

KIC 004378863

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})
004378863-01	OBS	No	1.226704	131.854177	15.5	3.689	11.0	6.3	2.45	7492	1.12	23119.55
004378863-02	OBS	No	1.226845	131.919671	68.0	1.847	8.6	3.9	2.45	7492	2.35	23116.01

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004378863-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004378863-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_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.

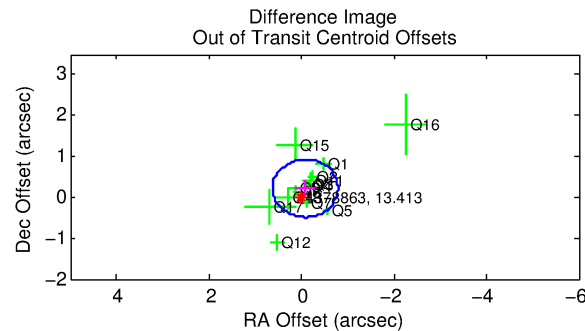
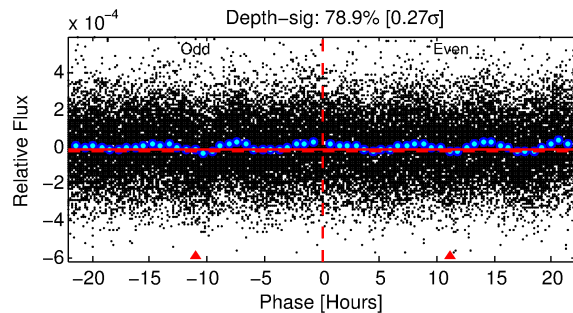
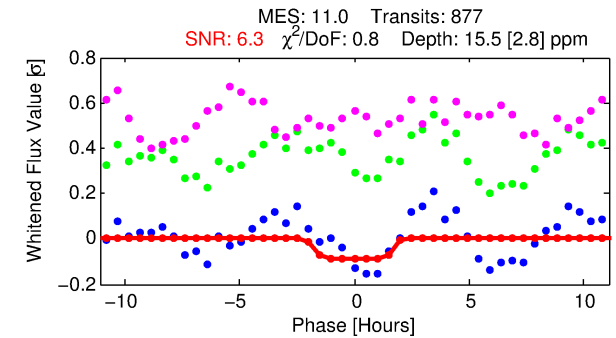
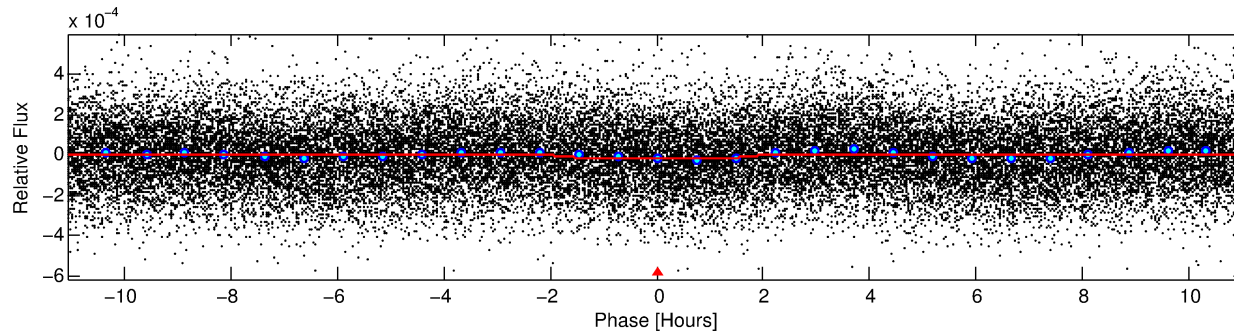
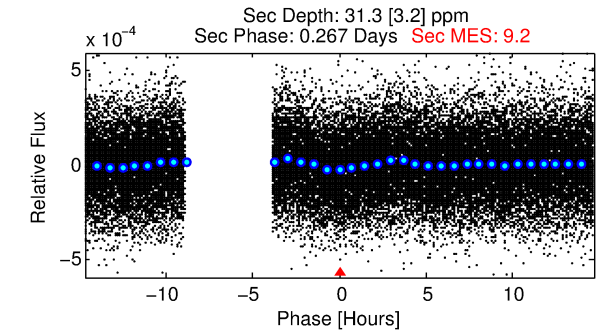
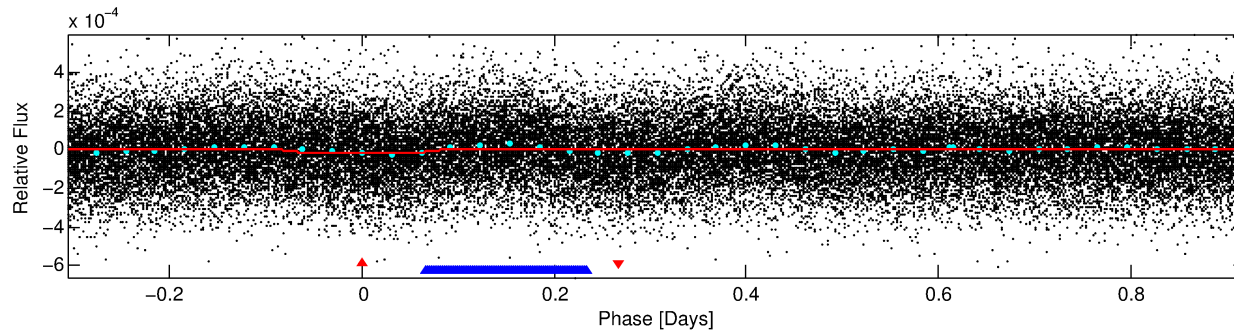
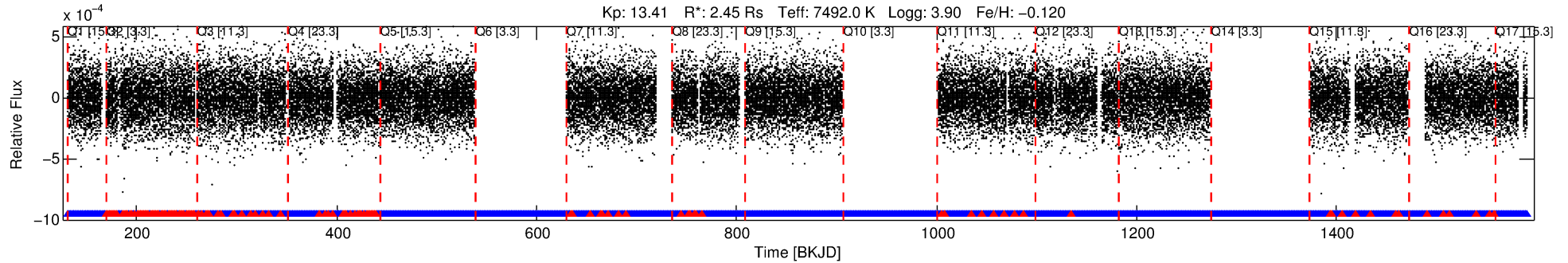
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004378863-01

No Significant Match Found

DV One-Page Summary

KIC: 4378863 Candidate: 1 of 2 Period: 1.227 d



DV Fit Results:

Period = 1.22670 [0.00002] d
Epoch = 131.8542 [0.0066] BKJD
Rp/R* = 0.0042 [0.0015]
a/R* = 1.47 [1.77]
b = 0.90 [0.48]
Seff = 23119.55 [11638.82]
Teq = 3144 [396] K
Rp = 1.12 [0.55] Re
a = 0.0271 [0.0083] AU
Ag = 10.05 [8.77] [1.03σ]
Teffp = 8656 [1624] K [3.30σ]

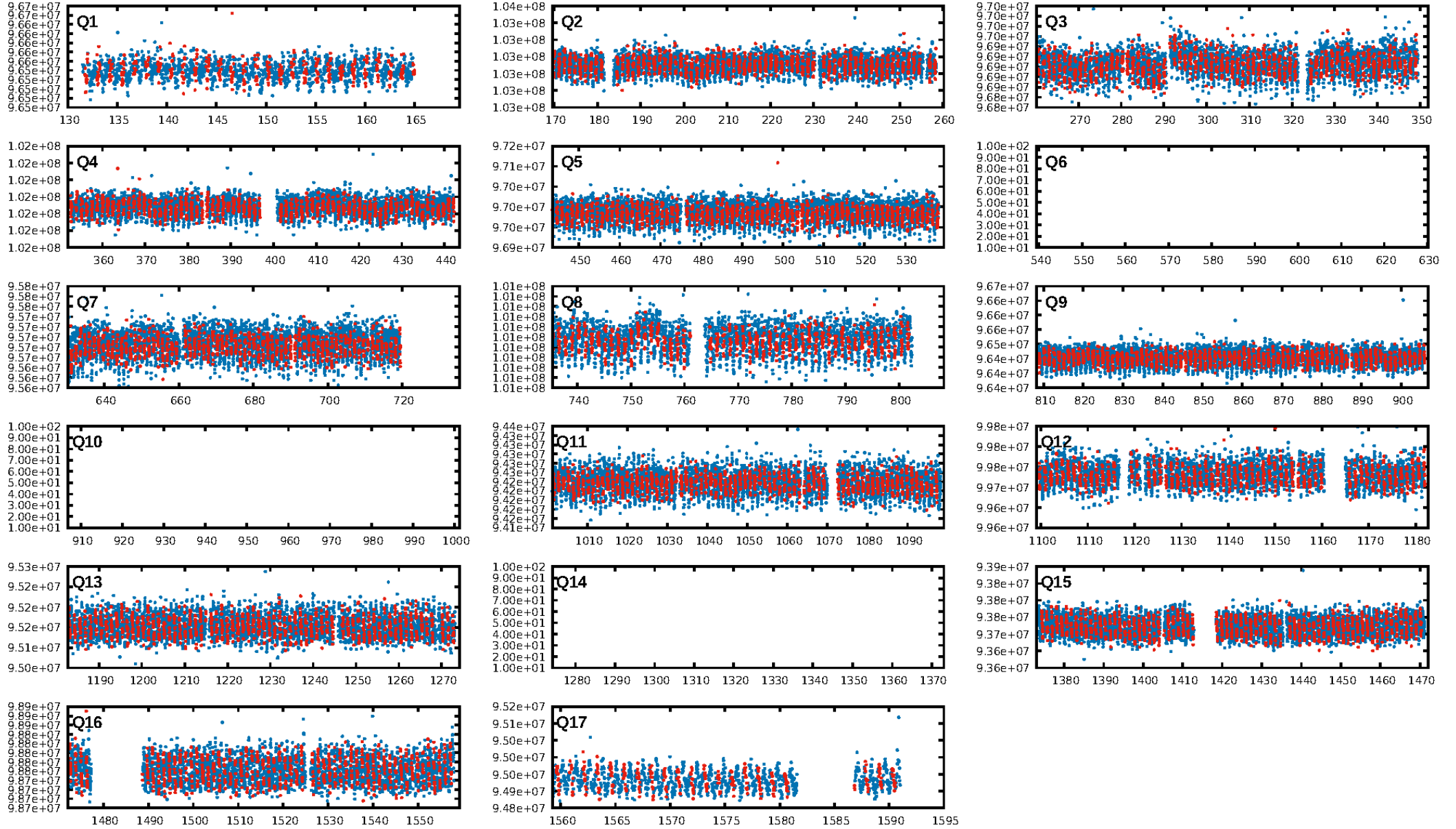
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.1% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.18e-25
RollingBand-fgt: 0.84 [693/828]
GhostDiagnostic-chr: 1.722
Centroid-sig: 0.1%
Centroid-so: 4.499 arcsec [2.09σ]
OotOffset-rm: 0.233 arcsec [0.99σ]
KicOffset-rm: 0.317 arcsec [1.39σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 0.86 [12/14]
DiffImageOverlap-fno: 0.00 [0/14]

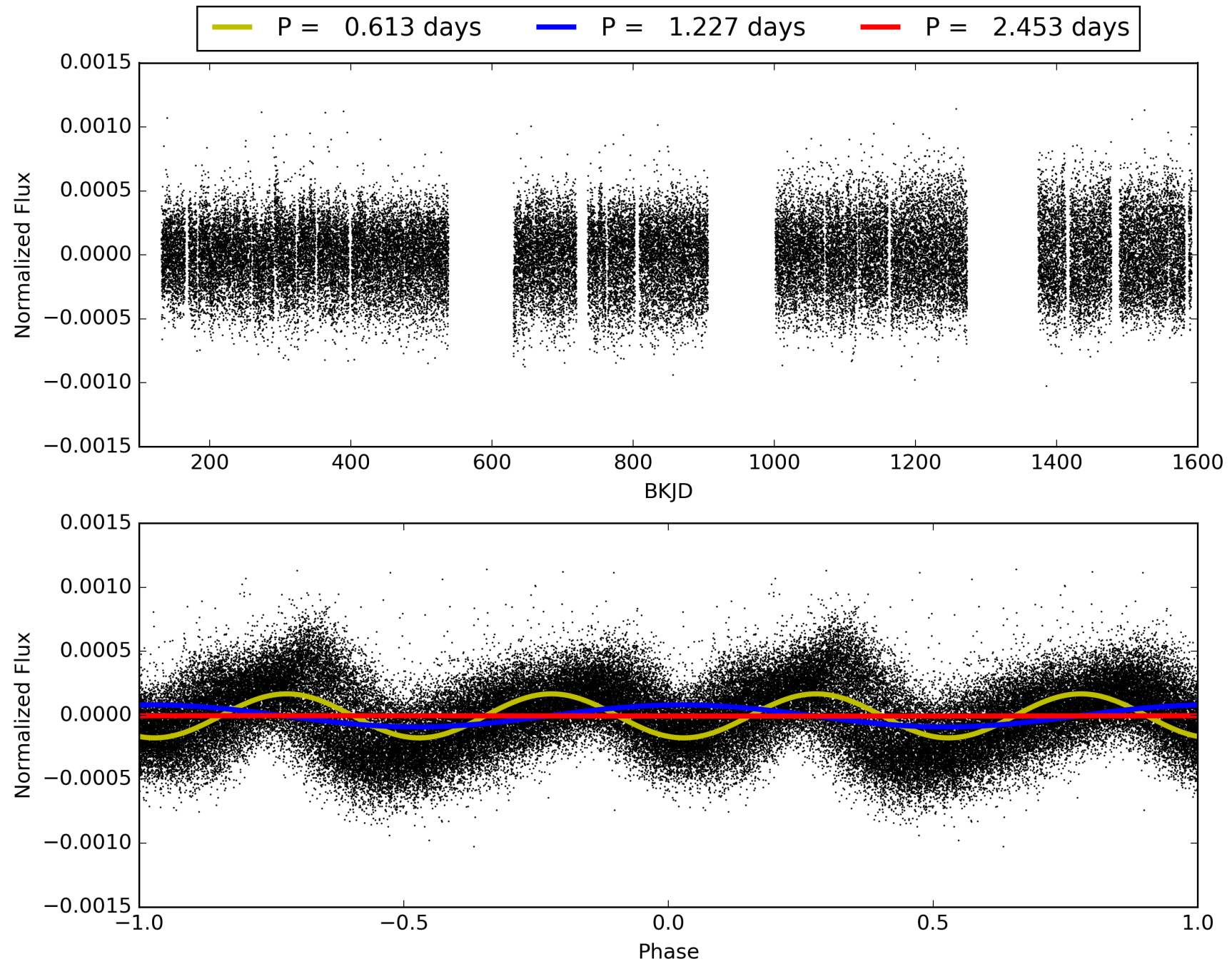
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:03:56 Z

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

TCE 004378863-01, PDC Light Curves

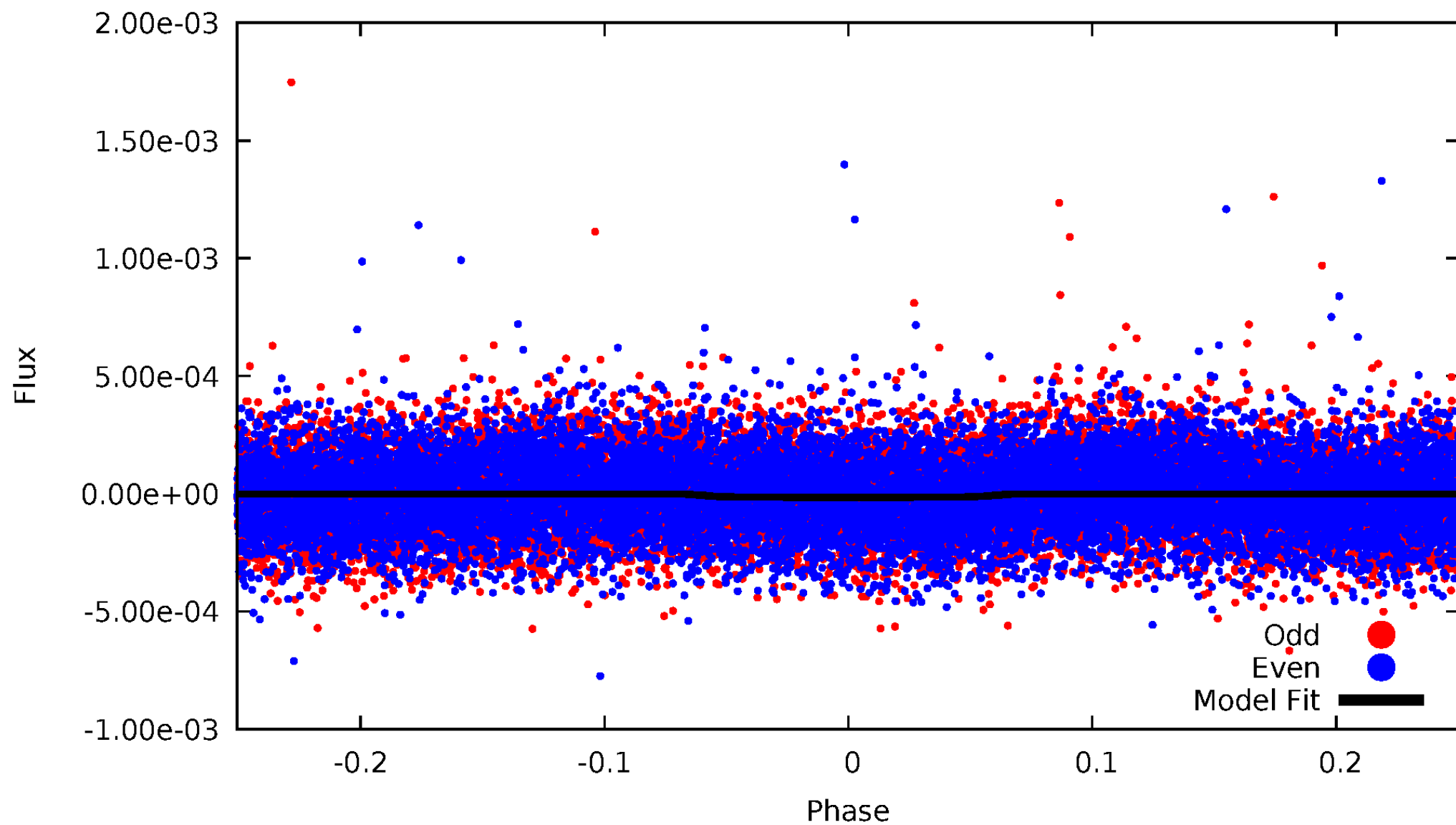


TCE 004378863-01



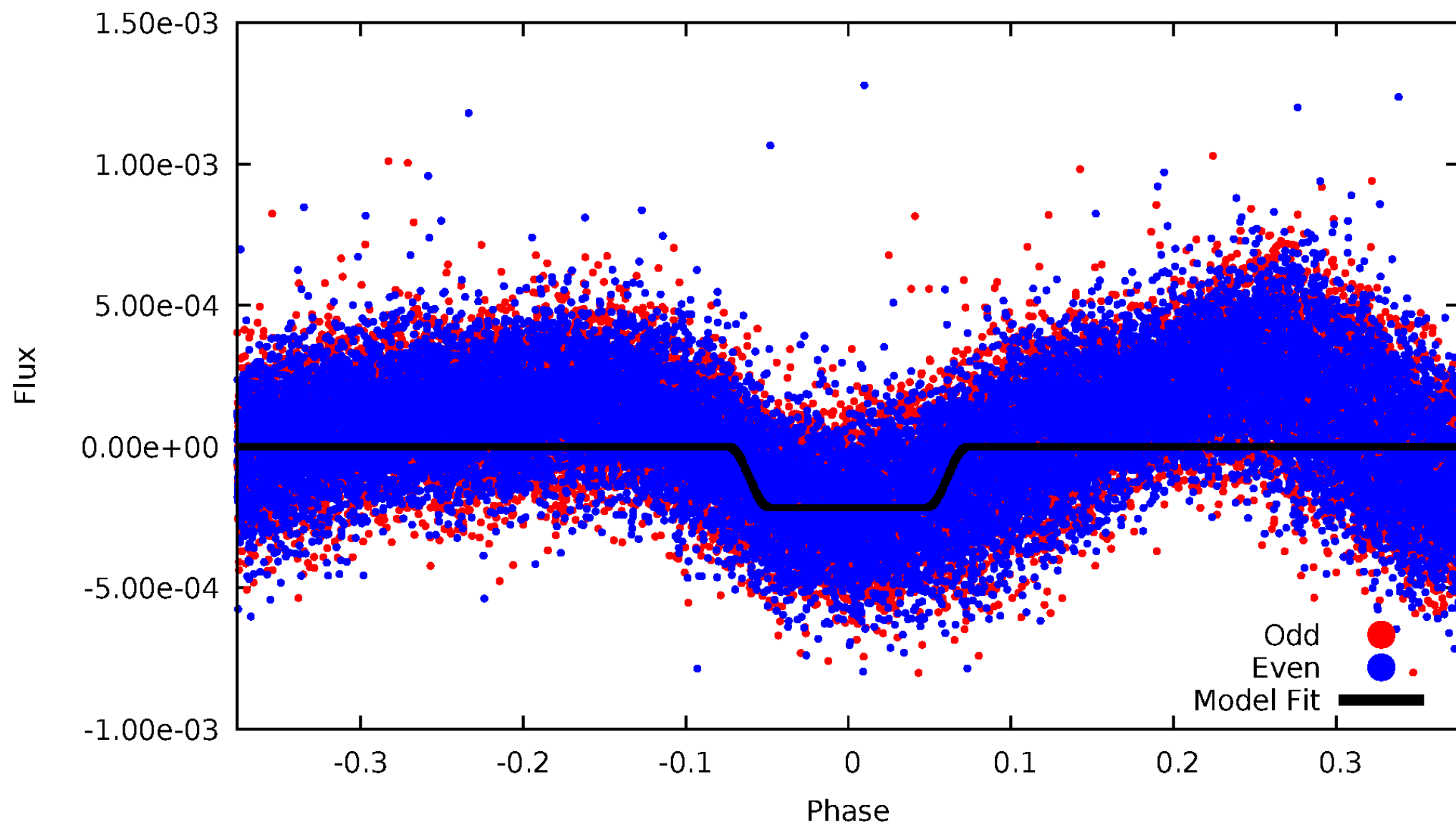
DV Odd/Even

TCE 004378863-01



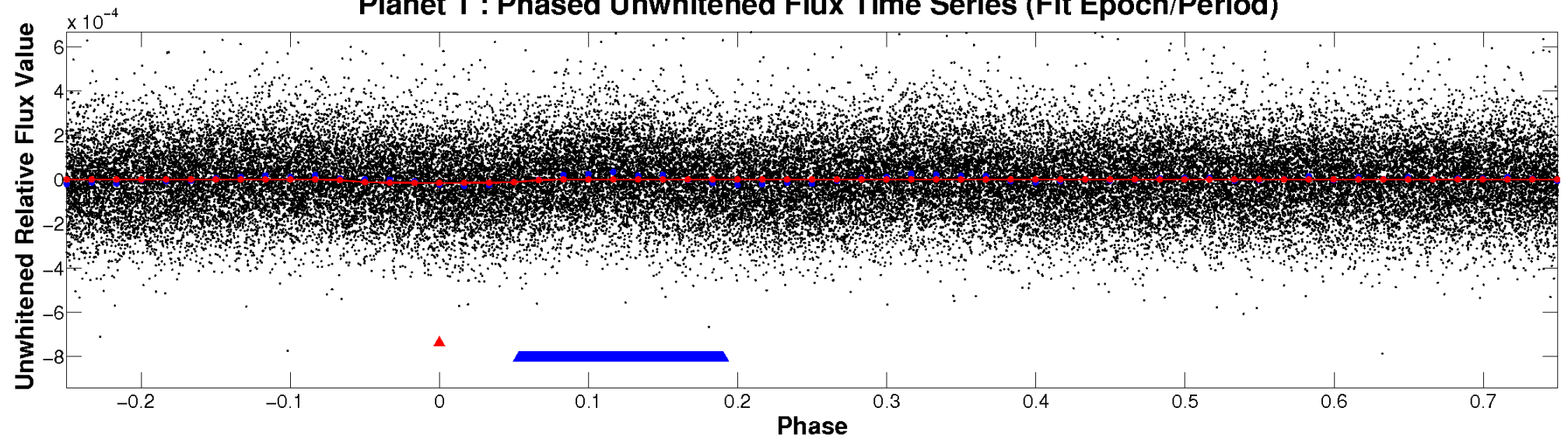
ALT Odd/Even

TCE 004378863-01

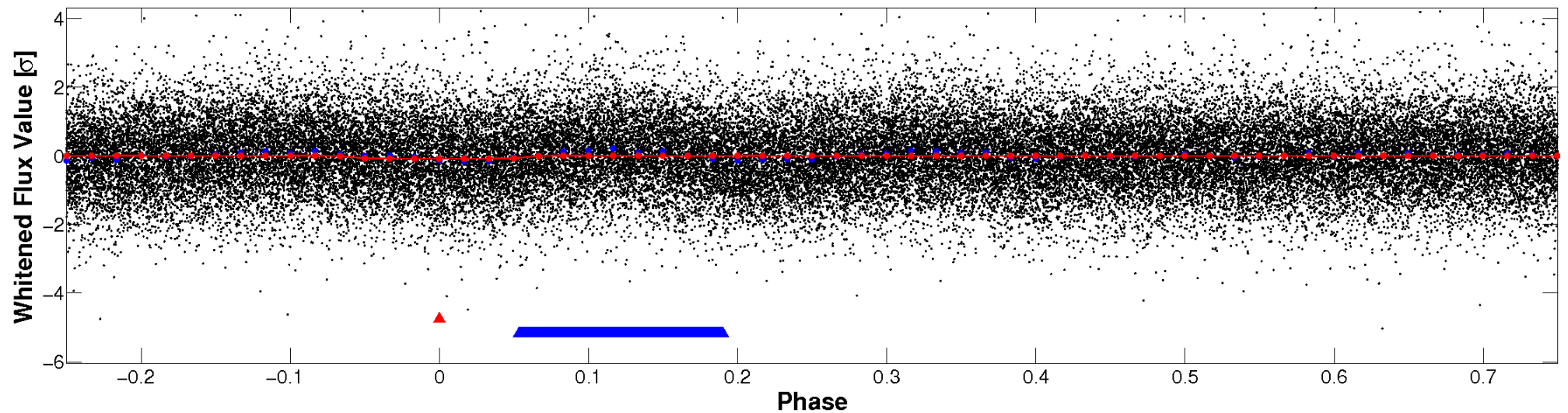


Non-Whitened Vs. Whitened Light Curve

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

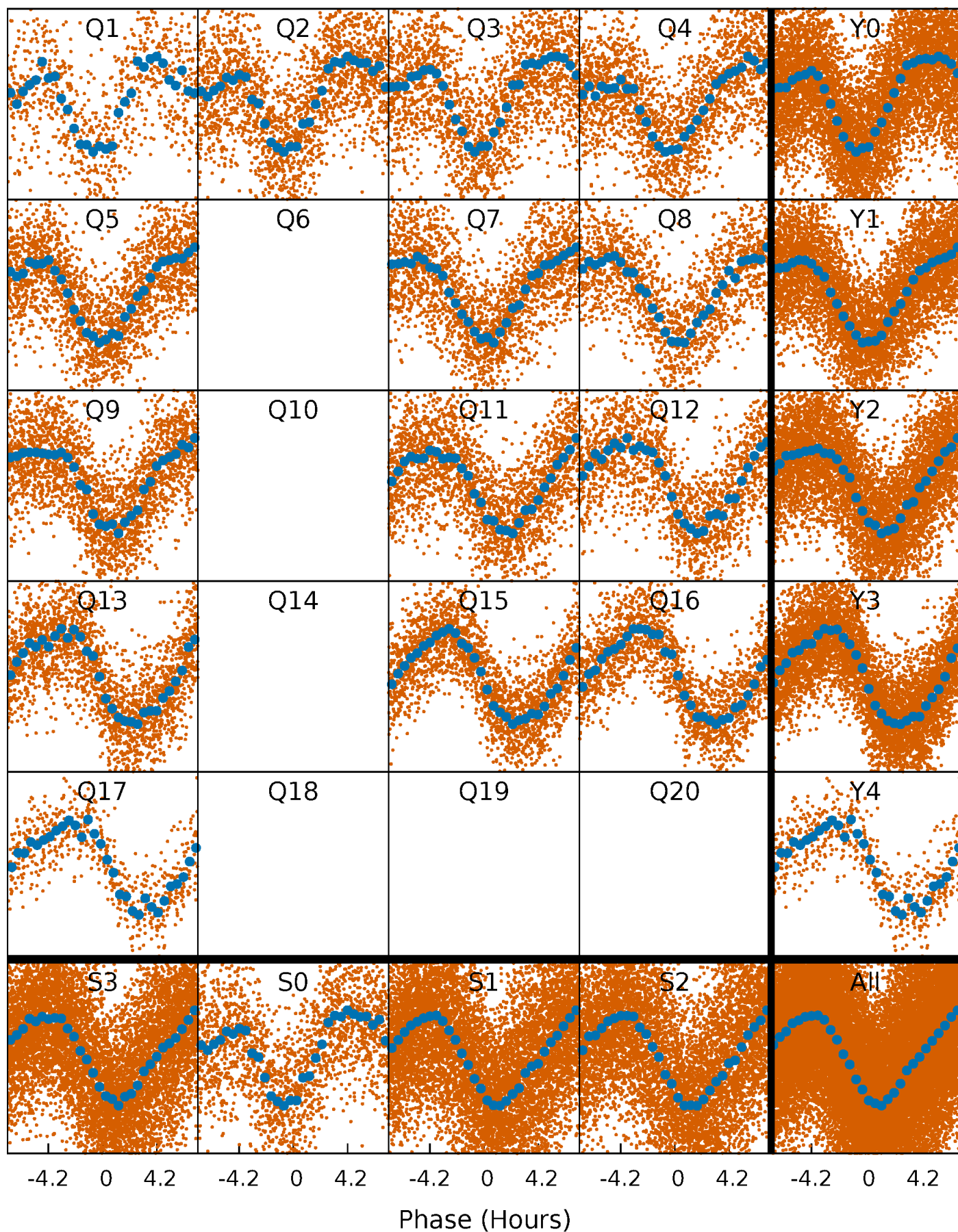


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



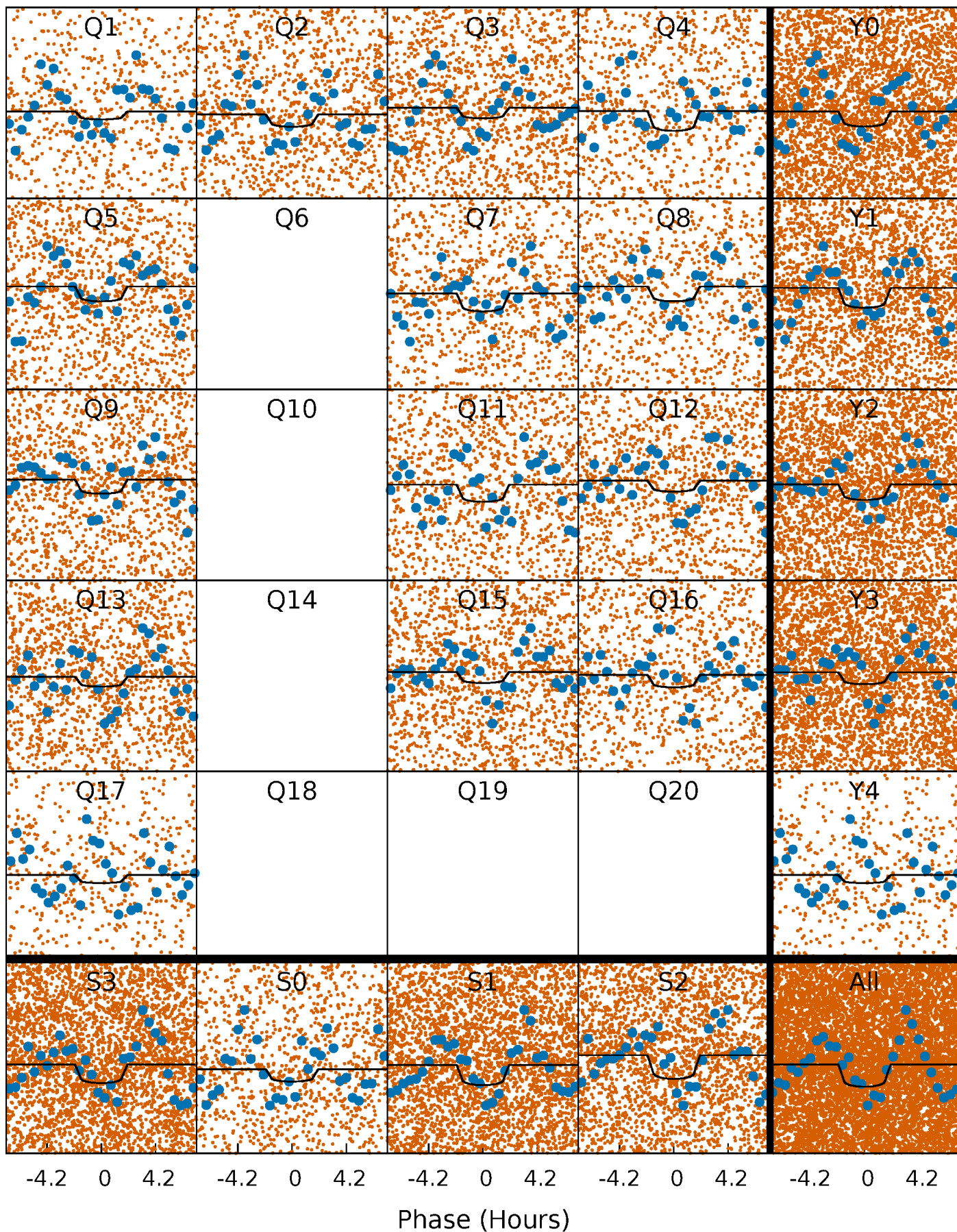
PDC Quarter-Phased Transit Curves

TCE 004378863-01 P= 1.226704 Days $T_0=131.854177$ (BKJD)



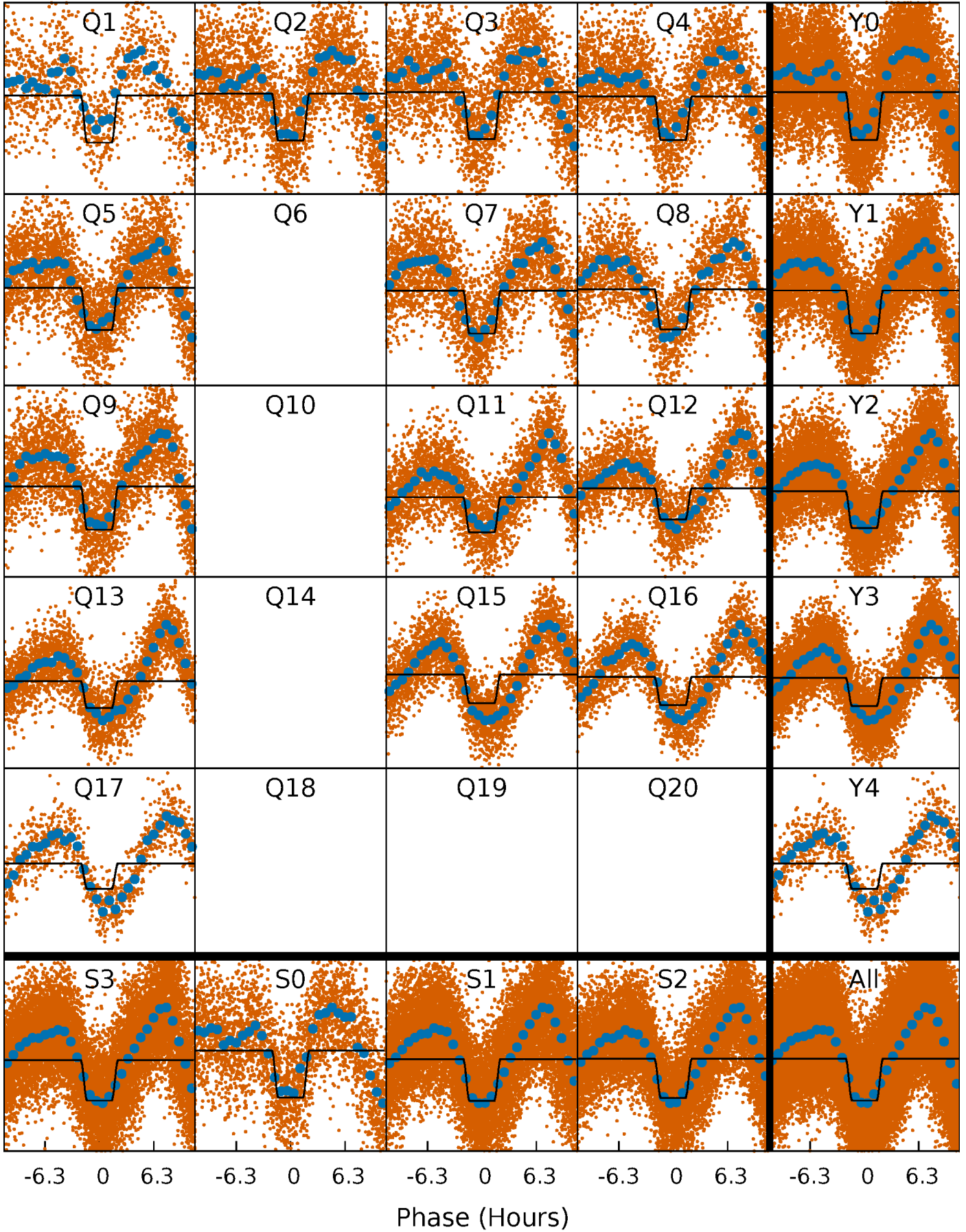
DV Quarter-Phased Transit Curves

TCE 004378863-01 P= 1.226704 Days $T_0=131.854177$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

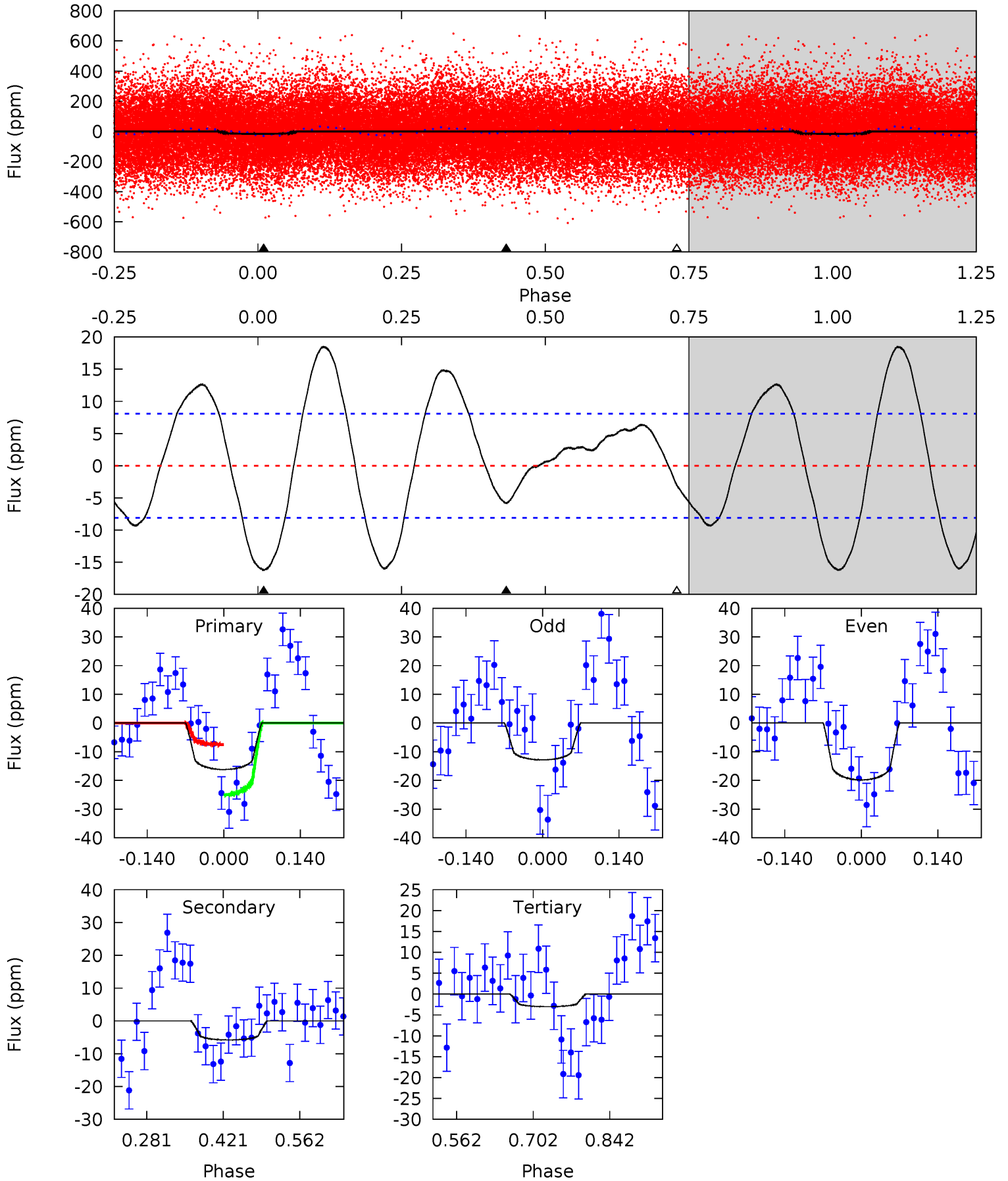
TCE 004378863-01 P= 1.226797 Days $T_0=131.838936$ (BKJD)



DV Model-Shift Uniqueness Test

004378863-01, P = 1.226704 Days, E = 130.627473 Days

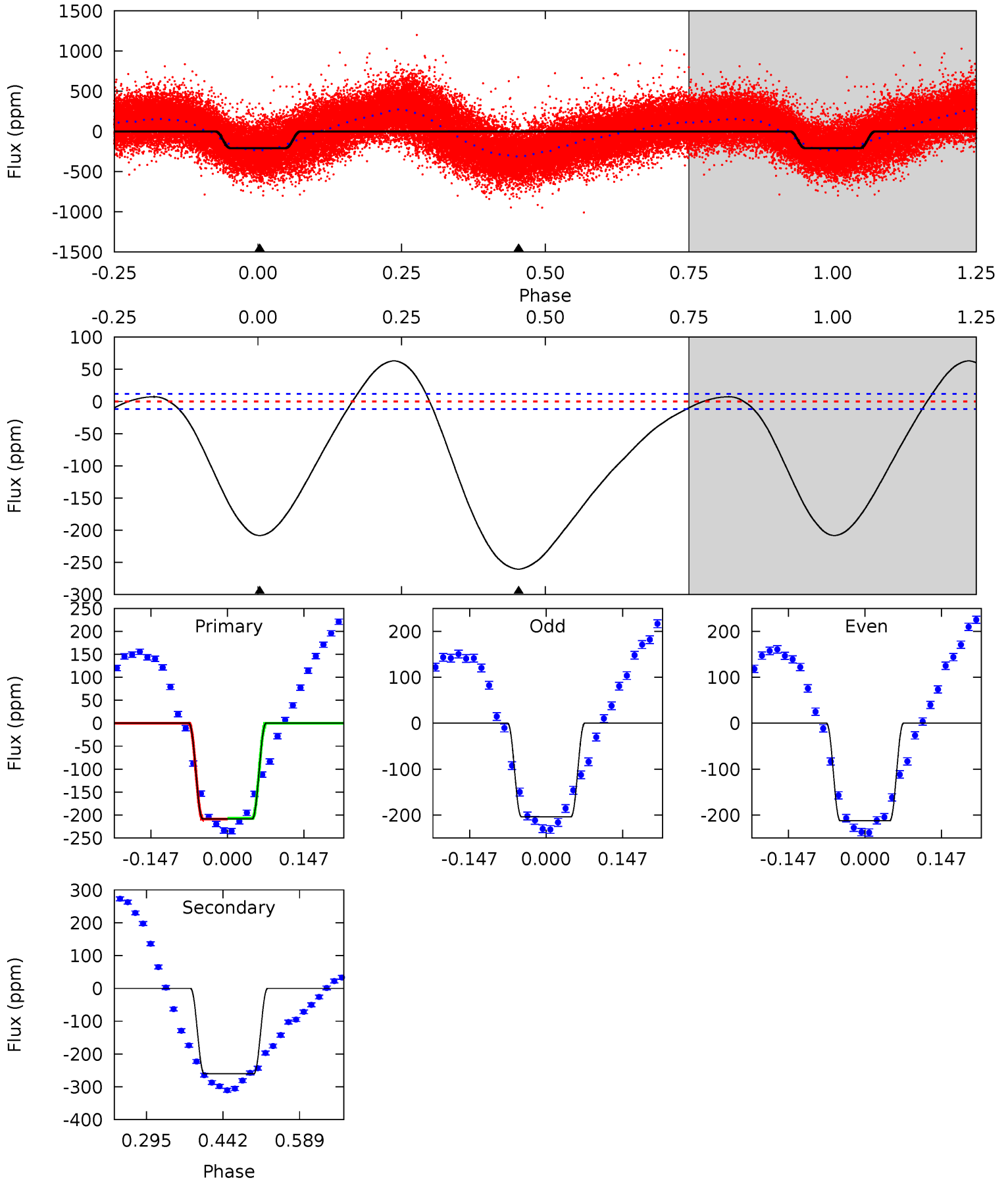
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.99	3.22	1.67	0	4.49	1.47	3.94	7.32	8.99	1.55	3.22	1.93	0.91	0.53	4.81



Alt Model-Shift Uniqueness Test

004378863-01, P = 1.226797 Days, E = 130.612139 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
79.6	99.6	0	0	4.48	1.45	18.2	79.6	79.6	99.6	99.6	1.68	1.01	0.19	0.30



Stellar Parameters For KIC 004378863

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7492^{+235}_{-314}	$3.905^{+0.273}_{-0.126}$	$-0.120^{+0.200}_{-0.350}$	$2.452^{+0.478}_{-0.820}$	$1.763^{+0.195}_{-0.363}$	$0.168^{+0.339}_{-0.063}$
	+3%/-4%	+7%/-3%	+167%/-292%	+19%/-33%	+11%/-21%	+201%/-37%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 004378863-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-6 ± 2	$1.07^{+0.43}_{-0.40}$	4317^{+338}_{-415}	5391^{+1385}_{-1007}	$2.032^{+2.931}_{-1.136}$
Alt.	-260 ± 3	$3.77^{+0.72}_{-0.71}$	4330^{+315}_{-389}	7798^{+609}_{-514}	$7.331^{+3.503}_{-2.163}$

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

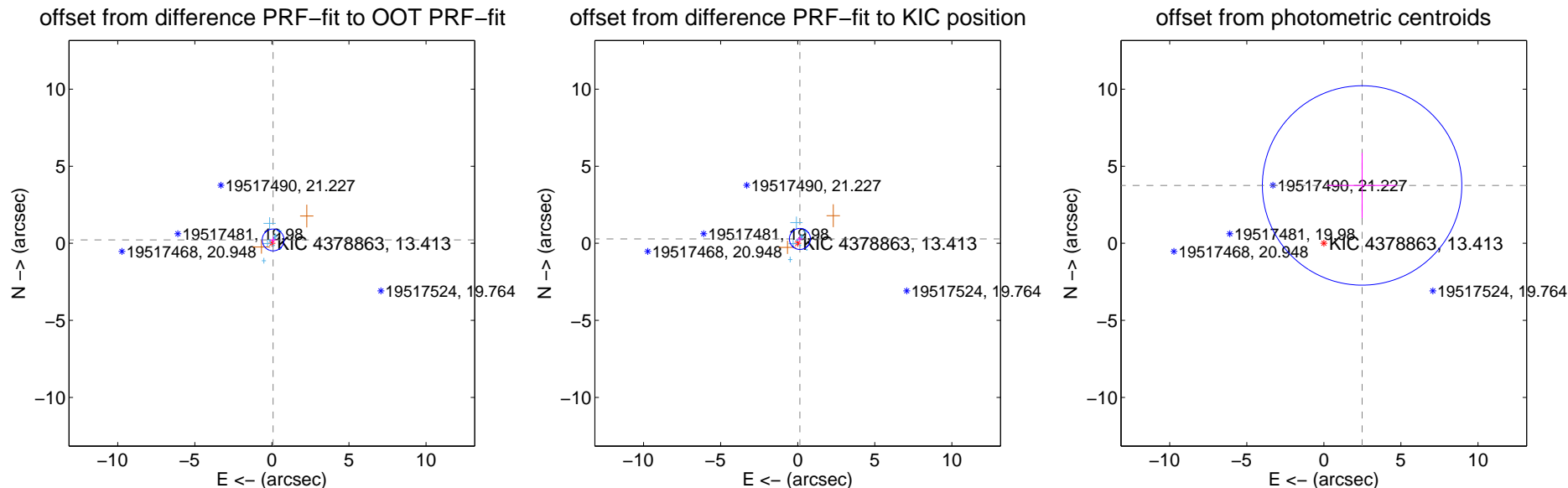
DV Centroid Data

Supplemental centroid analysis for 004378863-01. Kepler magnitude: 13.41. Transit SNR 6.35

There are 12 quarters with good PRF difference image offsets

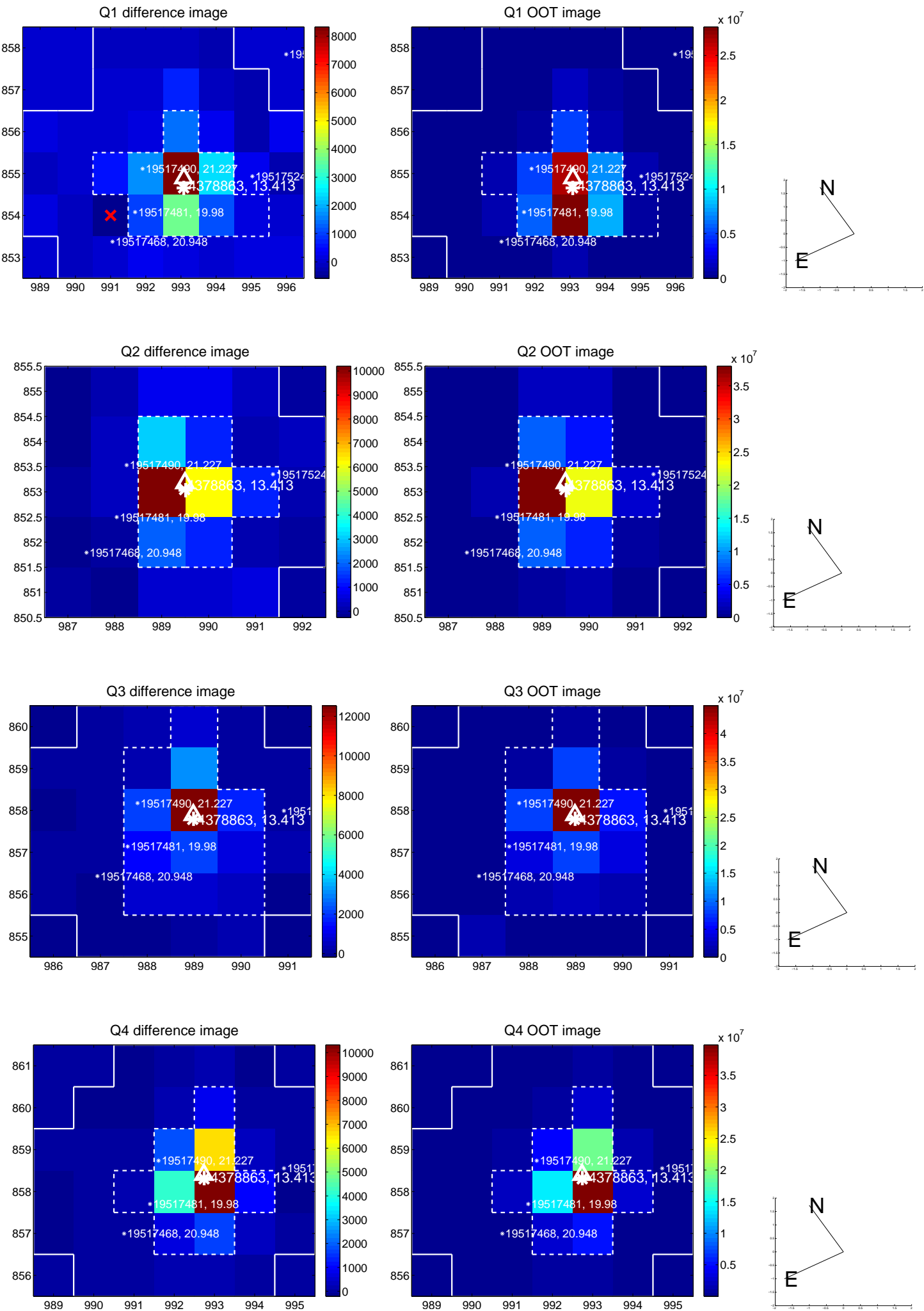
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.233 ± 0.236	0.99	-0.079 ± 0.196	0.219 ± 0.202
PRF-fit source offset from KIC position	0.317 ± 0.228	1.39	-0.142 ± 0.185	0.283 ± 0.192
photometric centroid source offset	4.50 ± 2.16	2.09	-2.48 ± 2.26	3.75 ± 2.11

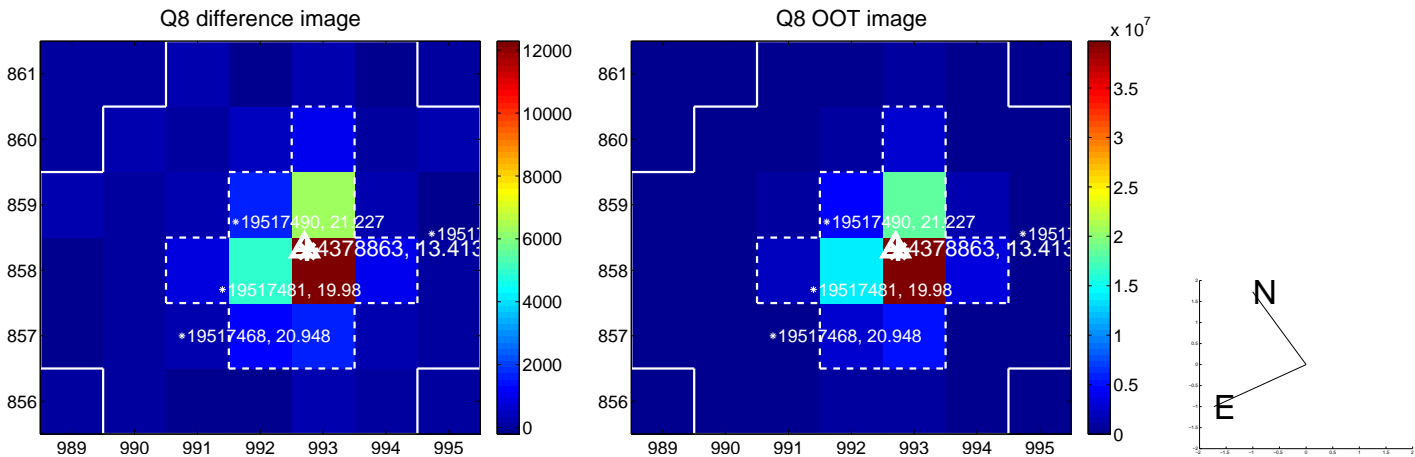
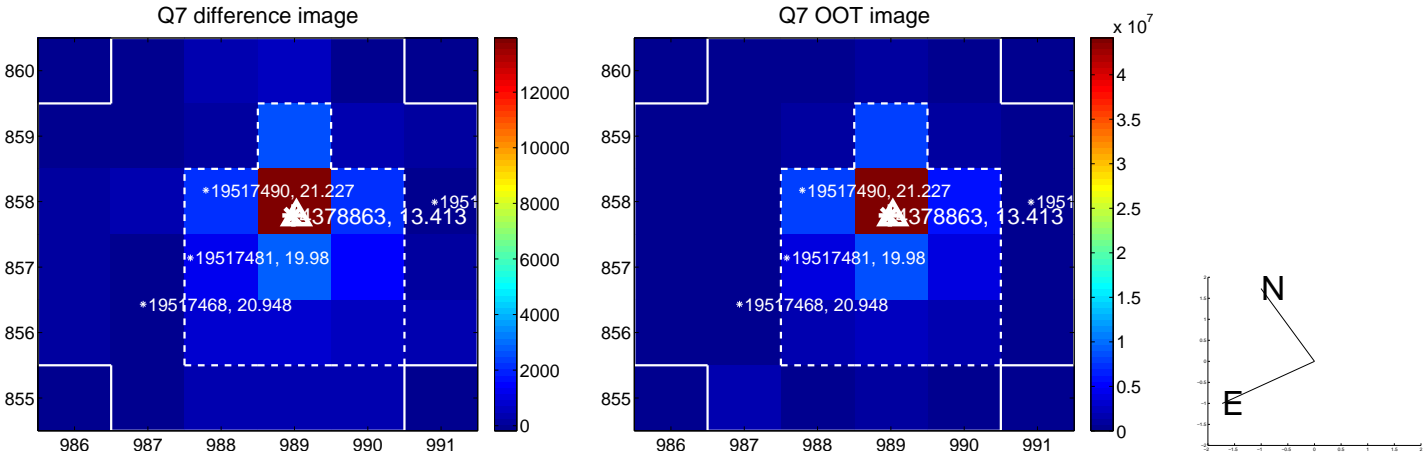
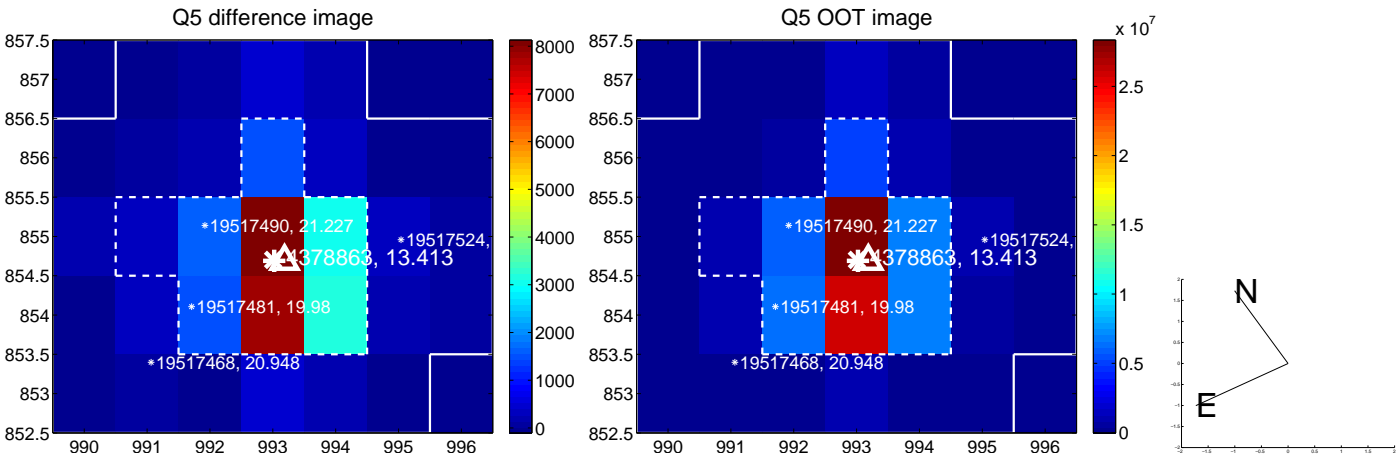


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

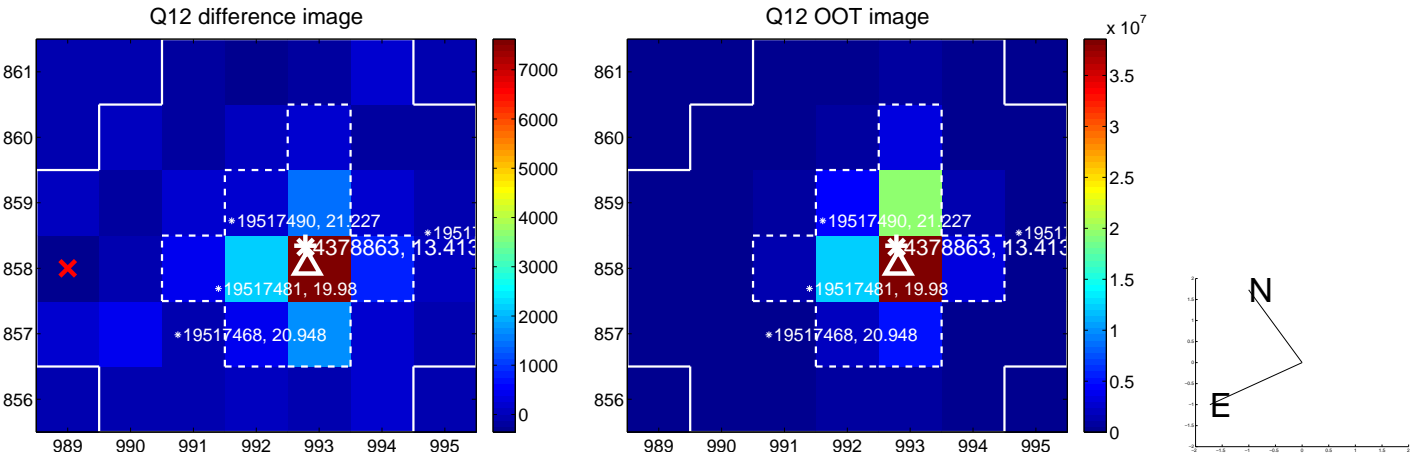
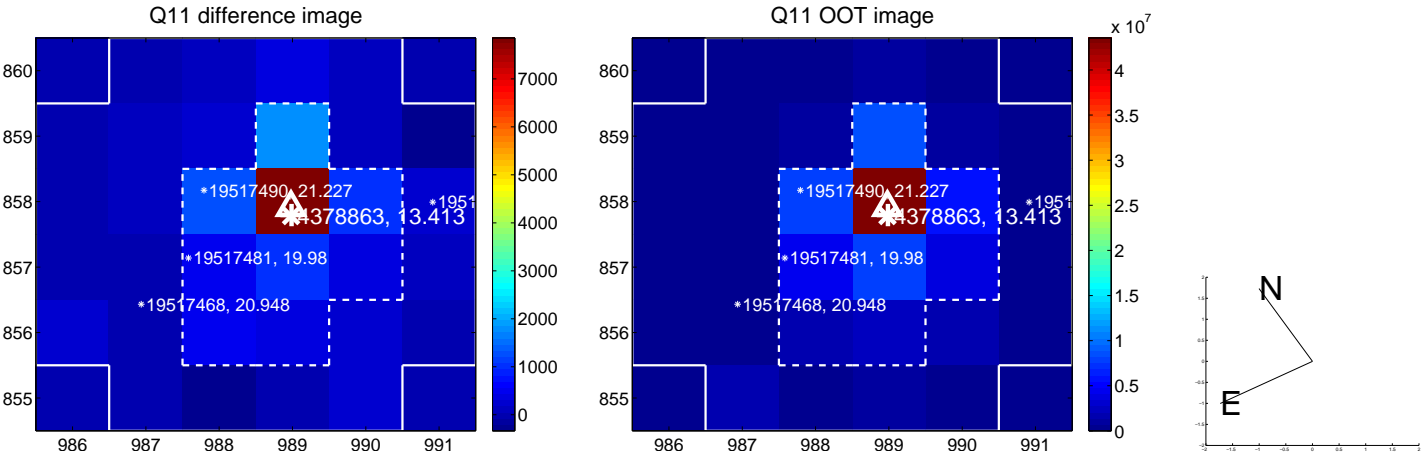
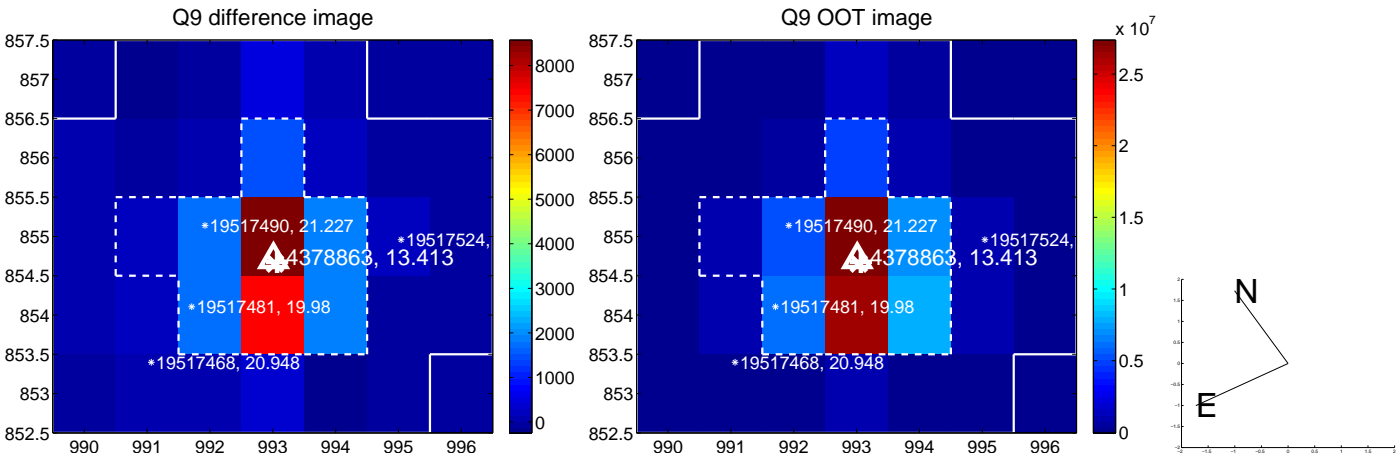
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



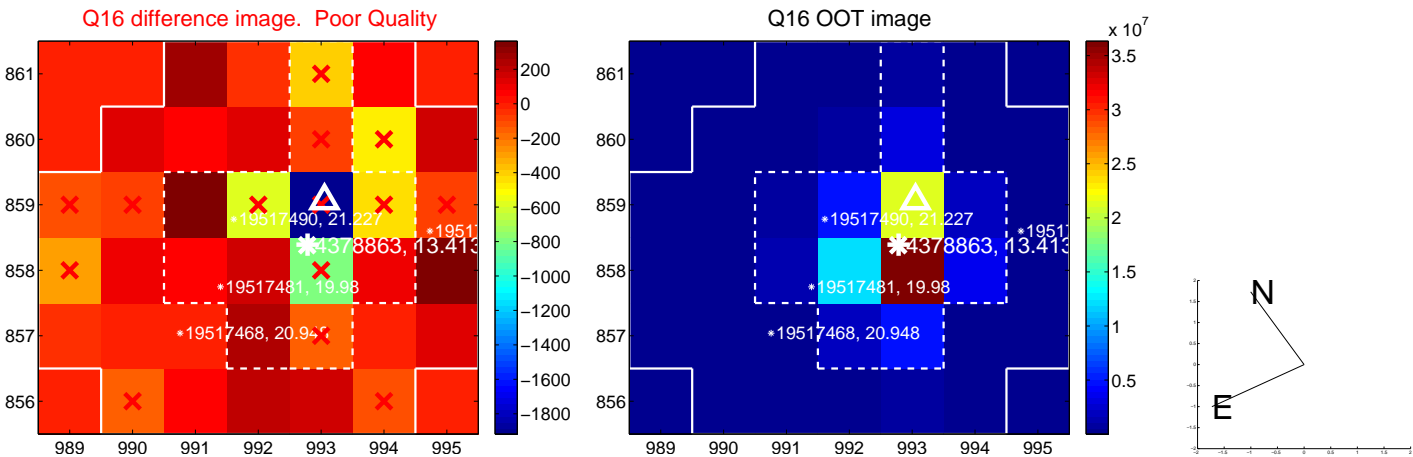
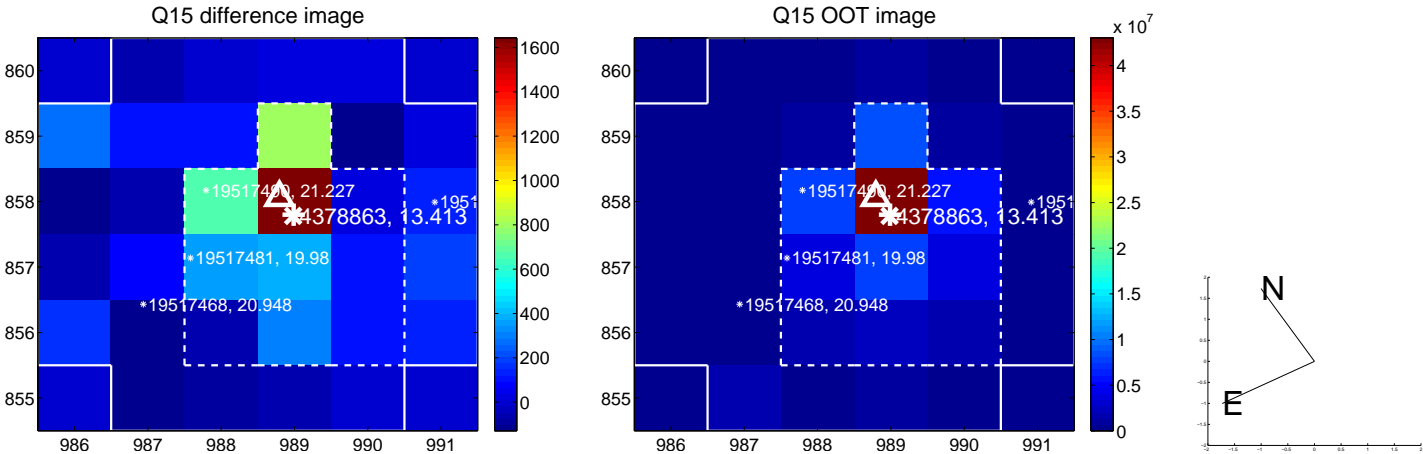
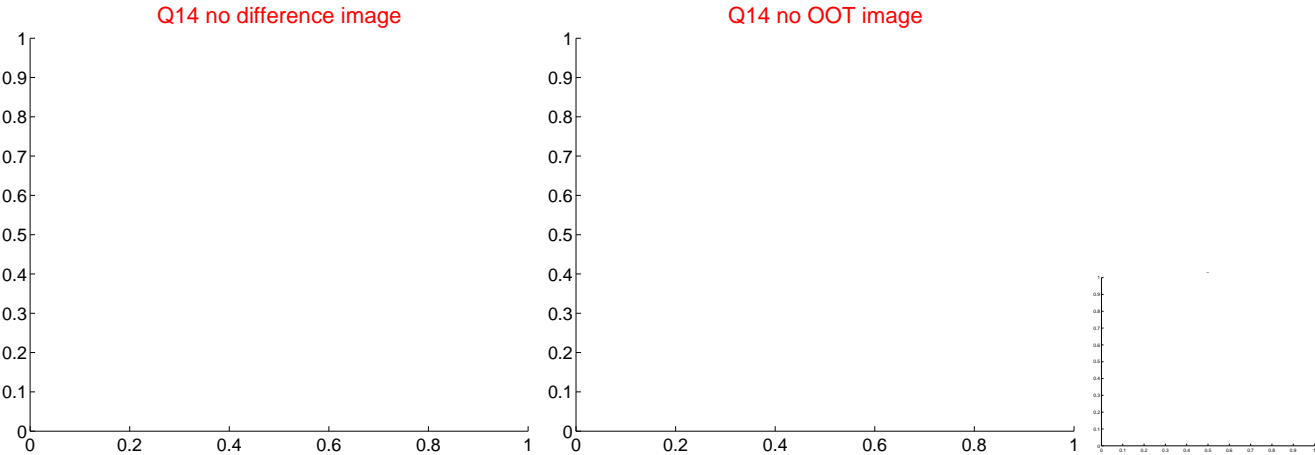
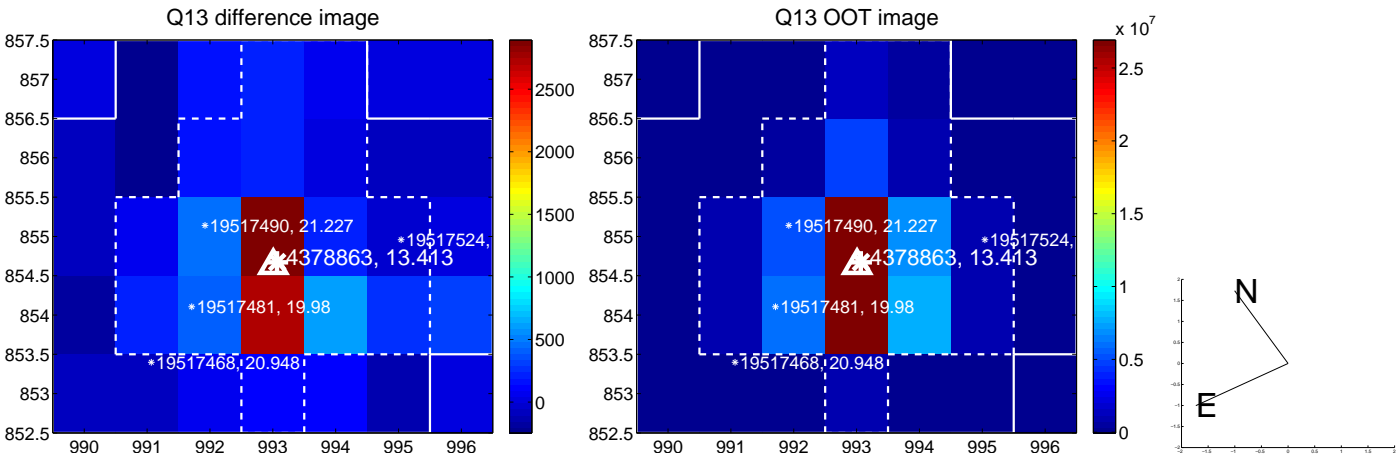
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



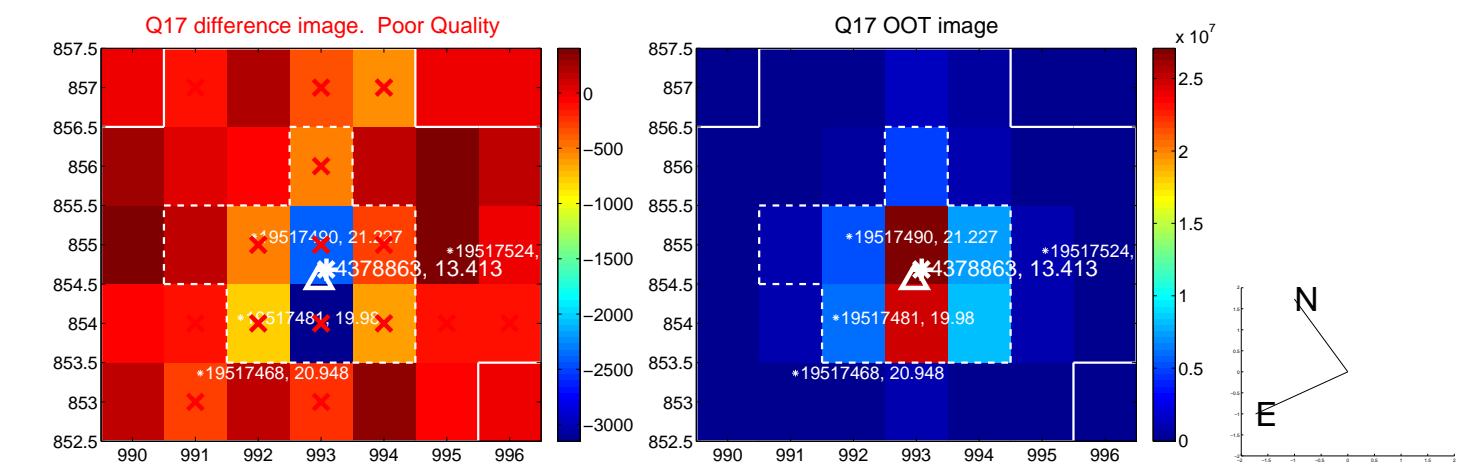
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



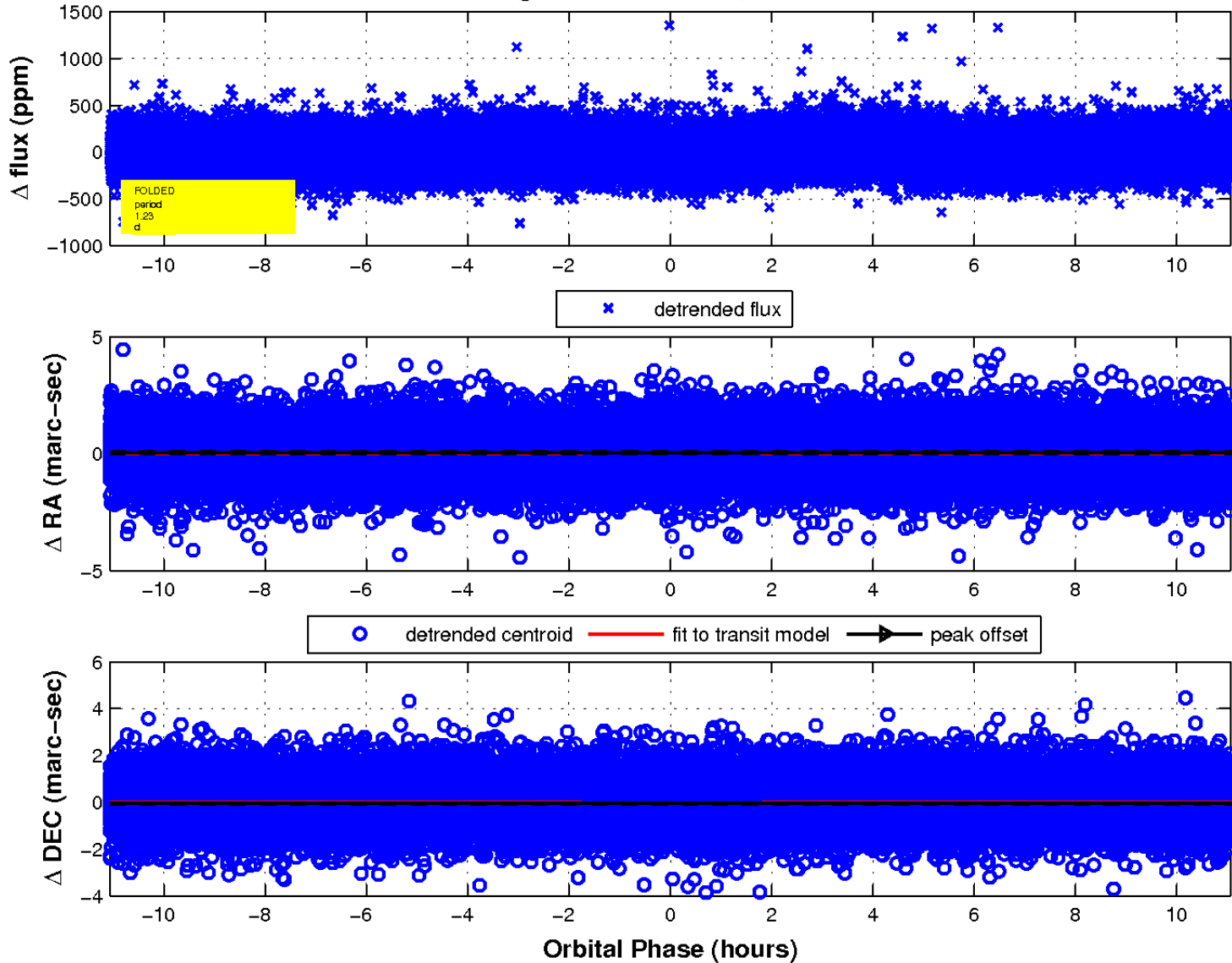
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

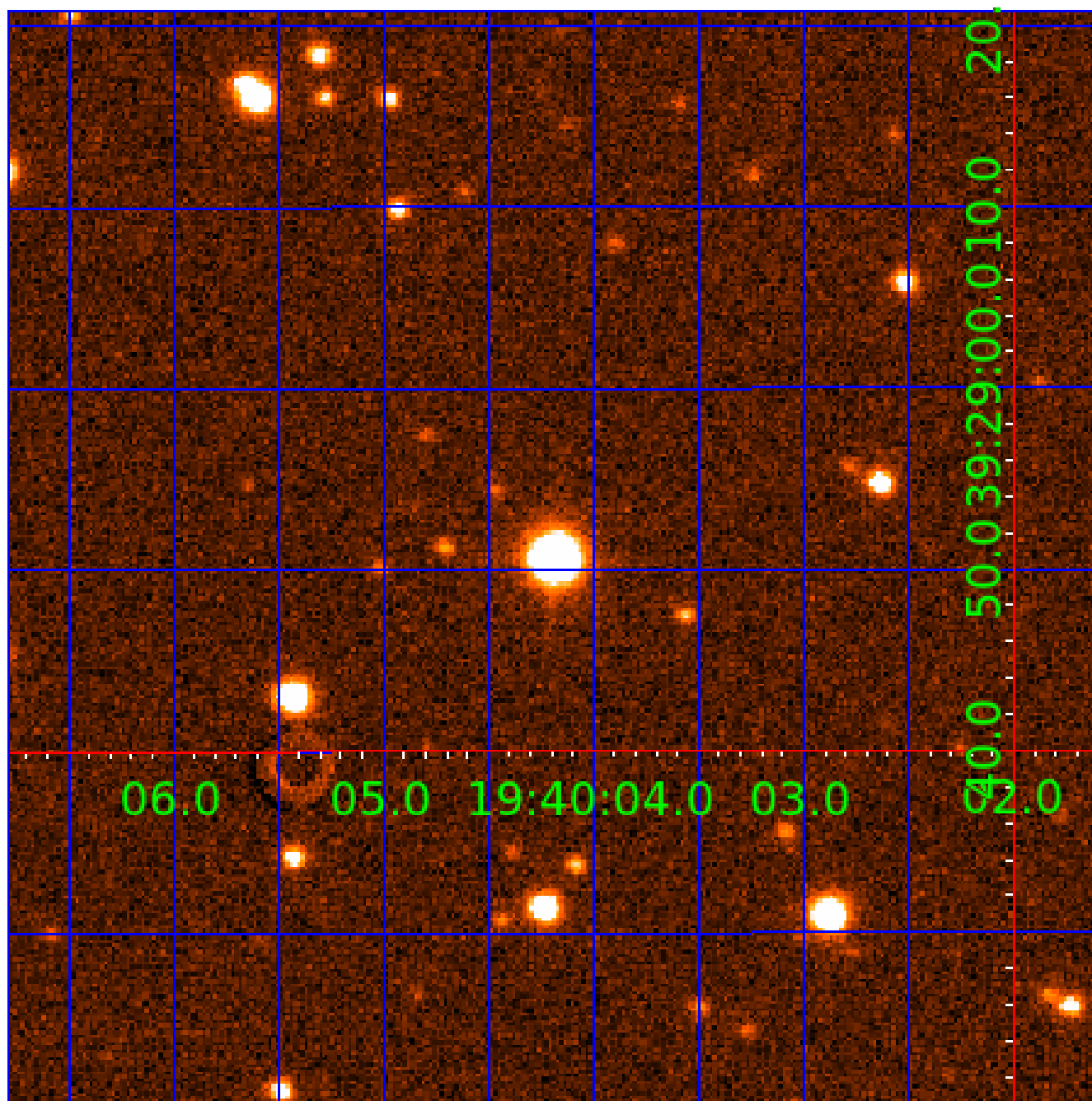


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 004378863

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})
004378863-01	OBS	No	1.226704	131.854177	15.5	3.689	11.0	6.3	2.45	7492	1.12	23119.55
004378863-02	OBS	No	1.226845	131.919671	68.0	1.847	8.6	3.9	2.45	7492	2.35	23116.01

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004378863-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
004378863-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_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.

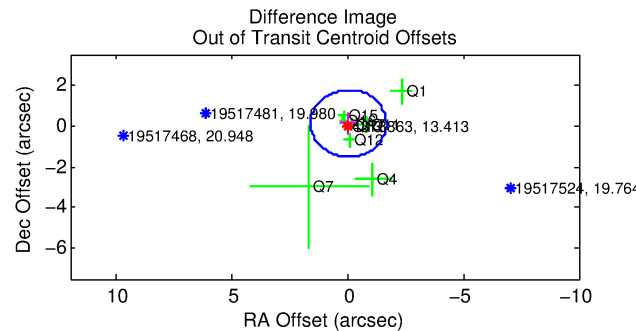
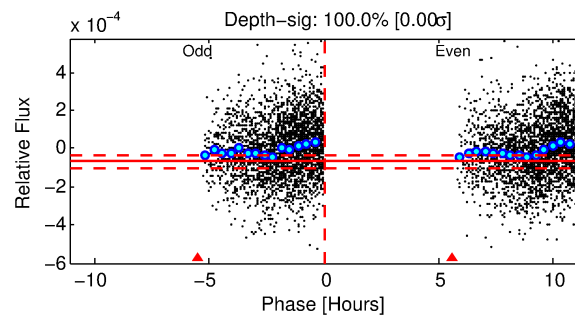
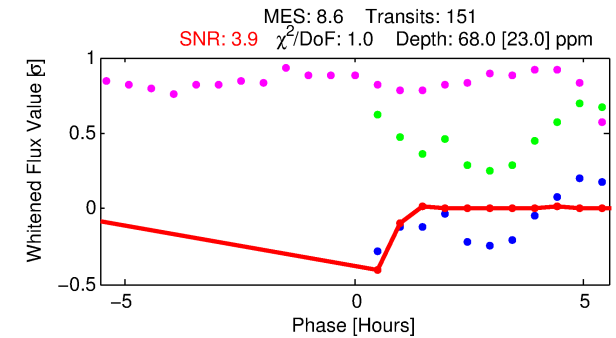
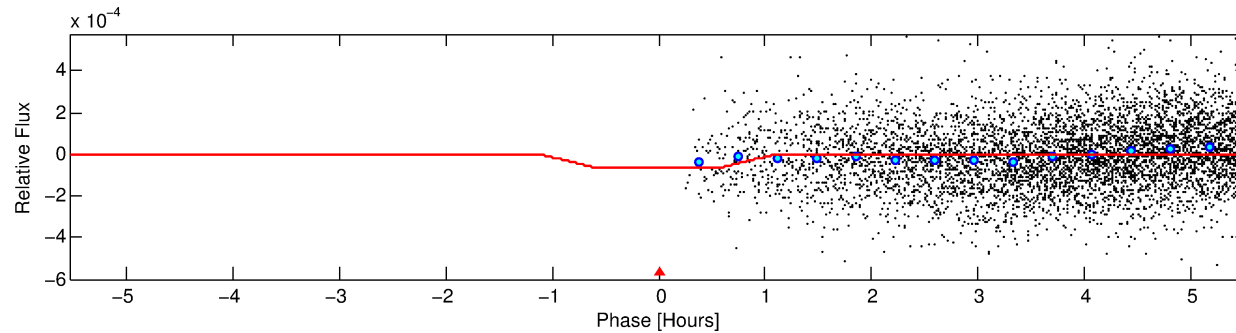
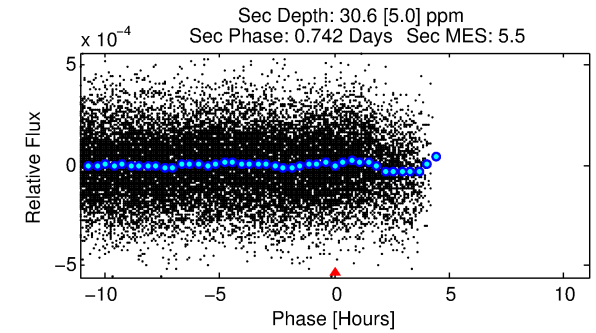
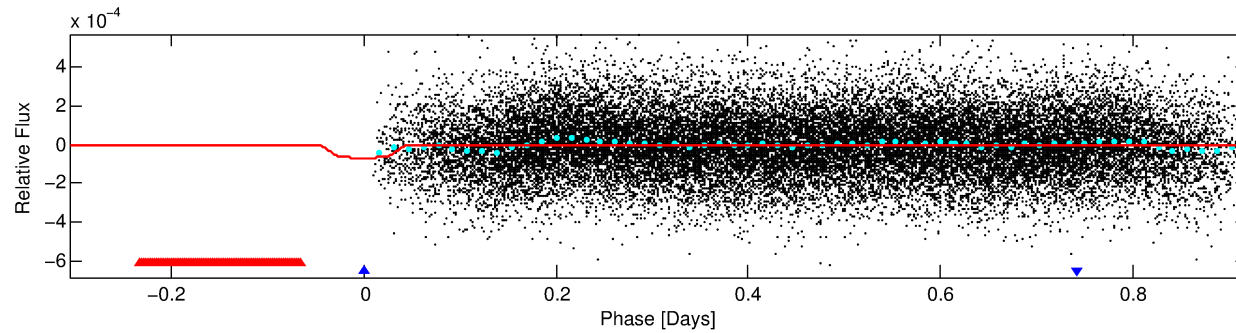
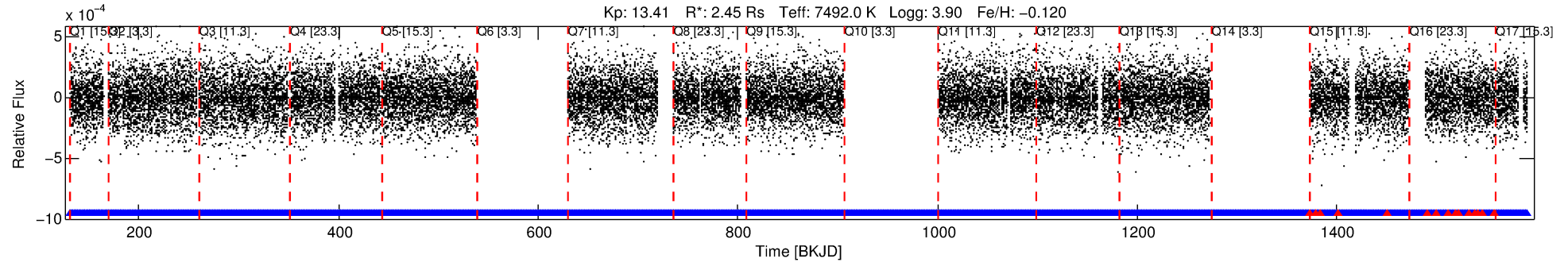
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004378863-02

No Significant Match Found

DV One-Page Summary

KIC: 4378863 Candidate: 2 of 2 Period: 1.227 d



DV Fit Results:

Period = 1.22684 [0.00001] d
Epoch = 131.9197 [0.0144] BKJD
Rp/R* = 0.0088 [0.0073]
a/R* = 2.50 [11.01]
b = 0.90 [1.11]
Seff = 23116.01 [11637.03]
Teq = 3144 [396] K
Rp = 2.35 [2.11] Re
a = 0.0271 [0.0083] AU
Ag = 2.24 [3.90] [0.32σ]
Teffp = 5946 [2502] K [1.11σ]

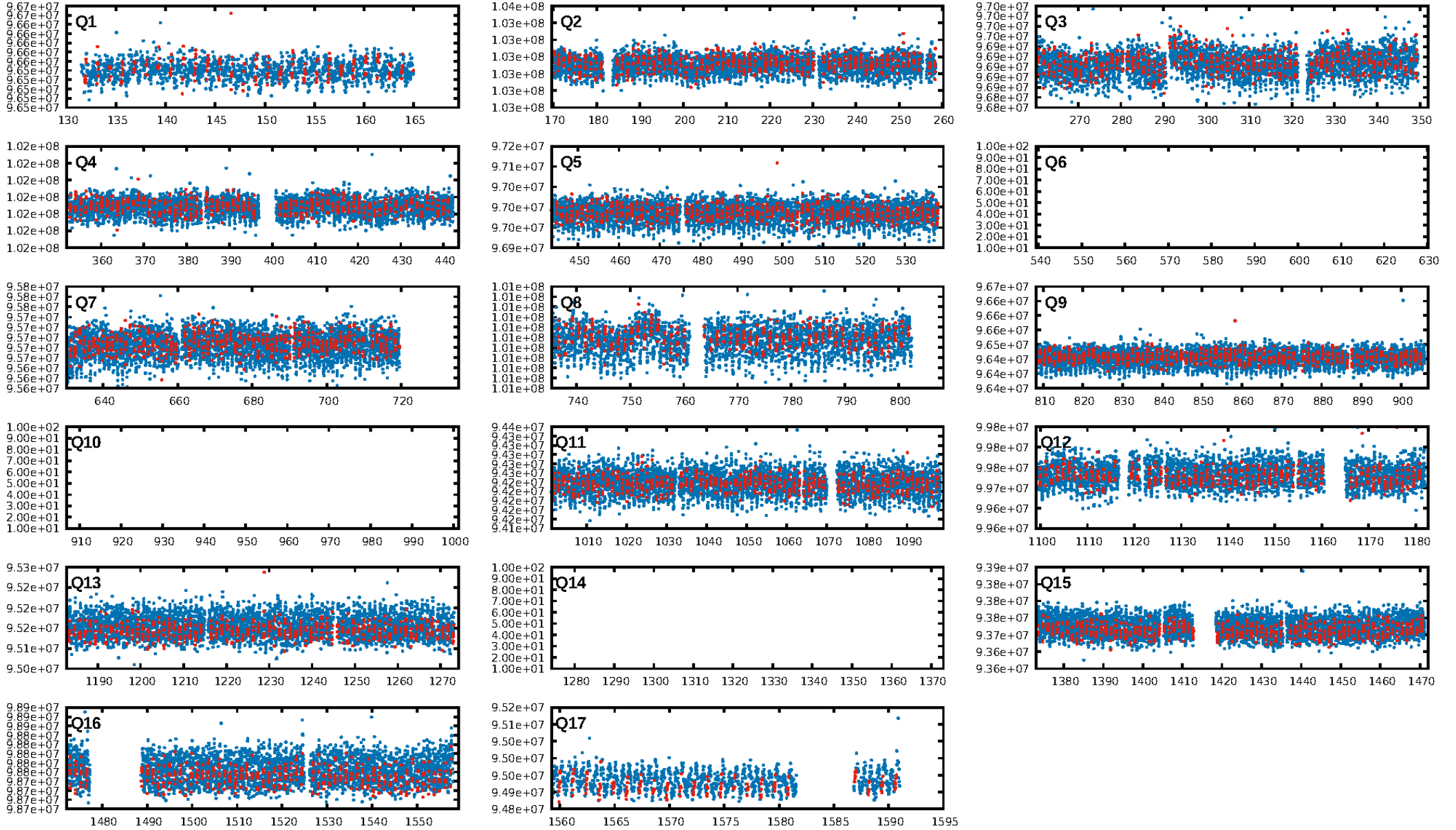
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 97.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.59e-17
RollingBand-fgt: 0.87 [112/129]
GhostDiagnostic-chr: -0.7145
Centroid-sig: 48.7%
Centroid-so: 0.327 arcsec [0.48σ]
OotOffset-rm: 0.119 arcsec [0.22σ]
KicOffset-rm: 0.128 arcsec [0.25σ]
OotOffset-st: 0/3/3 [9]
KicOffset-st: 0/3/3 [9]
DiffImageQuality-fgm: 0.89 [8/9]
DiffImageOverlap-fno: 0.00 [0/14]

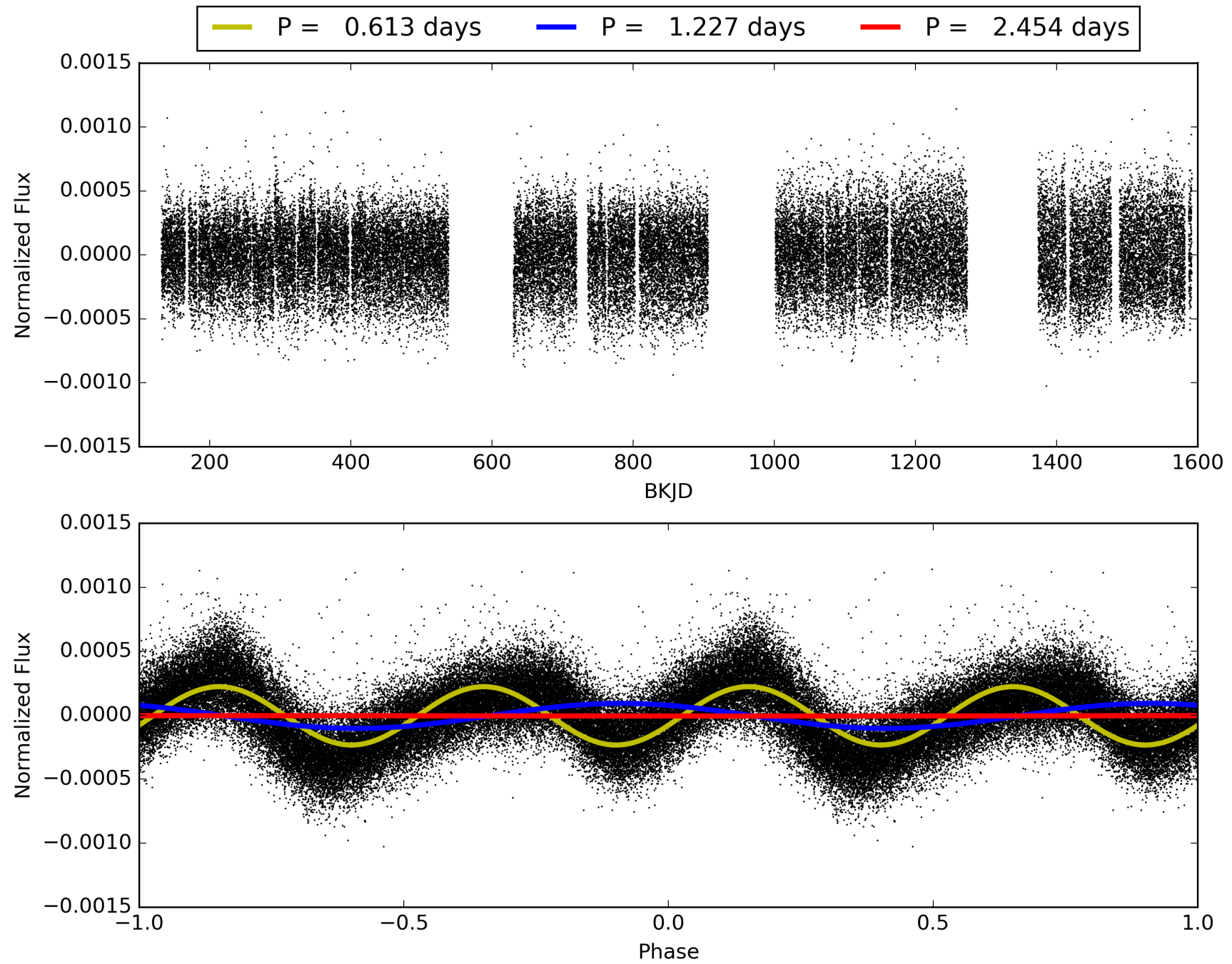
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:04:06 Z

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

TCE 004378863-02, PDC Light Curves

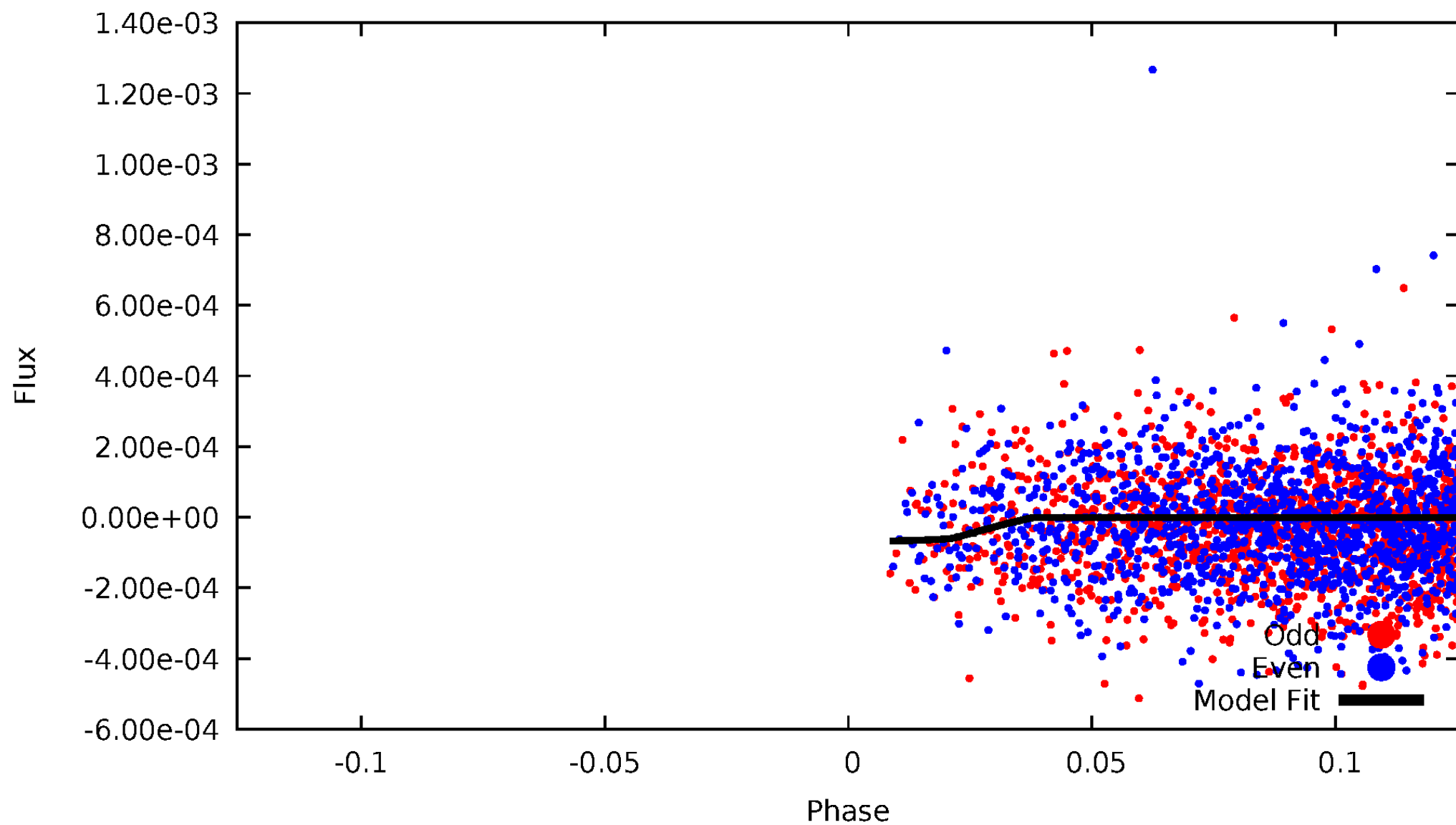


TCE 004378863-02



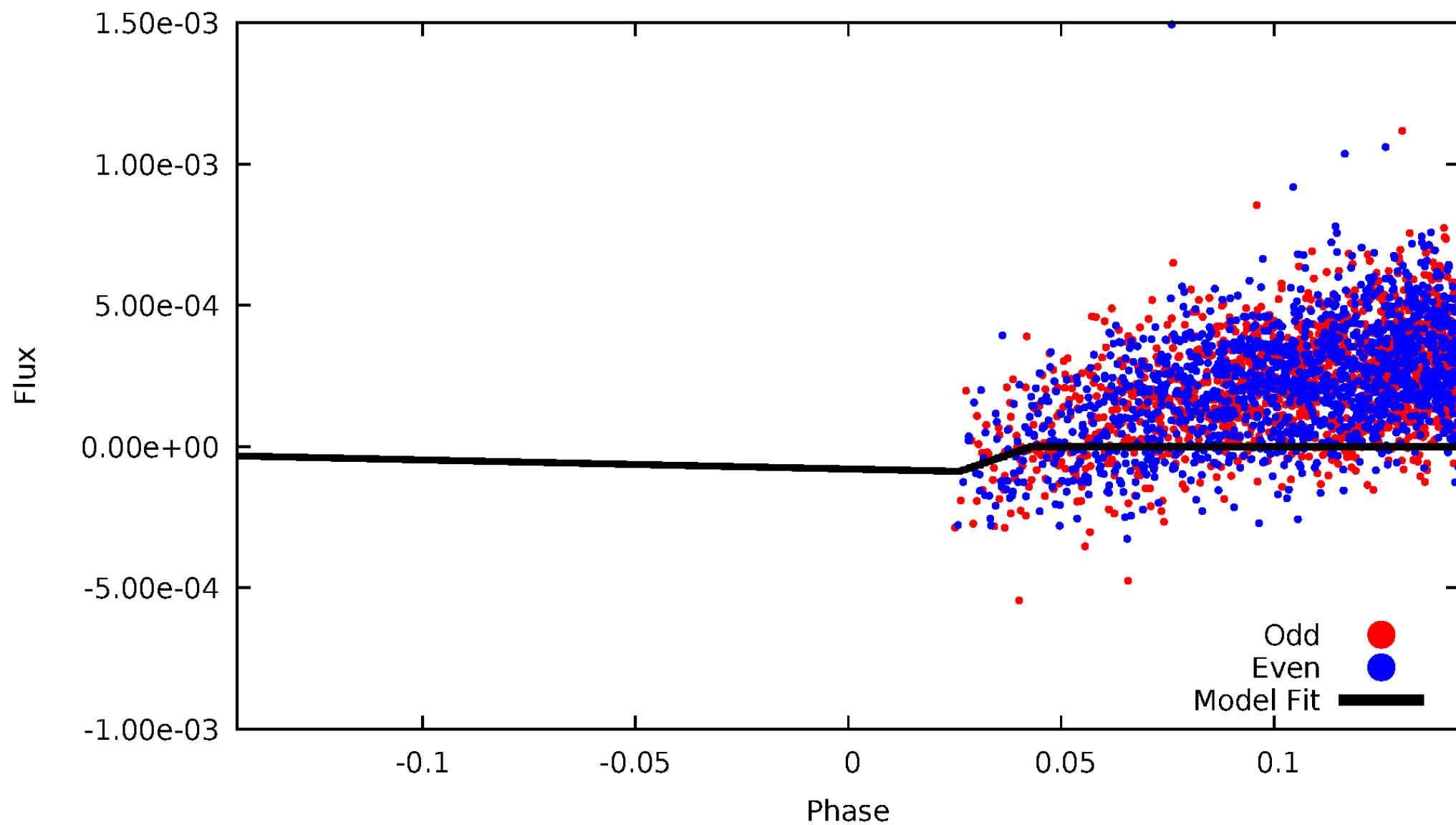
DV Odd/Even

TCE 004378863-02



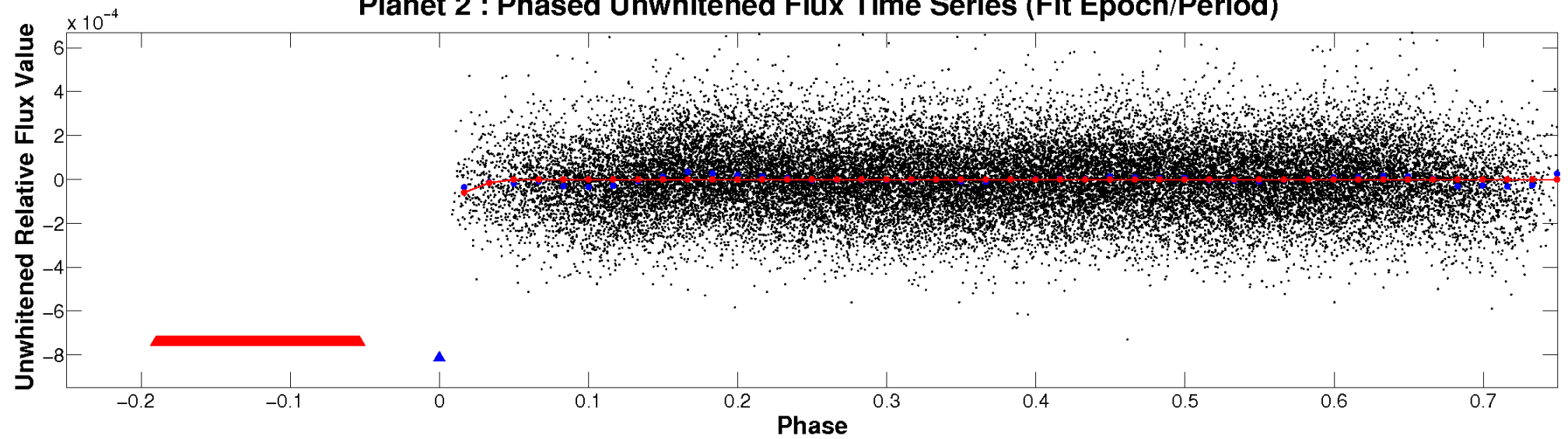
ALT Odd/Even

TCE 004378863-02

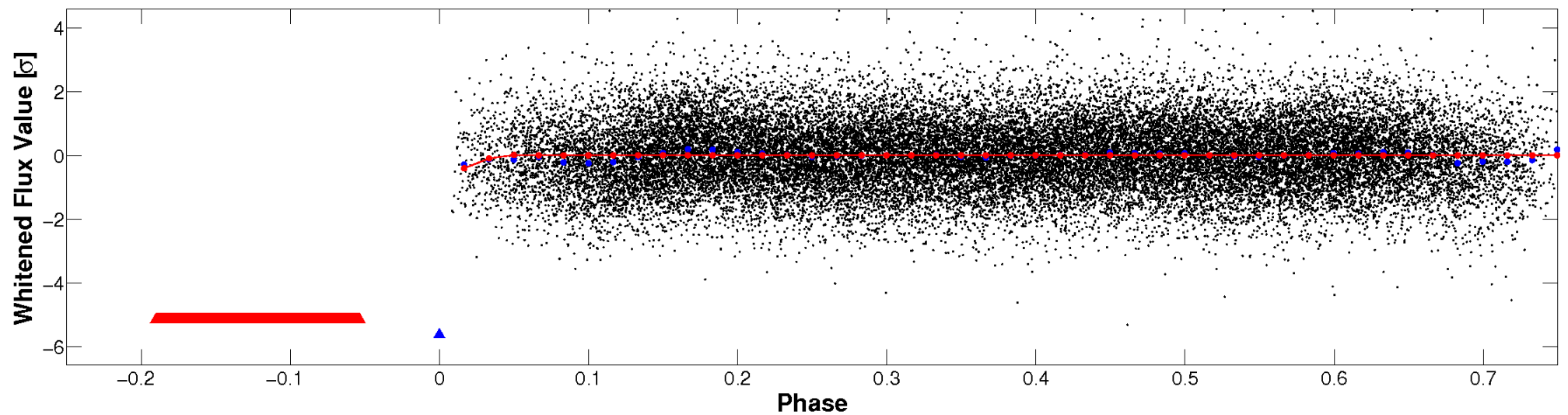


Non-Whitened Vs. Whitened Light Curve

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

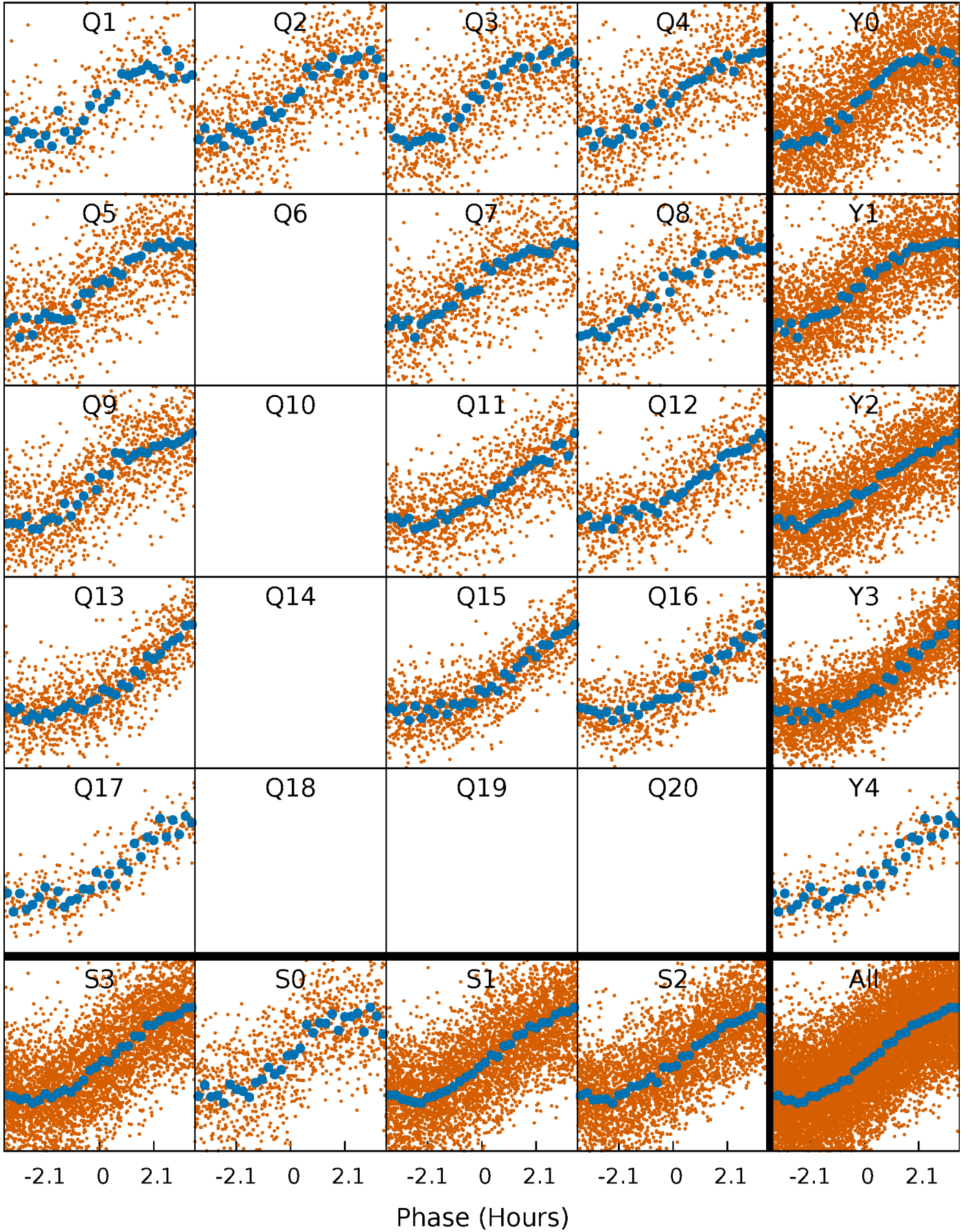


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



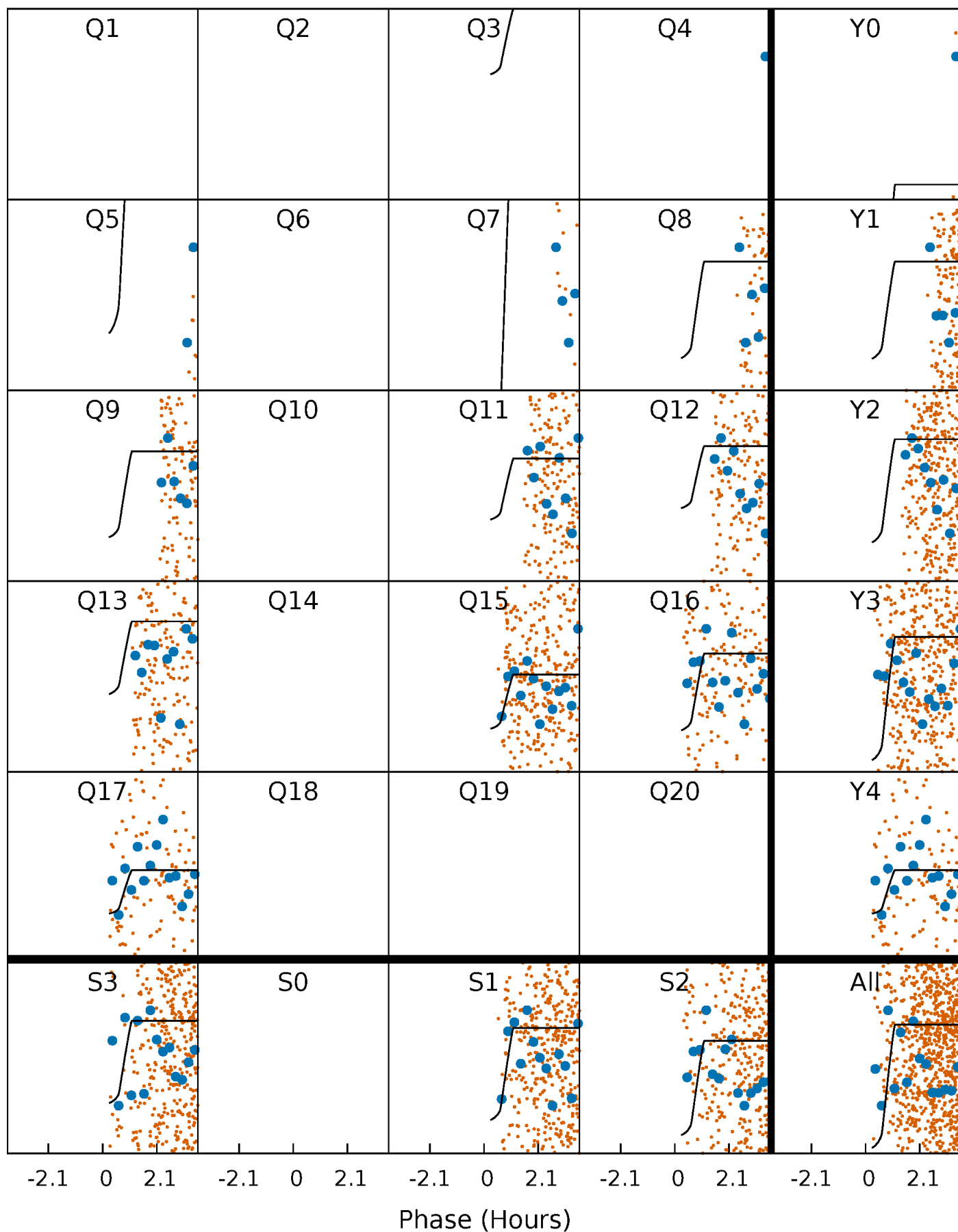
PDC Quarter-Phased Transit Curves

TCE 004378863-02 P= 1.226845 Days $T_0=131.919671$ (BKJD)



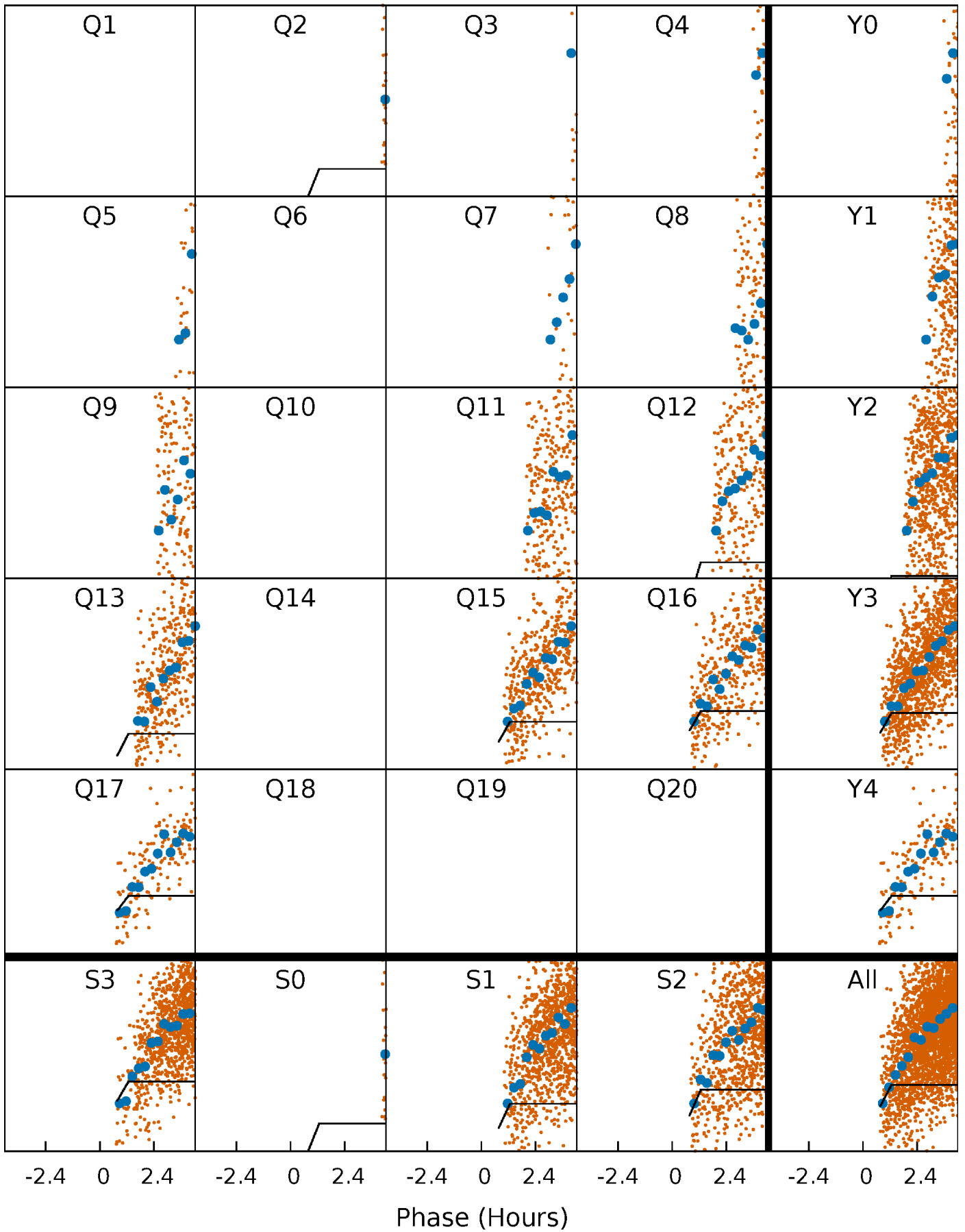
DV Quarter-Phased Transit Curves

TCE 004378863-02 P= 1.226845 Days $T_0=131.919671$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

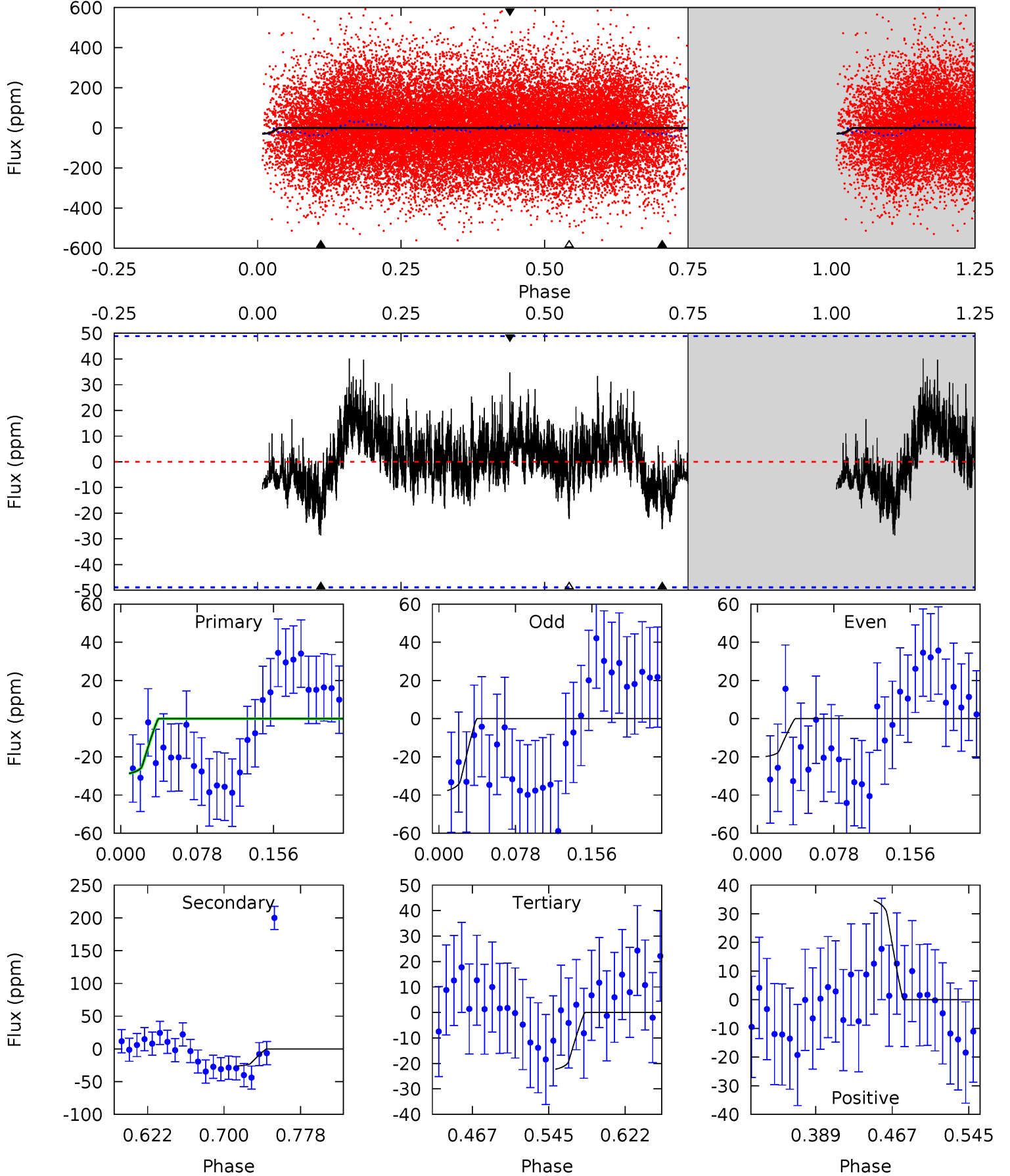
TCE 004378863-02 P= 1.226832 Days $T_0=131.914952$ (BKJD)



DV Model-Shift Uniqueness Test

004378863-02, P = 1.226845 Days, E = 130.692826 Days

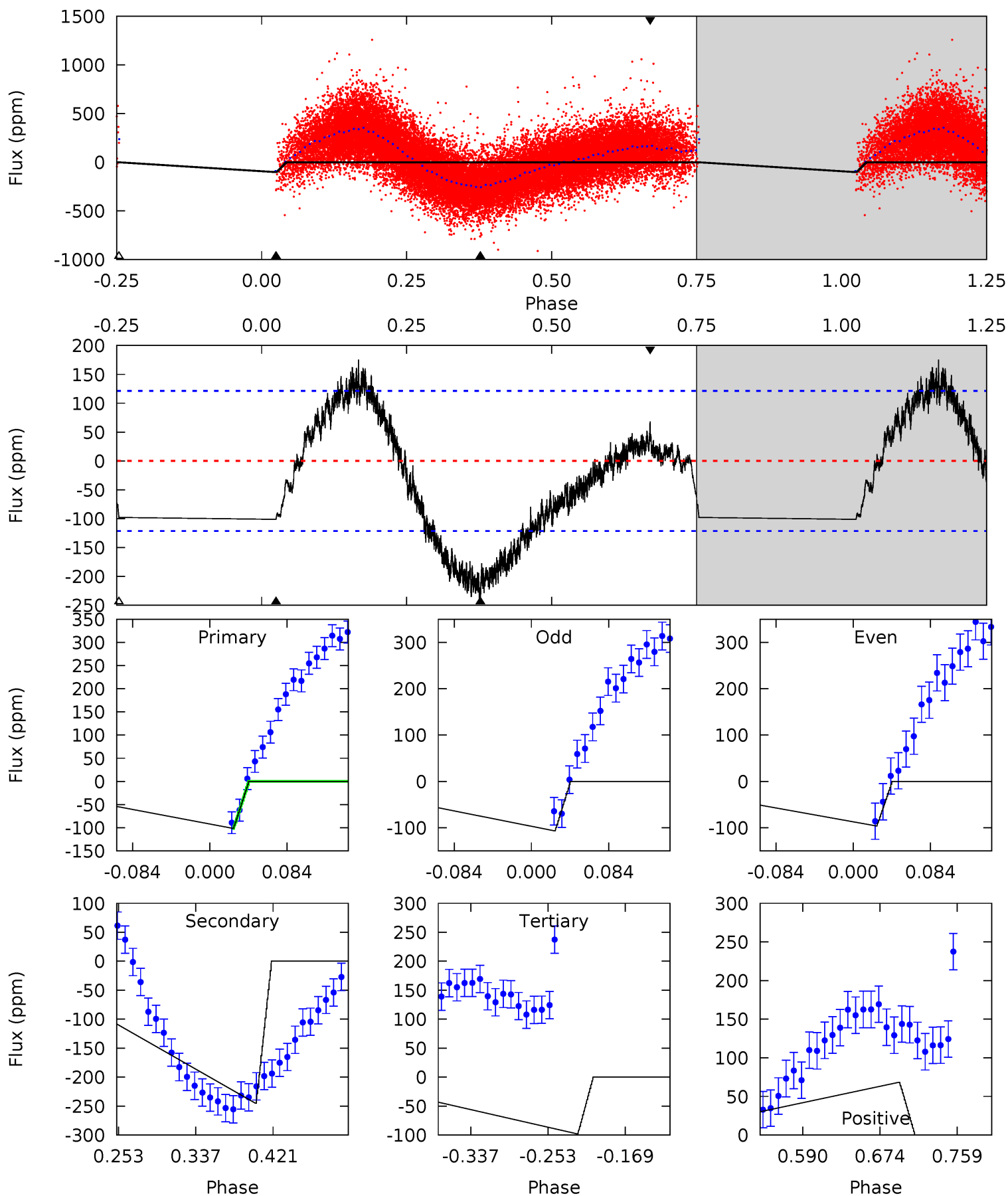
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.71	2.47	2.10	3.28	4.62	1.76	0.62	0.61	-0.57	0.37	-0.81	0.84	0.73	0.58	0



Alt Model-Shift Uniqueness Test

004378863-02, P = 1.226832 Days, E = 130.688120 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.83	9.27	3.71	2.59	4.60	1.73	2.86	0.13	1.25	5.57	6.69	0.20	1.00	0.42	0



Stellar Parameters For KIC 004378863

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7492^{+235}_{-314}	$3.905^{+0.273}_{-0.126}$	$-0.120^{+0.200}_{-0.350}$	$2.452^{+0.478}_{-0.820}$	$1.763^{+0.195}_{-0.363}$	$0.168^{+0.339}_{-0.063}$
	+3%/-4%	+7%/-3%	+167%/-292%	+19%/-33%	+11%/-21%	+201%/-37%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 004378863-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-26 ± 11	$2.51^{+1.86}_{-1.52}$	4342^{+299}_{-377}	4999^{+3335}_{-1577}	$1.643^{+7.602}_{-1.198}$
Alt.	-245 ± 26	$2.60^{+1.86}_{-1.56}$	4301^{+323}_{-364}	9606^{+13251}_{-2687}	14^{+75}_{-10}

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

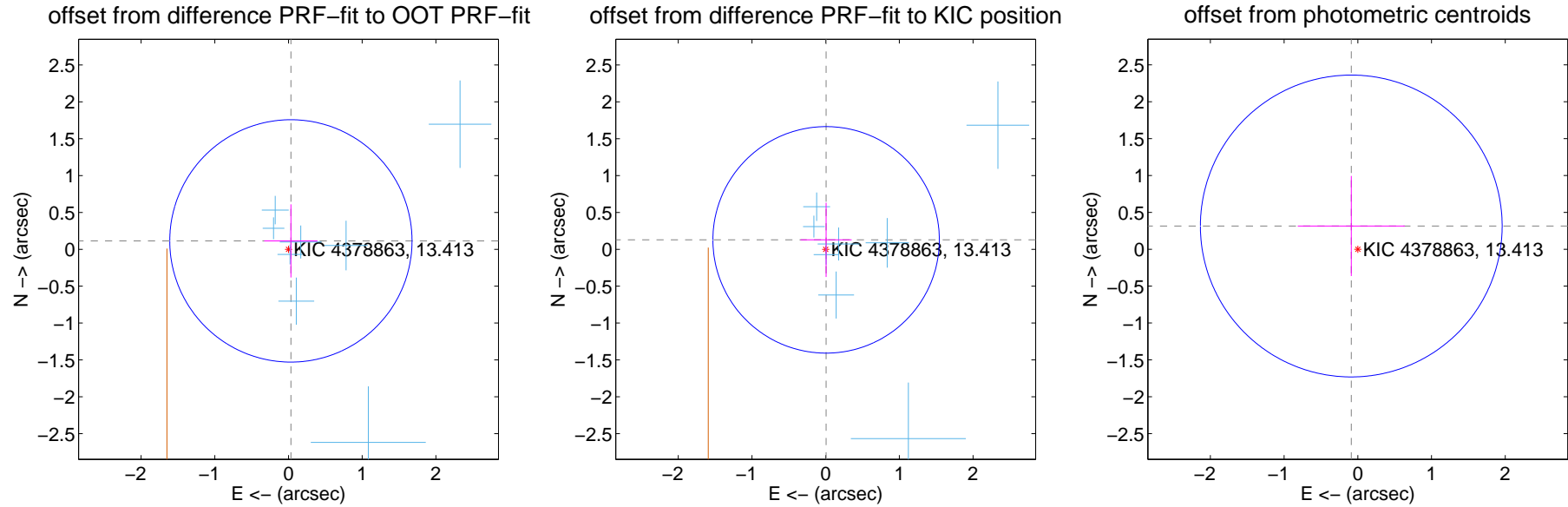
DV Centroid Data

Supplemental centroid analysis for 004378863-02. Kepler magnitude: 13.41. Transit SNR 3.95

There are 8 quarters with good PRF difference image offsets

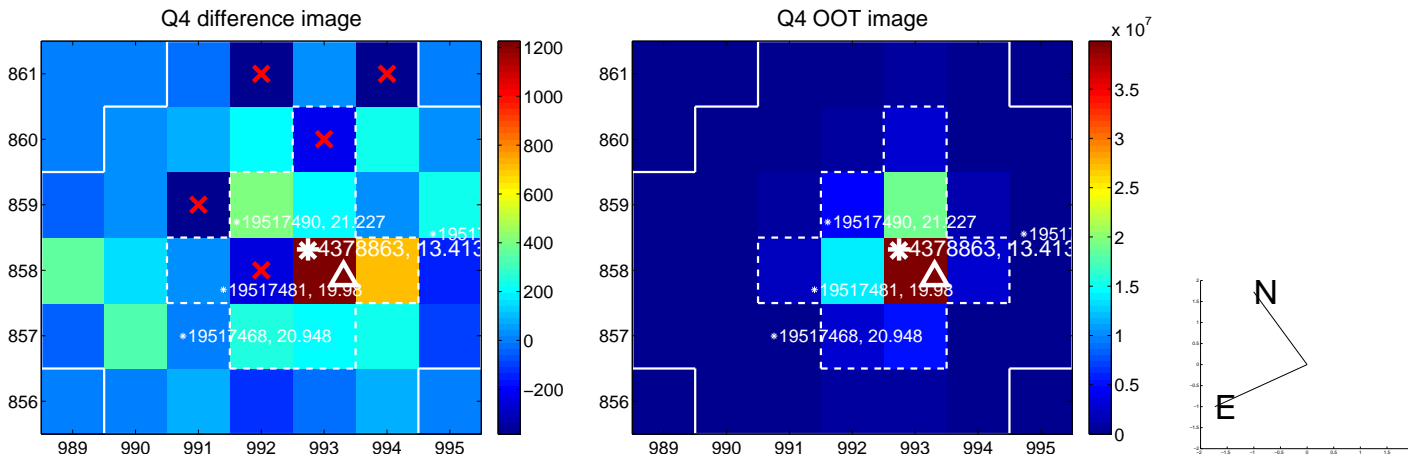
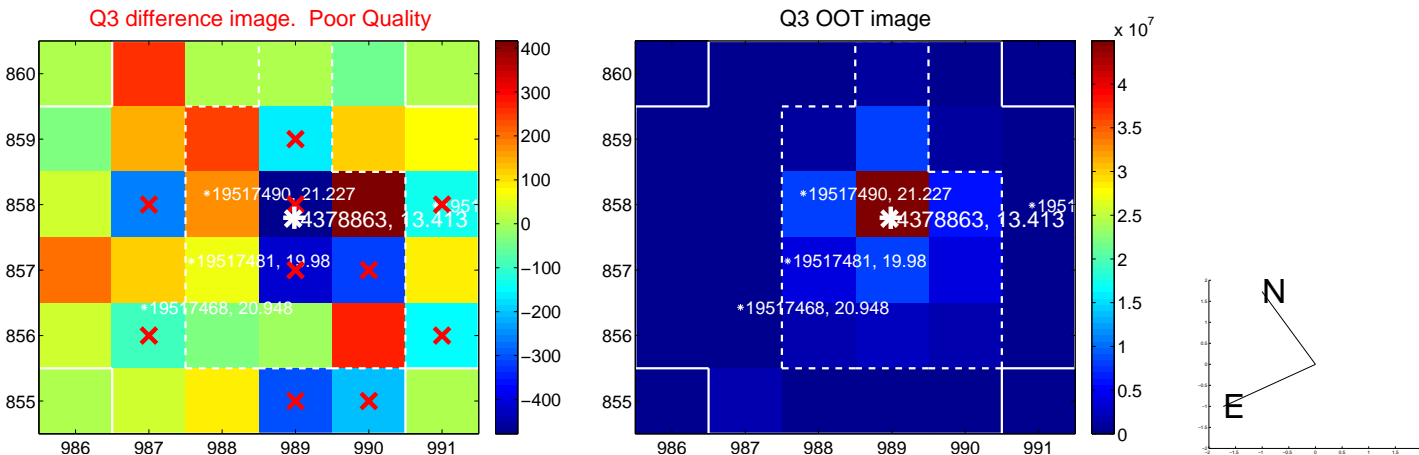
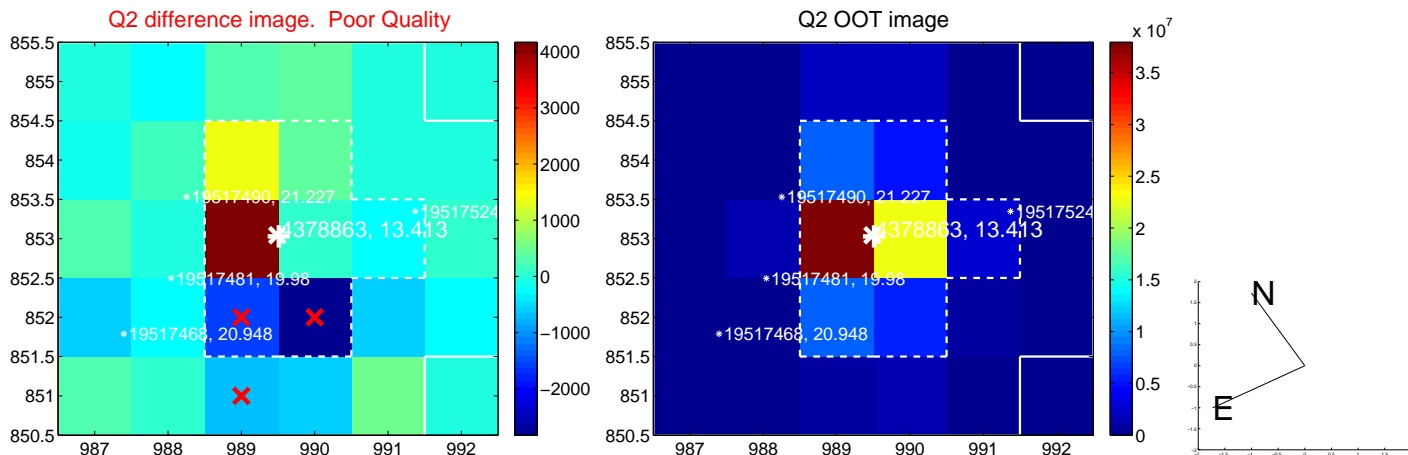
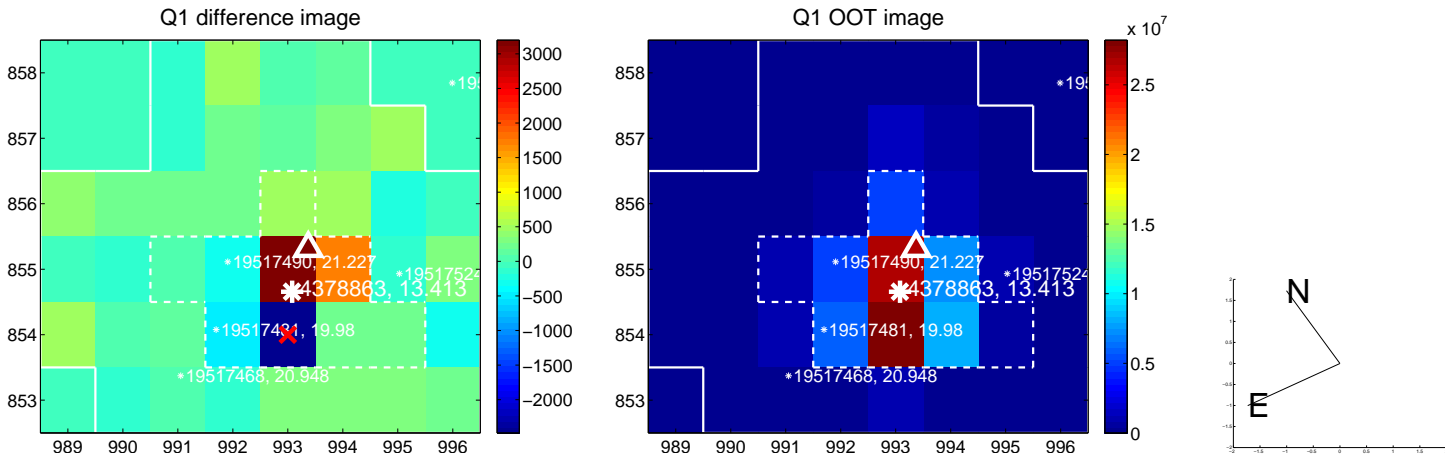
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.119 ± 0.548	0.22	-0.033 ± 0.361	0.114 ± 0.496
PRF-fit source offset from KIC position	0.128 ± 0.512	0.25	-0.006 ± 0.346	0.128 ± 0.503
photometric centroid source offset	0.33 ± 0.68	0.48	0.09 ± 0.73	0.32 ± 0.68

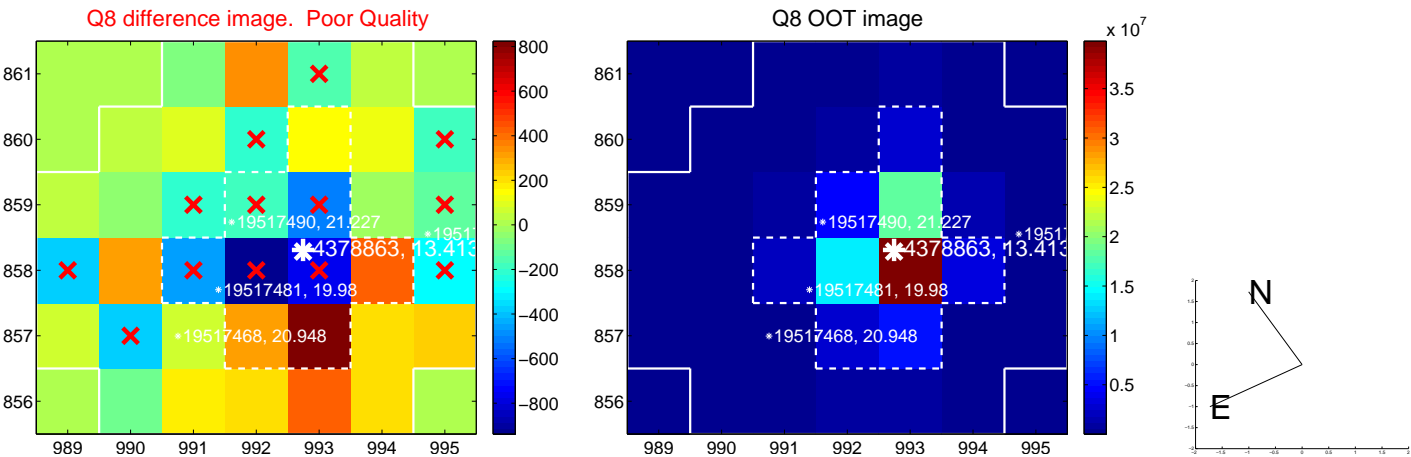
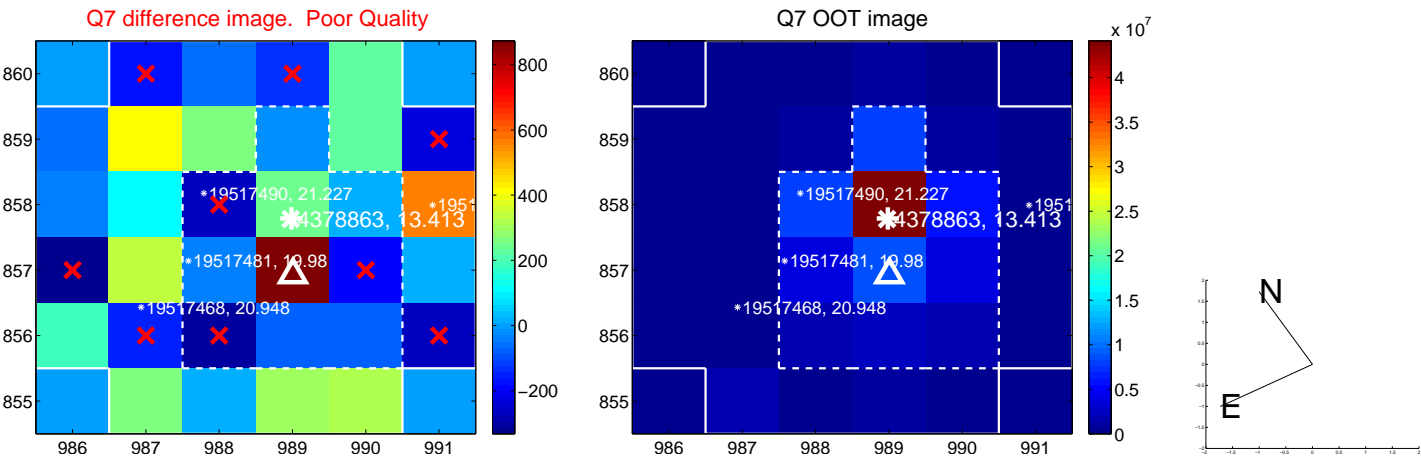
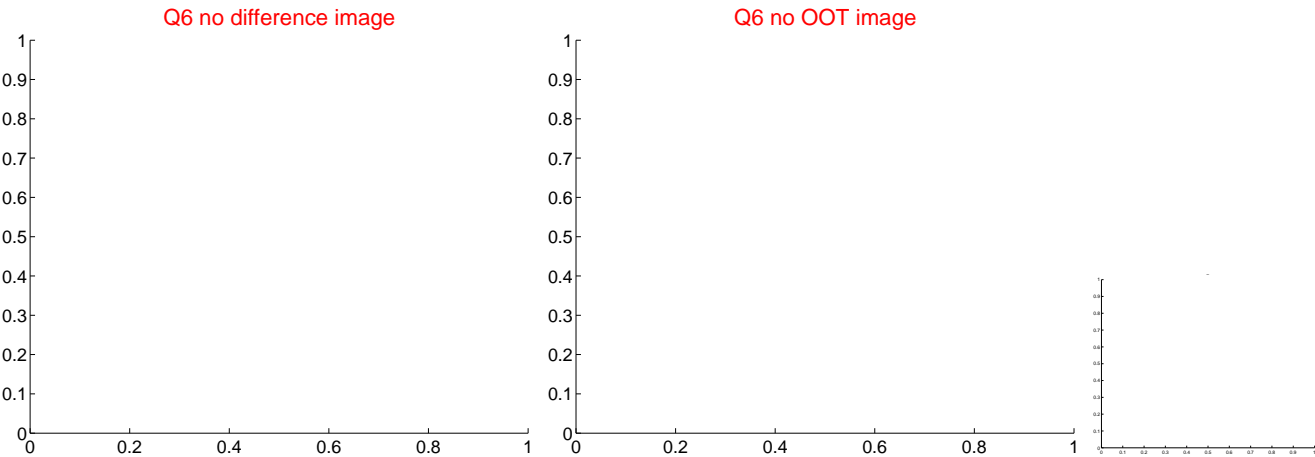
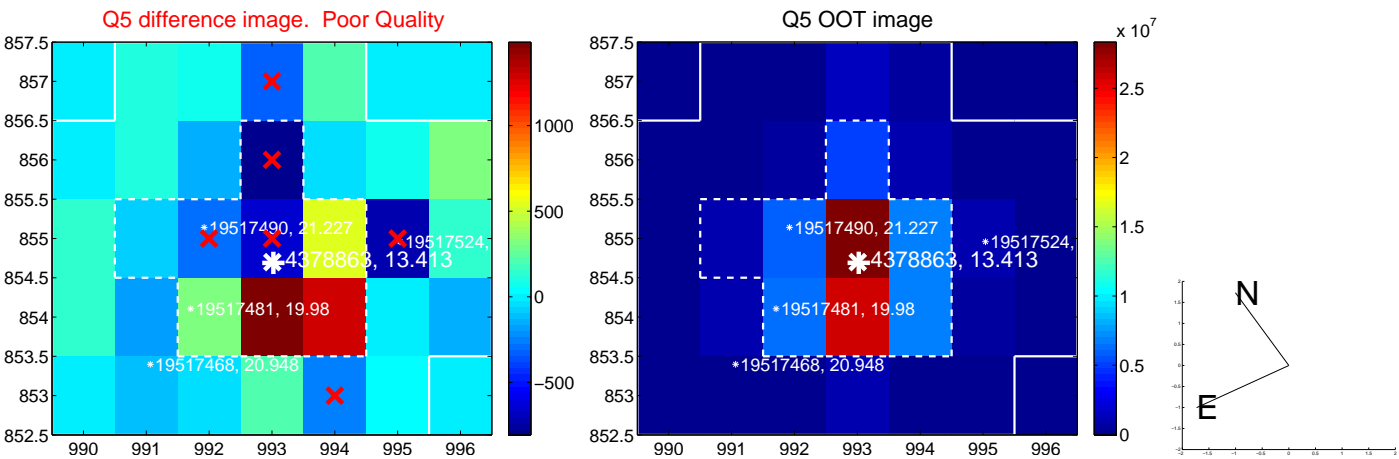


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

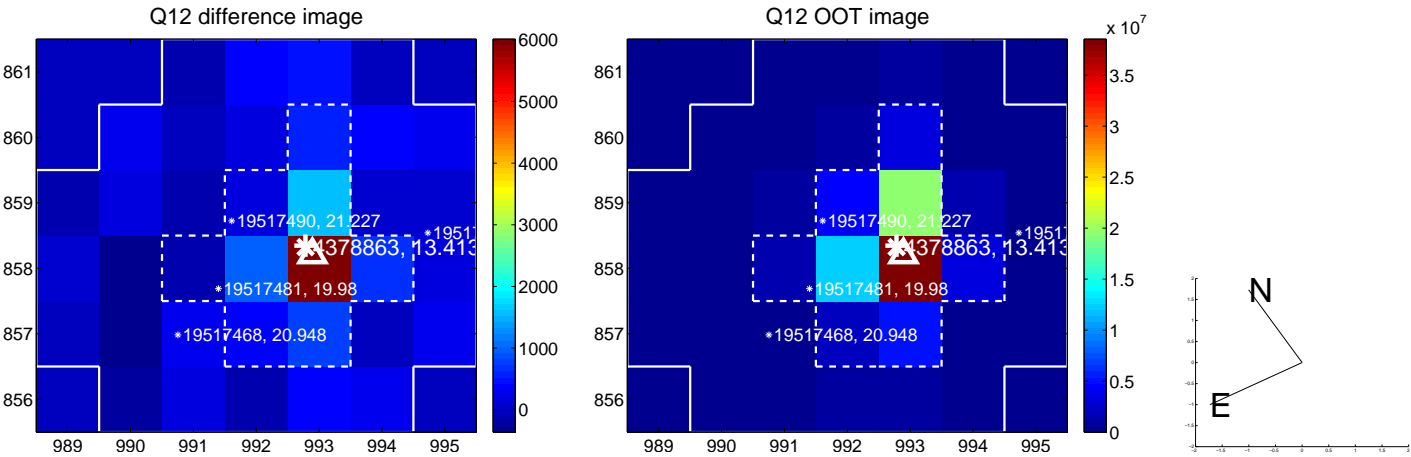
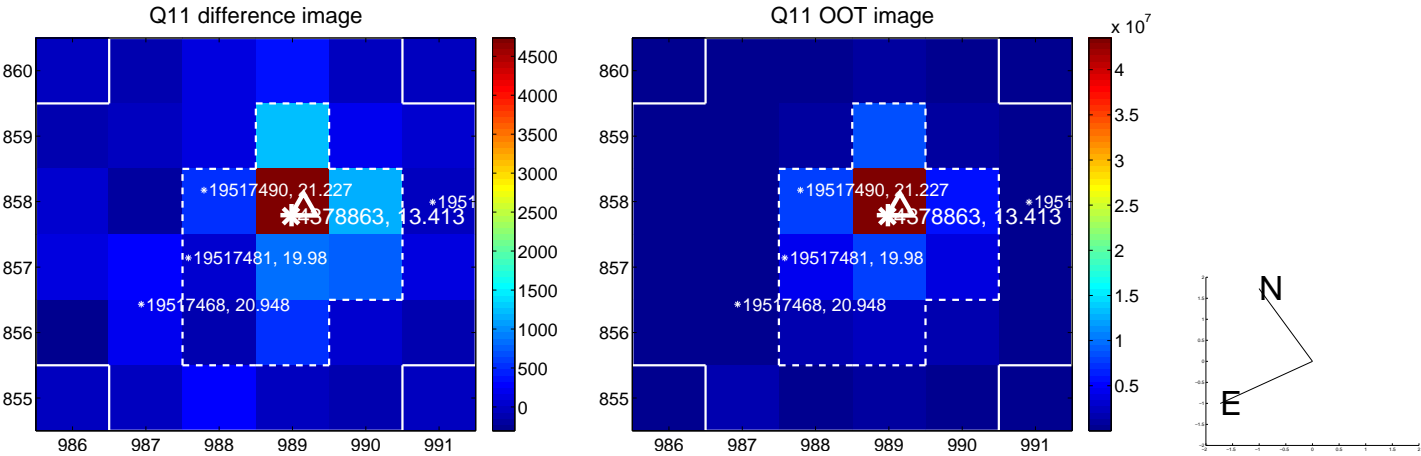
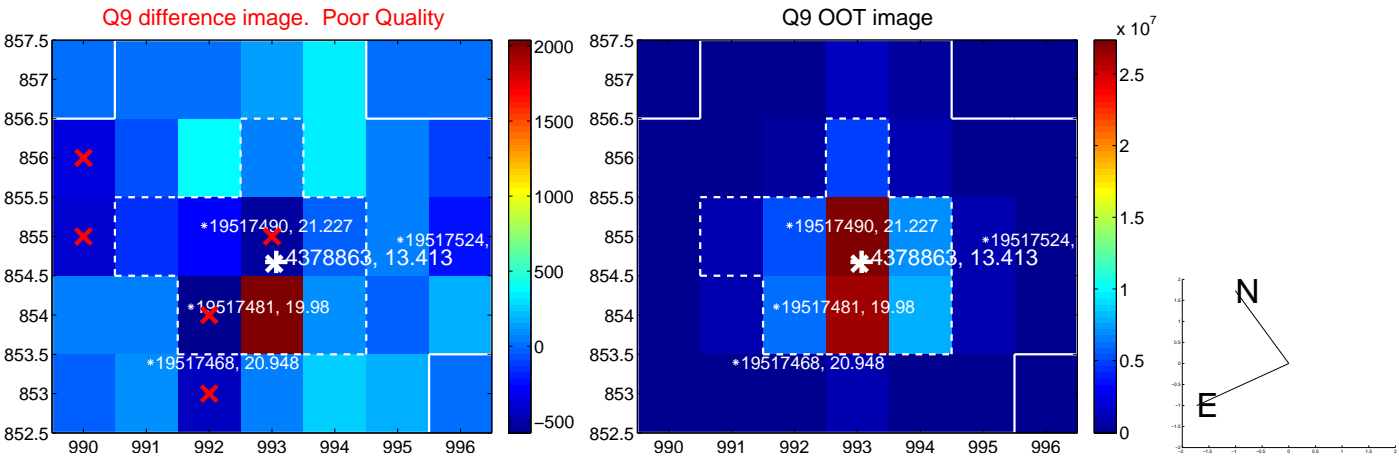
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



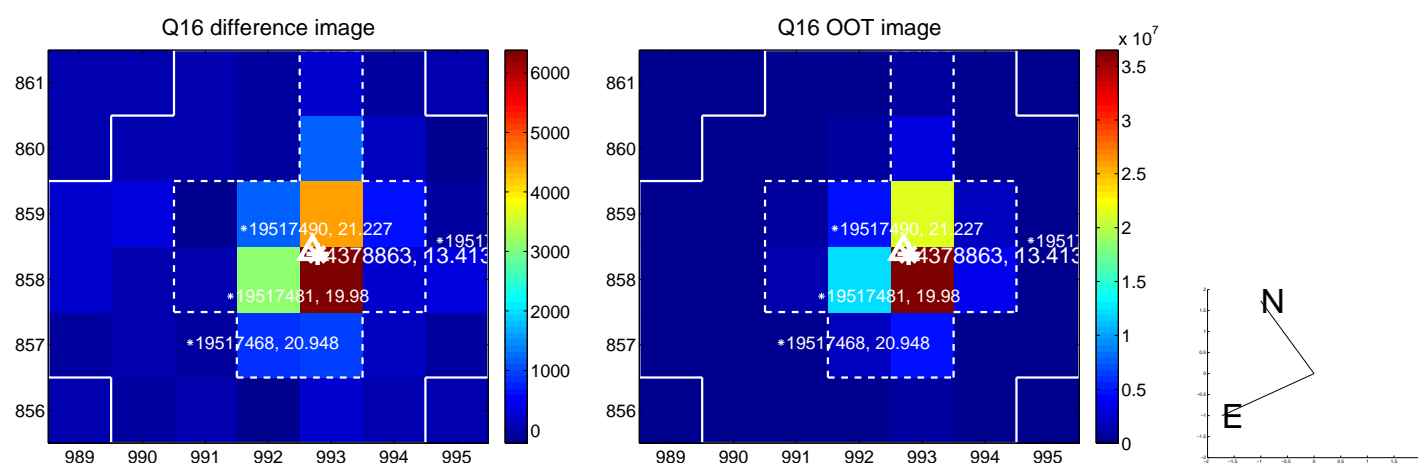
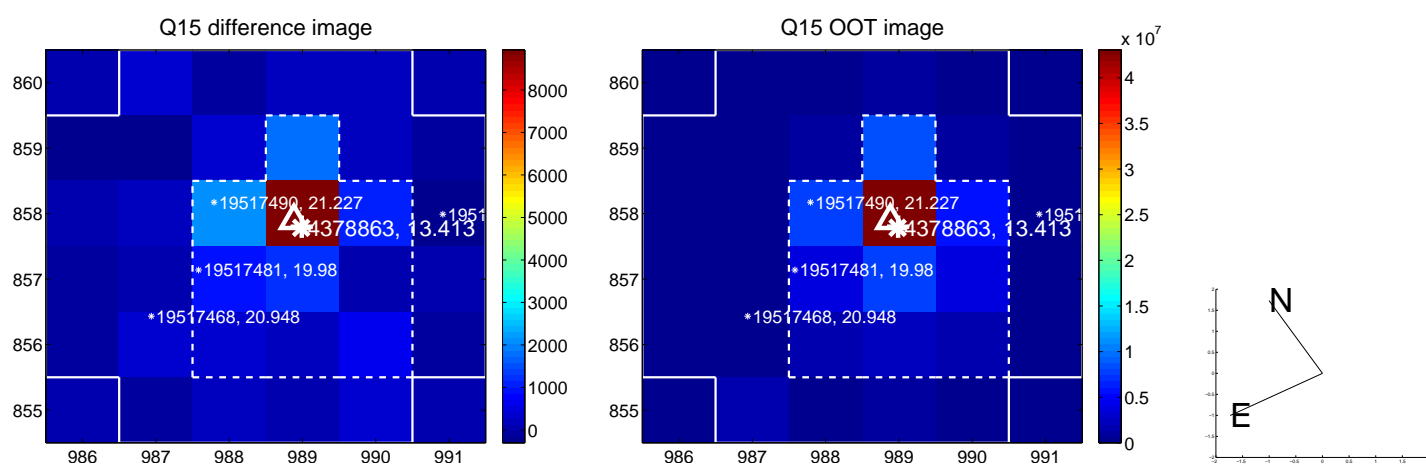
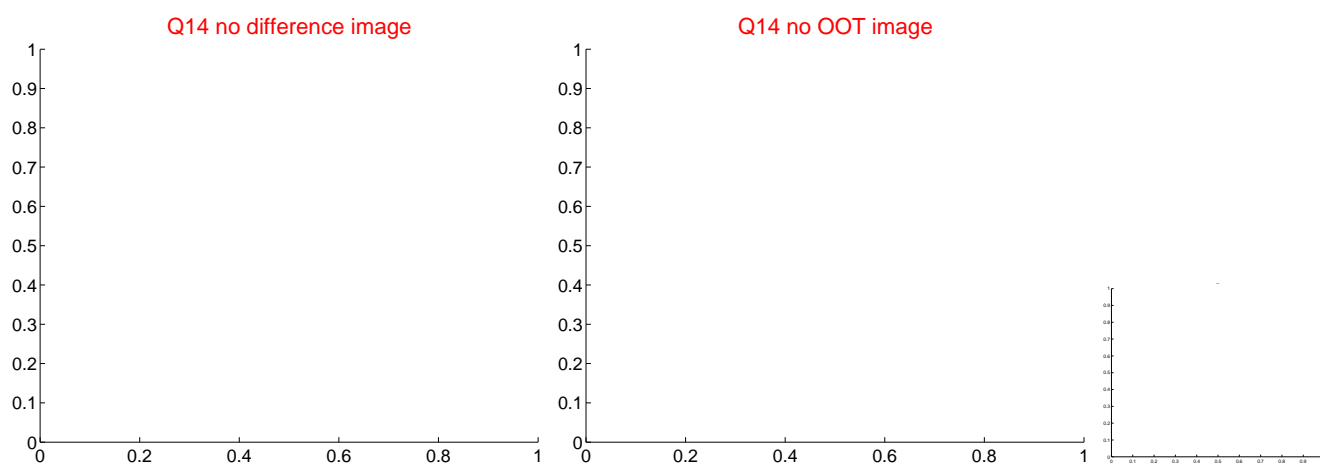
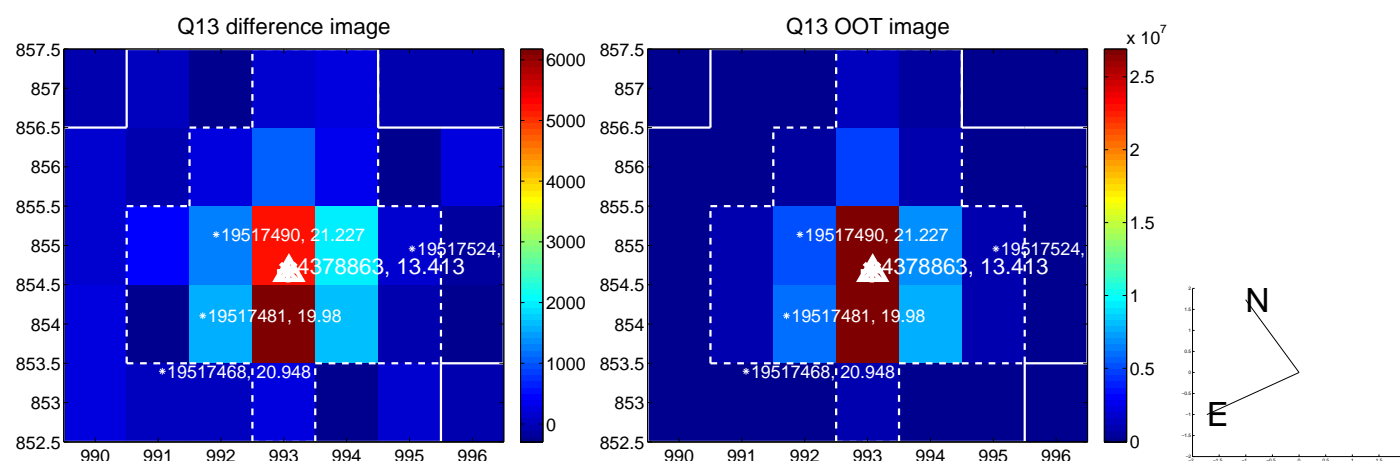
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



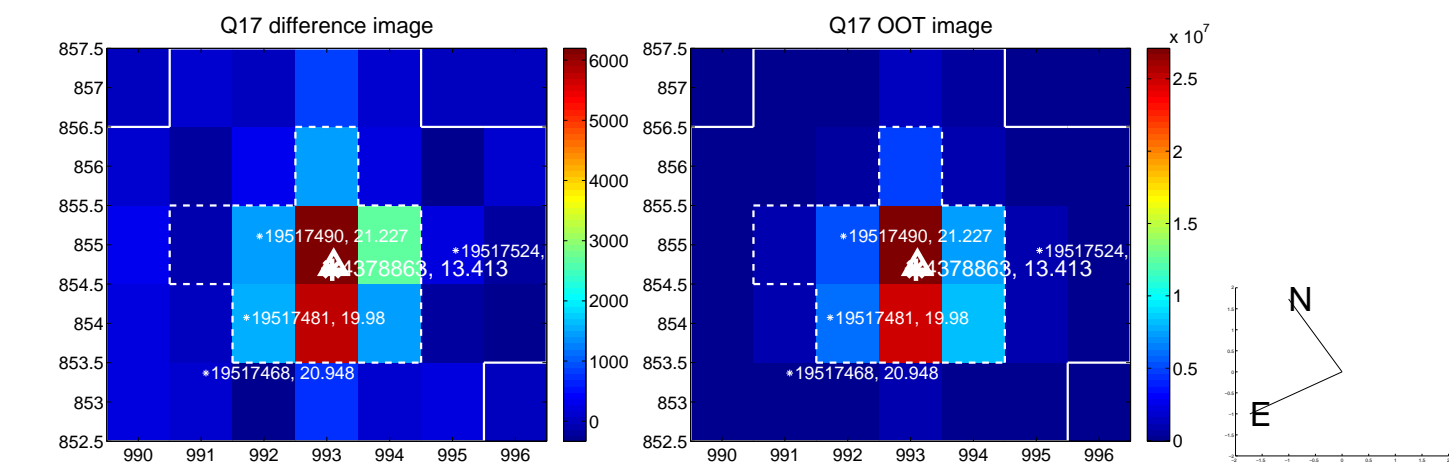
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



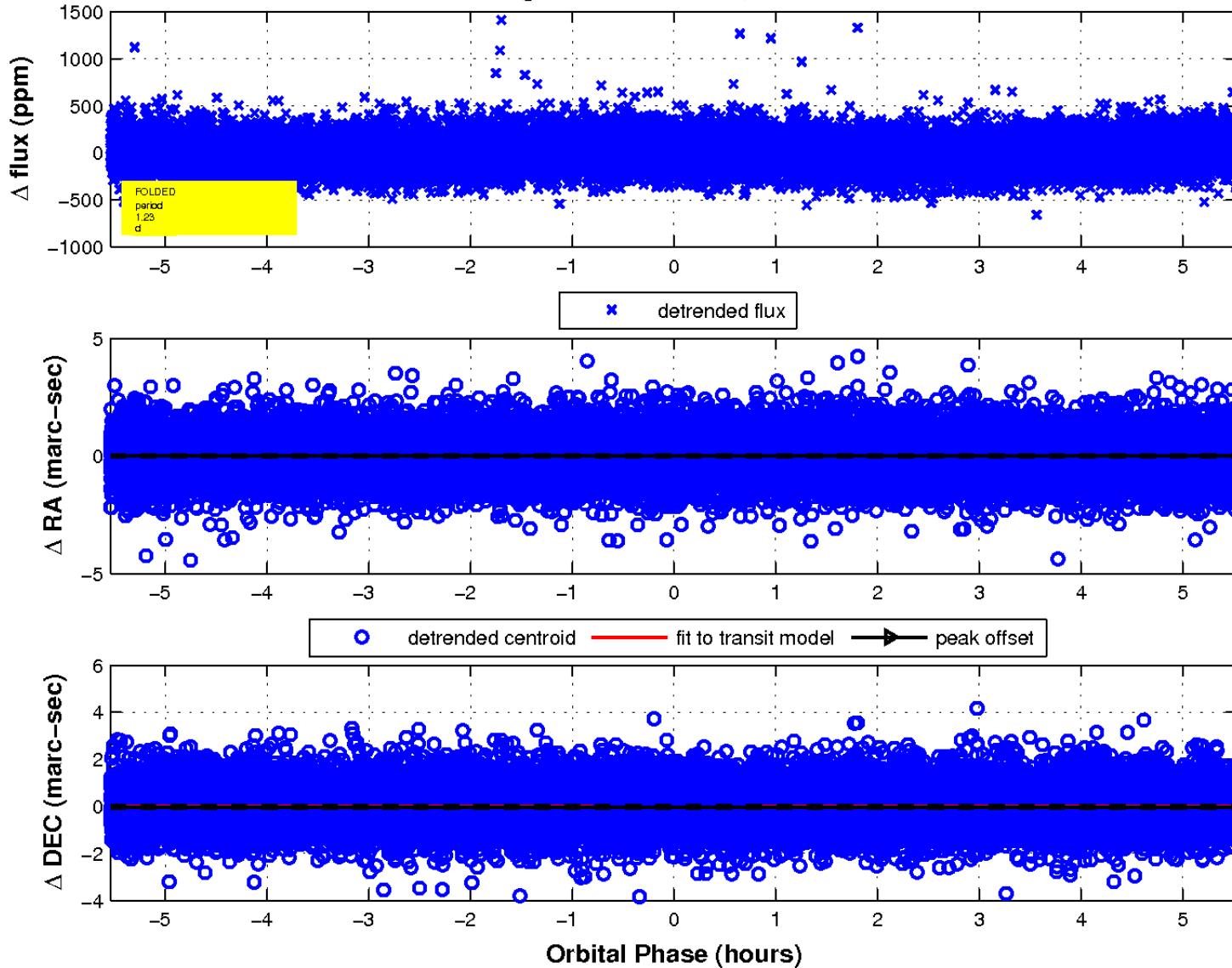
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

