

KIC 009088058

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})
009088058-01	OBS	No	392.822526	465.879559	903.6	5.194	13.8	7.9	1.78	5140	5.62	1.95
009088058-02	OBS	No	576.225991	364.876455	976.3	11.969	12.9	7.0	1.78	5140	5.80	1.17
009088058-03	OBS	No	278.750613	262.255629	619.0	5.208	10.9	6.5	1.78	5140	4.81	3.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009088058-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009088058-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009088058-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—CENT_FEW_DIFFS

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

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

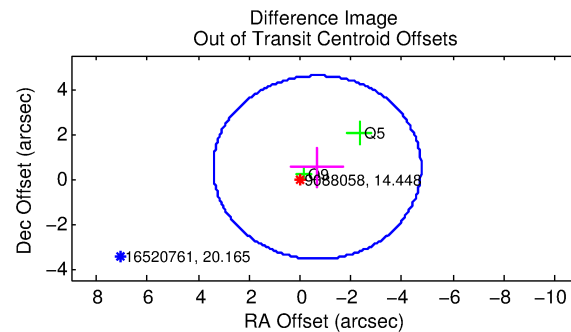
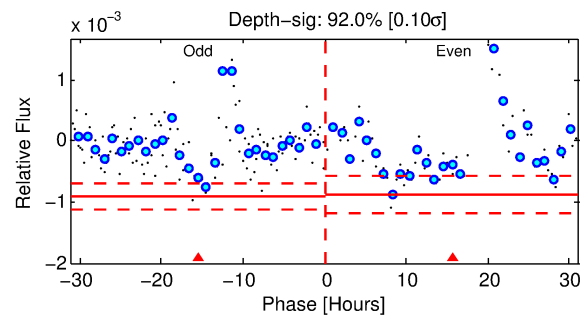
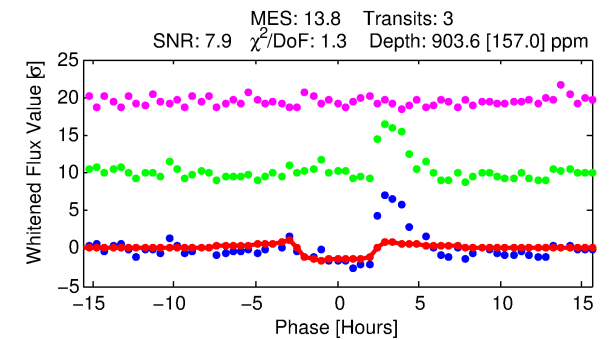
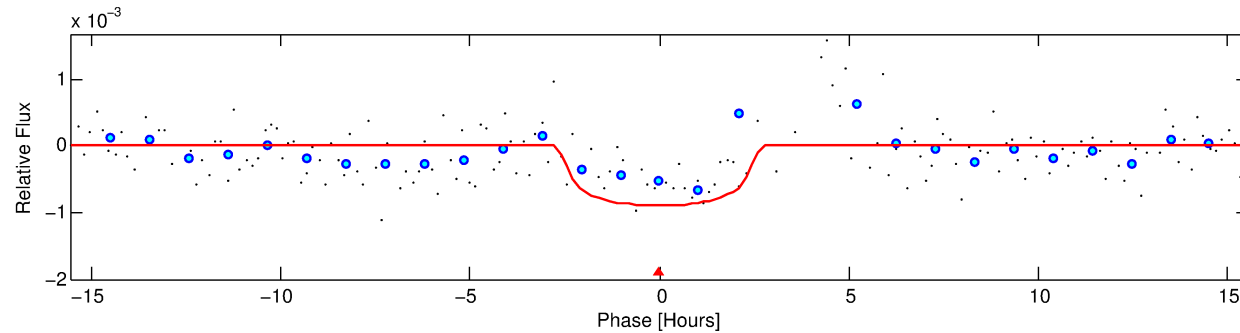
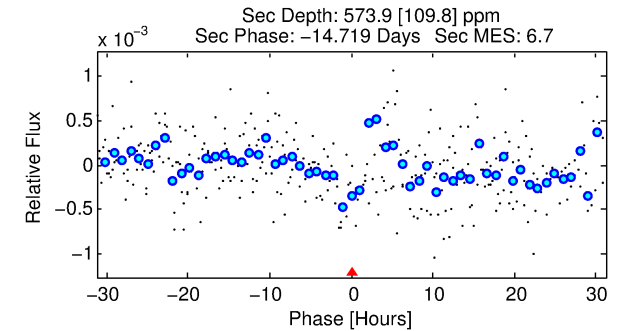
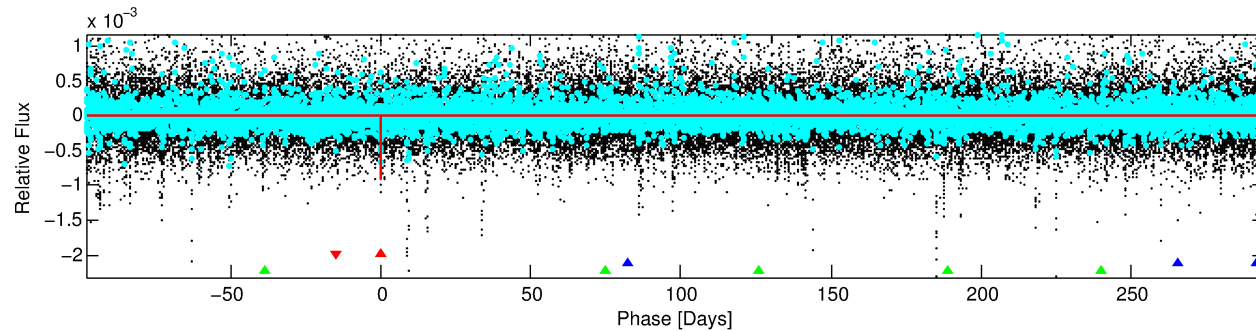
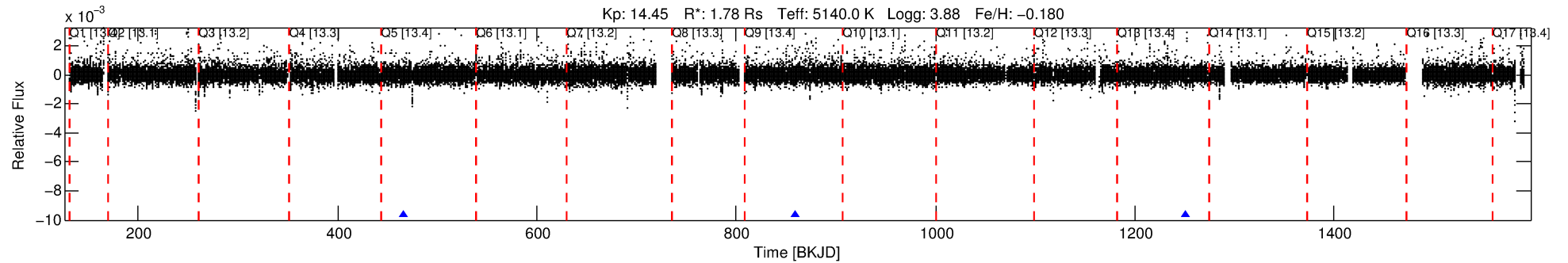
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009088058-01

No Significant Match Found

DV One-Page Summary

KIC: 9088058 Candidate: 1 of 3 Period: 392.823 d



DV Fit Results:

Period = 392.82253 [0.00763] d
Epoch = 465.8796 [0.0100] BKJD
Rp/R* = 0.0289 [0.0509]
a/R* = 460.10 [3003.07]
b = 0.65 [5.86]
Seff = 1.95 [2.33]
Teq = 301 [90] K
Rp = 5.62 [10.54] Re
a = 1.0076 [0.7048] AU
Ag = 10153.66 [37803.51] [0.27 σ]
Teffp = 4679 [4130] K [1.06 σ]

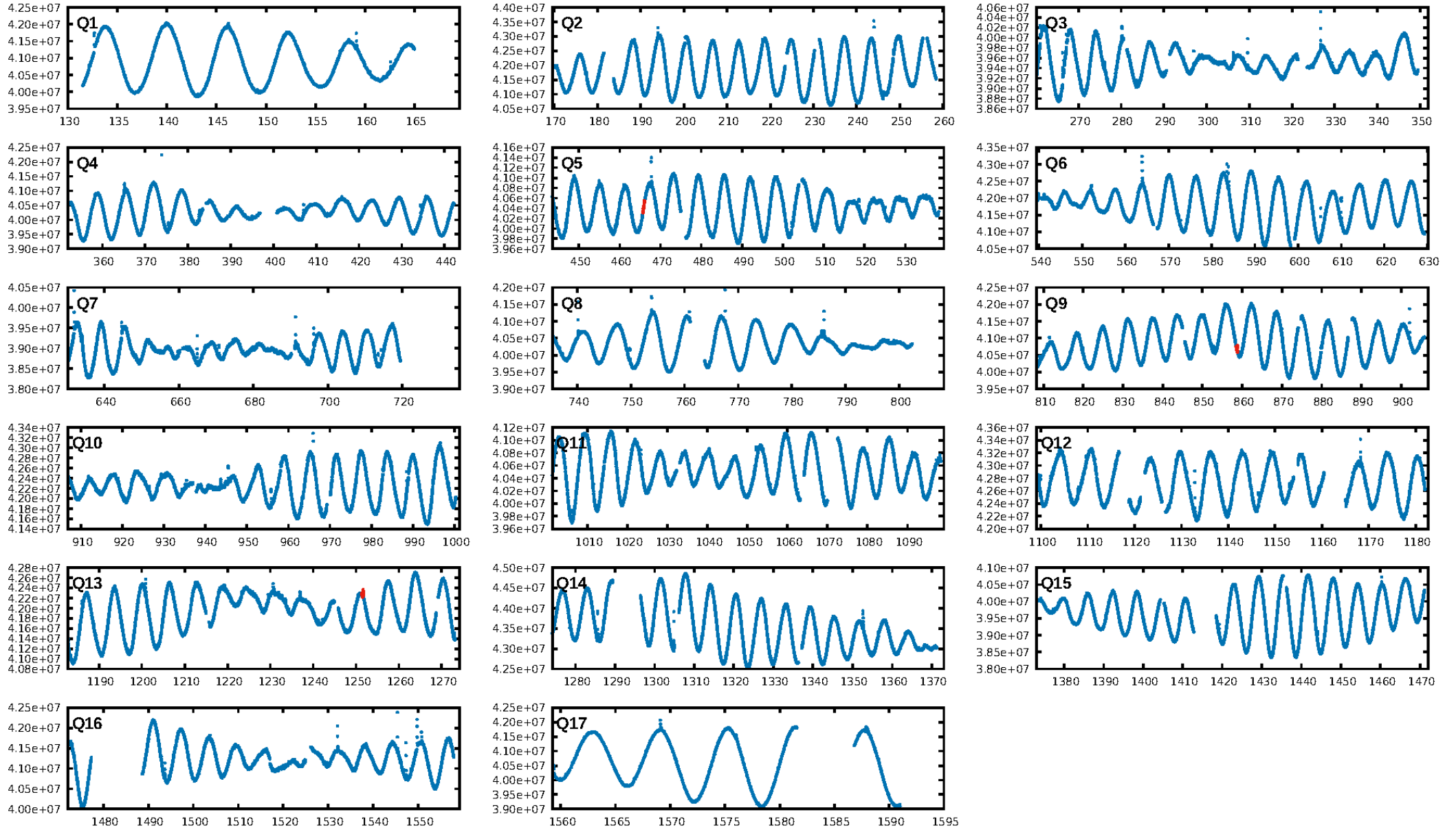
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [372.20 σ]
LongPeriod-sig: 100.0% [337.37 σ]
ModelChiSquare2-sig: 11.1%
ModelChiSquareGof-sig: 62.2%
Bootstrap-pfa: 3.15e-14
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.02638
Centroid-sig: 1.9%
Centroid-so: 1.868 arcsec [1.58 σ]
OotOffset-rm: 0.849 arcsec [0.62 σ]
KicOffset-rm: 1.056 arcsec [0.92 σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [3/3]

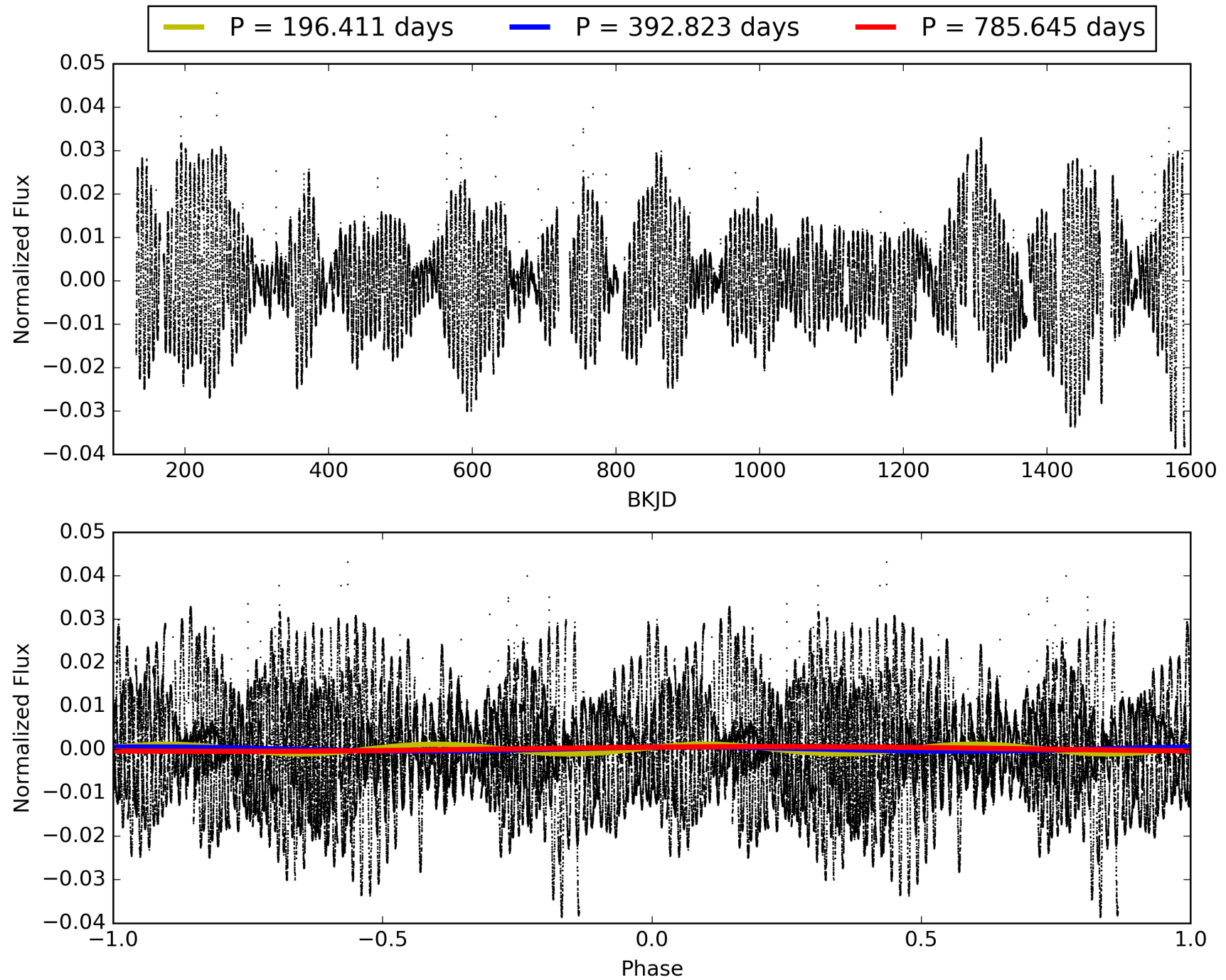
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:28:31 Z

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

TCE 009088058-01, PDC Light Curves

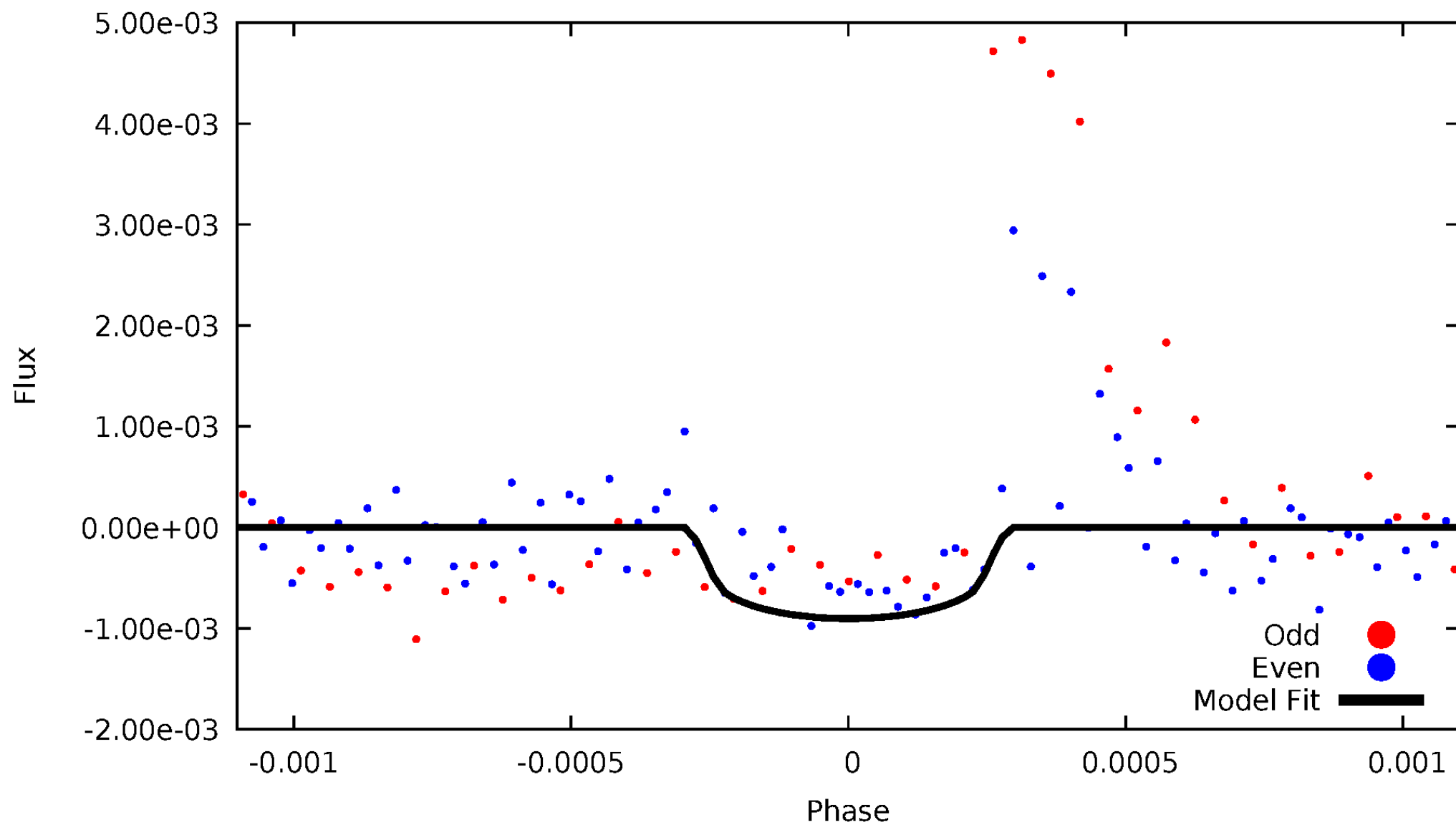


TCE 009088058-01



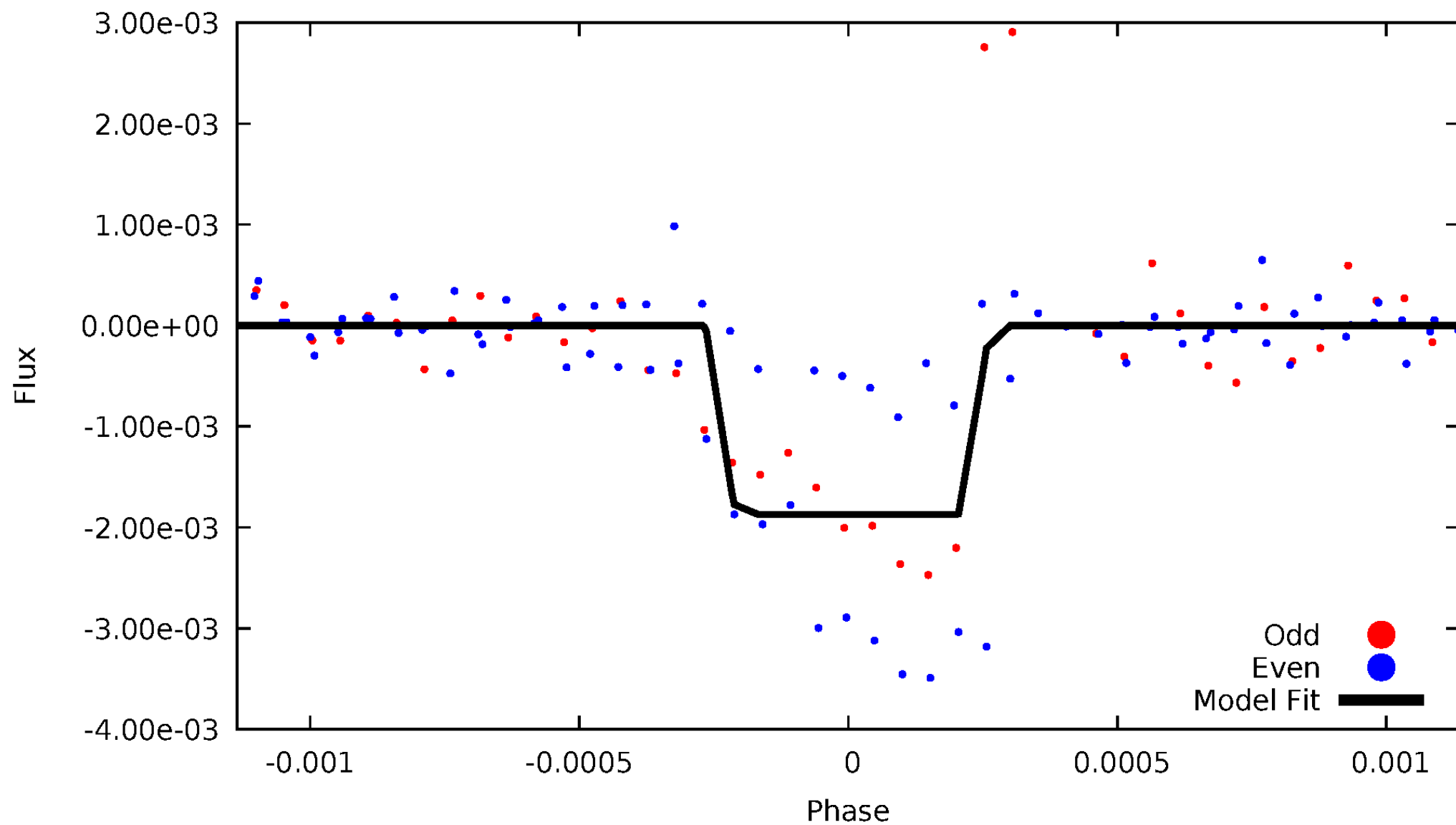
DV Odd/Even

TCE 009088058-01



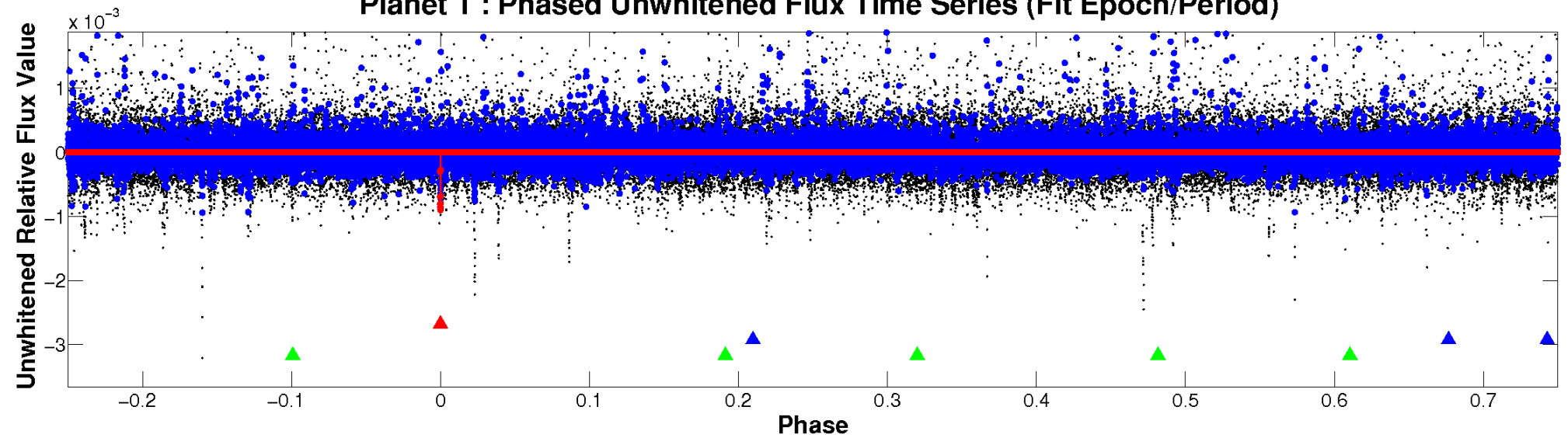
ALT Odd/Even

TCE 009088058-01

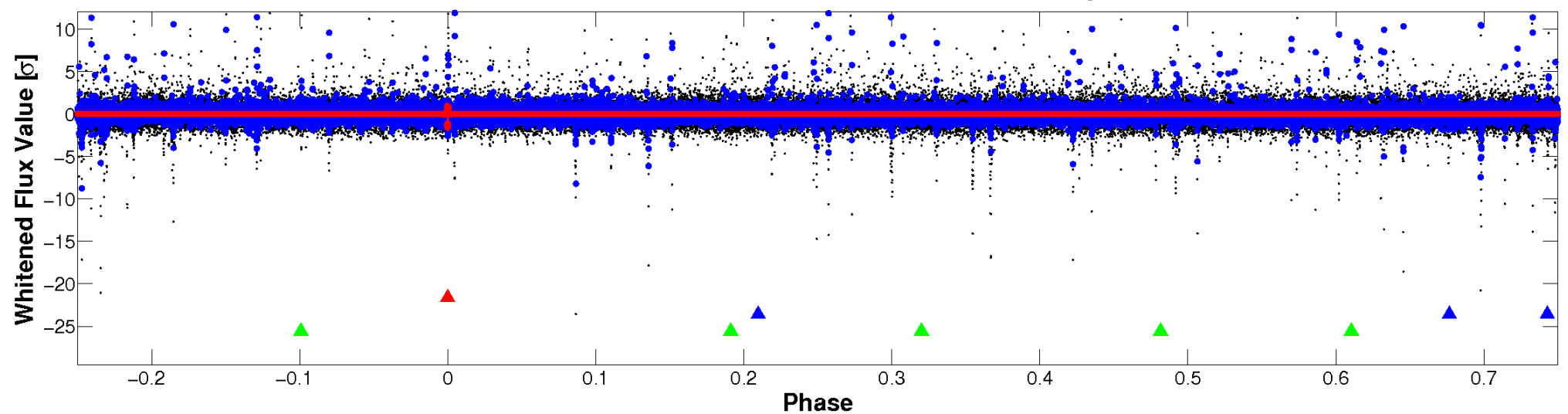


Non-Whitened Vs. Whitened Light Curve

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

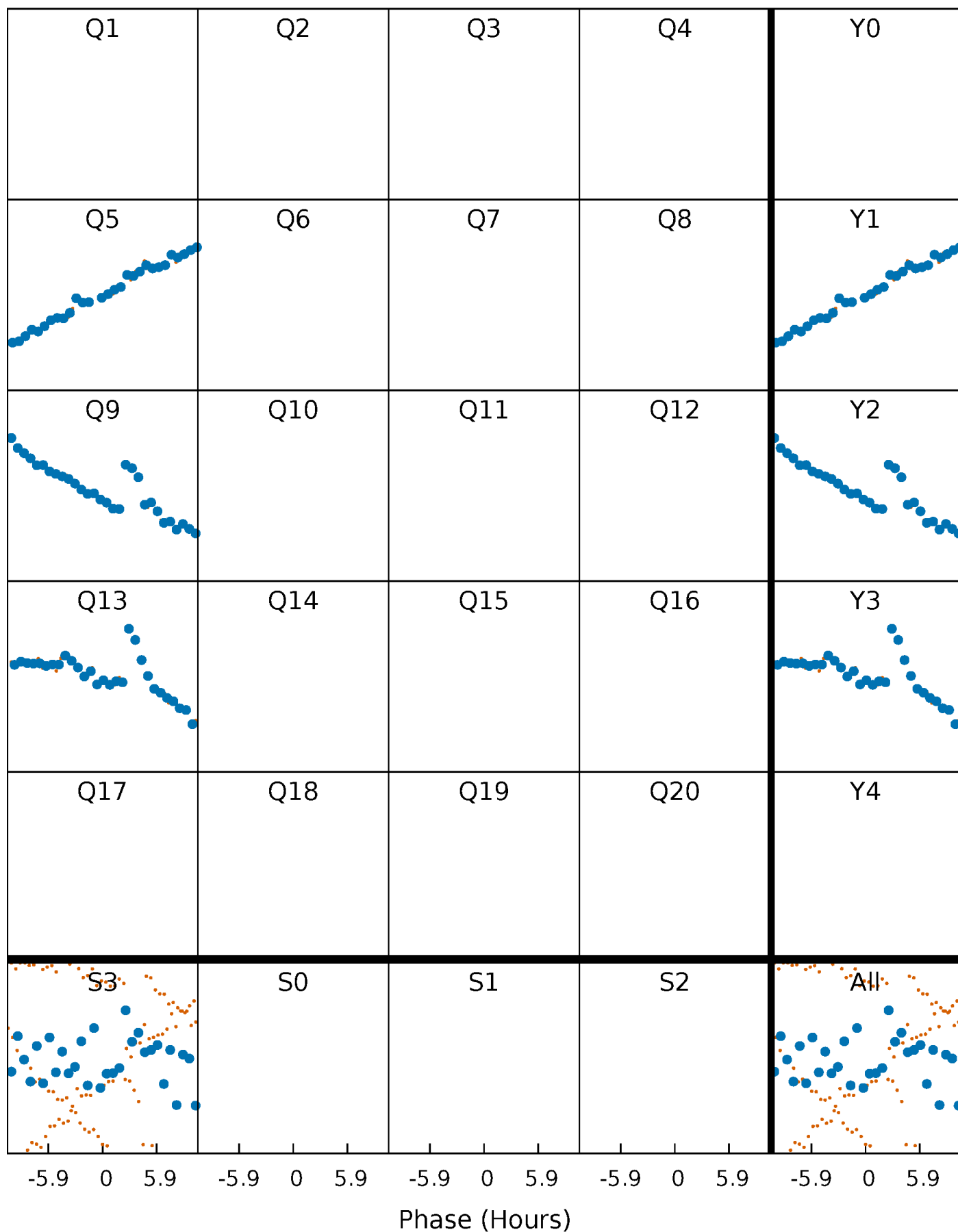


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



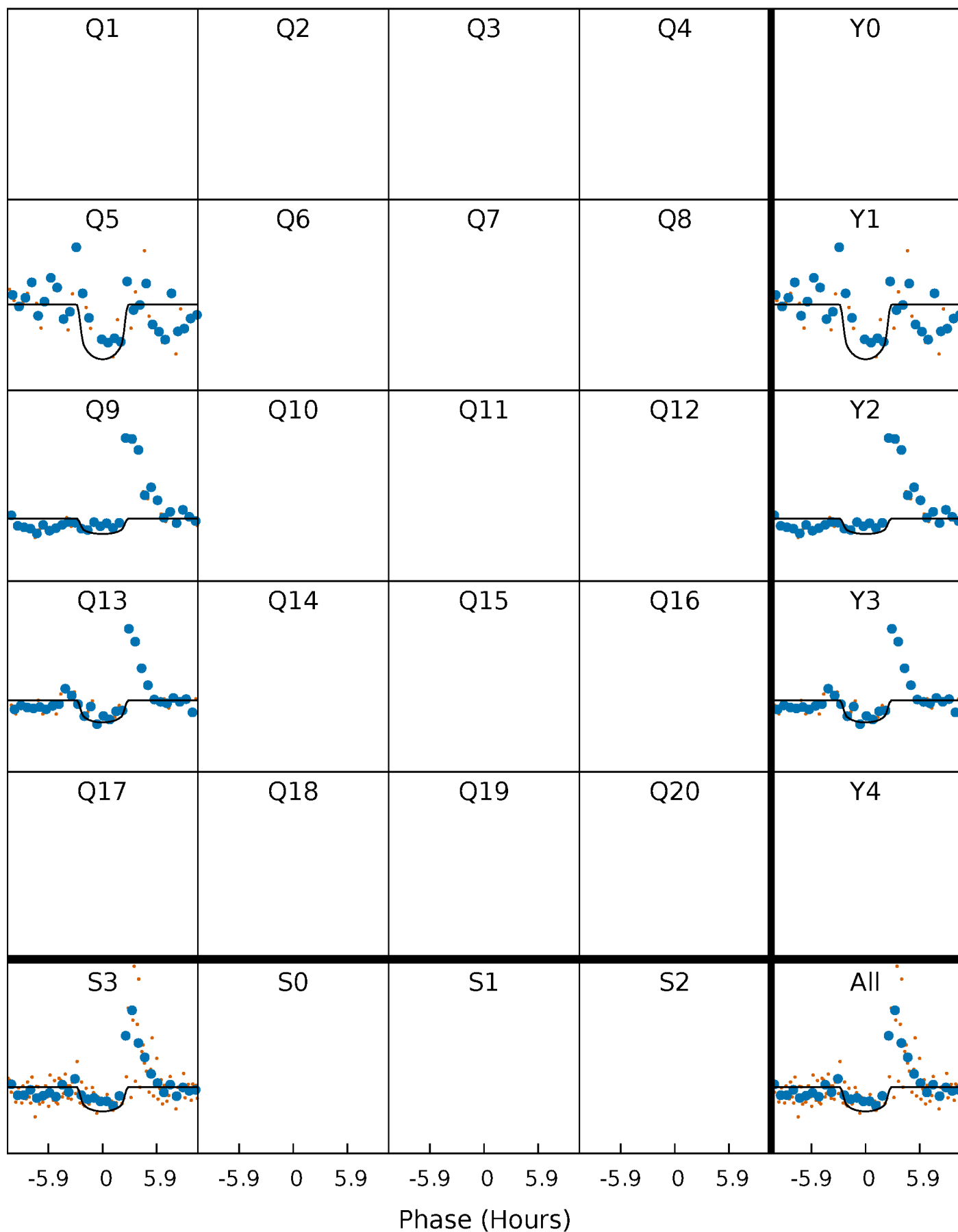
PDC Quarter-Phased Transit Curves

TCE 009088058-01 $P=392.822526$ Days $T_0=465.879559$ (BKJD)



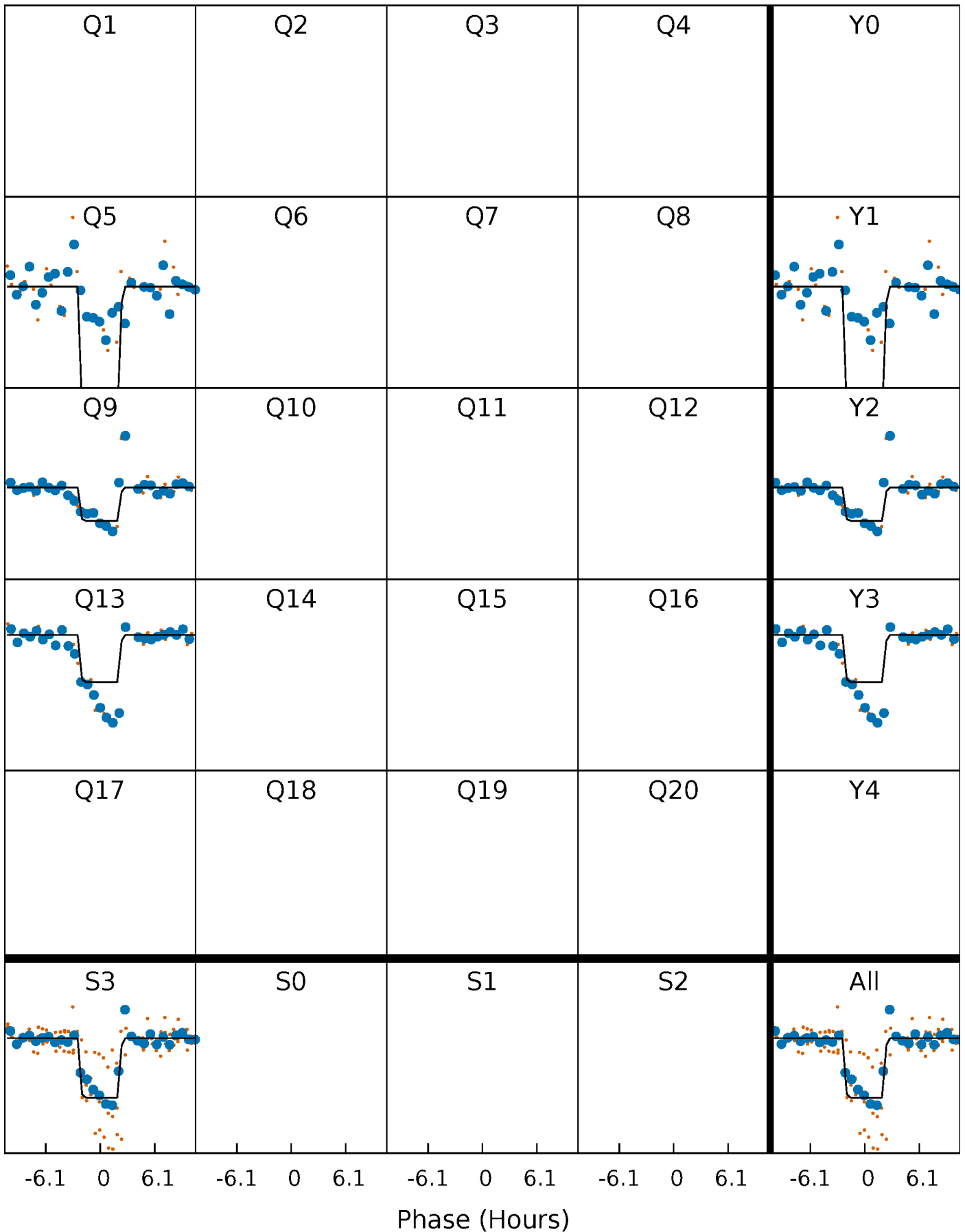
DV Quarter-Phased Transit Curves

TCE 009088058-01 $P=392.822526$ Days $T_0=465.879559$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

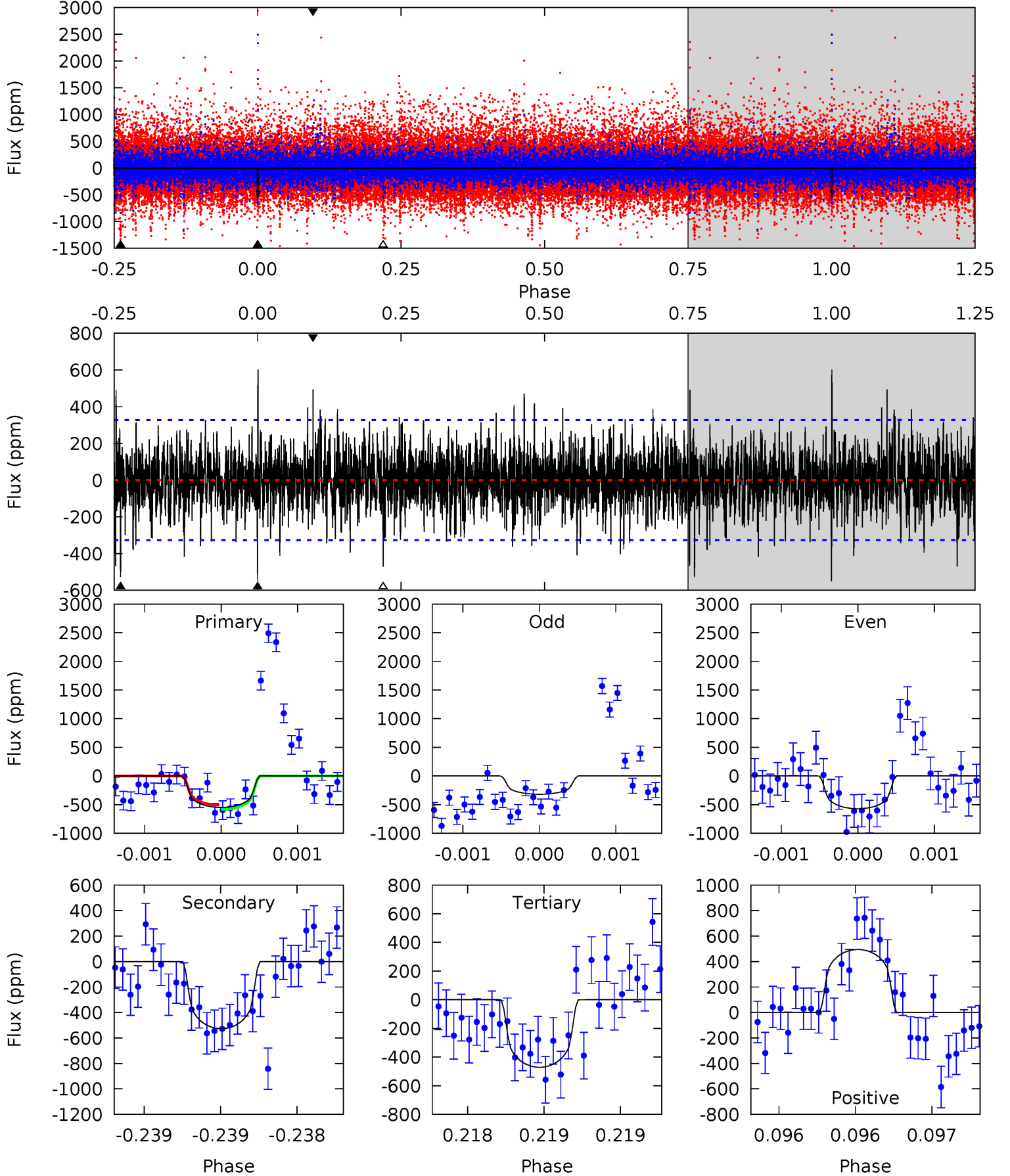
TCE 009088058-01 P=392.814757 Days $T_0=465.890732$ (BKJD)



DV Model-Shift Uniqueness Test

009088058-01, $P = 392.822526$ Days, $E = 73.057033$ Days

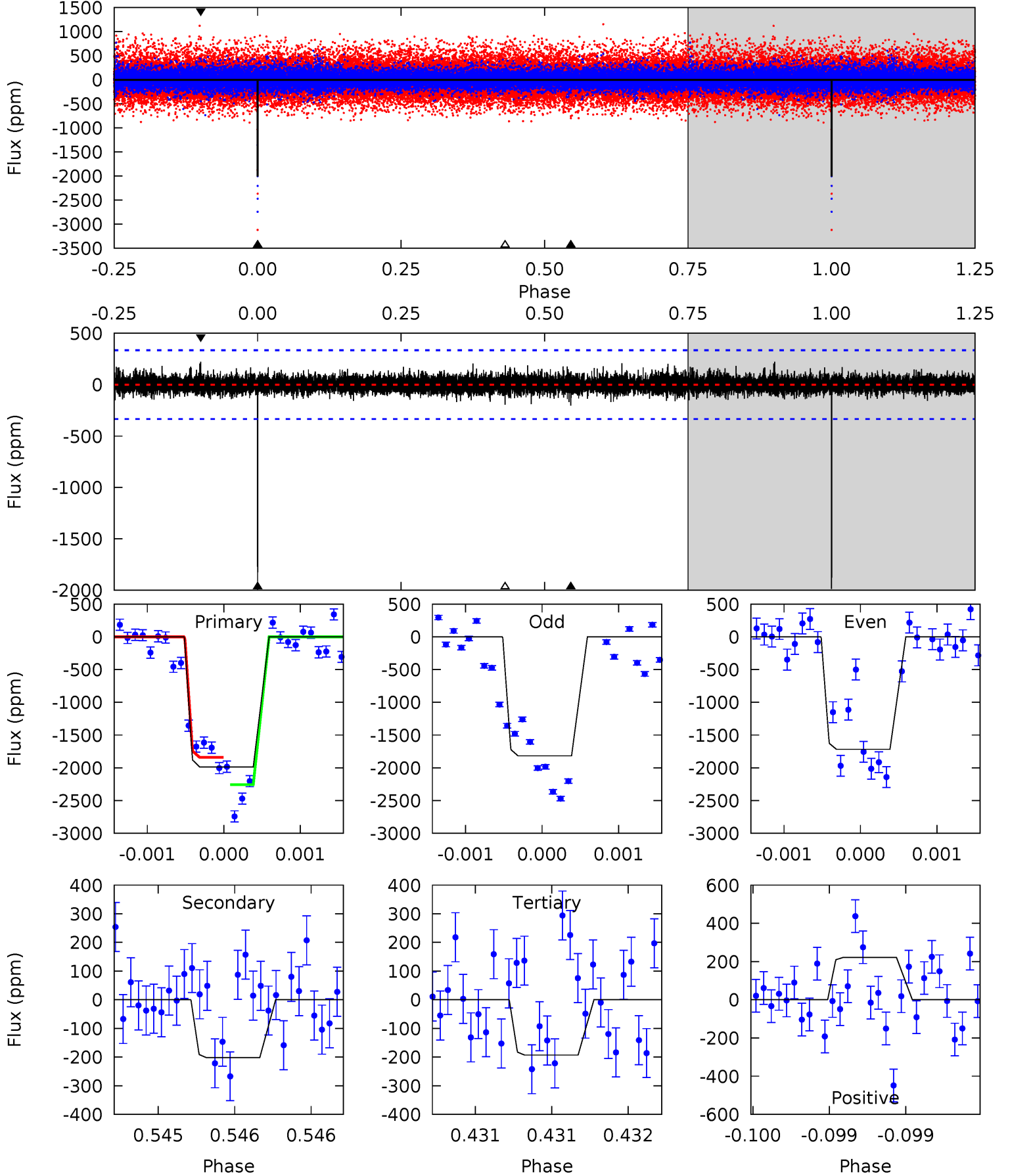
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.33	8.94	8.00	8.39	5.54	3.44	1.91	1.33	0.94	0.94	0.55	1.72	0.96	0.52	0.62



Alt Model-Shift Uniqueness Test

009088058-01, $P = 392.814757$ Days, $E = 73.075975$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.0	3.36	3.21	3.68	5.57	3.47	0.72	29.8	29.4	0.15	-0.32	1.13	0.94	0.10	3.21



Stellar Parameters For KIC 009088058

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5140^{+153}_{-153}	$3.883^{+0.721}_{-0.309}$	$-0.180^{+0.300}_{-0.300}$	$1.781^{+0.935}_{-1.143}$	$0.883^{+0.147}_{-0.161}$	$0.220^{+2.932}_{-0.154}$
	+3%/-3%	+19%/-8%	+167%/-167%	+52%/-64%	+17%/-18%	+1330%/-70%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009088058-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-527 ± 59	$8.30^{+9.32}_{-5.74}$	416^{+64}_{-69}	3917^{+2297}_{-780}	4203^{+41353}_{-3292}
Alt.	-202 ± 60	$10.42^{+9.55}_{-6.80}$	416^{+57}_{-66}	3165^{+1278}_{-528}	1027^{+7640}_{-756}

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

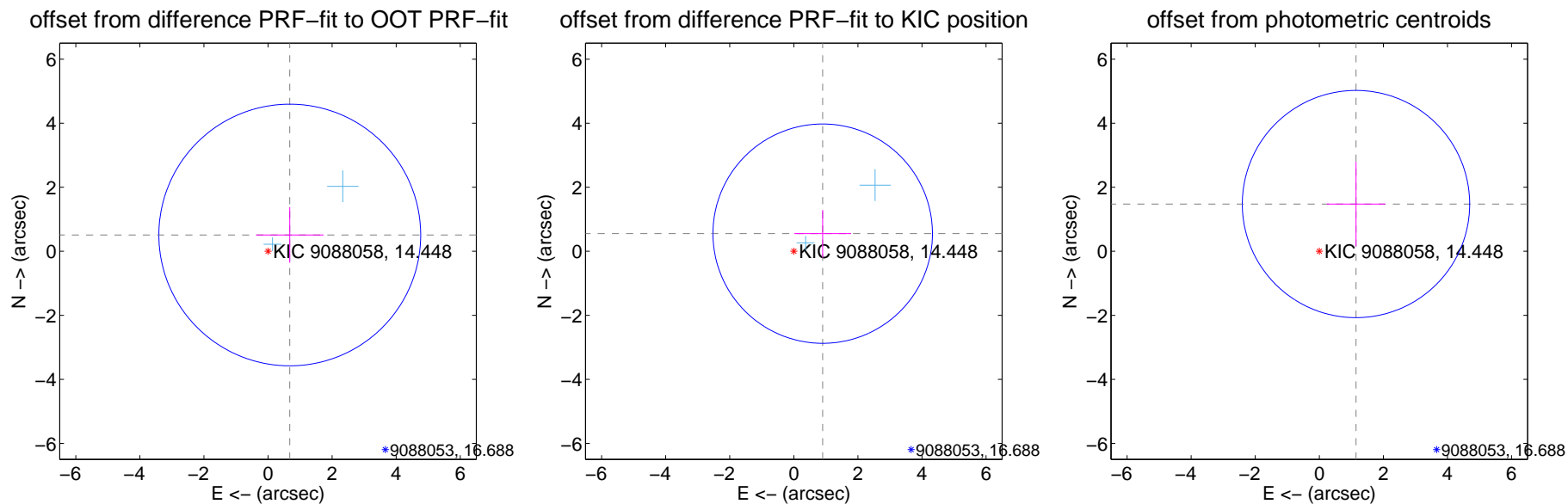
DV Centroid Data

Supplemental centroid analysis for 009088058-01. Kepler magnitude: 14.45. Transit SNR 7.90

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.849 ± 1.362	0.62	-0.679 ± 1.053	0.509 ± 0.869
PRF-fit source offset from KIC position	1.056 ± 1.142	0.92	-0.901 ± 0.888	0.551 ± 0.740
photometric centroid source offset	1.87 ± 1.18	1.58	-1.14 ± 0.91	1.48 ± 1.32

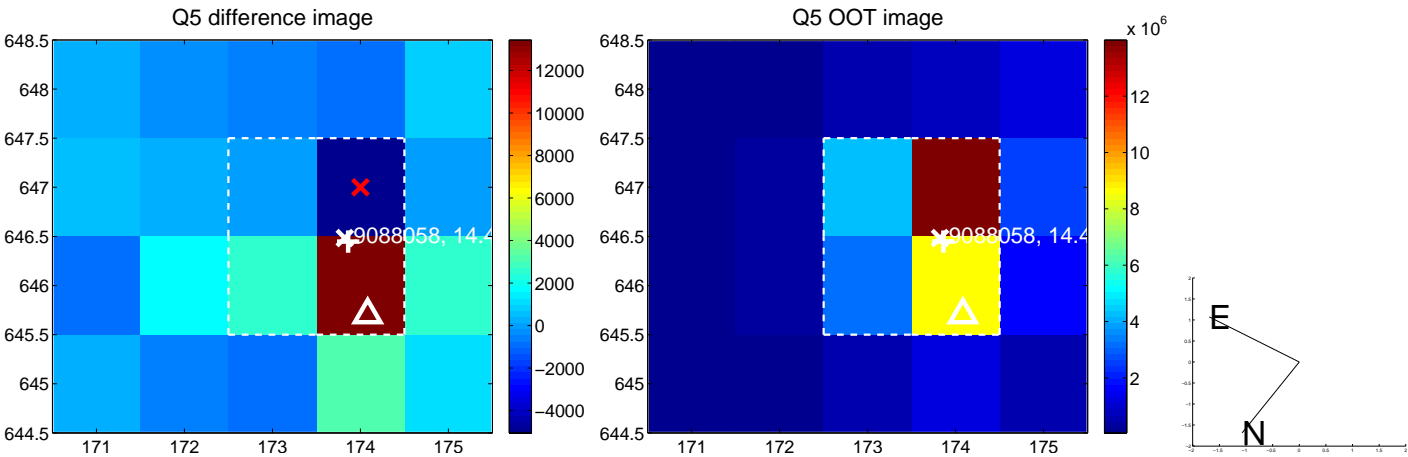


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

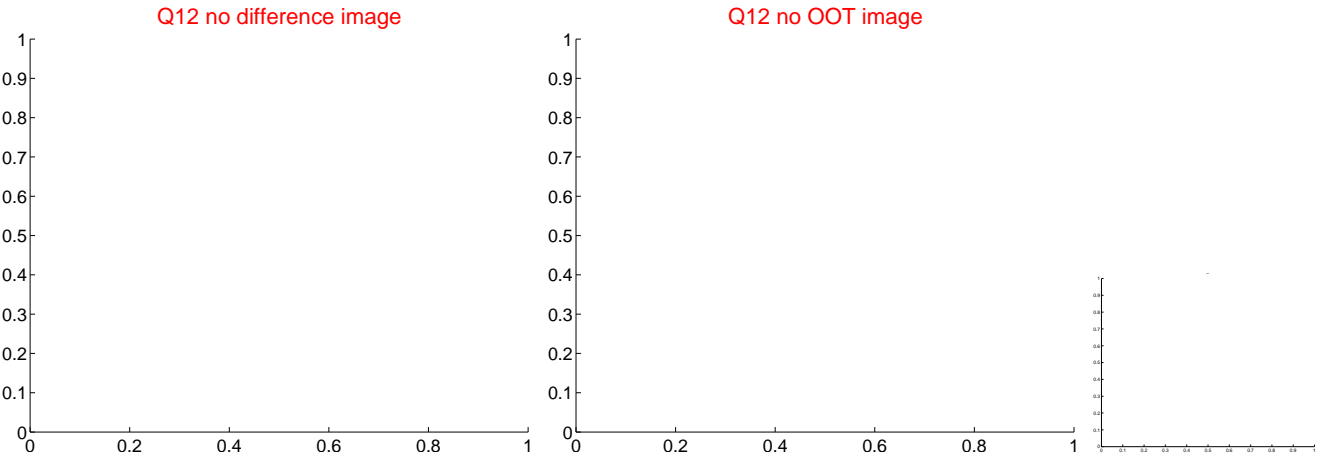
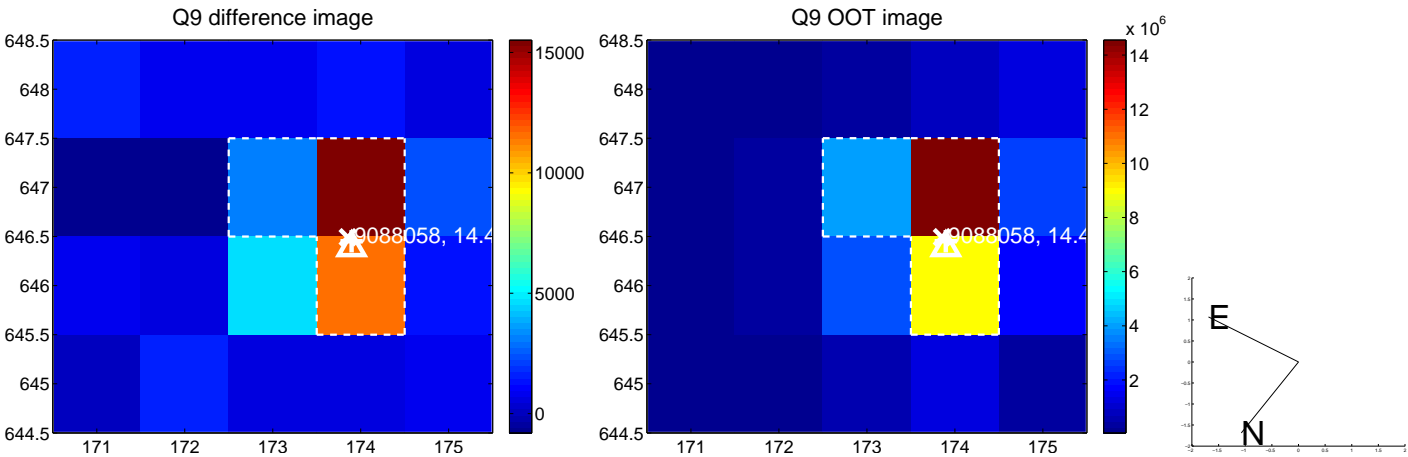
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



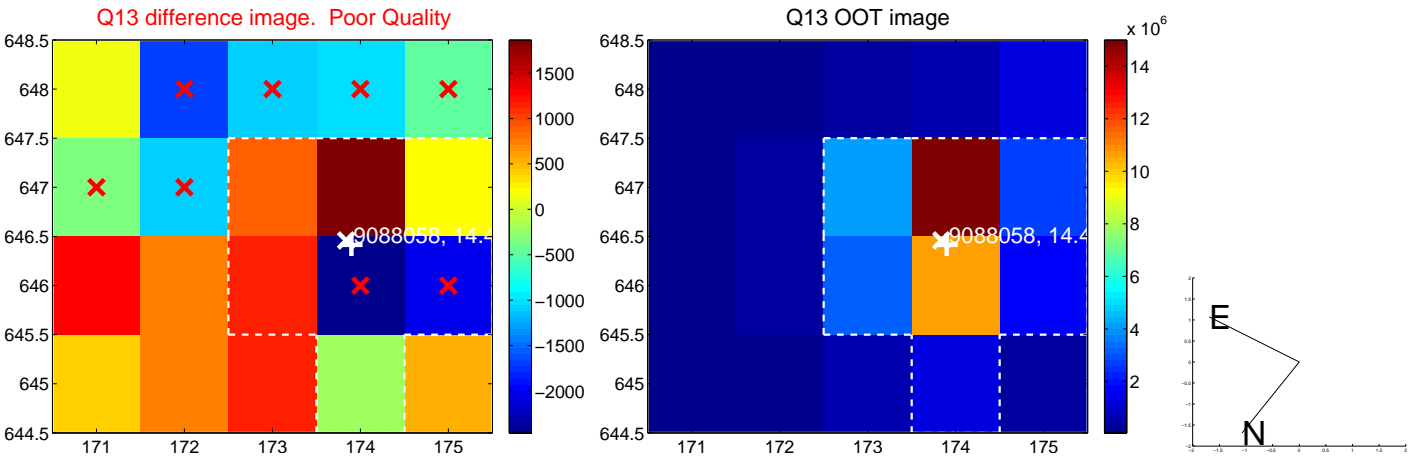
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



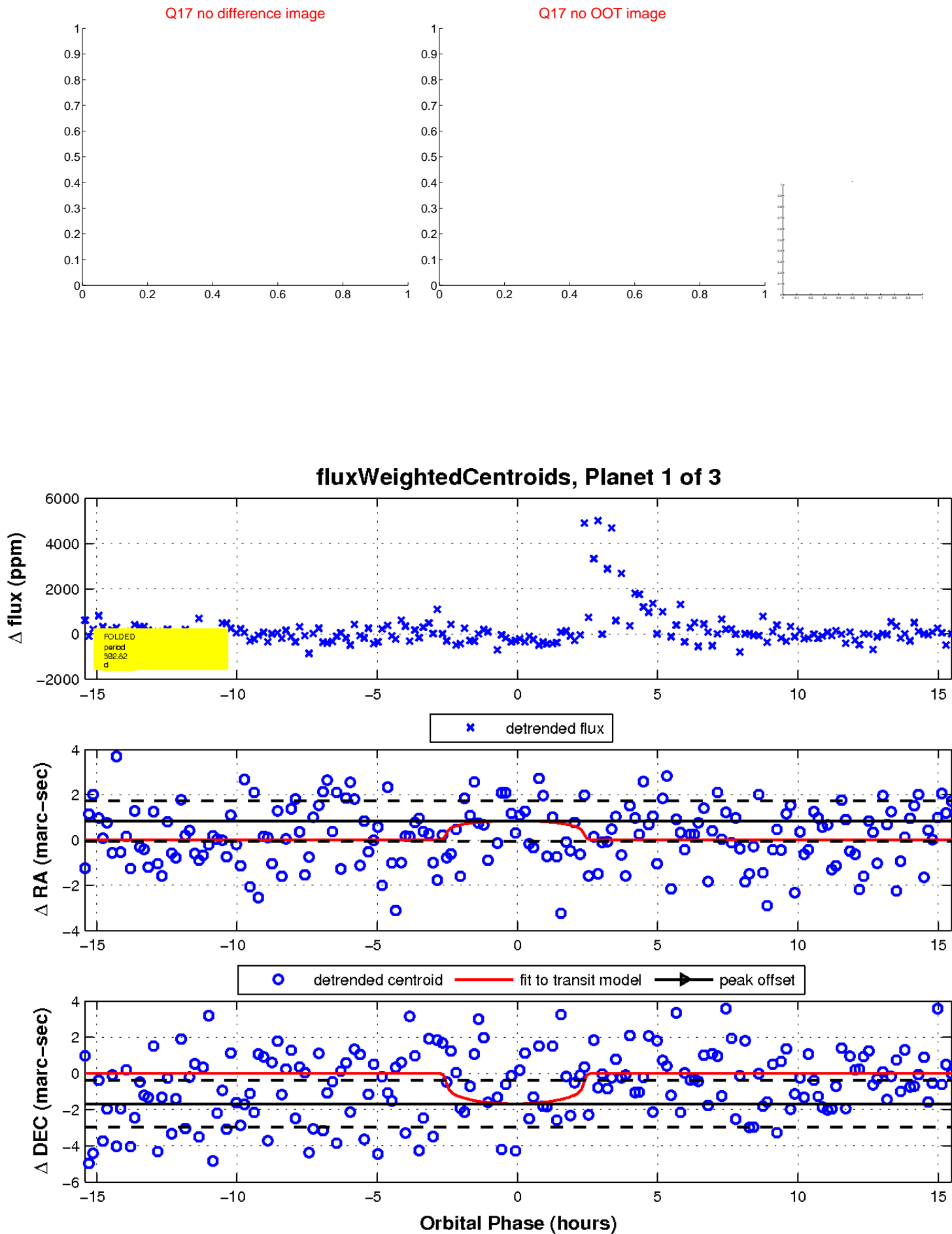
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



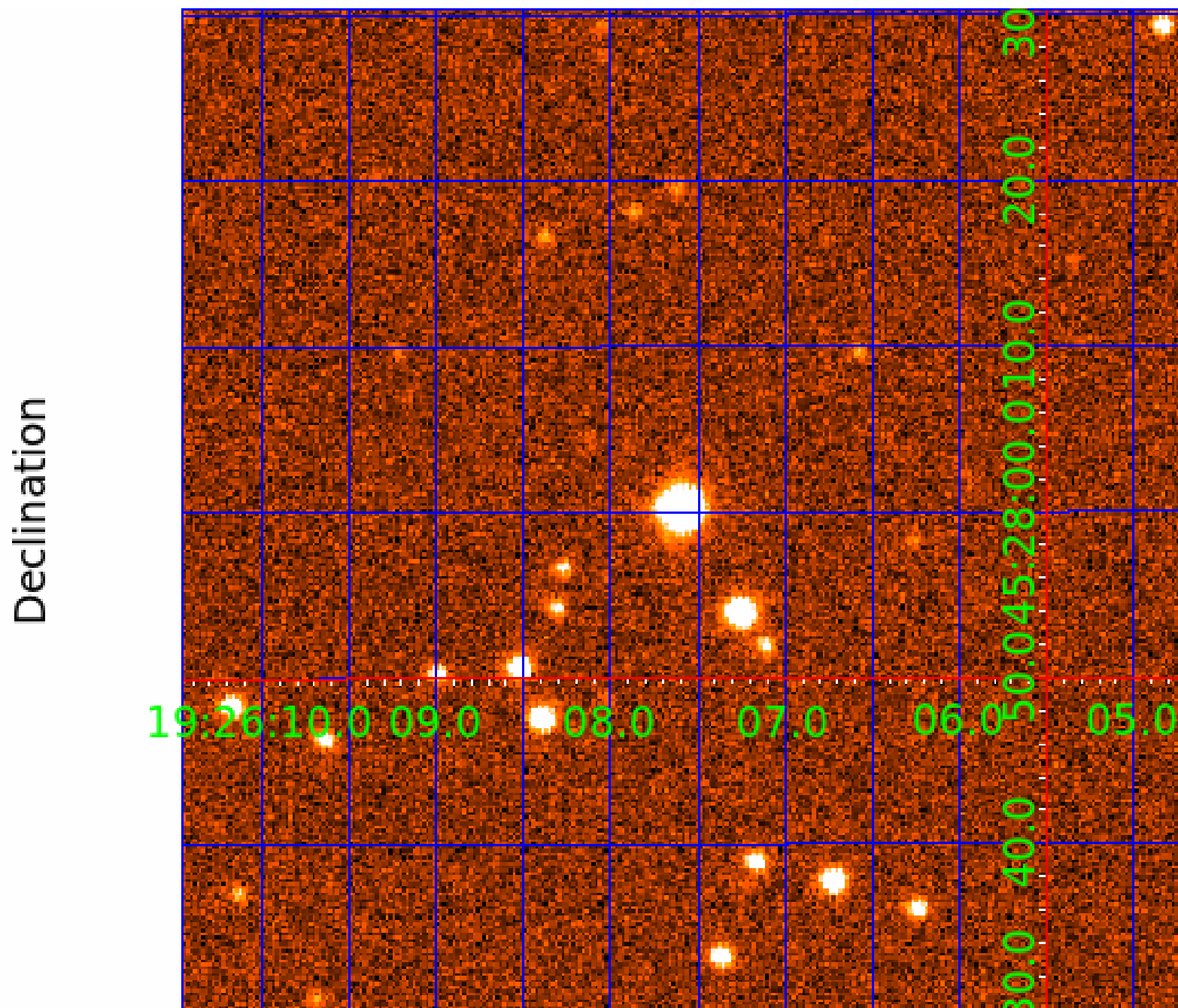
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



UKIRT Image



KIC 009088058

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})
009088058-01	OBS	No	392.822526	465.879559	903.6	5.194	13.8	7.9	1.78	5140	5.62	1.95
009088058-02	OBS	No	576.225991	364.876455	976.3	11.969	12.9	7.0	1.78	5140	5.80	1.17
009088058-03	OBS	No	278.750613	262.255629	619.0	5.208	10.9	6.5	1.78	5140	4.81	3.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009088058-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009088058-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009088058-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—CENT_FEW_DIFFS

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

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

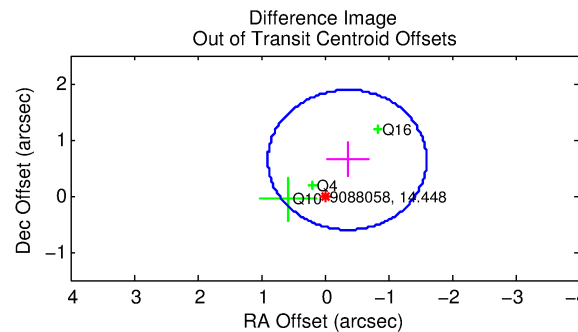
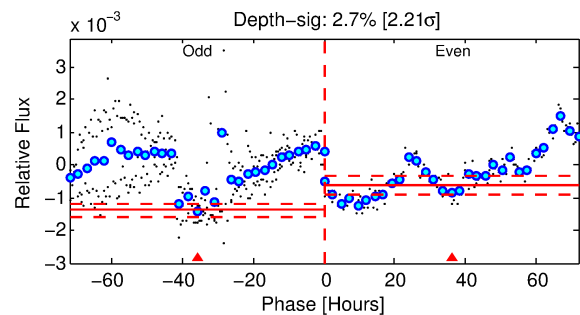
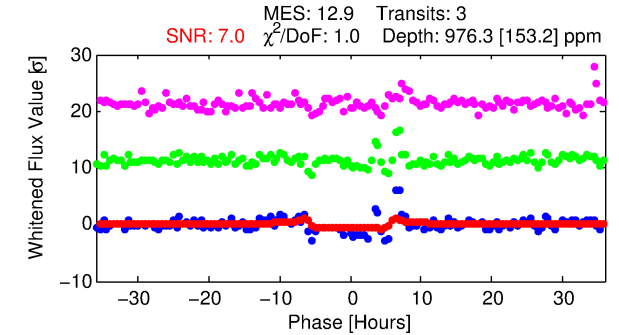
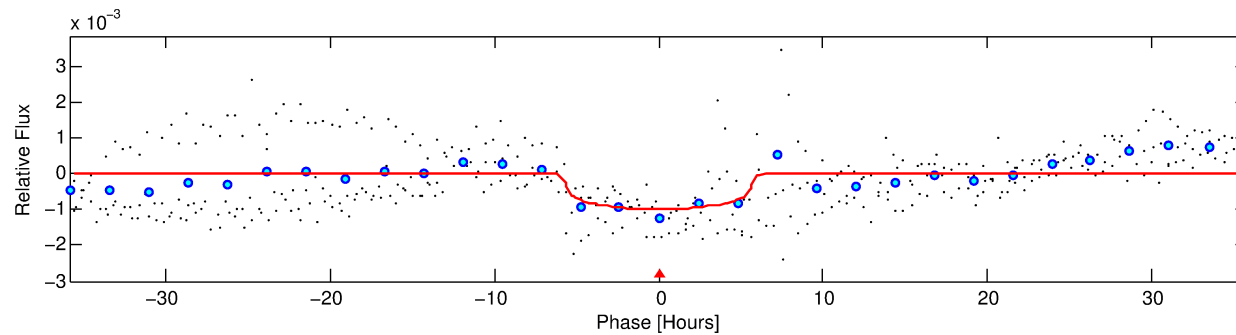
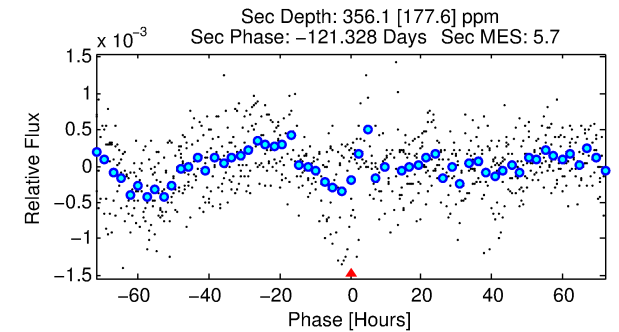
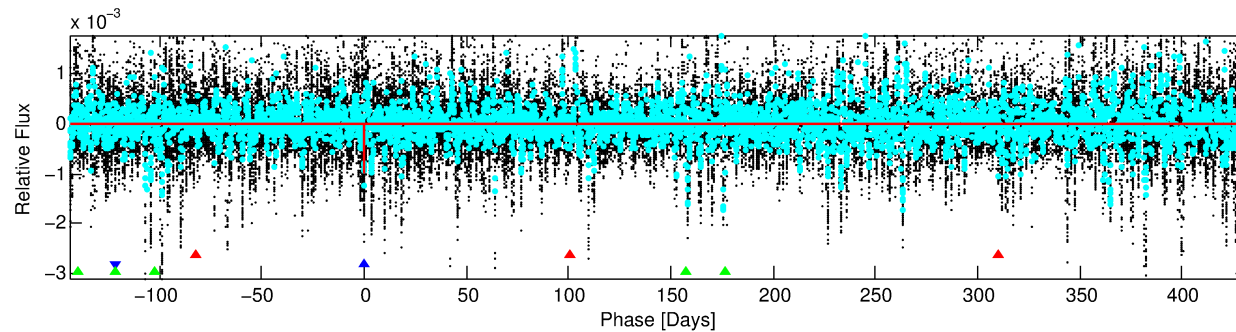
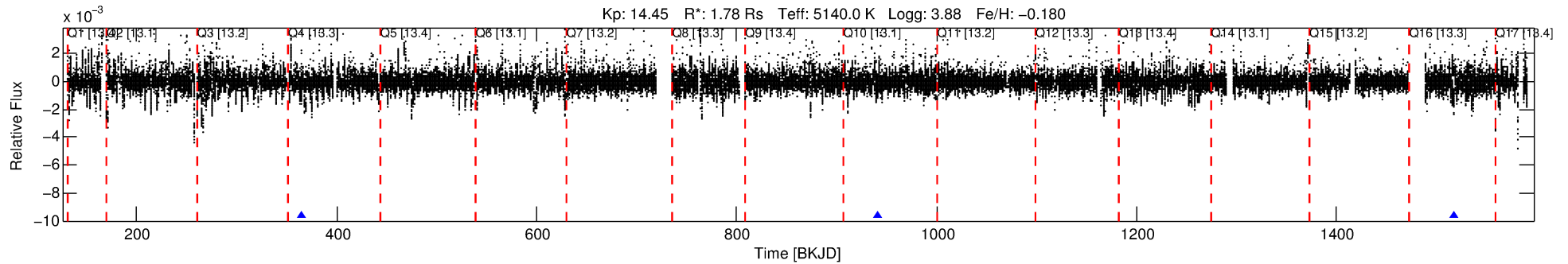
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009088058-02

No Significant Match Found

DV One-Page Summary

KIC: 9088058 Candidate: 2 of 3 Period: 576.226 d



DV Fit Results:

Period = 576.22599 [0.00753] d
Epoch = 364.8765 [0.0102] BKJD
Rp/R* = 0.0298 [0.0111]
a/R* = 300.19 [396.20]
b = 0.63 [1.28]
Seff = 1.17 [1.40]
Teq = 265 [79] K
Rp = 5.80 [4.30] Re
a = 1.3008 [0.9099] AU
Ag = 9857.70 [14666.91] [0.67 σ]
Teffp = 4088 [925] K [4.12 σ]

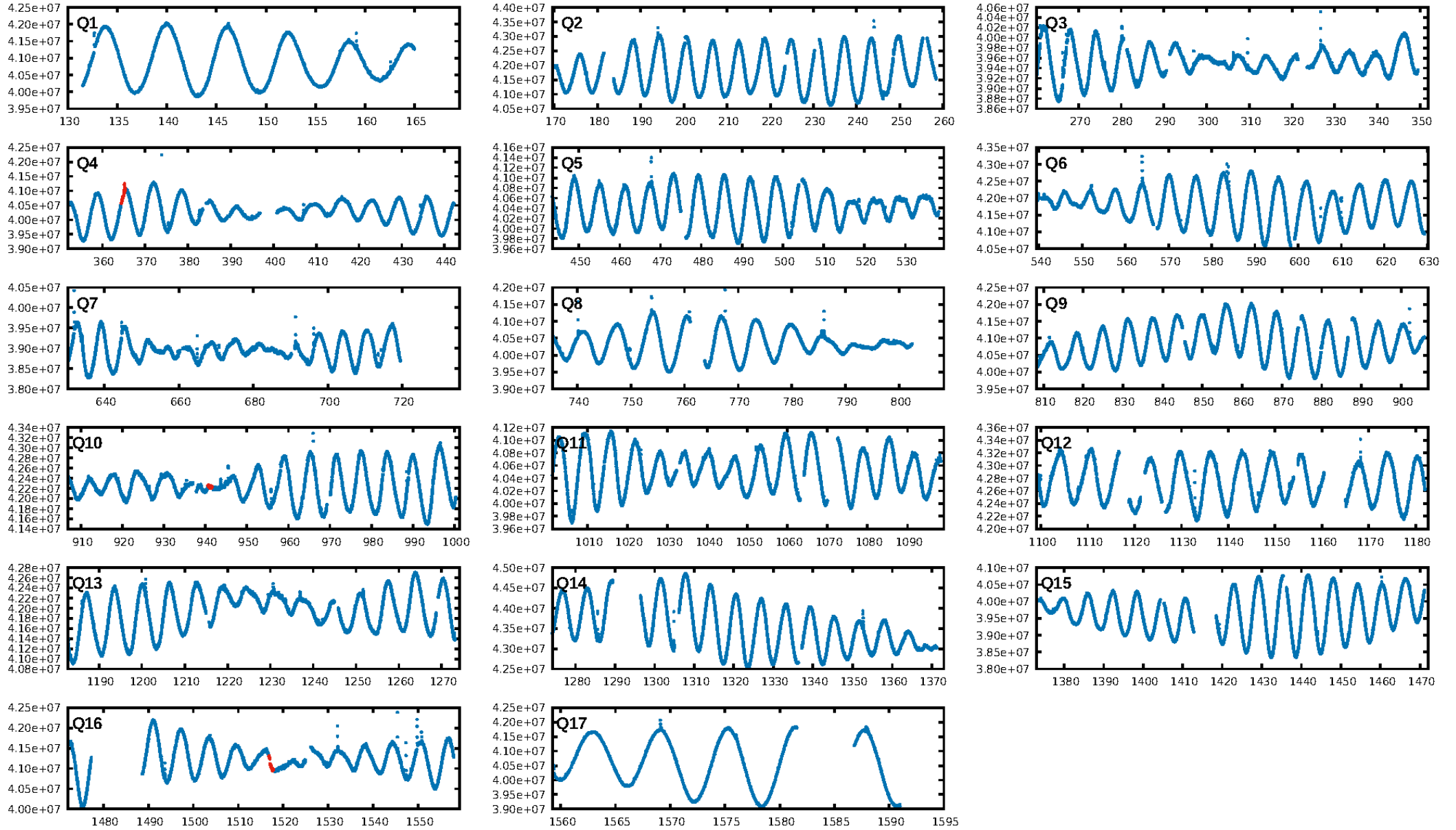
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [337.37 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.6%
ModelChiSquareGof-sig: 96.4%
Bootstrap-pfa: 1.49e-11
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.3482
Centroid-sig: 2.2%
Centroid-so: 1.616 arcsec [1.33 σ]
OotOffset-rm: 0.730 arcsec [1.76 σ]
OotOffset-st: 1/0/2/0 [3]
KicOffset-rm: 0.891 arcsec [1.93 σ]
KicOffset-st: 1/0/2/0 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 1.00 [3/3]

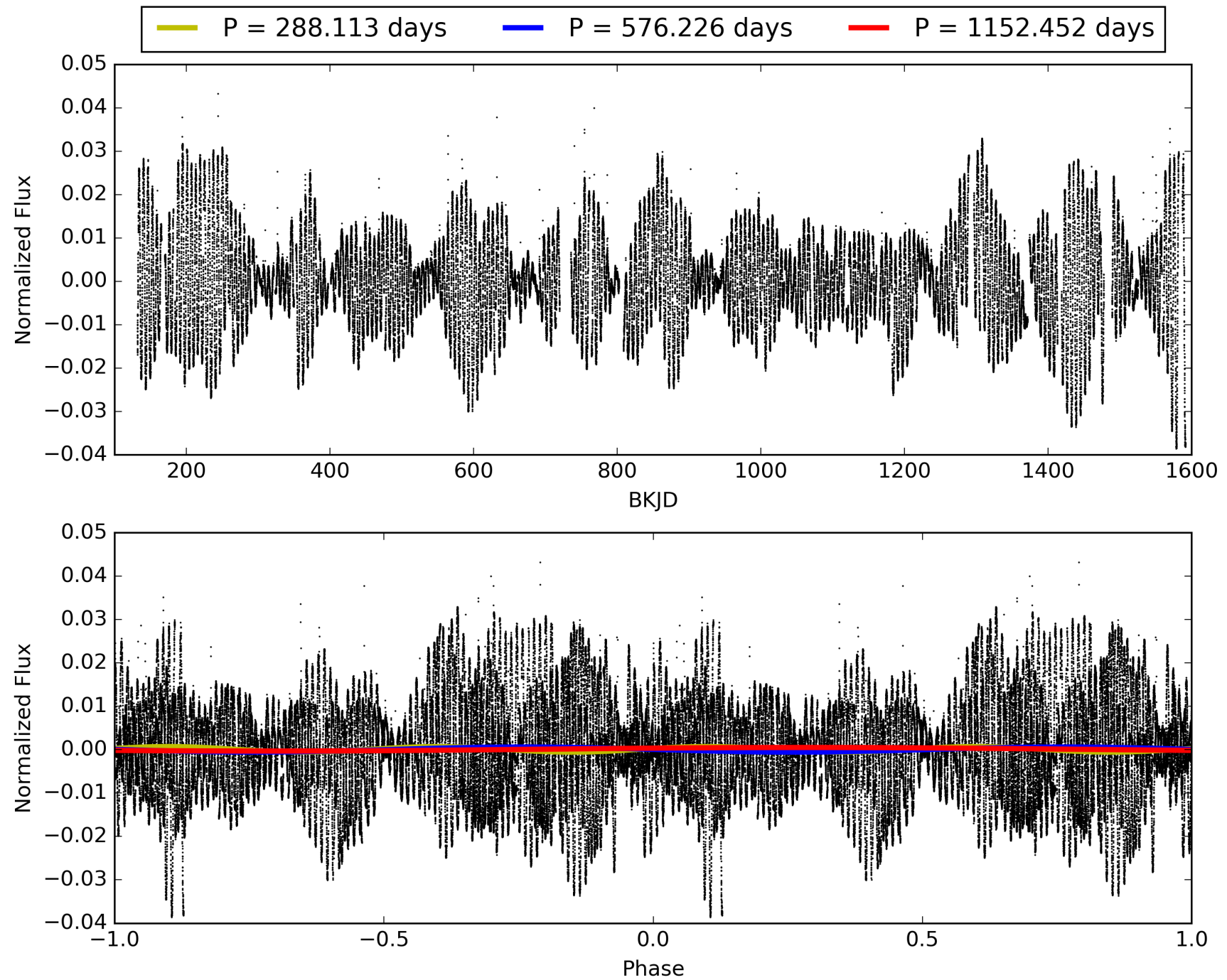
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 03:28:42 Z

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

TCE 009088058-02, PDC Light Curves

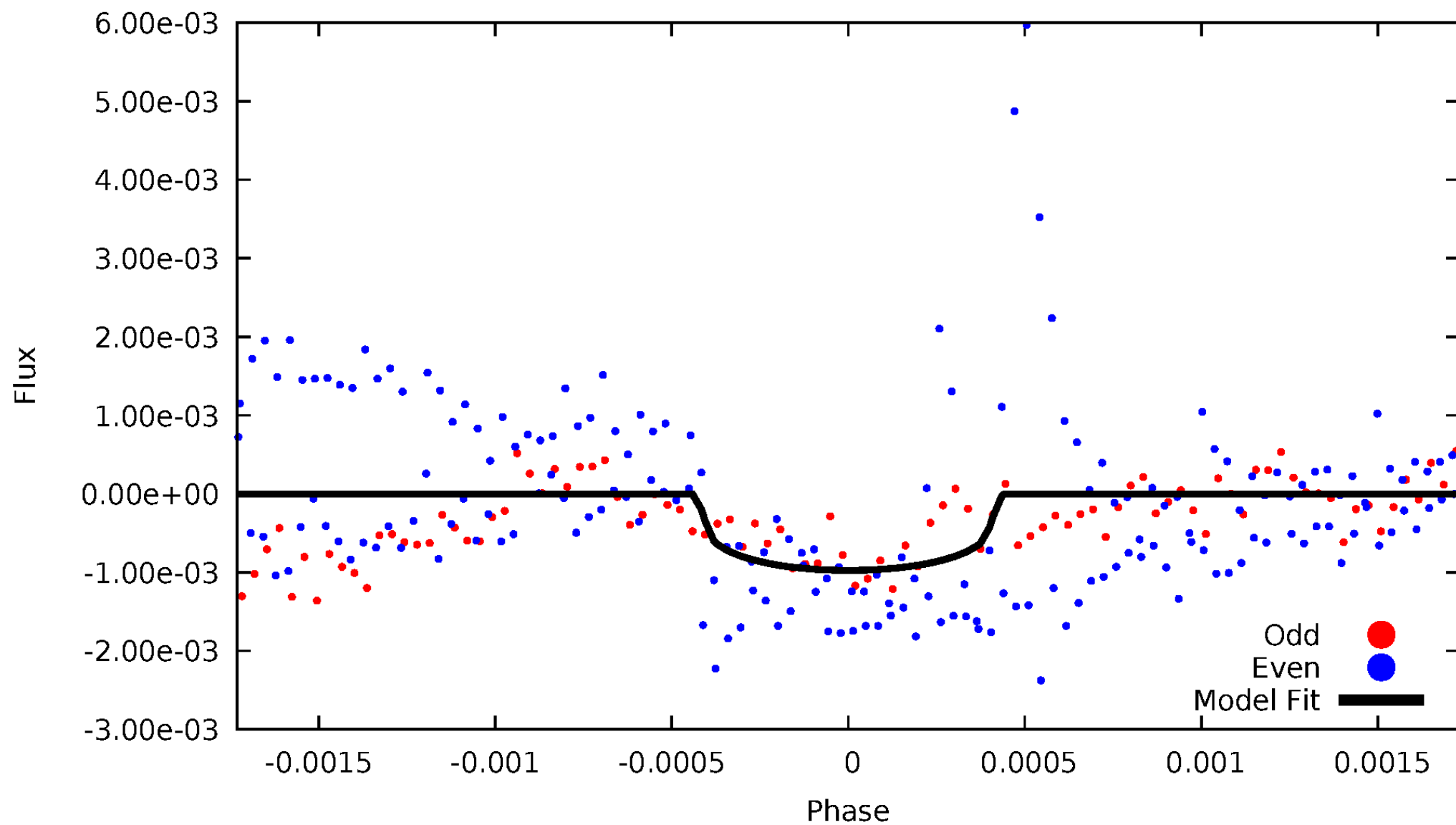


TCE 009088058-02



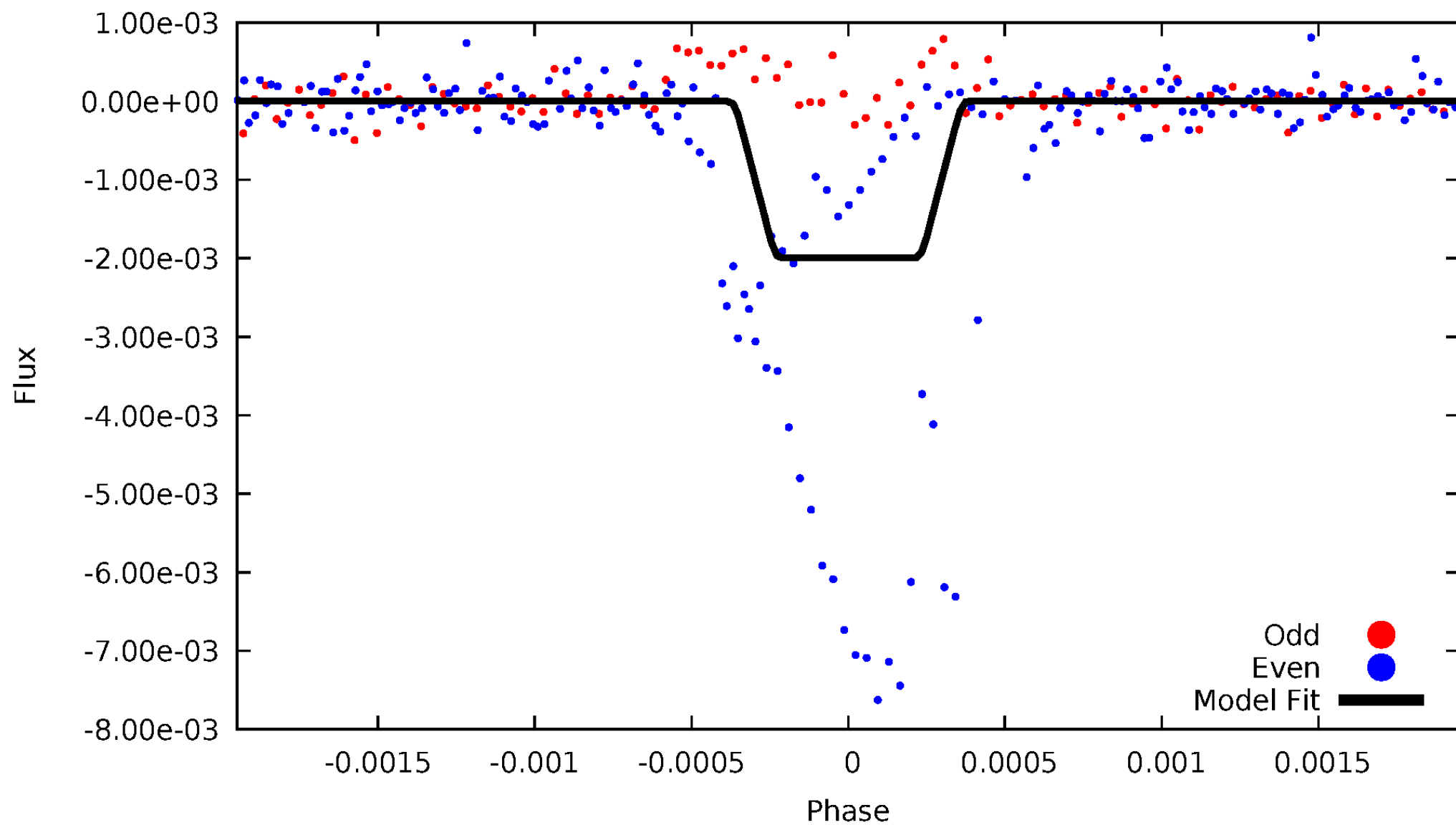
DV Odd/Even

TCE 009088058-02



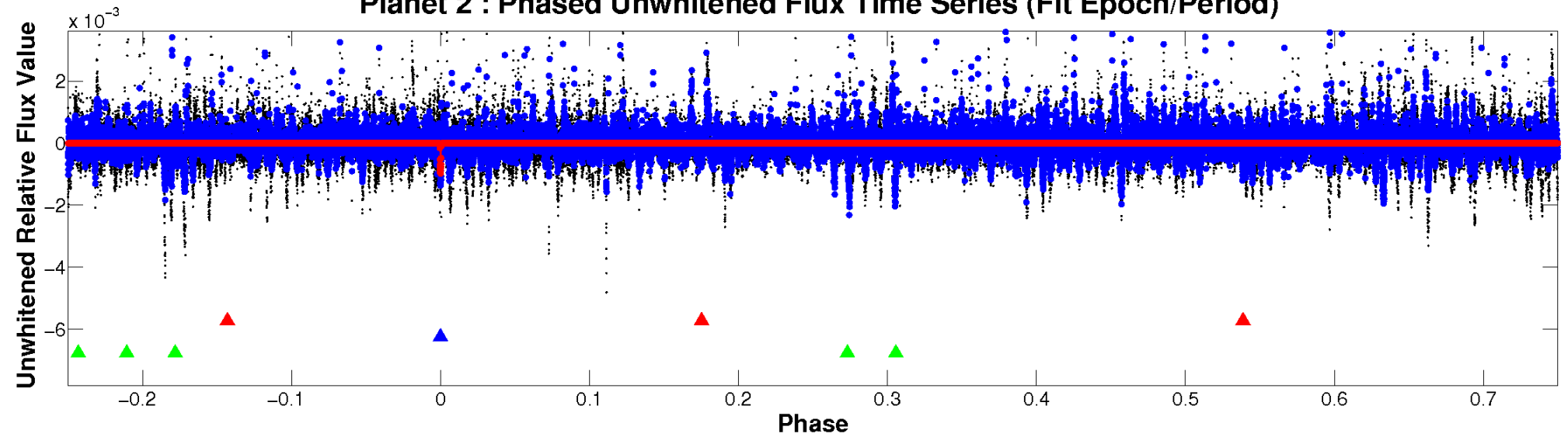
ALT Odd/Even

TCE 009088058-02

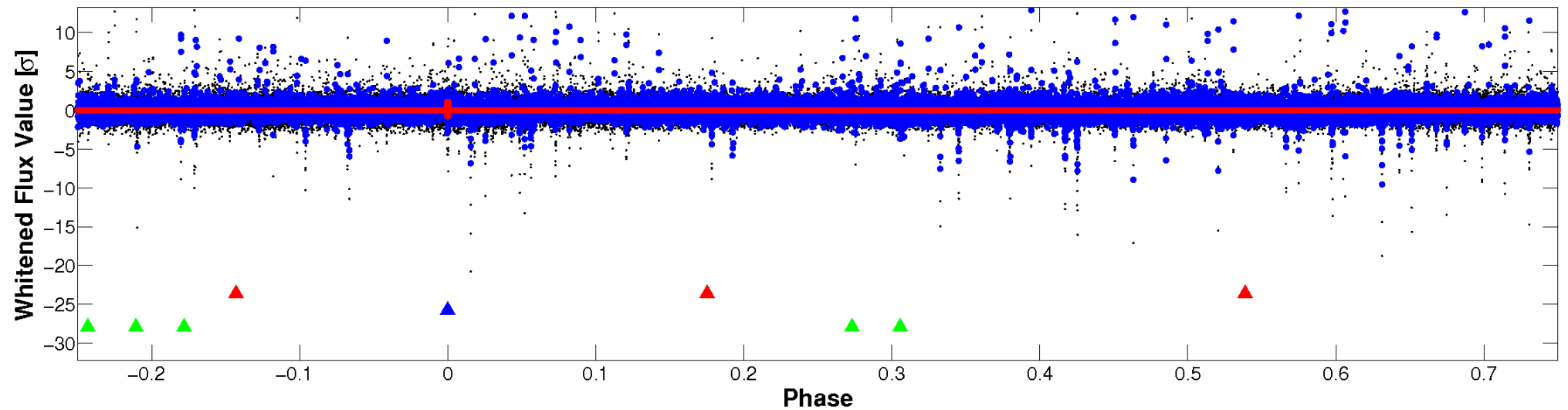


Non-Whitened Vs. Whitened Light Curve

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

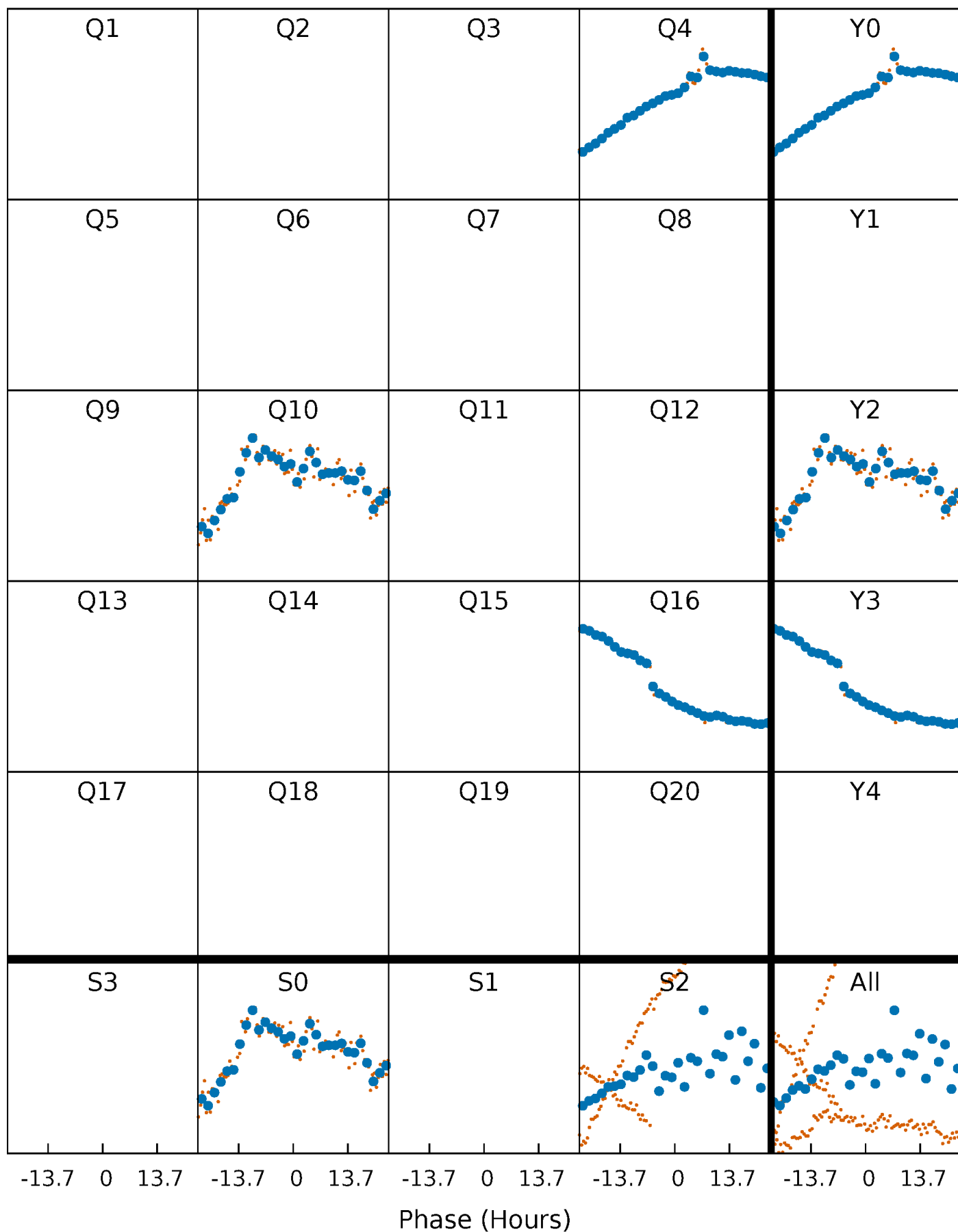


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



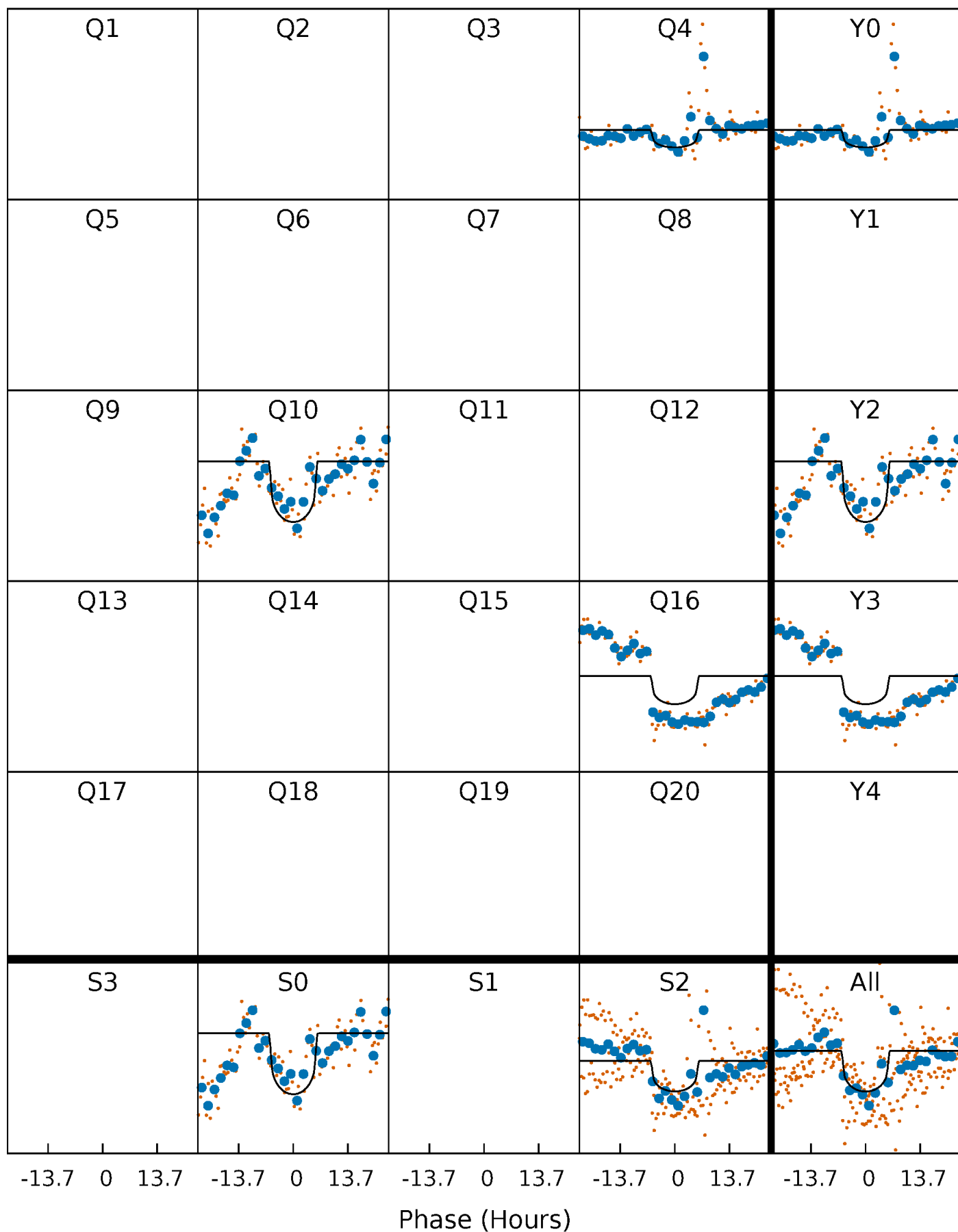
PDC Quarter-Phased Transit Curves

TCE 009088058-02 P=576.225991 Days $T_0=364.876455$ (BKJD)



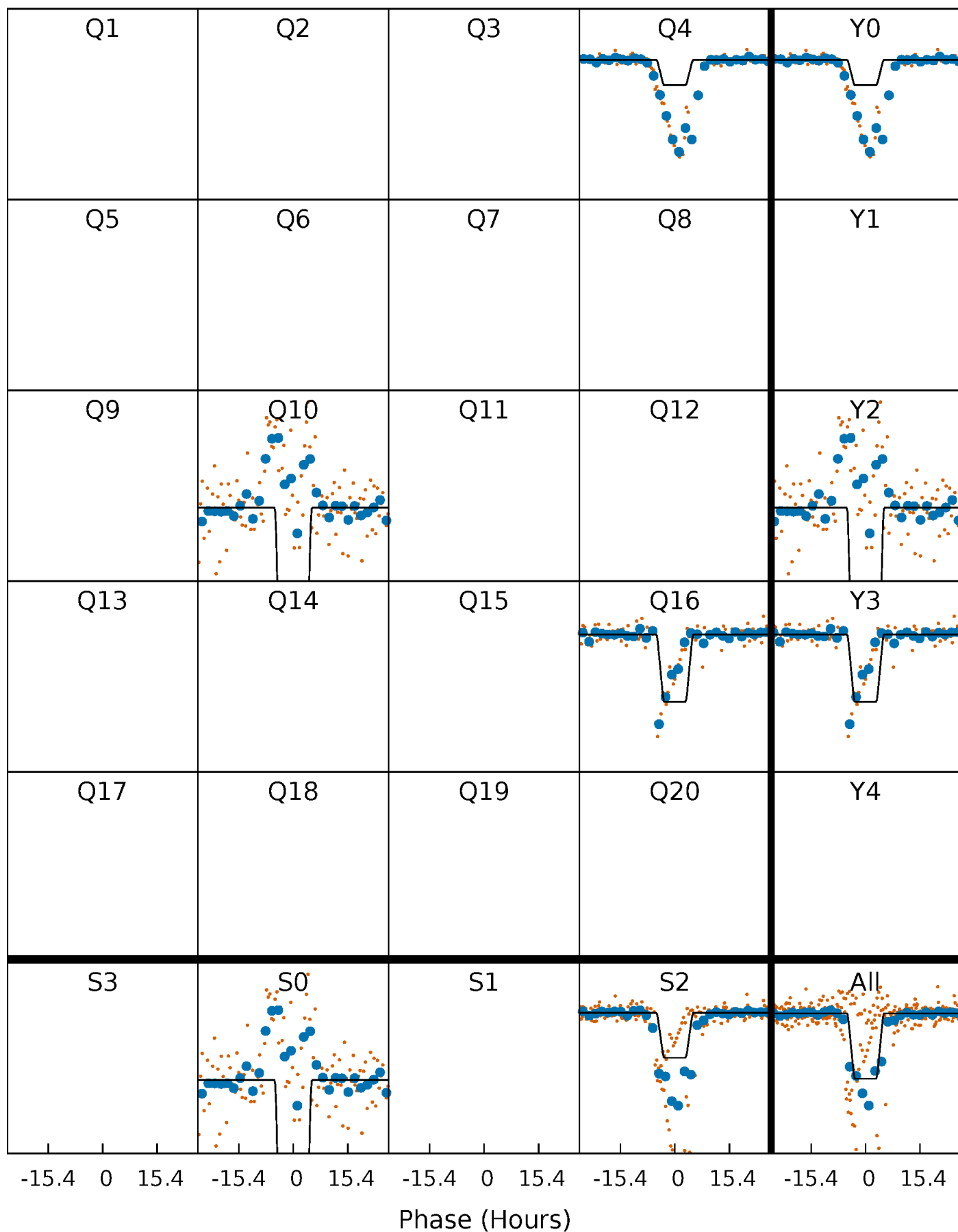
DV Quarter-Phased Transit Curves

TCE 009088058-02 P=576.225991 Days $T_0=364.876455$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

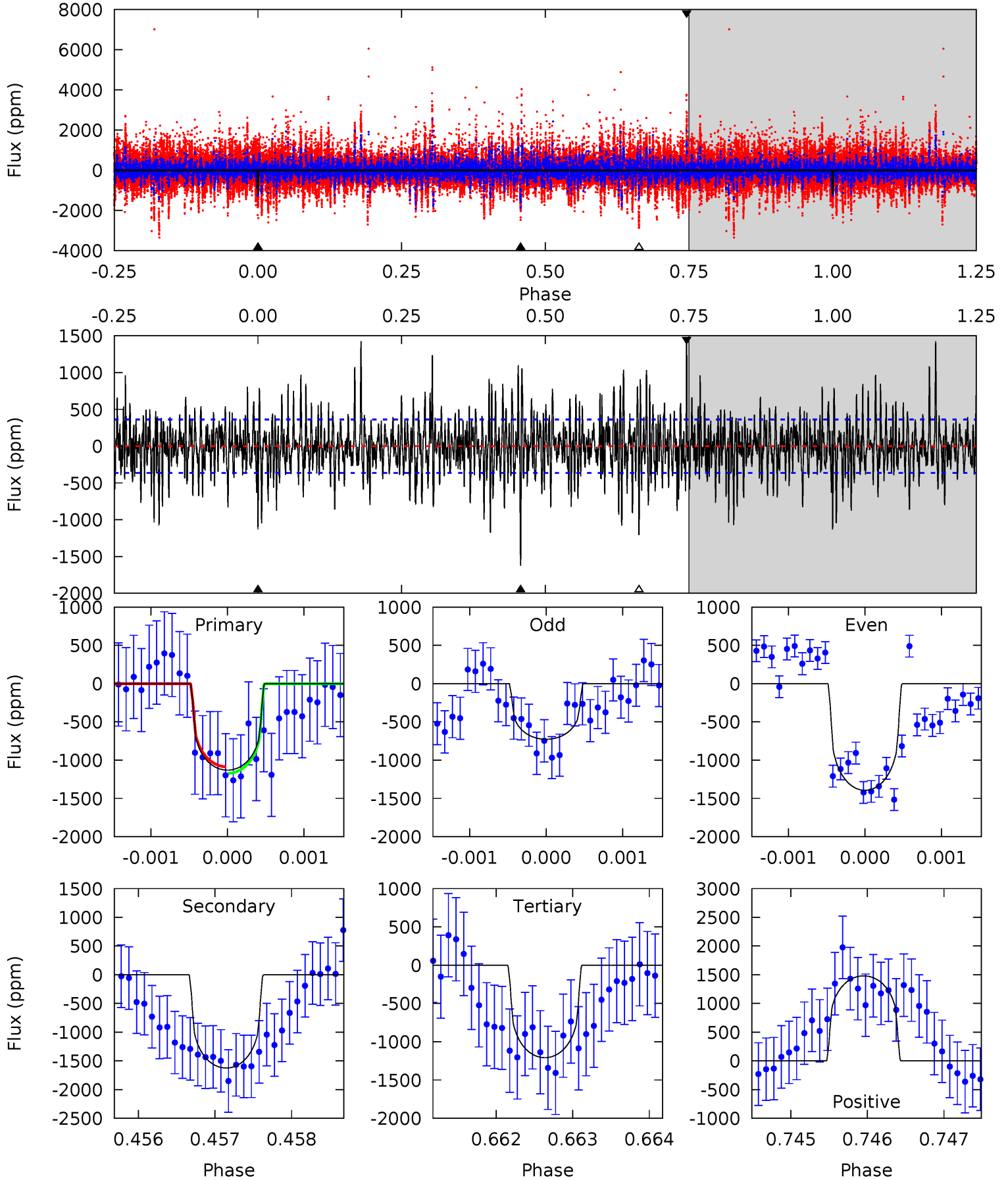
TCE 009088058-02 $P=576.212770$ Days $T_0=364.889152$ (BKJD)



DV Model-Shift Uniqueness Test

009088058-02, P = 576.225991 Days, E = 364.876455 Days

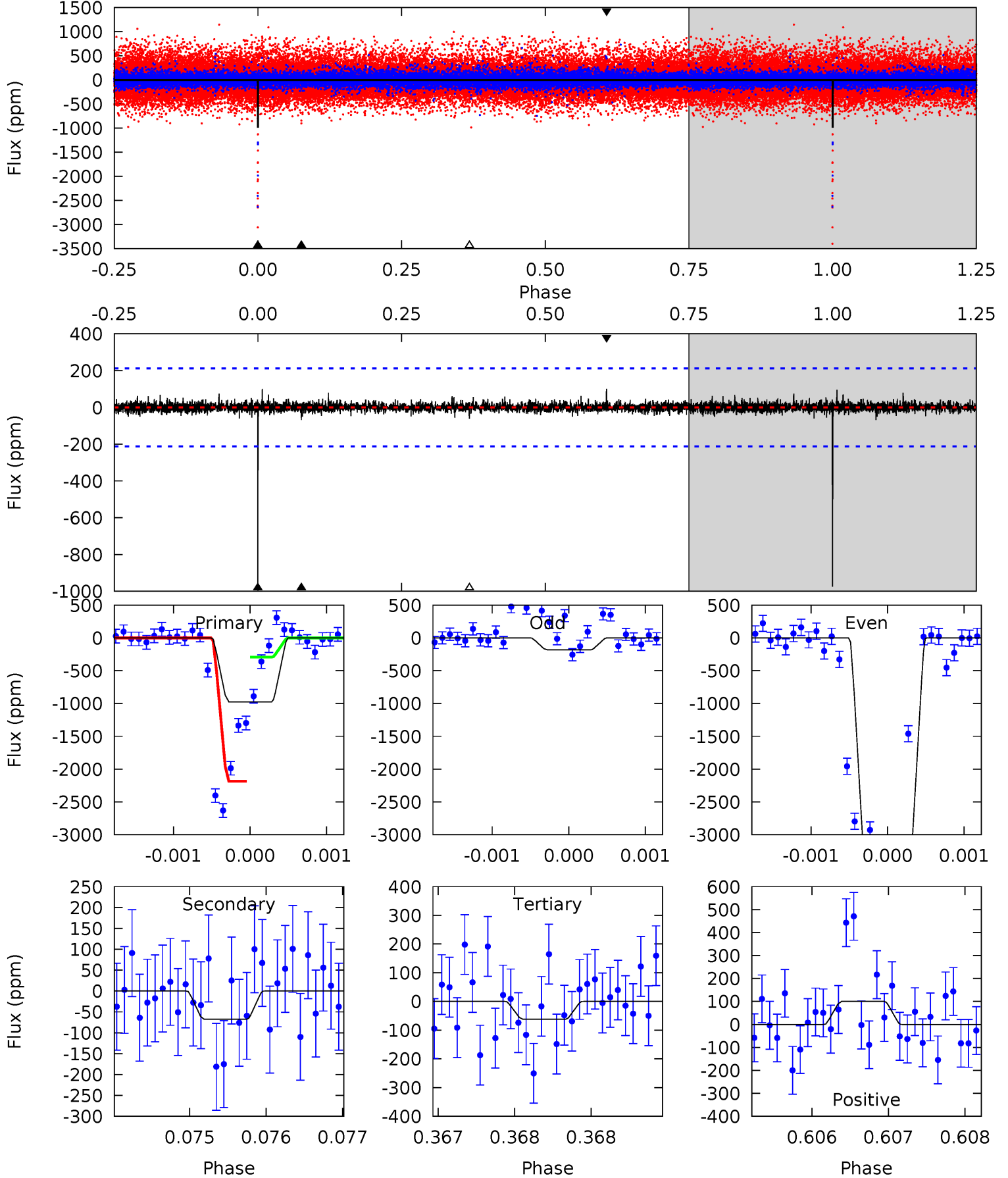
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.0	24.5	18.2	22.3	5.47	3.31	4.89	-1.17	-5.27	6.27	2.17	4.27	1.47	0.48	0.65



Alt Model-Shift Uniqueness Test

009088058-02, P = 576.212770 Days, E = 364.889152 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.3	1.76	1.60	2.59	5.50	3.37	0.35	23.7	22.7	0.16	-0.84	53.2	1.97	0.09	0



Stellar Parameters For KIC 009088058

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5140^{+153}_{-153}	$3.883^{+0.721}_{-0.309}$	$-0.180^{+0.300}_{-0.300}$	$1.781^{+0.935}_{-1.143}$	$0.883^{+0.147}_{-0.161}$	$0.220^{+2.932}_{-0.154}$
	+3%/-3%	+19%/-8%	+167%/-167%	+52%/-64%	+17%/-18%	+1330%/-70%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009088058-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1625 ± 66	$5.33^{+3.06}_{-2.52}$	367^{+54}_{-67}	5855^{+1793}_{-758}	$51671^{+132047}_{-30362}$
Alt.	-68 ± 38	$8.08^{+3.36}_{-2.78}$	366^{+49}_{-59}	2882^{+343}_{-326}	869^{+1649}_{-547}

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

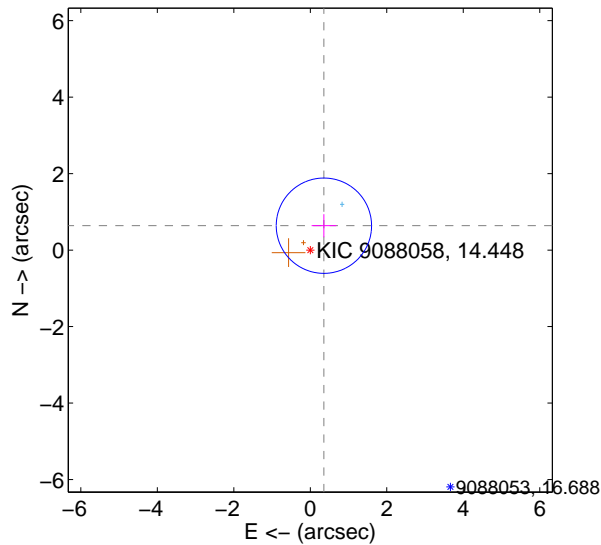
Supplemental centroid analysis for 009088058-02. Kepler magnitude: 14.45. Transit SNR 6.98

There are 1 quarters with good PRF difference image offsets

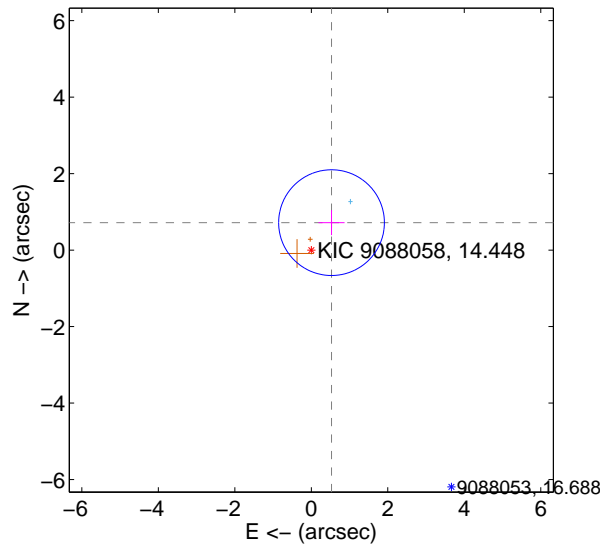
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.730 ± 0.415	1.76	-0.356 ± 0.323	0.638 ± 0.301
PRF-fit source offset from KIC position	0.891 ± 0.461	1.93	-0.529 ± 0.341	0.718 ± 0.327
photometric centroid source offset	1.62 ± 1.22	1.33	-0.60 ± 0.68	1.50 ± 1.29

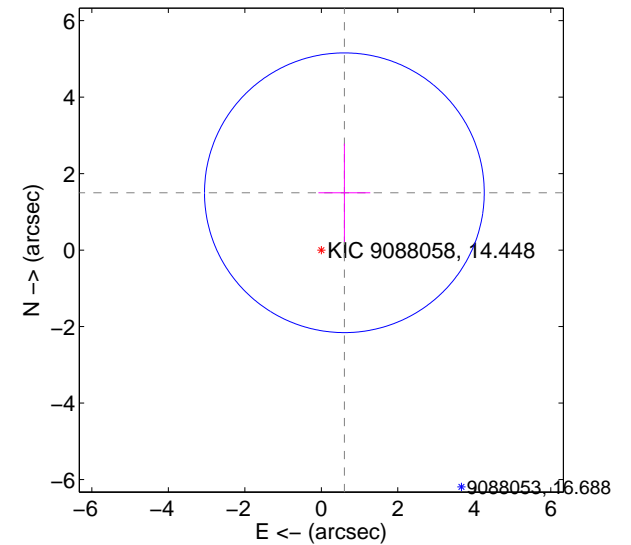
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

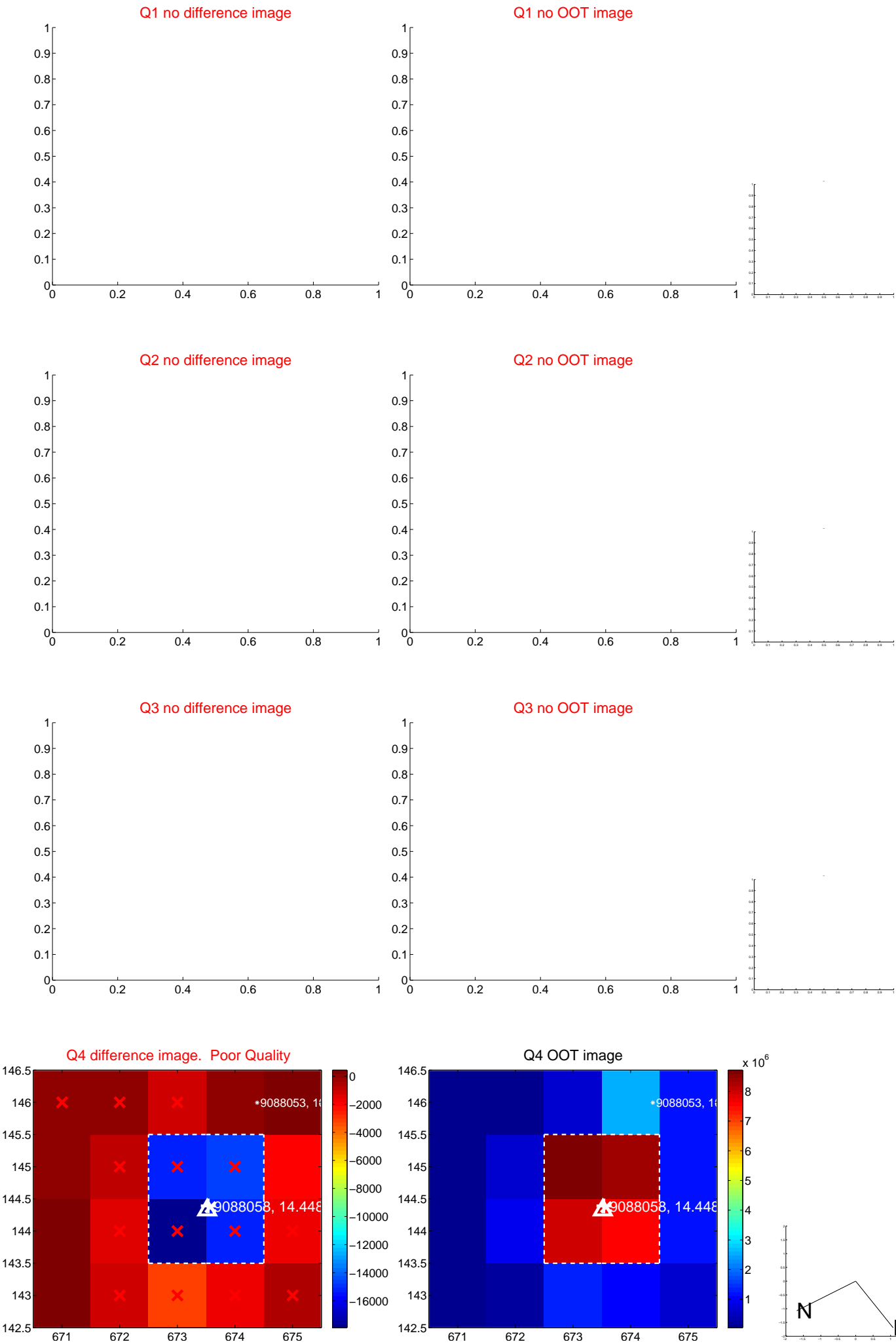


offset from photometric centroids



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.

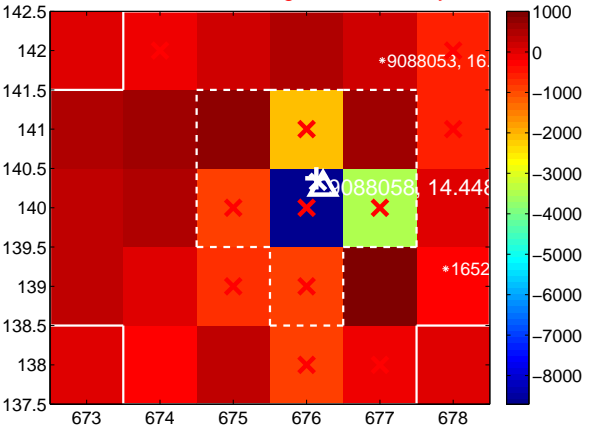
Q9 no difference image



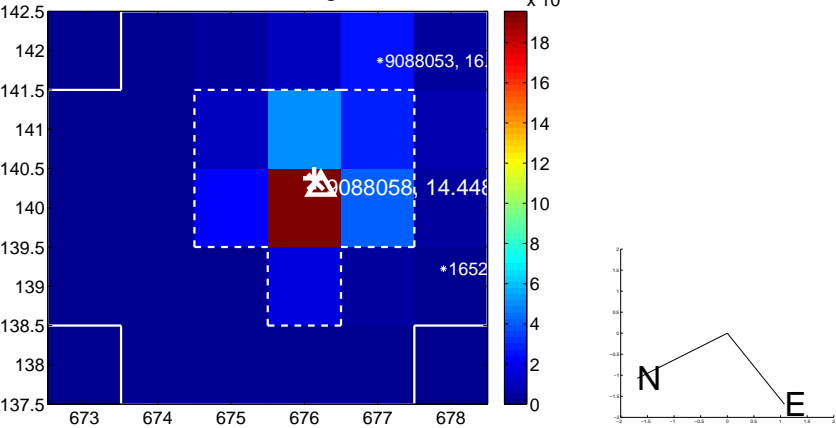
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



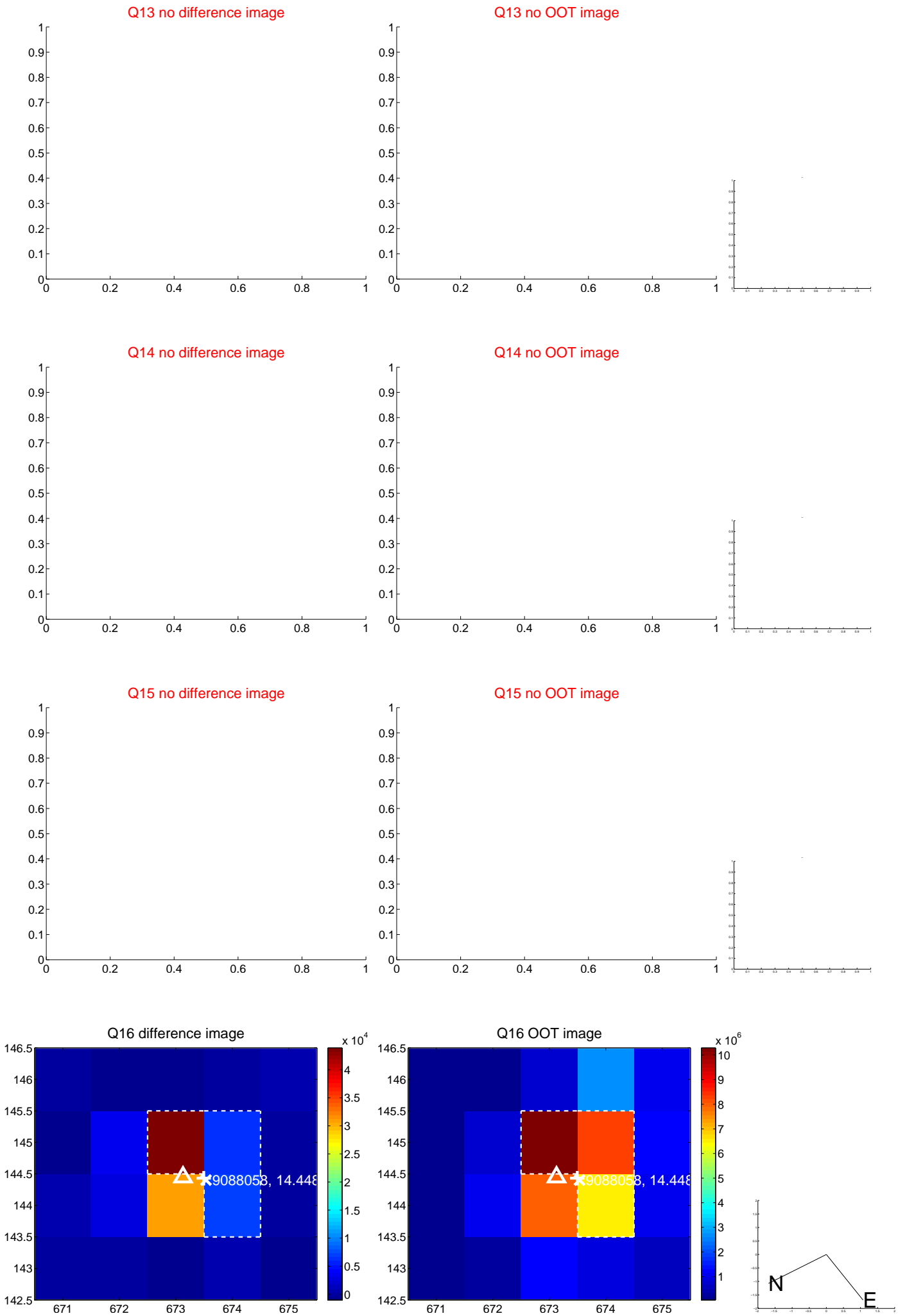
Q12 no difference image



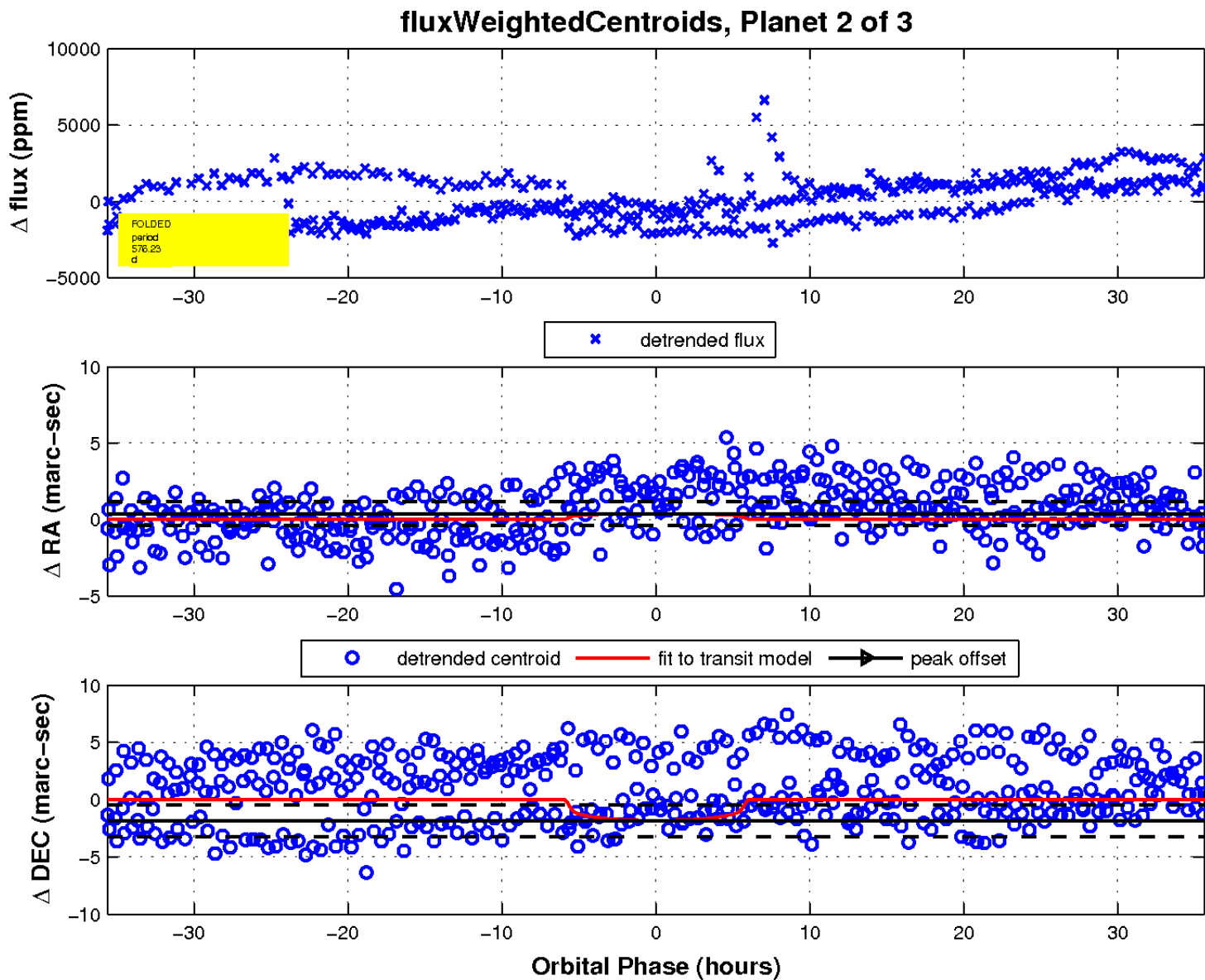
Q12 no OOT image



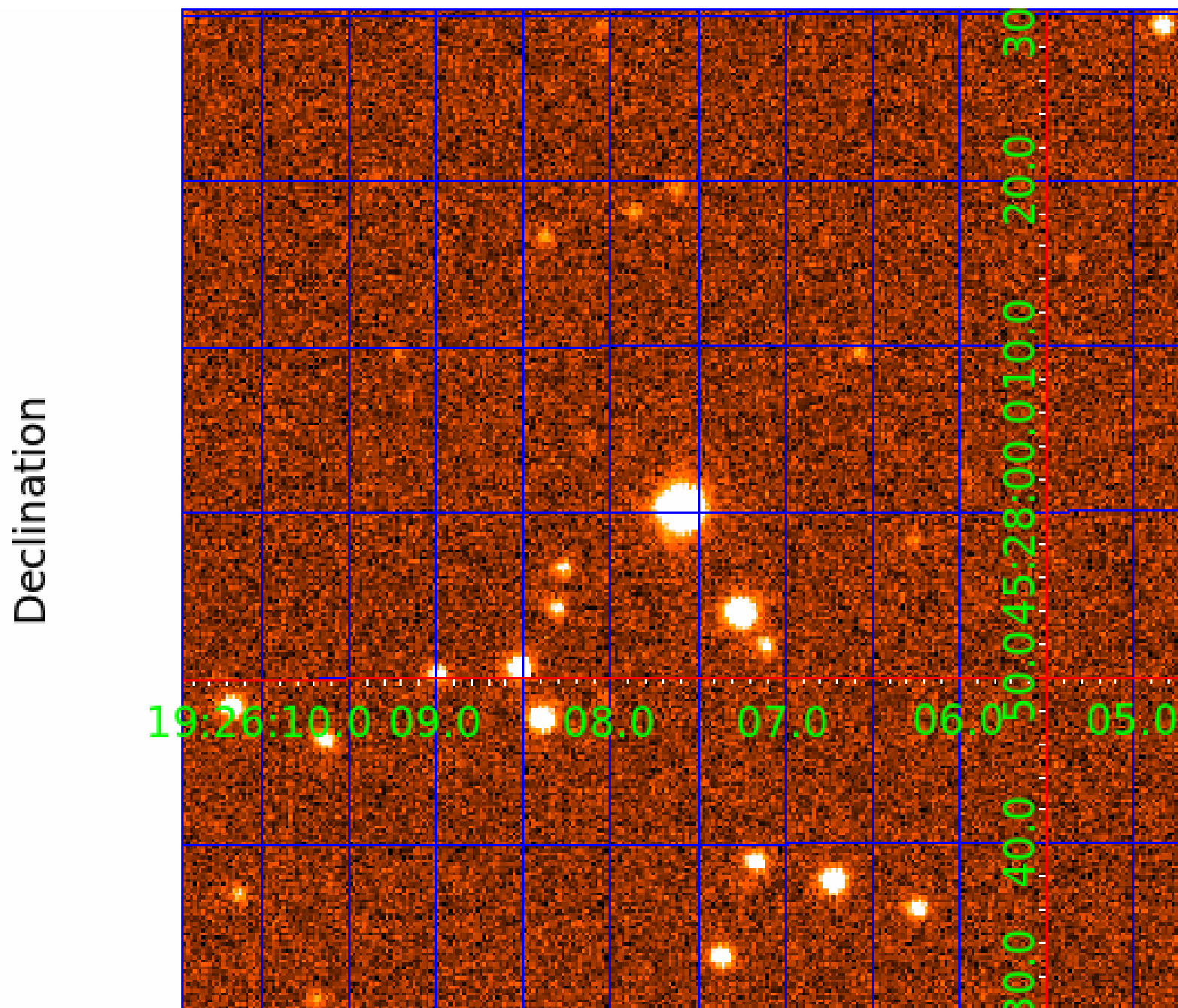
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009088058

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})
009088058-01	OBS	No	392.822526	465.879559	903.6	5.194	13.8	7.9	1.78	5140	5.62	1.95
009088058-02	OBS	No	576.225991	364.876455	976.3	11.969	12.9	7.0	1.78	5140	5.80	1.17
009088058-03	OBS	No	278.750613	262.255629	619.0	5.208	10.9	6.5	1.78	5140	4.81	3.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009088058-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
009088058-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS
009088058-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—CENT_FEW_DIFFS

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

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

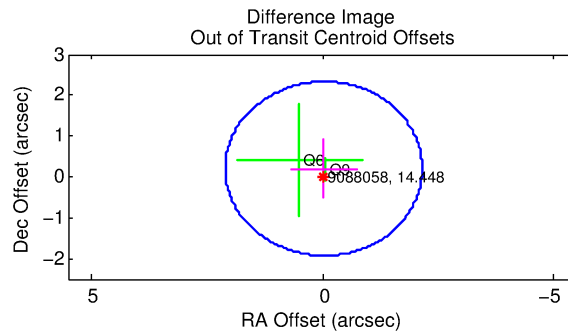
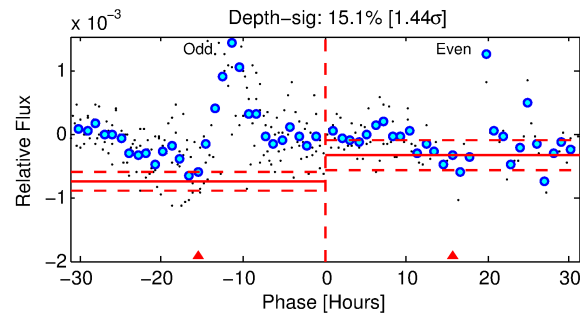
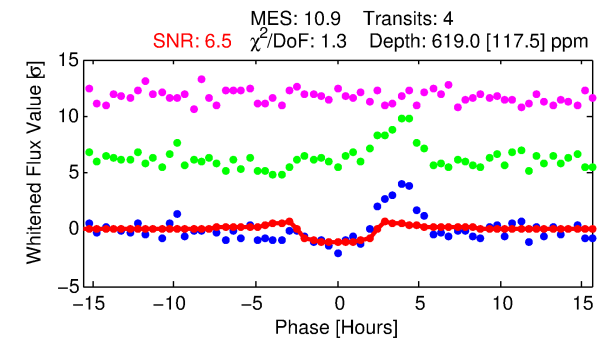
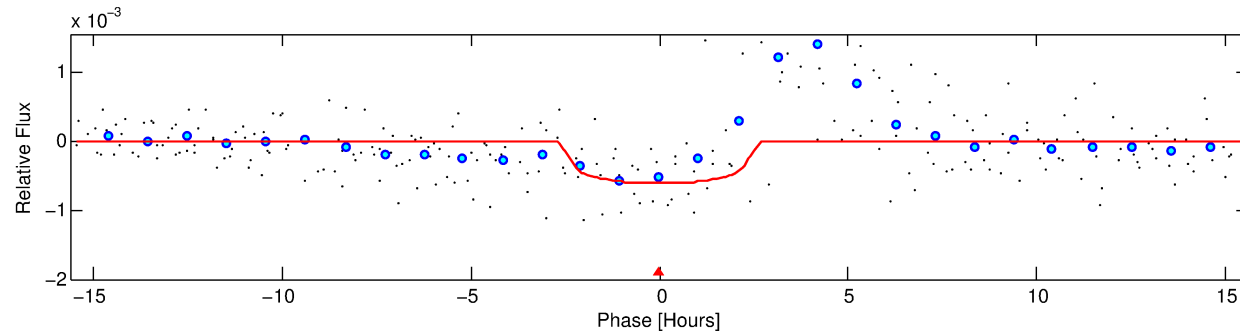
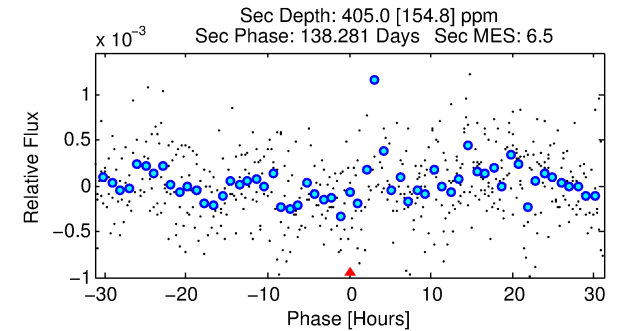
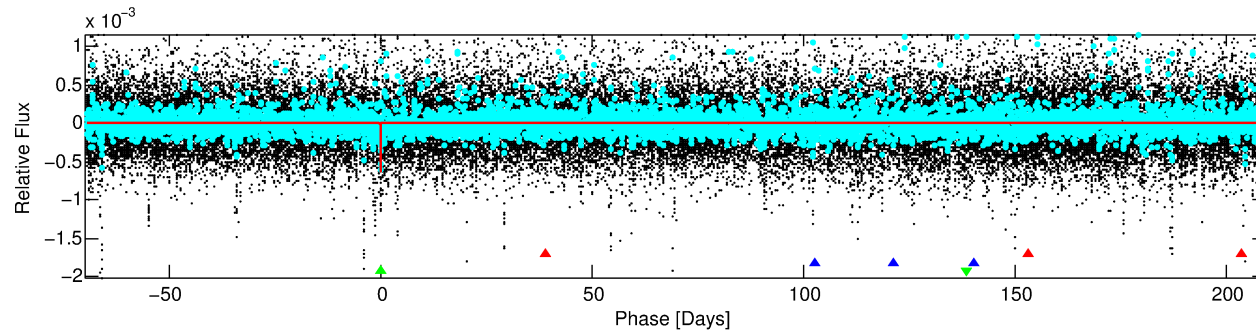
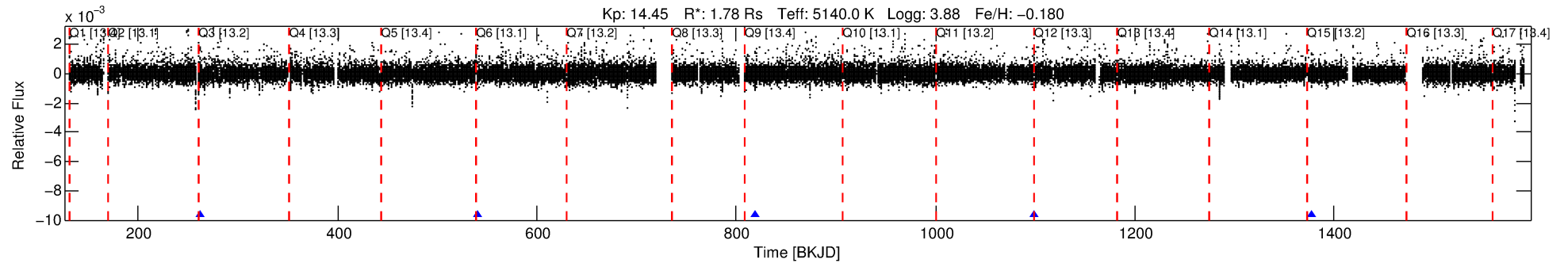
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009088058-03

No Significant Match Found

DV One-Page Summary

KIC: 9088058 Candidate: 3 of 3 Period: 278.751 d



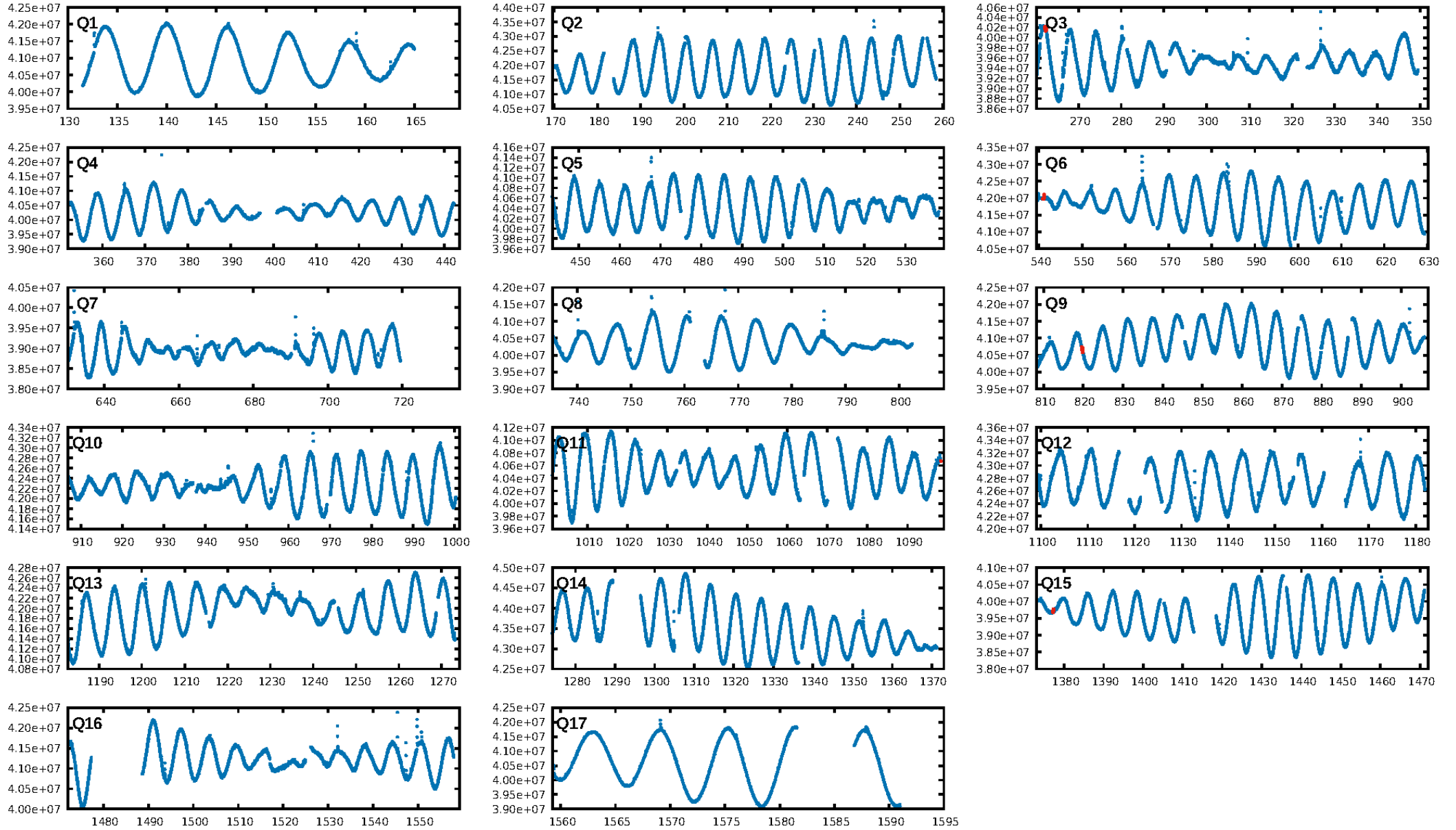
DV Fit Results:

Period = 278.75061 [0.00575] d
Epoch = 262.2556 [0.0138] BKJD
Rp/R* = 0.0247 [0.0215]
a/R* = 288.94 [926.05]
b = 0.74 [1.97]
Seff = 3.09 [3.68]
Teq = 338 [101] K
Rp = 4.81 [5.20] Re
a = 0.8016 [0.5607] AU
Ag = 6196.06 [13266.90] [0.47 σ]
Teffp = 4636 [2071] K [2.07 σ]

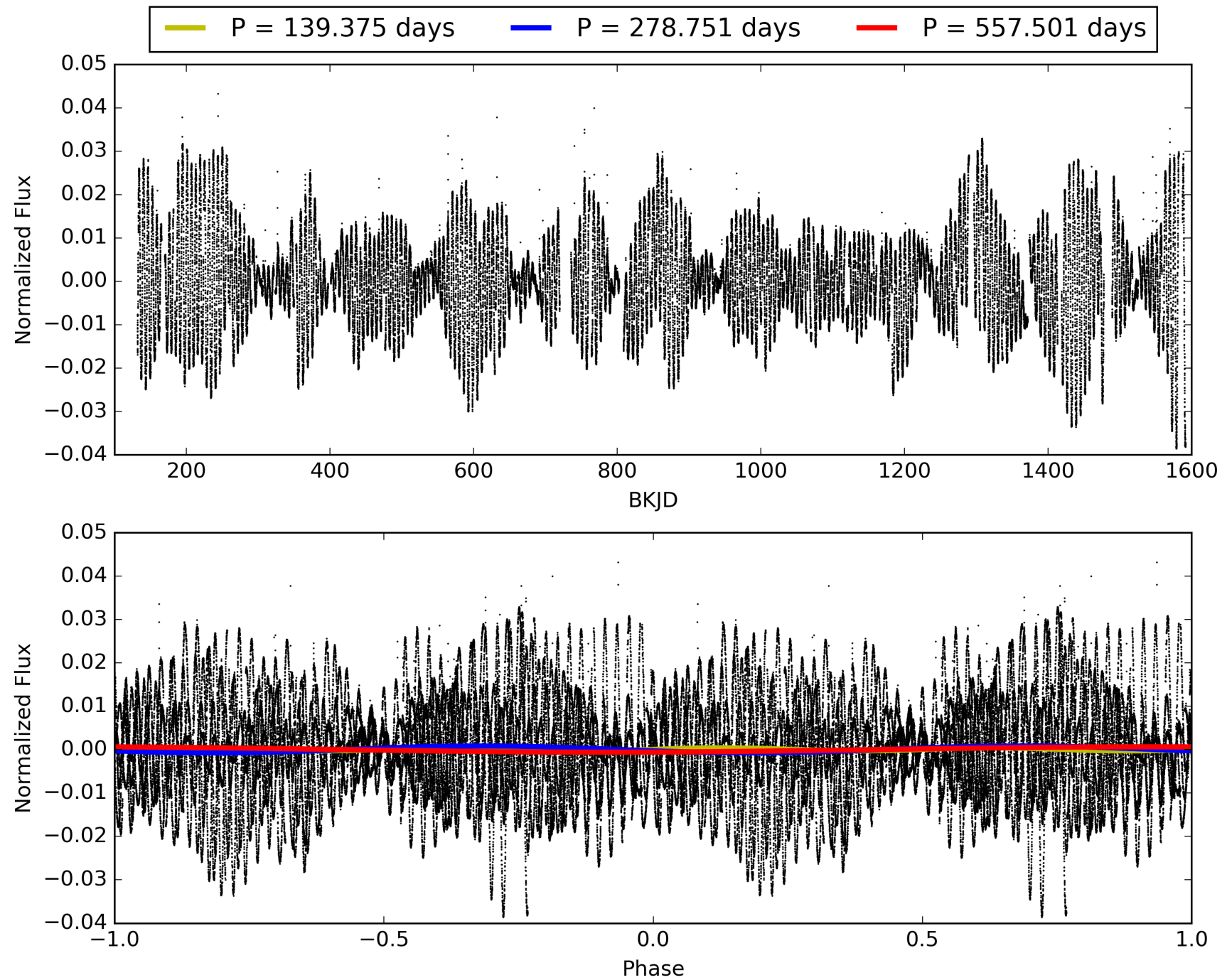
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [372.20 σ]
ModelChiSquare2-sig: 10.1%
ModelChiSquareGof-sig: 89.1%
Bootstrap-pfa: 1.27e-10
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -3.81
Centroid-sig: 10.2%
Centroid-so: 2.067 arcsec [1.37 σ]
OotOffset-rm: 0.204 arcsec [0.29 σ]
KicOffset-rm: 0.345 arcsec [0.49 σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-st: 1/0/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [4/4]

TCE 009088058-03, PDC Light Curves

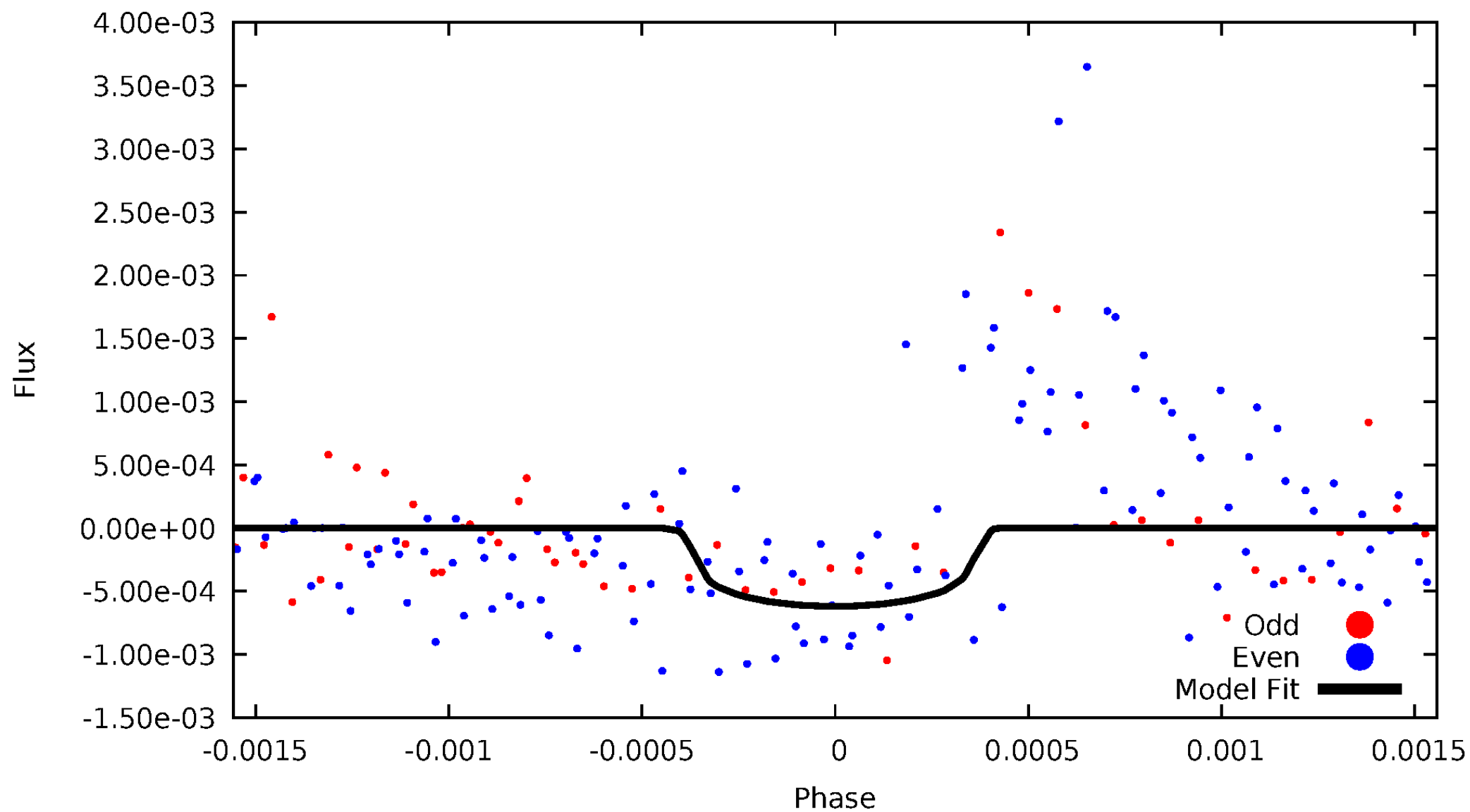


TCE 009088058-03



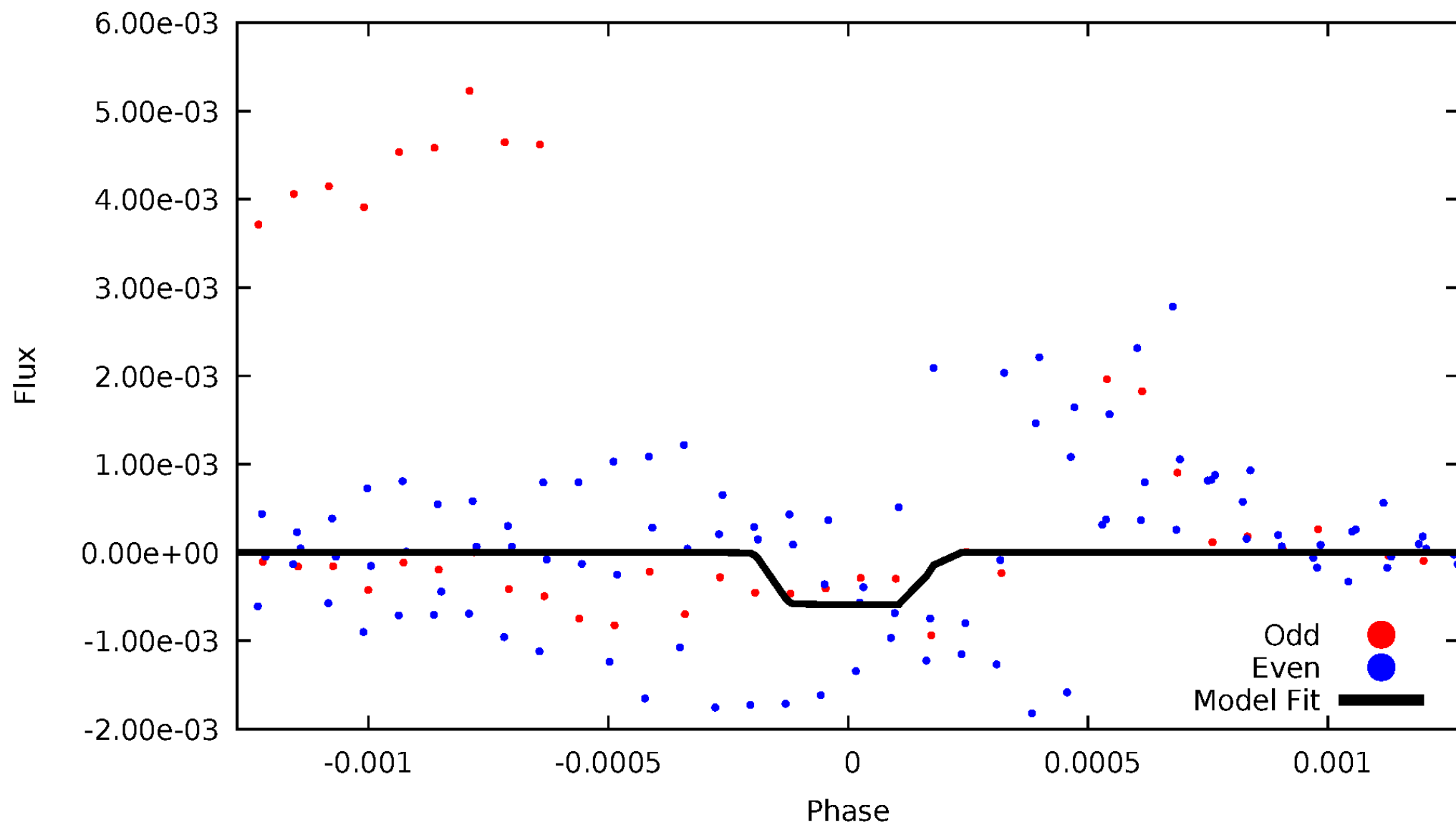
DV Odd/Even

TCE 009088058-03



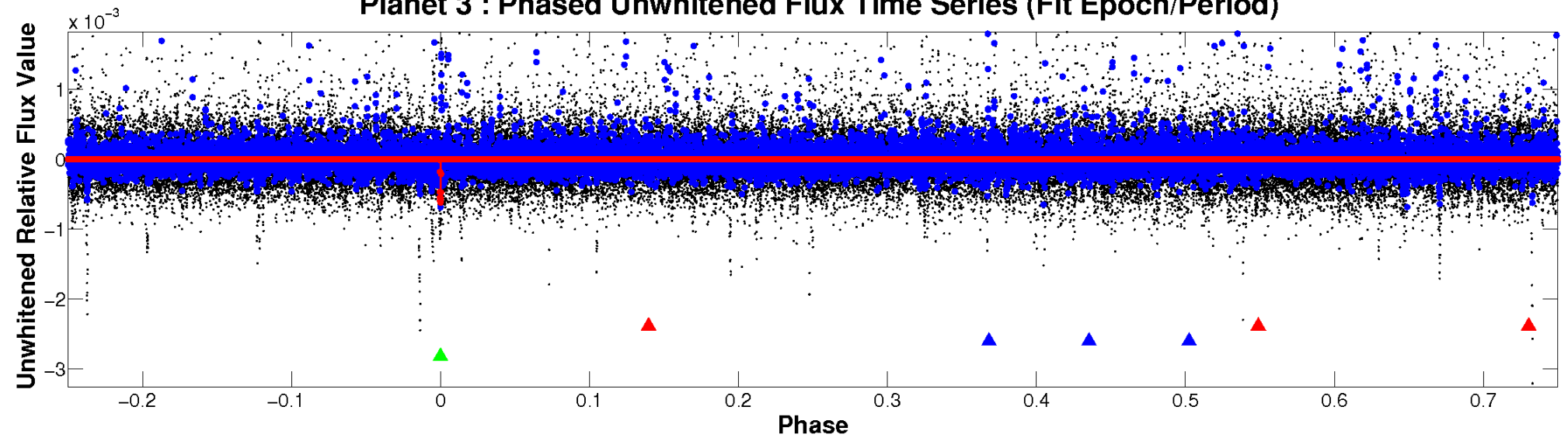
ALT Odd/Even

TCE 009088058-03

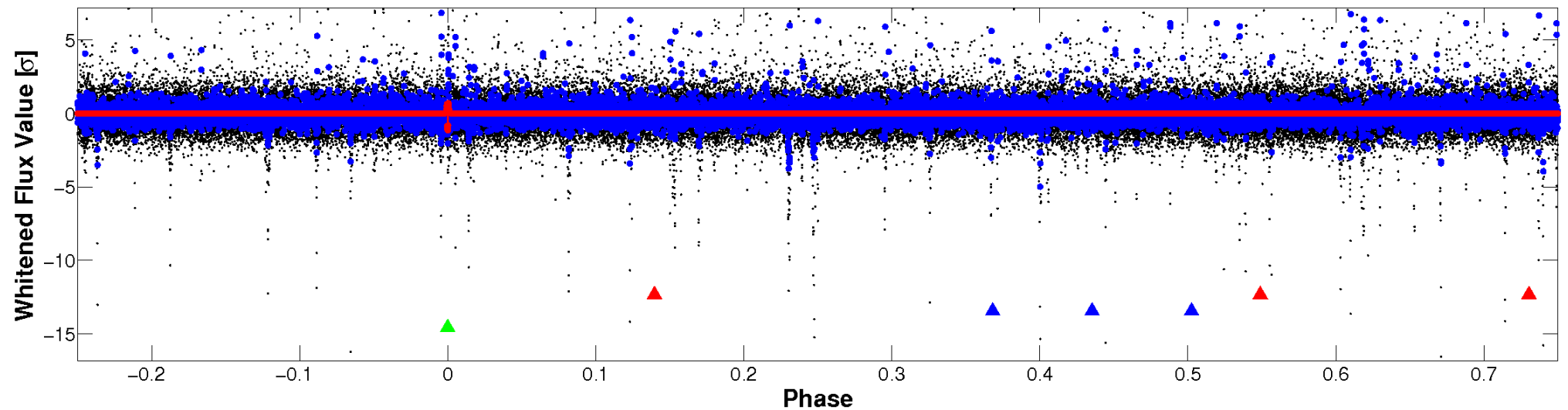


Non-Whitened Vs. Whitened Light Curve

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

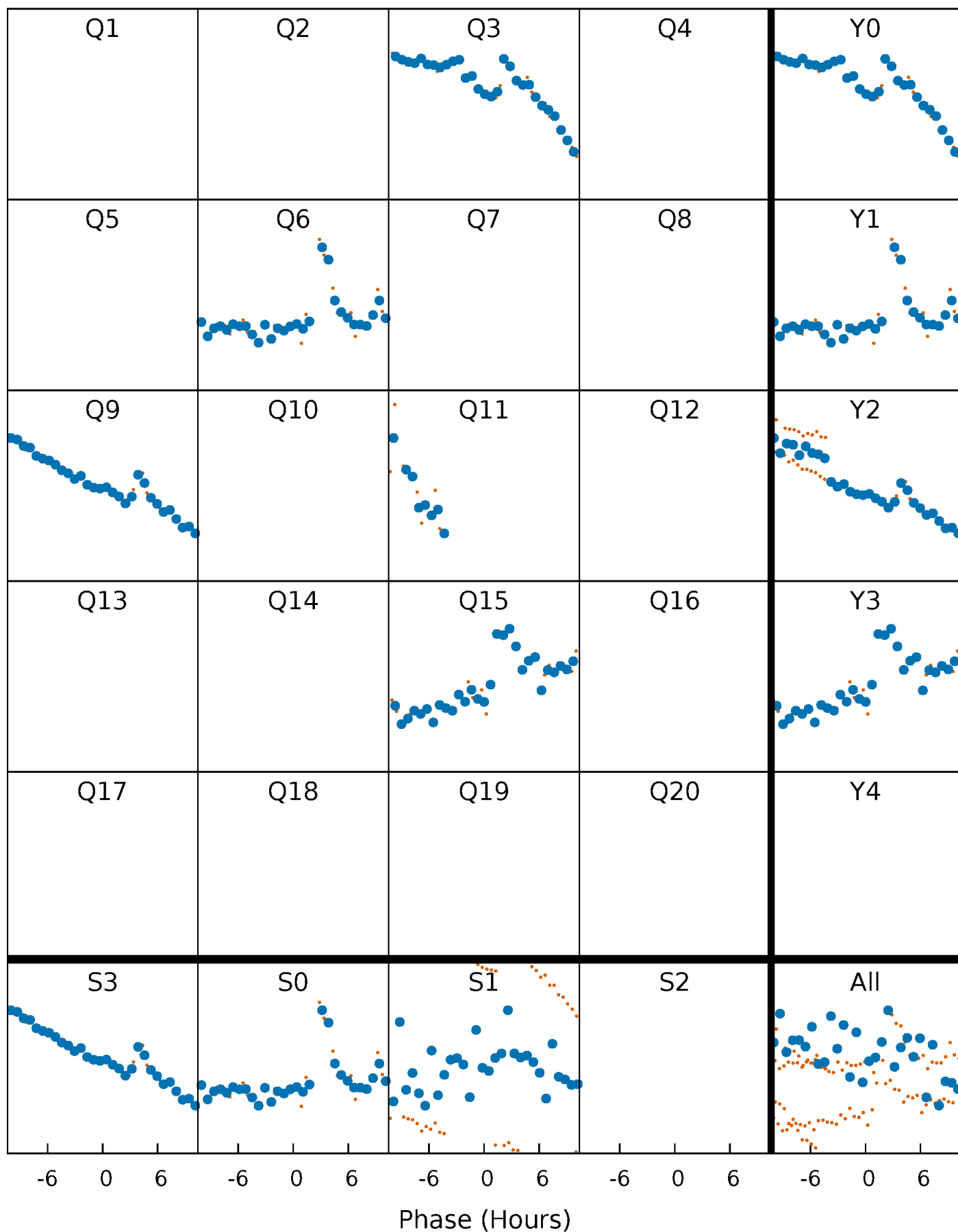


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



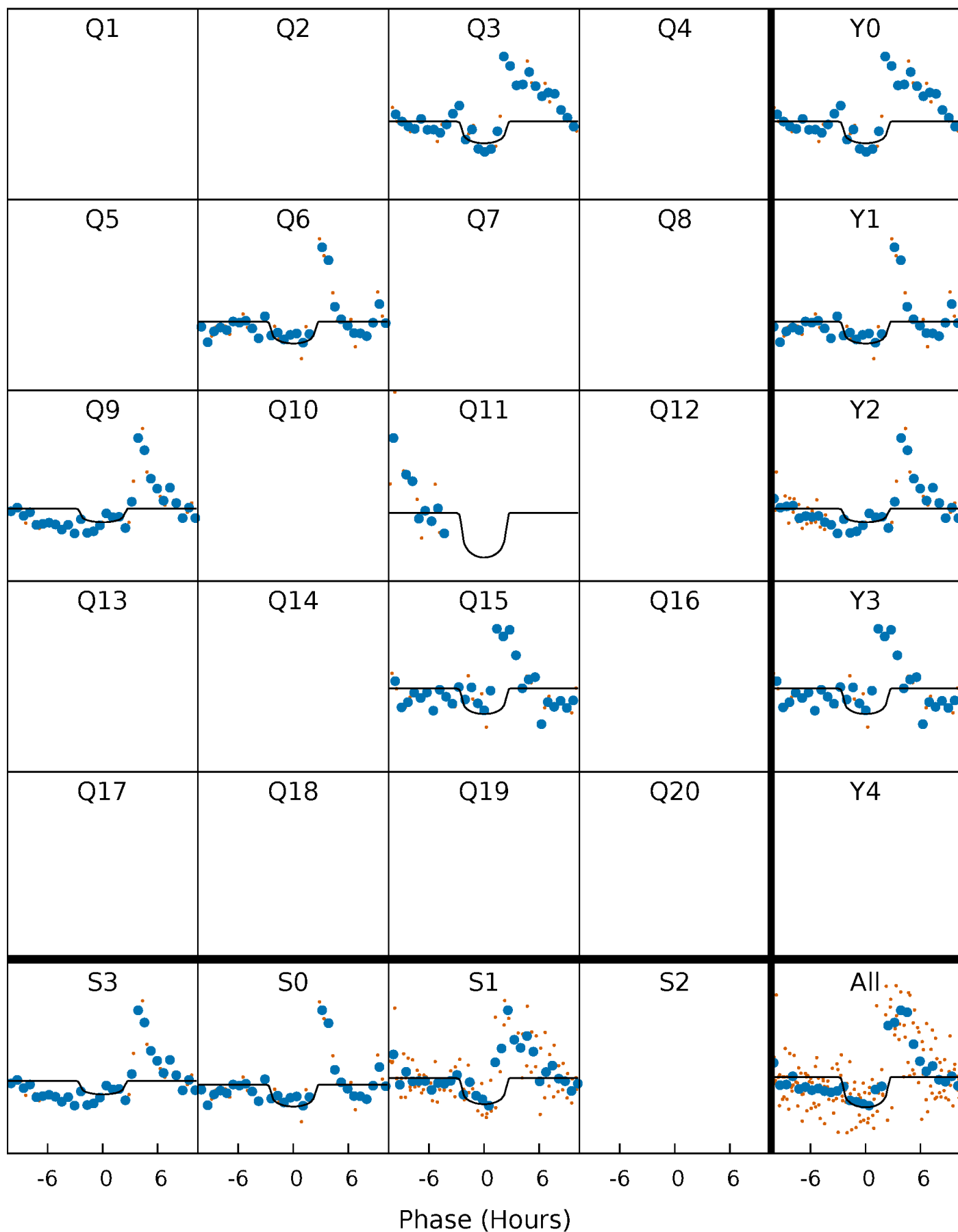
PDC Quarter-Phased Transit Curves

TCE 009088058-03 P=278.750613 Days $T_0=262.255629$ (BKJD)



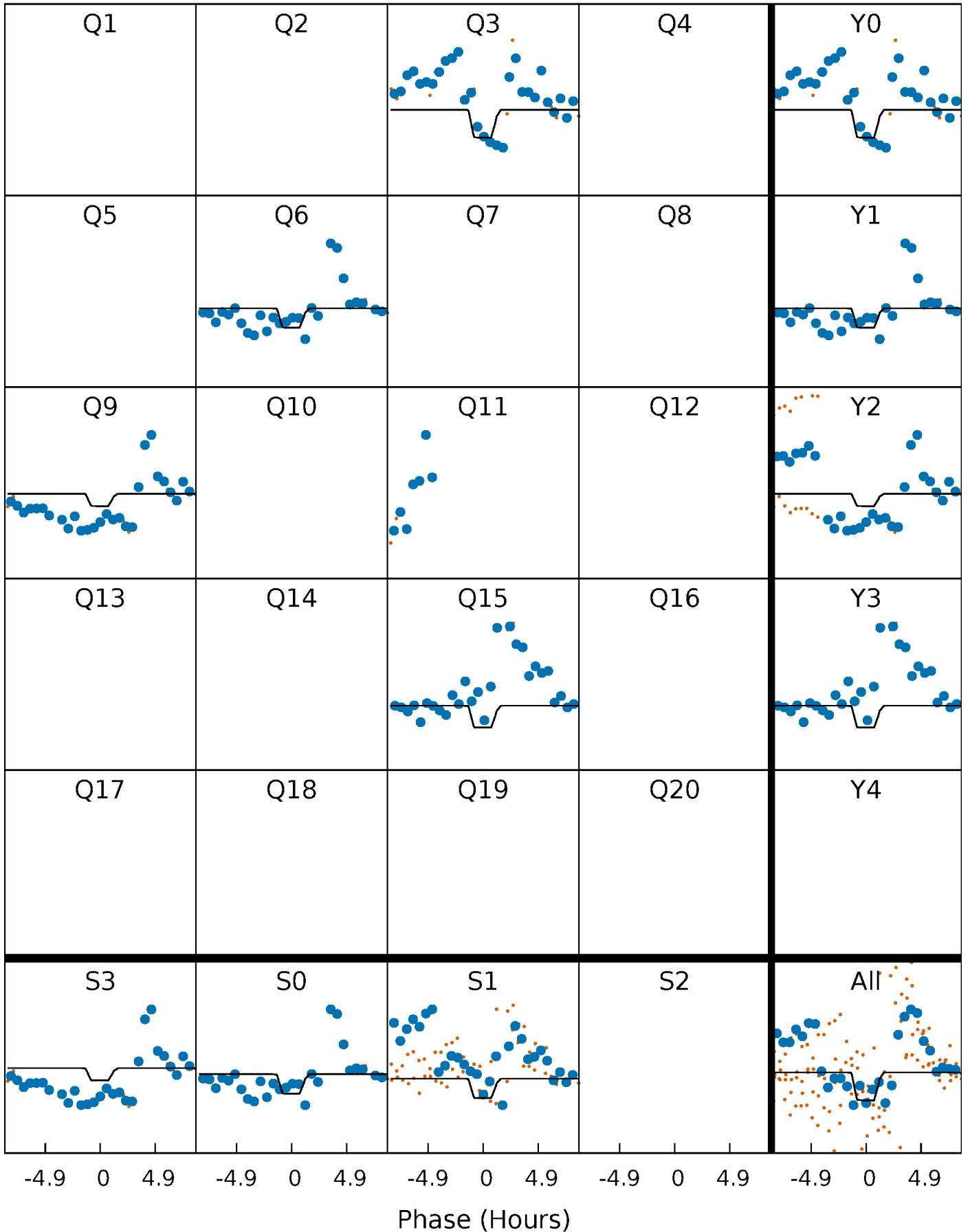
DV Quarter-Phased Transit Curves

TCE 009088058-03 $P=278.750613$ Days $T_0=262.255629$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

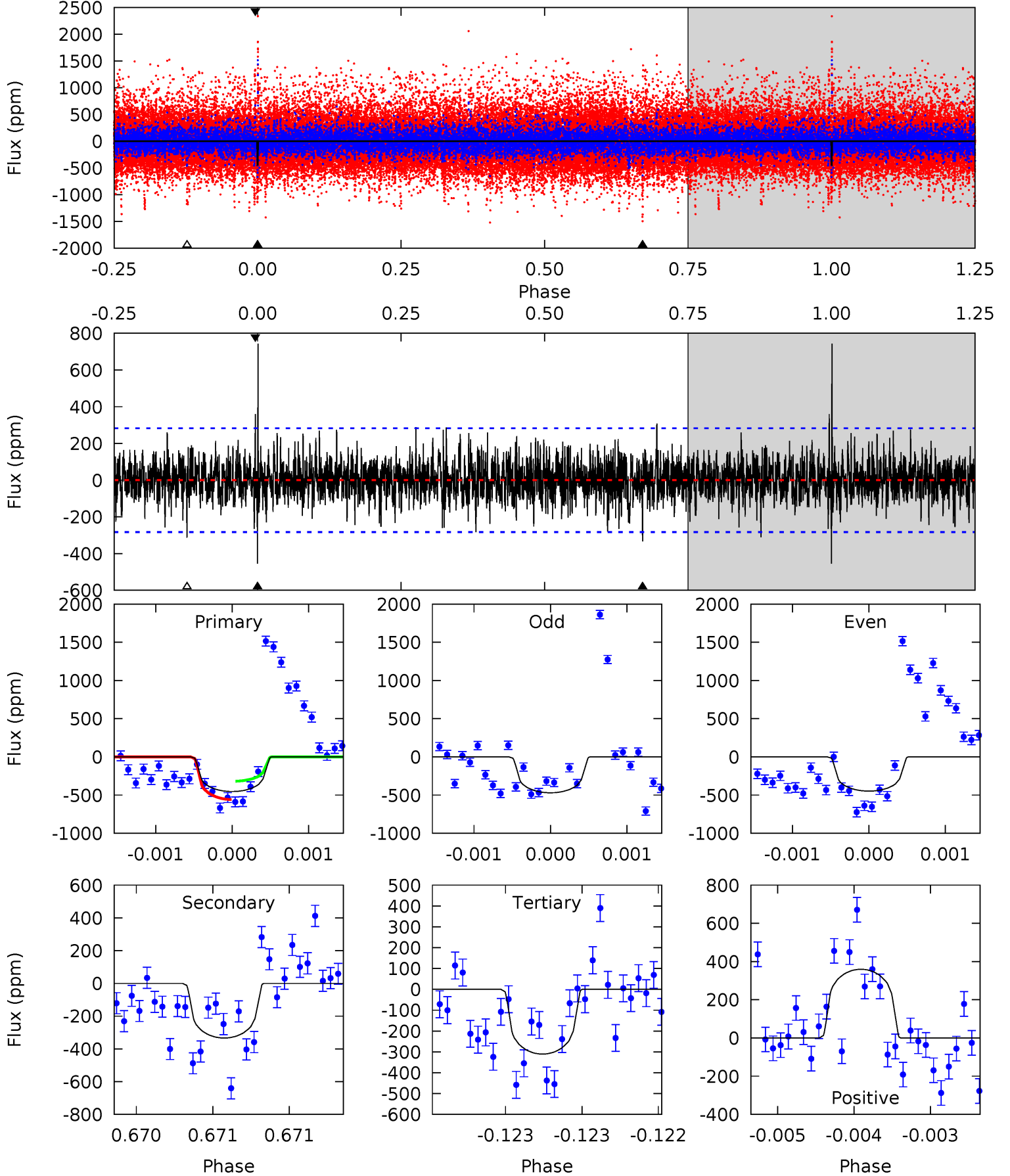
TCE 009088058-03 P=278.754625 Days $T_0=262.241012$ (BKJD)



DV Model-Shift Uniqueness Test

009088058-03, P = 278.750613 Days, E = 262.255629 Days

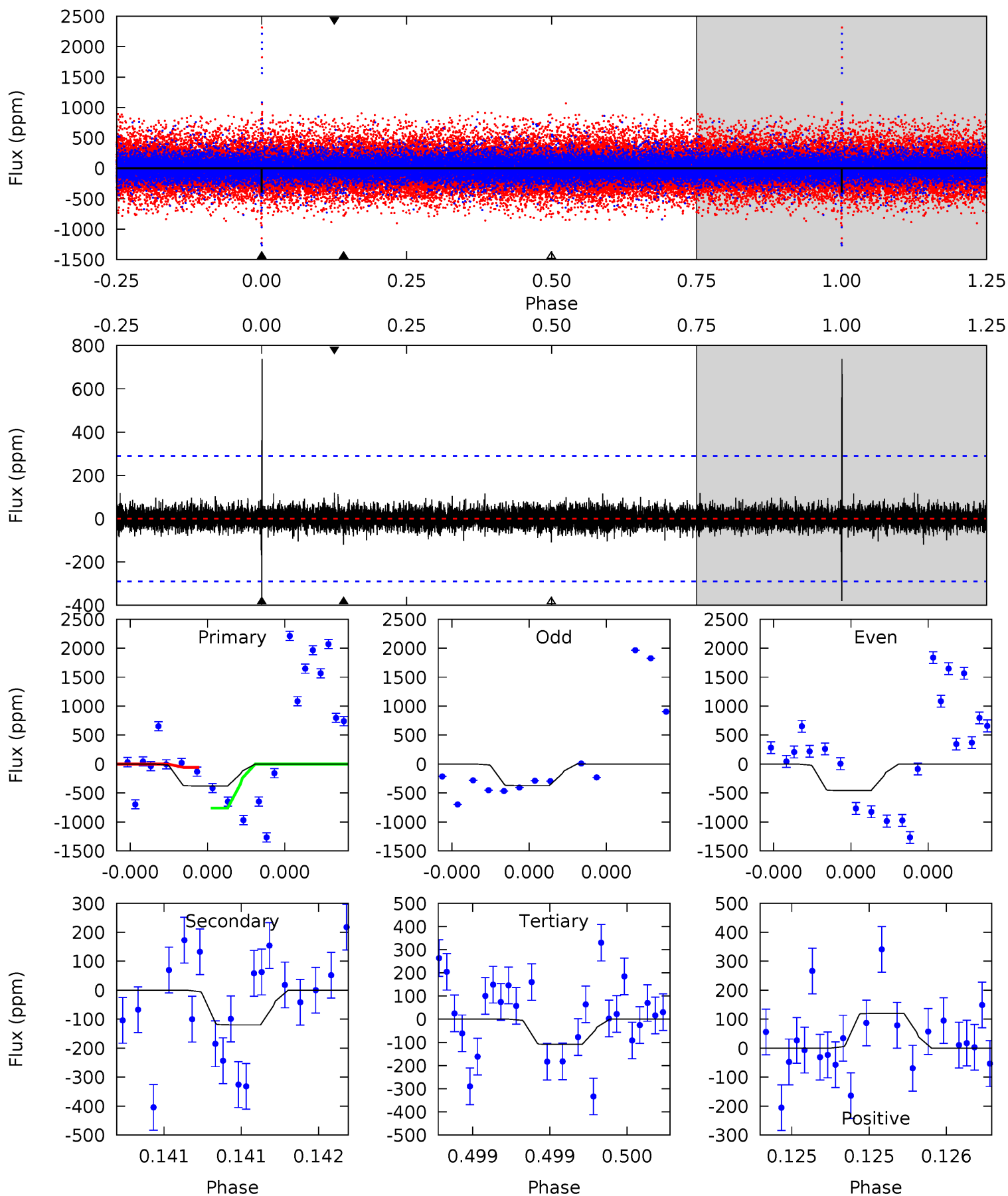
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.82	6.48	6.03	6.99	5.49	3.34	1.56	2.78	1.83	0.45	-0.51	0.17	0.88	0.62	2.33



Alt Model-Shift Uniqueness Test

009088058-03, P = 278.754625 Days, E = 262.241012 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.35	2.32	2.11	2.33	5.62	3.55	0.53	5.24	5.02	0.22	-0.01	0.72	1.28	0.66	7.03



Stellar Parameters For KIC 009088058

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5140^{+153}_{-153}	$3.883^{+0.721}_{-0.309}$	$-0.180^{+0.300}_{-0.300}$	$1.781^{+0.935}_{-1.143}$	$0.883^{+0.147}_{-0.161}$	$0.220^{+2.932}_{-0.154}$
	+3%/-3%	+19%/-8%	+167%/-167%	+52%/-64%	+17%/-18%	+1330%/-70%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009088058-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-334 ± 51	$4.76^{+4.70}_{-3.04}$	465^{+72}_{-77}	4340^{+2402}_{-753}	5150^{+33596}_{-3849}
Alt.	-120 ± 52	$4.95^{+4.27}_{-3.15}$	468^{+72}_{-86}	3590^{+1535}_{-561}	1632^{+11482}_{-1262}

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

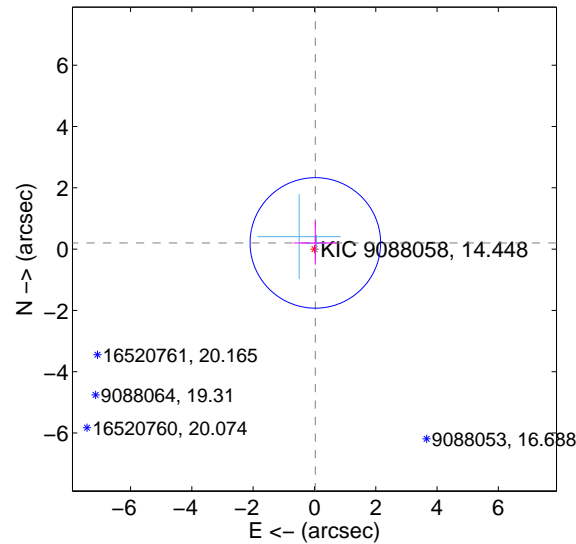
Supplemental centroid analysis for 009088058-03. Kepler magnitude: 14.45. Transit SNR 6.52

There are 2 quarters with good PRF difference image offsets

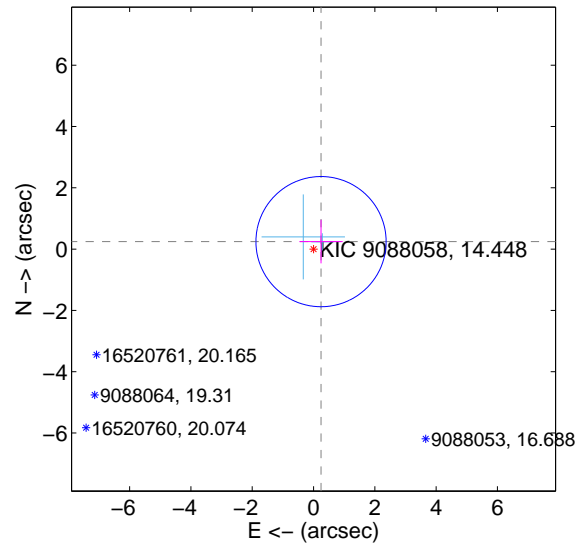
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.204 ± 0.710	0.29	-0.030 ± 0.706	0.202 ± 0.710
PRF-fit source offset from KIC position	0.345 ± 0.708	0.49	-0.245 ± 0.706	0.244 ± 0.710
photometric centroid source offset	2.07 ± 1.50	1.37	1.50 ± 1.26	-1.43 ± 1.73

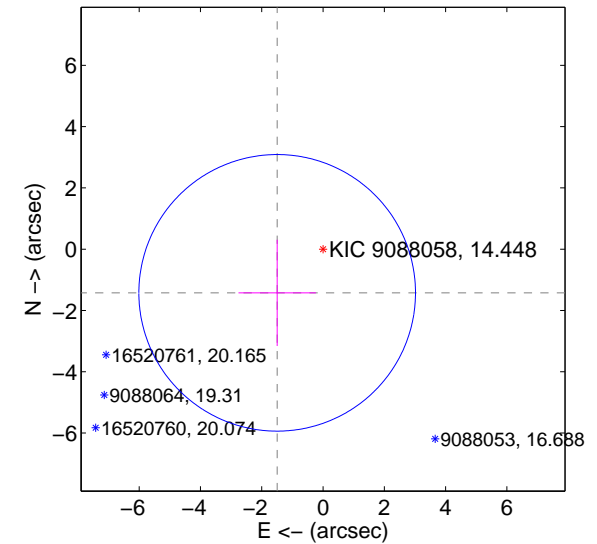
offset from difference PRF-fit to OOT PRF-fit



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.

Q1 no difference image



Q1 no OOT image



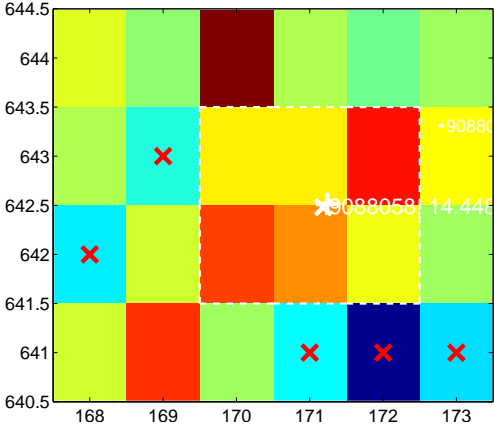
Q2 no difference image



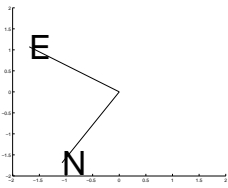
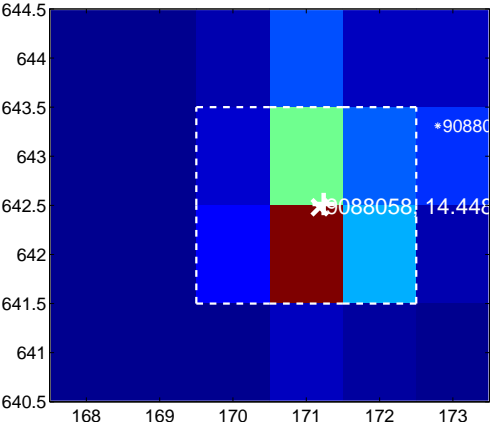
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



Q4 no difference image



Q4 no OOT image



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

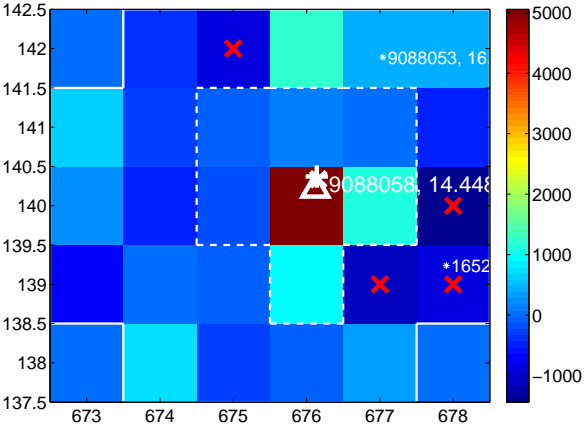
Q5 no difference image



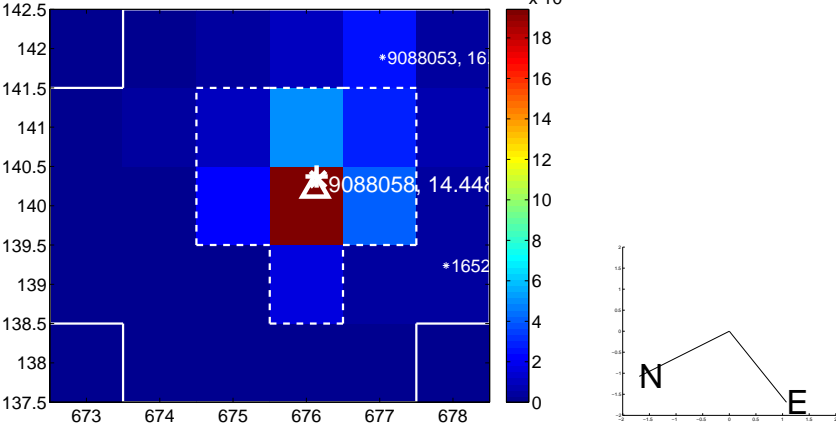
Q5 no OOT image



Q6 difference image



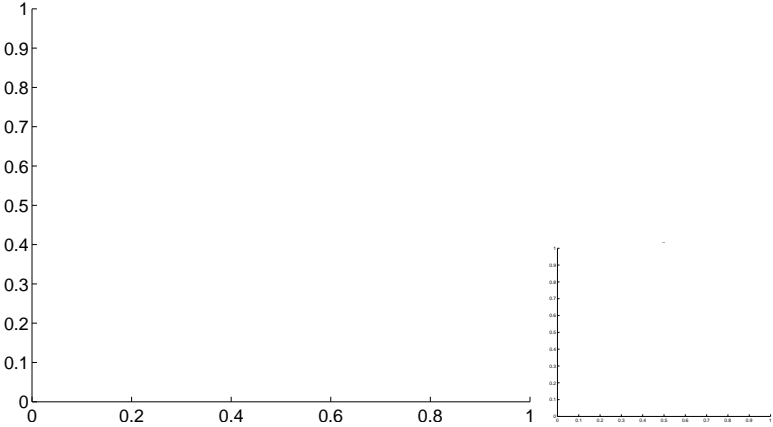
Q6 OOT image



Q7 no difference image



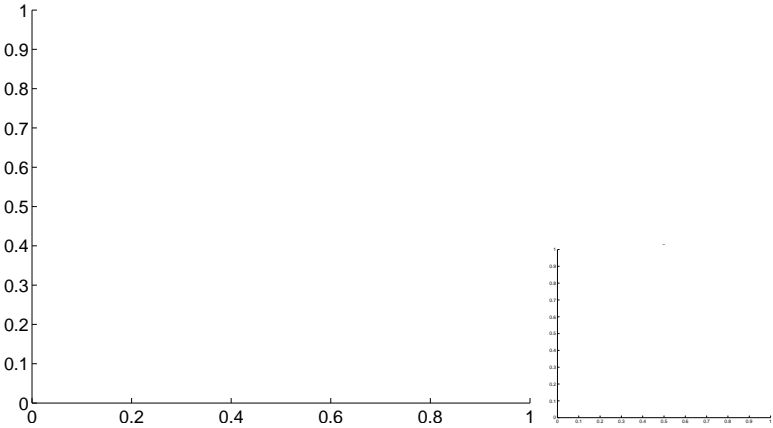
Q7 no OOT image



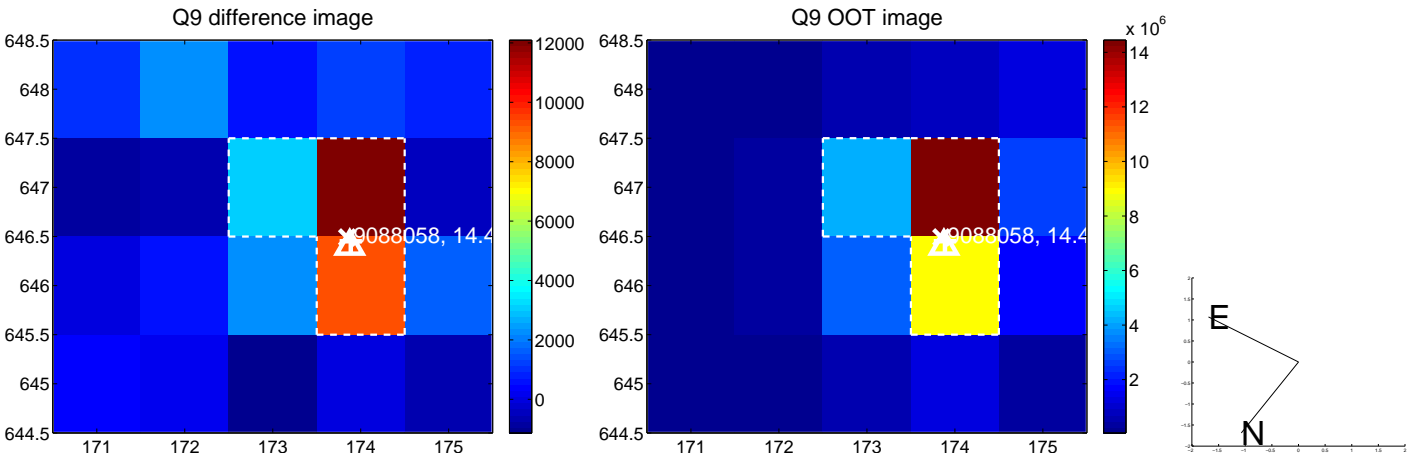
Q8 no difference image



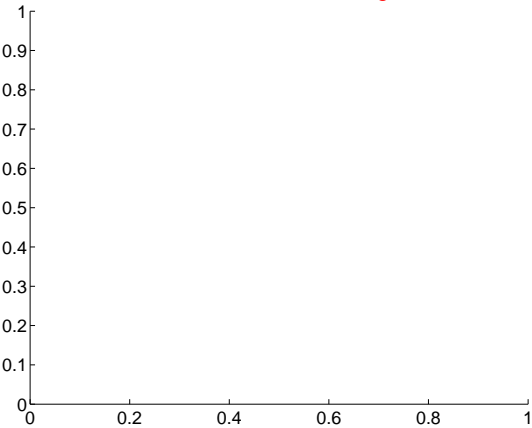
Q8 no OOT image



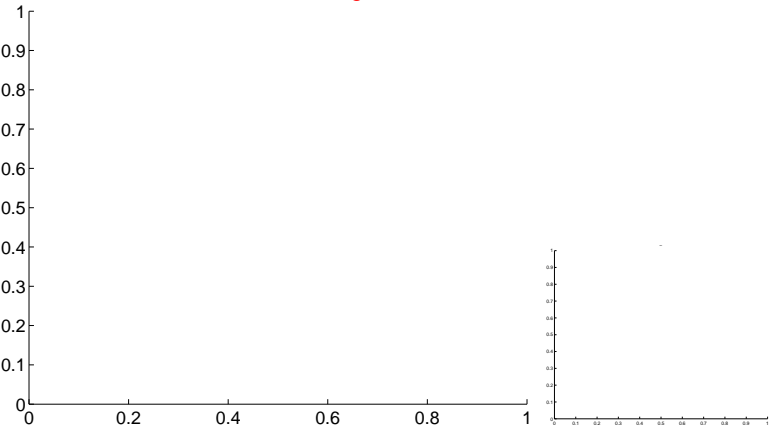
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



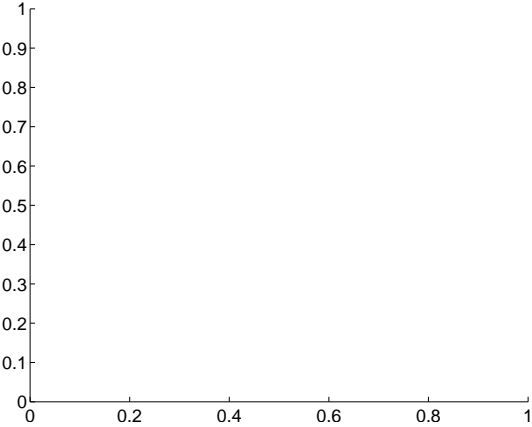
Q10 no difference image



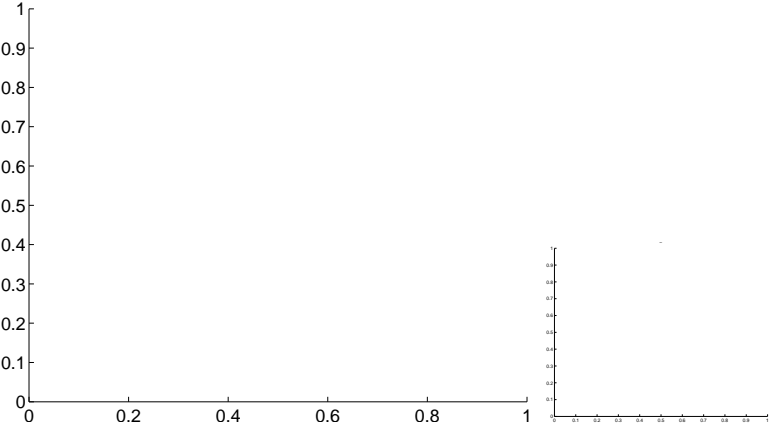
Q10 no OOT image



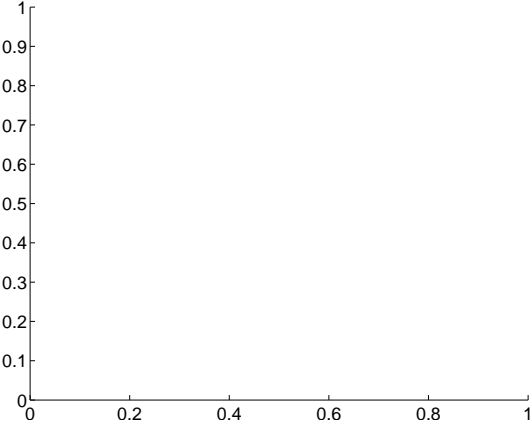
Q11 no difference image



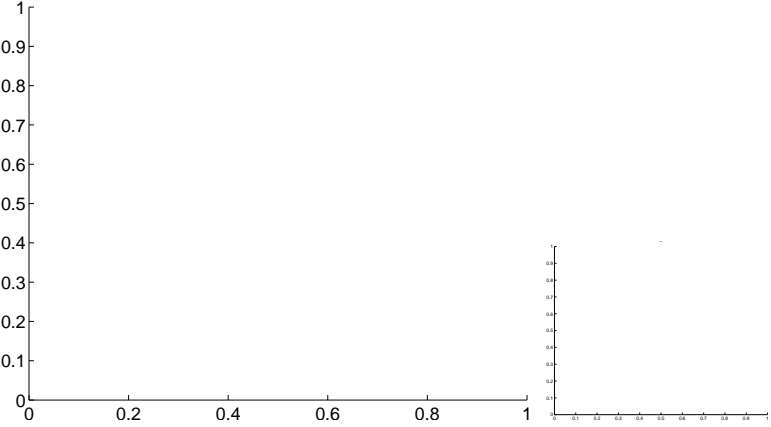
Q11 no OOT image



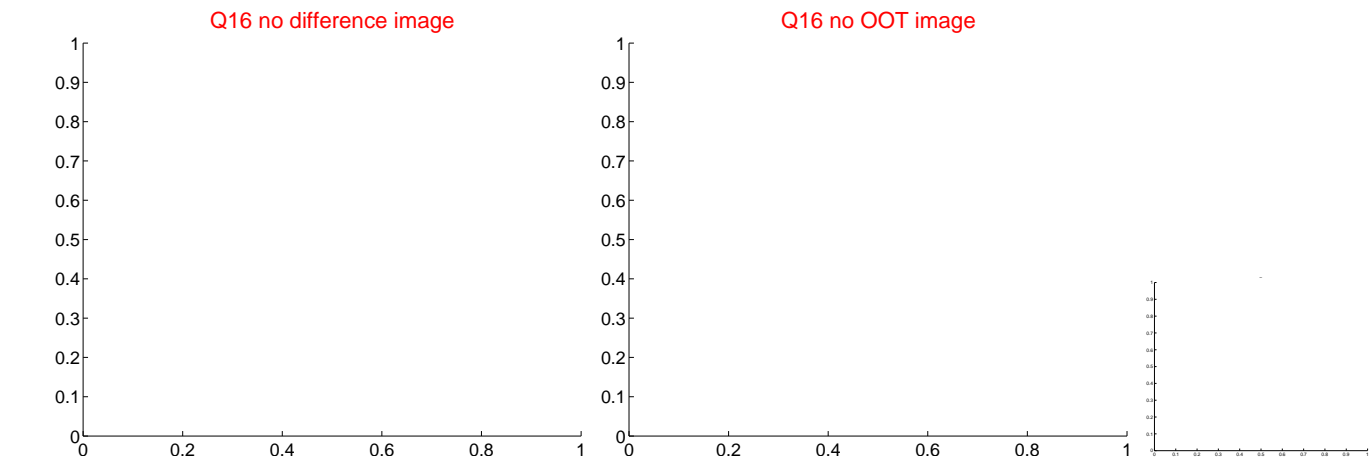
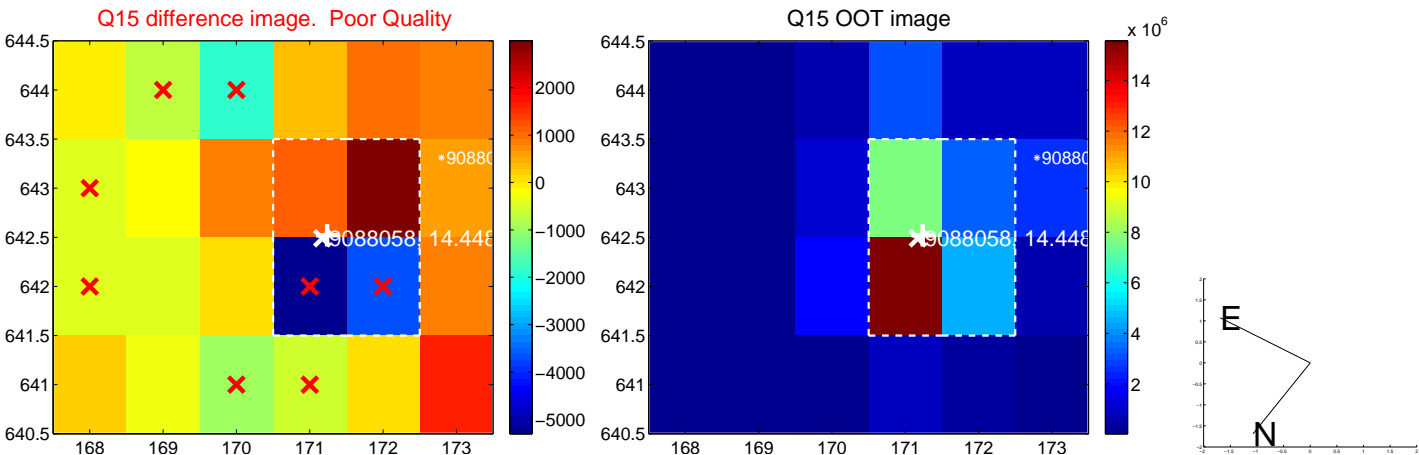
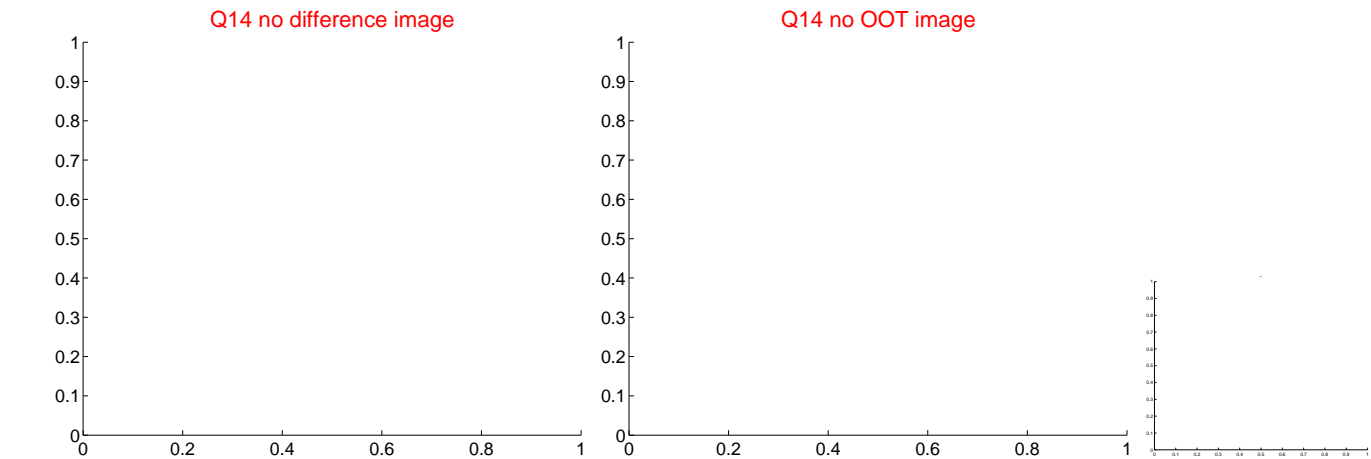
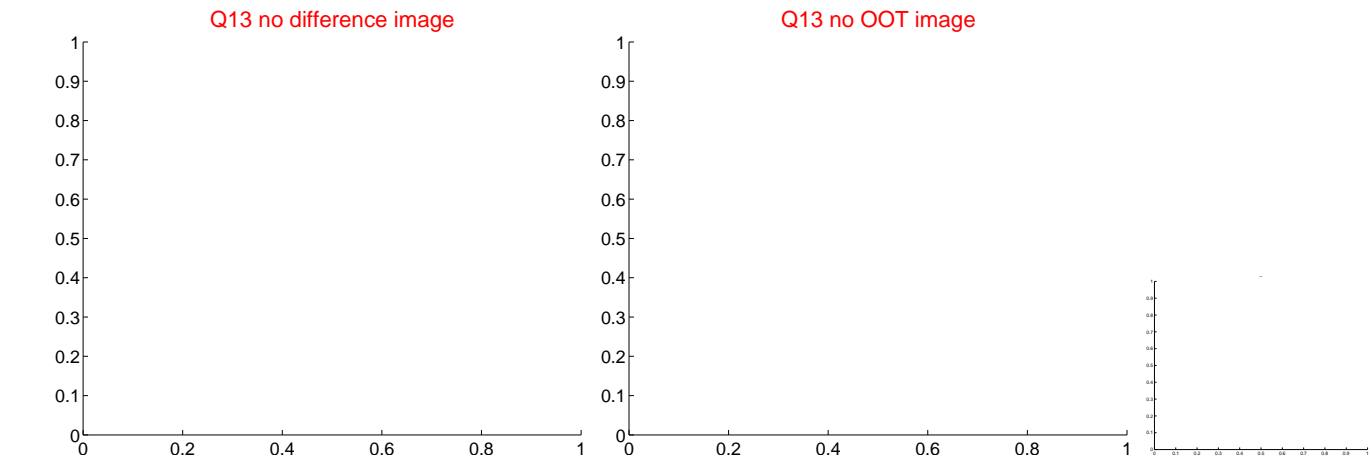
Q12 no difference image



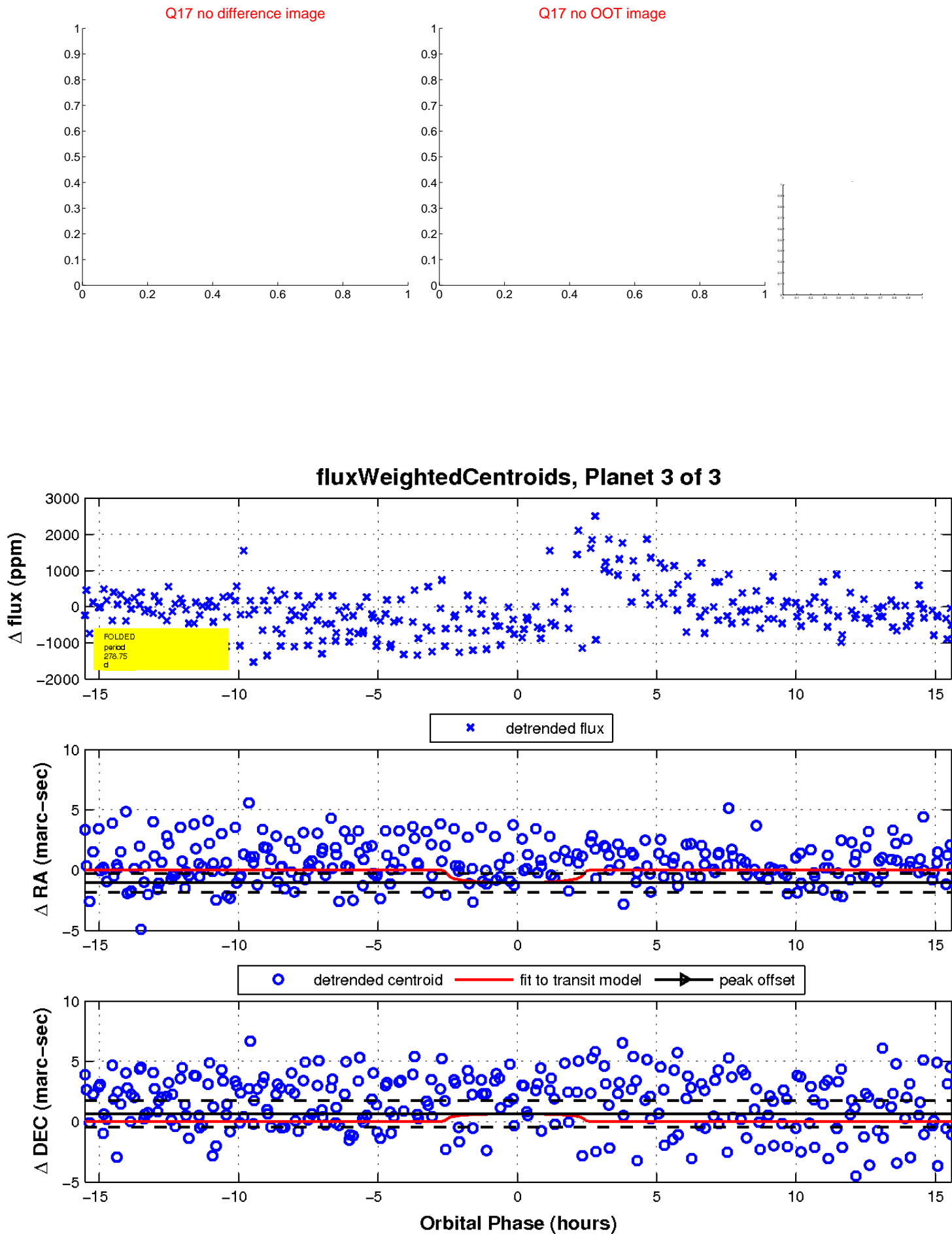
Q12 no OOT image



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



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



UKIRT Image

