

KIC 009165393

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})
009165393-01	OBS	No	1.321857	131.981971	43.2	5.896	10.3	10.6	2.46	7892	1.68	24268.32
009165393-02	OBS	No	1.321827	132.658621	54.2	5.604	10.6	12.7	2.46	7892	1.84	24269.05

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009165393-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009165393-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_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.

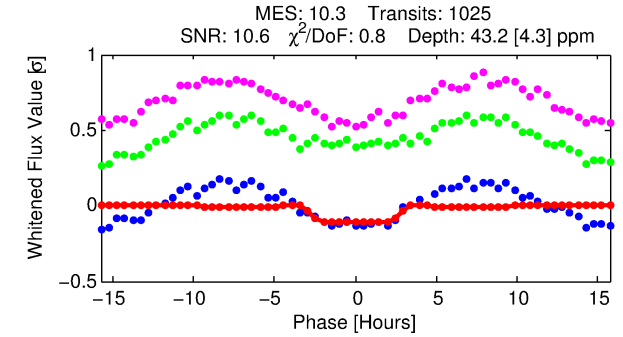
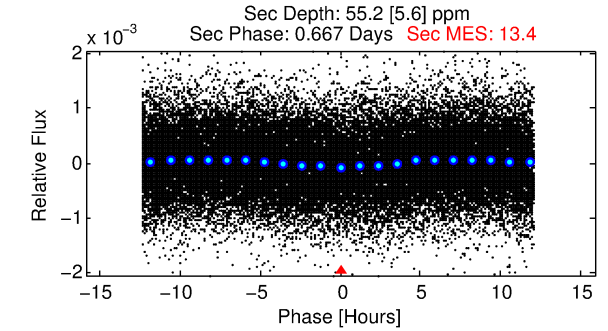
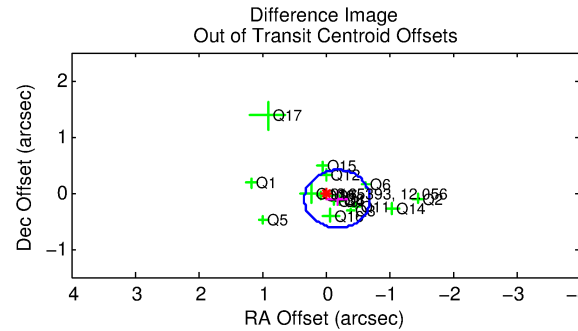
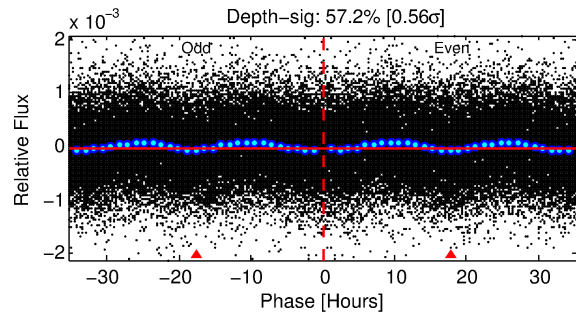
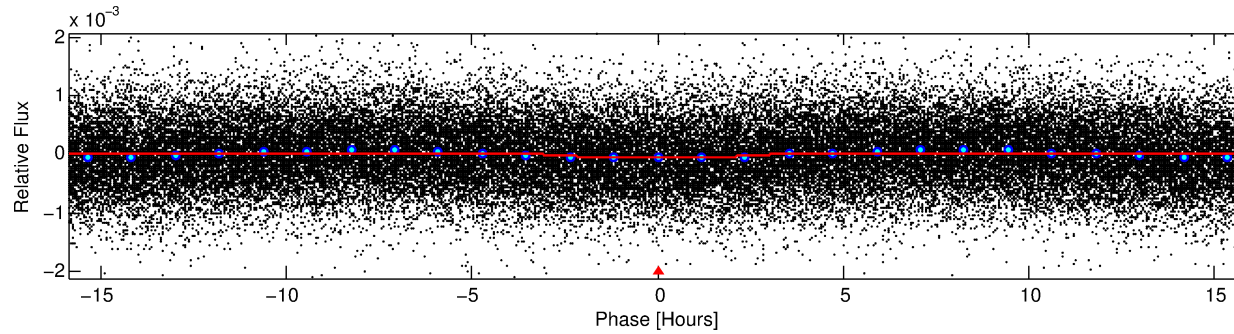
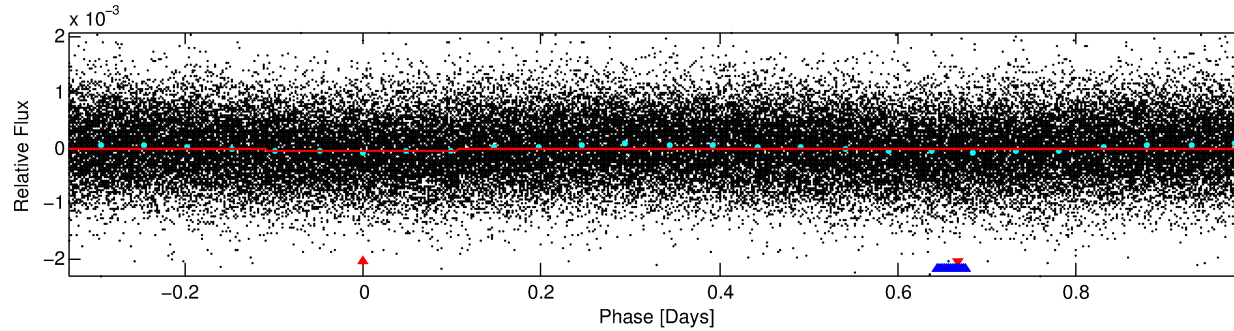
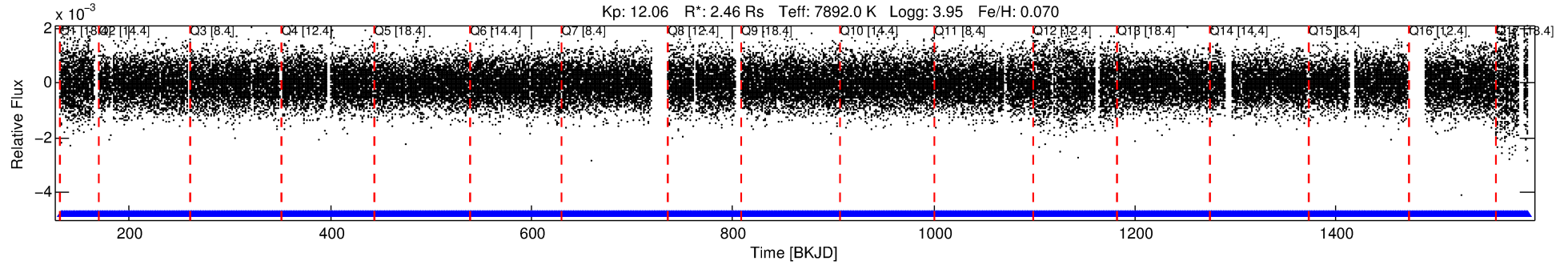
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009165393-01

No Significant Match Found

DV One-Page Summary

KIC: 9165393 Candidate: 1 of 2 Period: 1.322 d



DV Fit Results:

Period = 1.32186 [0.00002] d
Epoch = 131.9820 [0.0067] BKJD
Rp/R* = 0.0062 [0.0054]
a/R* = 1.67 [5.40]
b = 0.49 [7.97]
Seff = 24268.32 [10545.70]
Teq = 3183 [346] K
Rp = 1.68 [1.54] Re
a = 0.0295 [0.0081] AU
Ag = 9.39 [16.58] [0.51 σ]
Teffp = 8614 [3724] K [1.45 σ]

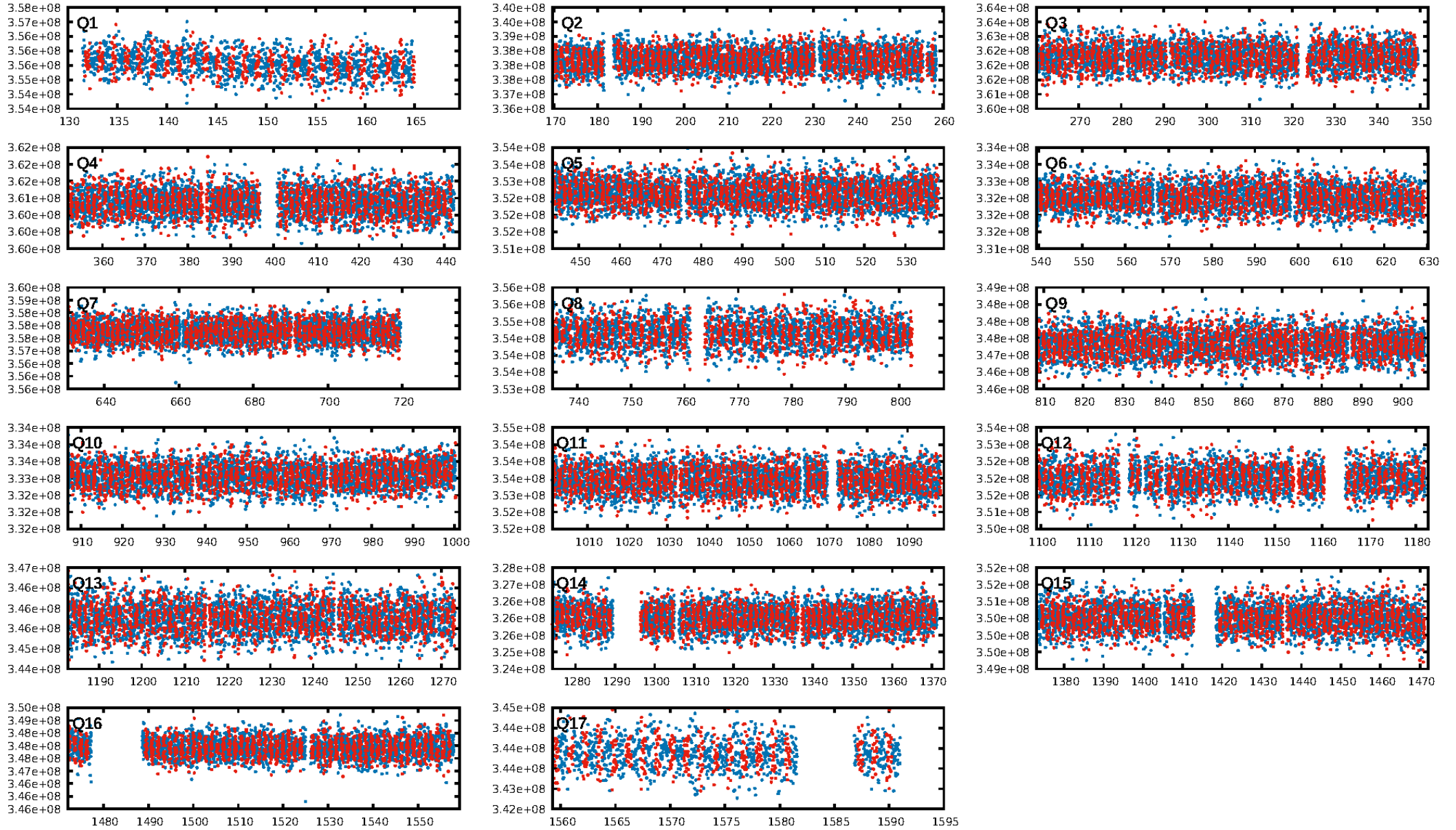
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [979/979]
GhostDiagnostic-chr: 3.701
Centroid-sig: N/A
Centroid-so: 0.586 arcsec [2.73 σ]
OotOffset-rm: 0.213 arcsec [1.24 σ]
KicOffset-rm: 0.188 arcsec [1.16 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

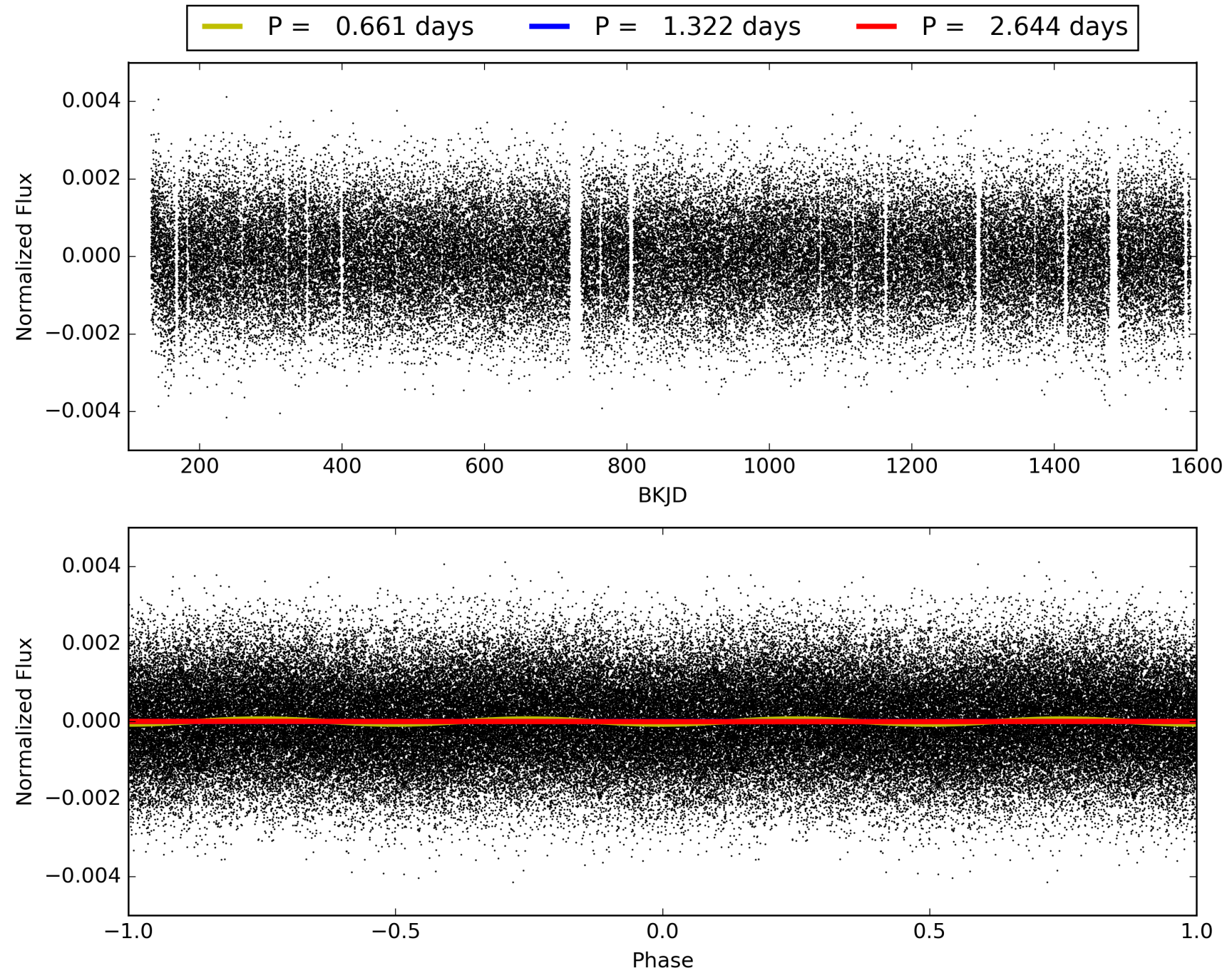
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:17:21 Z

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

TCE 009165393-01, PDC Light Curves

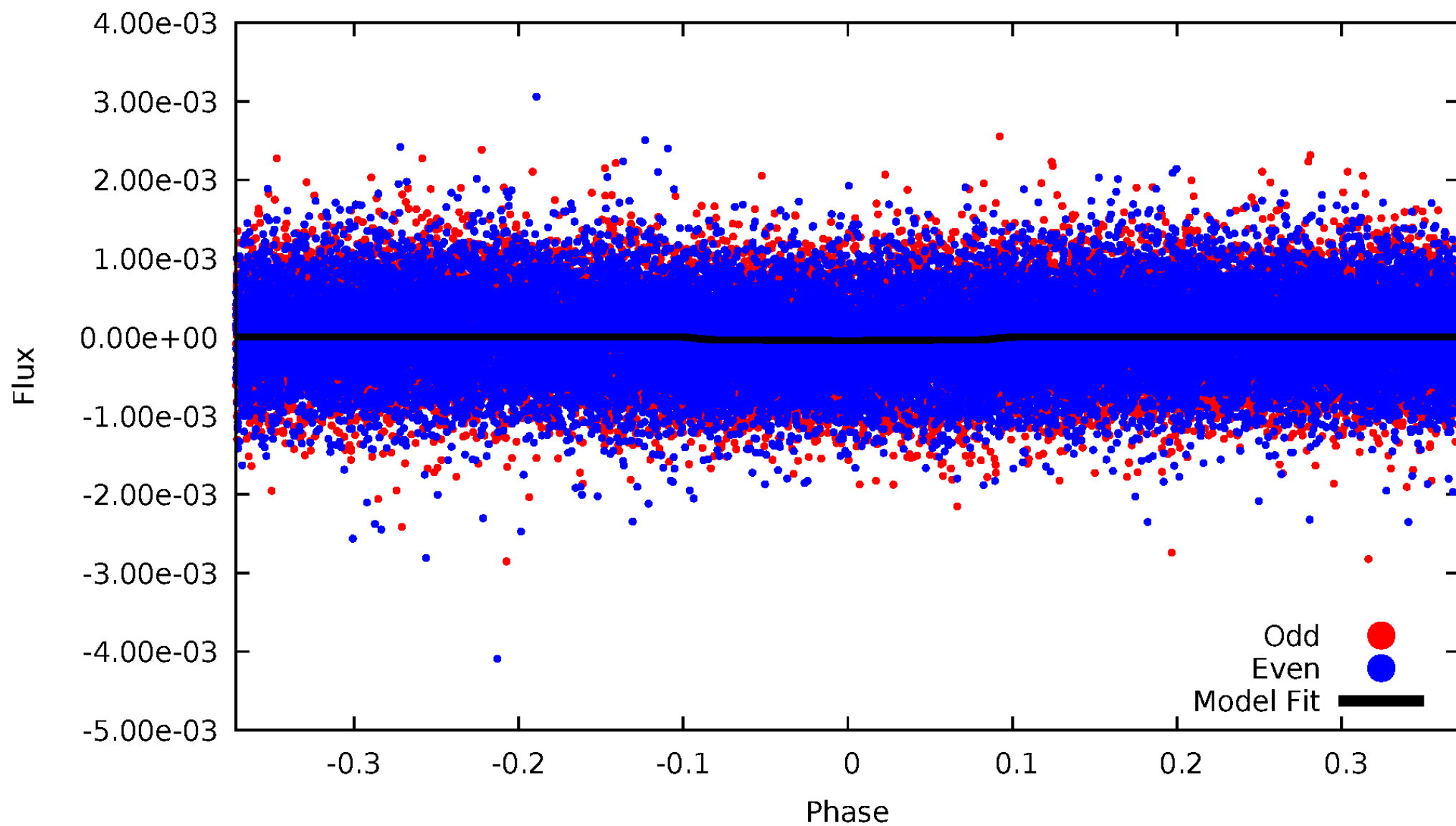


TCE 009165393-01



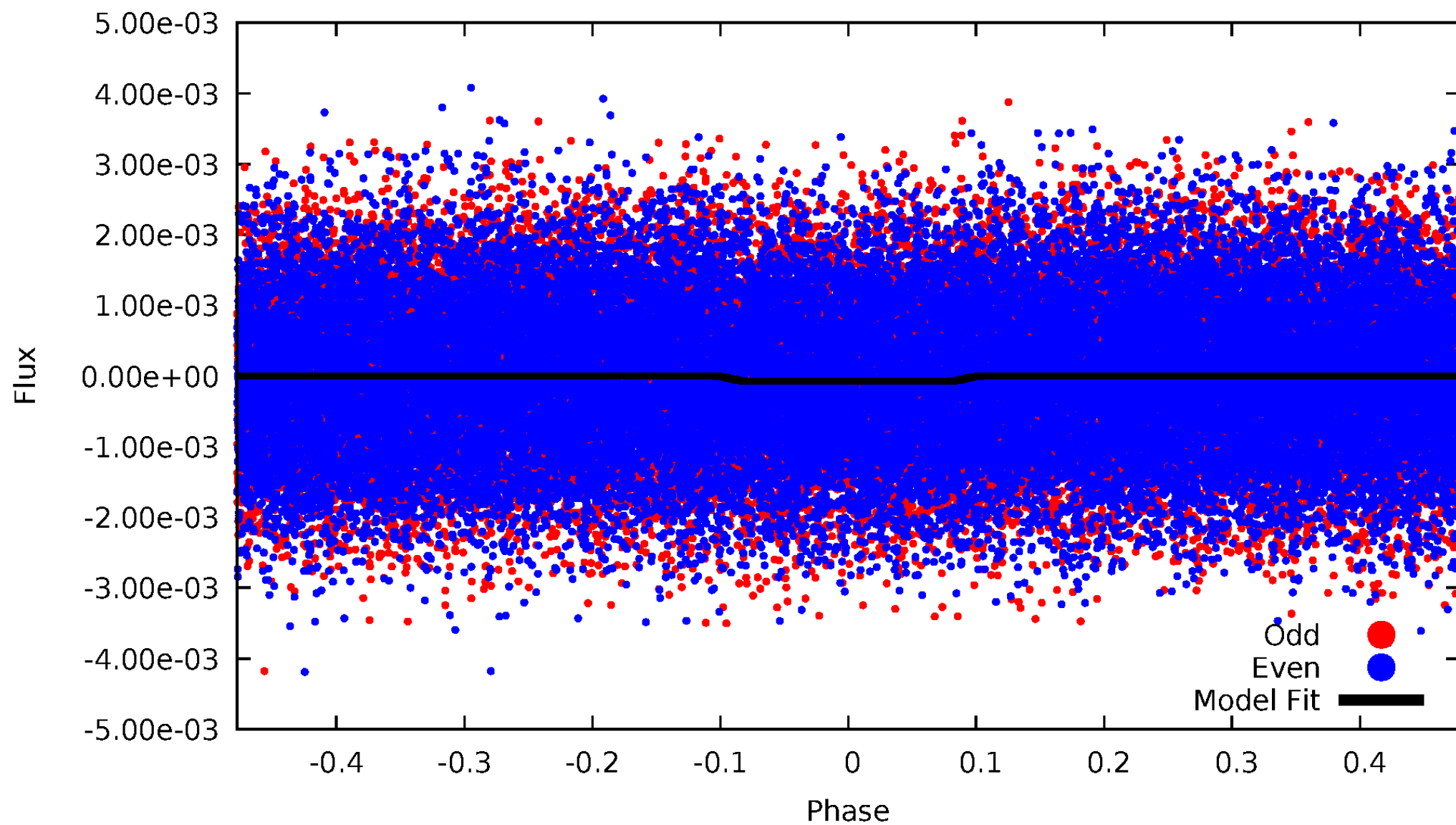
DV Odd/Even

TCE 009165393-01



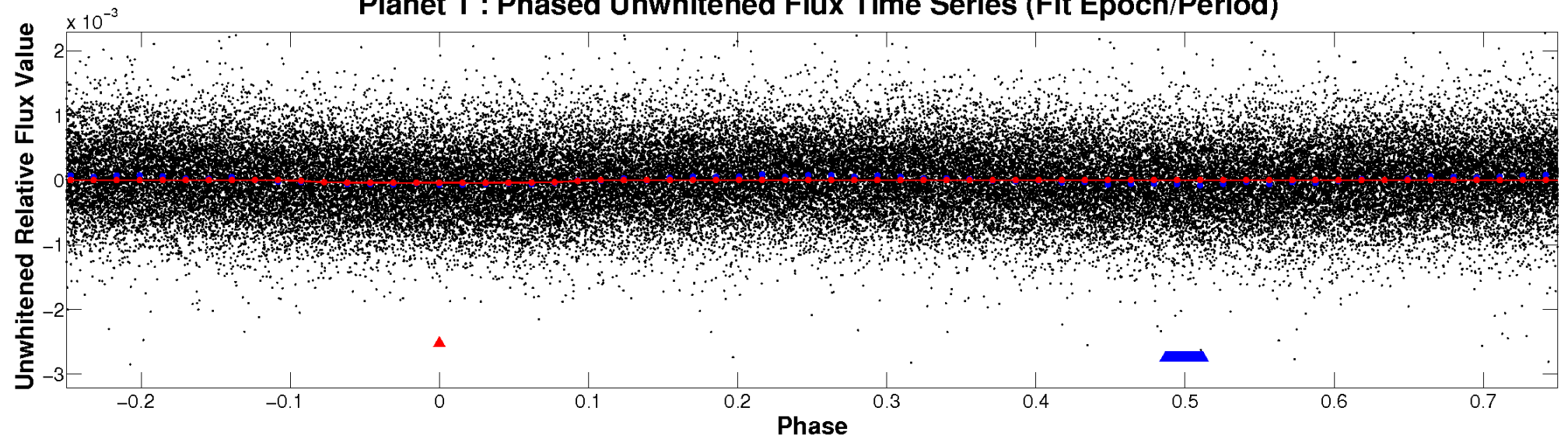
ALT Odd/Even

TCE 009165393-01

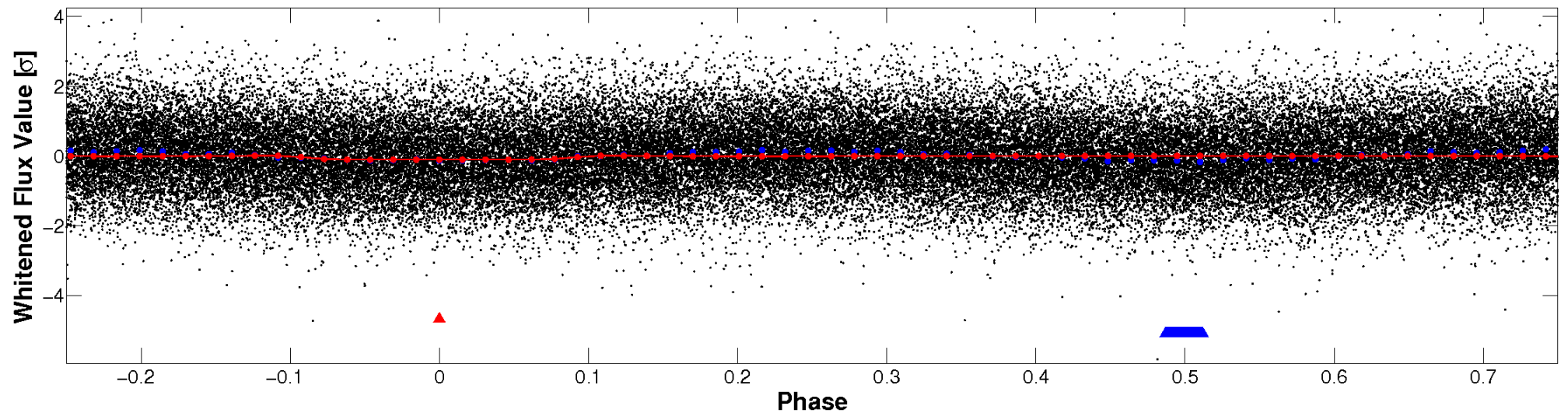


Non-Whitened Vs. Whitened Light Curve

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

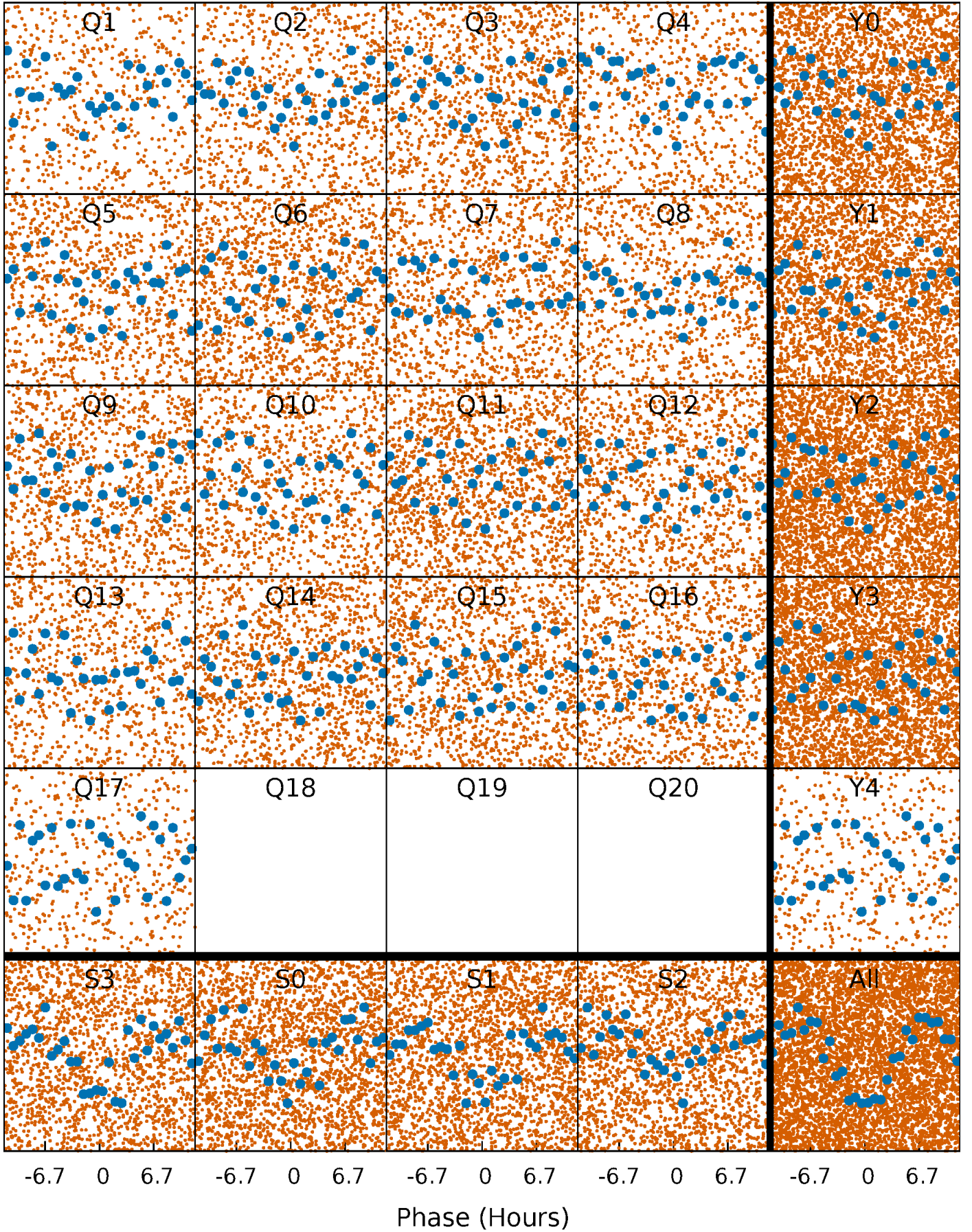


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



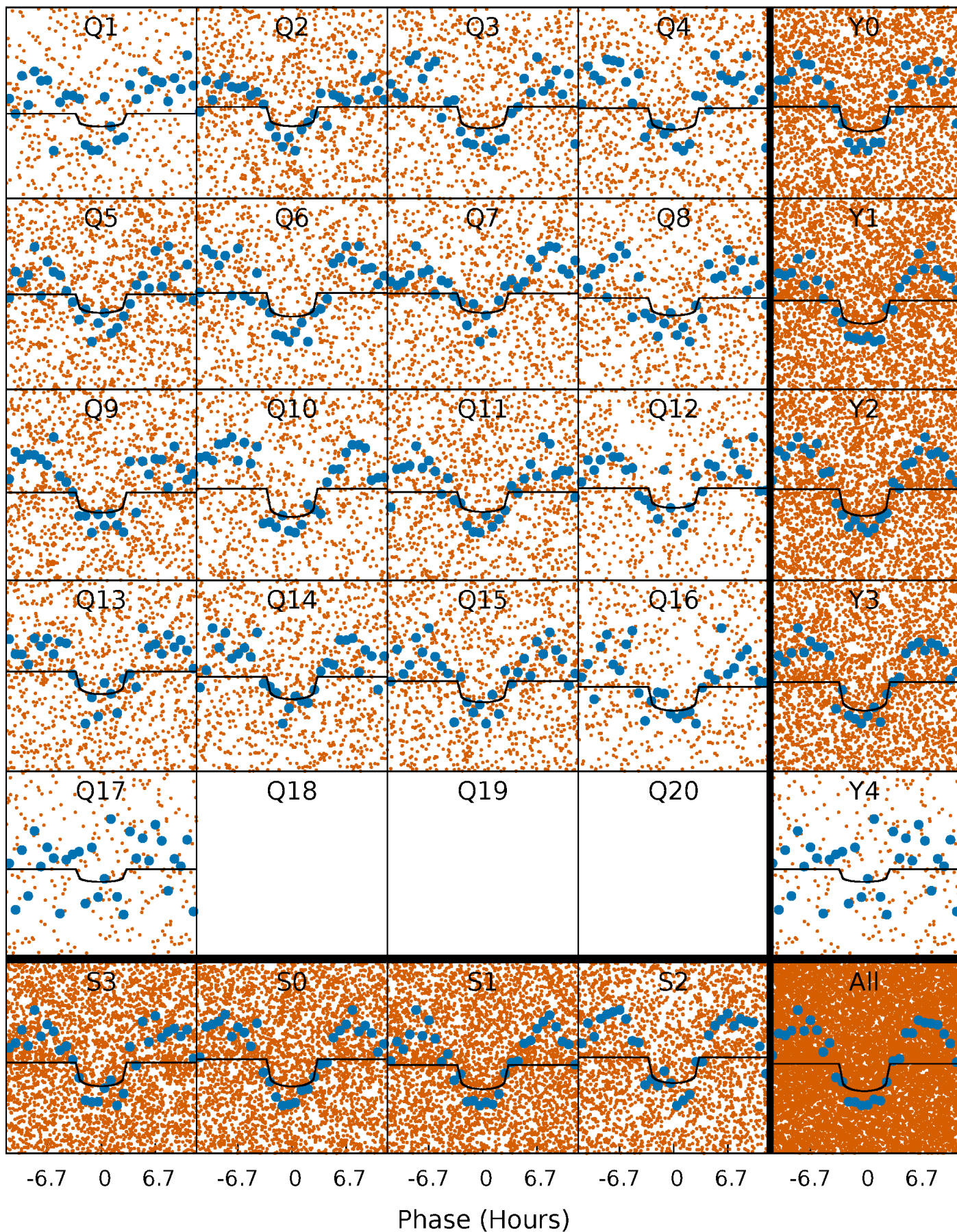
PDC Quarter-Phased Transit Curves

TCE 009165393-01 P= 1.321857 Days $T_0=131.981971$ (BKJD)



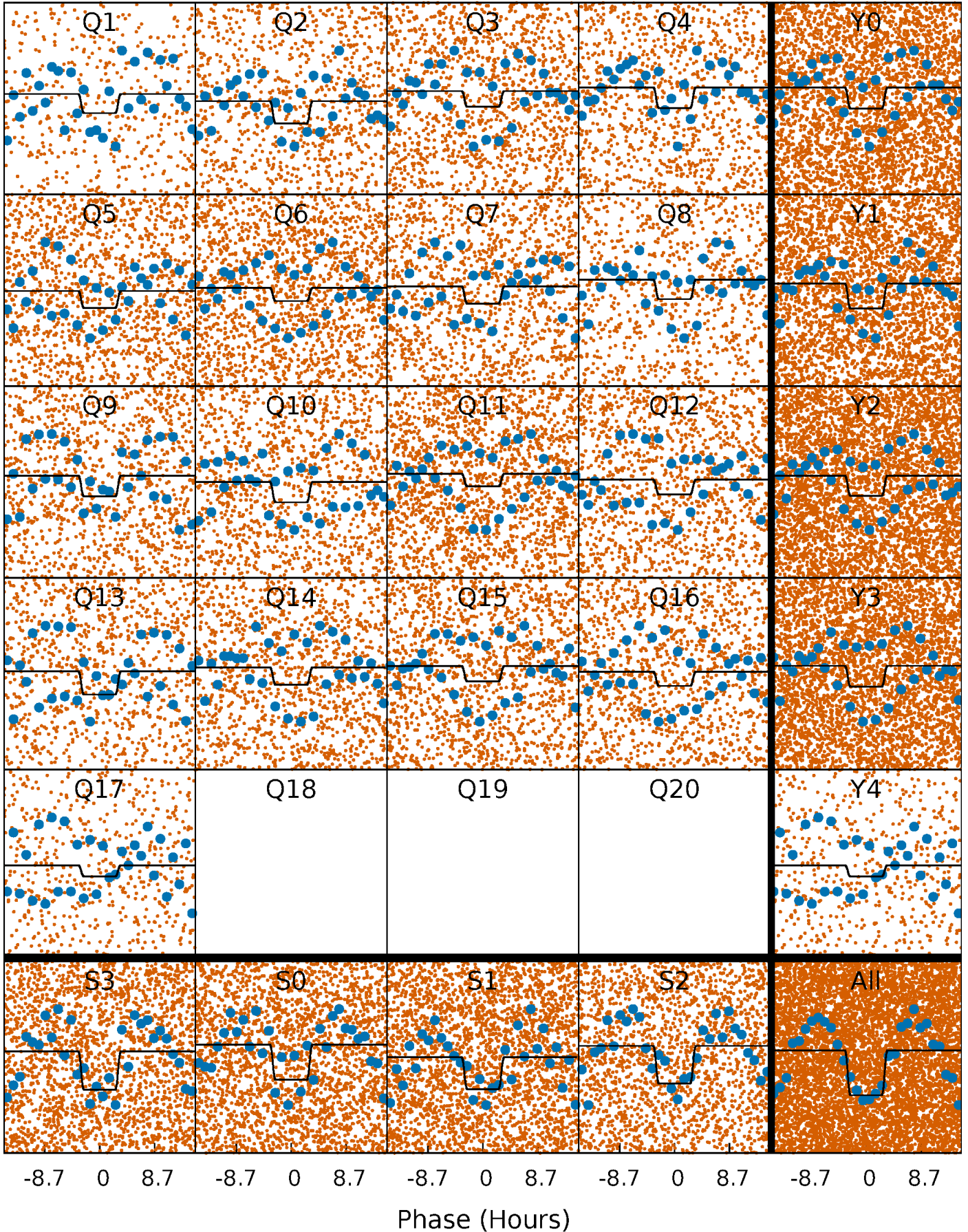
DV Quarter-Phased Transit Curves

TCE 009165393-01 P= 1.321857 Days $T_0=131.981971$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

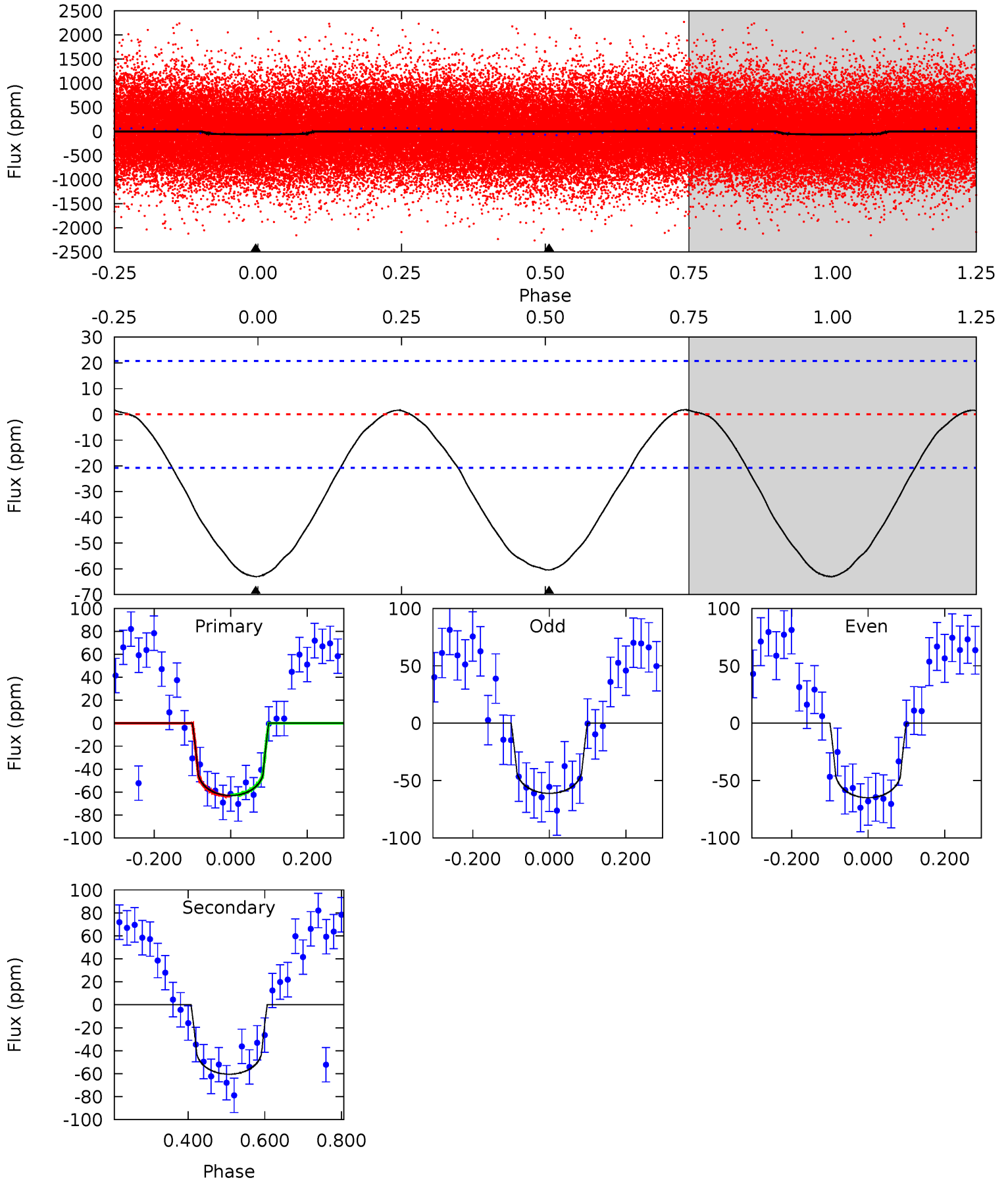
TCE 009165393-01 P= 1.321850 Days $T_0=131.981625$ (BKJD)



DV Model-Shift Uniqueness Test

009165393-01, P = 1.321857 Days, E = 130.660114 Days

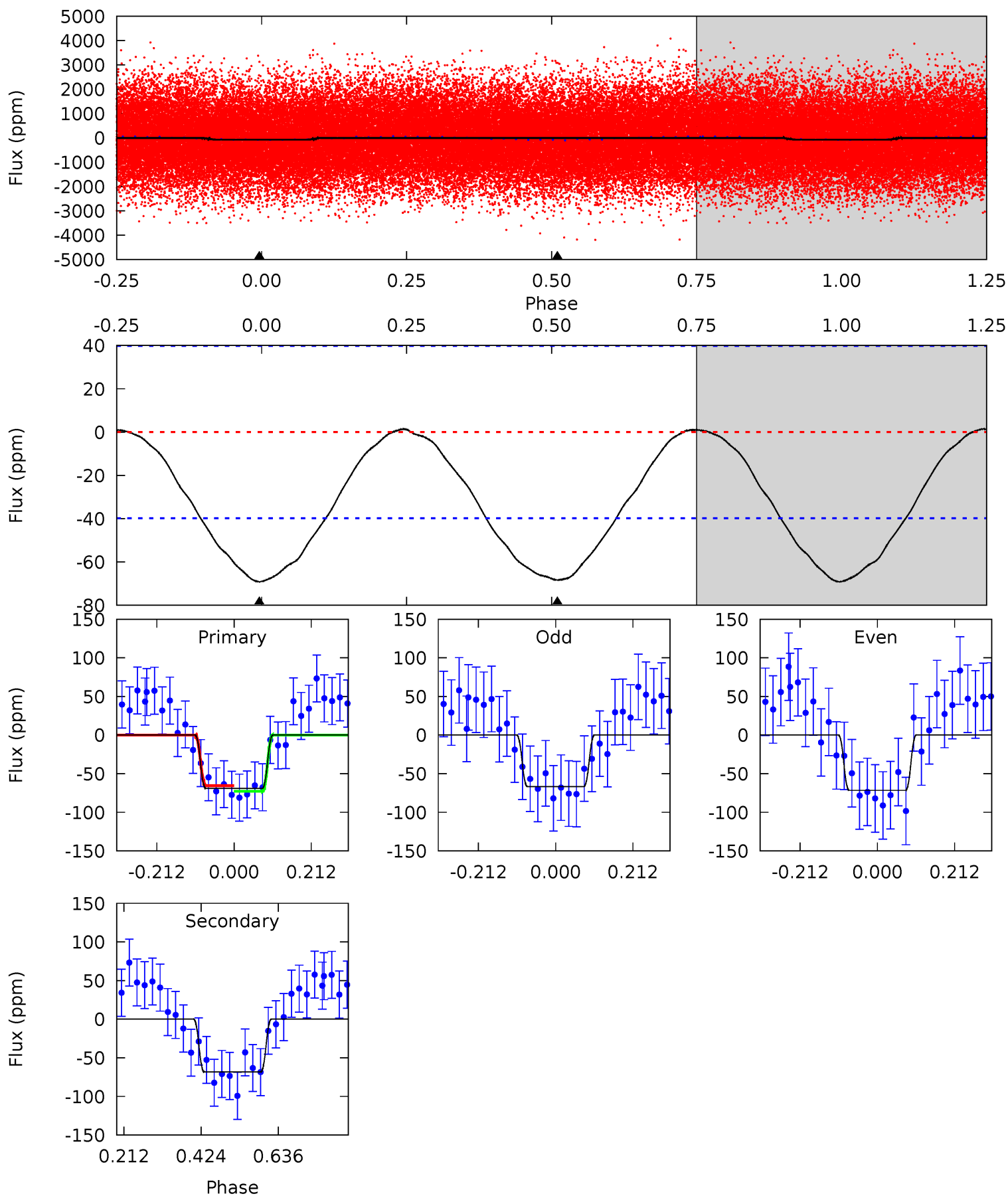
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.4	12.9	0	0	4.42	1.28	0.48	13.4	13.4	12.9	12.9	0.41	0.96	0.03	0.10



Alt Model-Shift Uniqueness Test

009165393-01, P = 1.321850 Days, E = 130.659775 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.65	7.57	0	0	4.40	1.25	0.18	7.65	7.65	7.57	7.57	0.28	0.99	0.02	0.39



Stellar Parameters For KIC 009165393

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7892^{+216}_{-351}	$3.946^{+0.216}_{-0.126}$	$0.070^{+0.250}_{-0.400}$	$2.463^{+0.494}_{-0.803}$	$1.953^{+0.229}_{-0.426}$	$0.184^{+0.257}_{-0.069}$
	+3%/-4%	+5%/-3%	+357%/-571%	+20%/-33%	+12%/-22%	+140%/-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 009165393-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-60 ± 5	$1.76^{+1.27}_{-1.03}$	4424^{+284}_{-369}	8515^{+9131}_{-2361}	$9.103^{+46.866}_{-6.061}$
Alt.	-68 ± 9	$2.28^{+1.34}_{-1.26}$	4381^{+294}_{-346}	7556^{+5934}_{-1825}	$6.318^{+25.038}_{-3.911}$

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

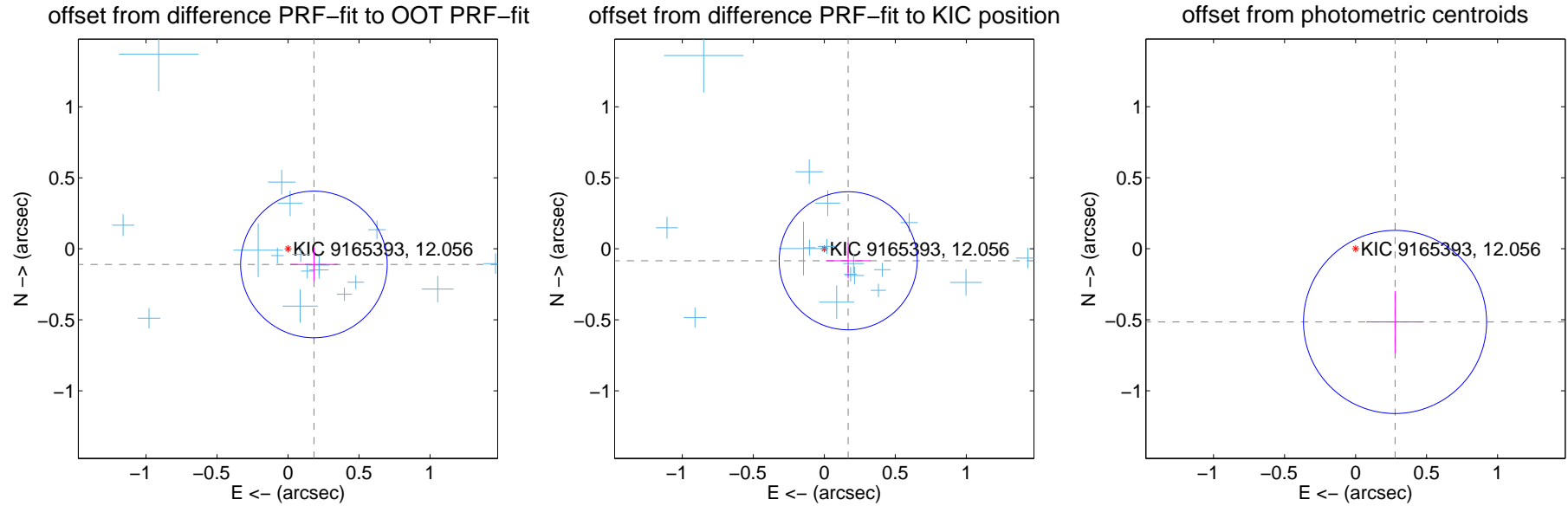
DV Centroid Data

Supplemental centroid analysis for 009165393-01. Kepler magnitude: 12.06. Transit SNR 10.59

There are 17 quarters with good PRF difference image offsets

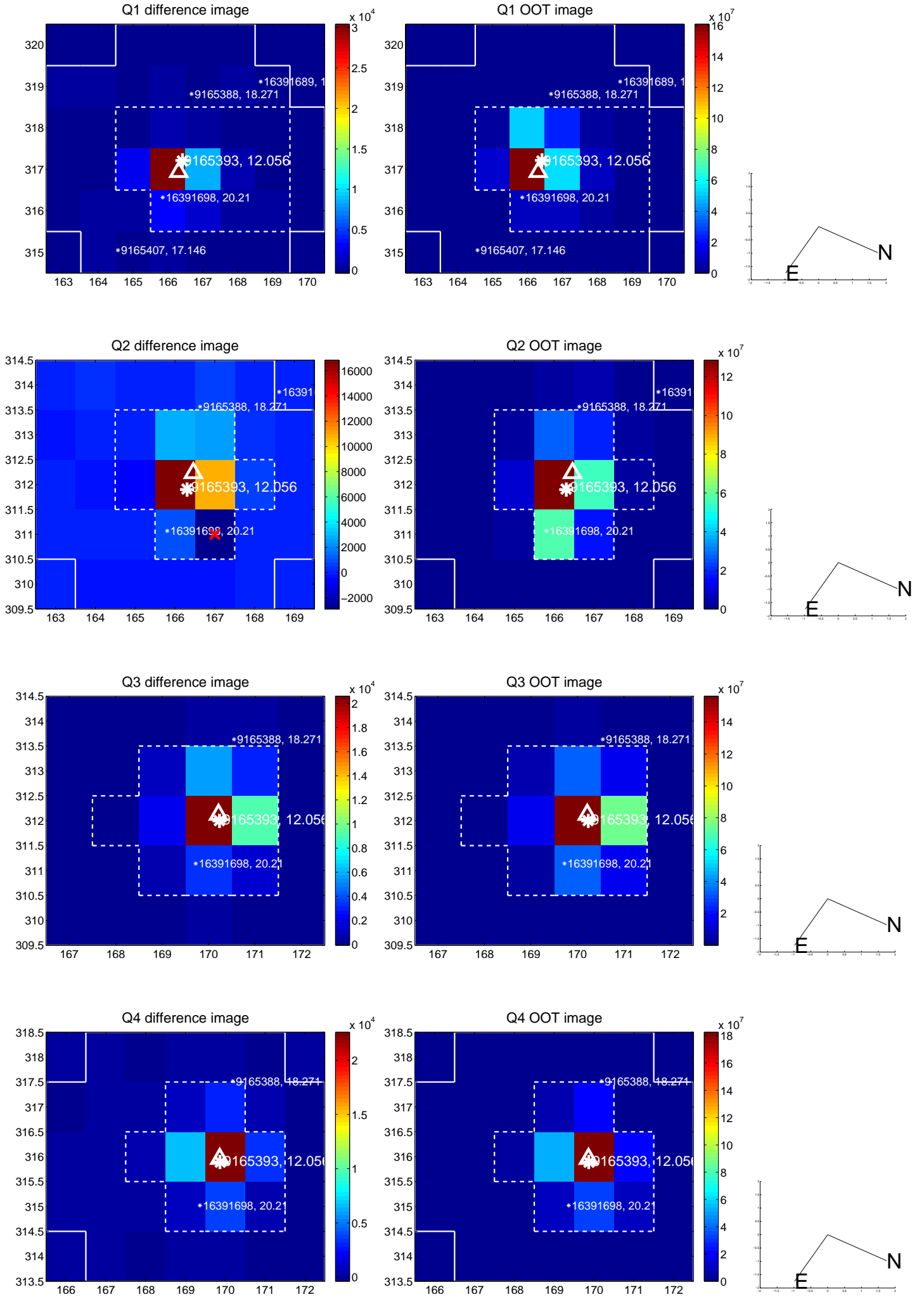
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.213 ± 0.172	1.24	-0.182 ± 0.168	-0.110 ± 0.118
PRF-fit source offset from KIC position	0.188 ± 0.162	1.16	-0.168 ± 0.157	-0.084 ± 0.124
photometric centroid source offset	0.59 ± 0.21	2.73	-0.28 ± 0.20	-0.52 ± 0.22

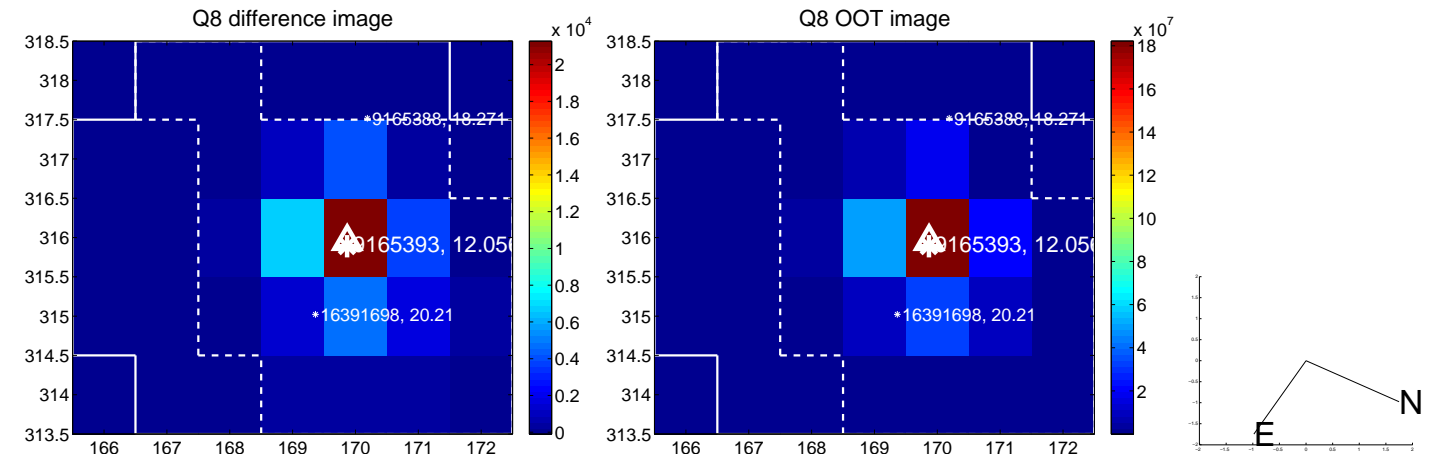
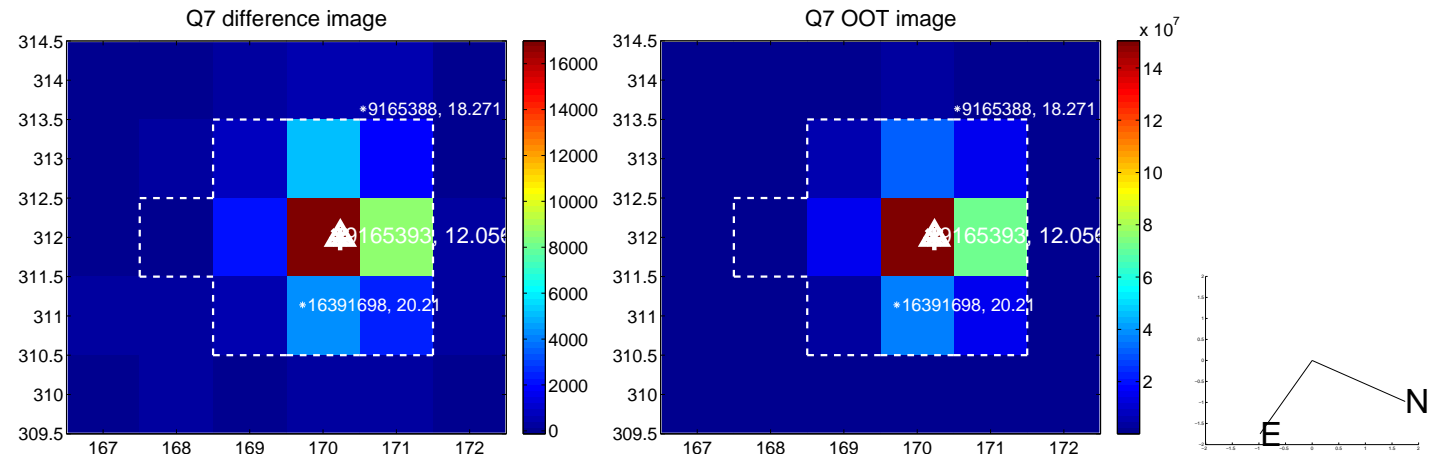
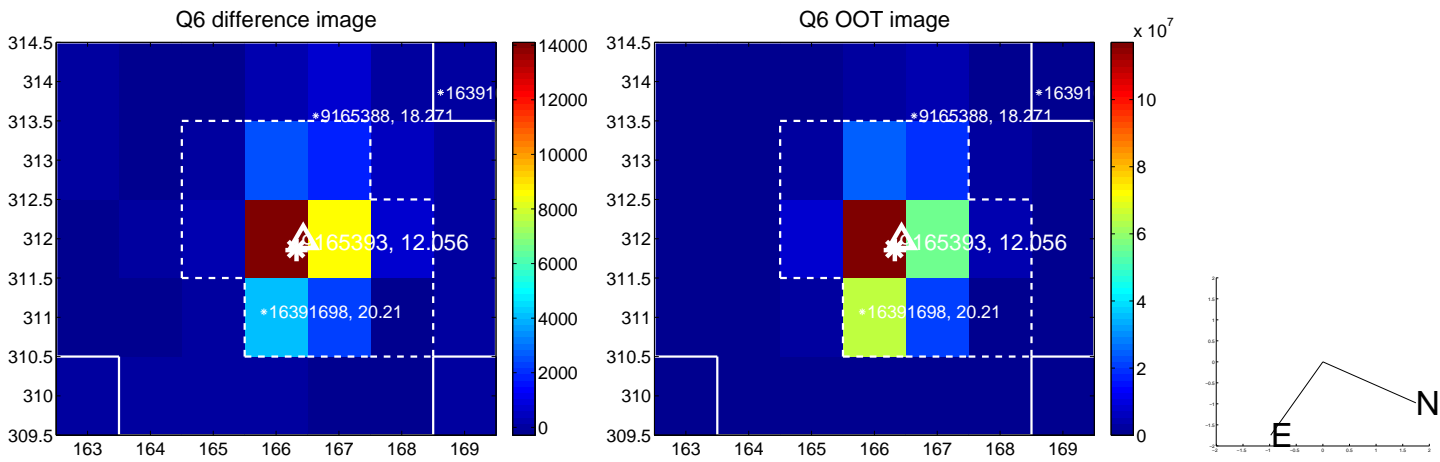
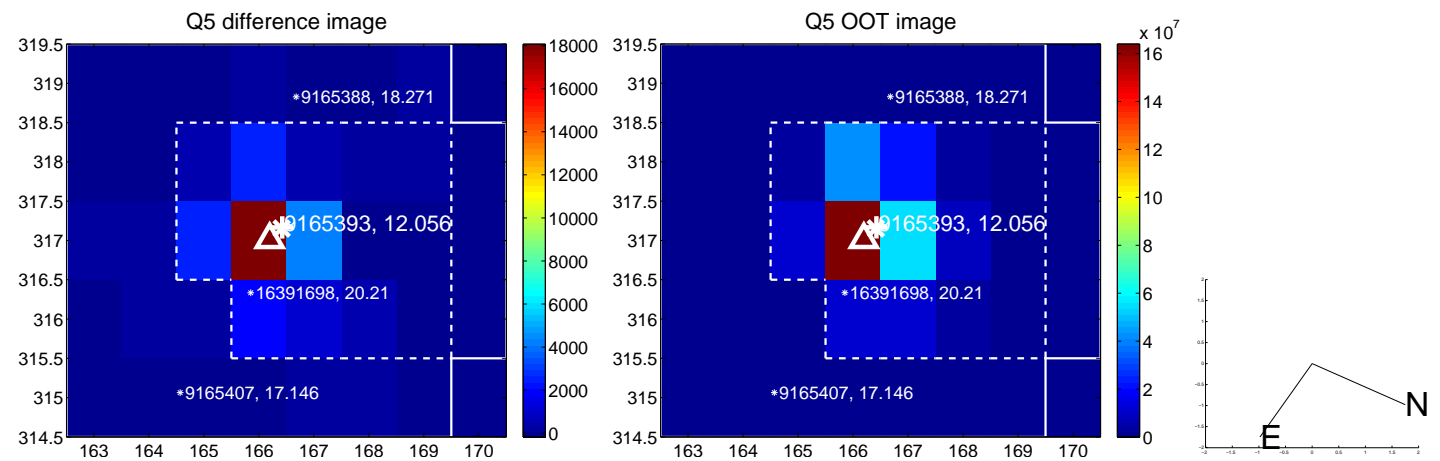


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

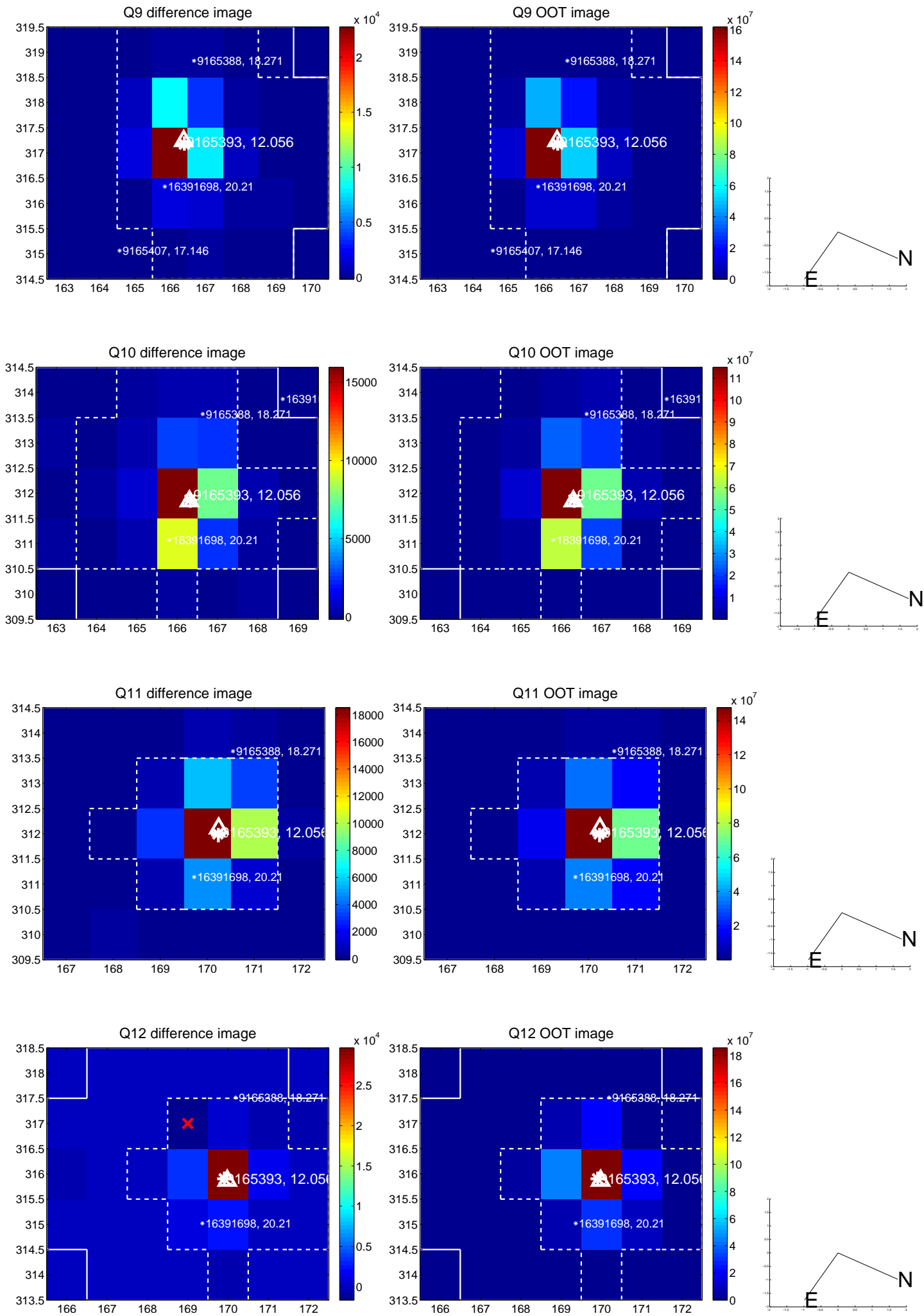
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



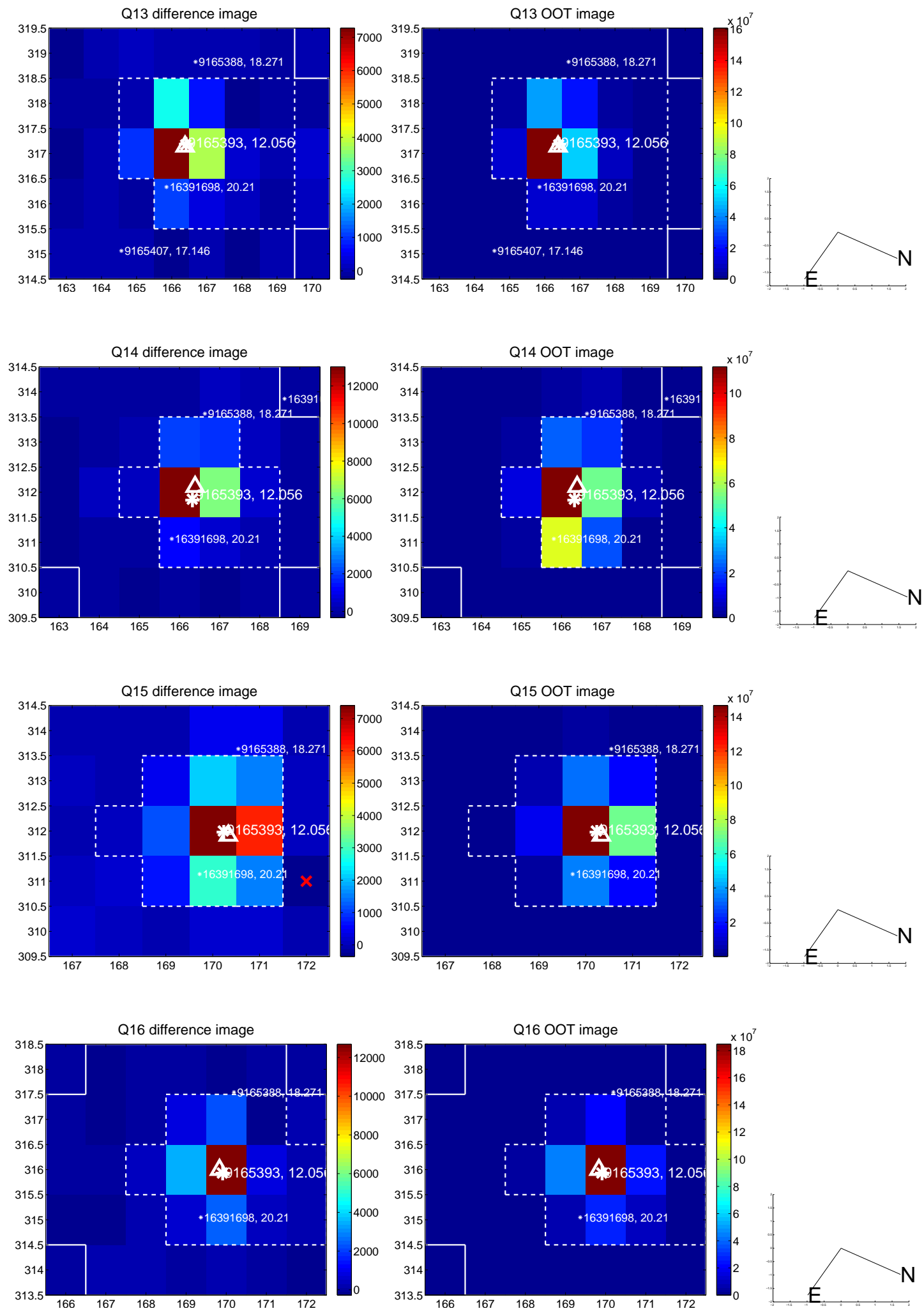
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



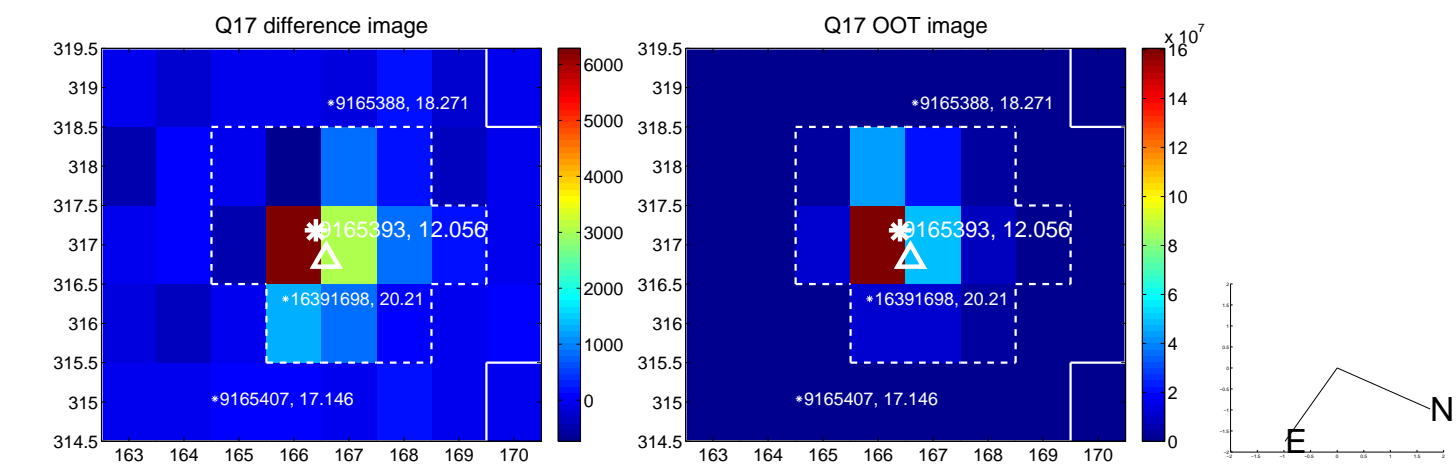
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



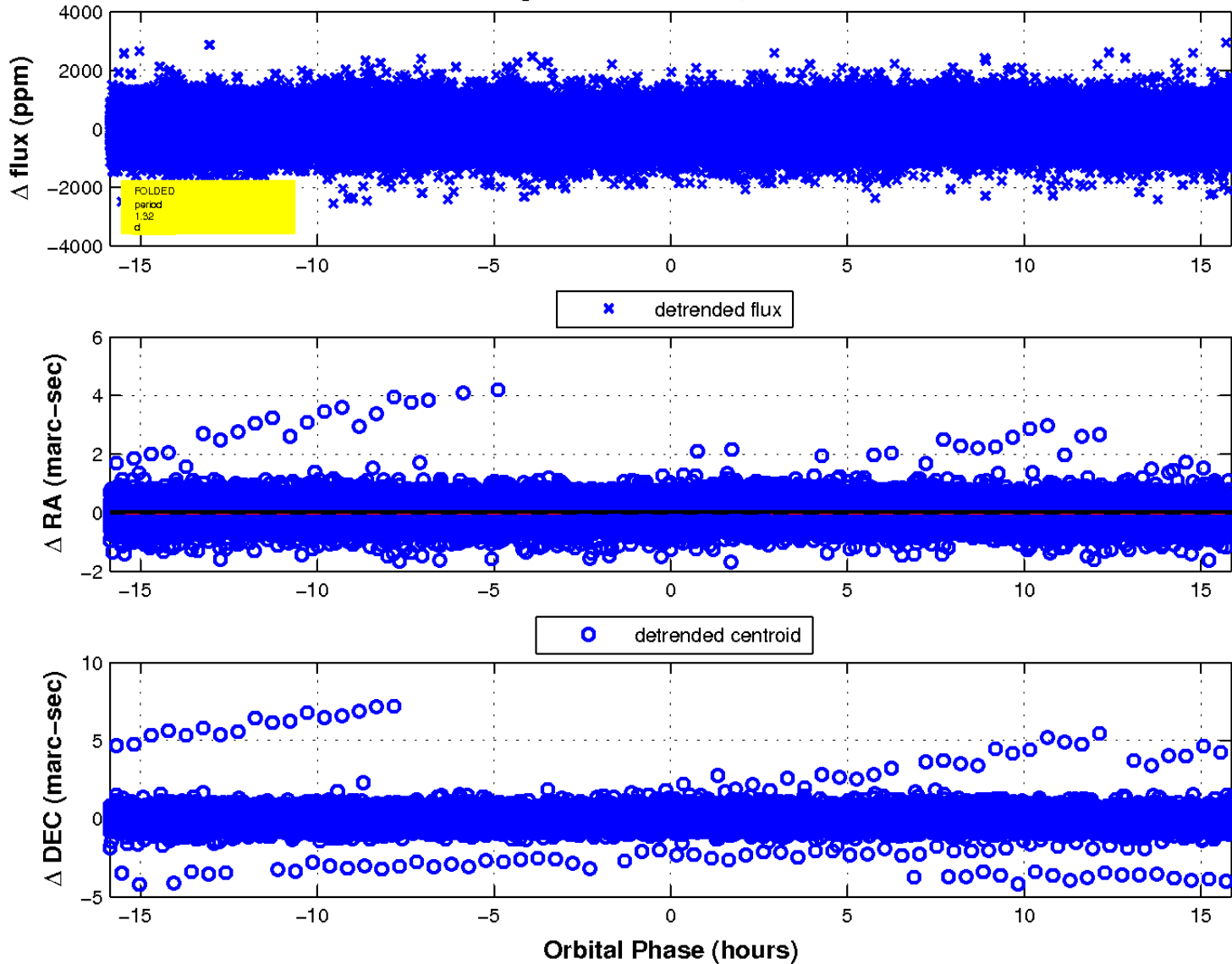
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

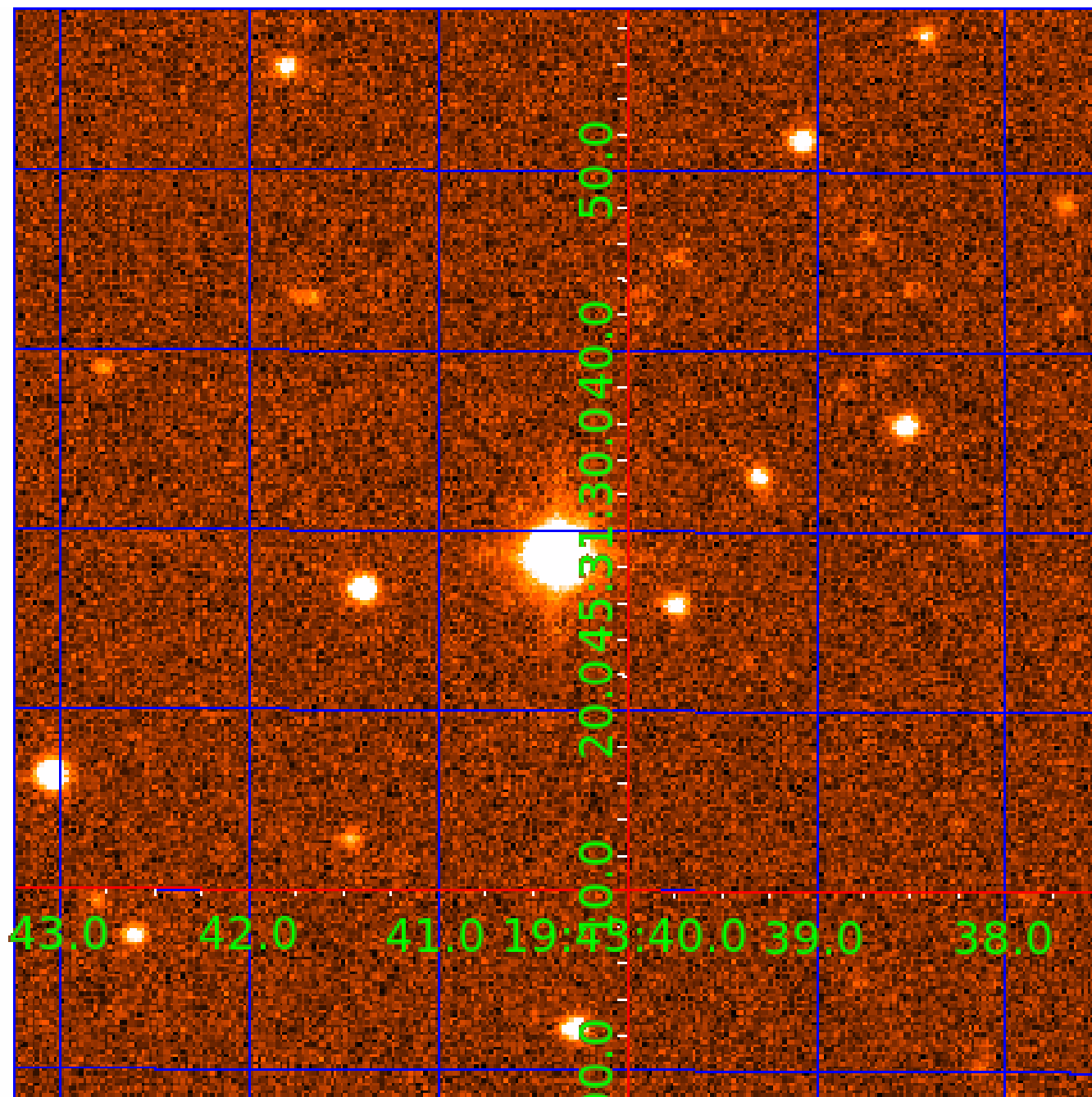


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009165393

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})
009165393-01	OBS	No	1.321857	131.981971	43.2	5.896	10.3	10.6	2.46	7892	1.68	24268.32
009165393-02	OBS	No	1.321827	132.658621	54.2	5.604	10.6	12.7	2.46	7892	1.84	24269.05

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009165393-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009165393-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_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.

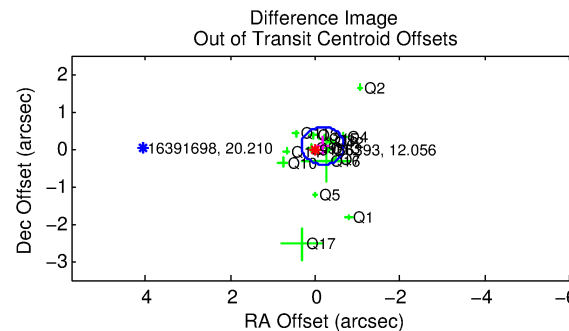
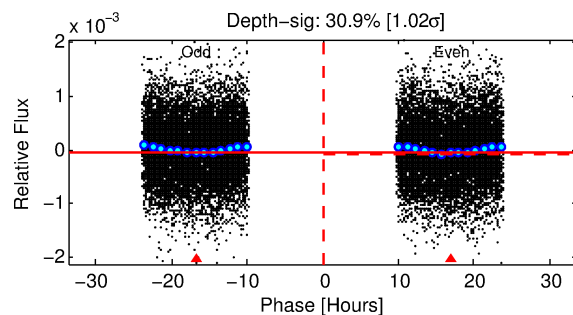
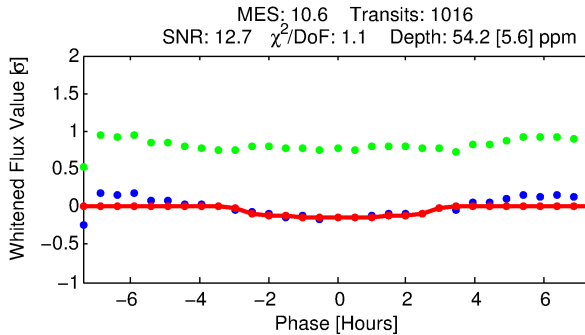
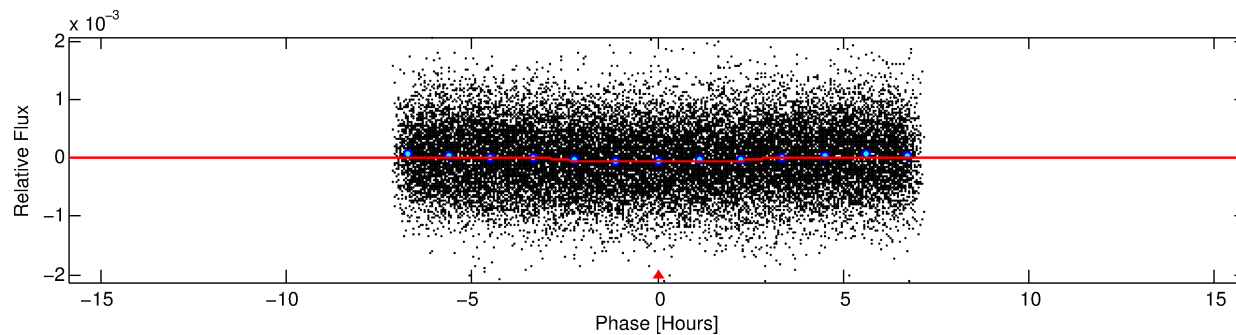
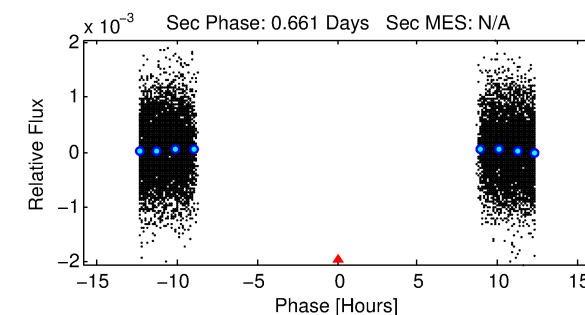
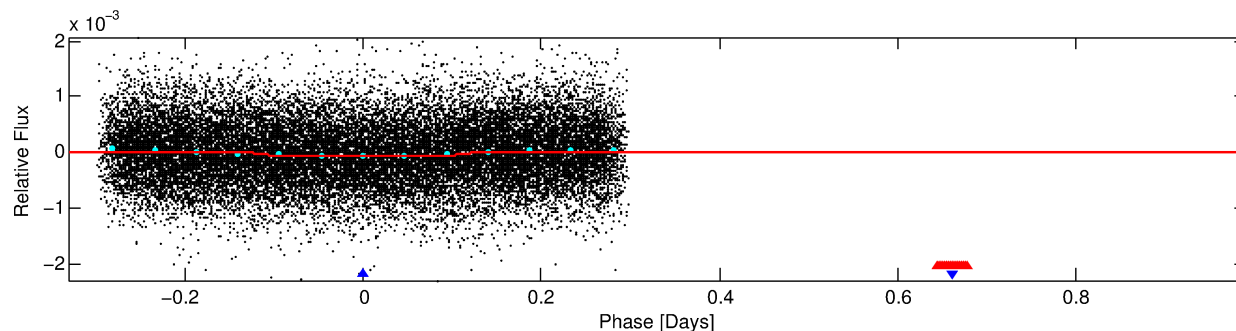
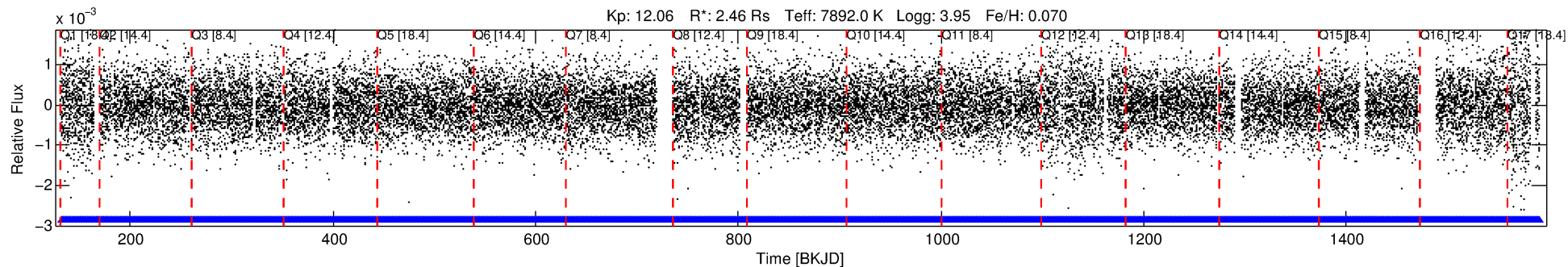
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009165393-02

No Significant Match Found

DV One-Page Summary

KIC: 9165393 Candidate: 2 of 2 Period: 1.322 d



DV Fit Results:

Period = 1.32183 [0.00002] d
Epoch = 132.6586 [0.0060] BKJD
Rp/R* = 0.0068 [0.0094]
a/R* = 1.90 [11.08]
b = 0.10 [83.59]
Seff = 24269.05 [10546.02]
Teff = 3183 [346] K
Rp = 1.84 [2.60] Re
a = 0.0295 [0.0081] AU

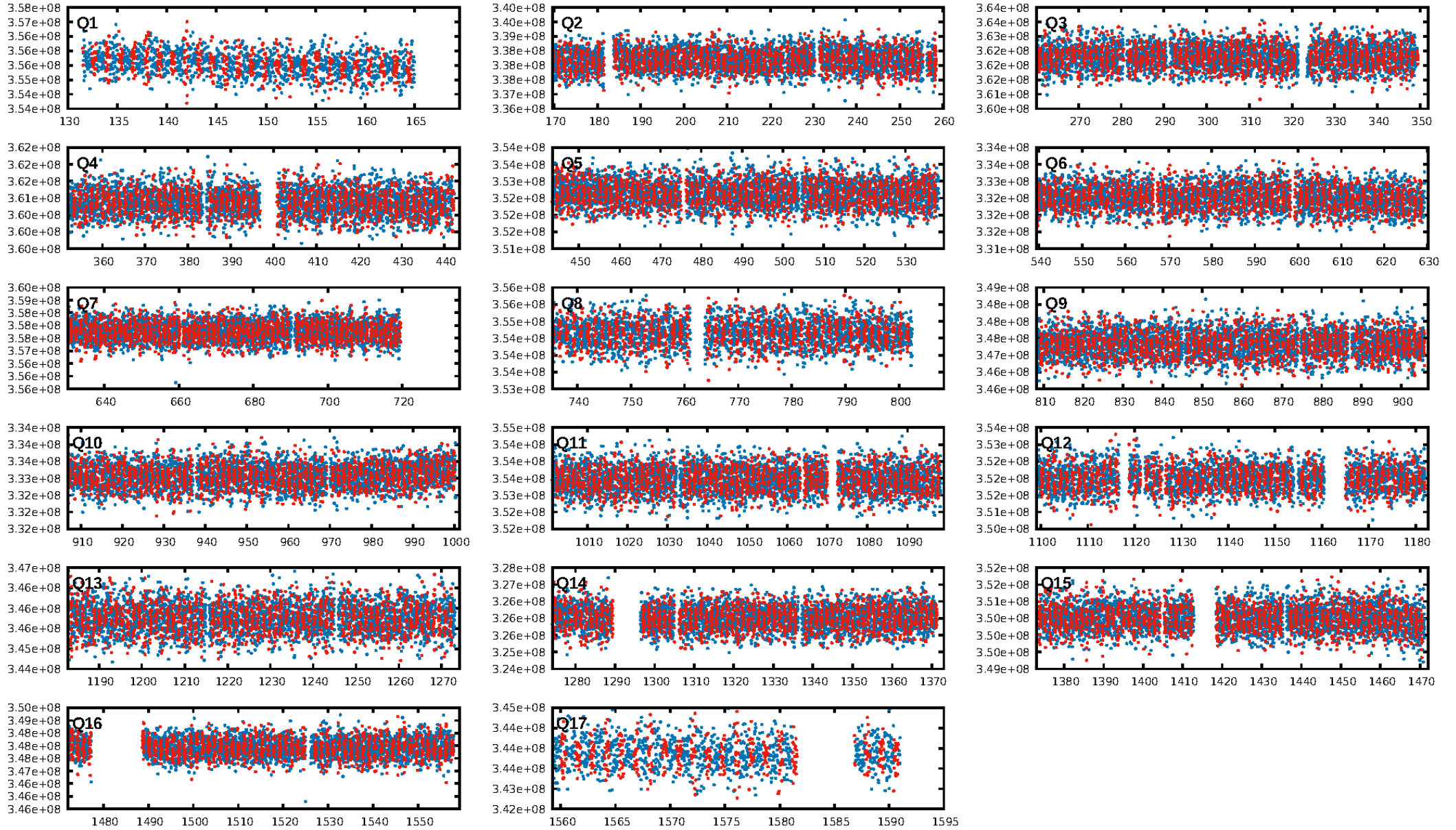
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [971/971]
GhostDiagnostic-chr: 2.466
Centroid-sig: N/A
Centroid-so: 0.325 arcsec [1.96σ]
OotOffset-rm: 0.202 arcsec [1.21σ]
KicOffset-rm: 0.231 arcsec [1.22σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

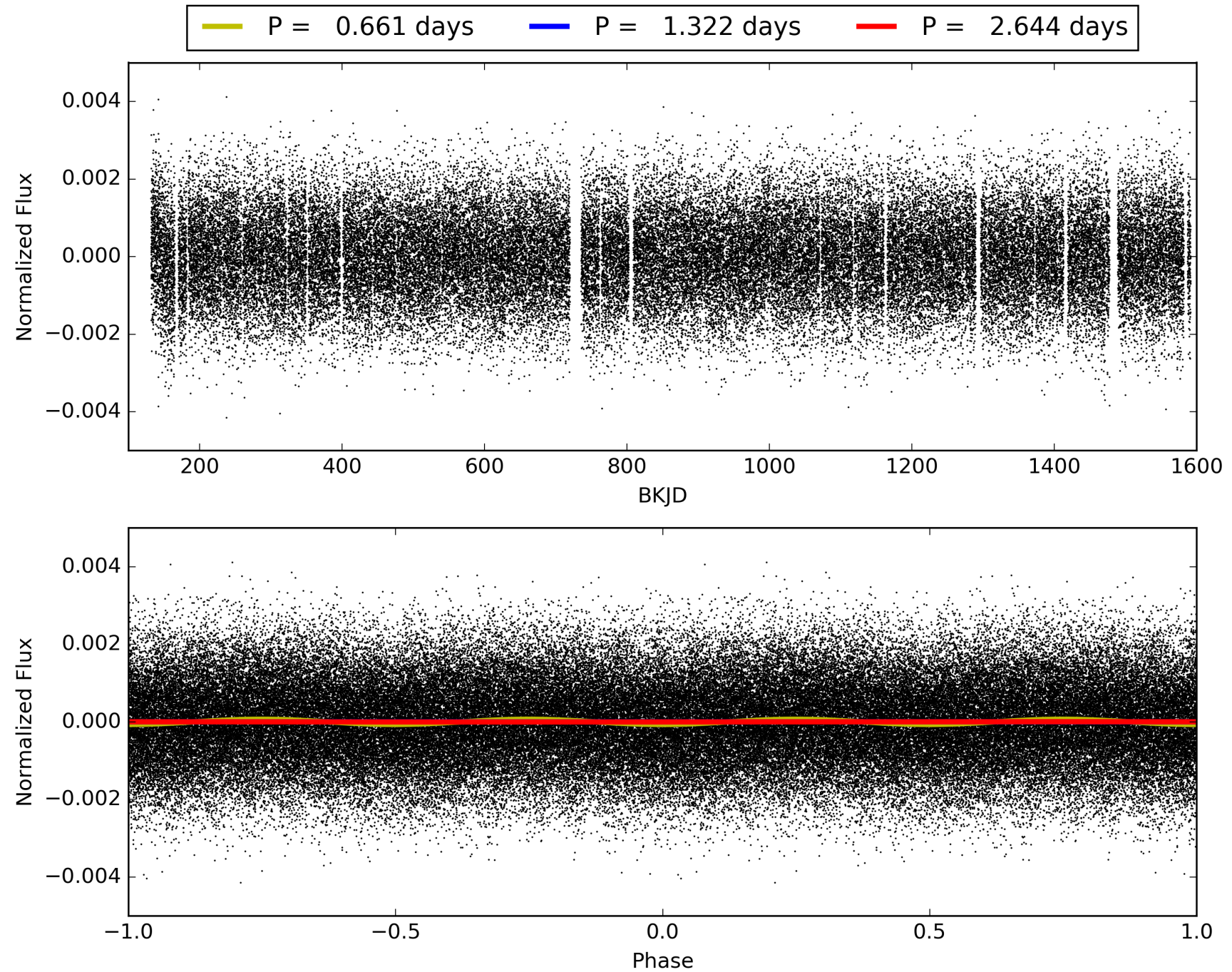
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:17:34 Z

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

TCE 009165393-02, PDC Light Curves

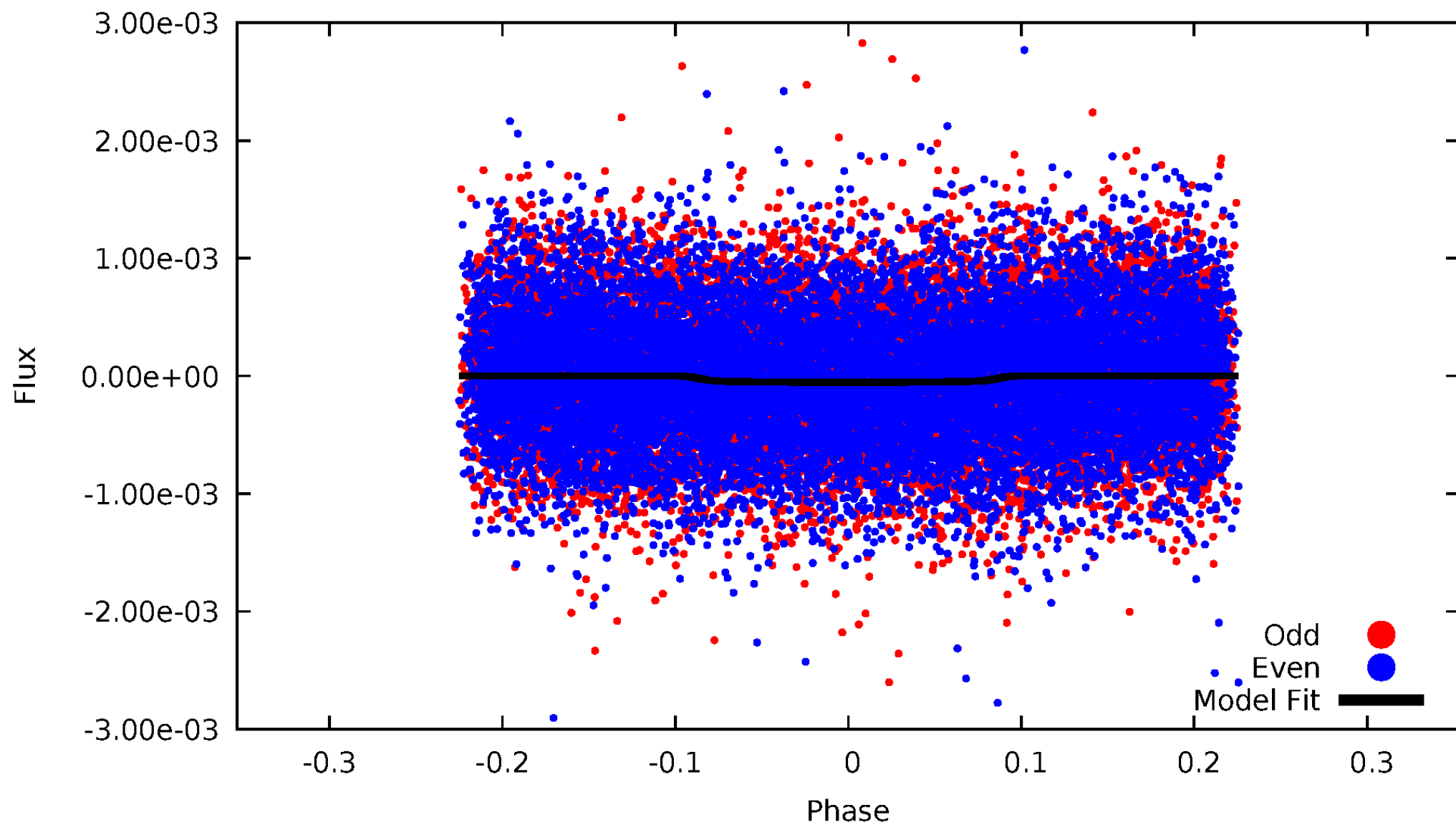


TCE 009165393-02



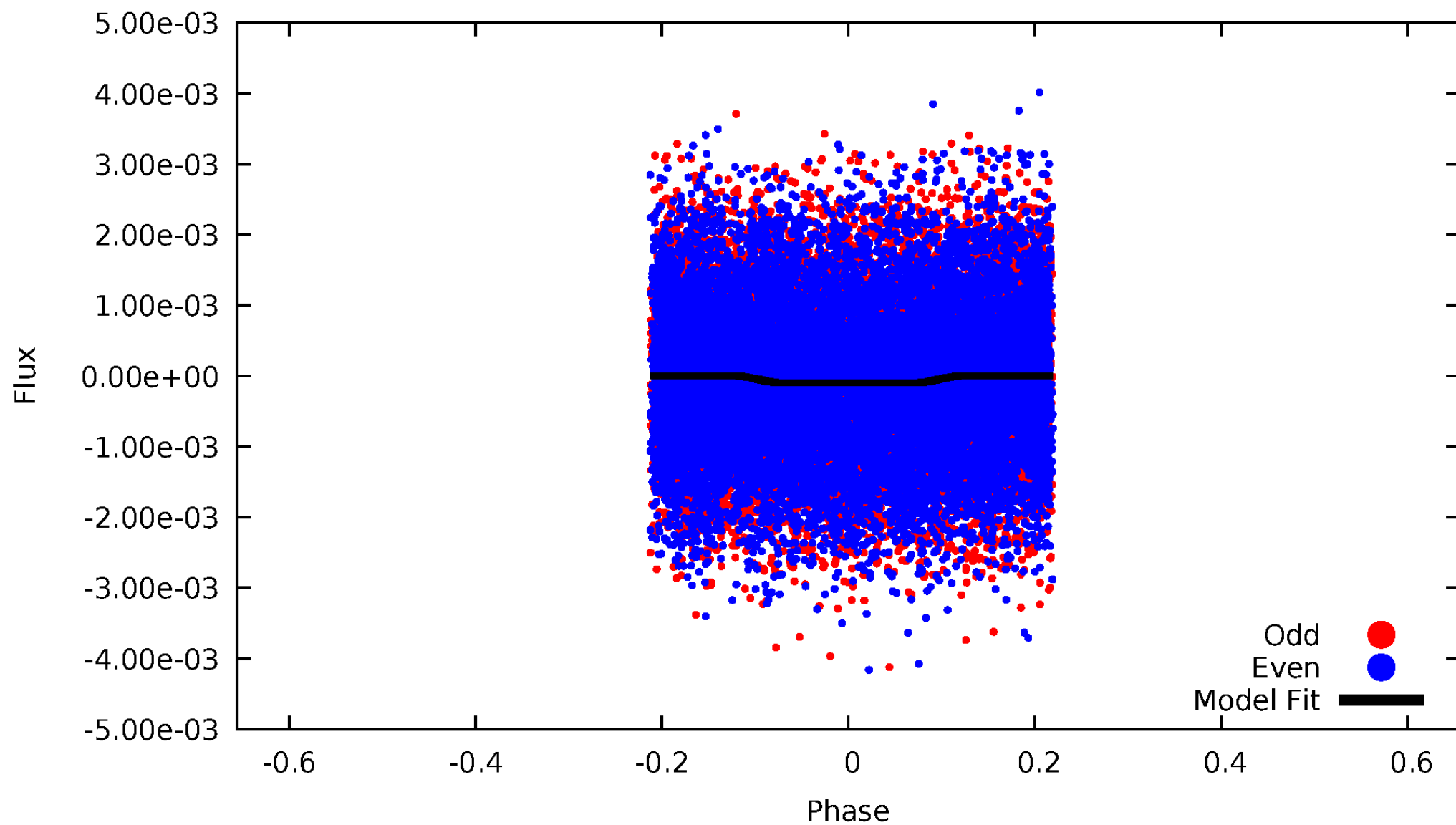
DV Odd/Even

TCE 009165393-02



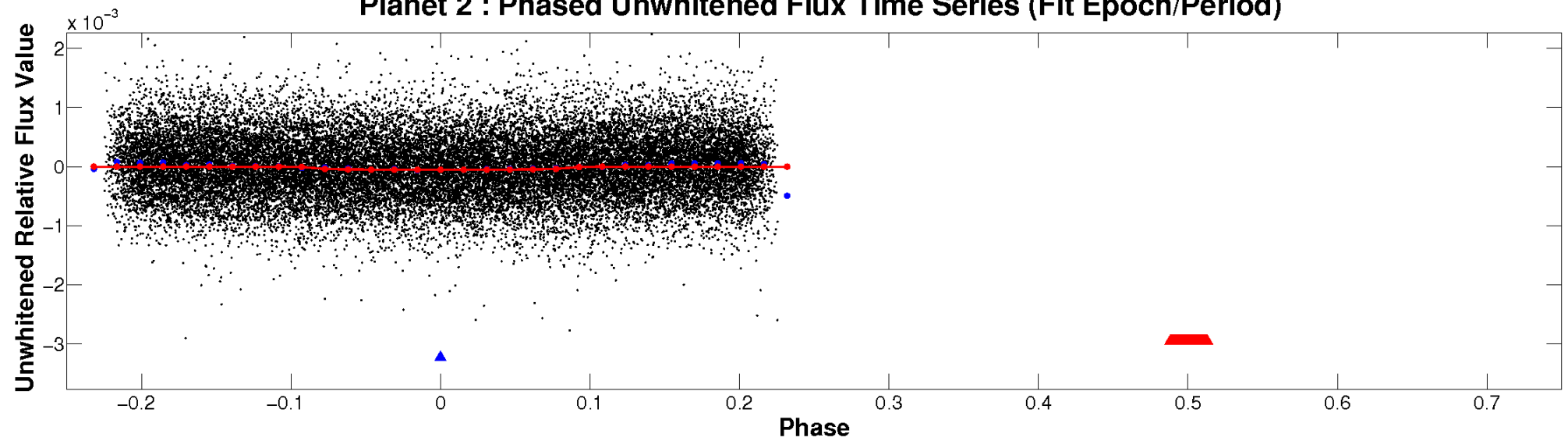
ALT Odd/Even

TCE 009165393-02

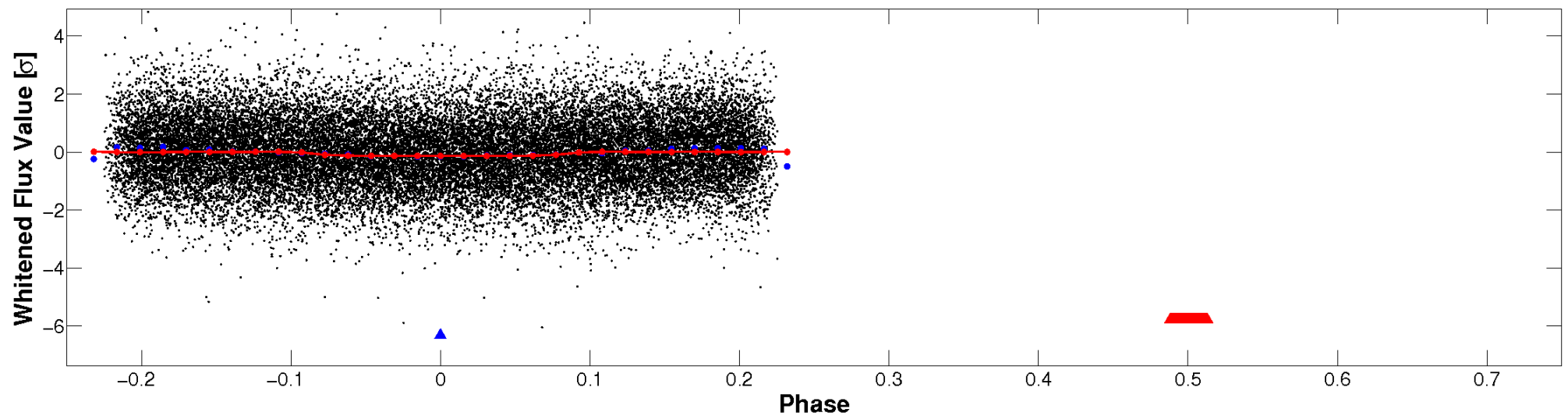


Non-Whitened Vs. Whitened Light Curve

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

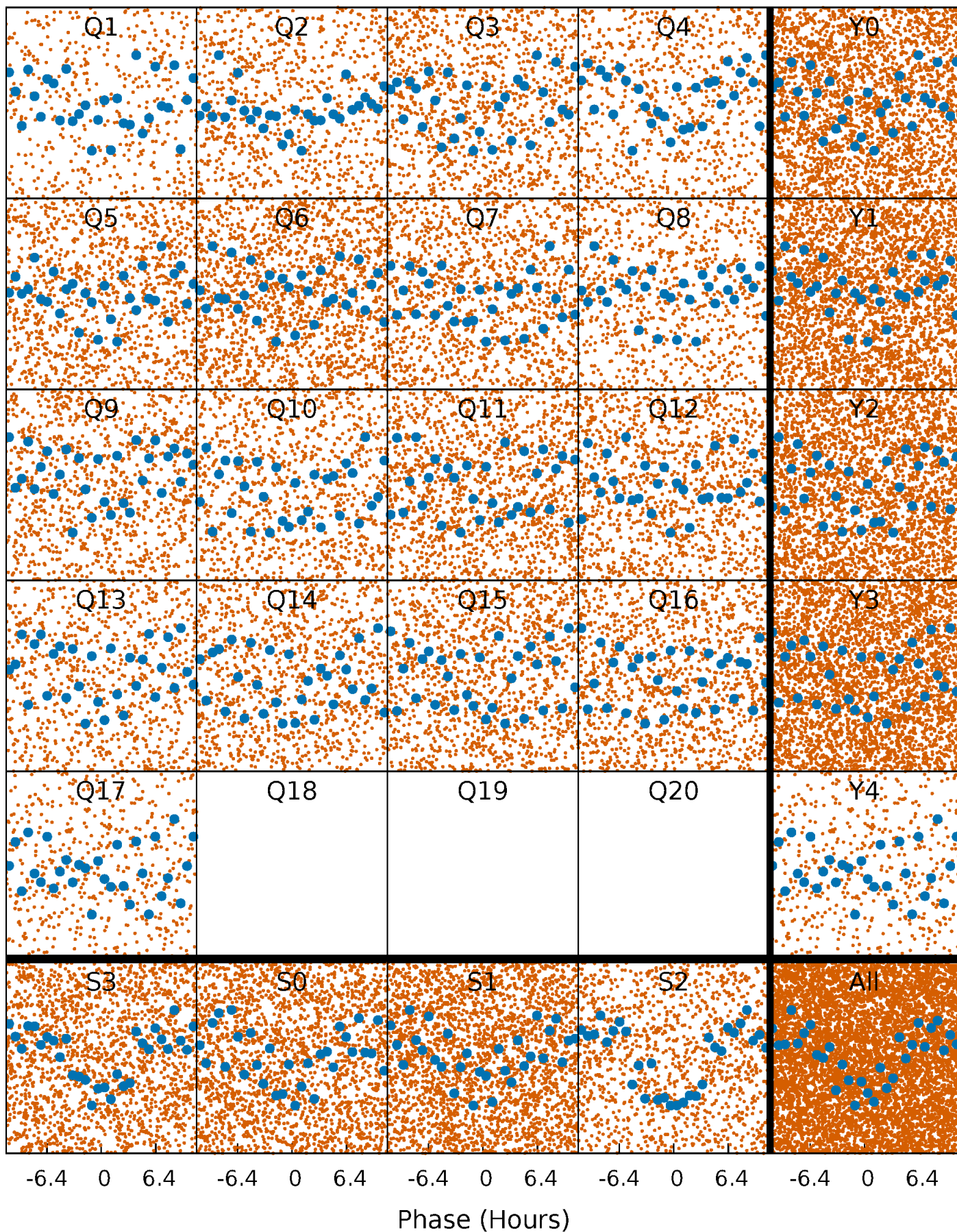


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



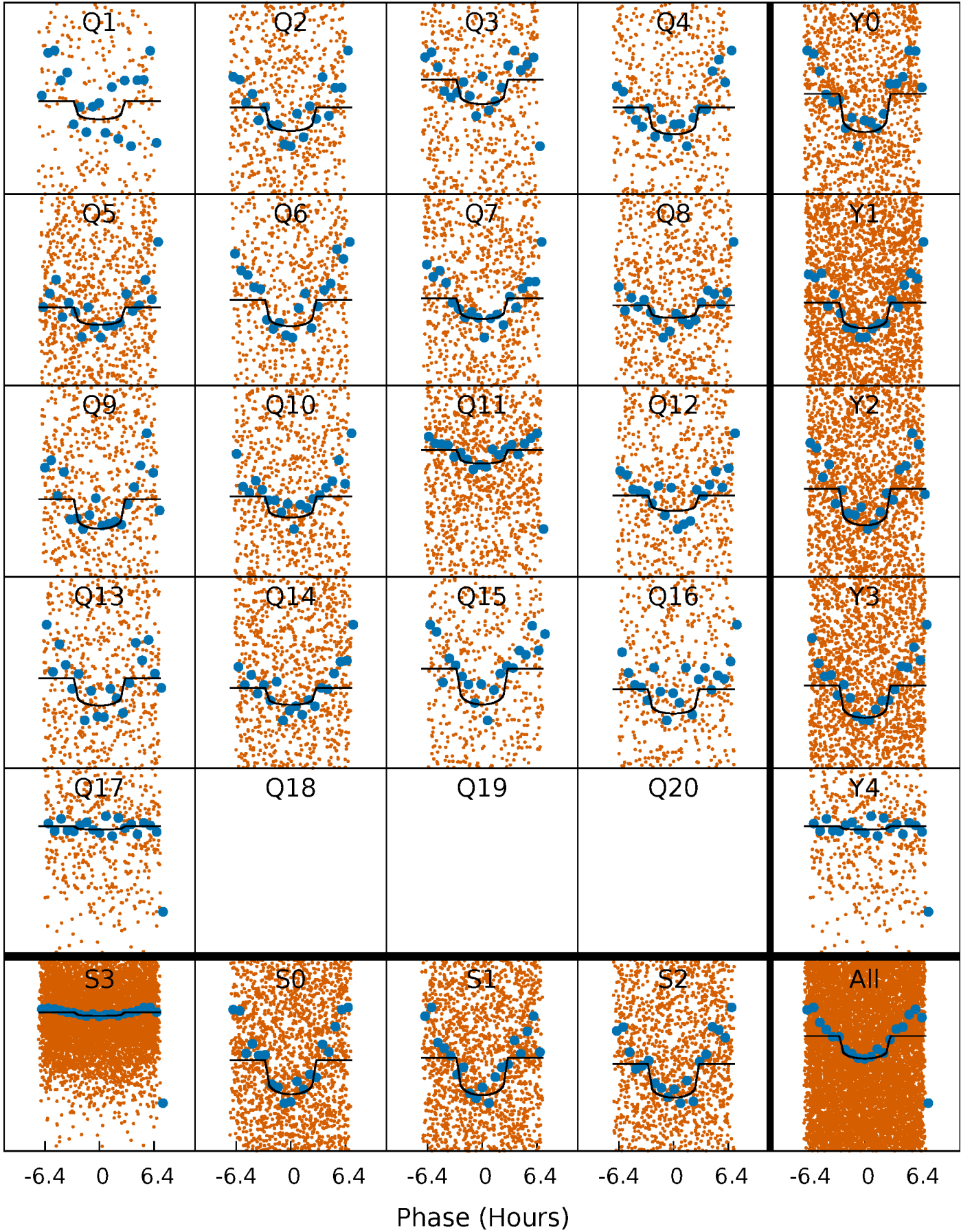
PDC Quarter-Phased Transit Curves

TCE 009165393-02 P= 1.321827 Days $T_0=132.658621$ (BKJD)



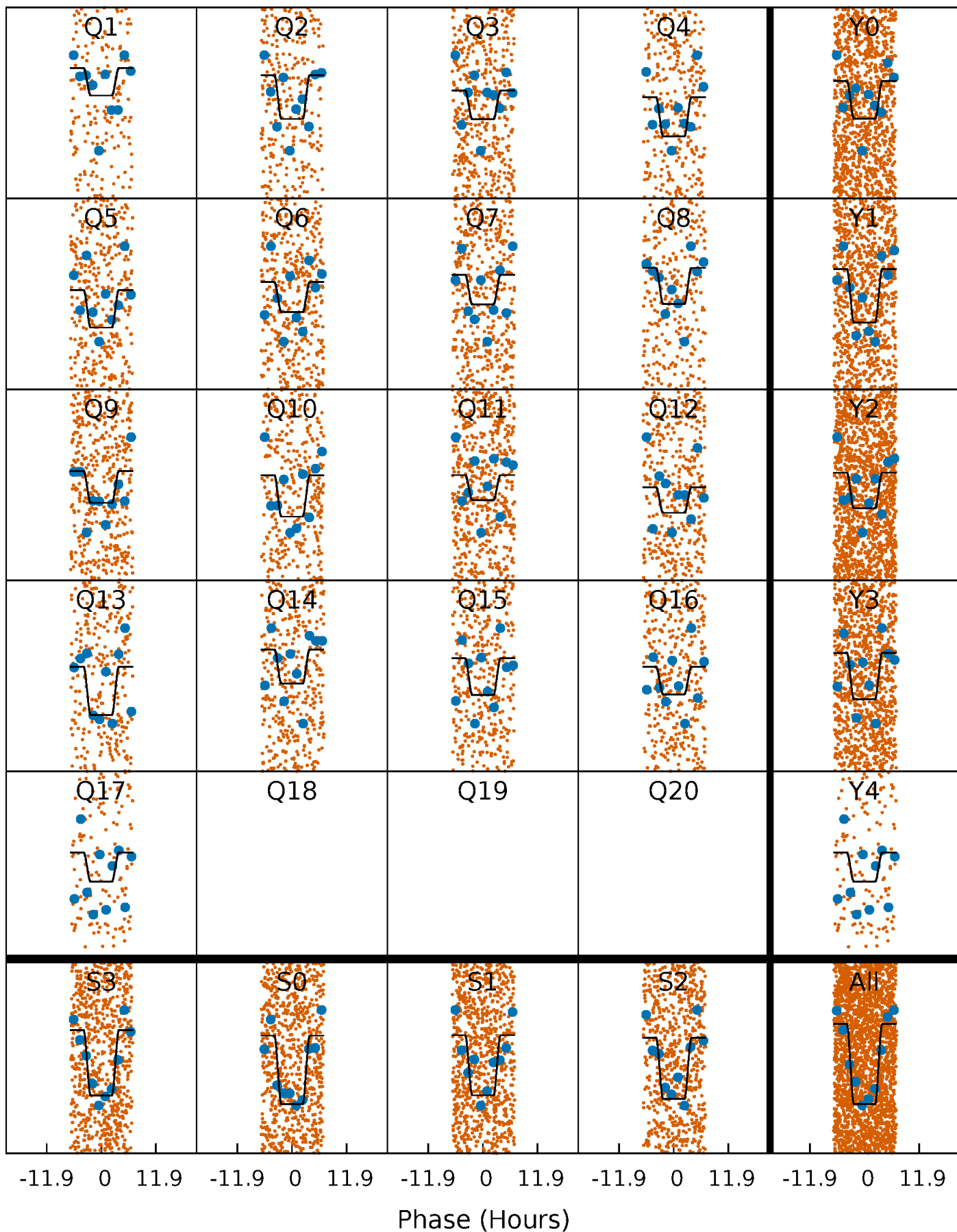
DV Quarter-Phased Transit Curves

TCE 009165393-02 P= 1.321827 Days $T_0=132.658621$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

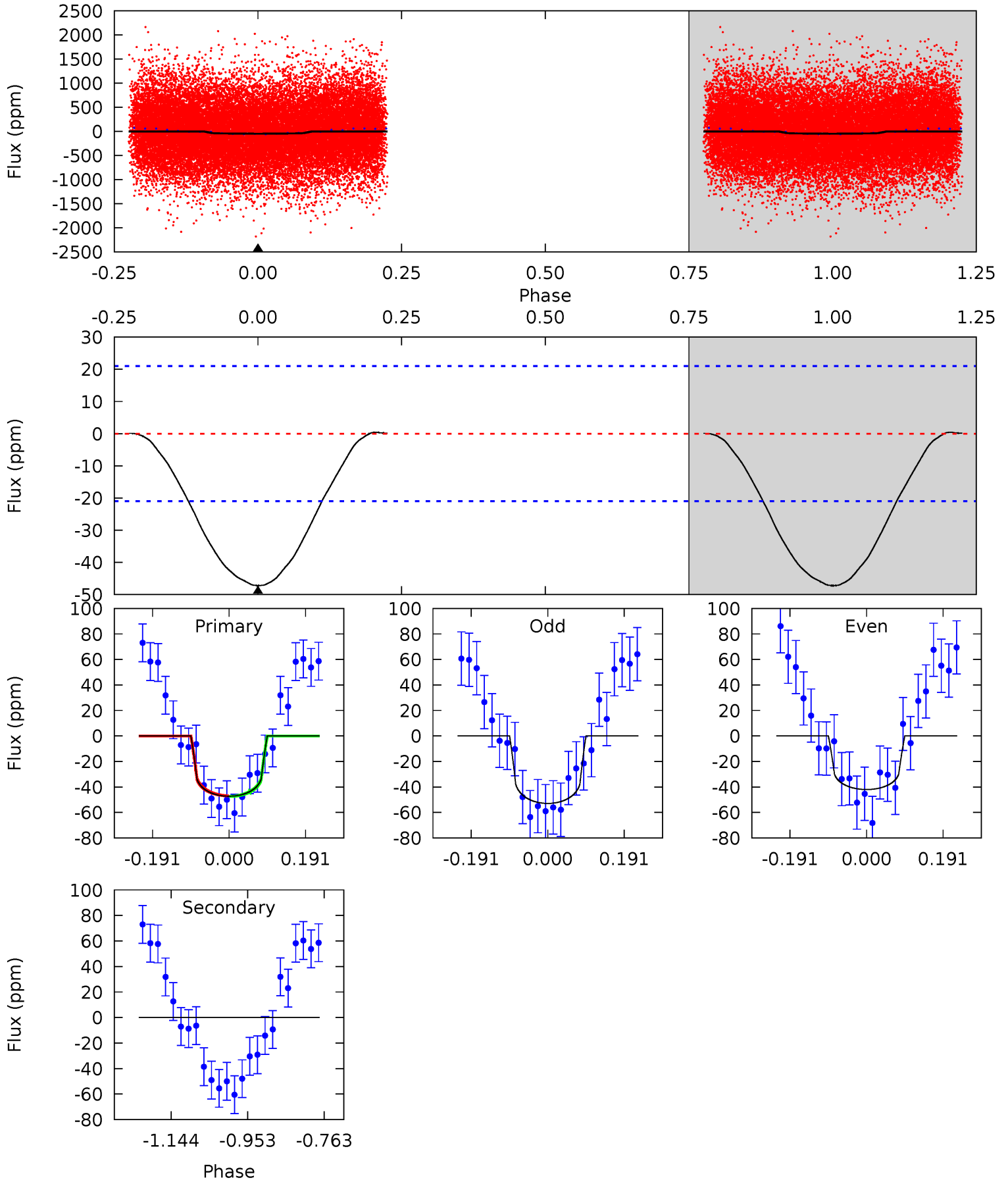
TCE 009165393-02 P= 1.321850 Days $T_0=132.642036$ (BKJD)



DV Model-Shift Uniqueness Test

009165393-02, P = 1.321827 Days, E = 131.336794 Days

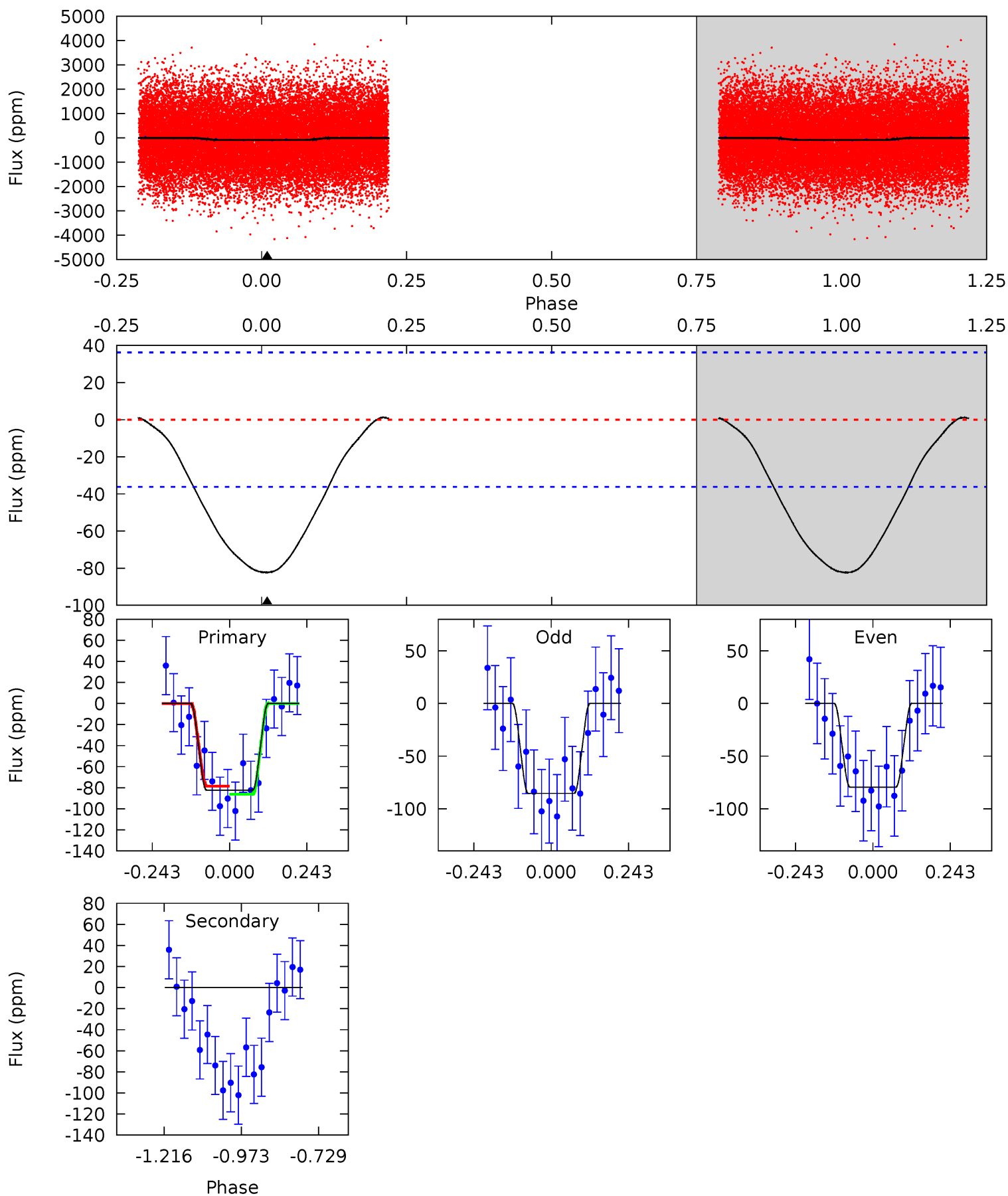
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.96	0	0	0	4.43	1.31	0.14	9.96	9.96	0	0	1.15	0.97	0.01	0.05



Alt Model-Shift Uniqueness Test

009165393-02, P = 1.321850 Days, E = 131.320186 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.95	0	0	0	4.37	1.17	0.22	9.95	9.95	0	0	0.36	0.99	0.01	0.46



Stellar Parameters For KIC 009165393

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7892^{+216}_{-351}	$3.946^{+0.216}_{-0.126}$	$0.070^{+0.250}_{-0.400}$	$2.463^{+0.494}_{-0.803}$	$1.953^{+0.229}_{-0.426}$	$0.184^{+0.257}_{-0.069}$
	+3%/-4%	+5%/-3%	+357%/-571%	+20%/-33%	+12%/-22%	+140%/-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 009165393-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 5	$2.39^{+2.14}_{-1.57}$	4416^{+266}_{-374}	-3889^{+7711}_{-915}	$0.008^{+0.600}_{-0.693}$
Alt.	0 ± 8	$2.82^{+2.41}_{-1.82}$	4391^{+288}_{-338}	-3826^{+8183}_{-910}	$0.015^{+0.812}_{-0.607}$

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

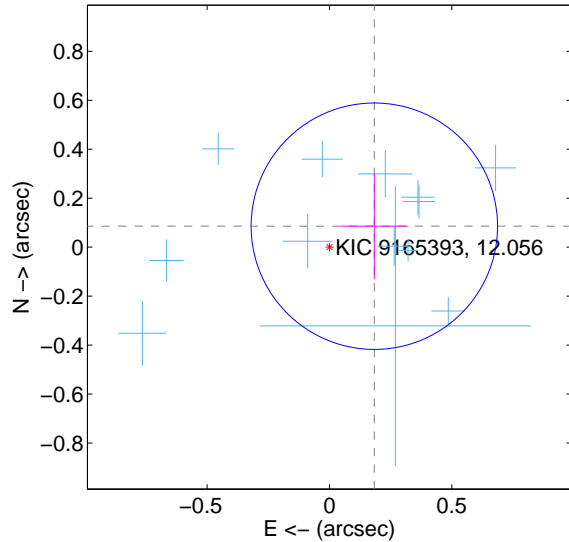
Supplemental centroid analysis for 009165393-02. Kepler magnitude: 12.06. Transit SNR 12.71

There are 17 quarters with good PRF difference image offsets

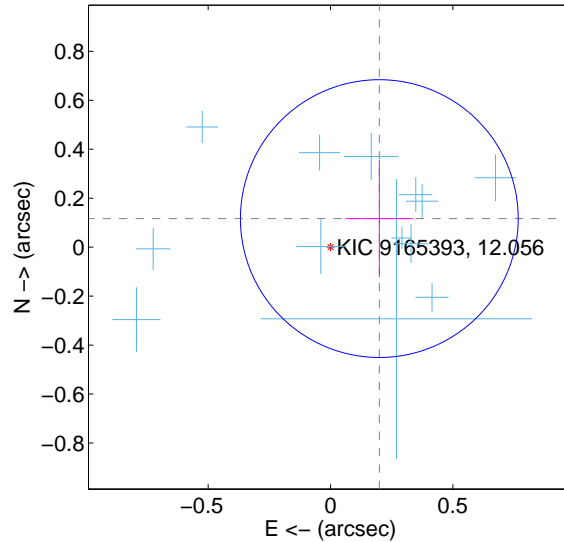
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.202 ± 0.168	1.21	-0.183 ± 0.136	0.086 ± 0.216
PRF-fit source offset from KIC position	0.231 ± 0.189	1.22	-0.199 ± 0.137	0.117 ± 0.239
photometric centroid source offset	0.33 ± 0.17	1.96	-0.32 ± 0.17	-0.04 ± 0.18

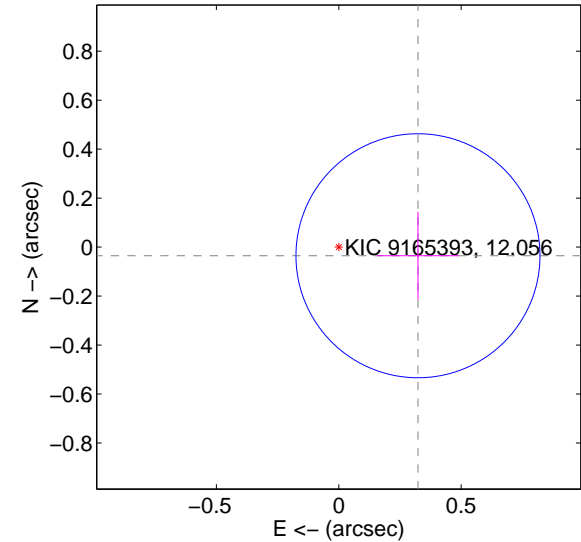
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

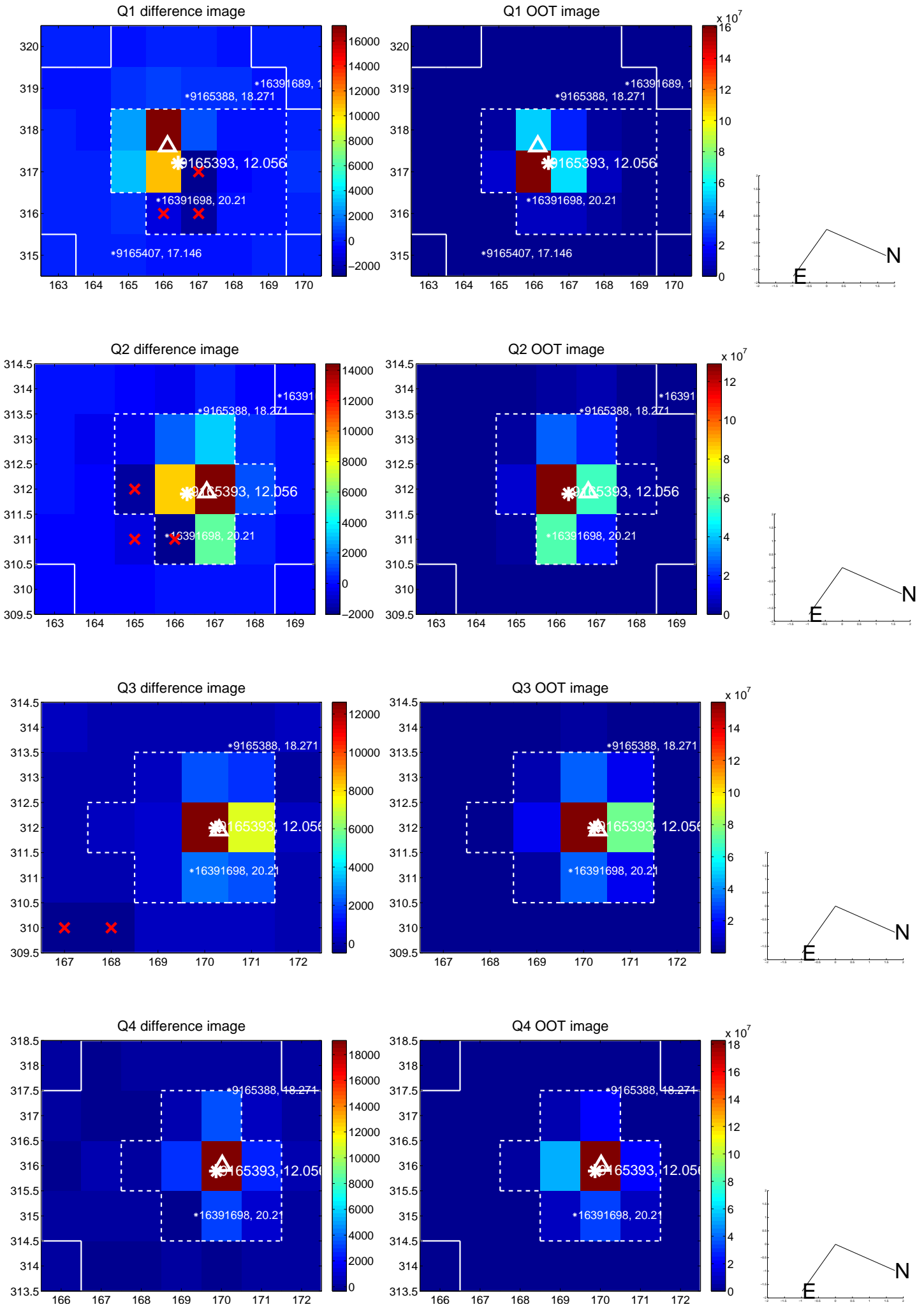


offset from photometric centroids

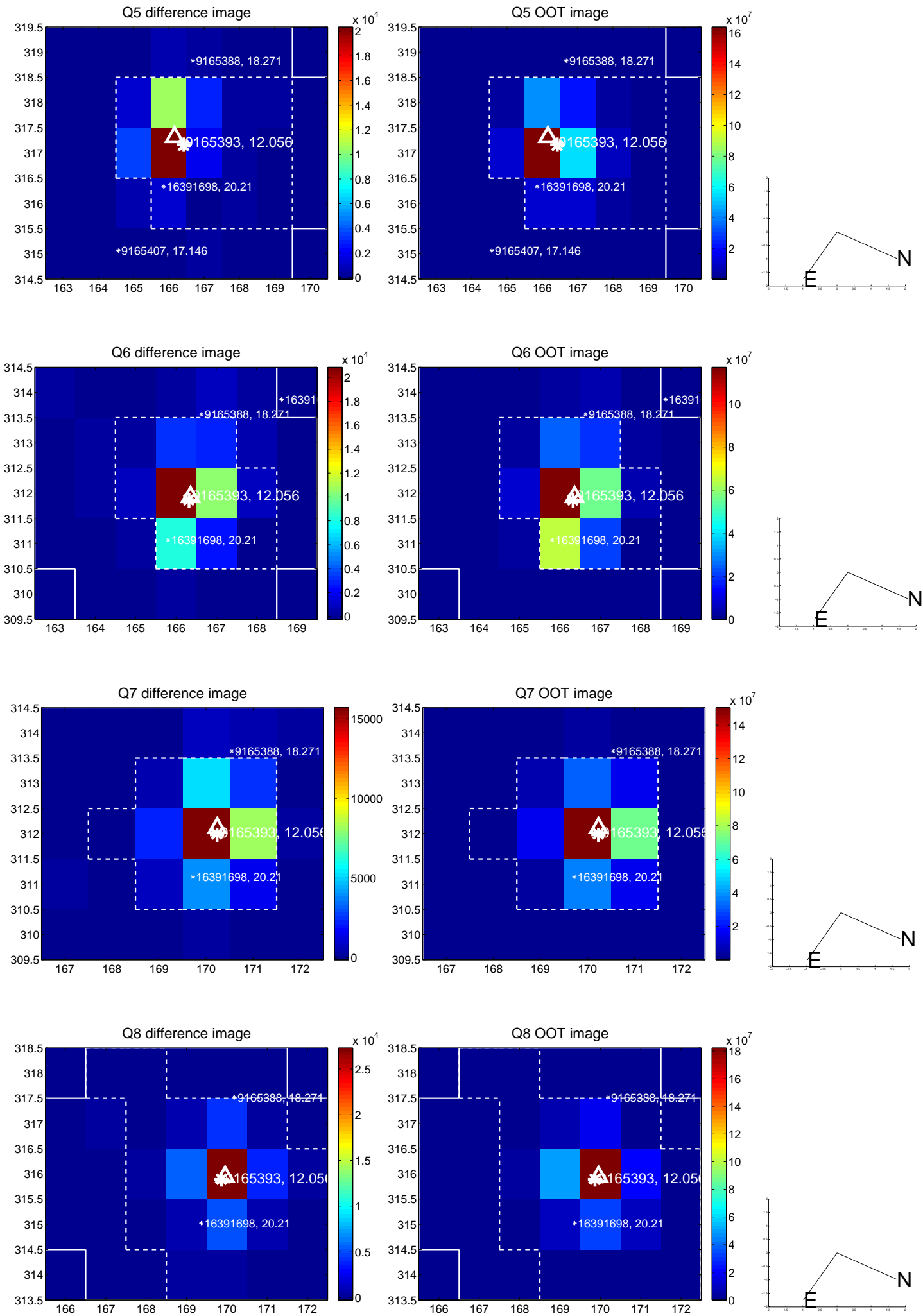


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

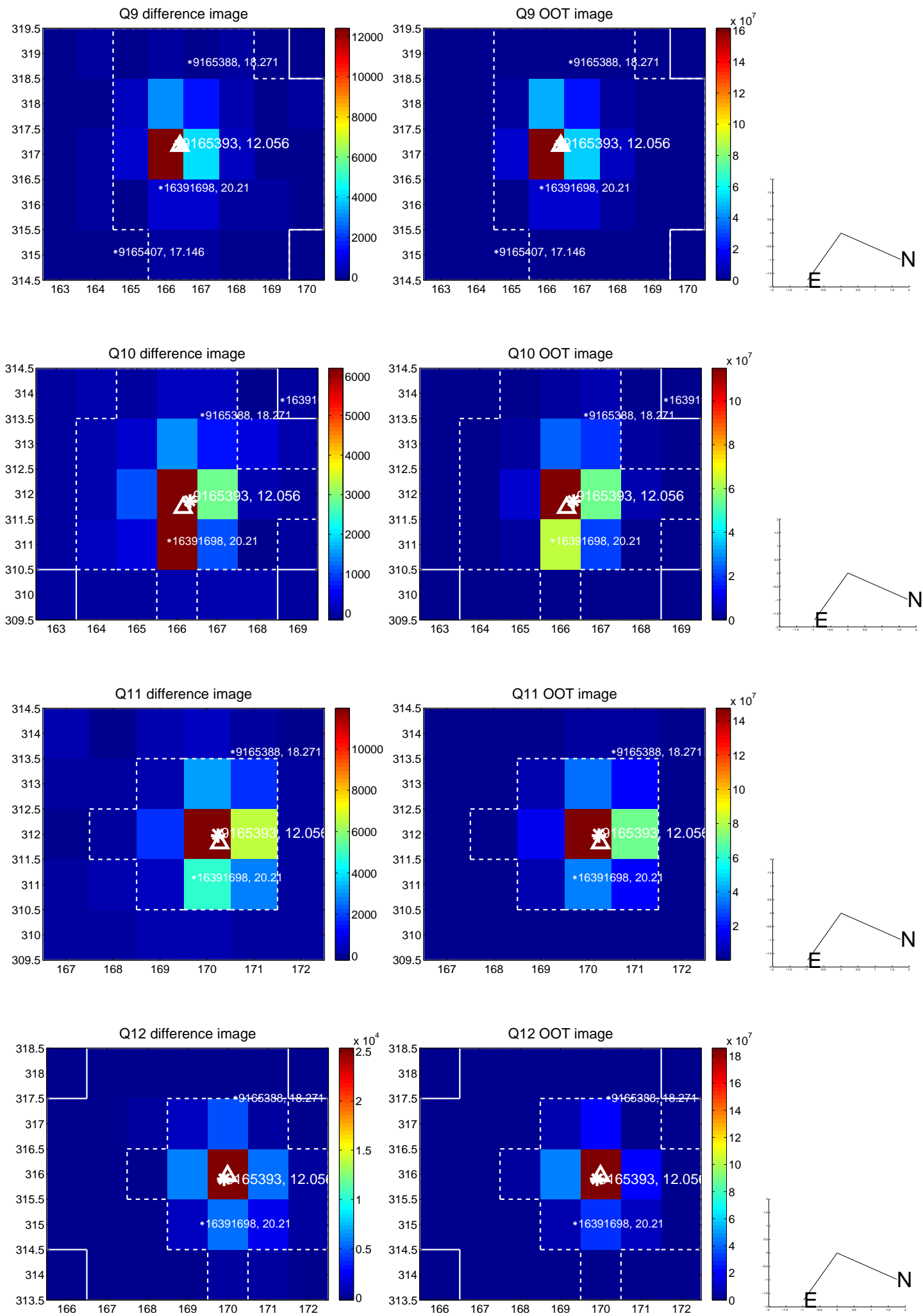
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



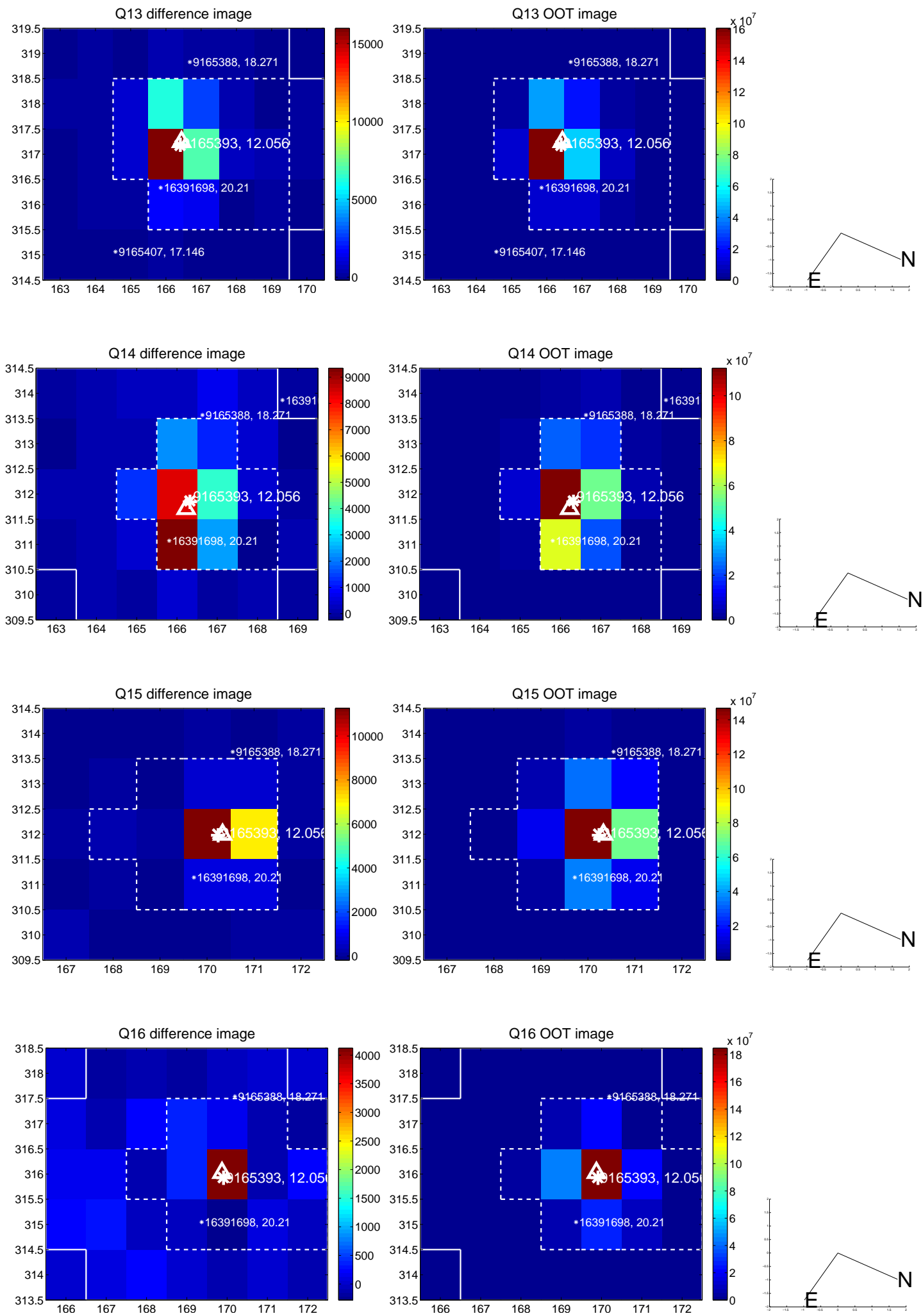
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



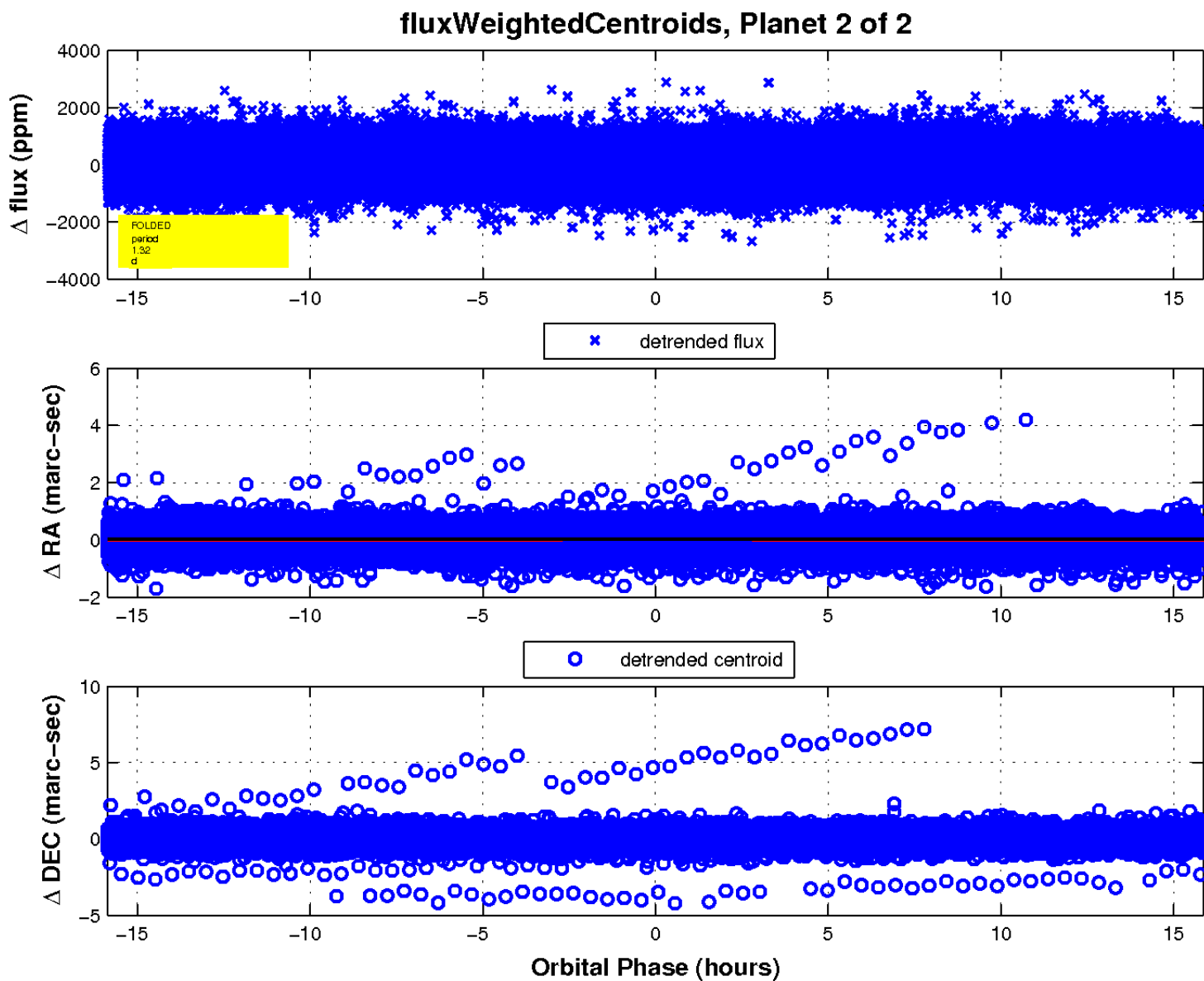
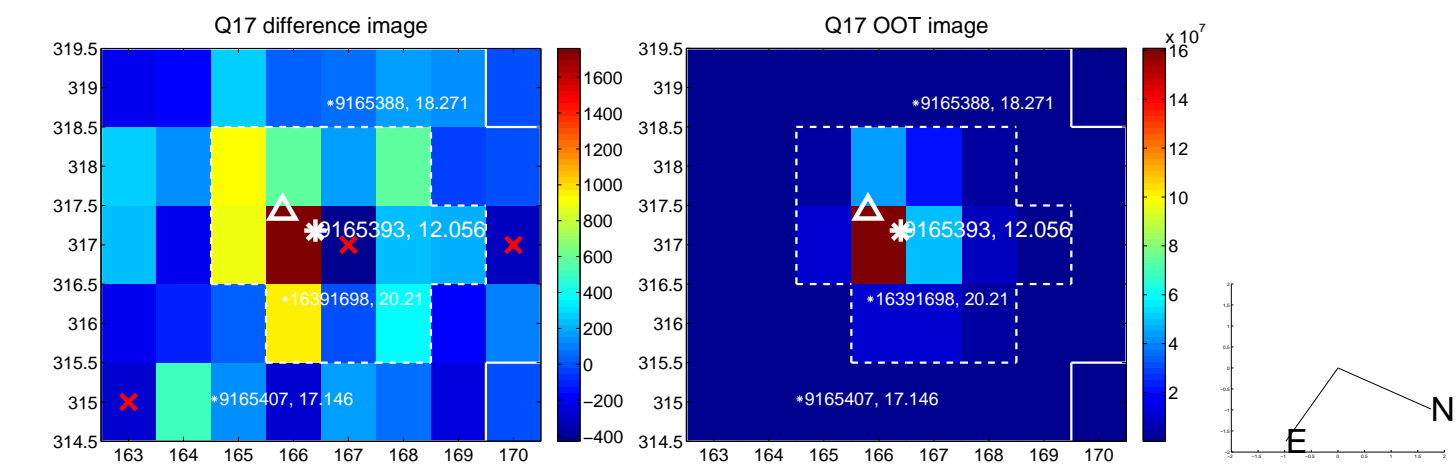
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

