

KIC 006470232

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})
006470232-01	OBS	No	0.504378	131.749291	82.3	1.344	12.1	14.2	1.78	6826	1.74	30855.72
006470232-02	OBS	No	0.504377	131.949689	77.9	0.994	12.9	12.3	1.78	6826	1.84	30855.79

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006470232-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006470232-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

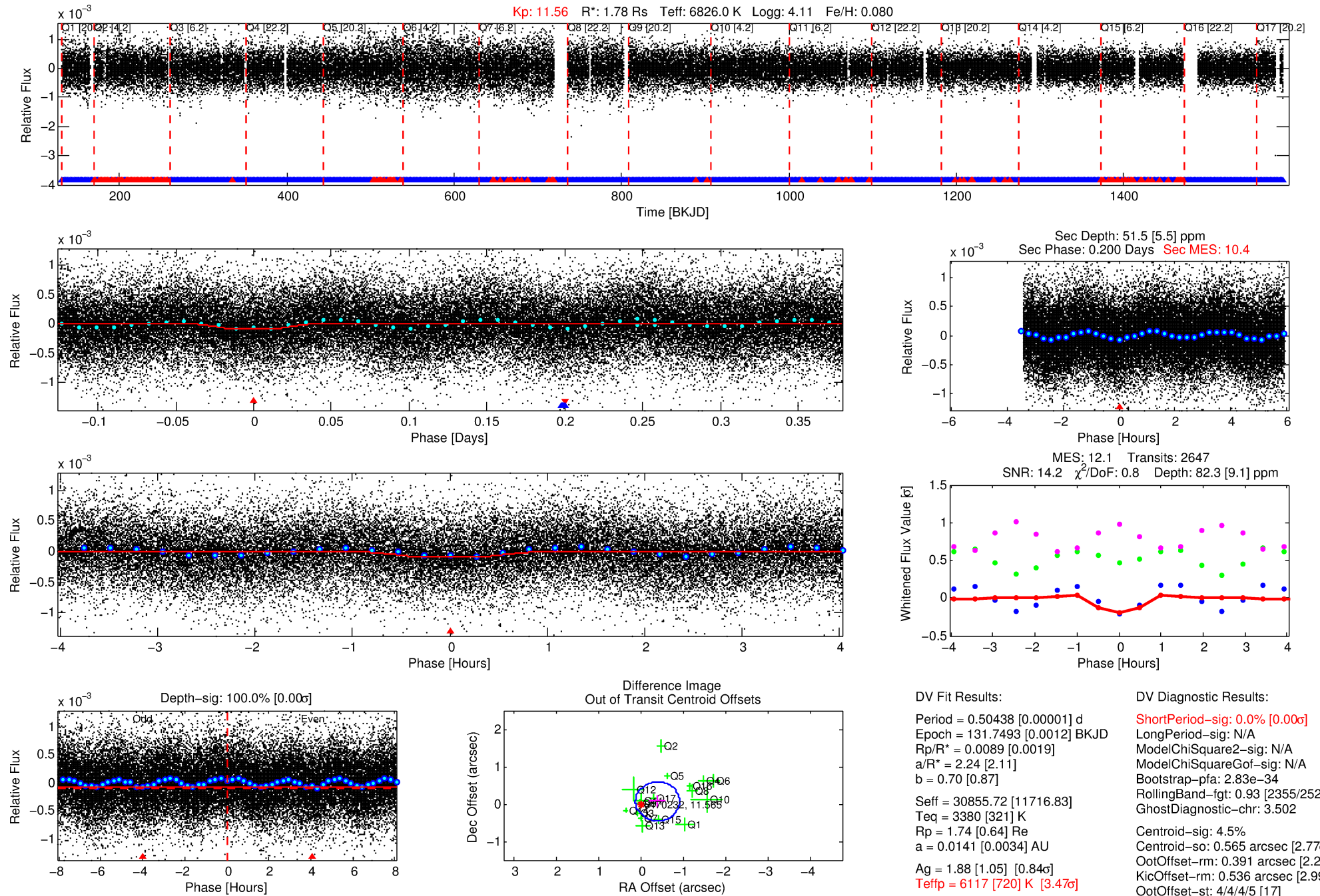
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 006470232-01

No Significant Match Found

DV One-Page Summary

KIC: 6470232 Candidate: 1 of 2 Period: 0.504 d



DV Fit Results:

Period = 0.50438 [0.00001] d
 Epoch = 131.7493 [0.0012] BKJD
 Rp/R* = 0.0089 [0.0019]
 a/R* = 2.24 [2.11]
 b = 0.70 [0.87]
 Seff = 30855.72 [11716.83]
 Teq = 3380 [321] K
 Rp = 1.74 [0.64] Re
 a = 0.0141 [0.0034] AU
 Ag = 1.88 [1.05] [0.84σ]
 Teffp = 6117 [720] K [3.47σ]

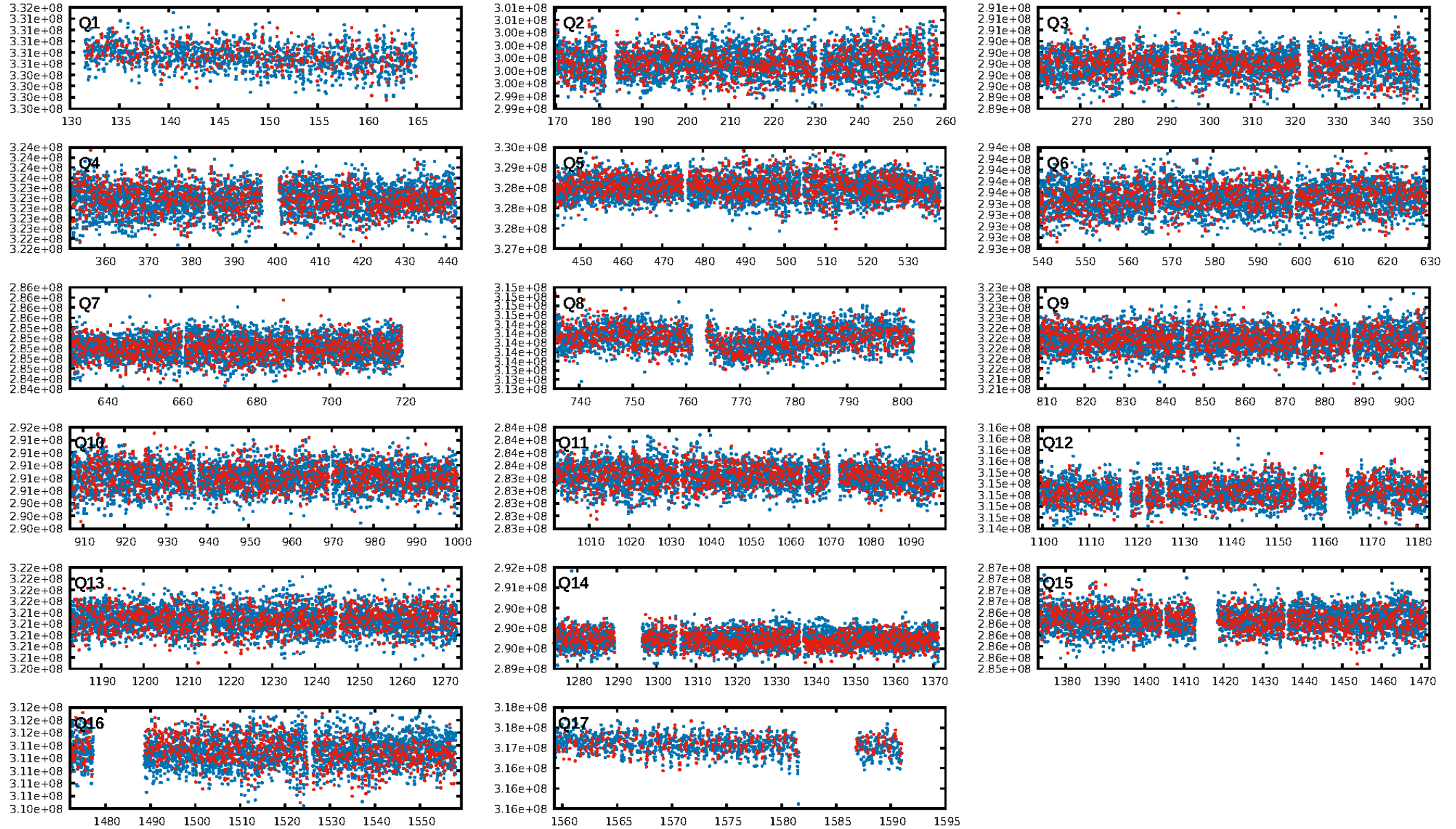
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
 LongPeriod-sig: N/A
 ModelChiSquare2-sig: N/A
 ModelChiSquareGof-sig: N/A
 Bootstrap-pfa: 2.83e-34
 RollingBand-fgt: 0.93 [2355/2528]
 GhostDiagnostic-chr: 3.502
 Centroid-sig: 4.5%
 Centroid-so: 0.565 arcsec [2.77σ]
 OotOffset-rm: 0.391 arcsec [2.26σ]
 KicOffset-rm: 0.536 arcsec [2.99σ]
 OotOffset-st: 4/4/4/5 [17]
 KicOffset-st: 4/4/4/5 [17]
 DiffImageQuality-fgm: 0.82 [14/17]
 DiffImageOverlap-fno: 0.00 [0/17]

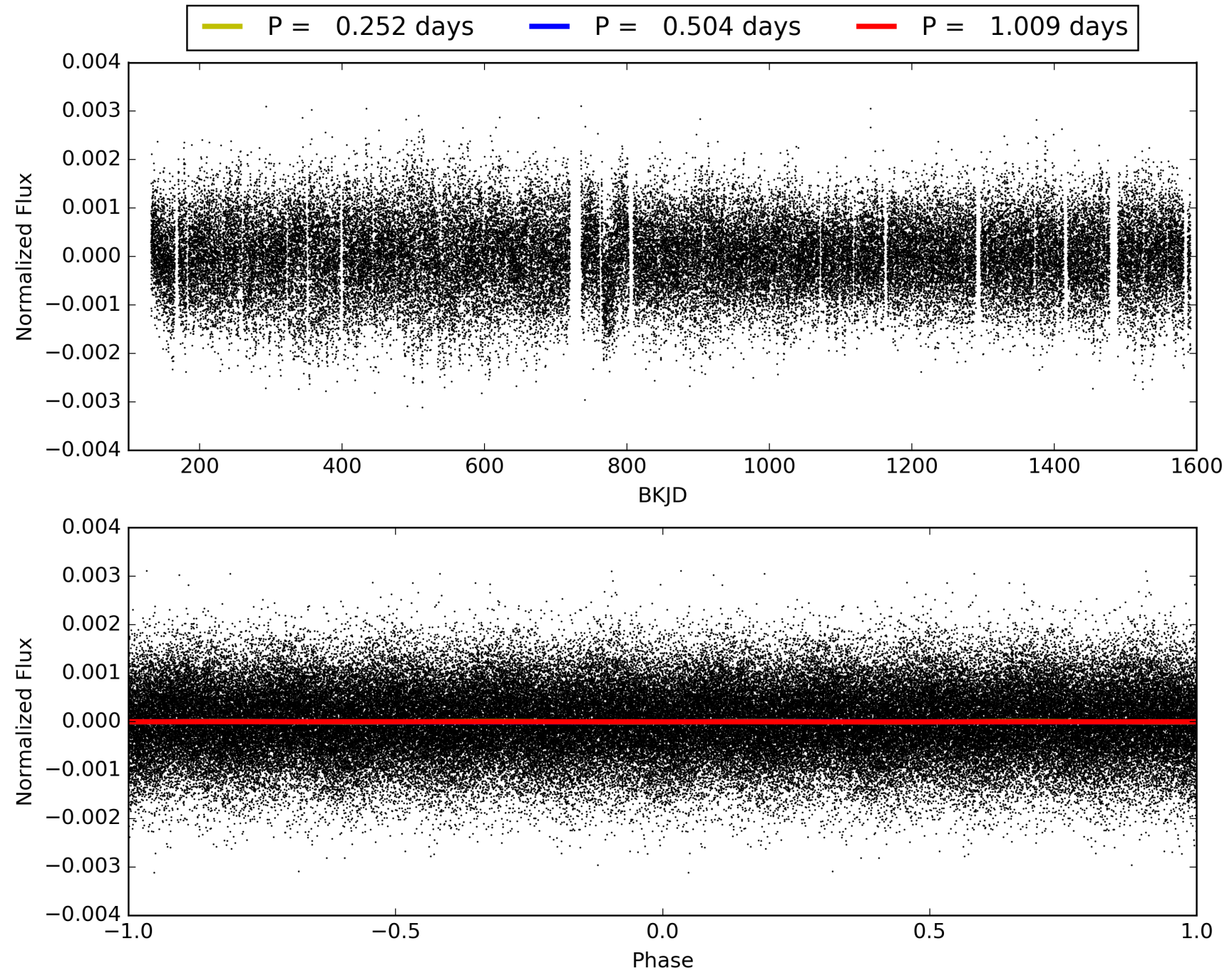
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 12:20:16 Z

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

TCE 006470232-01, PDC Light Curves

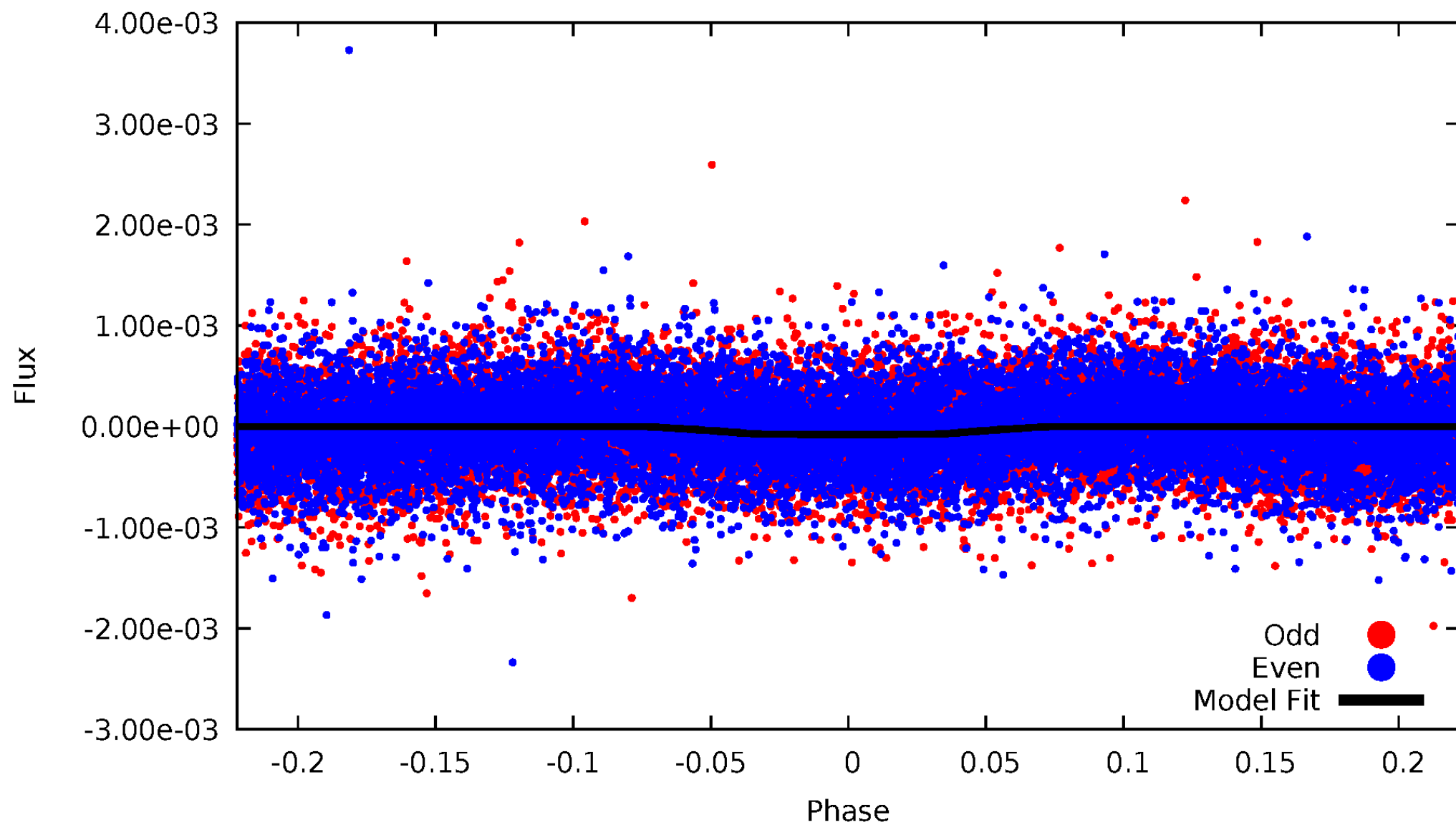


TCE 006470232-01



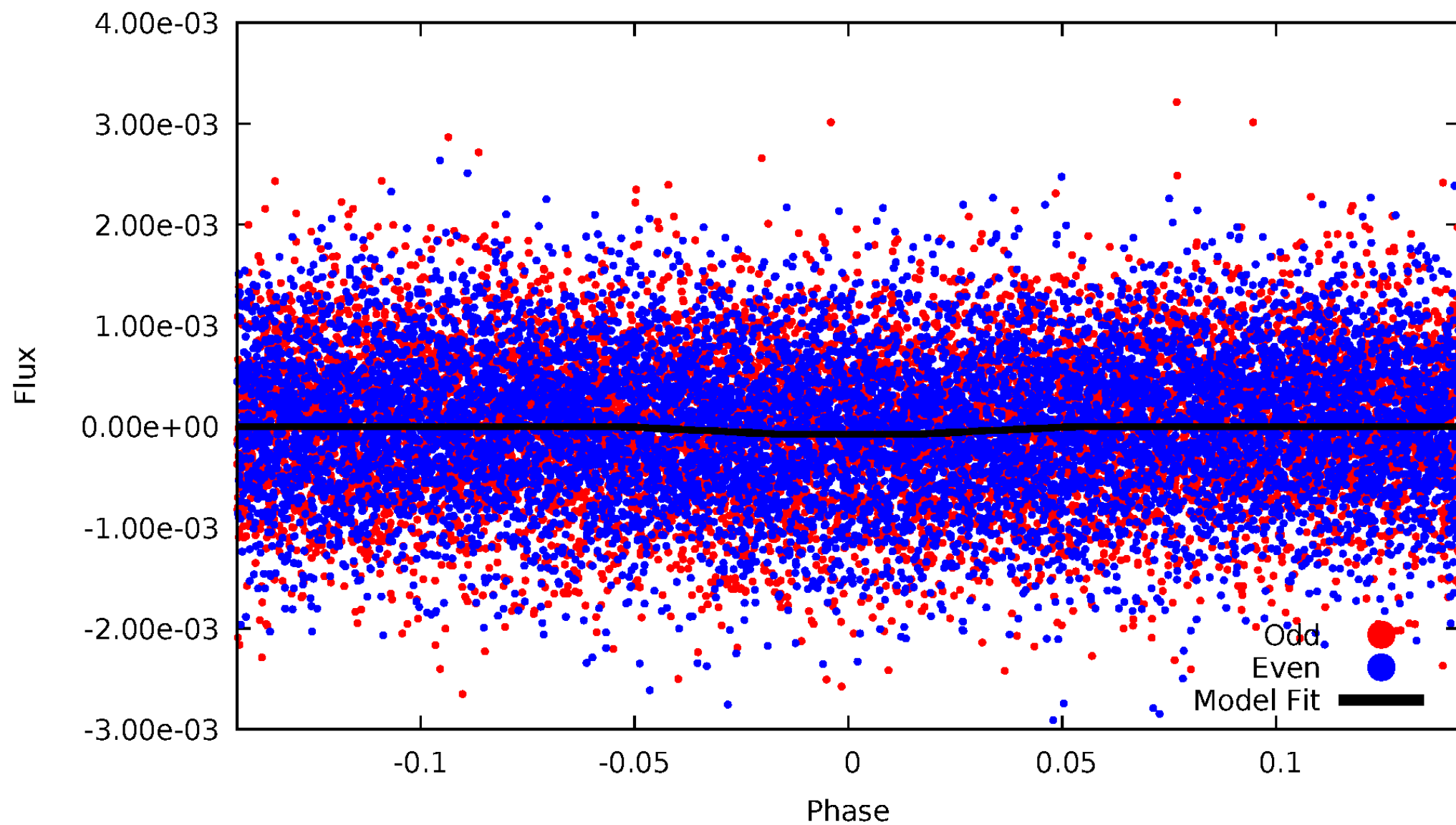
DV Odd/Even

TCE 006470232-01



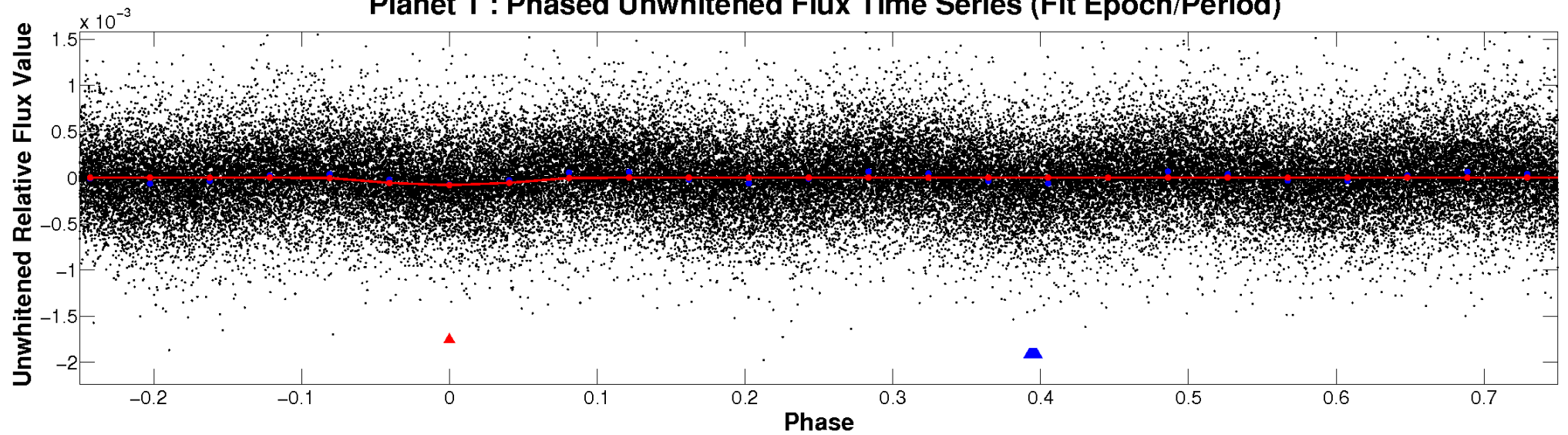
ALT Odd/Even

TCE 006470232-01

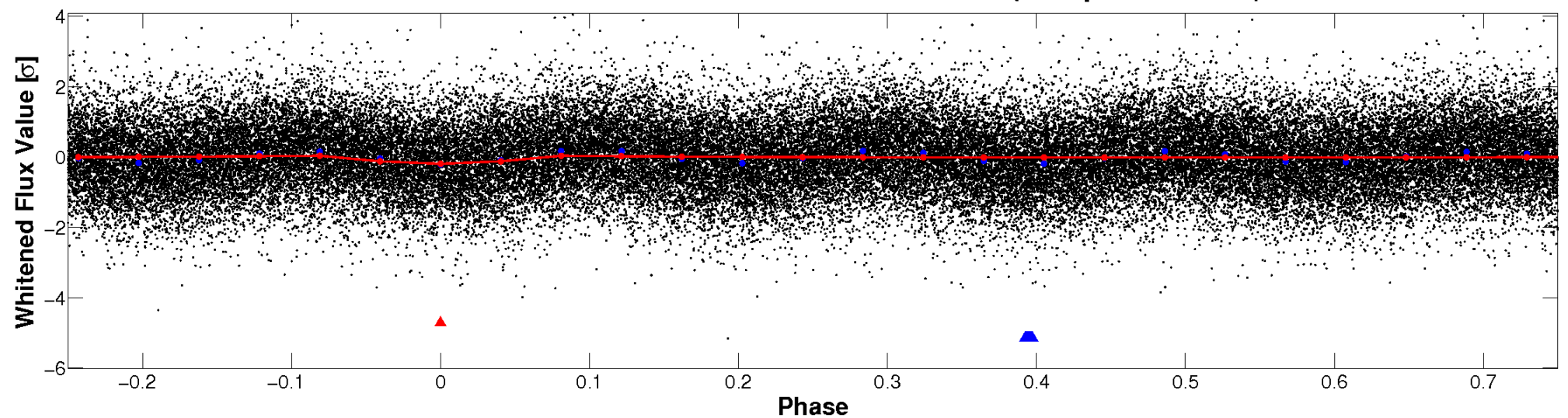


Non-Whitened Vs. Whitened Light Curve

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

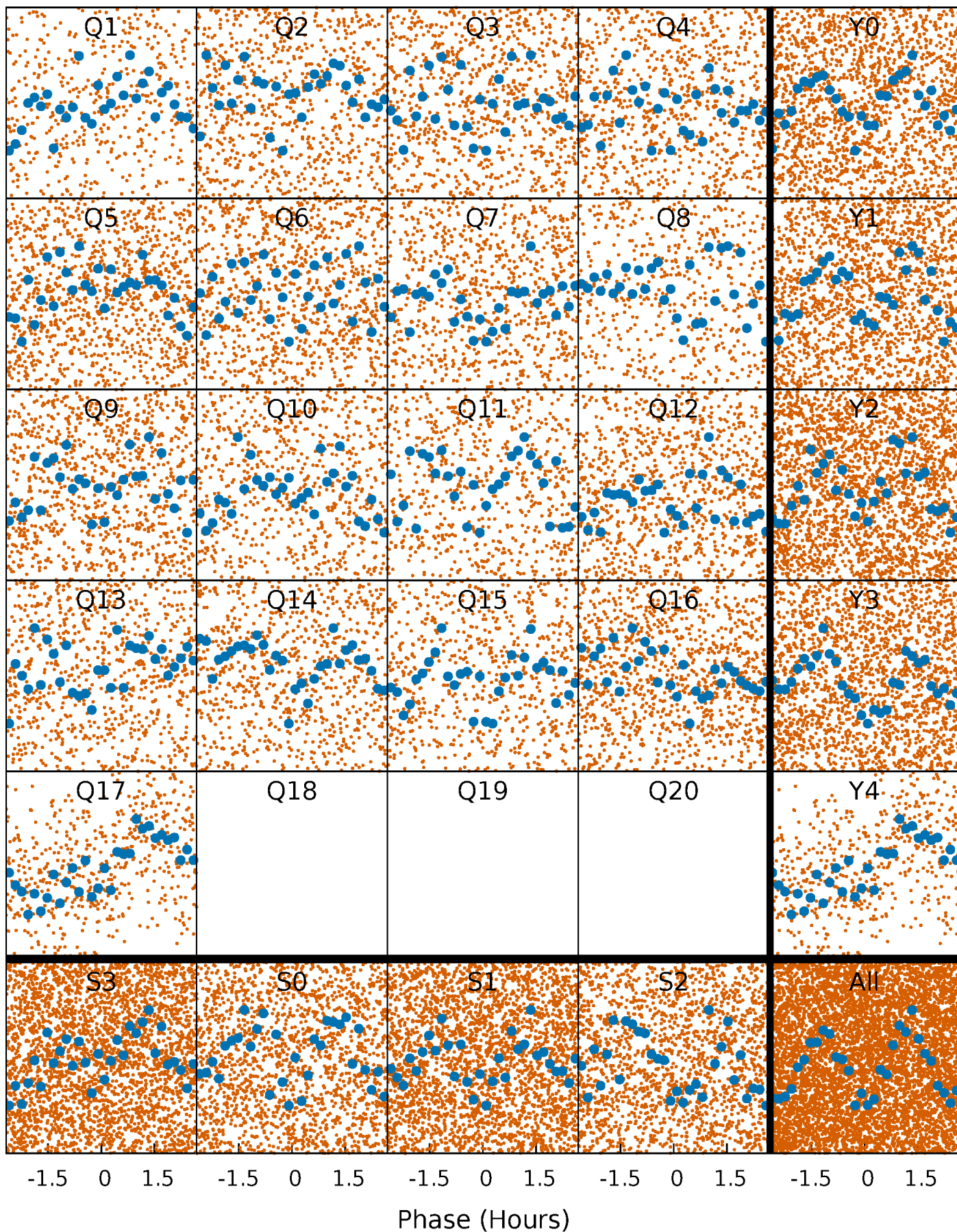


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



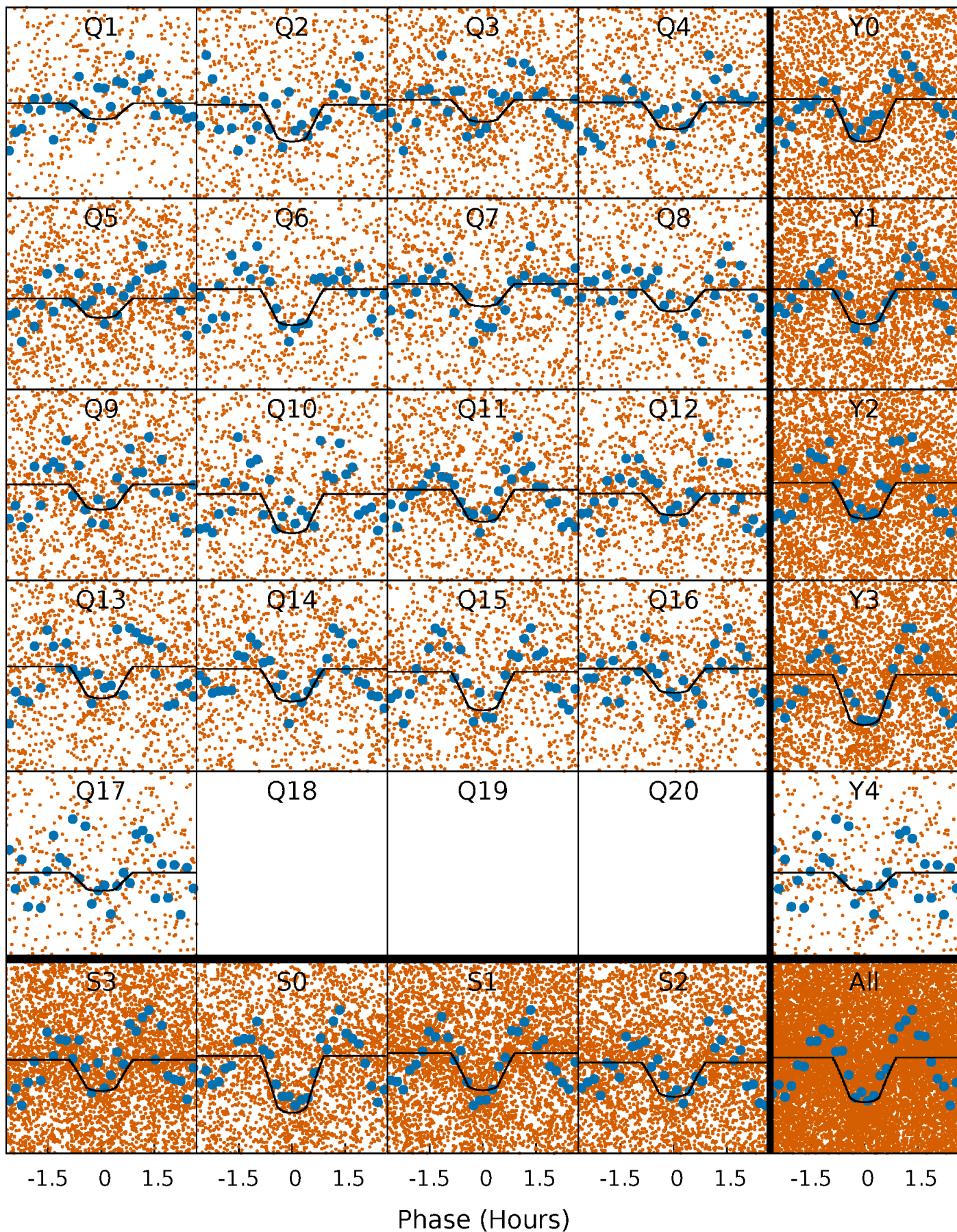
PDC Quarter-Phased Transit Curves

TCE 006470232-01 P= 0.504378 Days $T_0=131.749291$ (BKJD)



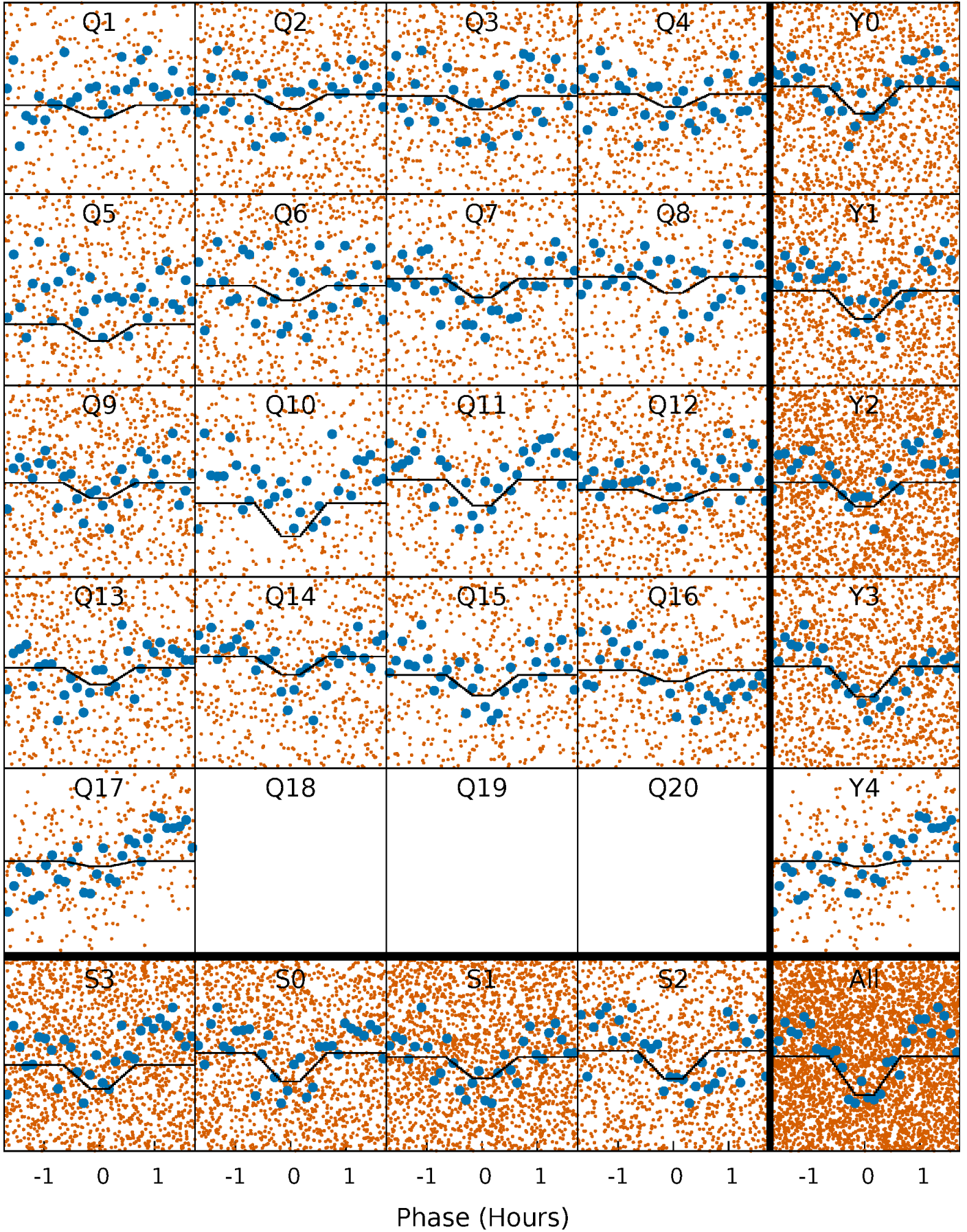
DV Quarter-Phased Transit Curves

TCE 006470232-01 P= 0.504378 Days $T_0=131.749291$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

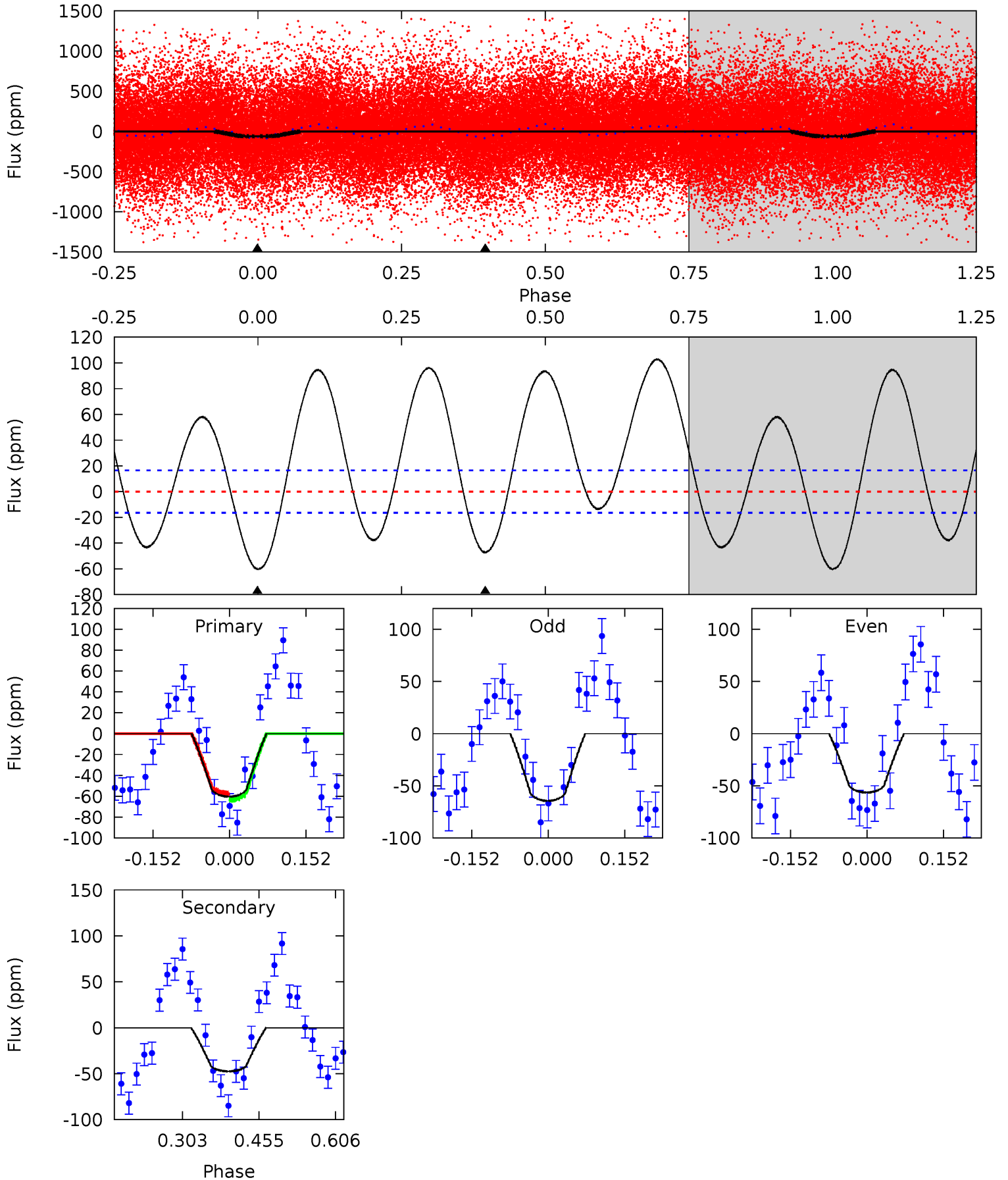
TCE 006470232-01 P= 0.504378 Days $T_0=131.749291$ (BKJD)



DV Model-Shift Uniqueness Test

006470232-01, P = 0.504378 Days, E = 131.244913 Days

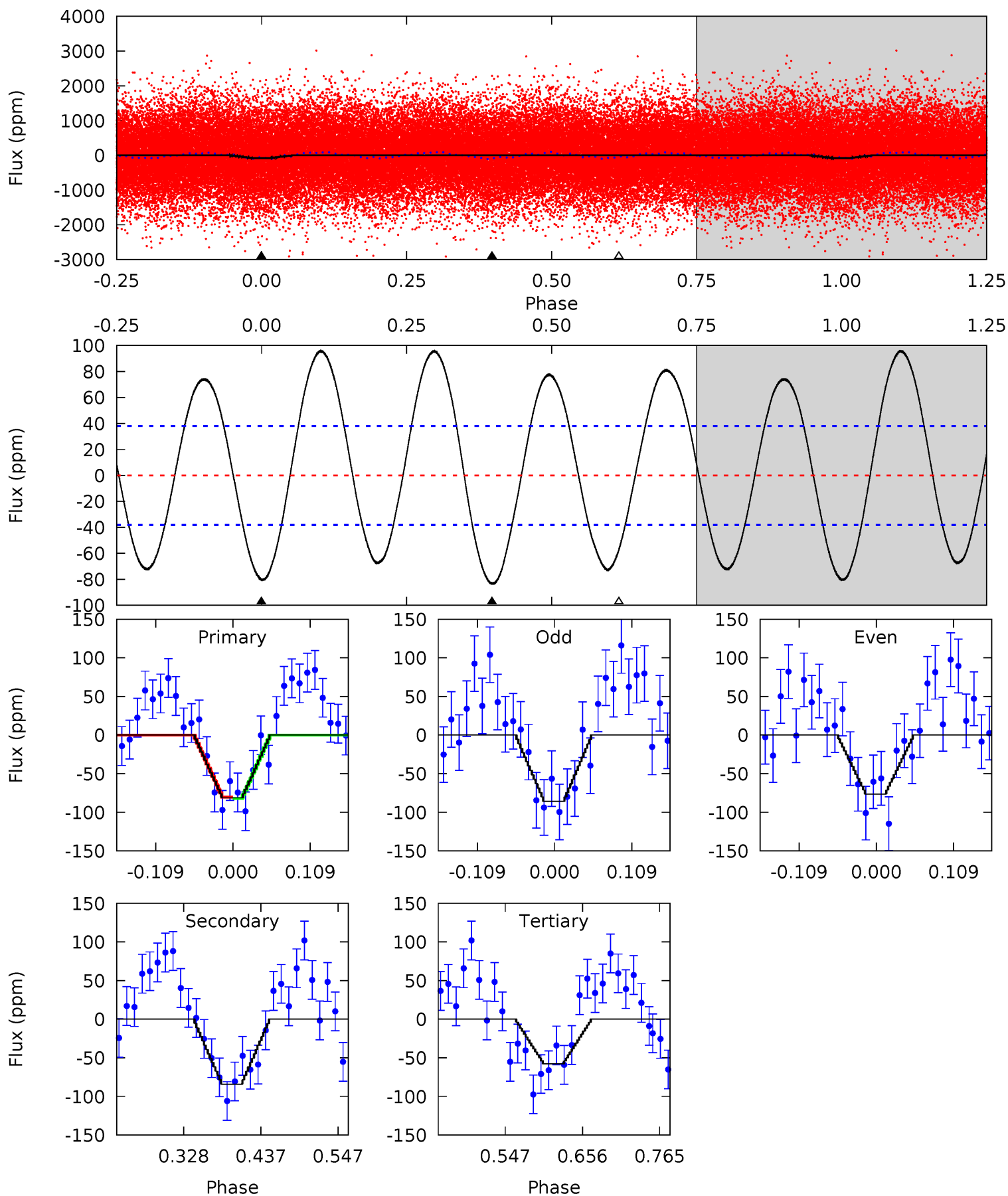
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.4	12.9	0	0	4.48	1.43	12.2	16.4	16.4	12.9	12.9	1.10	0.92	0.63	0.75



Alt Model-Shift Uniqueness Test

006470232-01, P = 0.504378 Days, E = 131.244913 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.72	10.1	6.92	0	4.55	1.60	6.32	2.80	9.72	3.15	10.1	0.57	1.59	0.53	0.10



Stellar Parameters For KIC 006470232

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6826^{+189}_{-283}	$4.107^{+0.180}_{-0.180}$	$0.080^{+0.200}_{-0.350}$	$1.779^{+0.536}_{-0.390}$	$1.477^{+0.196}_{-0.269}$	$0.370^{+0.353}_{-0.179}$
	+3%/-4%	+4%/-4%	+250%/-438%	+30%/-22%	+13%/-18%	+95%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 006470232-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-47 ± 4	$1.71^{+0.48}_{-0.38}$	4708^{+345}_{-332}	5652^{+774}_{-648}	$1.724^{+1.118}_{-0.663}$
Alt.	-84 ± 8	$1.70^{+0.49}_{-0.38}$	4693^{+367}_{-333}	6728^{+1098}_{-795}	$3.067^{+2.316}_{-1.089}$

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 $A_{obs} \gg 1.0$

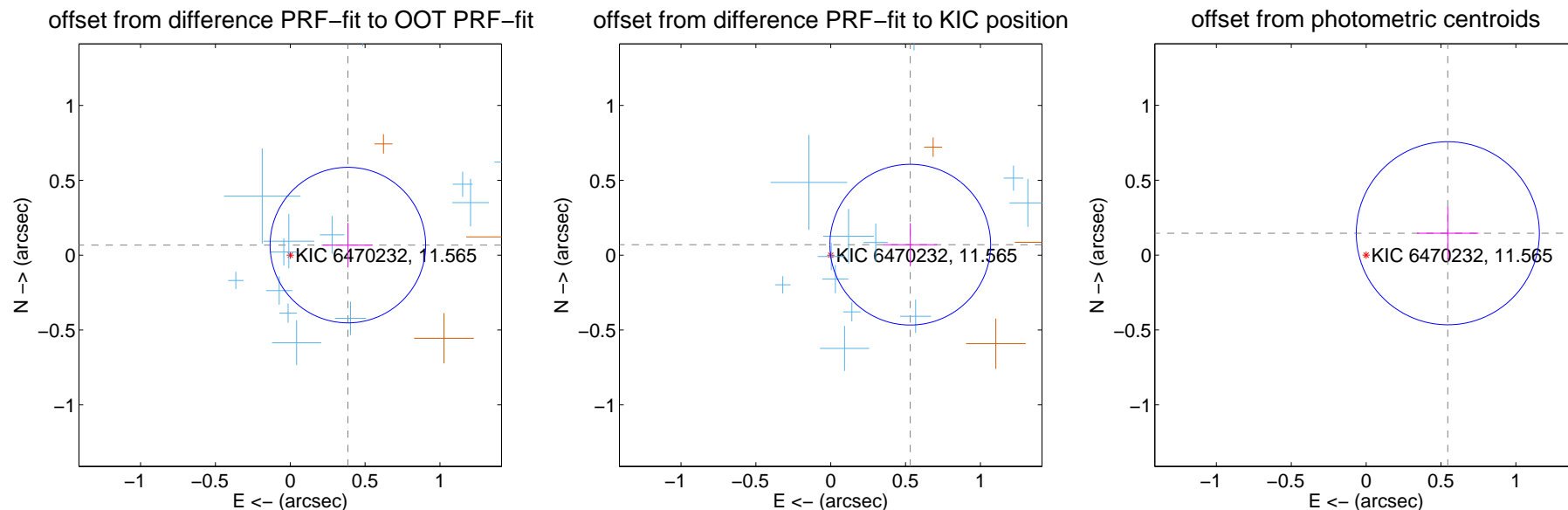
DV Centroid Data

Supplemental centroid analysis for 006470232-01. **Kepler magnitude: 11.56.** Transit SNR 14.22

There are 14 quarters with good PRF difference image offsets

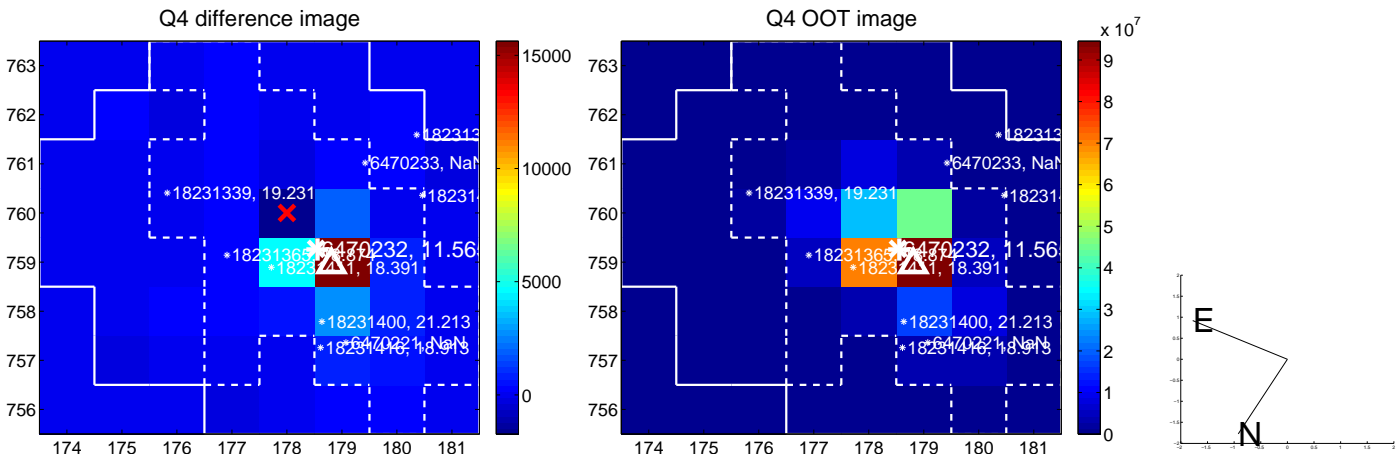
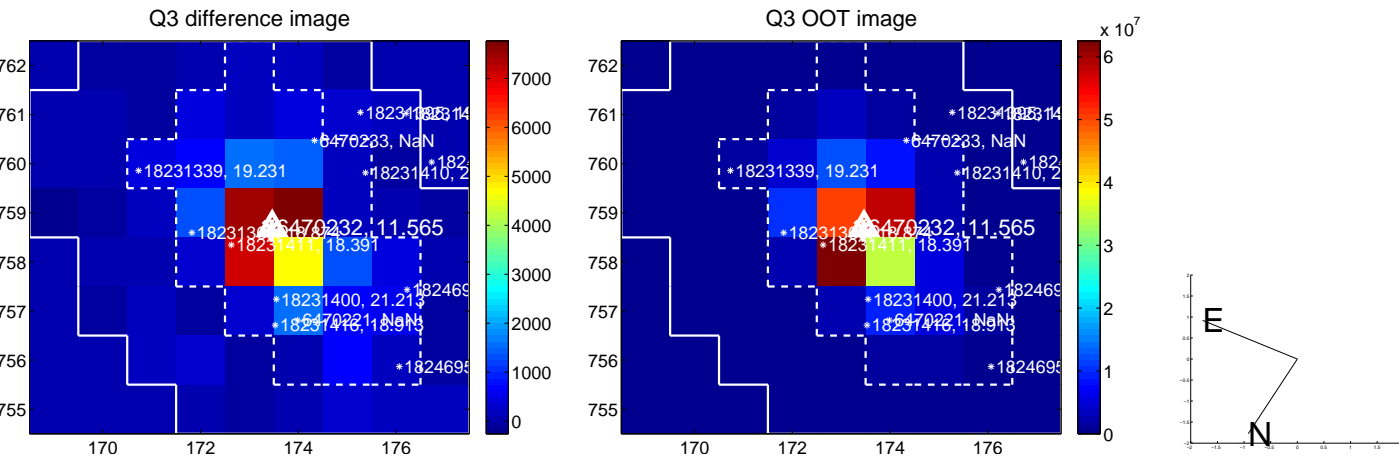
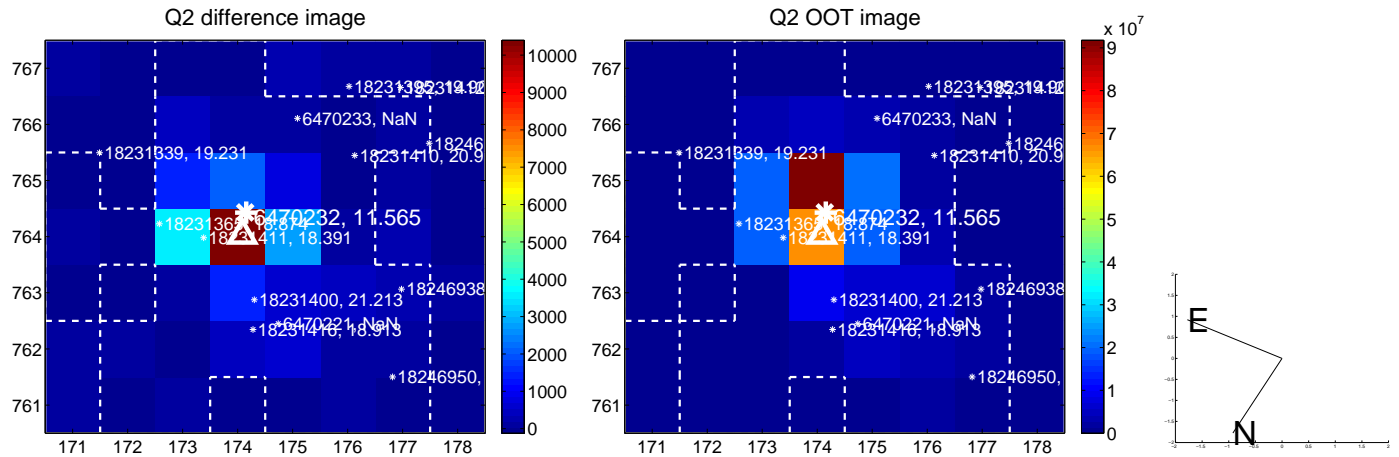
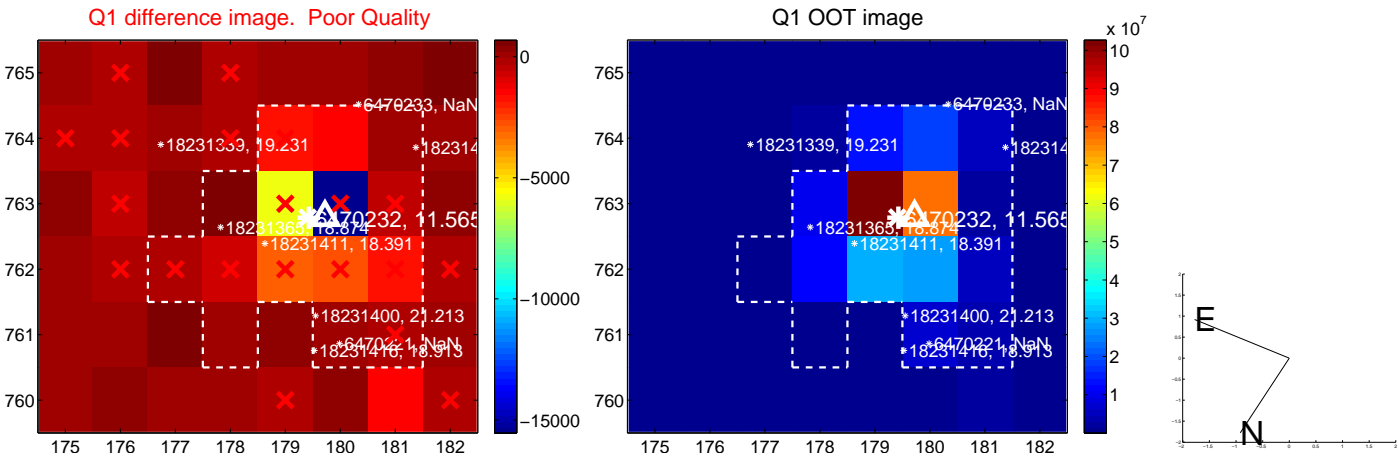
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.391 ± 0.173	2.26	-0.385 ± 0.166	0.067 ± 0.148
PRF-fit source offset from KIC position	0.536 ± 0.179	2.99	-0.531 ± 0.179	0.070 ± 0.144
photometric centroid source offset	0.56 ± 0.20	2.77	-0.55 ± 0.21	0.15 ± 0.18

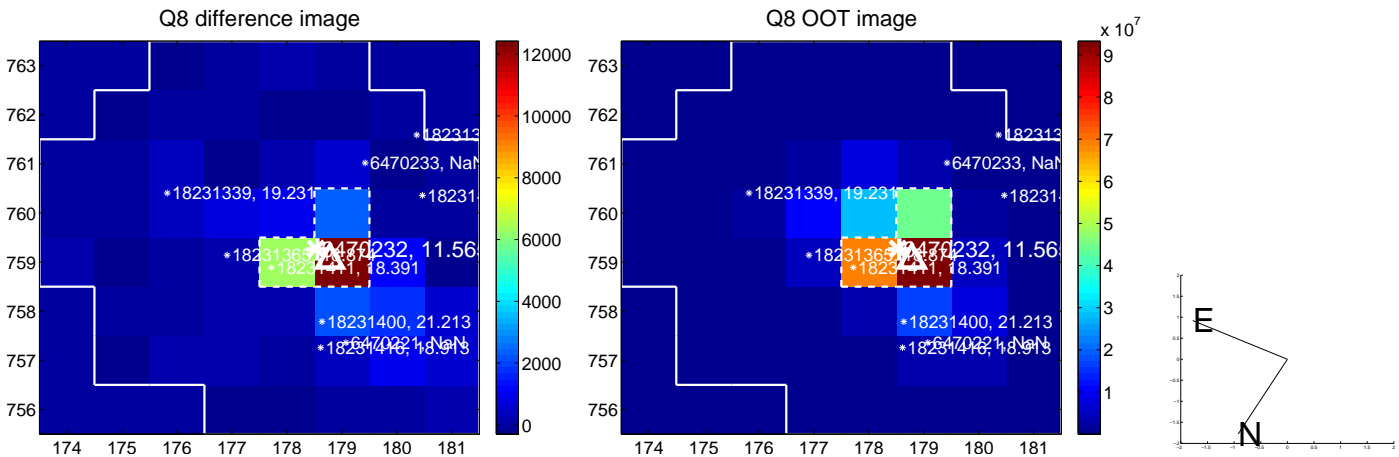
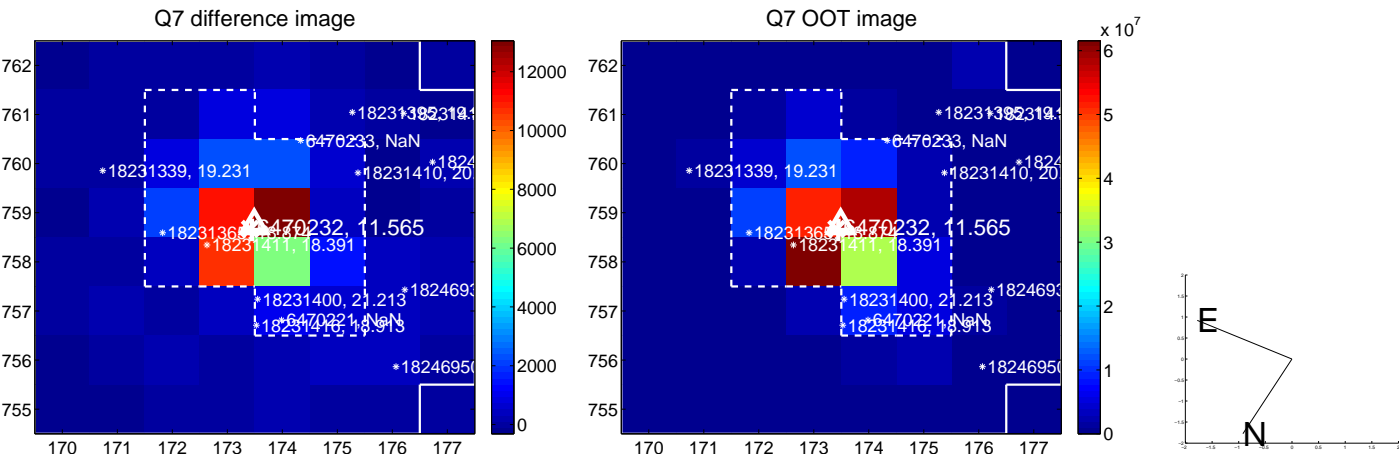
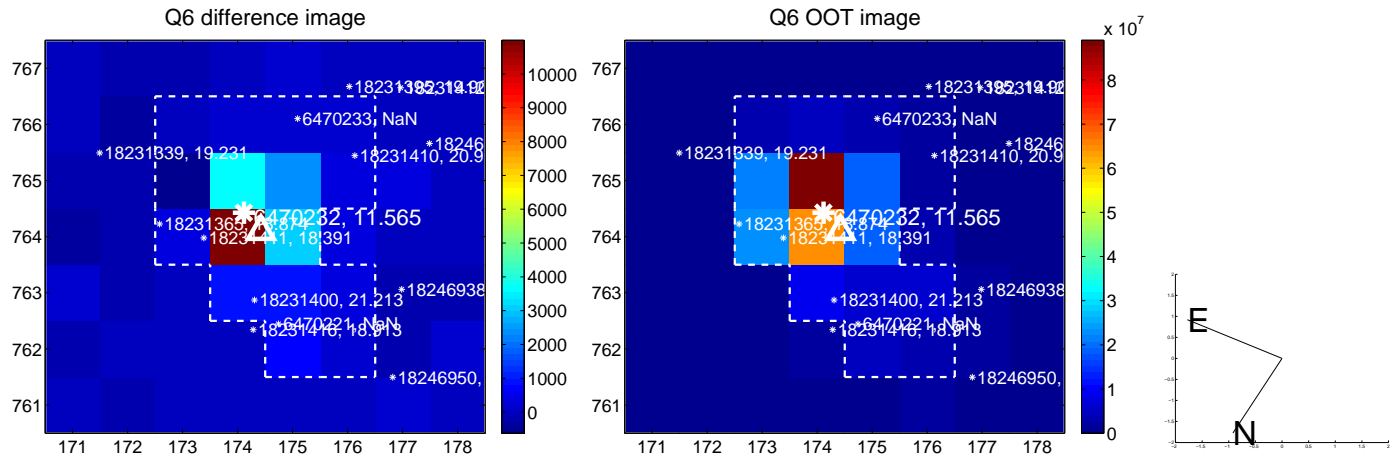
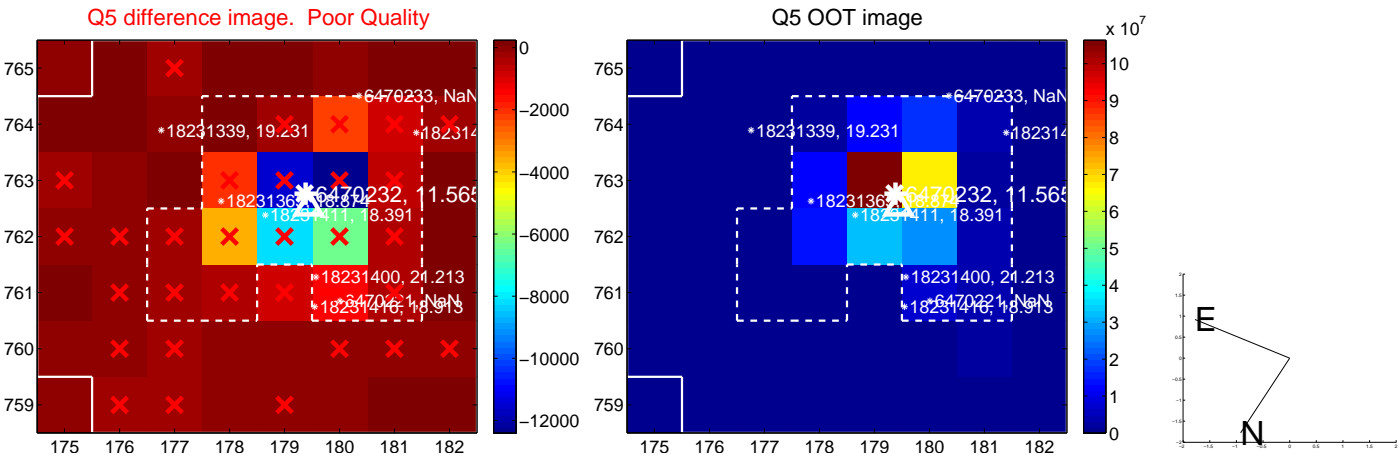


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

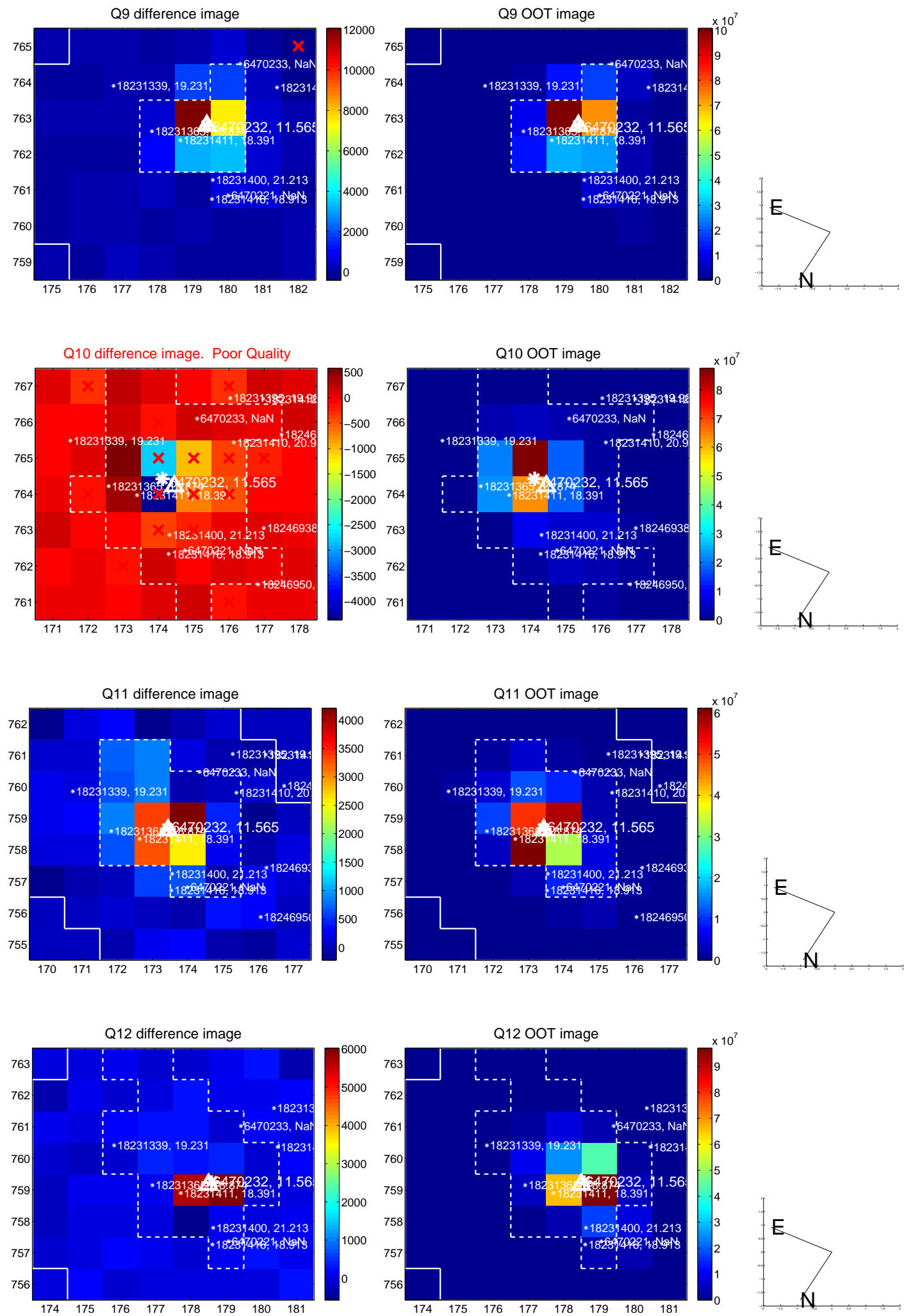
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



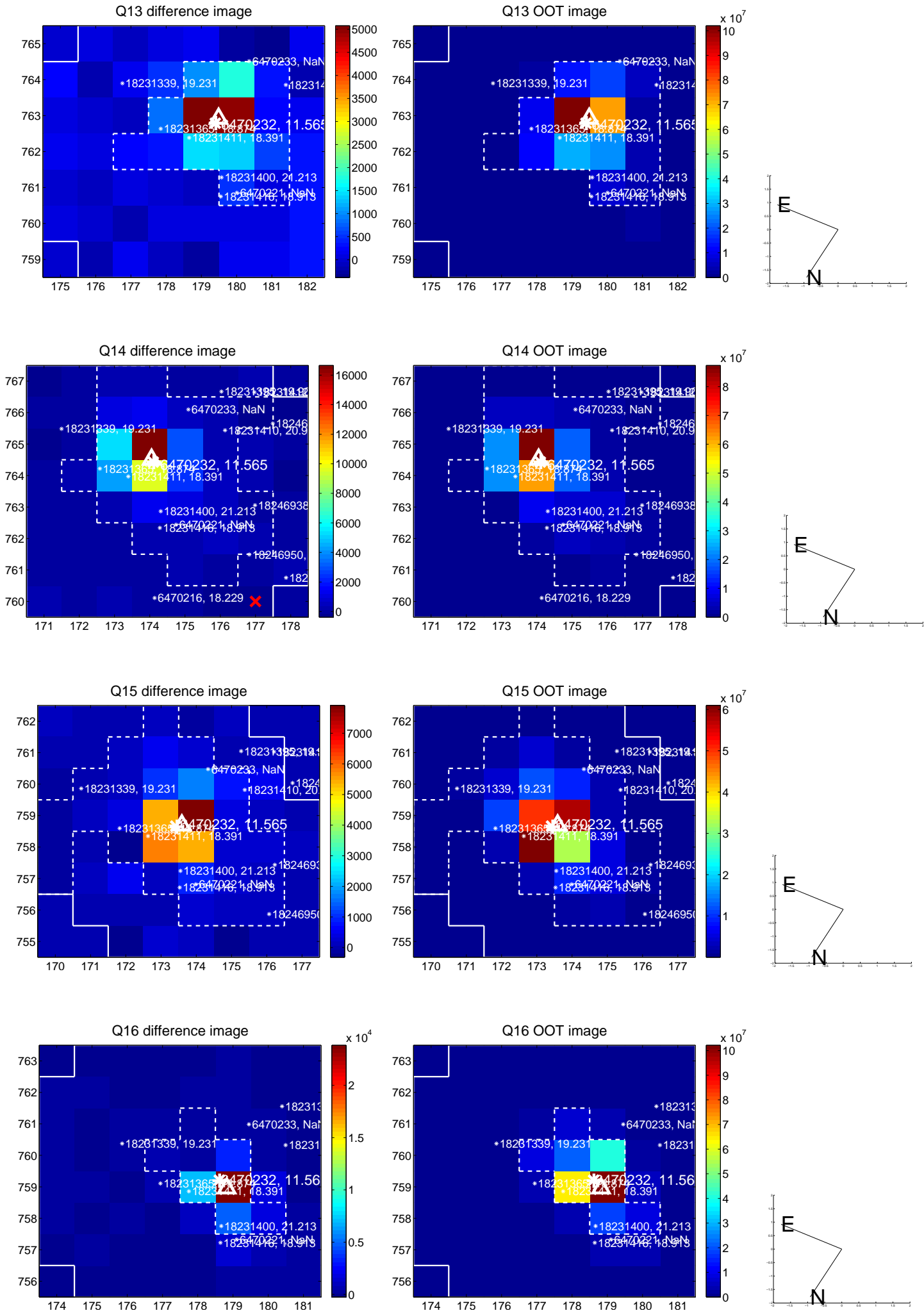
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



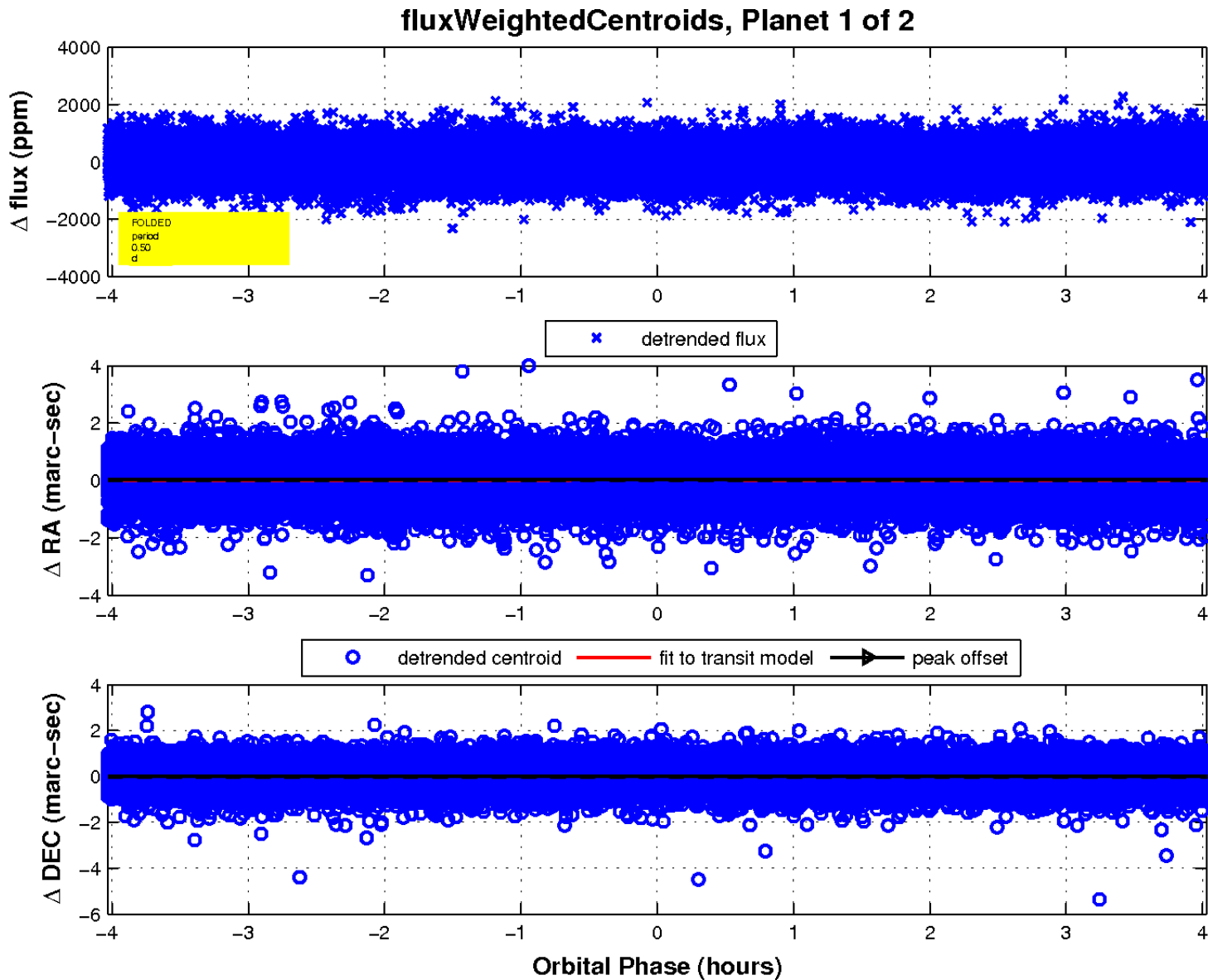
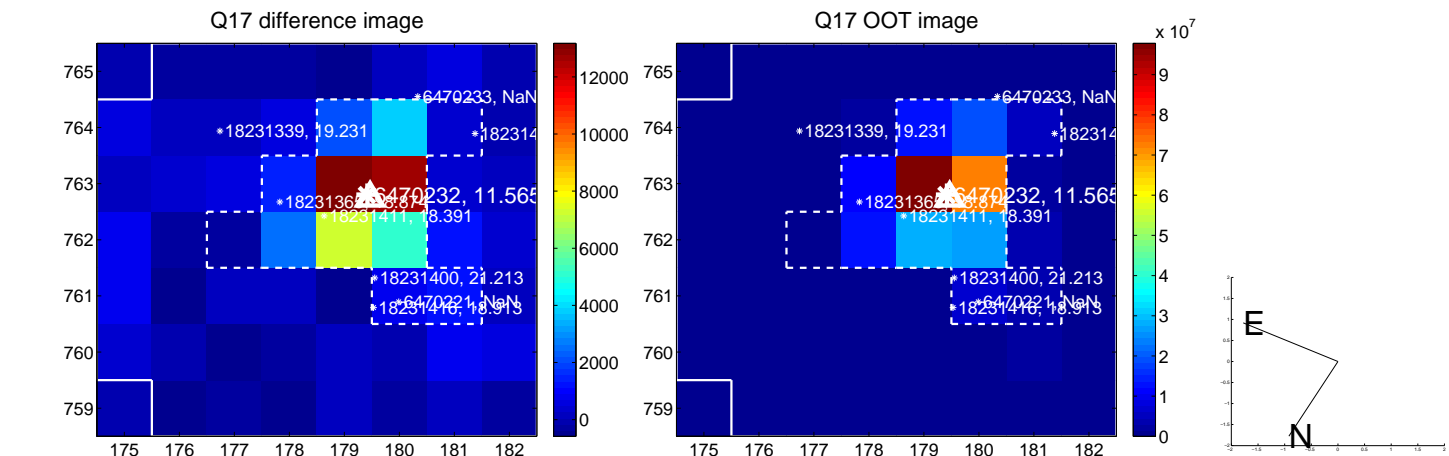
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

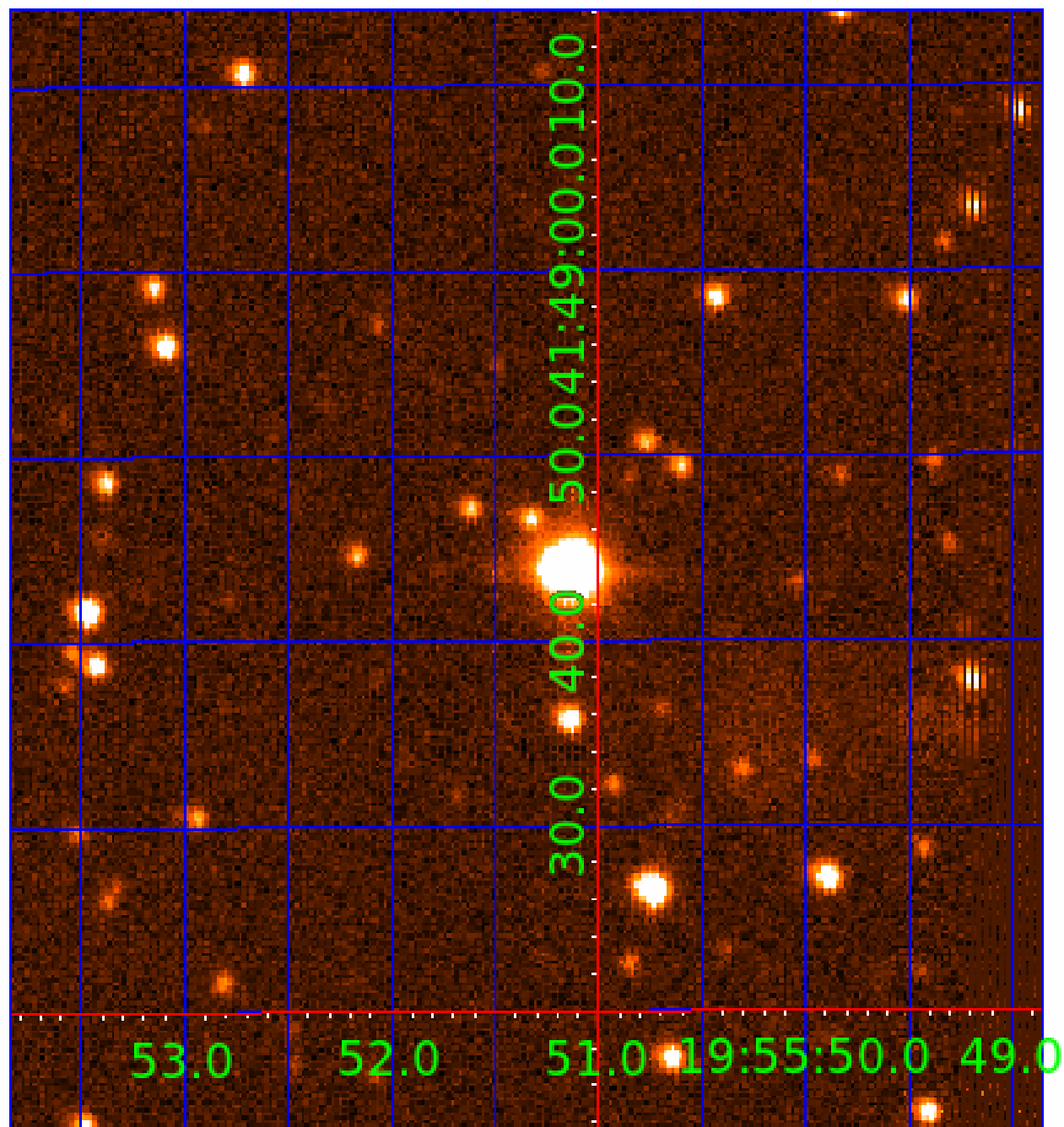


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 006470232

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})
006470232-01	OBS	No	0.504378	131.749291	82.3	1.344	12.1	14.2	1.78	6826	1.74	30855.72
006470232-02	OBS	No	0.504377	131.949689	77.9	0.994	12.9	12.3	1.78	6826	1.84	30855.79

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006470232-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006470232-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

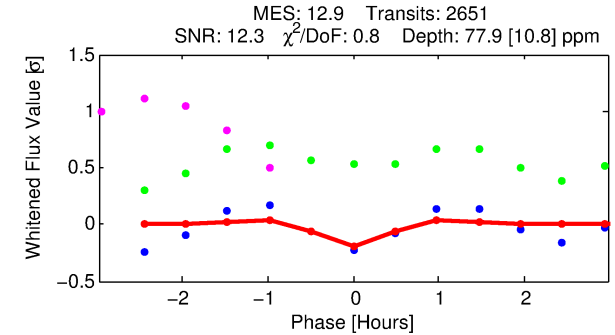
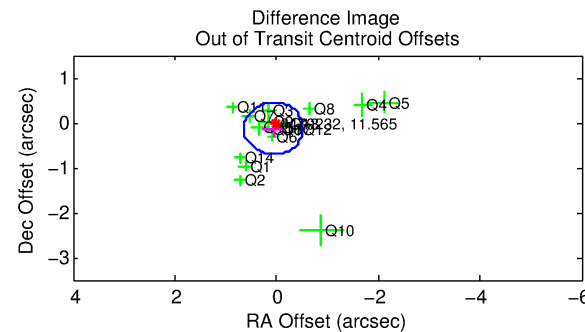
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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

Ephemeris Match Information For 006470232-02

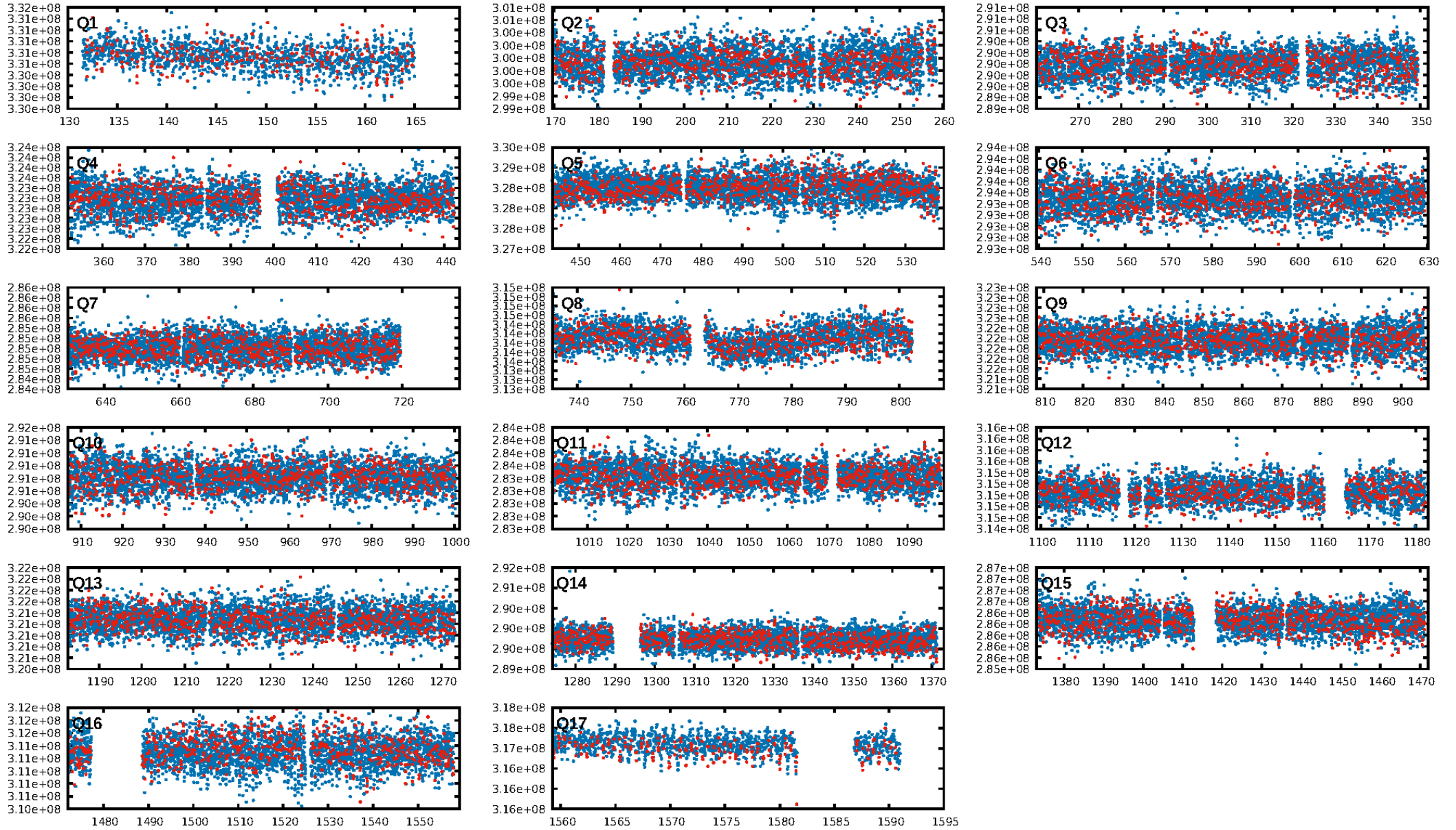
No Significant Match Found

KIC: 6470232 Candidate: 2 of 2 Period: 0.504 d

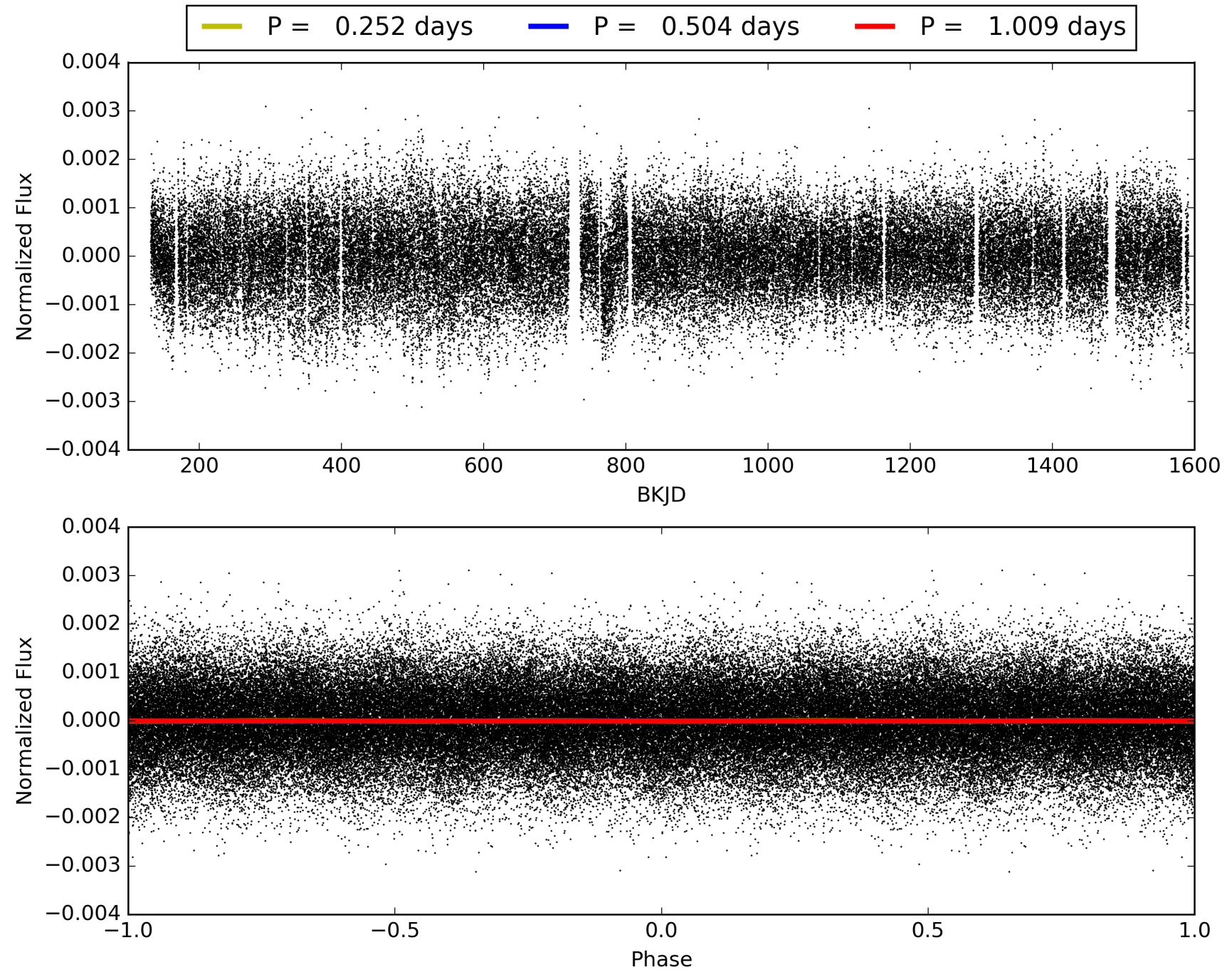


ShortPeriod-sig: N/A
 LongPeriod-sig: 0.0% [0.00s]
 ModelChiSquare2-sig: N/A
 ModelChiSquareGof-sig: N/A
 Bootstrap-pfa: 3.43e-38
 RollingBand-fgt: 0.93 [2348/2532]
 GhostDiagnostic-chr: 1.04
 Centroid-sig: 0.2%
 Centroid-so: 0.680 arcsec [2.78s]
 OotOffset-rm: 0.141 arcsec [0.73s]
 KicOffset-rm: 0.162 arcsec [0.87s]
 OotOffset-st: 4/4/4/5 [17]
 KicOffset-st: 4/4/4/5 [17]
 DiffImageQuality-fgm: 0.94 [16/17]
 DiffImageOverlap-fno: 0.00 [0/17]

TCE 006470232-02, PDC Light Curves

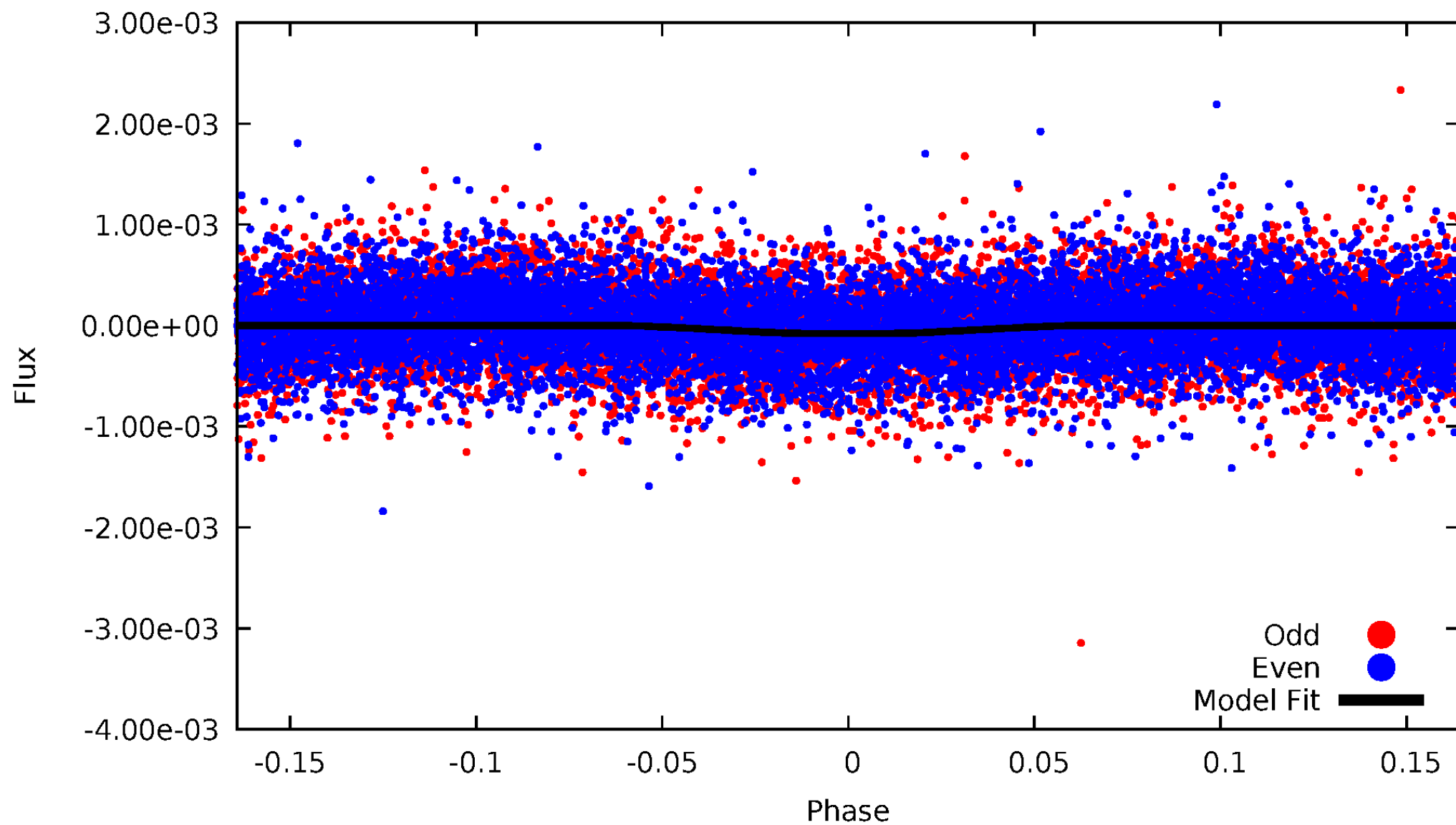


TCE 006470232-02



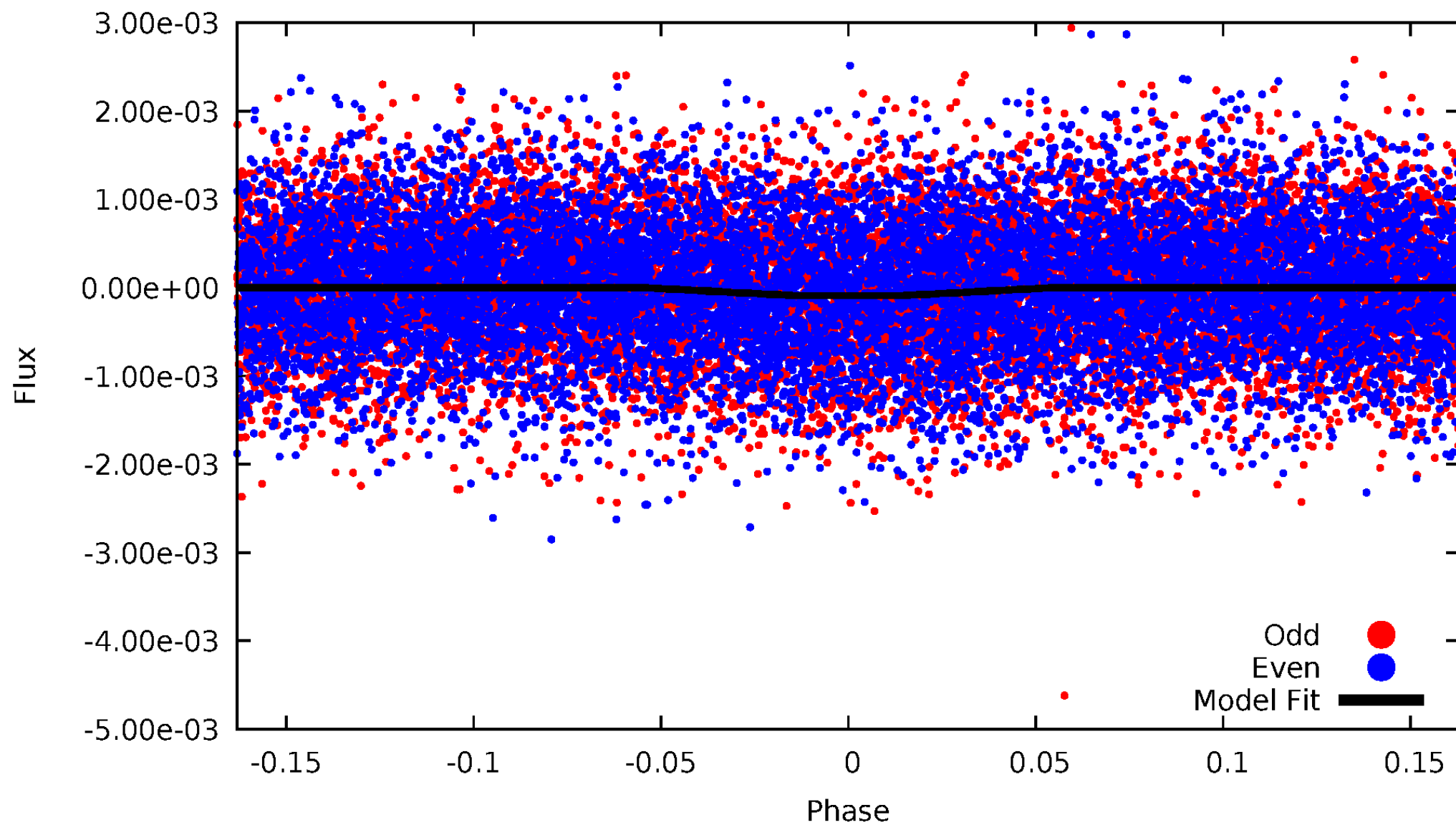
DV Odd/Even

TCE 006470232-02



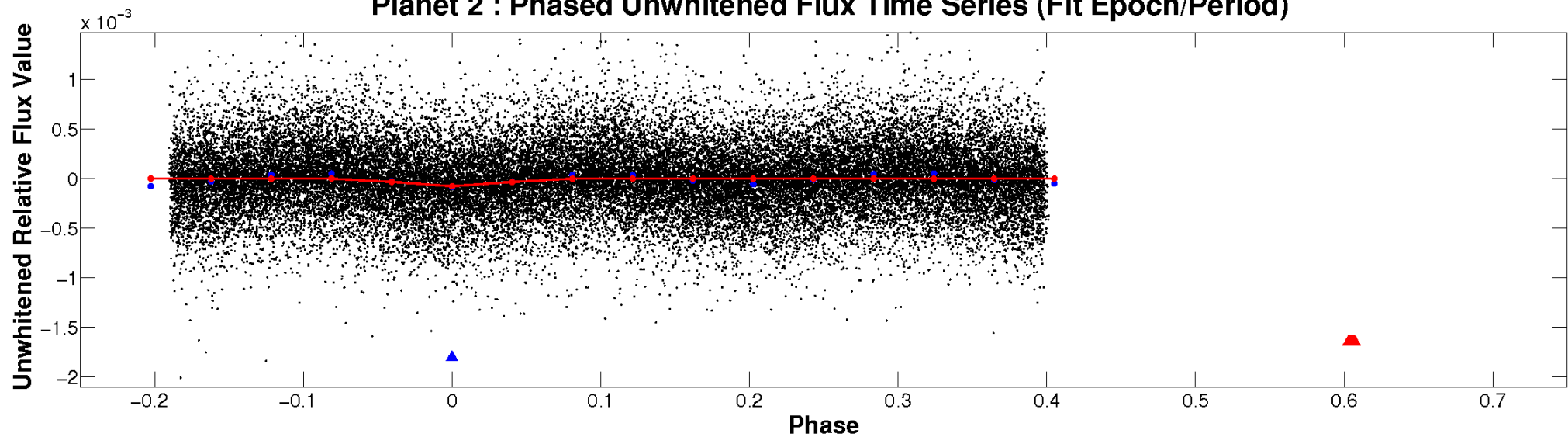
ALT Odd/Even

TCE 006470232-02

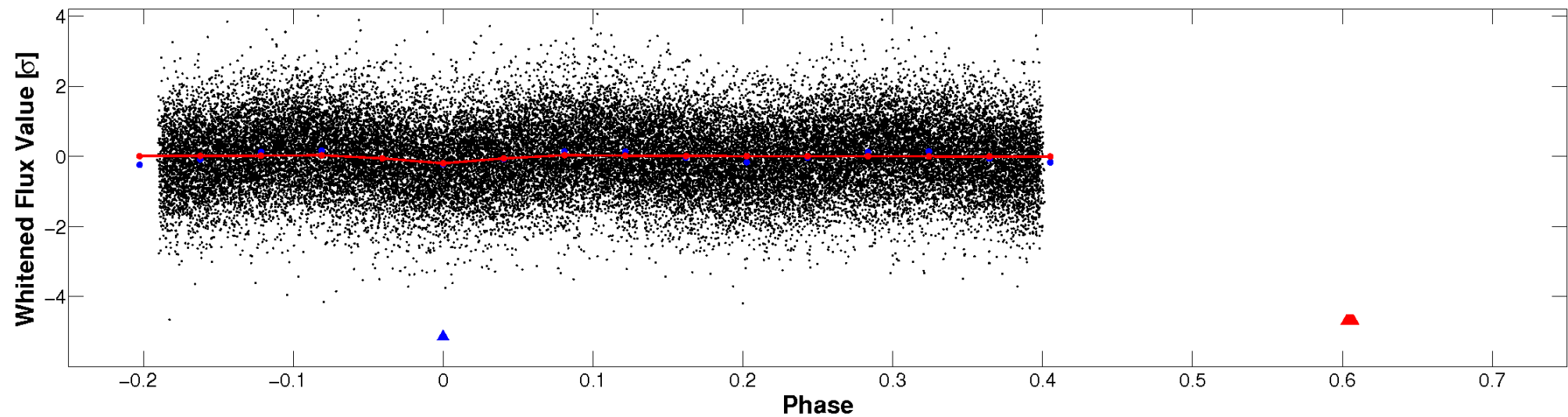


Non-Whitened Vs. Whitened Light Curve

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

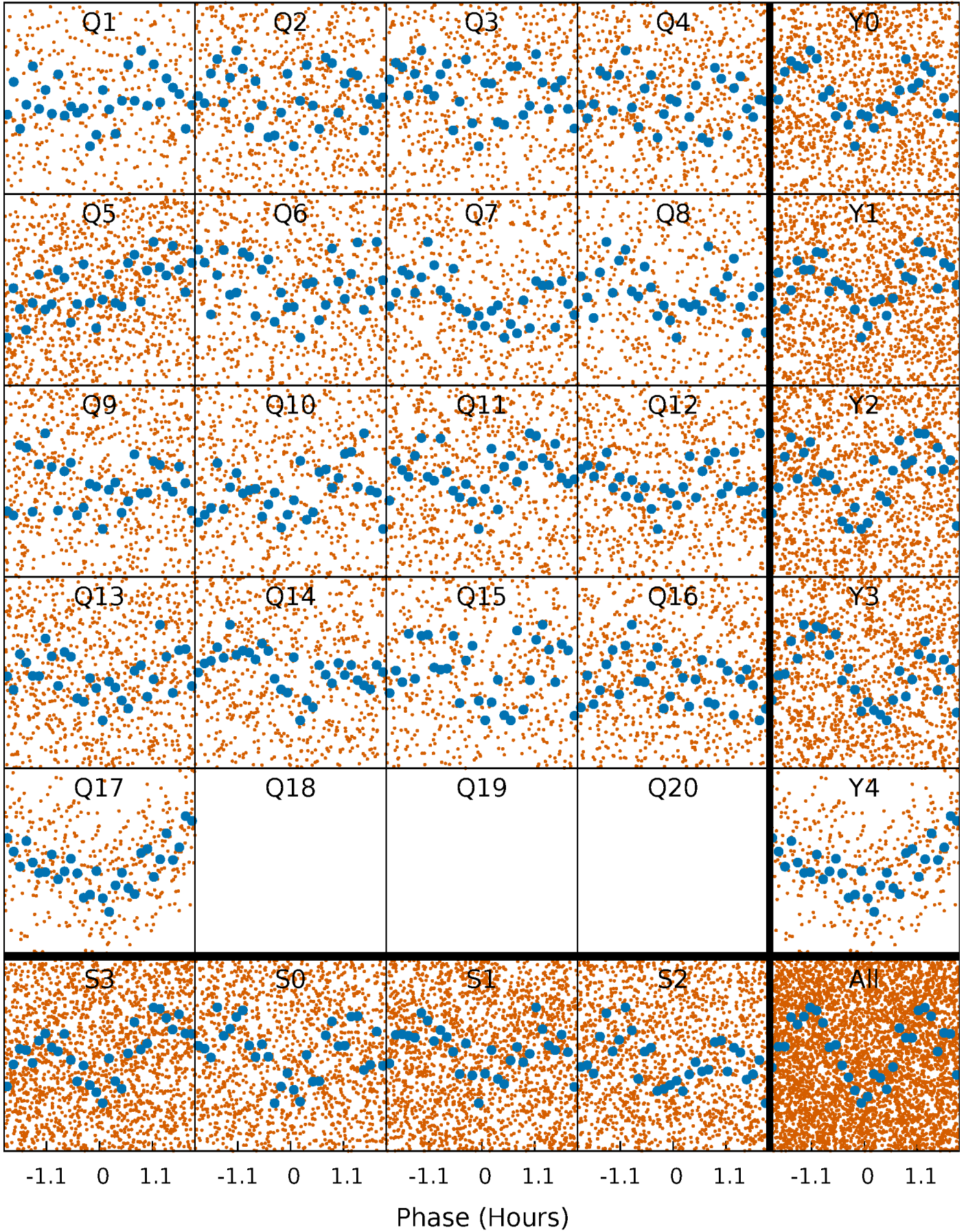


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



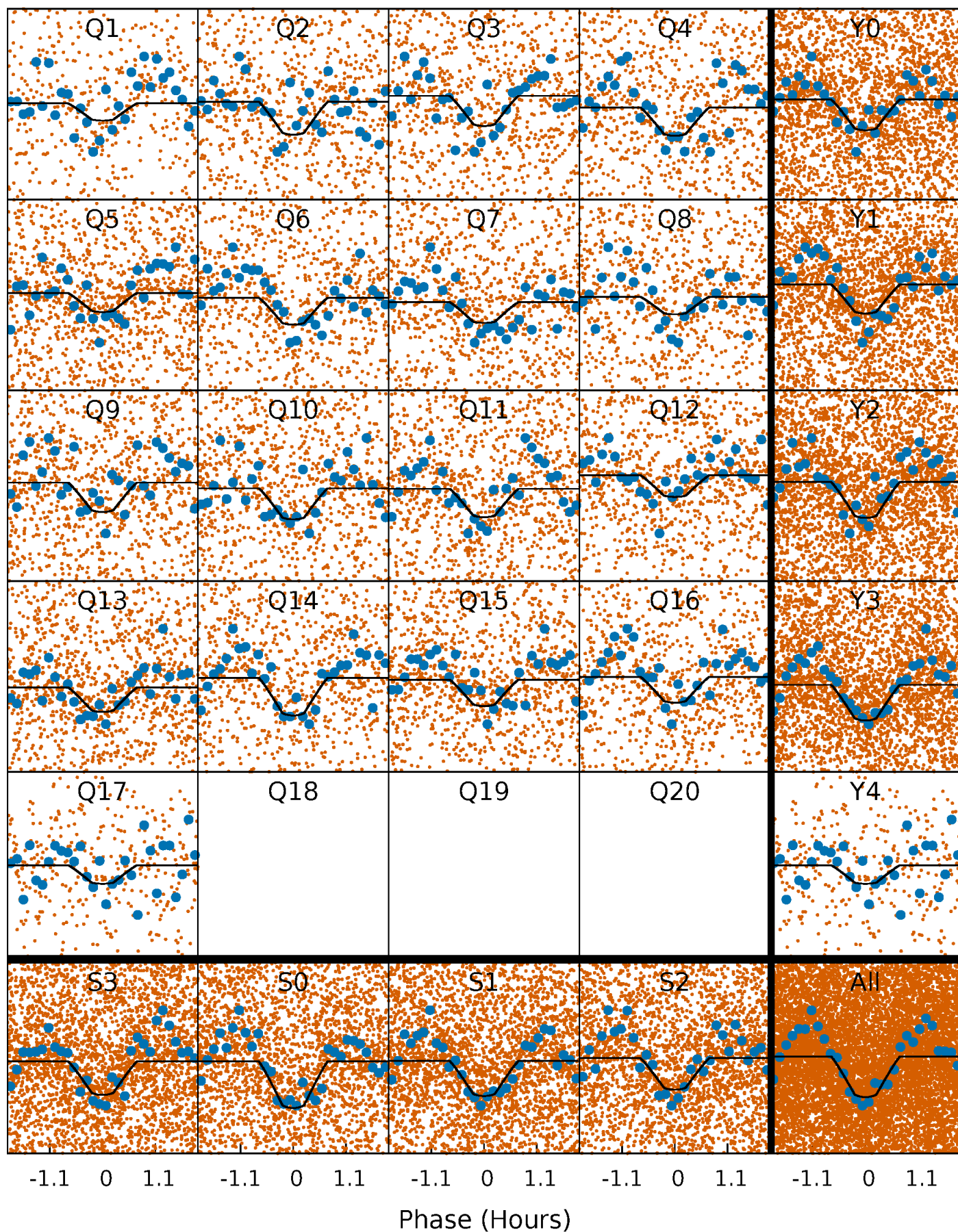
PDC Quarter-Phased Transit Curves

TCE 006470232-02 P= 0.504377 Days $T_0=131.949689$ (BKJD)



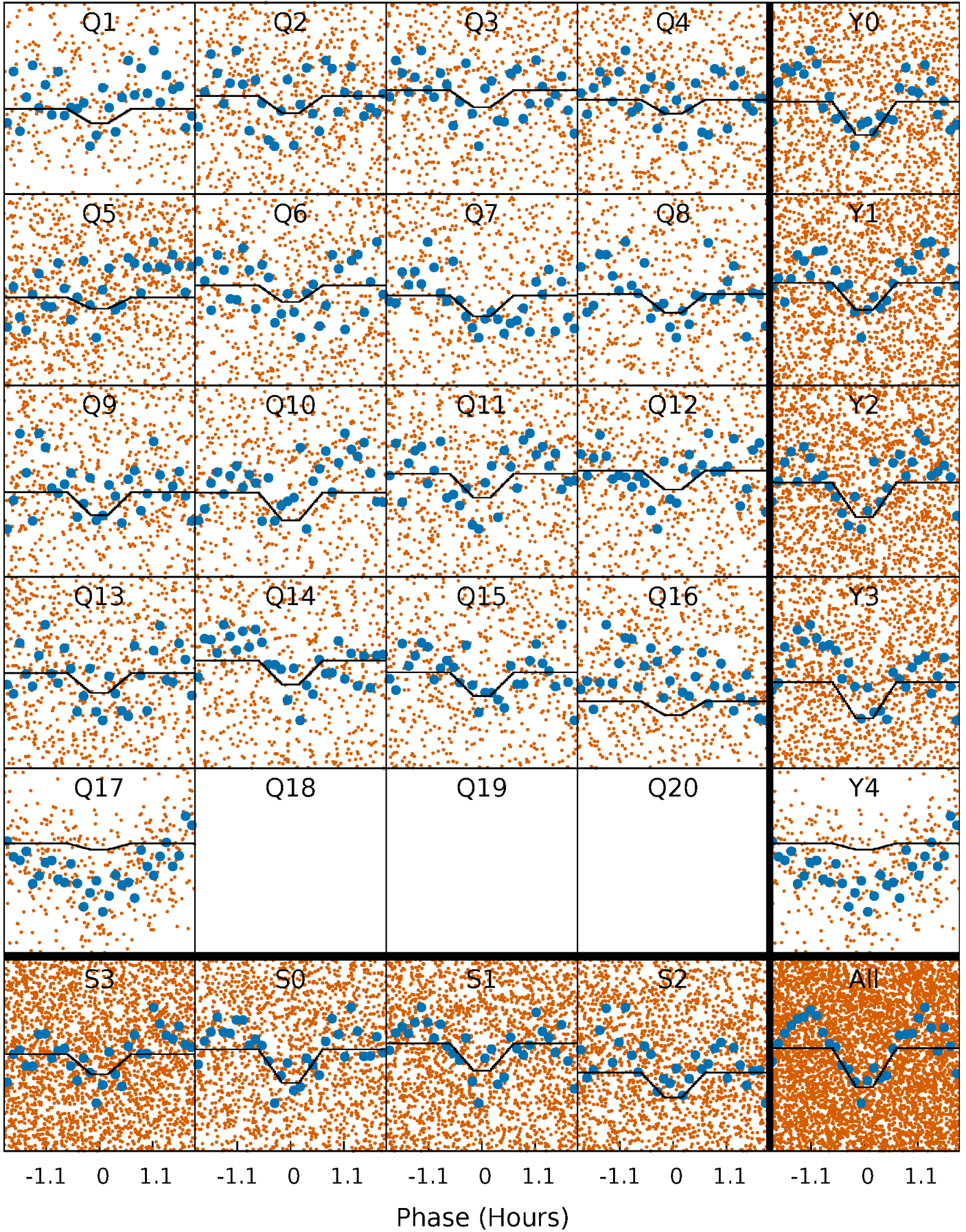
DV Quarter-Phased Transit Curves

TCE 006470232-02 $P = 0.504377$ Days $T_0 = 131.949689$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

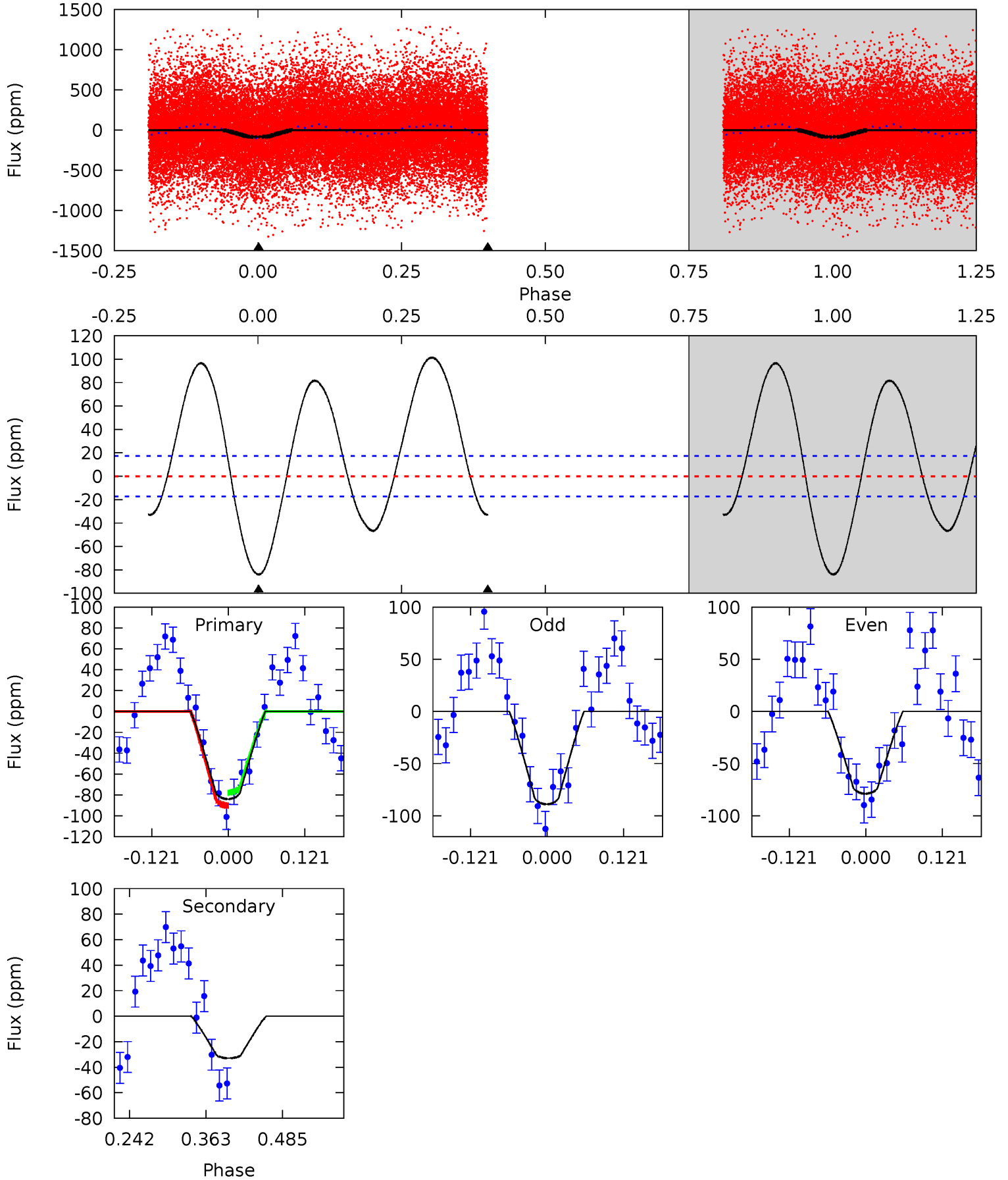
TCE 006470232-02 P= 0.504378 Days $T_0=131.949699$ (BKJD)



DV Model-Shift Uniqueness Test

006470232-02, P = 0.504377 Days, E = 131.445312 Days

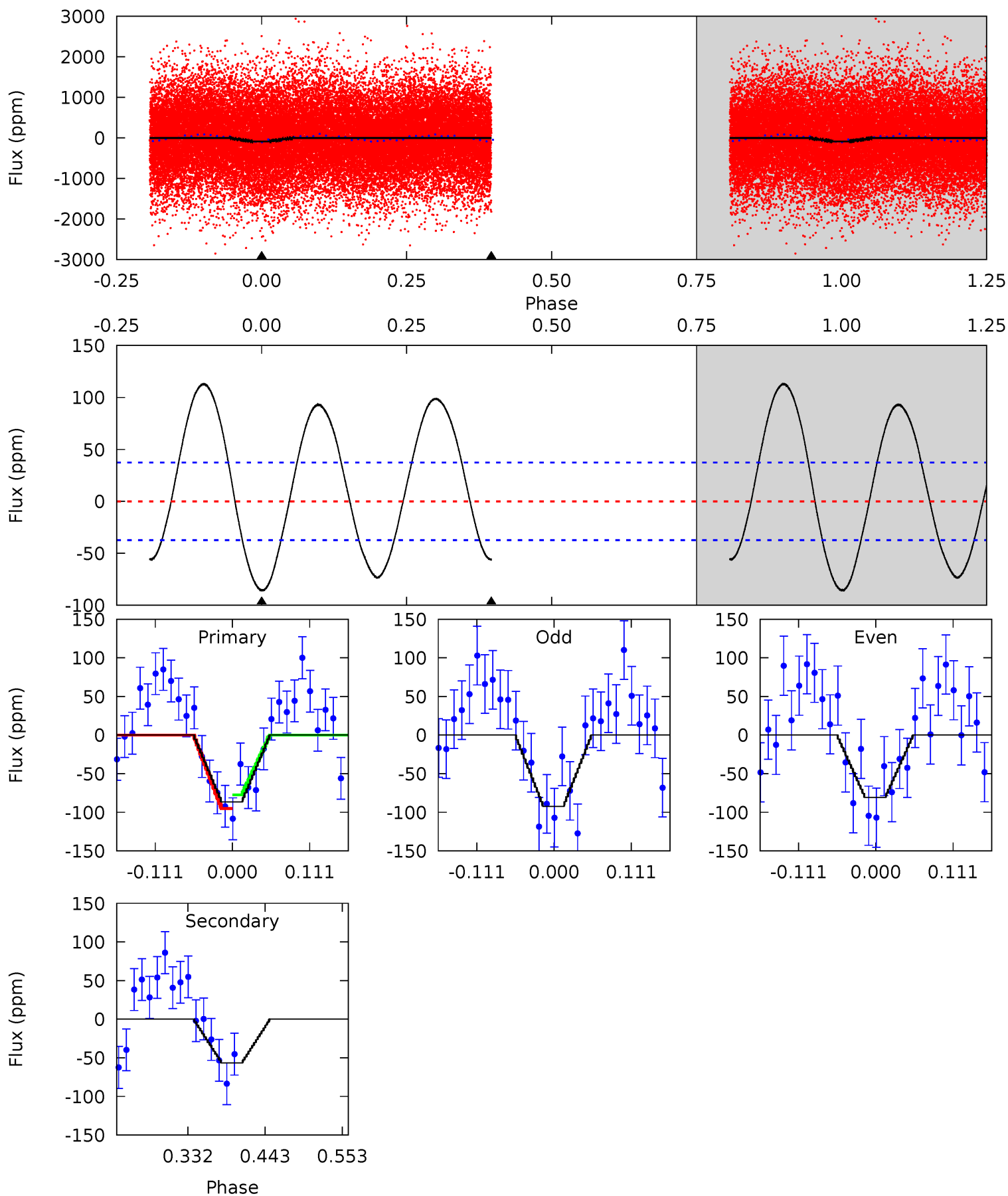
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.0	8.64	0	0	4.52	1.55	10.2	22.0	22.0	8.64	8.64	1.34	1.04	0.55	1.64



Alt Model-Shift Uniqueness Test

006470232-02, P = 0.504378 Days, E = 131.445321 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.5	6.88	0	0	4.54	1.60	6.66	10.5	10.5	6.88	6.88	0.68	1.24	0.57	1.03



Stellar Parameters For KIC 006470232

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6826^{+189}_{-283}	$4.107^{+0.180}_{-0.180}$	$0.080^{+0.200}_{-0.350}$	$1.779^{+0.536}_{-0.390}$	$1.477^{+0.196}_{-0.269}$	$0.370^{+0.353}_{-0.179}$
	+3%/-4%	+4%/-4%	+250%/-438%	+30%/-22%	+13%/-18%	+95%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 006470232-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-33 ± 4	$1.83^{+0.59}_{-0.53}$	4708^{+393}_{-341}	4875^{+1046}_{-712}	$1.037^{+1.043}_{-0.440}$
Alt.	-57 ± 8	$1.81^{+0.63}_{-0.51}$	4744^{+348}_{-352}	5746^{+1269}_{-766}	$1.803^{+1.754}_{-0.759}$

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 $A_{obs} \gg 1.0$

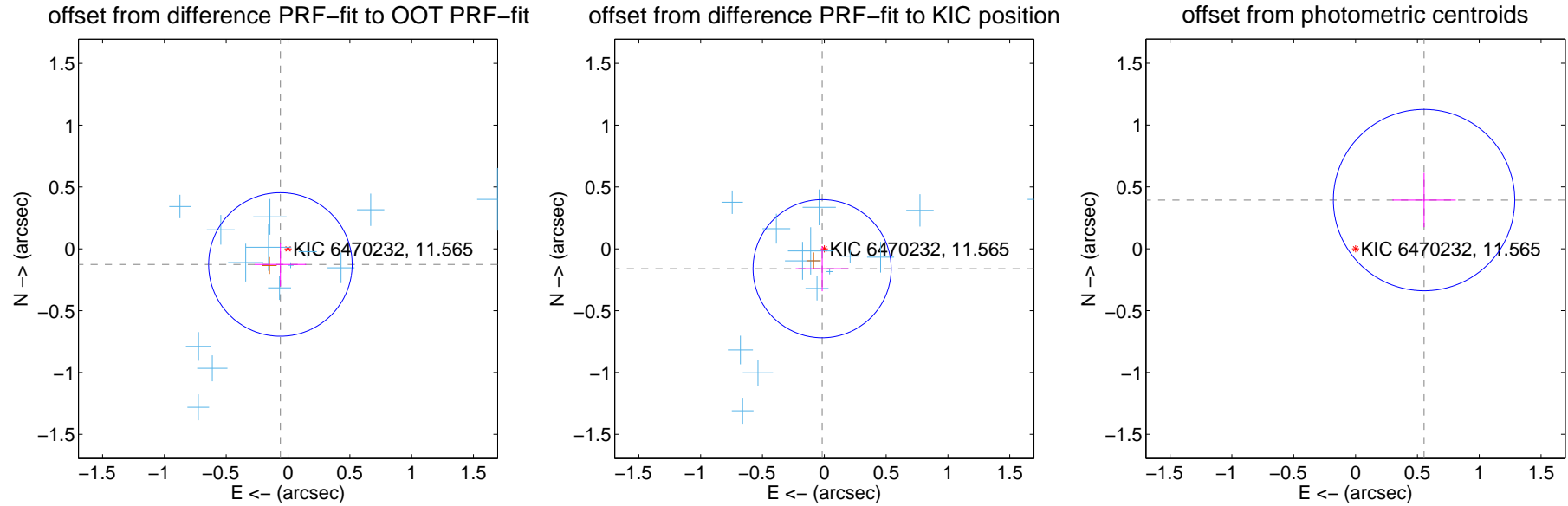
DV Centroid Data

Supplemental centroid analysis for 006470232-02. **Kepler magnitude: 11.56.** Transit SNR 12.28

There are 16 quarters with good PRF difference image offsets

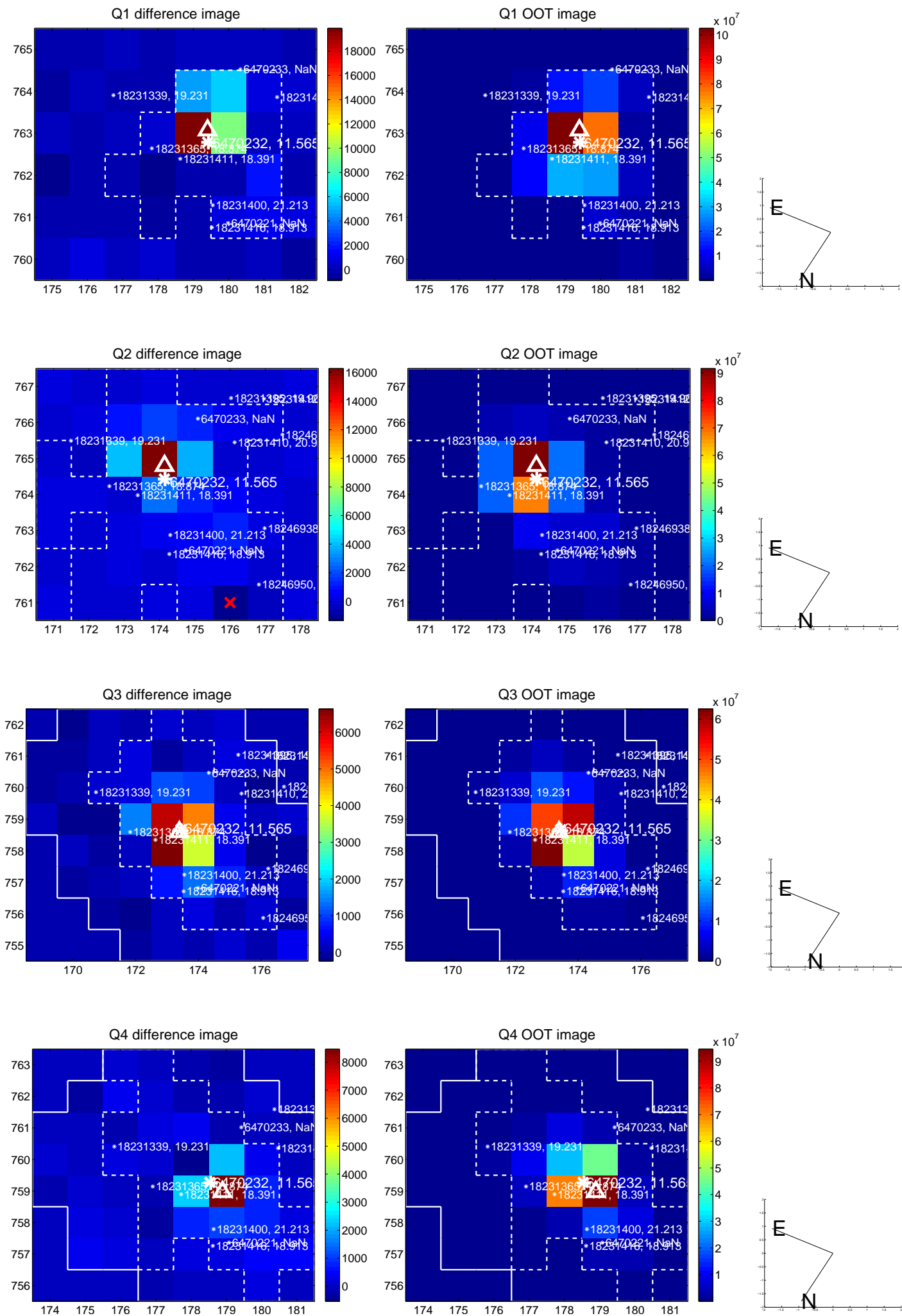
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.141 ± 0.194	0.73	0.062 ± 0.208	-0.126 ± 0.177
PRF-fit source offset from KIC position	0.162 ± 0.186	0.87	0.018 ± 0.214	-0.161 ± 0.182
photometric centroid source offset	0.68 ± 0.24	2.78	-0.55 ± 0.26	0.39 ± 0.22

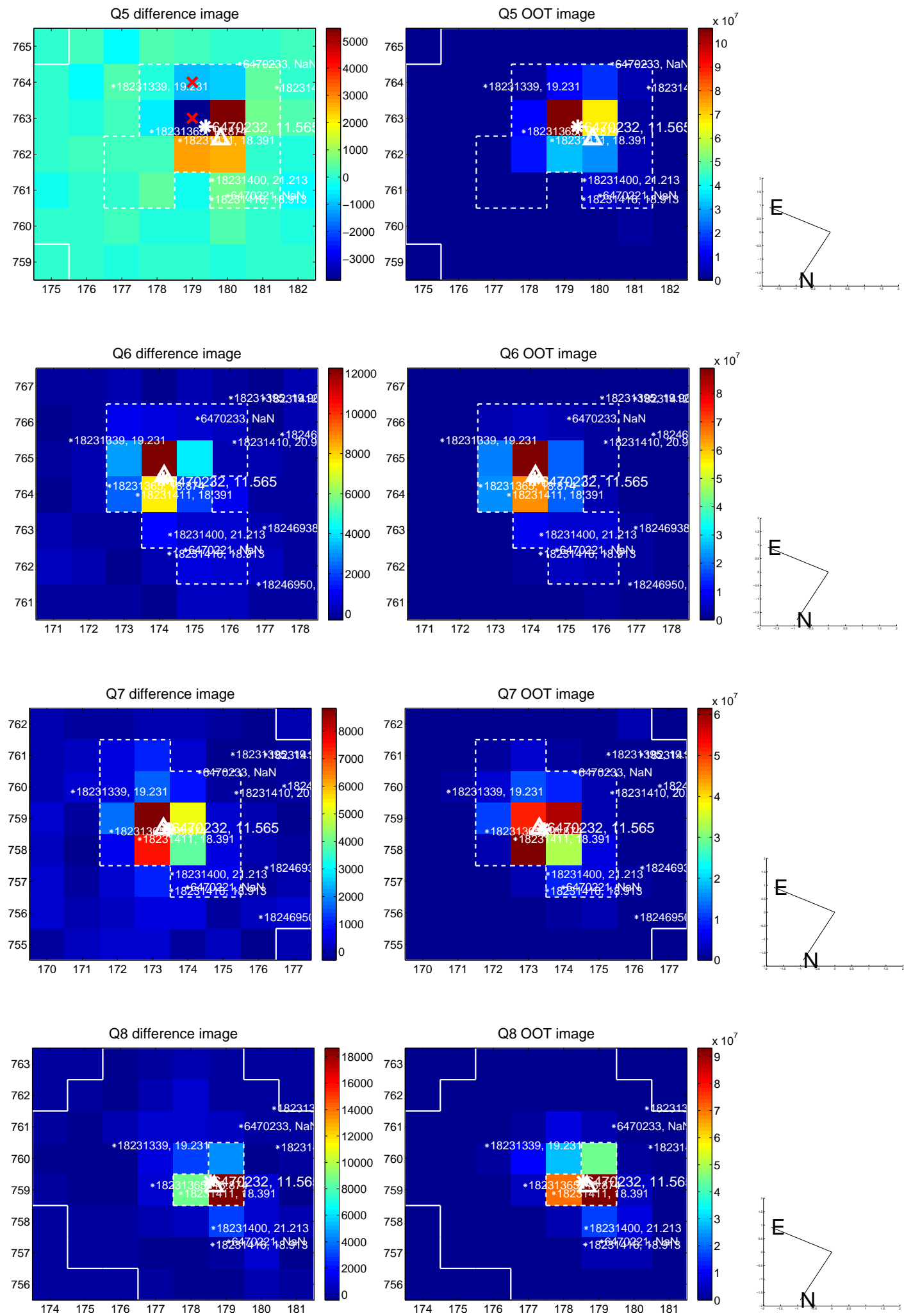


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

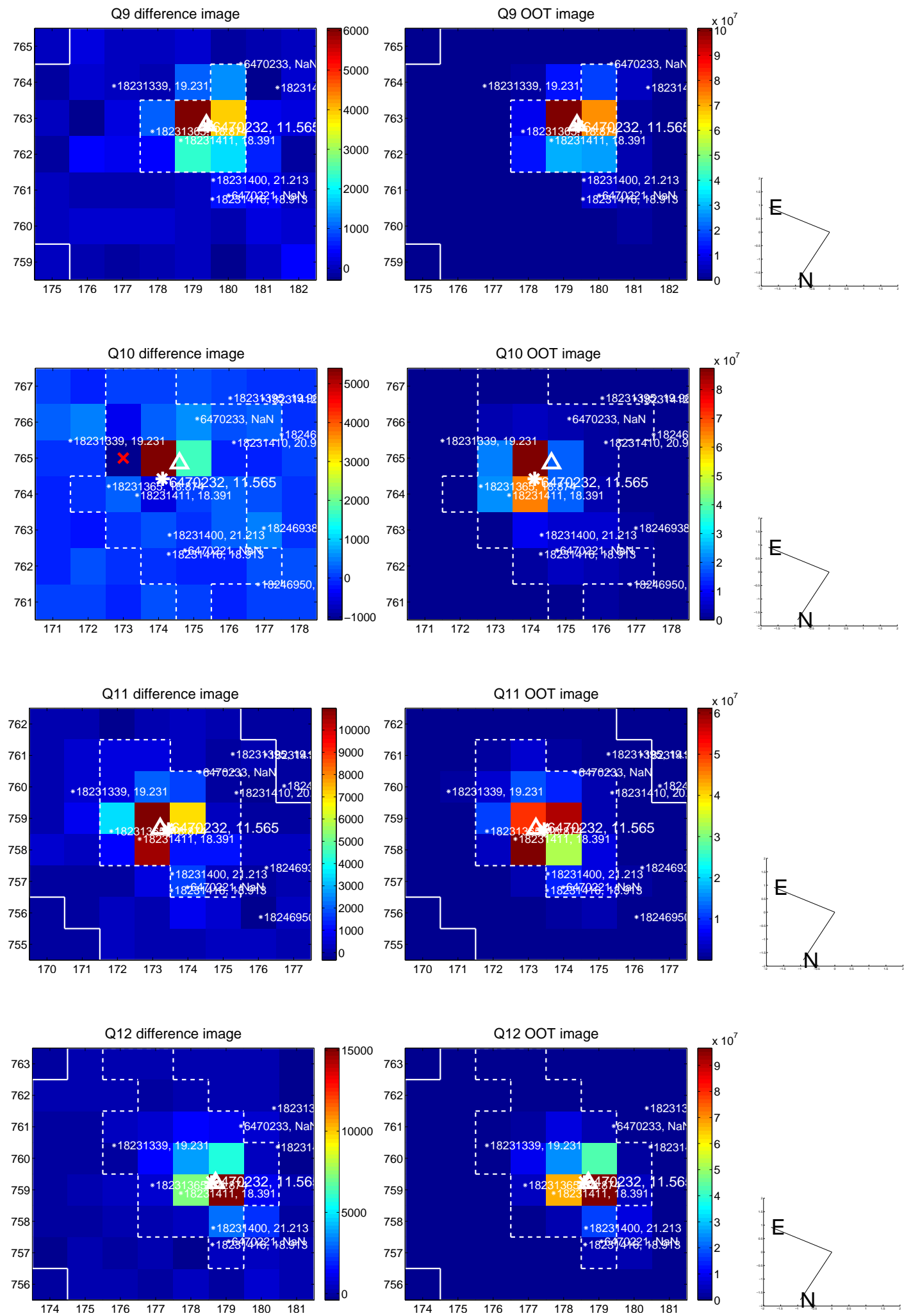
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



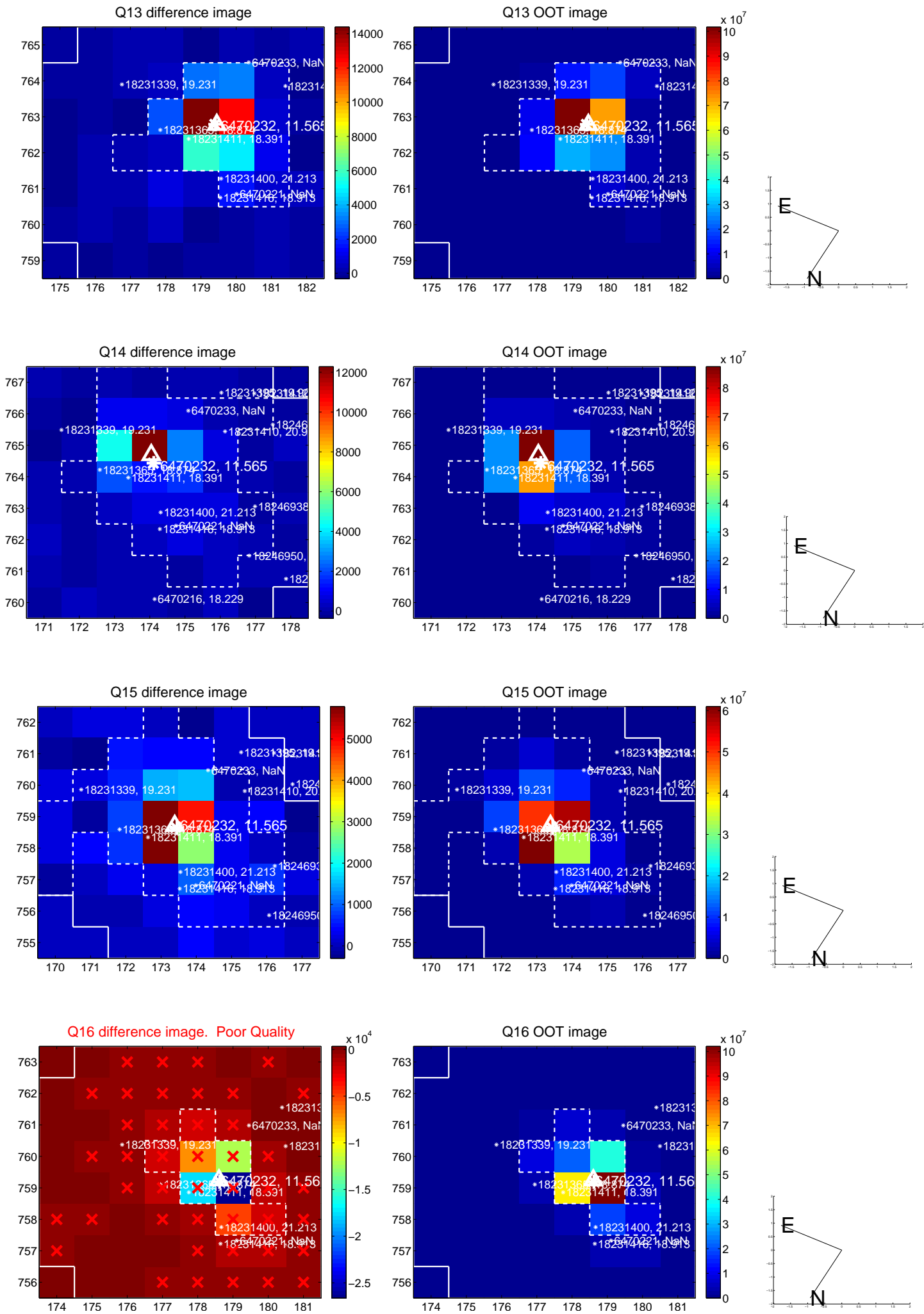
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



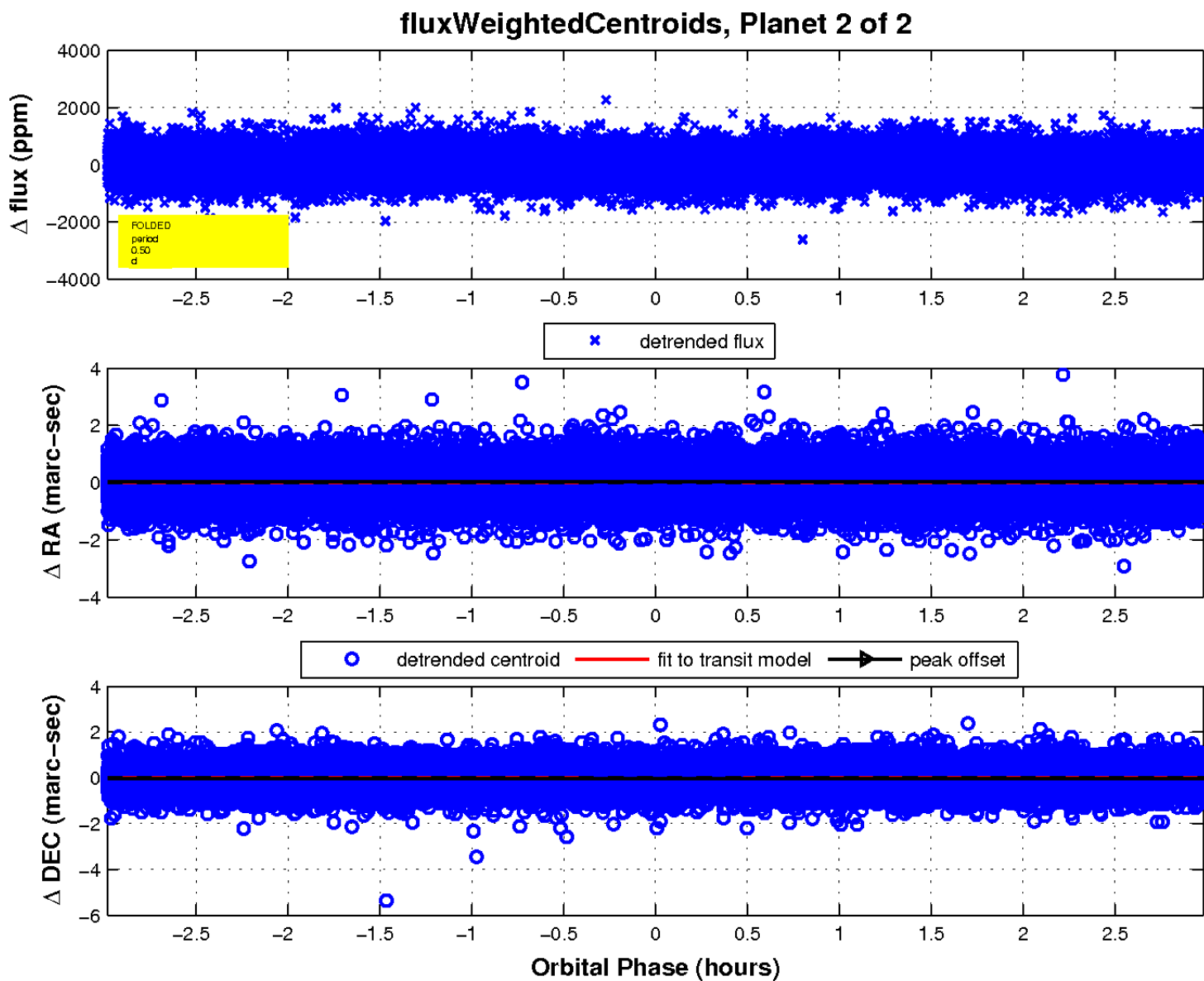
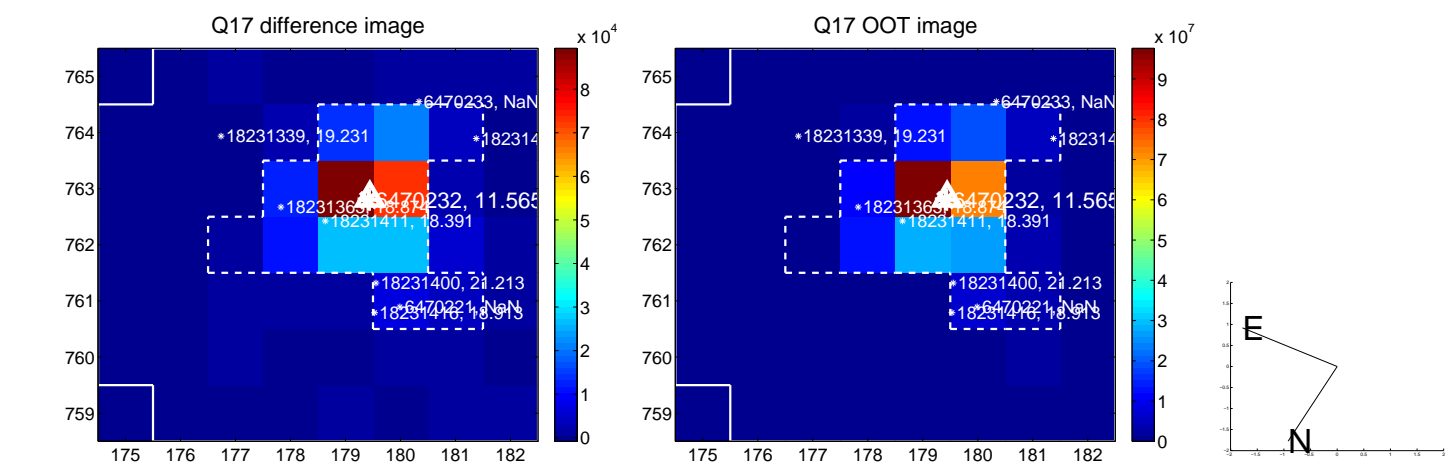
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

