

KIC 004860678

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})
004860678-01	OBS	1602.01	9.977214	137.233447	241.5	6.023	18.6	19.3	1.62	5557	2.75	264.57
004860678-02	OBS	1602.02	3.033585	133.084486	91.1	4.080	10.4	10.8	1.62	5557	1.83	1294.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004860678-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
004860678-02	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.

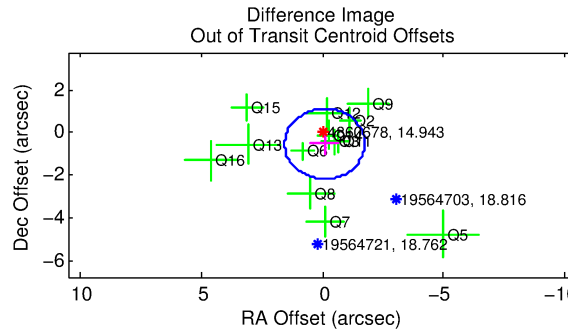
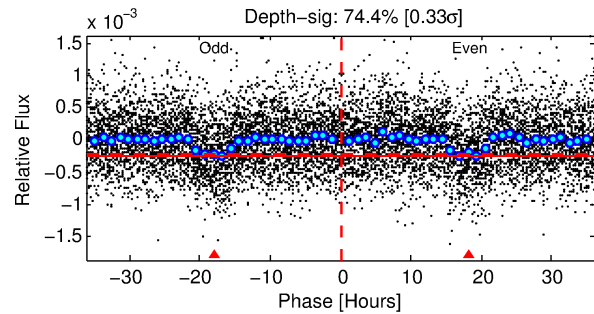
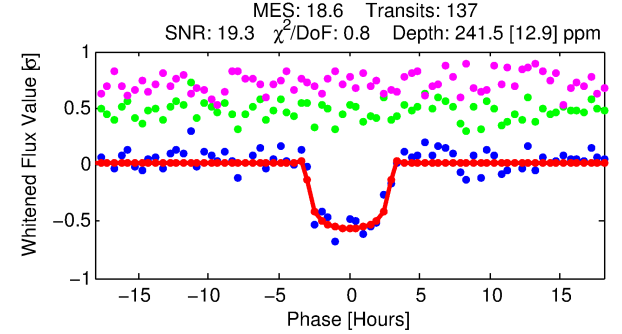
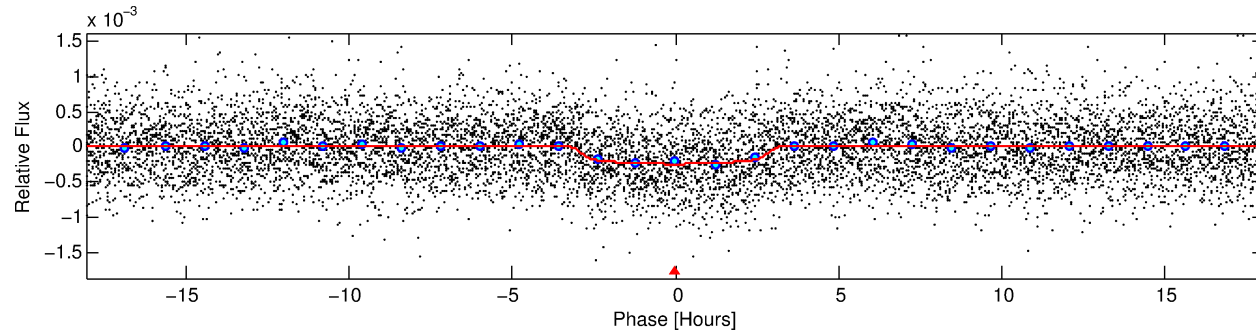
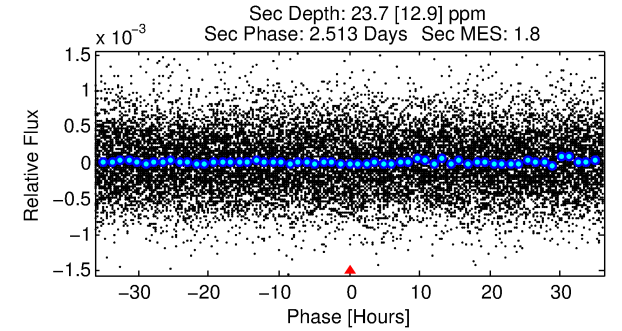
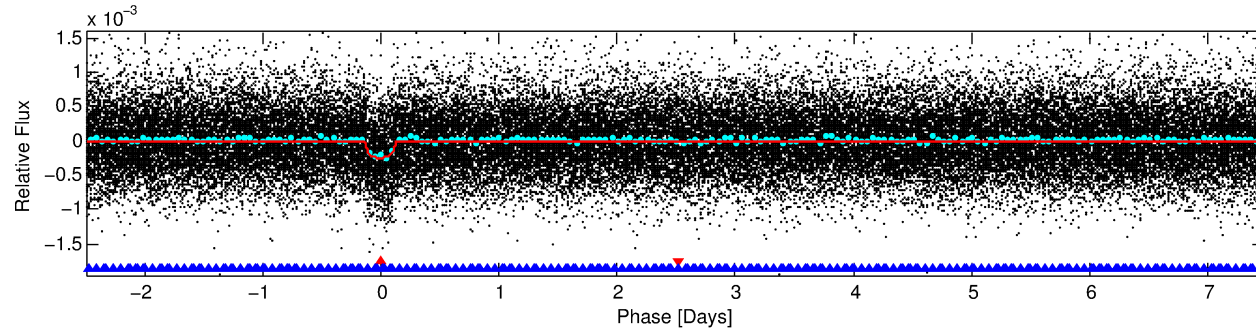
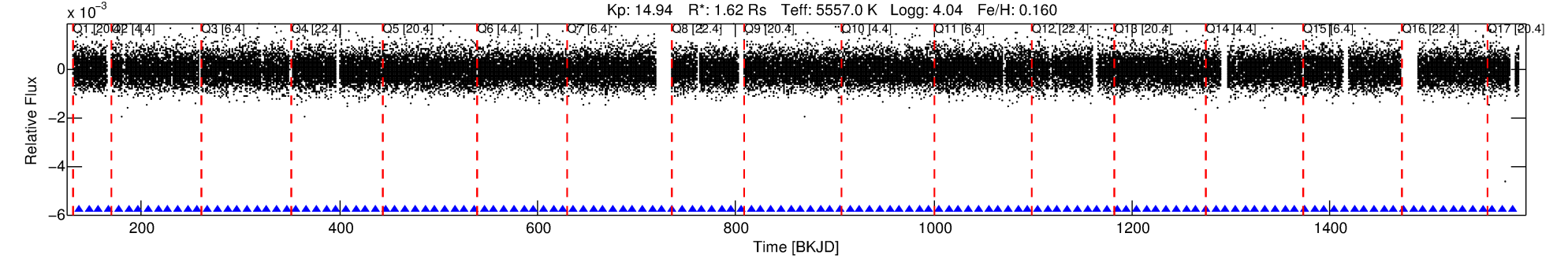
Ephemeris Match Information For 004860678-01

No Significant Match Found

DV One-Page Summary

KIC: 4860678 Candidate: 1 of 2 Period: 9.977 d

KOI: K01602.01 Corr: 0.993



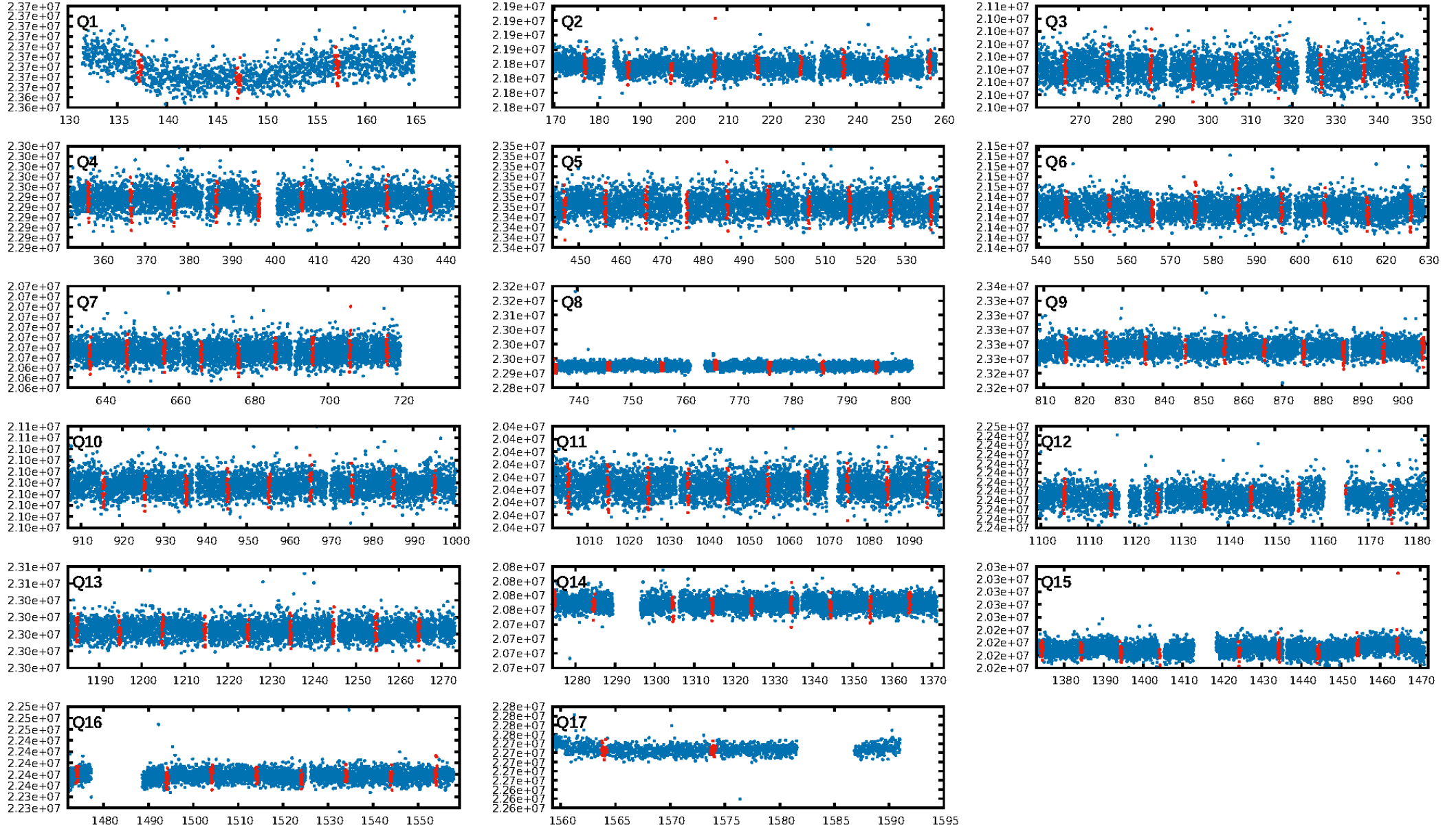
DV Fit Results:

Period = 9.97721 [0.00007] d
Epoch = 137.2334 [0.0058] BKJD
 R_p/R^* = 0.0156 [0.0067]
 a/R^* = 8.45 [14.84]
 b = 0.77 [0.96]
 T_{eff} = 264.57 [97.75]
 T_{eq} = 1028 [95] K
 R_p = 2.75 [1.37] R_e
 a = 0.0918 [0.0215] AU
 A_g = 14.49 [15.64] [0.86 σ]
 T_{effp} = 3102 [789] K [2.61 σ]

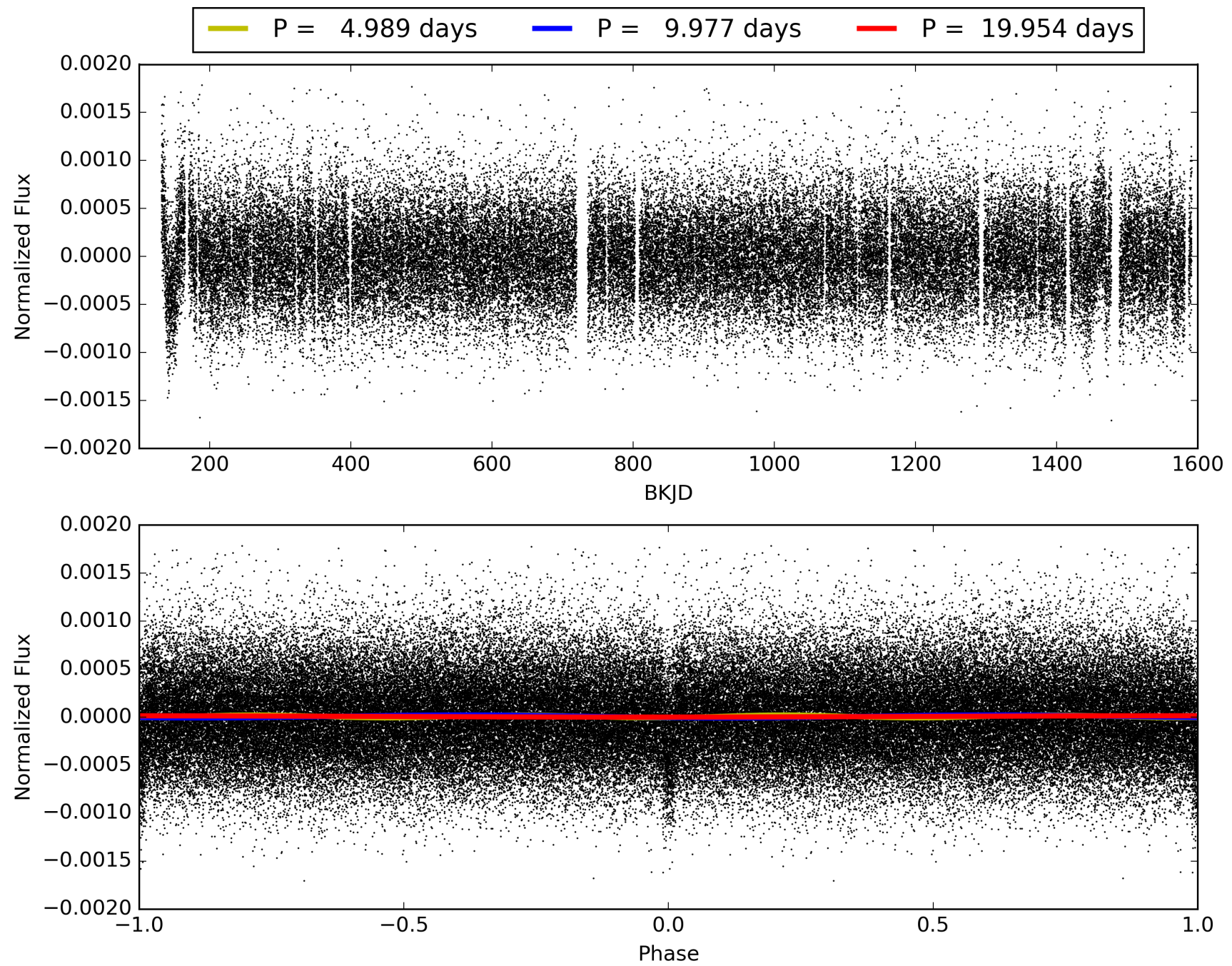
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [22.91 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.69e-75
RollingBand-fgt: 1.00 [132/132]
GhostDiagnostic-chr: -5.355
Centroid-sig: 37.3%
Centroid-so: 0.034 arcsec [0.05 σ]
OotOffset-rm: 0.534 arcsec [0.97 σ]
OotOffset-st: 3/4/3/3 [13]
KicOffset-rm: 0.722 arcsec [1.20 σ]
KicOffset-st: 3/4/3/3 [13]
DiffImageQuality-fgm: 0.62 [8/13]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 004860678-01, PDC Light Curves

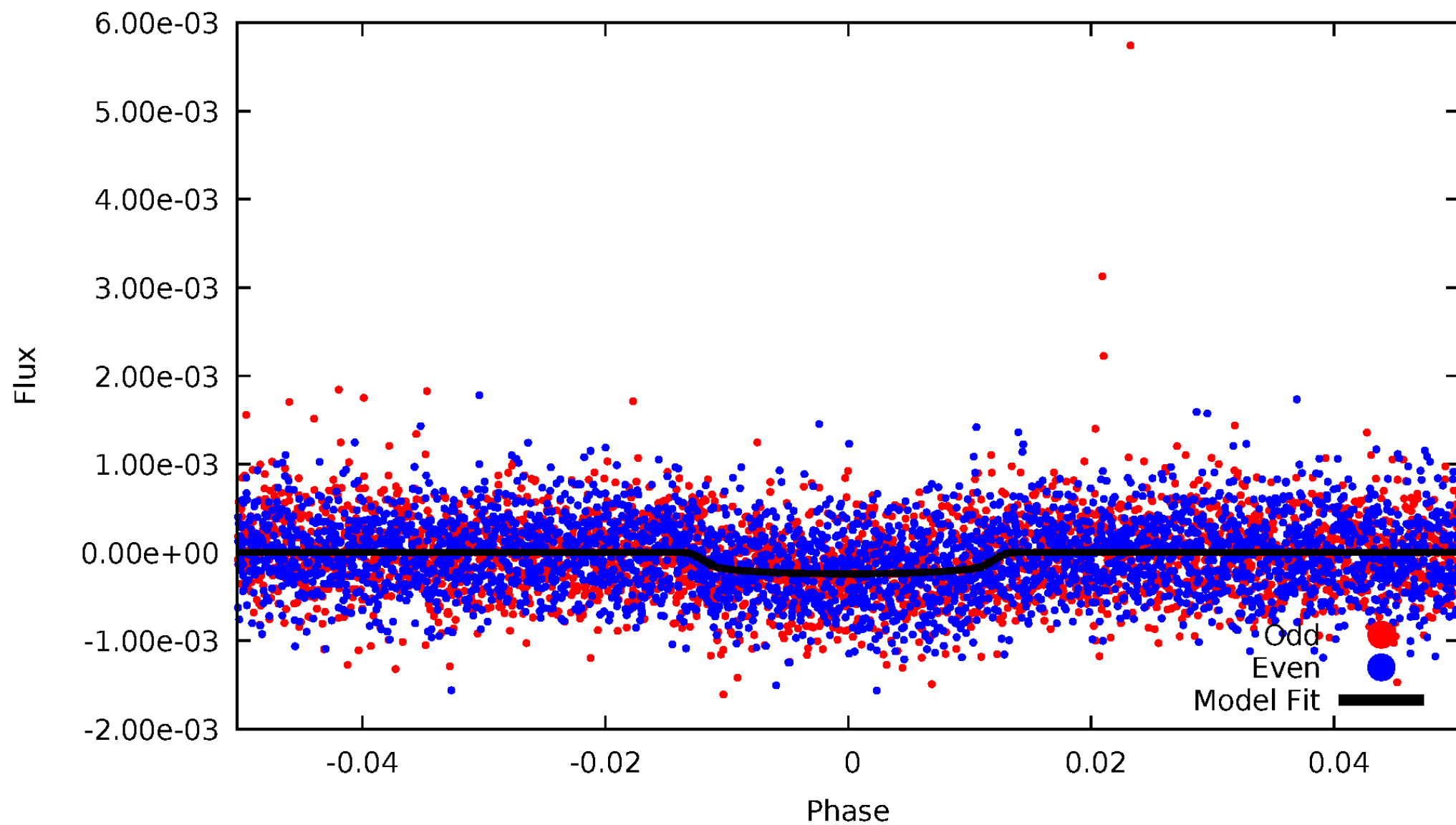


TCE 004860678-01



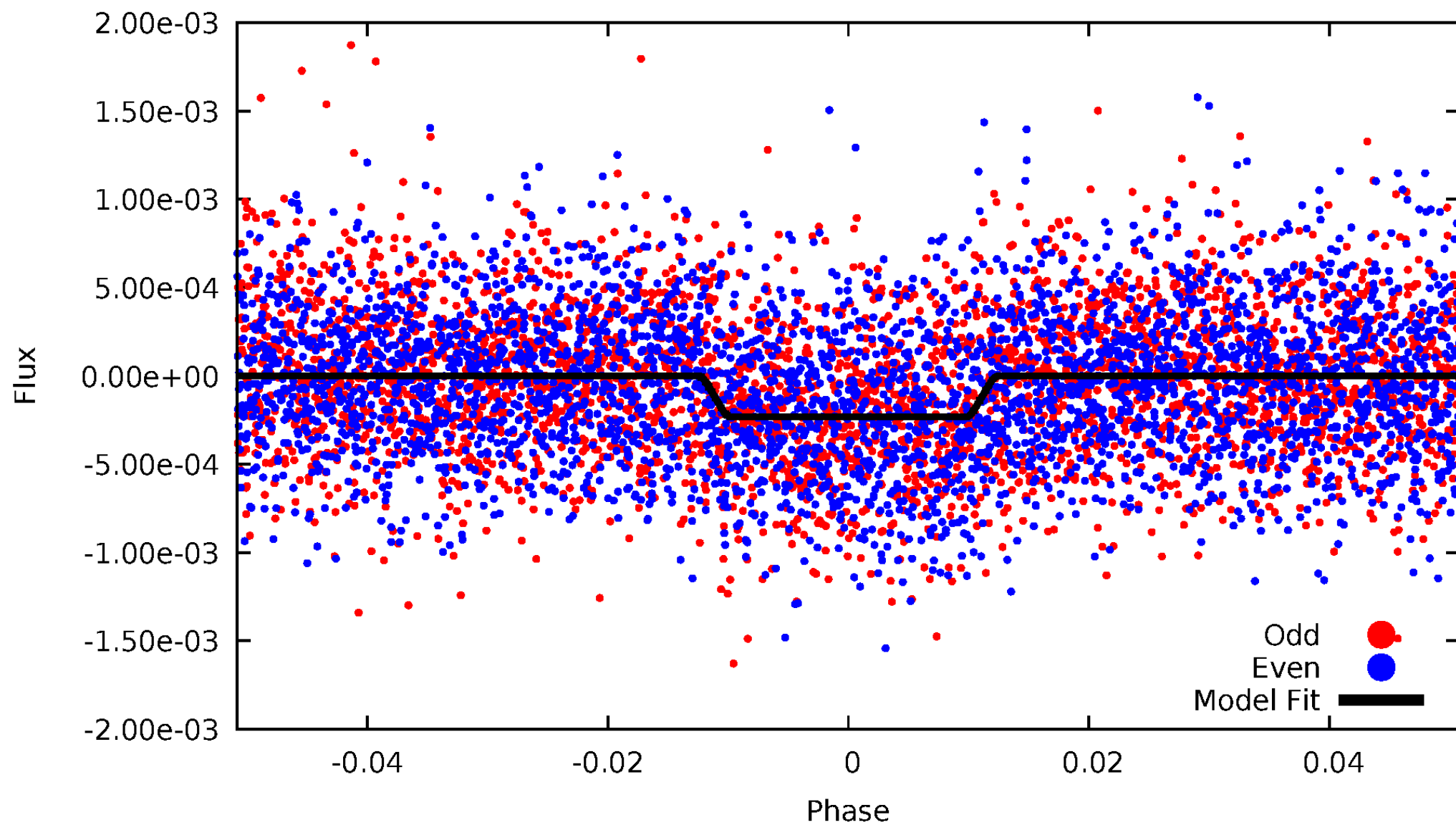
DV Odd/Even

TCE 004860678-01



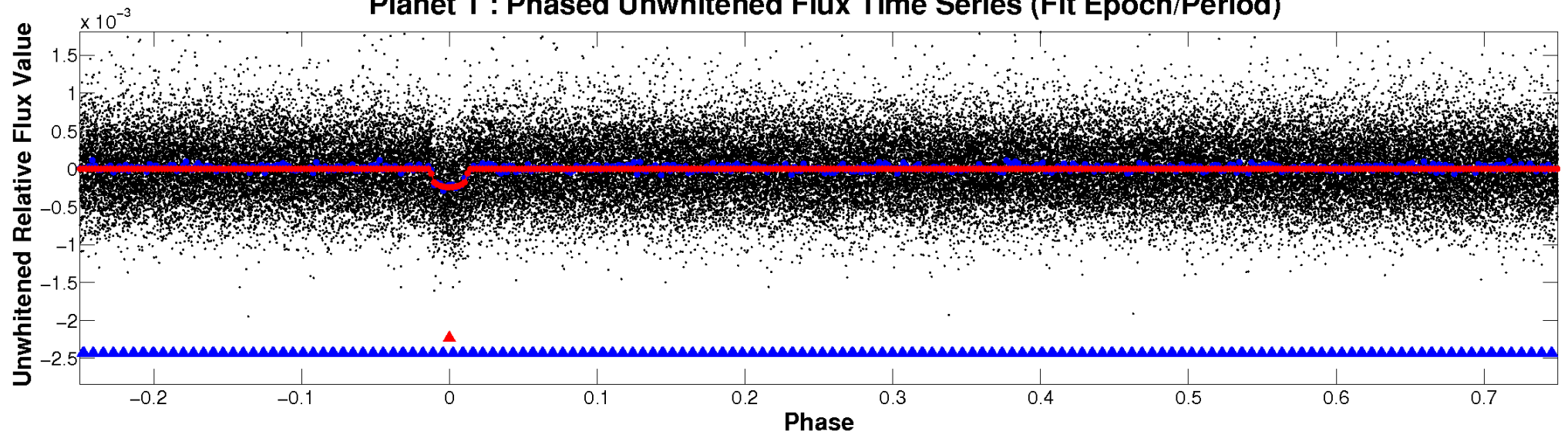
ALT Odd/Even

TCE 004860678-01

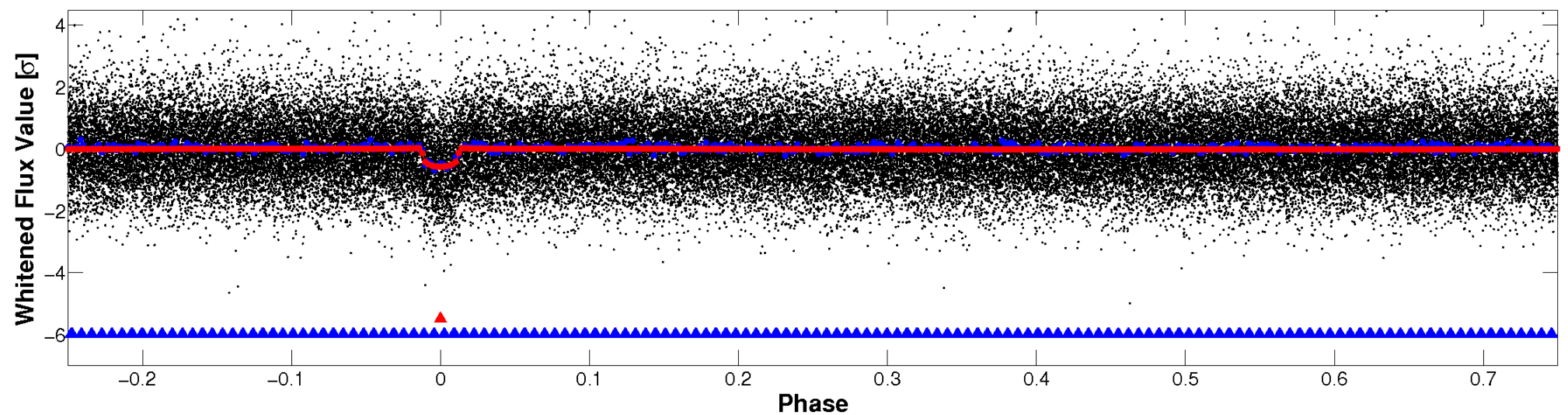


Non-Whitened Vs. Whitened Light Curve

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

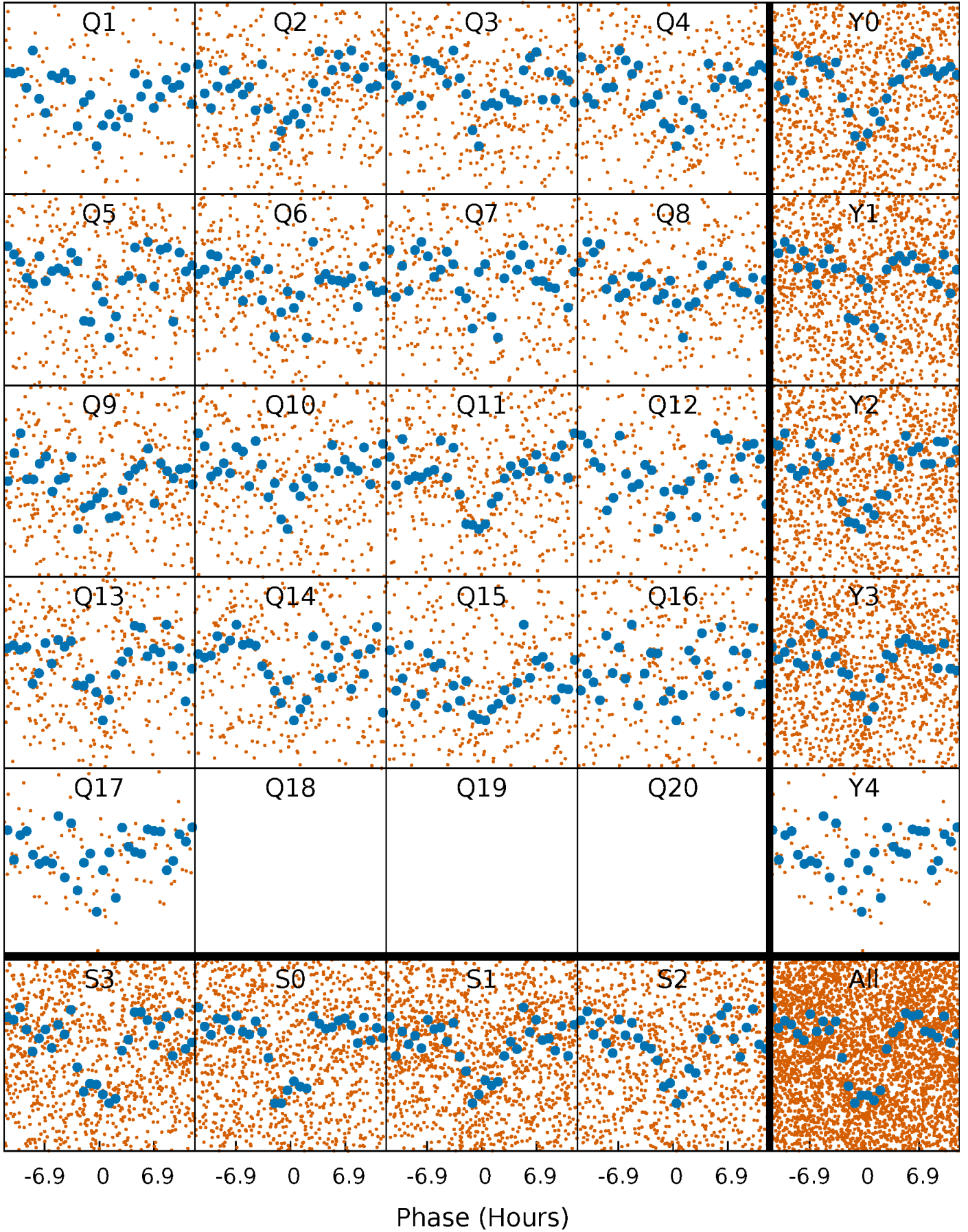


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



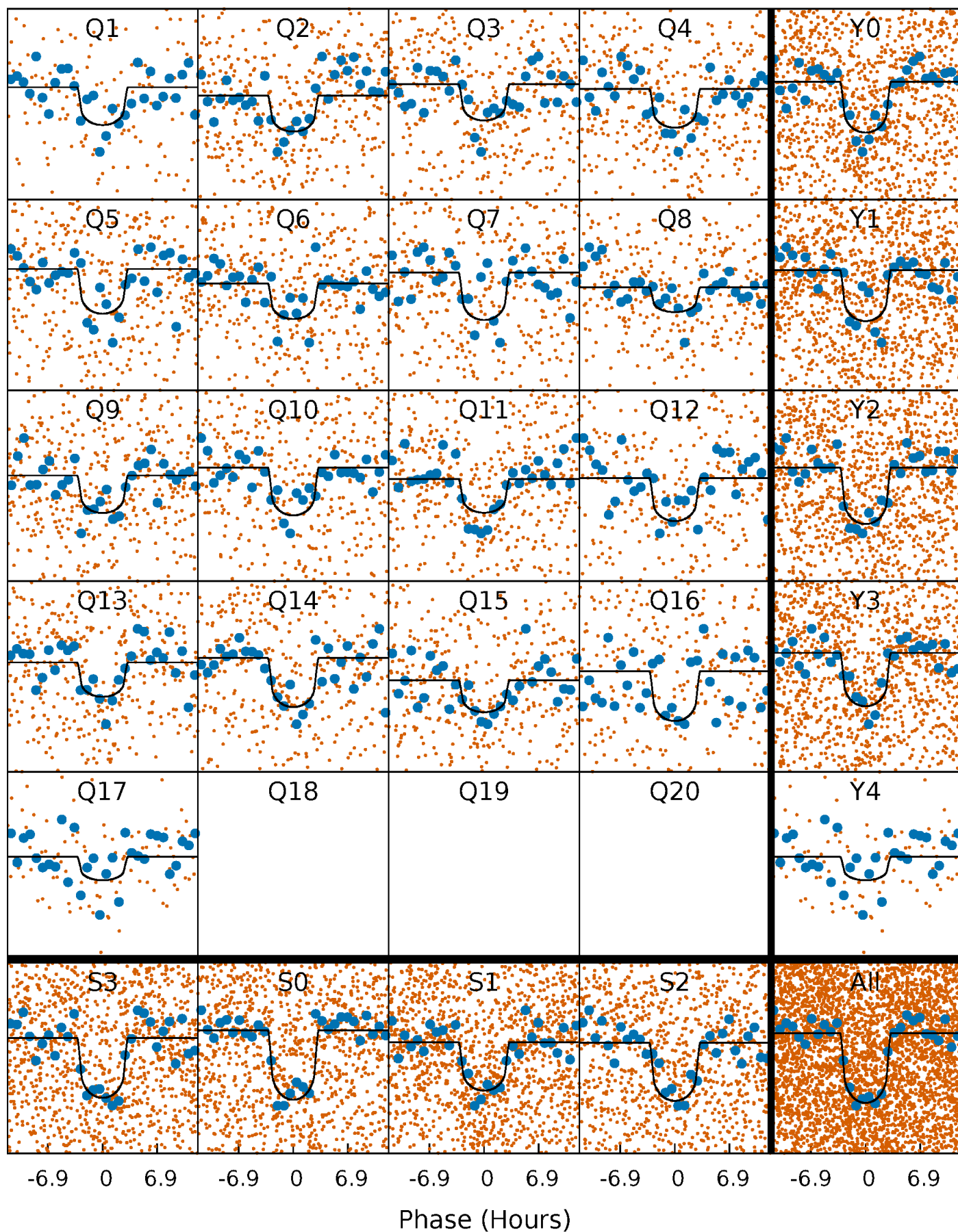
PDC Quarter-Phased Transit Curves

TCE 004860678-01 P= 9.977214 Days $T_0=137.233447$ (BKJD)



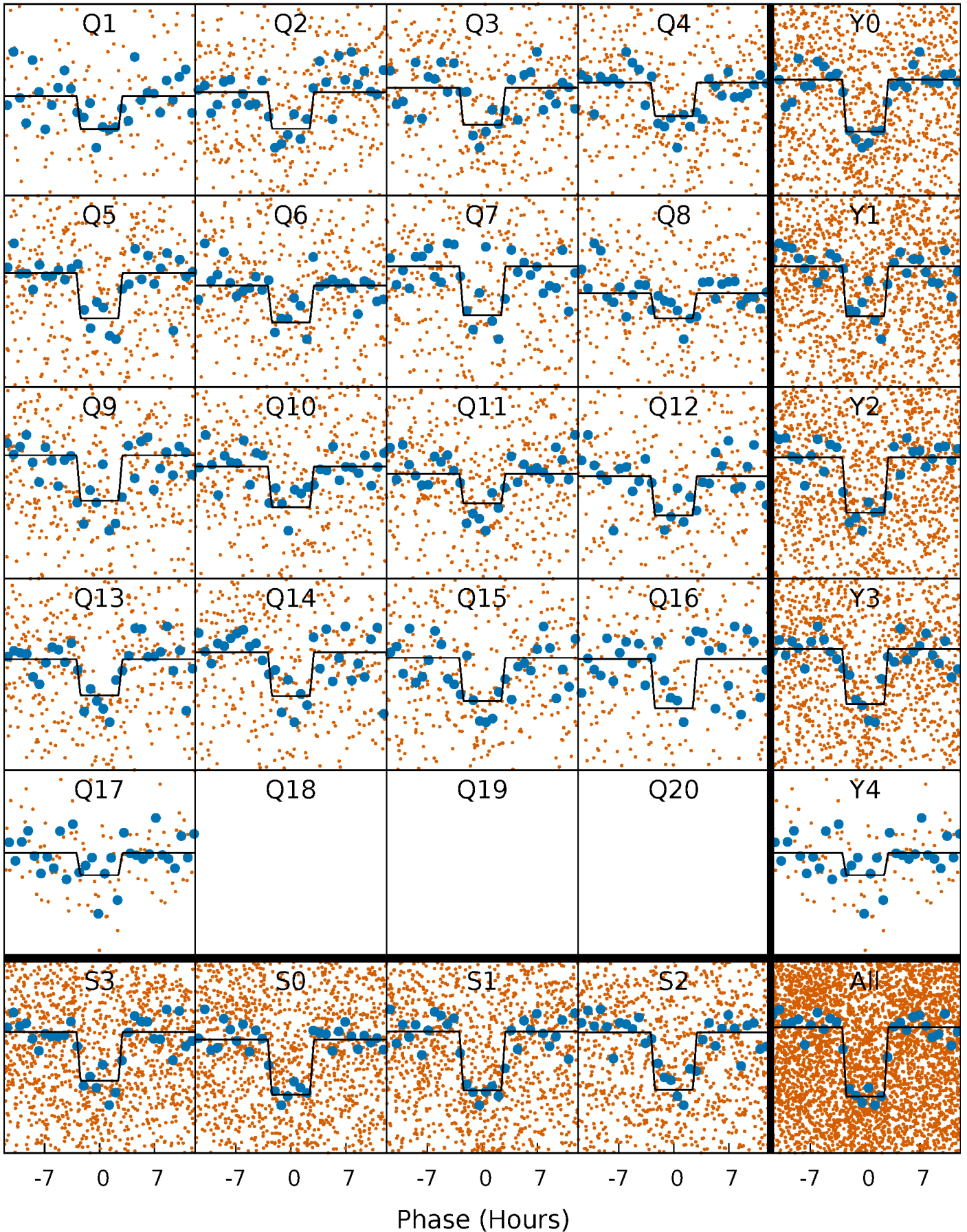
DV Quarter-Phased Transit Curves

TCE 004860678-01 P= 9.977214 Days $T_0=137.233447$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

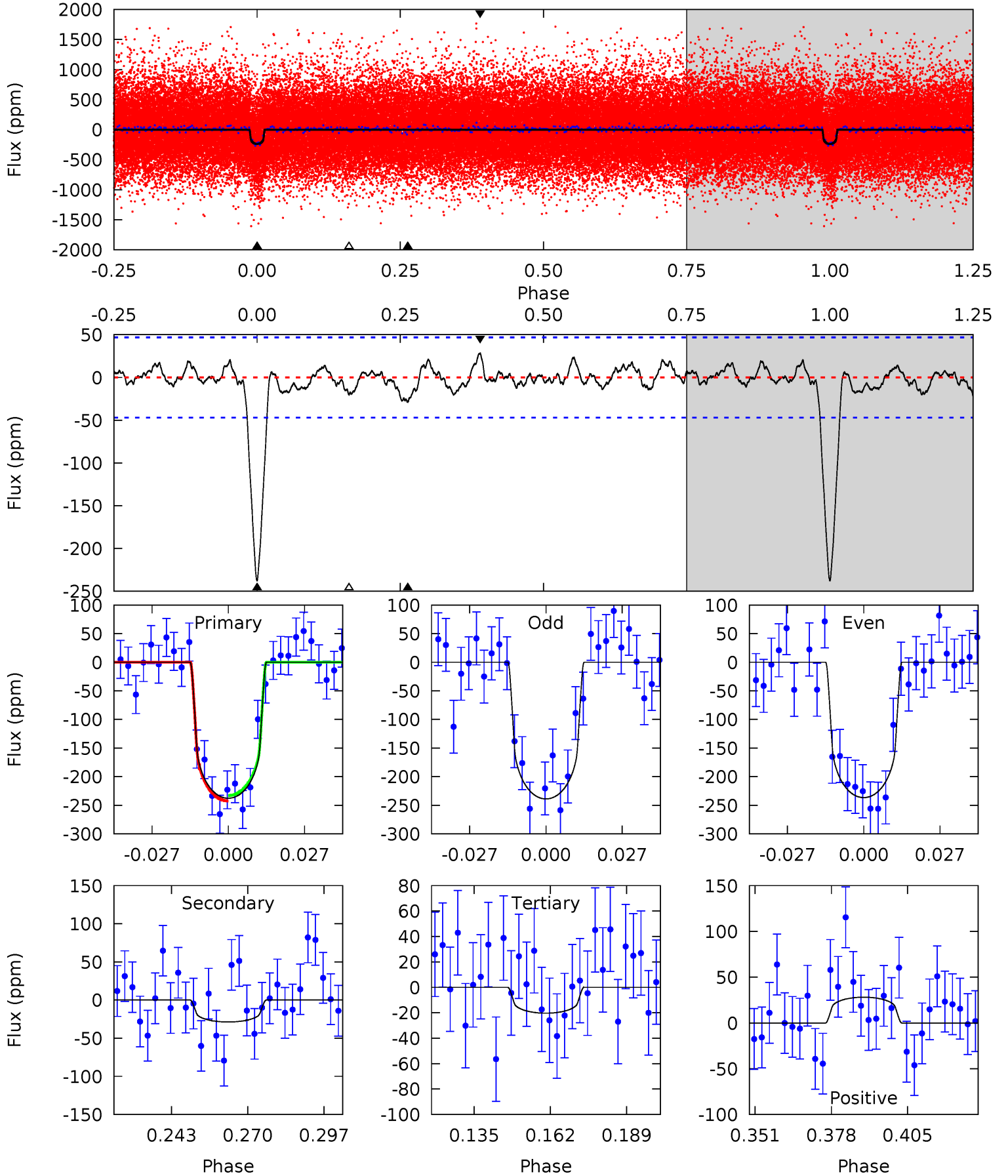
TCE 004860678-01 P= 9.977182 Days $T_0=137.229649$ (BKJD)



DV Model-Shift Uniqueness Test

004860678-01, P = 9.977214 Days, E = 127.256233 Days

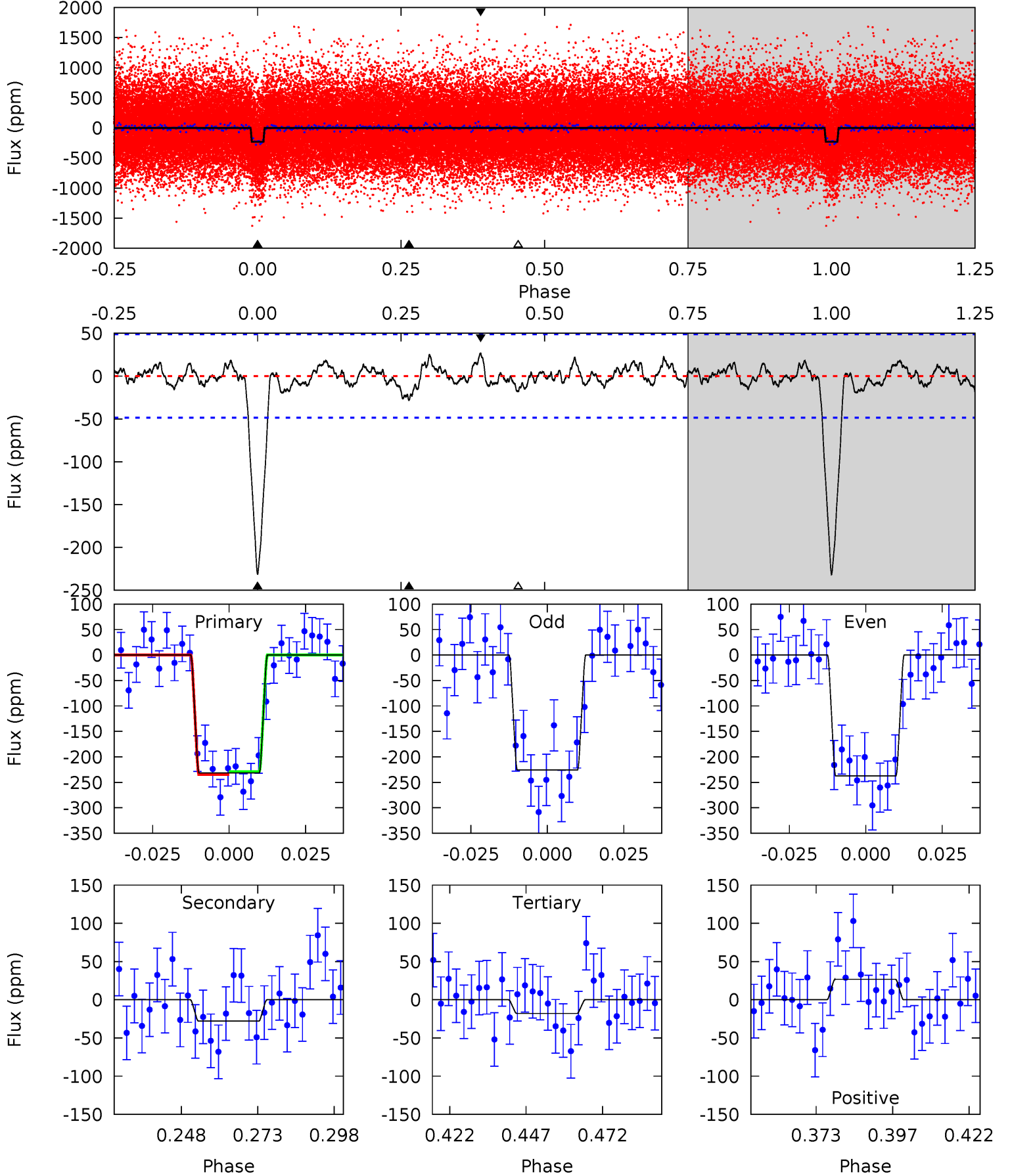
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.5	2.96	2.09	2.90	4.83	2.21	0.98	22.4	21.6	0.87	0.06	0.12	0.98	0.11	0.49



Alt Model-Shift Uniqueness Test

004860678-01, P = 9.977182 Days, E = 127.252467 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.1	2.79	1.79	2.67	4.85	2.24	0.88	21.3	20.4	1.00	0.12	0.58	0.94	0.10	0.29



Stellar Parameters For KIC 004860678

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5557^{+83}_{-72}	$4.037^{+0.210}_{-0.090}$	$0.160^{+0.150}_{-0.100}$	$1.616^{+0.254}_{-0.413}$	$1.035^{+0.085}_{-0.094}$	$0.346^{+0.420}_{-0.100}$
	+1%/-1%	+5%/-2%	+94%/-62%	+16%/-26%	+8%/-9%	+122%/-29%
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 004860678-01 / KOI 1602.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-29 ± 10	$2.63^{+1.20}_{-1.12}$	1428^{+62}_{-93}	3640^{+793}_{-436}	18^{+38}_{-11}
Alt.	-28 ± 10	$2.58^{+1.23}_{-1.16}$	1425^{+62}_{-87}	3649^{+916}_{-484}	19^{+46}_{-11}

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming $A=0.3$)

A_{obs} = Observed Albedo (Assuming $T=0$)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

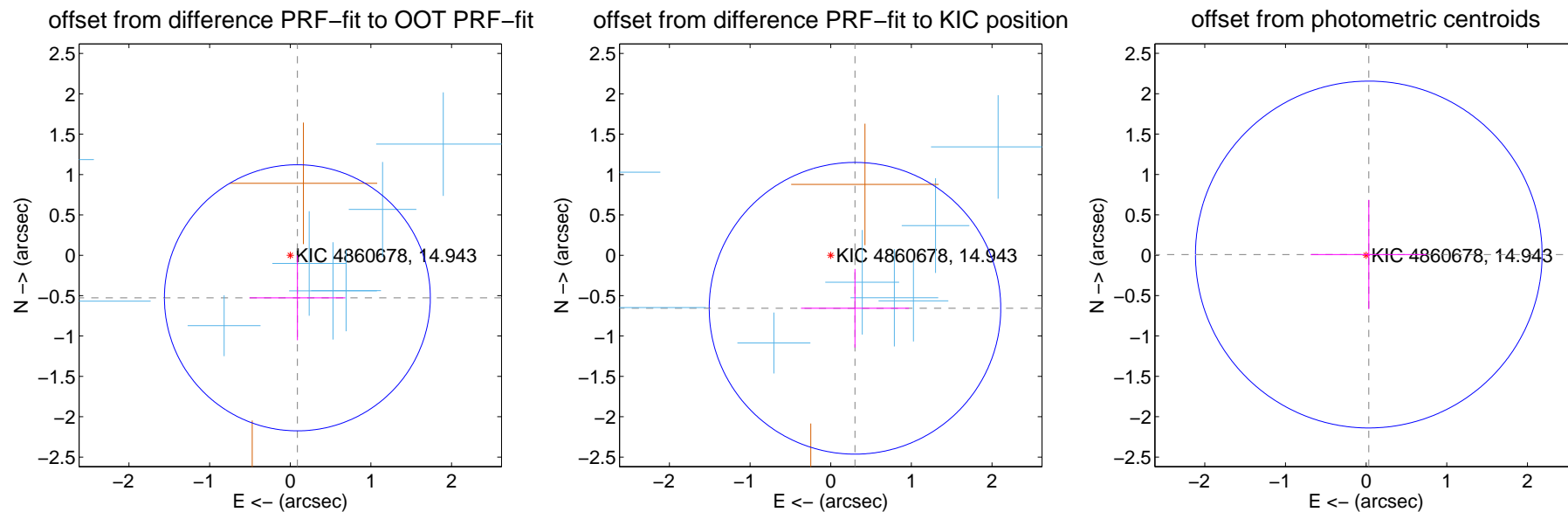
DV Centroid Data

Supplemental centroid analysis for 004860678-01. Kepler magnitude: 14.94. Transit SNR 19.25

There are 8 quarters with good PRF difference image offsets

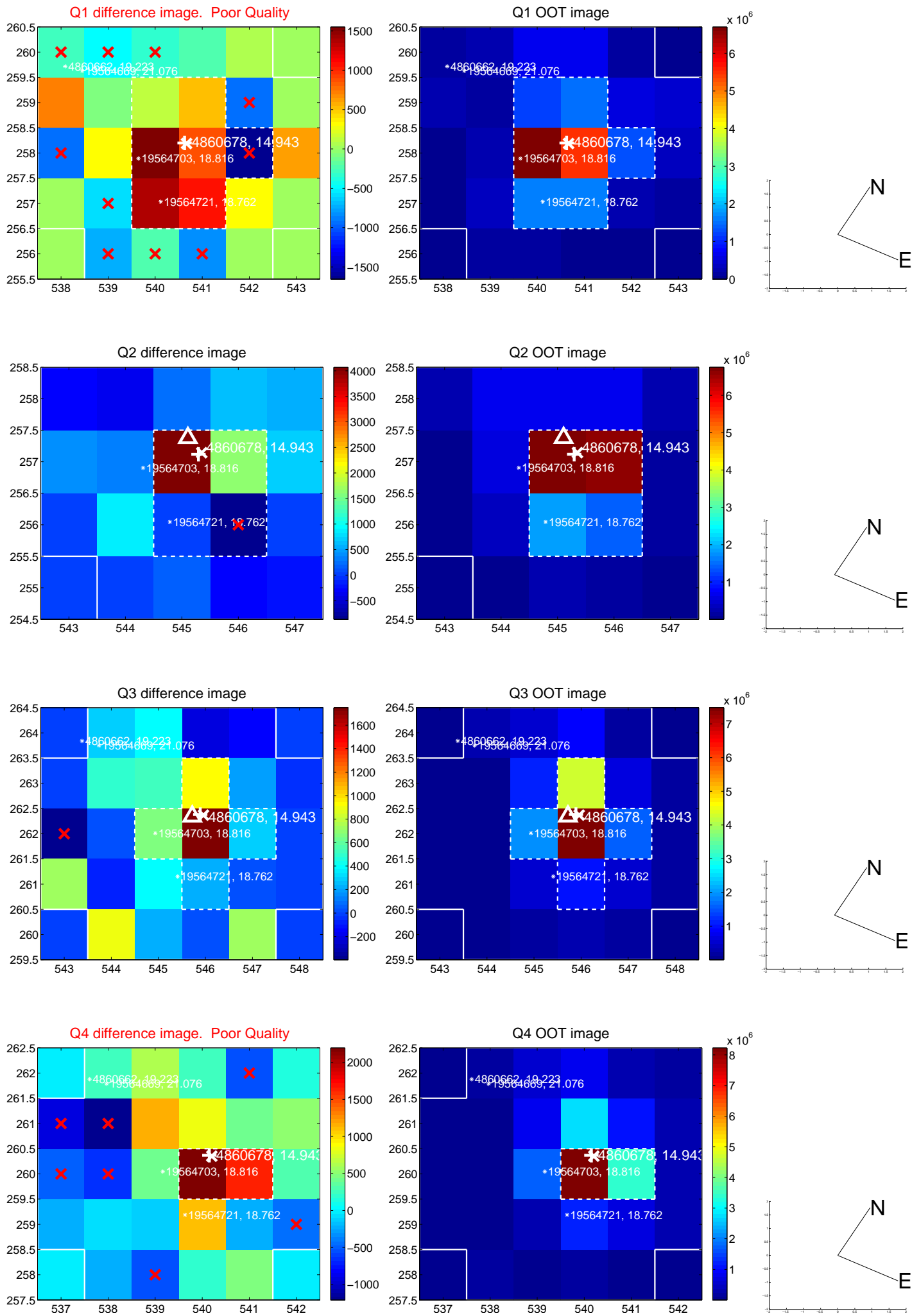
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.534 ± 0.549	0.97	-0.088 ± 0.594	-0.527 ± 0.526
PRF-fit source offset from KIC position	0.722 ± 0.602	1.20	-0.301 ± 0.669	-0.657 ± 0.487
photometric centroid source offset	0.03 ± 0.72	0.05	-0.03 ± 0.72	0.01 ± 0.68

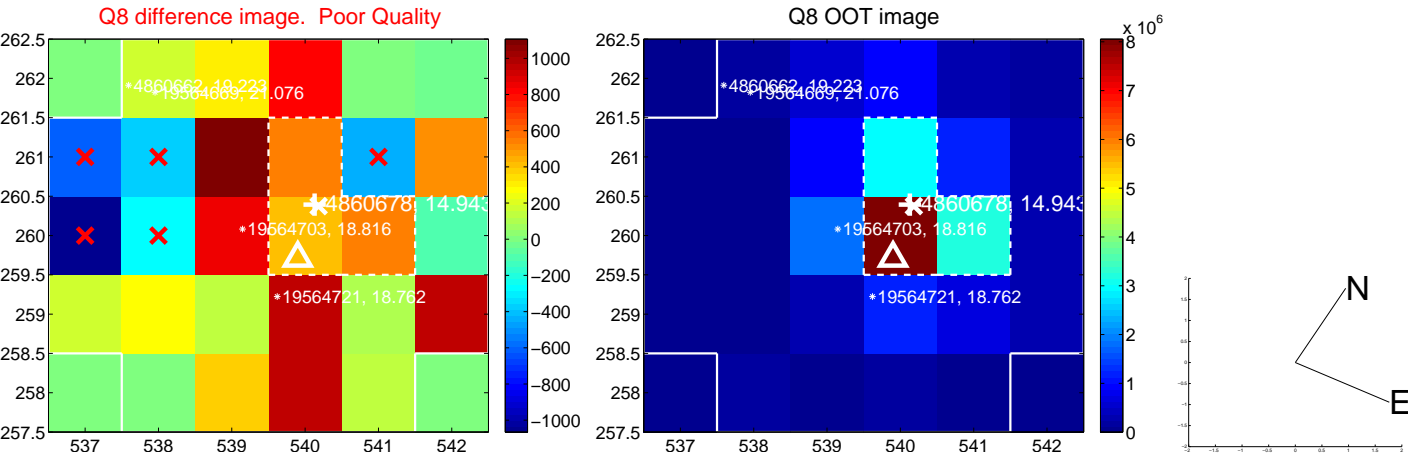
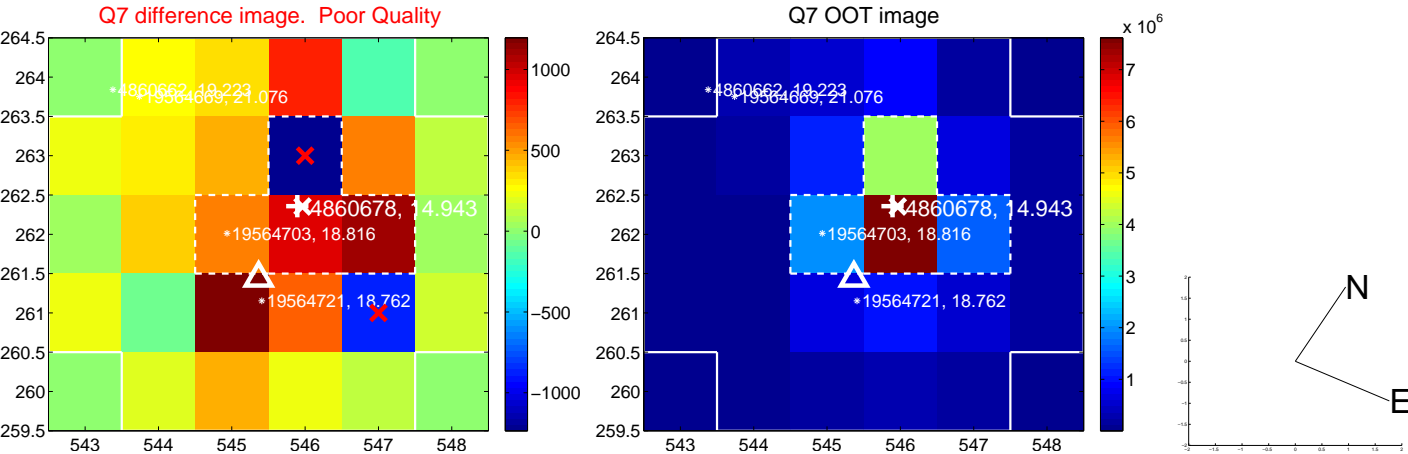
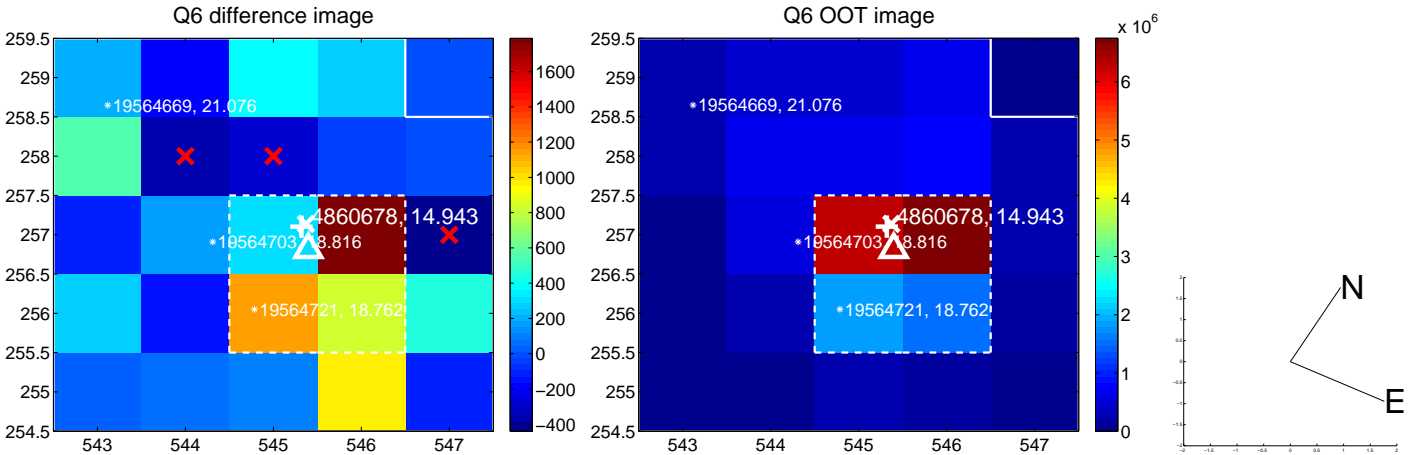
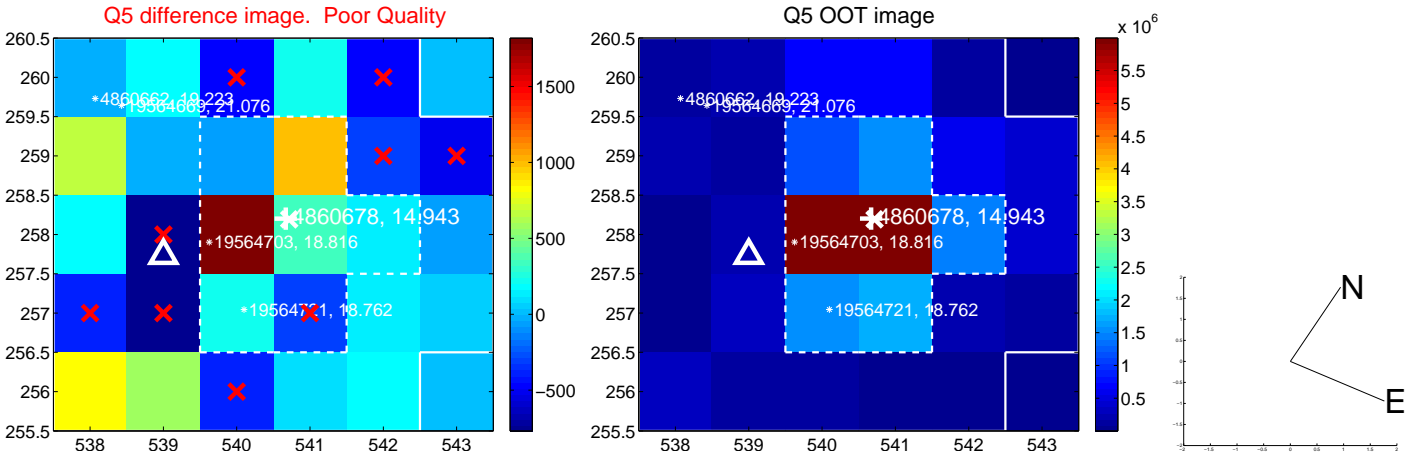


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

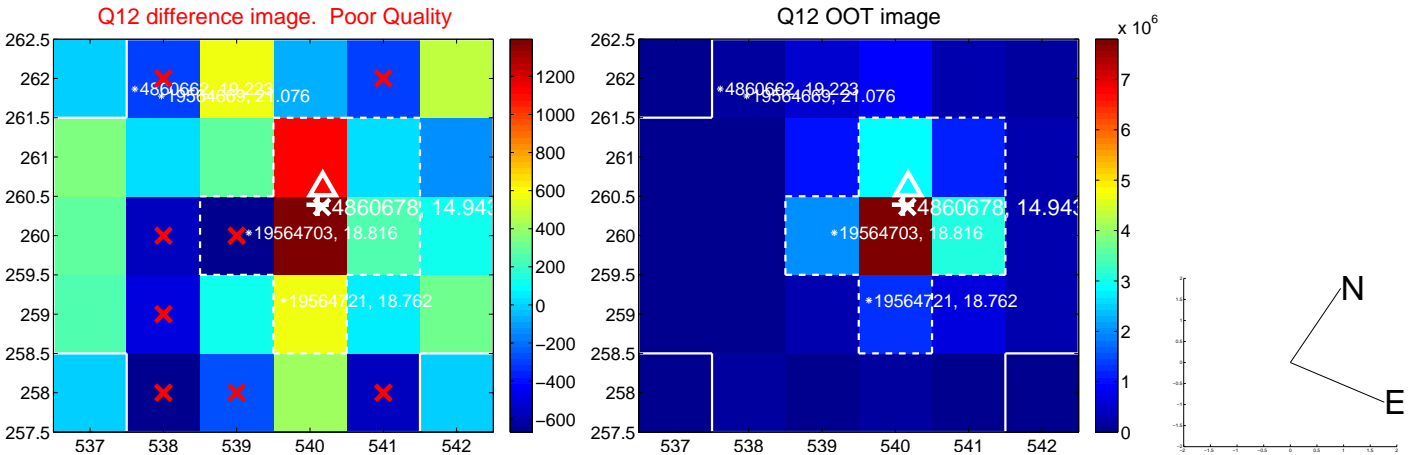
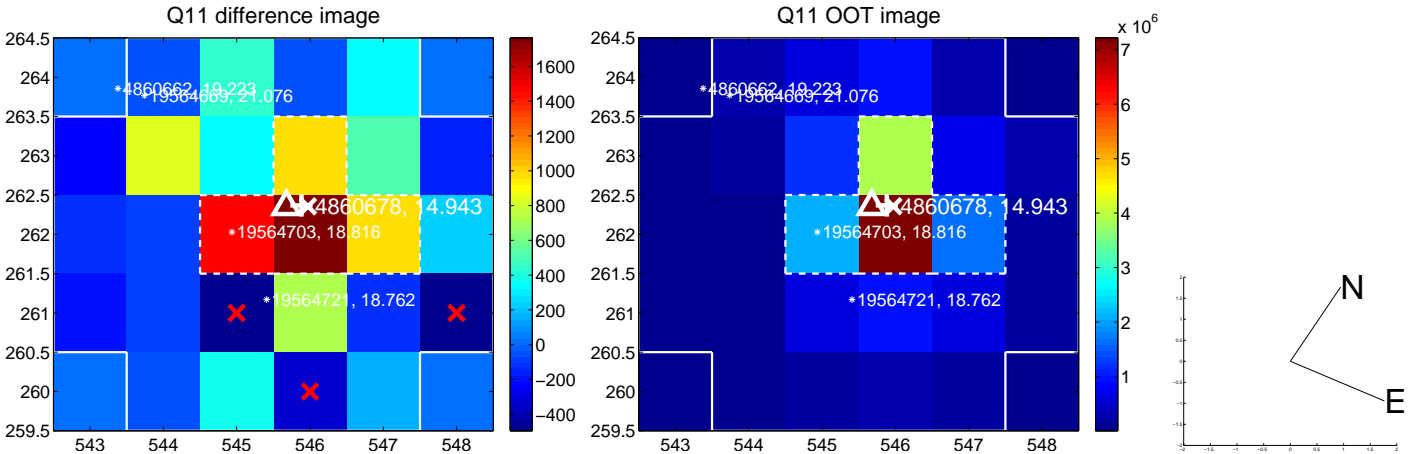
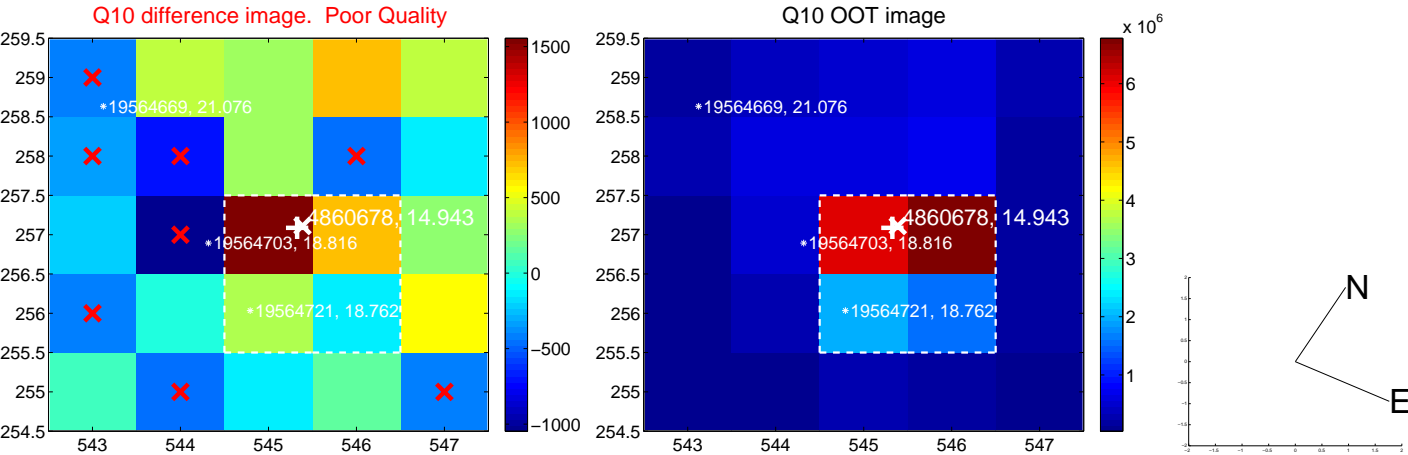
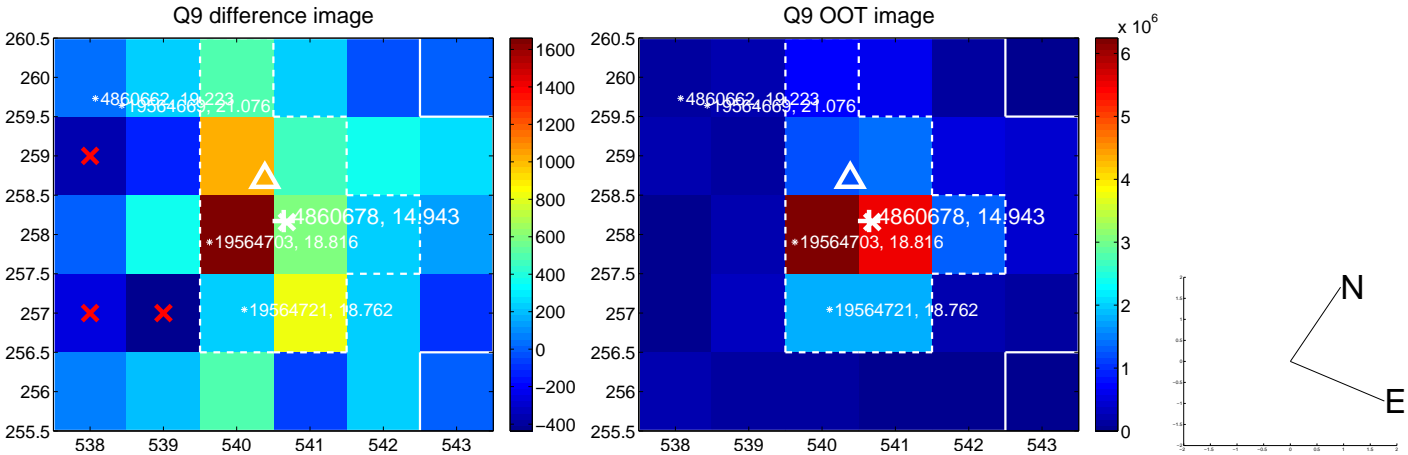
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



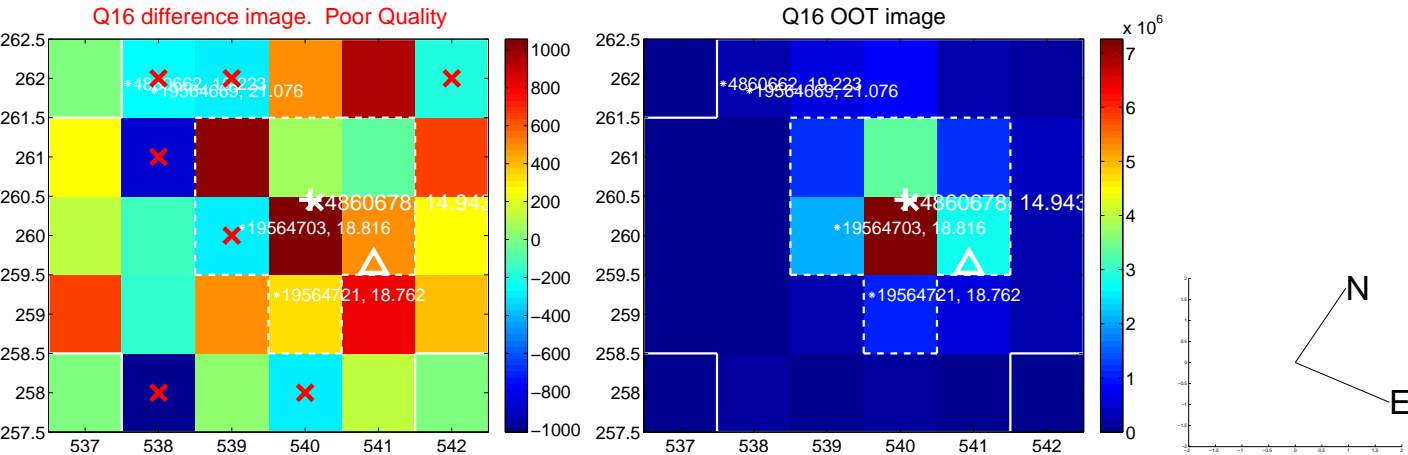
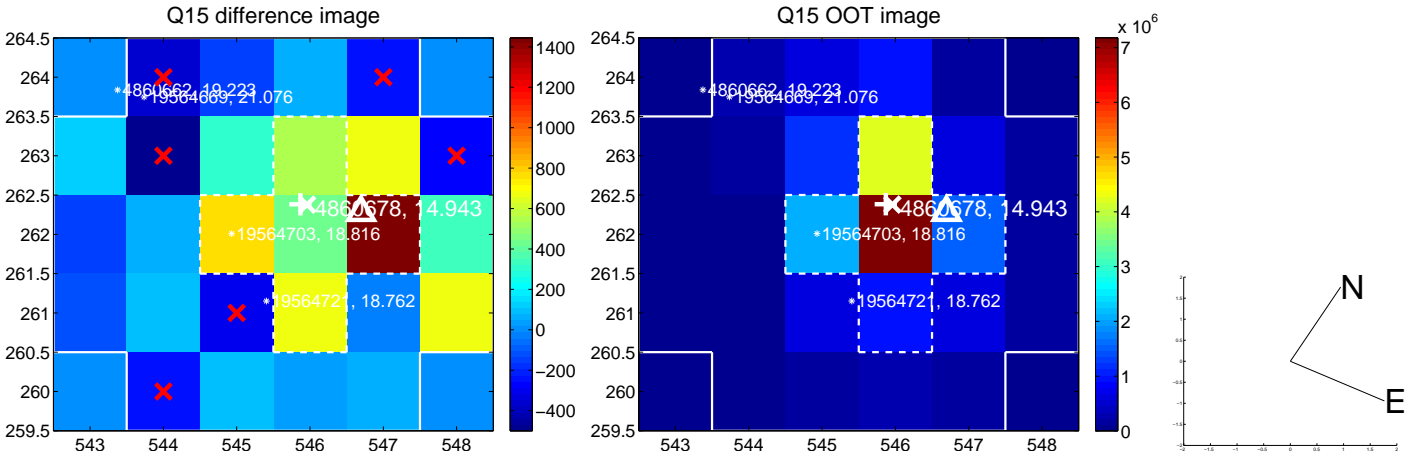
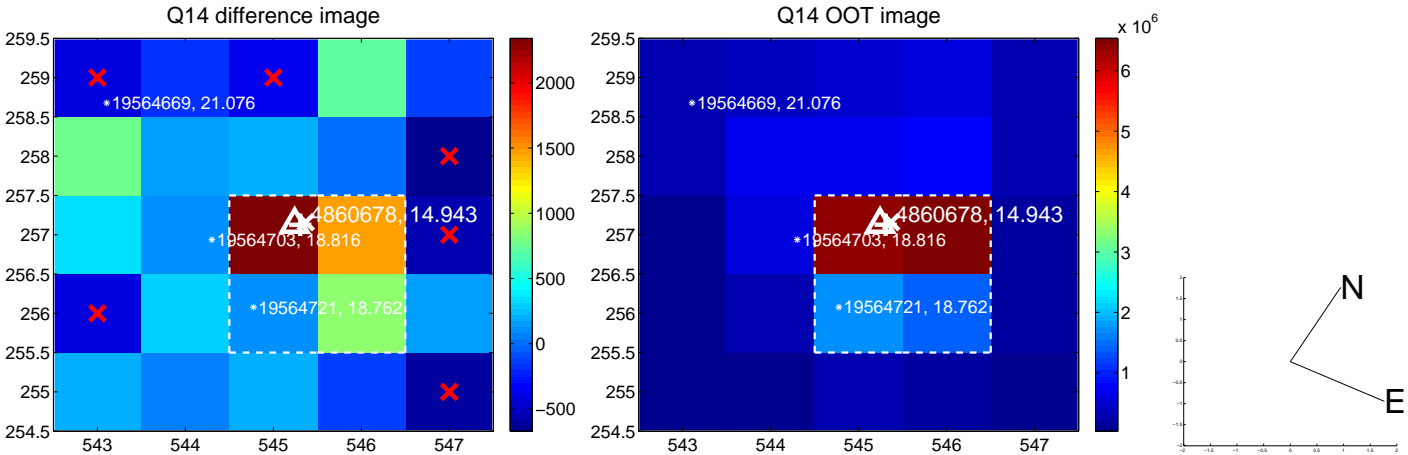
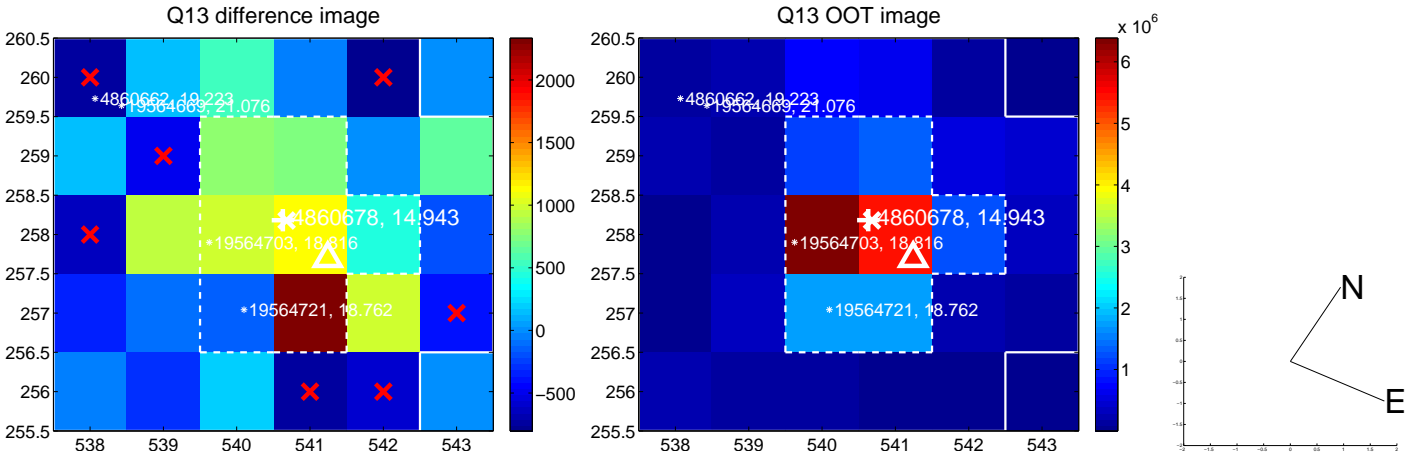
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



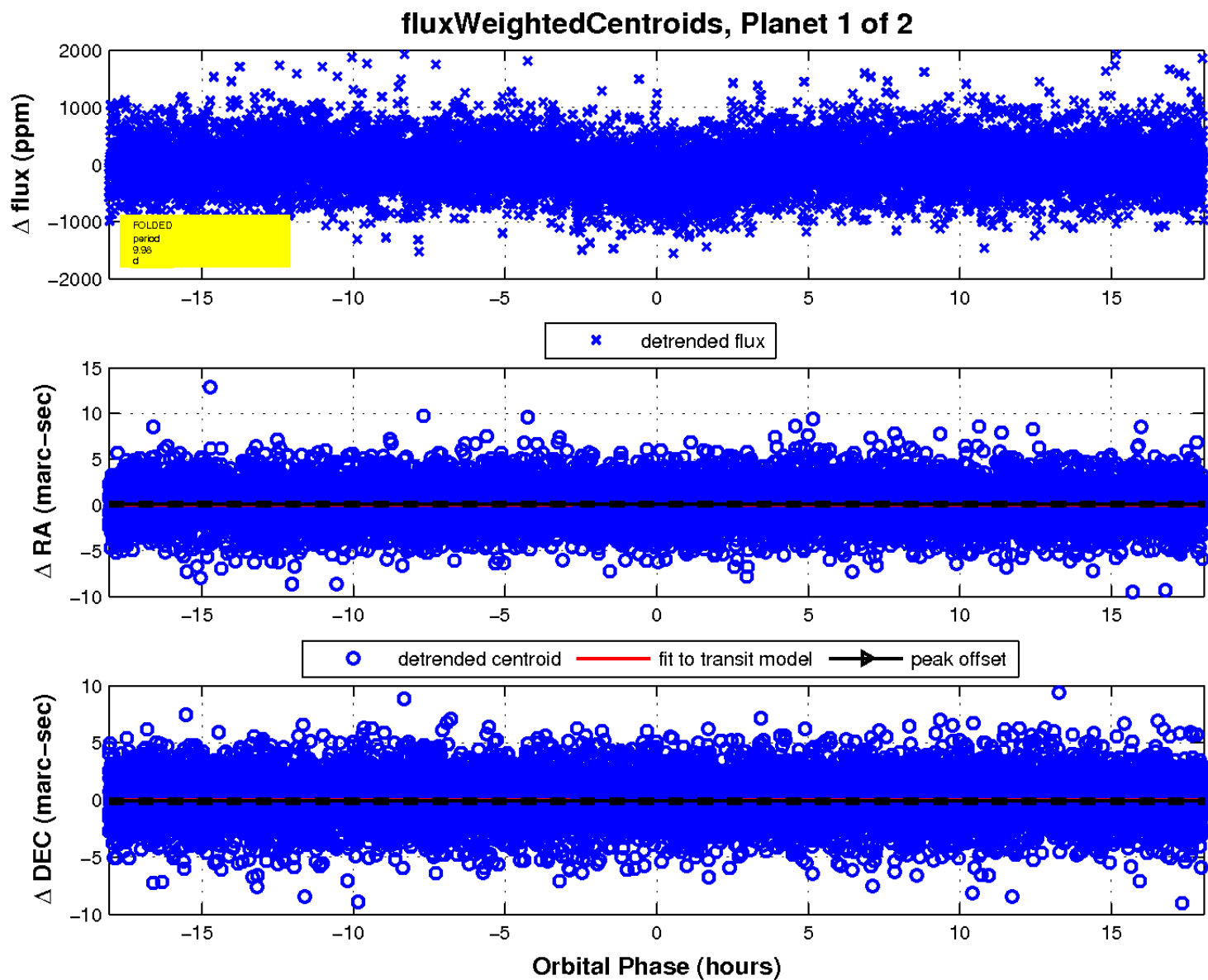
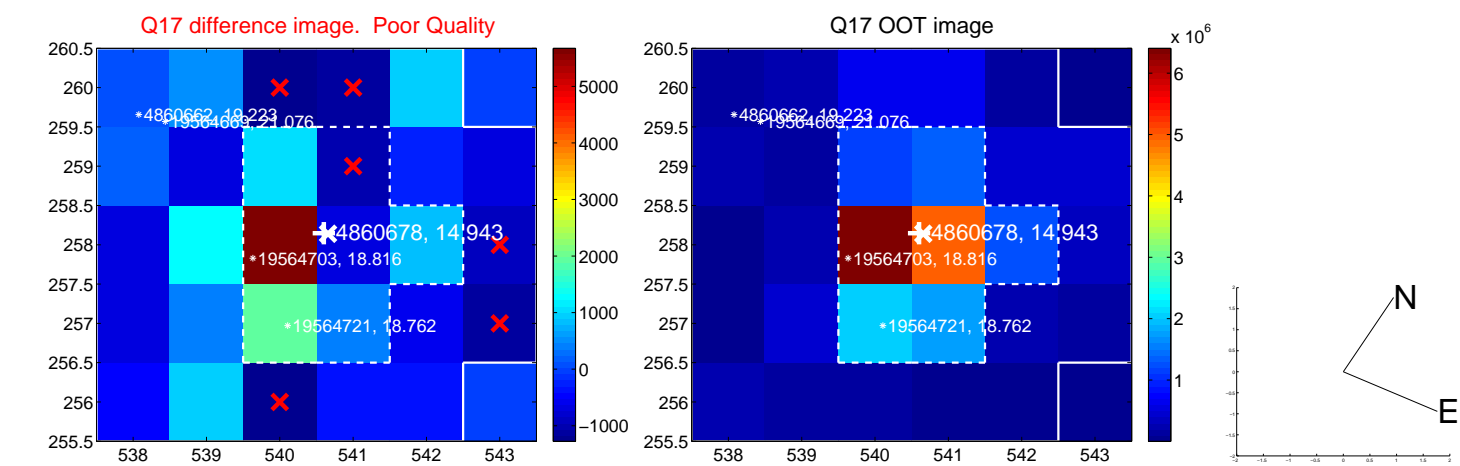
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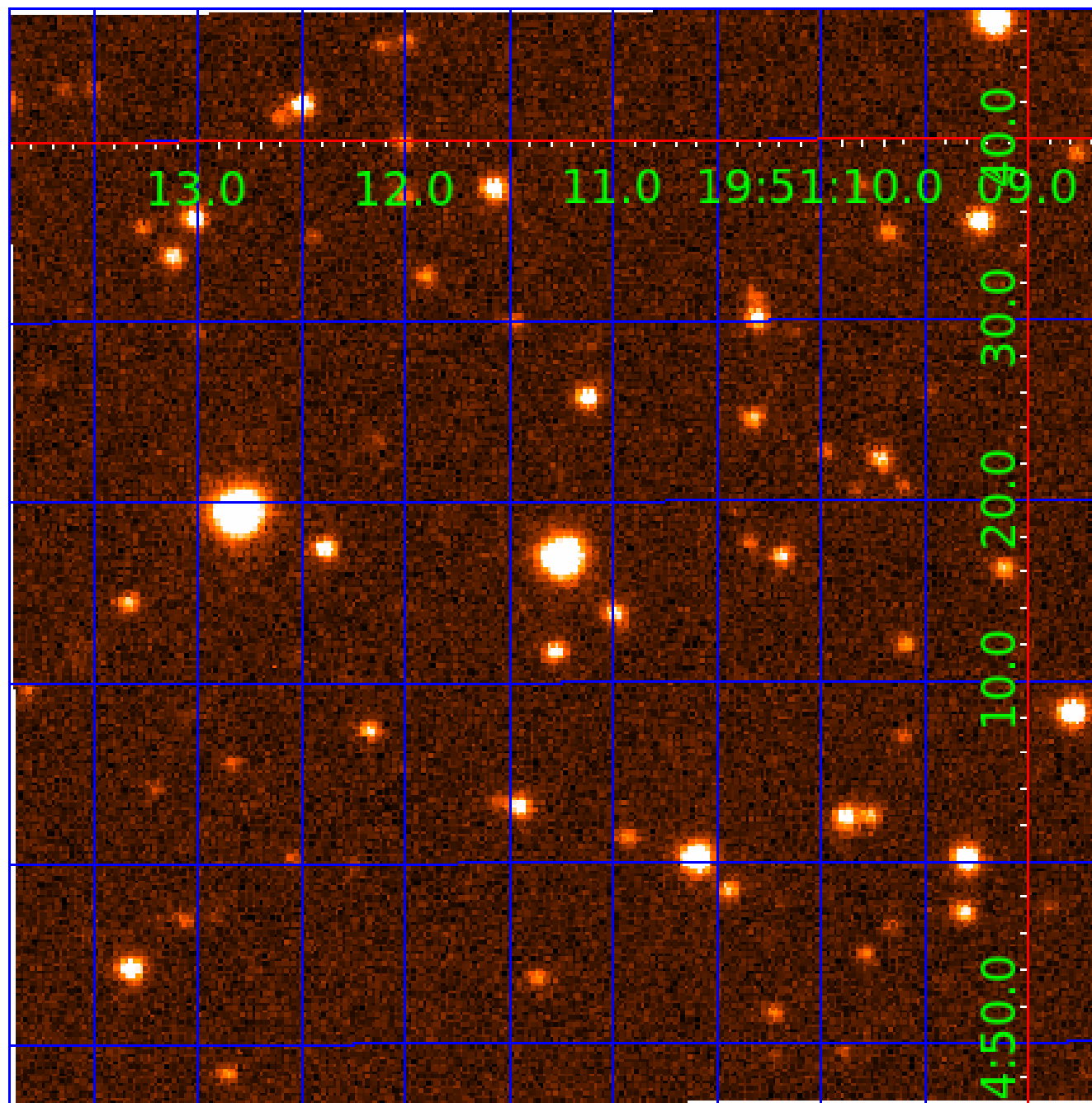


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



UKIRT Image

Declination



KIC 004860678

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})
004860678-01	OBS	1602.01	9.977214	137.233447	241.5	6.023	18.6	19.3	1.62	5557	2.75	264.57
004860678-02	OBS	1602.02	3.033585	133.084486	91.1	4.080	10.4	10.8	1.62	5557	1.83	1294.02

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004860678-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
004860678-02	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.

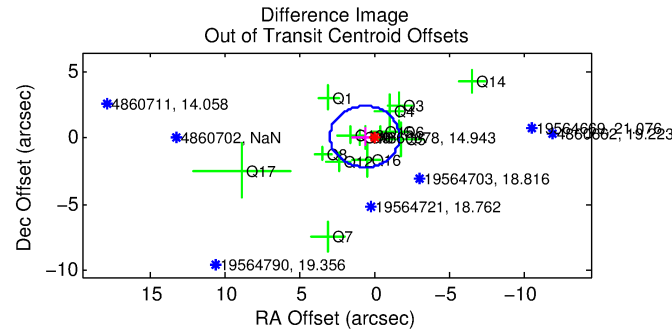
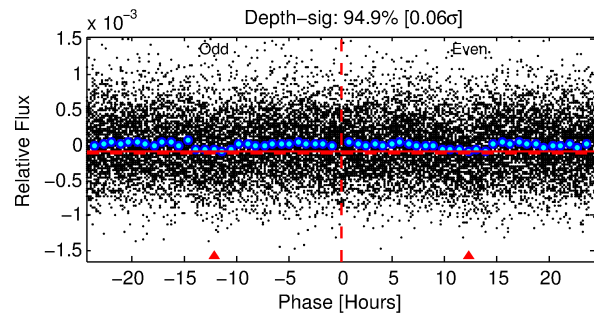
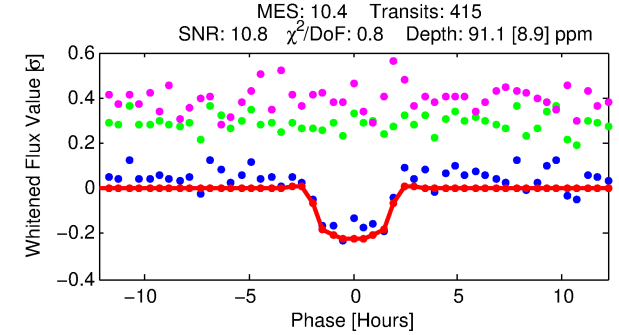
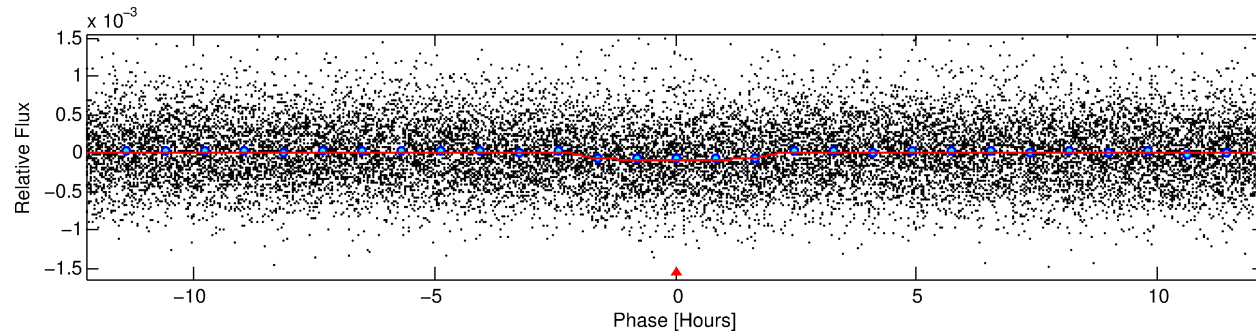
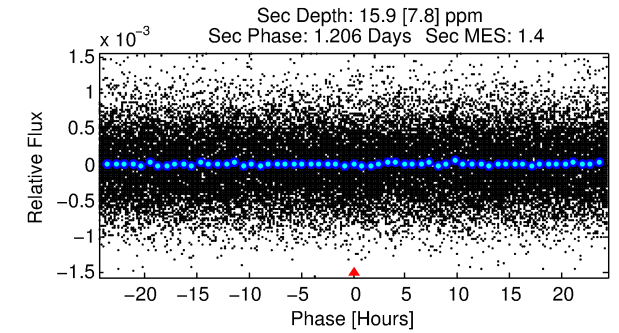
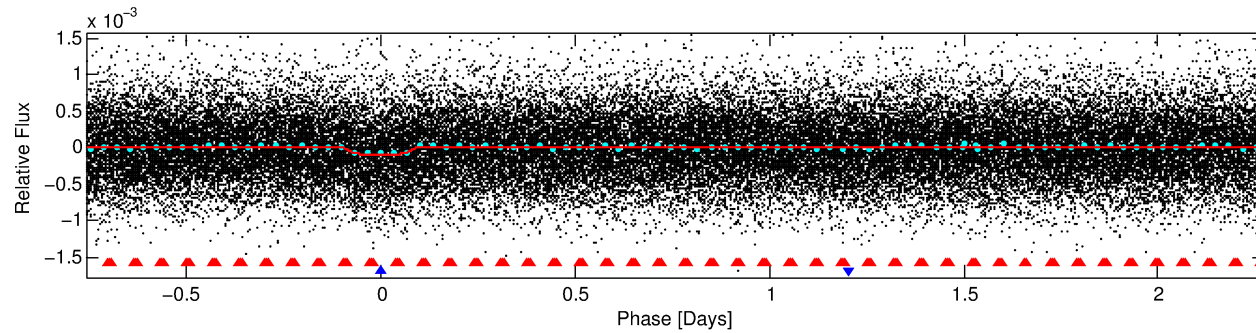
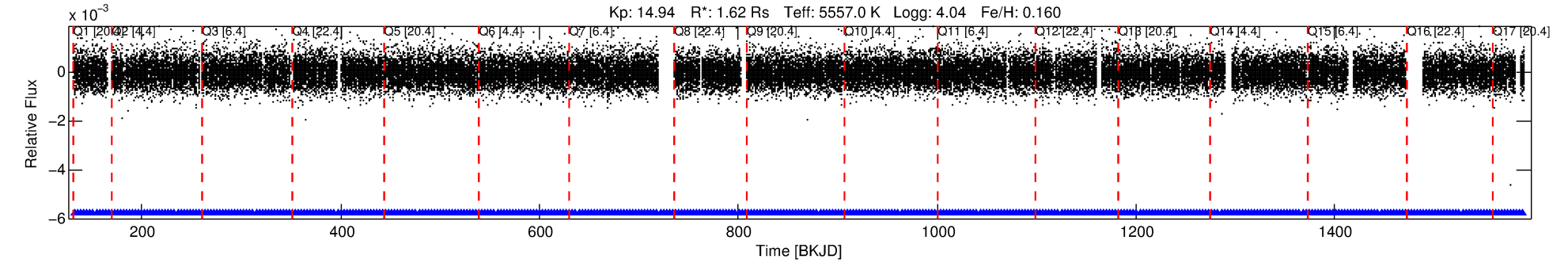
Ephemeris Match Information For 004860678-02

No Significant Match Found

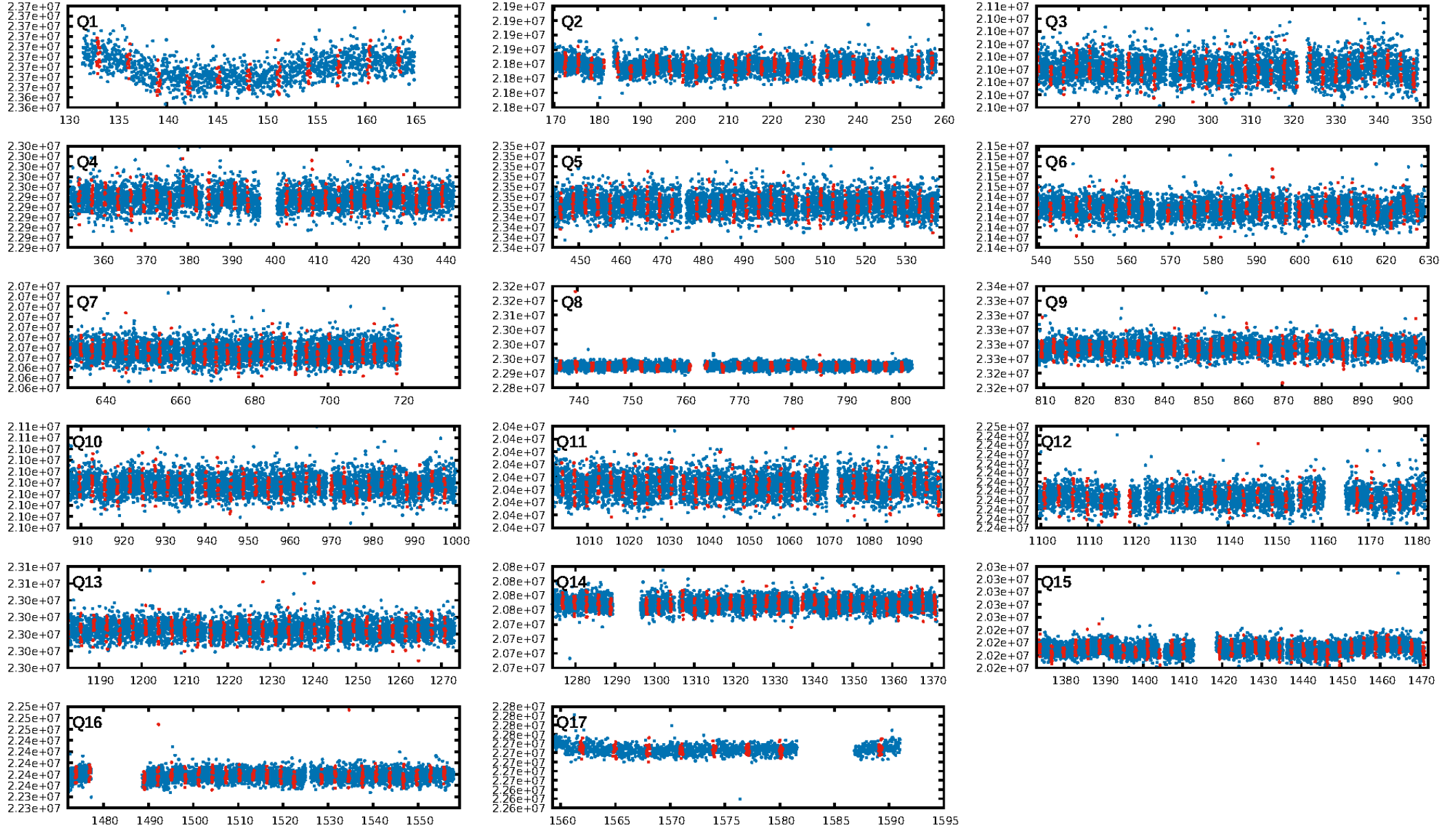
DV One-Page Summary

KIC: 4860678 Candidate: 2 of 2 Period: 3.034 d

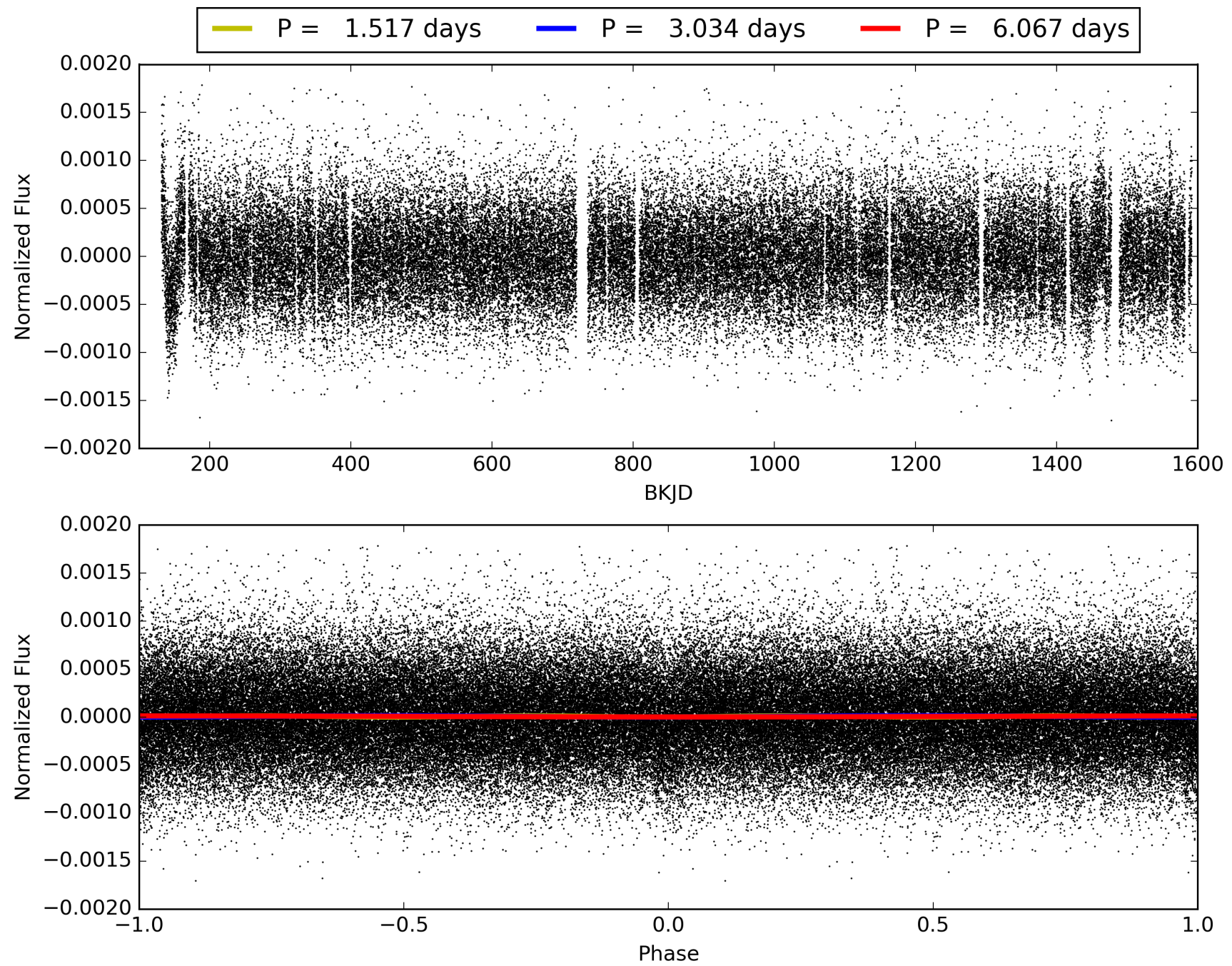
KOI: K01602.02 Corr: 0.992



TCE 004860678-02, PDC Light Curves

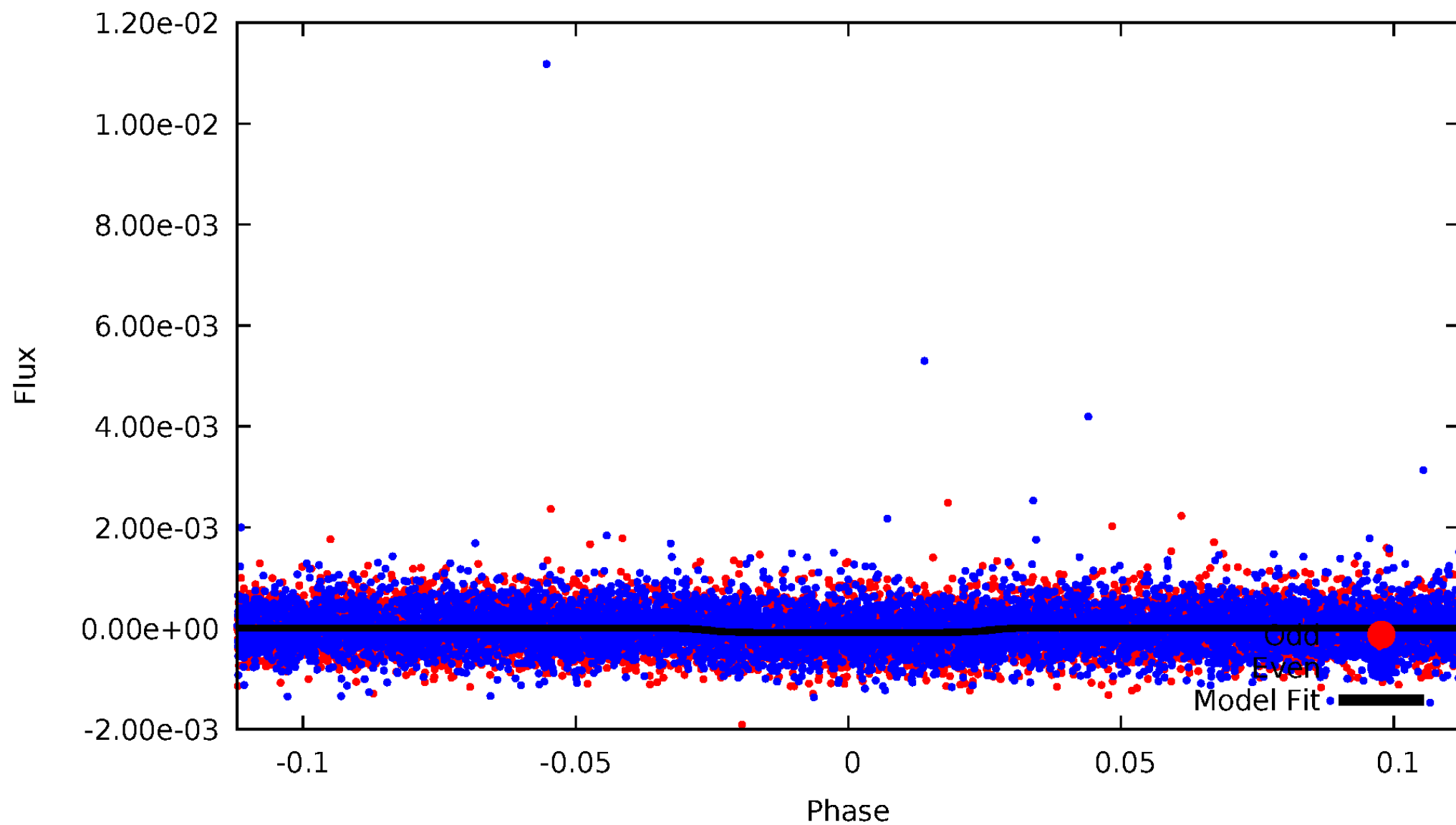


TCE 004860678-02



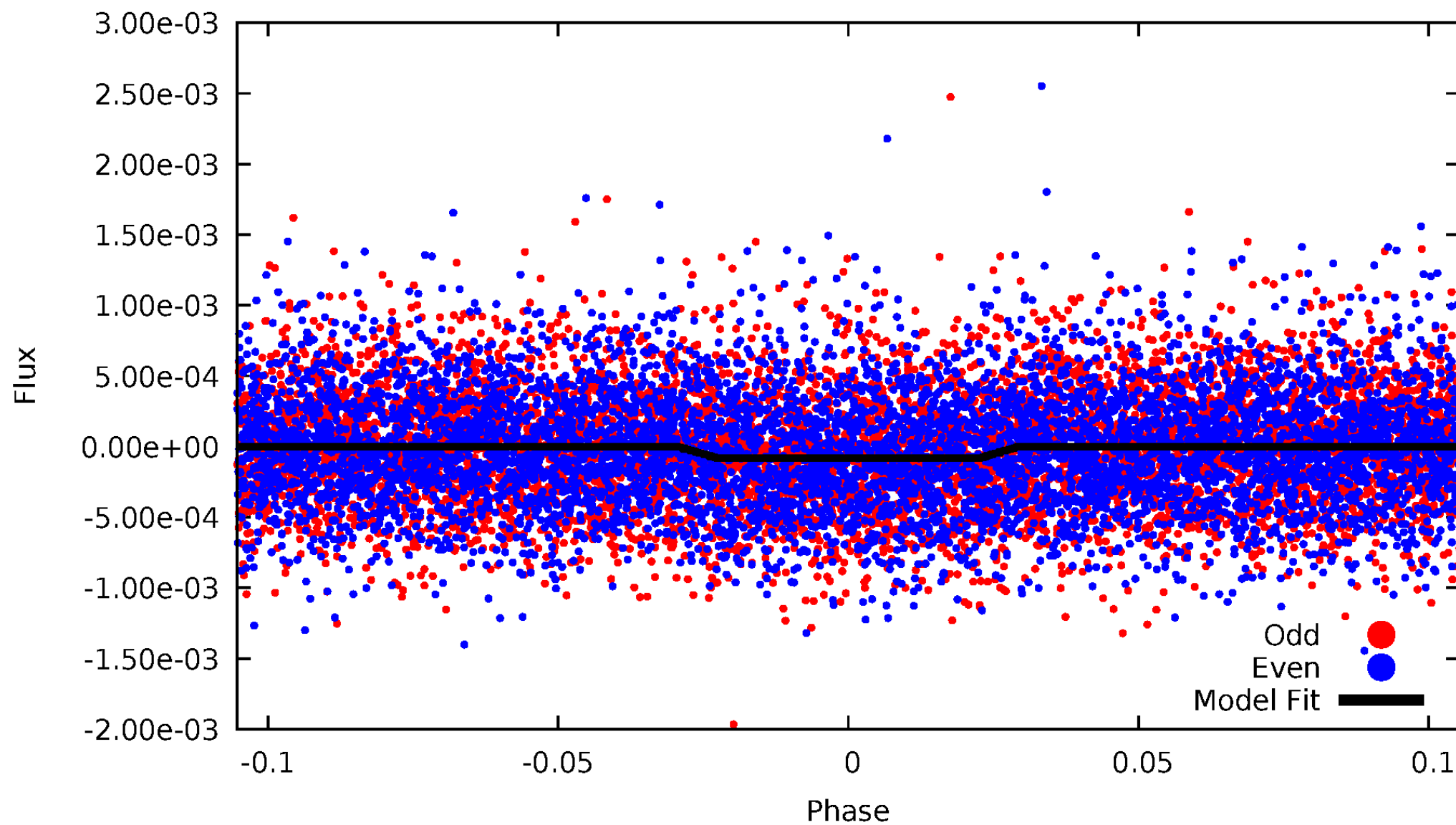
DV Odd/Even

TCE 004860678-02



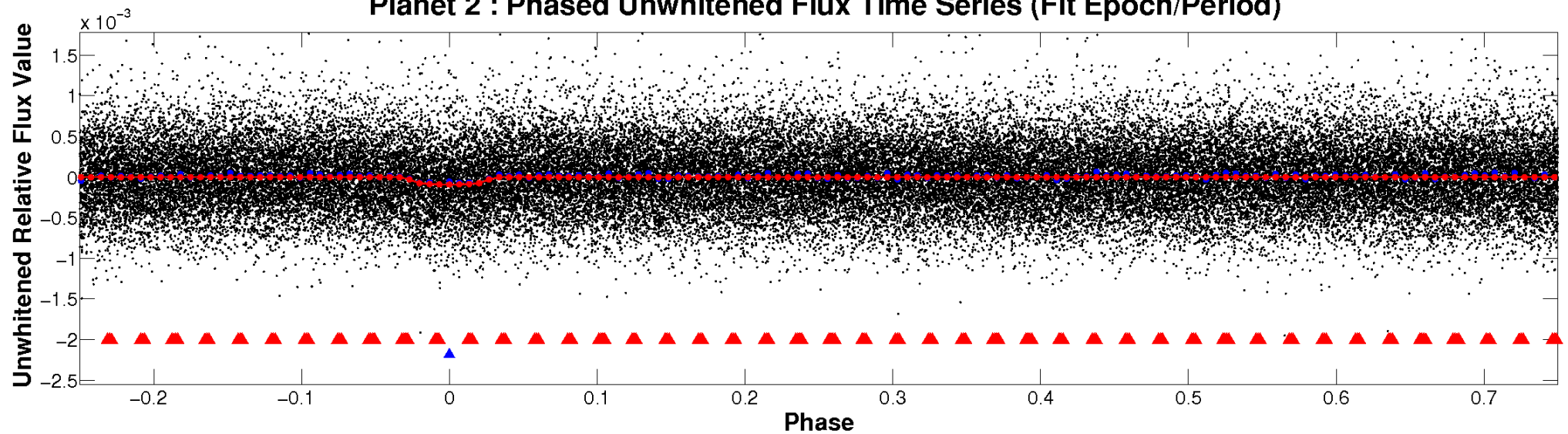
ALT Odd/Even

TCE 004860678-02

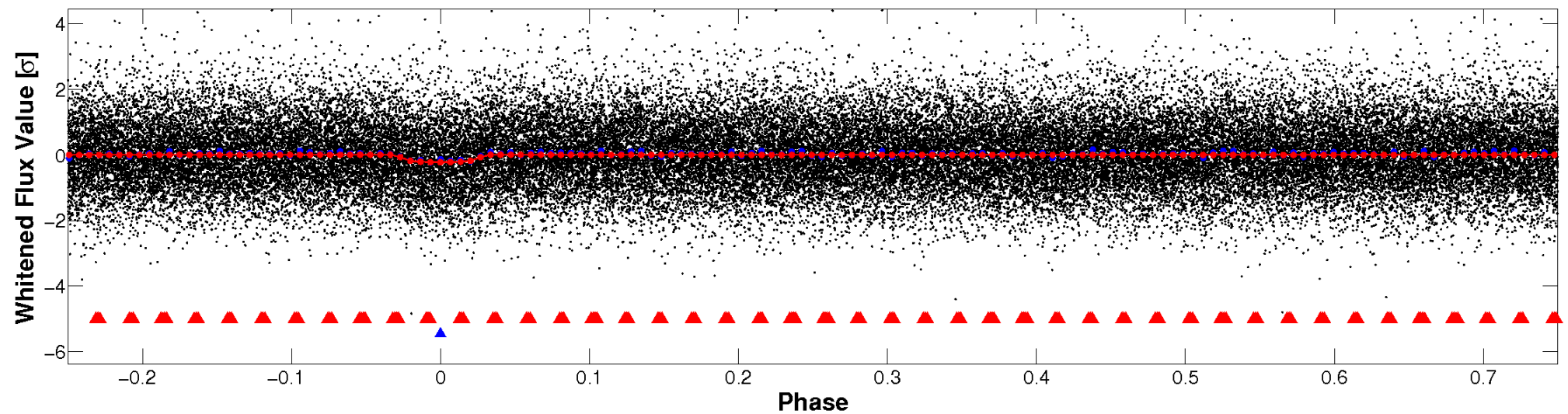


Non-Whitened Vs. Whitened Light Curve

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

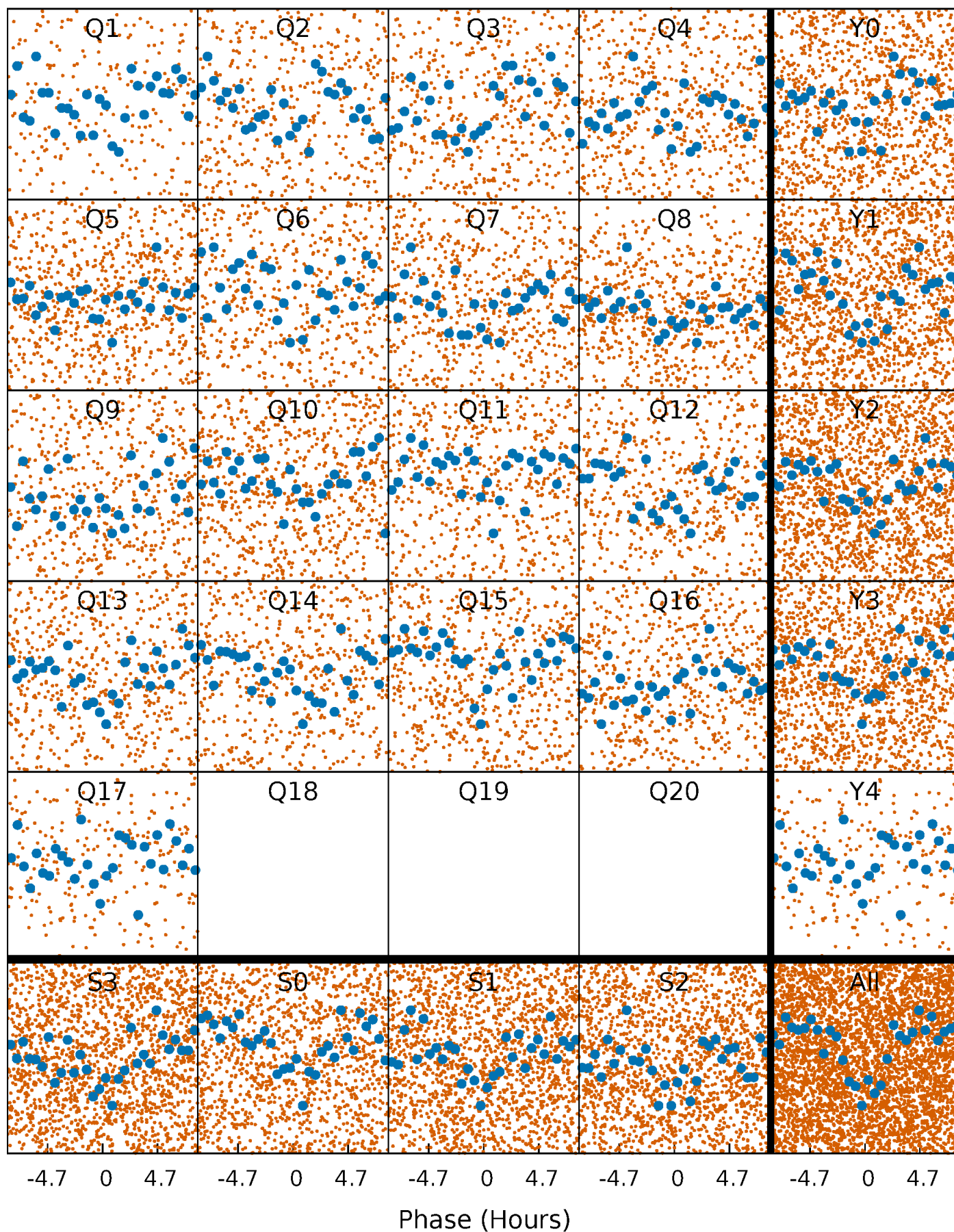


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



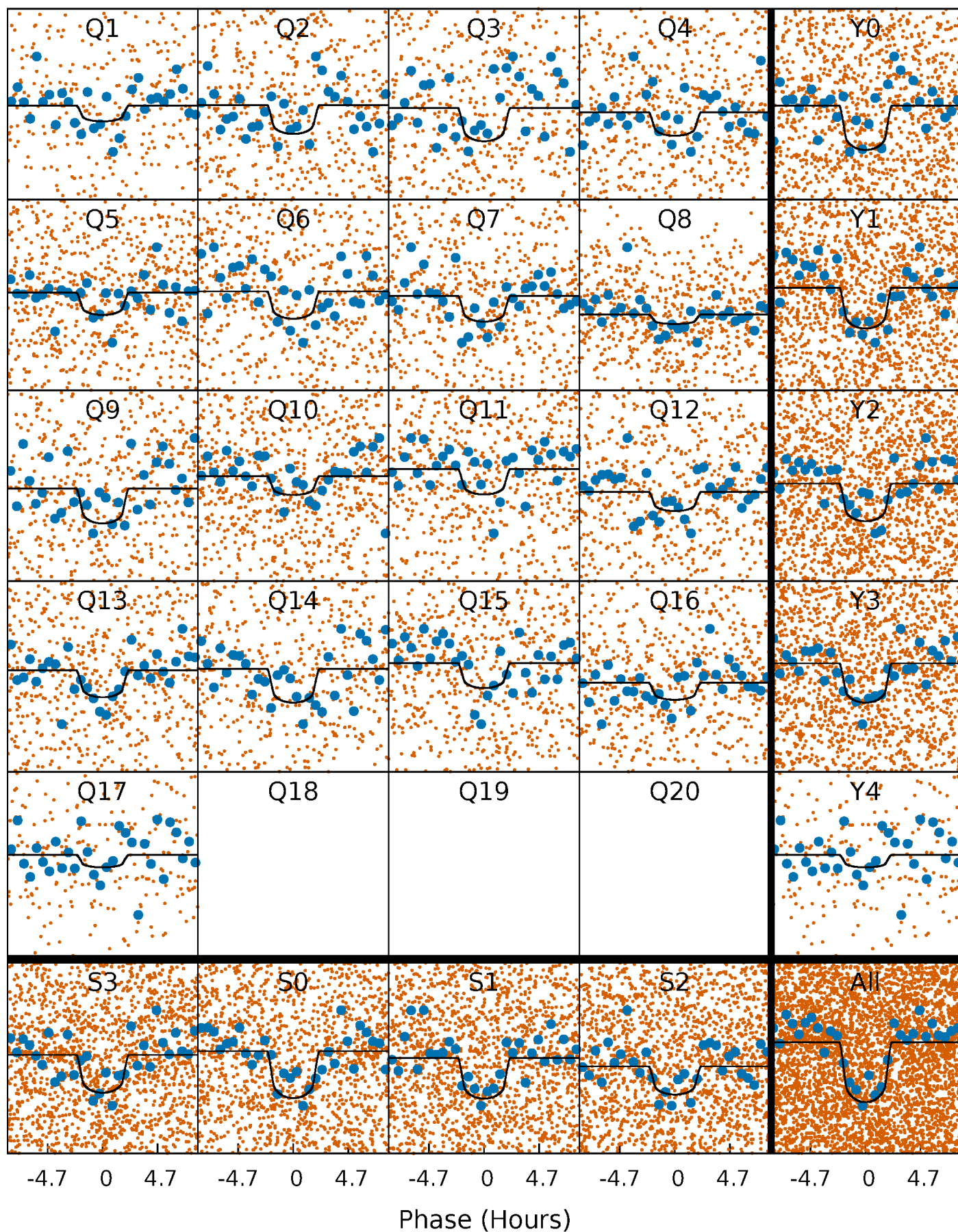
PDC Quarter-Phased Transit Curves

TCE 004860678-02 P= 3.033585 Days $T_0=133.084486$ (BKJD)



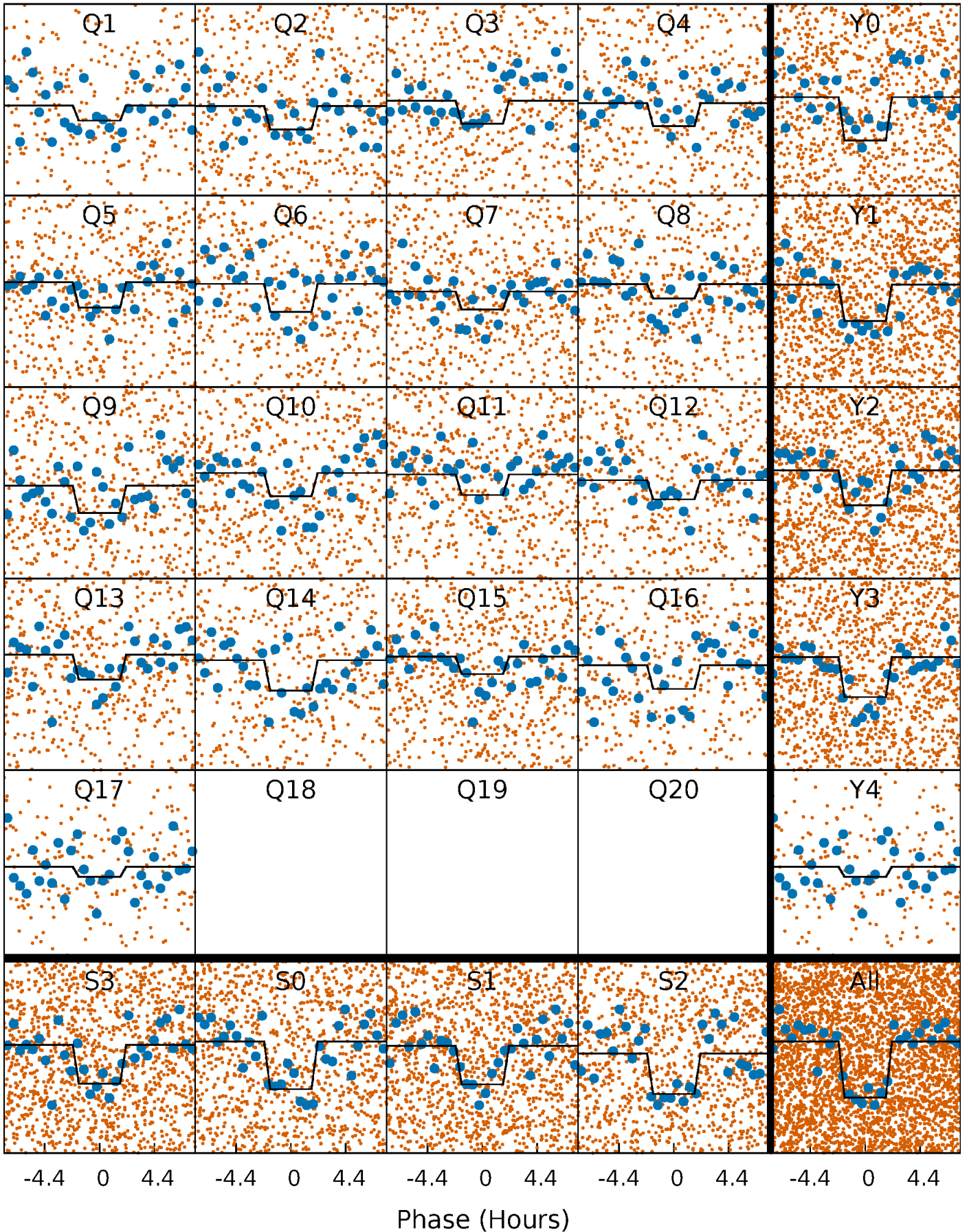
DV Quarter-Phased Transit Curves

TCE 004860678-02 P= 3.033585 Days $T_0=133.084486$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

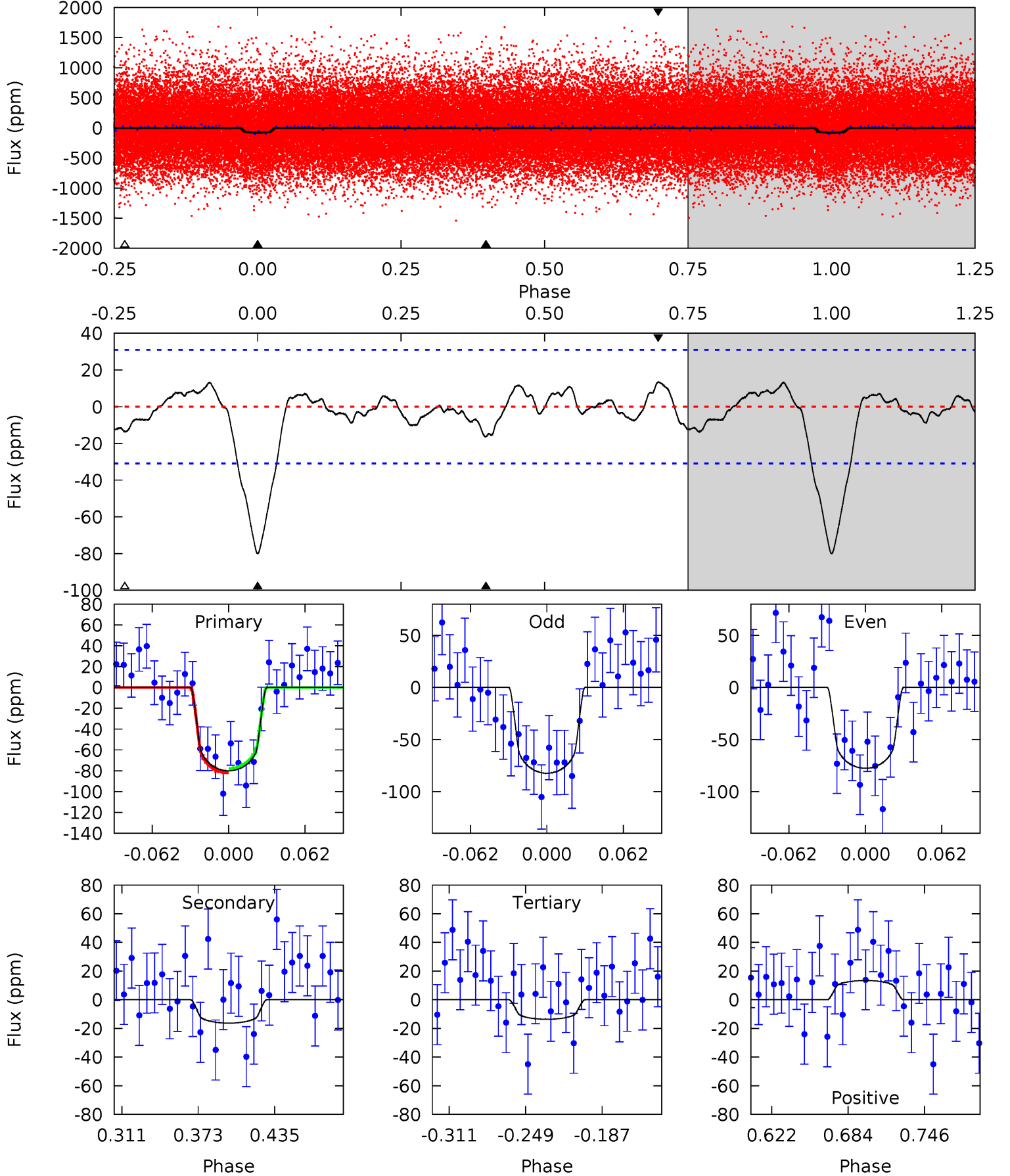
TCE 004860678-02 P= 3.033596 Days $T_0=133.082594$ (BKJD)



DV Model-Shift Uniqueness Test

004860678-02, P = 3.033585 Days, E = 130.050901 Days

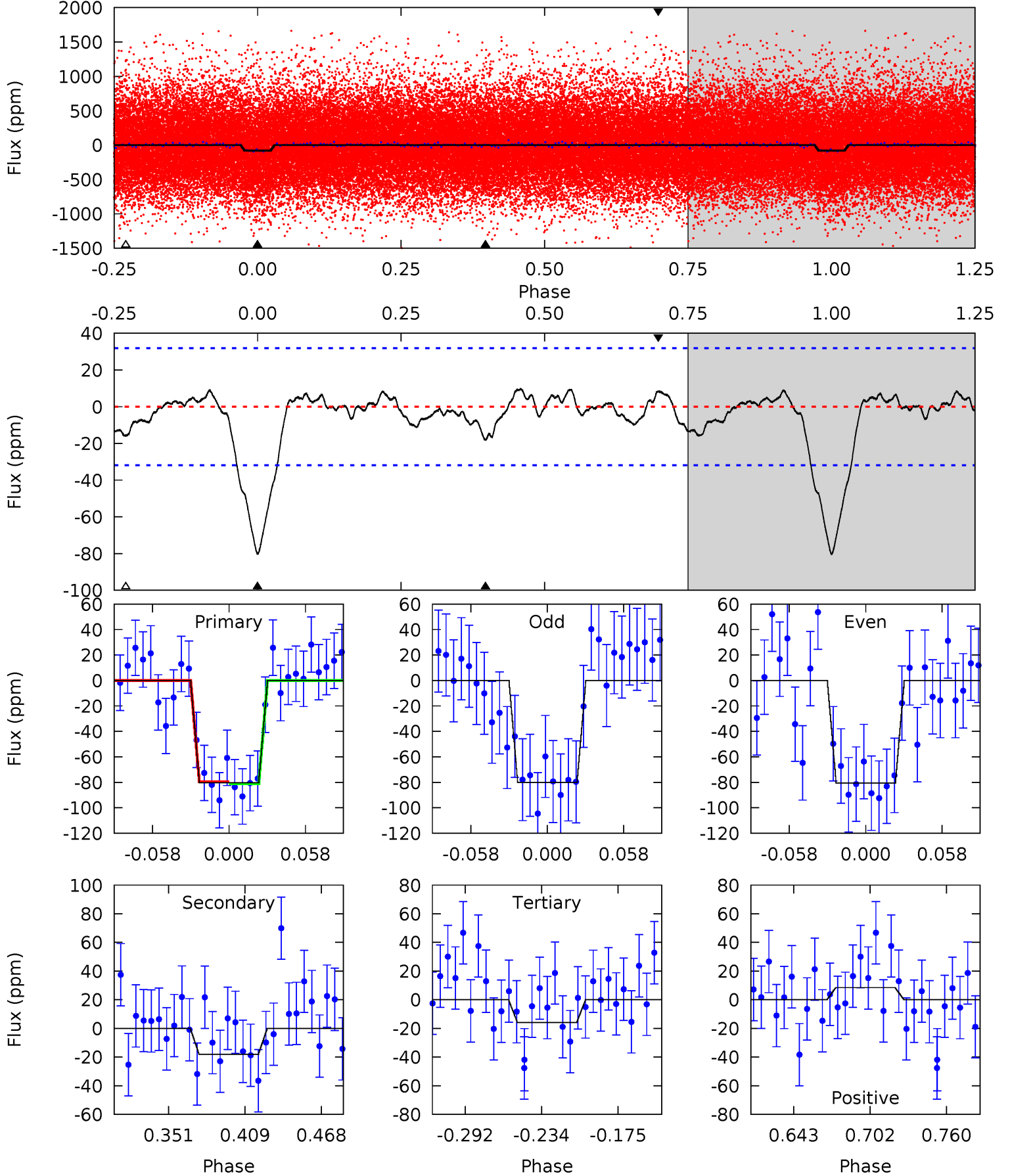
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.1	2.46	2.05	2.02	4.66	1.87	0.96	10.0	10.0	0.40	0.44	0.36	0.87	0.14	0.29



Alt Model-Shift Uniqueness Test

004860678-02, P = 3.033596 Days, E = 130.048998 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.8	2.65	2.33	1.24	4.68	1.89	0.84	9.46	10.5	0.33	1.41	0.03	0.85	0.11	0.12



Stellar Parameters For KIC 004860678

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5557^{+83}_{-72}	$4.037^{+0.210}_{-0.090}$	$0.160^{+0.150}_{-0.100}$	$1.616^{+0.254}_{-0.413}$	$1.035^{+0.085}_{-0.094}$	$0.346^{+0.420}_{-0.100}$
	+1%/-1%	+5%/-2%	+94%/-62%	+16%/-26%	+8%/-9%	+122%/-29%
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 004860678-02 / KOI 1602.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-16 ± 7	$1.83^{+1.05}_{-0.93}$	2112^{+98}_{-133}	3707^{+1188}_{-617}	$4.344^{+13.815}_{-2.809}$
Alt.	-18 ± 7	$1.60^{+1.21}_{-0.86}$	2124^{+88}_{-144}	3944^{+1556}_{-713}	$6.275^{+29.062}_{-4.357}$

T_{max} = Theoretical Maximum Planetary Temperature

T_{obs} = Observed Planetary Temperature (Assuming A=0.3)

A_{obs} = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if $T_{obs} \gg T_{max}$ AND $A_{obs} \gg 1.0$

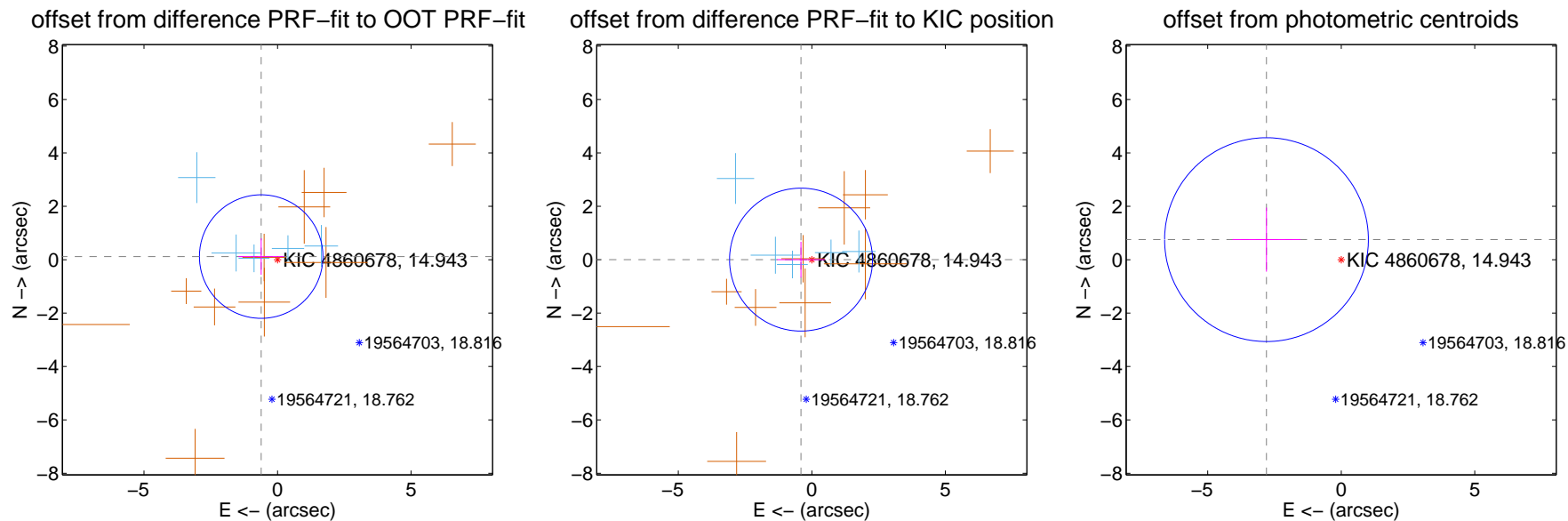
DV Centroid Data

Supplemental centroid analysis for 004860678-02. Kepler magnitude: 14.94. Transit SNR 10.82

There are 5 quarters with good PRF difference image offsets

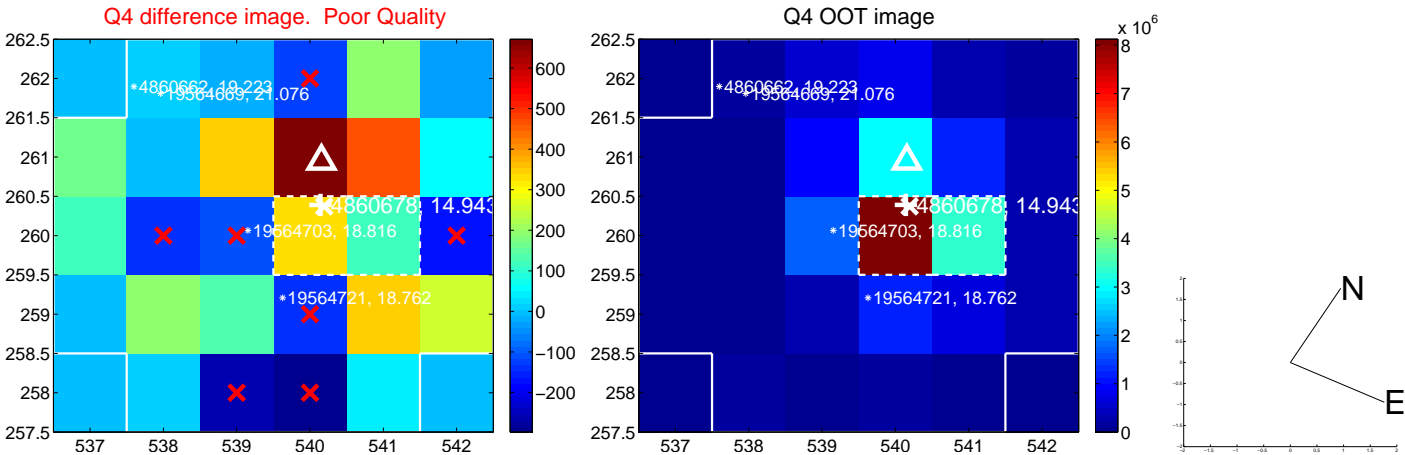
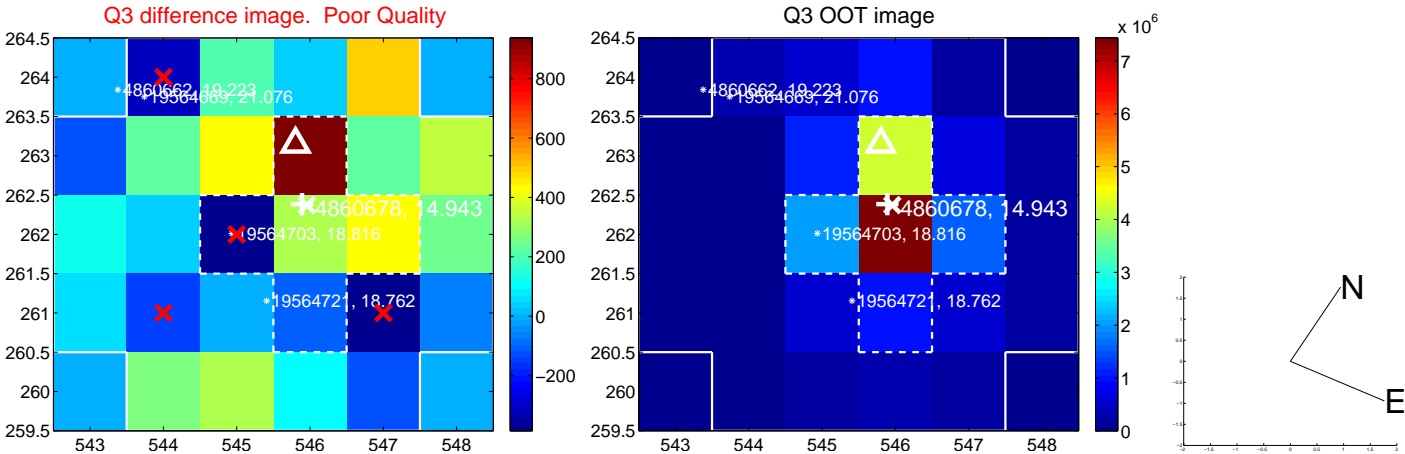
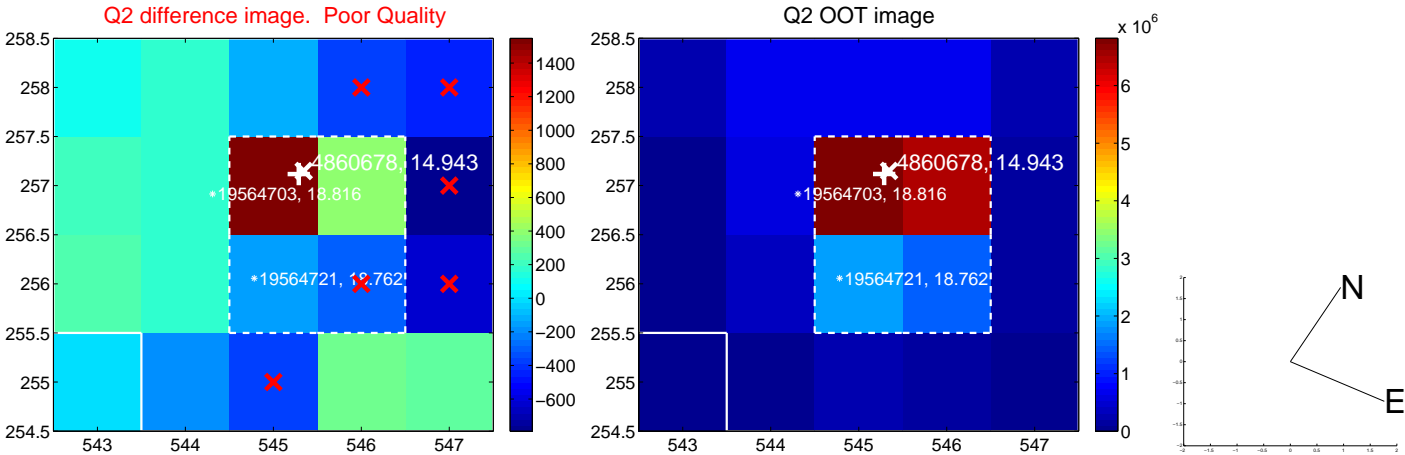
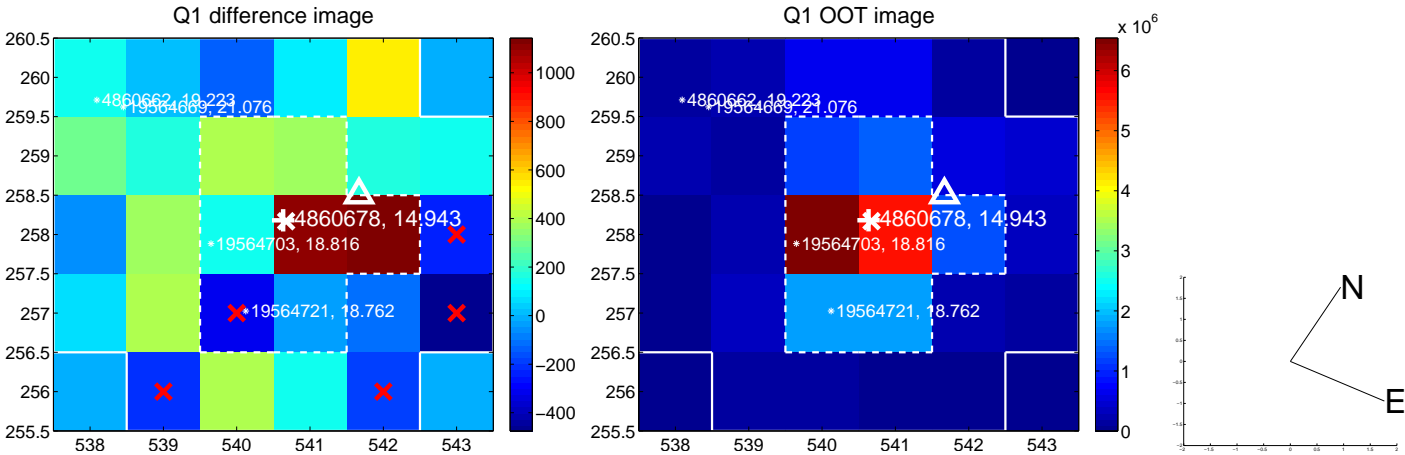
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.623 ± 0.771	0.81	0.612 ± 0.847	0.117 ± 0.681
PRF-fit source offset from KIC position	0.404 ± 0.892	0.45	0.404 ± 0.896	0.003 ± 0.670
photometric centroid source offset	2.90 ± 1.27	2.28	2.80 ± 1.28	0.75 ± 1.20

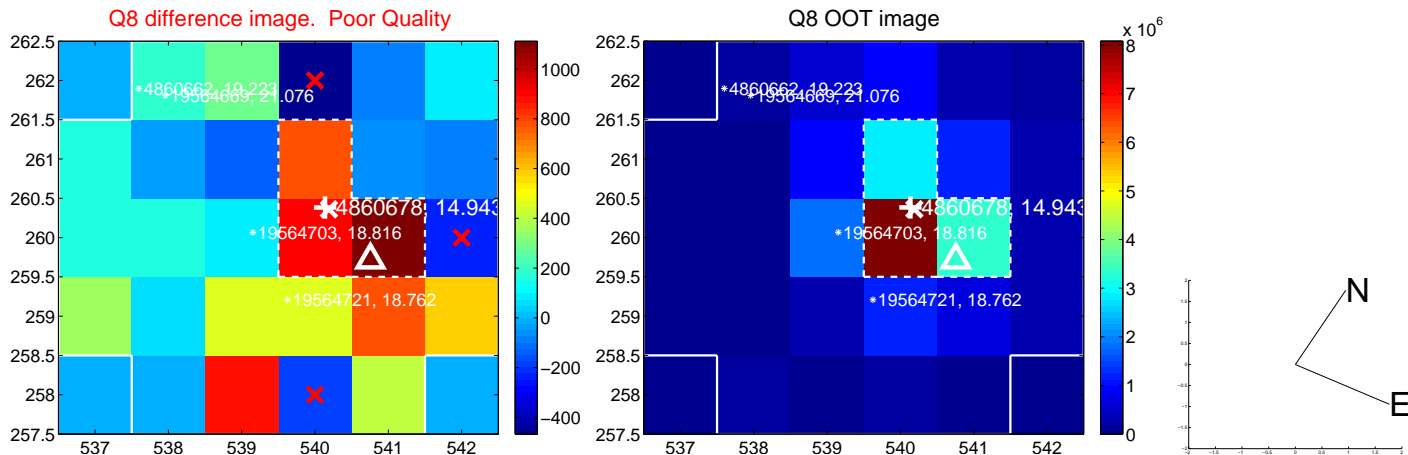
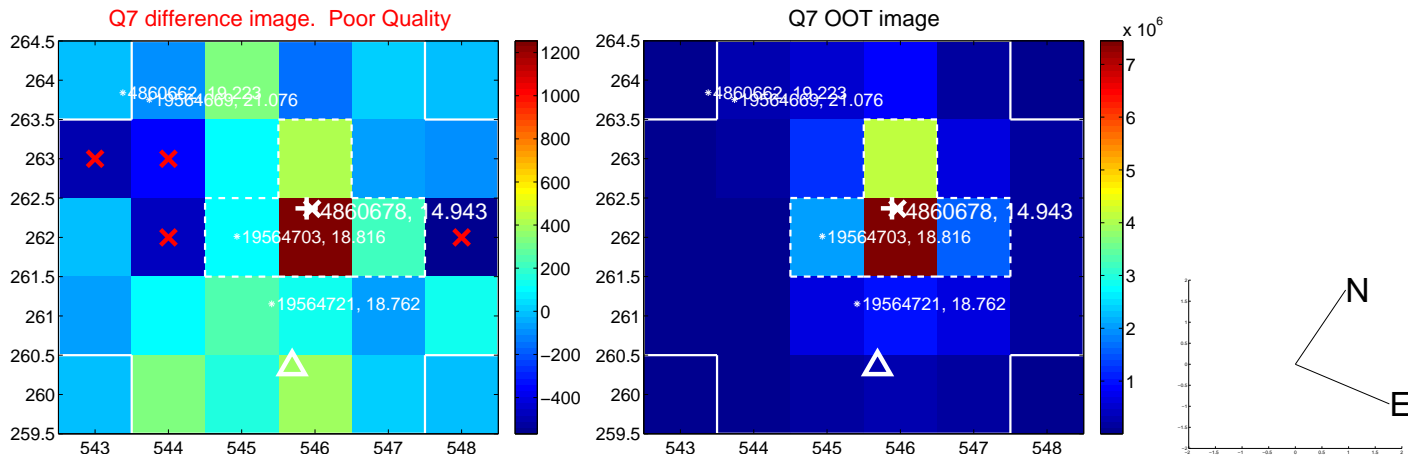
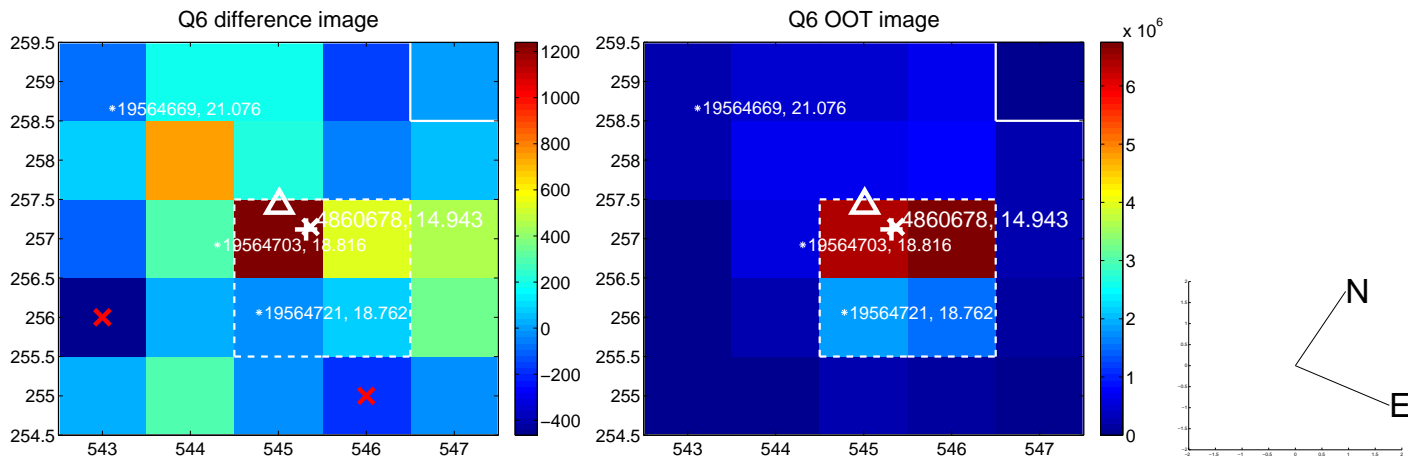
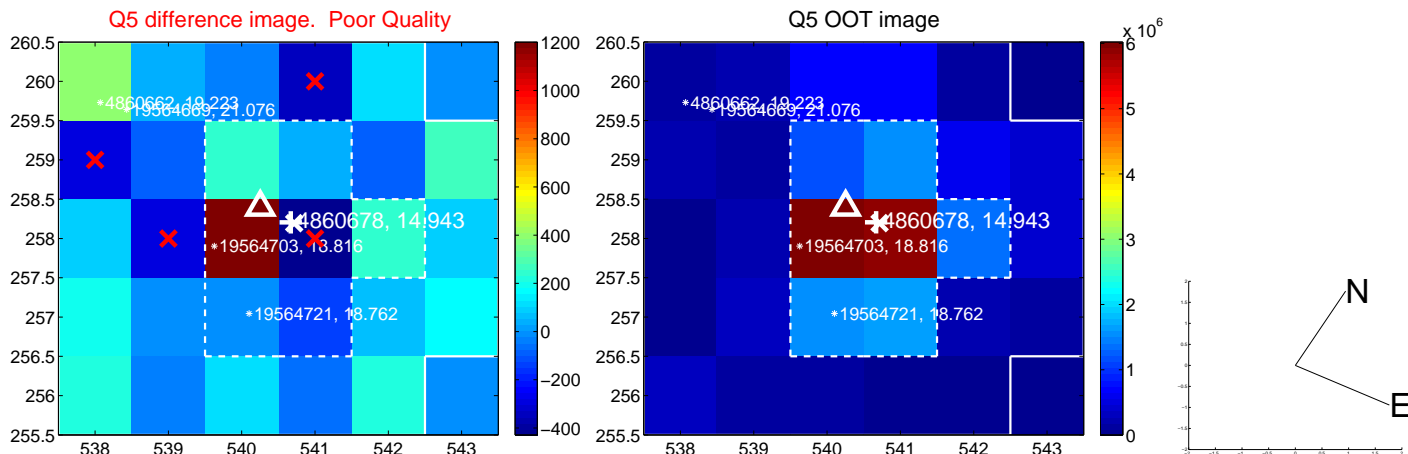


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

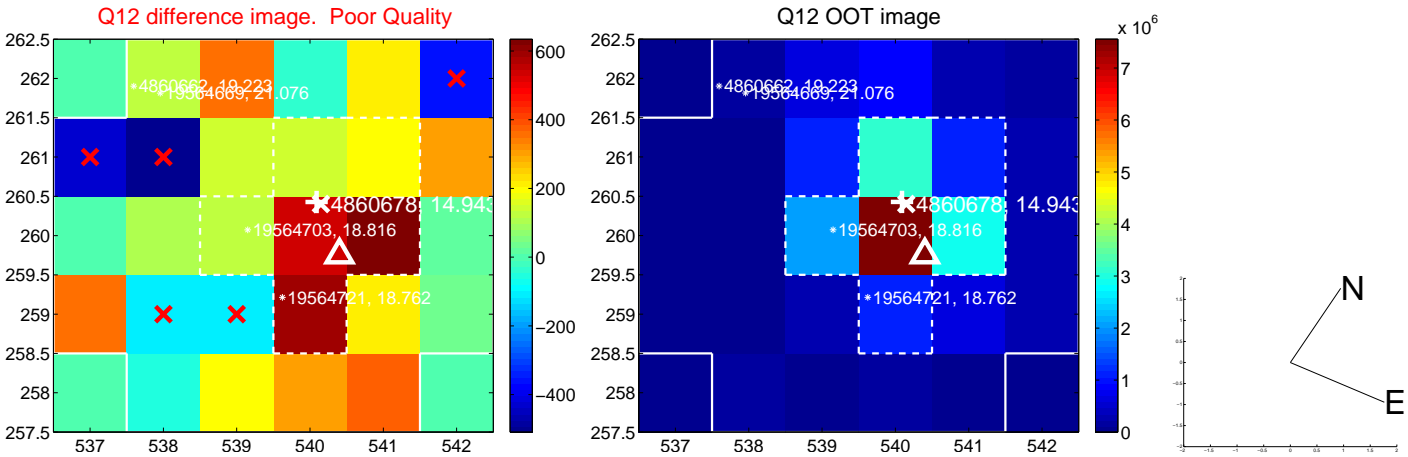
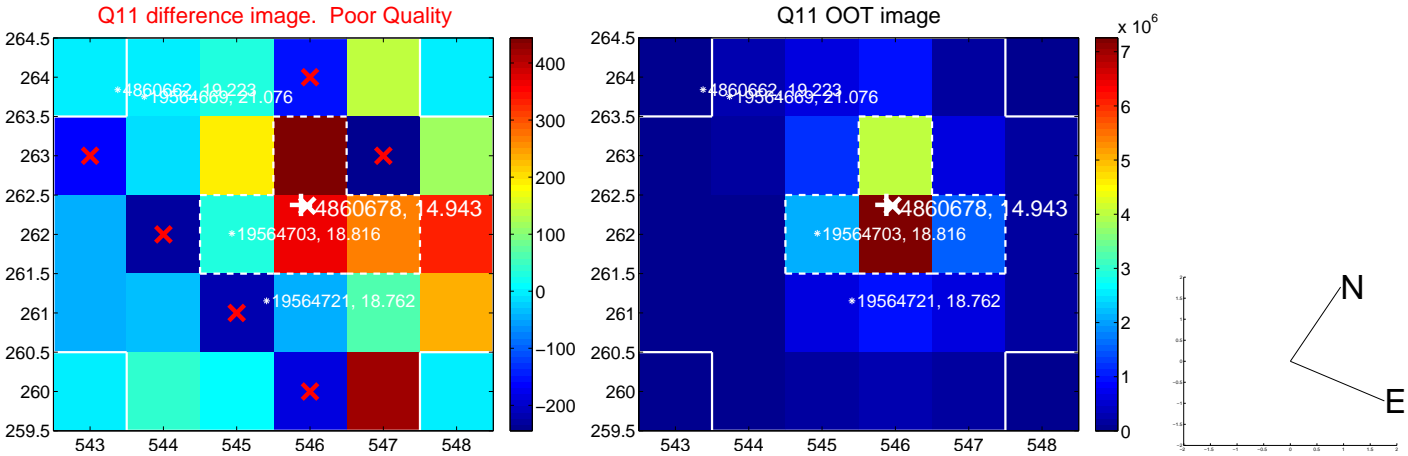
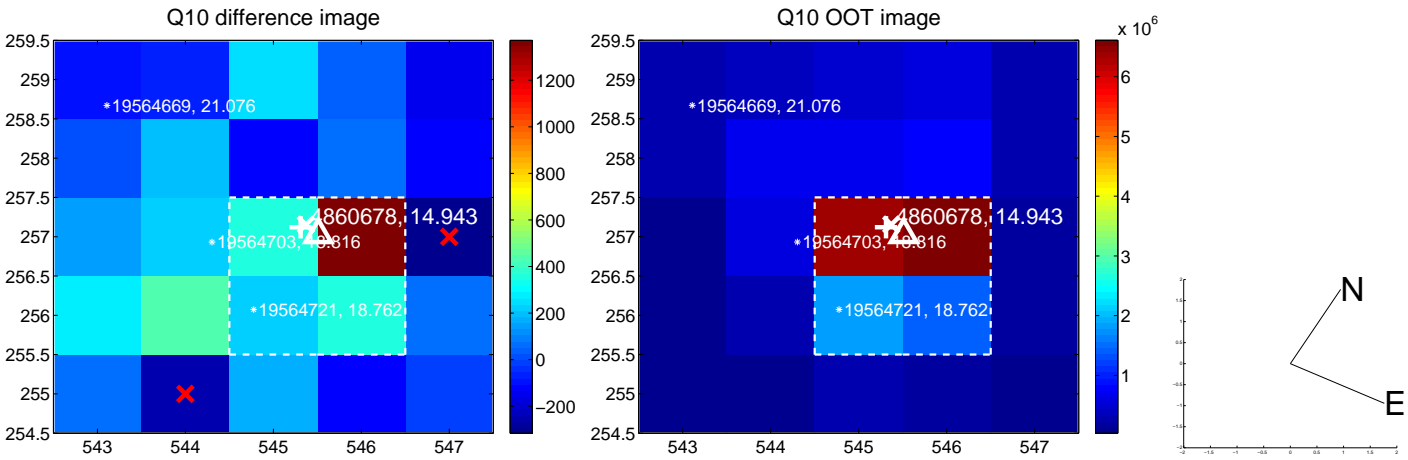
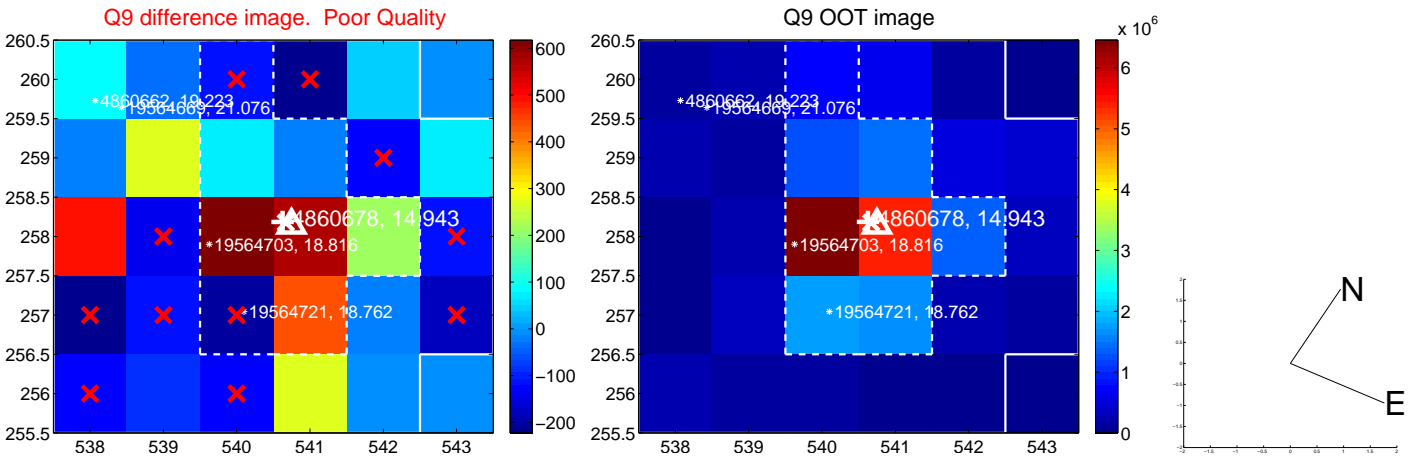
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



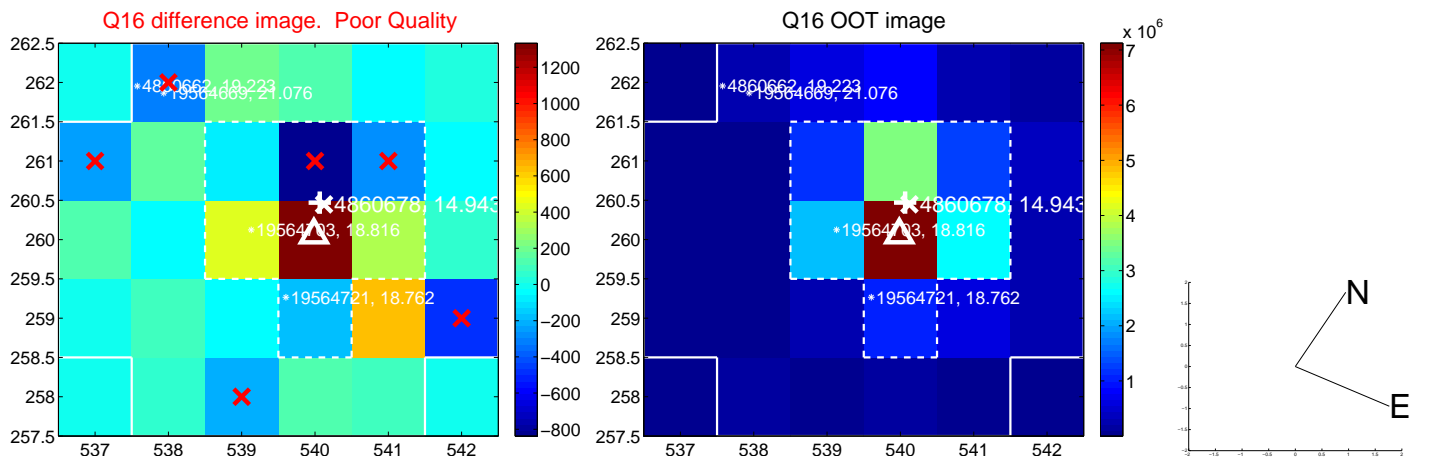
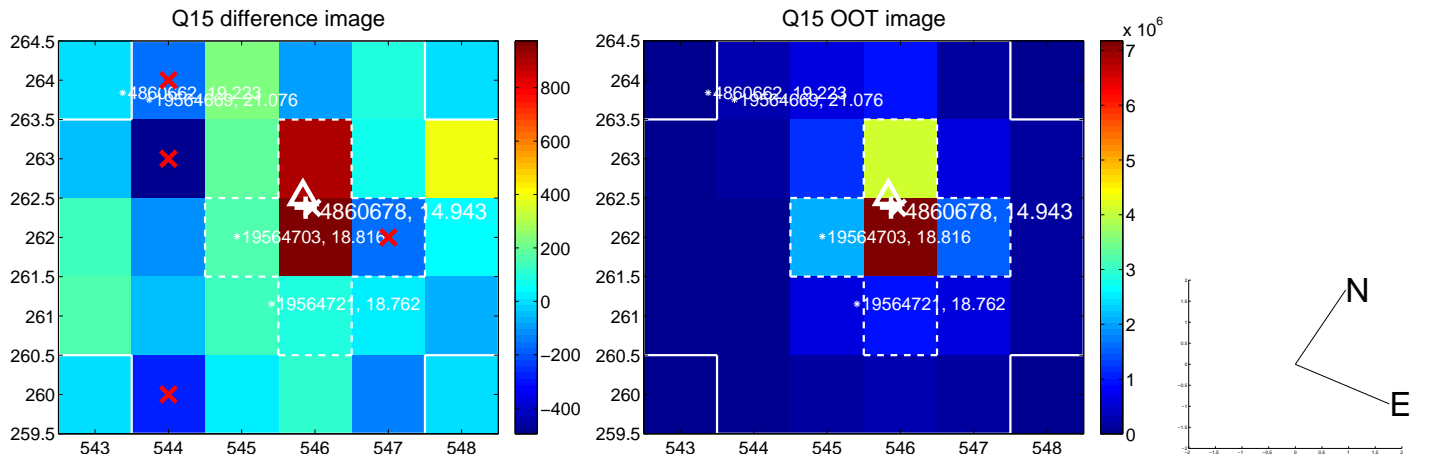
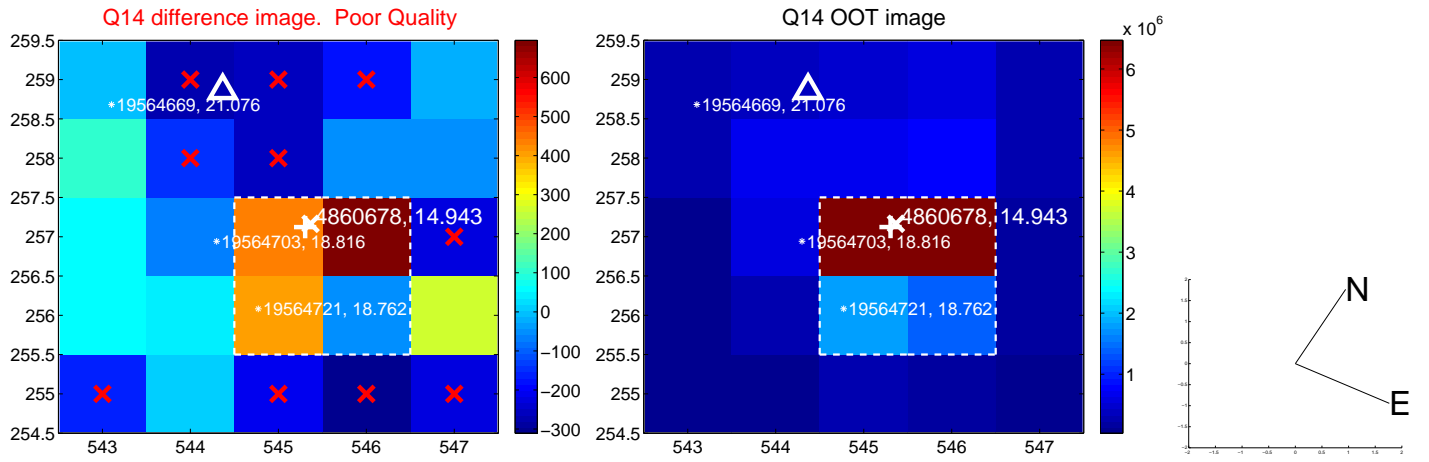
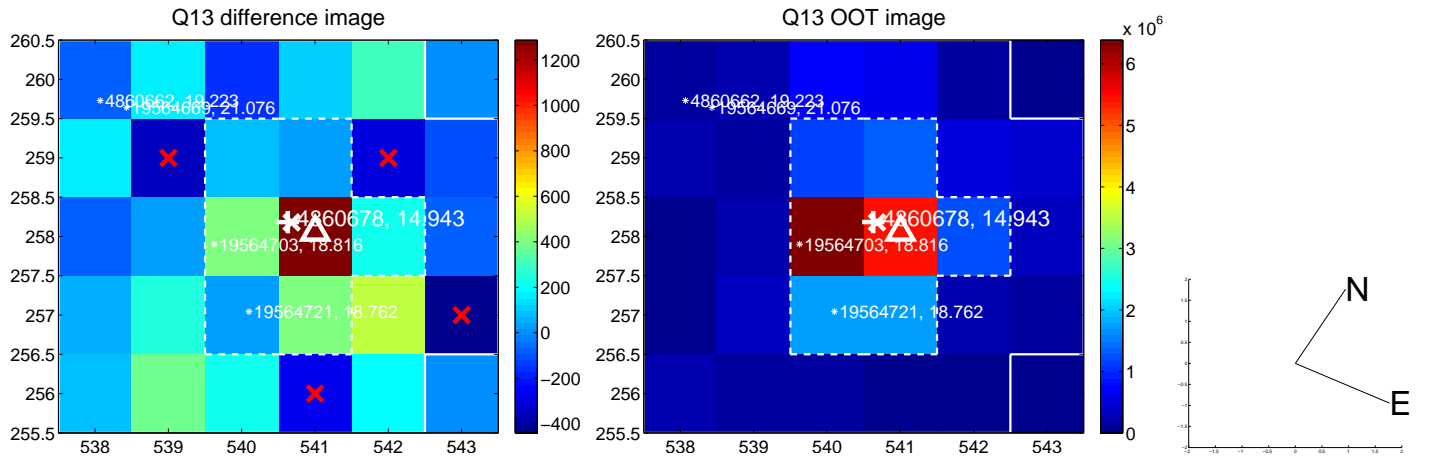
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



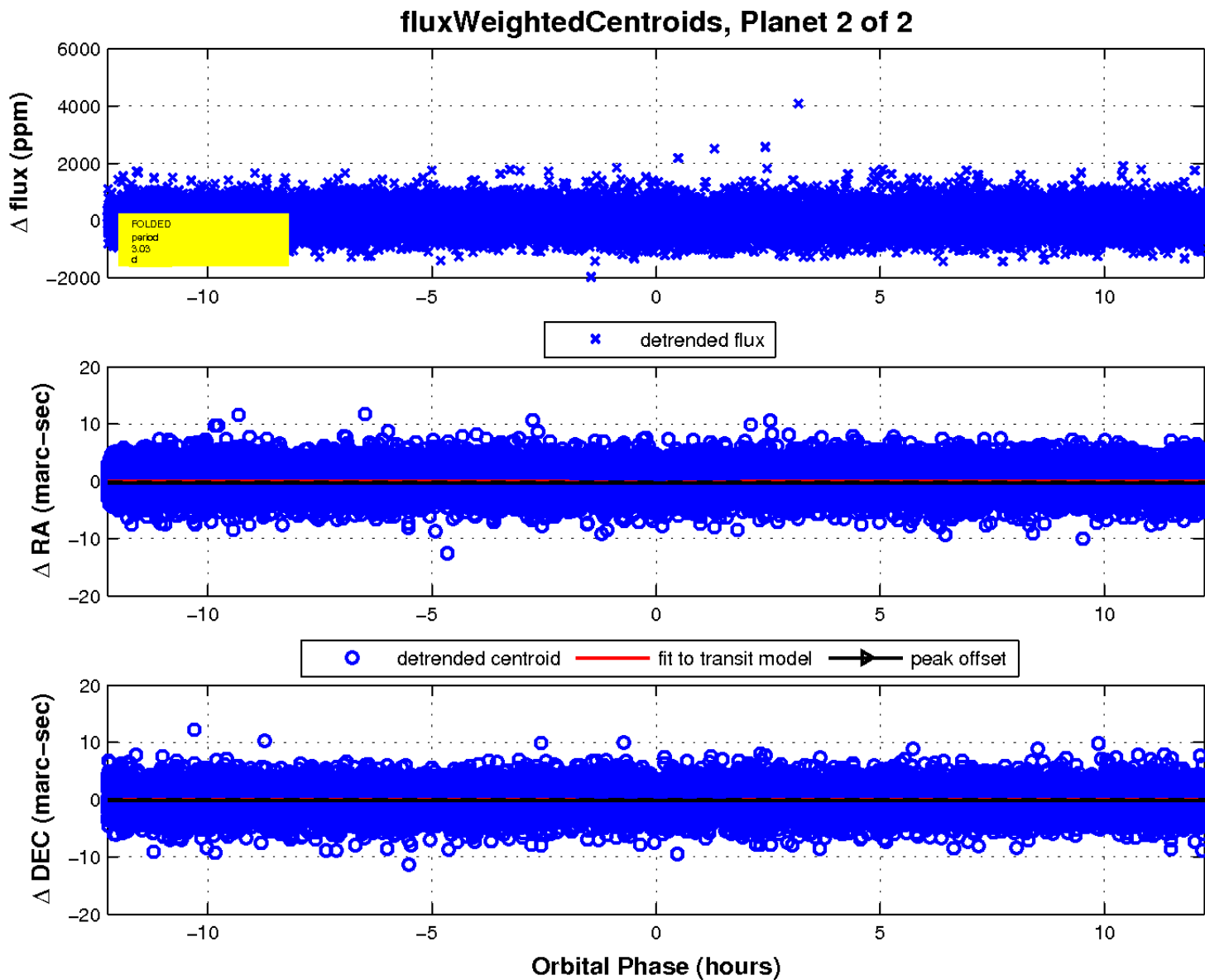
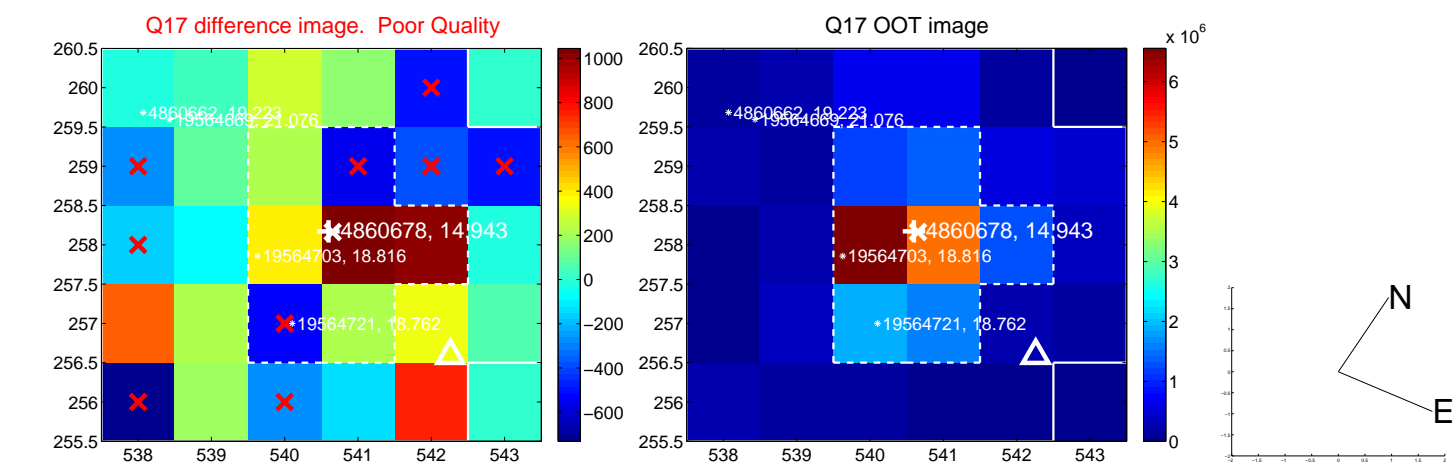
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

