

KIC 009640891

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})
009640891-01	OBS	No	0.585850	131.909439	35.8	3.720	9.4	6.3	3.13	8443	1.93	147882.89
009640891-02	OBS	No	106.499645	146.580520	1503.5	1.615	8.1	8.2	3.13	8443	13.85	143.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009640891-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009640891-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

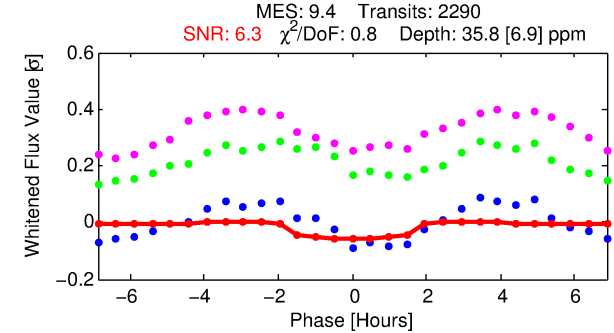
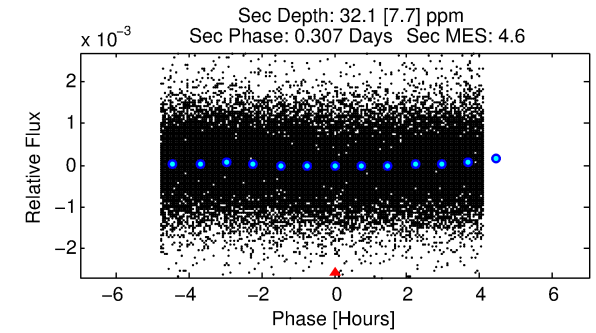
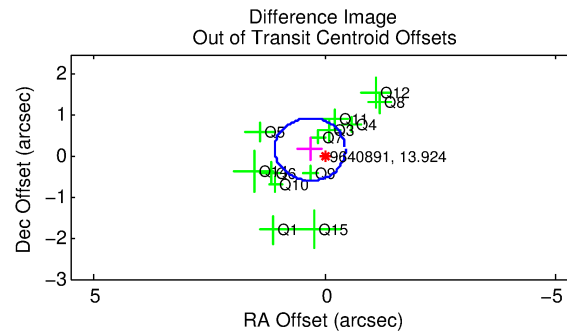
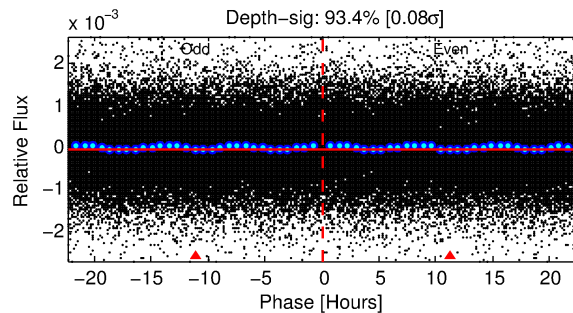
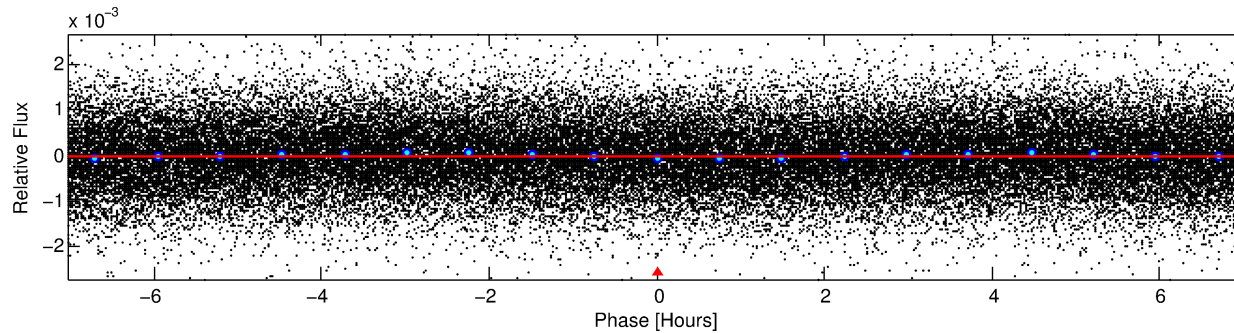
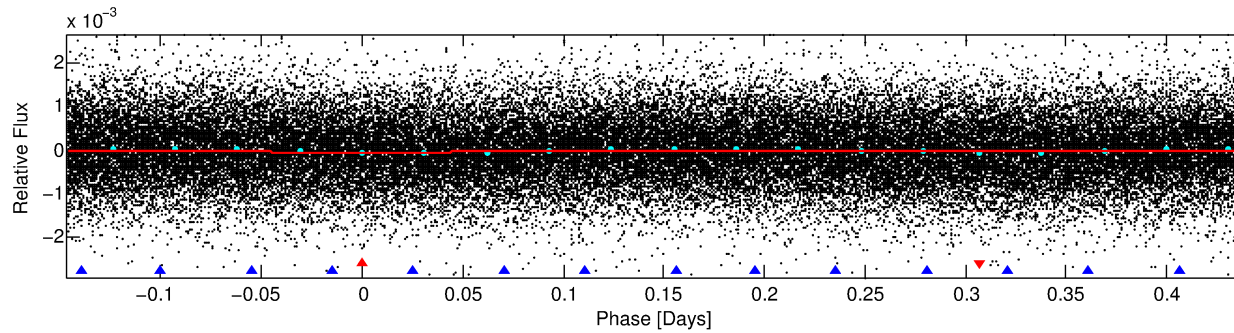
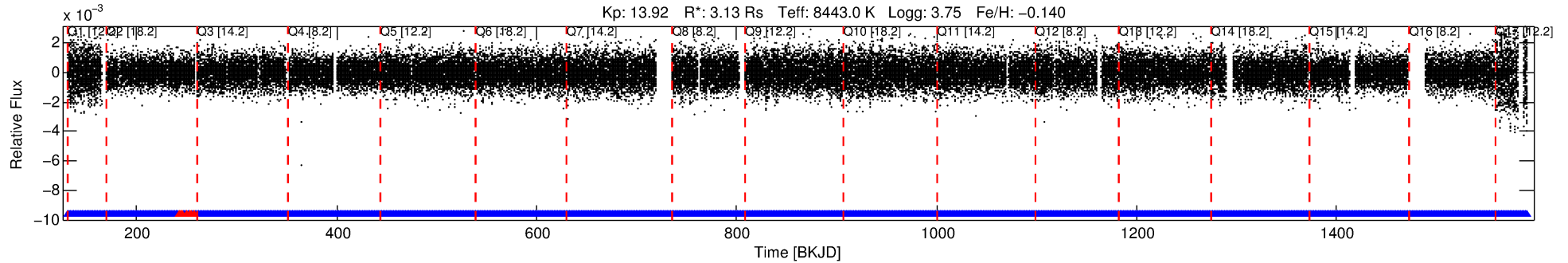
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009640891-01

No Significant Match Found

DV One-Page Summary

KIC: 9640891 Candidate: 1 of 2 Period: 0.586 d



DV Fit Results:

Period = 0.58585 [0.00002] d
Epoch = 131.9094 [0.0068] BKJD
Rp/R* = 0.0056 [0.0069]
a/R* = 1.31 [3.88]
b = 0.41 [14.68]
Seff = 147882.89 [106992.91]
Teff = 5000 [904] K
Rp = 1.92 [2.50] Re
a = 0.0174 [0.0076] AU
Ag = 1.43 [3.65] [0.12 σ]
Teffp = 8461 [5184] K [0.66 σ]

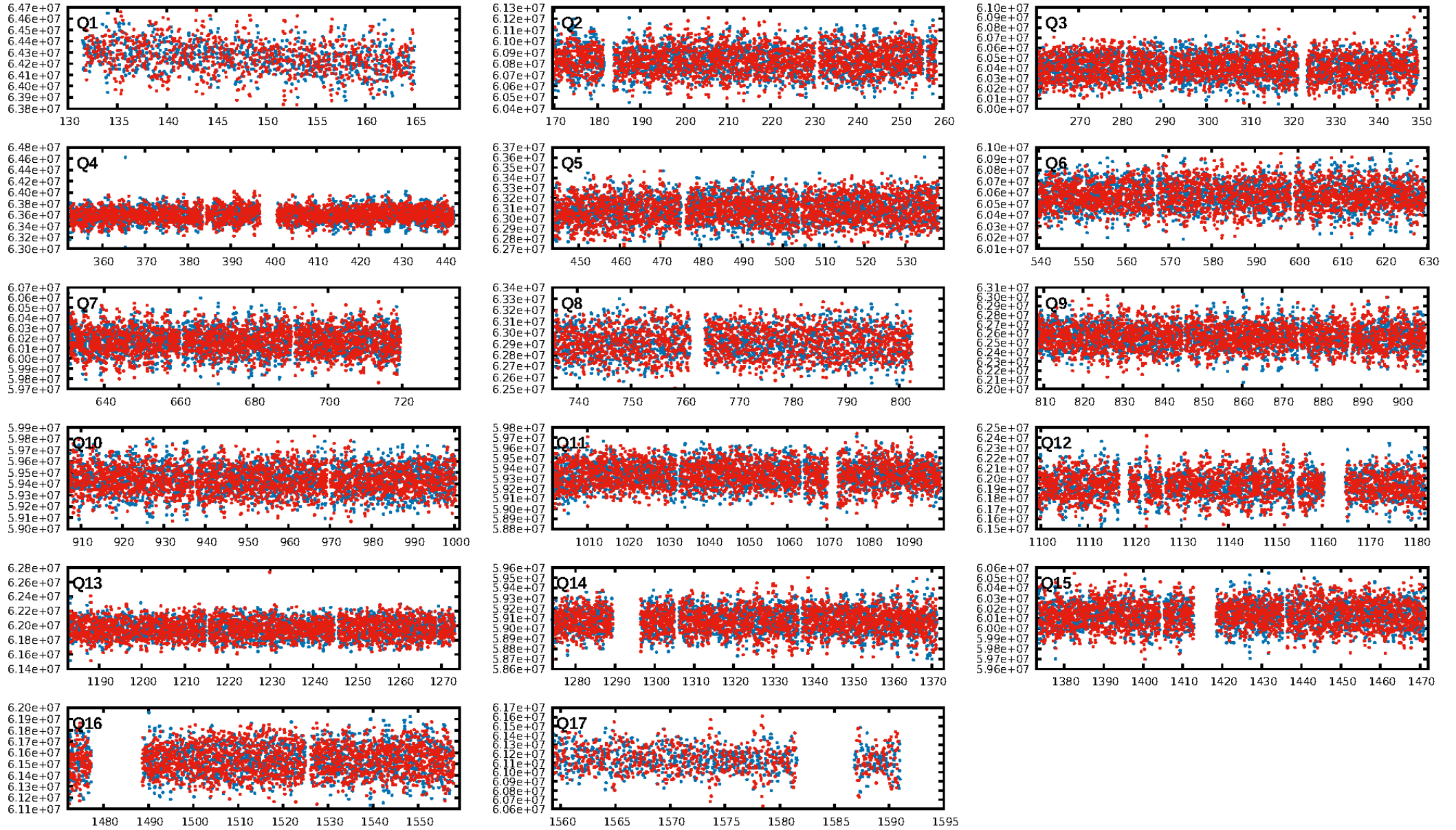
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [626.71 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.98e-11
RollingBand-fgt: 1.00 [2181/2188]
GhostDiagnostic-chr: 4.66
Centroid-sig: 6.7%
Centroid-so: 1.154 arcsec [1.75 σ]
OotOffset-rm: 0.364 arcsec [1.42 σ]
KicOffset-rm: 0.343 arcsec [1.36 σ]
OotOffset-st: 3/4/3/3 [13]
KicOffset-st: 3/4/3/3 [13]
DiffImageQuality-fgm: 0.77 [10/13]
DiffImageOverlap-fno: 1.00 [17/17]

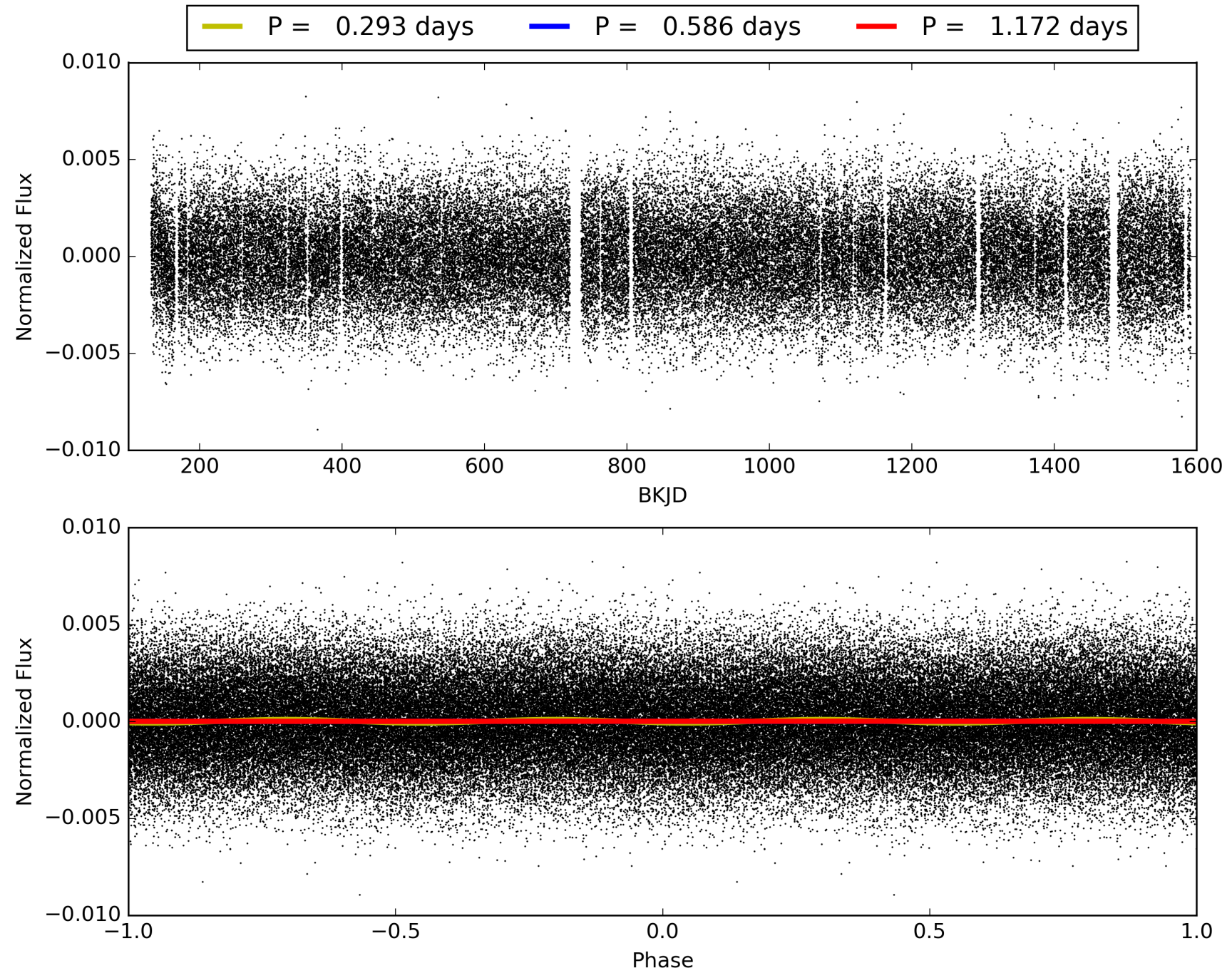
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 12:33:10 Z

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

TCE 009640891-01, PDC Light Curves

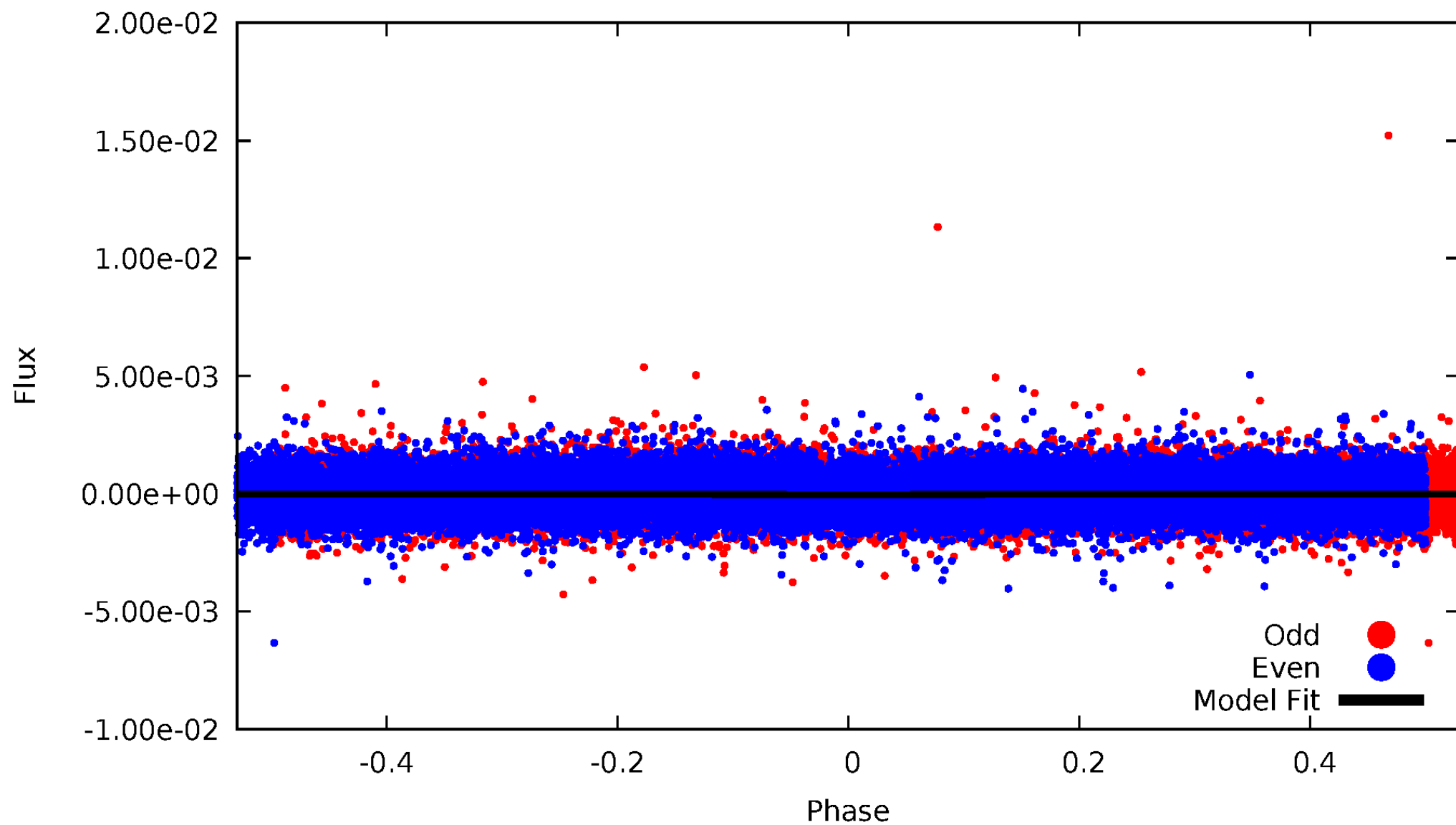


TCE 009640891-01



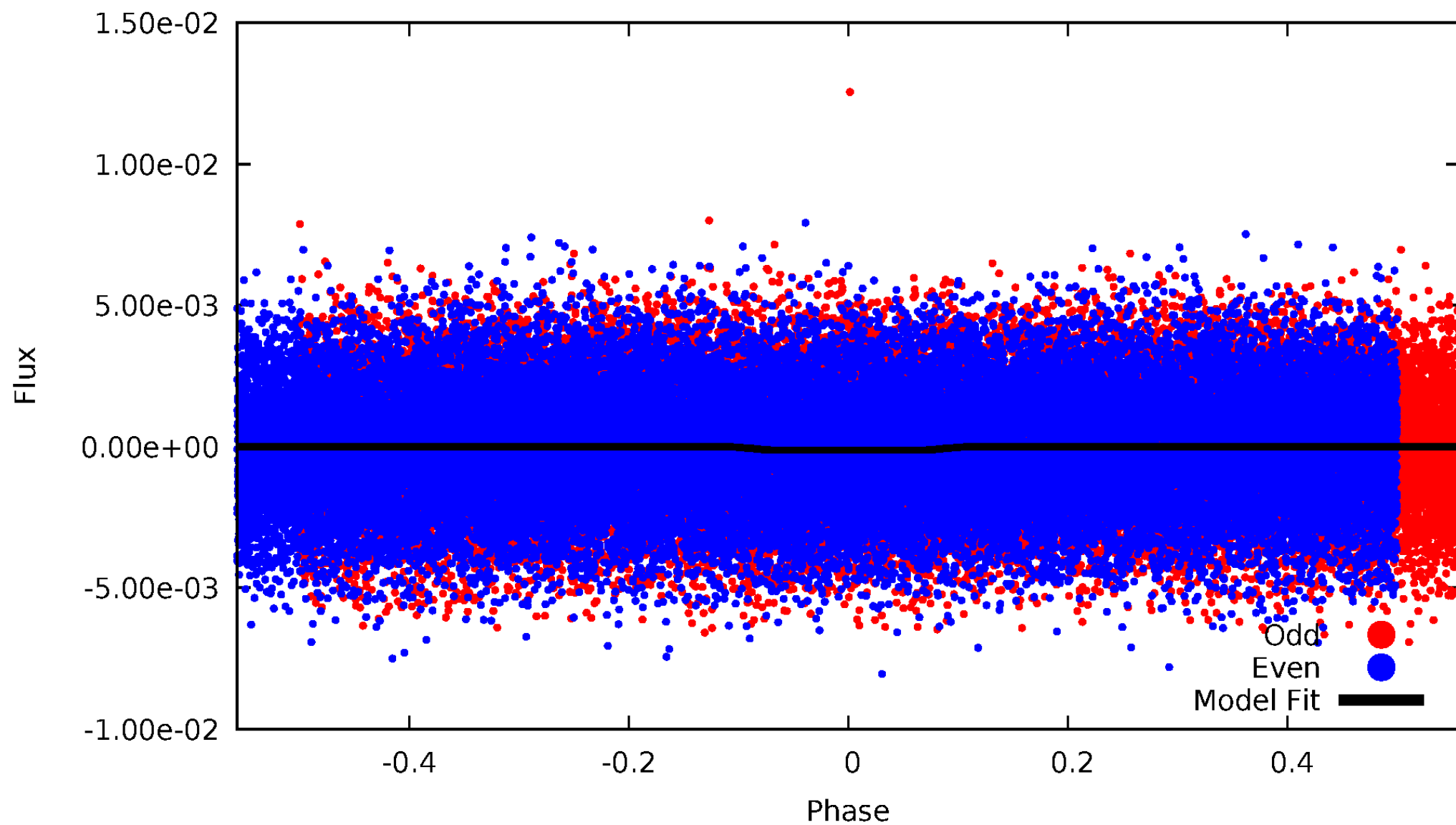
DV Odd/Even

TCE 009640891-01



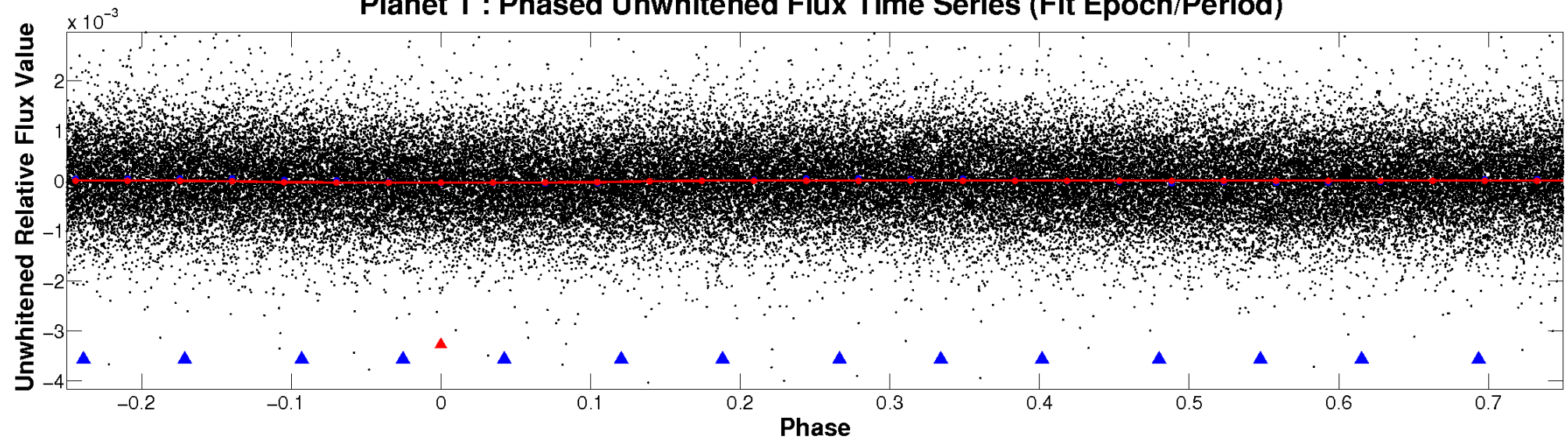
ALT Odd/Even

TCE 009640891-01

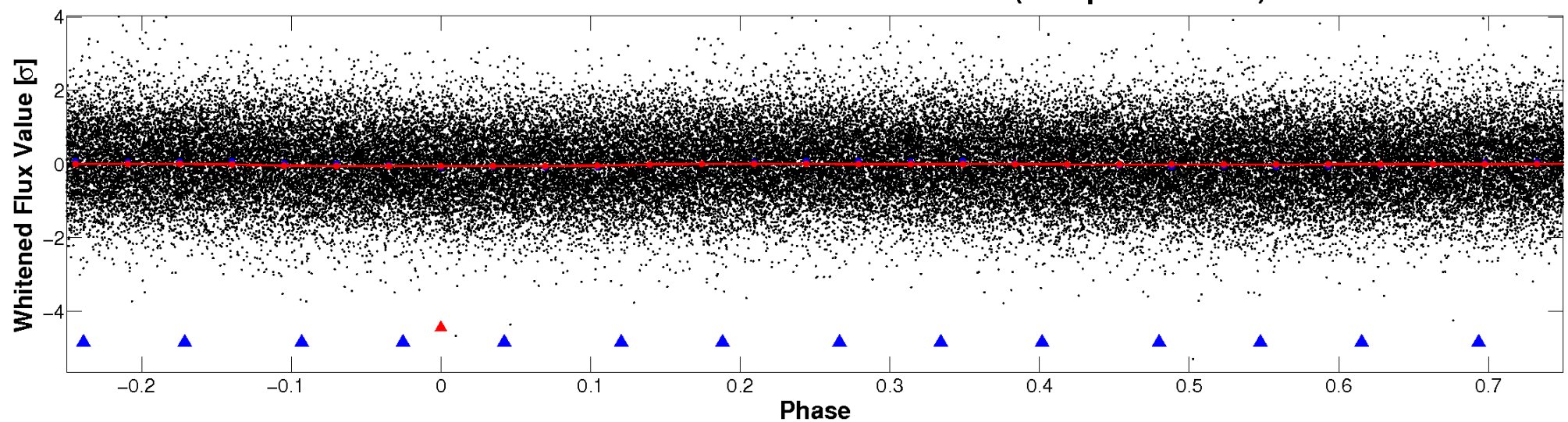


Non-Whitened Vs. Whitened Light Curve

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

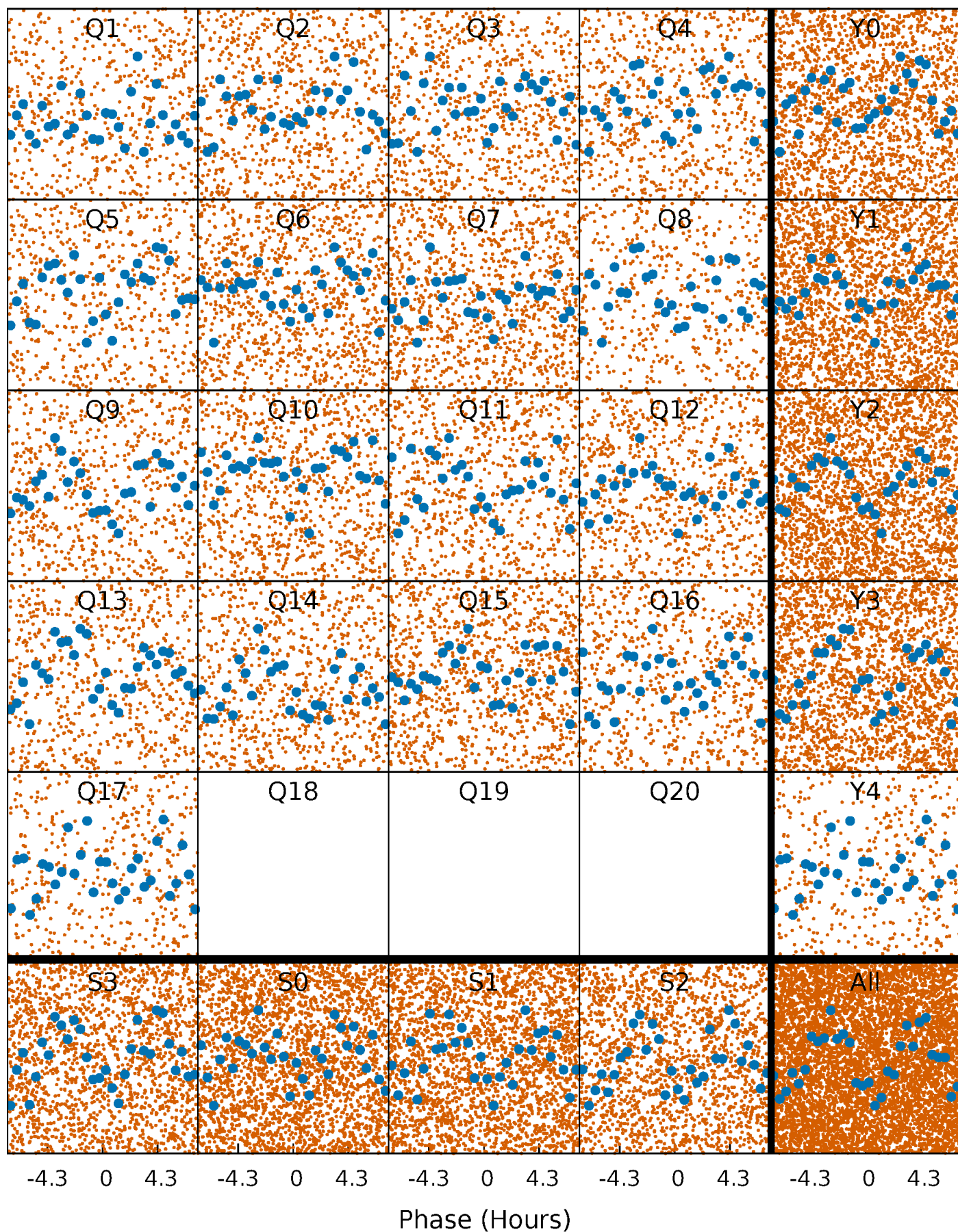


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



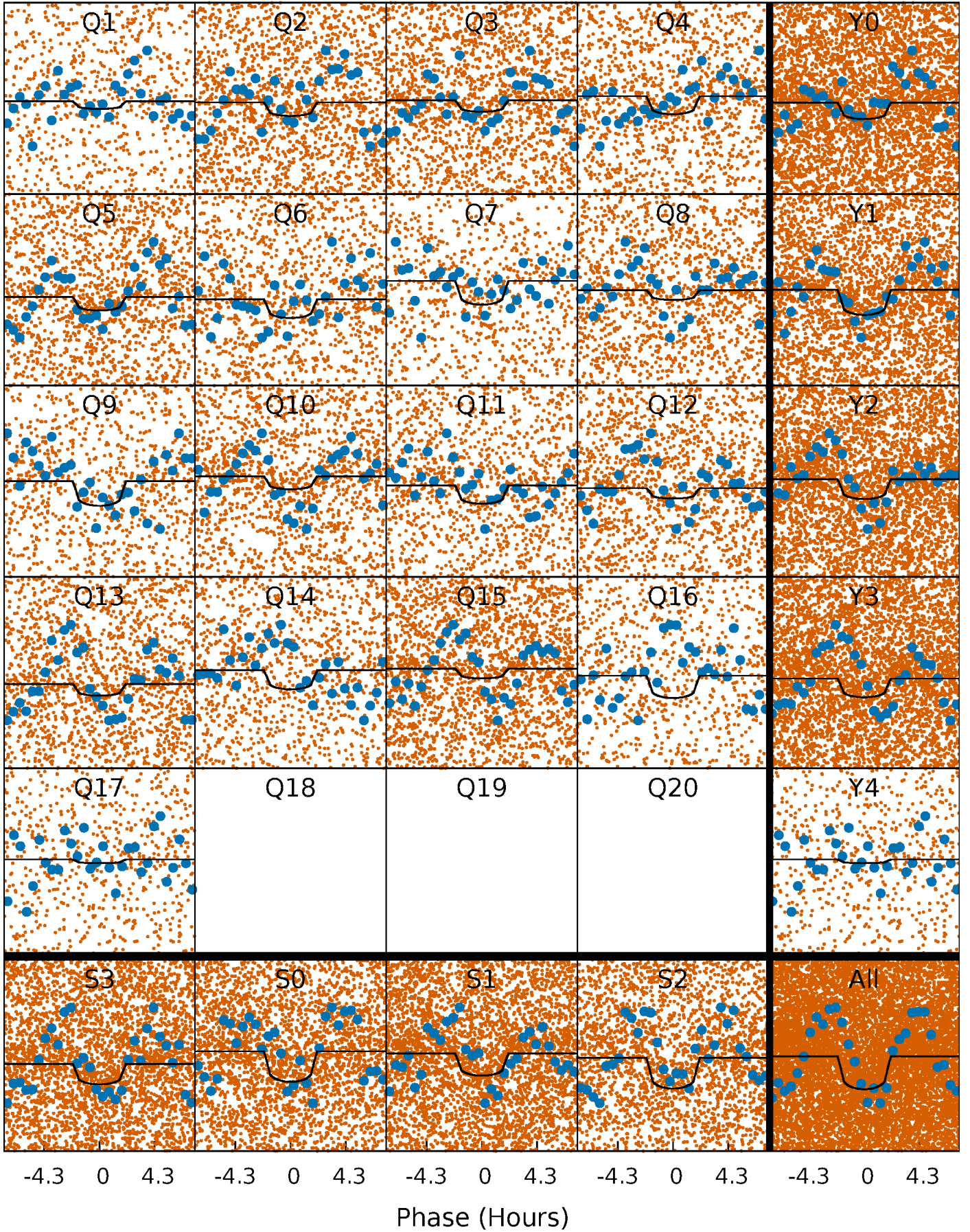
PDC Quarter-Phased Transit Curves

TCE 009640891-01 P= 0.585850 Days $T_0=131.909439$ (BKJD)



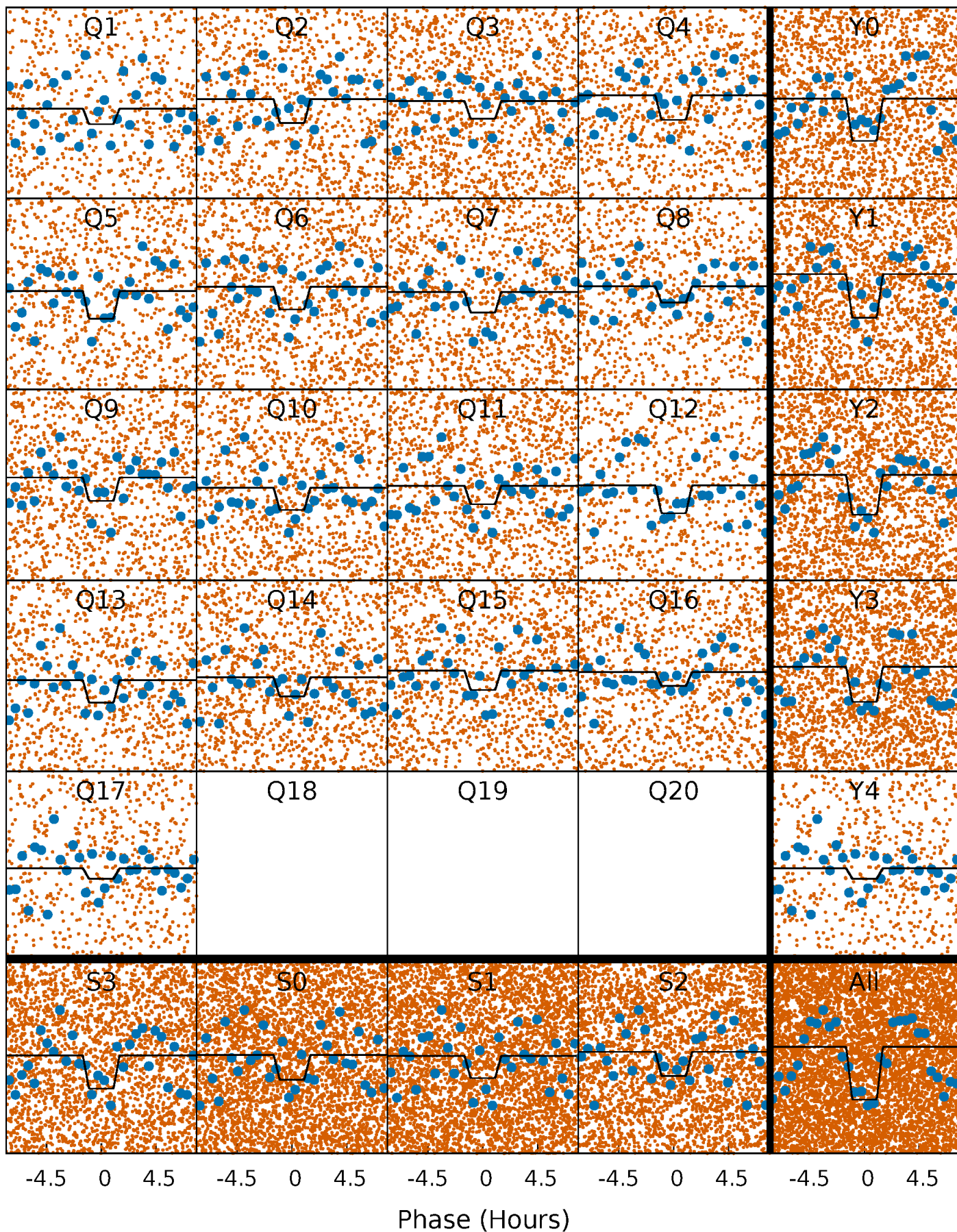
DV Quarter-Phased Transit Curves

TCE 009640891-01 P= 0.585850 Days $T_0=131.909439$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

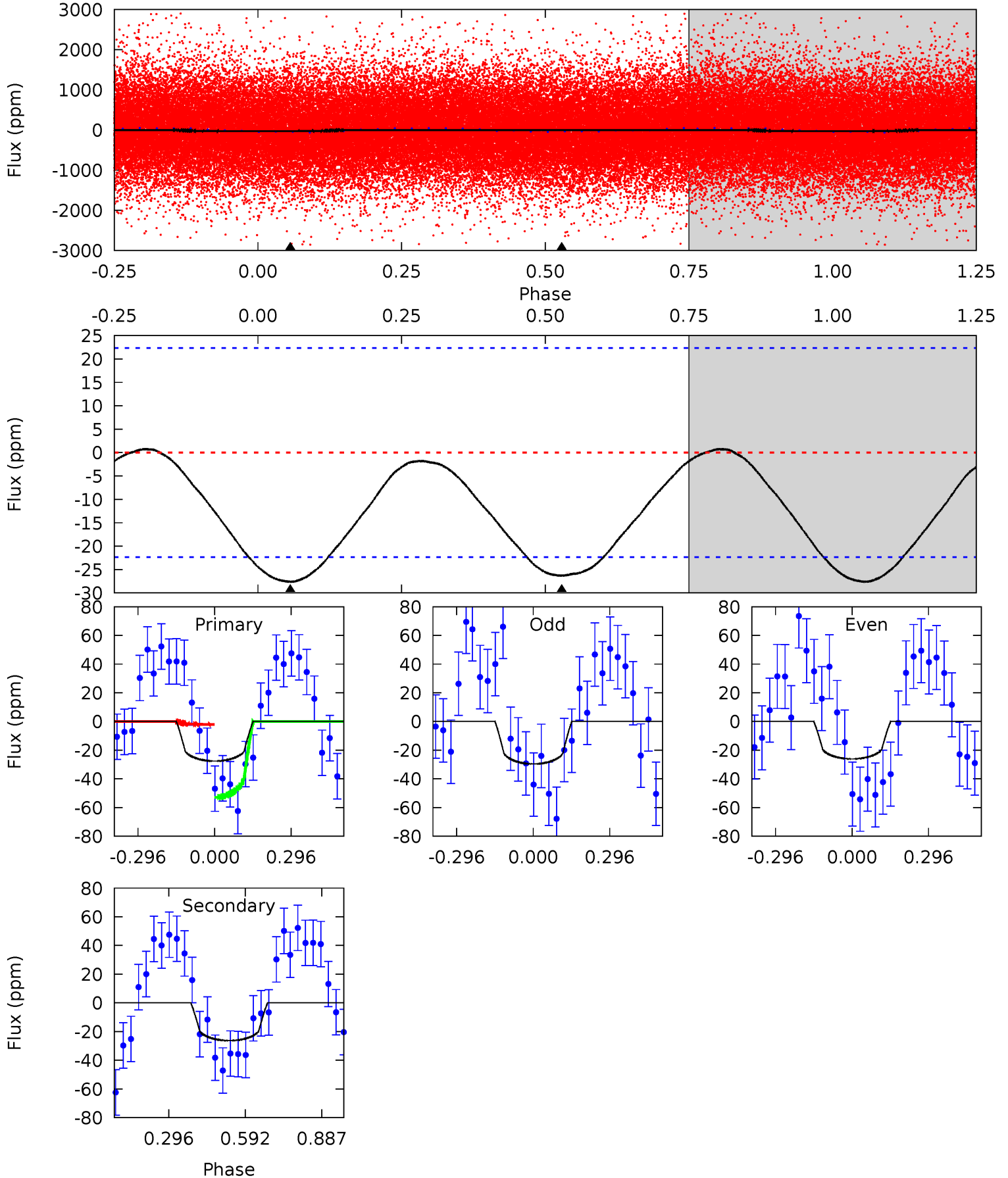
TCE 009640891-01 P= 0.585882 Days $T_0=131.894717$ (BKJD)



DV Model-Shift Uniqueness Test

009640891-01, P = 0.585850 Days, E = 131.323589 Days

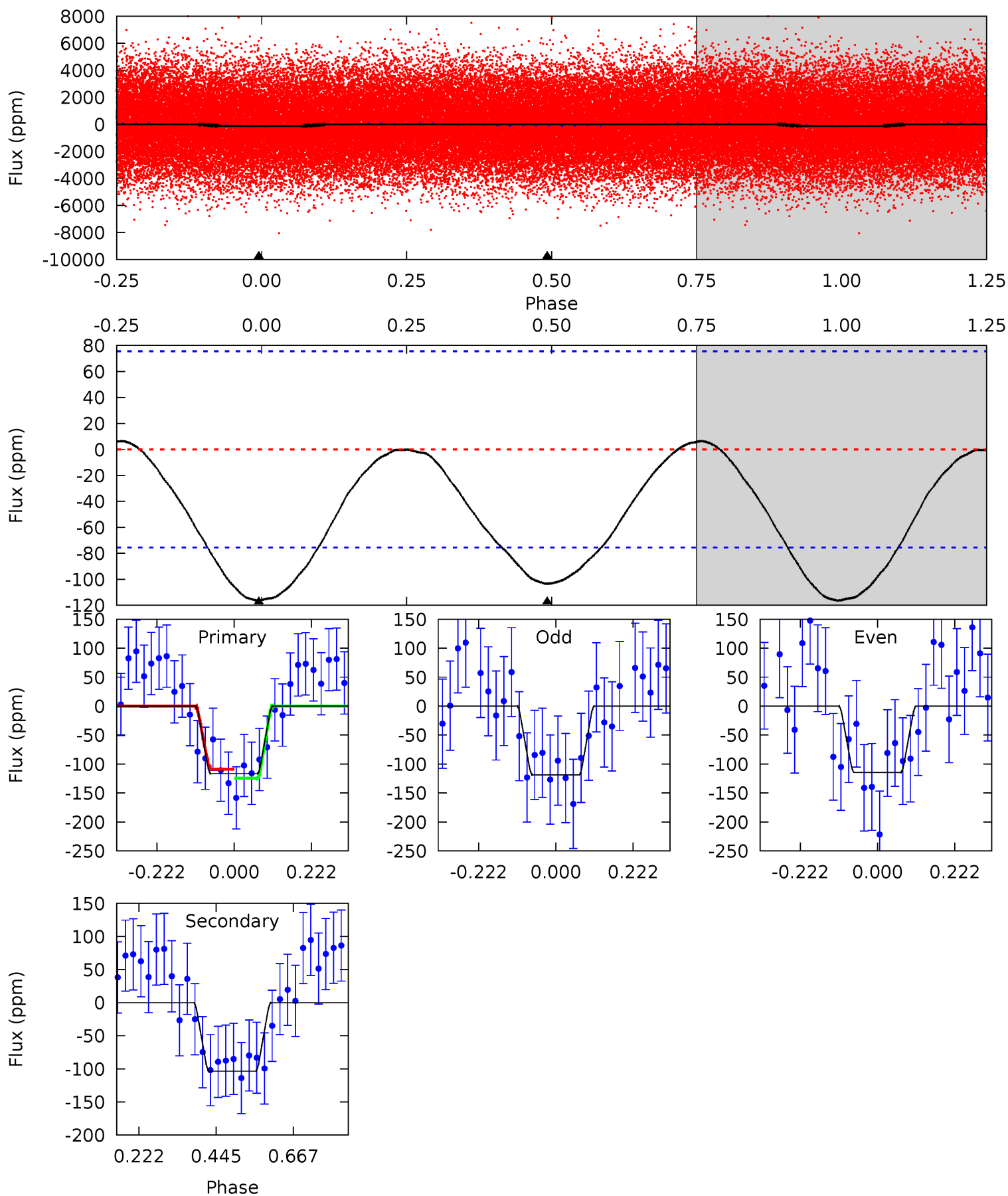
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.36	5.10	0	0	4.33	1.05	0.20	5.36	5.36	5.10	5.10	0.35	0.89	0.03	5.03



Alt Model-Shift Uniqueness Test

009640891-01, P = 0.585882 Days, E = 131.308835 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.78	6.02	0	0	4.39	1.22	0.18	6.78	6.78	6.02	6.02	0.12	1.03	0.05	0.45



Stellar Parameters For KIC 009640891

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8443^{+203}_{-378}	$3.755^{+0.412}_{-0.137}$	$-0.140^{+0.350}_{-0.350}$	$3.127^{+0.946}_{-1.418}$	$2.032^{+0.382}_{-0.467}$	$0.094^{+0.363}_{-0.043}$
	+2%/-4%	+11%/-4%	+250%/-250%	+30%/-45%	+19%/-23%	+388%/-46%
Source	KIC0	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 009640891-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-26 ± 5	$2.48^{+2.02}_{-1.60}$	6795^{+560}_{-734}	5640^{+6895}_{-9983}	$0.689^{+5.282}_{-0.483}$
Alt.	-104 ± 17	$3.57^{+2.57}_{-1.87}$	6791^{+572}_{-818}	7087^{+5642}_{-2415}	$1.318^{+4.670}_{-0.866}$

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 $A_{obs} \gg 1.0$

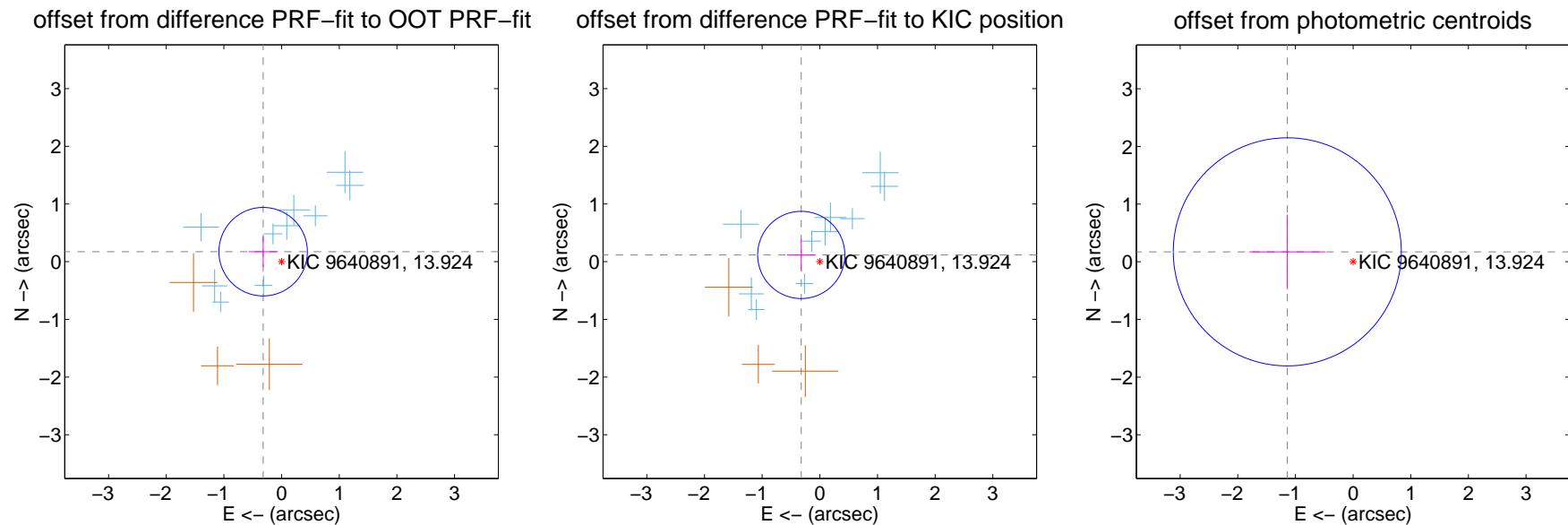
DV Centroid Data

Supplemental centroid analysis for 009640891-01. Kepler magnitude: 13.92. Transit SNR 6.34

There are 10 quarters with good PRF difference image offsets

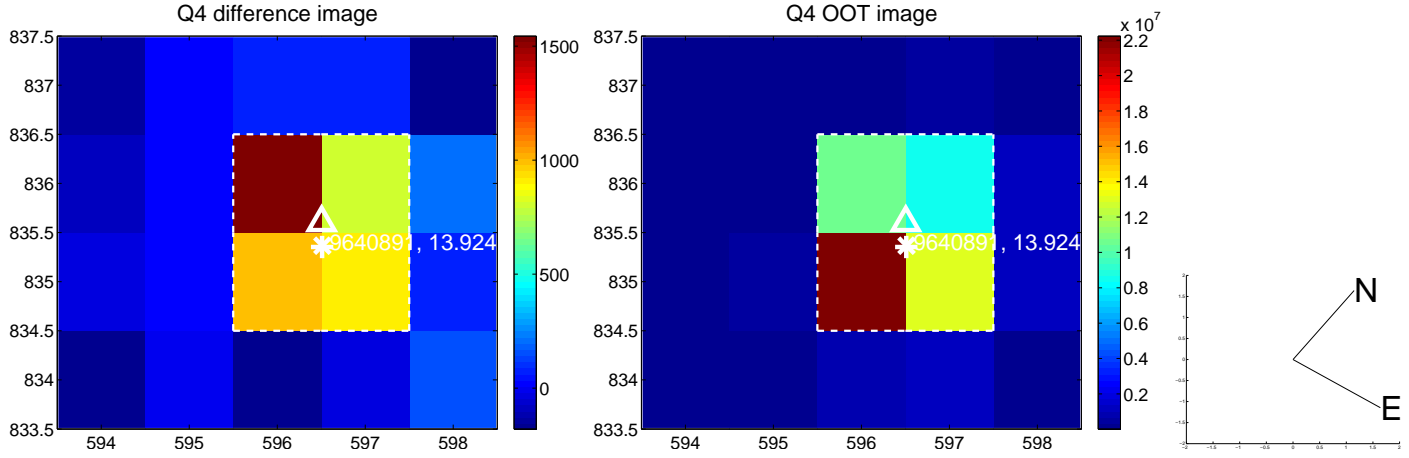
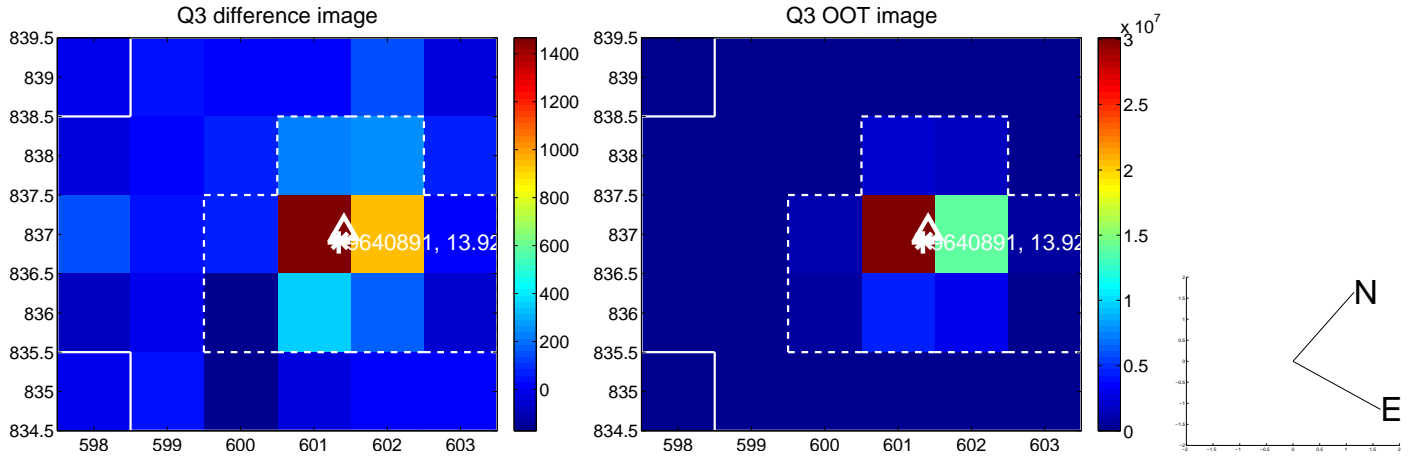
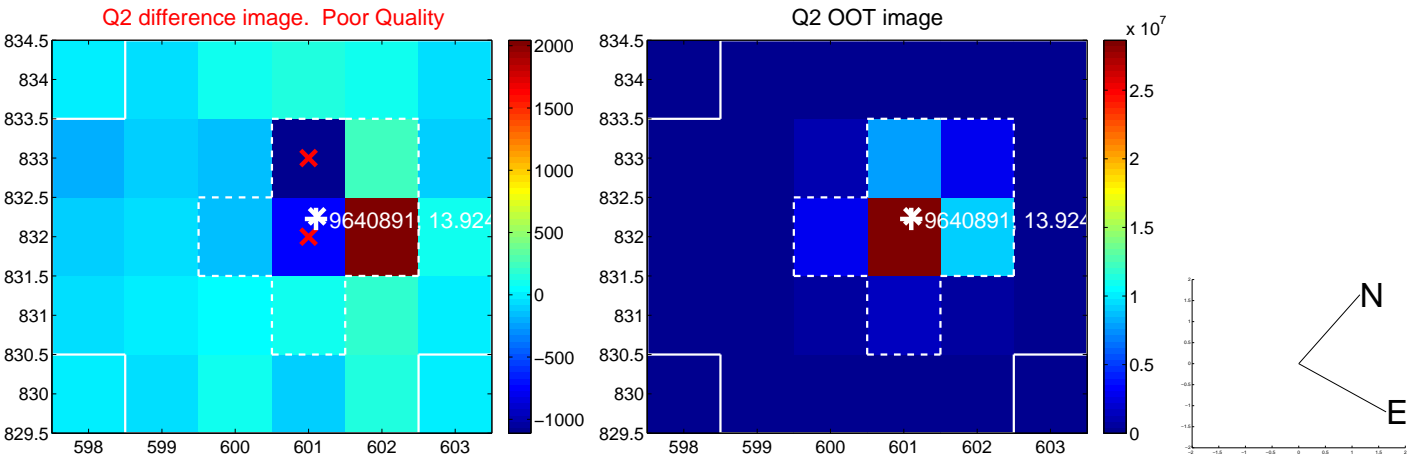
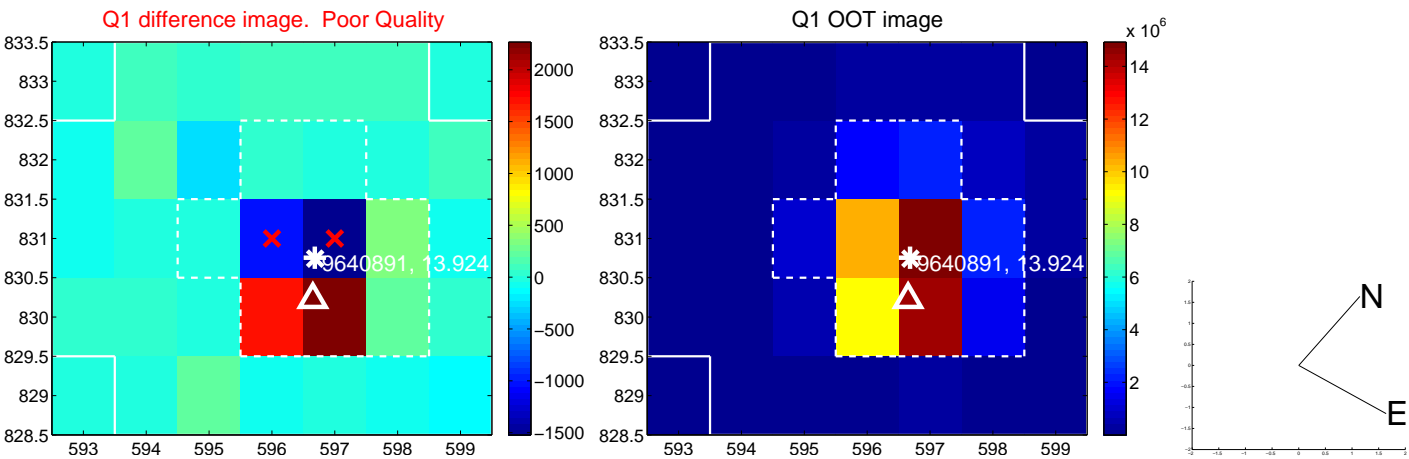
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.364 ± 0.256	1.42	0.320 ± 0.252	0.173 ± 0.267
PRF-fit source offset from KIC position	0.343 ± 0.252	1.36	0.322 ± 0.249	0.117 ± 0.276
photometric centroid source offset	1.15 ± 0.66	1.75	1.14 ± 0.66	0.17 ± 0.65

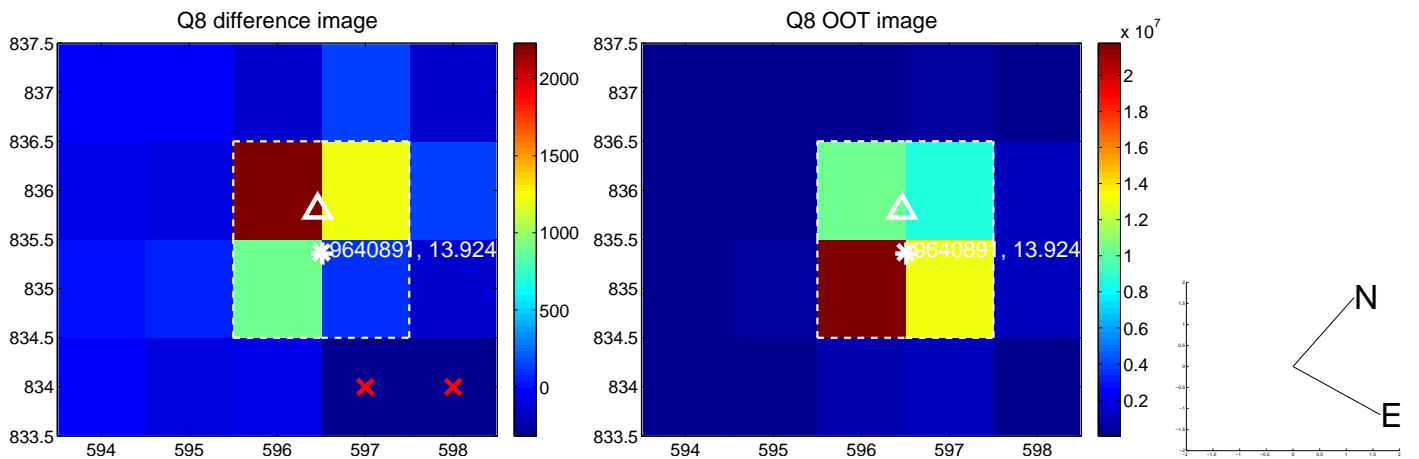
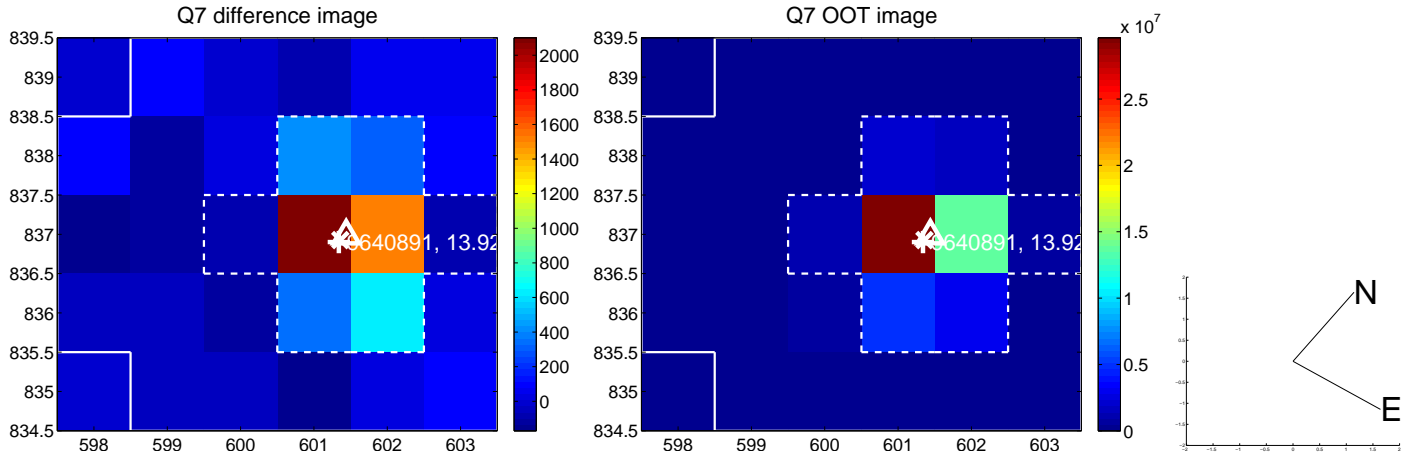
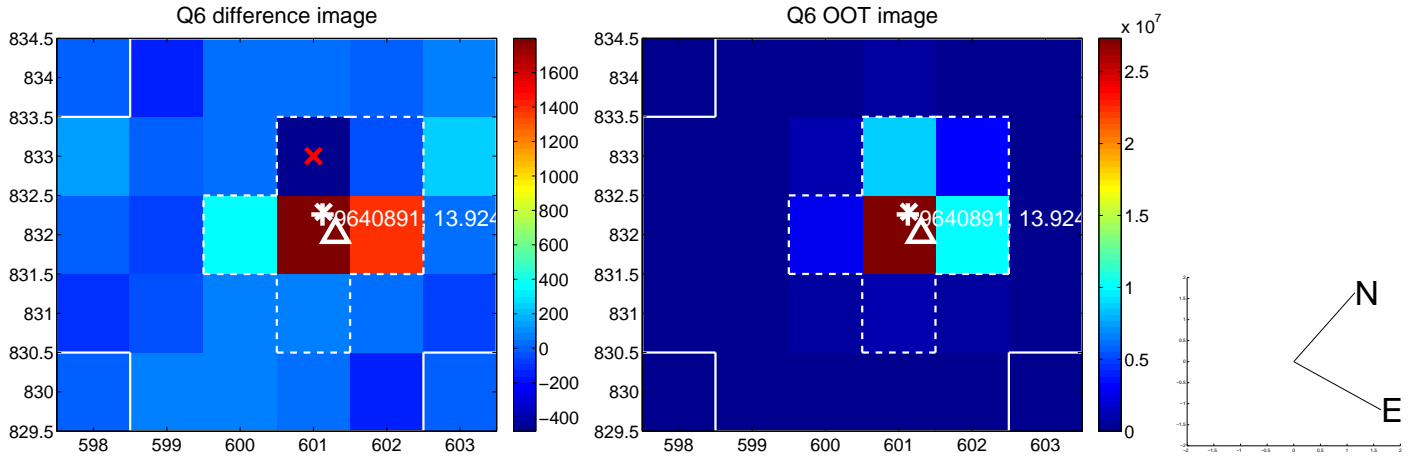
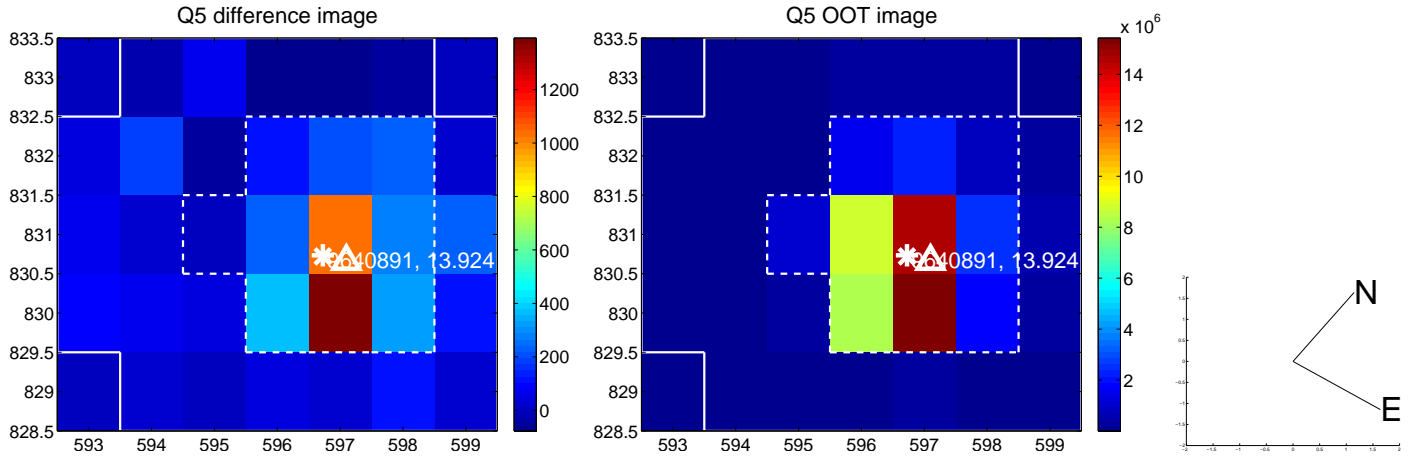


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

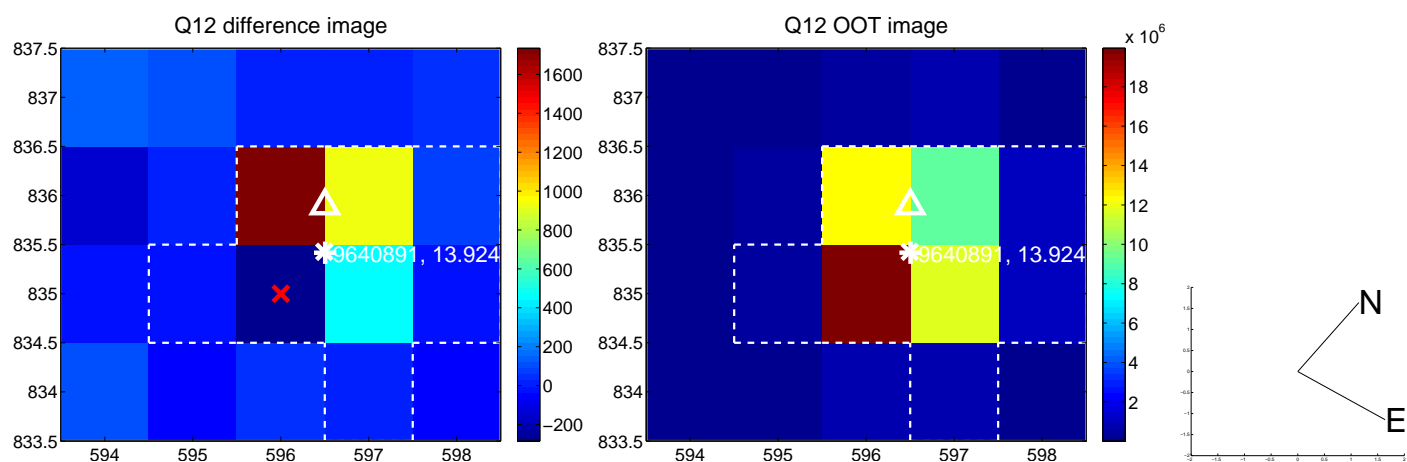
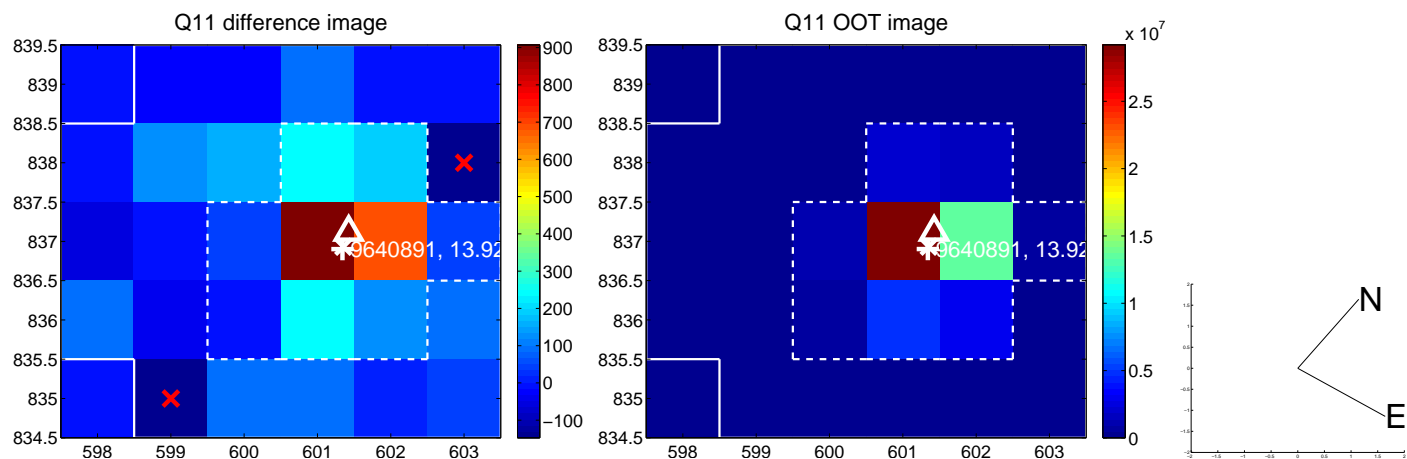
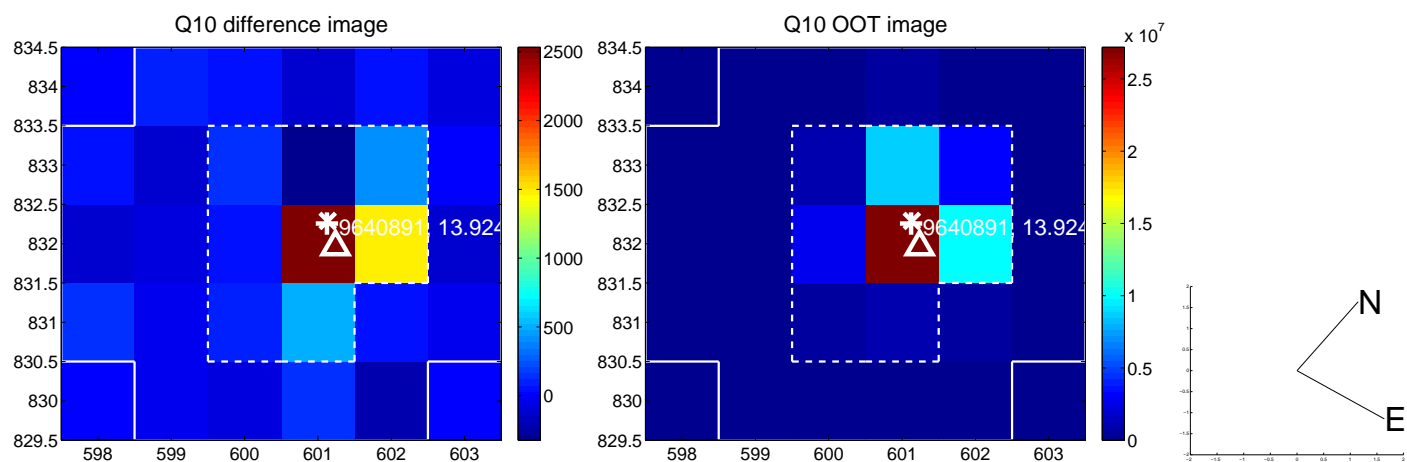
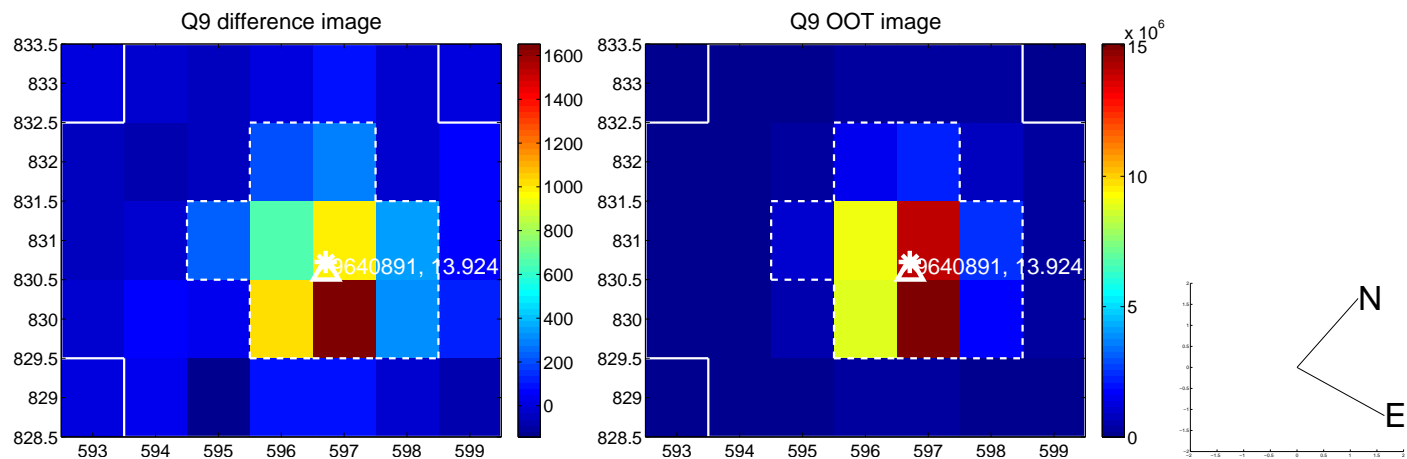
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



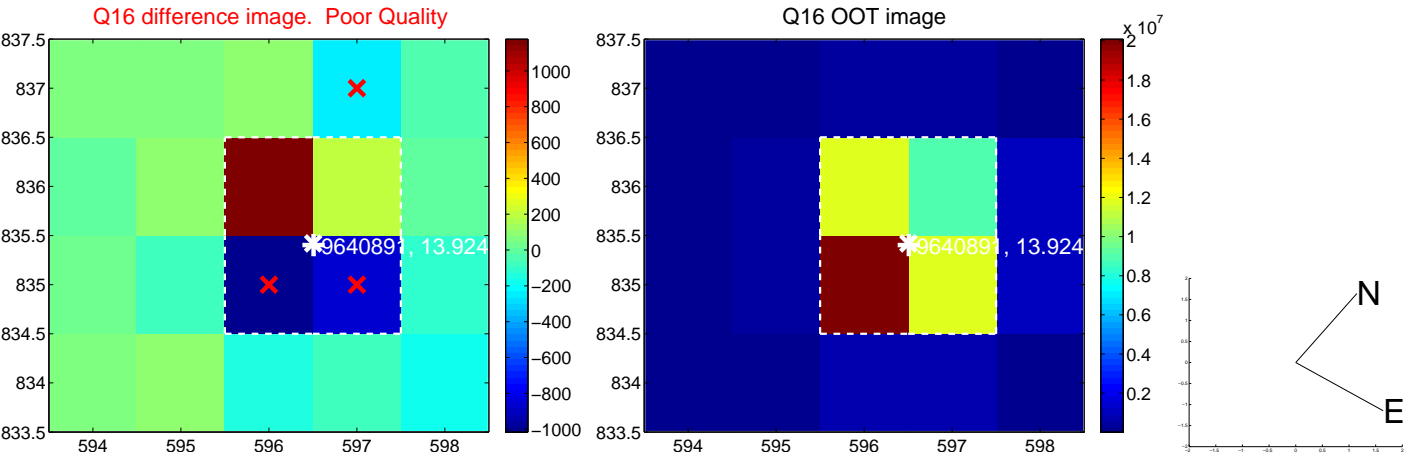
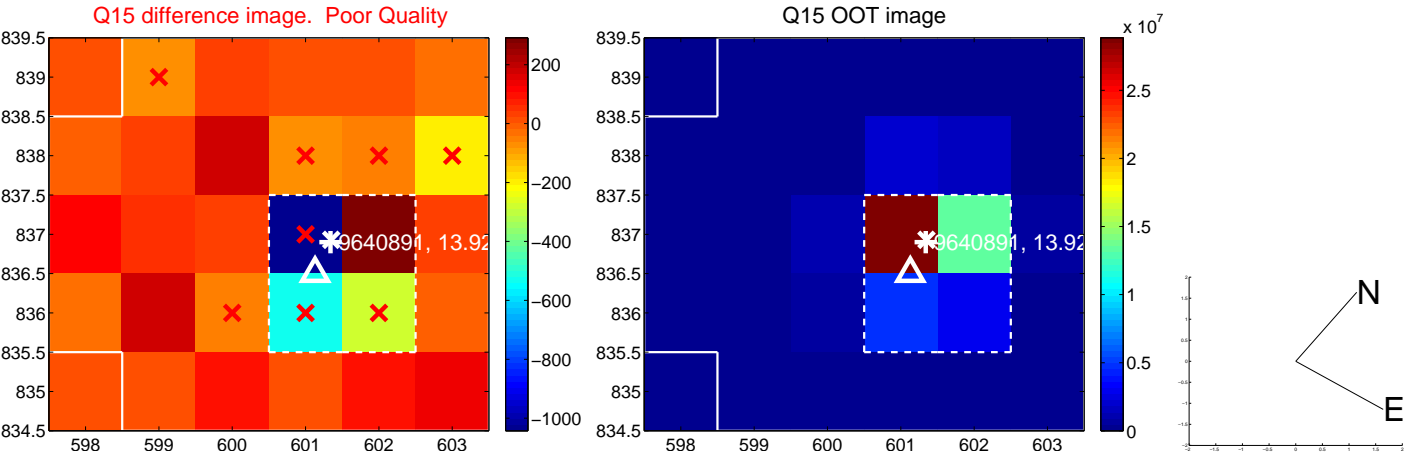
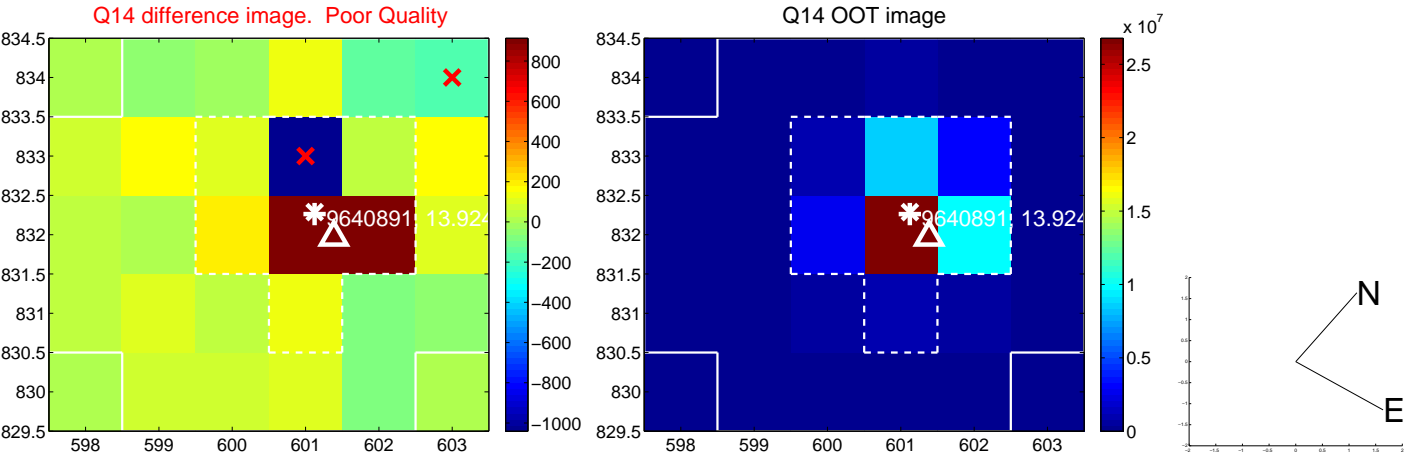
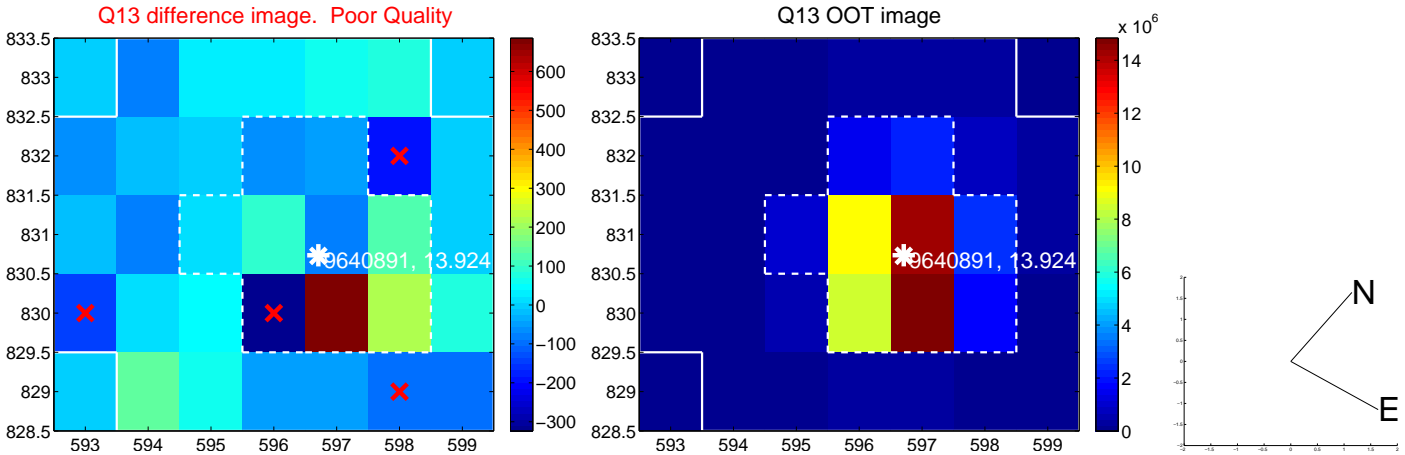
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



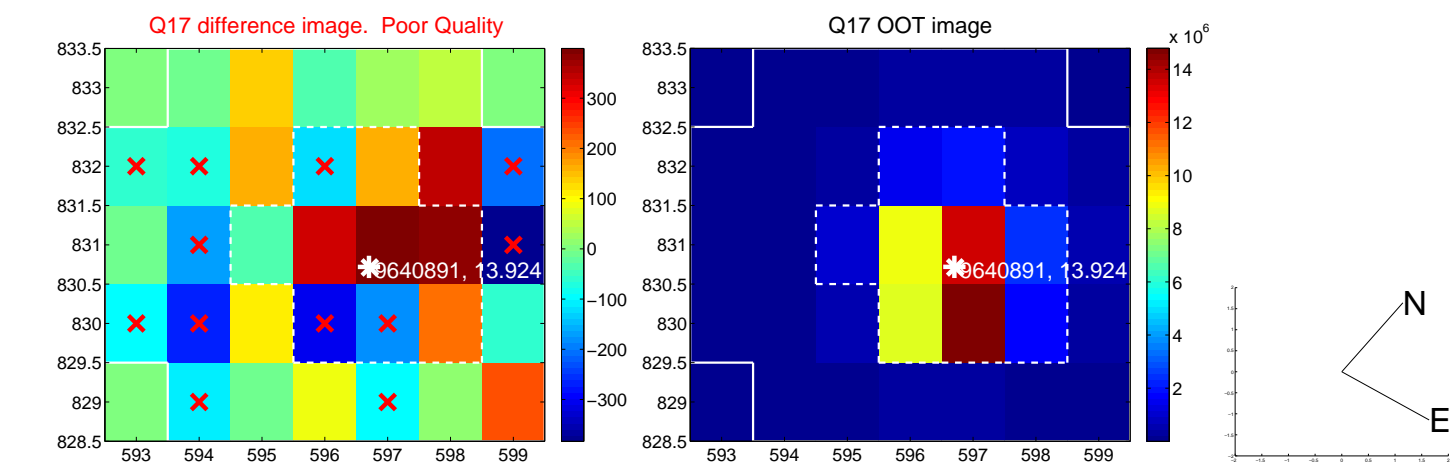
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



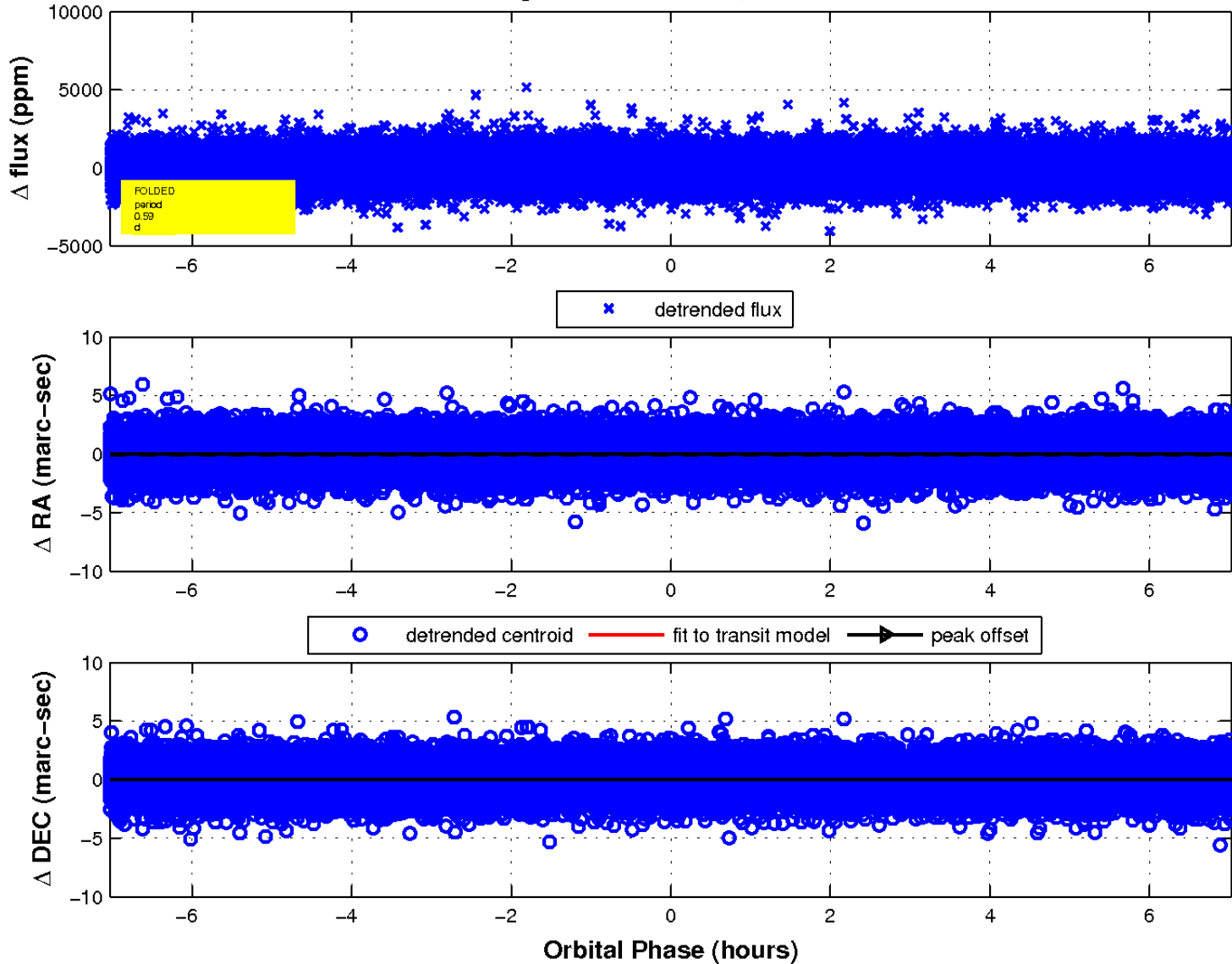
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

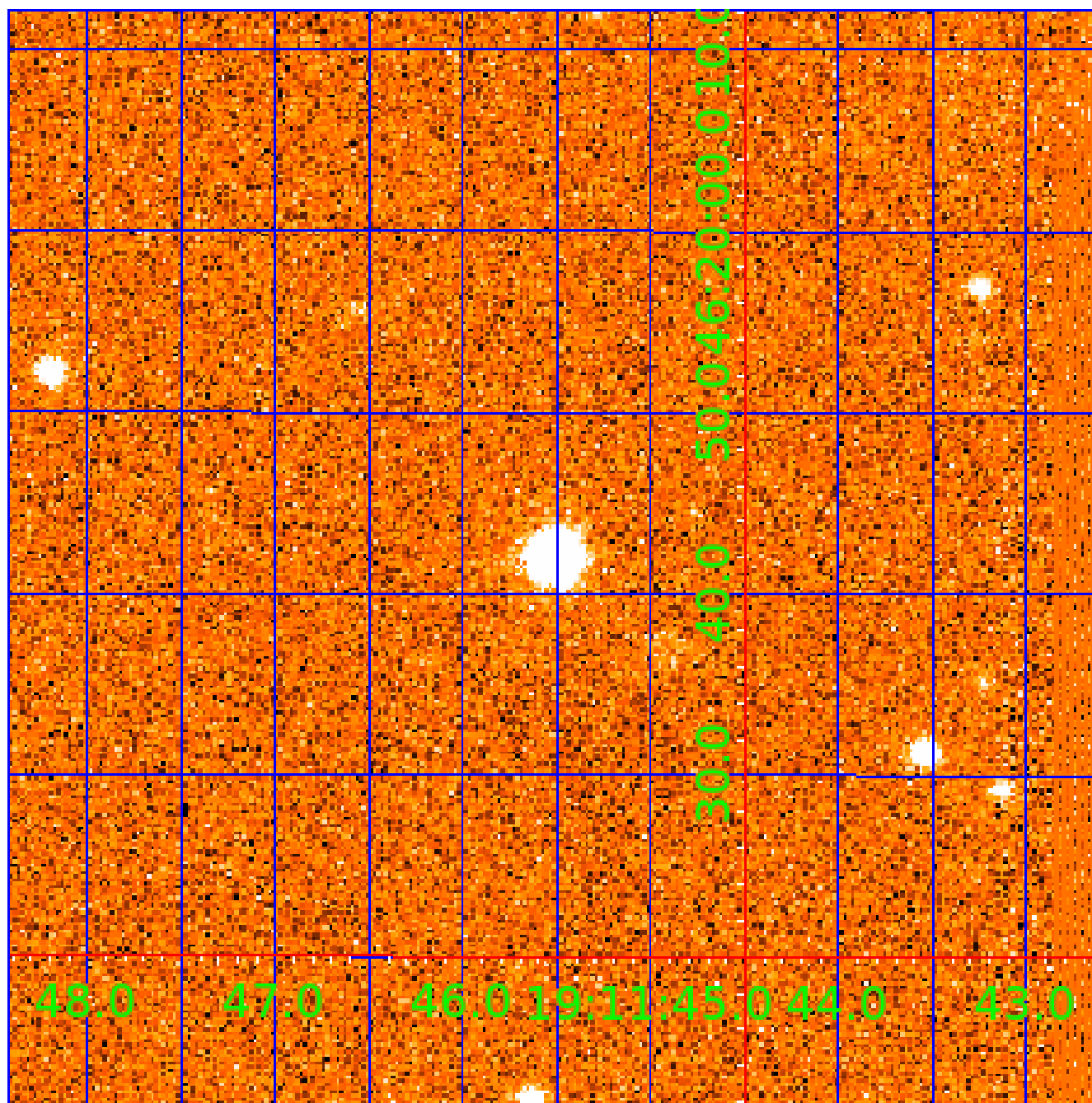


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009640891

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})
009640891-01	OBS	No	0.585850	131.909439	35.8	3.720	9.4	6.3	3.13	8443	1.93	147882.89
009640891-02	OBS	No	106.499645	146.580520	1503.5	1.615	8.1	8.2	3.13	8443	13.85	143.60

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009640891-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009640891-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

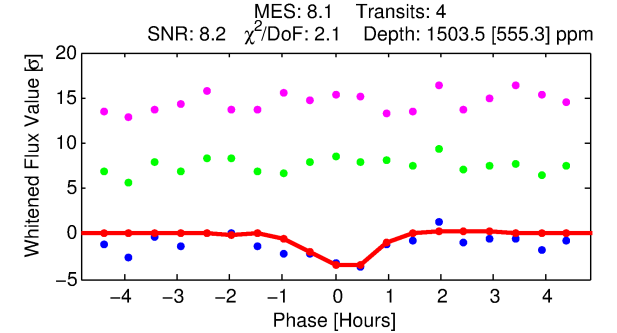
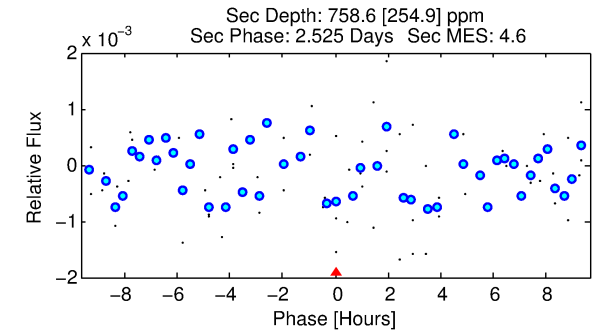
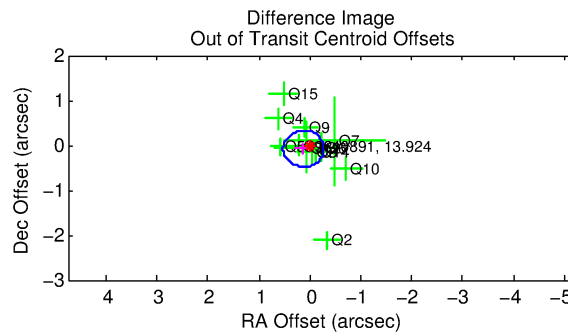
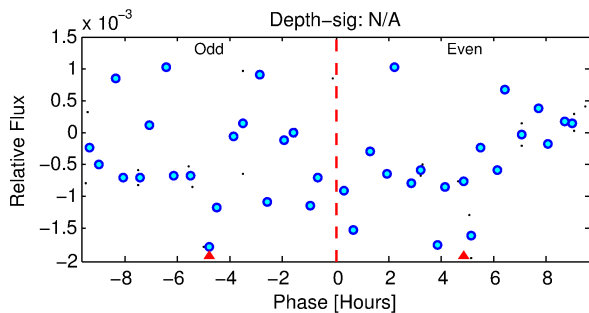
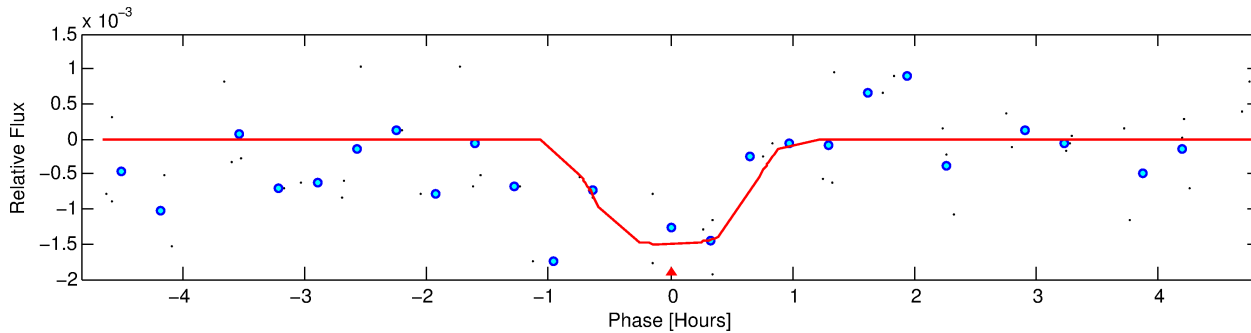
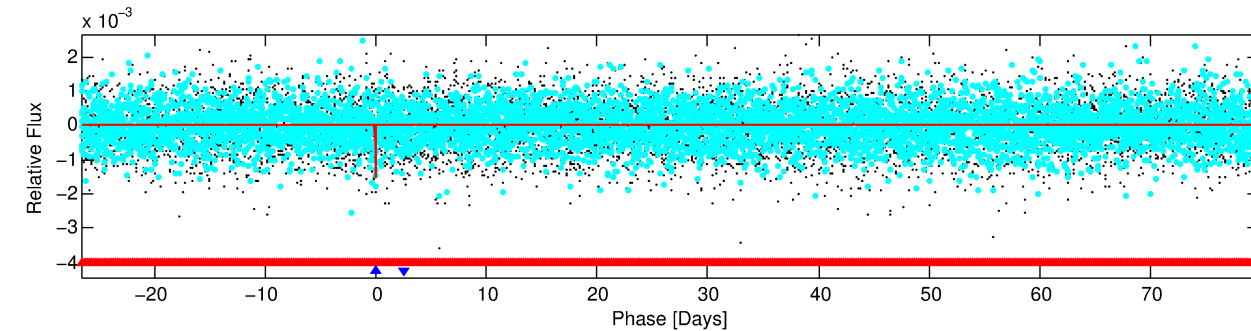
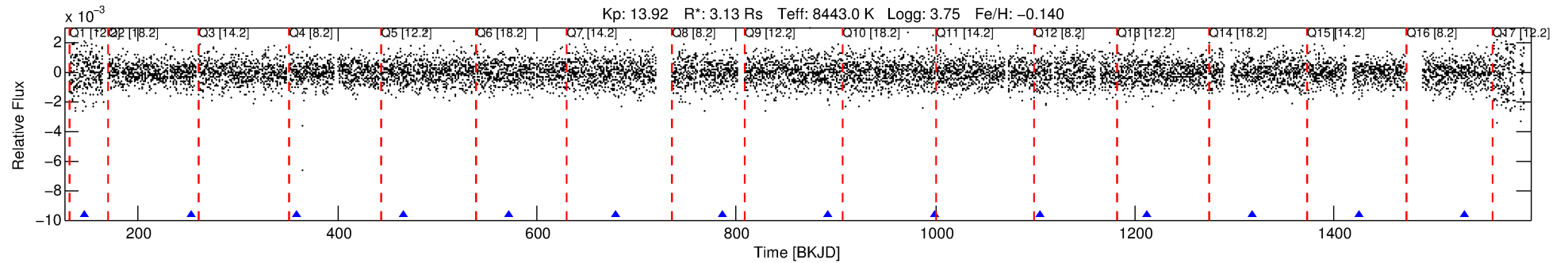
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009640891-02

No Significant Match Found

DV One-Page Summary

KIC: 9640891 Candidate: 2 of 2 Period: 106.500 d



DV Fit Results:

Period = 106.49965 [0.00243] d
Epoch = 146.5805 [0.0179] BKJD
Rp/R* = 0.0406 [0.2279]
a/R* = 290.72 [10178.74]
b = 0.87 [10.21]
Seff = 143.60 [103.90]
Teq = 883 [160] K
Rp = 13.85 [78.01] Re
a = 0.5568 [0.2436] AU
Ag = 674.55 [7592.90] [0.09σ]
Teffp = 6955 [19537] K [0.31σ]

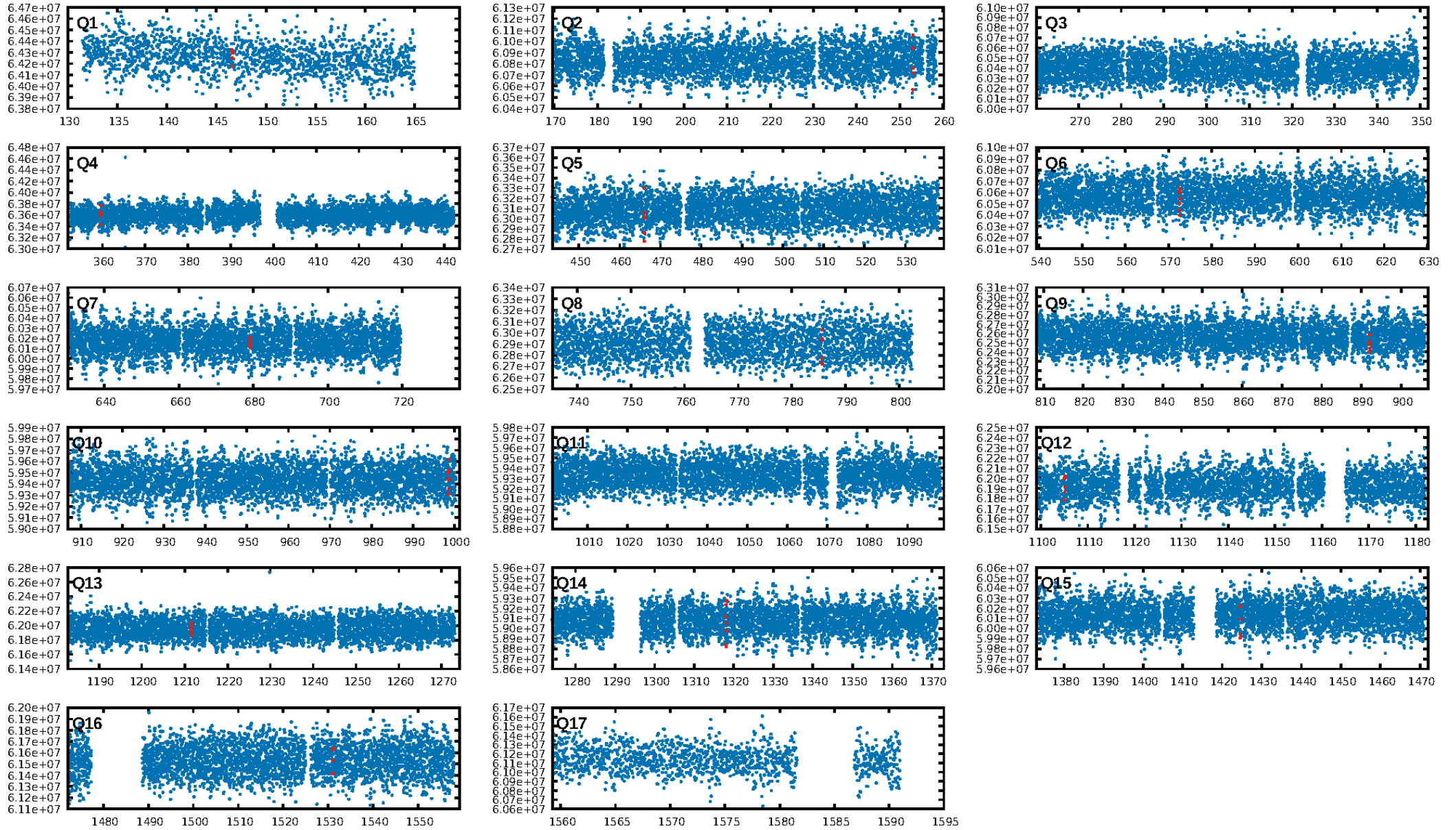
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [626.71σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 88.9%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.59e-09
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -2.412
Centroid-sig: 58.7%
Centroid-so: 0.303 arcsec [0.97σ]
OotOffset-rm: 0.144 arcsec [1.07σ]
KicOffset-rm: 0.154 arcsec [0.74σ]
OotOffset-st: 4/2/3/3 [12]
KicOffset-st: 4/2/3/3 [12]
DiffImageQuality-fgm: 0.50 [6/12]
DiffImageOverlap-fno: 0.00 [0/14]

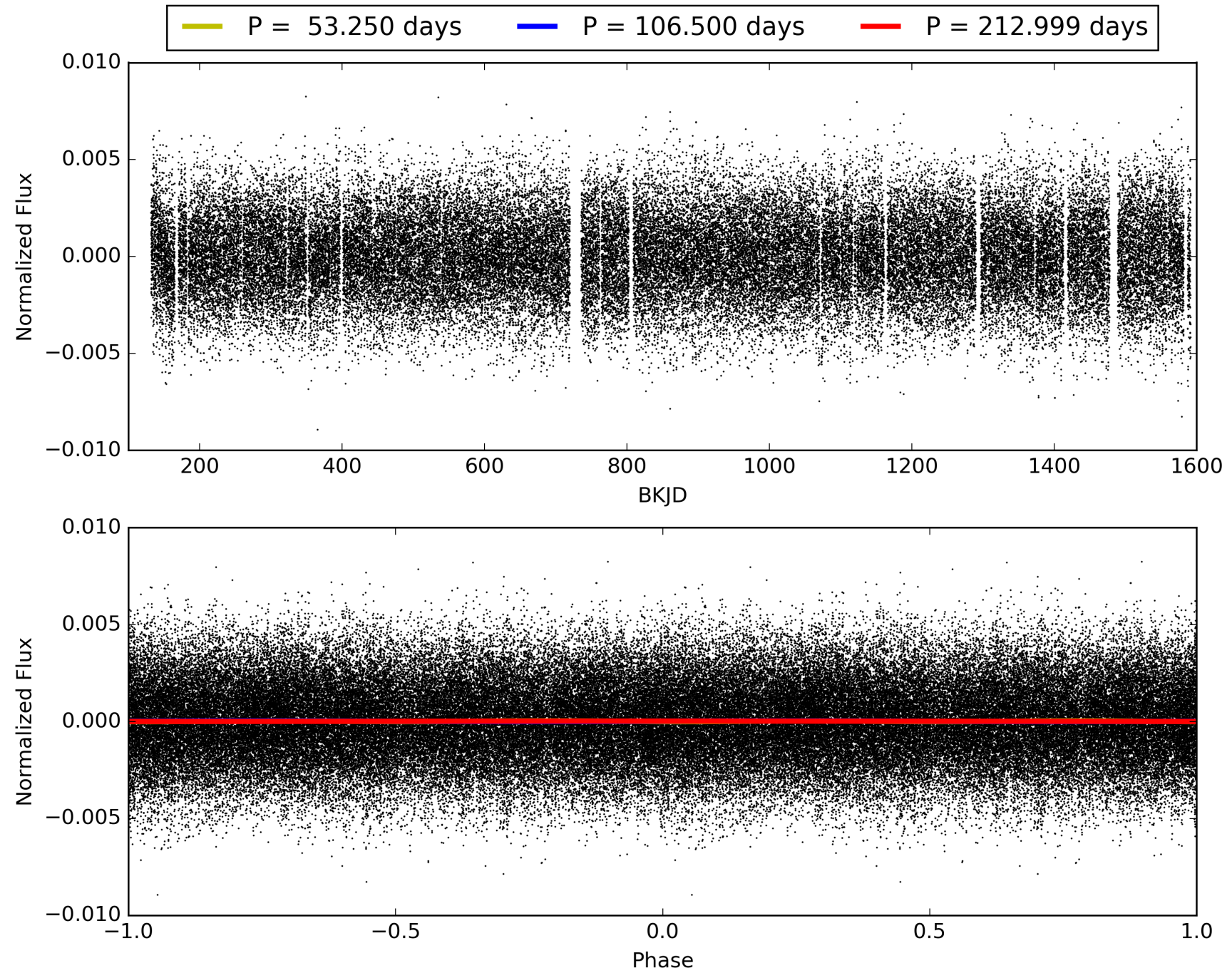
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 12:33:21 Z

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

TCE 009640891-02, PDC Light Curves

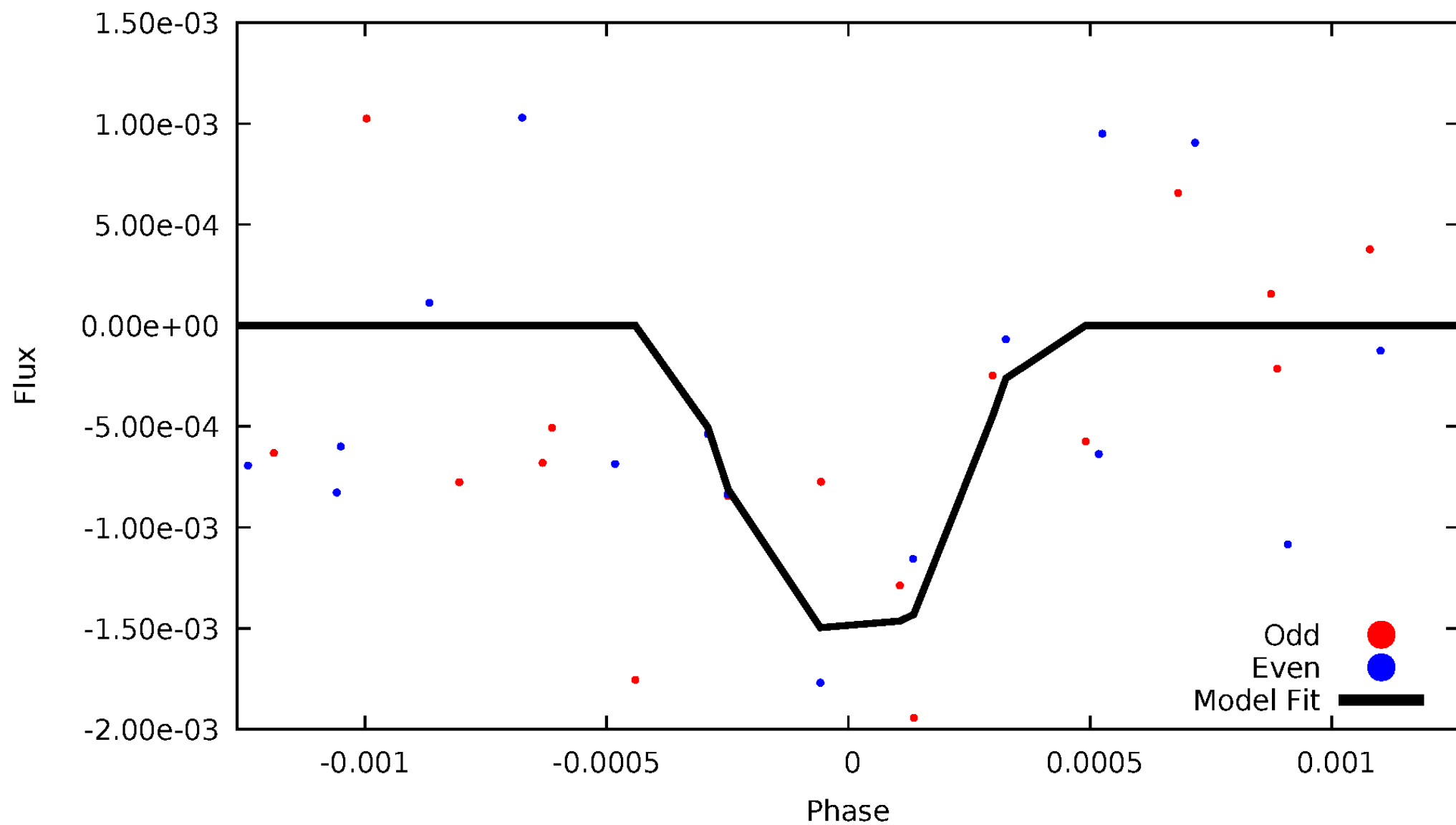


TCE 009640891-02



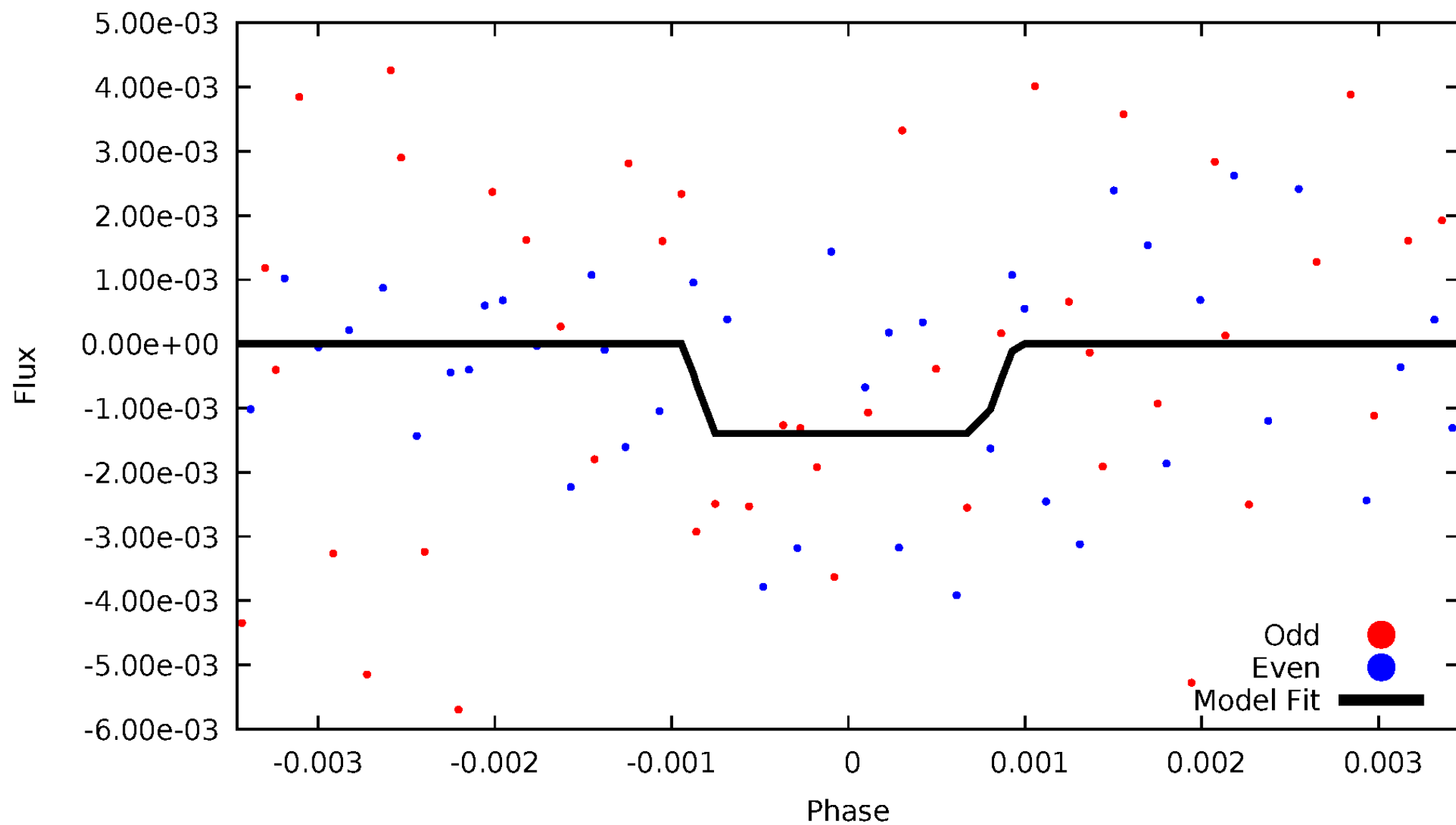
DV Odd/Even

TCE 009640891-02



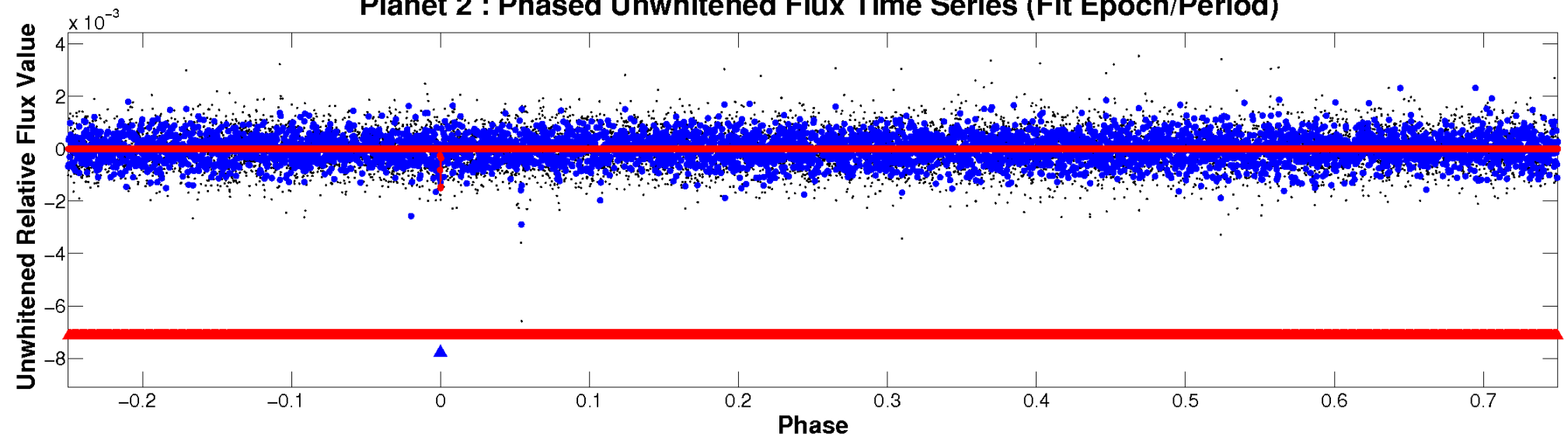
ALT Odd/Even

TCE 009640891-02

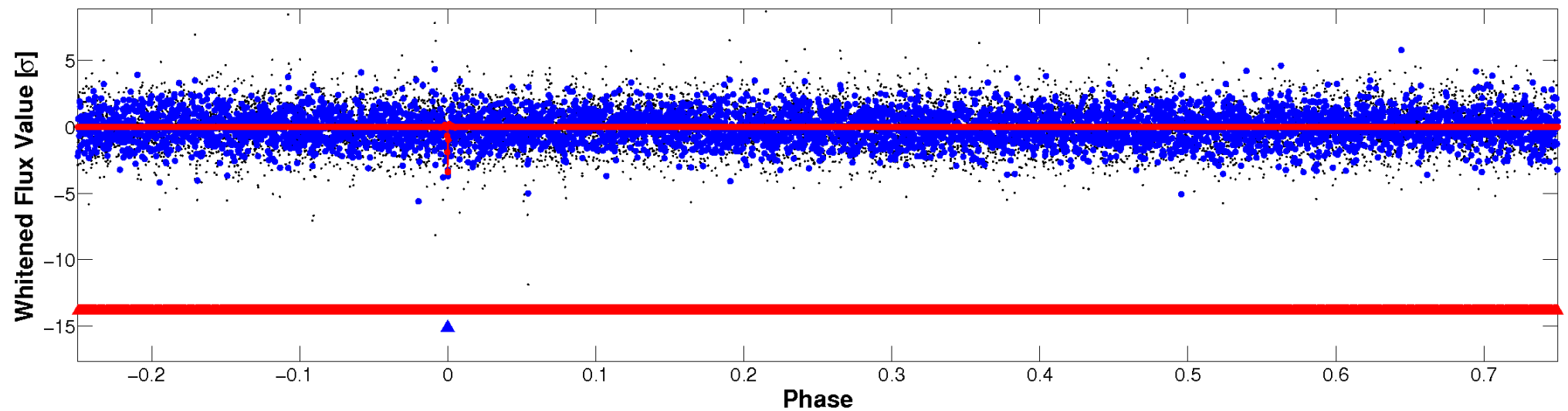


Non-Whitened Vs. Whitened Light Curve

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

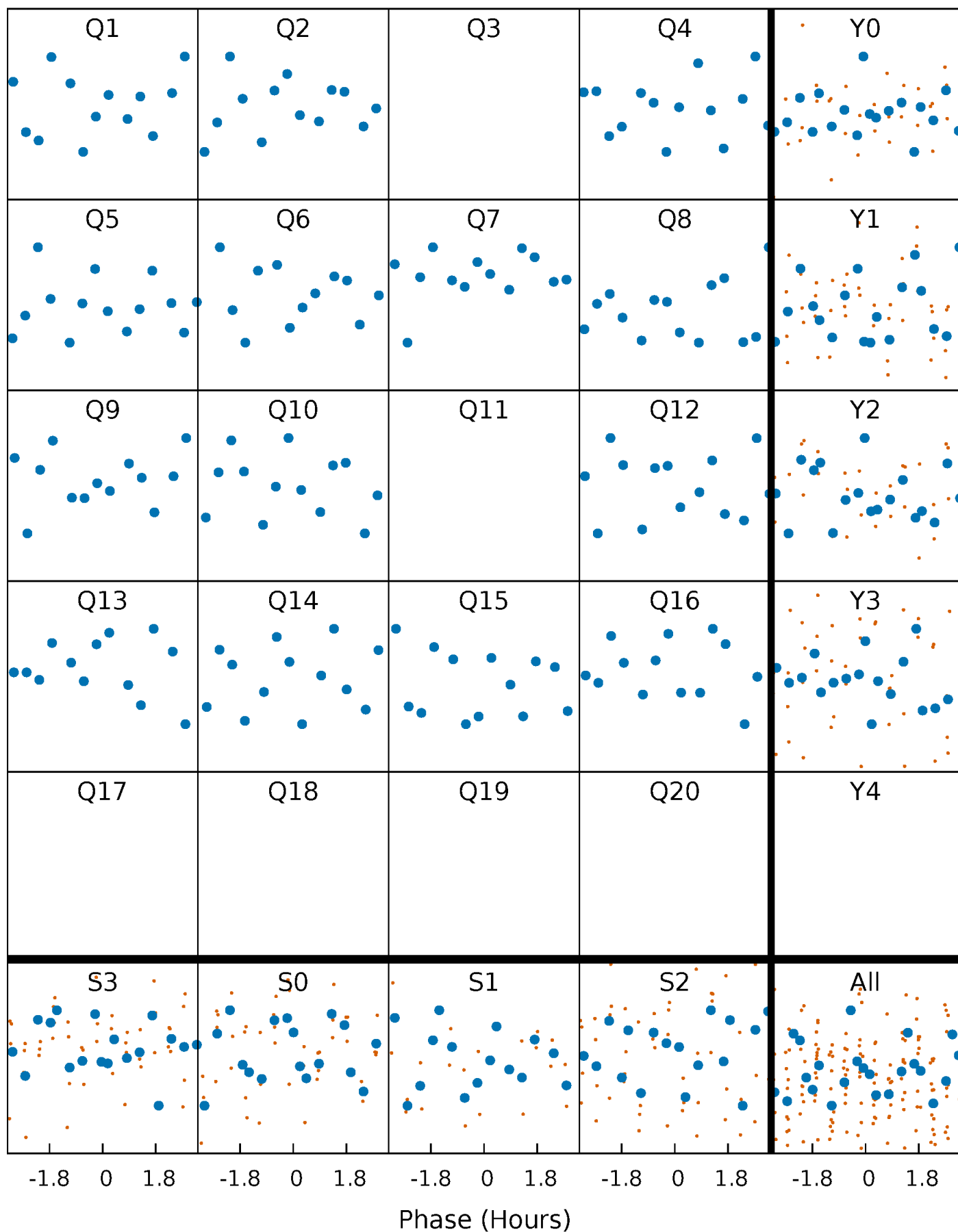


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



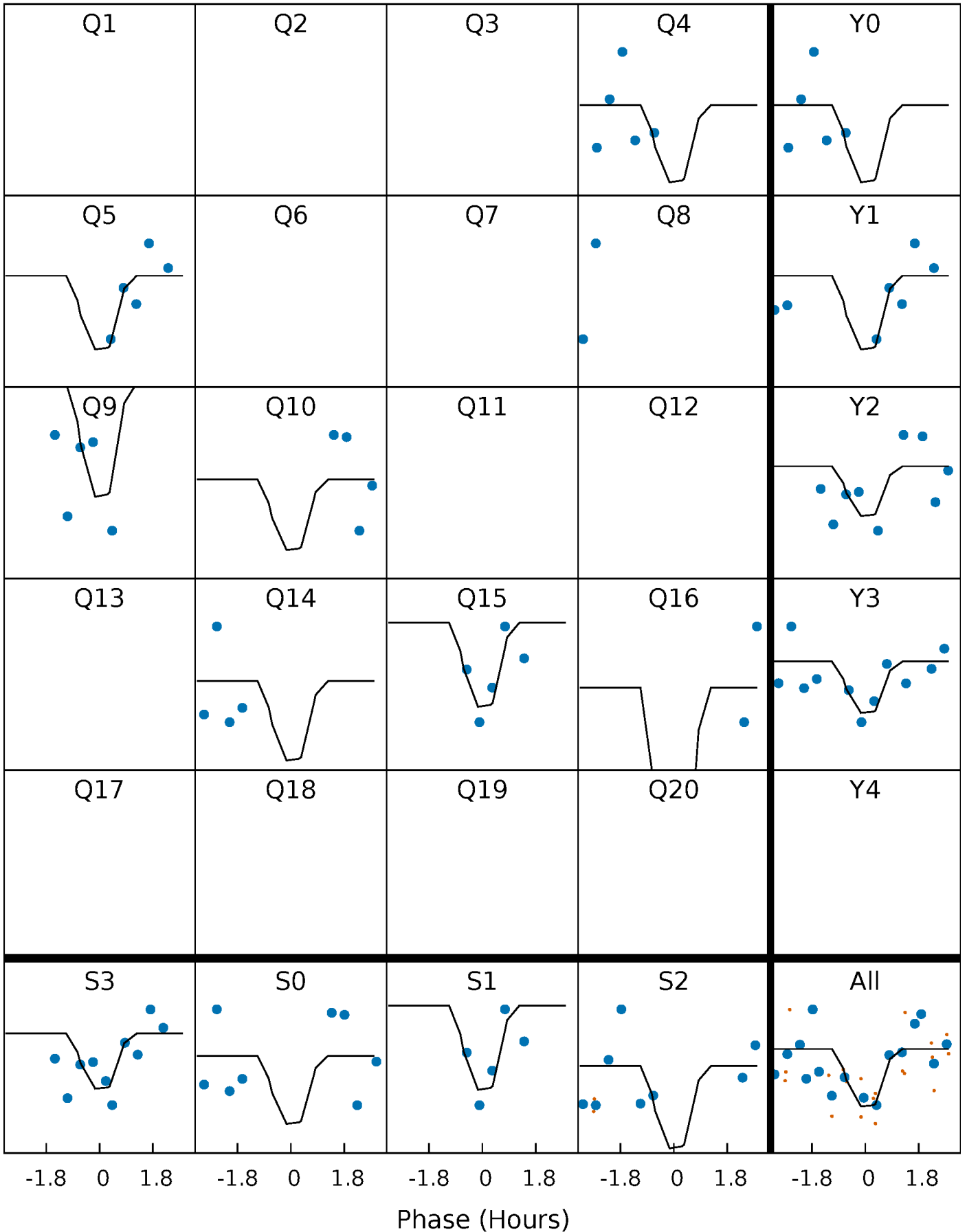
PDC Quarter-Phased Transit Curves

TCE 009640891-02 P=106.499645 Days $T_0=146.580520$ (BKJD)



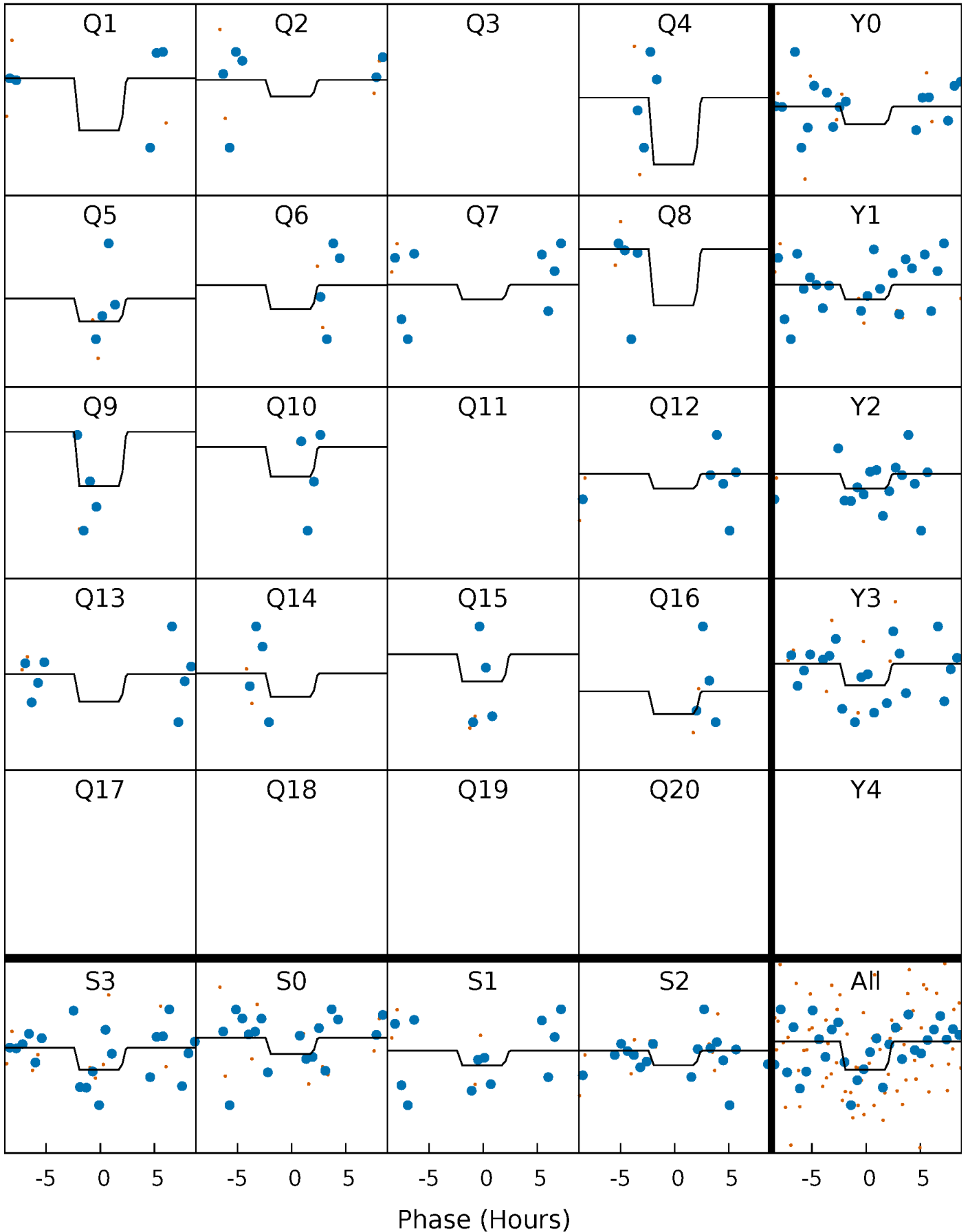
DV Quarter-Phased Transit Curves

TCE 009640891-02 $P=106.499645$ Days $T_0=146.580520$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

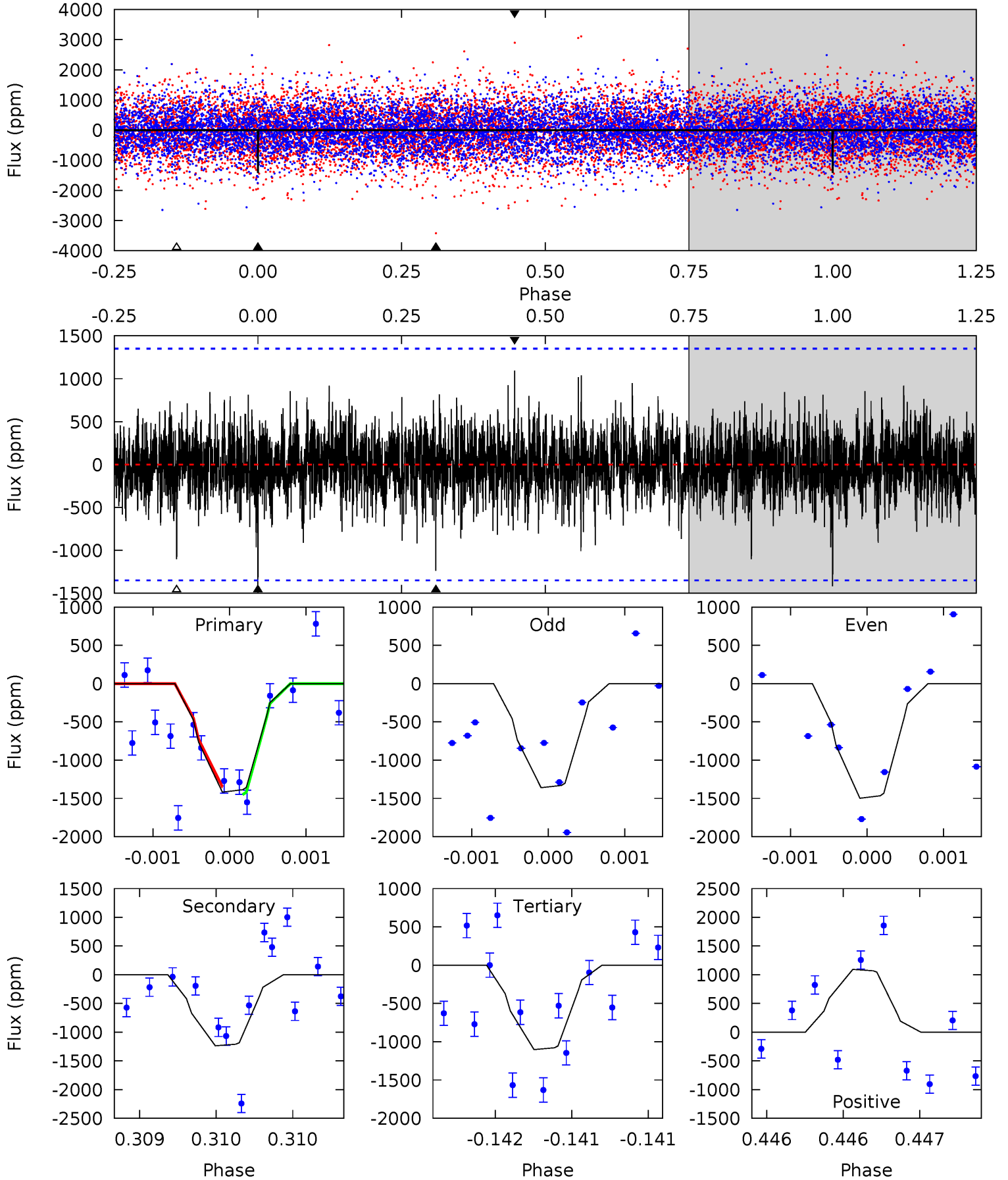
TCE 009640891-02 P=106.497901 Days $T_0=146.626019$ (BKJD)



DV Model-Shift Uniqueness Test

009640891-02, P = 106.499645 Days, E = 40.080875 Days

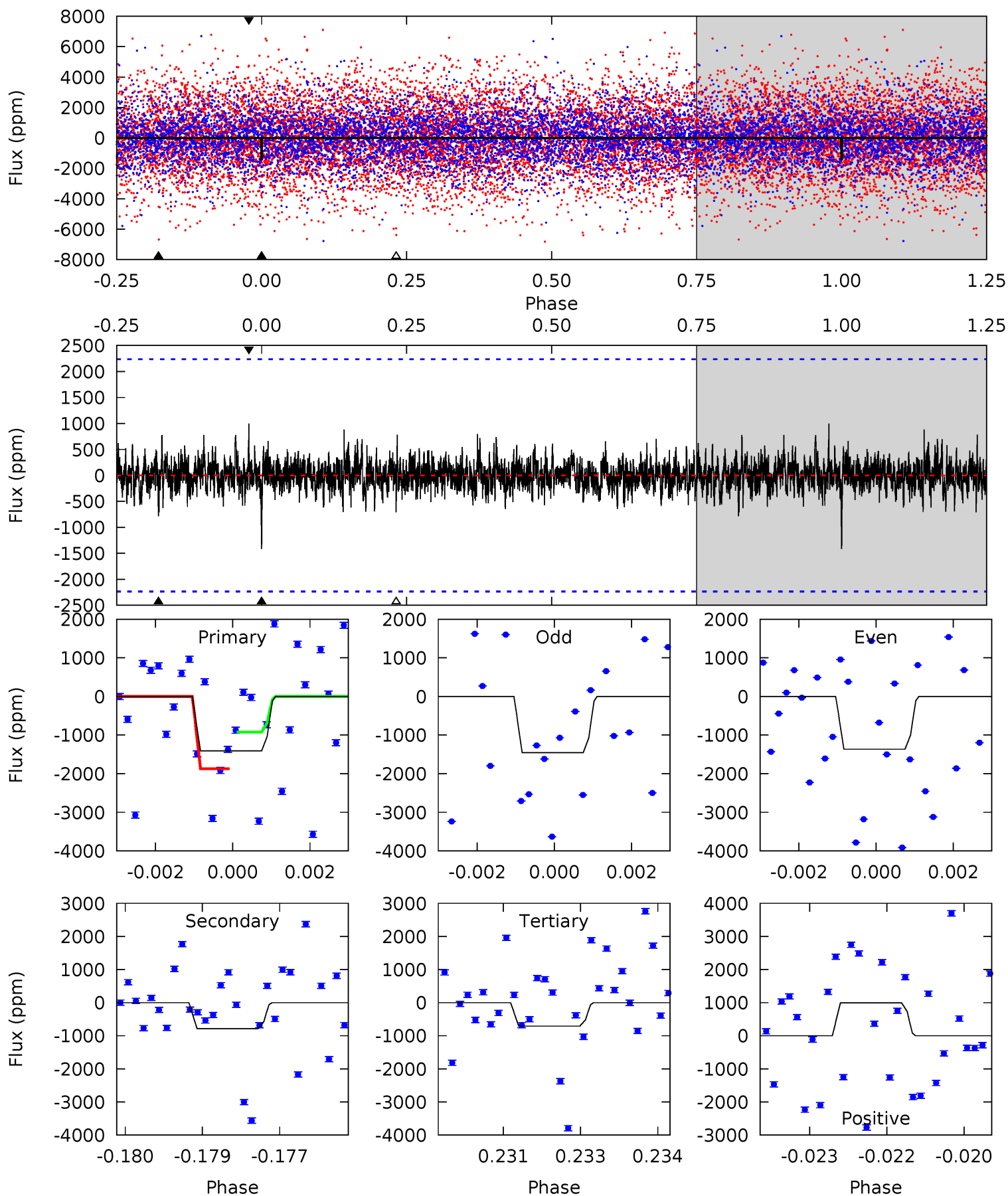
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.81	5.08	4.52	4.48	5.54	3.42	1.10	1.29	1.33	0.55	0.59	0.28	0.99	0.44	0.21



Alt Model-Shift Uniqueness Test

009640891-02, P = 106.497901 Days, E = 40.128118 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.38	1.88	1.70	2.38	5.35	3.12	0.52	1.68	1.00	0.18	-0.50	0.11	0.77	0.41	1.13



Stellar Parameters For KIC 009640891

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	8443^{+203}_{-378}	$3.755^{+0.412}_{-0.137}$	$-0.140^{+0.350}_{-0.350}$	$3.127^{+0.946}_{-1.418}$	$2.032^{+0.382}_{-0.467}$	$0.094^{+0.363}_{-0.043}$
	+2%/-4%	+11%/-4%	+250%/-250%	+30%/-45%	+19%/-23%	+388%/-46%
Source	KIC0	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 009640891-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1237 ± 244	$51.09^{+57.22}_{-35.85}$	1189^{+104}_{-138}	4004^{+2914}_{-821}	80^{+845}_{-62}
Alt.	-786 ± 418	$53.69^{+63.26}_{-37.91}$	1193^{+101}_{-127}	3603^{+2028}_{-787}	38^{+414}_{-31}

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

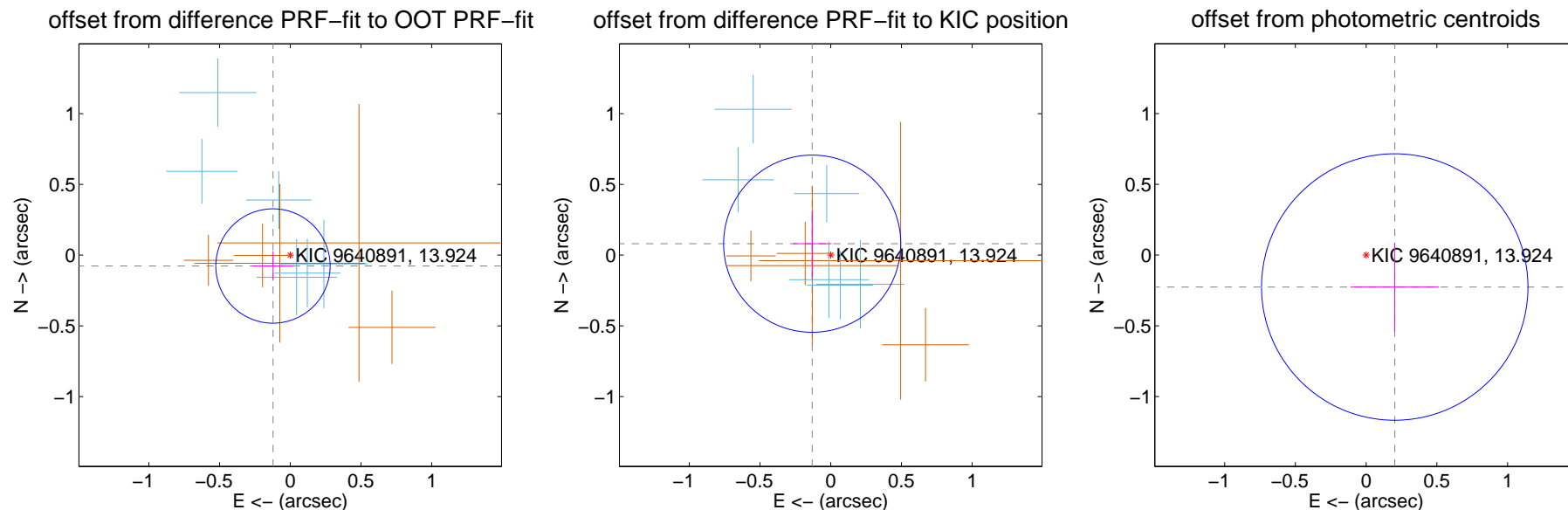
DV Centroid Data

Supplemental centroid analysis for 009640891-02. Kepler magnitude: 13.92. Transit SNR 8.20

There are 6 quarters with good PRF difference image offsets

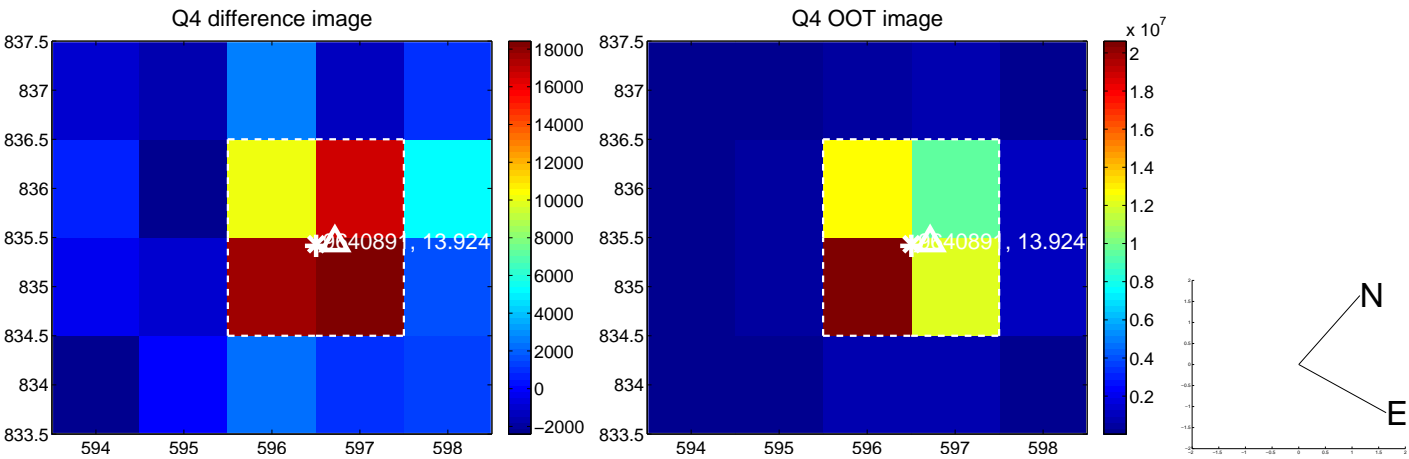
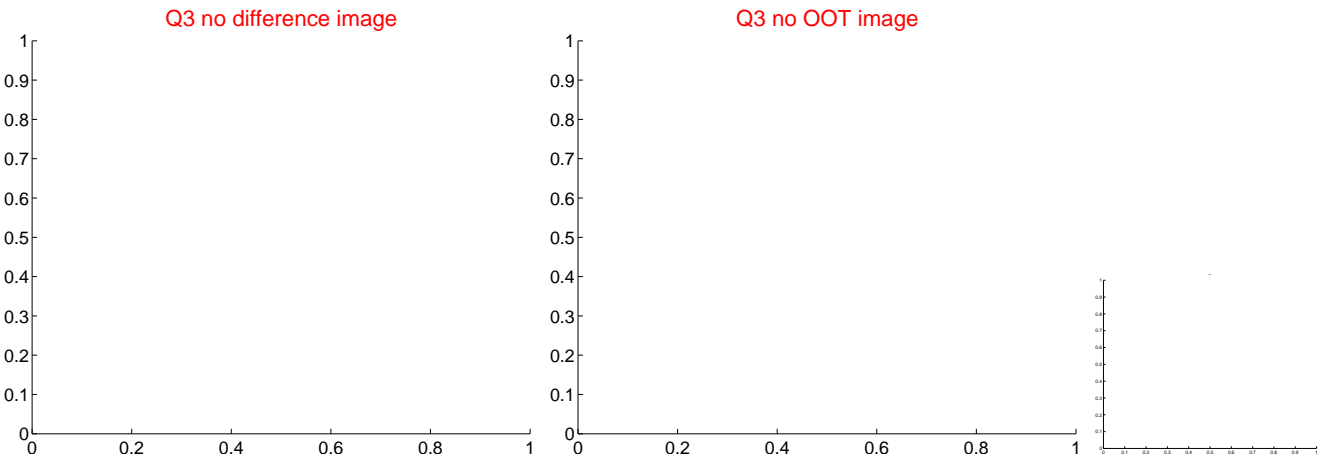
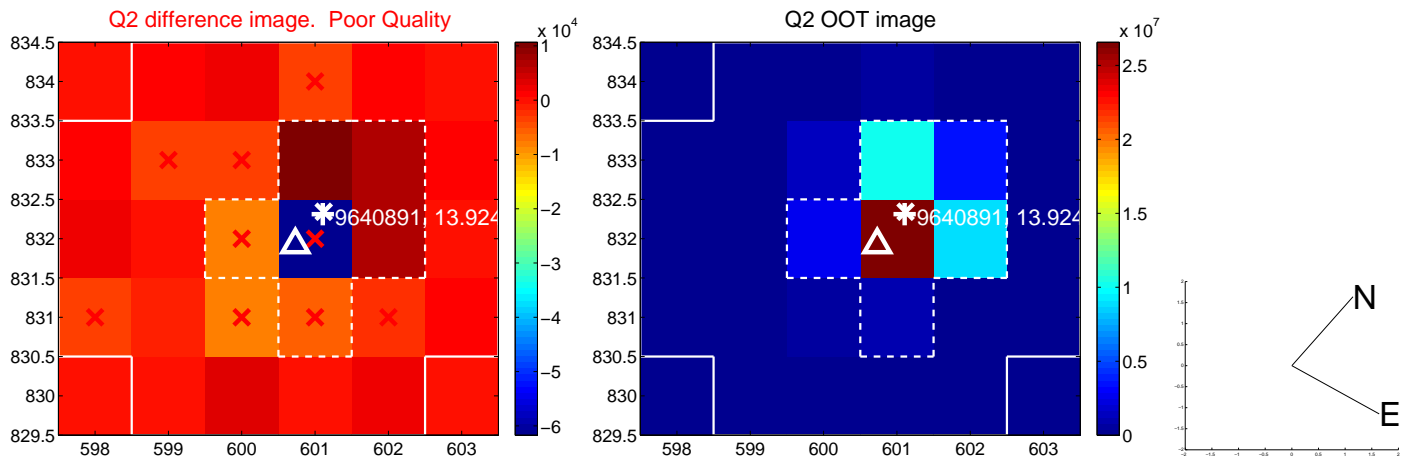
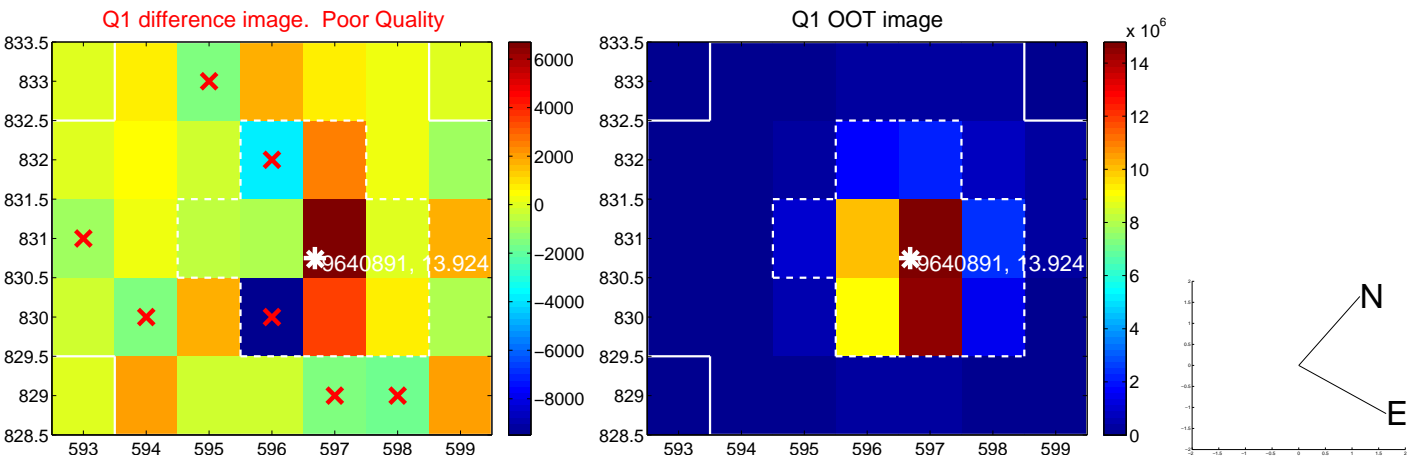
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.144 ± 0.135	1.07	0.122 ± 0.145	-0.077 ± 0.104
PRF-fit source offset from KIC position	0.154 ± 0.209	0.74	0.131 ± 0.138	0.081 ± 0.233
photometric centroid source offset	0.30 ± 0.31	0.97	-0.20 ± 0.31	-0.23 ± 0.31

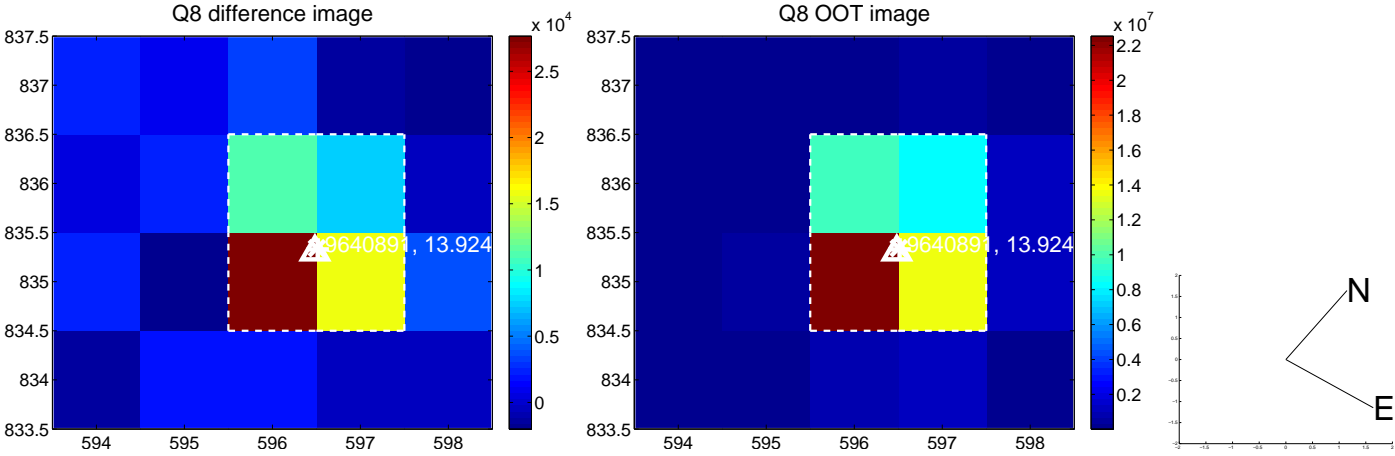
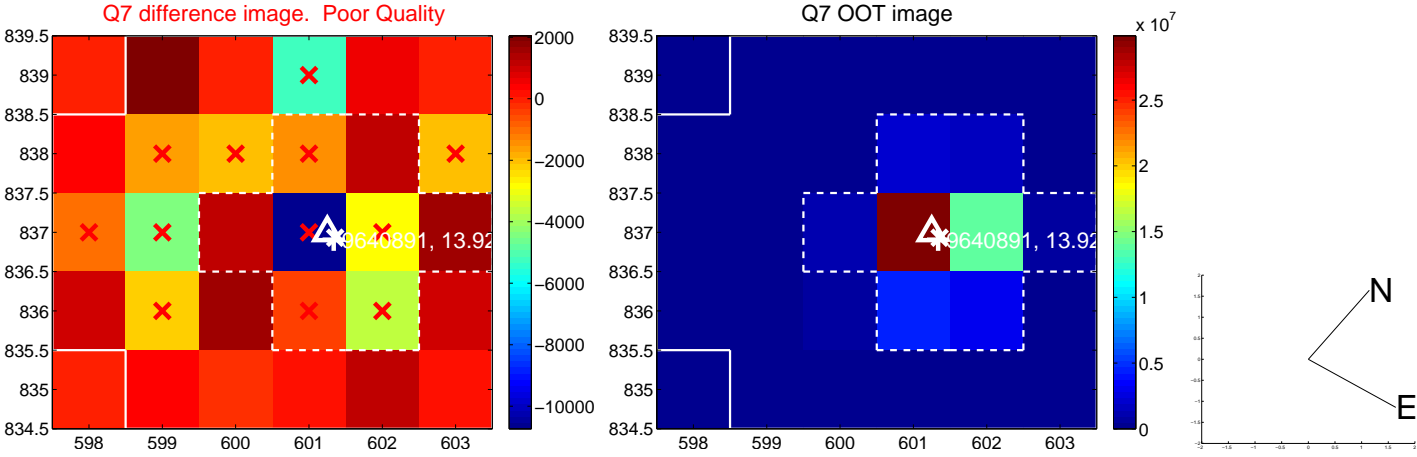
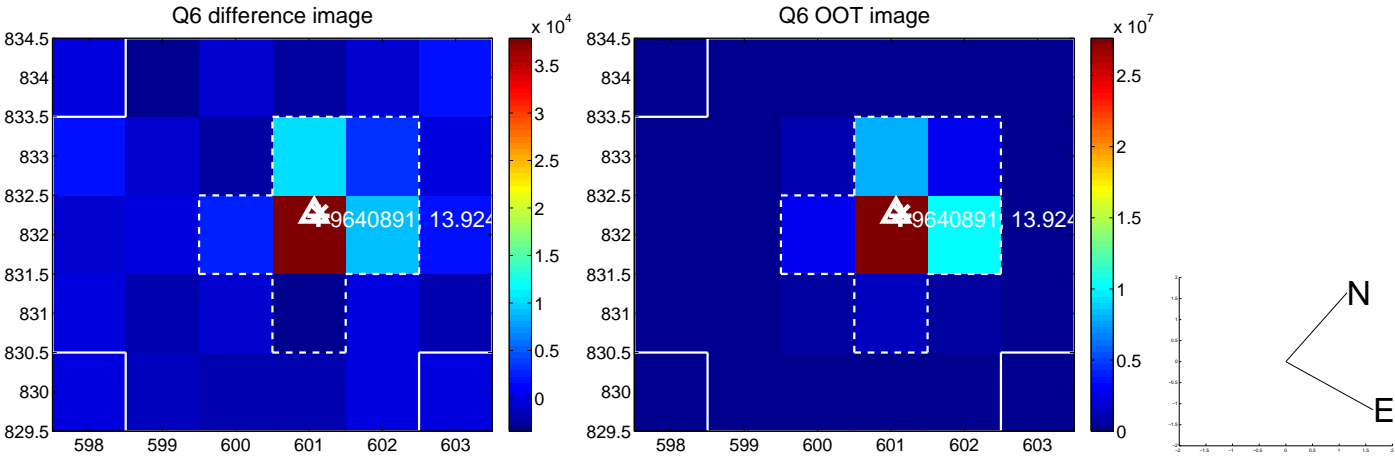
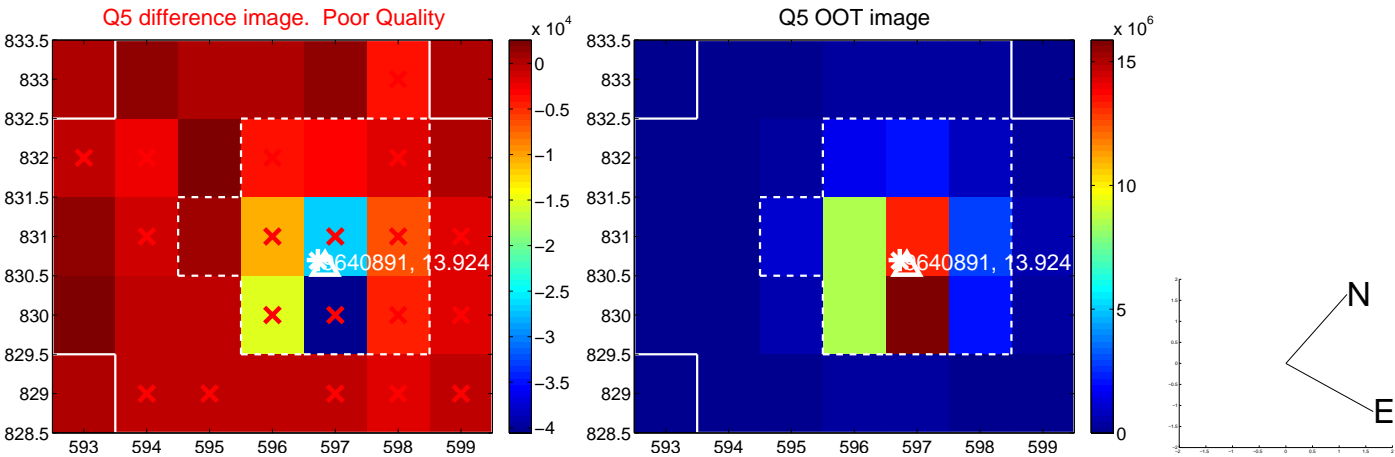


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

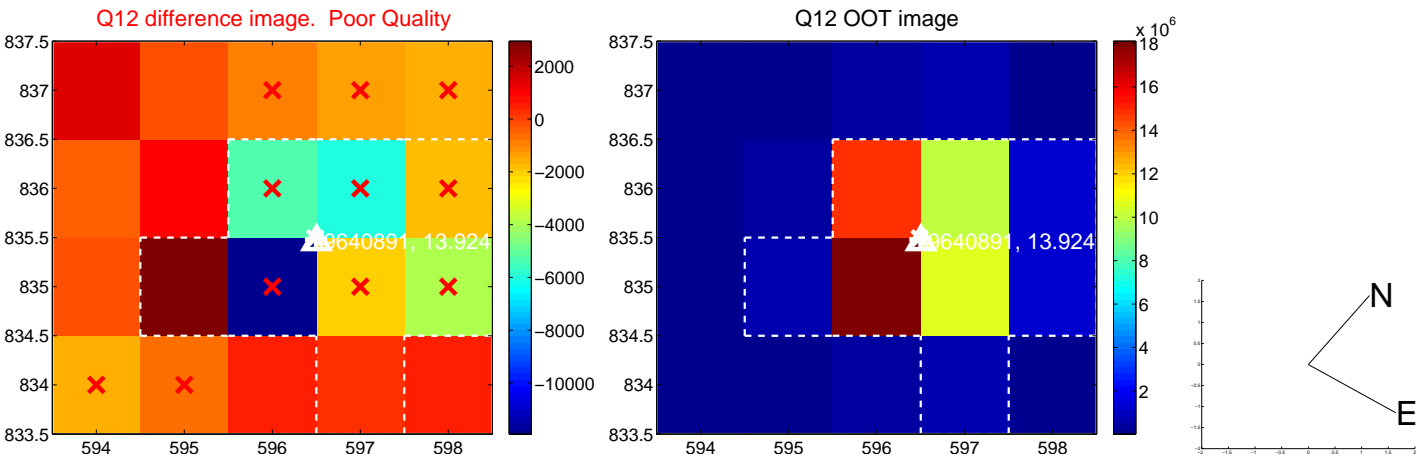
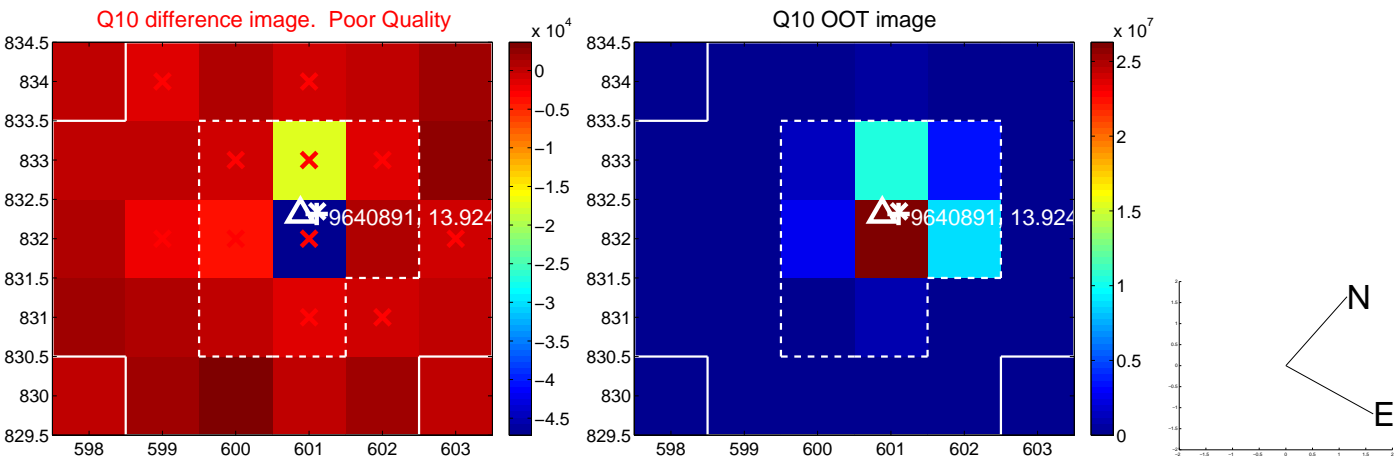
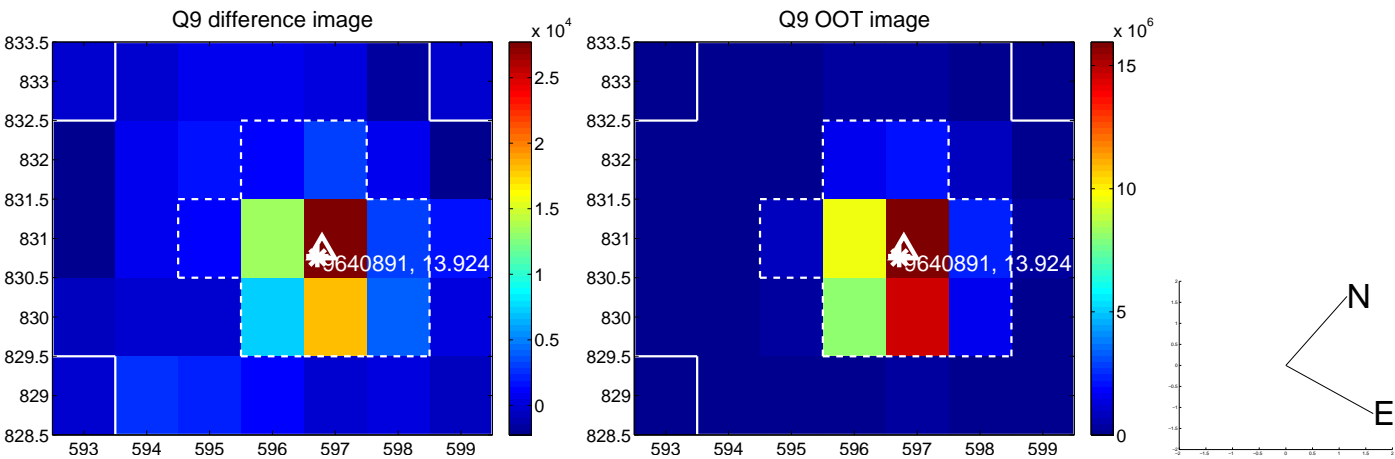
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



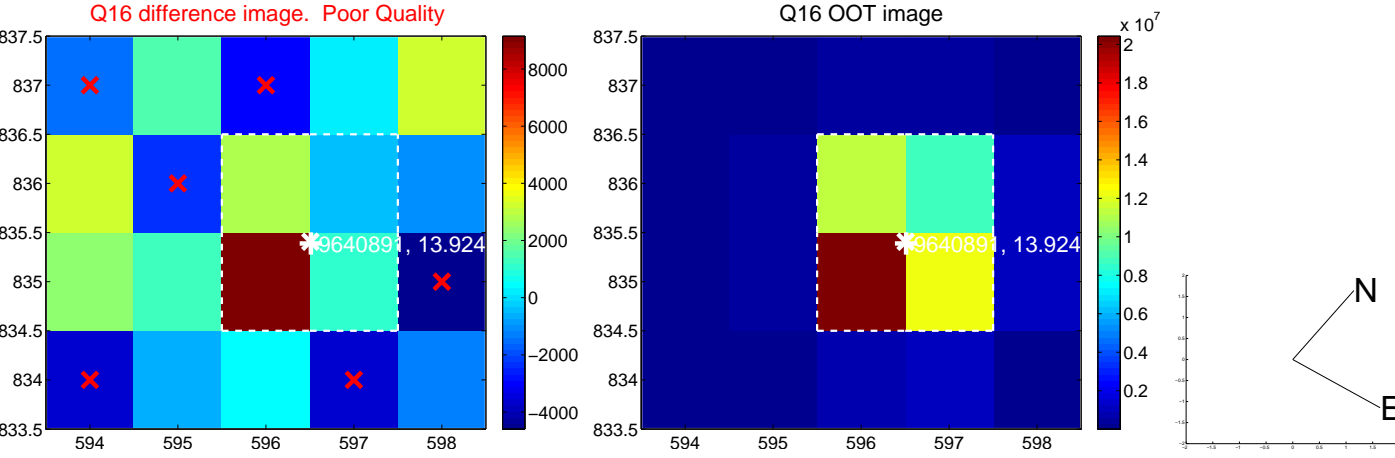
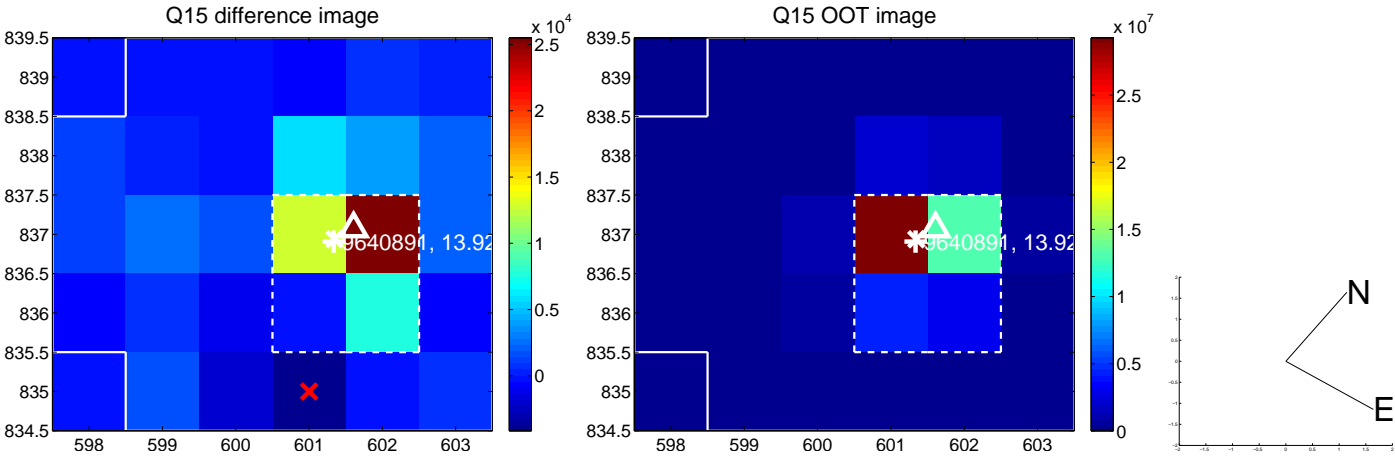
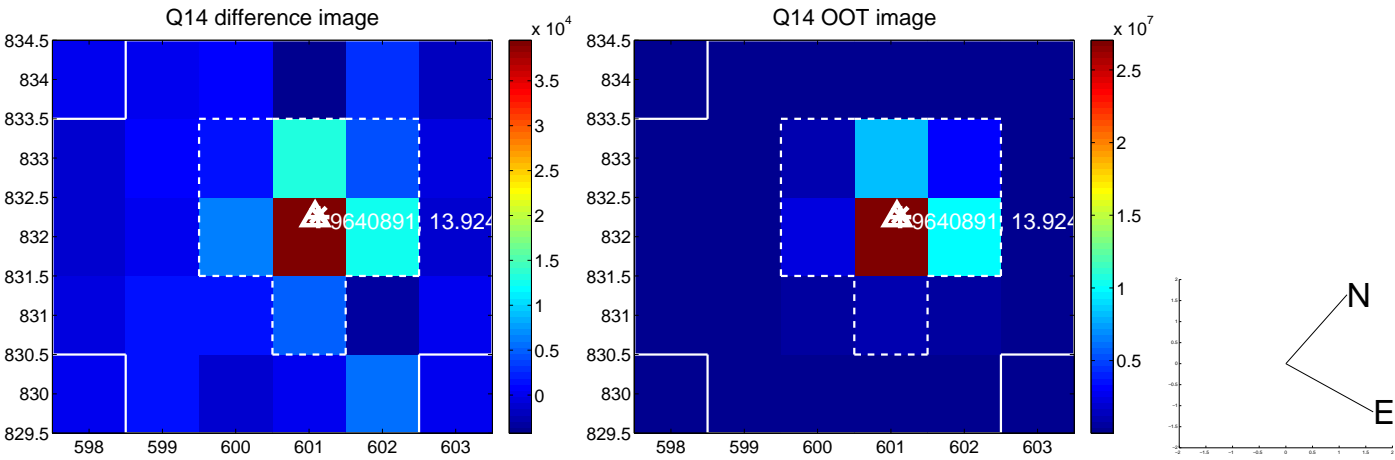
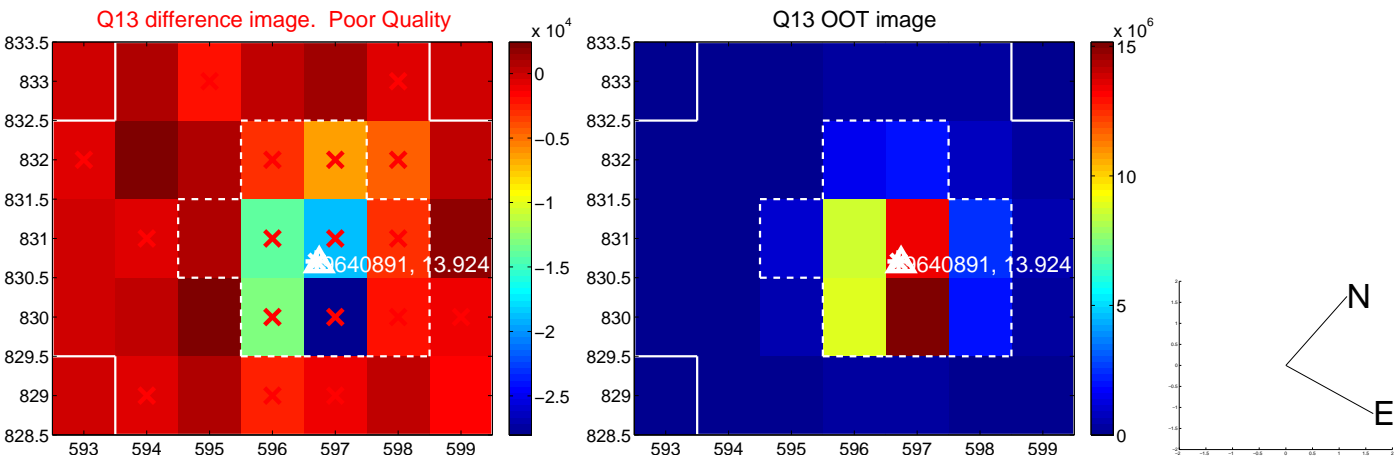
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



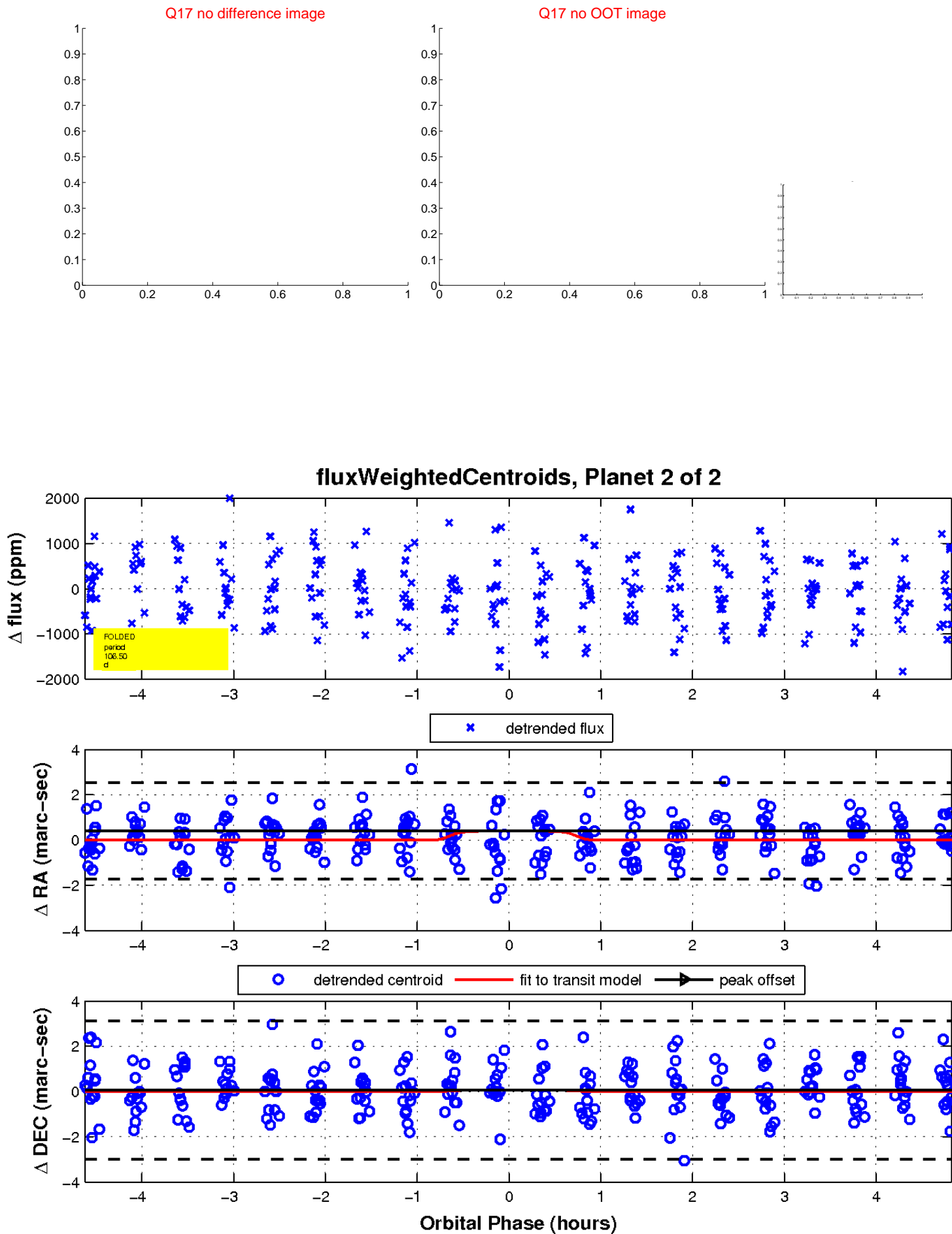
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

