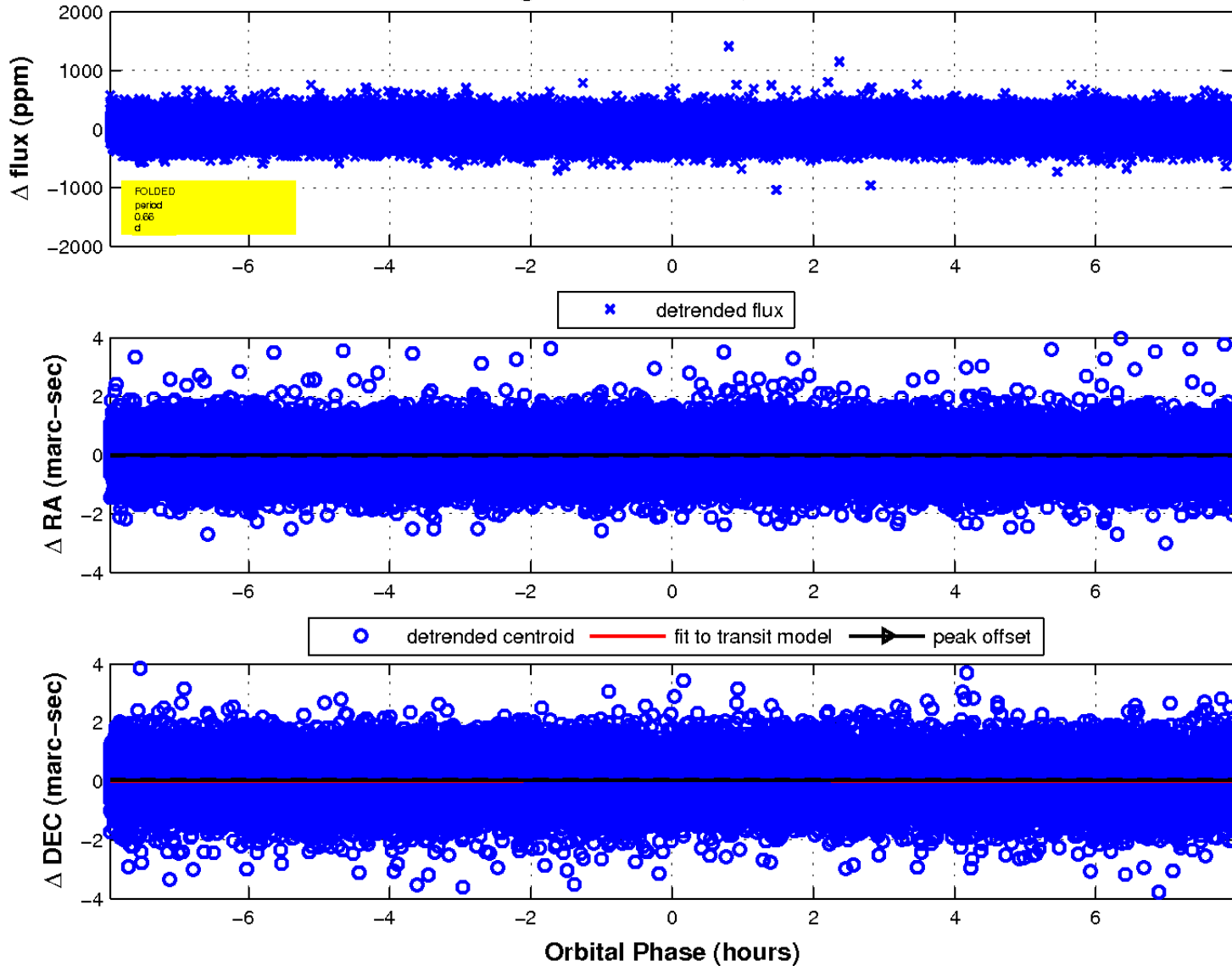
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



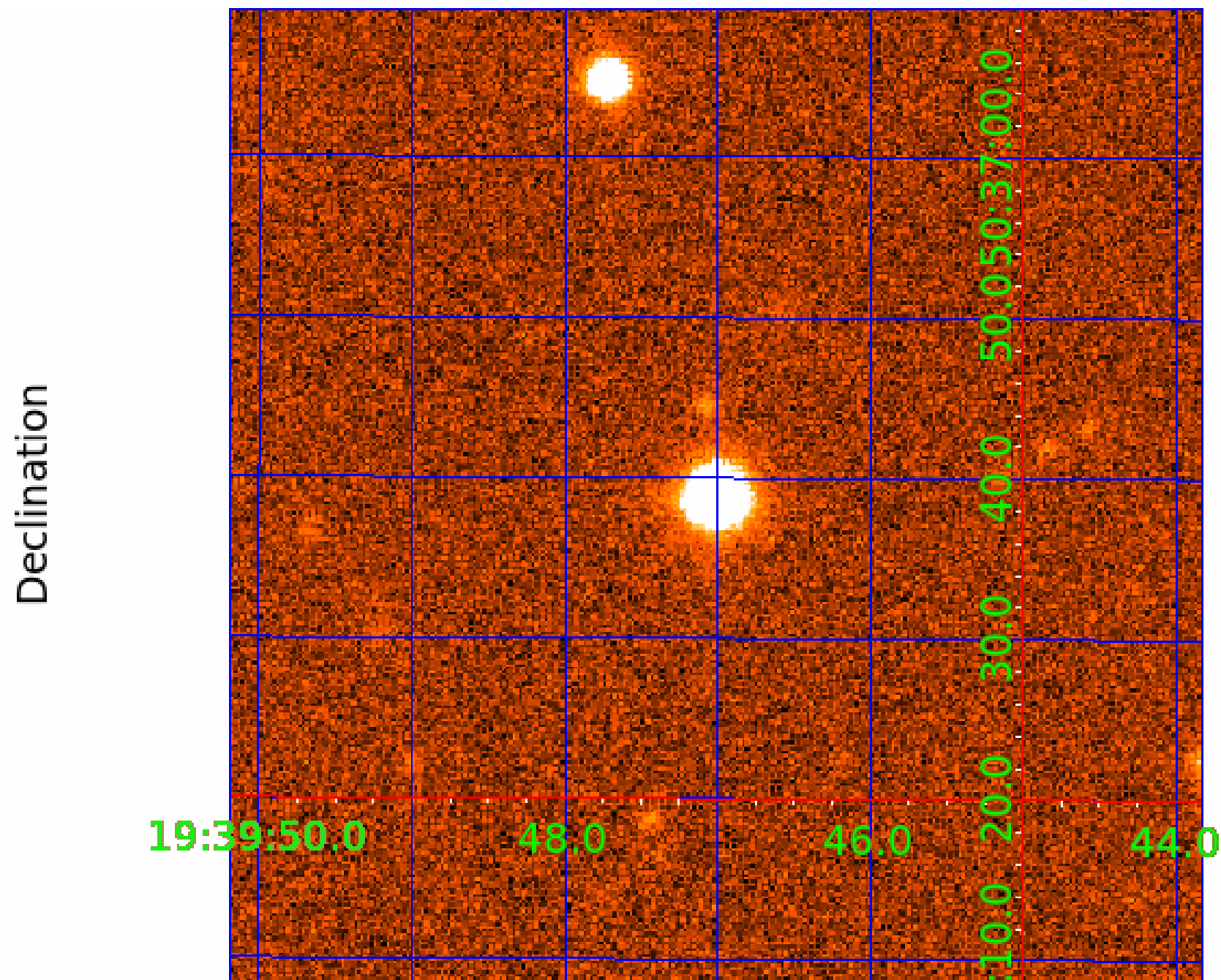
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 4



UKIRT Image



KIC 012117276

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})
012117276-01	OBS	No	0.663328	132.134685	17.1	4.486	10.1	8.1	2.16	7340	0.92	39695.86
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012117276-03	OBS	No	18.793425	137.540377	182.7	1.692	9.7	10.0	2.16	7340	3.44	459.60
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Robovetter Results

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012117276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
012117276-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

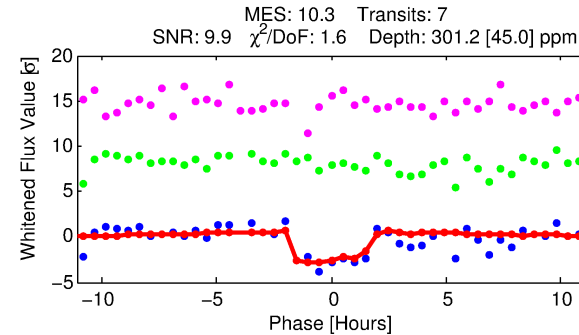
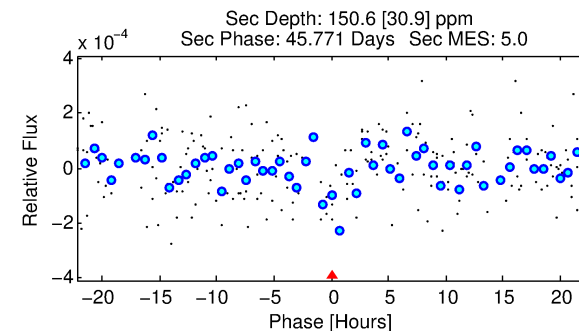
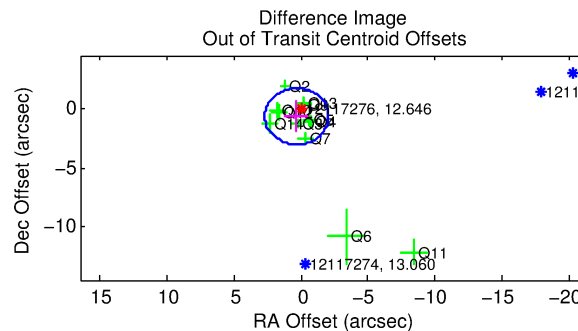
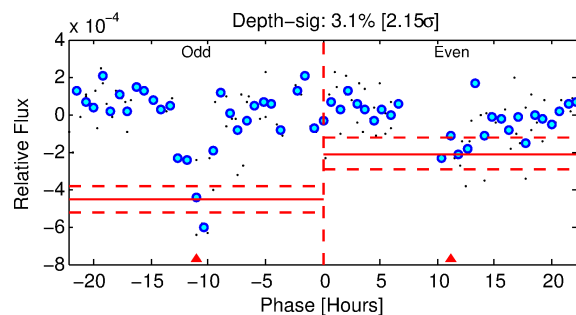
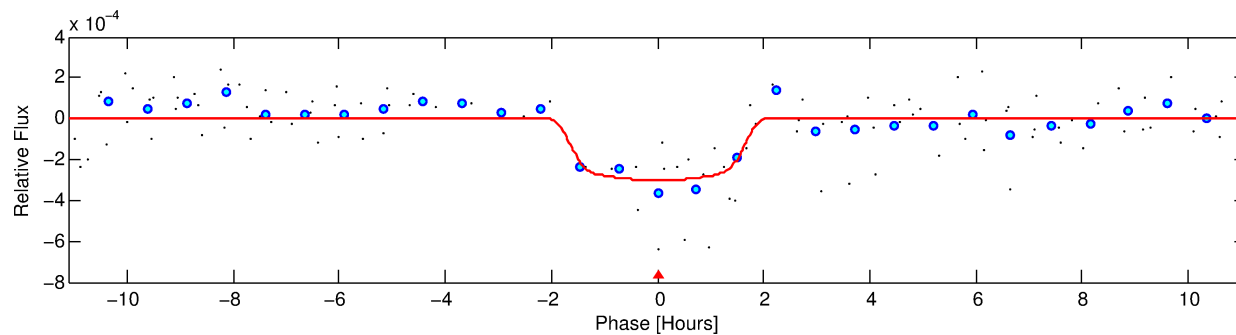
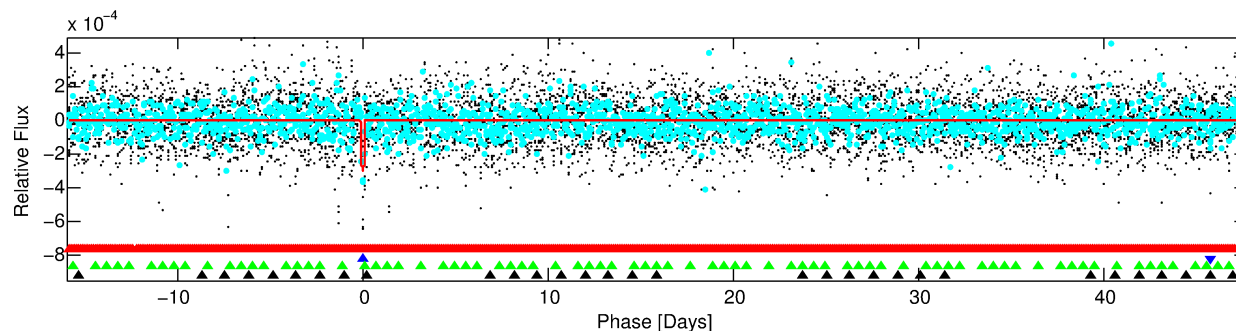
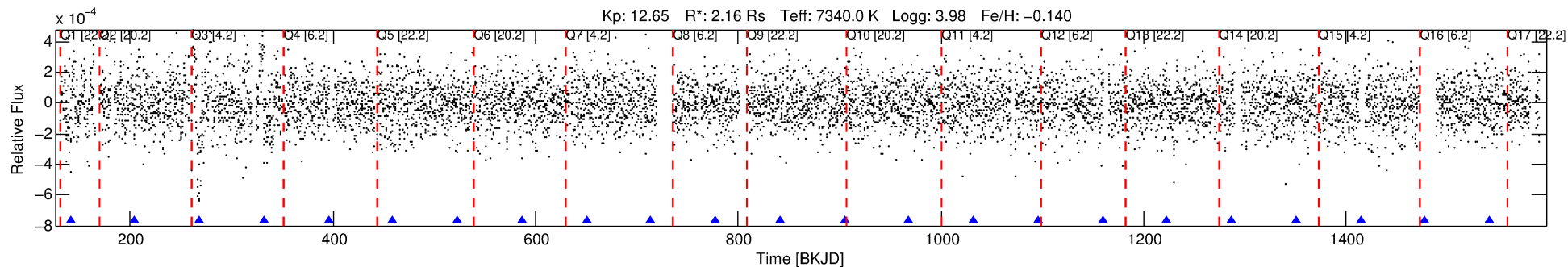
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012117276-02

No Significant Match Found

DV One-Page Summary

KIC: 12117276 Candidate: 2 of 4 Period: 63.654 d



DV Fit Results:

Period = 63.65371 [0.00311] d
Epoch = 141.1109 [0.0154] BKJD
Rp/R* = 0.0187 [0.0075]
a/R* = 59.52 [149.68]
b = 0.91 [0.44]
Seff = 90.35 [26.19]
Teq = 786 [57] K
Rp = 4.42 [2.01] Re
a = 0.3670 [0.0694] AU
Ag = 570.21 [498.57] [1.14 σ]
Teffp = 5940 [1228] K [4.19 σ]

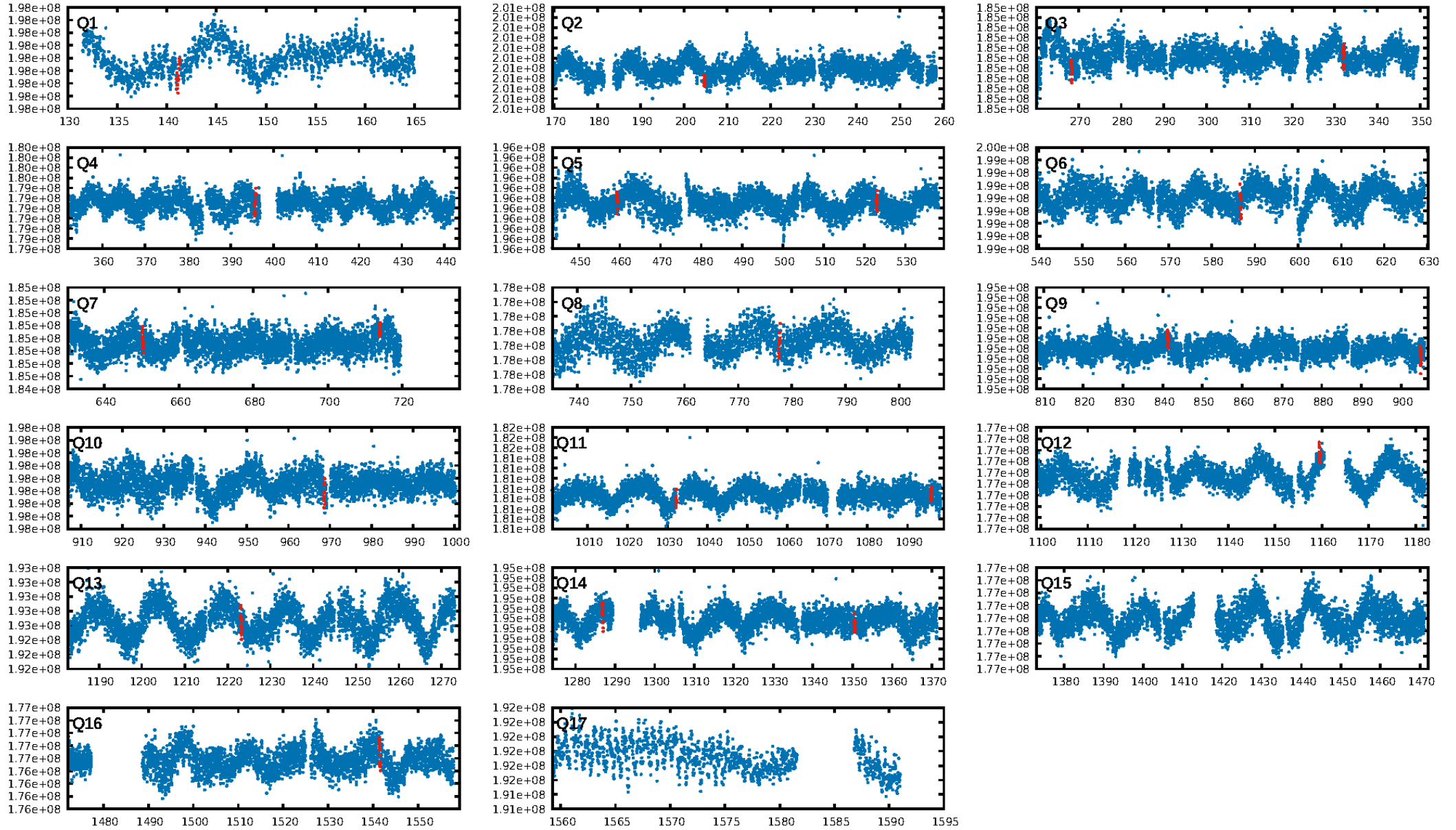
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [96.26 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 4.36e-14
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 0.2003
Centroid-sig: 59.0%
Centroid-so: 0.560 arcsec [1.09 σ]
OotOffset-rm: 0.746 arcsec [0.94 σ]
OotOffset-st: 4/3/2/3 [12]
KicOffset-rm: 0.856 arcsec [0.93 σ]
KicOffset-st: 4/3/2/3 [12]
DiffImageQuality-fgm: 0.58 [7/12]
DiffImageOverlap-fno: 0.00 [0/15]

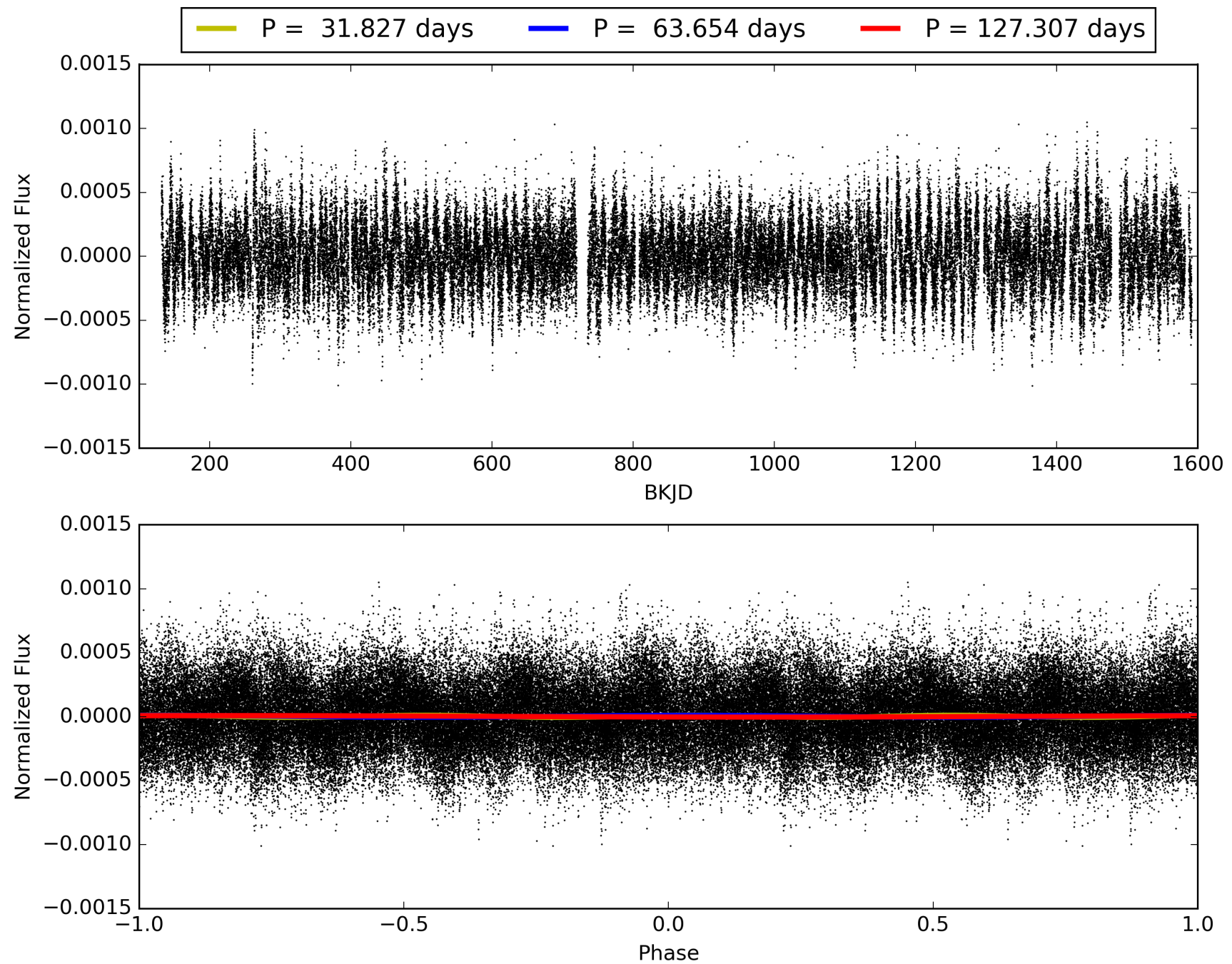
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:01:14 Z

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

TCE 012117276-02, PDC Light Curves

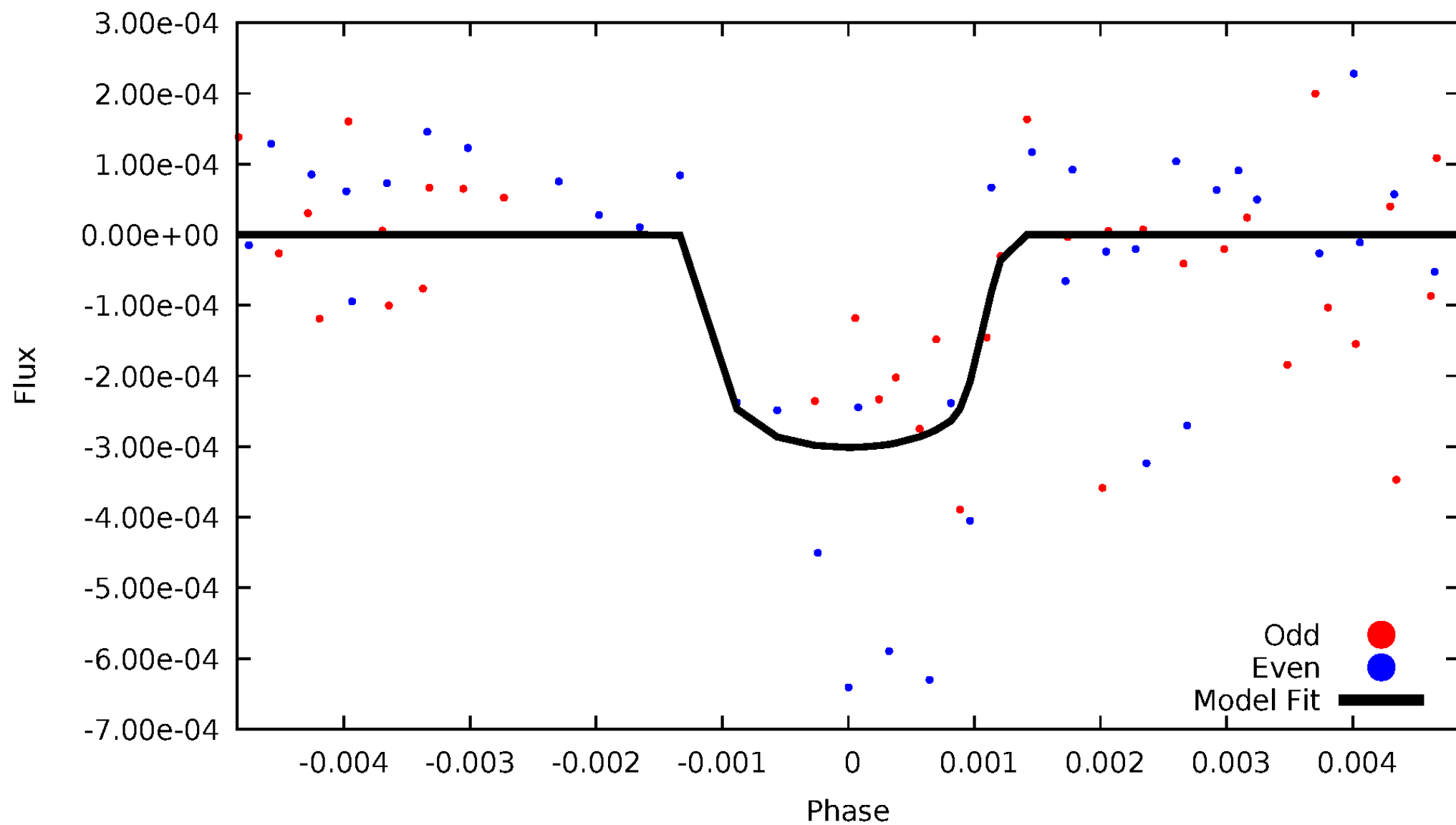


TCE 012117276-02



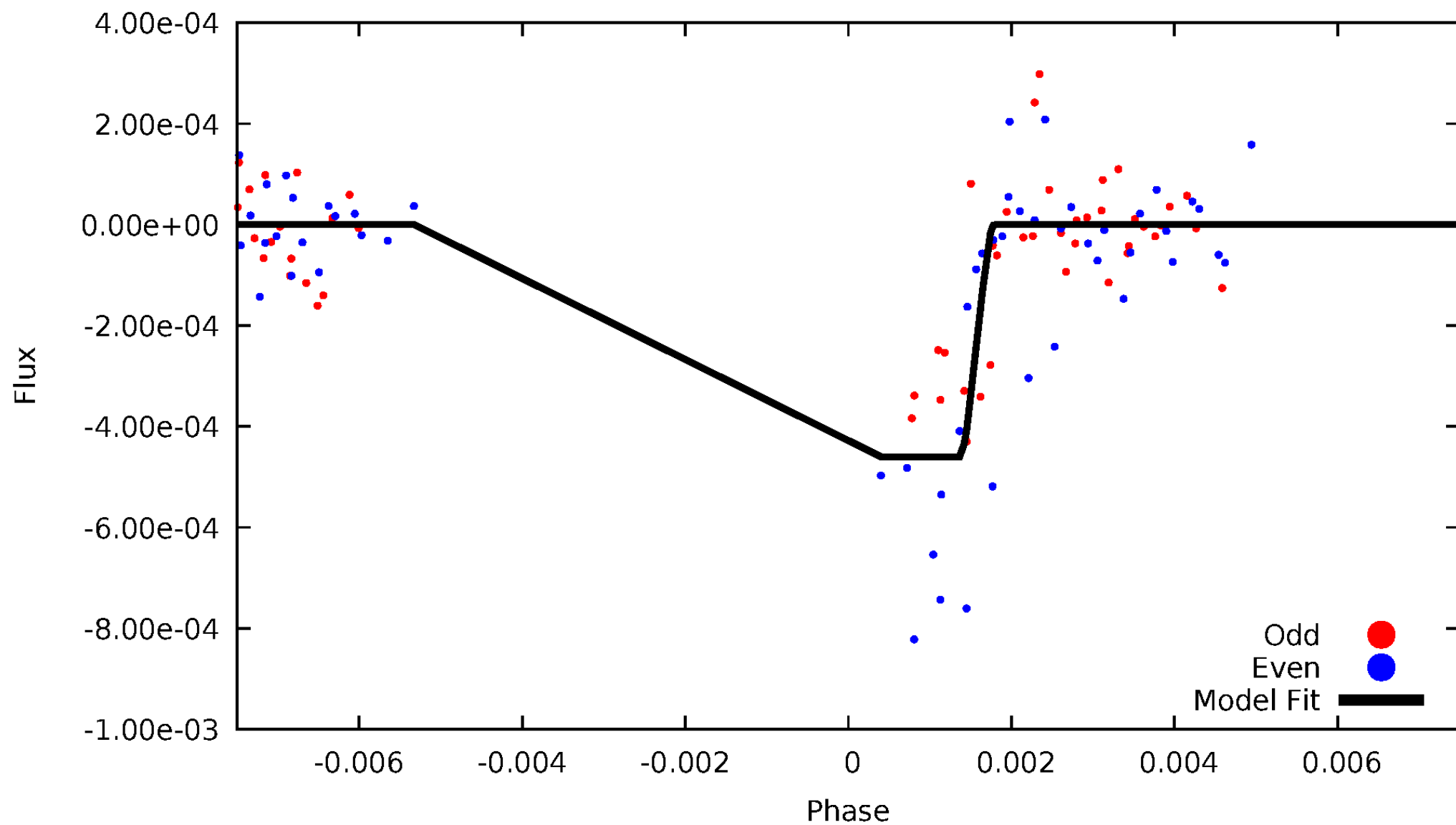
DV Odd/Even

TCE 012117276-02



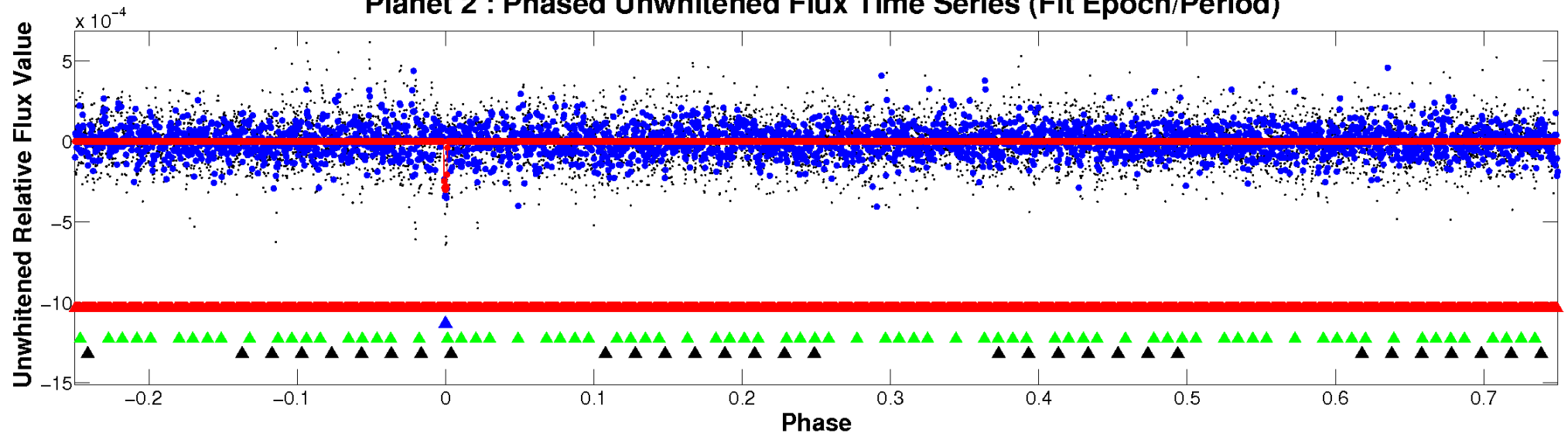
ALT Odd/Even

TCE 012117276-02

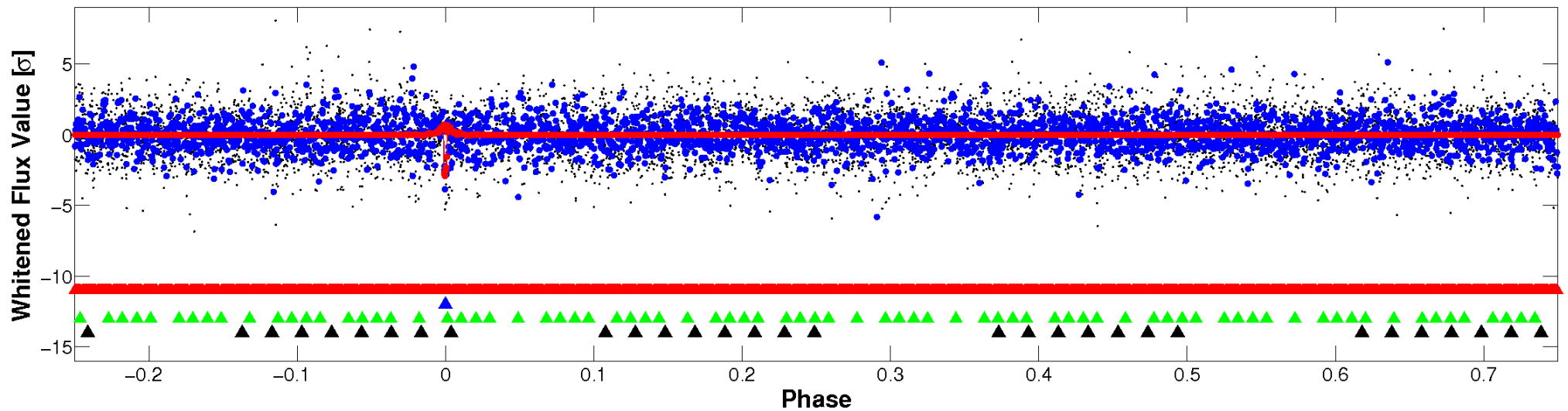


Non-Whitened Vs. Whitened Light Curve

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

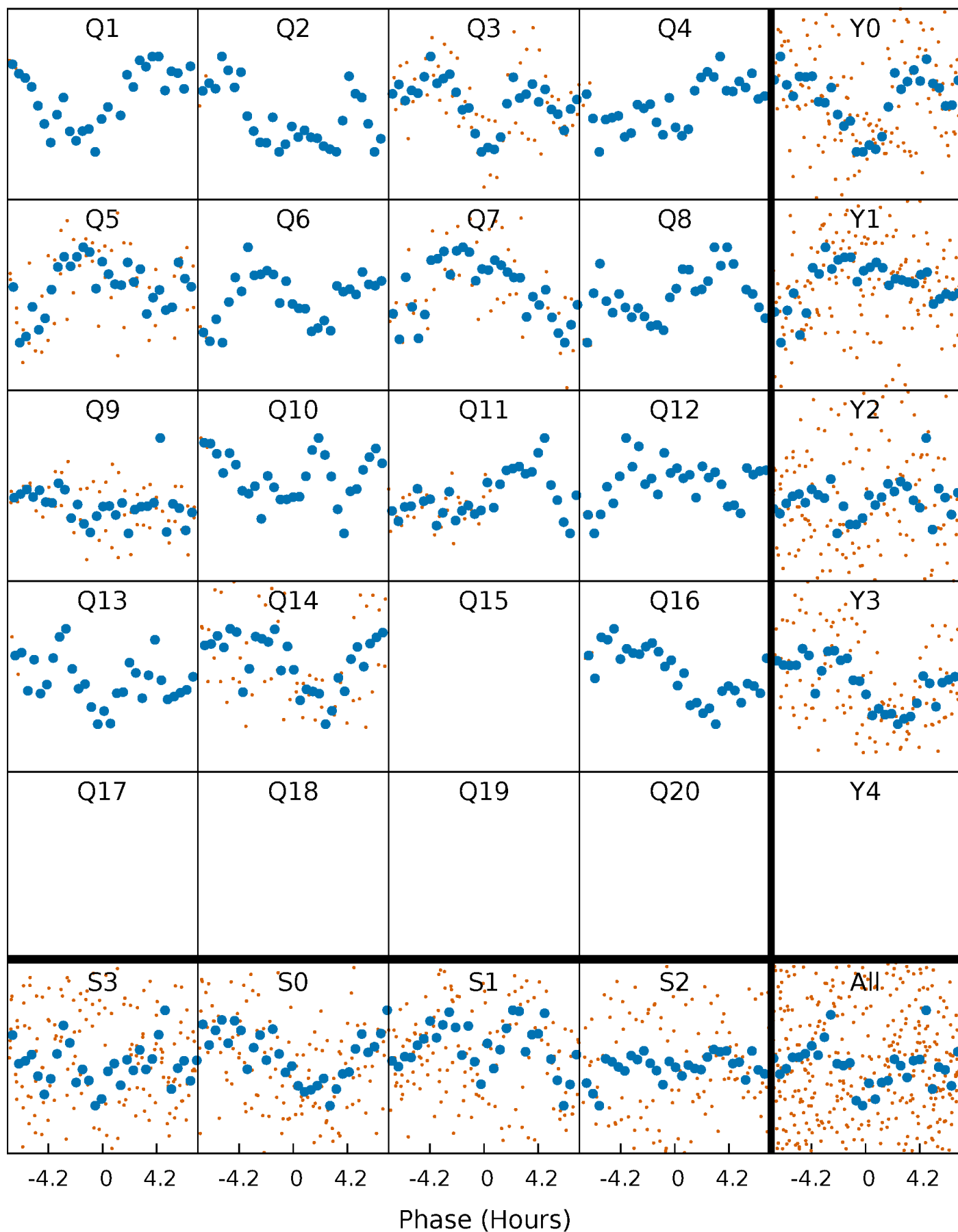


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



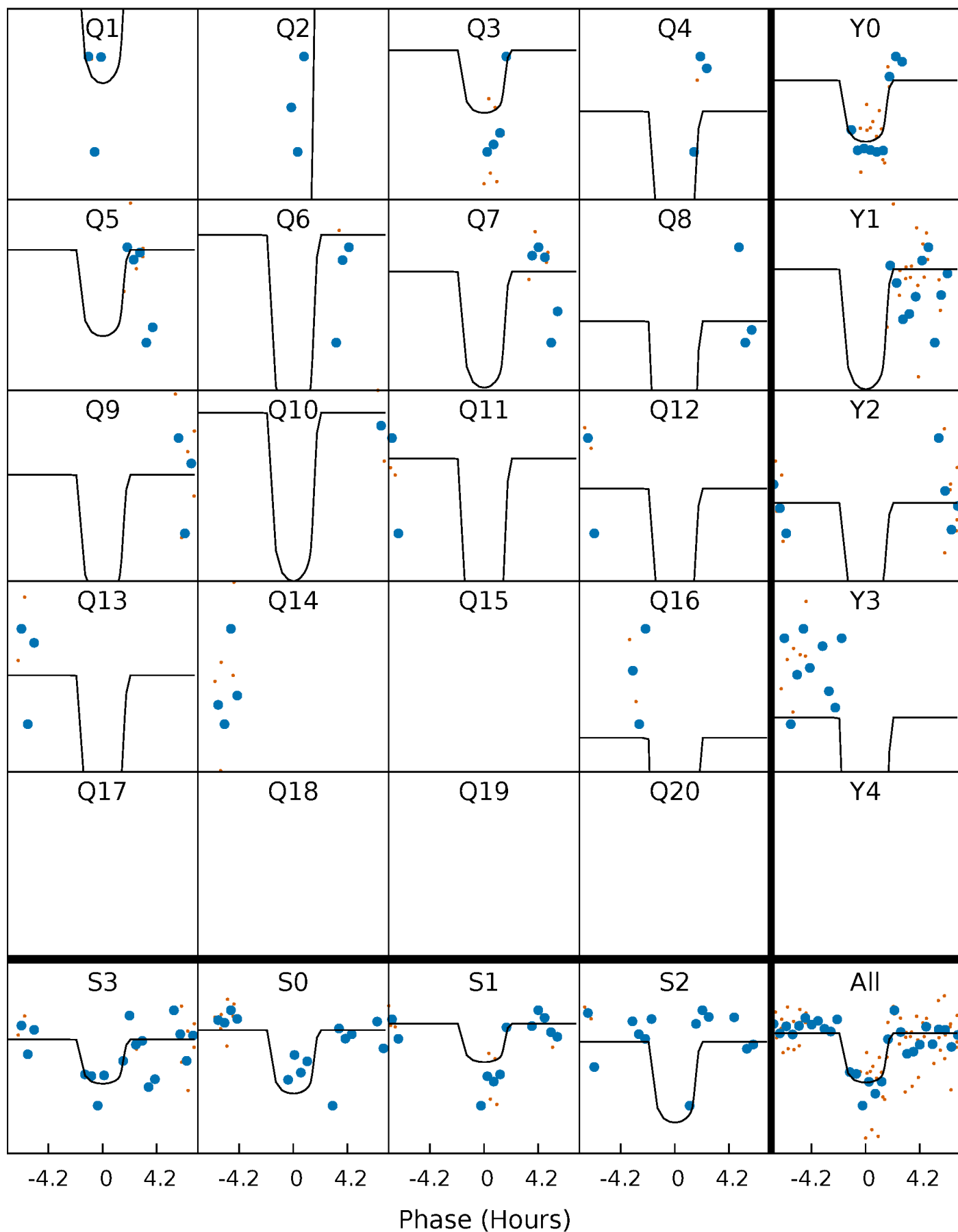
PDC Quarter-Phased Transit Curves

TCE 012117276-02 P= 63.653712 Days $T_0=141.110860$ (BKJD)



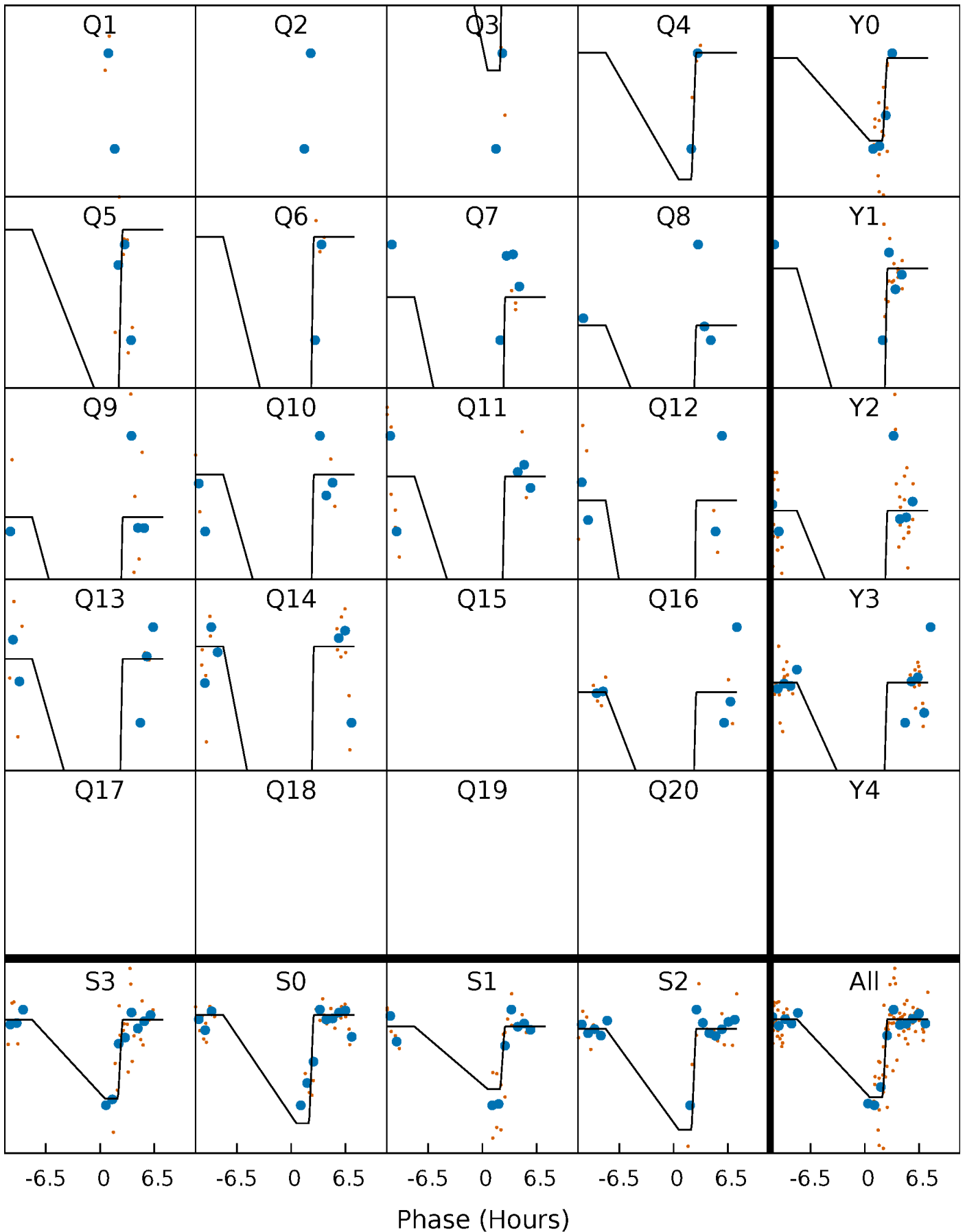
DV Quarter-Phased Transit Curves

TCE 012117276-02 P= 63.653712 Days $T_0=141.110860$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

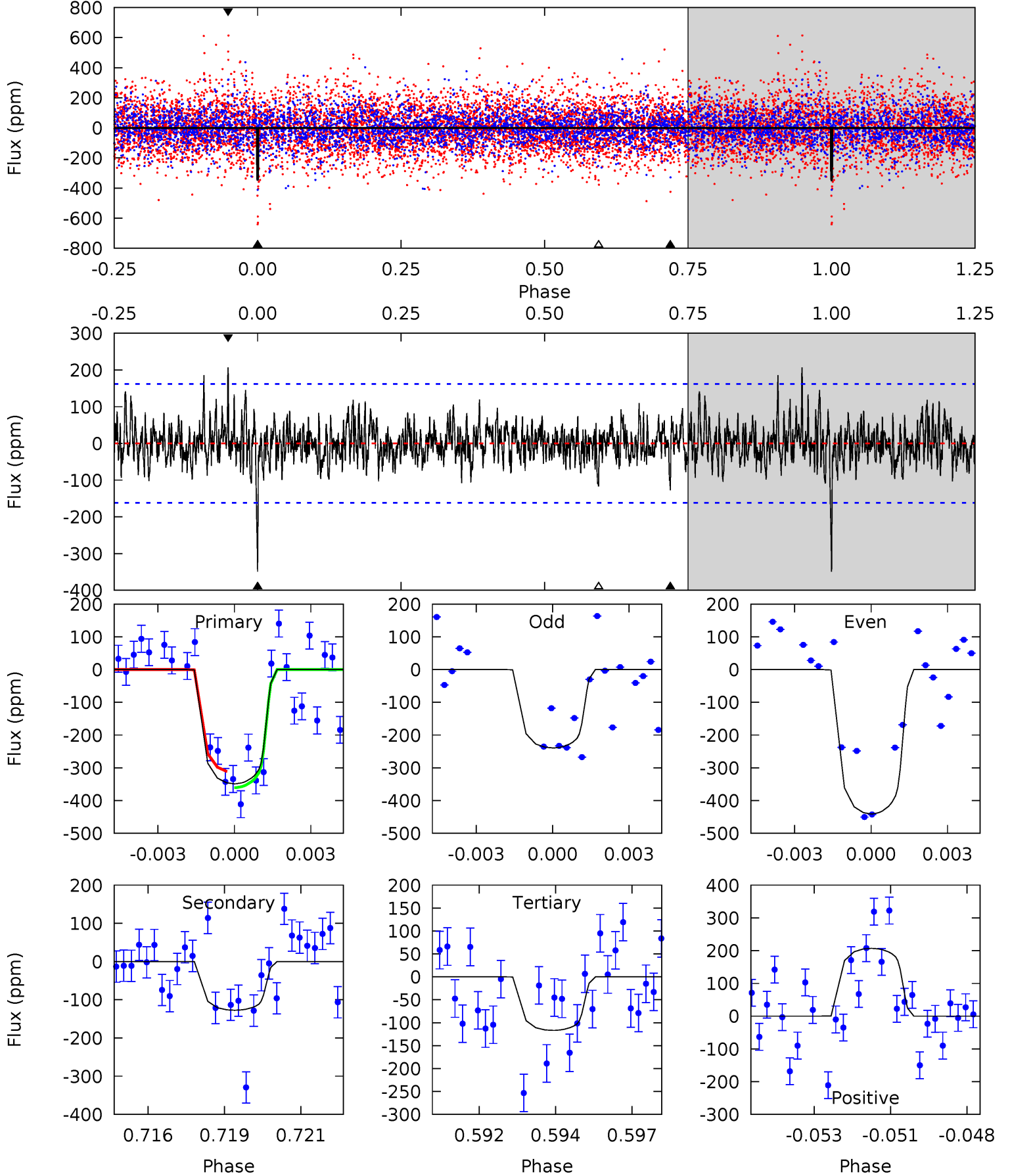
TCE 012117276-02 P= 63.668993 Days $T_0=141.029050$ (BKJD)



DV Model-Shift Uniqueness Test

012117276-02, P = 63.653712 Days, E = 77.457148 Days

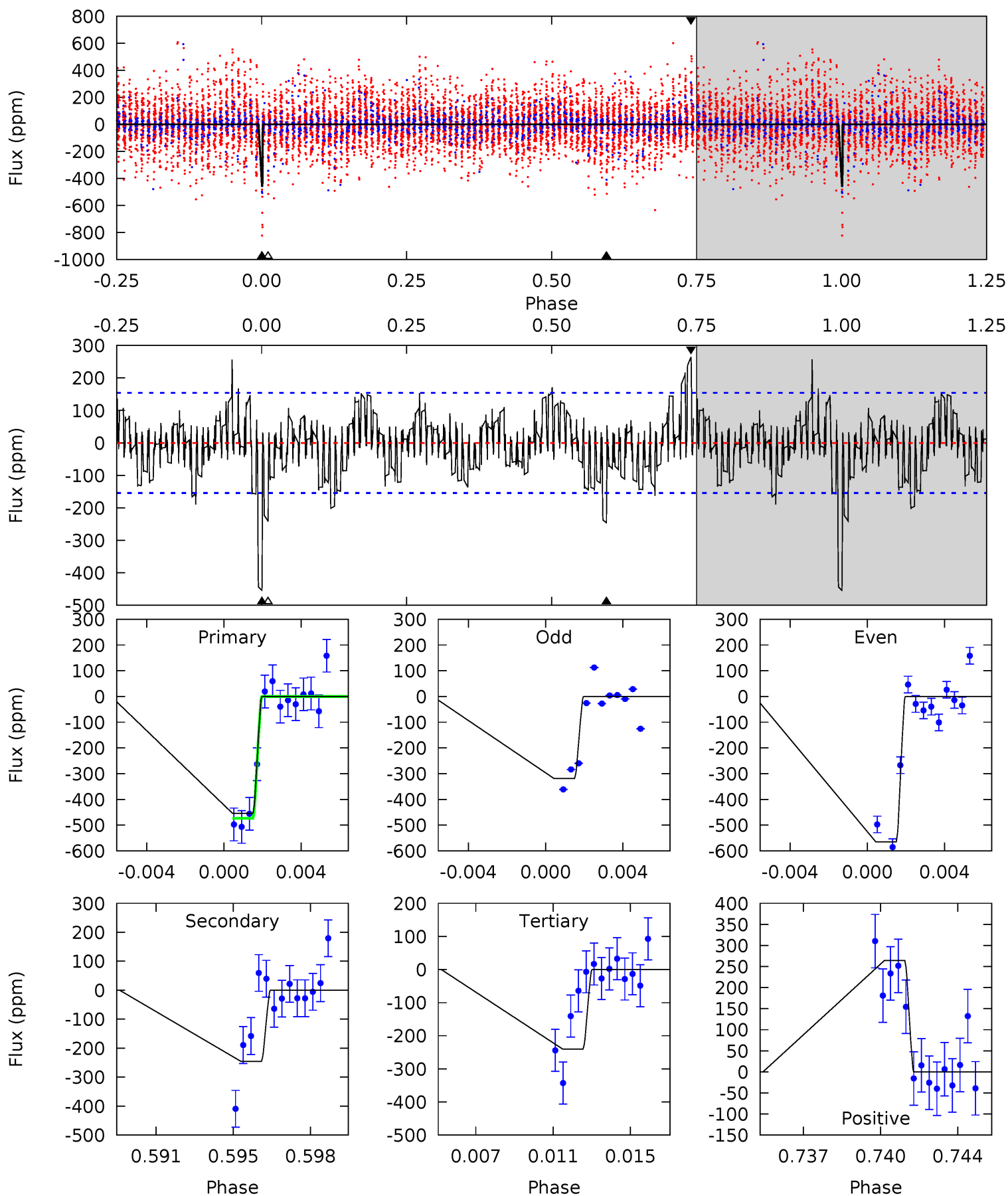
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	4.16	3.81	6.76	5.28	3.02	1.30	7.58	4.63	0.35	-2.60	3.25	1.06	0.37	0.68



Alt Model-Shift Uniqueness Test

012117276-02, P = 63.668993 Days, E = 77.360057 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.3	8.31	8.12	8.93	5.22	2.91	1.80	7.22	6.41	0.19	-0.62	4.13	1.10	0.37	0



Stellar Parameters For KIC 012117276

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7340^{+73}_{-80}	$3.979^{+0.162}_{-0.108}$	$-0.140^{+0.150}_{-0.150}$	$2.163^{+0.378}_{-0.462}$	$1.623^{+0.144}_{-0.160}$	$0.226^{+0.191}_{-0.076}$
	+1%/-1%	+4%/-3%	+107%/-107%	+17%/-21%	+9%/-10%	+85%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 012117276-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-127 ± 31	$4.45^{+1.85}_{-1.82}$	1091^{+50}_{-59}	5541^{+1636}_{-813}	476^{+812}_{-252}
Alt.	-246 ± 30	$4.90^{+1.80}_{-1.68}$	1095^{+51}_{-60}	6268^{+1588}_{-905}	771^{+1001}_{-373}

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 $A_{obs} \gg 1.0$

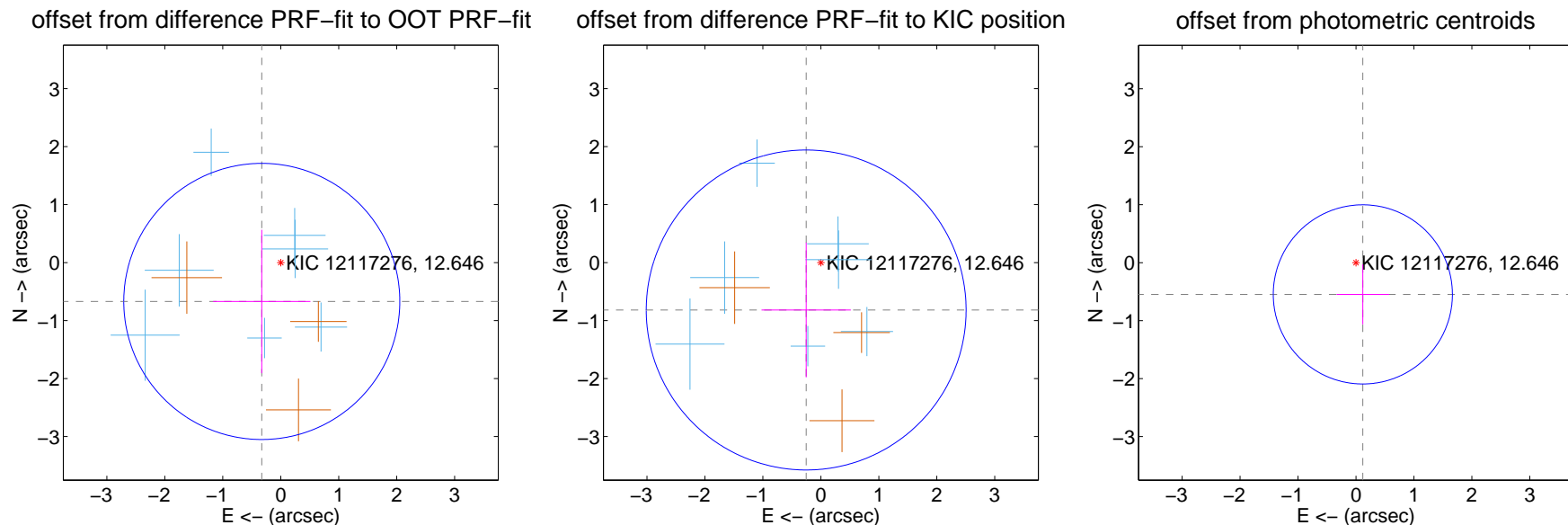
DV Centroid Data

Supplemental centroid analysis for 012117276-02. Kepler magnitude: 12.65. Transit SNR 9.87

There are 7 quarters with good PRF difference image offsets

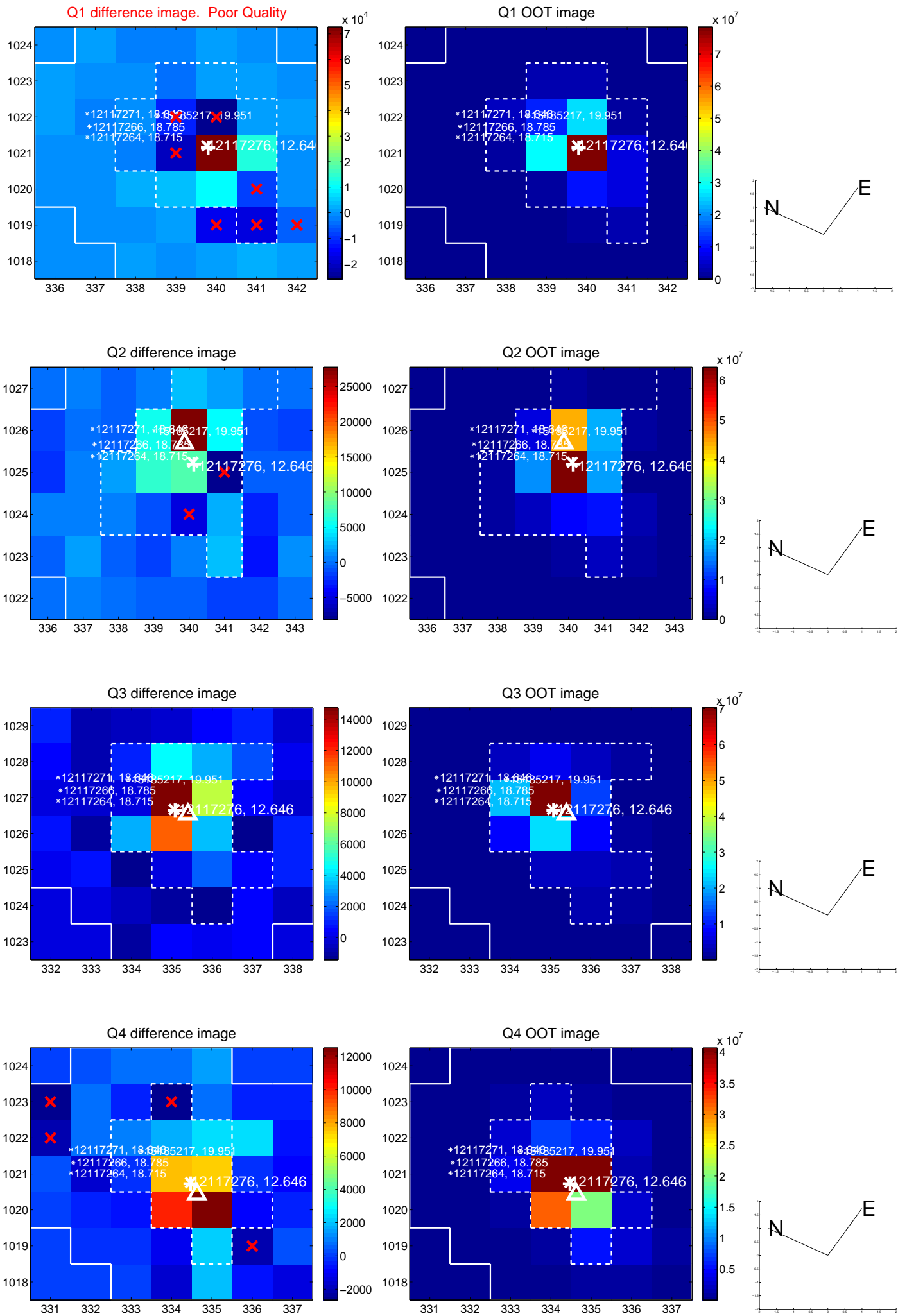
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.746 ± 0.794	0.94	0.327 ± 0.839	-0.670 ± 1.236
PRF-fit source offset from KIC position	0.856 ± 0.920	0.93	0.253 ± 0.771	-0.818 ± 1.163
photometric centroid source offset	0.56 ± 0.52	1.09	-0.12 ± 0.45	-0.55 ± 0.52

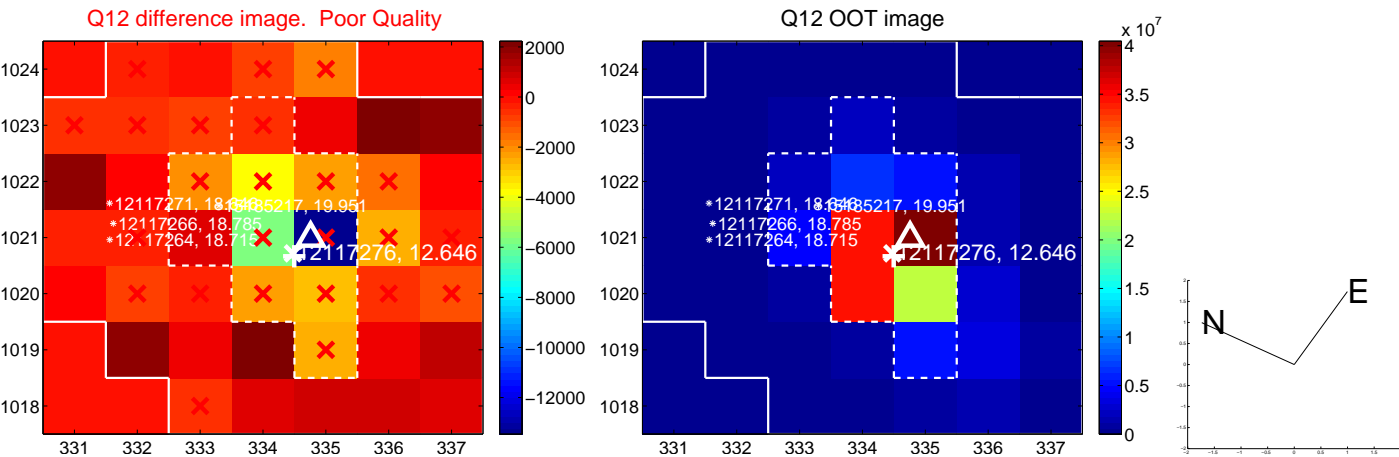
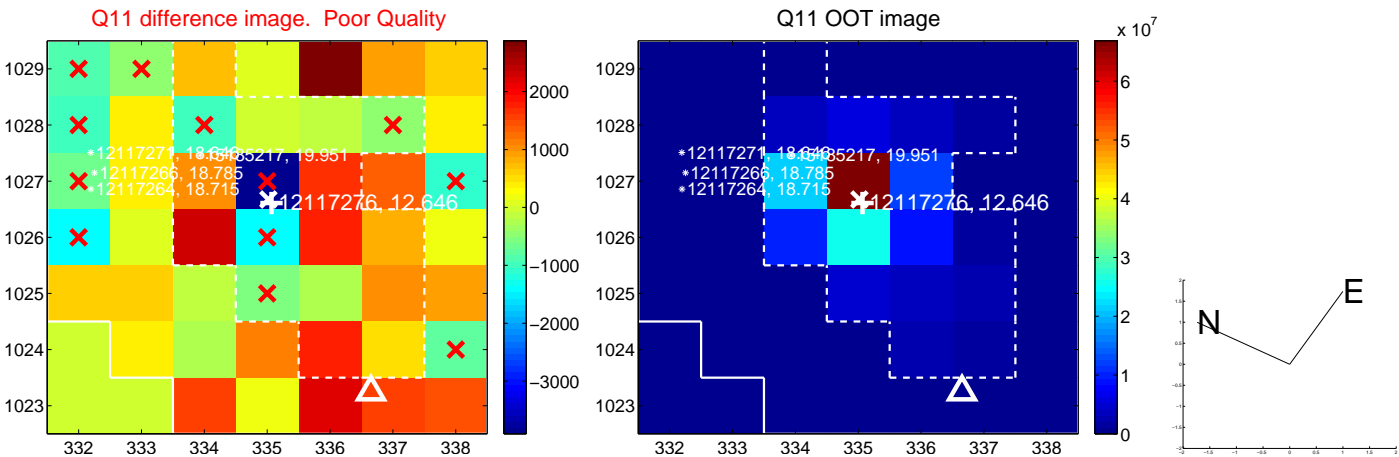
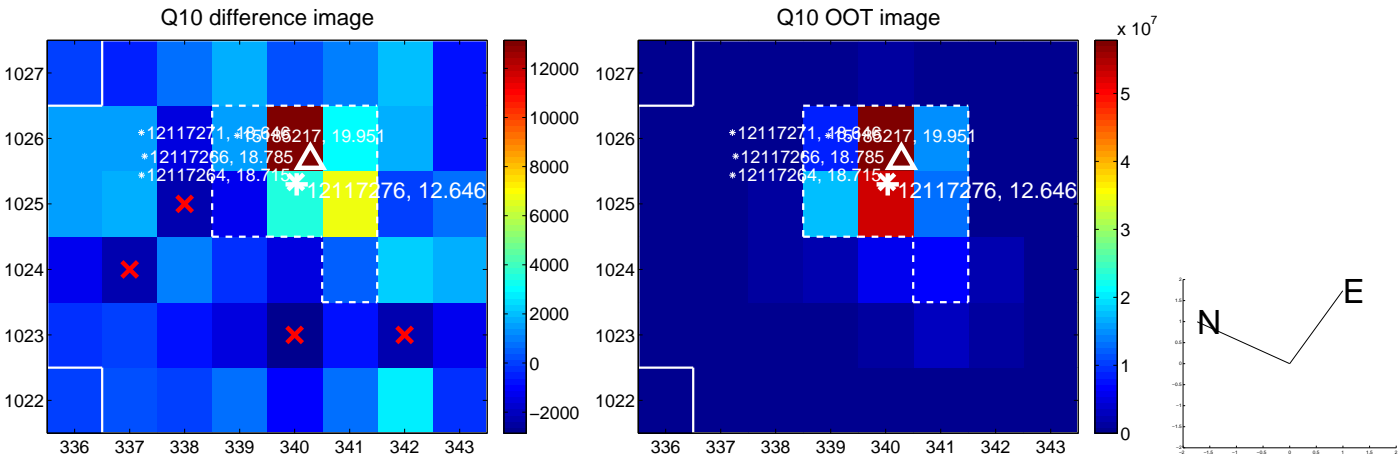
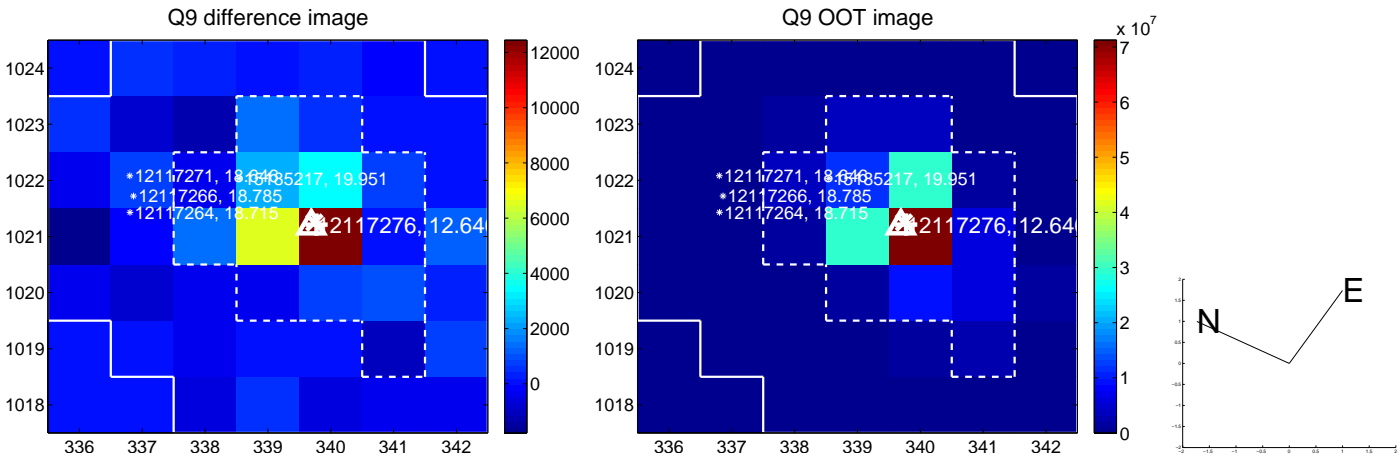


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

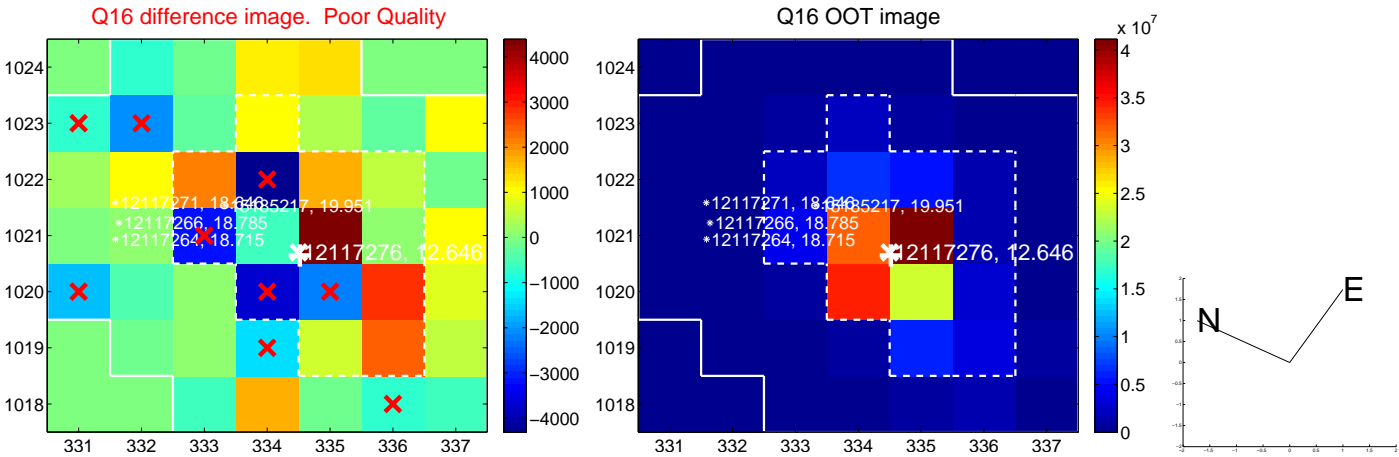
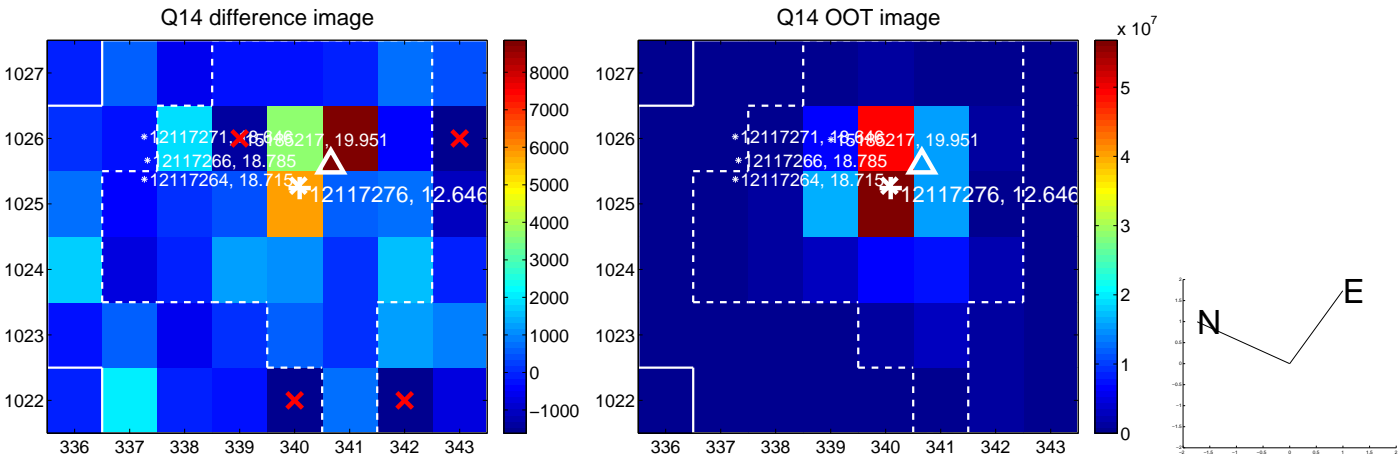
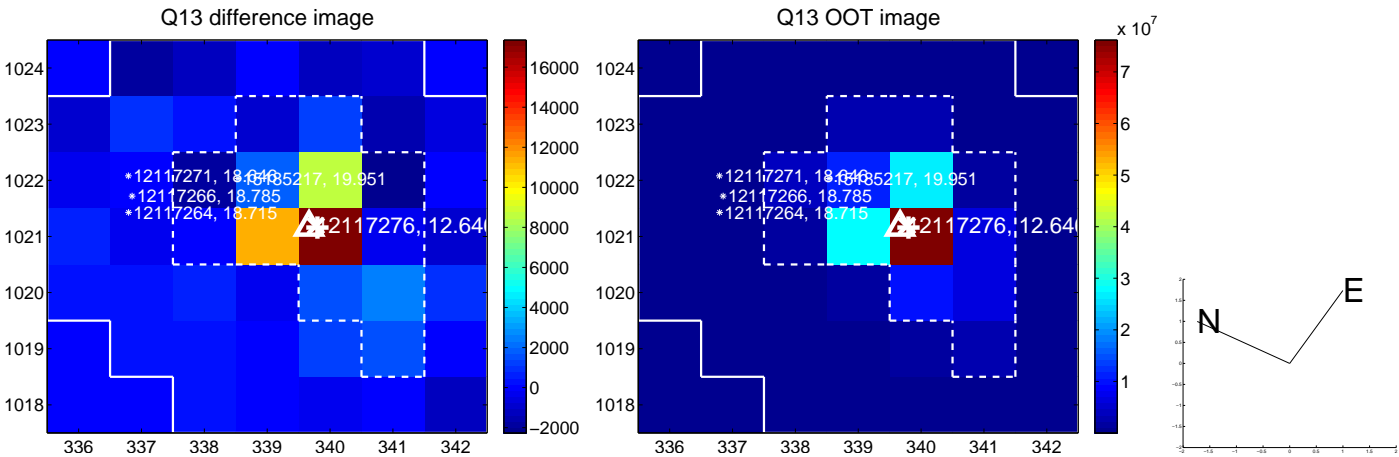
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



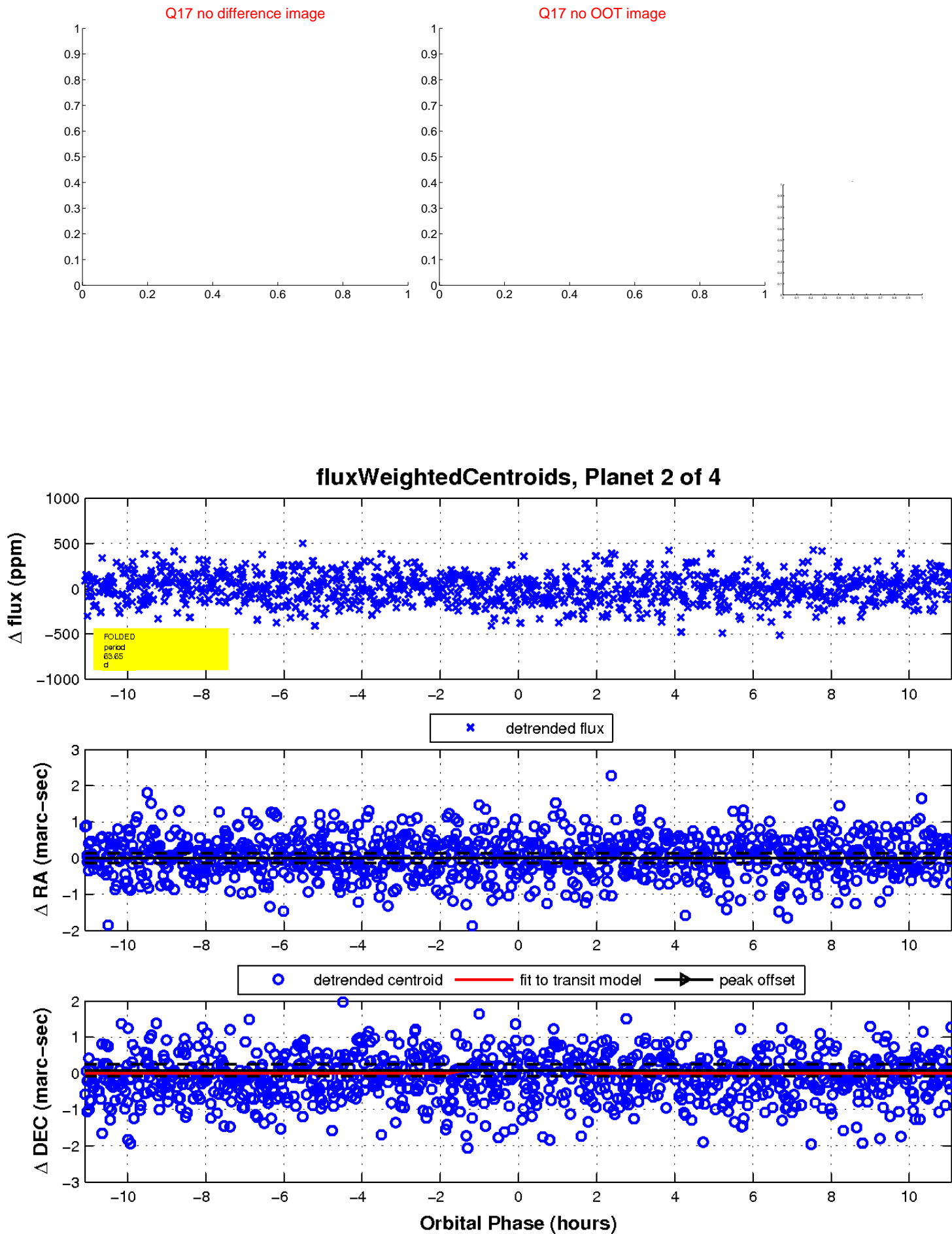
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



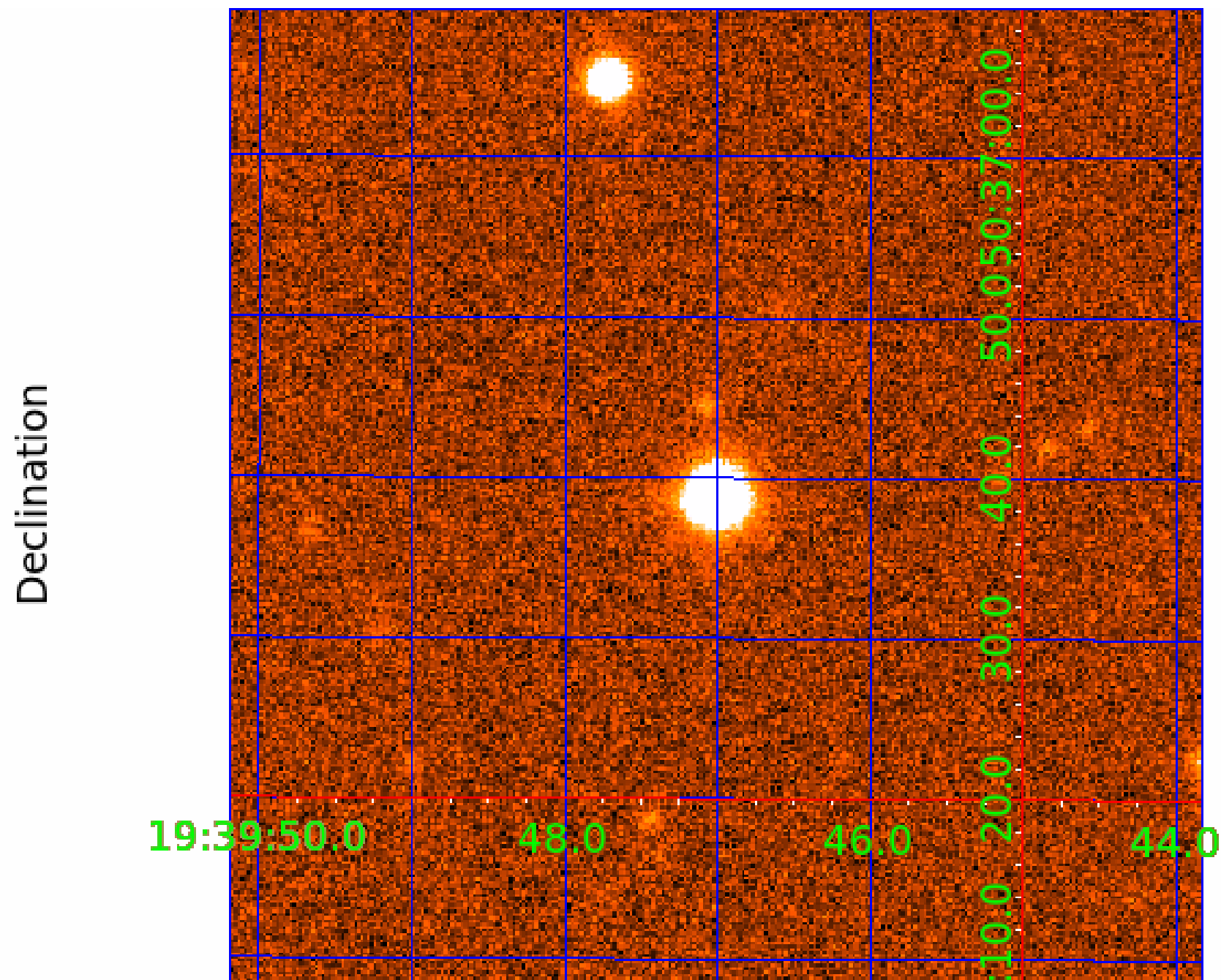
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 012117276

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})
012117276-01	OBS	No	0.663328	132.134685	17.1	4.486	10.1	8.1	2.16	7340	0.92	39695.86
012117276-02	OBS	No	63.653712	141.110860	301.2	3.701	10.3	9.9	2.16	7340	4.42	90.36
012117276-03	OBS	No	18.793425	137.540377	182.7	1.692	9.7	10.0	2.16	7340	3.44	459.60
012117276-04	OBS	No	48.060553	147.976866	285.1	1.190	8.5	7.7	2.16	7340	3.71	131.42

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012117276-01	OBS	FP	0.00	1	0	0	0	LPP_DV
012117276-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
012117276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
012117276-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

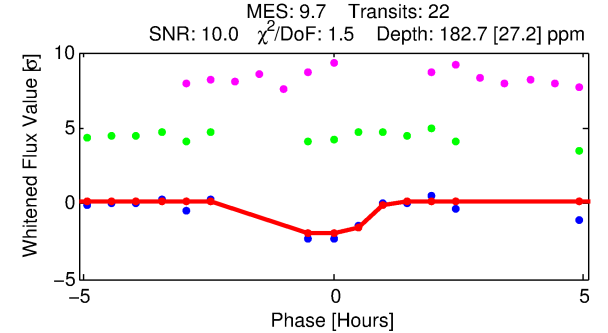
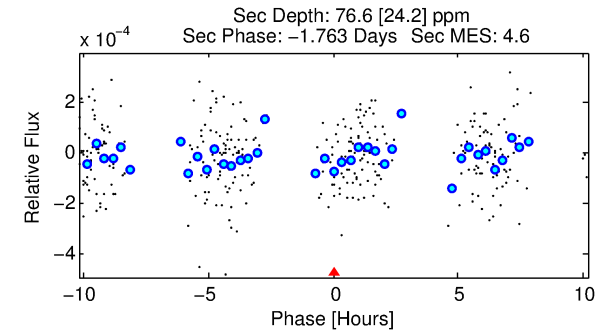
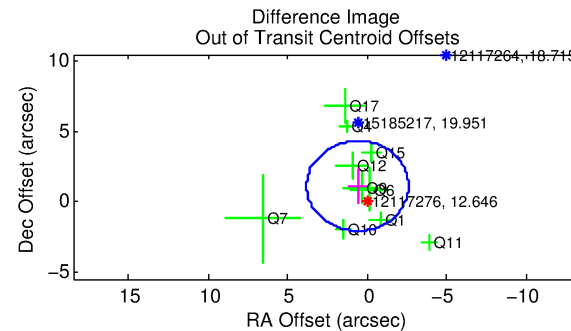
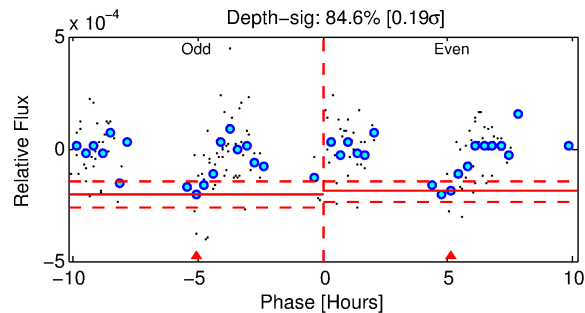
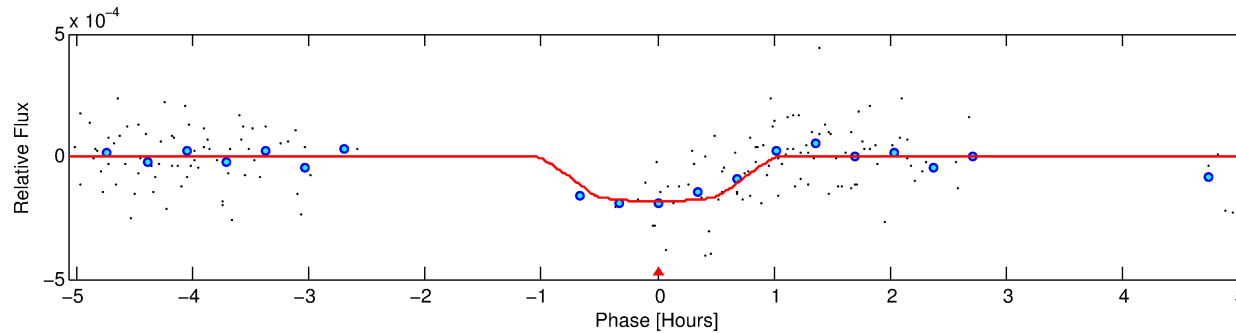
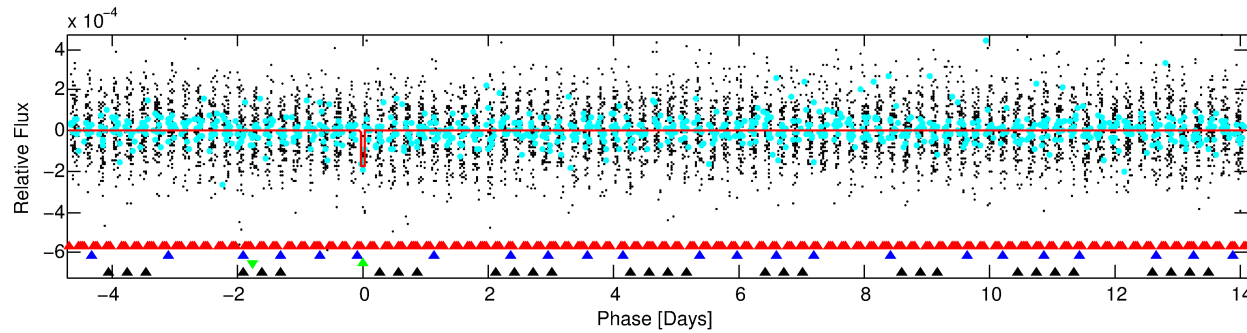
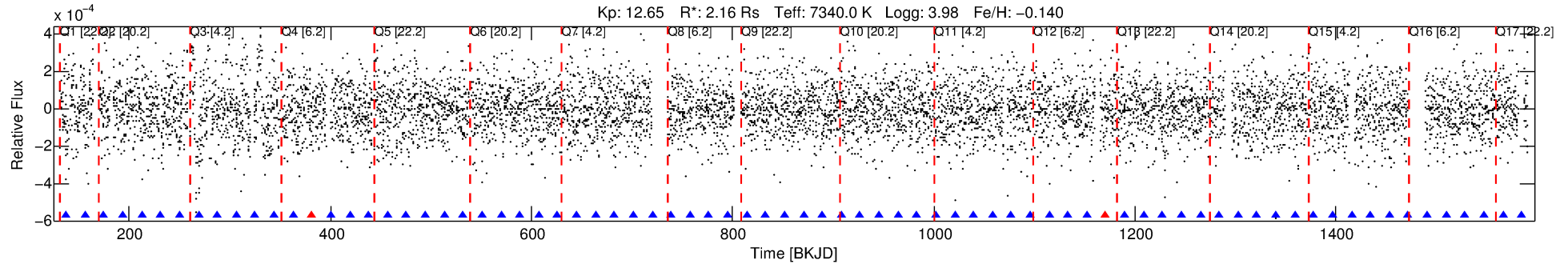
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012117276-03

No Significant Match Found

DV One-Page Summary

KIC: 12117276 Candidate: 3 of 4 Period: 18.793 d



DV Fit Results:

Period = 18.79343 [0.00013] d
Epoch = 137.5404 [0.0083] BKJD
Rp/R* = 0.0146 [0.0114]
a/R* = 38.38 [184.64]
b = 0.91 [0.92]
Seff = 459.59 [133.22]
Teq = 1181 [86] K
Rp = 3.44 [2.78] Re
a = 0.1627 [0.0308] AU
Ag = 94.31 [152.45] [0.61 σ]
Teffp = 5689 [2263] K [1.99 σ]

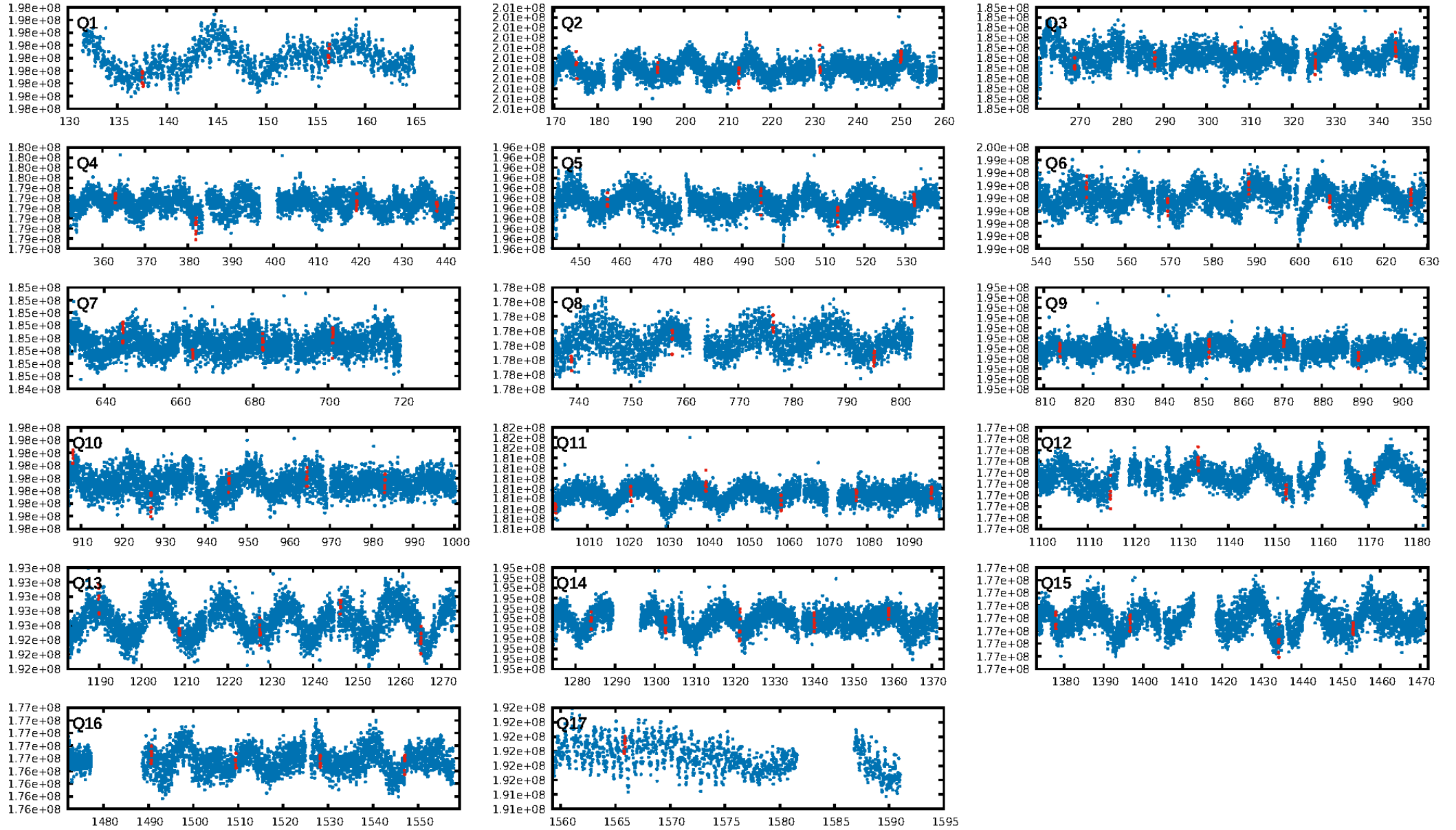
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [90.76 σ]
LongPeriod-sig: 100.0% [339.51 σ]
ModelChiSquare2-sig: 1.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.06e-11
RollingBand-fgt: 0.90 [19/21]
GhostDiagnostic-chr: -0.2596
Centroid-sig: 8.3%
Centroid-so: 0.672 arcsec [1.15 σ]
OotOffset-rm: 1.277 arcsec [1.20 σ]
OotOffset-st: 2/3/2/3 [10]
KicOffset-rm: 0.989 arcsec [0.85 σ]
KicOffset-st: 2/3/2/3 [10]
DiffImageQuality-fgm: 0.30 [3/10]
DiffImageOverlap-fno: 0.00 [0/17]

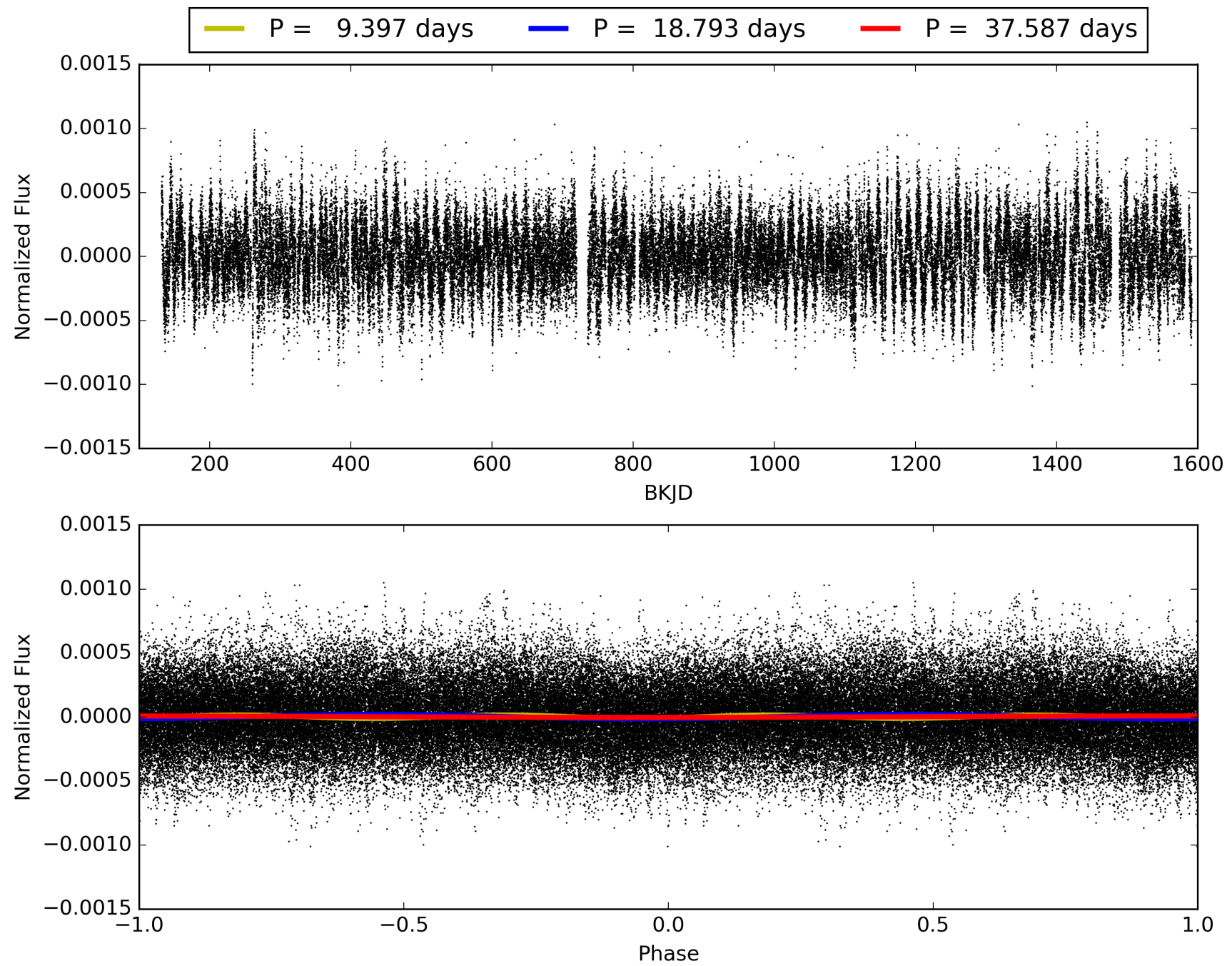
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:01:18 Z

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

TCE 012117276-03, PDC Light Curves

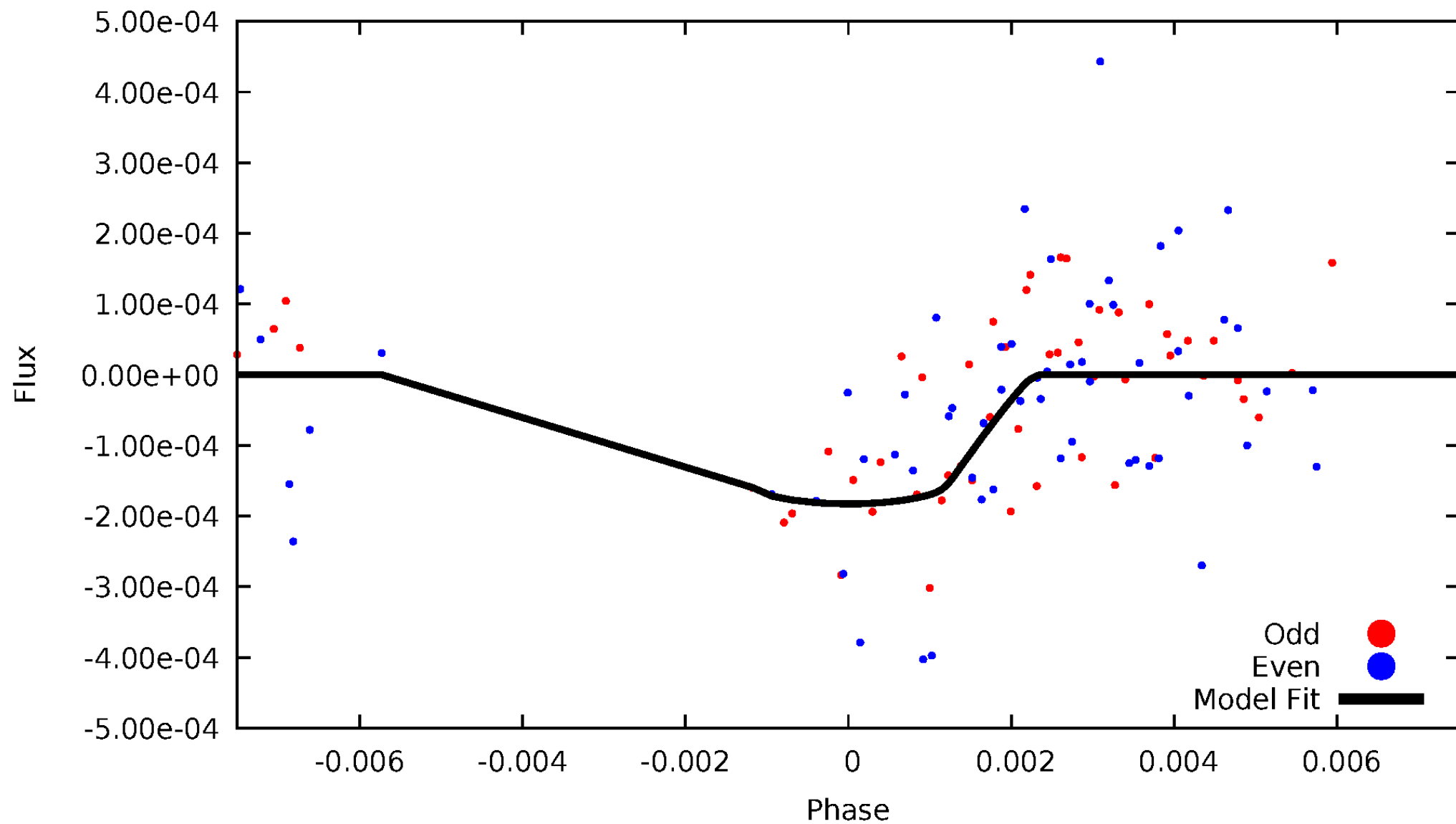


TCE 012117276-03



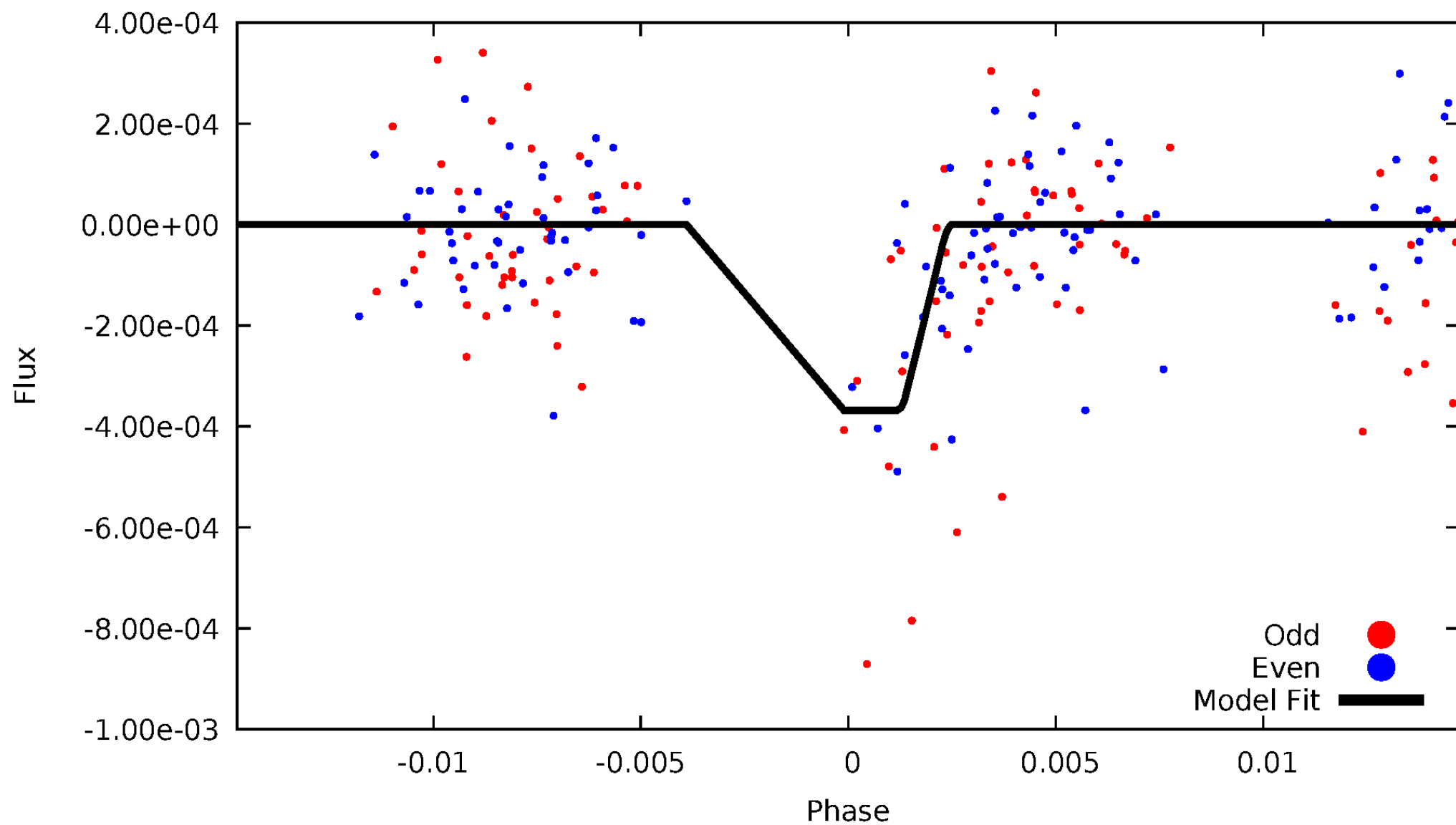
DV Odd/Even

TCE 012117276-03



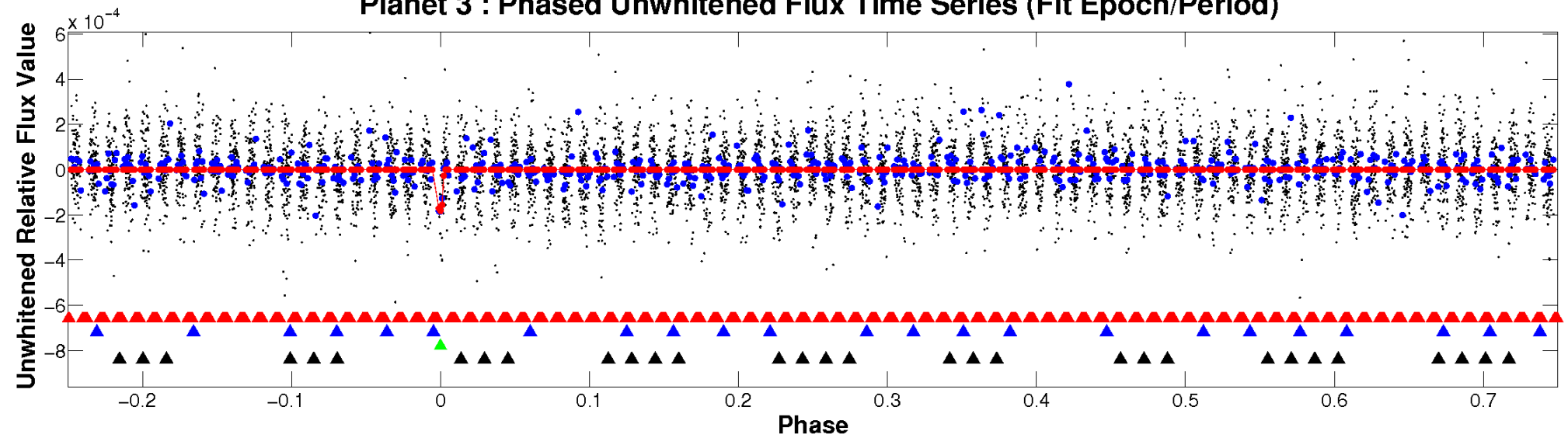
ALT Odd/Even

TCE 012117276-03

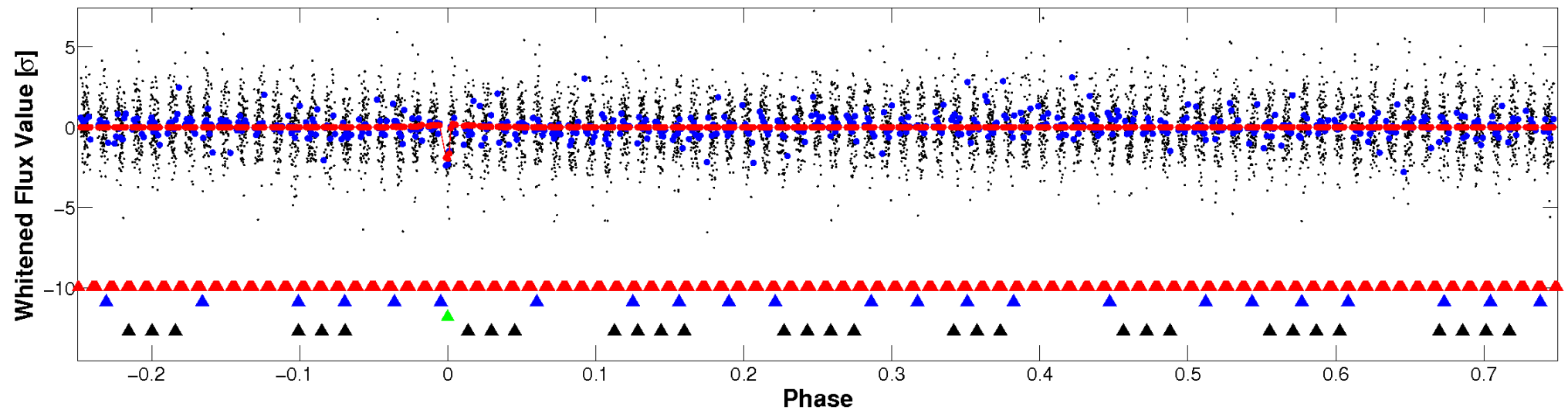


Non-Whitened Vs. Whitened Light Curve

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

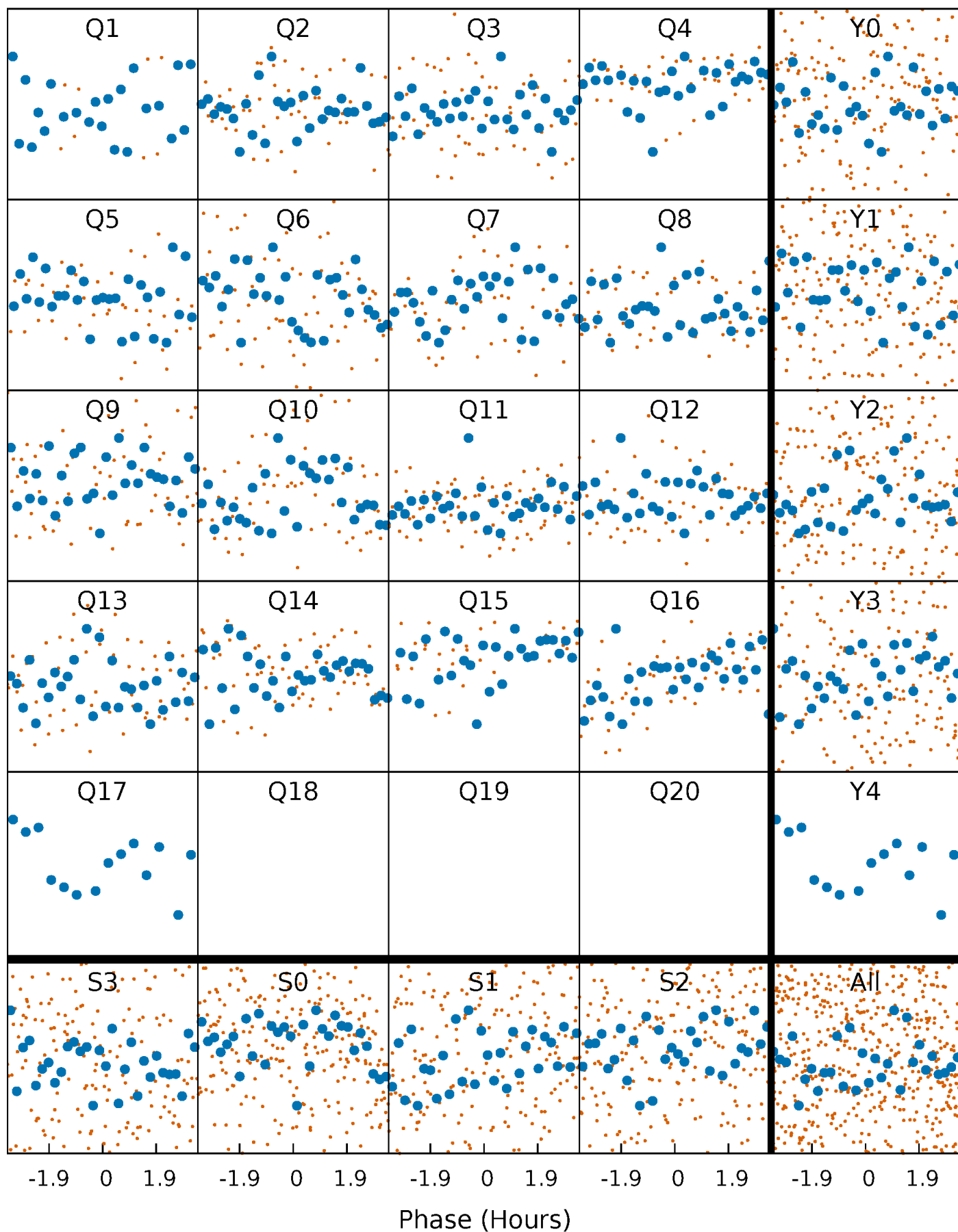


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



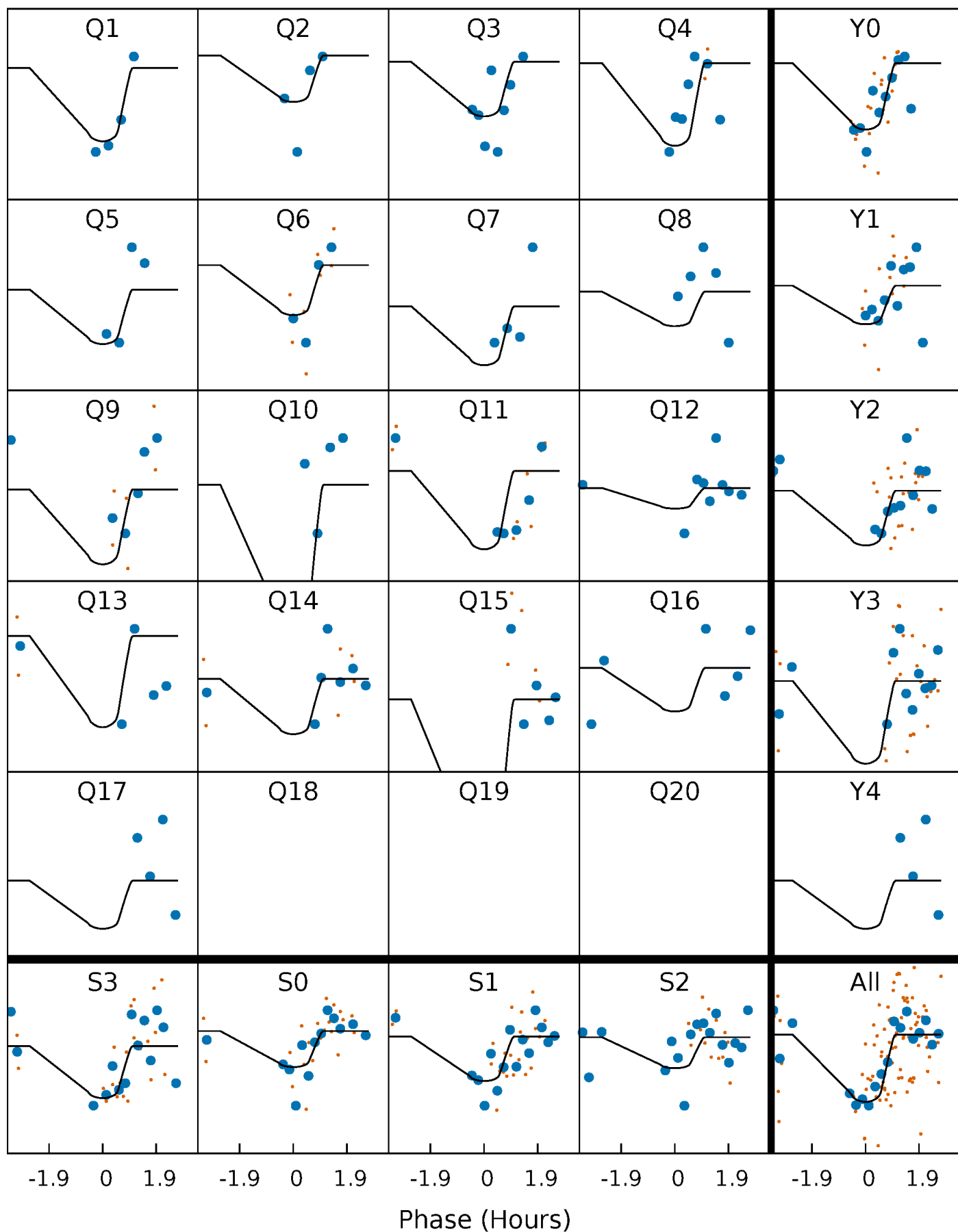
PDC Quarter-Phased Transit Curves

TCE 012117276-03 P= 18.793425 Days $T_0=137.540377$ (BKJD)



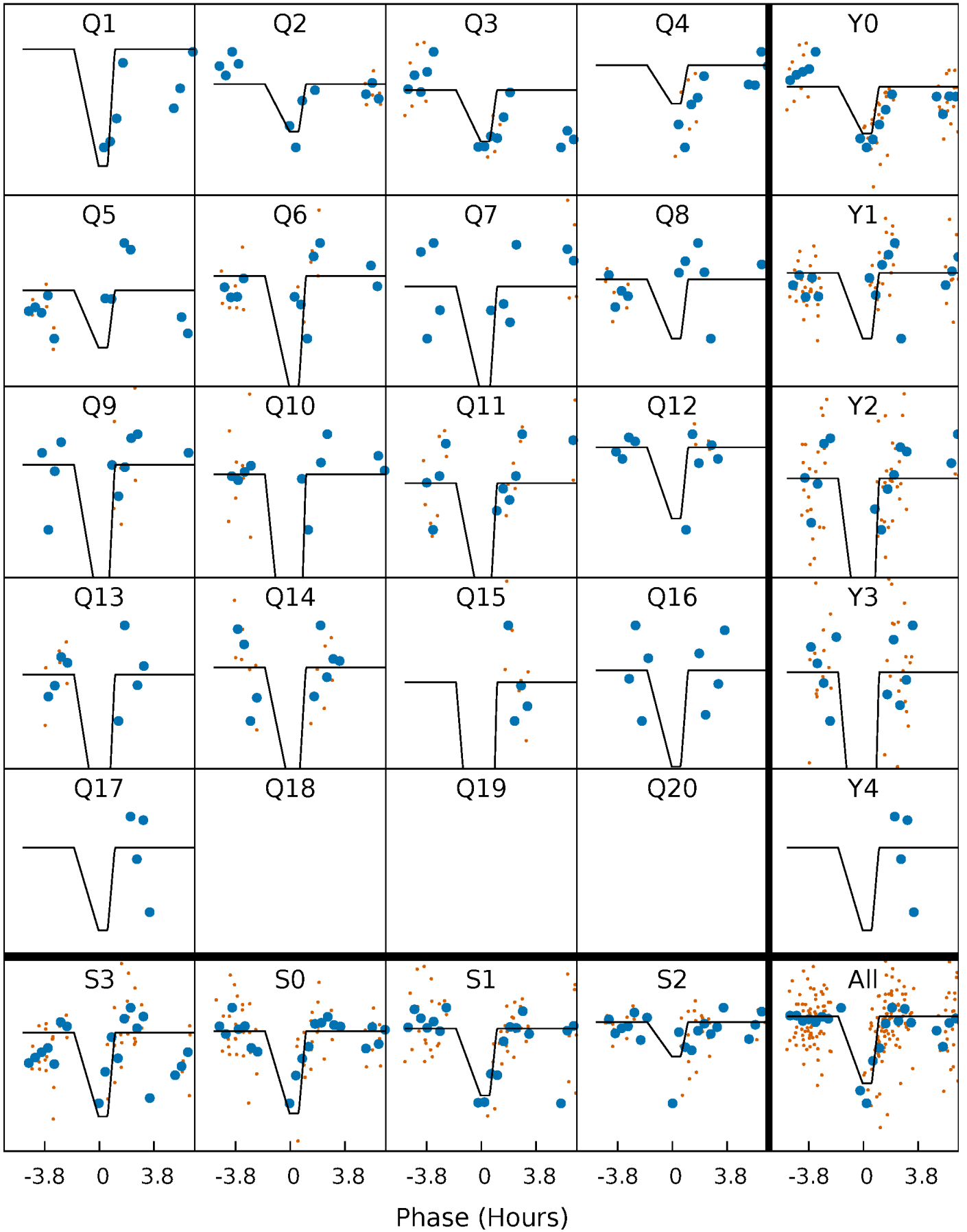
DV Quarter-Phased Transit Curves

TCE 012117276-03 P= 18.793425 Days $T_0=137.540377$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

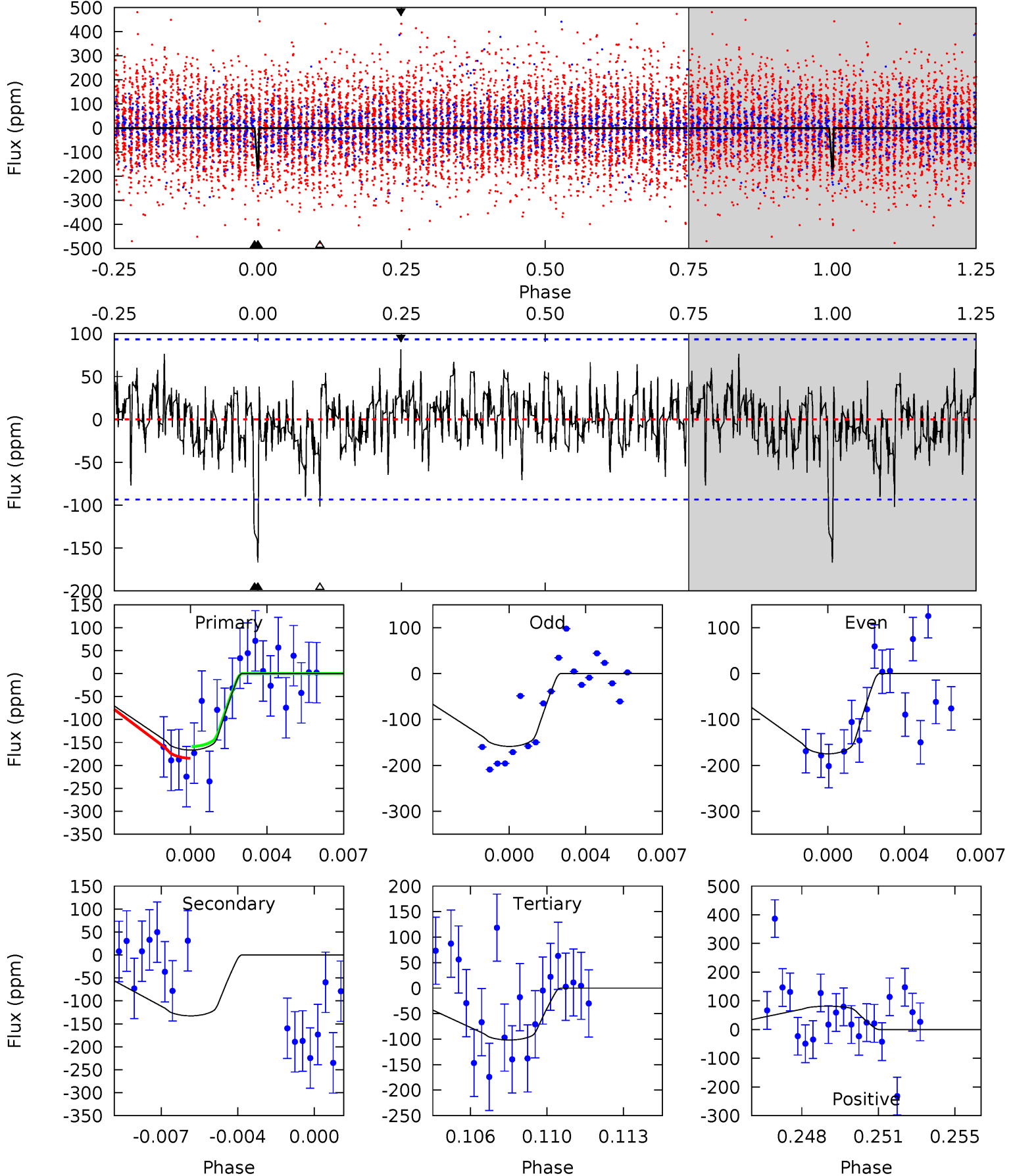
TCE 012117276-03 P= 18.793213 Days $T_0=137.521831$ (BKJD)



DV Model-Shift Uniqueness Test

012117276-03, $P = 18.793425$ Days, $E = 118.746952$ Days

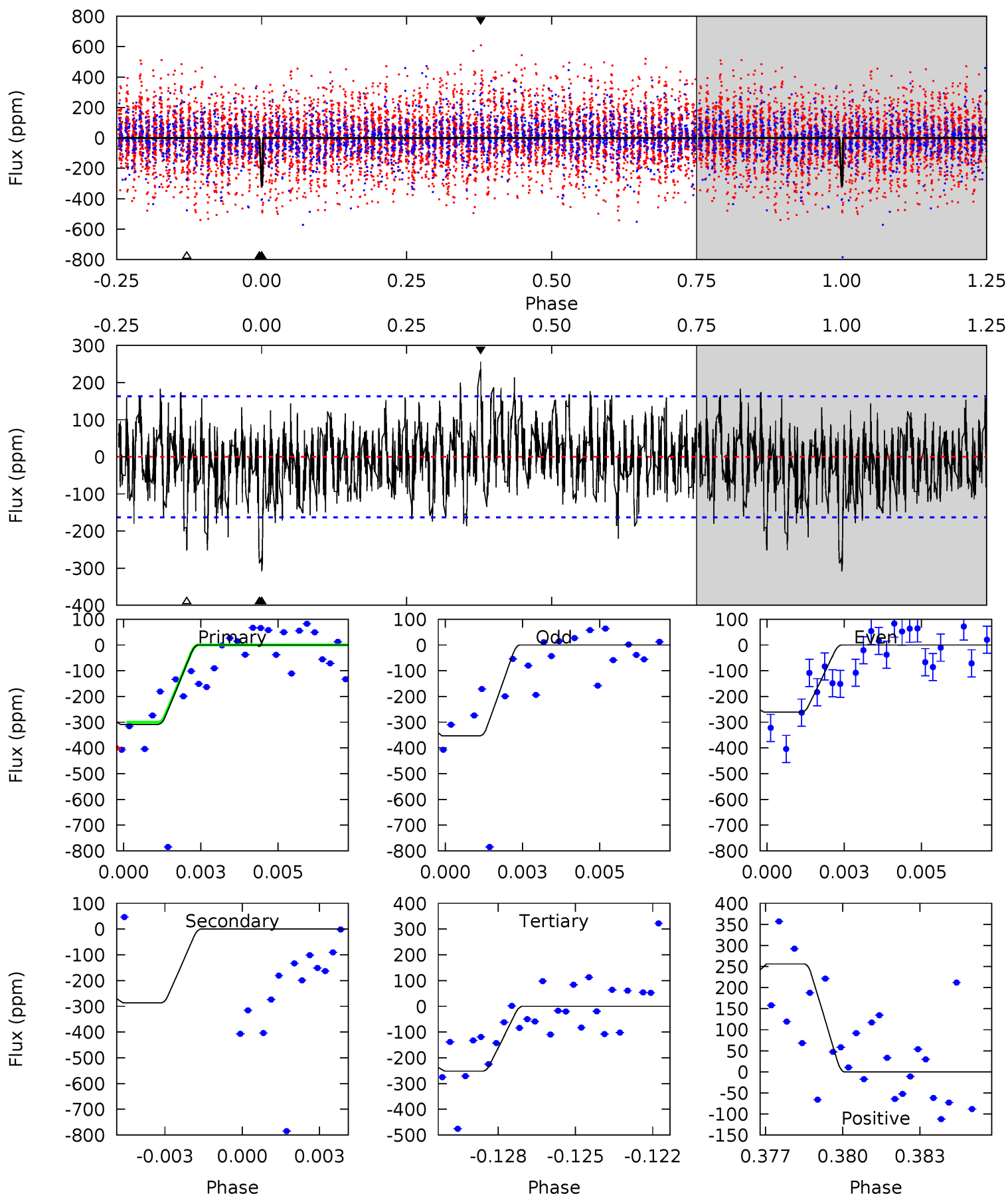
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.32	7.42	5.69	4.56	5.22	2.92	1.44	3.63	4.77	1.73	2.87	0.45	1.19	0.33	0.54



Alt Model-Shift Uniqueness Test

012117276-03, P = 18.793213 Days, E = 118.728618 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.99	9.29	8.16	8.30	5.28	3.01	2.02	1.83	1.70	1.13	0.99	1.50	1.01	0.45	0.00



Stellar Parameters For KIC 012117276

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7340^{+73}_{-80}	$3.979^{+0.162}_{-0.108}$	$-0.140^{+0.150}_{-0.150}$	$2.163^{+0.378}_{-0.462}$	$1.623^{+0.144}_{-0.160}$	$0.226^{+0.191}_{-0.076}$
	+1%/-1%	+4%/-3%	+107%/-107%	+17%/-21%	+9%/-10%	+85%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 012117276-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-133 ± 18	$3.81^{+2.64}_{-2.21}$	1651^{+66}_{-85}	6097^{+4144}_{-1321}	135^{+582}_{-87}
Alt.	-287 ± 31	$4.55^{+2.53}_{-2.28}$	1637^{+78}_{-86}	6750^{+3728}_{-1324}	201^{+584}_{-118}

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 $A_{obs} \gg 1.0$

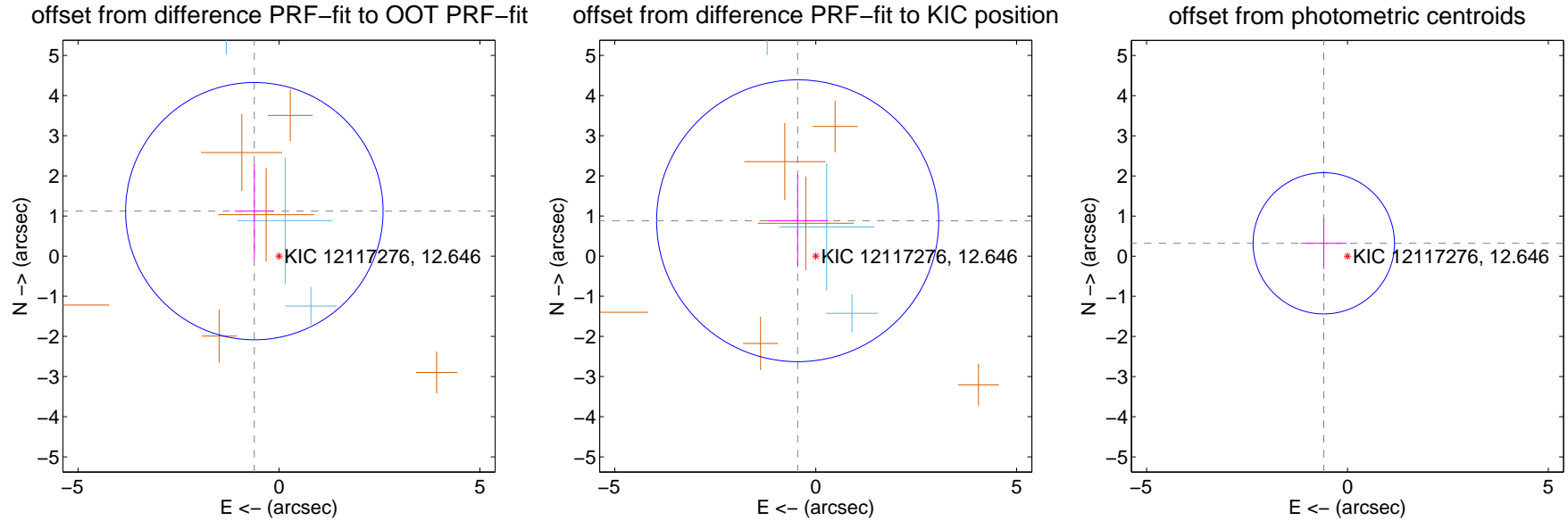
DV Centroid Data

Supplemental centroid analysis for 012117276-03. Kepler magnitude: 12.65. Transit SNR 9.98

There are 3 quarters with good PRF difference image offsets

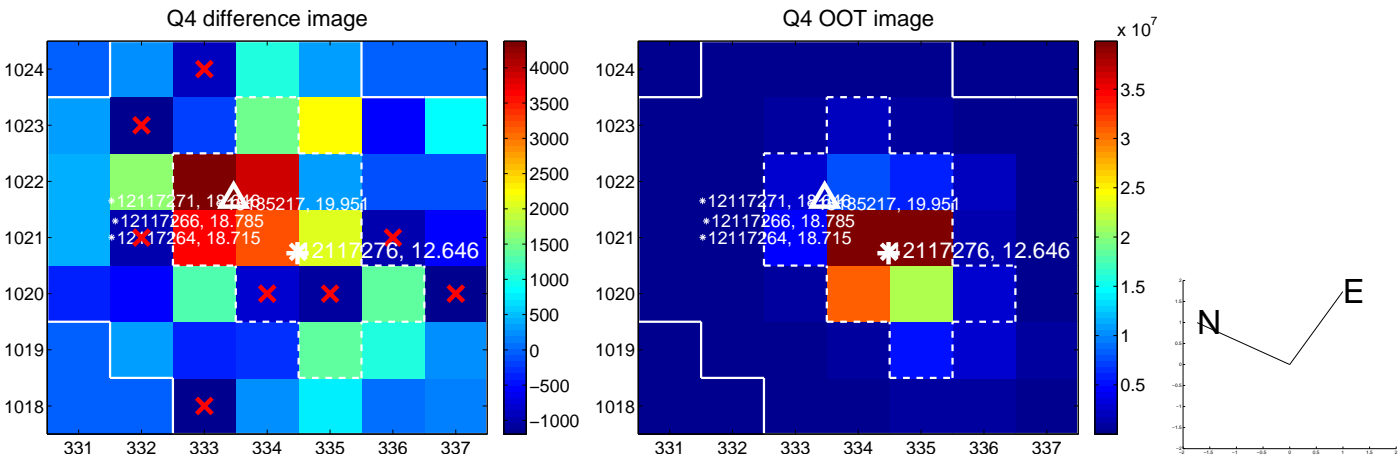
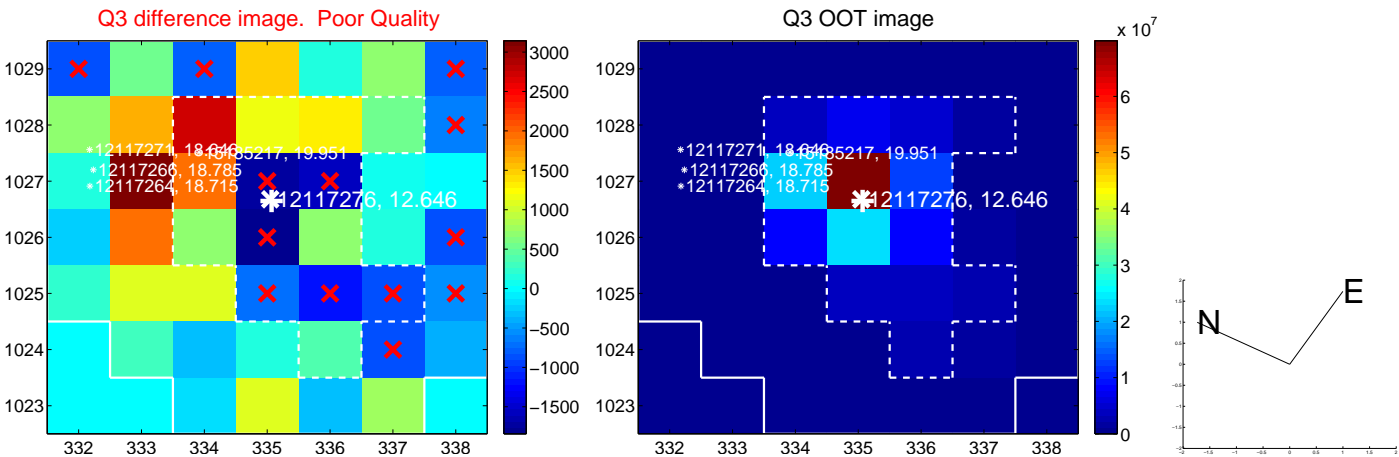
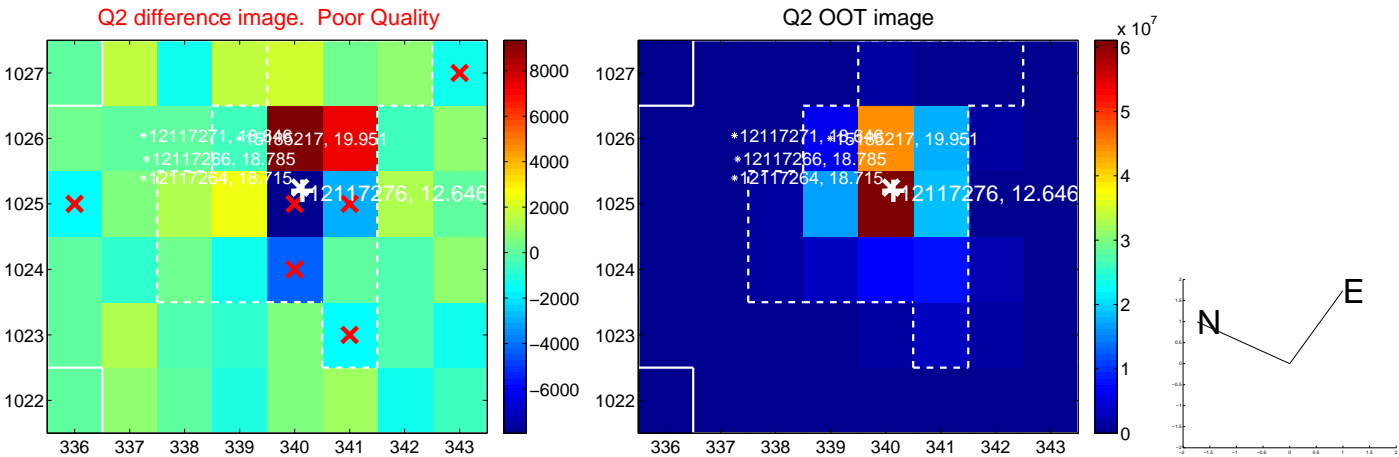
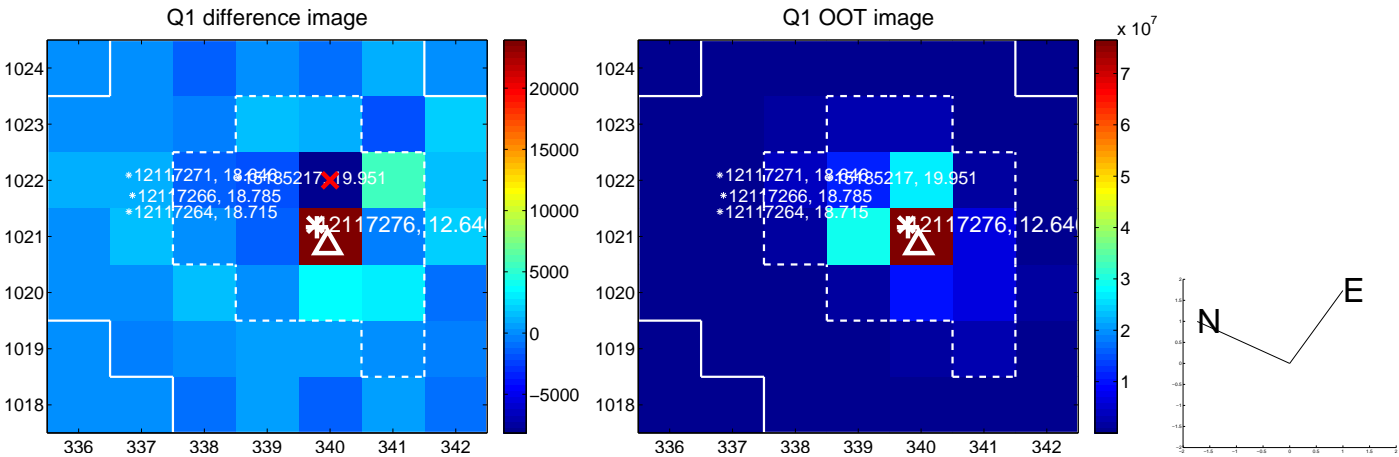
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.277 ± 1.068	1.20	0.613 ± 0.484	1.120 ± 1.188
PRF-fit source offset from KIC position	0.989 ± 1.170	0.85	0.449 ± 0.767	0.881 ± 1.153
photometric centroid source offset	0.67 ± 0.59	1.15	0.59 ± 0.57	0.32 ± 0.64

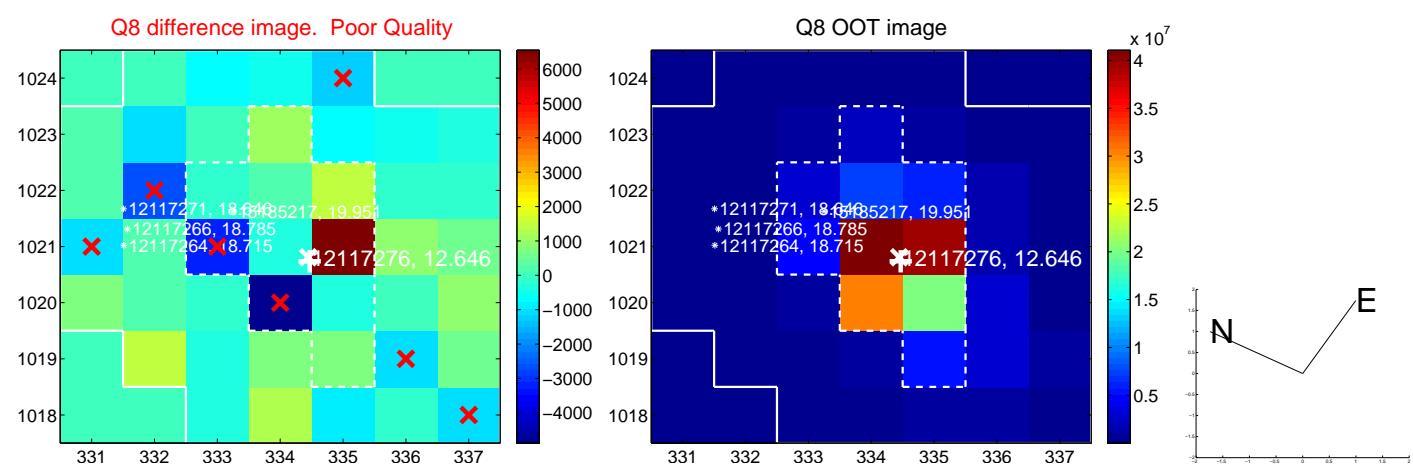
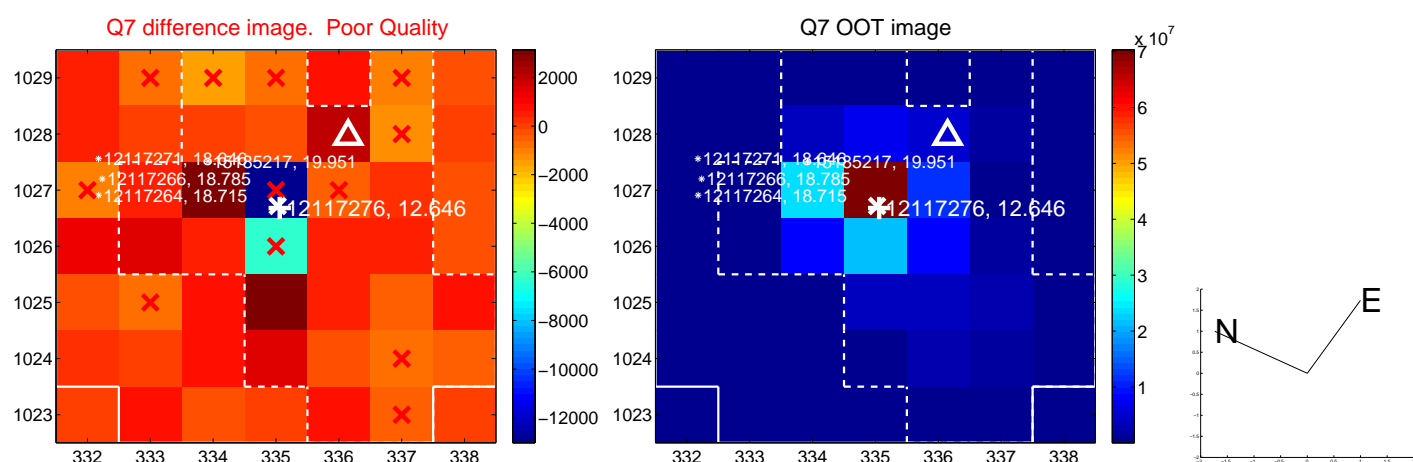
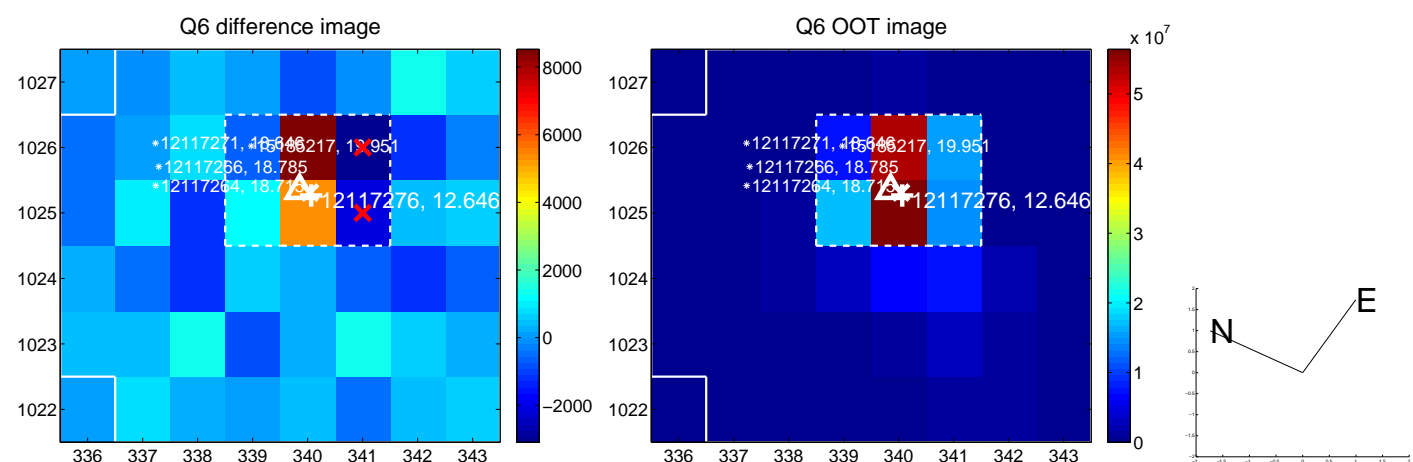
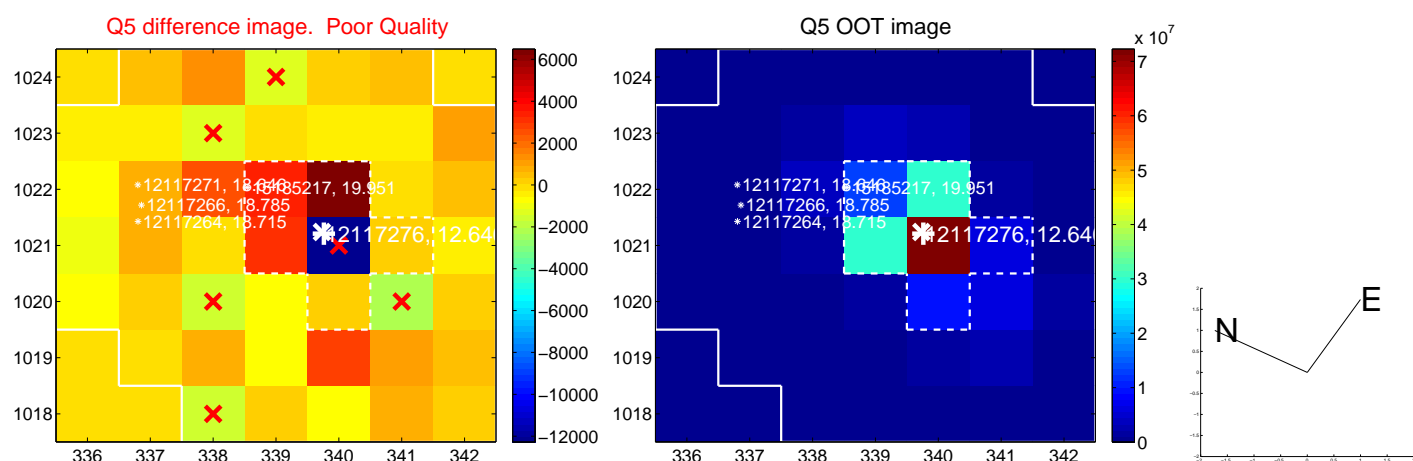


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

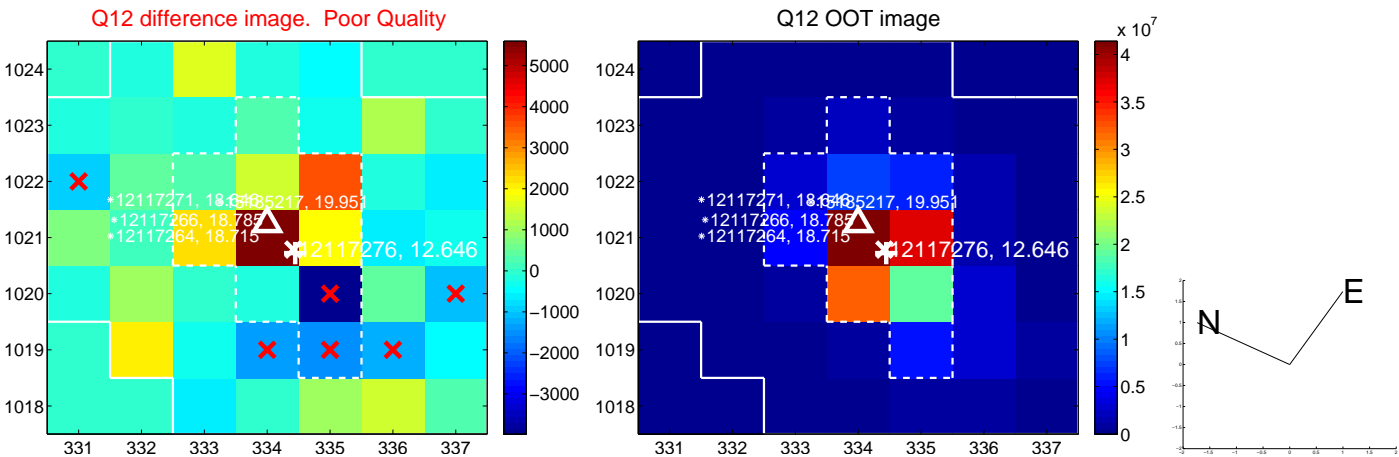
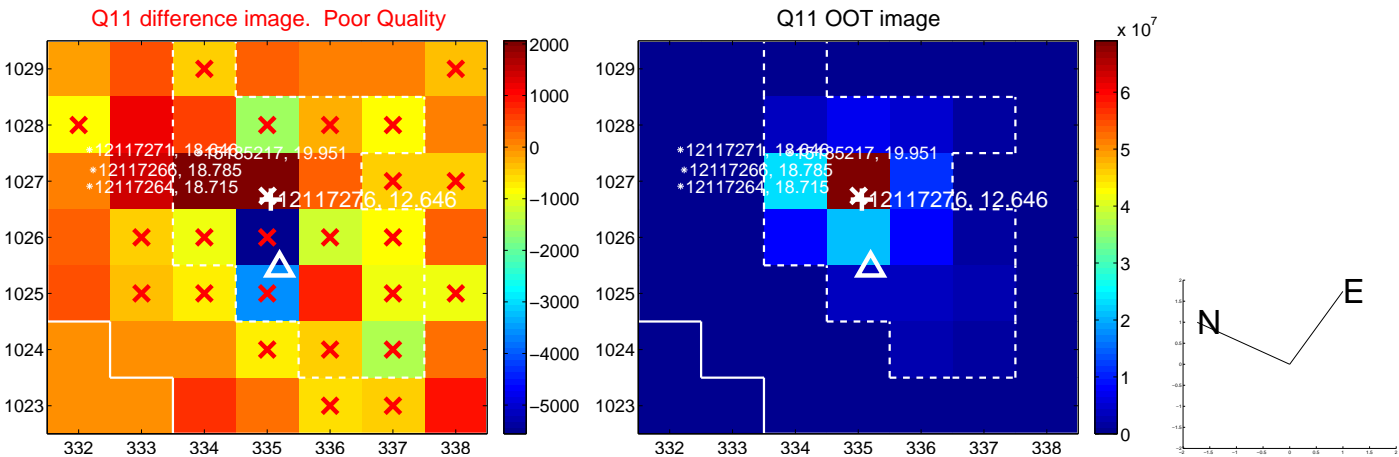
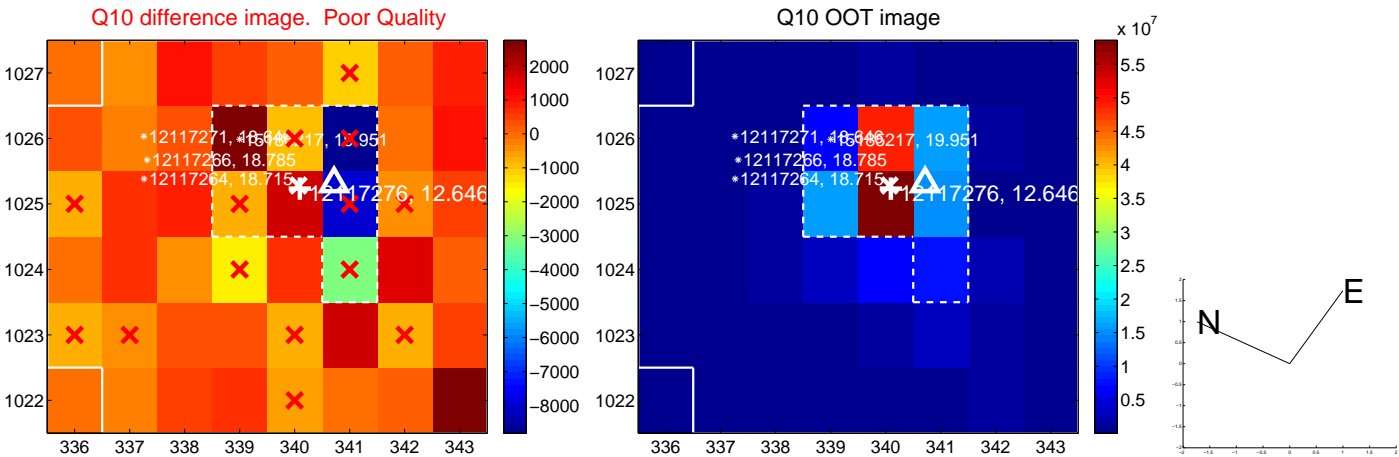
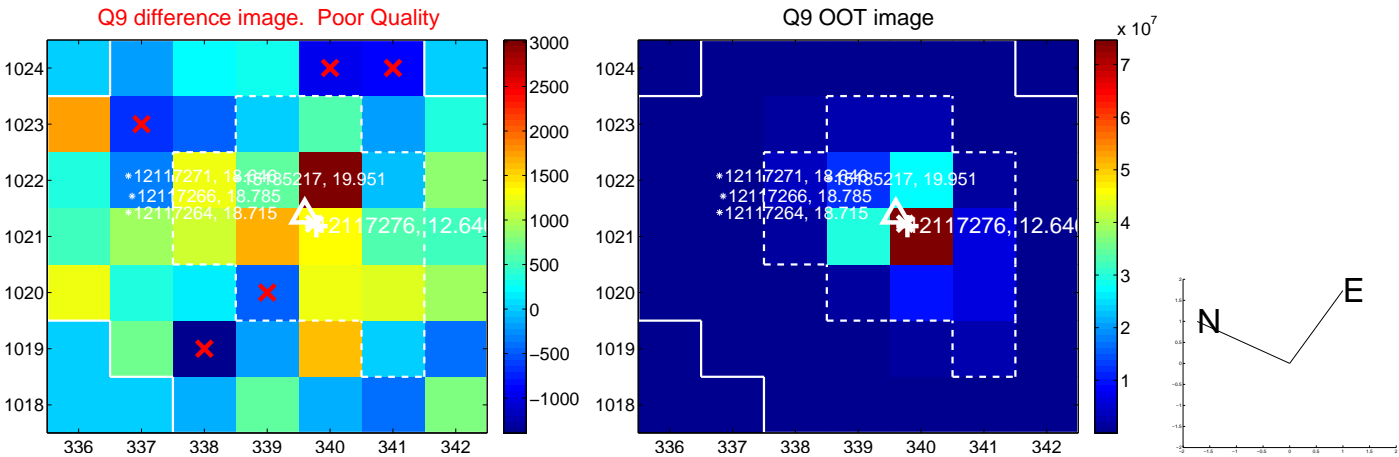
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



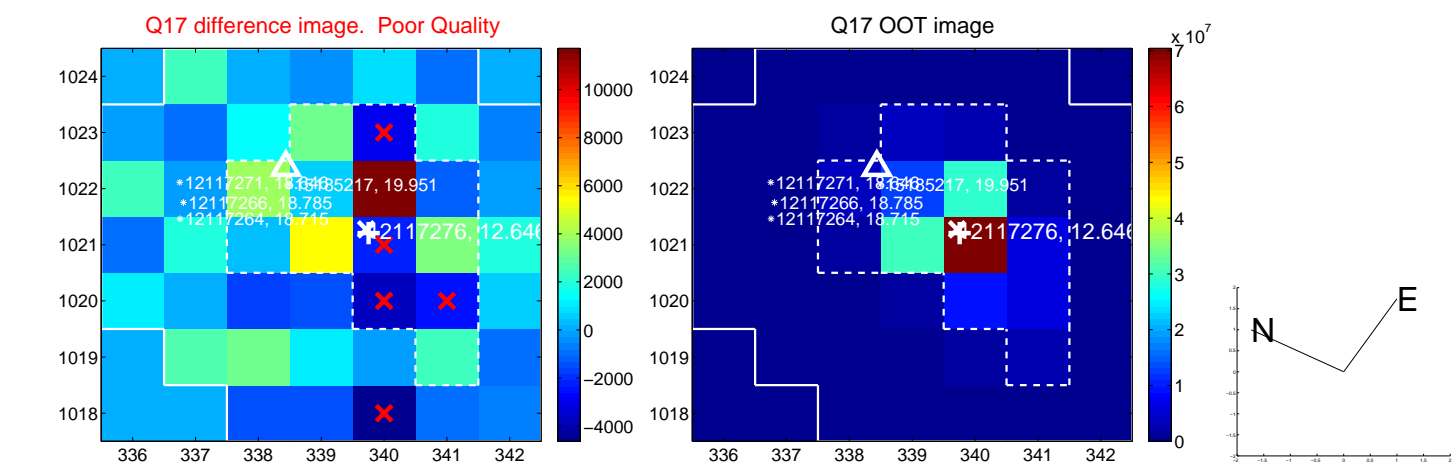
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



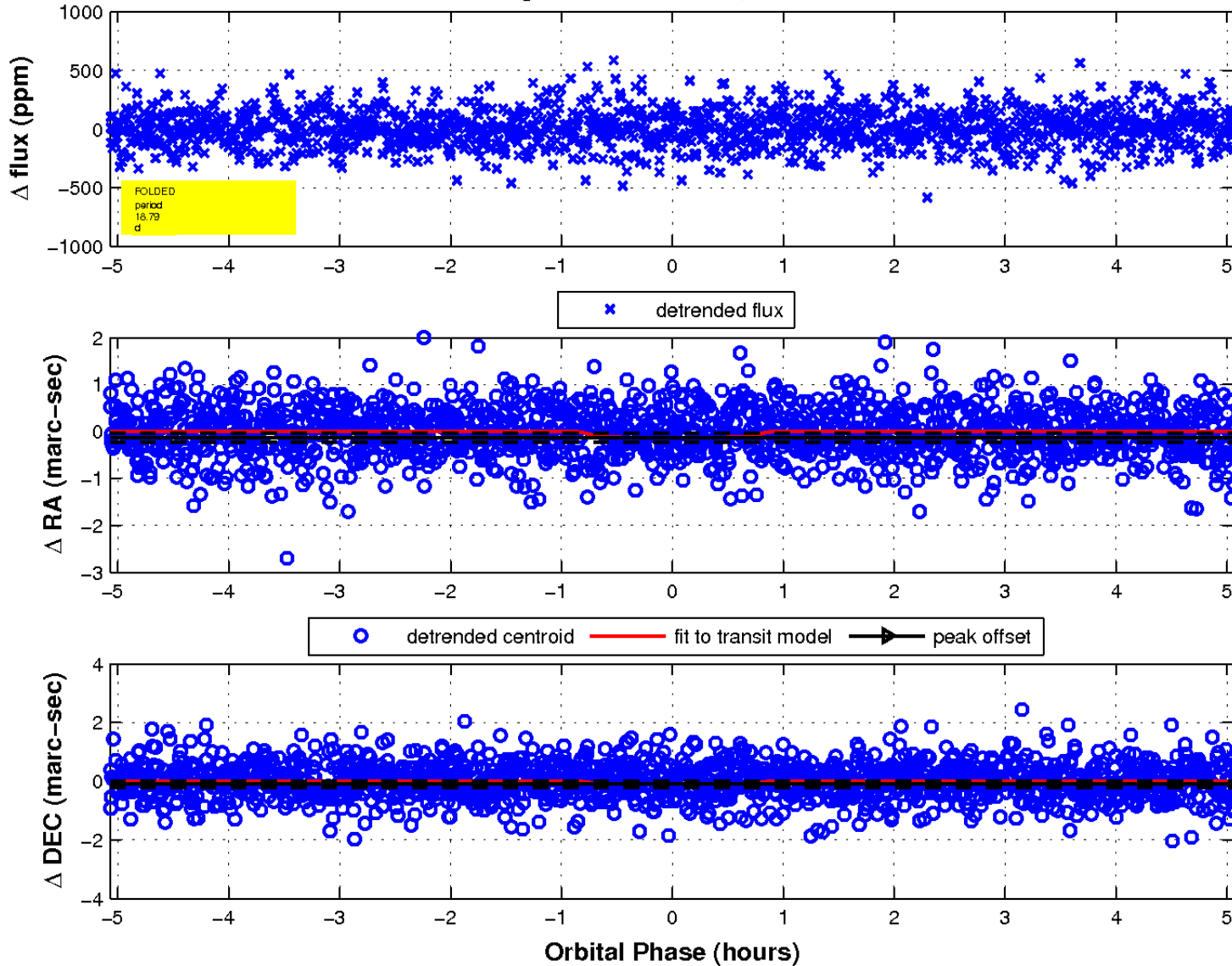
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



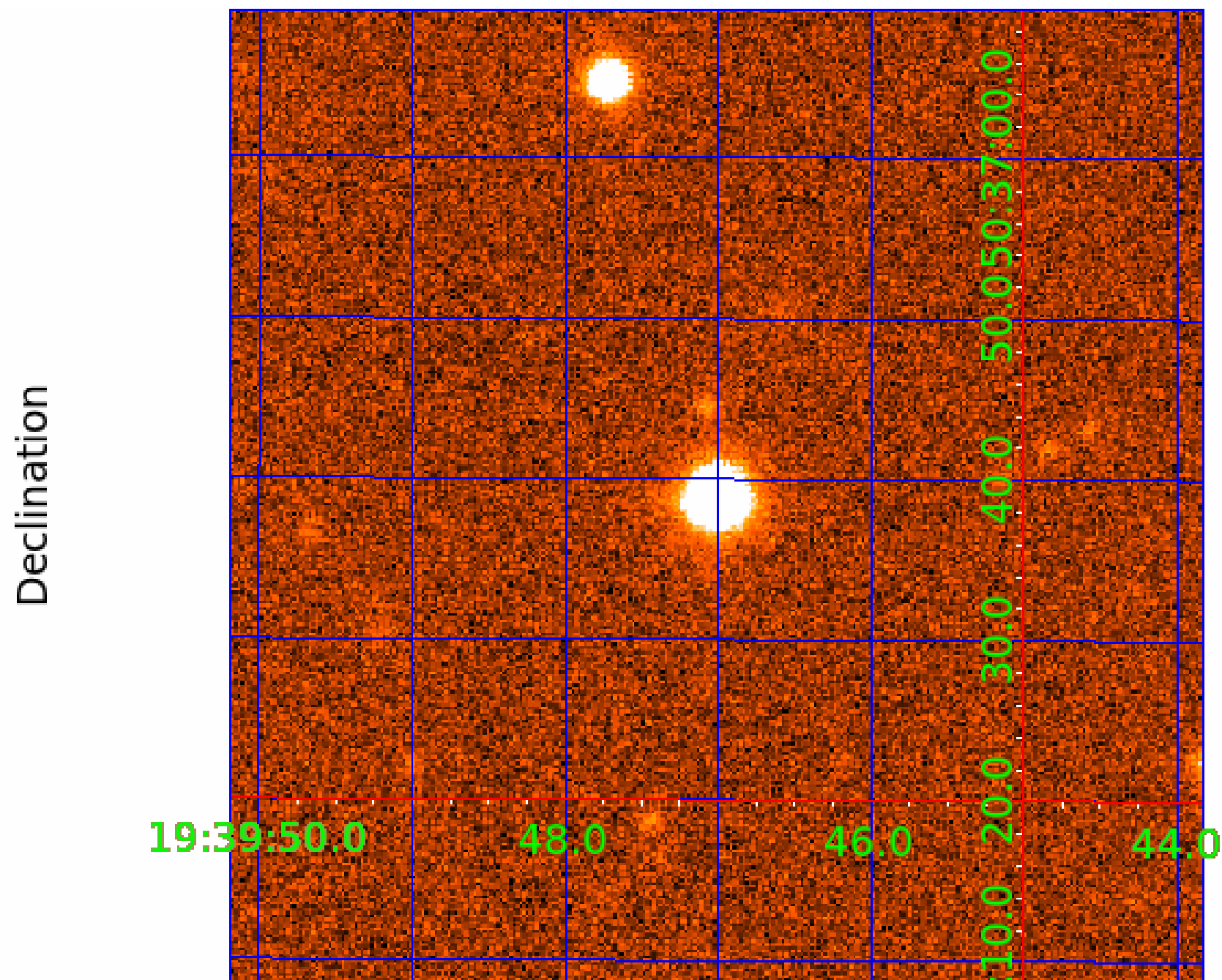
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 3 of 4



UKIRT Image



KIC 012117276

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})
012117276-01	OBS	No	0.663328	132.134685	17.1	4.486	10.1	8.1	2.16	7340	0.92	39695.86
012117276-02	OBS	No	63.653712	141.110860	301.2	3.701	10.3	9.9	2.16	7340	4.42	90.36
012117276-03	OBS	No	18.793425	137.540377	182.7	1.692	9.7	10.0	2.16	7340	3.44	459.60
012117276-04	OBS	No	48.060553	147.976866	285.1	1.190	8.5	7.7	2.16	7340	3.71	131.42

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012117276-01	OBS	FP	0.00	1	0	0	0	LPP_DV
012117276-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
012117276-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
012117276-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

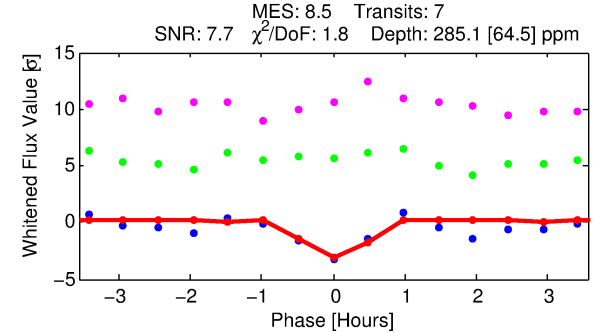
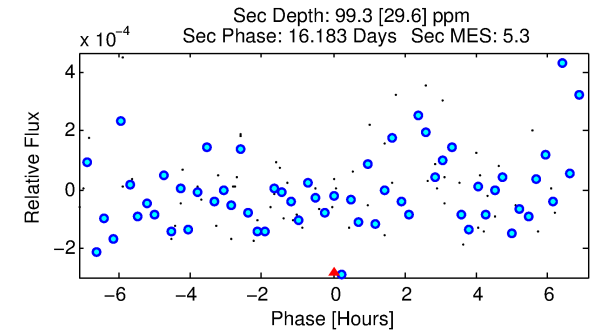
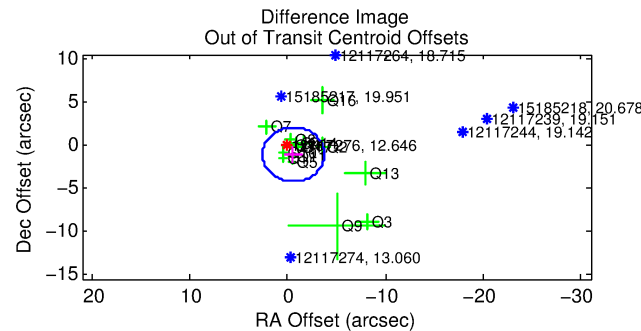
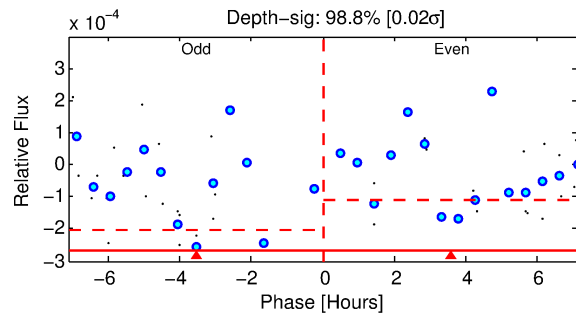
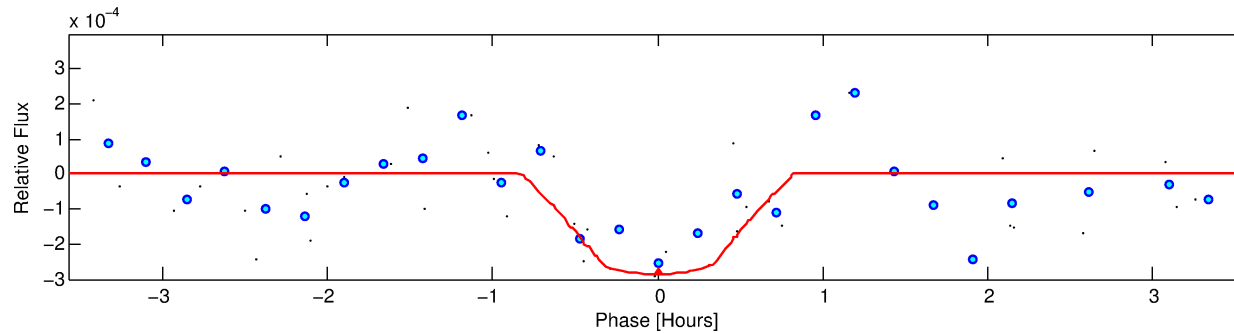
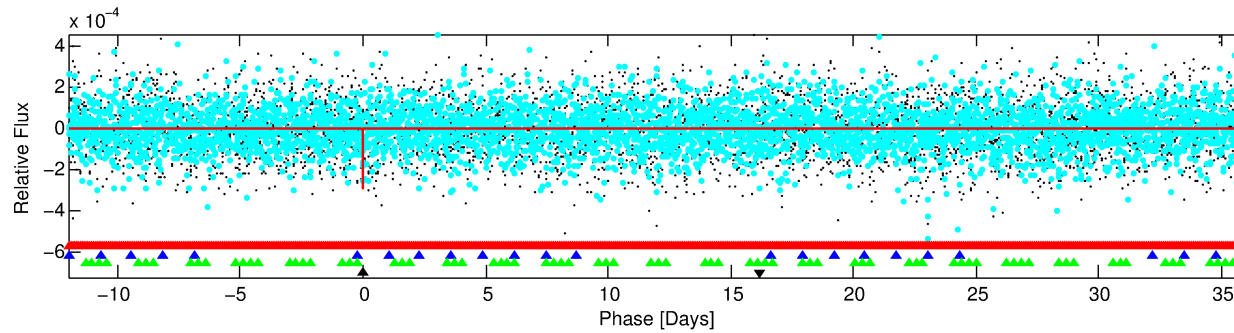
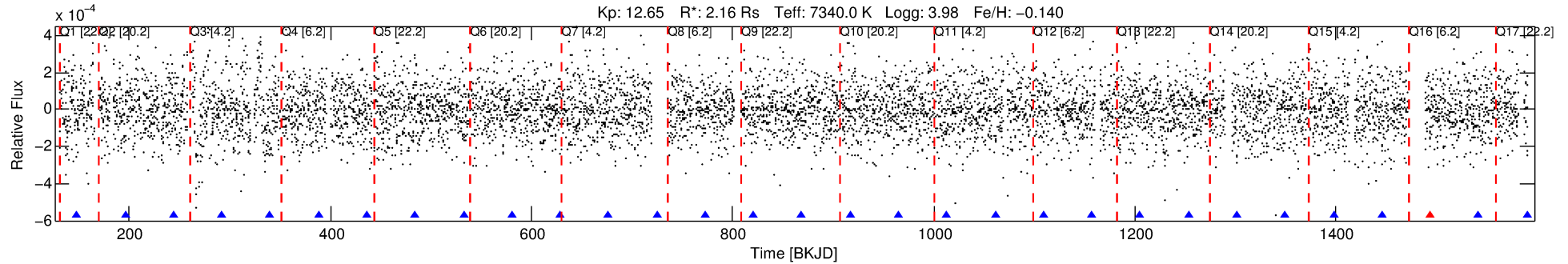
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 012117276-04

No Significant Match Found

DV One-Page Summary

KIC: 12117276 Candidate: 4 of 4 Period: 48.061 d



DV Fit Results:

Period = 48.06055 [0.00039] d
Epoch = 147.9769 [0.0082] BKJD
Rp/R* = 0.0157 [0.0259]
a/R* = 308.13 [2875.51]
b = 0.18 [48.94]
Seff = 131.42 [38.09]
Teq = 863 [63] K
Rp = 3.71 [6.17] Re
a = 0.3043 [0.0575] AU
Ag = 367.04 [1219.75] [0.30σ]
Teffp = 5843 [4836] K [1.03σ]

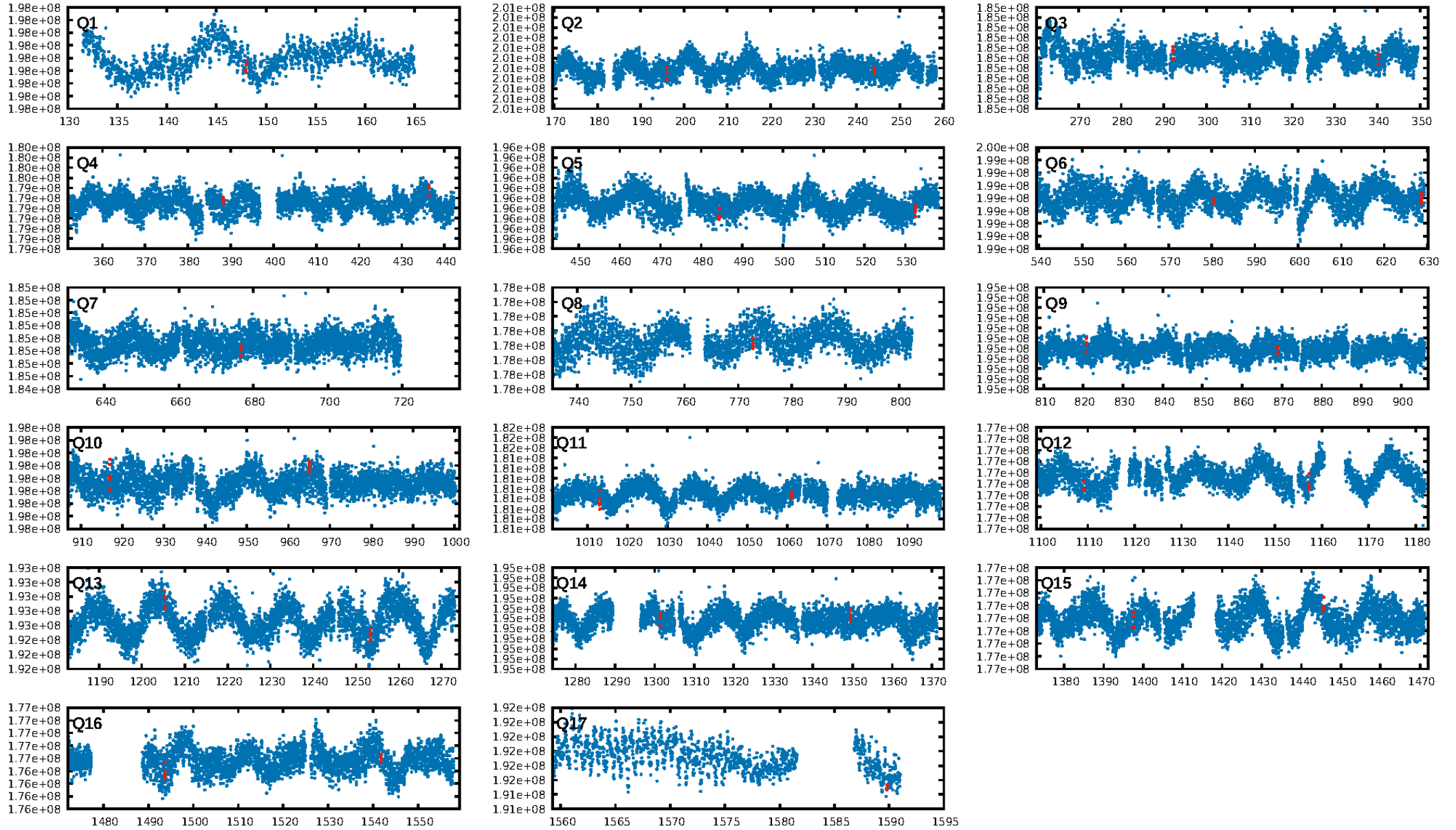
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [339.51σ]
LongPeriod-sig: 100.0% [96.26σ]
ModelChiSquare2-sig: 23.7%
ModelChiSquareGof-sig: 99.3%
Bootstrap-pfa: 4.69e-13
RollingBand-fgt: 0.83 [5/6]
GhostDiagnostic-chr: -0.143
Centroid-sig: 9.1%
Centroid-so: 1.110 arcsec [1.57σ]
OotOffset-rm: 1.241 arcsec [1.19σ]
KicOffset-rm: 1.469 arcsec [1.37σ]
OotOffset-st: 3/4/3/5 [15]
KicOffset-st: 3/4/3/5 [15]
DiffImageQuality-fgm: 0.33 [5/15]
DiffImageOverlap-fno: 0.12 [2/17]

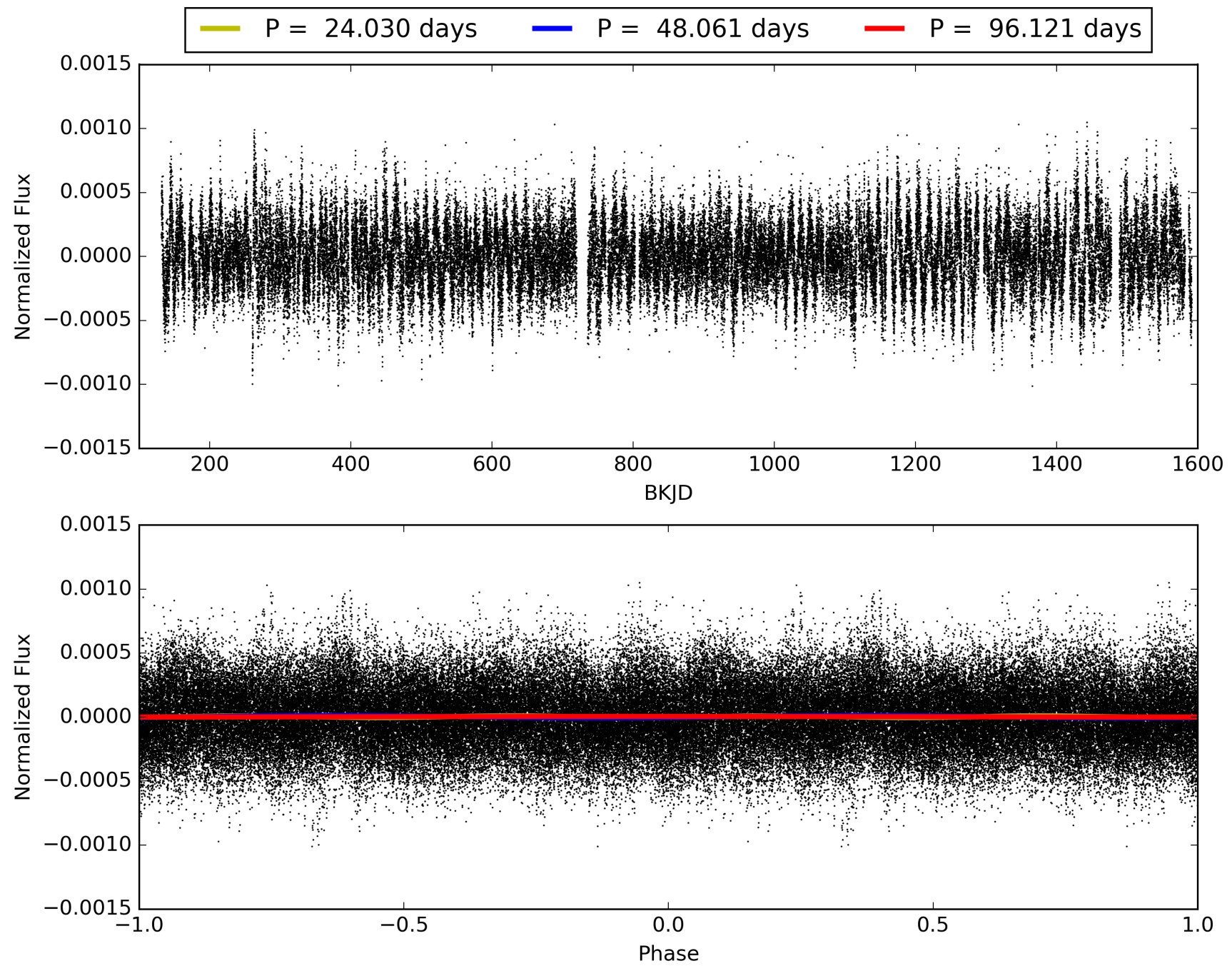
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:01:22 Z

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

TCE 012117276-04, PDC Light Curves

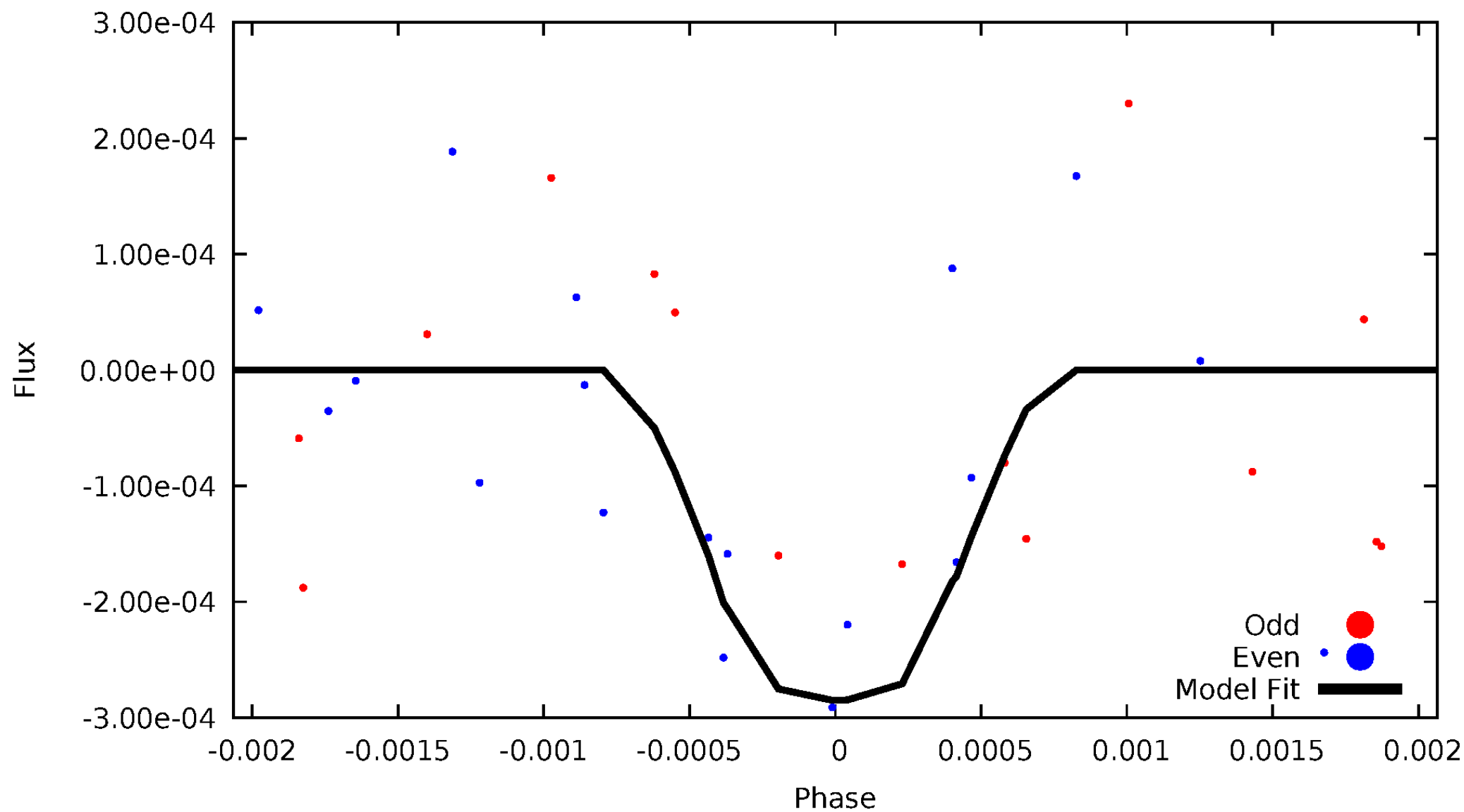


TCE 012117276-04



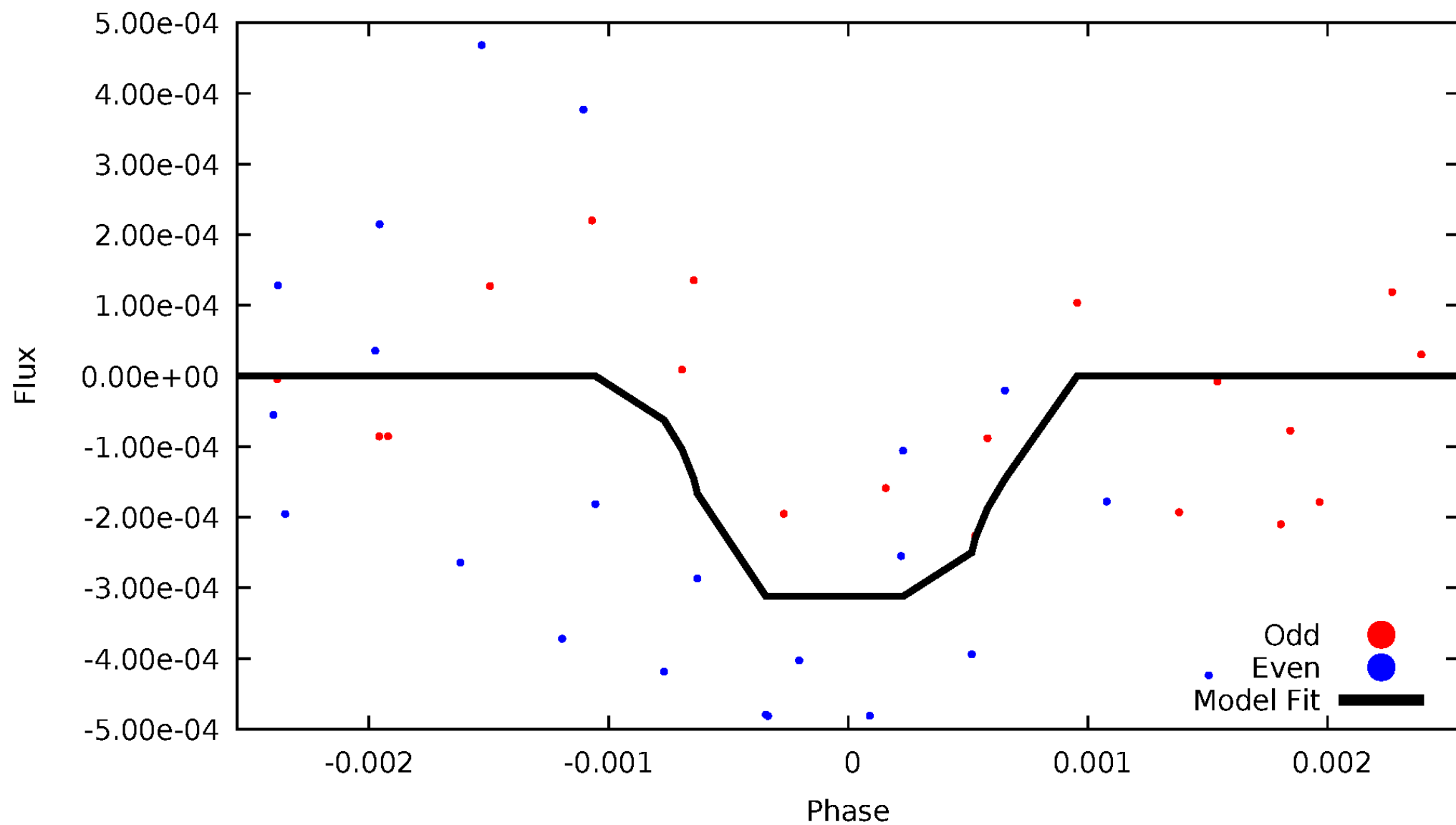
DV Odd/Even

TCE 012117276-04



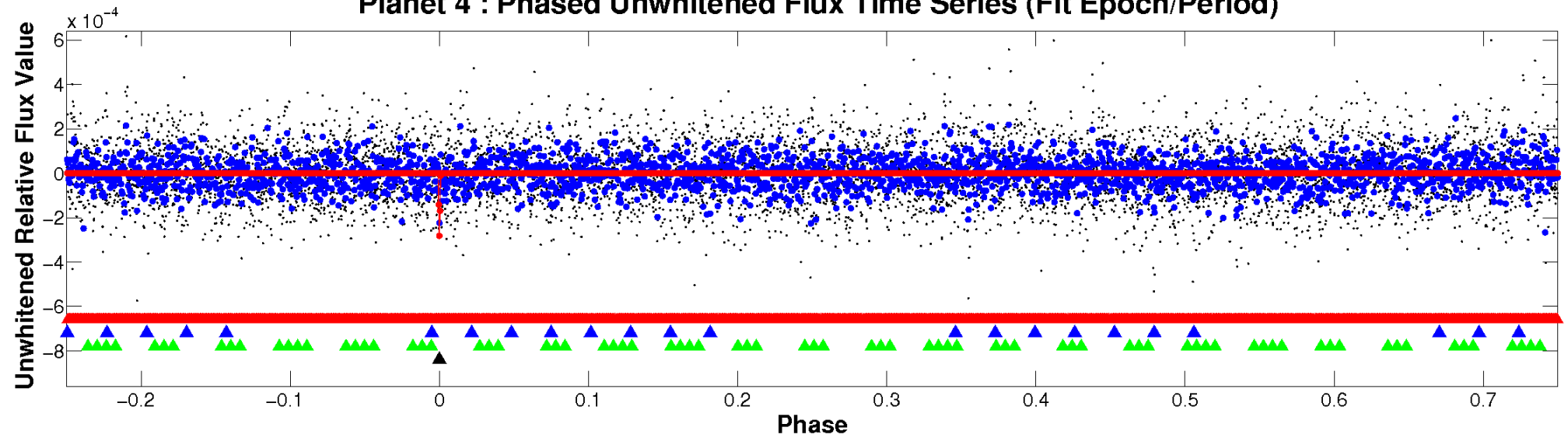
ALT Odd/Even

TCE 012117276-04

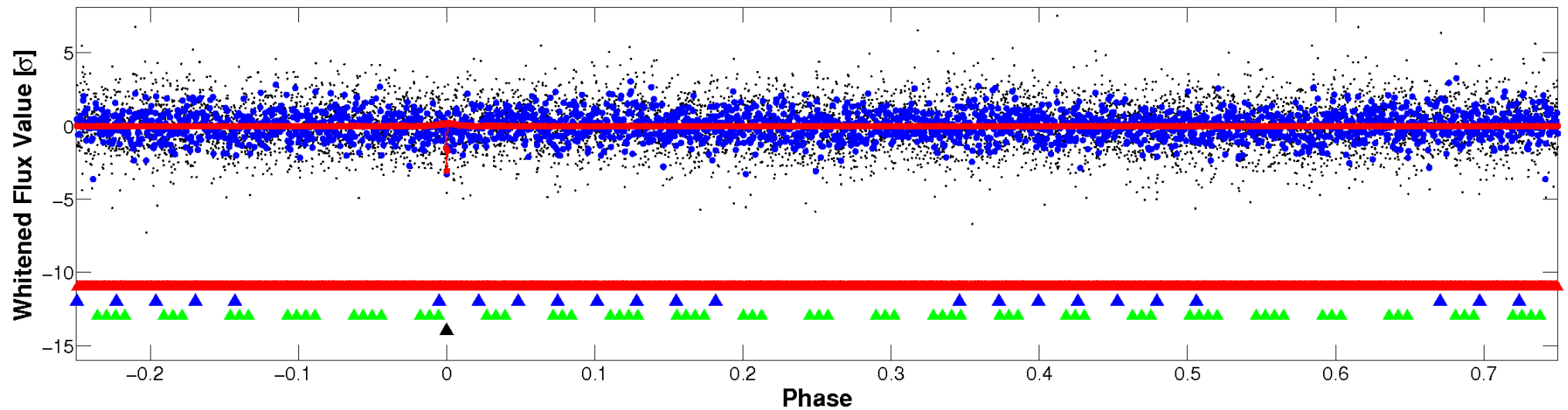


Non-Whitened Vs. Whitened Light Curve

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

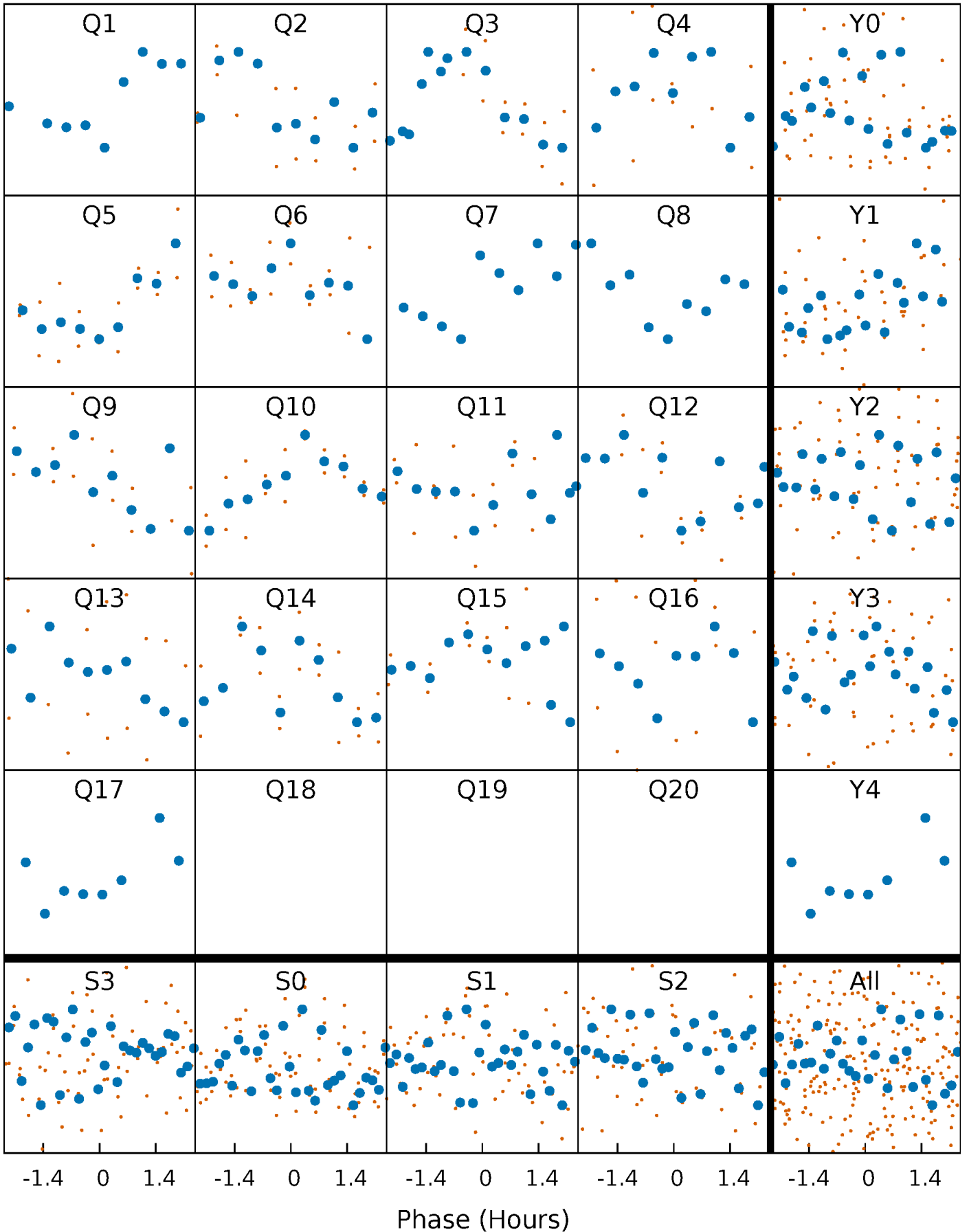


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



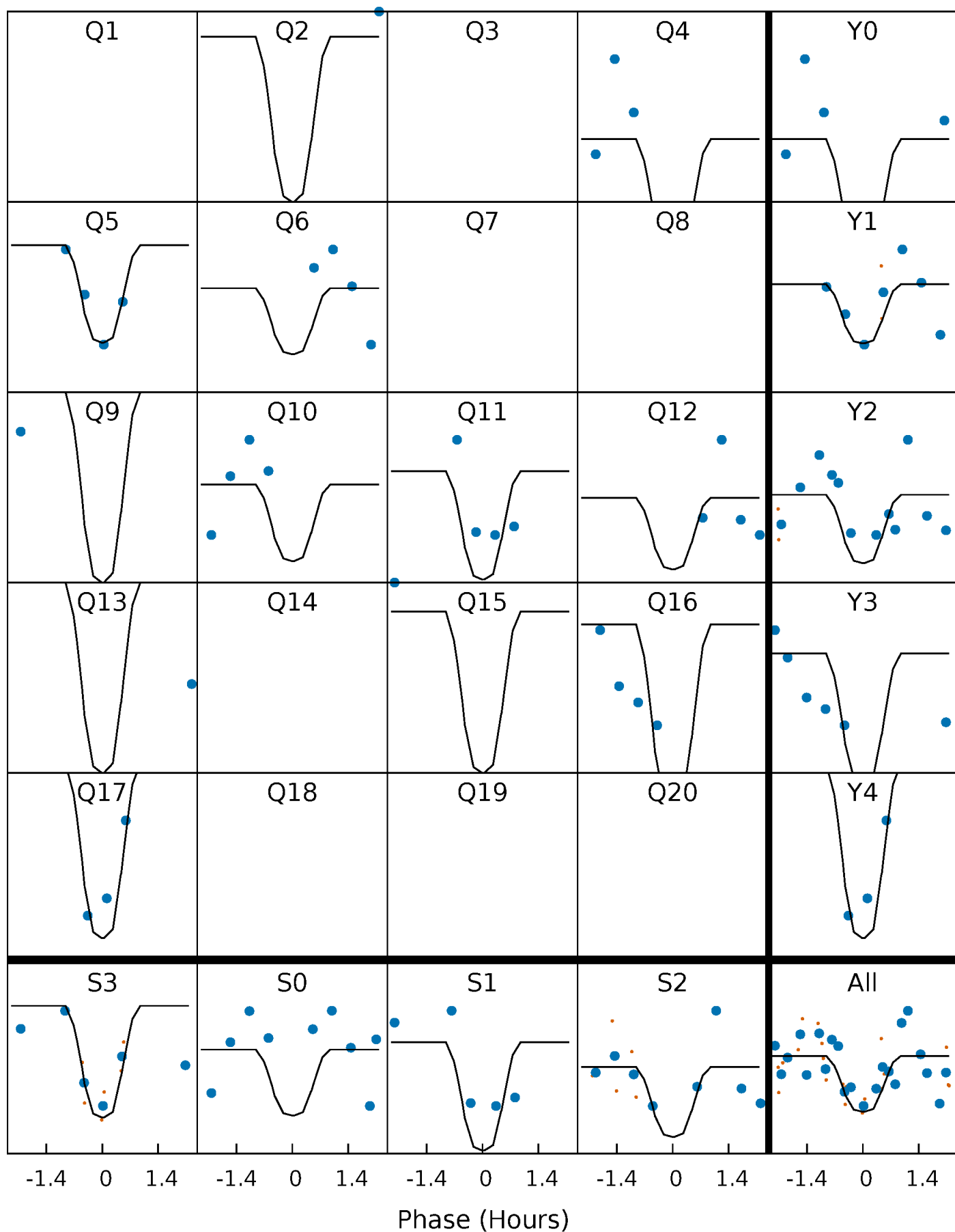
PDC Quarter-Phased Transit Curves

TCE 012117276-04 P= 48.060553 Days $T_0=147.976866$ (BKJD)



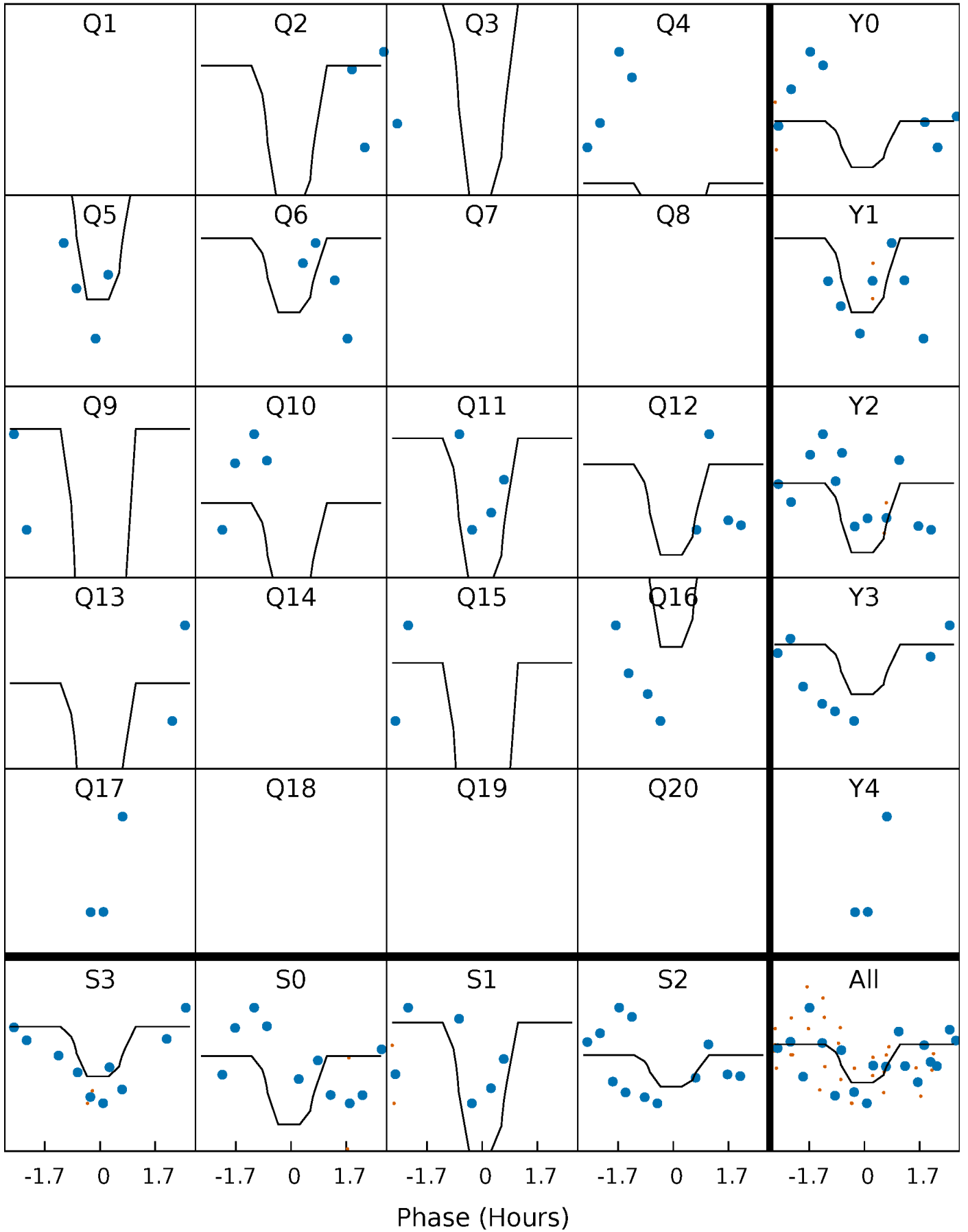
DV Quarter-Phased Transit Curves

TCE 012117276-04 P= 48.060553 Days $T_0=147.976866$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

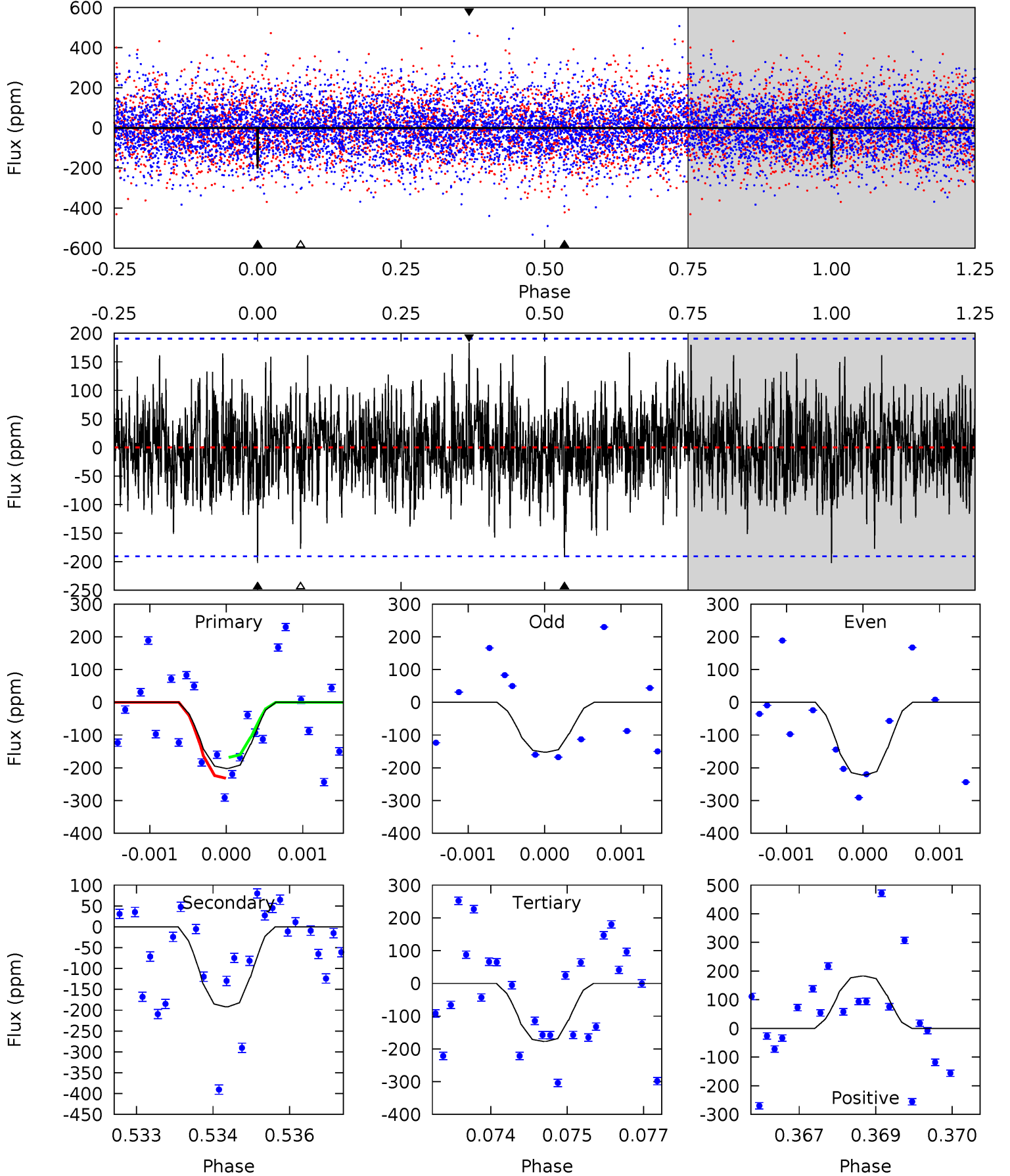
TCE 012117276-04 P= 48.060021 Days $T_0=147.990487$ (BKJD)



DV Model-Shift Uniqueness Test

012117276-04, P = 48.060553 Days, E = 99.916313 Days

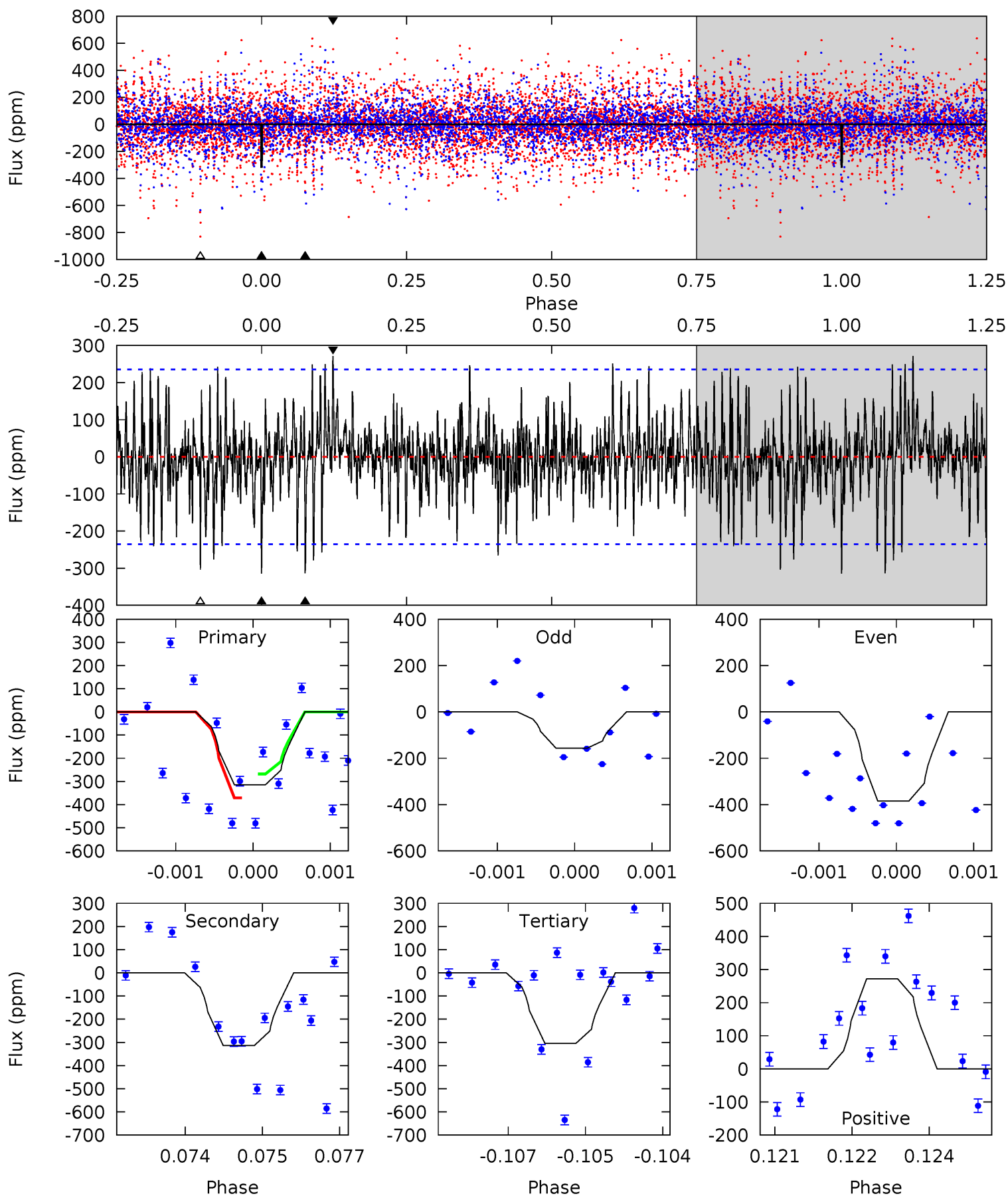
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.73	5.45	5.03	5.20	5.41	3.22	1.51	0.70	0.54	0.41	0.25	0.94	0.92	0.48	0.91



Alt Model-Shift Uniqueness Test

012117276-04, P = 48.060021 Days, E = 99.930466 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.20	7.19	6.96	6.22	5.39	3.19	1.77	0.23	0.98	0.22	0.97	2.57	0.92	0.46	1.20



Stellar Parameters For KIC 012117276

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7340^{+73}_{-80}	$3.979^{+0.162}_{-0.108}$	$-0.140^{+0.150}_{-0.150}$	$2.163^{+0.378}_{-0.462}$	$1.623^{+0.144}_{-0.160}$	$0.226^{+0.191}_{-0.076}$
	+1%/-1%	+4%/-3%	+107%/-107%	+17%/-21%	+9%/-10%	+85%/-34%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 012117276-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-192 ± 35	$5.81^{+5.27}_{-3.89}$	1200^{+50}_{-63}	5425^{+4918}_{-1289}	286^{+2315}_{-209}
Alt.	-314 ± 44	$5.75^{+5.46}_{-3.76}$	1200^{+56}_{-62}	6113^{+6125}_{-1528}	480^{+3603}_{-354}

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 $A_{obs} \gg 1.0$

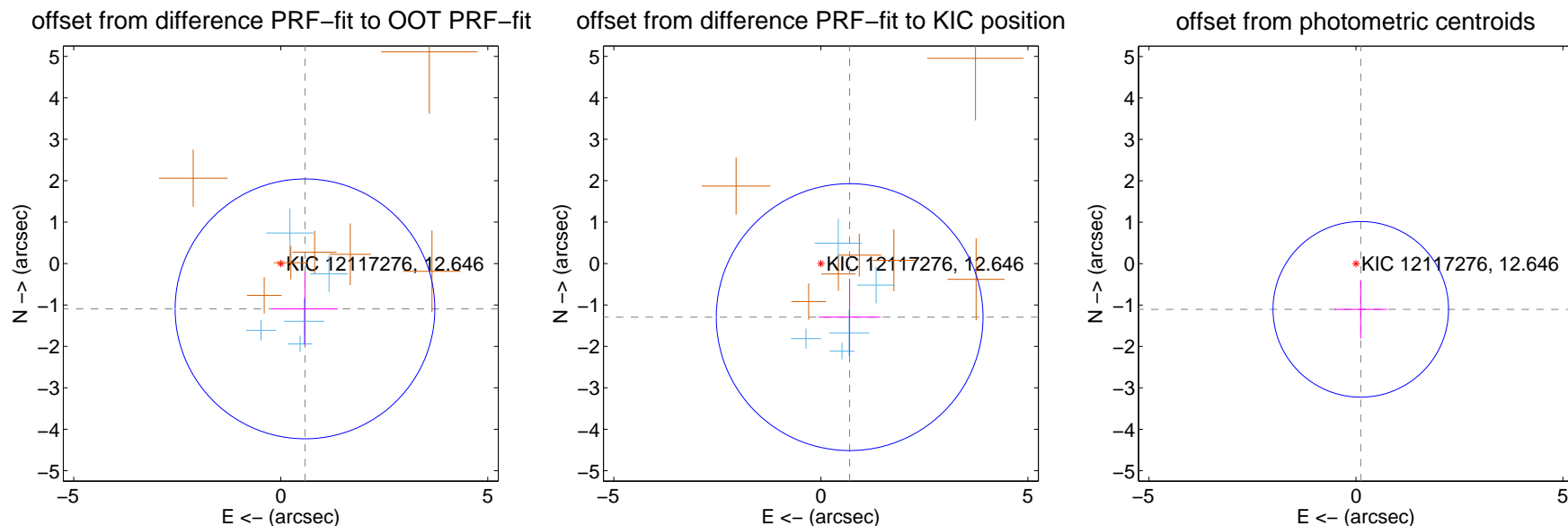
DV Centroid Data

Supplemental centroid analysis for 012117276-04. Kepler magnitude: 12.65. Transit SNR 7.71

There are 5 quarters with good PRF difference image offsets

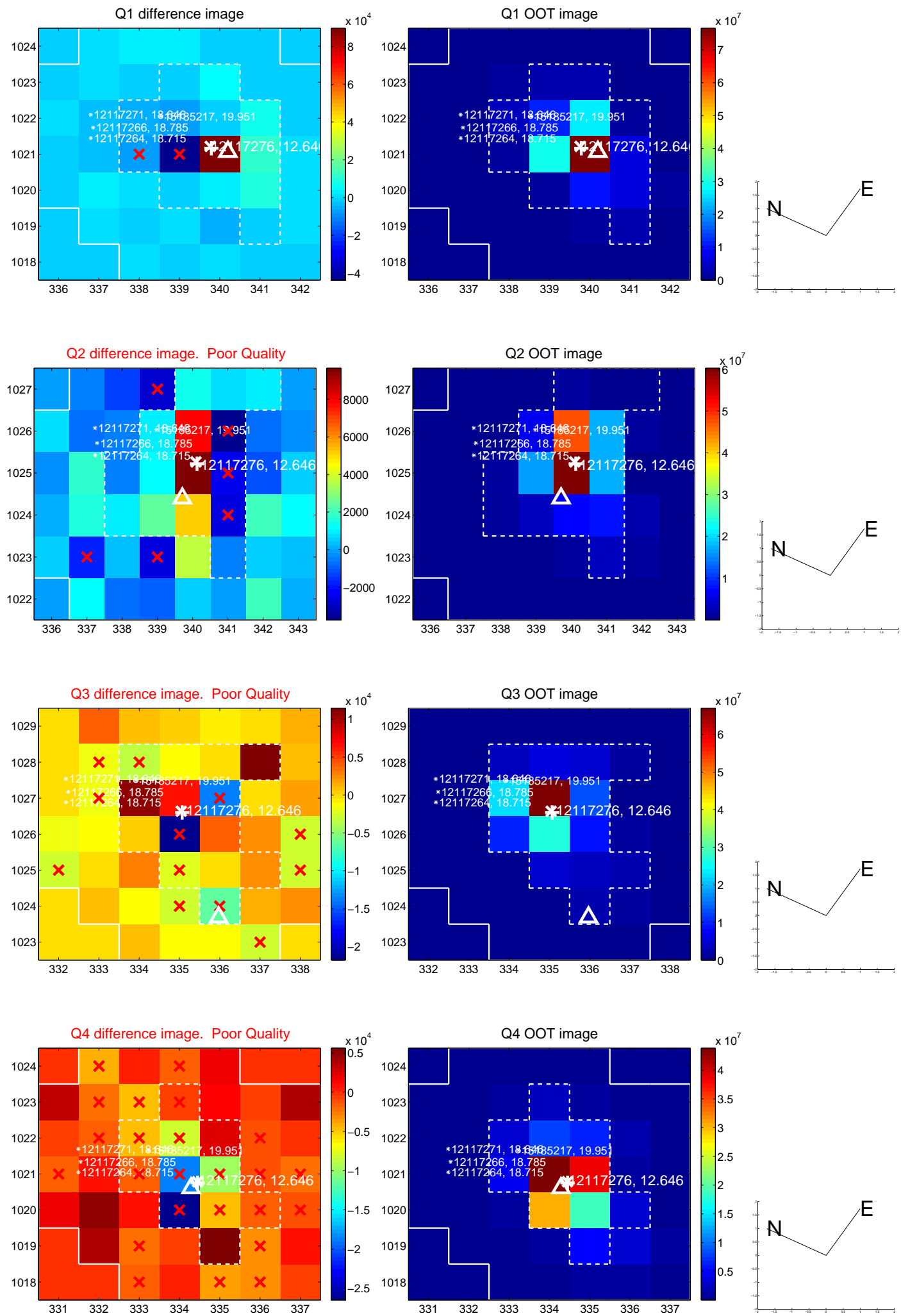
The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.241 ± 1.045	1.19	-0.585 ± 0.794	-1.094 ± 0.890
PRF-fit source offset from KIC position	1.469 ± 1.074	1.37	-0.695 ± 0.746	-1.294 ± 0.928
photometric centroid source offset	1.11 ± 0.71	1.57	-0.12 ± 0.63	-1.10 ± 0.71

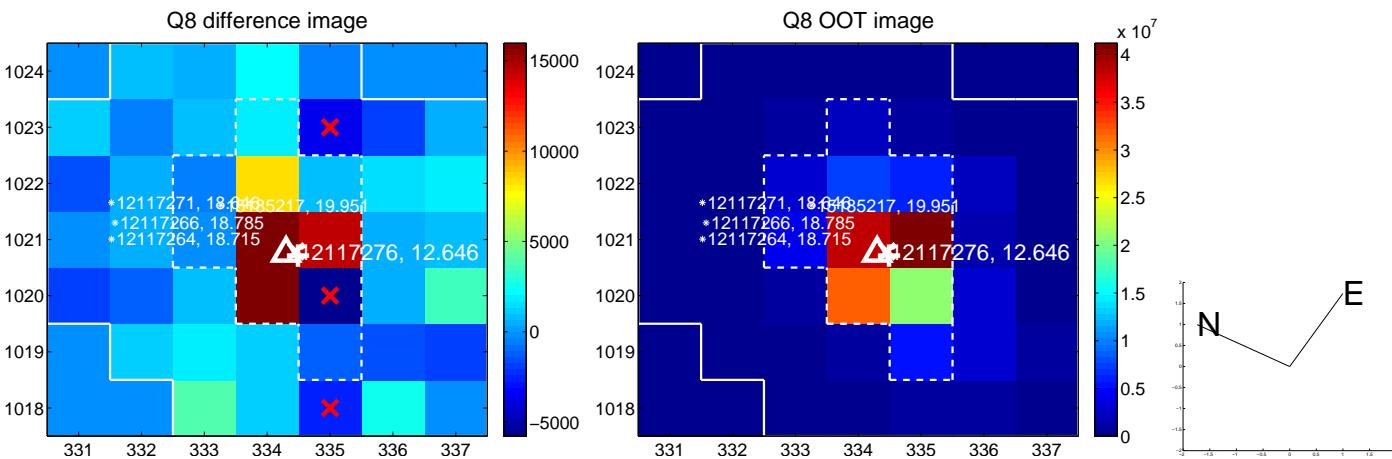
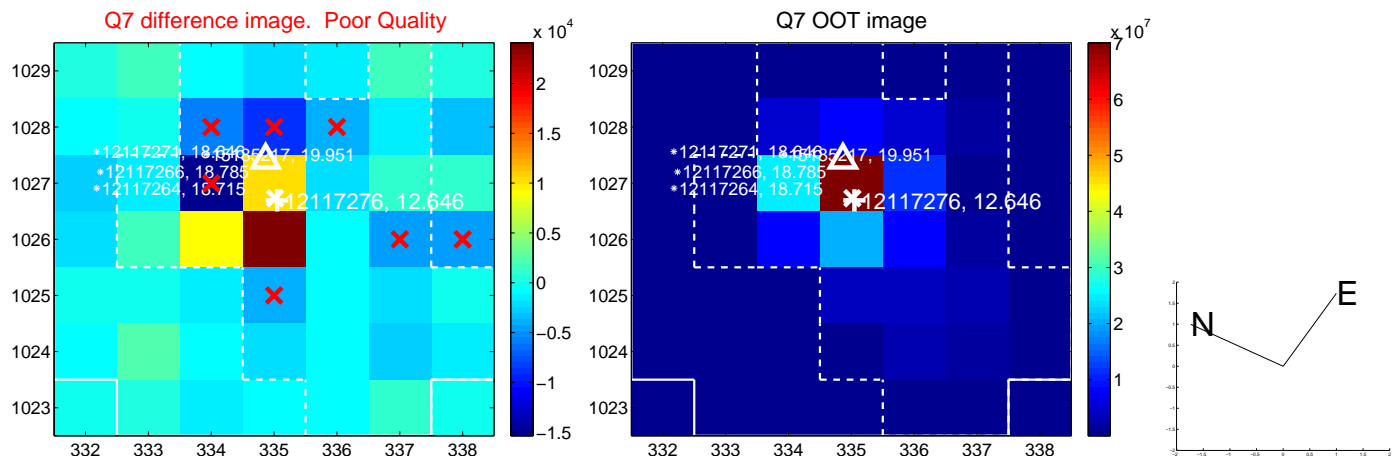
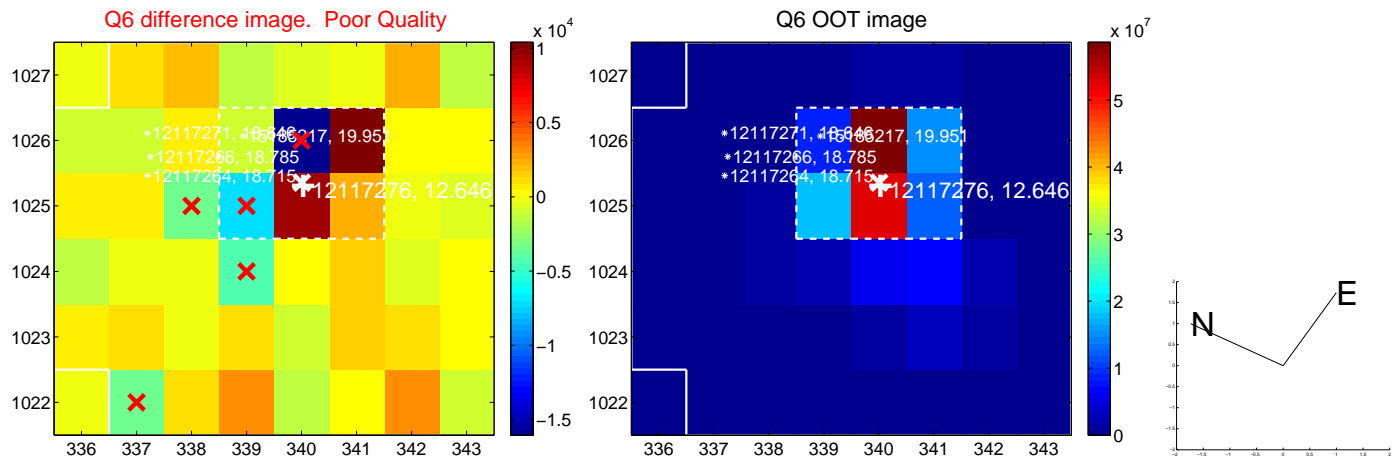
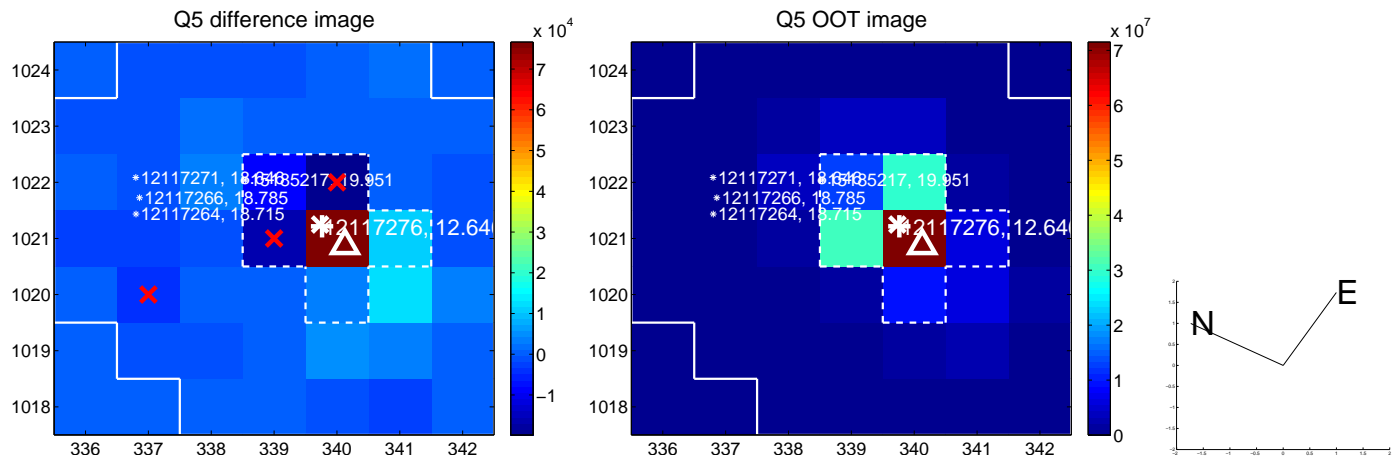


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

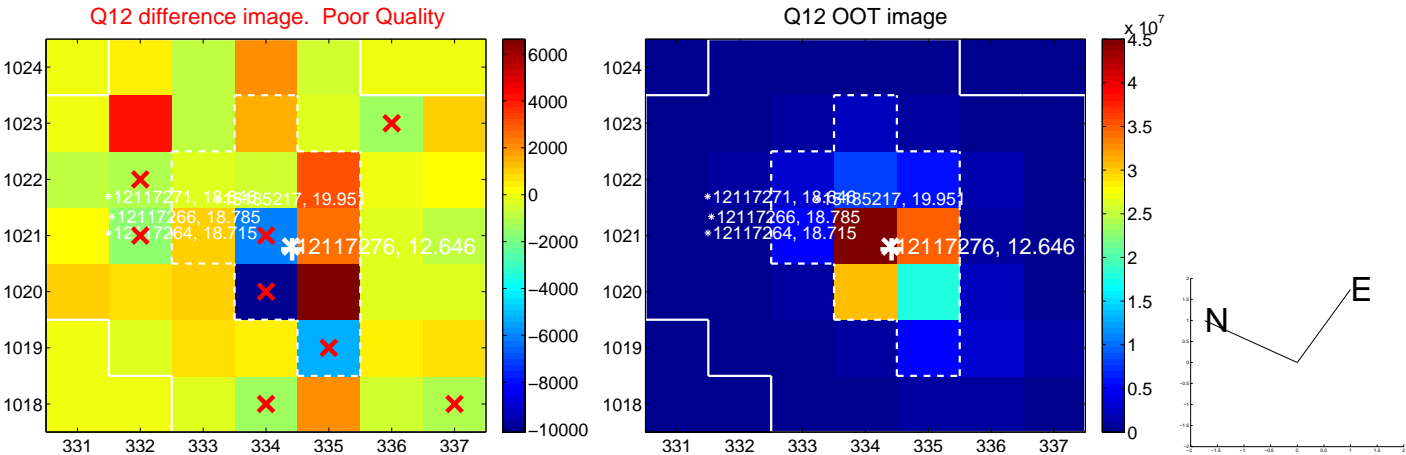
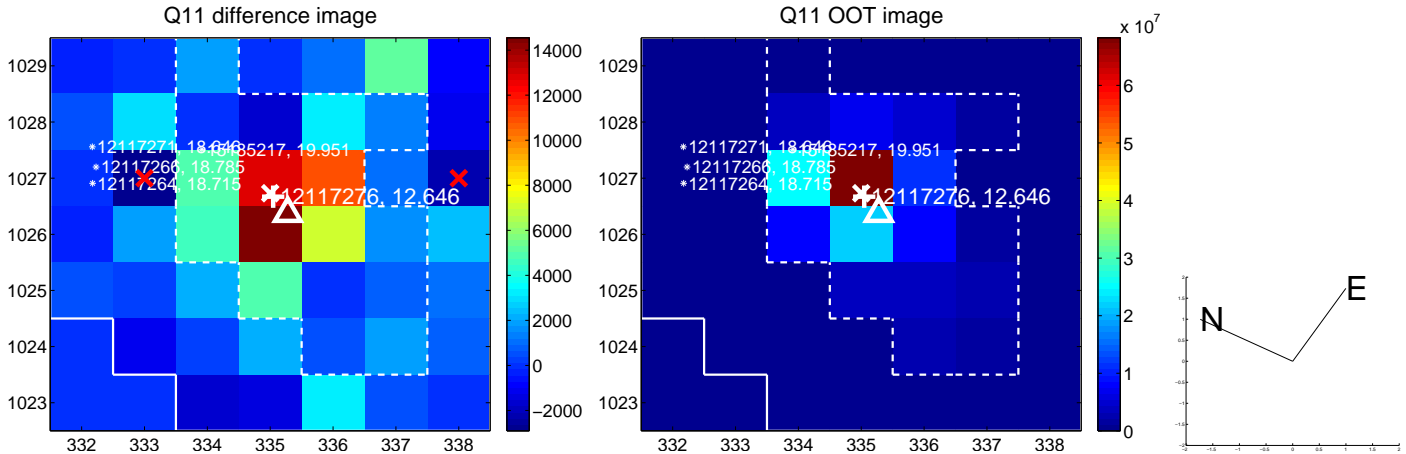
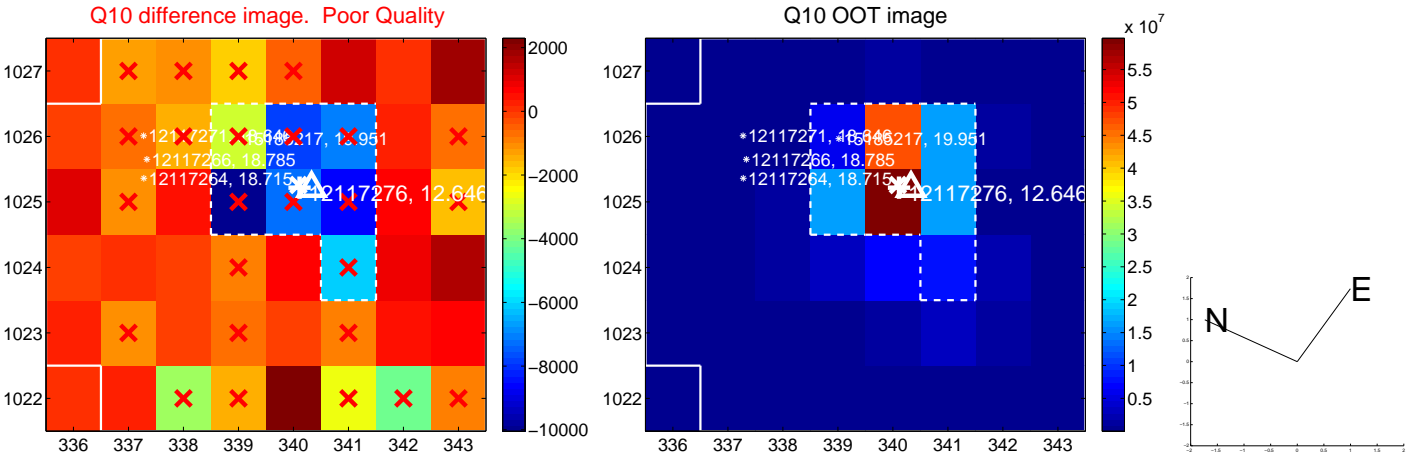
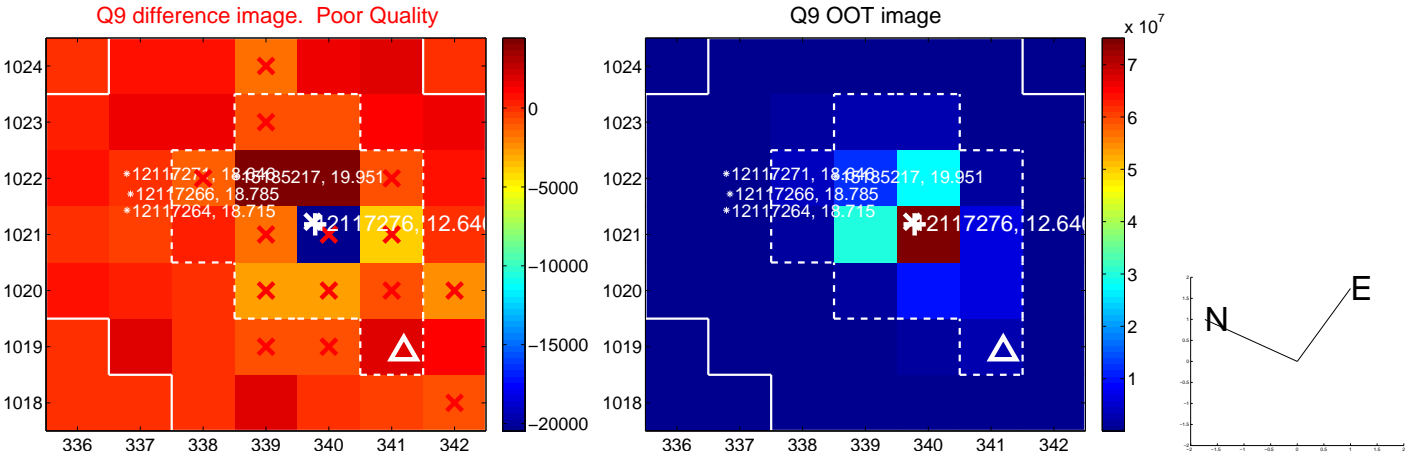
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



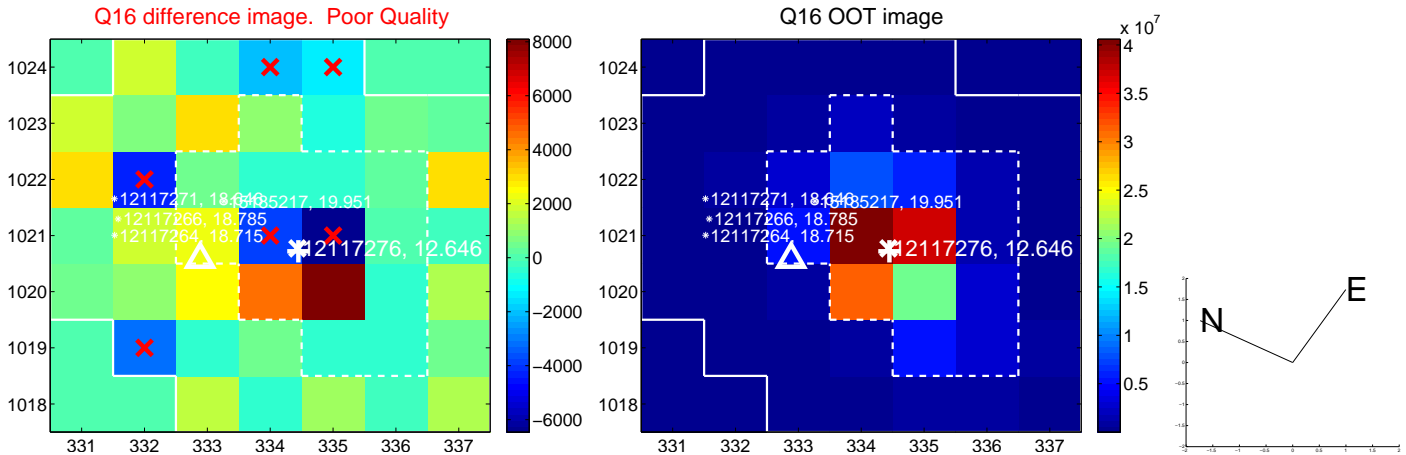
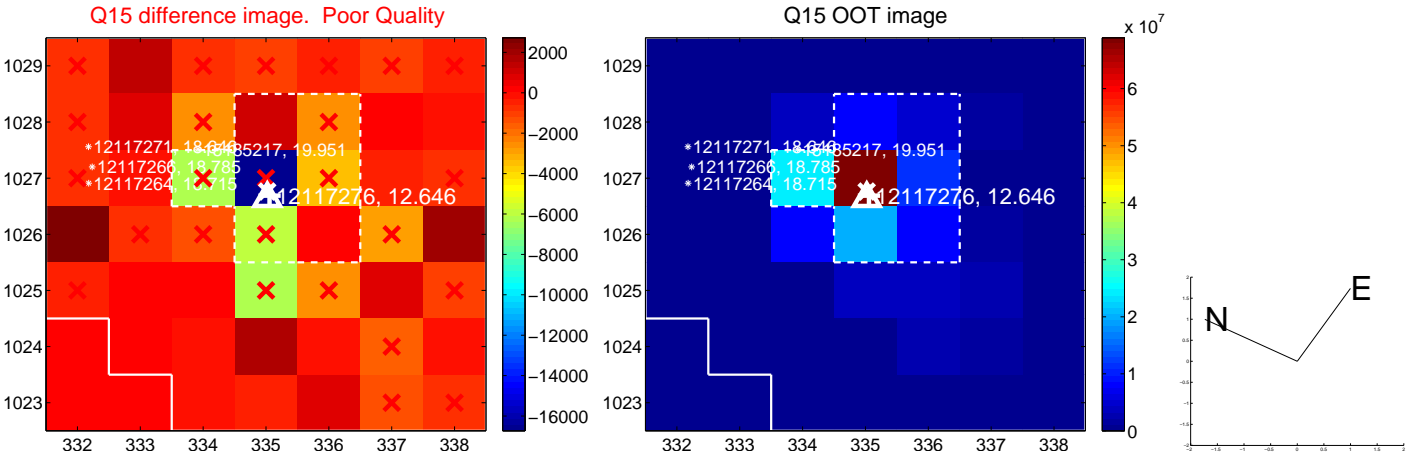
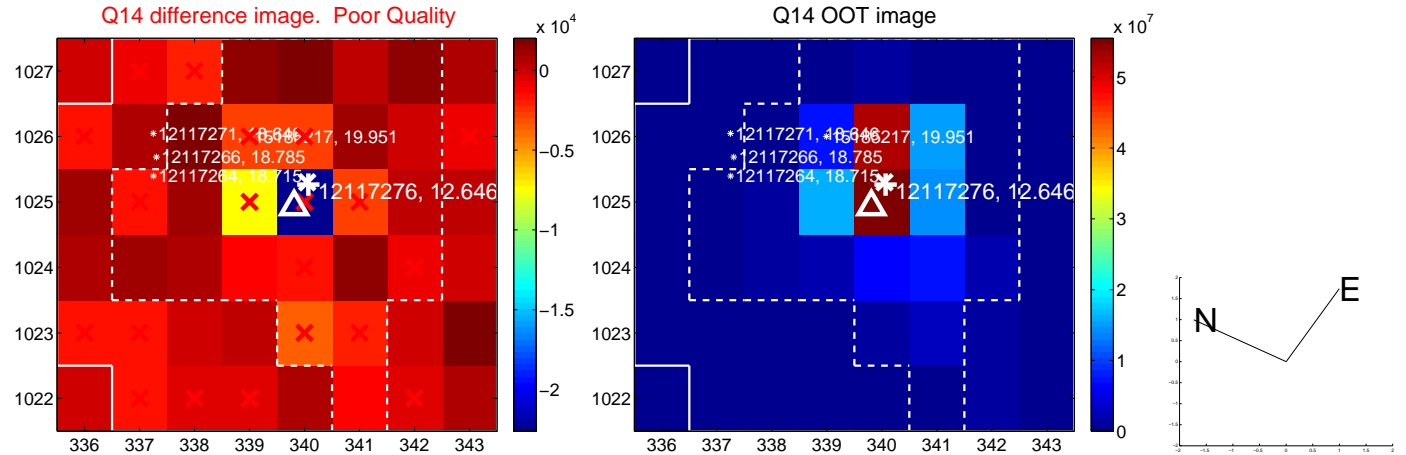
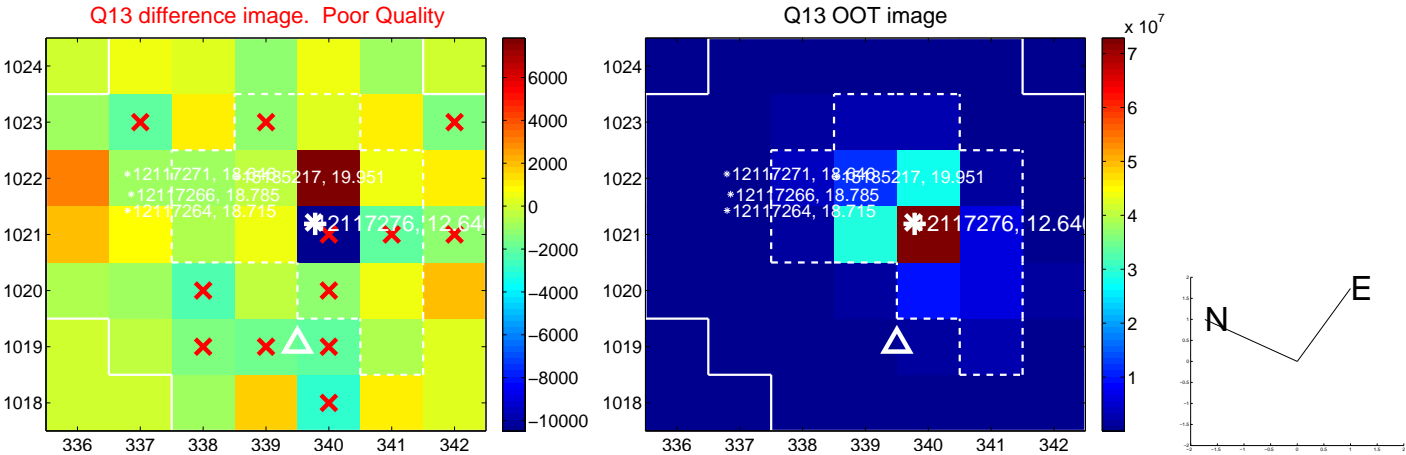
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



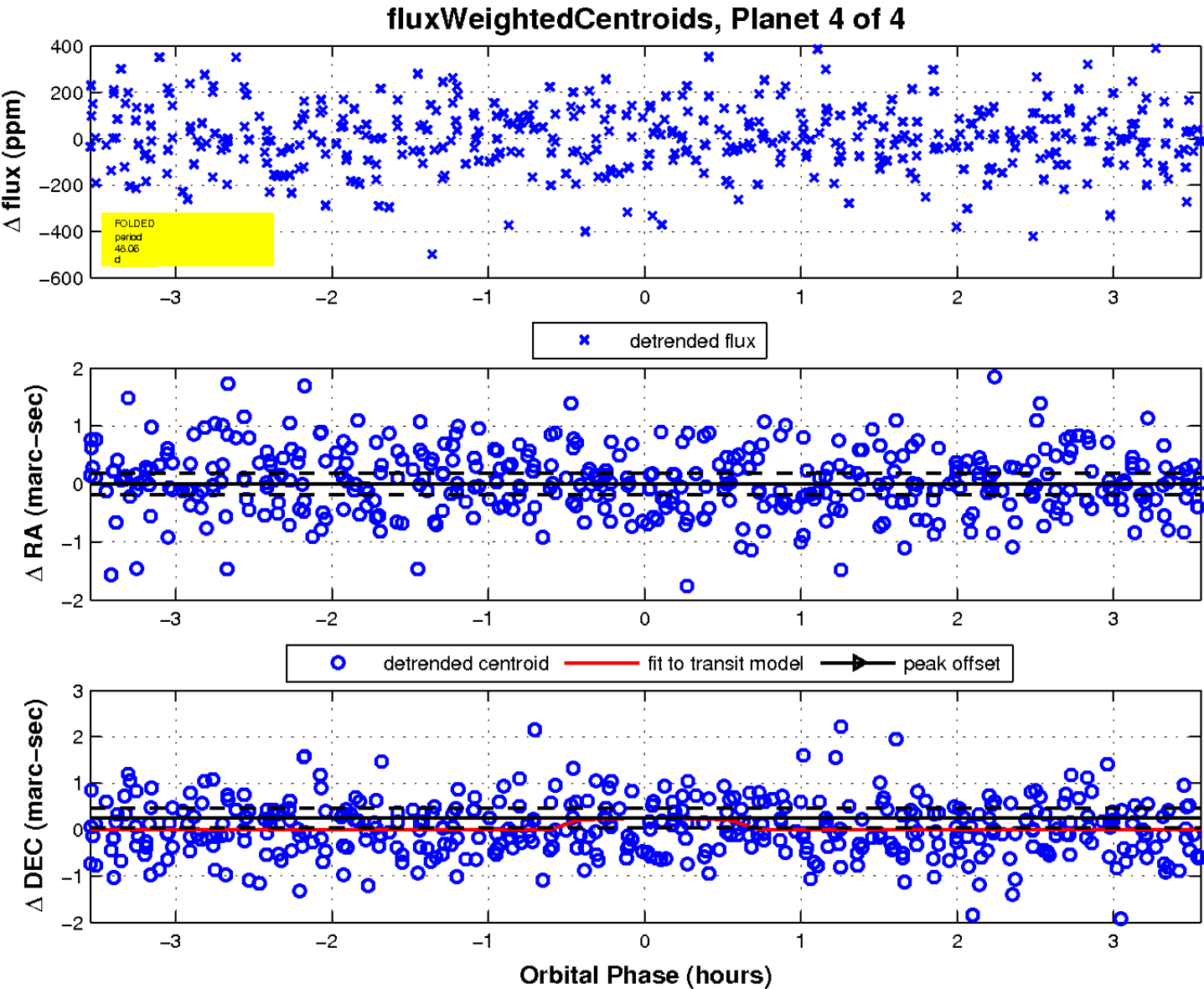
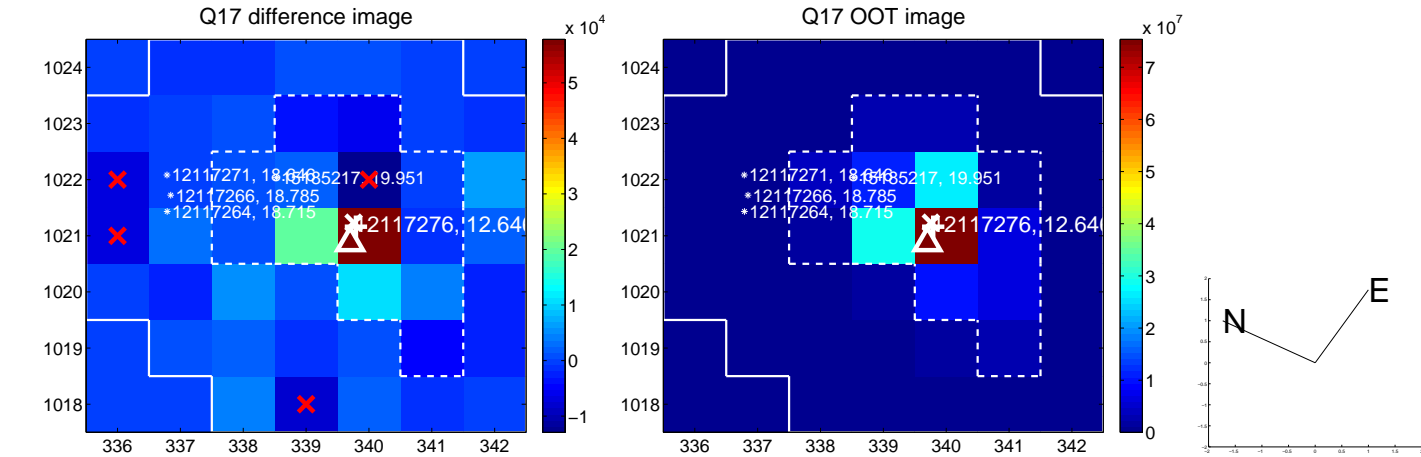
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

