

KIC 008491816

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})
008491816-01	OBS	No	0.698553	131.607169	79.5	0.550	8.5	7.0	3.48	7610	3.24	95639.30
008491816-02	OBS	No	2.406776	131.963074	54.9	5.489	7.4	5.9	3.48	7610	3.02	18378.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008491816-01	OBS	FP	0.00	1	0	0	0	LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
008491816-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

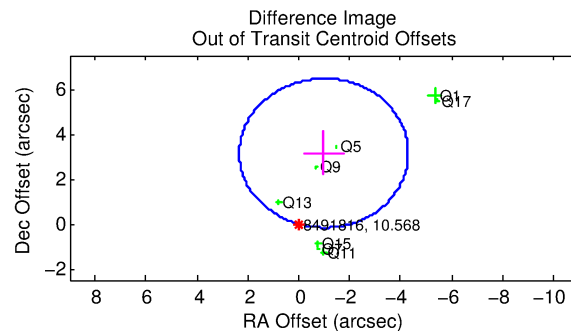
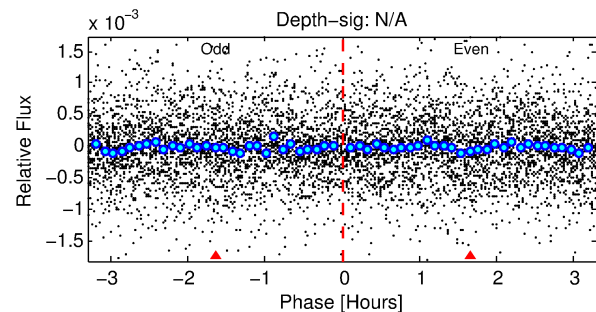
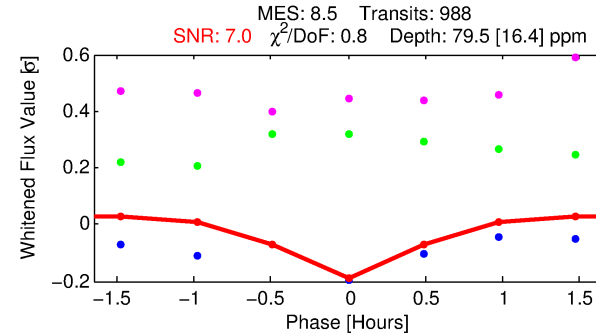
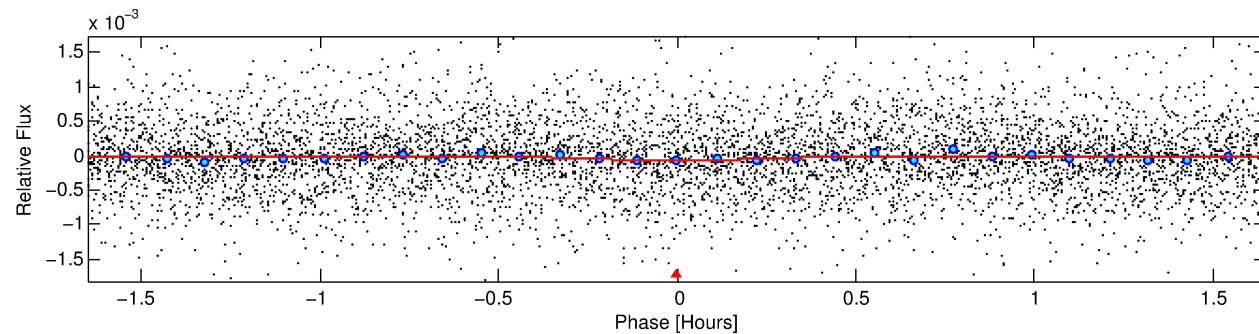
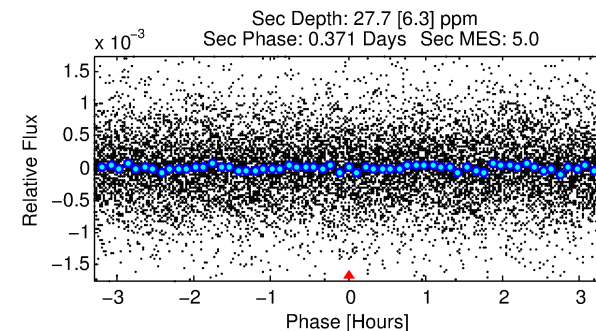
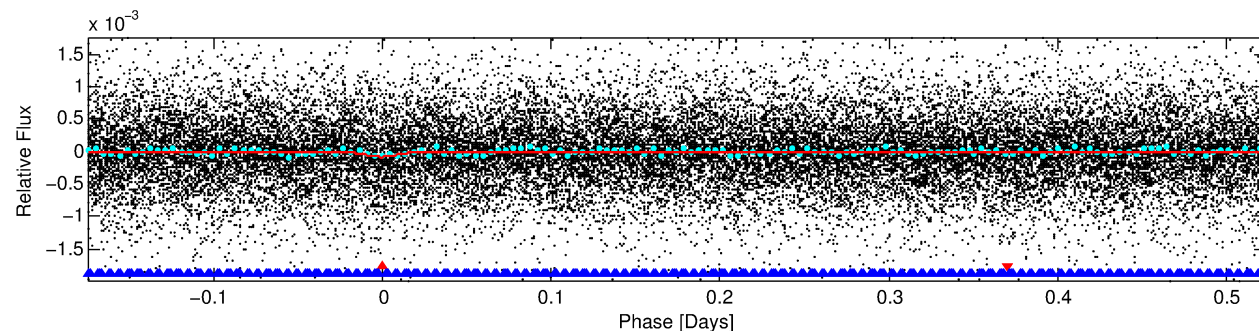
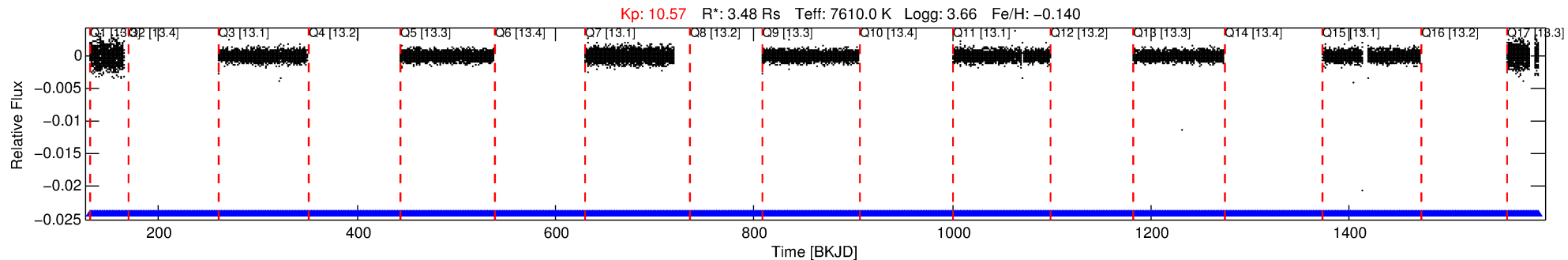
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008491816-01

No Significant Match Found

DV One-Page Summary

KIC: 8491816 Candidate: 1 of 2 Period: 0.699 d



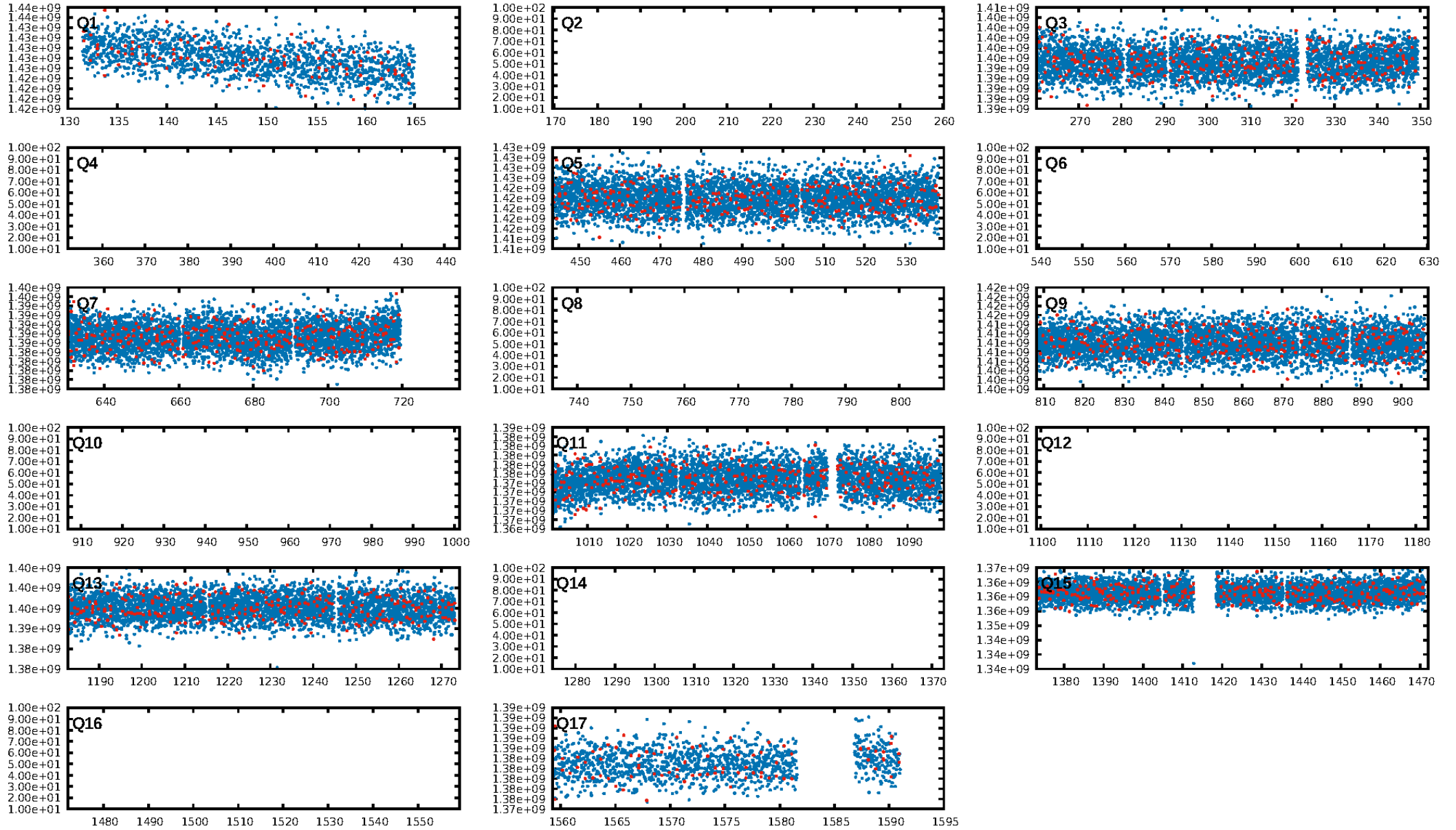
DV Fit Results:

Period = 0.69855 [0.00001] d
Epoch = 131.6072 [0.0024] BKJD
Rp/R* = 0.0085 [0.0162]
a/R* = 9.66 [101.62]
b = 0.17 [59.34]
Seff = 95639.30 [76565.35]
Teq = 4484 [897] K
Rp = 3.24 [6.37] Re
a = 0.0195 [0.0096] AU
Ag = 0.55 [2.15] [-0.21σ]
Teff = 5978 [5687] K [0.26σ]

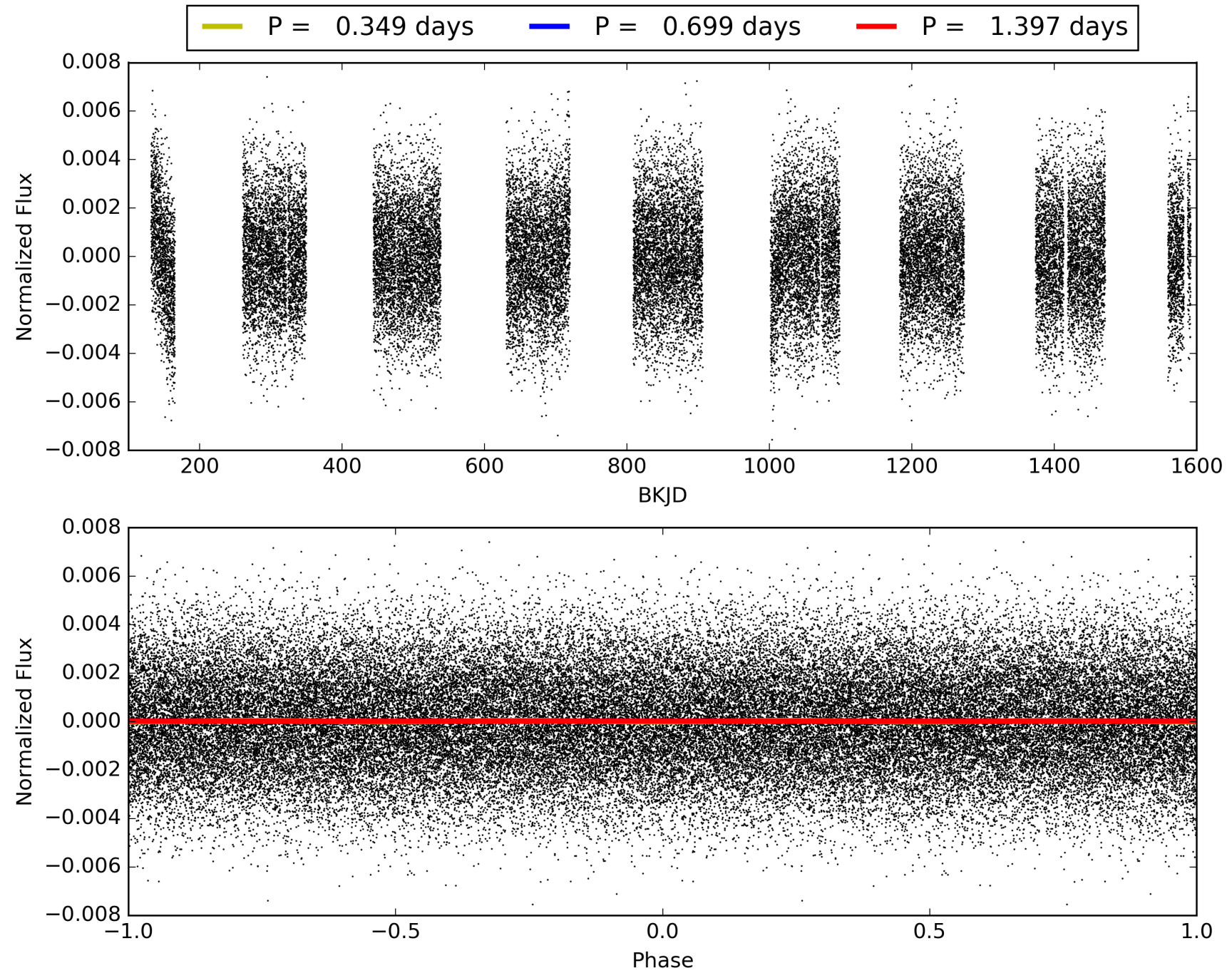
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [7.43σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.19e-24
RollingBand-fgt: 1.00 [902/902]
GhostDiagnostic-chr: 2.089
Centroid-sig: 0.9%
Centroid-so: 1.107 arcsec [2.36σ]
OotOffset-rm: 3.298 arcsec [2.98σ]
KicOffset-rm: 3.577 arcsec [3.50σ]
OotOffset-st: 0/3/0/5 [8]
KicOffset-st: 0/3/0/5 [8]
DiffImageQuality-fgm: 0.00 [0/8]
DiffImageOverlap-fno: 1.00 [9/9]

TCE 008491816-01, PDC Light Curves

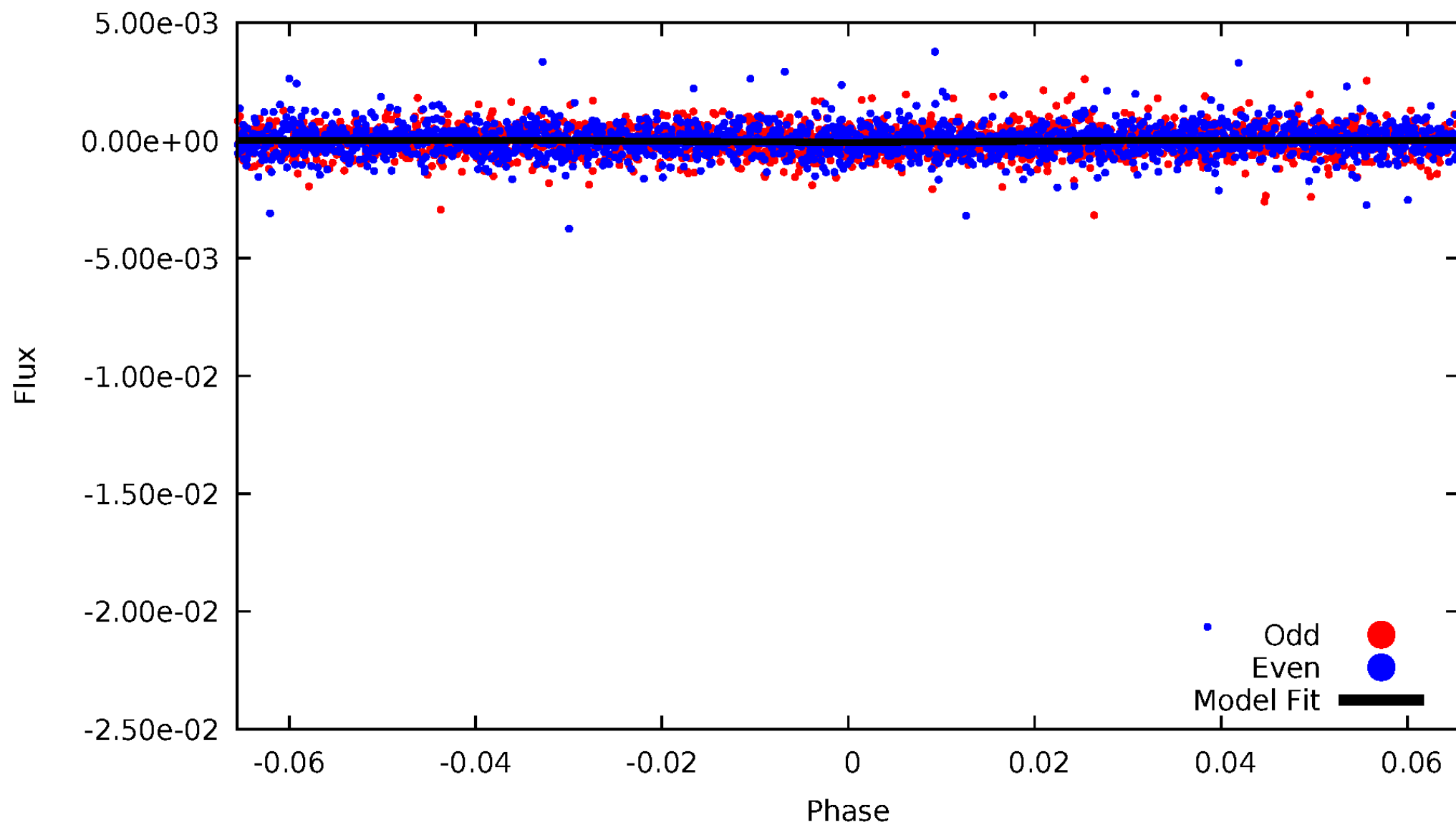


TCE 008491816-01



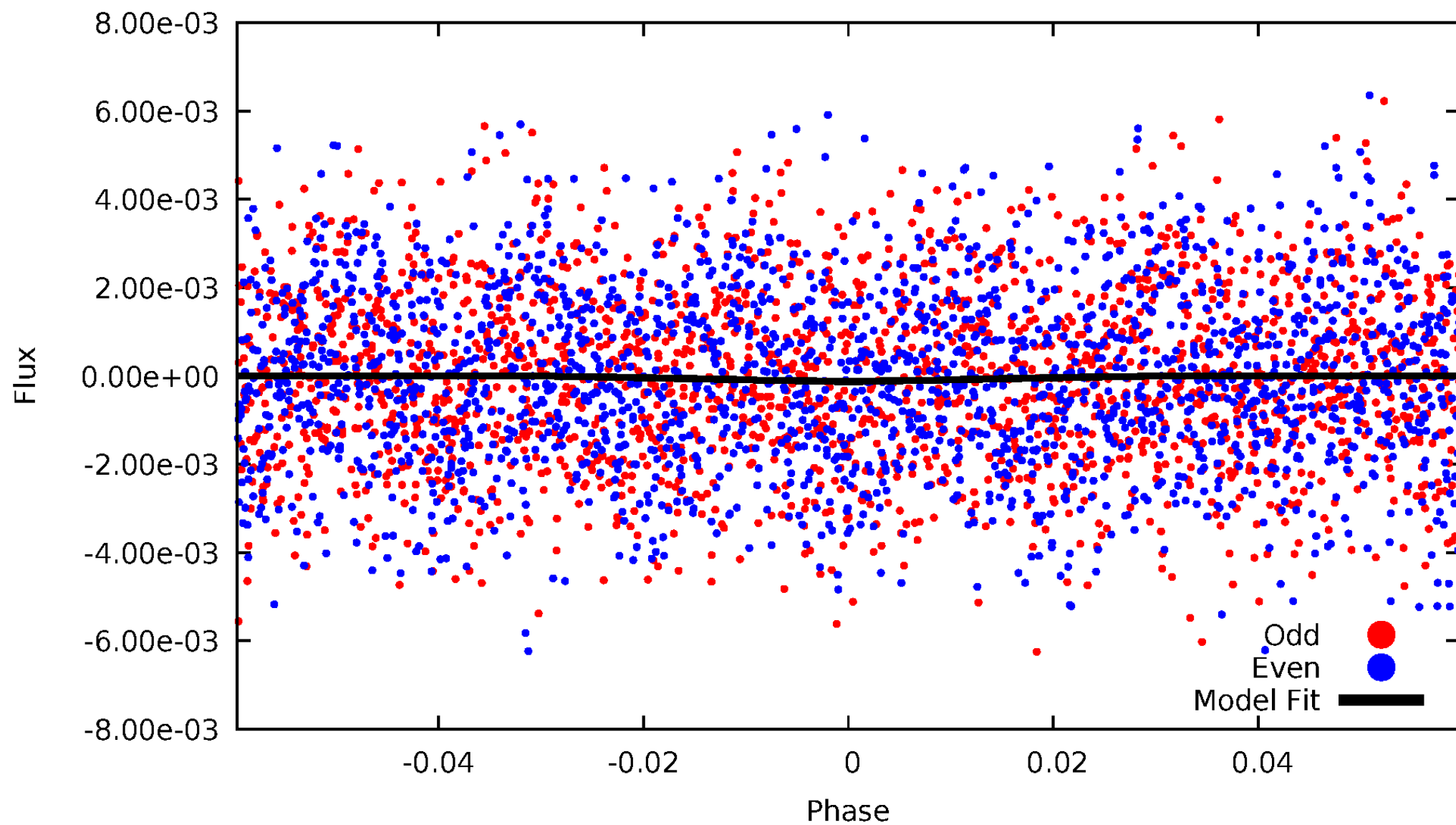
DV Odd/Even

TCE 008491816-01



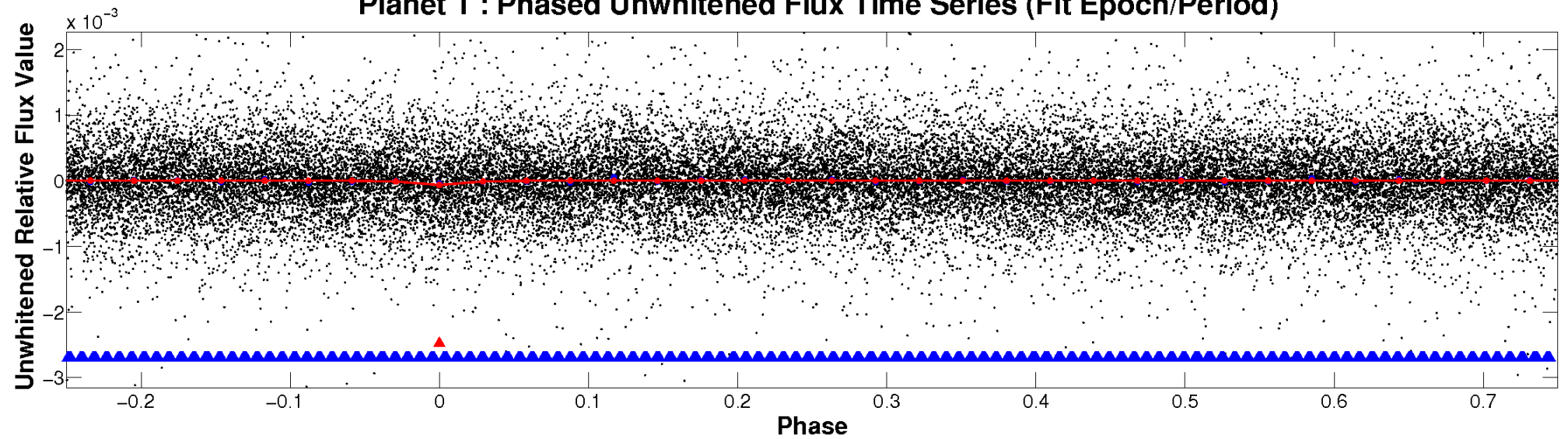
ALT Odd/Even

TCE 008491816-01

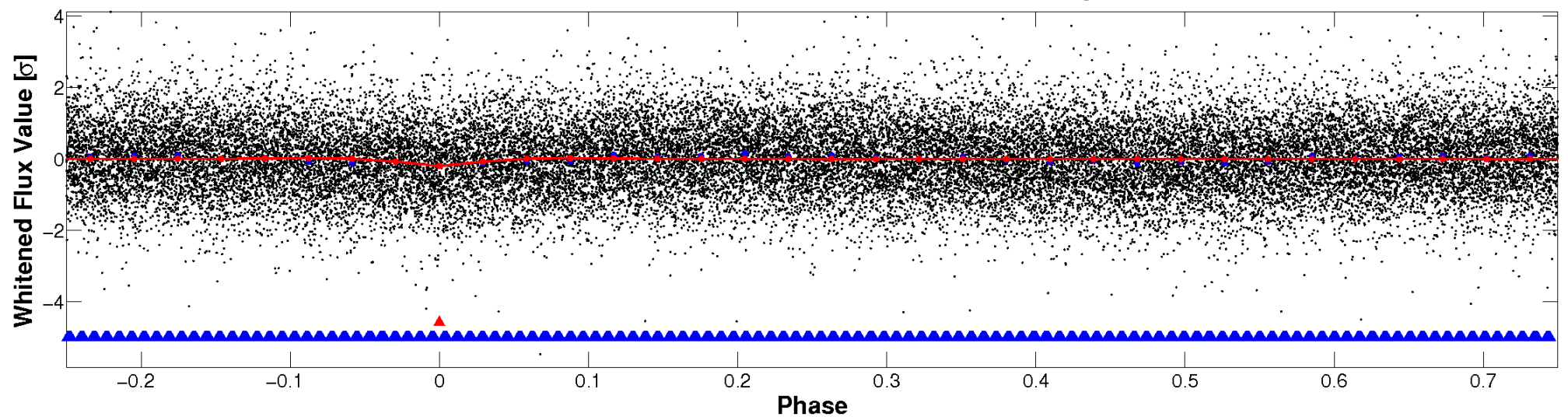


Non-Whitened Vs. Whitened Light Curve

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

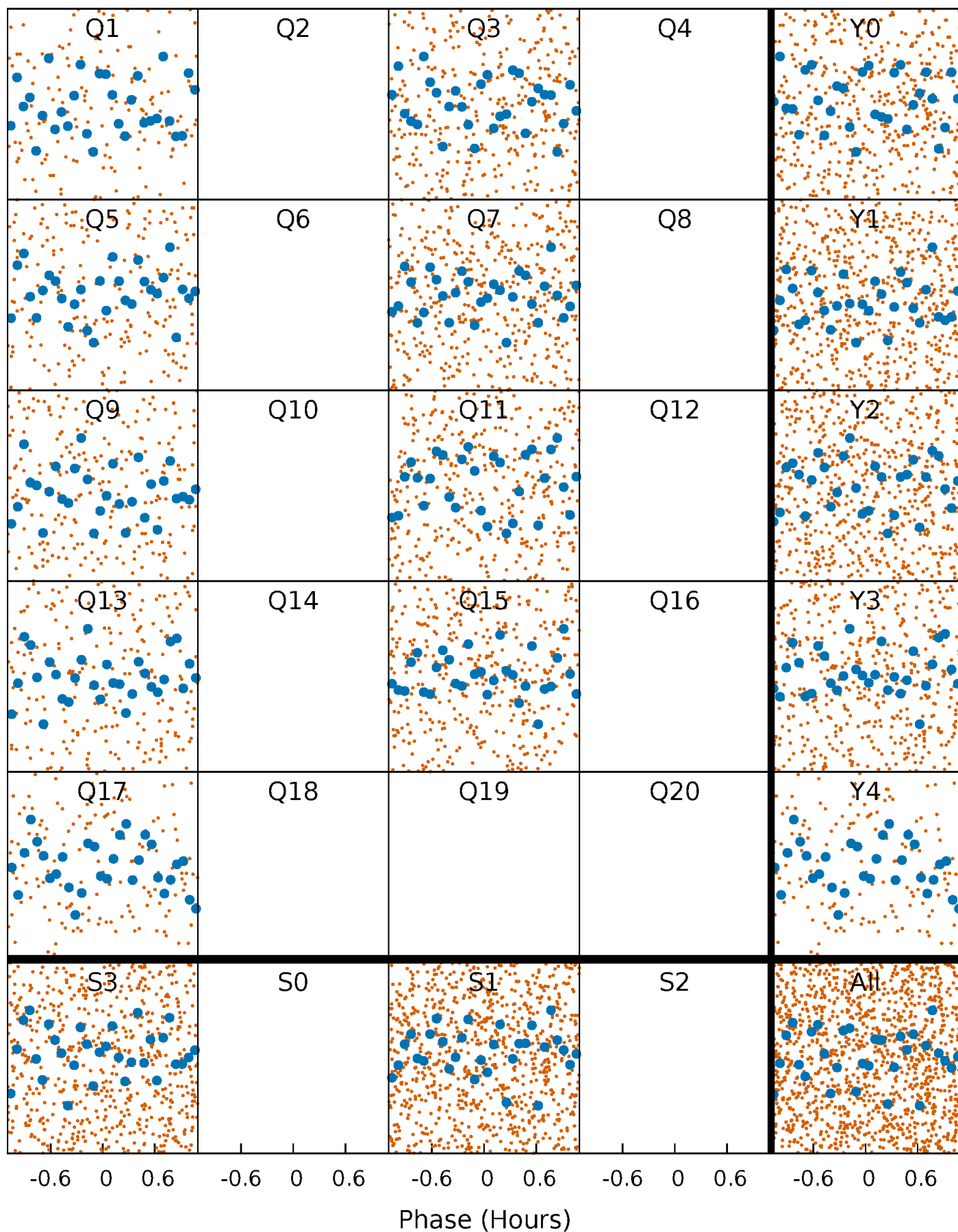


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



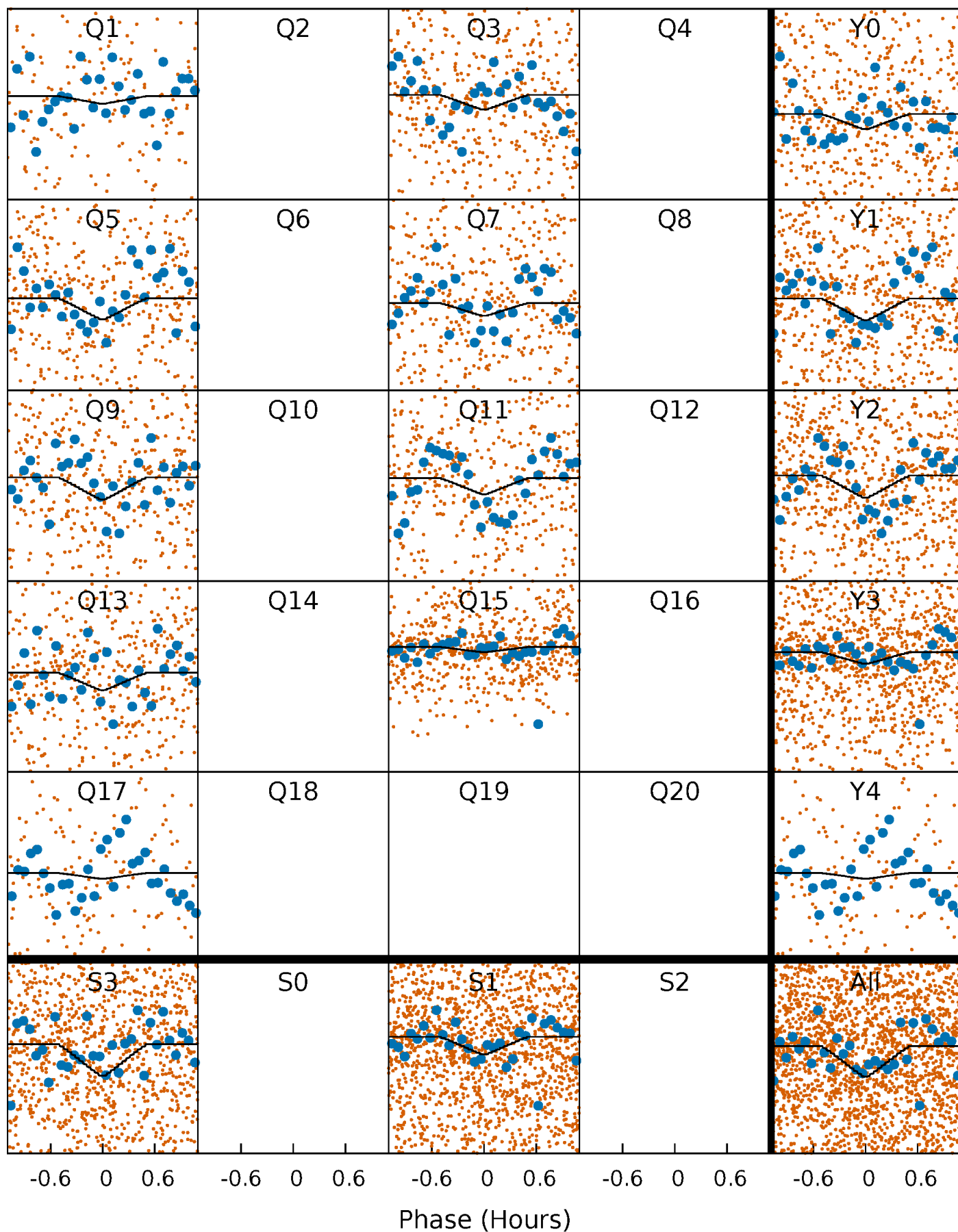
PDC Quarter-Phased Transit Curves

TCE 008491816-01 P= 0.698553 Days $T_0=131.607169$ (BKJD)



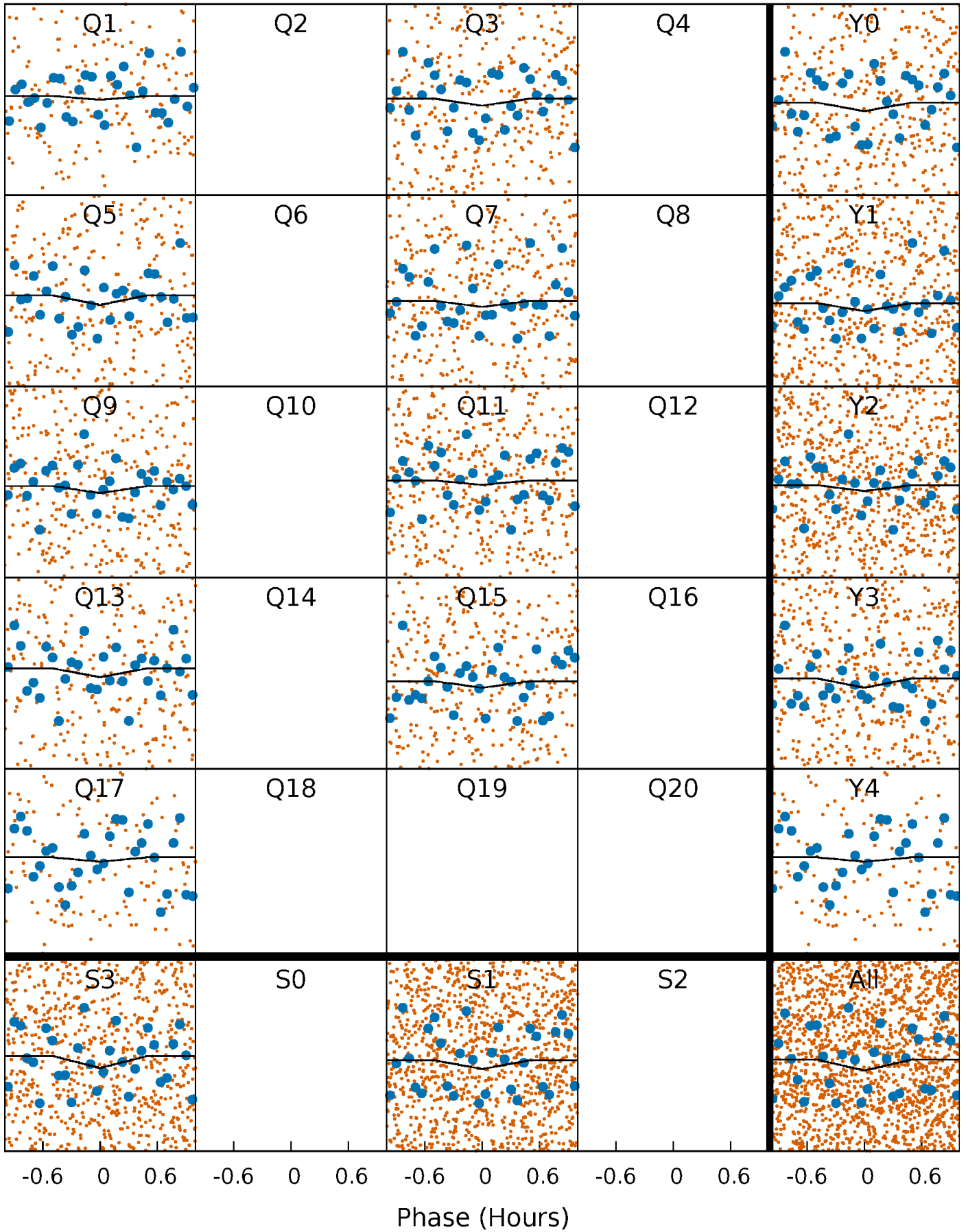
DV Quarter-Phased Transit Curves

TCE 008491816-01 P= 0.698553 Days $T_0=131.607169$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

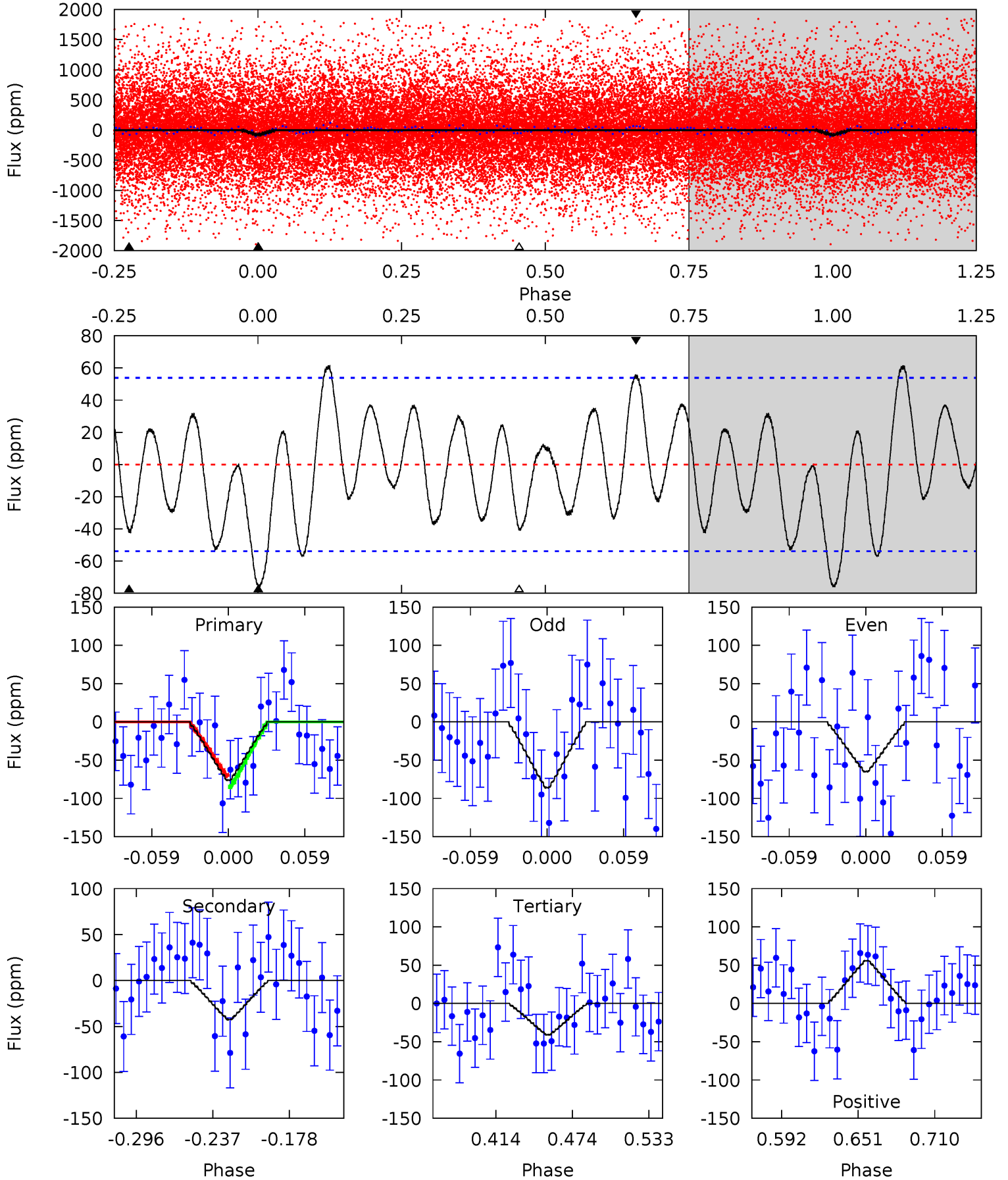
TCE 008491816-01 P= 0.698557 Days $T_0=131.600888$ (BKJD)



DV Model-Shift Uniqueness Test

008491816-01, P = 0.698553 Days, E = 130.908616 Days

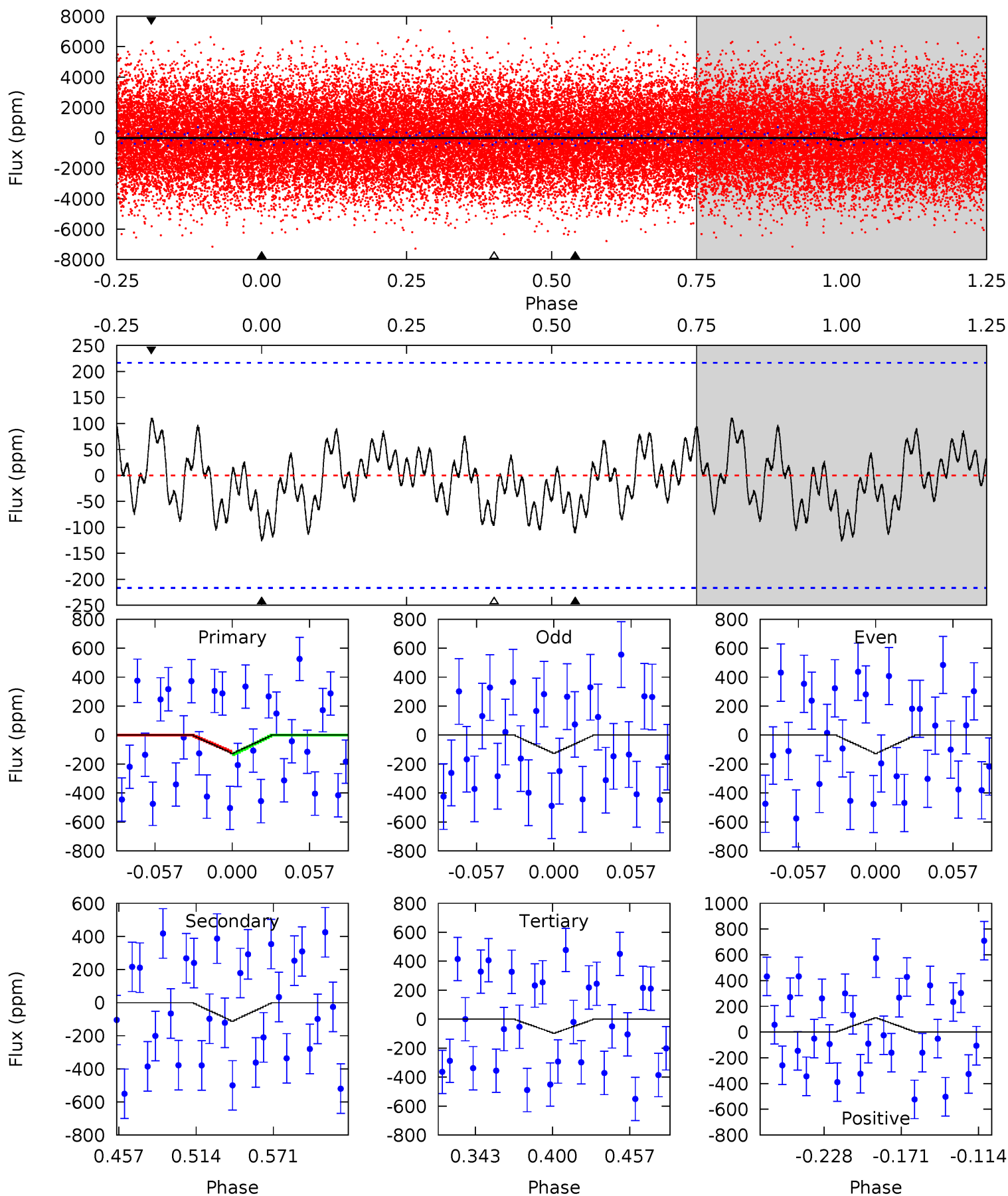
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.61	3.69	3.55	4.84	4.67	1.89	2.35	3.06	1.76	0.14	-1.16	0.92	0.72	0.45	0.69



Alt Model-Shift Uniqueness Test

008491816-01, P = 0.698557 Days, E = 130.902331 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.74	2.41	2.09	2.39	4.68	1.90	1.06	0.65	0.35	0.32	0.02	0.01	-1.07	0.47	0.18



Stellar Parameters For KIC 008491816

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7610^{+211}_{-316}	$3.662^{+0.459}_{-0.081}$	$-0.140^{+0.200}_{-0.350}$	$3.481^{+0.446}_{-1.785}$	$2.029^{+0.236}_{-0.551}$	$0.068^{+0.345}_{-0.017}$
	+3%/-4%	+13%/-2%	+143%/-250%	+13%/-51%	+12%/-27%	+509%/-25%
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 008491816-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-43 ± 12	$5.00^{+5.06}_{-3.21}$	6059^{+419}_{-710}	2836^{+5025}_{-7564}	$0.319^{+2.289}_{-0.238}$
Alt.	-112 ± 46	$5.57^{+5.11}_{-3.82}$	6025^{+447}_{-744}	5154^{+6353}_{-9364}	$0.714^{+6.247}_{-0.543}$

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

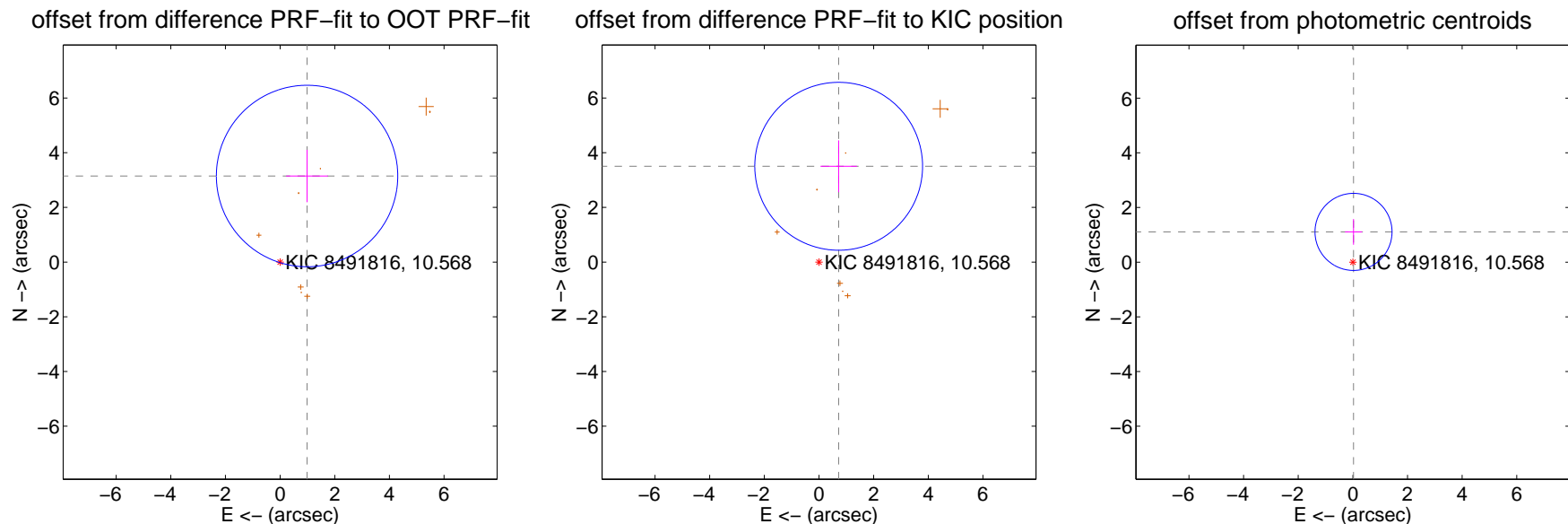
DV Centroid Data

Supplemental centroid analysis for 008491816-01. **Kepler magnitude: 10.57.** Transit SNR 7.01

There are 0 quarters with good PRF difference image offsets

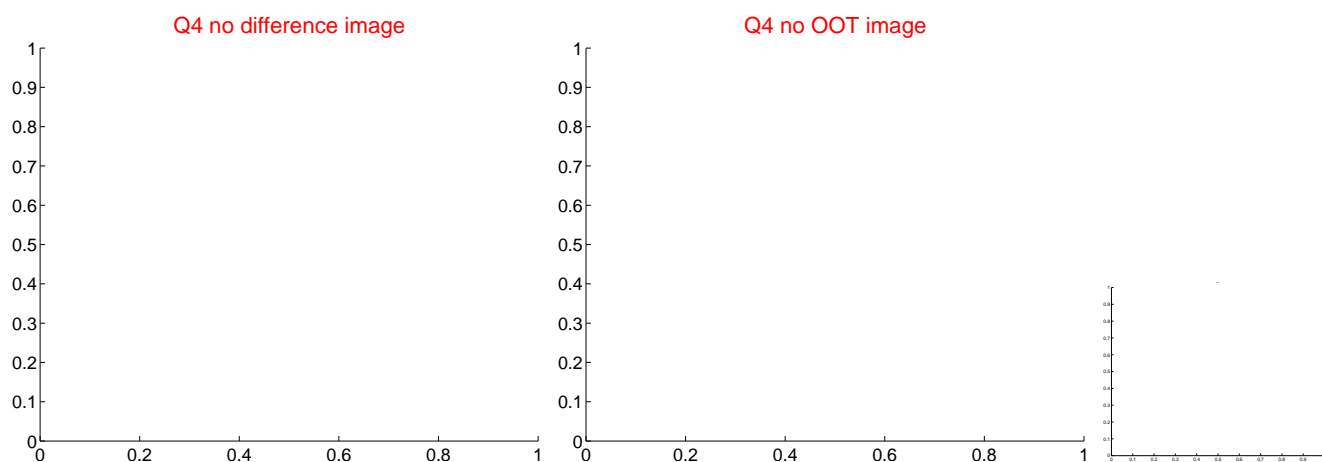
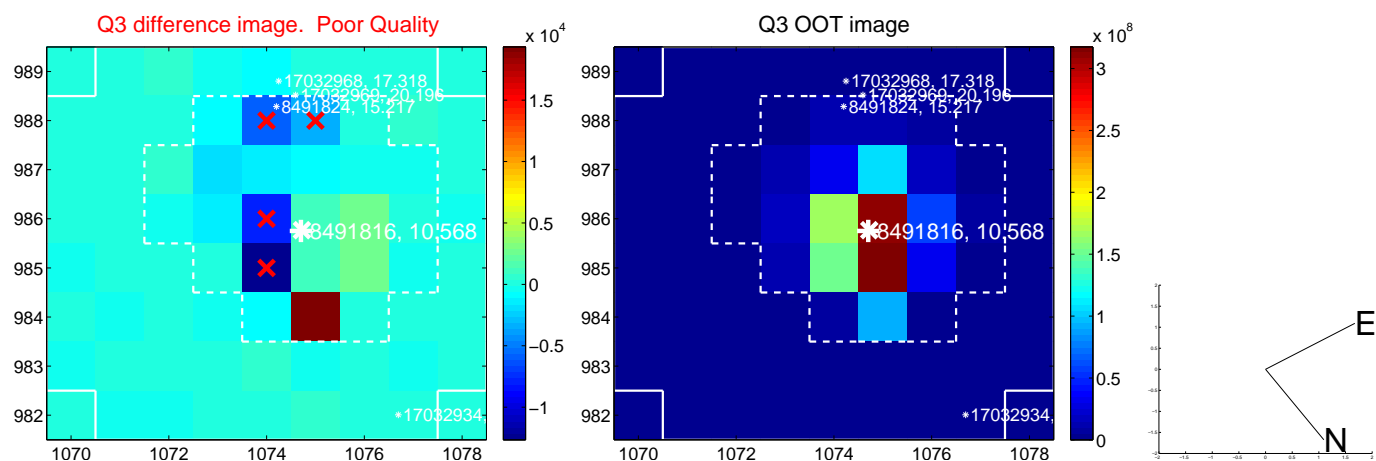
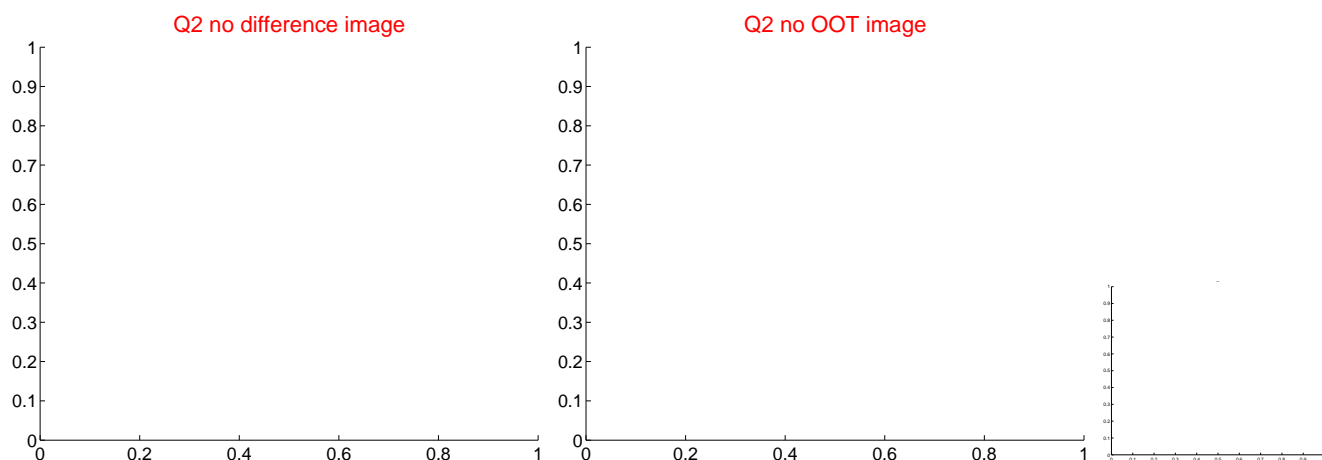
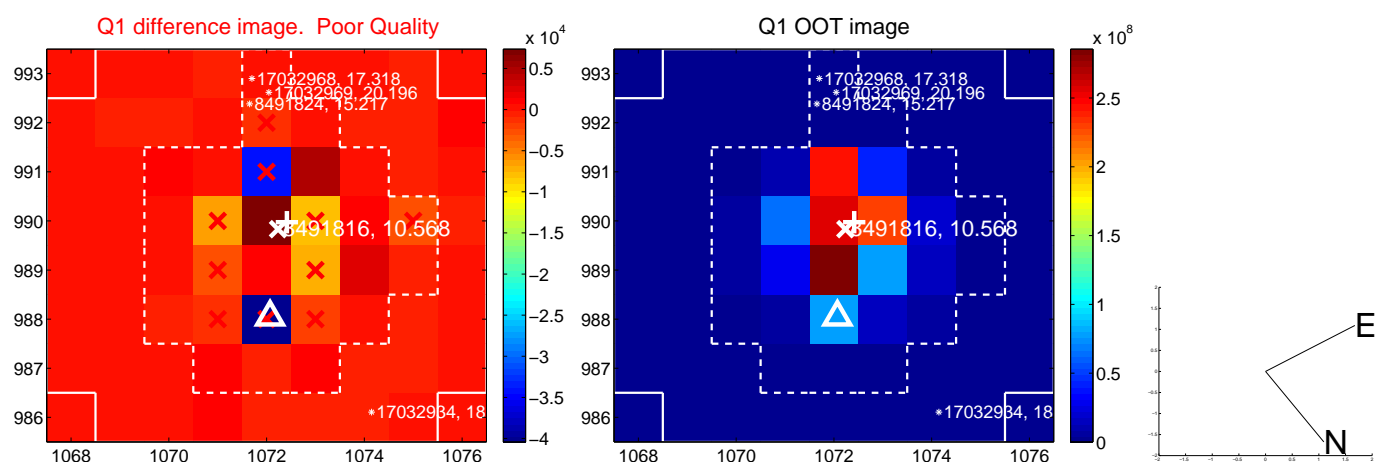
The direct PRF centroid is offset from the target star catalog position by about 0.78 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.298 ± 1.106	2.98	-0.986 ± 0.765	3.147 ± 0.959
PRF-fit source offset from KIC position	3.577 ± 1.023	3.50	-0.721 ± 0.666	3.503 ± 0.946
photometric centroid source offset	1.11 ± 0.47	2.36	-0.02 ± 0.31	1.11 ± 0.47

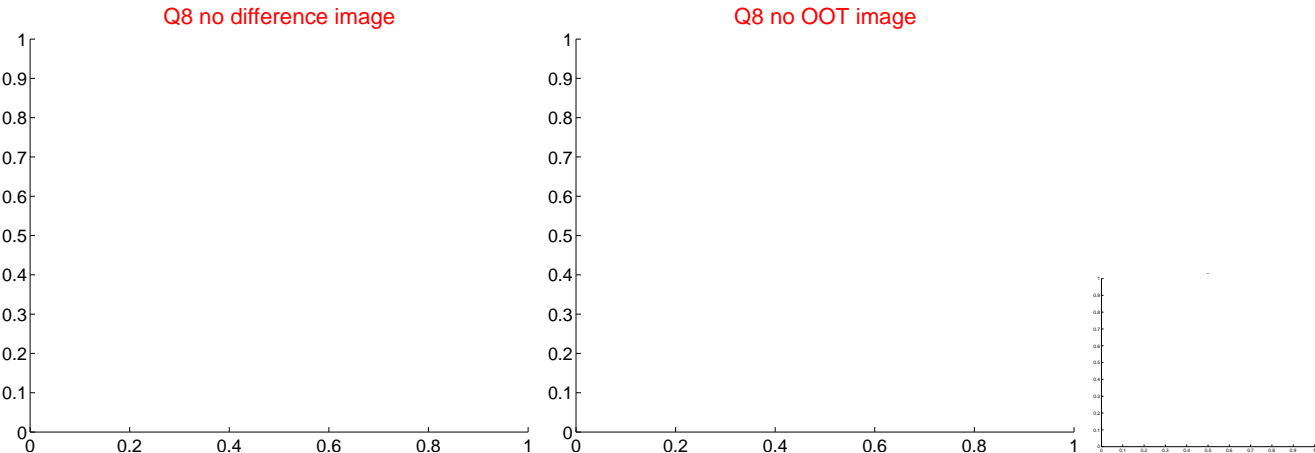
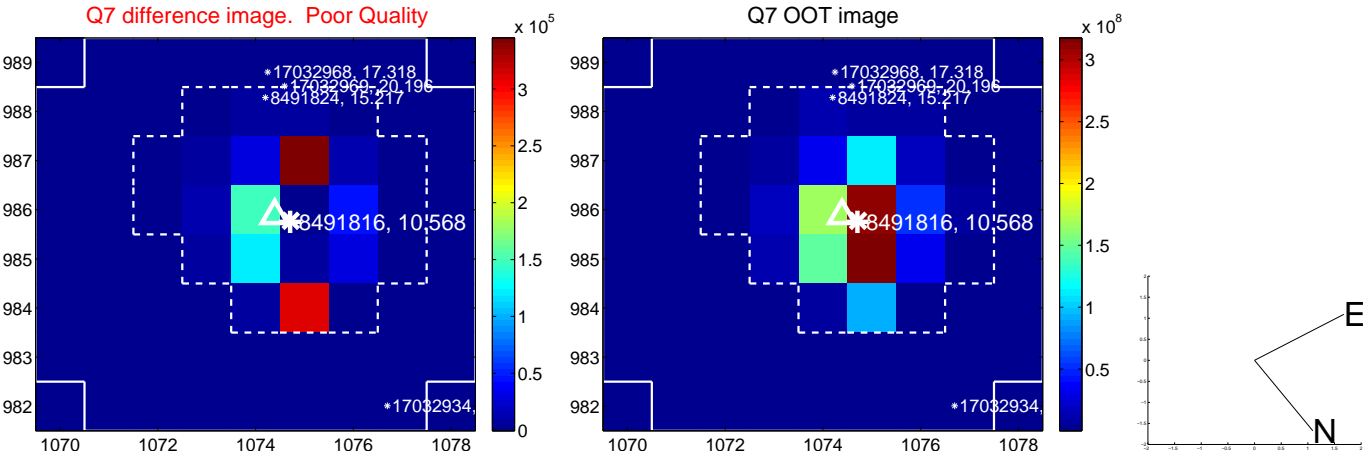
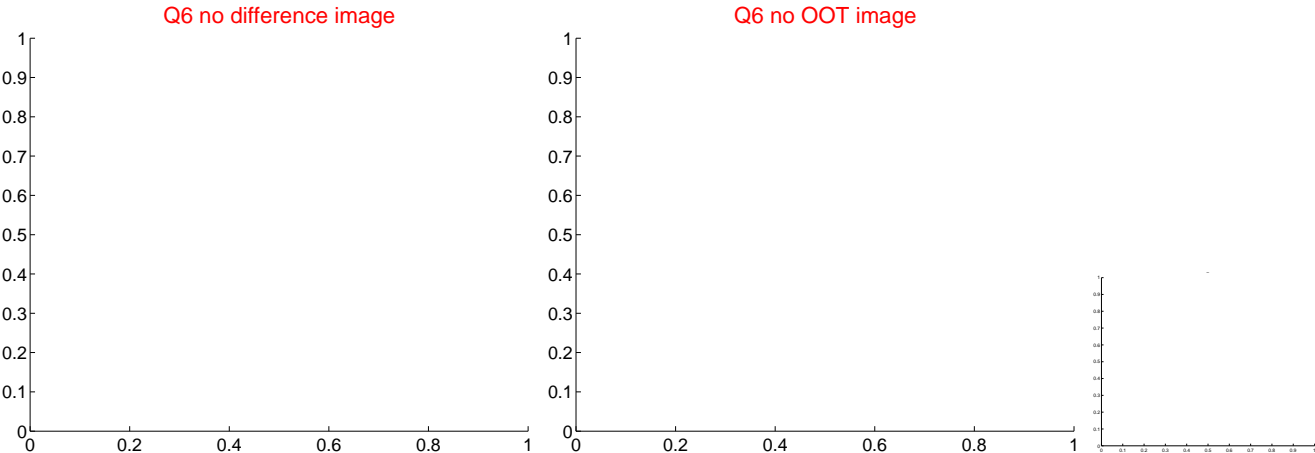
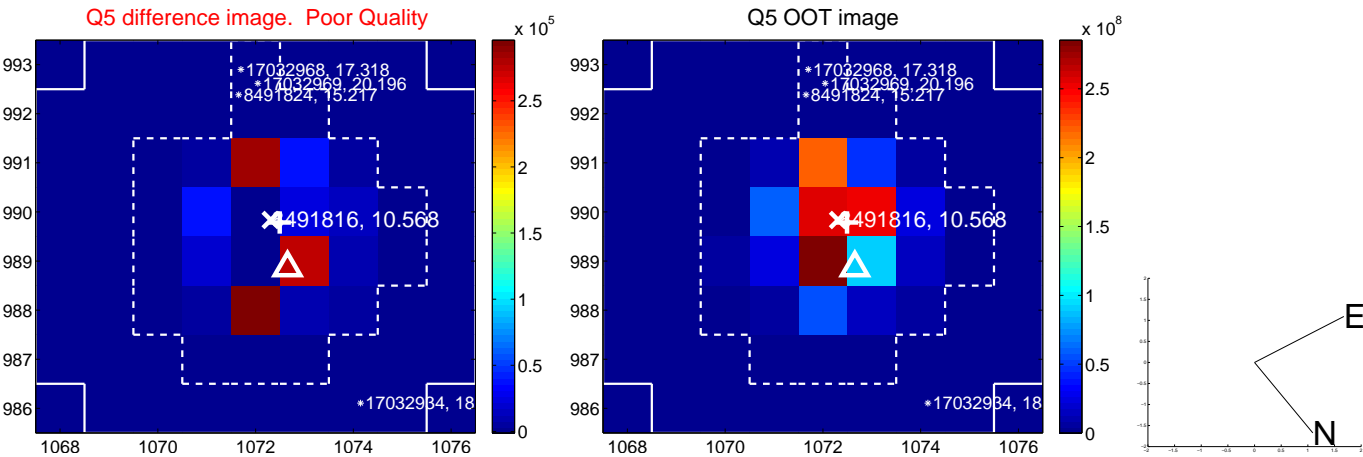


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

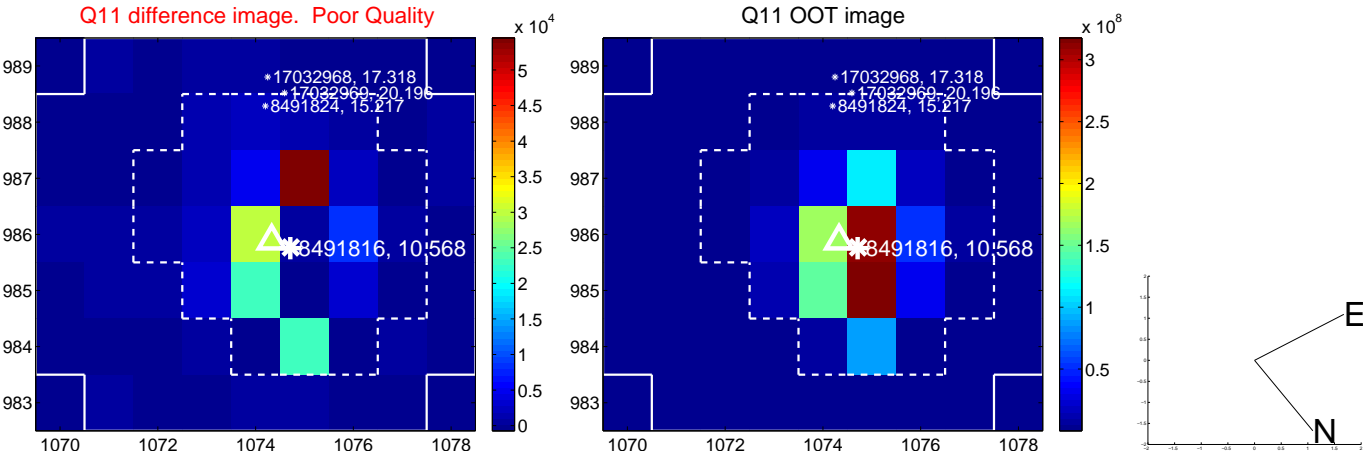
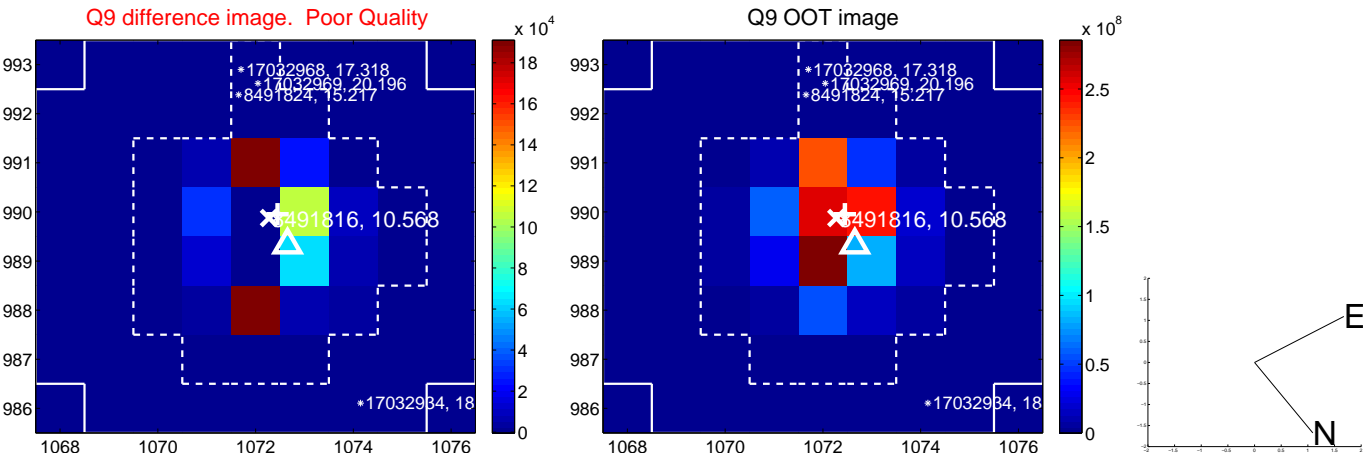
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



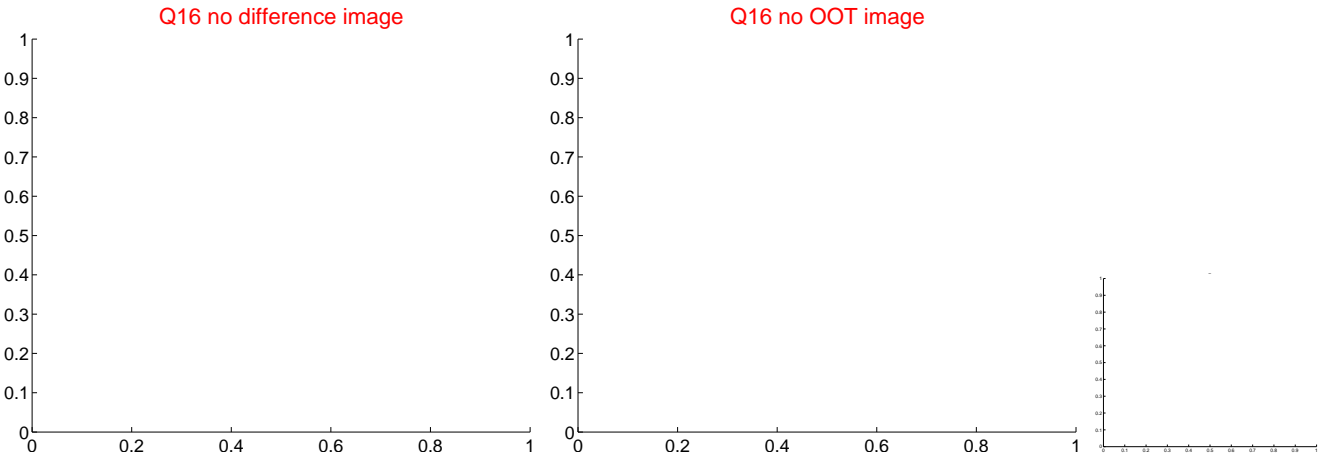
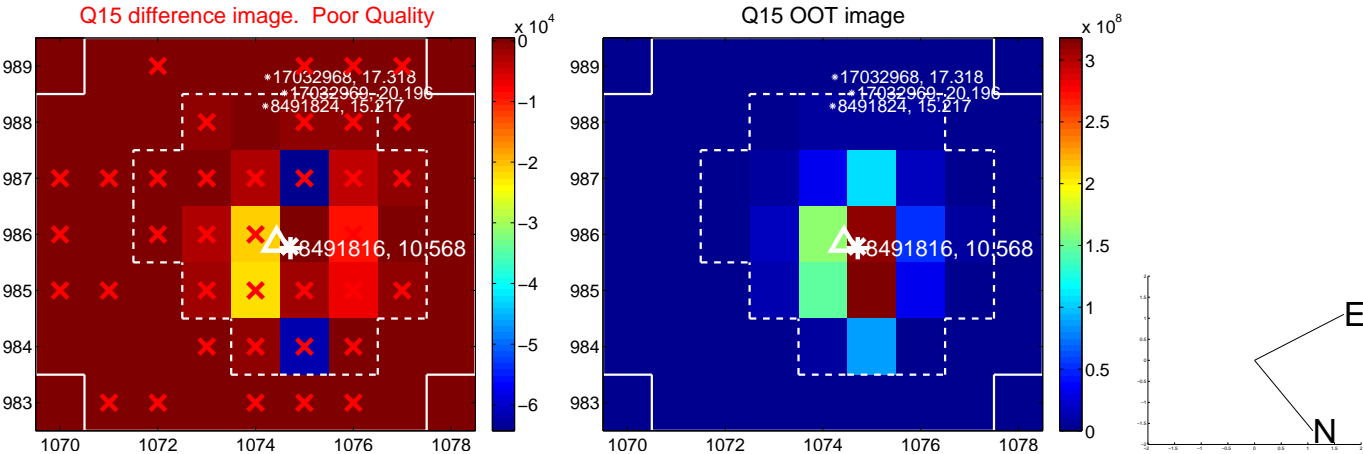
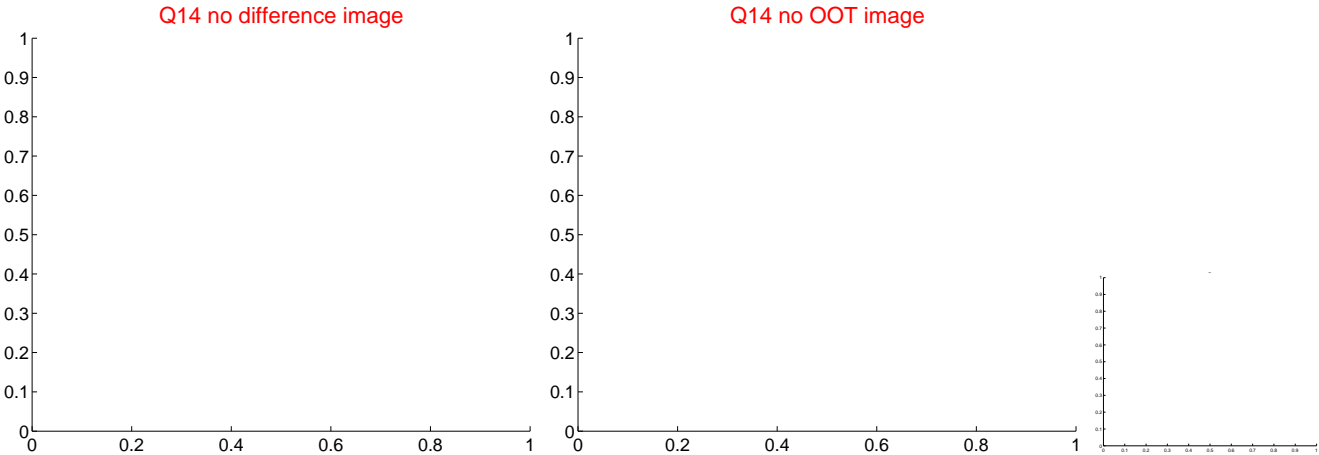
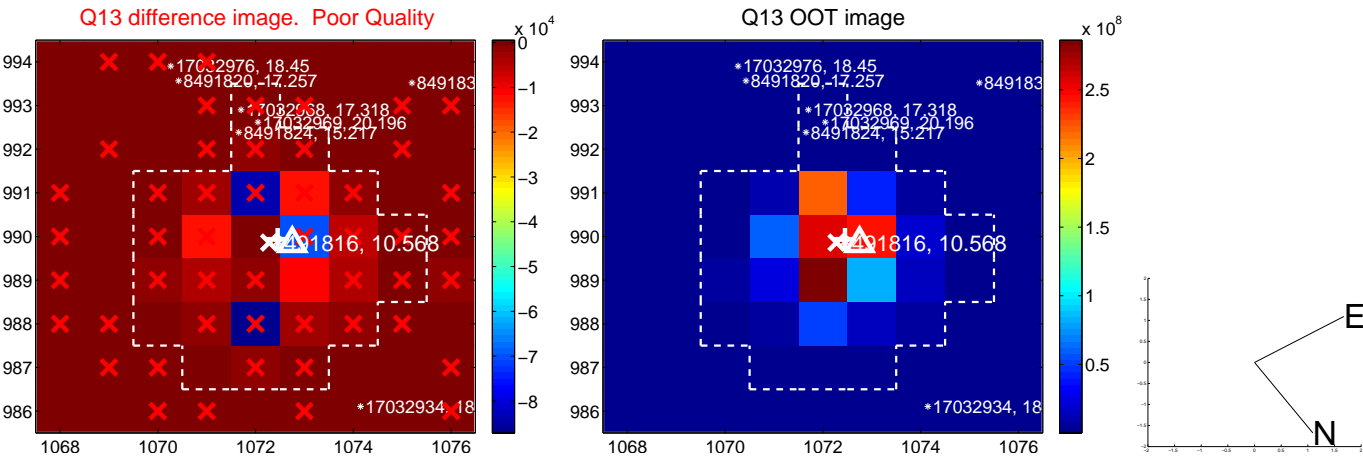
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



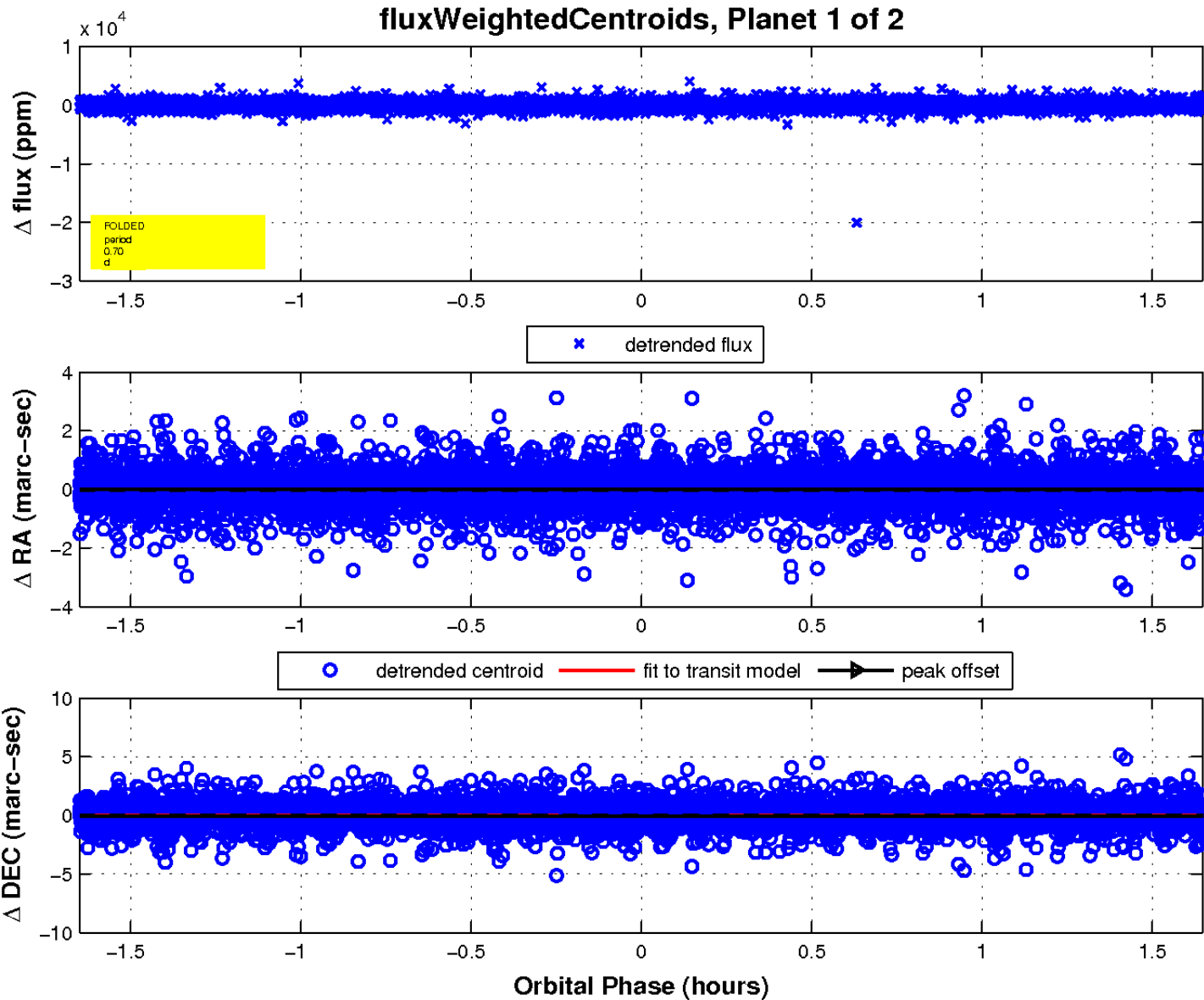
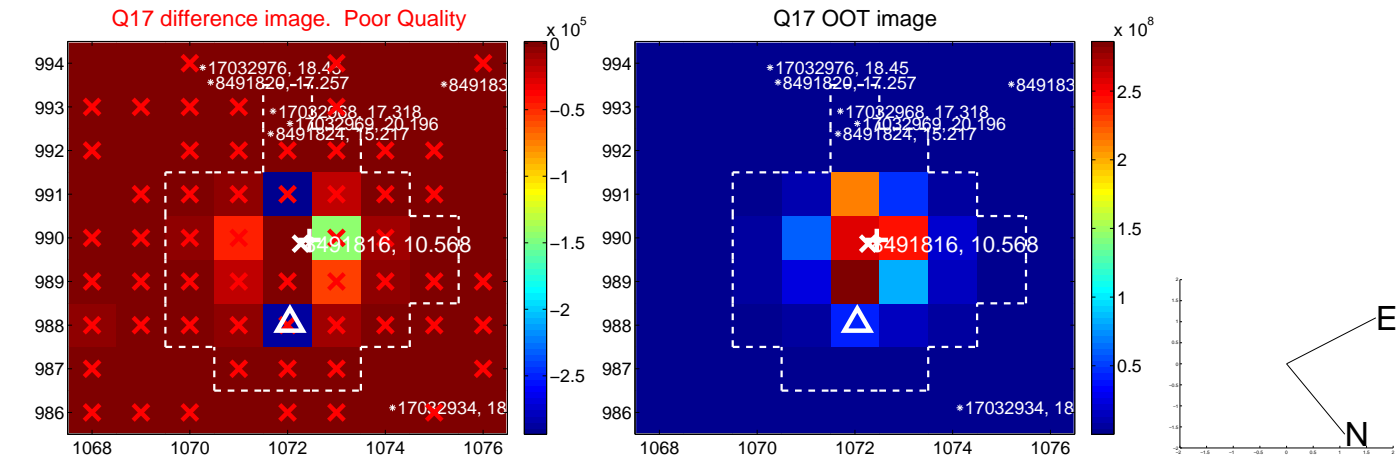
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



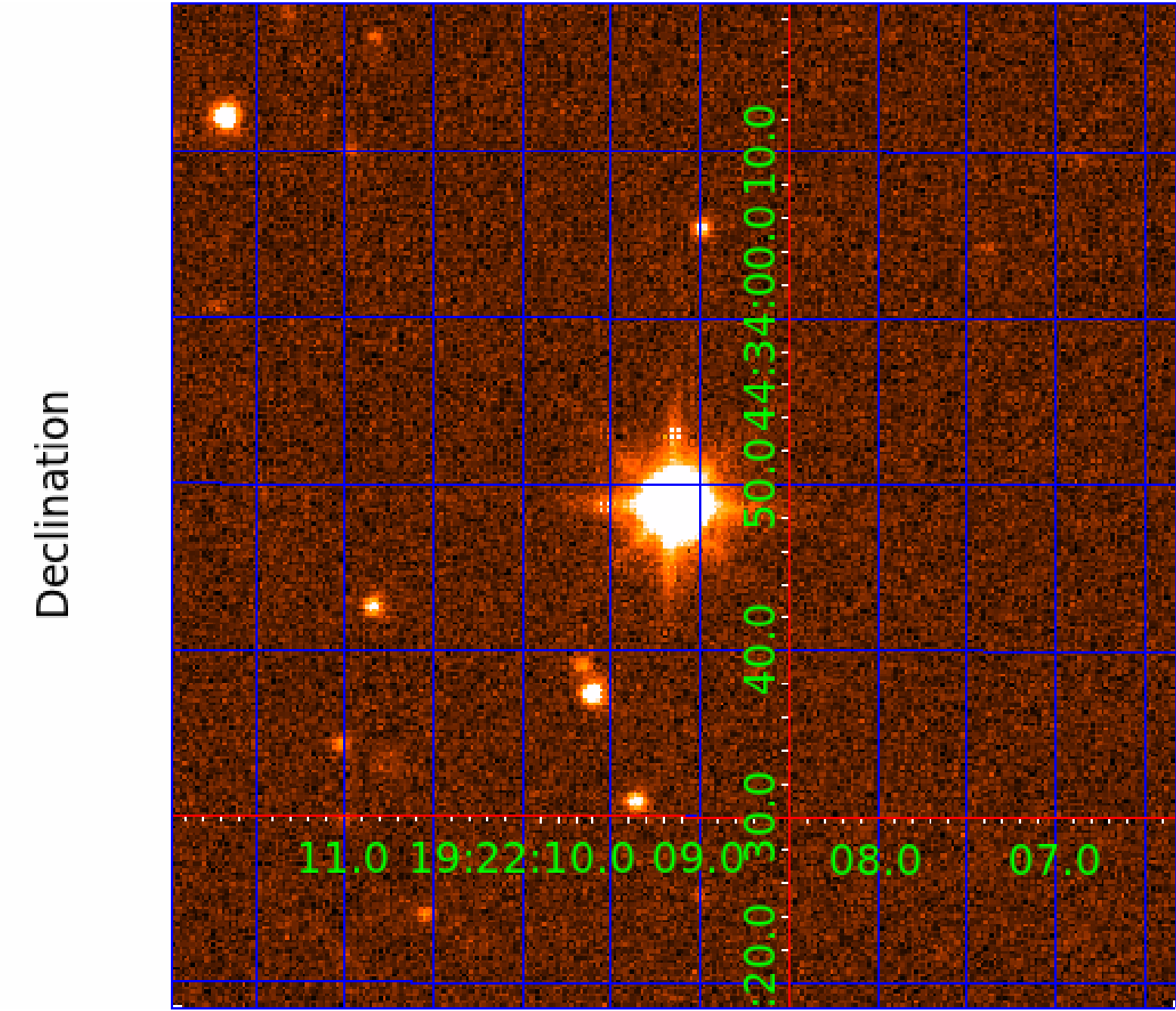
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 008491816

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})
008491816-01	OBS	No	0.698553	131.607169	79.5	0.550	8.5	7.0	3.48	7610	3.24	95639.30
008491816-02	OBS	No	2.406776	131.963074	54.9	5.489	7.4	5.9	3.48	7610	3.02	18378.98

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008491816-01	OBS	FP	0.00	1	0	0	0	LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
008491816-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED

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

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

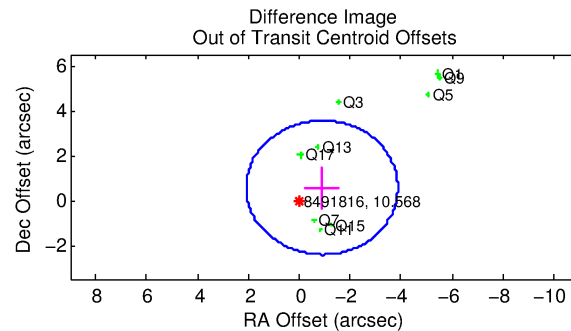
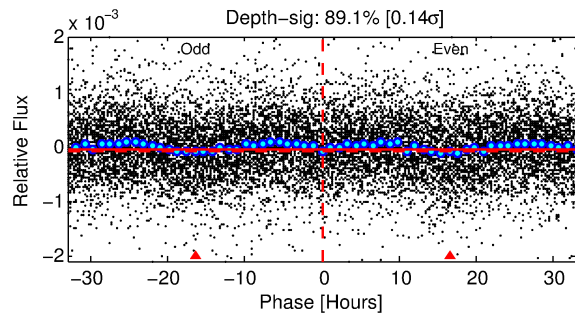
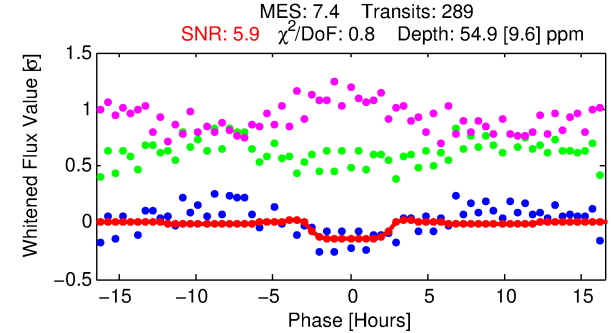
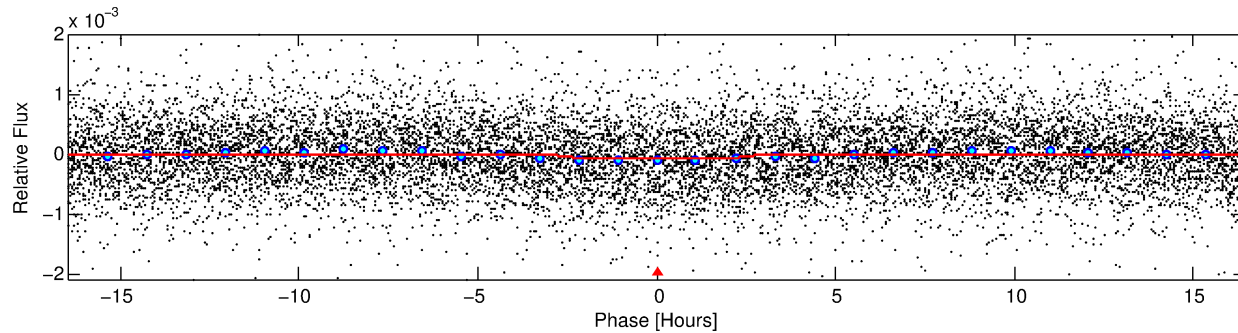
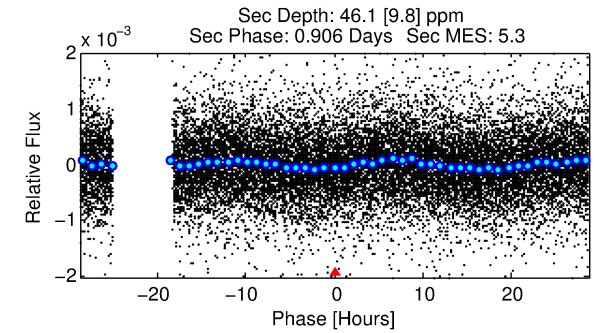
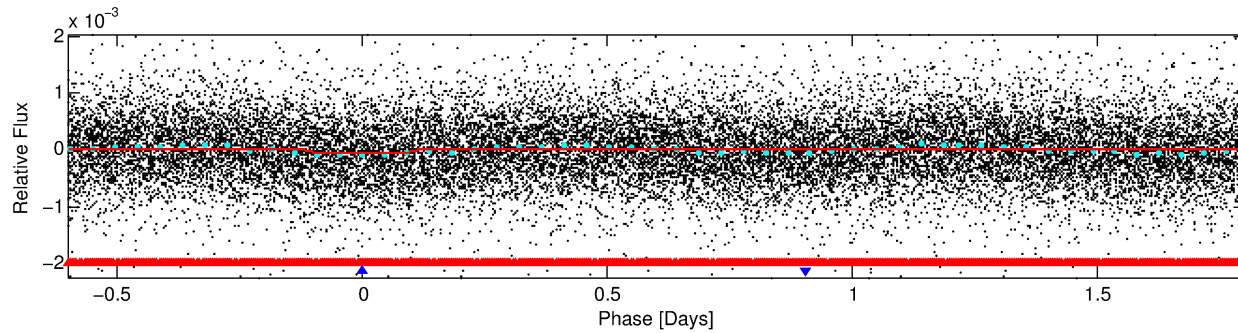
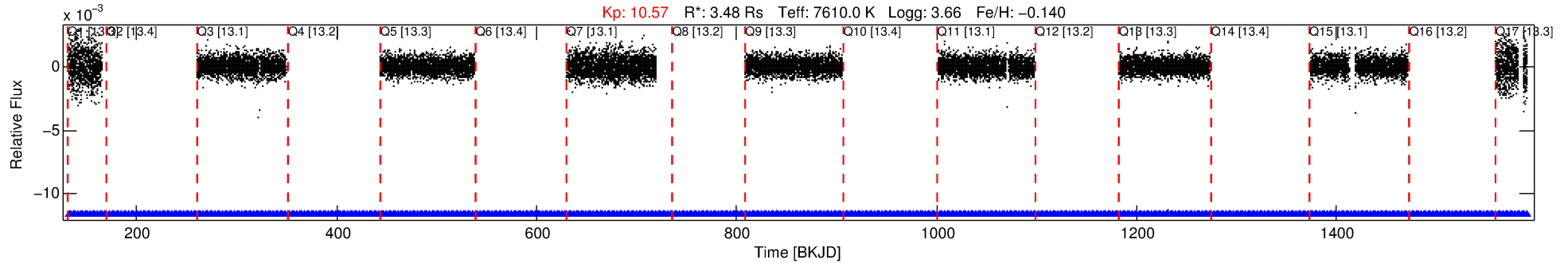
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008491816-02

No Significant Match Found

DV One-Page Summary

KIC: 8491816 Candidate: 2 of 2 Period: 2.407 d



DV Fit Results:

Period = 2.40678 [0.00004] d
Epoch = 131.9631 [0.0117] BKJD
Rp/R* = 0.0079 [0.0060]
a/R* = 1.76 [5.50]
b = 0.91 [0.93]
Seff = 18378.98 [14713.54]
Teq = 2969 [594] K
Rp = 3.02 [2.77] Re
a = 0.0445 [0.0218] AU
Ag = 5.51 [9.49] [0.47σ]
Teffp = 7032 [2716] K [1.46σ]

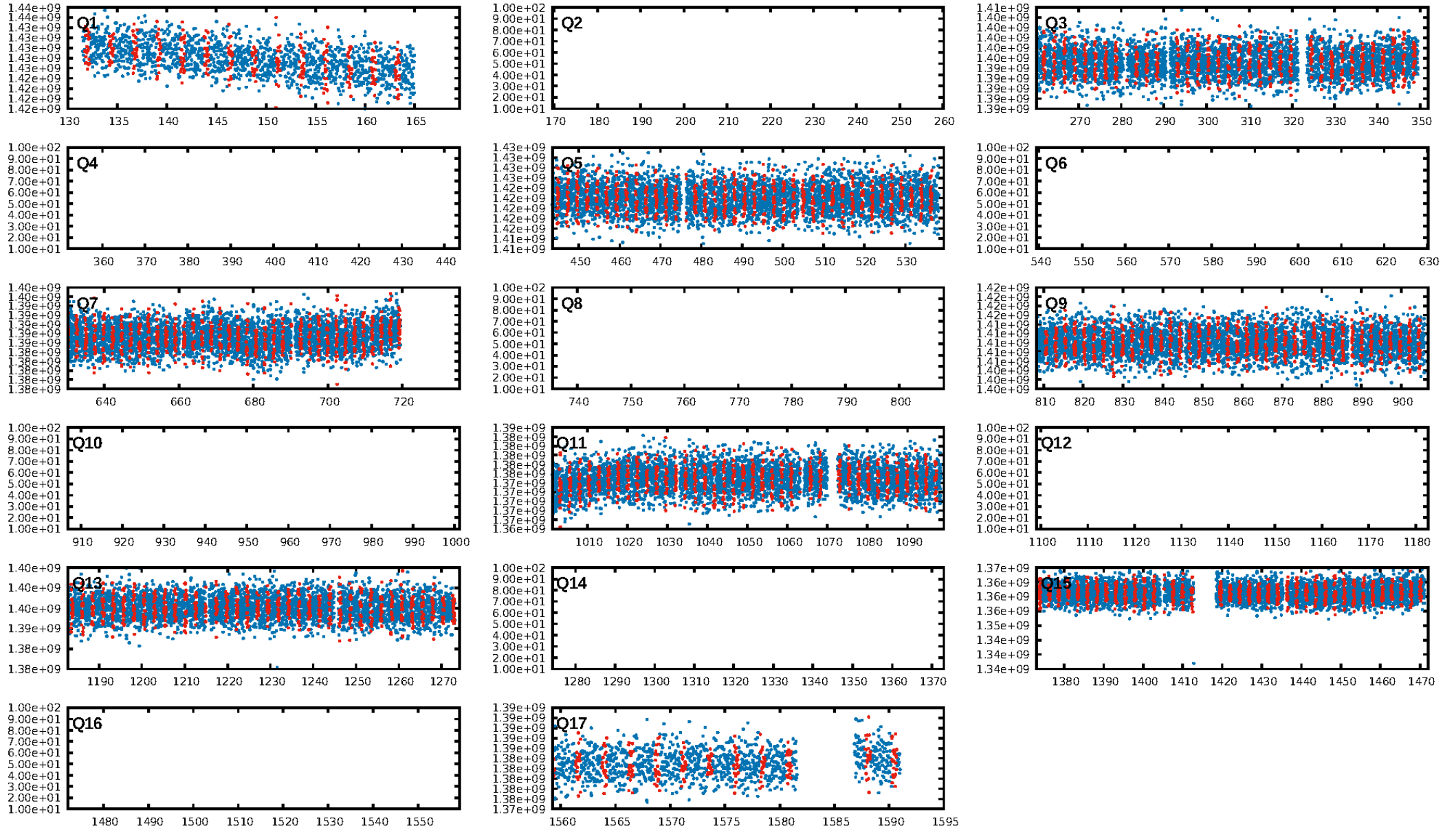
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.43σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.23e-13
RollingBand-fgt: 1.00 [263/263]
GhostDiagnostic-chr: 1.457
Centroid-sig: 0.0%
Centroid-so: 1.917 arcsec [4.24σ]
OotOffset-rm: 1.060 arcsec [1.07σ]
KicOffset-rm: 1.707 arcsec [2.13σ]
OotOffset-st: 0/4/0/5 [9]
KicOffset-st: 0/4/0/5 [9]
DiffImageQuality-fgm: 0.22 [2/9]
DiffImageOverlap-fno: 0.00 [0/9]

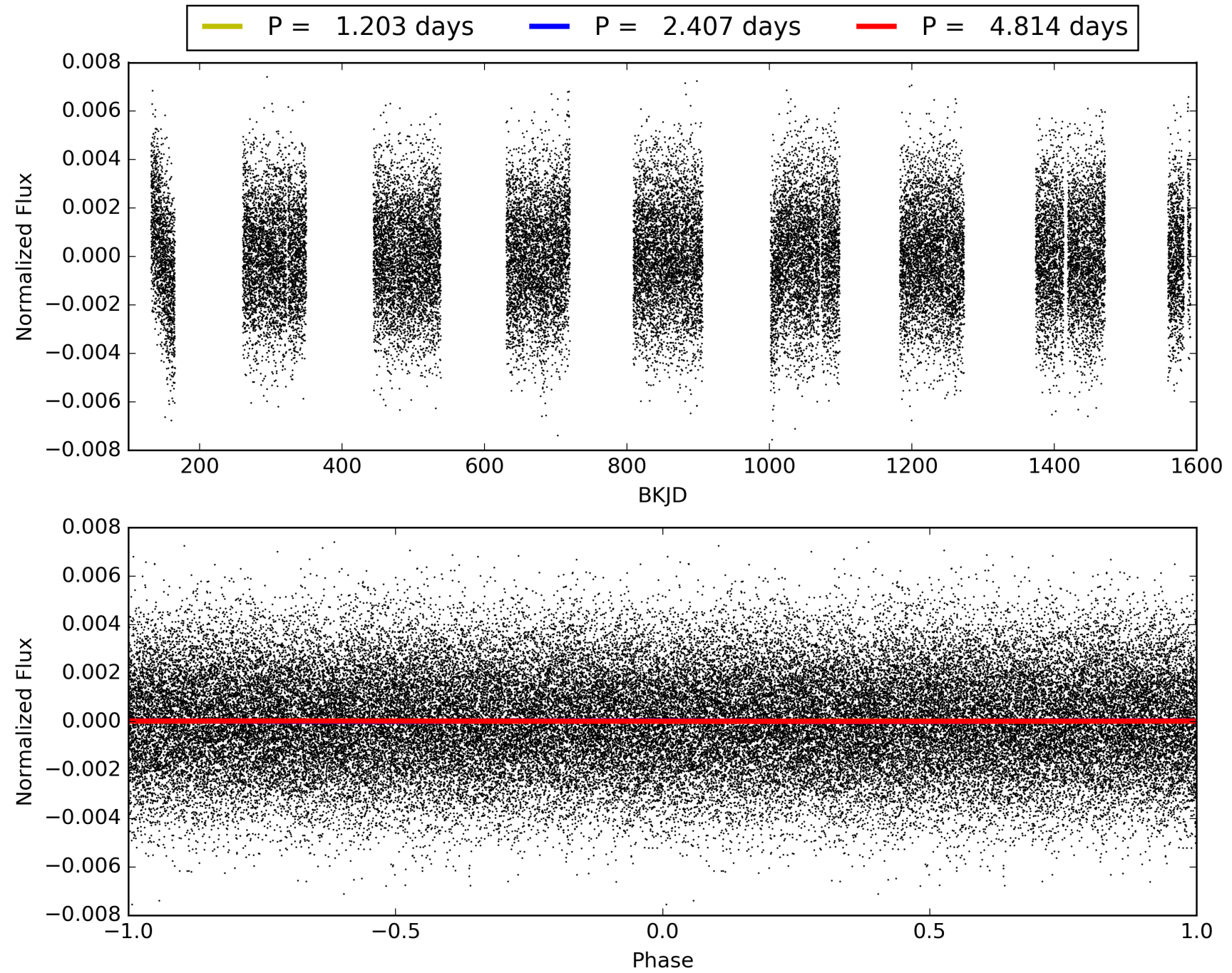
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 23:01:40 Z

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

TCE 008491816-02, PDC Light Curves

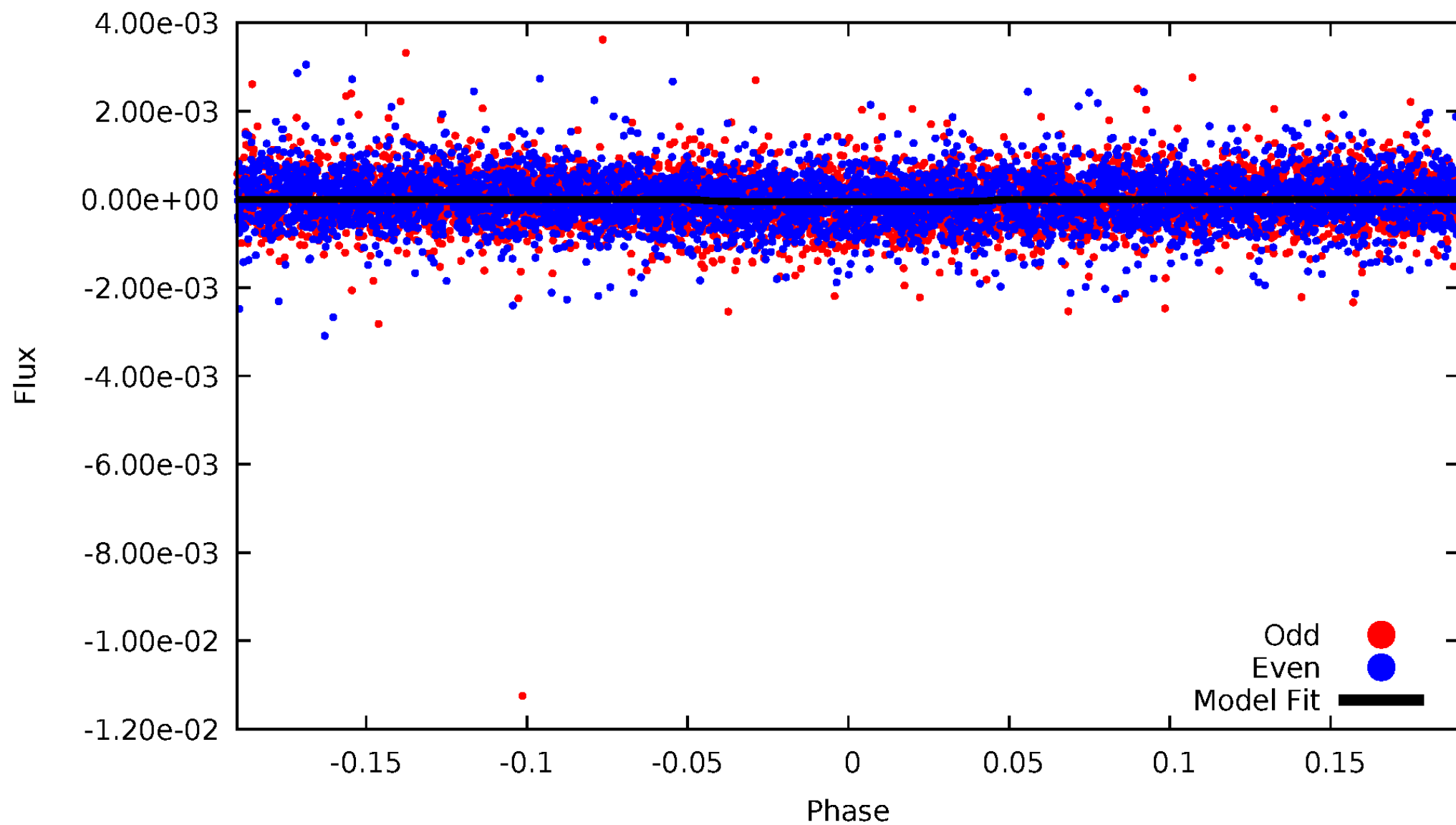


TCE 008491816-02



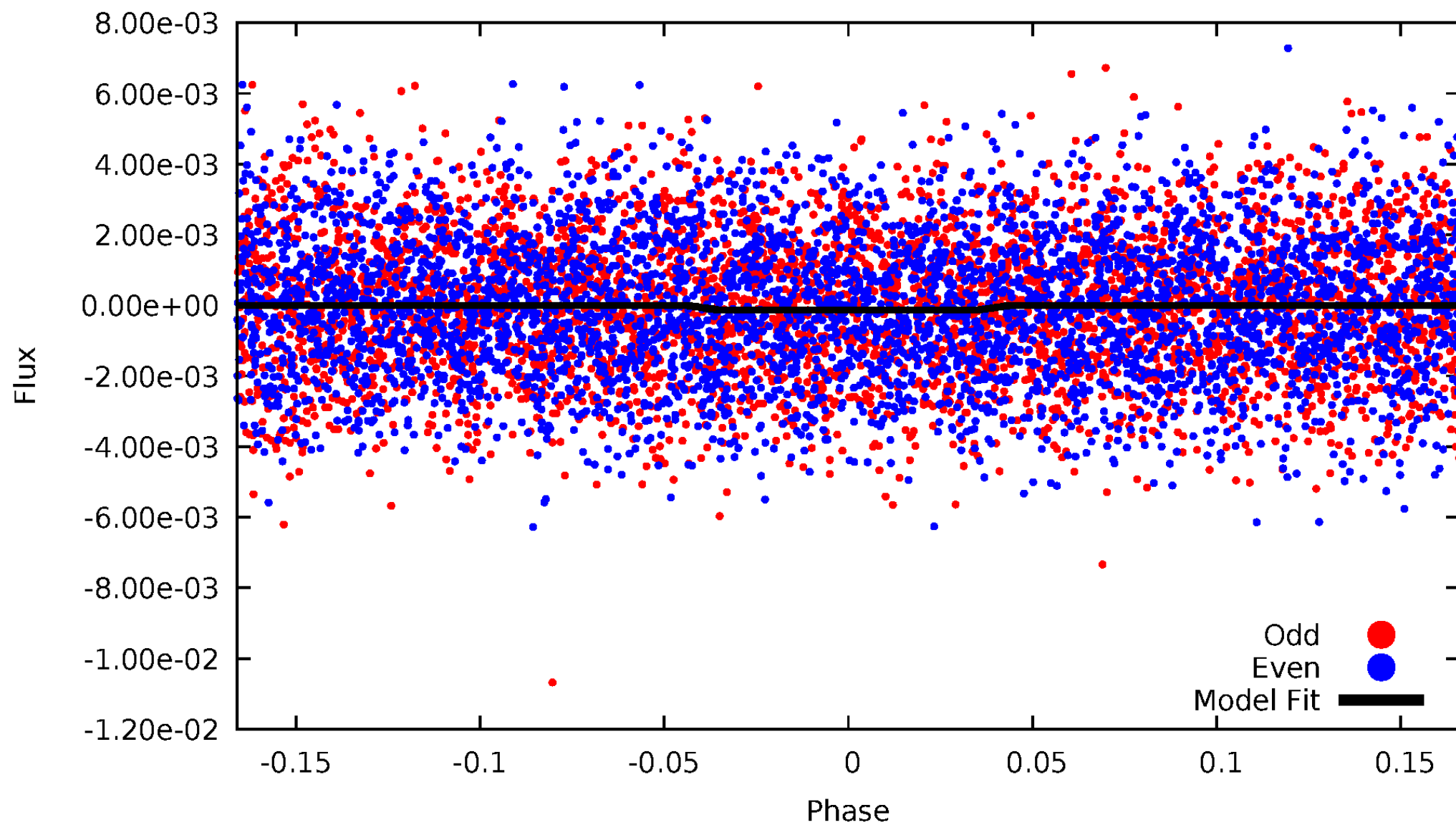
DV Odd/Even

TCE 008491816-02



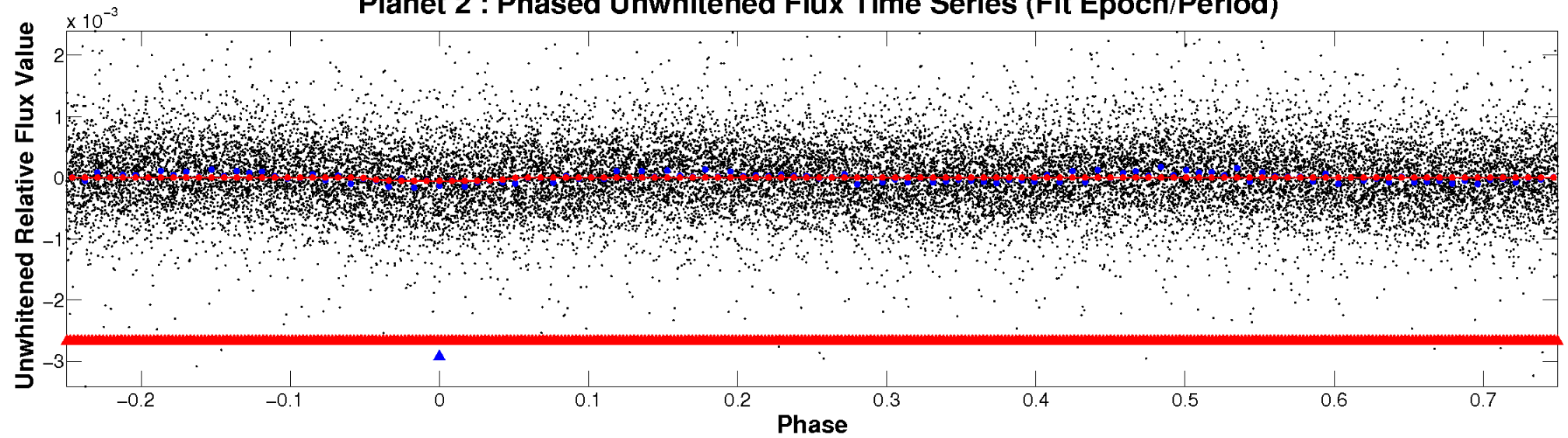
ALT Odd/Even

TCE 008491816-02

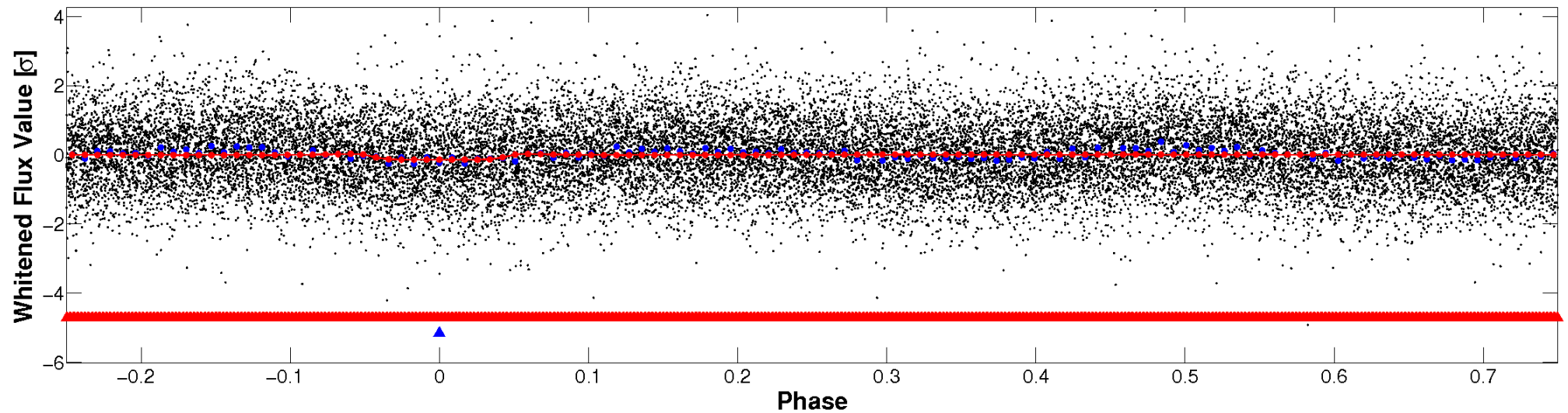


Non-Whitened Vs. Whitened Light Curve

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

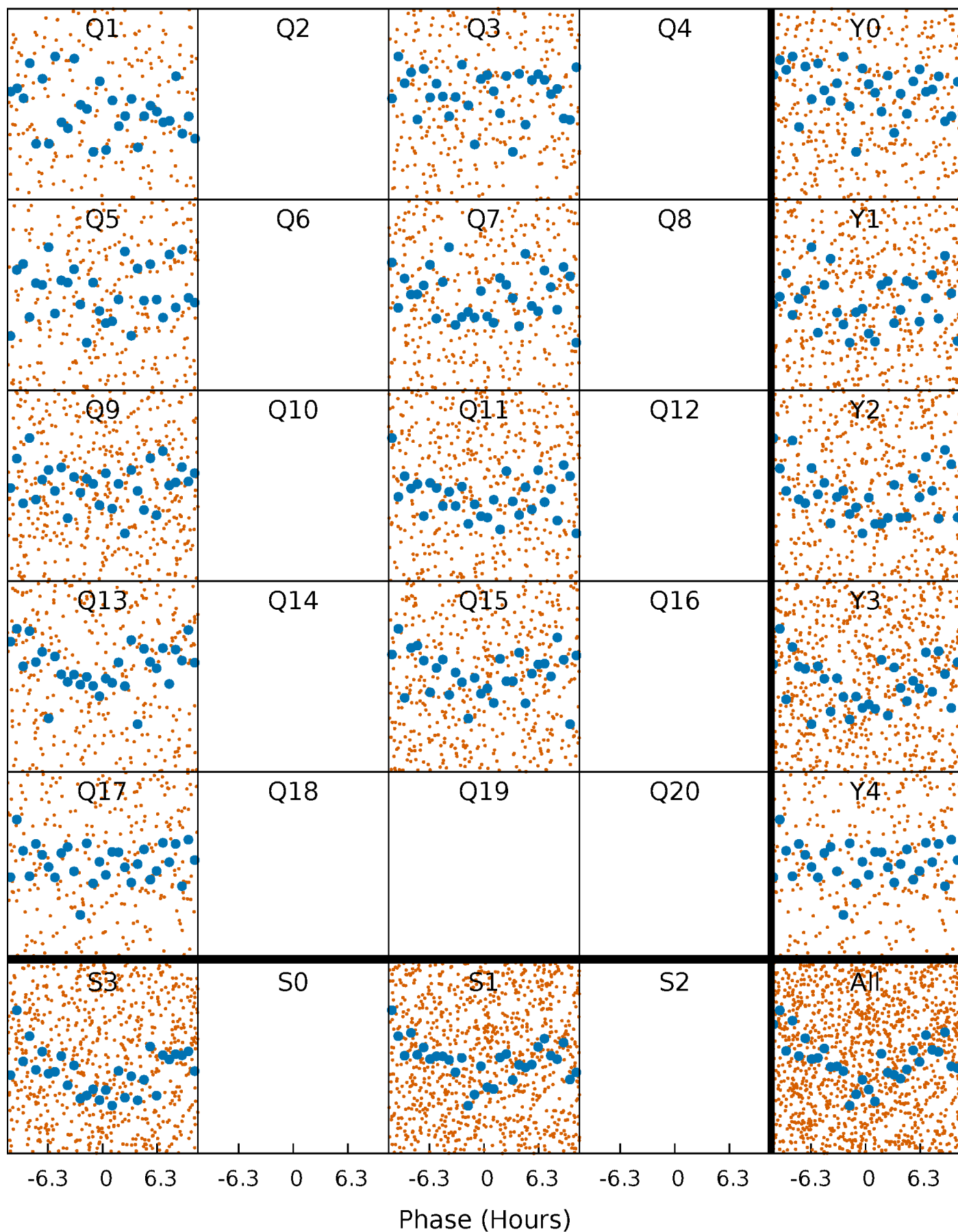


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



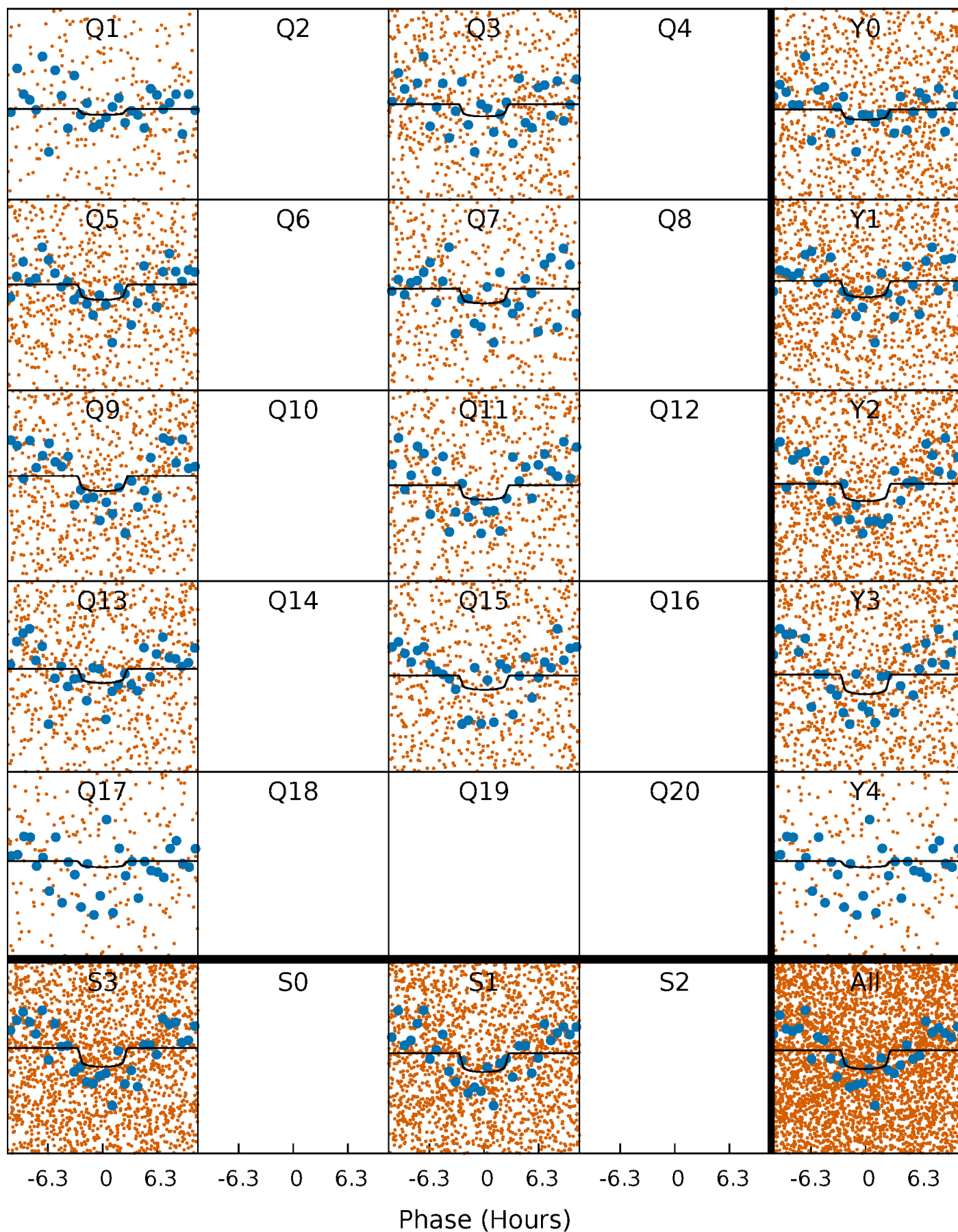
PDC Quarter-Phased Transit Curves

TCE 008491816-02 P= 2.406776 Days $T_0=131.963074$ (BKJD)



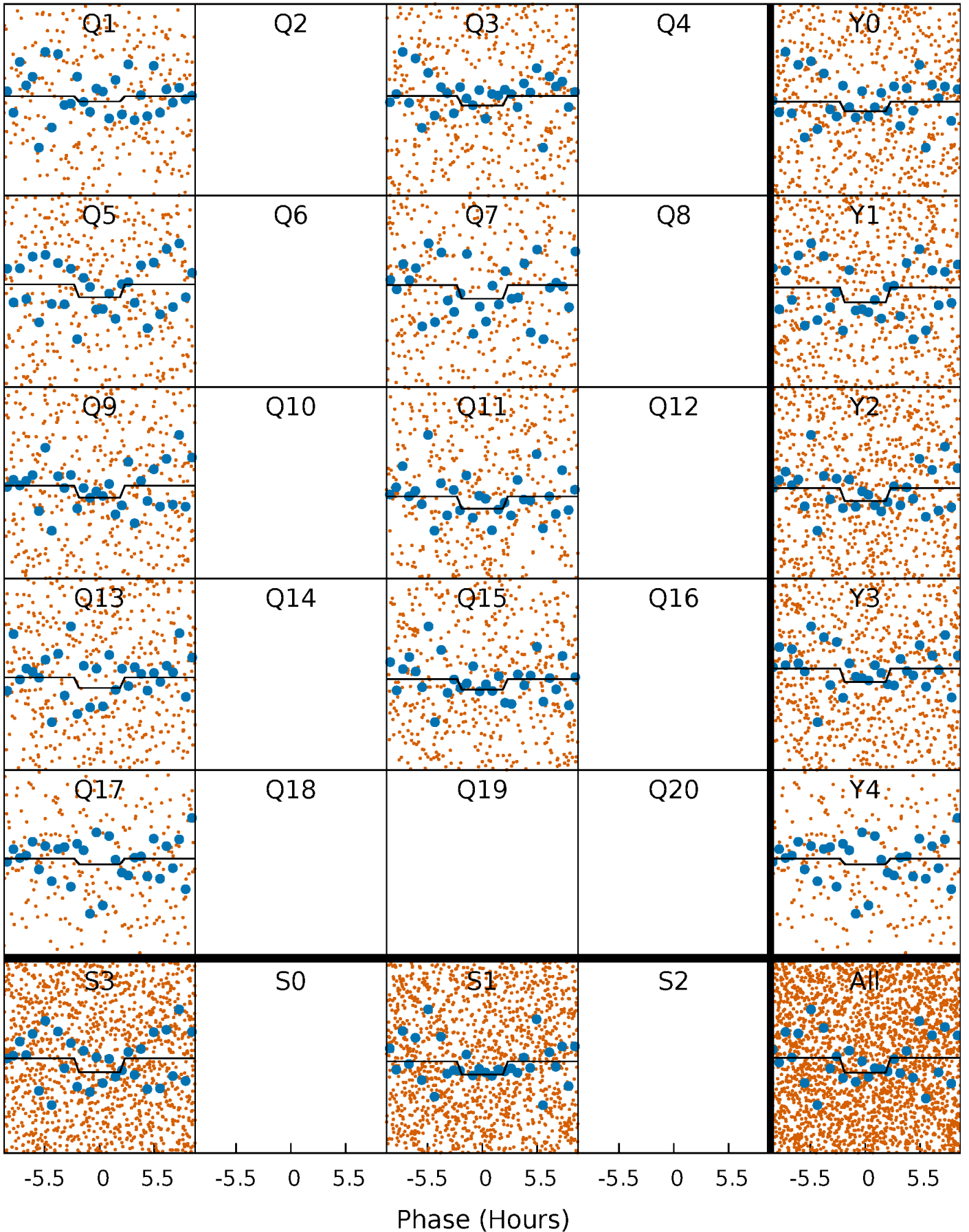
DV Quarter-Phased Transit Curves

TCE 008491816-02 P= 2.406776 Days $T_0=131.963074$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

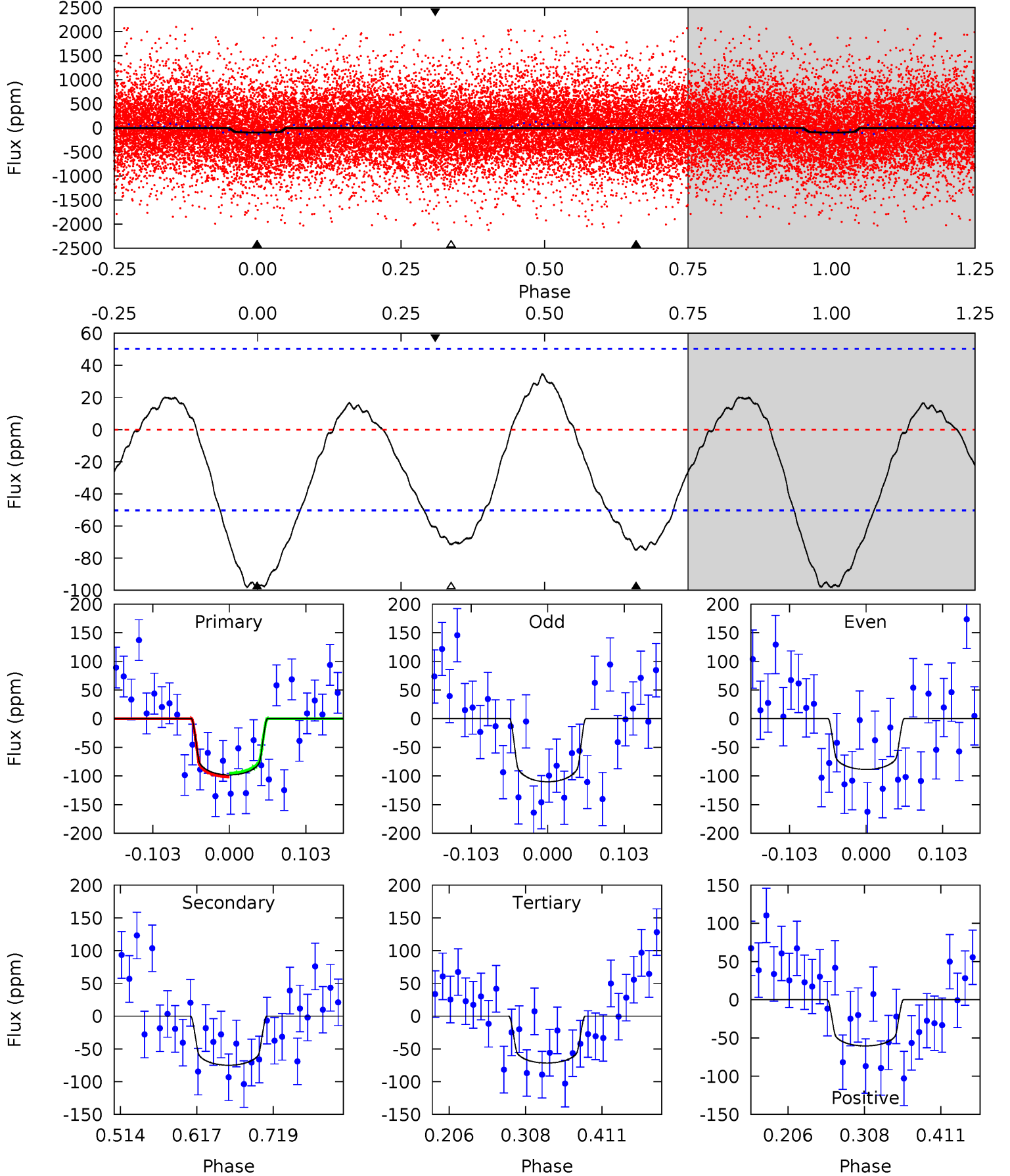
TCE 008491816-02 P= 2.406673 Days $T_0=131.959469$ (BKJD)



DV Model-Shift Uniqueness Test

008491816-02, P = 2.406776 Days, E = 129.556298 Days

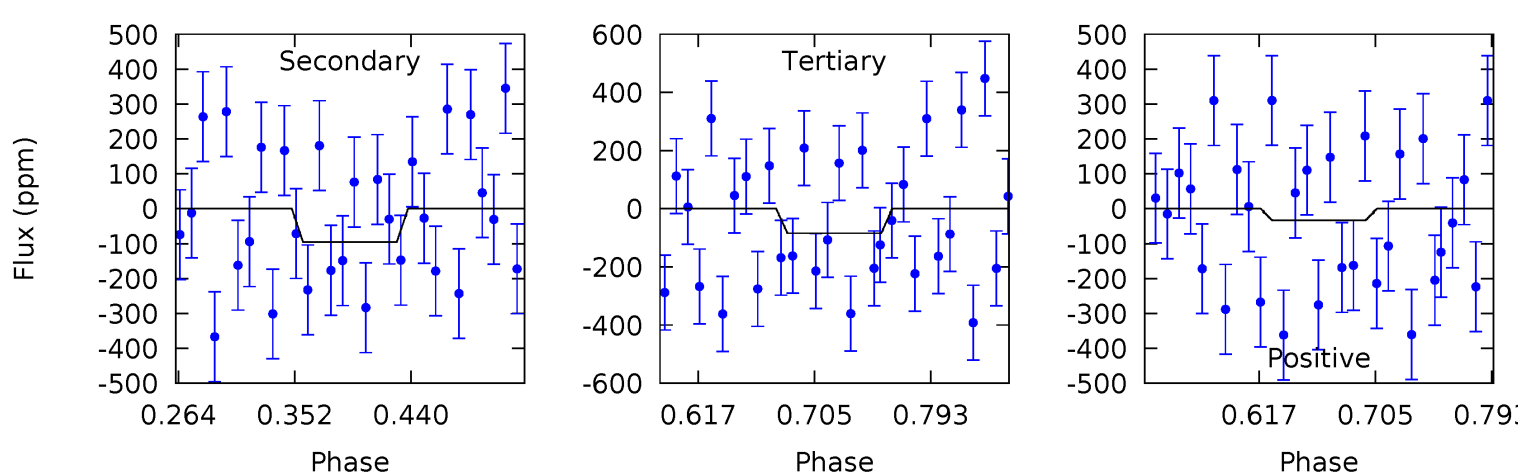
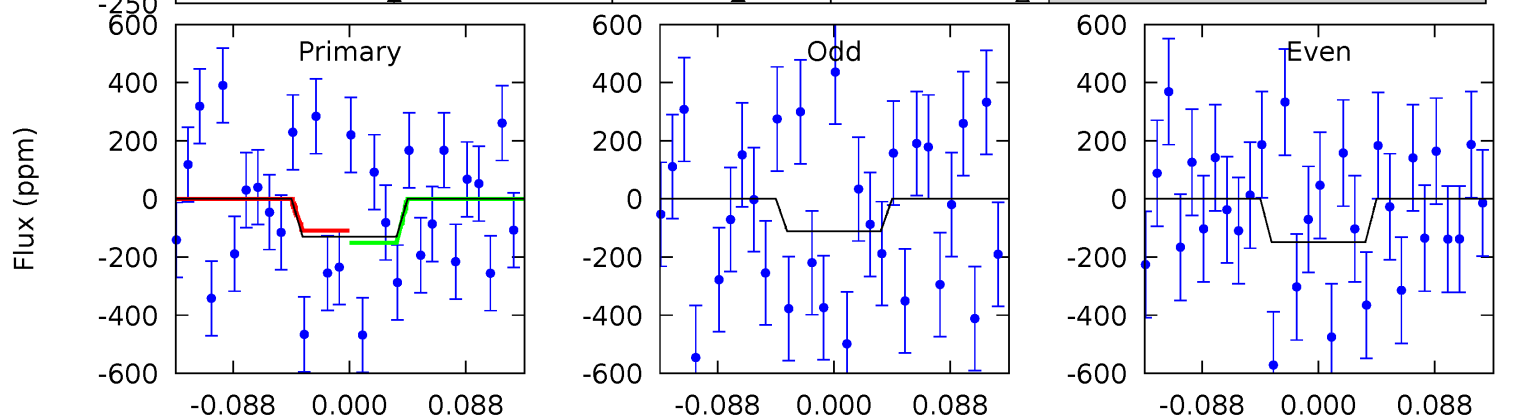
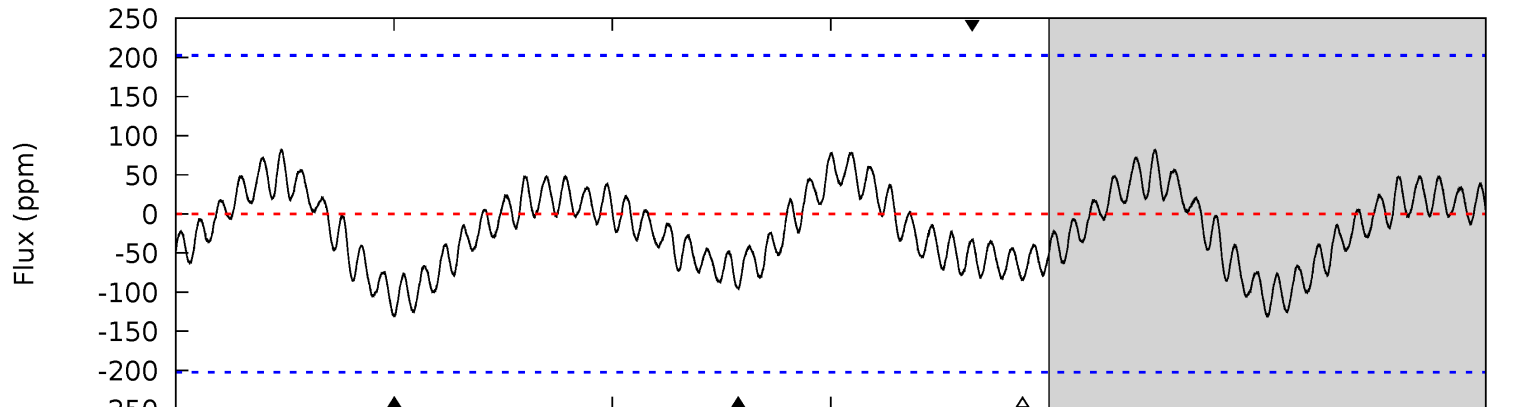
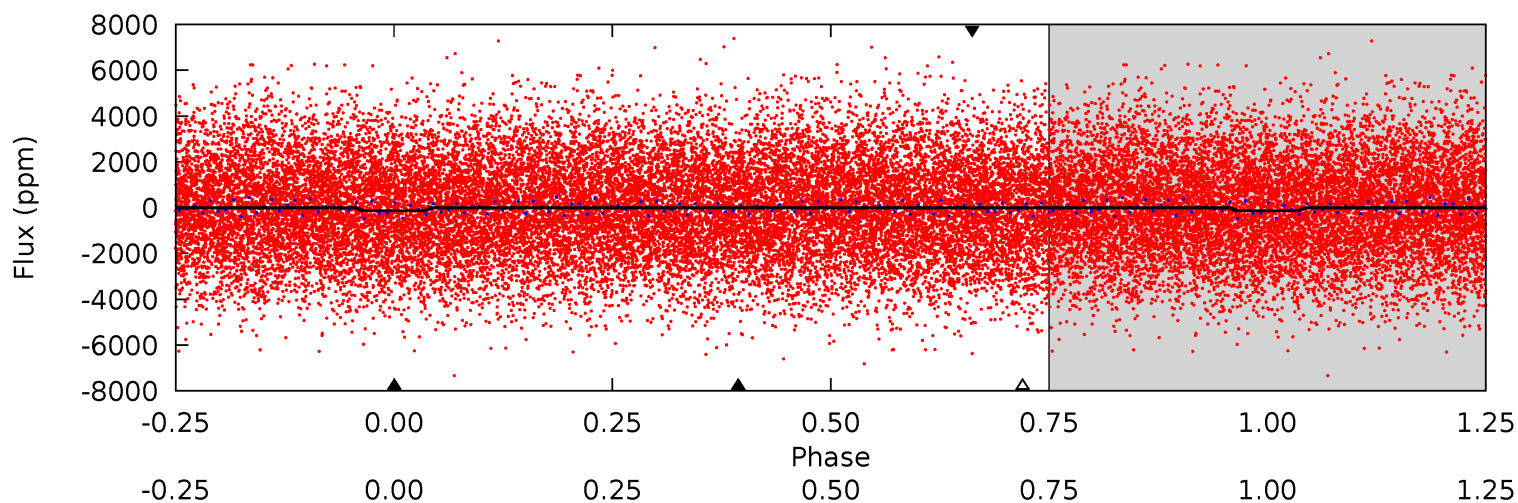
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.91	6.80	6.49	-5.48	4.56	1.63	2.84	2.41	14.4	0.30	12.3	0.98	0.92	0.26	0.29



Alt Model-Shift Uniqueness Test

008491816-02, P = 2.406673 Days, E = 129.552796 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.95	2.16	1.91	-0.75	4.59	1.71	0.92	1.04	3.70	0.25	2.91	0.44	0.84	0.39	0.49



Stellar Parameters For KIC 008491816

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7610^{+211}_{-316}	$3.662^{+0.459}_{-0.081}$	$-0.140^{+0.200}_{-0.350}$	$3.481^{+0.446}_{-1.785}$	$2.029^{+0.236}_{-0.551}$	$0.068^{+0.345}_{-0.017}$
	+3%/-4%	+13%/-2%	+143%/-250%	+13%/-51%	+12%/-27%	+509%/-25%
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 008491816-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-75 ± 11	$2.93^{+2.15}_{-1.75}$	4005^{+261}_{-498}	7475^{+7535}_{-1876}	$9.711^{+49.220}_{-6.499}$
Alt.	-95 ± 44	$3.86^{+2.38}_{-2.05}$	3997^{+296}_{-473}	6672^{+4083}_{-1572}	$6.568^{+23.006}_{-4.433}$

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

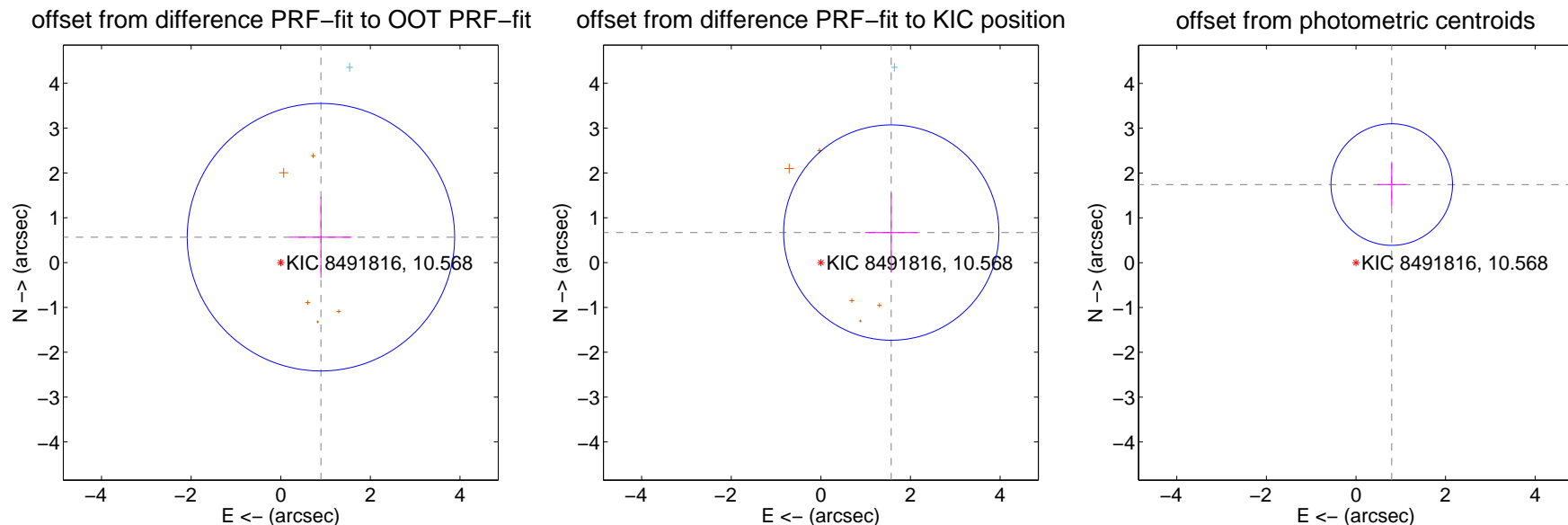
DV Centroid Data

Supplemental centroid analysis for 008491816-02. **Kepler magnitude: 10.57.** Transit SNR 5.88

There are 2 quarters with good PRF difference image offsets

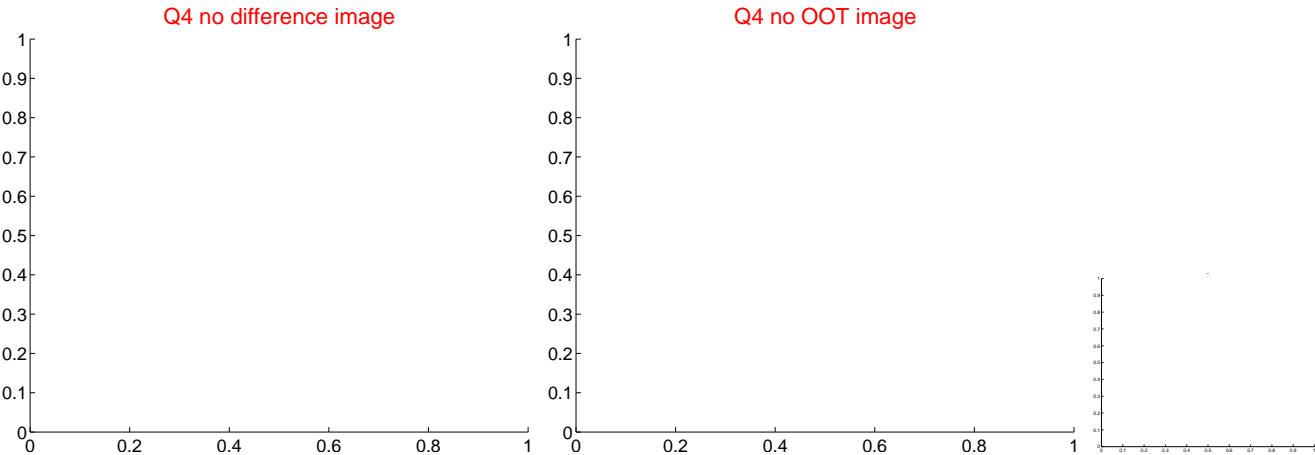
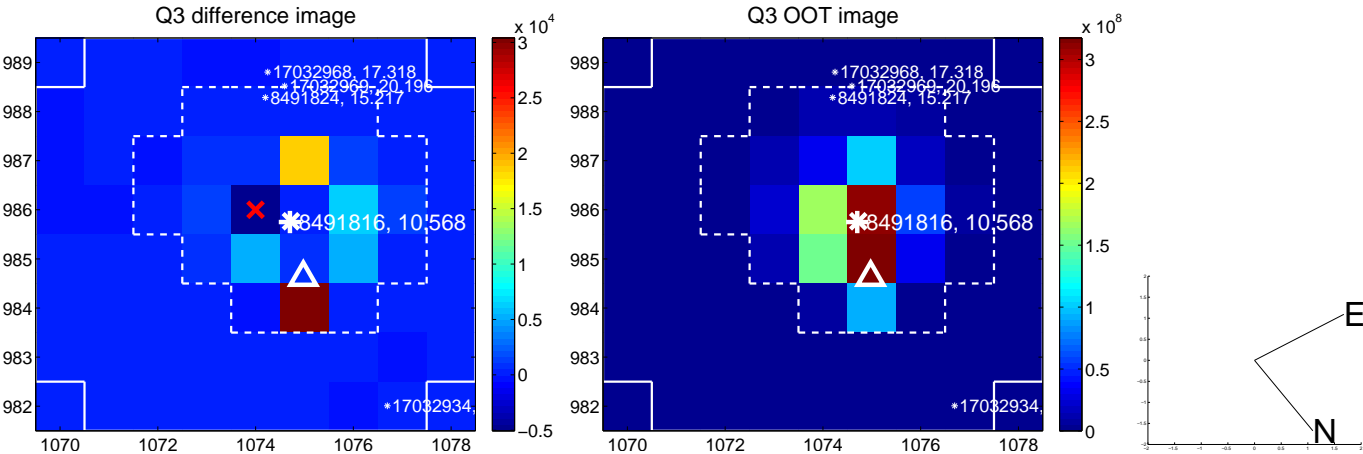
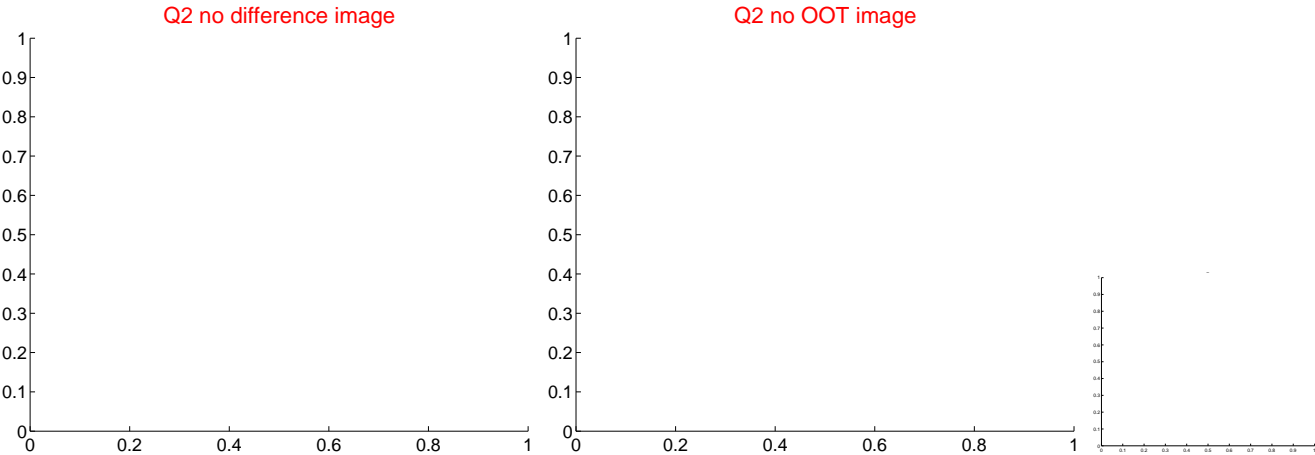
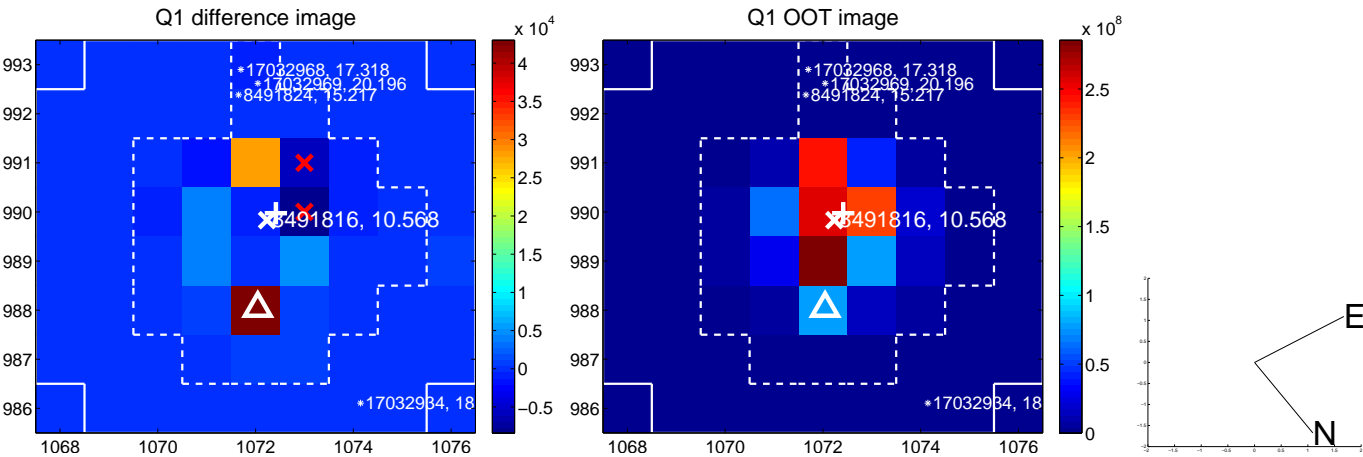
The direct PRF centroid is offset from the target star catalog position by about 0.78 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.060 ± 0.994	1.07	-0.897 ± 0.687	0.566 ± 0.905
PRF-fit source offset from KIC position	1.707 ± 0.801	2.13	-1.570 ± 0.585	0.669 ± 0.883
photometric centroid source offset	1.92 ± 0.45	4.24	-0.80 ± 0.32	1.74 ± 0.48

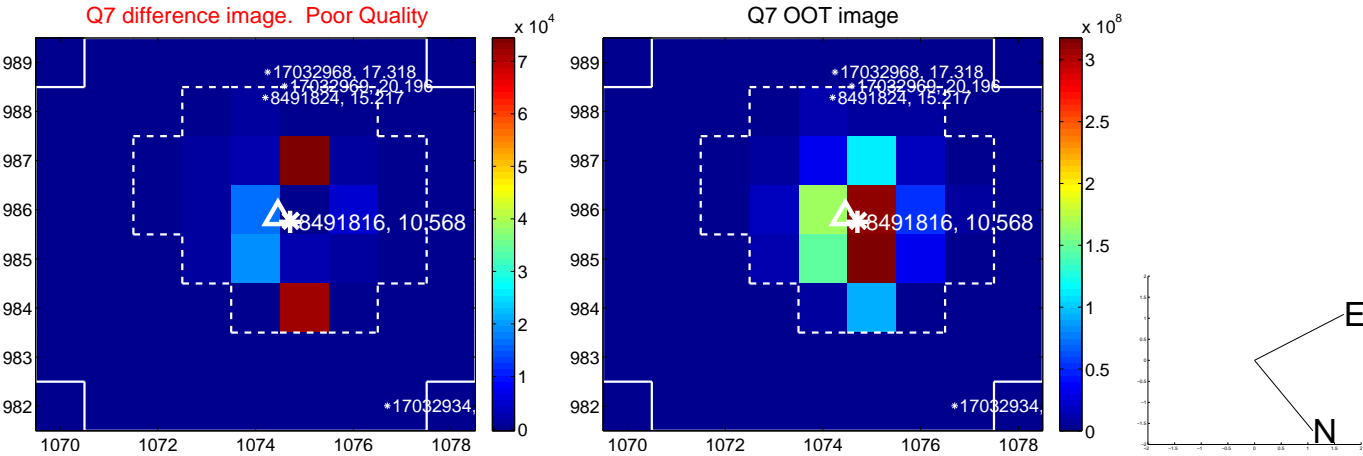
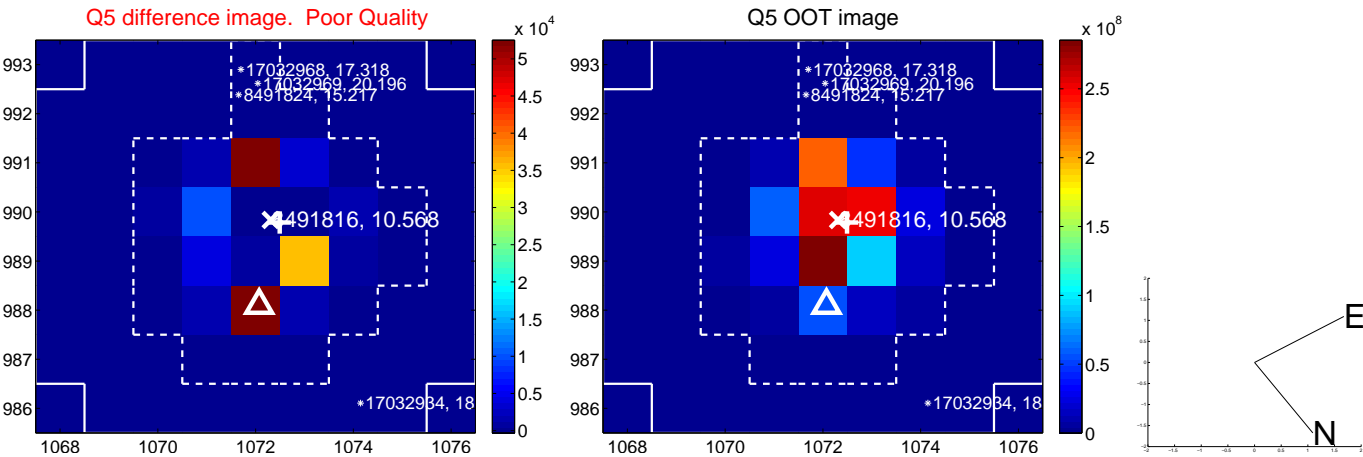


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

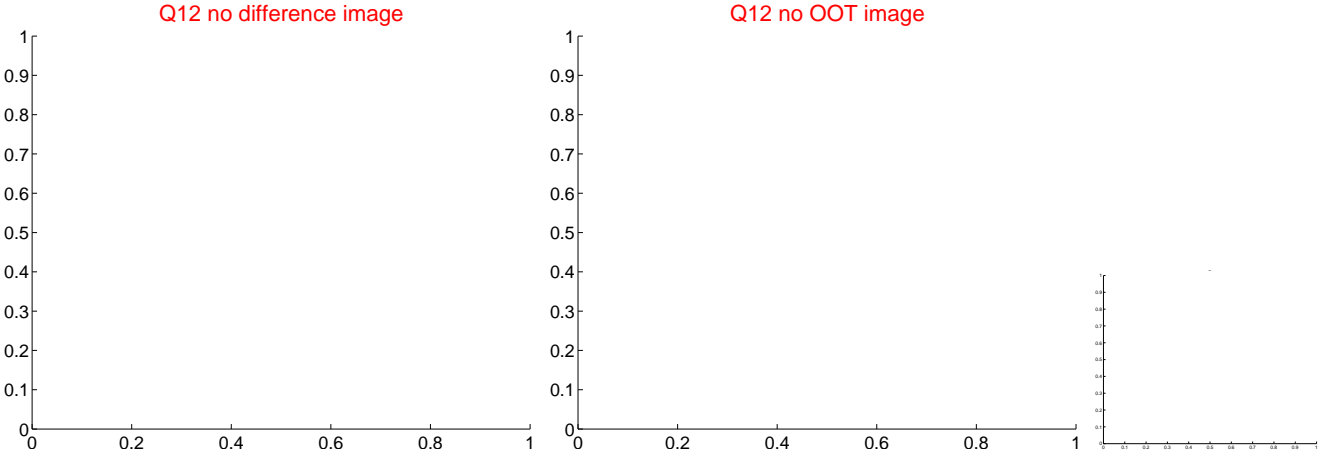
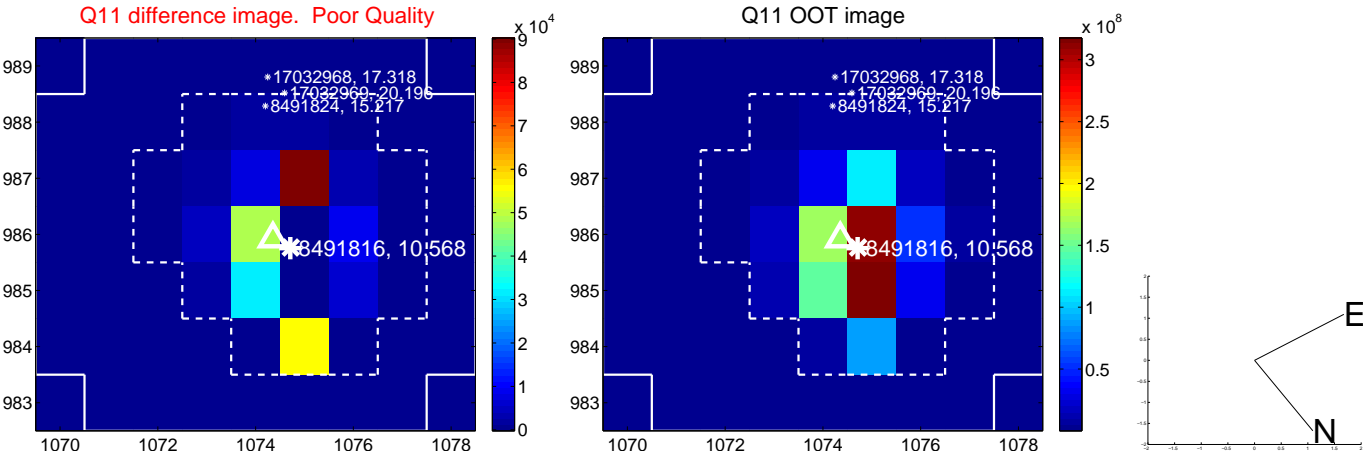
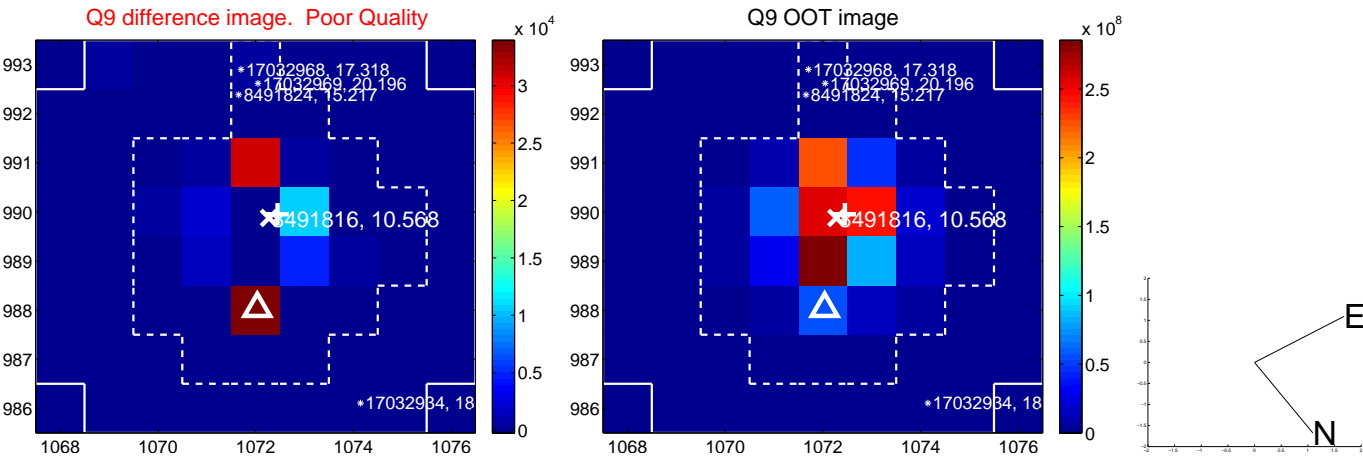
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



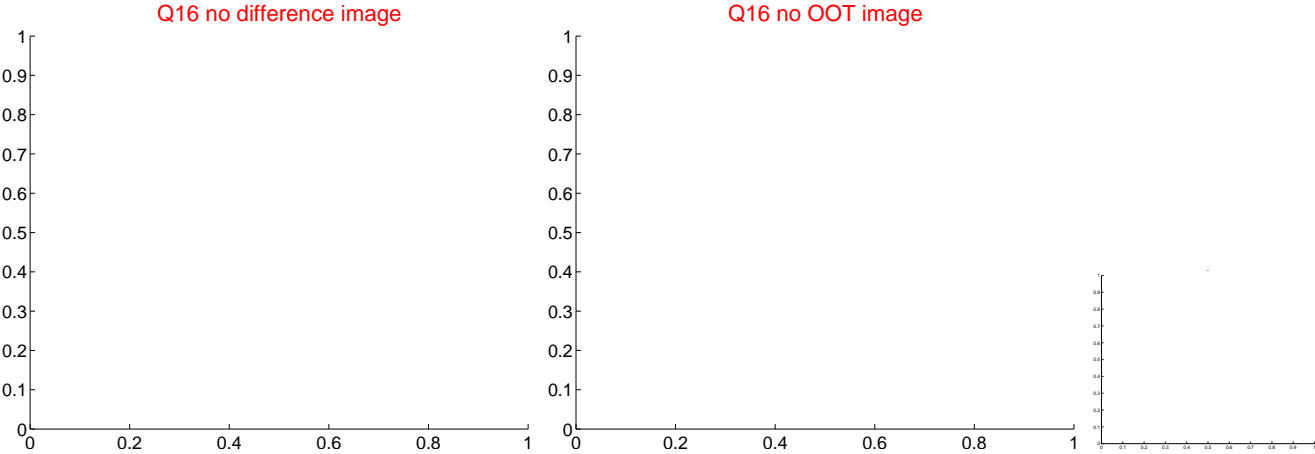
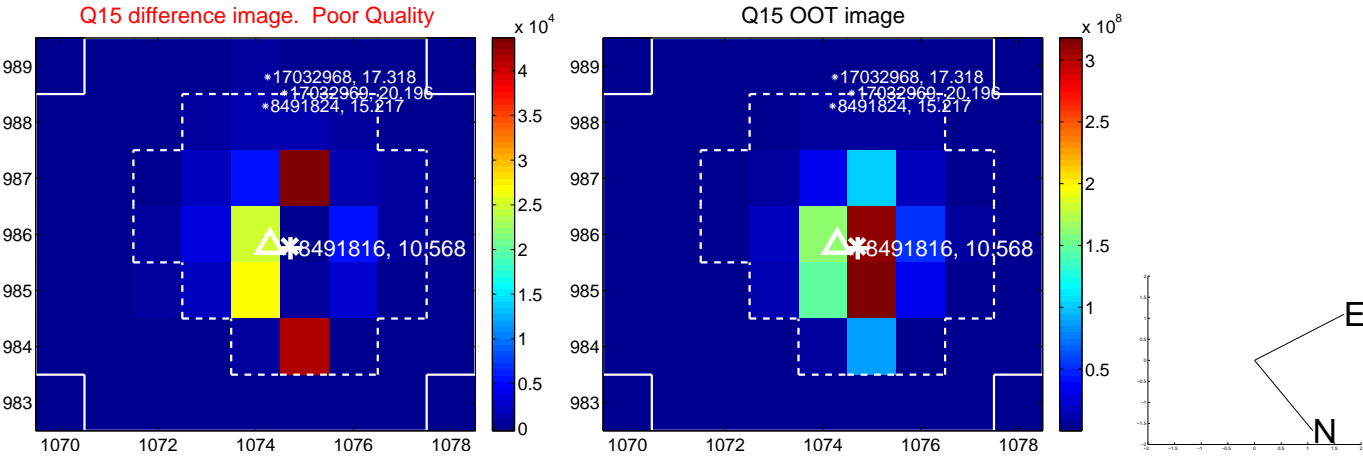
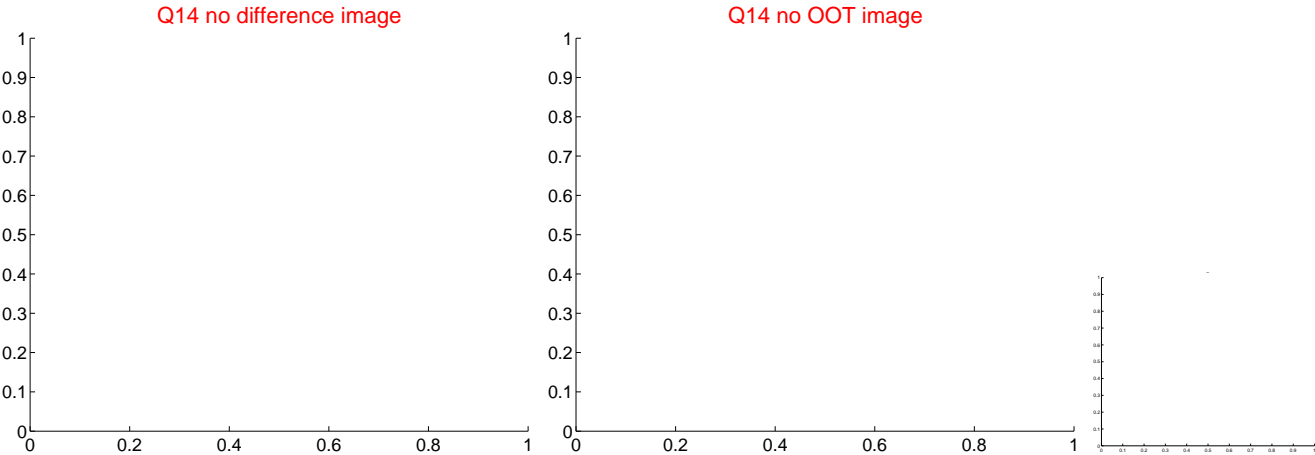
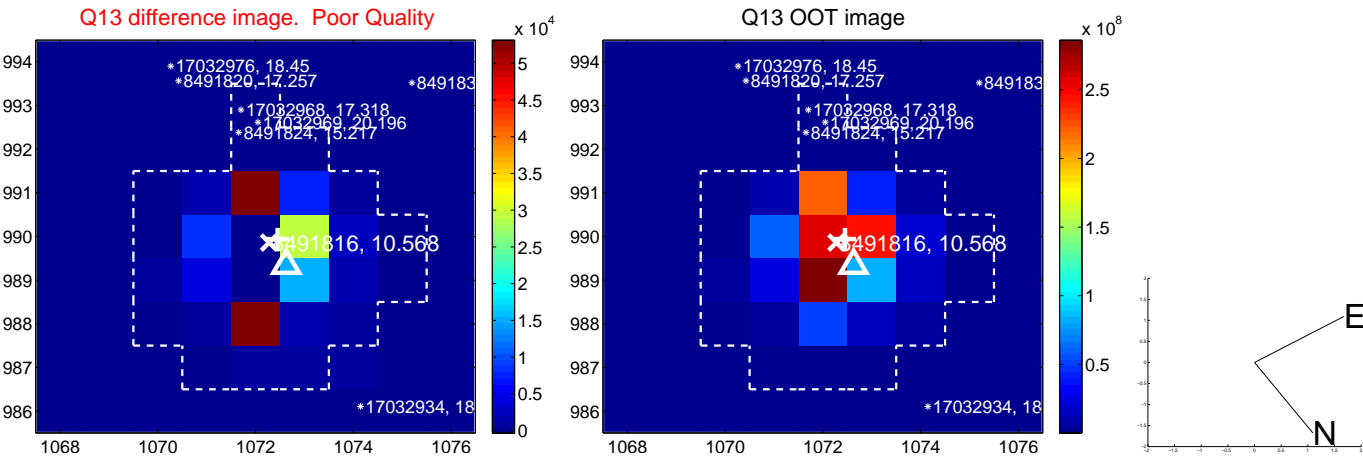
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



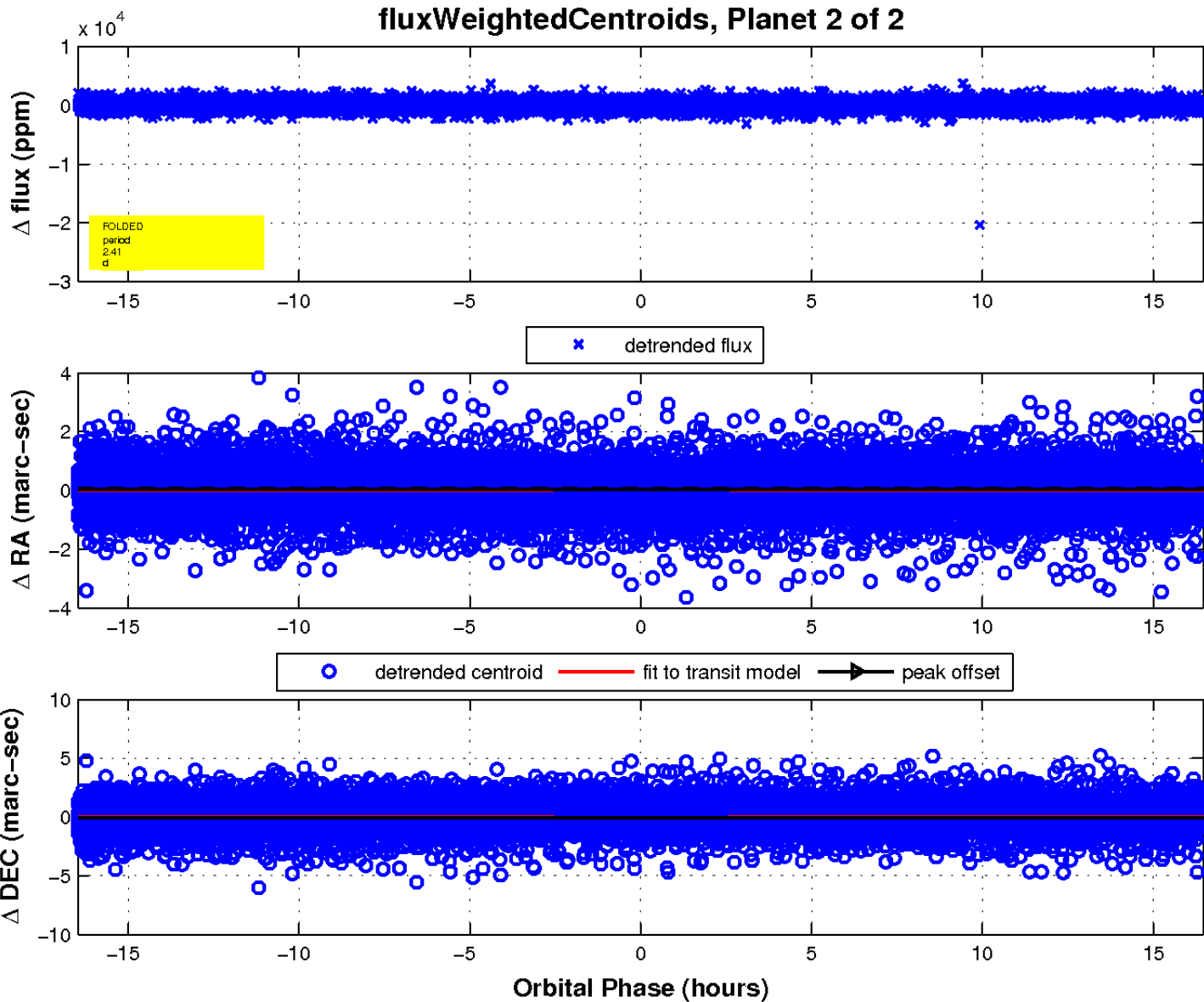
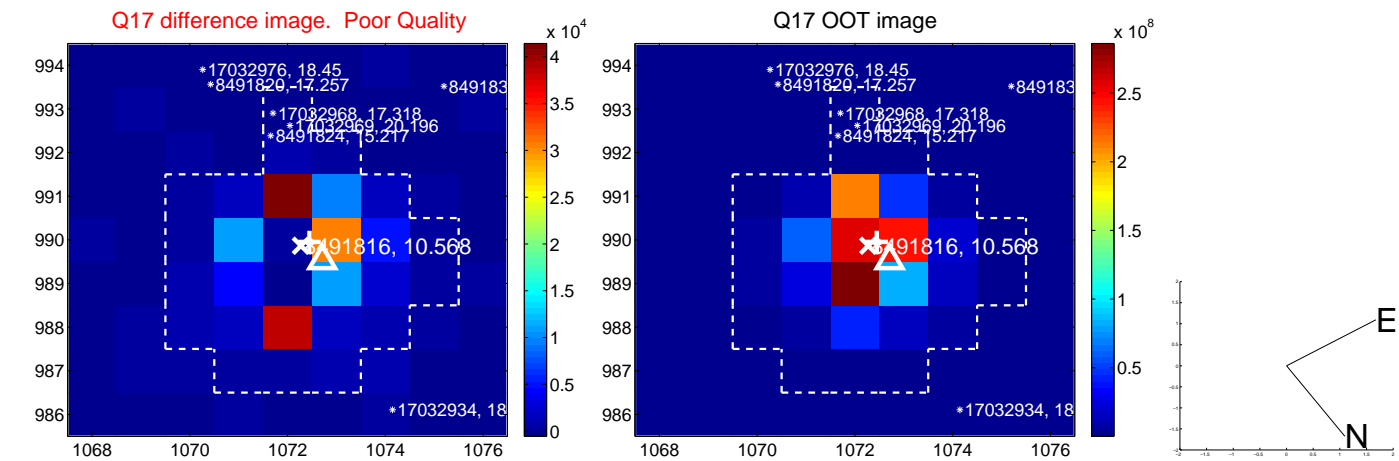
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

