

KIC 010648728

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})
010648728-01	OBS	No	0.942746	131.635623	13.3	3.856	8.0	7.8	2.71	6911	1.13	32957.26
010648728-02	OBS	No	326.752157	225.065238	223.8	6.406	7.9	7.7	2.71	6911	4.64	13.54

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010648728-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
010648728-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED—HALO_GHOST

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

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

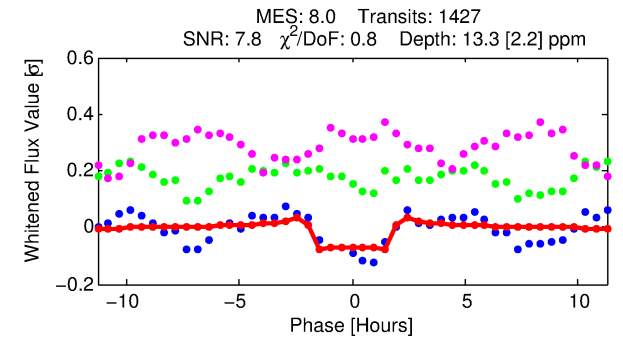
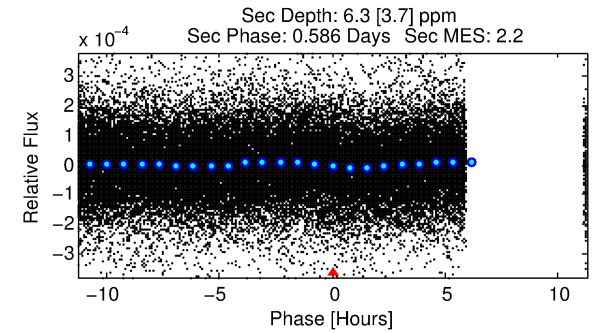
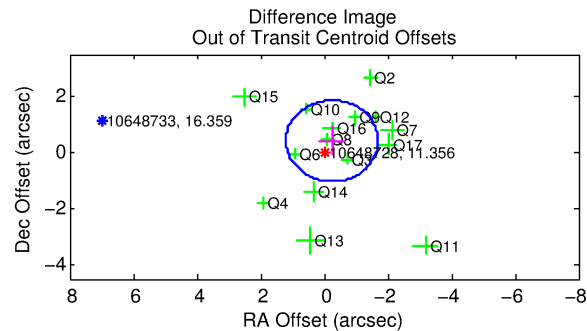
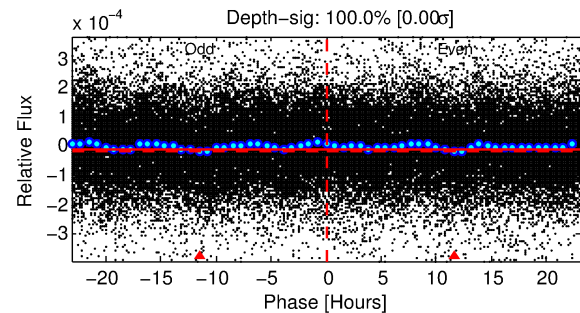
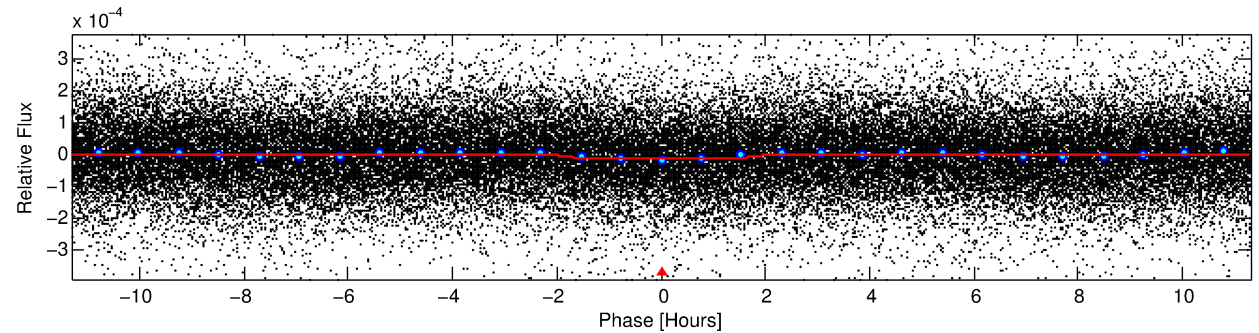
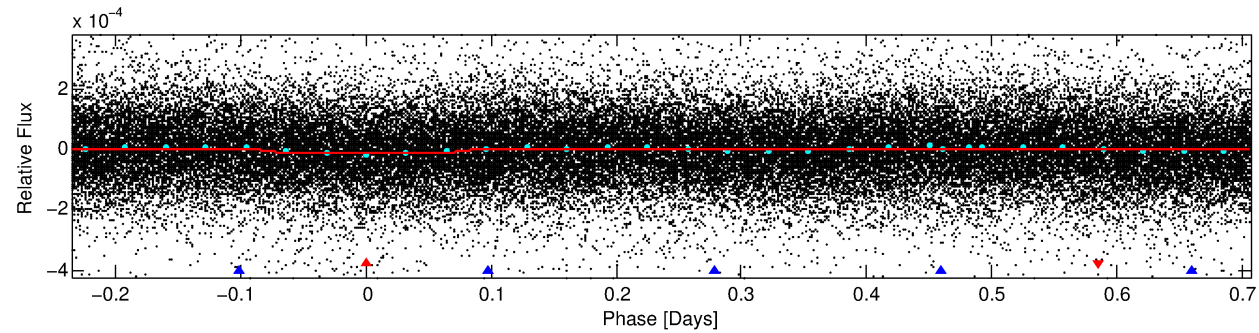
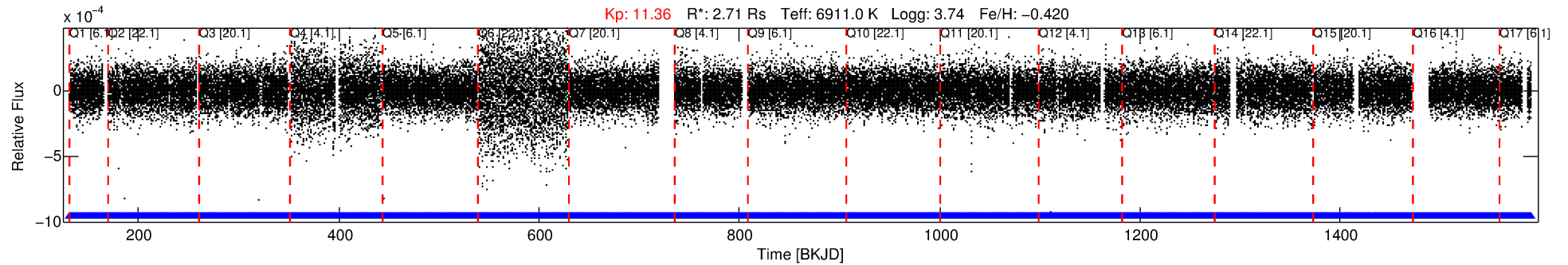
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010648728-01

No Significant Match Found

DV One-Page Summary

KIC: 10648728 Candidate: 1 of 2 Period: 0.943 d



DV Fit Results:

Period = 0.94275 [0.00001] d
Epoch = 131.6356 [0.0031] BKJD
 $R_p/R^* = 0.0038$ [0.0008]
 $a/R^* = 1.31$ [0.70]
 $b = 0.87$ [0.36]
 $S_{\text{eff}} = 32957.26$ [18101.90]
 $T_{\text{eq}} = 3436$ [472] K
 $R_p = 1.13$ [0.46] R_e
 $a = 0.0213$ [0.0071] AU
 $A_g = 1.24$ [1.12] [0.21 σ]
 $T_{\text{effp}} = 5605$ [1046] K [1.89 σ]

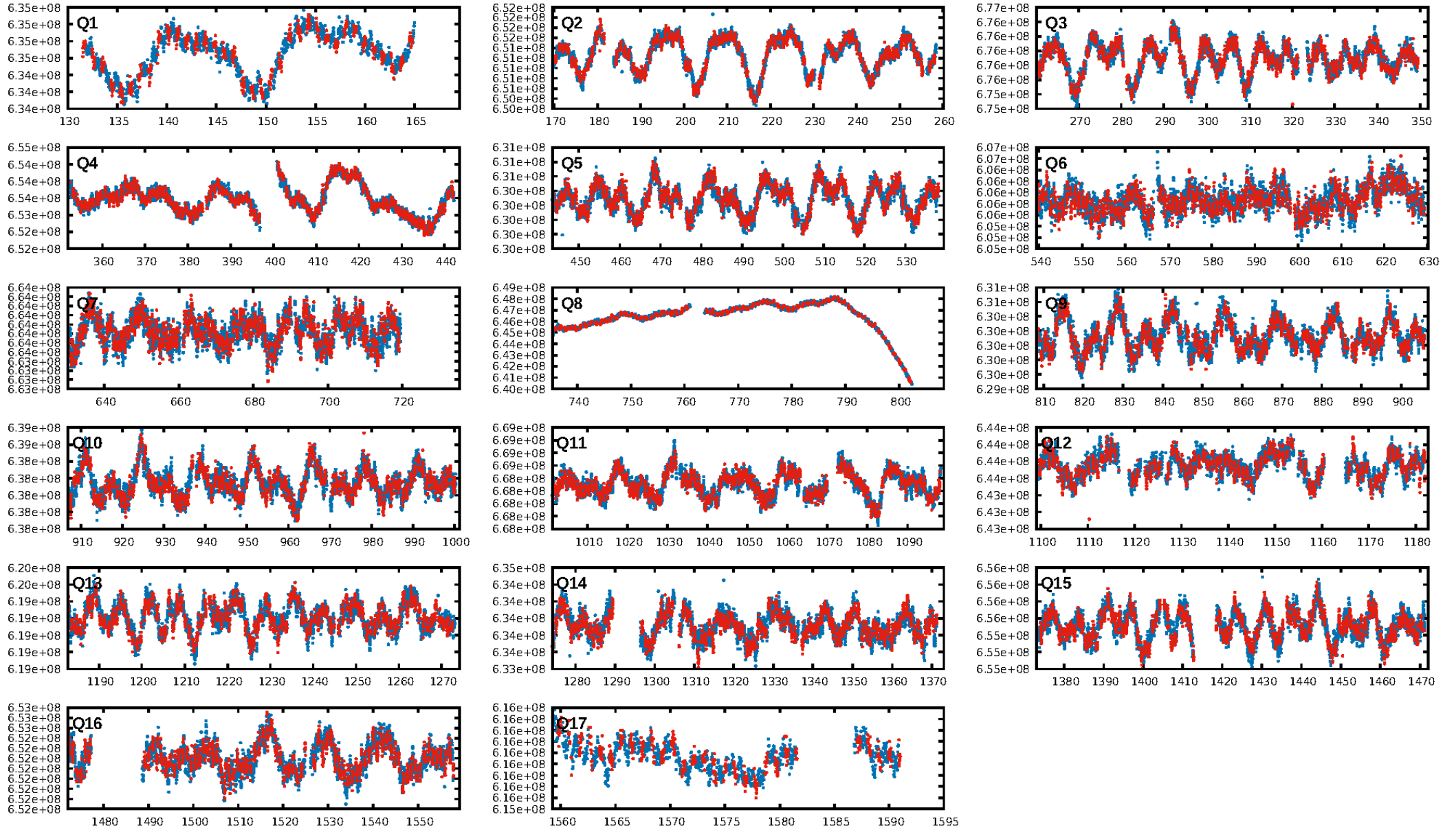
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [1045.76 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.78e-10
RollingBand-fgt: 1.00 [1362/1362]
GhostDiagnostic-chr: 1.85
Centroid-sig: 2.5%
Centroid-so: 1.121 arcsec [1.80 σ]
OotOffset-rm: 0.478 arcsec [0.99 σ]
OotOffset-st: 4/4/4/3 [15]
KicOffset-rm: 0.368 arcsec [0.94 σ]
KicOffset-st: 4/4/4/3 [15]
DiffImageQuality-fgm: 0.87 [13/15]
DiffImageOverlap-fno: 1.00 [17/17]

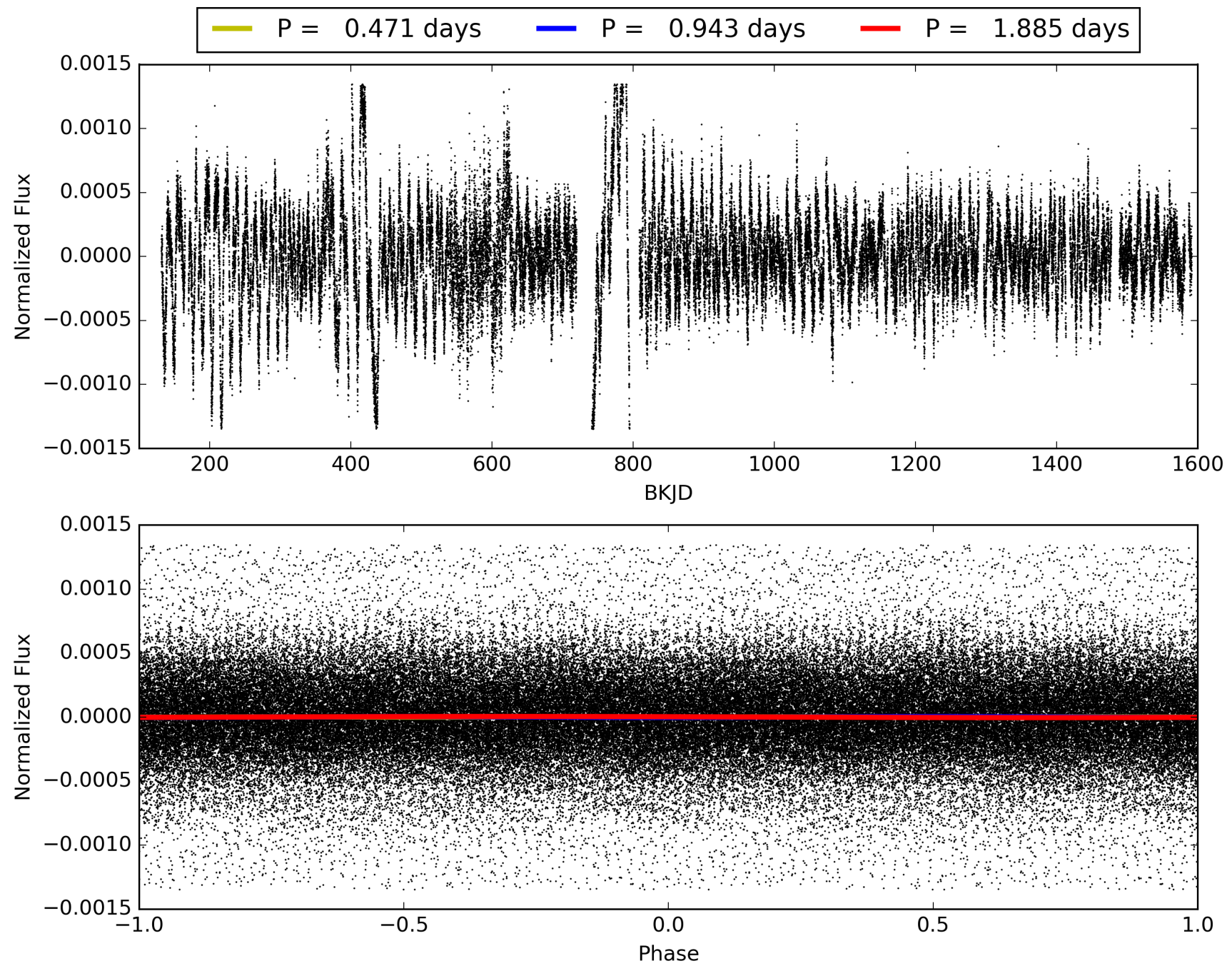
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:37:40 Z

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

TCE 010648728-01, PDC Light Curves

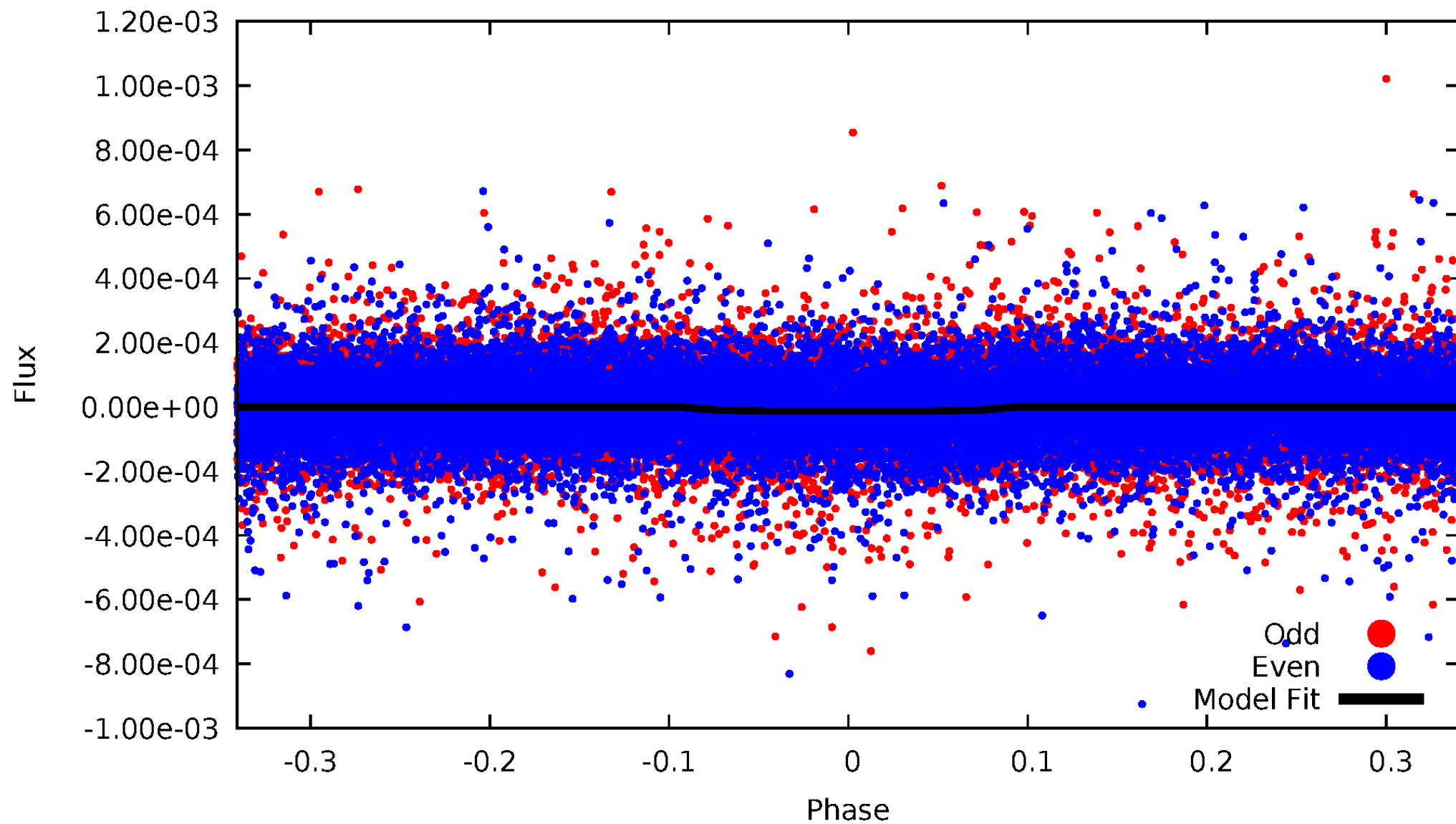


TCE 010648728-01



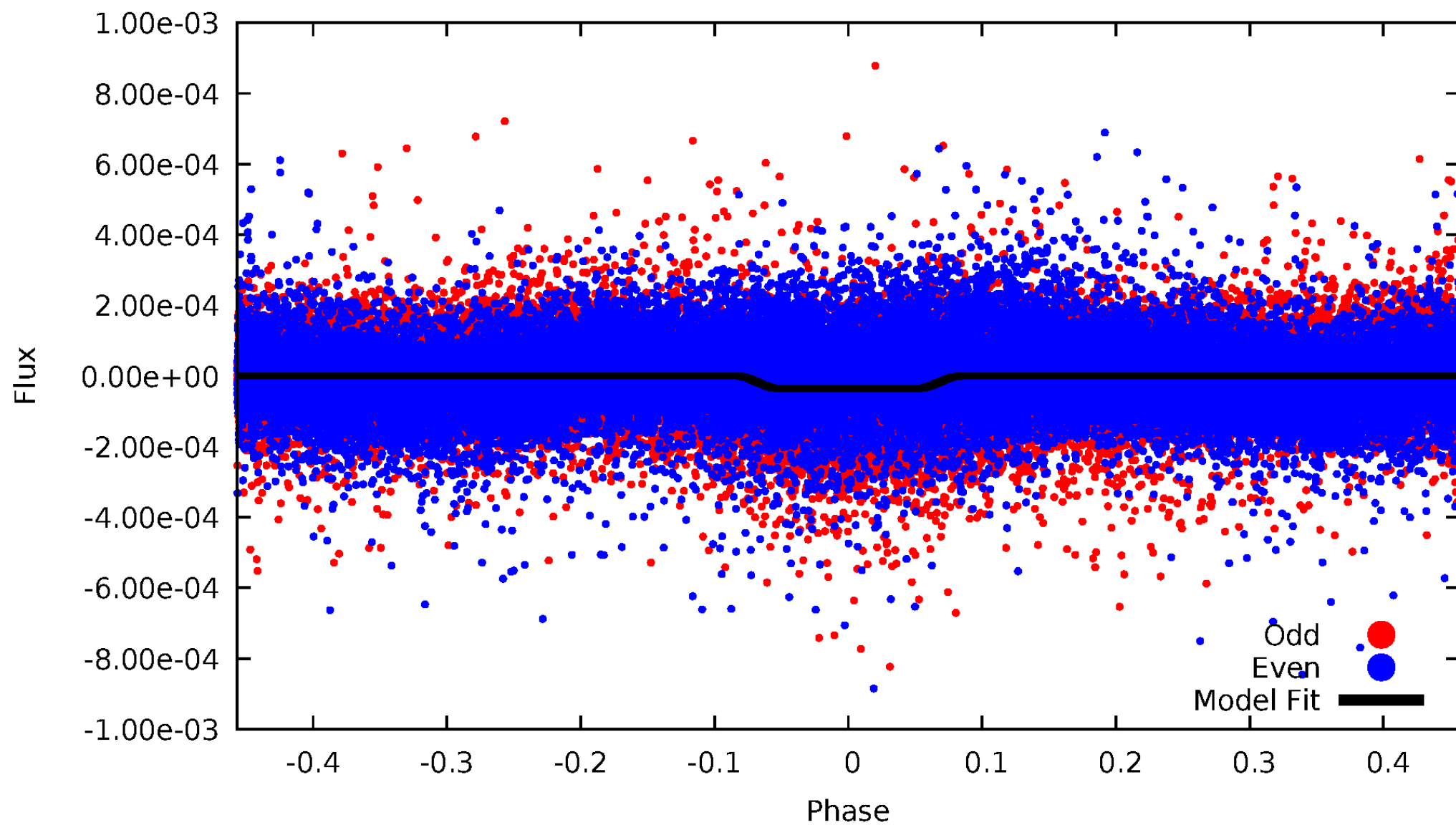
DV Odd/Even

TCE 010648728-01



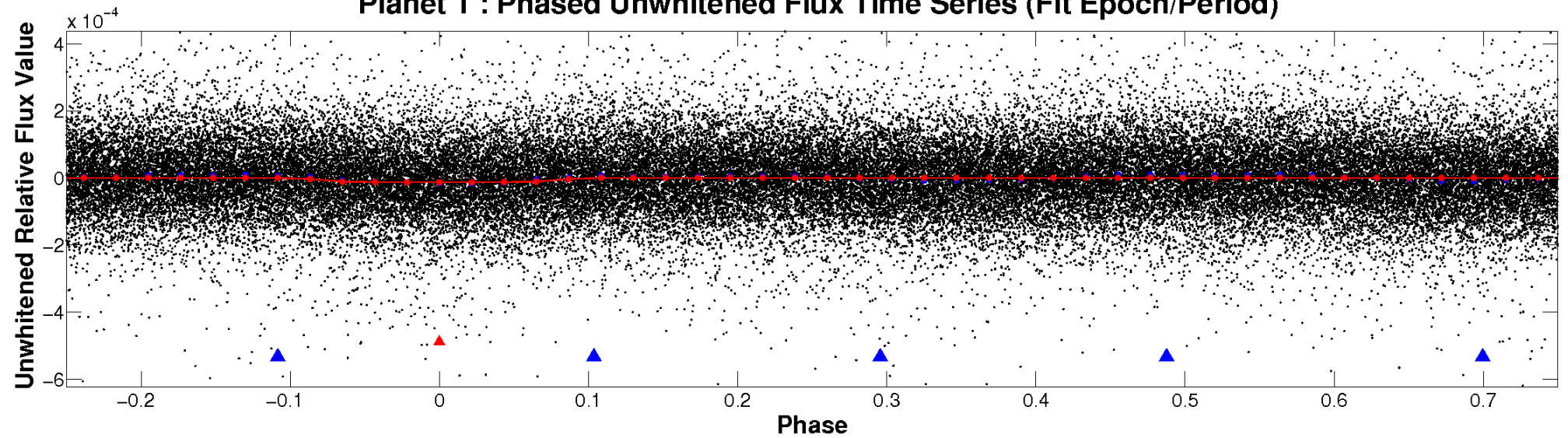
ALT Odd/Even

TCE 010648728-01

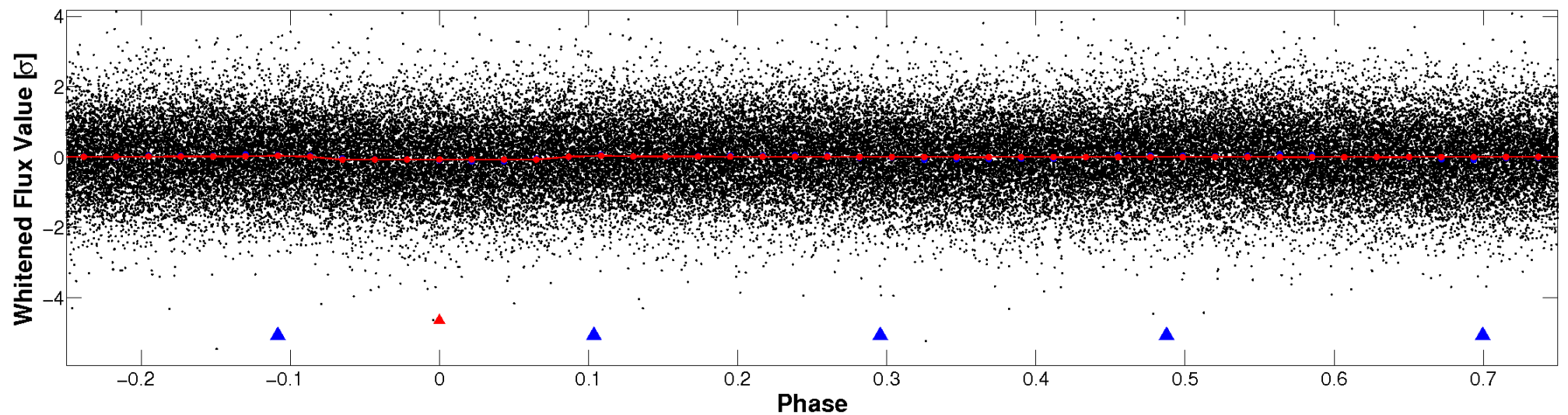


Non-Whitened Vs. Whitened Light Curve

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

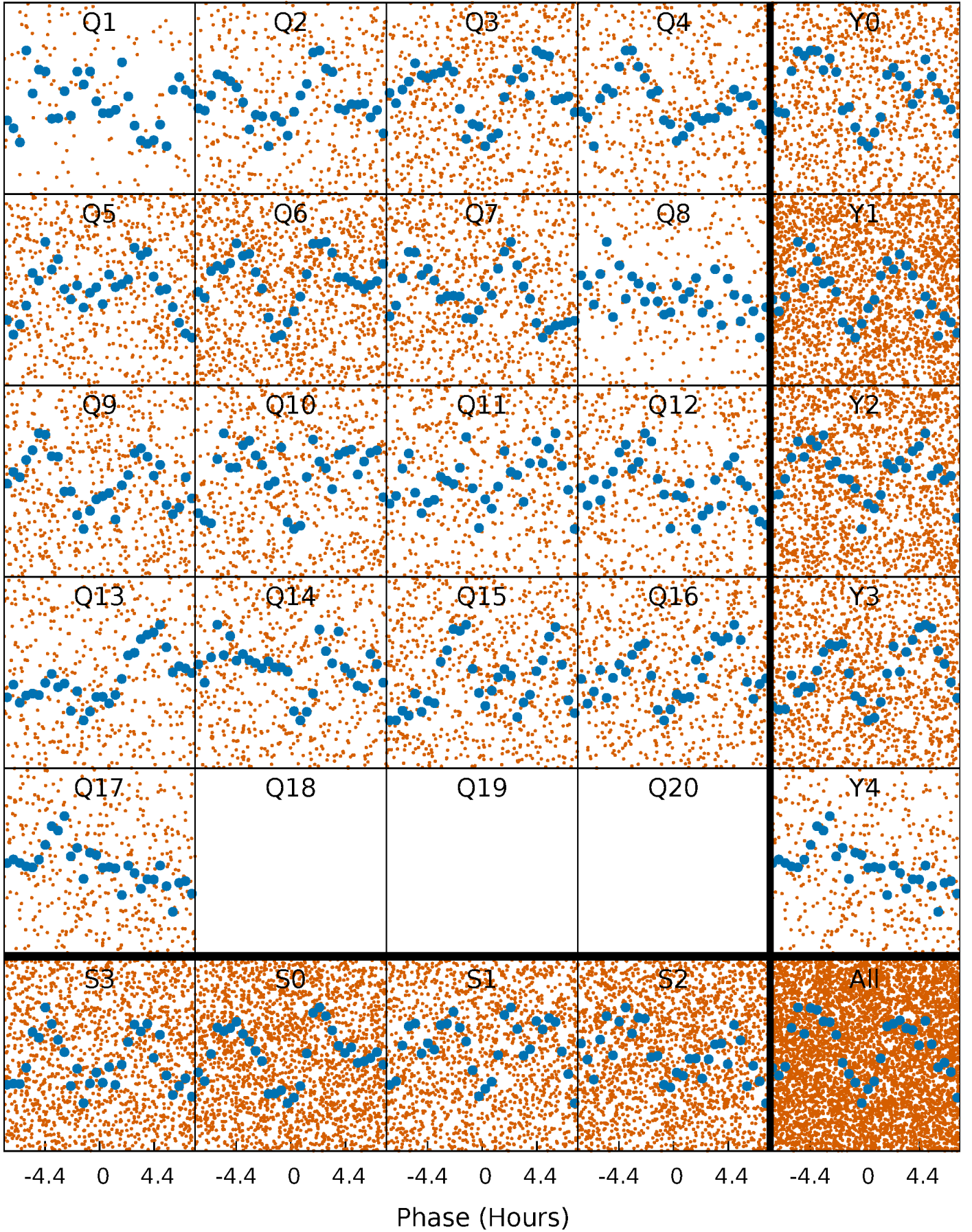


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



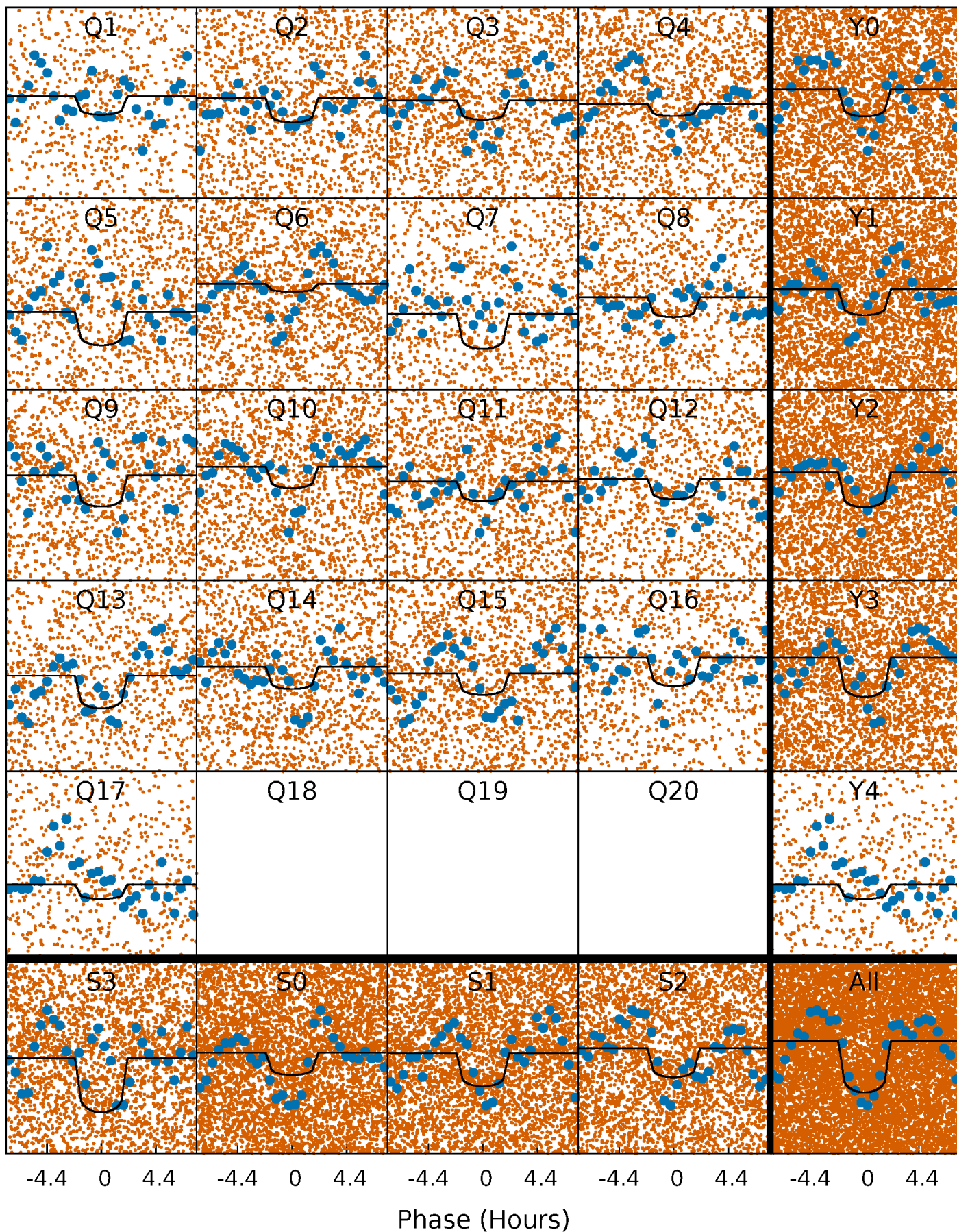
PDC Quarter-Phased Transit Curves

TCE 010648728-01 P= 0.942746 Days $T_0=131.635623$ (BKJD)



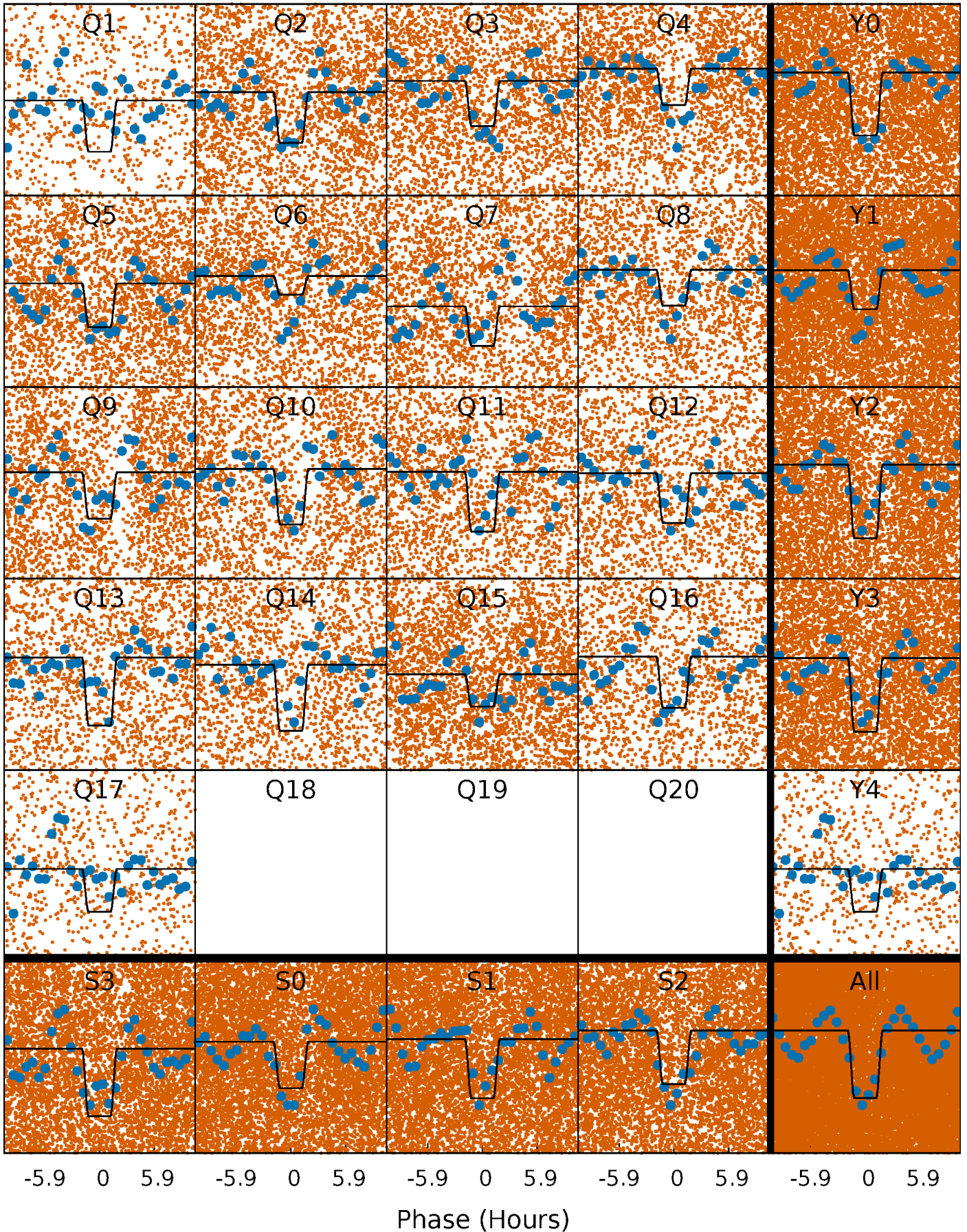
DV Quarter-Phased Transit Curves

TCE 010648728-01 P= 0.942746 Days $T_0=131.635623$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

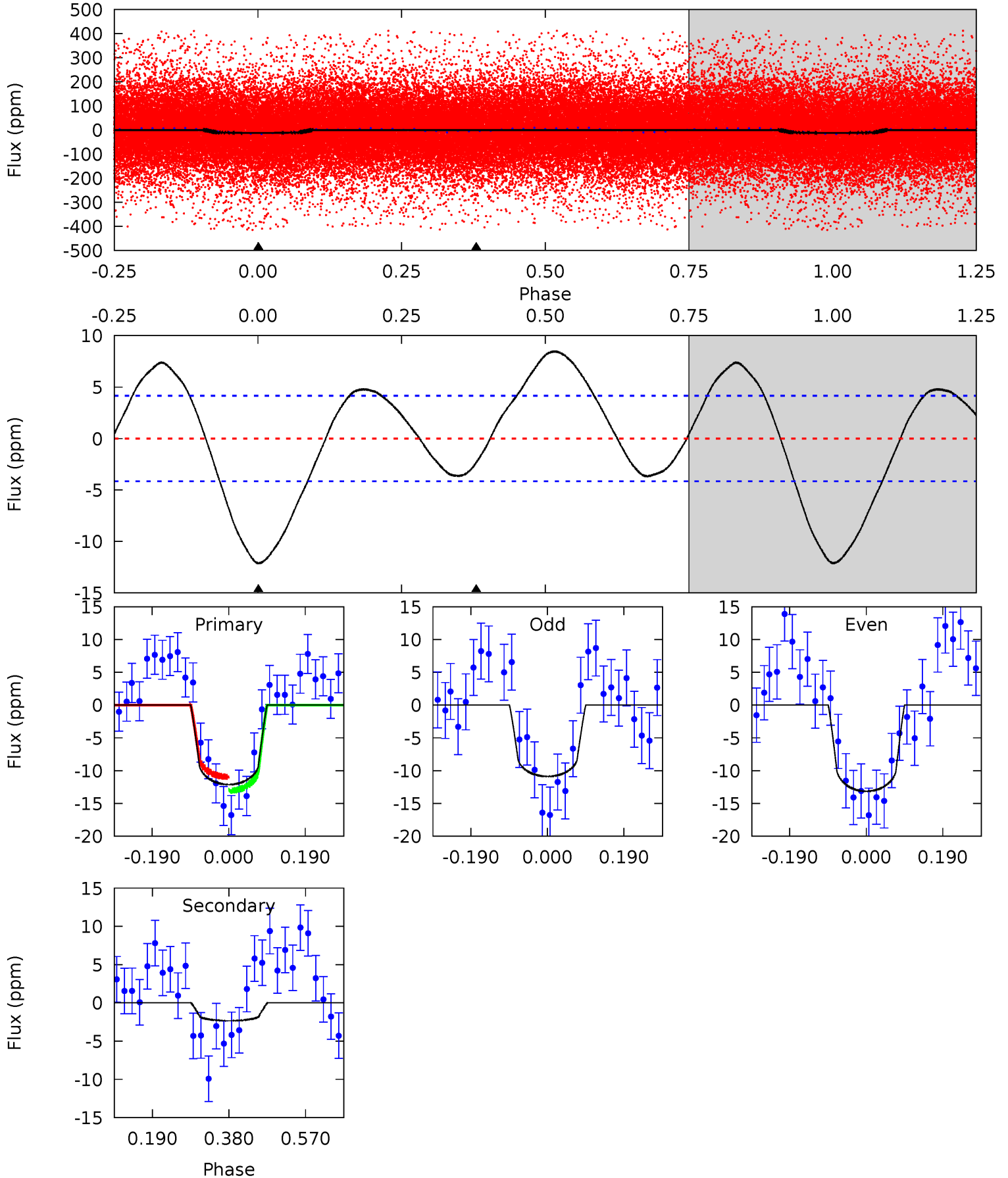
TCE 010648728-01 P= 0.942794 Days $T_0=131.597188$ (BKJD)



DV Model-Shift Uniqueness Test

010648728-01, P = 0.942746 Days, E = 130.692877 Days

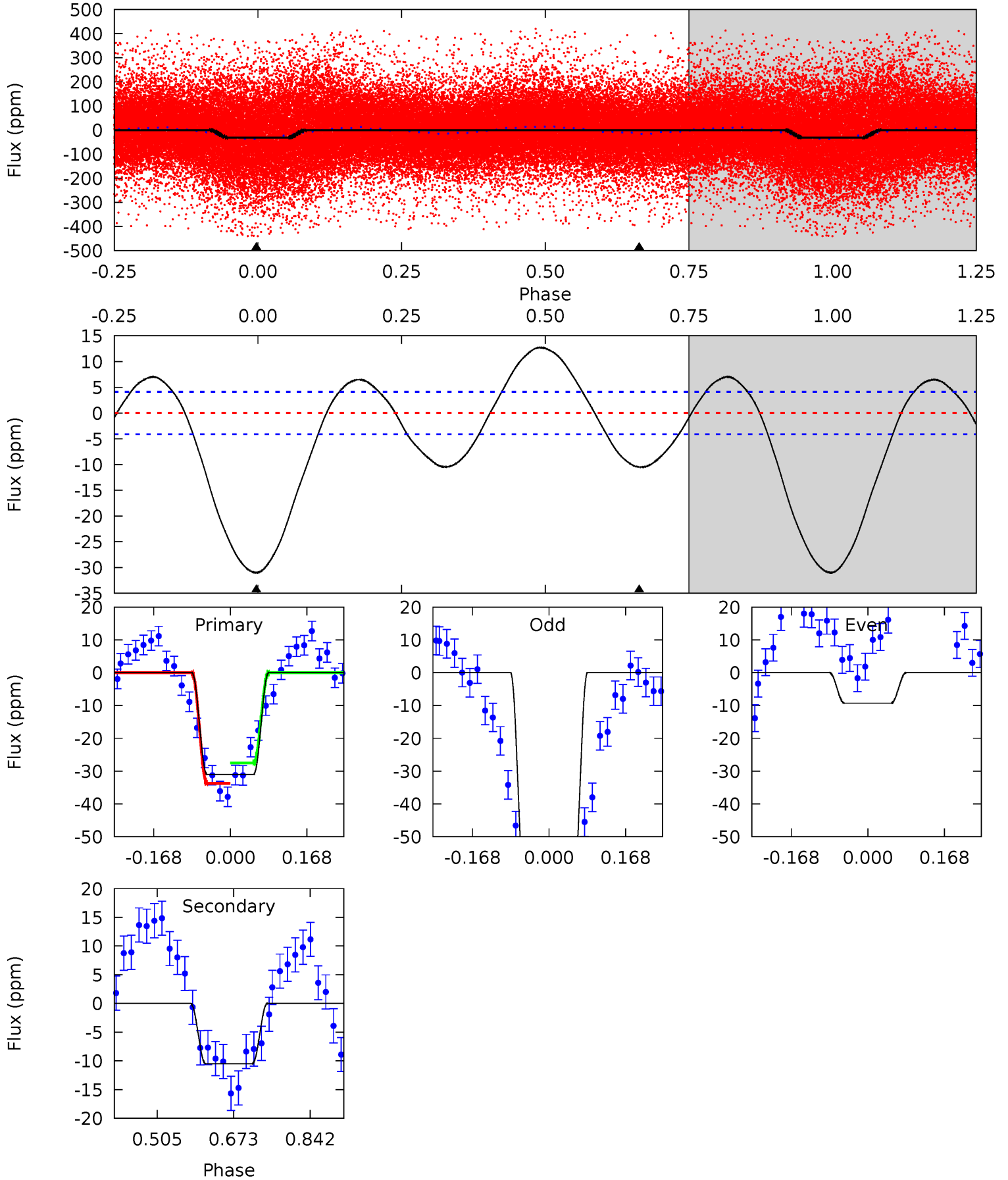
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	2.49	0	0	4.43	1.31	3.43	12.9	12.9	2.49	2.49	1.21	1.15	0.41	1.14



Alt Model-Shift Uniqueness Test

010648728-01, P = 0.942794 Days, E = 130.654394 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.5	11.4	0	0	4.45	1.38	8.02	33.5	33.5	11.4	11.4	33.1	1.10	0.29	3.37



Stellar Parameters For KIC 010648728

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6911^{+163}_{-245}	$3.736^{+0.312}_{-0.078}$	$-0.420^{+0.300}_{-0.250}$	$2.711^{+0.429}_{-0.929}$	$1.459^{+0.231}_{-0.282}$	$0.103^{+0.237}_{-0.027}$
	+2%/-4%	+8%/-2%	+71%/-60%	+16%/-34%	+16%/-19%	+230%/-26%
Source	PHO1	FLK73	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 010648728-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2 ± 1	$1.06^{+0.31}_{-0.29}$	4676^{+290}_{-385}	3878^{+862}_{-6889}	$0.532^{+0.500}_{-0.275}$
Alt.	-10 ± 1	$1.67^{+0.37}_{-0.39}$	4680^{+258}_{-403}	4764^{+488}_{-444}	$0.967^{+0.603}_{-0.304}$

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

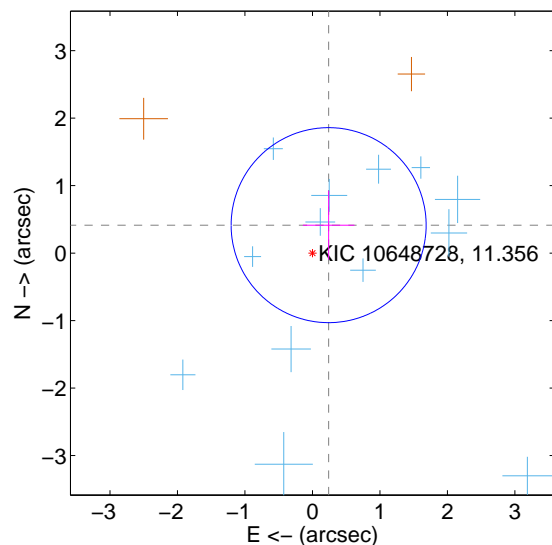
Supplemental centroid analysis for 010648728-01. **Kepler magnitude: 11.36.** Transit SNR 7.76

There are 13 quarters with good PRF difference image offsets

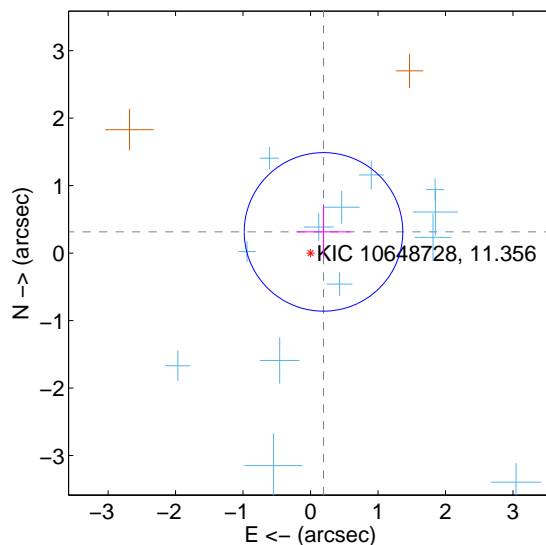
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.478 ± 0.481	0.99	-0.240 ± 0.382	0.414 ± 0.510
PRF-fit source offset from KIC position	0.368 ± 0.391	0.94	-0.192 ± 0.399	0.314 ± 0.407
photometric centroid source offset	1.12 ± 0.62	1.80	-1.01 ± 0.62	-0.49 ± 0.64

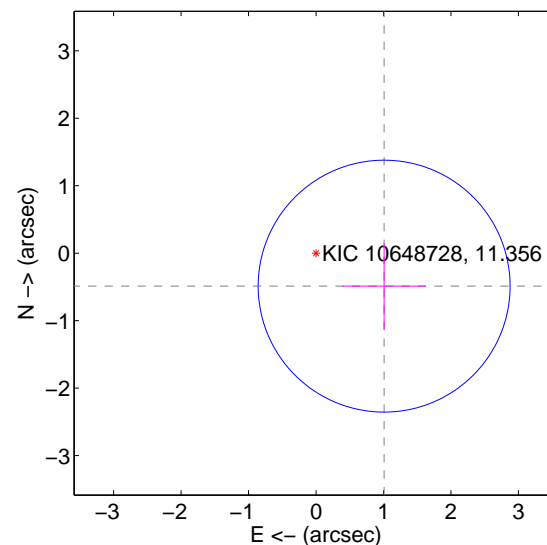
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

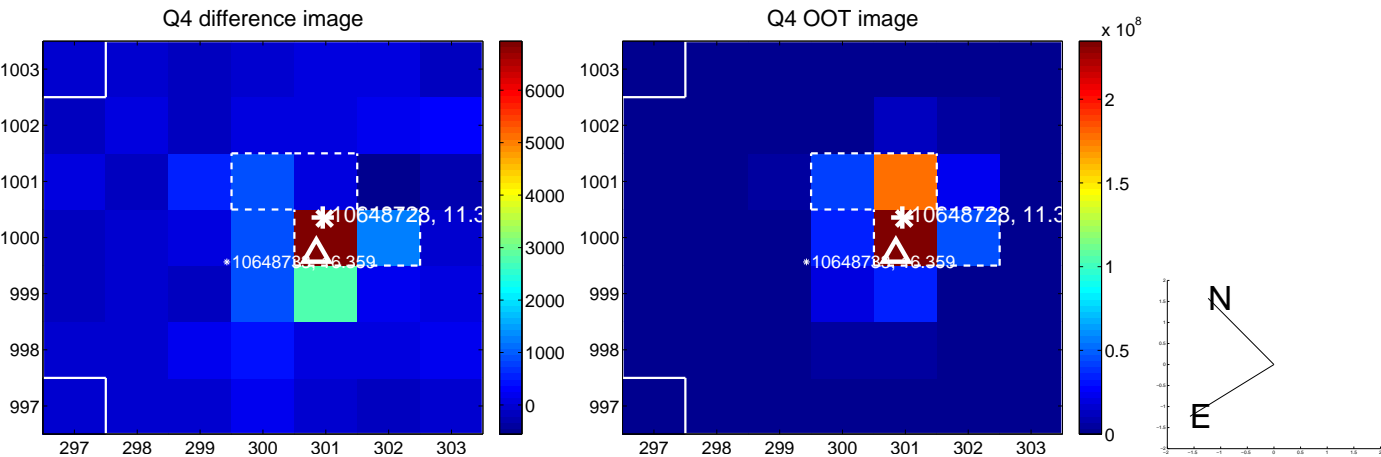
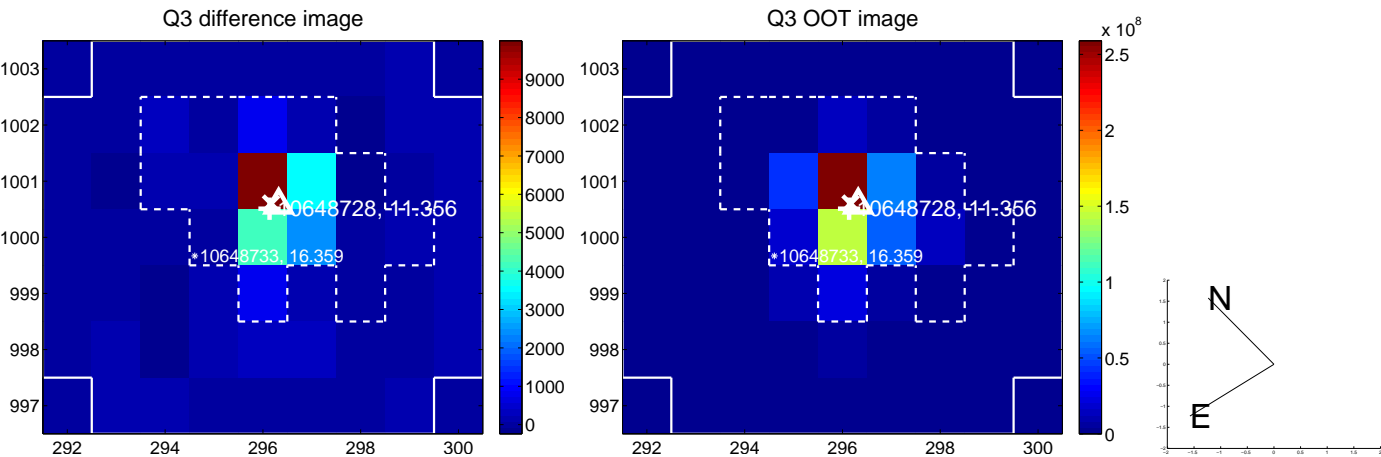
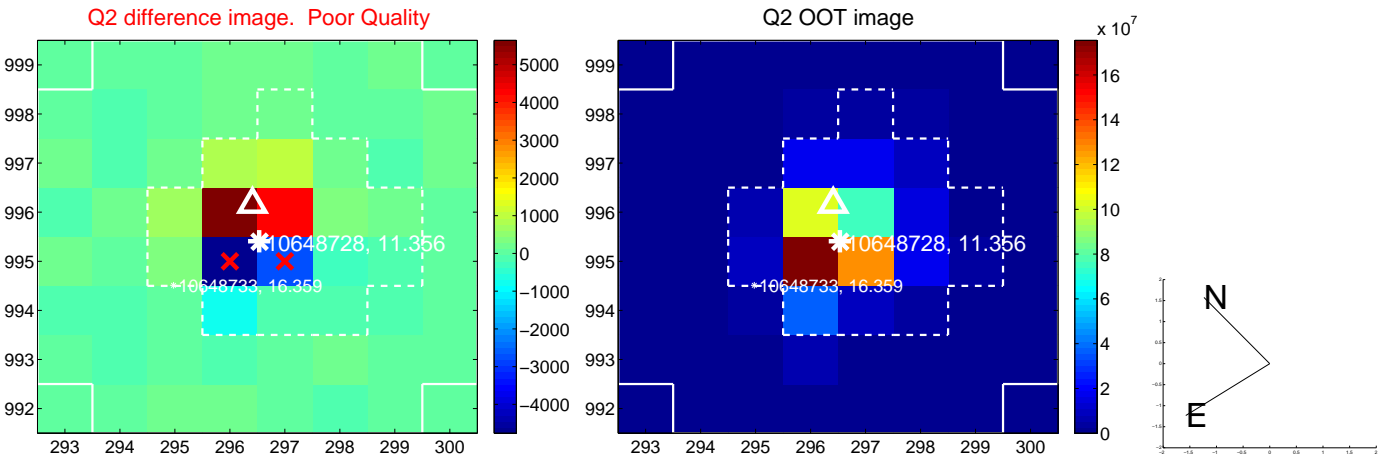
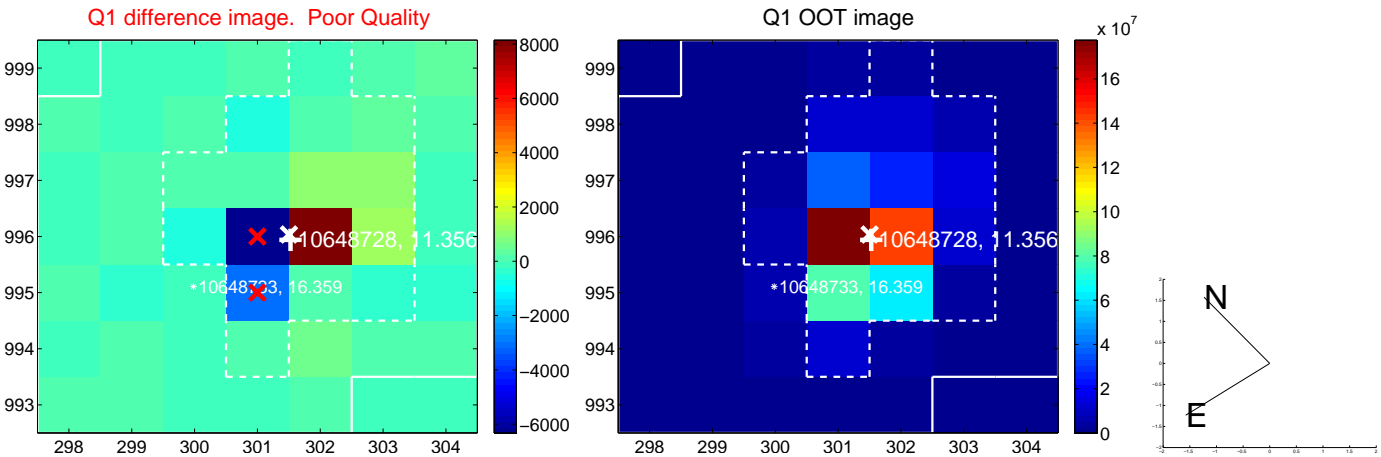


offset from photometric centroids

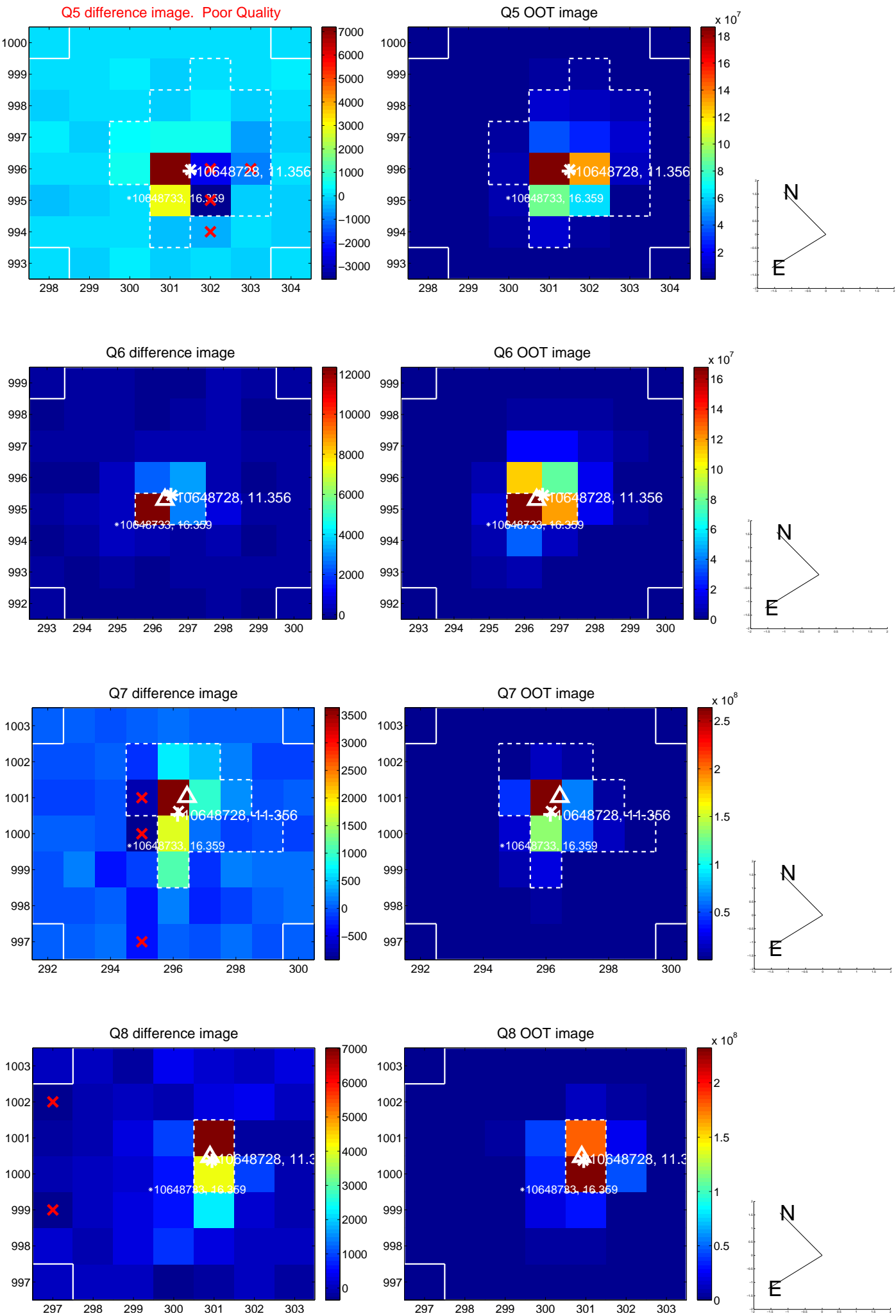


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

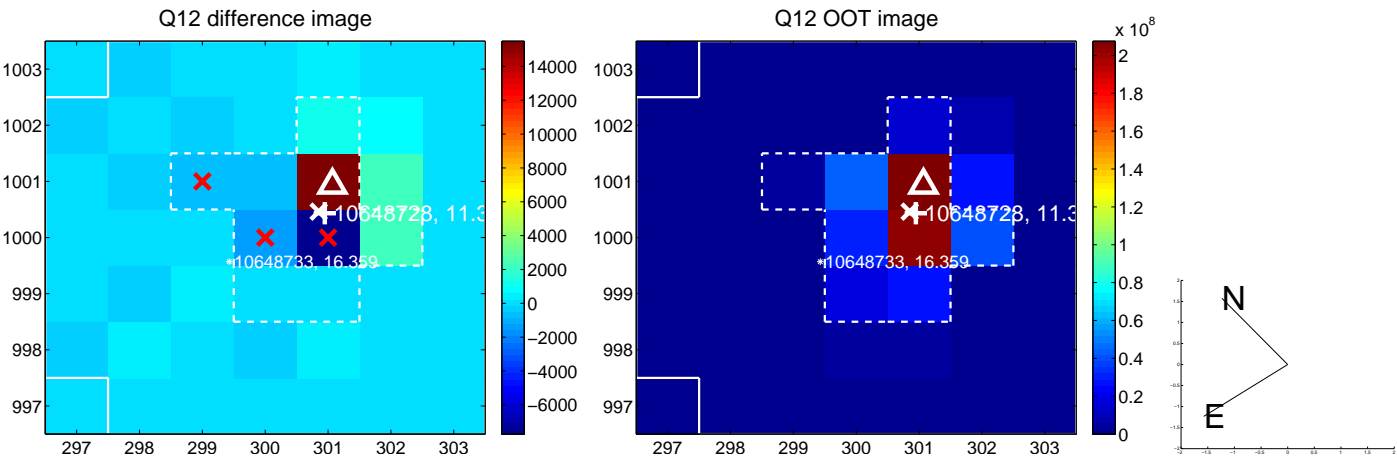
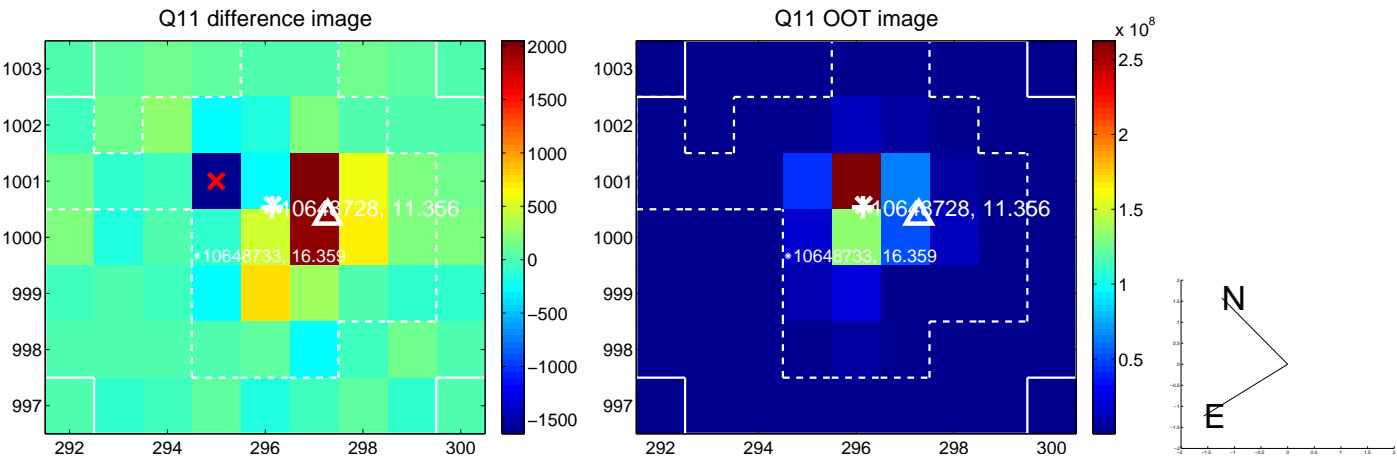
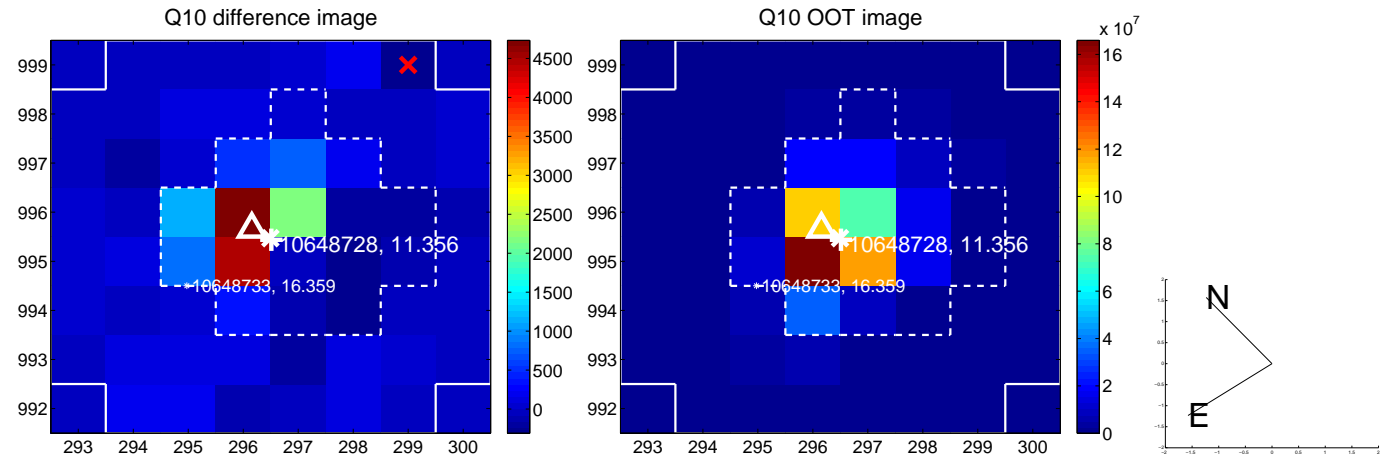
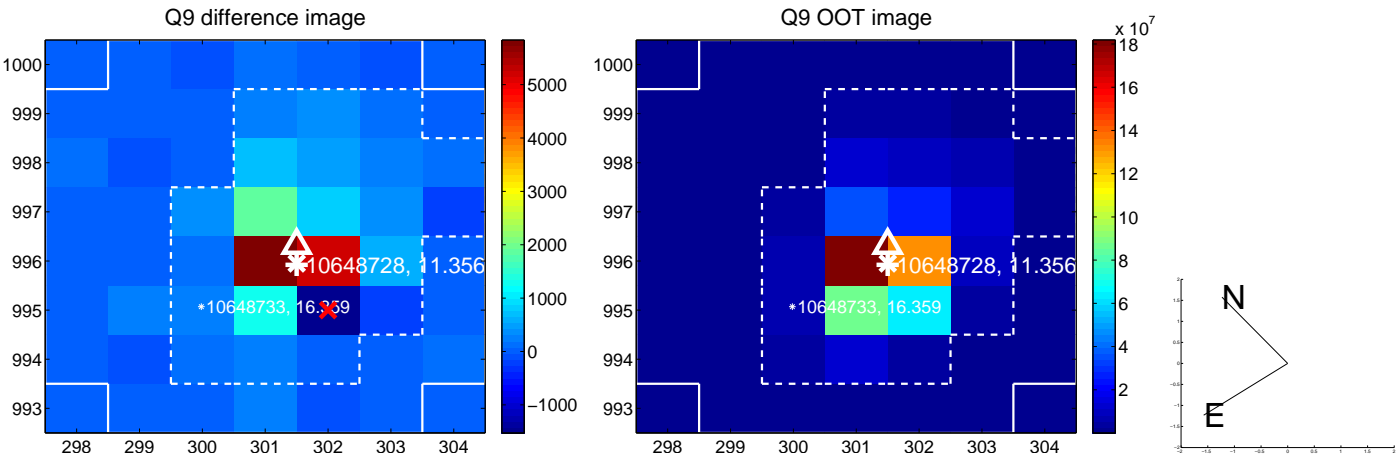
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



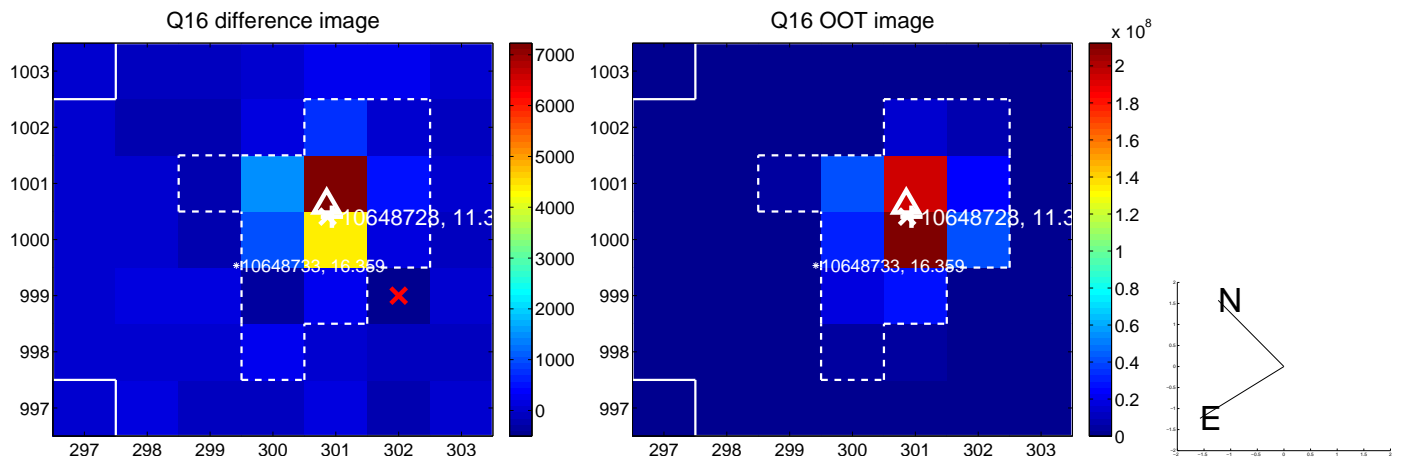
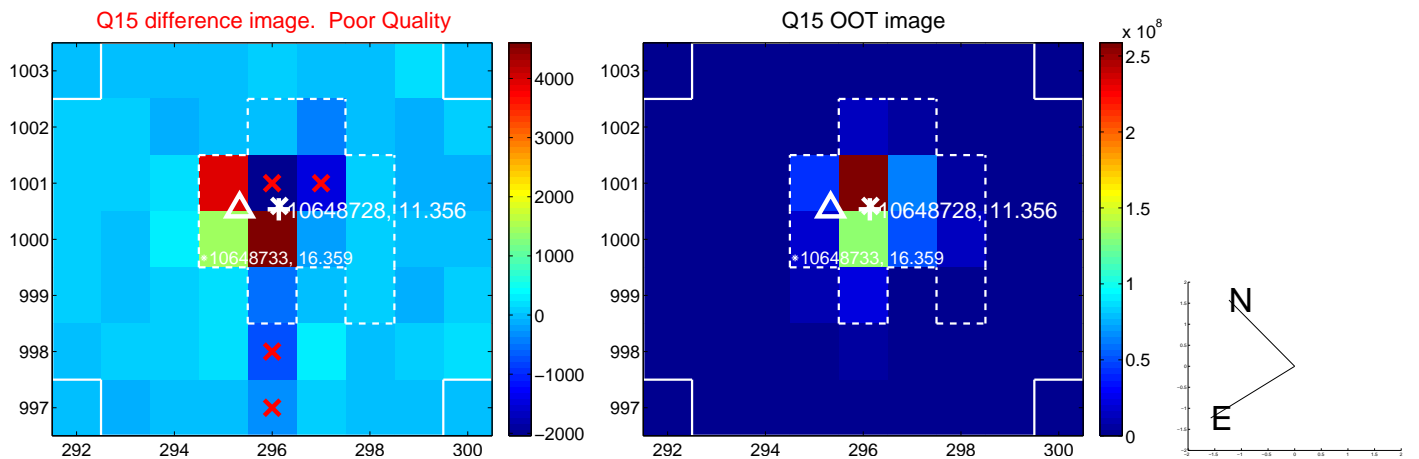
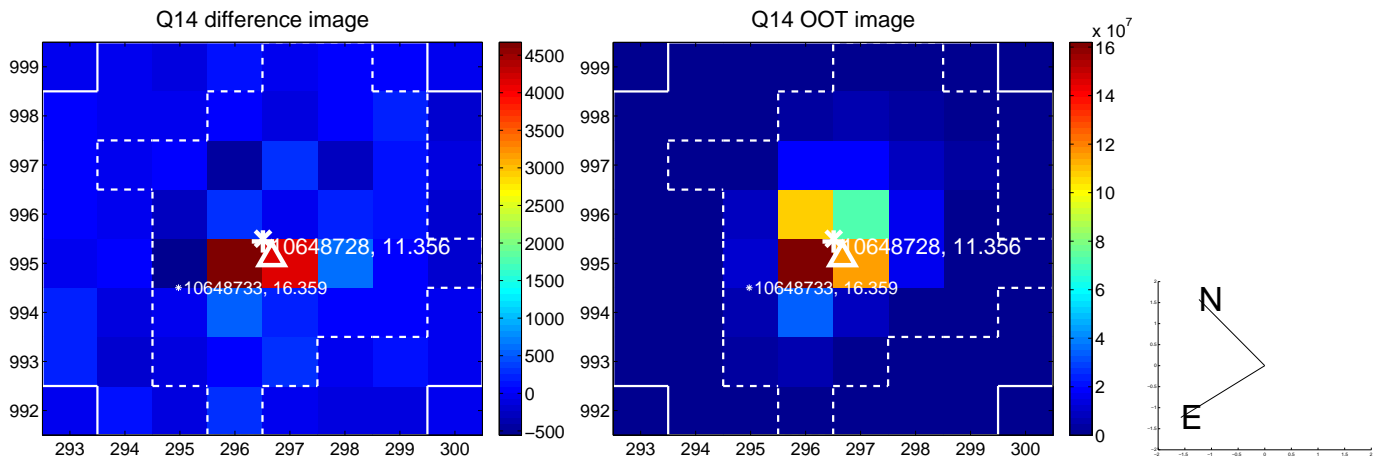
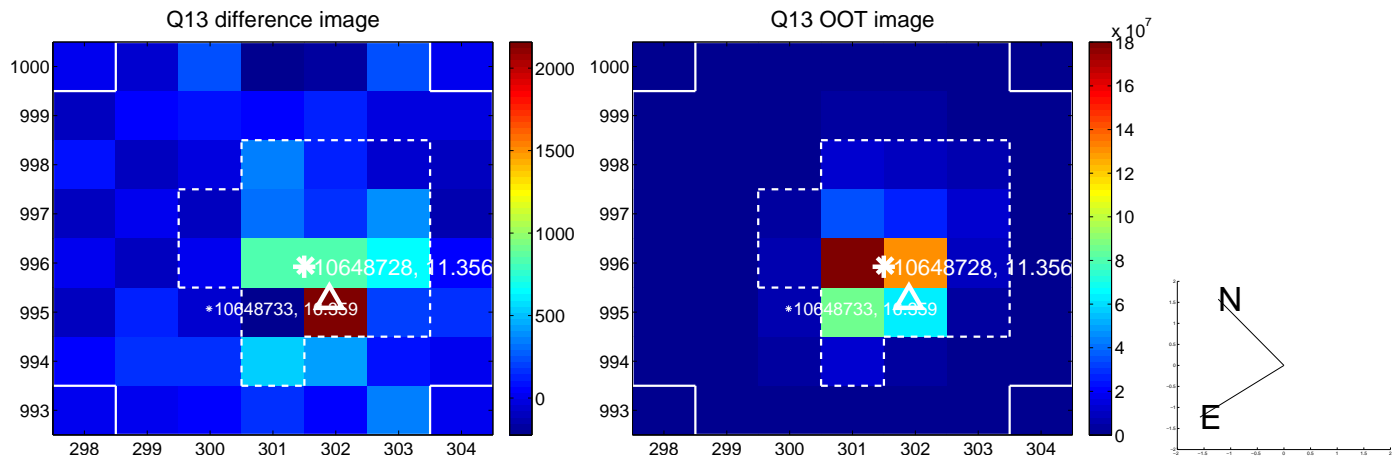
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



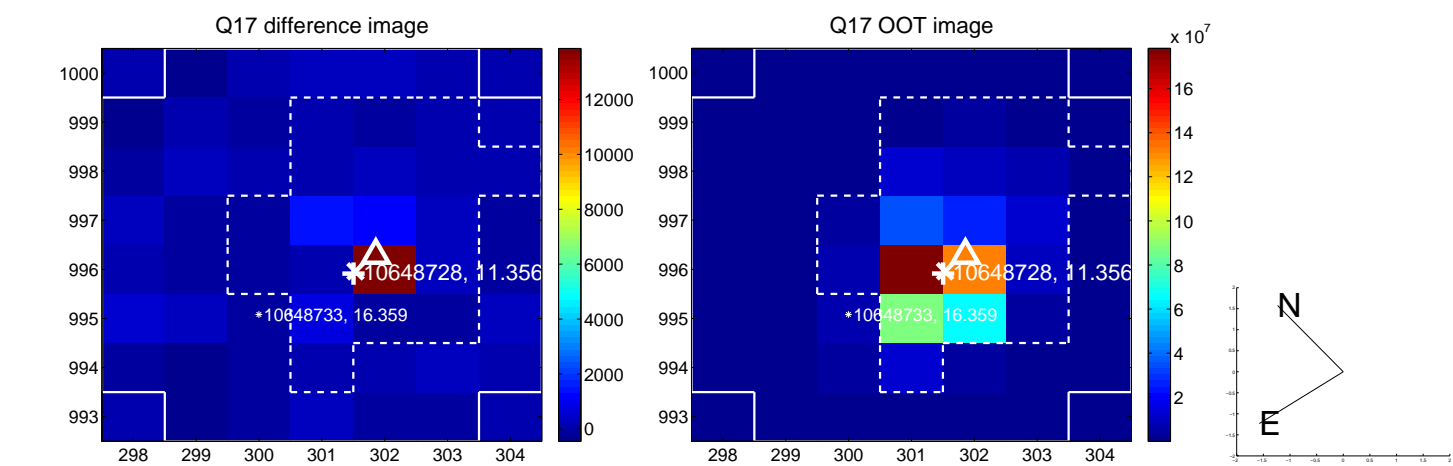
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



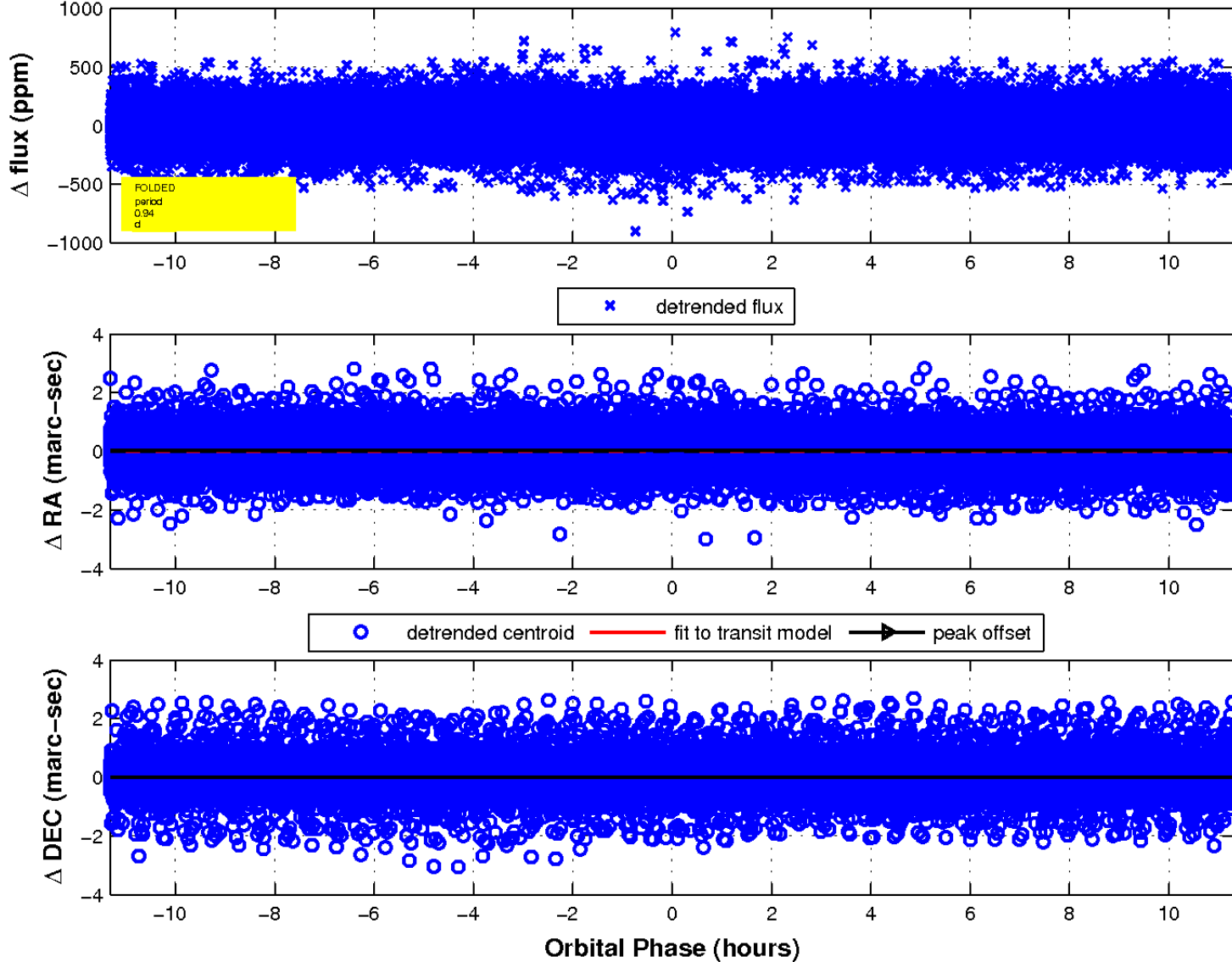
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

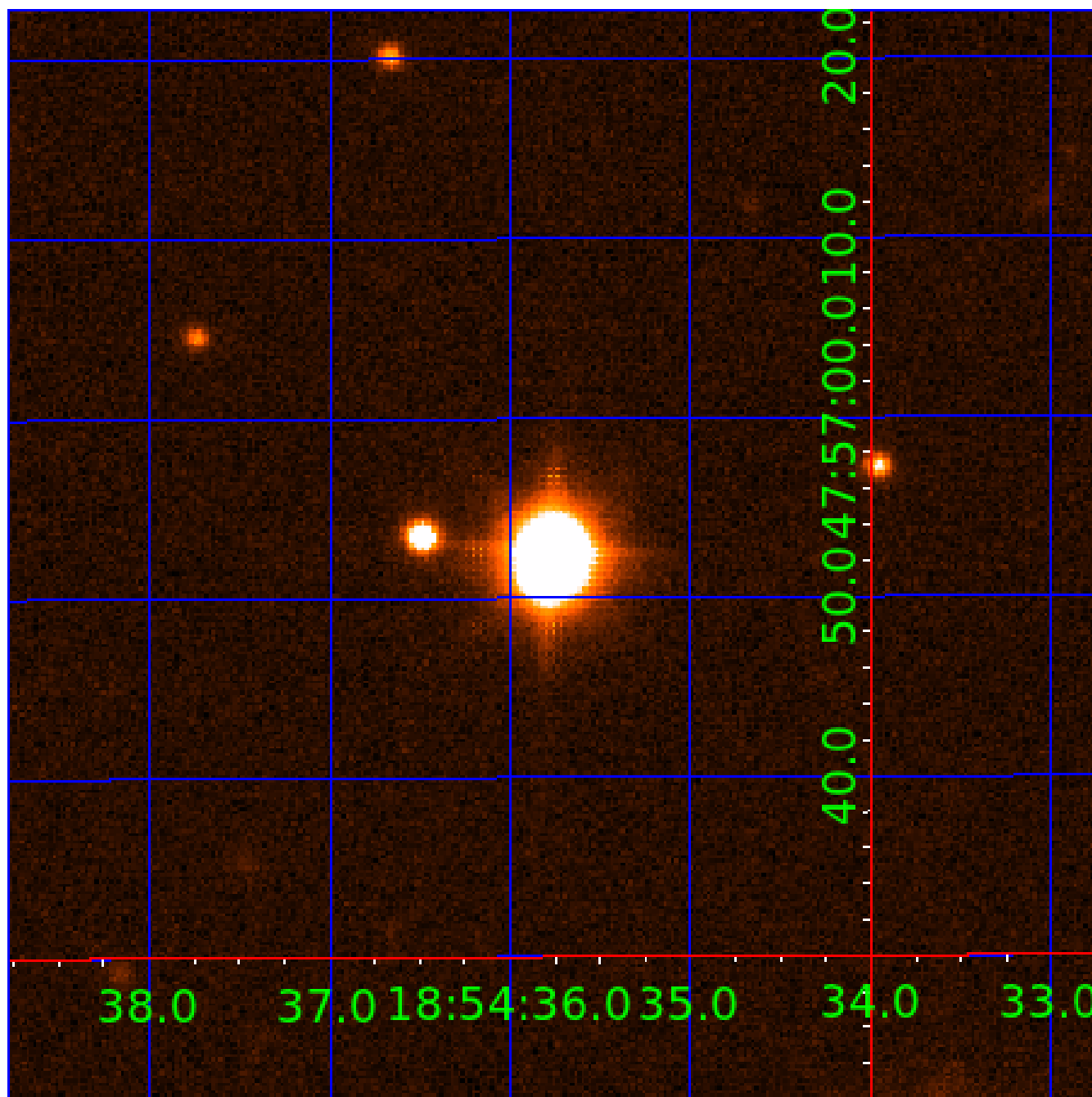


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010648728

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})
010648728-01	OBS	No	0.942746	131.635623	13.3	3.856	8.0	7.8	2.71	6911	1.13	32957.26
010648728-02	OBS	No	326.752157	225.065238	223.8	6.406	7.9	7.7	2.71	6911	4.64	13.54

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010648728-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
010648728-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—MOD_NONUNIQ_DV—MOD_POS_DV—CENT_SATURATED—HALO_GHOST

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

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

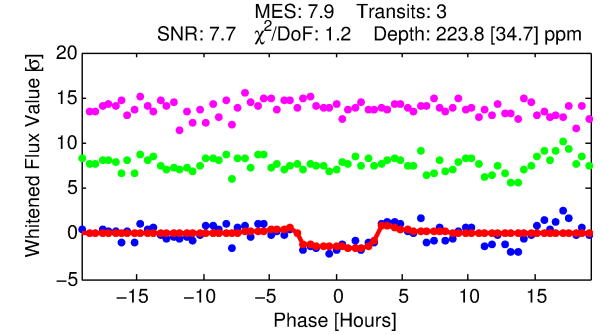
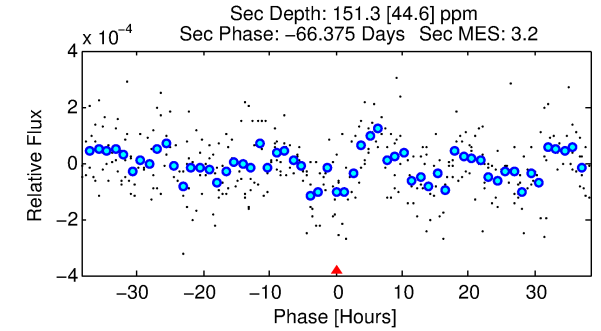
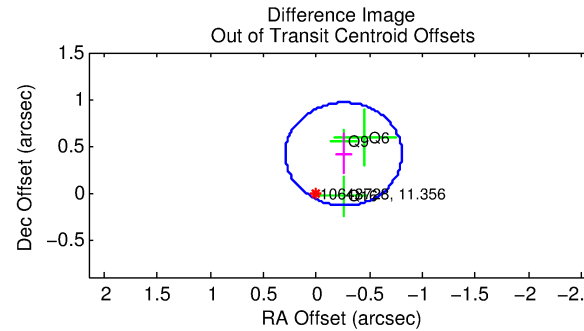
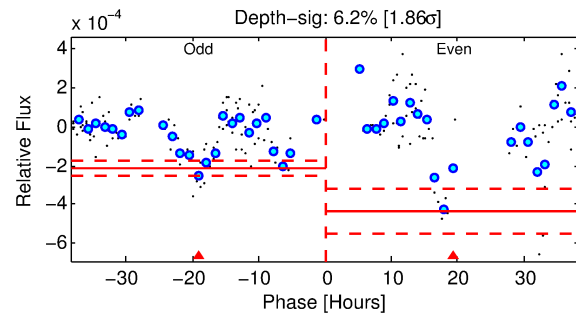
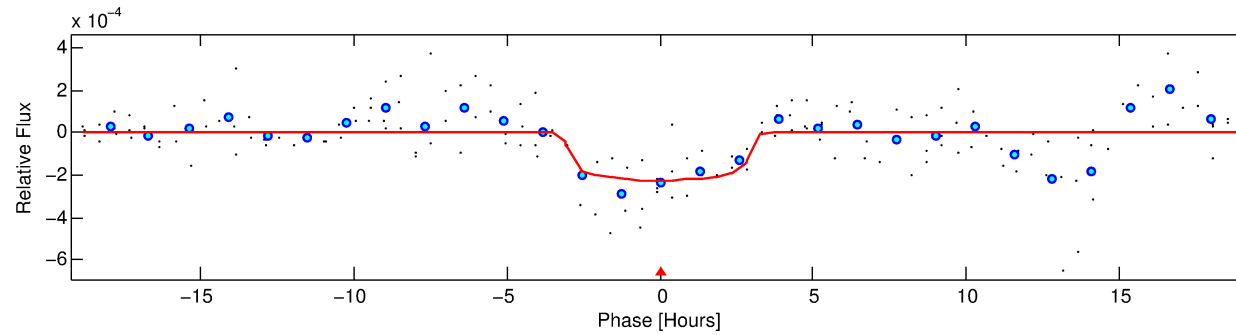
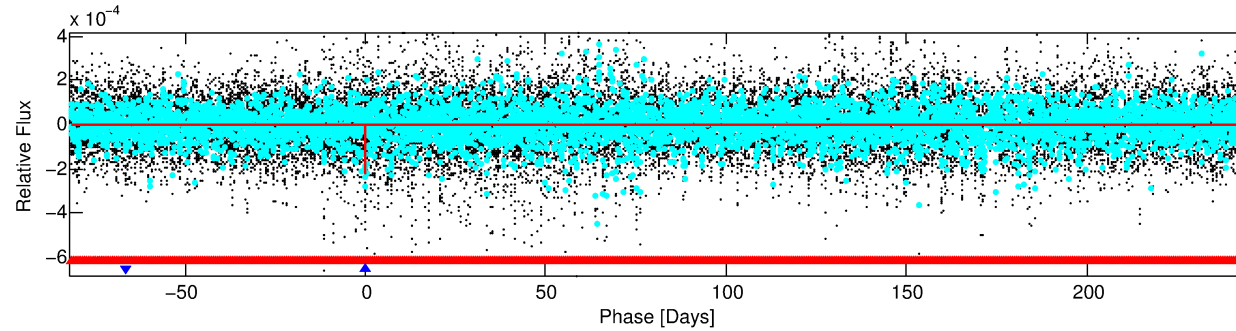
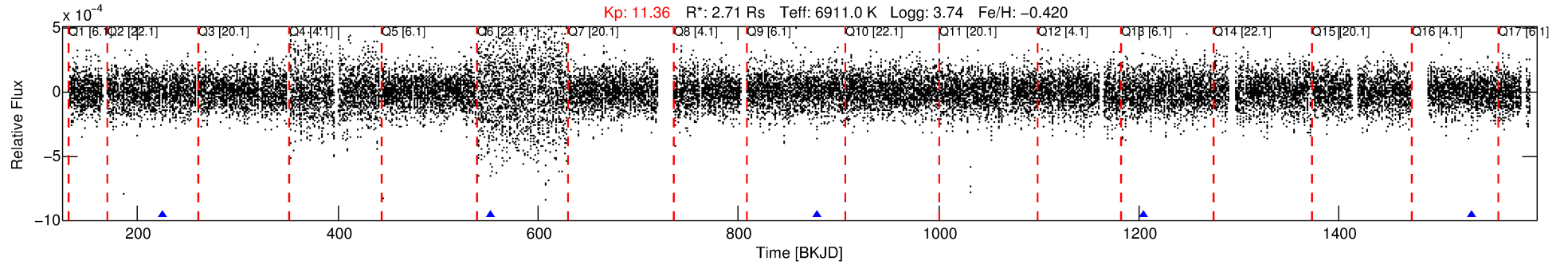
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010648728-02

No Significant Match Found

DV One-Page Summary

KIC: 10648728 Candidate: 2 of 2 Period: 326.752 d



DV Fit Results:

Period = 326.75216 [0.00559] d
Epoch = 225.0652 [0.0205] BKJD
Rp/R* = 0.0157 [0.0044]
a/R* = 199.43 [317.29]
b = 0.88 [0.42]
Seff = 13.54 [7.44]
Teq = 489 [67] K
Rp = 4.64 [2.05] Re
a = 1.0534 [0.3486] AU
Ag = 4287.97 [3540.95] [1.21σ]
Teffp = 6119 [992] K [5.66σ]

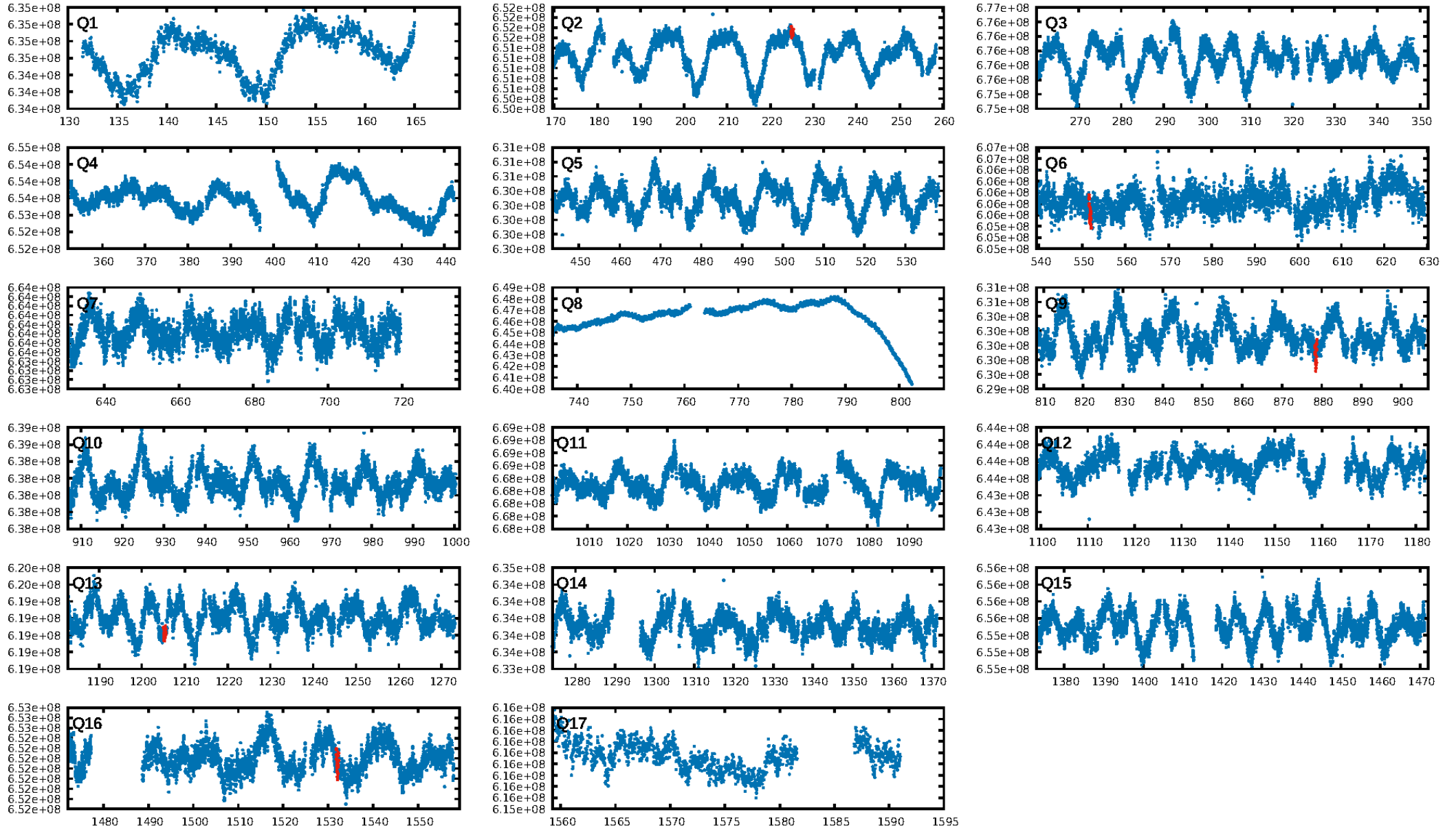
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1045.76σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 5.2%
ModelChiSquareGof-sig: 98.3%
Bootstrap-pfa: 1.57e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.2397
Centroid-sig: 15.8%
Centroid-so: 0.672 arcsec [1.16σ]
OotOffset-rm: 0.486 arcsec [2.65σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-rm: 0.436 arcsec [2.00σ]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 0.00 [0/5]

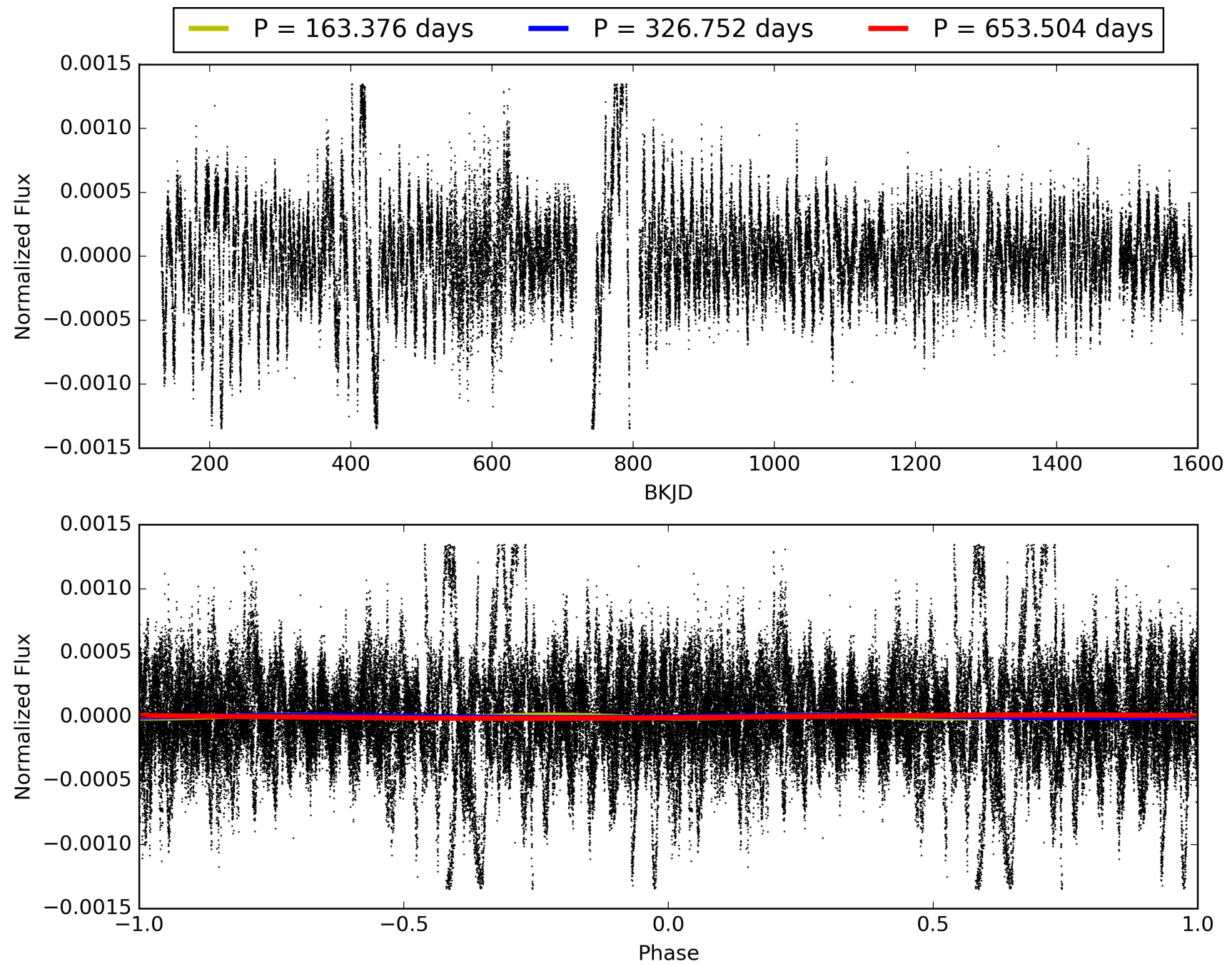
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:37:52 Z

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

TCE 010648728-02, PDC Light Curves

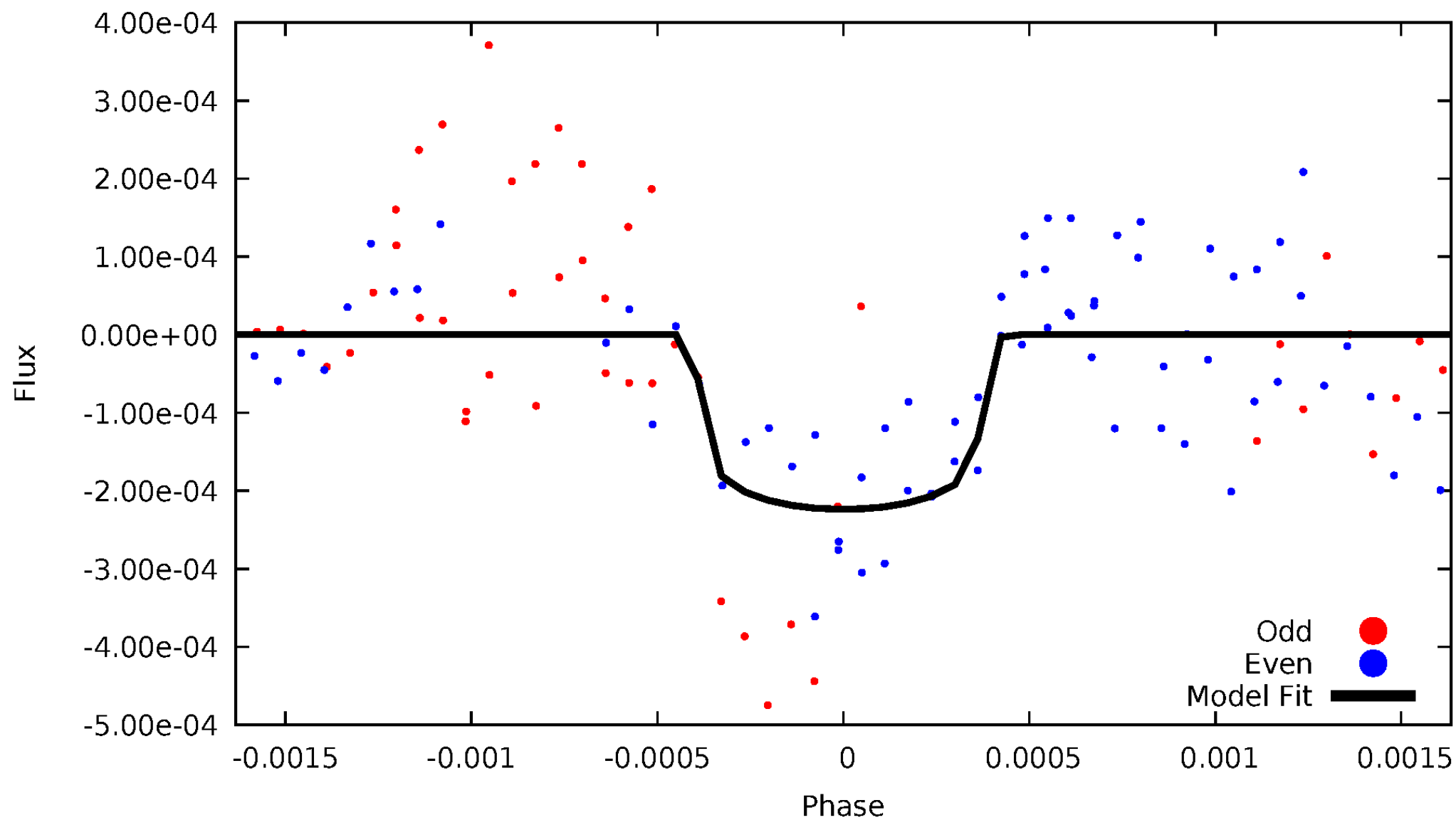


TCE 010648728-02



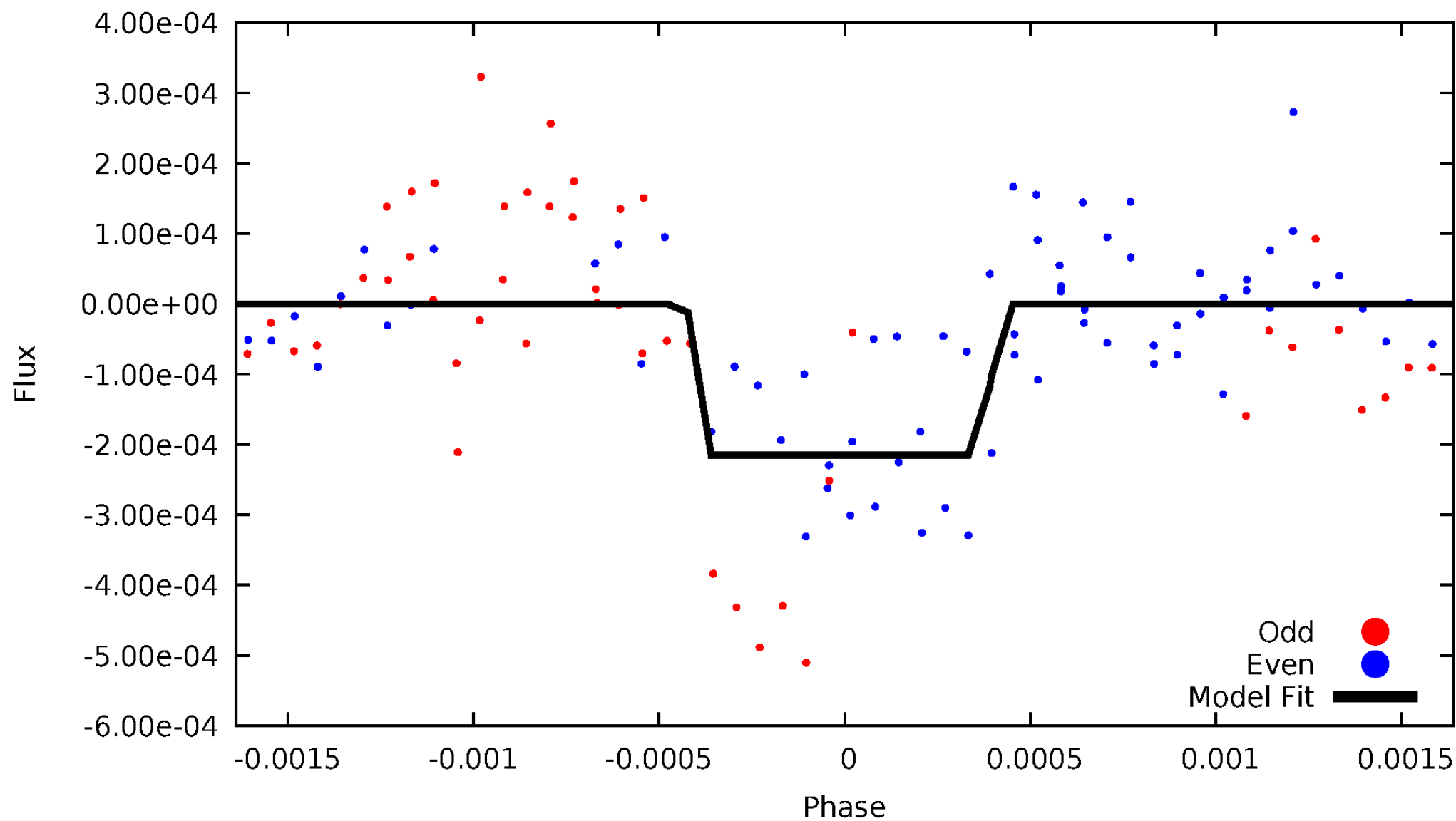
DV Odd/Even

TCE 010648728-02



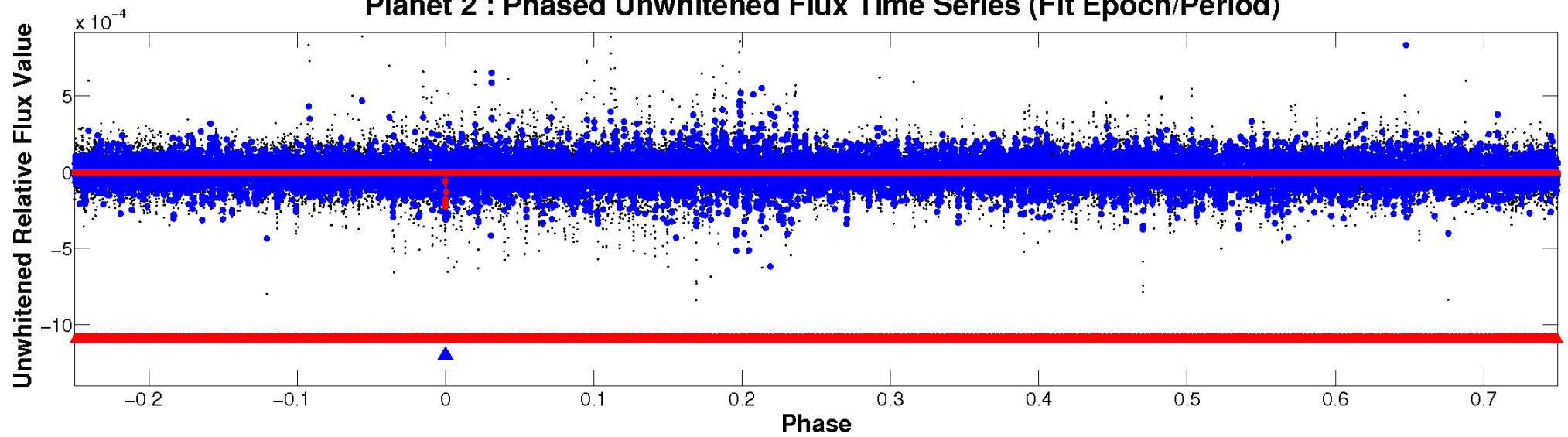
ALT Odd/Even

TCE 010648728-02

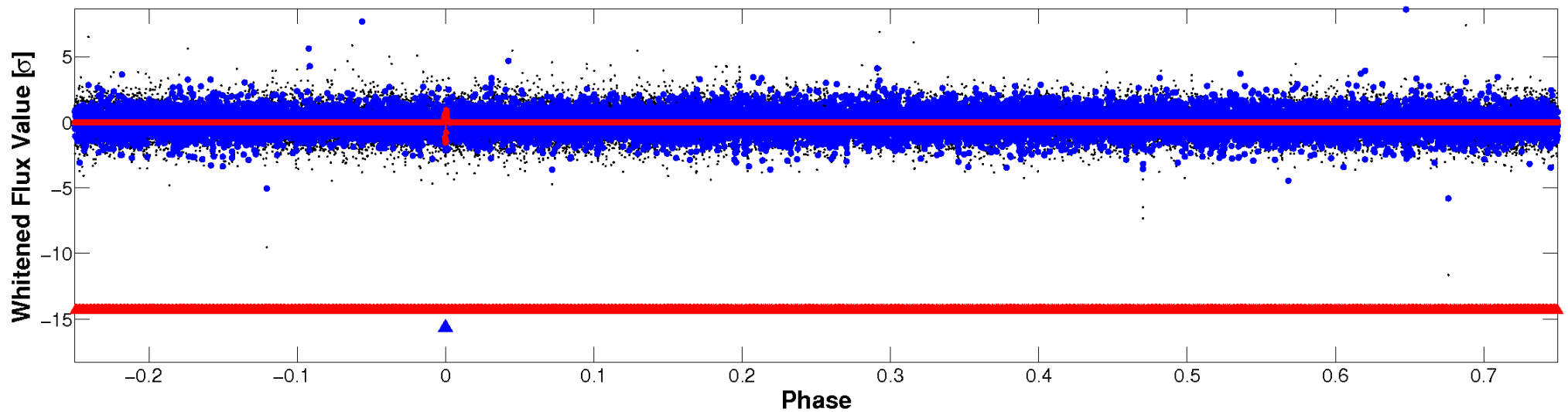


Non-Whitened Vs. Whitened Light Curve

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

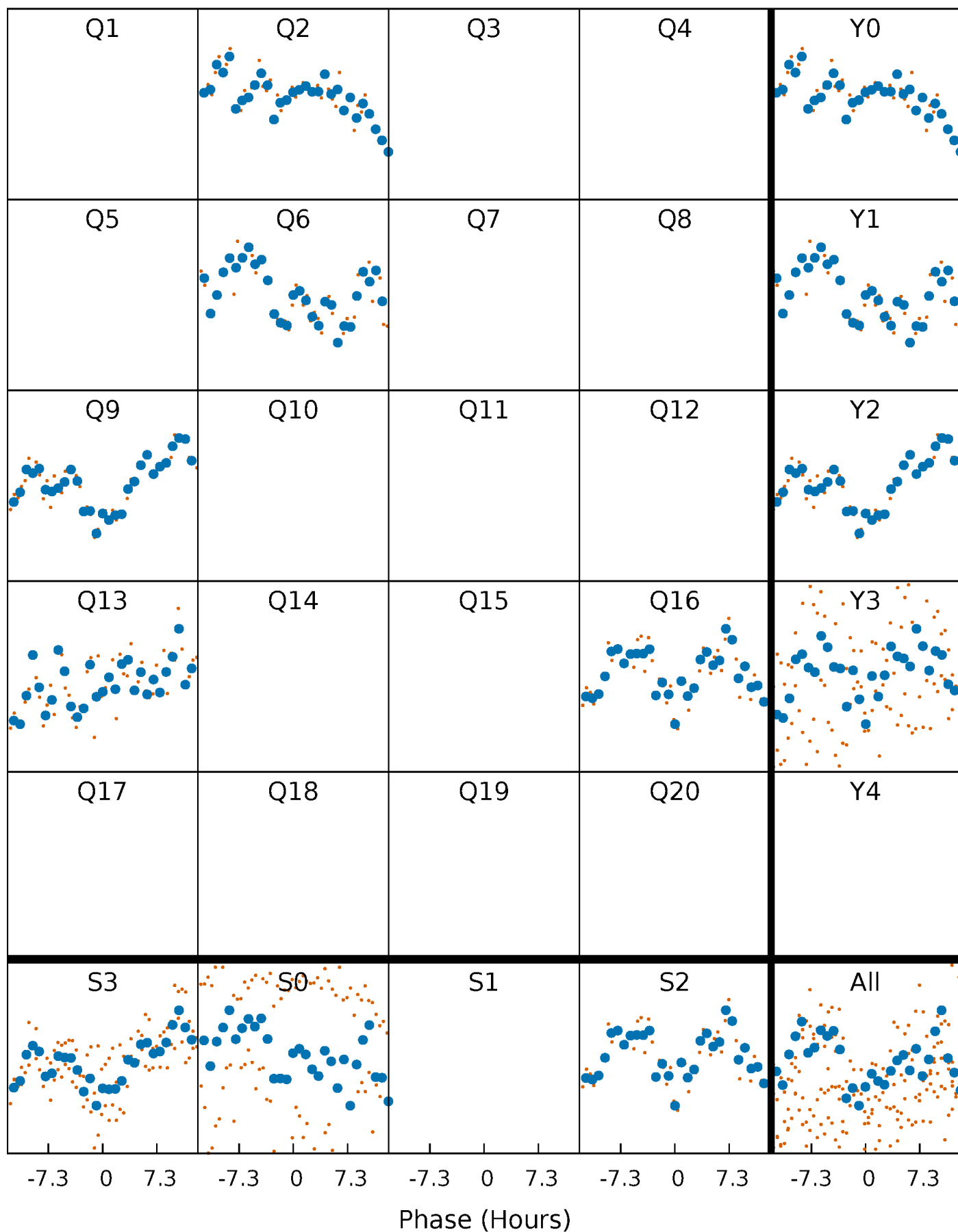


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



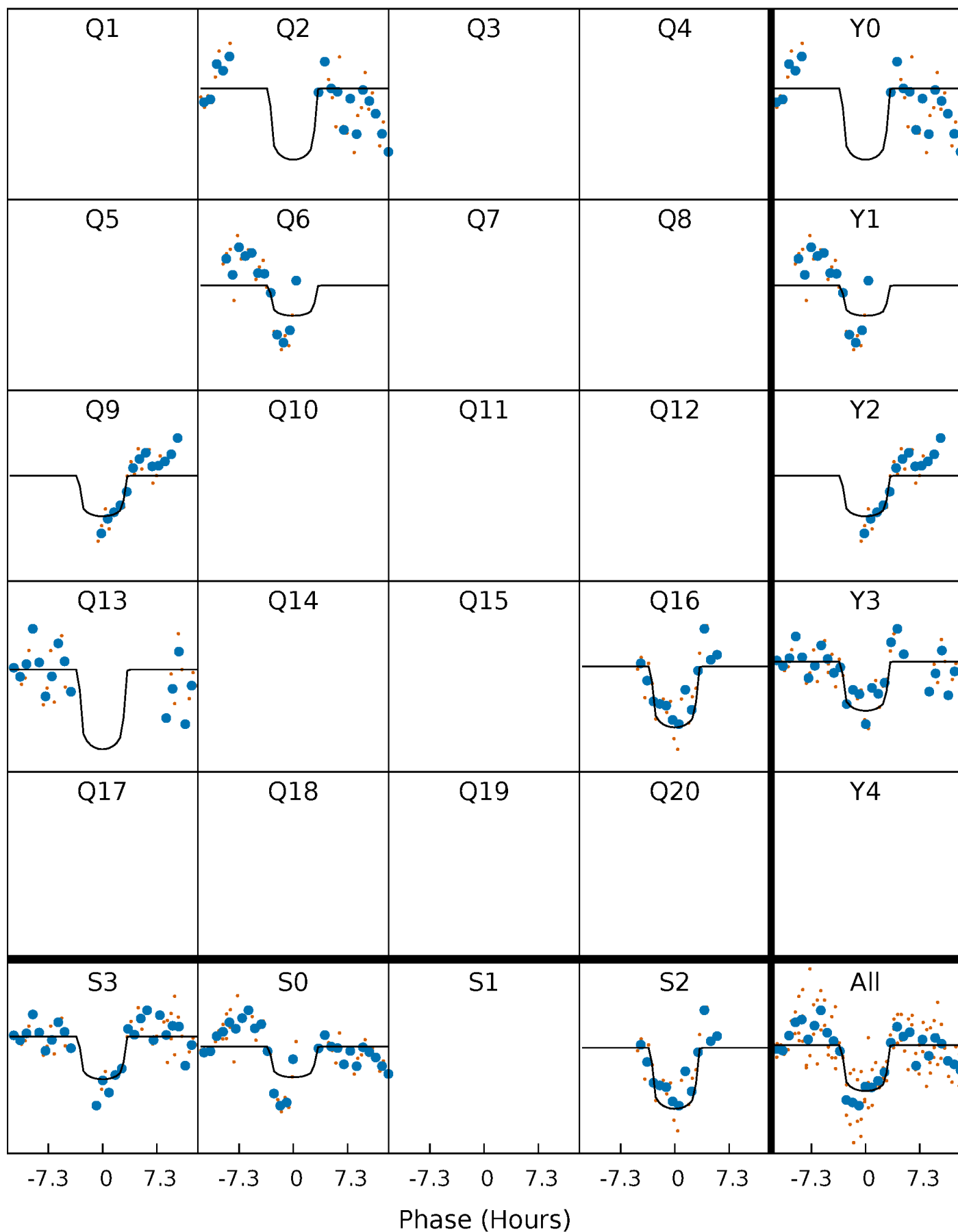
PDC Quarter-Phased Transit Curves

TCE 010648728-02 $P=326.752158$ Days $T_0=225.065238$ (BKJD)



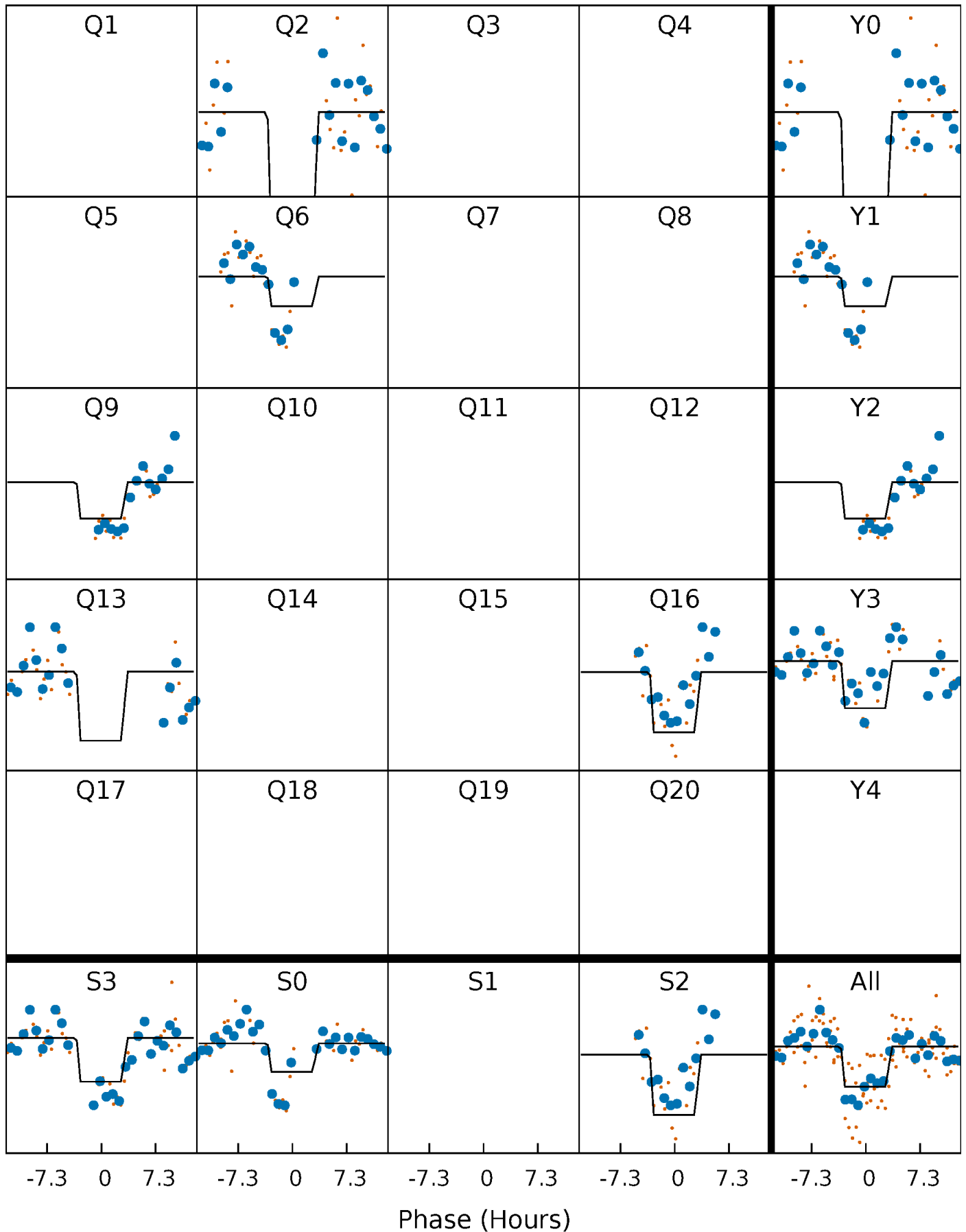
DV Quarter-Phased Transit Curves

TCE 010648728-02 $P=326.752158$ Days $T_0=225.065238$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

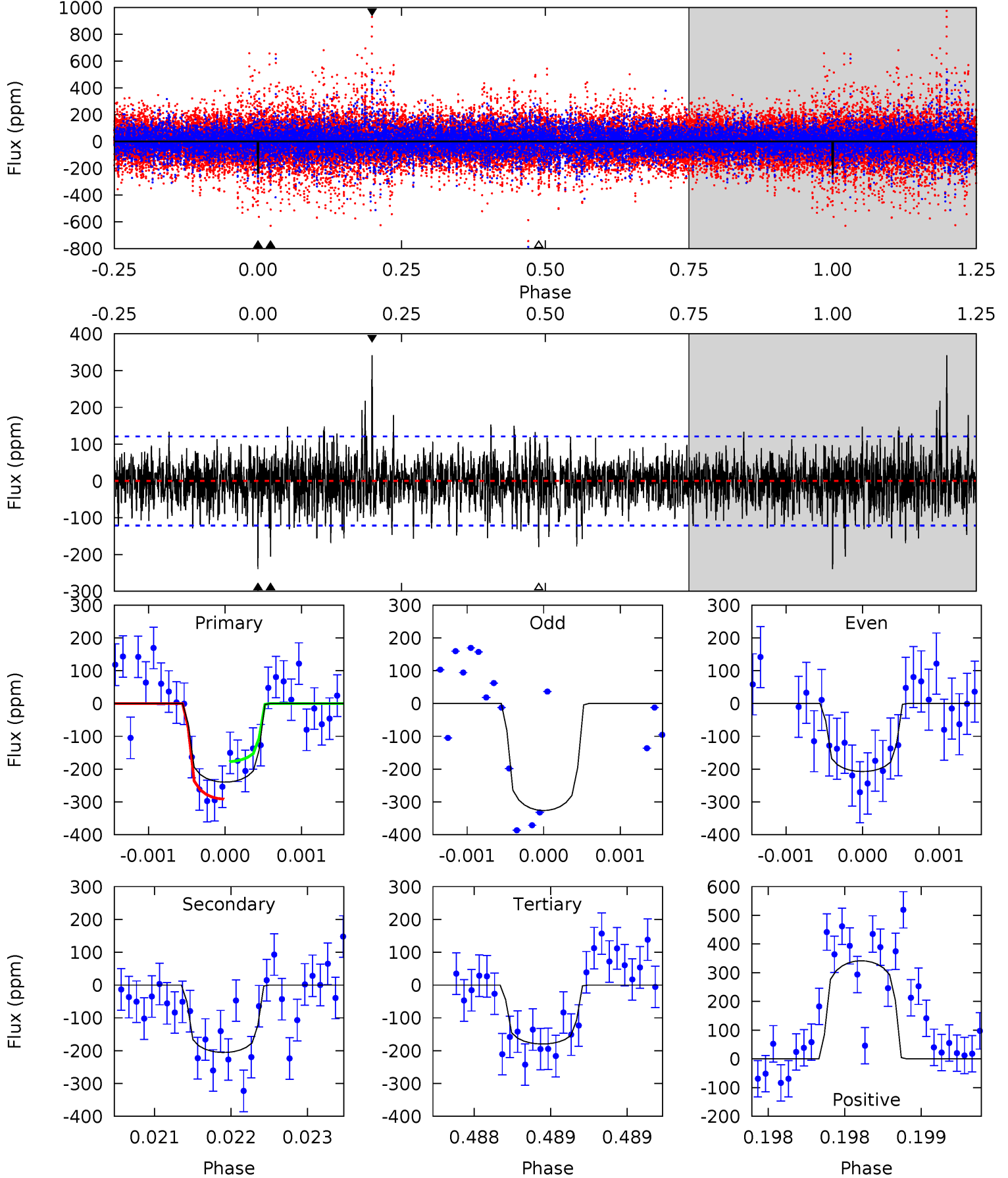
TCE 010648728-02 P=326.753058 Days $T_0=225.072702$ (BKJD)



DV Model-Shift Uniqueness Test

010648728-02, P = 326.752158 Days, E = 225.065238 Days

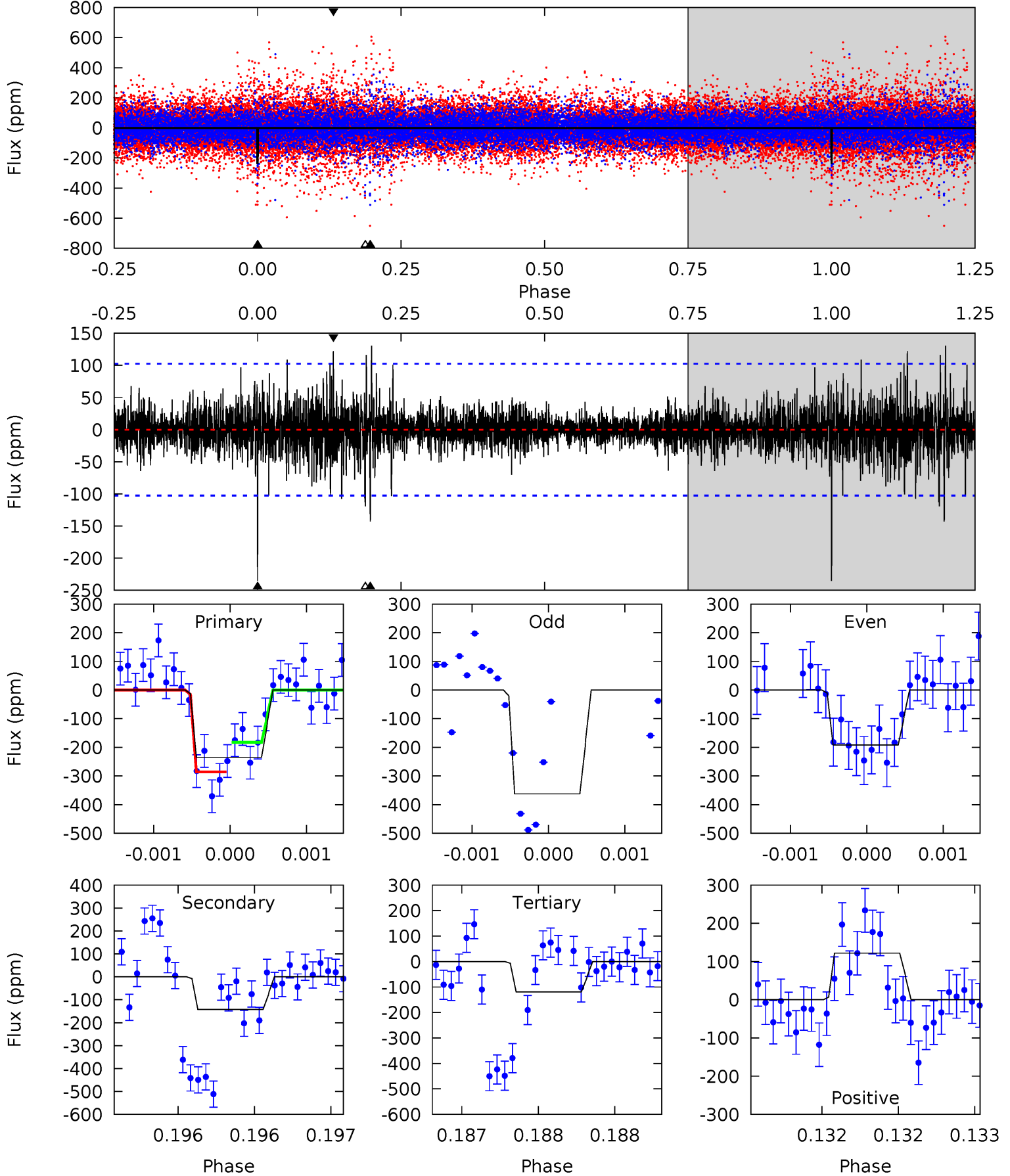
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	9.31	8.14	15.5	5.49	3.35	2.12	2.73	-4.62	1.17	-6.17	2.15	1.00	0.59	2.58



Alt Model-Shift Uniqueness Test

010648728-02, P = 326.753058 Days, E = 225.072702 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.6	7.63	6.38	6.53	5.49	3.35	1.22	6.21	6.05	1.26	1.10	3.58	0.92	0.36	2.77



Stellar Parameters For KIC 010648728

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6911^{+163}_{-245}	$3.736^{+0.312}_{-0.078}$	$-0.420^{+0.300}_{-0.250}$	$2.711^{+0.429}_{-0.929}$	$1.459^{+0.231}_{-0.282}$	$0.103^{+0.237}_{-0.027}$
	+2%/-4%	+8%/-2%	+71%/-60%	+16%/-34%	+16%/-19%	+230%/-26%
Source	PHO1	FLK73	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 010648728-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-206 ± 22	$4.27^{+1.56}_{-1.33}$	668^{+35}_{-60}	6592^{+1345}_{-830}	7067^{+7933}_{-3420}
Alt.	-143 ± 19	$3.98^{+1.47}_{-1.39}$	662^{+42}_{-58}	6197^{+1477}_{-799}	5631^{+7449}_{-2695}

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

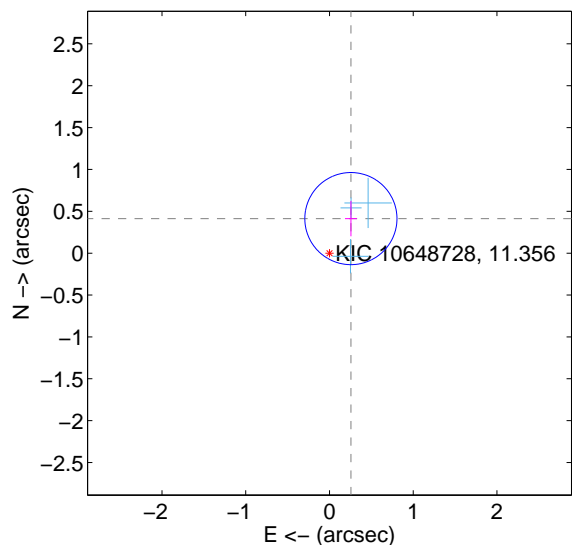
Supplemental centroid analysis for 010648728-02. **Kepler magnitude: 11.36.** Transit SNR 7.65

There are 3 quarters with good PRF difference image offsets

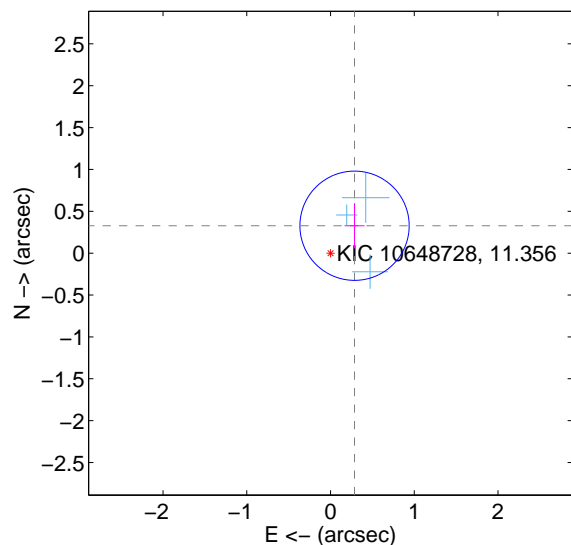
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.486 ± 0.183	2.65	-0.256 ± 0.071	0.413 ± 0.211
PRF-fit source offset from KIC position	0.436 ± 0.217	2.00	-0.287 ± 0.120	0.328 ± 0.269
photometric centroid source offset	0.67 ± 0.58	1.16	-0.31 ± 0.57	-0.60 ± 0.58

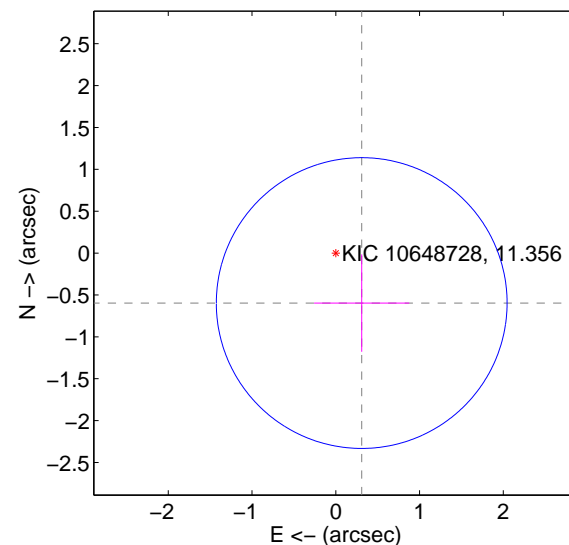
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

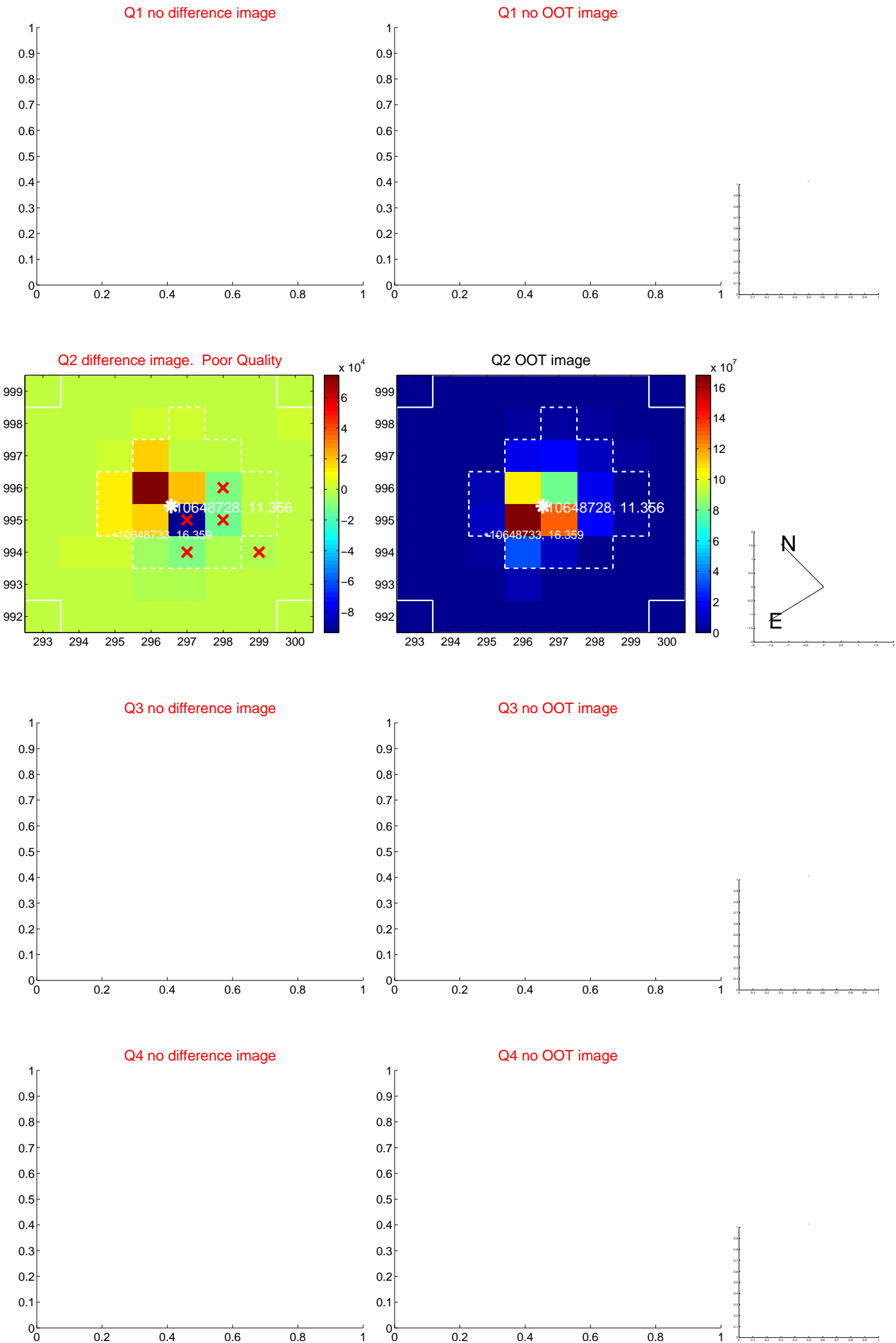


offset from photometric centroids

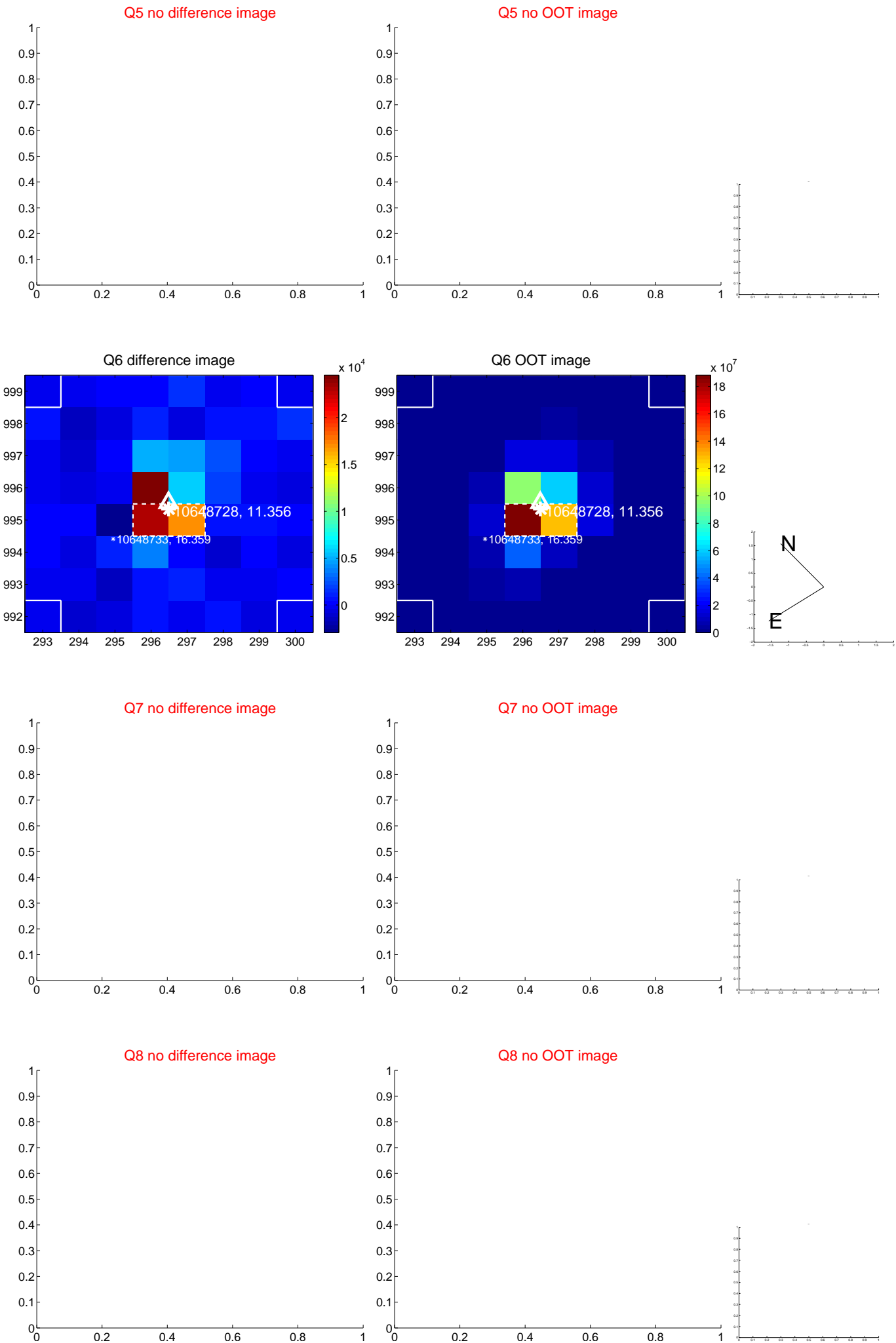


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

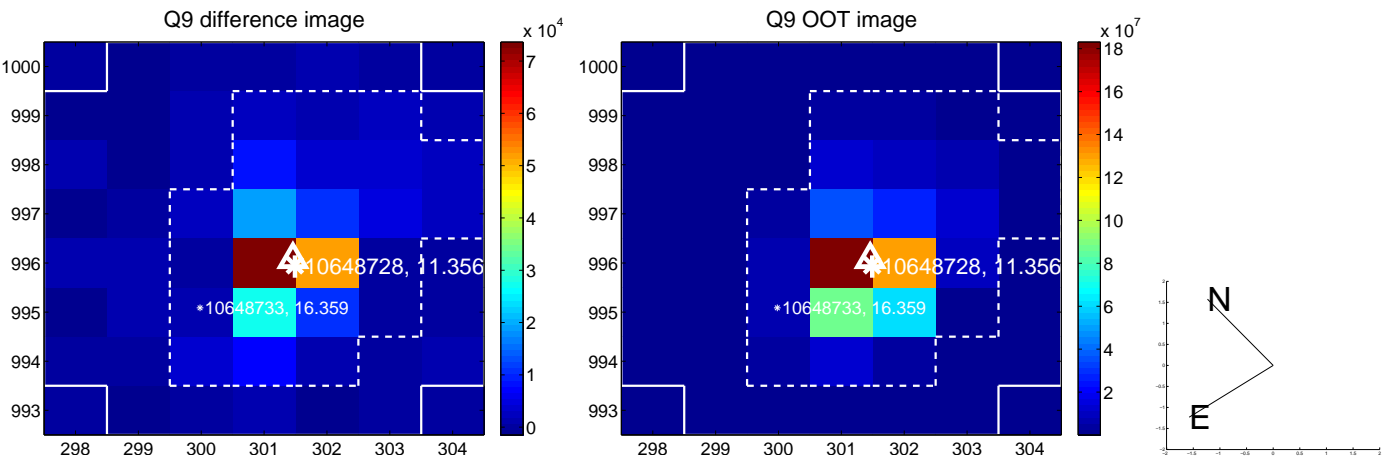
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



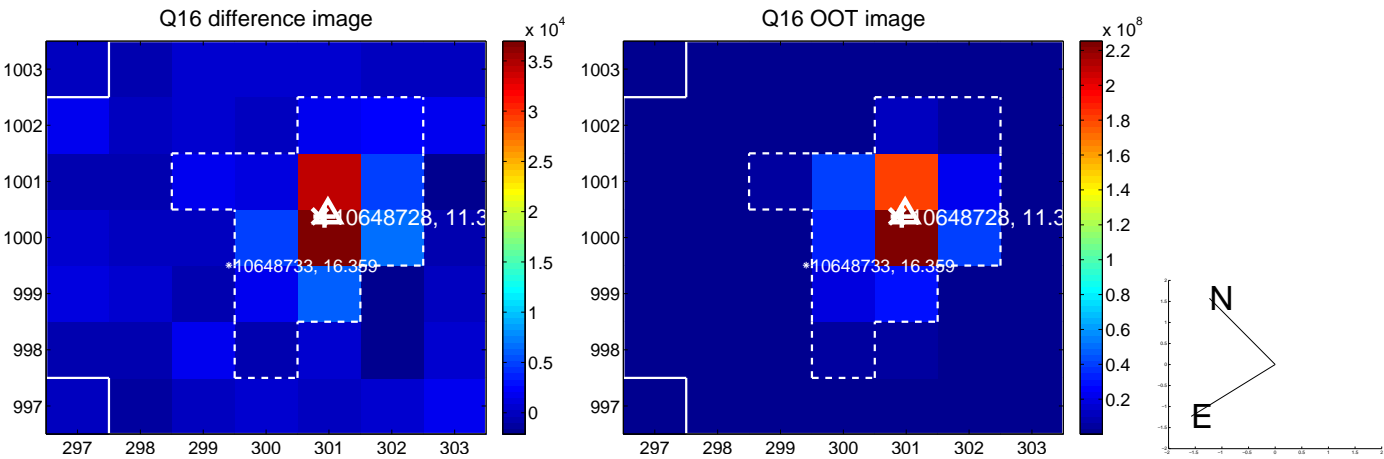
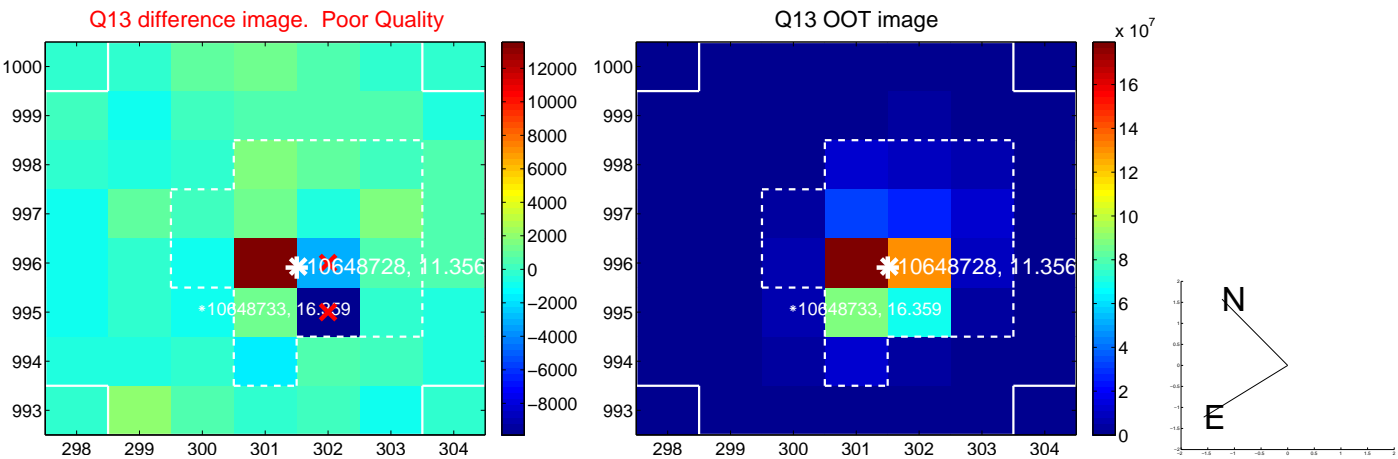
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



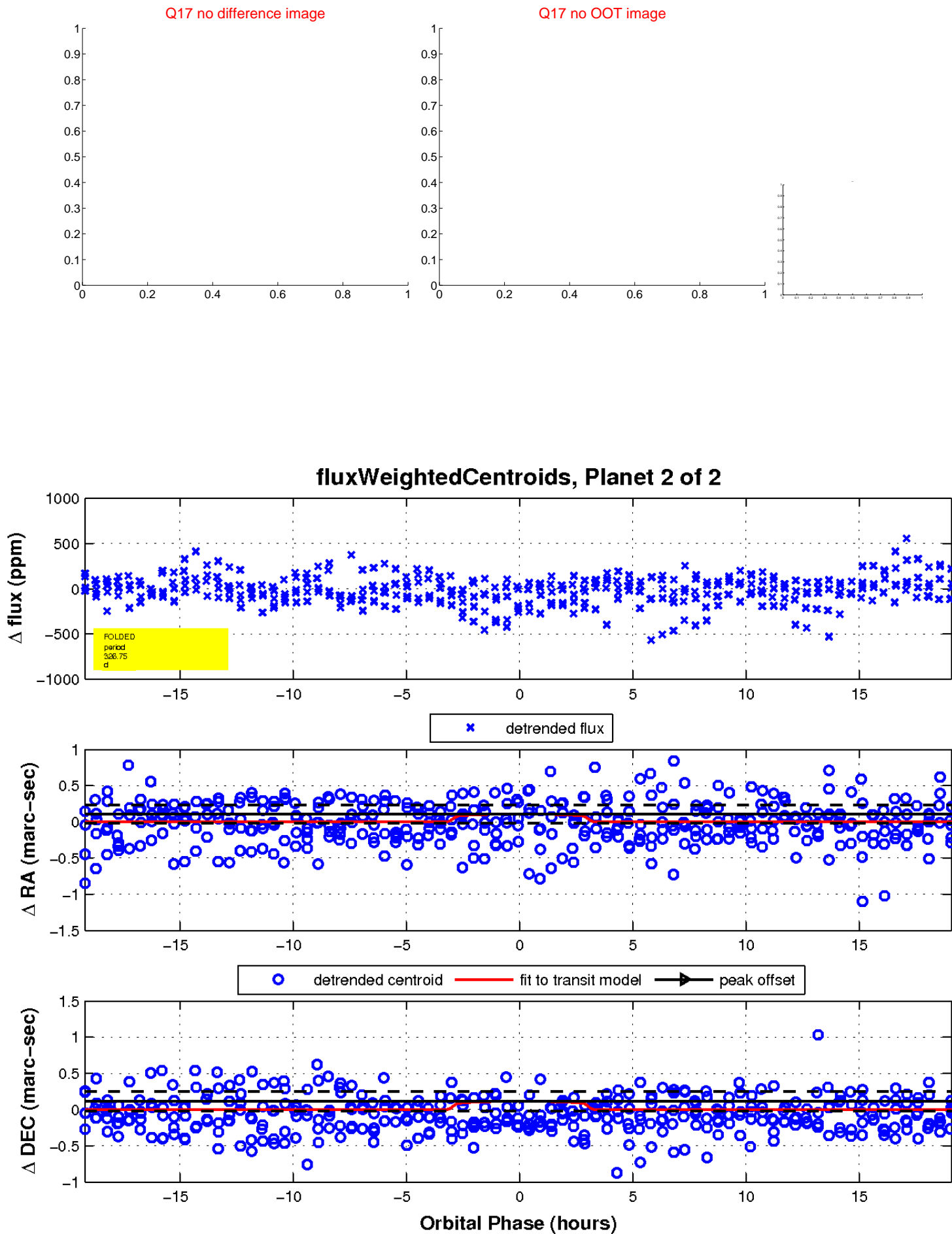
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

