

KIC 002140782

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})
002140782-01	OBS	No	2.099245	132.422800	37.9	12.425	7.5	5.5	0.60	5068	0.37	294.66
002140782-02	OBS	No	327.400231	266.831494	575.9	59.925	11.5	5.4	0.60	5068	1.49	0.35
002140782-03	OBS	No	119.461129	206.974121	984.7	3.069	8.3	8.6	0.60	5068	2.09	1.35
002140782-04	OBS	No	111.962601	138.993343	1059.3	2.920	7.9	8.3	0.60	5068	2.29	1.47
002140782-05	OBS	No	135.864497	246.661959	1071.8	5.073	7.4	7.9	0.60	5068	3.91	1.13
002140782-06	OBS	No	109.652349	185.820052	1395.6	4.525	7.3	7.2	0.60	5068	4.36	1.51

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002140782-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
002140782-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002140782-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002140782-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002140782-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
002140782-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_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.

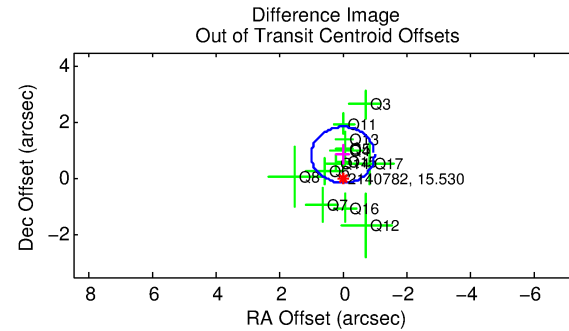
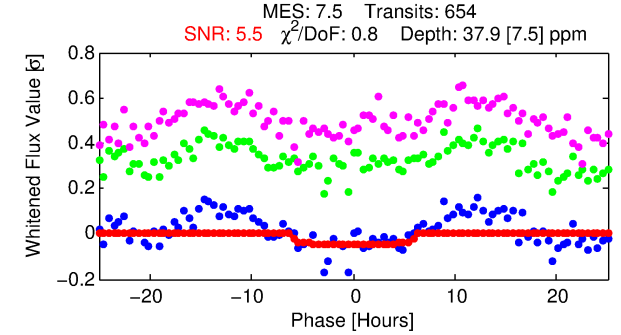
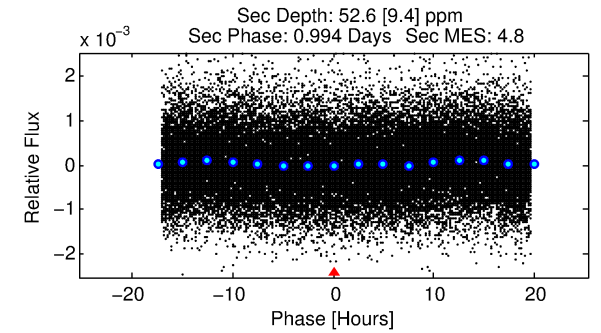
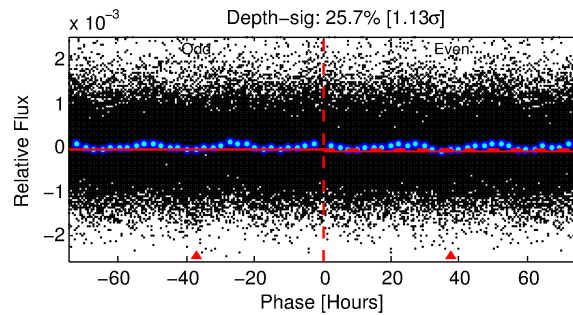
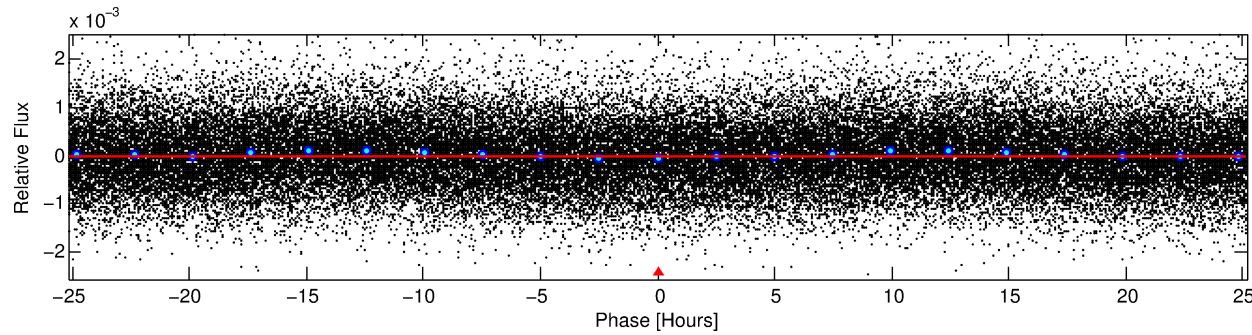
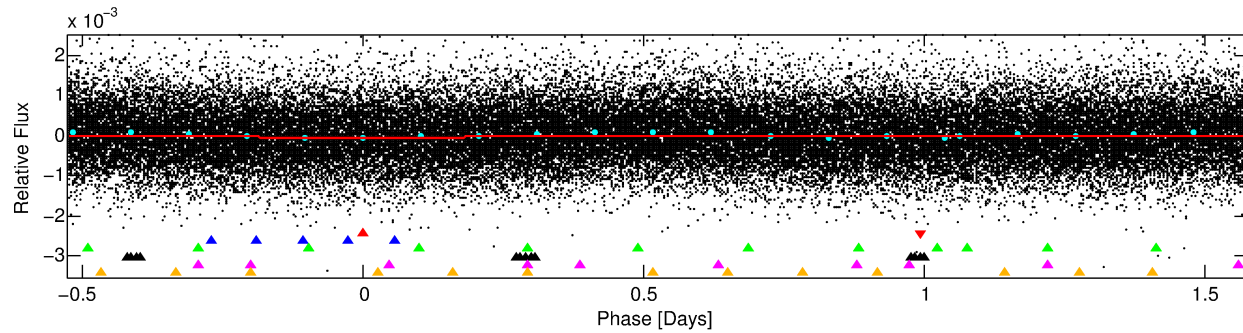
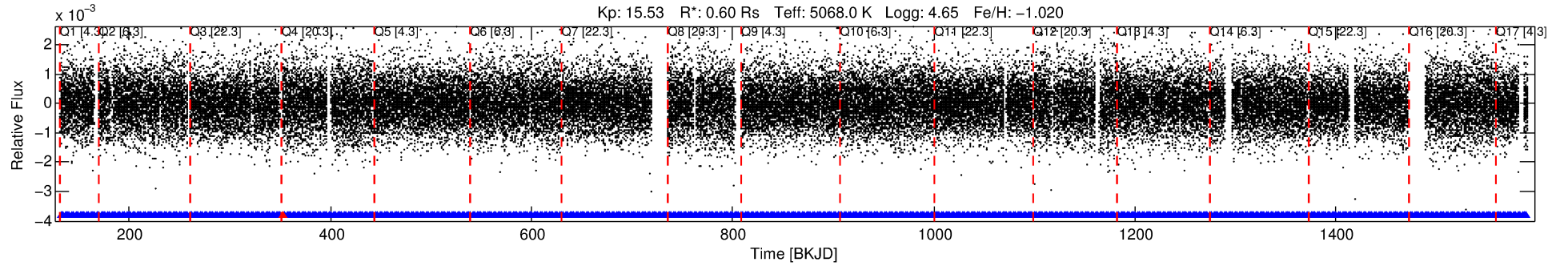
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002140782-01

No Significant Match Found

DV One-Page Summary

KIC: 2140782 Candidate: 1 of 6 Period: 2.099 d



DV Fit Results:

Period = 2.09925 [0.00008] d
Epoch = 132.4228 [0.0220] BKJD
Rp/R* = 0.0056 [0.0202]
a/R* = 1.44 [11.34]
b = 0.05 [308.77]
Seff = 294.66 [46.17]
Teq = 1056 [41] K
Rp = 0.37 [1.34] Re
a = 0.0271 [0.0018] AU
Ag = 158.05 [1152.49] [0.14 σ]
Teffp = 5792 [10558] K [0.45 σ]

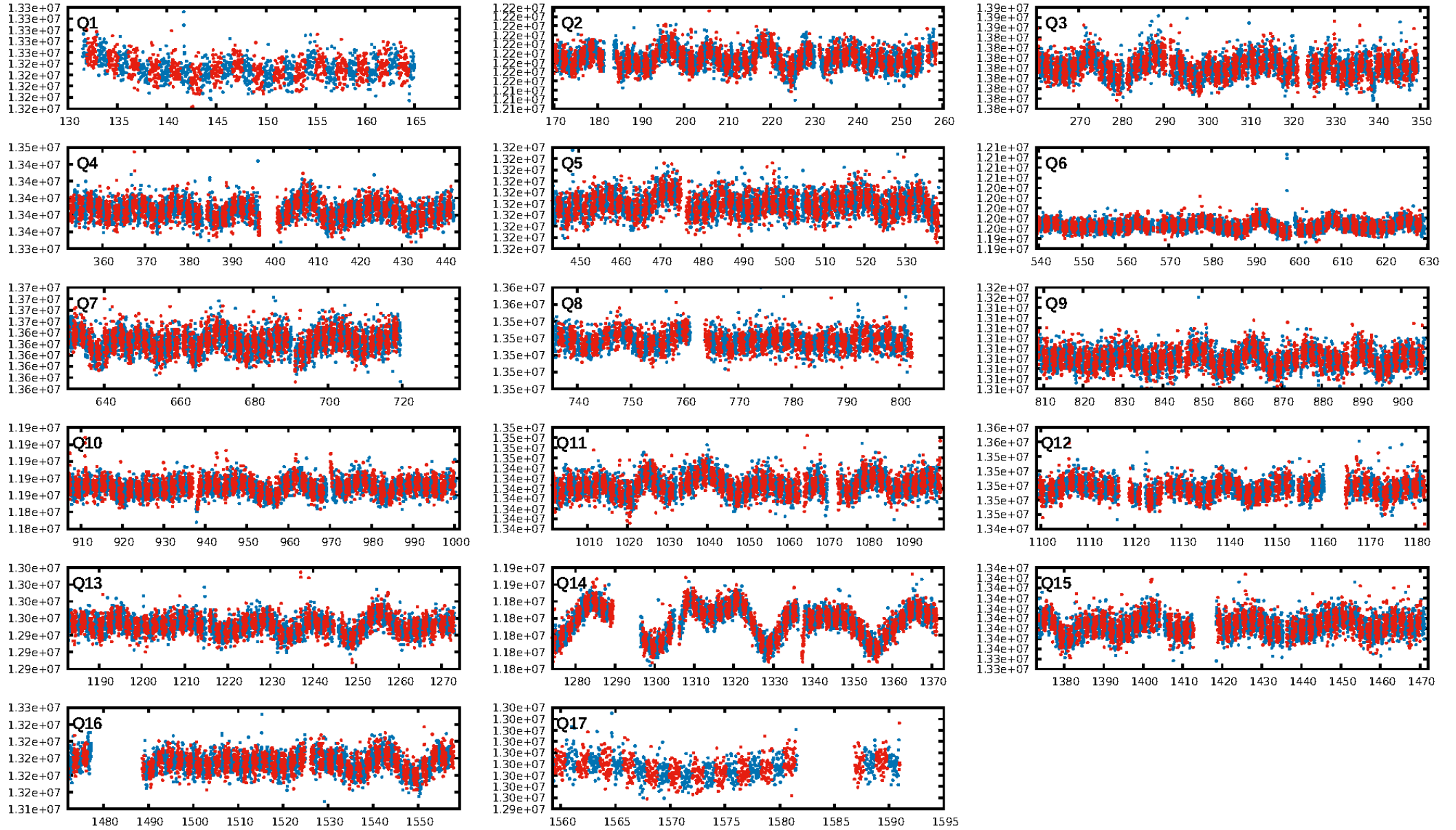
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [195.20 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.62e-13
RollingBand-fgt: 1.00 [624/625]
GhostDiagnostic-chr: 3.259
Centroid-sig: 17.9%
Centroid-so: 1.601 arcsec [0.64 σ]
OotOffset-rm: 0.846 arcsec [2.55 σ]
KicOffset-rm: 0.855 arcsec [2.87 σ]
OotOffset-st: 2/4/4/3 [13]
KicOffset-st: 2/4/4/3 [13]
DiffImageQuality-fgm: 0.92 [12/13]
DiffImageOverlap-fno: 1.00 [17/17]

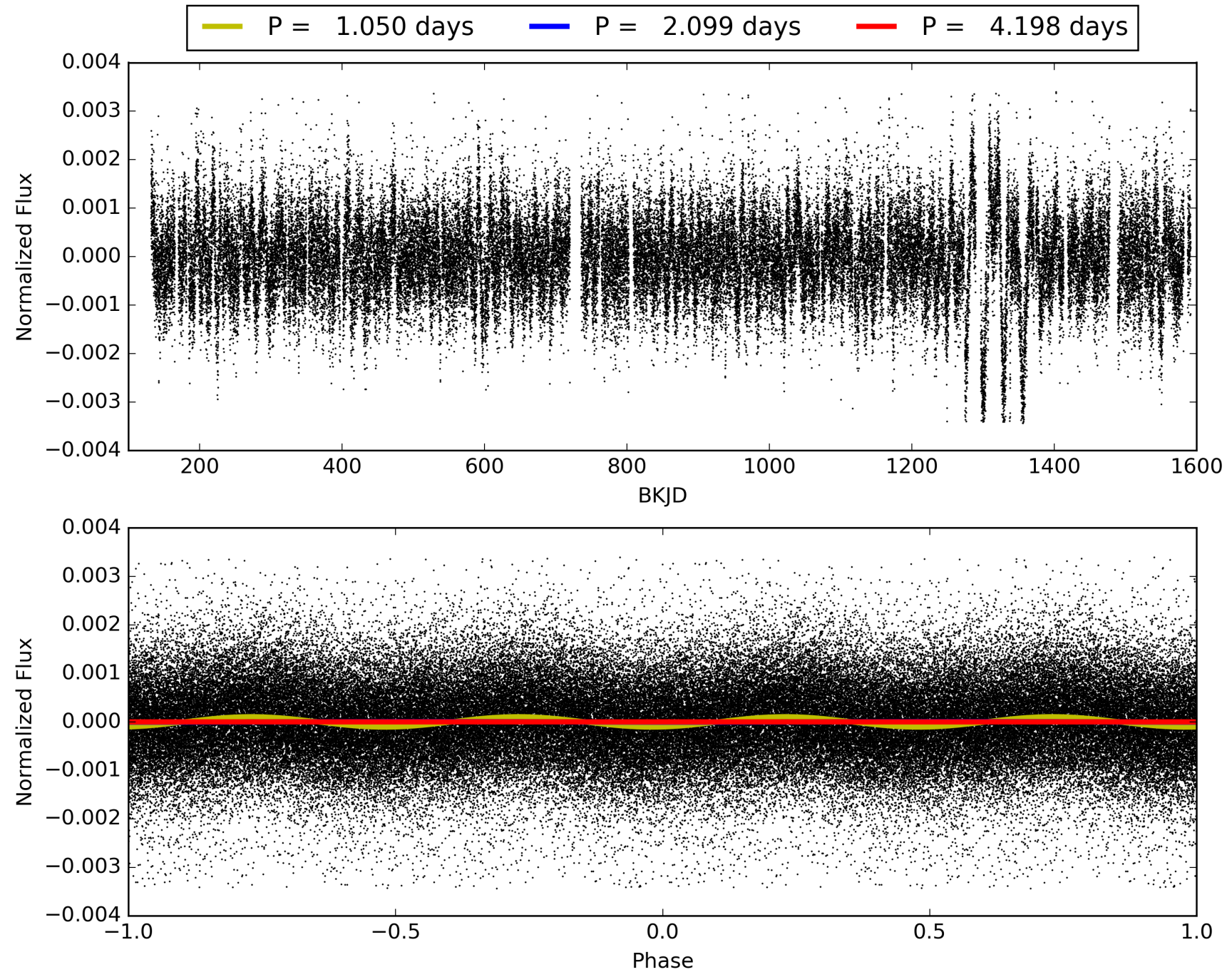
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:38:44 Z

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

TCE 002140782-01, PDC Light Curves

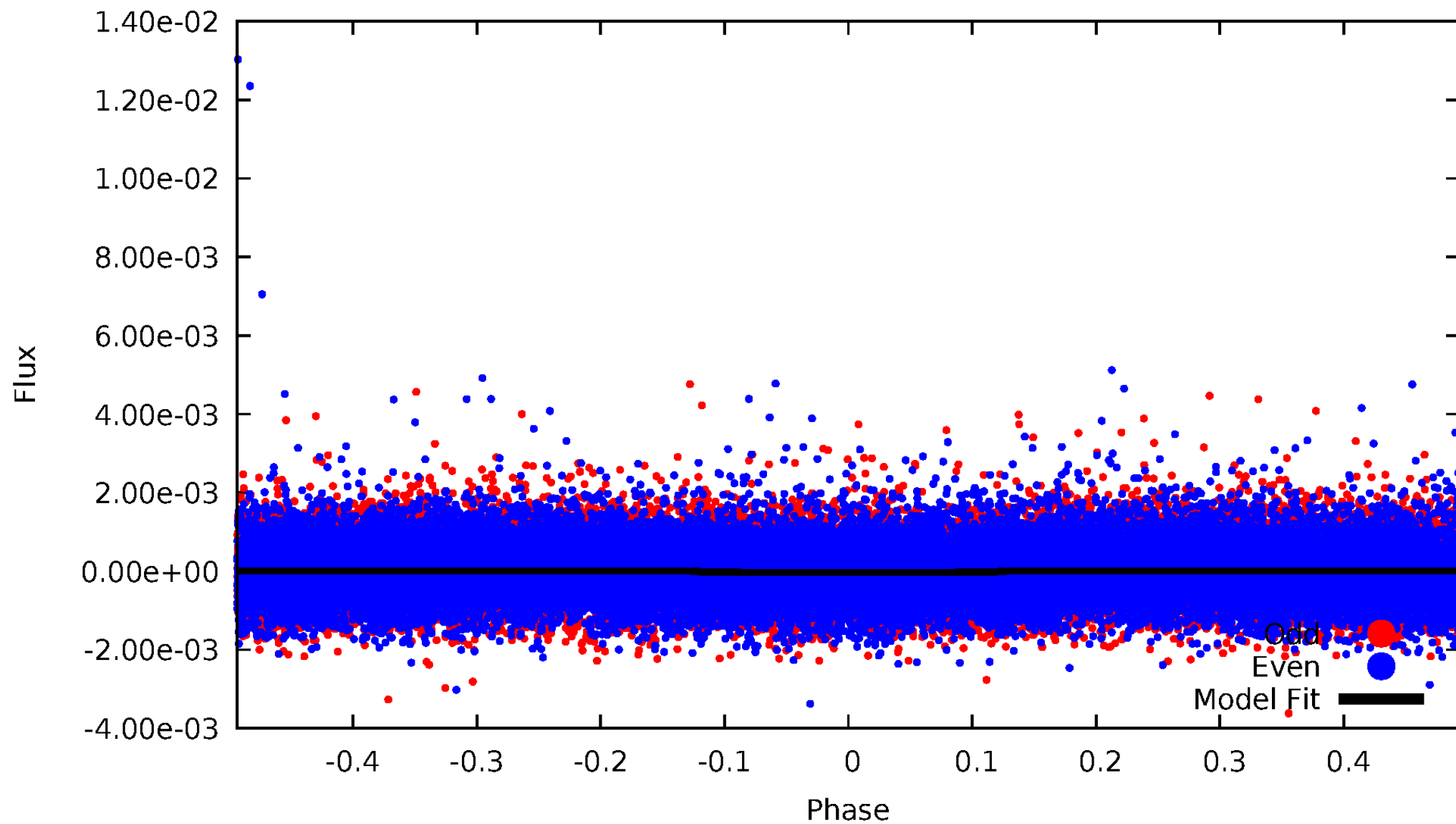


TCE 002140782-01



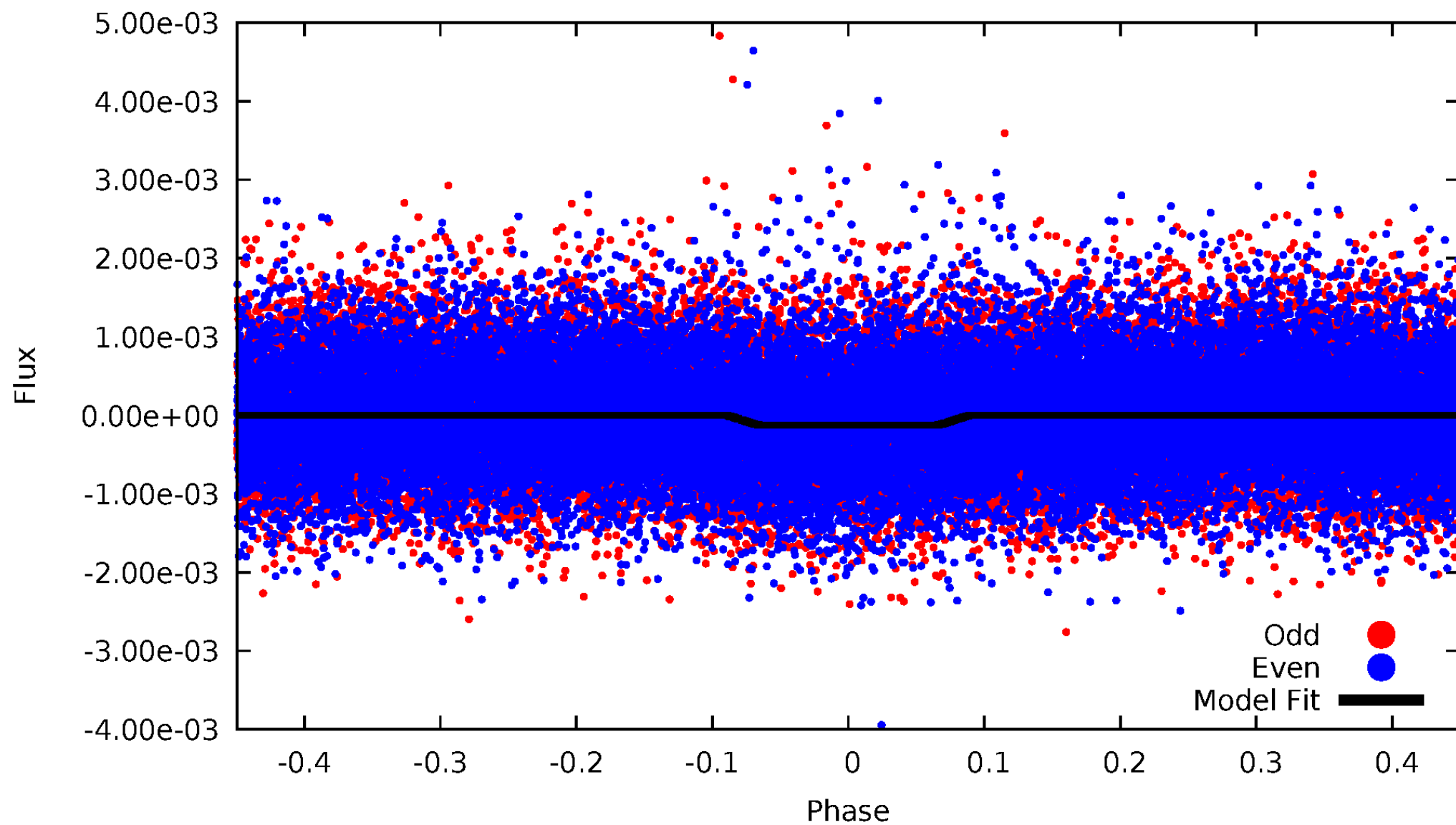
DV Odd/Even

TCE 002140782-01

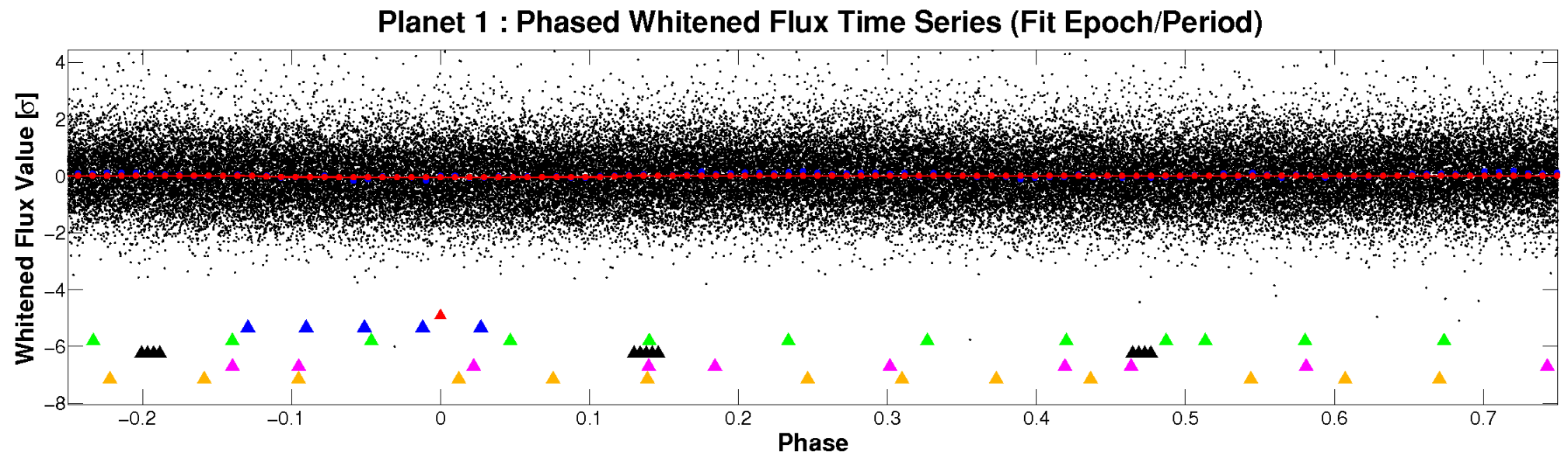
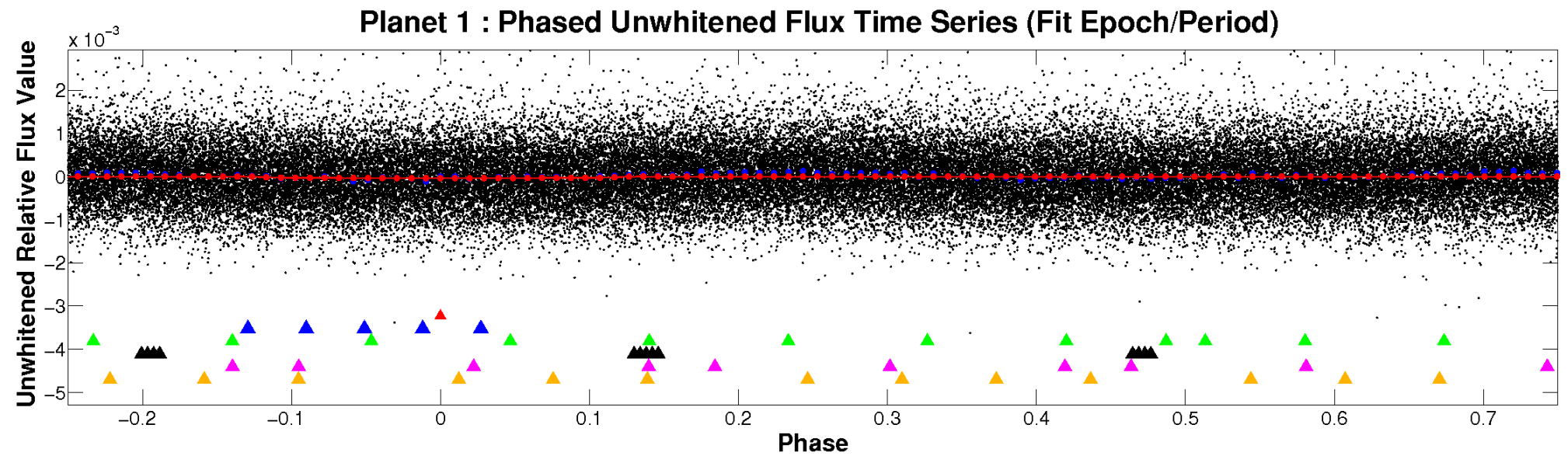


ALT Odd/Even

TCE 002140782-01

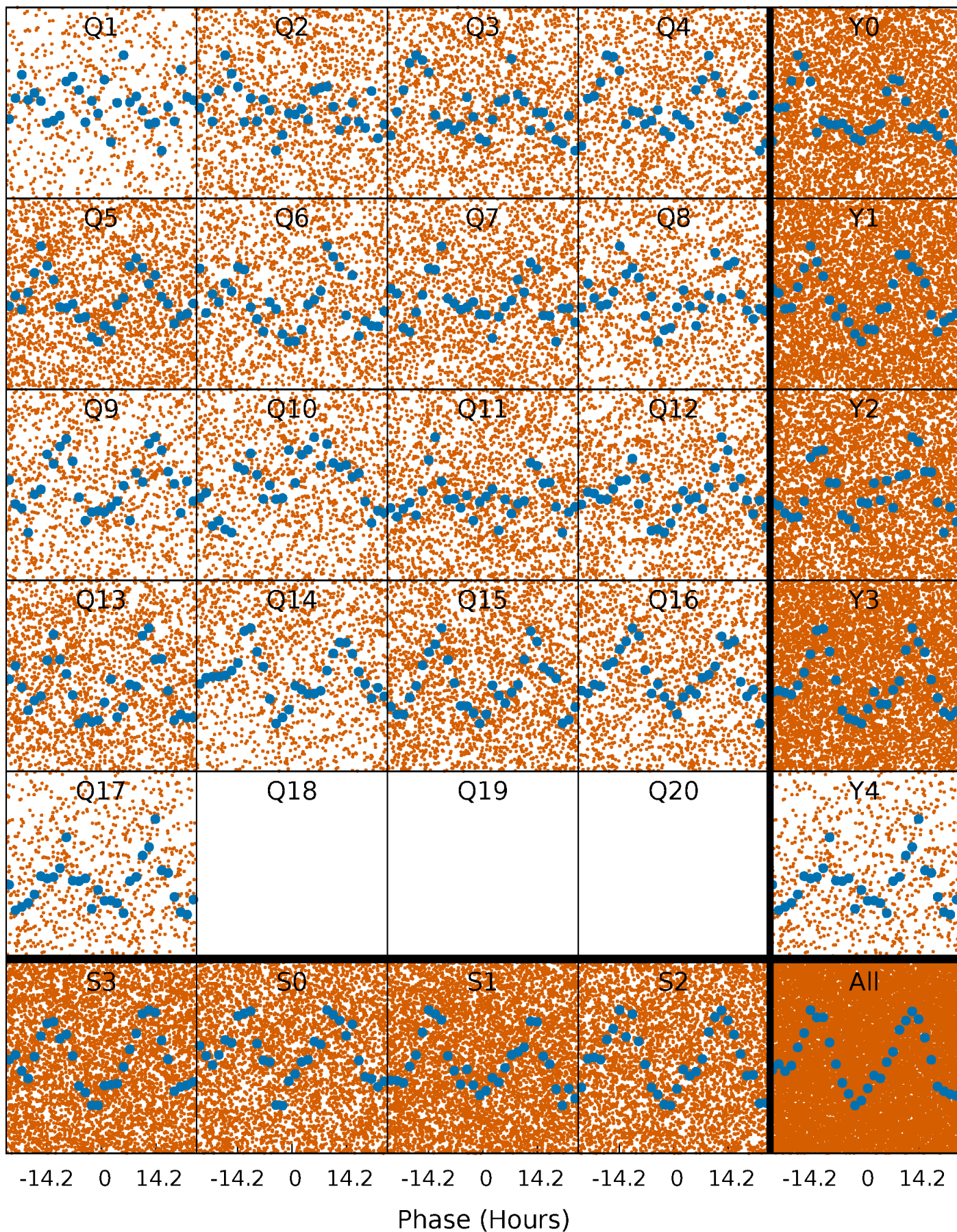


Non-Whitened Vs. Whitened Light Curve



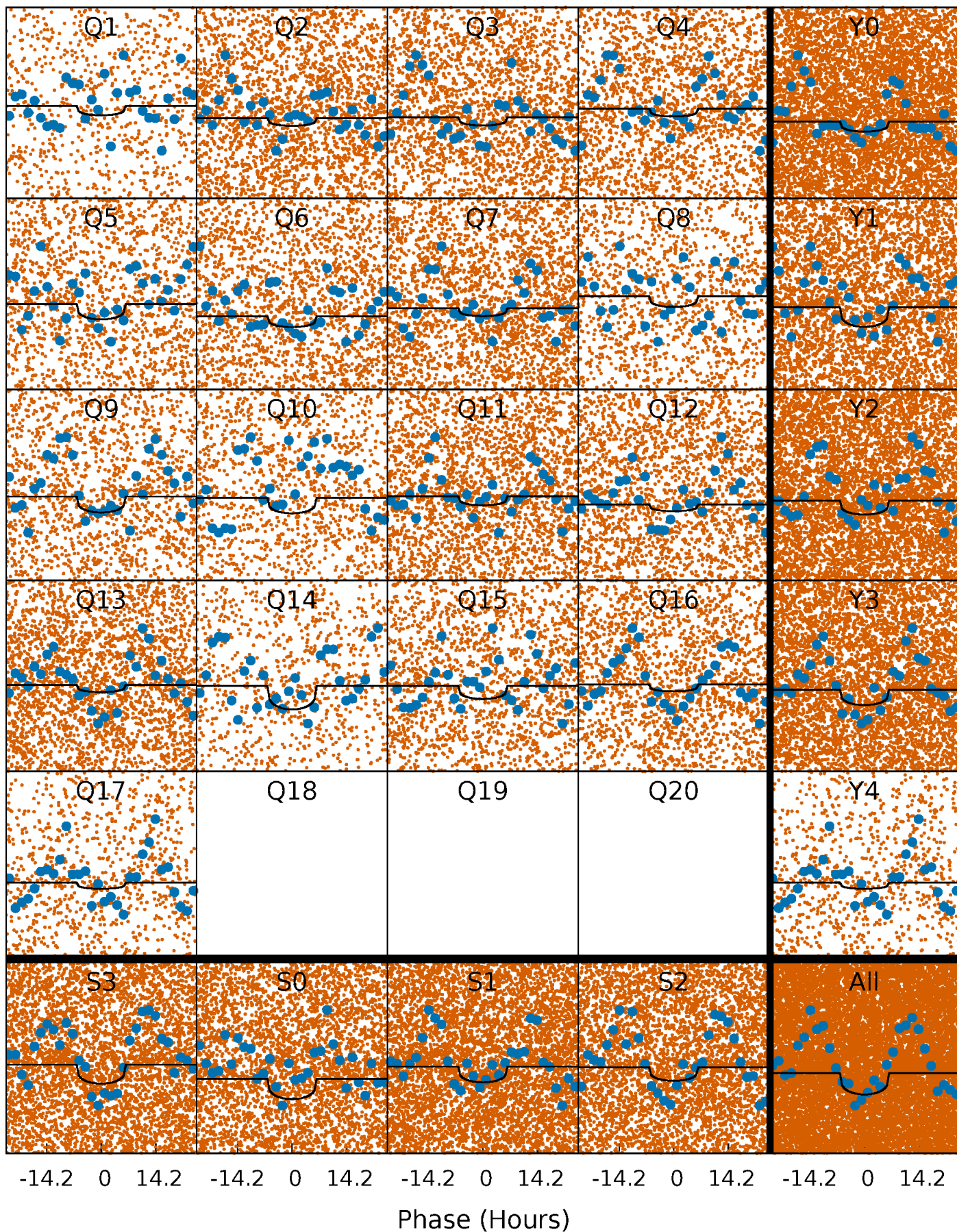
PDC Quarter-Phased Transit Curves

TCE 002140782-01 P= 2.099245 Days $T_0=132.422800$ (BKJD)



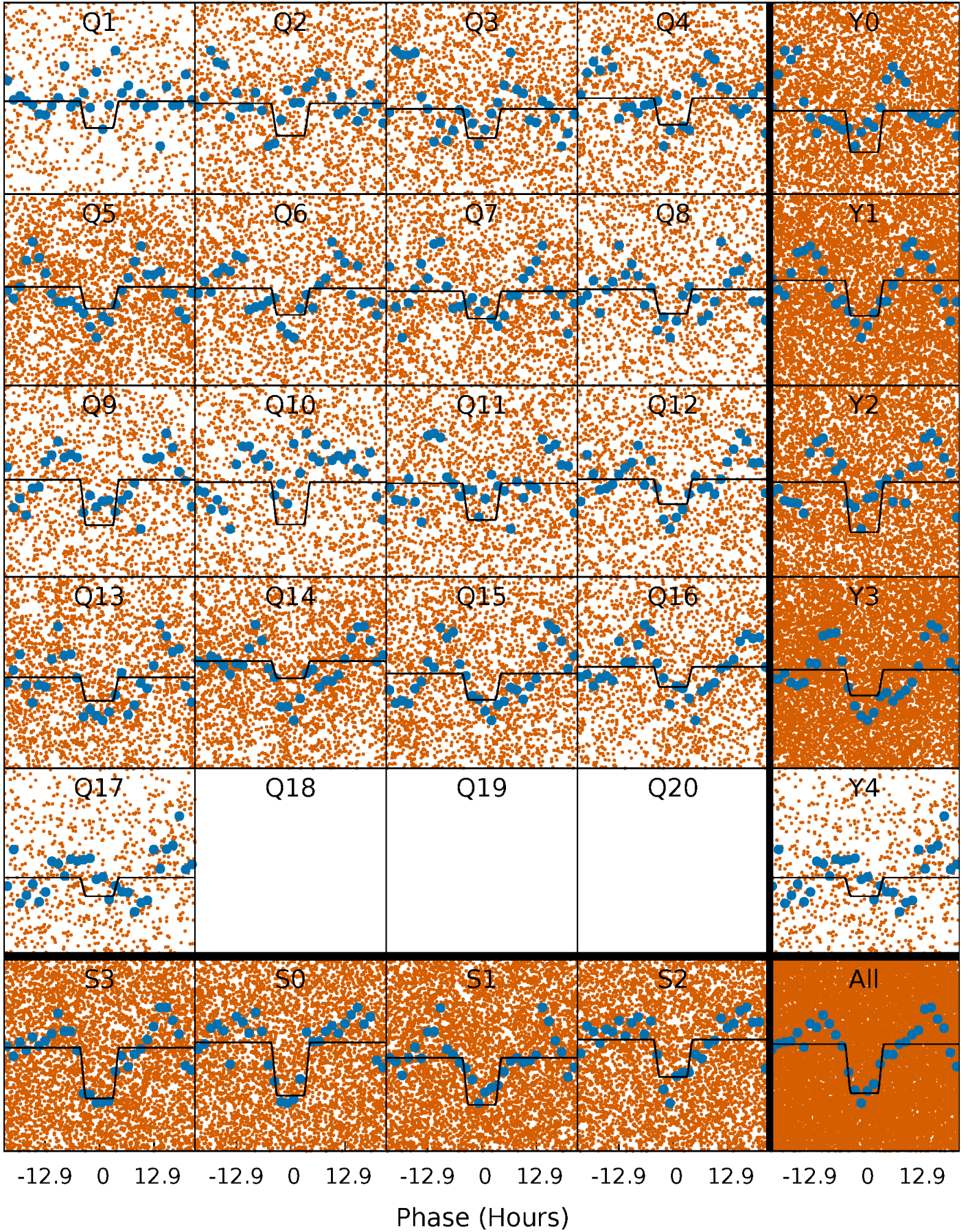
DV Quarter-Phased Transit Curves

TCE 002140782-01 P= 2.099245 Days $T_0=132.422800$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

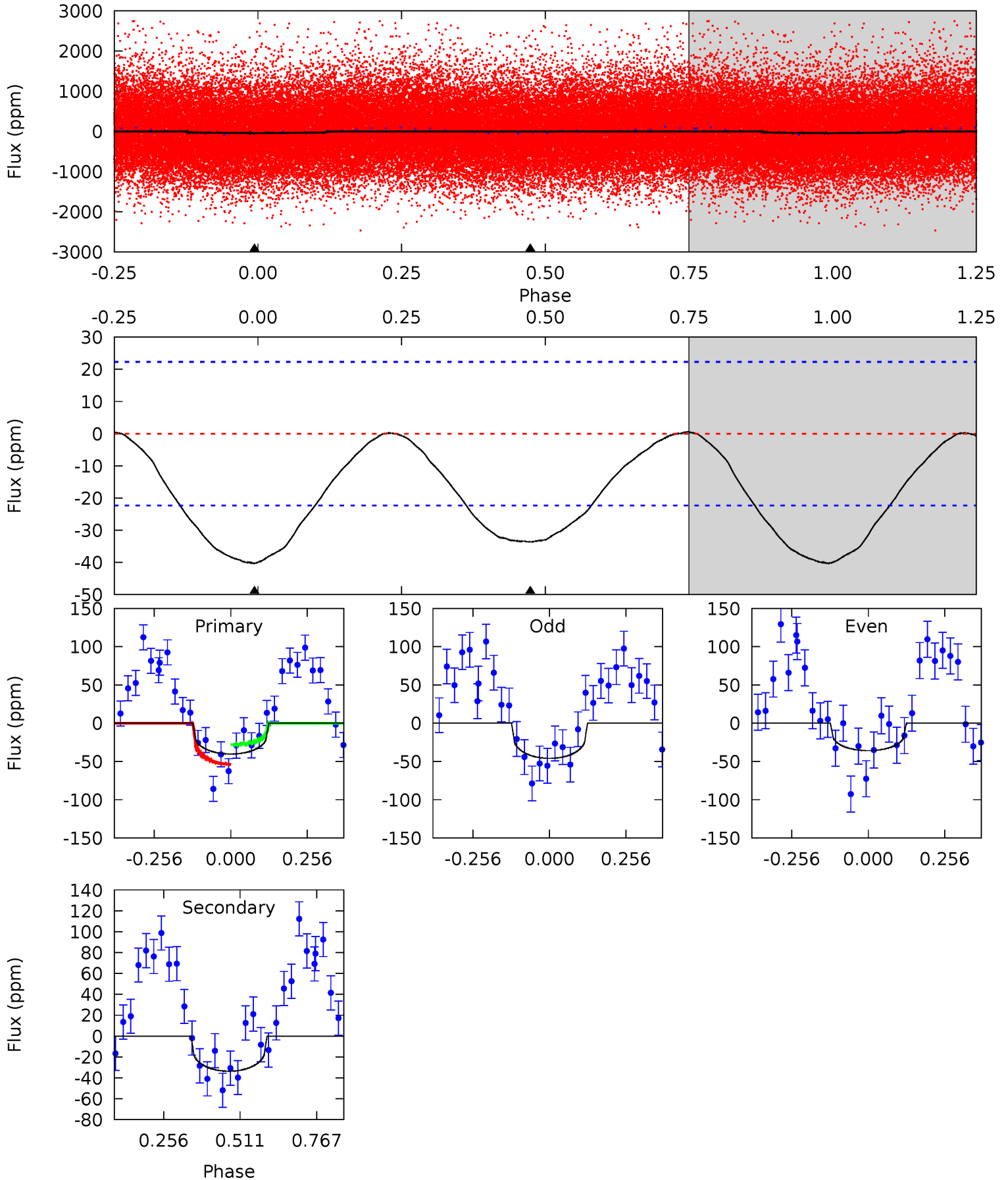
TCE 002140782-01 P= 2.098887 Days $T_0=132.486275$ (BKJD)



DV Model-Shift Uniqueness Test

002140782-01, P = 2.099245 Days, E = 130.323555 Days

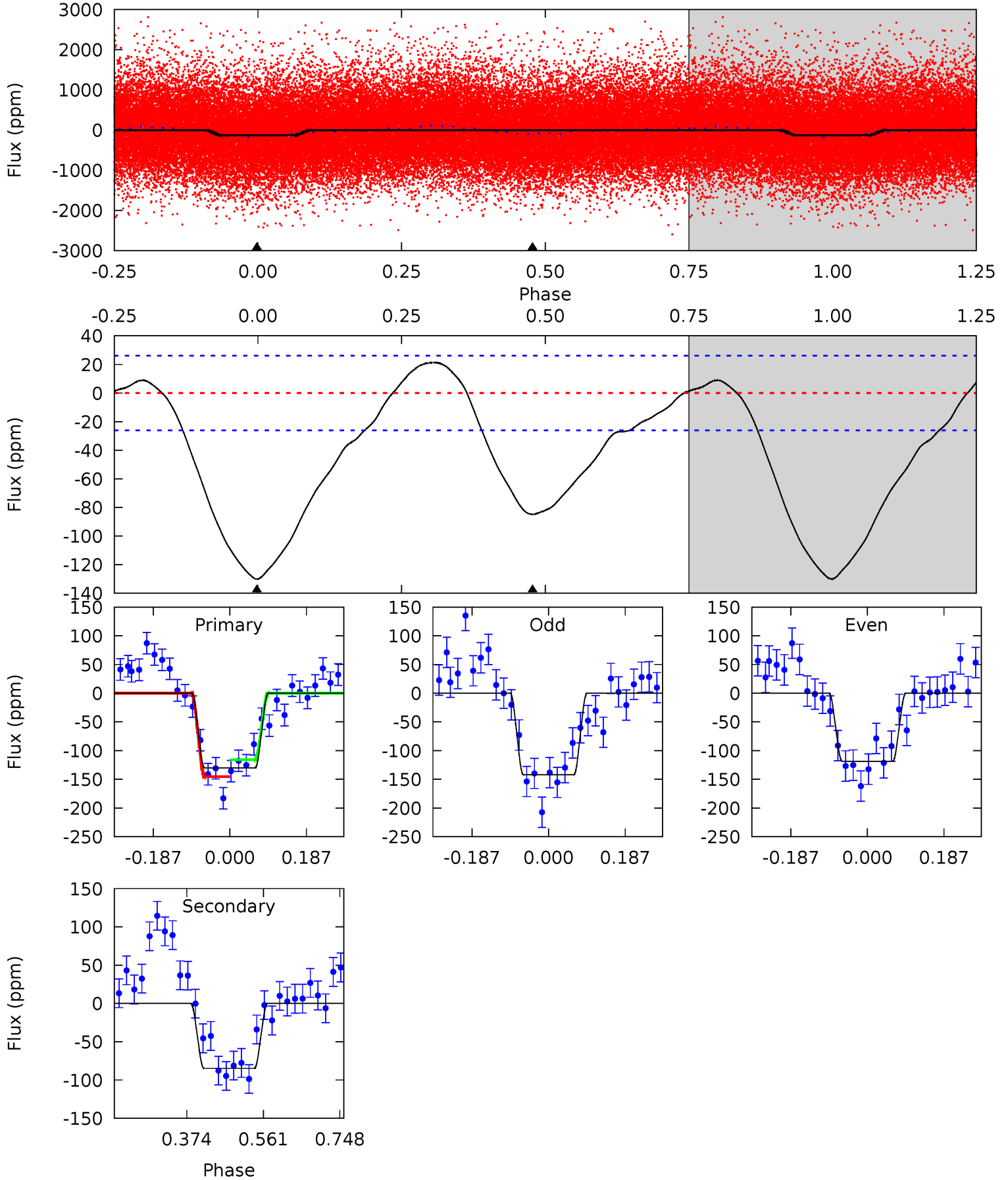
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.87	6.58	0	0	4.36	1.14	0.12	7.87	7.87	6.58	6.58	0.99	0.79	0.01	2.54



Alt Model-Shift Uniqueness Test

002140782-01, P = 2.098887 Days, E = 130.387388 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.1	14.4	0	0	4.43	1.32	2.10	22.1	22.1	14.4	14.4	2.00	0.90	0.14	2.53



Stellar Parameters For KIC 002140782

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5068^{+151}_{-151}	$4.654^{+0.059}_{-0.036}$	$-1.020^{+0.300}_{-0.300}$	$0.605^{+0.042}_{-0.042}$	$0.601^{+0.052}_{-0.022}$	$3.832^{+0.888}_{-0.555}$
	+3%/-3%	+1%/-1%	+29%/-29%	+7%/-7%	+9%/-4%	+23%/-14%
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 002140782-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-34 ± 5	$1.01^{+1.08}_{-0.68}$	1471^{+49}_{-48}	3522^{+1900}_{-697}	13^{+115}_{-10}
Alt.	-85 ± 6	$1.28^{+1.14}_{-0.81}$	1469^{+51}_{-46}	3816^{+1880}_{-731}	21^{+138}_{-15}

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 $A_{obs} \gg 1.0$

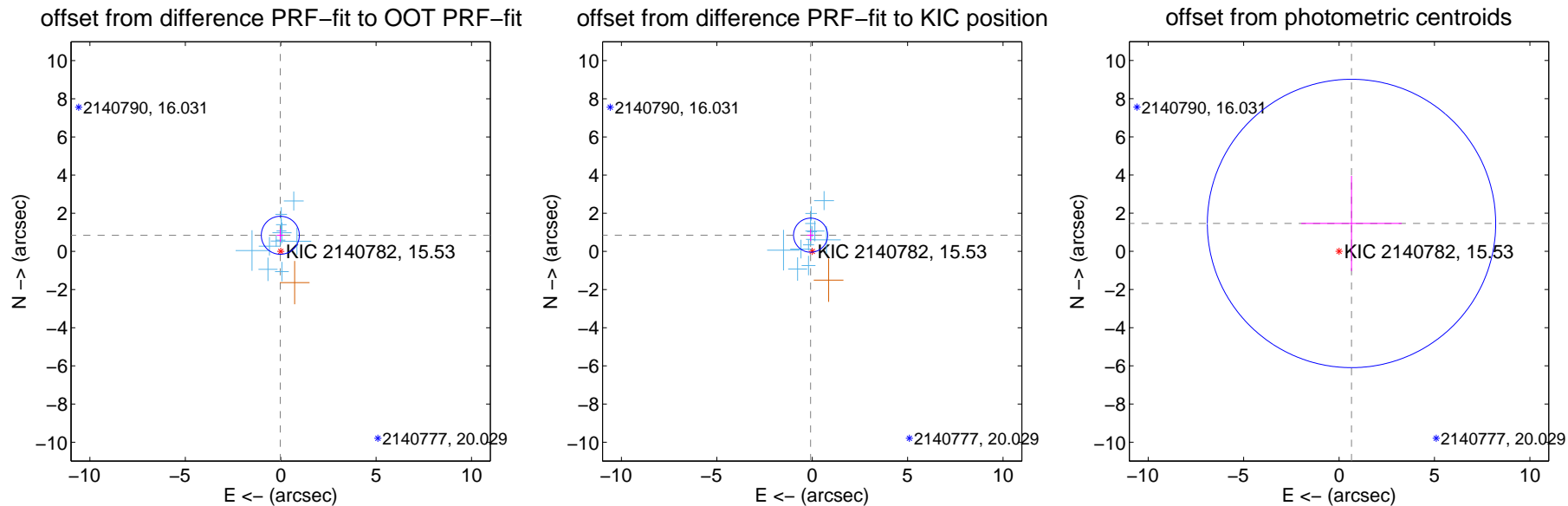
DV Centroid Data

Supplemental centroid analysis for 002140782-01. Kepler magnitude: 15.53. Transit SNR 5.53

There are 12 quarters with good PRF difference image offsets

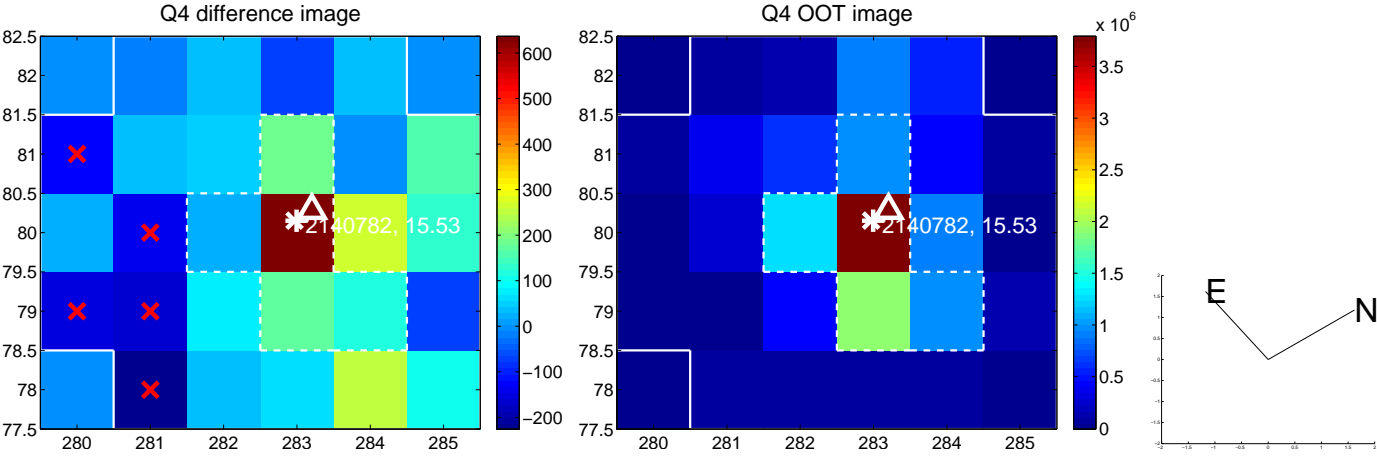
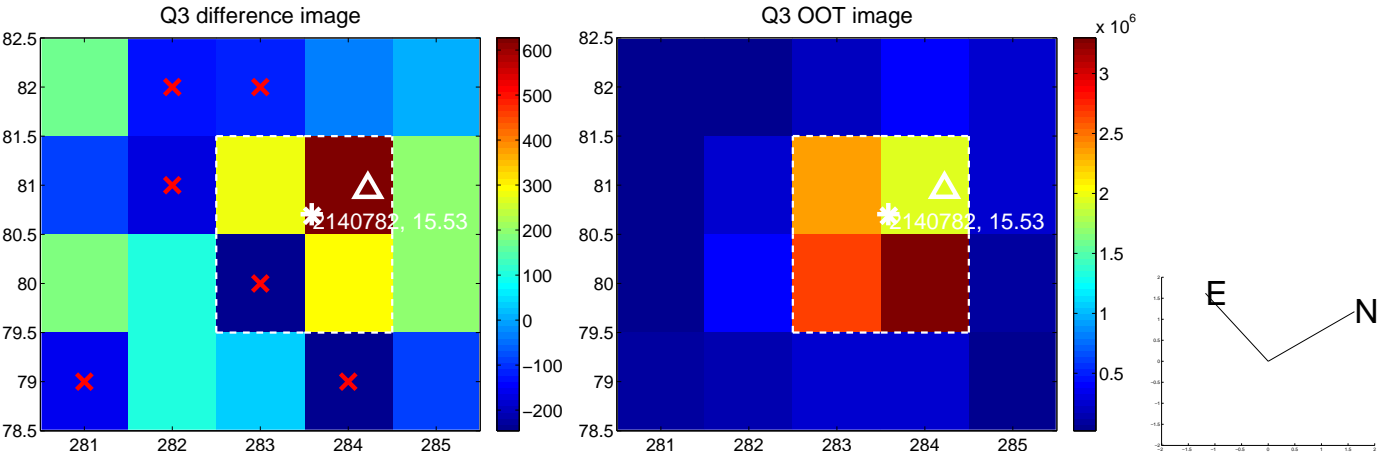
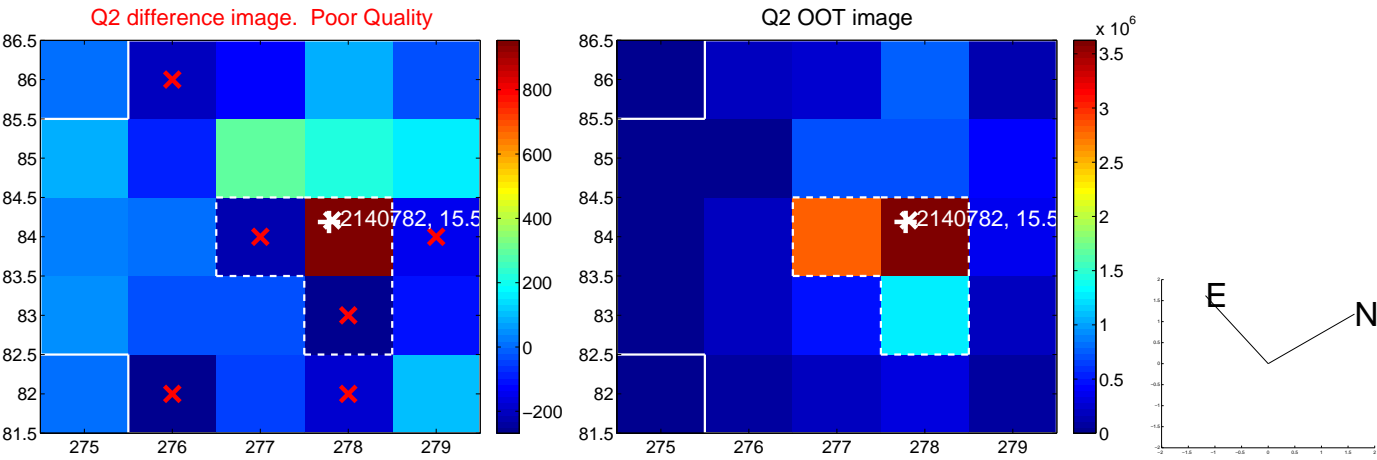
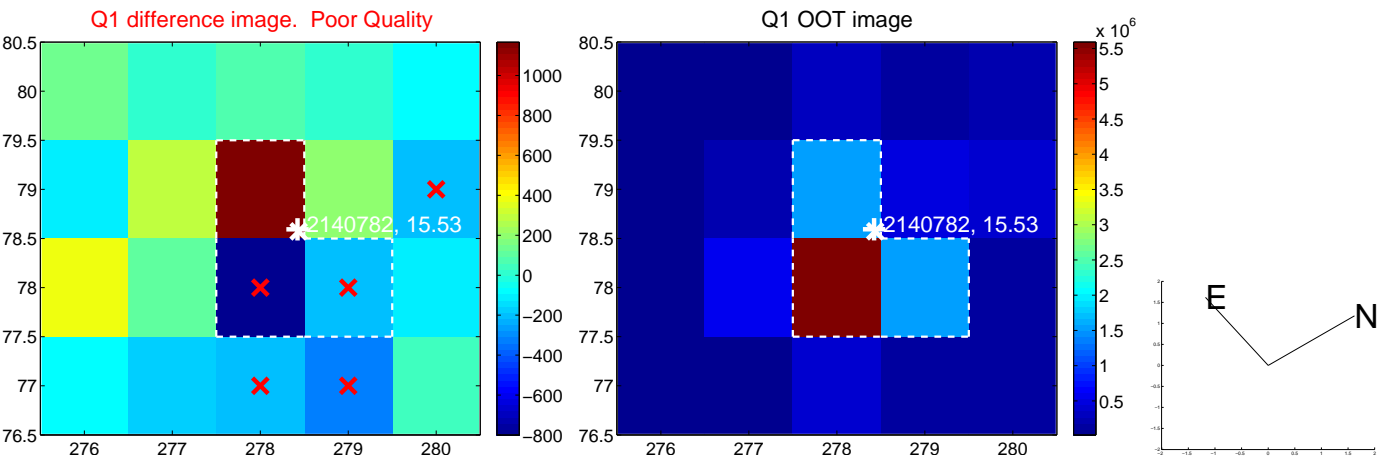
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.846 ± 0.332	2.55	0.021 ± 0.193	0.846 ± 0.333
PRF-fit source offset from KIC position	0.855 ± 0.298	2.87	0.085 ± 0.184	0.851 ± 0.302
photometric centroid source offset	1.60 ± 2.52	0.64	-0.65 ± 2.63	1.46 ± 2.50

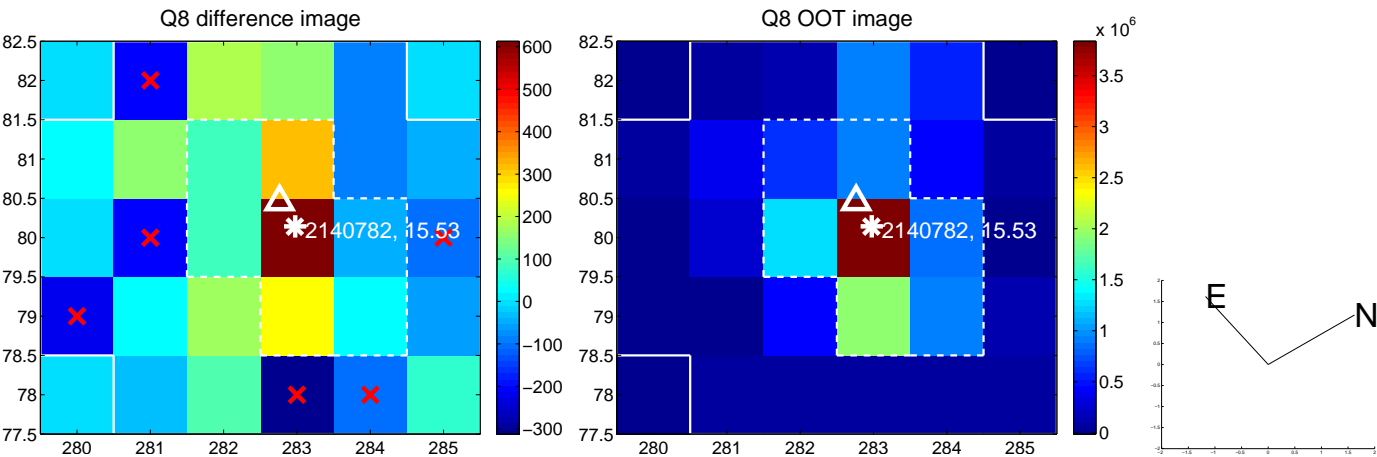
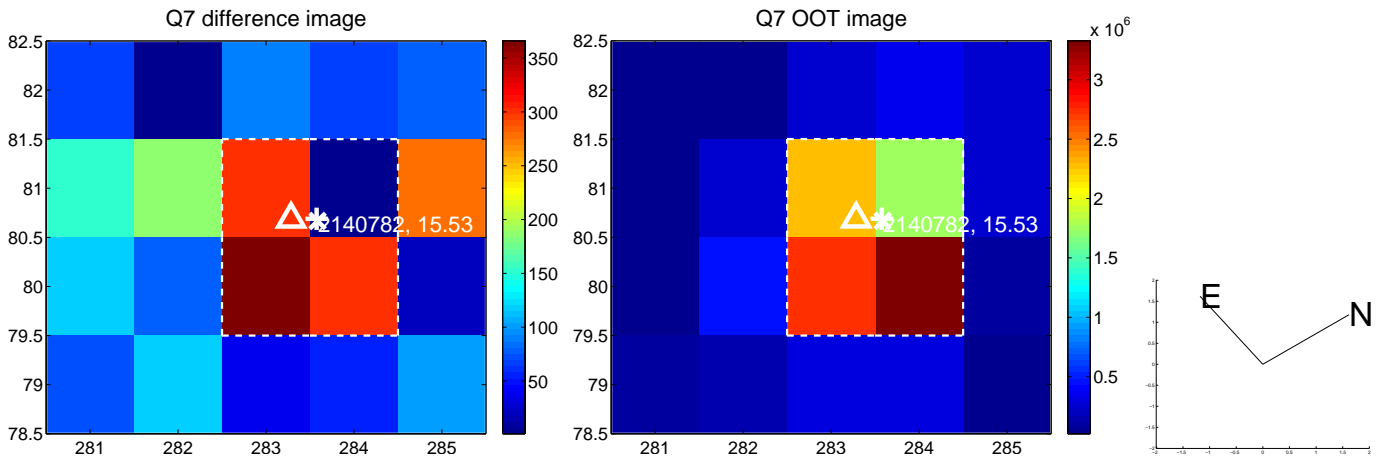
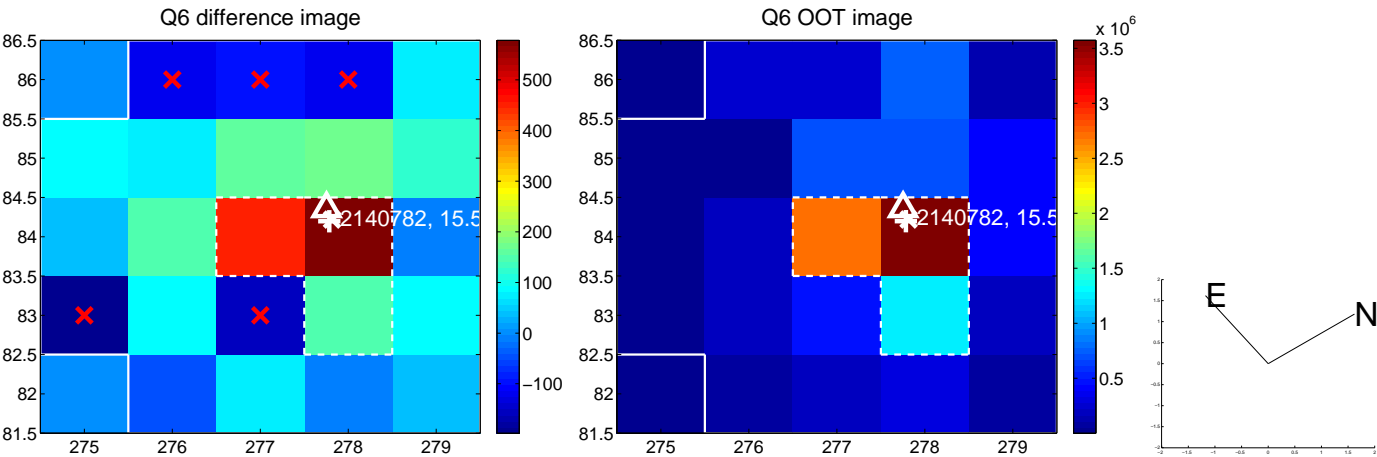
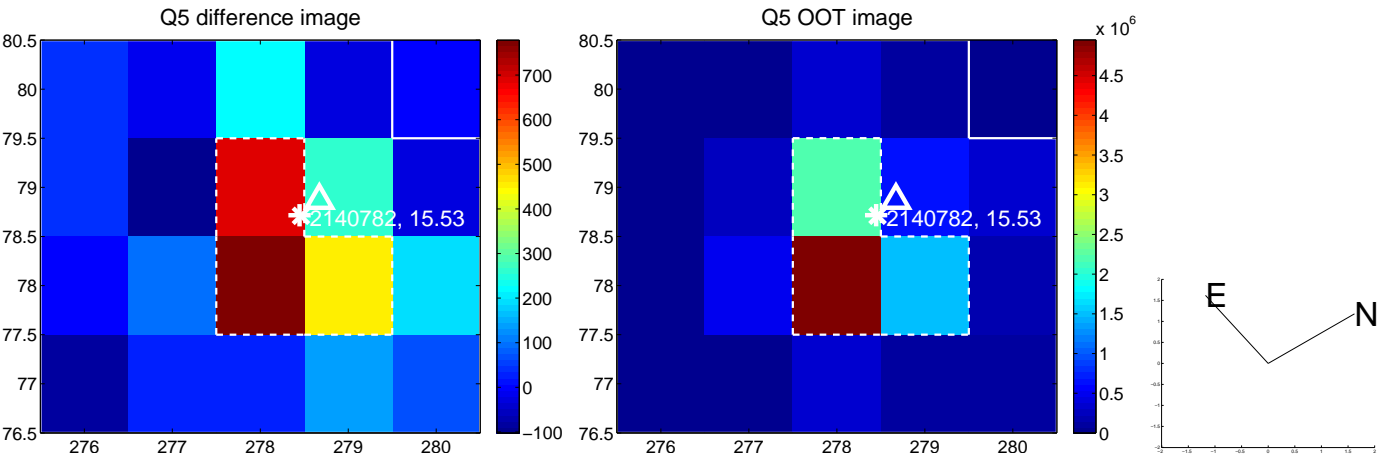


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

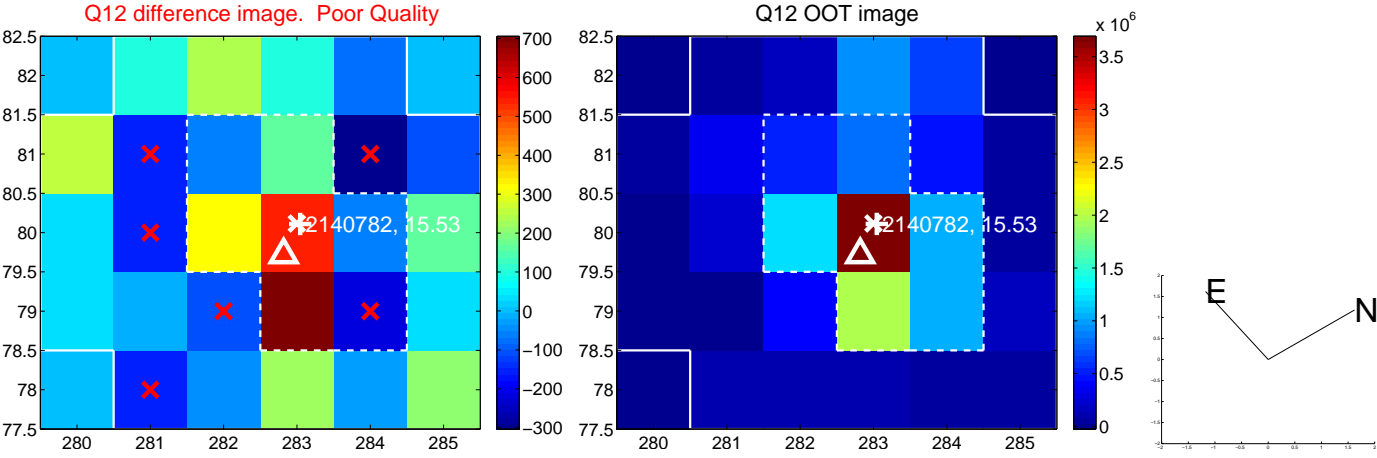
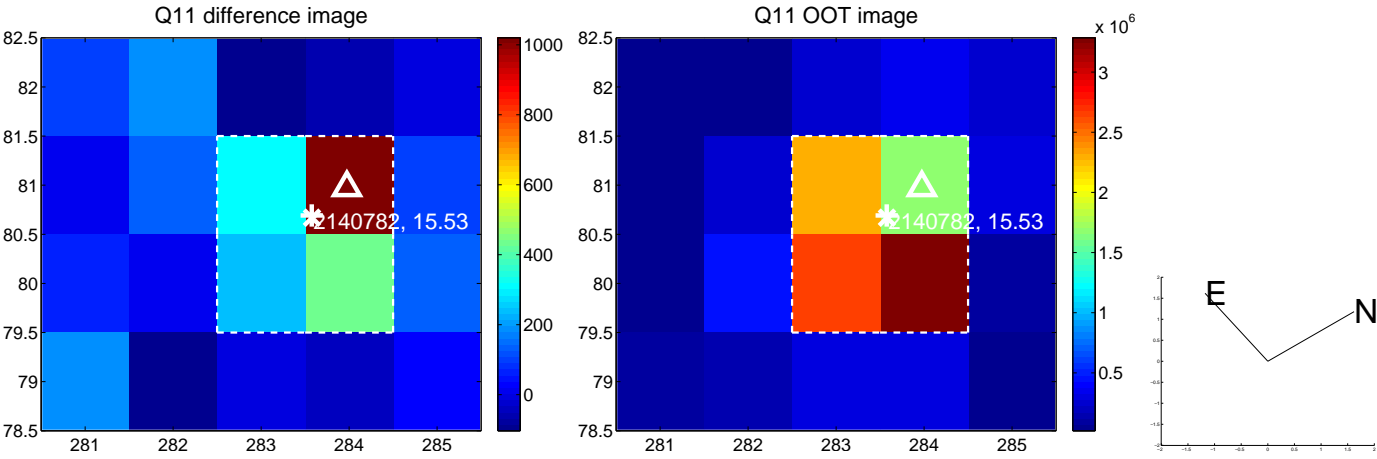
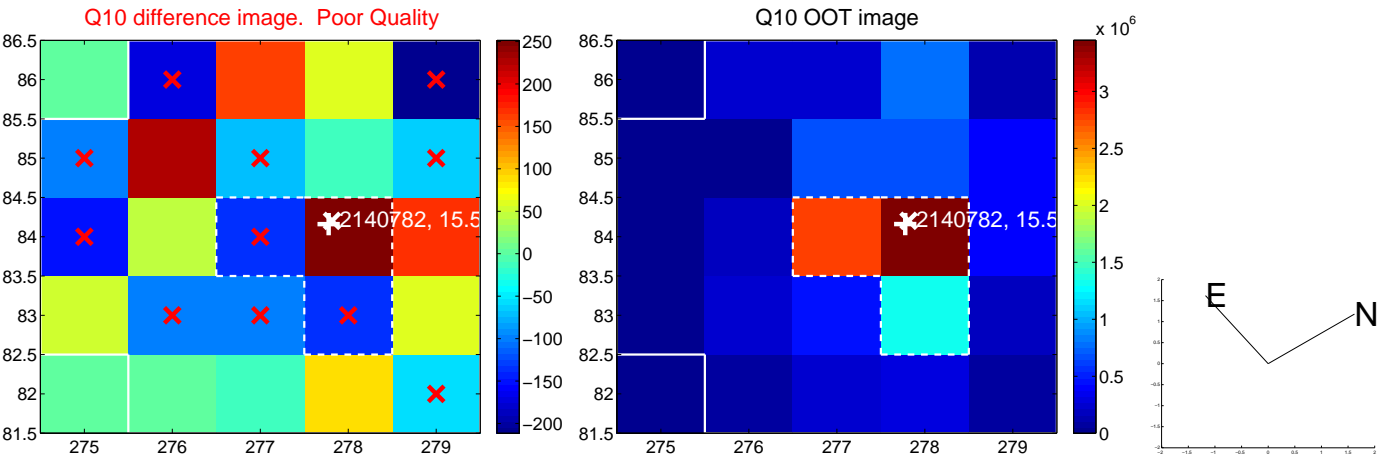
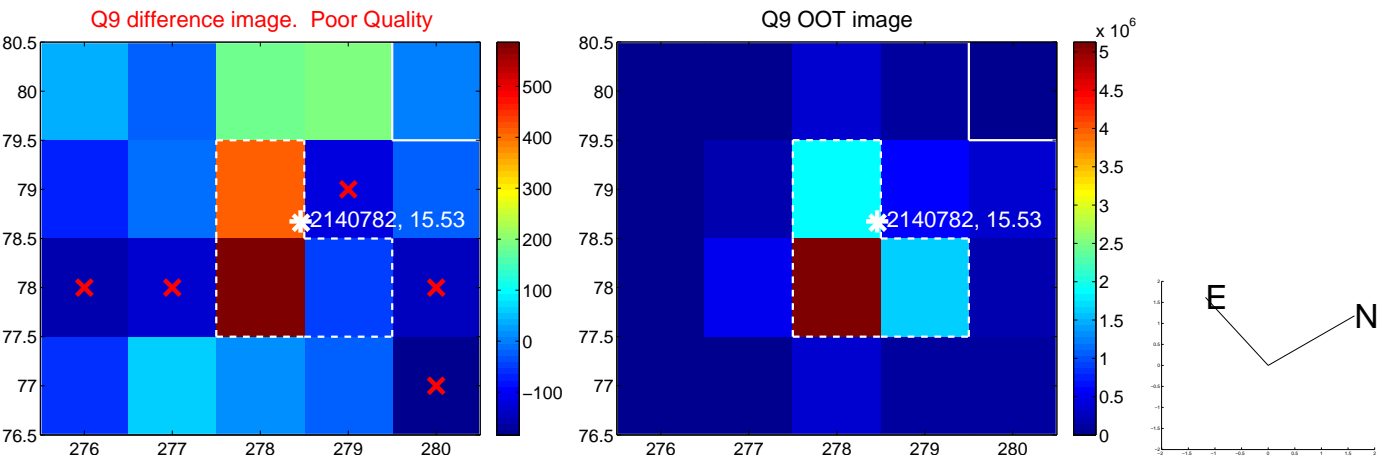
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



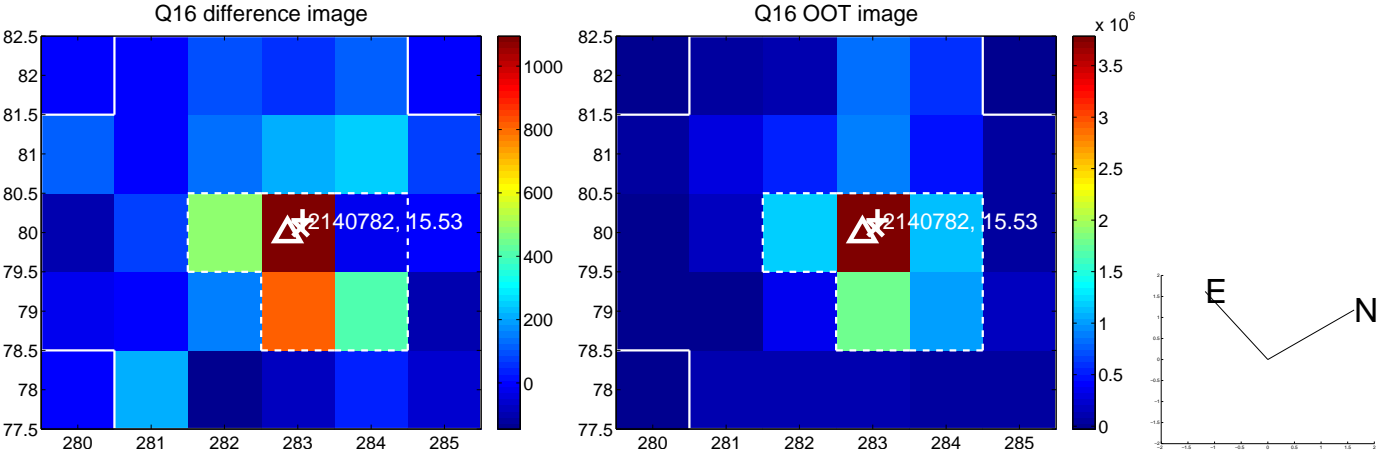
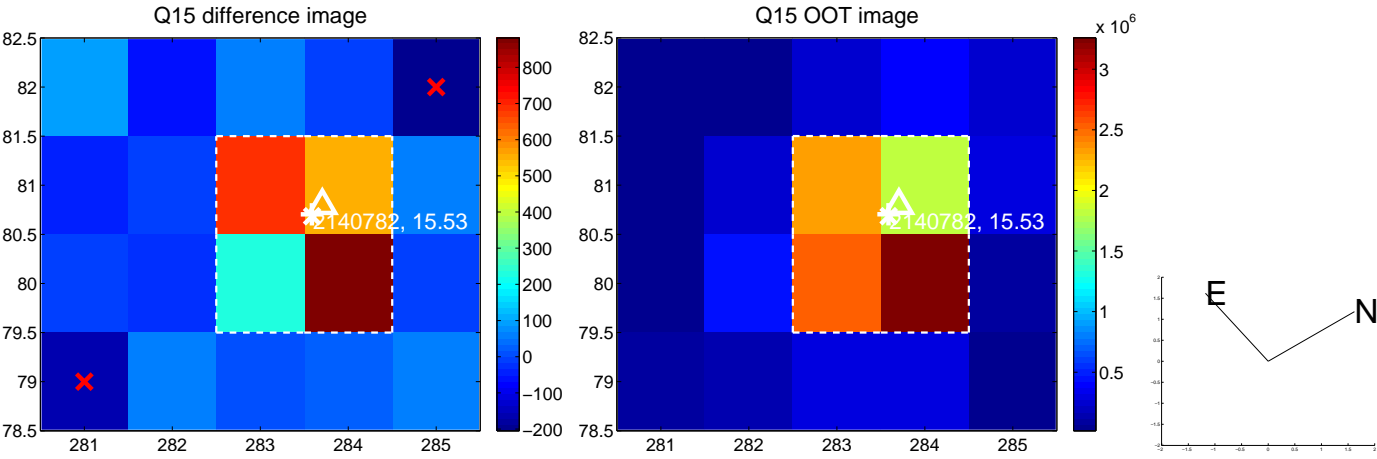
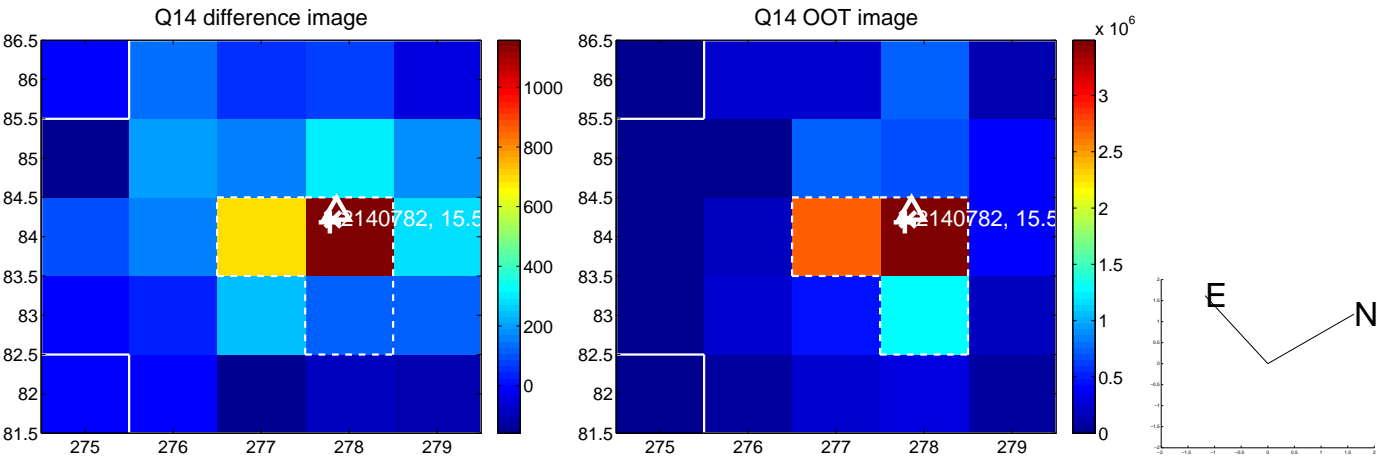
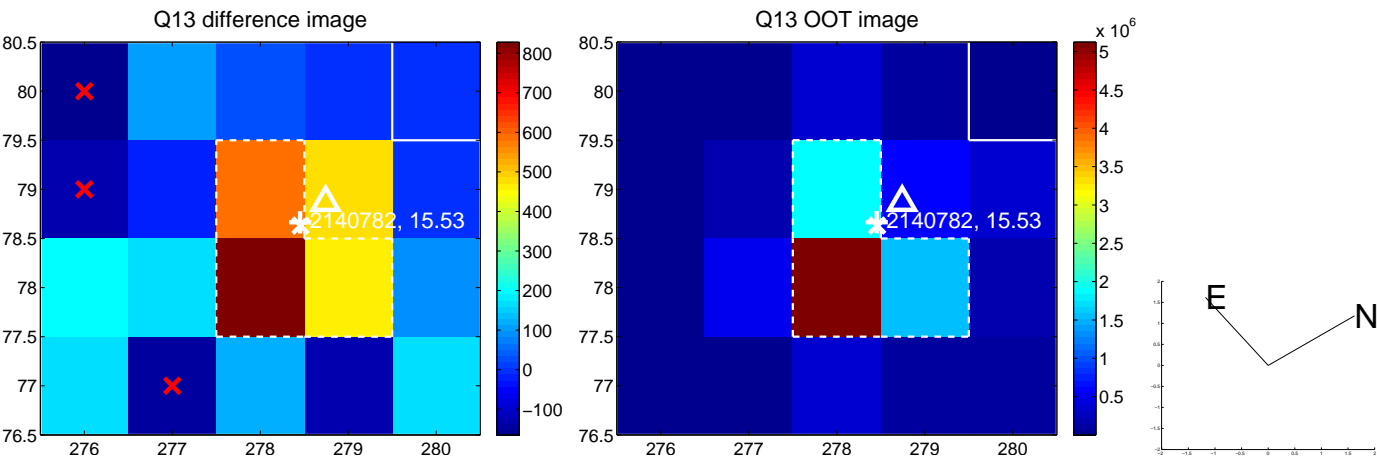
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



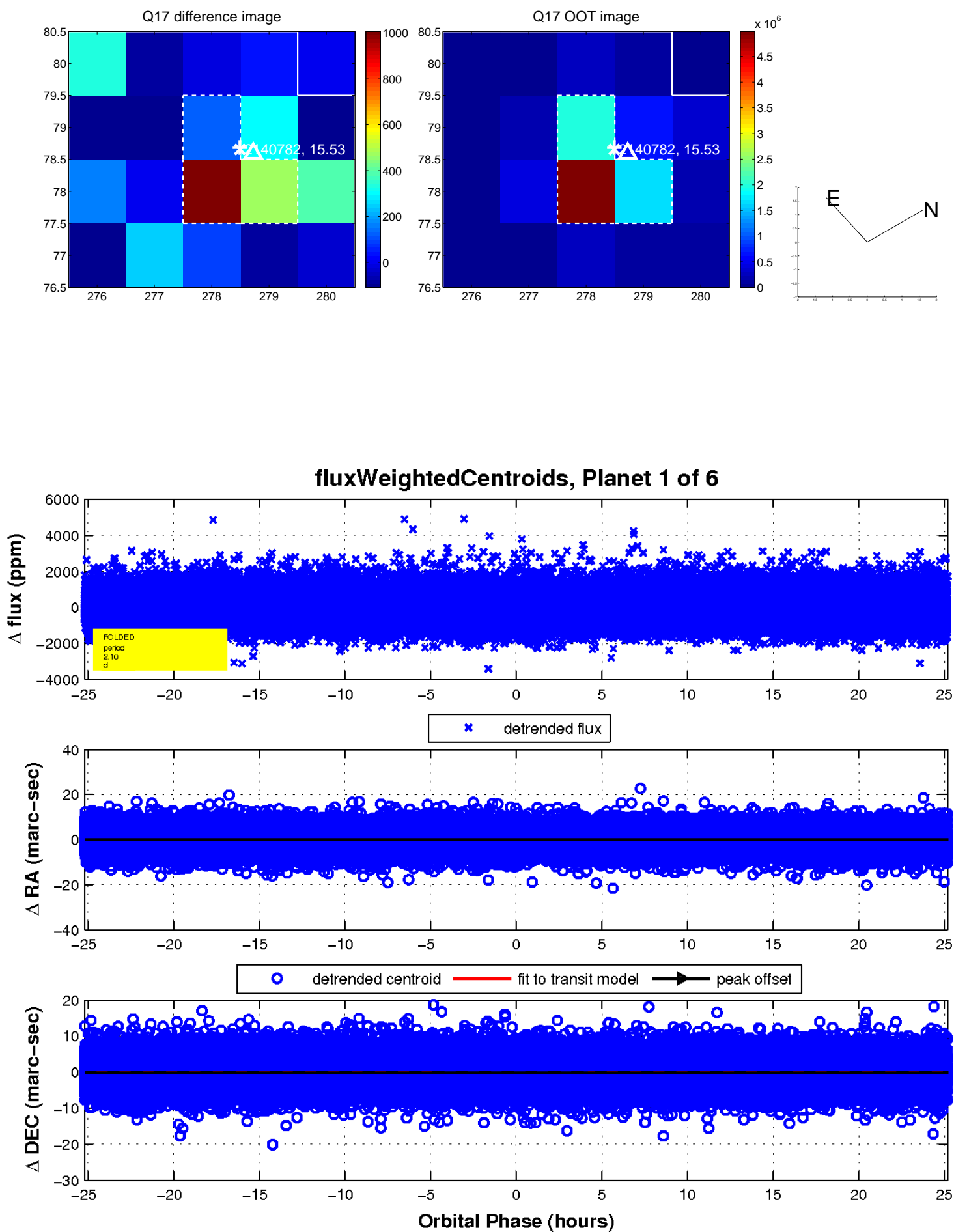
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

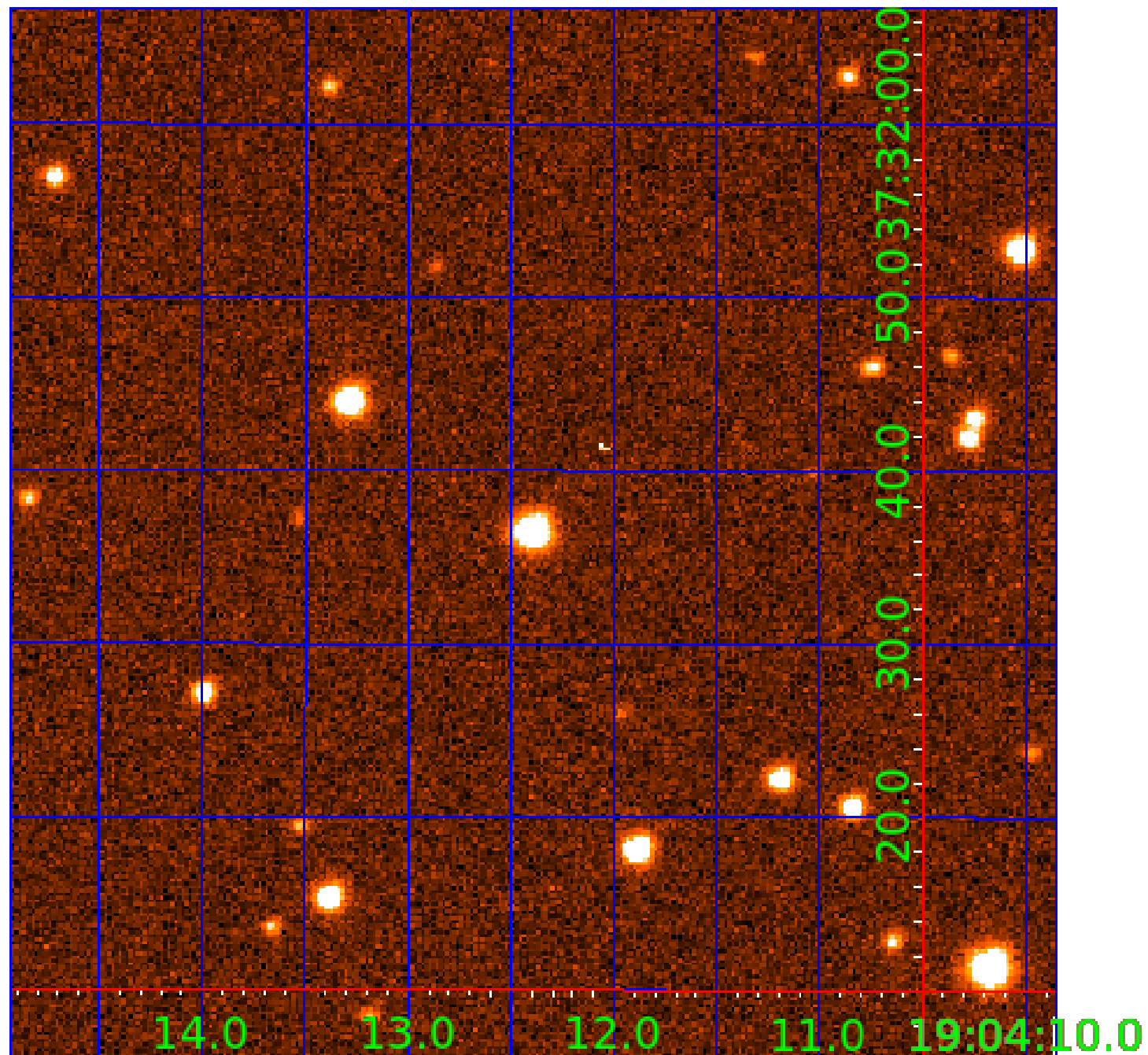


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002140782

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})
002140782-01	OBS	No	2.099245	132.422800	37.9	12.425	7.5	5.5	0.60	5068	0.37	294.66
002140782-02	OBS	No	327.400231	266.831494	575.9	59.925	11.5	5.4	0.60	5068	1.49	0.35
002140782-03	OBS	No	119.461129	206.974121	984.7	3.069	8.3	8.6	0.60	5068	2.09	1.35
002140782-04	OBS	No	111.962601	138.993343	1059.3	2.920	7.9	8.3	0.60	5068	2.29	1.47
002140782-05	OBS	No	135.864497	246.661959	1071.8	5.073	7.4	7.9	0.60	5068	3.91	1.13
002140782-06	OBS	No	109.652349	185.820052	1395.6	4.525	7.3	7.2	0.60	5068	4.36	1.51

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002140782-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
002140782-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002140782-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002140782-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002140782-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
002140782-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_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.

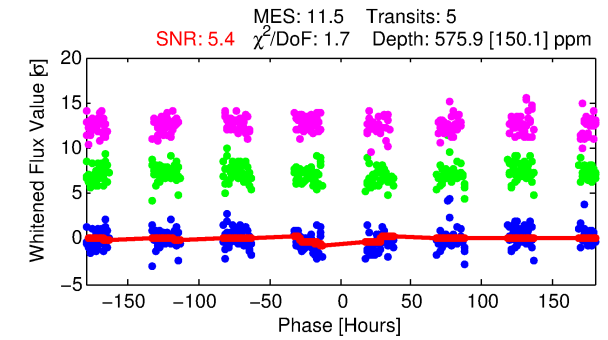
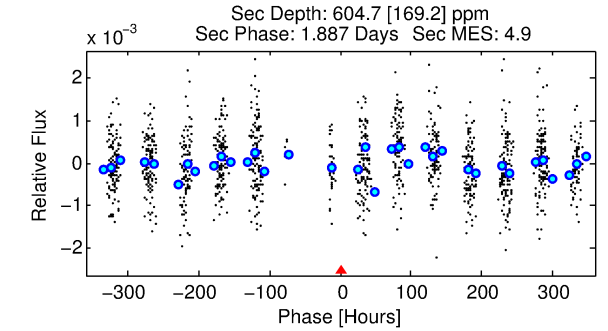
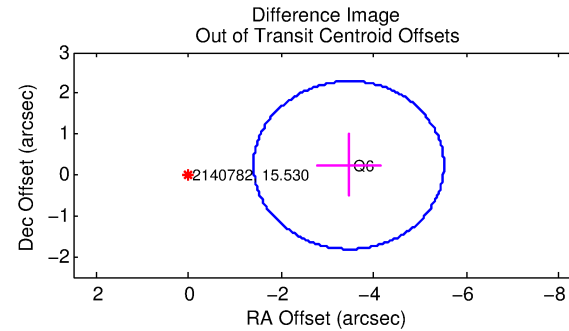
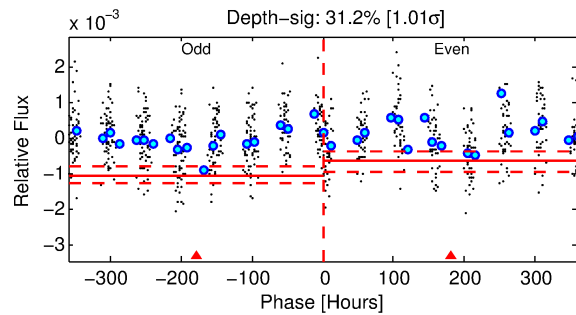
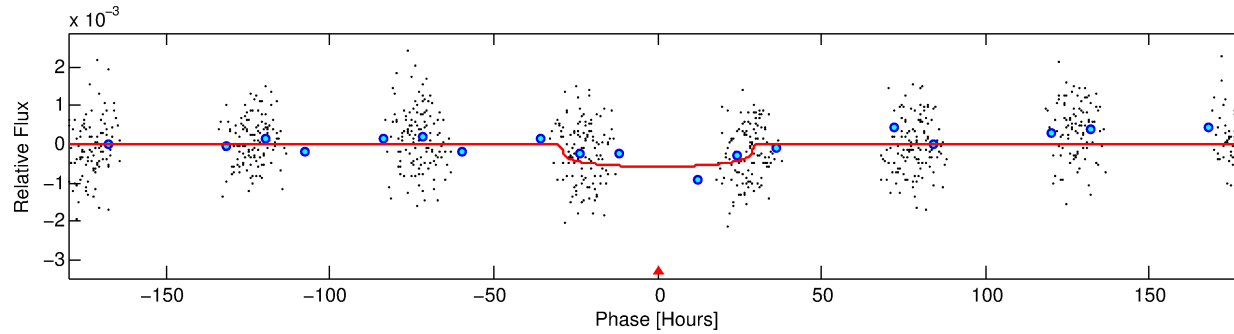
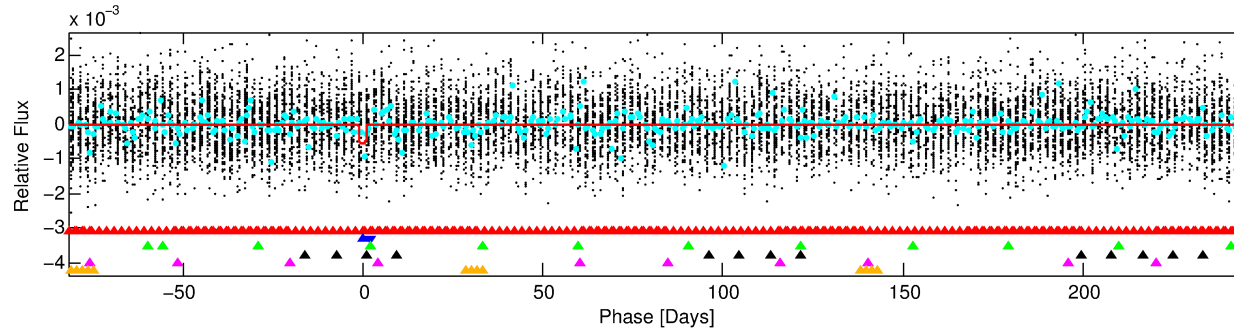
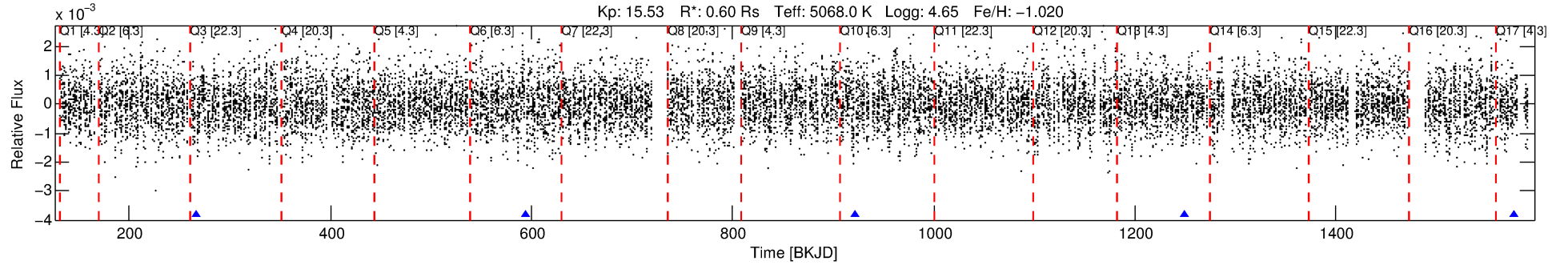
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002140782-02

No Significant Match Found

DV One-Page Summary

KIC: 2140782 Candidate: 2 of 6 Period: 327.400 d



DV Fit Results:

Period = 327.40023 [0.02562] d
Epoch = 266.8315 [0.0524] BKJD
Rp/R* = 0.0225 [0.0063]
a/R* = 36.24 [36.05]
b = 0.54 [1.31]
Seff = 0.35 [0.05]
Teq = 196 [8] K
Rp = 1.49 [0.43] Re
a = 0.7851 [0.0508] AU
Ag = 92615.45 [59015.38] [1.57 σ]
Teffp = 5294 [847] K [6.02 σ]

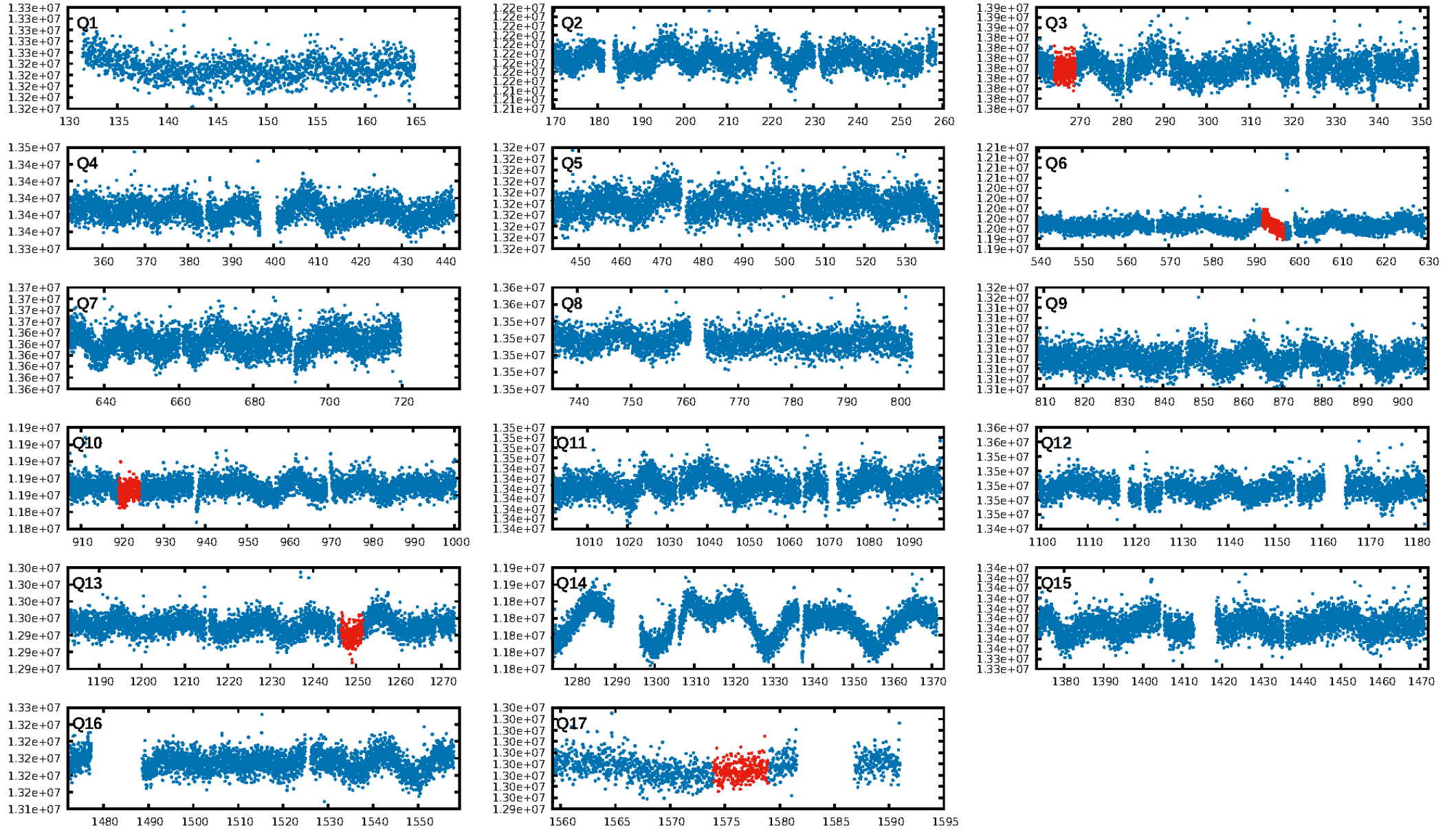
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [76.44 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 9.94e-23
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.2494
Centroid-sig: 57.6%
Centroid-so: 1.206 arcsec [1.38 σ]
OotOffset-rm: 3.467 arcsec [5.06 σ]
KicOffset-rm: 3.505 arcsec [5.12 σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 0.00 [0/3]

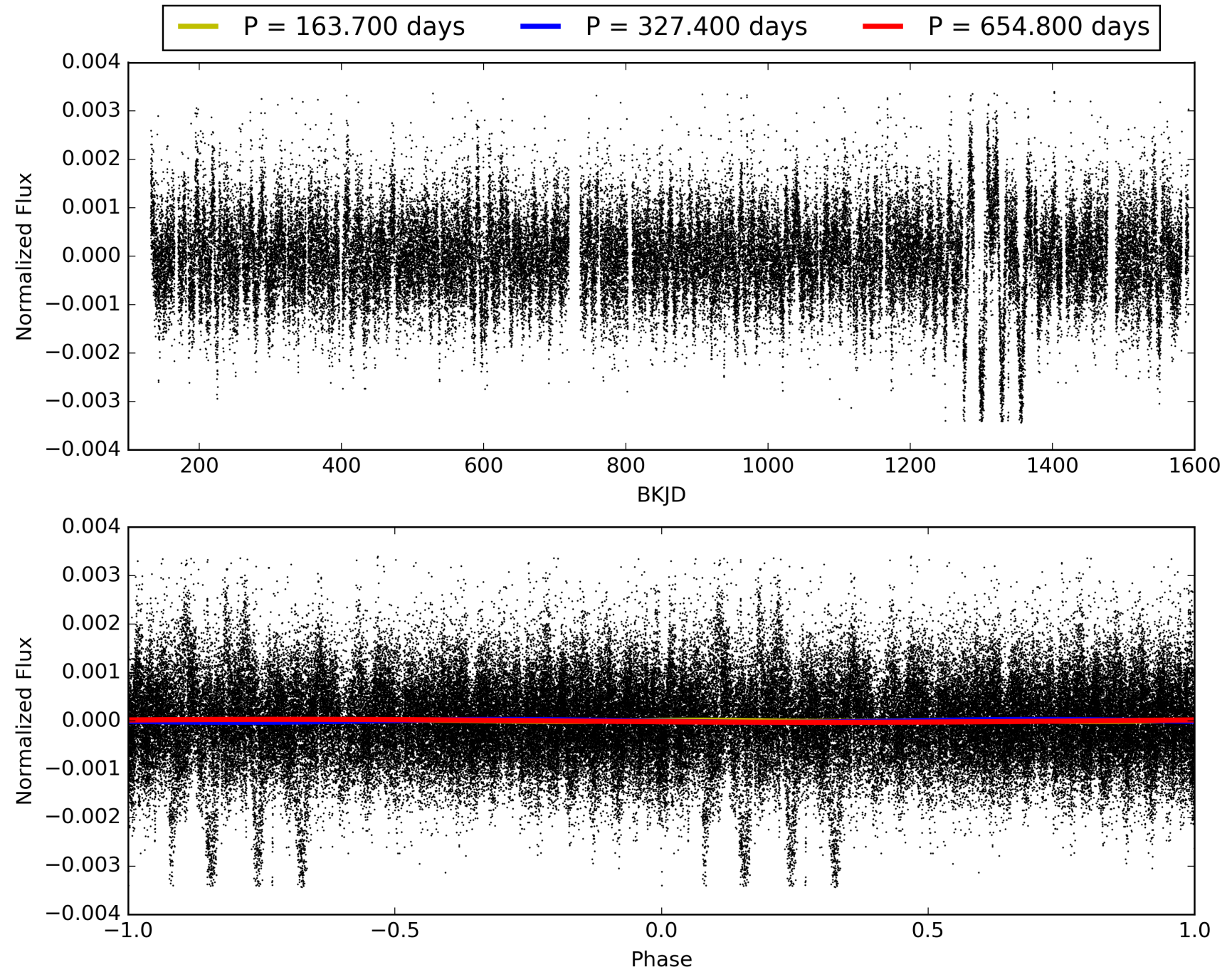
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:38:57 Z

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

TCE 002140782-02, PDC Light Curves

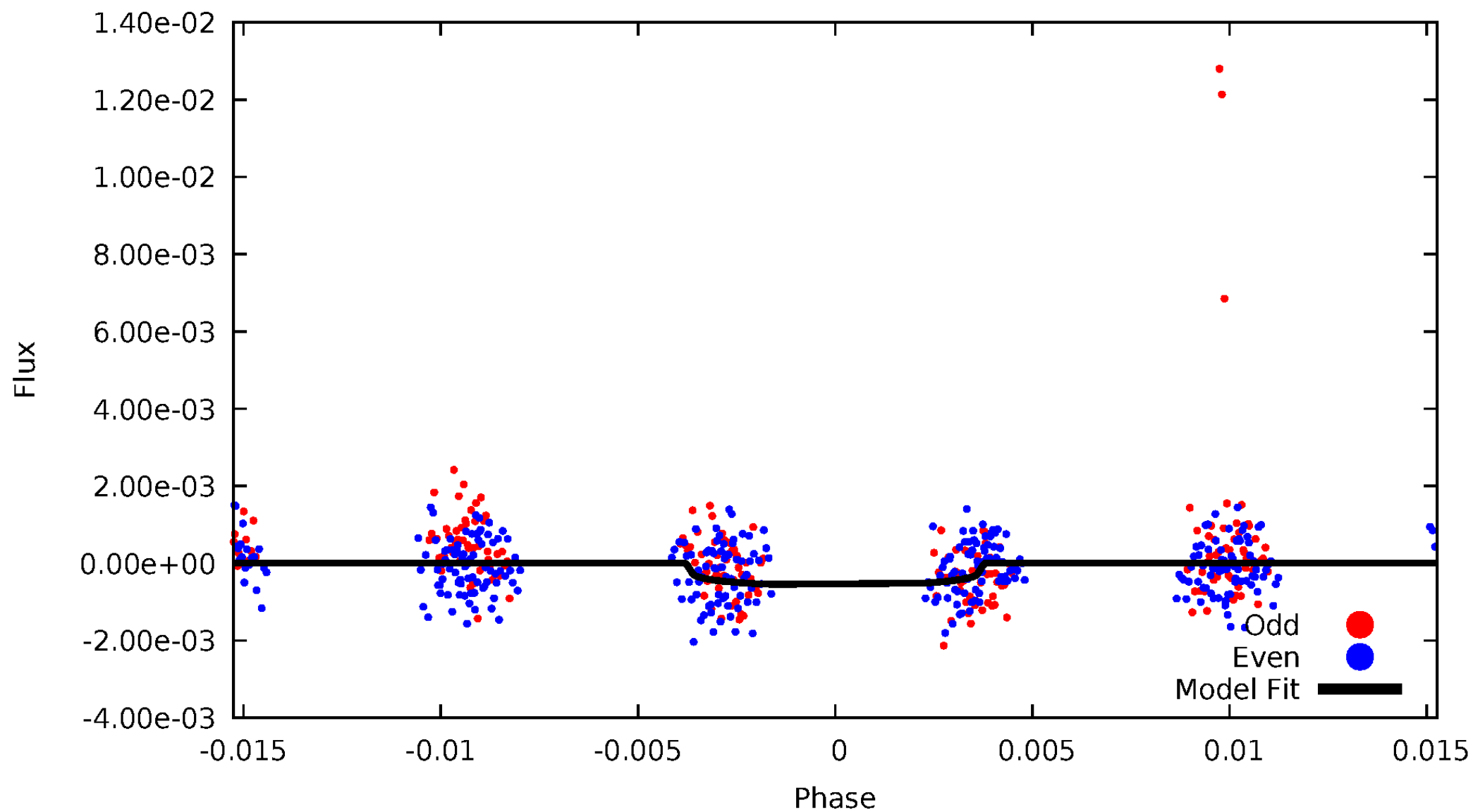


TCE 002140782-02



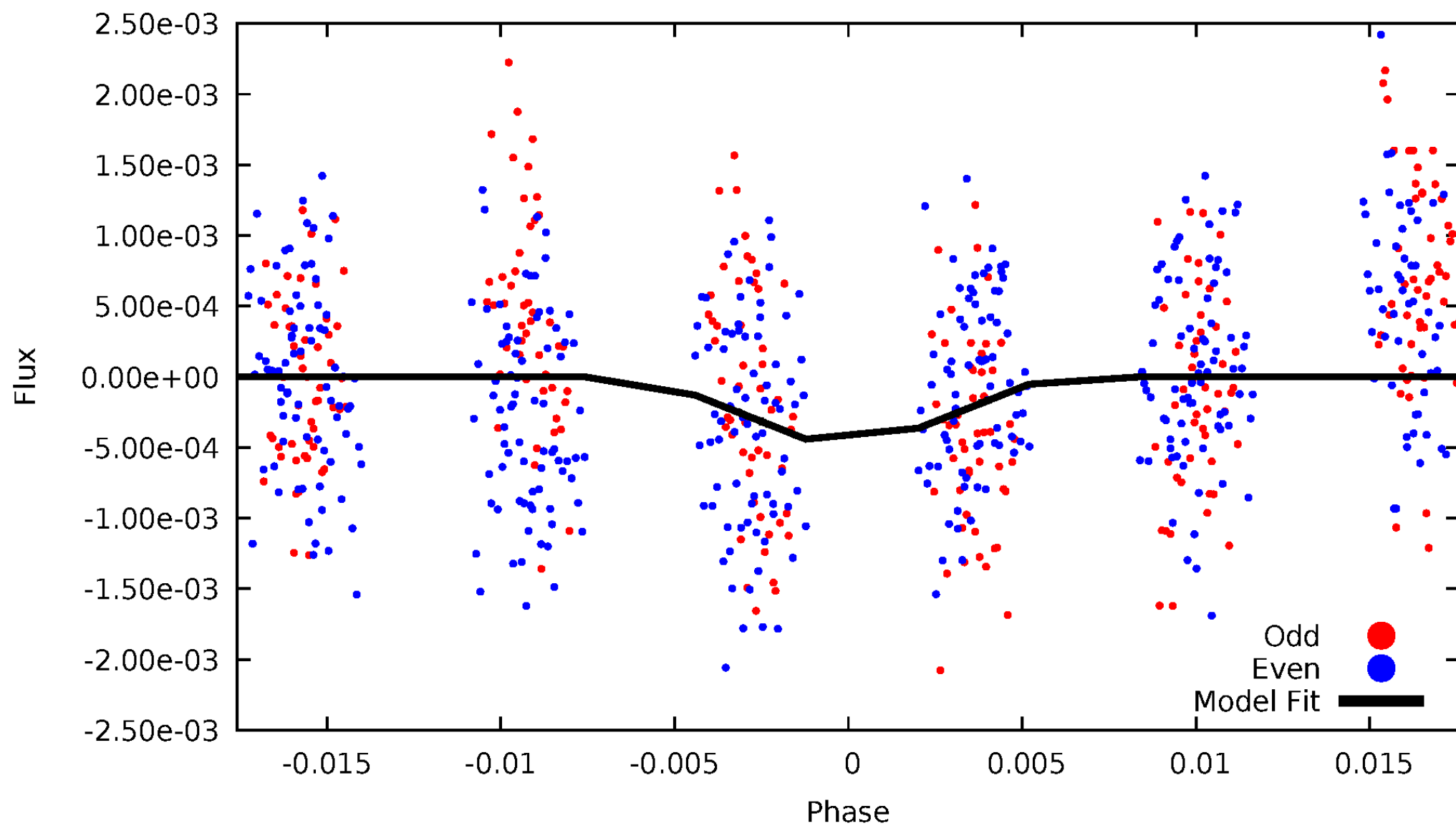
DV Odd/Even

TCE 002140782-02



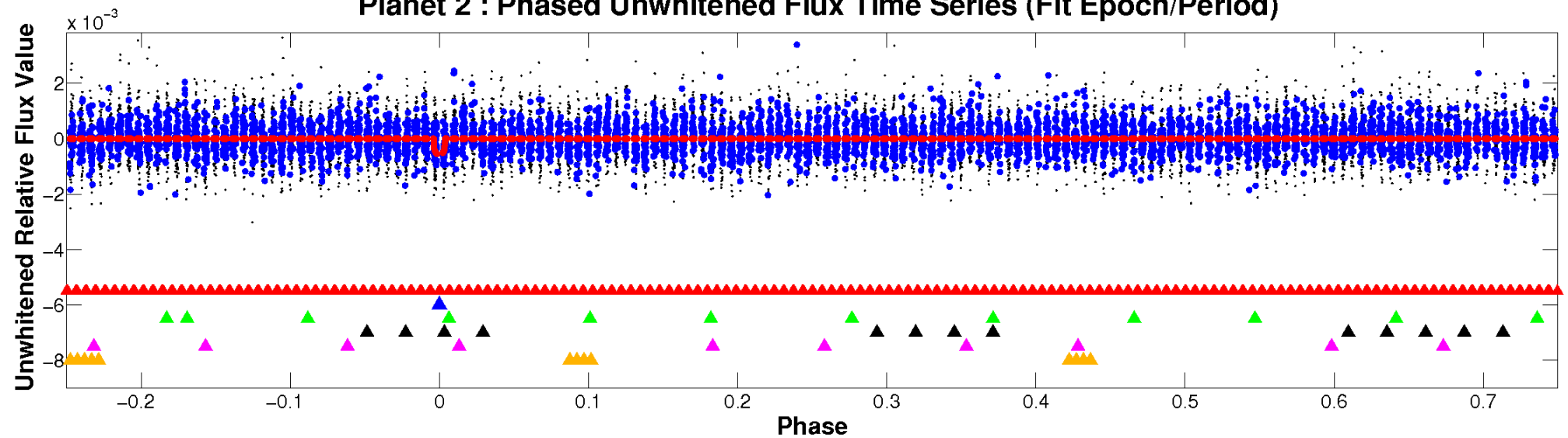
ALT Odd/Even

TCE 002140782-02

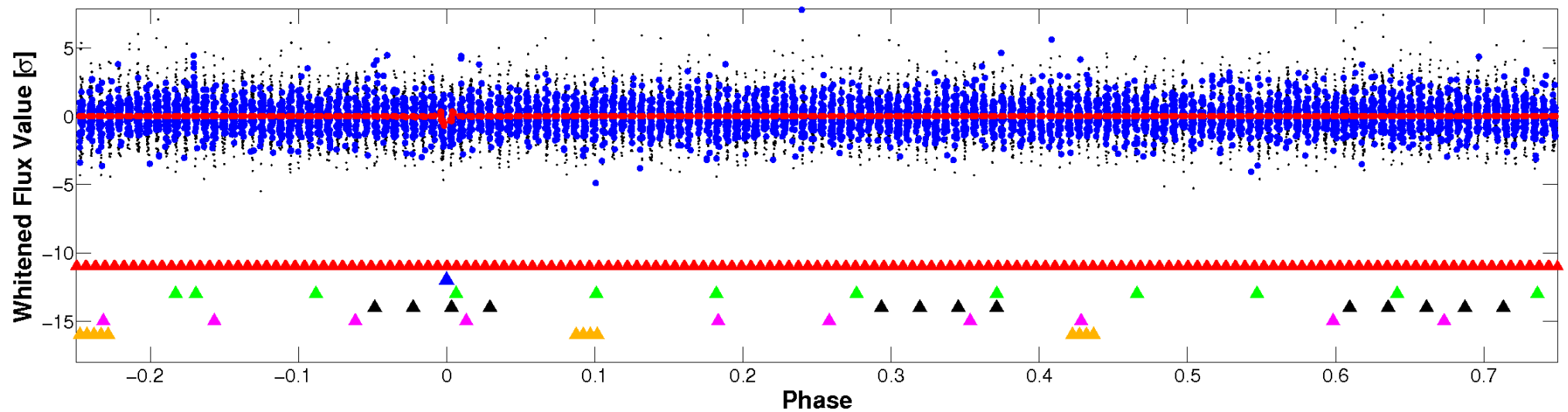


Non-Whitened Vs. Whitened Light Curve

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

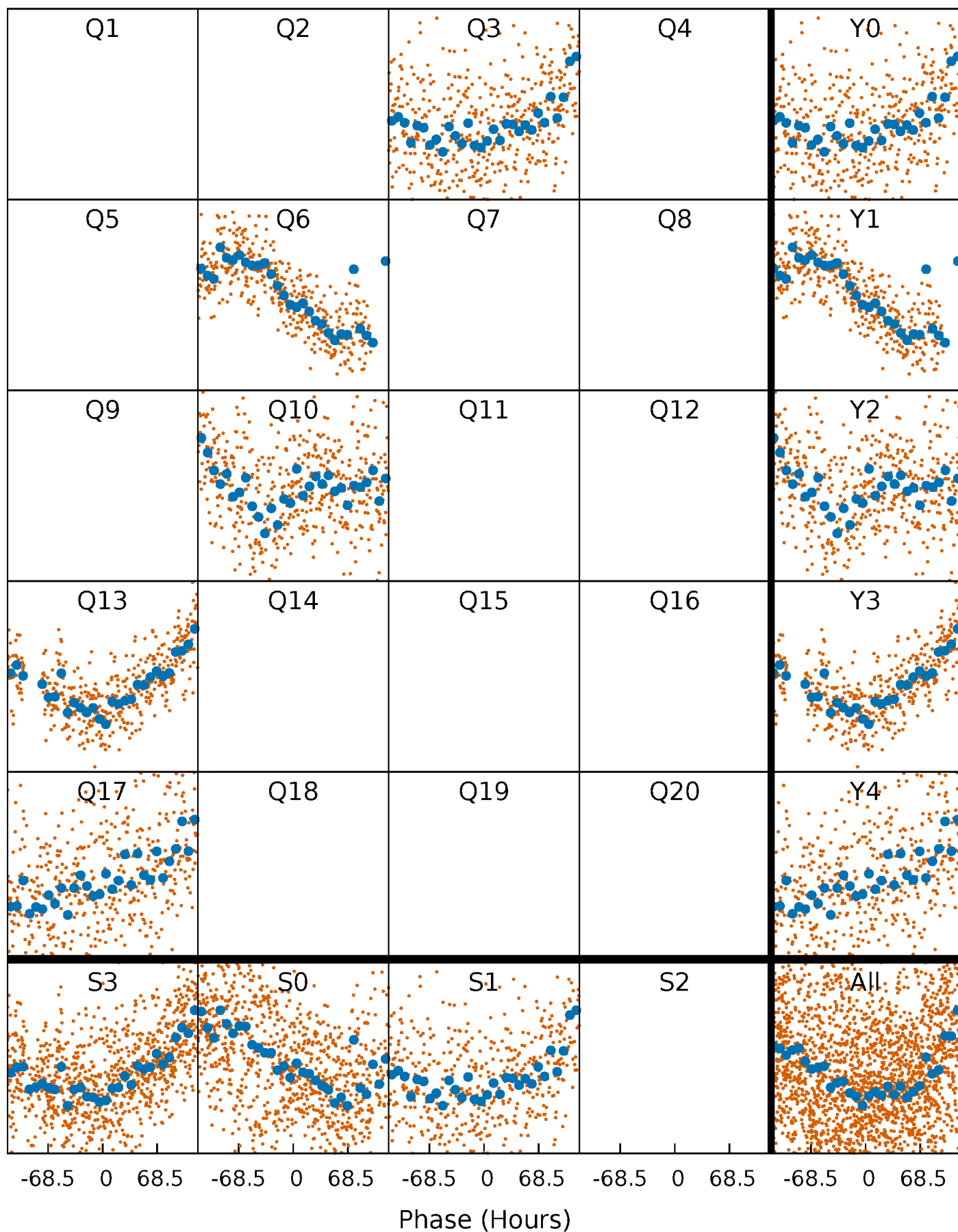


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



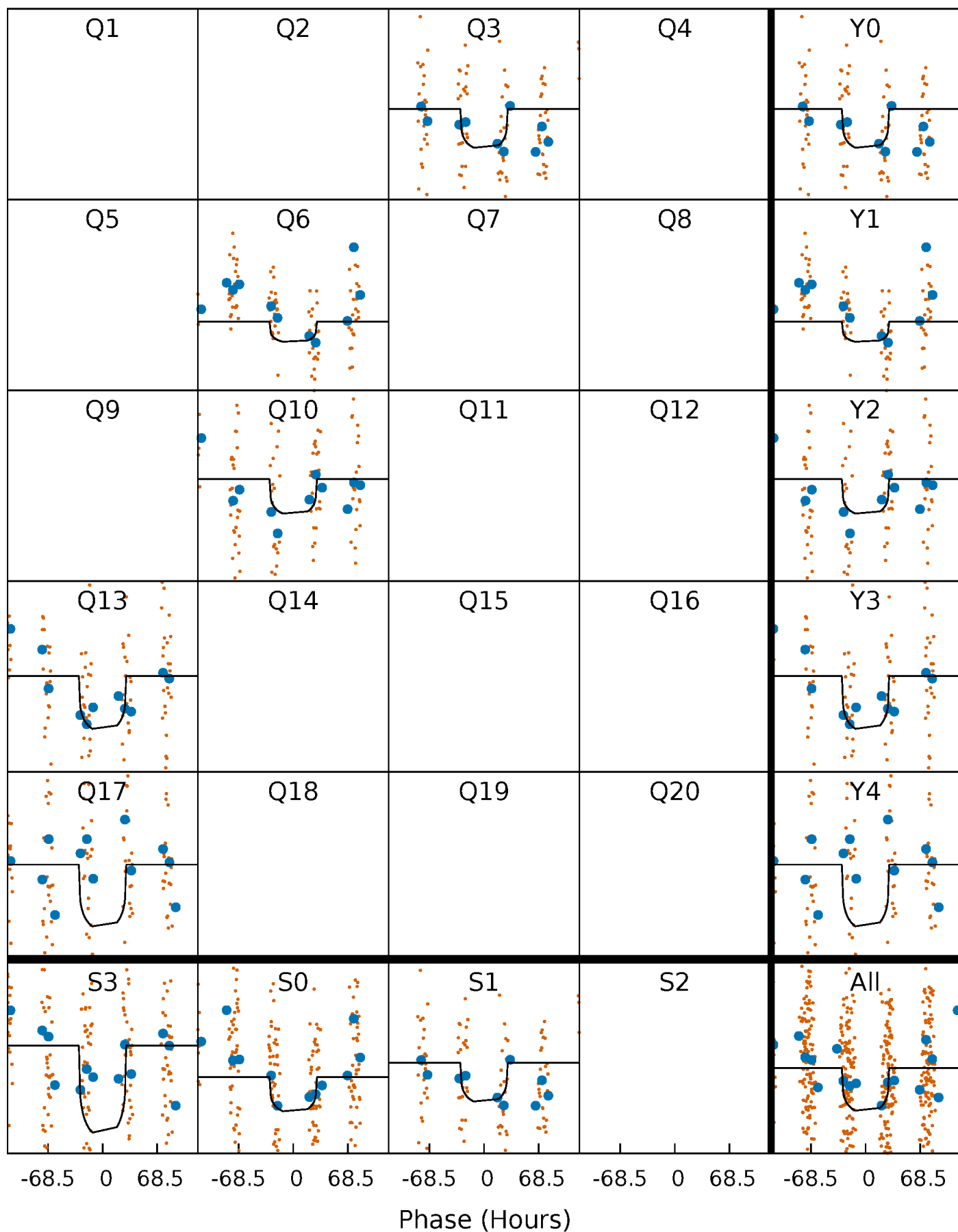
PDC Quarter-Phased Transit Curves

TCE 002140782-02 P=327.400231 Days $T_0=266.831494$ (BKJD)



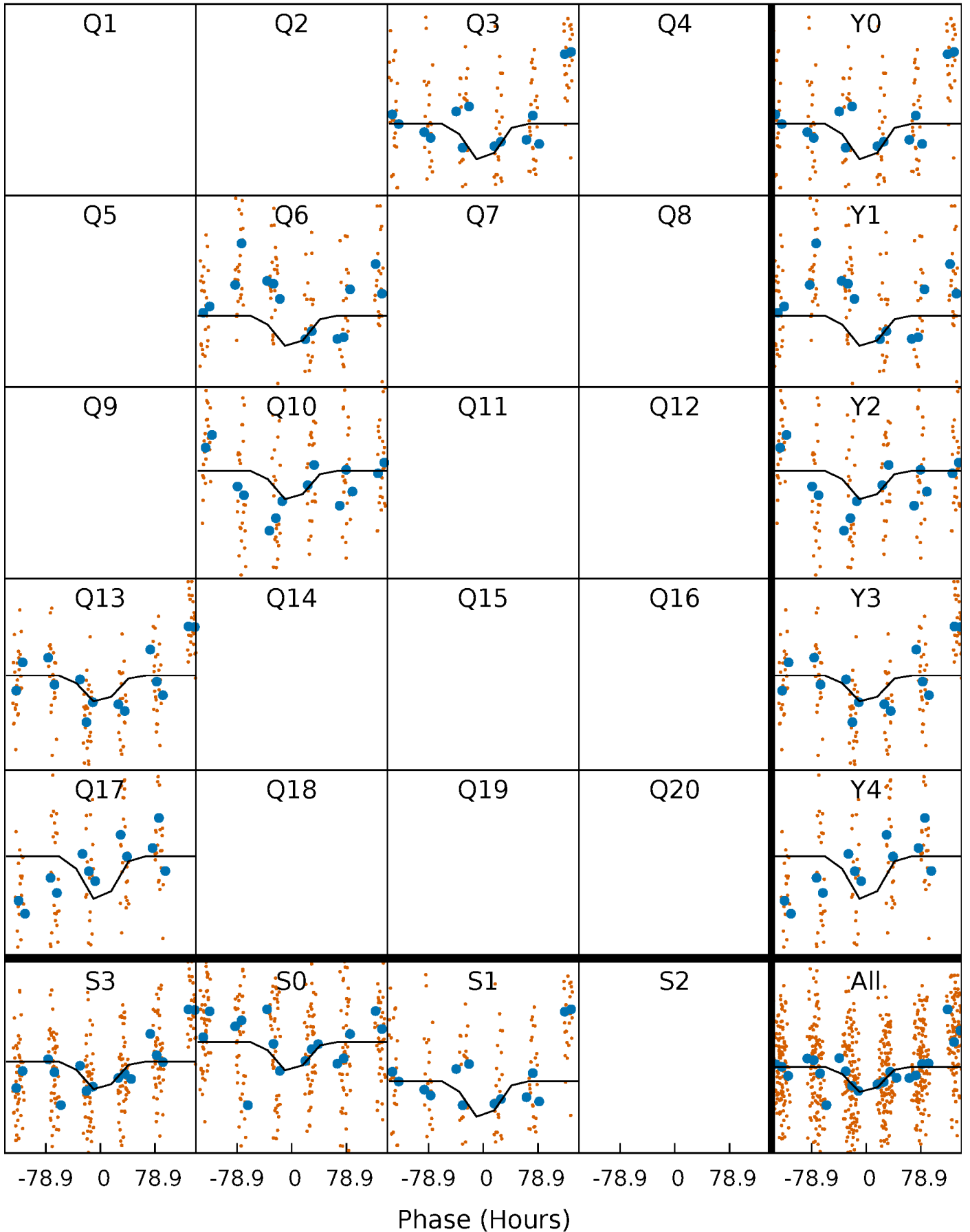
DV Quarter-Phased Transit Curves

TCE 002140782-02 $P=327.400231$ Days $T_0=266.831494$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

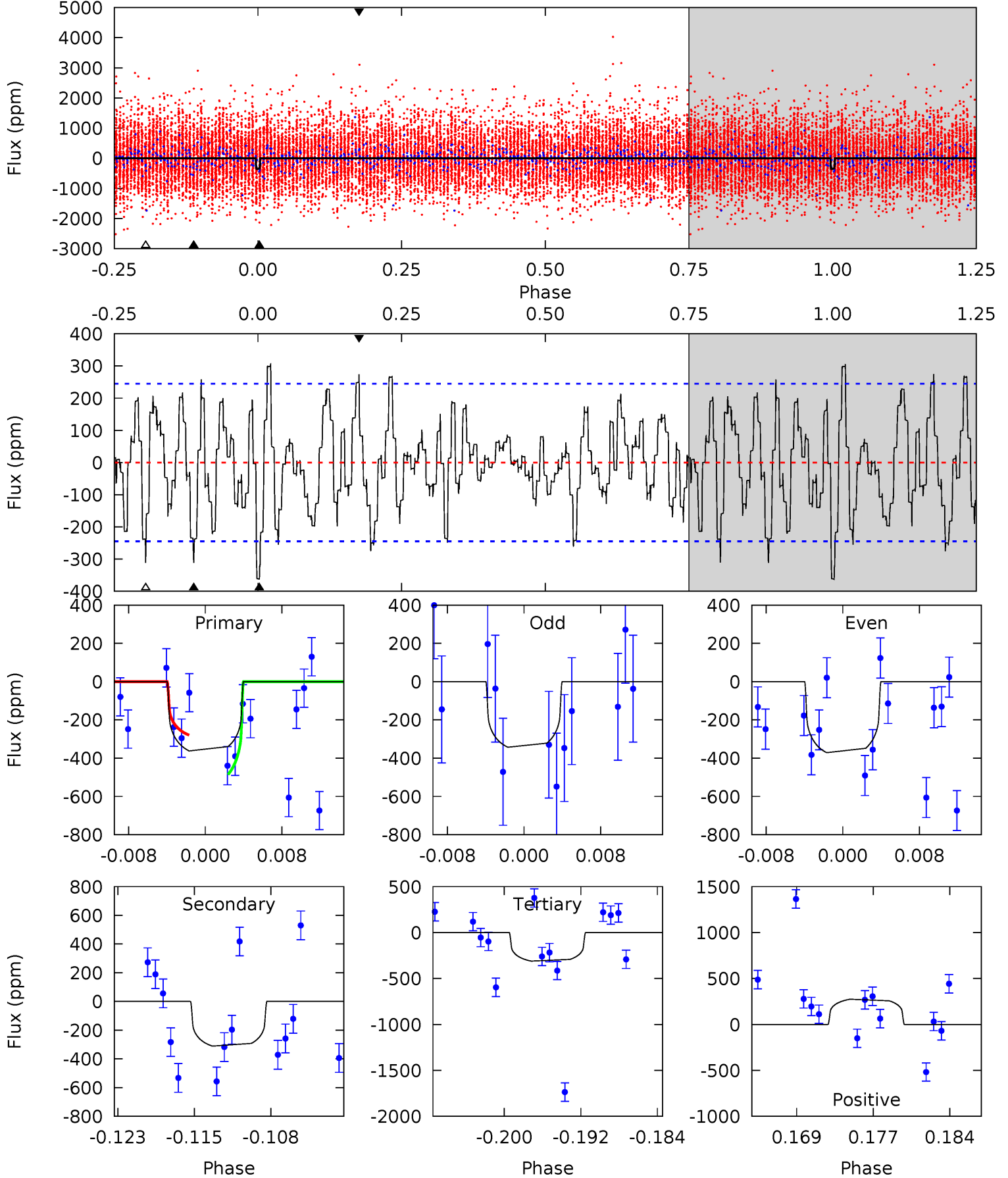
TCE 002140782-02 P=327.345631 Days $T_0=266.918421$ (BKJD)



DV Model-Shift Uniqueness Test

002140782-02, P = 327.400231 Days, E = 266.831494 Days

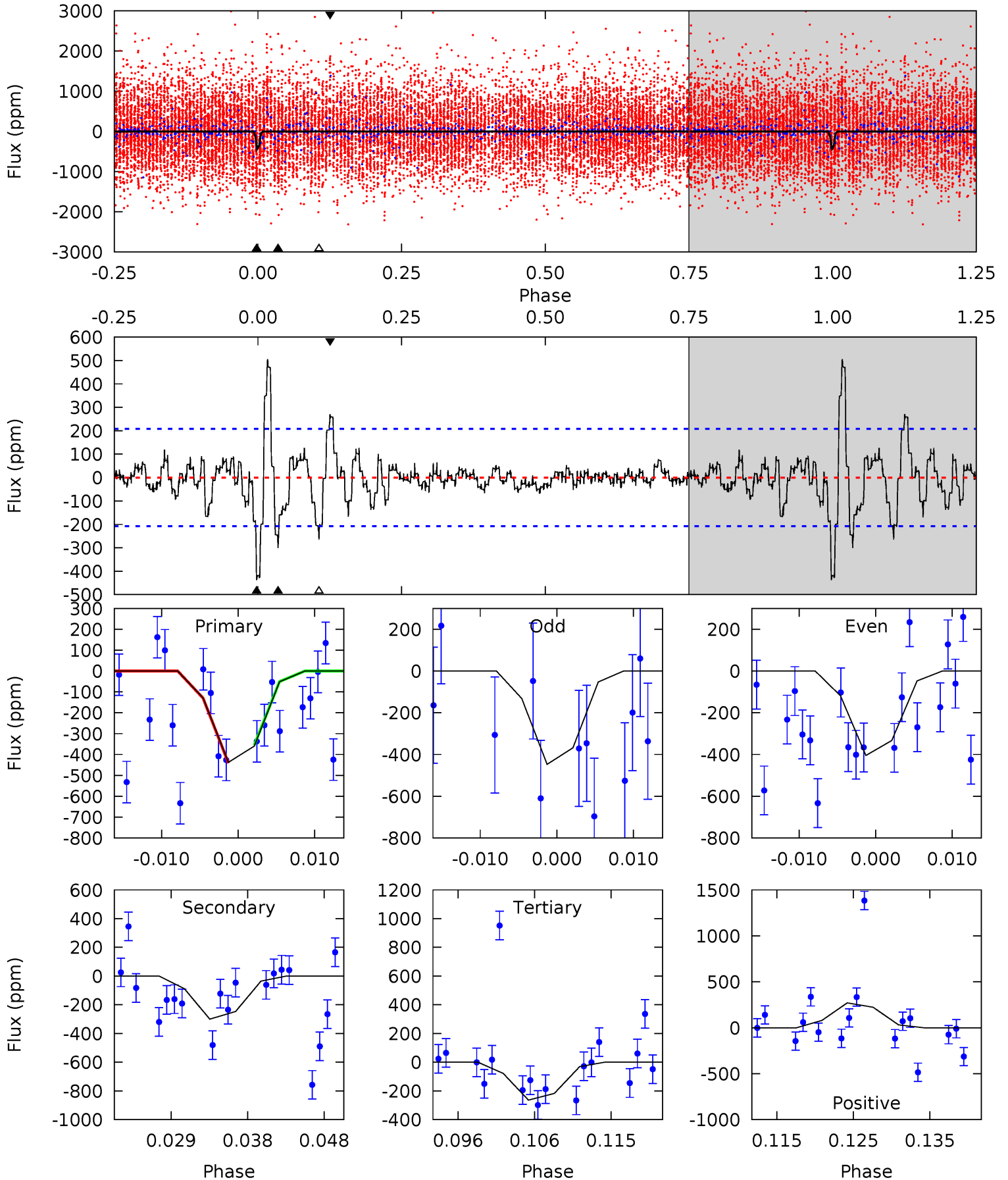
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.50	6.45	6.44	5.69	5.08	2.67	2.36	1.06	1.82	0.00	0.76	0.29	0.72	0.46	2.12



Alt Model-Shift Uniqueness Test

002140782-02, P = 327.345631 Days, E = 266.918421 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	7.26	6.40	6.55	5.03	2.59	1.78	4.19	4.03	0.86	0.70	0.50	1.20	0.54	1.04



Stellar Parameters For KIC 002140782

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5068^{+151}_{-151}	$4.654^{+0.059}_{-0.036}$	$-1.020^{+0.300}_{-0.300}$	$0.605^{+0.042}_{-0.042}$	$0.601^{+0.052}_{-0.022}$	$3.832^{+0.888}_{-0.555}$
	+3%/-3%	+1%/-1%	+29%/-29%	+7%/-7%	+9%/-4%	+23%/-14%
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 002140782-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-311 ± 48	$1.50^{+0.42}_{-0.44}$	273^{+9}_{-10}	4577^{+748}_{-464}	48400^{+47239}_{-20807}
Alt.	-300 ± 41	$1.55^{+0.46}_{-0.44}$	273^{+10}_{-9}	4469^{+642}_{-420}	42732^{+37464}_{-17377}

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

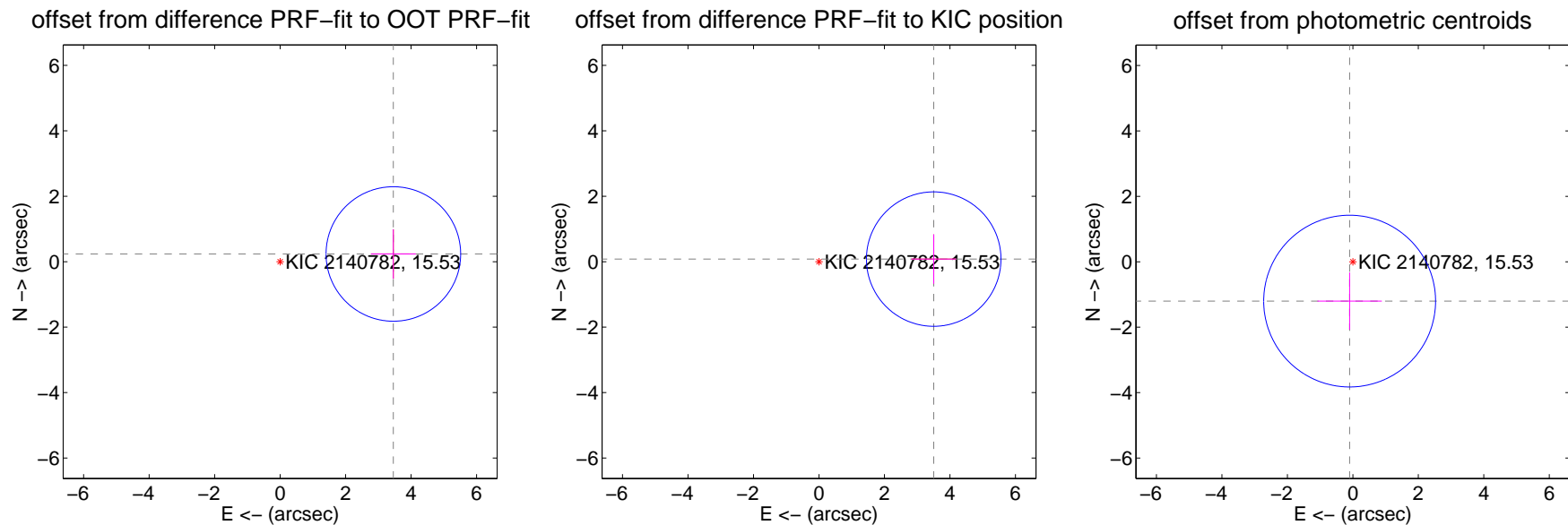
DV Centroid Data

Supplemental centroid analysis for 002140782-02. Kepler magnitude: 15.53. Transit SNR 5.42

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.467 ± 0.685	5.06	-3.459 ± 0.685	0.236 ± 0.757
PRF-fit source offset from KIC position	3.505 ± 0.685	5.12	-3.504 ± 0.685	0.080 ± 0.757
photometric centroid source offset	1.21 ± 0.88	1.38	0.10 ± 0.99	-1.20 ± 0.87

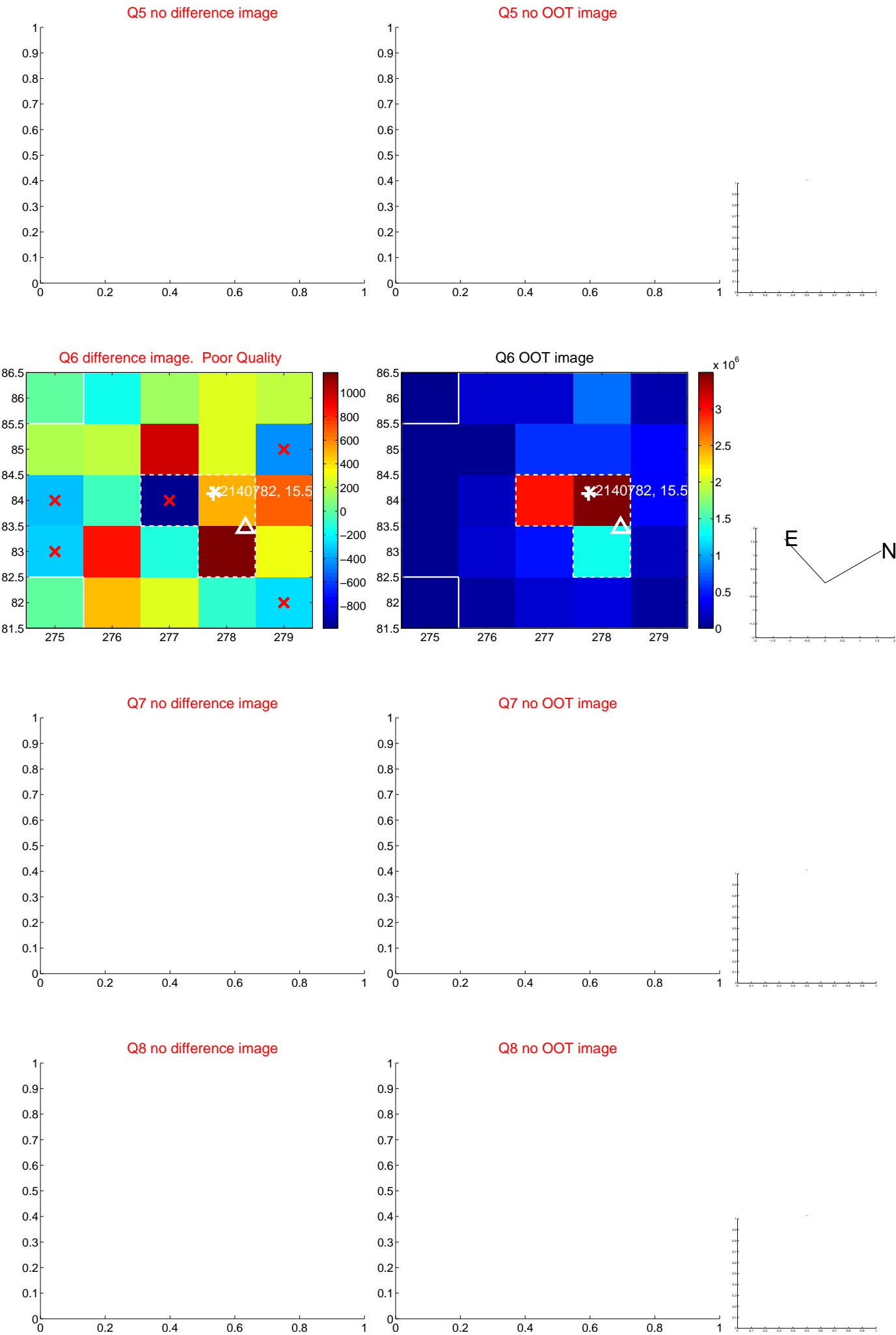


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

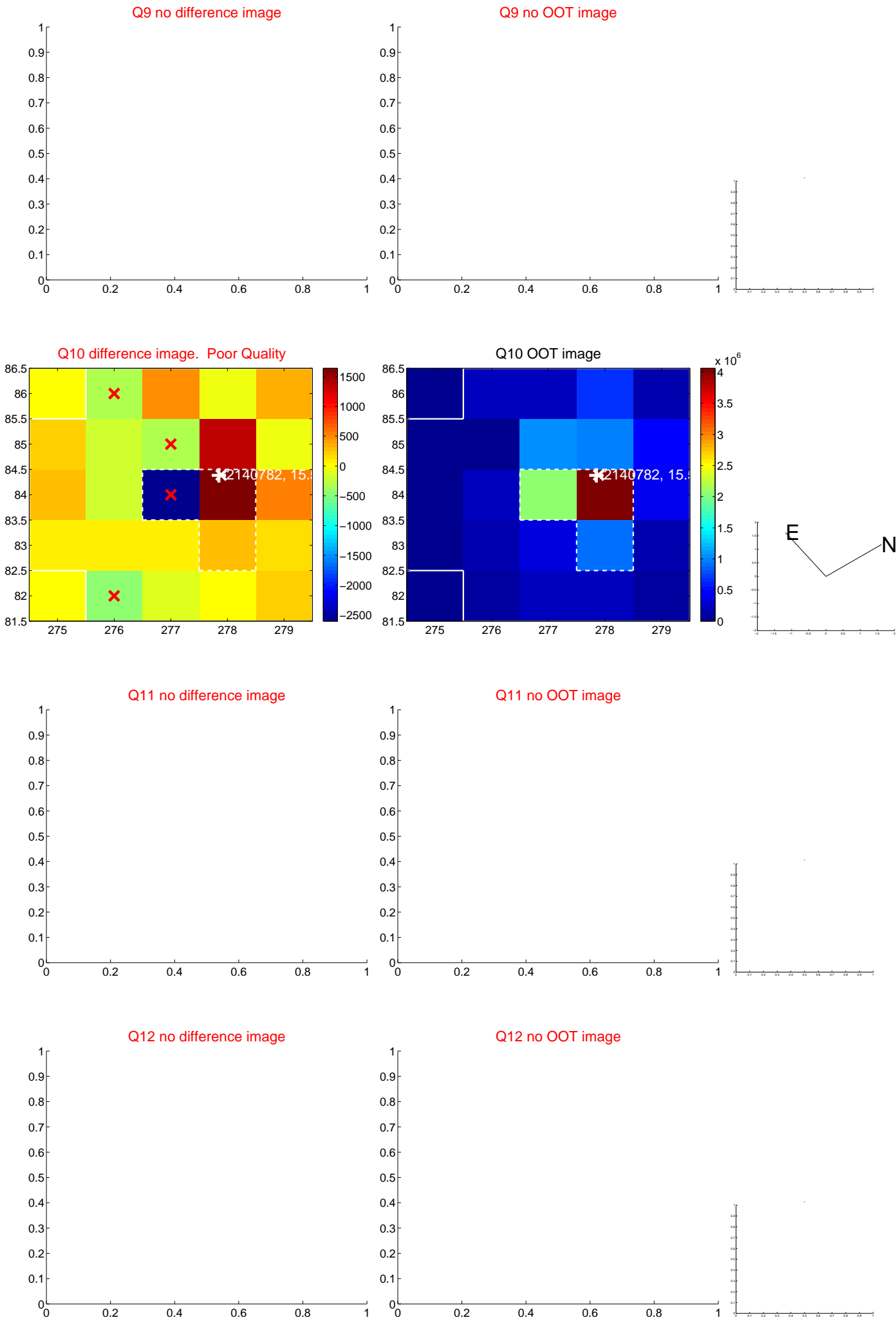
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



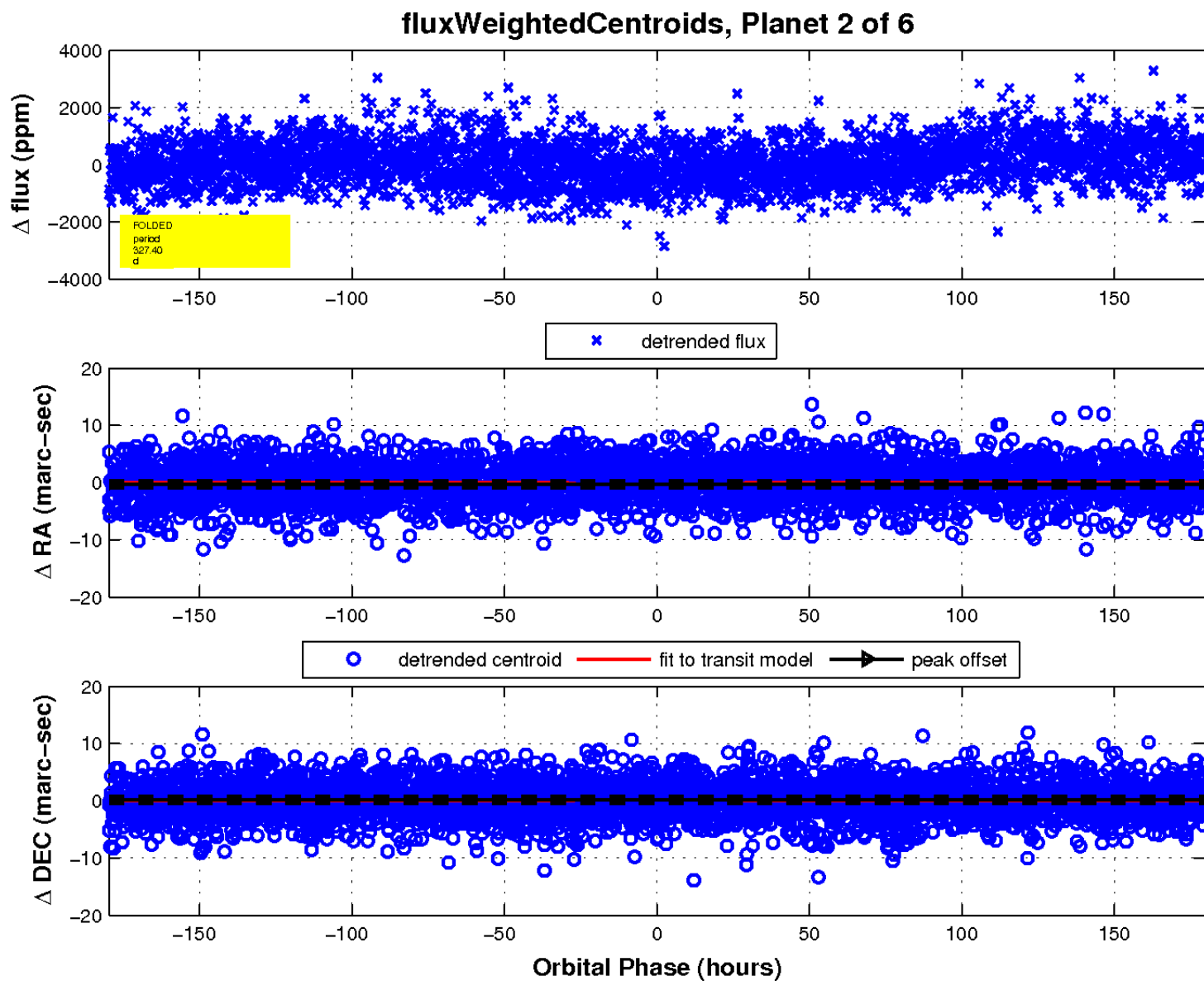
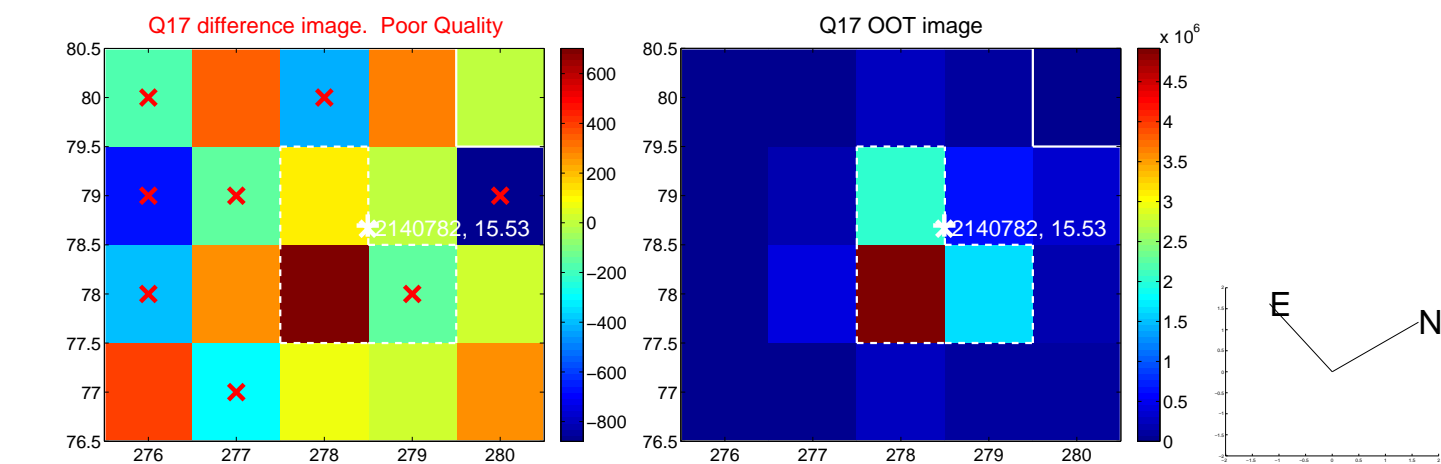
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

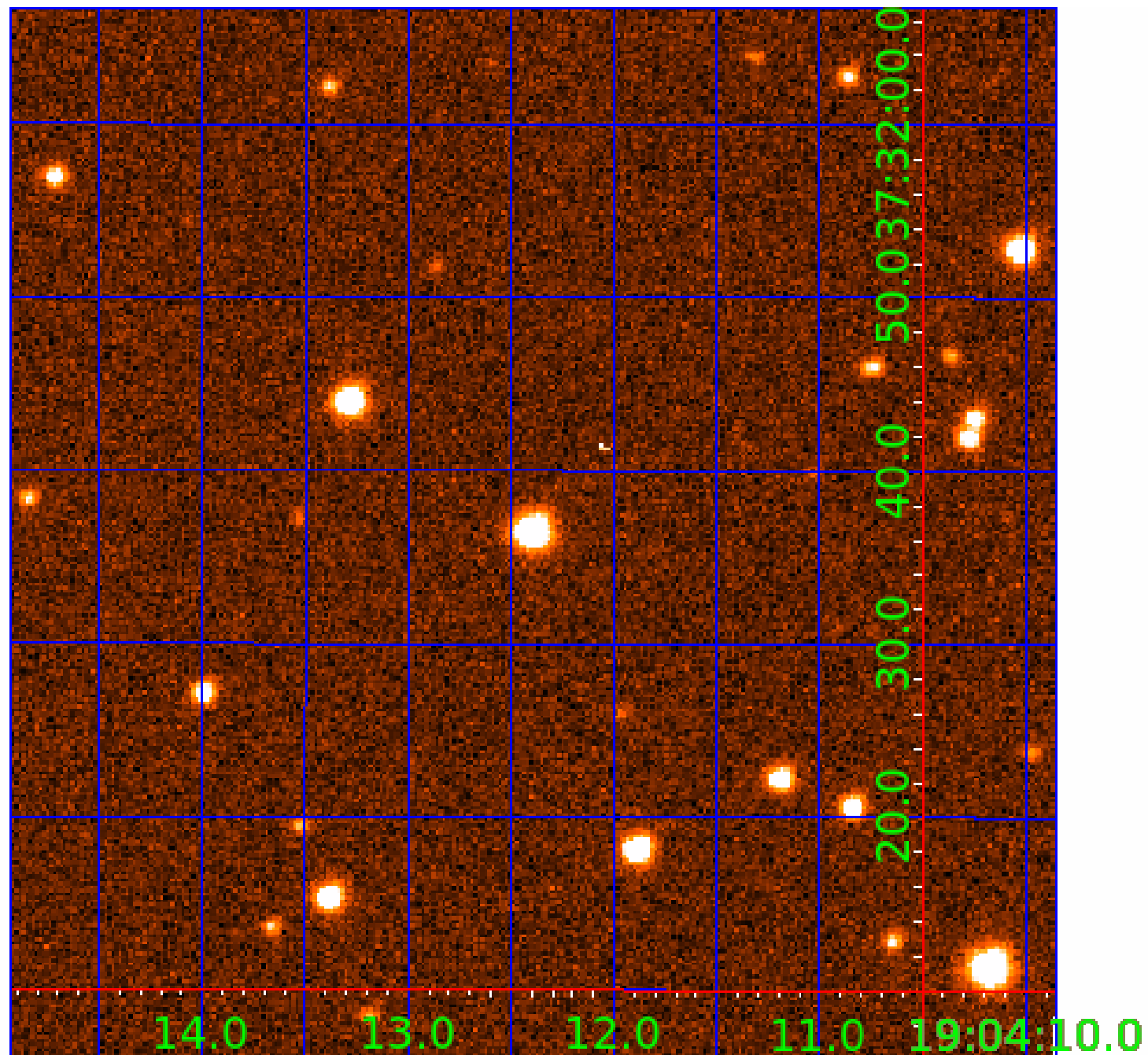


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002140782

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})
002140782-01	OBS	No	2.099245	132.422800	37.9	12.425	7.5	5.5	0.60	5068	0.37	294.66
002140782-02	OBS	No	327.400231	266.831494	575.9	59.925	11.5	5.4	0.60	5068	1.49	0.35
002140782-03	OBS	No	119.461129	206.974121	984.7	3.069	8.3	8.6	0.60	5068	2.09	1.35
002140782-04	OBS	No	111.962601	138.993343	1059.3	2.920	7.9	8.3	0.60	5068	2.29	1.47
002140782-05	OBS	No	135.864497	246.661959	1071.8	5.073	7.4	7.9	0.60	5068	3.91	1.13
002140782-06	OBS	No	109.652349	185.820052	1395.6	4.525	7.3	7.2	0.60	5068	4.36	1.51

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002140782-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
002140782-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002140782-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002140782-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002140782-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
002140782-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_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.

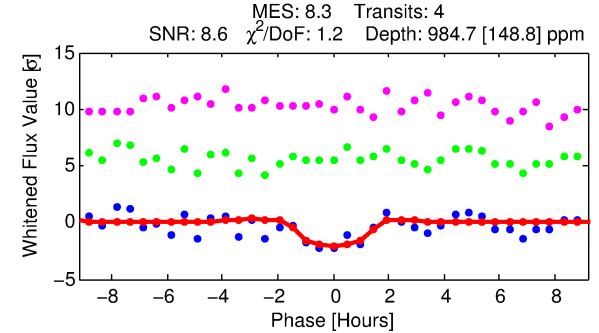
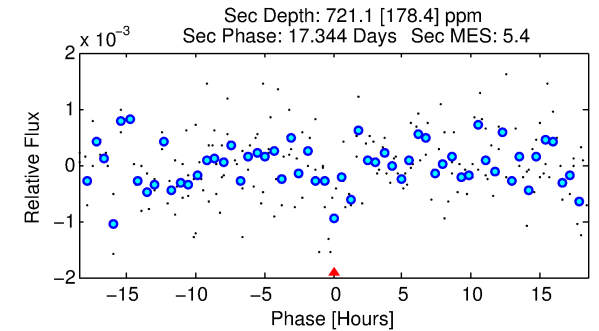
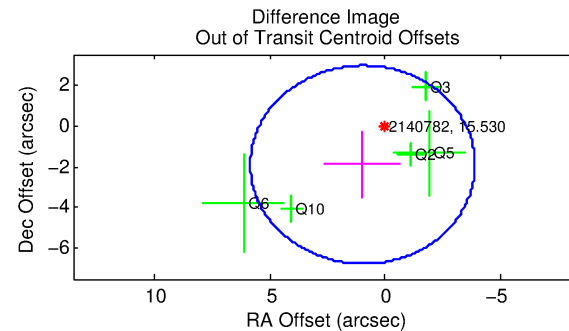
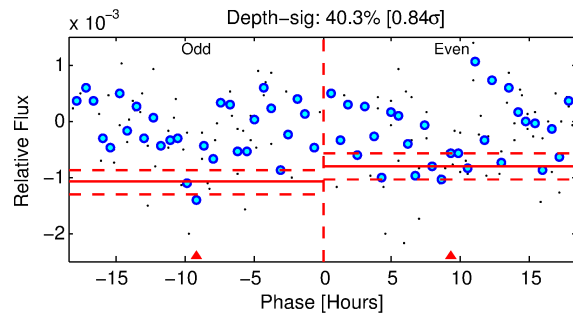
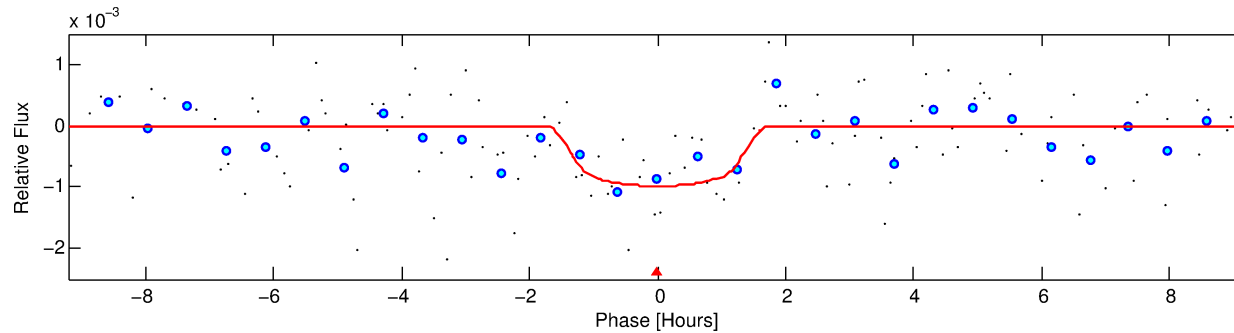
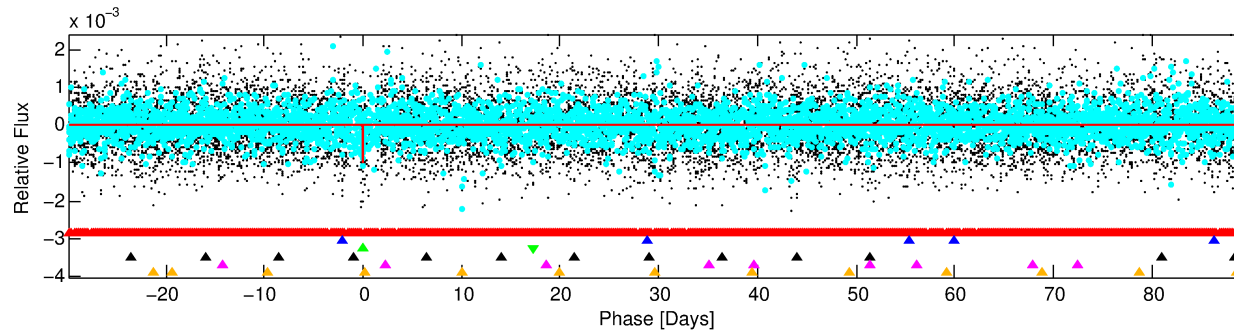
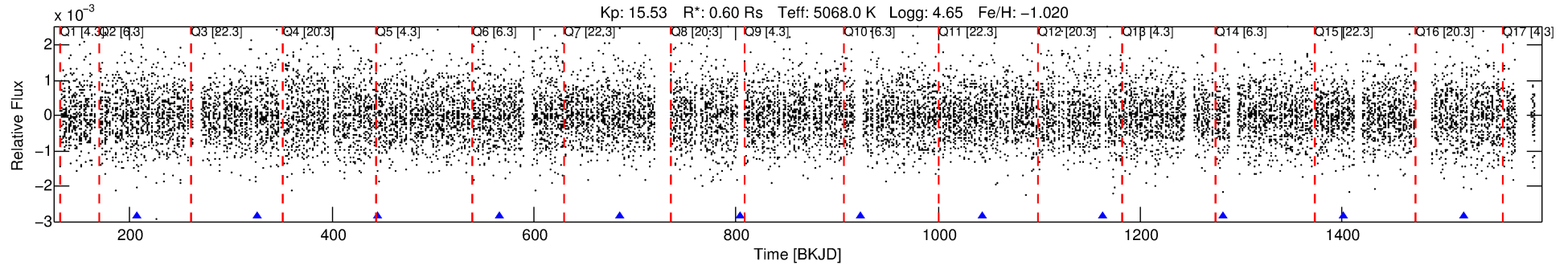
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002140782-03

No Significant Match Found

DV One-Page Summary

KIC: 2140782 Candidate: 3 of 6 Period: 119.461 d



DV Fit Results:

Period = 119.46113 [0.00118] d
Epoch = 206.9741 [0.0091] BKJD
Rp/R* = 0.0316 [0.0485]
a/R* = 201.60 [1279.71]
b = 0.78 [3.28]
Seff = 1.35 [0.21]
Teq = 275 [11] K
Rp = 2.09 [3.21] Re
a = 0.4009 [0.0260] AU
Ag = 14611.81 [44966.21] [0.32 σ]
Teffp = 4669 [3593] K [1.22 σ]

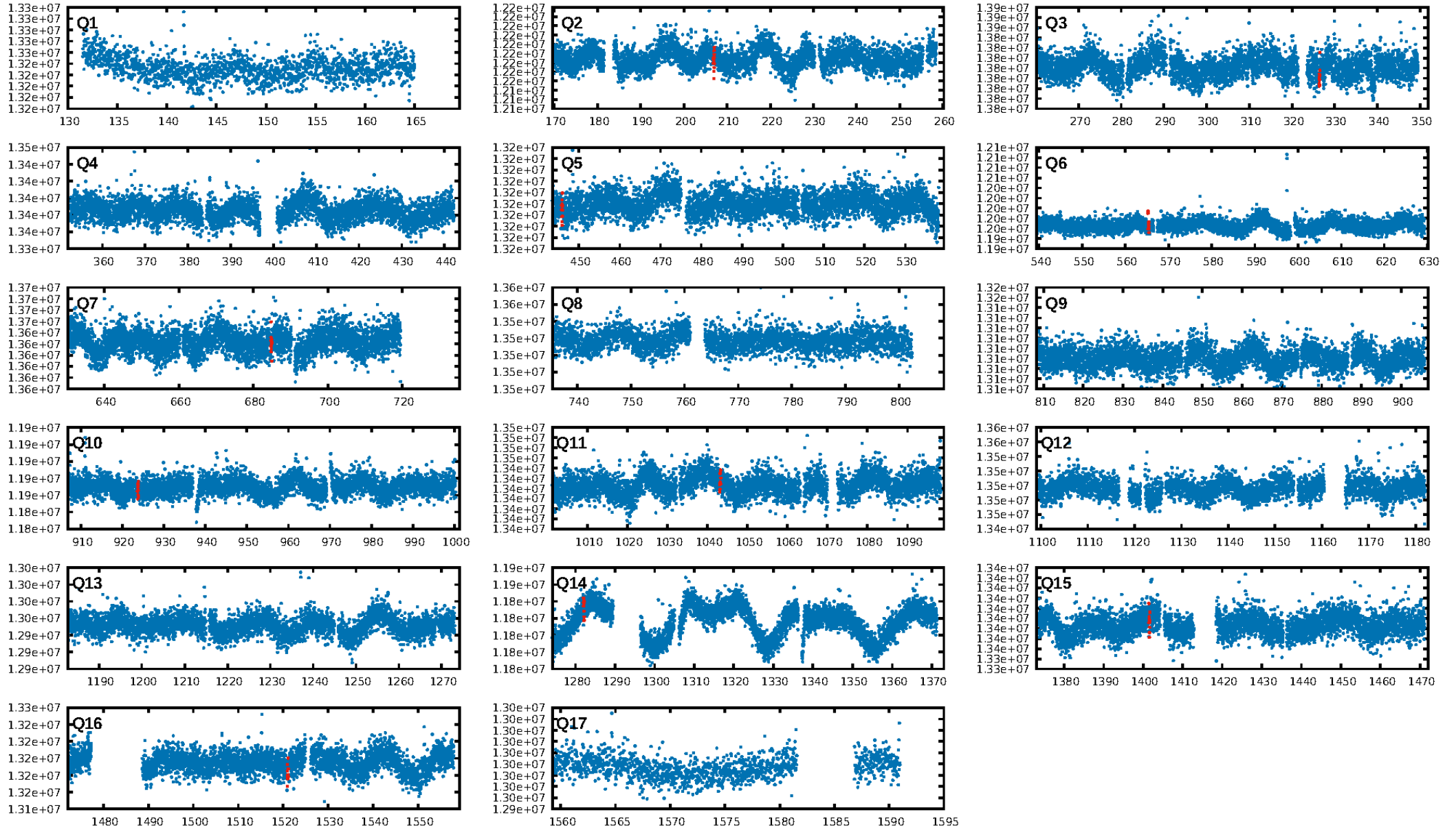
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [42.48 σ]
LongPeriod-sig: 100.0% [66.40 σ]
ModelChiSquare2-sig: 89.5%
ModelChiSquareGof-sig: 90.8%
Bootstrap-pfa: 5.98e-11
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -2.531
Centroid-sig: 53.8%
Centroid-so: 2.044 arcsec [1.34 σ]
OotOffset-rm: 2.139 arcsec [1.32 σ]
OotOffset-st: 3/1/0/1 [5]
KicOffset-rm: 2.304 arcsec [1.43 σ]
KicOffset-st: 3/1/0/1 [5]
DiffImageQuality-fgm: 0.00 [0/5]
DiffImageOverlap-fno: 0.56 [5/9]

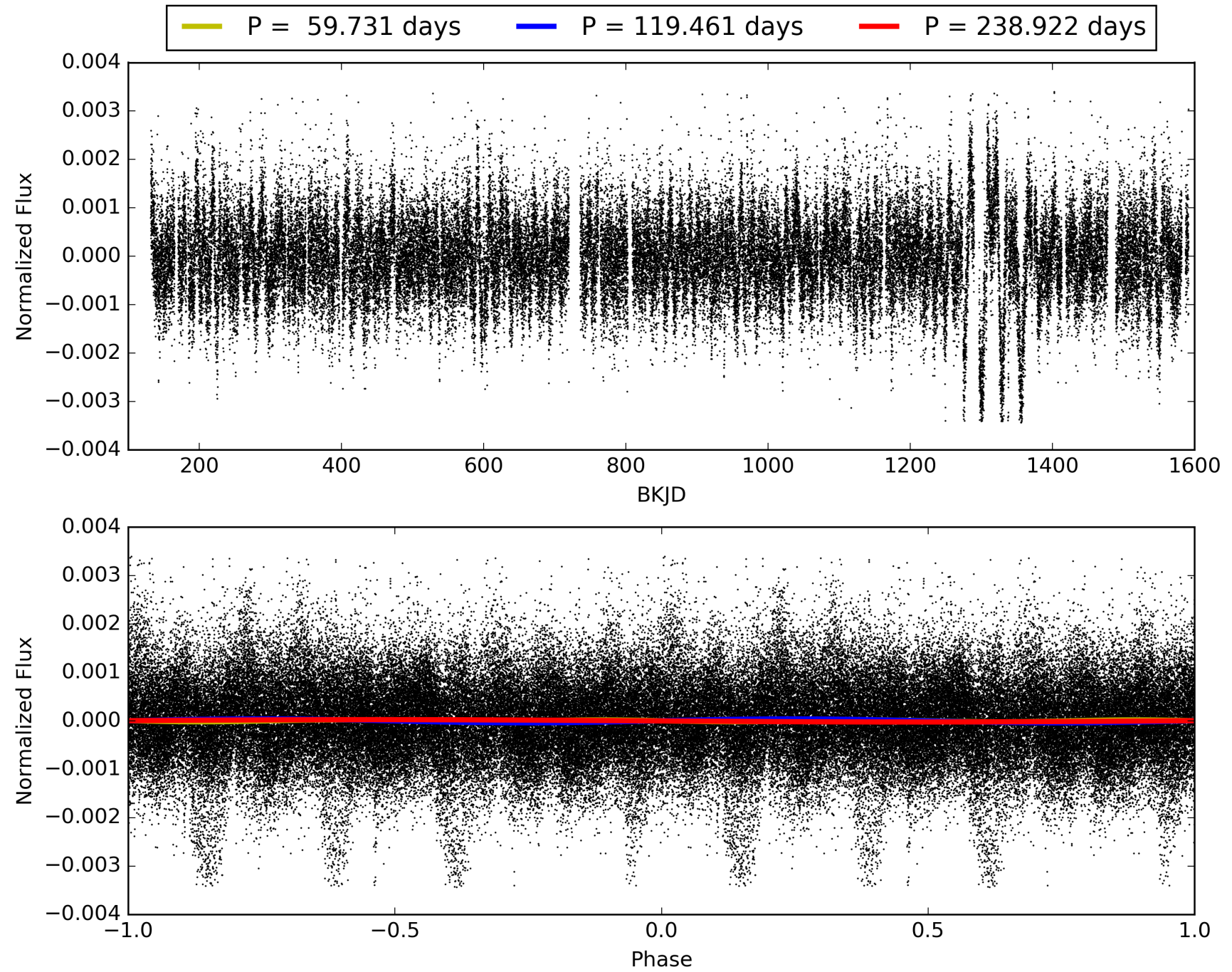
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:39:01 Z

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

TCE 002140782-03, PDC Light Curves

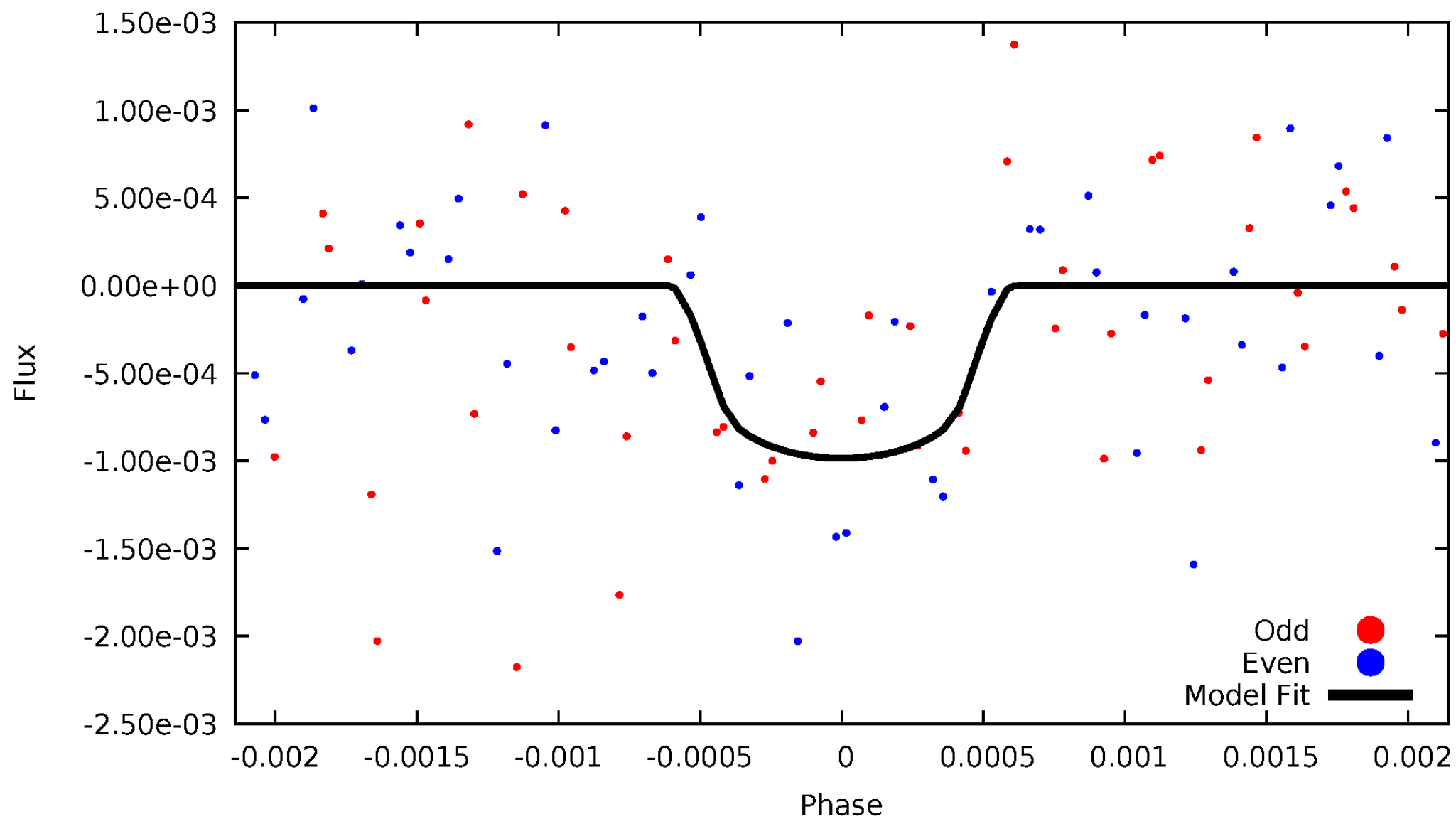


TCE 002140782-03



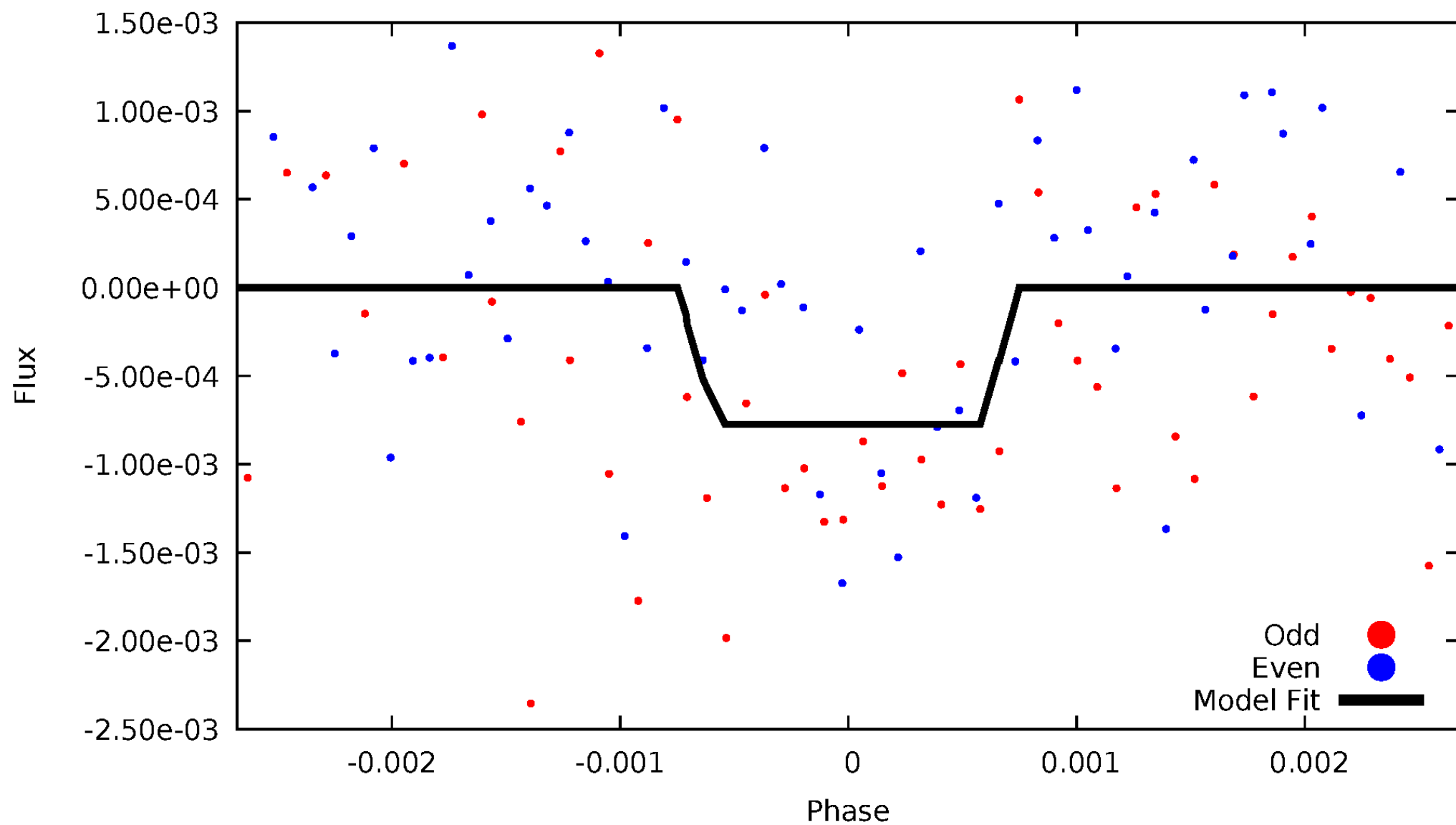
DV Odd/Even

TCE 002140782-03



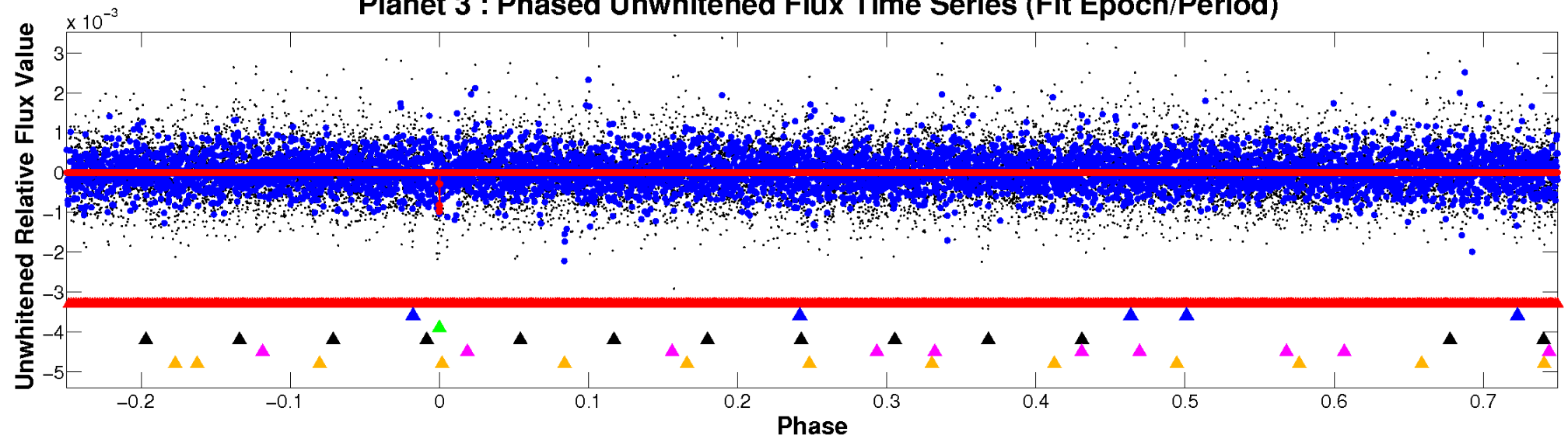
ALT Odd/Even

TCE 002140782-03

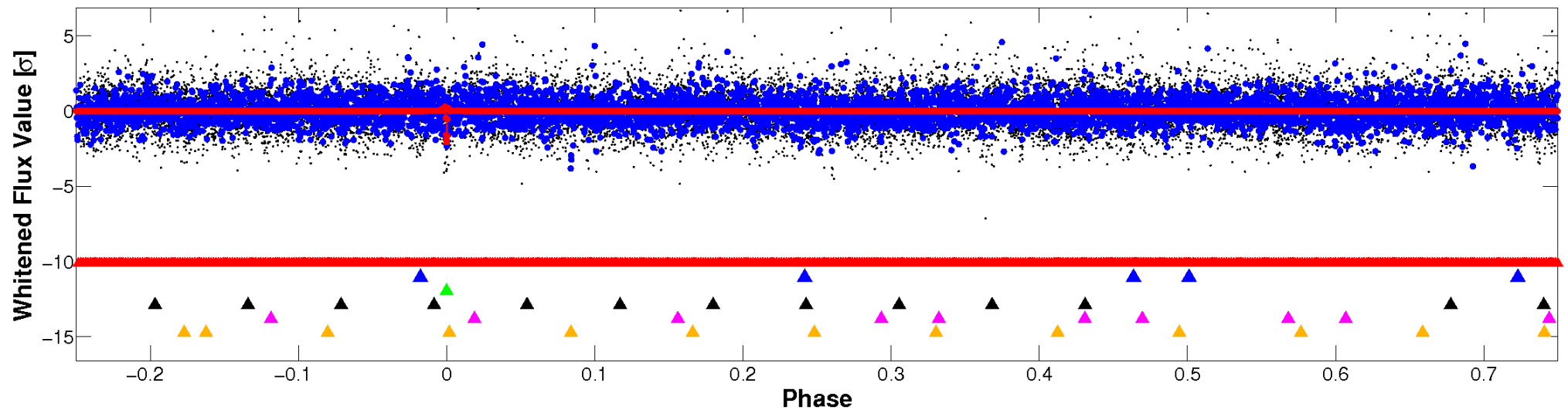


Non-Whitened Vs. Whitened Light Curve

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

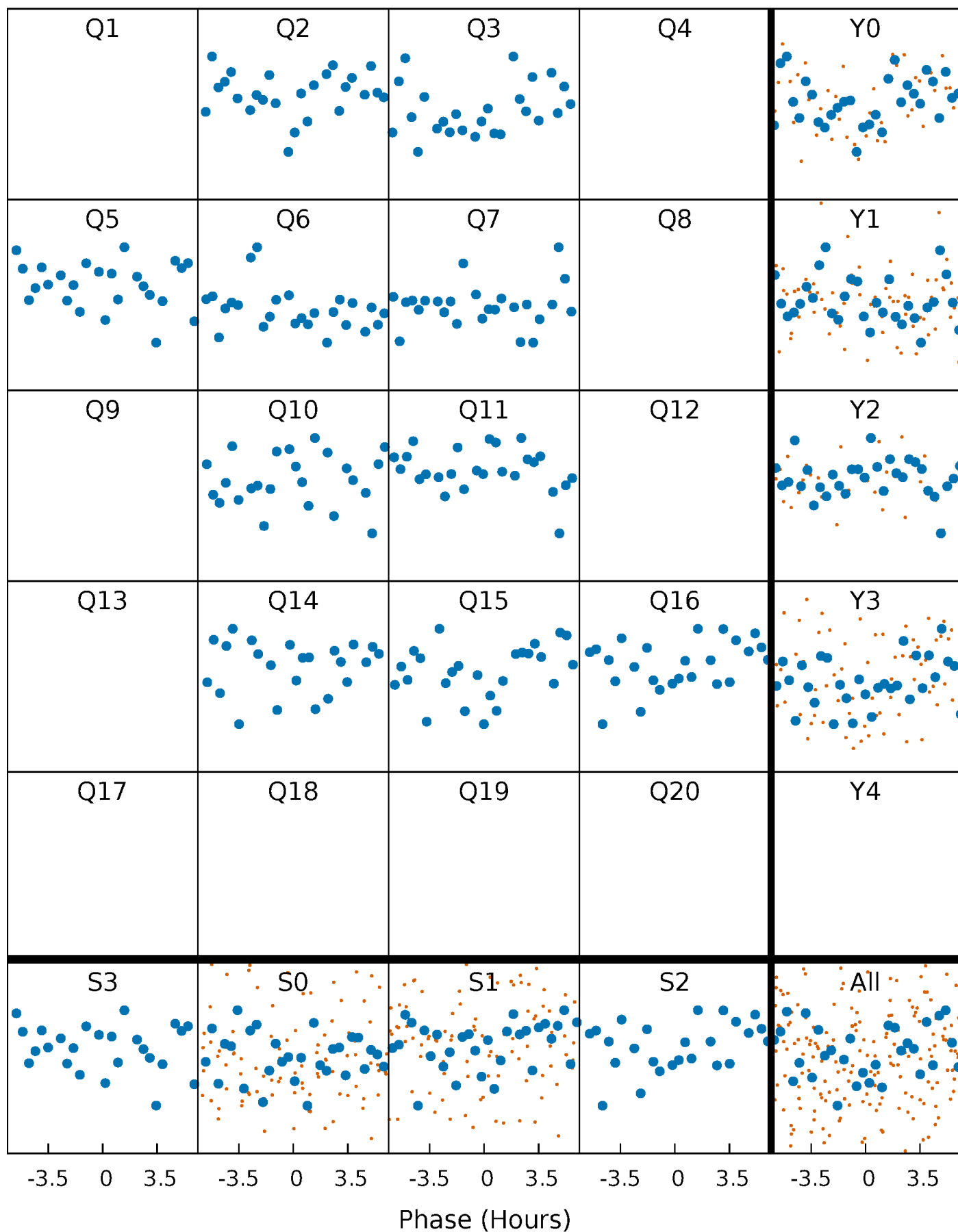


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



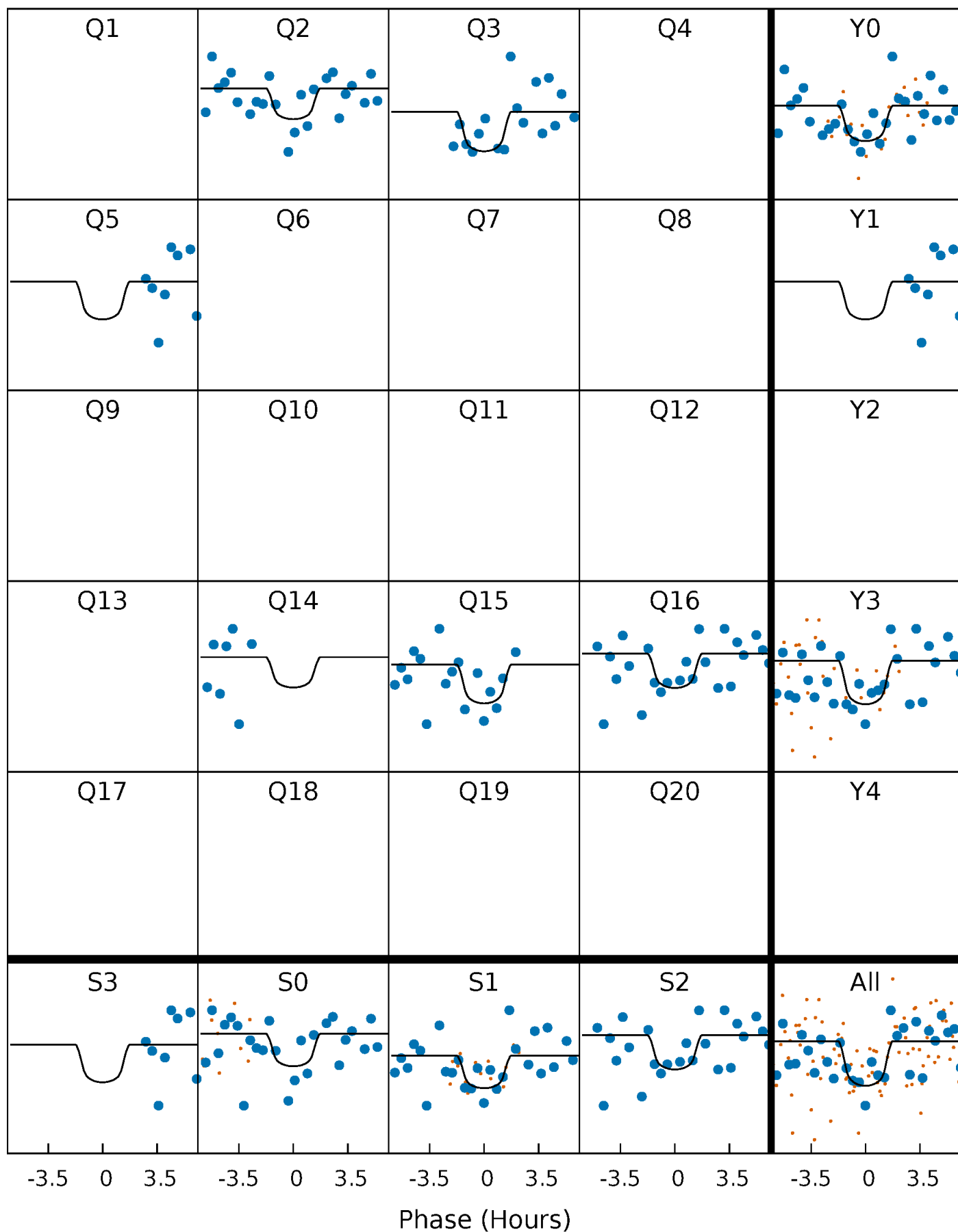
PDC Quarter-Phased Transit Curves

TCE 002140782-03 P=119.461129 Days $T_0=206.974121$ (BKJD)



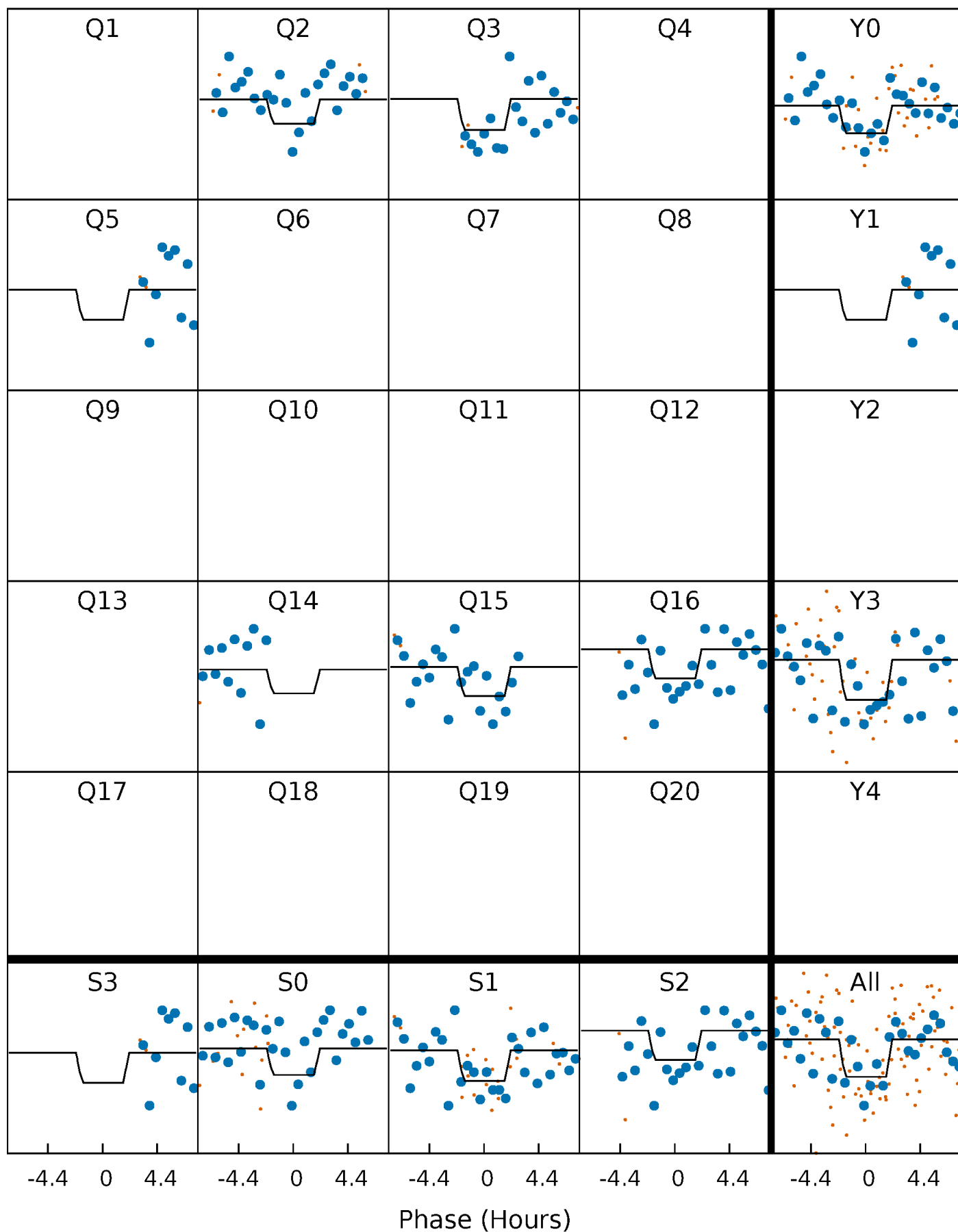
DV Quarter-Phased Transit Curves

TCE 002140782-03 $P=119.461129$ Days $T_0=206.974121$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

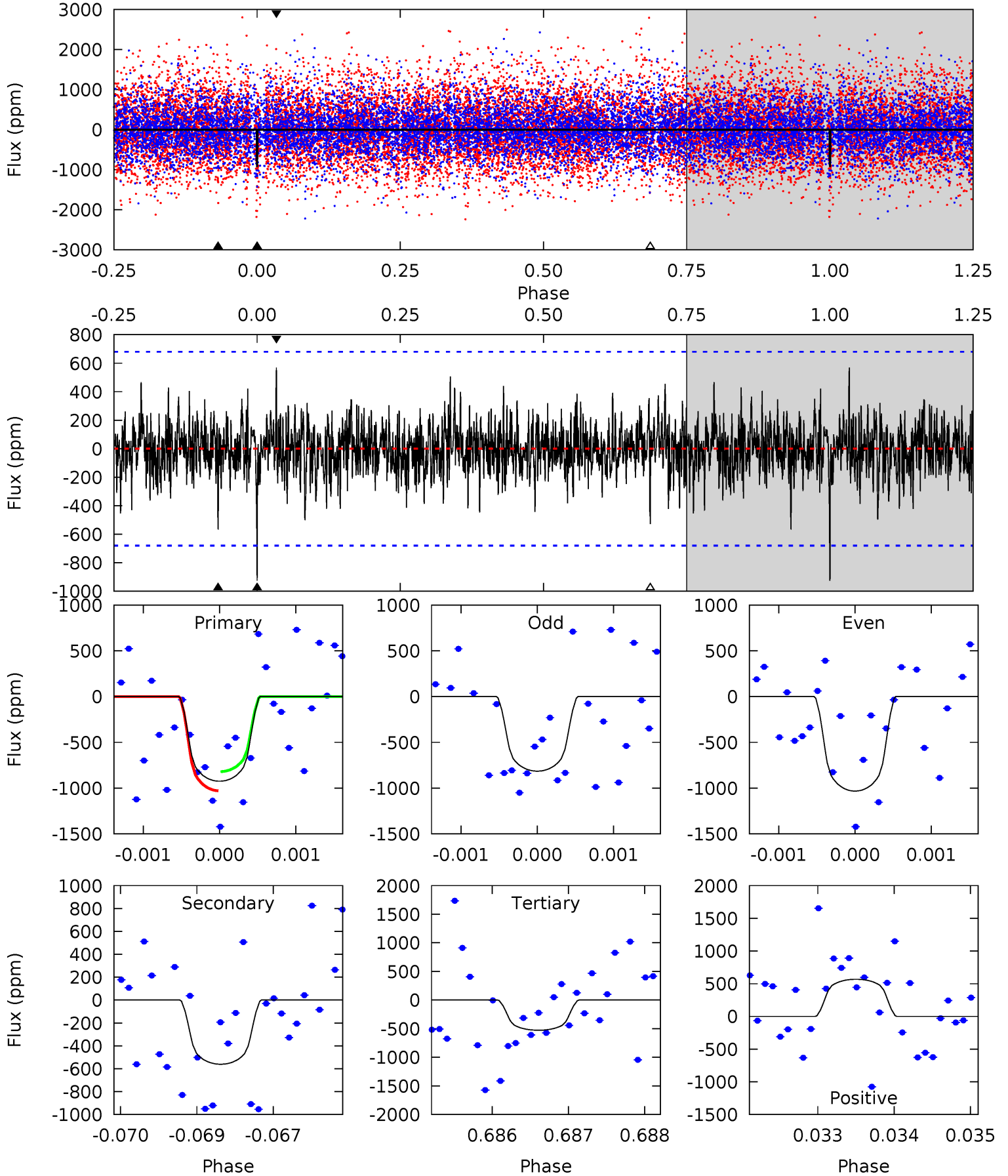
TCE 002140782-03 $P=119.459823$ Days $T_0=206.958758$ (BKJD)



DV Model-Shift Uniqueness Test

002140782-03, P = 119.461129 Days, E = 87.512992 Days

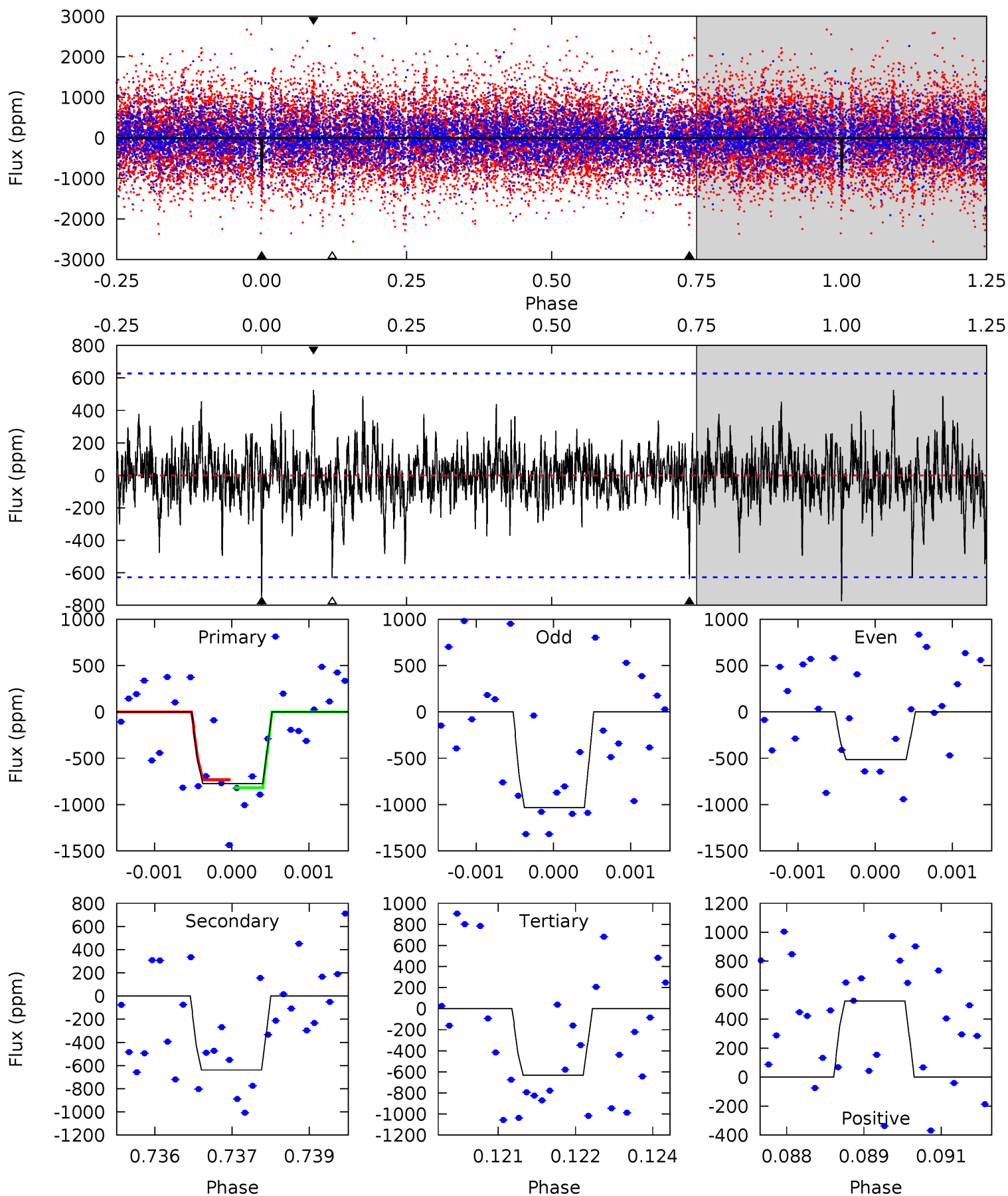
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.38	4.47	4.21	4.53	5.43	3.25	1.14	3.17	2.85	0.27	-0.06	0.87	1.02	0.38	0.83



Alt Model-Shift Uniqueness Test

002140782-03, P = 119.459823 Days, E = 87.498935 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.65	5.48	5.42	4.51	5.39	3.19	1.16	1.22	2.13	0.06	0.97	2.22	0.89	0.40	0.38



Stellar Parameters For KIC 002140782

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5068^{+151}_{-151}	$4.654^{+0.059}_{-0.036}$	$-1.020^{+0.300}_{-0.300}$	$0.605^{+0.042}_{-0.042}$	$0.601^{+0.052}_{-0.022}$	$3.832^{+0.888}_{-0.555}$
	+3%/-3%	+1%/-1%	+29%/-29%	+7%/-7%	+9%/-4%	+23%/-14%
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 002140782-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-561 ± 125	$3.12^{+2.68}_{-2.00}$	382^{+13}_{-13}	3864^{+2122}_{-692}	5004^{+35890}_{-3524}
Alt.	-638 ± 116	$3.12^{+2.59}_{-2.12}$	382^{+13}_{-14}	3979^{+2426}_{-732}	5952^{+54844}_{-4254}

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 $A_{obs} \gg 1.0$

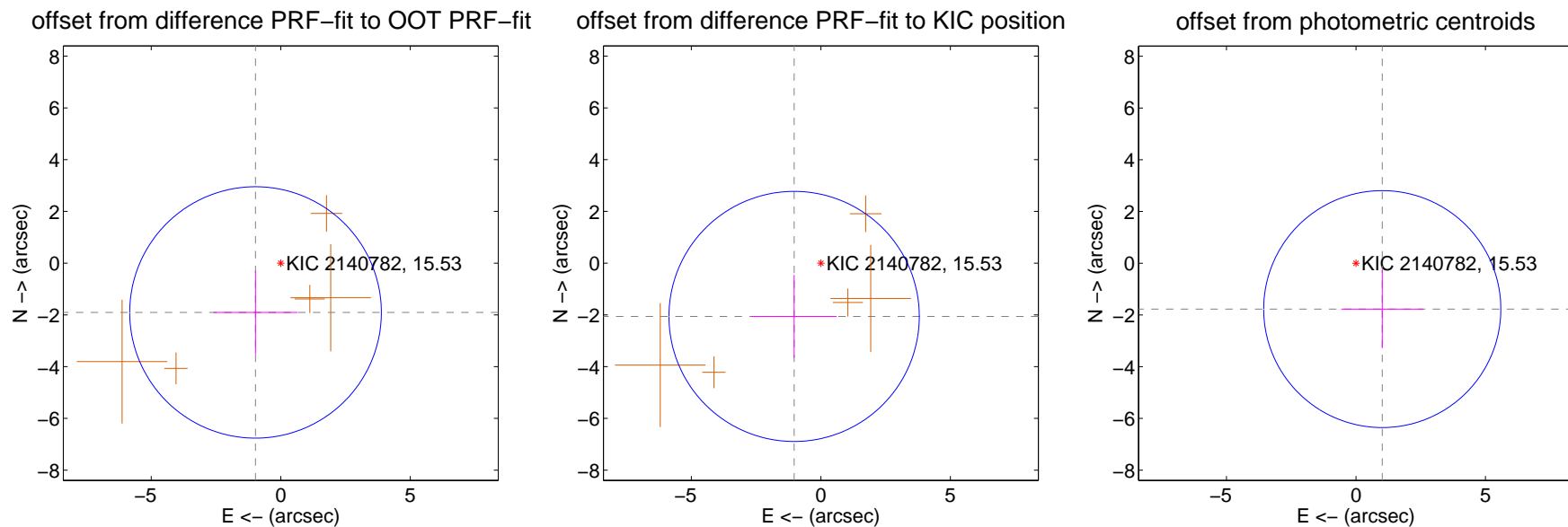
DV Centroid Data

Supplemental centroid analysis for 002140782-03. Kepler magnitude: 15.53. Transit SNR 8.65

There are 0 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	2.139 ± 1.619	1.32	0.974 ± 1.626	-1.905 ± 1.617
PRF-fit source offset from KIC position	2.304 ± 1.611	1.43	1.033 ± 1.642	-2.060 ± 1.603
photometric centroid source offset	2.04 ± 1.53	1.34	-1.02 ± 1.58	-1.77 ± 1.51



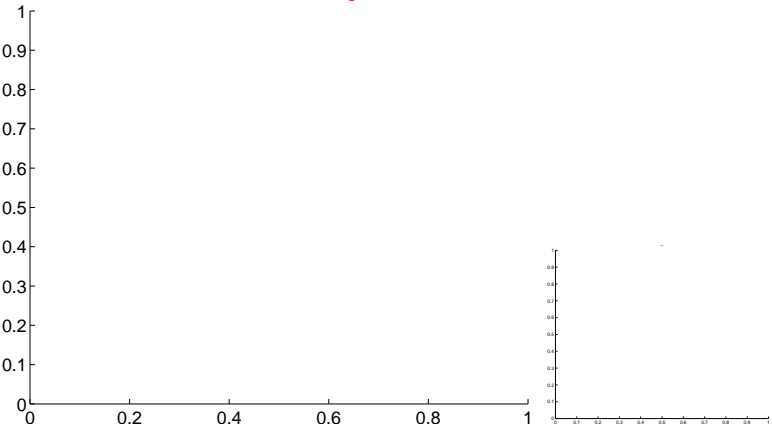
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

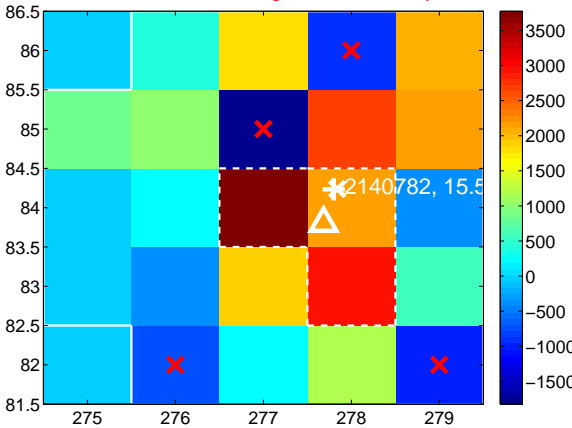
Q1 no difference image



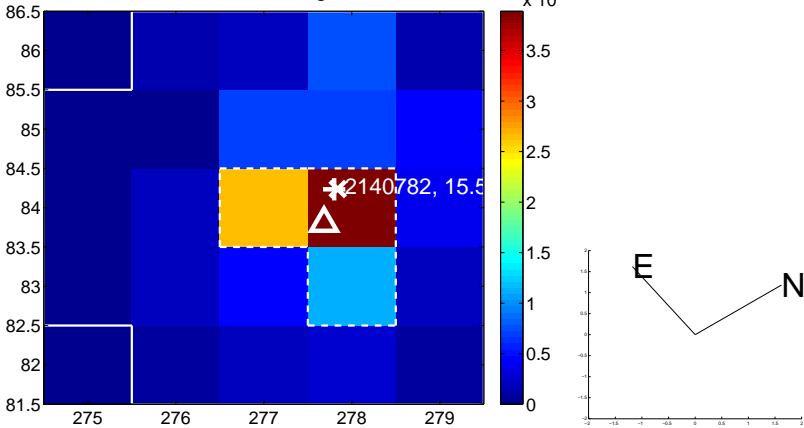
Q1 no OOT image



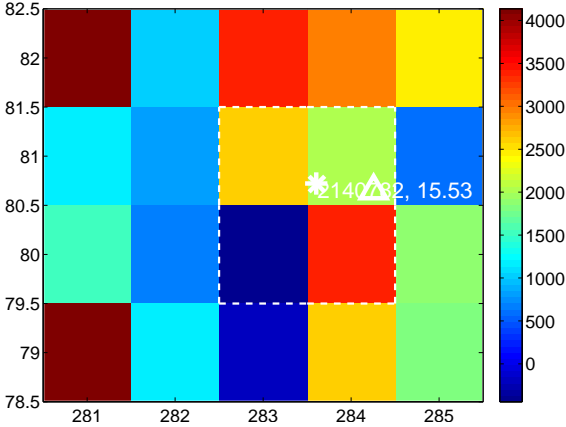
Q2 difference image. Poor Quality



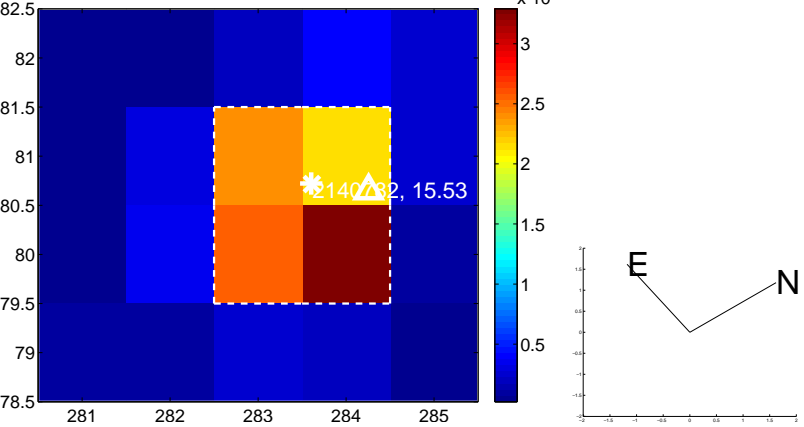
Q2 OOT image



Q3 difference image. Poor Quality



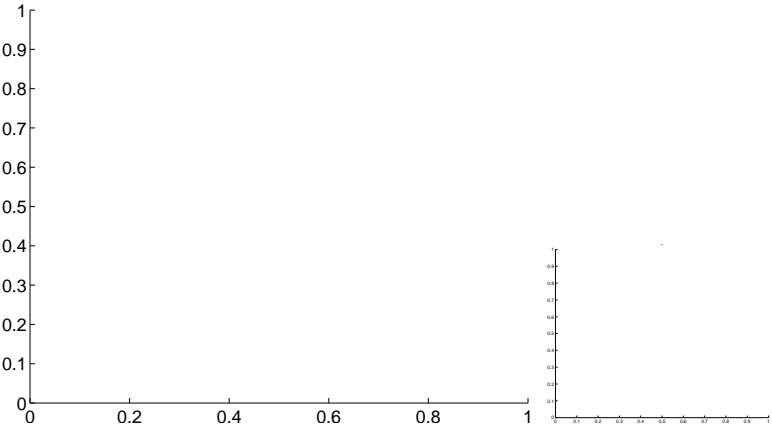
Q3 OOT image



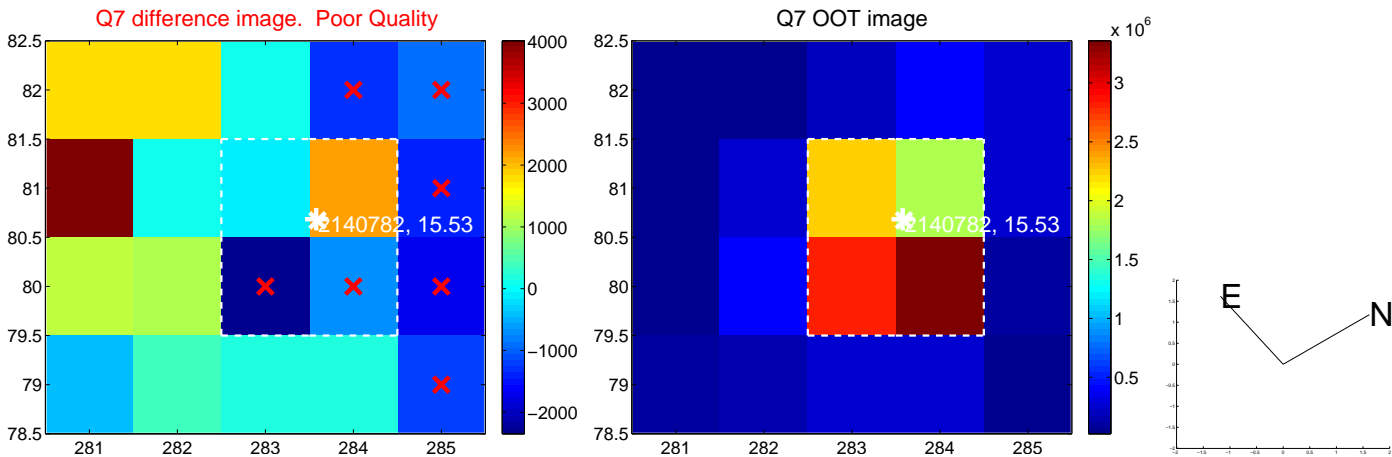
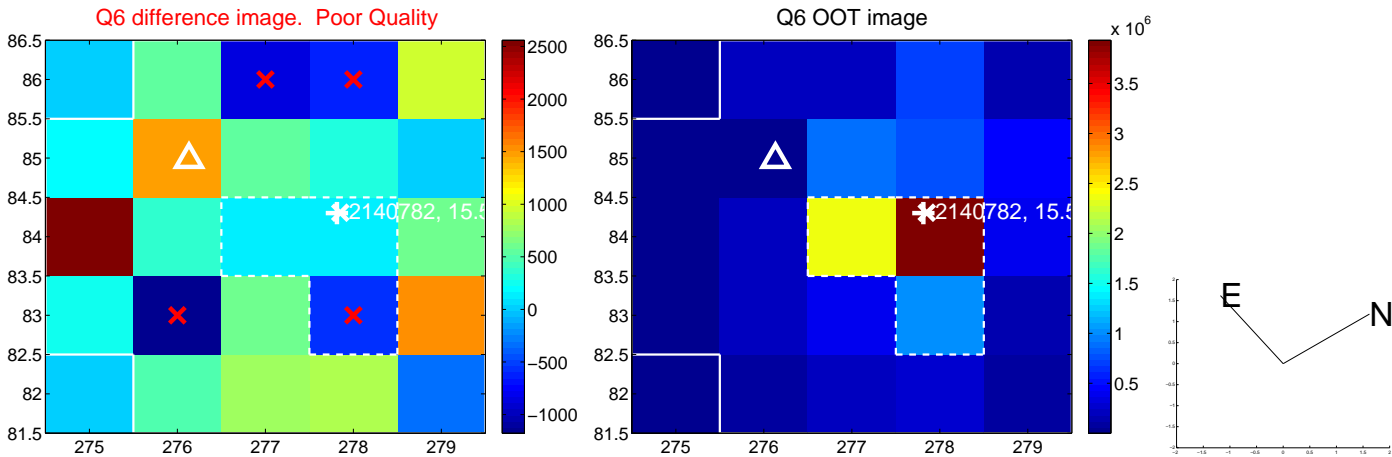
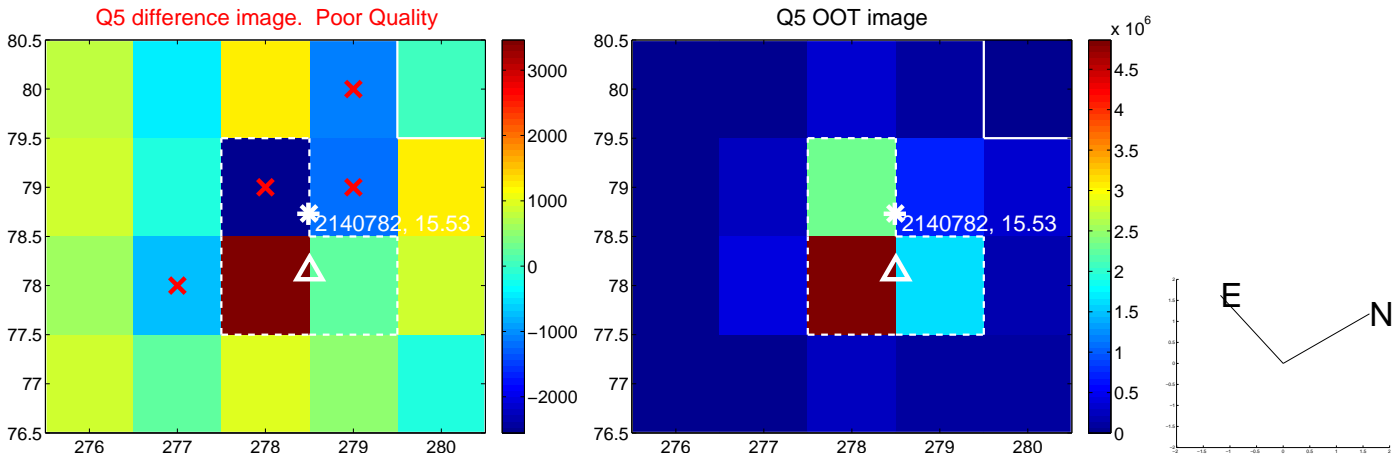
Q4 no difference image



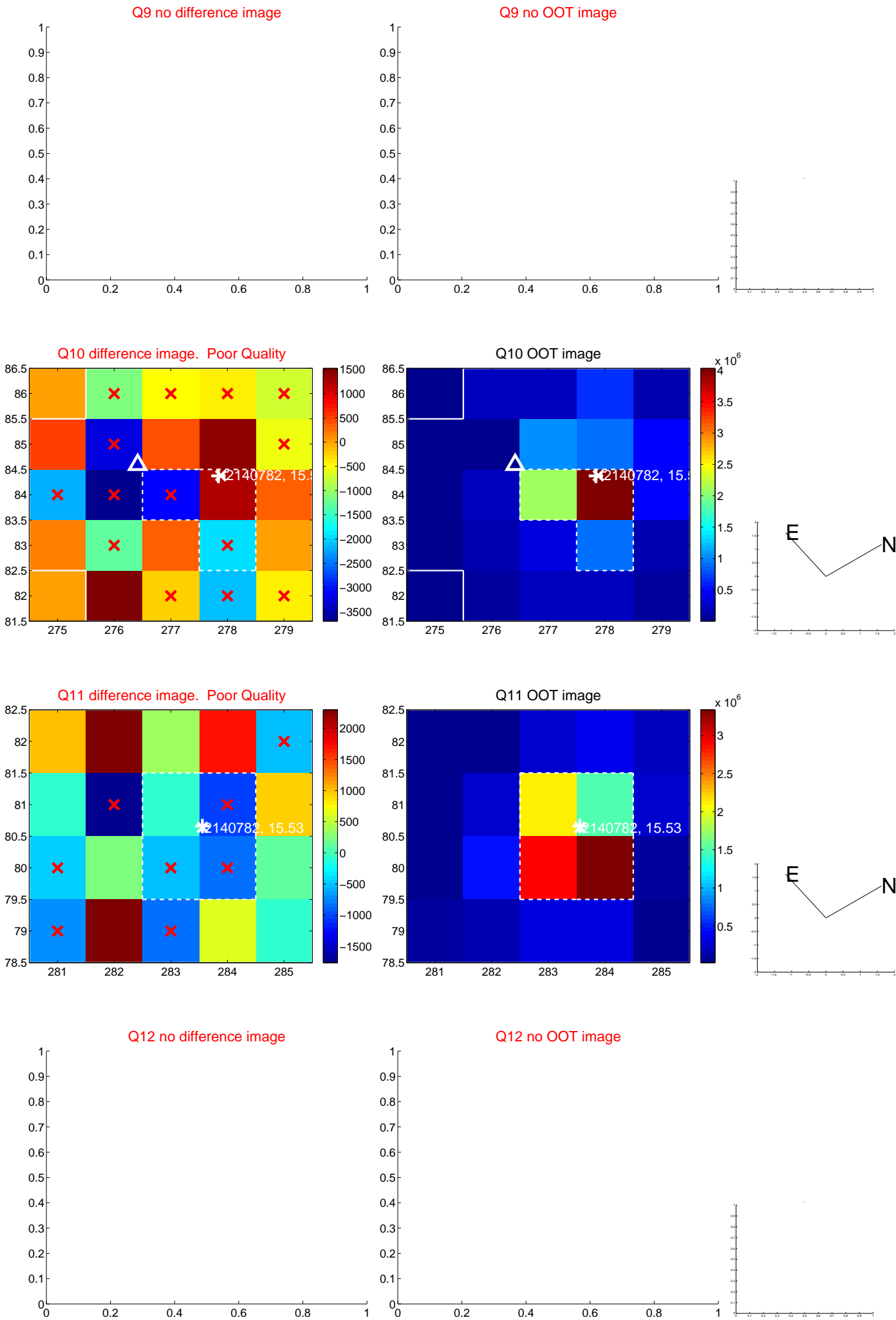
Q4 no OOT image



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

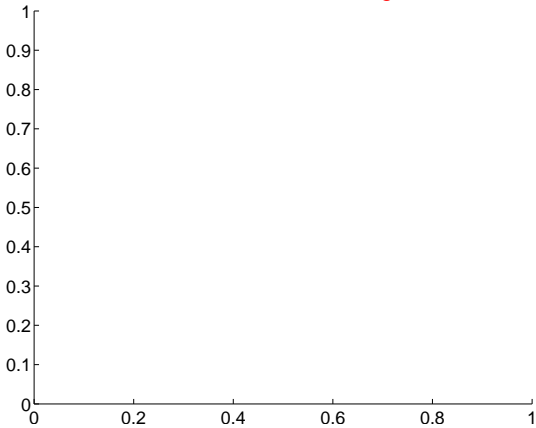


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

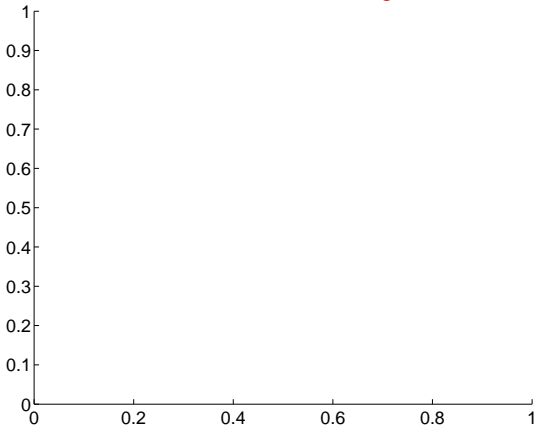
Q13 no difference image



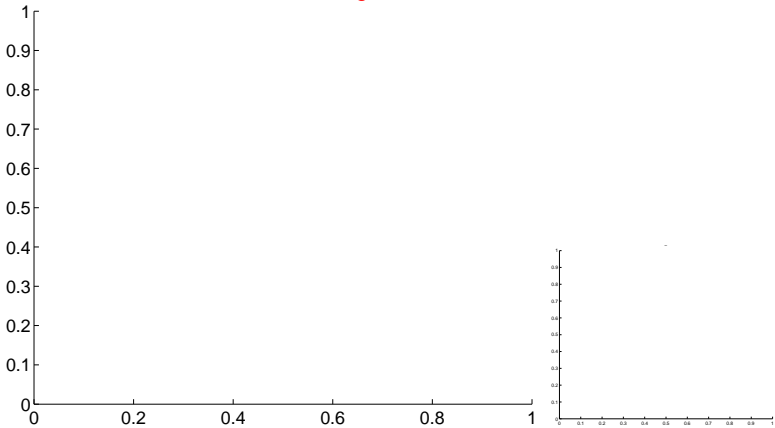
Q13 no OOT image



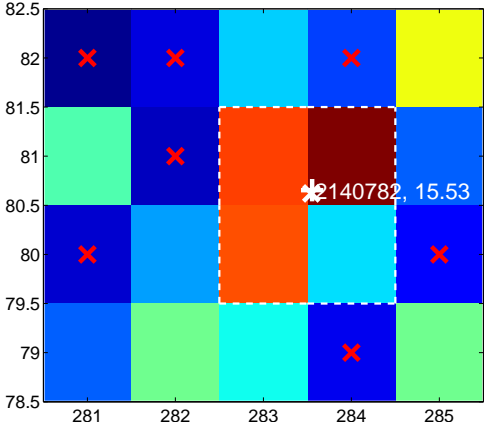
Q14 no difference image



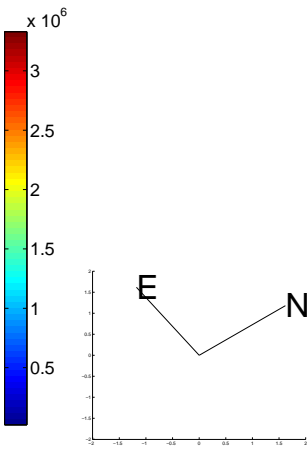
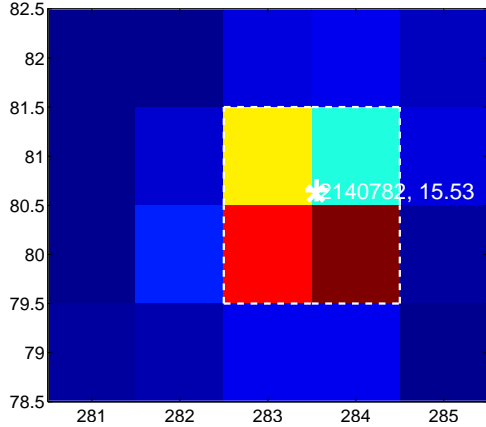
Q14 no OOT image



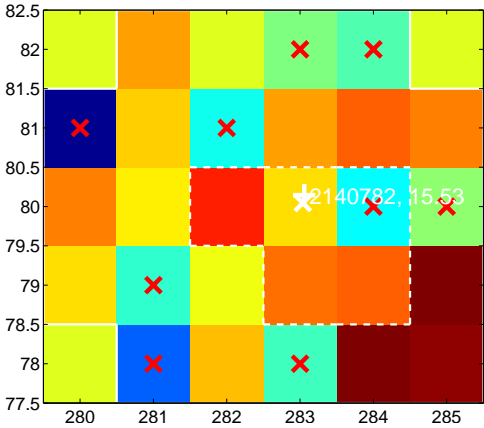
Q15 difference image. Poor Quality



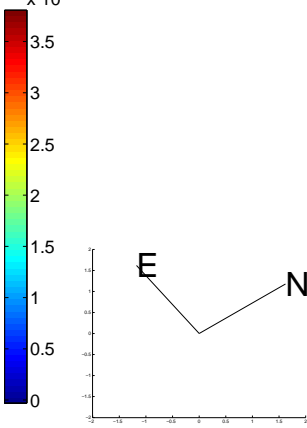
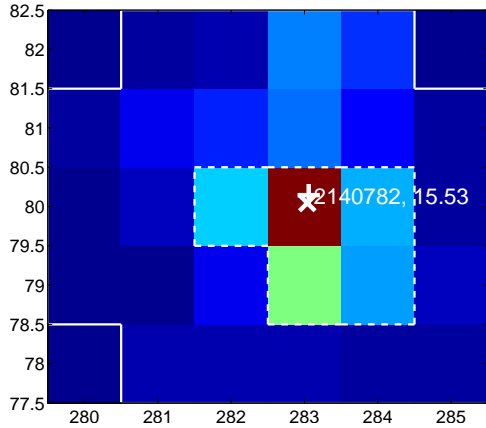
Q15 OOT image



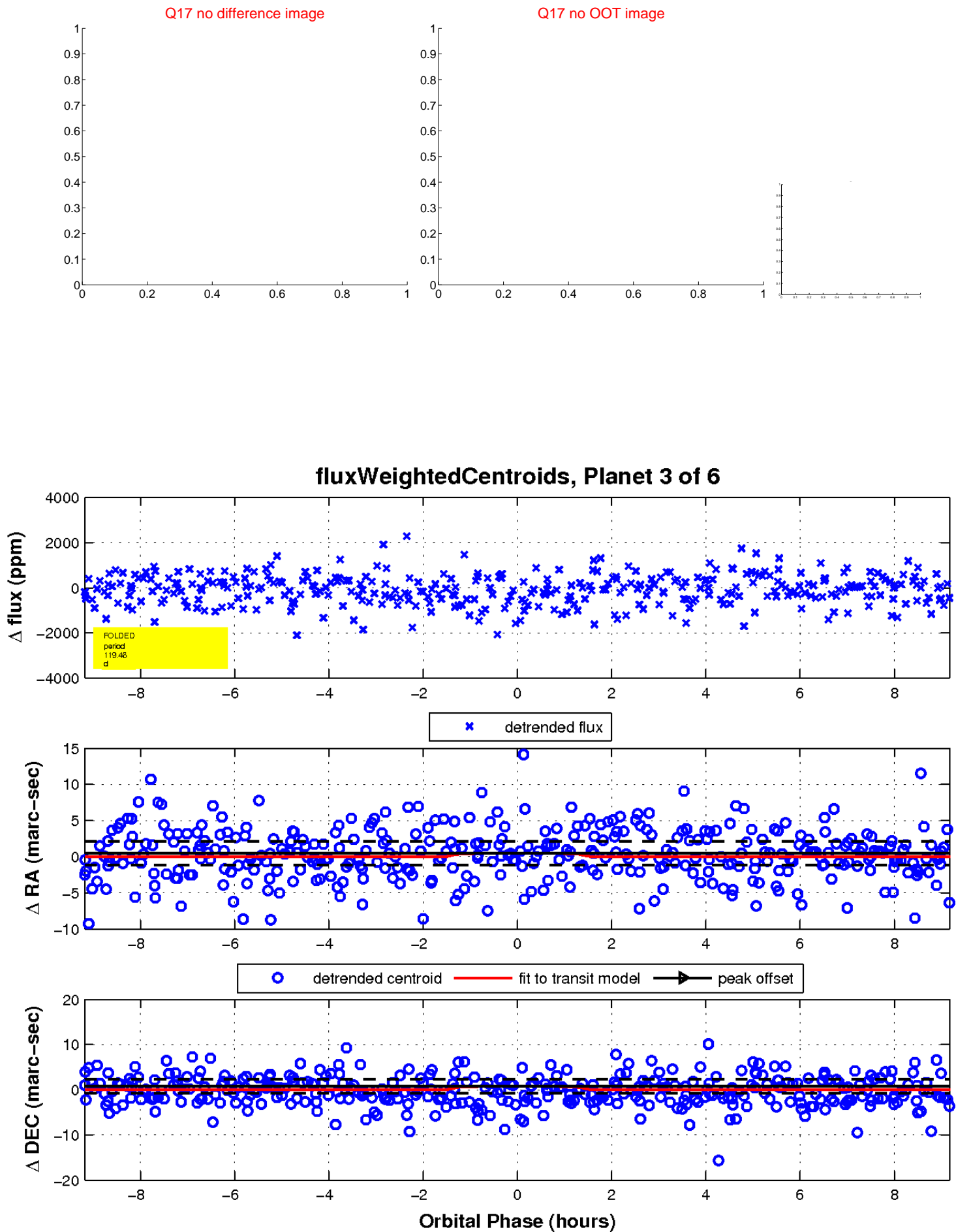
Q16 difference image. Poor Quality



Q16 OOT image

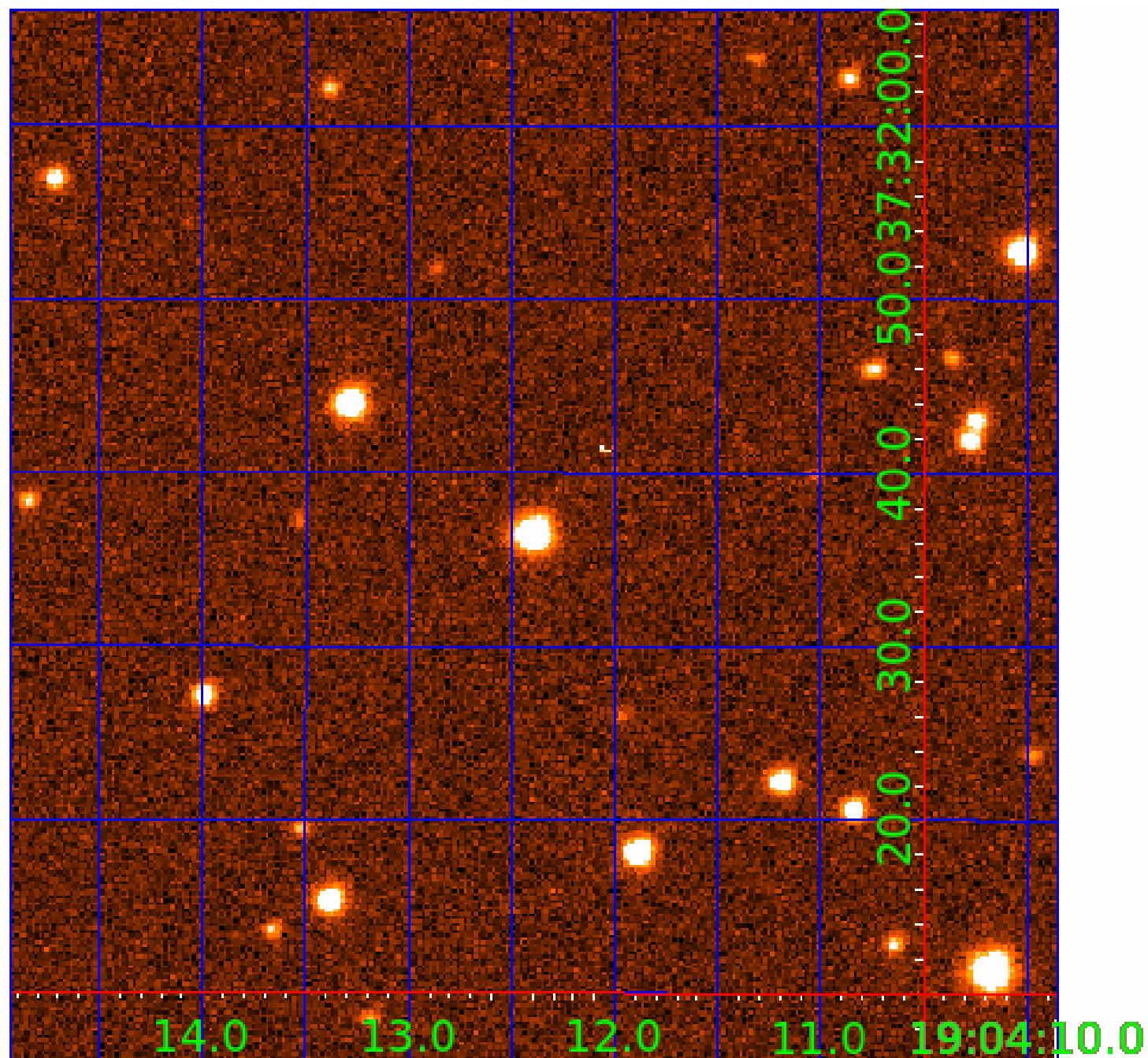


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002140782

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})
002140782-01	OBS	No	2.099245	132.422800	37.9	12.425	7.5	5.5	0.60	5068	0.37	294.66
002140782-02	OBS	No	327.400231	266.831494	575.9	59.925	11.5	5.4	0.60	5068	1.49	0.35
002140782-03	OBS	No	119.461129	206.974121	984.7	3.069	8.3	8.6	0.60	5068	2.09	1.35
002140782-04	OBS	No	111.962601	138.993343	1059.3	2.920	7.9	8.3	0.60	5068	2.29	1.47
002140782-05	OBS	No	135.864497	246.661959	1071.8	5.073	7.4	7.9	0.60	5068	3.91	1.13
002140782-06	OBS	No	109.652349	185.820052	1395.6	4.525	7.3	7.2	0.60	5068	4.36	1.51

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002140782-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
002140782-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002140782-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002140782-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002140782-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
002140782-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_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.

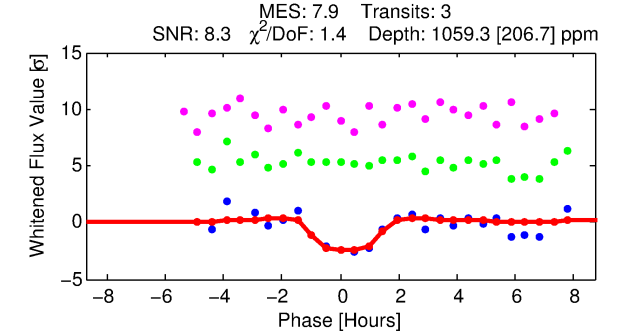
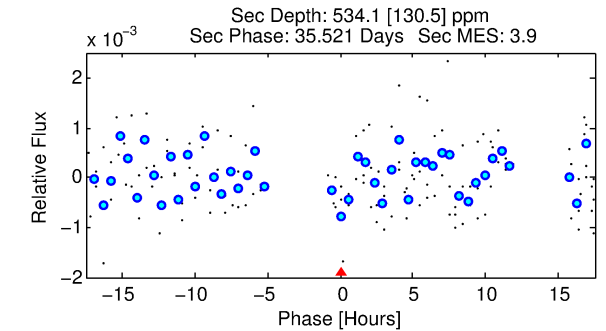
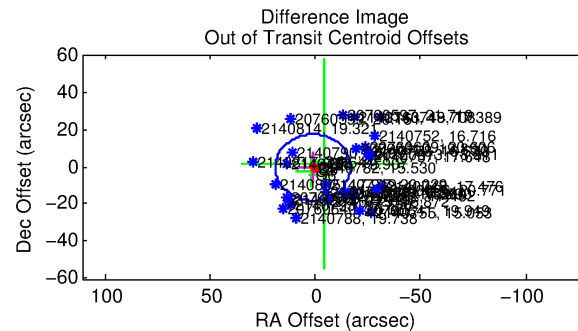
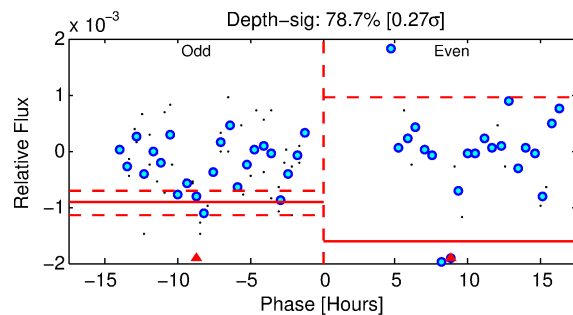
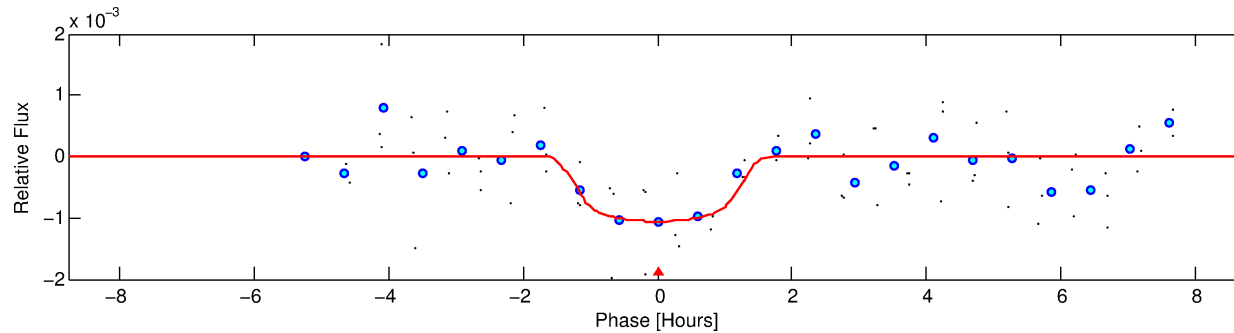
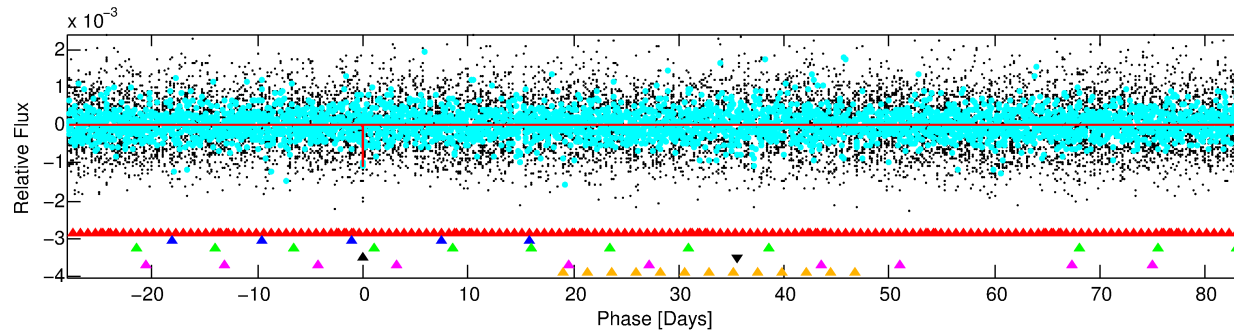
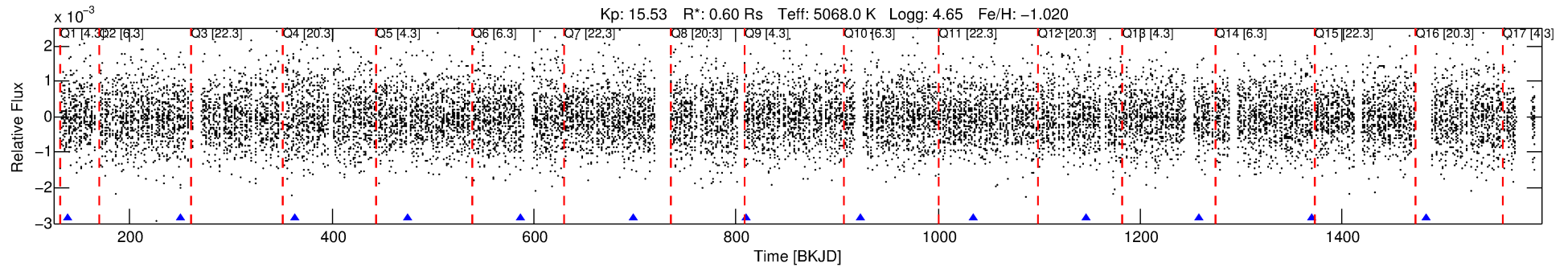
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002140782-04

No Significant Match Found

DV One-Page Summary

KIC: 2140782 Candidate: 4 of 6 Period: 111.963 d



DV Fit Results:

Period = 111.96260 [0.00140] d
Epoch = 138.9933 [0.0111] BKJD
Rp/R* = 0.0347 [0.1018]
a/R* = 164.99 [2060.60]
b = 0.87 [3.62]
Seff = 1.47 [0.23]
Teq = 281 [11] K
Rp = 2.29 [6.73] Re
a = 0.3839 [0.0249] AU
Ag = 8257.98 [48539.51] [0.17σ]
Teffp = 4137 [6079] K [0.63σ]

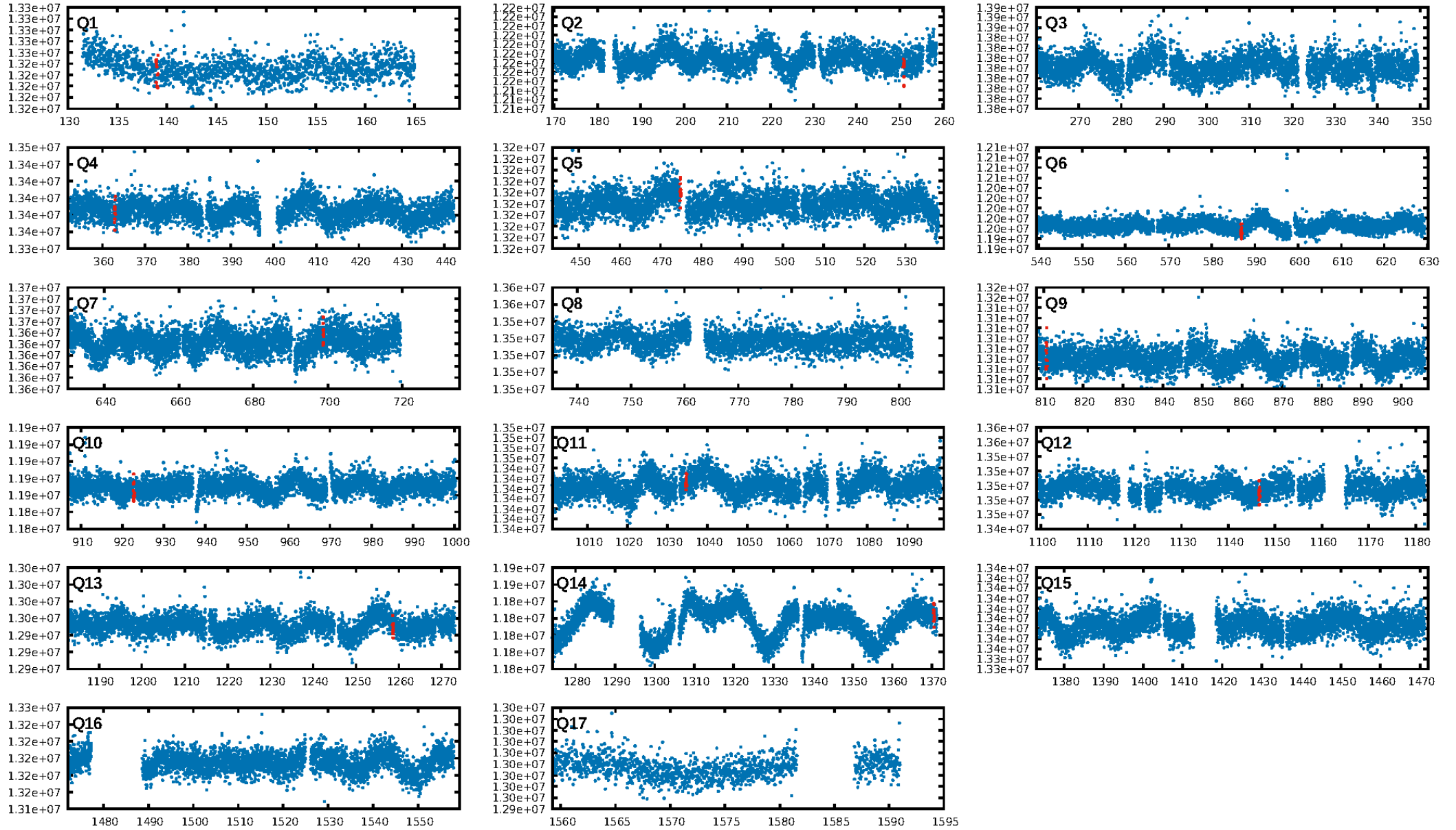
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.30σ]
LongPeriod-sig: 100.0% [42.48σ]
ModelChiSquare2-sig: 56.5%
ModelChiSquareGof-sig: 86.7%
Bootstrap-pfa: 4.91e-10
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -3.328
Centroid-sig: 14.3%
Centroid-so: 1.778 arcsec [1.23σ]
OotOffset-rm: 1.474 arcsec [0.25σ]
OotOffset-st: 2/1/1/3 [7]
KicOffset-rm: 1.550 arcsec [0.26σ]
KicOffset-st: 2/1/1/3 [7]
DiffImageQuality-fgm: 0.14 [1/7]
DiffImageOverlap-fno: 0.30 [3/10]

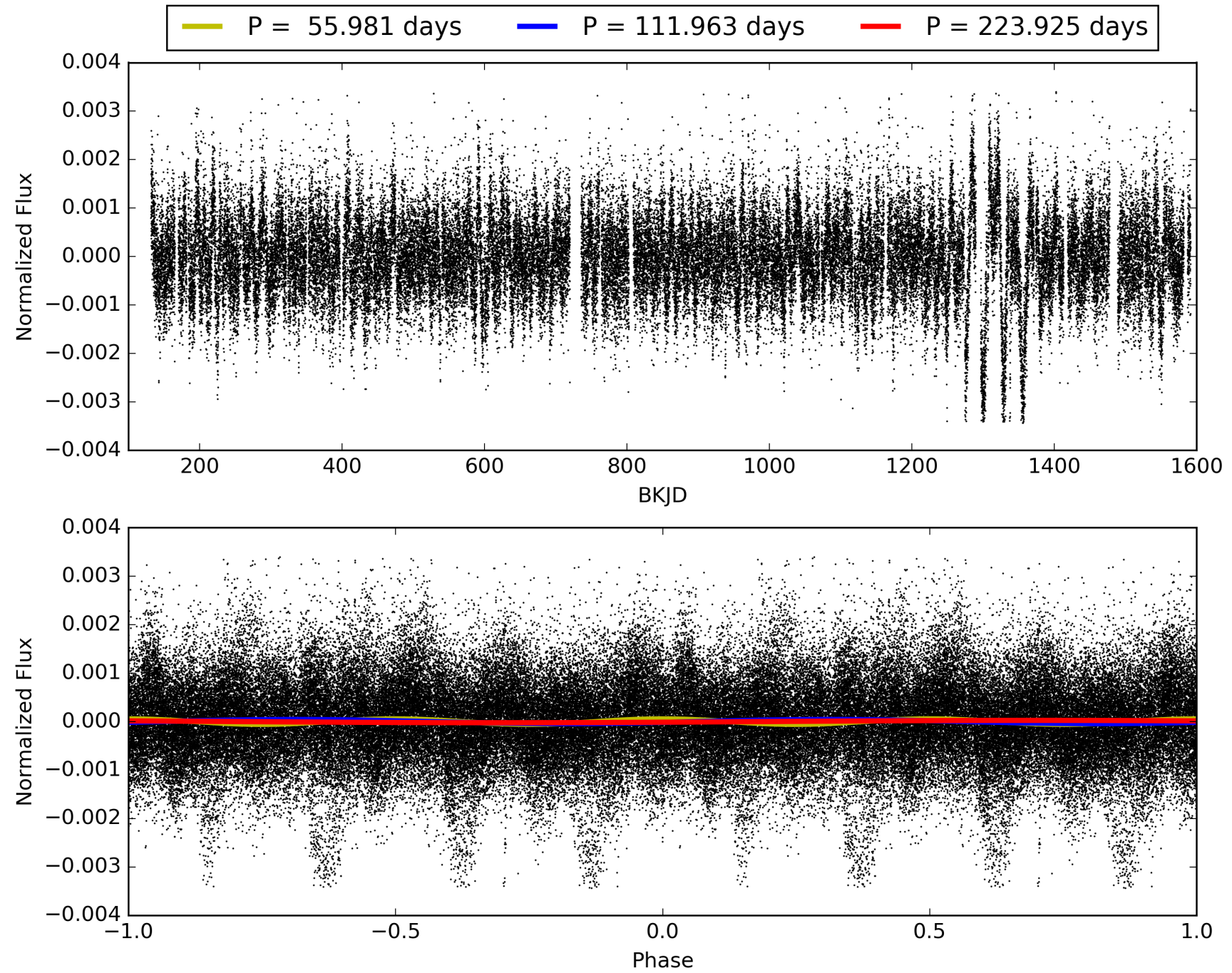
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:39:06 Z

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

TCE 002140782-04, PDC Light Curves

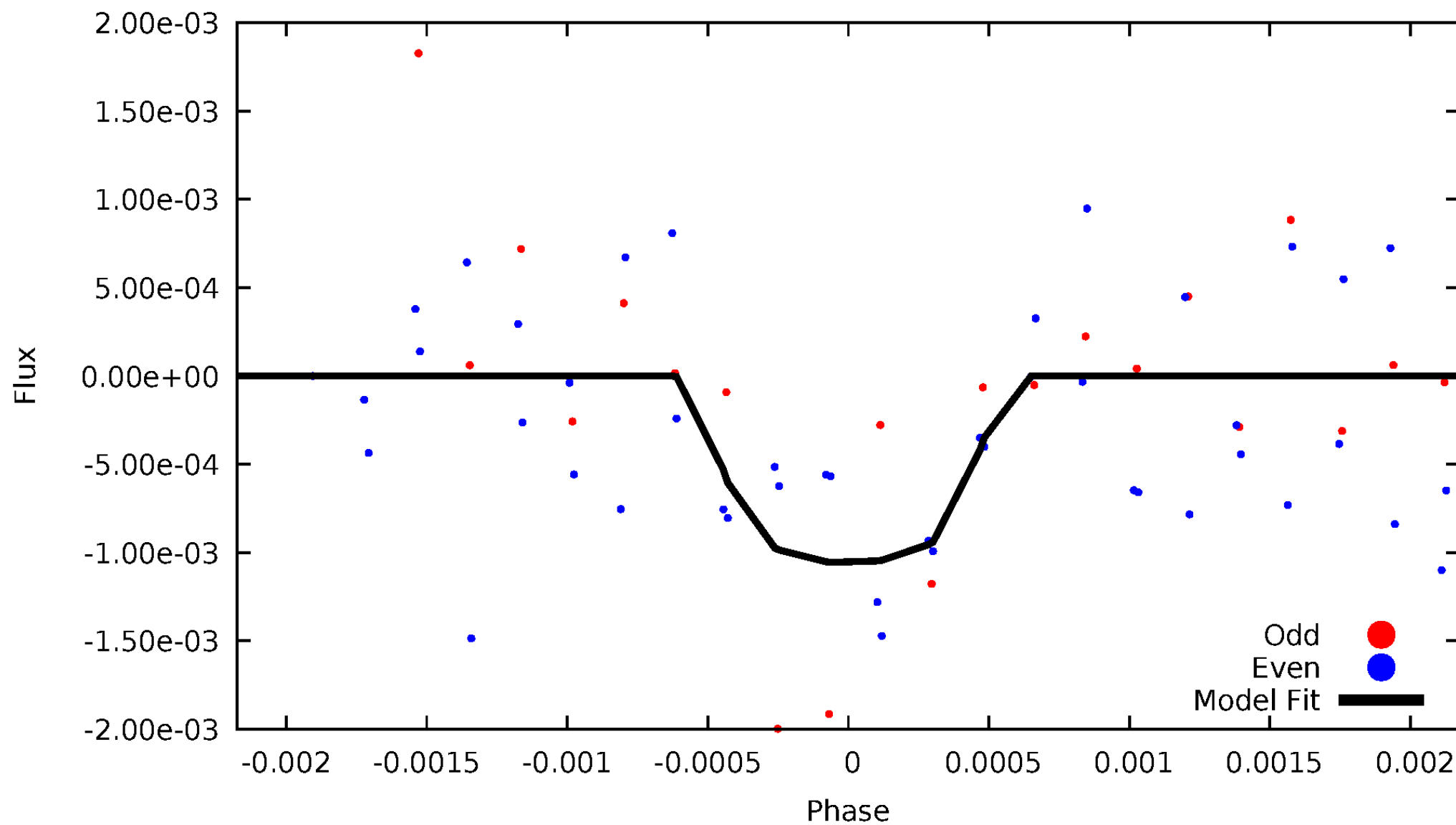


TCE 002140782-04



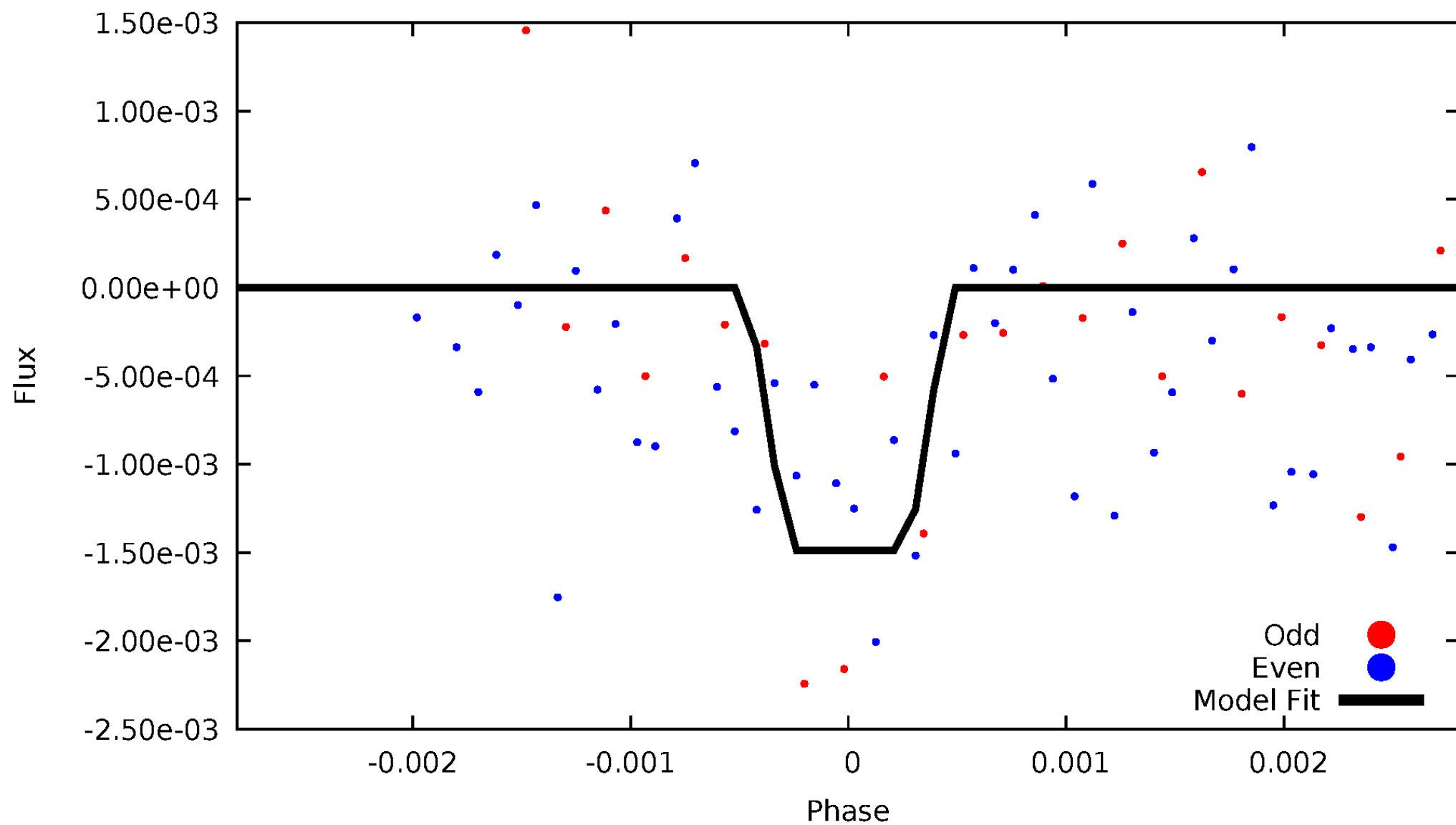
DV Odd/Even

TCE 002140782-04



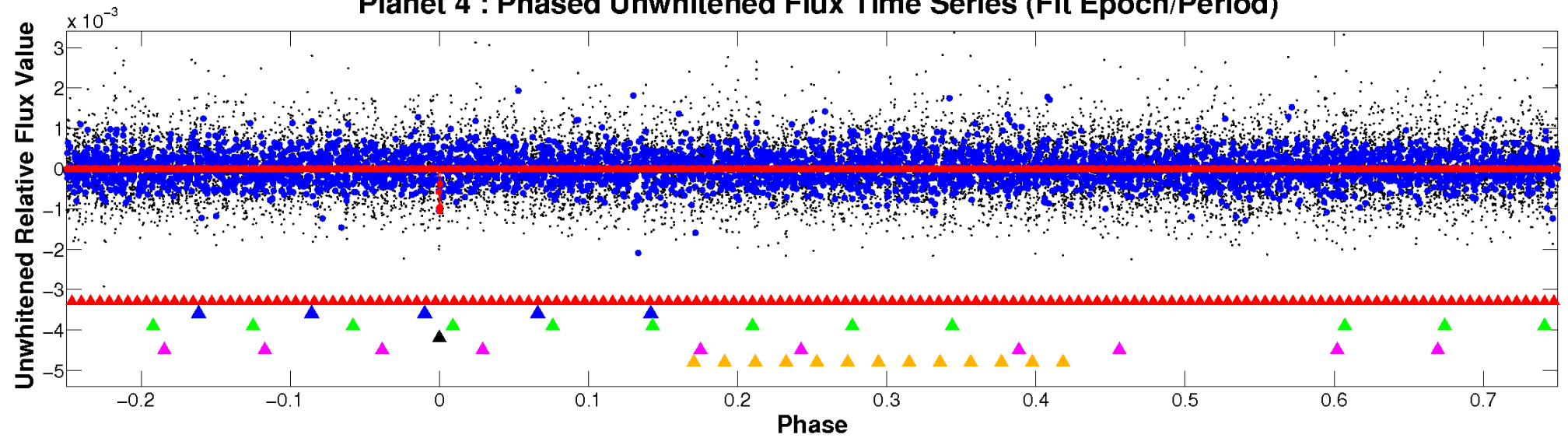
ALT Odd/Even

TCE 002140782-04

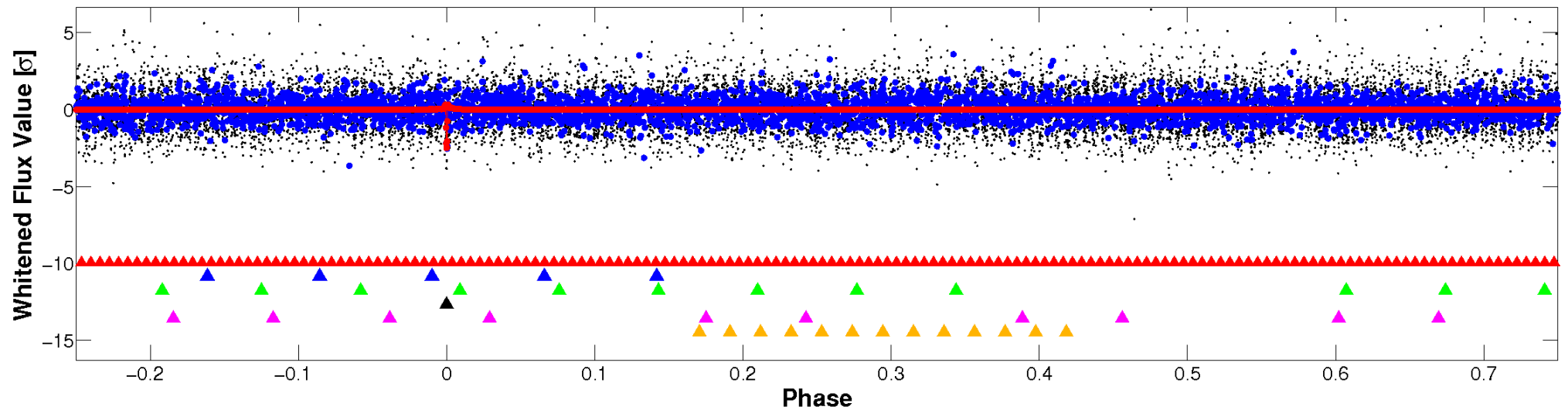


Non-Whitened Vs. Whitened Light Curve

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

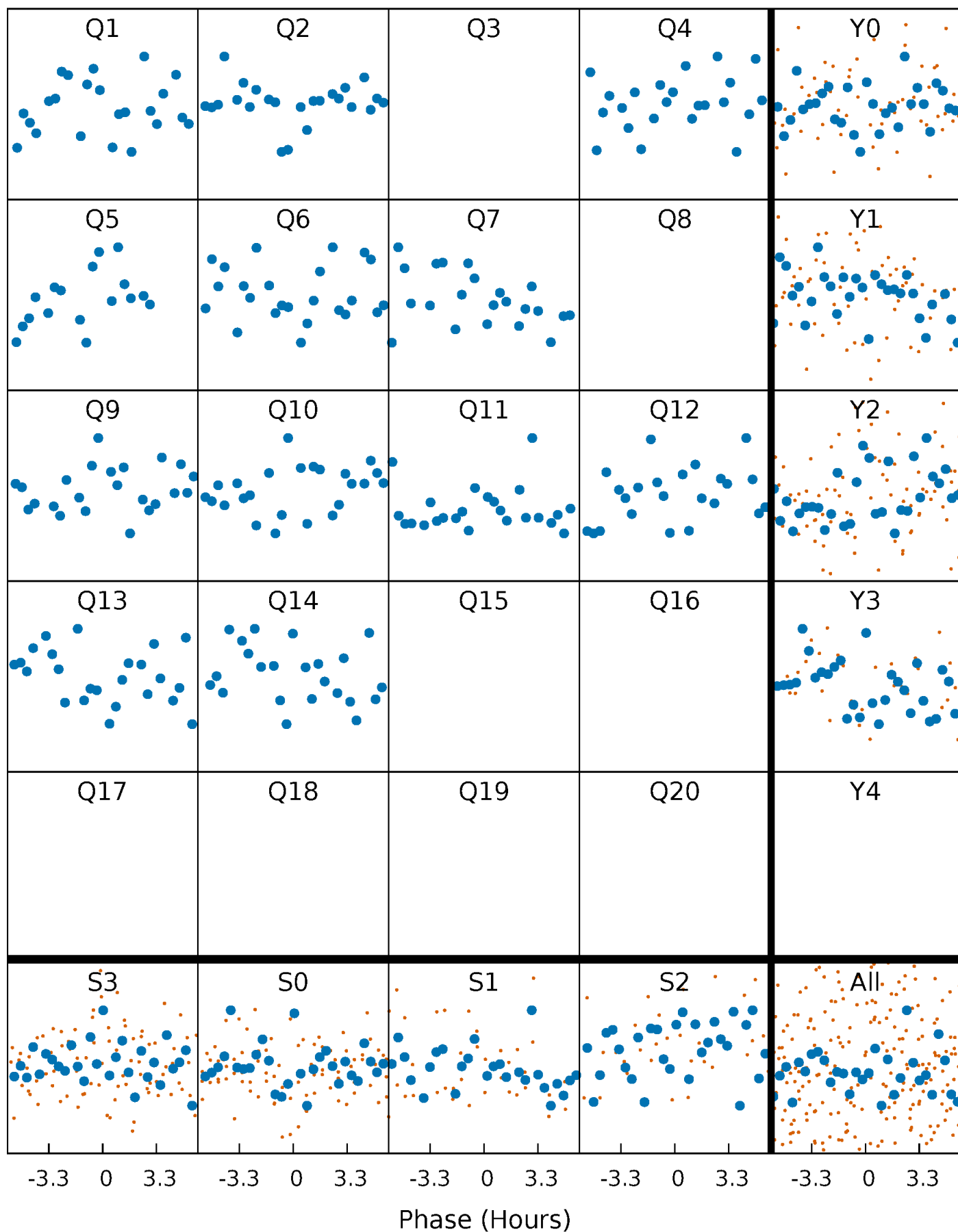


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



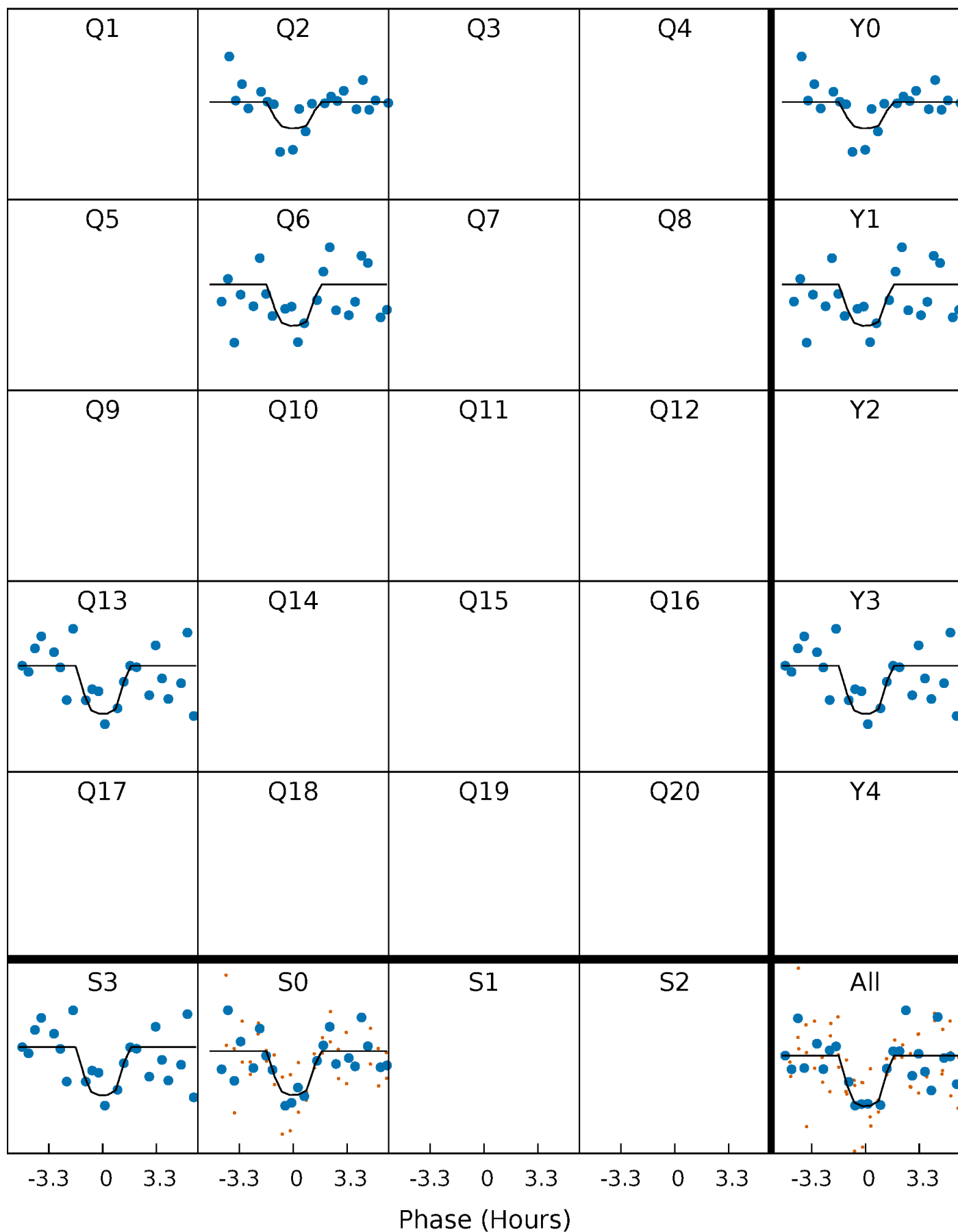
PDC Quarter-Phased Transit Curves

TCE 002140782-04 P=111.962601 Days $T_0=138.993343$ (BKJD)



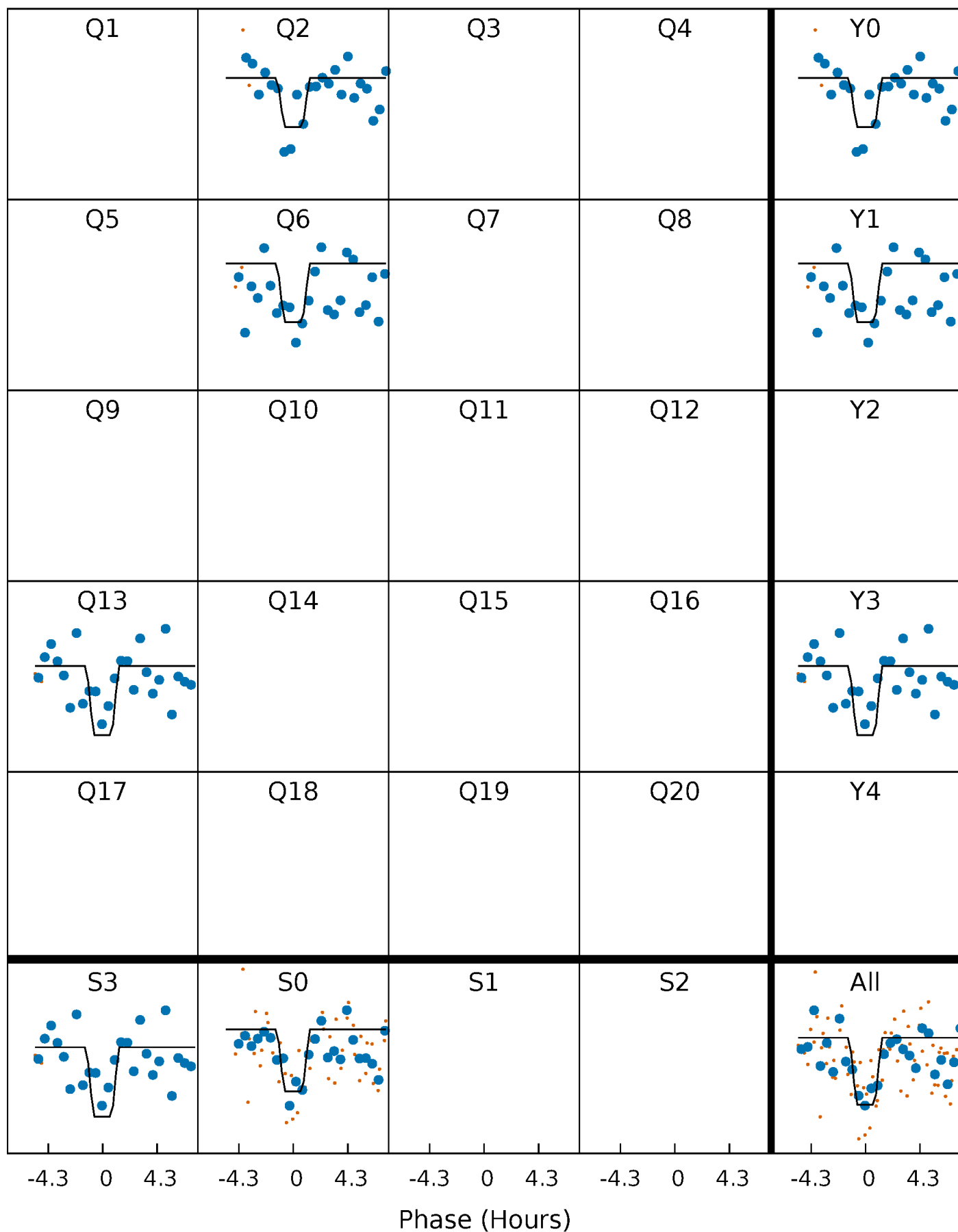
DV Quarter-Phased Transit Curves

TCE 002140782-04 P=111.962601 Days $T_0=138.993343$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

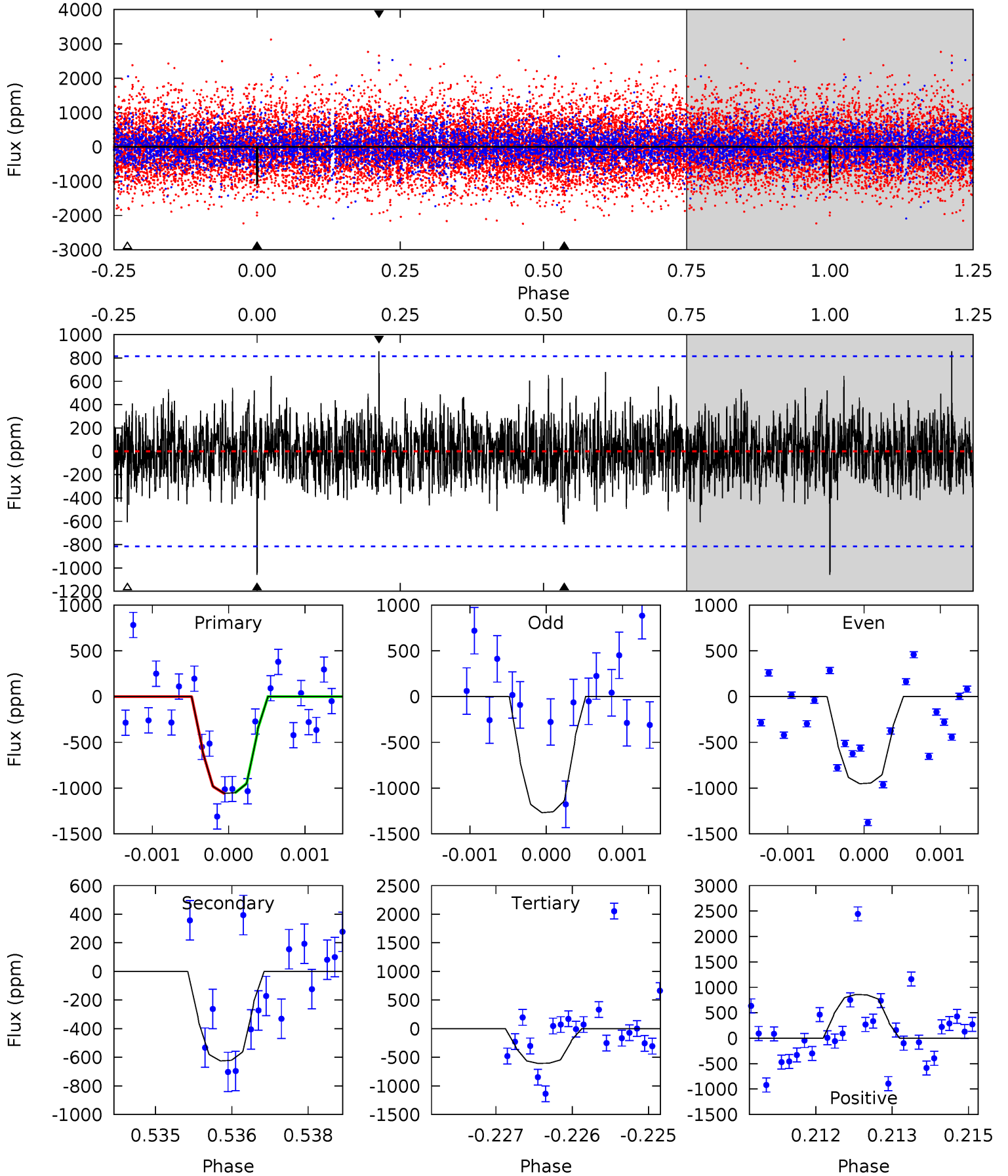
TCE 002140782-04 P=111.964171 Days $T_0=138.986204$ (BKJD)



DV Model-Shift Uniqueness Test

002140782-04, P = 111.962601 Days, E = 27.030742 Days

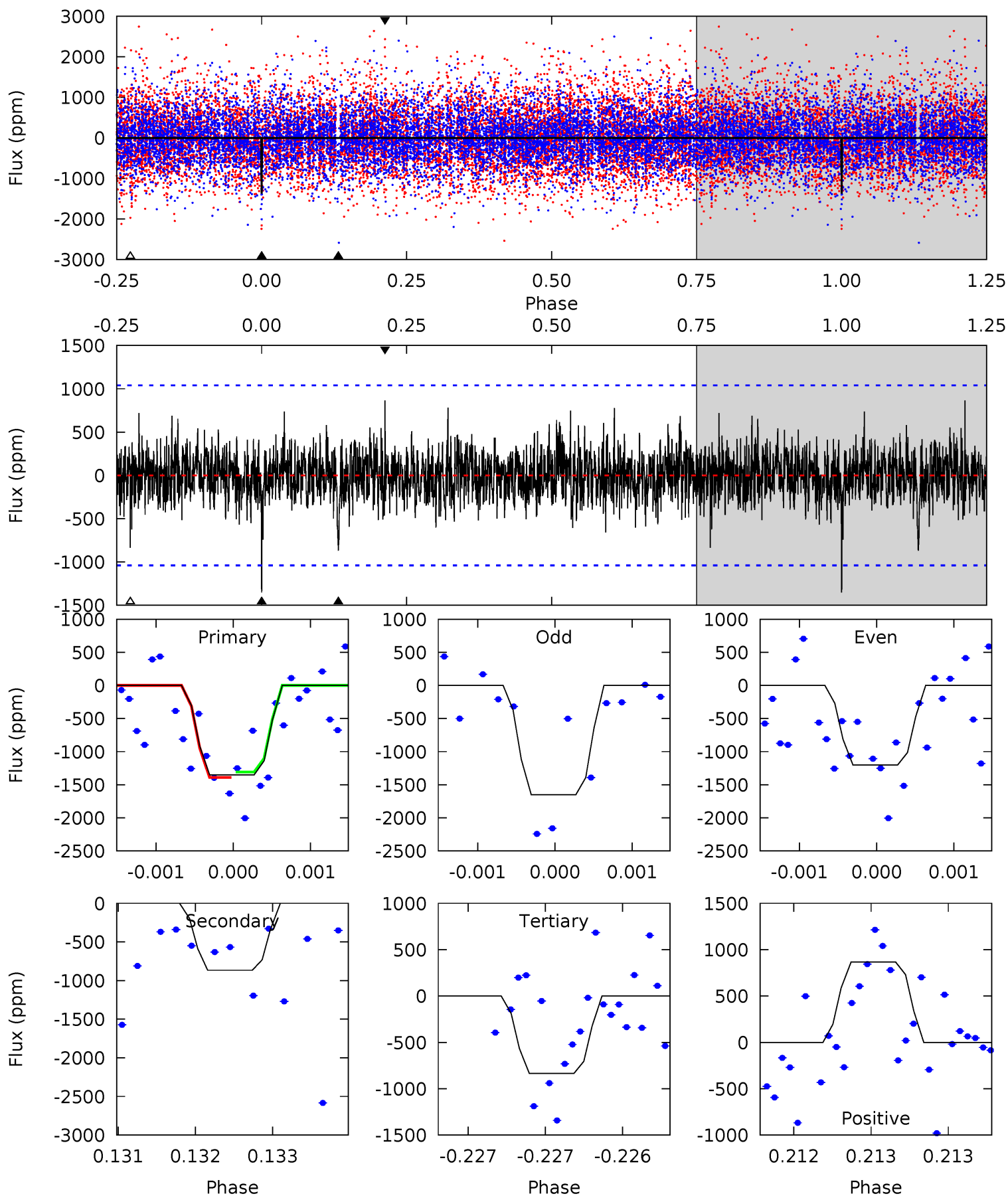
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.01	4.15	4.03	5.69	5.41	3.22	1.15	2.98	1.32	0.12	-1.54	1.03	1.06	0.45	0.03



Alt Model-Shift Uniqueness Test

002140782-04, P = 111.964171 Days, E = 27.022033 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.14	4.59	4.42	4.58	5.50	3.36	1.07	2.72	2.56	0.16	0.00	1.12	0.88	0.39	0.21



Stellar Parameters For KIC 002140782

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5068^{+151}_{-151}	$4.654^{+0.059}_{-0.036}$	$-1.020^{+0.300}_{-0.300}$	$0.605^{+0.042}_{-0.042}$	$0.601^{+0.052}_{-0.022}$	$3.832^{+0.888}_{-0.555}$
	+3%/-3%	+1%/-1%	+29%/-29%	+7%/-7%	+9%/-4%	+23%/-14%
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 002140782-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-625 ± 151	$5.45^{+4.96}_{-3.95}$	392^{+13}_{-13}	3306^{+1823}_{-579}	1668^{+18768}_{-1206}
Alt.	-867 ± 189	$5.42^{+5.28}_{-3.66}$	391^{+13}_{-13}	3469^{+1783}_{-626}	2424^{+20576}_{-1820}

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 $A_{obs} \gg 1.0$

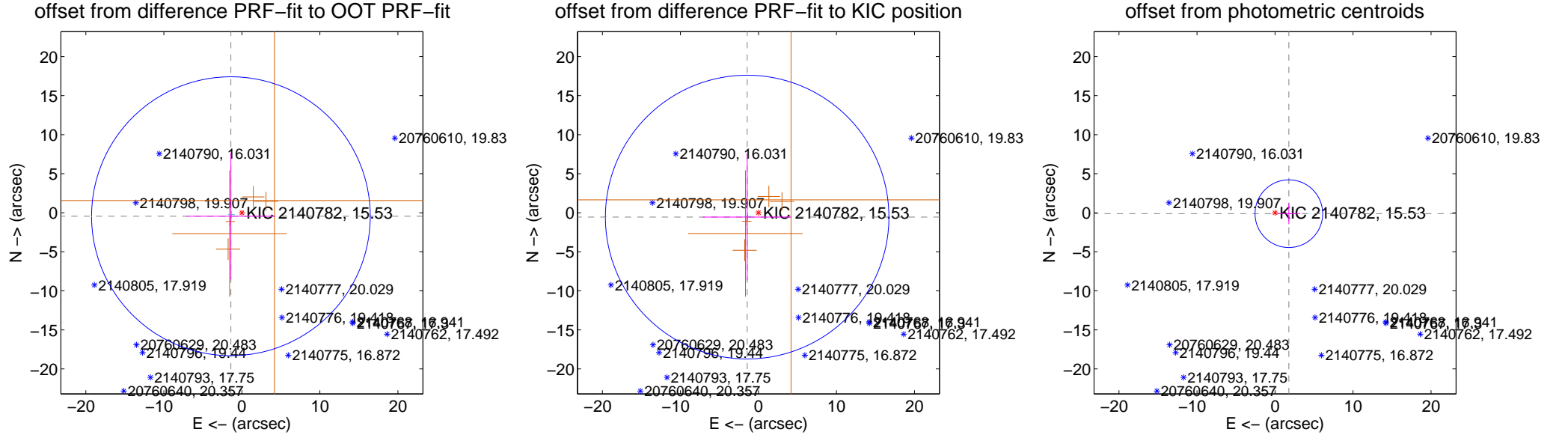
DV Centroid Data

Supplemental centroid analysis for 002140782-04. Kepler magnitude: 15.53. Transit SNR 8.27

There are 1 quarters with good PRF difference image offsets

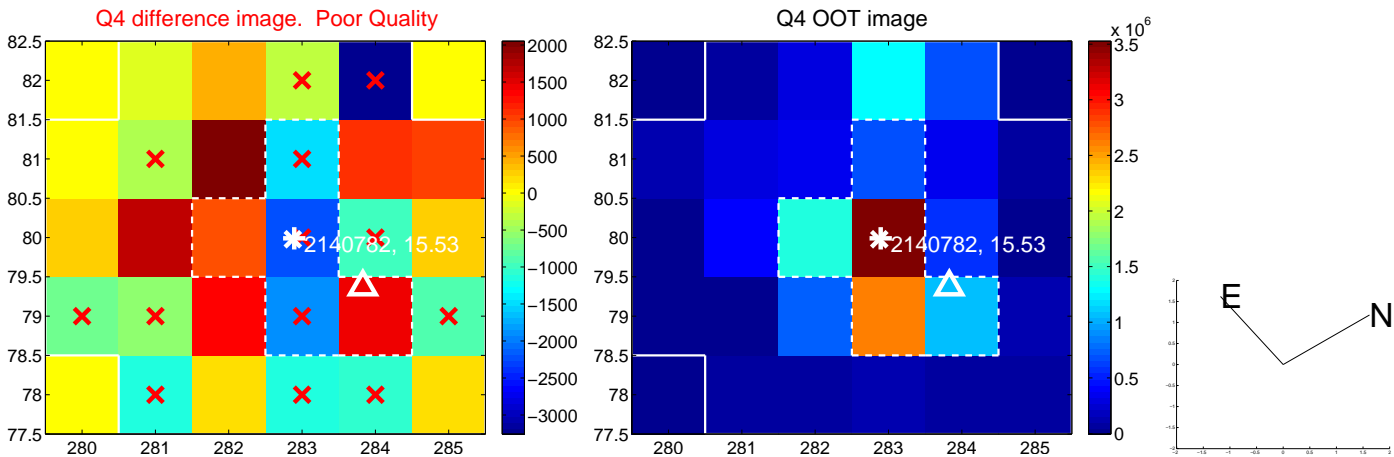
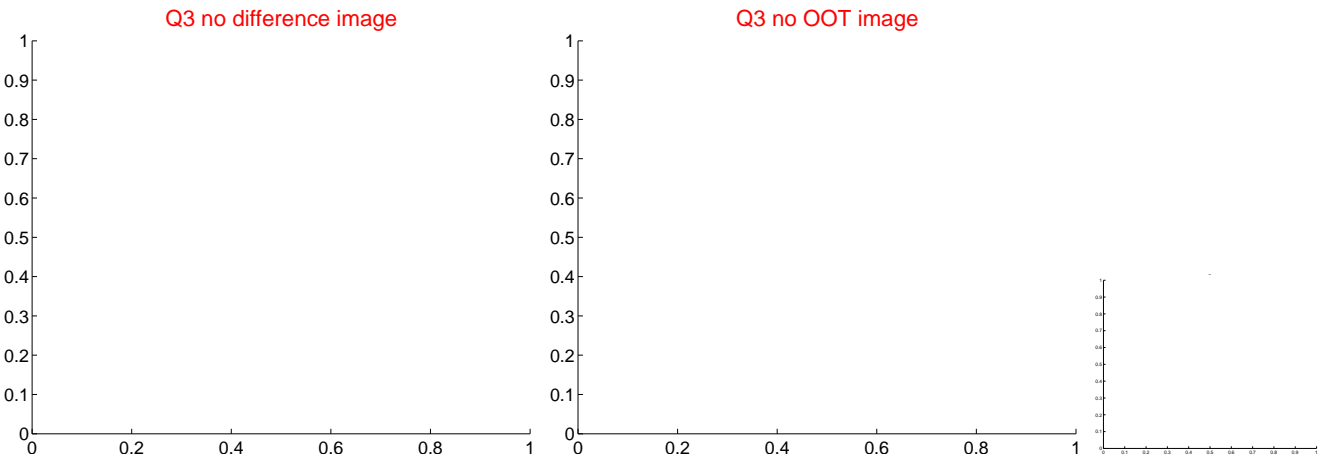
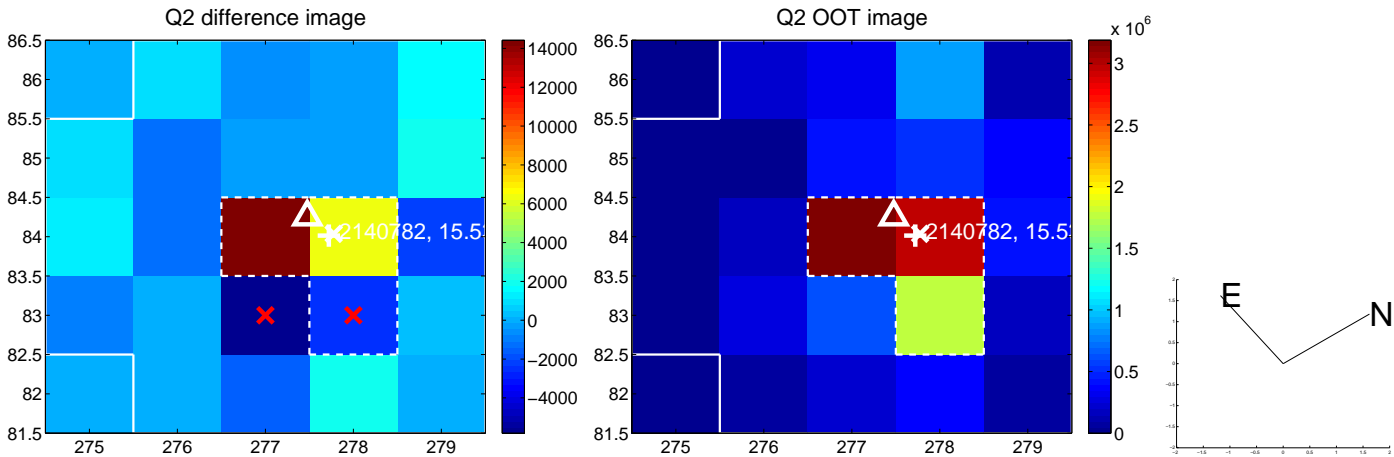
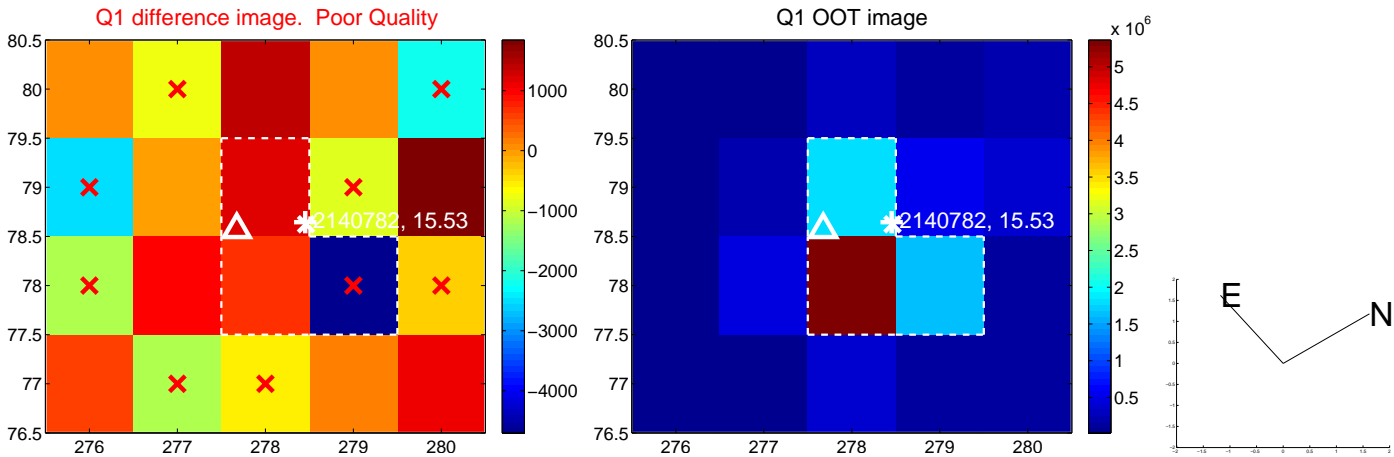
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.474 ± 5.952	0.25	1.405 ± 5.692	-0.445 ± 8.102
PRF-fit source offset from KIC position	1.550 ± 6.055	0.26	1.447 ± 5.692	-0.555 ± 8.102
photometric centroid source offset	1.78 ± 1.44	1.23	-1.77 ± 1.44	-0.12 ± 1.34

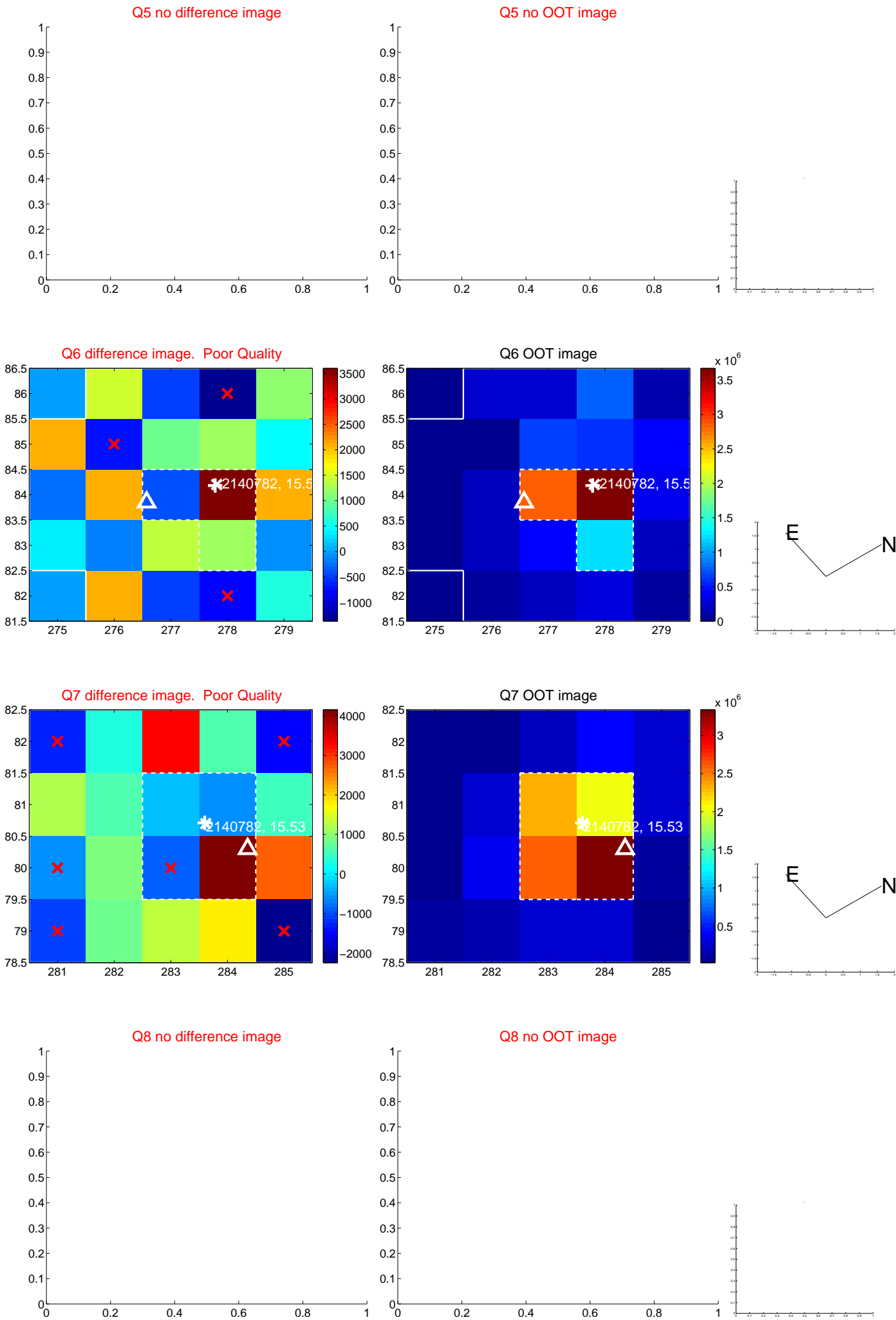


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

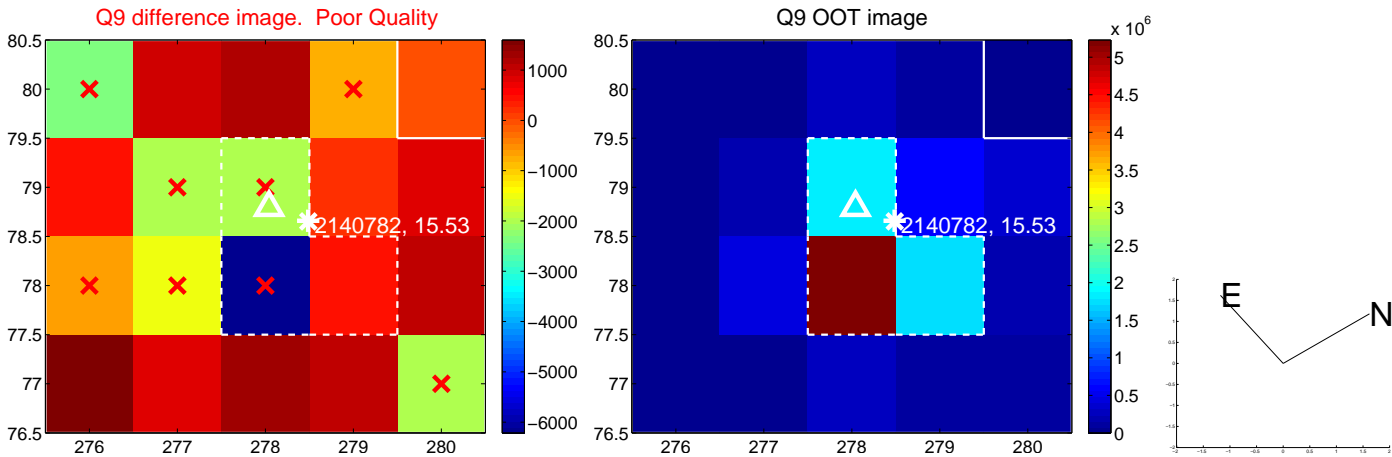
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



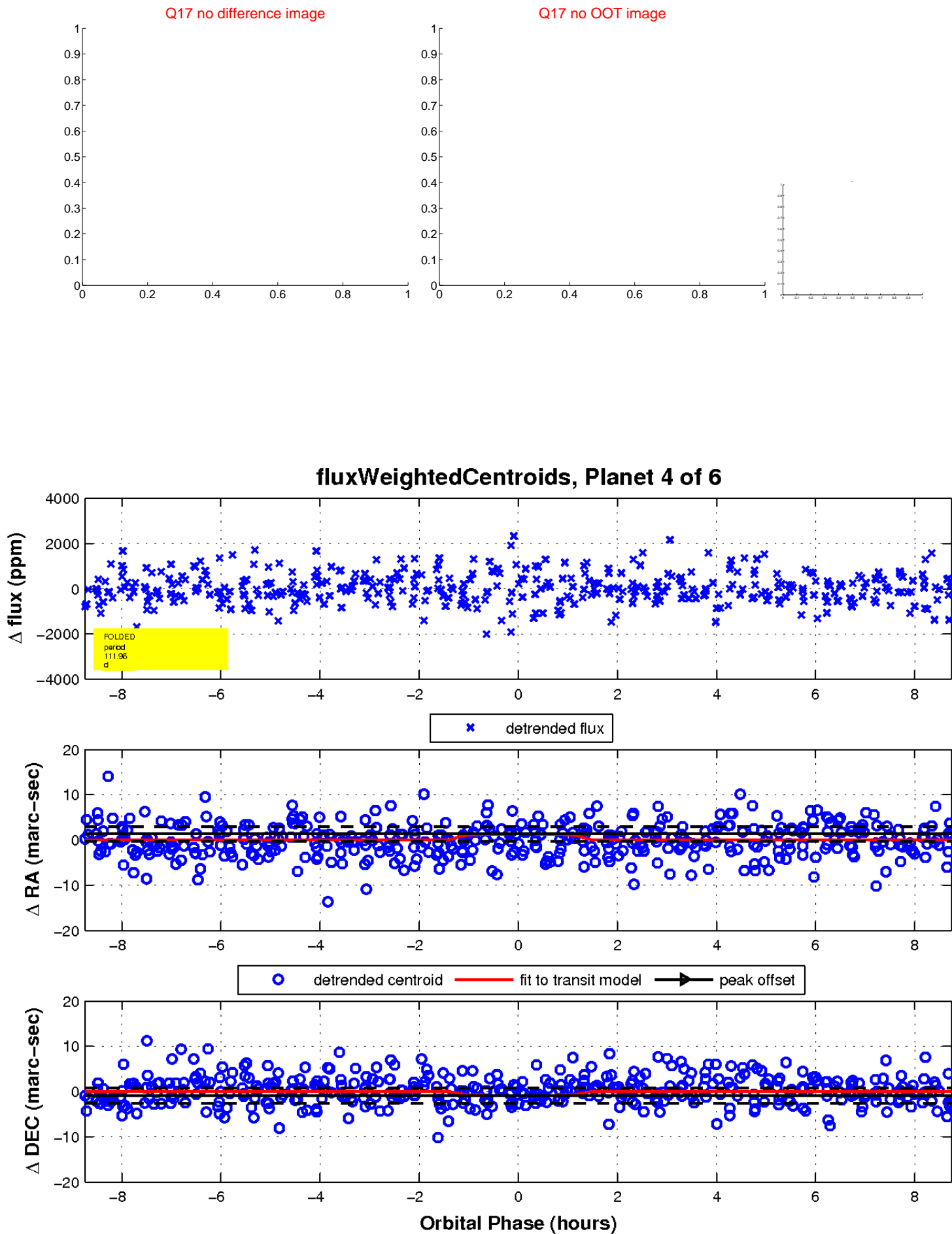
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

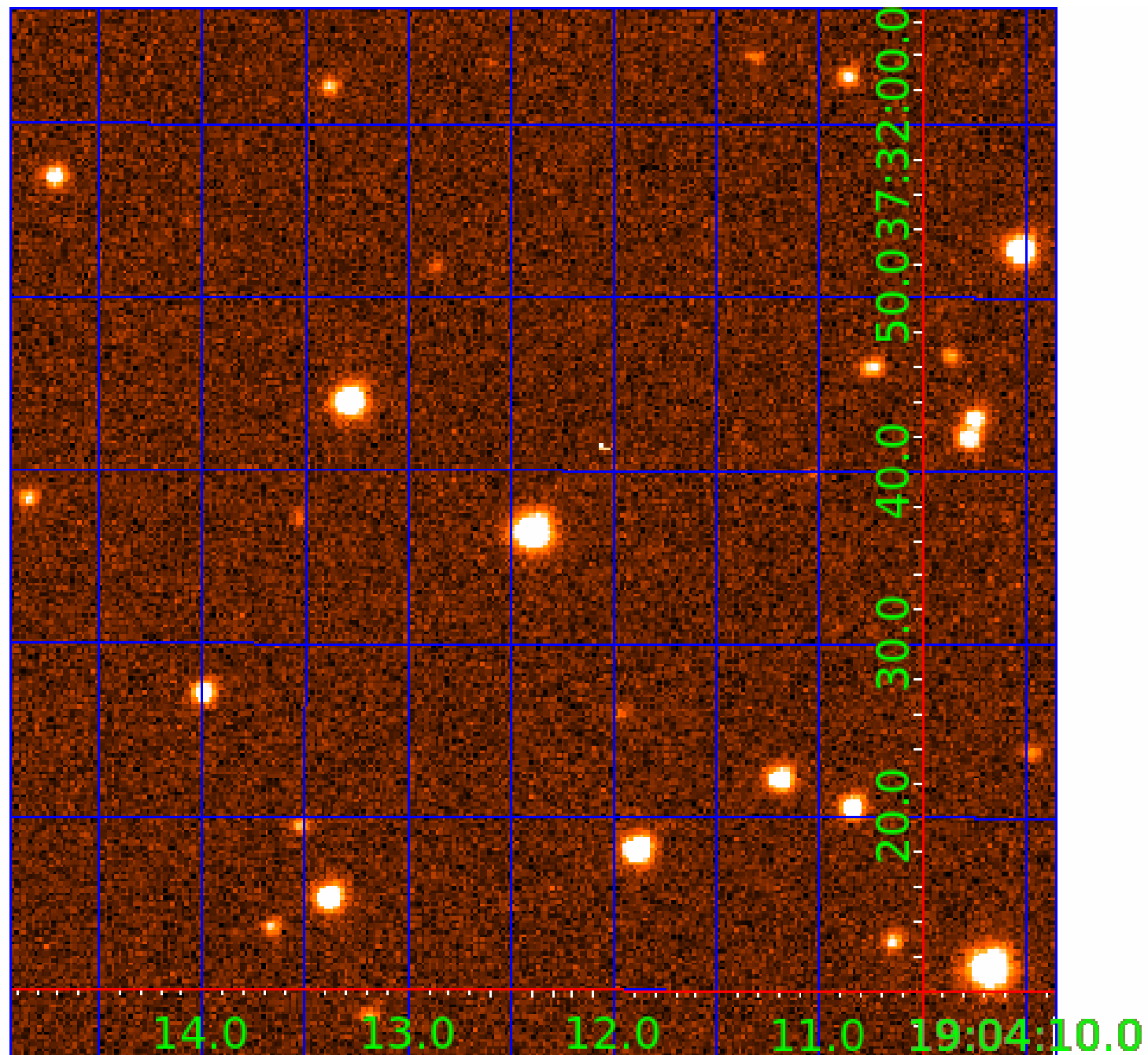


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002140782

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})
002140782-01	OBS	No	2.099245	132.422800	37.9	12.425	7.5	5.5	0.60	5068	0.37	294.66
002140782-02	OBS	No	327.400231	266.831494	575.9	59.925	11.5	5.4	0.60	5068	1.49	0.35
002140782-03	OBS	No	119.461129	206.974121	984.7	3.069	8.3	8.6	0.60	5068	2.09	1.35
002140782-04	OBS	No	111.962601	138.993343	1059.3	2.920	7.9	8.3	0.60	5068	2.29	1.47
002140782-05	OBS	No	135.864497	246.661959	1071.8	5.073	7.4	7.9	0.60	5068	3.91	1.13
002140782-06	OBS	No	109.652349	185.820052	1395.6	4.525	7.3	7.2	0.60	5068	4.36	1.51

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002140782-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
002140782-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002140782-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002140782-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002140782-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
002140782-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_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.

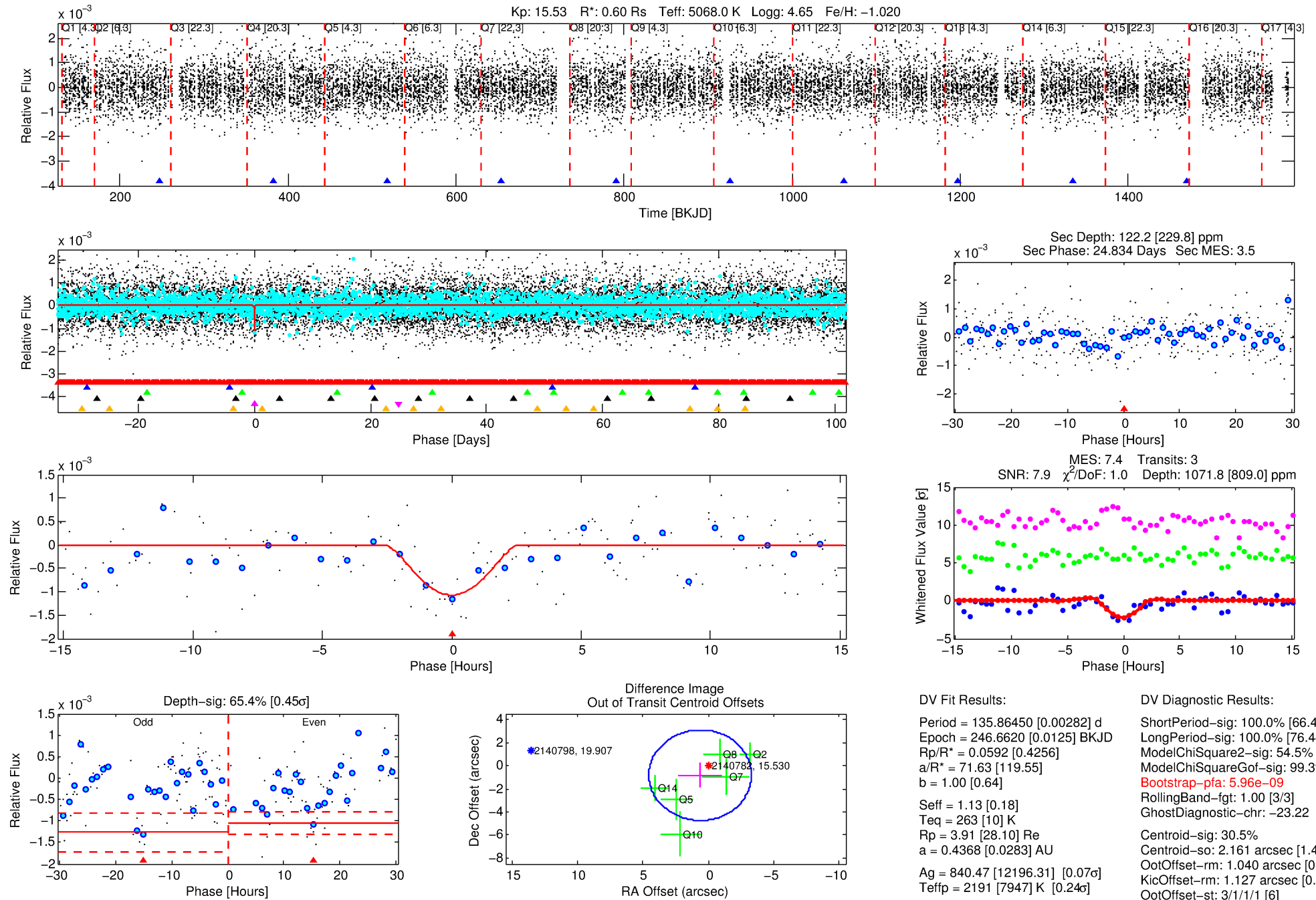
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002140782-05

No Significant Match Found

DV One-Page Summary

KIC: 2140782 Candidate: 5 of 6 Period: 135.864 d



DV Fit Results:

Period = 135.86450 [0.00282] d
Epoch = 246.6620 [0.0125] BKJD
Rp/R* = 0.0592 [0.4256]
a/R* = 71.63 [119.55]
b = 1.00 [0.64]
Seff = 1.13 [0.18]
Teq = 263 [10] K
Rp = 3.91 [28.10] Re
a = 0.4368 [0.0283] AU
Ag = 840.47 [12196.31] [0.07 σ]
Teffp = 2191 [7947] K [0.24 σ]

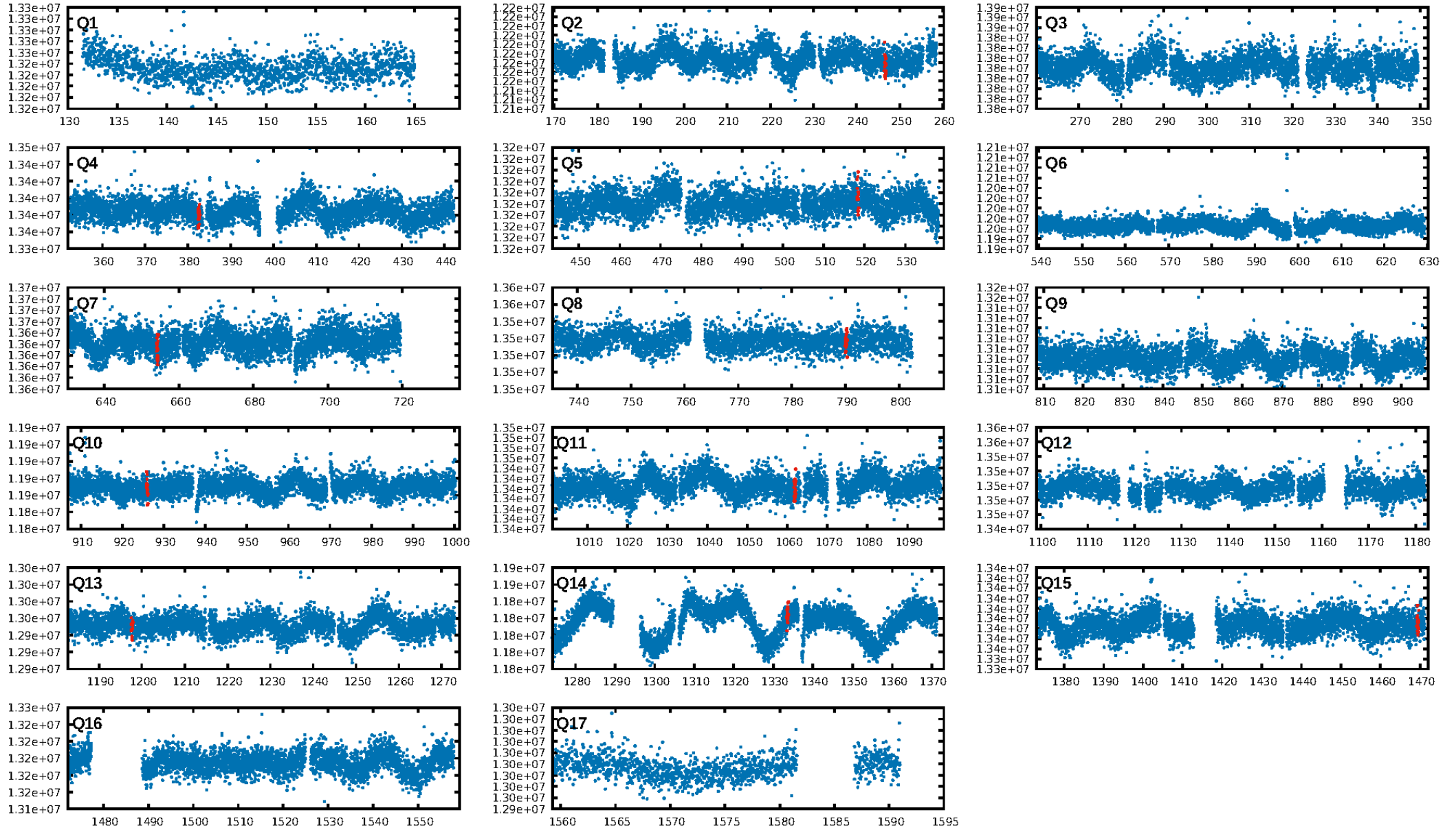
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [66.40 σ]
LongPeriod-sig: 100.0% [76.44 σ]
ModelChiSquare2-sig: 54.5%
ModelChiSquareGof-sig: 99.3%
Bootstrap-pfa: 5.96e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -23.22
Centroid-sig: 30.5%
Centroid-so: 2.161 arcsec [1.49 σ]
OotOffset-rm: 1.040 arcsec [0.80 σ]
KicOffset-rm: 1.127 arcsec [0.85 σ]
OotOffset-st: 3/1/1/1 [6]
KicOffset-st: 3/1/1/1 [6]
DiffImageQuality-fgm: 0.00 [0/6]
DiffImageOverlap-fno: 0.22 [2/9]

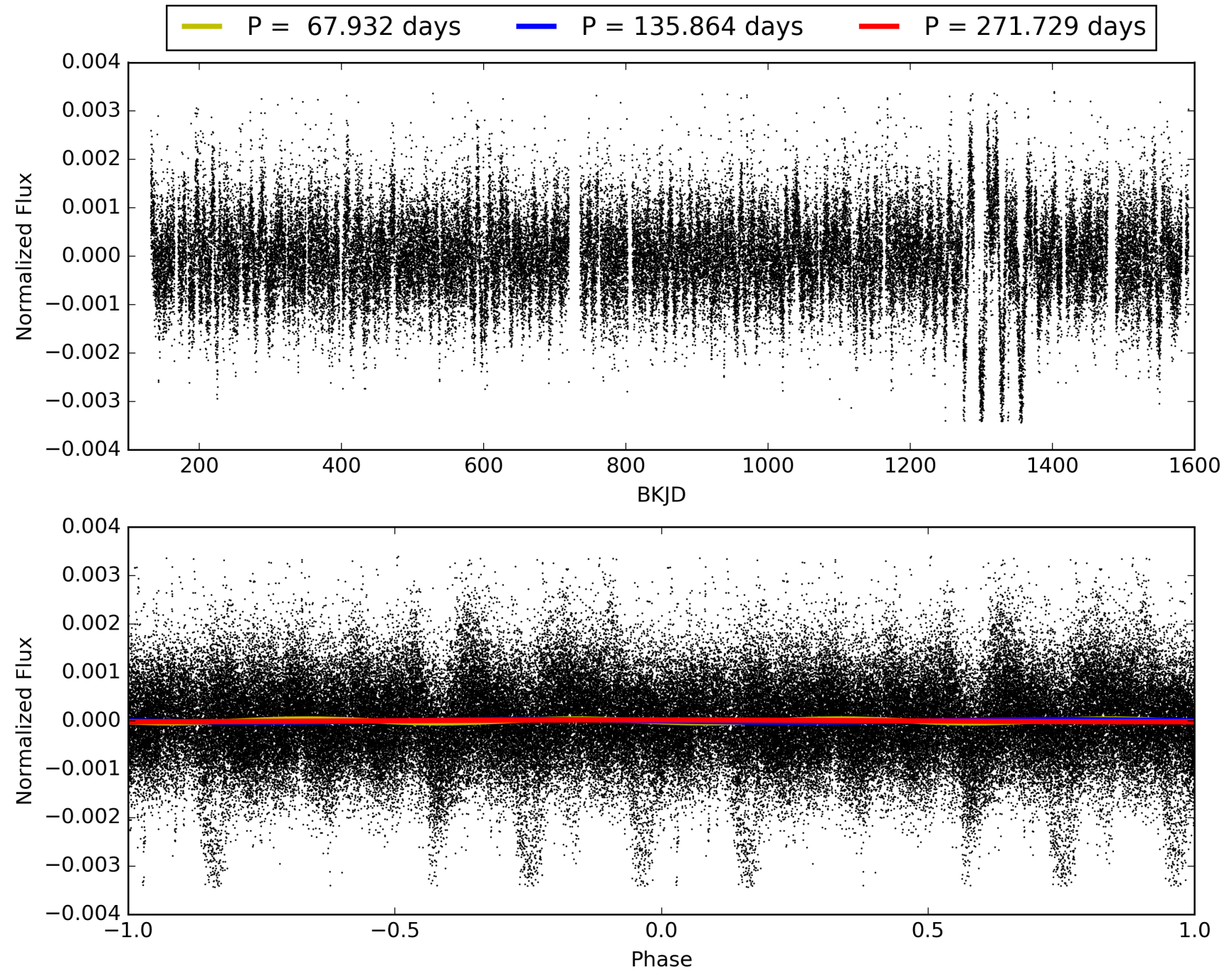
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:39:11 Z

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

TCE 002140782-05, PDC Light Curves

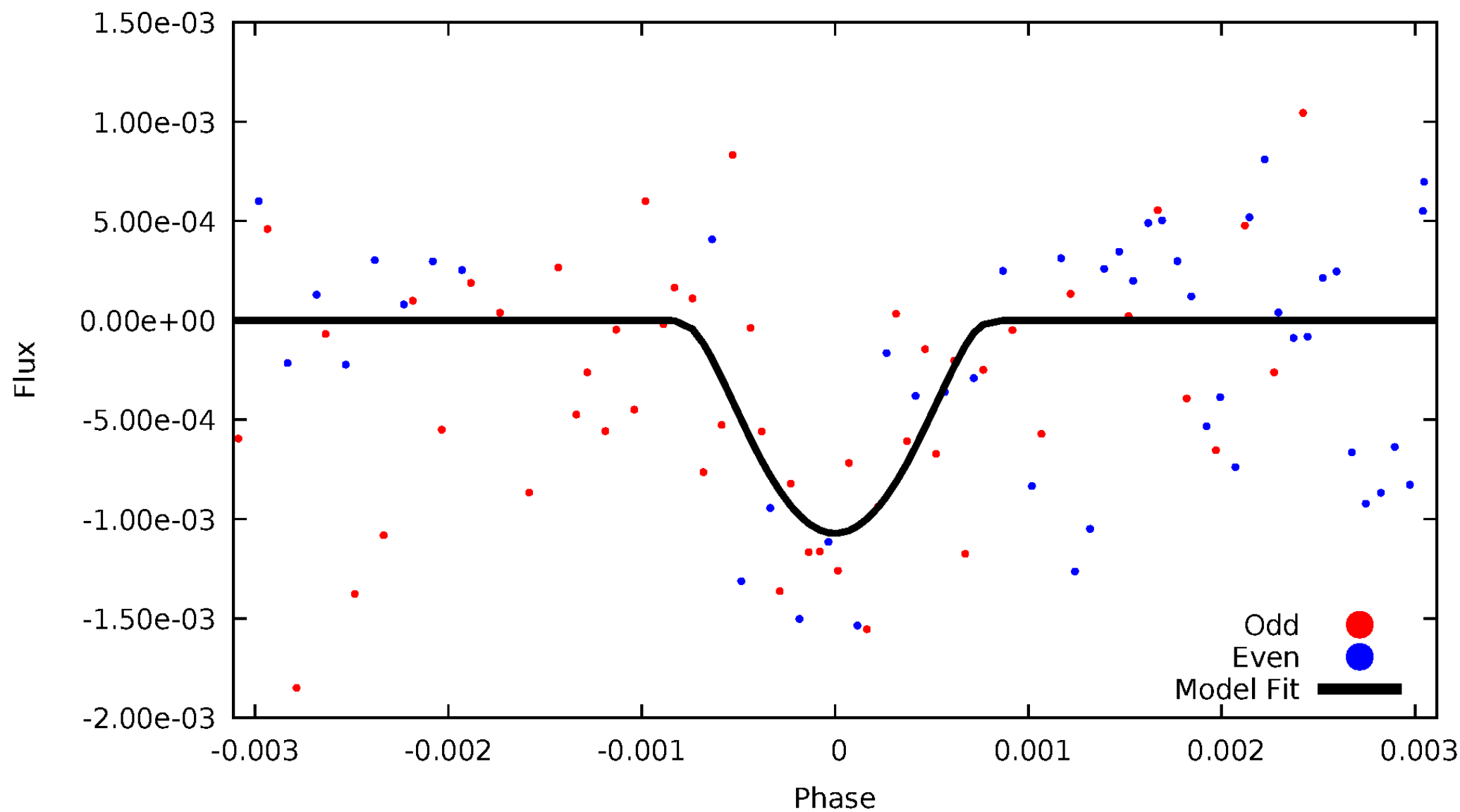


TCE 002140782-05



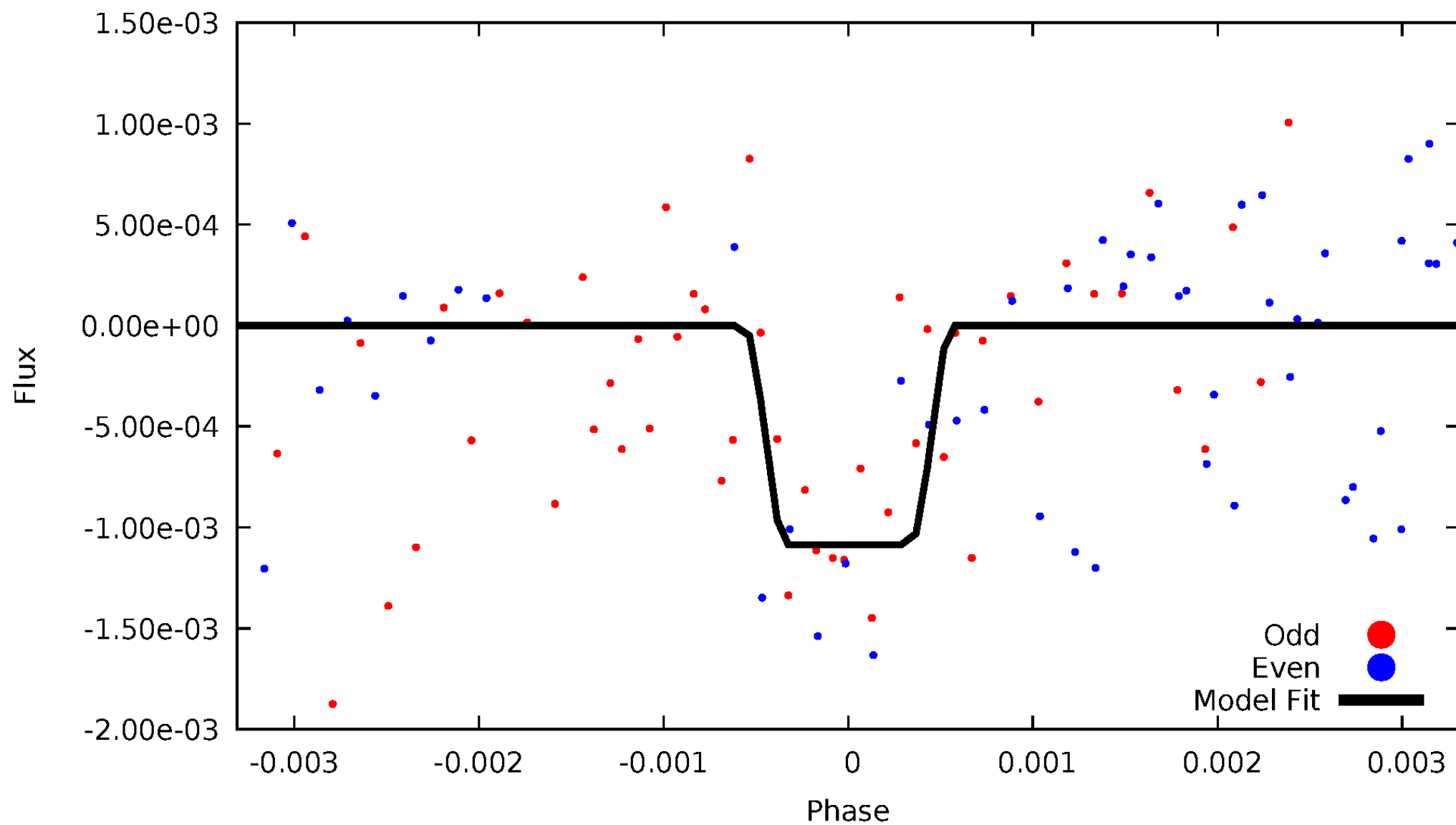
DV Odd/Even

TCE 002140782-05



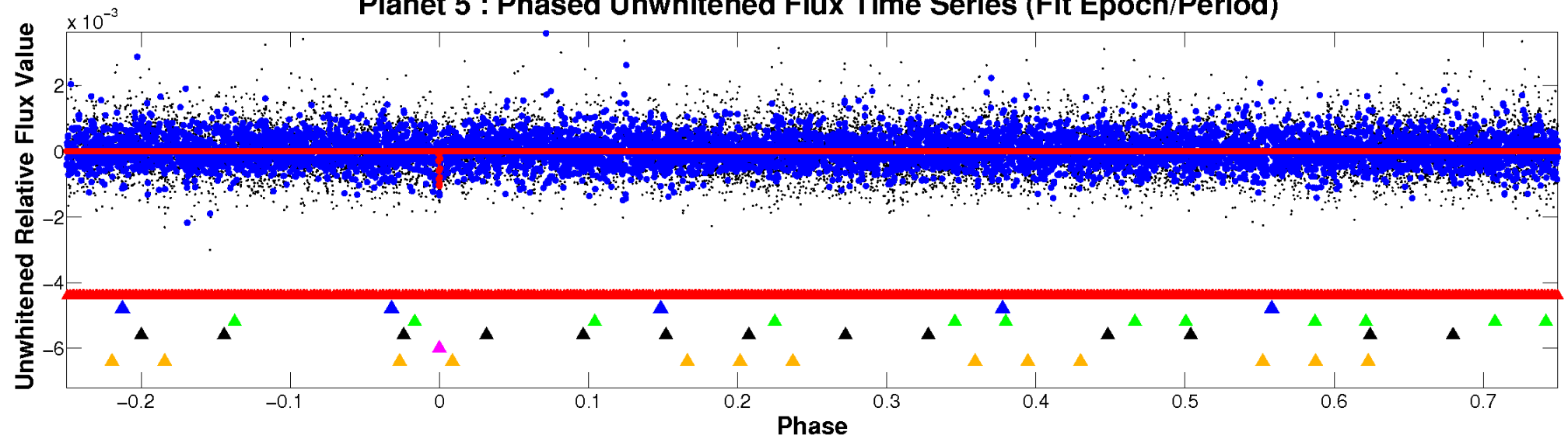
ALT Odd/Even

TCE 002140782-05

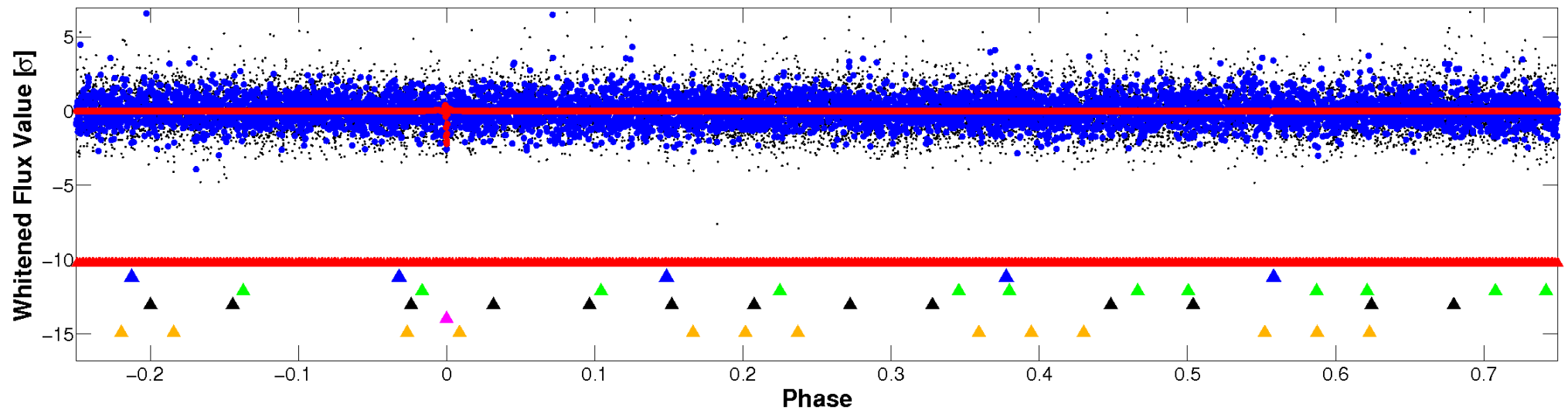


Non-Whitened Vs. Whitened Light Curve

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

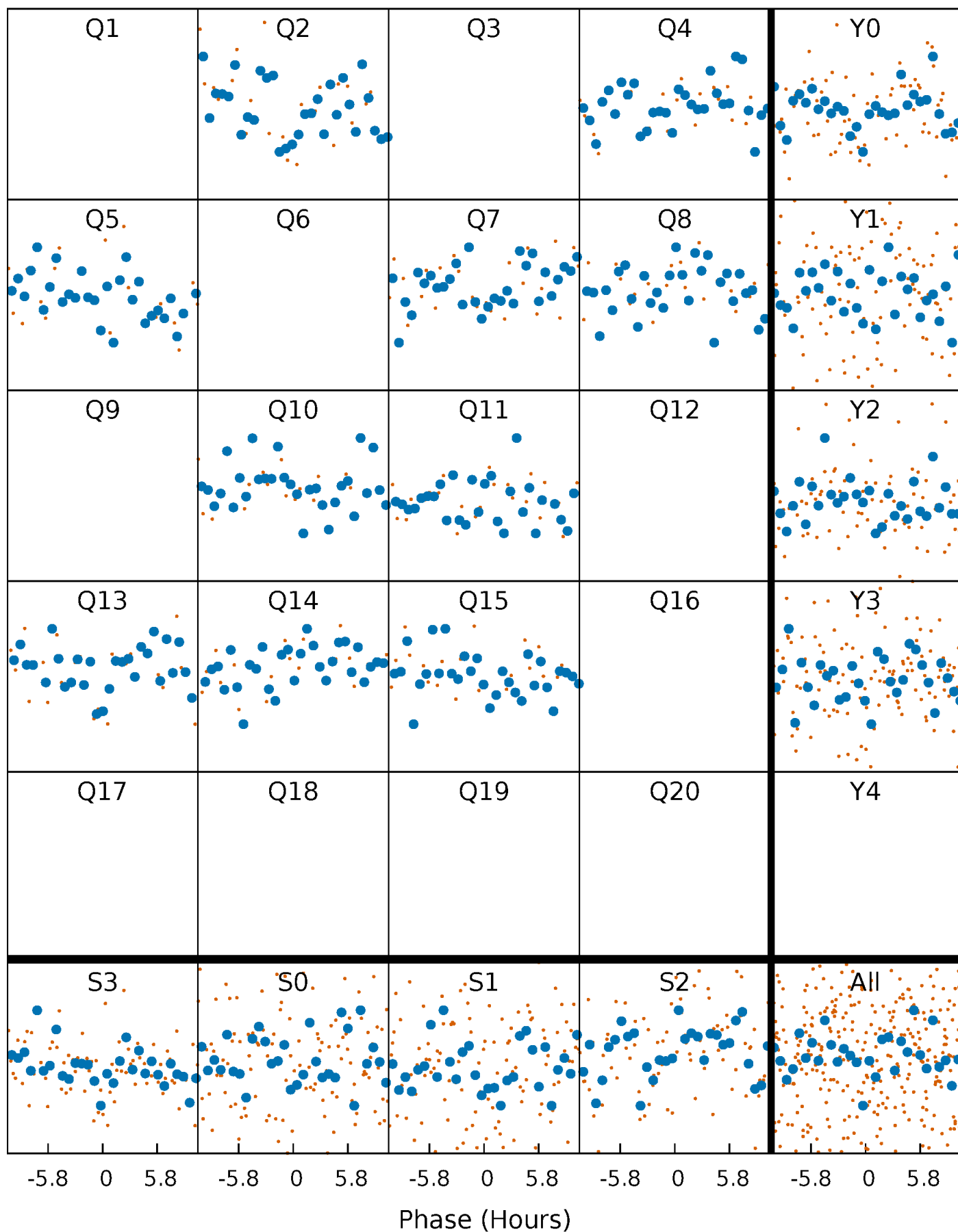


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



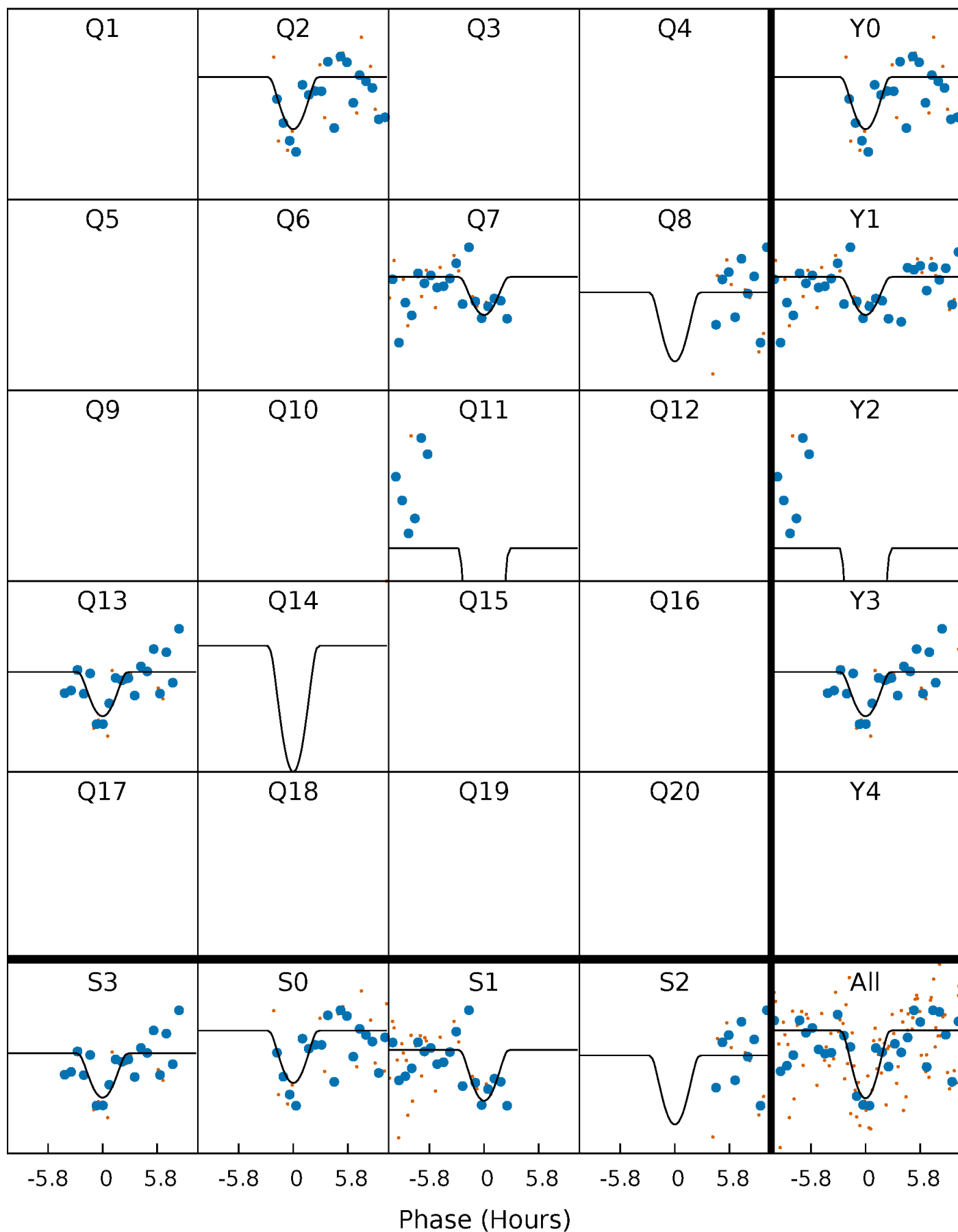
PDC Quarter-Phased Transit Curves

TCE 002140782-05 $P=135.864497$ Days $T_0=246.661959$ (BKJD)



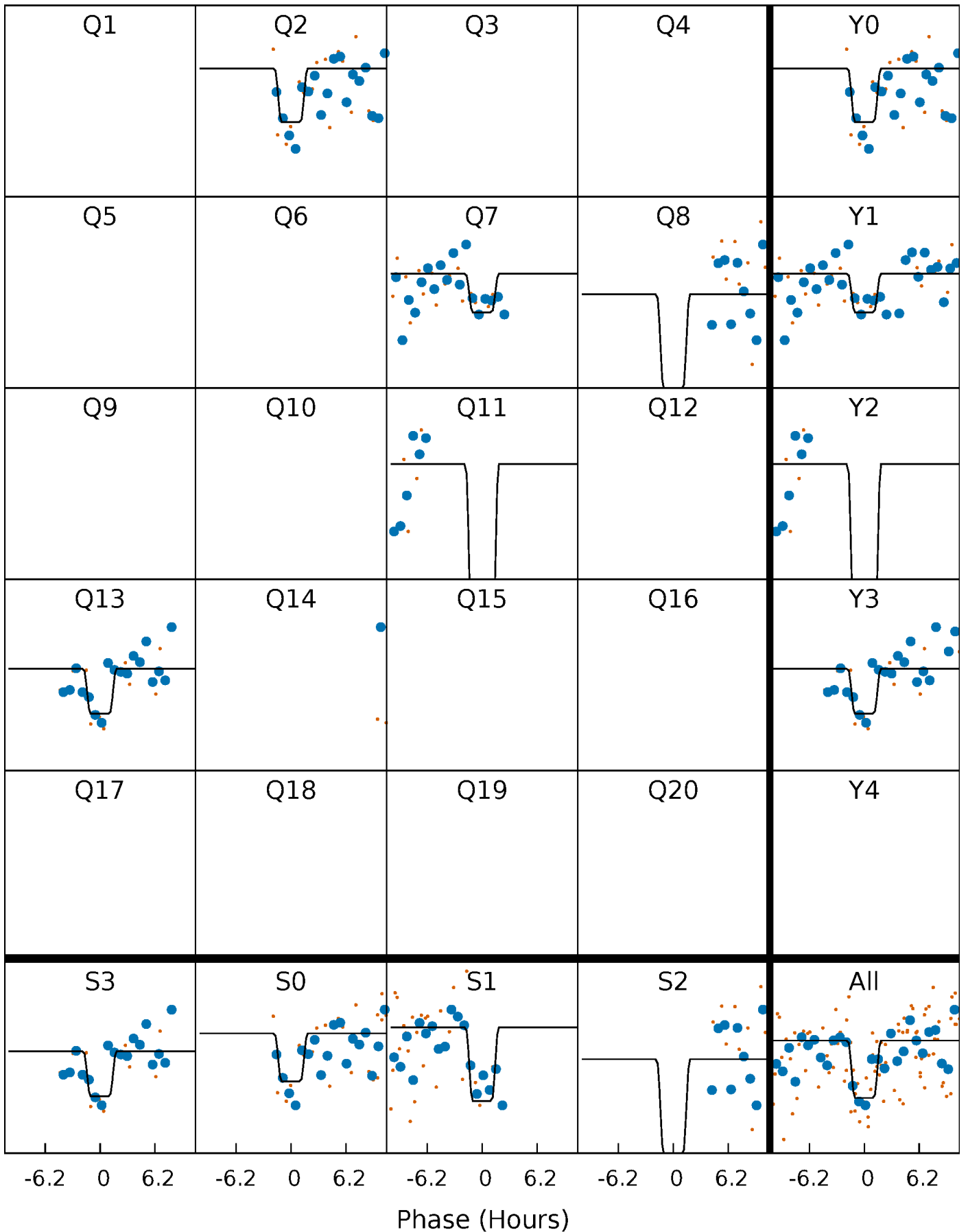
DV Quarter-Phased Transit Curves

TCE 002140782-05 $P=135.864497$ Days $T_0=246.661959$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

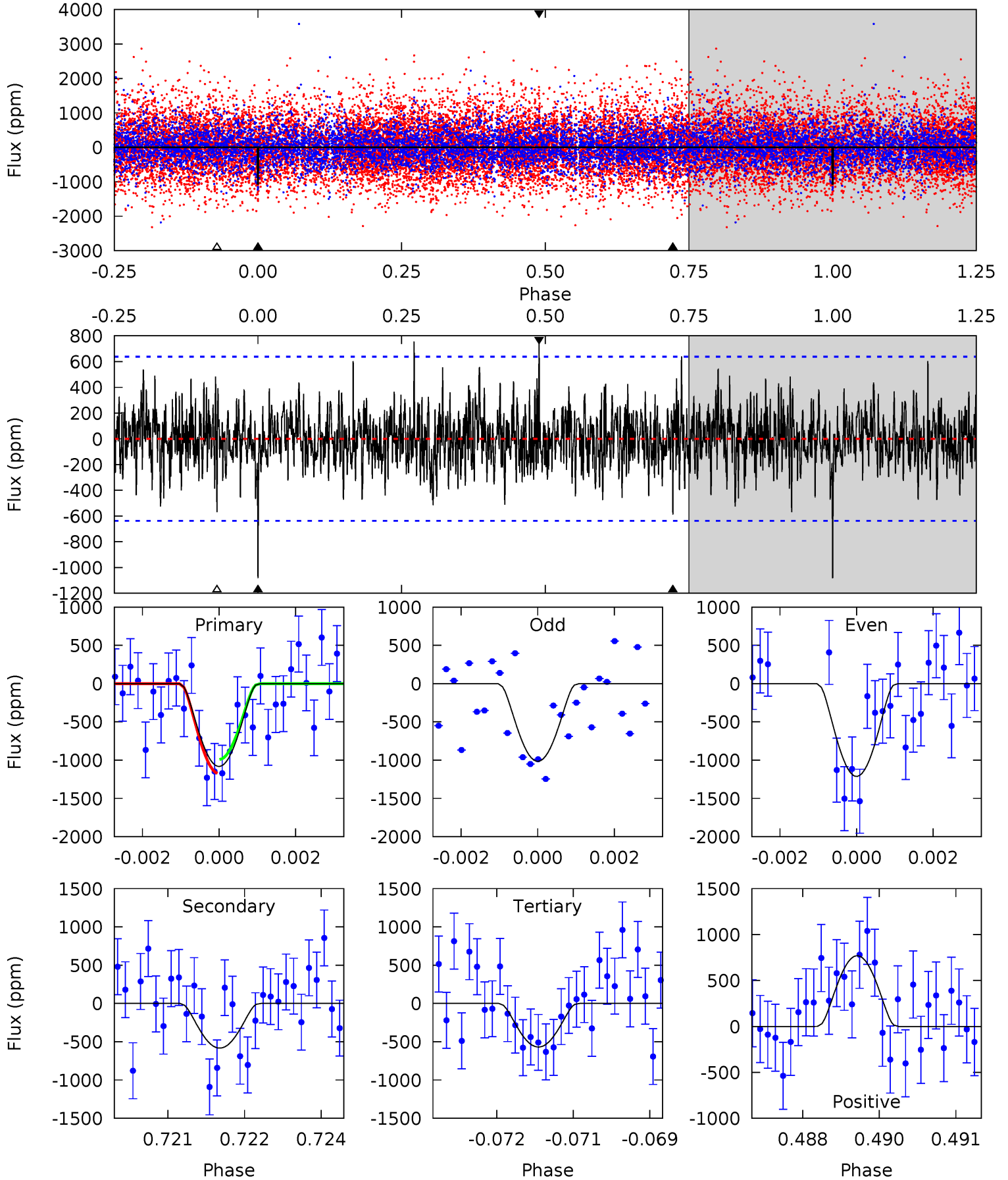
TCE 002140782-05 $P=135.865603$ Days $T_0=246.659372$ (BKJD)



DV Model-Shift Uniqueness Test

002140782-05, P = 135.864497 Days, E = 110.797462 Days

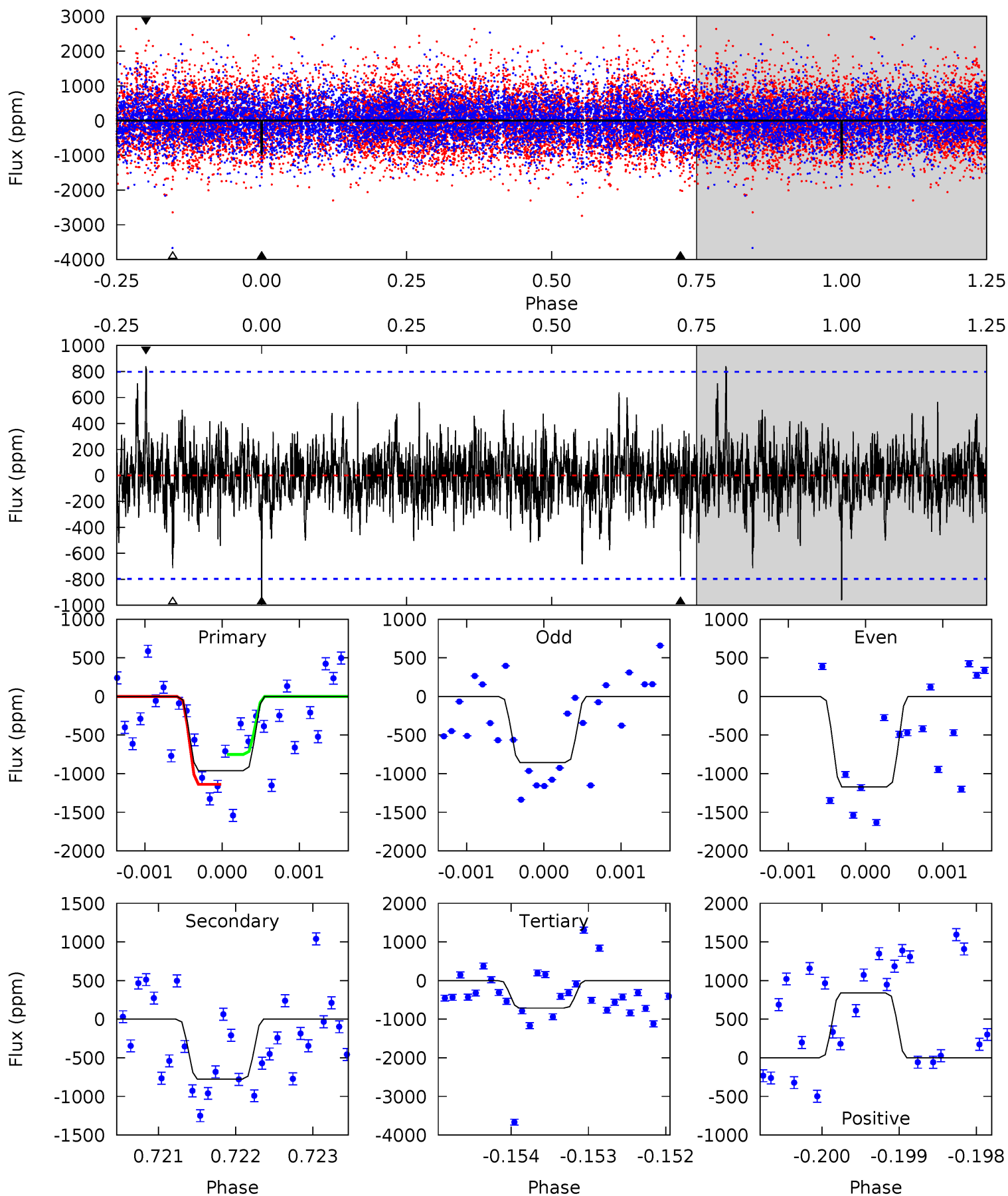
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.11	4.91	4.79	6.48	5.37	3.15	1.48	4.31	2.63	0.12	-1.57	0.81	0.98	0.42	0.76



Alt Model-Shift Uniqueness Test

002140782-05, P = 135.865603 Days, E = 110.793769 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.56	5.31	4.87	5.74	5.44	3.28	1.19	1.69	0.82	0.44	-0.43	1.03	1.08	0.47	1.32



Stellar Parameters For KIC 002140782

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5068^{+151}_{-151}	$4.654^{+0.059}_{-0.036}$	$-1.020^{+0.300}_{-0.300}$	$0.605^{+0.042}_{-0.042}$	$0.601^{+0.052}_{-0.022}$	$3.832^{+0.888}_{-0.555}$
	+3%/-3%	+1%/-1%	+29%/-29%	+7%/-7%	+9%/-4%	+23%/-14%
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 002140782-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-583 ± 119	$20.75^{+21.95}_{-14.46}$	366^{+12}_{-13}	2309^{+774}_{-337}	143^{+1307}_{-108}
Alt.	-778 ± 147	$19.87^{+20.17}_{-14.00}$	366^{+14}_{-14}	2405^{+935}_{-353}	204^{+2246}_{-154}

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

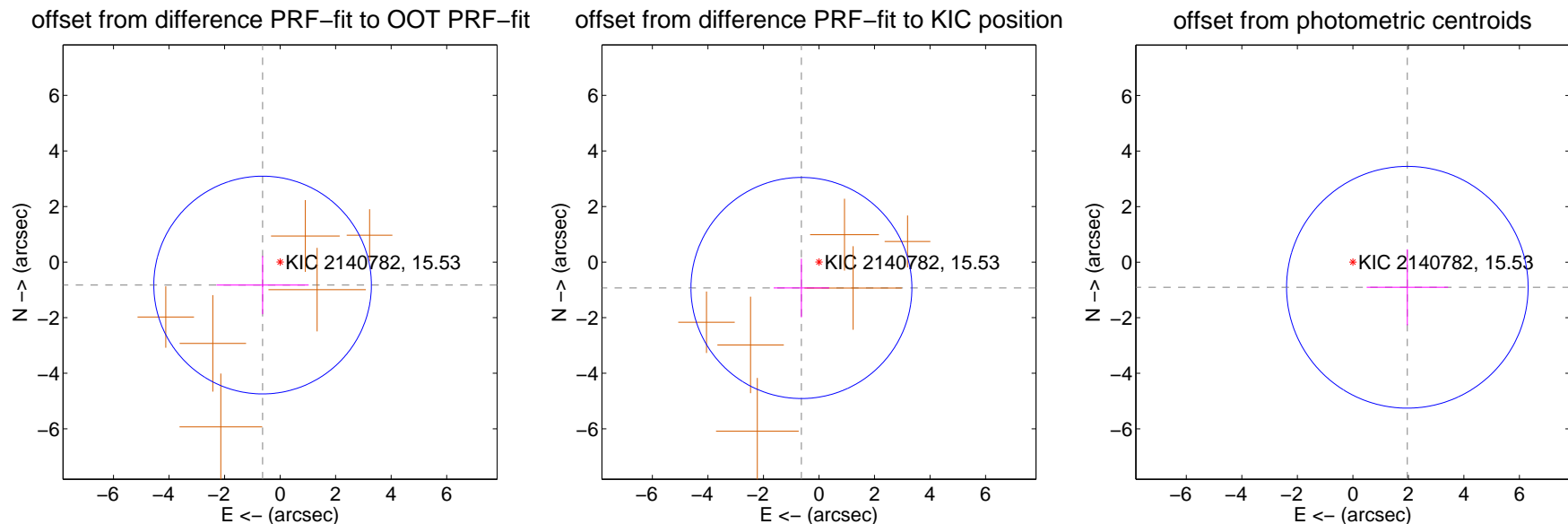
DV Centroid Data

Supplemental centroid analysis for 002140782-05. Kepler magnitude: 15.53. Transit SNR 7.85

There are 0 quarters with good PRF difference image offsets

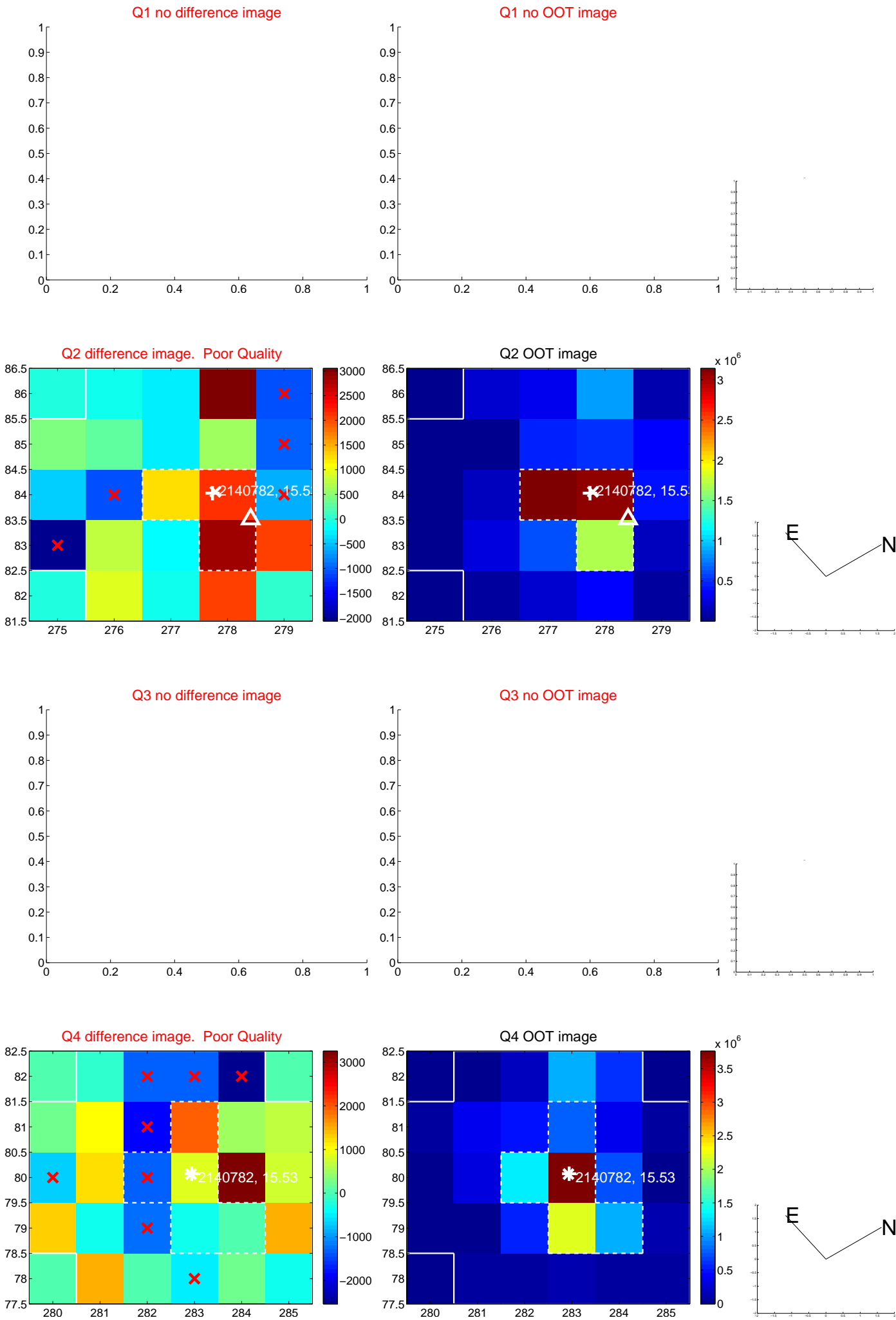
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.040 ± 1.306	0.80	0.631 ± 1.660	-0.826 ± 1.046
PRF-fit source offset from KIC position	1.127 ± 1.326	0.85	0.633 ± 1.000	-0.932 ± 1.056
photometric centroid source offset	2.16 ± 1.45	1.49	-1.96 ± 1.47	-0.90 ± 1.37

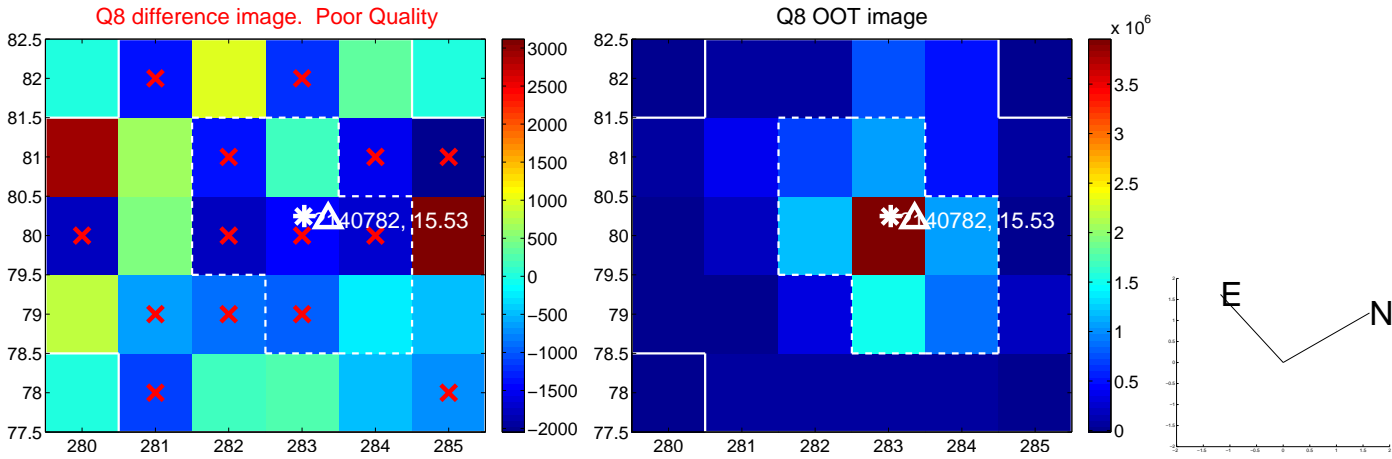
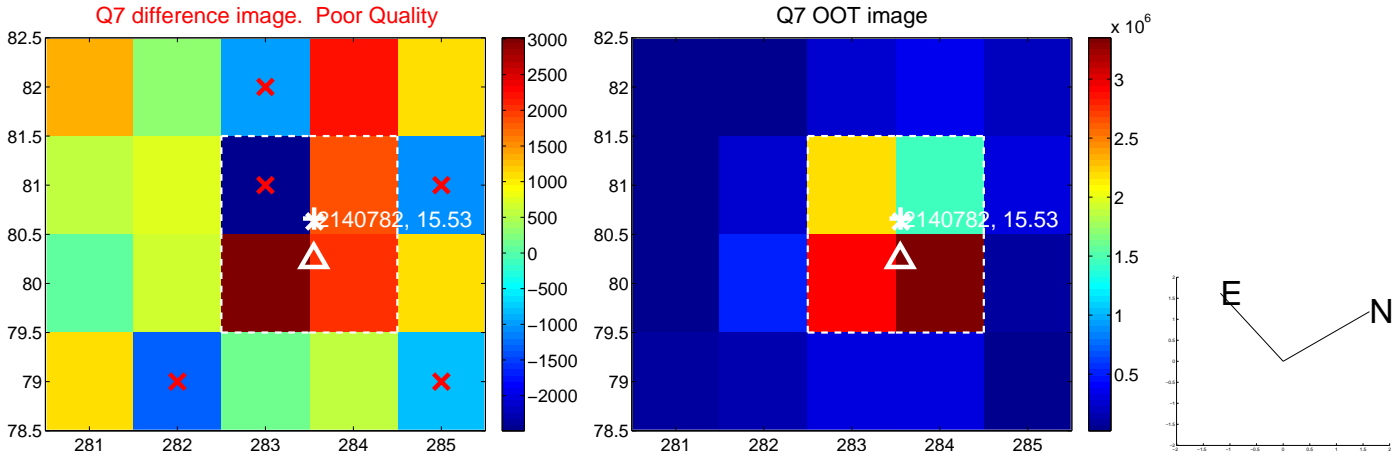
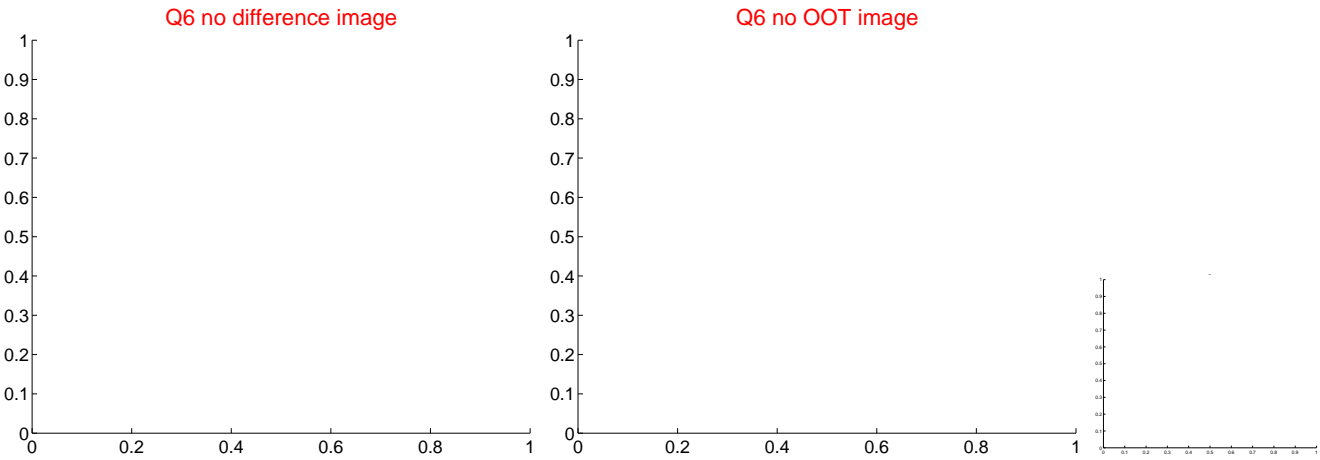
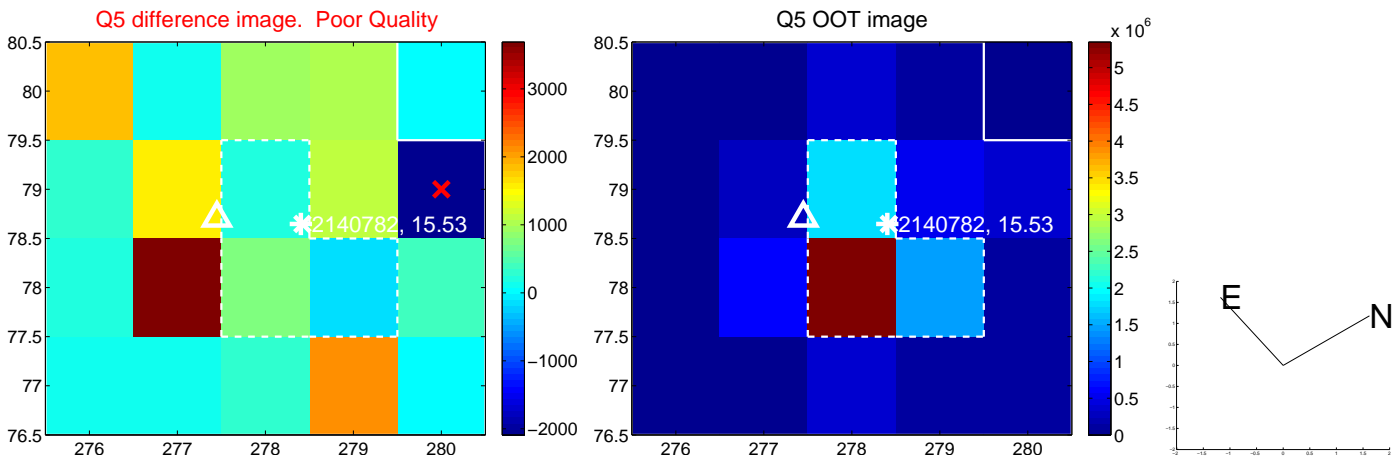


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

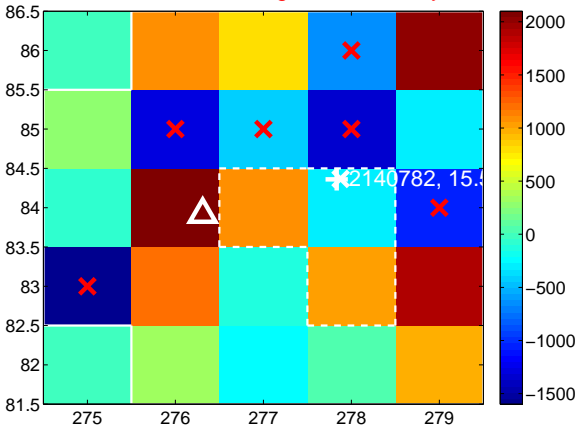
Q9 no difference image



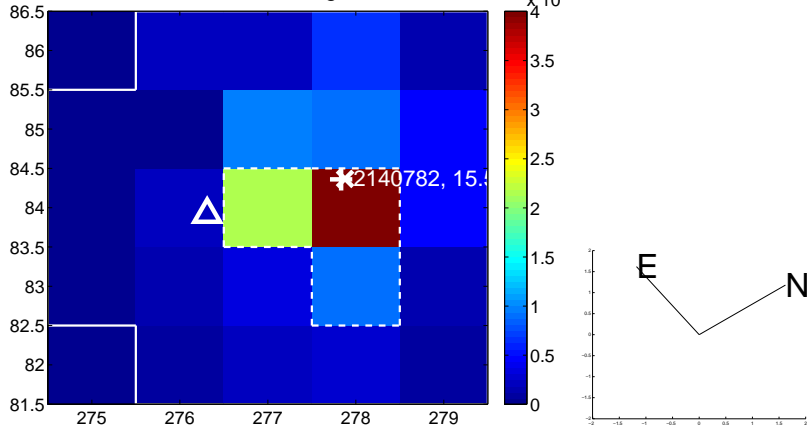
Q9 no OOT image



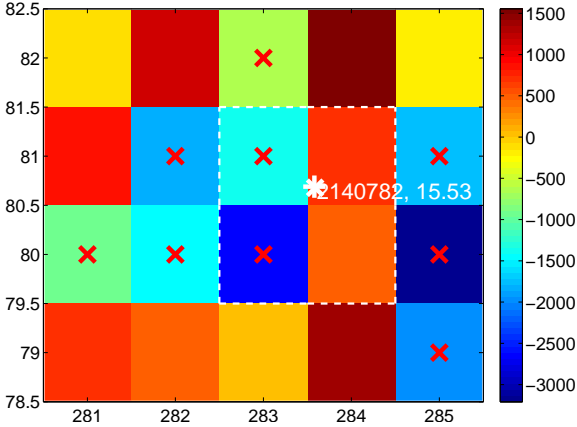
Q10 difference image. Poor Quality



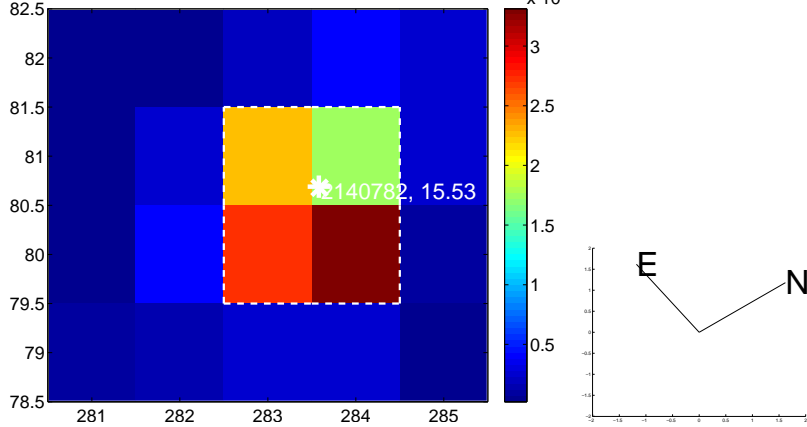
Q10 OOT image



Q11 difference image. Poor Quality



Q11 OOT image



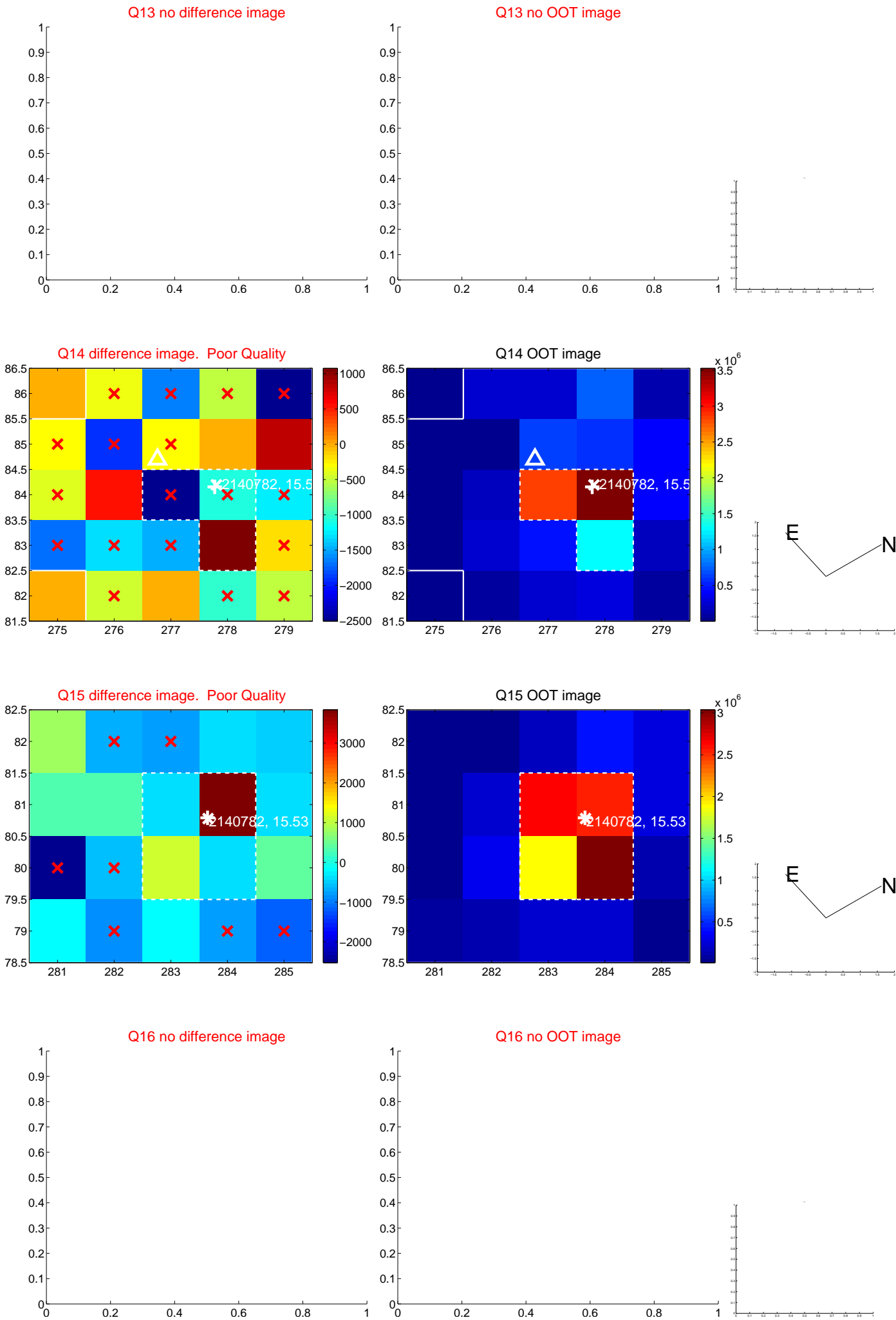
Q12 no difference image



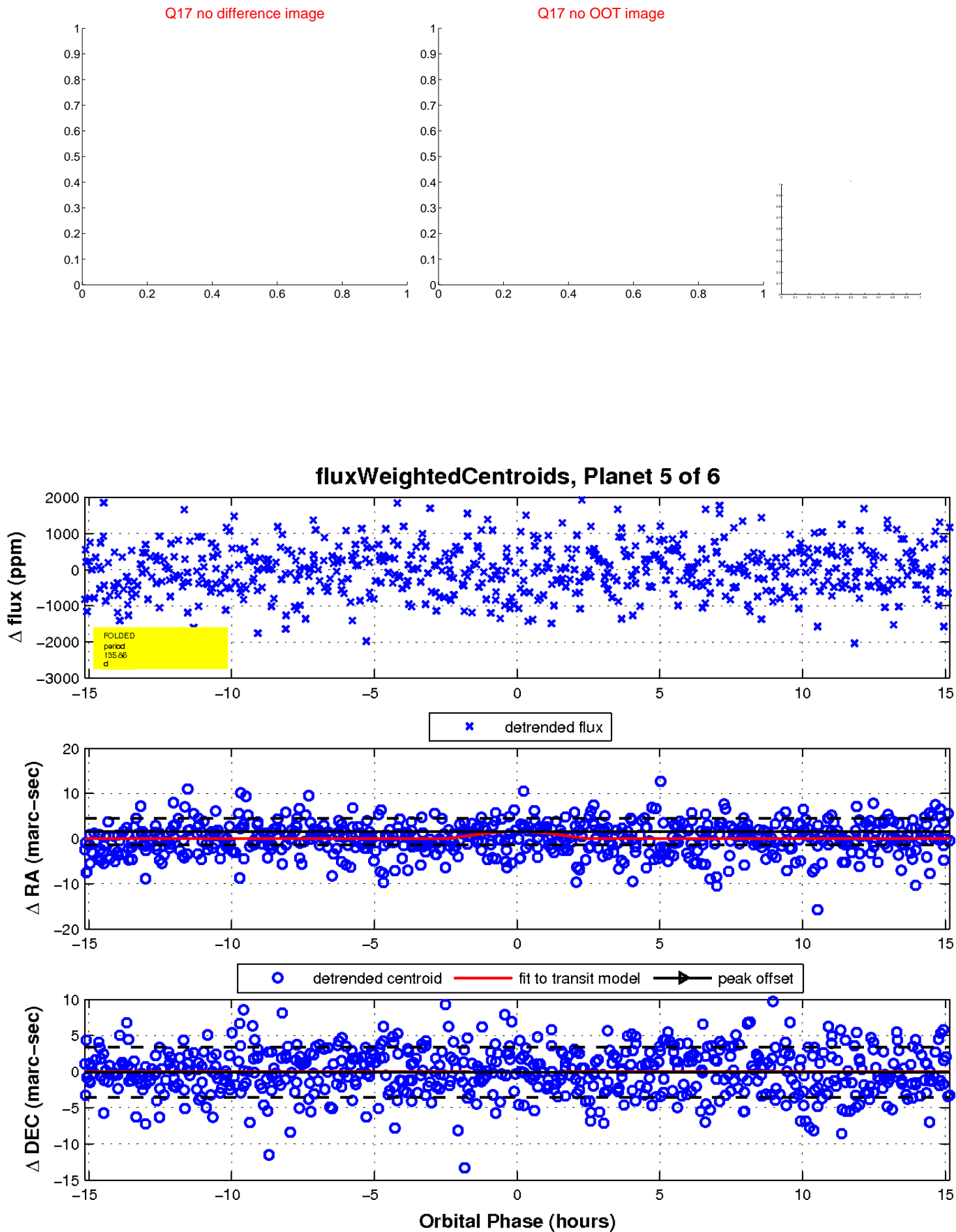
Q12 no OOT image



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

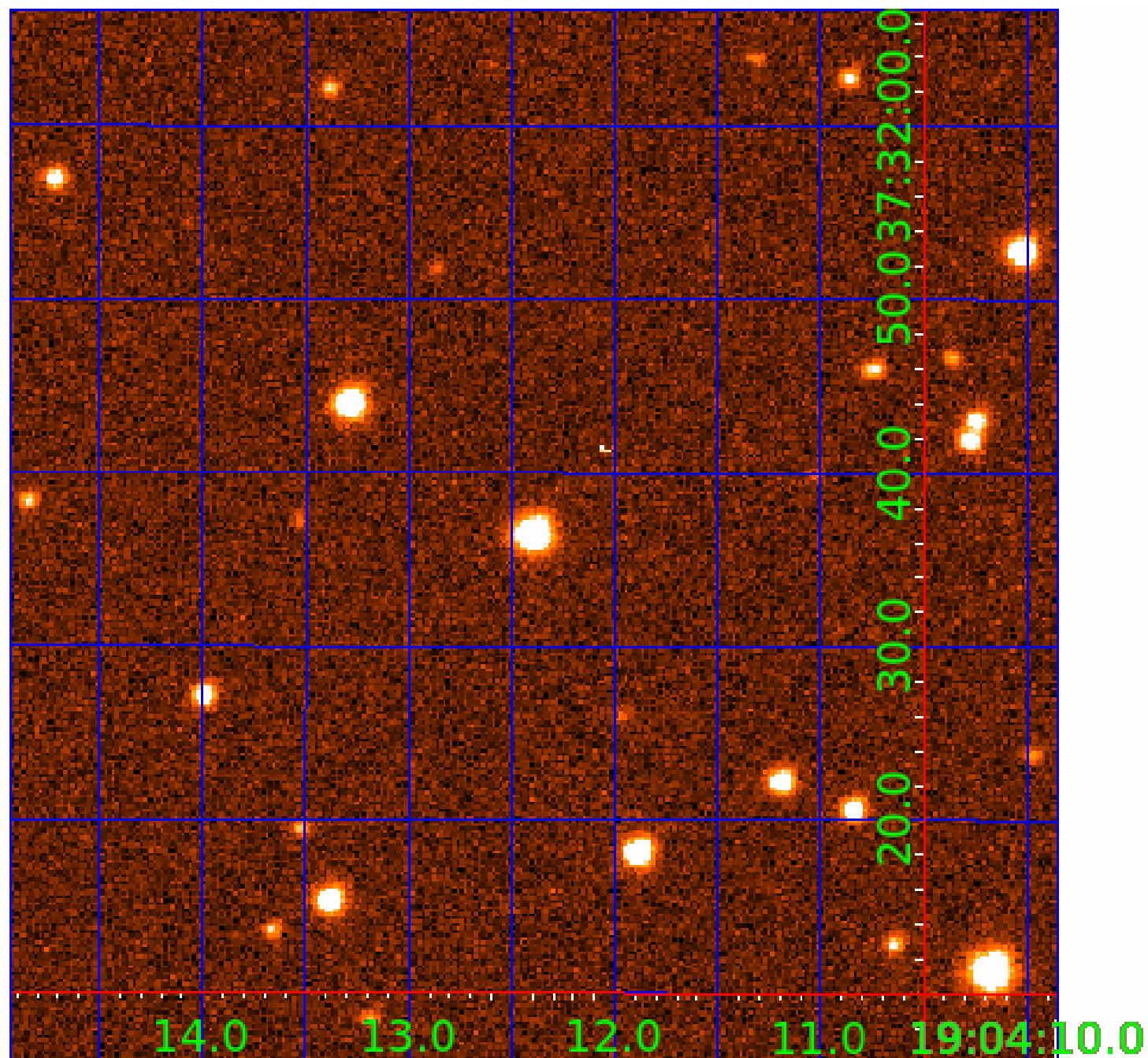


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002140782

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})
002140782-01	OBS	No	2.099245	132.422800	37.9	12.425	7.5	5.5	0.60	5068	0.37	294.66
002140782-02	OBS	No	327.400231	266.831494	575.9	59.925	11.5	5.4	0.60	5068	1.49	0.35
002140782-03	OBS	No	119.461129	206.974121	984.7	3.069	8.3	8.6	0.60	5068	2.09	1.35
002140782-04	OBS	No	111.962601	138.993343	1059.3	2.920	7.9	8.3	0.60	5068	2.29	1.47
002140782-05	OBS	No	135.864497	246.661959	1071.8	5.073	7.4	7.9	0.60	5068	3.91	1.13
002140782-06	OBS	No	109.652349	185.820052	1395.6	4.525	7.3	7.2	0.60	5068	4.36	1.51

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002140782-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
002140782-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
002140782-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
002140782-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
002140782-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
002140782-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_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.

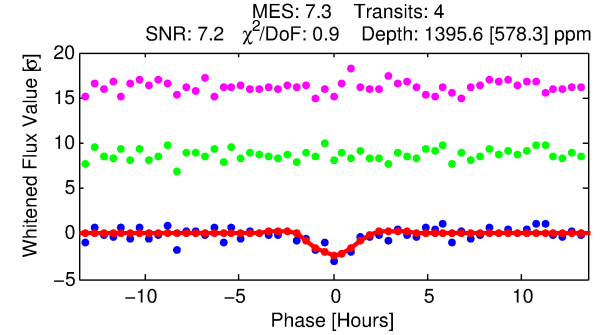
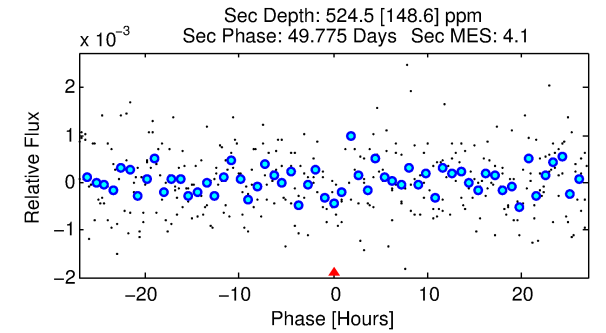
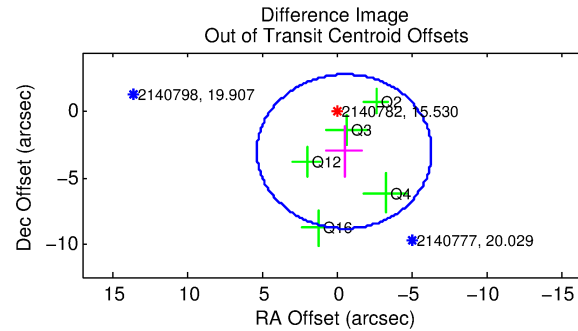
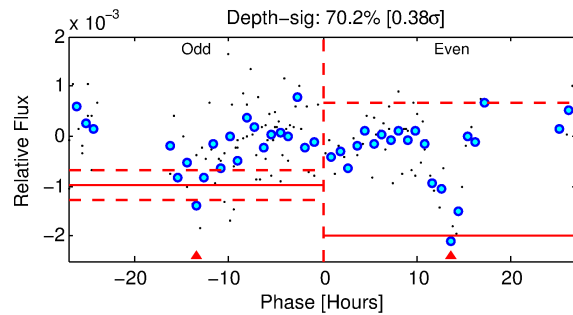
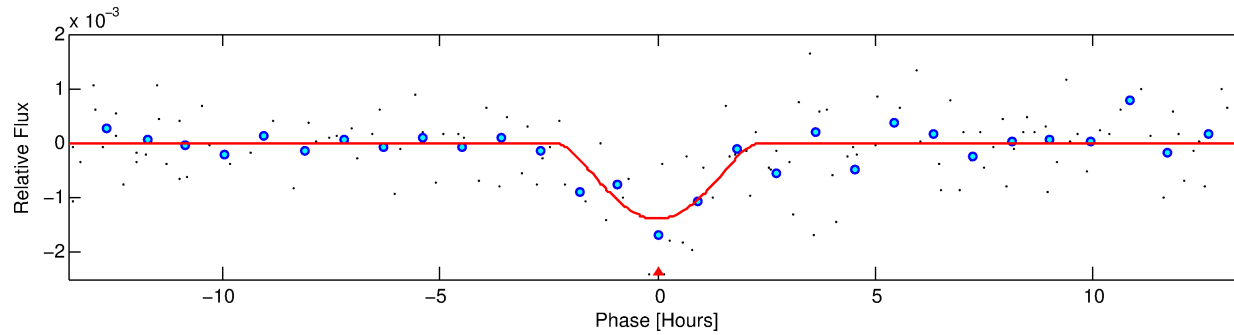
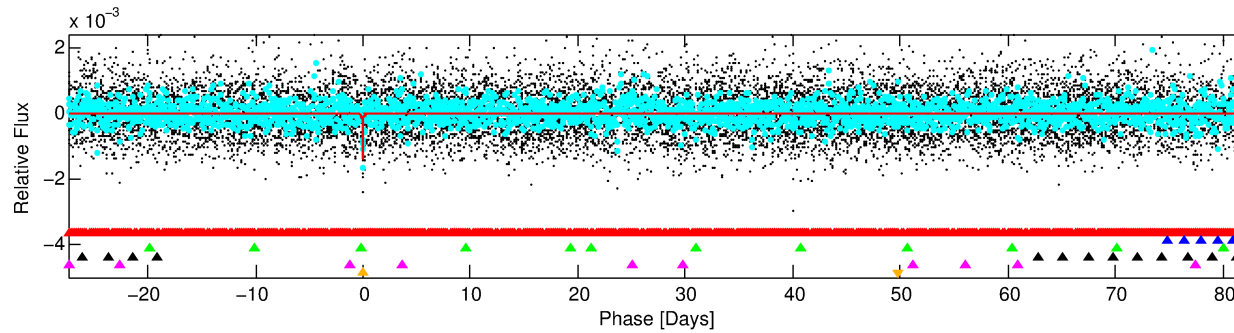
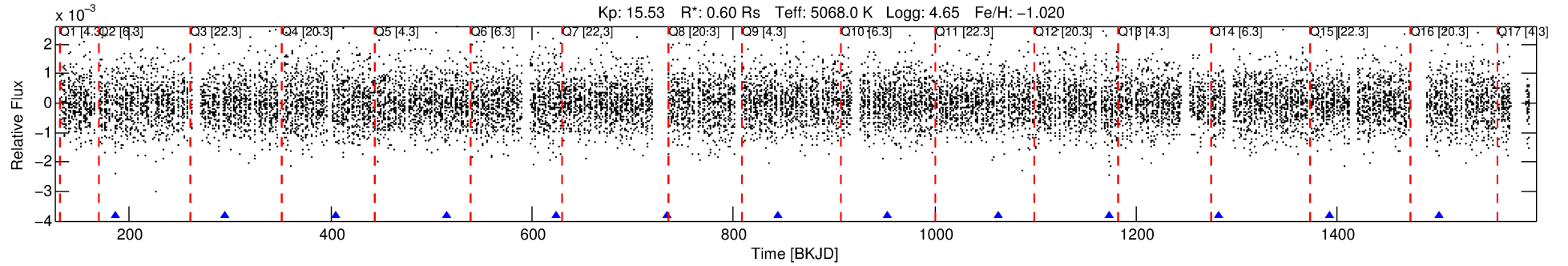
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002140782-06

No Significant Match Found

DV One-Page Summary

KIC: 2140782 Candidate: 6 of 6 Period: 109.652 d



DV Fit Results:

Period = 109.65235 [0.00191] d
Epoch = 185.8201 [0.0135] BKJD
Rp/R* = 0.0660 [0.4372]
a/R* = 69.24 [105.42]
b = 1.00 [0.65]
Seff = 1.51 [0.24]
Teq = 283 [11] K
Rp = 4.35 [28.87] Re
a = 0.3786 [0.0245] AU
Ag = 2181.39 [28924.61] [0.08 σ]
Teff = 2986 [9899] K [0.27 σ]

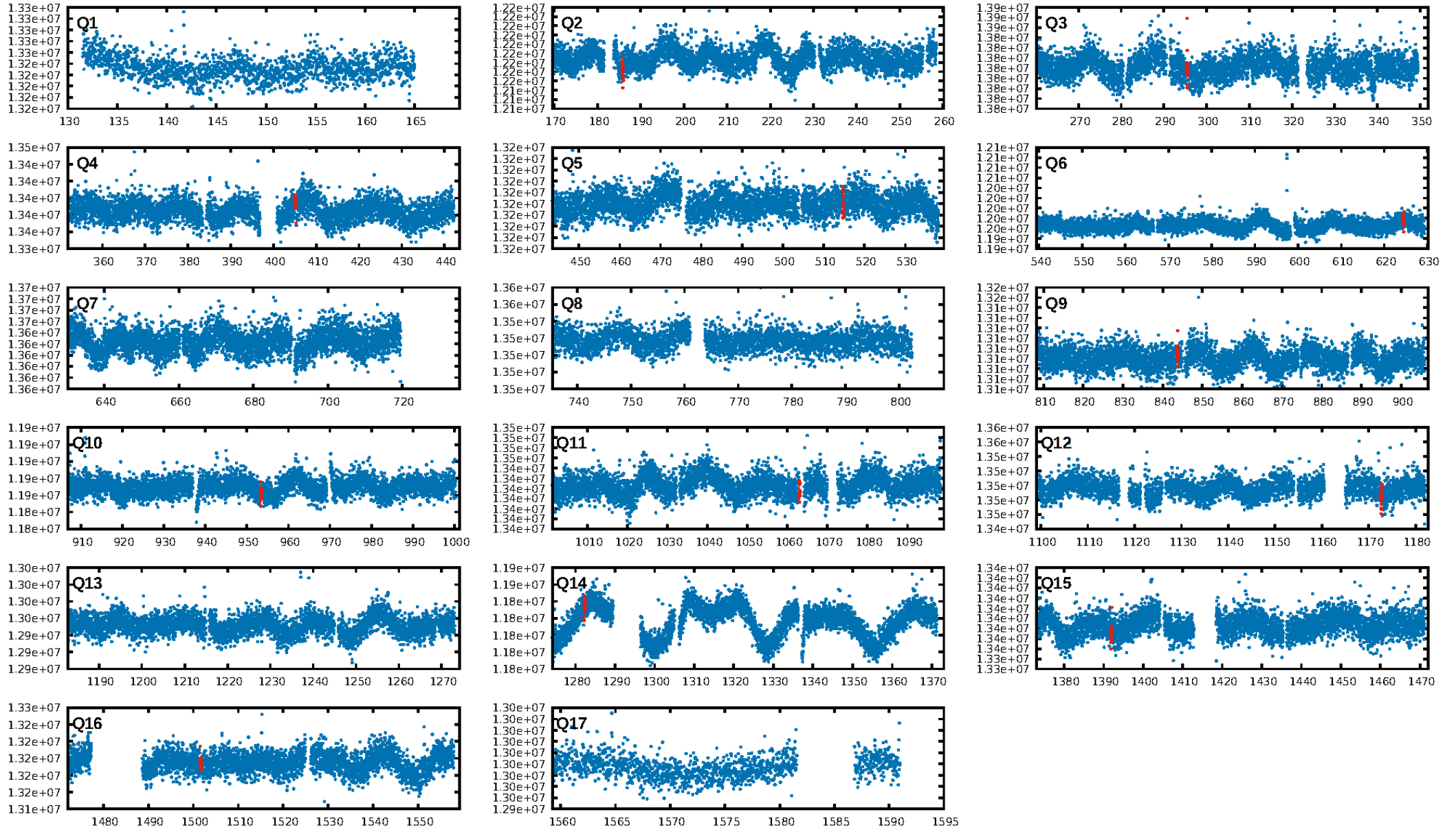
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [195.20 σ]
LongPeriod-sig: 100.0% [10.30 σ]
ModelChiSquare2-sig: 30.5%
ModelChiSquareGof-sig: 97.9%
Bootstrap-pfa: 5.65e-09
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.68
Centroid-sig: 97.2%
Centroid-so: 1.023 arcsec [0.95 σ]
OotOffset-rm: 3.052 arcsec [1.57 σ]
KicOffset-rm: 2.969 arcsec [1.60 σ]
OotOffset-st: 1/1/3/0 [5]
KicOffset-st: 1/1/3/0 [5]
DiffImageQuality-fgm: 0.00 [0/5]
DiffImageOverlap-fno: 0.40 [4/10]

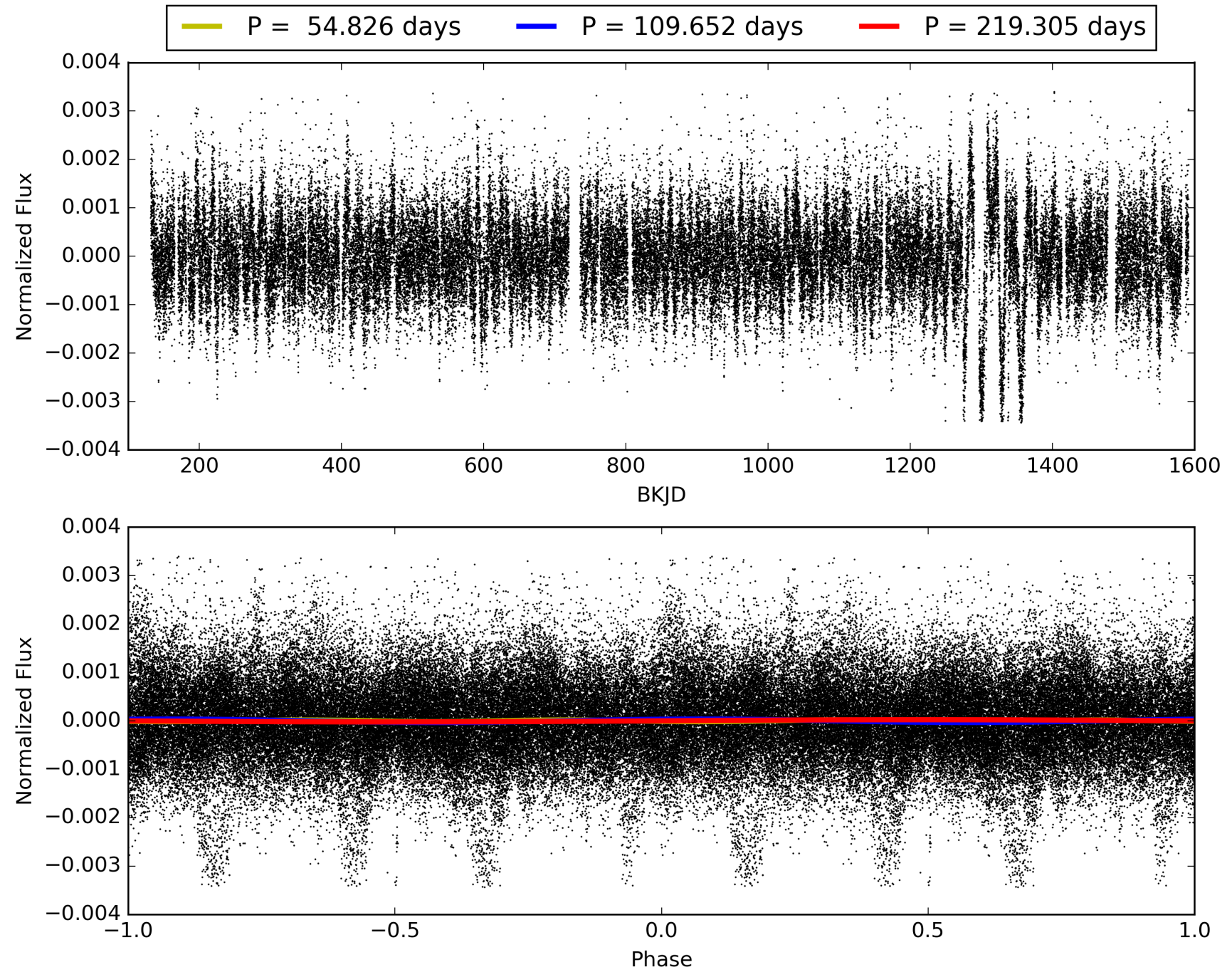
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:39:15 Z

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

TCE 002140782-06, PDC Light Curves

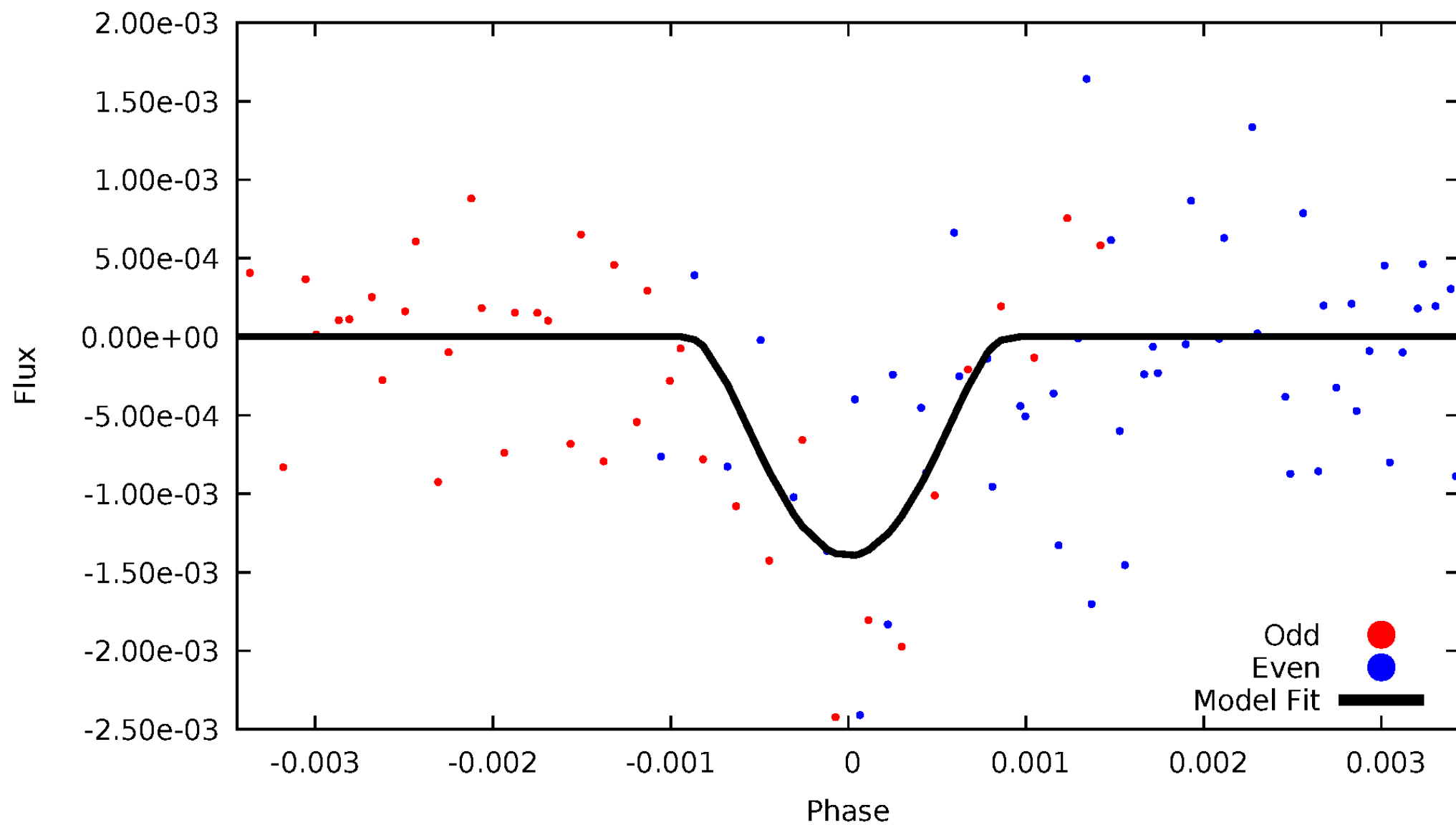


TCE 002140782-06



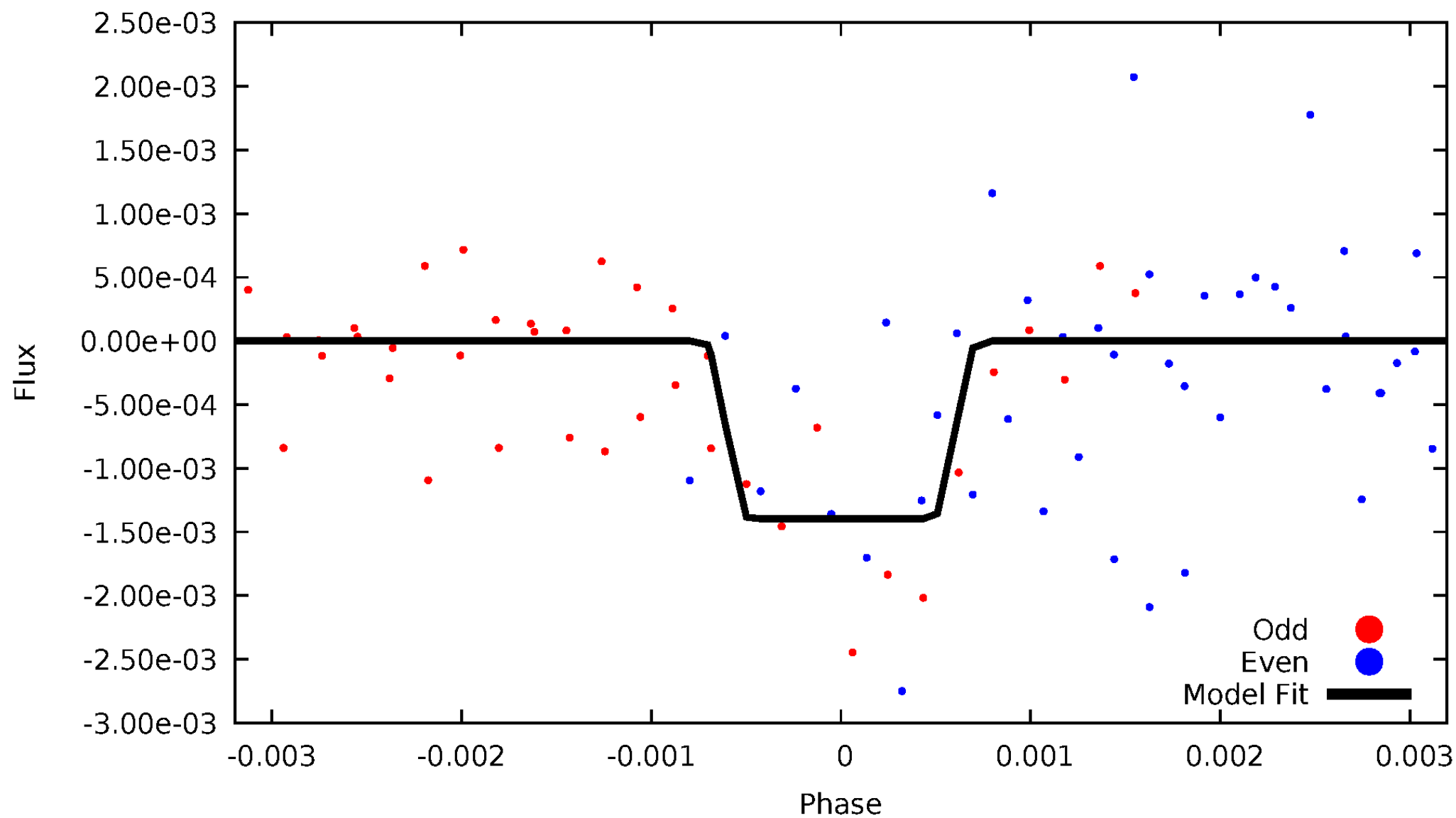
DV Odd/Even

TCE 002140782-06



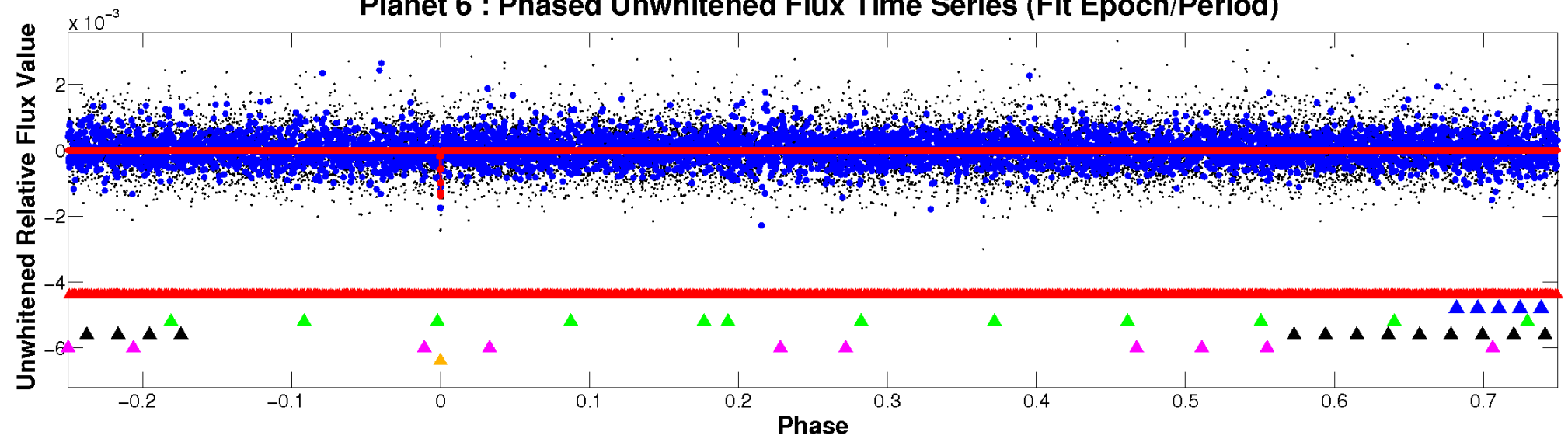
ALT Odd/Even

TCE 002140782-06

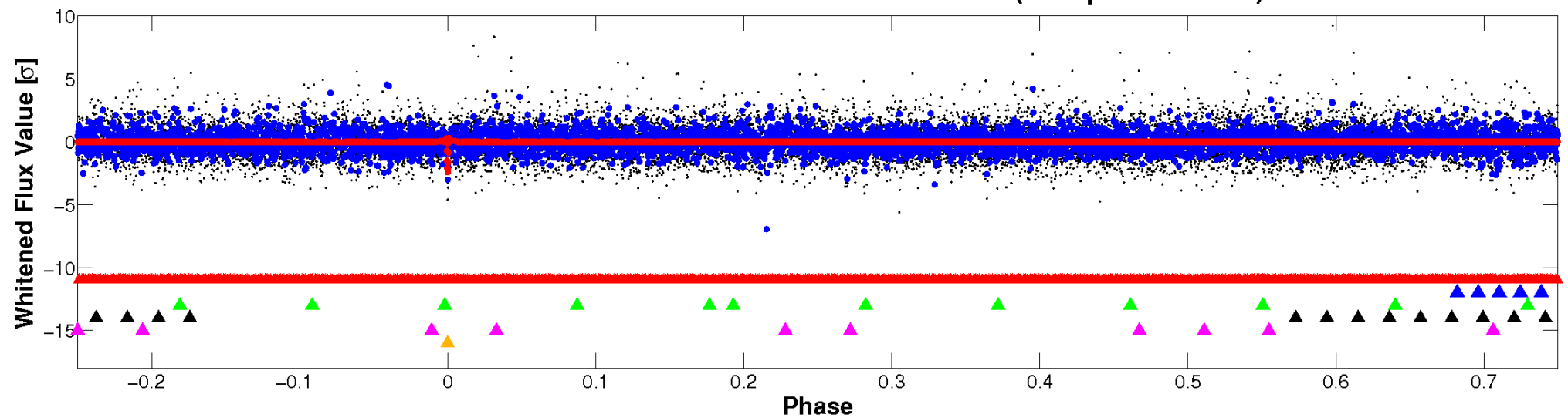


Non-Whitened Vs. Whitened Light Curve

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

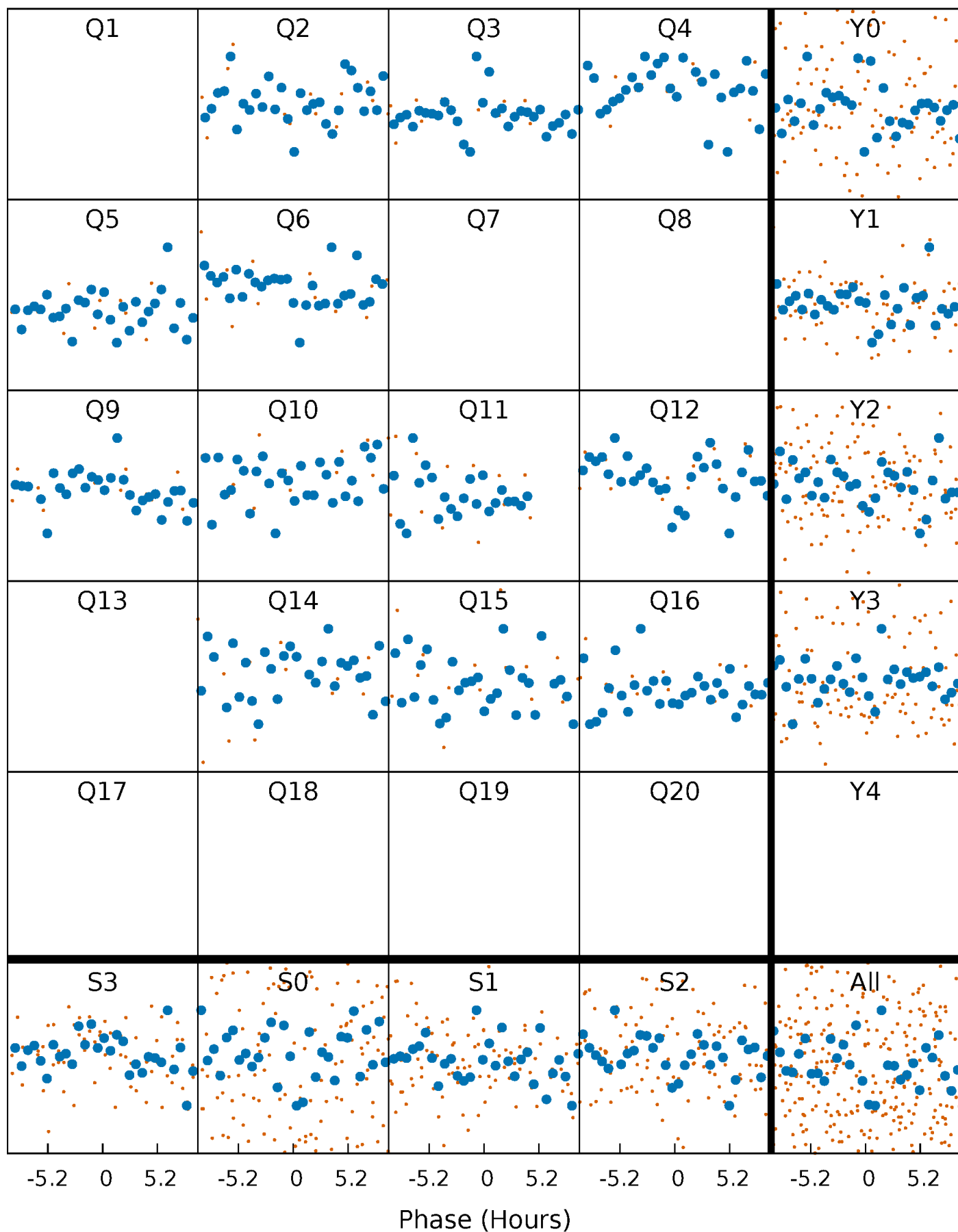


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



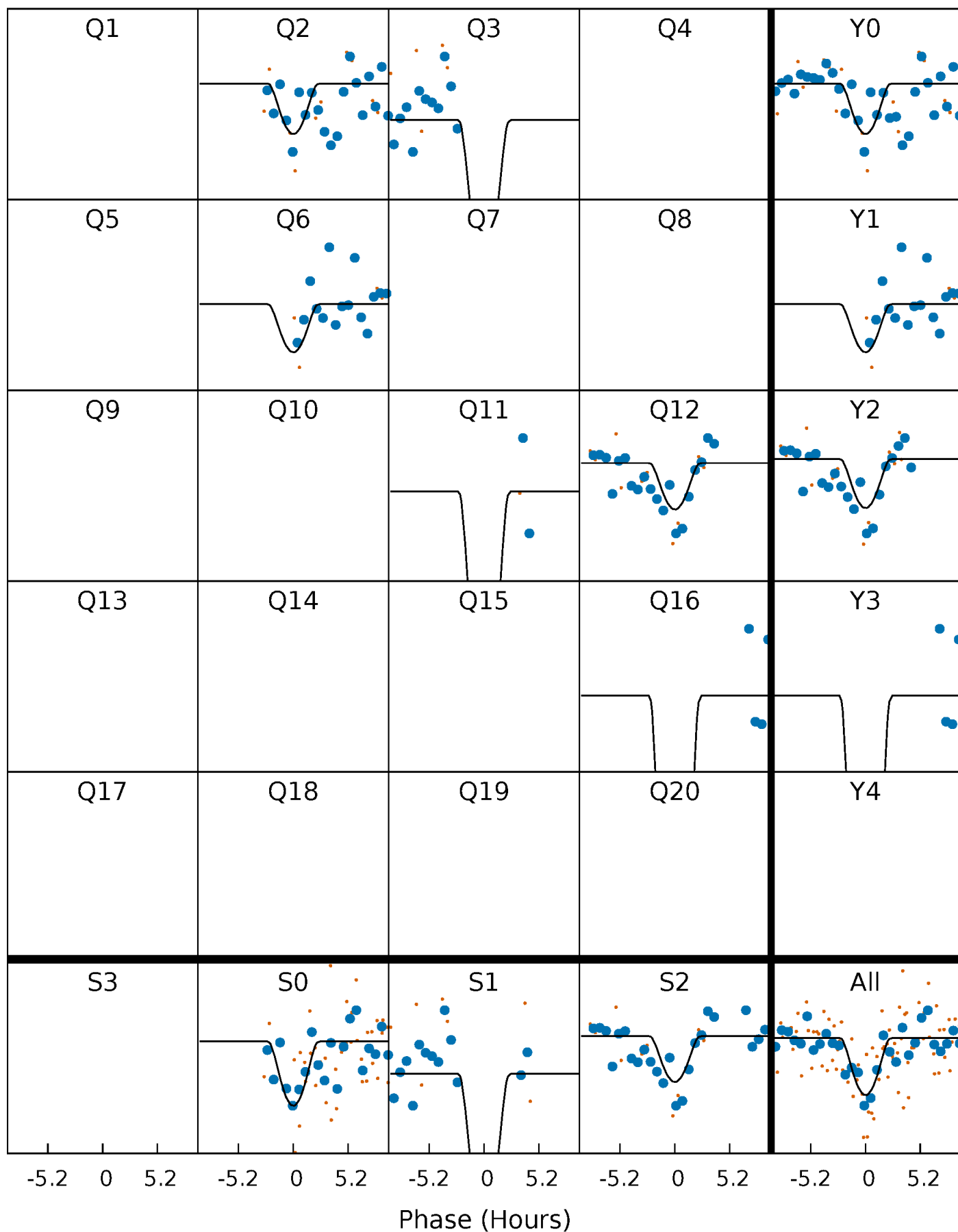
PDC Quarter-Phased Transit Curves

TCE 002140782-06 P=109.652349 Days $T_0=185.820052$ (BKJD)



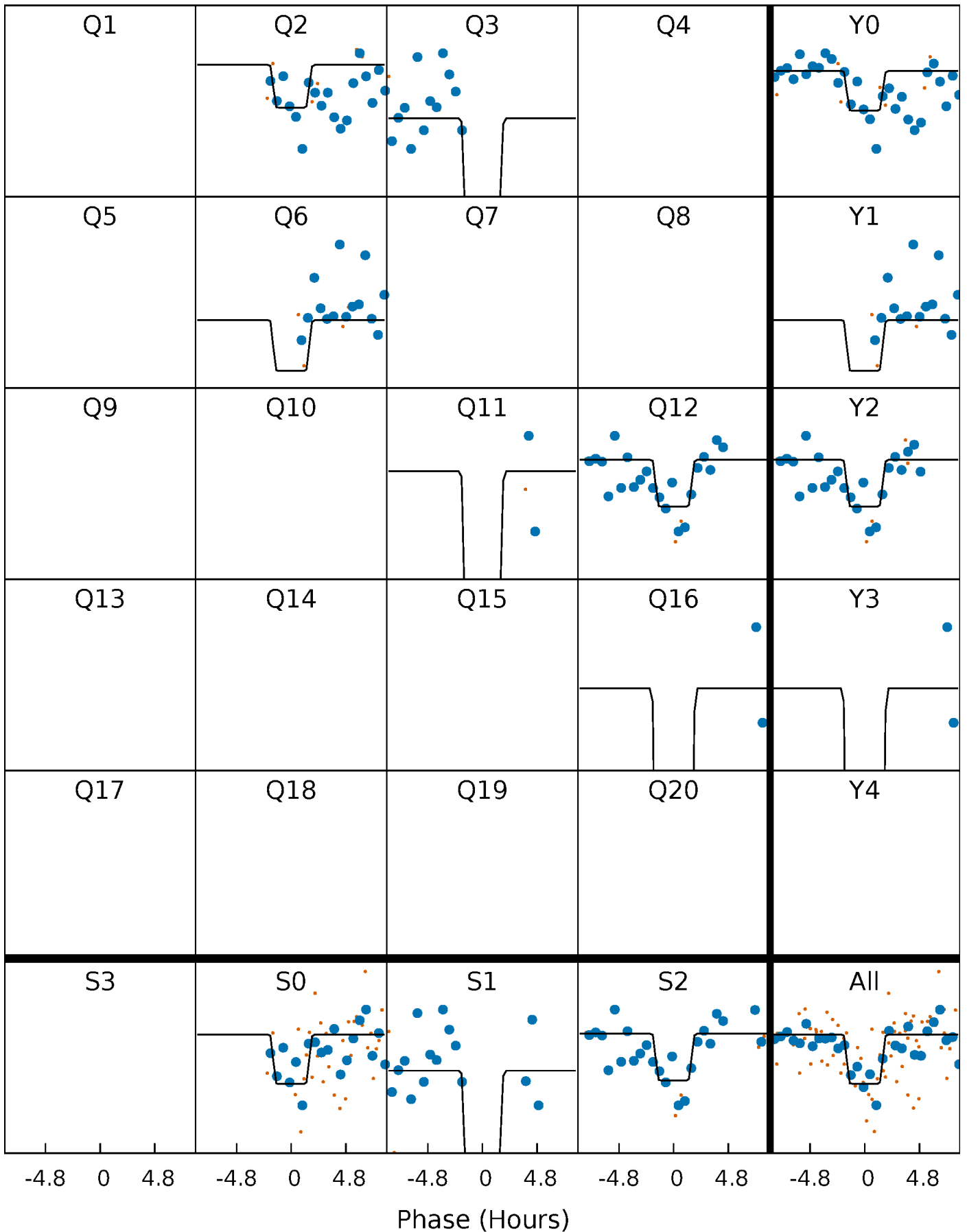
DV Quarter-Phased Transit Curves

TCE 002140782-06 P=109.652349 Days $T_0=185.820052$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

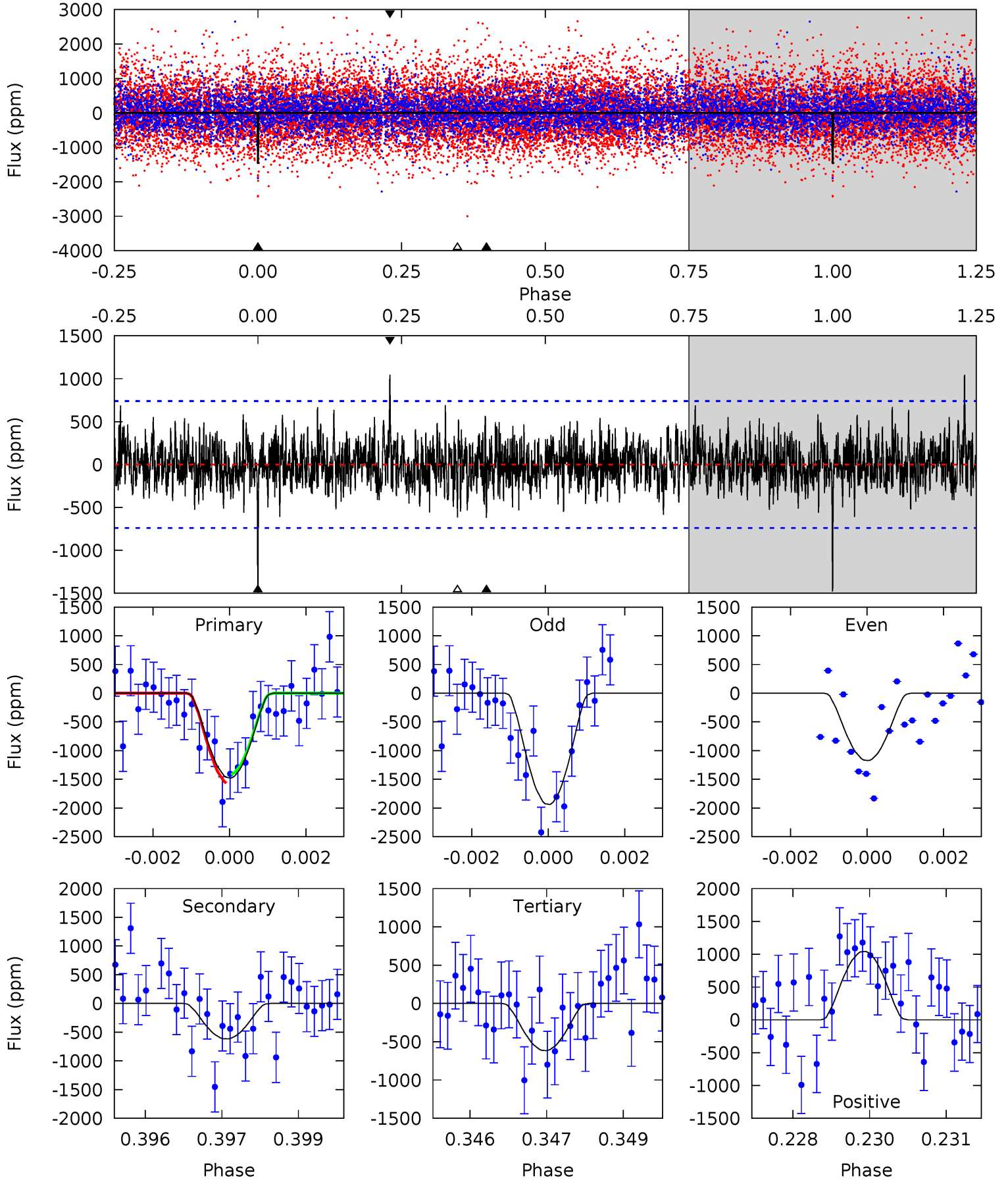
TCE 002140782-06 P=109.653854 Days $T_0=185.791869$ (BKJD)



DV Model-Shift Uniqueness Test

002140782-06, P = 109.652349 Days, E = 76.167703 Days

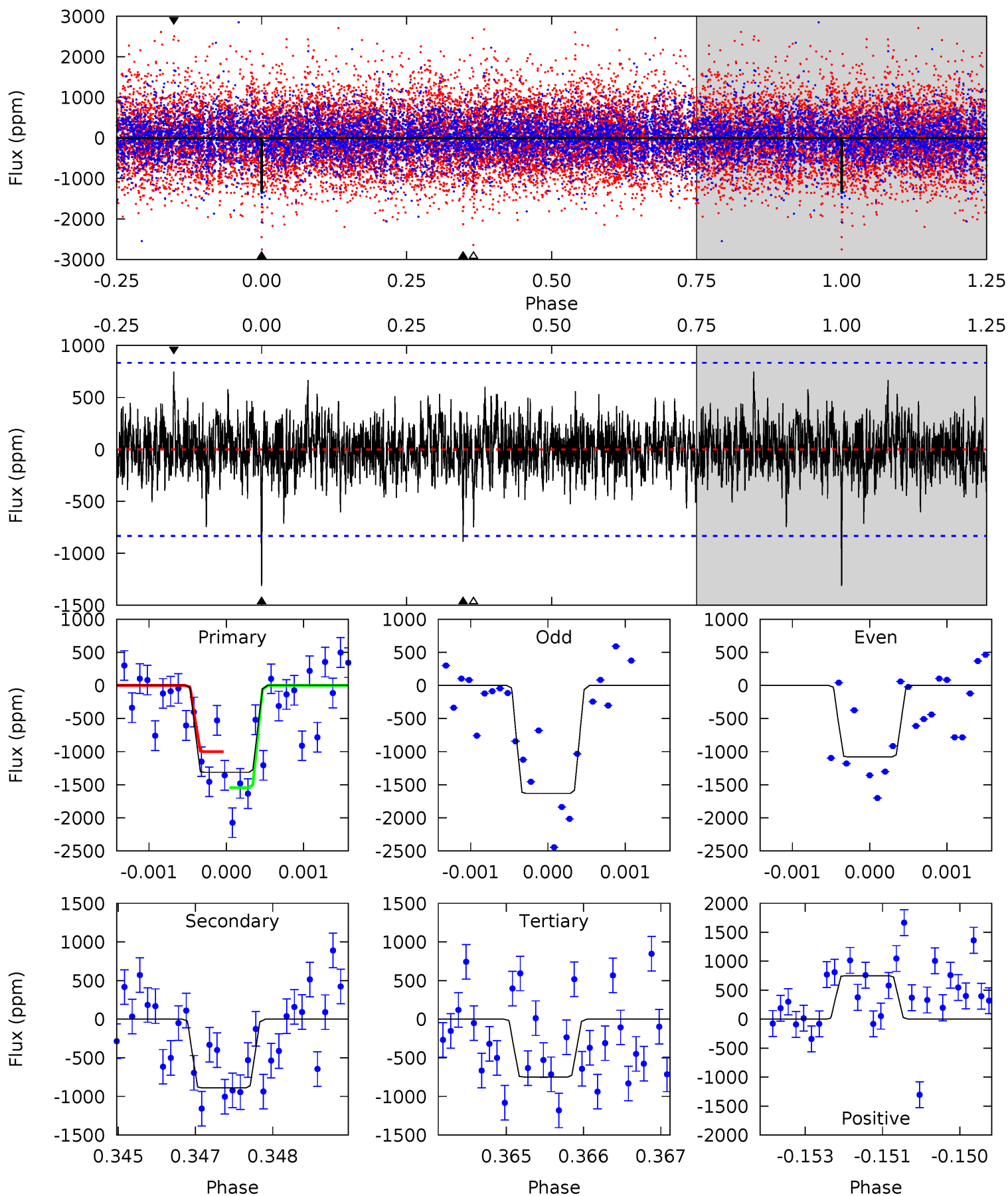
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.7	4.48	4.46	7.56	5.36	3.14	1.44	6.24	3.14	0.02	-3.08	2.67	1.04	0.41	0.53



Alt Model-Shift Uniqueness Test

002140782-06, P = 109.653854 Days, E = 76.138015 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.48	5.73	4.83	4.84	5.38	3.18	1.20	3.65	3.64	0.90	0.89	1.75	0.88	0.36	1.73



Stellar Parameters For KIC 002140782

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5068^{+151}_{-151}	$4.654^{+0.059}_{-0.036}$	$-1.020^{+0.300}_{-0.300}$	$0.605^{+0.042}_{-0.042}$	$0.601^{+0.052}_{-0.022}$	$3.832^{+0.888}_{-0.555}$
	+3%/-3%	+1%/-1%	+29%/-29%	+7%/-7%	+9%/-4%	+23%/-14%
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 002140782-06 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-618 ± 138	$21.90^{+22.14}_{-14.78}$	394^{+13}_{-14}	2284^{+759}_{-314}	100^{+850}_{-74}
Alt.	-887 ± 155	$19.94^{+20.51}_{-13.73}$	394^{+14}_{-13}	2435^{+935}_{-366}	172^{+1728}_{-130}

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

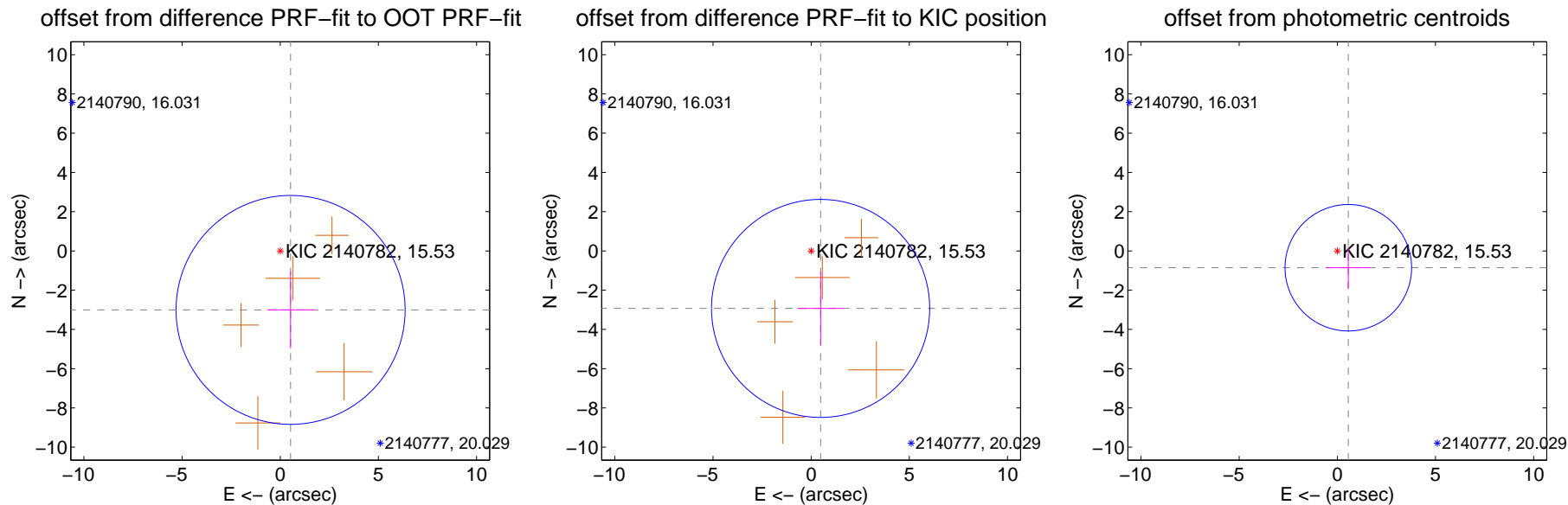
DV Centroid Data

Supplemental centroid analysis for 002140782-06. Kepler magnitude: 15.53. Transit SNR 7.15

There are 0 quarters with good PRF difference image offsets

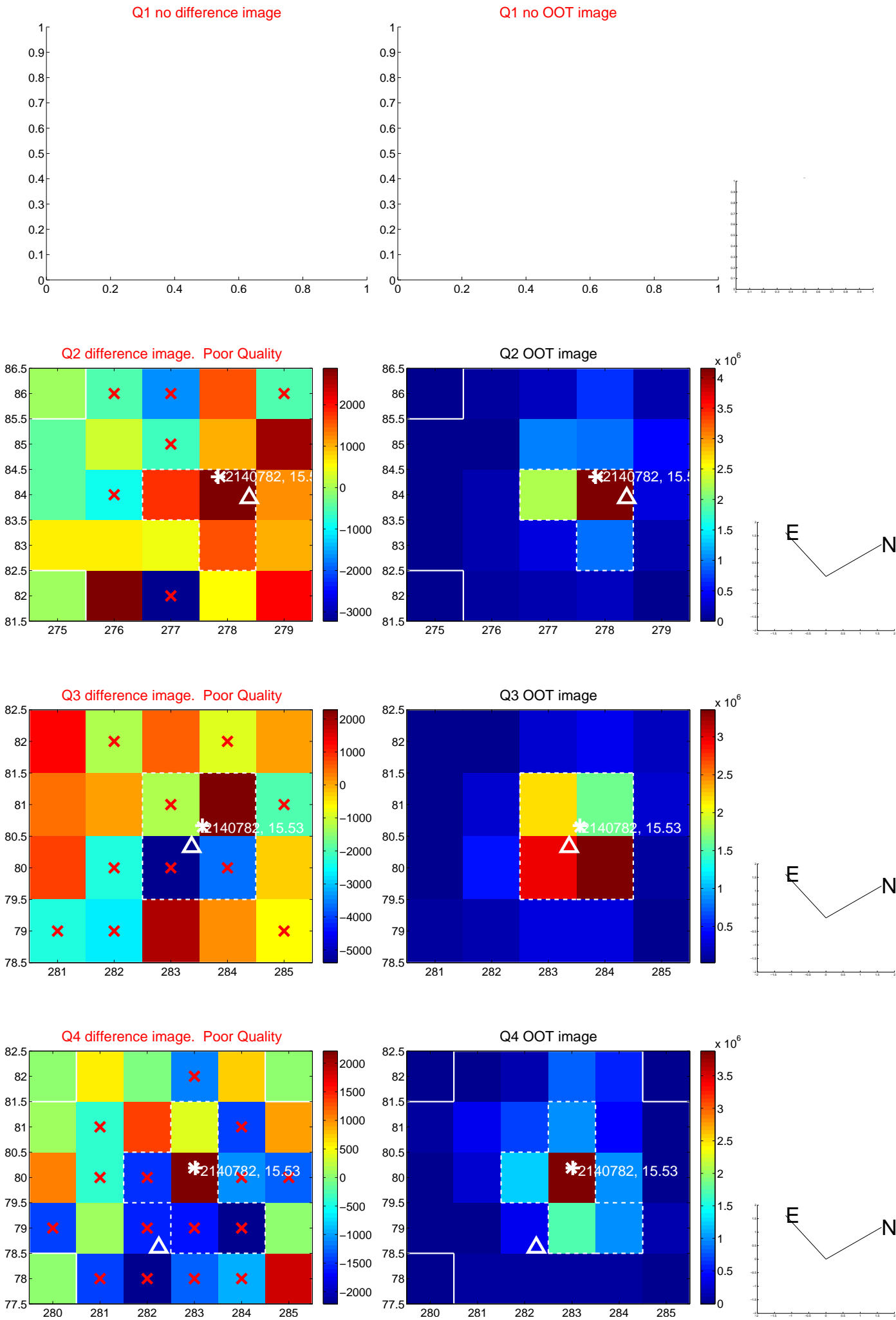
The direct PRF centroid is offset from the target star catalog position by about 0.42 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.052 ± 1.944	1.57	-0.527 ± 1.197	-3.006 ± 1.963
PRF-fit source offset from KIC position	2.969 ± 1.852	1.60	-0.481 ± 1.180	-2.930 ± 1.866
photometric centroid source offset	1.02 ± 1.07	0.95	-0.56 ± 1.12	-0.86 ± 1.05

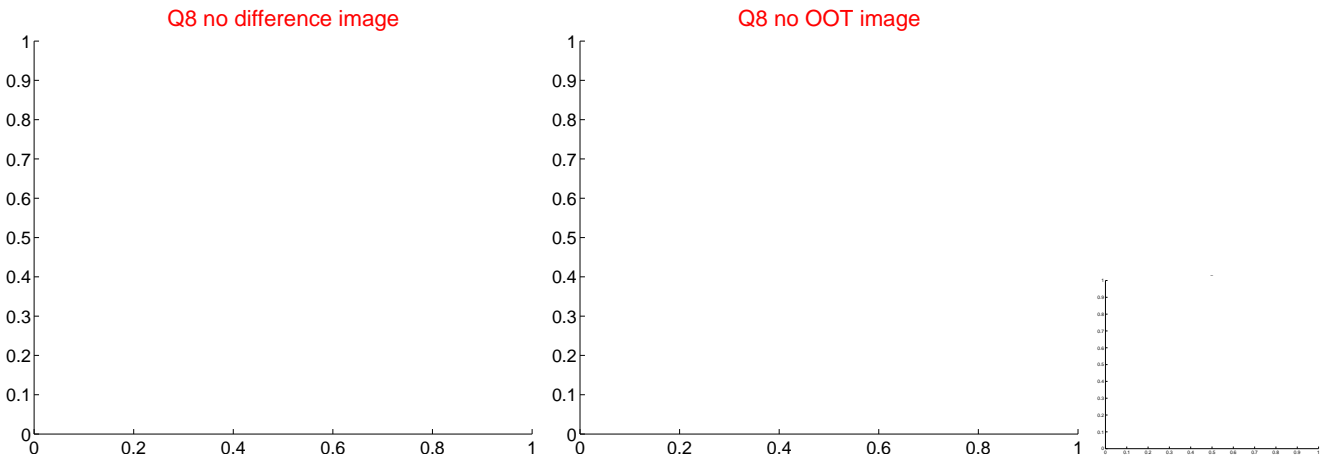
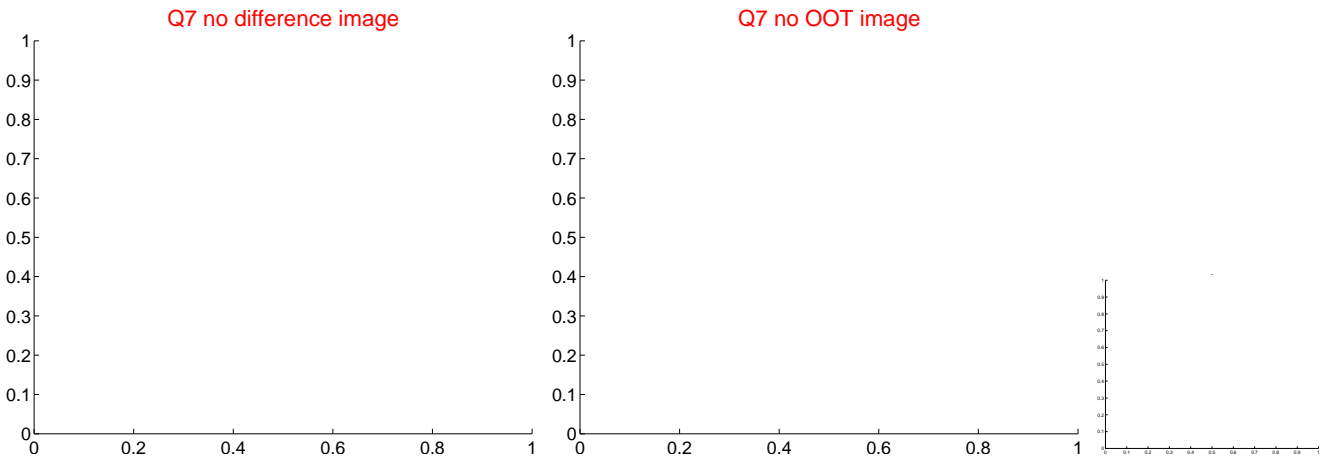
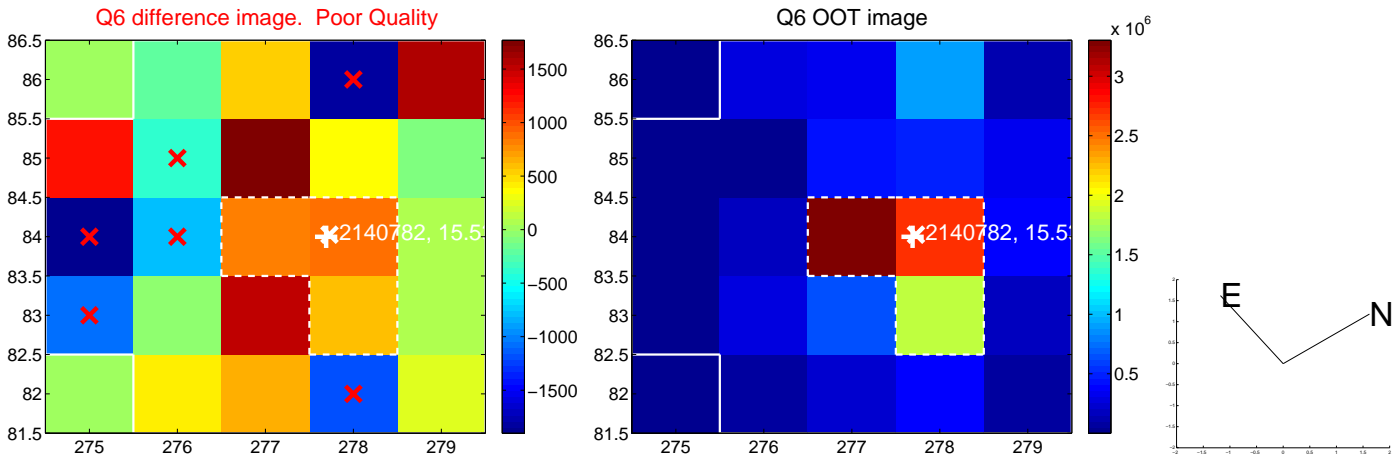
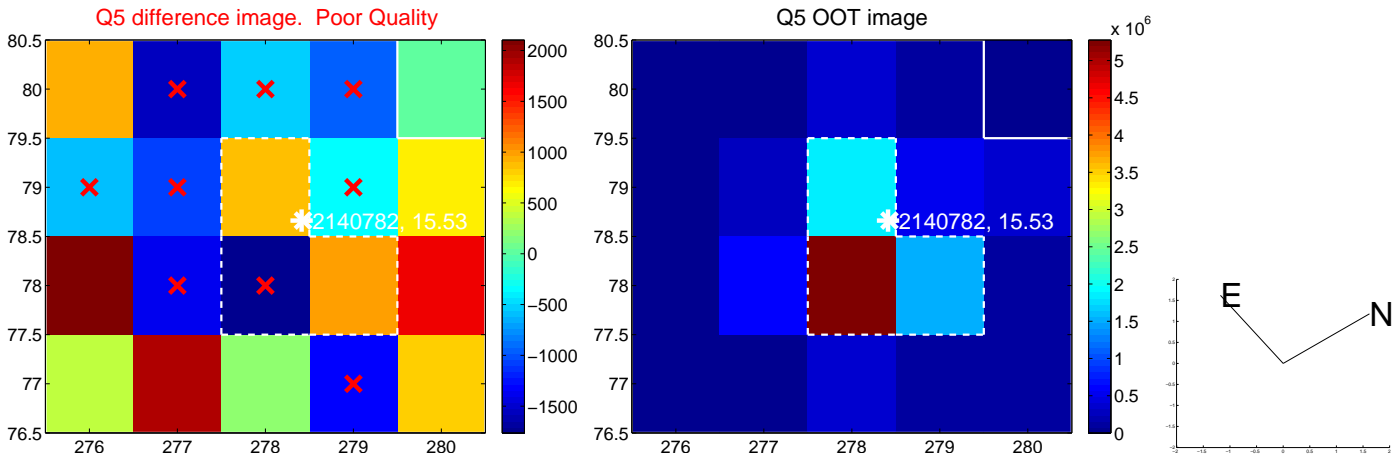


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

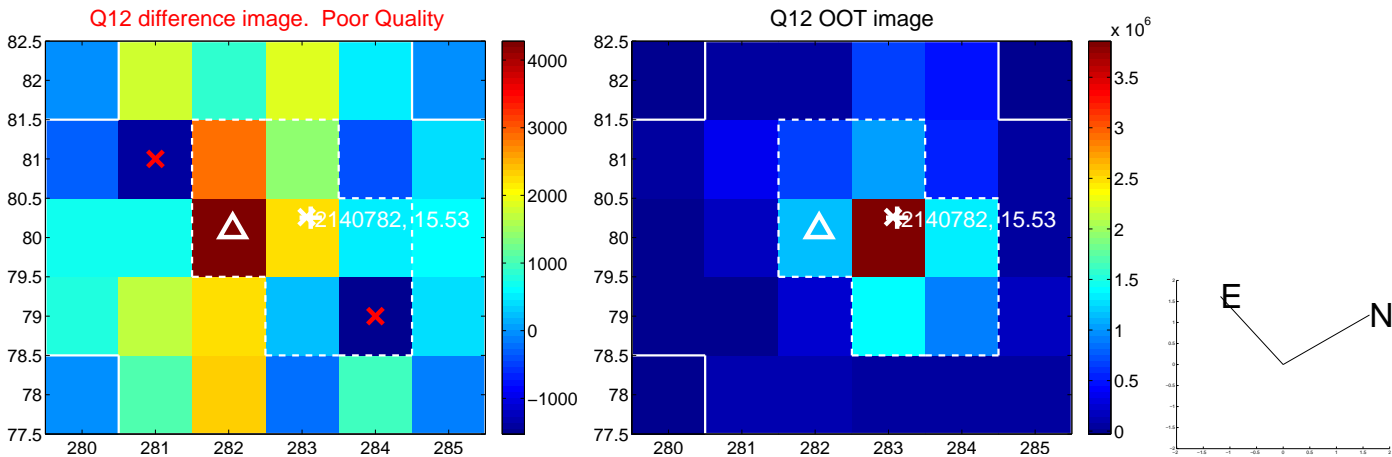
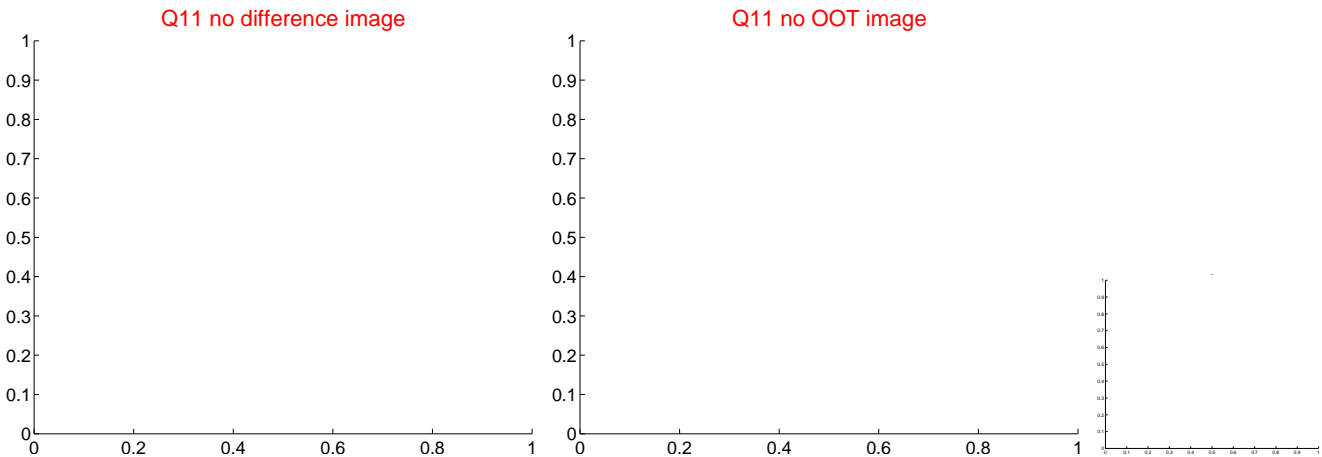
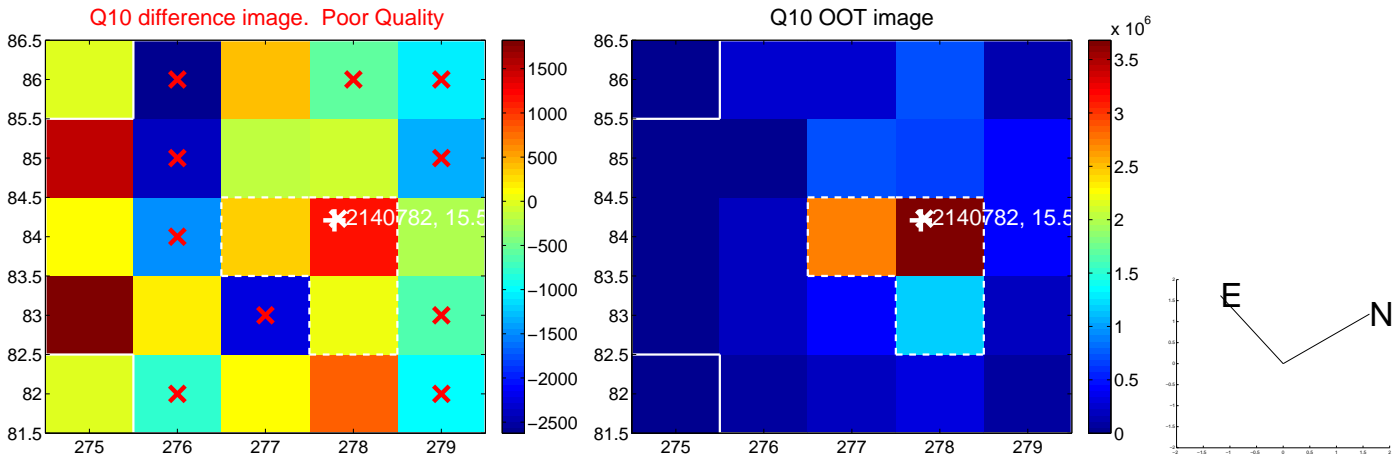
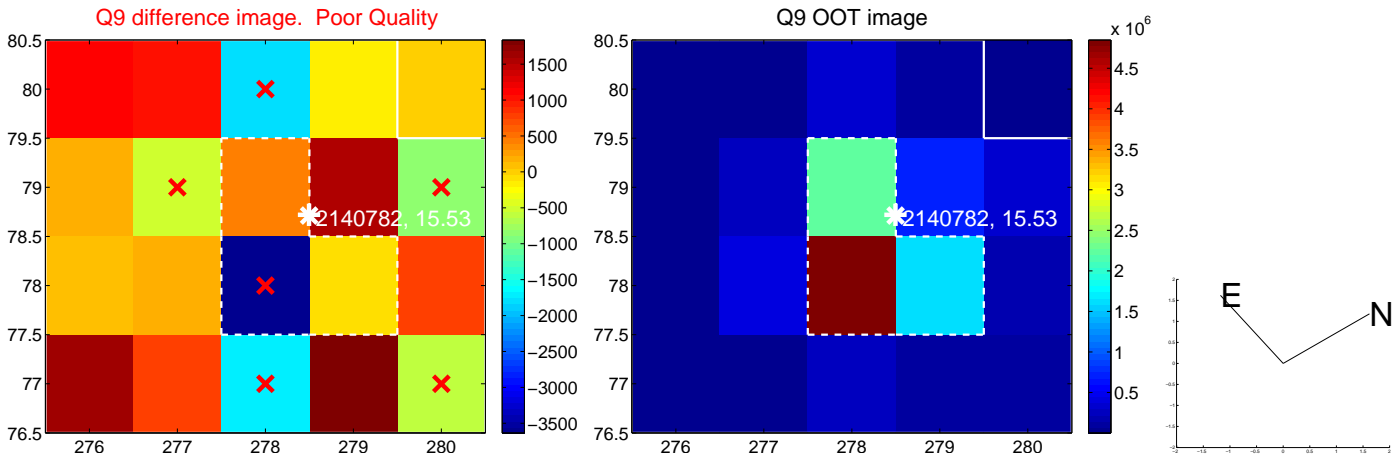
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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

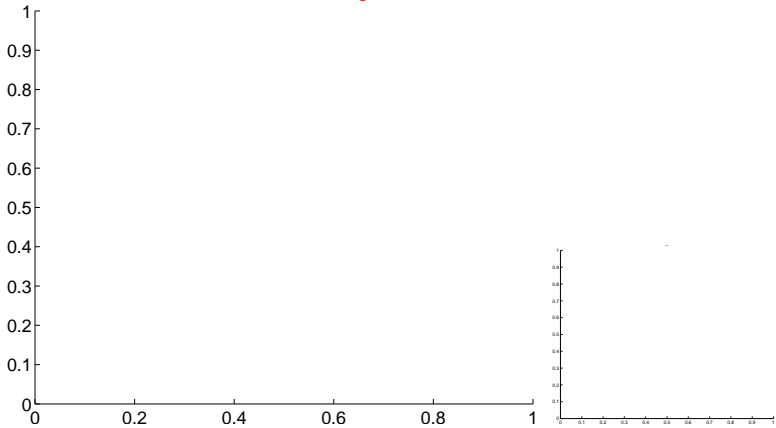


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

Q13 no difference image



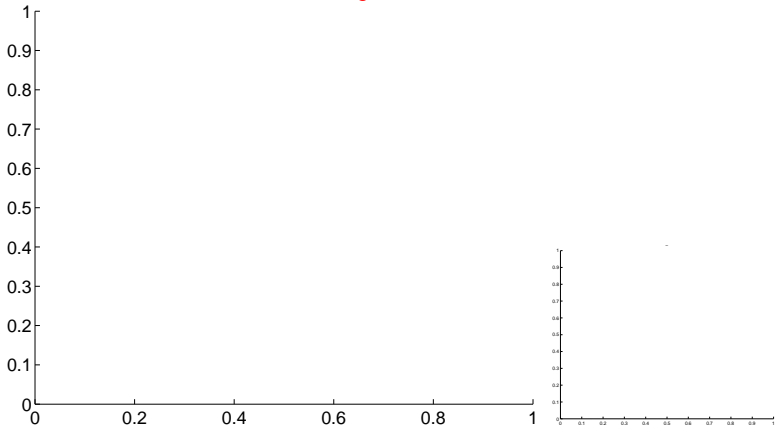
Q13 no OOT image



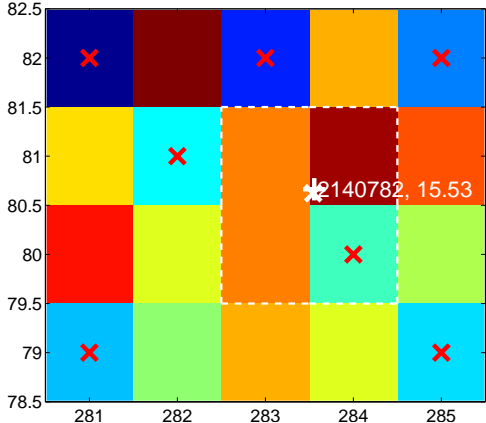
Q14 no difference image



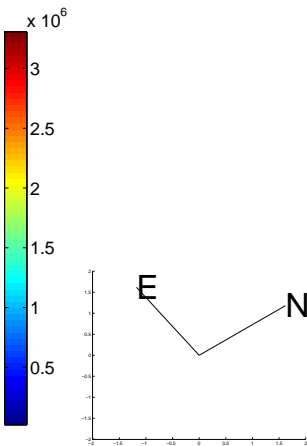
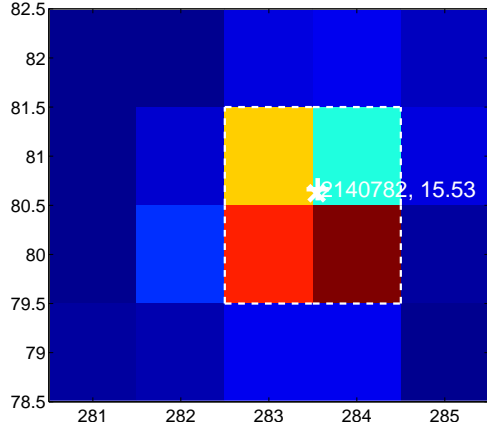
Q14 no OOT image



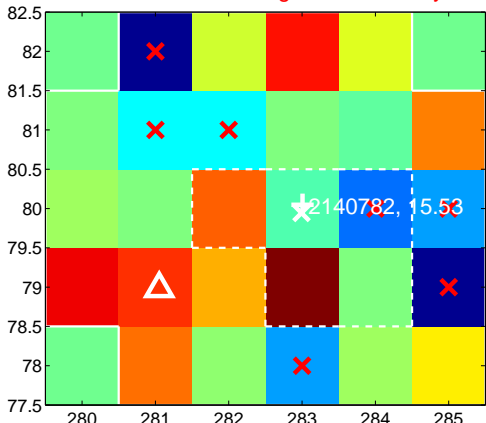
Q15 difference image. Poor Quality



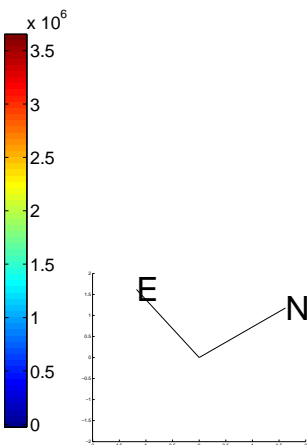
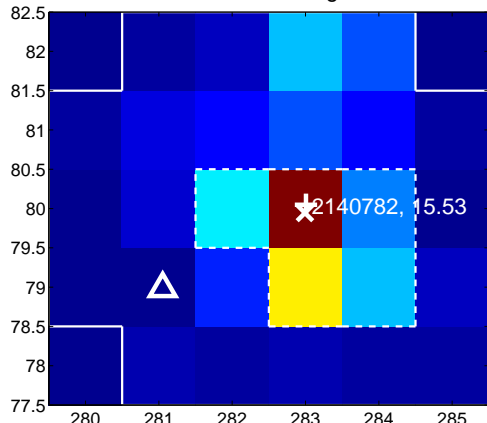
Q15 OOT image



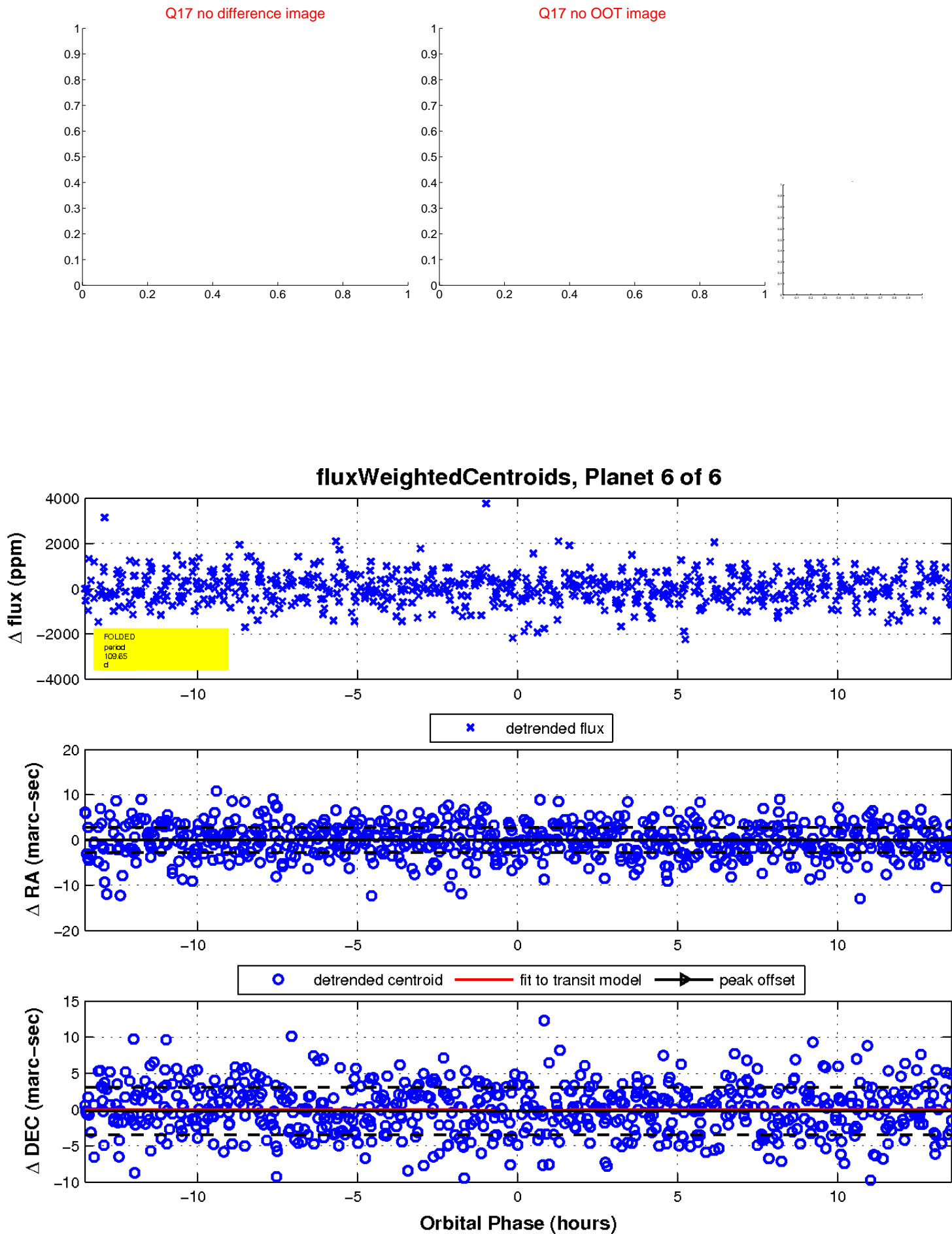
Q16 difference image. Poor Quality



Q16 OOT image



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



UKIRT Image

Declination

