

KIC 009018502

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})
009018502-01	OBS	No	0.792356	131.744787	23.9	3.063	10.1	8.2	1.30	7160	0.74	12358.02
009018502-02	OBS	No	0.792311	132.276791	22.3	7.043	9.3	6.4	1.30	7160	0.69	12358.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009018502-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
009018502-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

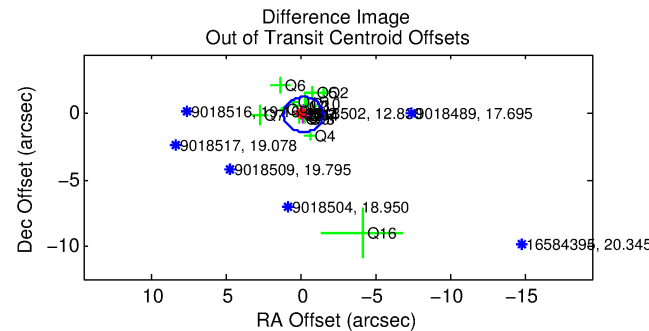
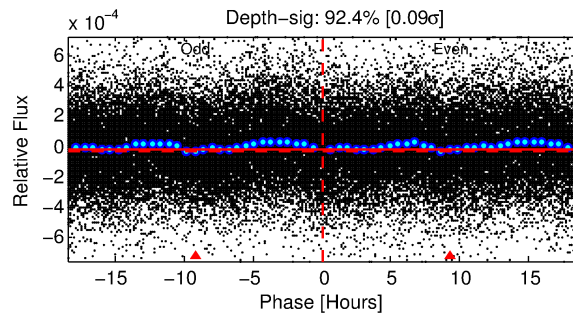
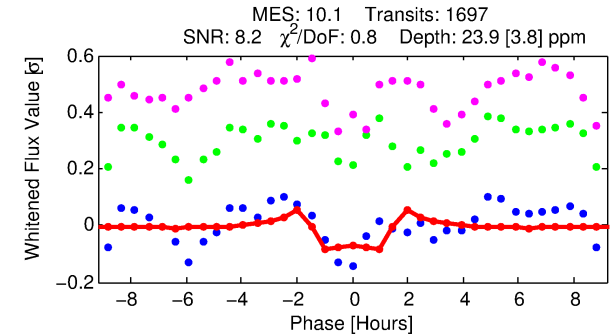
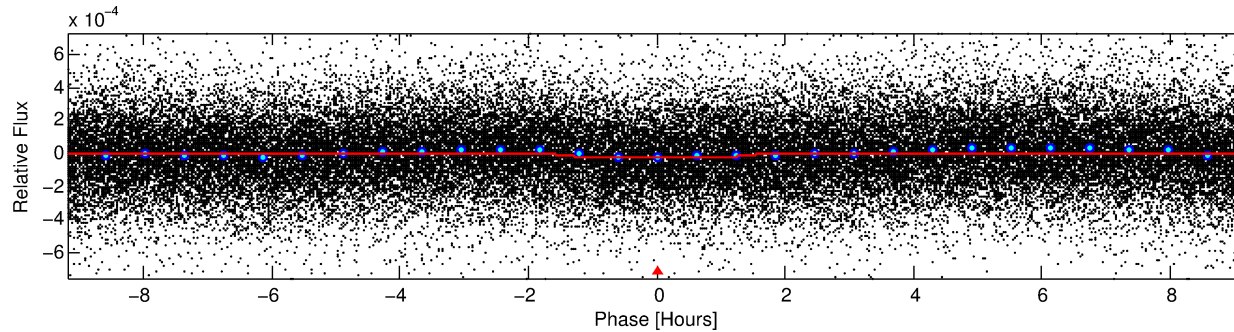
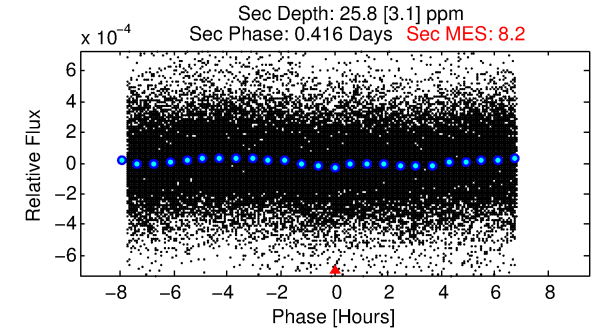
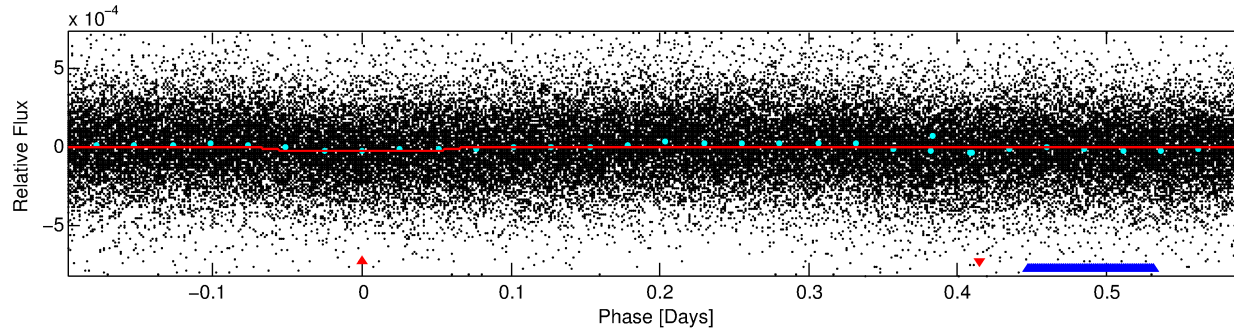
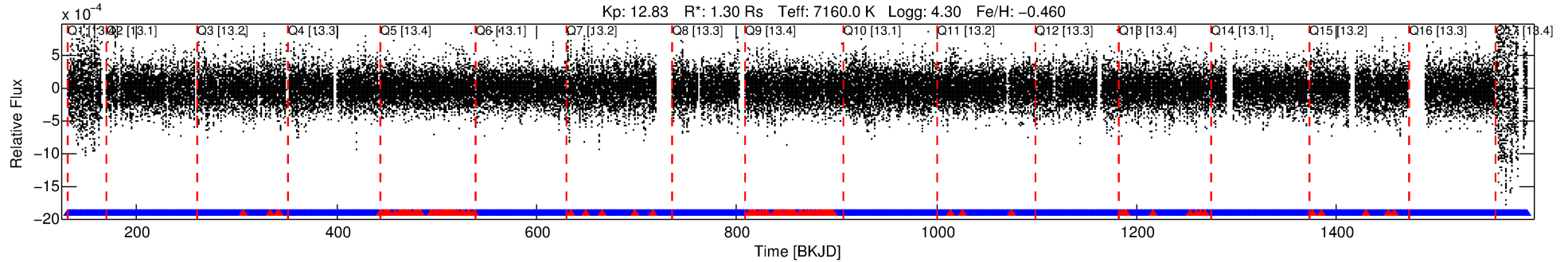
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009018502-01

No Significant Match Found

DV One-Page Summary

KIC: 9018502 Candidate: 1 of 2 Period: 0.792 d



DV Fit Results:

Period = 0.79236 [0.00001] d
Epoch = 131.7448 [0.0024] BKJD
Rp/R* = 0.0052 [0.0013]
a/R* = 1.28 [0.77]
b = 0.90 [0.32]
Seff = 12358.02 [4809.23]
Teq = 2689 [262] K
Rp = 0.74 [0.29] Re
a = 0.0180 [0.0045] AU
Ag = 8.37 [5.34] [1.38σ]
Teffp = 7071 [959] K [4.41σ]

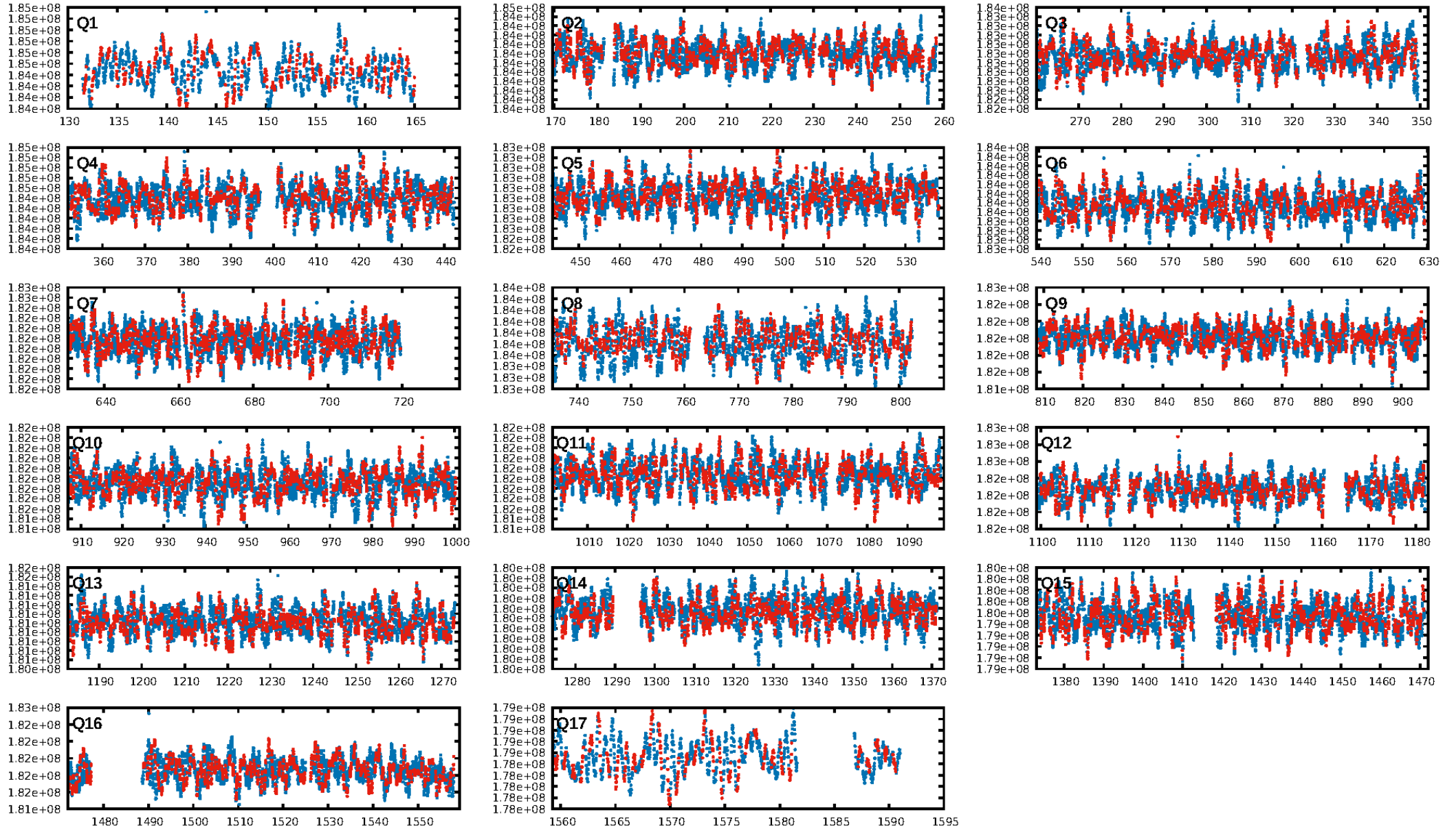
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.92 [1495/1621]
GhostDiagnostic-chr: 1.142
Centroid-sig: 6.9%
Centroid-so: 0.885 arcsec [1.32σ]
OotOffset-rm: 0.194 arcsec [0.44σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.241 arcsec [0.48σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.59 [10/17]
DiffImageOverlap-fno: 0.00 [0/17]

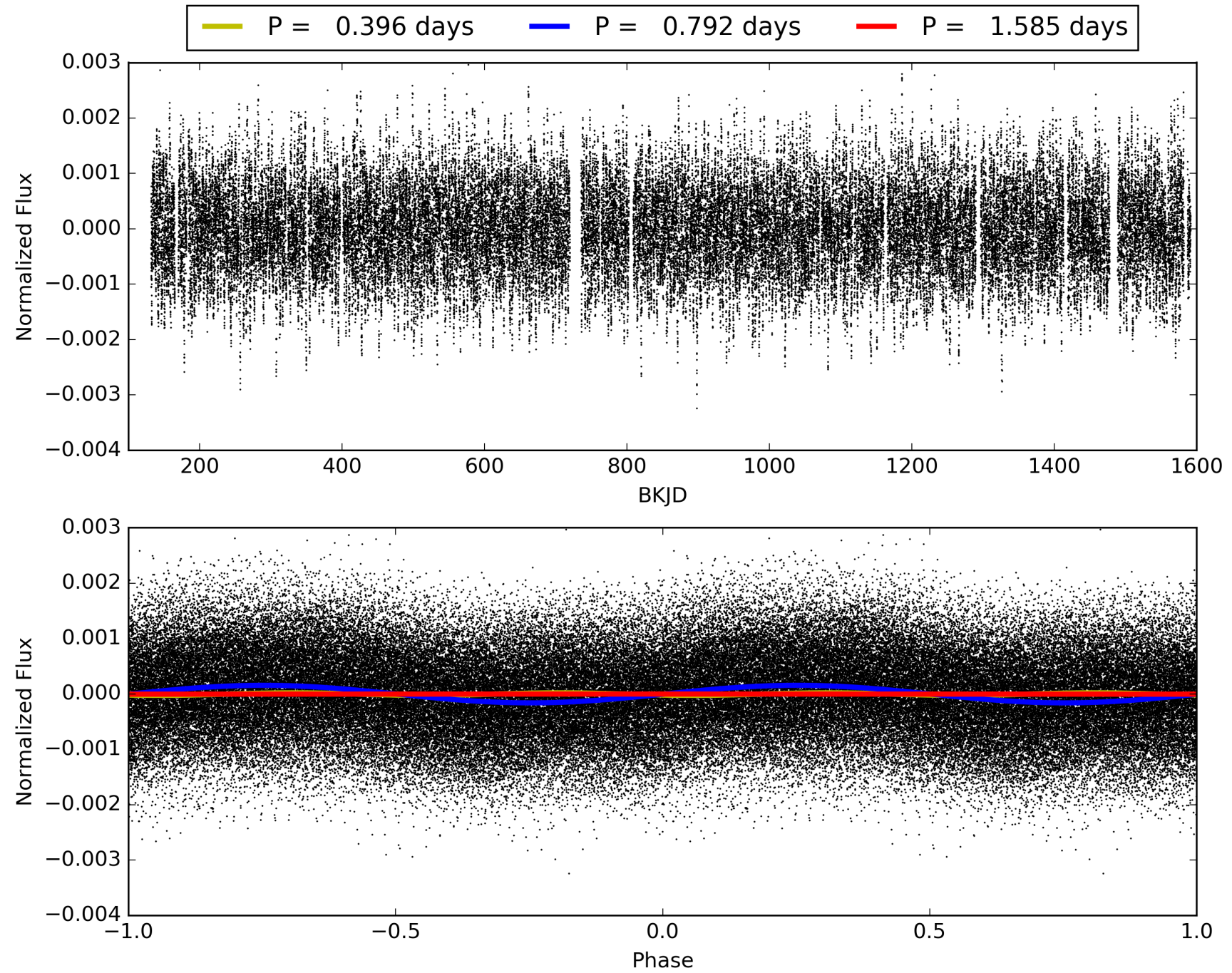
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 07:13:04 Z

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

TCE 009018502-01, PDC Light Curves

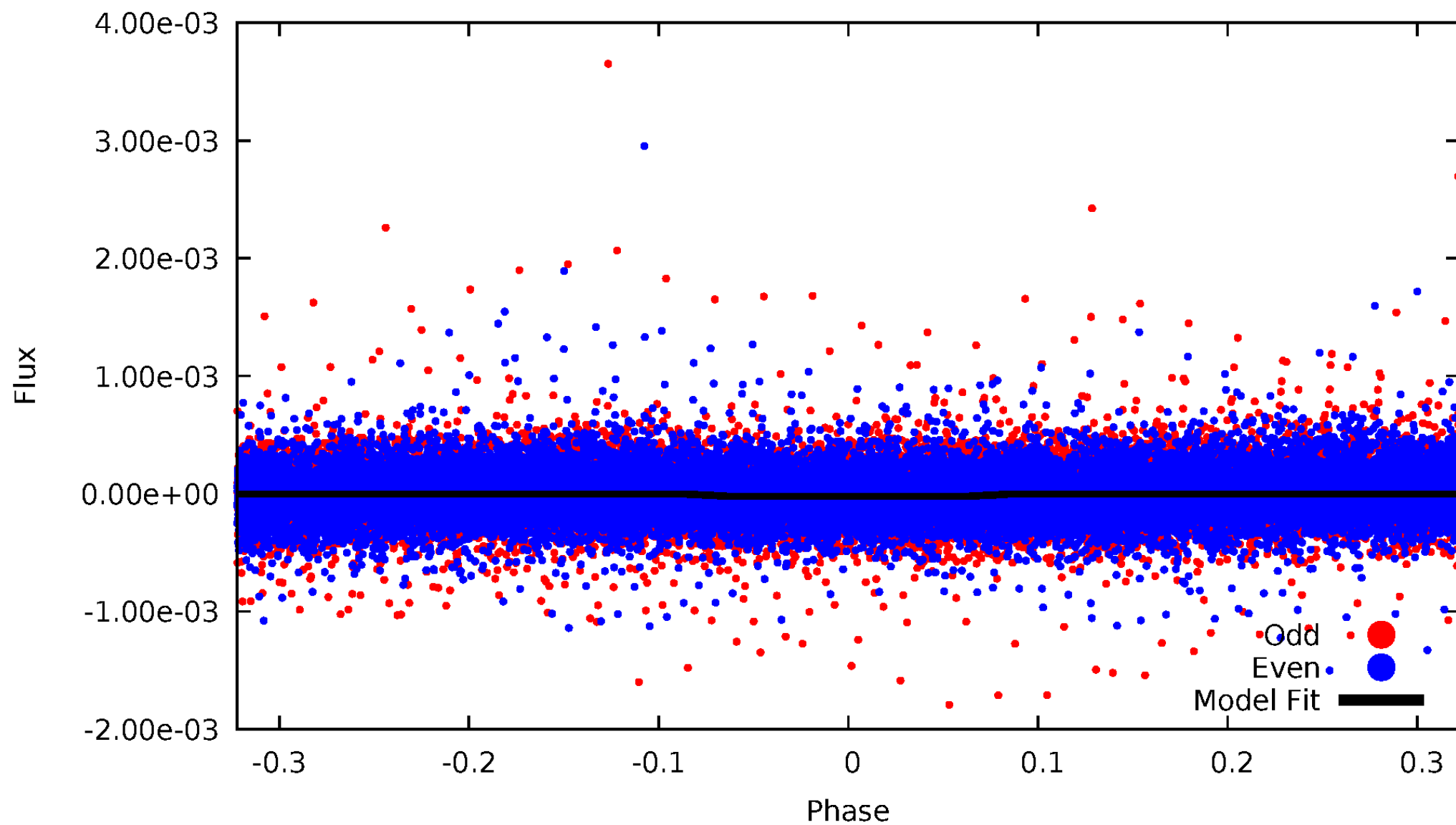


TCE 009018502-01



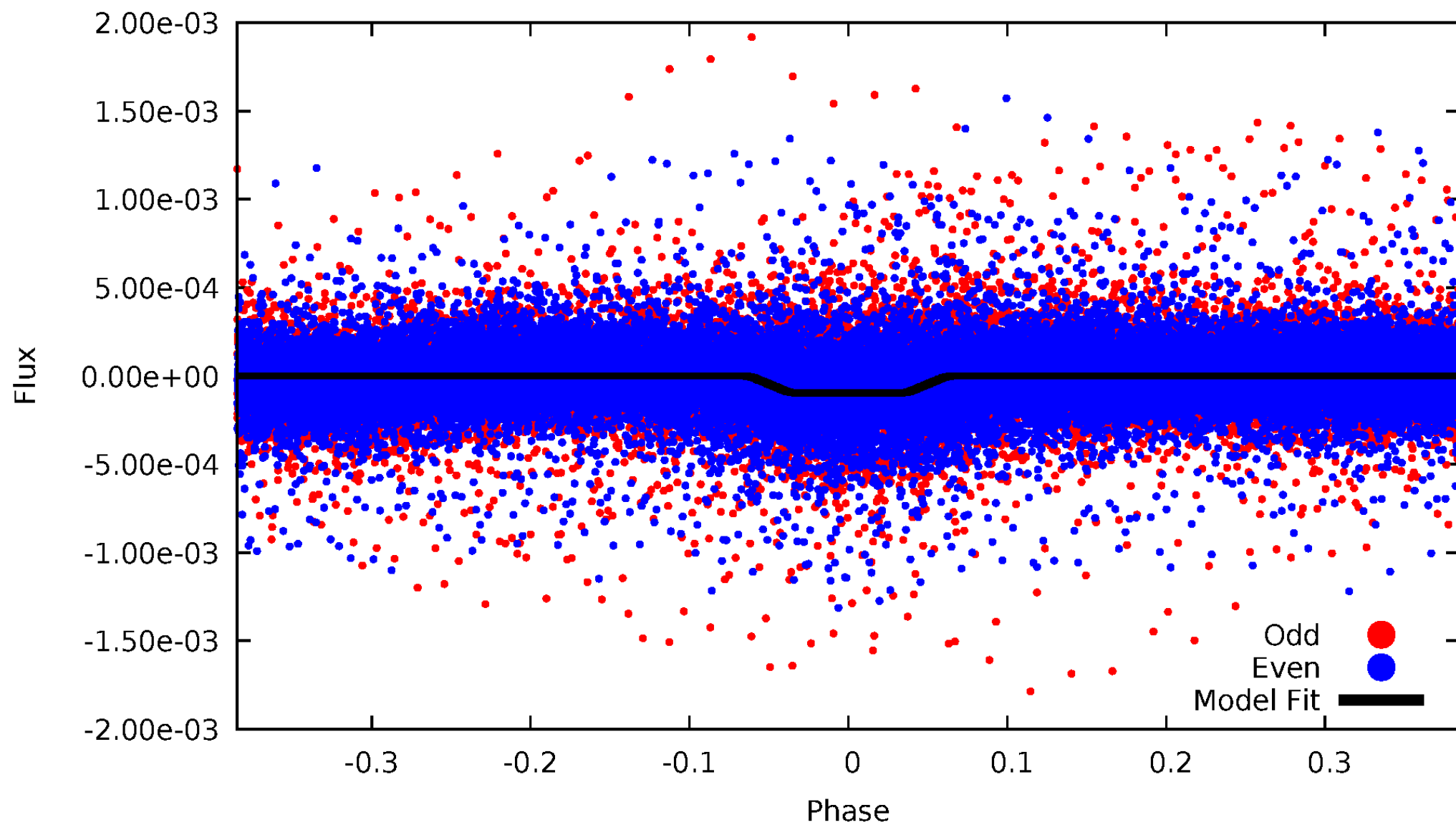
DV Odd/Even

TCE 009018502-01



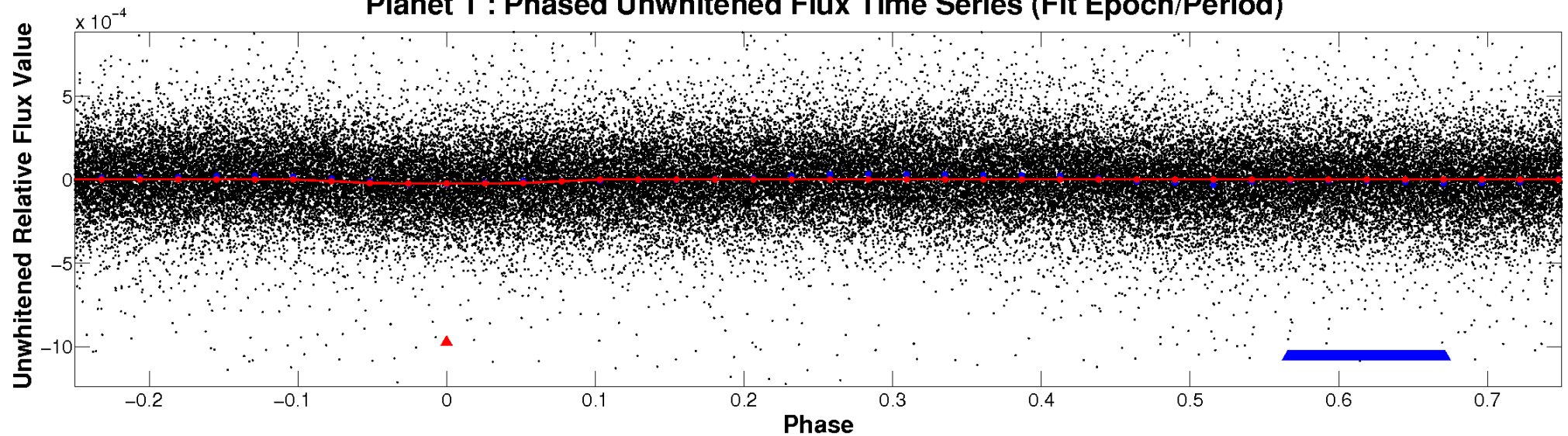
ALT Odd/Even

TCE 009018502-01

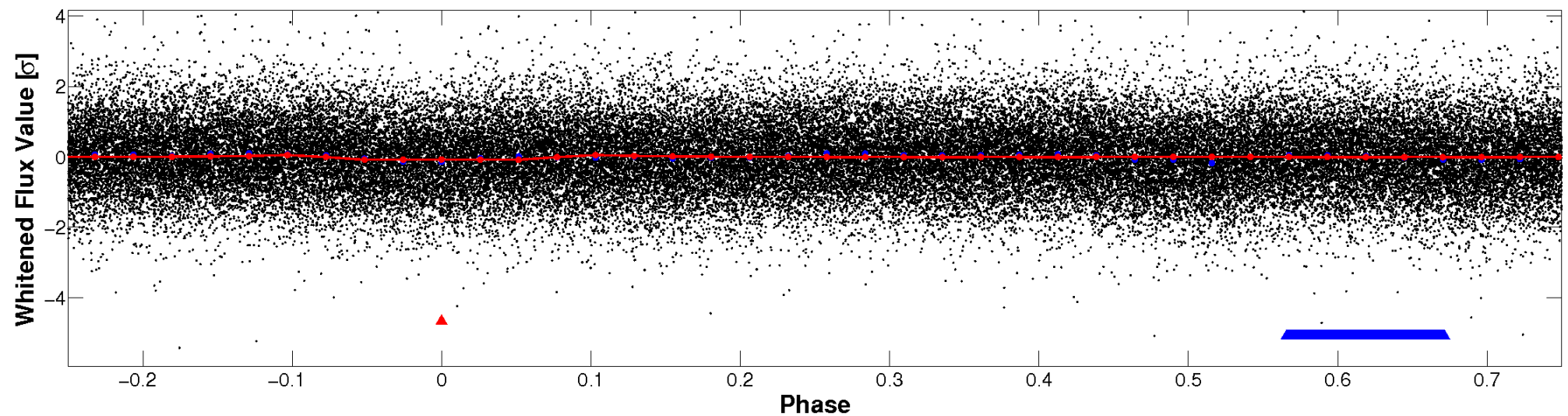


Non-Whitened Vs. Whitened Light Curve

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

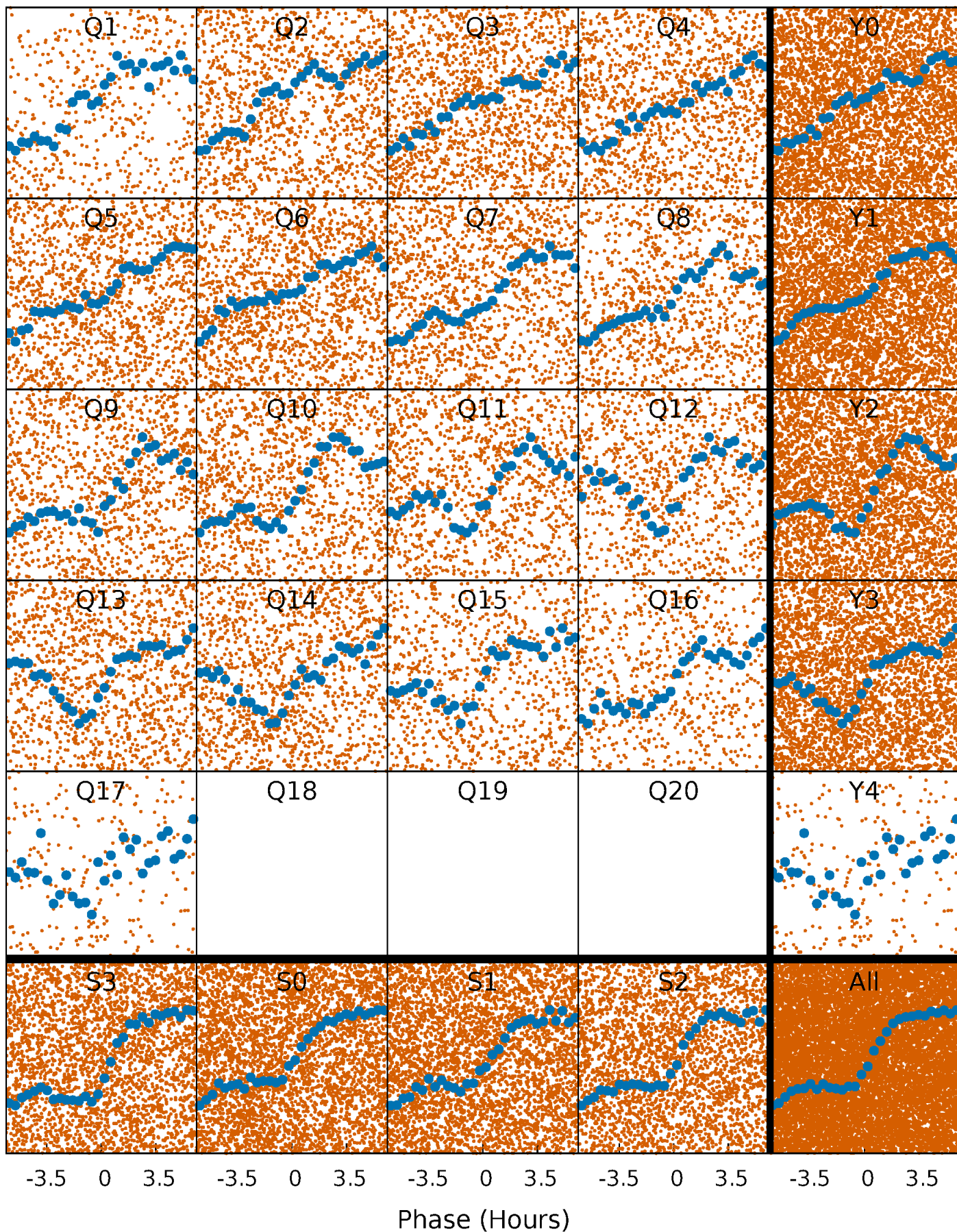


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



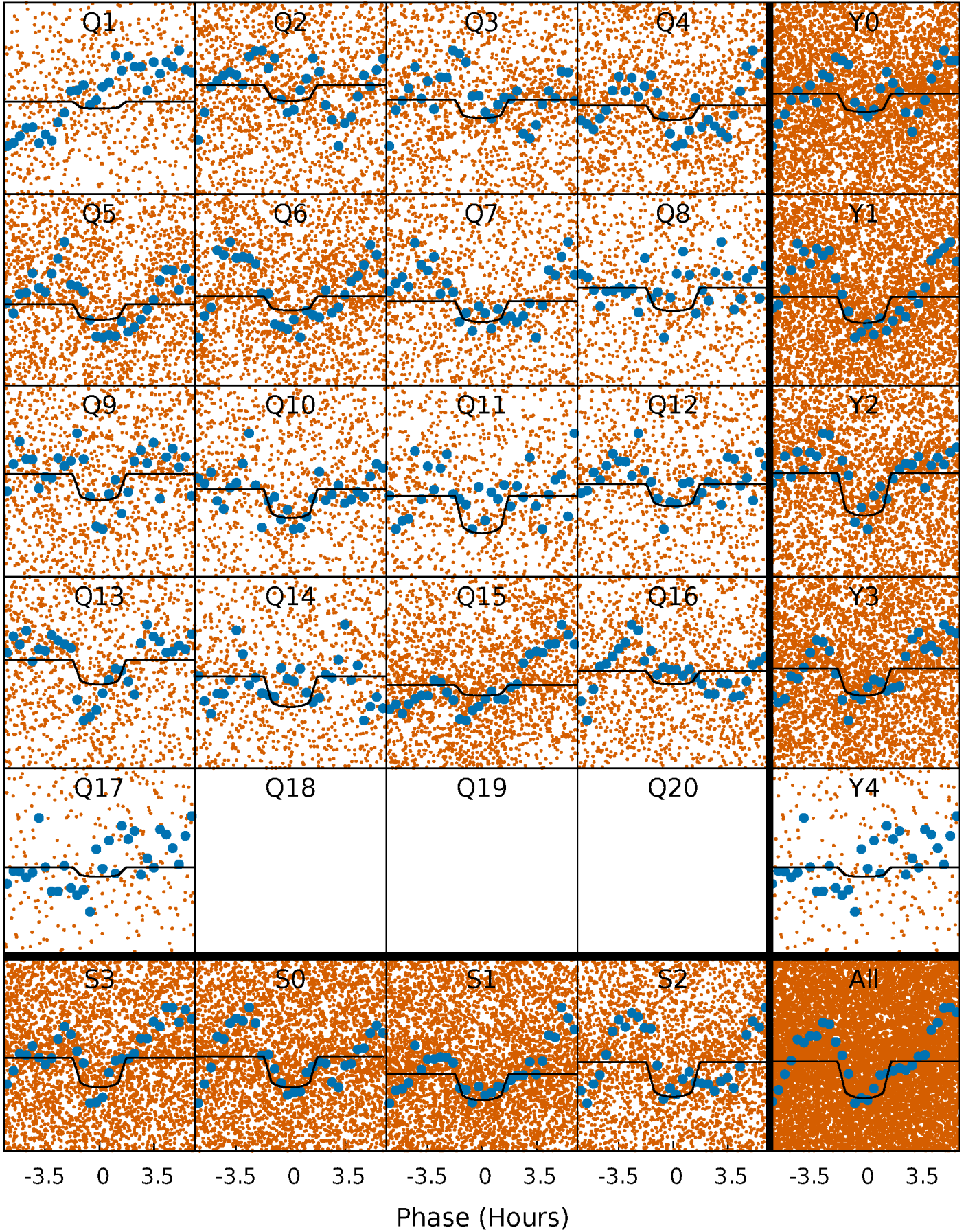
PDC Quarter-Phased Transit Curves

TCE 009018502-01 P= 0.792356 Days $T_0=131.744787$ (BKJD)



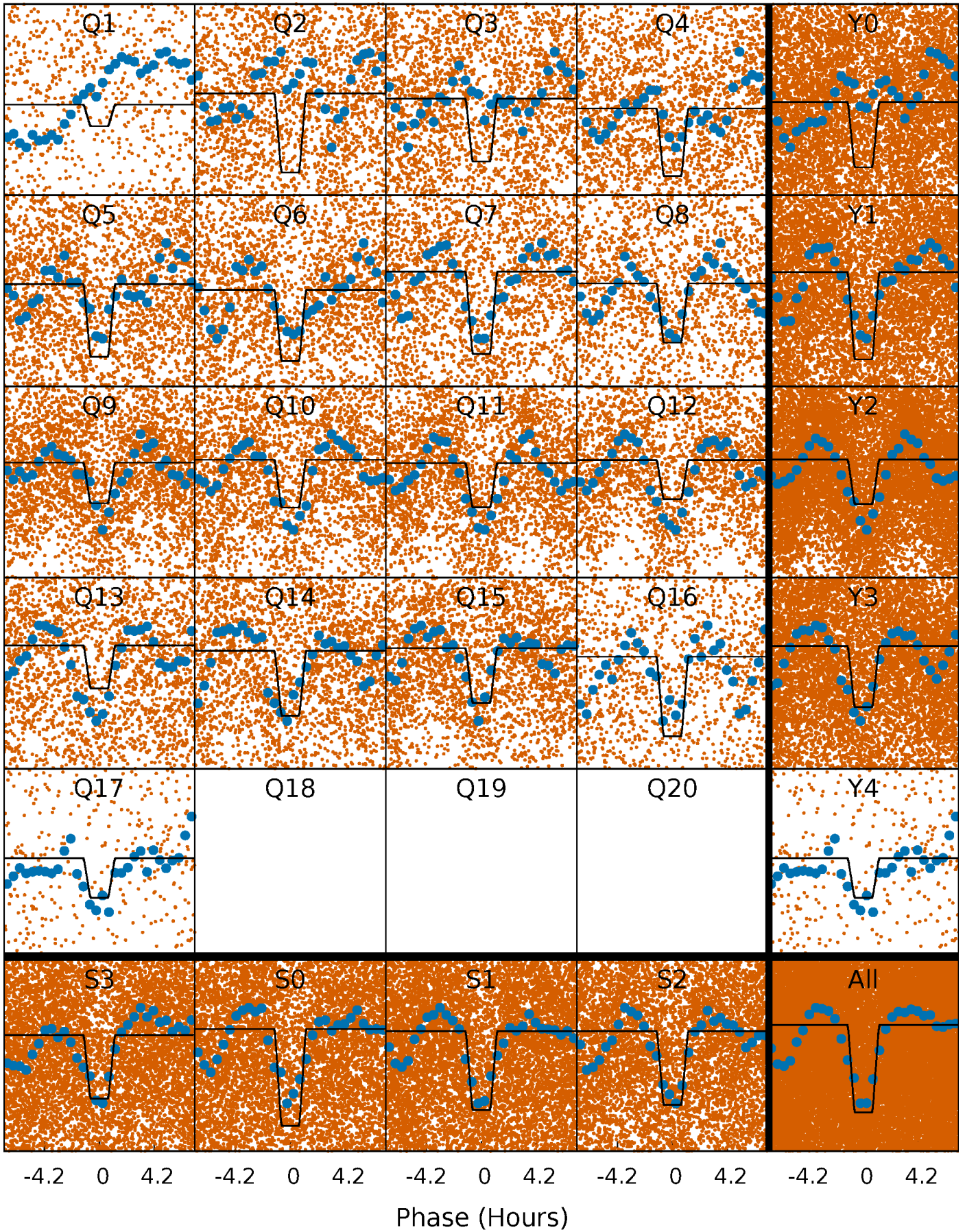
DV Quarter-Phased Transit Curves

TCE 009018502-01 P= 0.792356 Days $T_0=131.744787$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

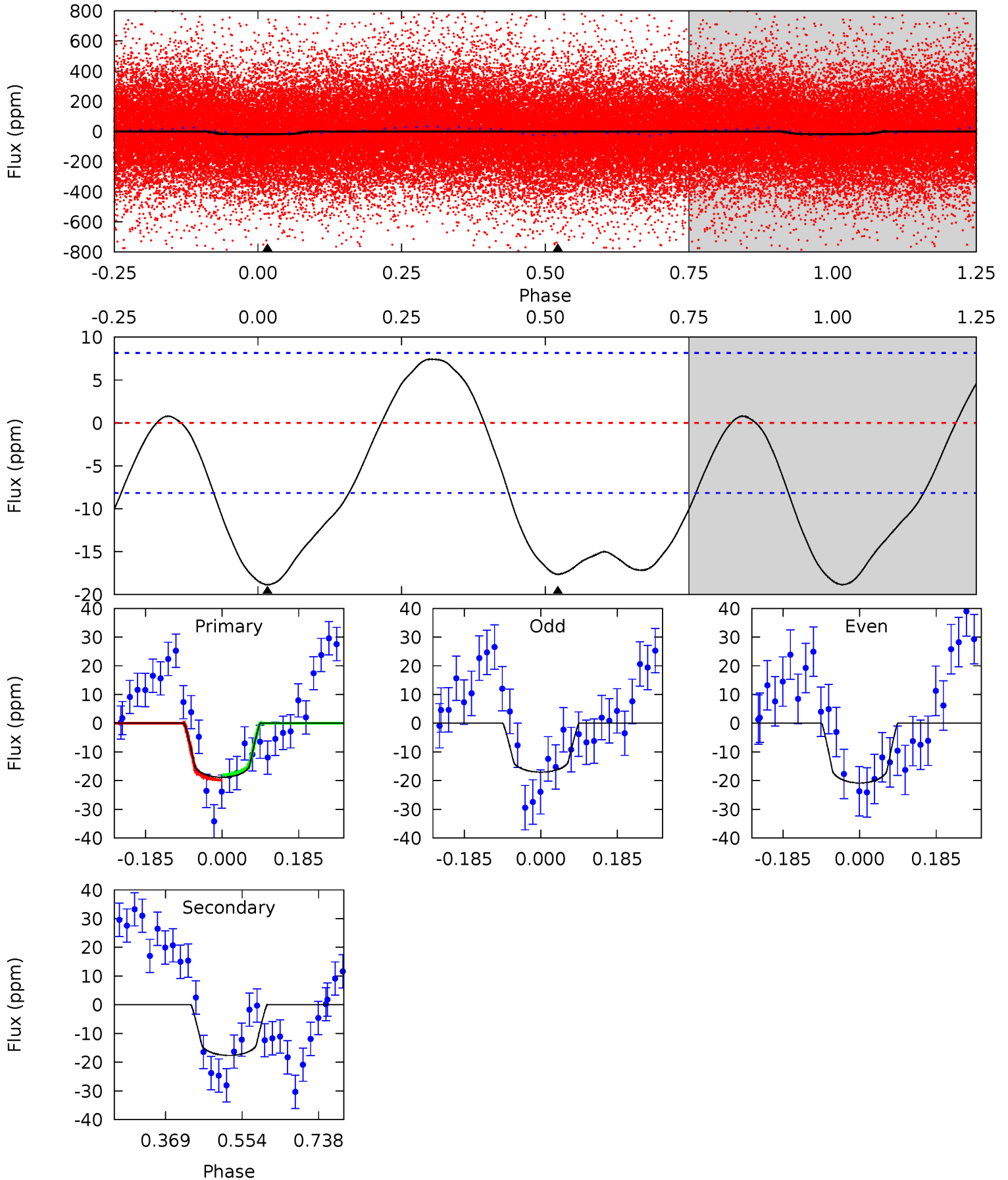
TCE 009018502-01 P= 0.792330 Days $T_0=131.743206$ (BKJD)



DV Model-Shift Uniqueness Test

009018502-01, P = 0.792356 Days, E = 130.952431 Days

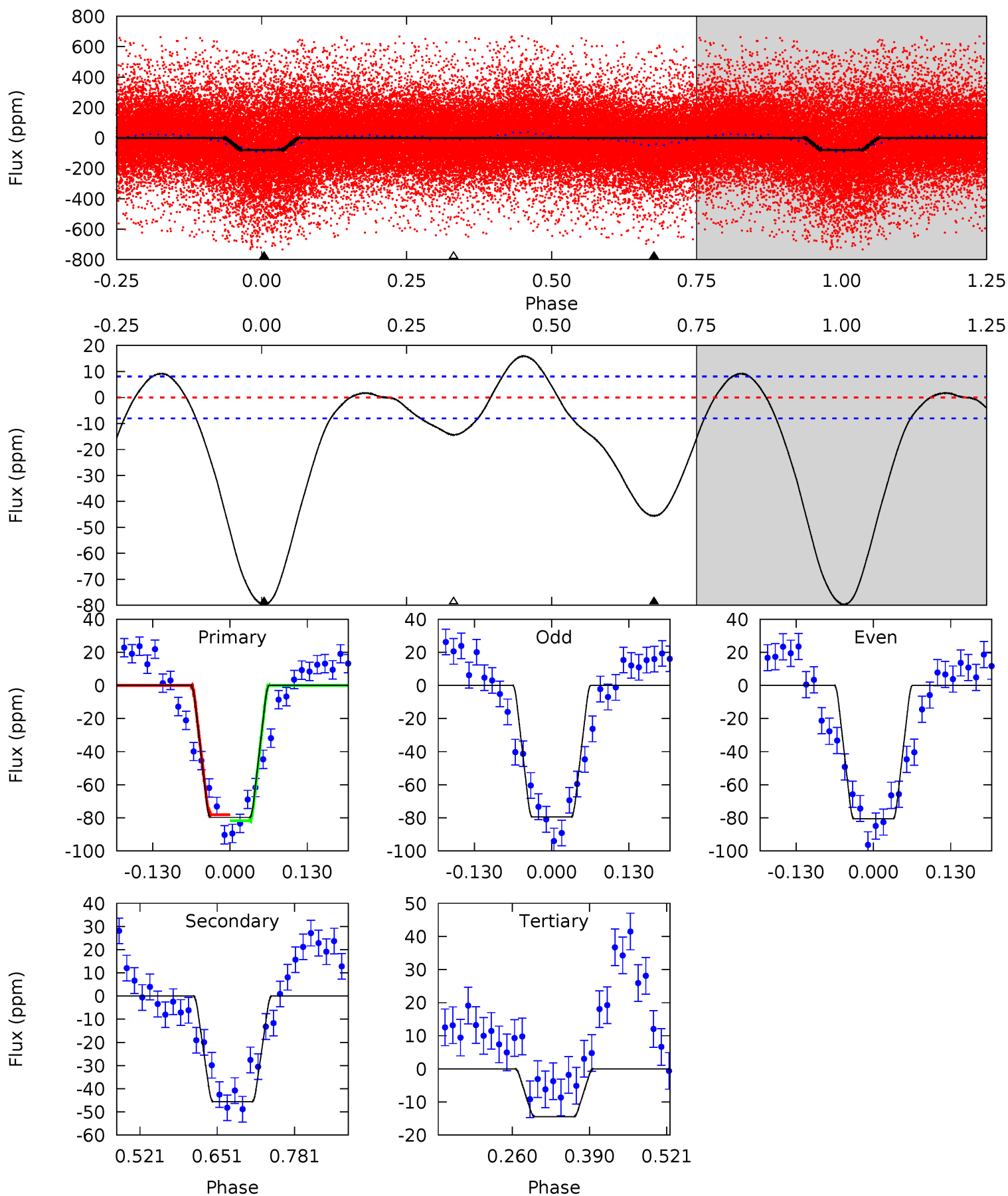
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	9.59	0	0	4.43	1.33	3.90	10.2	10.2	9.59	9.59	1.04	0.83	0.28	0.50



Alt Model-Shift Uniqueness Test

009018502-01, P = 0.792330 Days, E = 130.950876 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
44.6	25.5	8.06	0	4.51	1.51	4.79	36.5	44.6	17.4	25.5	0.32	1.05	0.17	1.02



Stellar Parameters For KIC 009018502

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7160^{+200}_{-251}	$4.300^{+0.084}_{-0.196}$	$-0.460^{+0.250}_{-0.300}$	$1.303^{+0.397}_{-0.183}$	$1.240^{+0.179}_{-0.163}$	$0.789^{+0.354}_{-0.389}$
	+3%/-4%	+2%/-5%	+54%/-65%	+30%/-14%	+14%/-13%	+45%/-49%
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 009018502-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-18 ± 2	$0.76^{+0.24}_{-0.19}$	3811^{+278}_{-210}	6286^{+1070}_{-734}	$5.418^{+4.242}_{-2.249}$
Alt.	-46 ± 2	$1.43^{+0.26}_{-0.24}$	3810^{+256}_{-191}	5786^{+456}_{-394}	$3.947^{+1.535}_{-1.123}$

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 $A_{obs} \gg 1.0$

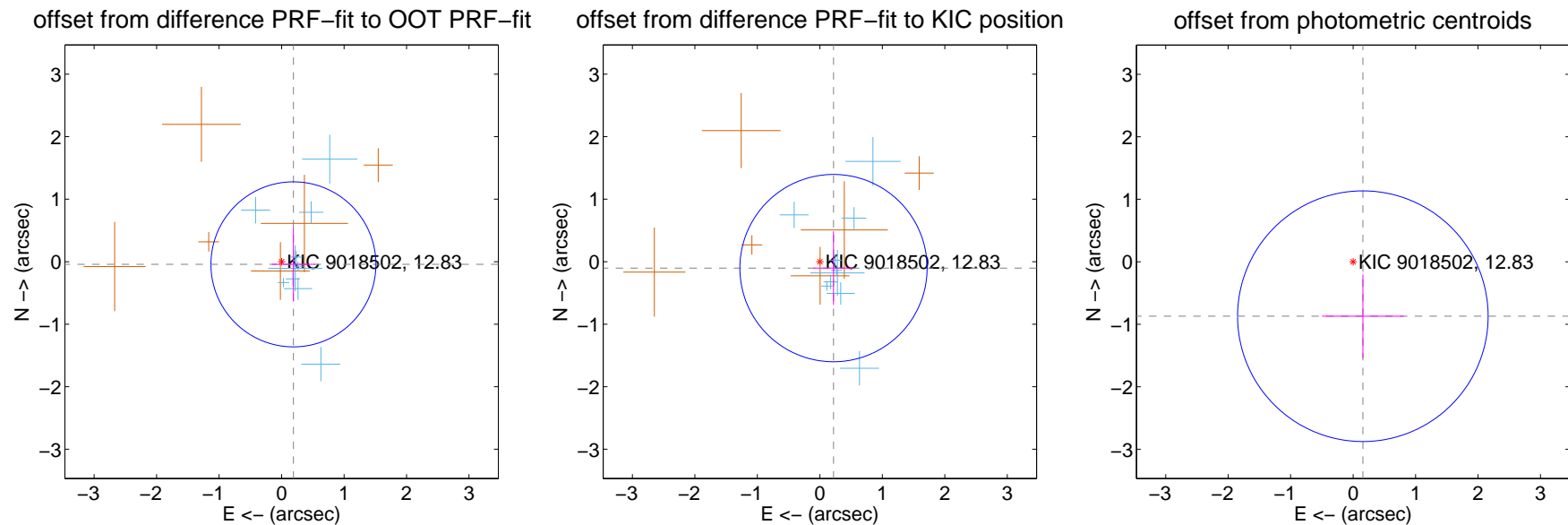
DV Centroid Data

Supplemental centroid analysis for 009018502-01. Kepler magnitude: 12.83. Transit SNR 8.22

There are 10 quarters with good PRF difference image offsets

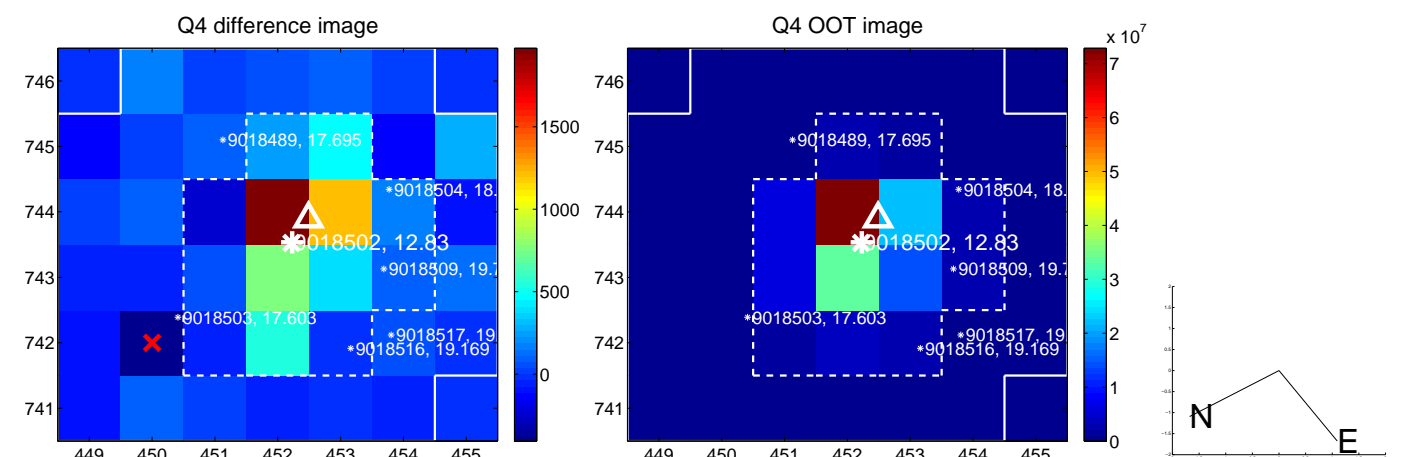
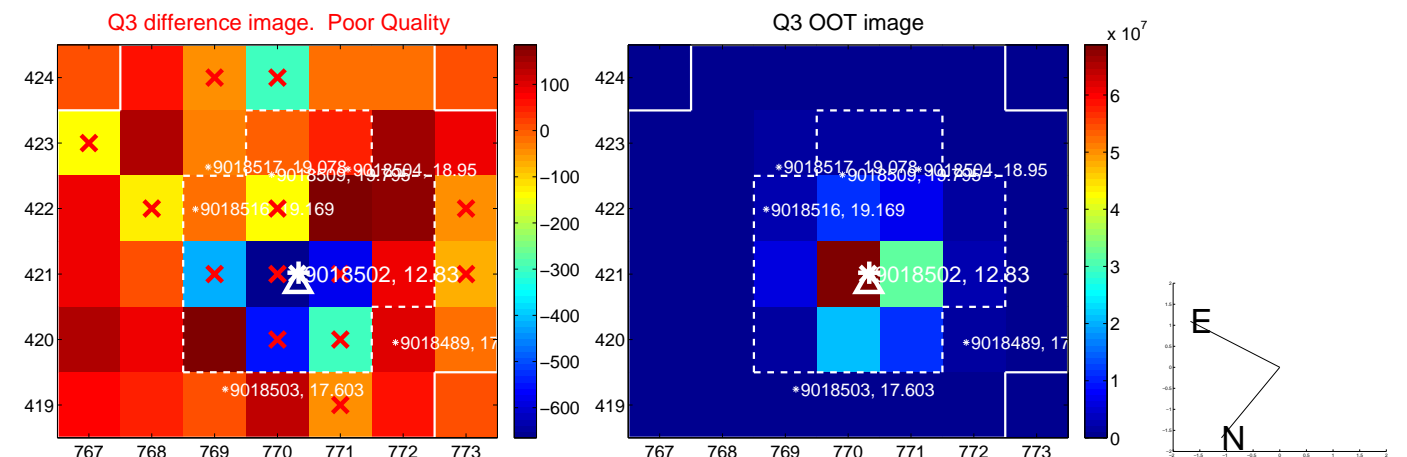
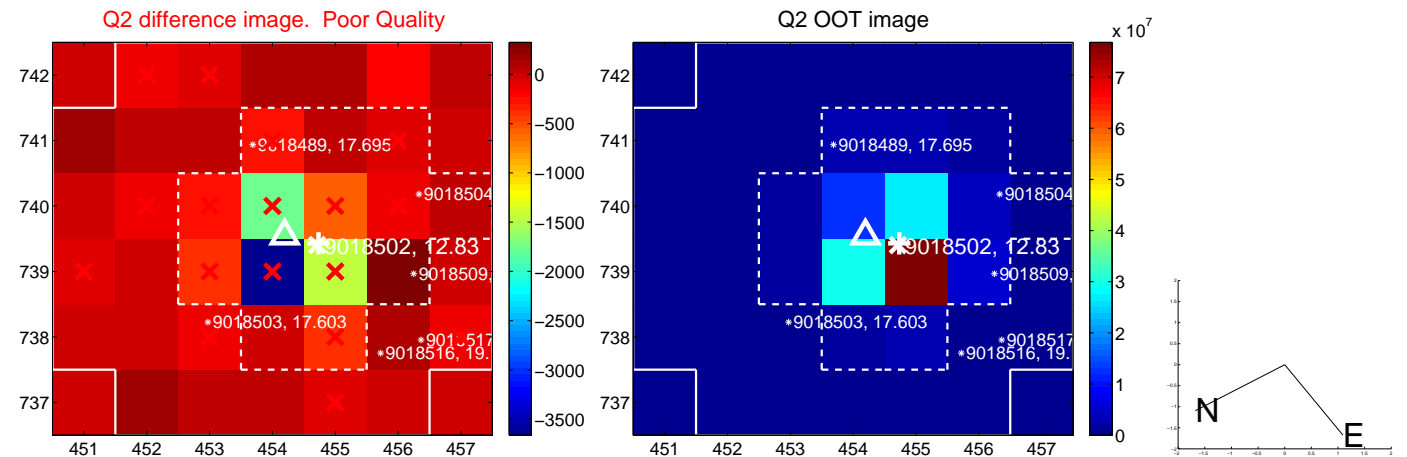
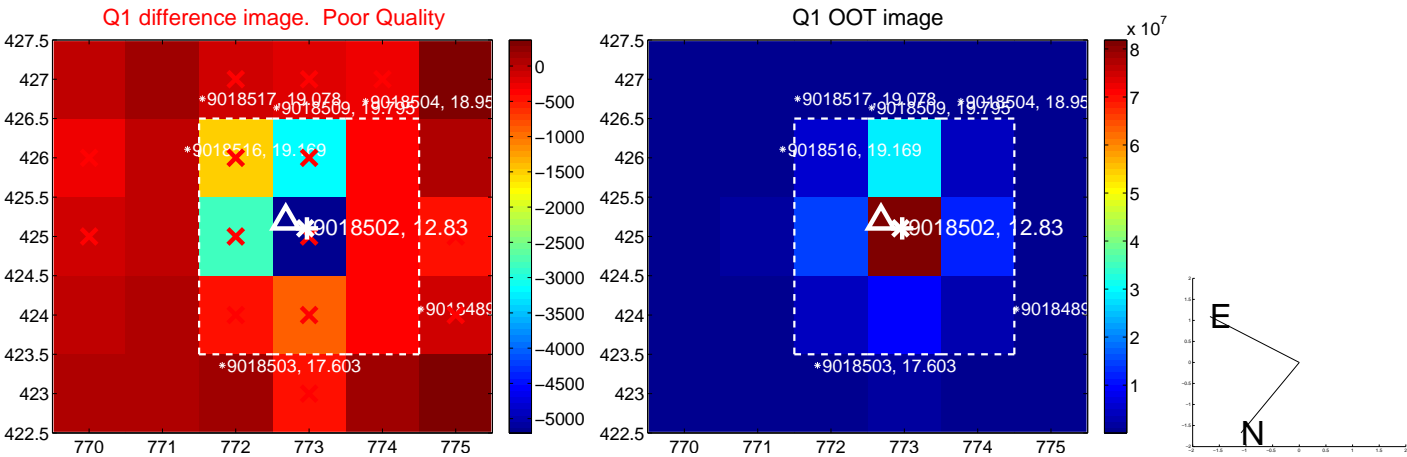
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.194 ± 0.440	0.44	-0.190 ± 0.345	-0.043 ± 0.592
PRF-fit source offset from KIC position	0.241 ± 0.500	0.48	-0.219 ± 0.322	-0.103 ± 0.589
photometric centroid source offset	0.89 ± 0.67	1.32	-0.16 ± 0.65	-0.87 ± 0.67

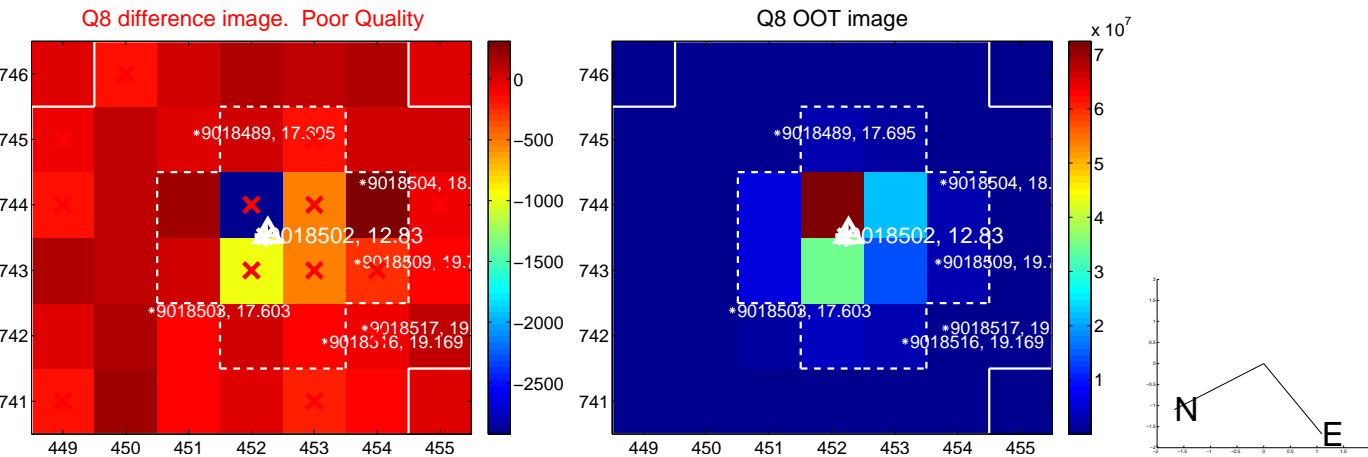
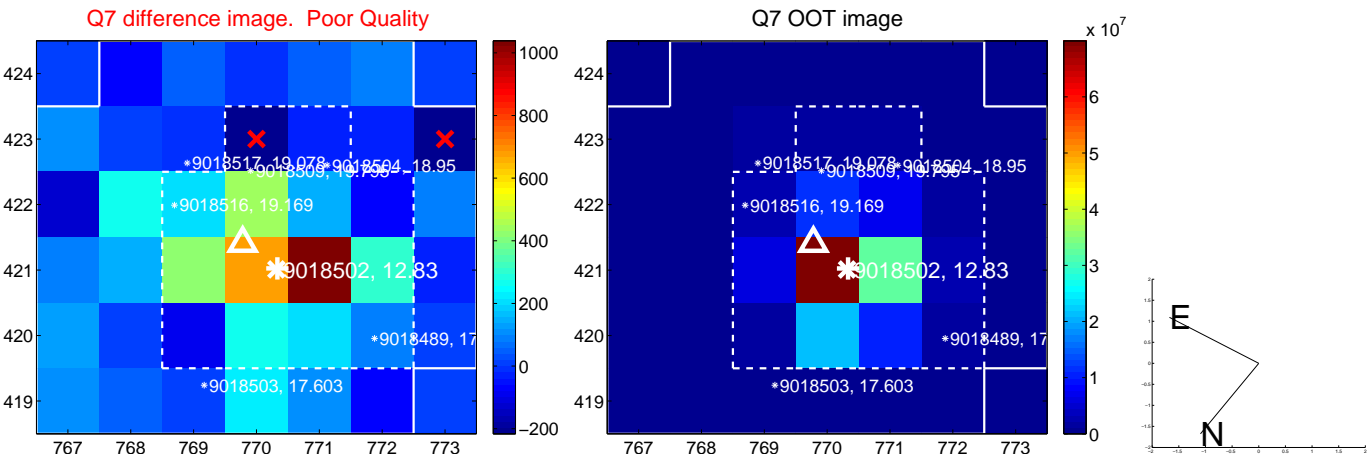
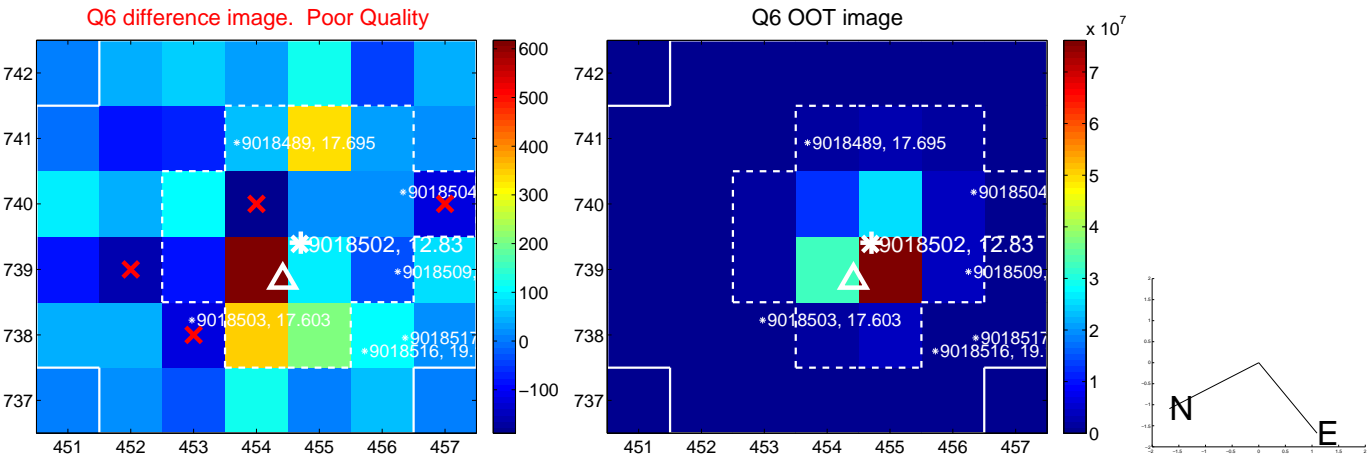
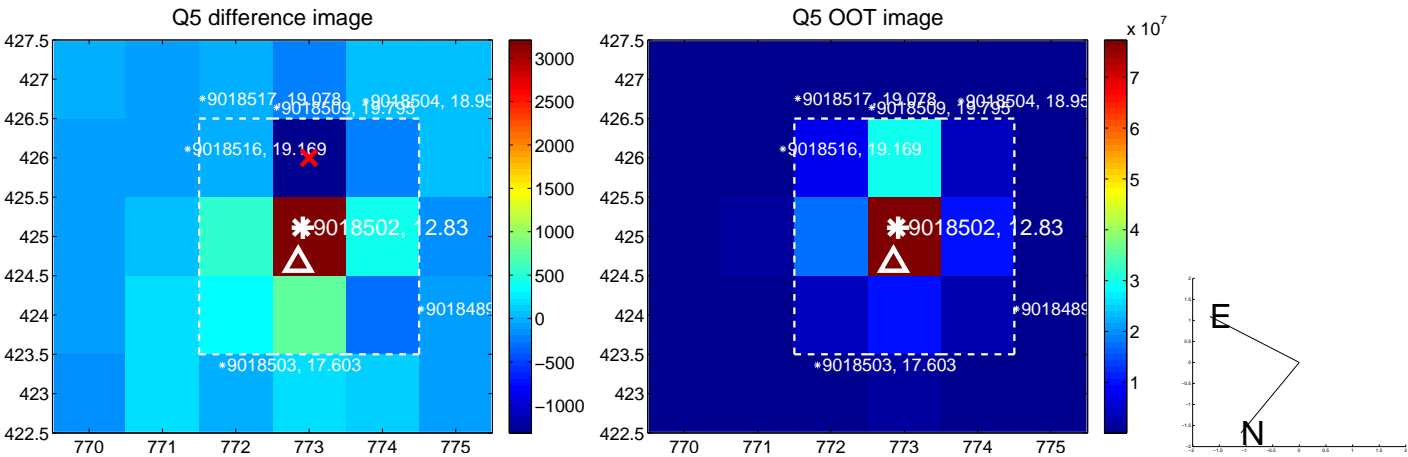


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

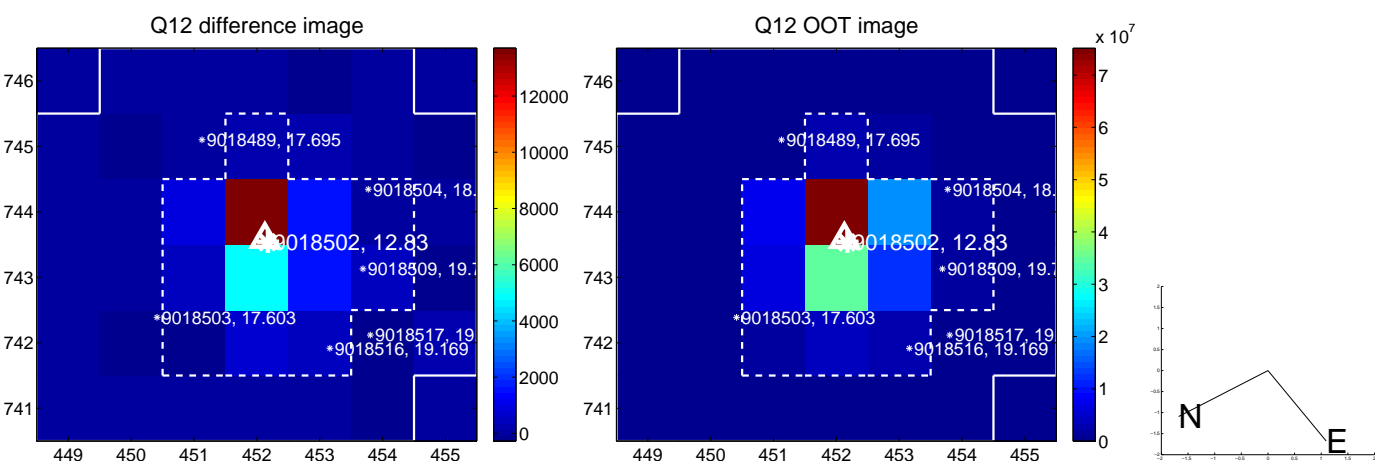
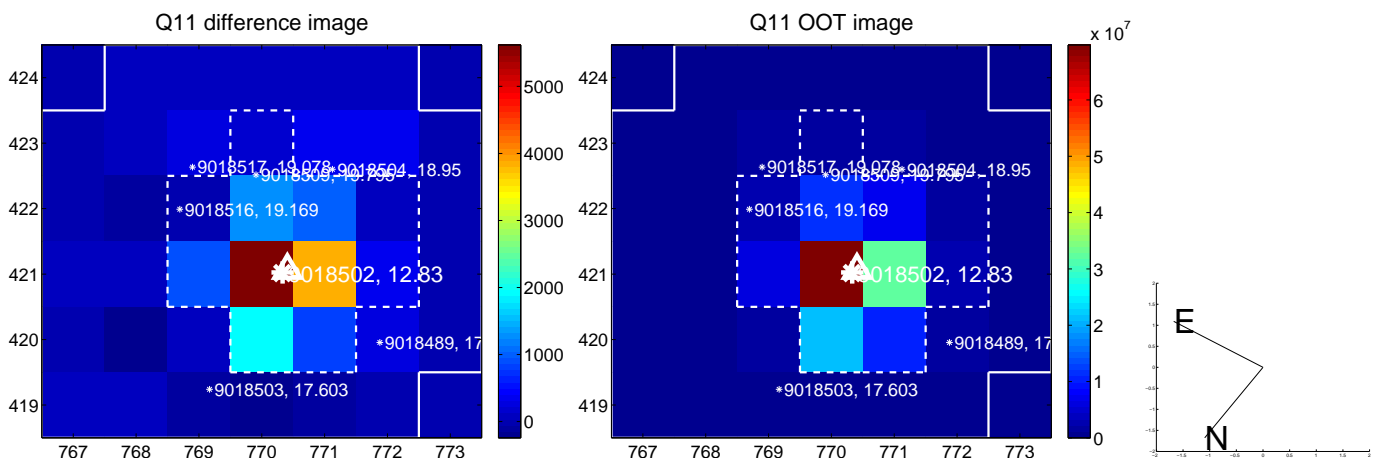
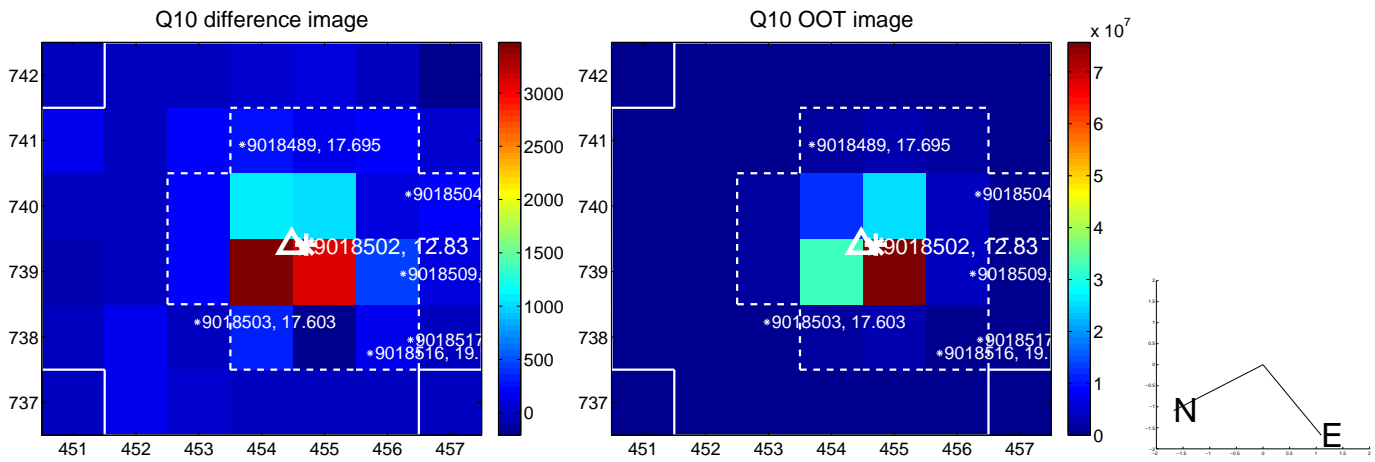
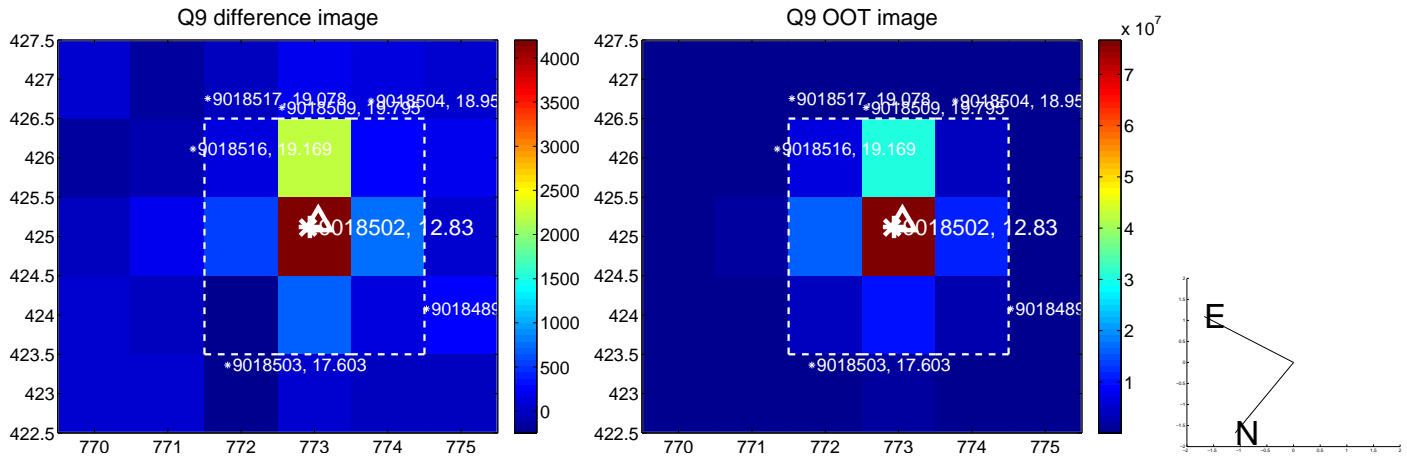
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



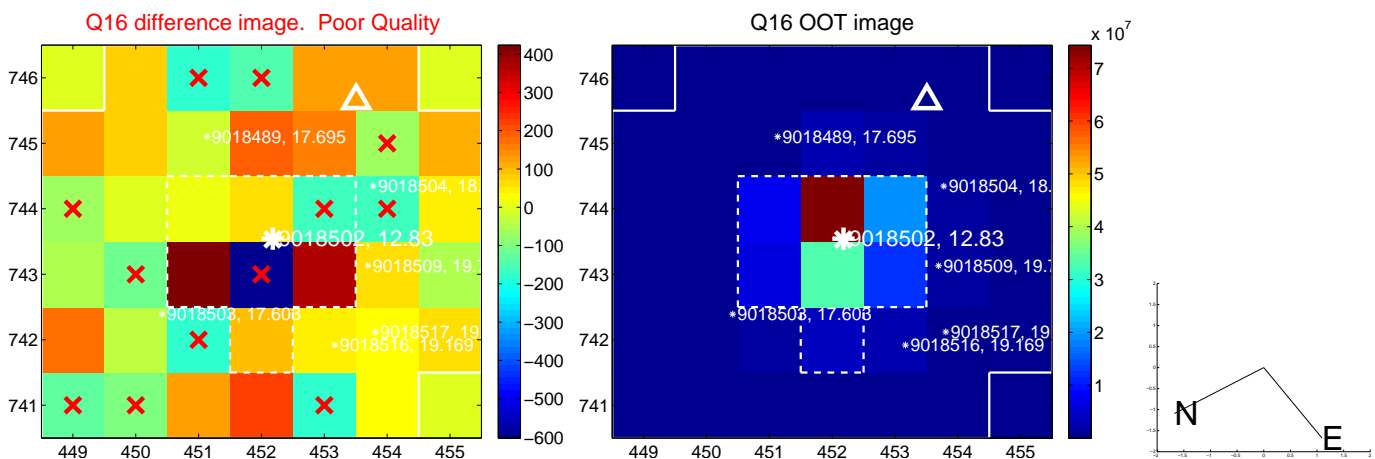
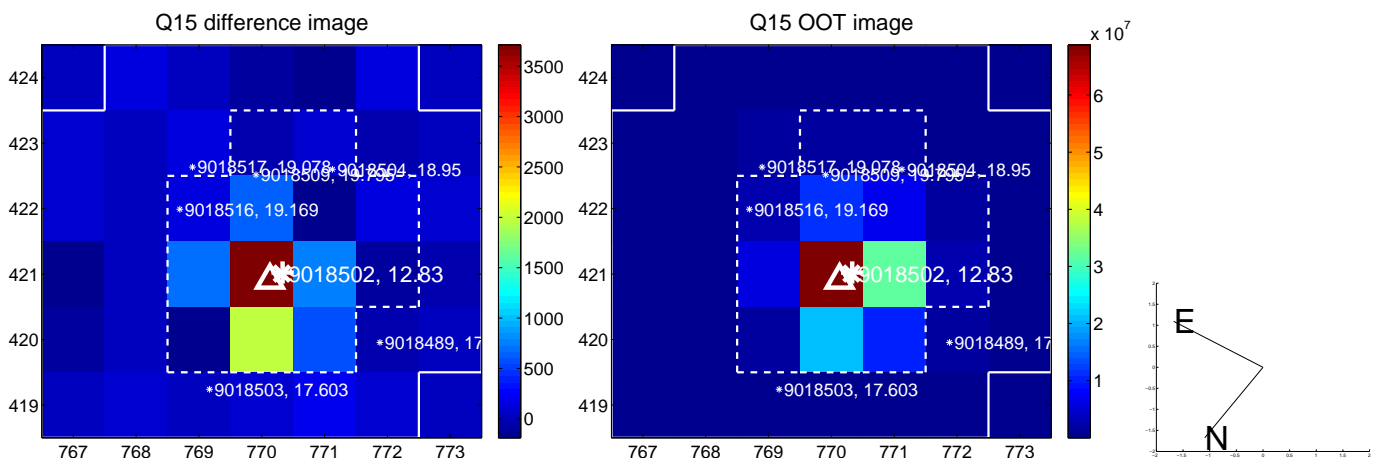
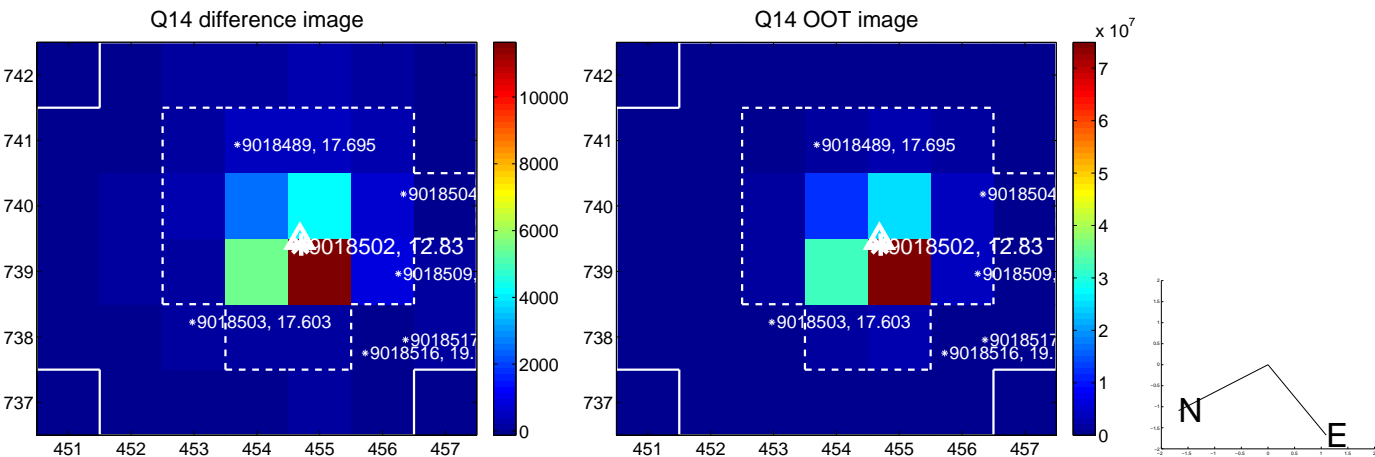
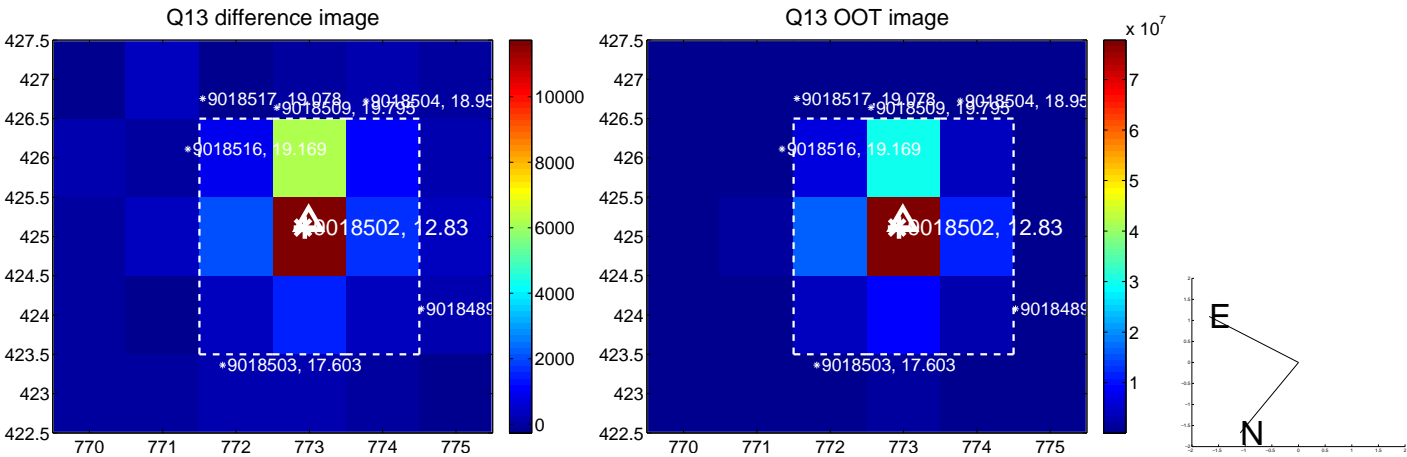
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



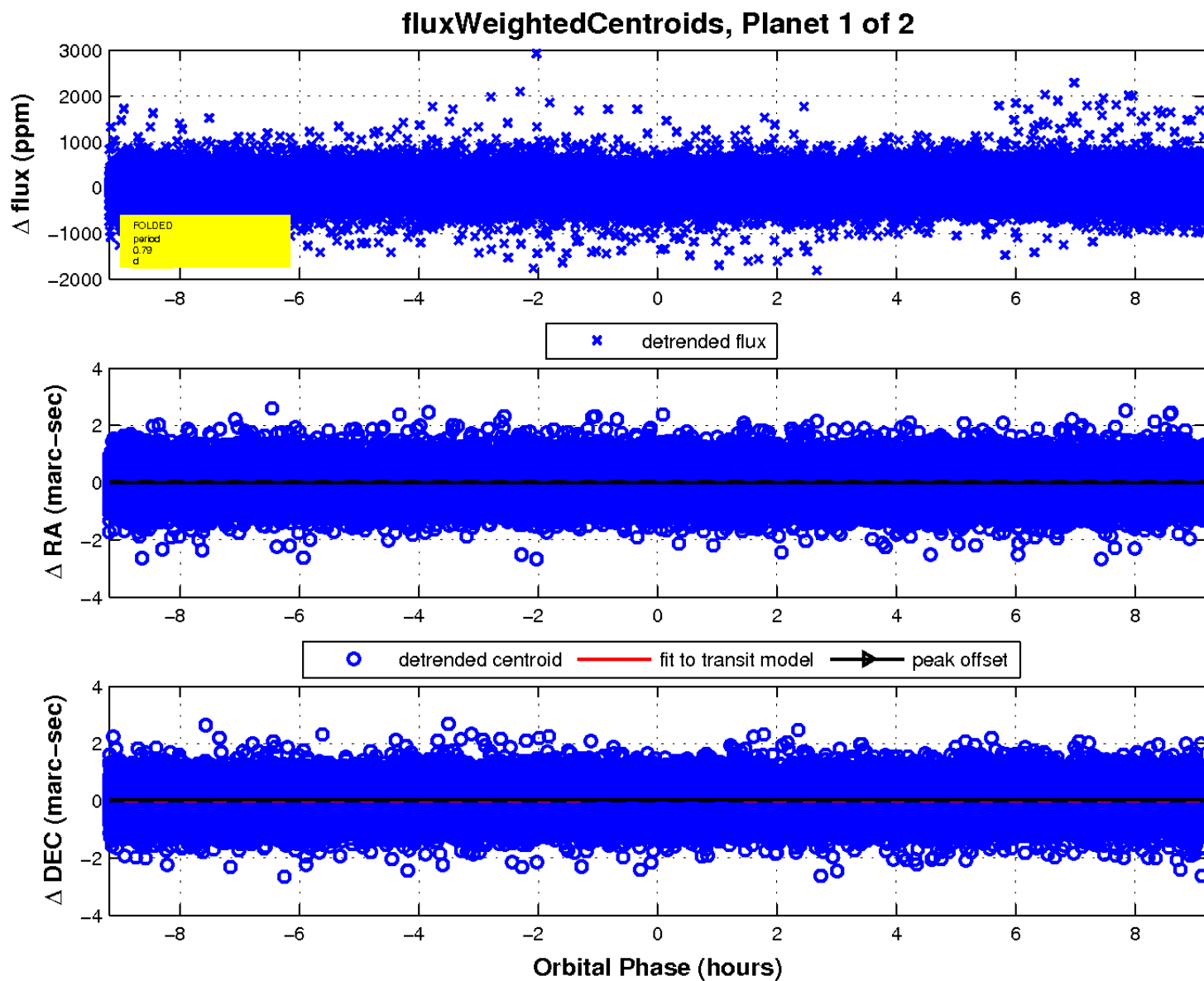
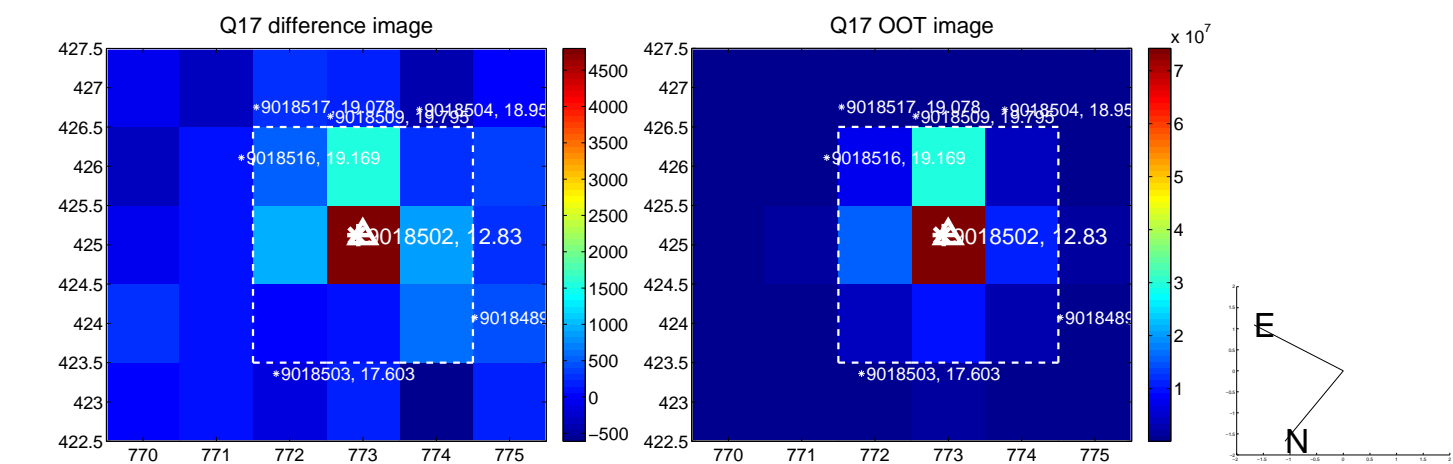
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



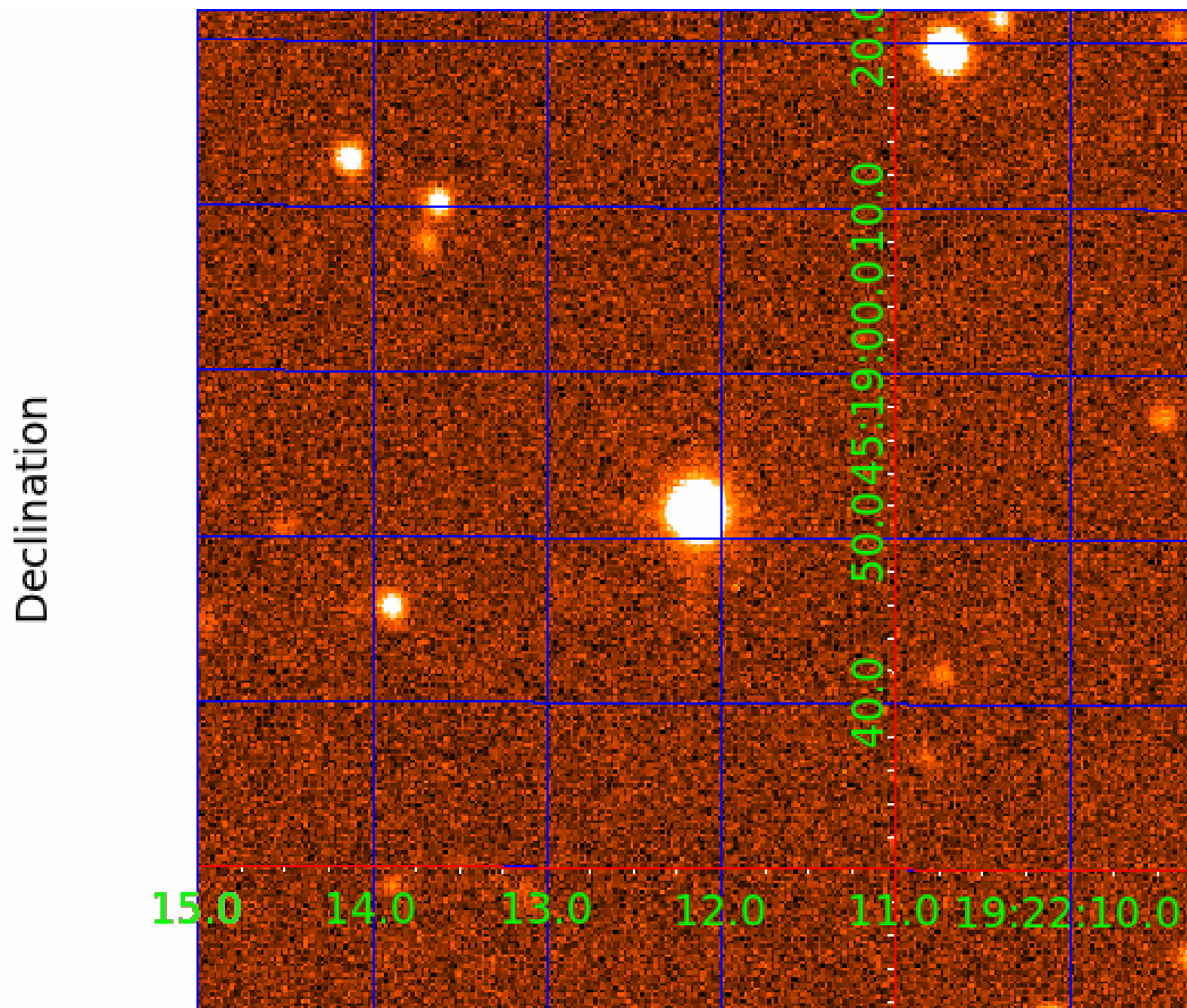
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009018502

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})
009018502-01	OBS	No	0.792356	131.744787	23.9	3.063	10.1	8.2	1.30	7160	0.74	12358.02
009018502-02	OBS	No	0.792311	132.276791	22.3	7.043	9.3	6.4	1.30	7160	0.69	12358.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009018502-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
009018502-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

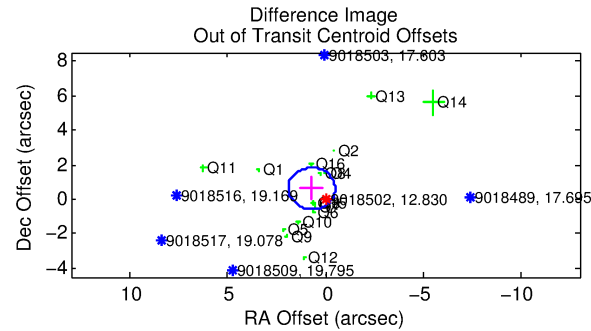
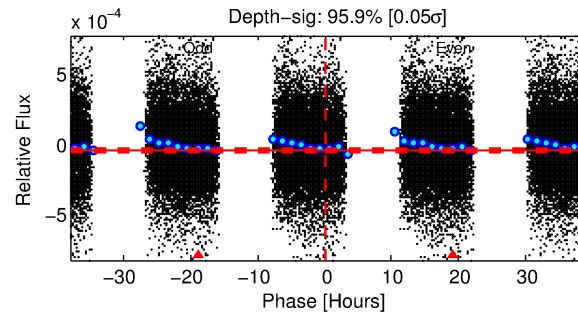
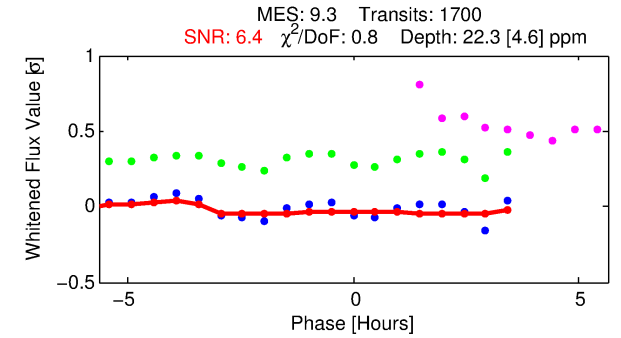
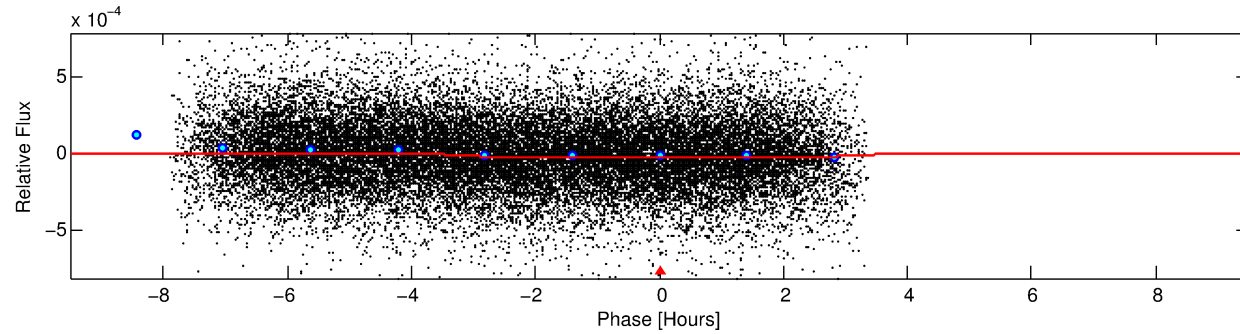
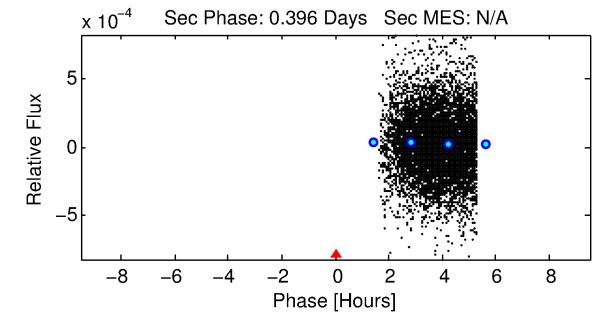
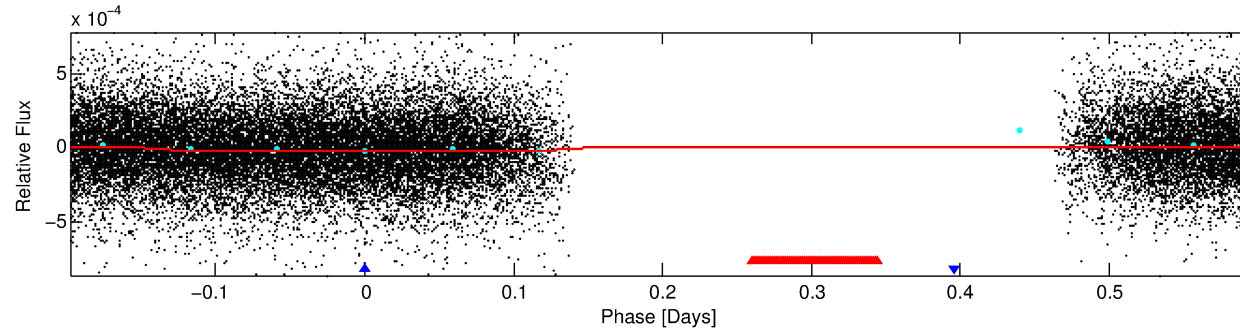
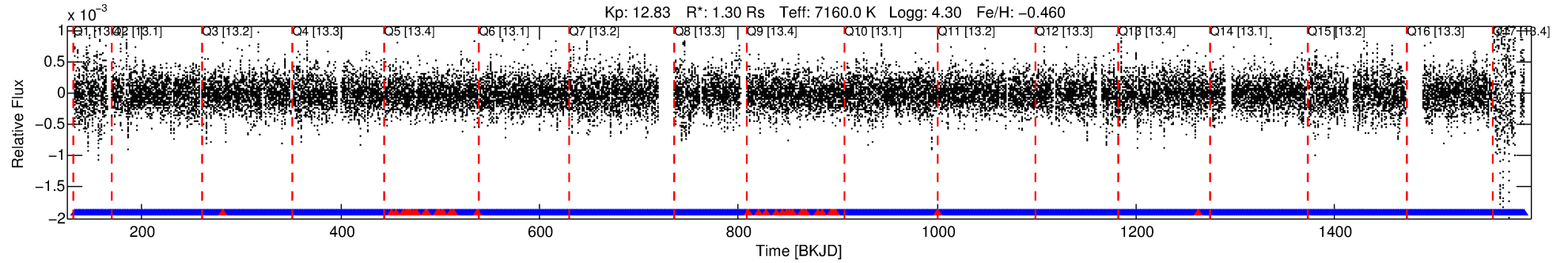
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009018502-02

No Significant Match Found

DV One-Page Summary

KIC: 9018502 Candidate: 2 of 2 Period: 0.792 d



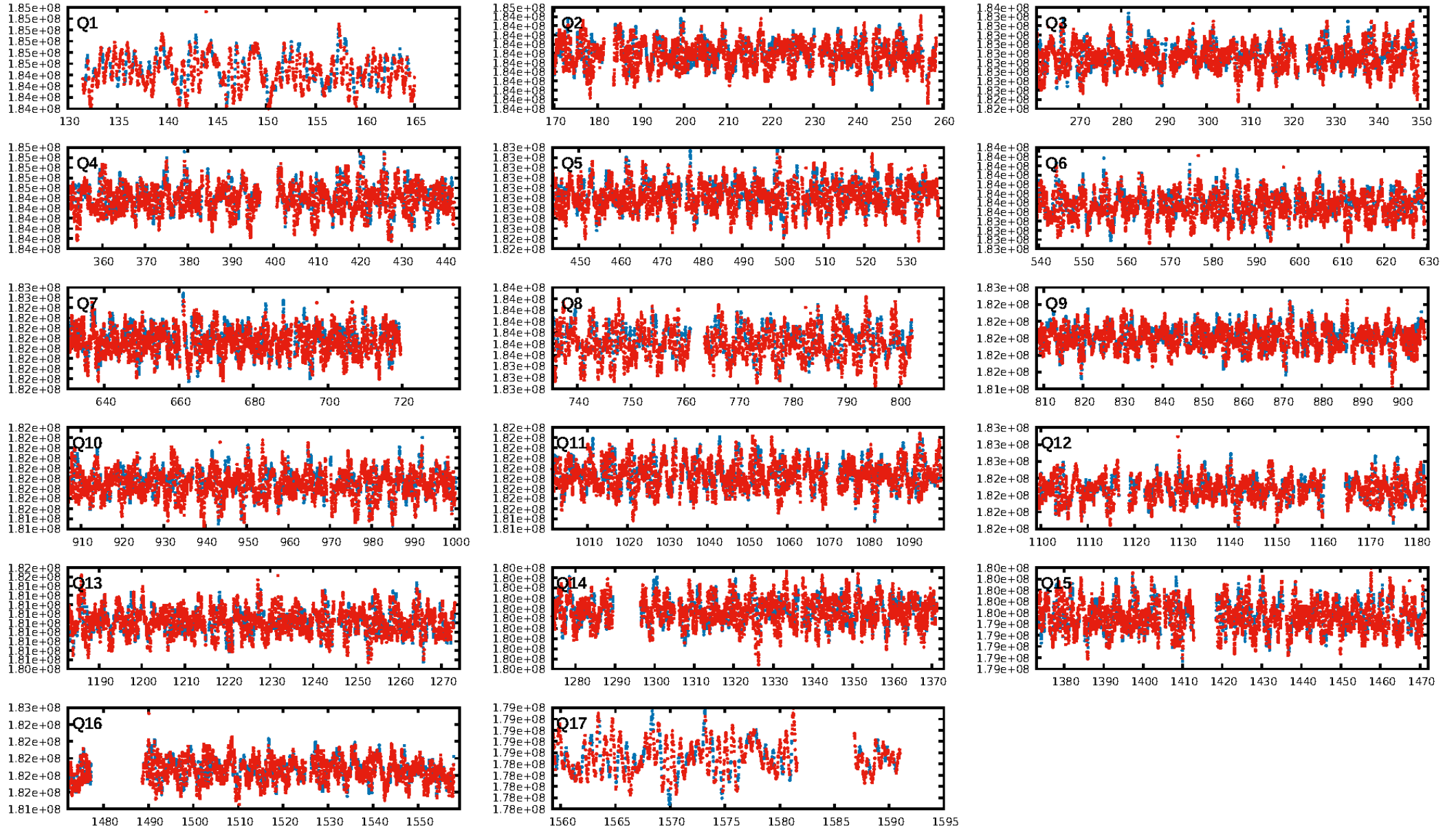
DV Fit Results:

Period = 0.79231 [0.00002] d
Epoch = 132.2768 [0.0127] BKJD
Rp/R* = 0.0049 [0.0025]
a/R* = 1.03 [0.19]
b = 0.85 [1.05]
Seff = 12358.97 [4809.59]
Teff = 2689 [262] K
Rp = 0.69 [0.41] Re
a = 0.0180 [0.0045] AU

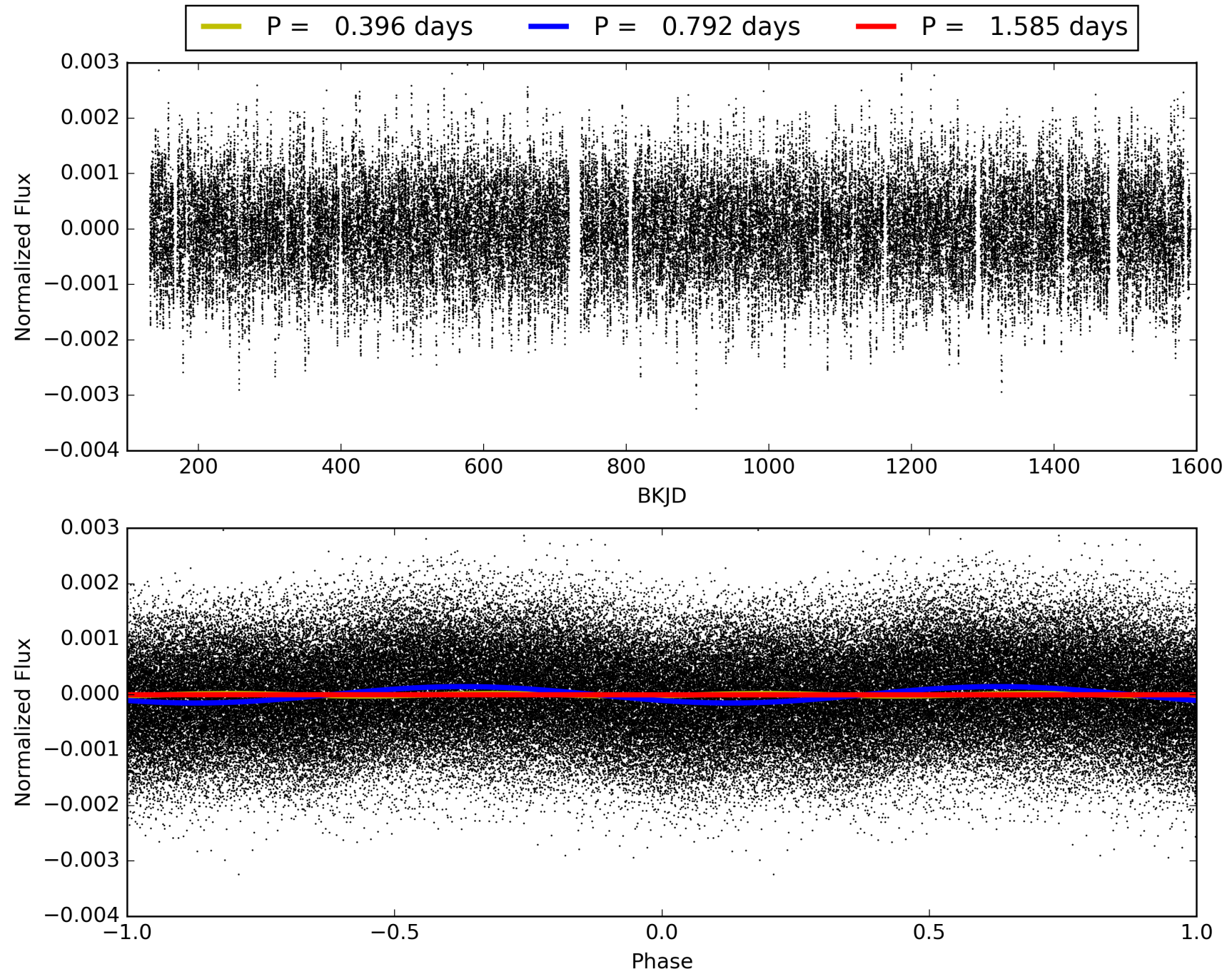
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.97 [1581/1622]
GhostDiagnostic-chr: 0.634
Centroid-sig: 1.0%
Centroid-so: 0.923 arcsec [1.88 σ]
OotOffset-rm: 0.938 arcsec [2.35 σ]
KicOffset-rm: 0.879 arcsec [2.01 σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.56 [9/16]
DiffImageOverlap-fno: 0.00 [0/17]

TCE 009018502-02, PDC Light Curves

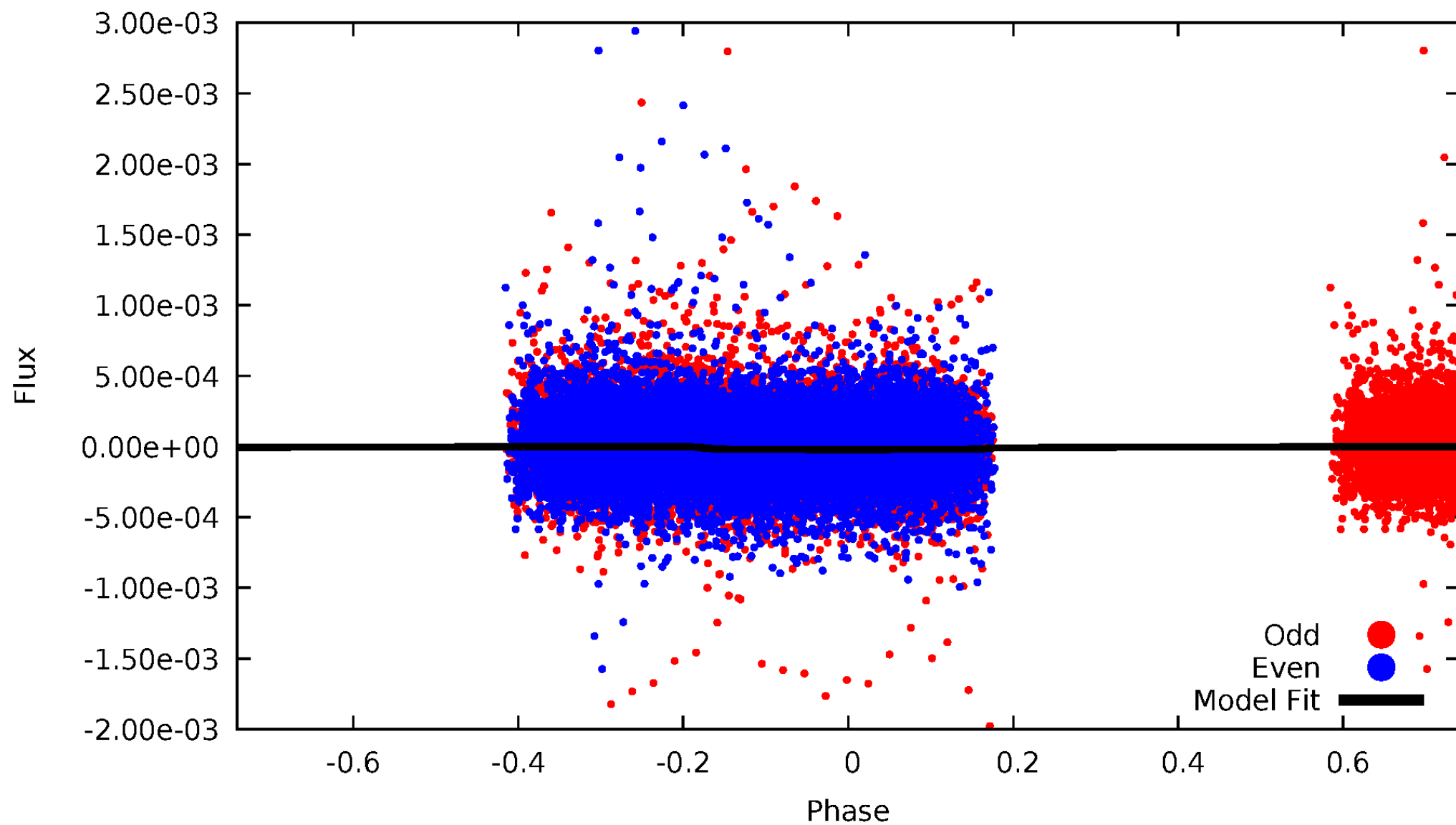


TCE 009018502-02



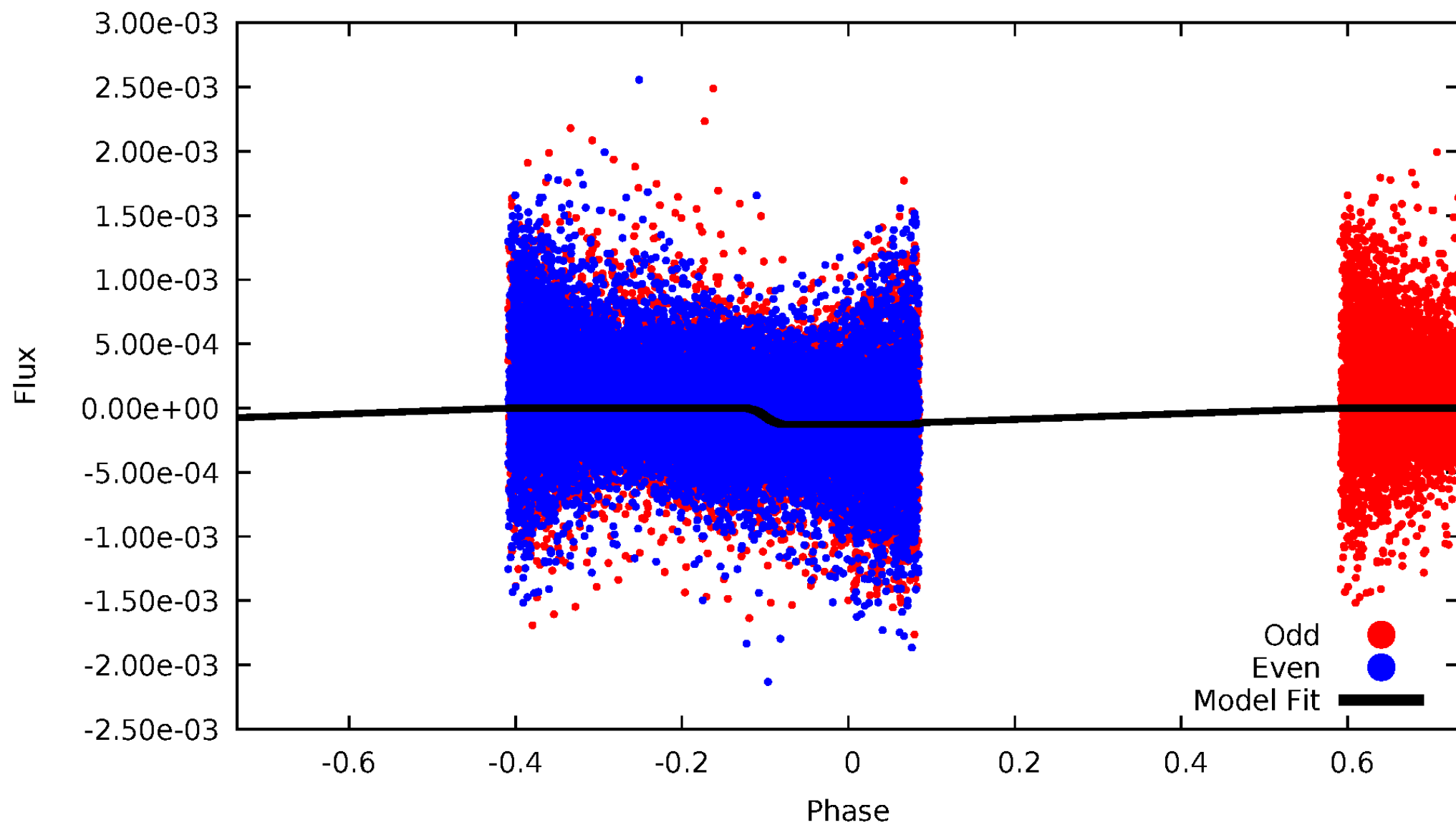
DV Odd/Even

TCE 009018502-02



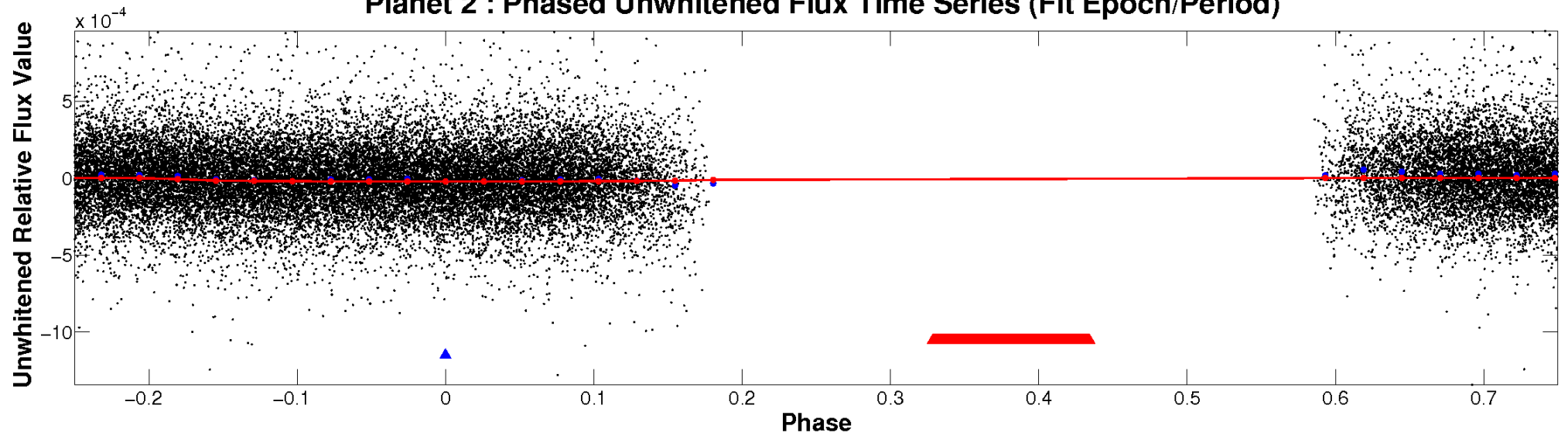
ALT Odd/Even

TCE 009018502-02

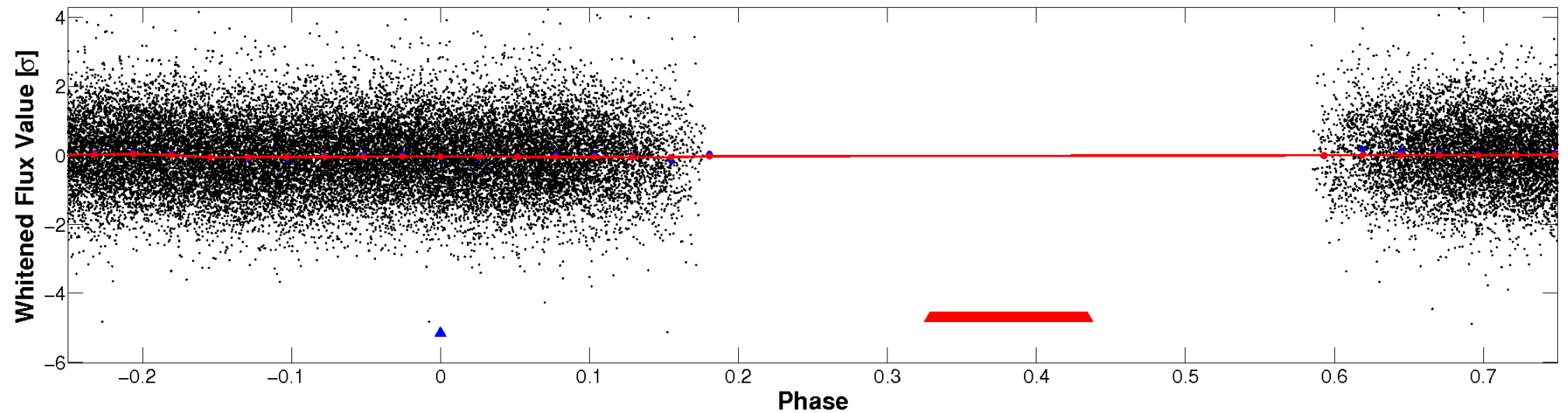


Non-Whitened Vs. Whitened Light Curve

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

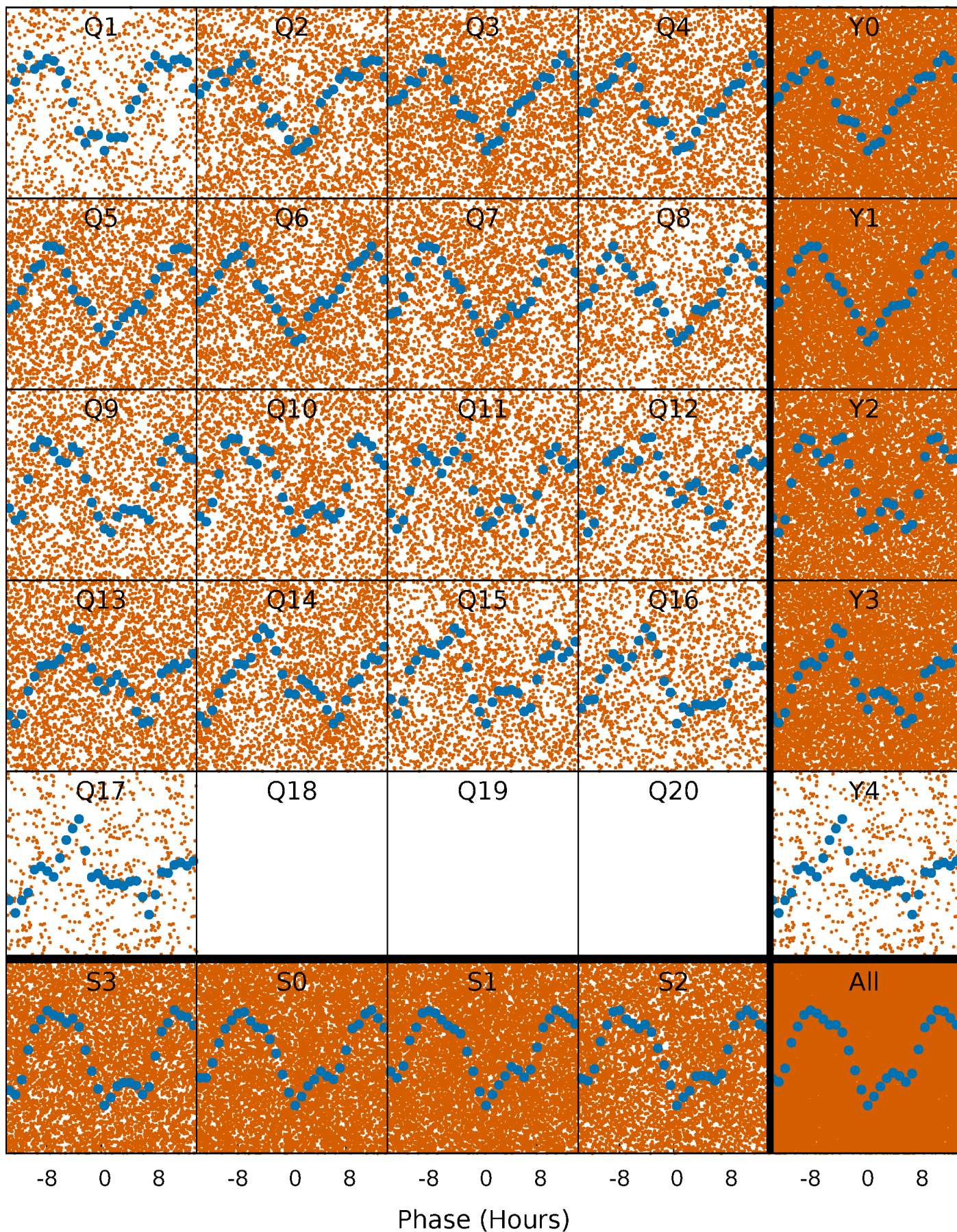


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



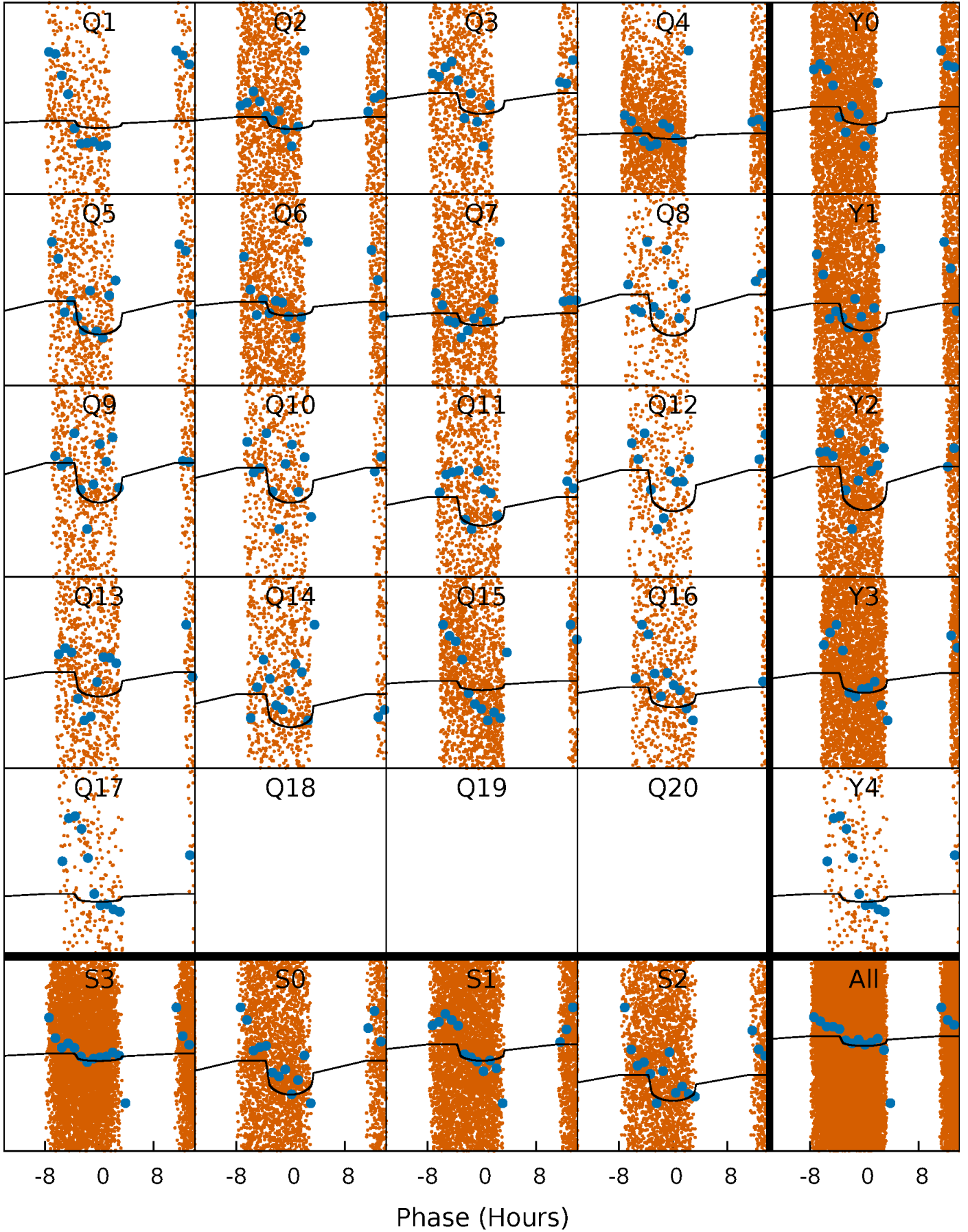
PDC Quarter-Phased Transit Curves

TCE 009018502-02 P= 0.792311 Days $T_0=132.276791$ (BKJD)



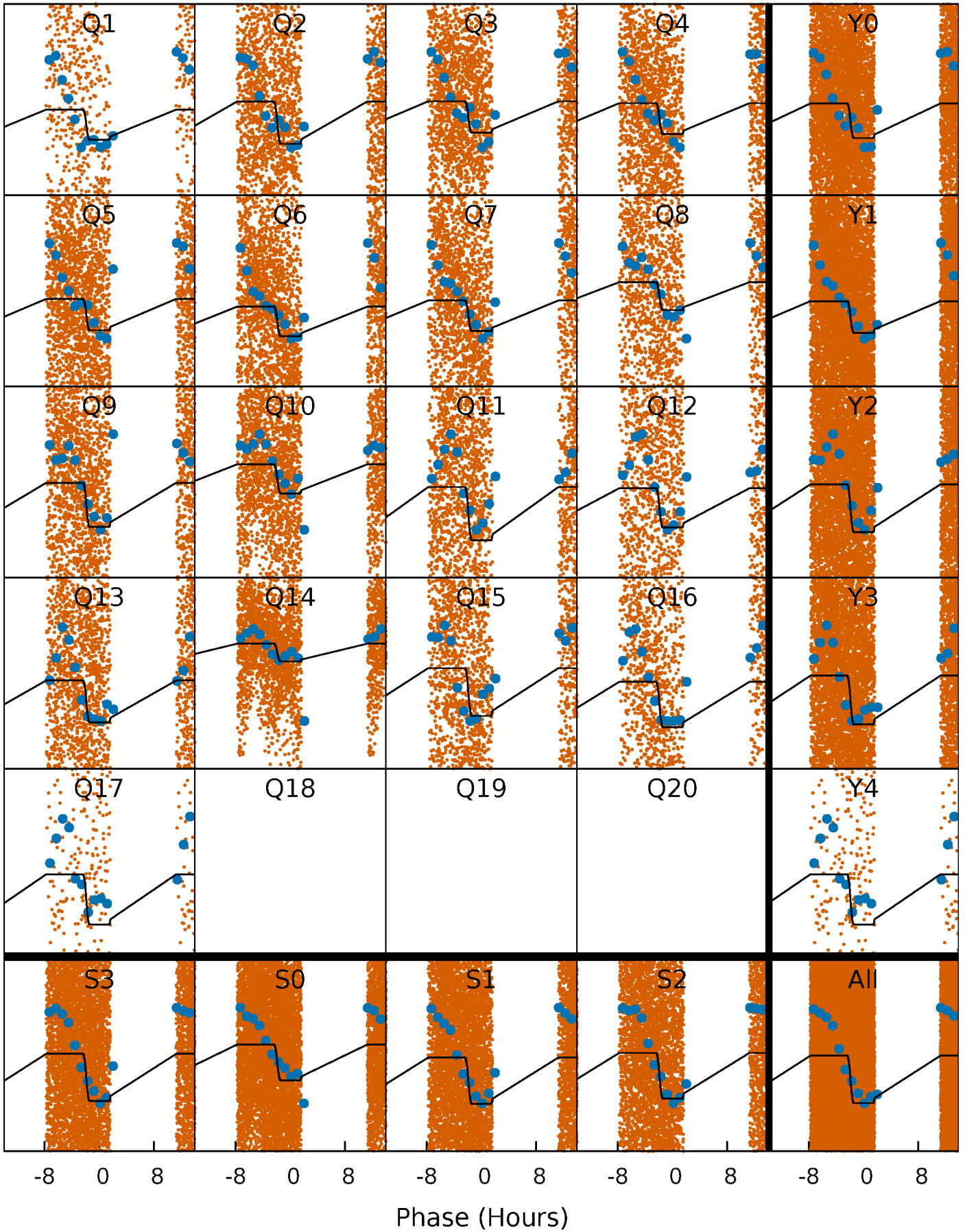
DV Quarter-Phased Transit Curves

TCE 009018502-02 $P = 0.792311$ Days $T_0 = 132.276791$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

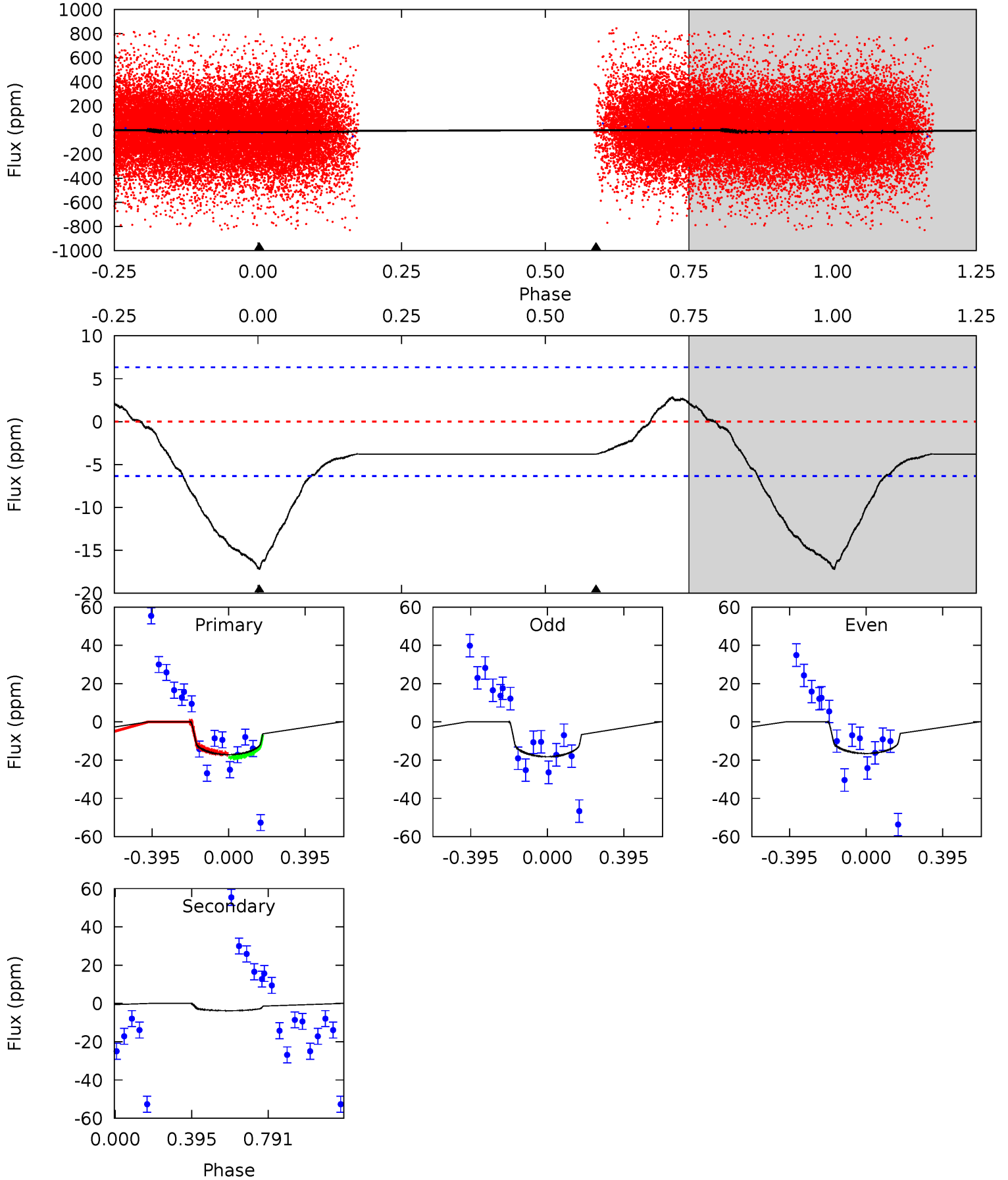
TCE 009018502-02 $P = 0.792354$ Days $T_0 = 132.270772$ (BKJD)



DV Model-Shift Uniqueness Test

009018502-02, P = 0.792311 Days, E = 131.484480 Days

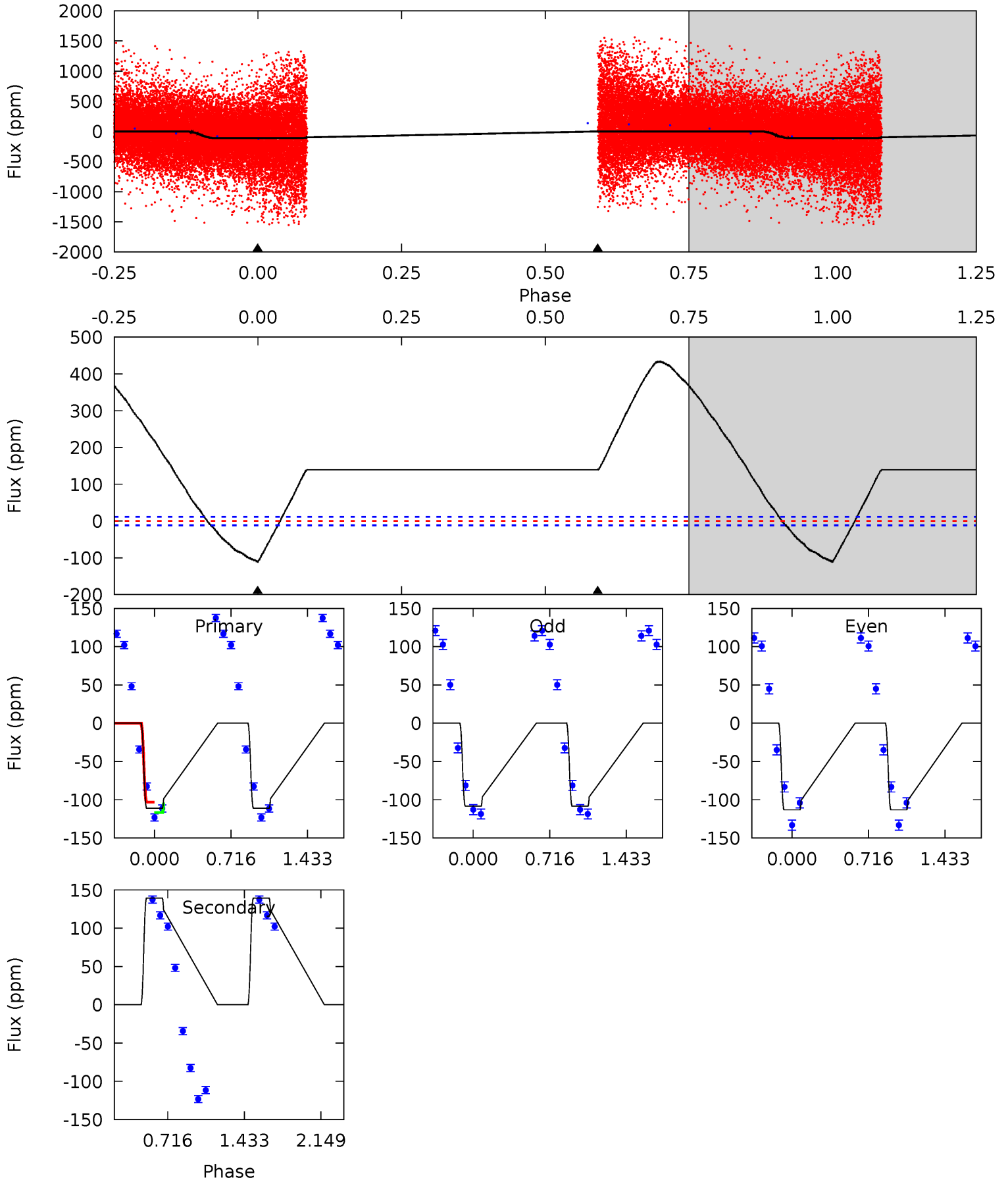
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.6	2.55	0	0	4.27	0.85	0.45	11.6	11.6	2.55	2.55	0.58	0.95	0.14	0.62



Alt Model-Shift Uniqueness Test

009018502-02, P = 0.792354 Days, E = 131.478418 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.6	-50.9	0	0	4.13	0.36	10.5	40.6	40.6	-50.9	-50.9	0.90	1.11	0.80	1.66



Stellar Parameters For KIC 009018502

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7160^{+200}_{-251}	$4.300^{+0.084}_{-0.196}$	$-0.460^{+0.250}_{-0.300}$	$1.303^{+0.397}_{-0.183}$	$1.240^{+0.179}_{-0.163}$	$0.789^{+0.354}_{-0.389}$
	+3%/-4%	+2%/-5%	+54%/-65%	+30%/-14%	+14%/-13%	+45%/-49%
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 009018502-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-4 ± 1	$0.72^{+0.36}_{-0.37}$	3811^{+272}_{-199}	4367^{+1953}_{-1145}	$1.250^{+4.265}_{-0.803}$
Alt.	139 ± 3	$1.67^{+0.47}_{-0.42}$	3805^{+296}_{-203}	-7442^{+839}_{-1149}	$-8.837^{+3.406}_{-6.608}$

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

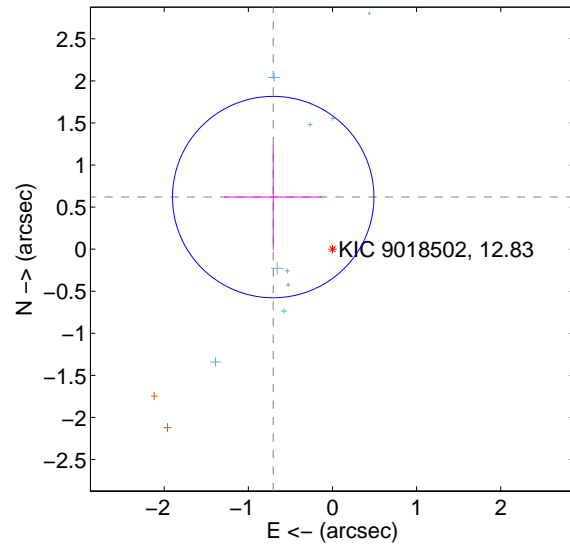
Supplemental centroid analysis for 009018502-02. Kepler magnitude: 12.83. Transit SNR 6.43

There are 9 quarters with good PRF difference image offsets

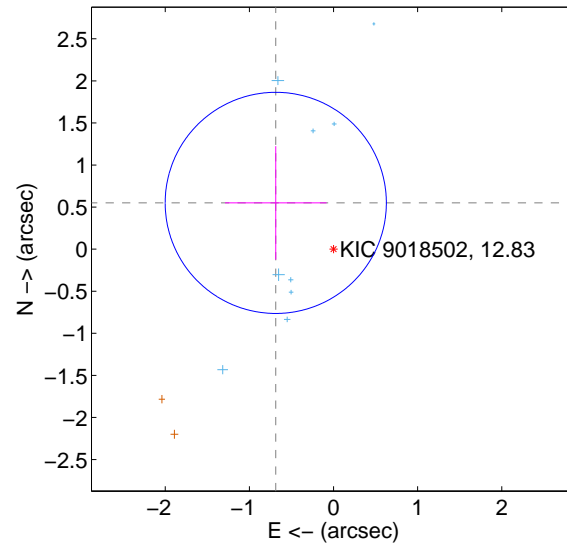
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.938 ± 0.399	2.35	0.704 ± 0.586	0.619 ± 0.626
PRF-fit source offset from KIC position	0.879 ± 0.438	2.01	0.686 ± 0.603	0.550 ± 0.674
photometric centroid source offset	0.92 ± 0.49	1.88	-0.54 ± 0.48	-0.75 ± 0.49

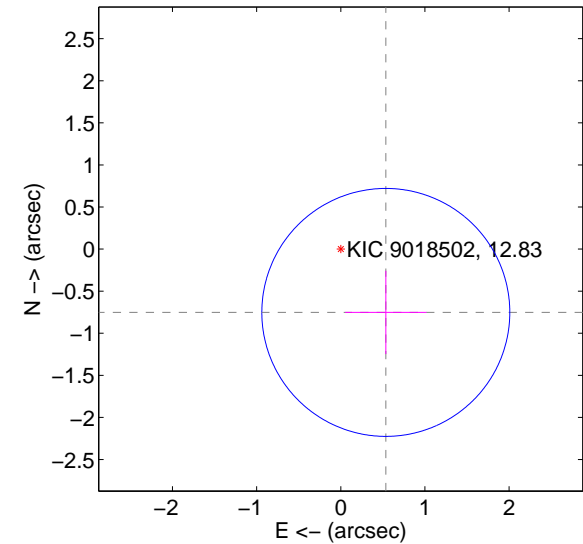
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

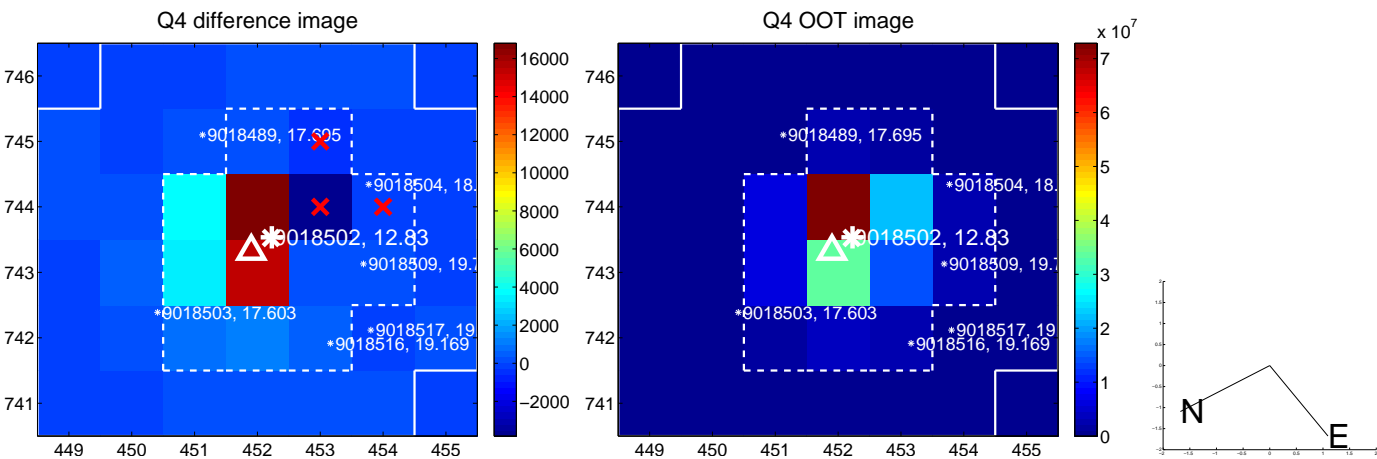
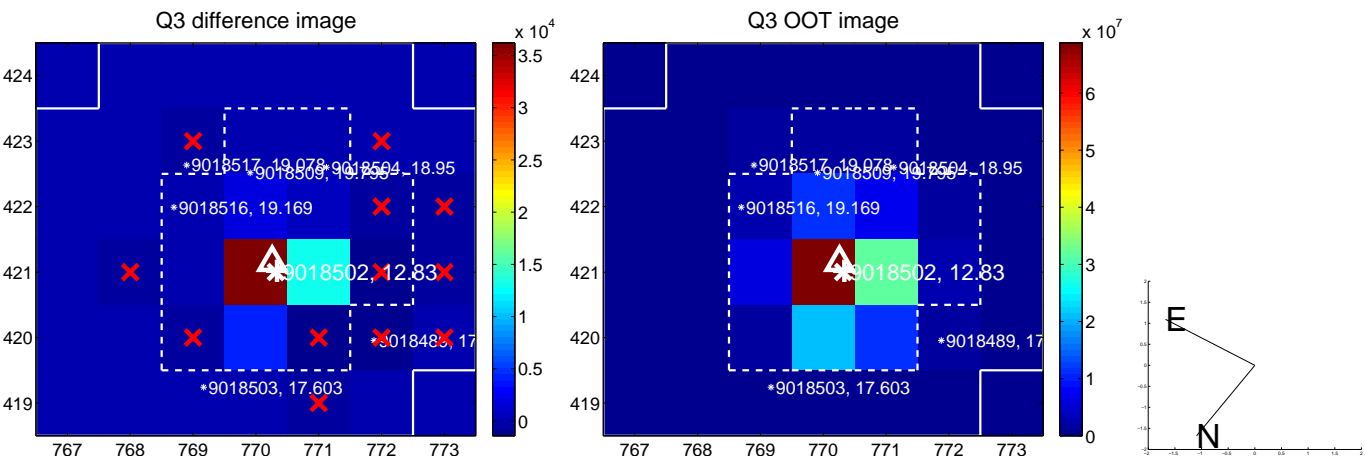
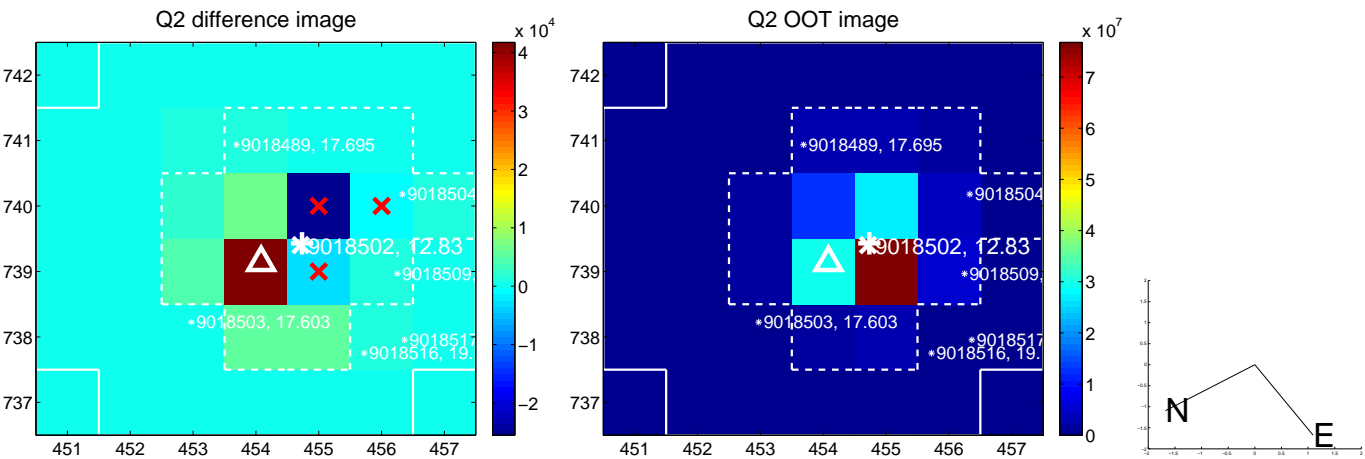
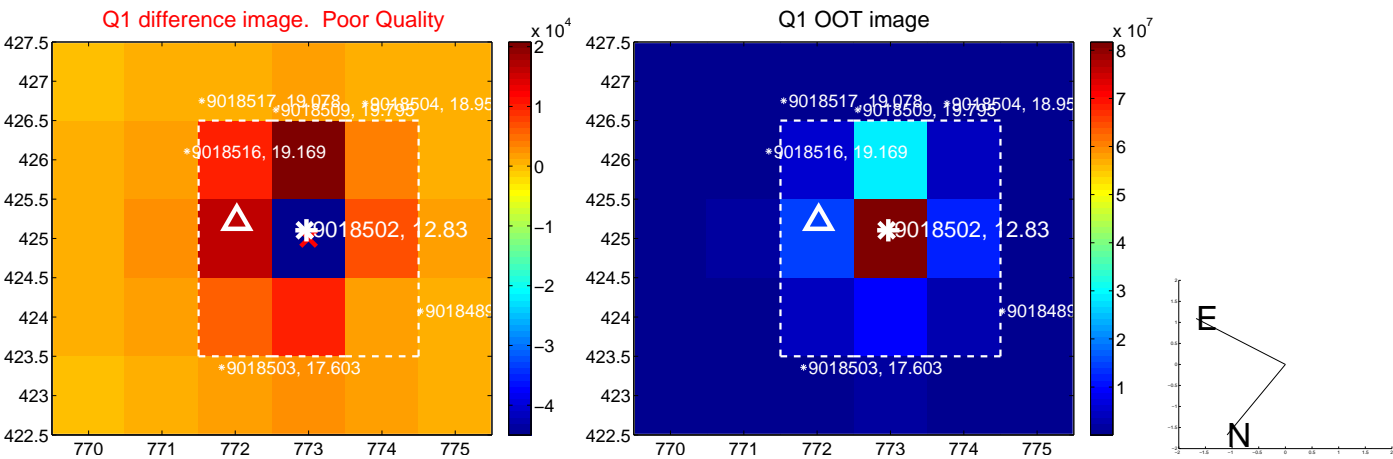


offset from photometric centroids

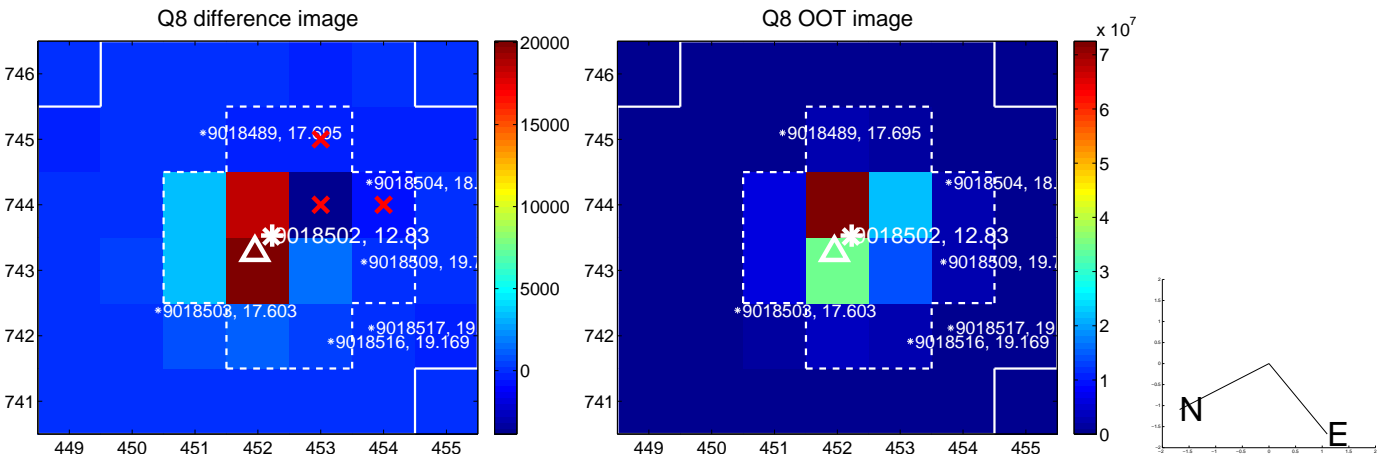
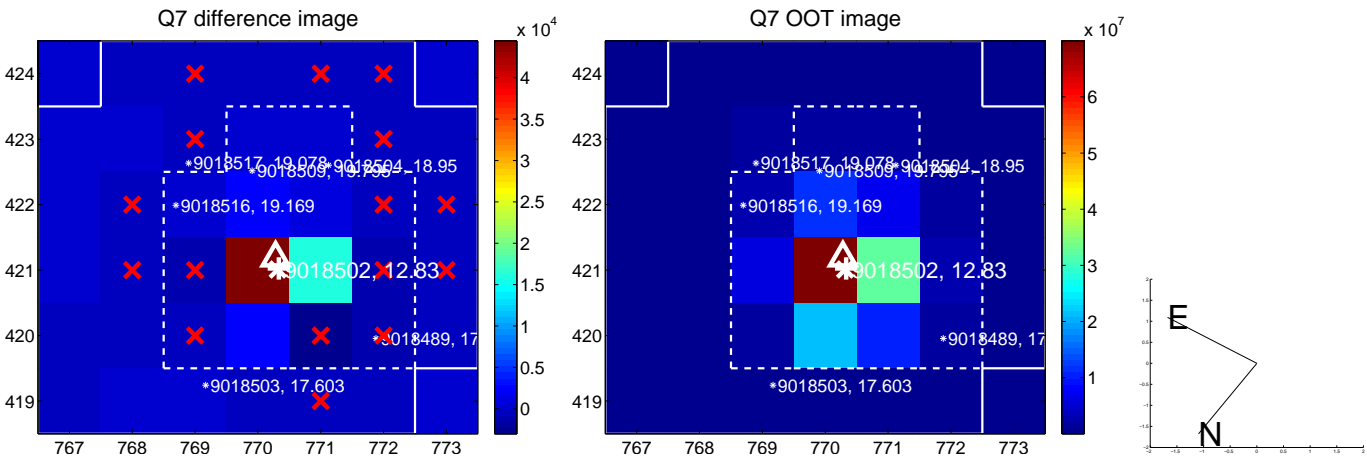
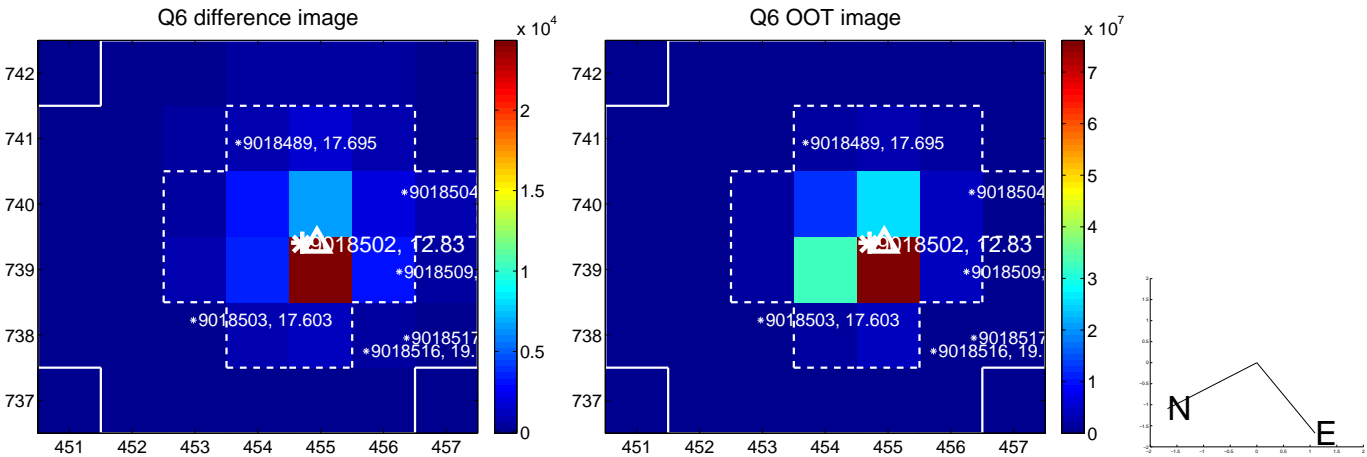
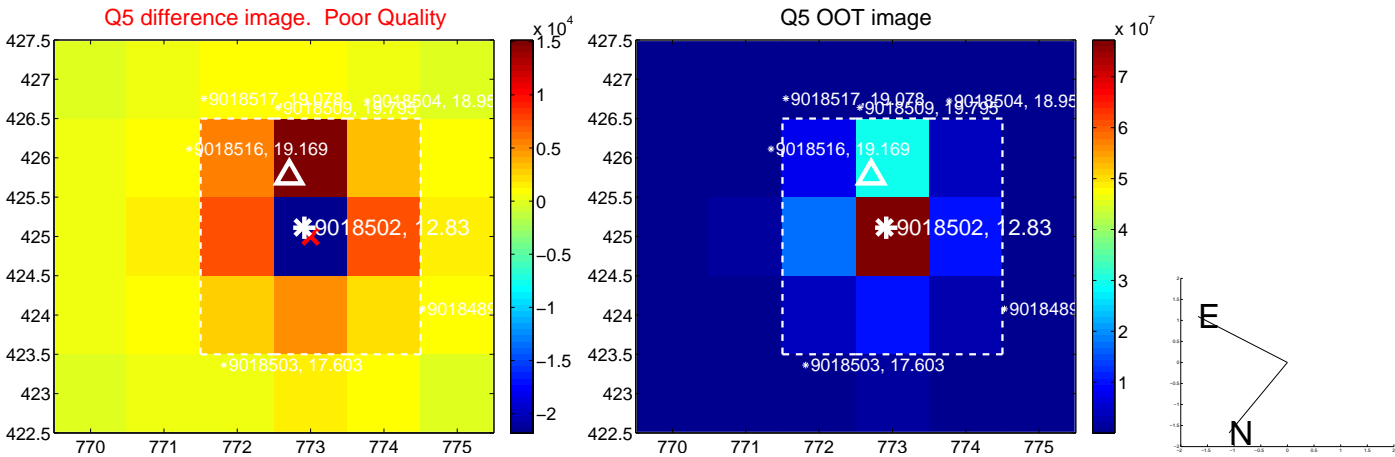


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

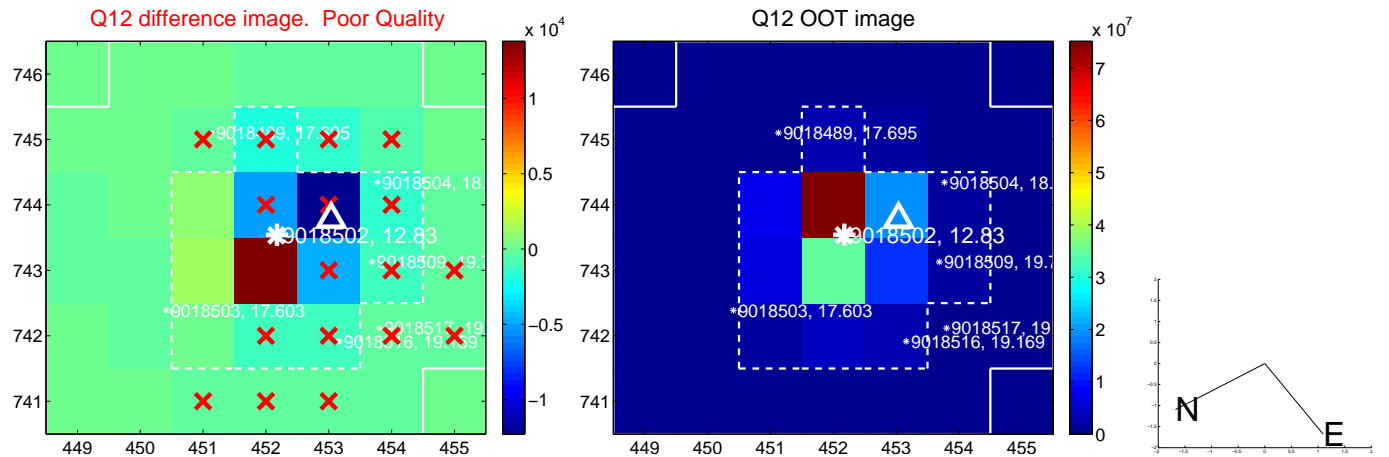
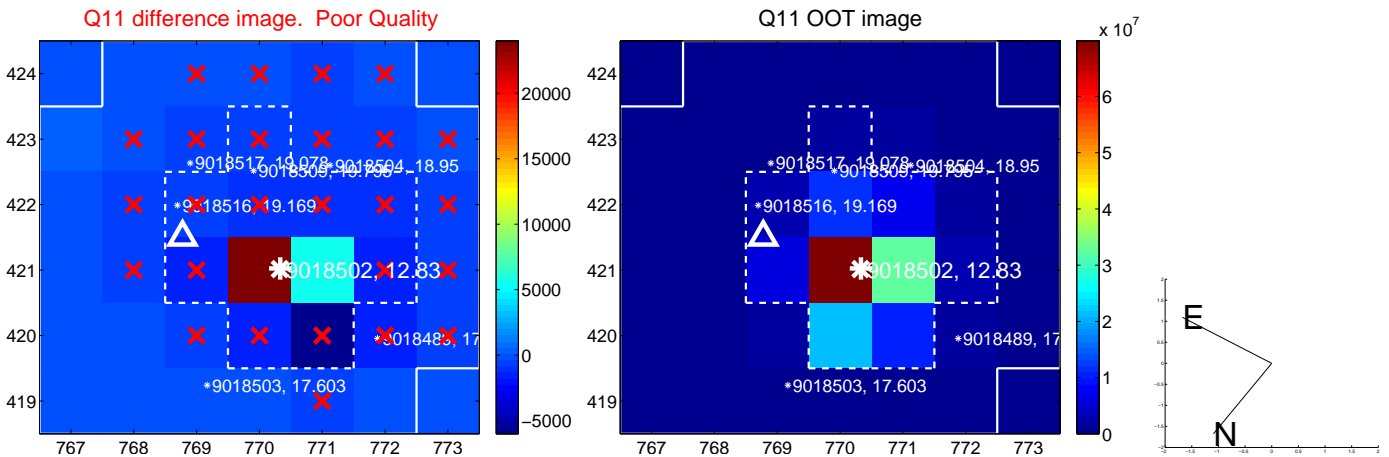
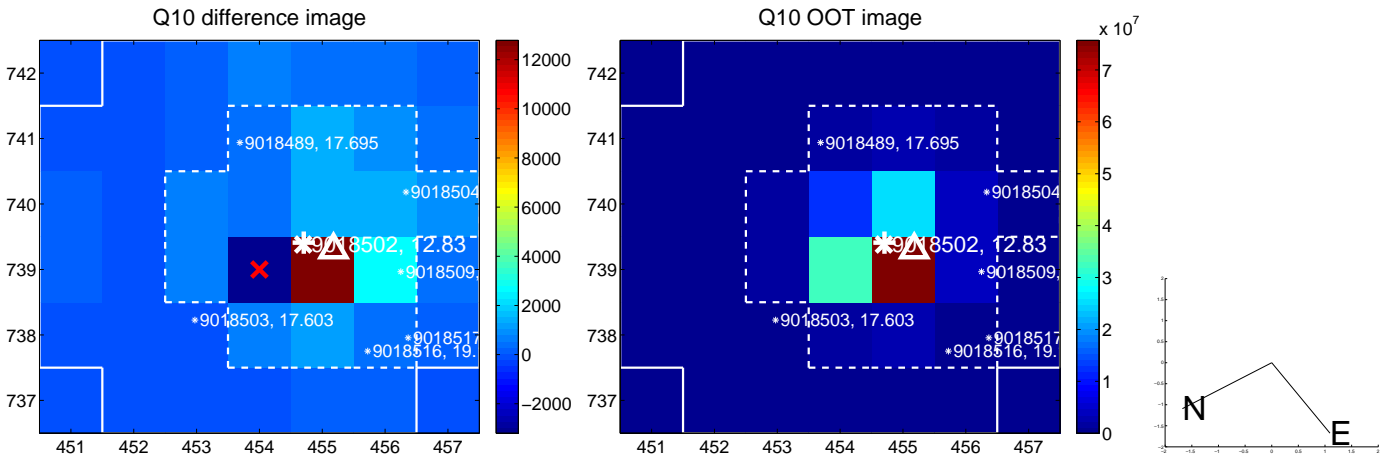
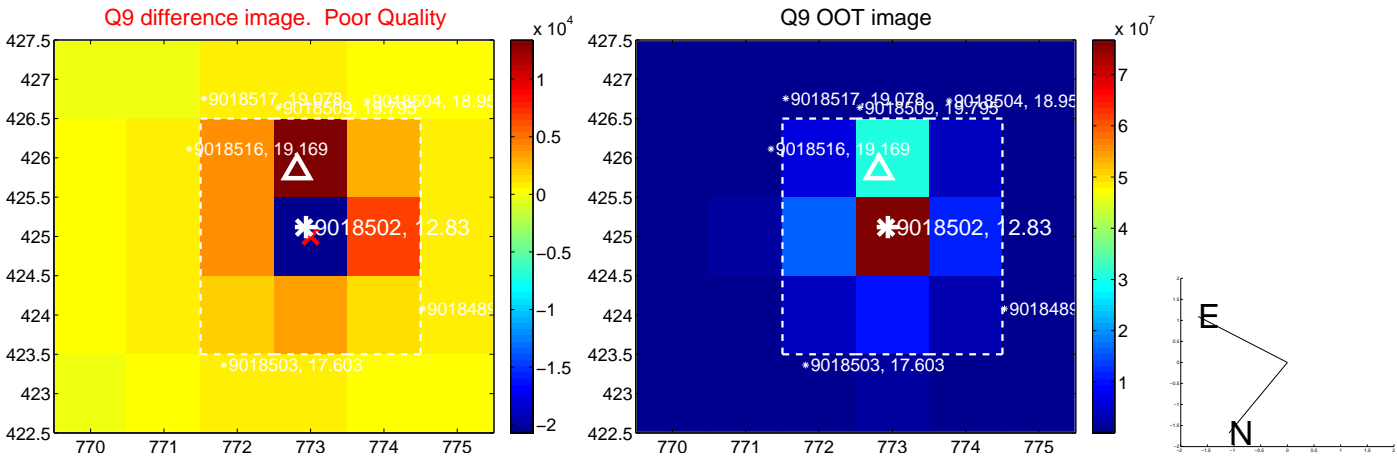
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



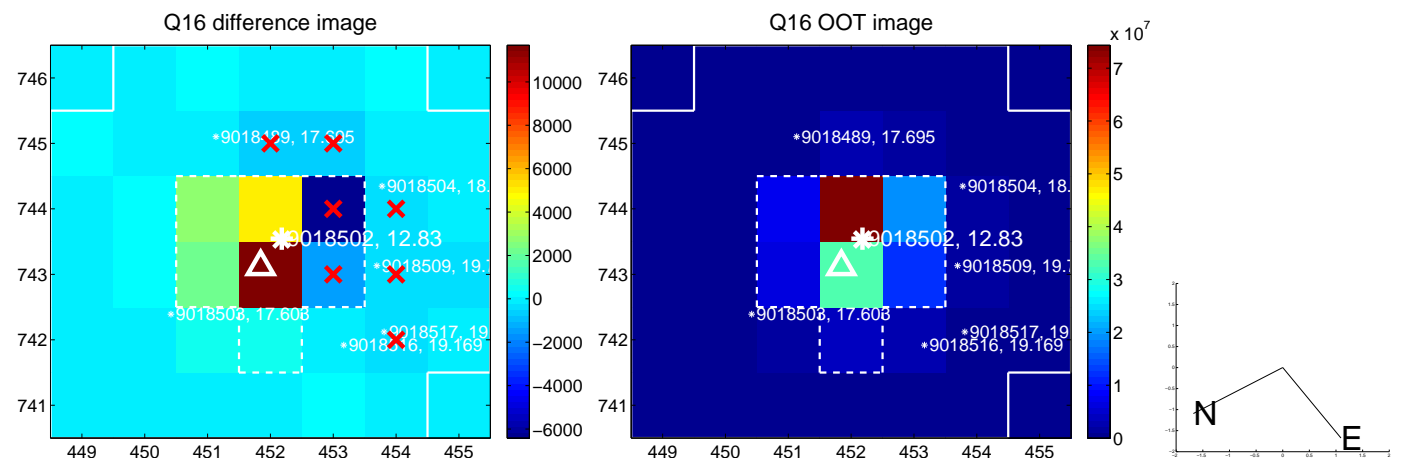
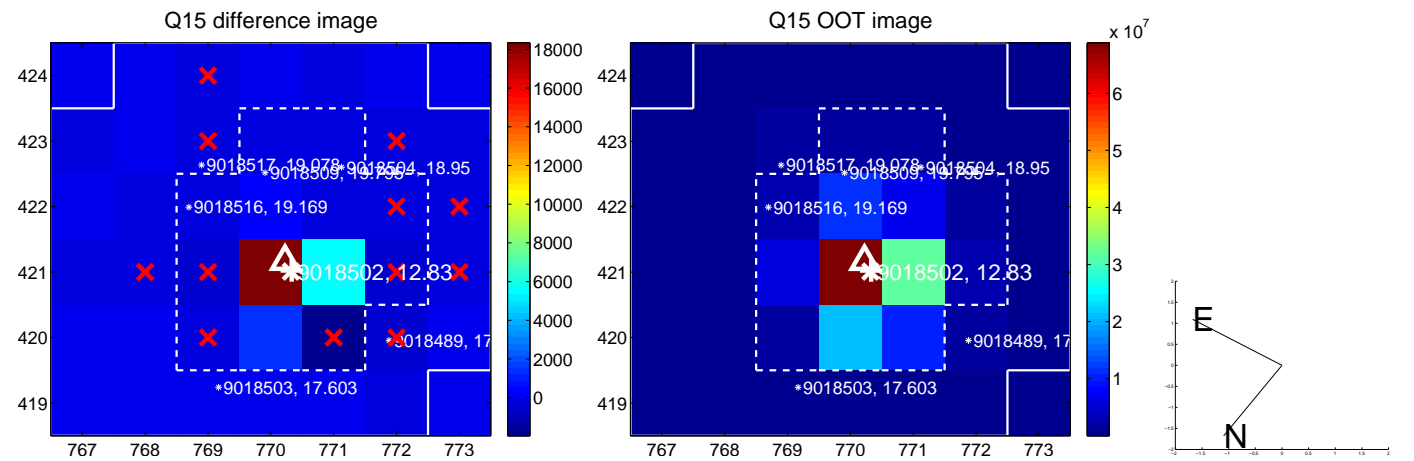
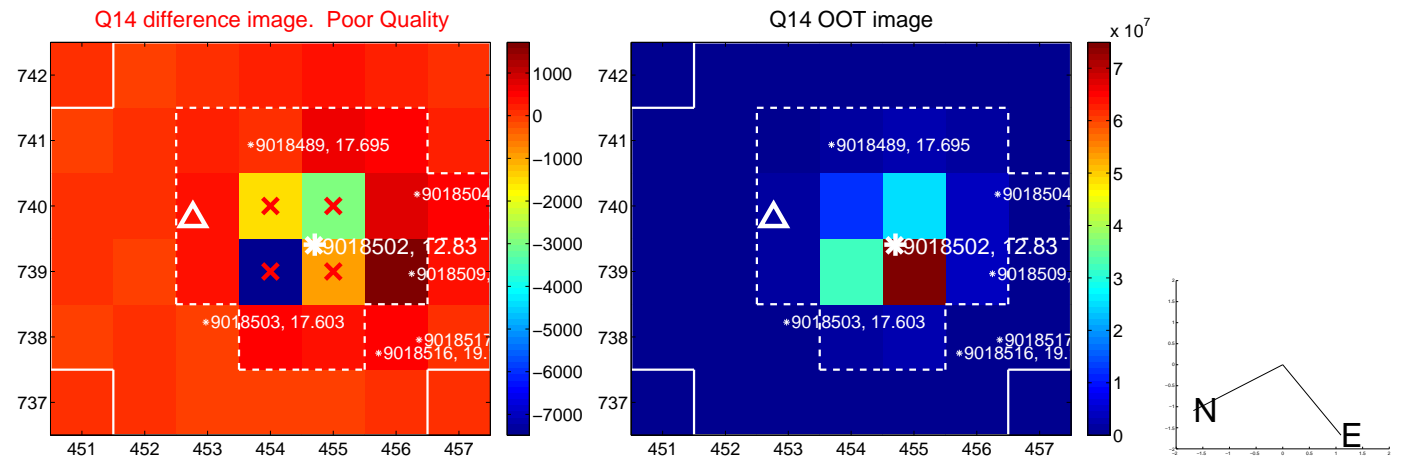
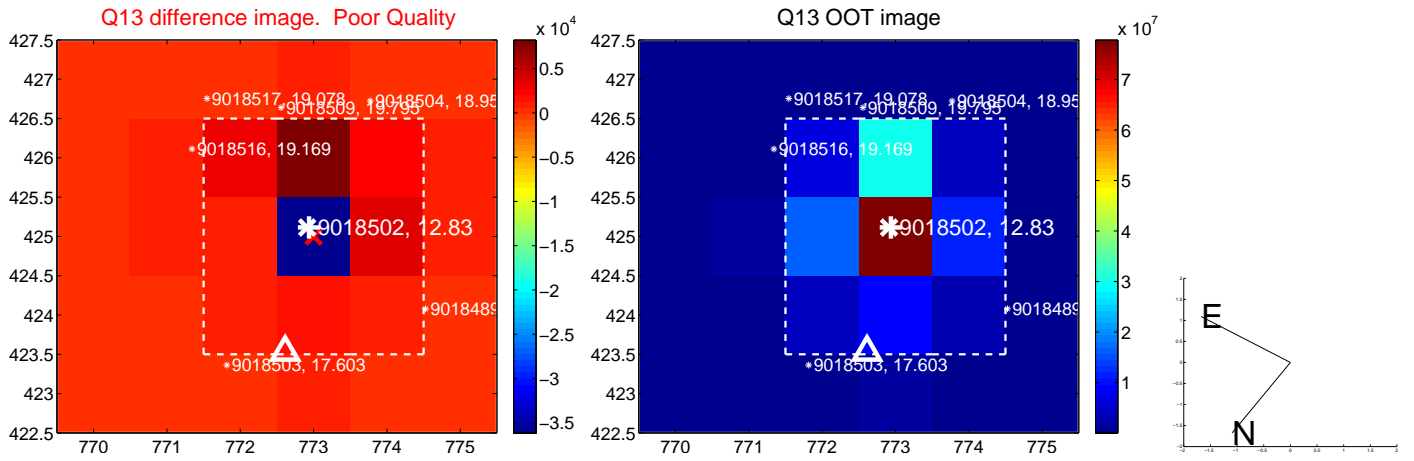
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



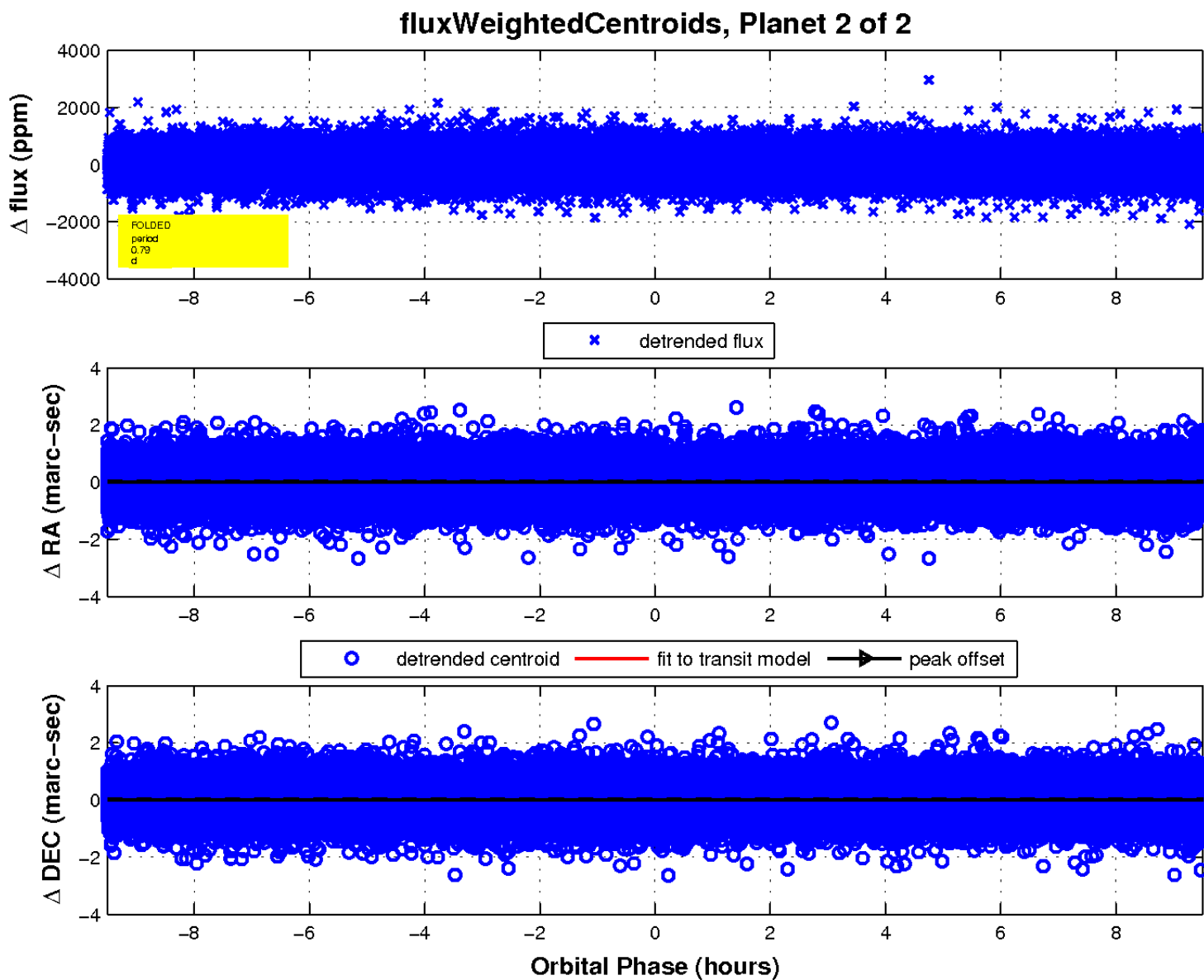
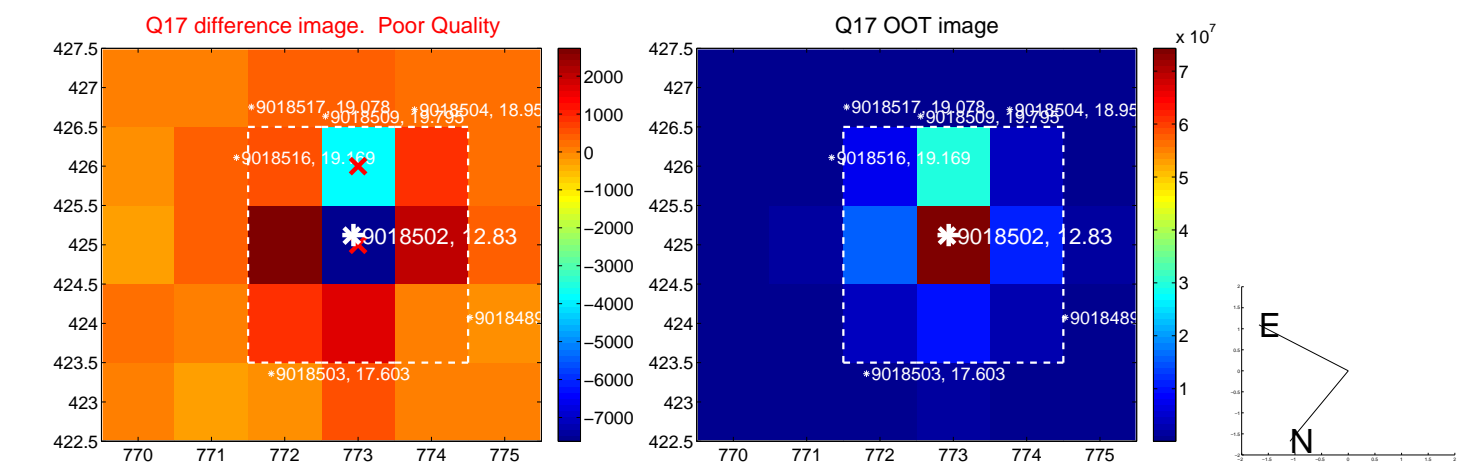
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

