

KIC 009006186

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})
009006186-01	OBS	2169.01	5.452974	134.152435	88.9	2.231	23.1	25.3	0.84	5450	0.95	158.19
009006186-02	OBS	2169.02	3.266644	132.815659	55.9	2.167	18.0	20.1	0.84	5450	0.76	313.25
009006186-03	OBS	2169.03	4.272255	133.220264	49.4	2.169	13.7	15.2	0.84	5450	0.62	219.02
009006186-04	OBS	2169.04	2.192531	132.233444	20.0	2.152	8.2	8.3	0.84	5450	0.45	533.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009006186-01	OBS	PC	0.90	0	0	0	0	NO_COMMENT
009006186-02	OBS	PC	0.96	0	0	0	0	NO_COMMENT
009006186-03	OBS	PC	0.65	0	0	0	0	NO_COMMENT
009006186-04	OBS	PC	0.99	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.

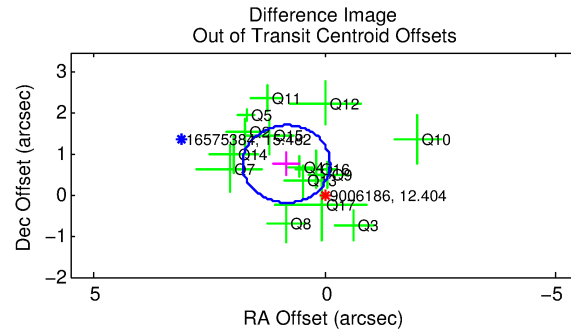
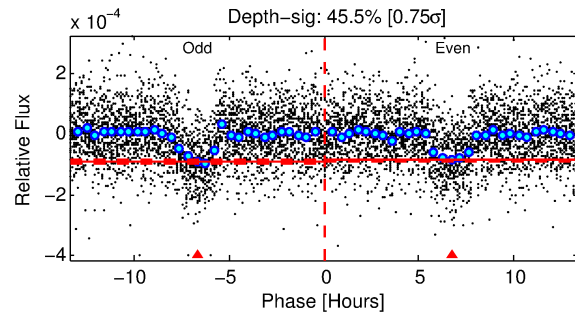
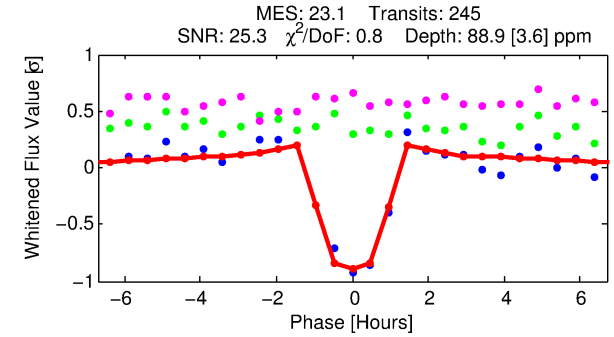
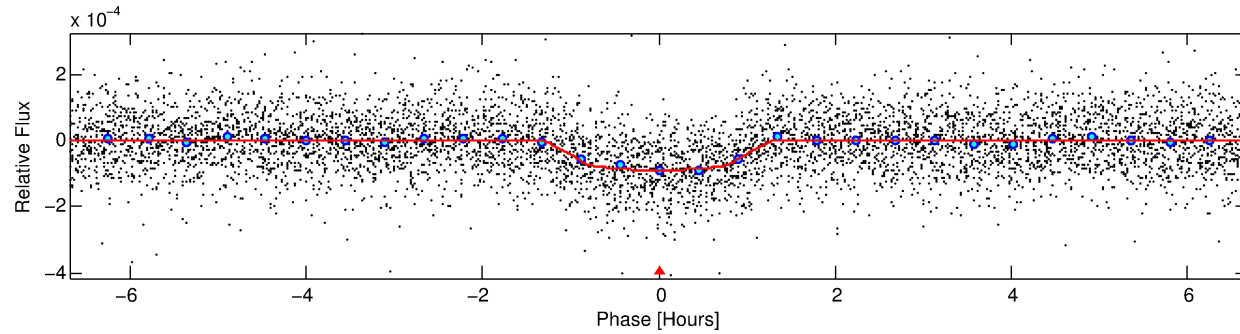
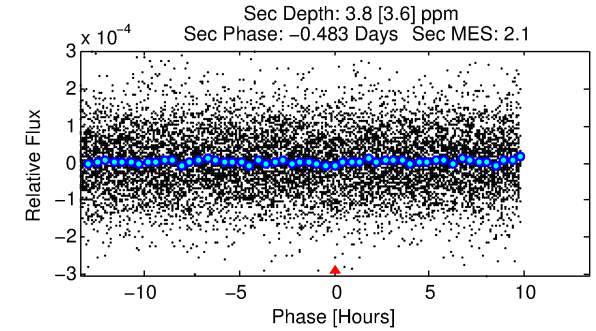
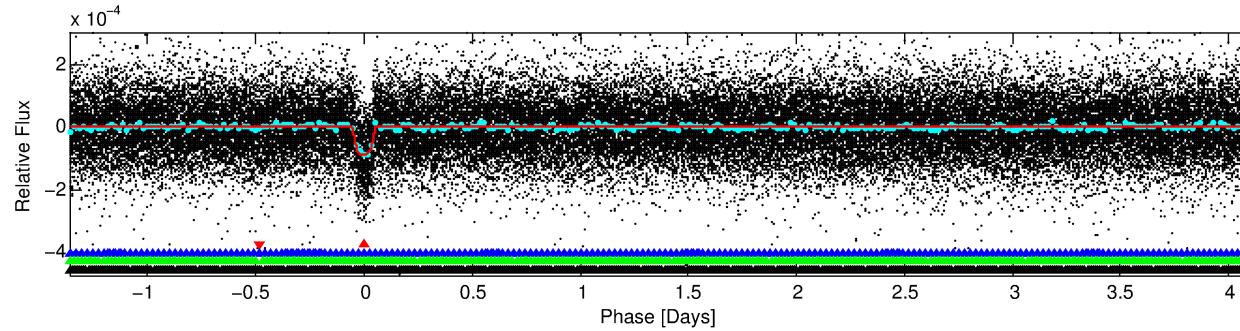
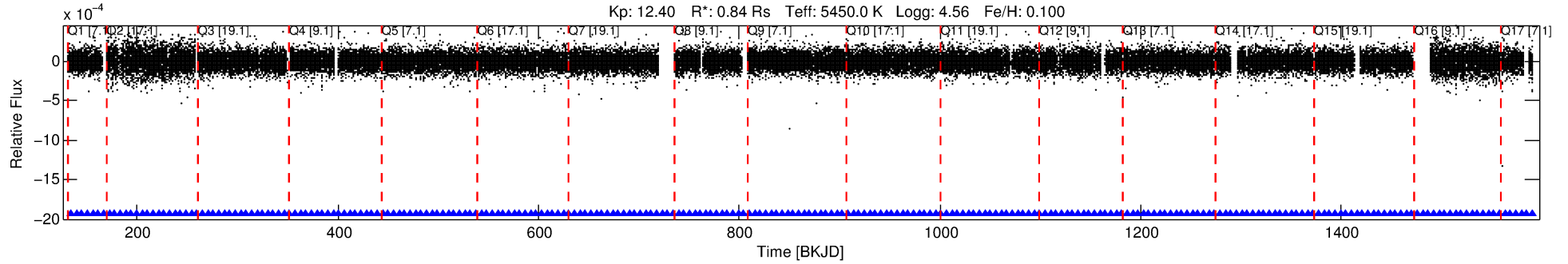
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009006186-01

No Significant Match Found

DV One-Page Summary

KIC: 9006186 Candidate: 1 of 4 Period: 5.453 d
KOI: K02169.01 Corr: 0.971



DV Fit Results:

Period = 5.45297 [0.00001] d
Epoch = 134.1524 [0.0015] BKJD
Rp/R* = 0.0104 [0.0027]
a/R* = 8.64 [9.74]
b = 0.90 [0.25]
Seff = 158.19 [28.53]
Teq = 904 [41] K
Rp = 0.96 [0.27] Re
a = 0.0595 [0.0061] AU
Ag = 8.13 [8.82] [0.81σ]
Teffp = 2361 [635] K [2.29σ]

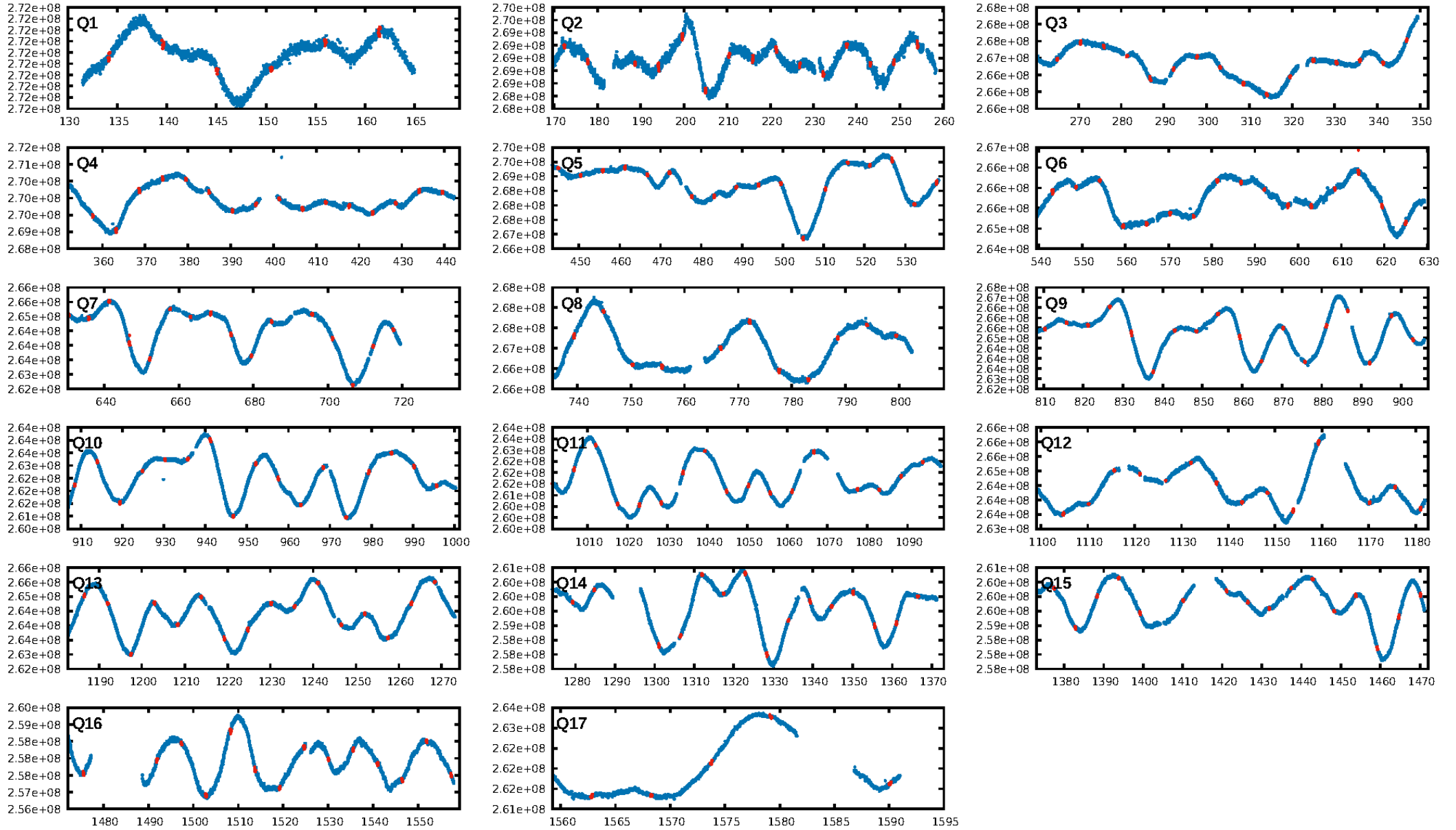
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [9.11σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 7.32e-112
RollingBand-fgt: 1.00 [234/234]
GhostDiagnostic-chr: 6.993
Centroid-sig: 0.1%
Centroid-so: 0.589 arcsec [1.82σ]
OotOffset-rm: 1.128 arcsec [3.57σ]
KicOffset-rm: 1.003 arcsec [3.59σ]
OotOffset-st: 3/4/4/4 [15]
KicOffset-st: 3/4/4/4 [15]
DiffImageQuality-fgm: 0.93 [14/15]
DiffImageOverlap-fno: 1.00 [17/17]

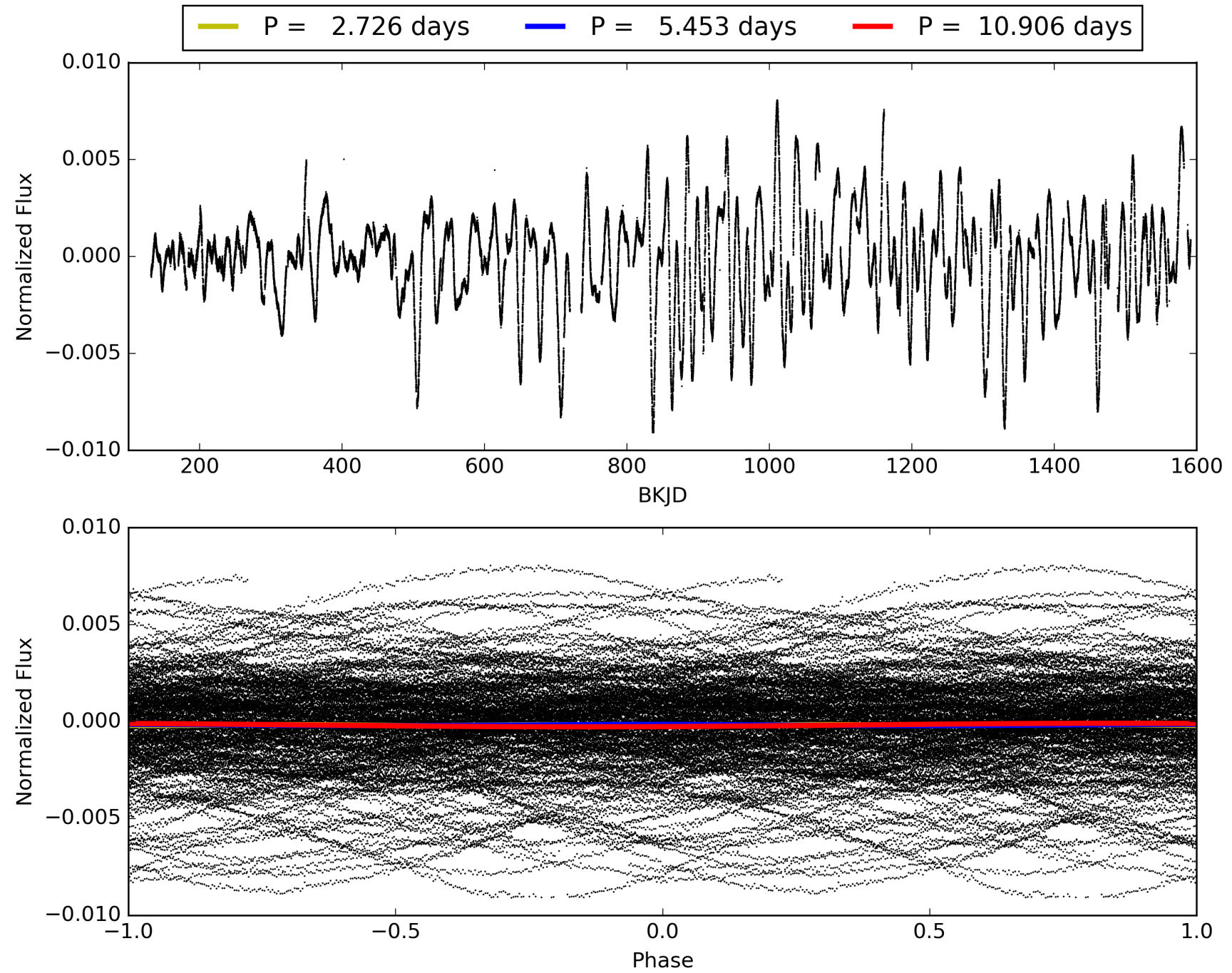
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 12:13:17 Z

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

TCE 009006186-01, PDC Light Curves

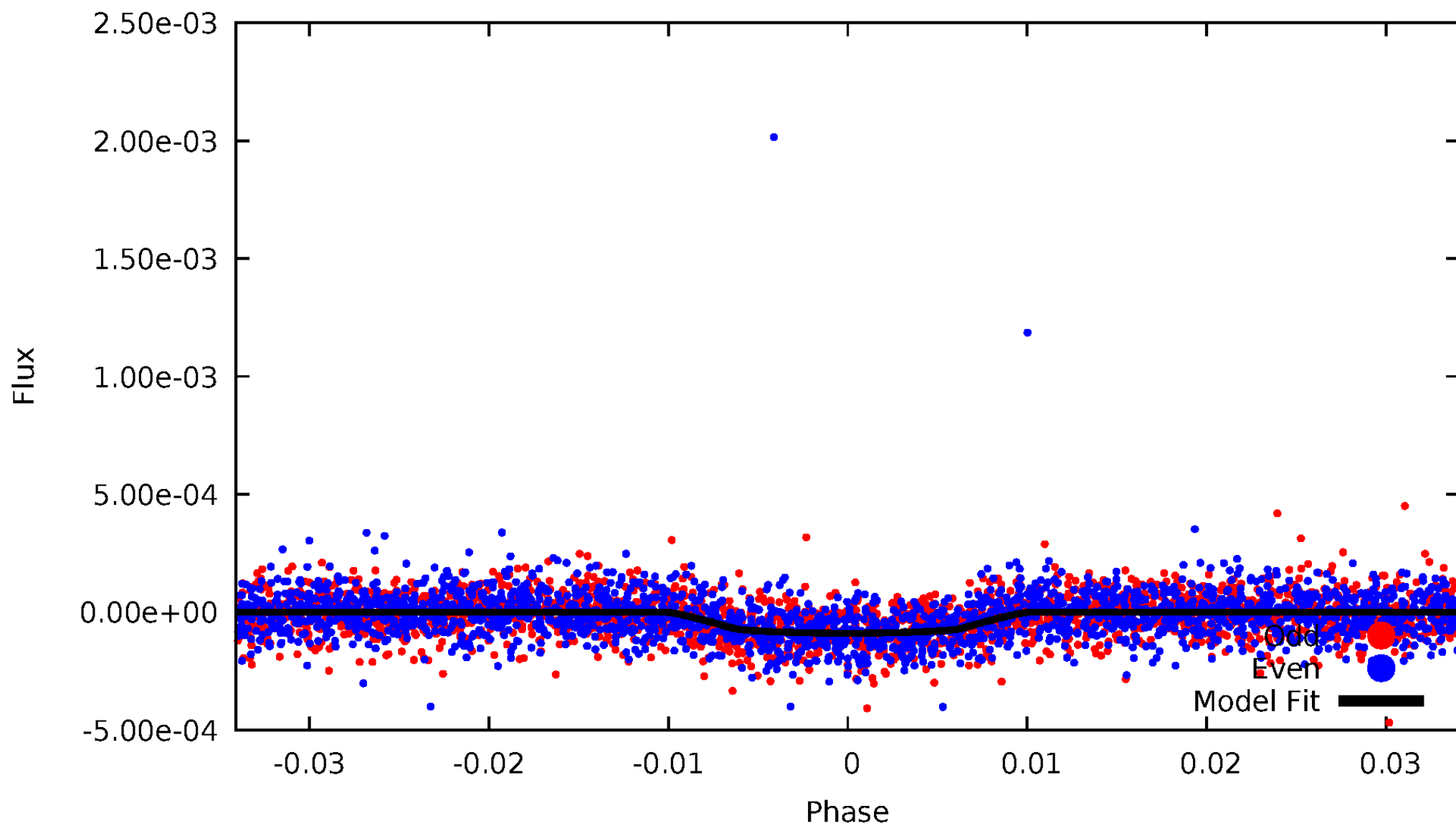


TCE 009006186-01



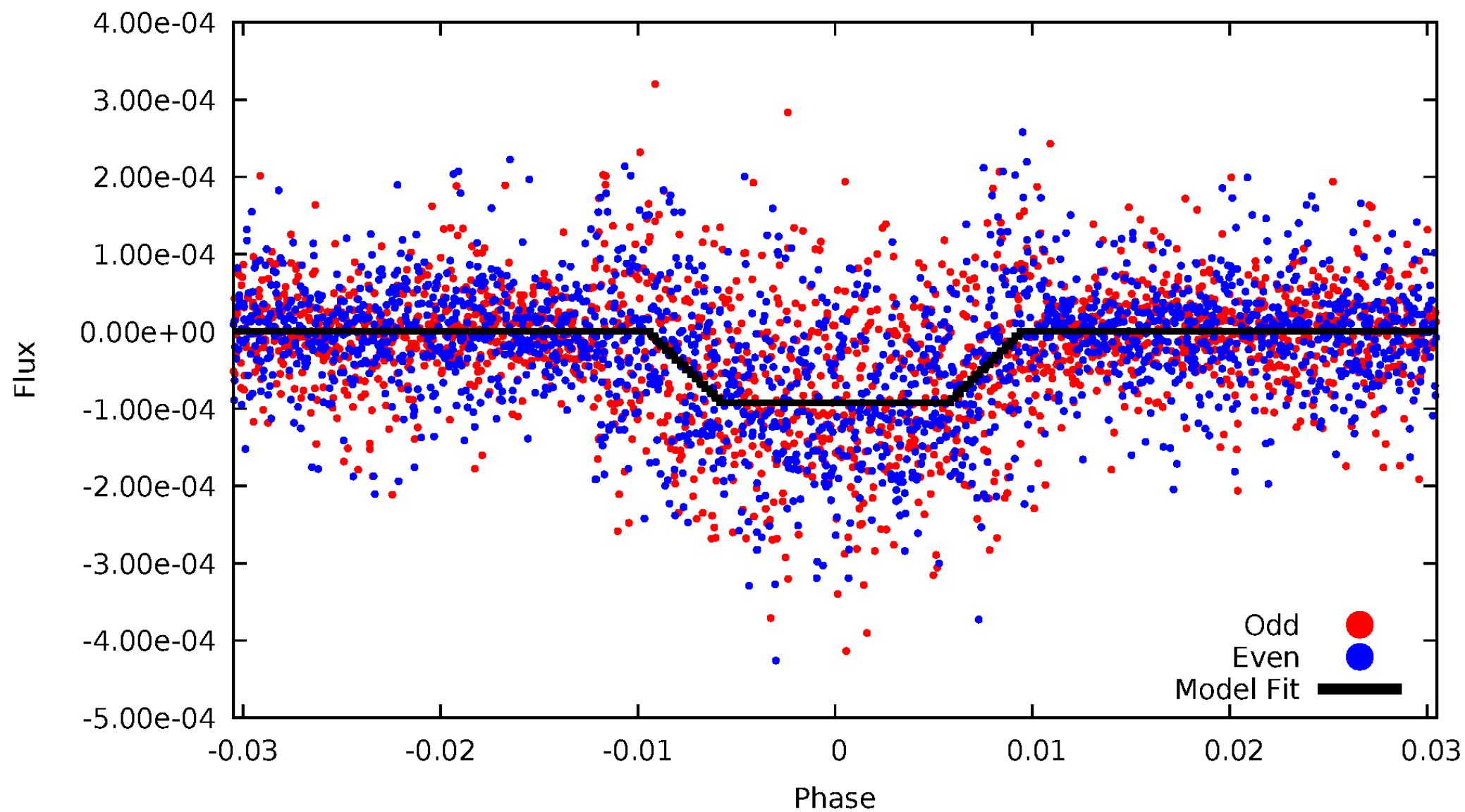
DV Odd/Even

TCE 009006186-01



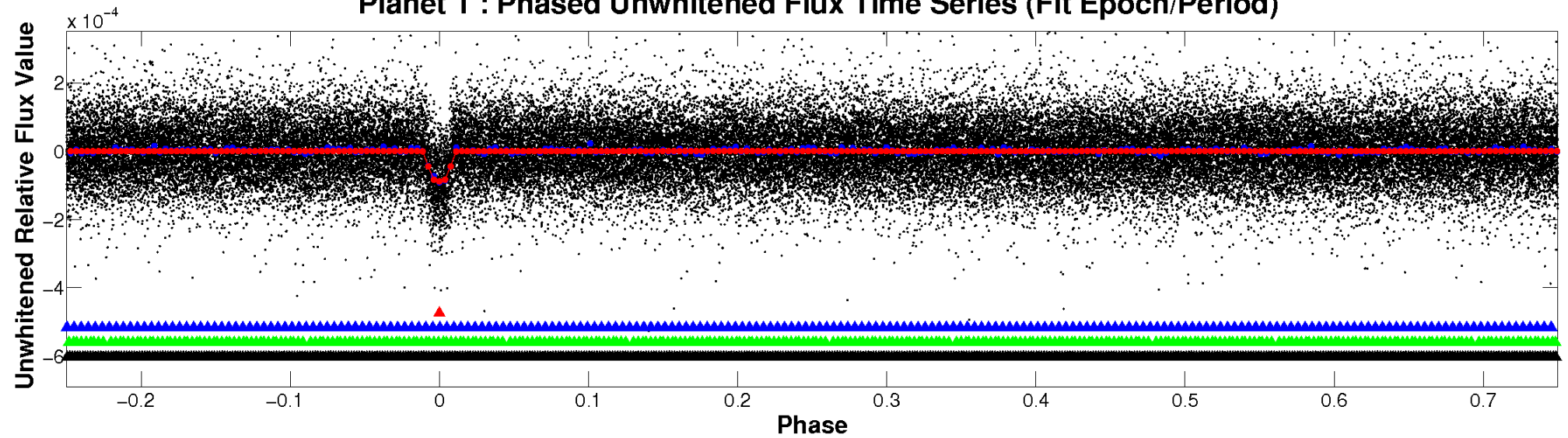
ALT Odd/Even

TCE 009006186-01

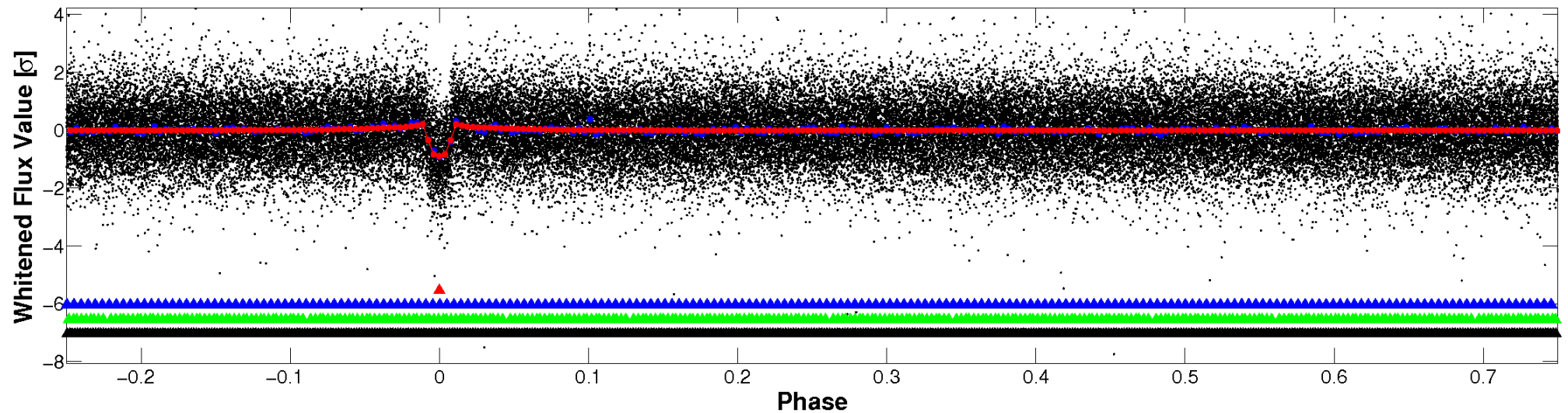


Non-Whitened Vs. Whitened Light Curve

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

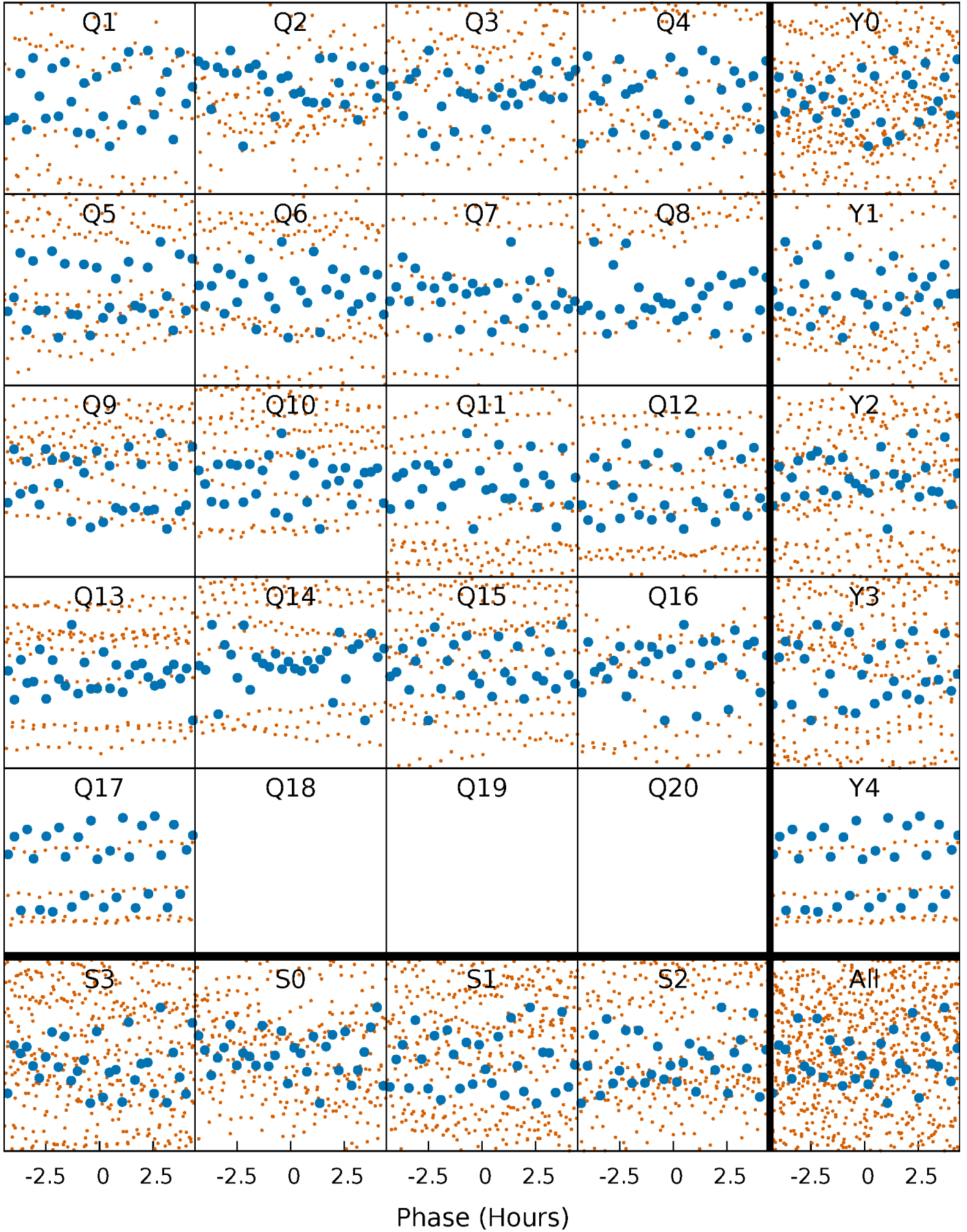


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



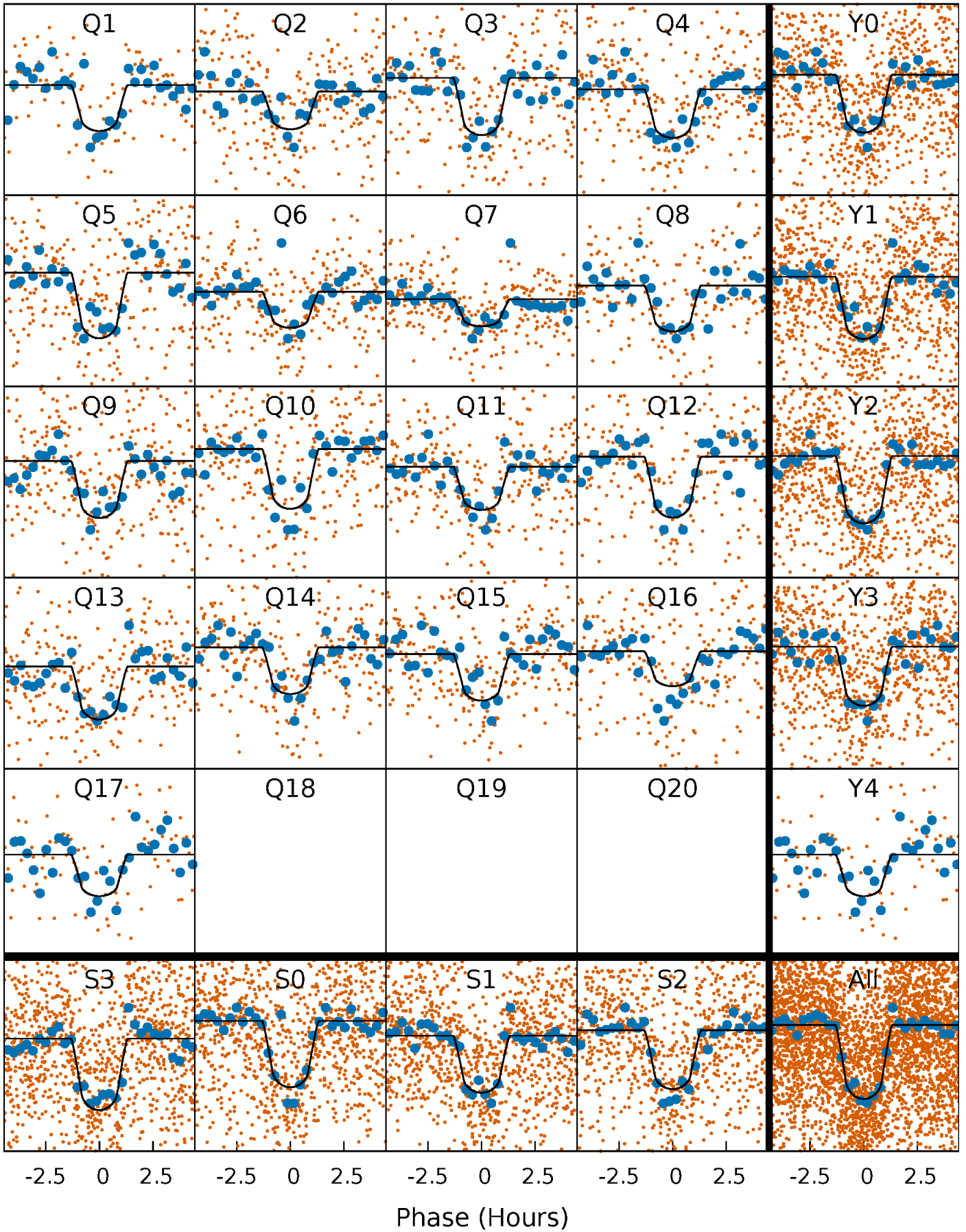
PDC Quarter-Phased Transit Curves

TCE 009006186-01 P= 5.452974 Days $T_0=134.152435$ (BKJD)



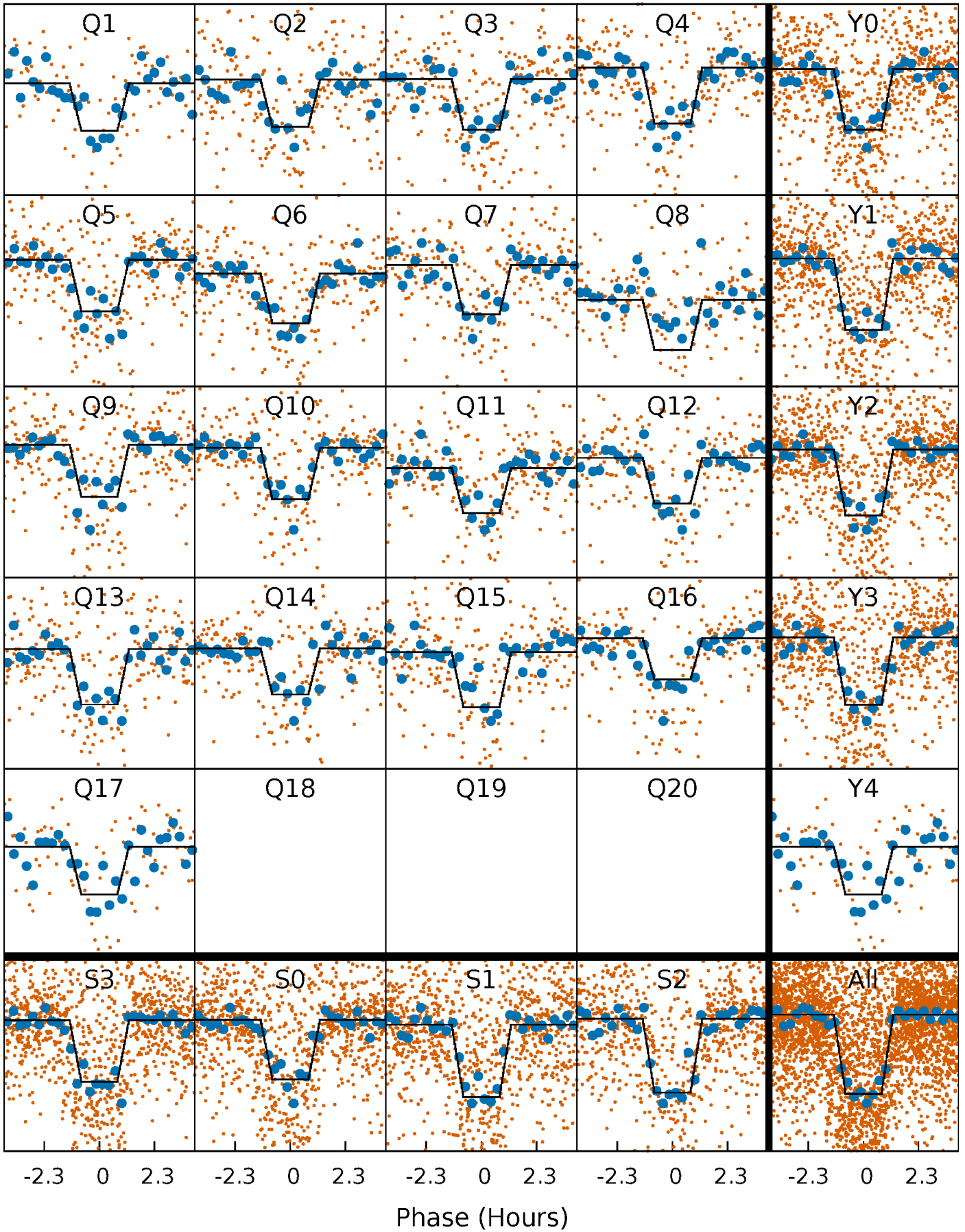
DV Quarter-Phased Transit Curves

TCE 009006186-01 P= 5.452974 Days $T_0=134.152435$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

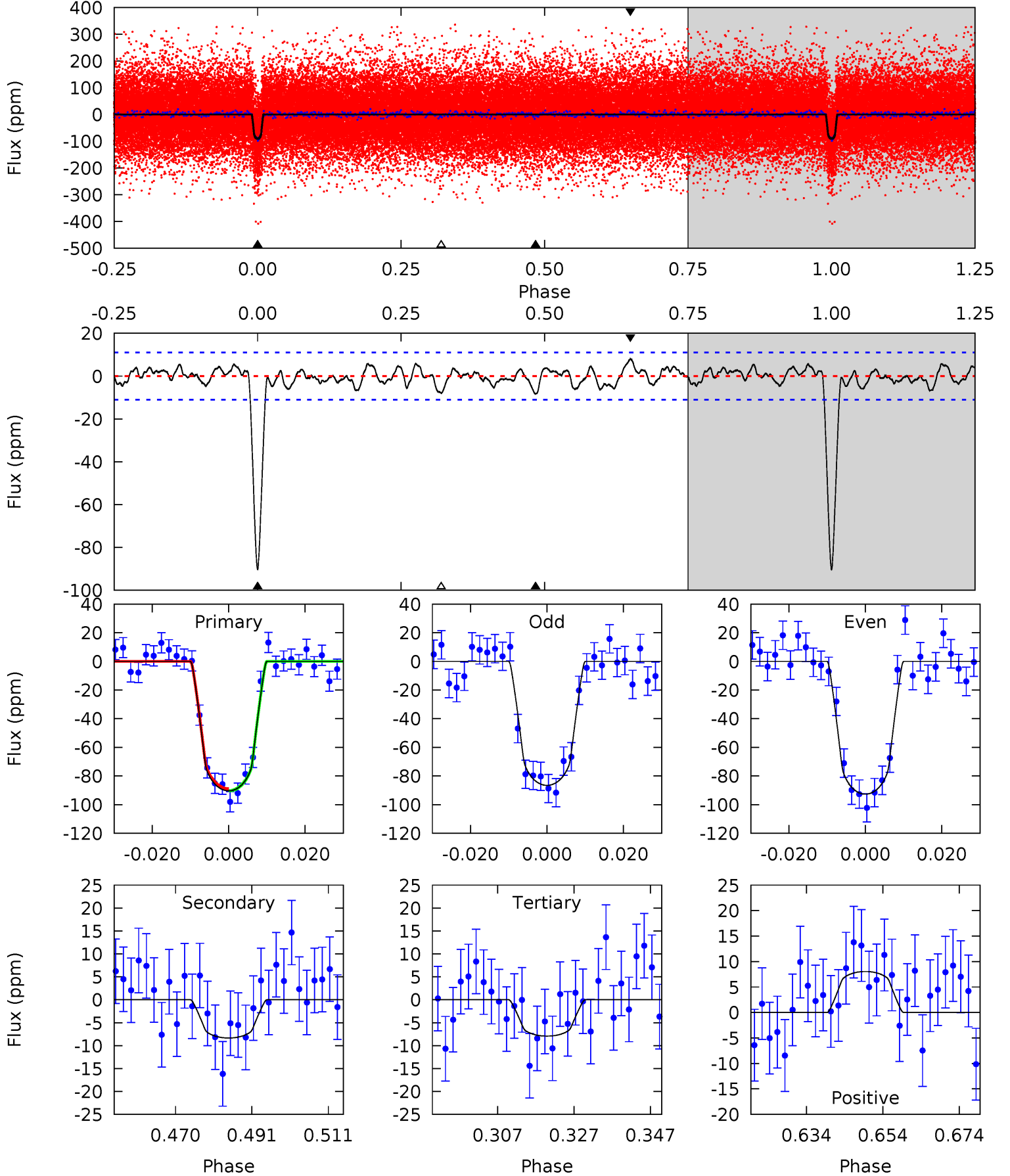
TCE 009006186-01 P= 5.452968 Days $T_0=134.152928$ (BKJD)



DV Model-Shift Uniqueness Test

009006186-01, P = 5.452974 Days, E = 128.699461 Days

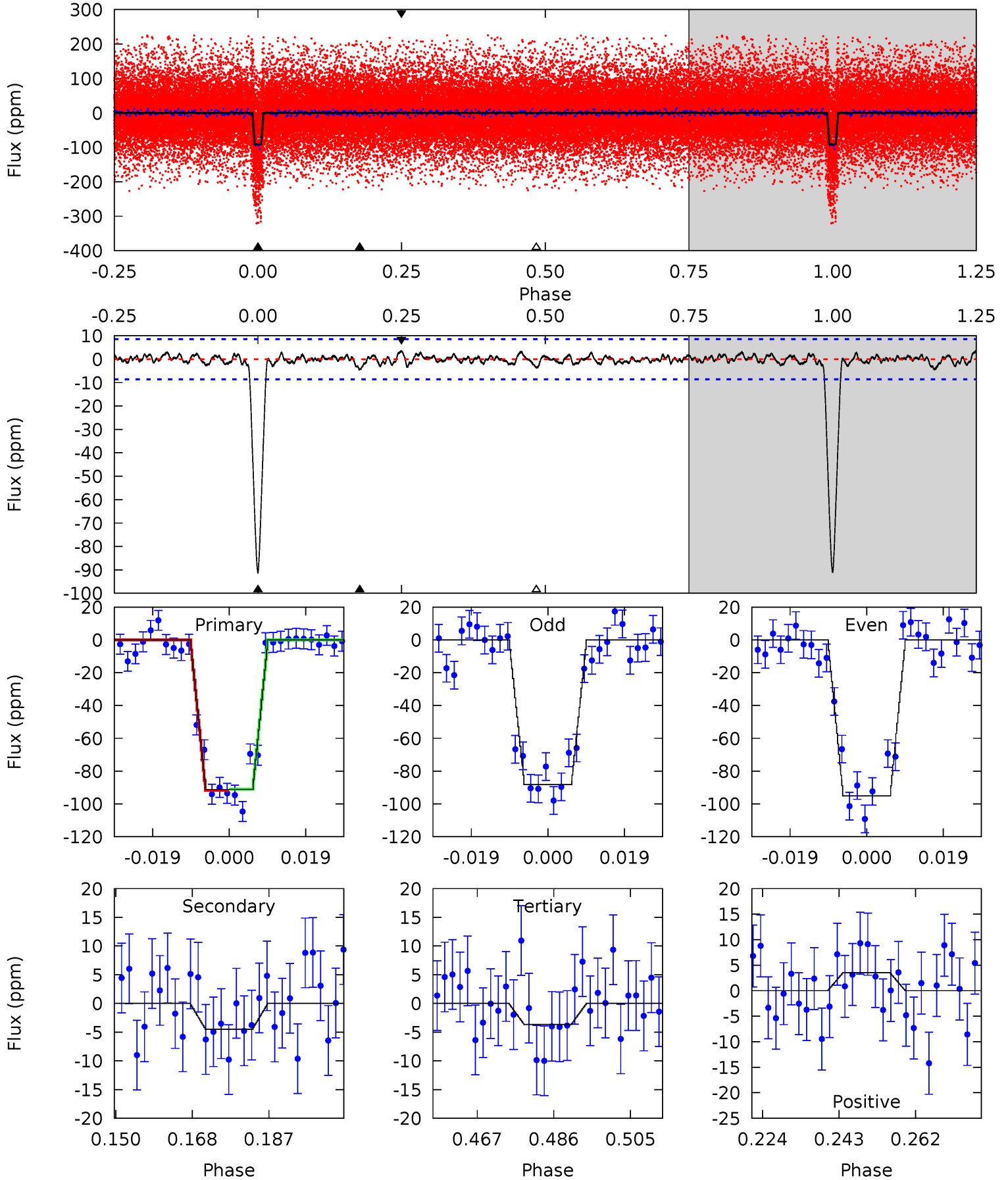
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.0	3.69	3.51	3.57	4.89	2.32	1.37	36.5	36.5	0.18	0.13	1.36	0.94	0.08	0.33



Alt Model-Shift Uniqueness Test

009006186-01, P = 5.452968 Days, E = 128.699960 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
52.2	2.56	2.10	2.01	4.90	2.35	0.74	50.1	50.2	0.46	0.55	1.97	1.01	0.04	0.23



Stellar Parameters For KIC 009006186

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5450^{+108}_{-108}	$4.563^{+0.017}_{-0.094}$	$0.100^{+0.150}_{-0.150}$	$0.842^{+0.093}_{-0.033}$	$0.944^{+0.039}_{-0.066}$	$2.227^{+0.172}_{-0.603}$
	+2%/-2%	+0%/-2%	+150%/-150%	+11%/-4%	+4%/-7%	+8%/-27%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 009006186-01 / KOI 2169.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-8 ± 2	$0.97^{+0.28}_{-0.27}$	1280^{+44}_{-33}	3375^{+410}_{-310}	17^{+16}_{-8}
Alt.	-4 ± 2	$0.91^{+0.24}_{-0.24}$	1278^{+41}_{-33}	3116^{+362}_{-296}	$9.876^{+10.955}_{-4.874}$

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

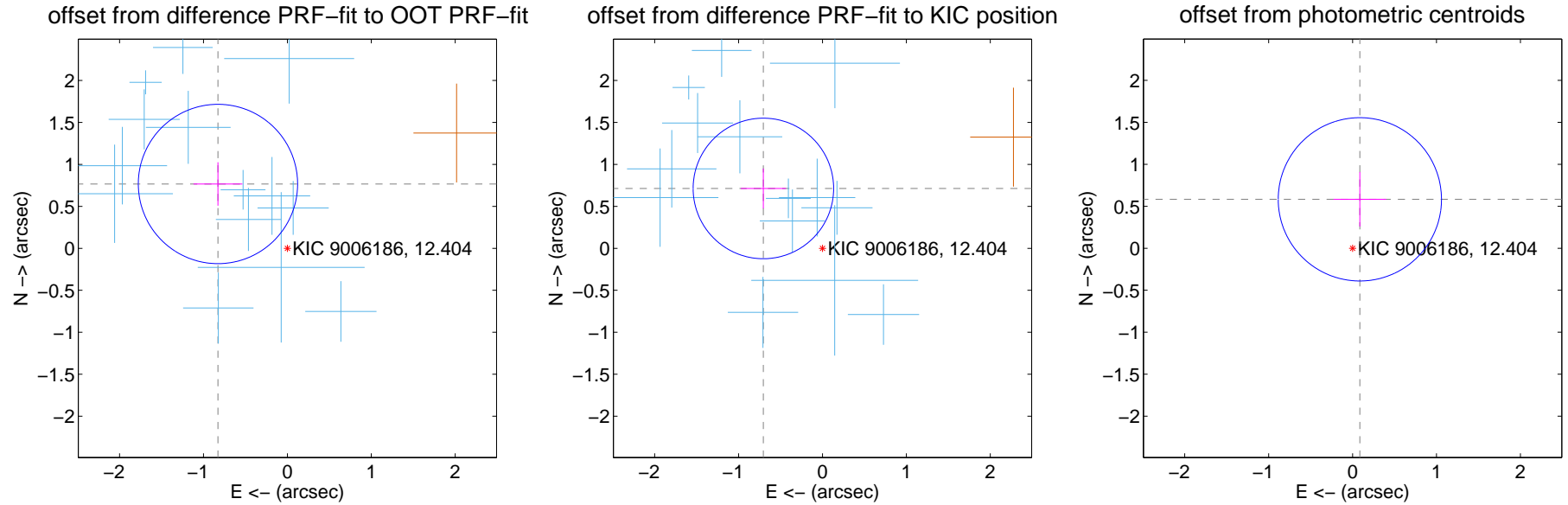
DV Centroid Data

Supplemental centroid analysis for 009006186-01. Kepler magnitude: 12.40. Transit SNR 25.32

There are 14 quarters with good PRF difference image offsets

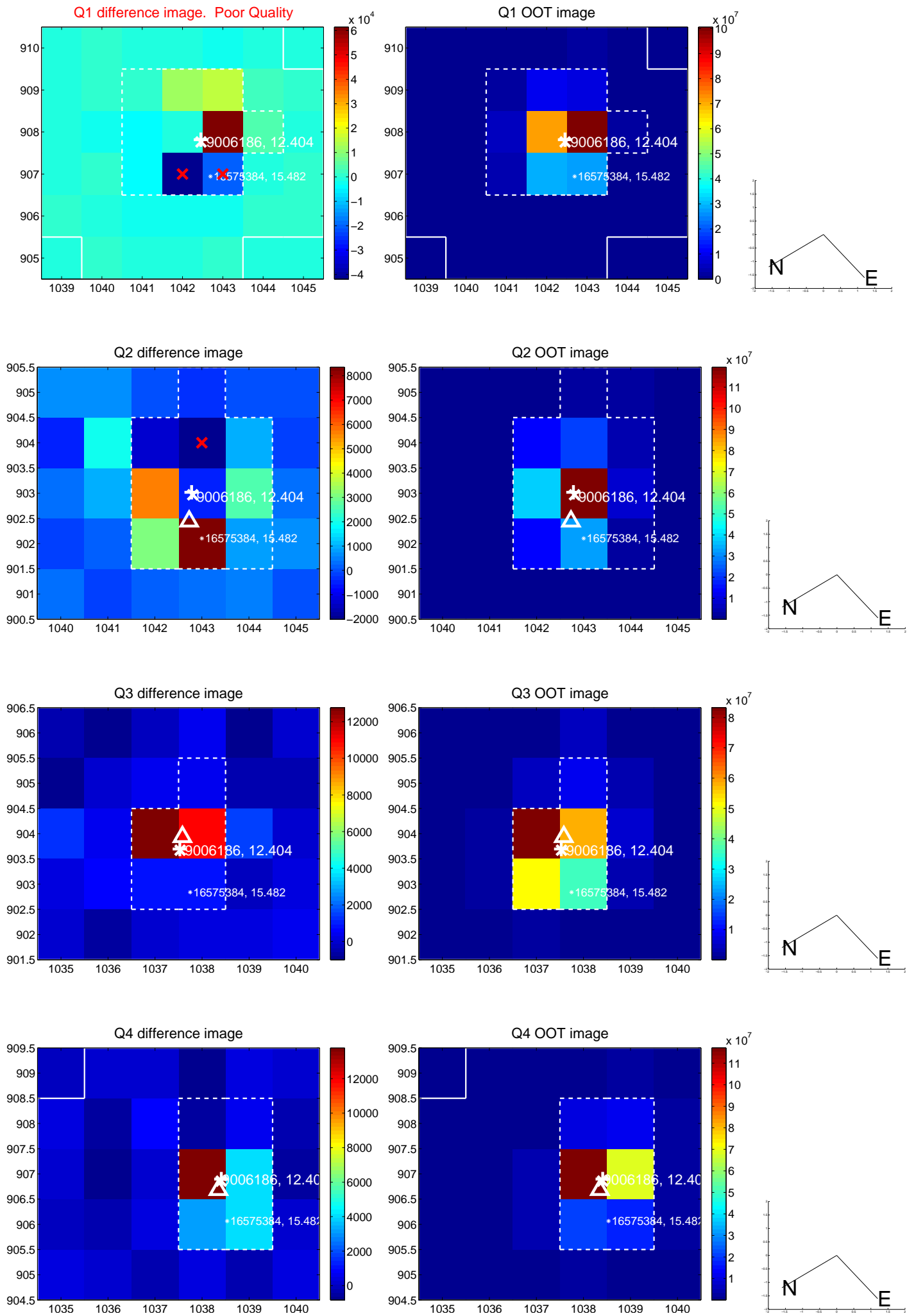
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.128 \pm 0.316	3.57	0.828 \pm 0.291	0.767 \pm 0.259
PRF-fit source offset from KIC position	1.003 \pm 0.279	3.59	0.704 \pm 0.270	0.713 \pm 0.238
photometric centroid source offset	0.59 \pm 0.32	1.82	-0.09 \pm 0.31	0.58 \pm 0.32

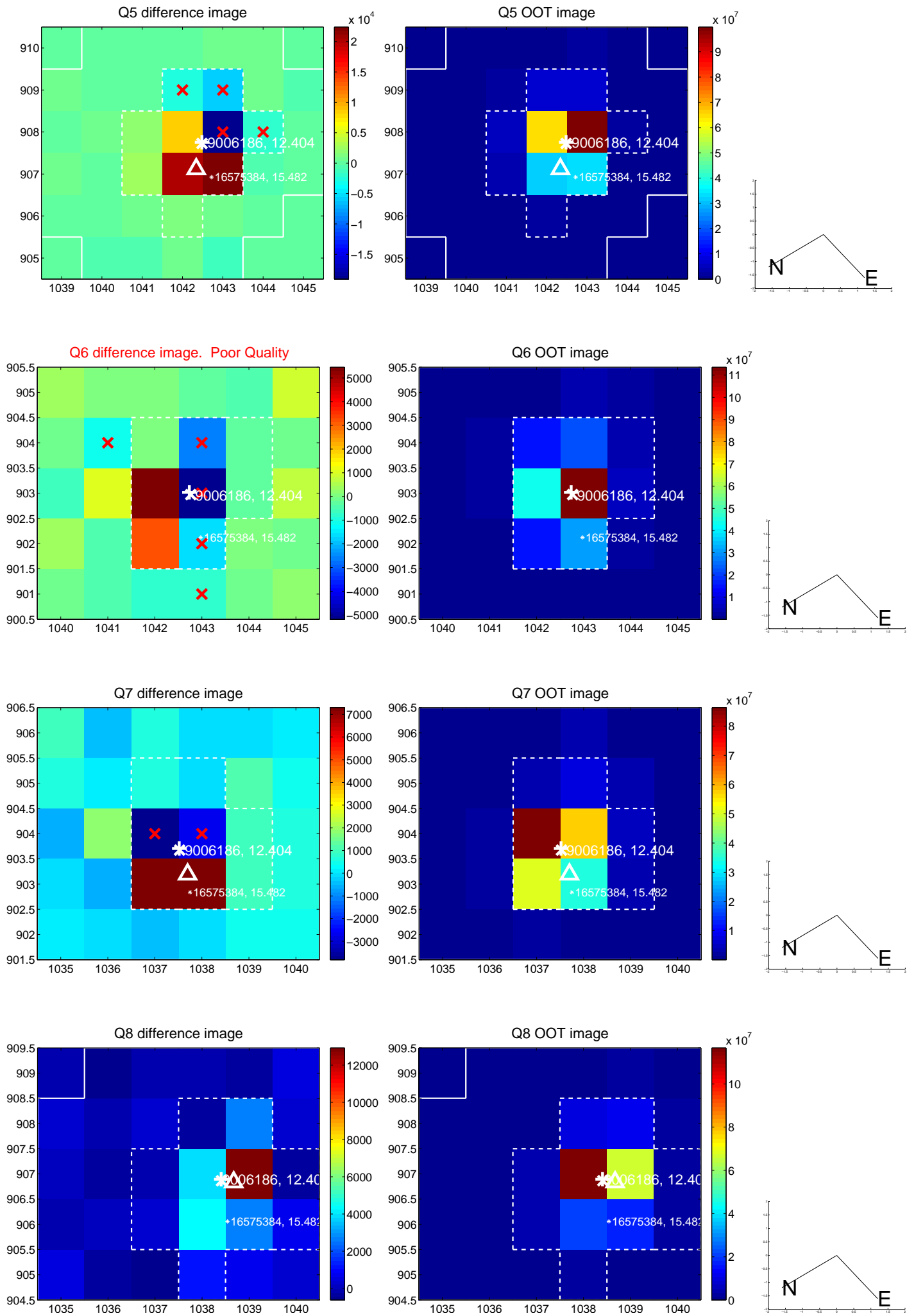


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

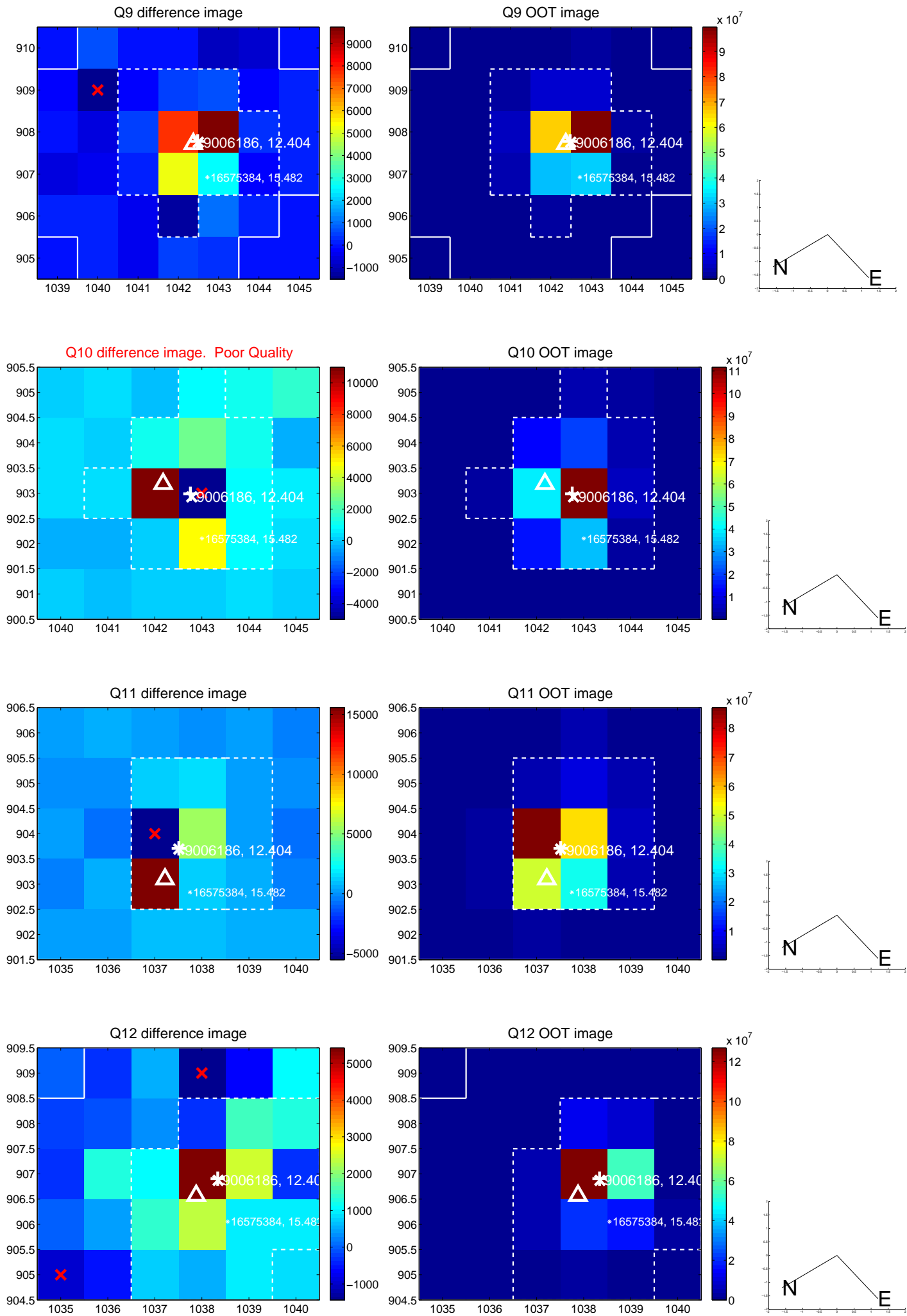
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



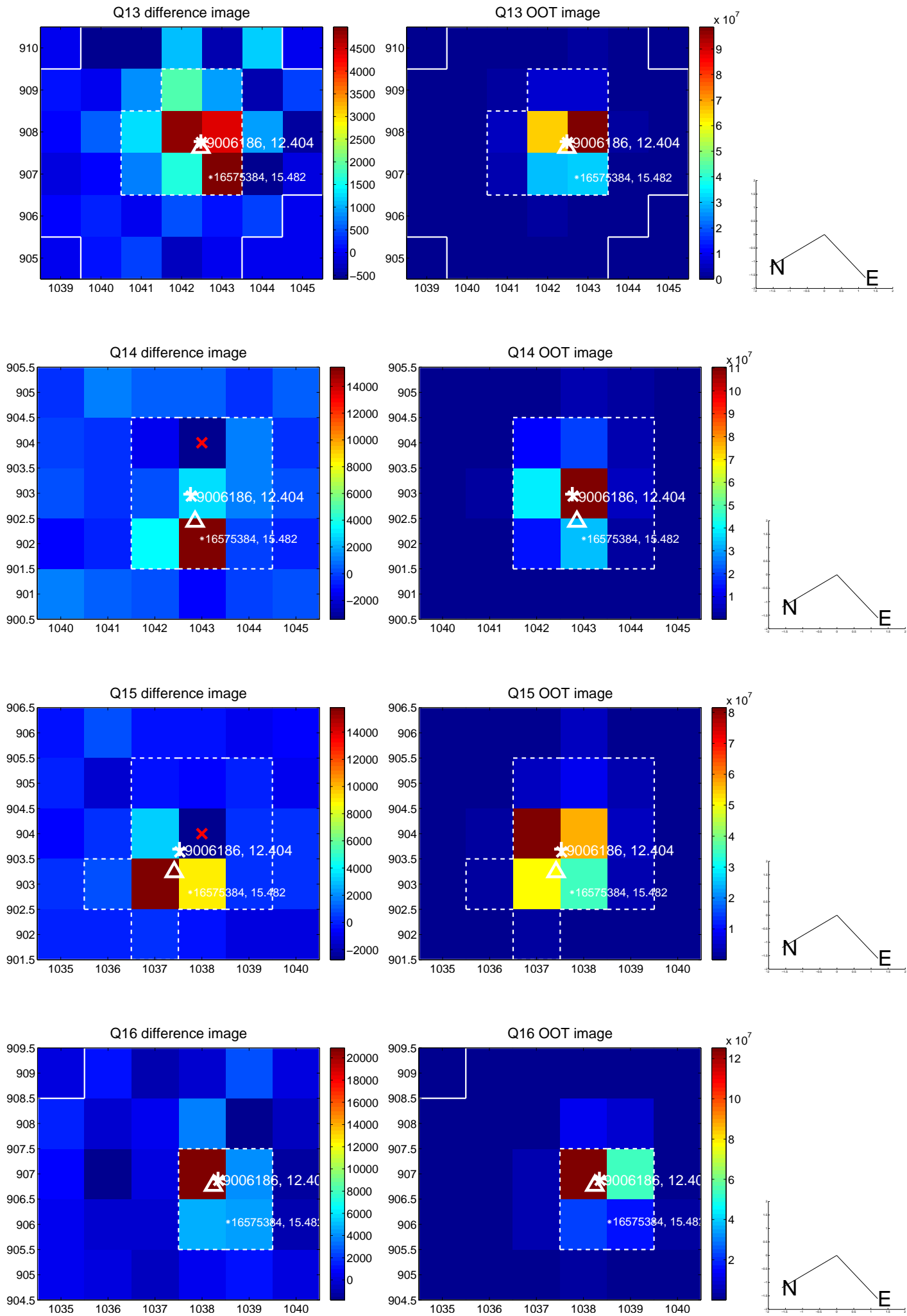
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



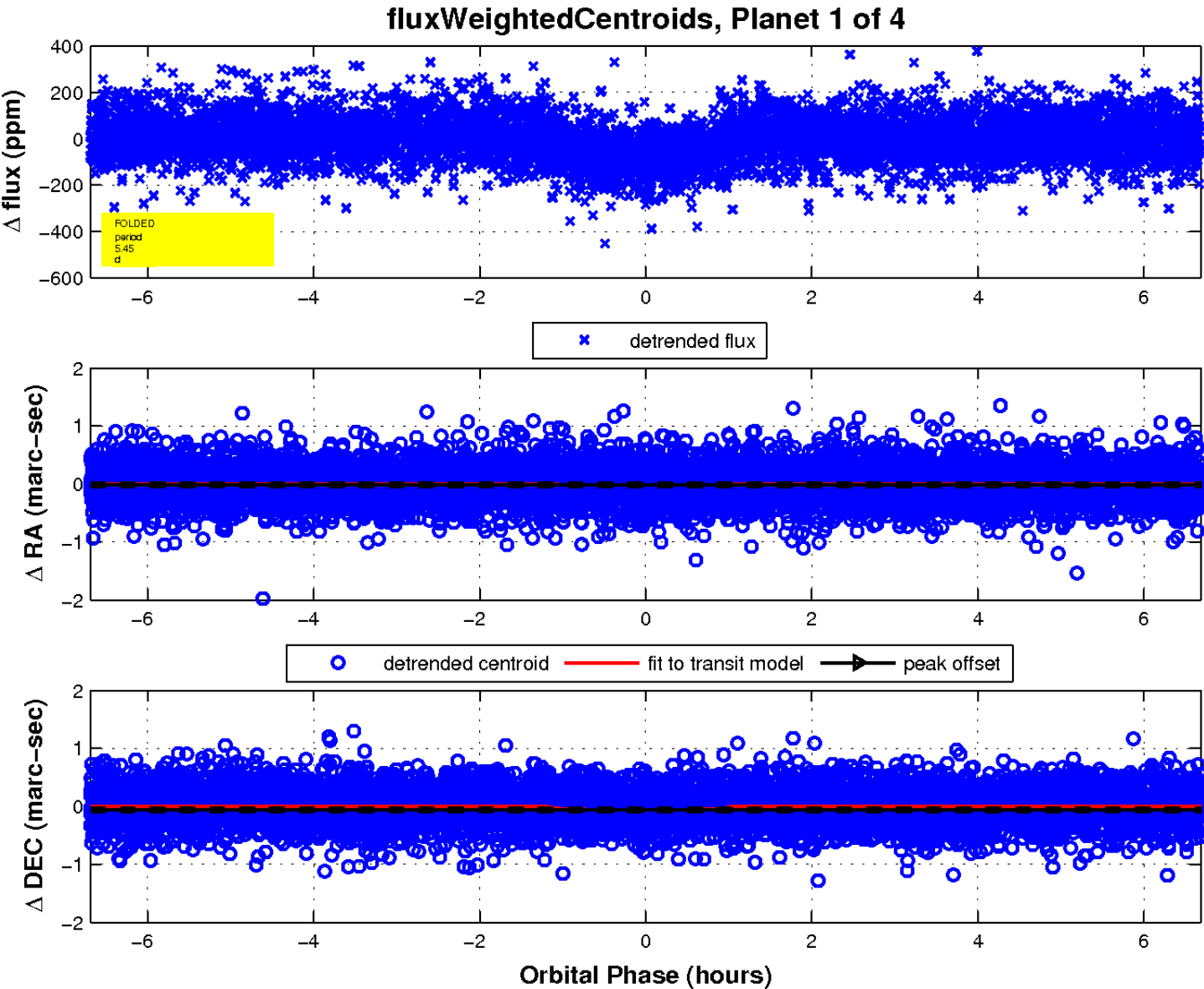
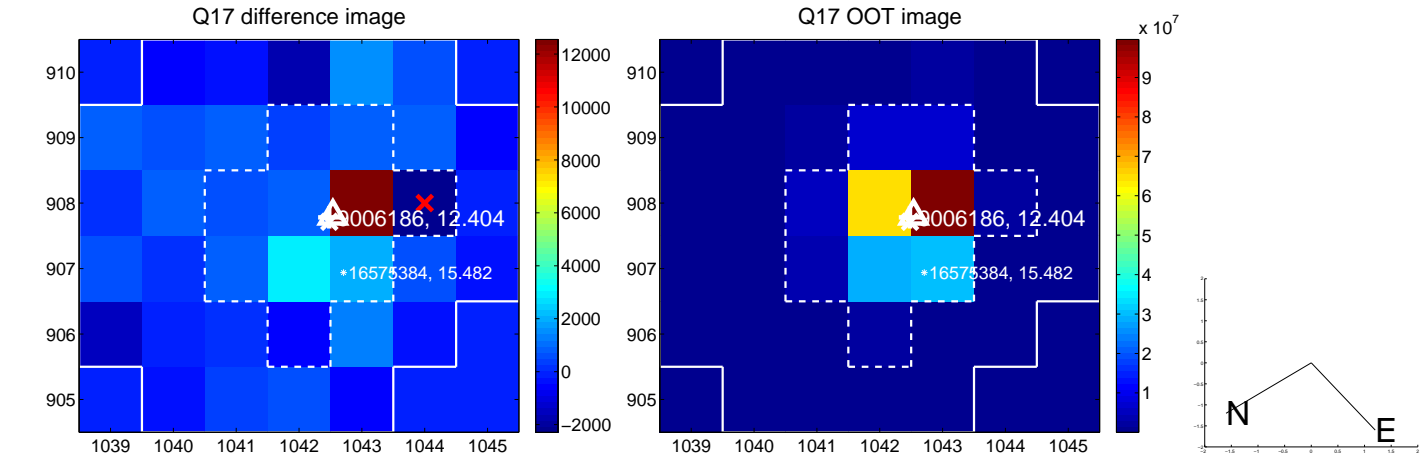
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

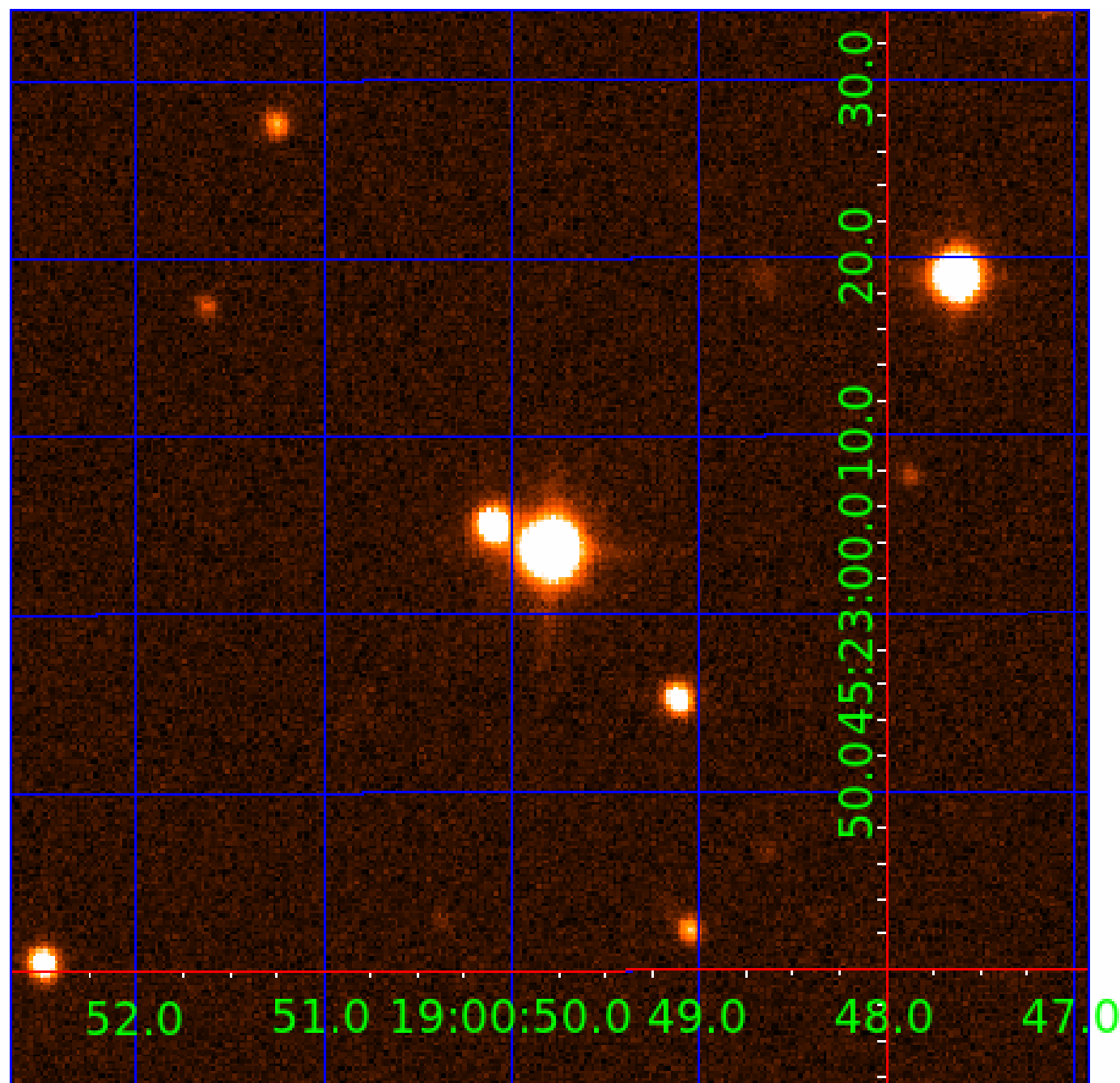


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009006186

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})
009006186-01	OBS	2169.01	5.452974	134.152435	88.9	2.231	23.1	25.3	0.84	5450	0.95	158.19
009006186-02	OBS	2169.02	3.266644	132.815659	55.9	2.167	18.0	20.1	0.84	5450	0.76	313.25
009006186-03	OBS	2169.03	4.272255	133.220264	49.4	2.169	13.7	15.2	0.84	5450	0.62	219.02
009006186-04	OBS	2169.04	2.192531	132.233444	20.0	2.152	8.2	8.3	0.84	5450	0.45	533.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009006186-01	OBS	PC	0.90	0	0	0	0	NO_COMMENT
009006186-02	OBS	PC	0.96	0	0	0	0	NO_COMMENT
009006186-03	OBS	PC	0.65	0	0	0	0	NO_COMMENT
009006186-04	OBS	PC	0.99	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.

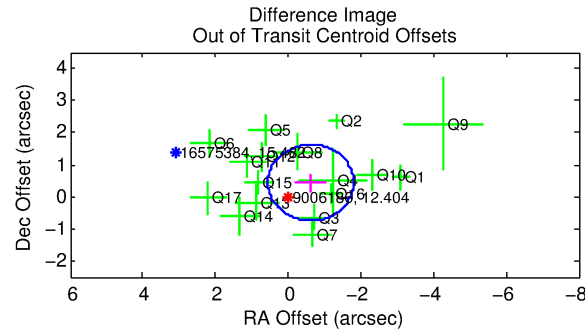
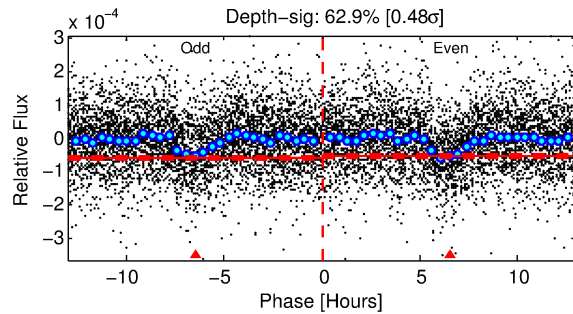
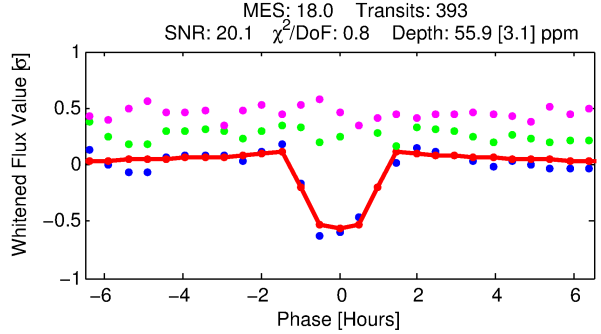
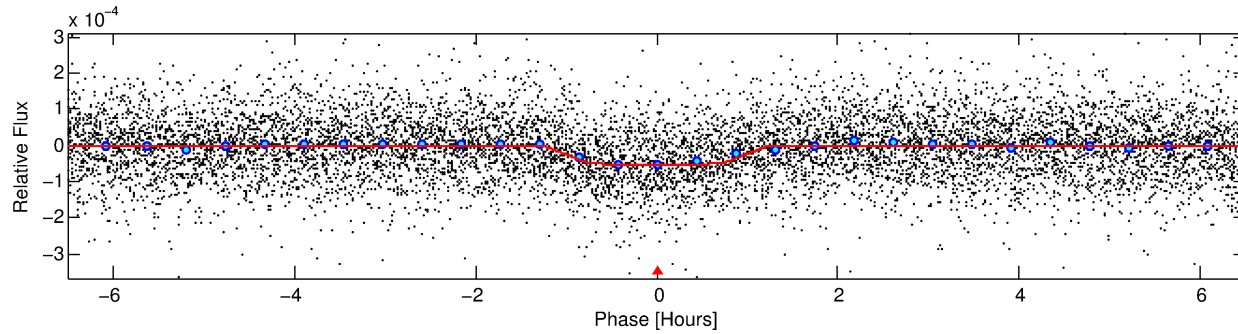
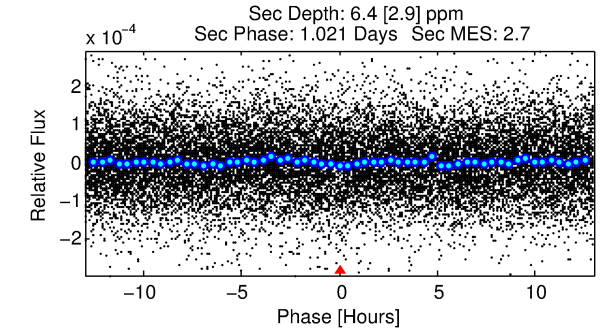
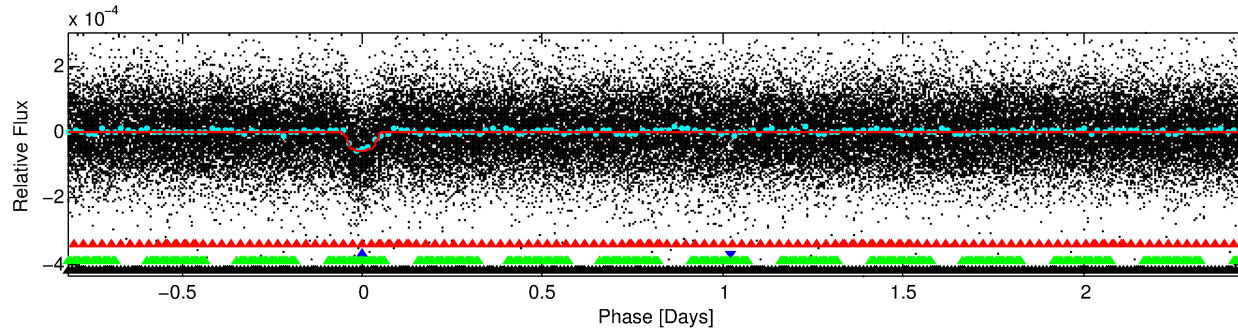
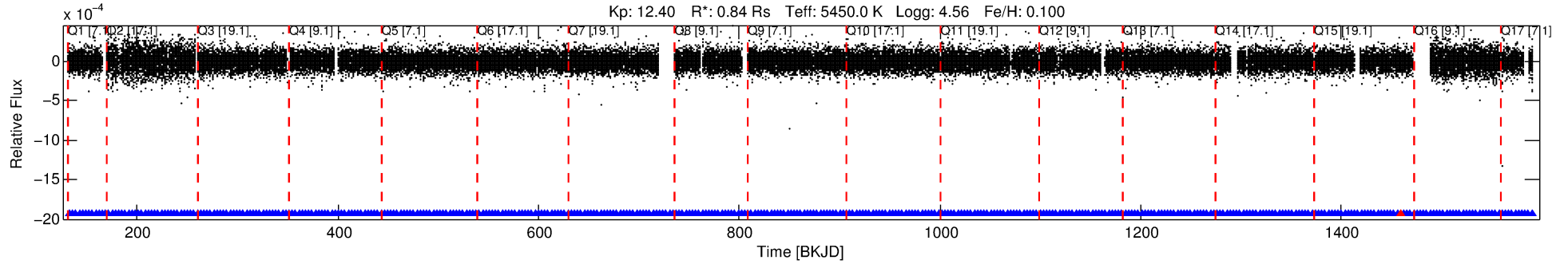
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009006186-02

No Significant Match Found

DV One-Page Summary

KIC: 9006186 Candidate: 2 of 4 Period: 3.267 d
KOI: K02169.02 Corr: 0.951



DV Fit Results:

Period = 3.26664 [0.00001] d
Epoch = 132.8157 [0.0016] BKJD
Rp/R* = 0.0083 [0.0025]
a/R* = 5.22 [6.72]
b = 0.90 [0.28]
Seff = 313.25 [56.49]
Teq = 1073 [48] K
Rp = 0.76 [0.24] Re
a = 0.0423 [0.0044] AU
Ag = 10.86 [8.37] [1.18σ]
Teffp = 3011 [570] K [3.38σ]

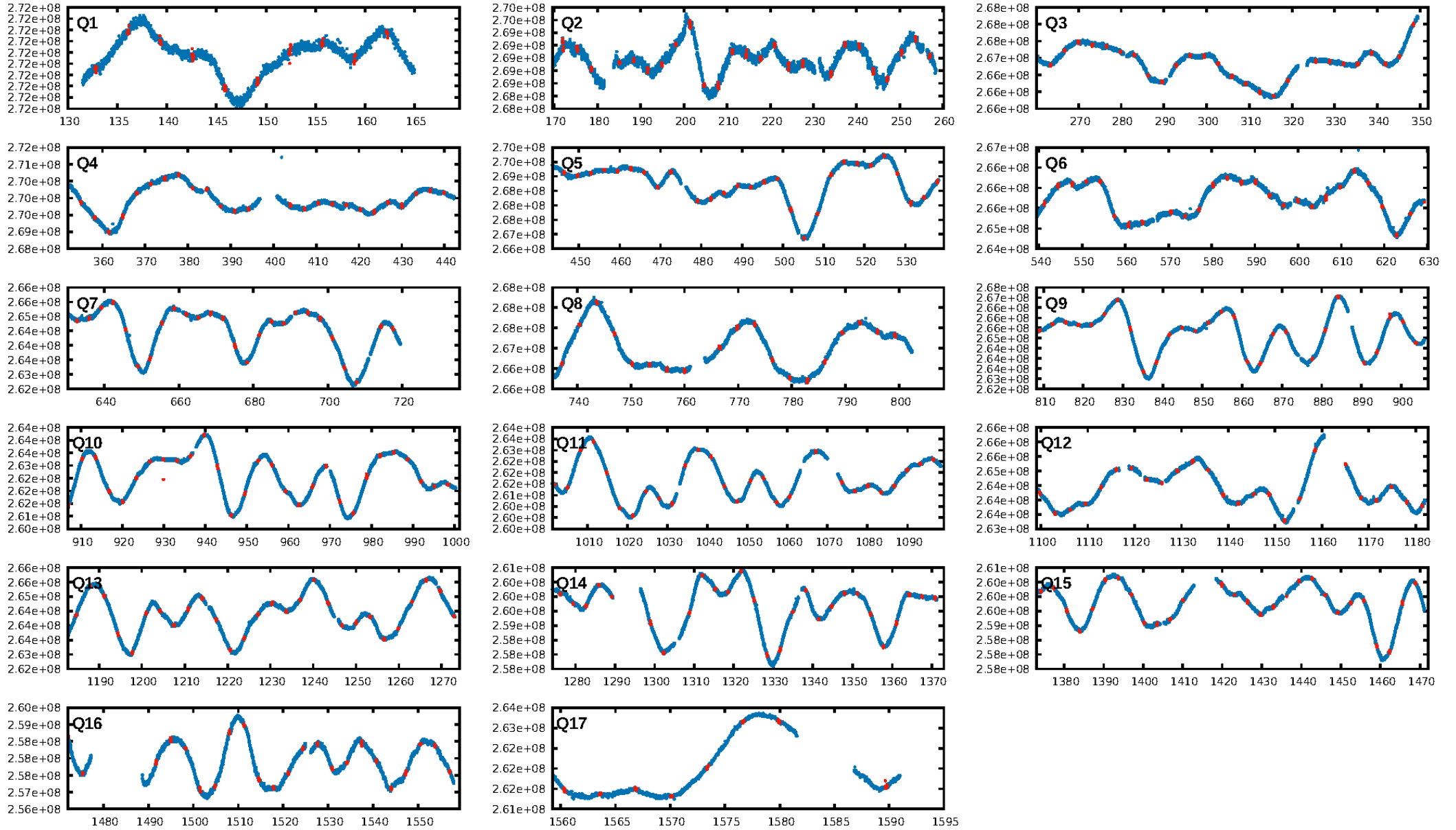
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.44σ]
LongPeriod-sig: 100.0% [7.87σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.82e-69
RollingBand-fgt: 1.00 [374/375]
GhostDiagnostic-chr: 6.396
Centroid-sig: 0.0%
Centroid-so: 0.826 arcsec [2.04σ]
OotOffset-rm: 0.757 arcsec [1.92σ]
KicOffset-rm: 0.883 arcsec [2.23σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.94 [16/17]
DiffImageOverlap-fno: 1.00 [17/17]

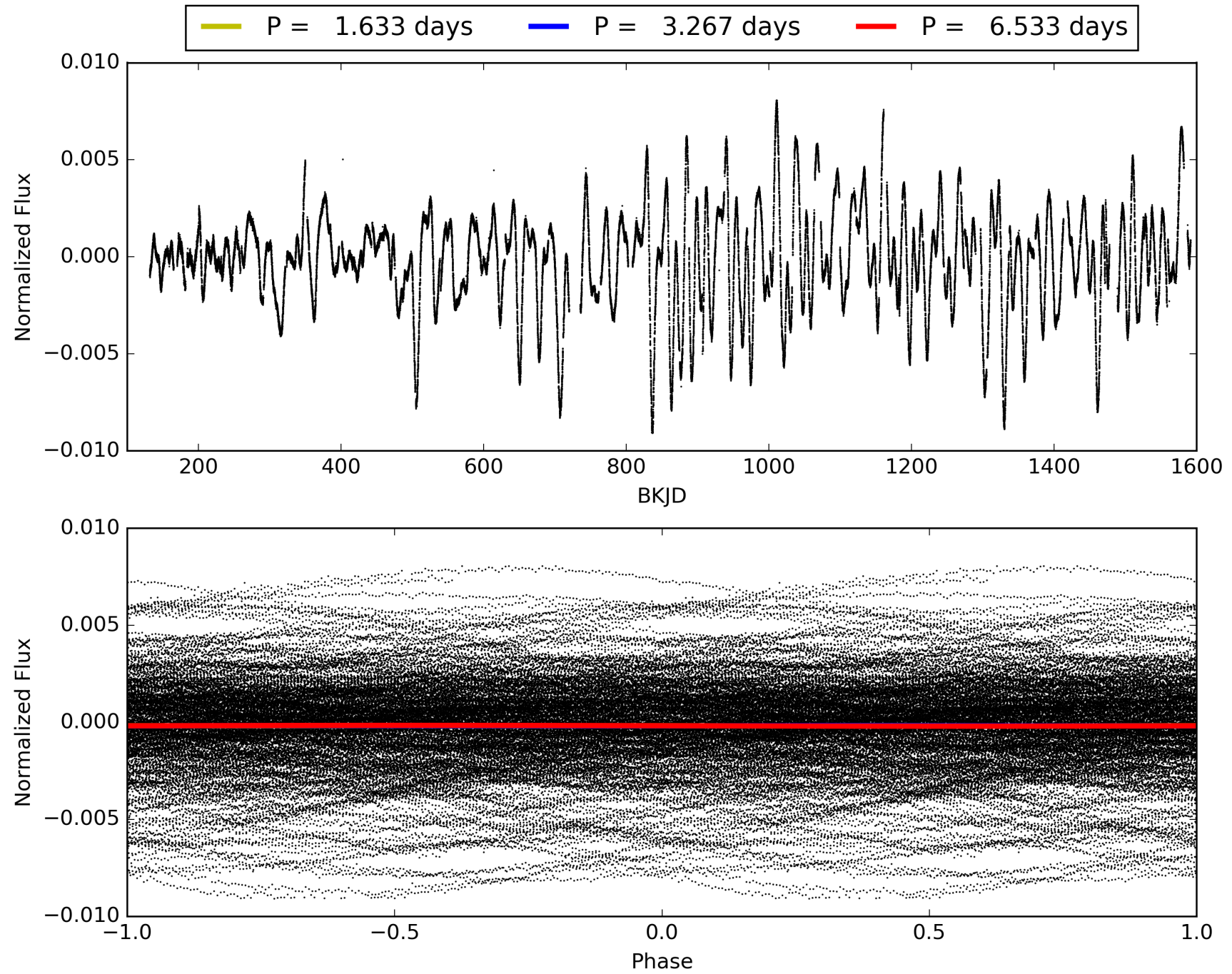
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 12:13:24 Z

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

TCE 009006186-02, PDC Light Curves

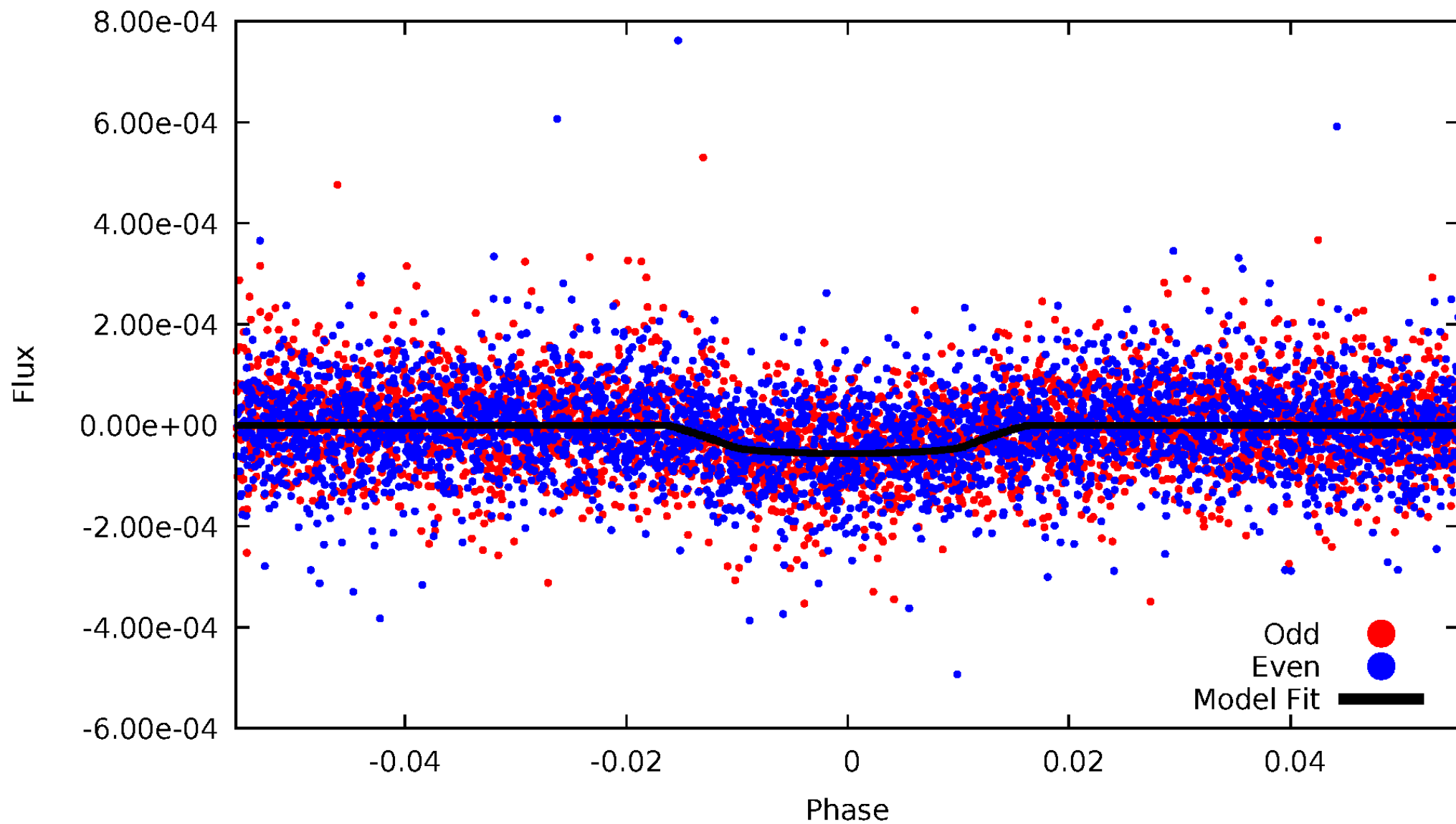


TCE 009006186-02



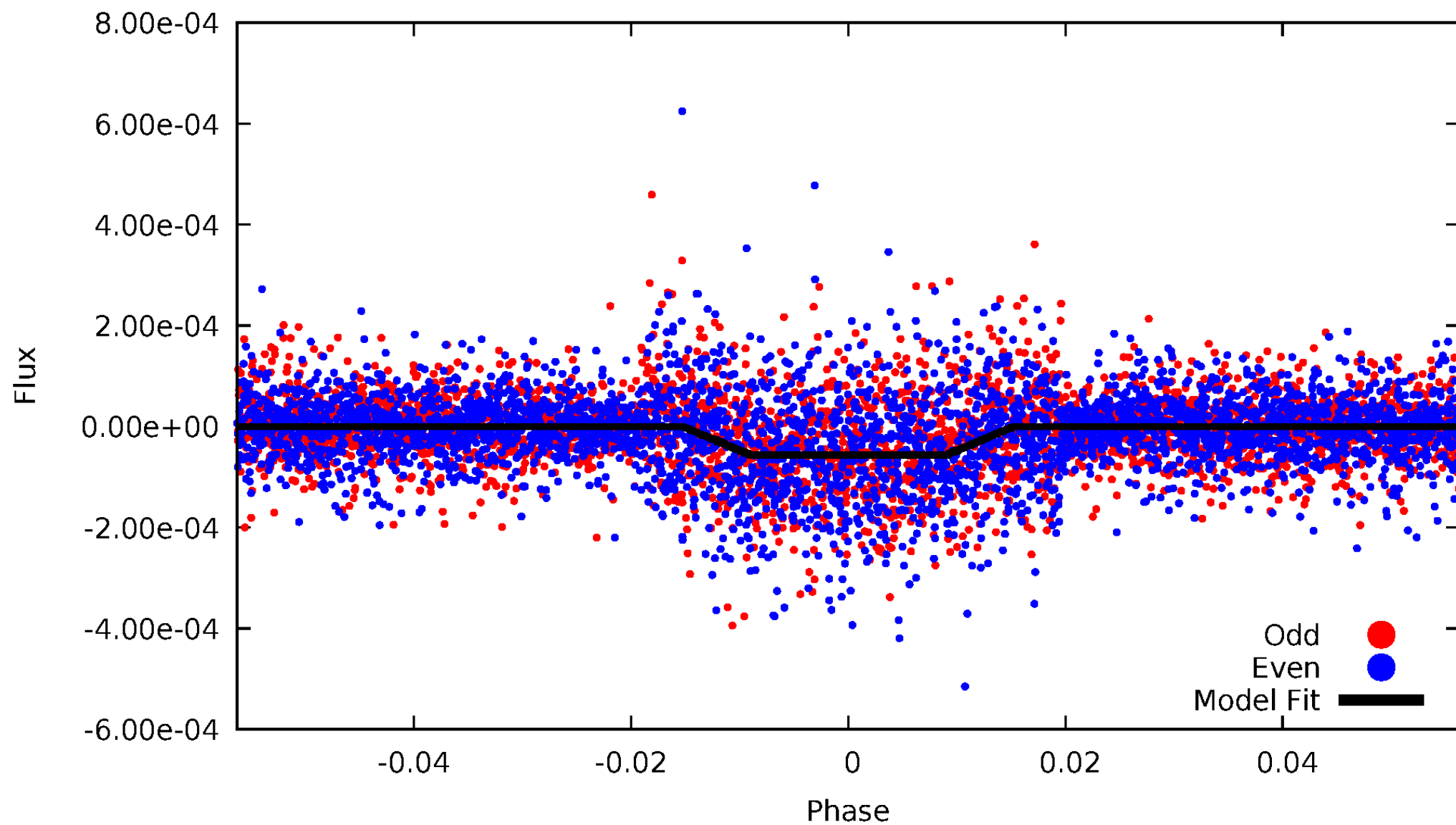
DV Odd/Even

TCE 009006186-02



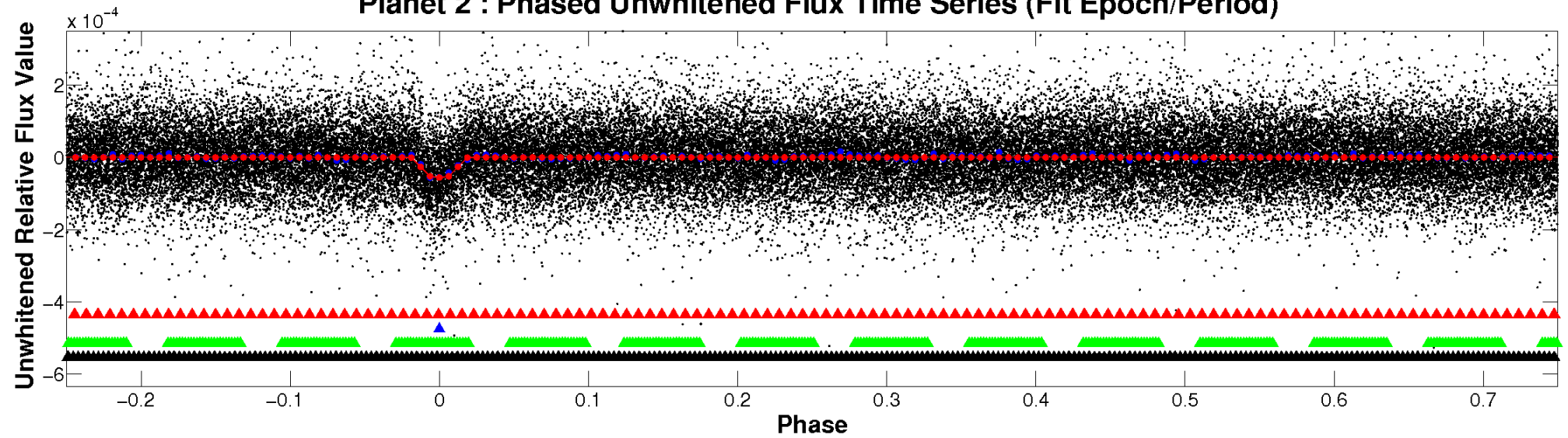
ALT Odd/Even

TCE 009006186-02

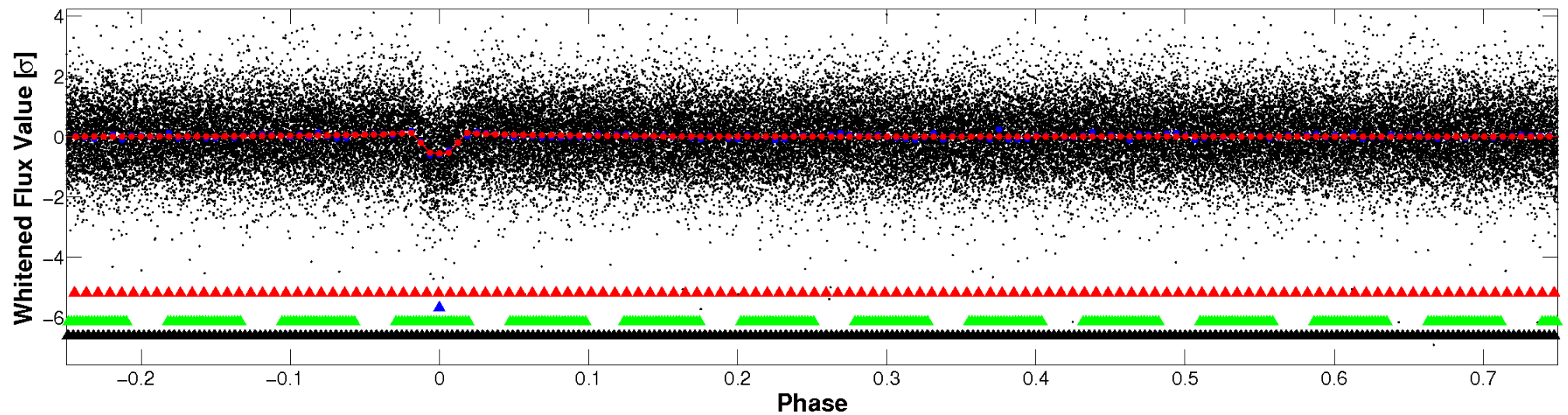


Non-Whitened Vs. Whitened Light Curve

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

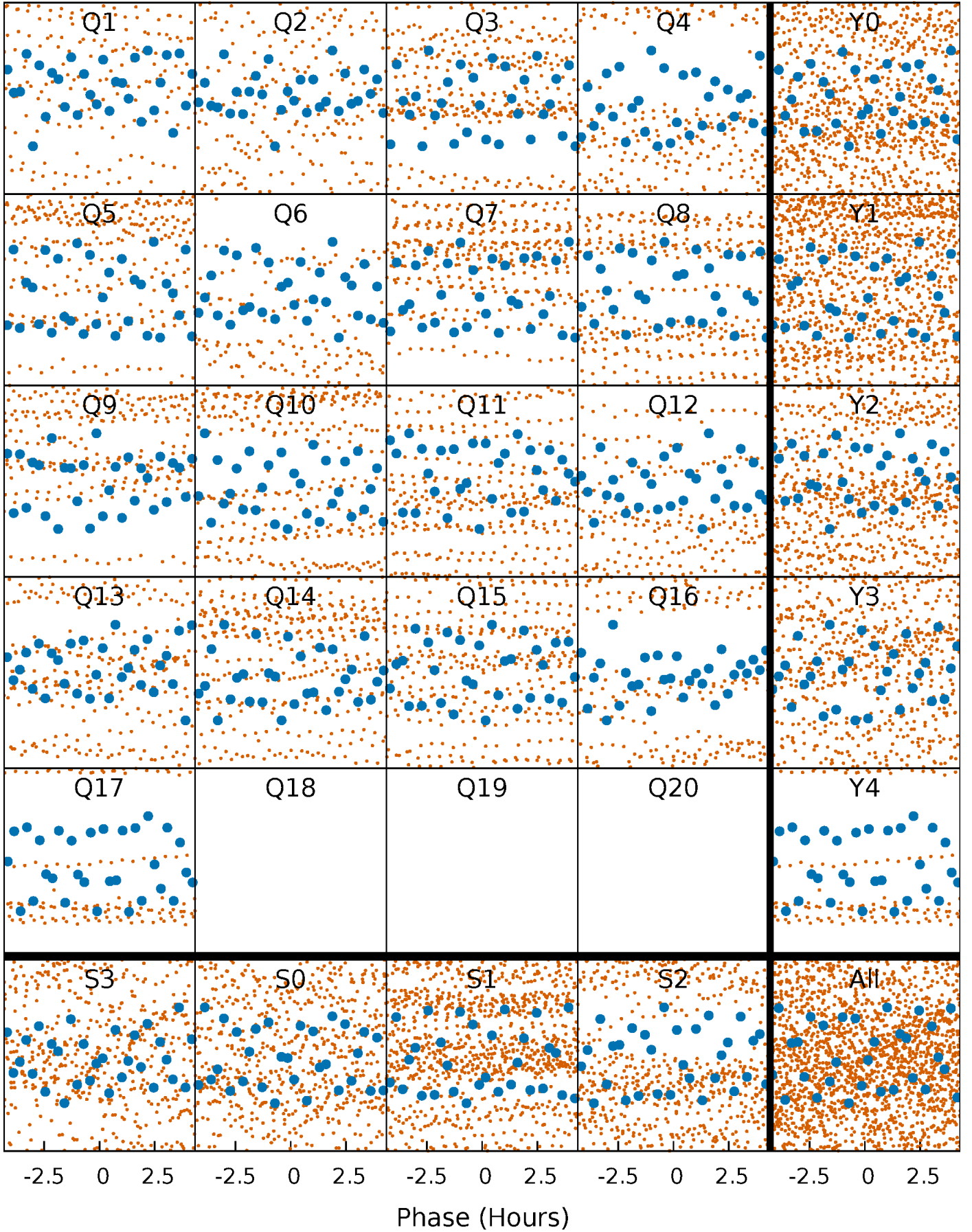


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



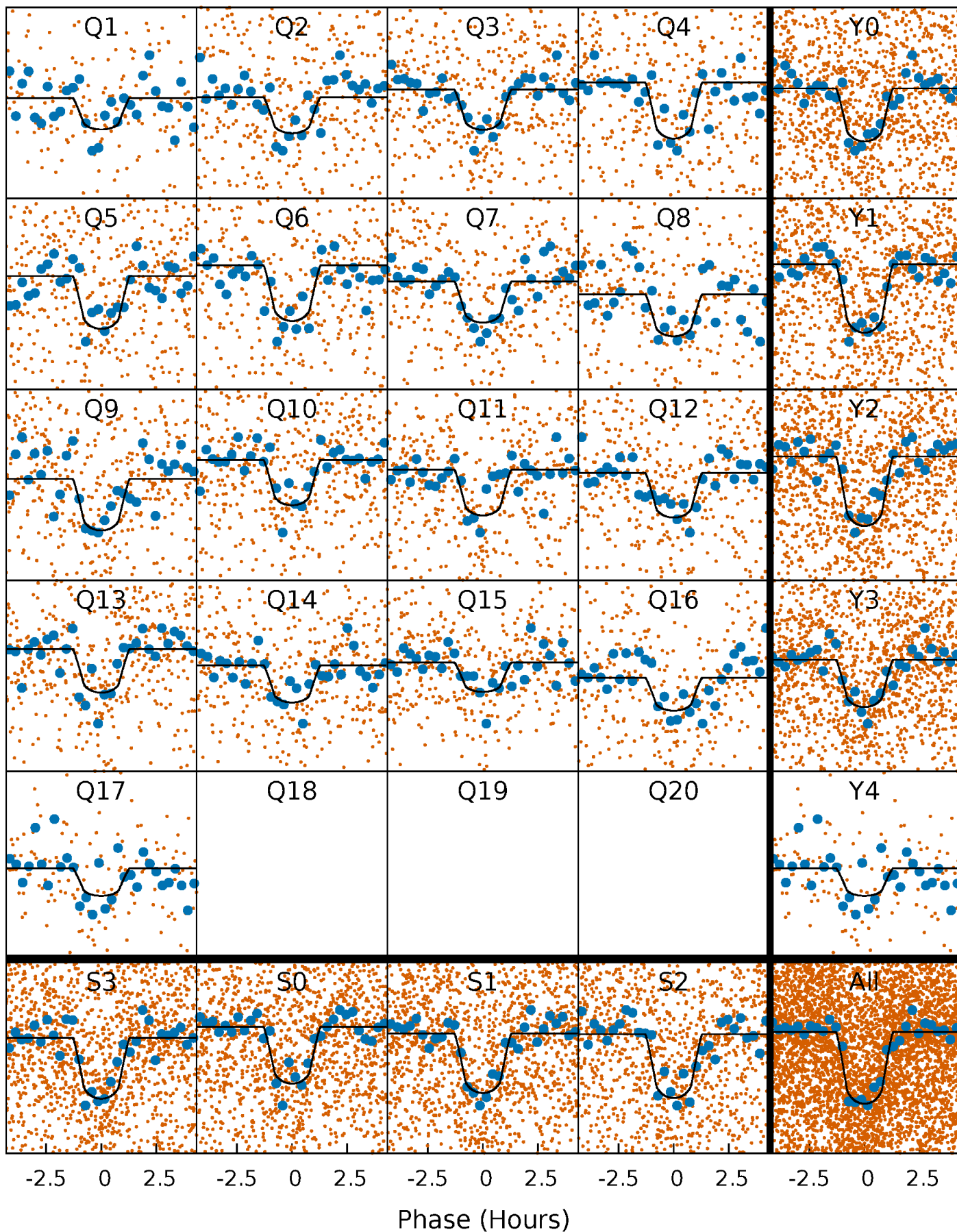
PDC Quarter-Phased Transit Curves

TCE 009006186-02 P= 3.266644 Days $T_0=132.815659$ (BKJD)



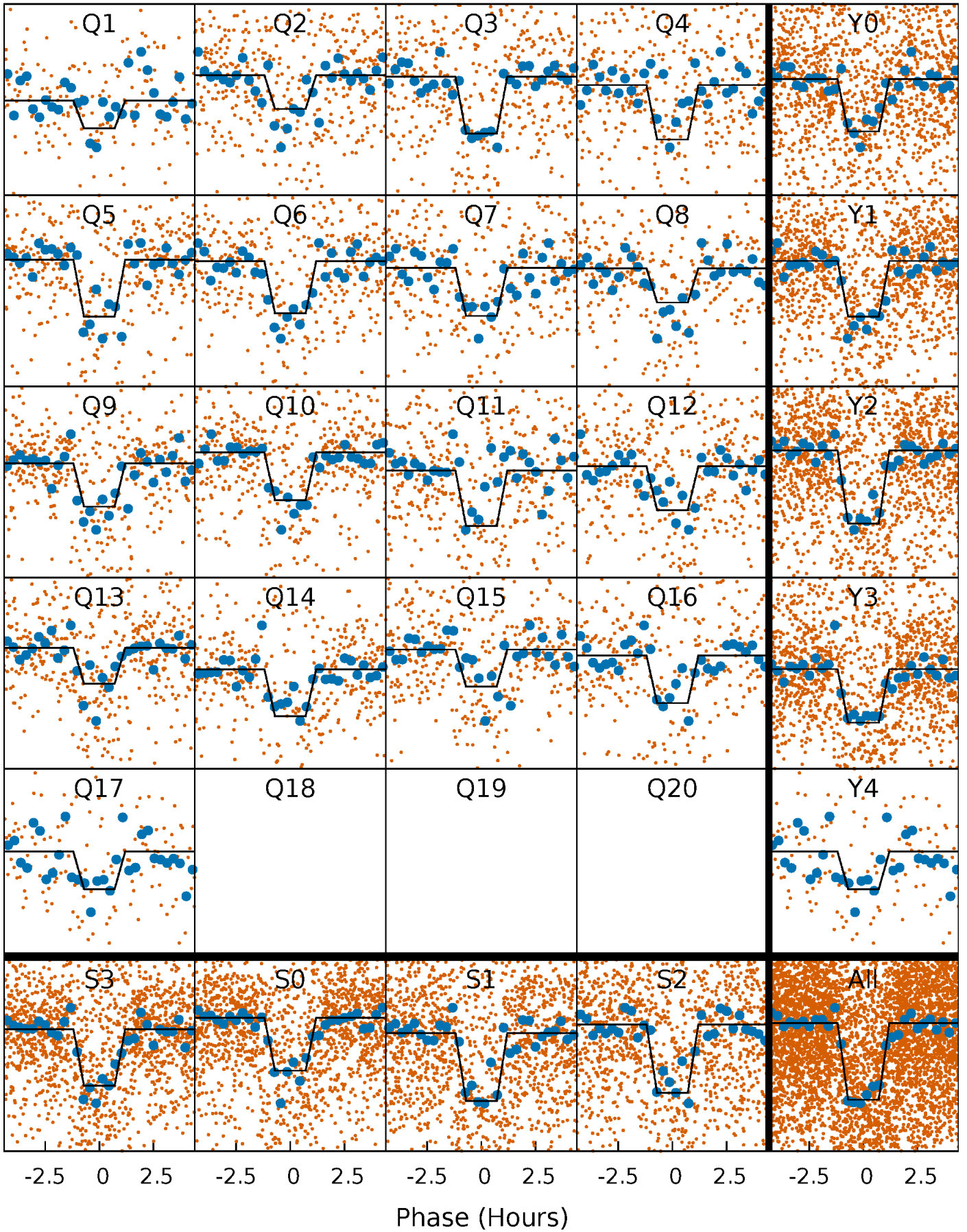
DV Quarter-Phased Transit Curves

TCE 009006186-02 P= 3.266644 Days $T_0=132.815659$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

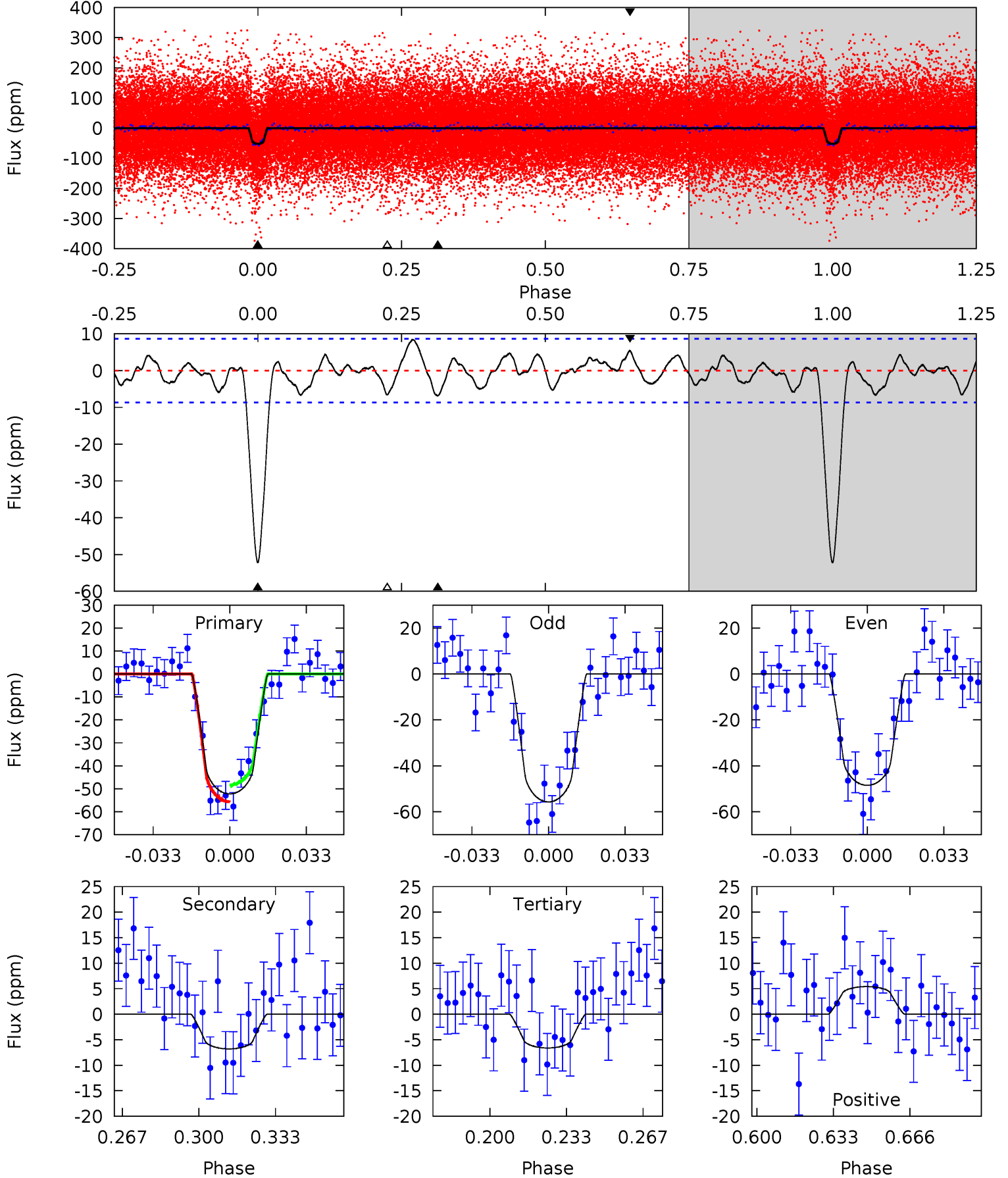
TCE 009006186-02 $P = 3.266630$ Days $T_0 = 132.818871$ (BKJD)



DV Model-Shift Uniqueness Test

009006186-02, P = 3.266644 Days, E = 129.549015 Days

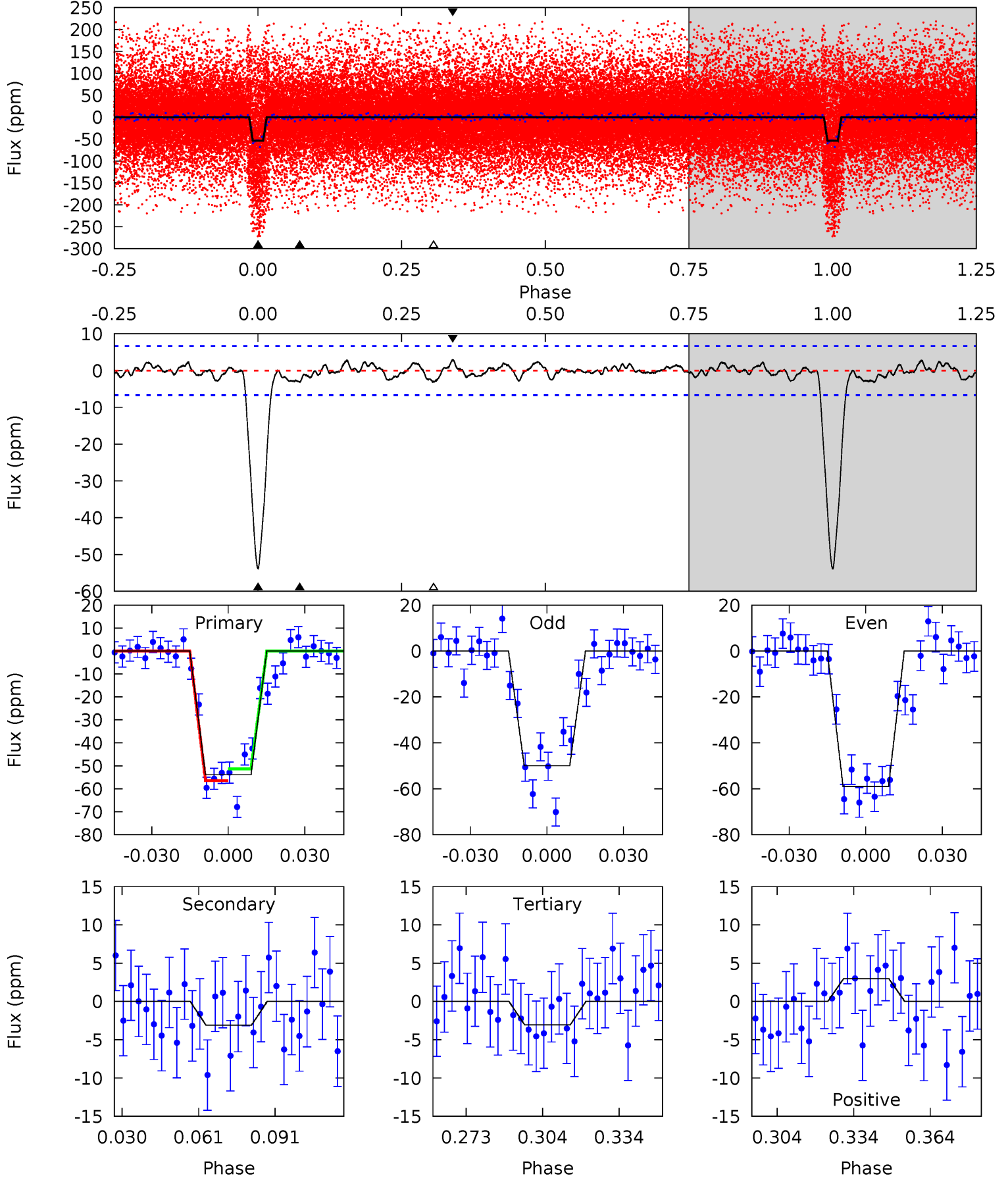
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.9	3.77	3.67	3.00	4.79	2.13	1.61	25.3	25.9	0.10	0.77	1.99	0.98	0.14	2.01



Alt Model-Shift Uniqueness Test

009006186-02, P = 3.266630 Days, E = 129.552241 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.6	2.22	2.20	2.12	4.81	2.17	0.86	36.4	36.5	0.02	0.10	3.24	1.08	0.05	1.84



Stellar Parameters For KIC 009006186

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5450^{+108}_{-108}	$4.563^{+0.017}_{-0.094}$	$0.100^{+0.150}_{-0.150}$	$0.842^{+0.093}_{-0.033}$	$0.944^{+0.039}_{-0.066}$	$2.227^{+0.172}_{-0.603}$
	+2%/-2%	+0%/-2%	+150%/-150%	+11%/-4%	+4%/-7%	+8%/-27%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 009006186-02 / KOI 2169.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-7 ± 2	$0.79^{+0.23}_{-0.24}$	1518^{+51}_{-36}	3503^{+468}_{-334}	11^{+12}_{-5}
Alt.	-3 ± 1	$0.72^{+0.22}_{-0.24}$	1521^{+46}_{-46}	3157^{+481}_{-380}	$5.648^{+7.748}_{-3.172}$

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

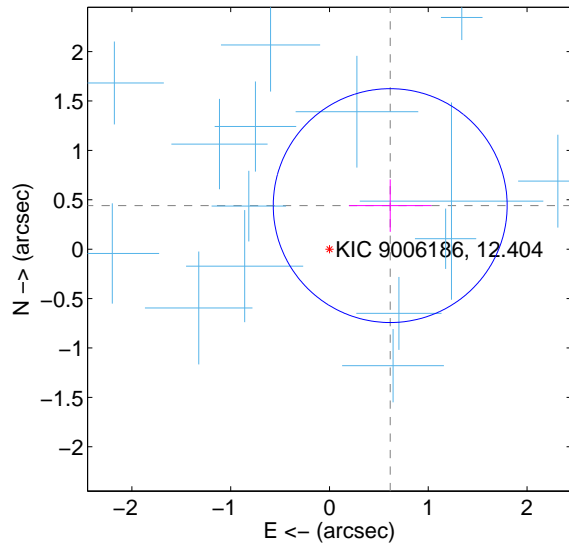
Supplemental centroid analysis for 009006186-02. Kepler magnitude: 12.40. Transit SNR 20.12

There are 16 quarters with good PRF difference image offsets

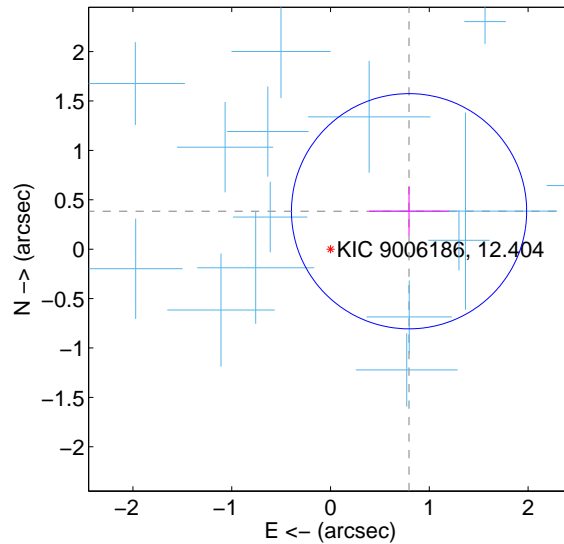
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.757 ± 0.395	1.92	-0.615 ± 0.417	0.441 ± 0.265
PRF-fit source offset from KIC position	0.883 ± 0.397	2.23	-0.795 ± 0.405	0.384 ± 0.248
photometric centroid source offset	0.83 ± 0.41	2.04	0.21 ± 0.39	0.80 ± 0.41

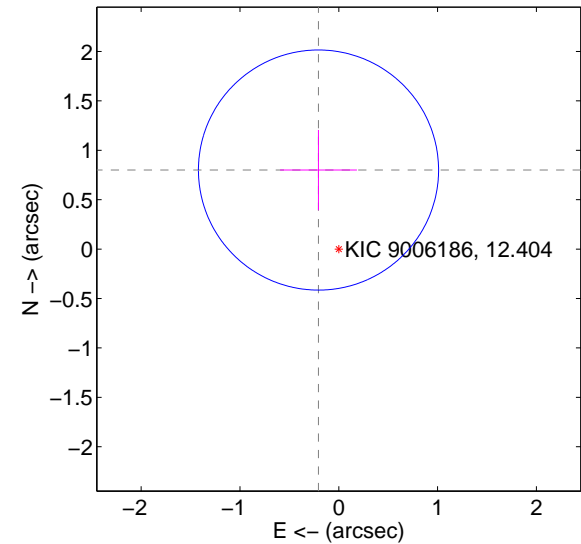
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

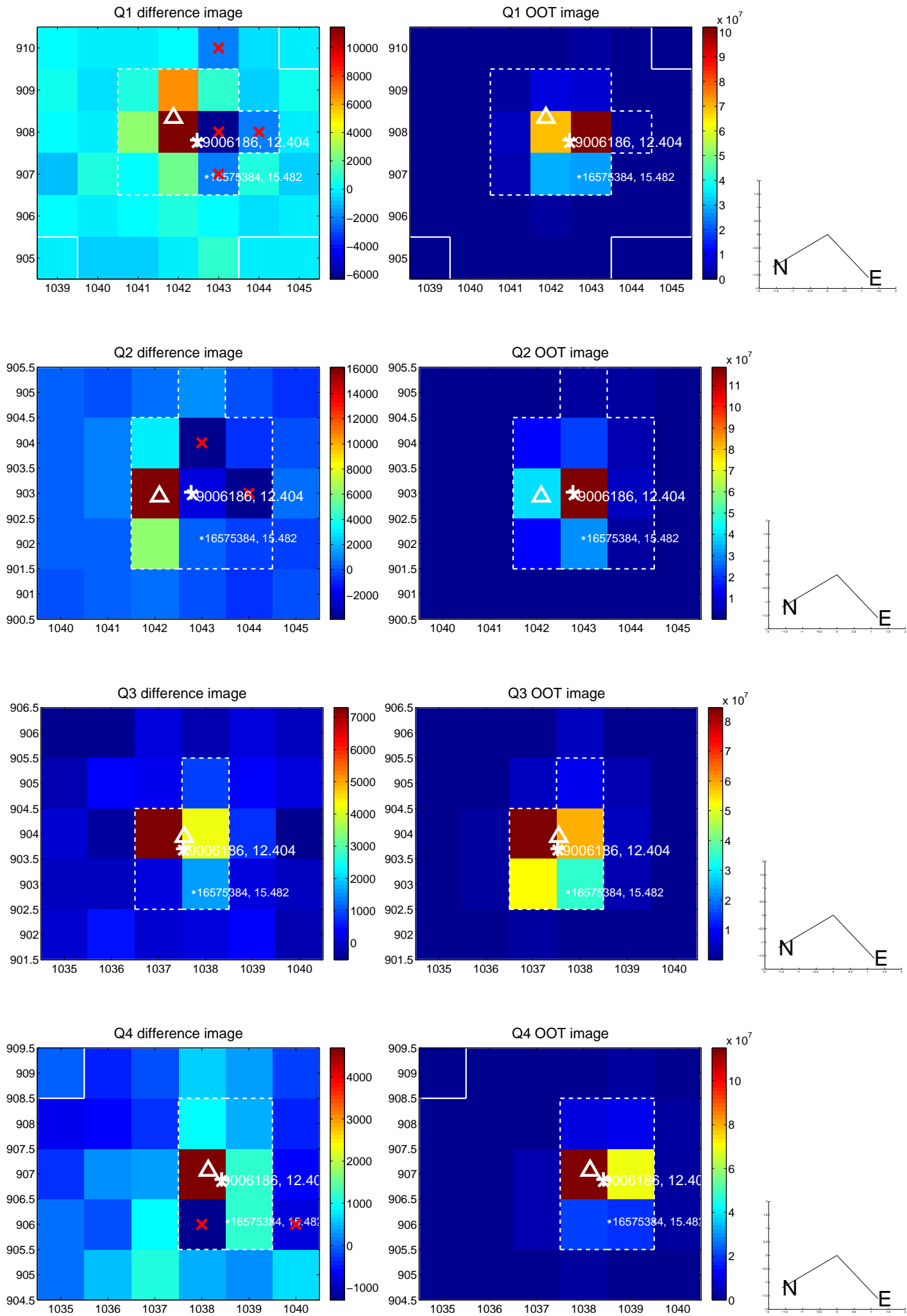


offset from photometric centroids

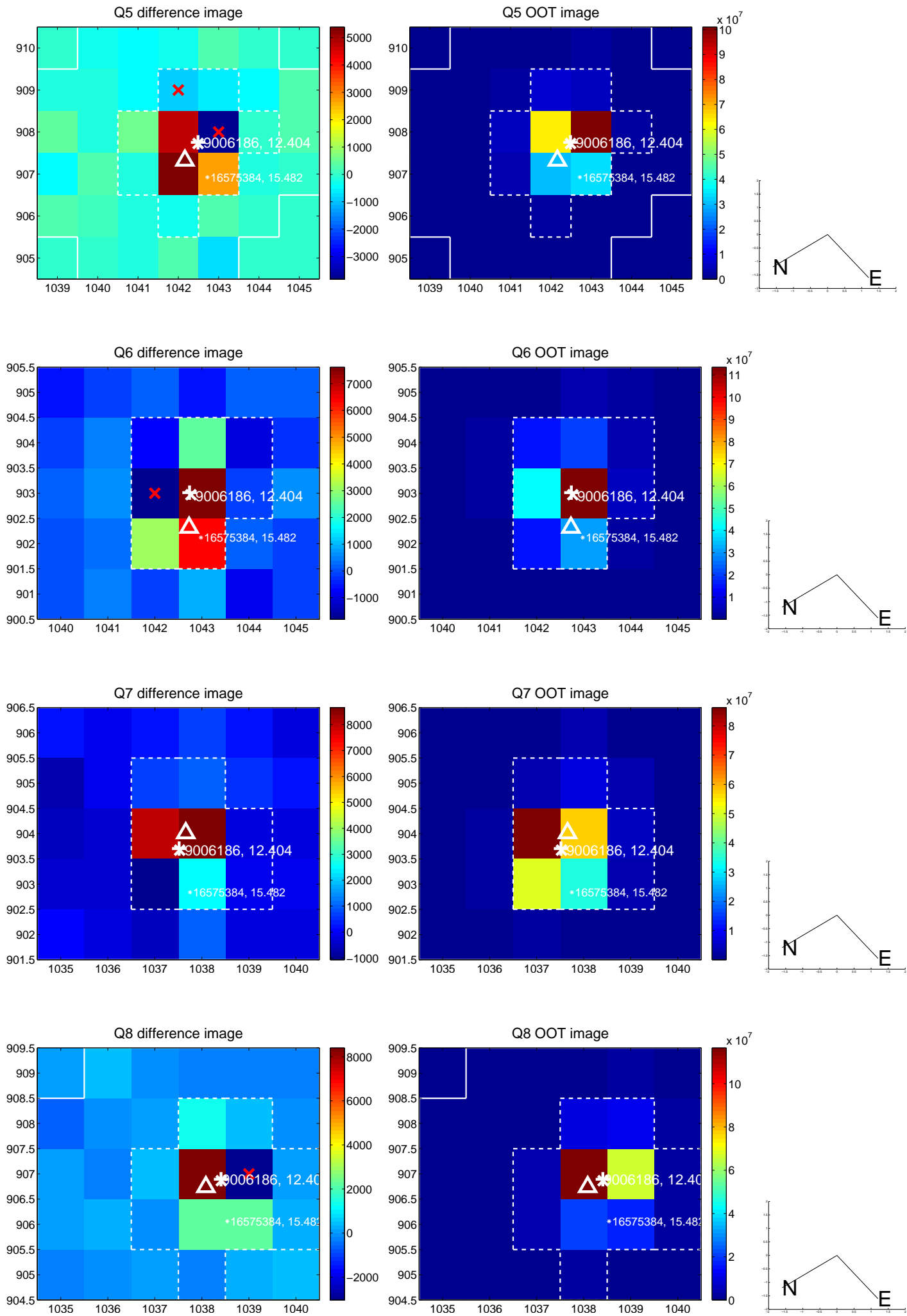


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

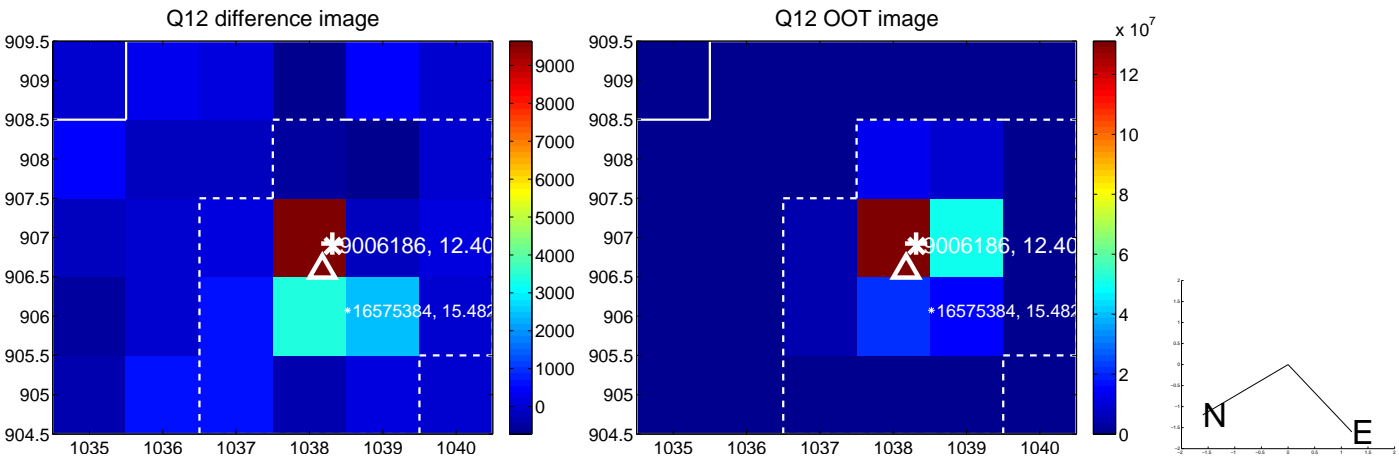
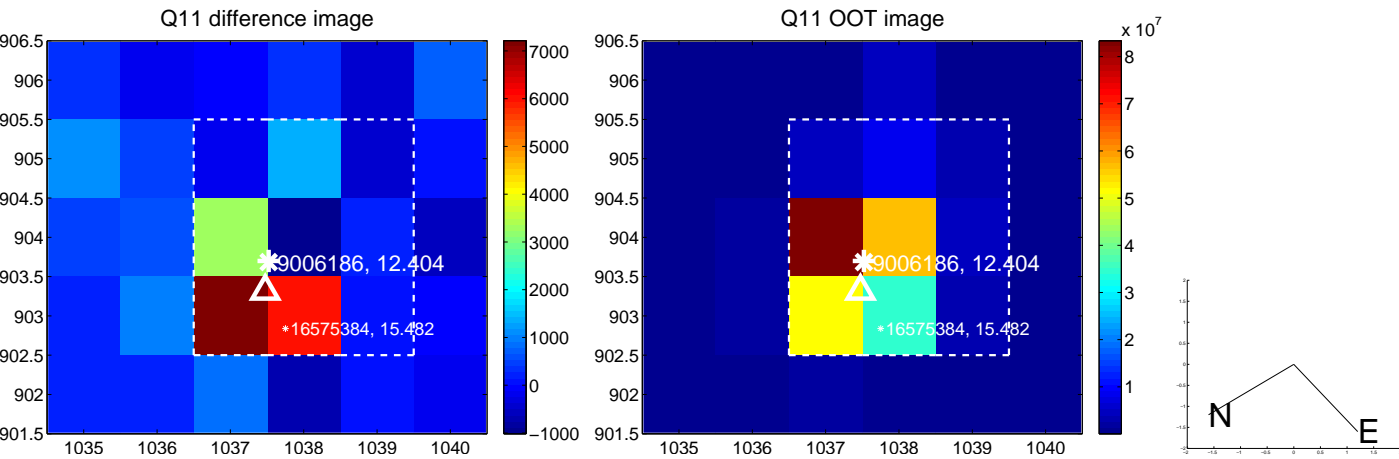
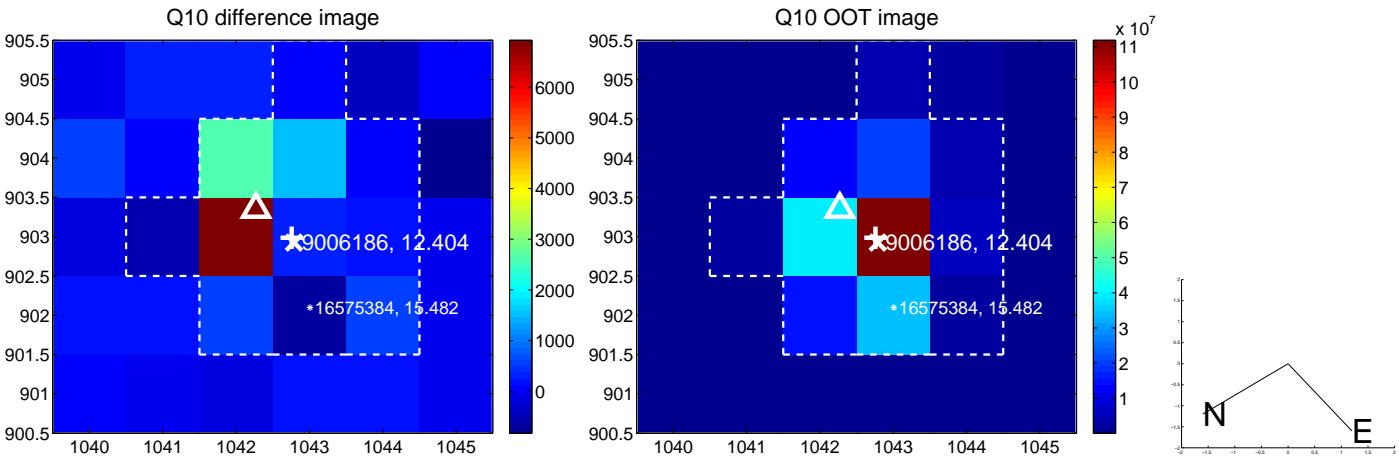
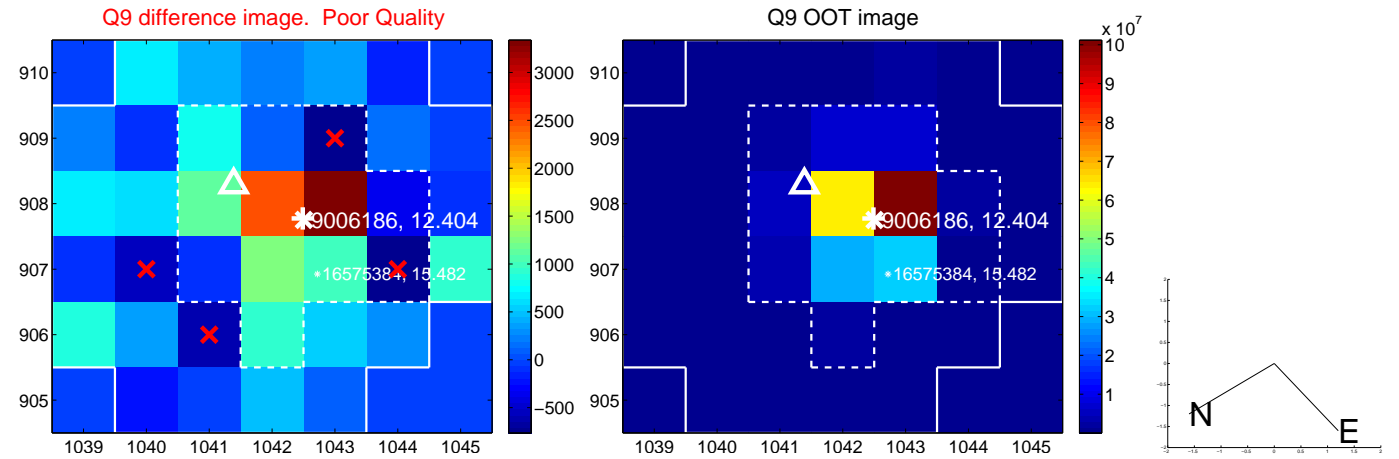
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



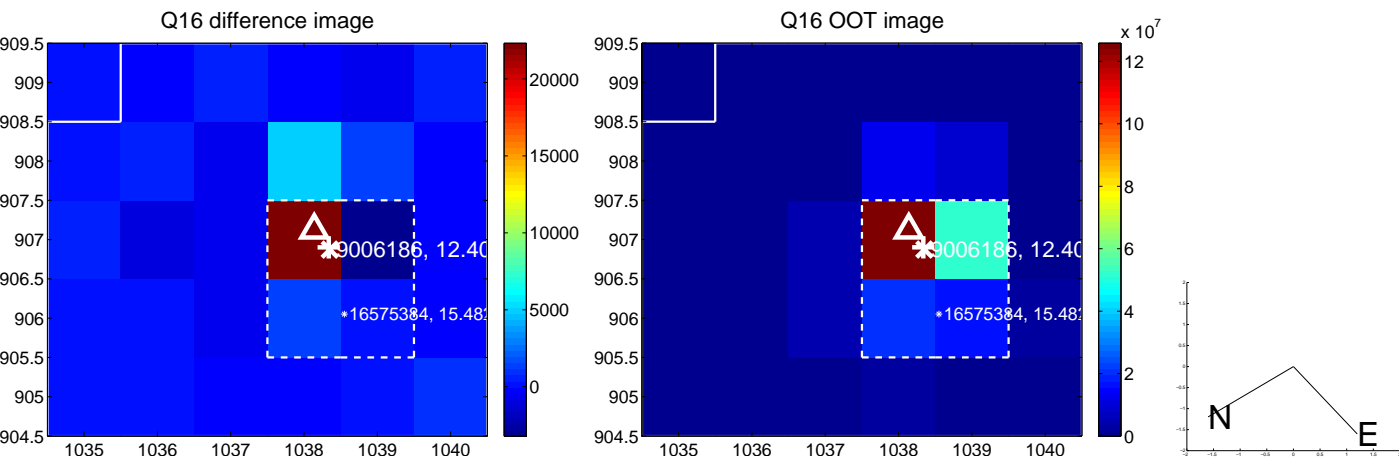
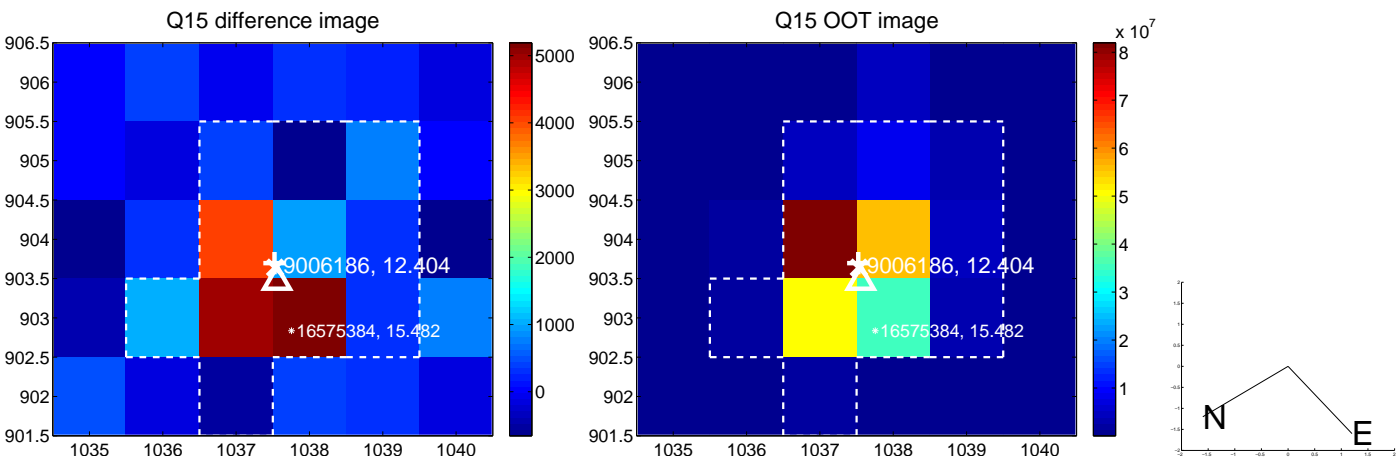
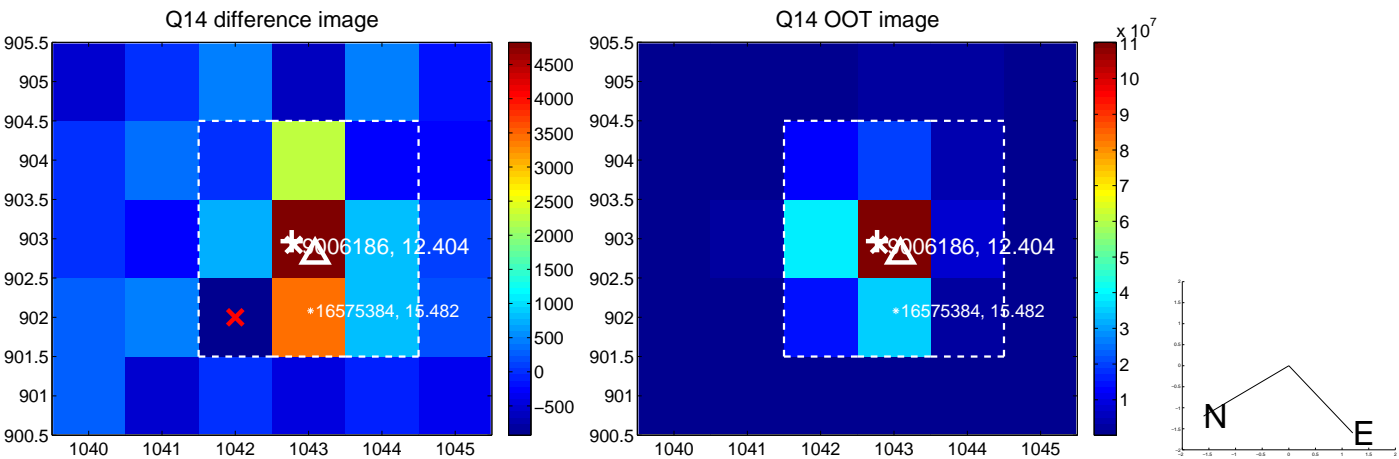
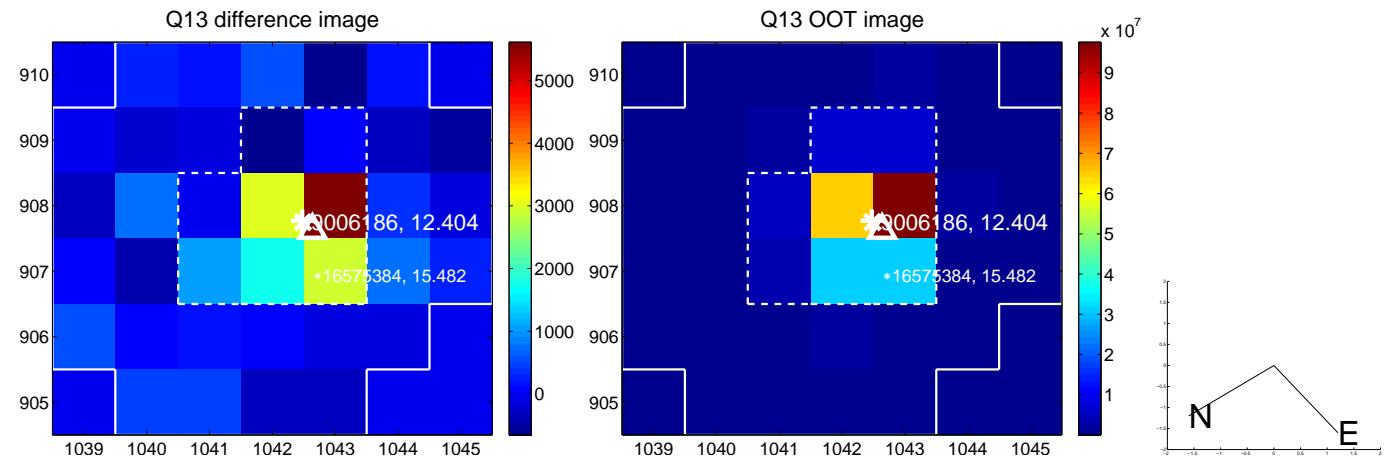
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



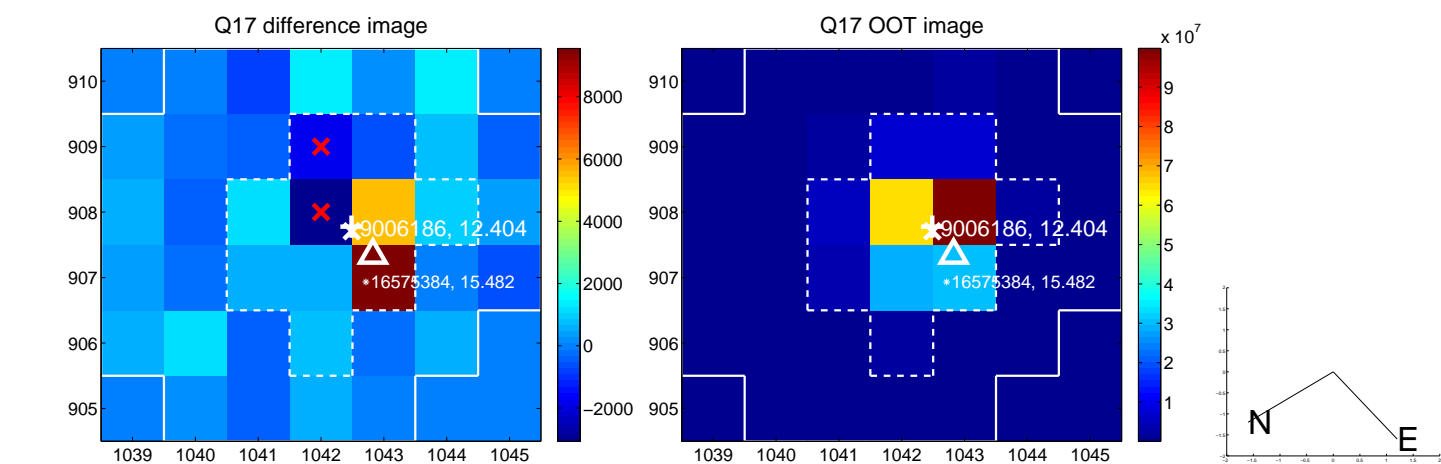
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



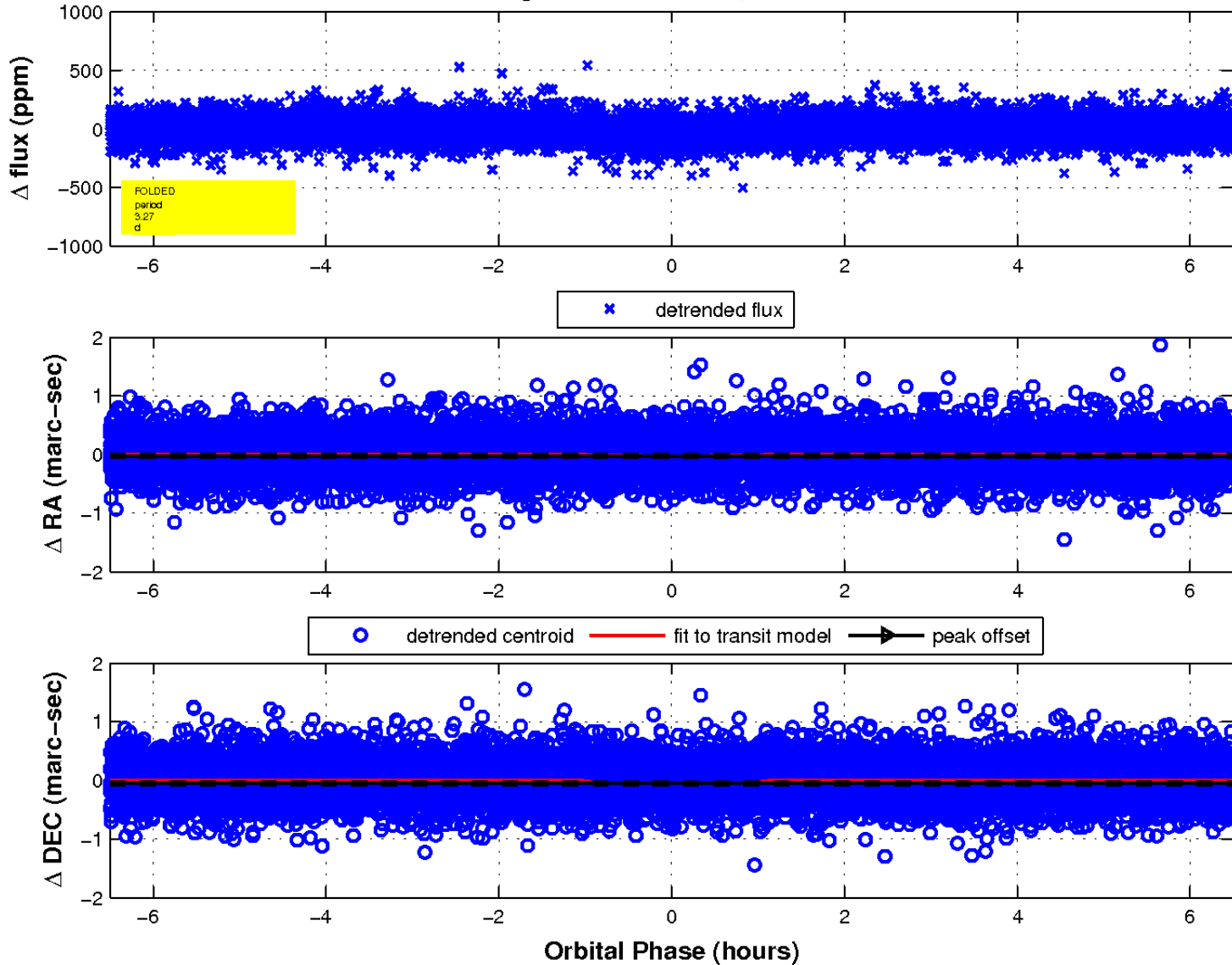
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

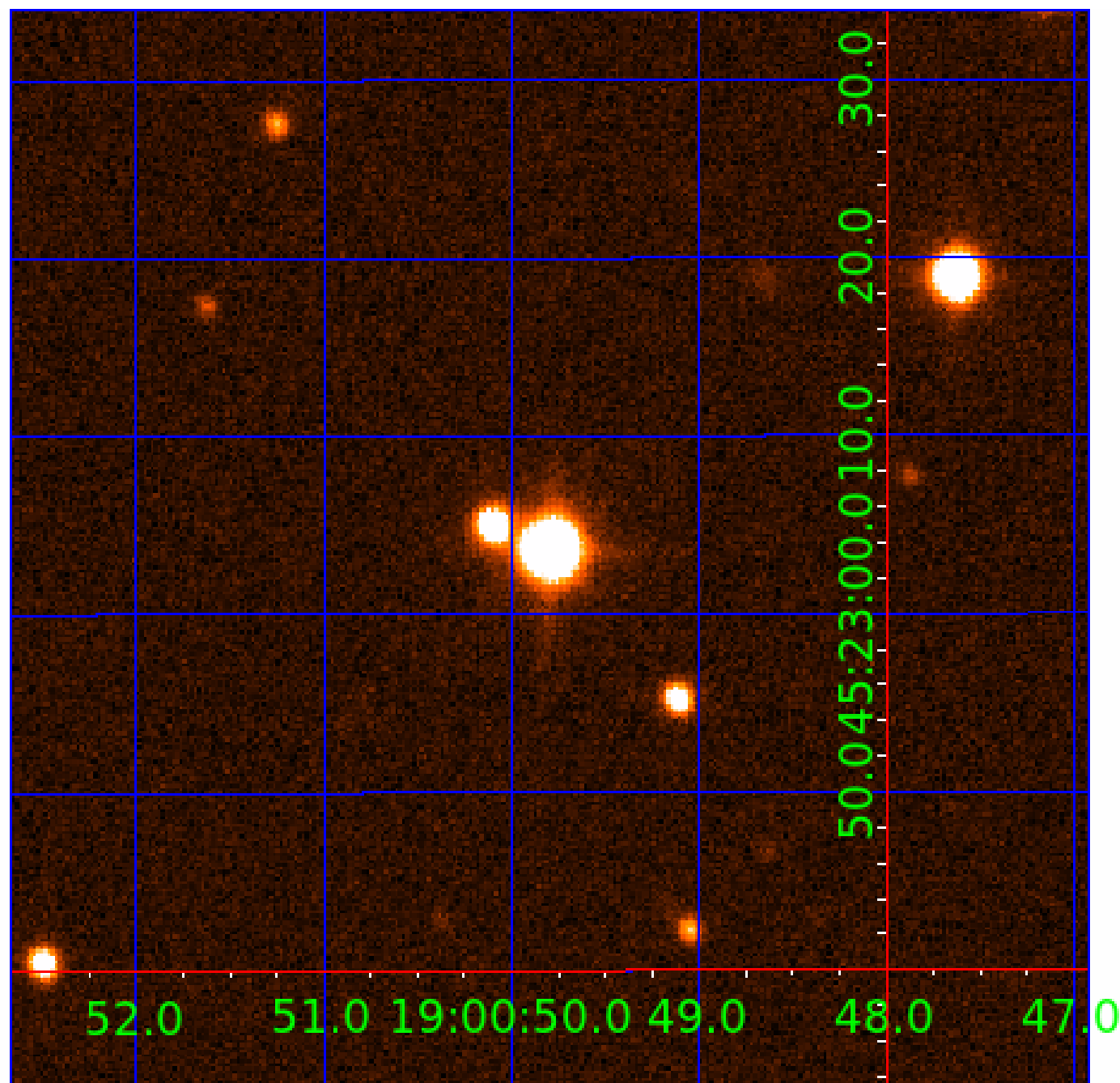


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



KIC 009006186

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})
009006186-01	OBS	2169.01	5.452974	134.152435	88.9	2.231	23.1	25.3	0.84	5450	0.95	158.19
009006186-02	OBS	2169.02	3.266644	132.815659	55.9	2.167	18.0	20.1	0.84	5450	0.76	313.25
009006186-03	OBS	2169.03	4.272255	133.220264	49.4	2.169	13.7	15.2	0.84	5450	0.62	219.02
009006186-04	OBS	2169.04	2.192531	132.233444	20.0	2.152	8.2	8.3	0.84	5450	0.45	533.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009006186-01	OBS	PC	0.90	0	0	0	0	NO_COMMENT
009006186-02	OBS	PC	0.96	0	0	0	0	NO_COMMENT
009006186-03	OBS	PC	0.65	0	0	0	0	NO_COMMENT
009006186-04	OBS	PC	0.99	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.

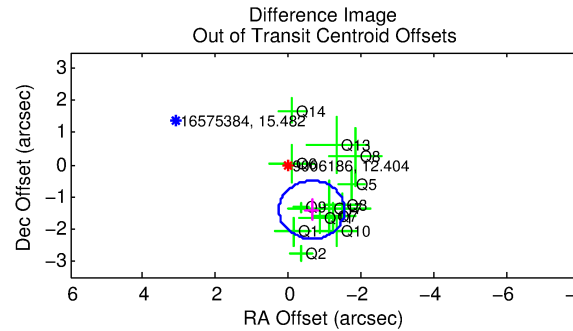
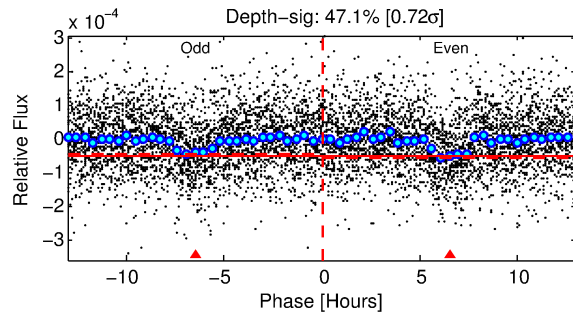
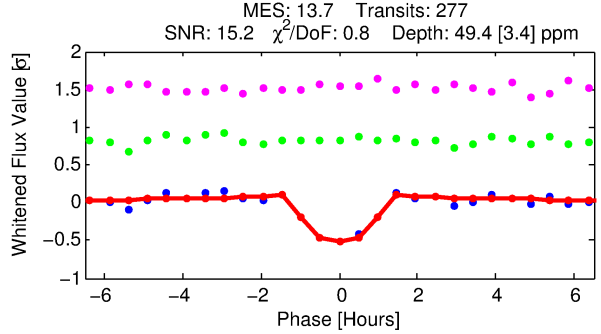
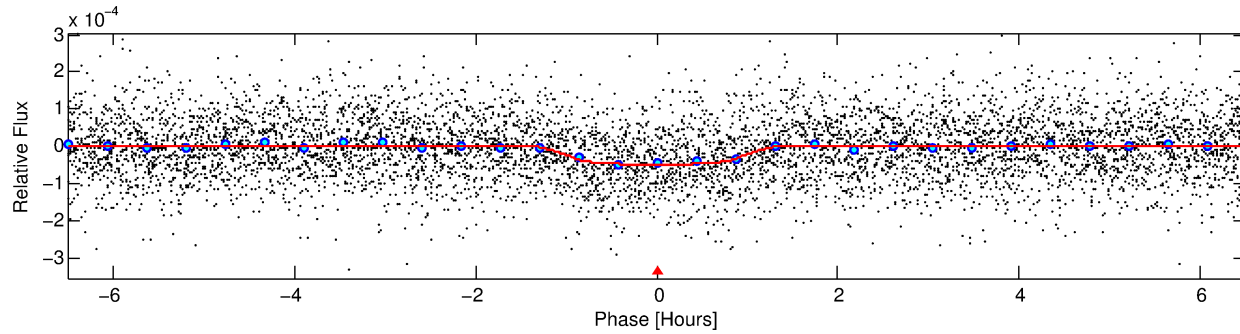
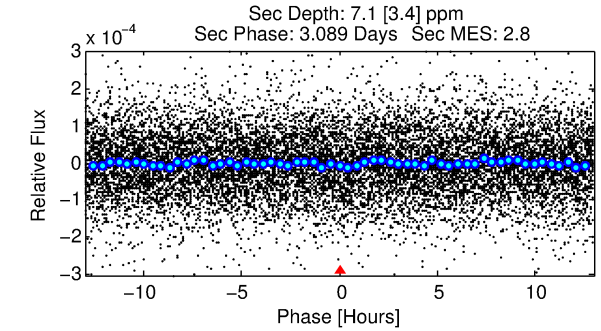
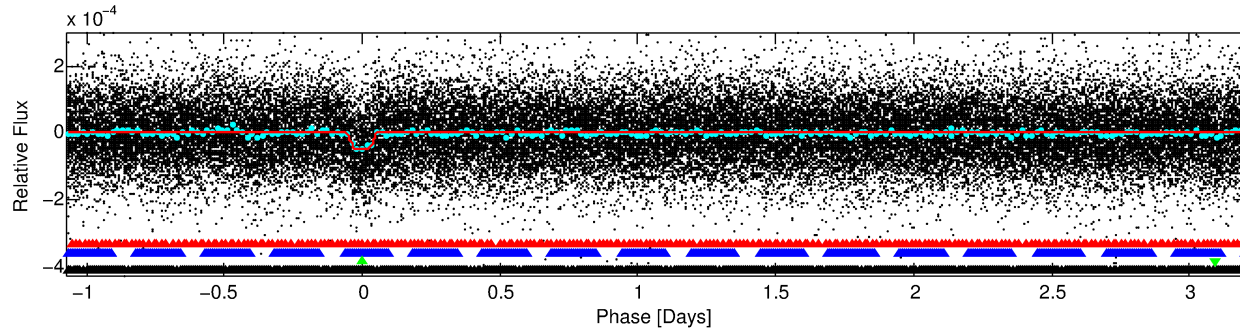
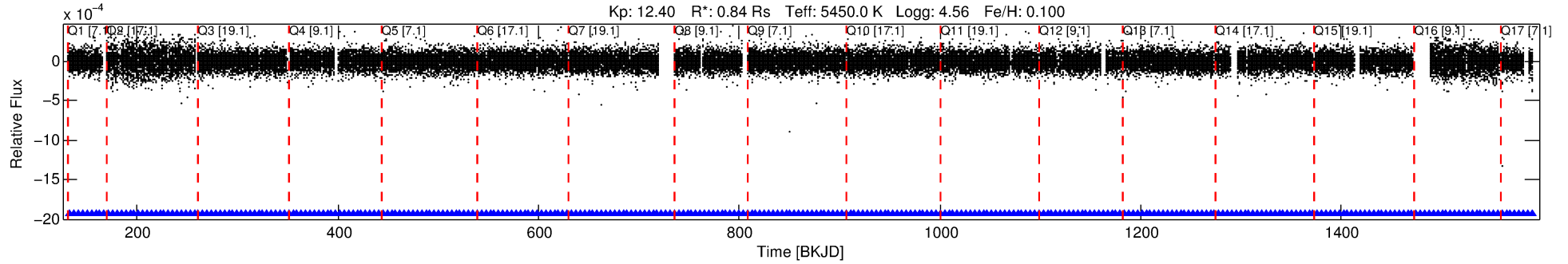
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009006186-03

No Significant Match Found

DV One-Page Summary

KIC: 9006186 Candidate: 3 of 4 Period: 4.272 d
KOI: K02169.03 Corr: 0.994



DV Fit Results:

Period = 4.27225 [0.00002] d
Epoch = 133.2203 [0.0024] BKJD
Rp/R* = 0.0067 [0.0017]
a/R* = 11.81 [11.45]
b = 0.63 [0.94]
Seff = 219.02 [39.50]
Teq = 981 [44] K
Rp = 0.62 [0.17] Re
a = 0.0506 [0.0052] AU
Ag = 25.93 [18.62] [1.34sigma]
Teffp = 3422 [603] K [4.04sigma]

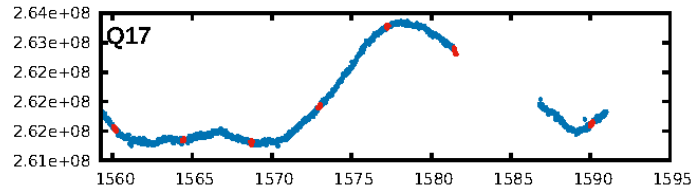
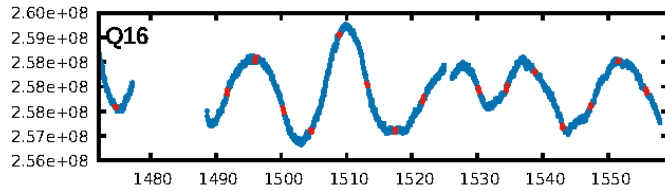
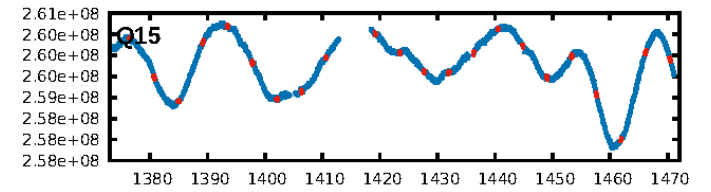
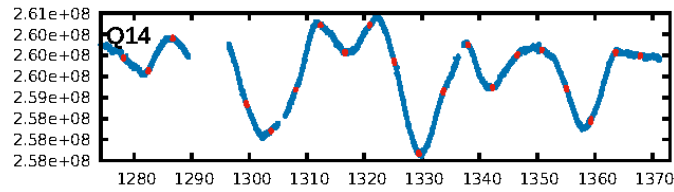
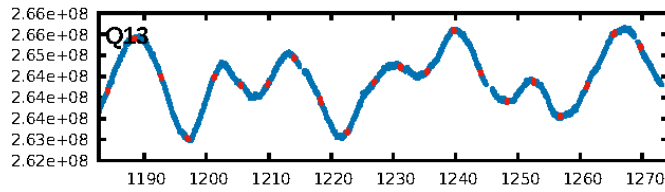
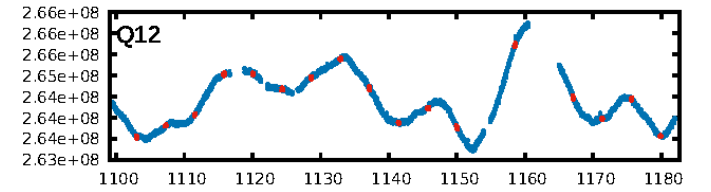
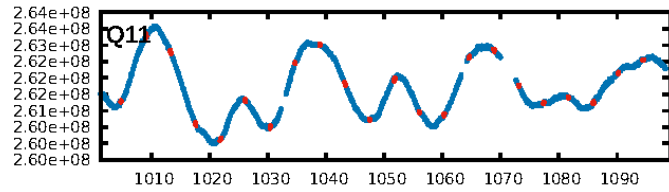
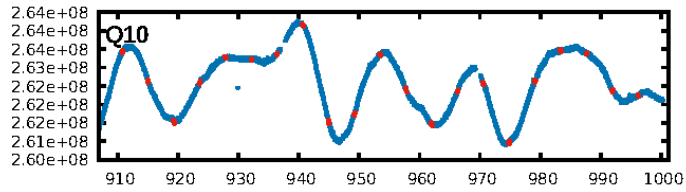
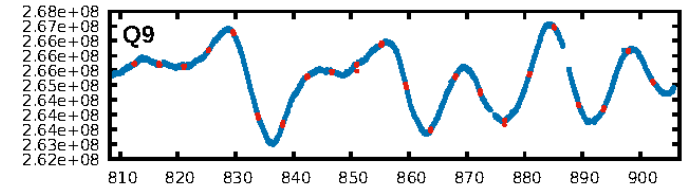
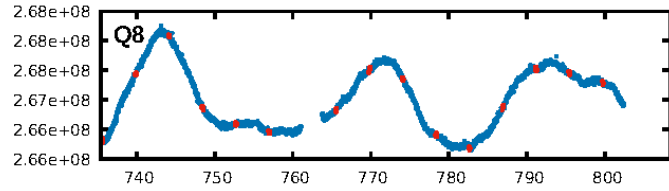
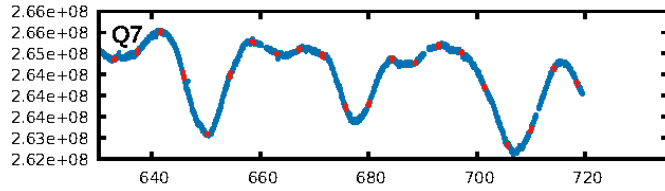
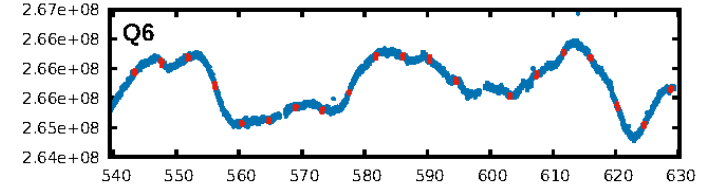
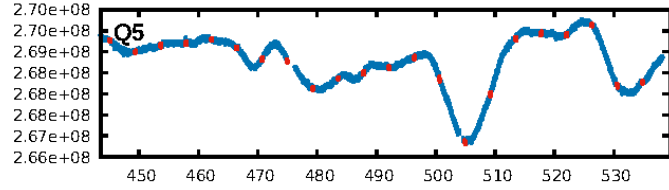
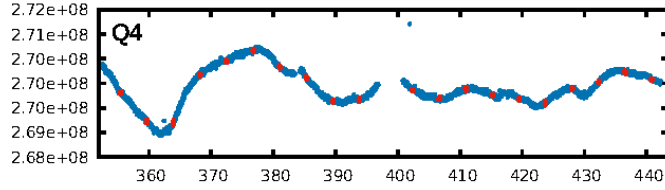
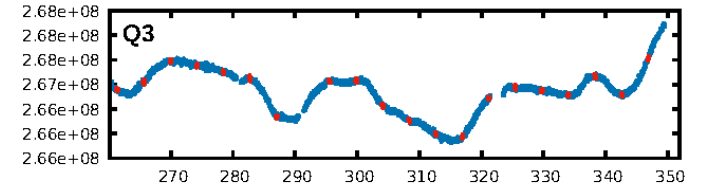
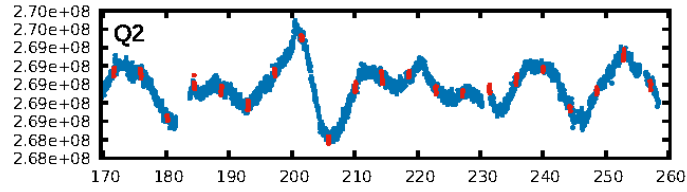
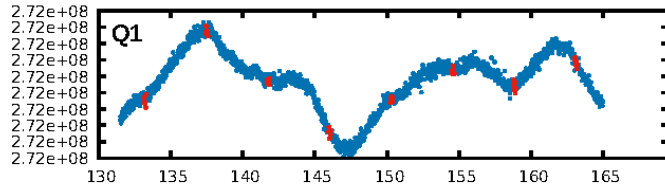
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.87sigma]
LongPeriod-sig: 100.0% [9.11sigma]
ModelChiSquare2-sig: N/A
ModelChiSquareGoF-sig: N/A
Bootstrap-pfa: 2.86e-41
RollingBand-fgt: 1.00 [264/264]
GhostDiagnostic-chr: 1.943
Centroid-sig: 6.6%
Centroid-so: 0.699 arcsec [1.35sigma]
OotOffset-rm: 1.549 arcsec [5.14sigma]
KicOffset-rm: 1.634 arcsec [5.33sigma]
OotOffset-st: 4/3/1/5 [13]
KicOffset-st: 4/3/1/5 [13]
DiffImageQuality-fgm: 0.85 [11/13]
DiffImageOverlap-fno: 1.00 [17/17]

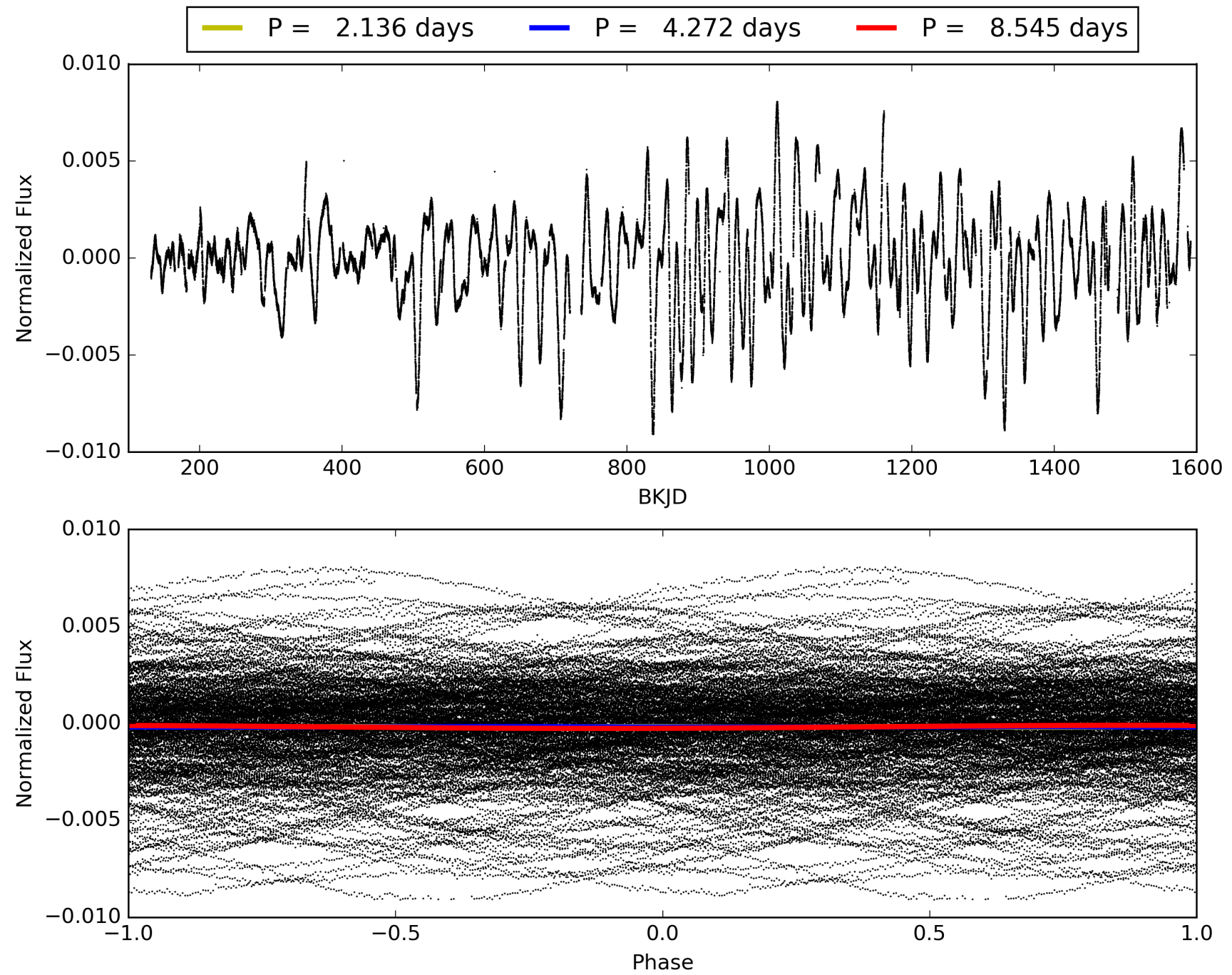
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 12:13:31 Z

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

TCE 009006186-03, PDC Light Curves

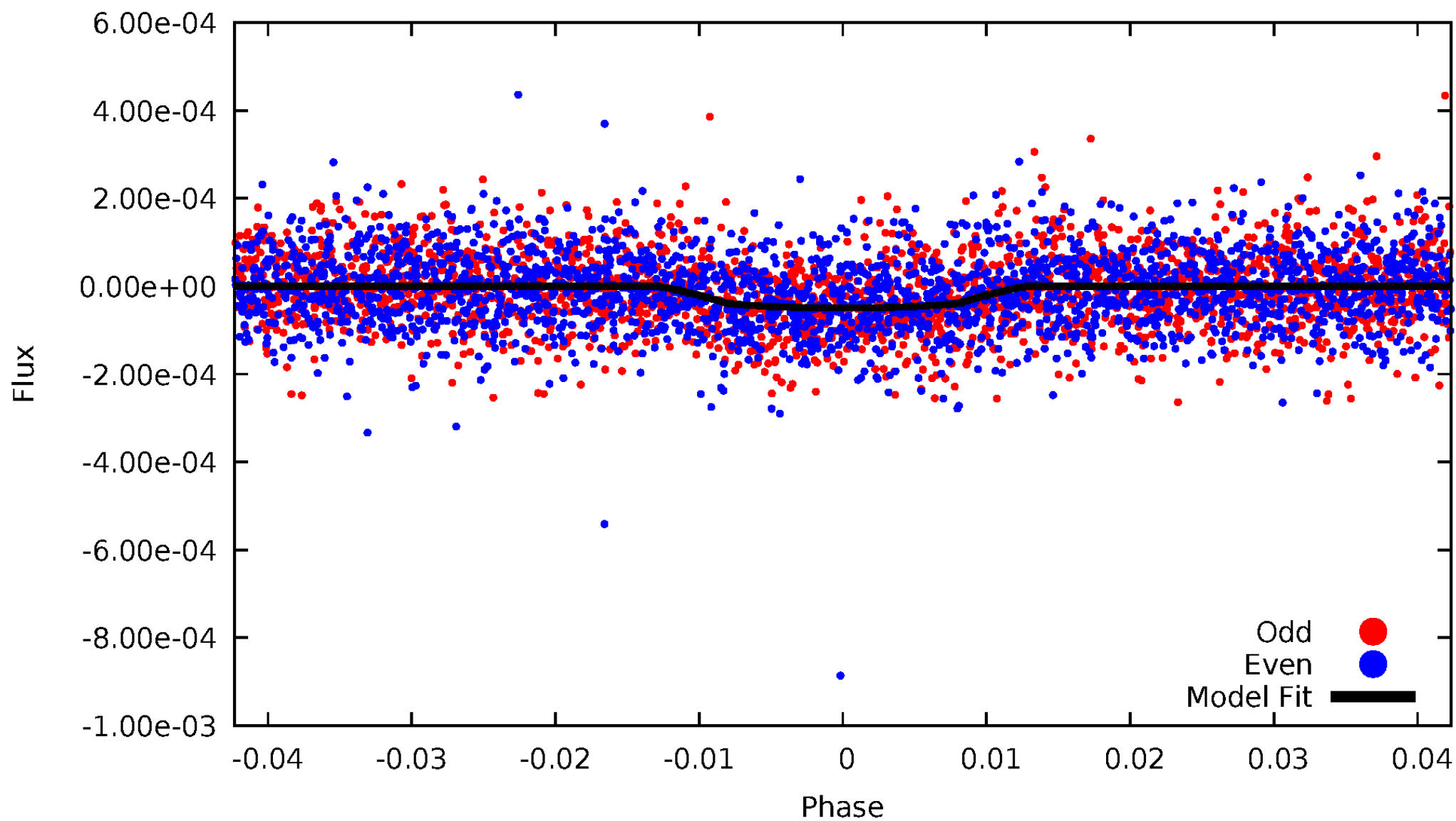


TCE 009006186-03



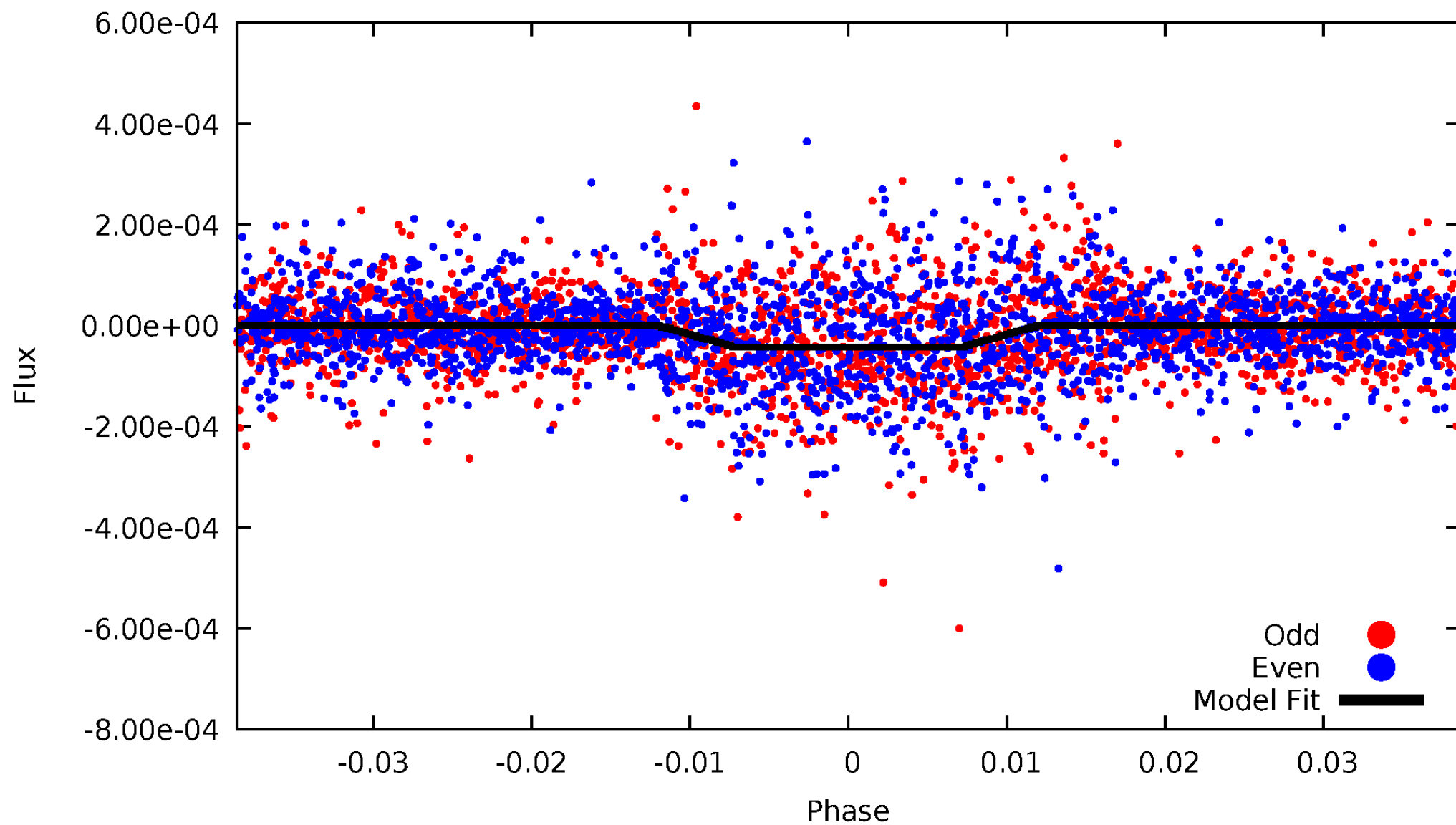
DV Odd/Even

TCE 009006186-03

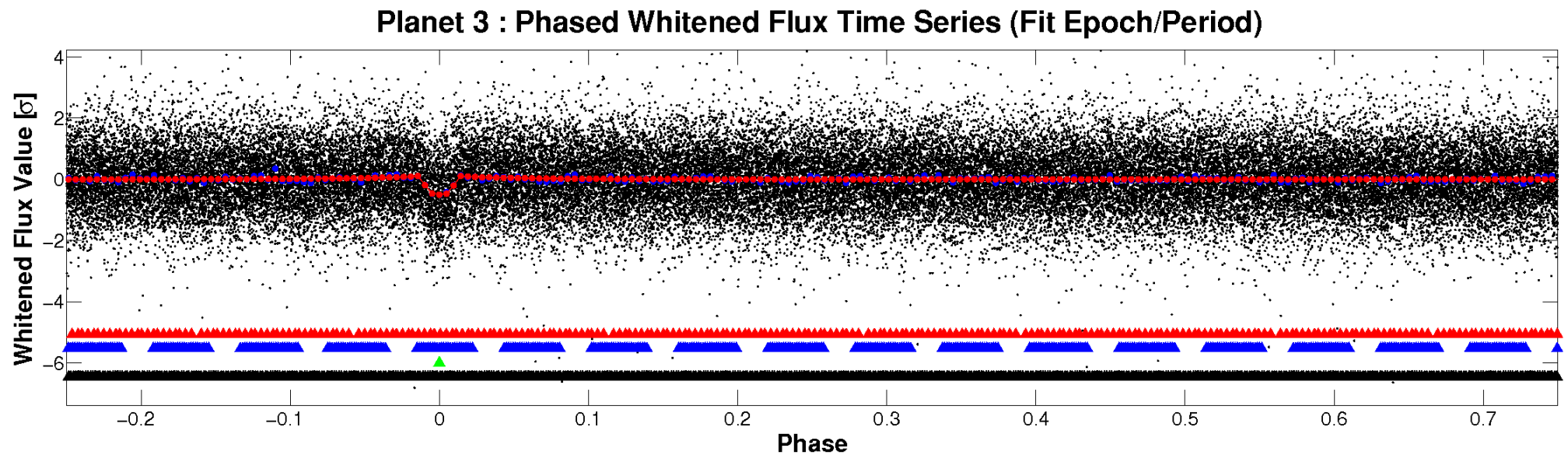
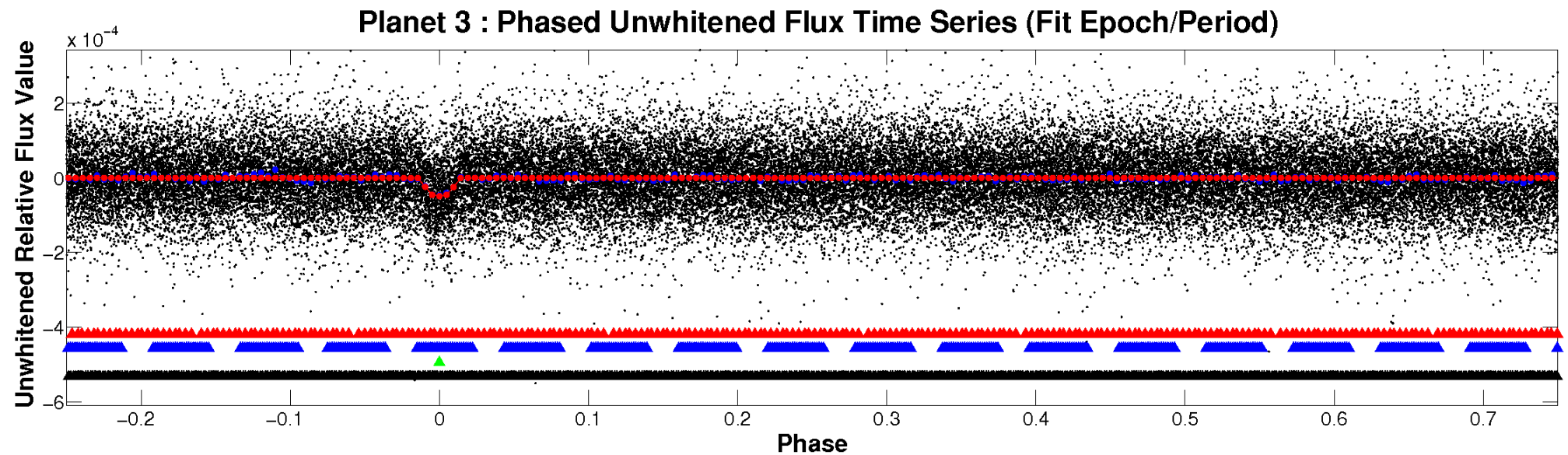


ALT Odd/Even

TCE 009006186-03

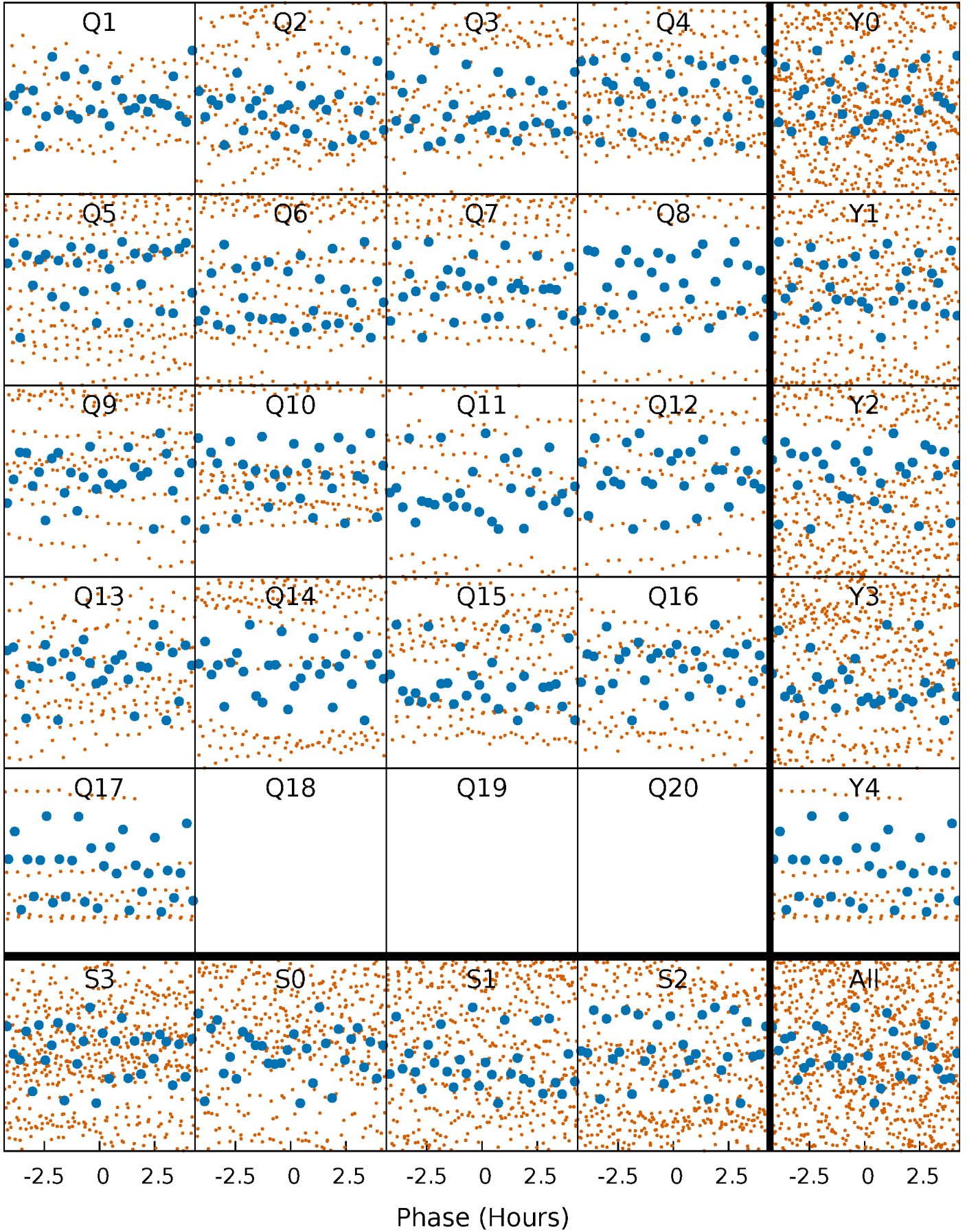


Non-Whitened Vs. Whitened Light Curve



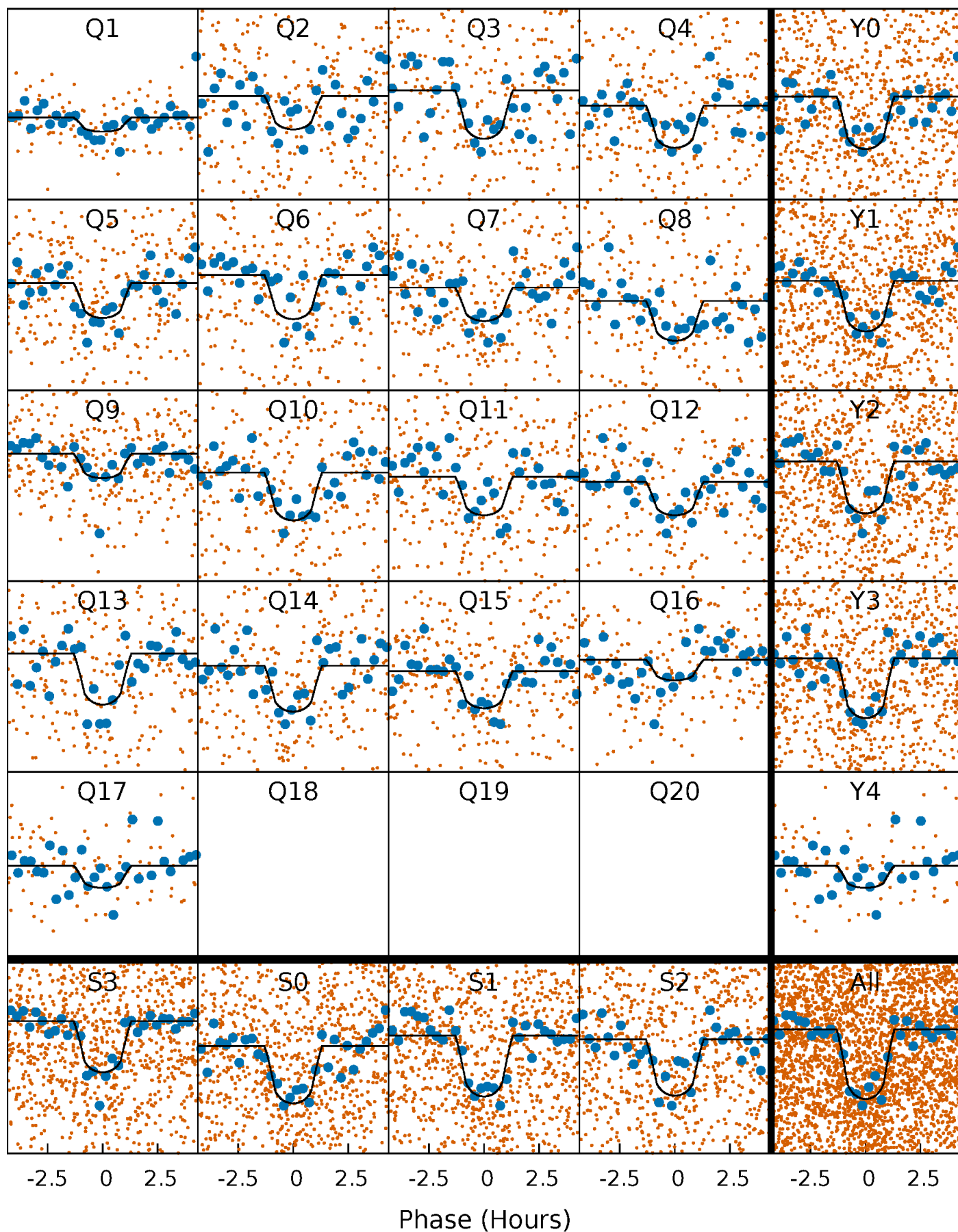
PDC Quarter-Phased Transit Curves

TCE 009006186-03 P= 4.272255 Days $T_0=133.220264$ (BKJD)



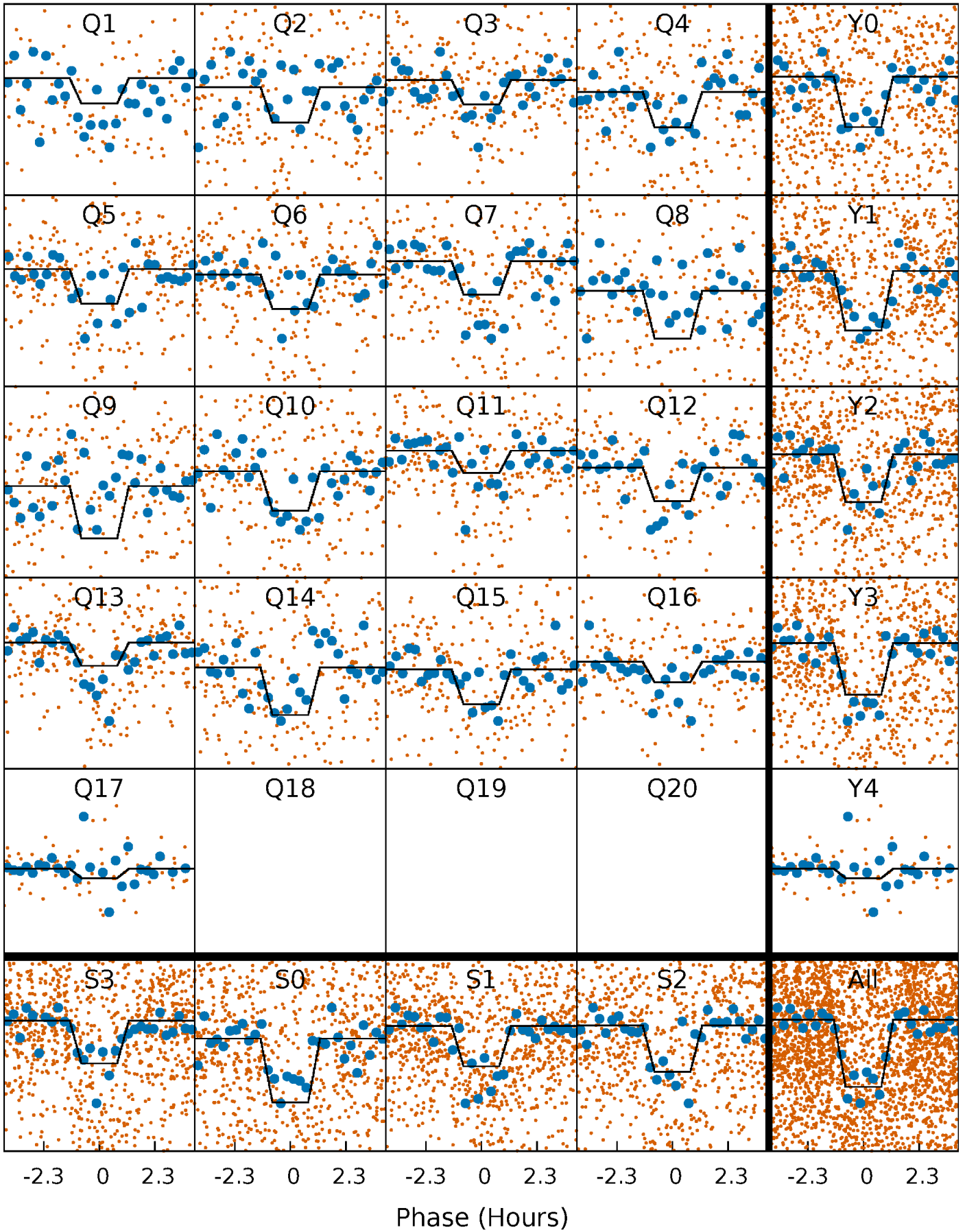
DV Quarter-Phased Transit Curves

TCE 009006186-03 P= 4.272255 Days $T_0=133.220264$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

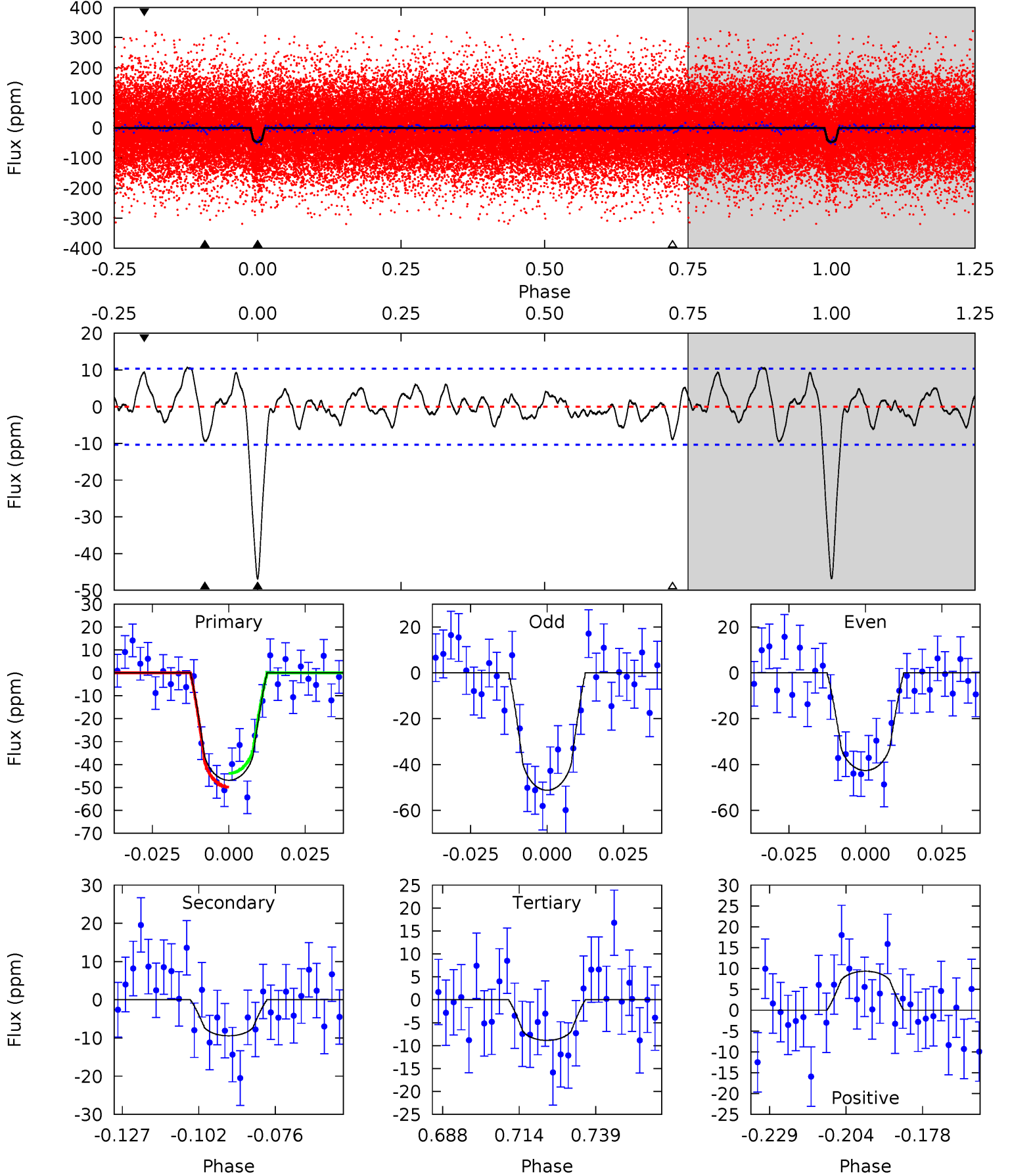
TCE 009006186-03 P= 4.272271 Days $T_0=133.218556$ (BKJD)



DV Model-Shift Uniqueness Test

009006186-03, P = 4.272255 Days, E = 128.948009 Days

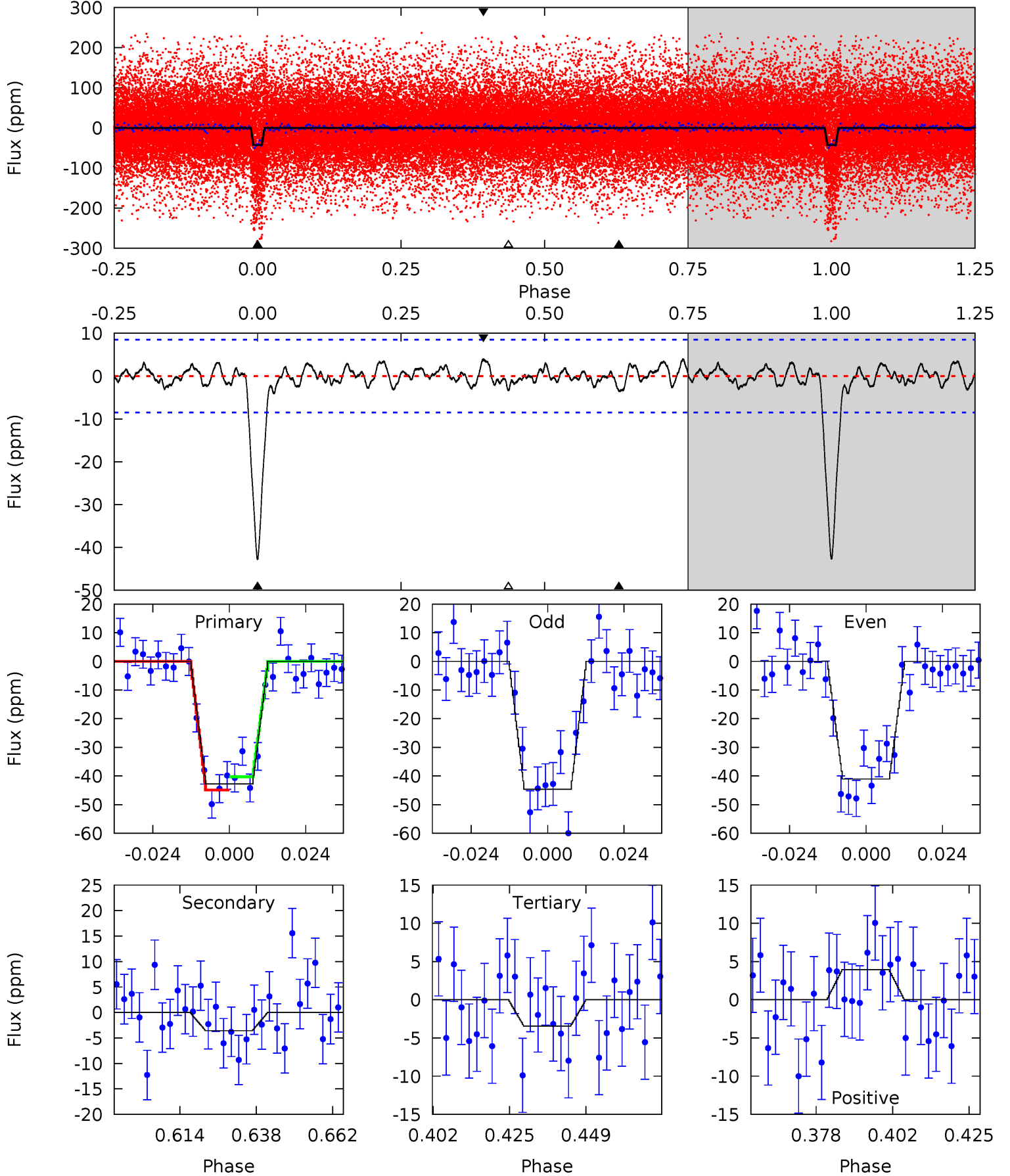
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.9	4.41	4.15	4.37	4.84	2.23	1.54	17.8	17.6	0.27	0.04	2.02	1.12	0.19	1.40



Alt Model-Shift Uniqueness Test

009006186-03, P = 4.272271 Days, E = 128.946285 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.4	2.05	1.97	2.26	4.86	2.26	0.91	22.5	22.2	0.07	-0.21	1.03	1.05	0.08	1.31



Stellar Parameters For KIC 009006186

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5450^{+108}_{-108}	$4.563^{+0.017}_{-0.094}$	$0.100^{+0.150}_{-0.150}$	$0.842^{+0.093}_{-0.033}$	$0.944^{+0.039}_{-0.066}$	$2.227^{+0.172}_{-0.603}$
	+2%/-2%	+0%/-2%	+150%/-150%	+11%/-4%	+4%/-7%	+8%/-27%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 009006186-03 / KOI 2169.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-9 ± 2	$0.63^{+0.18}_{-0.16}$	1390^{+38}_{-35}	3985^{+516}_{-358}	33^{+29}_{-14}
Alt.	-4 ± 2	$0.61^{+0.17}_{-0.16}$	1388^{+42}_{-38}	3404^{+442}_{-358}	13^{+15}_{-7}

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

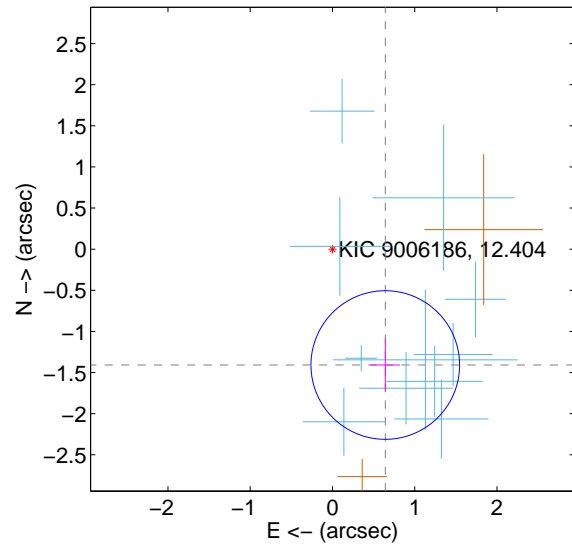
Supplemental centroid analysis for 009006186-03. Kepler magnitude: 12.40. Transit SNR 15.17

There are 11 quarters with good PRF difference image offsets

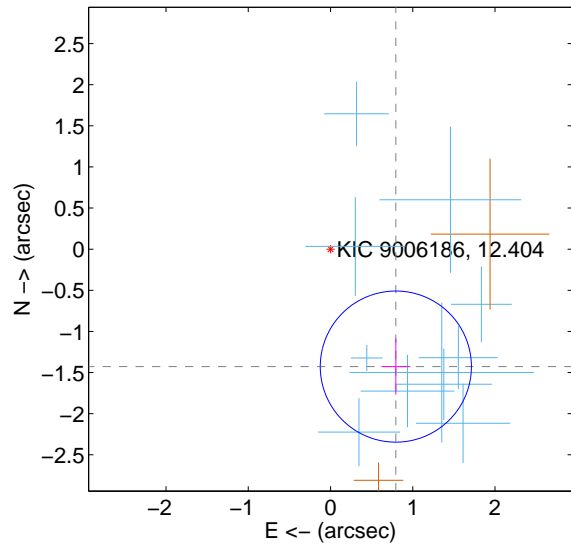
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.549 ± 0.301	5.14	-0.642 ± 0.182	-1.409 ± 0.317
PRF-fit source offset from KIC position	1.634 ± 0.306	5.33	-0.794 ± 0.175	-1.428 ± 0.342
photometric centroid source offset	0.70 ± 0.52	1.35	0.20 ± 0.50	-0.67 ± 0.52

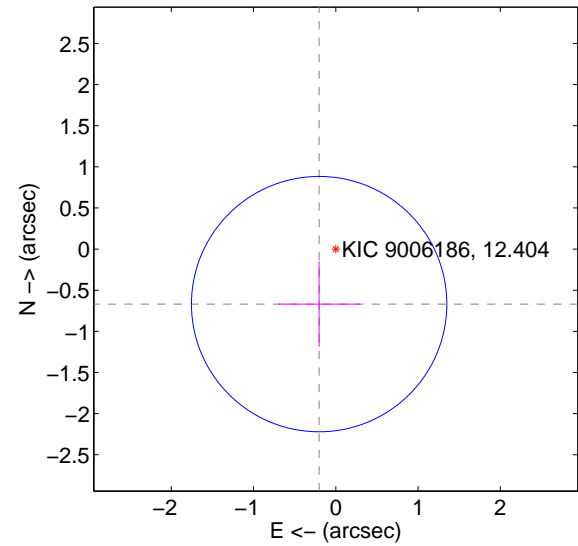
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

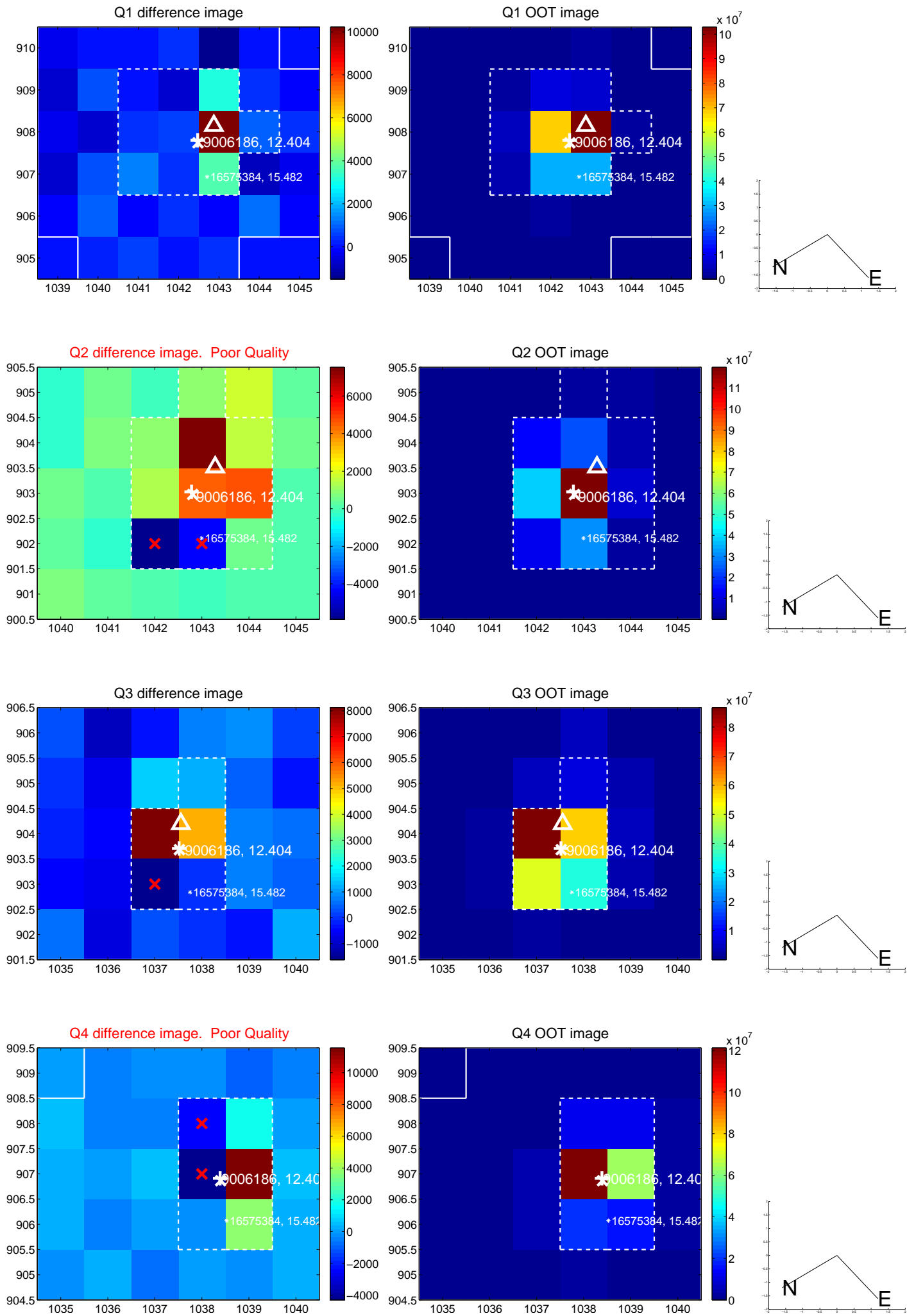


offset from photometric centroids

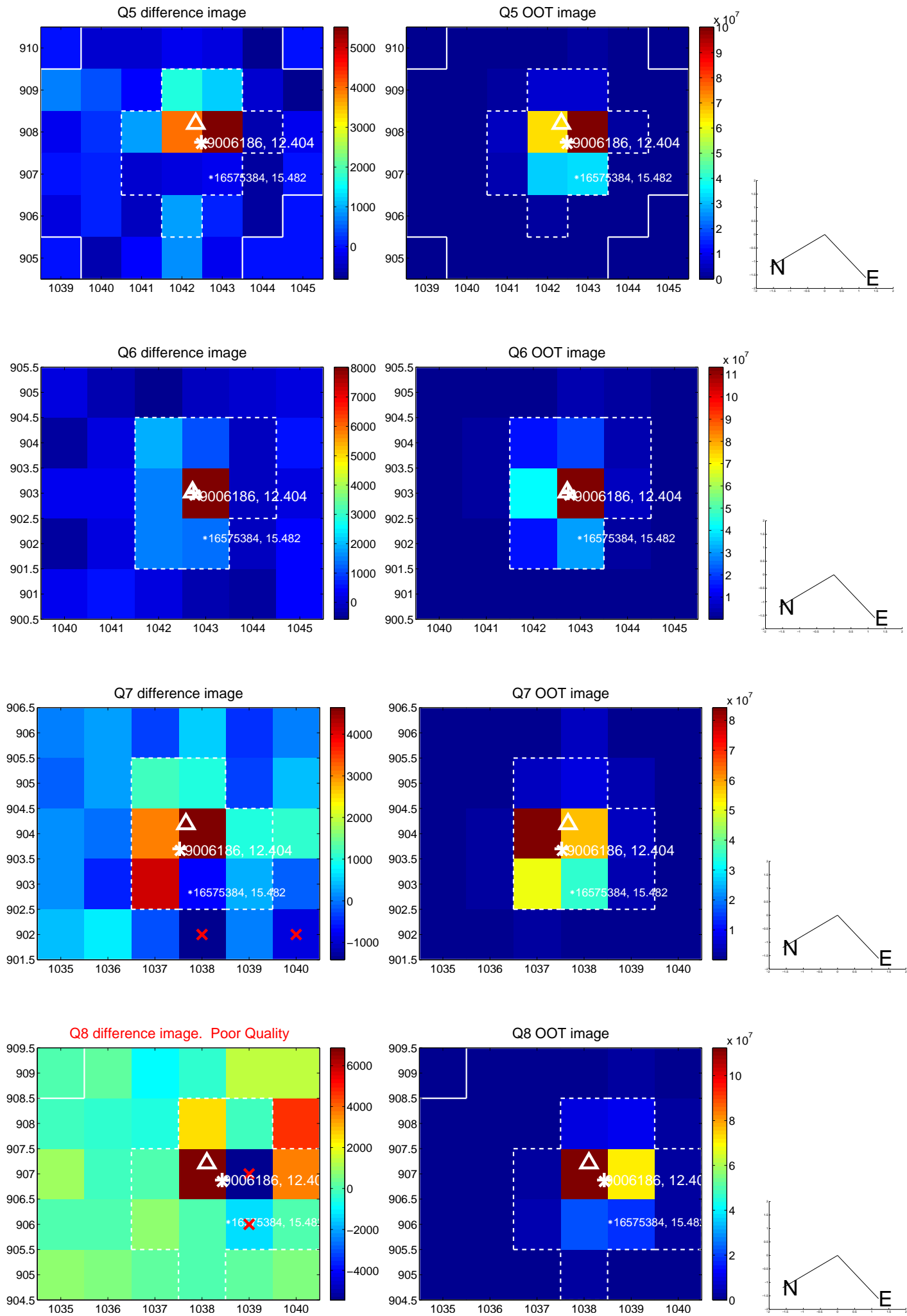


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

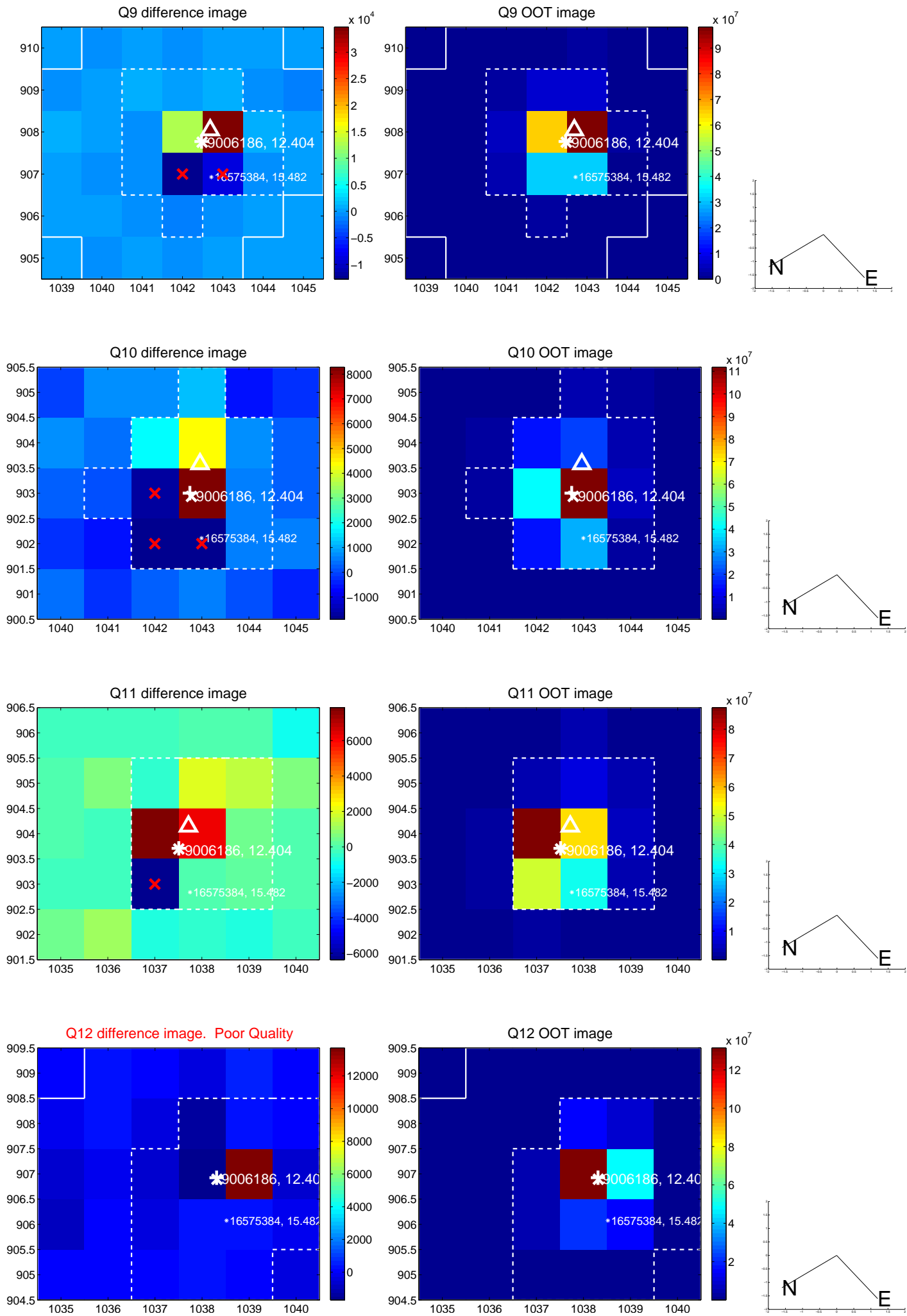
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



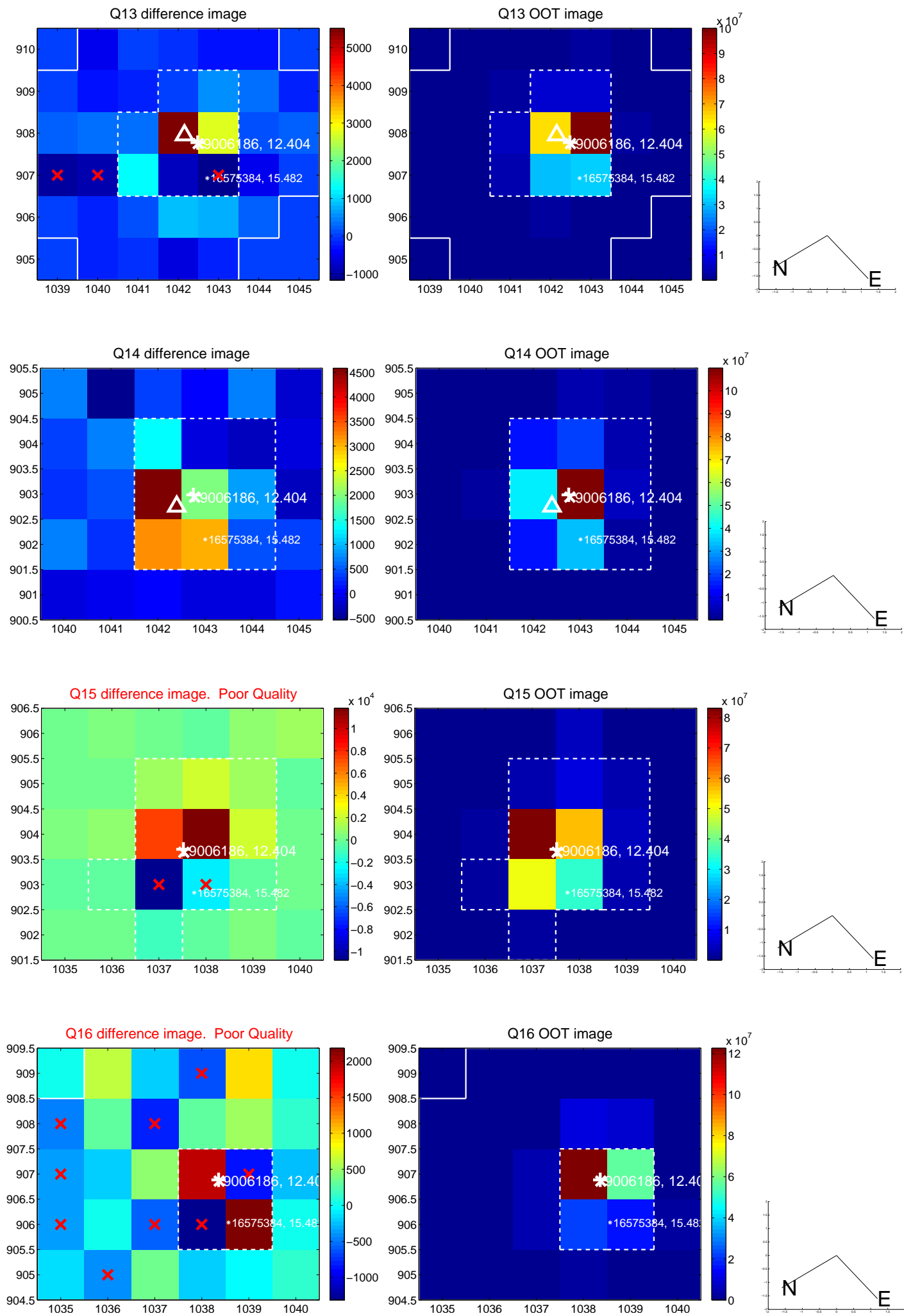
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



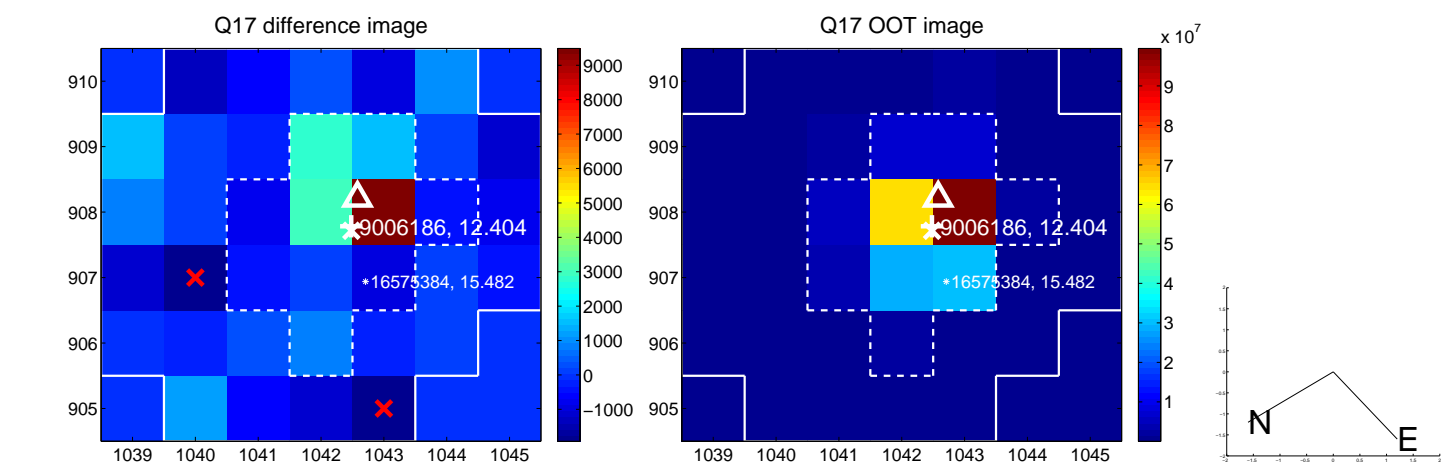
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



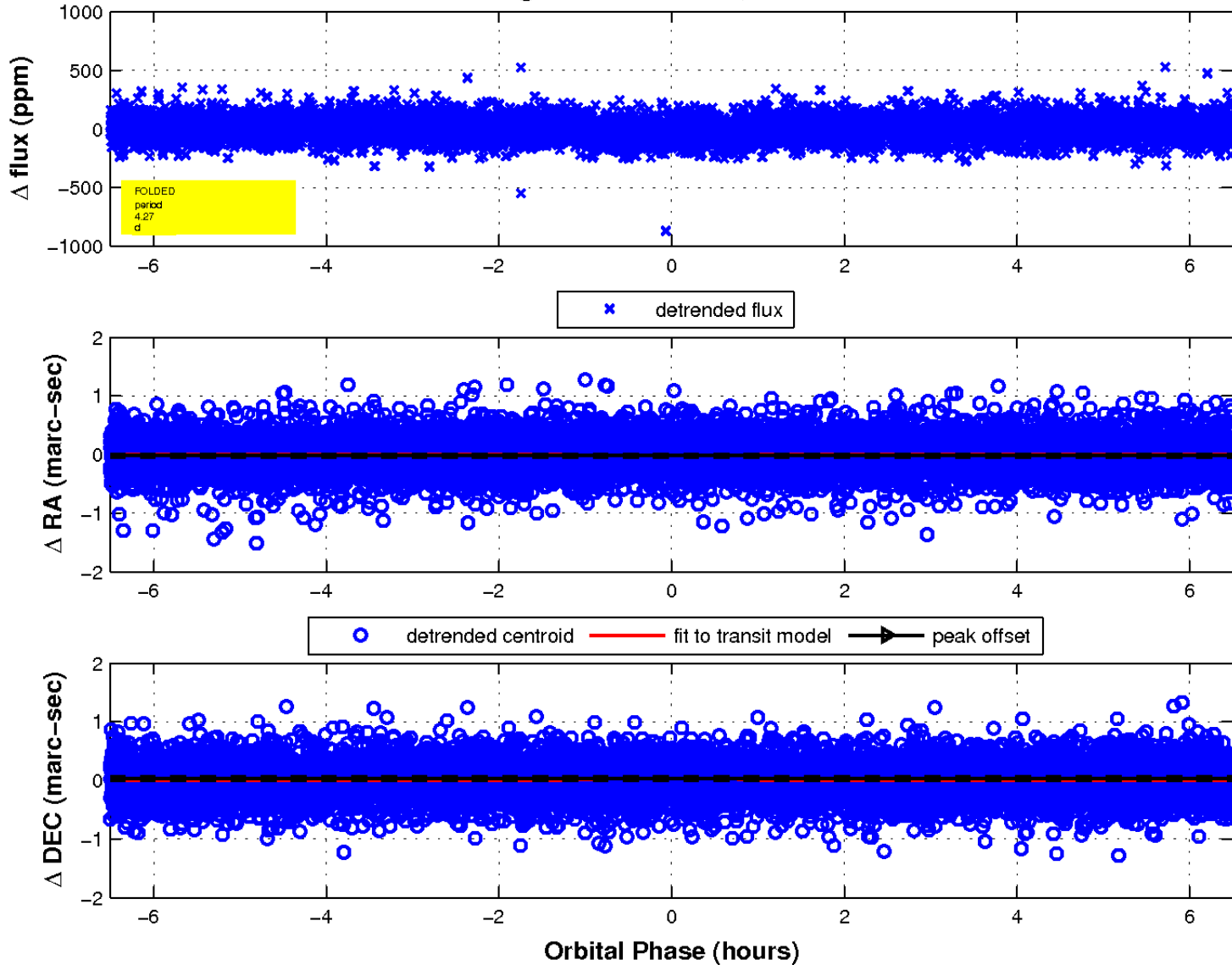
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

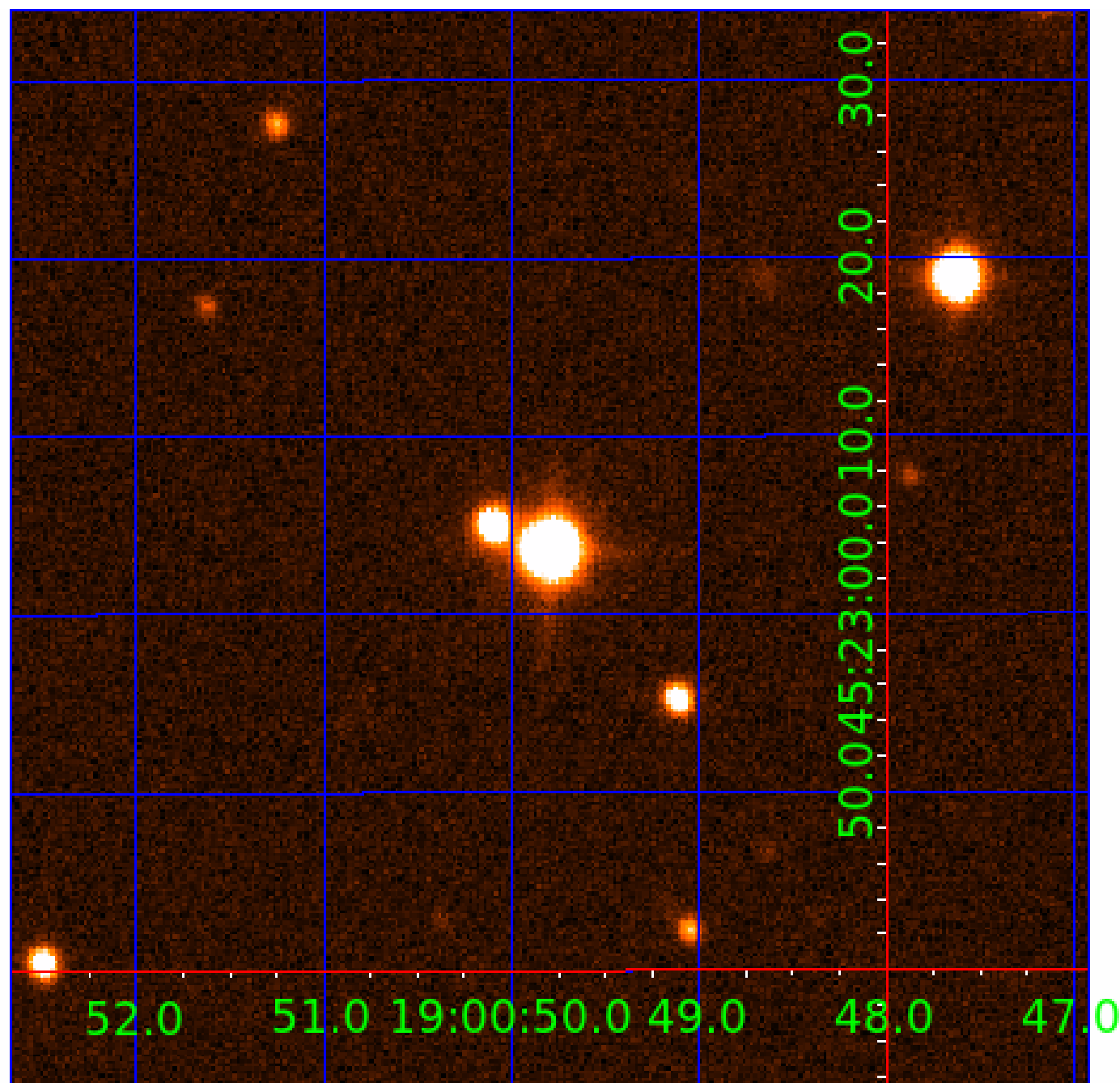


fluxWeightedCentroids, Planet 3 of 4



UKIRT Image

Declination



KIC 009006186

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})
009006186-01	OBS	2169.01	5.452974	134.152435	88.9	2.231	23.1	25.3	0.84	5450	0.95	158.19
009006186-02	OBS	2169.02	3.266644	132.815659	55.9	2.167	18.0	20.1	0.84	5450	0.76	313.25
009006186-03	OBS	2169.03	4.272255	133.220264	49.4	2.169	13.7	15.2	0.84	5450	0.62	219.02
009006186-04	OBS	2169.04	2.192531	132.233444	20.0	2.152	8.2	8.3	0.84	5450	0.45	533.04

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009006186-01	OBS	PC	0.90	0	0	0	0	NO_COMMENT
009006186-02	OBS	PC	0.96	0	0	0	0	NO_COMMENT
009006186-03	OBS	PC	0.65	0	0	0	0	NO_COMMENT
009006186-04	OBS	PC	0.99	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.

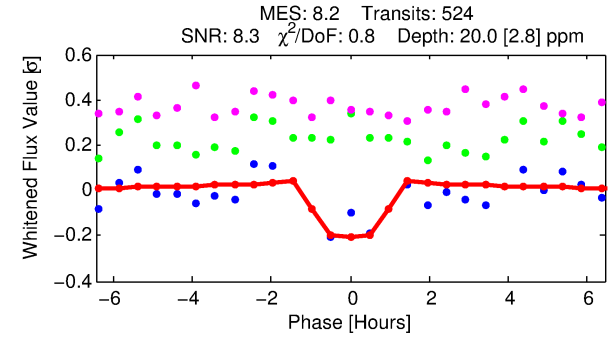
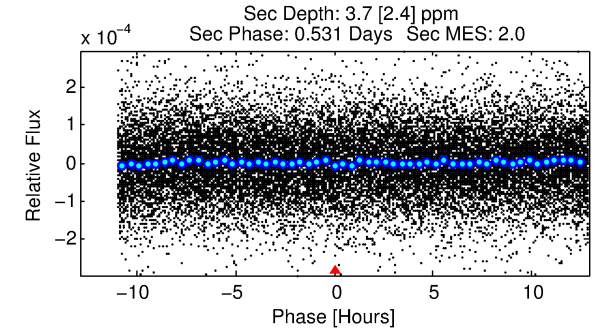
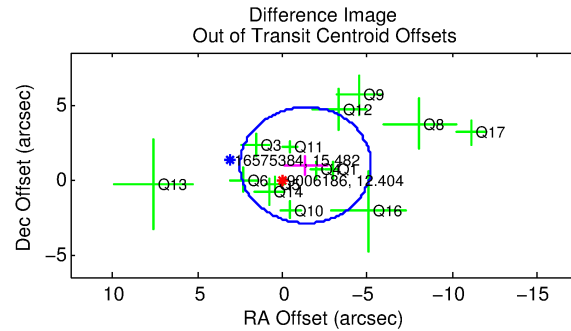
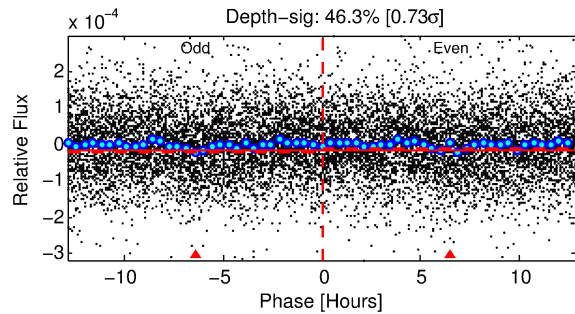
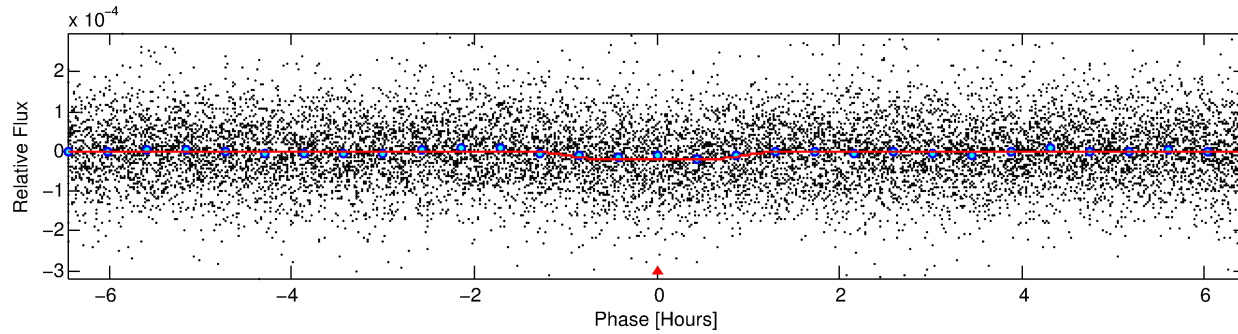
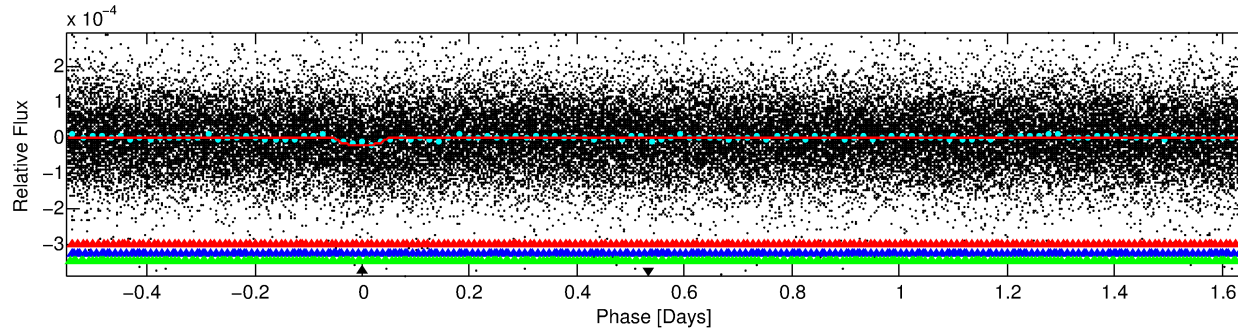
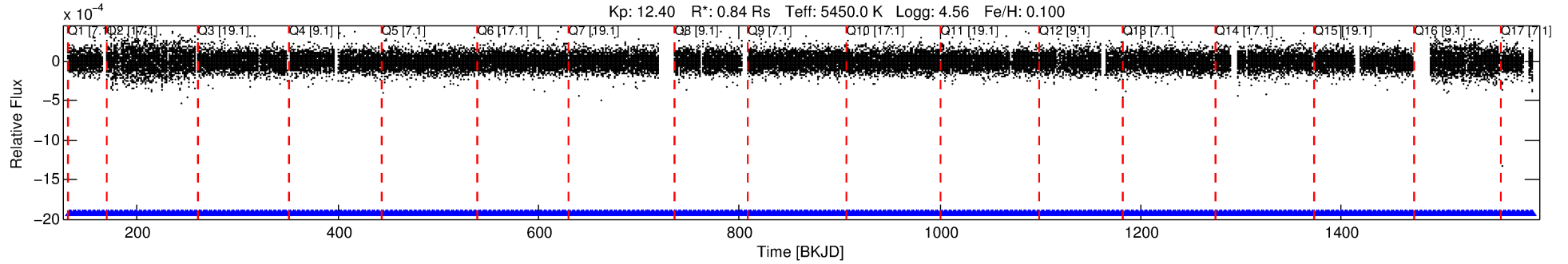
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009006186-04

No Significant Match Found

DV One-Page Summary

KIC: 9006186 Candidate: 4 of 4 Period: 2.193 d
KOI: K02169.04 Corr: 0.930



DV Fit Results:

Period = 2.19253 [0.00002] d
Epoch = 132.2334 [0.0037] BKJD
Rp/R* = 0.0049 [0.0025]
a/R* = 3.64 [7.53]
b = 0.90 [0.50]
Seff = 533.04 [96.13]
Teq = 1225 [55] K
Rp = 0.45 [0.24] Re
a = 0.0324 [0.0033] AU
Ag = 10.58 [12.91] [0.74 σ]
Teffp = 3416 [1036] K [2.11 σ]

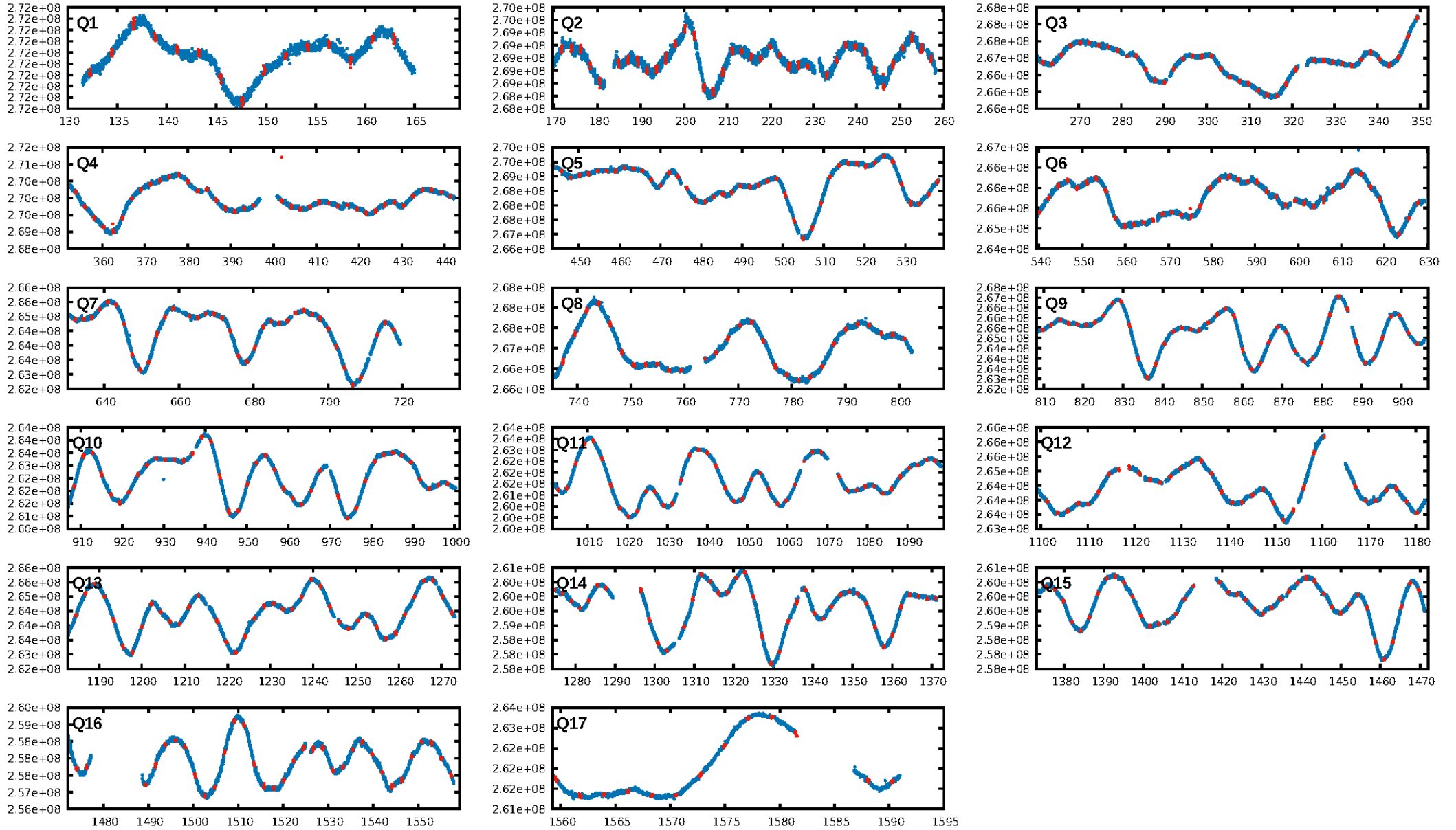
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [8.44 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 9.91e-17
RollingBand-fgt: 1.00 [498/498]
GhostDiagnostic-chr: -7.402
Centroid-sig: 9.5%
Centroid-so: 1.637 arcsec [1.88 σ]
OotOffset-rm: 1.678 arcsec [1.30 σ]
KicOffset-rm: 1.751 arcsec [1.53 σ]
OotOffset-st: 3/2/4/5 [14]
KicOffset-st: 3/2/4/5 [14]
DiffImageQuality-fgm: 0.50 [7/14]
DiffImageOverlap-fno: 1.00 [17/17]

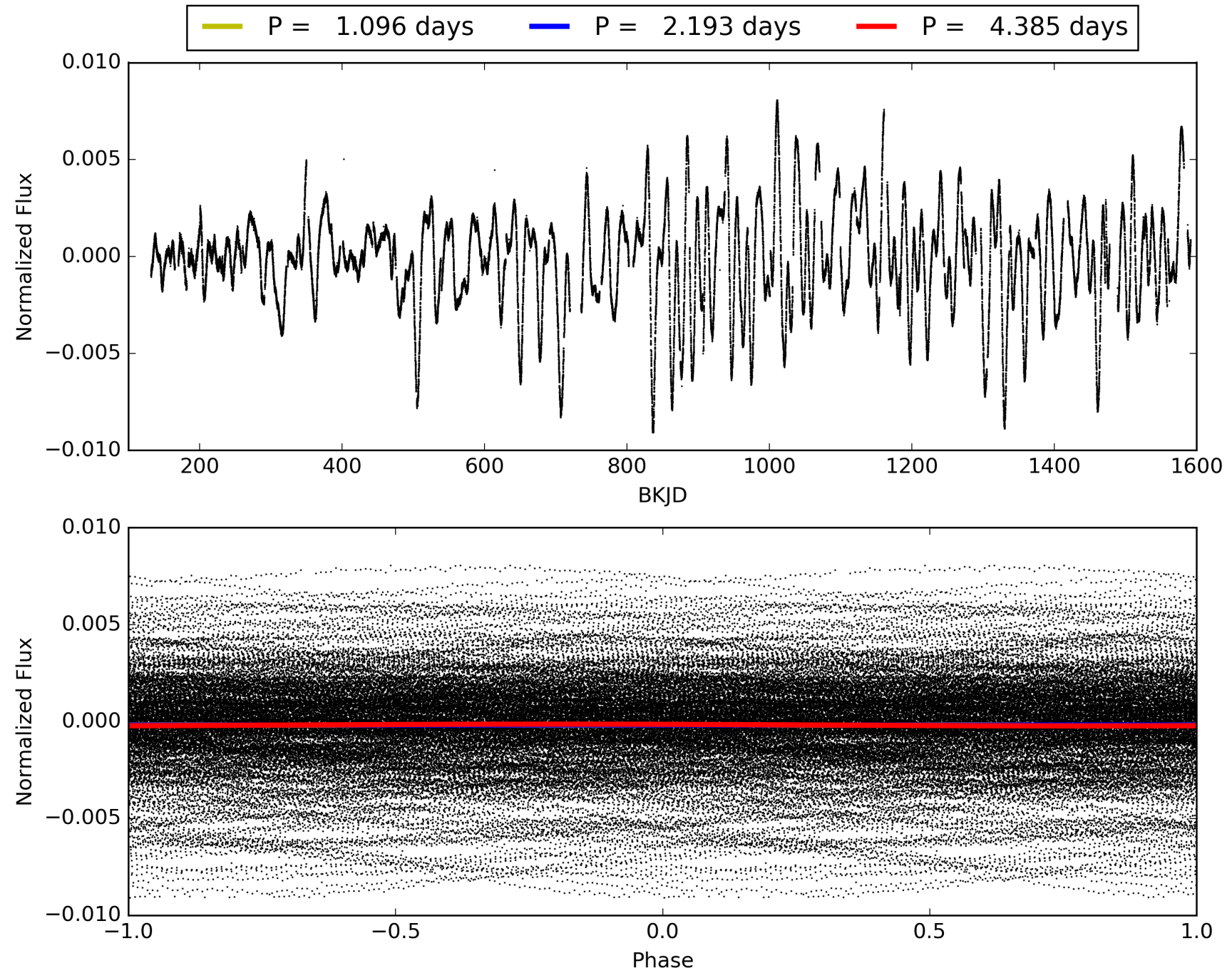
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 12:13:38 Z

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

TCE 009006186-04, PDC Light Curves

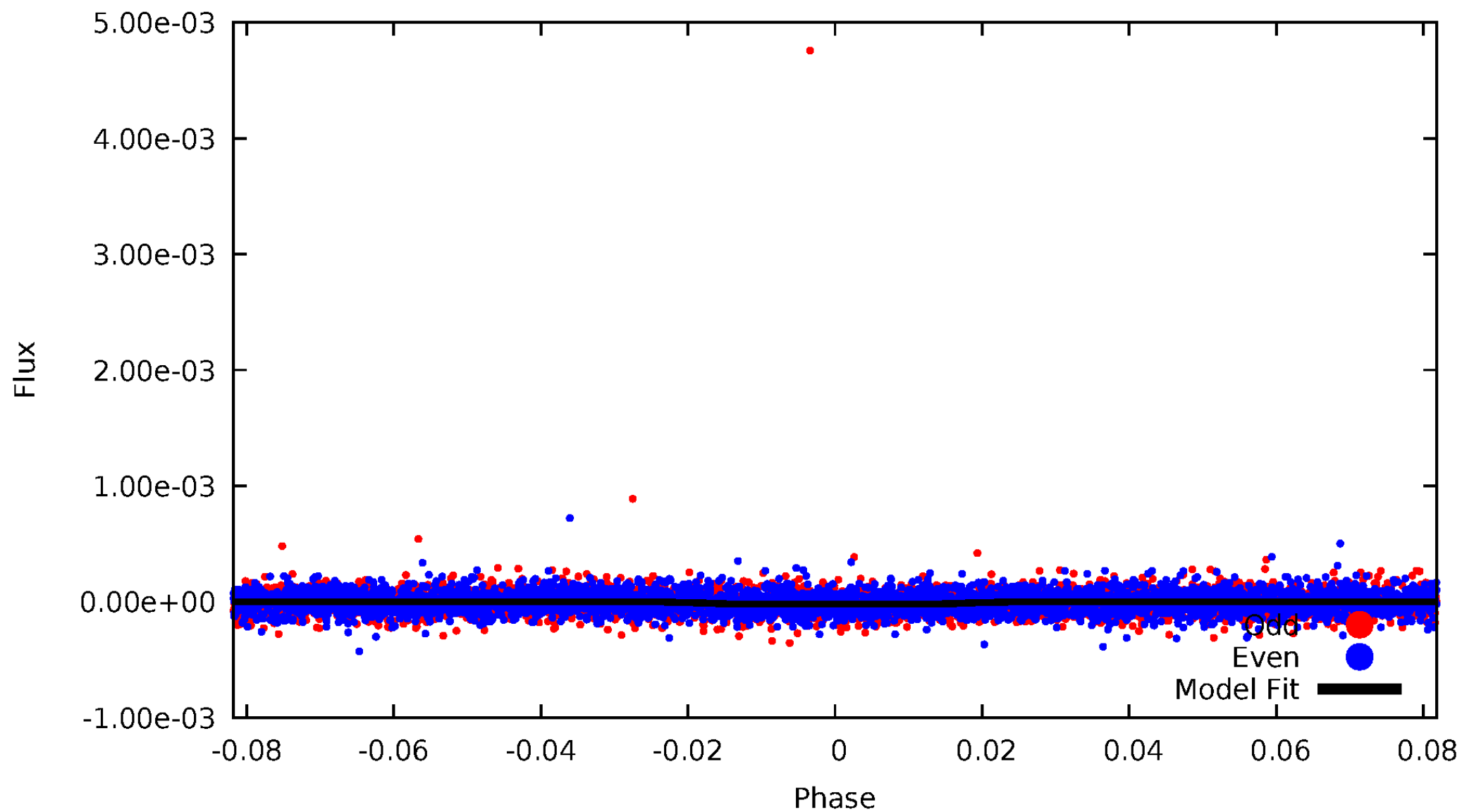


TCE 009006186-04



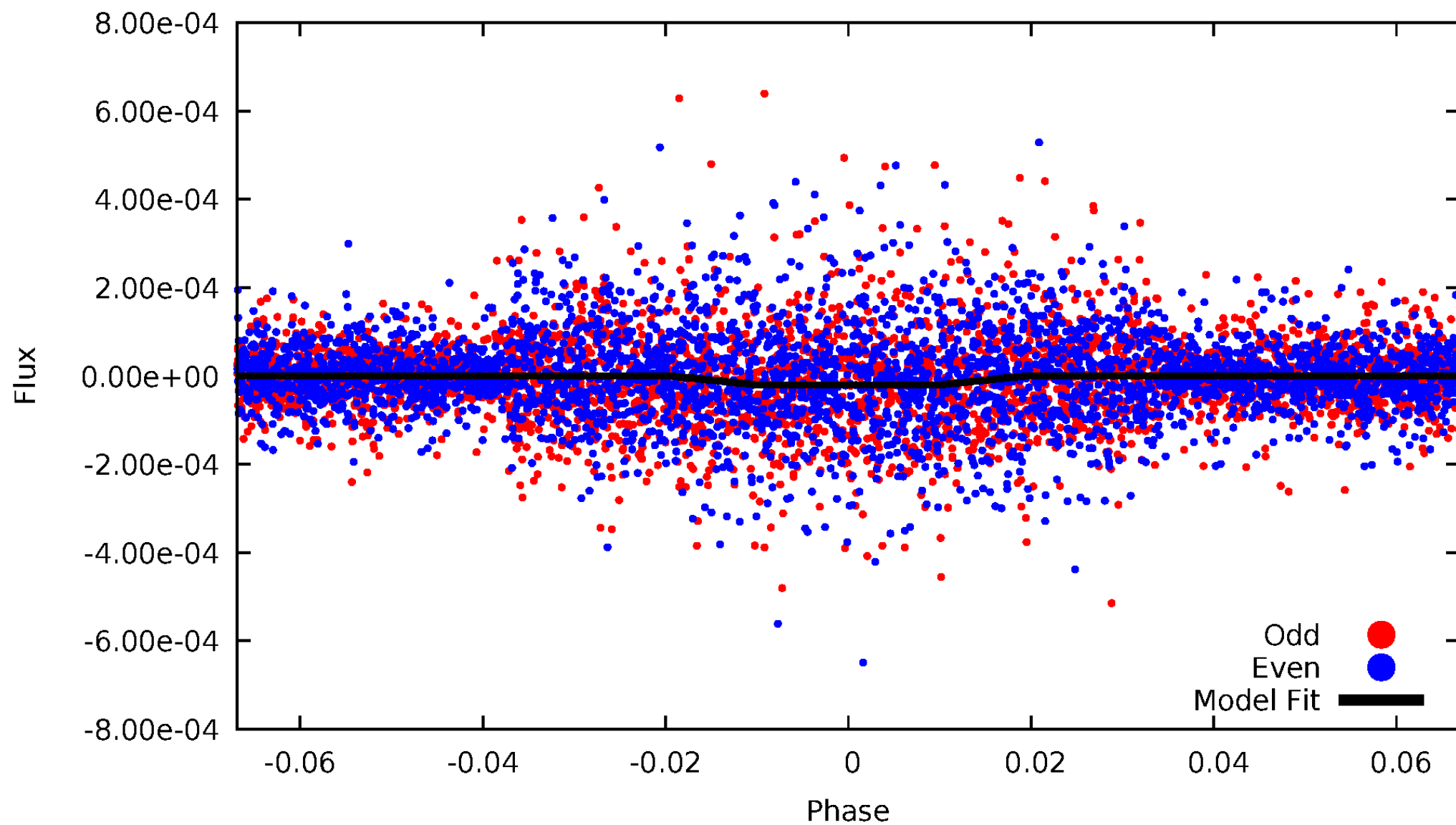
DV Odd/Even

TCE 009006186-04



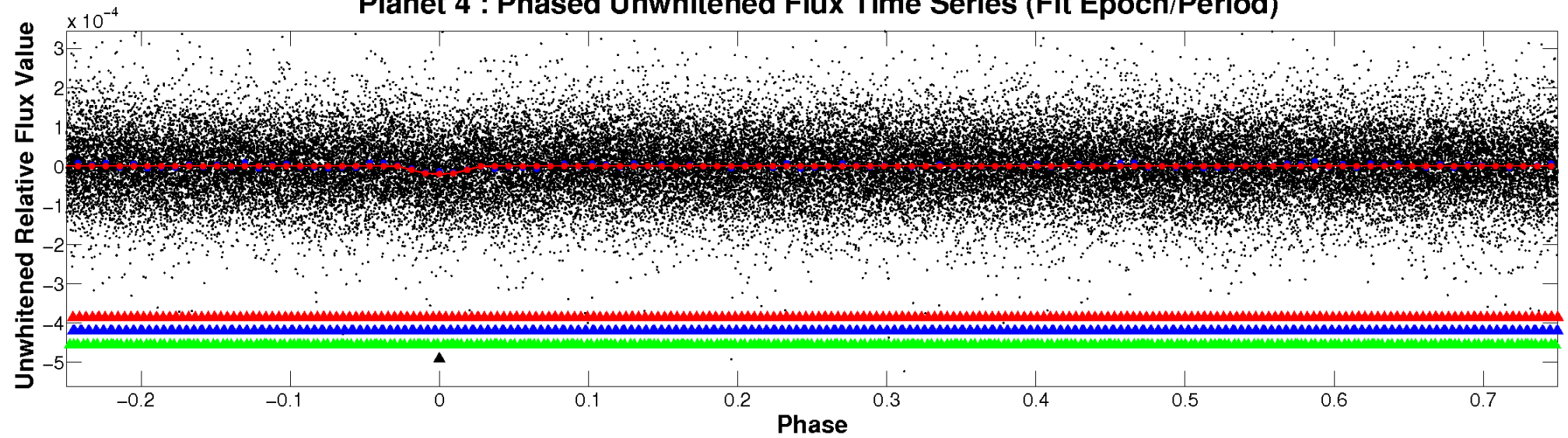
ALT Odd/Even

TCE 009006186-04

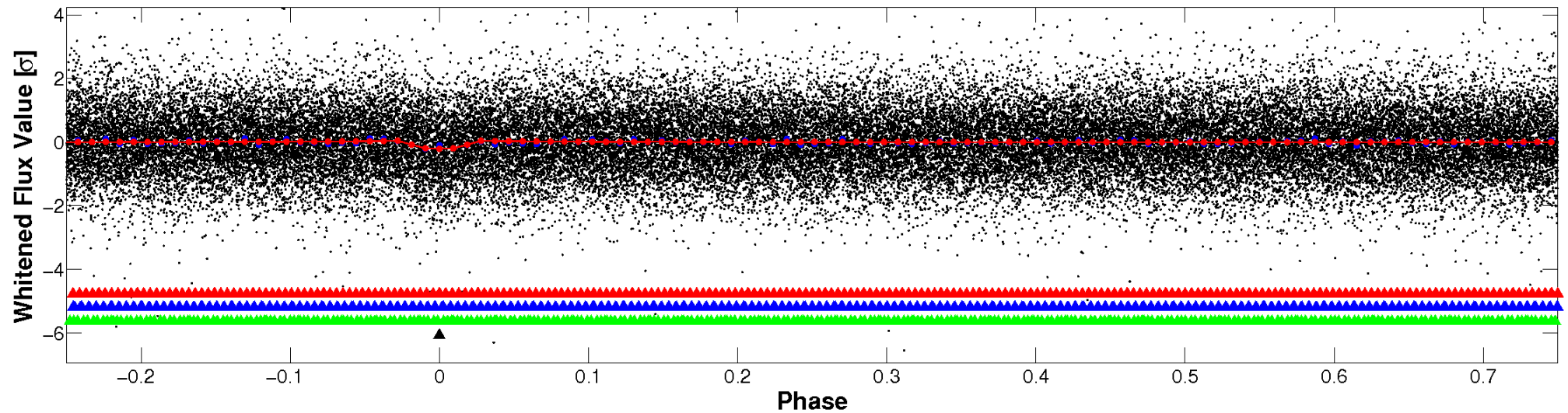


Non-Whitened Vs. Whitened Light Curve

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

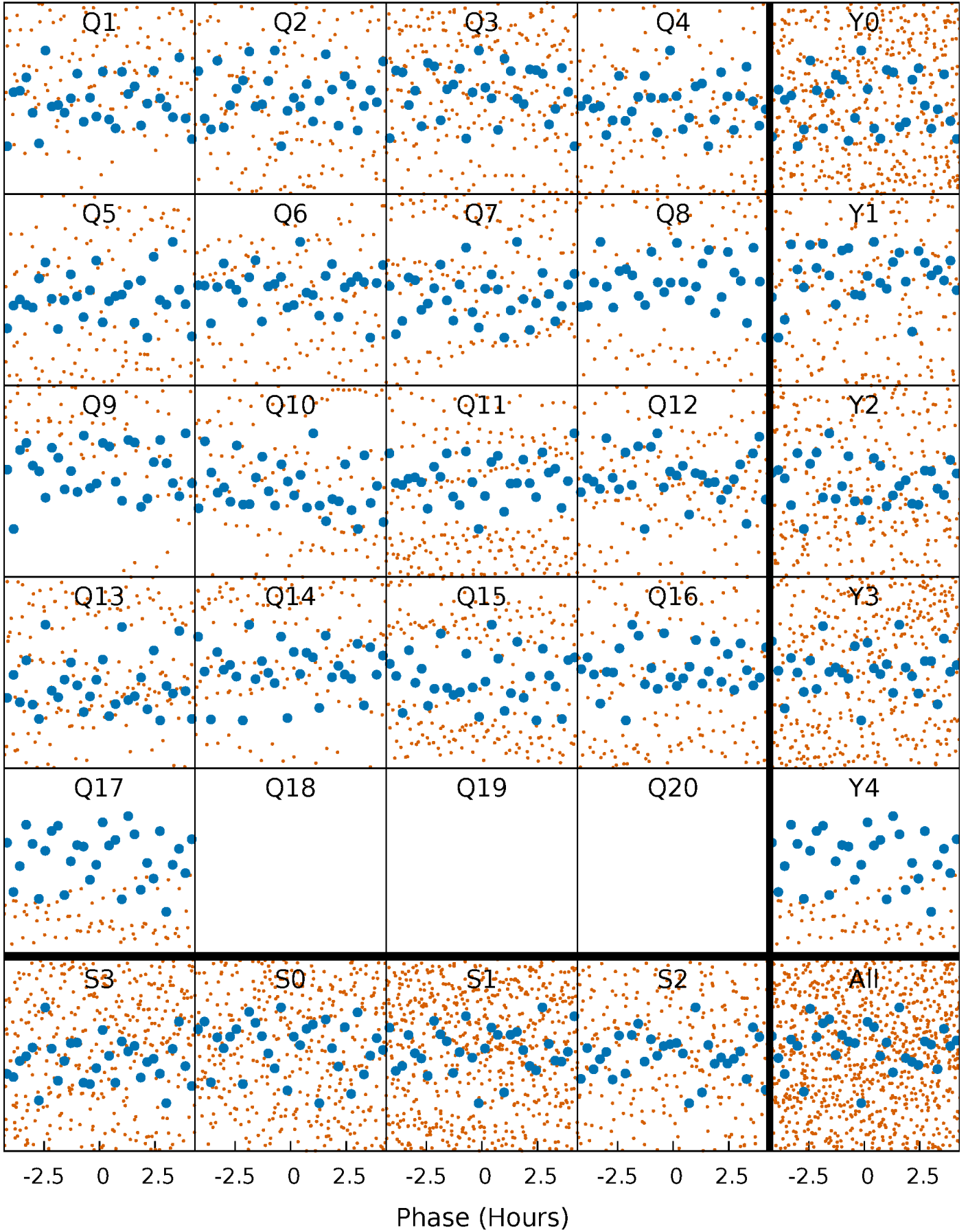


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



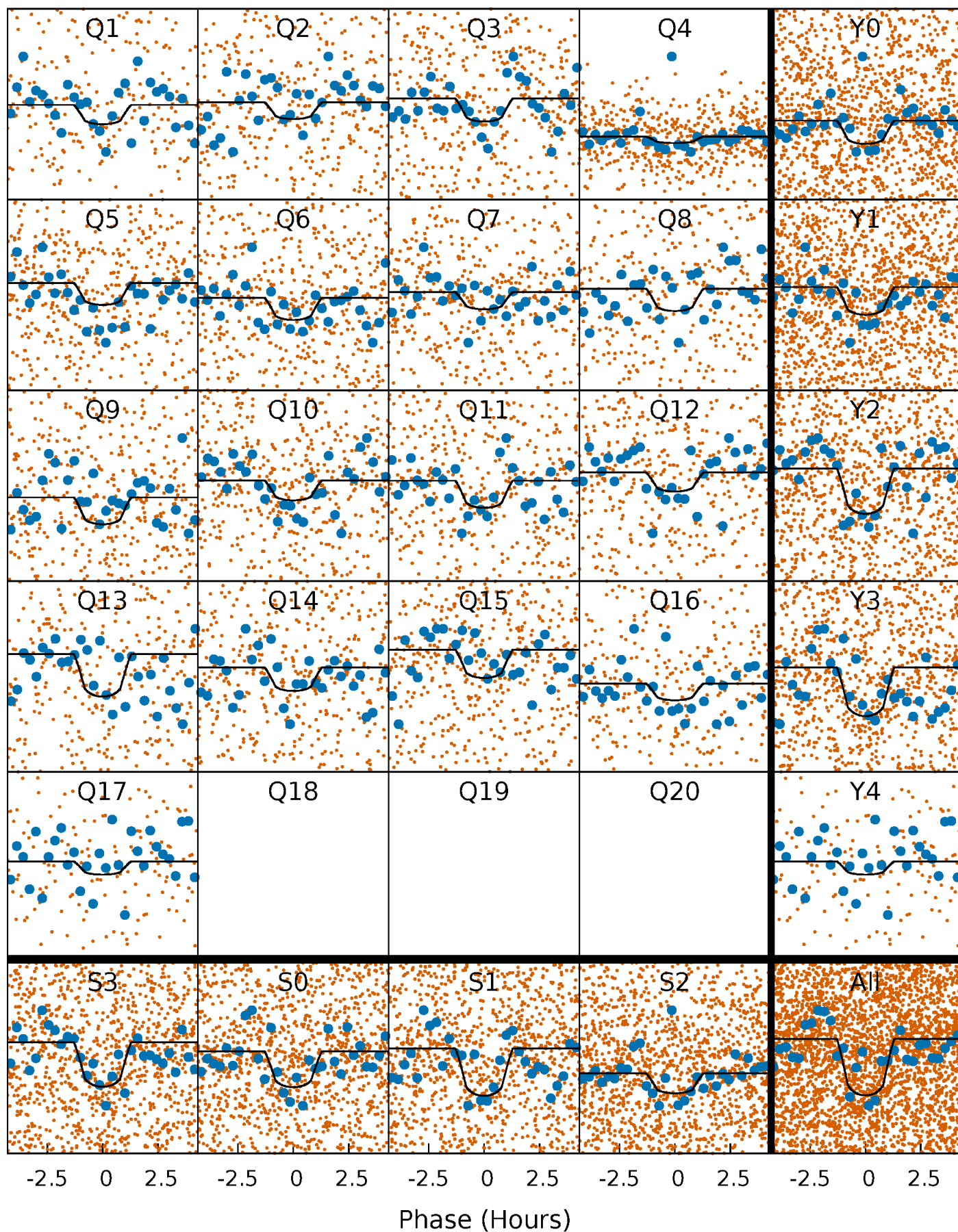
PDC Quarter-Phased Transit Curves

TCE 009006186-04 P= 2.192531 Days $T_0=132.233444$ (BKJD)



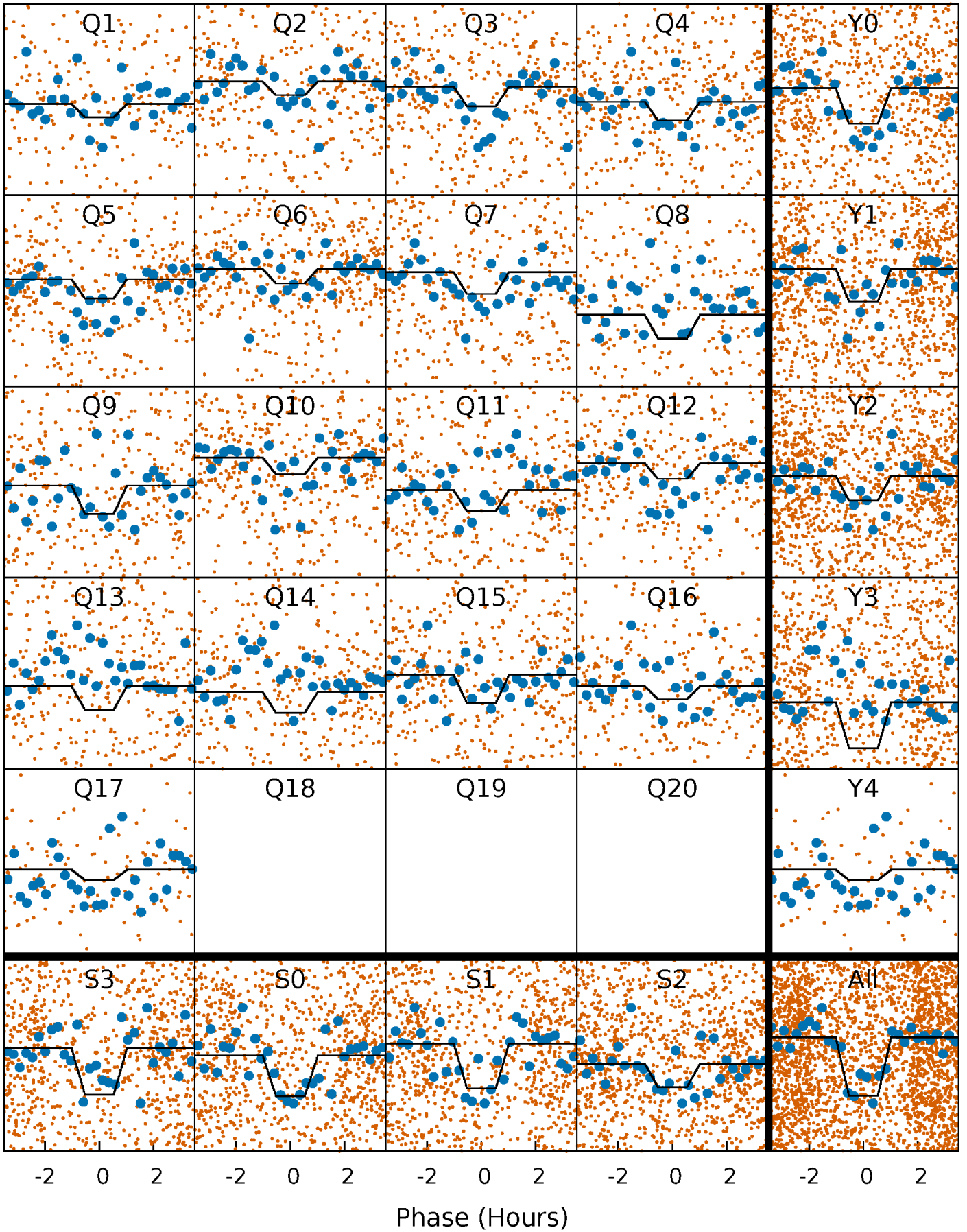
DV Quarter-Phased Transit Curves

TCE 009006186-04 $P = 2.192531$ Days $T_0 = 132.233444$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

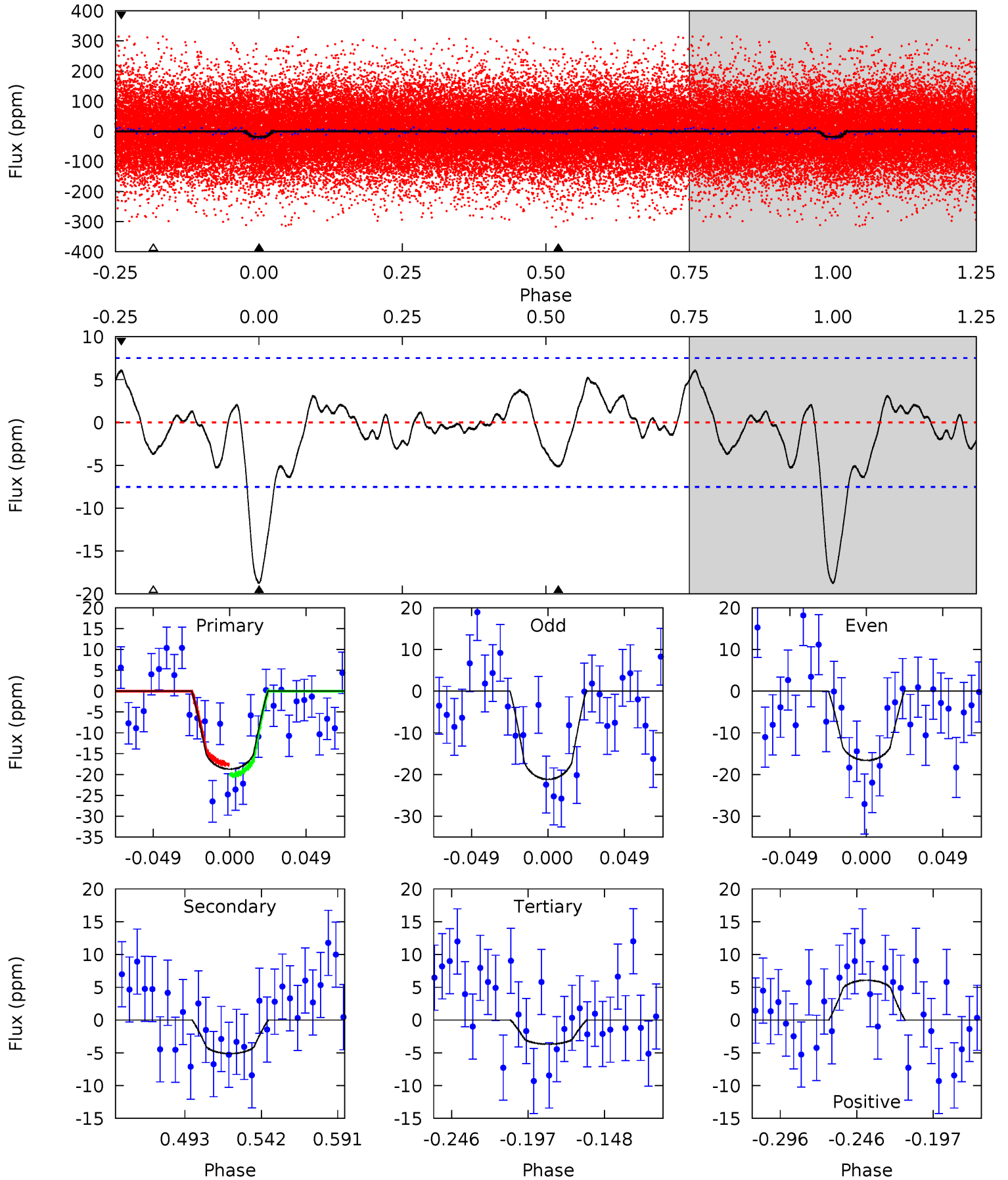
TCE 009006186-04 P= 2.192509 Days $T_0=132.231245$ (BKJD)



DV Model-Shift Uniqueness Test

009006186-04, P = 2.192531 Days, E = 130.040913 Days

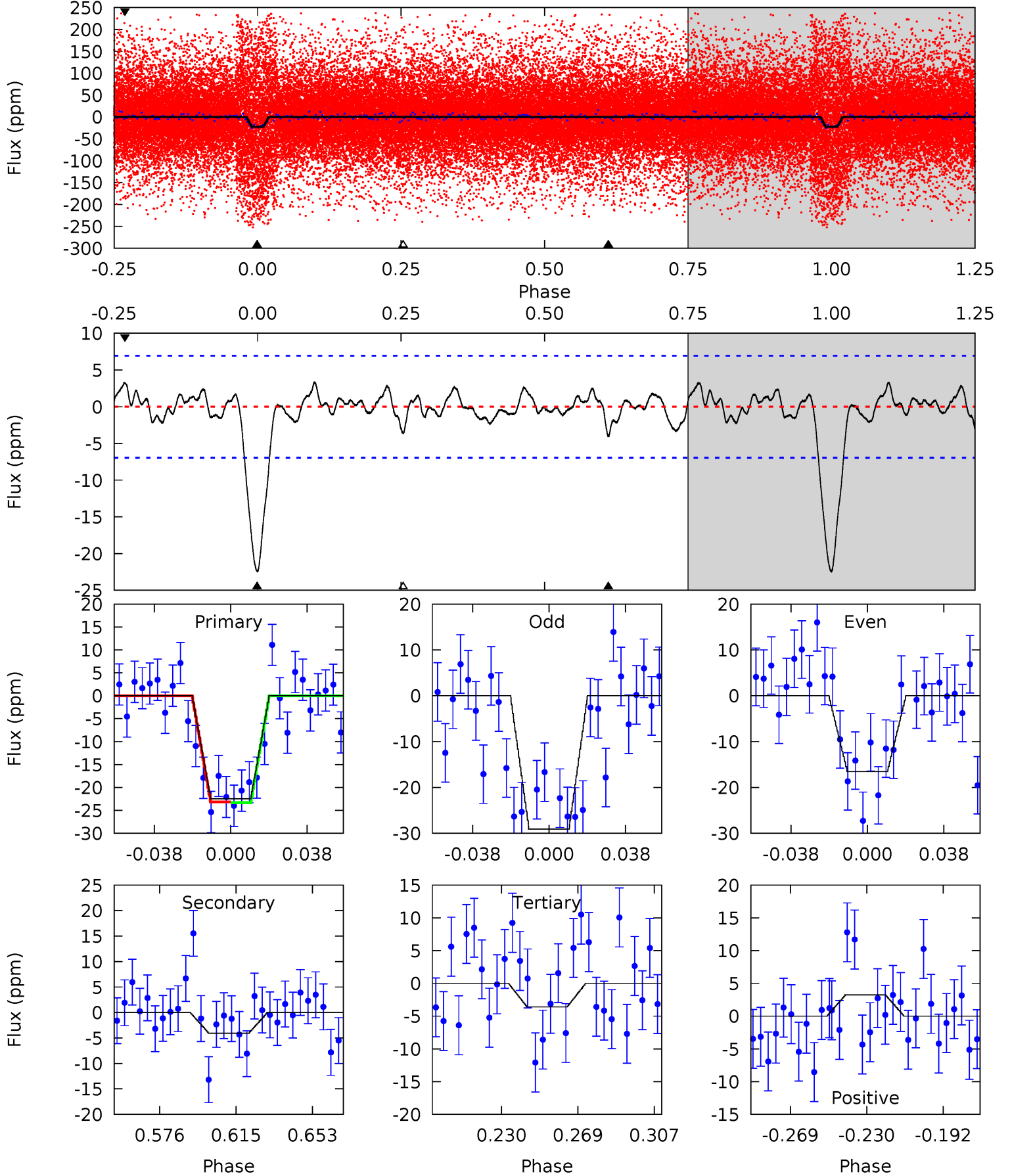
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.7	3.21	2.30	3.81	4.71	1.97	1.46	9.43	7.93	0.91	-0.60	1.43	0.78	0.25	0.83



Alt Model-Shift Uniqueness Test

009006186-04, P = 2.192509 Days, E = 130.038736 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.4	2.79	2.47	2.22	4.76	2.07	0.93	12.9	13.2	0.32	0.57	4.29	1.00	0.13	0.05



Stellar Parameters For KIC 009006186

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	5450^{+108}_{-108}	$4.563^{+0.017}_{-0.094}$	$0.100^{+0.150}_{-0.150}$	$0.842^{+0.093}_{-0.033}$	$0.944^{+0.039}_{-0.066}$	$2.227^{+0.172}_{-0.603}$
	+2%/-2%	+0%/-2%	+150%/-150%	+11%/-4%	+4%/-7%	+8%/-27%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 009006186-04 / KOI 2169.04

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-5 ± 2	$0.46^{+0.23}_{-0.21}$	1735^{+55}_{-46}	4010^{+1093}_{-594}	14^{+35}_{-9}
Alt.	-4 ± 1	$0.44^{+0.23}_{-0.24}$	1734^{+55}_{-44}	3848^{+1507}_{-589}	11^{+48}_{-7}

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

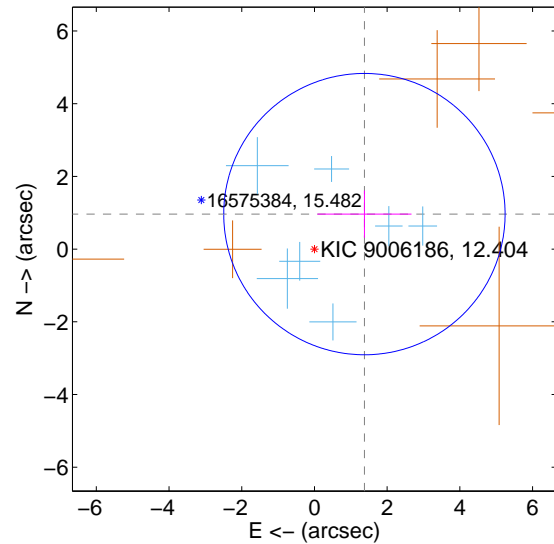
Supplemental centroid analysis for 009006186-04. Kepler magnitude: 12.40. Transit SNR 8.29

There are 7 quarters with good PRF difference image offsets

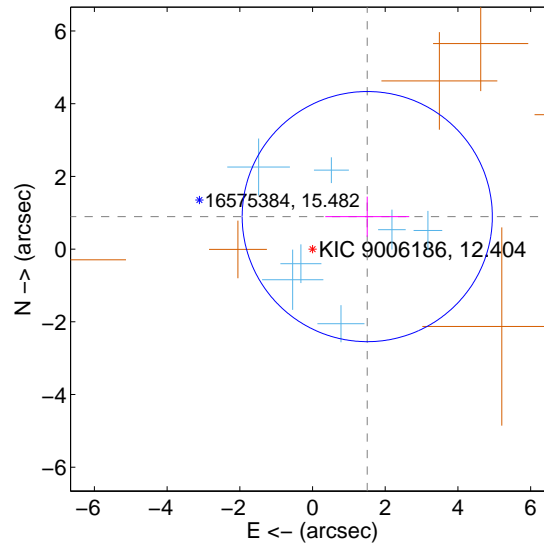
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.678 ± 1.290	1.30	-1.375 ± 1.294	0.963 ± 0.648
PRF-fit source offset from KIC position	1.751 ± 1.147	1.53	-1.506 ± 1.156	0.894 ± 0.552
photometric centroid source offset	1.64 ± 0.87	1.88	-1.64 ± 0.87	-0.04 ± 0.91

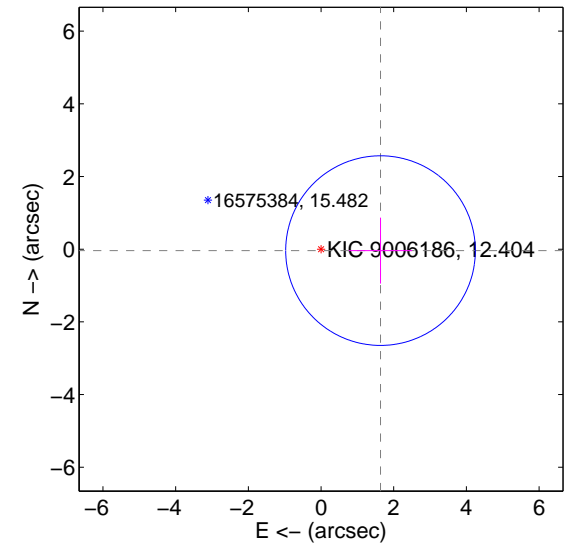
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

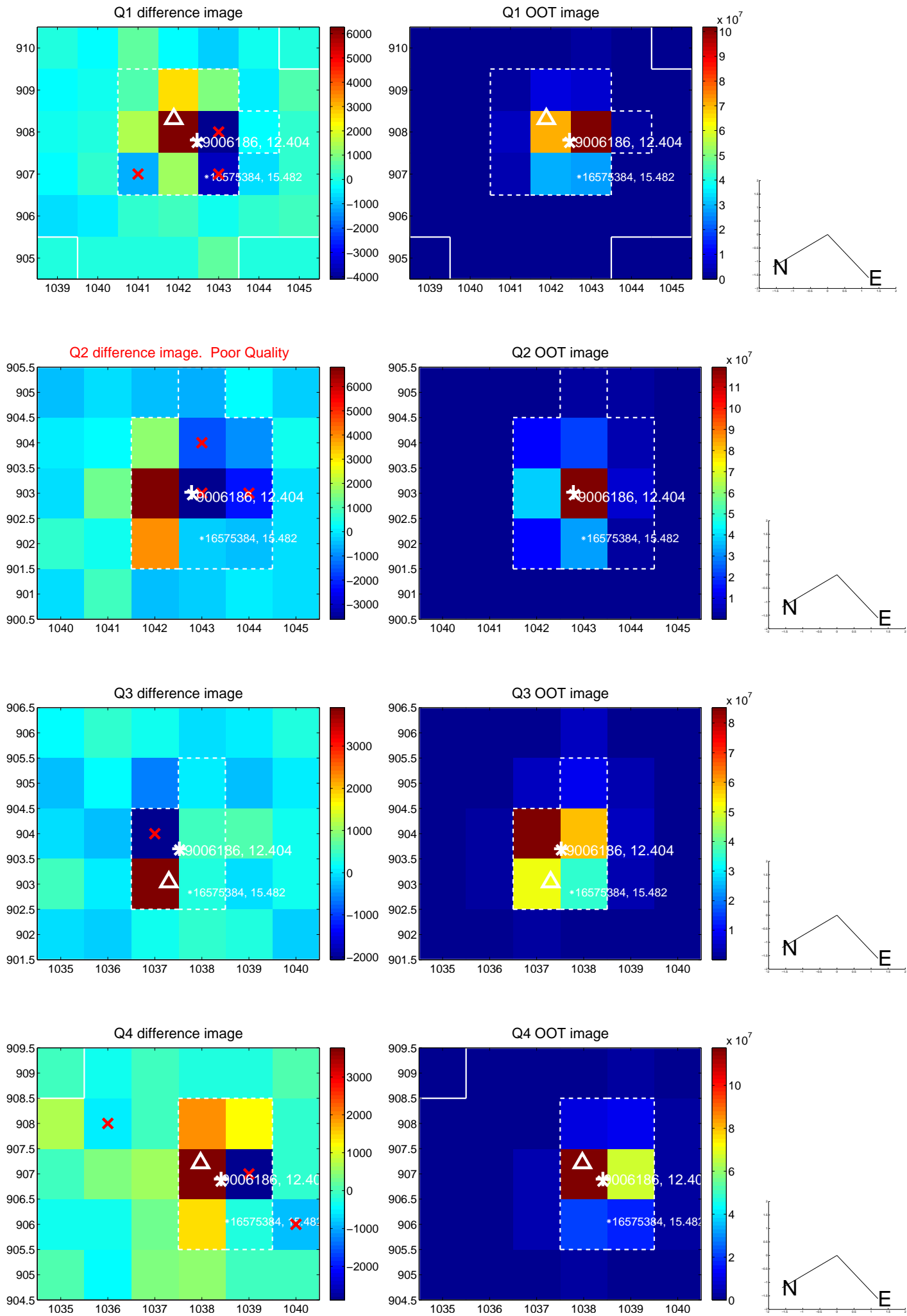


offset from photometric centroids

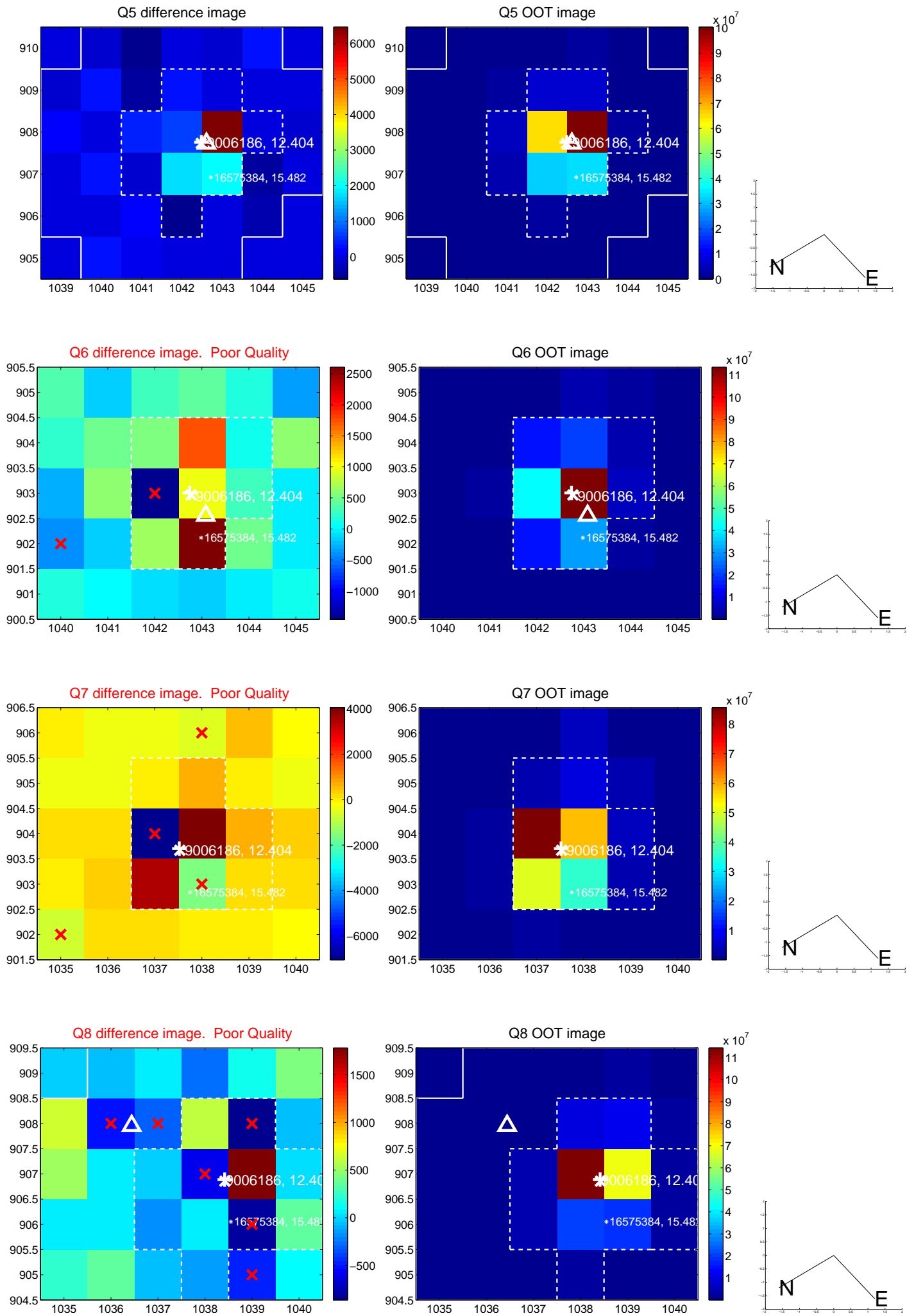


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

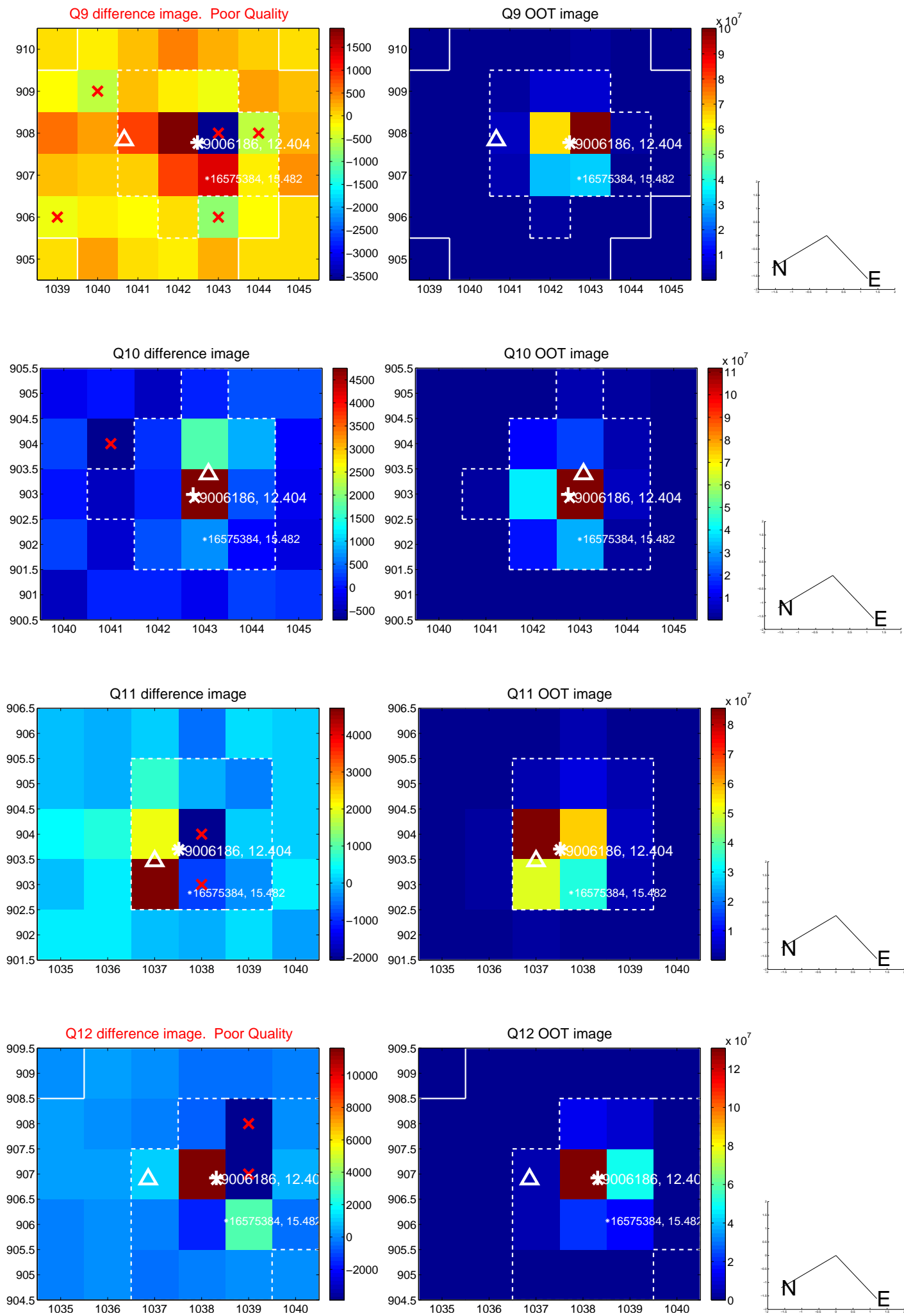
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



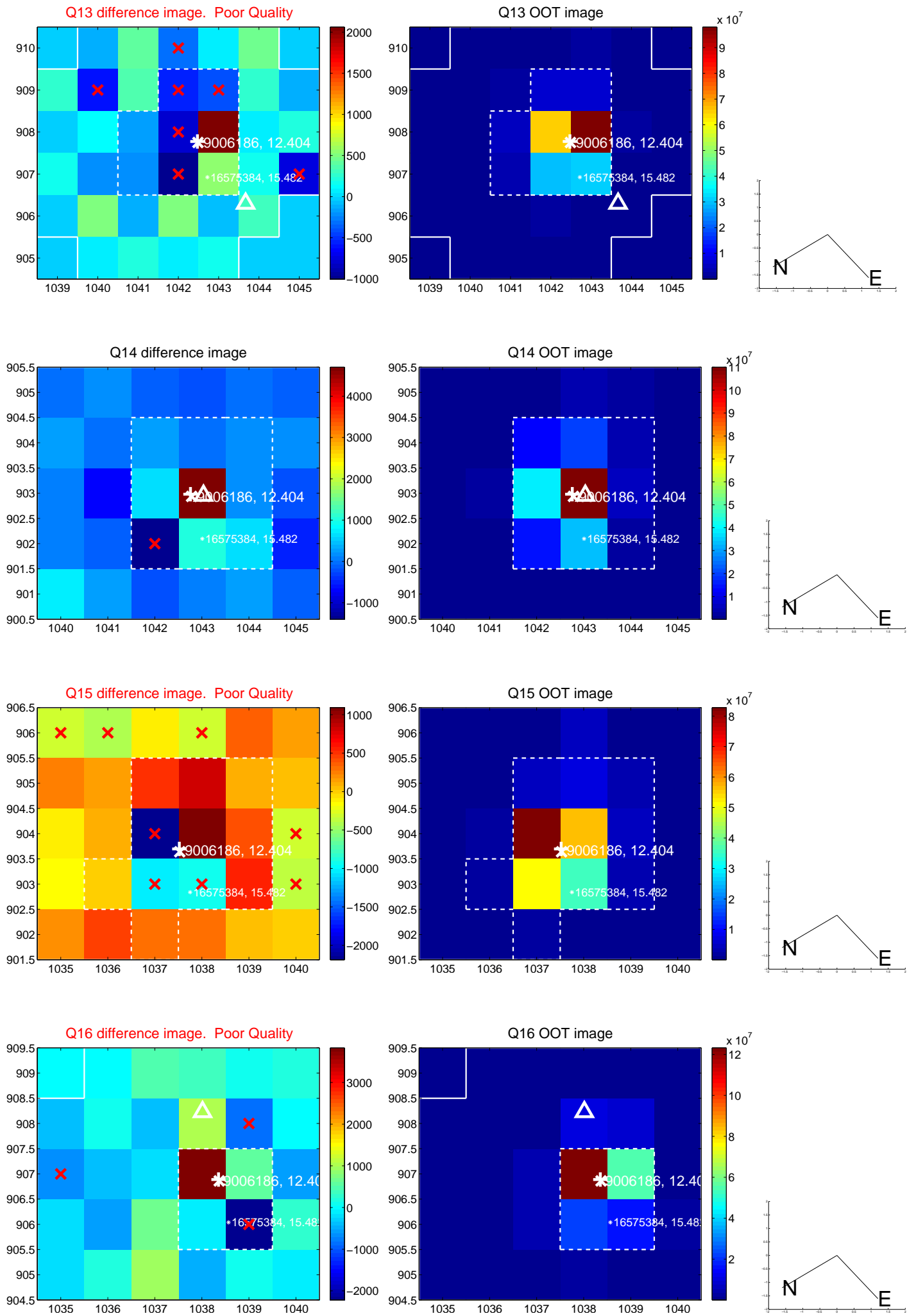
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



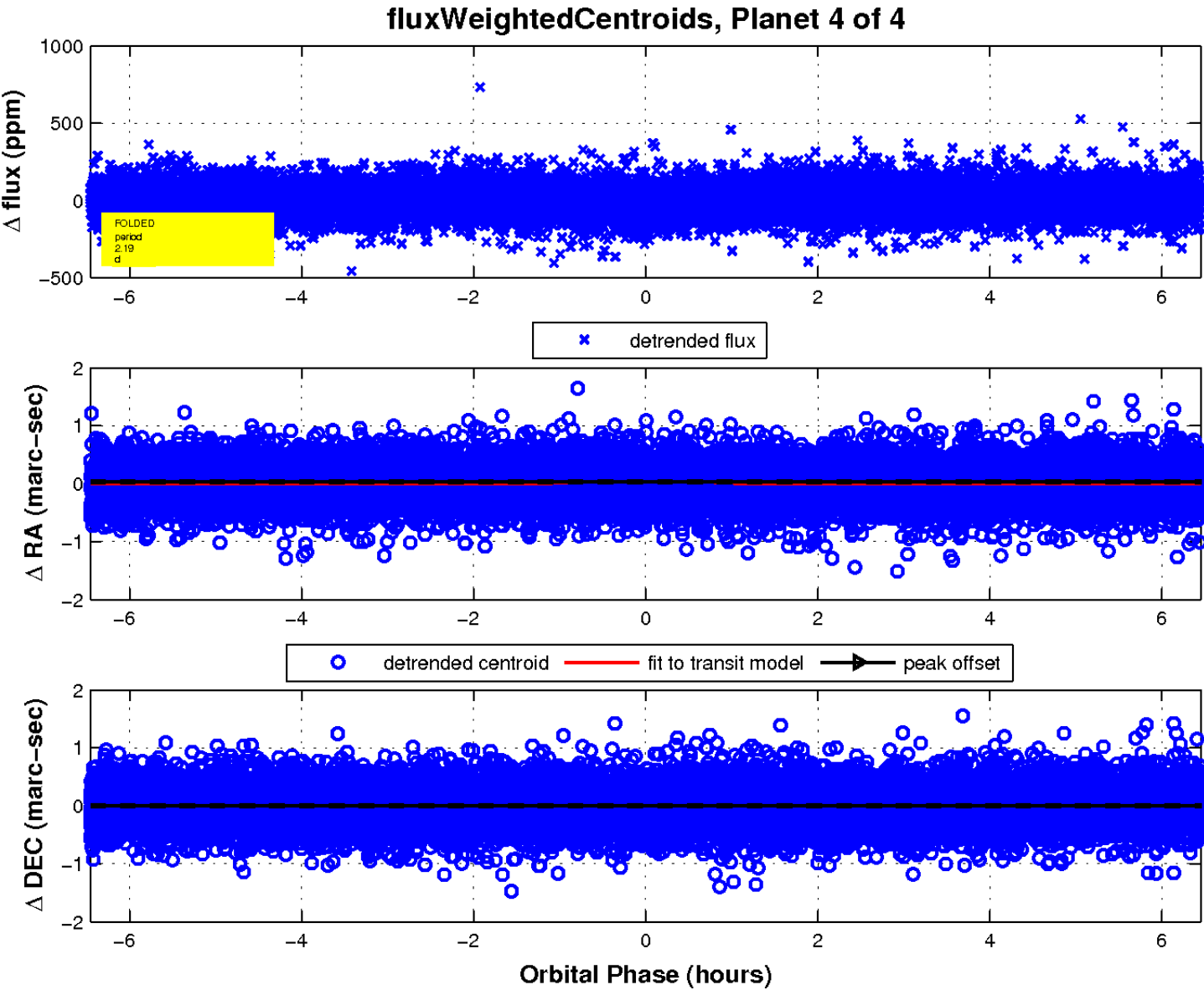
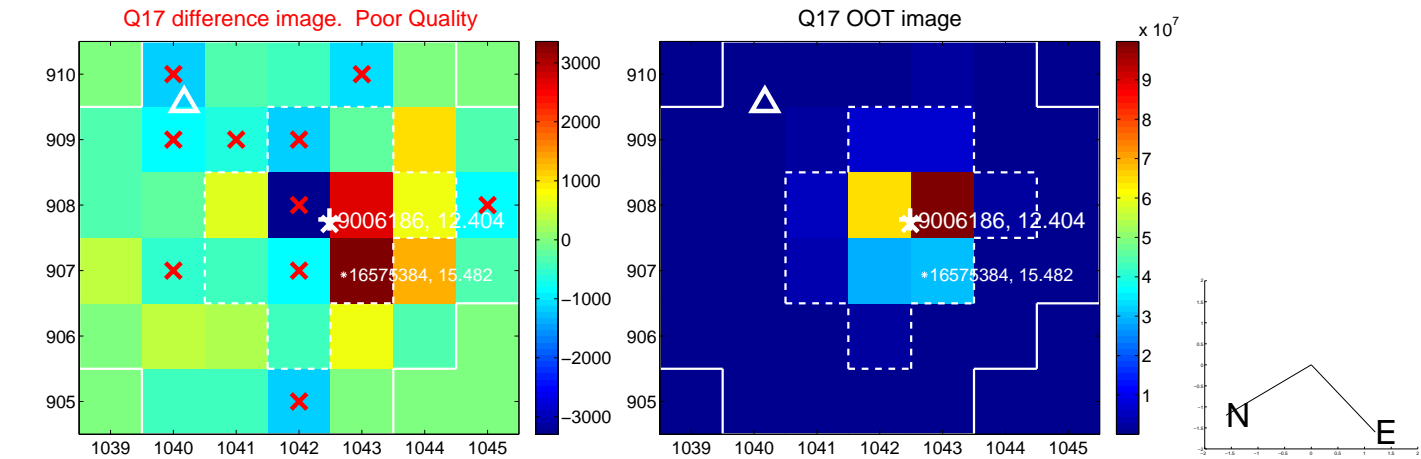
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

