

KIC 007871954

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})
007871954-01	OBS	1515.01	1.937019	132.787950	305.5	1.605	35.3	40.9	0.49	4042	1.01	97.85
007871954-02	OBS	1515.02	7.061193	136.271549	461.8	1.079	20.6	25.7	0.49	4042	1.25	17.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007871954-01	OBS	PC	0.89	0	0	0	0	CENT_KIC_POS
007871954-02	OBS	PC	0.99	0	0	0	0	CENT_KIC_POS

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

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

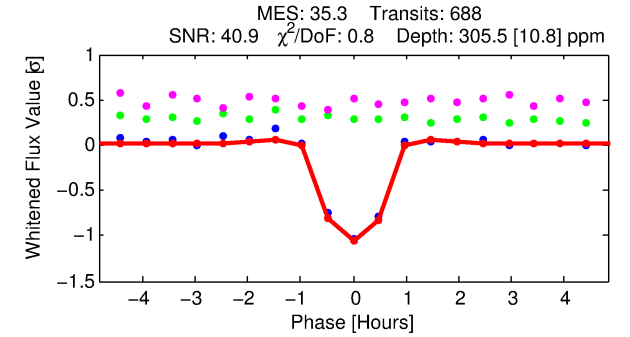
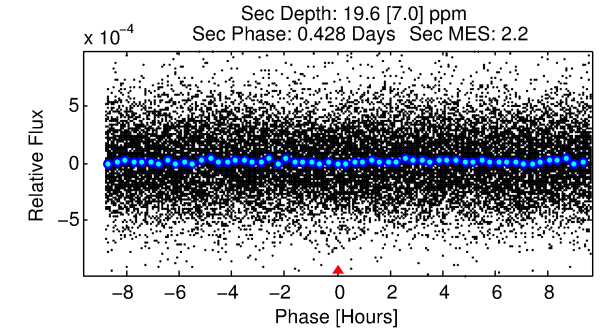
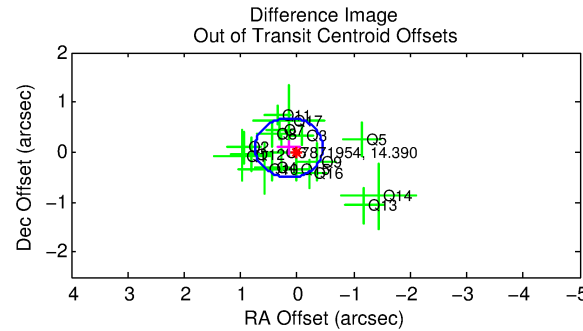
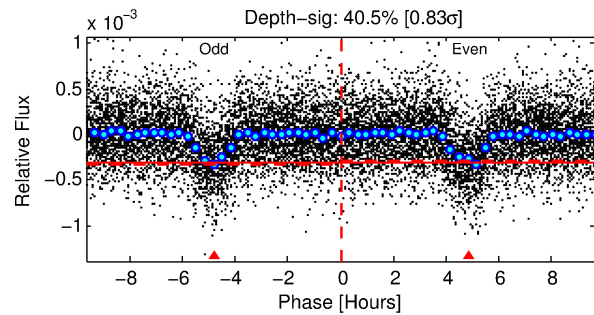
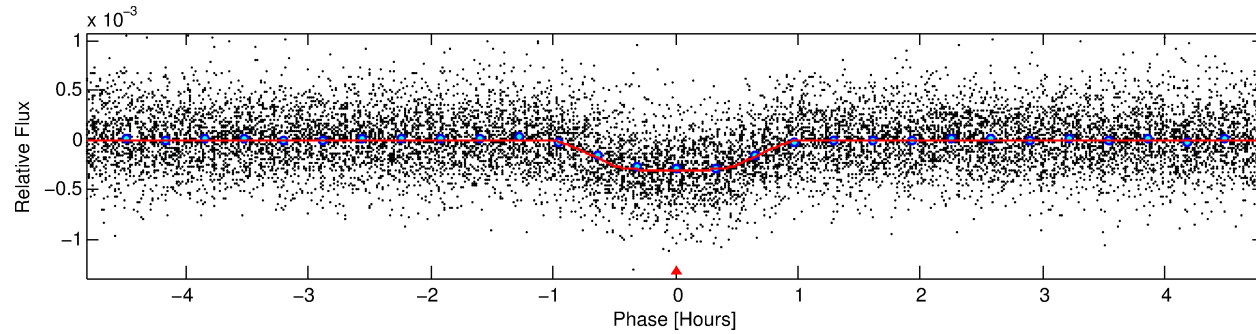
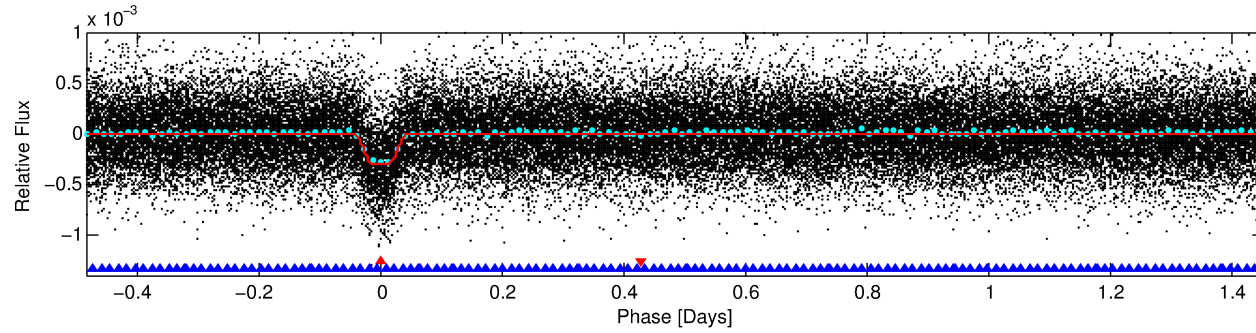
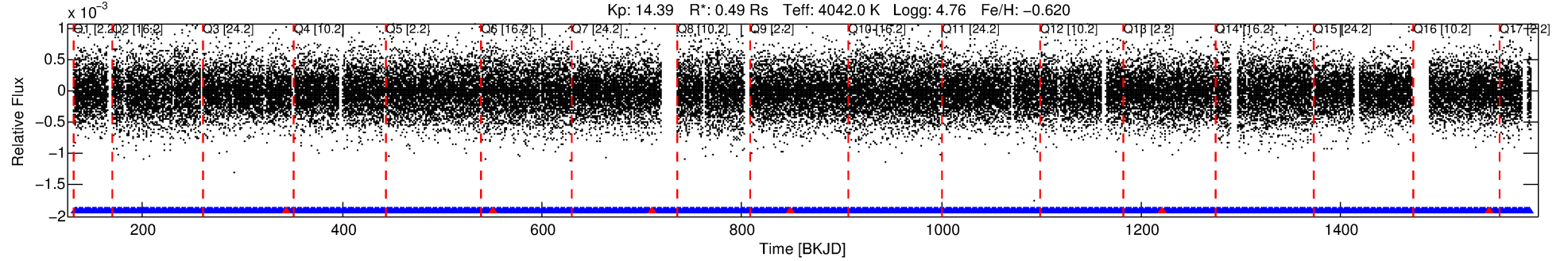
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007871954-01

No Significant Match Found

DV One-Page Summary

KIC: 7871954 Candidate: 1 of 2 Period: 1.937 d
KOI: K01515.01 Name: Kepler-303b Corr: 0.950



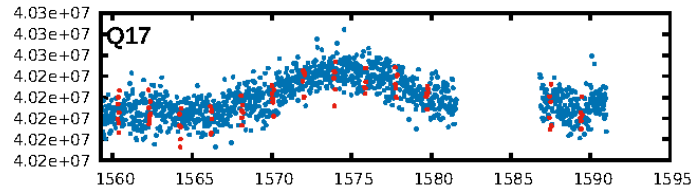
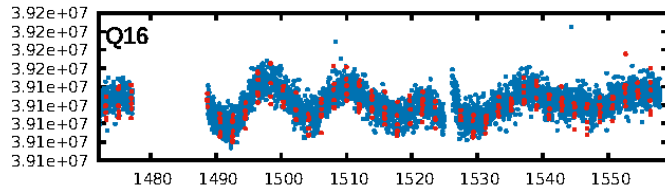
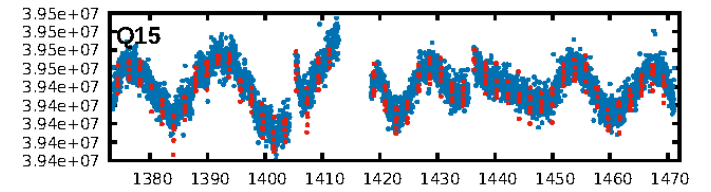
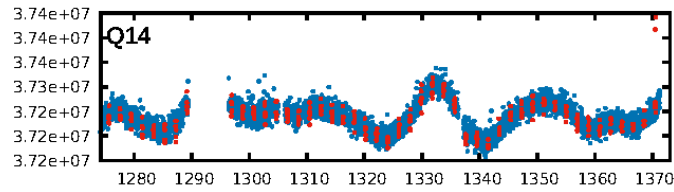
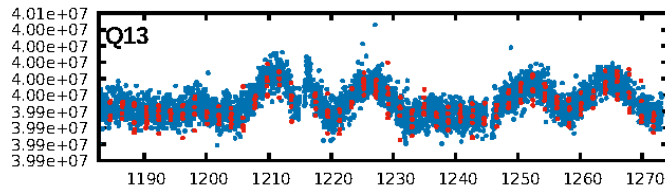
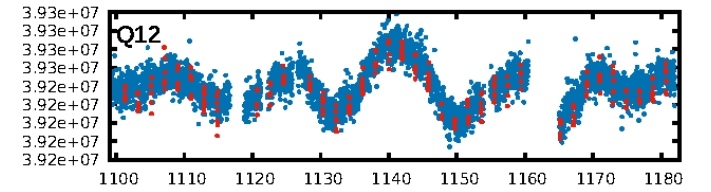
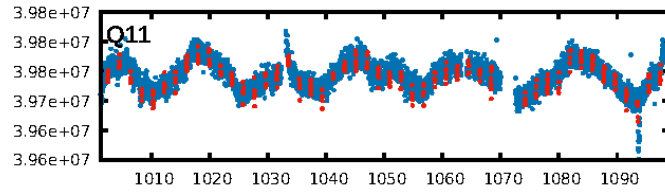
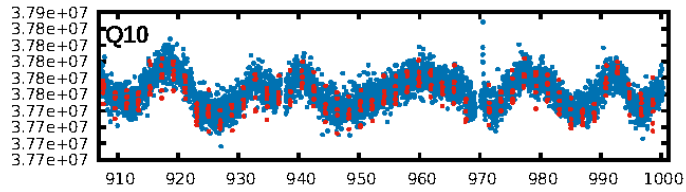
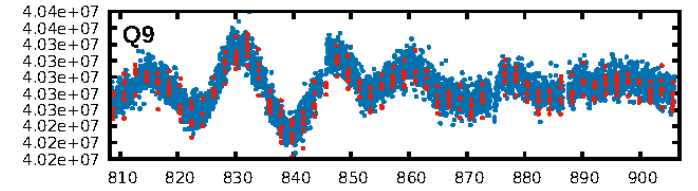
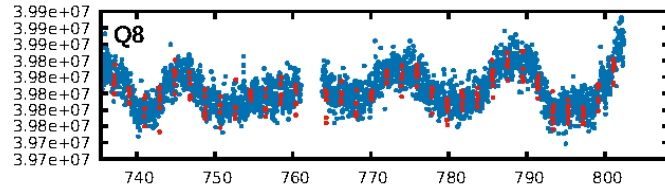
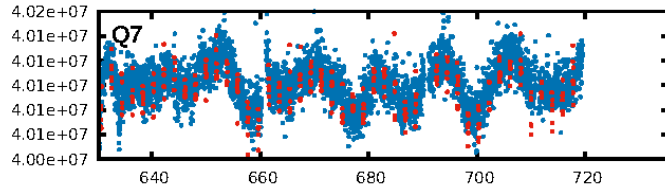
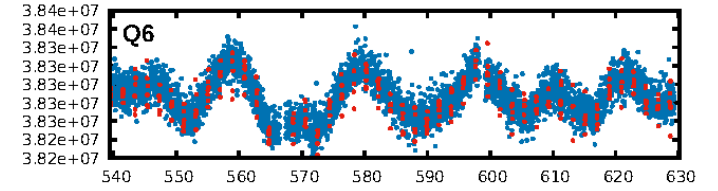
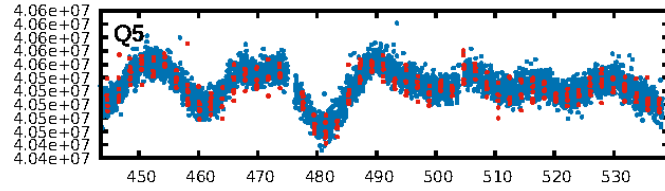
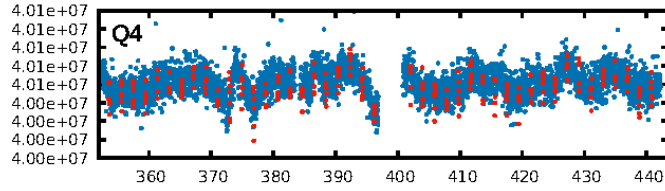
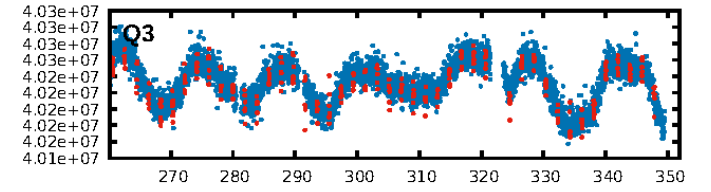
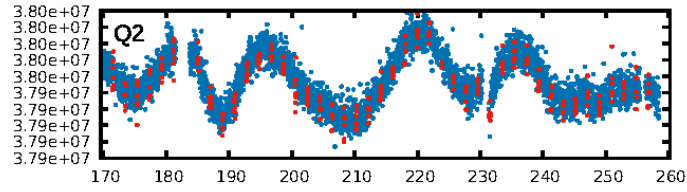
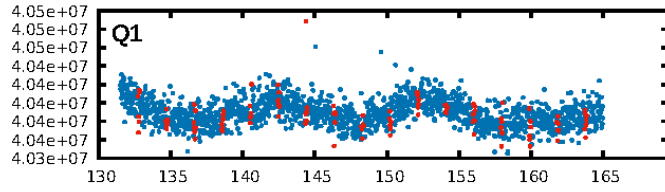
DV Fit Results:

Period = 1.93702 [0.00000] d
Epoch = 132.7879 [0.0006] BKJD
Rp/R* = 0.0189 [0.0028]
a/R* = 4.48 [3.23]
b = 0.90 [0.16]
Seff = 97.85 [11.38]
Teff = 802 [23] K
Rp = 1.01 [0.17] Re
a = 0.0242 [0.0014] AU
Ag = 6.16 [2.91] [1.77 σ]
Teffp = 1953 [231] K [4.95 σ]

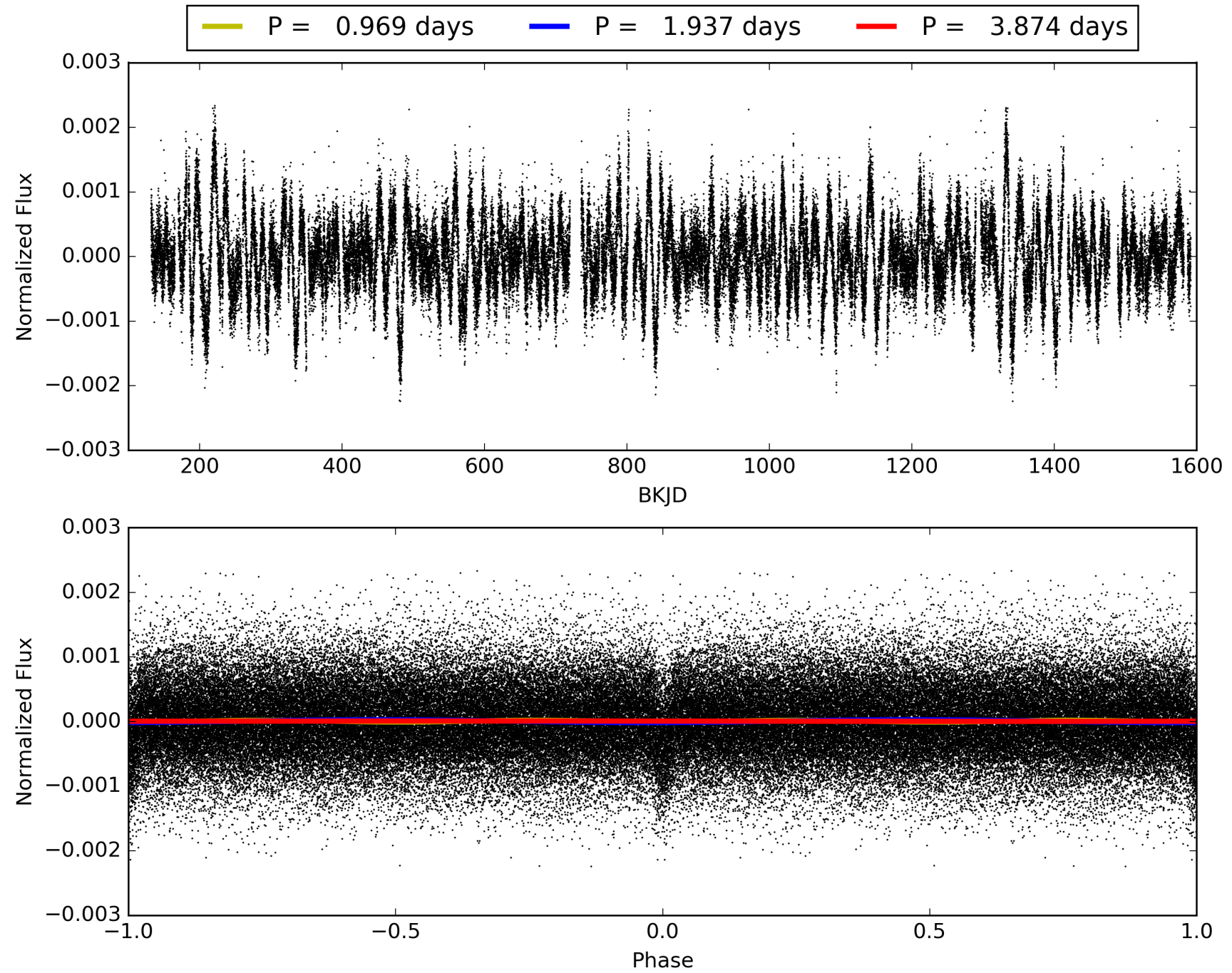
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [63.58 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.69e-257
RollingBand-fgt: 0.99 [652/658]
GhostDiagnostic-chr: 4.823
Centroid-sig: 10.9%
Centroid-so: 0.447 arcsec [1.36 σ]
OotOffset-rm: 0.171 arcsec [0.86 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.694 arcsec [4.75 σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 007871954-01, PDC Light Curves

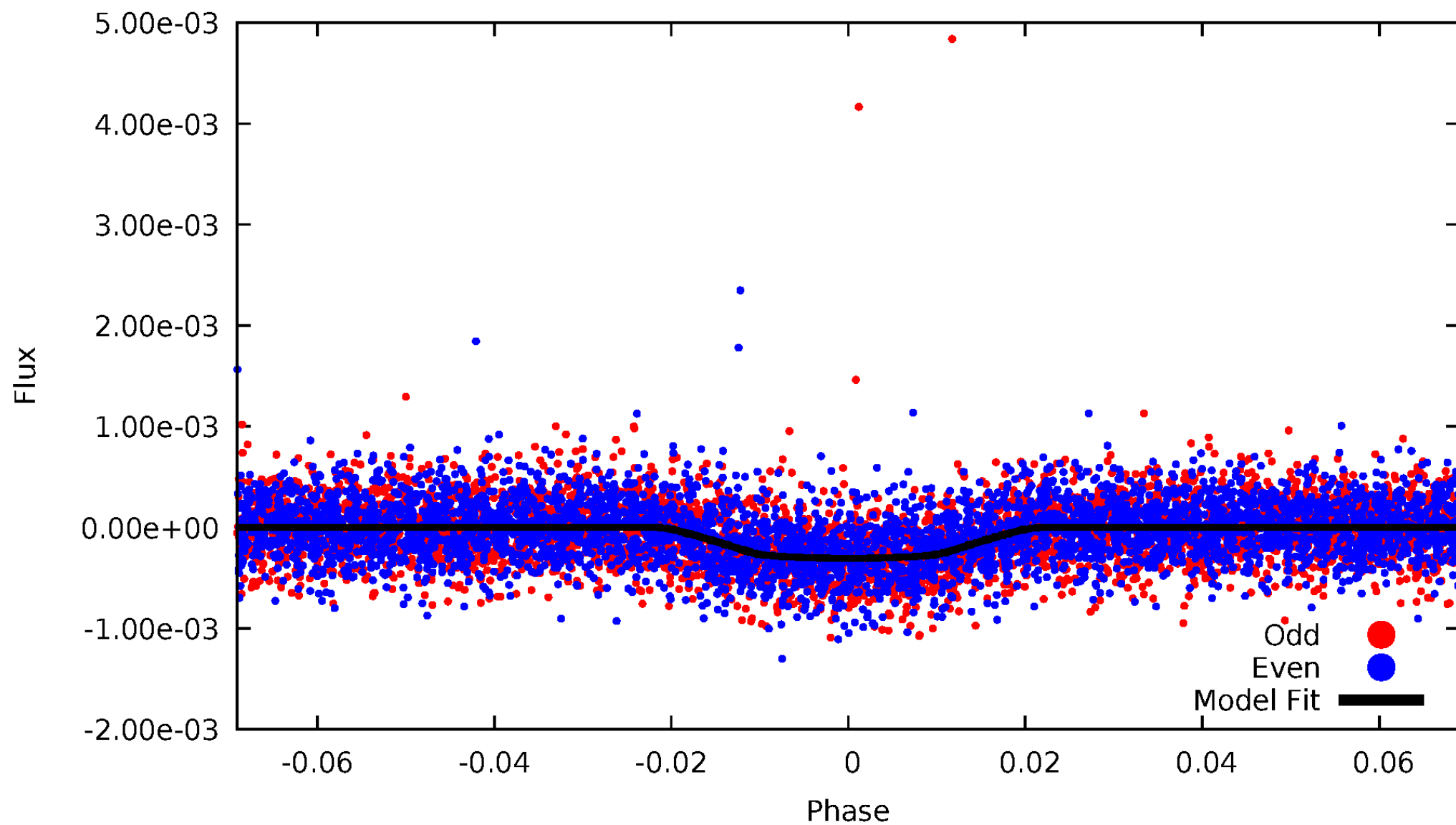


TCE 007871954-01



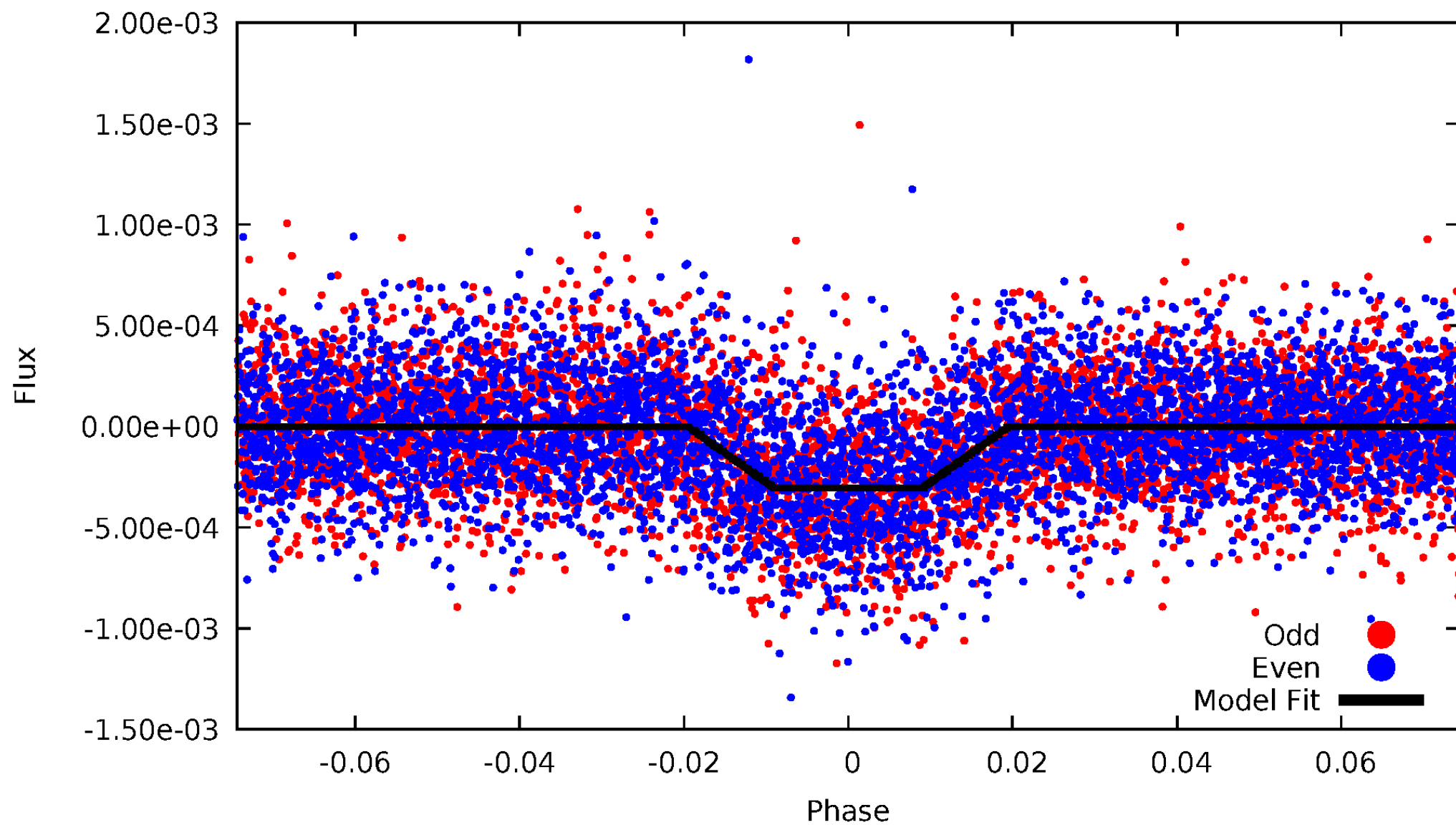
DV Odd/Even

TCE 007871954-01



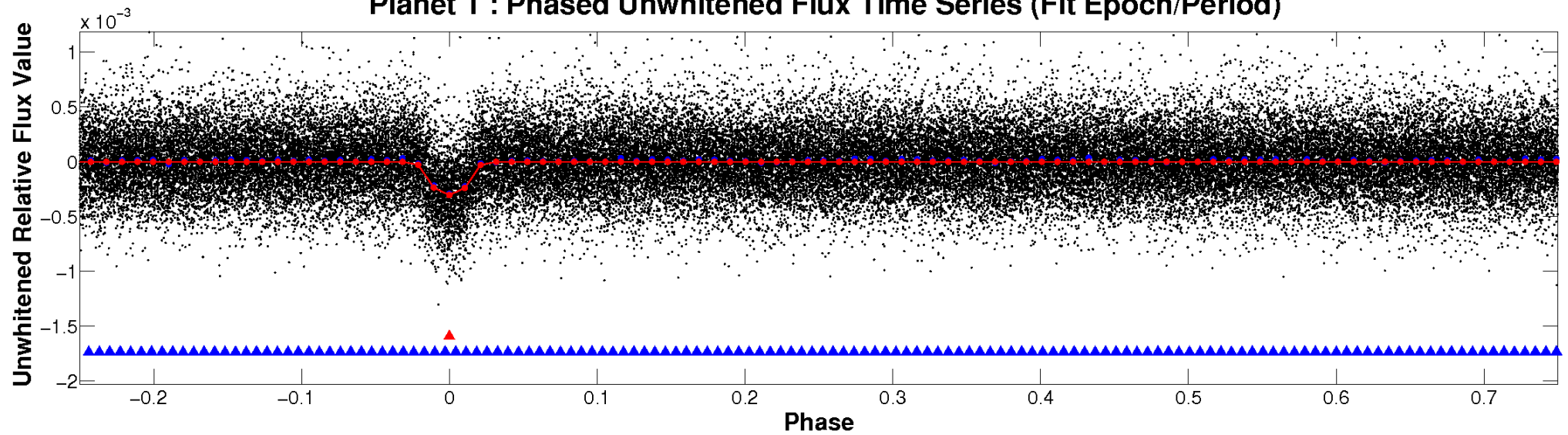
ALT Odd/Even

TCE 007871954-01

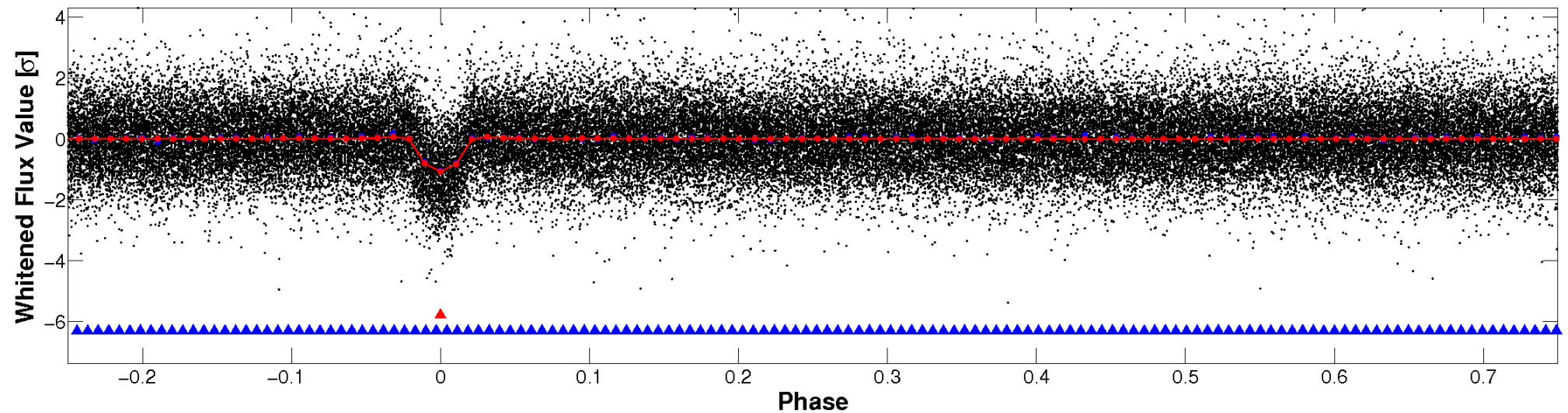


Non-Whitened Vs. Whitened Light Curve

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

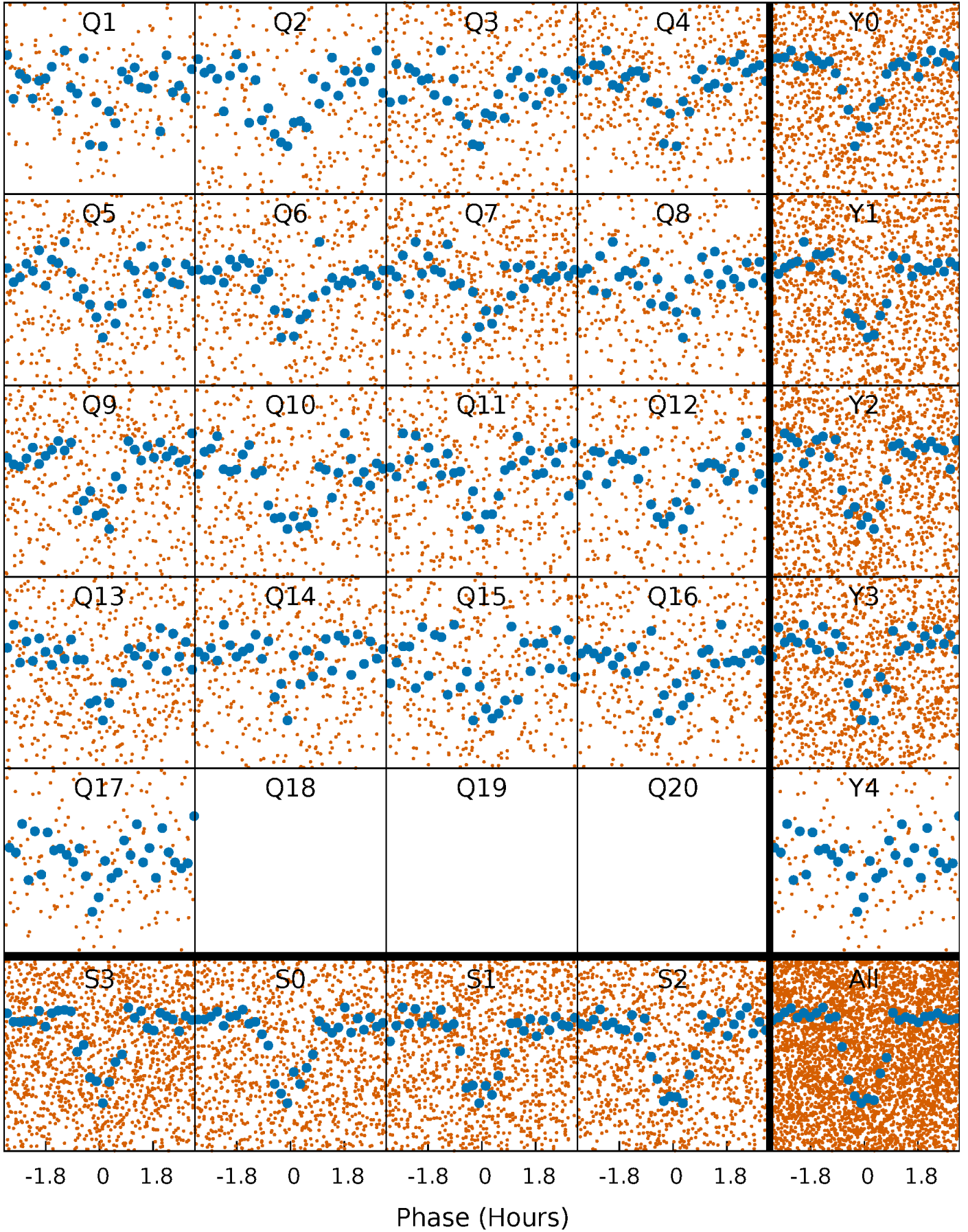


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



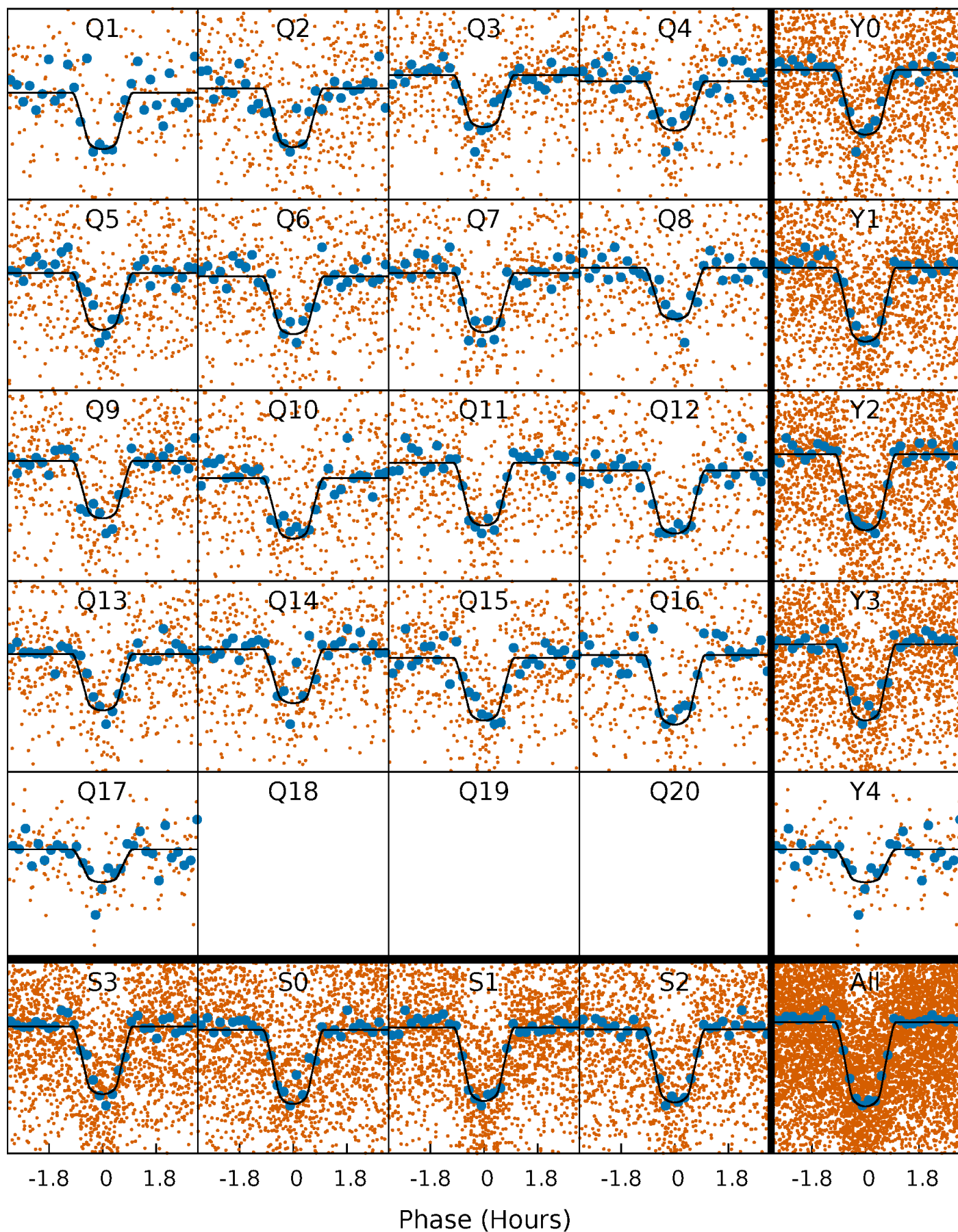
PDC Quarter-Phased Transit Curves

TCE 007871954-01 P= 1.937019 Days $T_0=132.787950$ (BKJD)



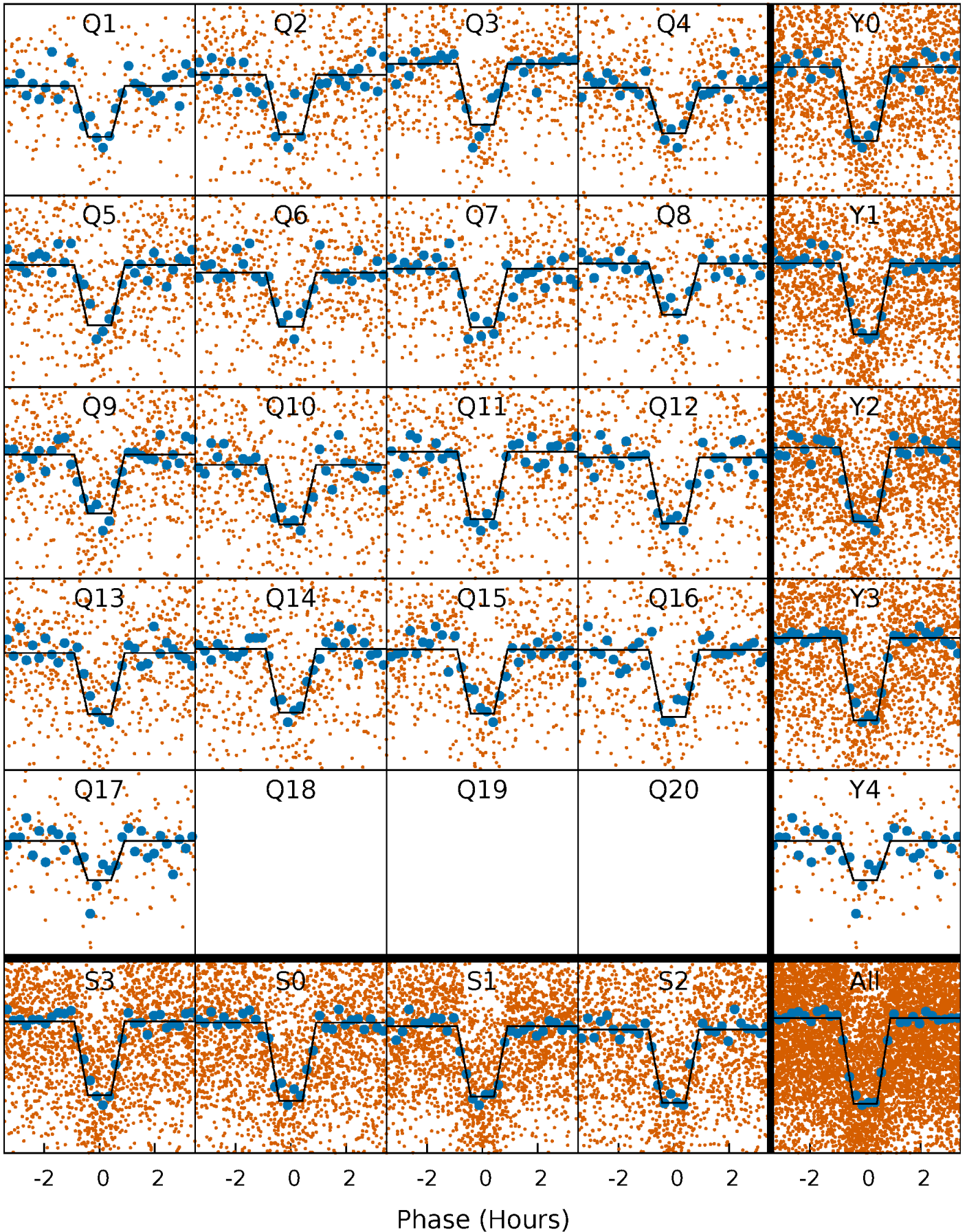
DV Quarter-Phased Transit Curves

TCE 007871954-01 P= 1.937019 Days $T_0=132.787950$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

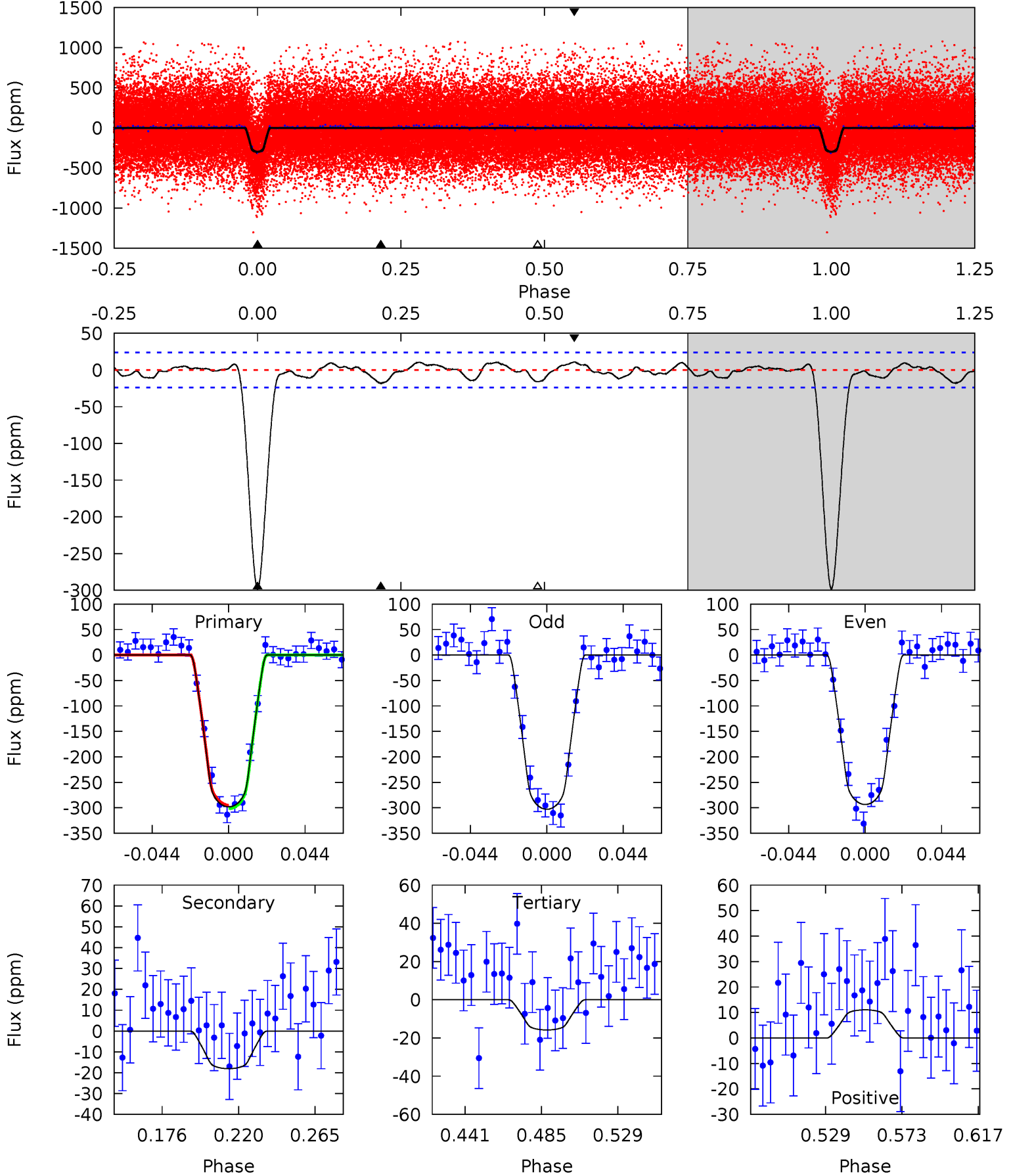
TCE 007871954-01 P= 1.937023 Days $T_0=132.786664$ (BKJD)



DV Model-Shift Uniqueness Test

007871954-01, P = 1.937019 Days, E = 130.850931 Days

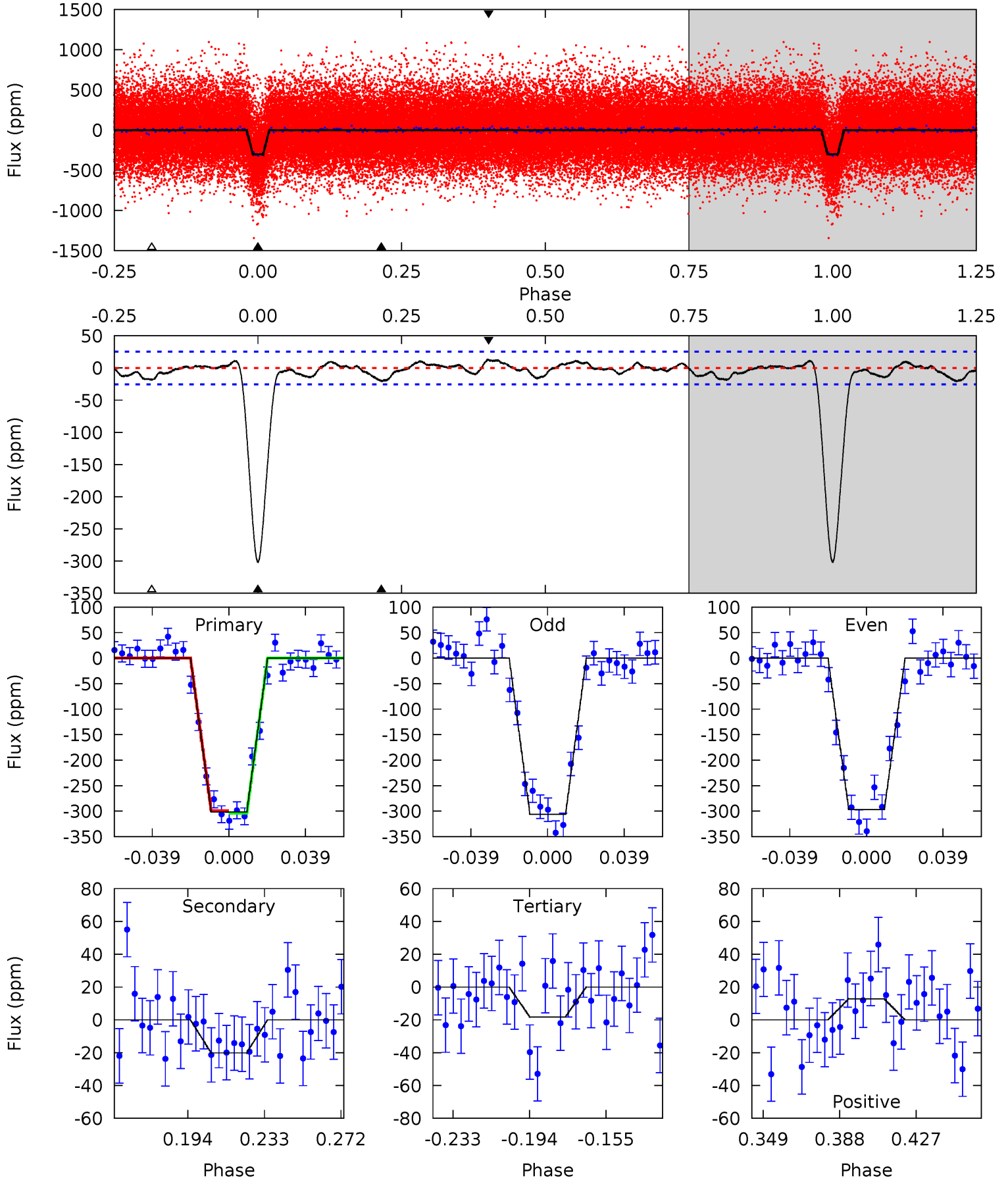
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
59.1	3.58	3.14	2.19	4.73	2.01	1.29	56.0	56.9	0.44	1.39	0.93	0.98	0.04	0.64



Alt Model-Shift Uniqueness Test

007871954-01, P = 1.937023 Days, E = 130.849641 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
56.3	3.76	3.40	2.39	4.76	2.07	1.30	52.9	54.0	0.36	1.37	0.89	0.99	0.04	0.52



Stellar Parameters For KIC 007871954

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4042^{+72}_{-88}	$4.761^{+0.038}_{-0.035}$	$-0.620^{+0.150}_{-0.150}$	$0.490^{+0.030}_{-0.037}$	$0.505^{+0.027}_{-0.033}$	$6.038^{+1.078}_{-0.759}$
	+2%/-2%	+1%/-1%	+24%/-24%	+6%/-8%	+5%/-7%	+18%/-13%
Source	SPE60	SPE60	SPE60	DSEP		

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

Secondary Eclipse Parameters for KIC 007871954-01 / KOI 1515.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-18 ± 5	$1.01^{+0.17}_{-0.14}$	1119^{+27}_{-27}	2568^{+141}_{-141}	$5.624^{+2.784}_{-1.930}$
Alt.	-20 ± 5	$0.94^{+0.14}_{-0.16}$	1120^{+27}_{-29}	2644^{+173}_{-152}	$7.124^{+4.109}_{-2.616}$

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

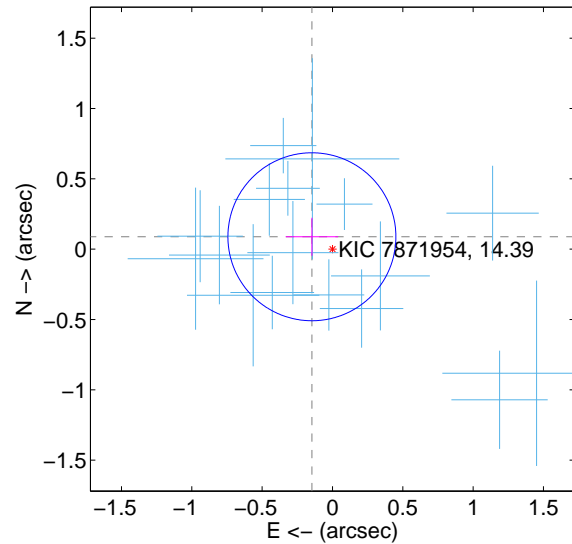
Supplemental centroid analysis for 007871954-01. Kepler magnitude: 14.39. Transit SNR 40.86

There are 17 quarters with good PRF difference image offsets

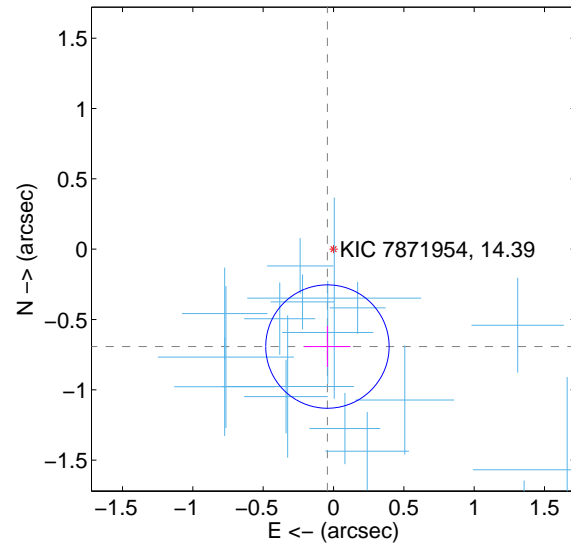
The direct PRF centroid is offset from the target star catalog position by about 1.00 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.171 ± 0.199	0.86	0.146 ± 0.187	0.088 ± 0.135
PRF-fit source offset from KIC position	0.694 ± 0.146	4.75	0.043 ± 0.164	-0.692 ± 0.146
photometric centroid source offset	0.45 ± 0.33	1.36	-0.01 ± 0.35	-0.45 ± 0.33

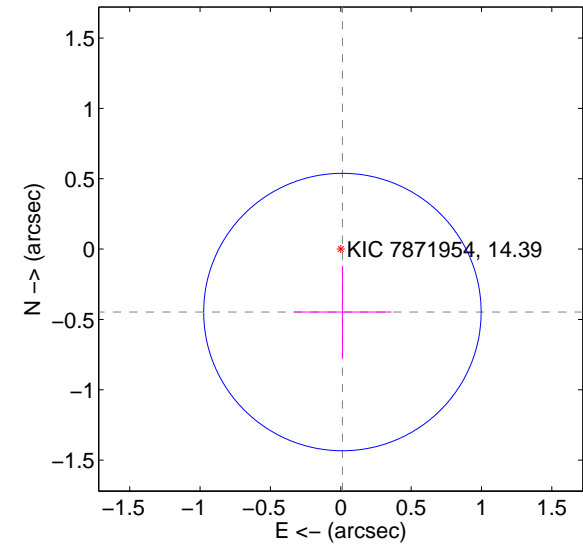
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

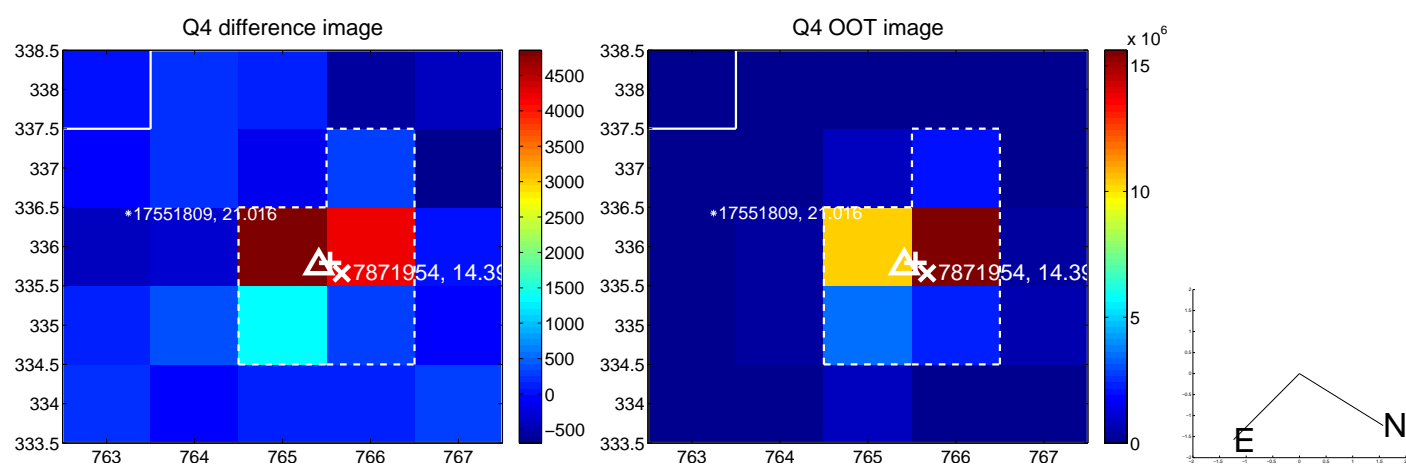
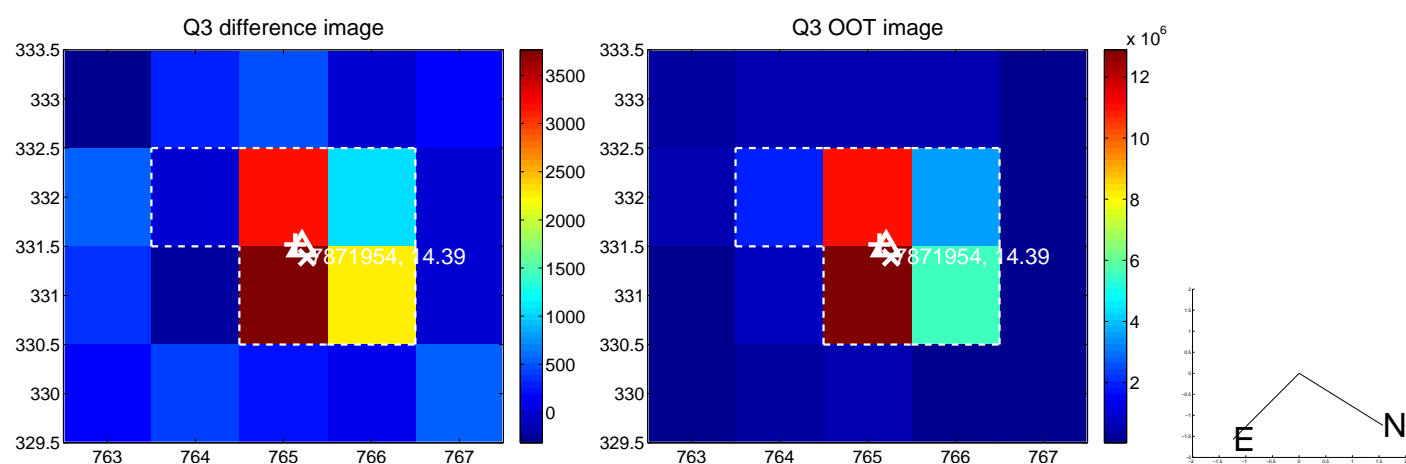
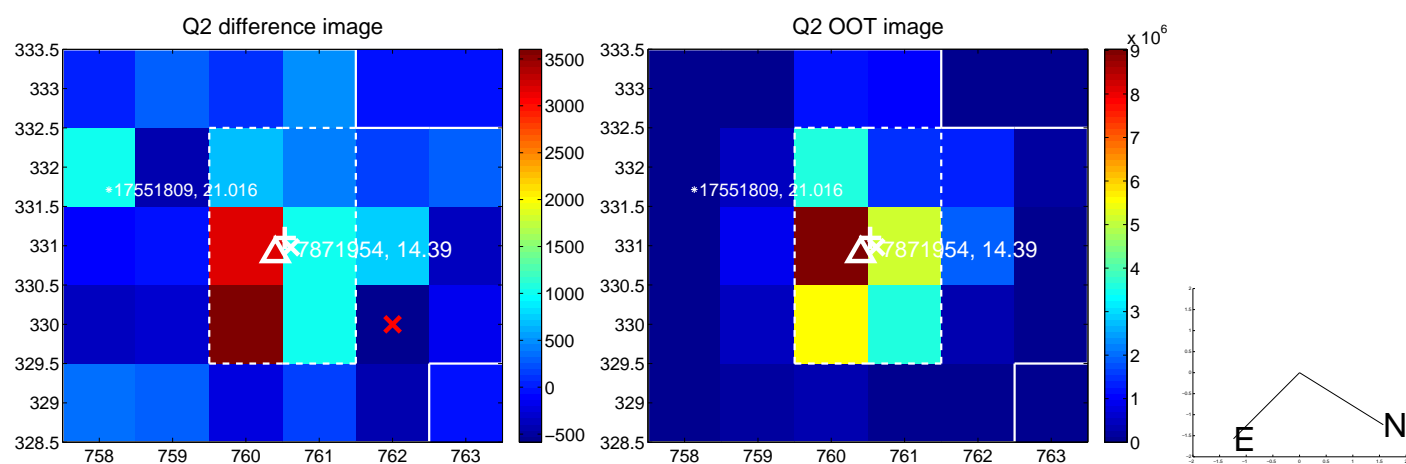
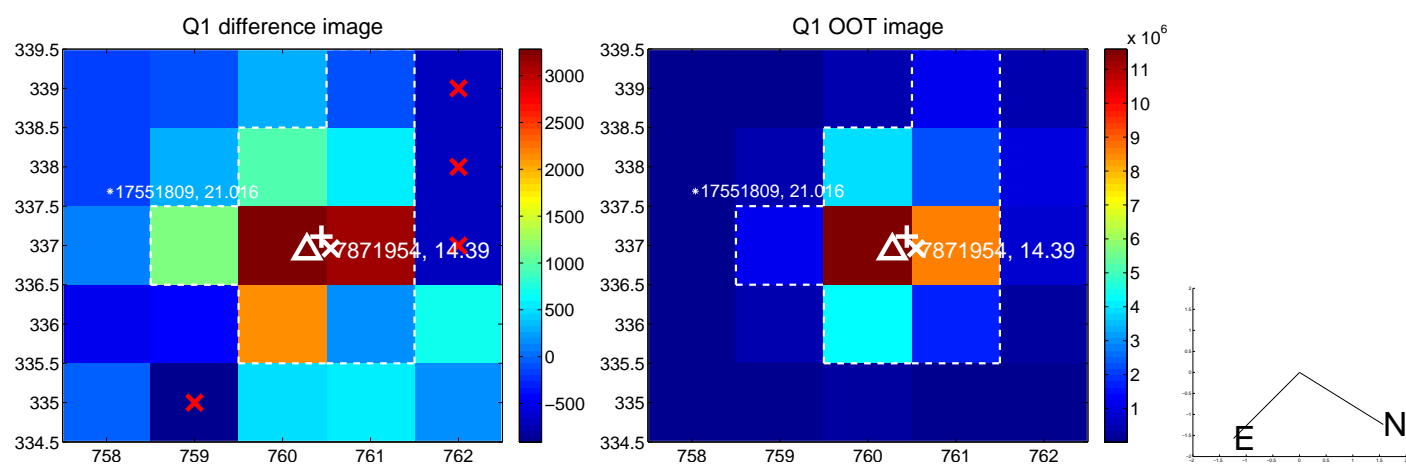


offset from photometric centroids

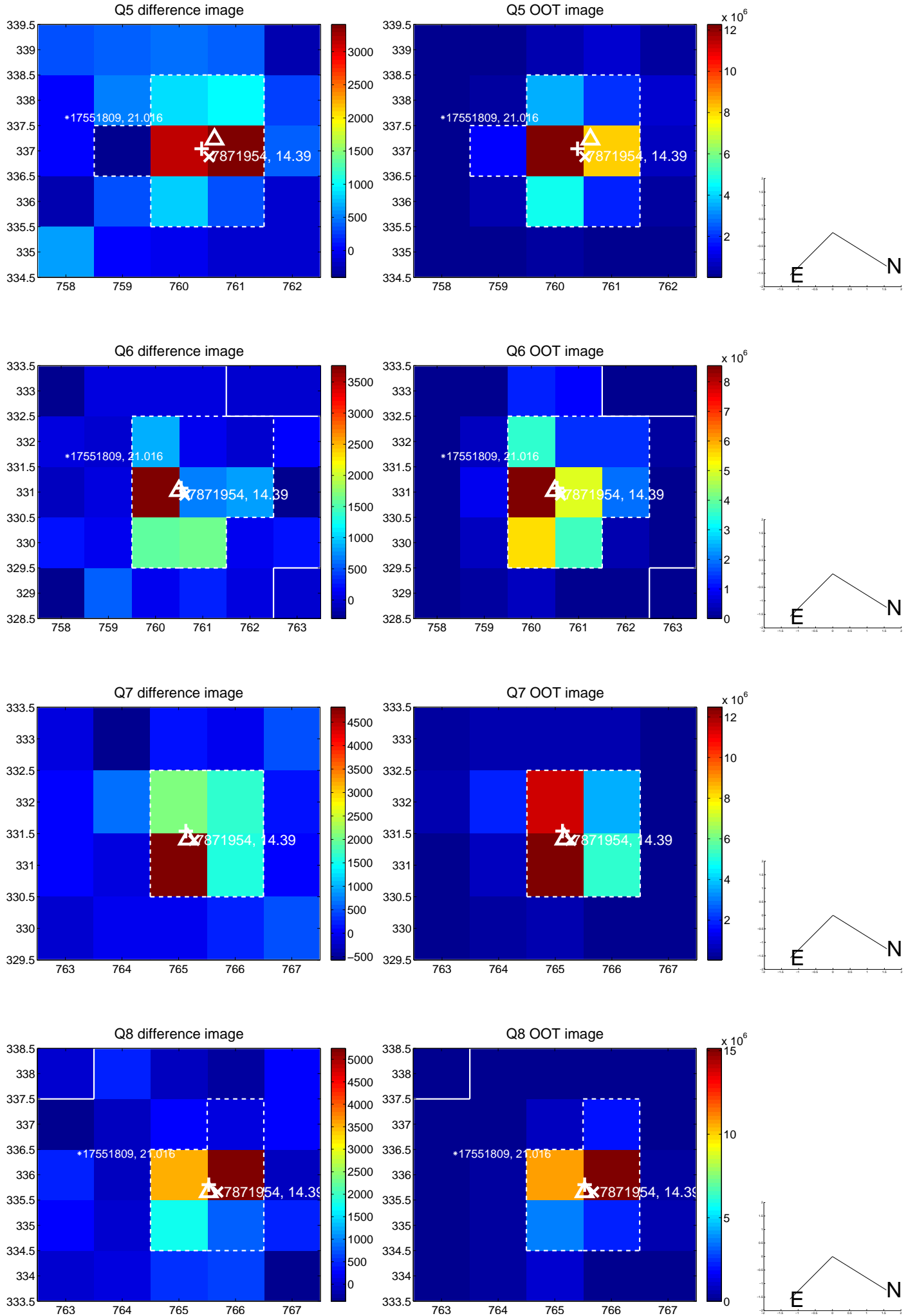


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

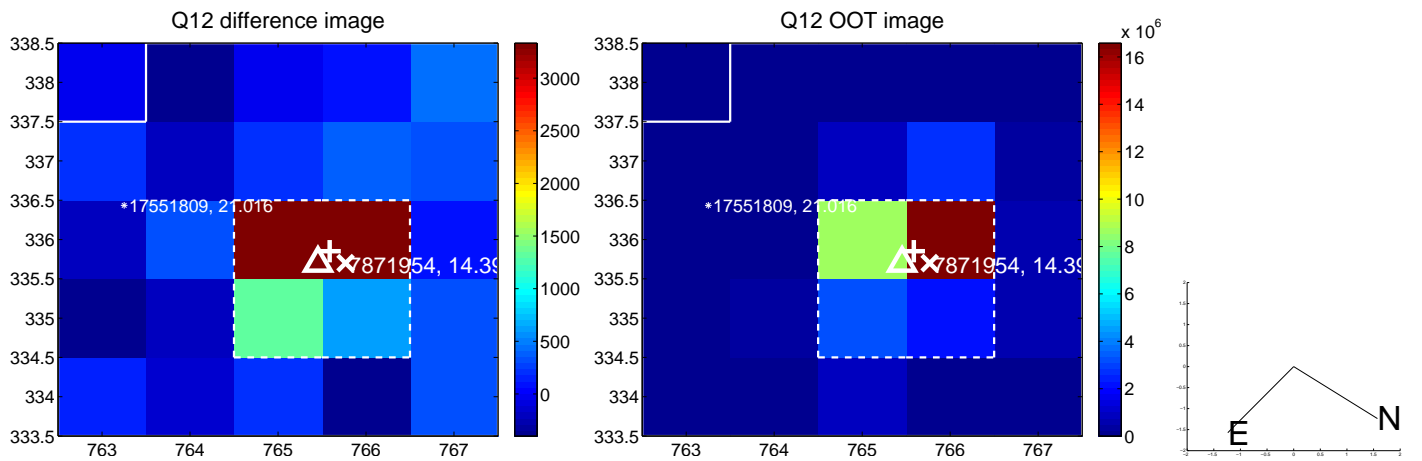
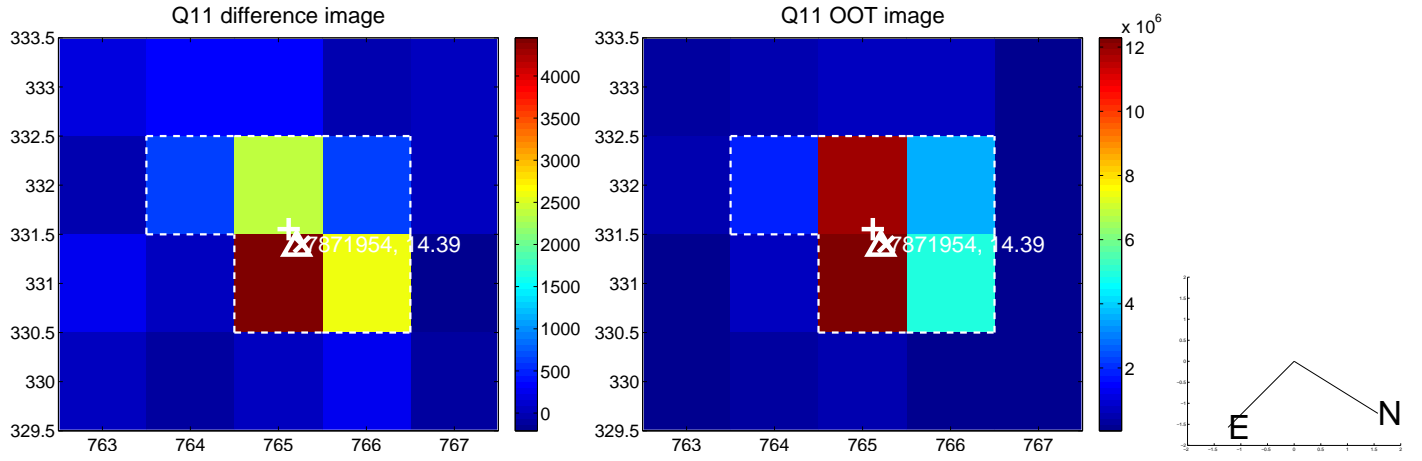
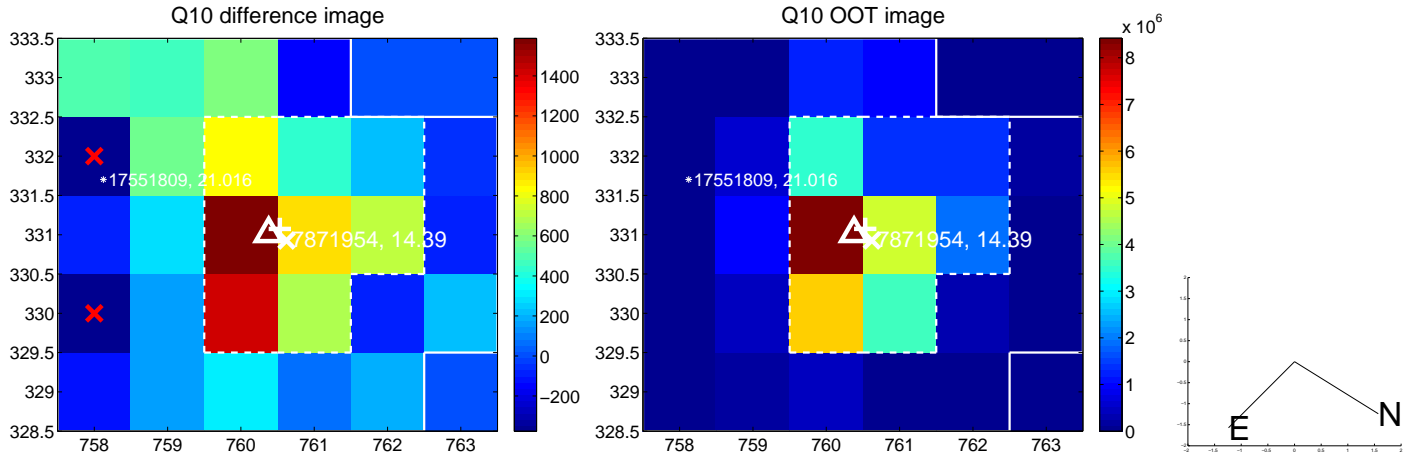
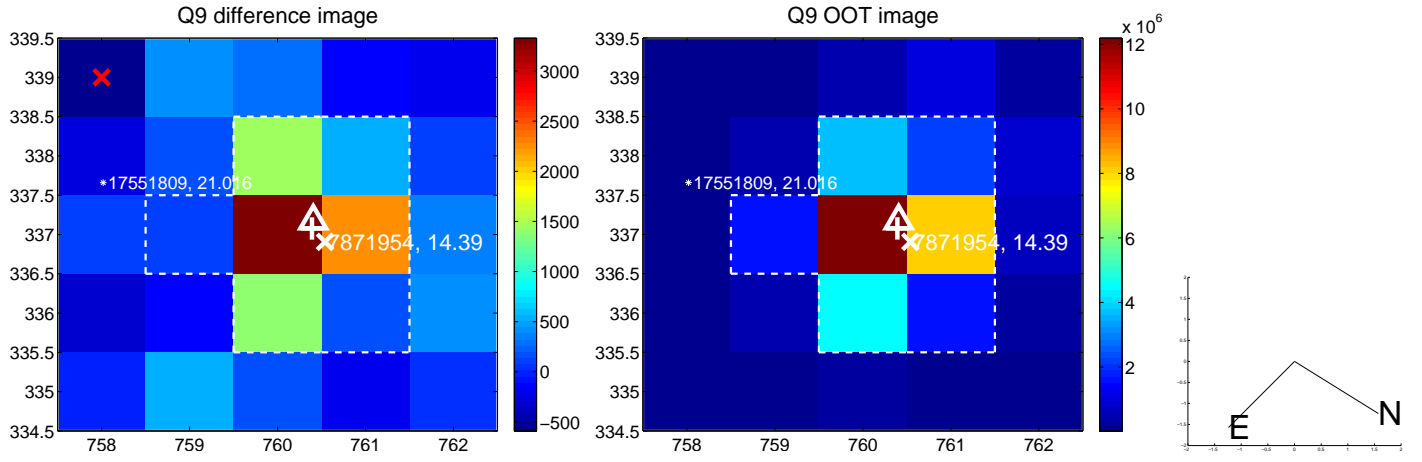
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



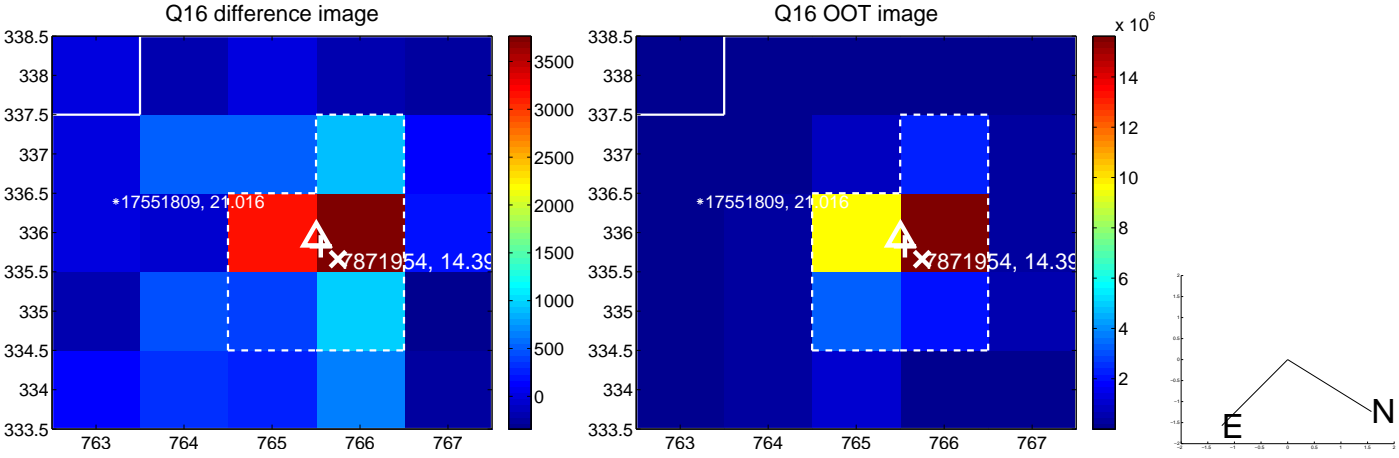
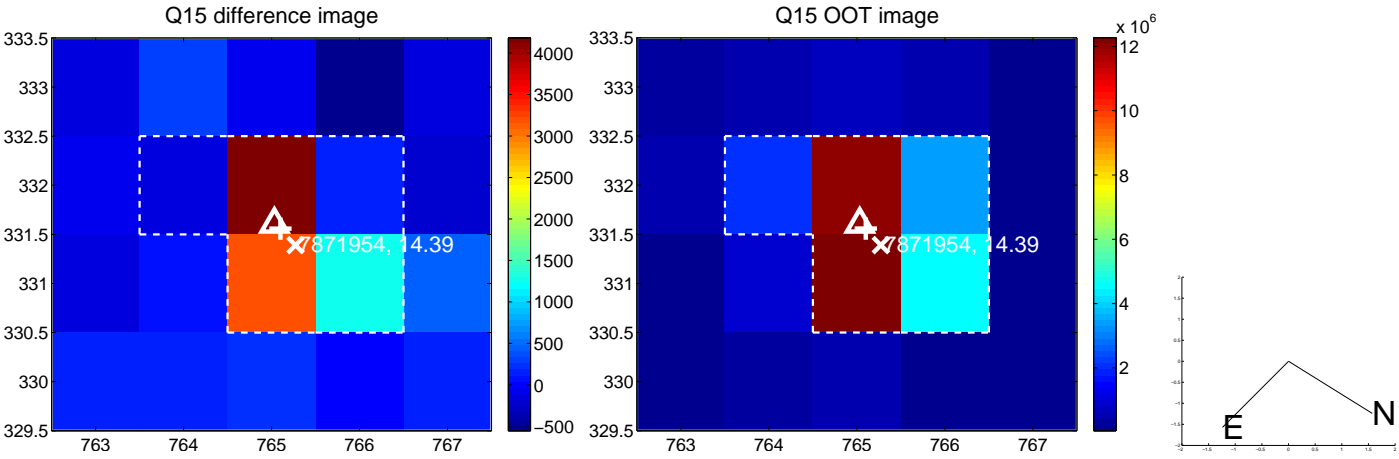
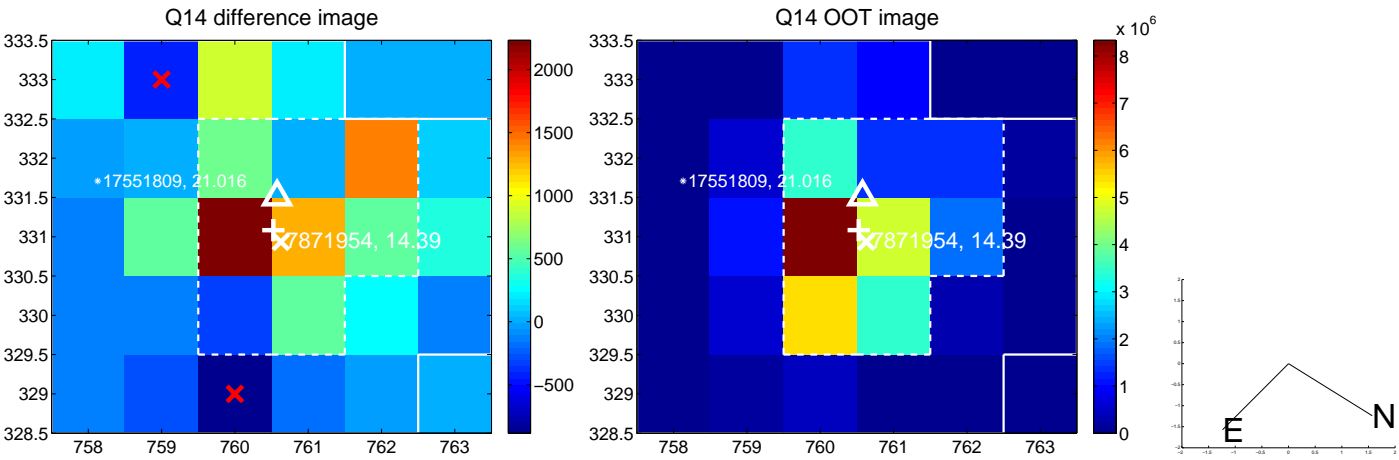
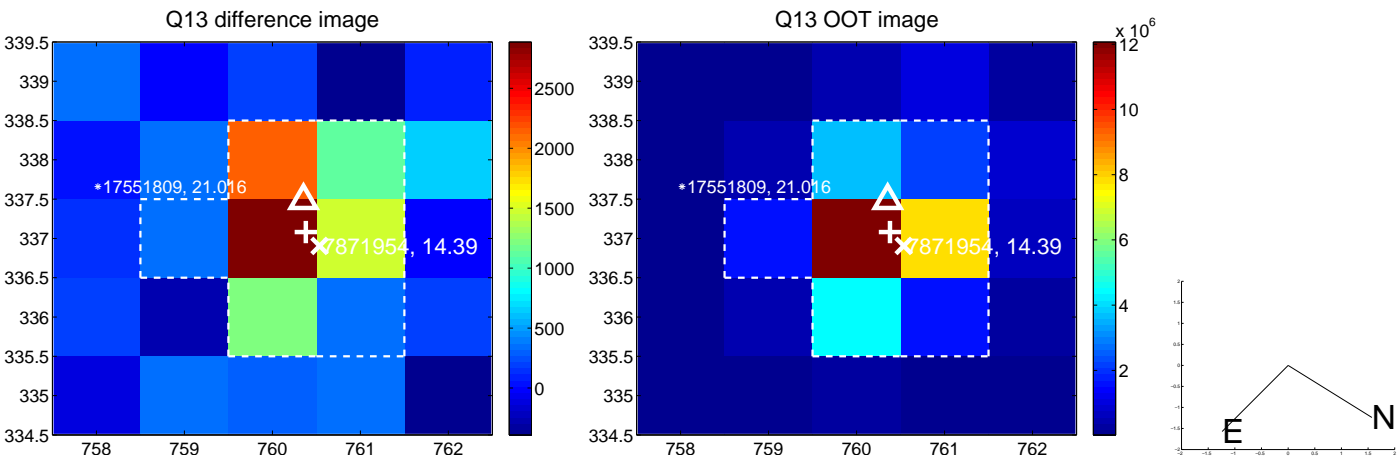
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



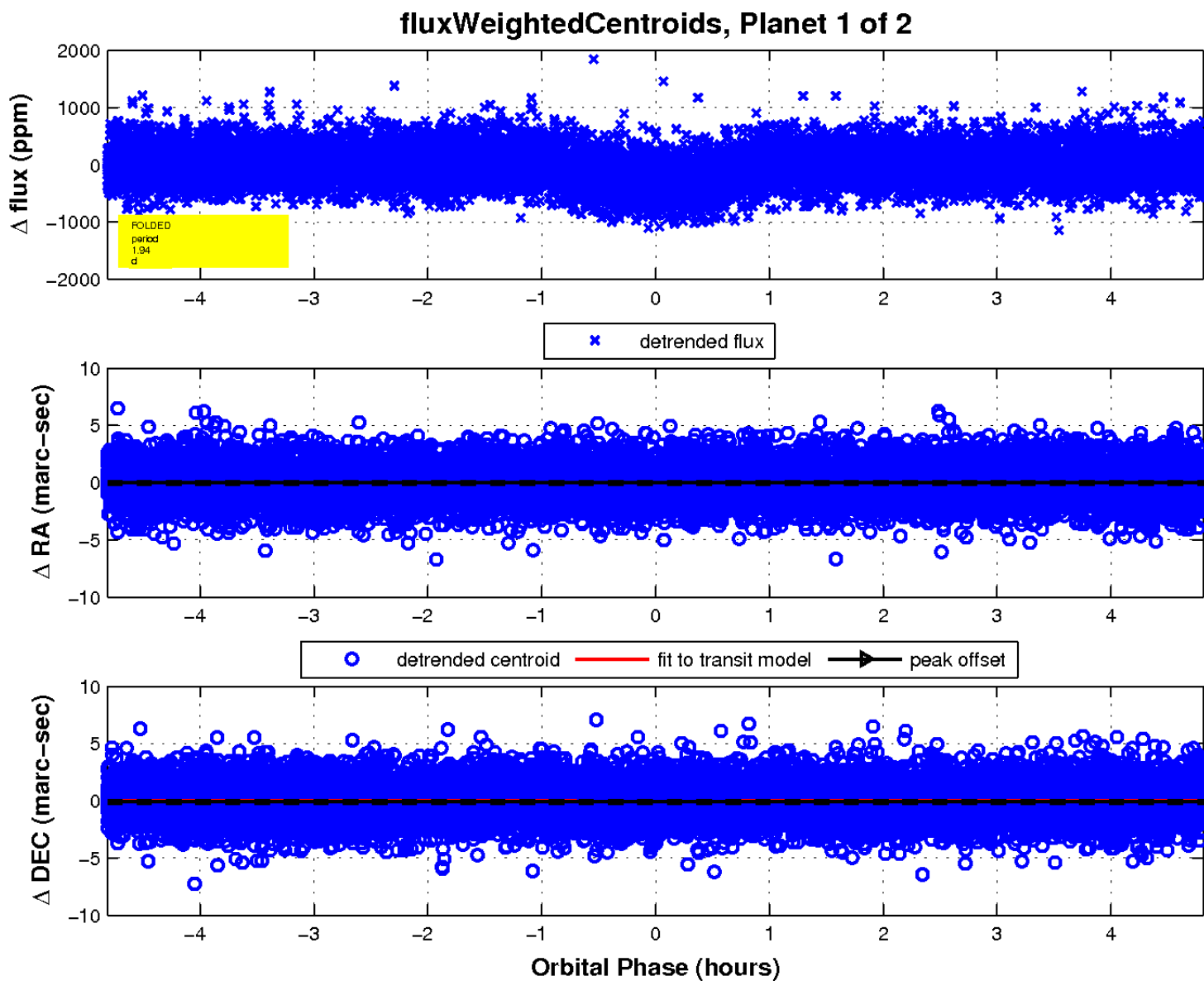
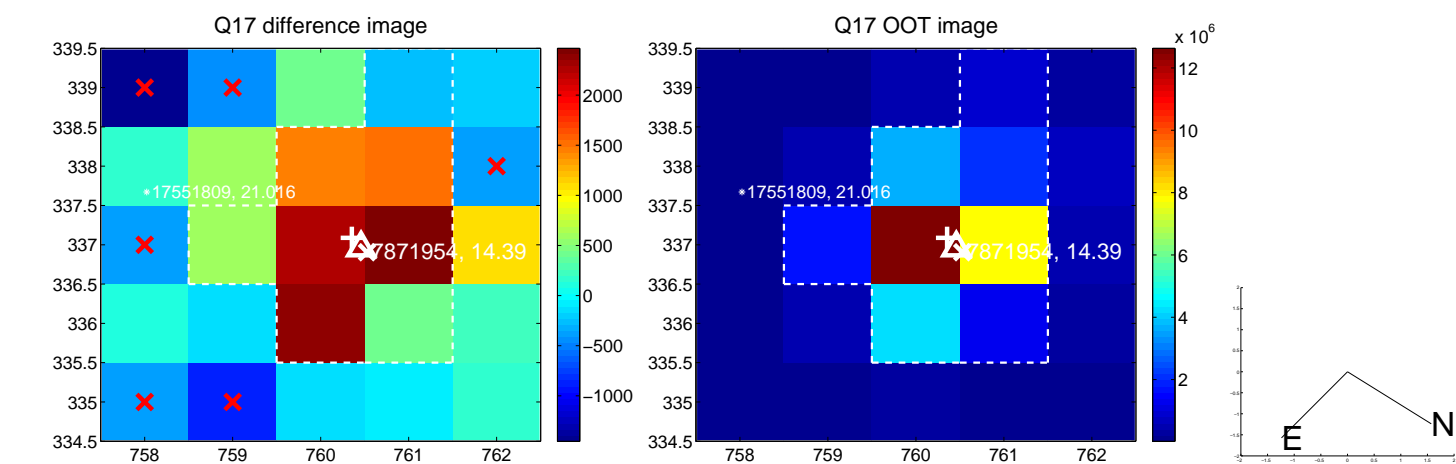
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

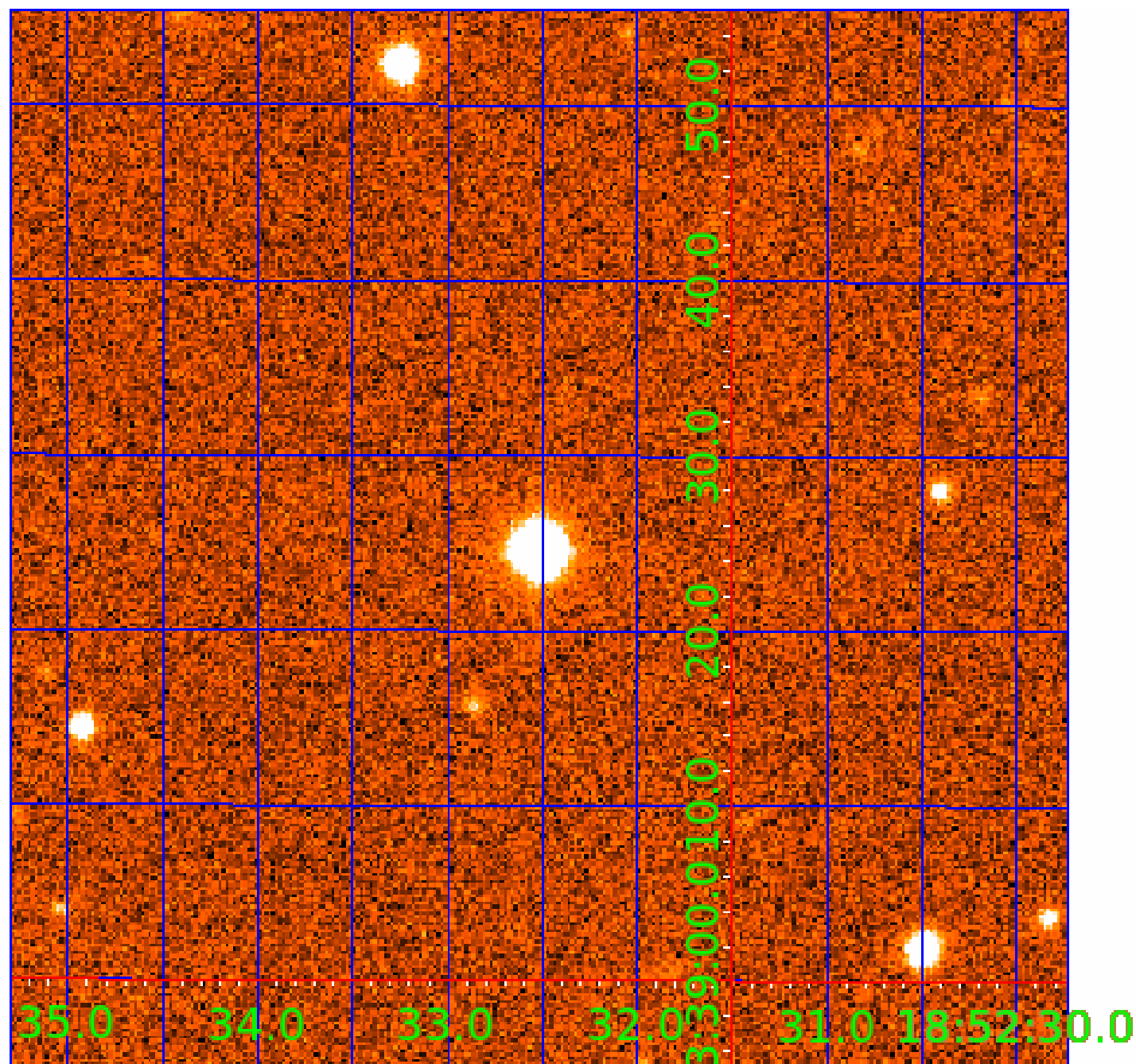


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007871954

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})
007871954-01	OBS	1515.01	1.937019	132.787950	305.5	1.605	35.3	40.9	0.49	4042	1.01	97.85
007871954-02	OBS	1515.02	7.061193	136.271549	461.8	1.079	20.6	25.7	0.49	4042	1.25	17.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007871954-01	OBS	PC	0.89	0	0	0	0	CENT_KIC_POS
007871954-02	OBS	PC	0.99	0	0	0	0	CENT_KIC_POS

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

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

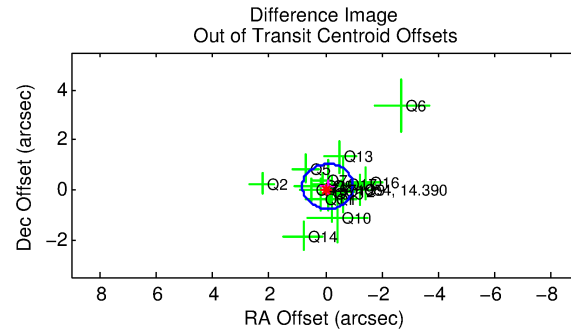
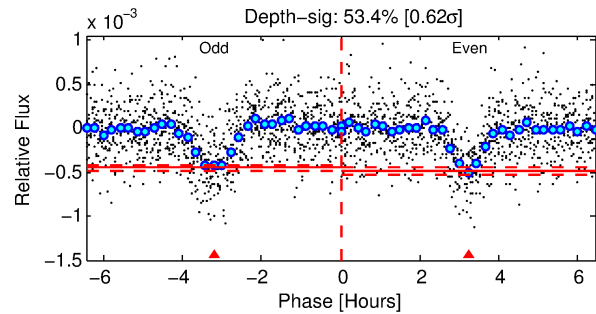
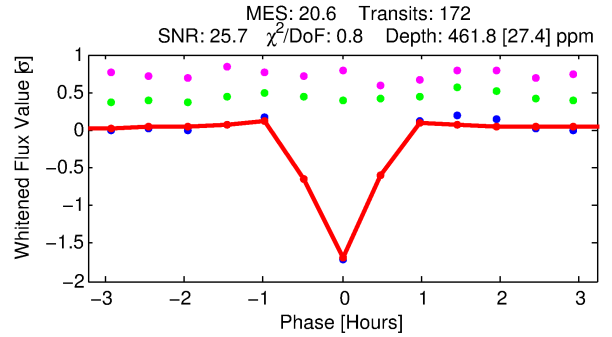
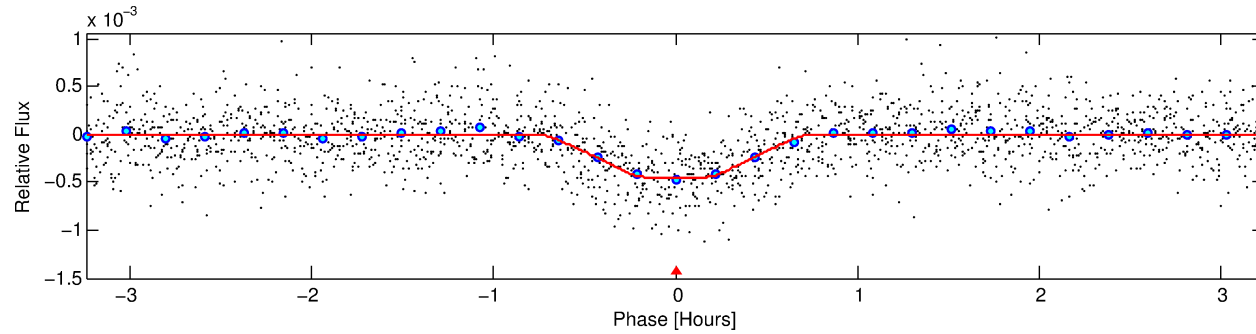
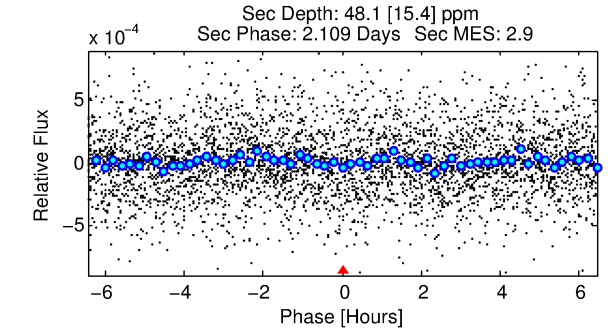
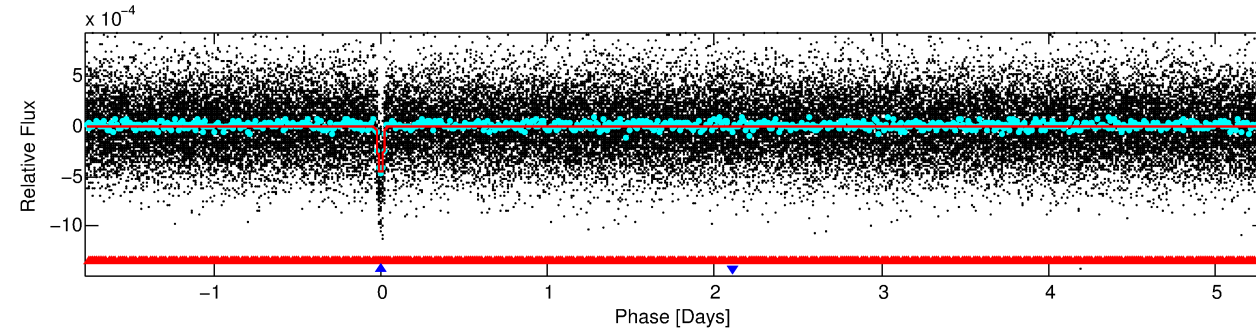
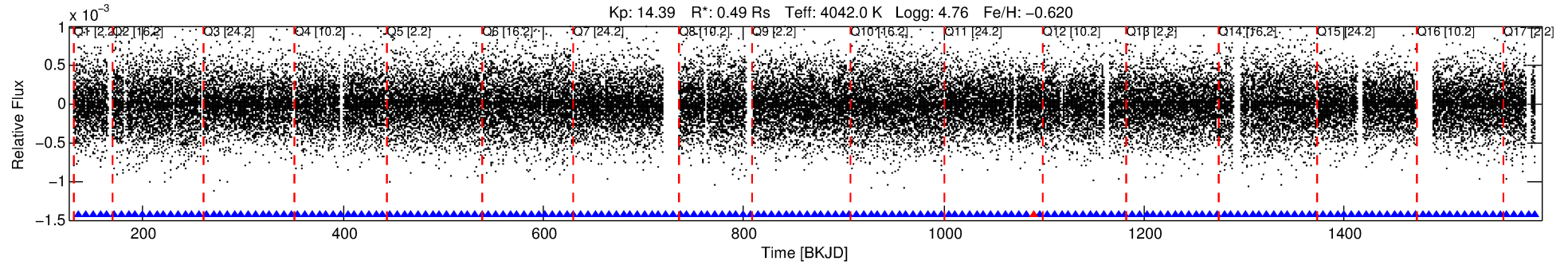
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007871954-02

No Significant Match Found

DV One-Page Summary

KIC: 7871954 Candidate: 2 of 2 Period: 7.061 d
KOI: K01515.02 Name: Kepler-303c Corr: 0.968



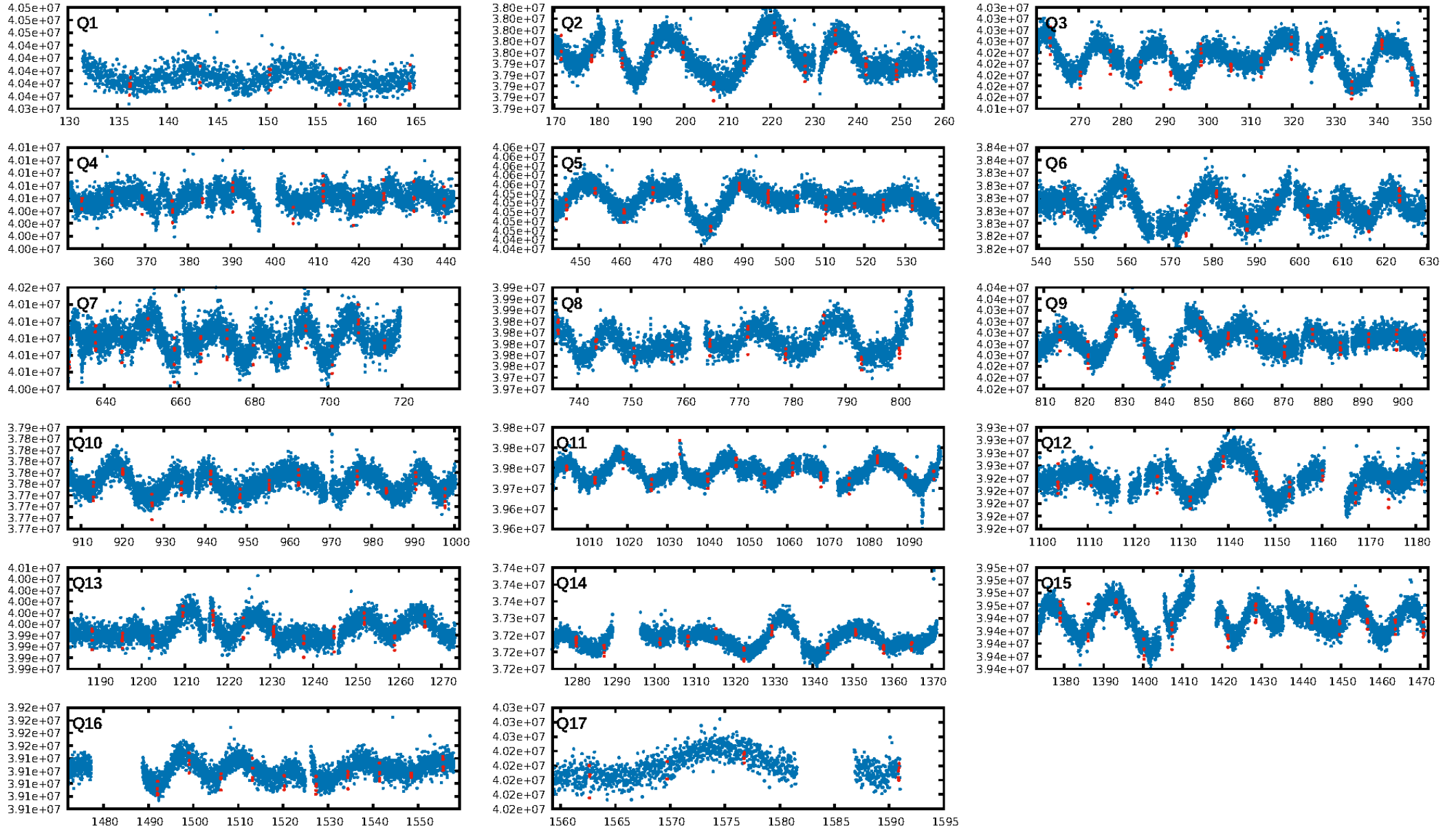
DV Fit Results:

Period = 7.06119 [0.00001] d
Epoch = 136.2715 [0.0010] BKJD
Rp/R* = 0.0235 [0.0055]
a/R* = 24.03 [27.61]
b = 0.90 [0.24]
Seff = 17.44 [2.03]
Teq = 521 [15] K
Rp = 1.25 [0.31] Re
a = 0.0574 [0.0033] AU
Ag = 55.34 [31.54] [1.72σ]
Teffp = 2197 [314] K [5.33σ]

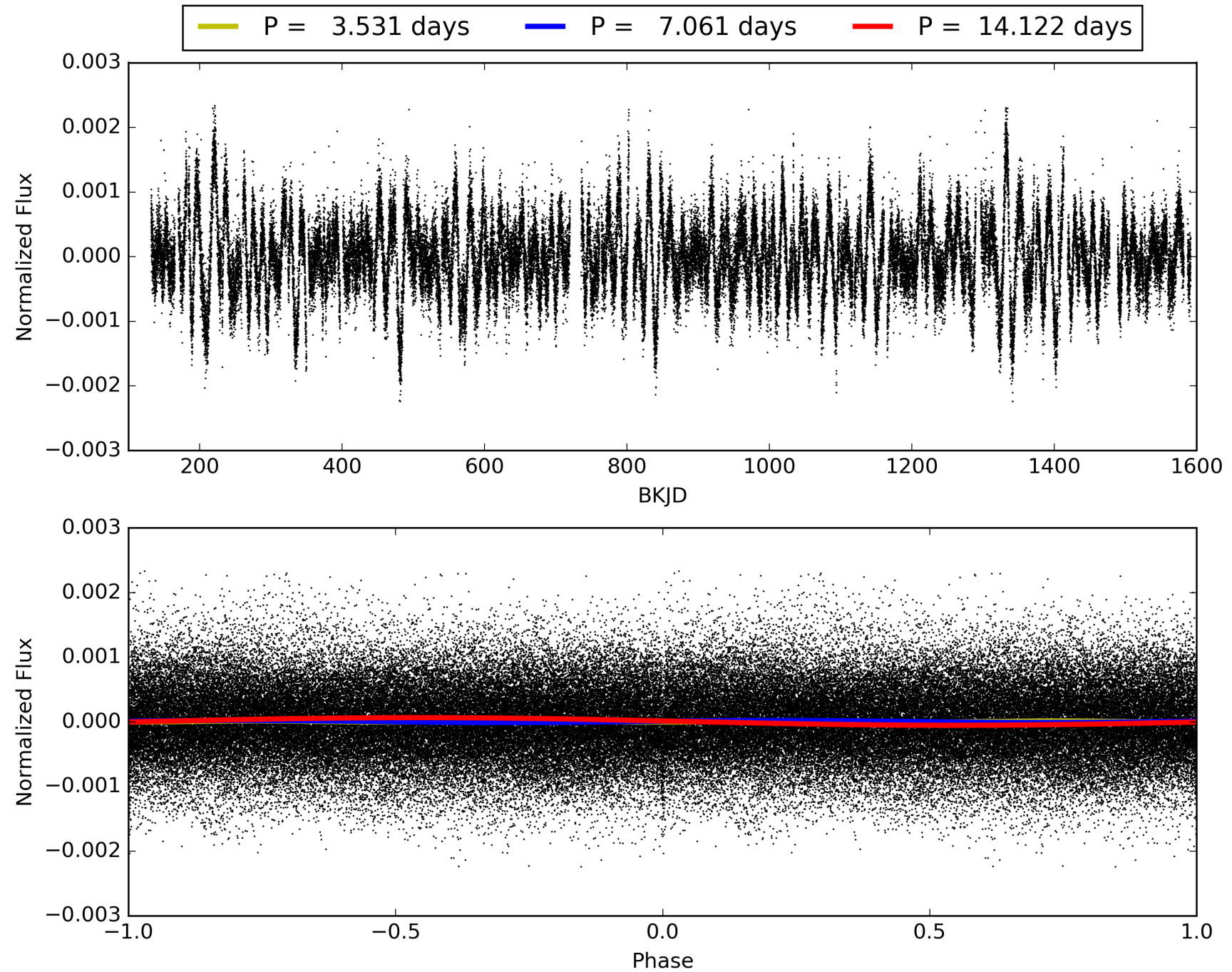
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [63.58σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.95e-89
RollingBand-fgt: 0.99 [162/163]
GhostDiagnostic-chr: 6.251
Centroid-sig: 1.1%
Centroid-so: 0.192 arcsec [0.35σ]
OotOffset-rm: 0.149 arcsec [0.50σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.723 arcsec [3.17σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.88 [15/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 007871954-02, PDC Light Curves

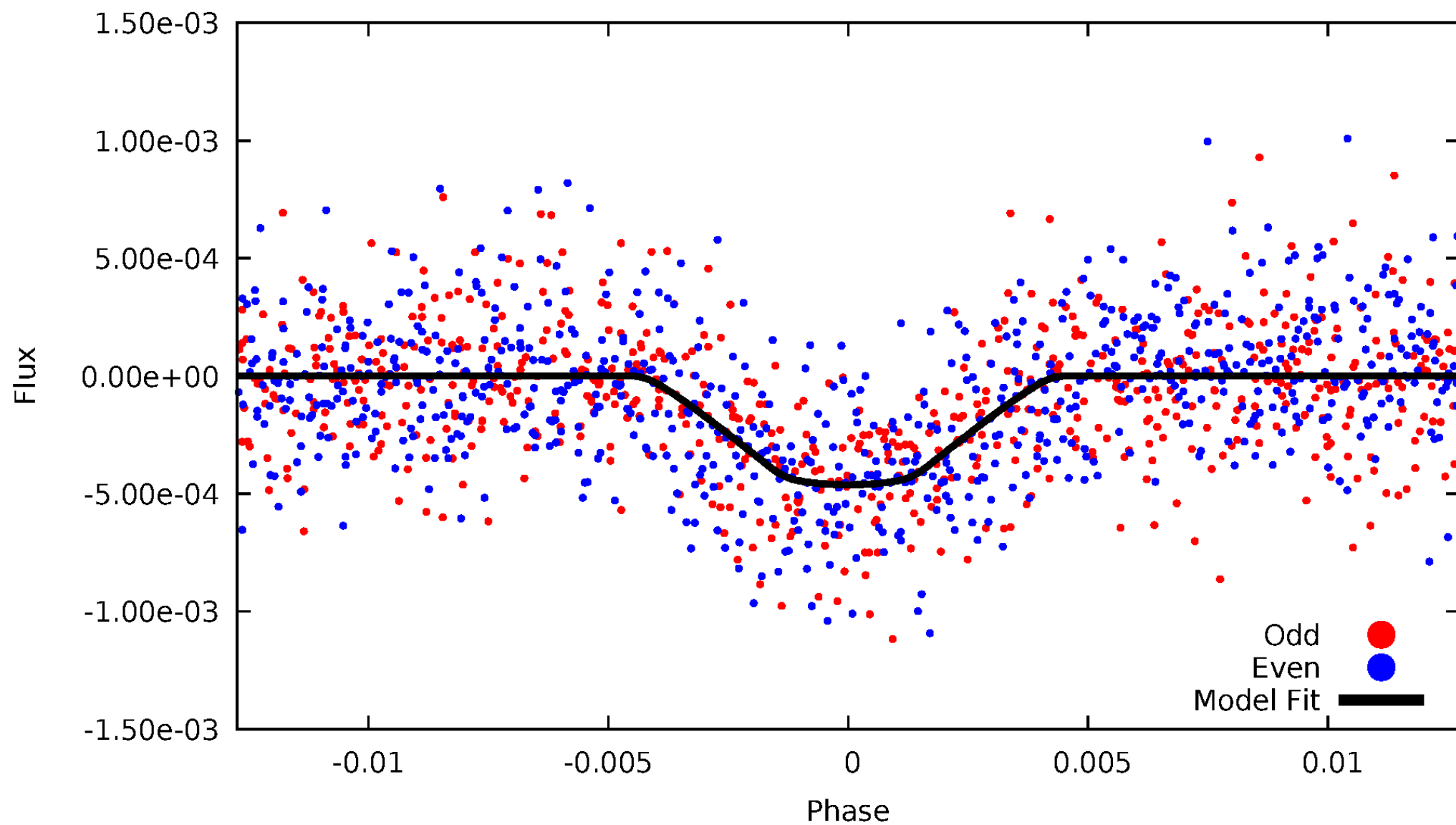


TCE 007871954-02



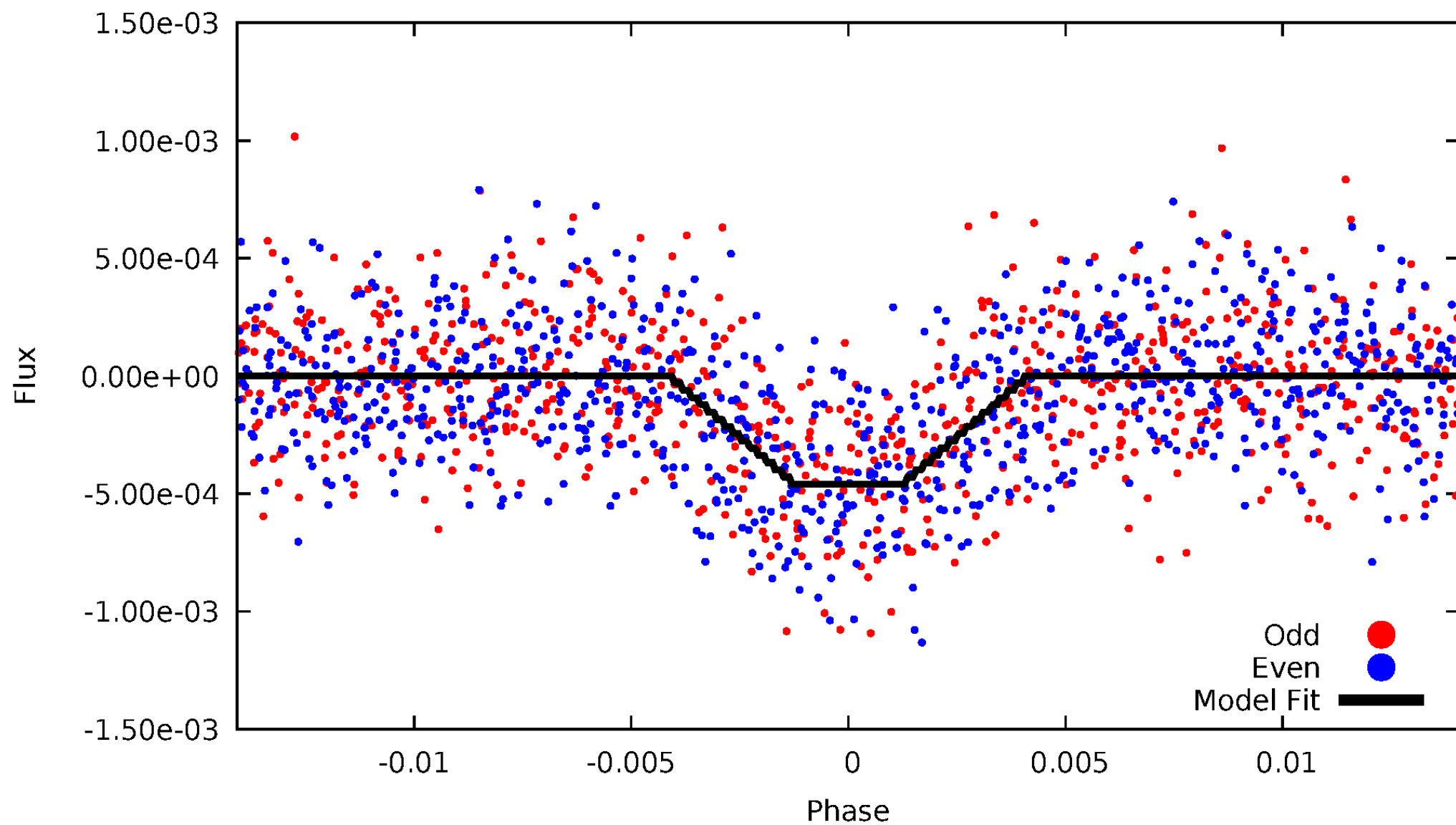
DV Odd/Even

TCE 007871954-02



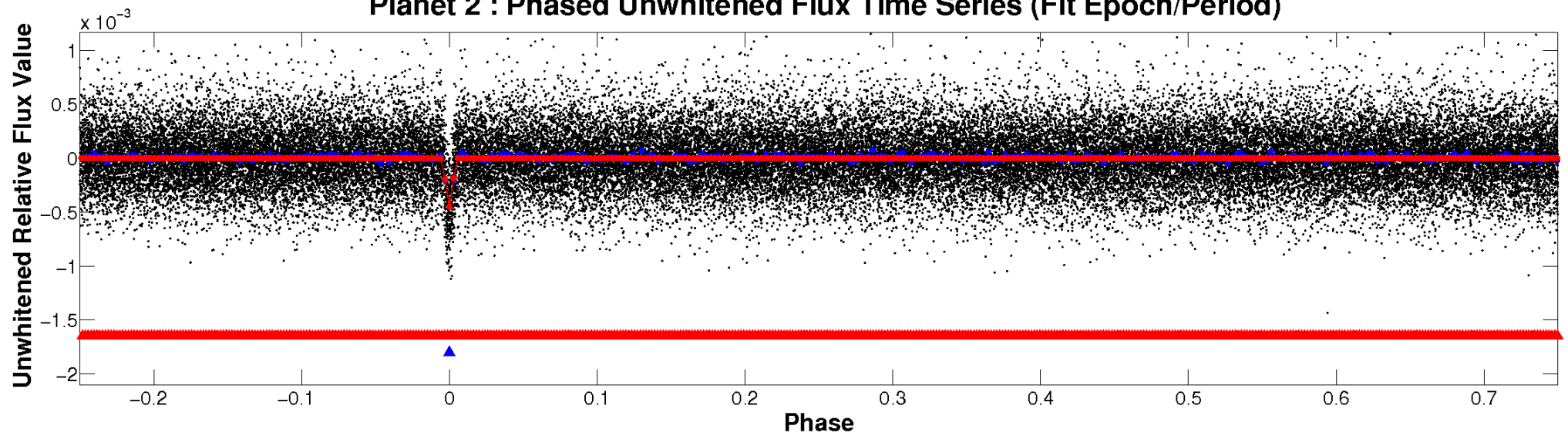
ALT Odd/Even

TCE 007871954-02

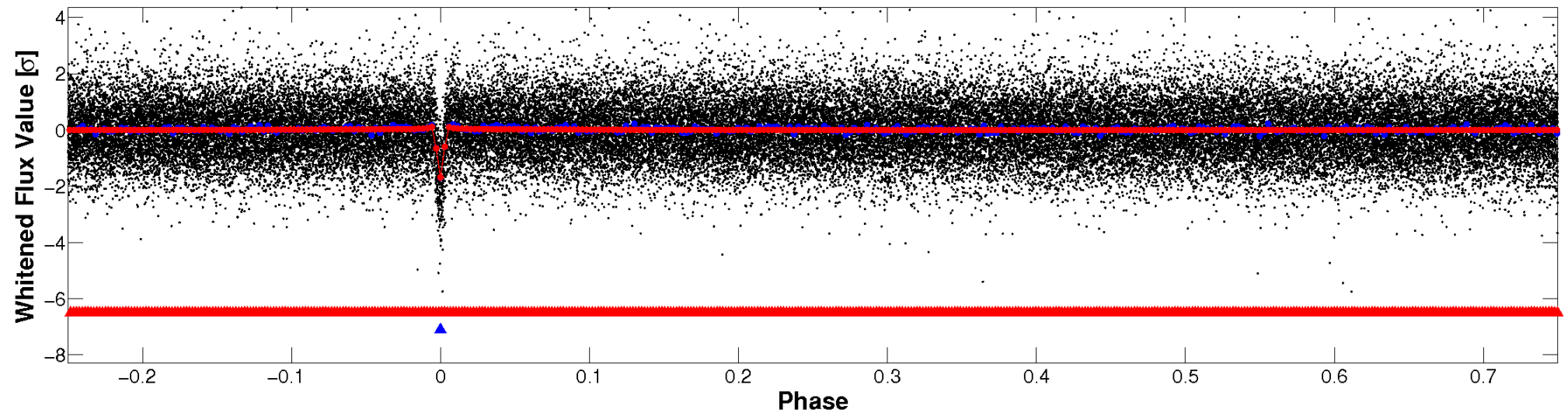


Non-Whitened Vs. Whitened Light Curve

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

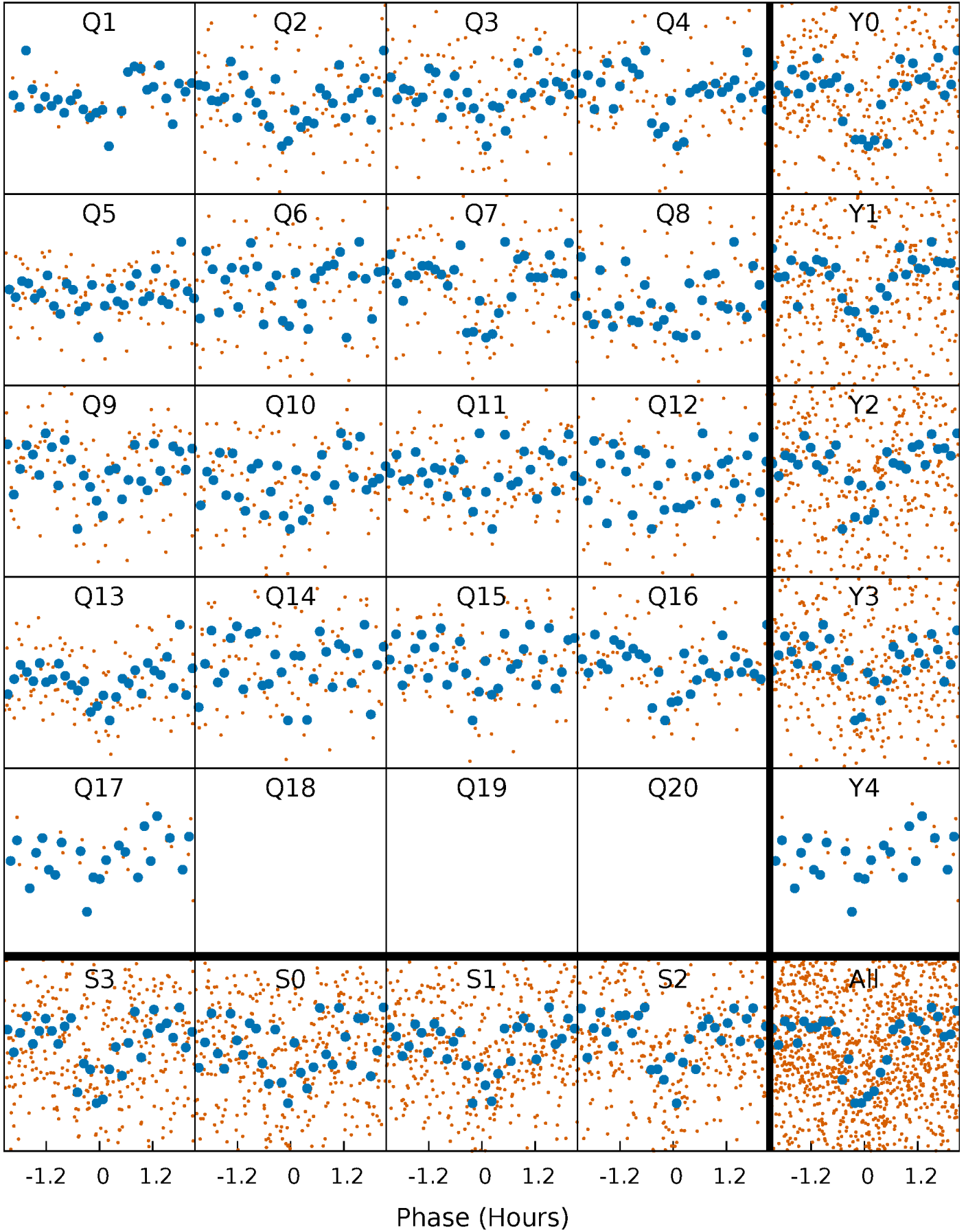


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



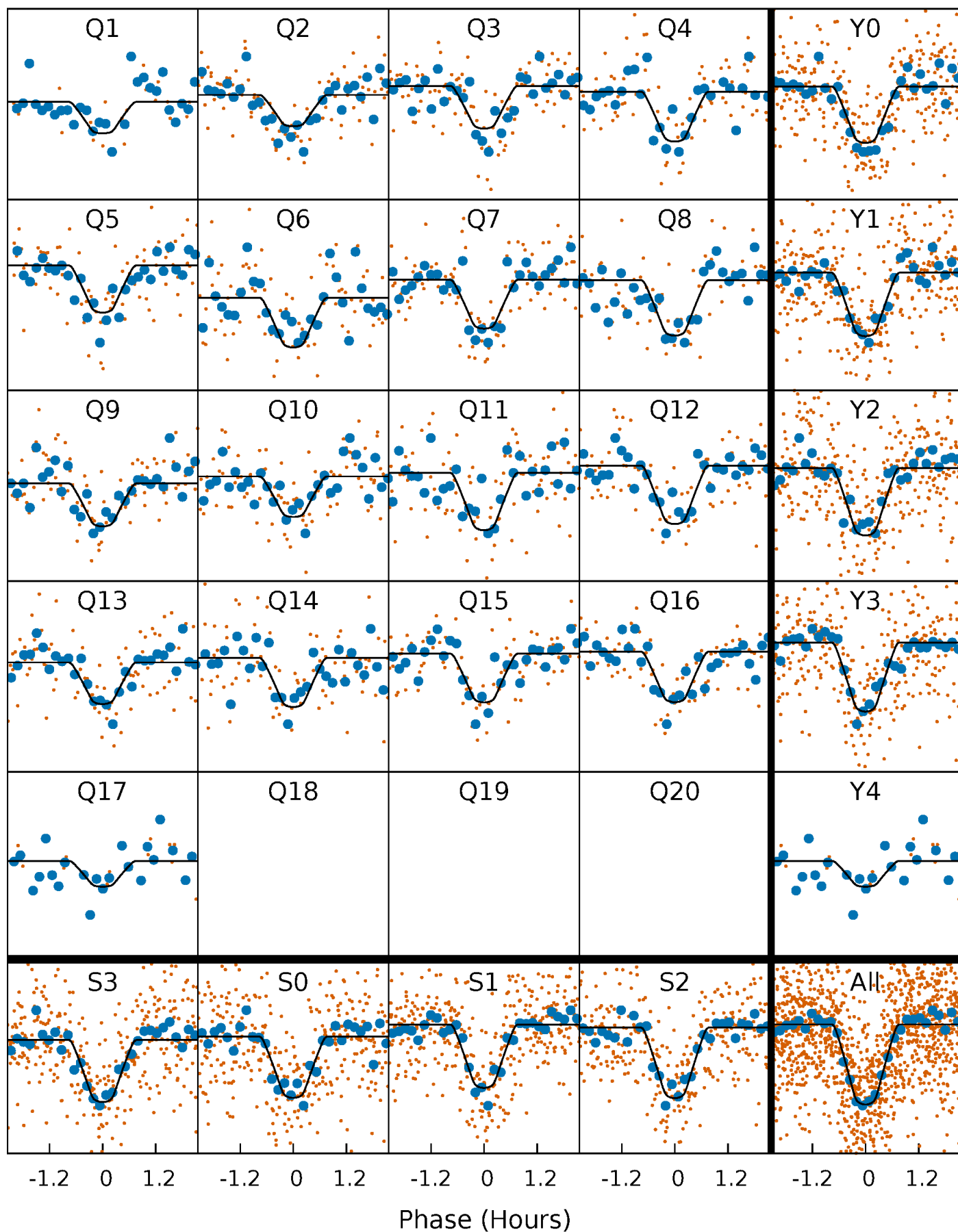
PDC Quarter-Phased Transit Curves

TCE 007871954-02 P= 7.061193 Days $T_0=136.271549$ (BKJD)



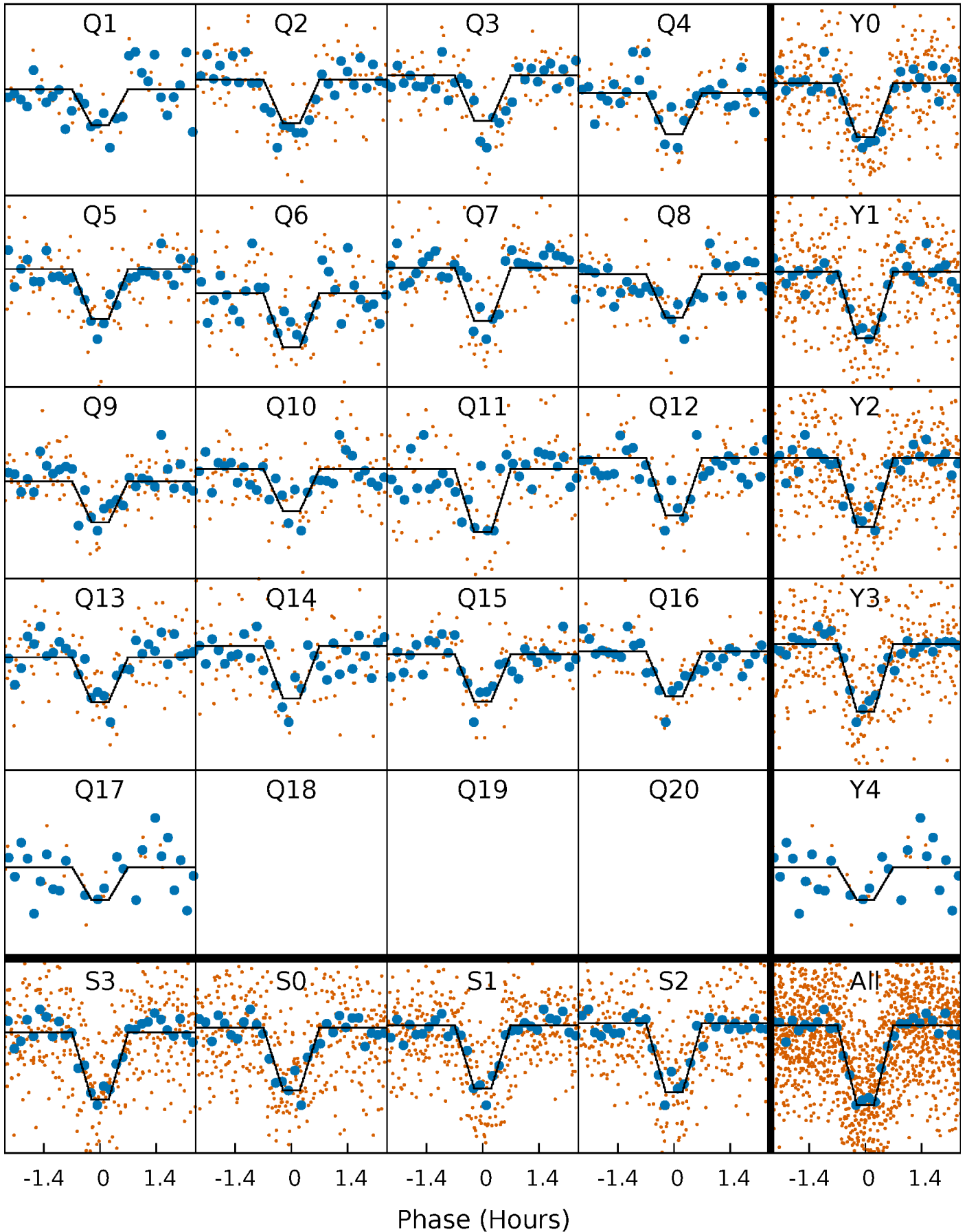
DV Quarter-Phased Transit Curves

TCE 007871954-02 P= 7.061193 Days $T_0=136.271549$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

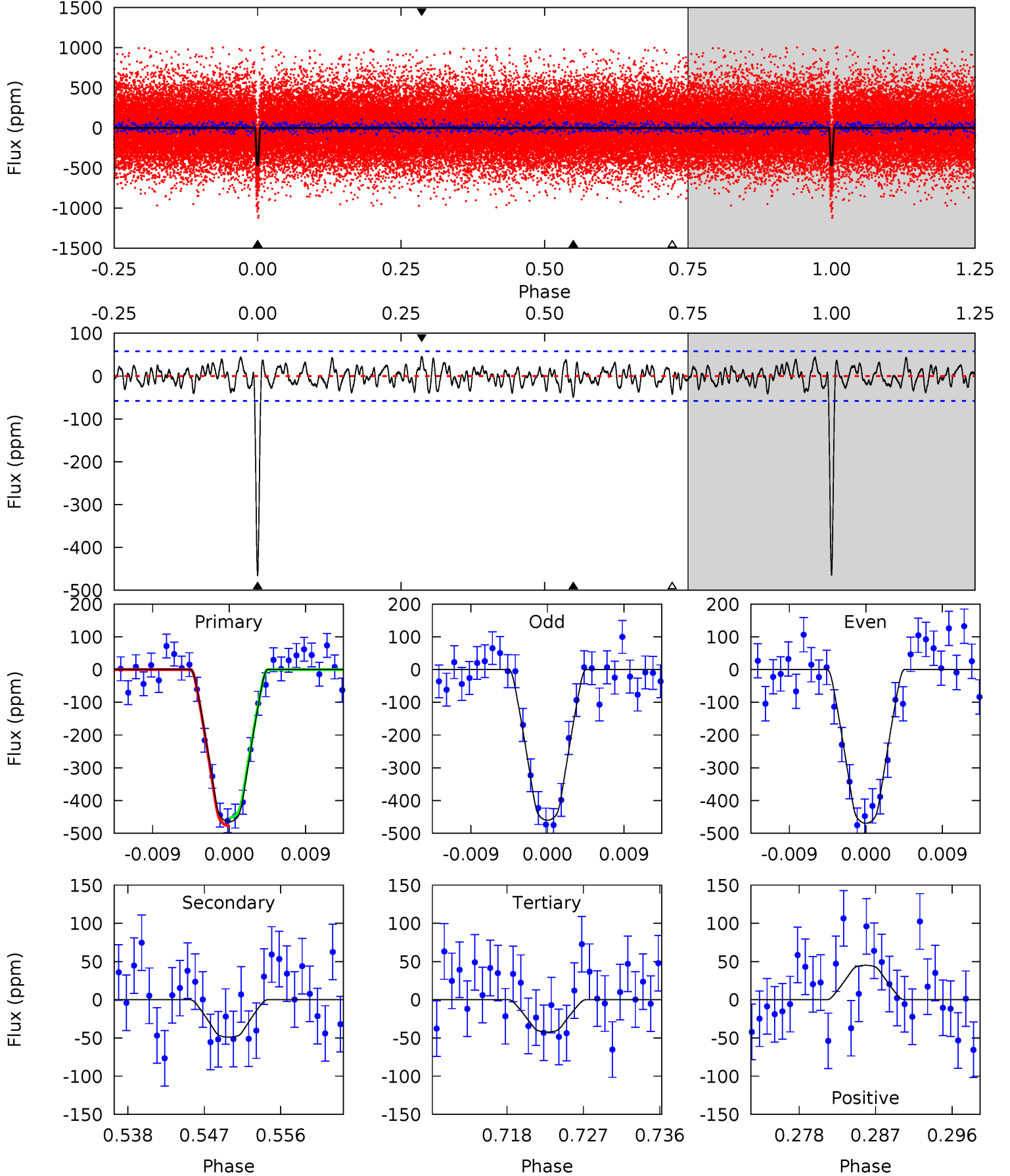
TCE 007871954-02 P= 7.061199 Days $T_0=136.270961$ (BKJD)



DV Model-Shift Uniqueness Test

007871954-02, P = 7.061193 Days, E = 129.210356 Days

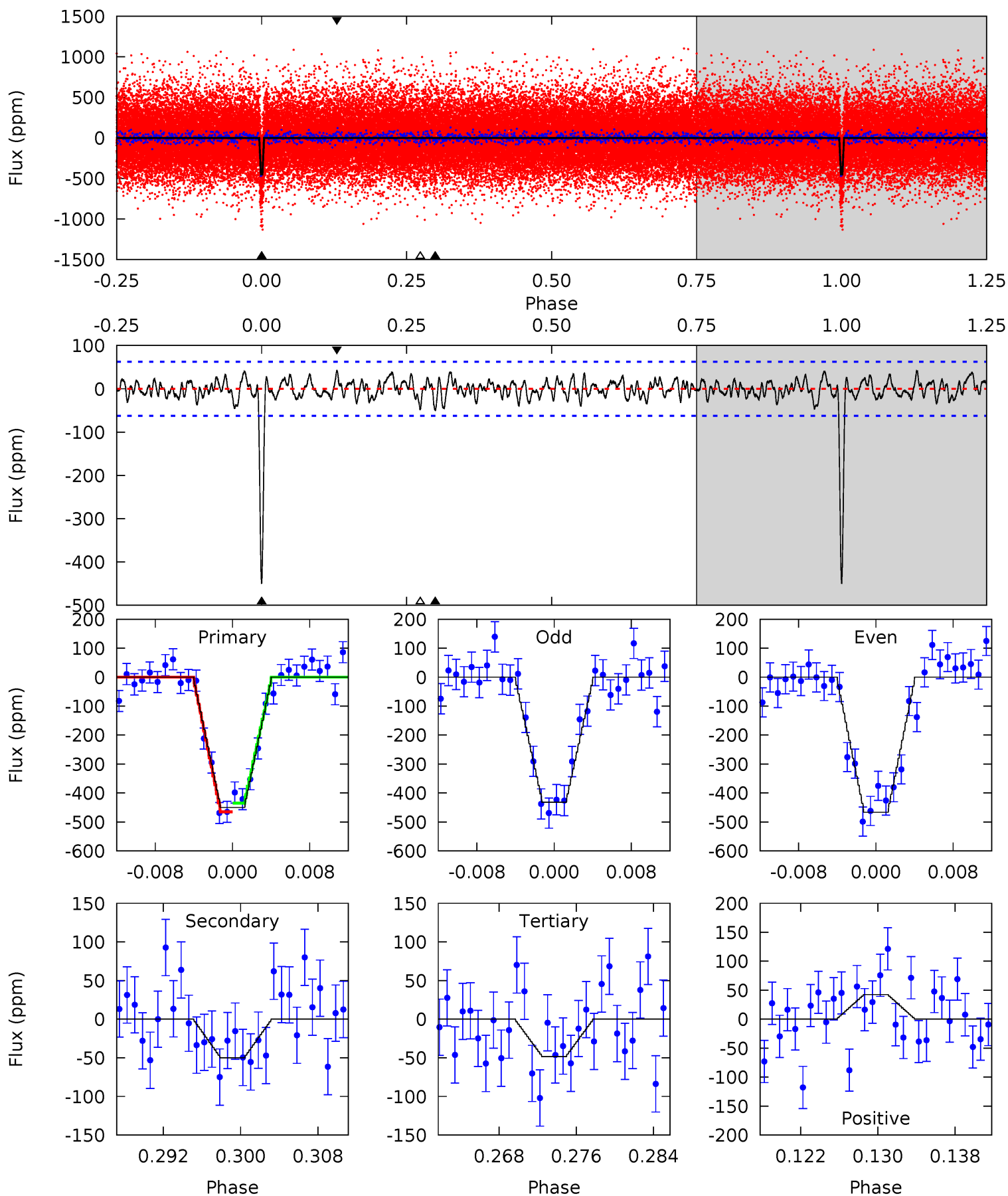
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.5	4.26	3.67	3.93	5.05	2.61	1.48	36.8	36.6	0.59	0.34	0.40	1.05	0.09	1.07



Alt Model-Shift Uniqueness Test

007871954-02, P = 7.061199 Days, E = 129.209762 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.5	4.06	3.93	3.45	5.07	2.65	1.35	32.6	33.1	0.13	0.61	1.42	1.01	0.09	1.22



Stellar Parameters For KIC 007871954

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	4042^{+72}_{-88}	$4.761^{+0.038}_{-0.035}$	$-0.620^{+0.150}_{-0.150}$	$0.490^{+0.030}_{-0.037}$	$0.505^{+0.027}_{-0.033}$	$6.038^{+1.078}_{-0.759}$
	+2%/-2%	+1%/-1%	+24%/-24%	+6%/-8%	+5%/-7%	+18%/-13%
Source	SPE60	SPE60	SPE60	DSEP		

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

Secondary Eclipse Parameters for KIC 007871954-02 / KOI 1515.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-49 ± 11	$1.24^{+0.31}_{-0.29}$	727^{+19}_{-20}	2782^{+249}_{-186}	57^{+45}_{-23}
Alt.	-50 ± 12	$1.17^{+0.30}_{-0.32}$	727^{+18}_{-17}	2859^{+273}_{-206}	67^{+61}_{-27}

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

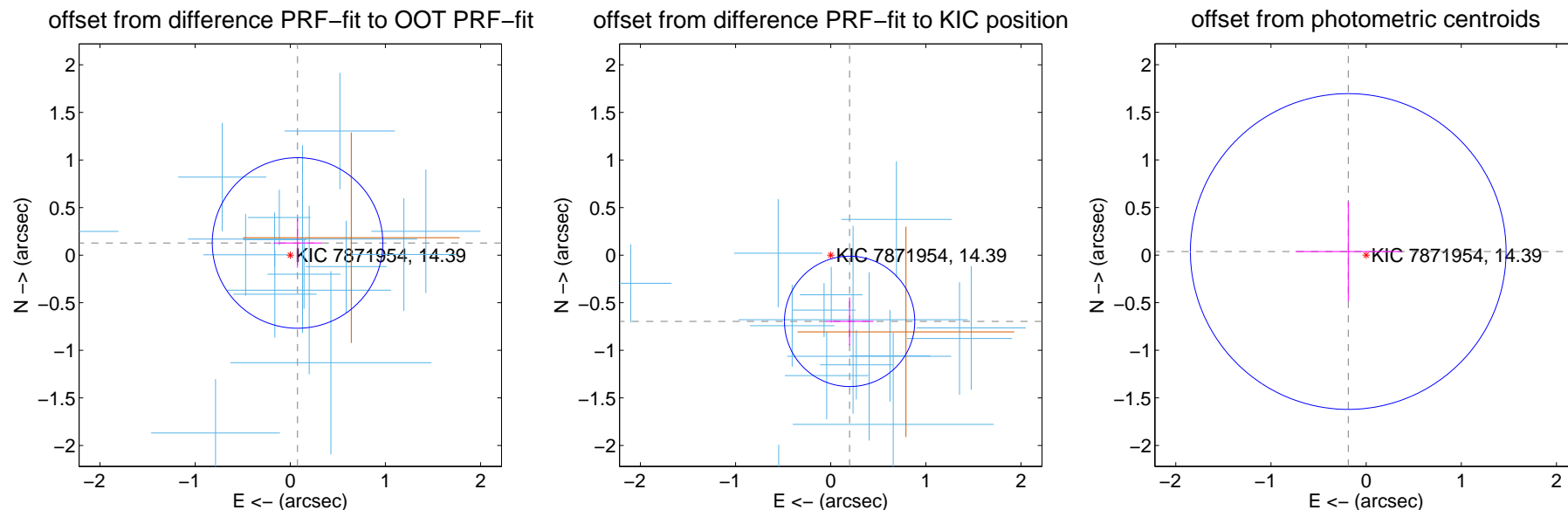
DV Centroid Data

Supplemental centroid analysis for 007871954-02. Kepler magnitude: 14.39. Transit SNR 25.68

There are 15 quarters with good PRF difference image offsets

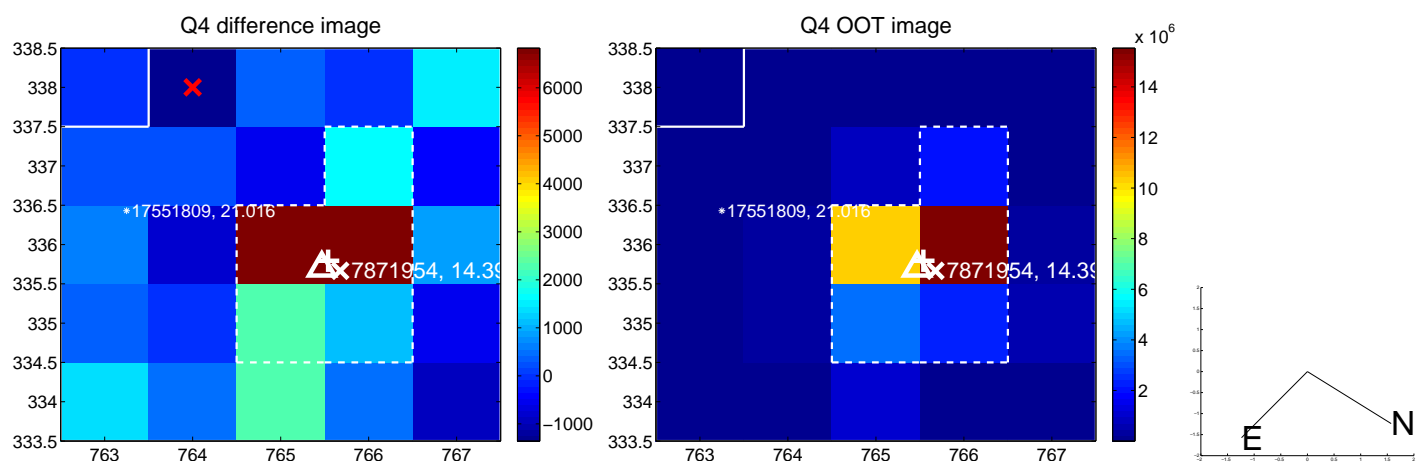
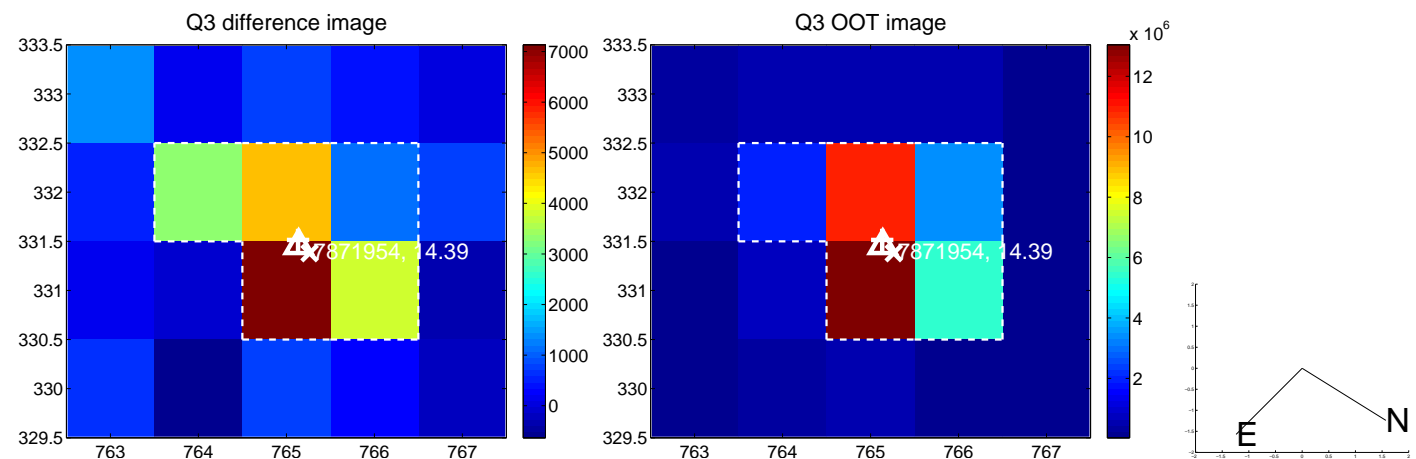
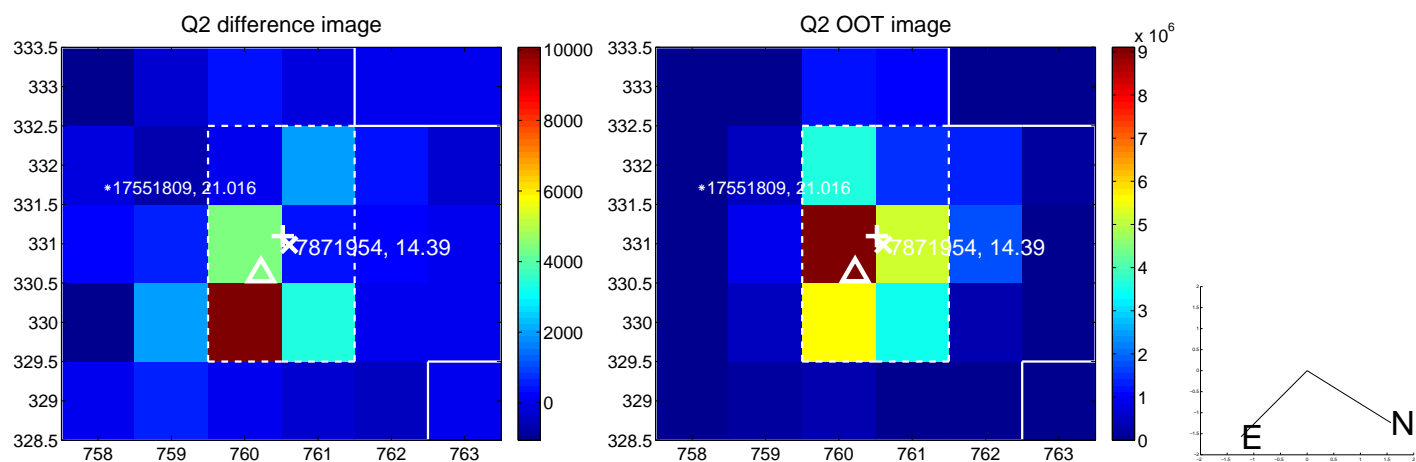
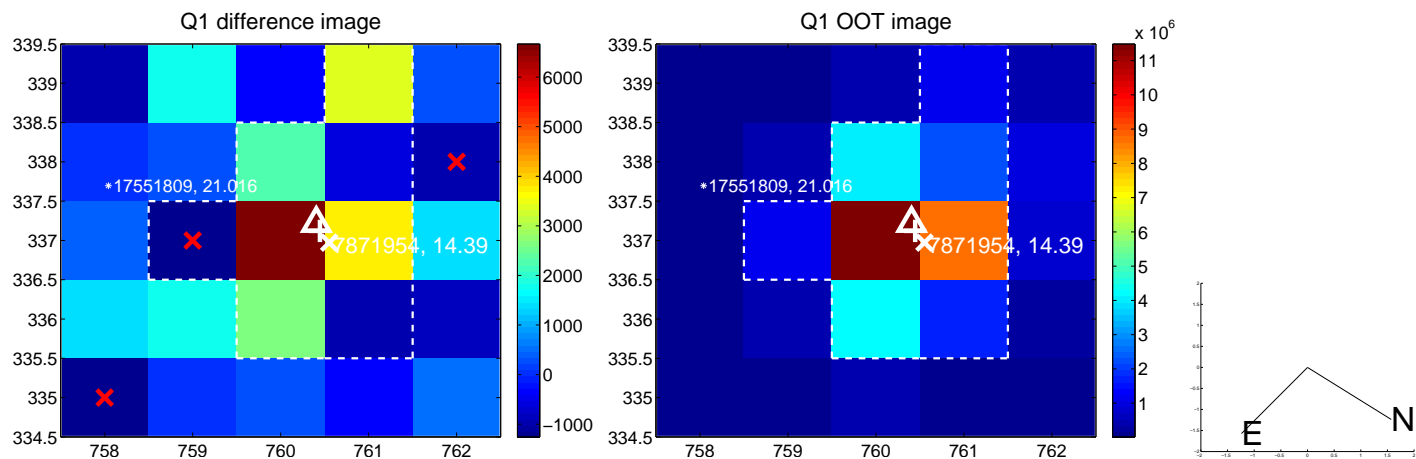
The direct PRF centroid is offset from the target star catalog position by about 1.00 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.149 ± 0.299	0.50	-0.076 ± 0.254	0.128 ± 0.260
PRF-fit source offset from KIC position	0.723 ± 0.228	3.17	-0.199 ± 0.252	-0.696 ± 0.252
photometric centroid source offset	0.19 ± 0.55	0.35	0.19 ± 0.55	0.04 ± 0.52

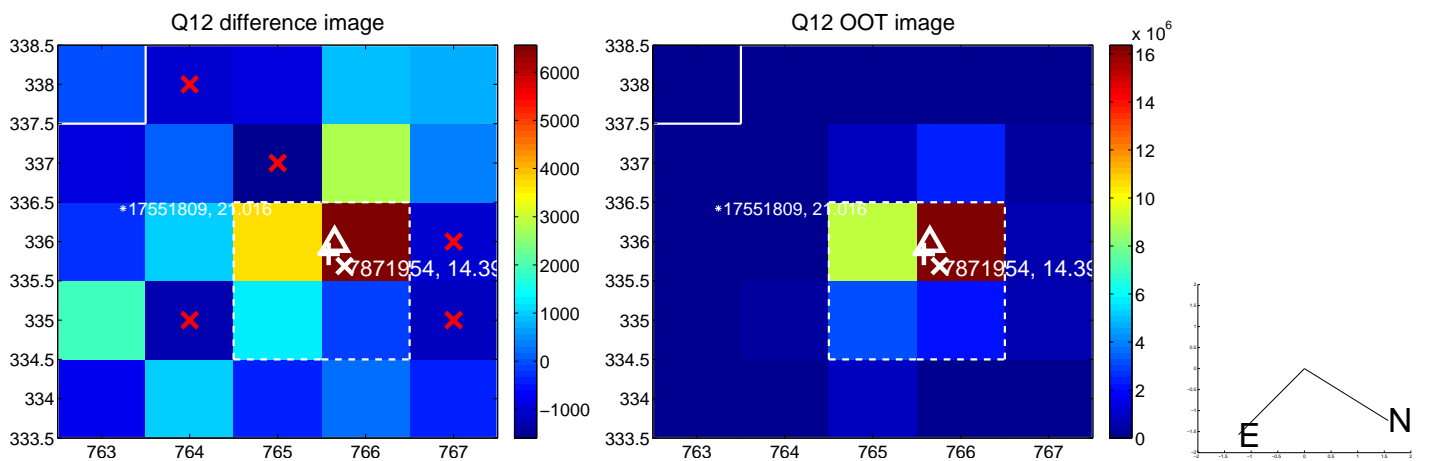
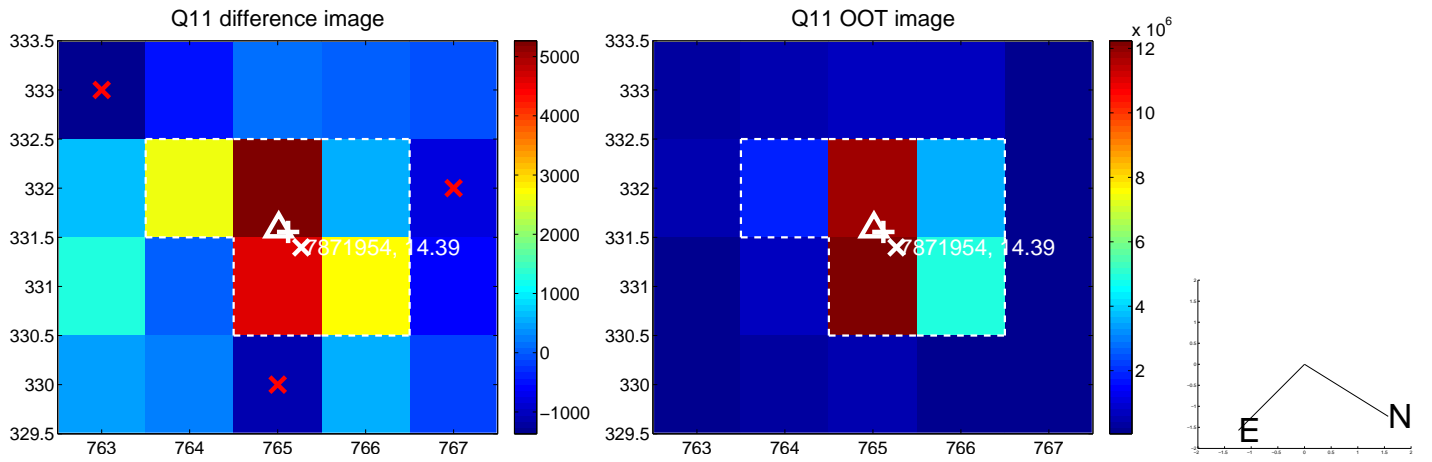
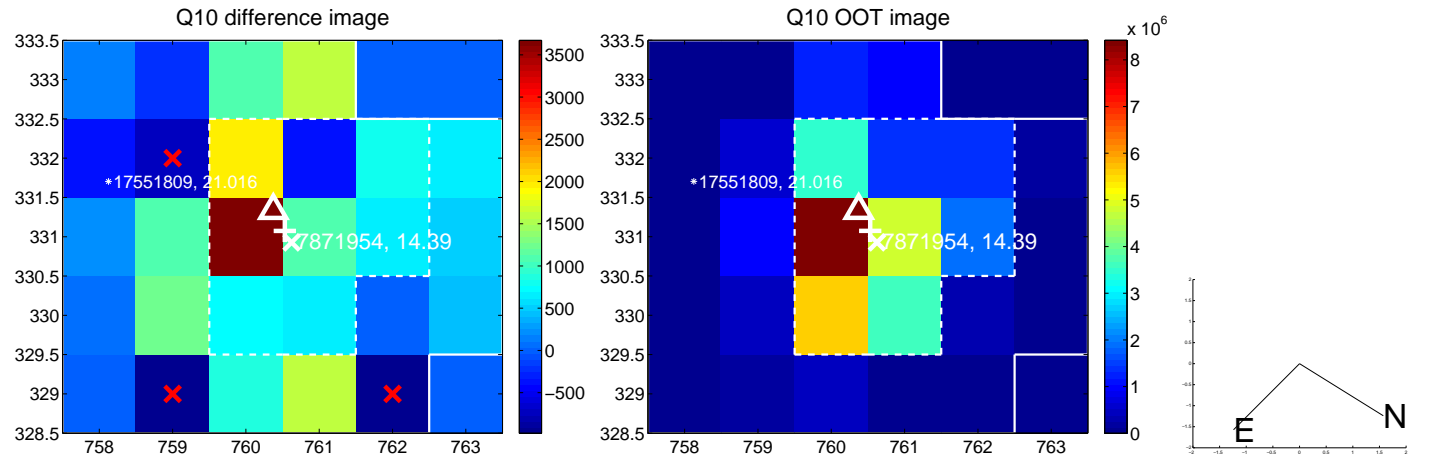
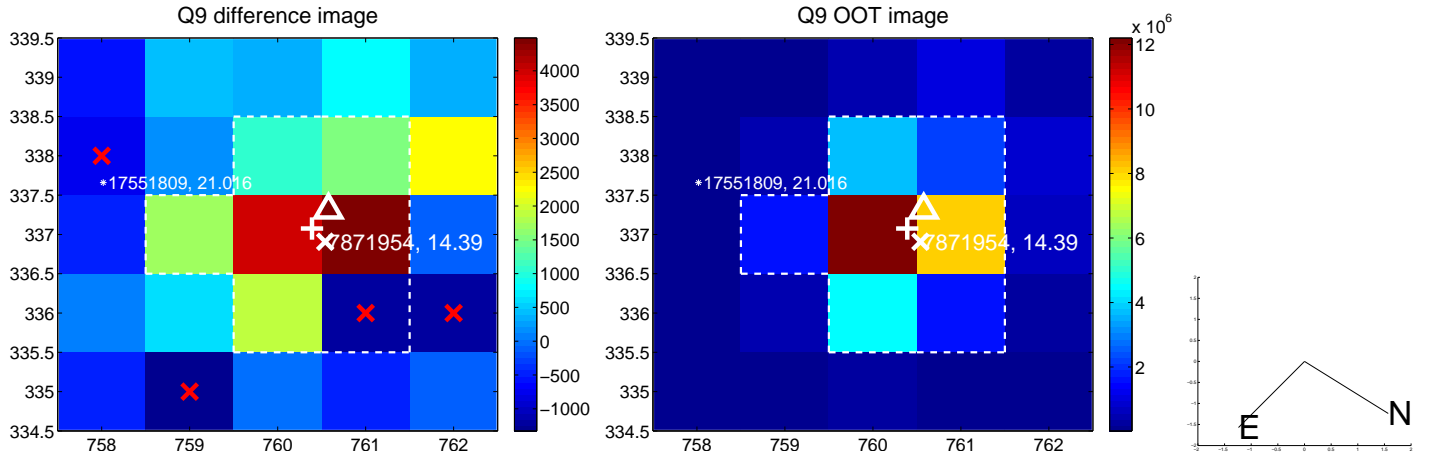


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

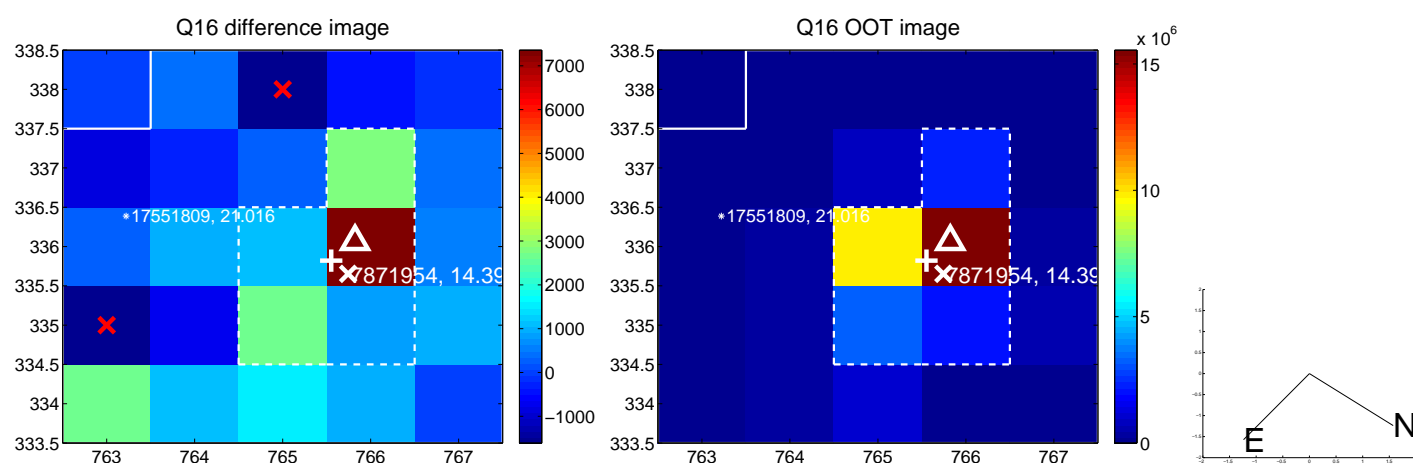
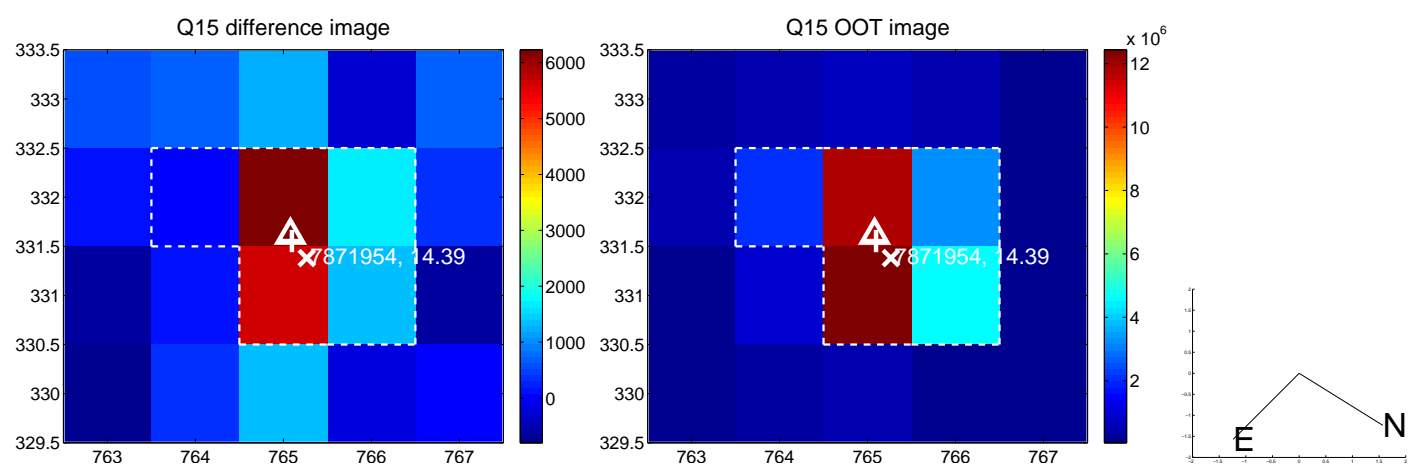
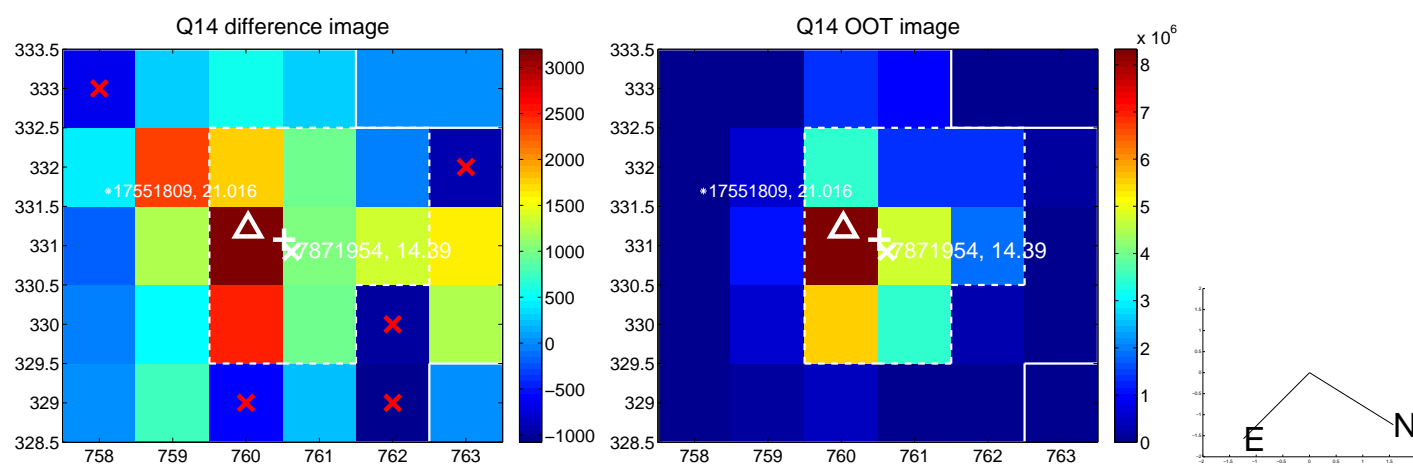
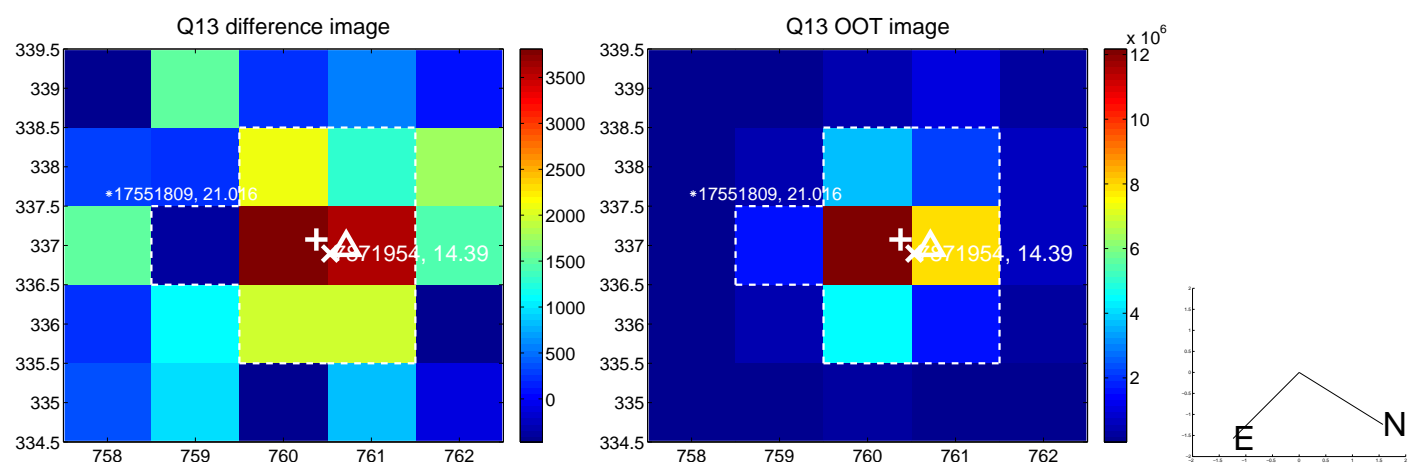
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



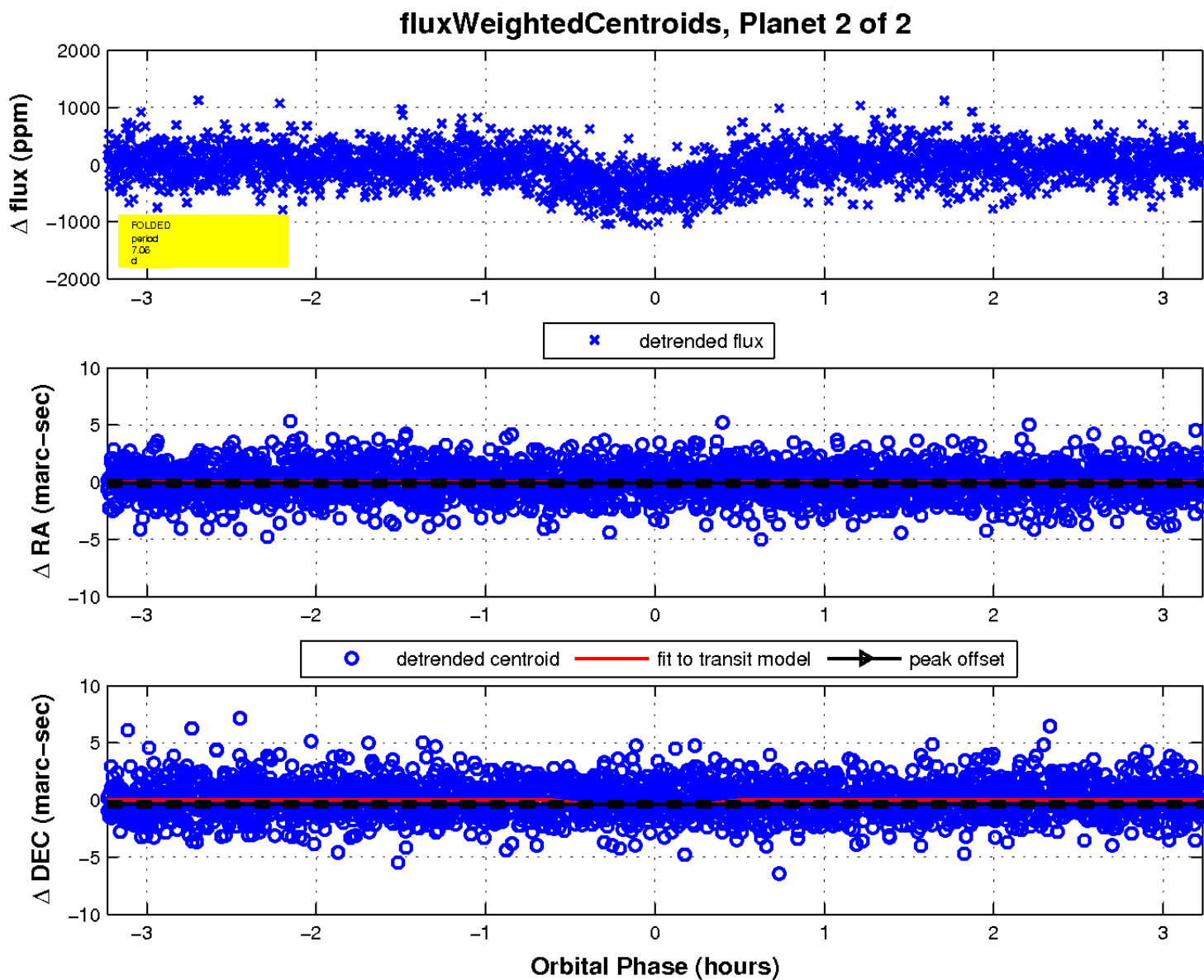
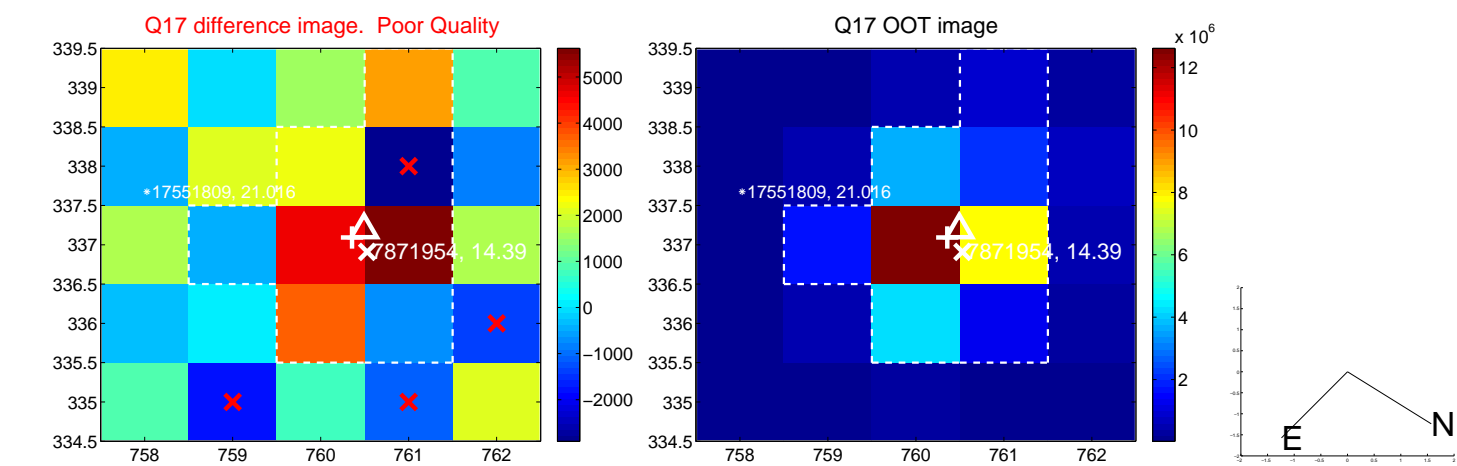
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

