

KIC 009488445

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})
009488445-01	OBS	No	1.965645	131.586100	83.3	8.934	12.6	12.8	2.21	7666	2.37	11126.65
009488445-02	OBS	No	1.965327	132.891876	63.7	5.726	9.0	9.2	2.21	7666	1.79	11129.05

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009488445-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
009488445-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_KIC_POS

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

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

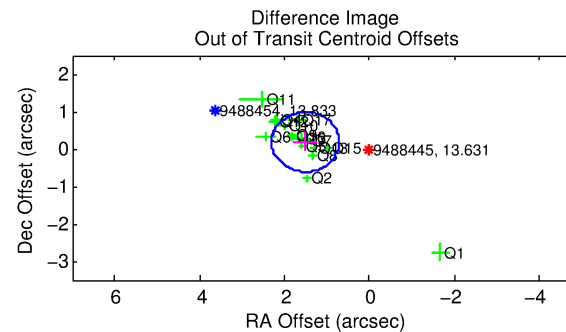
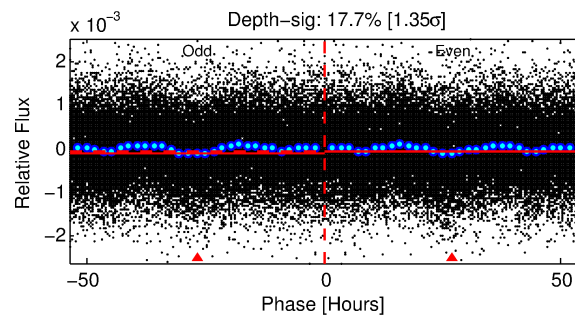
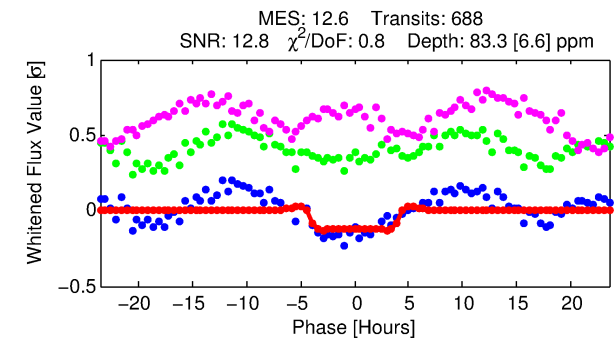
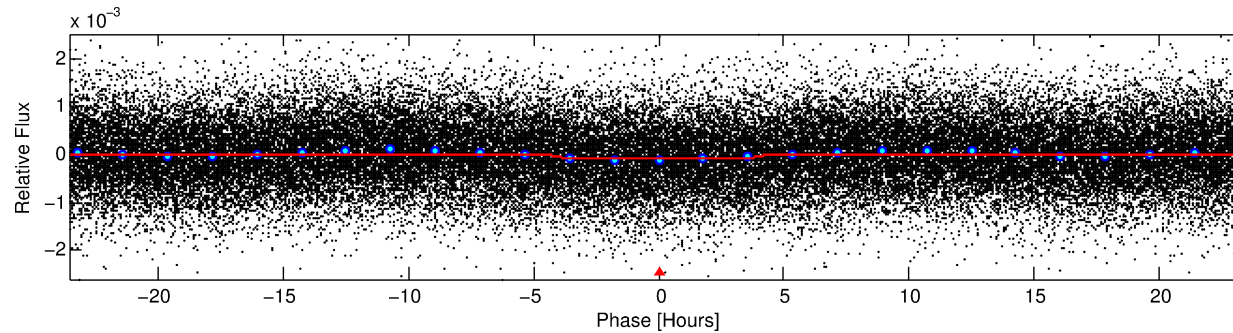
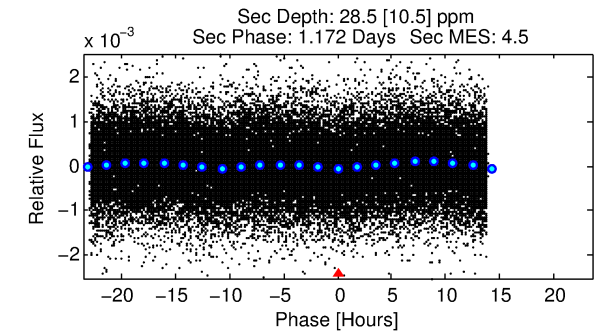
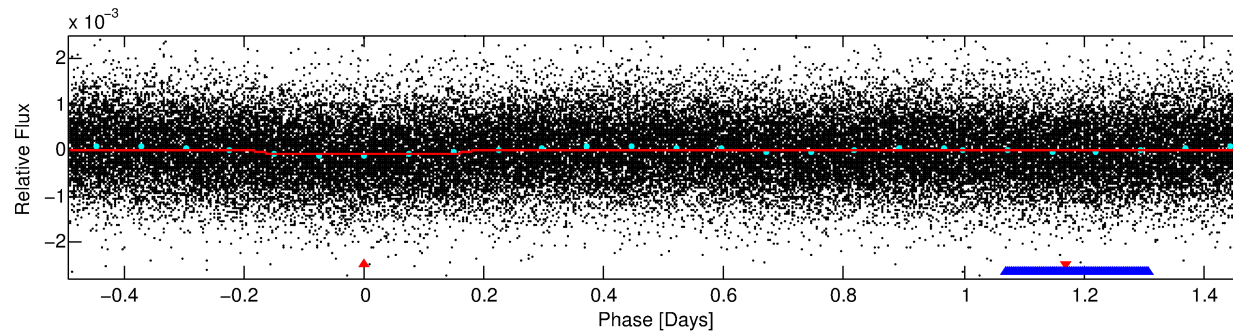
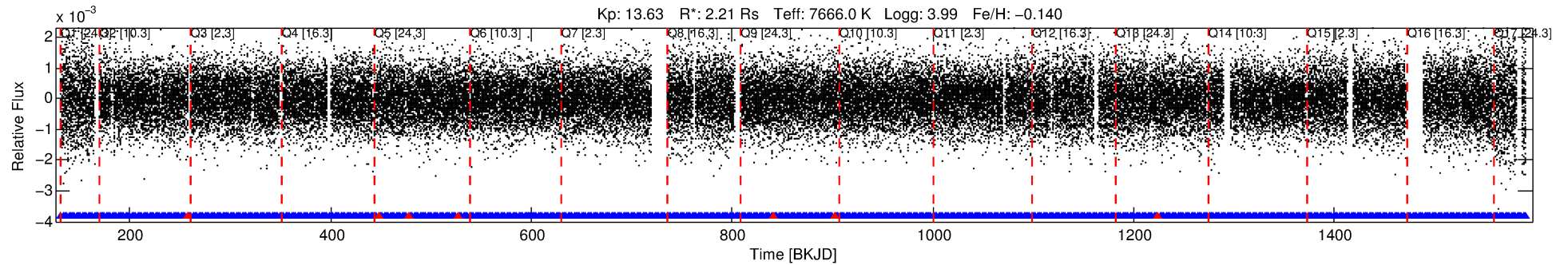
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009488445-01

No Significant Match Found

DV One-Page Summary

KIC: 9488445 Candidate: 1 of 2 Period: 1.966 d



DV Fit Results:

Period = 1.96565 [0.00002] d
Epoch = 131.5861 [0.0066] BKJD
Rp/R* = 0.0099 [0.0017]
a/R* = 1.19 [0.36]
b = 0.91 [0.19]
Seff = 11126.65 [4635.59]
Teq = 2619 [273] K
Rp = 2.37 [0.79] Re
a = 0.0368 [0.0093] AU
Ag = 3.78 [2.38] [1.17σ]
Teffp = 5646 [742] K [3.83σ]

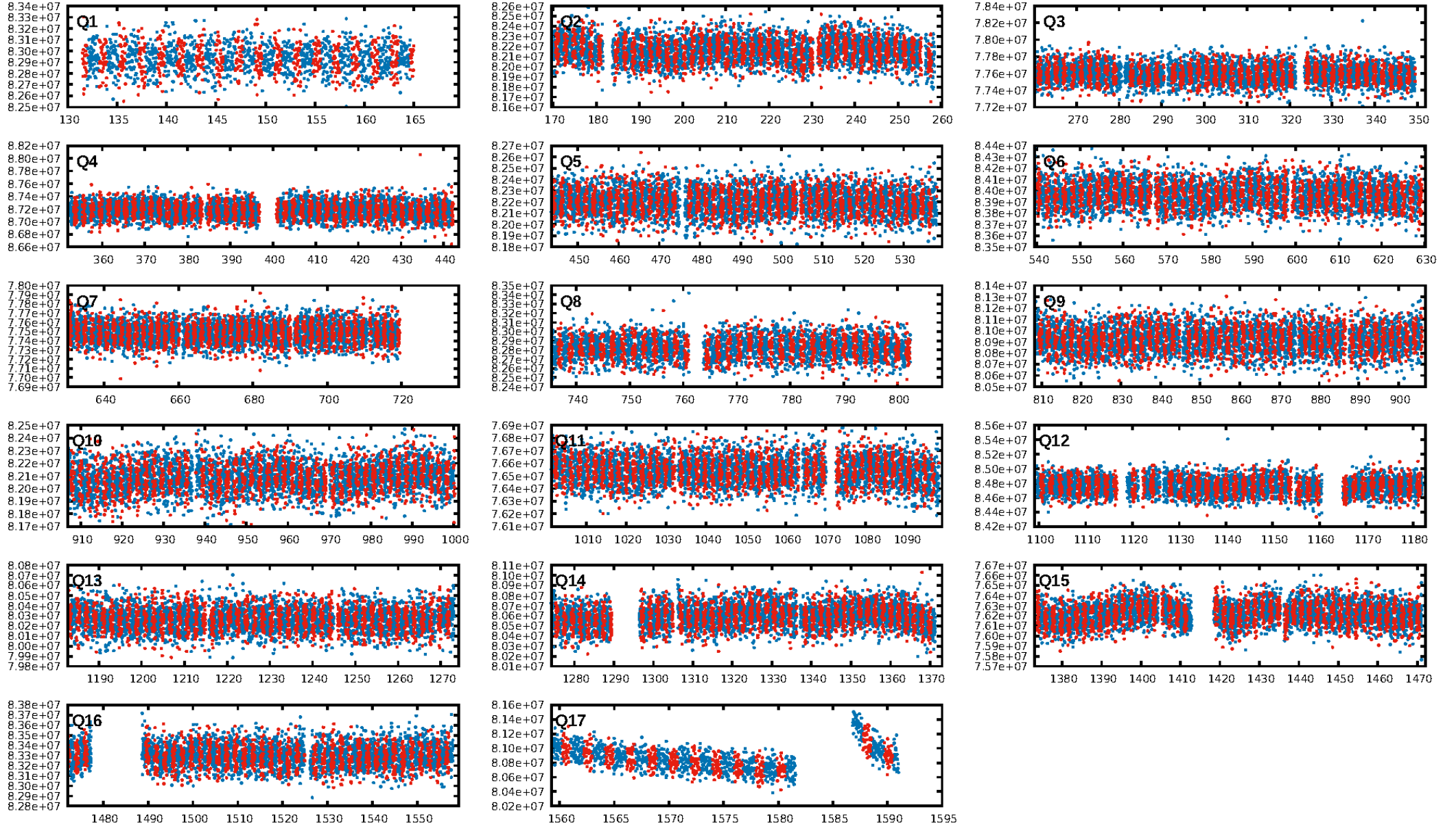
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.22e-32
RollingBand-fgt: 0.99 [650/657]
GhostDiagnostic-chr: 1.966
Centroid-sig: 0.0%
Centroid-so: 2.903 arcsec [8.92σ]
OotOffset-rm: 1.518 arcsec [5.71σ]
KicOffset-rm: 3.326 arcsec [11.59σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.94 [15/16]
DiffImageOverlap-fno: 0.41 [7/17]

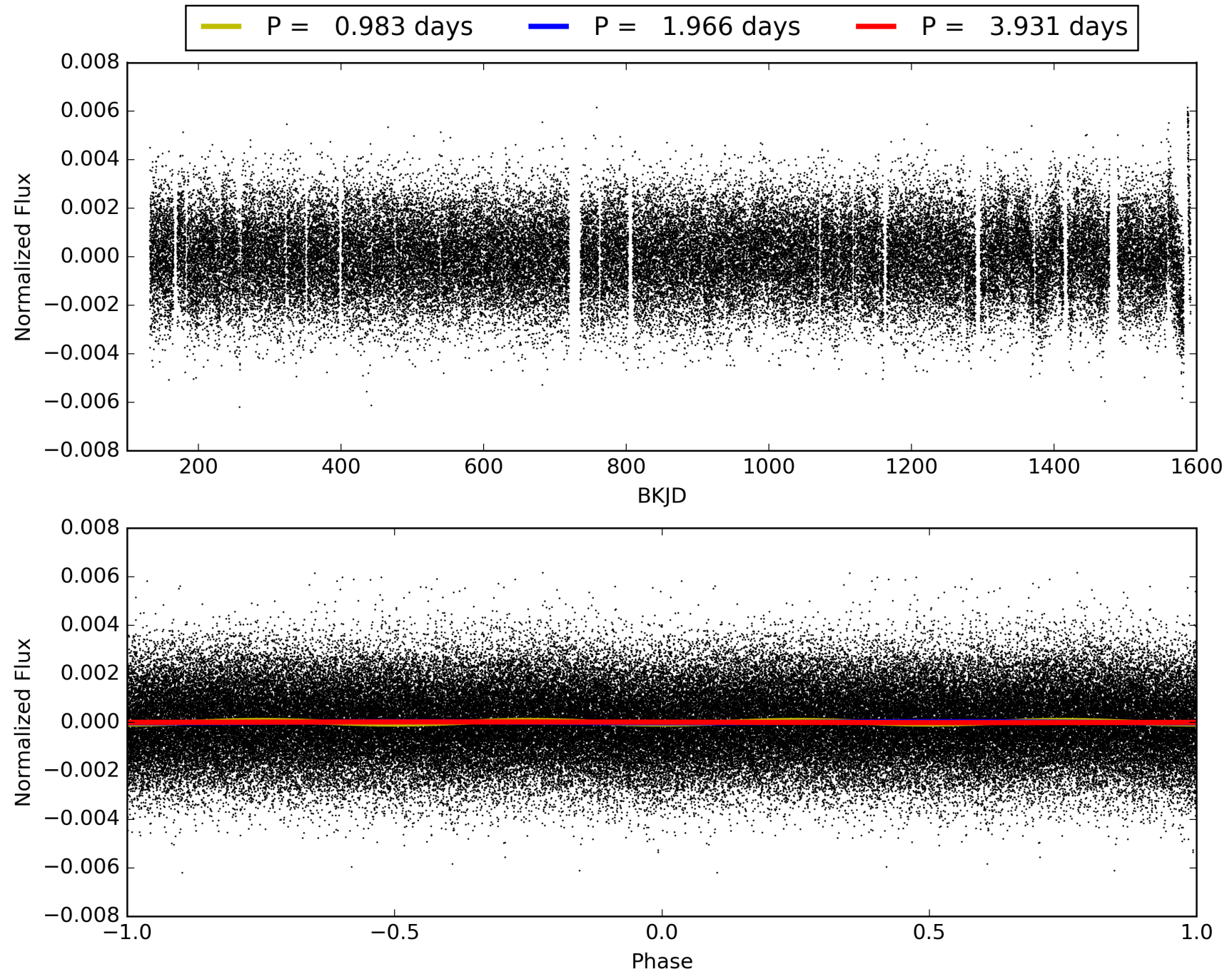
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:24:12 Z

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

TCE 009488445-01, PDC Light Curves

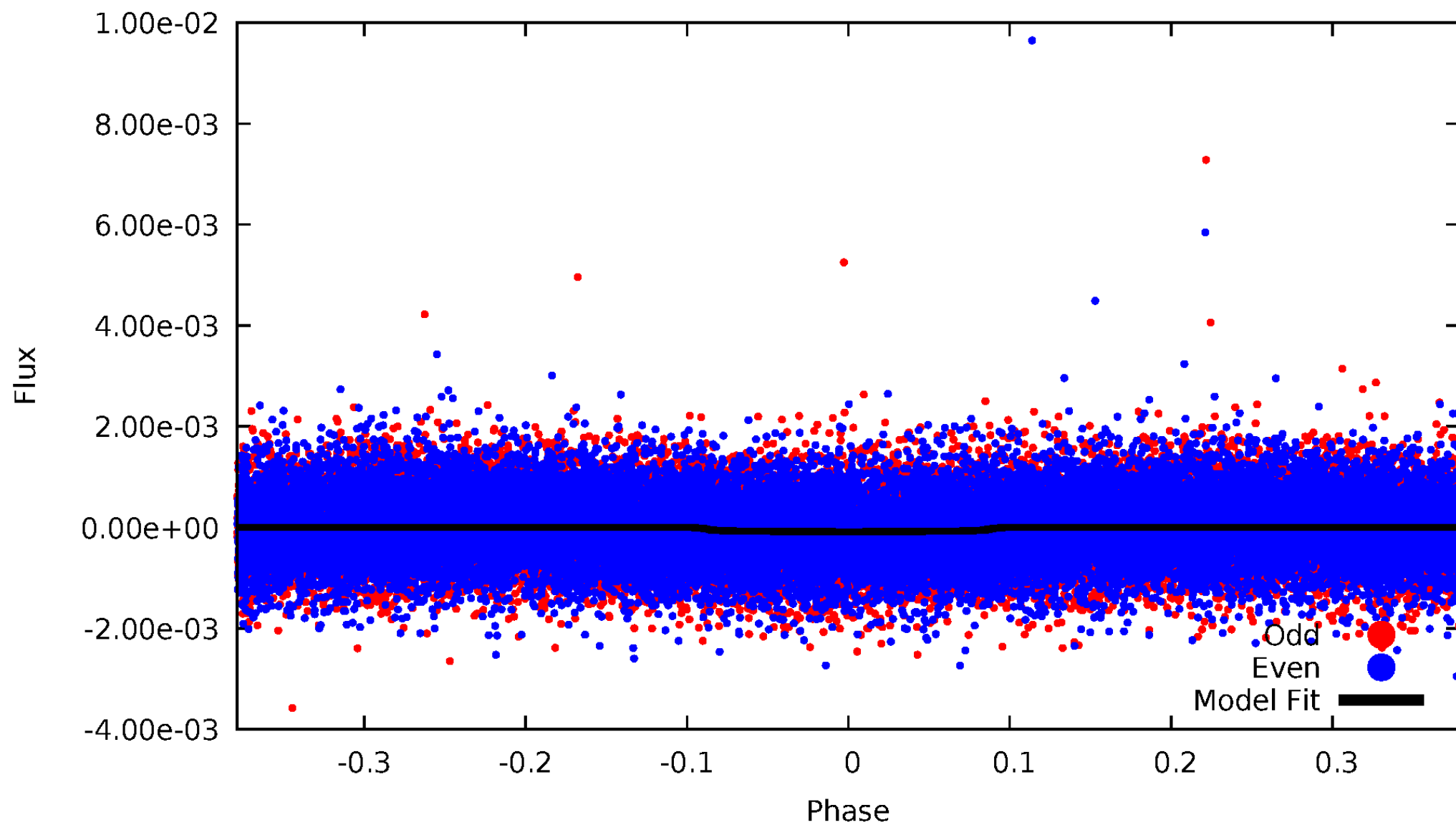


TCE 009488445-01



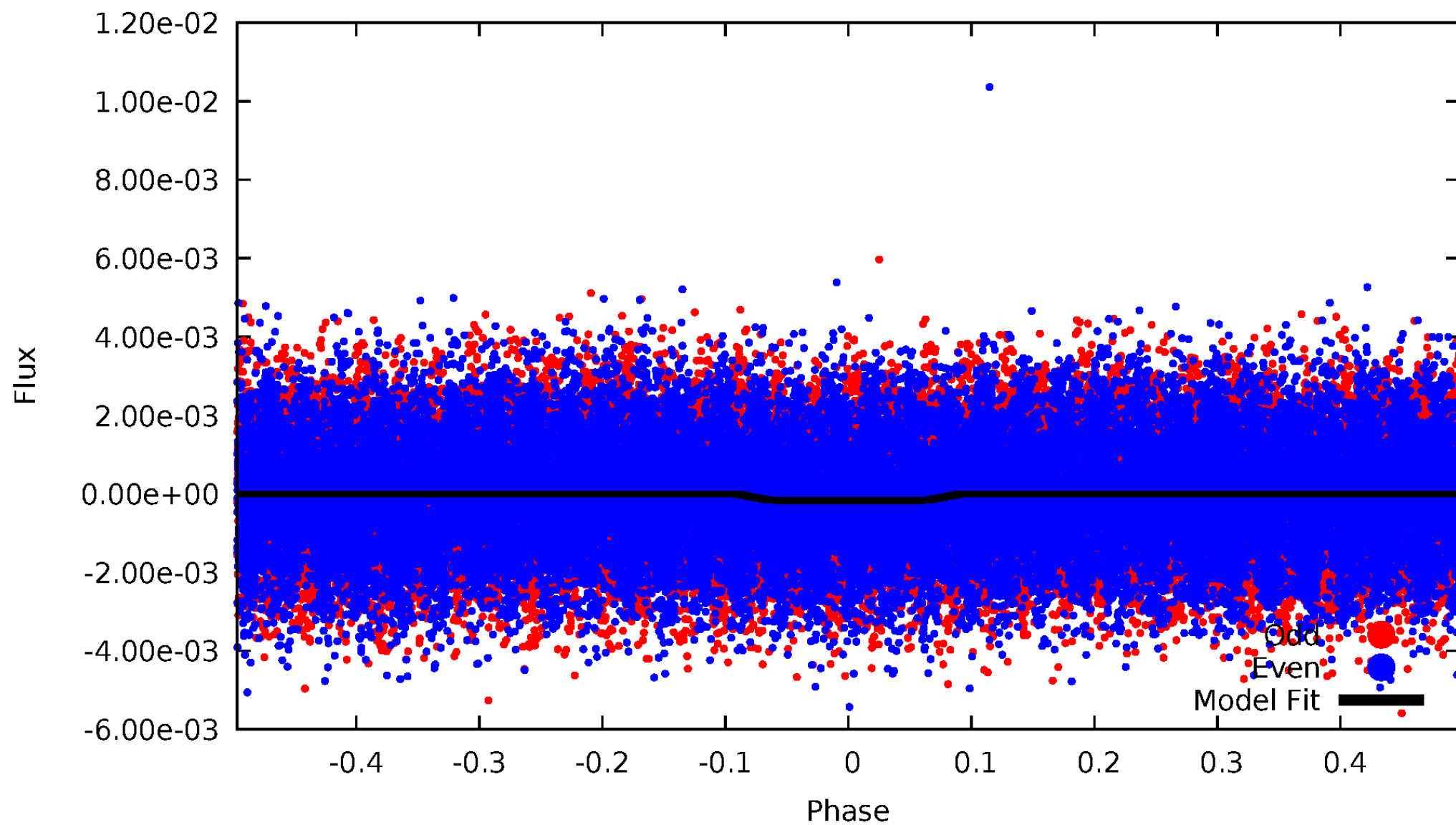
DV Odd/Even

TCE 009488445-01



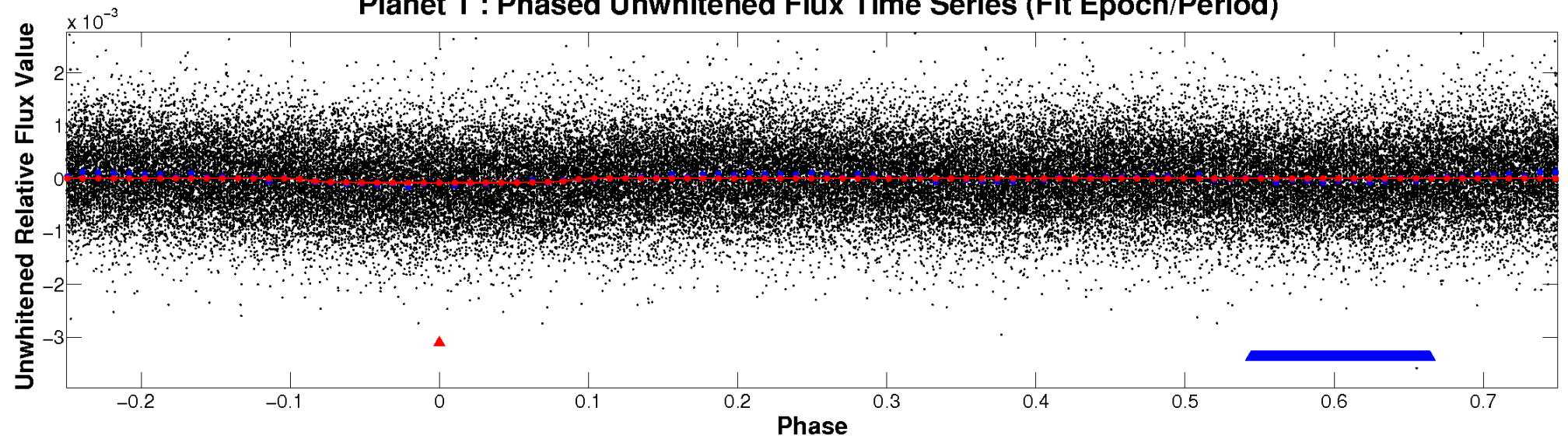
ALT Odd/Even

TCE 009488445-01

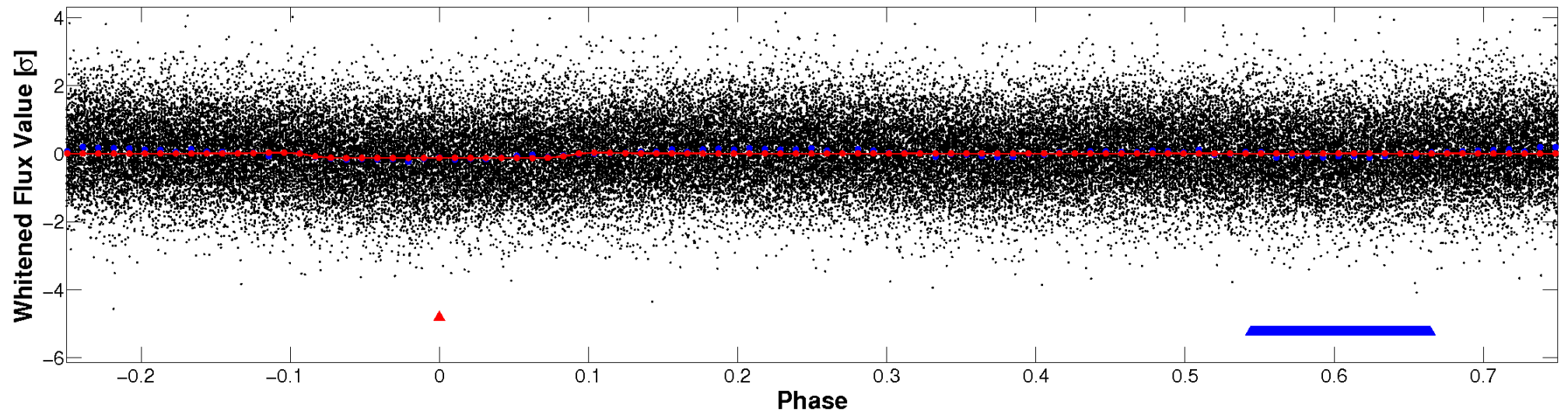


Non-Whitened Vs. Whitened Light Curve

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

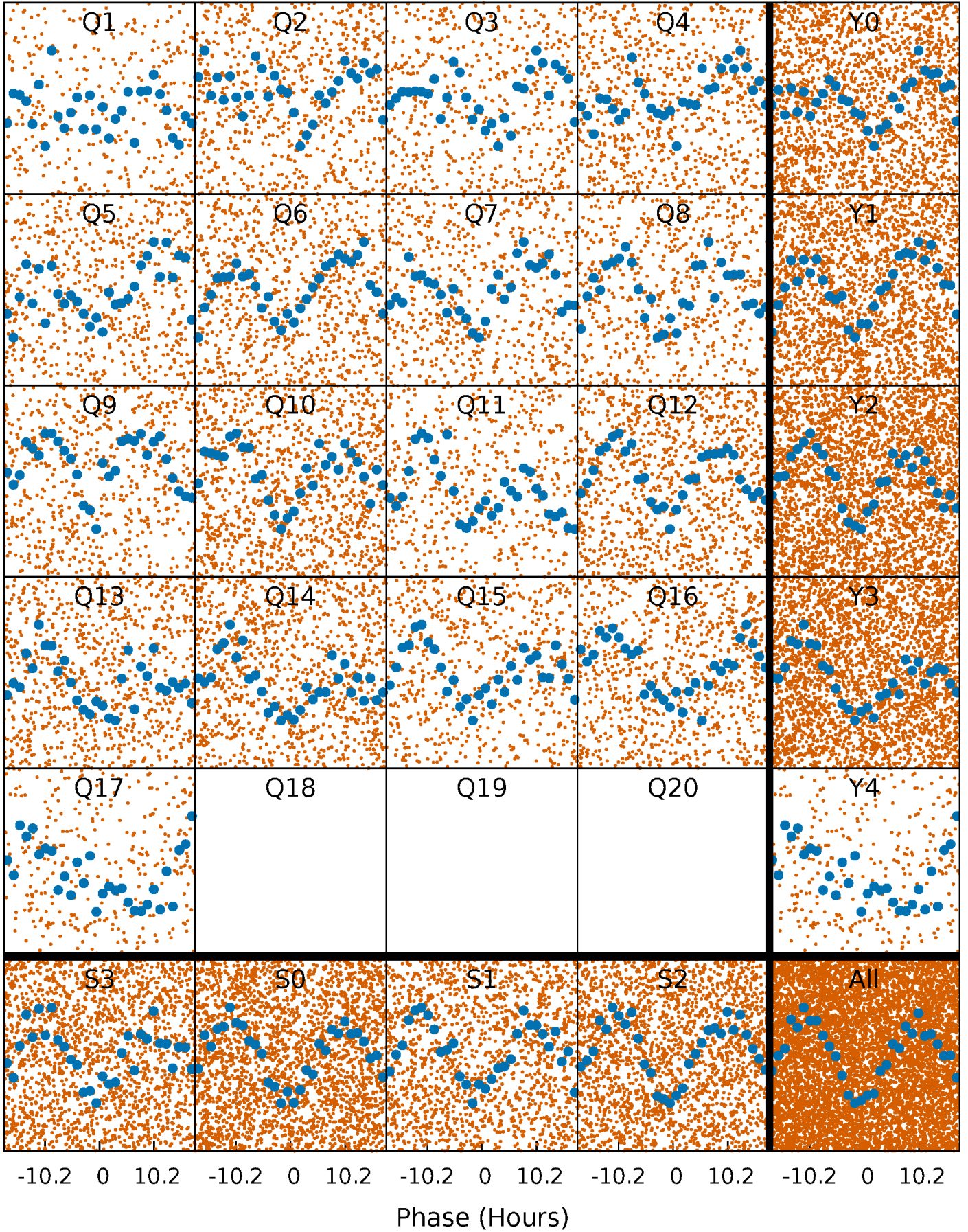


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



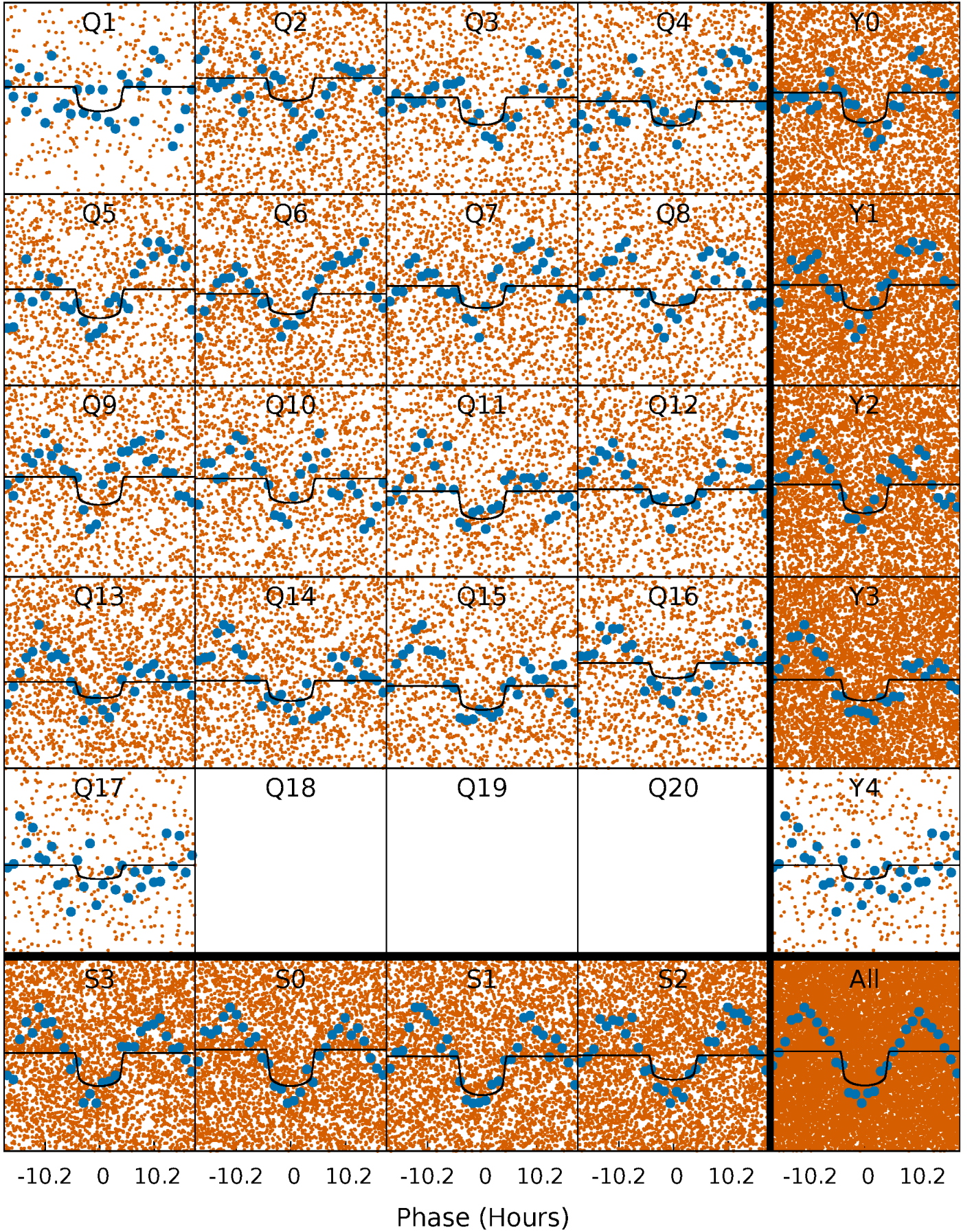
PDC Quarter-Phased Transit Curves

TCE 009488445-01 P= 1.965645 Days $T_0=131.586100$ (BKJD)



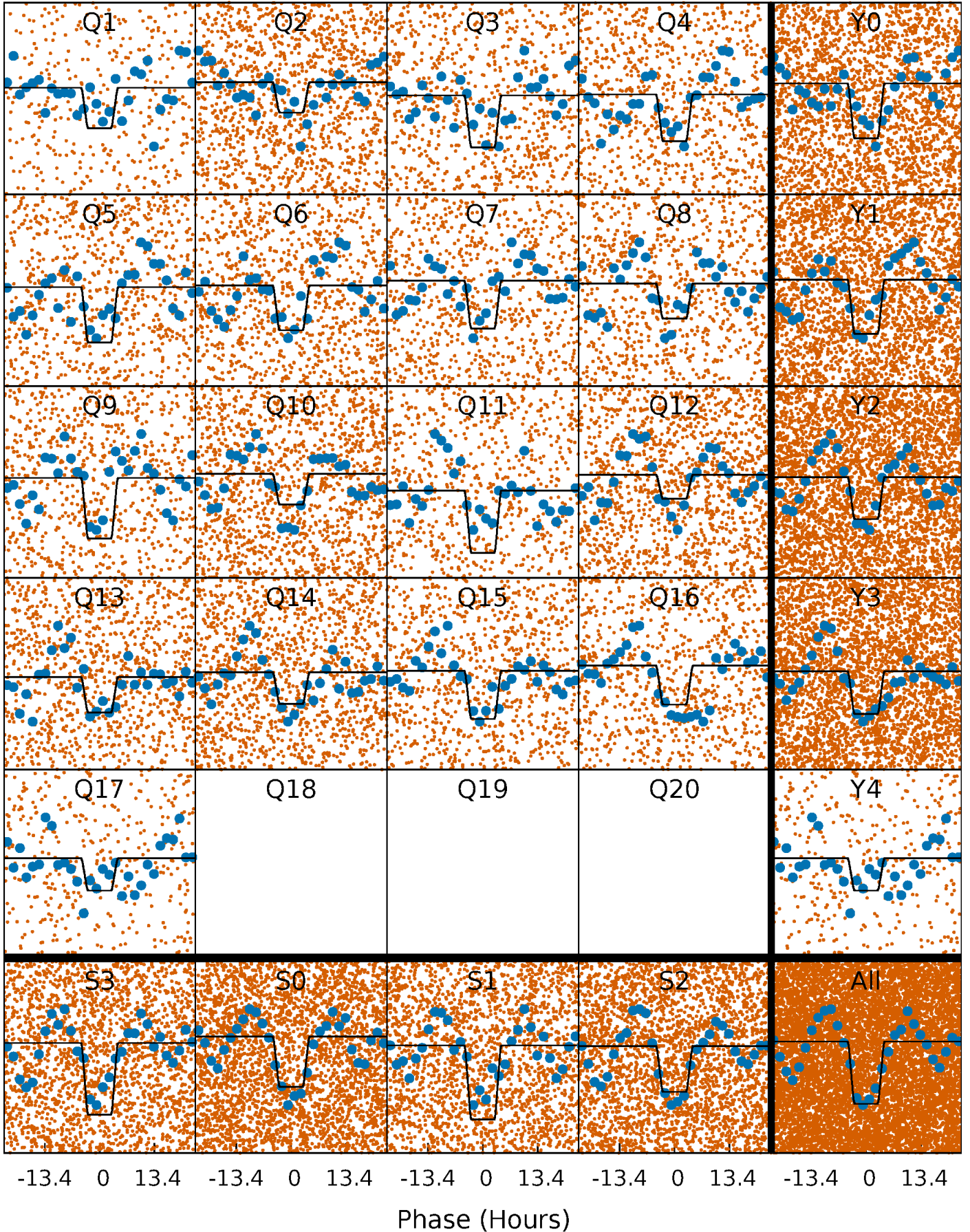
DV Quarter-Phased Transit Curves

TCE 009488445-01 P= 1.965645 Days $T_0=131.586100$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

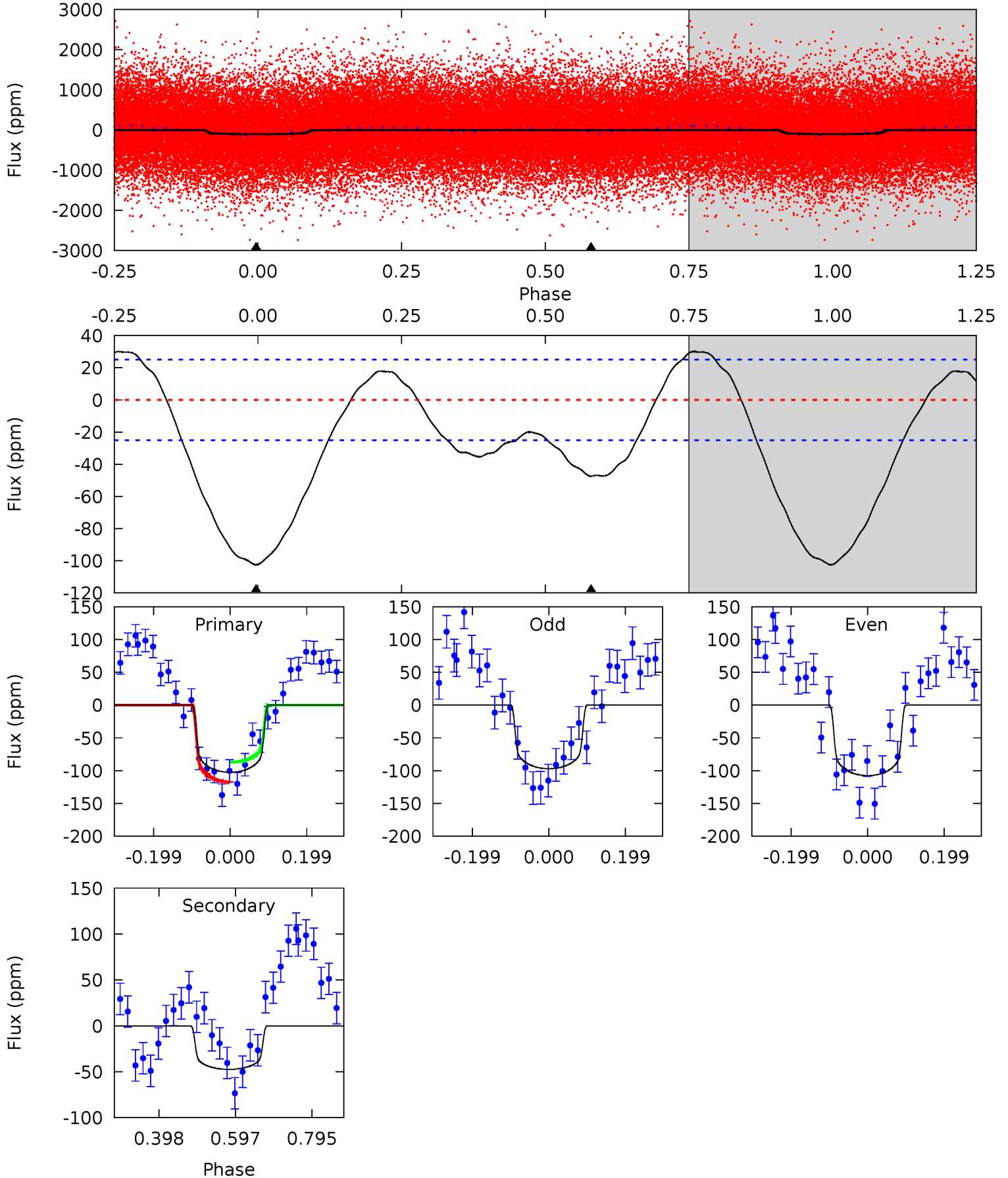
TCE 009488445-01 P= 1.965534 Days $T_0=131.601229$ (BKJD)



DV Model-Shift Uniqueness Test

009488445-01, P = 1.965645 Days, E = 129.620455 Days

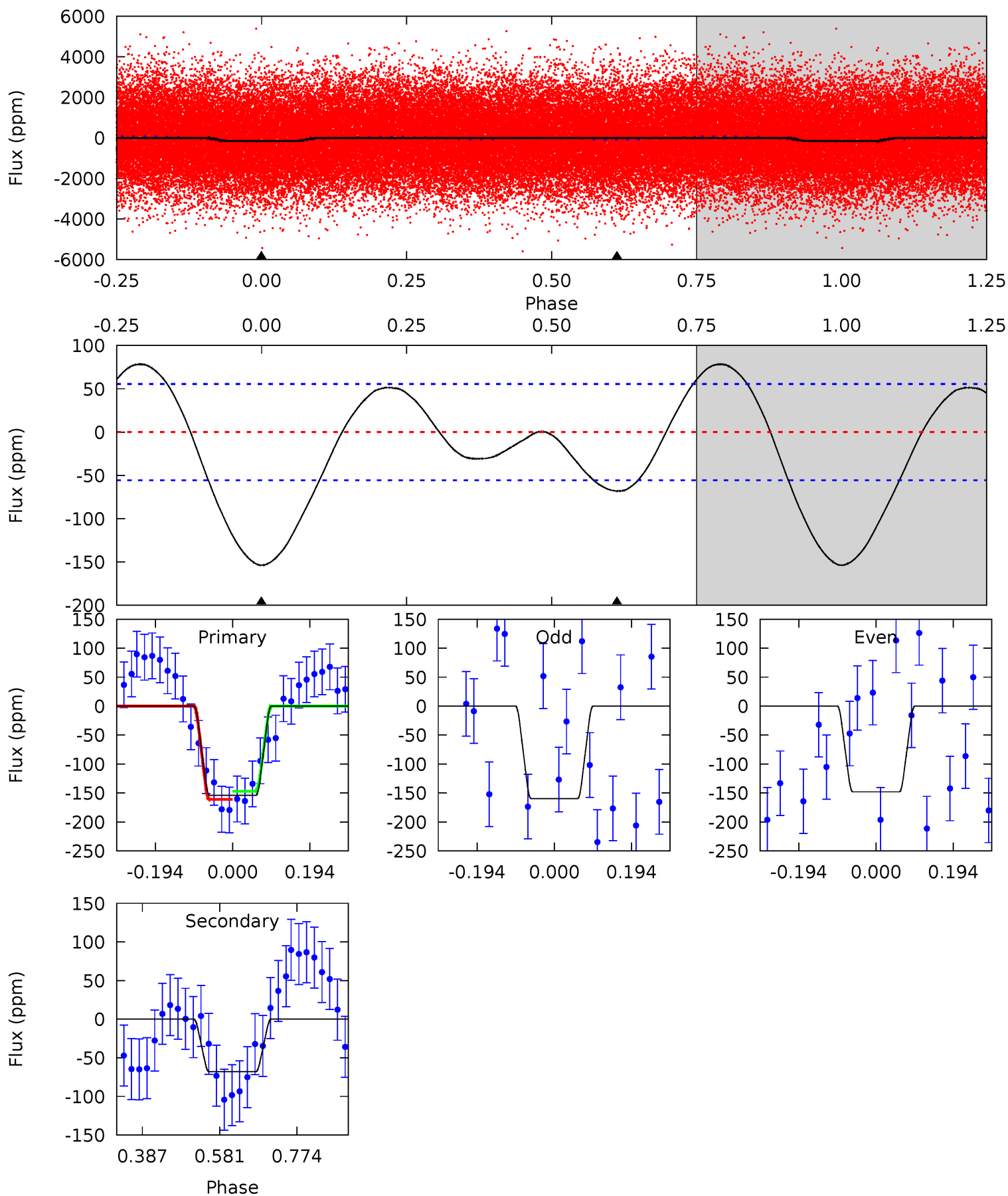
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.1	8.37	0	0	4.42	1.28	3.77	18.1	18.1	8.37	8.37	0.93	0.98	0.23	2.64



Alt Model-Shift Uniqueness Test

009488445-01, P = 1.965534 Days, E = 129.635695 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	5.42	0	0	4.42	1.30	2.64	12.3	12.3	5.42	5.42	0.46	1.00	0.34	0.56



Stellar Parameters For KIC 009488445

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7666^{+237}_{-316}	$3.986^{+0.216}_{-0.144}$	$-0.140^{+0.200}_{-0.300}$	$2.207^{+0.517}_{-0.632}$	$1.715^{+0.198}_{-0.322}$	$0.225^{+0.292}_{-0.096}$
	+3%/-4%	+5%/-4%	+143%/-214%	+23%/-29%	+12%/-19%	+130%/-43%
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 009488445-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-47 ± 6	$2.33^{+0.55}_{-0.52}$	3626^{+290}_{-283}	6232^{+711}_{-583}	$6.559^{+3.956}_{-2.406}$
Alt.	-68 ± 13	$3.09^{+0.63}_{-0.59}$	3630^{+261}_{-276}	5849^{+486}_{-449}	$5.106^{+2.947}_{-1.592}$

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

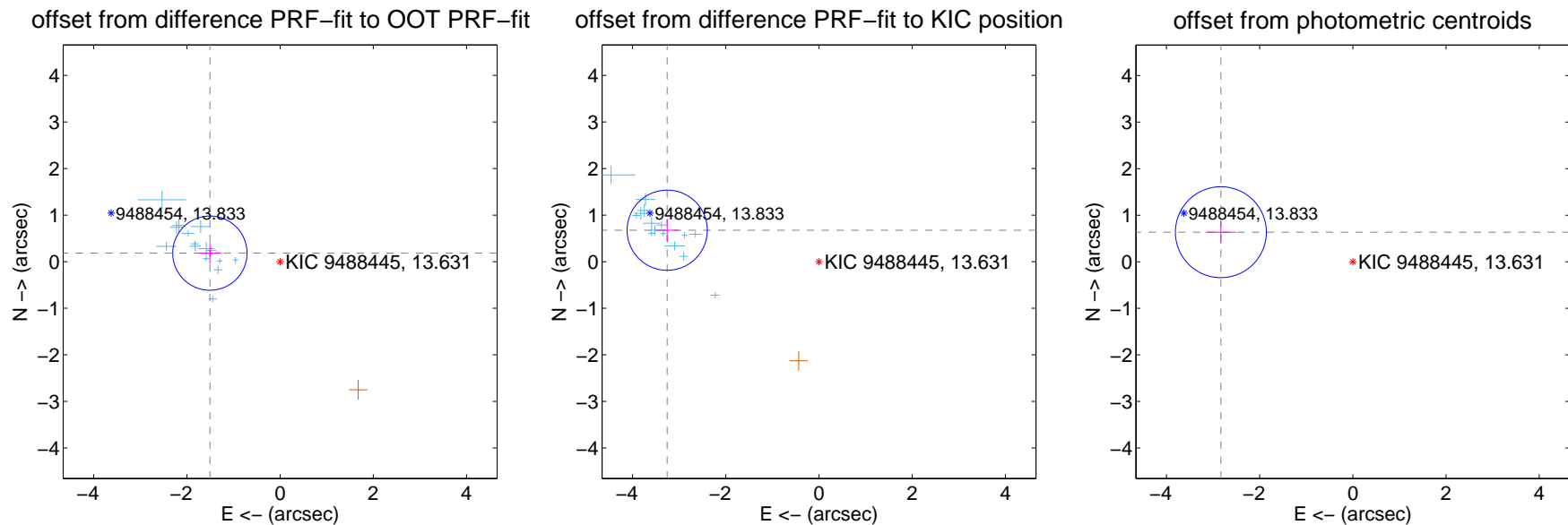
DV Centroid Data

Supplemental centroid analysis for 009488445-01. Kepler magnitude: 13.63. Transit SNR 12.79

There are 15 quarters with good PRF difference image offsets

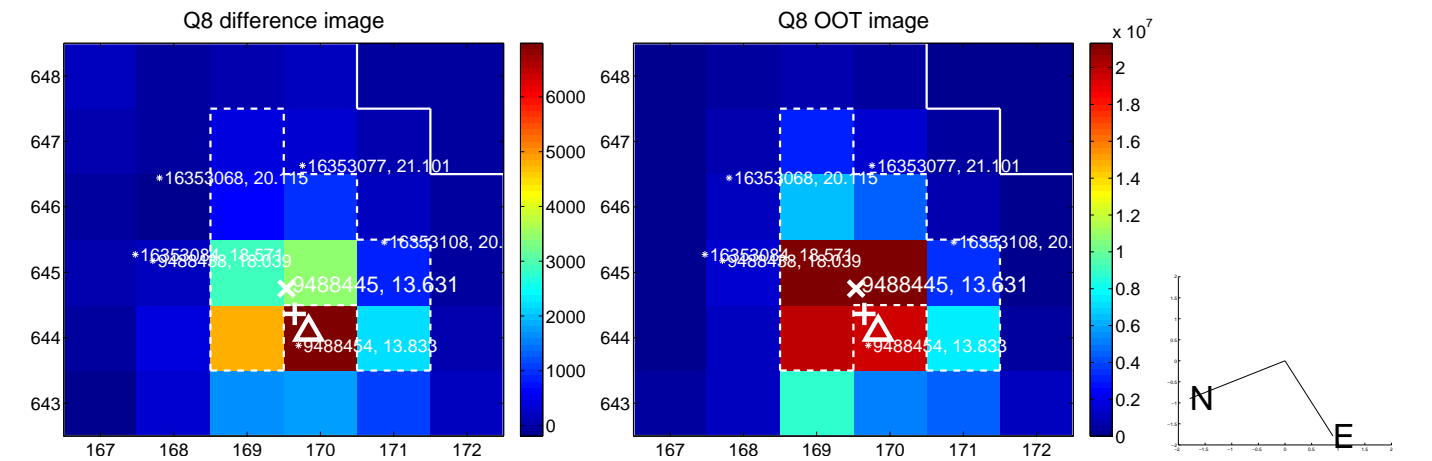
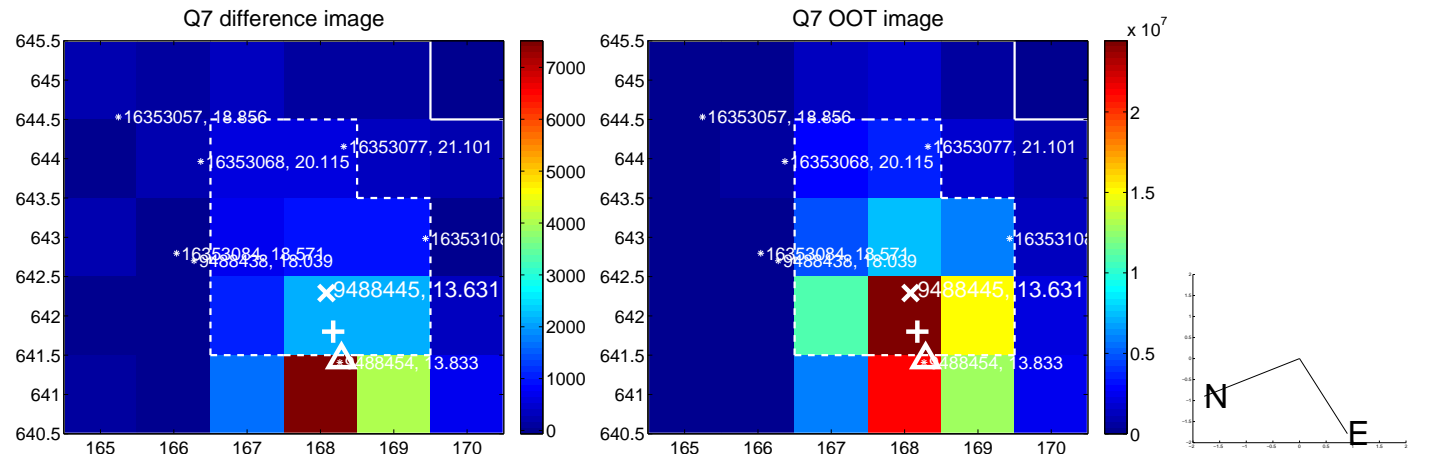
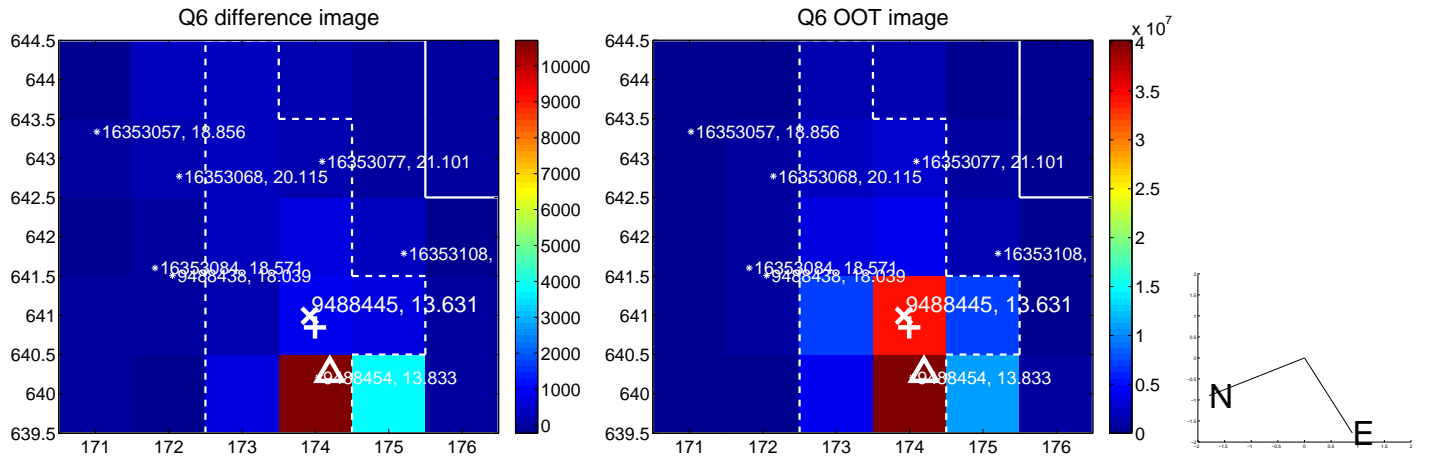
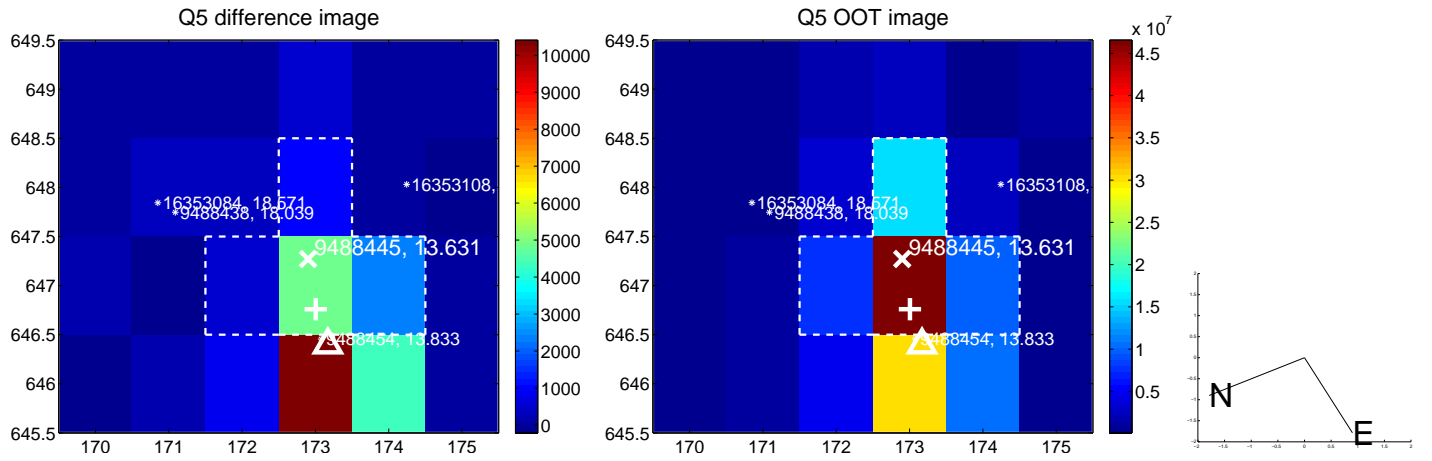
The OOT PRF centroid is offset from the target star catalog position by about 2.10 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.518 ± 0.266	5.71	1.507 ± 0.244	0.184 ± 0.226
PRF-fit source offset from KIC position	3.326 ± 0.287	11.59	3.257 ± 0.247	0.676 ± 0.244
photometric centroid source offset	2.90 ± 0.33	8.92	2.83 ± 0.33	0.64 ± 0.24

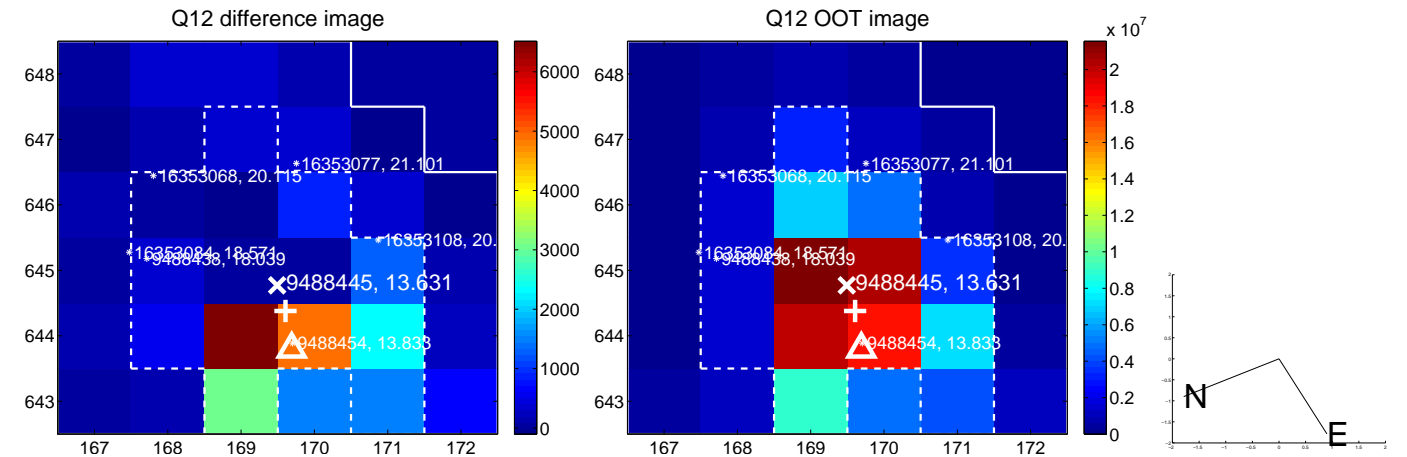
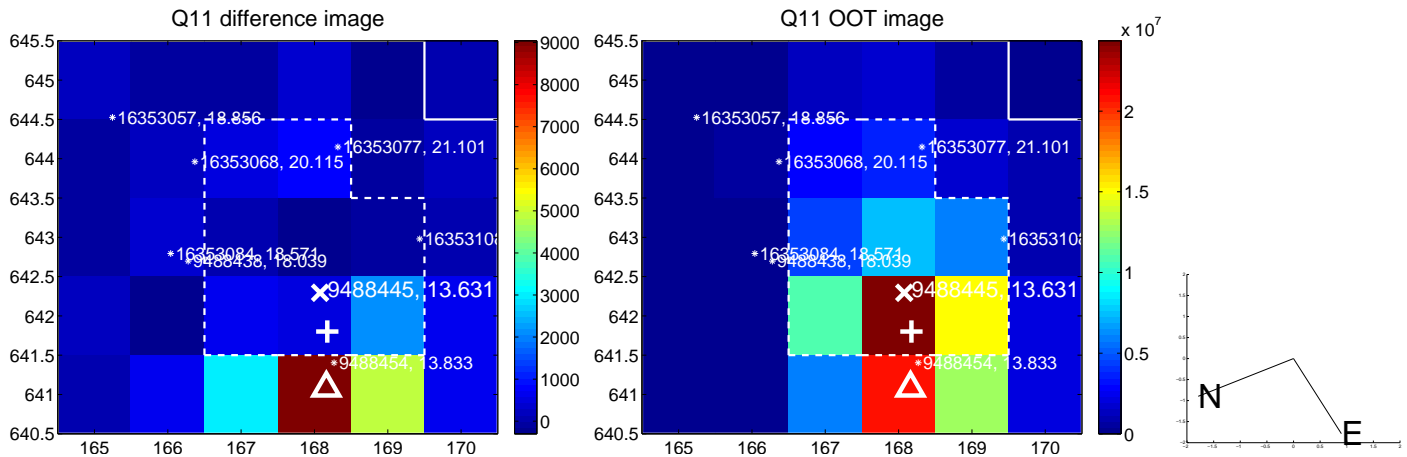
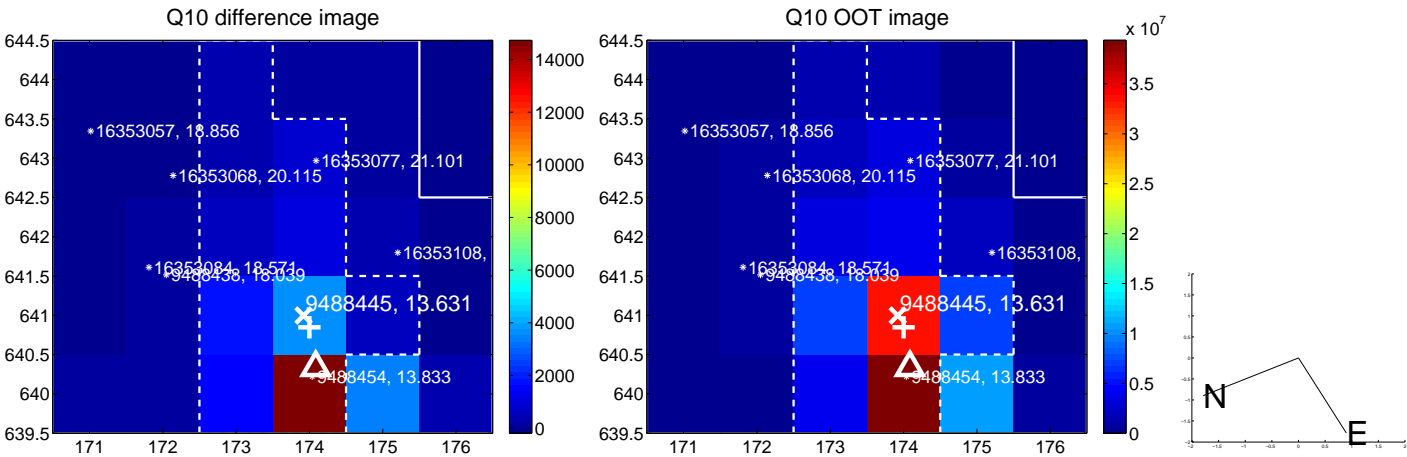
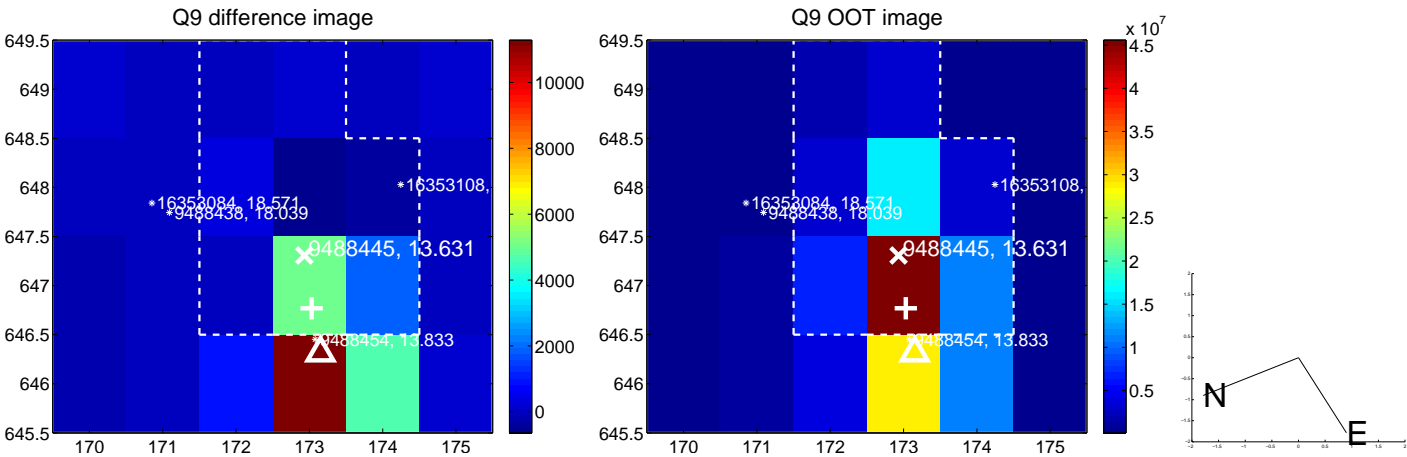


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

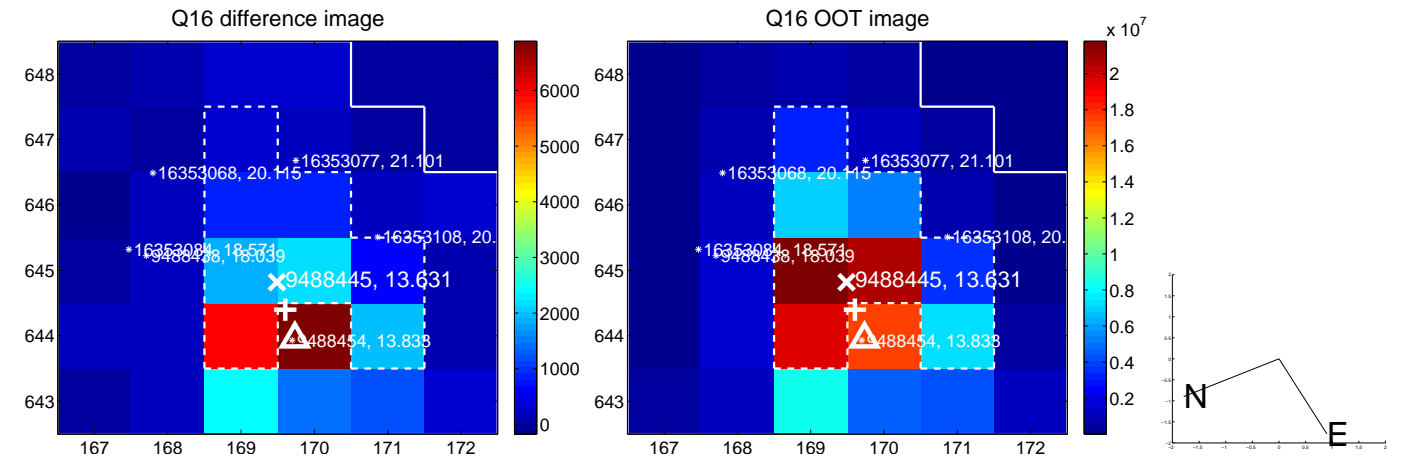
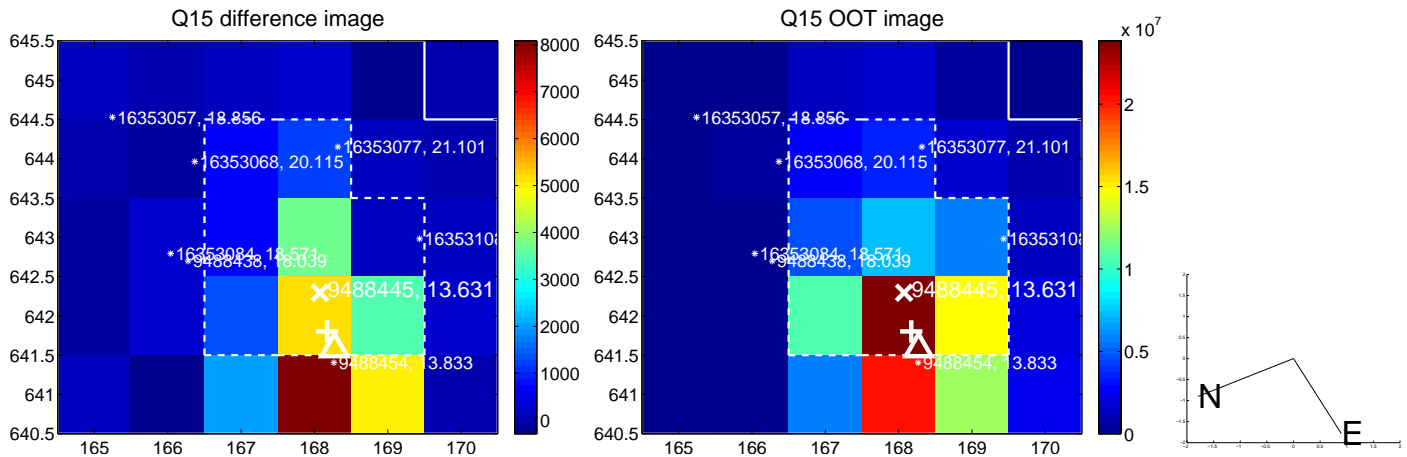
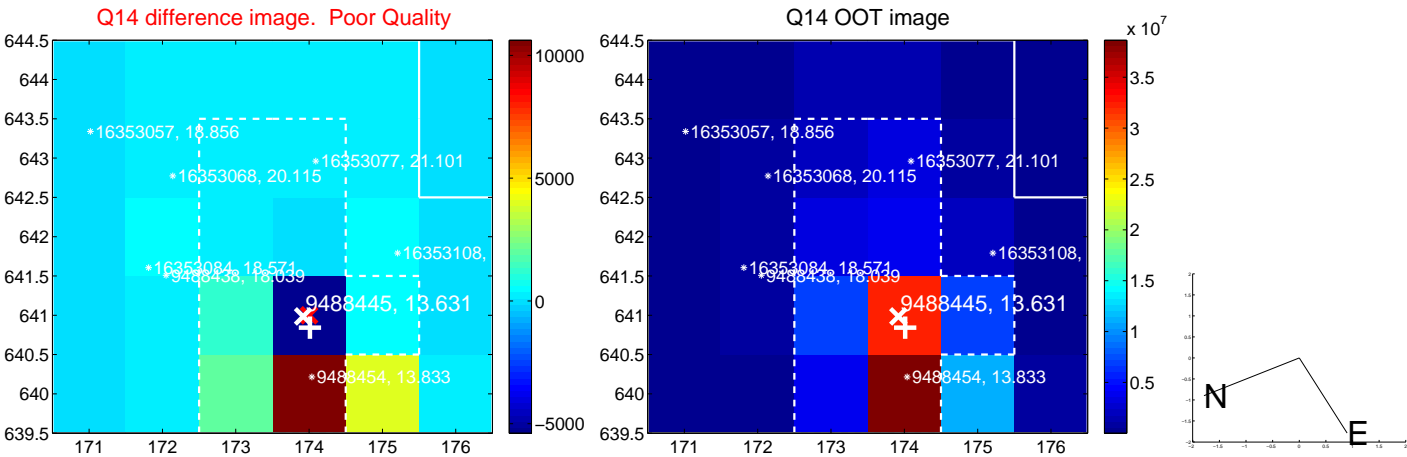
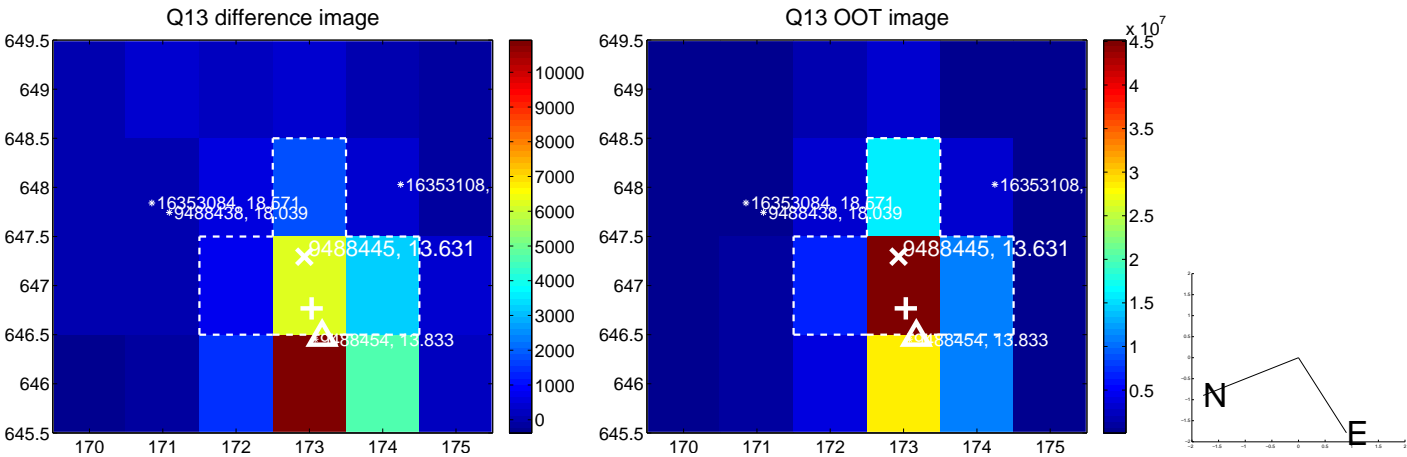
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



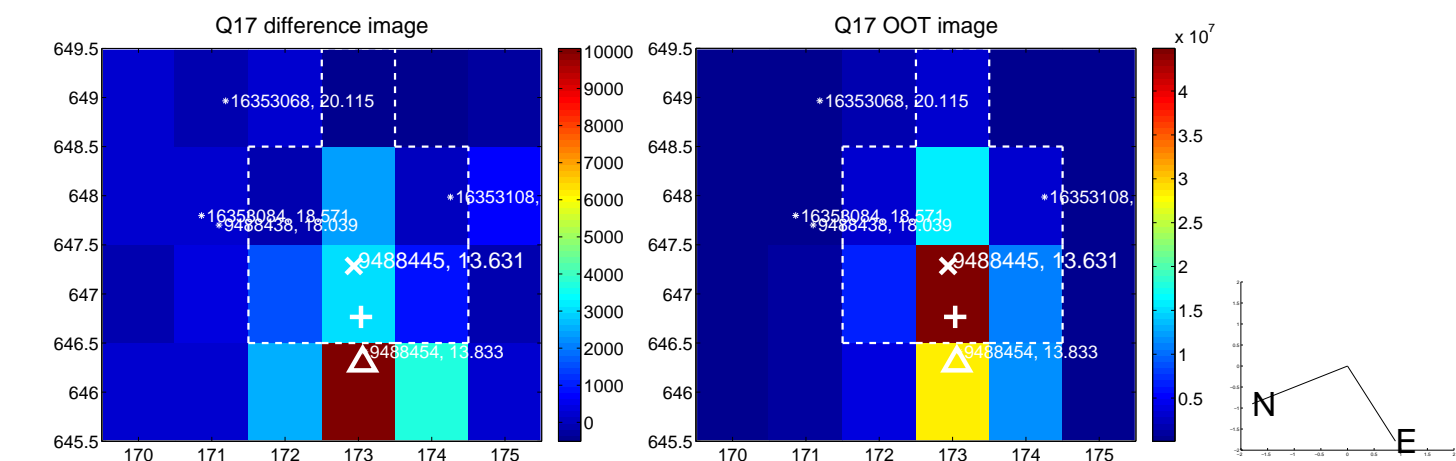
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



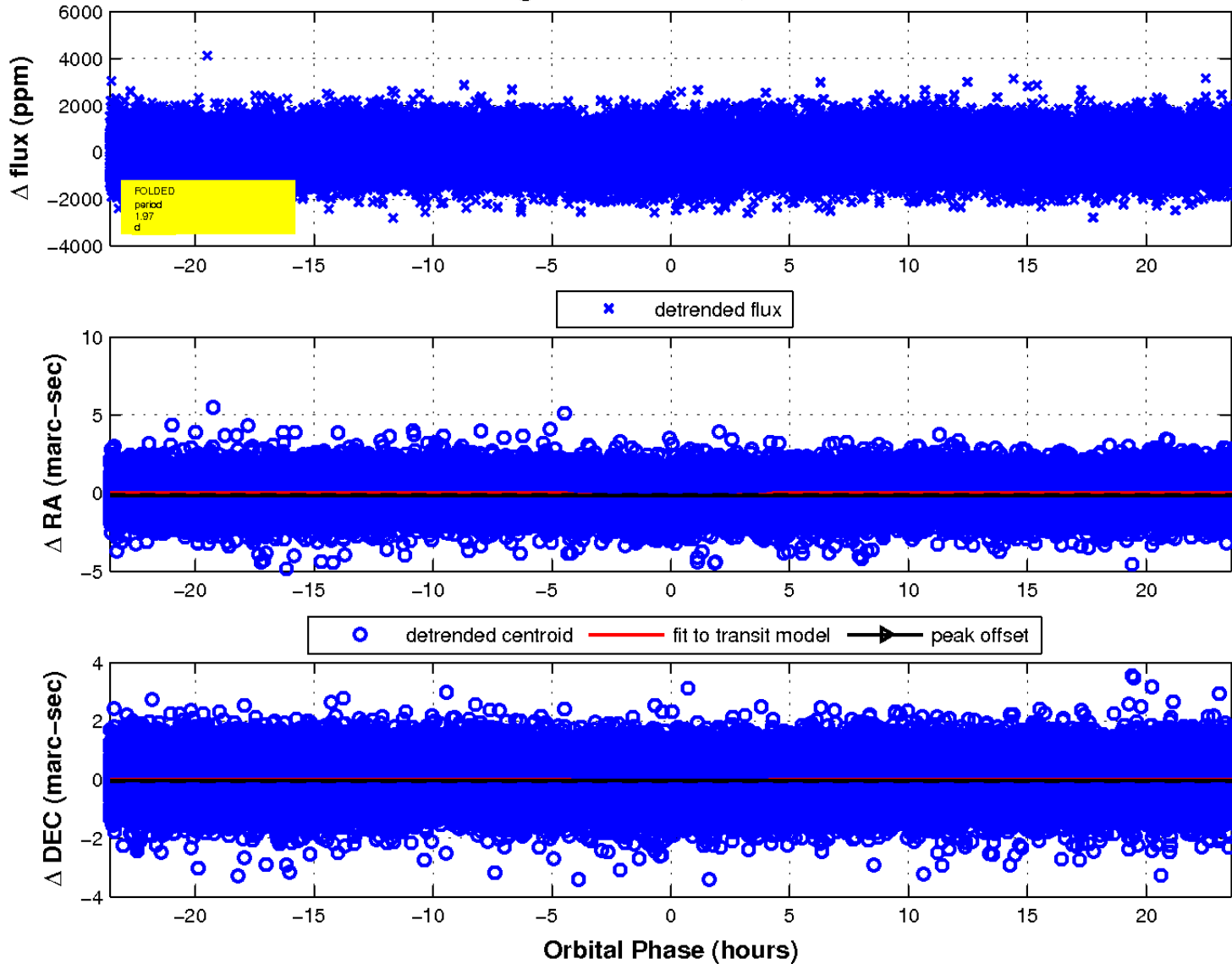
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

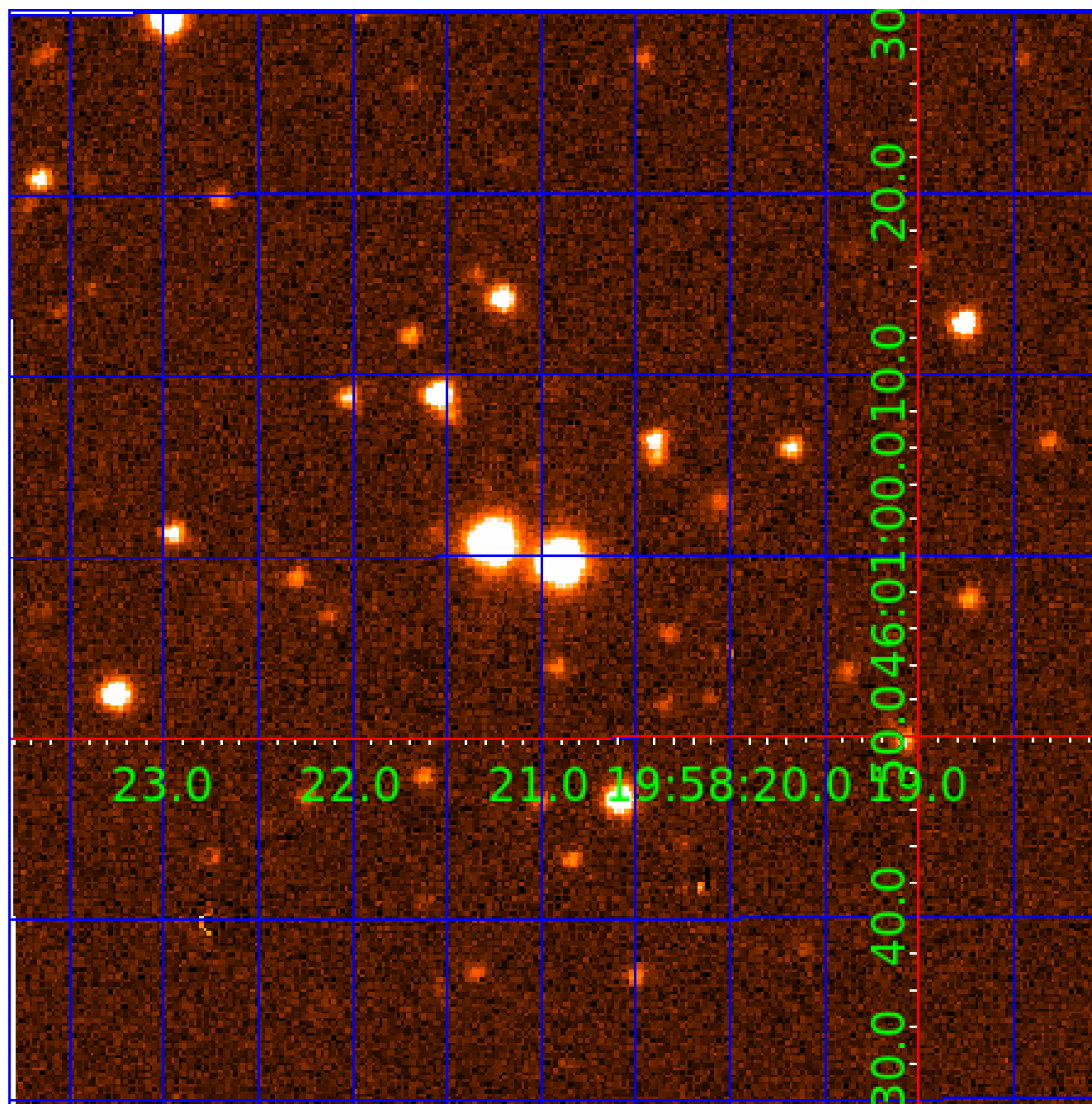


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009488445

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})
009488445-01	OBS	No	1.965645	131.586100	83.3	8.934	12.6	12.8	2.21	7666	2.37	11126.65
009488445-02	OBS	No	1.965327	132.891876	63.7	5.726	9.0	9.2	2.21	7666	1.79	11129.05

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009488445-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
009488445-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_KIC_POS

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

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

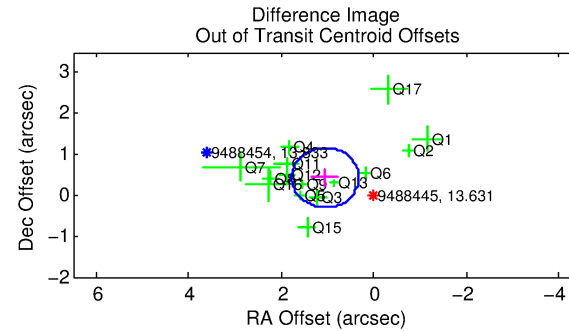
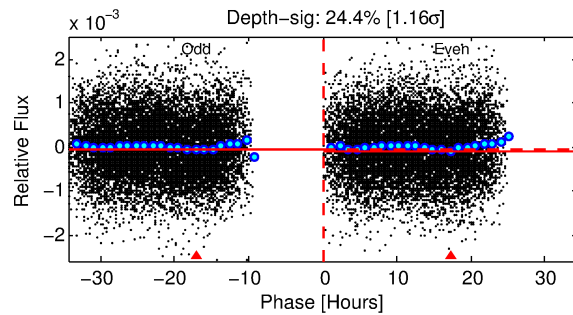
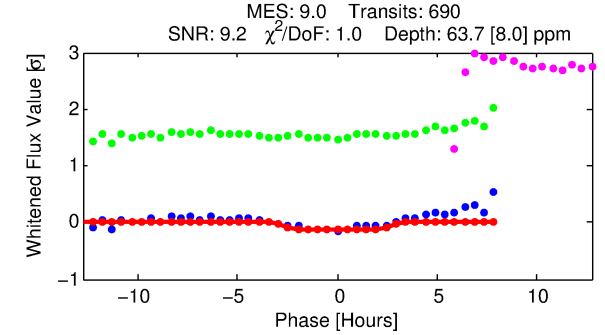
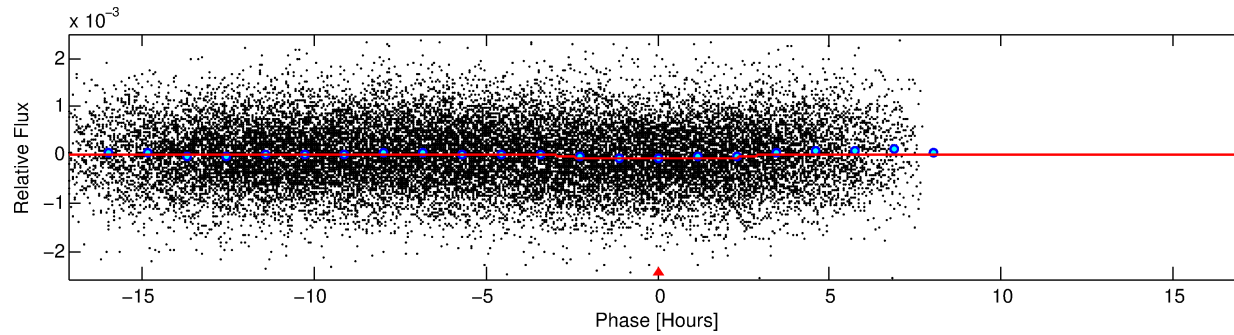
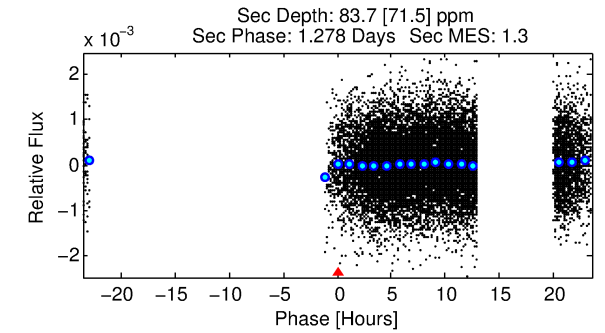
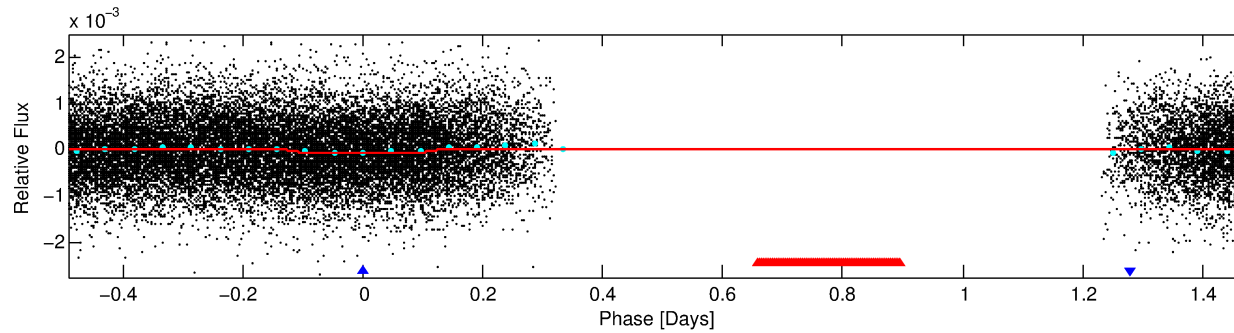
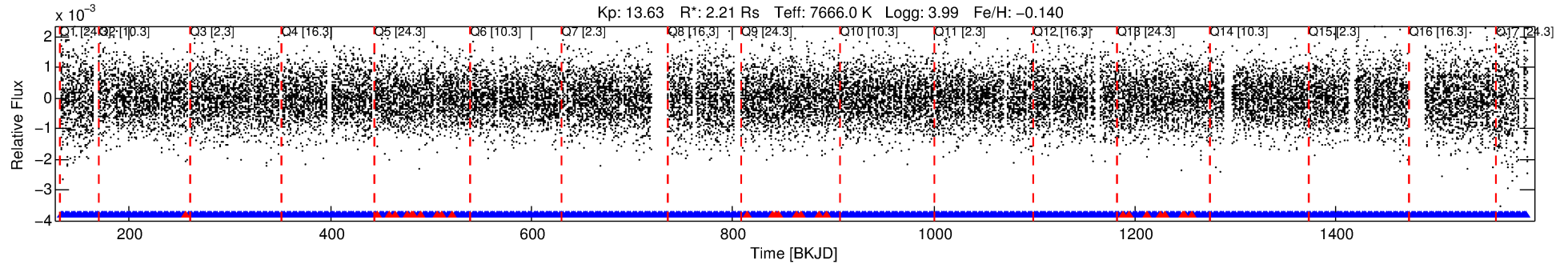
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009488445-02

No Significant Match Found

DV One-Page Summary

KIC: 9488445 Candidate: 2 of 2 Period: 1.965 d



DV Fit Results:

Period = 1.96533 [0.00003] d
Epoch = 132.8919 [0.0086] BKJD
Rp/R* = 0.0074 [0.0093]
a/R* = 2.61 [15.70]
b = 0.28 [22.91]
Seff = 11129.05 [4636.59]
Teff = 2619 [273] K
Rp = 1.79 [2.31] Re
a = 0.0368 [0.0093] AU
Ag = 19.45 [52.13] [0.35σ]
Teffp = 8504 [5650] K [1.04σ]

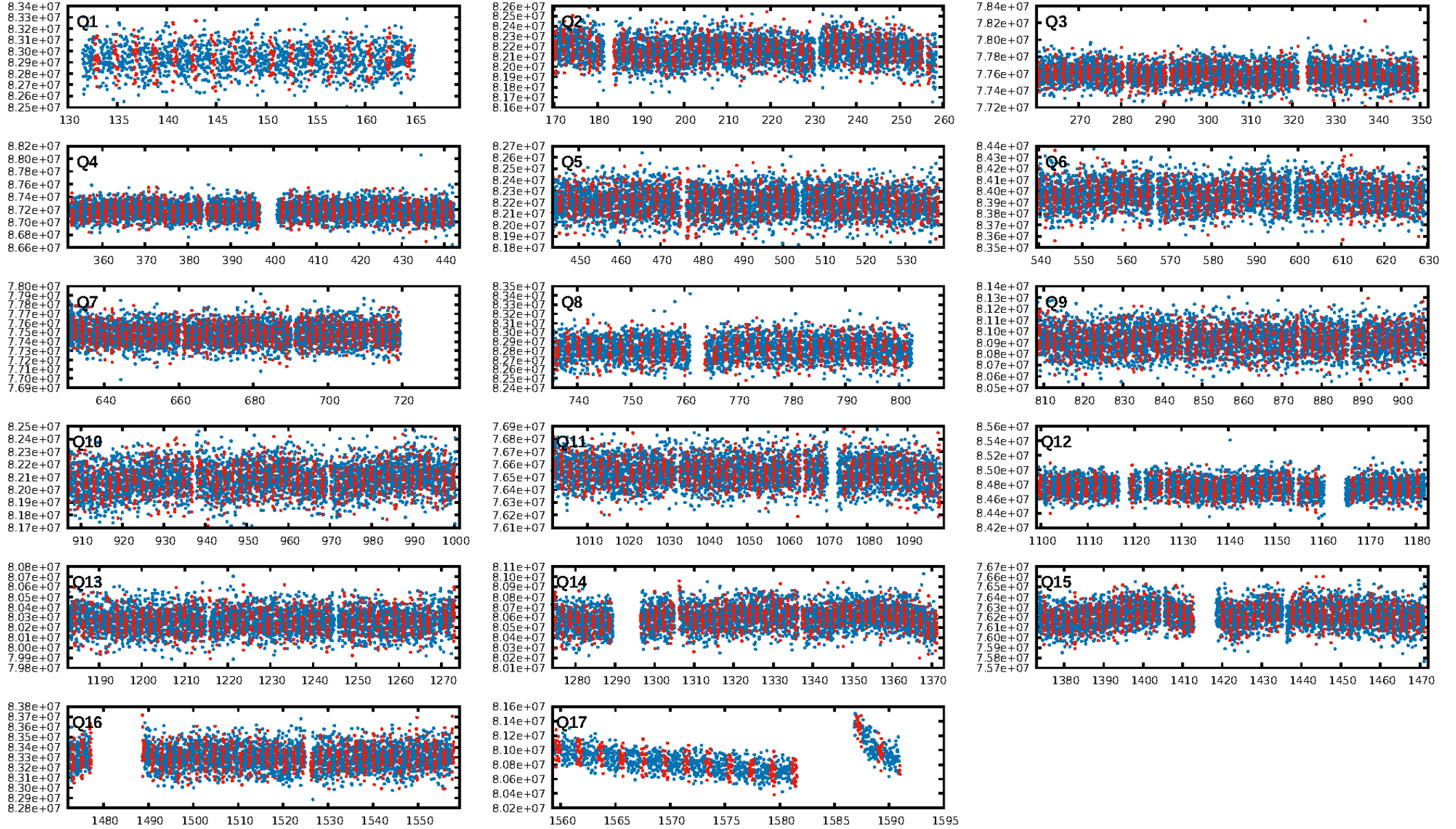
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.1% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.31e-13
RollingBand-fgt: 0.96 [632/659]
GhostDiagnostic-chr: 0.9844
Centroid-sig: 0.0%
Centroid-so: 2.652 arcsec [5.22σ]
OotOffset-rm: 1.134 arcsec [4.66σ]
KicOffset-rm: 3.432 arcsec [9.75σ]
OotOffset-st: 2/4/4/5 [15]
KicOffset-st: 2/4/4/5 [15]
DiffImageQuality-fgm: 1.00 [15/15]
DiffImageOverlap-fno: 0.94 [16/17]

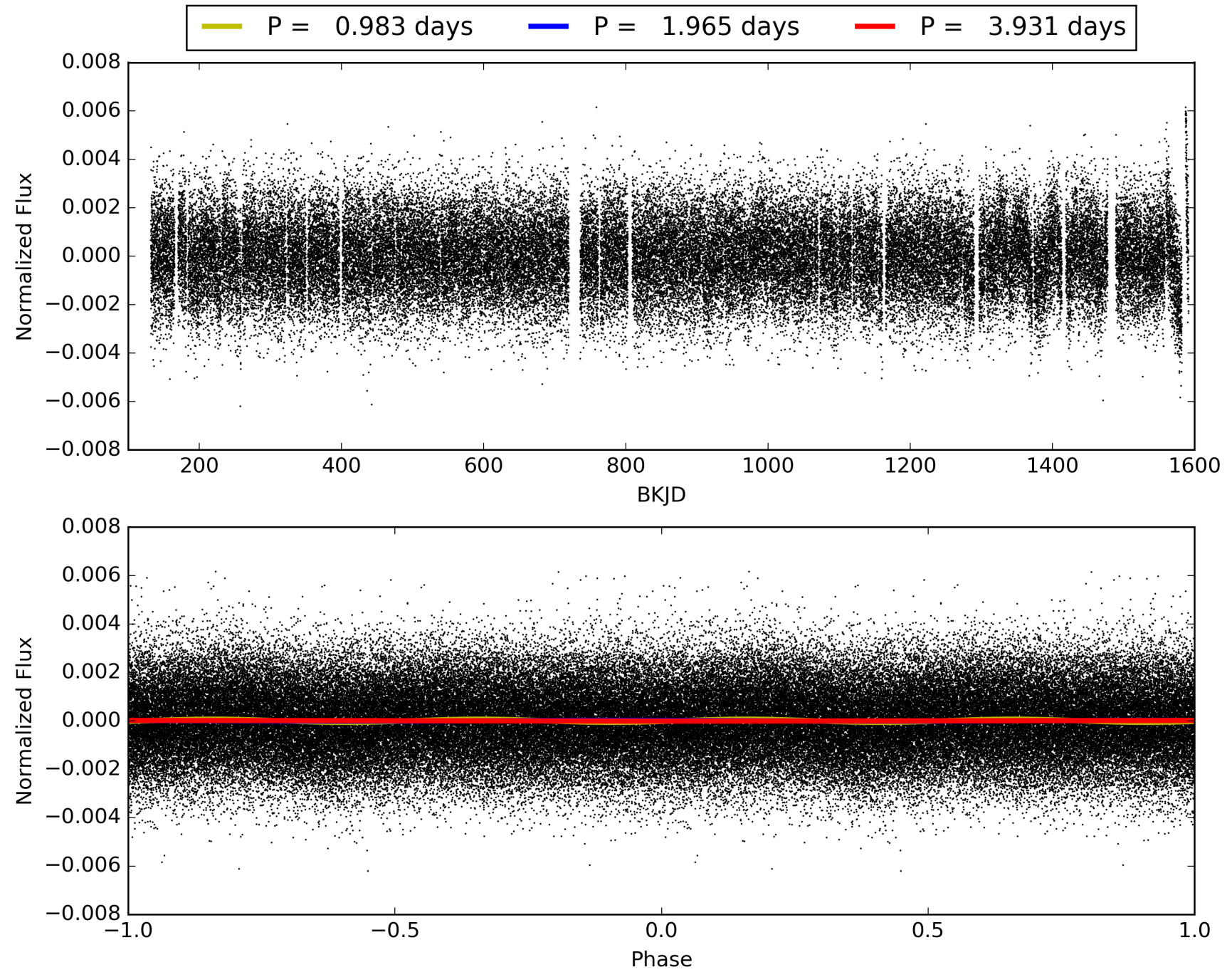
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:24:24 Z

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

TCE 009488445-02, PDC Light Curves

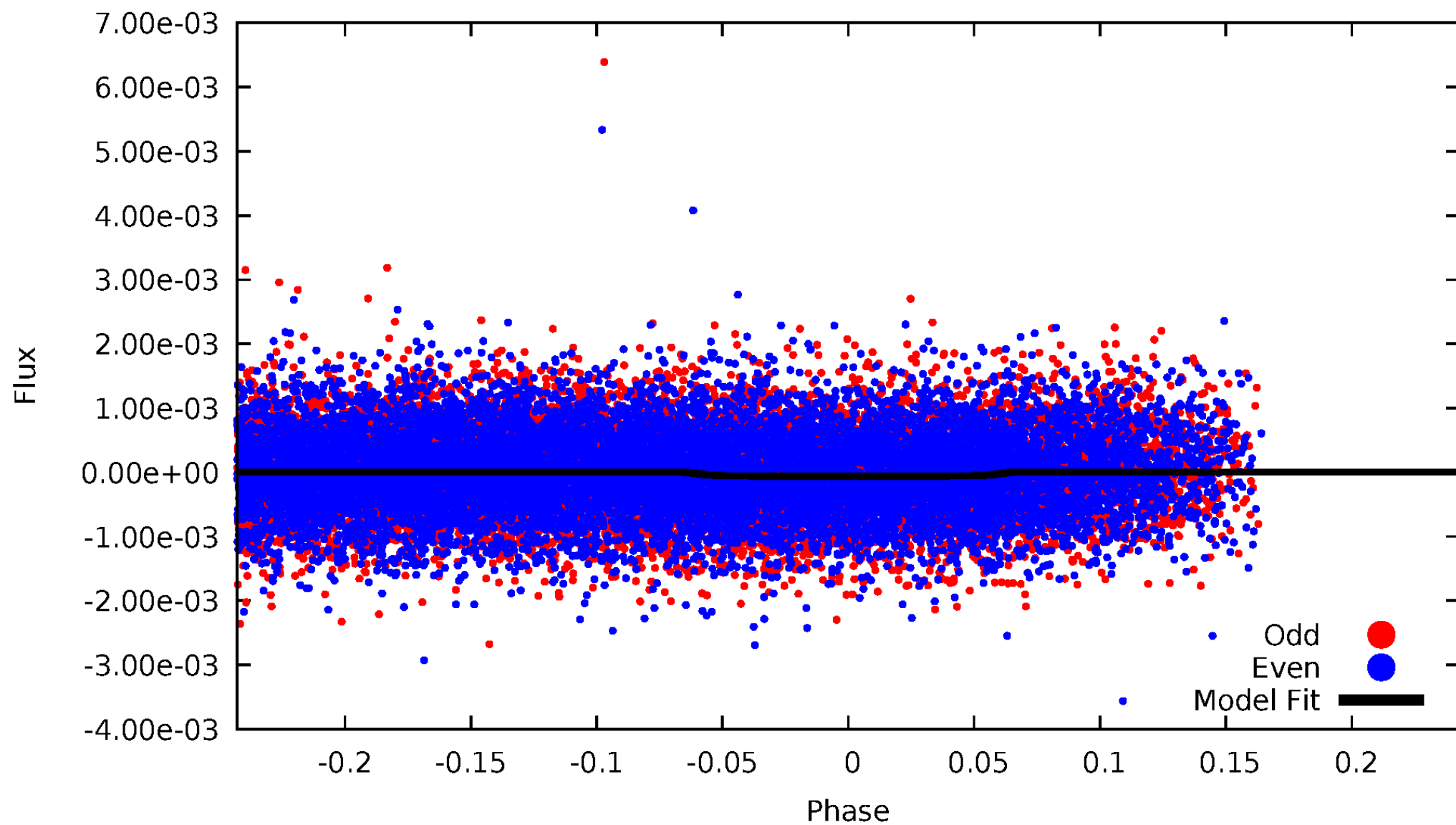


TCE 009488445-02



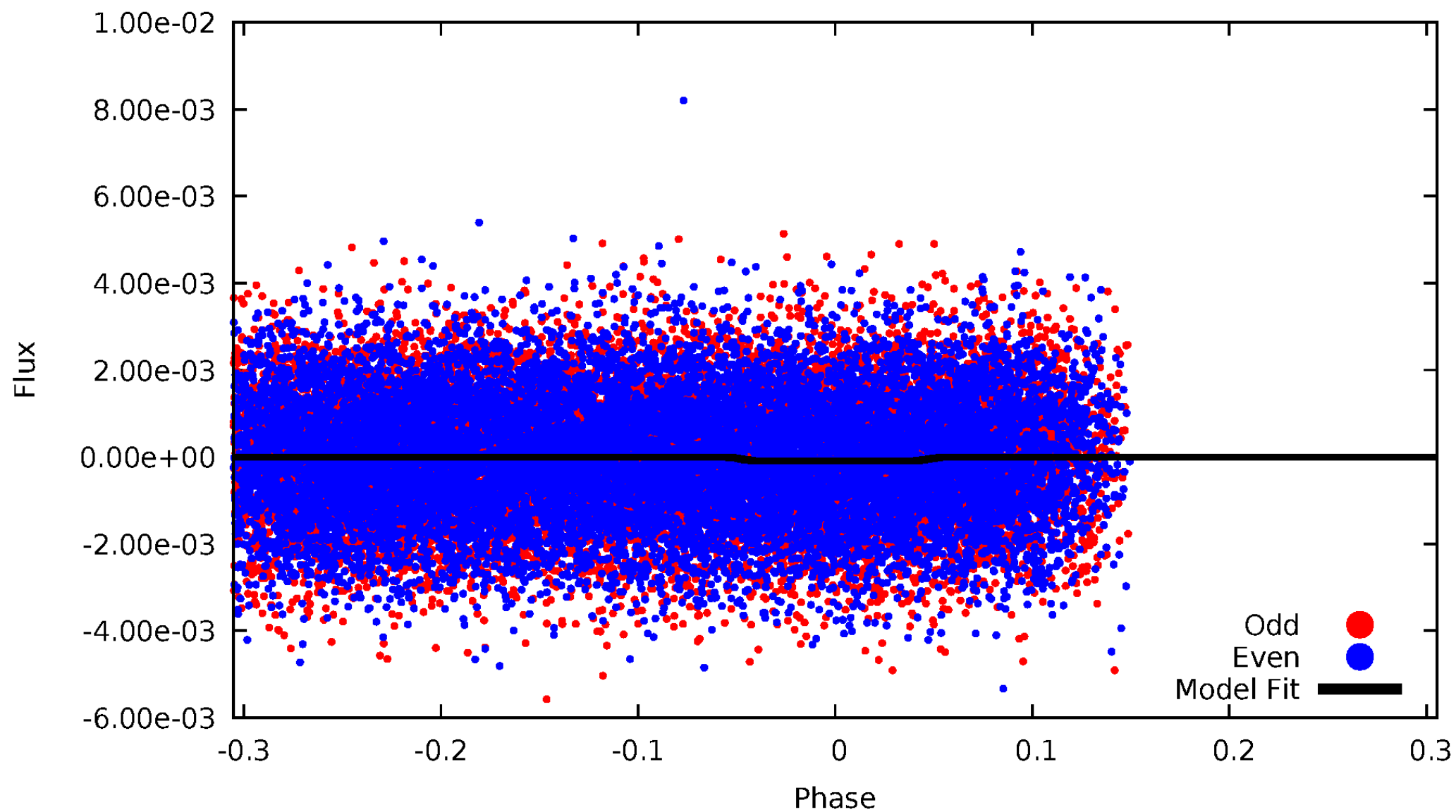
DV Odd/Even

TCE 009488445-02



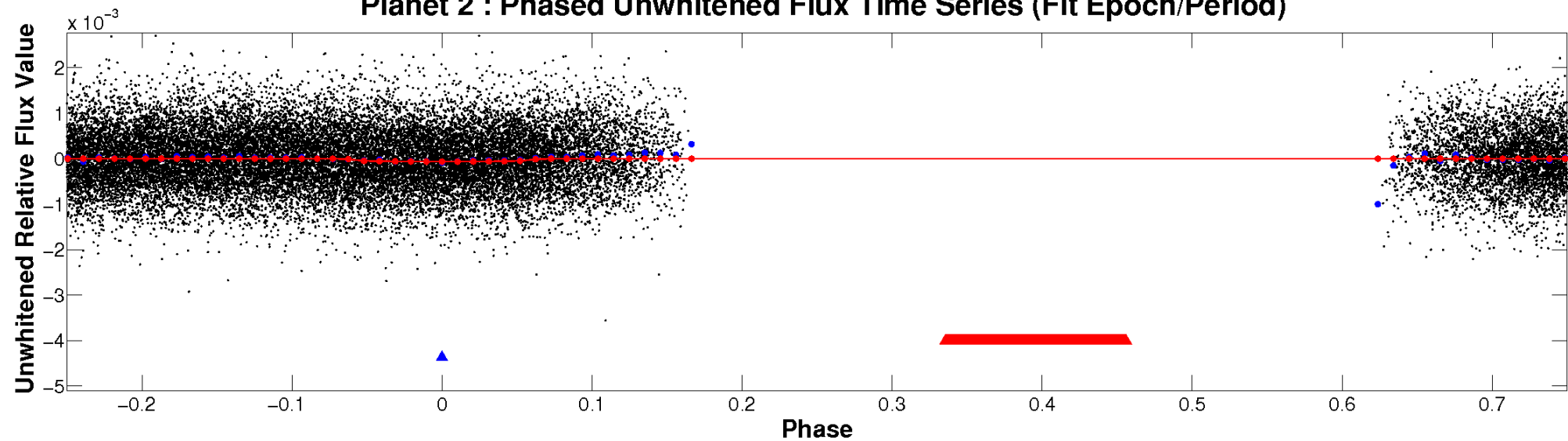
ALT Odd/Even

TCE 009488445-02

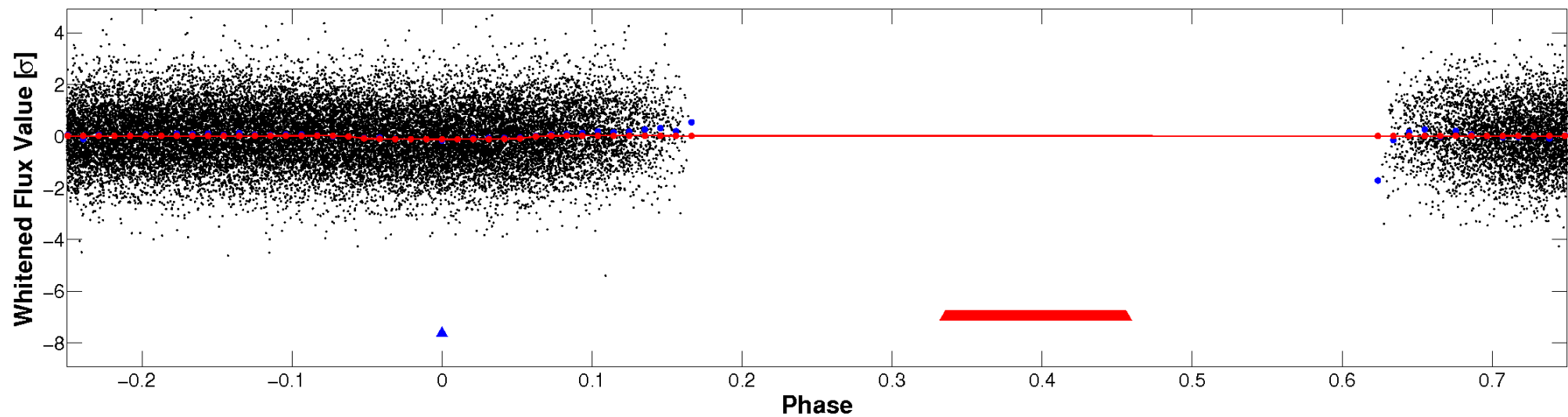


Non-Whitened Vs. Whitened Light Curve

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

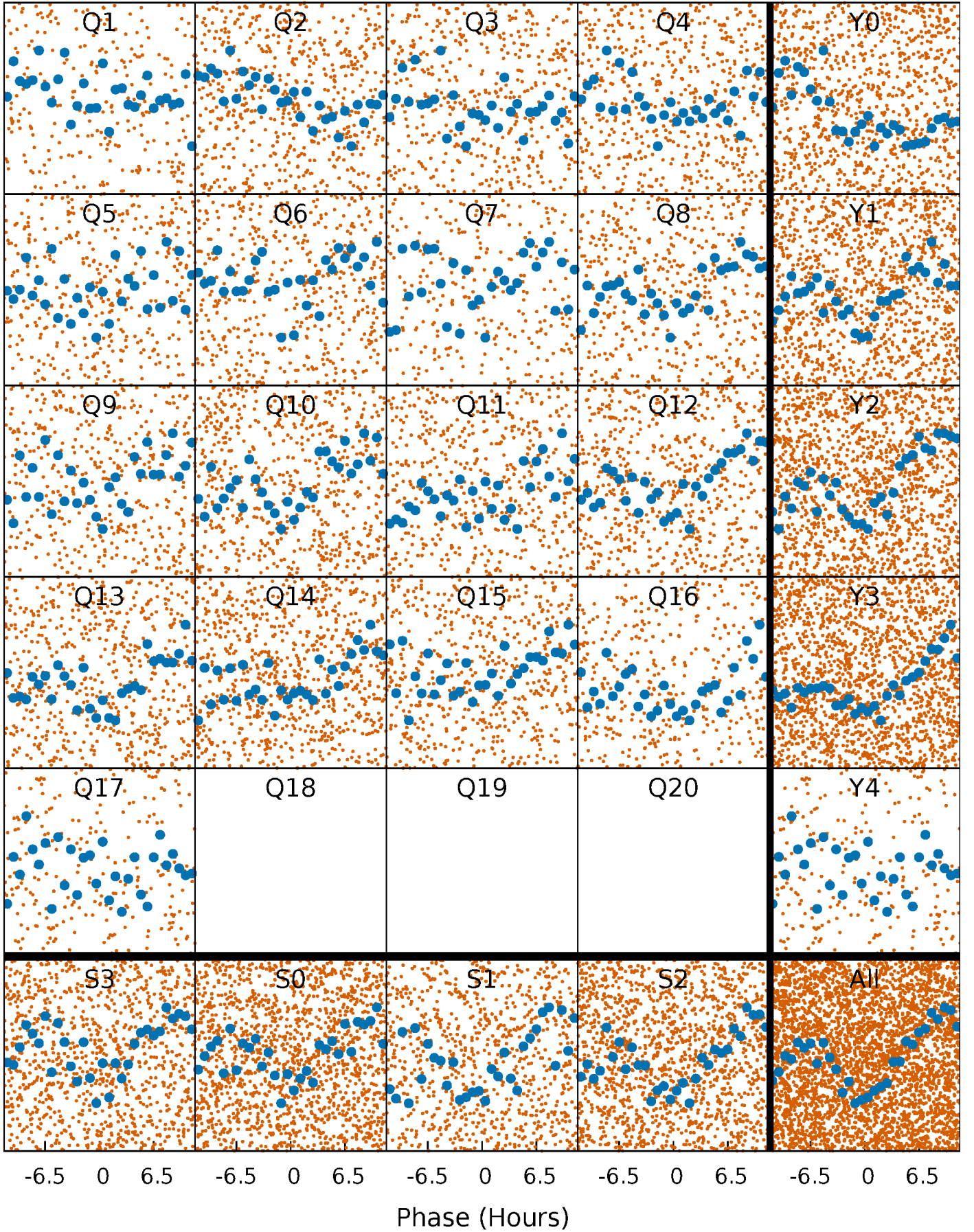


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



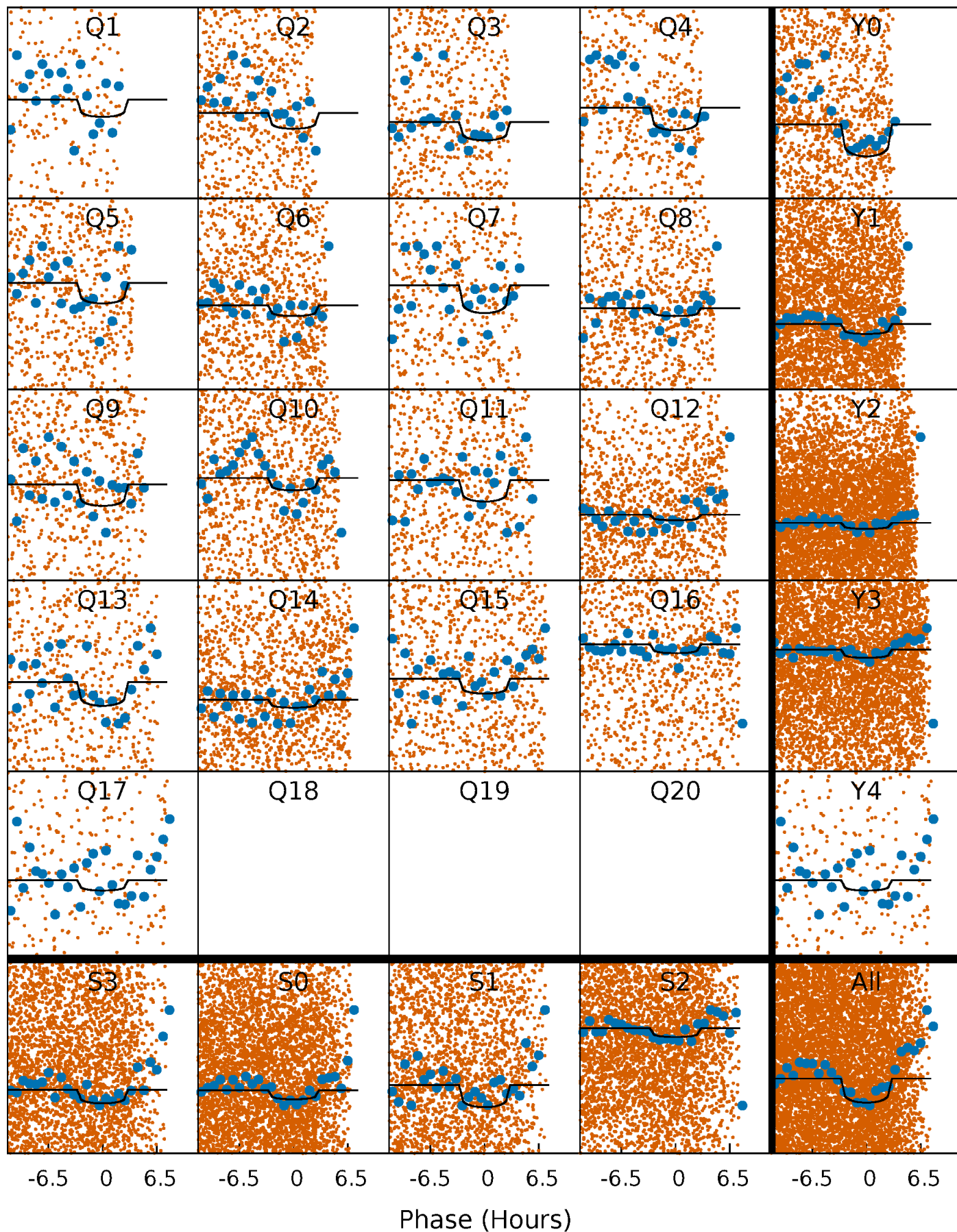
PDC Quarter-Phased Transit Curves

TCE 009488445-02 P= 1.965327 Days $T_0=132.891876$ (BKJD)



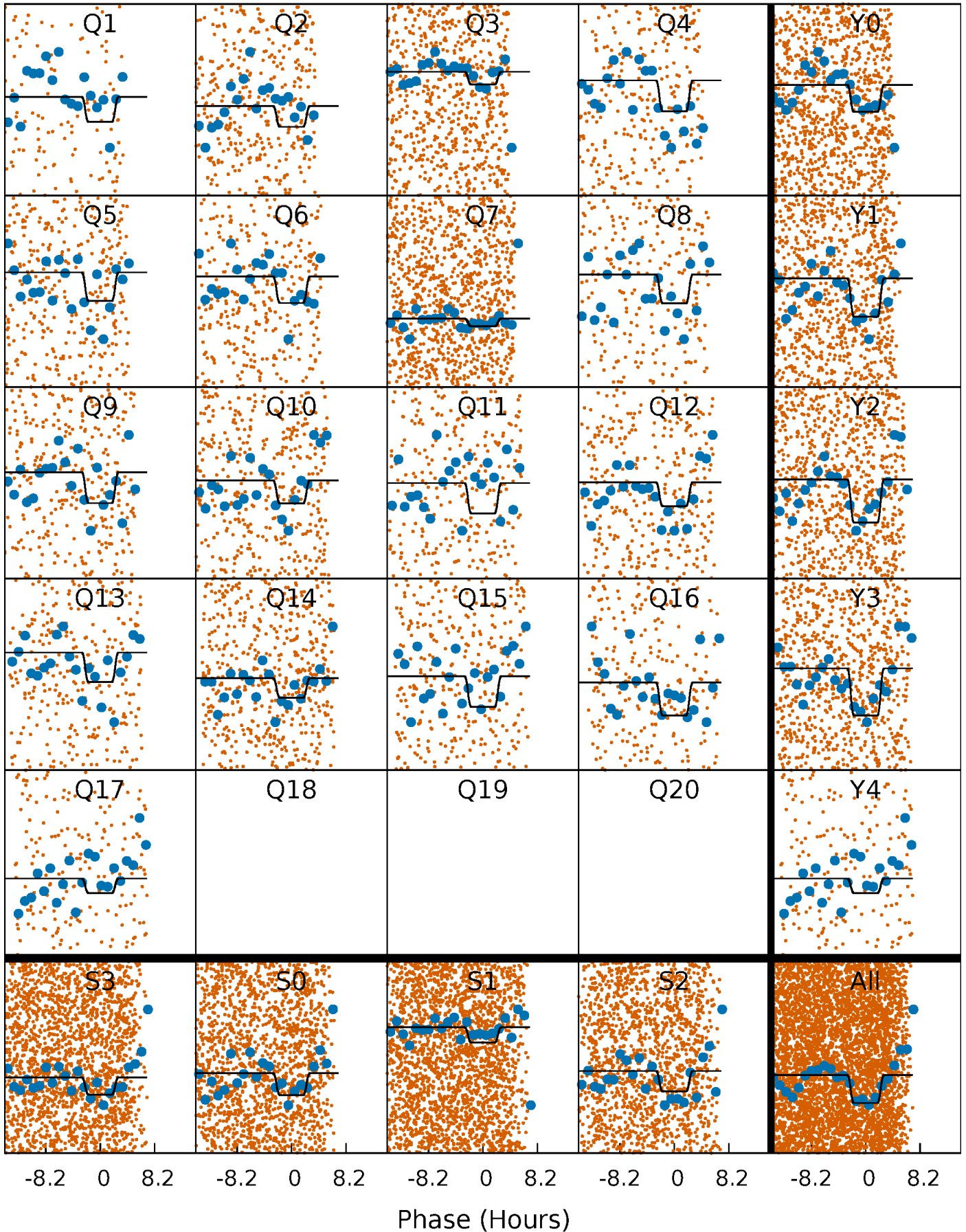
DV Quarter-Phased Transit Curves

TCE 009488445-02 P= 1.965327 Days $T_0=132.891876$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

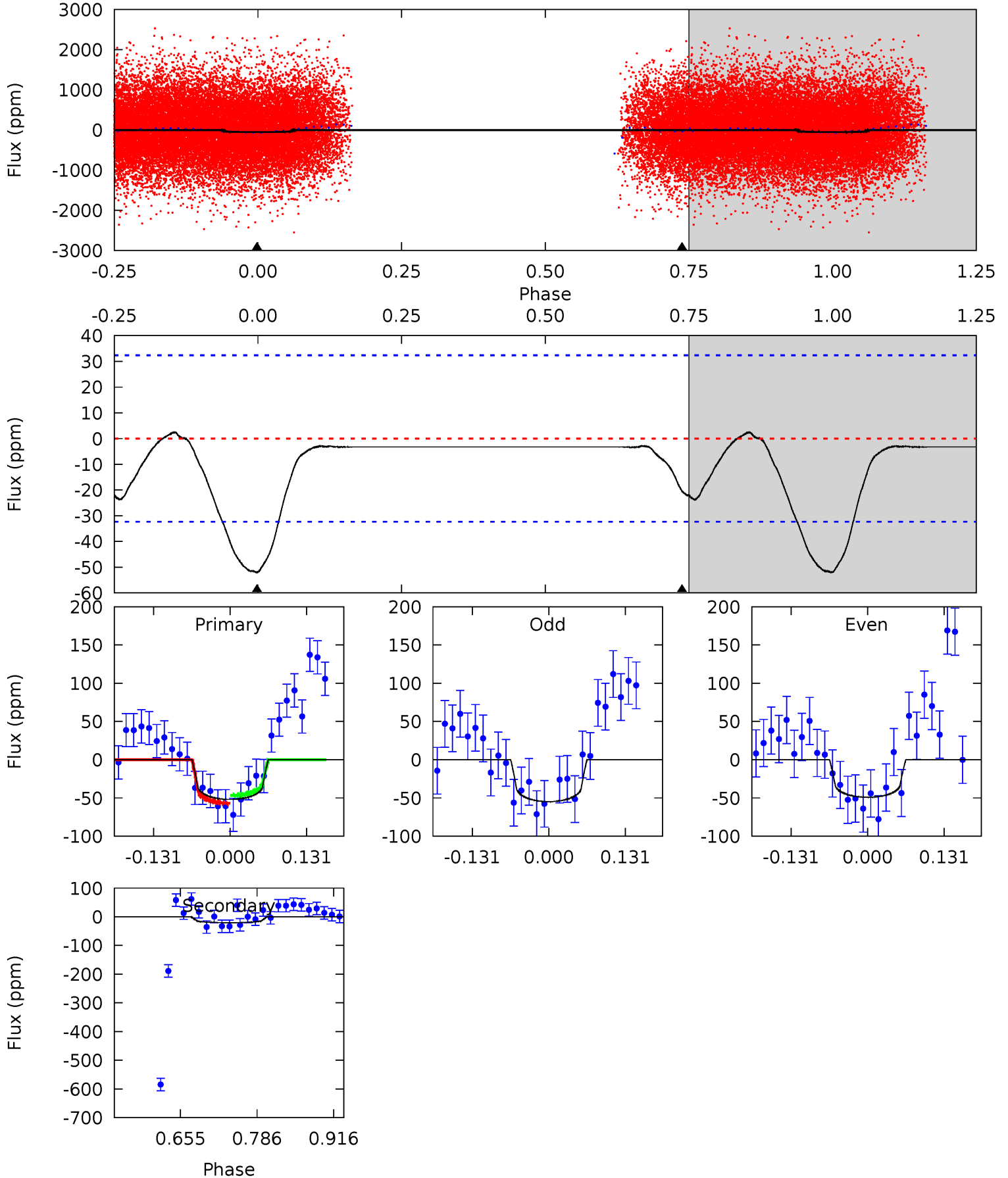
TCE 009488445-02 P= 1.965438 Days $T_0=132.839149$ (BKJD)



DV Model-Shift Uniqueness Test

009488445-02, P = 1.965327 Days, E = 130.926549 Days

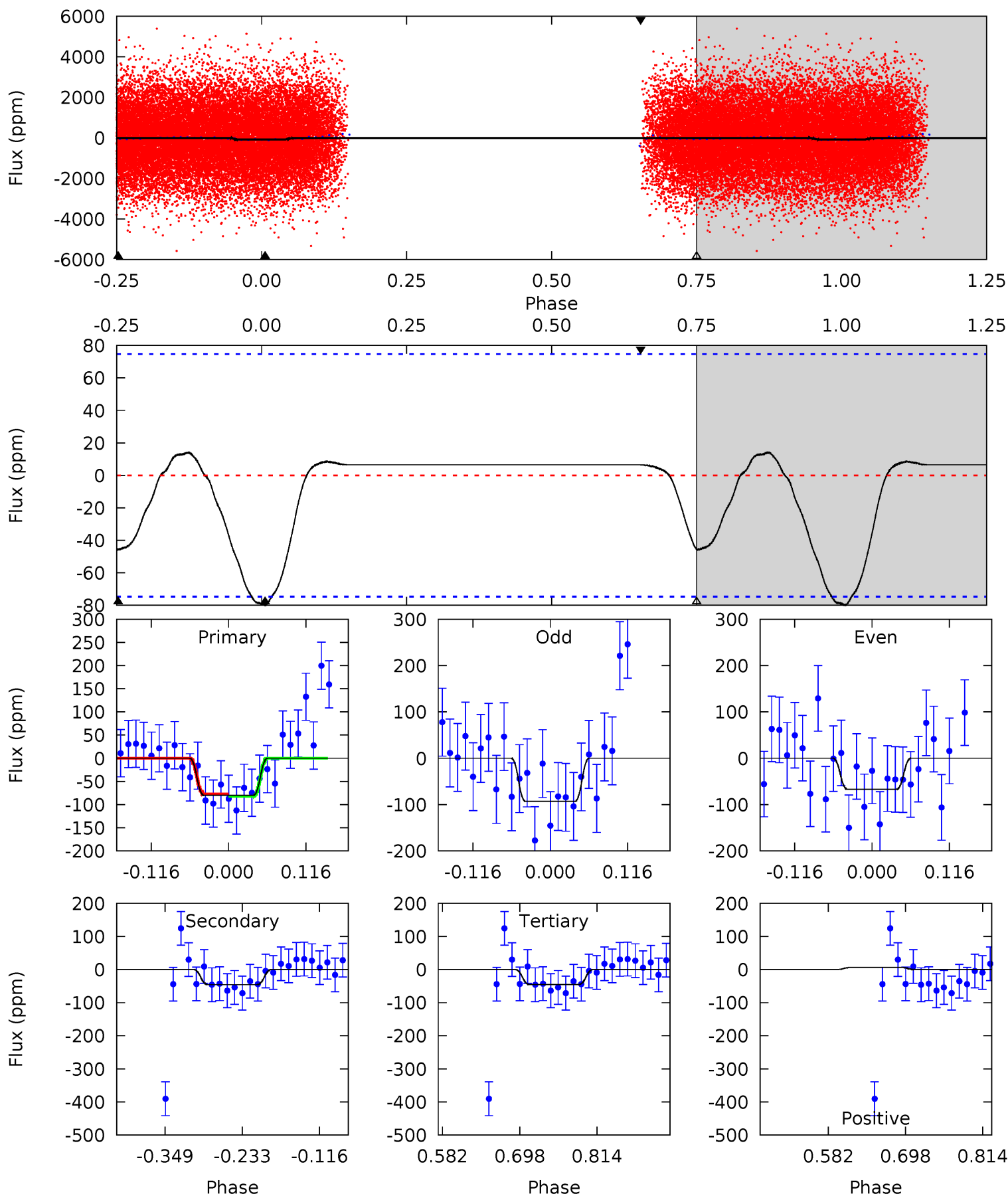
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.25	2.85	0	0	4.51	1.51	0.27	7.25	7.25	2.85	2.85	0.40	0.98	0.04	0.74



Alt Model-Shift Uniqueness Test

009488445-02, P = 1.965438 Days, E = 130.873711 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.85	2.77	2.75	0.40	4.53	1.57	1.18	2.10	4.45	0.02	2.37	0.79	0.86	0.15	0.16



Stellar Parameters For KIC 009488445

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	7666^{+237}_{-316}	$3.986^{+0.216}_{-0.144}$	$-0.140^{+0.200}_{-0.300}$	$2.207^{+0.517}_{-0.632}$	$1.715^{+0.198}_{-0.322}$	$0.225^{+0.292}_{-0.096}$
	+3%/-4%	+5%/-4%	+143%/-214%	+23%/-29%	+12%/-19%	+130%/-43%
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 009488445-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-20 ± 7	$2.41^{+2.02}_{-1.67}$	3628^{+250}_{-281}	4899^{+4454}_{-1371}	$2.564^{+25.672}_{-1.902}$
Alt.	-46 ± 16	$2.53^{+2.07}_{-1.65}$	3635^{+255}_{-288}	5752^{+5076}_{-1521}	$4.903^{+32.930}_{-3.565}$

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

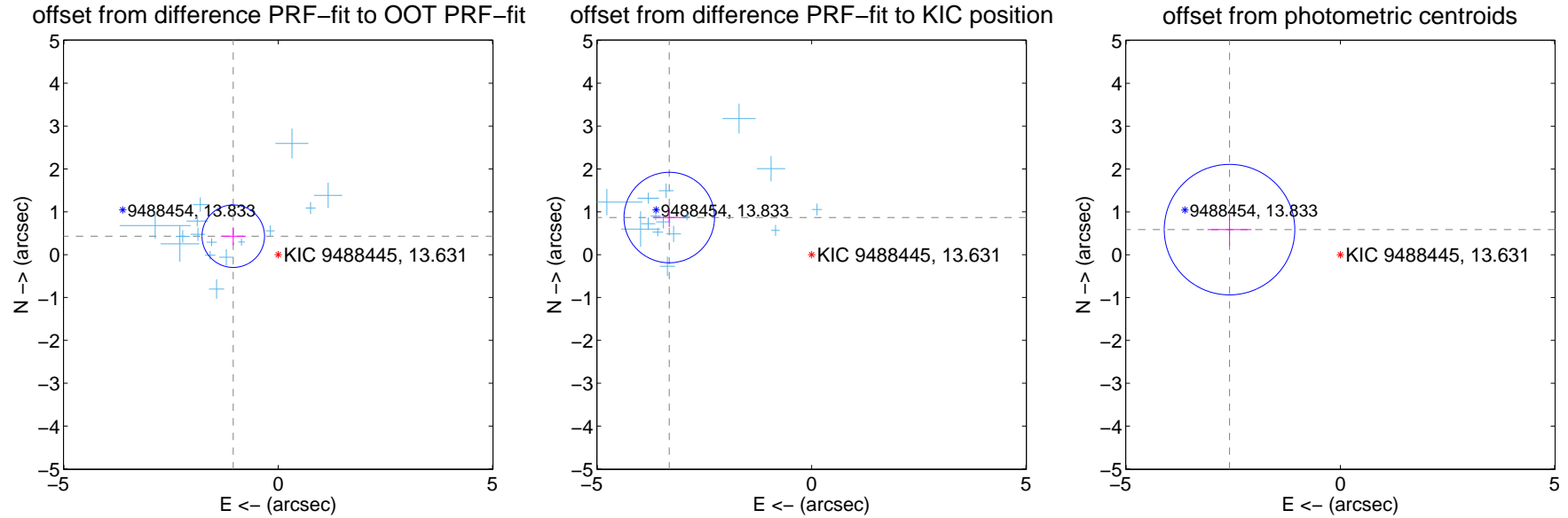
DV Centroid Data

Supplemental centroid analysis for 009488445-02. Kepler magnitude: 13.63. Transit SNR 9.25

There are 15 quarters with good PRF difference image offsets

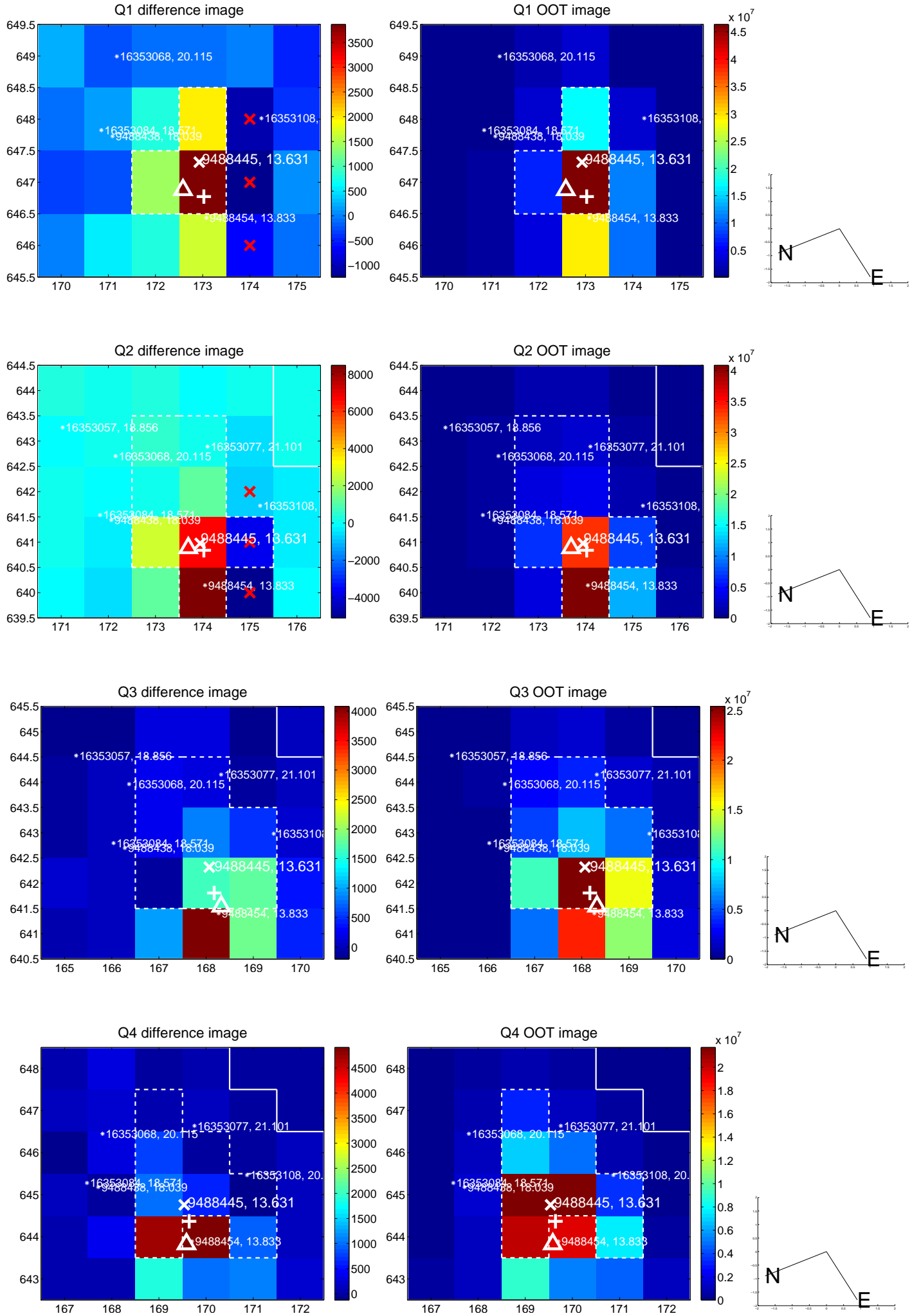
The OOT PRF centroid is offset from the target star catalog position by about 2.09 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.134 ± 0.243	4.66	1.048 ± 0.290	0.431 ± 0.208
PRF-fit source offset from KIC position	3.432 ± 0.352	9.75	3.321 ± 0.383	0.866 ± 0.223
photometric centroid source offset	2.65 ± 0.51	5.22	2.59 ± 0.51	0.59 ± 0.38

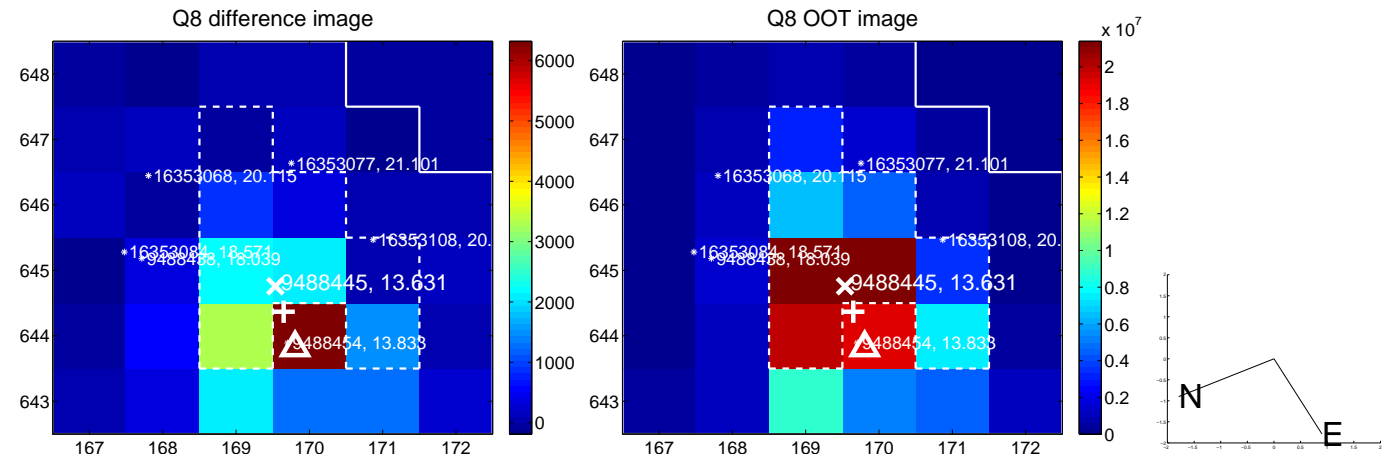
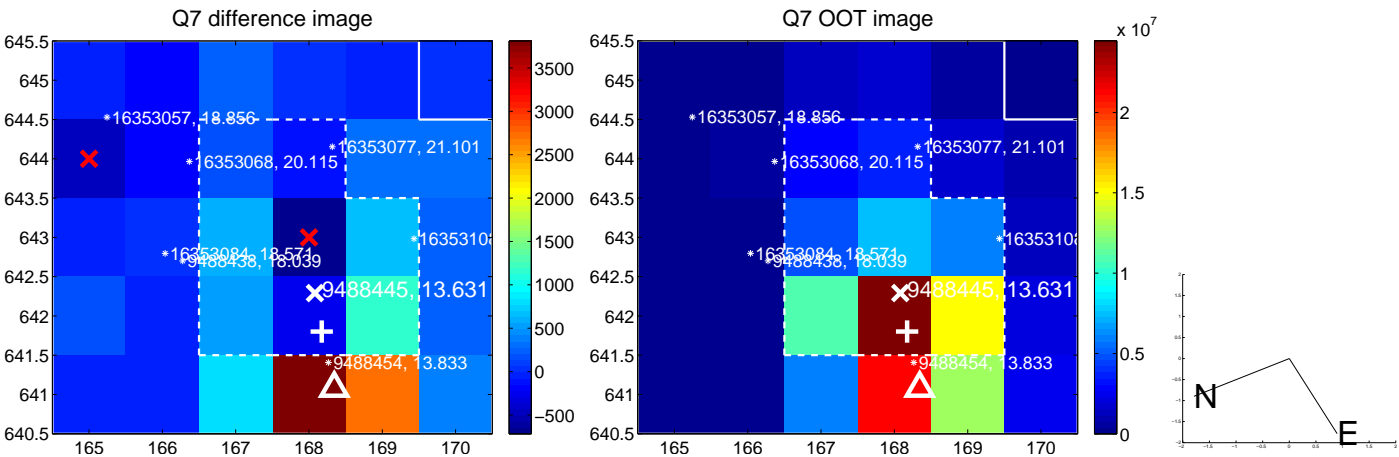
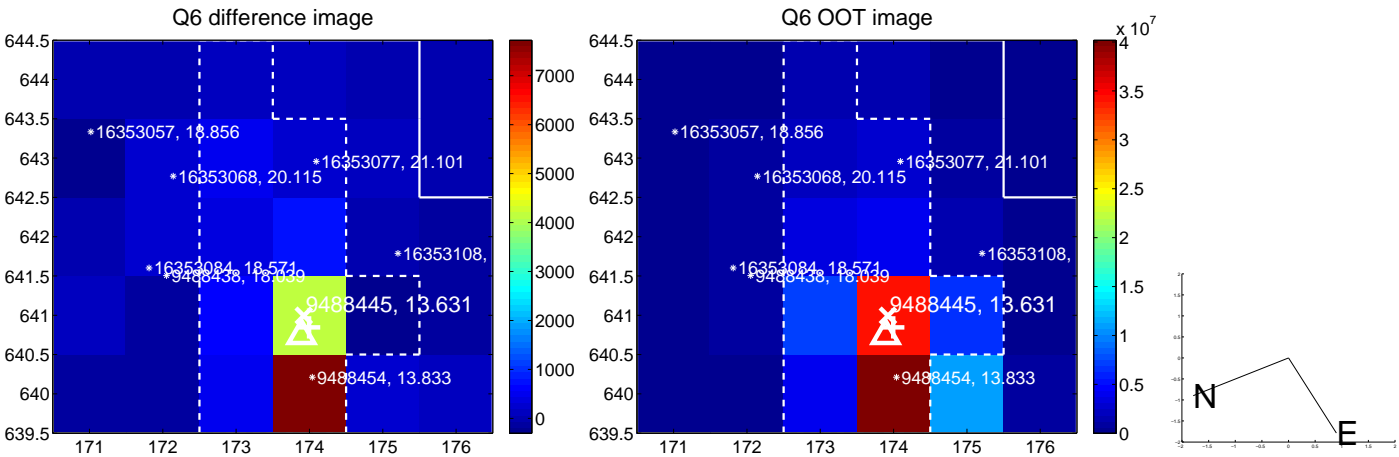
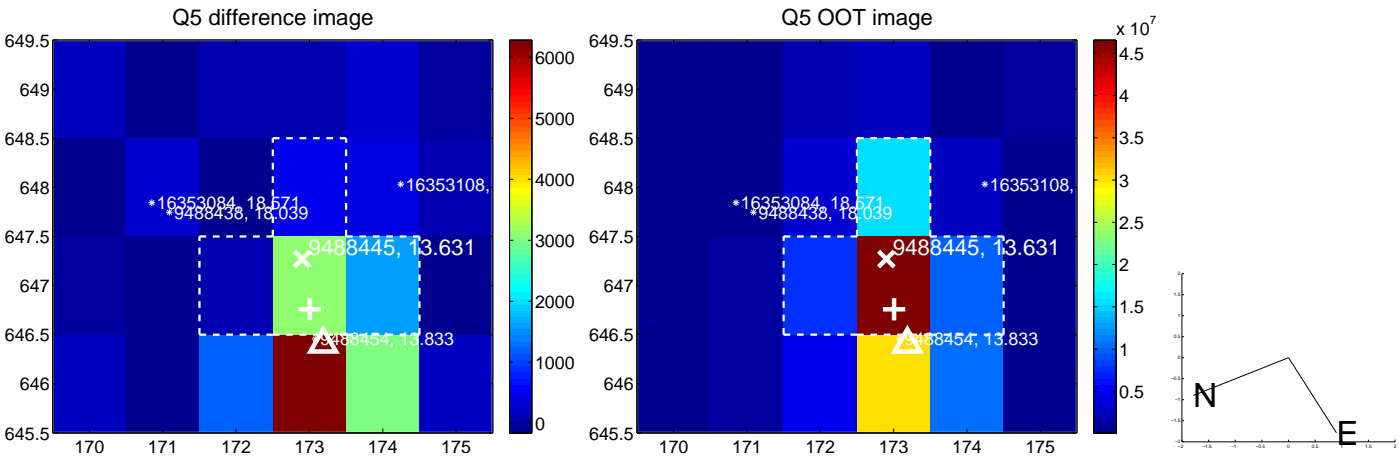


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

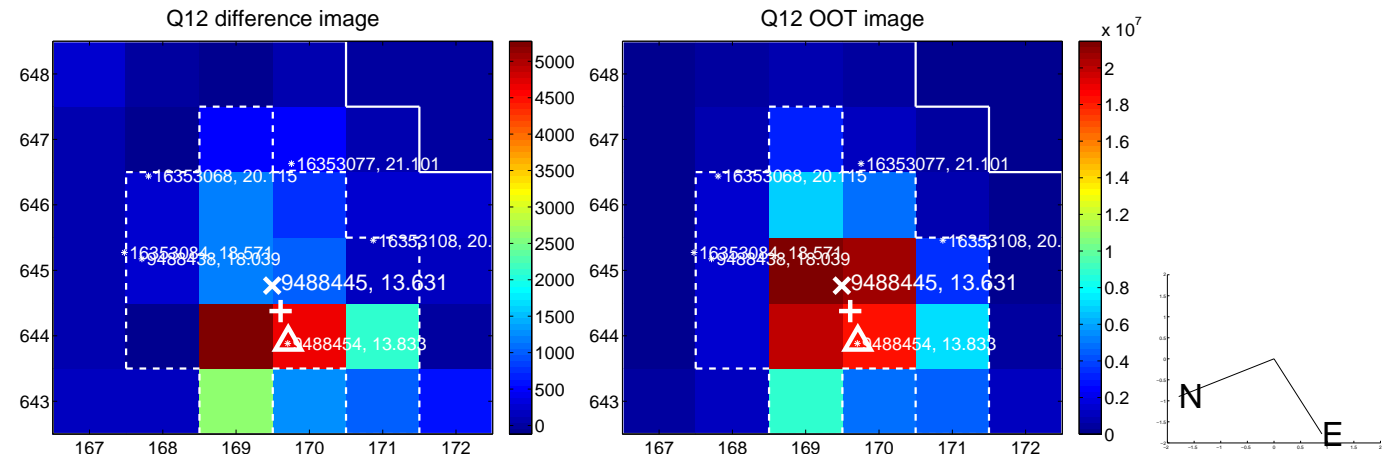
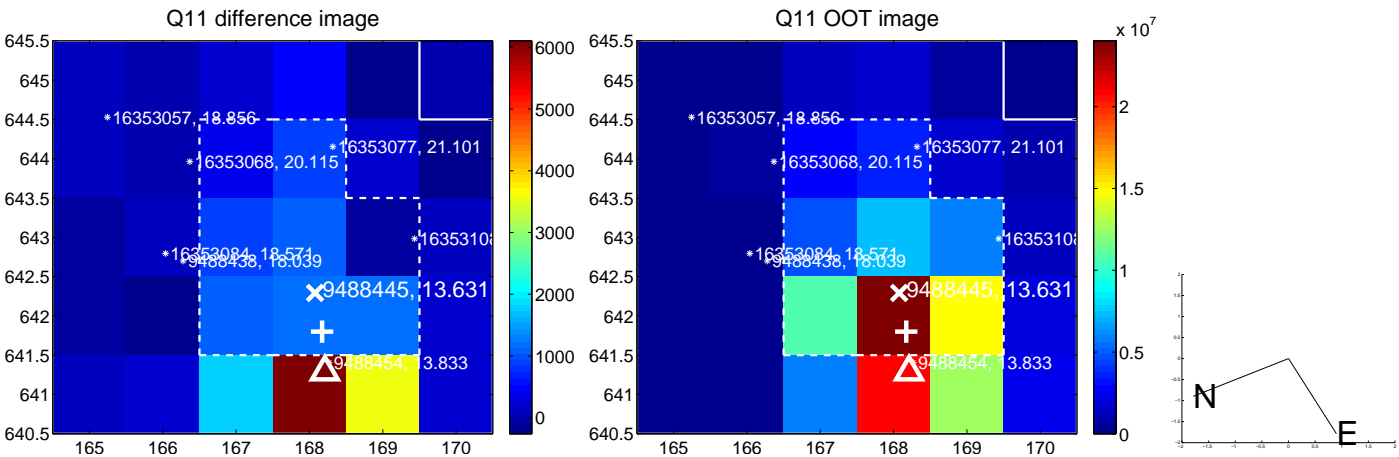
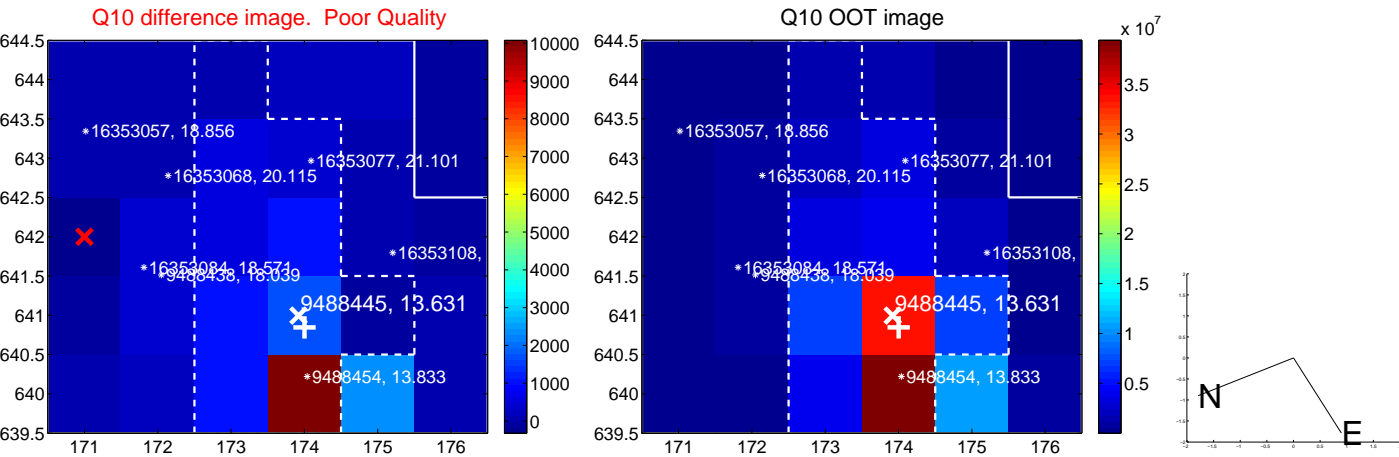
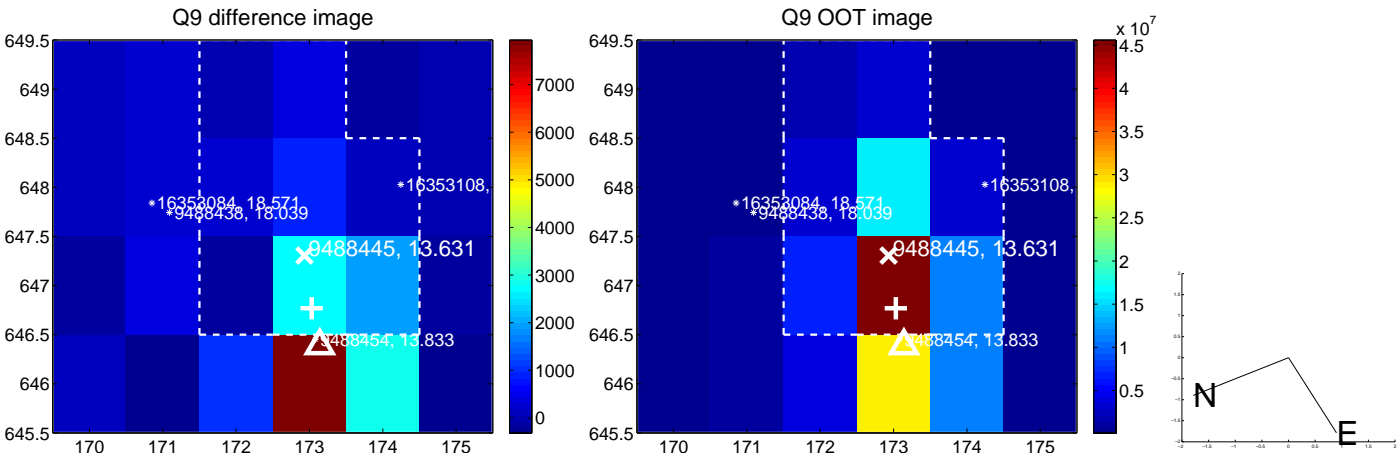
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



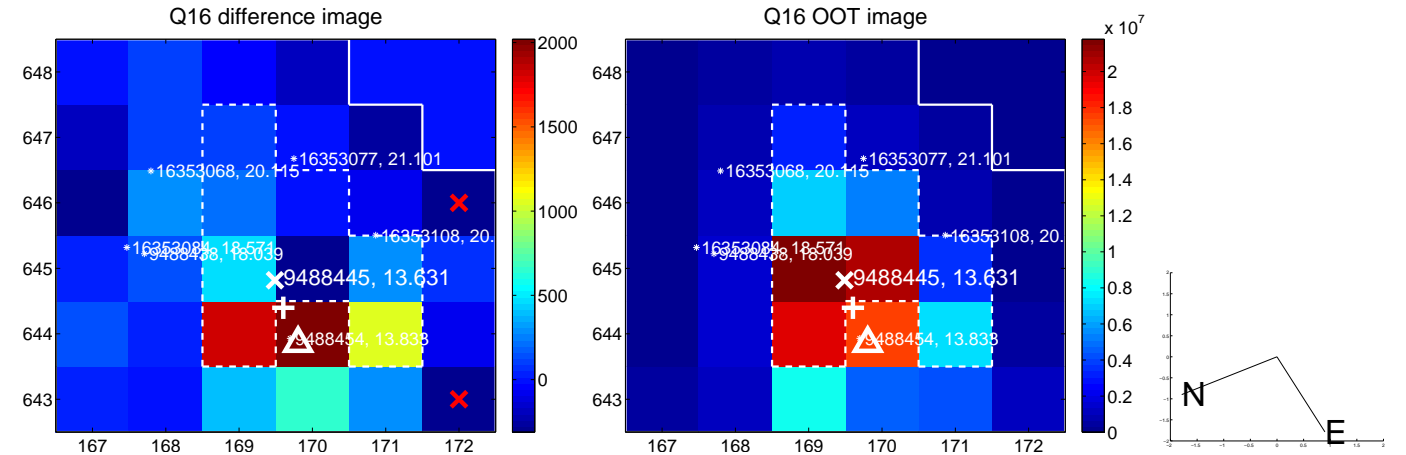
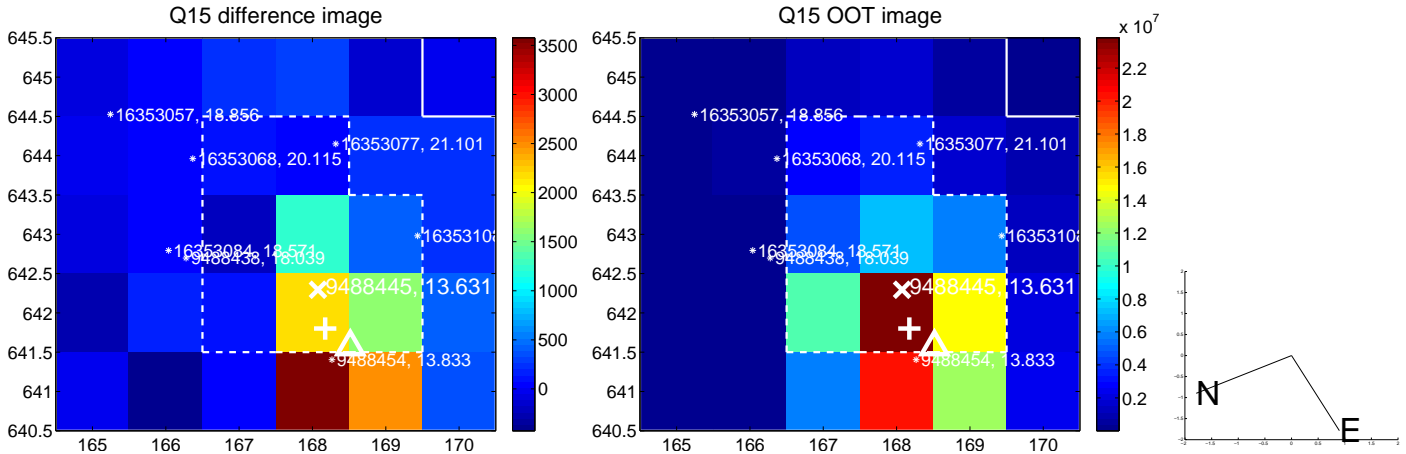
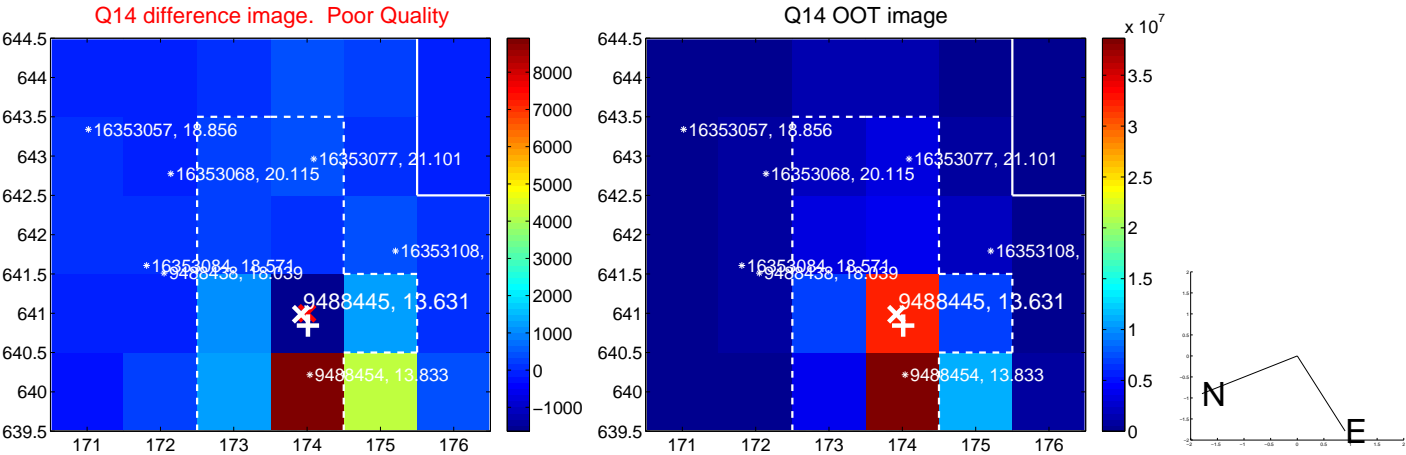
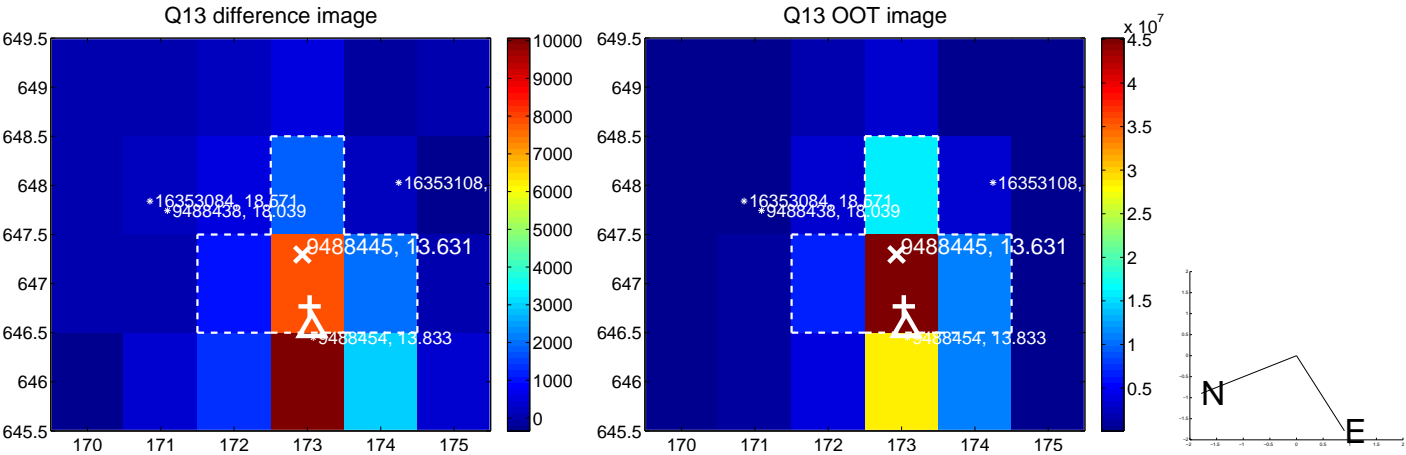
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



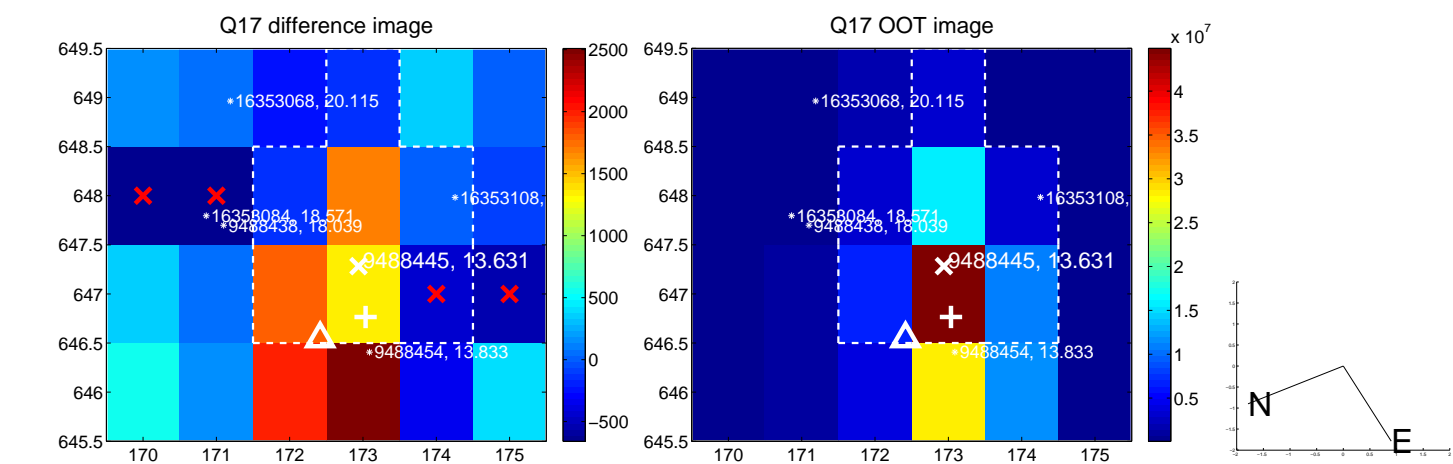
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



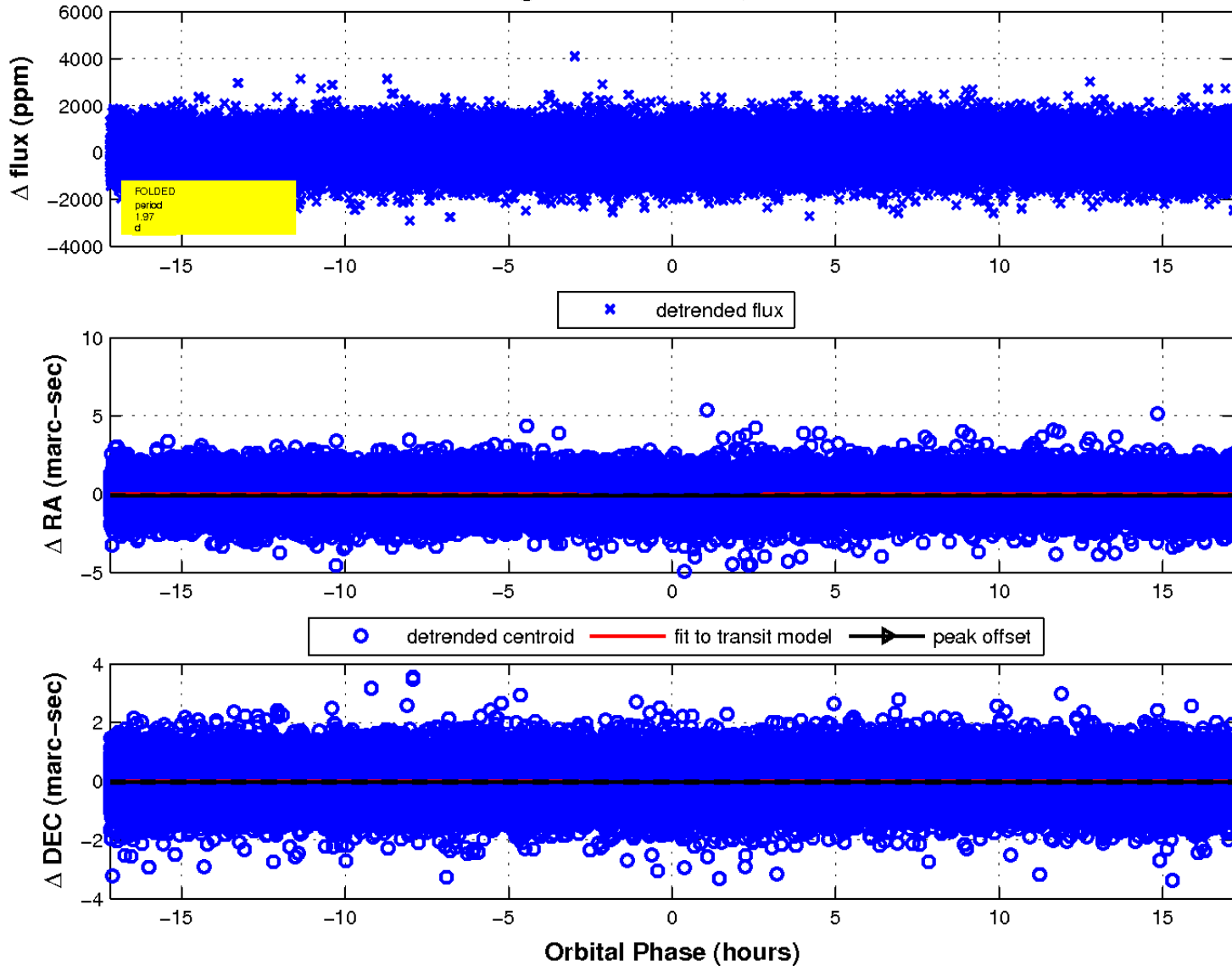
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

