

KIC 006871071

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R _★ (R _☉)	T _★ (K)	R _p (R _⊕)	S _p (S _⊕)
006871071-01	OBS	2220.03	1.897799	132.687937	118.5	2.707	22.6	22.7	1.51	5640	1.97	2276.59
006871071-02	OBS	2220.02	5.028181	134.110669	168.1	3.603	20.1	21.0	1.51	5640	2.30	620.97
006871071-03	OBS	2220.01	3.282801	131.897837	127.9	3.530	17.4	18.5	1.51	5640	2.21	1096.38
006871071-04	OBS	2220.04	7.664825	137.361068	103.9	3.808	9.8	10.0	1.51	5640	1.83	353.96

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006871071-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006871071-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT
006871071-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006871071-04	OBS	PC	0.90	0	0	0	0	NO_COMMENT

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

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

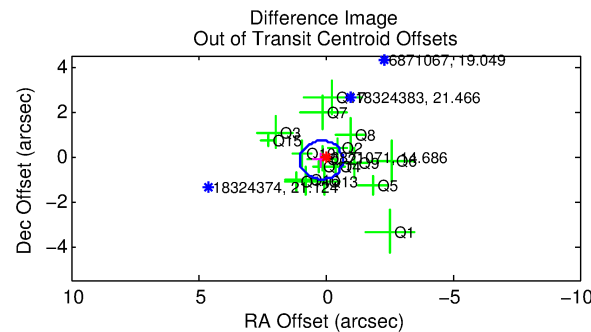
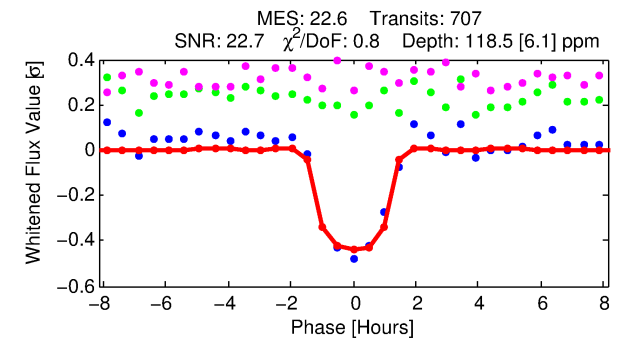
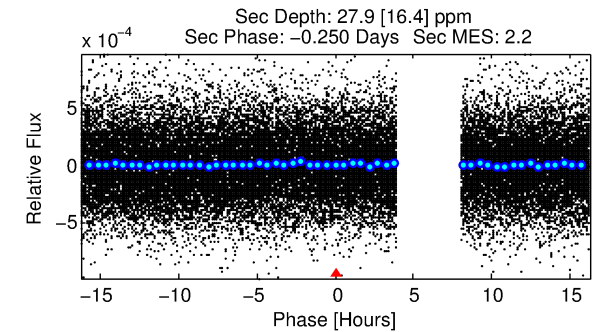
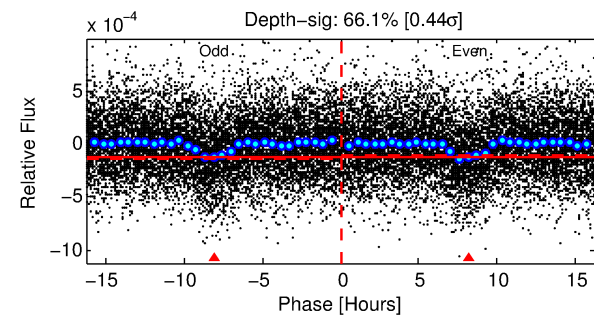
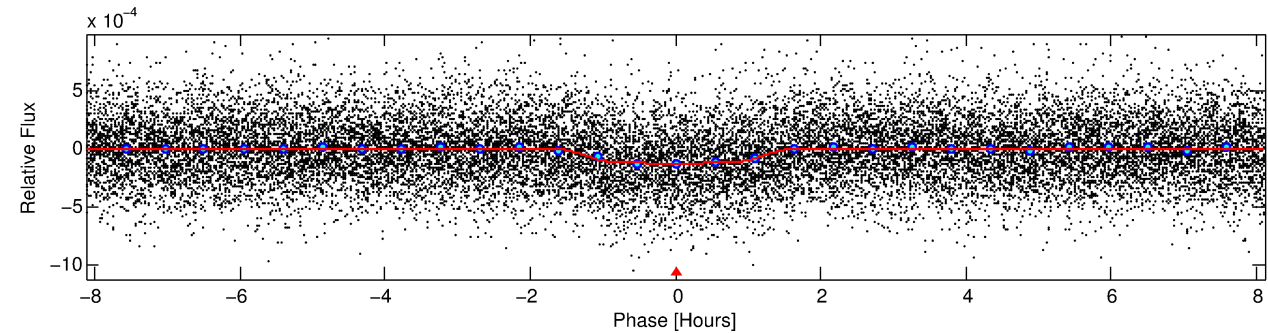
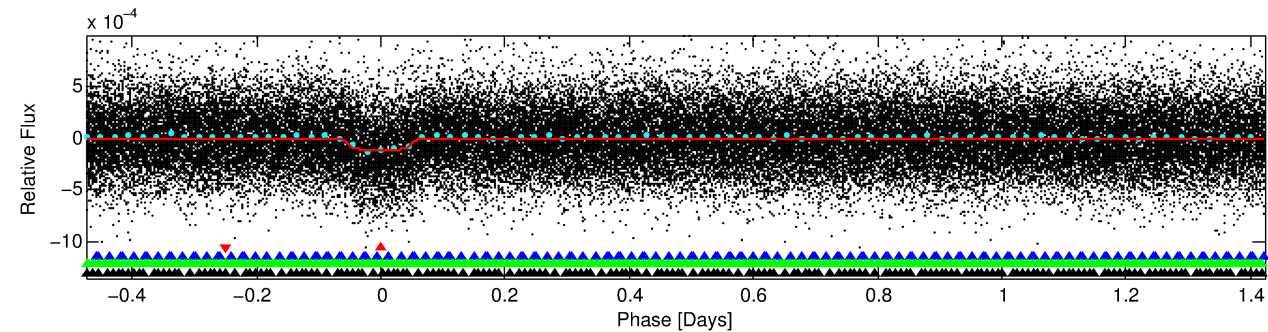
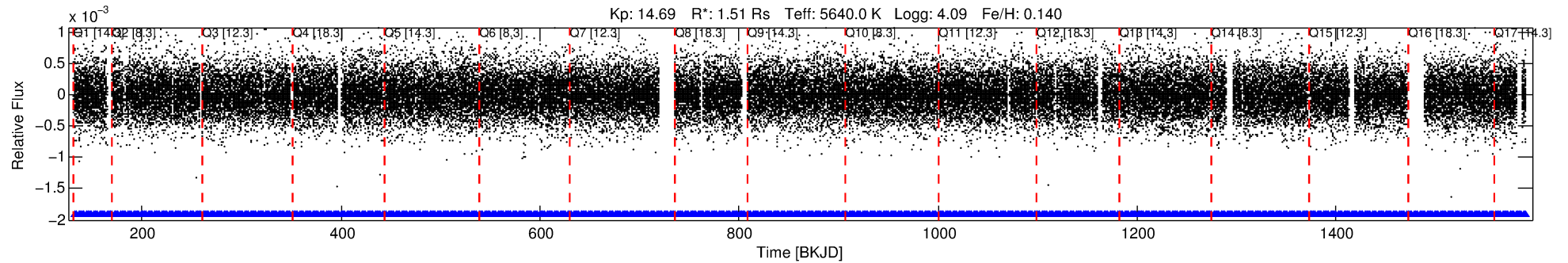
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006871071-01

No Significant Match Found

DV One-Page Summary

KIC: 6871071 Candidate: 1 of 4 Period: 1.898 d
KOI: K02220.03 Name: Kepler-374b Corr: 0.939



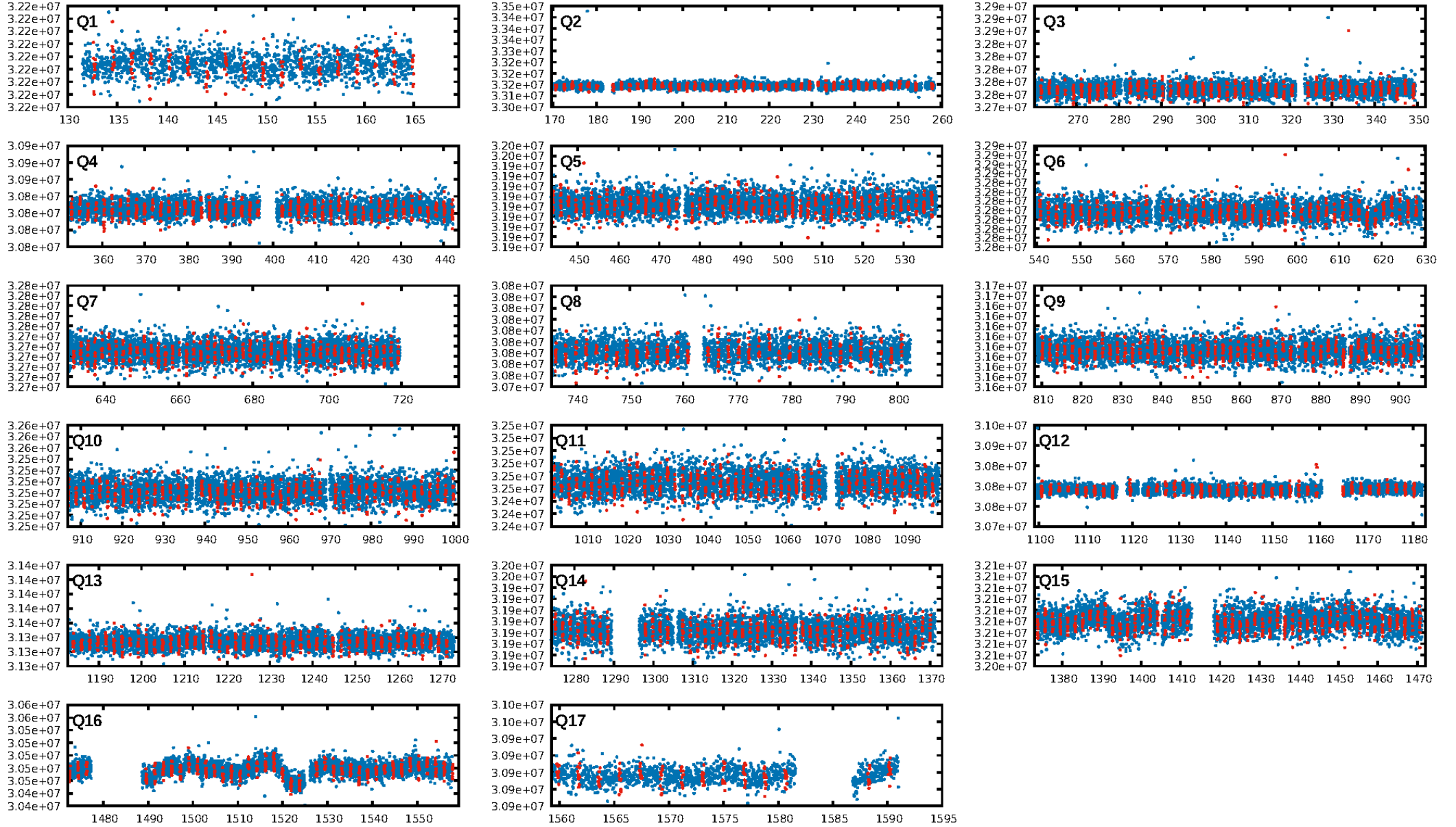
DV Fit Results:

Period = 1.89780 [0.00001] d
Epoch = 132.6879 [0.0017] BKJD
Rp/R* = 0.0119 [0.0040]
a/R* = 2.66 [3.55]
b = 0.90 [0.34]
Seff = 2276.59 [804.47]
Teff = 1761 [156] K
Rp = 1.97 [0.81] Re
a = 0.0302 [0.0067] AU
Ag = 3.61 [3.47] [0.75 σ]
Teffp = 3755 [842] K [2.33 σ]

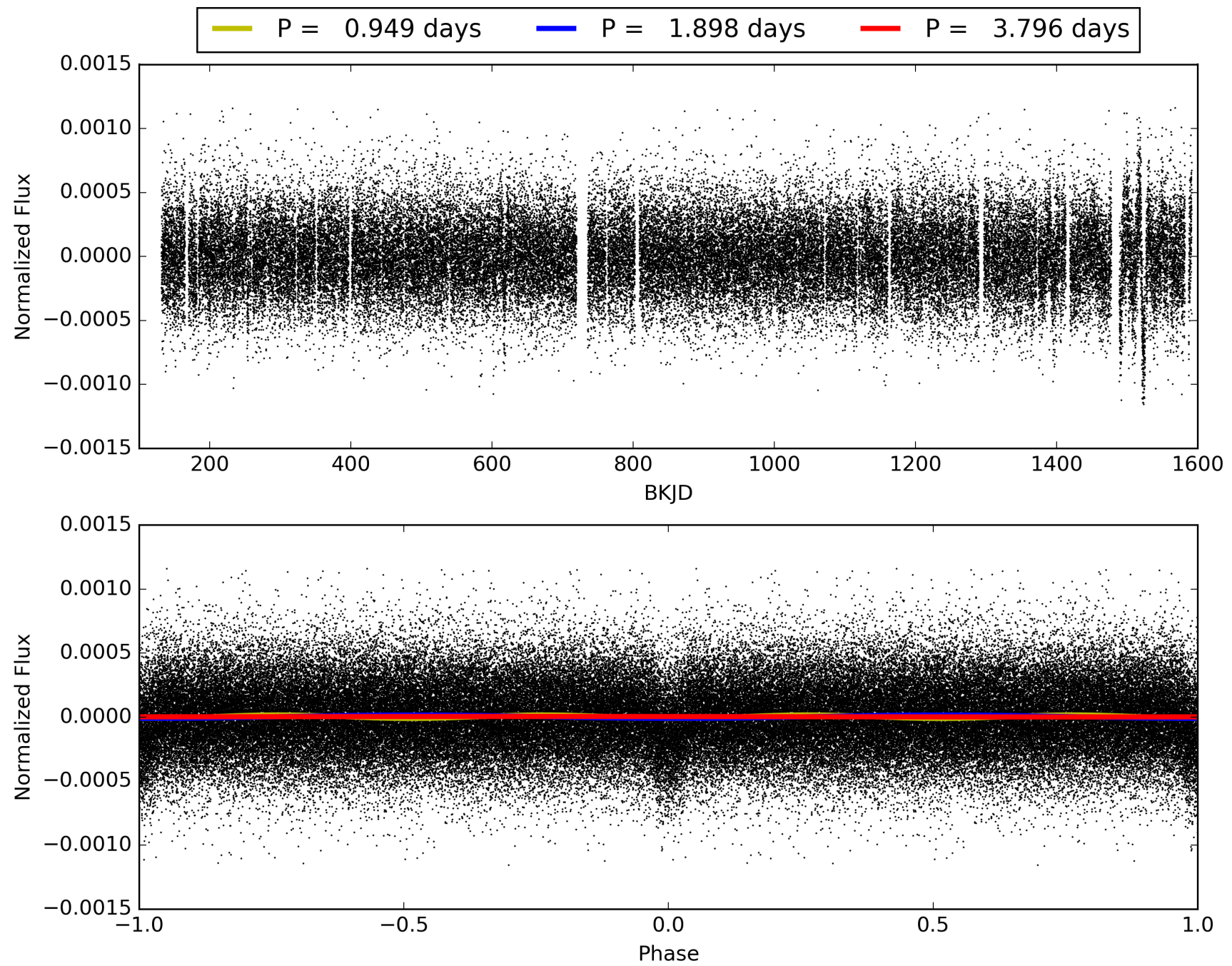
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [7.47 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.08e-115
RollingBand-fgt: 1.00 [675/675]
GhostDiagnostic-chr: 8.269
Centroid-sig: 32.4%
Centroid-so: 0.567 arcsec [0.99 σ]
OotOffset-rm: 0.228 arcsec [0.80 σ]
KicOffset-rm: 0.332 arcsec [1.04 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.88 [15/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 006871071-01, PDC Light Curves

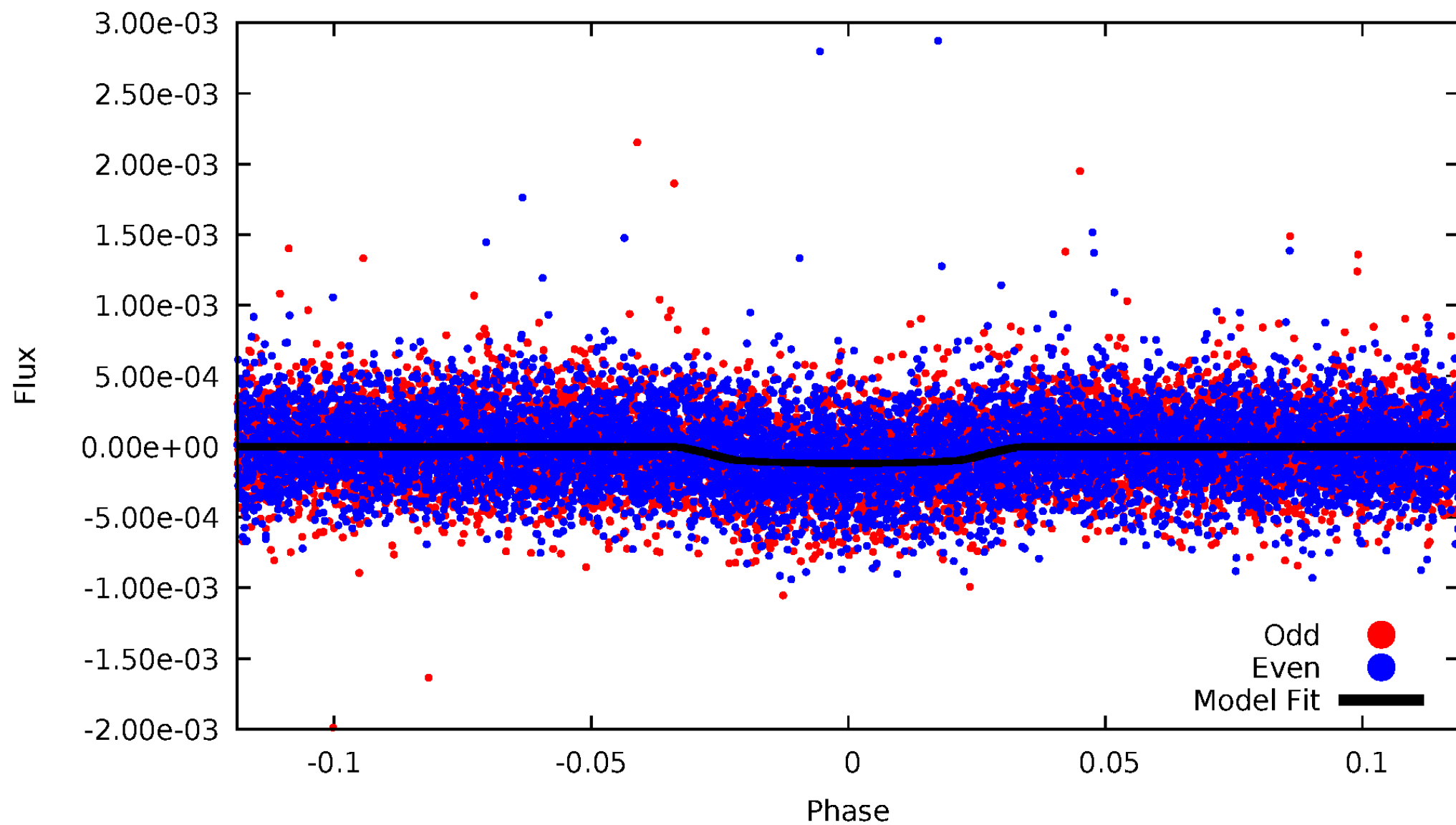


TCE 006871071-01



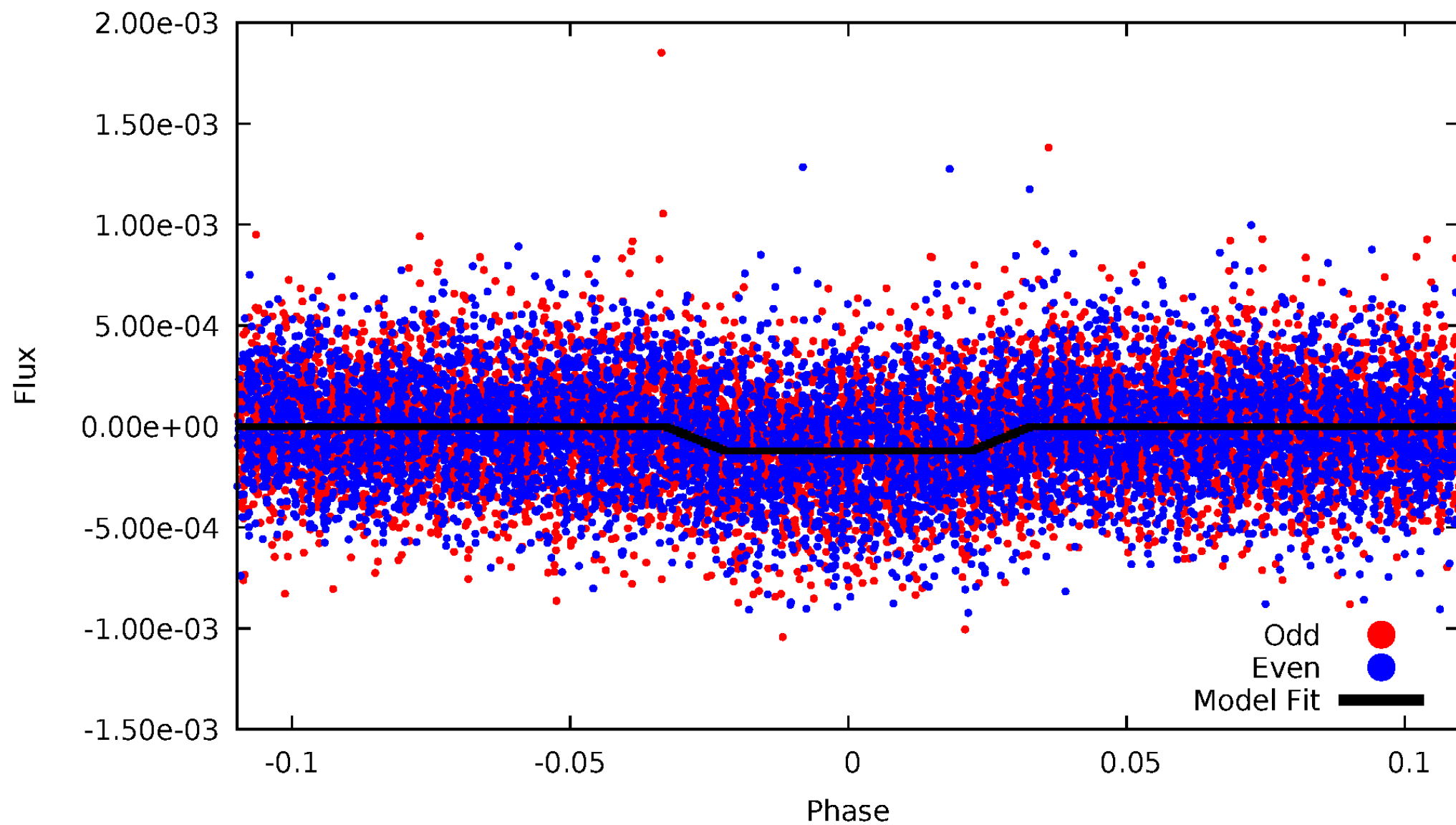
DV Odd/Even

TCE 006871071-01

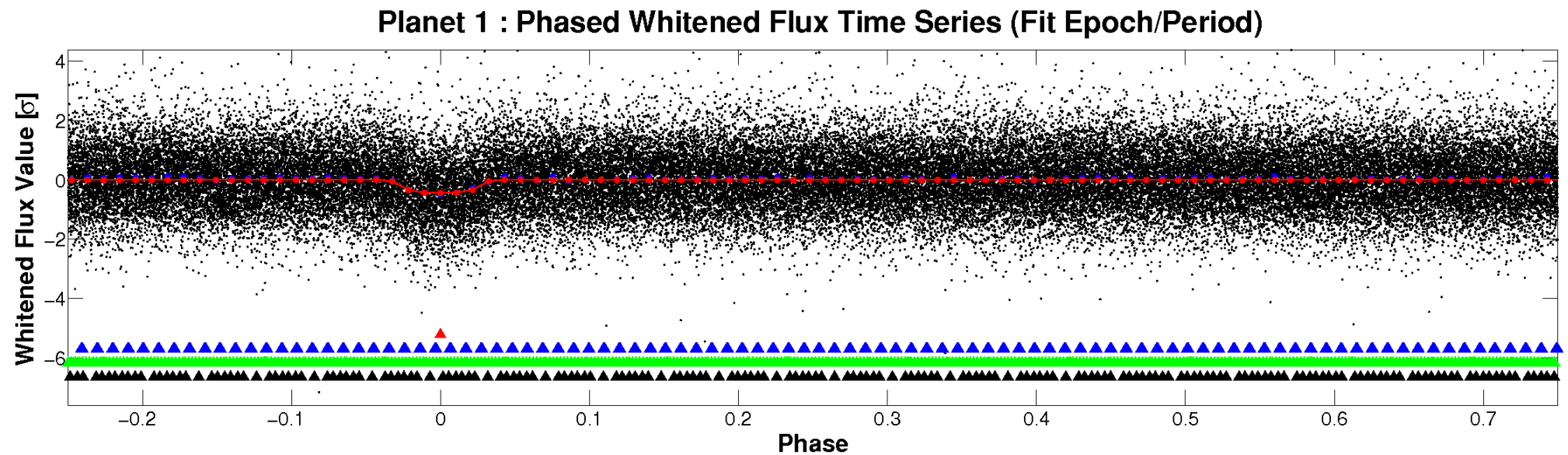
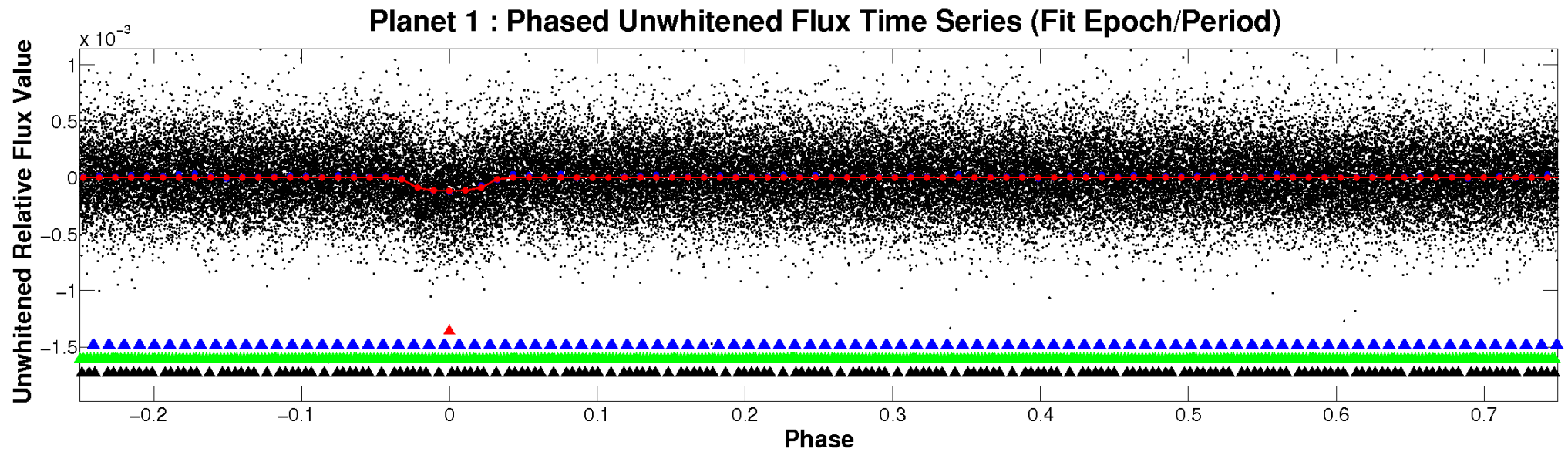


ALT Odd/Even

TCE 006871071-01

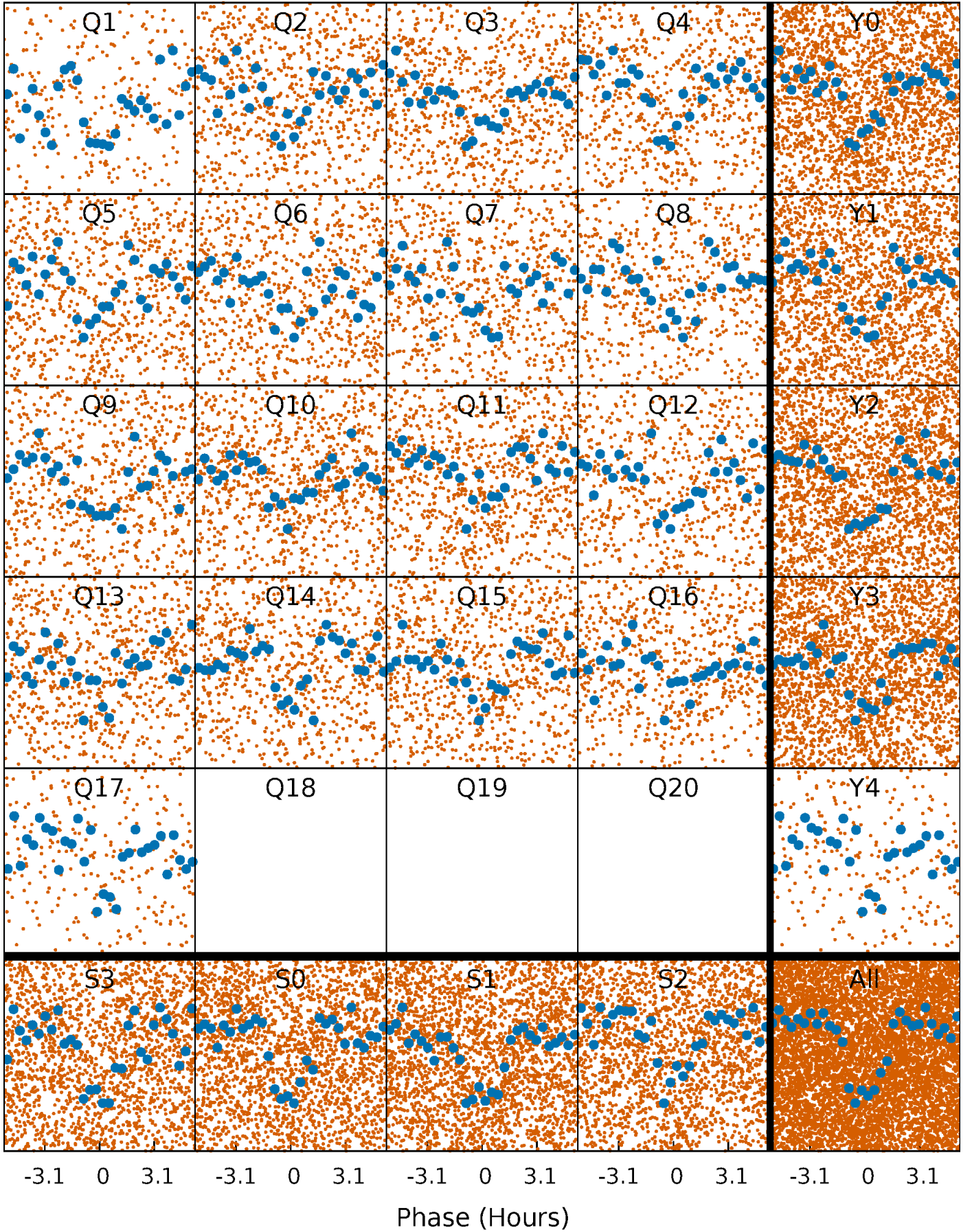


Non-Whitened Vs. Whitened Light Curve



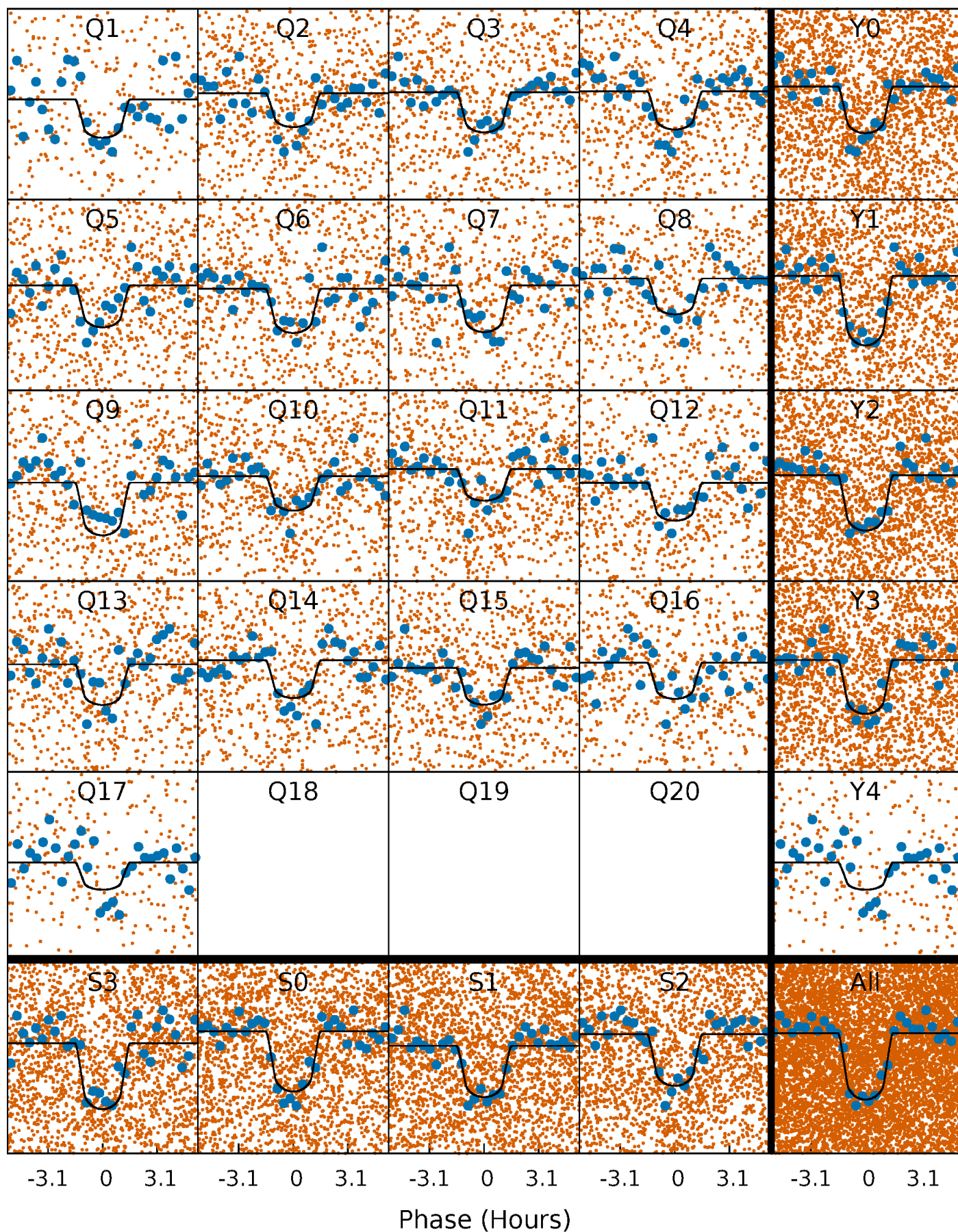
PDC Quarter-Phased Transit Curves

TCE 006871071-01 P= 1.897799 Days $T_0=132.687937$ (BKJD)



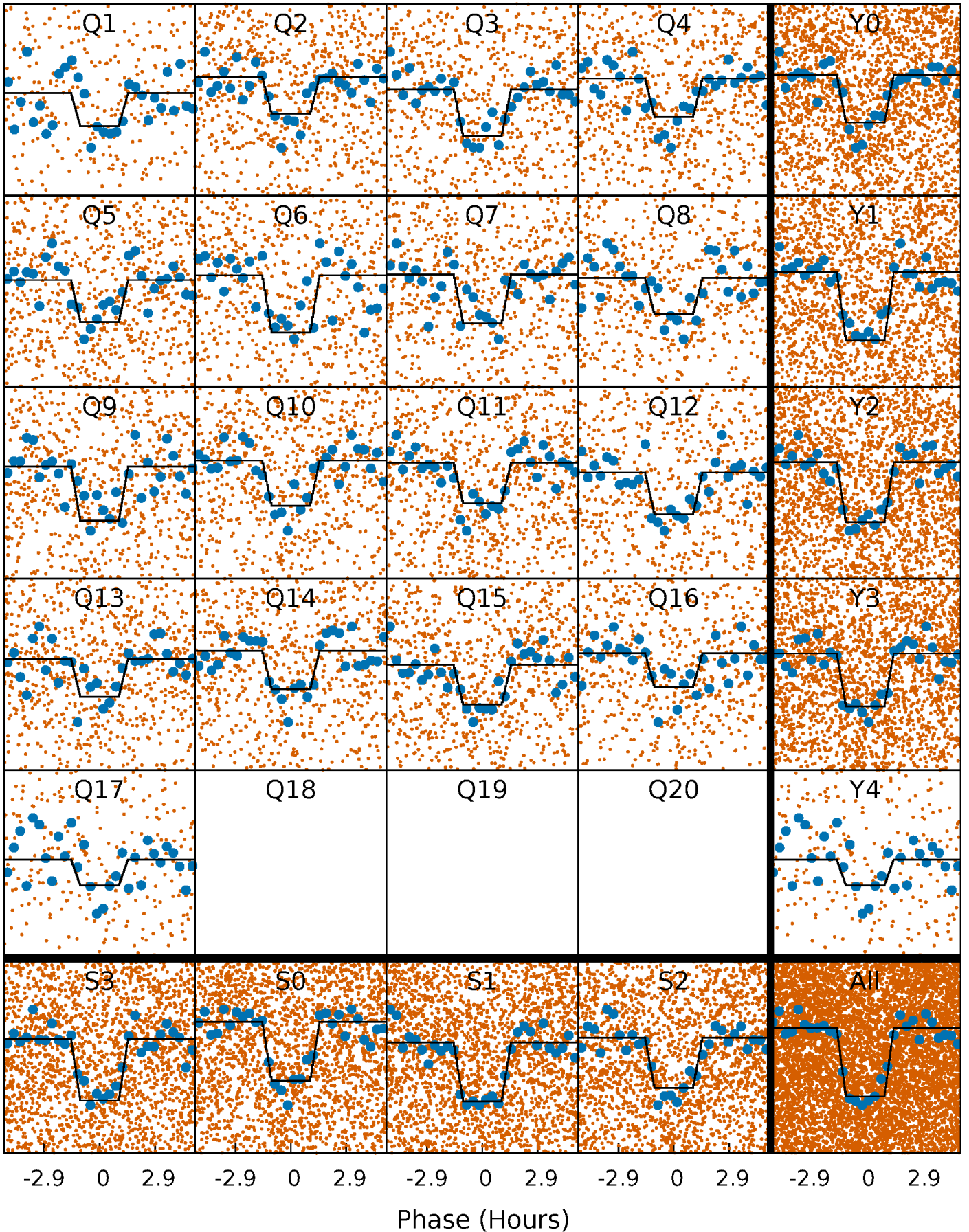
DV Quarter-Phased Transit Curves

TCE 006871071-01 P= 1.897799 Days $T_0=132.687937$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

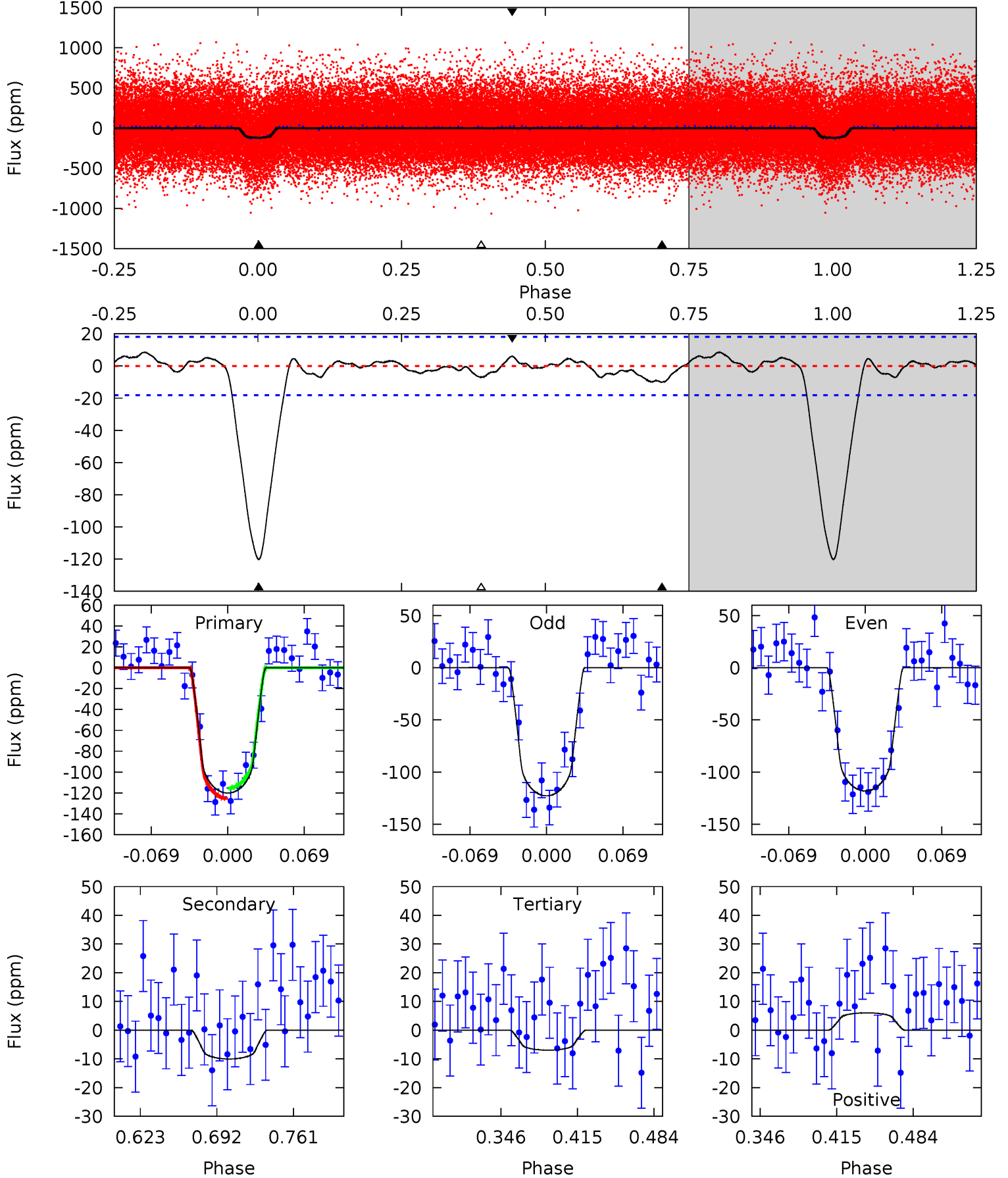
TCE 006871071-01 P= 1.897823 Days $T_0=132.681467$ (BKJD)



DV Model-Shift Uniqueness Test

006871071-01, P = 1.897799 Days, E = 130.790138 Days

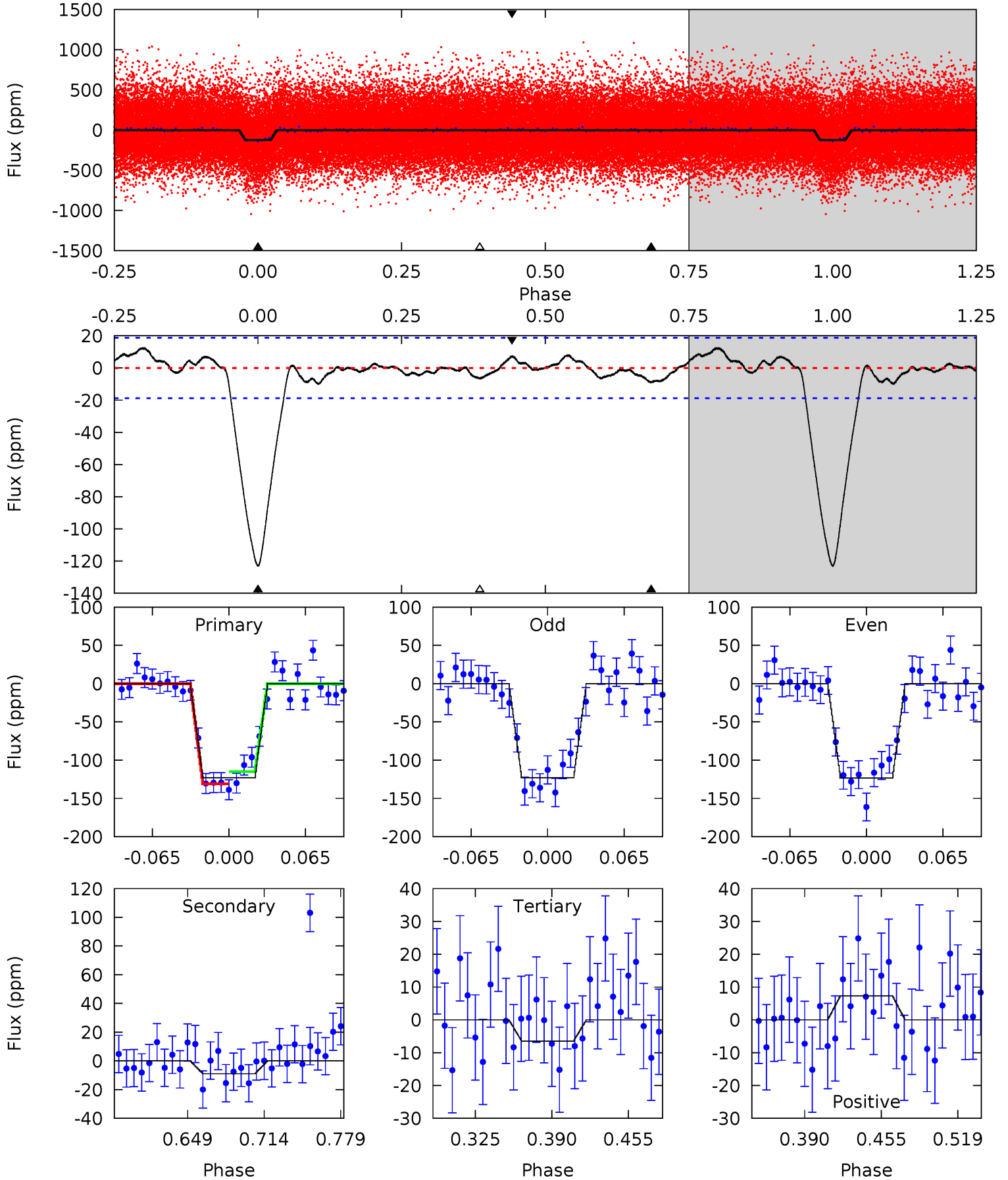
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.8	2.57	1.79	1.54	4.64	1.82	0.91	29.0	29.2	0.79	1.03	0.60	0.97	0.07	1.28



Alt Model-Shift Uniqueness Test

006871071-01, P = 1.897823 Days, E = 130.783644 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.5	2.22	1.60	1.81	4.65	1.85	1.13	28.9	28.7	0.61	0.40	0.04	1.03	0.09	1.96



Stellar Parameters For KIC 006871071

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5640^{+85}_{-77}	$4.087^{+0.203}_{-0.087}$	$0.140^{+0.150}_{-0.150}$	$1.515^{+0.236}_{-0.353}$	$1.024^{+0.093}_{-0.084}$	$0.415^{+0.420}_{-0.131}$
	+2%/-1%	+5%/-2%	+107%/-107%	+16%/-23%	+9%/-8%	+101%/-32%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 006871071-01 / KOI 2220.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-10 ± 4	$1.92^{+0.70}_{-0.63}$	2440^{+103}_{-147}	3266^{+583}_{-512}	$1.338^{+1.880}_{-0.741}$
Alt.	-9 ± 4	$1.77^{+0.72}_{-0.70}$	2437^{+110}_{-158}	3256^{+674}_{-532}	$1.350^{+2.282}_{-0.782}$

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

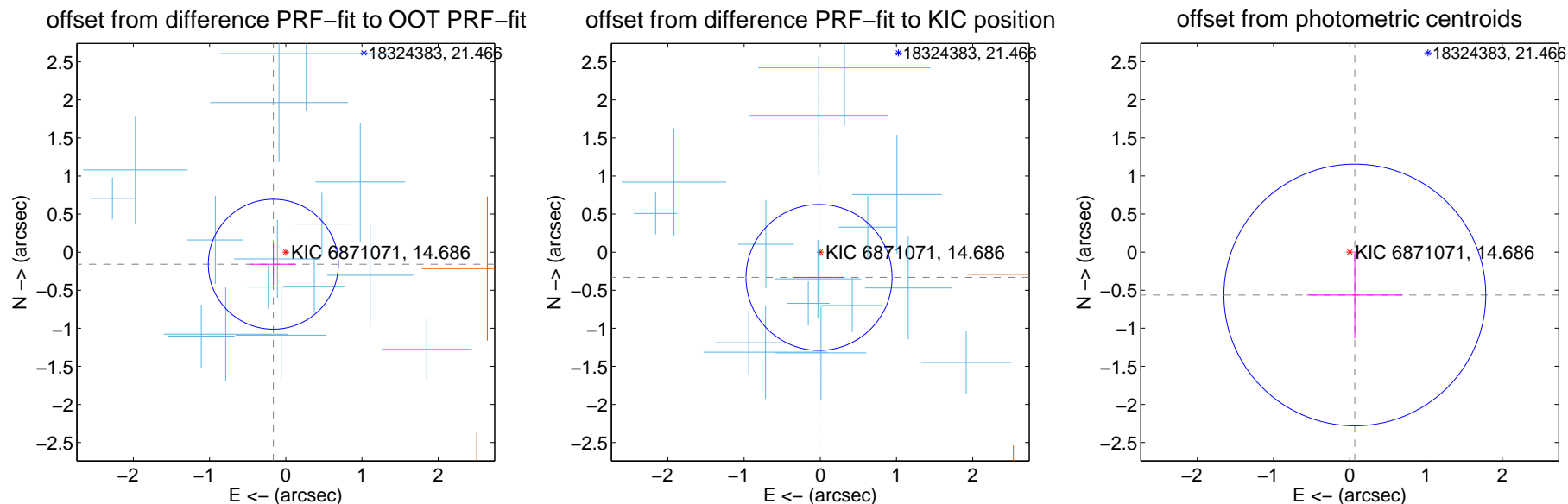
DV Centroid Data

Supplemental centroid analysis for 006871071-01. Kepler magnitude: 14.69. Transit SNR 22.73

There are 15 quarters with good PRF difference image offsets

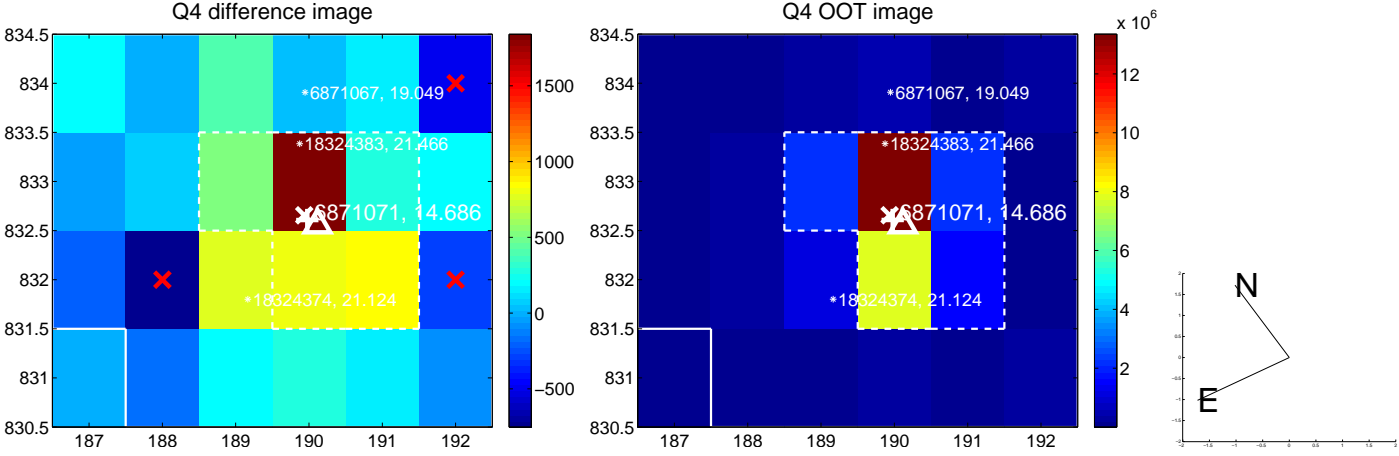
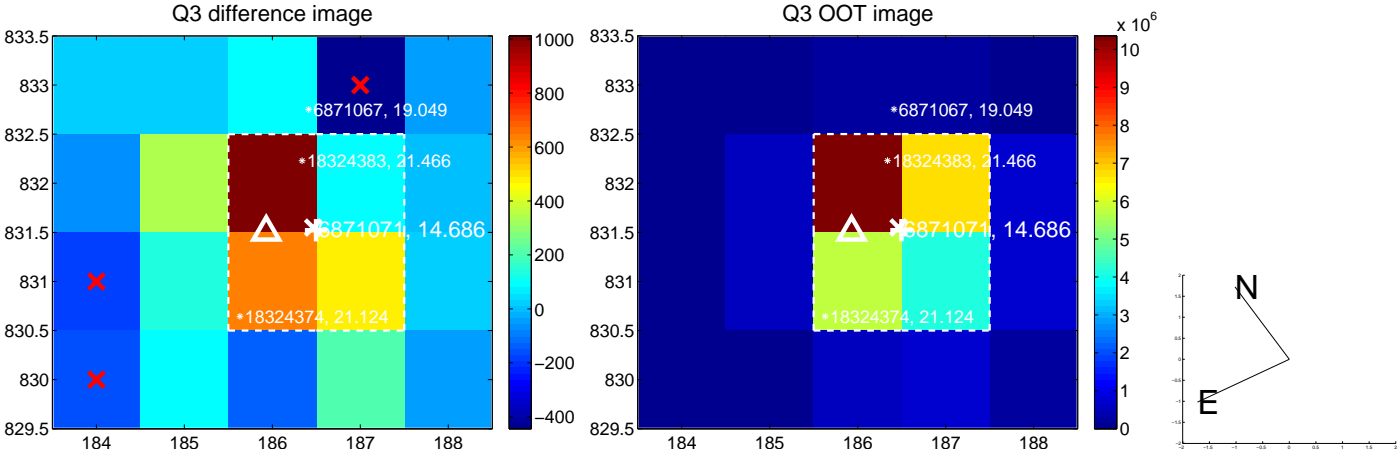
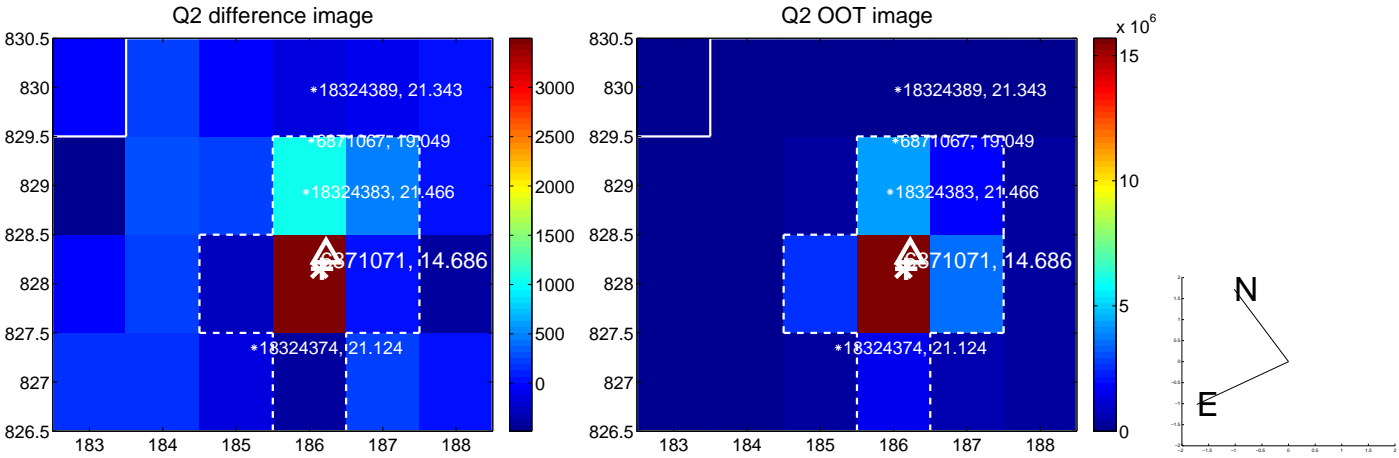
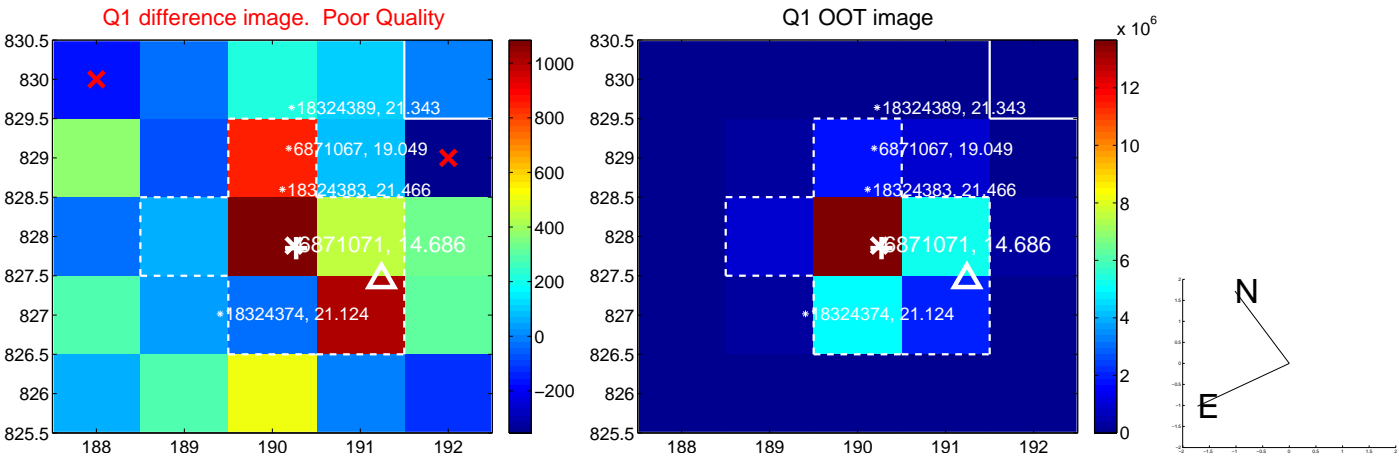
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.228 ± 0.284	0.80	0.163 ± 0.298	-0.159 ± 0.269
PRF-fit source offset from KIC position	0.332 ± 0.319	1.04	0.016 ± 0.335	-0.332 ± 0.326
photometric centroid source offset	0.57 ± 0.57	0.99	-0.07 ± 0.63	-0.56 ± 0.57

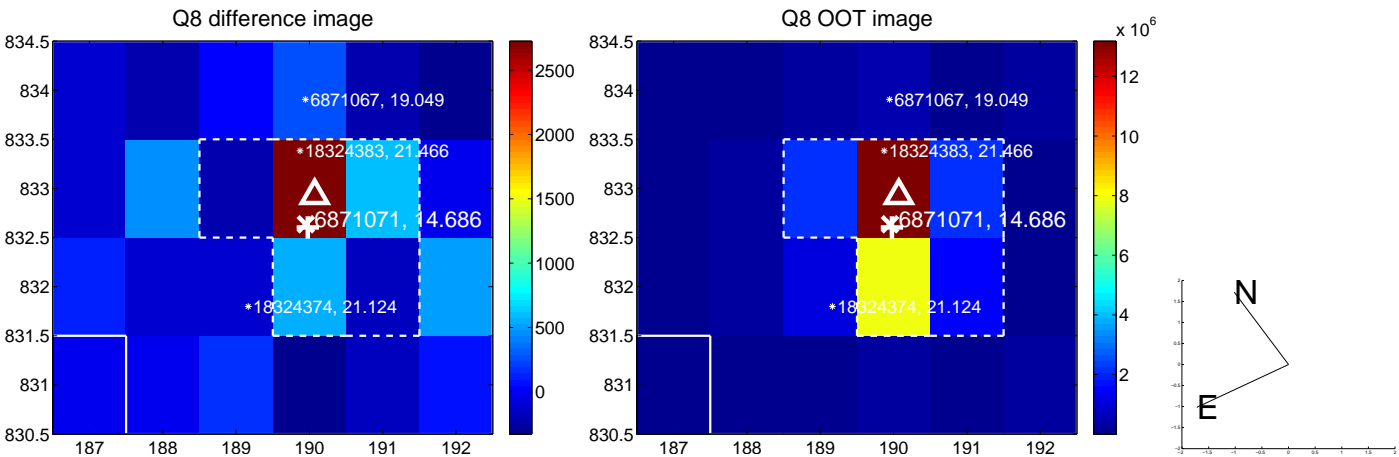
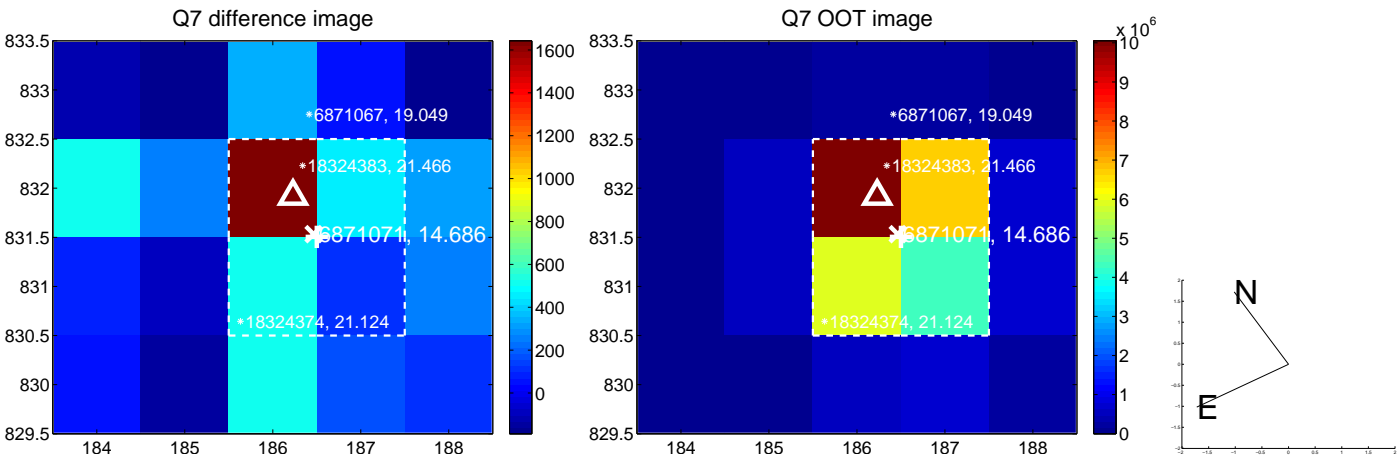
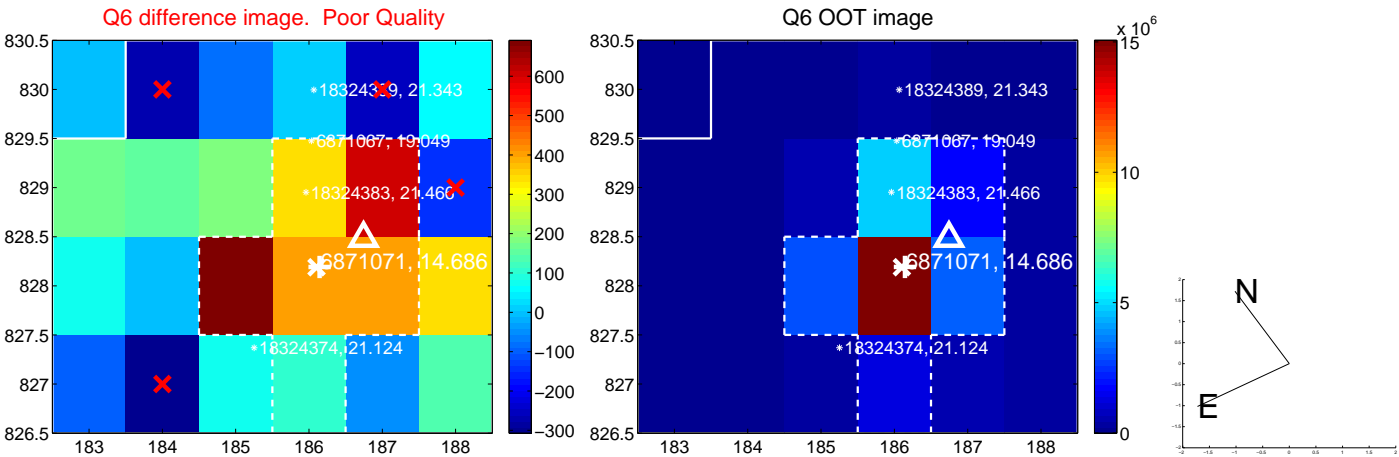
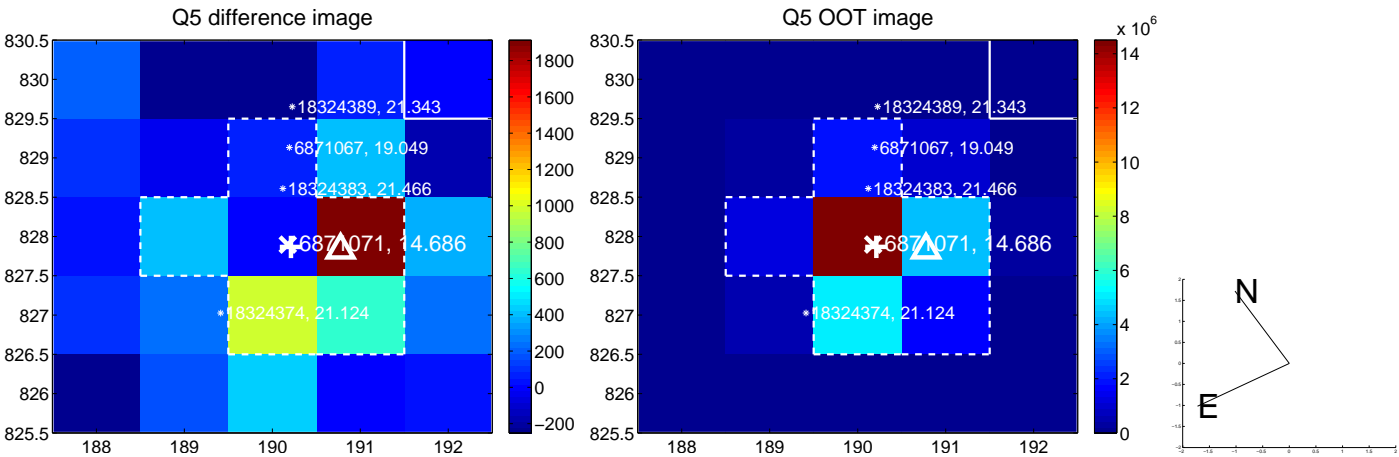


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

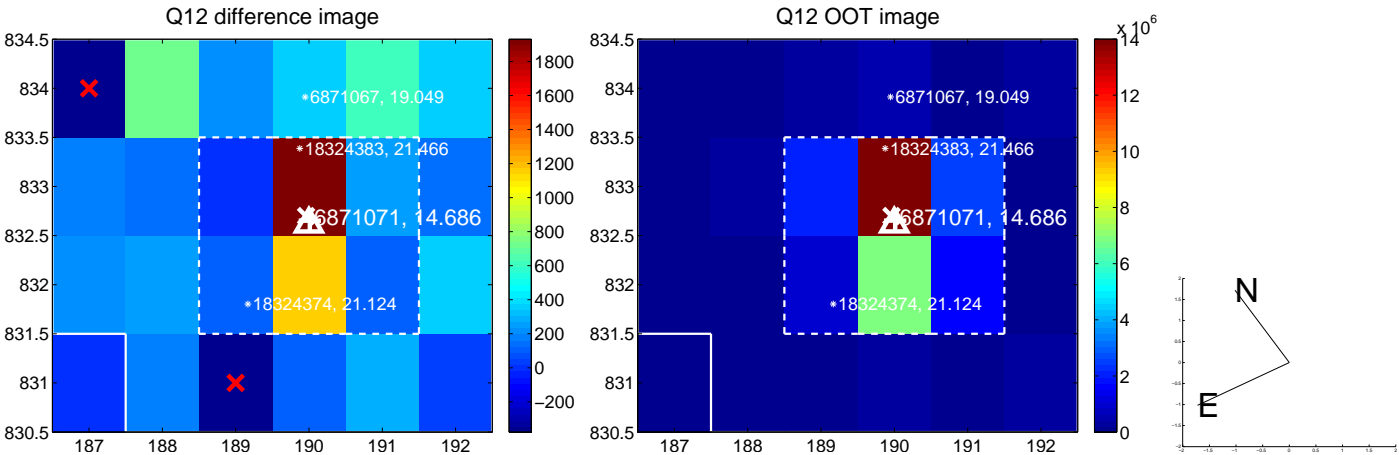
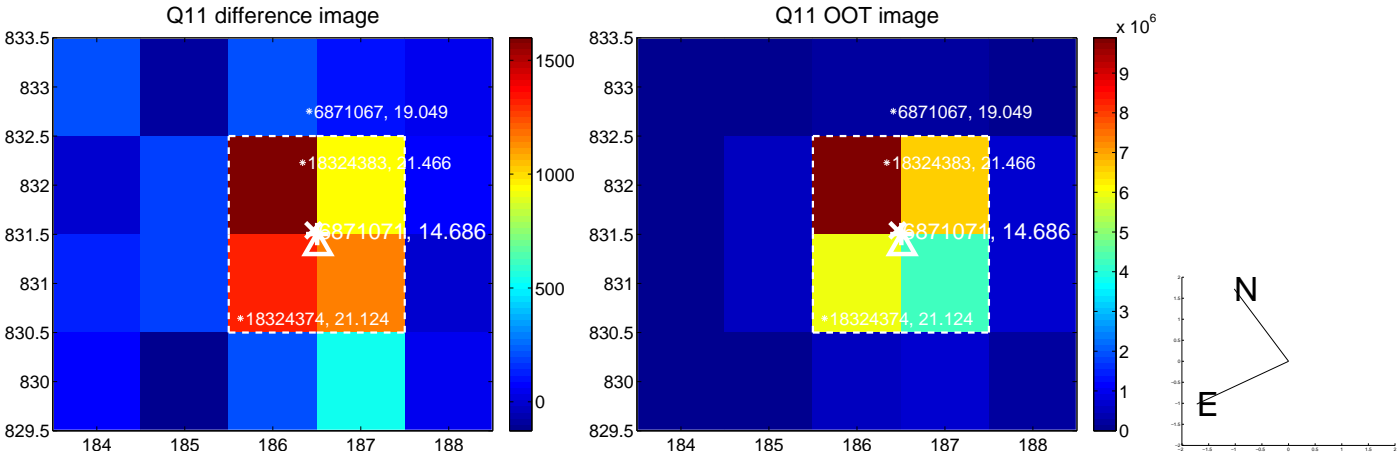
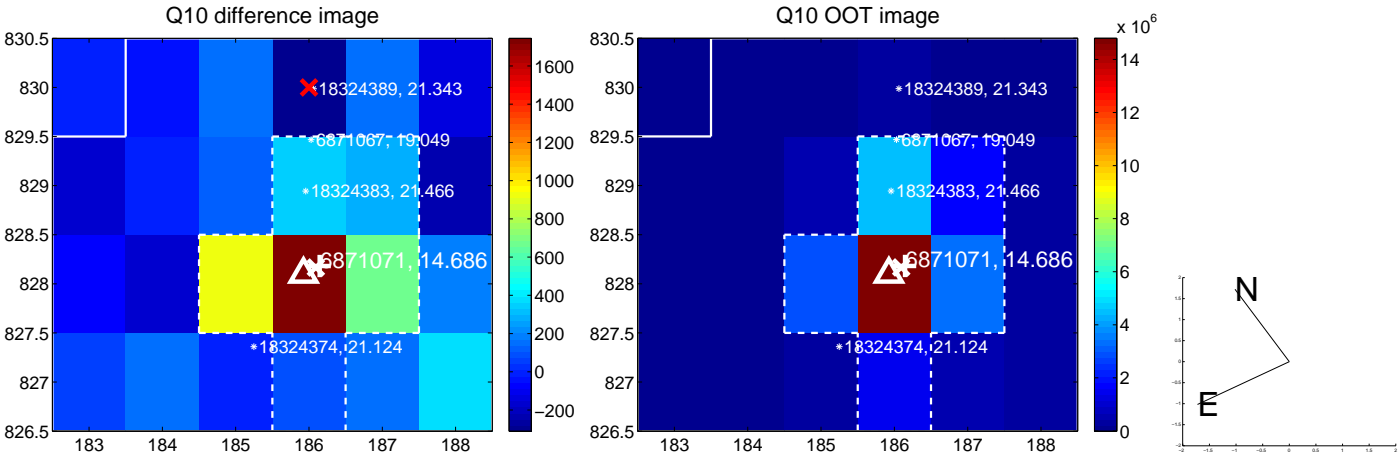
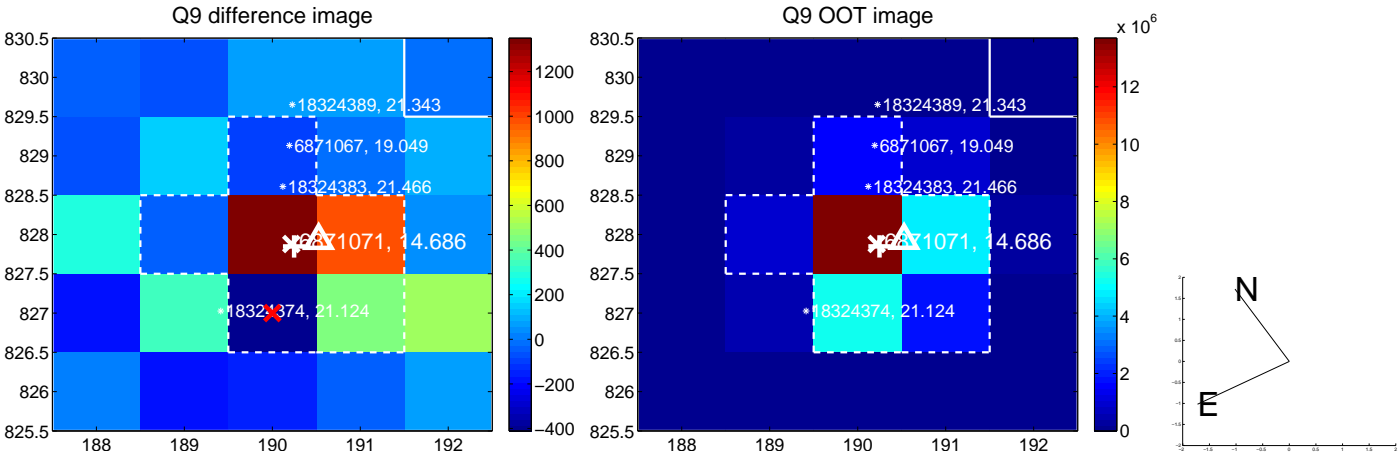
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



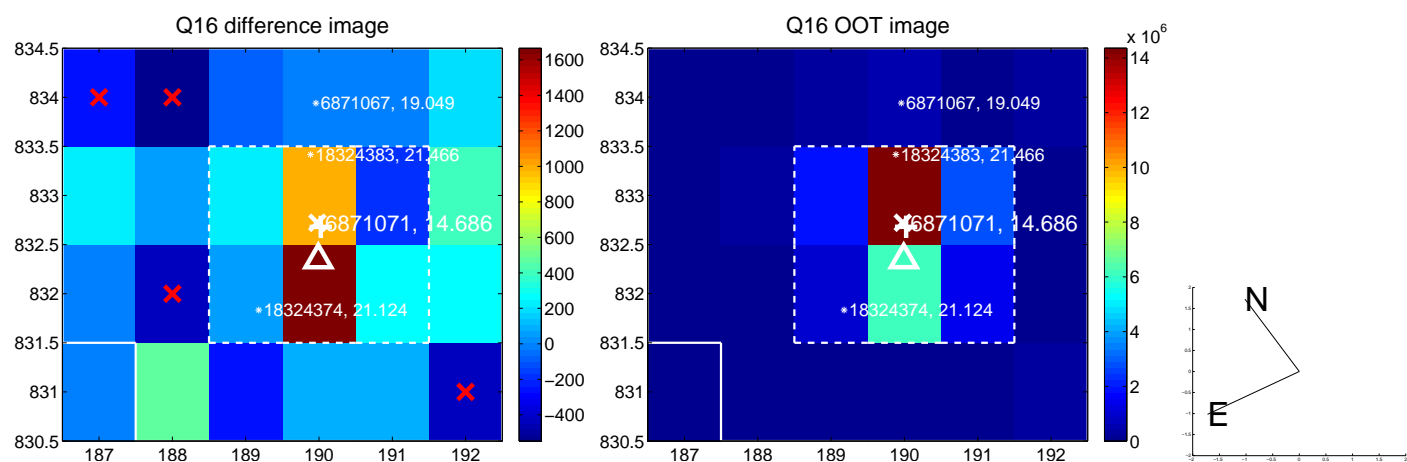
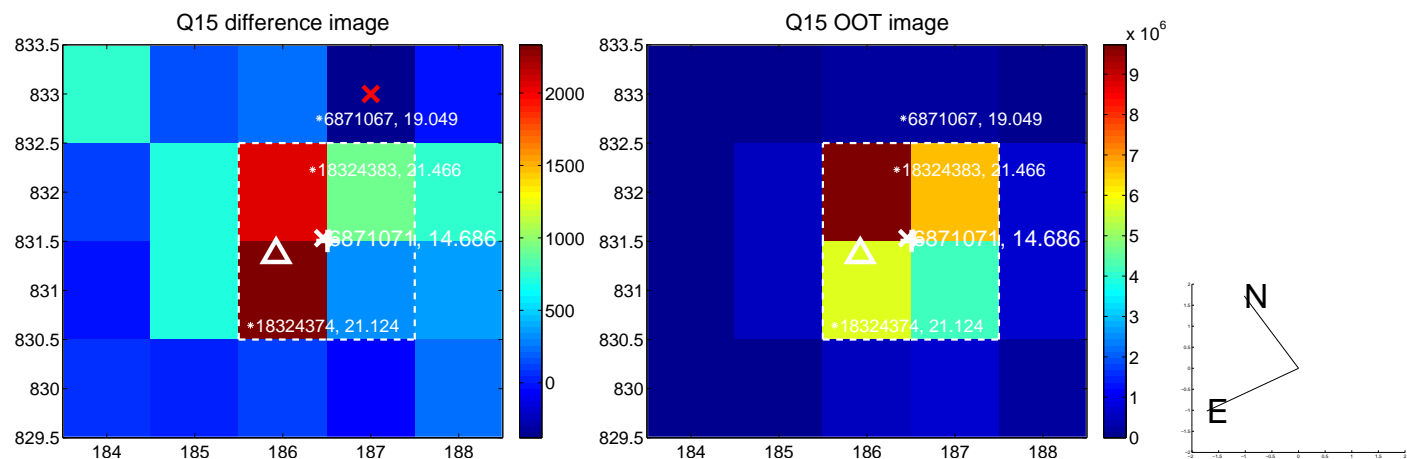
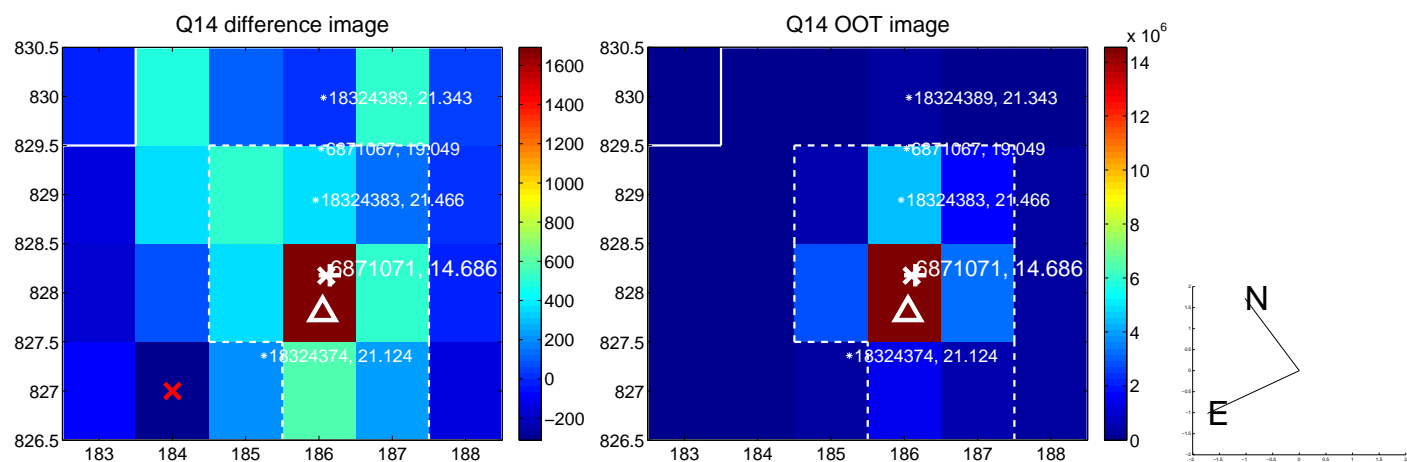
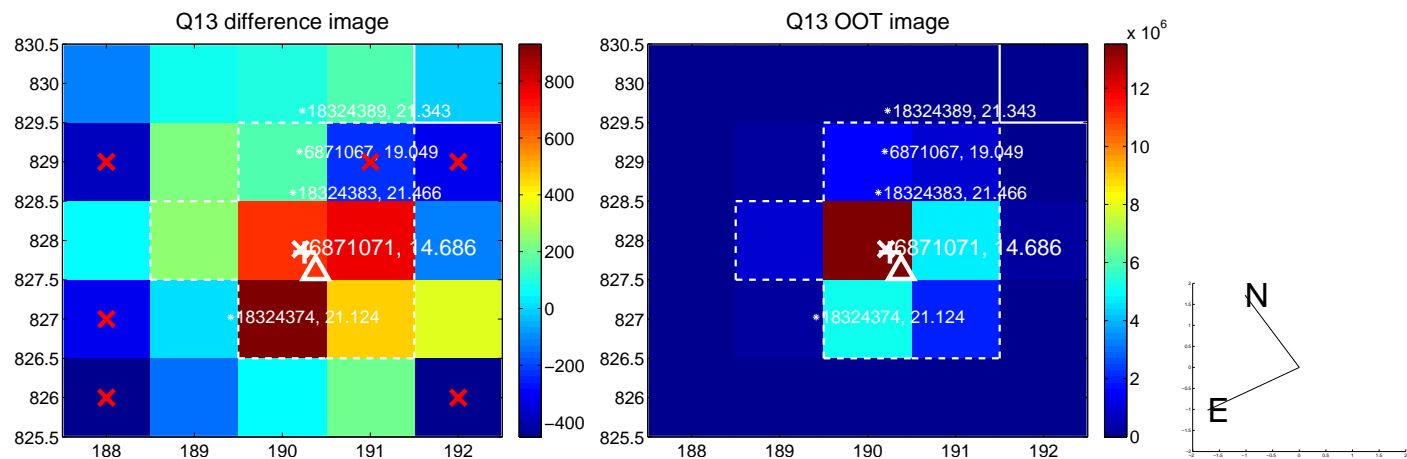
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



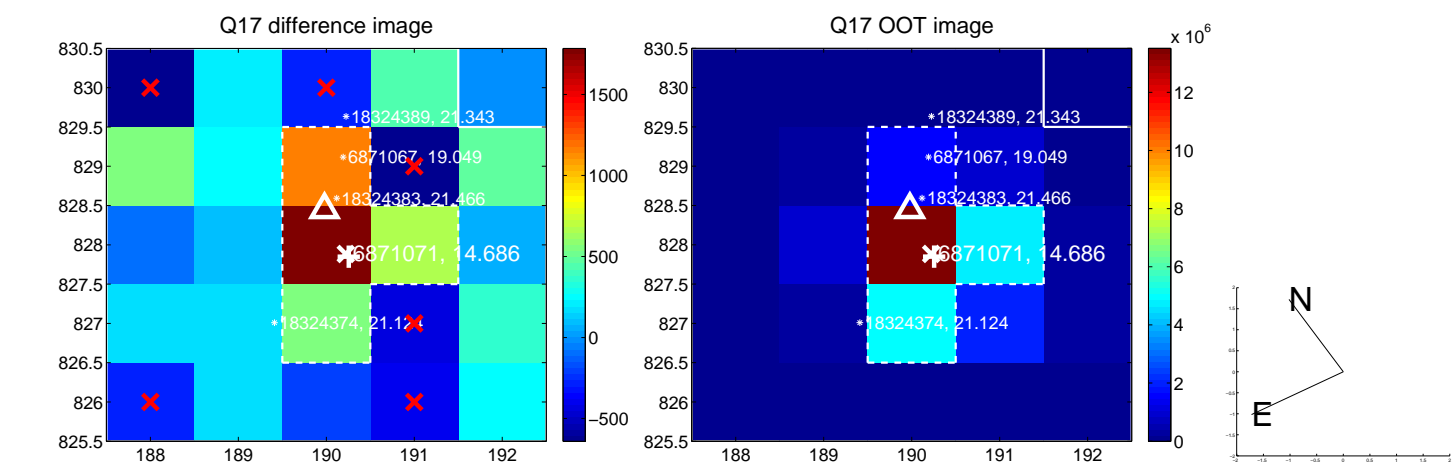
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



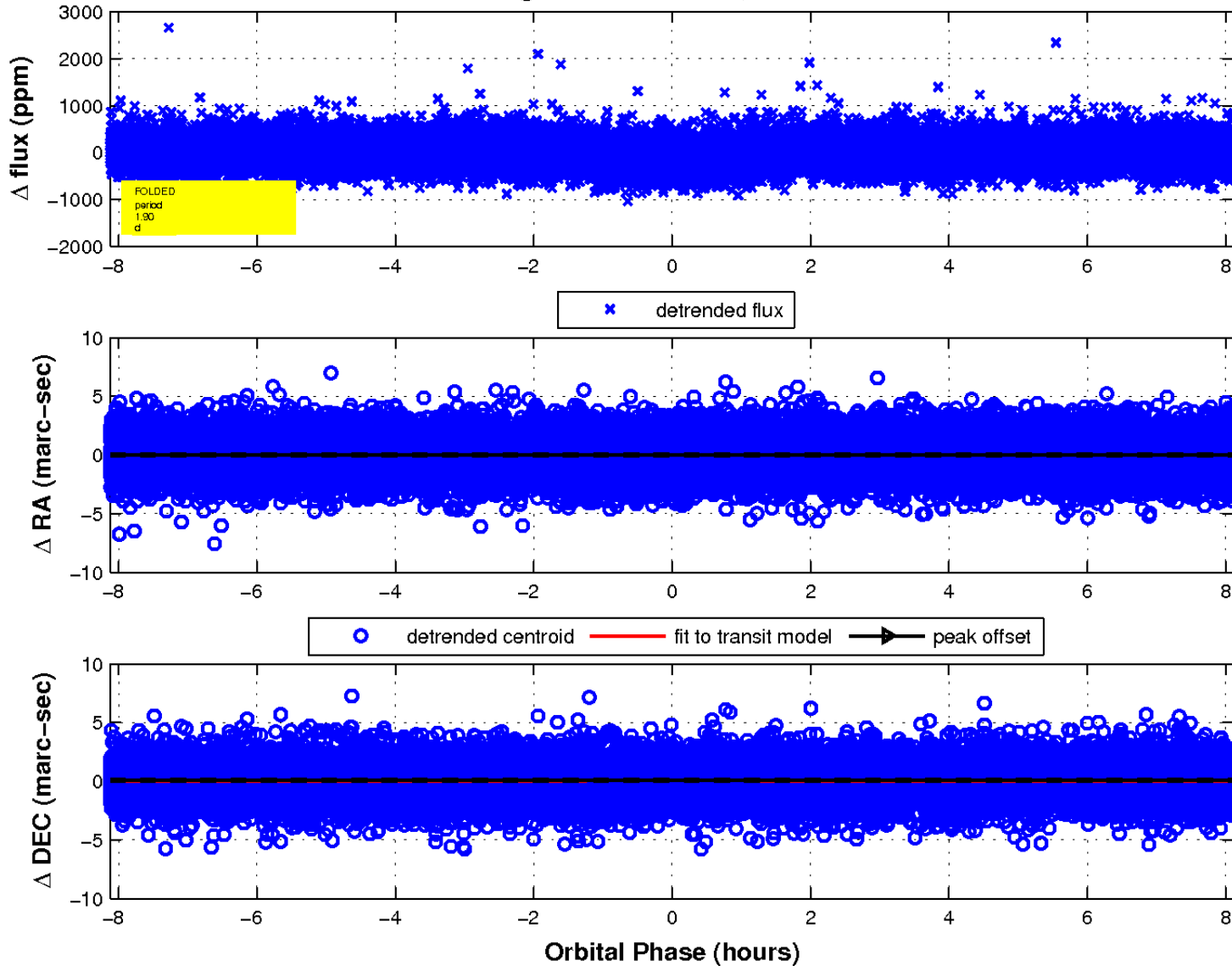
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

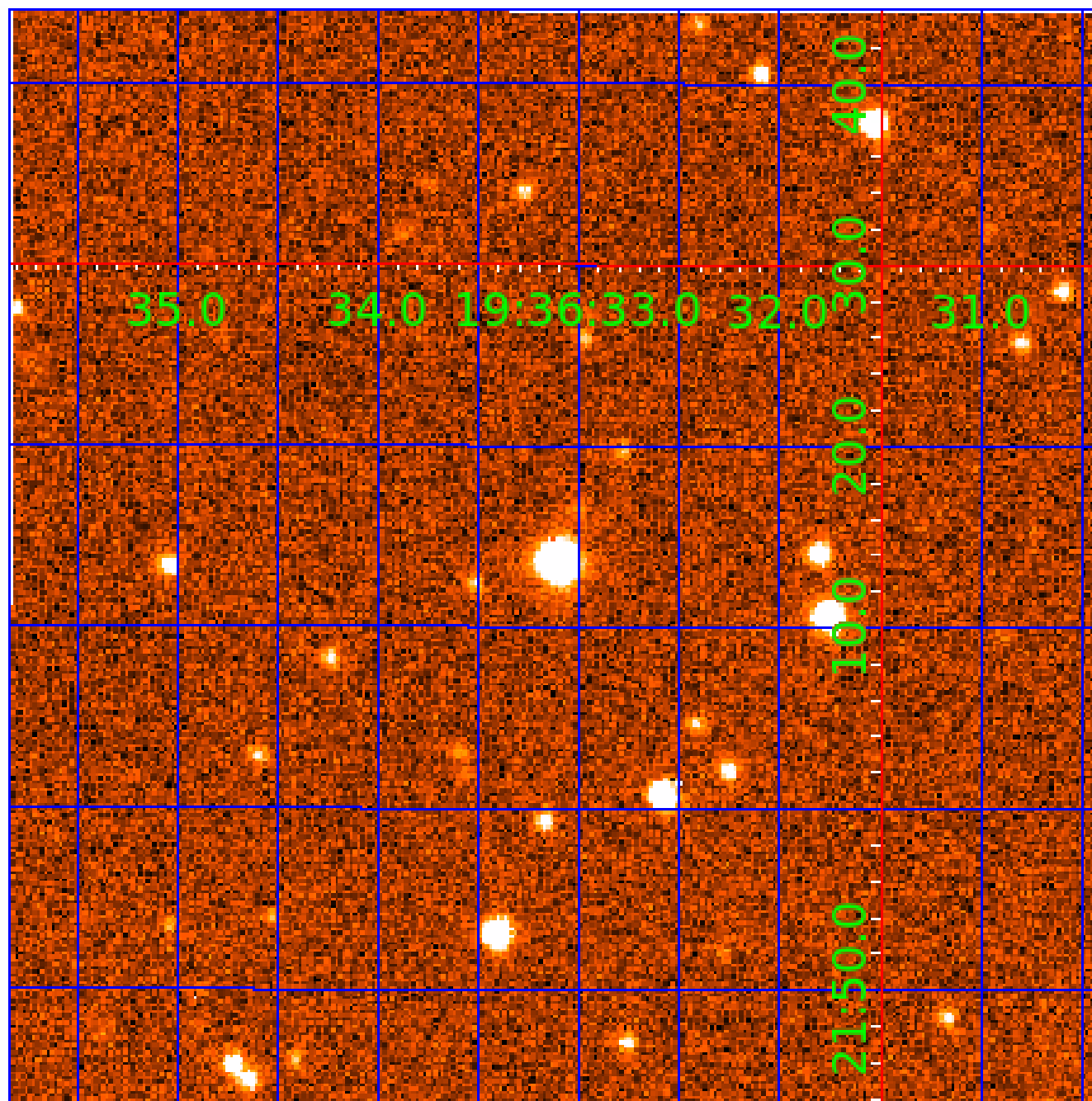


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 006871071

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})
006871071-01	OBS	2220.03	1.897799	132.687937	118.5	2.707	22.6	22.7	1.51	5640	1.97	2276.59
006871071-02	OBS	2220.02	5.028181	134.110669	168.1	3.603	20.1	21.0	1.51	5640	2.30	620.97
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006871071-04	OBS	2220.04	7.664825	137.361068	103.9	3.808	9.8	10.0	1.51	5640	1.83	353.96

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006871071-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006871071-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT
006871071-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006871071-04	OBS	PC	0.90	0	0	0	0	NO_COMMENT

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

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

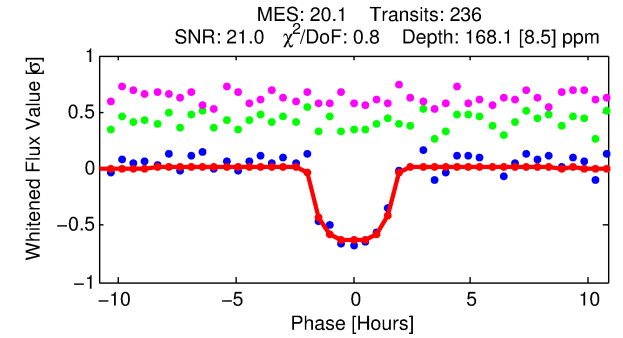
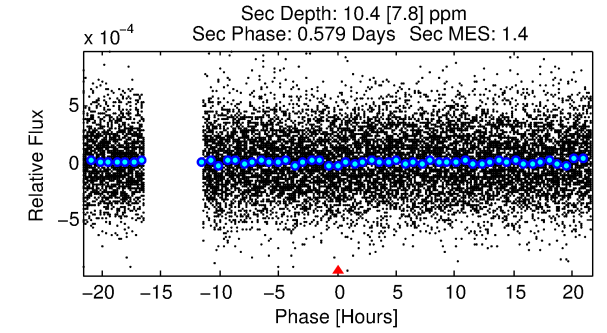
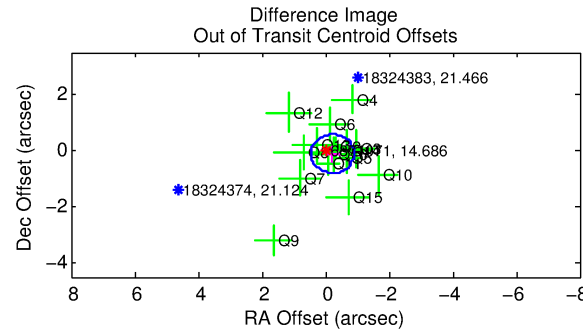
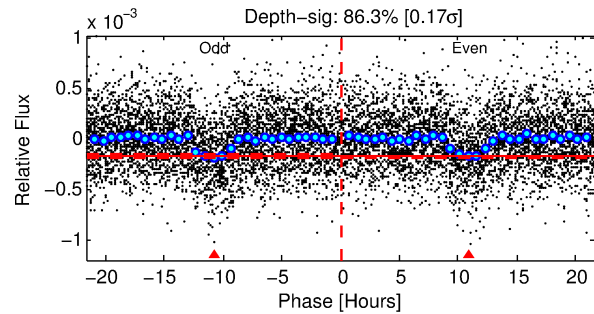
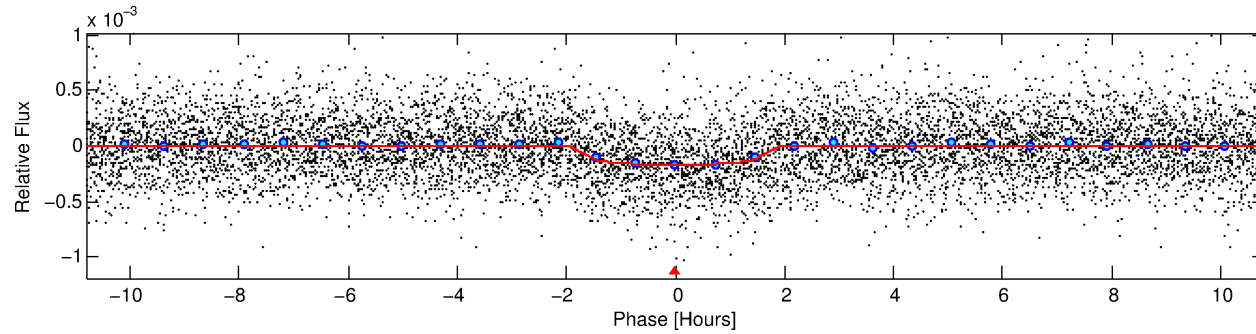
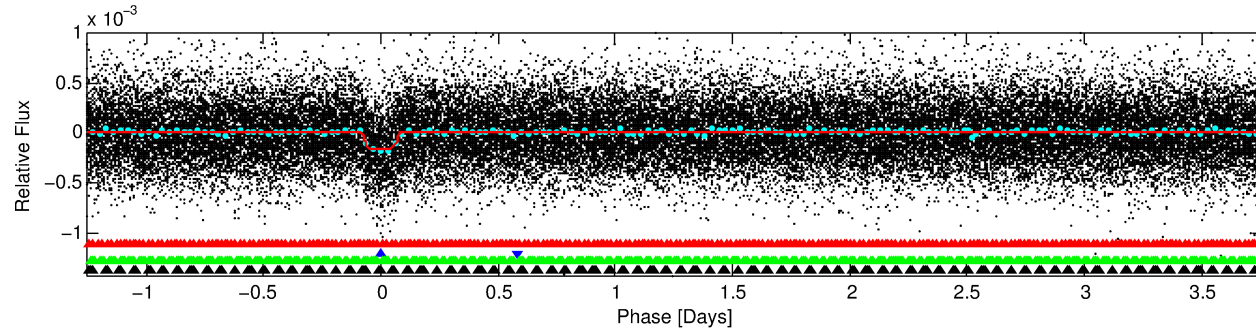
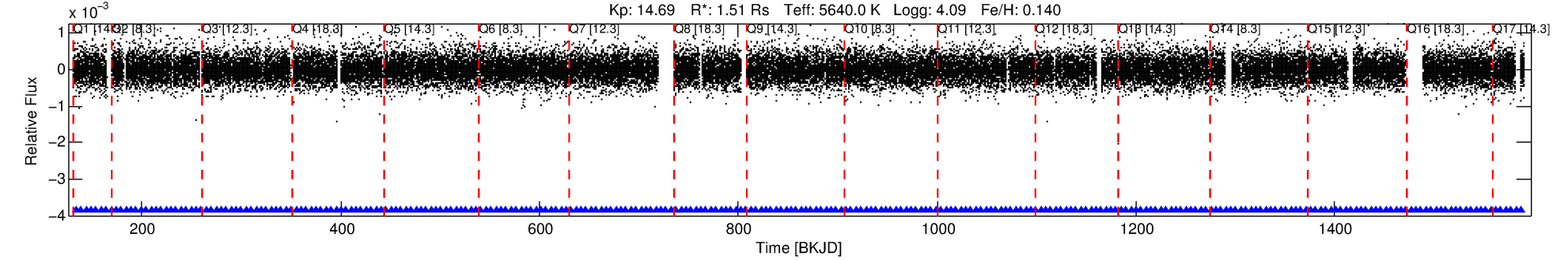
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006871071-02

No Significant Match Found

DV One-Page Summary

KIC: 6871071 Candidate: 2 of 4 Period: 5.028 d
KOI: K02220.02 Name: Kepler-374d Corr: 0.994



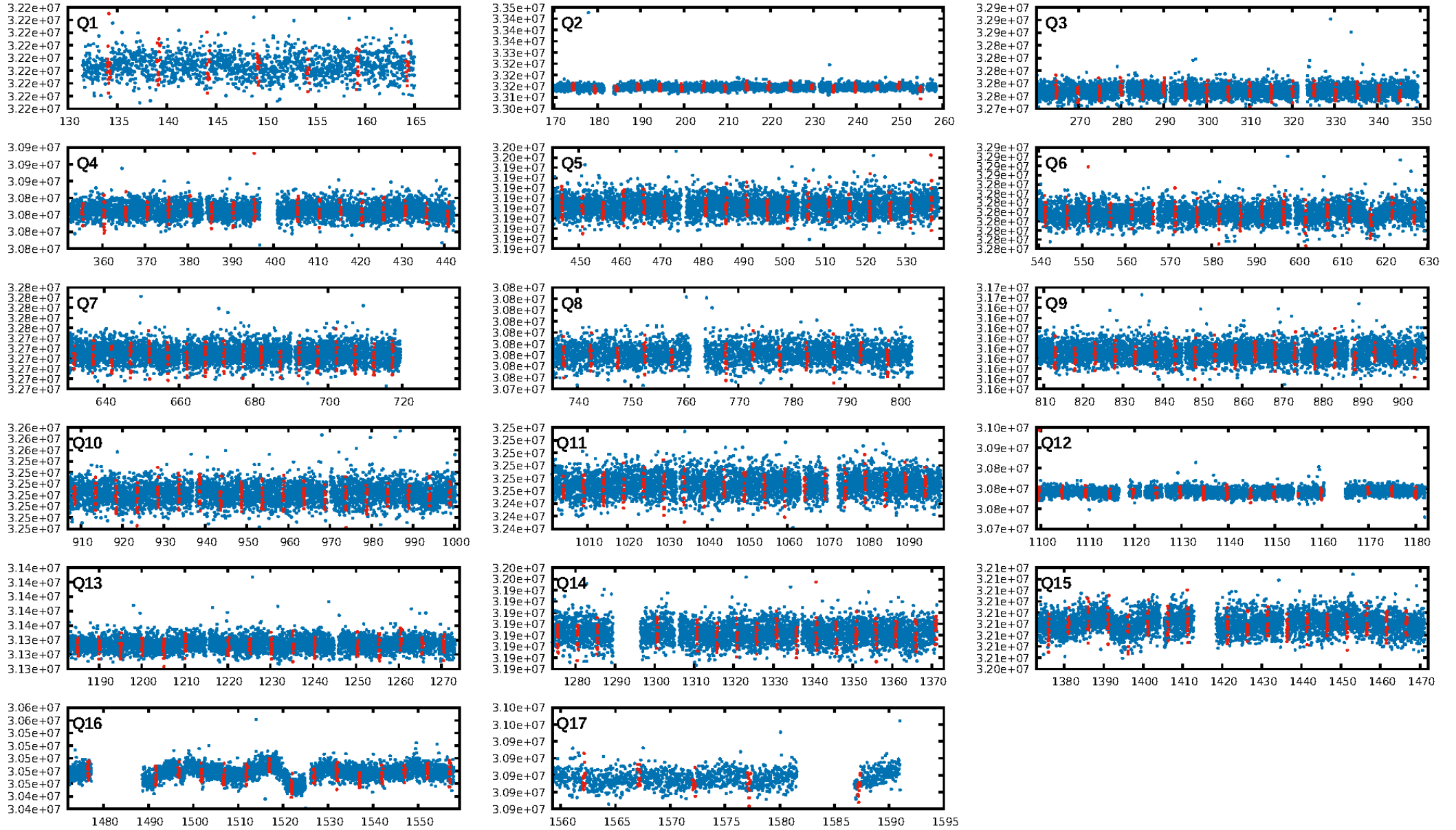
DV Fit Results:

Period = 5.02818 [0.00002] d
Epoch = 134.1107 [0.0030] BKJD
Rp/R* = 0.0139 [0.0050]
a/R* = 5.51 [8.60]
b = 0.88 [0.43]
Seff = 620.97 [219.43]
Teff = 1273 [112] K
Rp = 2.30 [0.98] Re
a = 0.0579 [0.0127] AU
Ag = 3.65 [3.99] [0.66 σ]
Teffp = 2720 [706] K [2.02 σ]

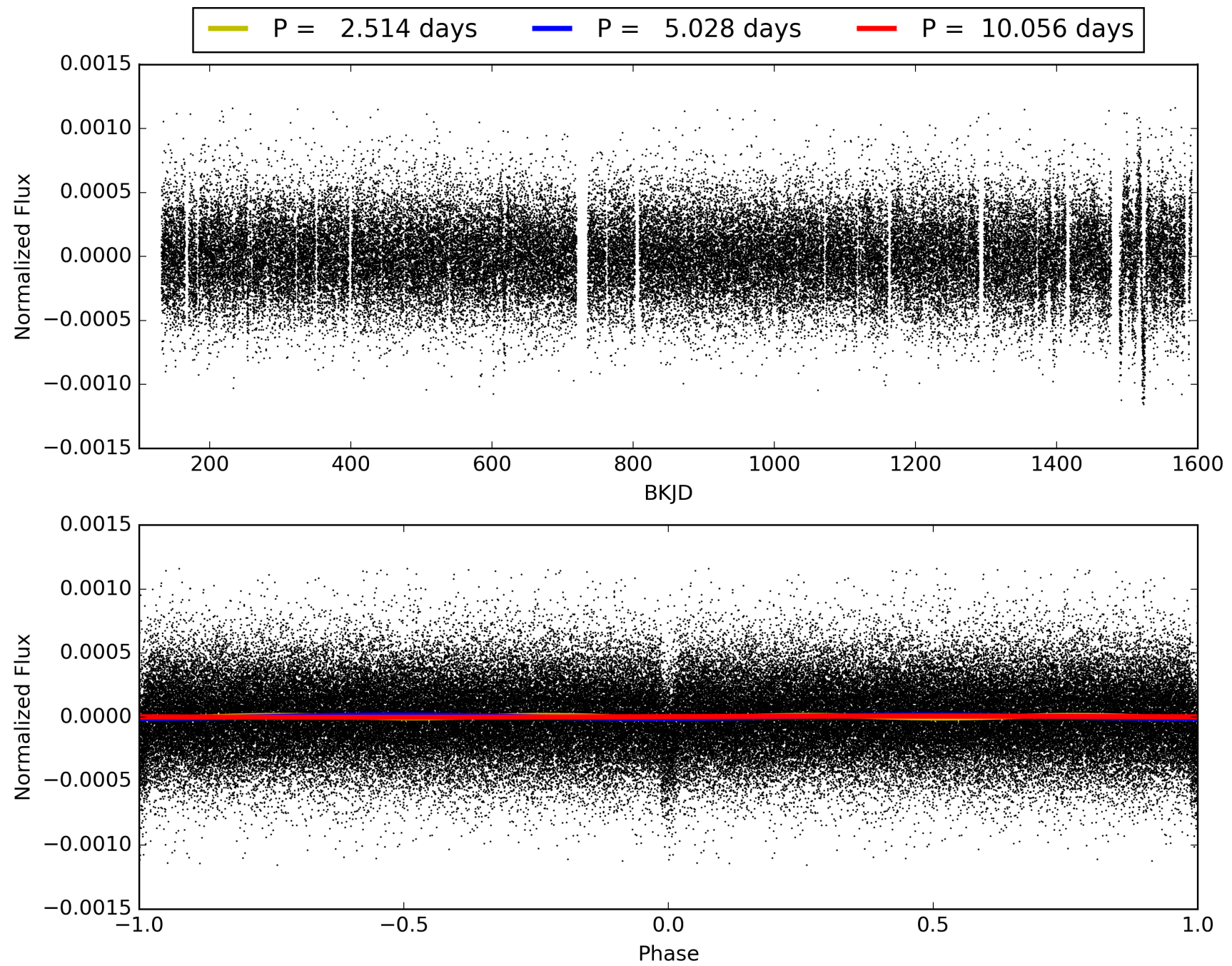
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.31 σ]
LongPeriod-sig: 100.0% [12.07 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.43e-90
RollingBand-fgt: 1.00 [226/226]
GhostDiagnostic-chr: 4.563
Centroid-sig: 6.7%
Centroid-so: 0.685 arcsec [1.19 σ]
OotOffset-rm: 0.243 arcsec [1.07 σ]
KicOffset-rm: 0.417 arcsec [1.73 σ]
OotOffset-st: 4/4/4/3 [15]
KicOffset-st: 4/4/4/3 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 006871071-02, PDC Light Curves

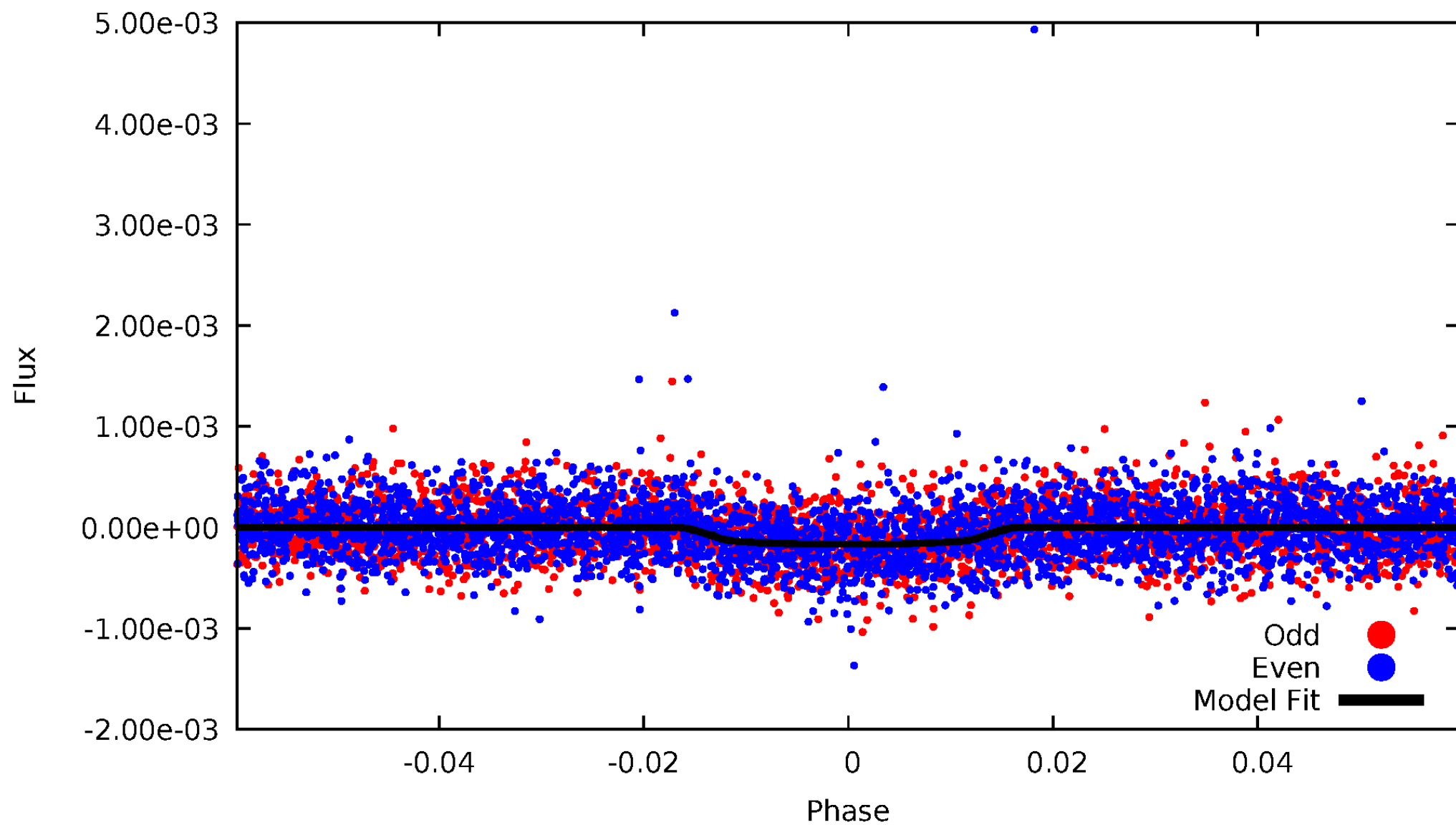


TCE 006871071-02



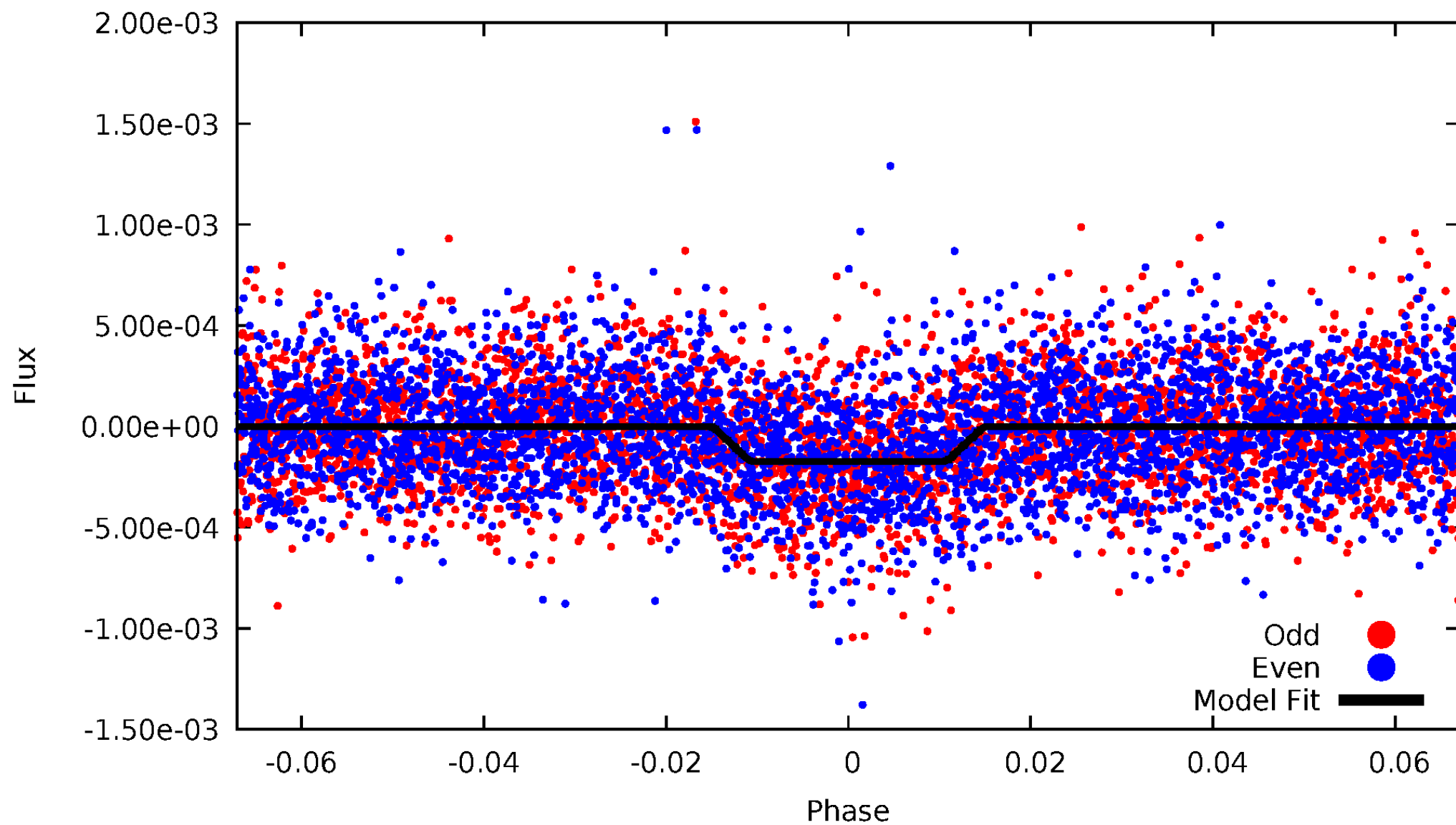
DV Odd/Even

TCE 006871071-02



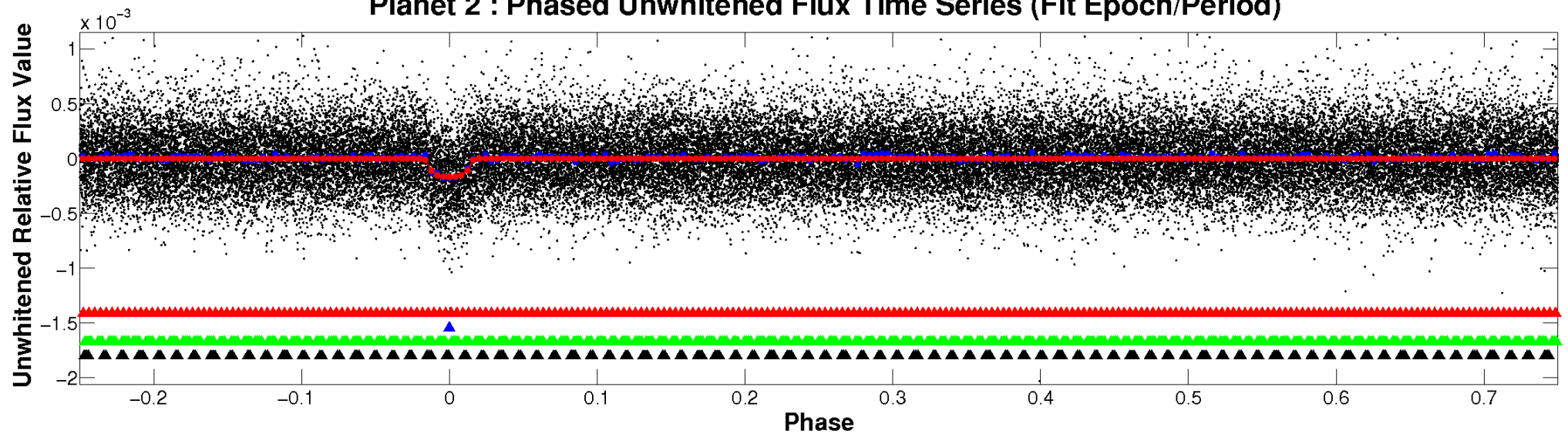
ALT Odd/Even

TCE 006871071-02

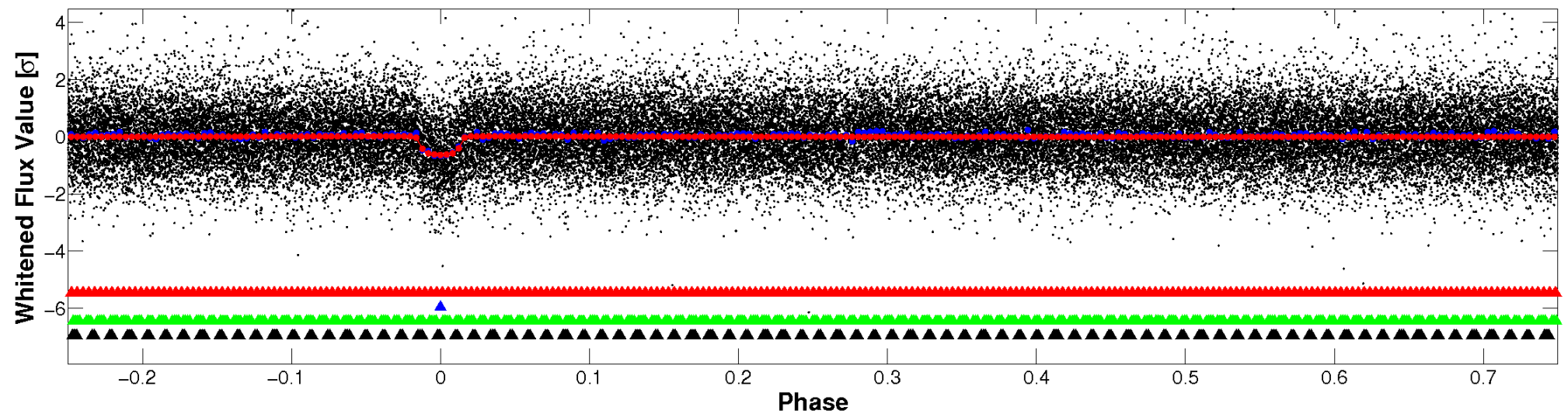


Non-Whitened Vs. Whitened Light Curve

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

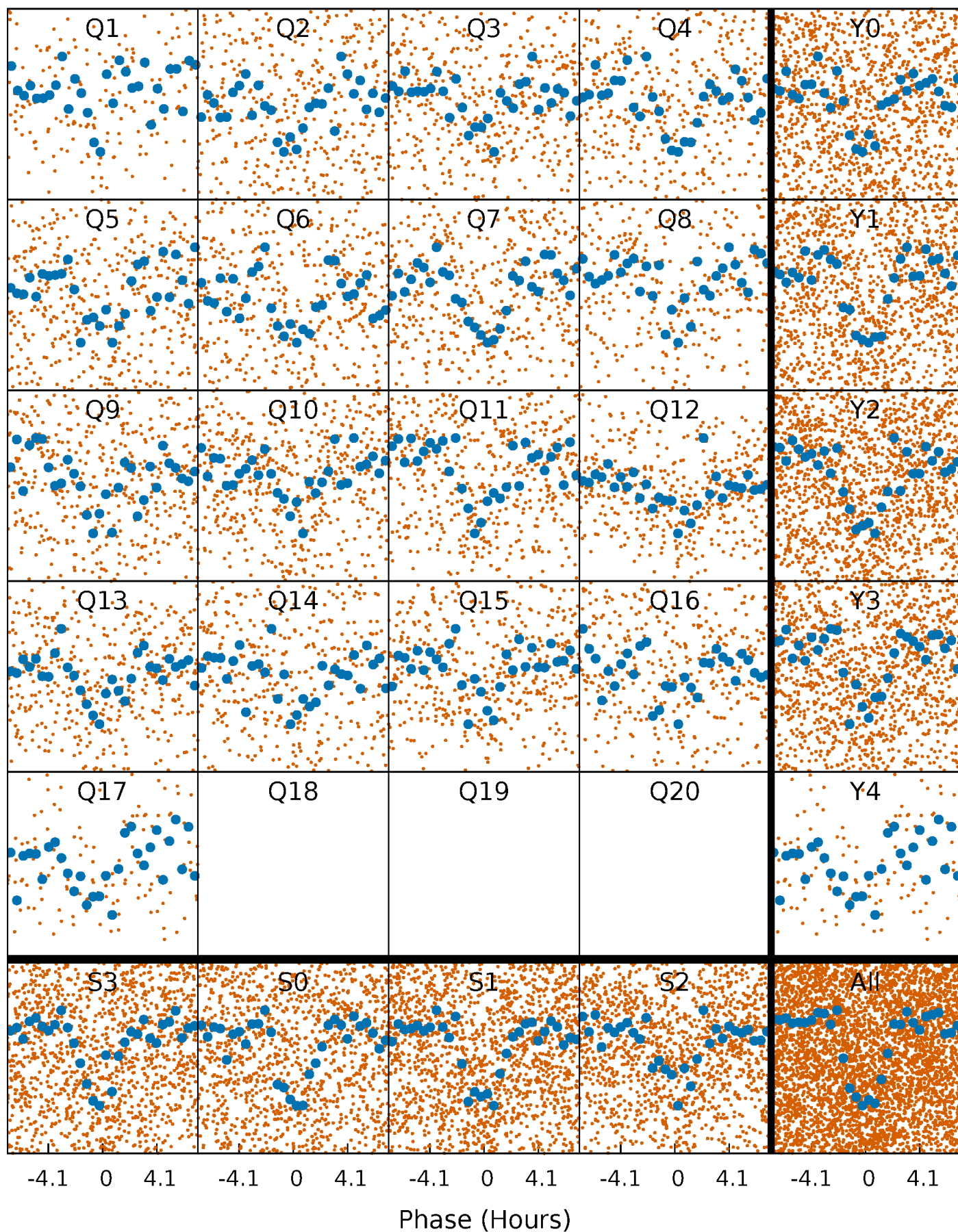


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



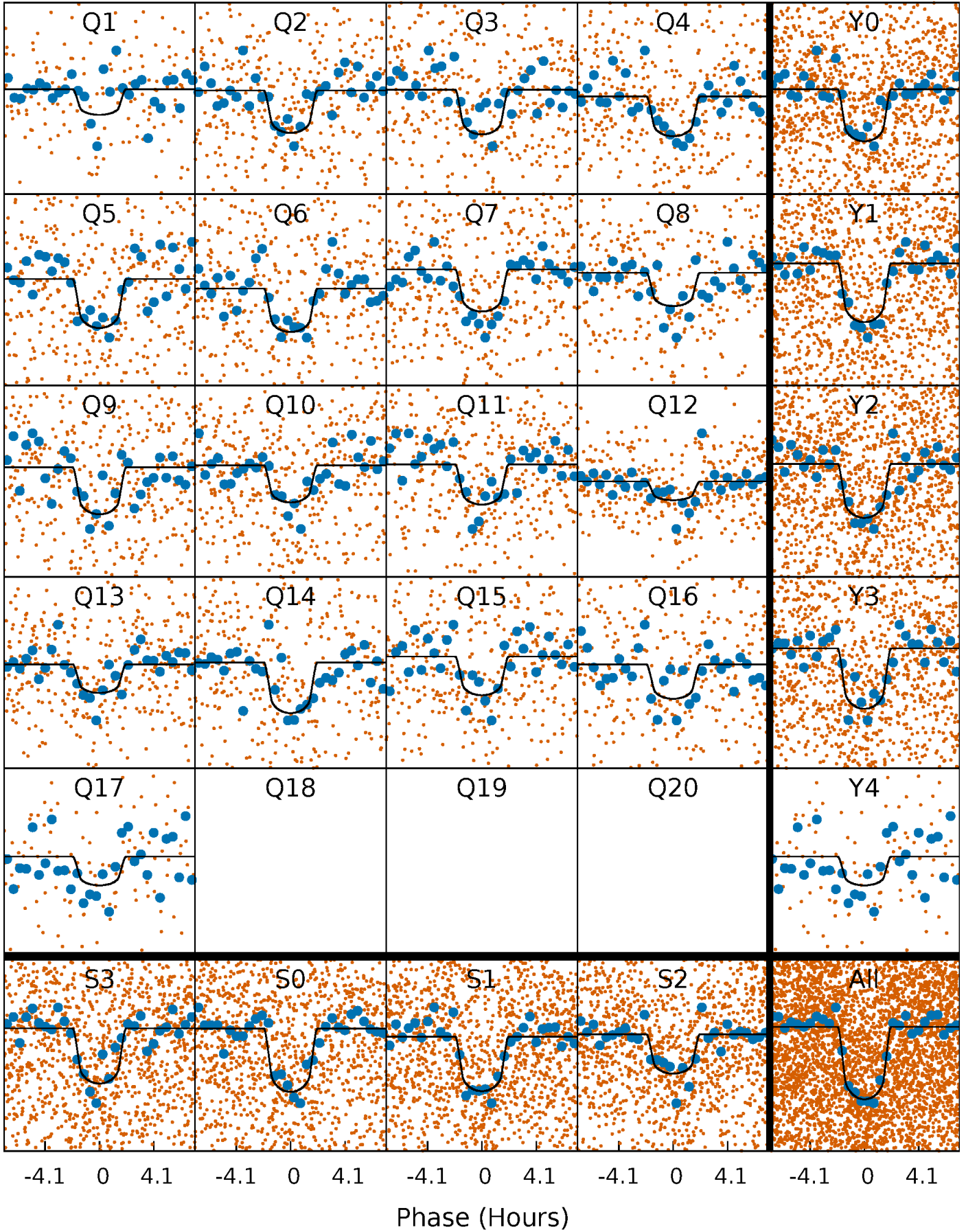
PDC Quarter-Phased Transit Curves

TCE 006871071-02 P= 5.028181 Days $T_0=134.110669$ (BKJD)



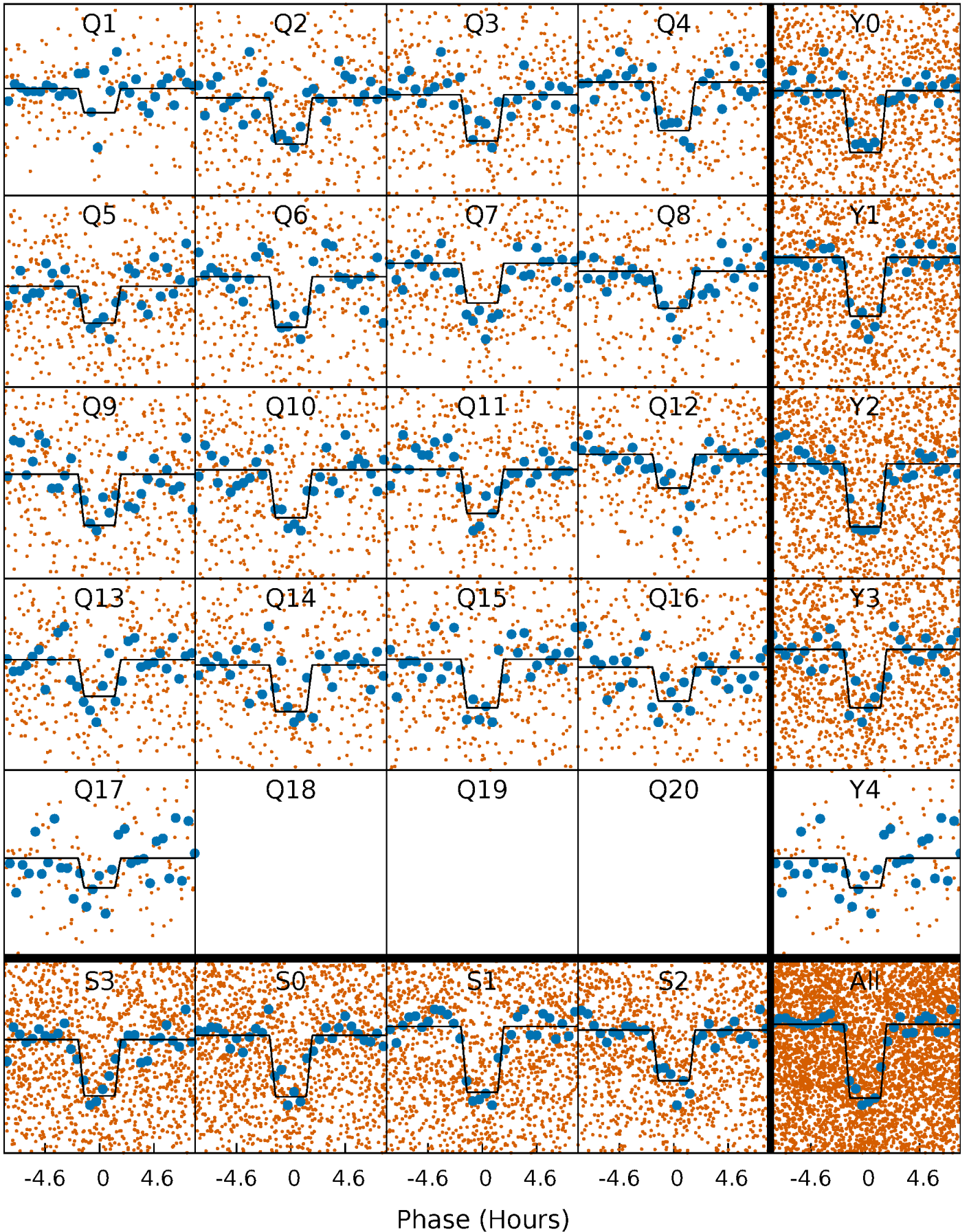
DV Quarter-Phased Transit Curves

TCE 006871071-02 P= 5.028181 Days $T_0=134.110669$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

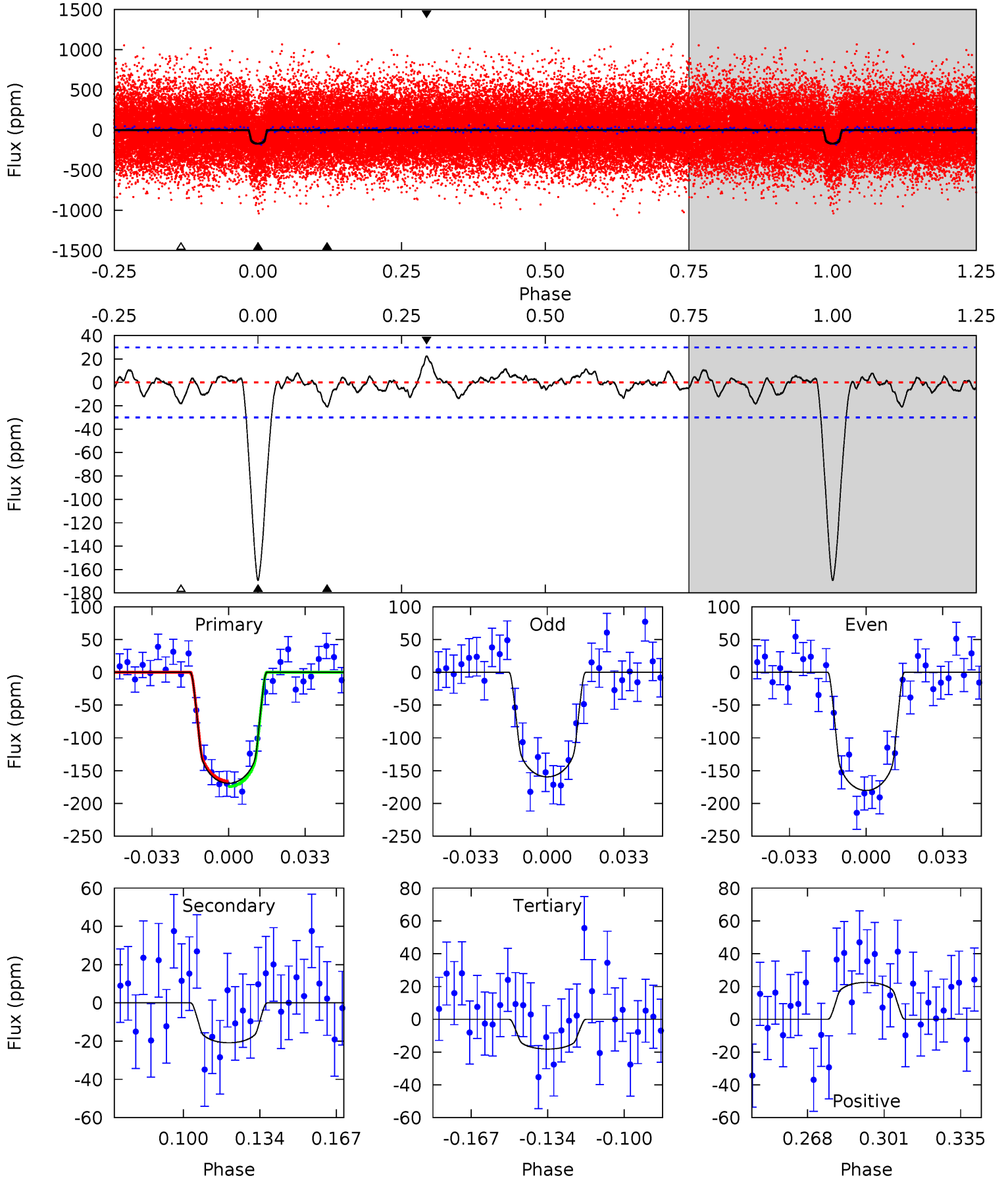
TCE 006871071-02 P= 5.028226 Days $T_0=134.104605$ (BKJD)



DV Model-Shift Uniqueness Test

006871071-02, P = 5.028181 Days, E = 129.082488 Days

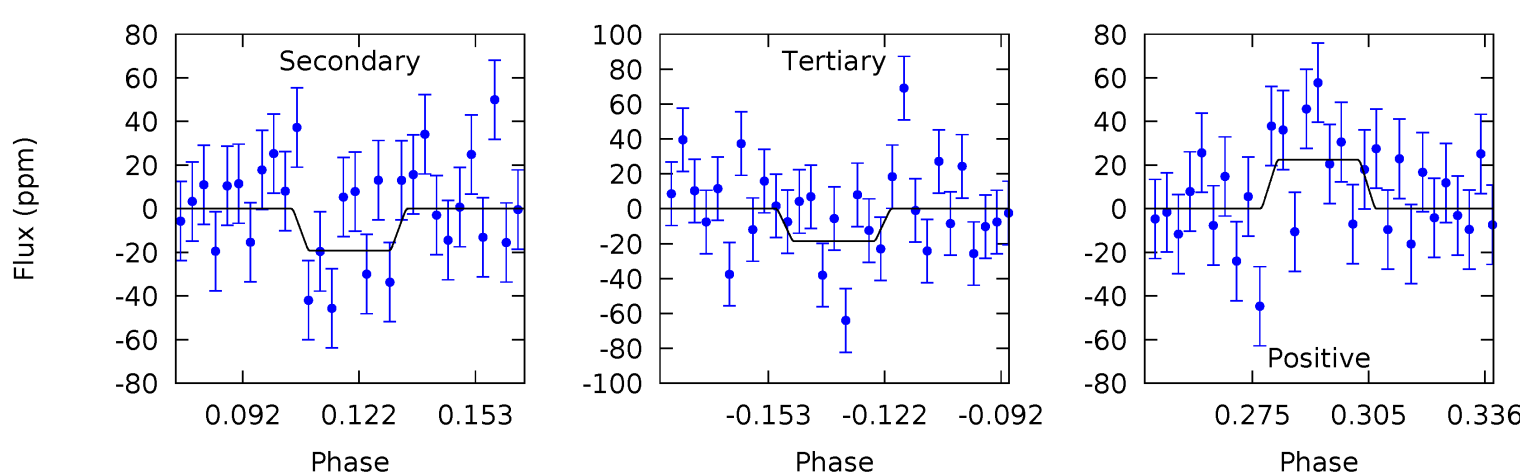
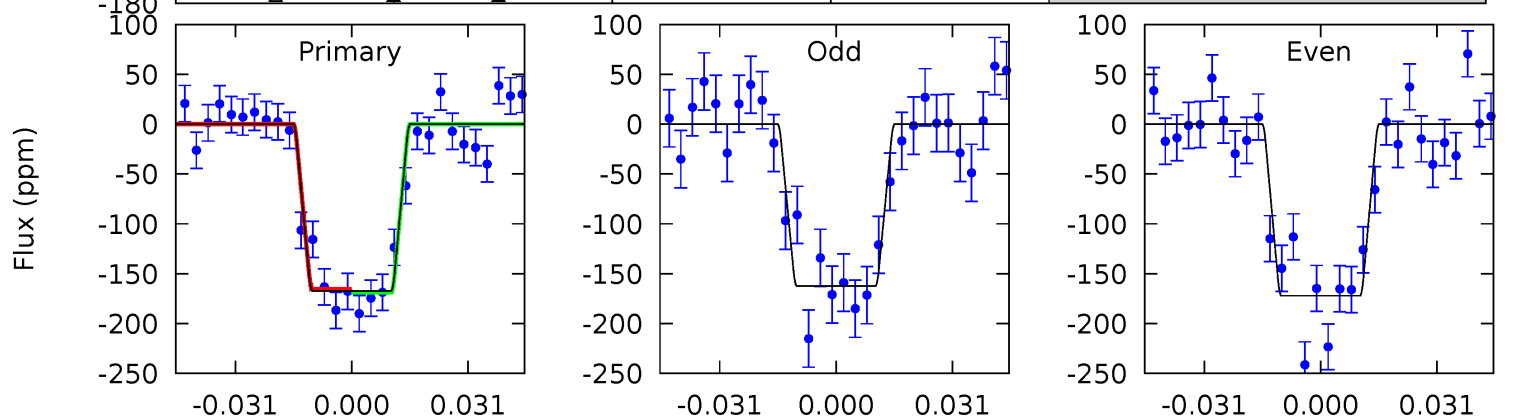
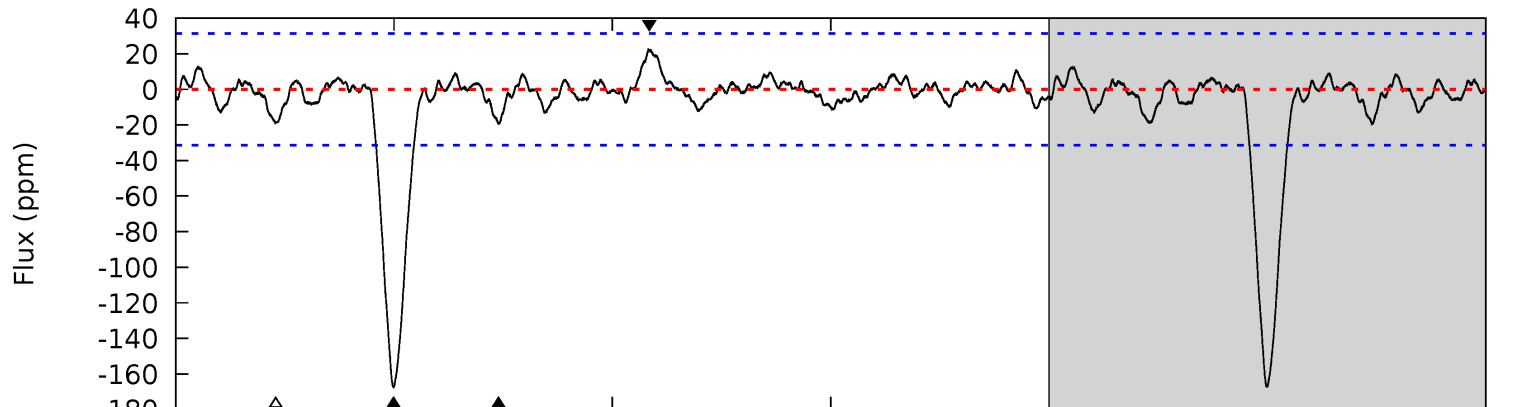
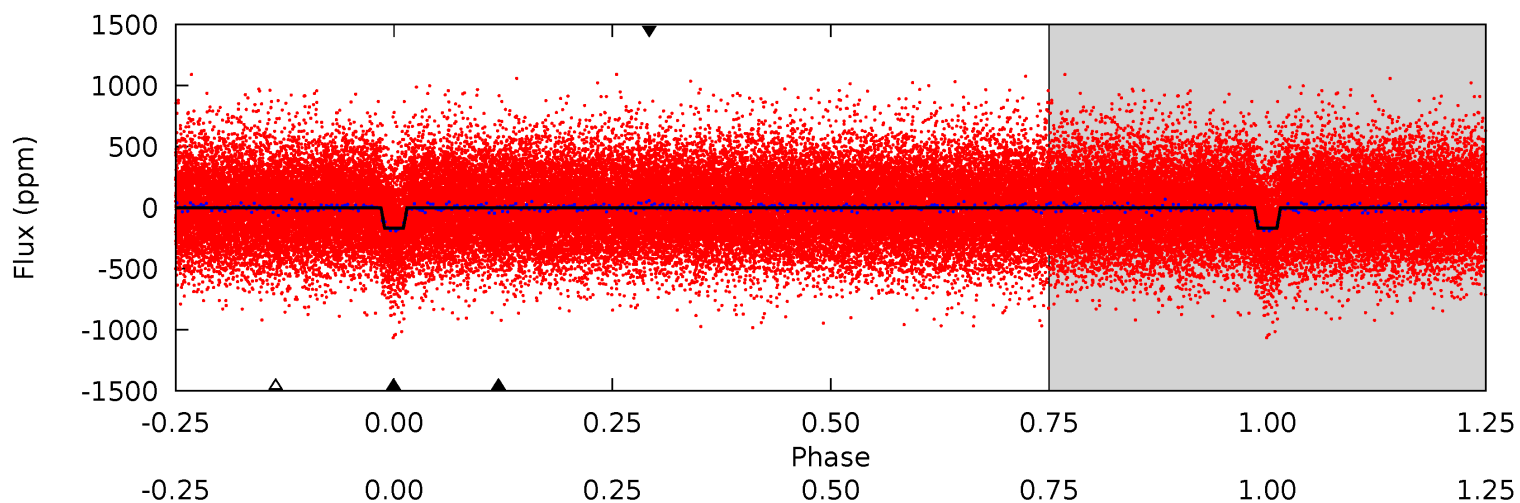
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.1	3.34	2.91	3.60	4.79	2.13	0.98	24.2	23.5	0.44	-0.26	1.66	1.00	0.12	0.66



Alt Model-Shift Uniqueness Test

006871071-02, P = 5.028226 Days, E = 129.076379 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.6	2.94	2.86	3.43	4.81	2.16	0.92	22.7	22.2	0.08	-0.49	0.76	1.02	0.12	0.27



Stellar Parameters For KIC 006871071

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5640^{+85}_{-77}	$4.087^{+0.203}_{-0.087}$	$0.140^{+0.150}_{-0.150}$	$1.515^{+0.236}_{-0.353}$	$1.024^{+0.093}_{-0.084}$	$0.415^{+0.420}_{-0.131}$
	+2%/-1%	+5%/-2%	+107%/-107%	+16%/-23%	+9%/-8%	+101%/-32%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 006871071-02 / KOI 2220.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-21 ± 6	$2.16^{+0.84}_{-0.85}$	1759^{+75}_{-109}	3661^{+679}_{-422}	$8.198^{+13.828}_{-4.374}$
Alt.	-19 ± 7	$2.08^{+0.81}_{-0.77}$	1762^{+74}_{-105}	3644^{+710}_{-432}	$8.102^{+13.838}_{-4.445}$

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

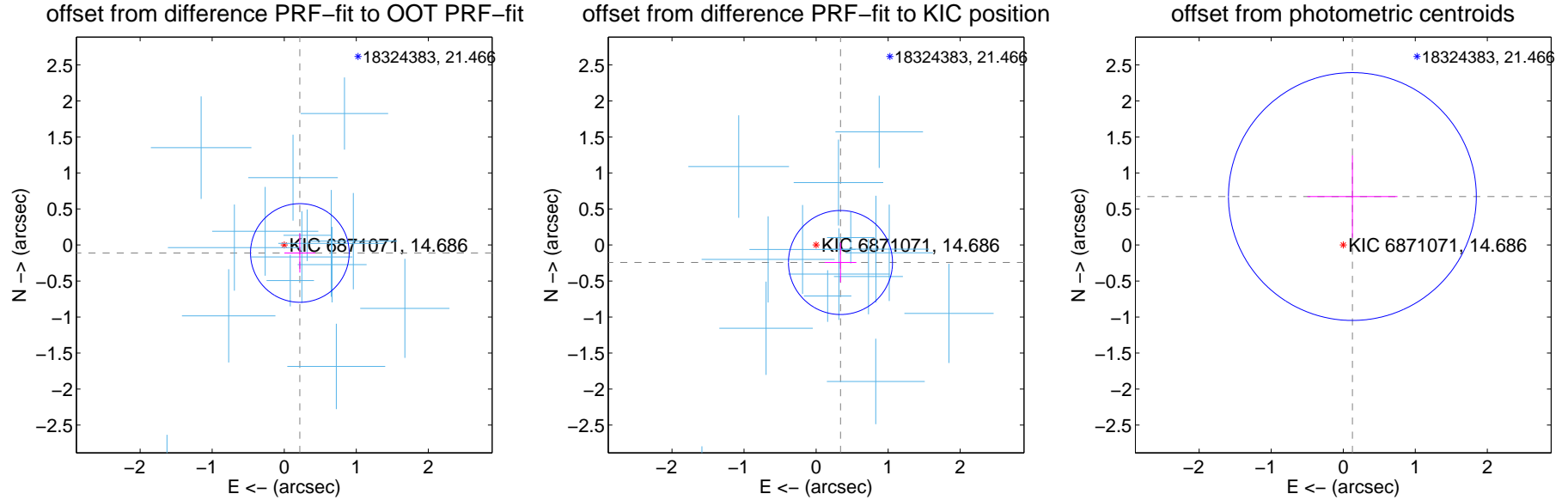
DV Centroid Data

Supplemental centroid analysis for 006871071-02. Kepler magnitude: 14.69. Transit SNR 20.99

There are 15 quarters with good PRF difference image offsets

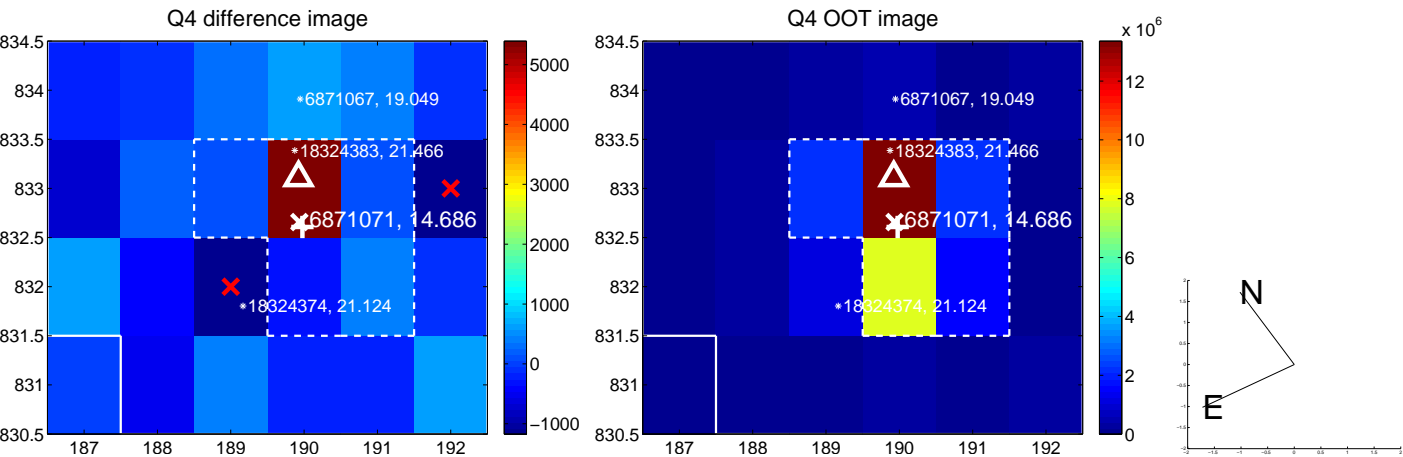
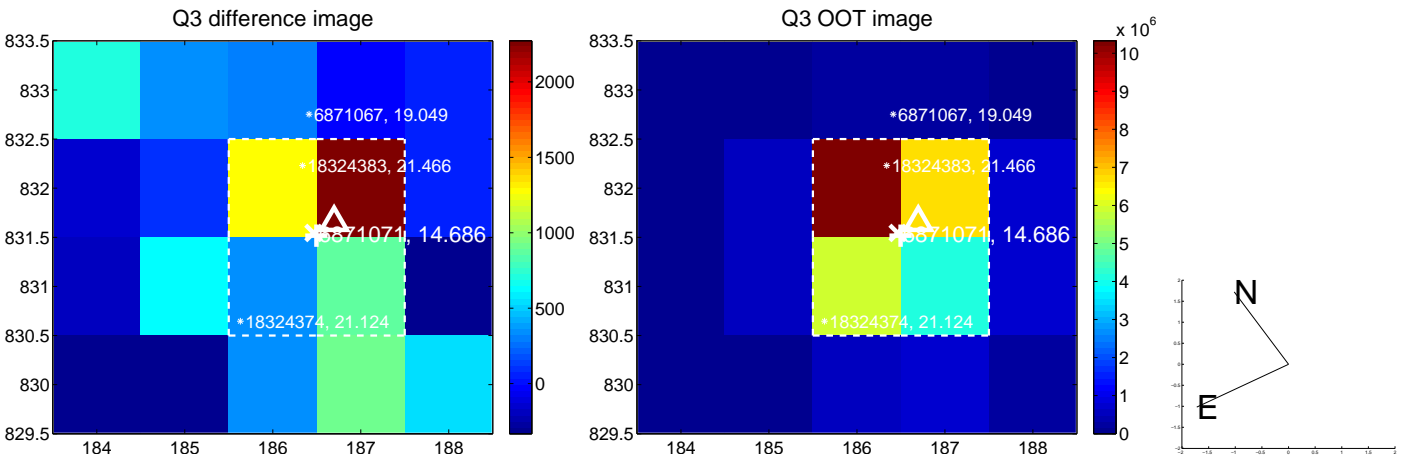
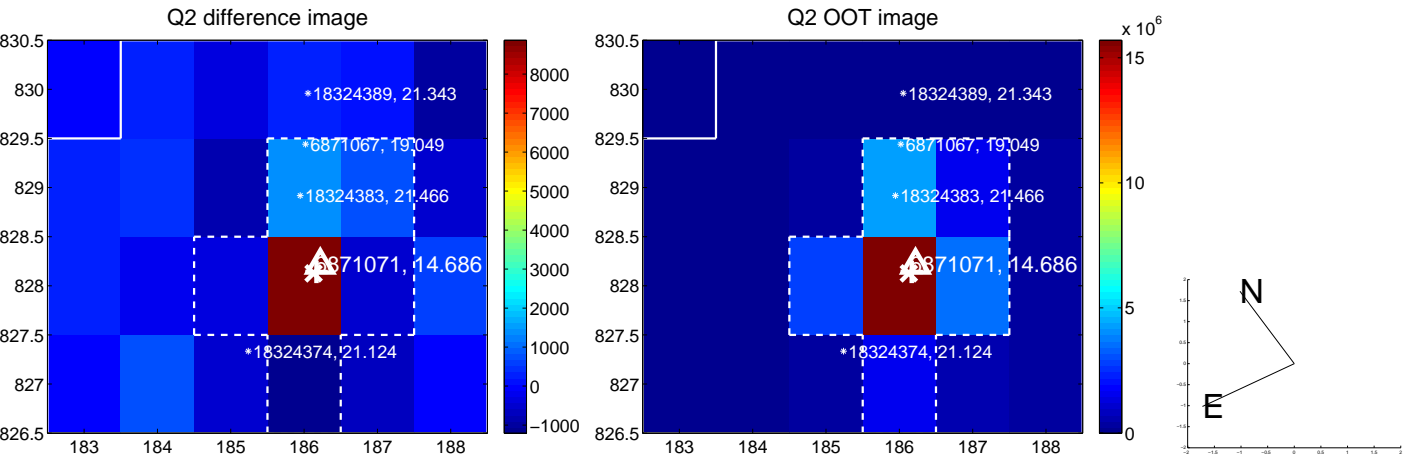
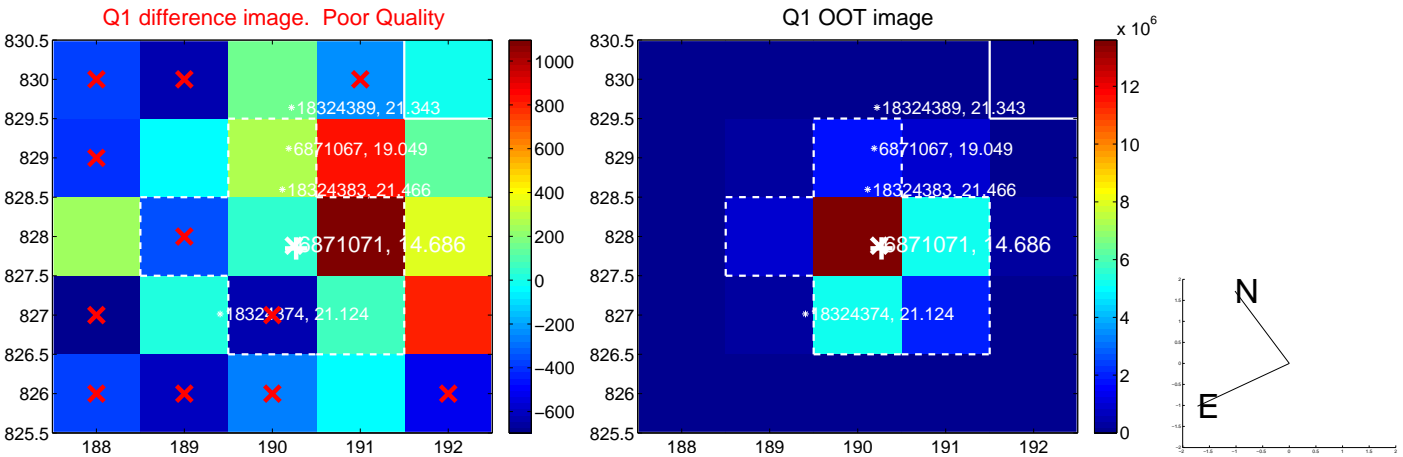
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.243 ± 0.228	1.07	-0.217 ± 0.215	-0.111 ± 0.272
PRF-fit source offset from KIC position	0.417 ± 0.241	1.73	-0.339 ± 0.221	-0.243 ± 0.275
photometric centroid source offset	0.68 ± 0.57	1.19	-0.13 ± 0.63	0.67 ± 0.57

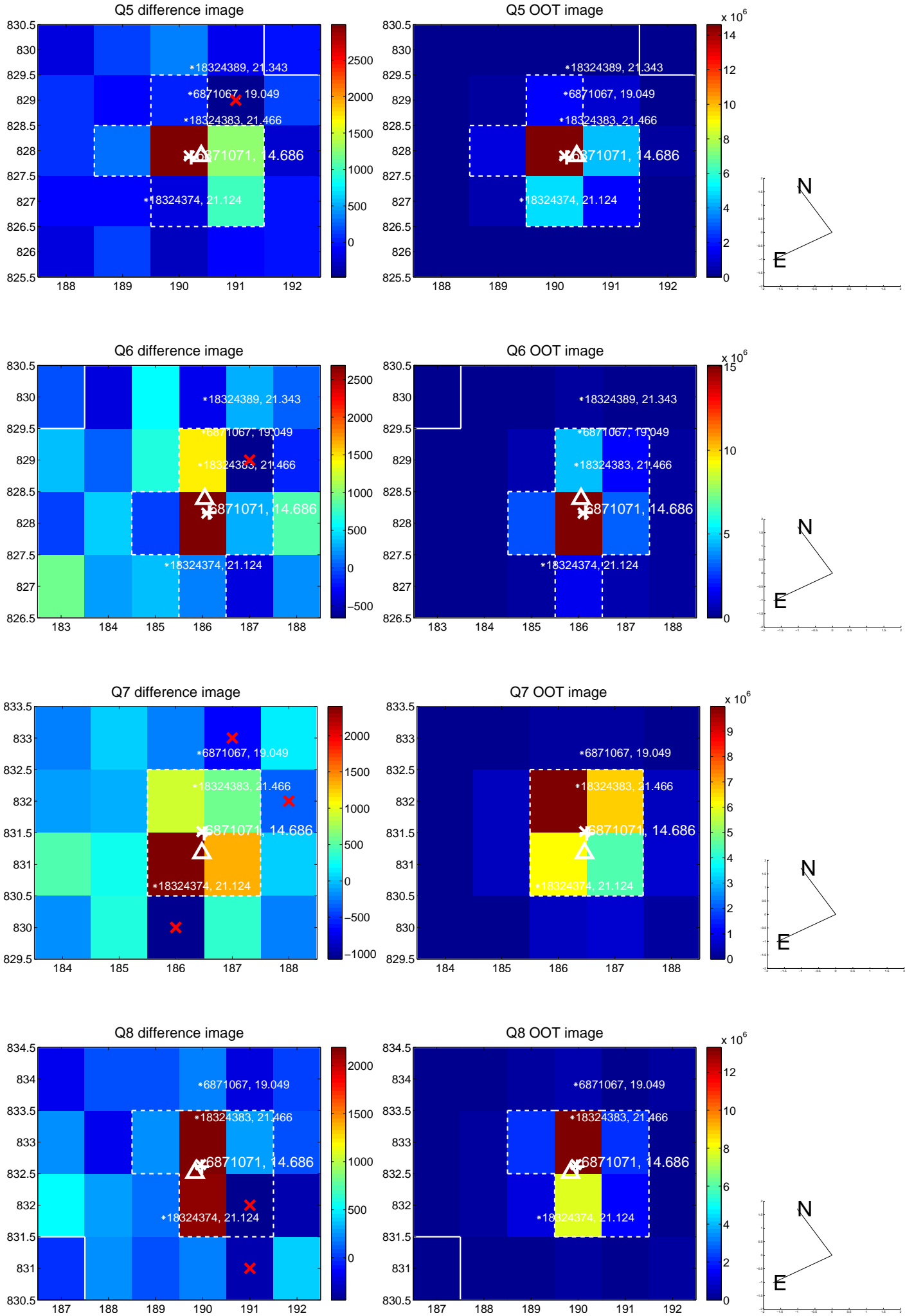


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

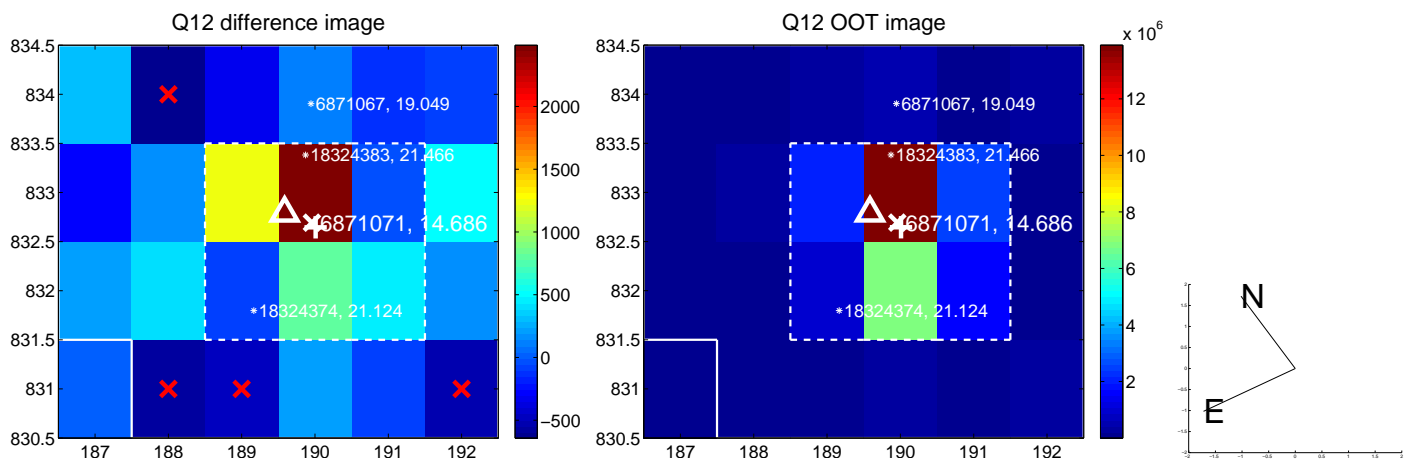
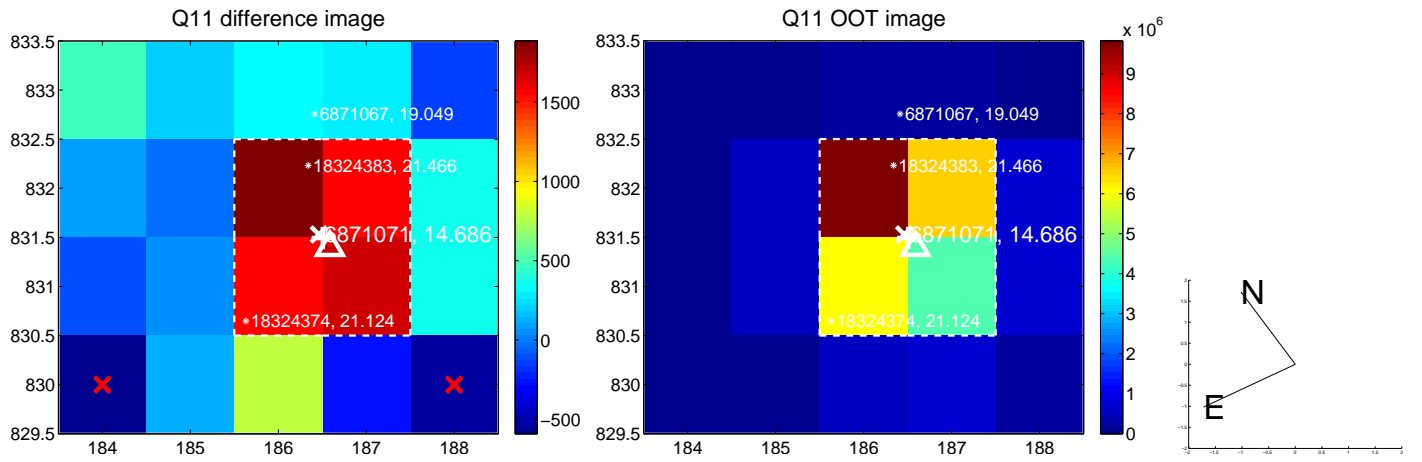
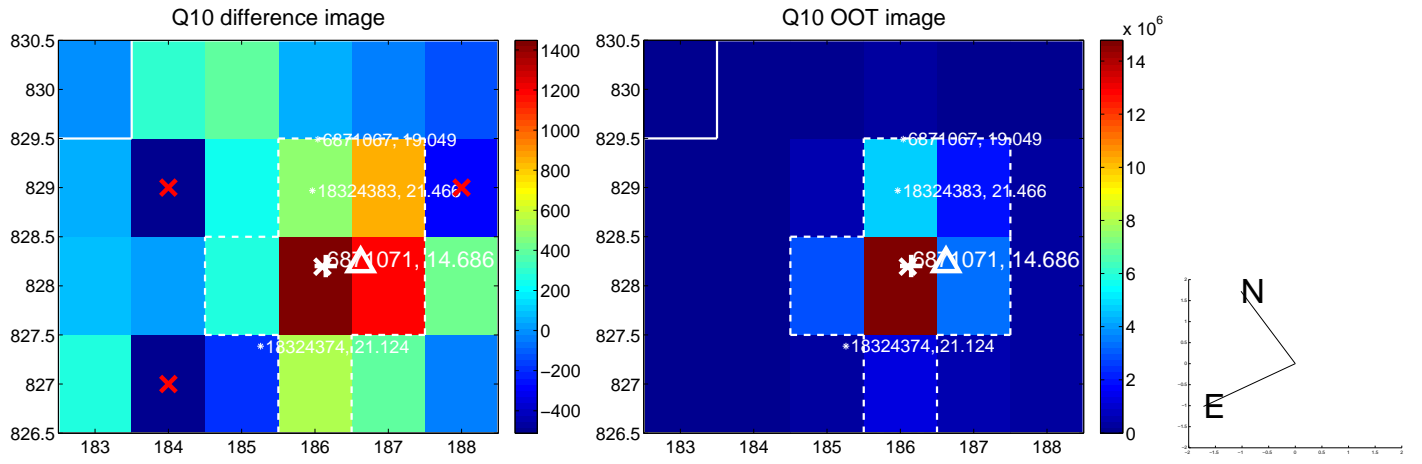
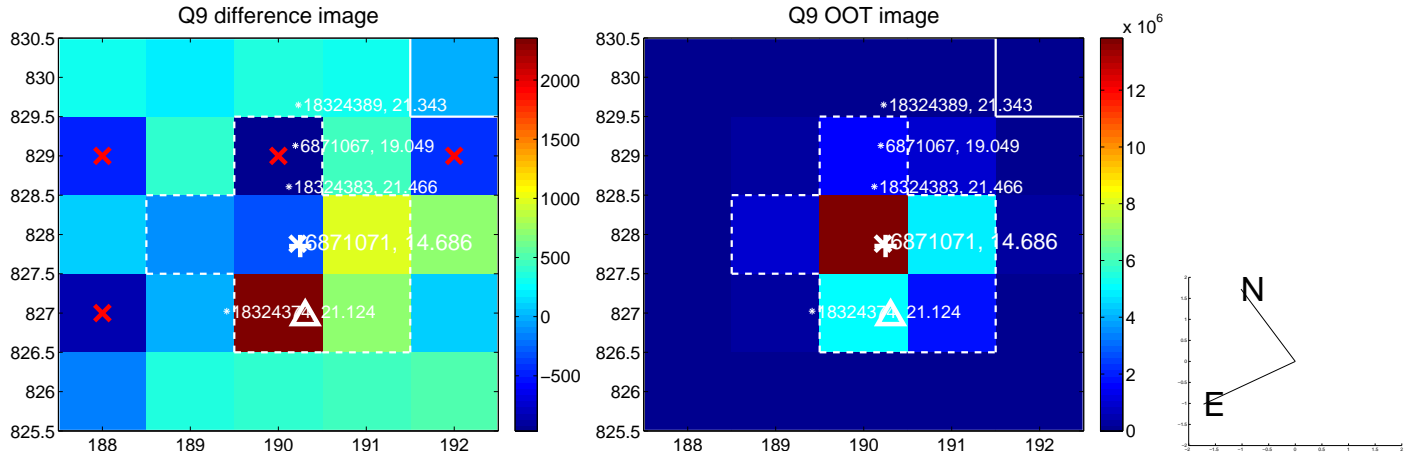
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



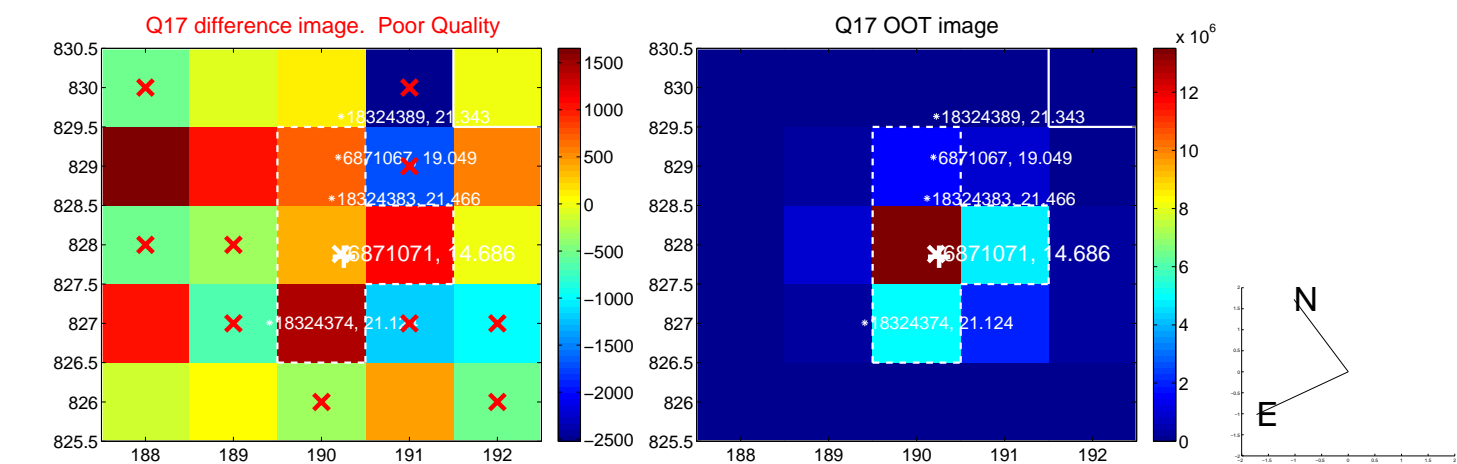
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



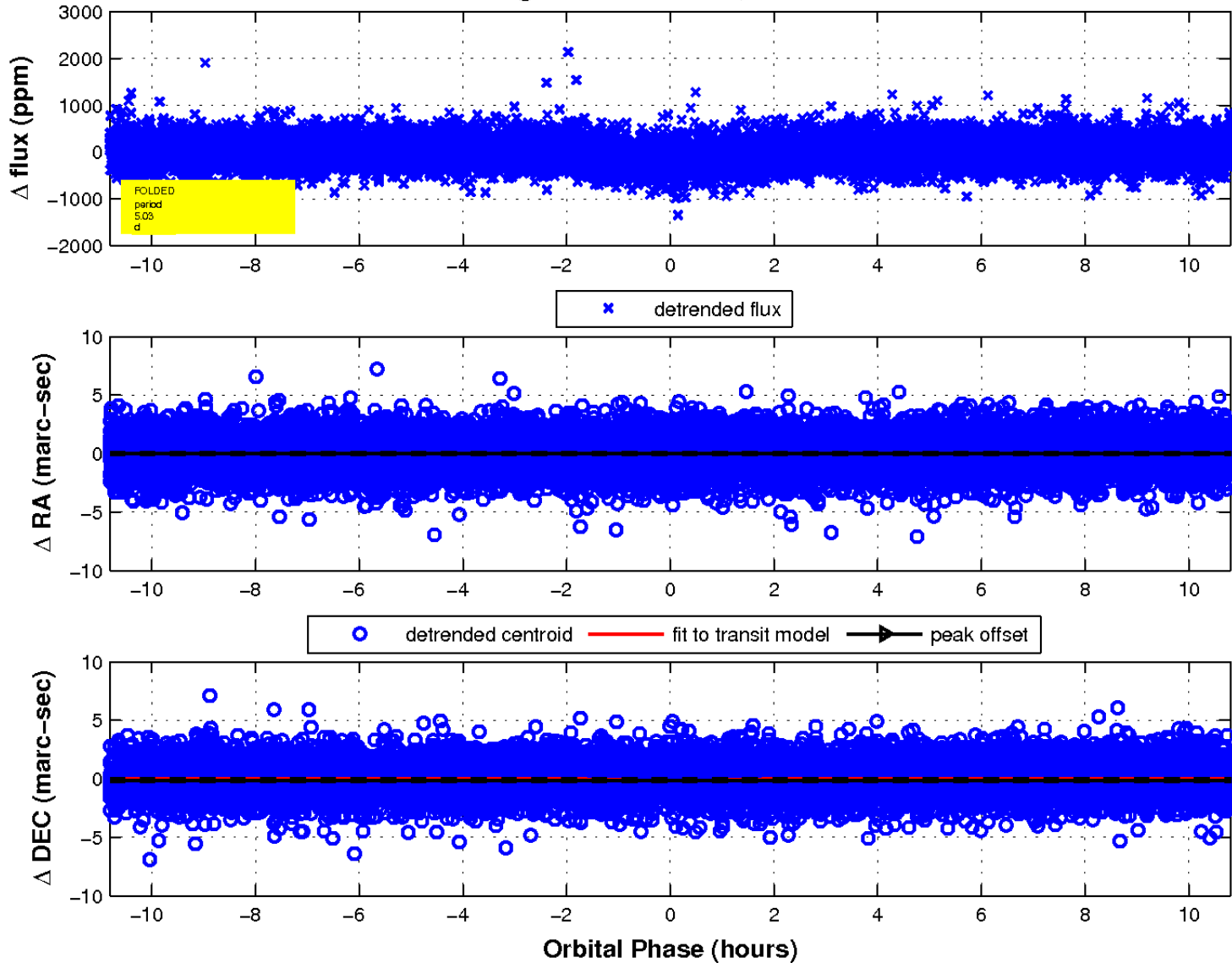
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

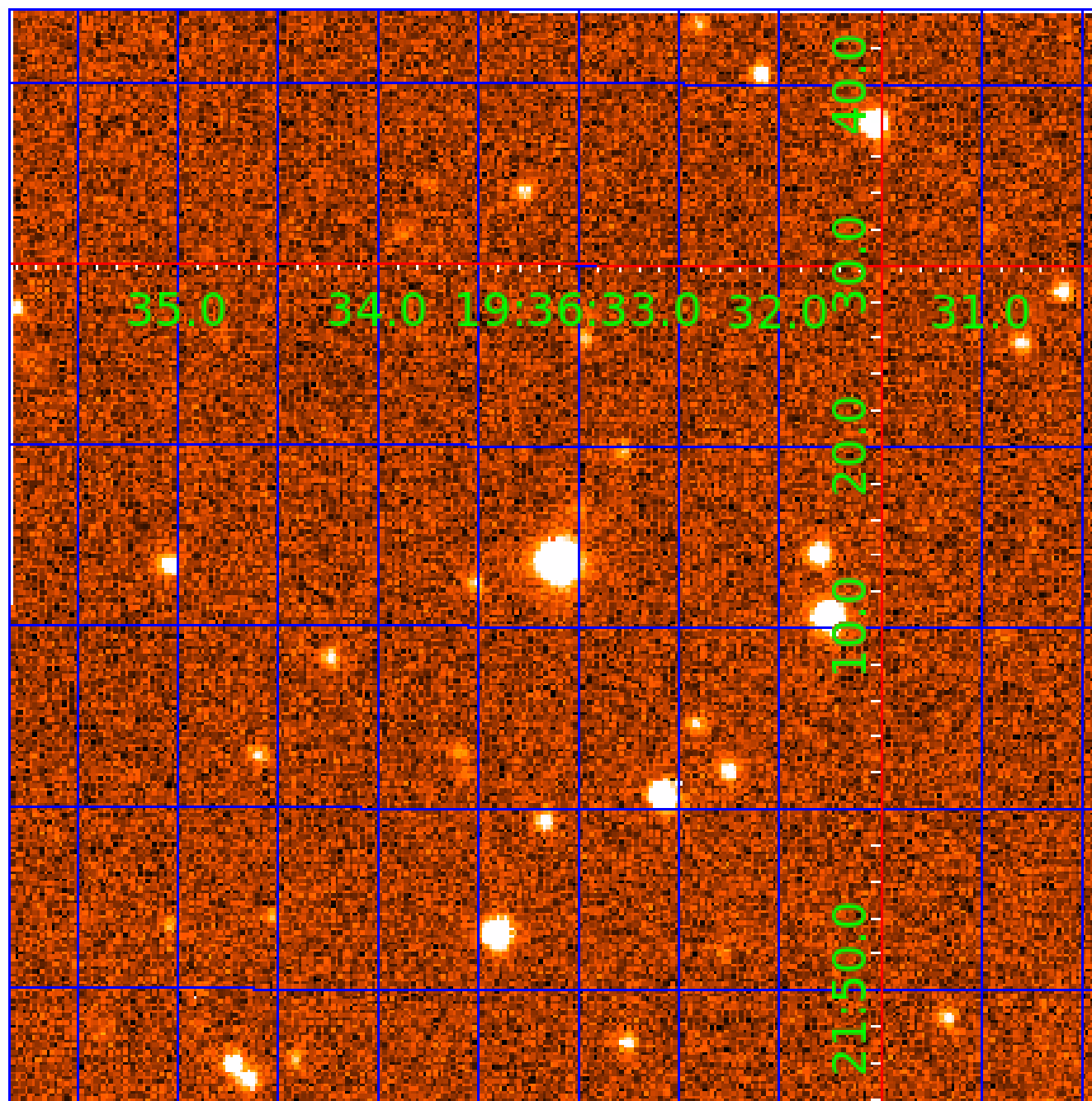


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



KIC 006871071

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})
006871071-01	OBS	2220.03	1.897799	132.687937	118.5	2.707	22.6	22.7	1.51	5640	1.97	2276.59
006871071-02	OBS	2220.02	5.028181	134.110669	168.1	3.603	20.1	21.0	1.51	5640	2.30	620.97
006871071-03	OBS	2220.01	3.282801	131.897837	127.9	3.530	17.4	18.5	1.51	5640	2.21	1096.38
006871071-04	OBS	2220.04	7.664825	137.361068	103.9	3.808	9.8	10.0	1.51	5640	1.83	353.96

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006871071-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006871071-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT
006871071-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006871071-04	OBS	PC	0.90	0	0	0	0	NO_COMMENT

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

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

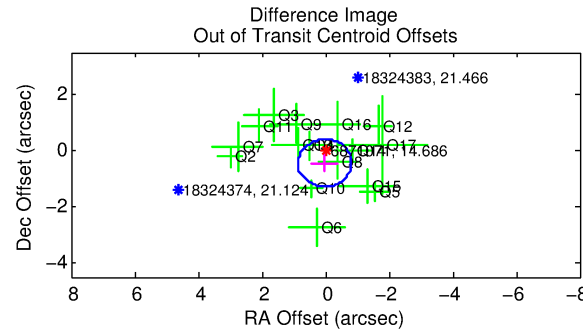
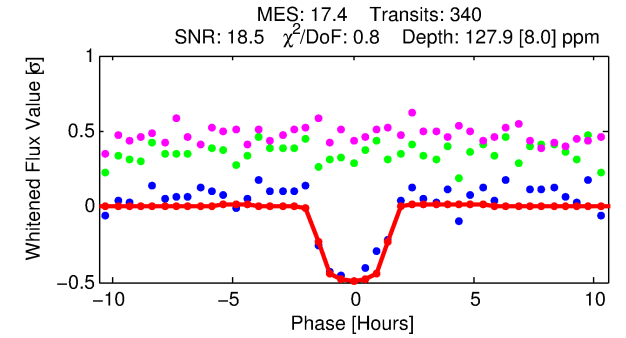
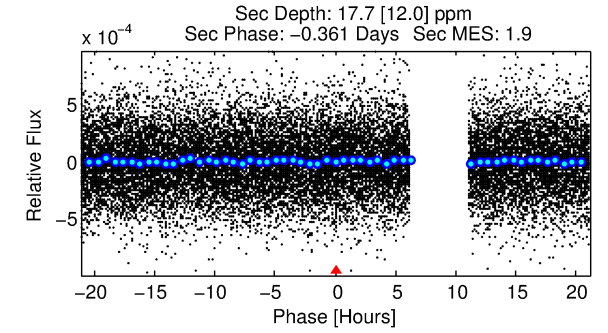
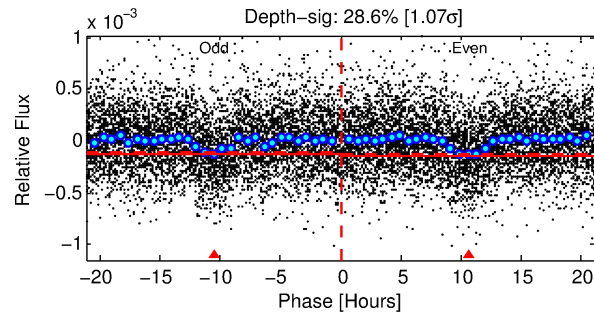
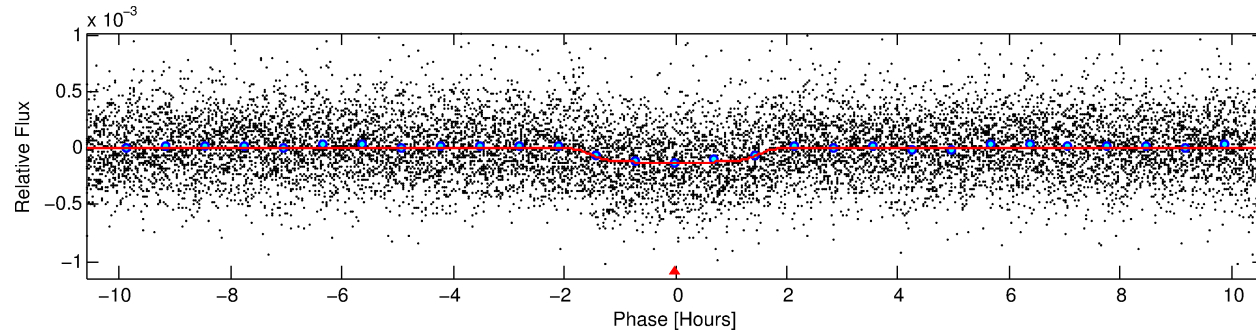
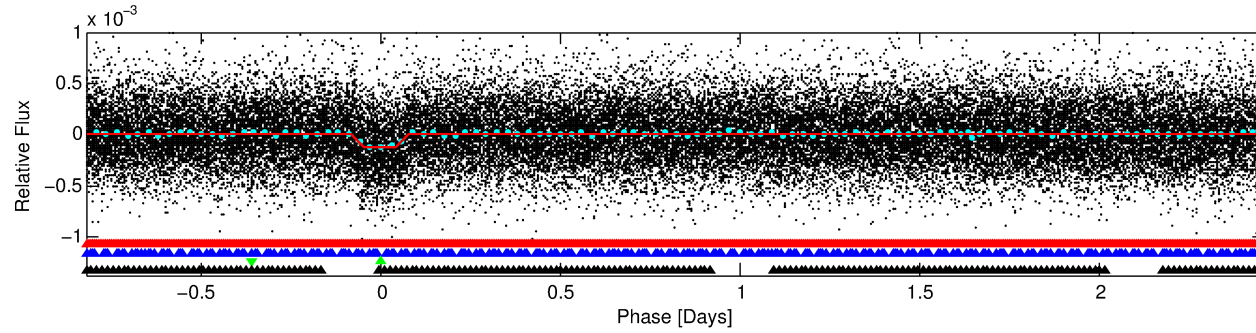
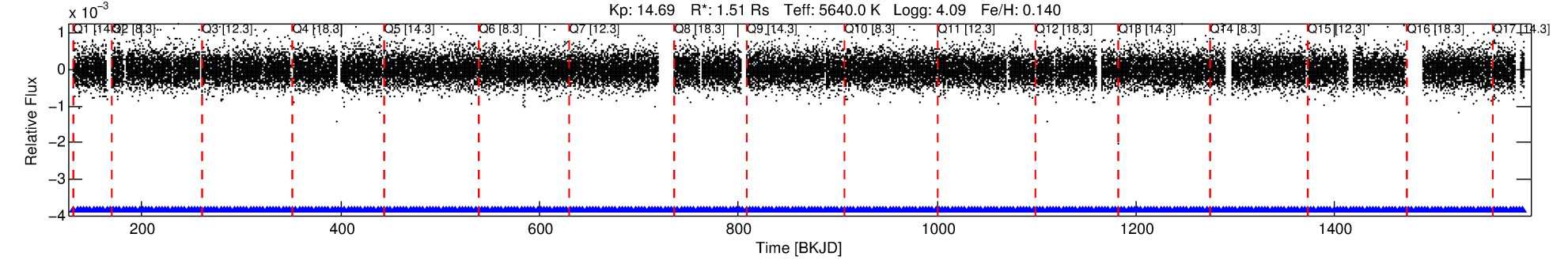
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006871071-03

No Significant Match Found

DV One-Page Summary

KIC: 6871071 Candidate: 3 of 4 Period: 3.283 d
KOI: K02220.01 Name: Kepler-374c Corr: 0.959



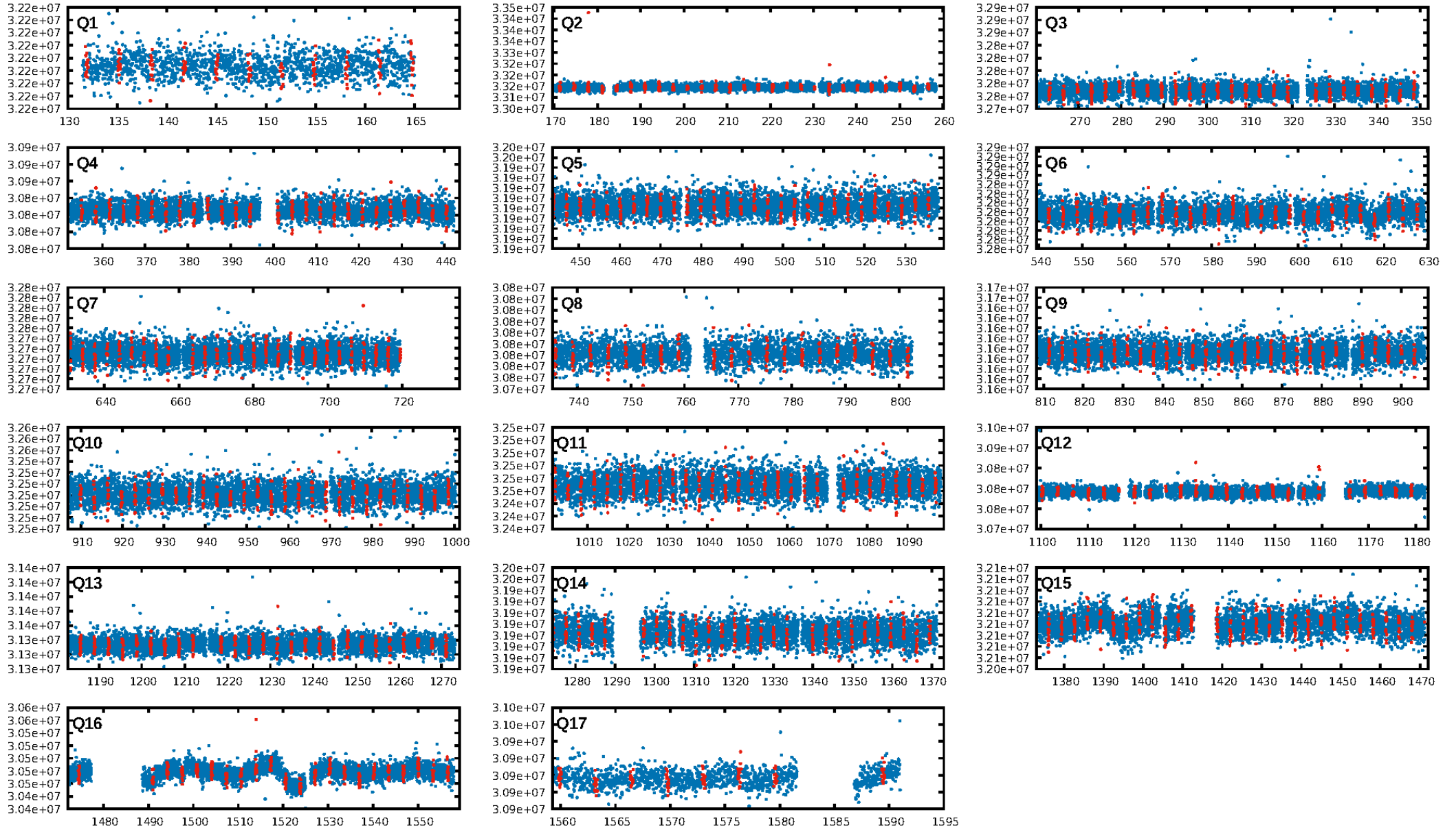
DV Fit Results:

Period = 3.28280 [0.00002] d
Epoch = 131.8978 [0.0031] BKJD
Rp/R* = 0.0133 [0.0016]
a/R* = 2.64 [1.32]
b = 0.95 [0.06]
Seff = 1096.38 [387.42]
Teq = 1467 [130] K
Rp = 2.21 [0.58] Re
a = 0.0436 [0.0096] AU
Ag = 3.79 [3.04] [0.92 σ]
Teffp = 3166 [574] K [2.89 σ]

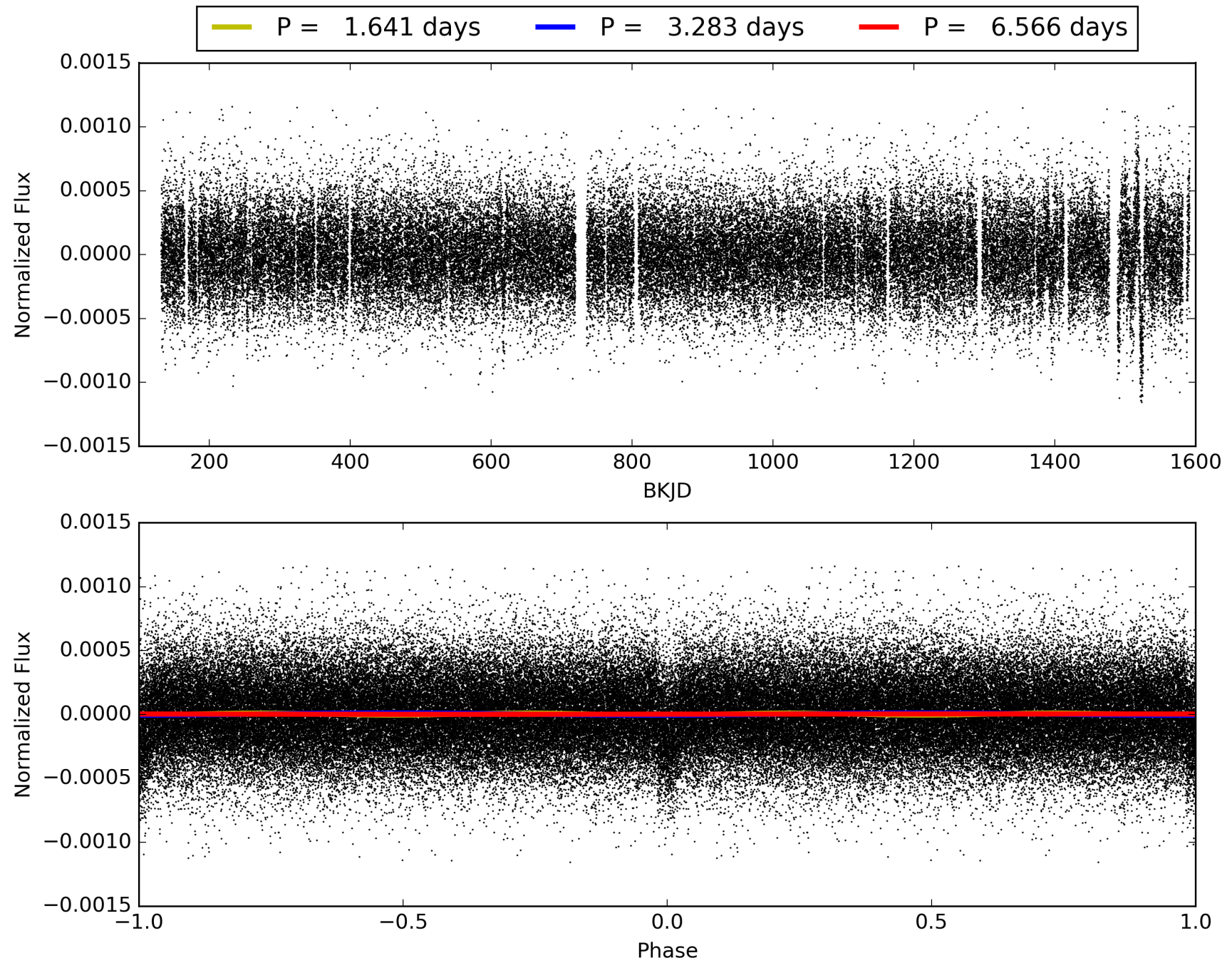
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.47 σ]
LongPeriod-sig: 100.0% [8.31 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.22e-70
RollingBand-fgt: 1.00 [325/325]
GhostDiagnostic-chr: 376.1
Centroid-sig: 1.7%
Centroid-so: 1.113 arcsec [1.66 σ]
OotOffset-rm: 0.445 arcsec [1.58 σ]
KicOffset-rm: 0.590 arcsec [2.08 σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.75 [12/16]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 006871071-03, PDC Light Curves

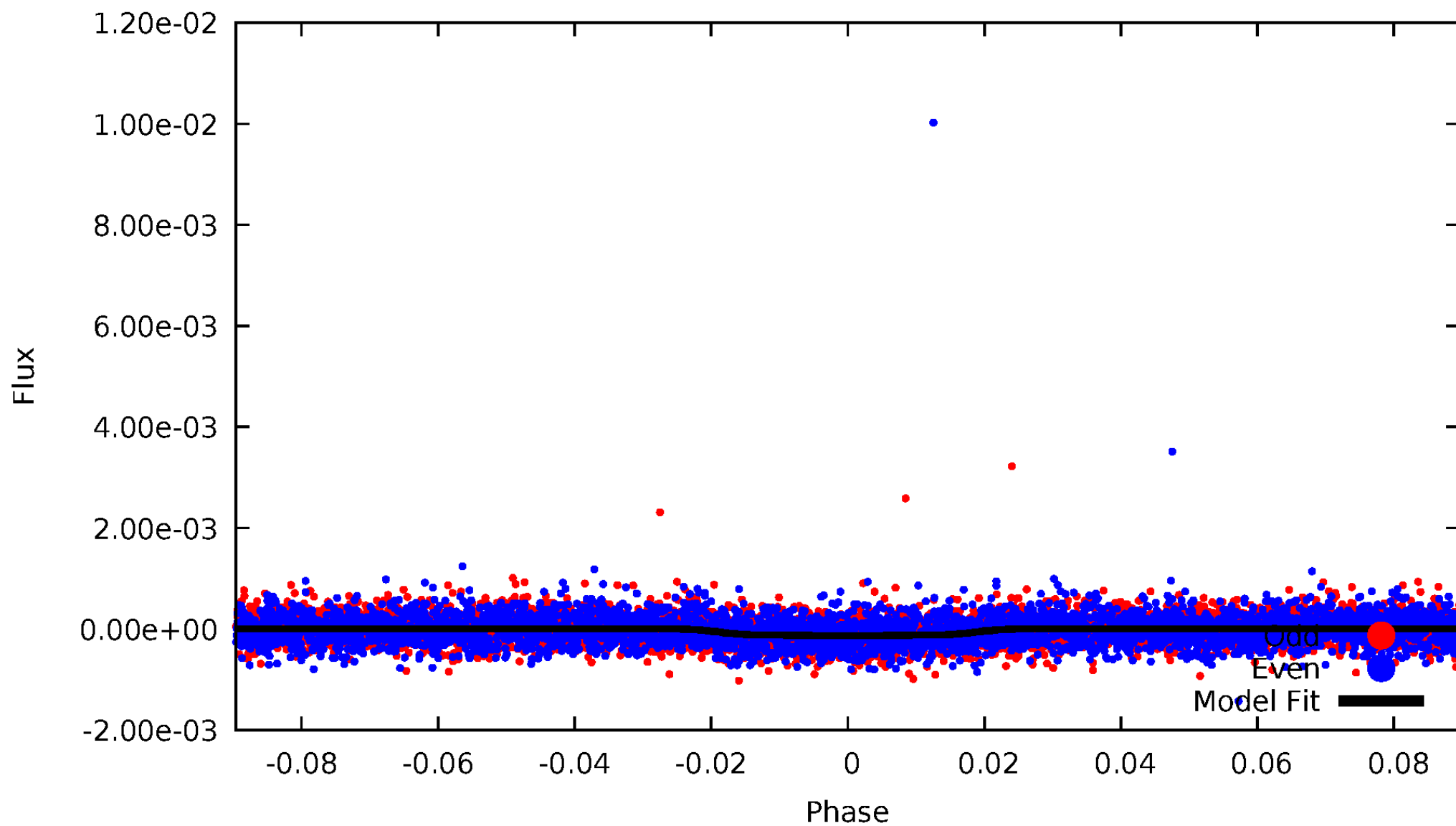


TCE 006871071-03



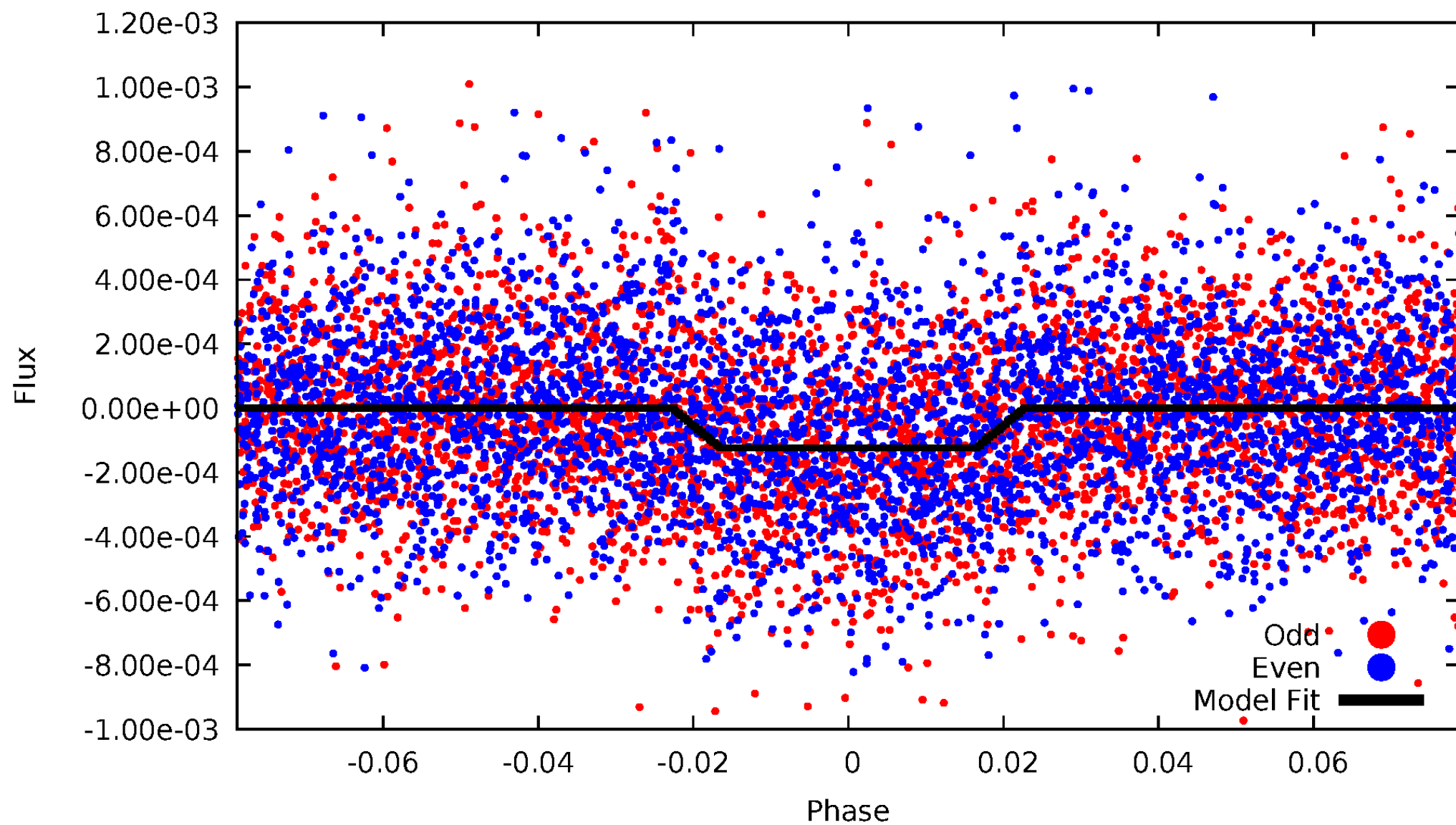
DV Odd/Even

TCE 006871071-03



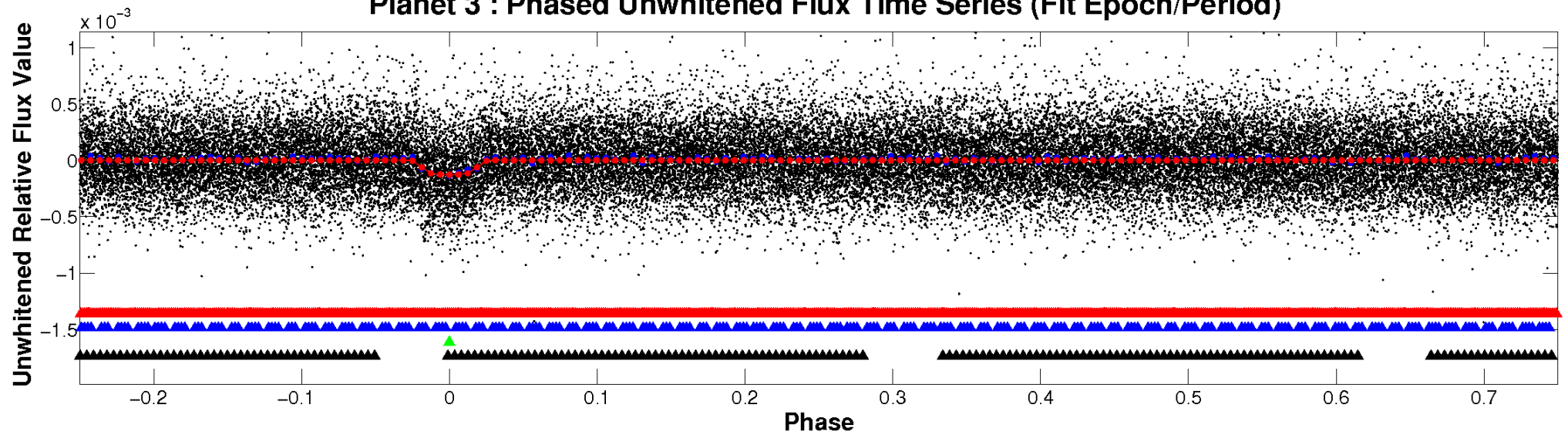
ALT Odd/Even

TCE 006871071-03

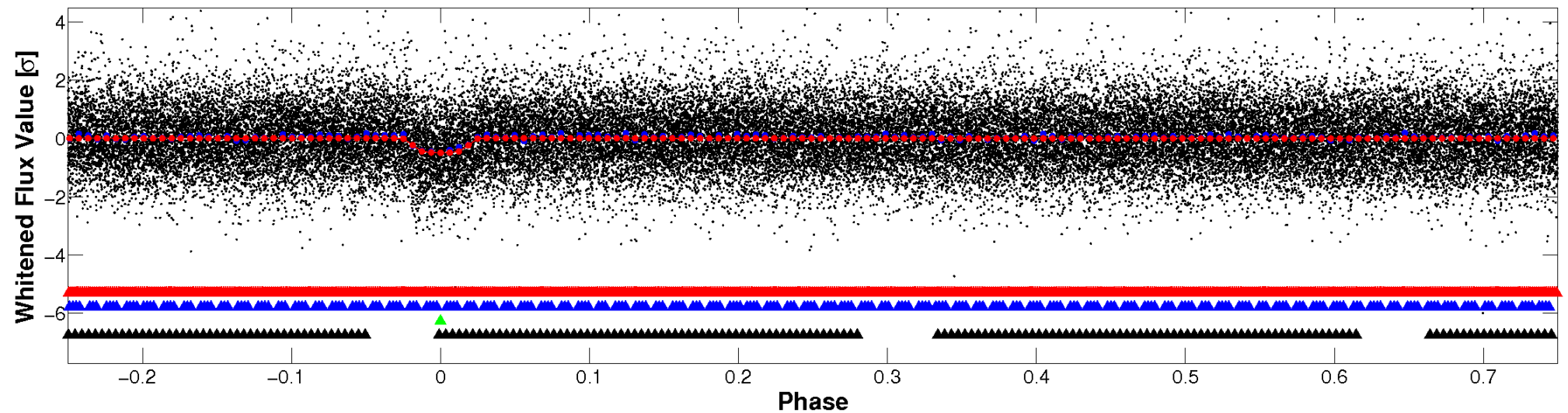


Non-Whitened Vs. Whitened Light Curve

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

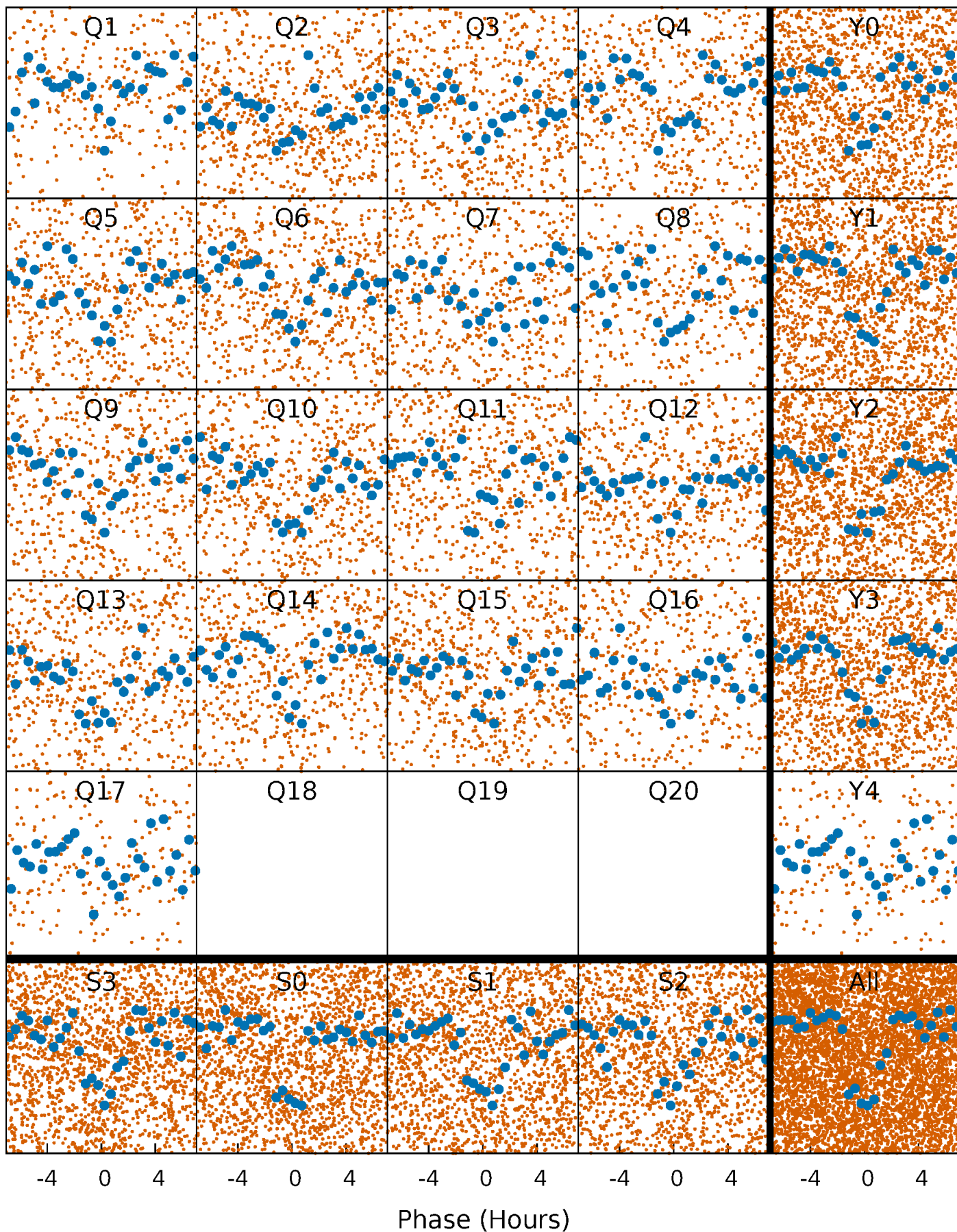


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



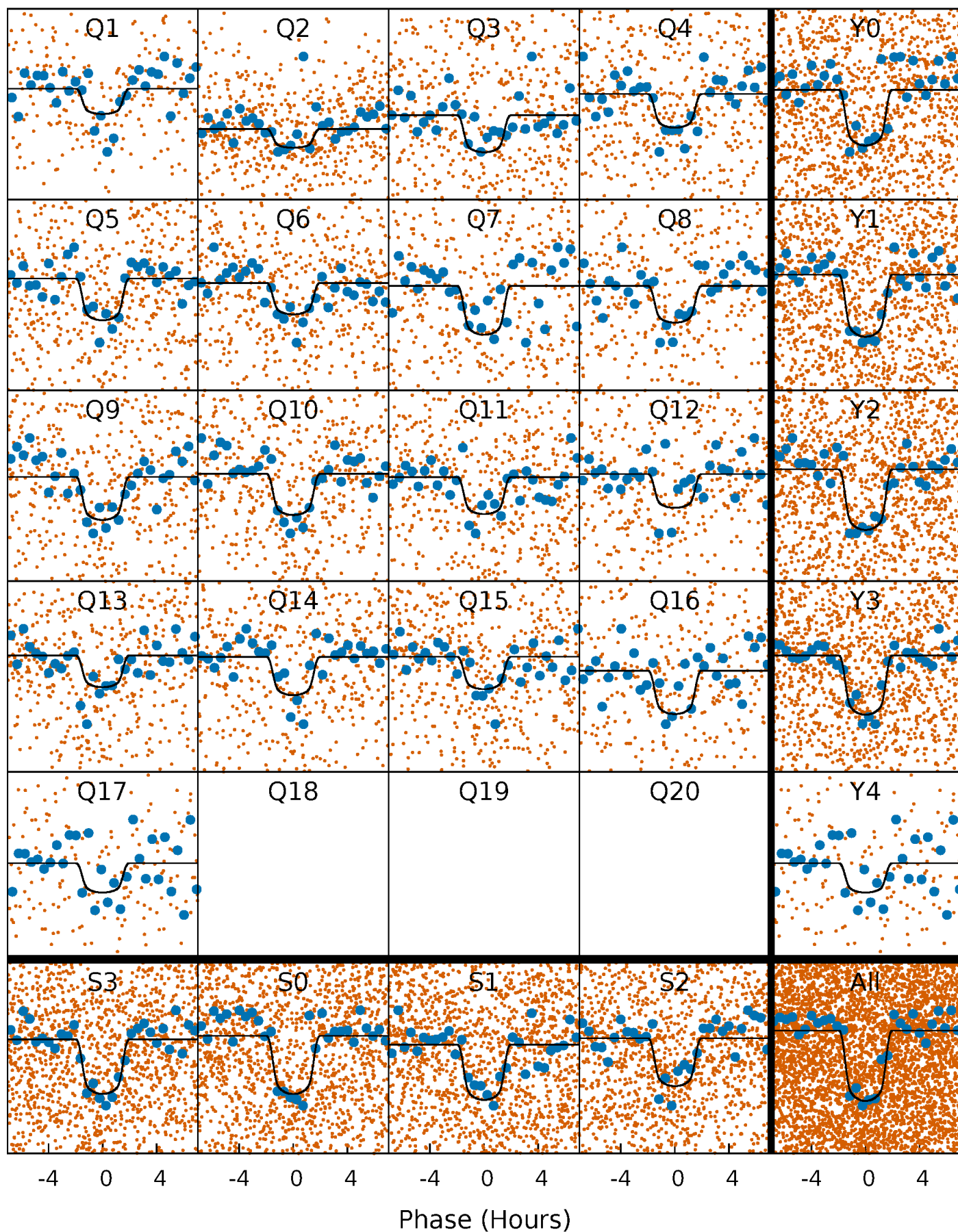
PDC Quarter-Phased Transit Curves

TCE 006871071-03 P= 3.282801 Days $T_0=131.897837$ (BKJD)



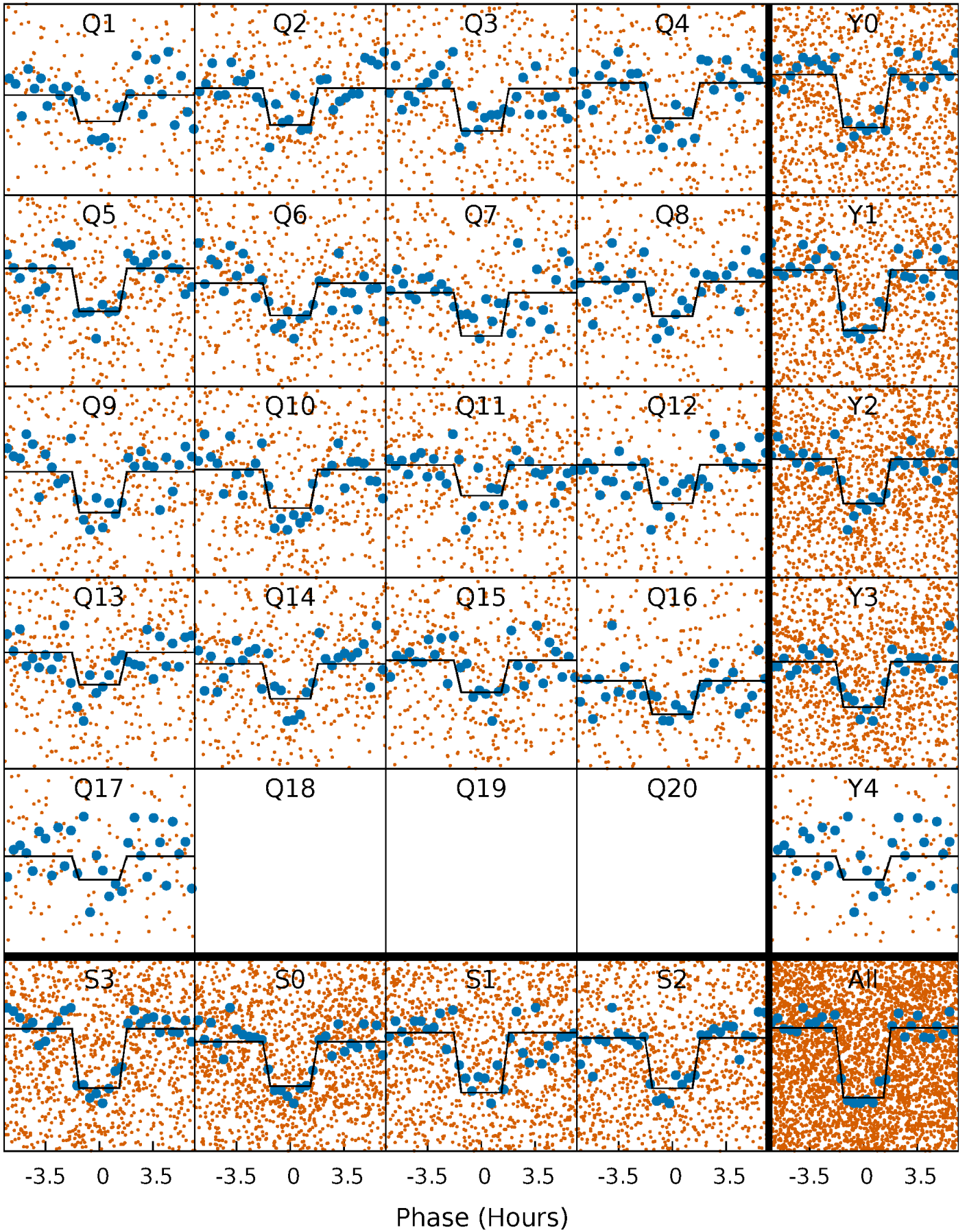
DV Quarter-Phased Transit Curves

TCE 006871071-03 P= 3.282801 Days $T_0=131.897837$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

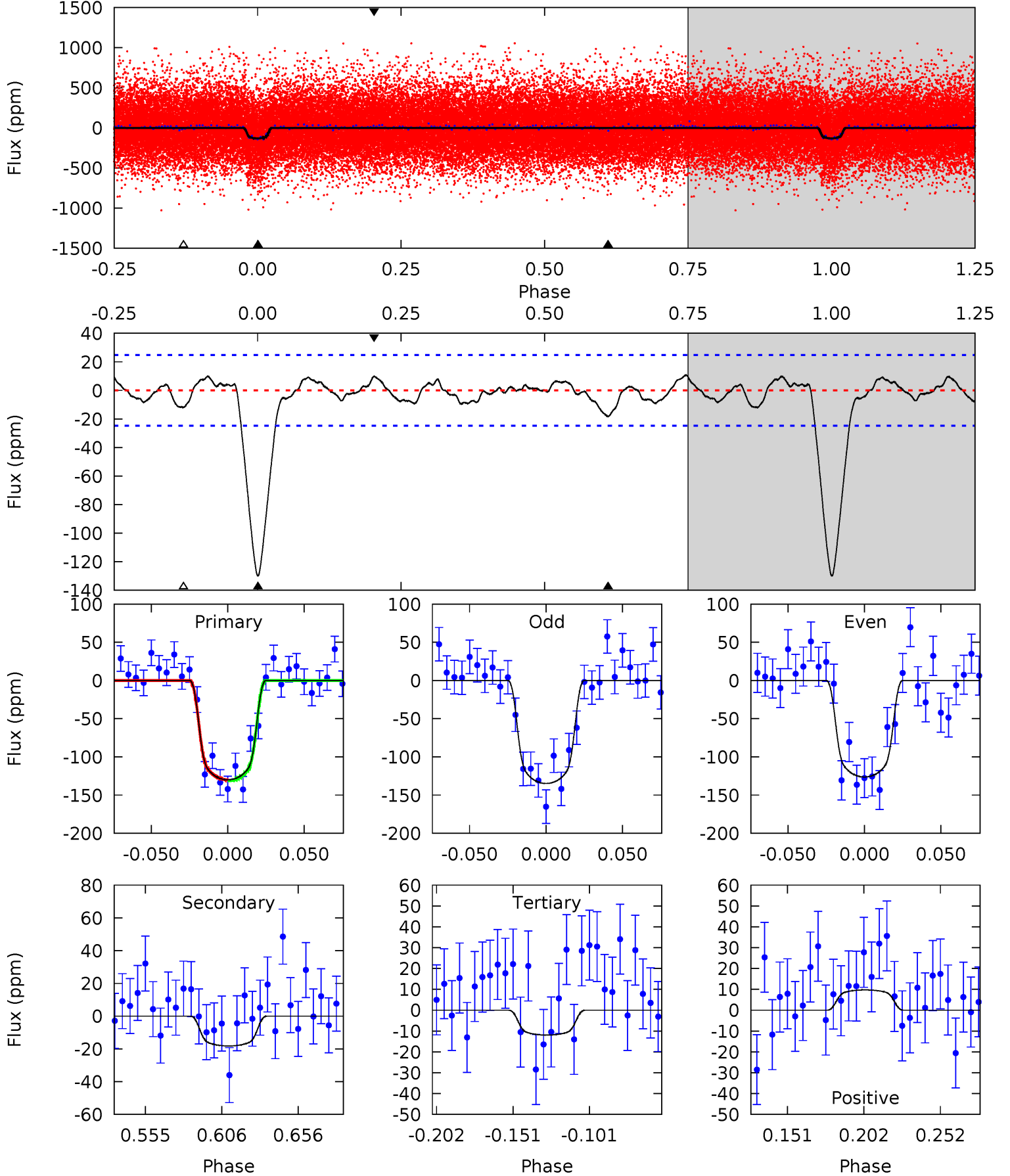
TCE 006871071-03 P= 3.282788 Days $T_0=131.902973$ (BKJD)



DV Model-Shift Uniqueness Test

006871071-03, P = 3.282801 Days, E = 128.615036 Days

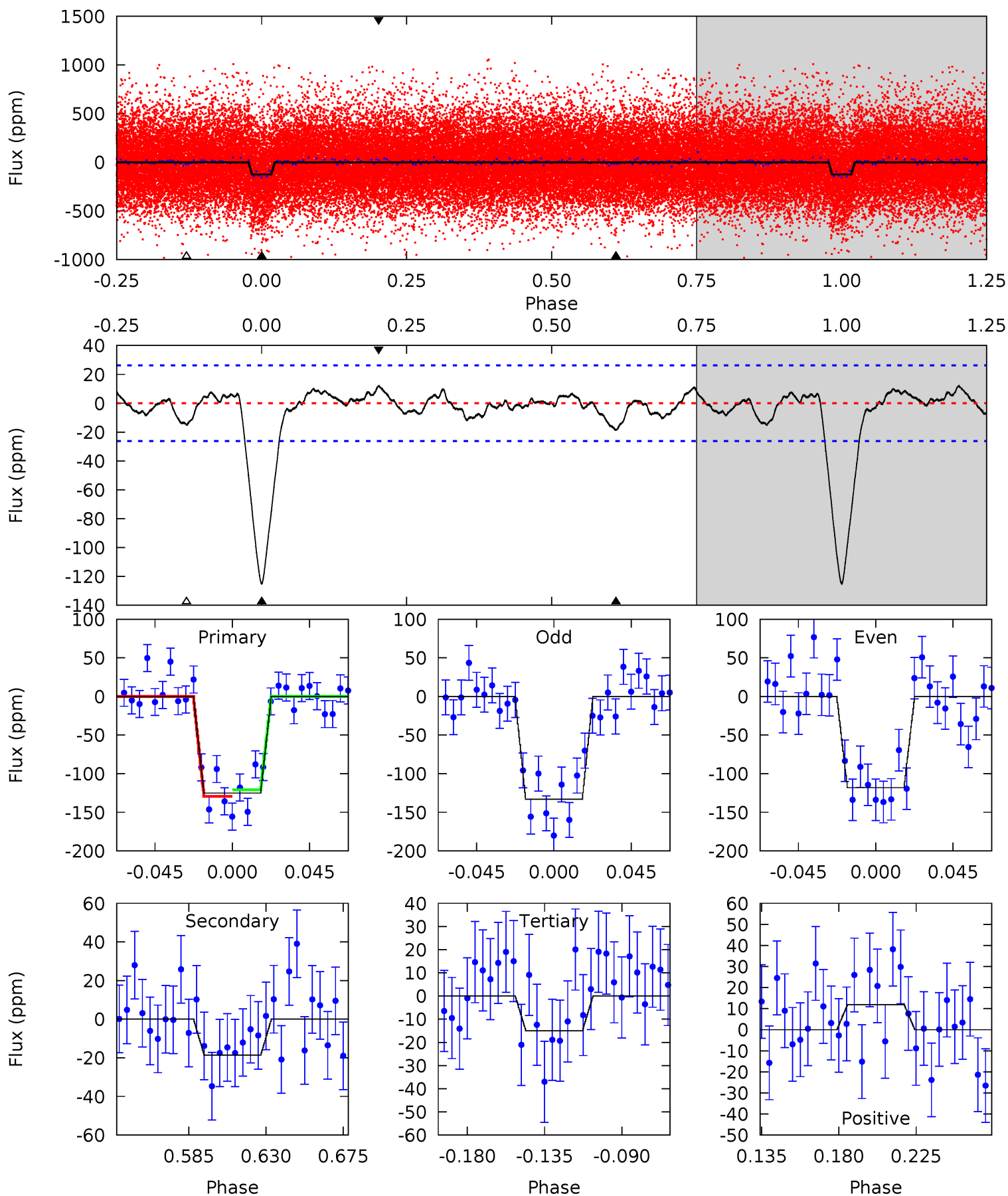
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.6	3.45	2.26	1.84	4.71	1.96	1.02	22.4	22.8	1.19	1.61	0.81	0.95	0.08	0.14



Alt Model-Shift Uniqueness Test

006871071-03, P = 3.282788 Days, E = 128.620185 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.5	3.34	2.69	2.15	4.73	2.00	1.02	19.8	20.4	0.65	1.19	1.35	0.96	0.09	0.78



Stellar Parameters For KIC 006871071

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5640^{+85}_{-77}	$4.087^{+0.203}_{-0.087}$	$0.140^{+0.150}_{-0.150}$	$1.515^{+0.236}_{-0.353}$	$1.024^{+0.093}_{-0.084}$	$0.415^{+0.420}_{-0.131}$
	+2%/-1%	+5%/-2%	+107%/-107%	+16%/-23%	+9%/-8%	+101%/-32%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 006871071-03 / KOI 2220.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-18 ± 5	$2.17^{+0.35}_{-0.34}$	2034^{+93}_{-117}	3572^{+238}_{-247}	$4.003^{+2.251}_{-1.425}$
Alt.	-19 ± 6	$1.78^{+0.34}_{-0.33}$	2027^{+92}_{-133}	3813^{+297}_{-300}	$5.892^{+3.572}_{-2.426}$

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

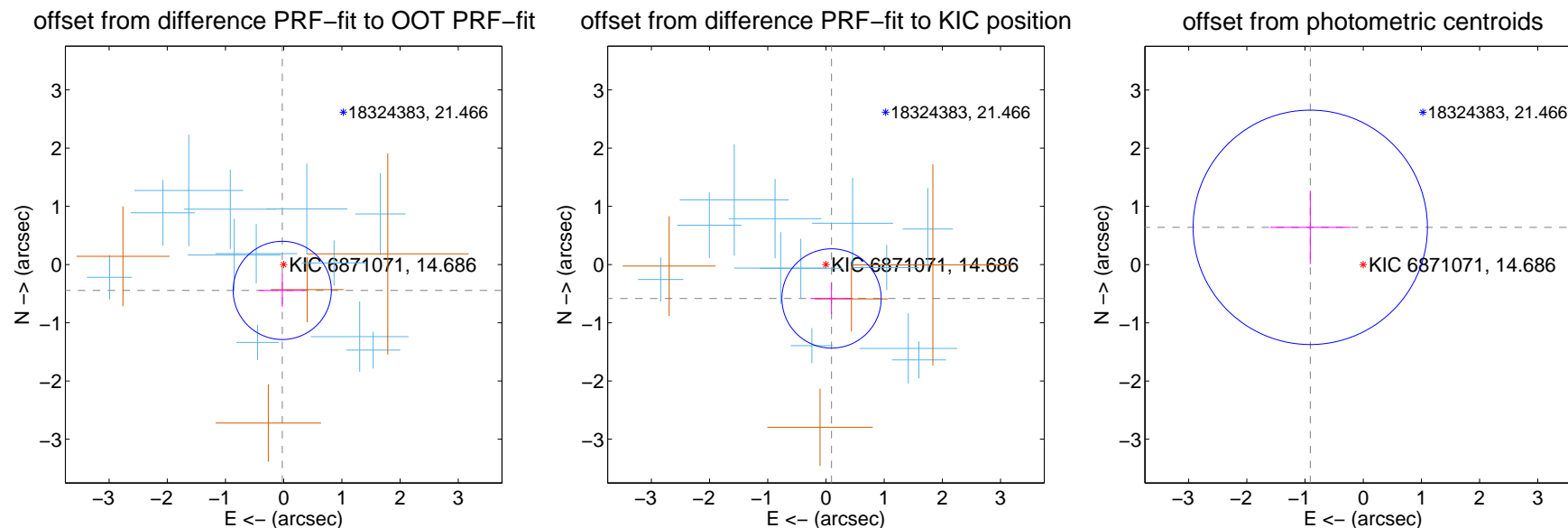
DV Centroid Data

Supplemental centroid analysis for 006871071-03. Kepler magnitude: 14.69. Transit SNR 18.51

There are 12 quarters with good PRF difference image offsets

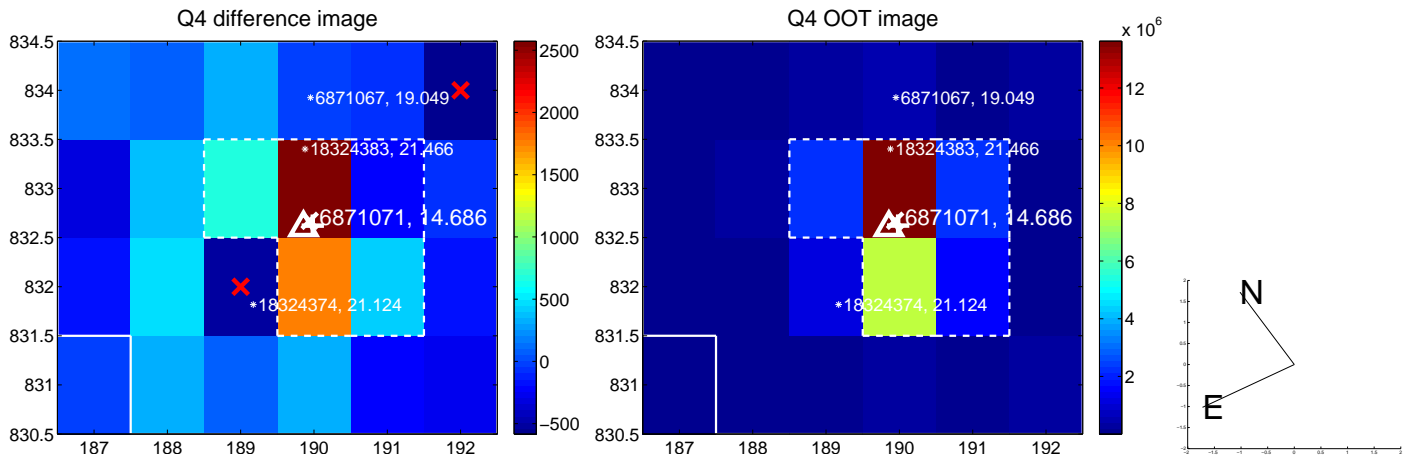
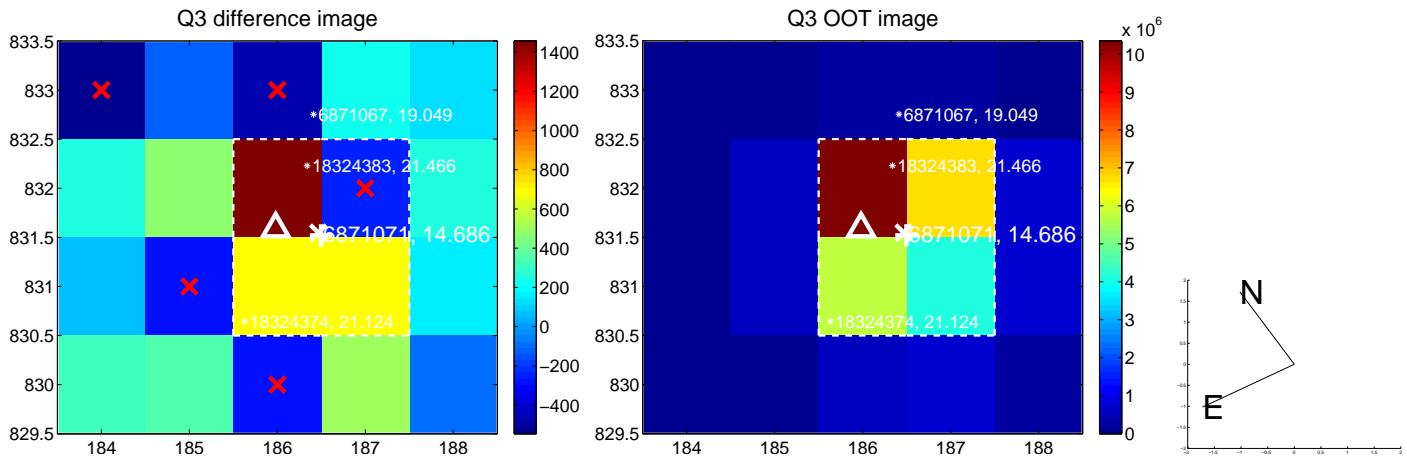
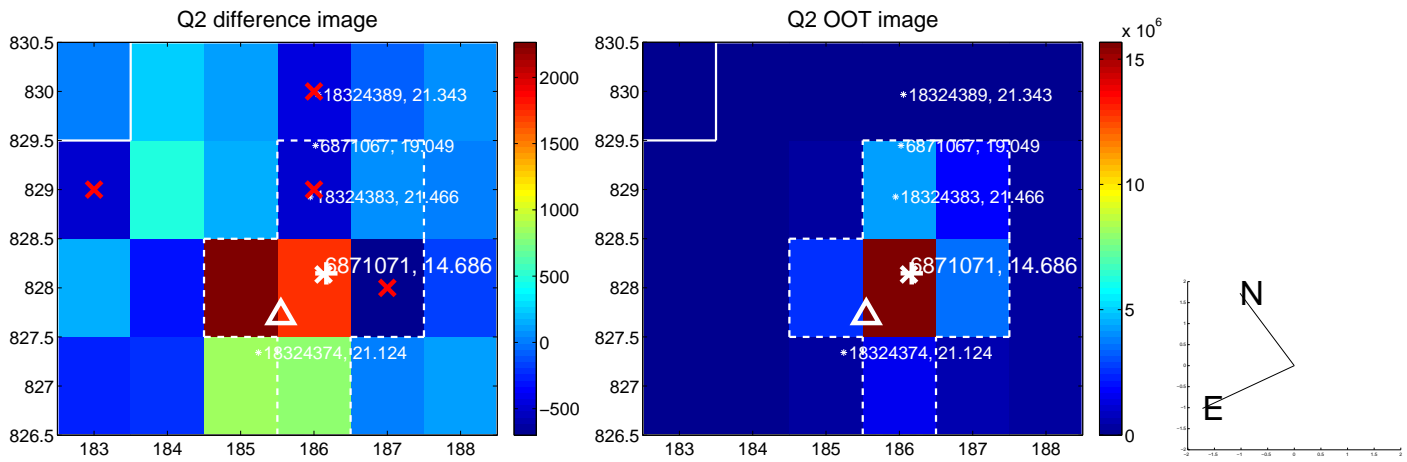
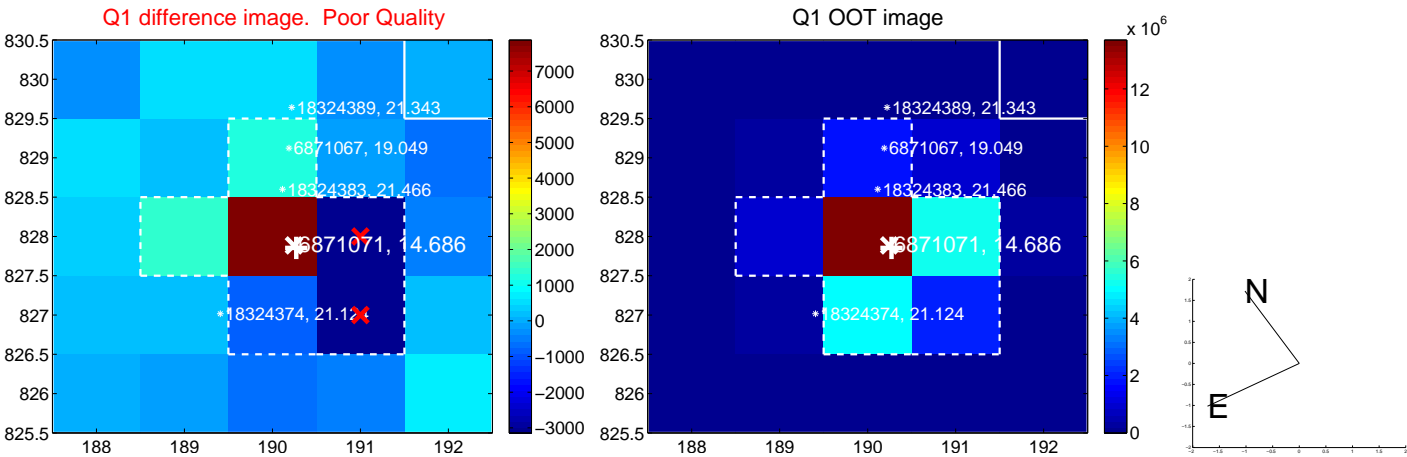
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.445 ± 0.281	1.58	0.025 ± 0.401	-0.444 ± 0.281
PRF-fit source offset from KIC position	0.590 ± 0.284	2.08	-0.096 ± 0.364	-0.583 ± 0.268
photometric centroid source offset	1.11 ± 0.67	1.66	0.91 ± 0.69	0.64 ± 0.63

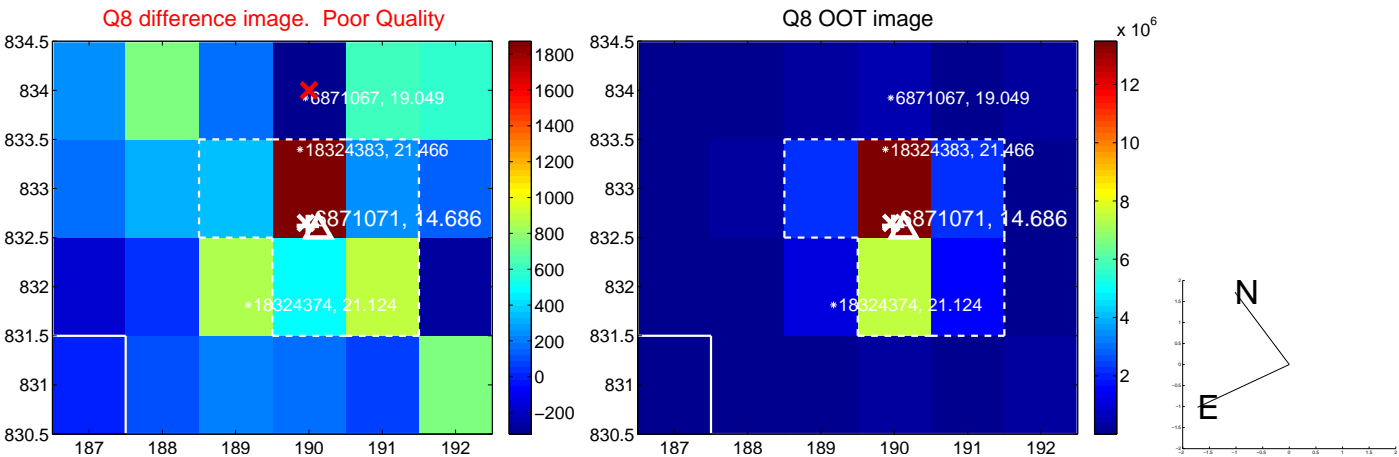
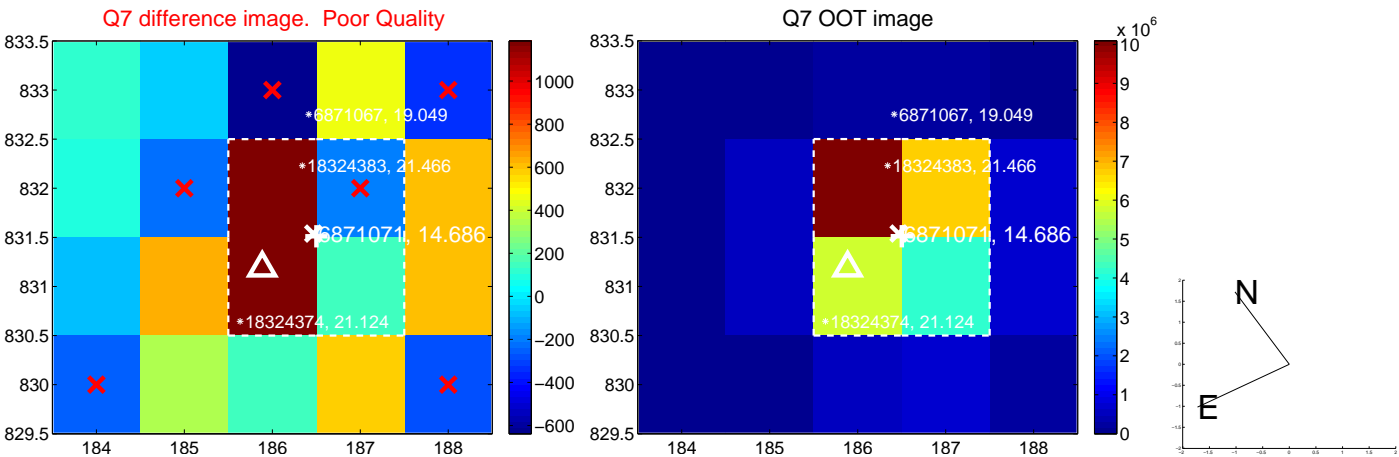
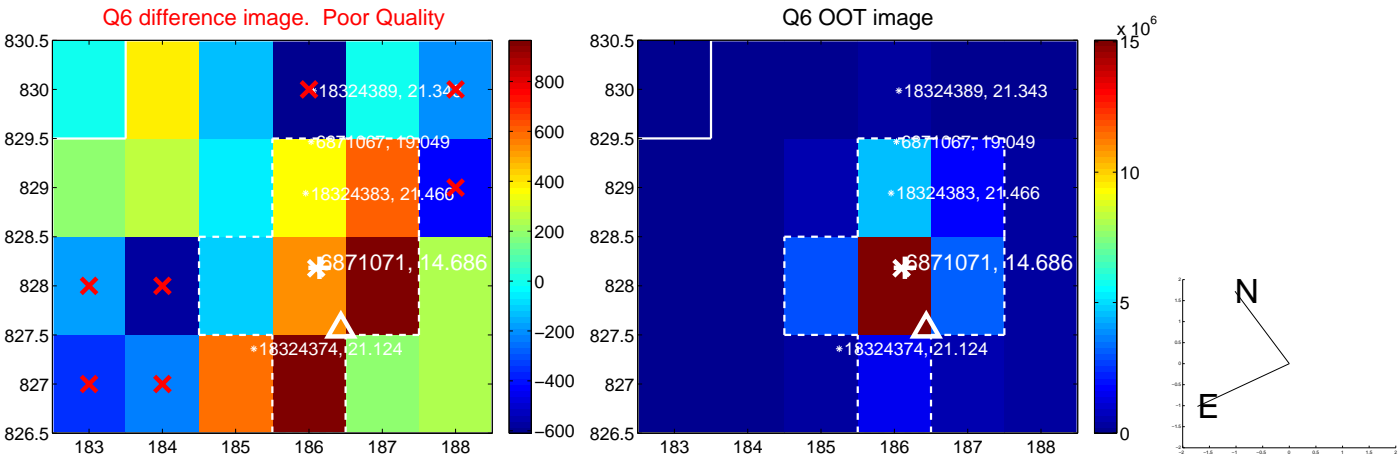
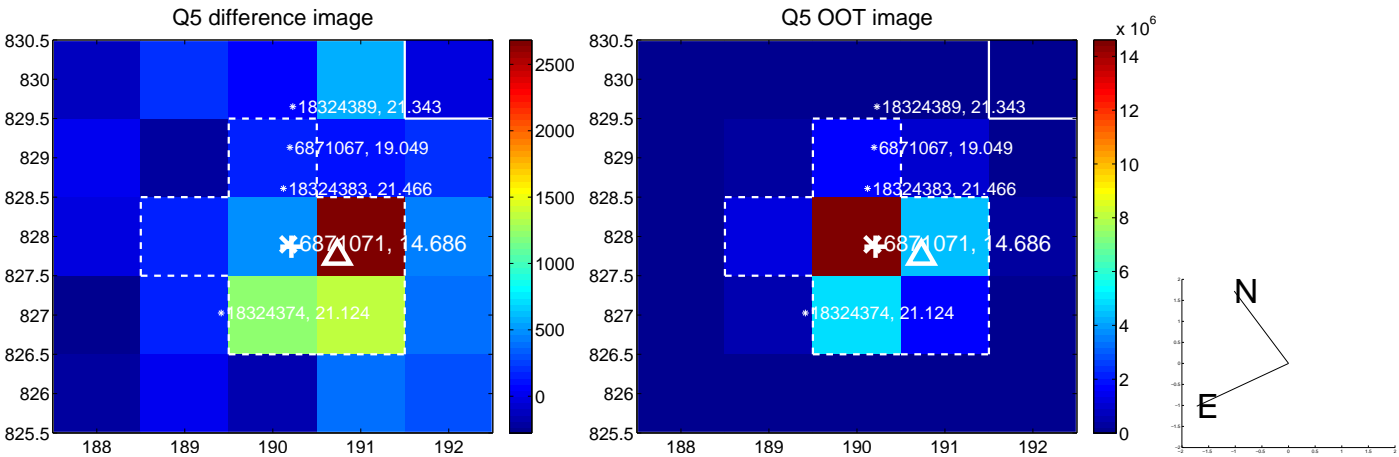


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

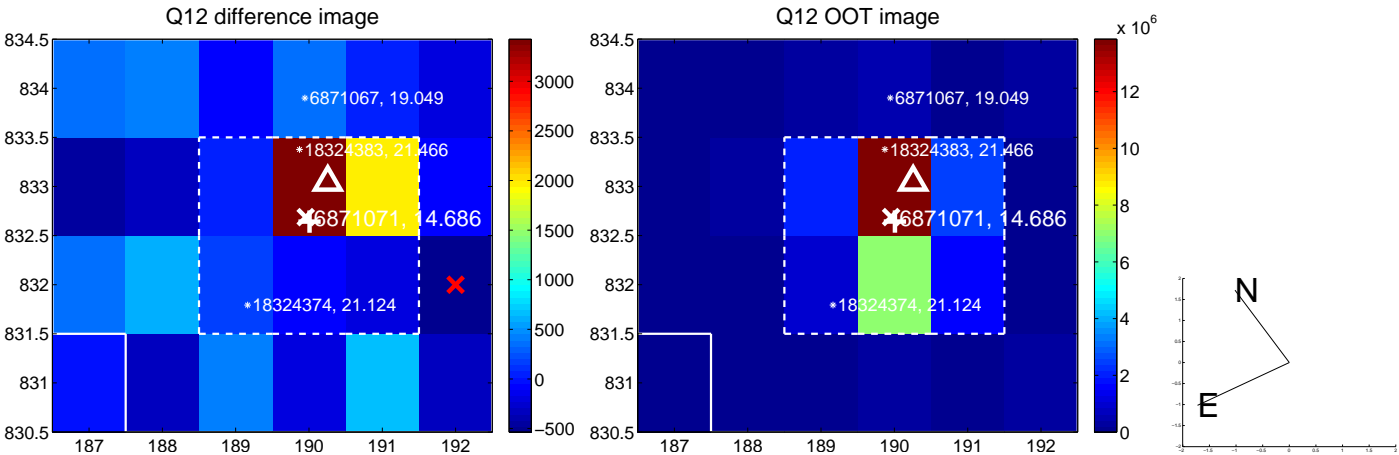
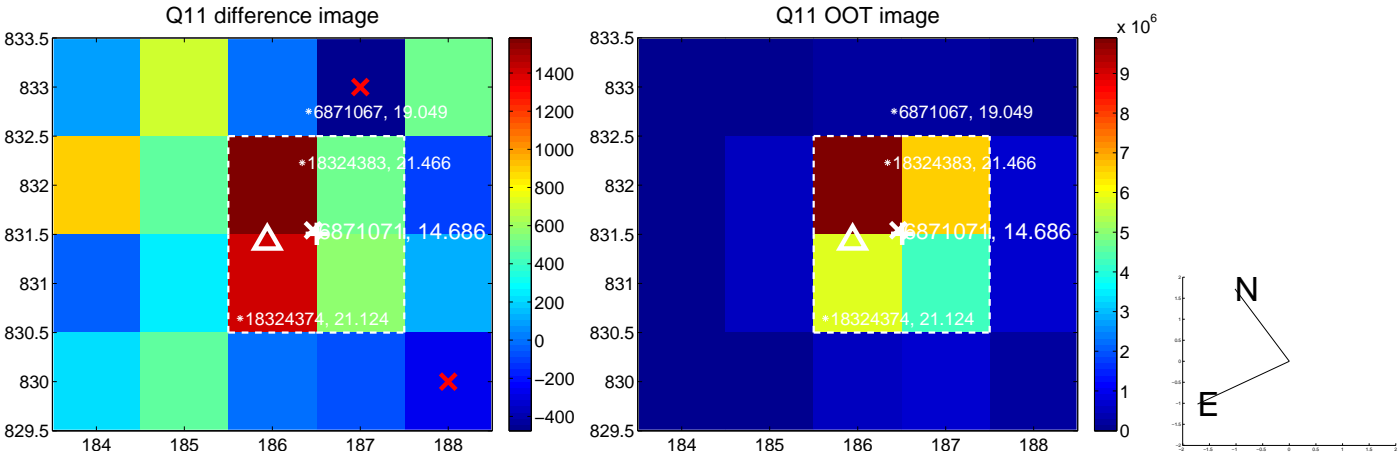
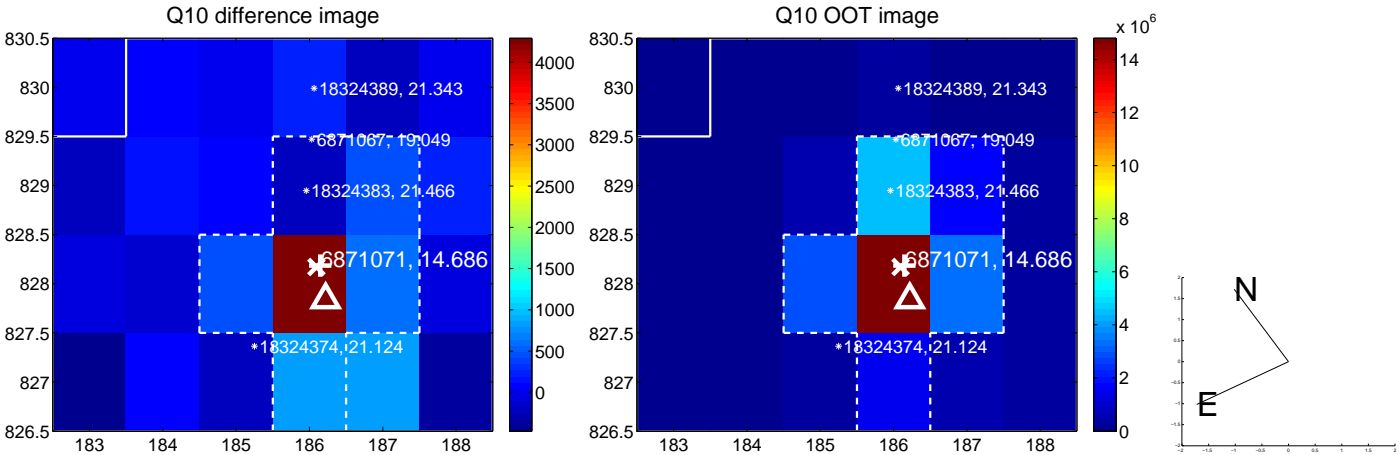
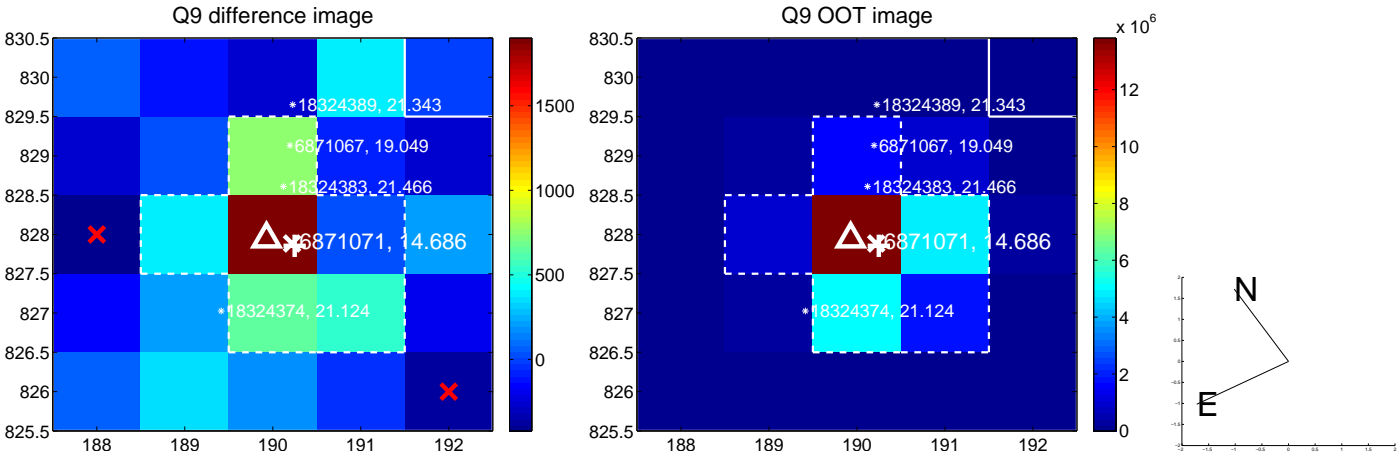
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



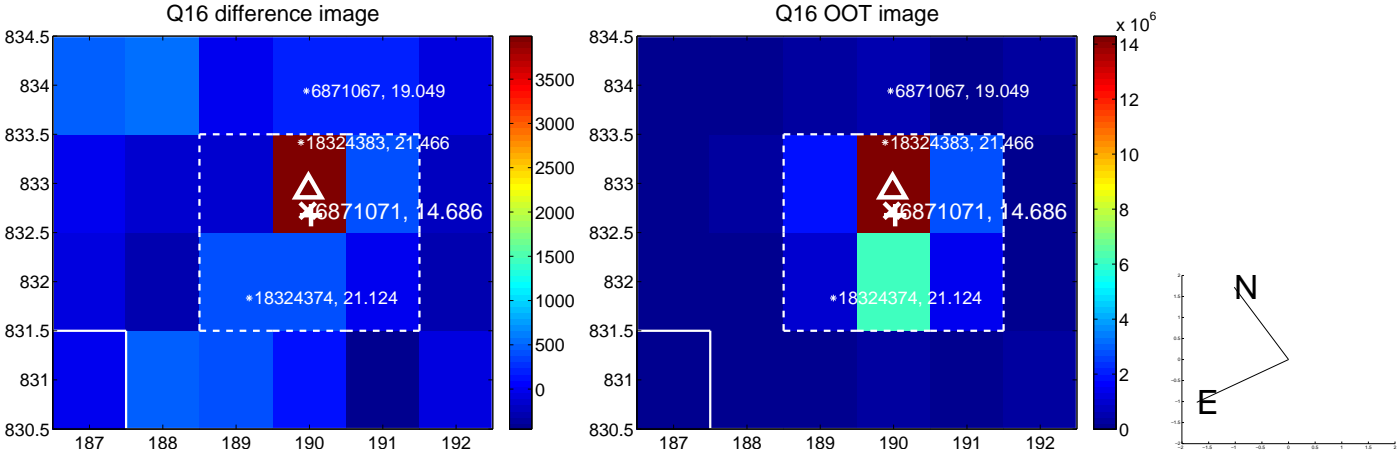
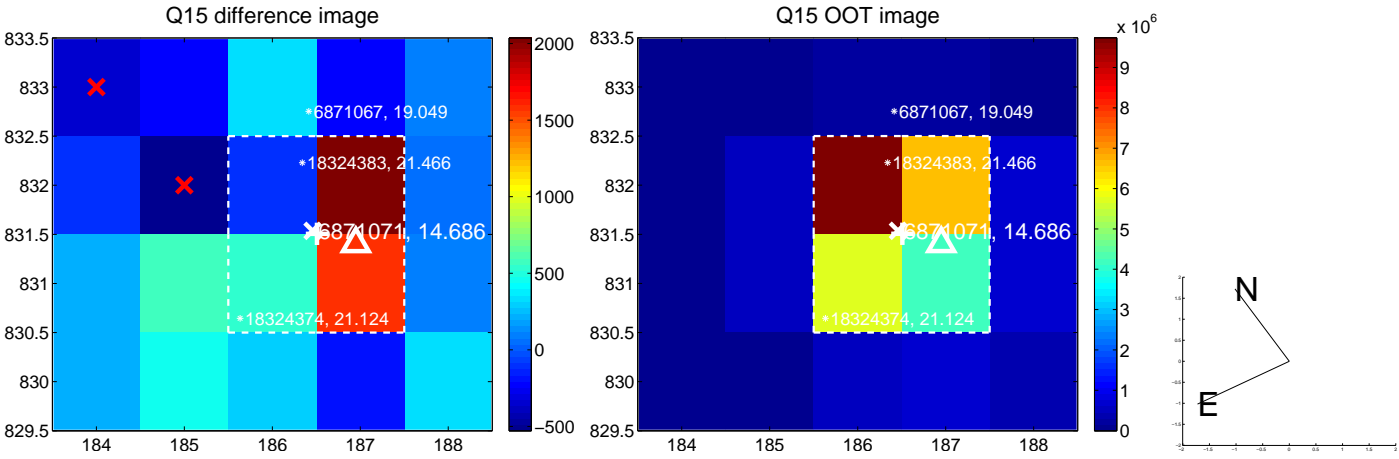
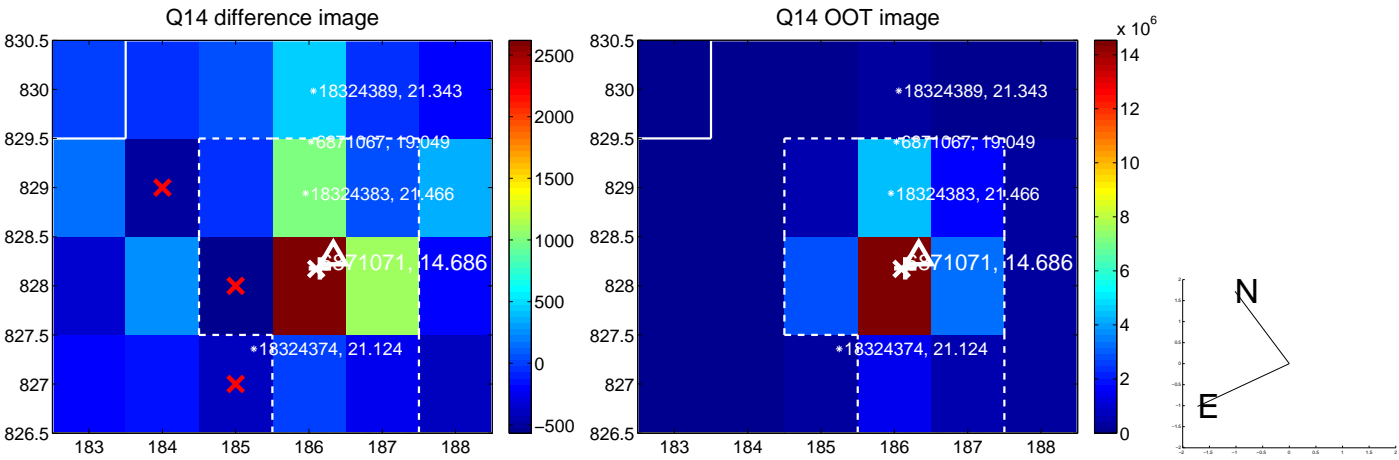
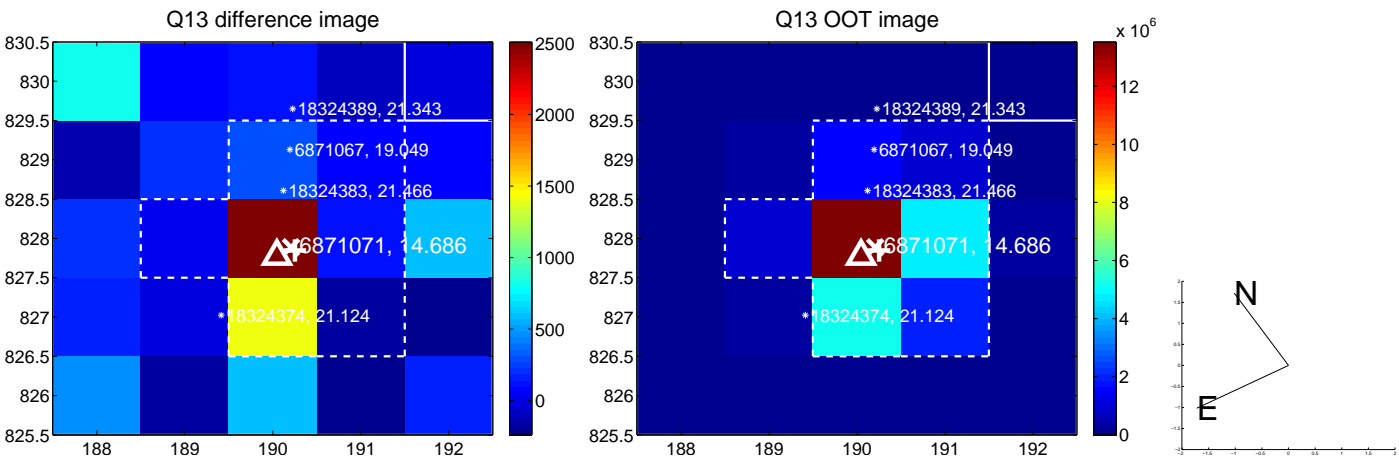
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



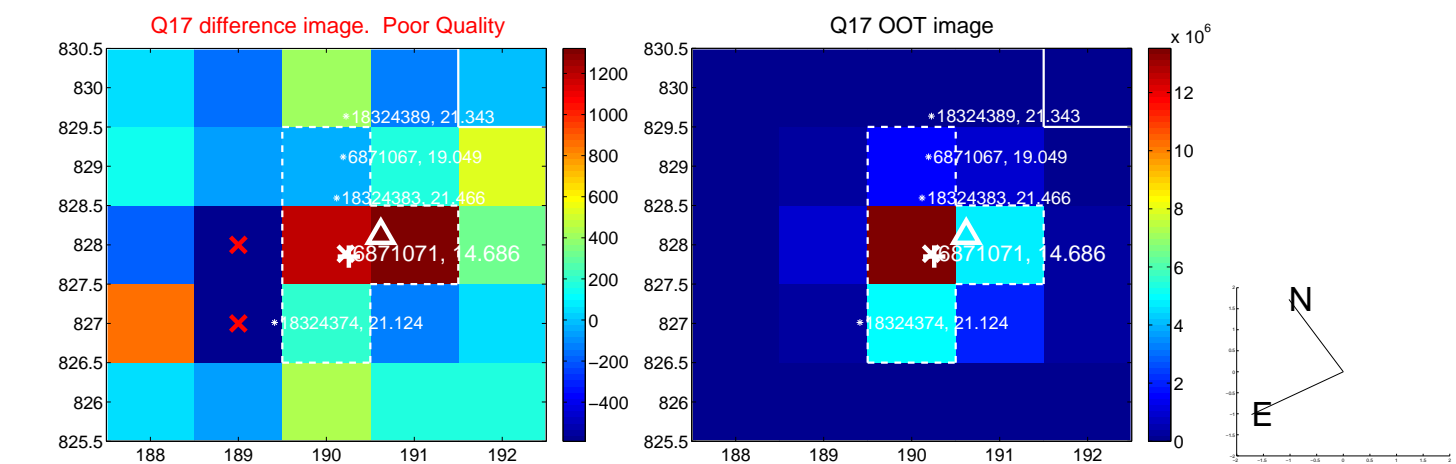
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



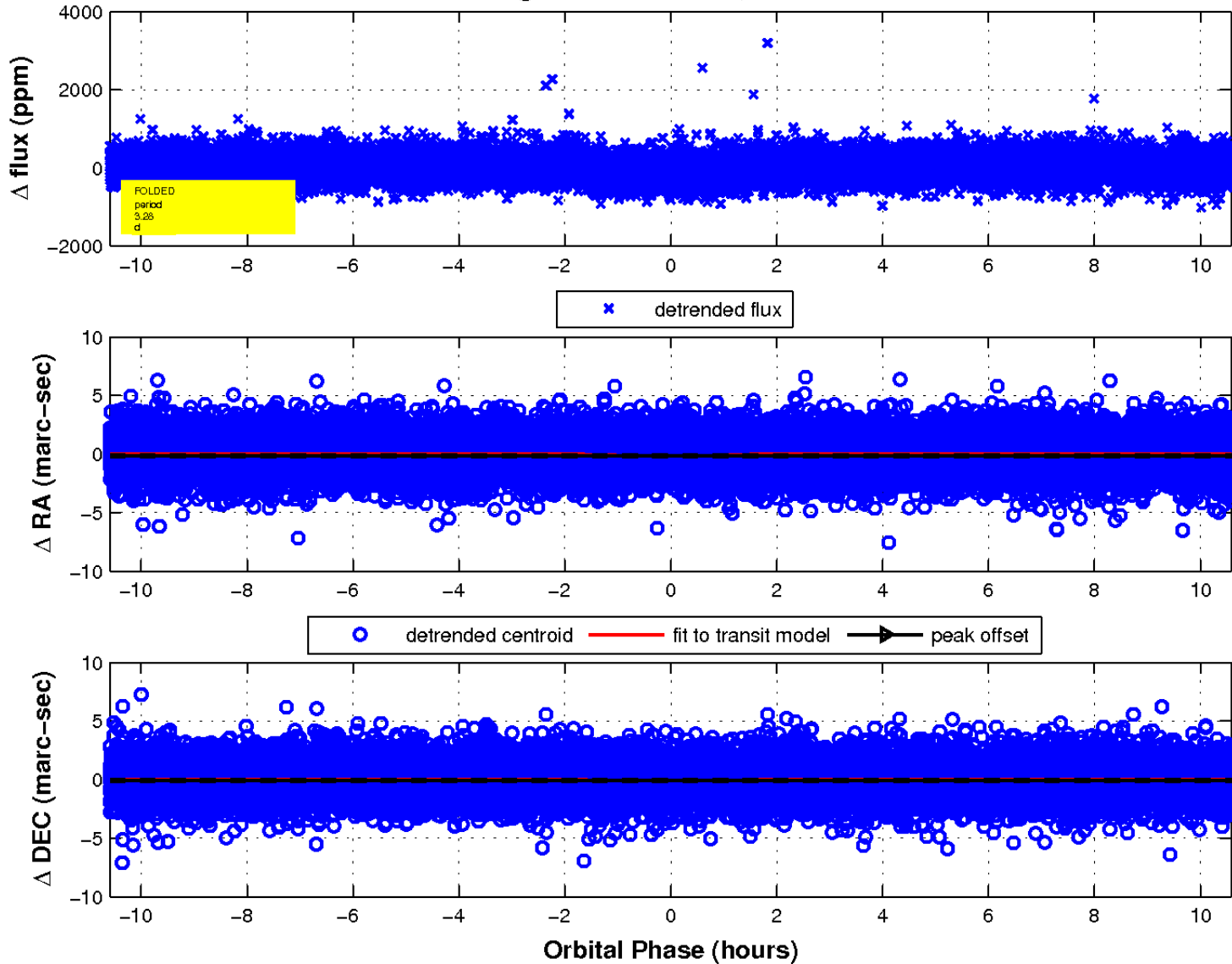
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

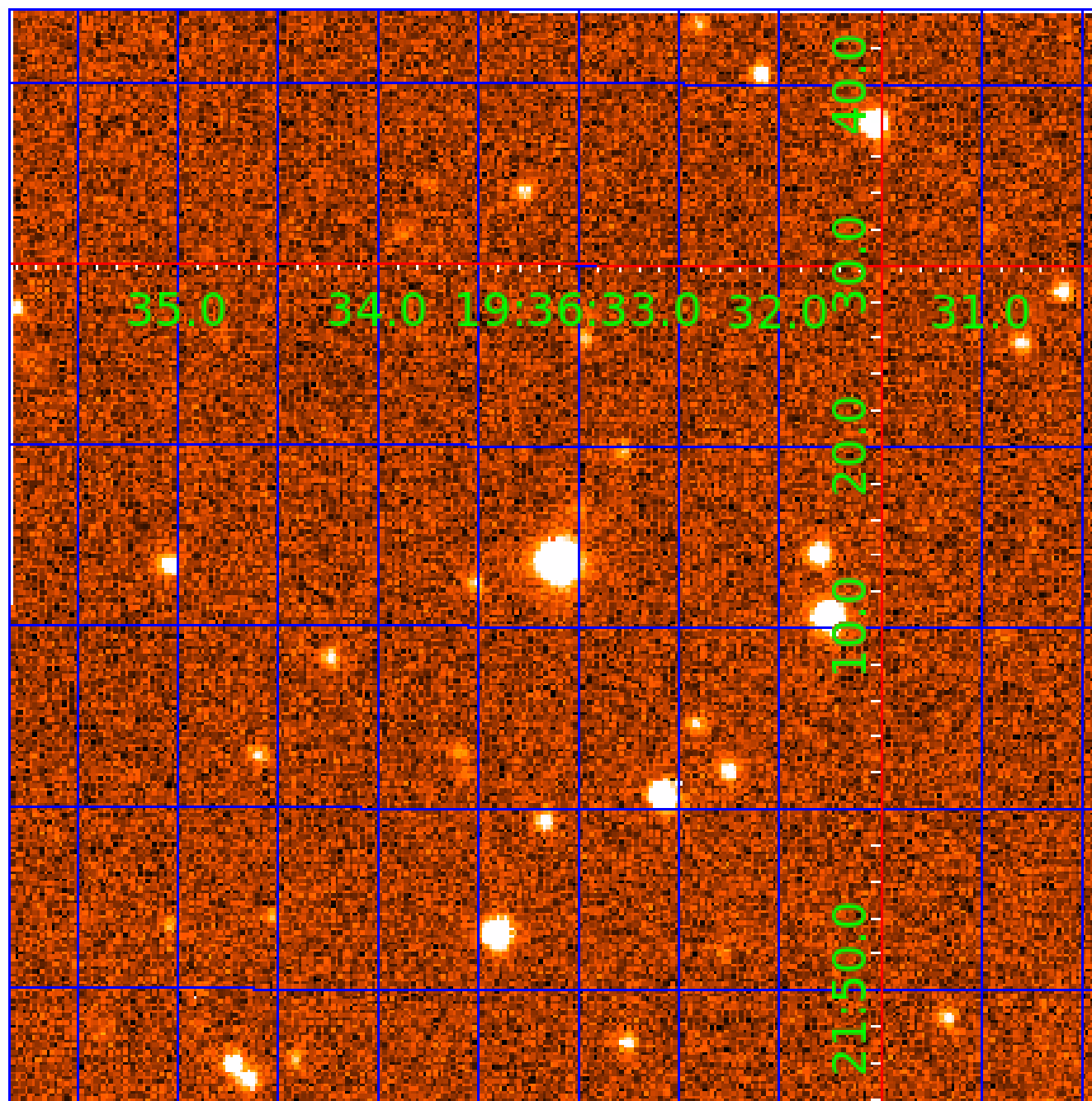


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination



KIC 006871071

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})
006871071-01	OBS	2220.03	1.897799	132.687937	118.5	2.707	22.6	22.7	1.51	5640	1.97	2276.59
006871071-02	OBS	2220.02	5.028181	134.110669	168.1	3.603	20.1	21.0	1.51	5640	2.30	620.97
006871071-03	OBS	2220.01	3.282801	131.897837	127.9	3.530	17.4	18.5	1.51	5640	2.21	1096.38
006871071-04	OBS	2220.04	7.664825	137.361068	103.9	3.808	9.8	10.0	1.51	5640	1.83	353.96

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006871071-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006871071-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT
006871071-03	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006871071-04	OBS	PC	0.90	0	0	0	0	NO_COMMENT

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

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

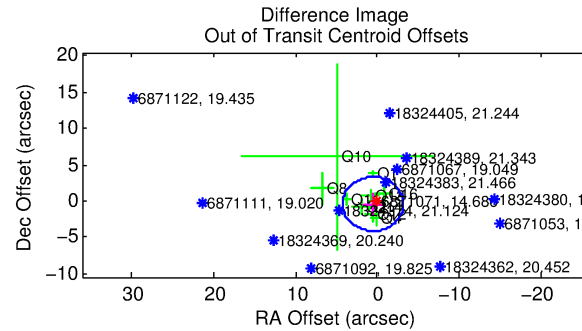
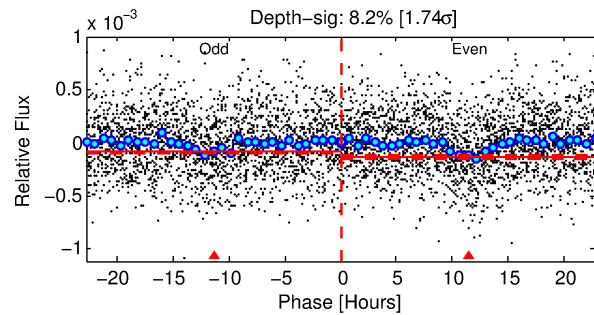
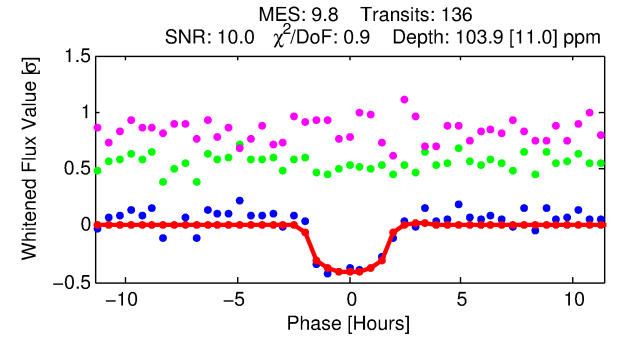
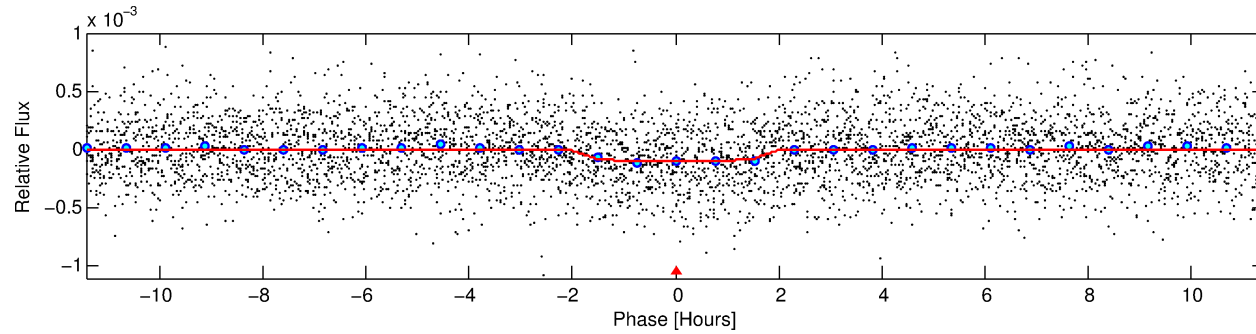
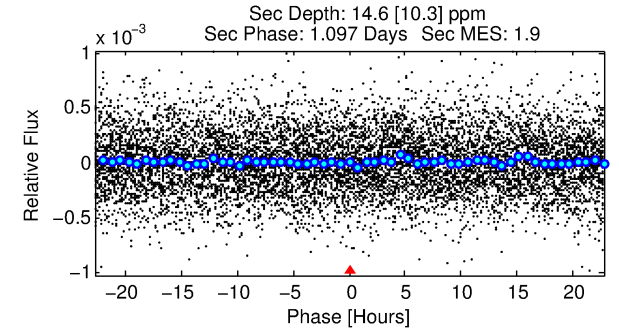
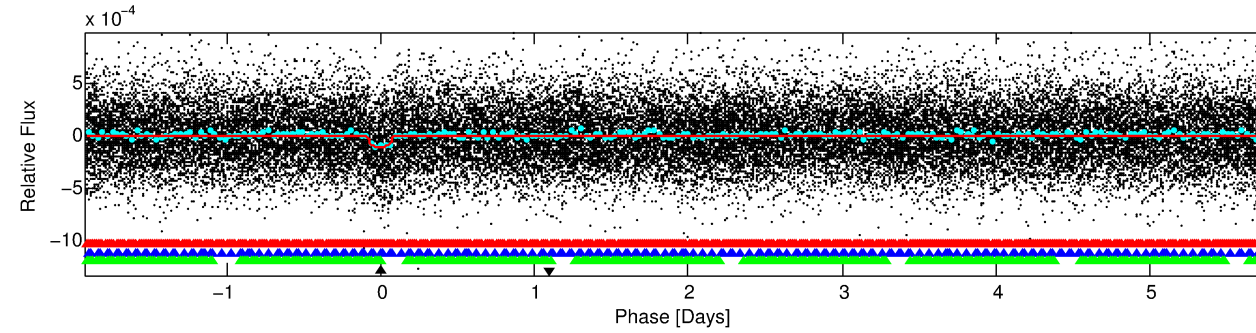
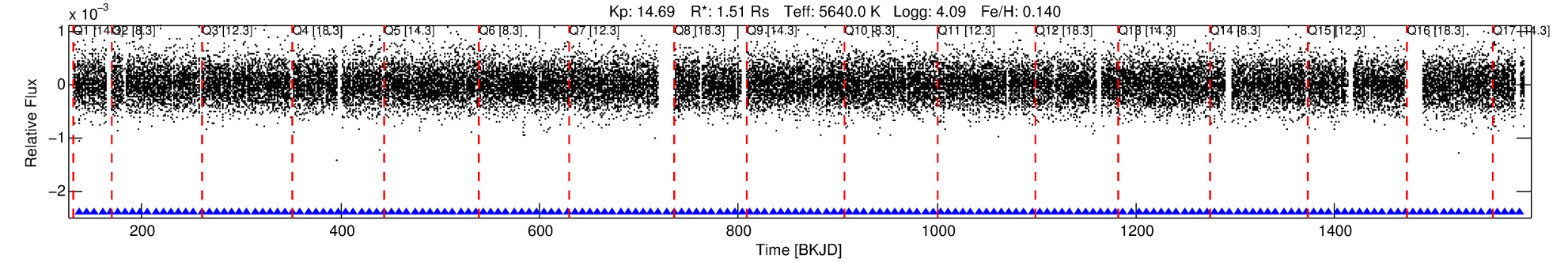
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006871071-04

No Significant Match Found

DV One-Page Summary

KIC: 6871071 Candidate: 4 of 4 Period: 7.665 d
KOI: K02220.04 Corr: 0.940



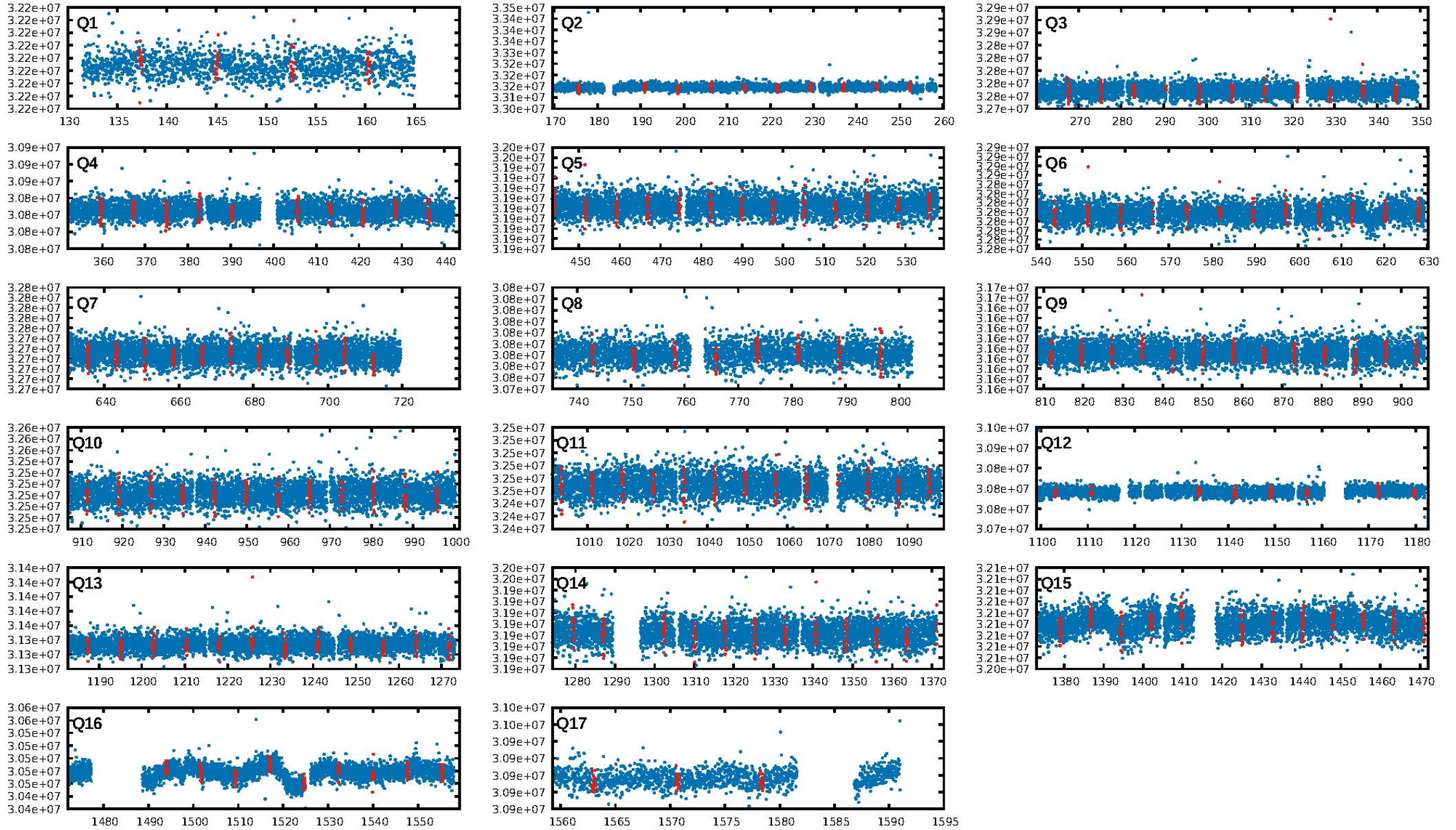
DV Fit Results:

Period = 7.66482 [0.00008] d
Epoch = 137.3611 [0.0084] BKJD
Rp/R* = 0.0110 [0.0081]
a/R* = 7.46 [24.75]
b = 0.89 [0.81]
Seff = 353.96 [125.08]
Teff = 1106 [98] K
Rp = 1.83 [1.41] Re
a = 0.0767 [0.0169] AU
Ag = 14.12 [23.58] [0.56σ]
Teffp = 3315 [1355] K [1.63σ]

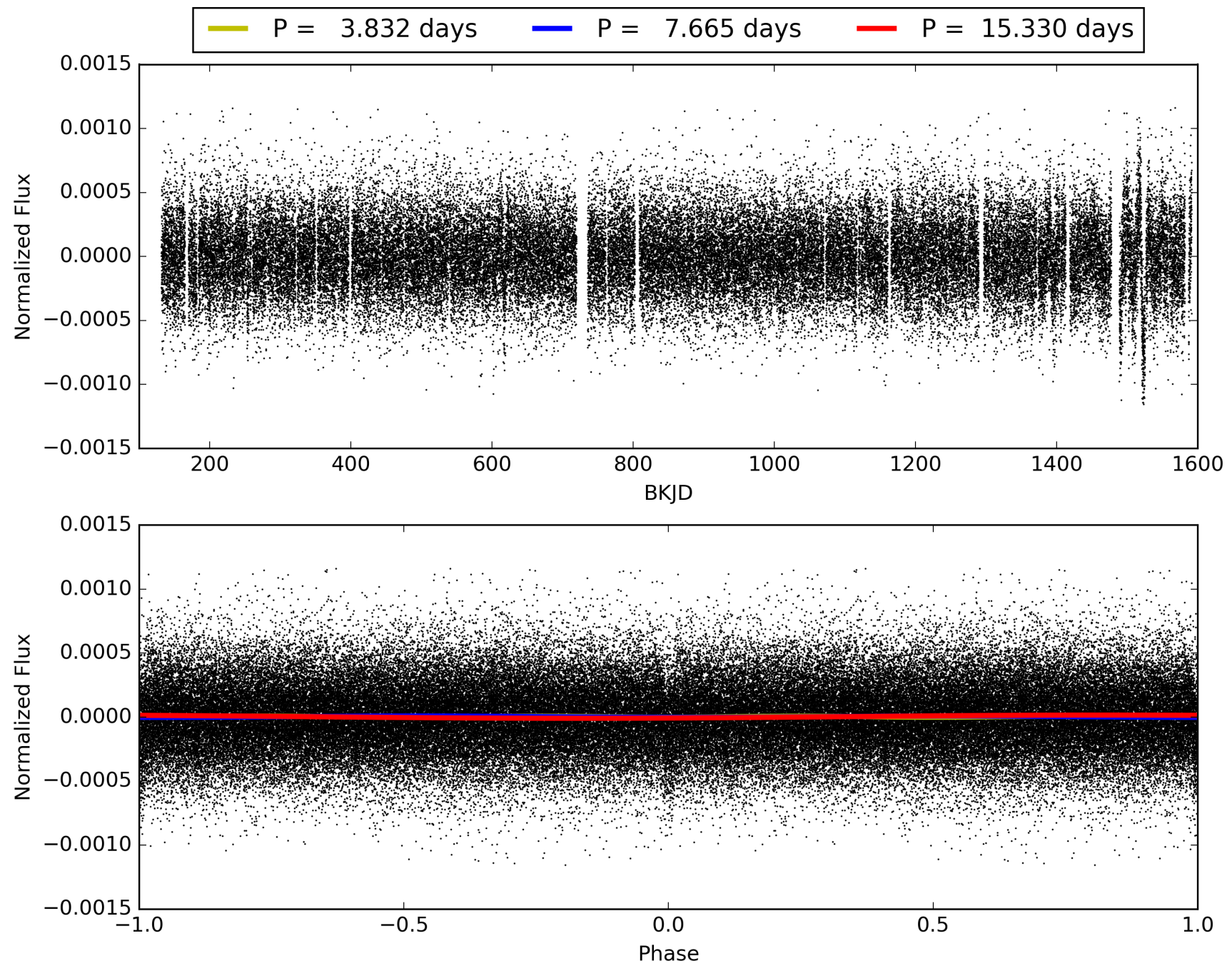
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.07σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.11e-24
RollingBand-fgt: 1.00 [130/130]
GhostDiagnostic-chr: -5.951
Centroid-sig: 24.0%
Centroid-so: 1.589 arcsec [1.31σ]
OotOffset-rm: 0.725 arcsec [0.58σ]
KicOffset-rm: 0.780 arcsec [0.61σ]
OotOffset-st: 3/1/4/2 [10]
KicOffset-st: 3/1/4/2 [10]
DiffImageQuality-fgm: 0.60 [6/10]
DiffImageOverlap-fno: 0.88 [15/17]

TCE 006871071-04, PDC Light Curves

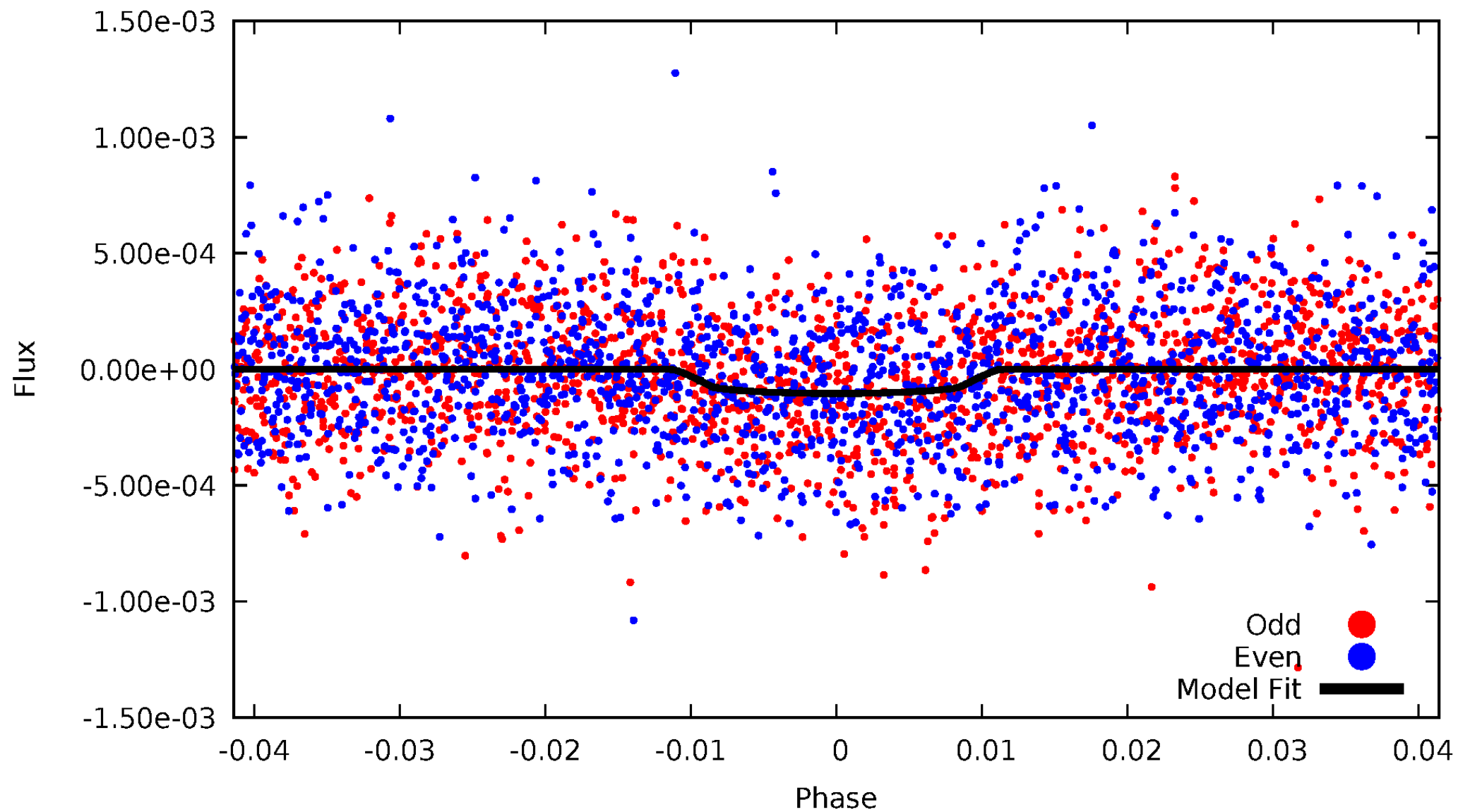


TCE 006871071-04



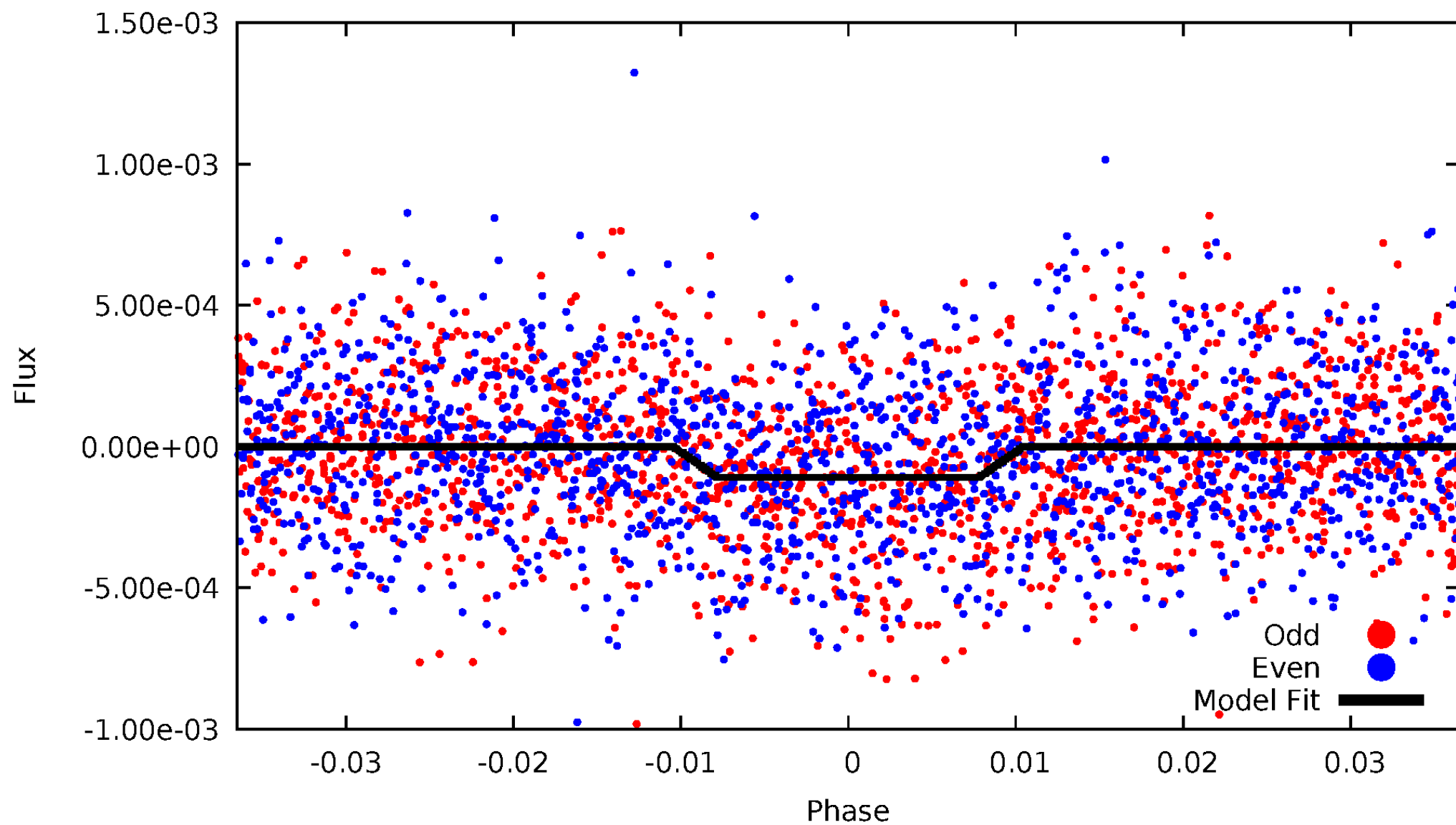
DV Odd/Even

TCE 006871071-04



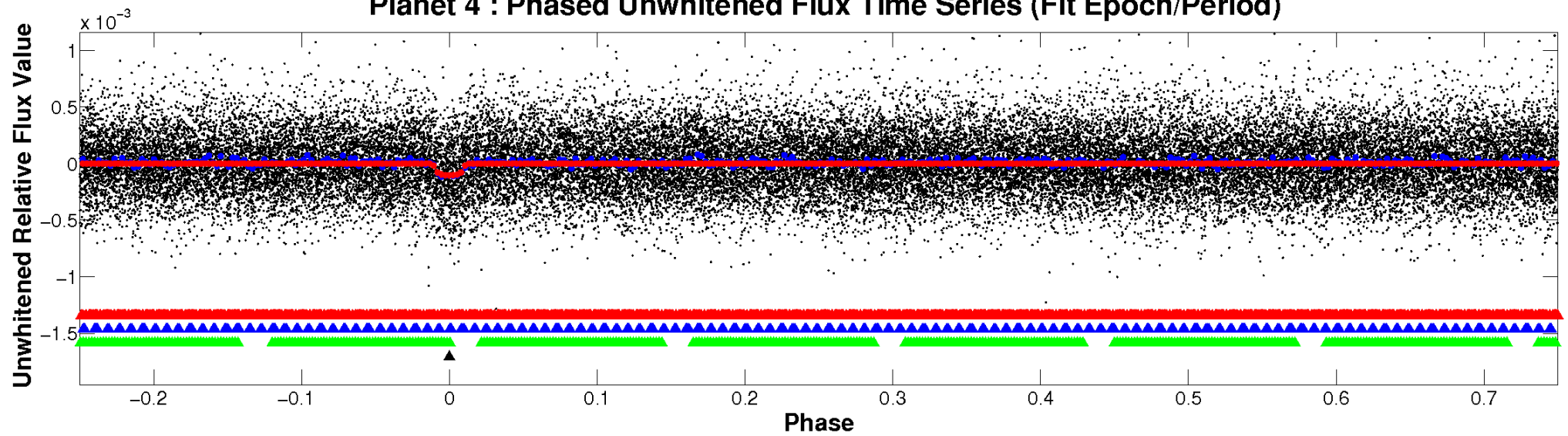
ALT Odd/Even

TCE 006871071-04

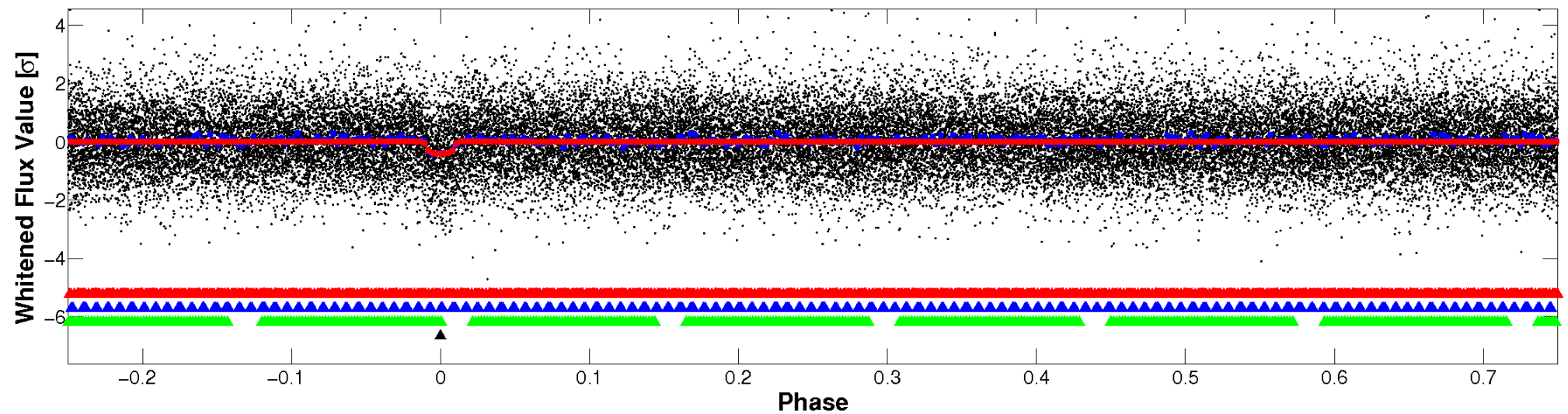


Non-Whitened Vs. Whitened Light Curve

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

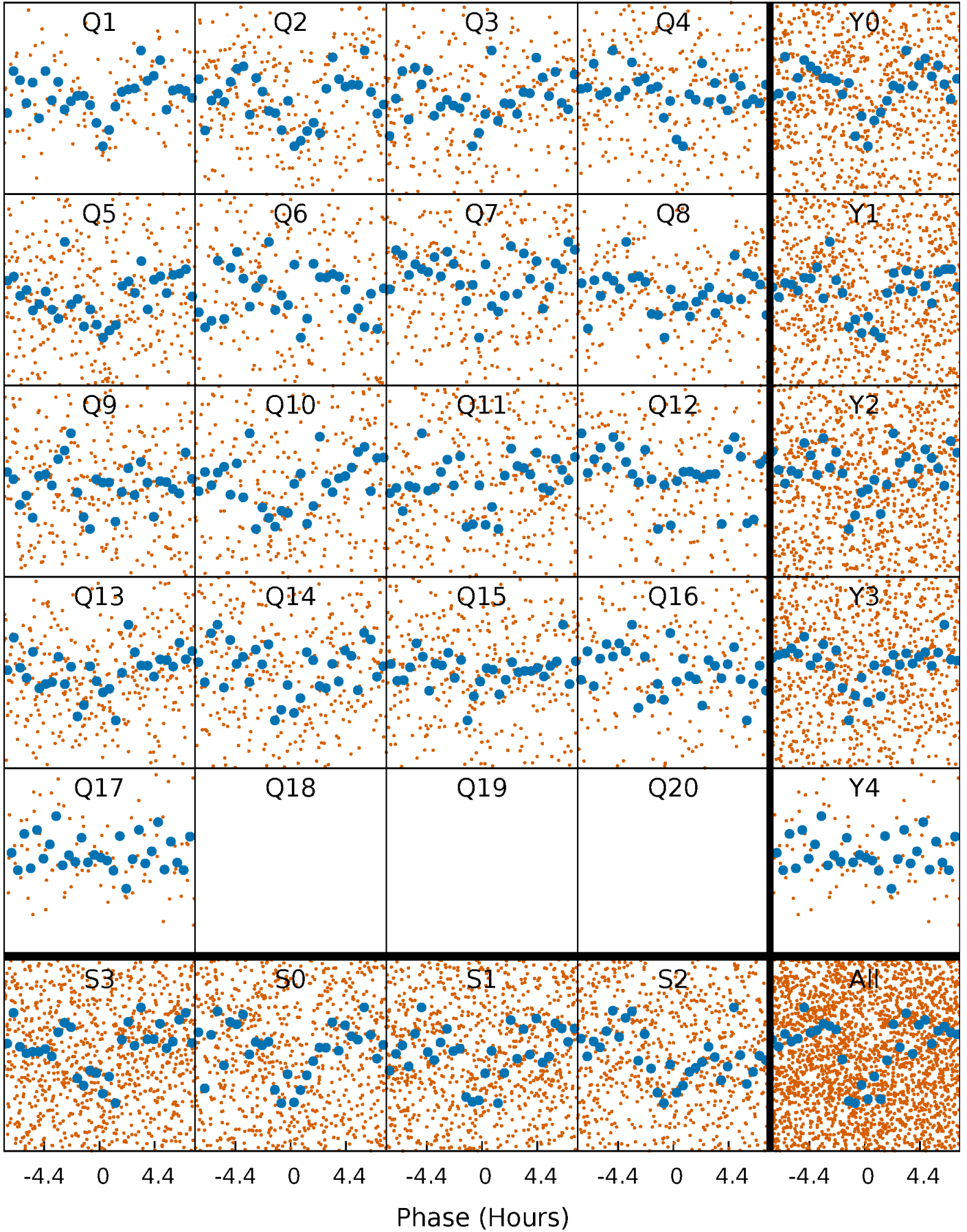


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



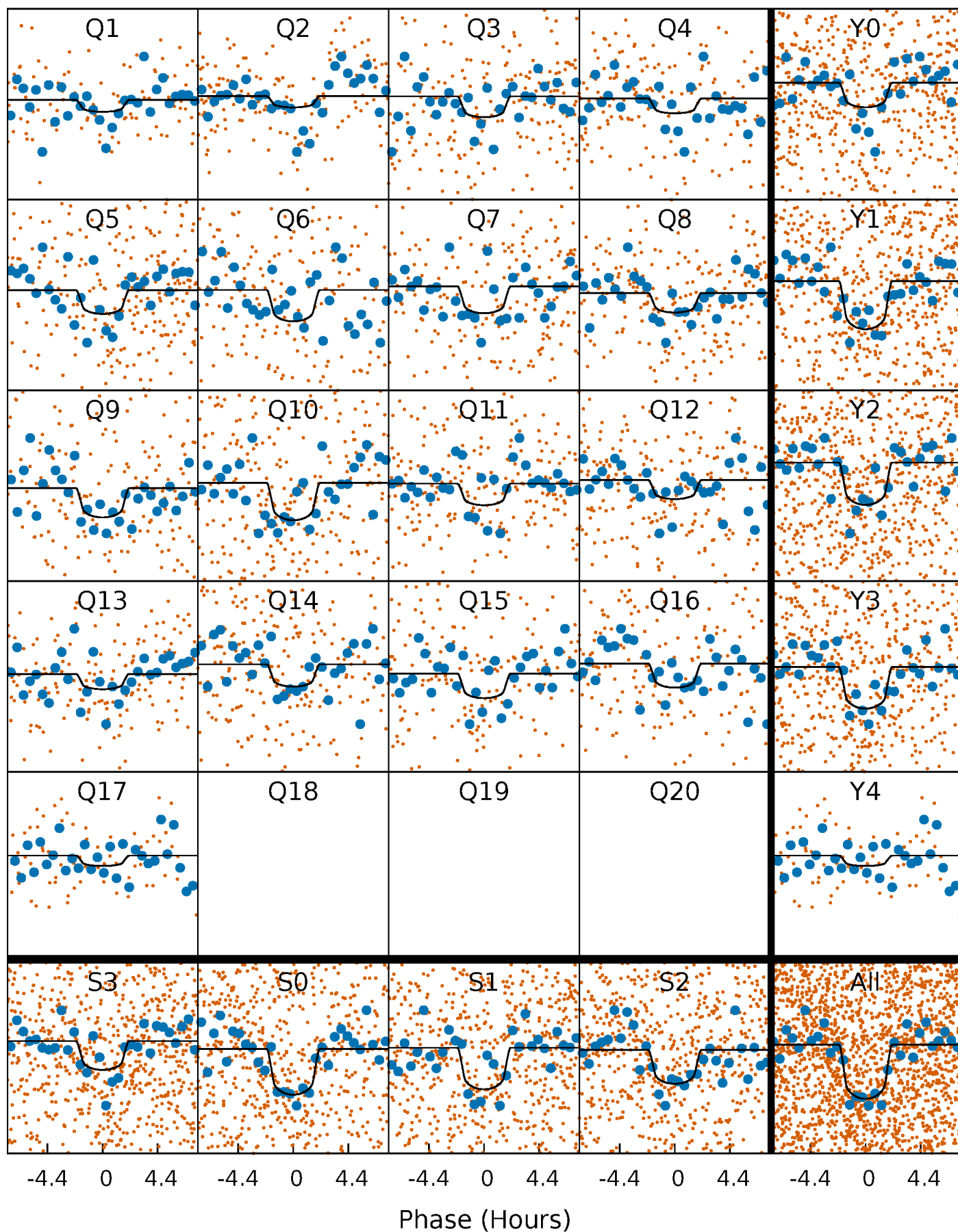
PDC Quarter-Phased Transit Curves

TCE 006871071-04 P= 7.664825 Days $T_0=137.361068$ (BKJD)



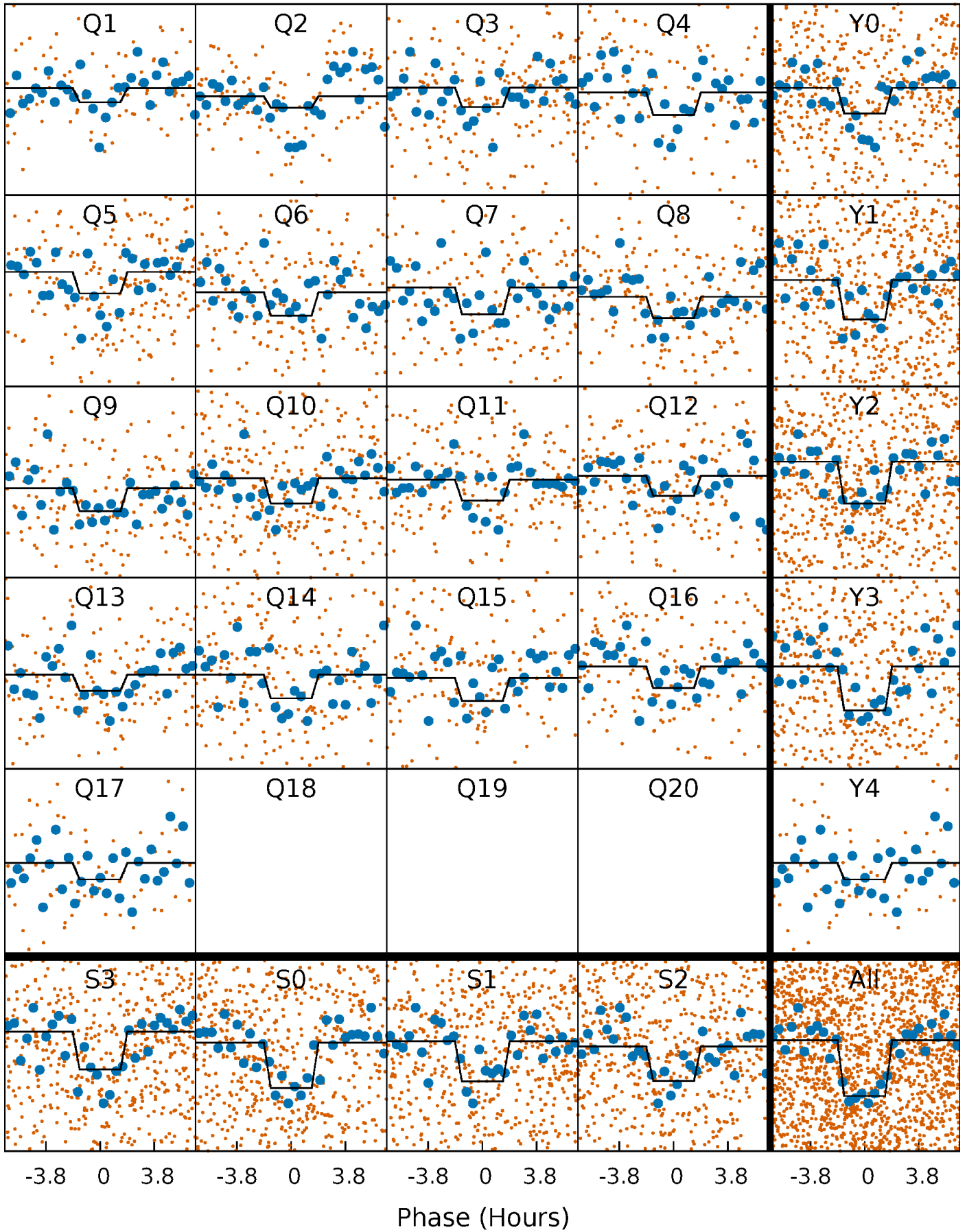
DV Quarter-Phased Transit Curves

TCE 006871071-04 P= 7.664825 Days $T_0=137.361068$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

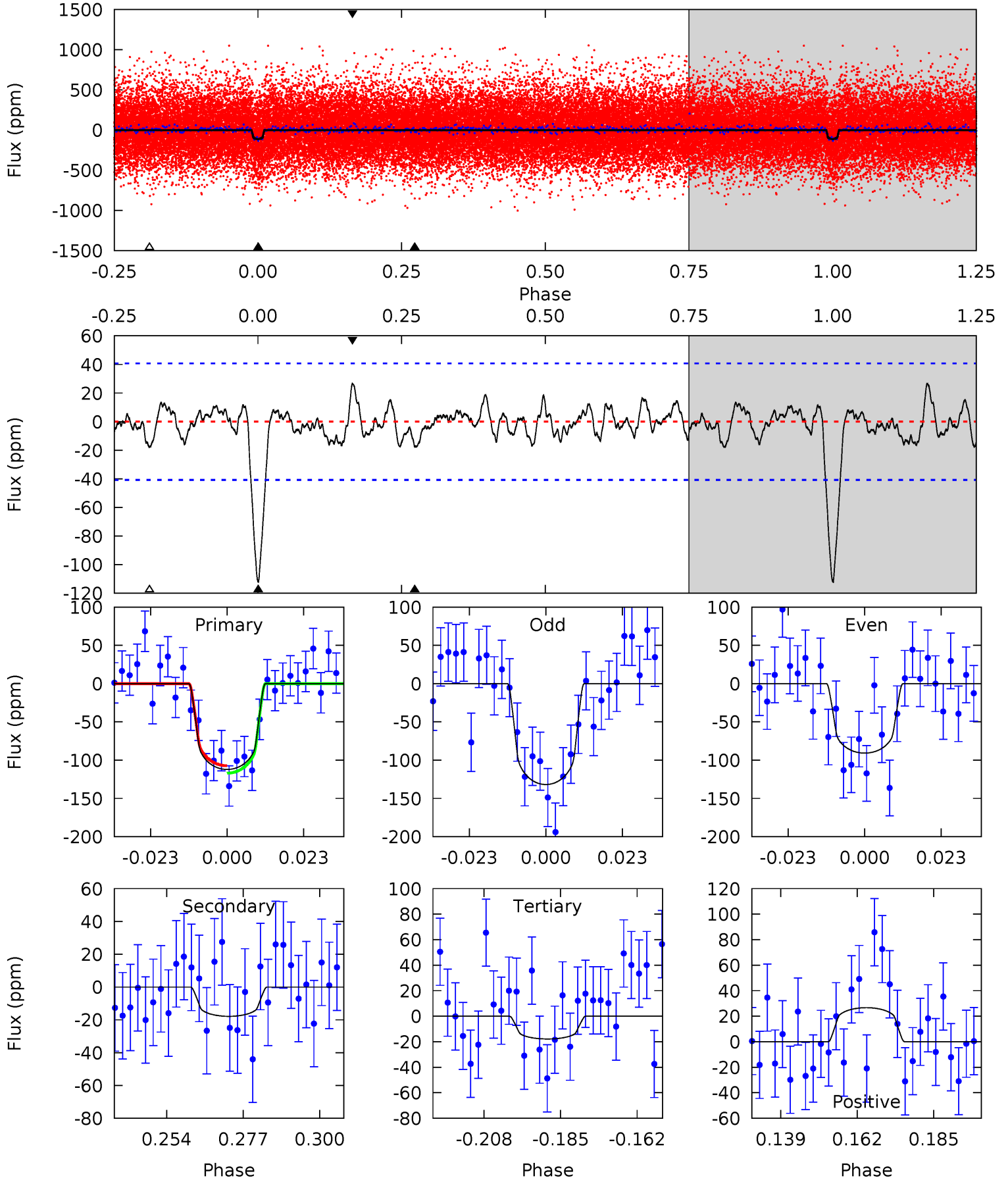
TCE 006871071-04 P= 7.664667 Days $T_0=137.378350$ (BKJD)



DV Model-Shift Uniqueness Test

006871071-04, P = 7.664825 Days, E = 129.696243 Days

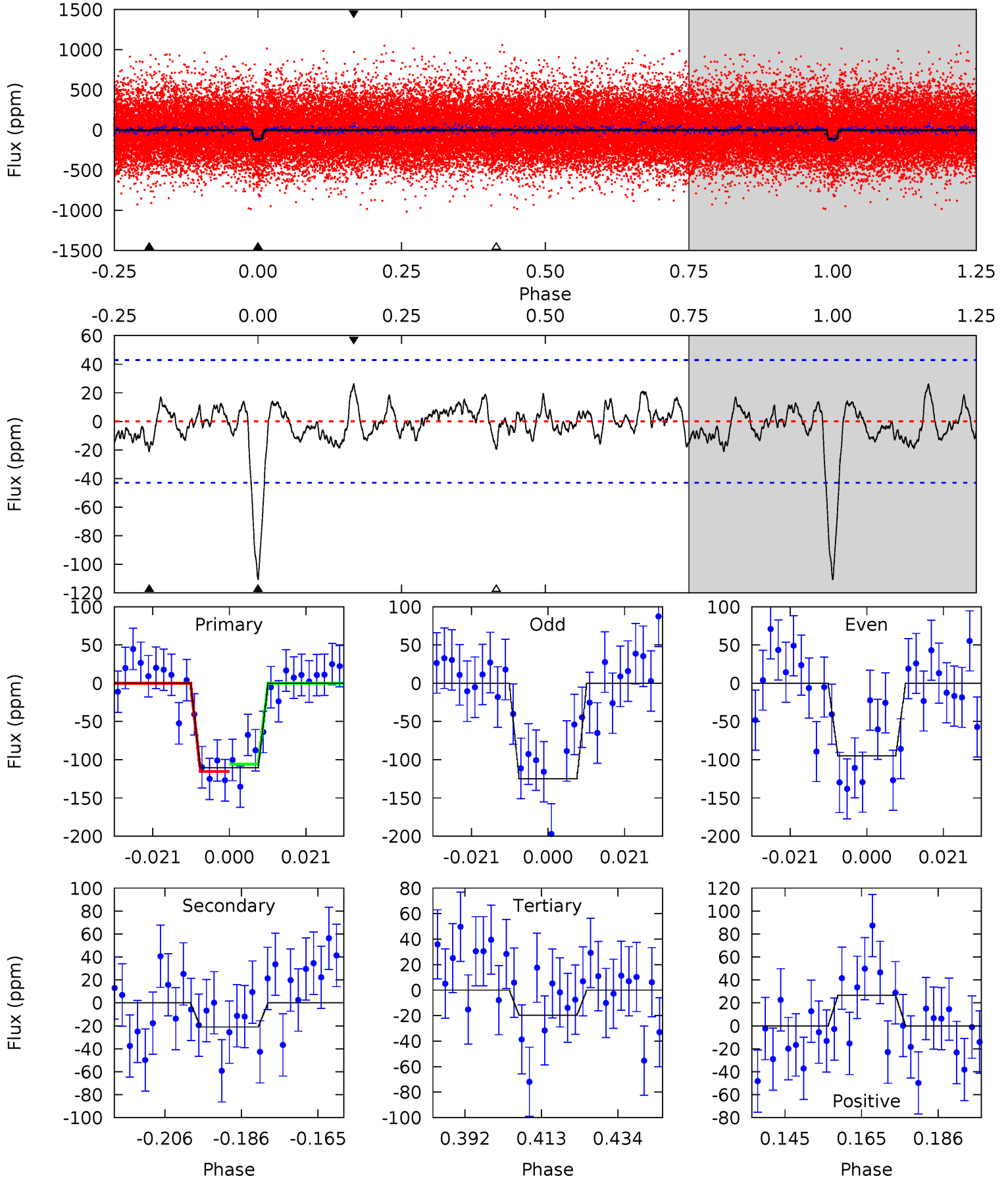
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.4	2.13	2.13	3.19	4.86	2.27	0.97	11.3	10.2	0.00	-1.05	2.45	0.99	0.19	0.58



Alt Model-Shift Uniqueness Test

006871071-04, P = 7.664667 Days, E = 129.713683 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.6	2.39	2.25	3.01	4.89	2.31	1.00	10.3	9.56	0.14	-0.62	1.70	0.95	0.19	0.54



Stellar Parameters For KIC 006871071

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5640^{+85}_{-77}	$4.087^{+0.203}_{-0.087}$	$0.140^{+0.150}_{-0.150}$	$1.515^{+0.236}_{-0.353}$	$1.024^{+0.093}_{-0.084}$	$0.415^{+0.420}_{-0.131}$
	+2%/-1%	+5%/-2%	+107%/-107%	+16%/-23%	+9%/-8%	+101%/-32%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 006871071-04 / KOI 2220.04

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-18 ± 8	$1.93^{+1.37}_{-1.06}$	1534^{+71}_{-96}	3696^{+1370}_{-636}	15^{+60}_{-11}
Alt.	-21 ± 9	$1.82^{+1.28}_{-1.07}$	1535^{+61}_{-97}	3887^{+1626}_{-667}	20^{+104}_{-13}

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

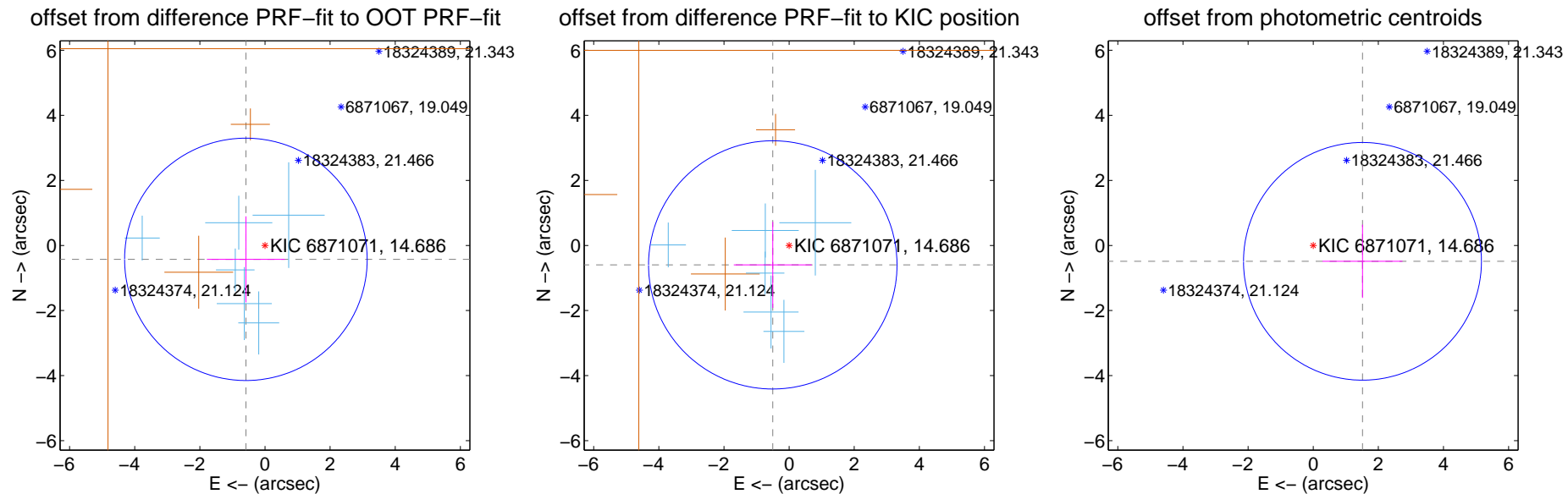
DV Centroid Data

Supplemental centroid analysis for 006871071-04. Kepler magnitude: 14.69. Transit SNR 10.03

There are 6 quarters with good PRF difference image offsets

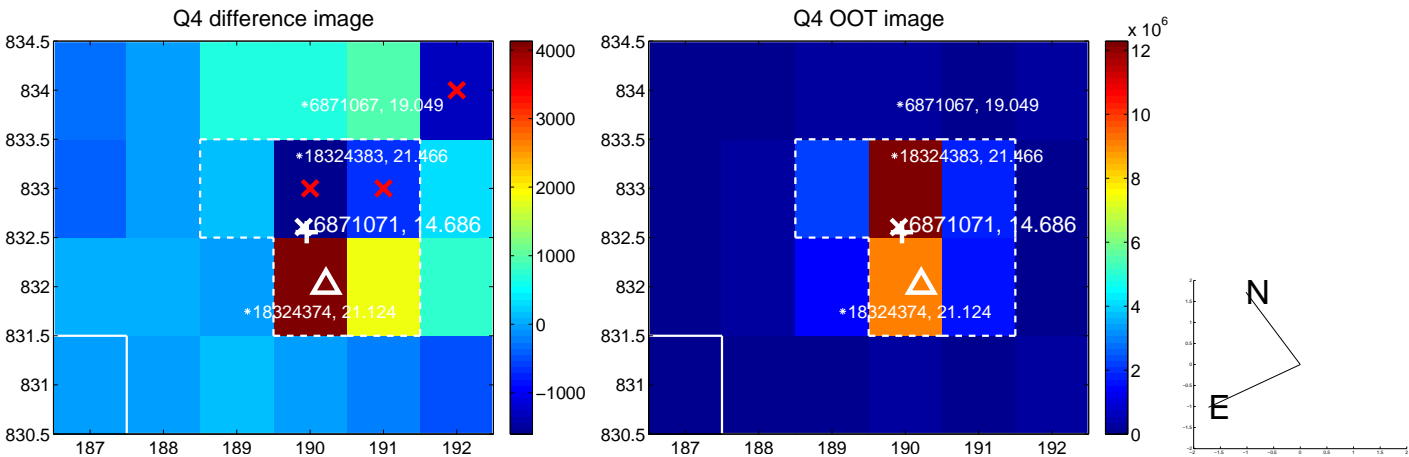
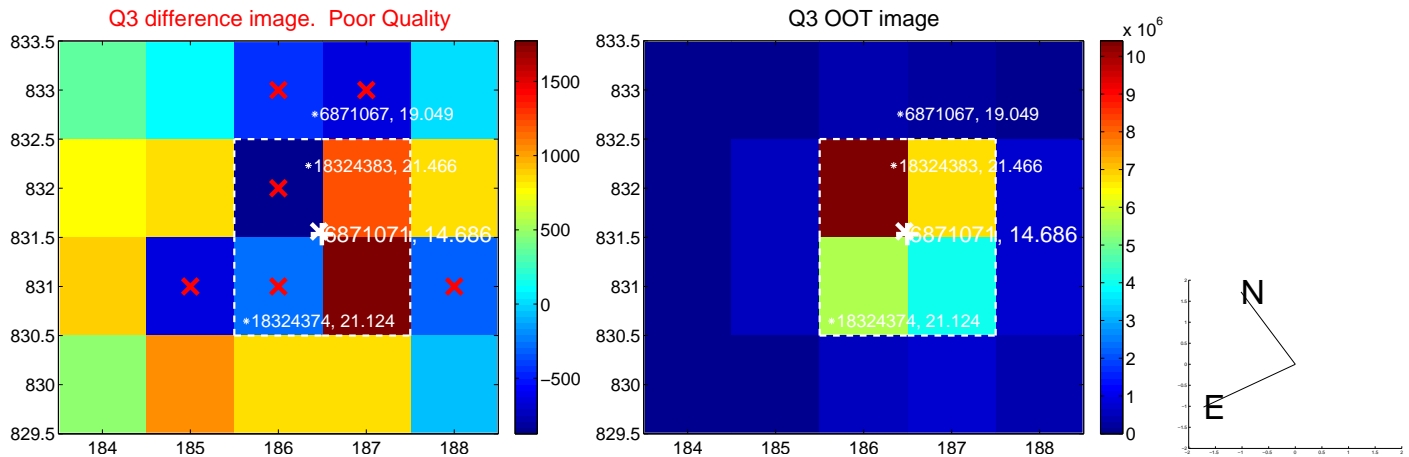
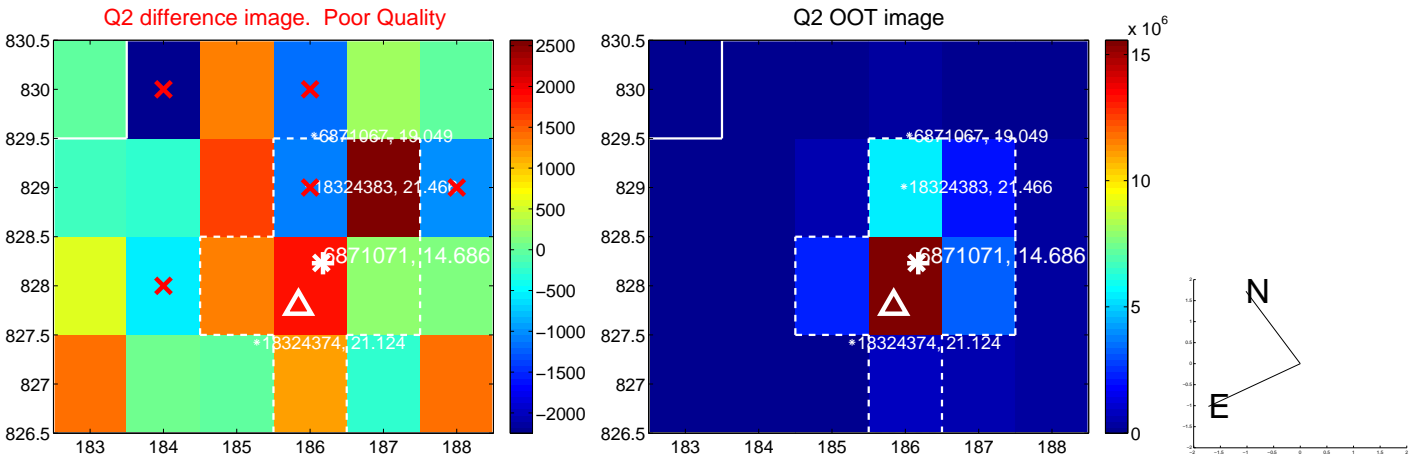
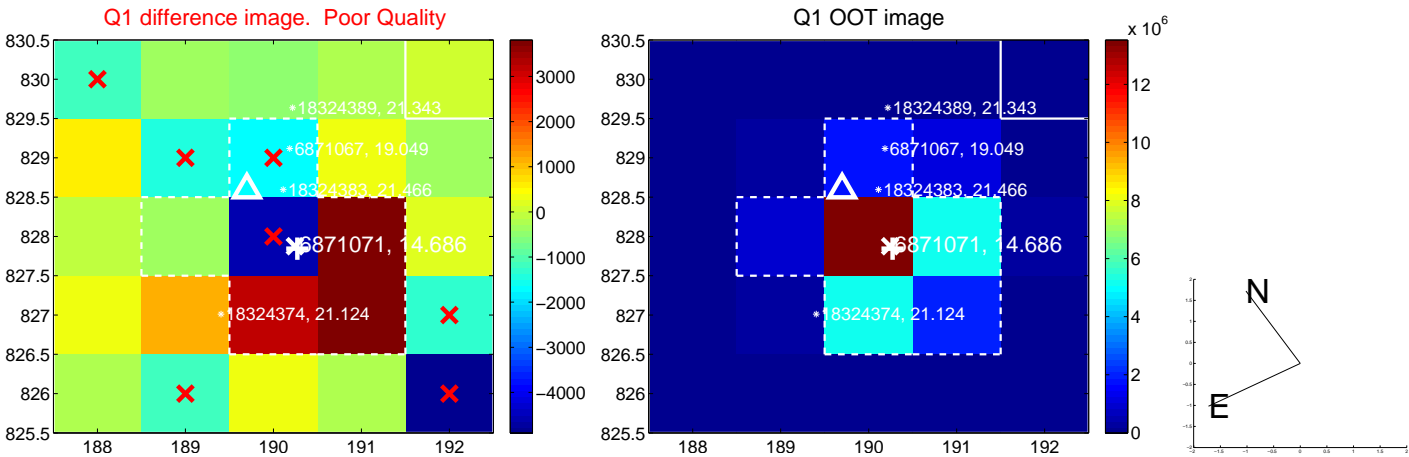
The direct PRF centroid is offset from the target star catalog position by about 0.24 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.725 ± 1.242	0.58	0.587 ± 1.197	-0.427 ± 1.322
PRF-fit source offset from KIC position	0.780 ± 1.272	0.61	0.501 ± 1.197	-0.598 ± 1.322
photometric centroid source offset	1.59 ± 1.22	1.31	-1.51 ± 1.23	-0.49 ± 1.13

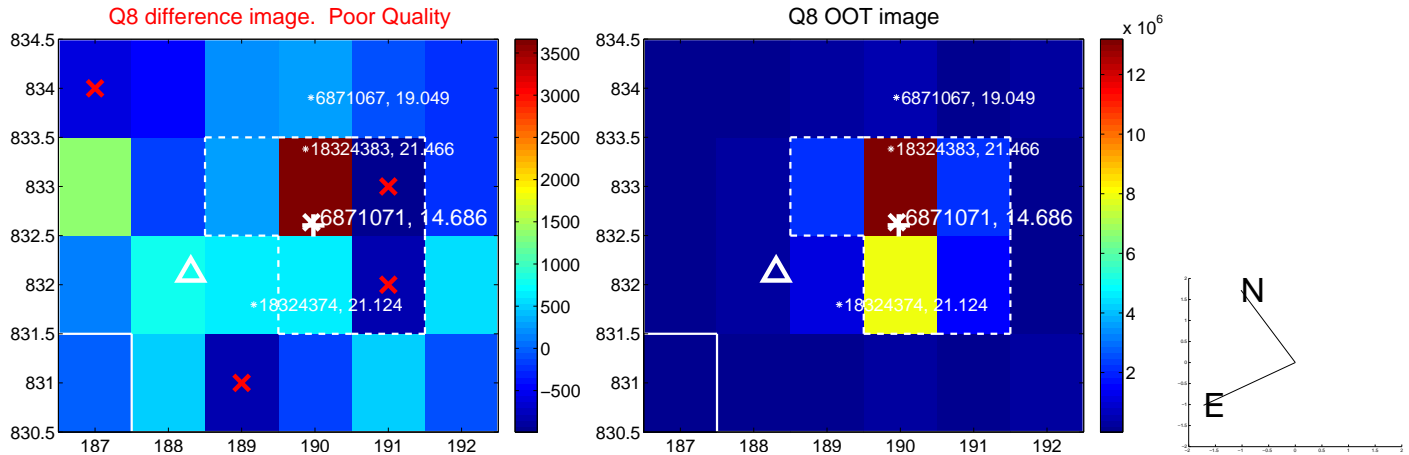
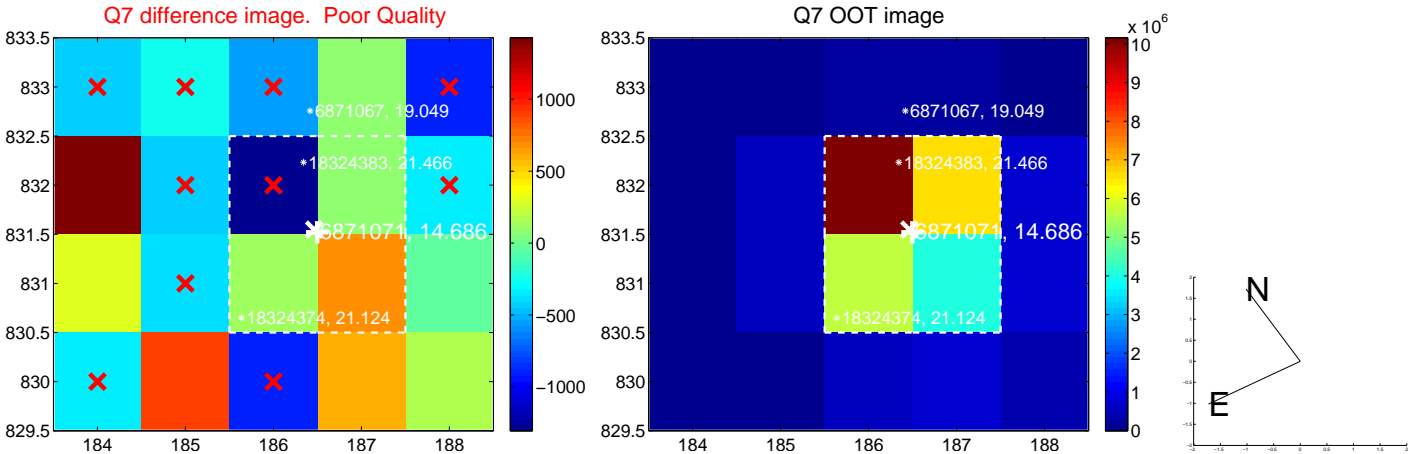
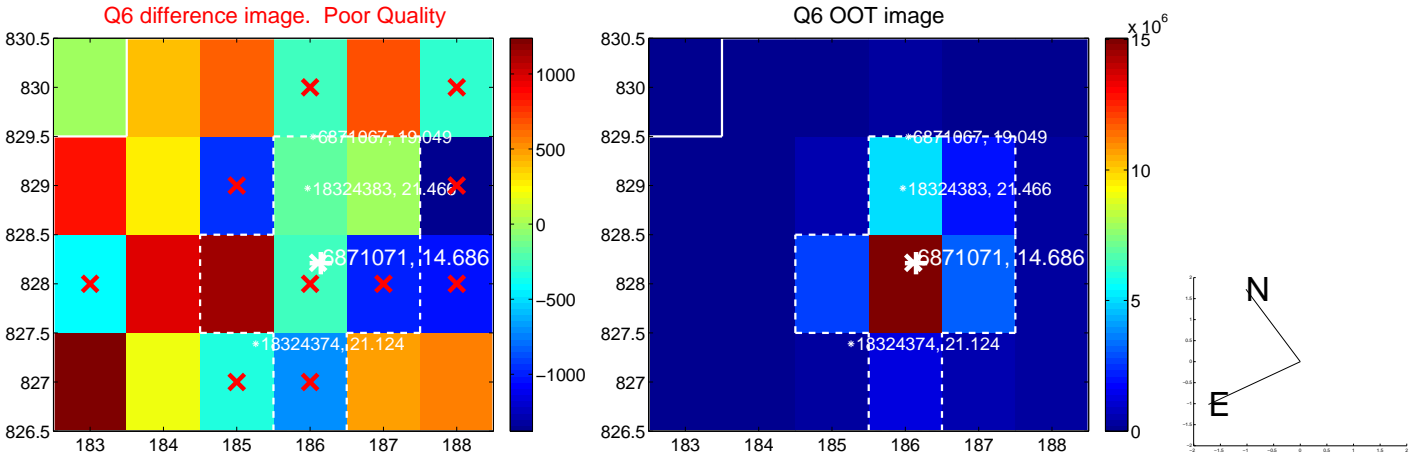
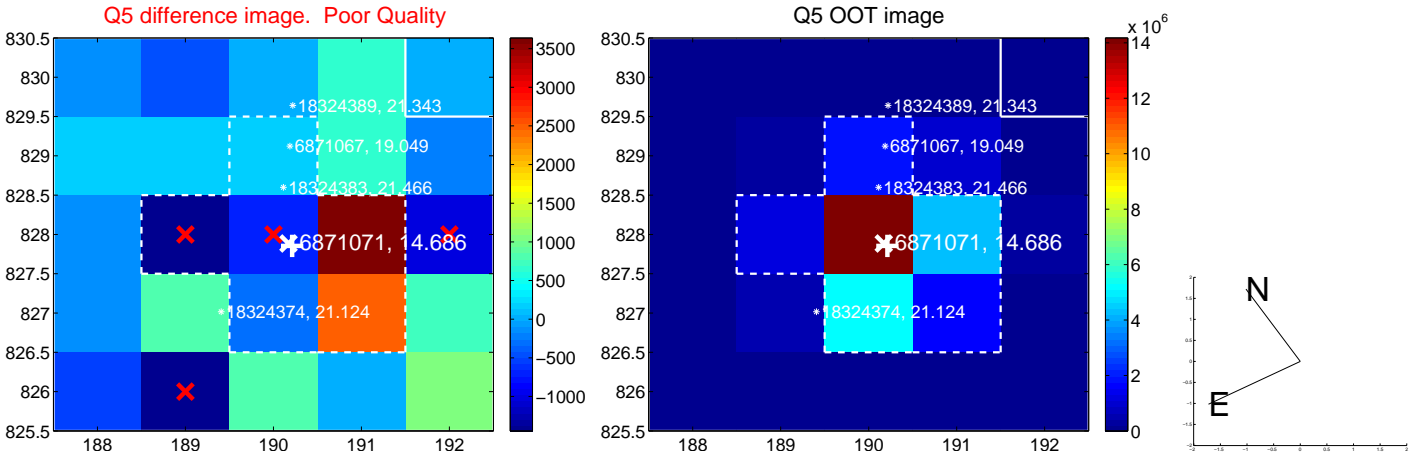


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

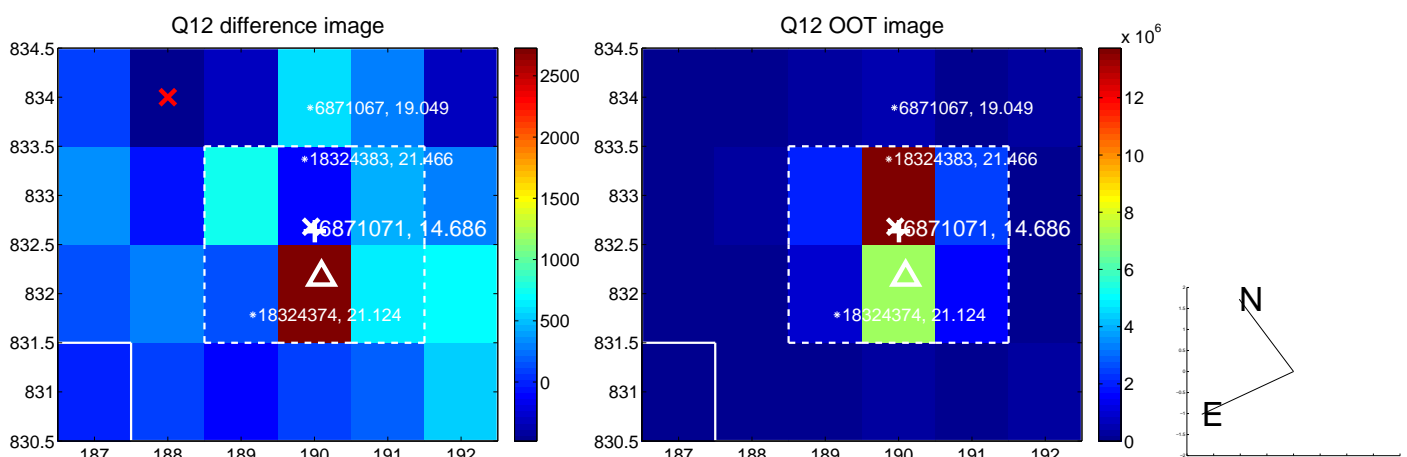
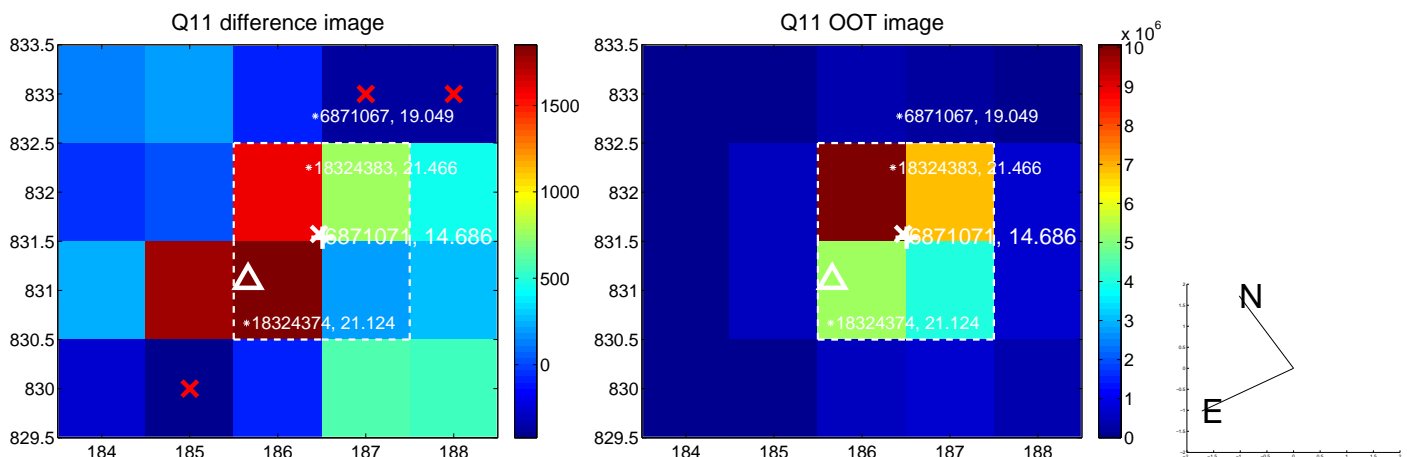
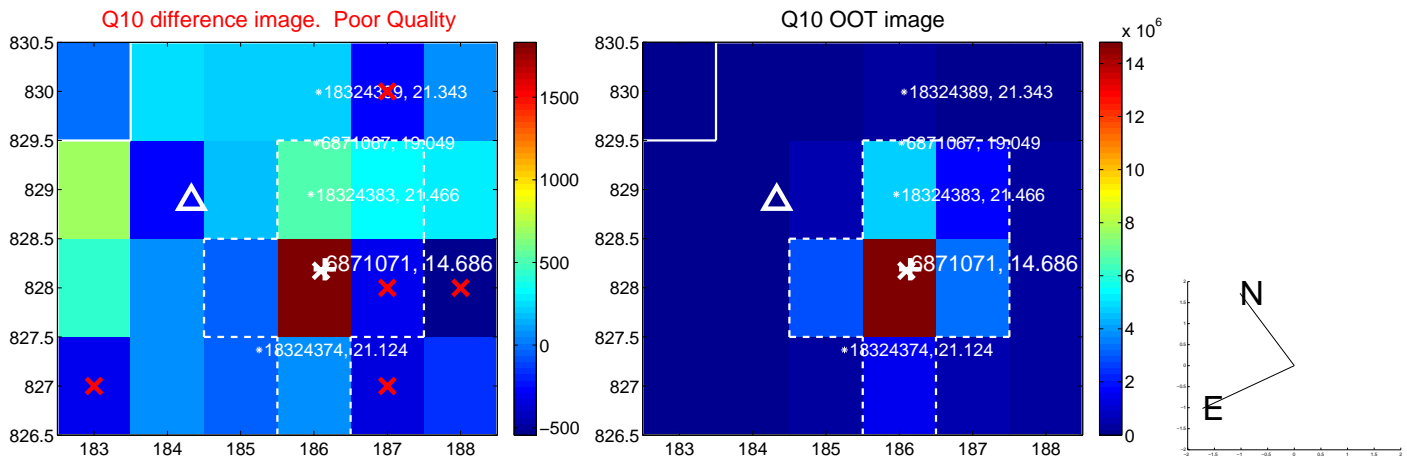
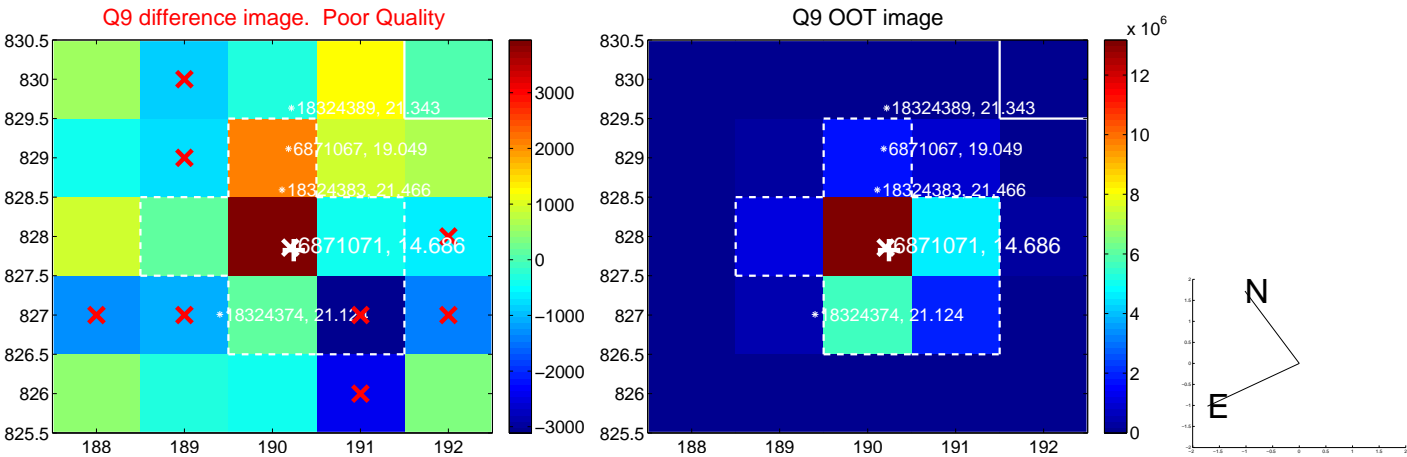
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



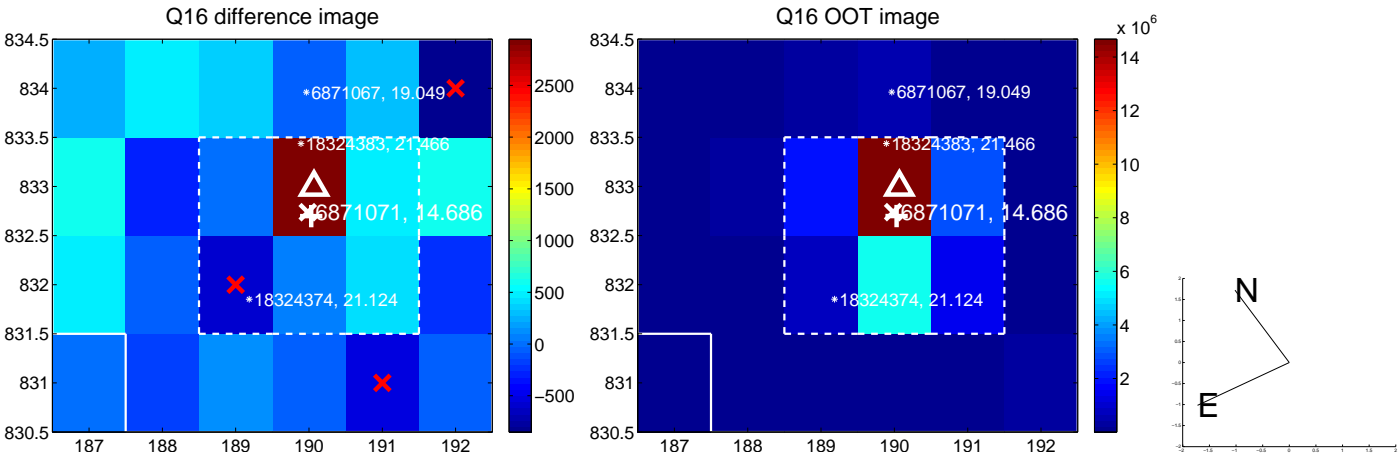
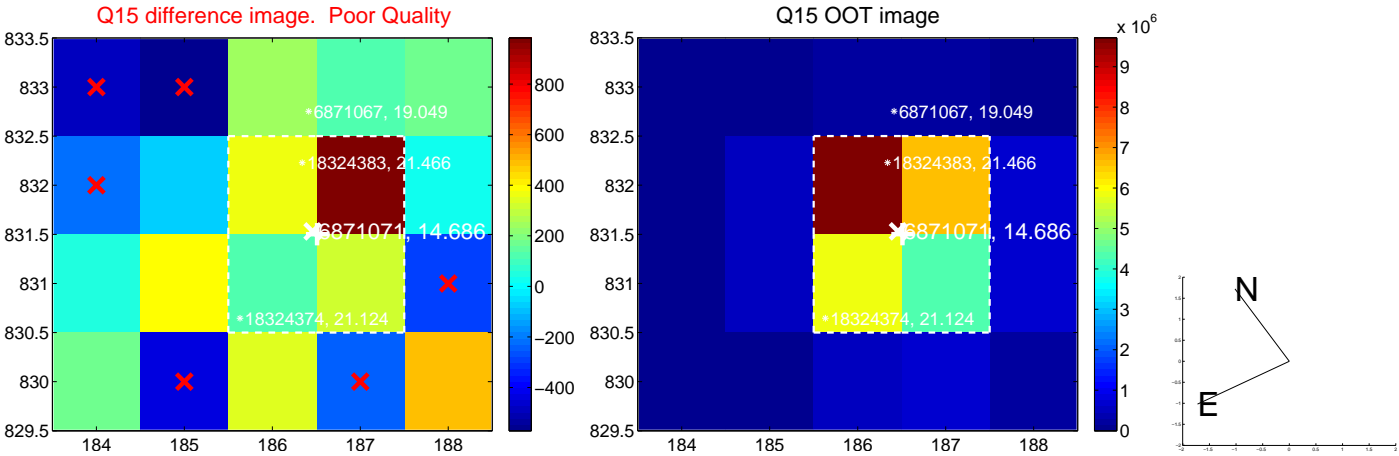
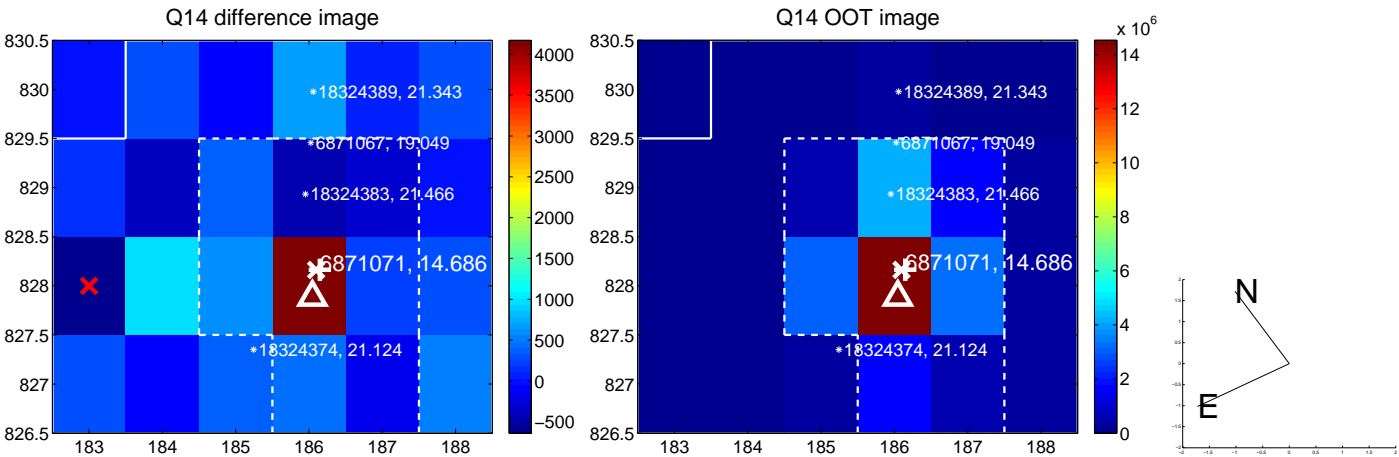
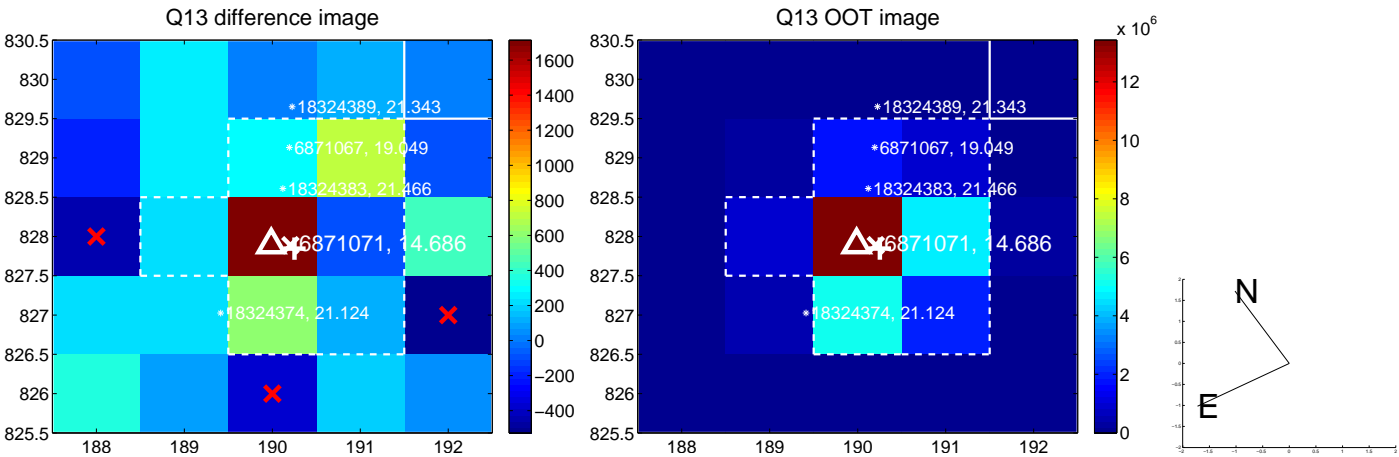
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



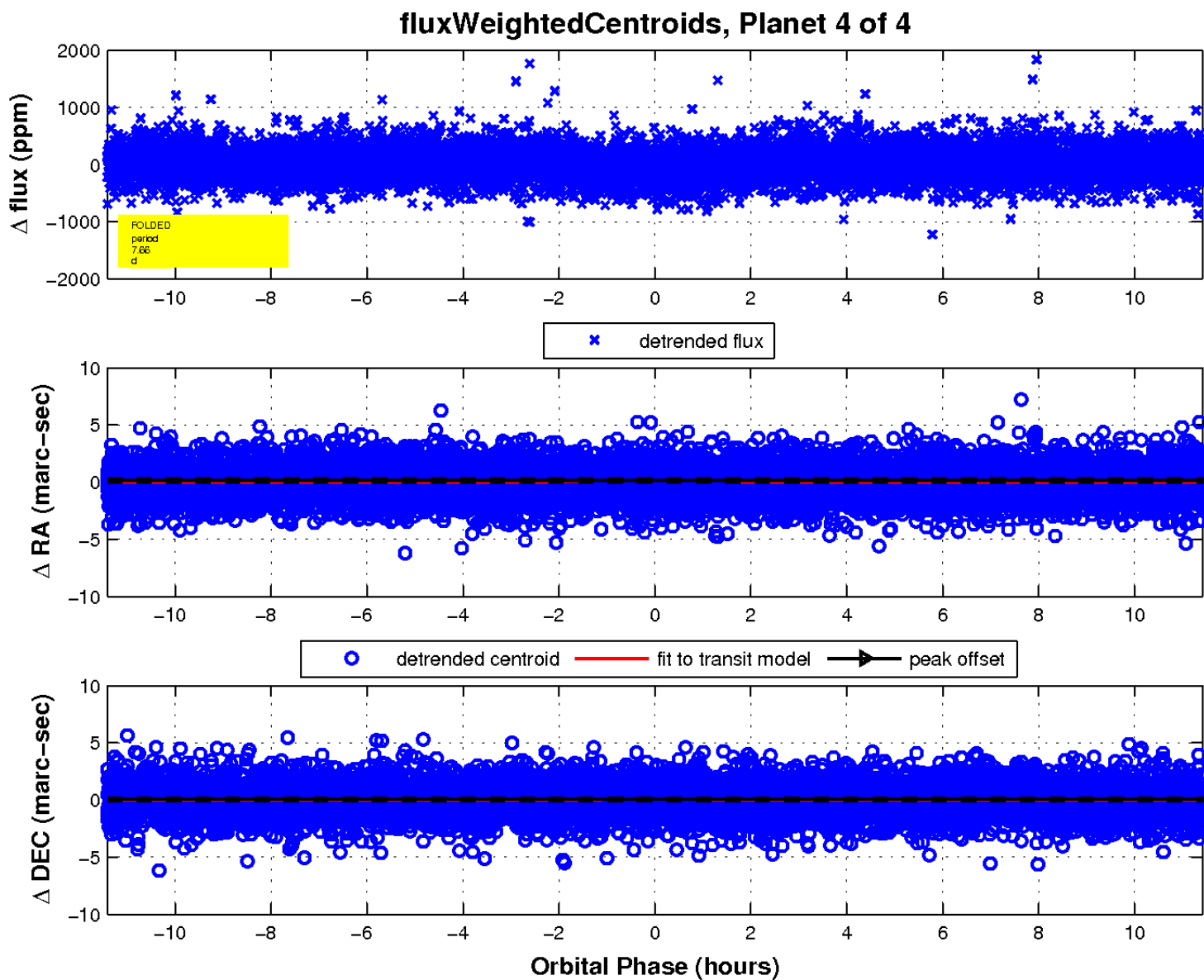
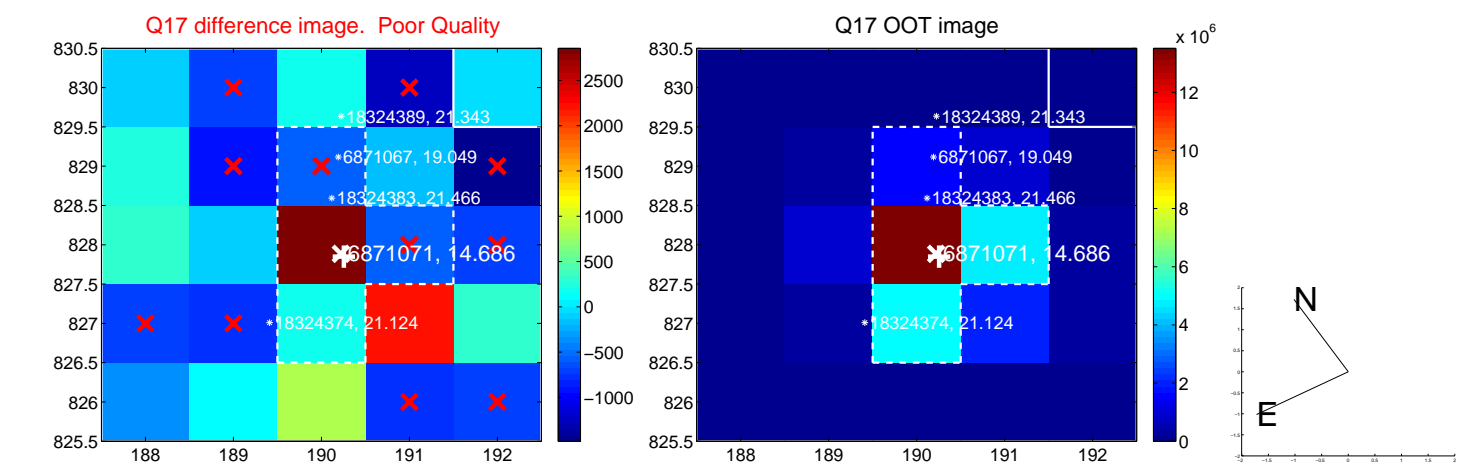
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

