

KIC 010089911

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})
010089911-01	OBS	4034.01	6.967127	138.242973	207.4	3.662	17.5	18.4	3.53	6303	5.97	2345.28
010089911-02	OBS	4034.02	11.609132	142.726272	150.3	1.732	8.5	9.6	3.53	6303	5.03	1187.23

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010089911-01	OBS	FP	0.10	1	0	0	0	LPP_DV
010089911-02	OBS	FP	0.22	1	0	0	0	MOD_NONUNIQU_ALT

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

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

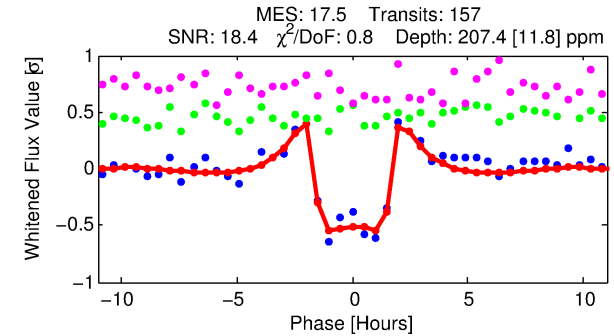
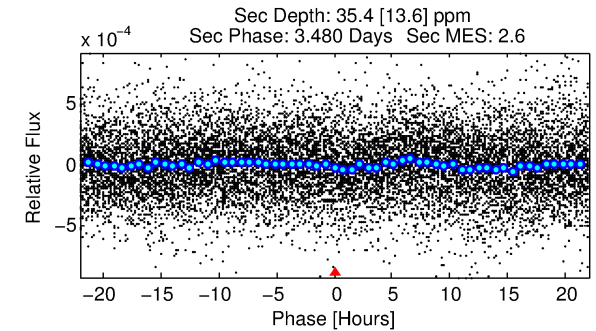
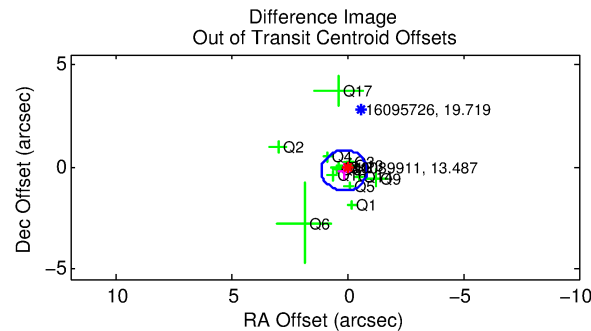
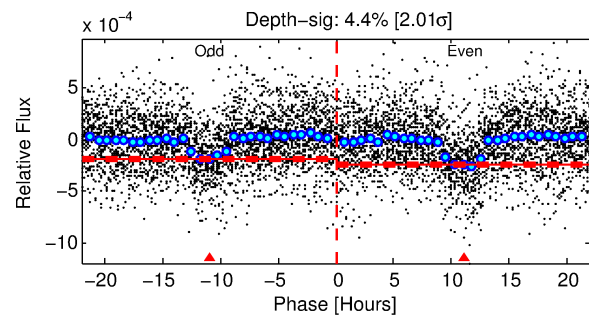
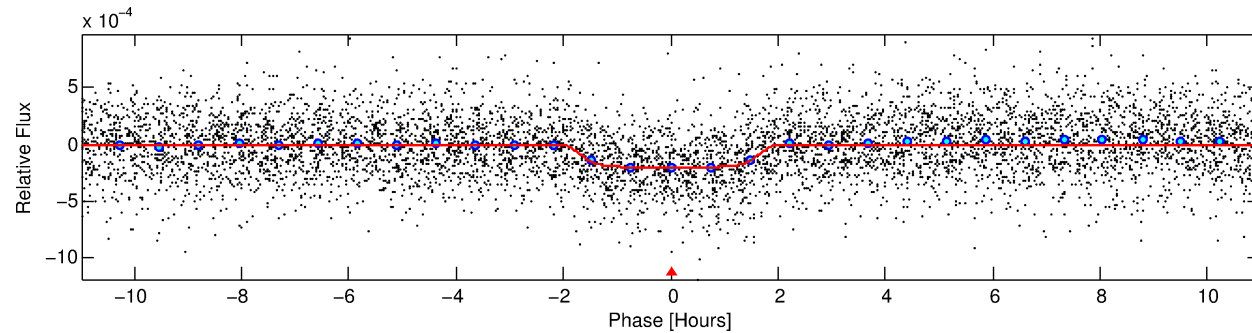
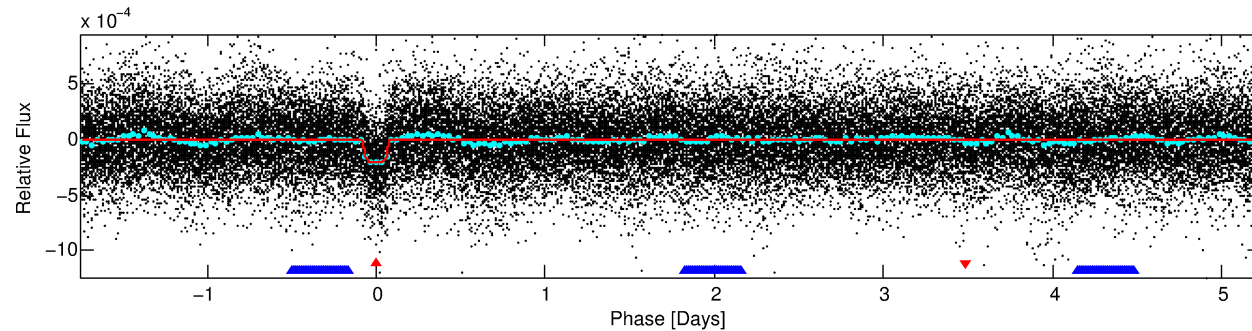
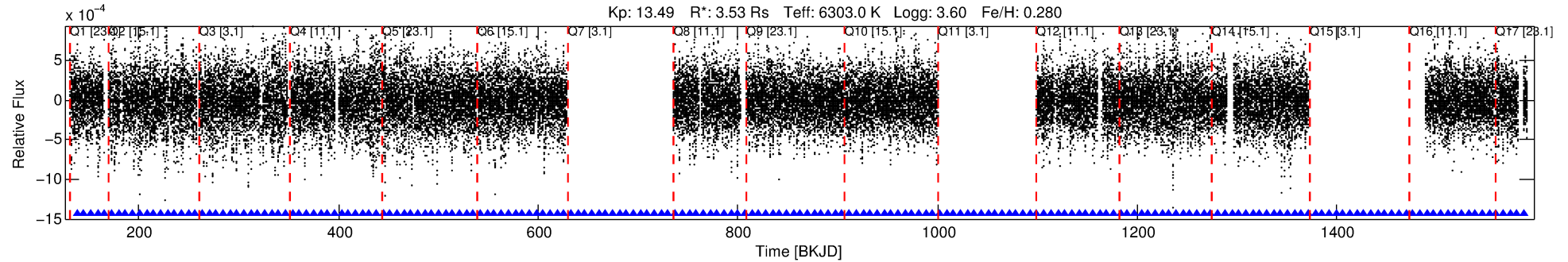
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010089911-01

No Significant Match Found

DV One-Page Summary

KIC: 10089911 Candidate: 1 of 2 Period: 6.967 d
KOI: K04034.01 Corr: 0.973



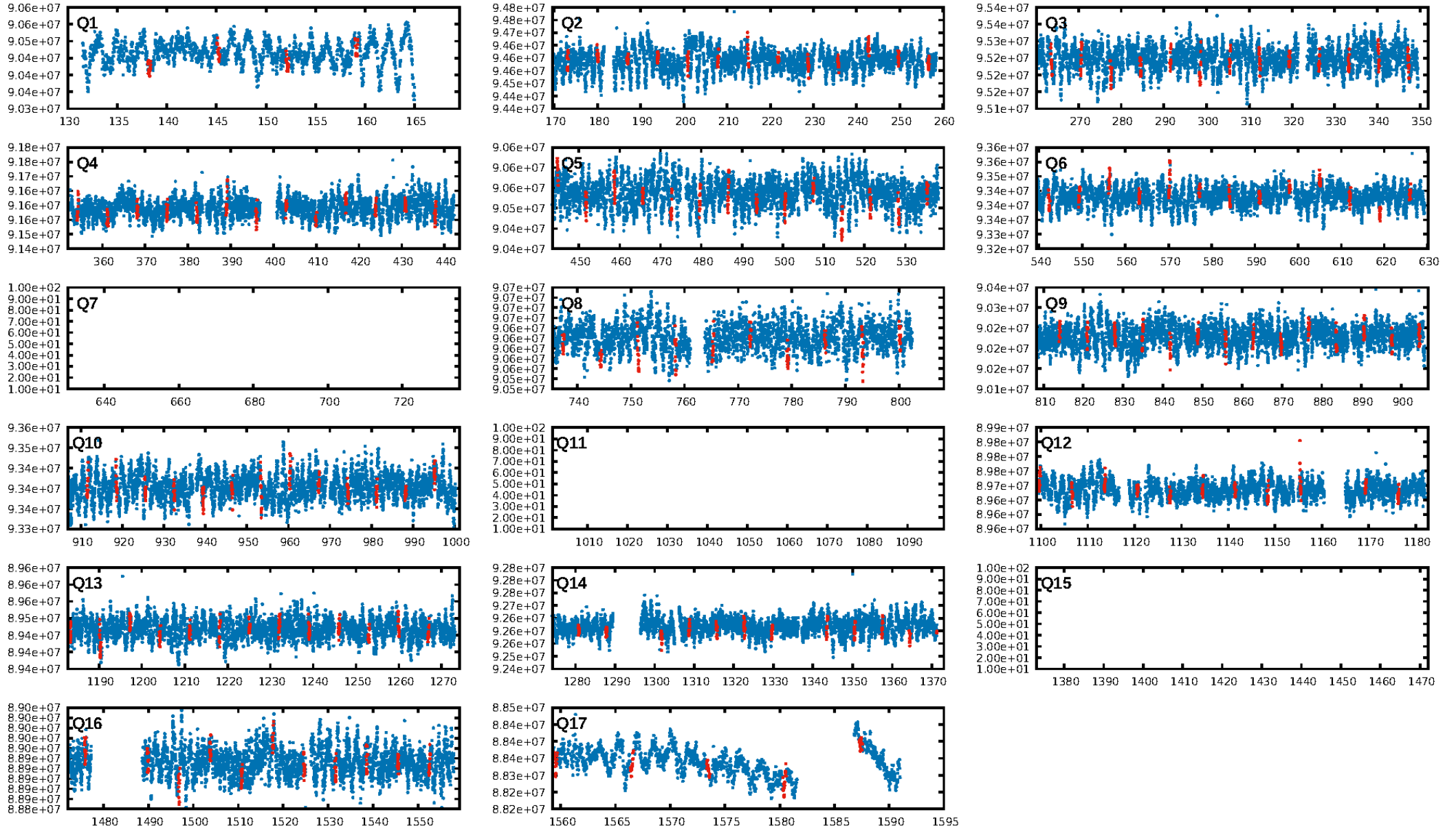
DV Fit Results:

Period = 6.96713 [0.00002] d
Epoch = 138.2430 [0.0020] BKJD
Rp/R* = 0.0155 [0.0017]
a/R* = 6.90 [3.71]
b = 0.90 [0.12]
Seff = 2345.28 [1067.81]
Teq = 1774 [202] K
Rp = 5.97 [1.94] Re
a = 0.0867 [0.0249] AU
Ag = 4.10 [2.59] [1.19 σ]
Teffp = 3903 [435] K [4.43 σ]

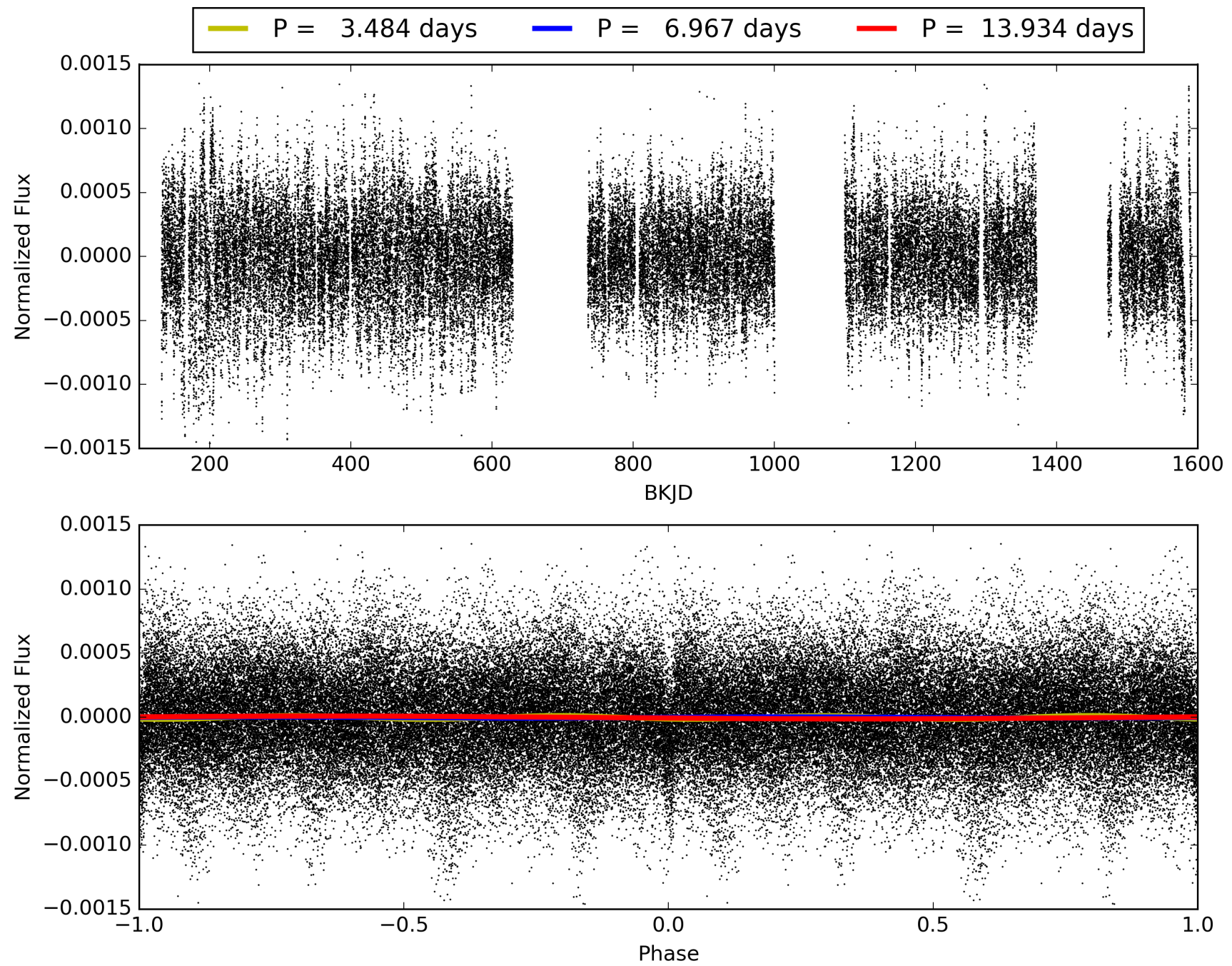
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [27.50 σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.22e-65
RollingBand-fgt: 1.00 [148/148]
GhostDiagnostic-chr: 3.166
Centroid-sig: 33.7%
Centroid-so: 0.300 arcsec [0.91 σ]
OotOffset-rm: 0.247 arcsec [0.75 σ]
KicOffset-rm: 0.195 arcsec [0.54 σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 0.86 [12/14]
DiffImageOverlap-fno: 1.00 [14/14]

TCE 010089911-01, PDC Light Curves

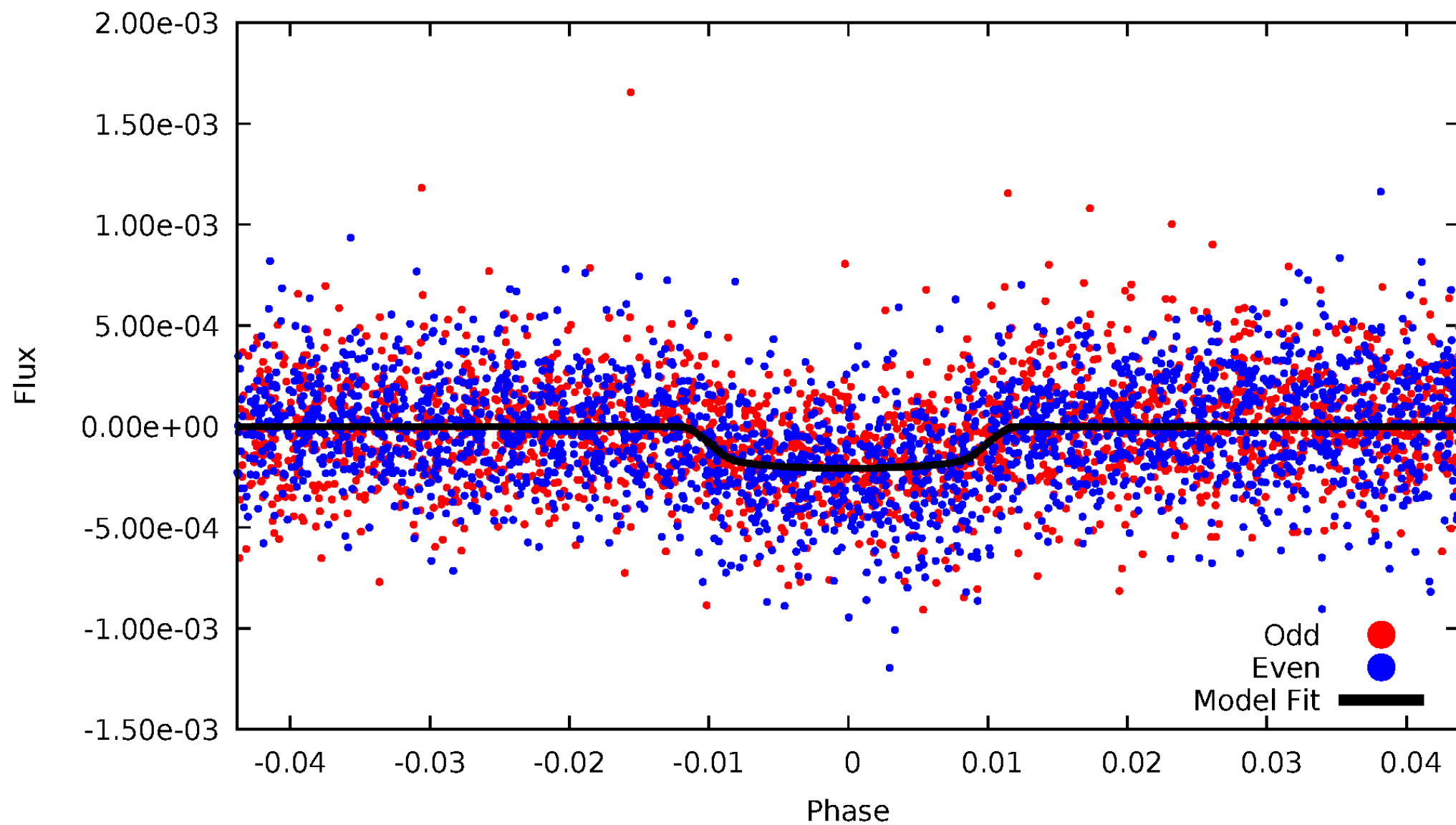


TCE 010089911-01



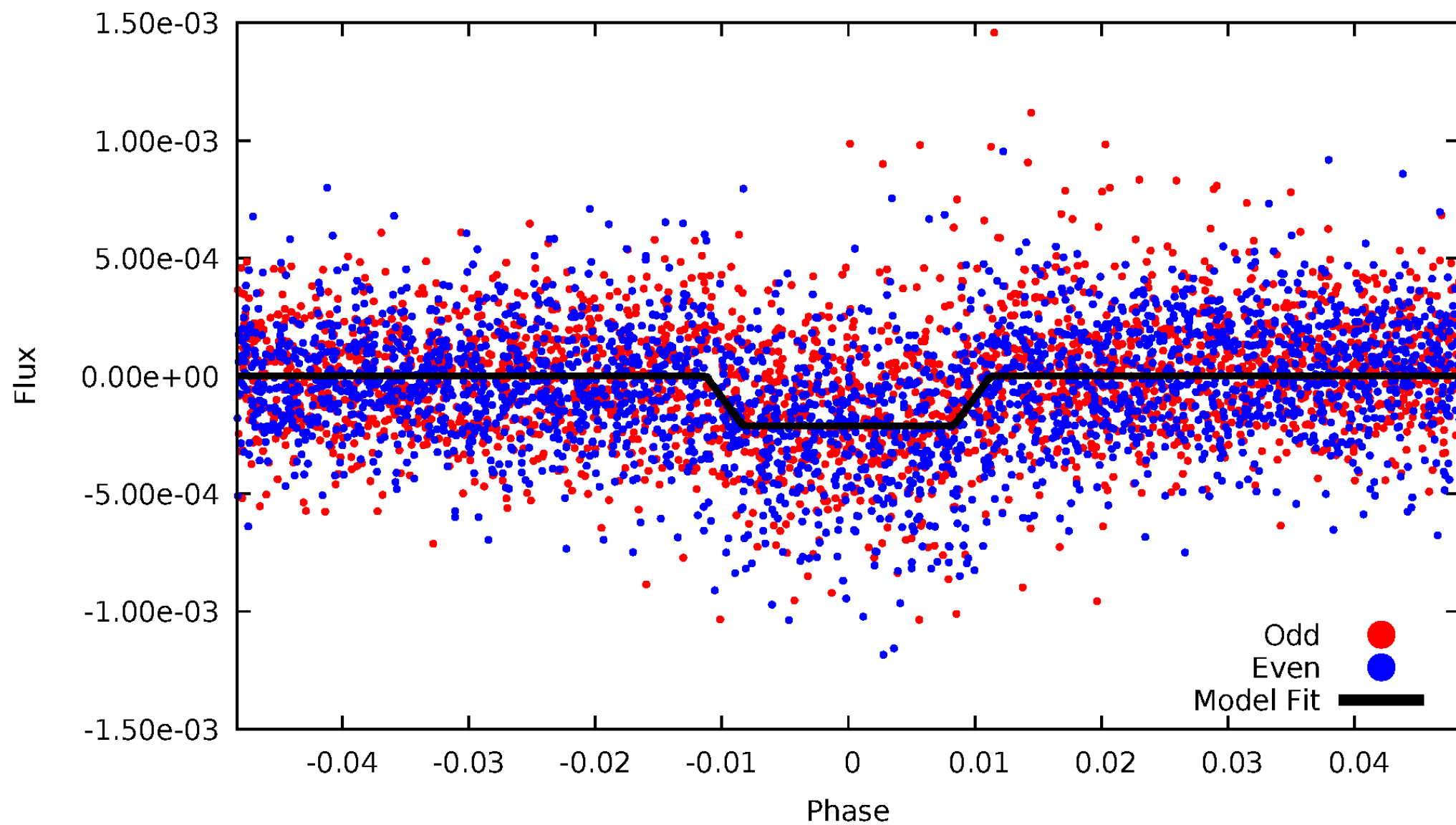
DV Odd/Even

TCE 010089911-01

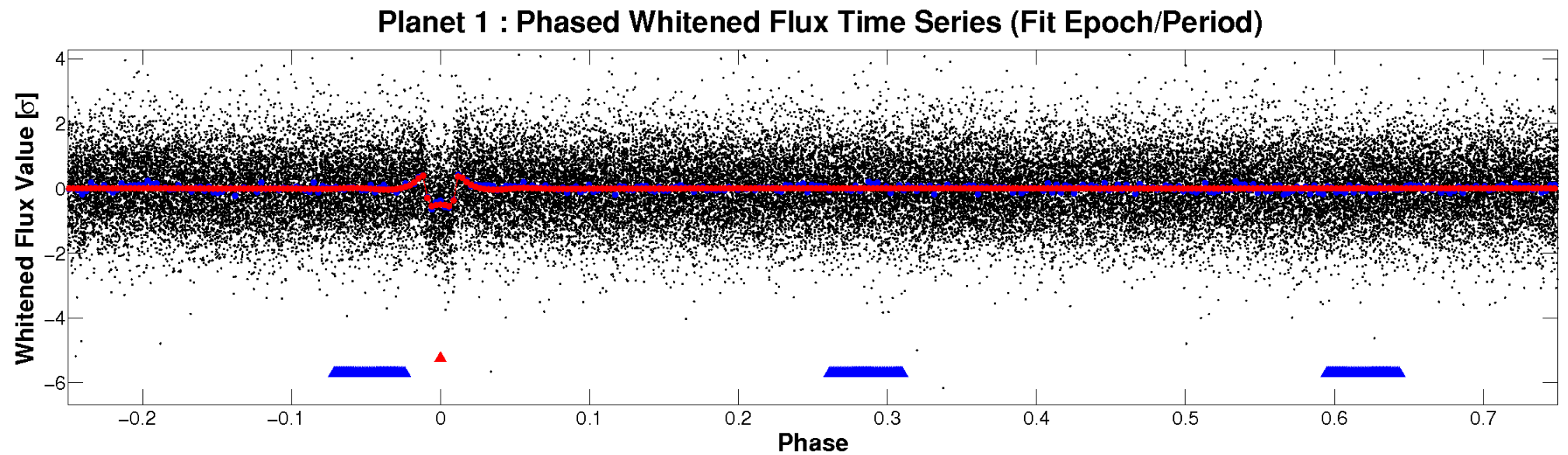
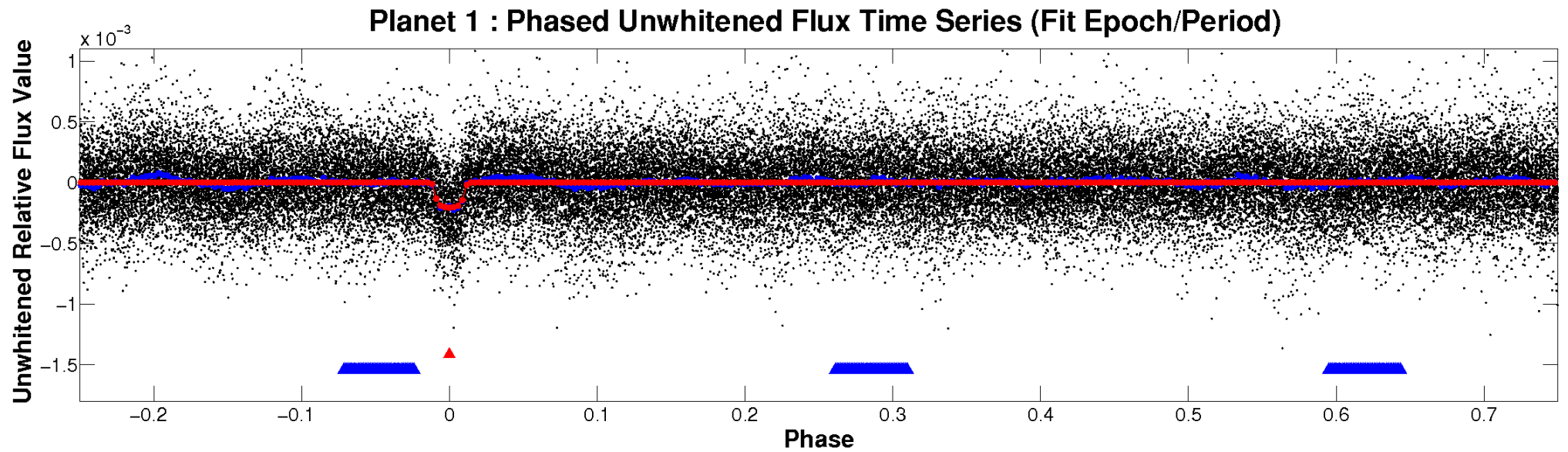


ALT Odd/Even

TCE 010089911-01

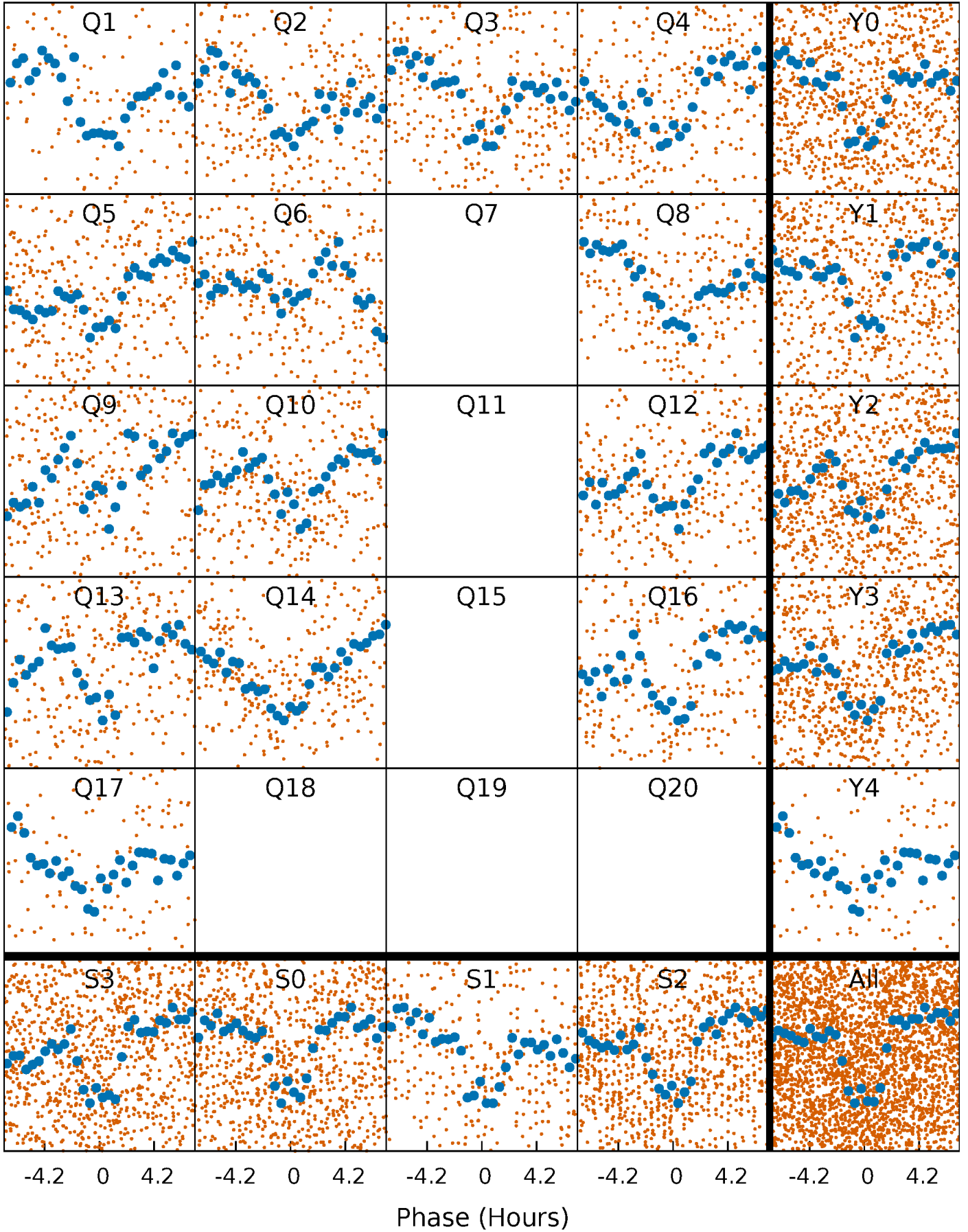


Non-Whitened Vs. Whitened Light Curve



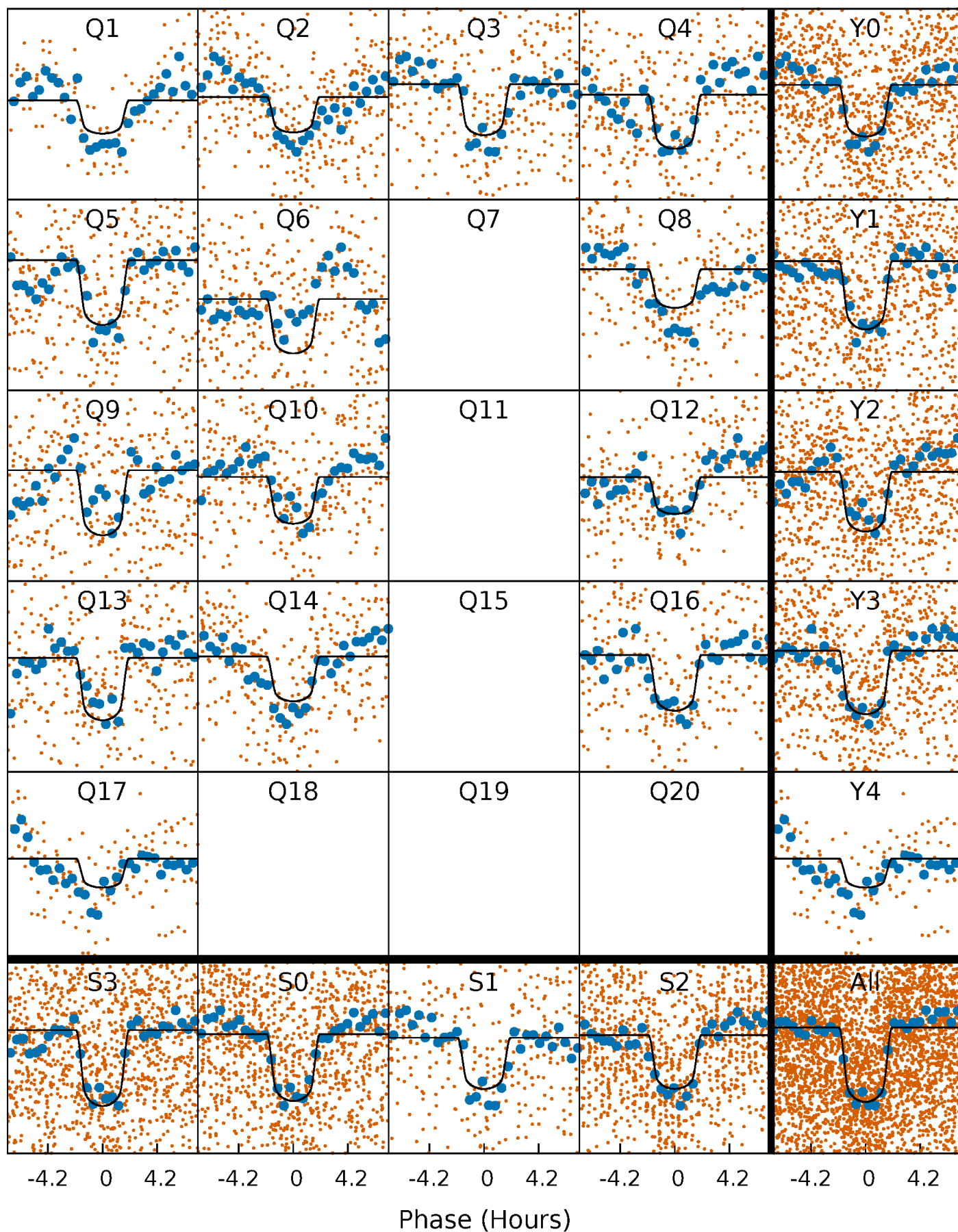
PDC Quarter-Phased Transit Curves

TCE 010089911-01 P= 6.967127 Days $T_0=138.242973$ (BKJD)



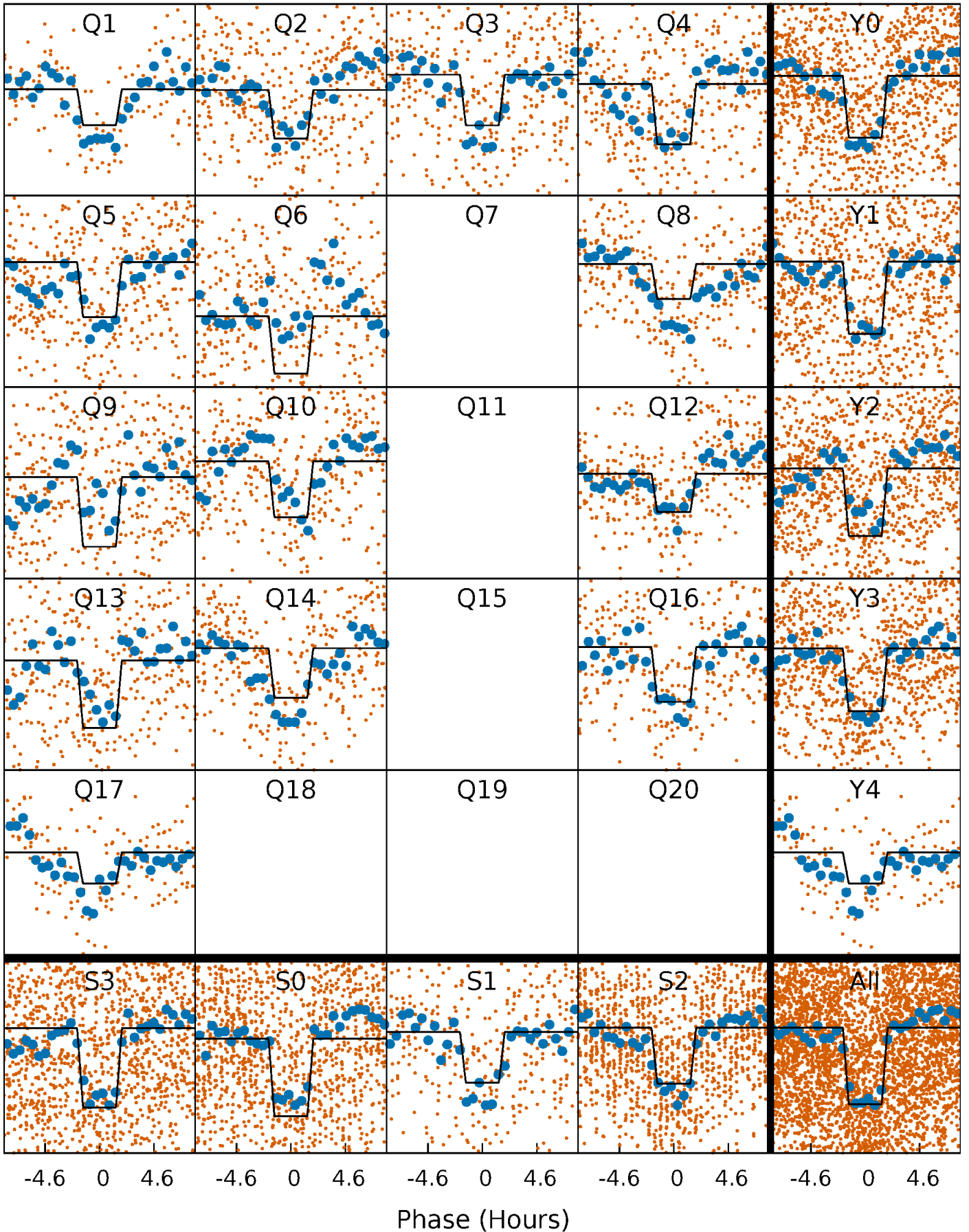
DV Quarter-Phased Transit Curves

TCE 010089911-01 P= 6.967127 Days $T_0=138.242973$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

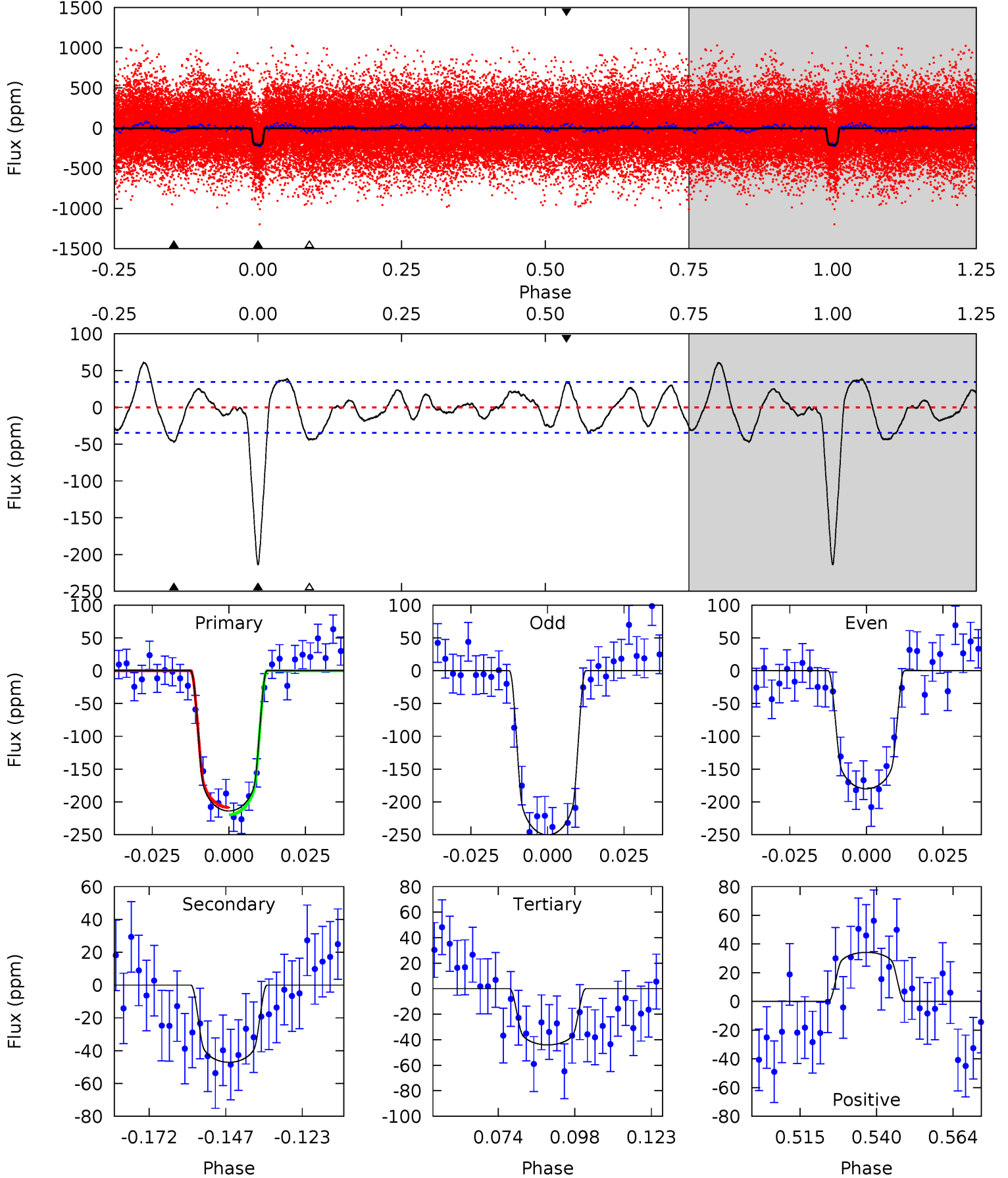
TCE 010089911-01 P= 6.967091 Days $T_0=138.244649$ (BKJD)



DV Model-Shift Uniqueness Test

010089911-01, P = 6.967127 Days, E = 131.275846 Days

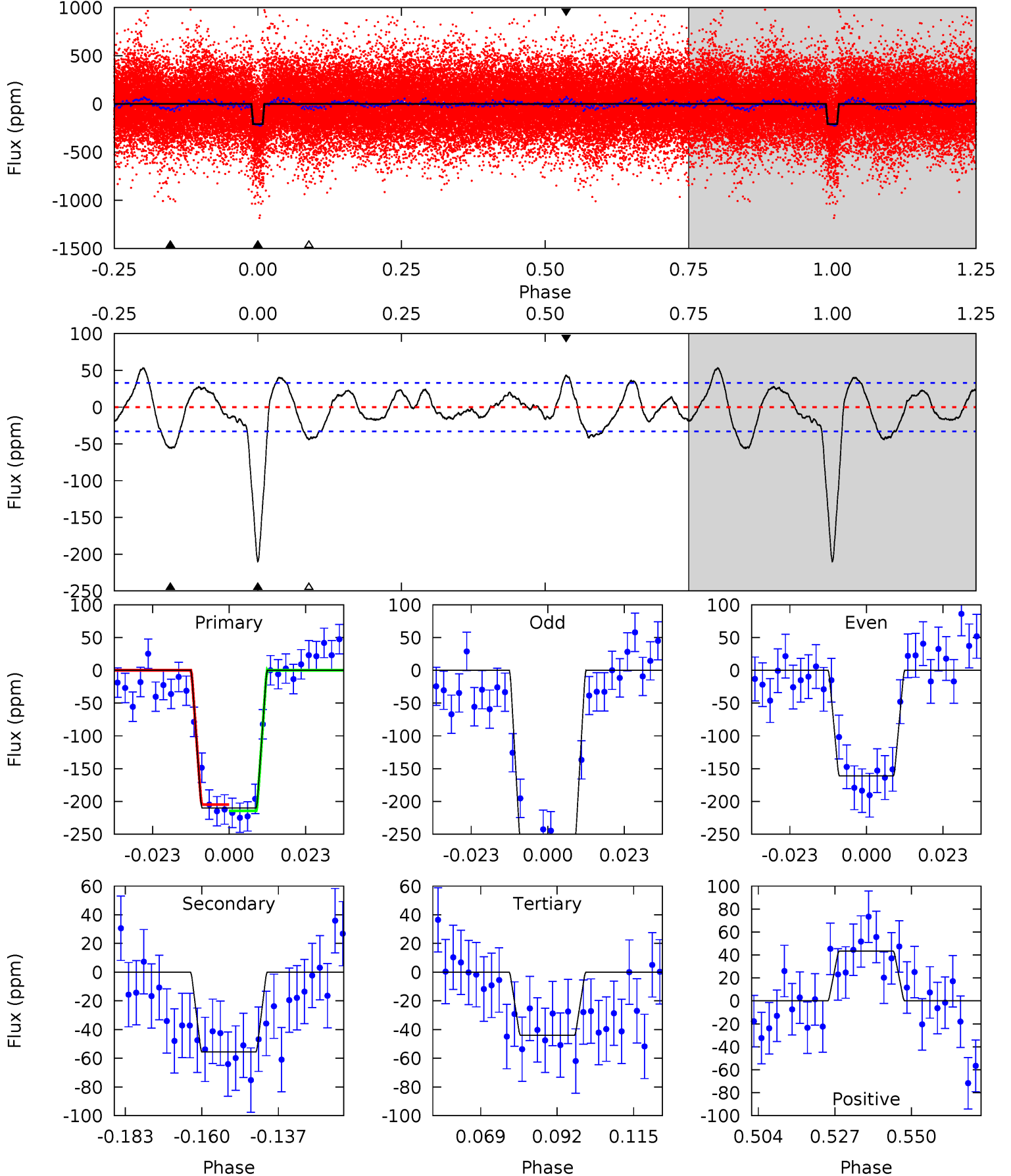
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.0	6.61	6.18	4.80	4.85	2.25	2.81	23.9	25.2	0.43	1.81	4.96	1.06	0.22	0.78



Alt Model-Shift Uniqueness Test

010089911-01, P = 6.967091 Days, E = 131.277558 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.9	8.20	6.48	6.39	4.86	2.27	3.00	24.5	24.5	1.72	1.81	7.32	1.00	0.20	0.70



Stellar Parameters For KIC 010089911

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6303^{+82}_{-75}	$3.595^{+0.263}_{-0.031}$	$0.280^{+0.150}_{-0.150}$	$3.530^{+0.254}_{-1.080}$	$1.786^{+0.158}_{-0.236}$	$0.057^{+0.100}_{-0.006}$
	+1%/-1%	+7%/-1%	+54%/-54%	+7%/-31%	+9%/-13%	+176%/-10%
Source	SPE90	FLK73	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 010089911-01 / KOI 4034.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-47 ± 7	$5.56^{+0.87}_{-0.97}$	2426^{+77}_{-190}	4362^{+268}_{-222}	$6.346^{+2.898}_{-1.809}$
Alt.	-56 ± 7	$5.31^{+0.86}_{-0.86}$	2433^{+82}_{-177}	4608^{+274}_{-229}	$8.213^{+3.490}_{-2.244}$

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 $A_{obs} \gg 1.0$

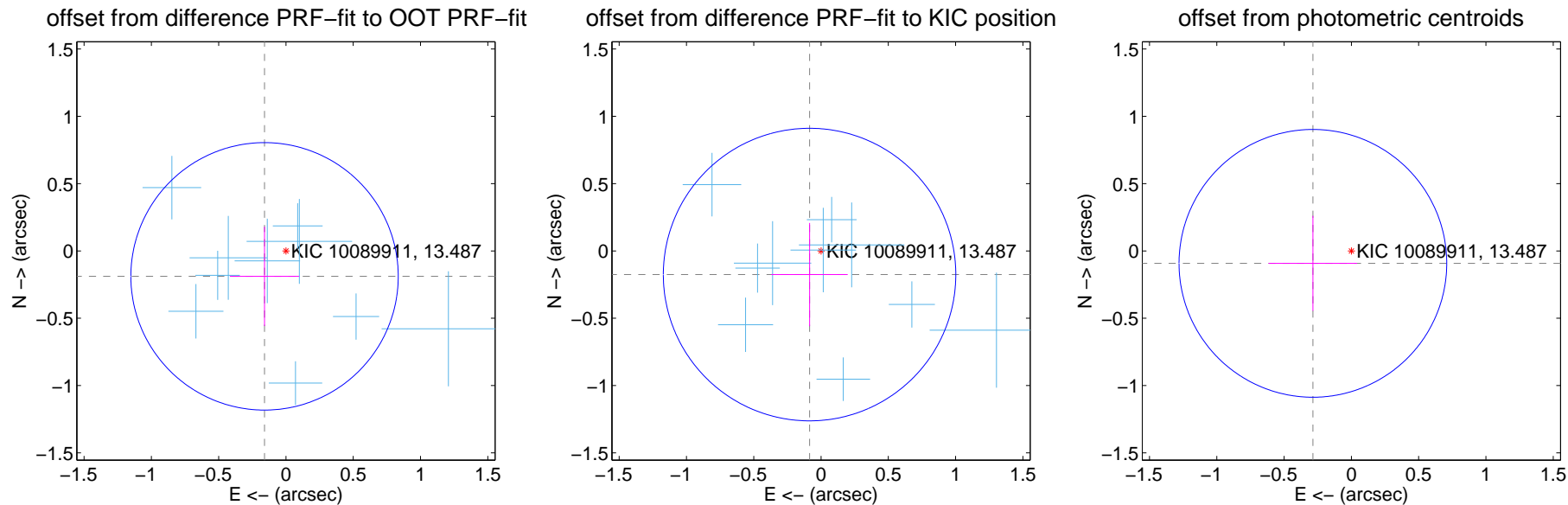
DV Centroid Data

Supplemental centroid analysis for 010089911-01. Kepler magnitude: 13.49. Transit SNR 18.40

There are 12 quarters with good PRF difference image offsets

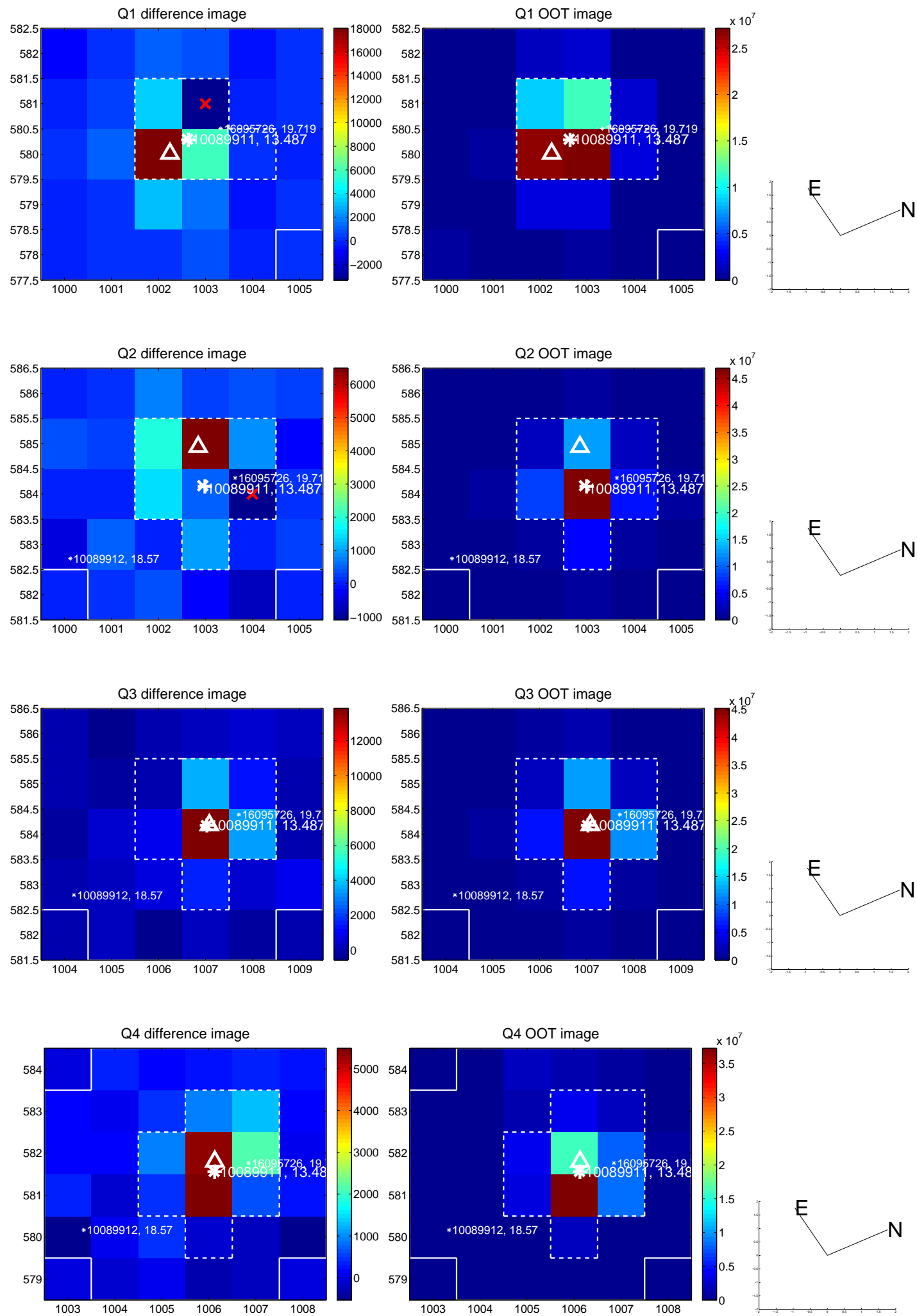
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.247 ± 0.331	0.75	0.159 ± 0.257	-0.189 ± 0.369
PRF-fit source offset from KIC position	0.195 ± 0.362	0.54	0.085 ± 0.283	-0.176 ± 0.383
photometric centroid source offset	0.30 ± 0.33	0.91	0.29 ± 0.33	-0.09 ± 0.35

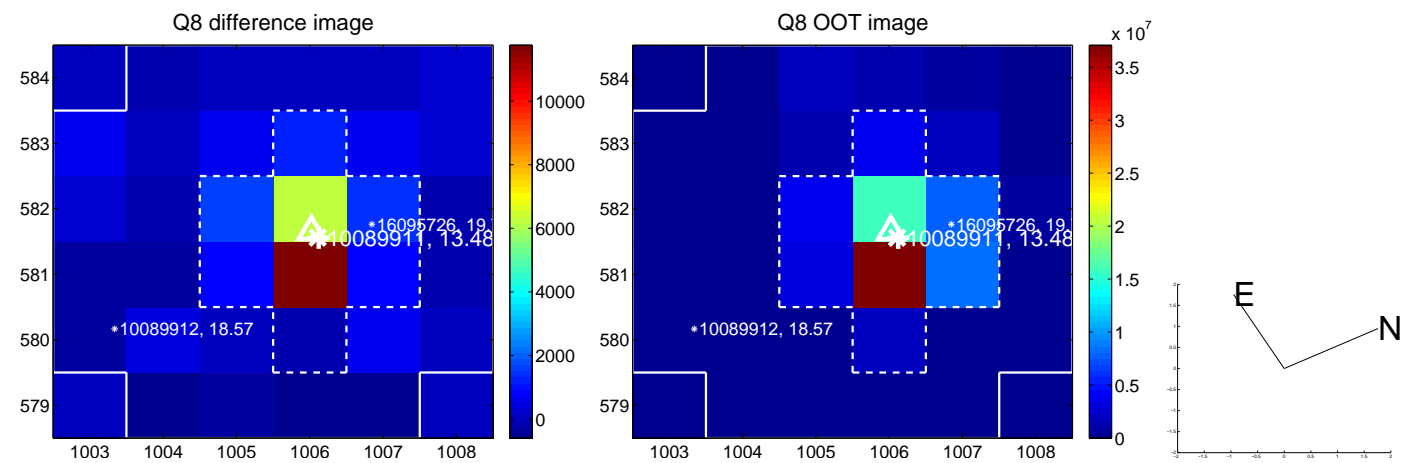
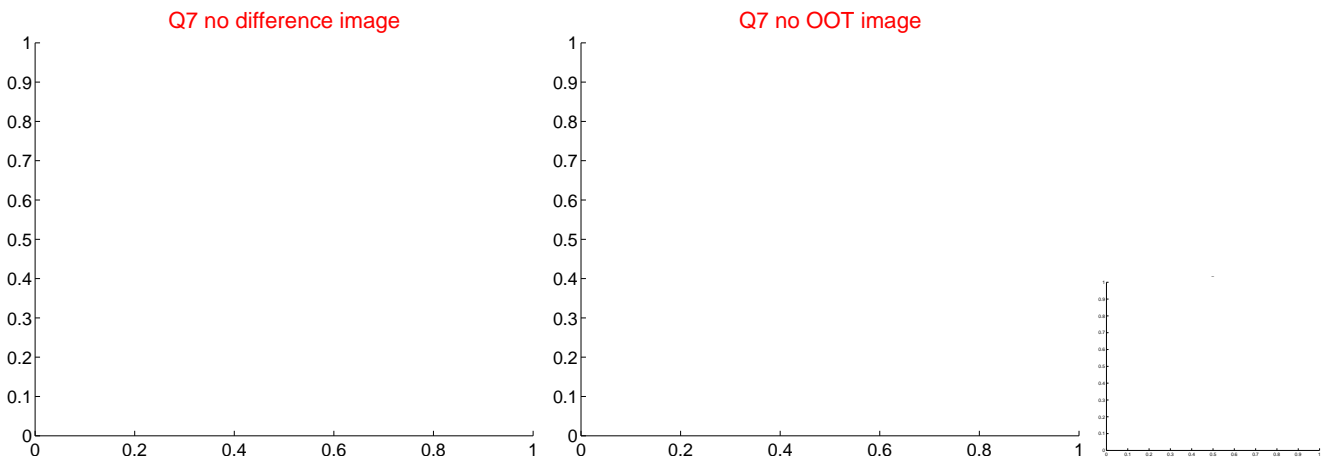
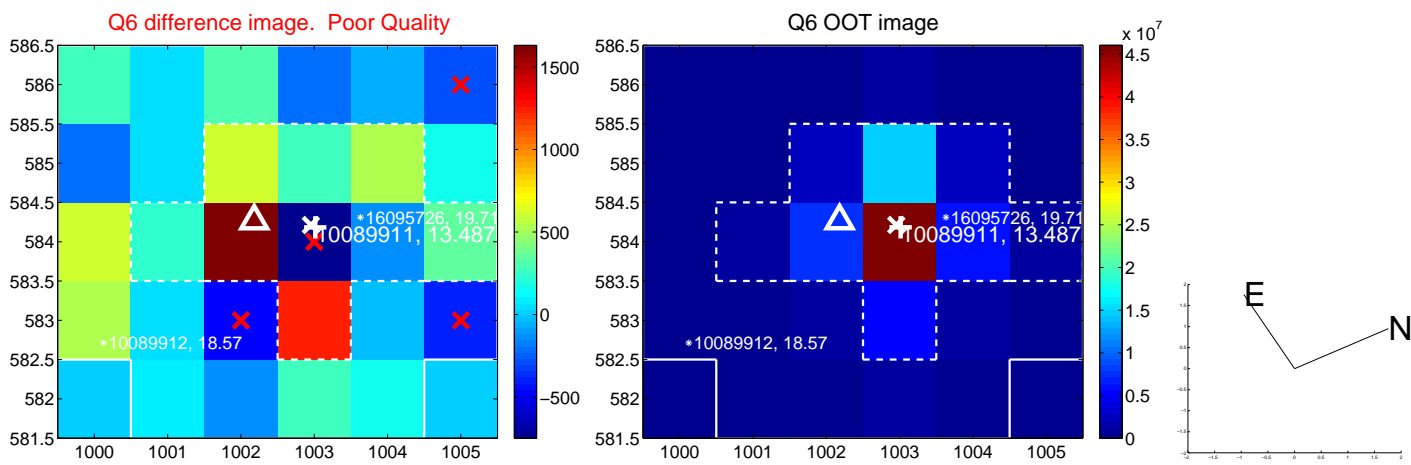
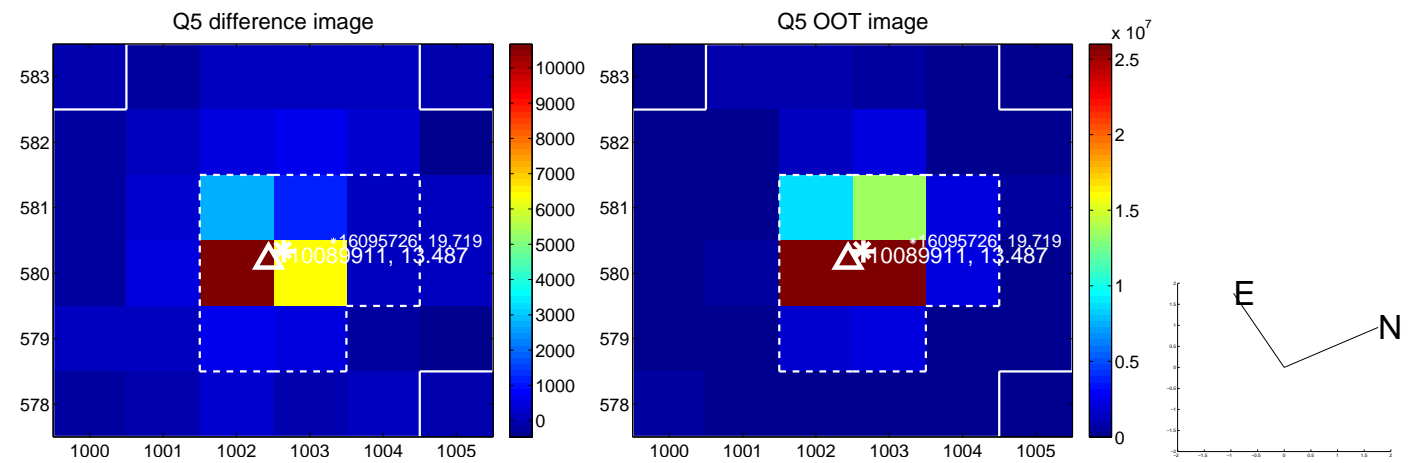


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

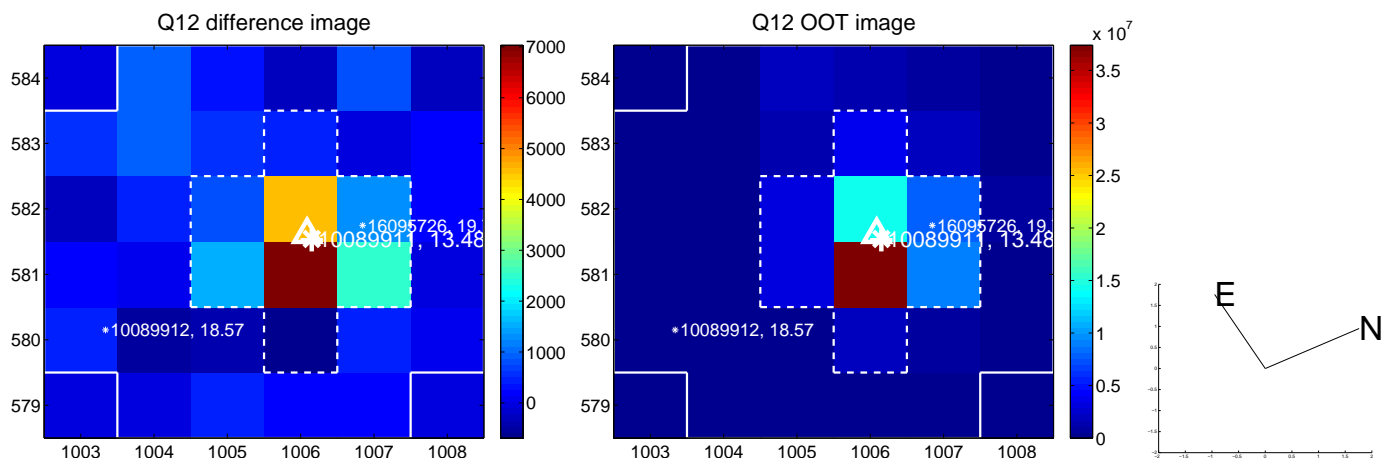
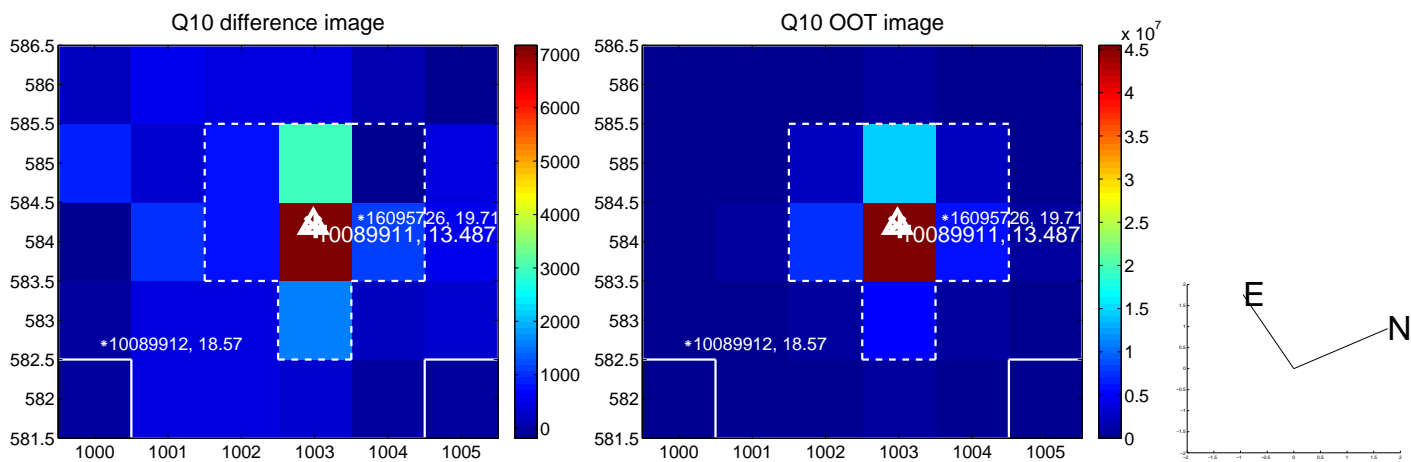
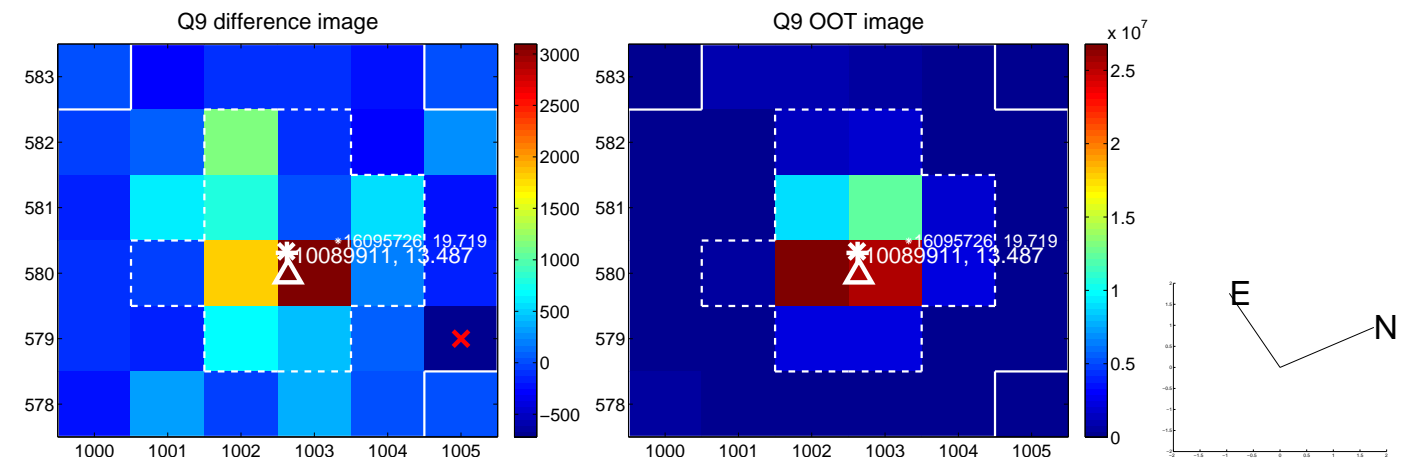
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



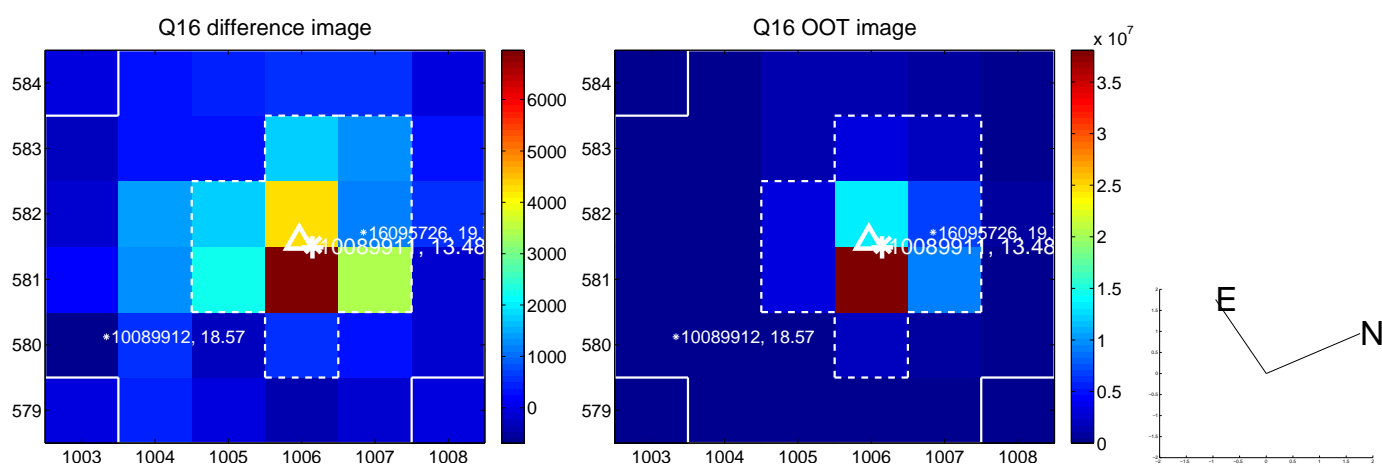
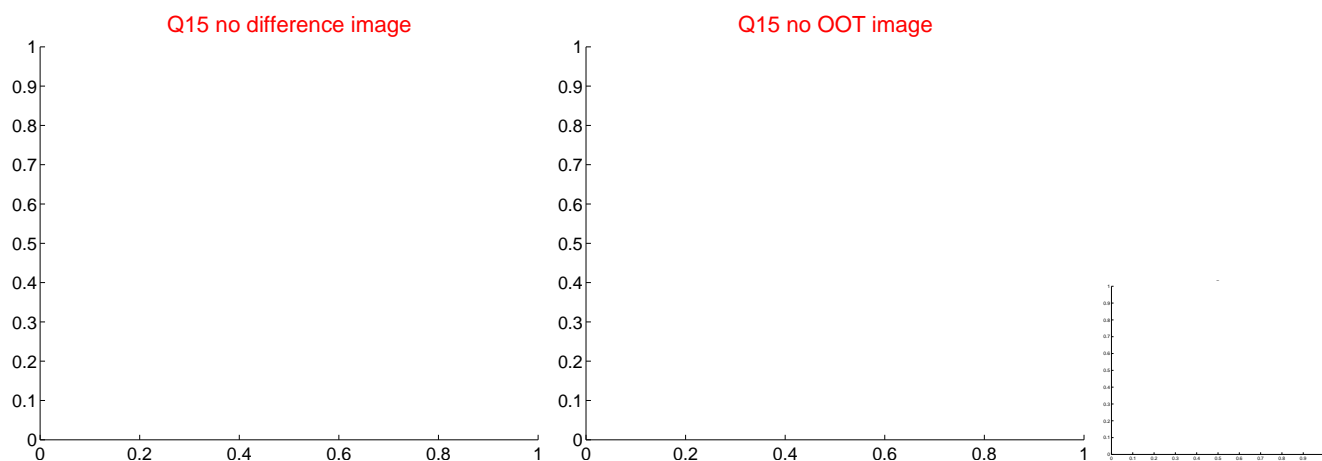
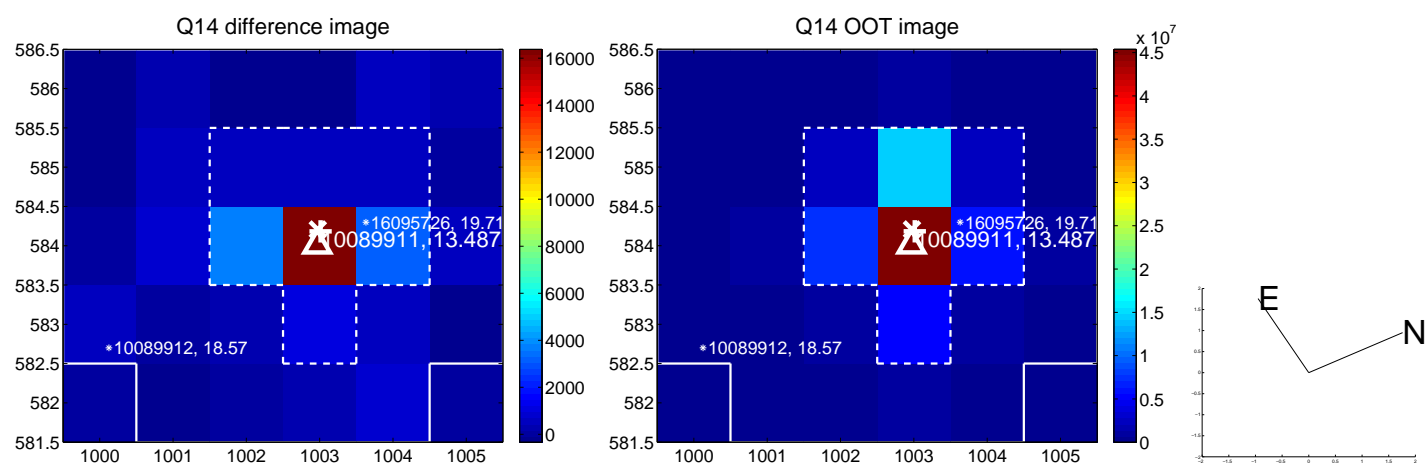
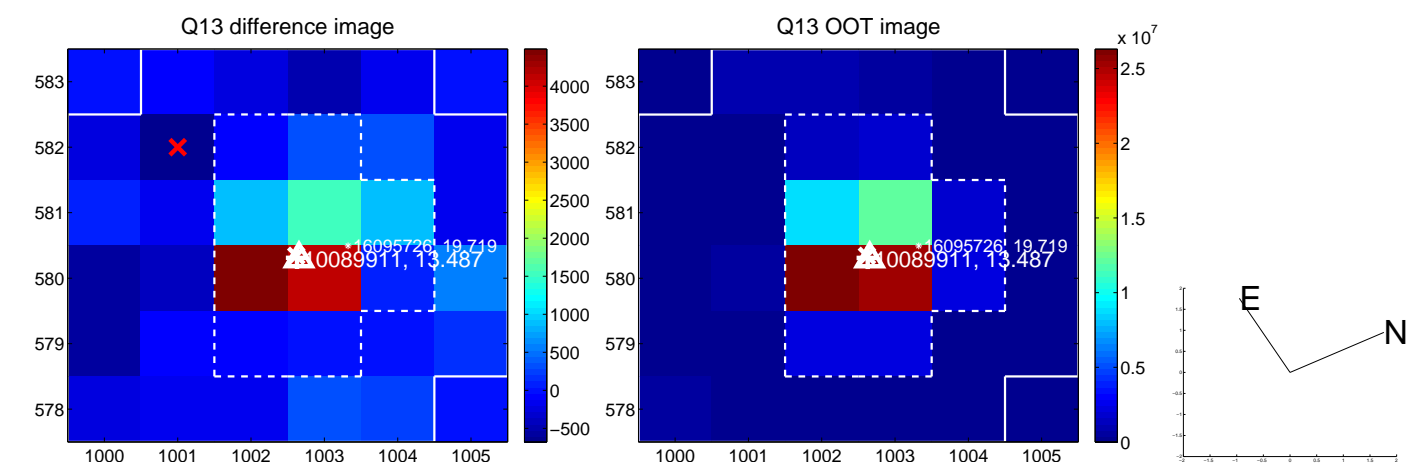
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



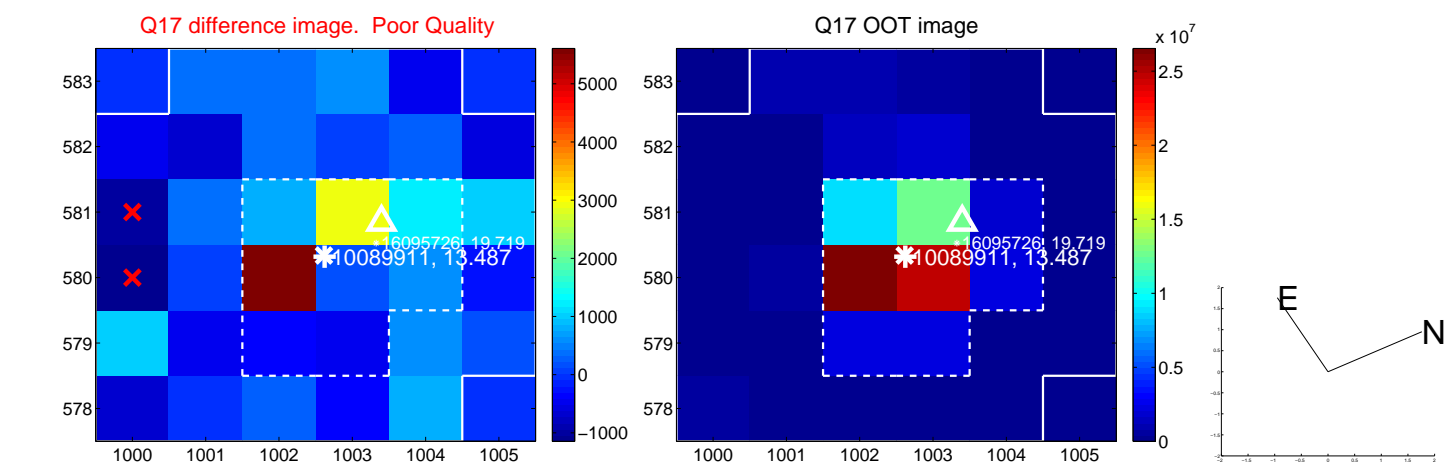
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



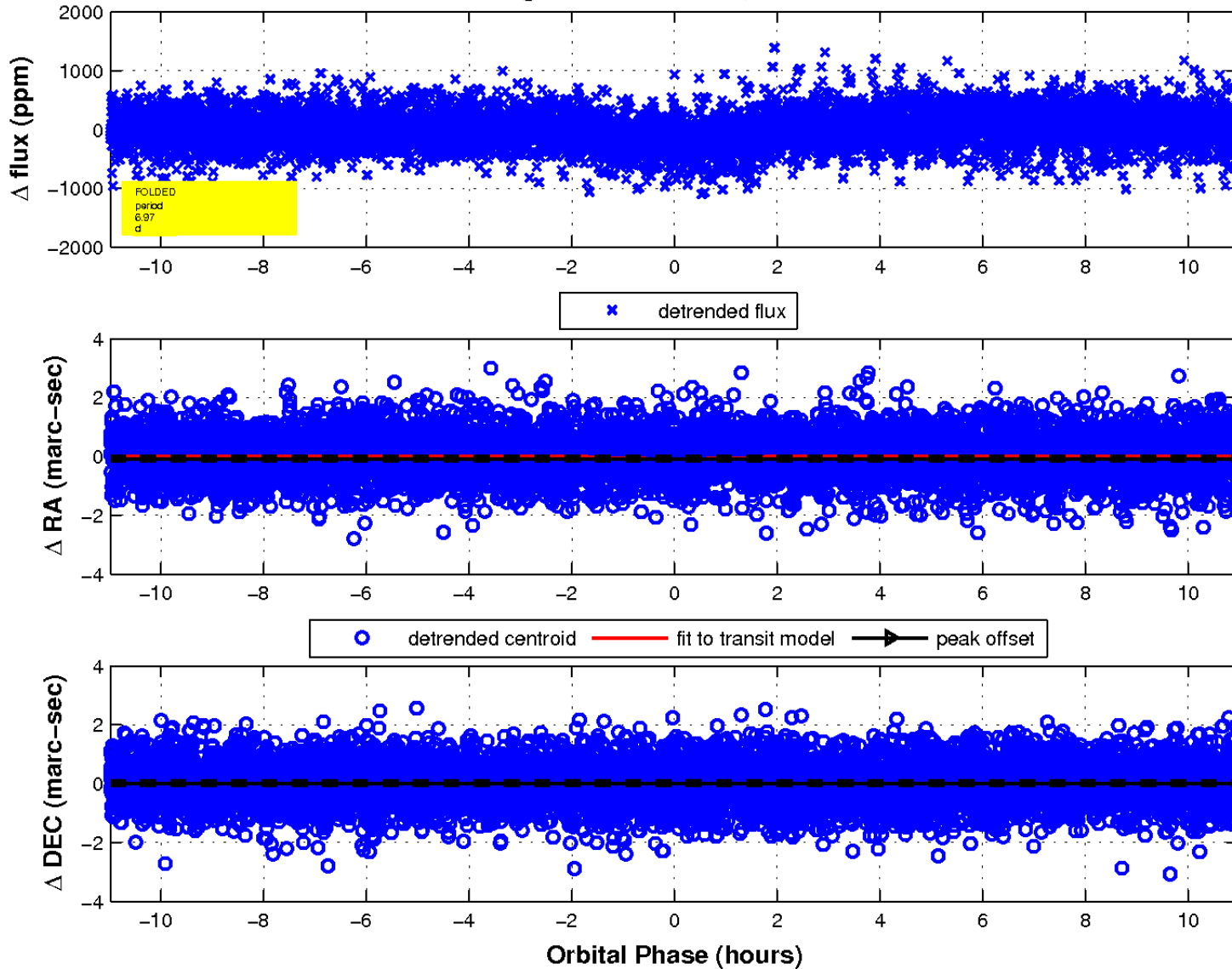
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

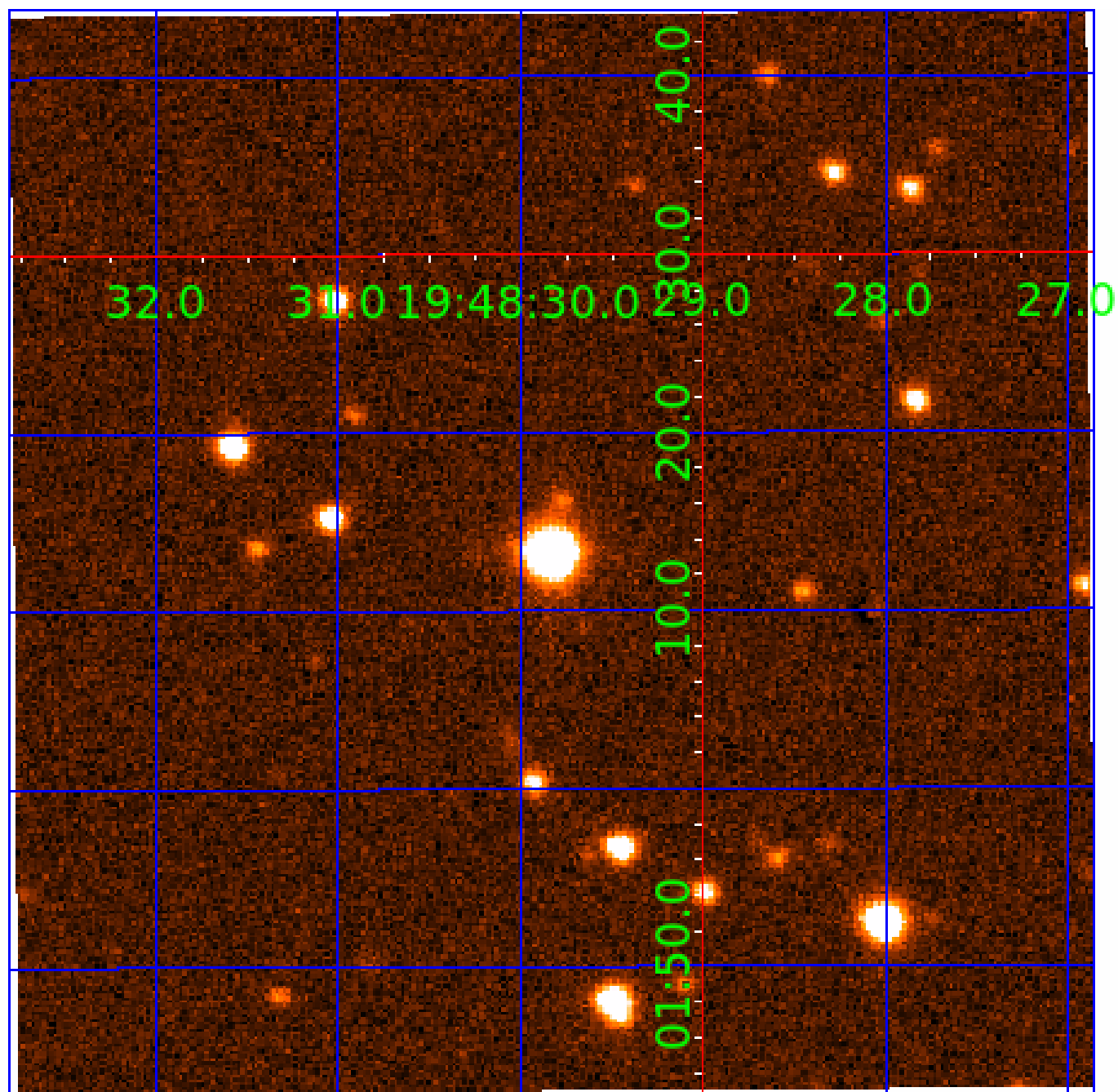


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010089911

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})
010089911-01	OBS	4034.01	6.967127	138.242973	207.4	3.662	17.5	18.4	3.53	6303	5.97	2345.28
010089911-02	OBS	4034.02	11.609132	142.726272	150.3	1.732	8.5	9.6	3.53	6303	5.03	1187.23

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010089911-01	OBS	FP	0.10	1	0	0	0	LPP_DV
010089911-02	OBS	FP	0.22	1	0	0	0	MOD_NONUNIQ_ALT

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

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

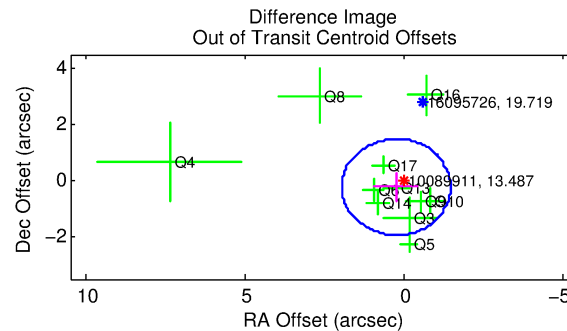
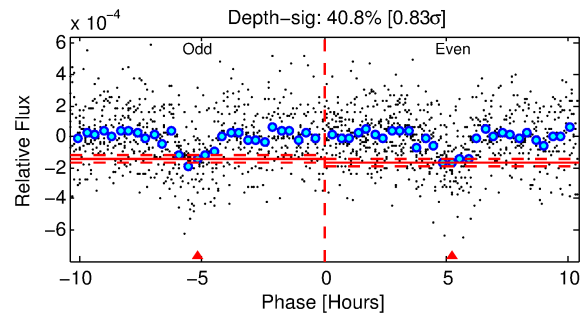
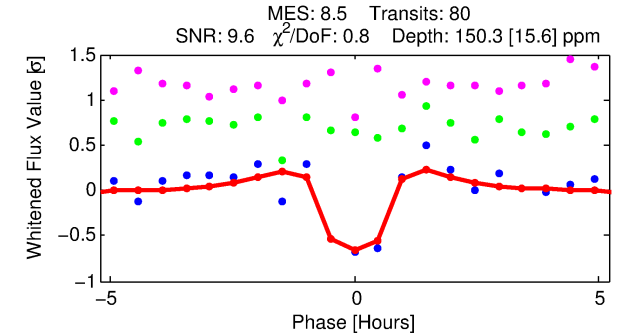
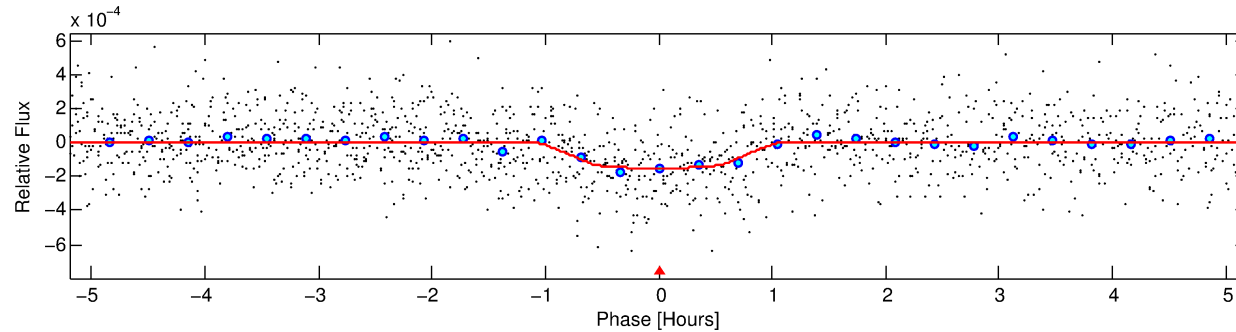
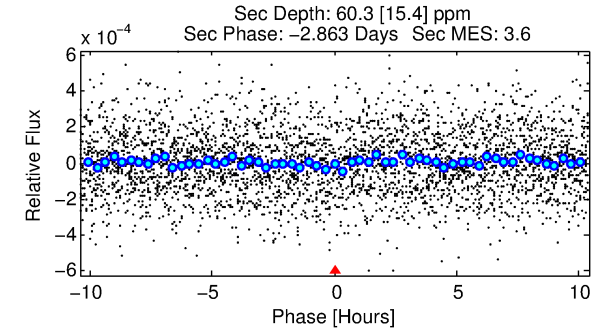
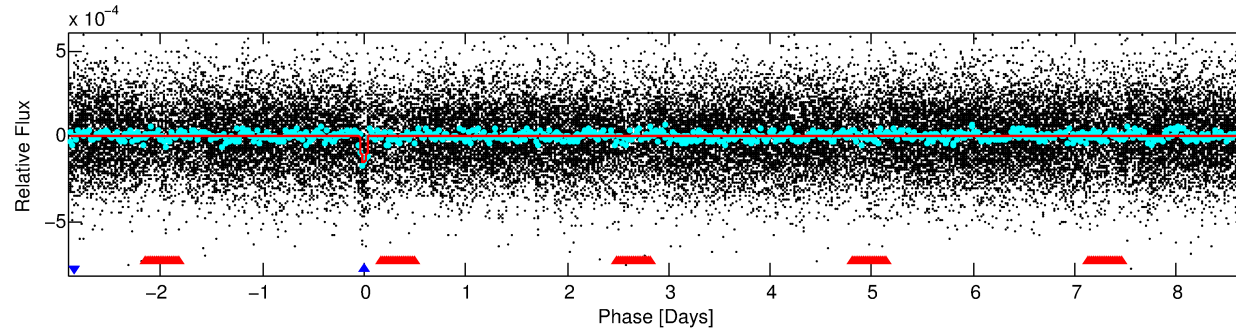
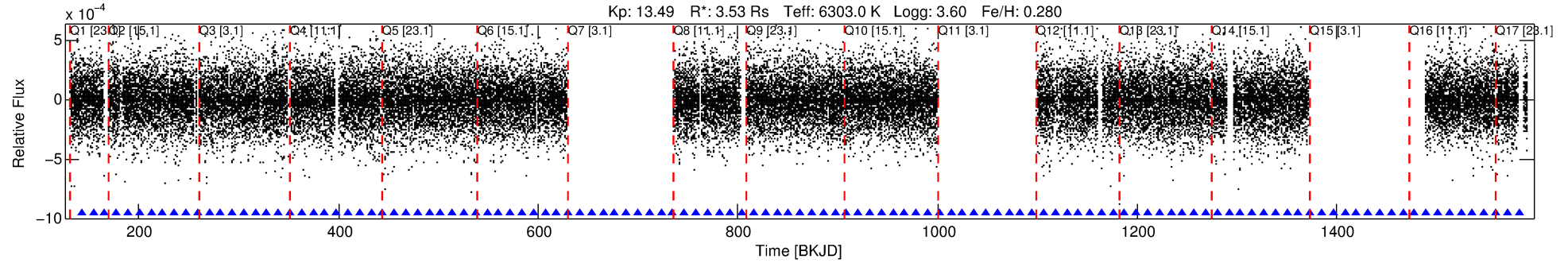
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010089911-02

No Significant Match Found

DV One-Page Summary

KIC: 10089911 Candidate: 2 of 2 Period: 11.609 d
KOI: K04034.02 Corr: 0.936



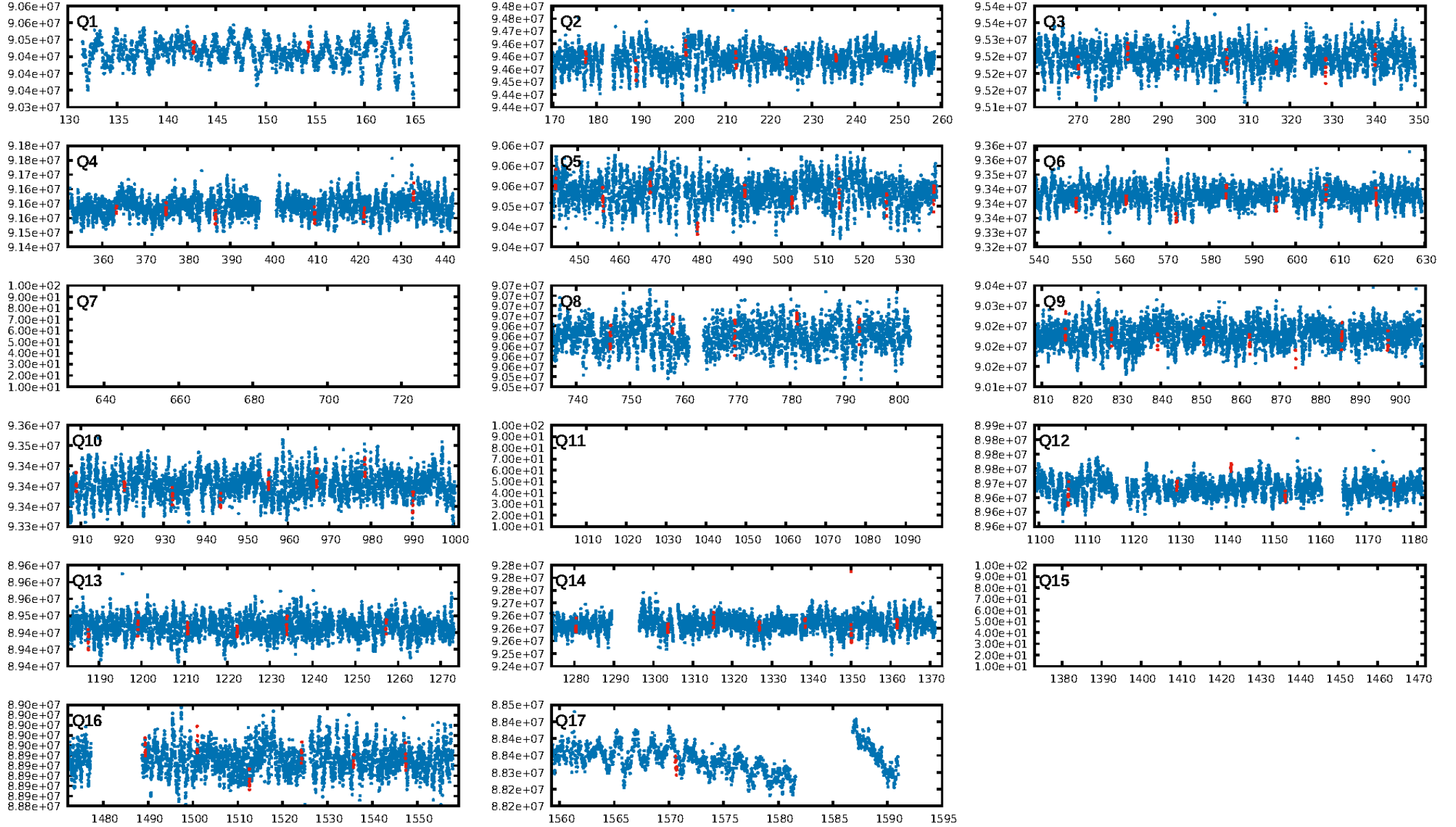
DV Fit Results:

Period = 11.60913 [0.00005] d
Epoch = 142.7263 [0.0034] BKJD
Rp/R* = 0.0131 [0.0068]
a/R* = 25.39 [70.01]
b = 0.88 [0.70]
Seff = 1187.23 [540.55]
Teq = 1497 [170] K
Rp = 5.03 [3.05] Re
a = 0.1218 [0.0350] AU
Ag = 19.48 [22.73] [0.81 sigma]
Teffp = 4862 [1309] K [2.55 sigma]

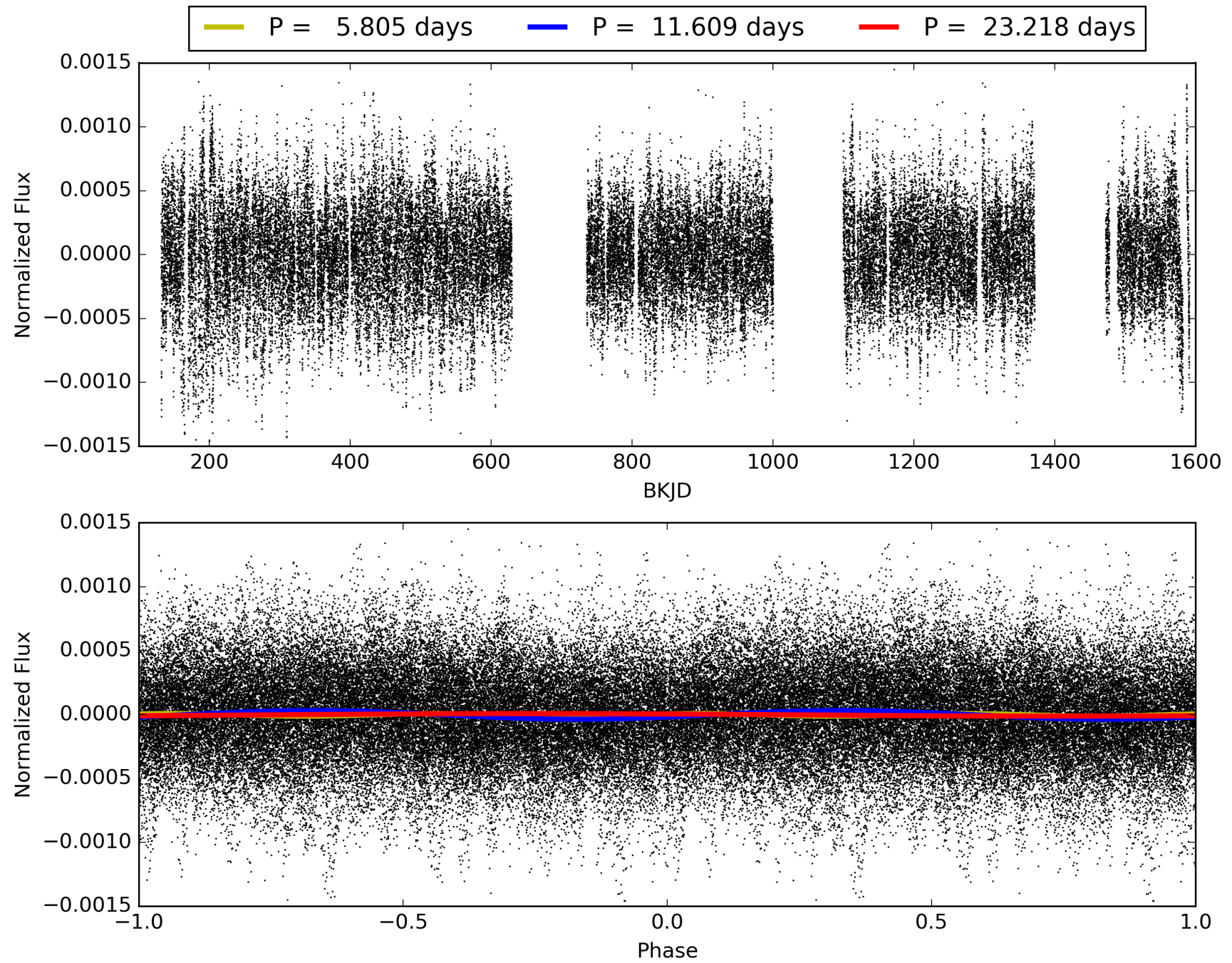
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [27.50 sigma]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 98.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.65e-17
RollingBand-fgt: 1.00 [77/77]
GhostDiagnostic-chr: 5.431
Centroid-sig: 8.3%
Centroid-so: 1.236 arcsec [1.39 sigma]
OotOffset-rm: 0.341 arcsec [0.60 sigma]
OotOffset-st: 3/1/3/4 [11]
KicOffset-rm: 0.229 arcsec [0.47 sigma]
KicOffset-st: 3/1/3/4 [11]
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TCE 010089911-02, PDC Light Curves

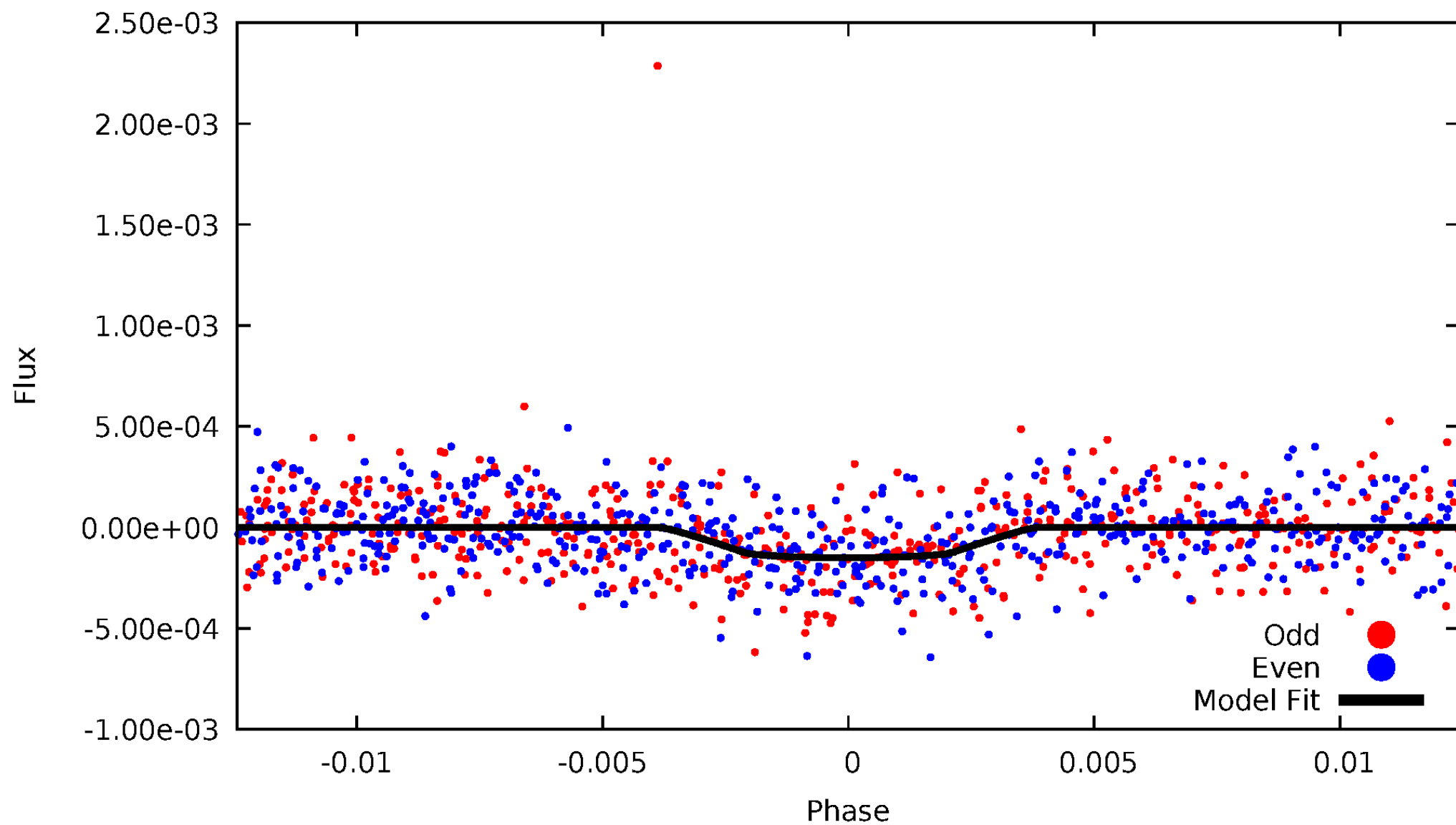


TCE 010089911-02



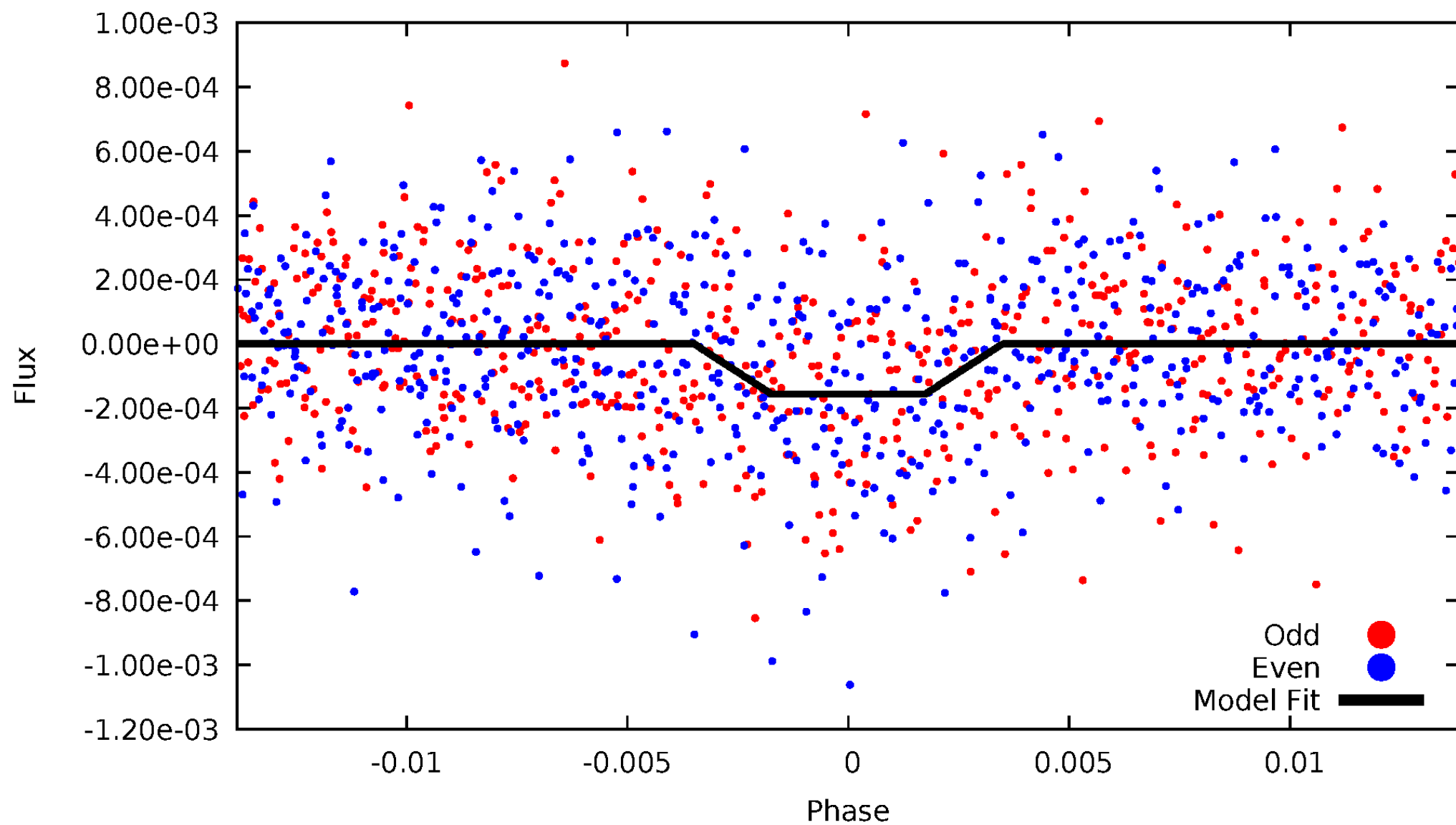
DV Odd/Even

TCE 010089911-02



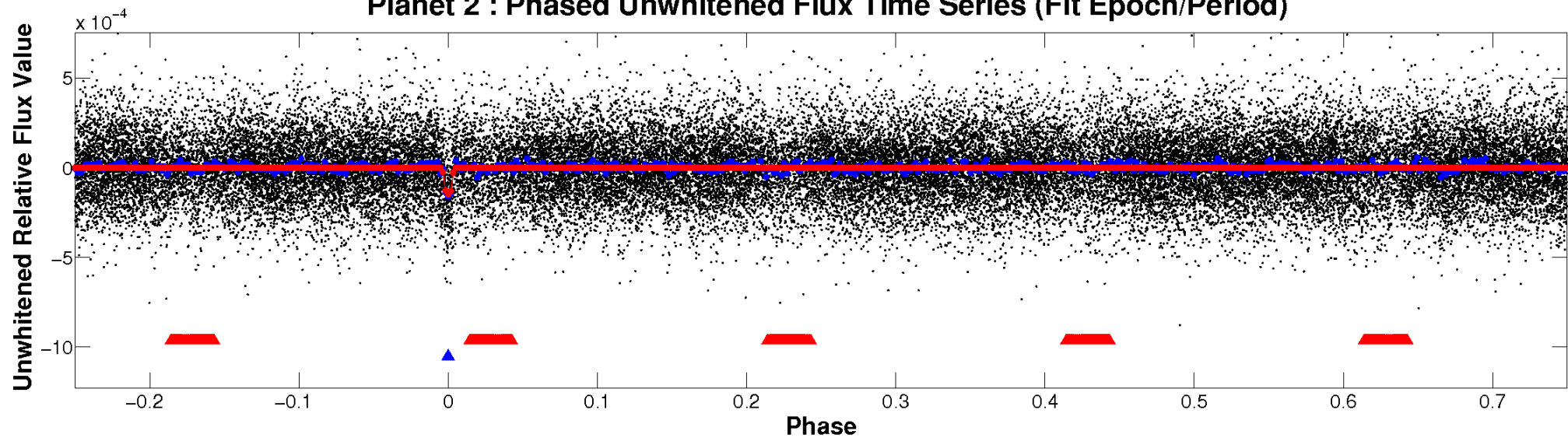
ALT Odd/Even

TCE 010089911-02

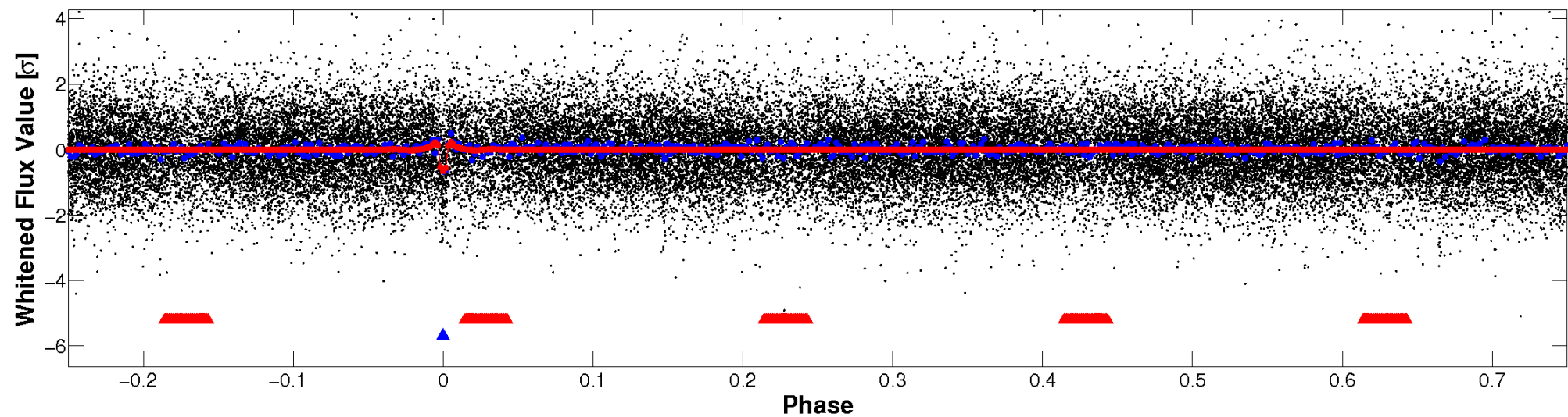


Non-Whitened Vs. Whitened Light Curve

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

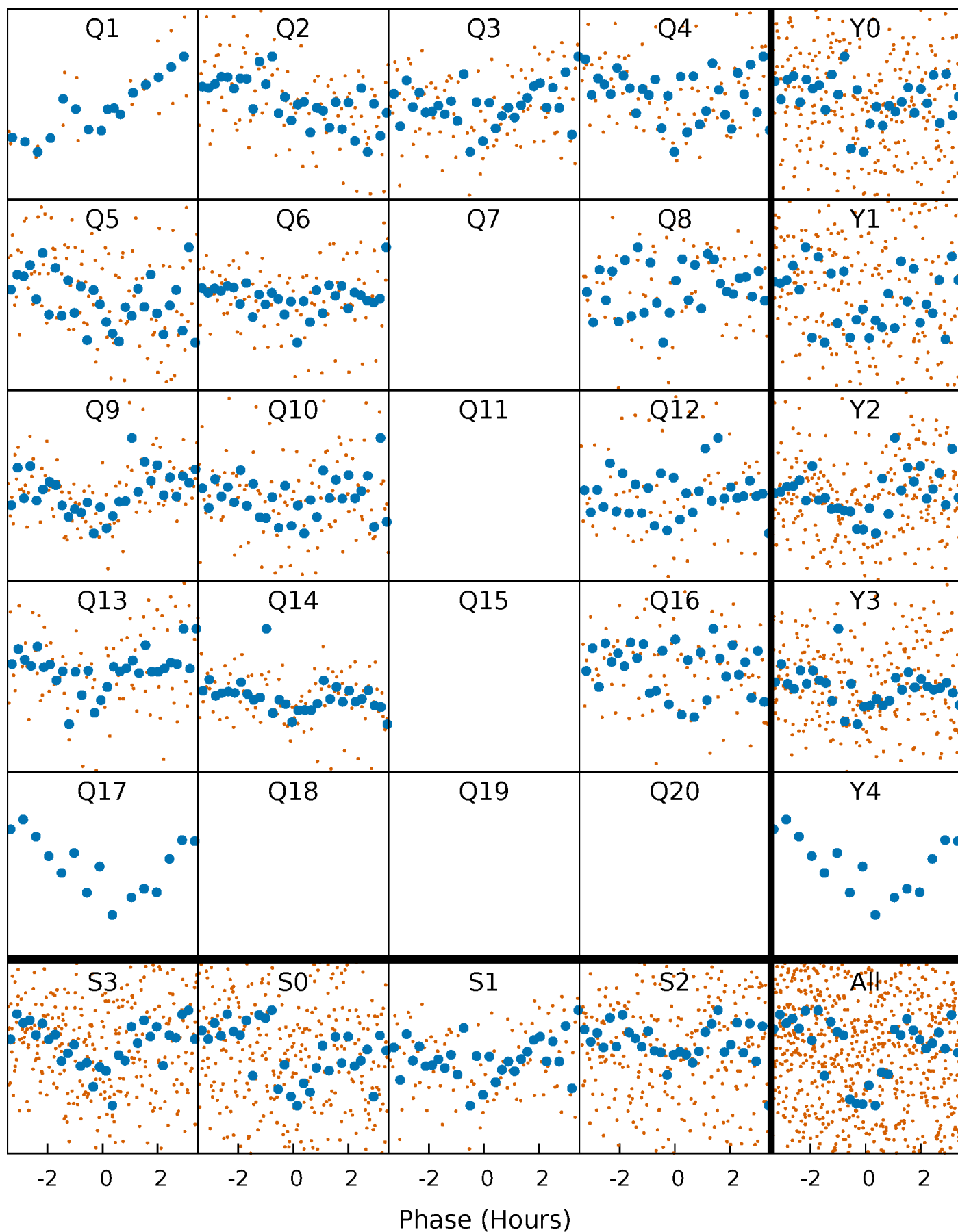


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



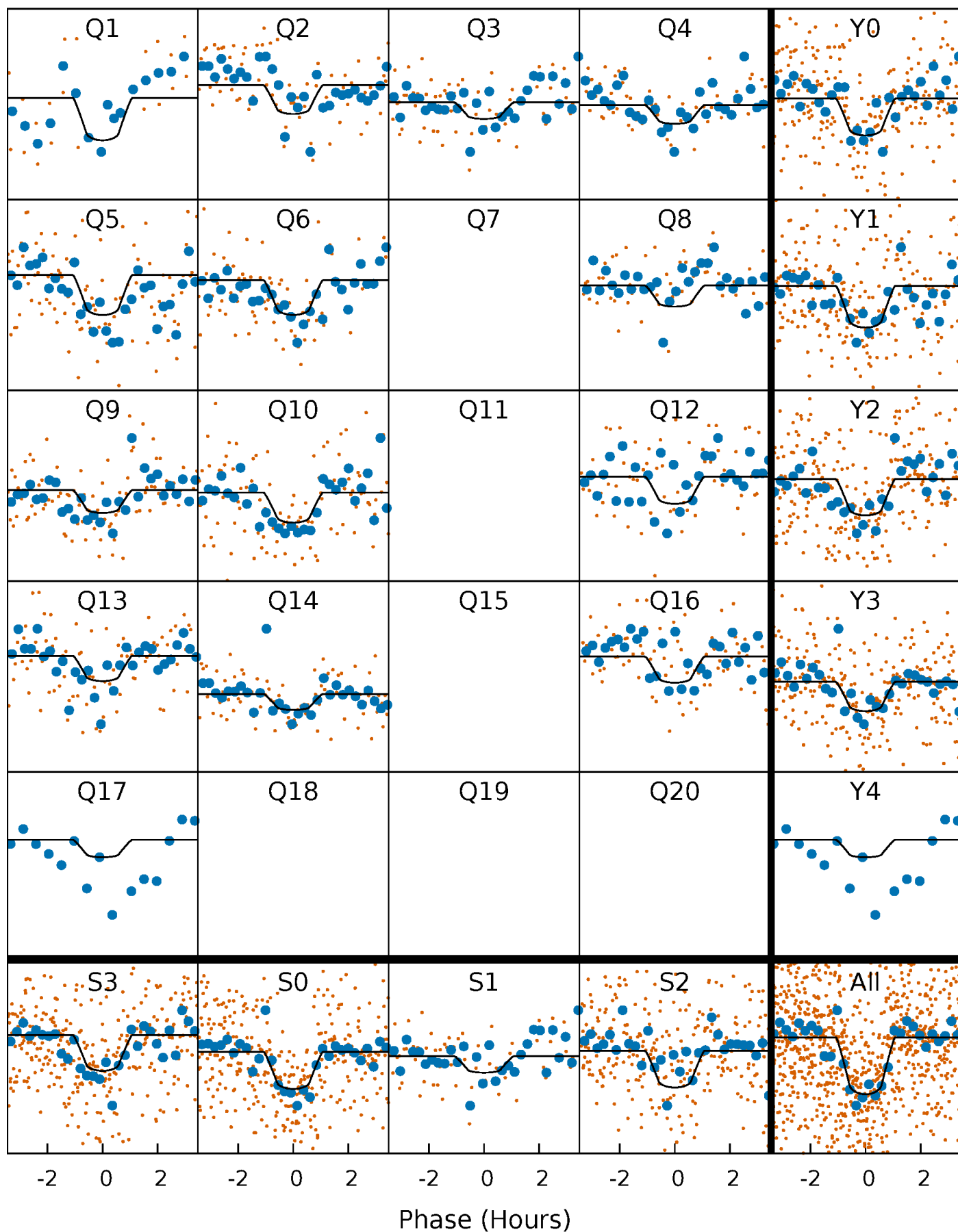
PDC Quarter-Phased Transit Curves

TCE 010089911-02 P= 11.609132 Days $T_0=142.726272$ (BKJD)



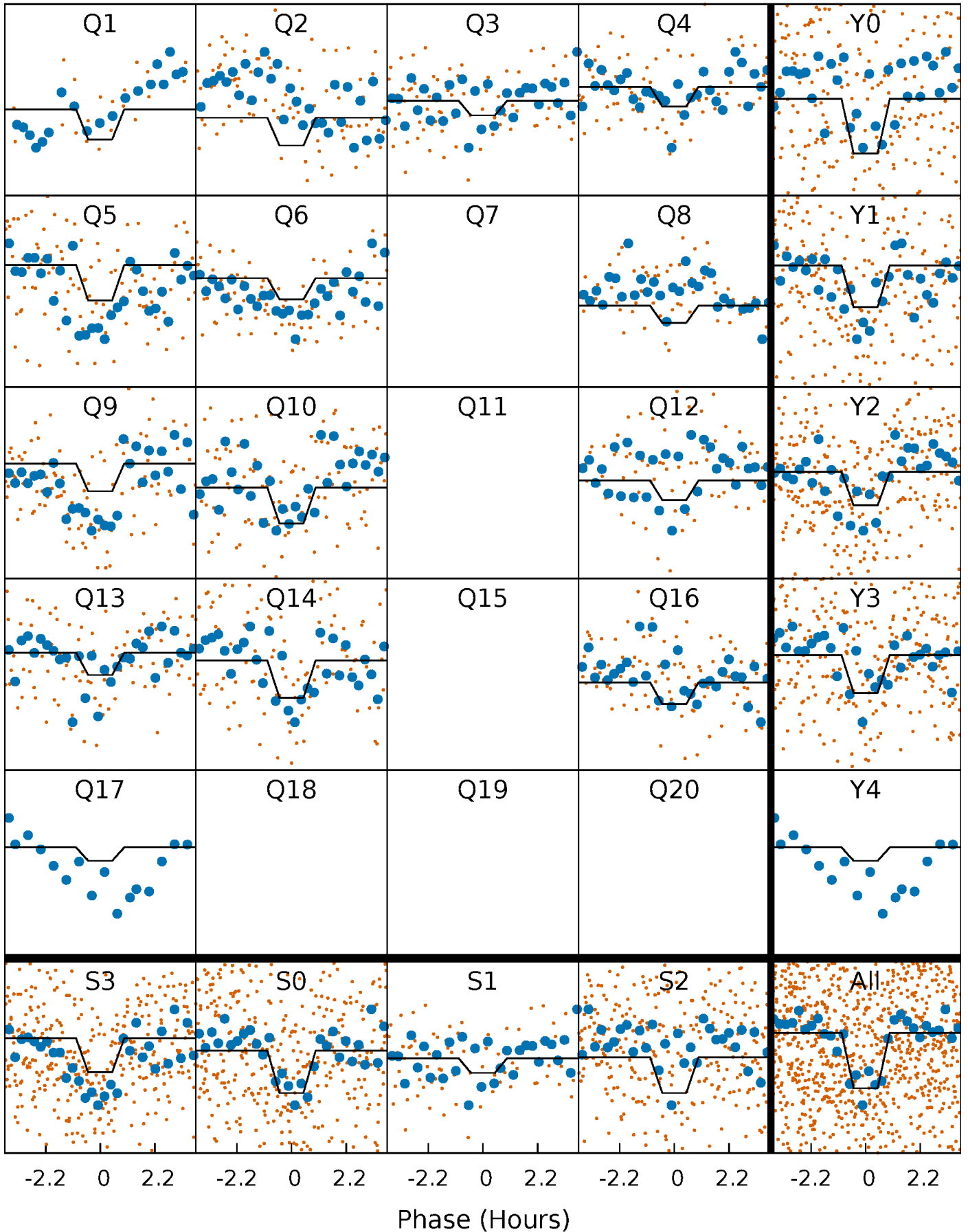
DV Quarter-Phased Transit Curves

TCE 010089911-02 P= 11.609132 Days $T_0=142.726272$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

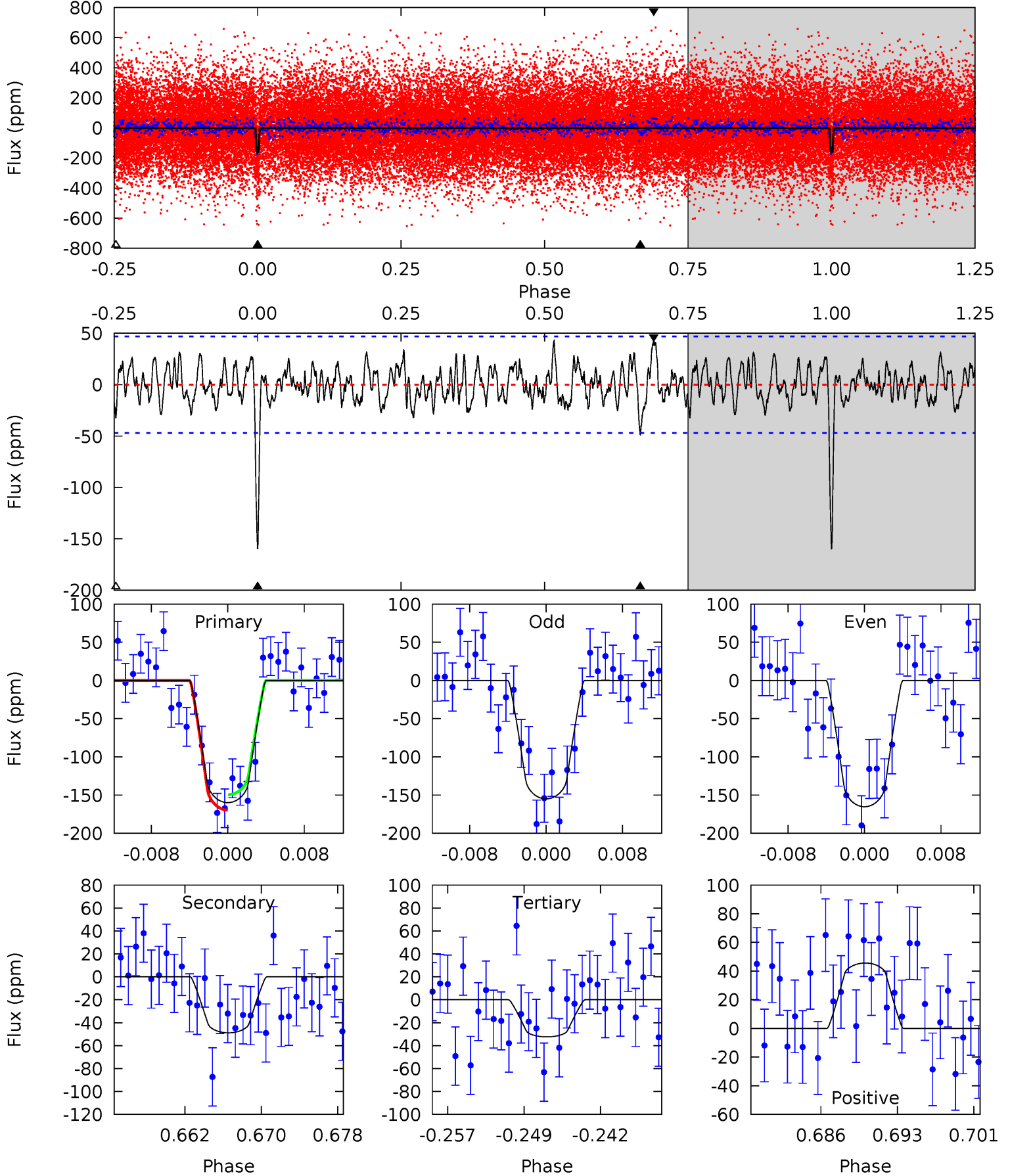
TCE 010089911-02 P= 11.609053 Days $T_0=142.729957$ (BKJD)



DV Model-Shift Uniqueness Test

010089911-02, $P = 11.609132$ Days, $E = 131.117140$ Days

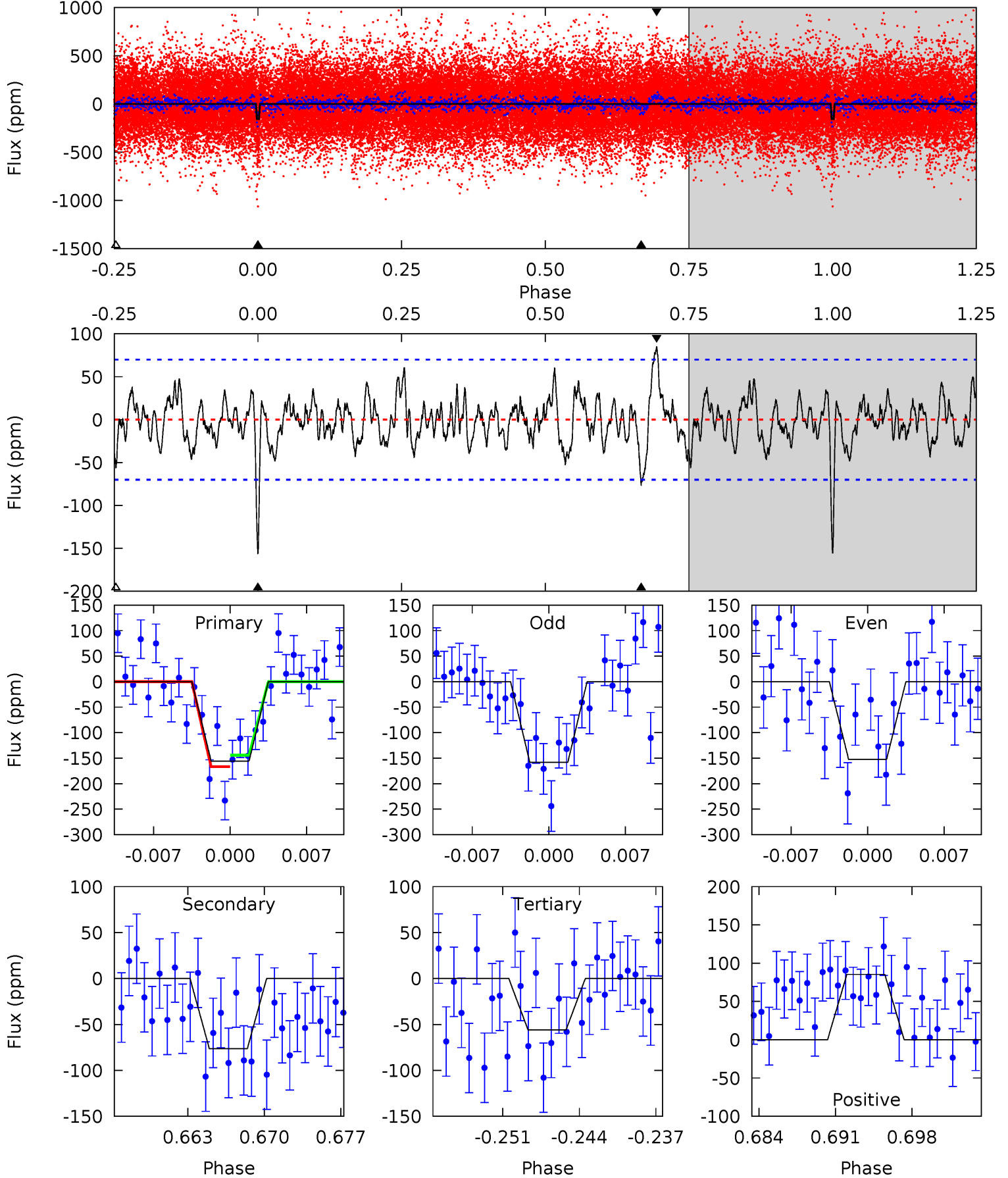
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.3	5.28	3.50	4.93	5.07	2.66	1.56	13.8	12.3	1.78	0.35	0.56	0.91	0.22	1.09



Alt Model-Shift Uniqueness Test

010089911-02, P = 11.609053 Days, E = 131.120904 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	5.57	4.08	6.21	5.09	2.70	1.64	7.25	5.12	1.49	-0.64	0.22	1.12	0.35	0.82



Stellar Parameters For KIC 010089911

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6303^{+82}_{-75}	$3.595^{+0.263}_{-0.031}$	$0.280^{+0.150}_{-0.150}$	$3.530^{+0.254}_{-1.080}$	$1.786^{+0.158}_{-0.236}$	$0.057^{+0.100}_{-0.006}$
	+1%/-1%	+7%/-1%	+54%/-54%	+7%/-31%	+9%/-13%	+176%/-10%
Source	SPE90	FLK73	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 010089911-02 / KOI 4034.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-49 ± 9	$4.86^{+2.48}_{-2.45}$	2050^{+67}_{-159}	4618^{+1652}_{-649}	17^{+48}_{-10}
Alt.	-76 ± 14	$4.59^{+2.59}_{-2.23}$	2046^{+70}_{-143}	5217^{+2076}_{-844}	31^{+80}_{-18}

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 $A_{obs} \gg 1.0$

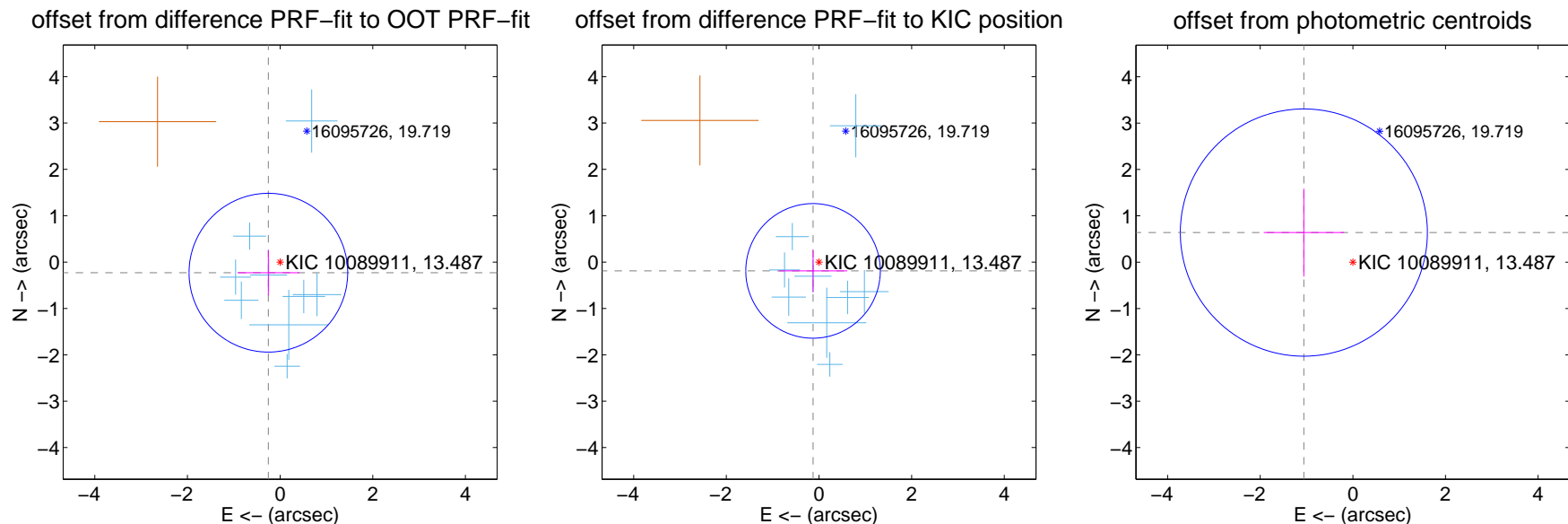
DV Centroid Data

Supplemental centroid analysis for 010089911-02. Kepler magnitude: 13.49. Transit SNR 9.60

There are 9 quarters with good PRF difference image offsets

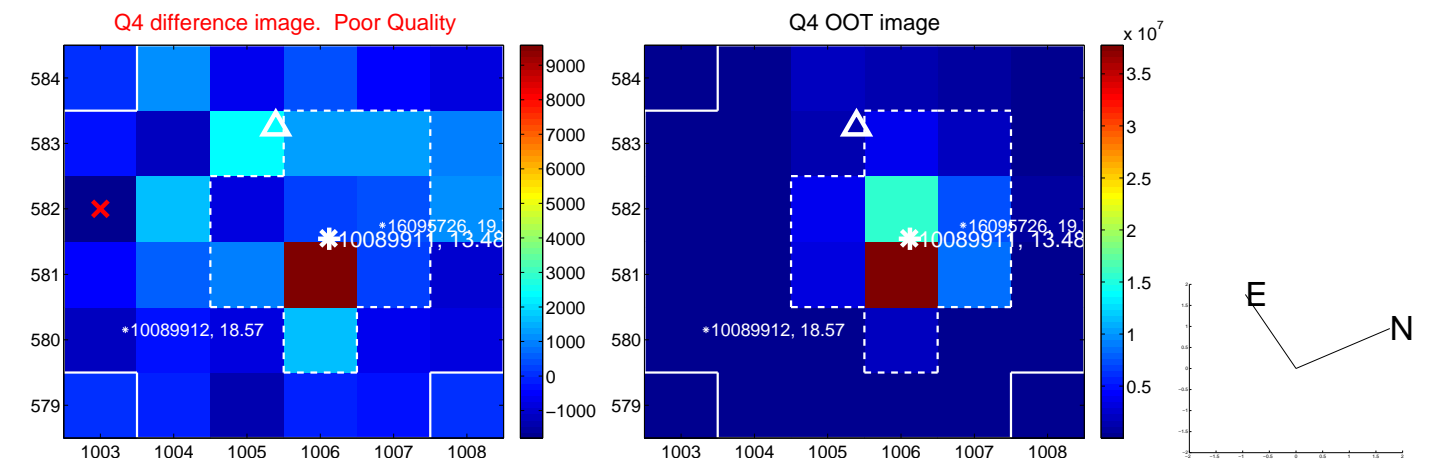
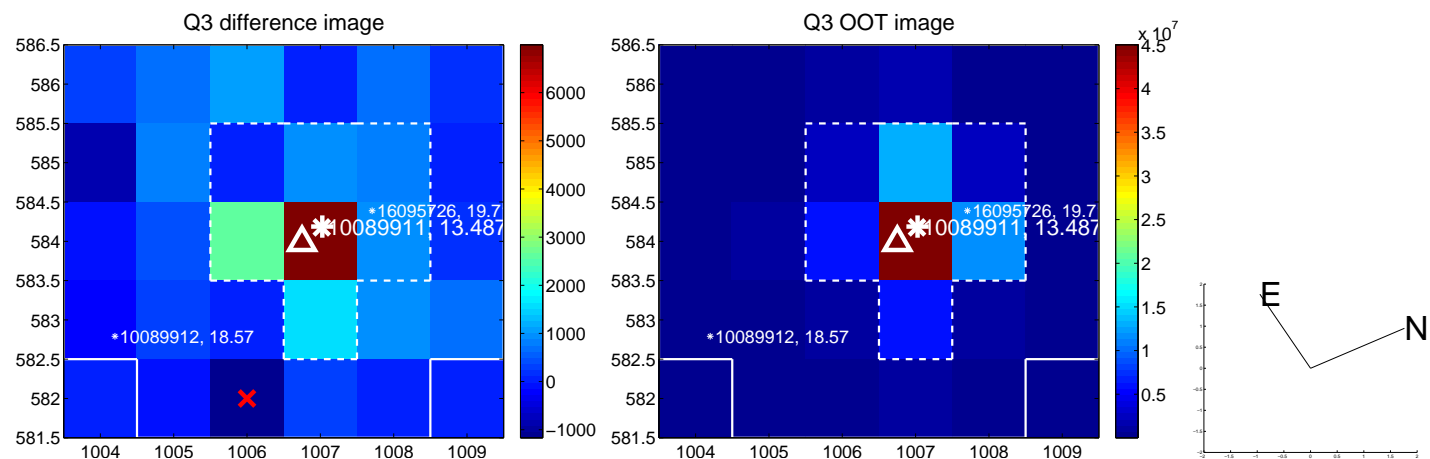
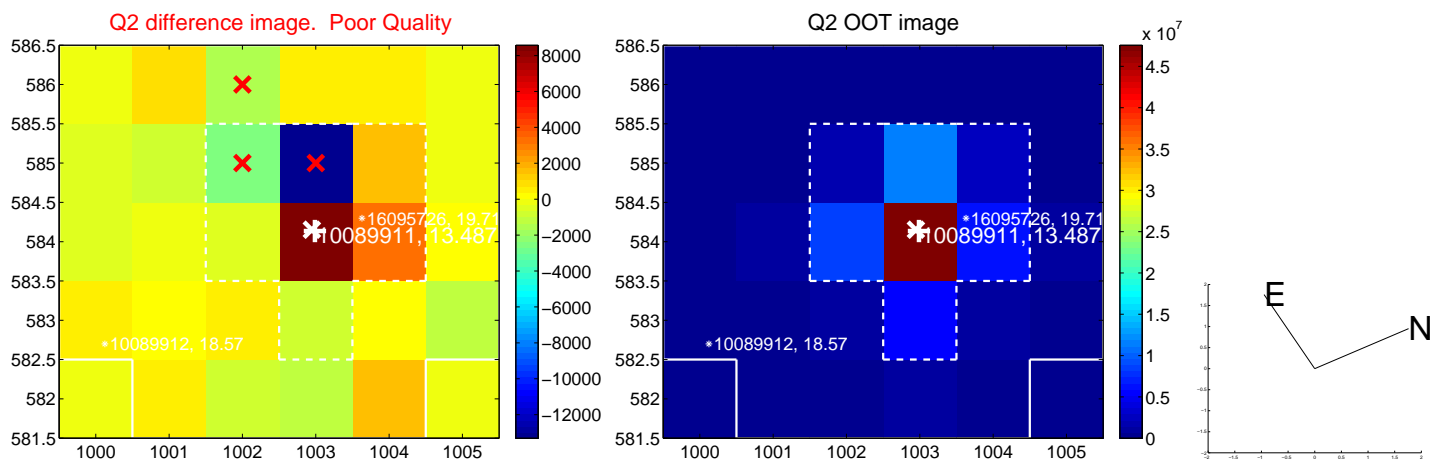
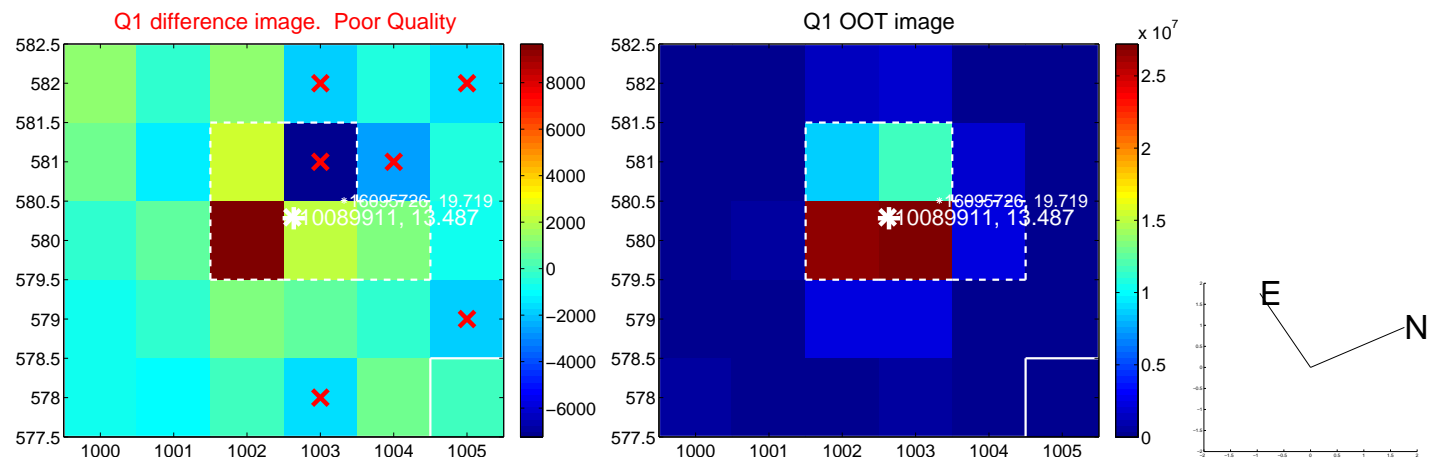
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.341 ± 0.571	0.60	0.253 ± 0.668	-0.229 ± 0.489
PRF-fit source offset from KIC position	0.229 ± 0.484	0.47	0.128 ± 0.737	-0.190 ± 0.454
photometric centroid source offset	1.24 ± 0.89	1.39	1.06 ± 0.87	0.64 ± 0.95

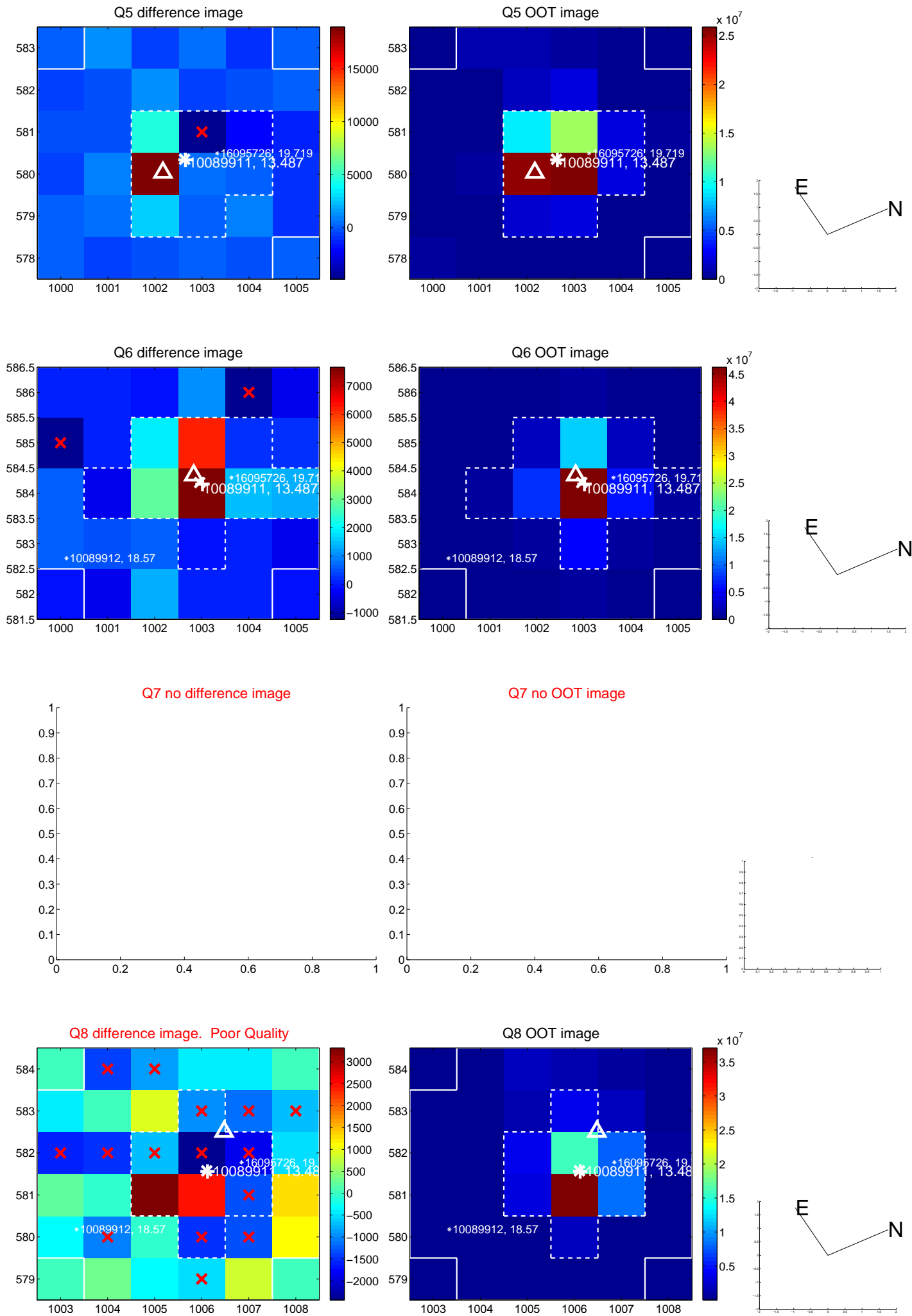


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

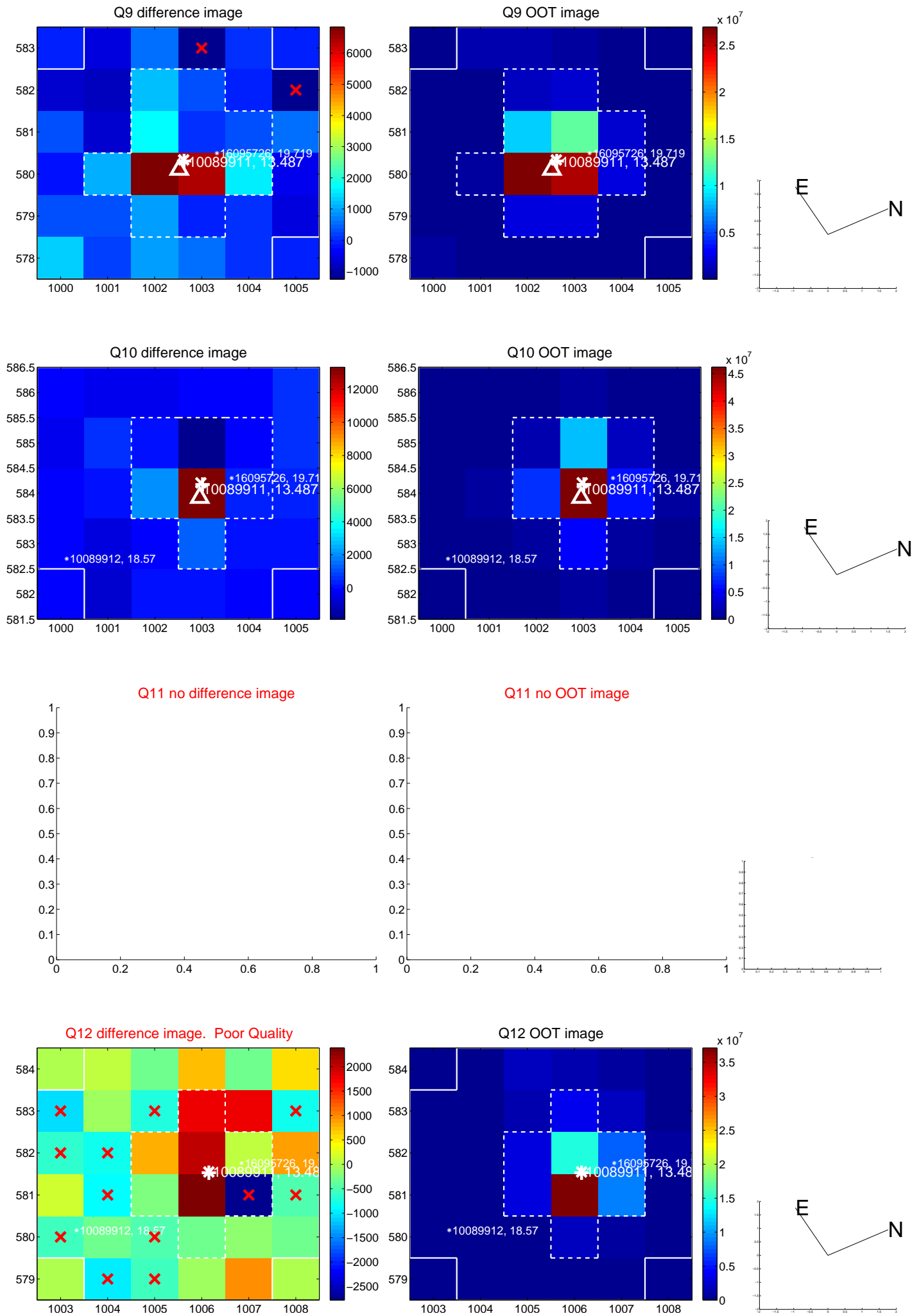
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



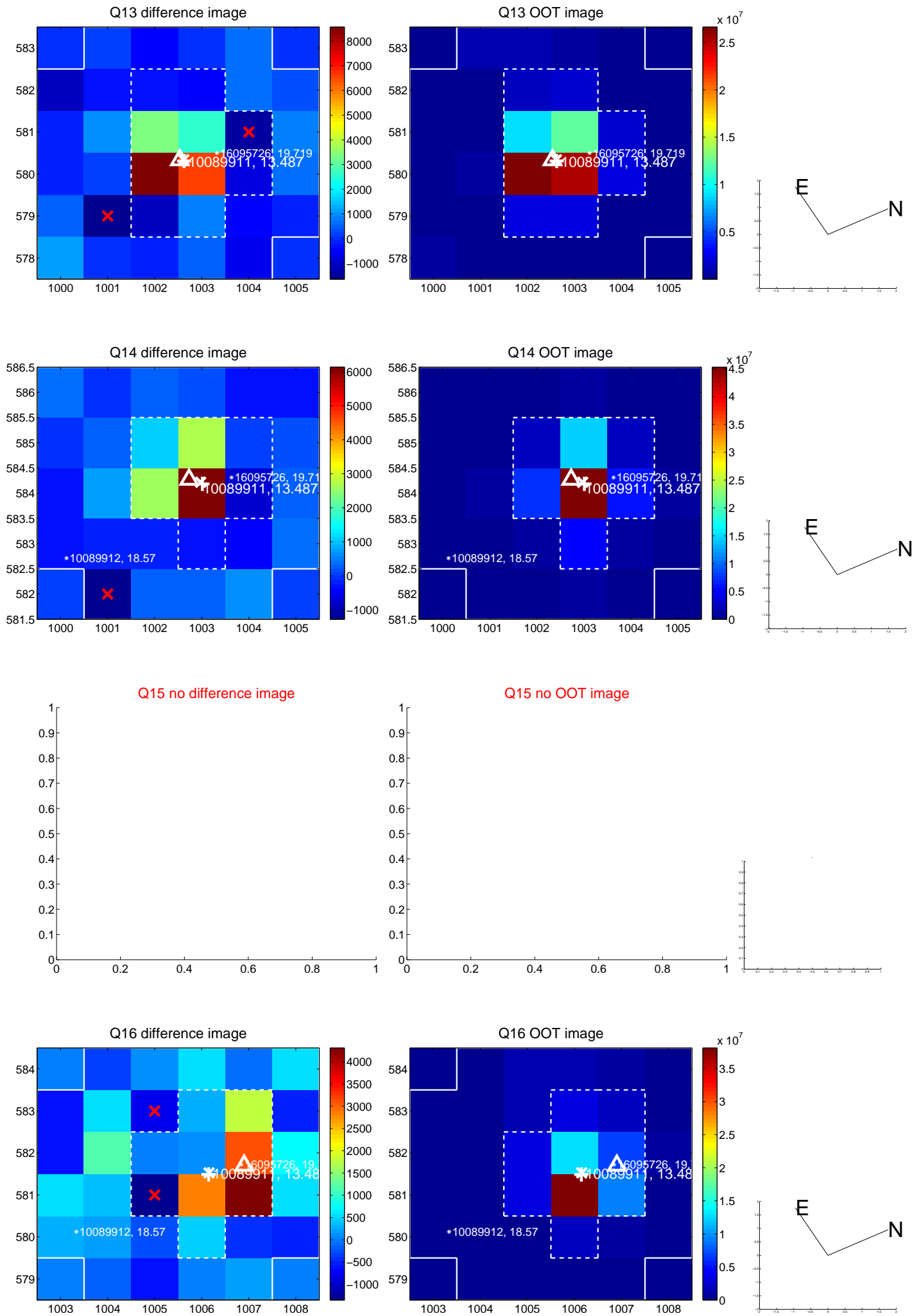
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



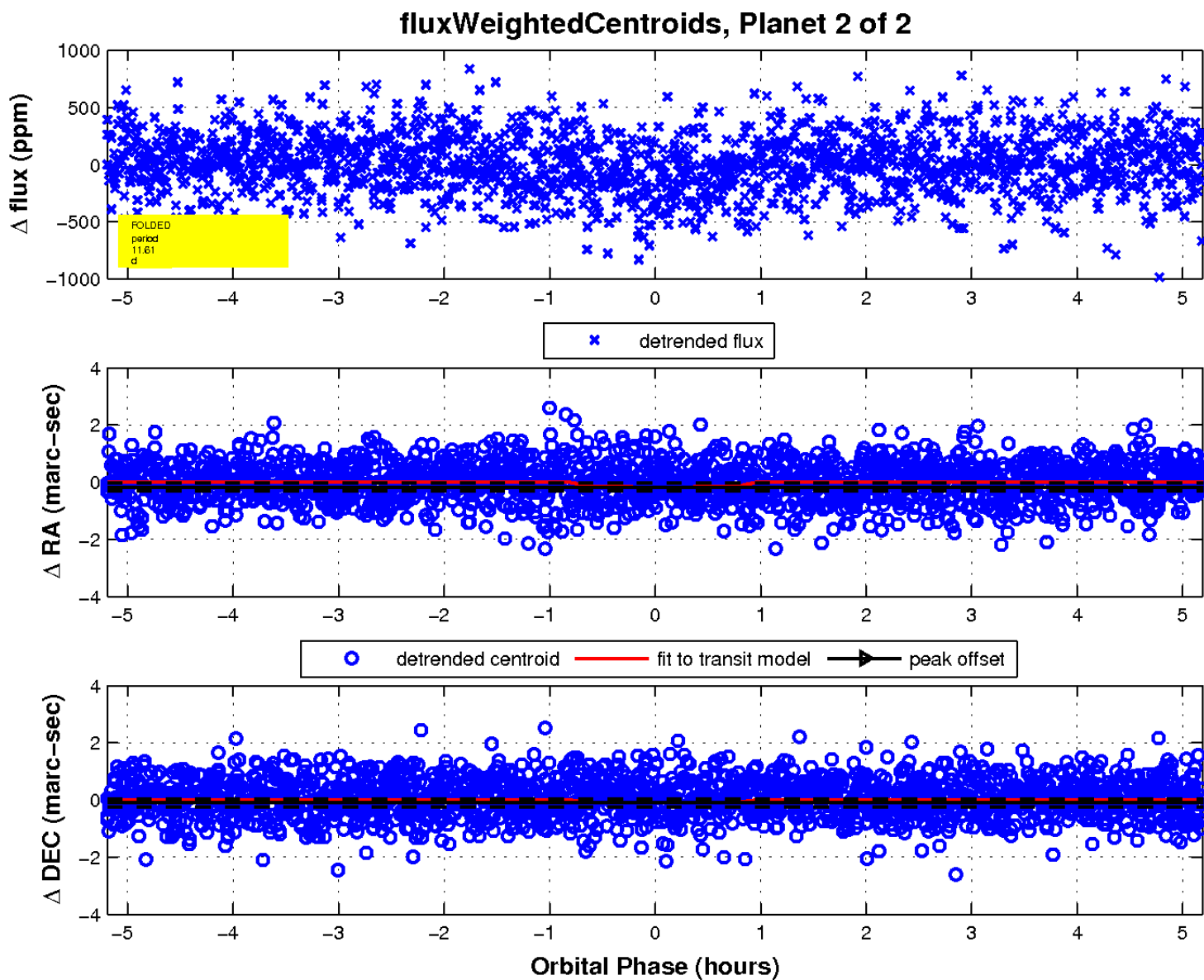
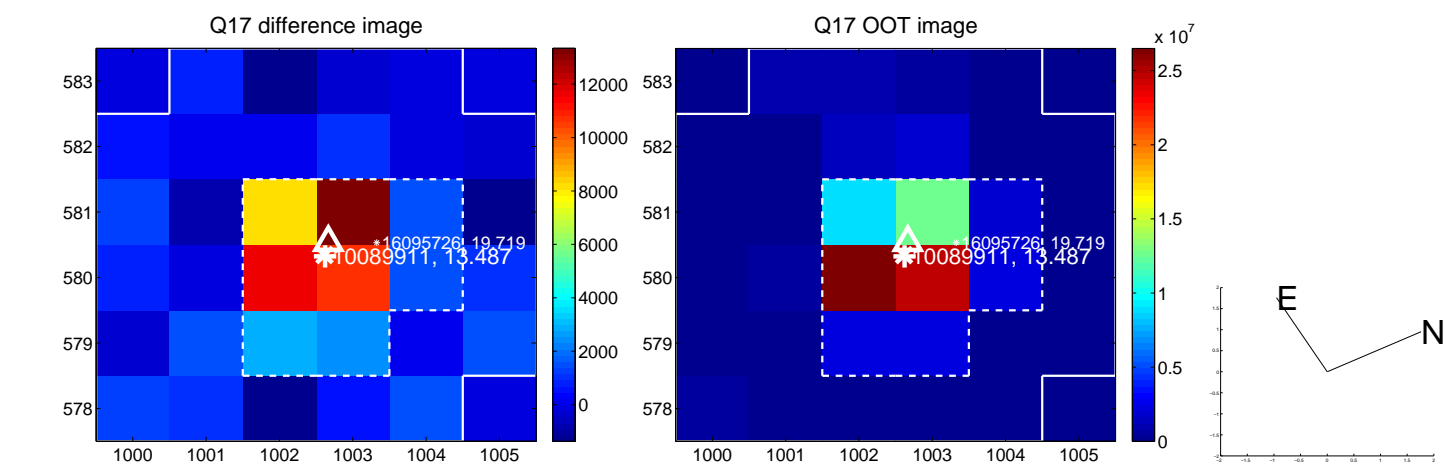
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UKIRT Image

Declination

