

KIC 002708445

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})
002708445-01	OBS	6288.01	1.891265	132.690976	59.6	6.830	8.1	5.1	6.86	5086	6.30	0.00
002708445-02	OBS	No	239.502428	297.986280	984.2	12.129	8.0	8.3	6.86	5086	22.27	58.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002708445-01	OBS	FP	0.00	0	0	1	1	PLANET_IN_STAR—CENT_UNRESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
002708445-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE

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.

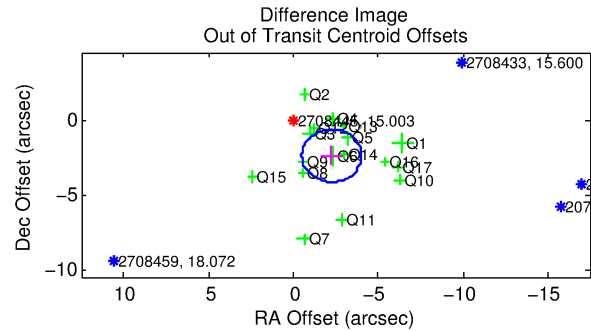
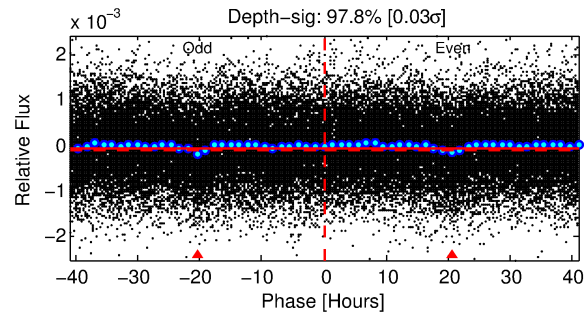
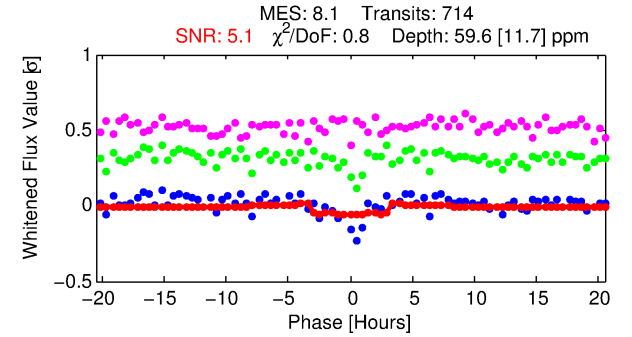
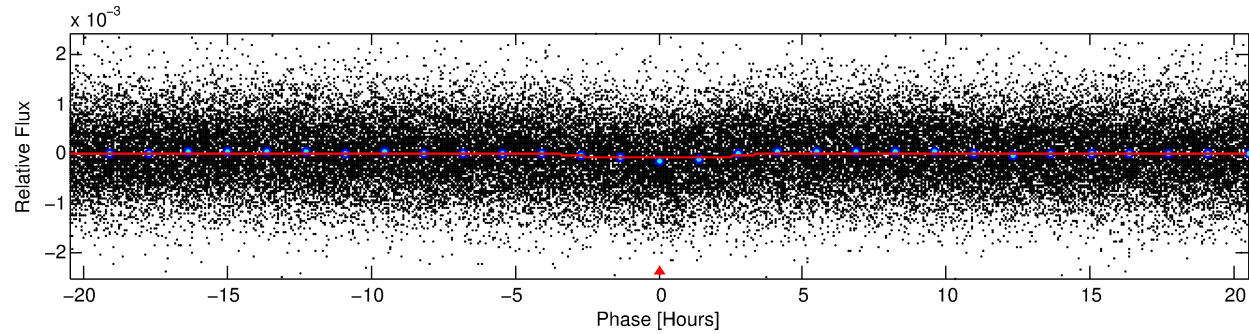
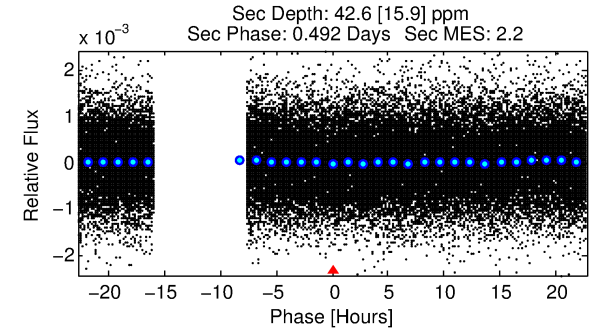
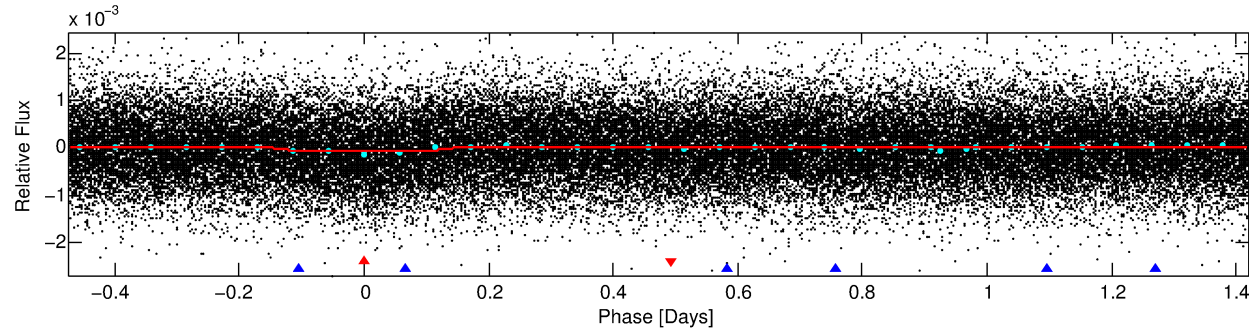
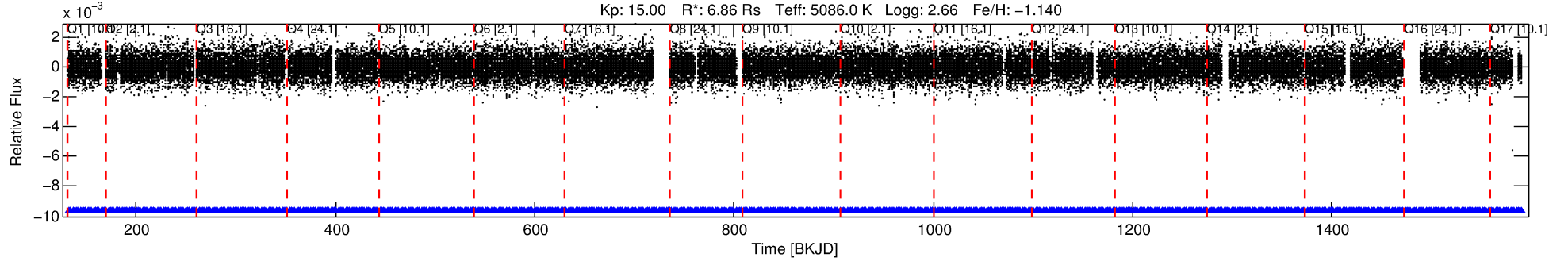
Ephemeris Match Information For 002708445-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
002708445-01	2708445	6286.01	2708156	1:1	198.1	25	43	10.67	15.00	10682.00	Direct-PRF	0	0.14	0.44

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 2708445 Candidate: 1 of 2 Period: 1.891 d
KOI: K06288.01 Corr: 0.849



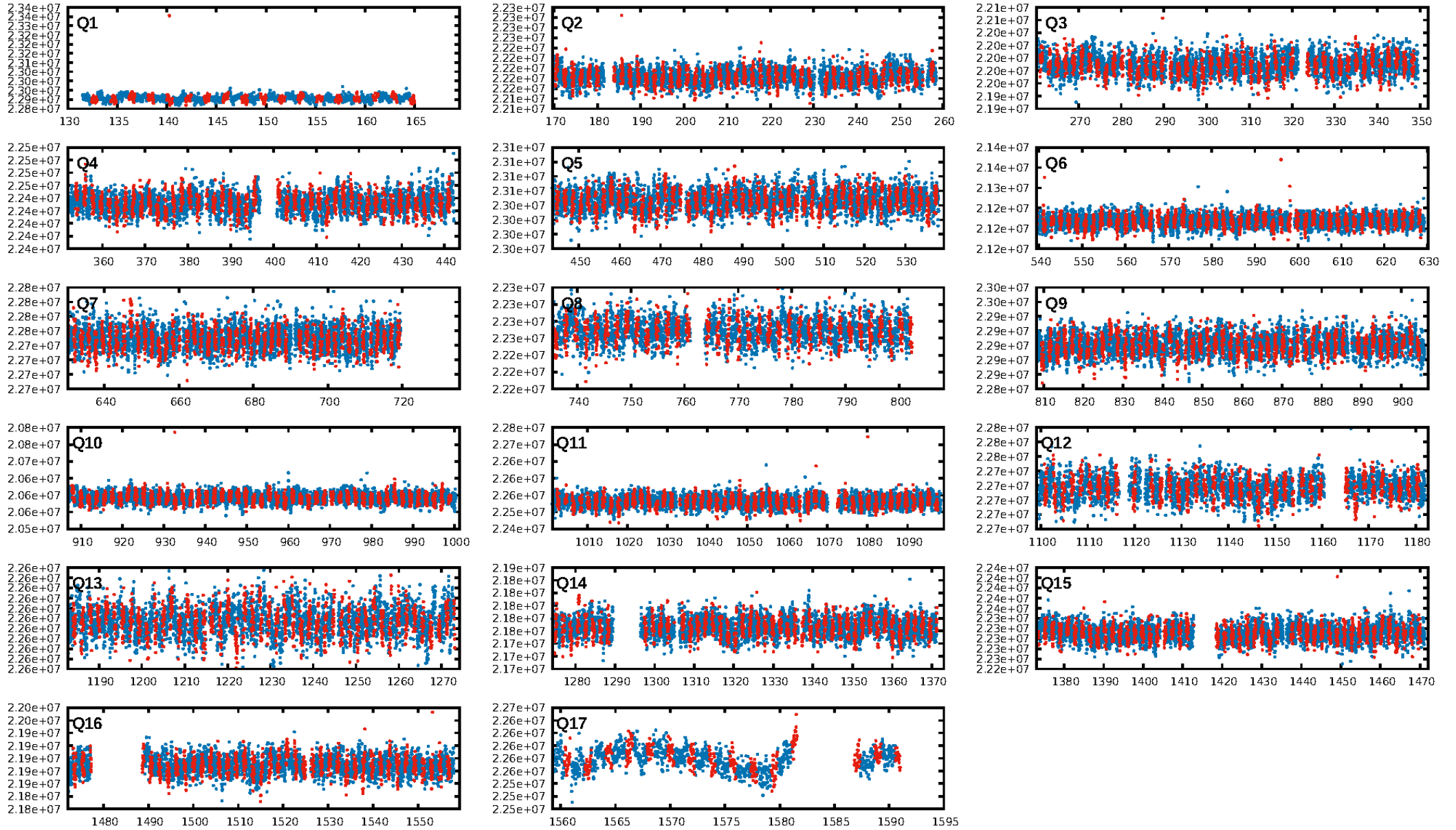
DV Fit Results:

Period = 1.89126 [0.00004] d
Epoch = 132.6910 [0.0080] BKJD
Rp/R* = 0.0084 [0.0036]
a/R* = 1.34 [1.17]
b = 0.90 [0.42]
Self = N/A
Teq = N/A
Rp = 6.30 [3.02] Re
a = N/A
Ag = N/A
Teffp = N/A

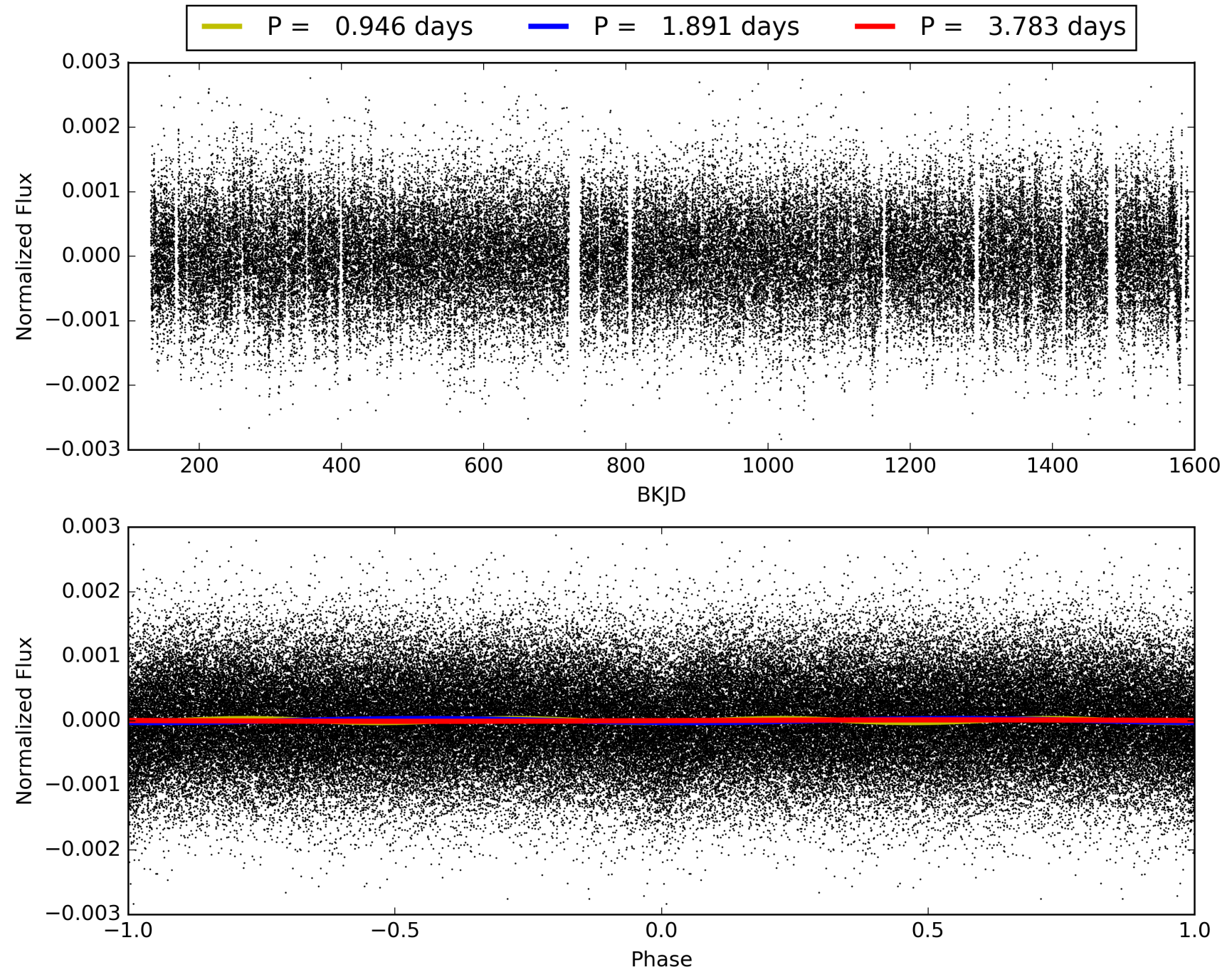
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [409.67σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.41e-10
RollingBand-fgt: 1.00 [681/681]
GhostDiagnostic-chr: -0.116
Centroid-sig: 0.0%
Centroid-so: 4.422 arcsec [3.76σ]
OotOffset-rm: 3.293 arcsec [5.61σ]
KicOffset-rm: 3.324 arcsec [6.07σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.06 [1/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 002708445-01, PDC Light Curves

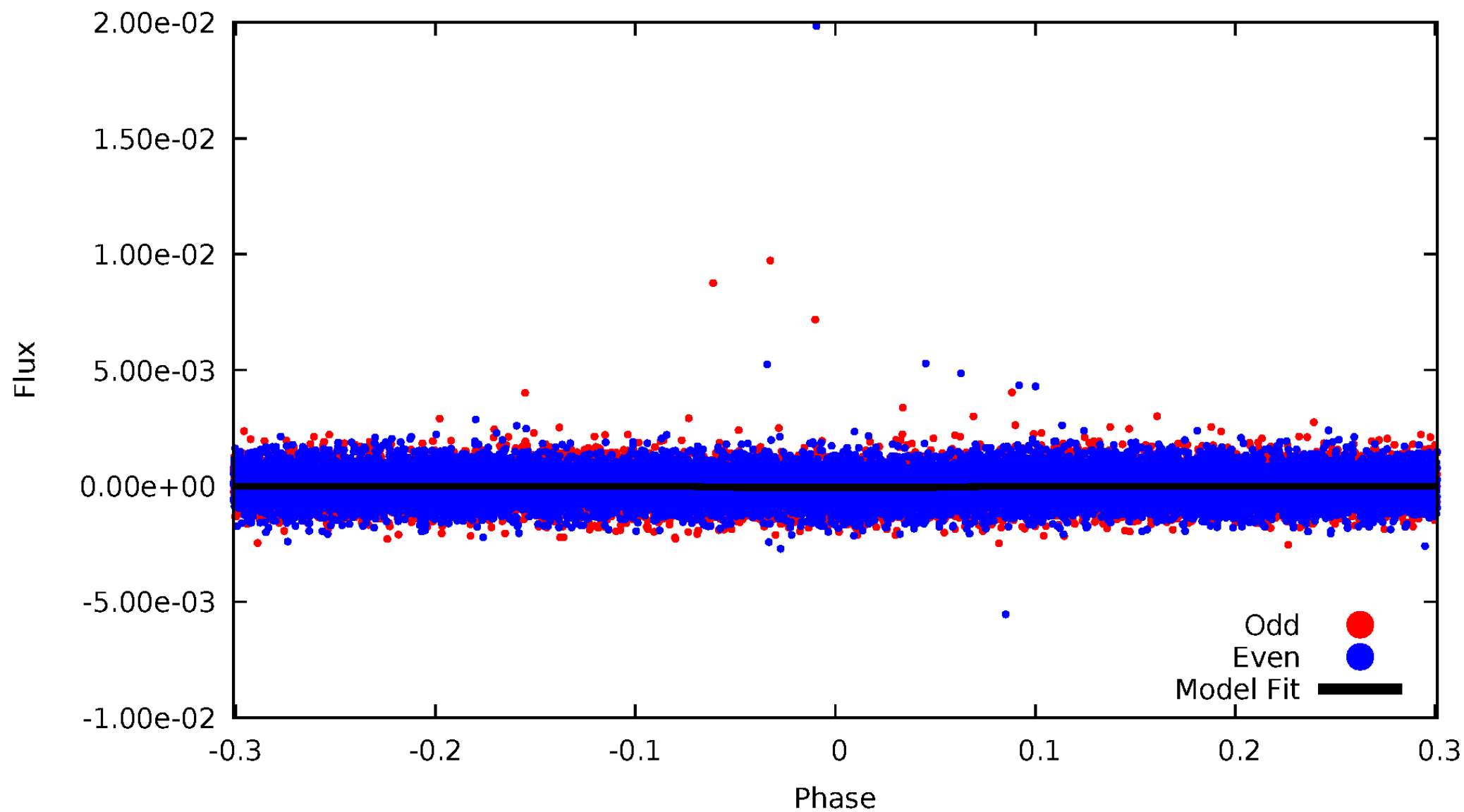


TCE 002708445-01



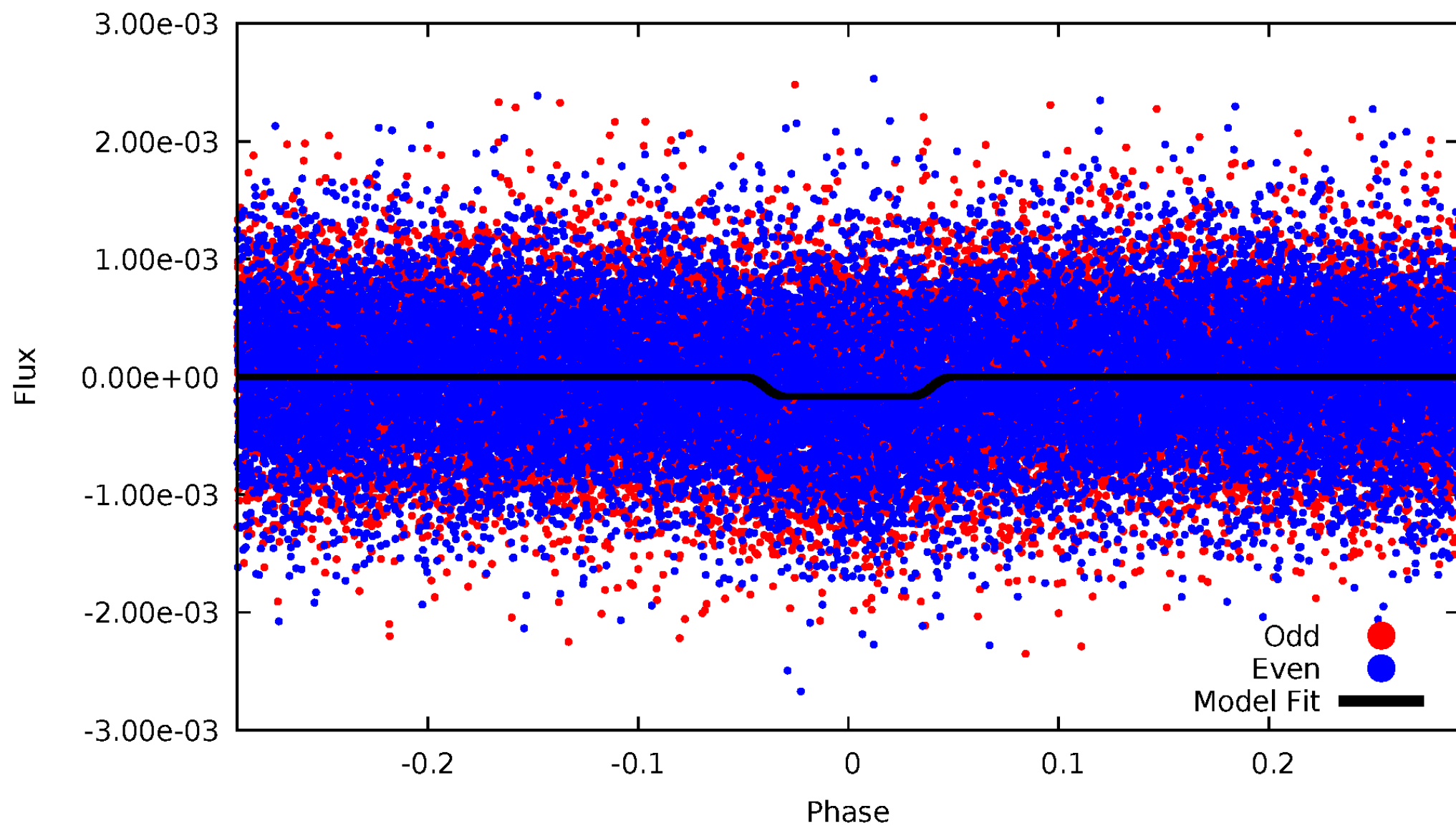
DV Odd/Even

TCE 002708445-01

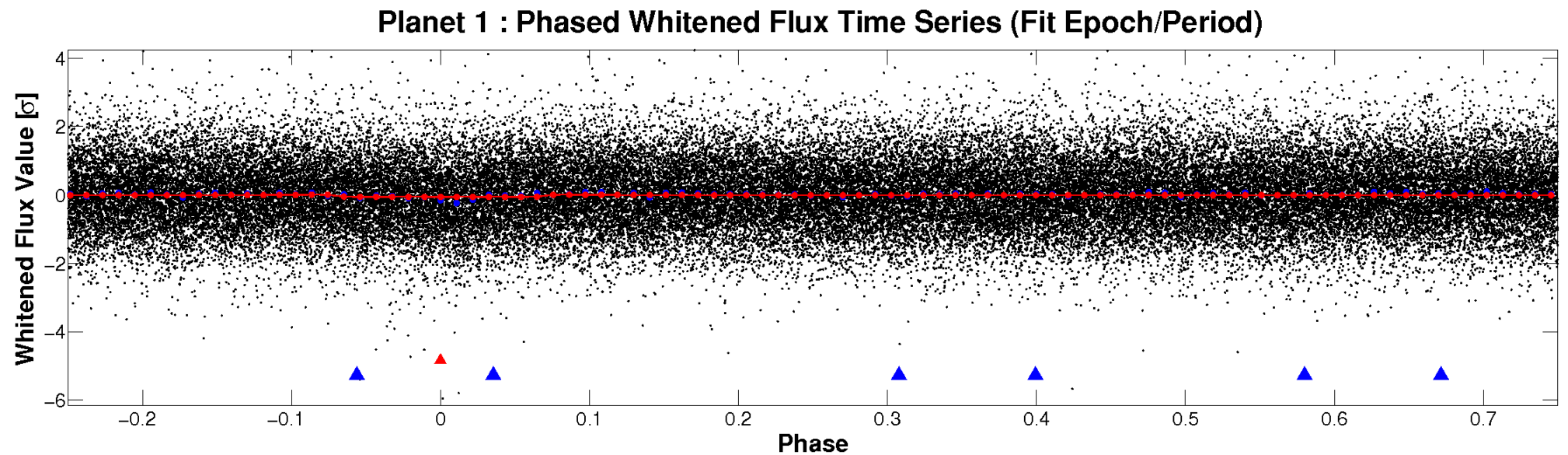
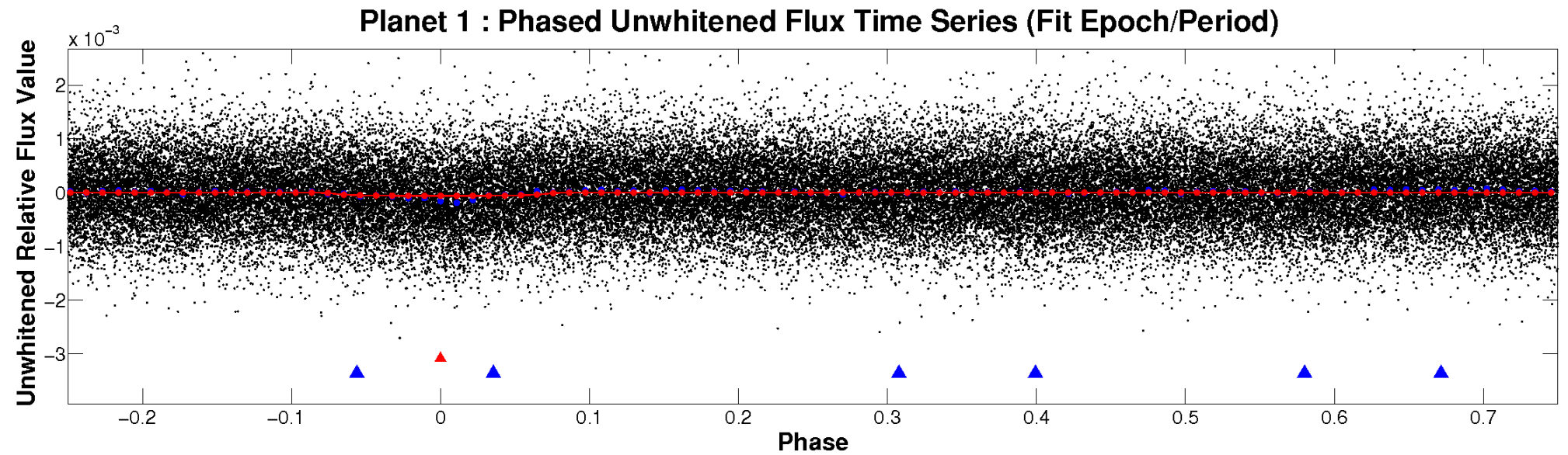


ALT Odd/Even

TCE 002708445-01

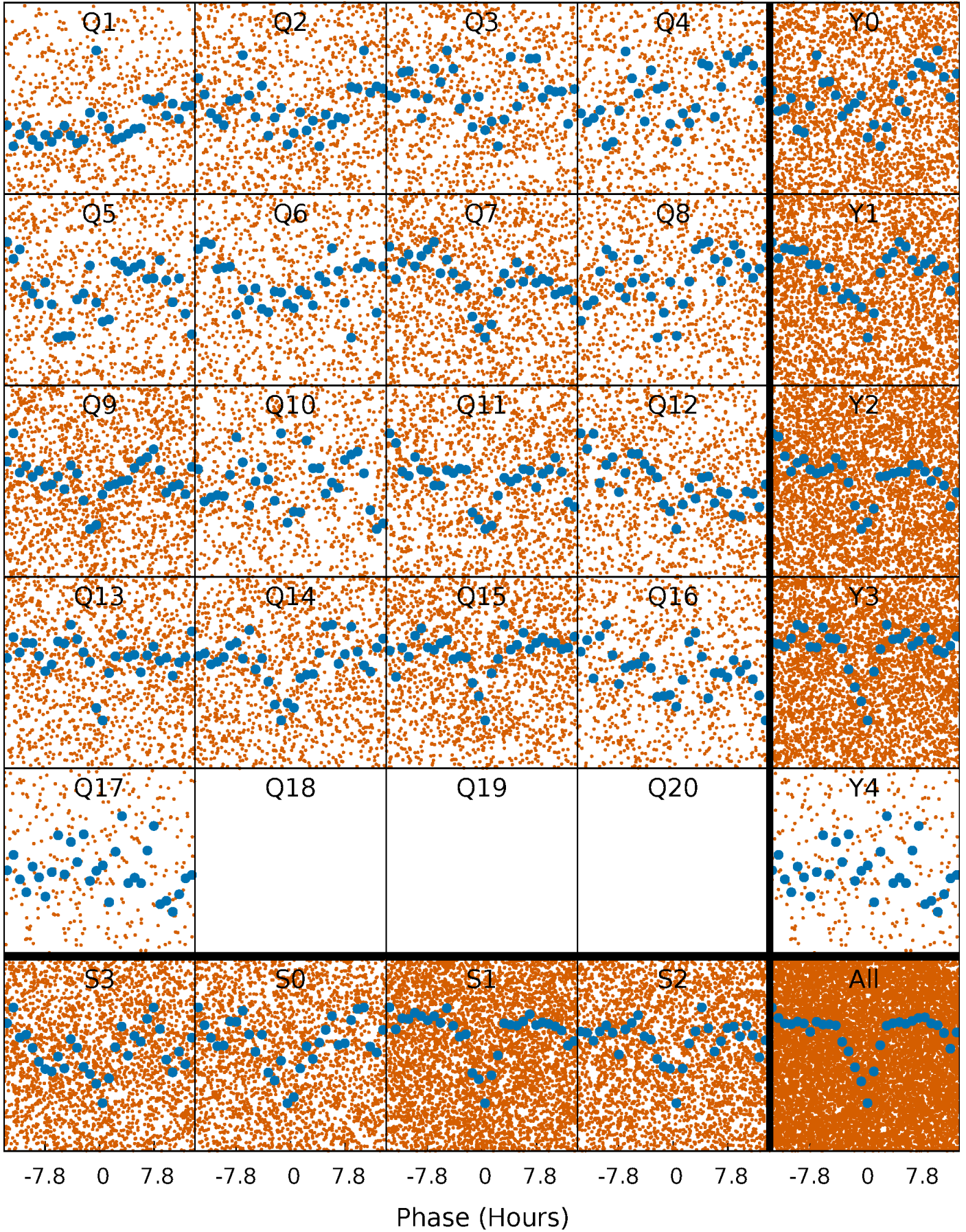


Non-Whitened Vs. Whitened Light Curve



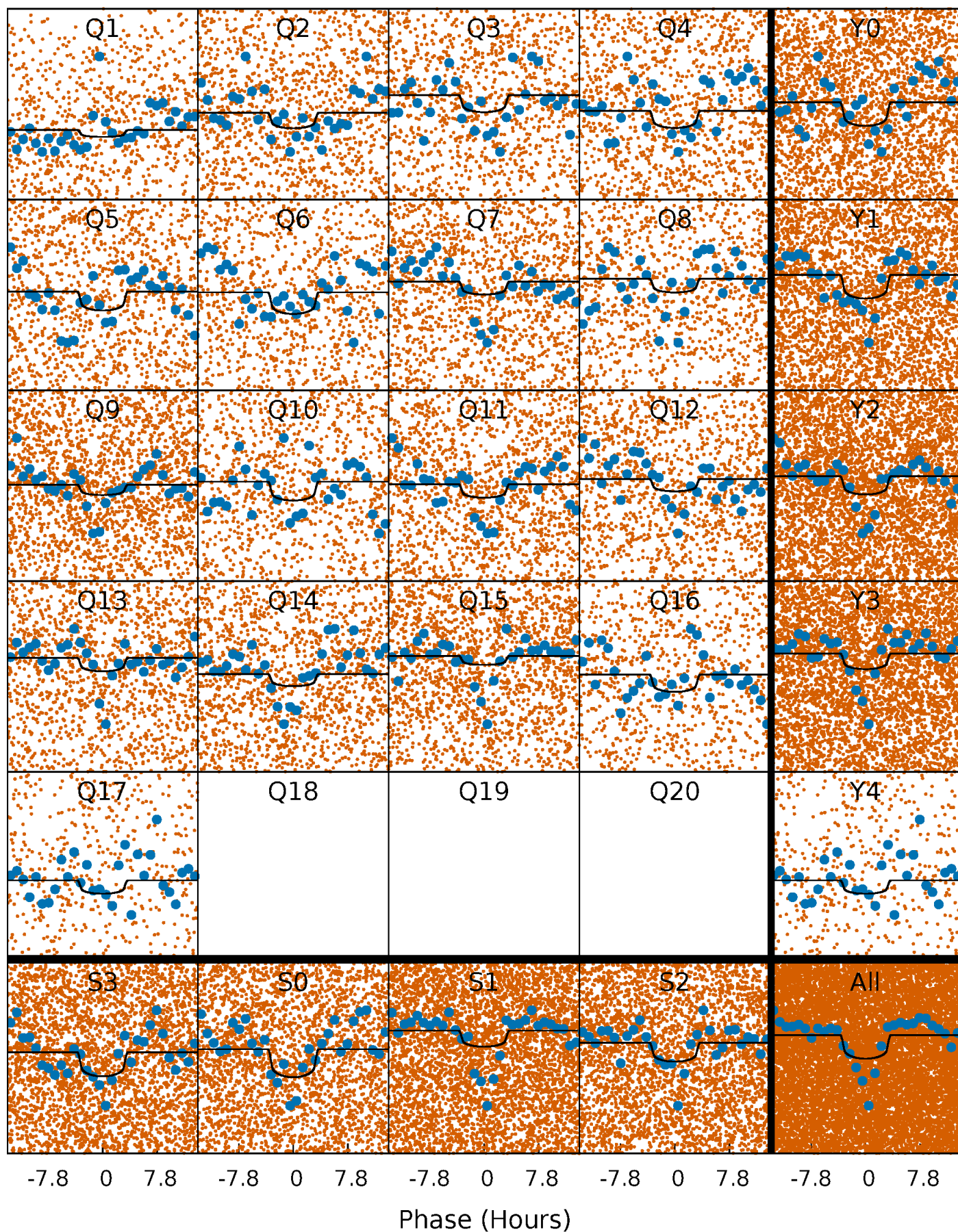
PDC Quarter-Phased Transit Curves

TCE 002708445-01 P= 1.891265 Days $T_0=132.690976$ (BKJD)



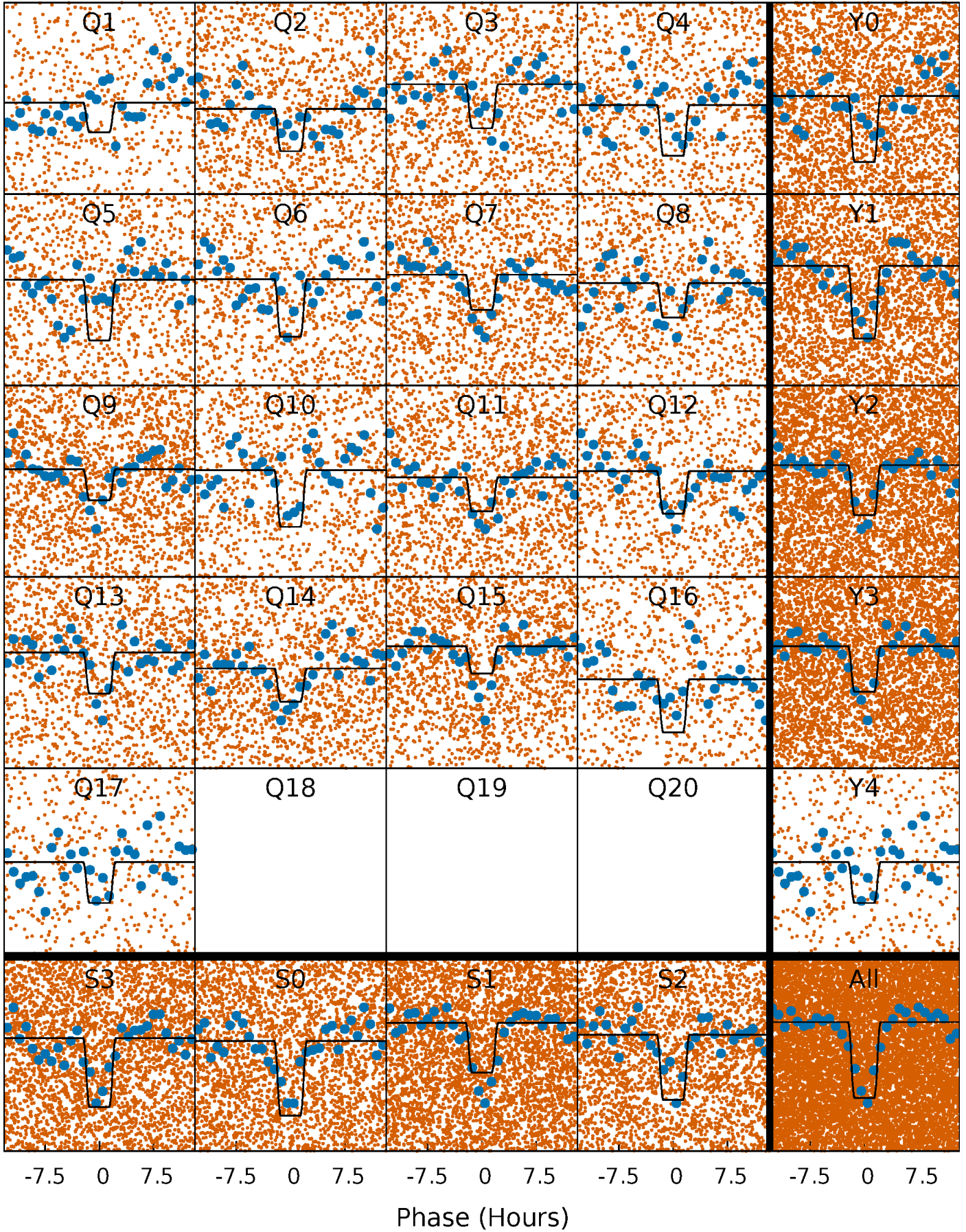
DV Quarter-Phased Transit Curves

TCE 002708445-01 P= 1.891265 Days $T_0=132.690976$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

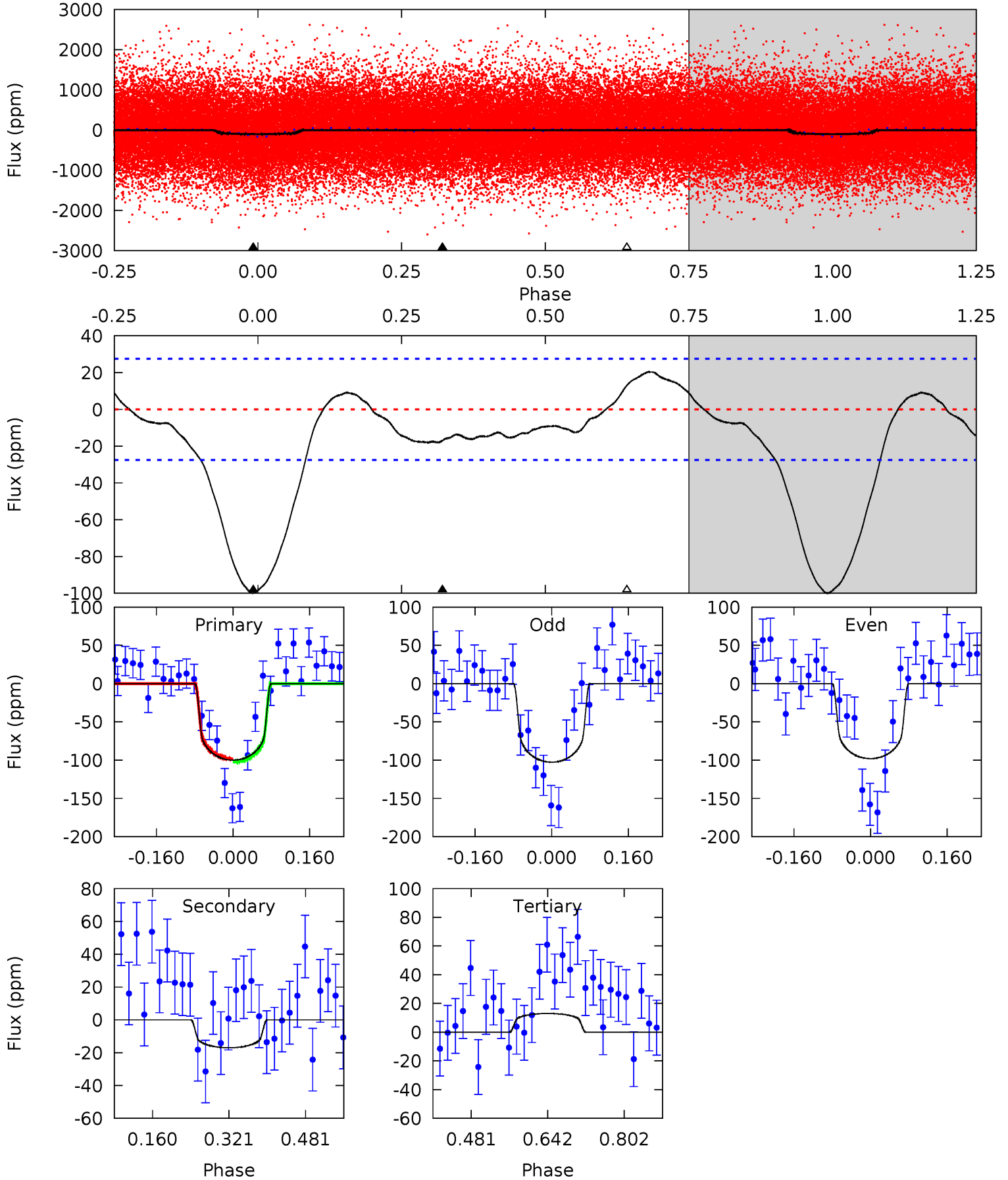
TCE 002708445-01 P= 1.891285 Days $T_0=132.676374$ (BKJD)



DV Model-Shift Uniqueness Test

002708445-01, P = 1.891265 Days, E = 130.799711 Days

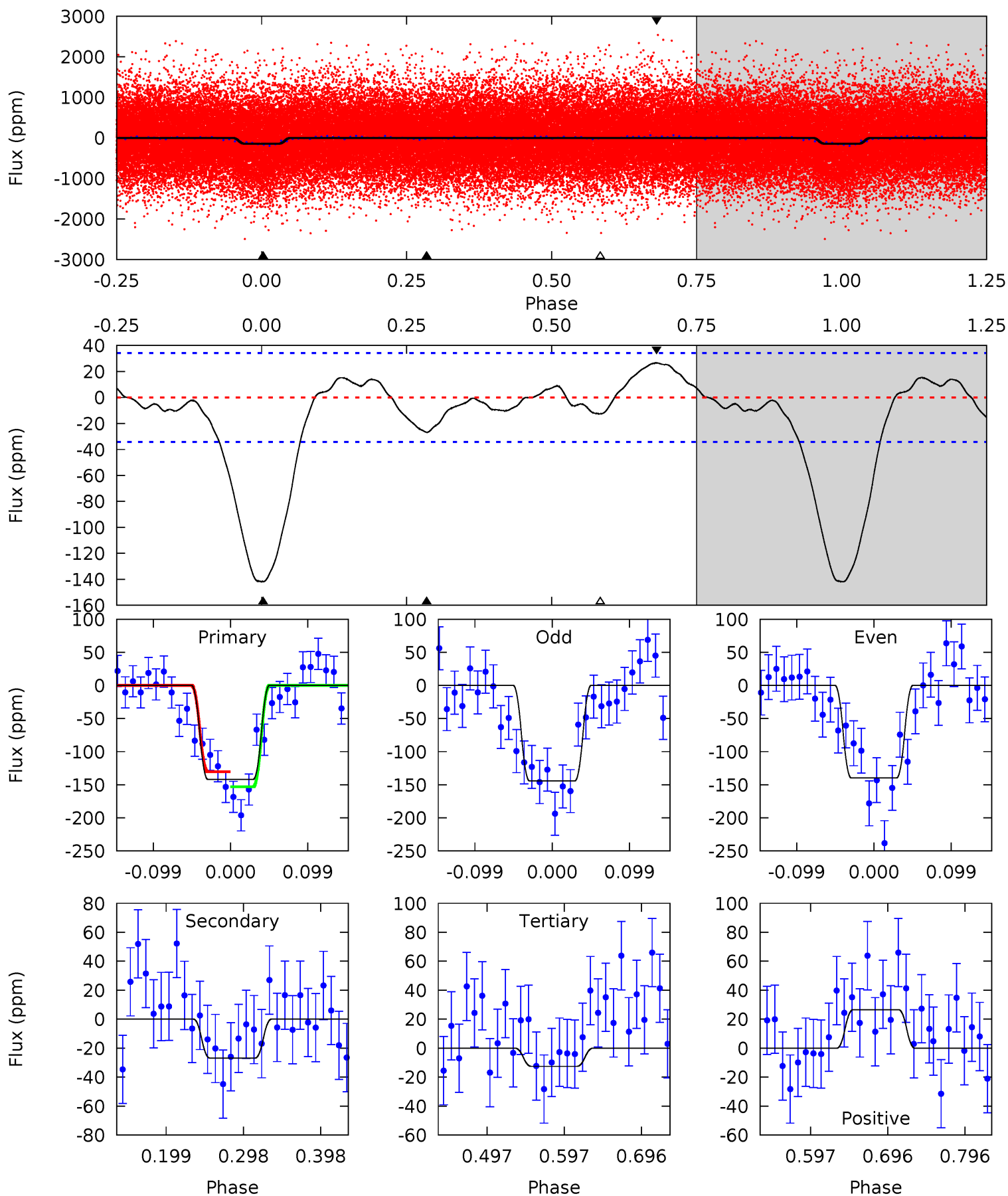
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.2	2.76	-2.12	0	4.46	1.40	1.77	18.4	16.2	4.88	2.76	0.38	1.05	0.17	0.33



Alt Model-Shift Uniqueness Test

002708445-01, P = 1.891285 Days, E = 130.785089 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.9	3.58	1.68	3.55	4.57	1.65	1.50	17.2	15.4	1.90	0.03	0.30	1.04	0.16	1.54



Stellar Parameters For KIC 002708445

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5086^{+143}_{-104}	$2.660^{+0.030}_{-0.030}$	$-1.140^{+0.300}_{-0.350}$	$6.860^{+1.569}_{-0.174}$	$0.784^{+0.371}_{-0.016}$	$0.003^{+0.000}_{-0.001}$
	+3%/-2%	+1%/-1%	+26%/-31%	+23%/-3%	+47%/-2%	+9%/-22%
Source	PHO1	AST71	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 002708445-01 / KOI 6288.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-17 ± 6	$6.38^{+2.73}_{-2.47}$	4940^{+155}_{-103}	-3648^{+7465}_{-399}	$0.173^{+0.295}_{-0.098}$
Alt.	-27 ± 7	$9.82^{+2.60}_{-2.63}$	4953^{+149}_{-127}	-3876^{+596}_{-209}	$0.117^{+0.121}_{-0.054}$

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 $A_{obs} \gg 1.0$

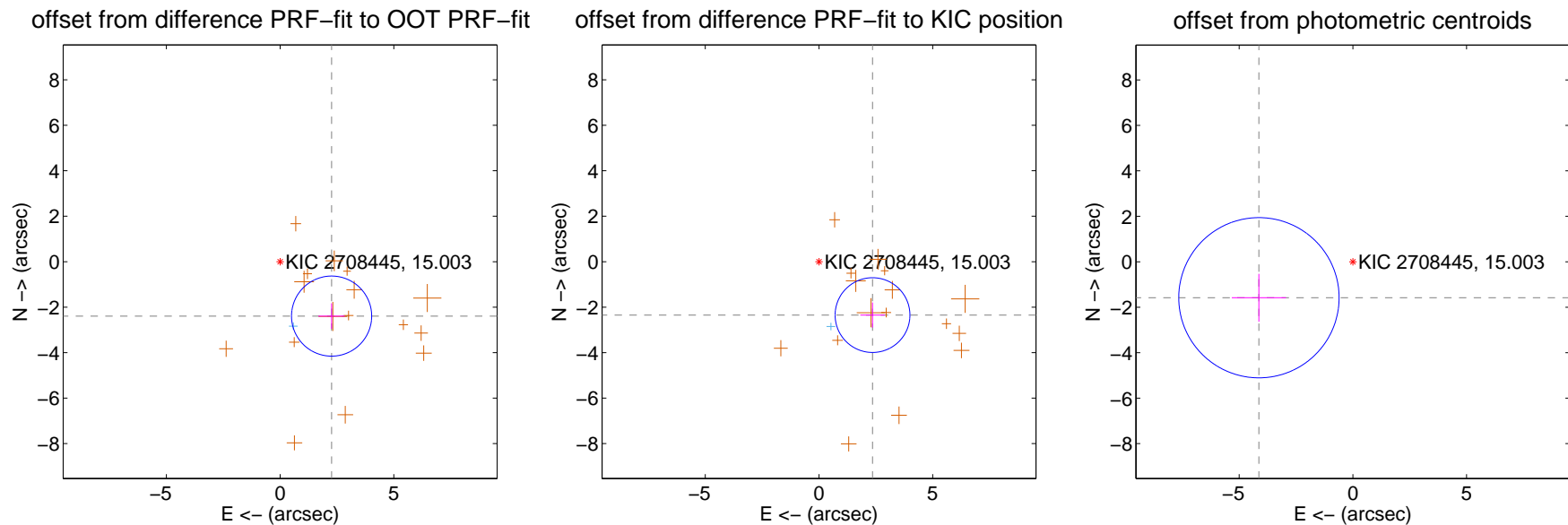
DV Centroid Data

Supplemental centroid analysis for 002708445-01. Kepler magnitude: 15.00. Transit SNR 5.06

There are 1 quarters with good PRF difference image offsets

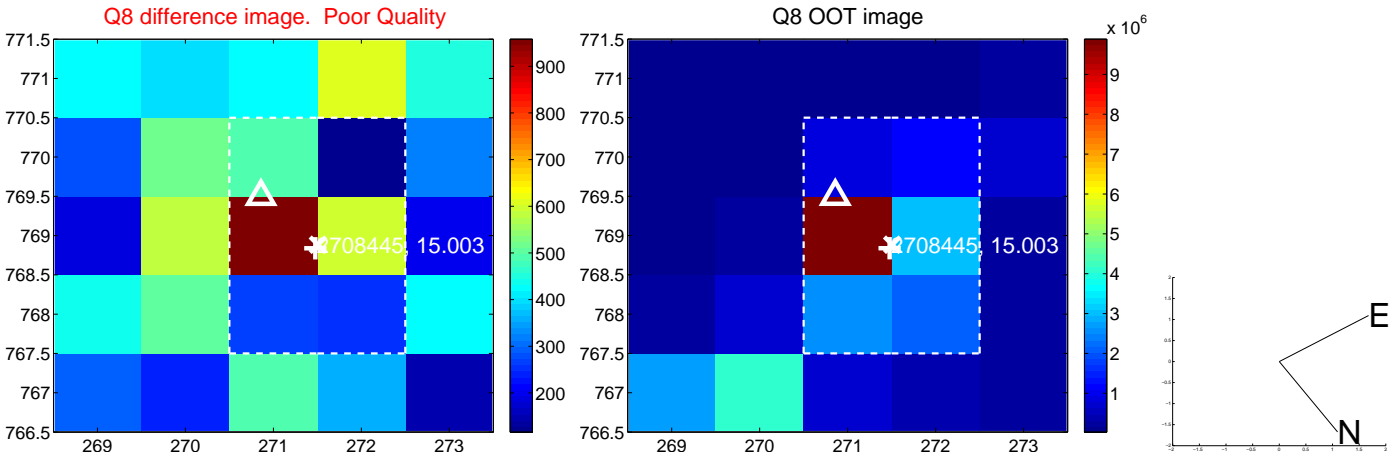
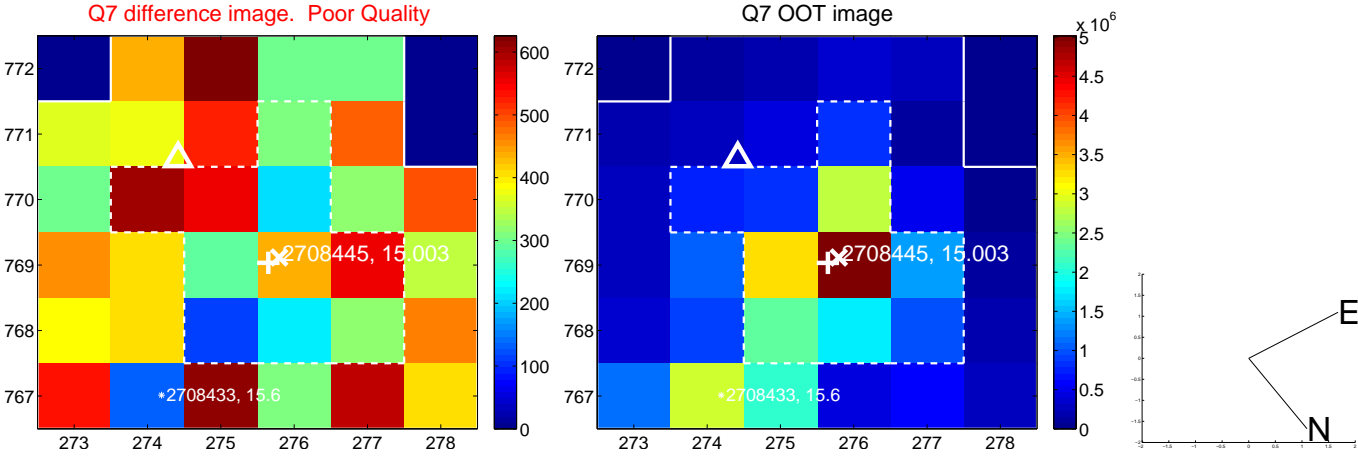
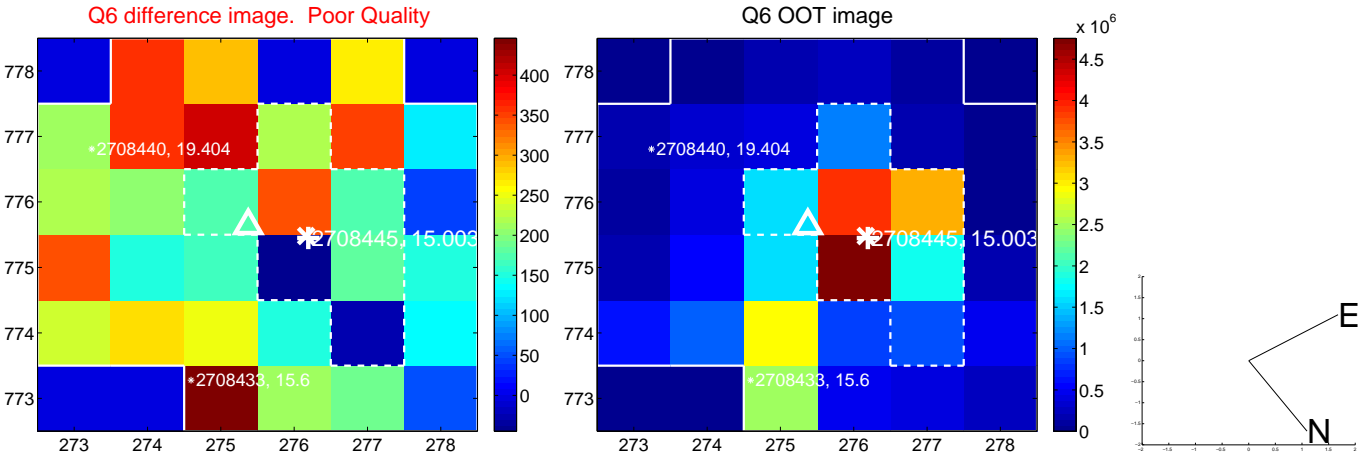
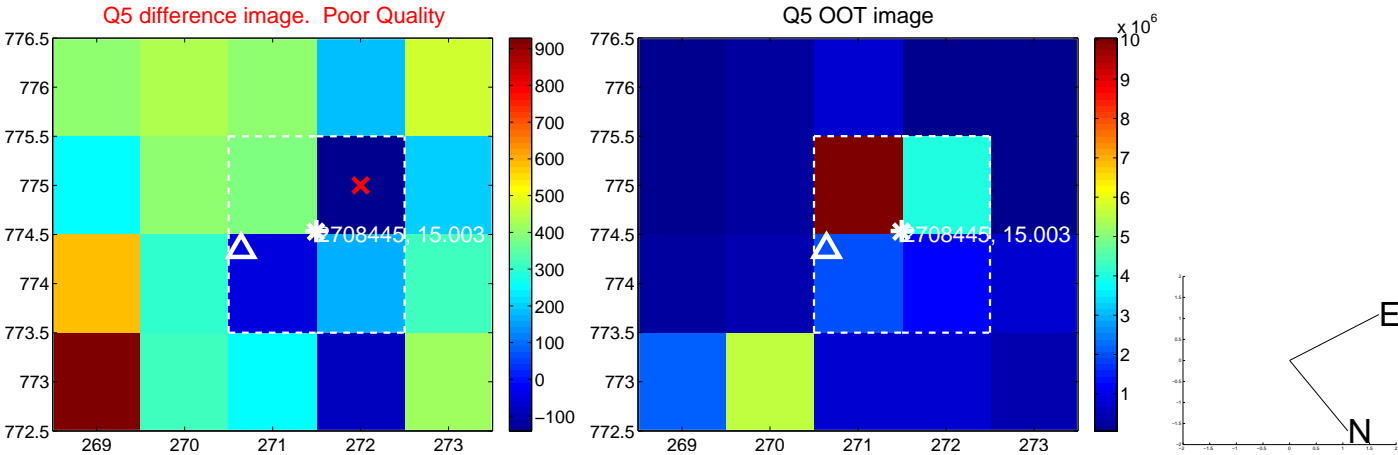
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.293 ± 0.587	5.61	-2.263 ± 0.580	-2.393 ± 0.563
PRF-fit source offset from KIC position	3.324 ± 0.548	6.07	-2.353 ± 0.537	-2.349 ± 0.553
photometric centroid source offset	4.42 ± 1.17	3.76	4.13 ± 1.19	-1.58 ± 1.05

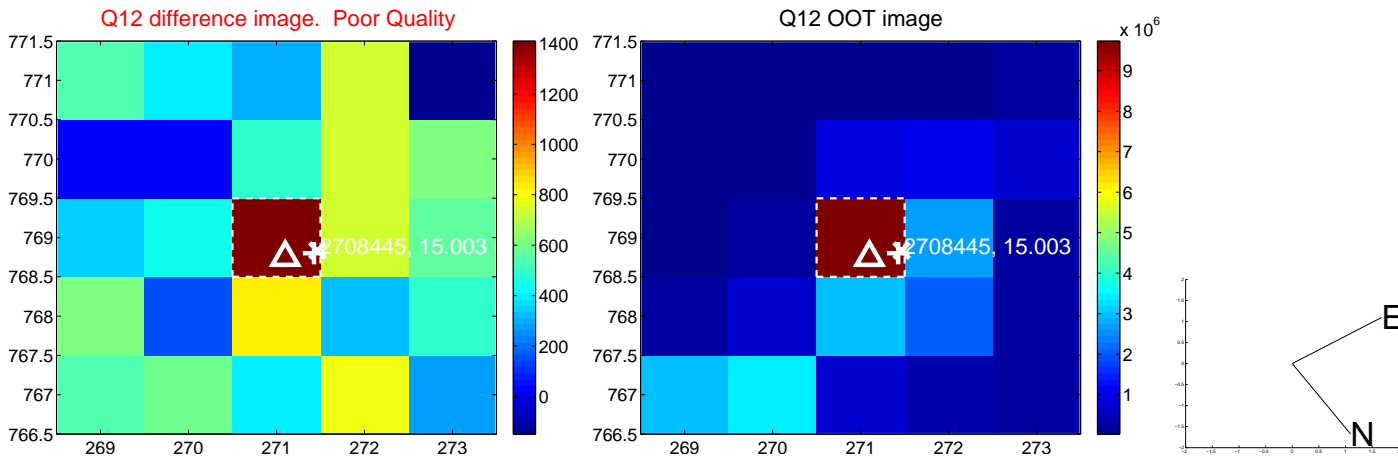
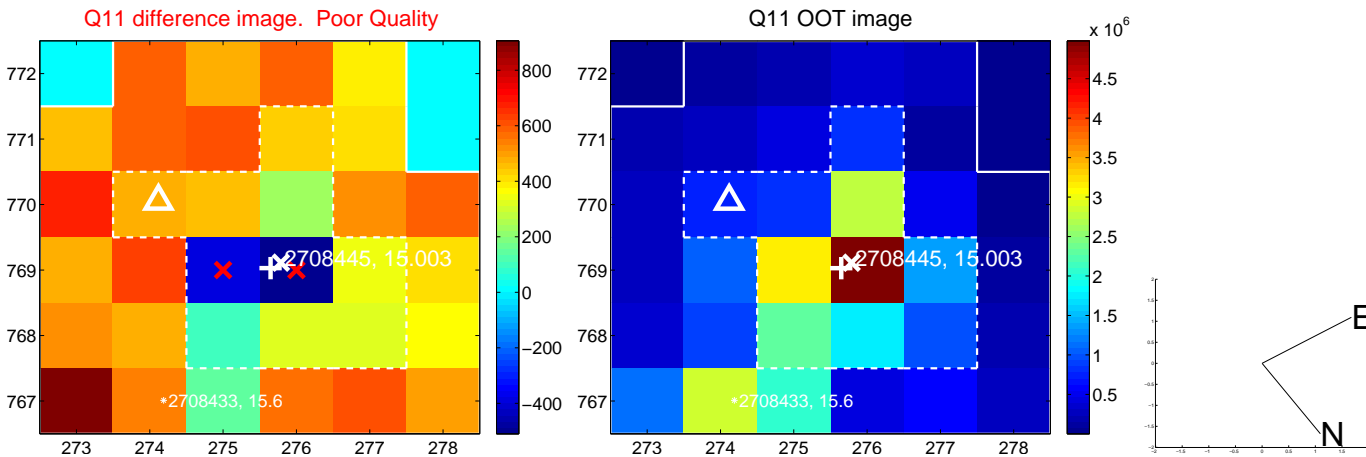
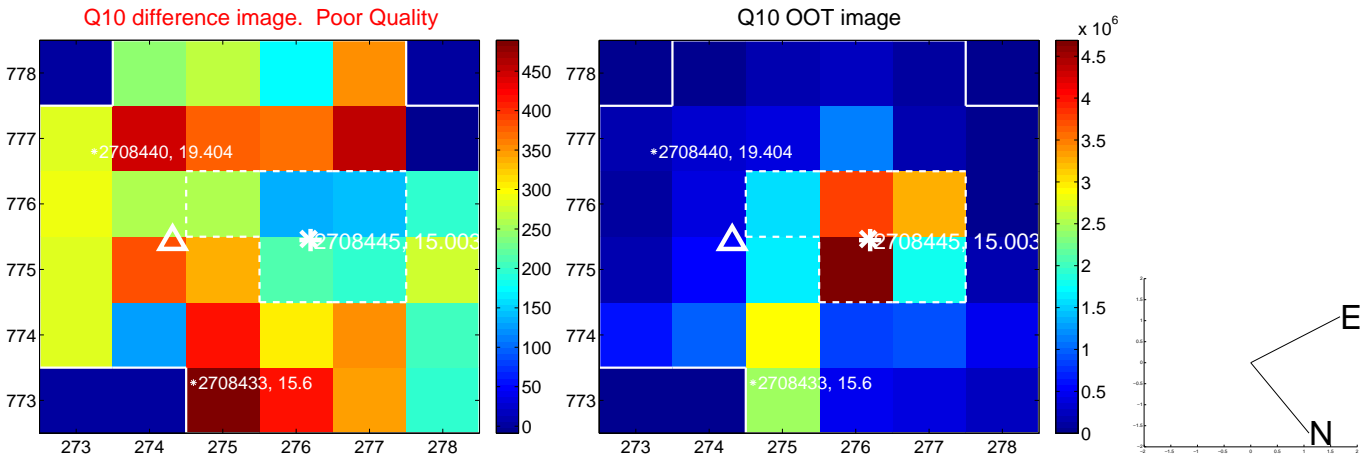
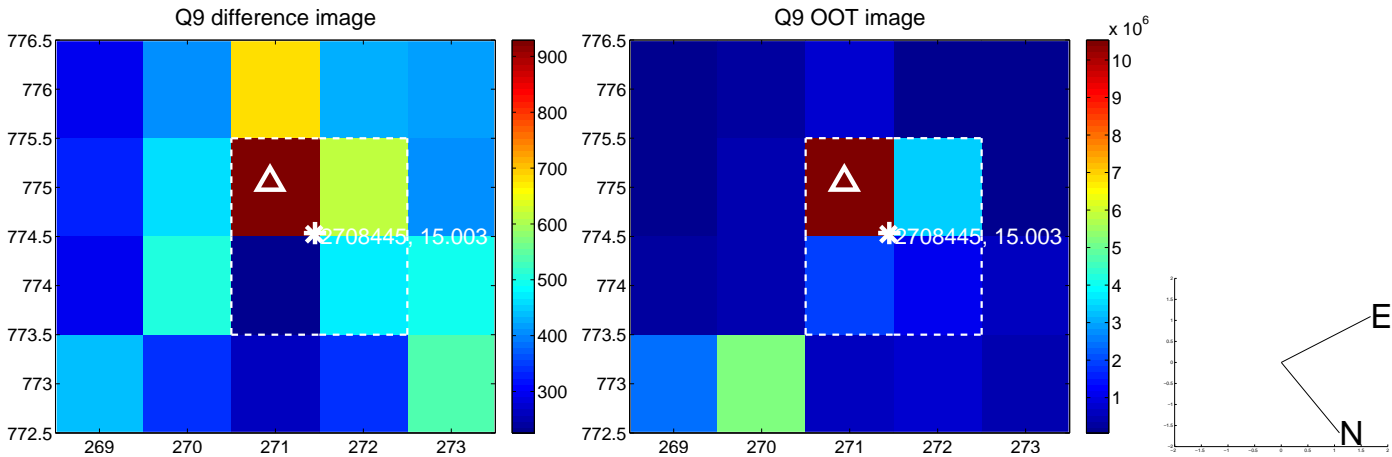


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

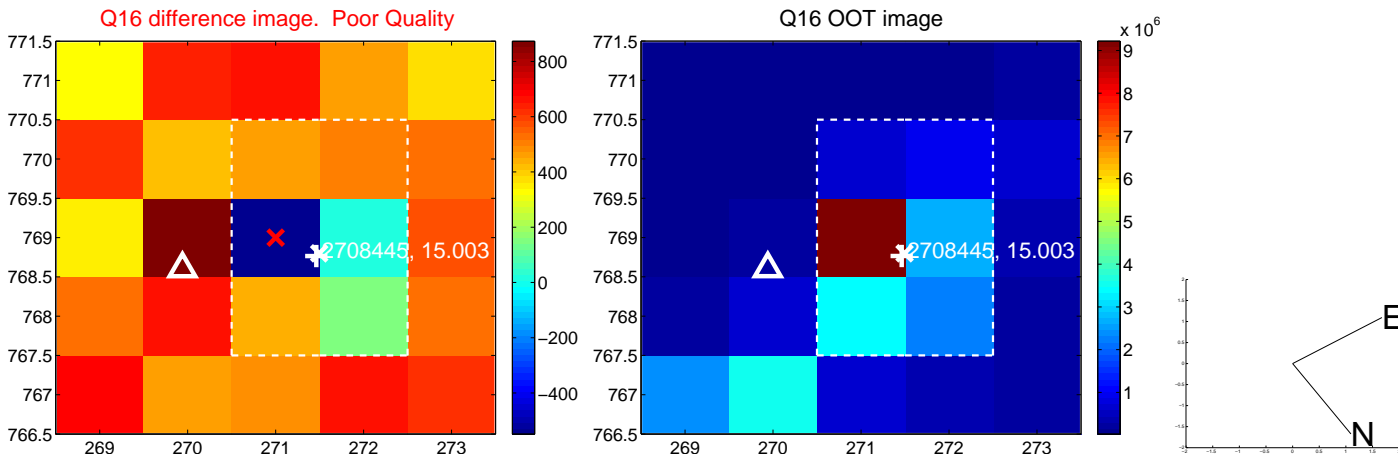
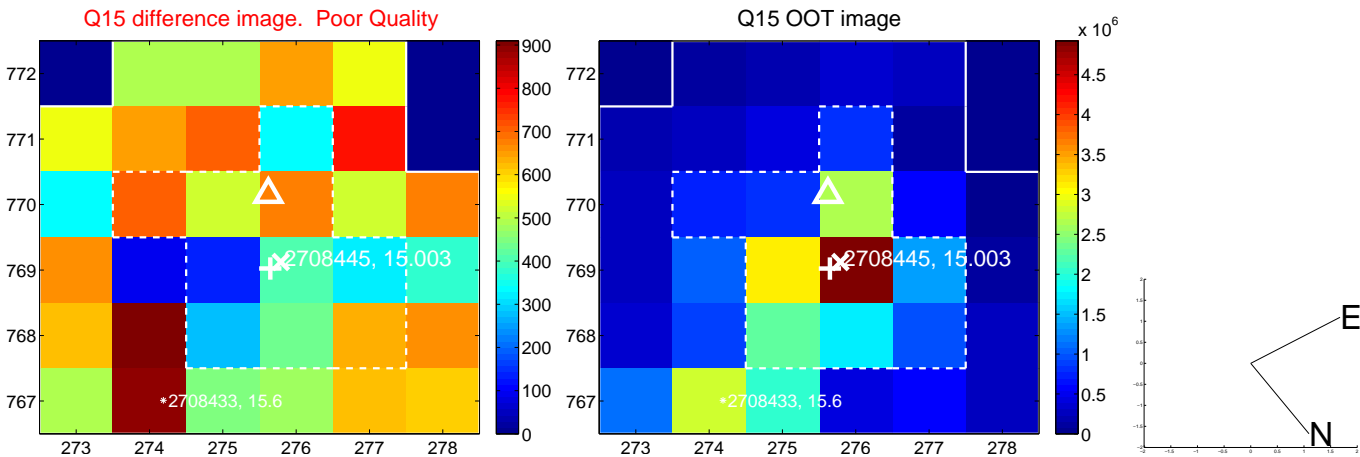
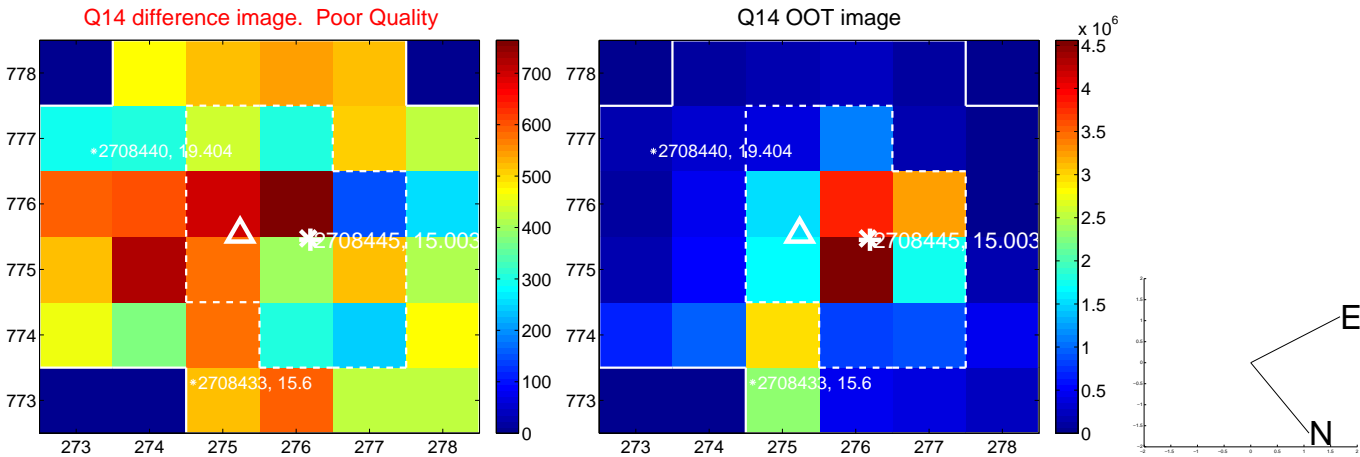
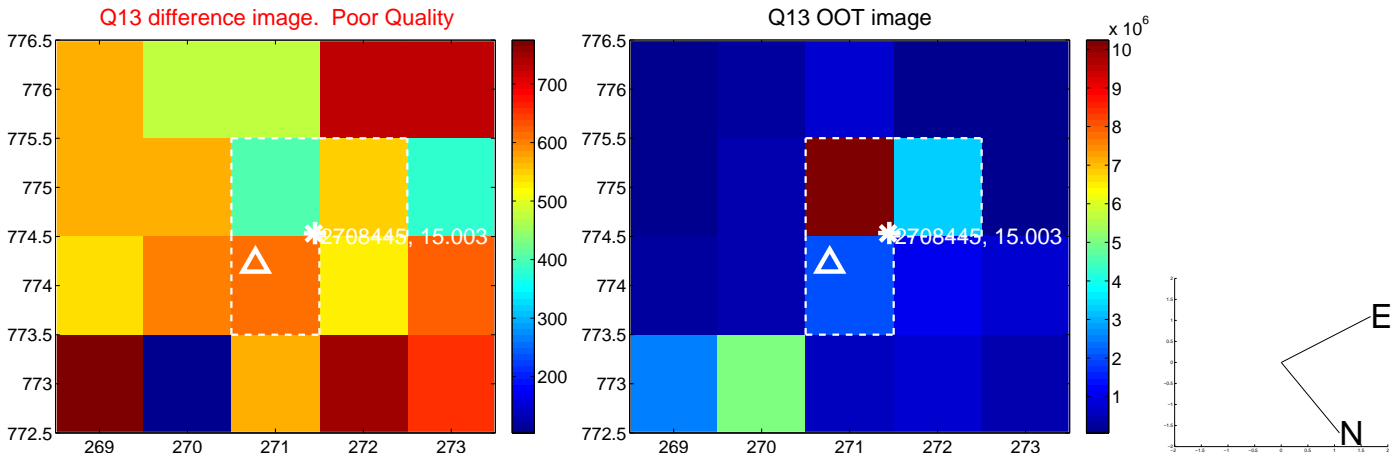
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



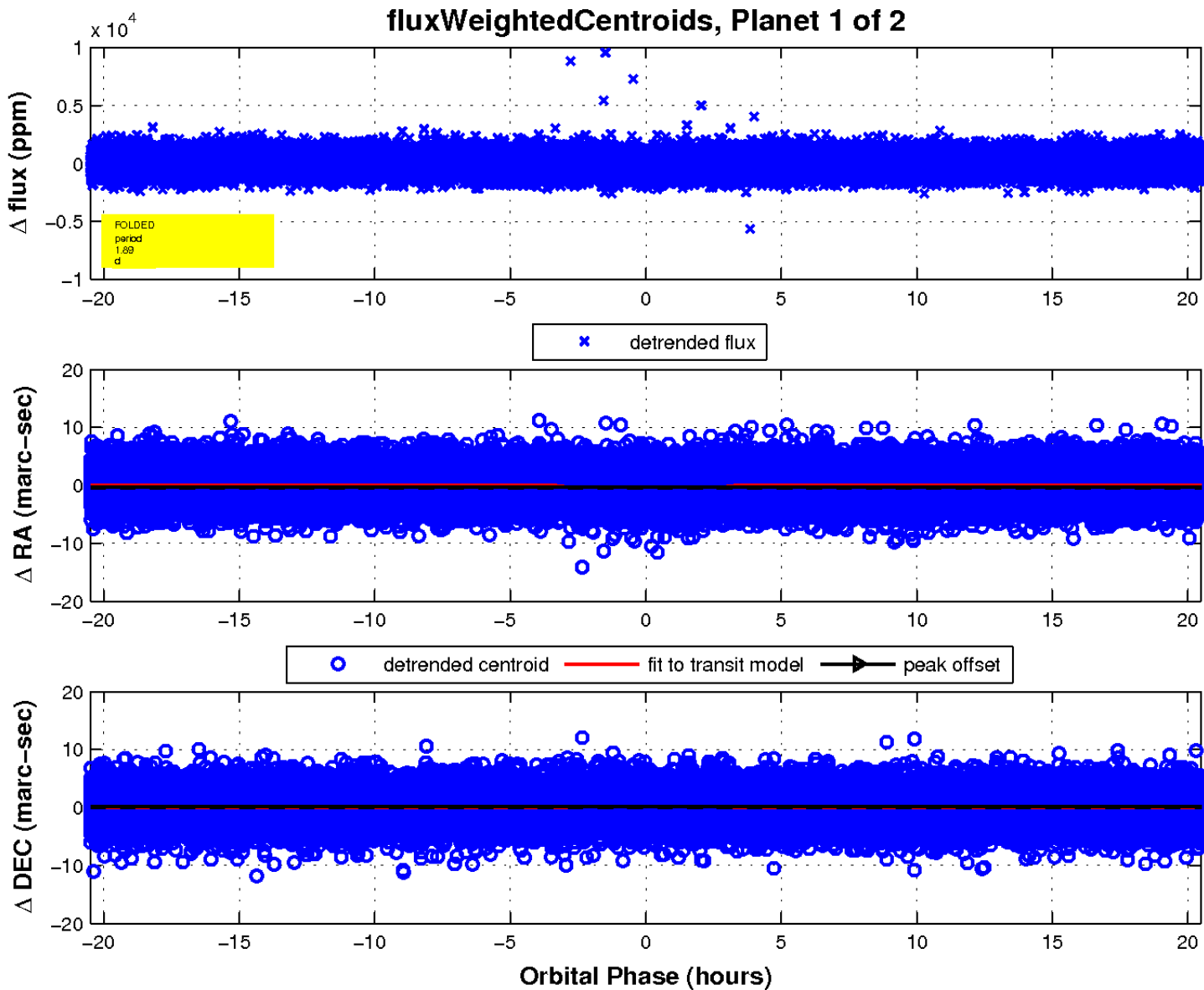
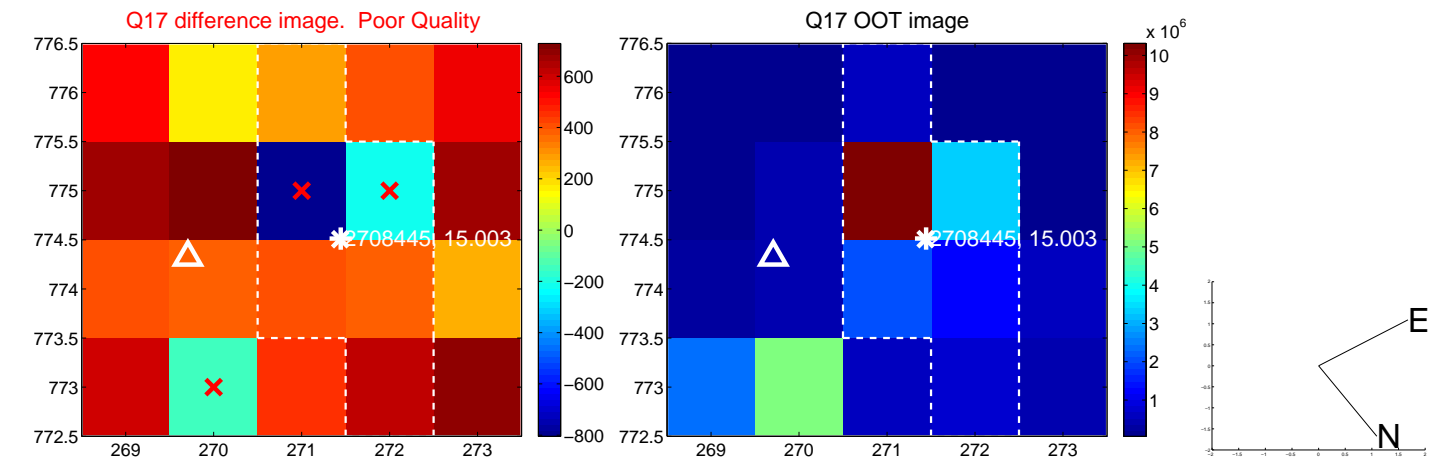
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white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

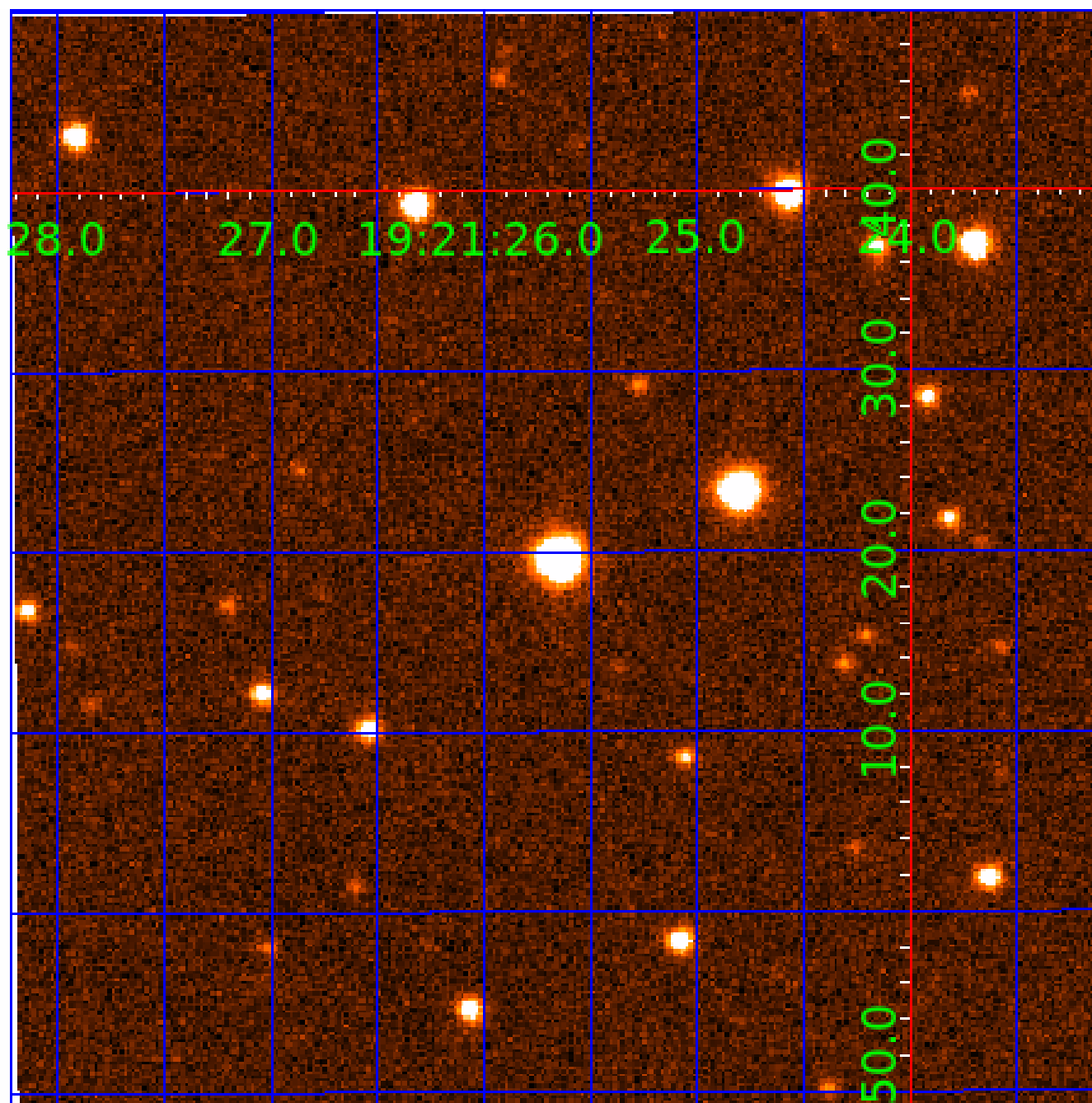


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002708445

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})
002708445-01	OBS	6288.01	1.891265	132.690976	59.6	6.830	8.1	5.1	6.86	5086	6.30	0.00
002708445-02	OBS	No	239.502428	297.986280	984.2	12.129	8.0	8.3	6.86	5086	22.27	58.19

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002708445-01	OBS	FP	0.00	0	0	1	1	PLANET_IN_STAR—CENT_UNRESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
002708445-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE

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.

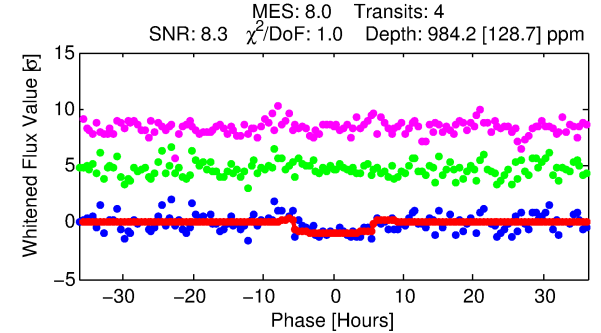
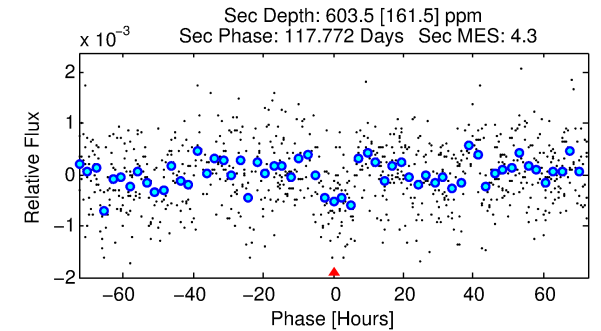
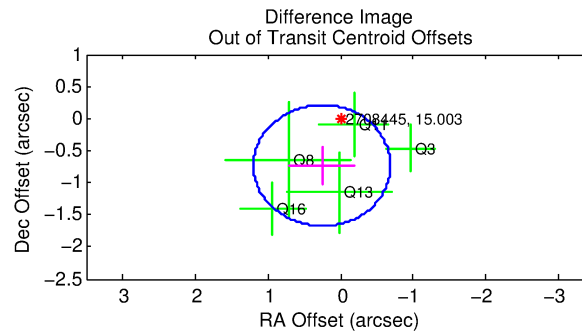
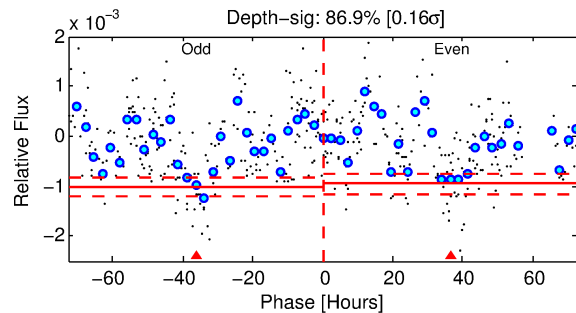
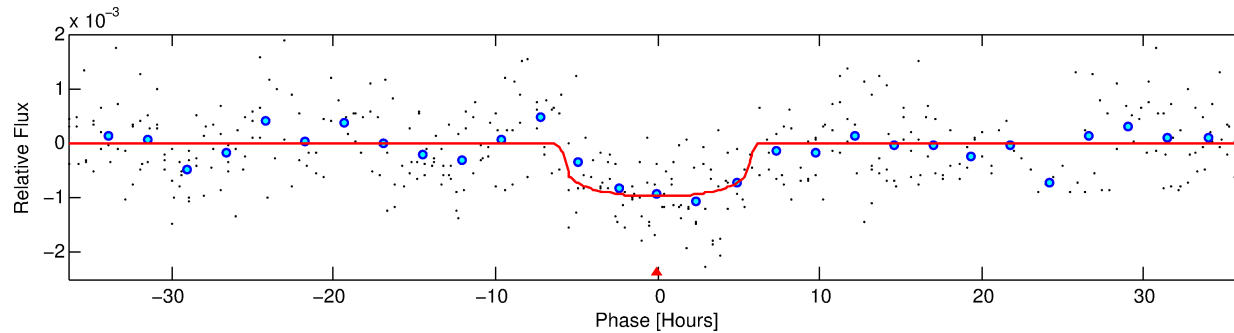
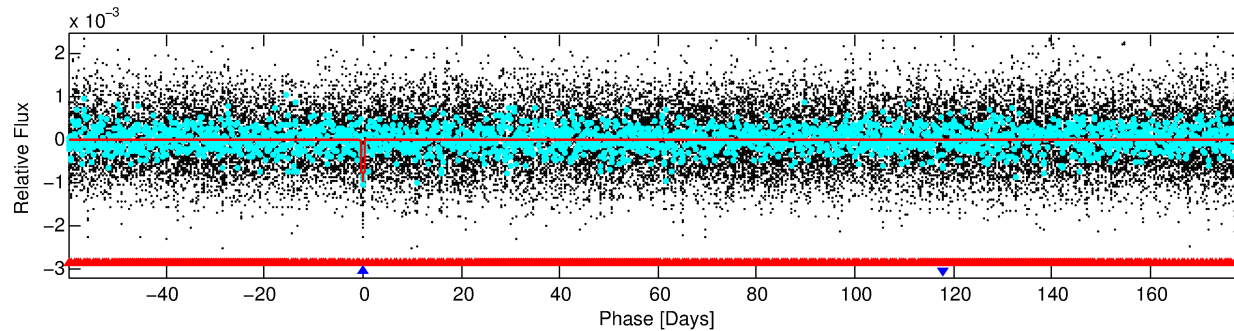
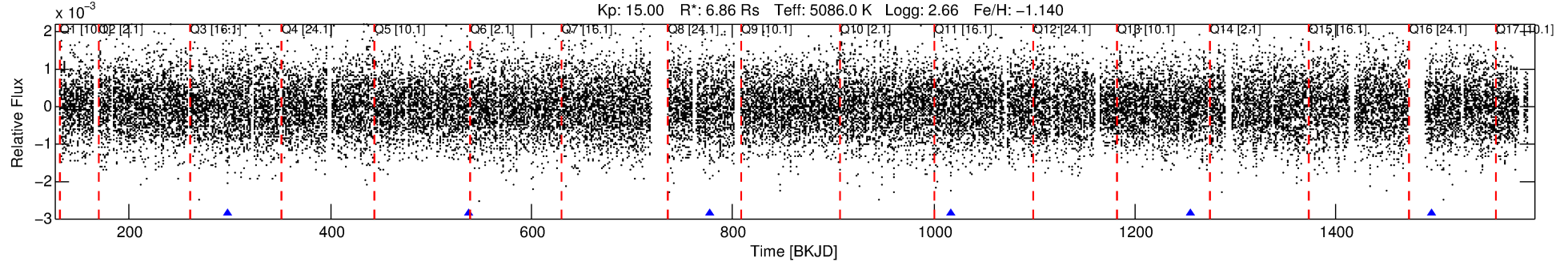
Ephemeris Match Information For 002708445-02

No Significant Match Found

DV One-Page Summary

KIC: 2708445 Candidate: 2 of 2 Period: 239.502 d
KOI: K06288 Corr: No Ephemeris Match

Kp: 15.00 R*: 6.86 Rs Teff: 5086.0 K Logg: 2.66 Fe/H: -1.140



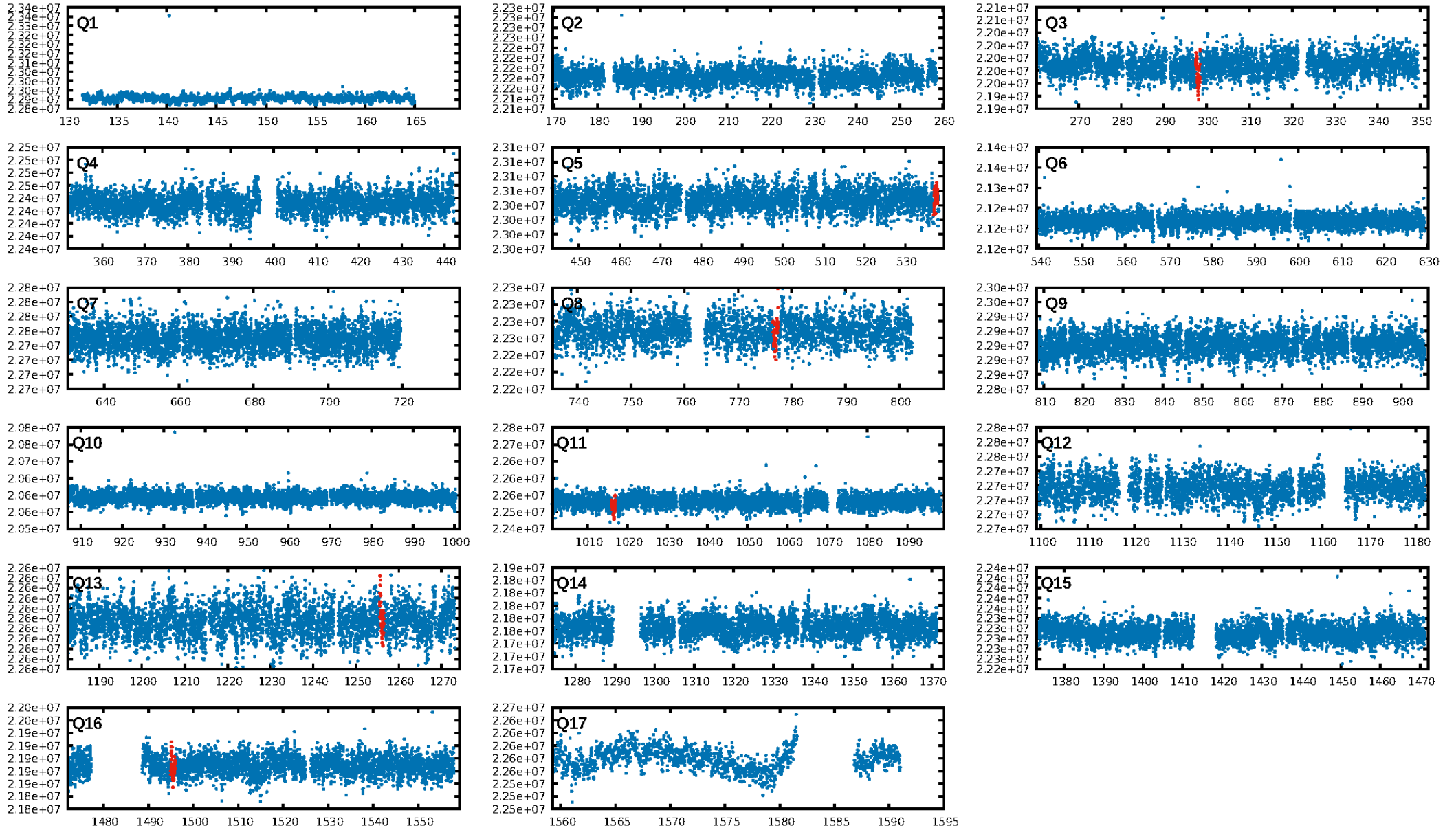
DV Fit Results:

Period = 239.50243 [0.00455] d
Epoch = 297.9863 [0.0159] BKJD
Rp/R* = 0.0298 [0.0114]
a/R* = 128.73 [207.09]
b = 0.58 [1.88]
Seff = 58.19 [11.35]
Teq = 704 [34] K
Rp = 22.27 [9.94] Re
a = 0.6963 [0.1074] AU
Ag = 324.40 [268.26] [1.21σ]
Teffp = 4621 [946] K [4.14σ]

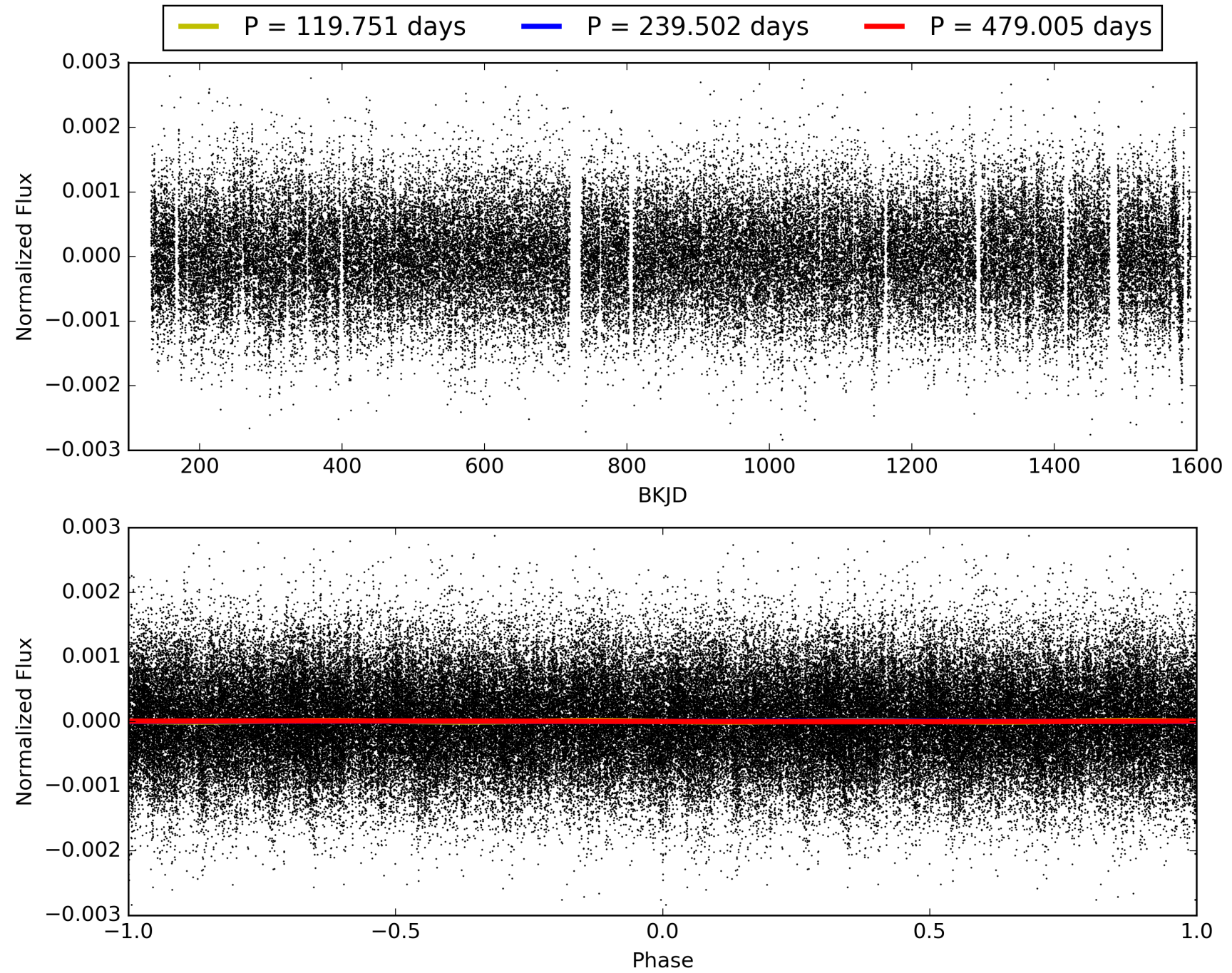
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [409.67σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 18.4%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.23e-11
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 9.897
Centroid-sig: 44.9%
Centroid-so: 1.202 arcsec [1.76σ]
OotOffset-rm: 0.777 arcsec [2.47σ]
KicOffset-rm: 1.053 arcsec [2.16σ]
OotOffset-st: 0/2/2/1 [5]
KicOffset-st: 0/2/2/1 [5]
DiffImageQuality-fgm: 1.00 [5/5]
DiffImageOverlap-fno: 0.00 [0/5]

TCE 002708445-02, PDC Light Curves

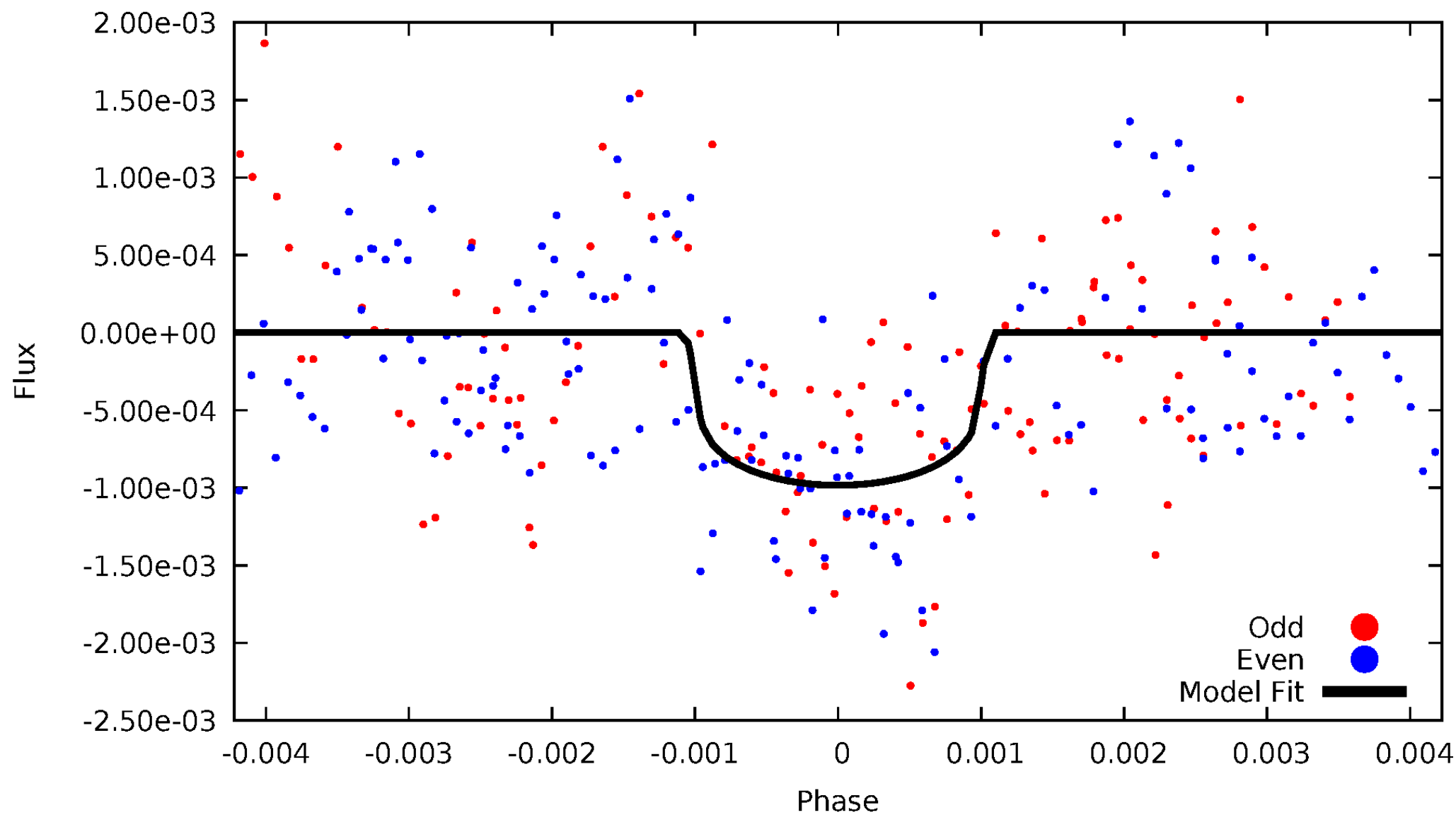


TCE 002708445-02



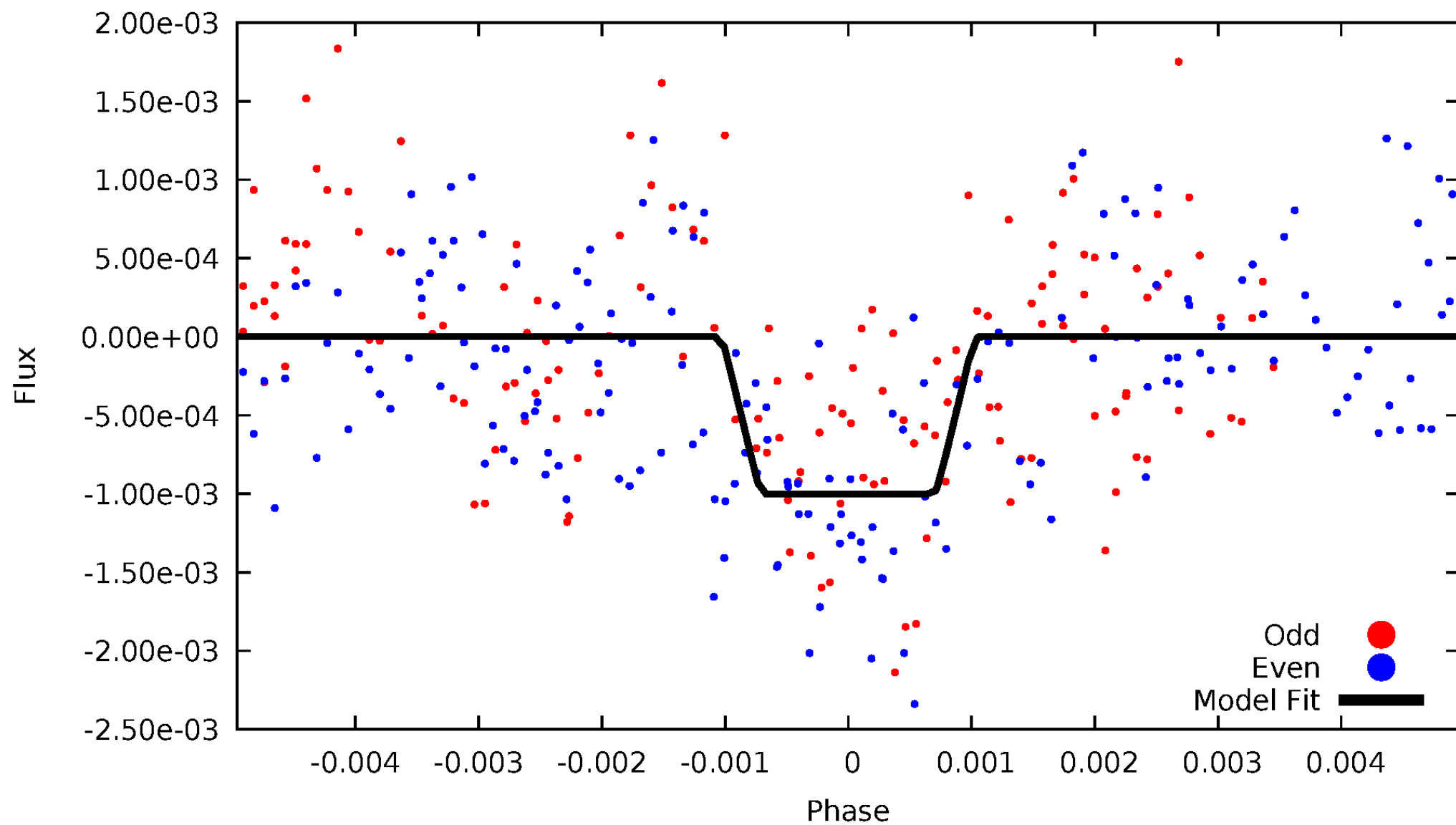
DV Odd/Even

TCE 002708445-02



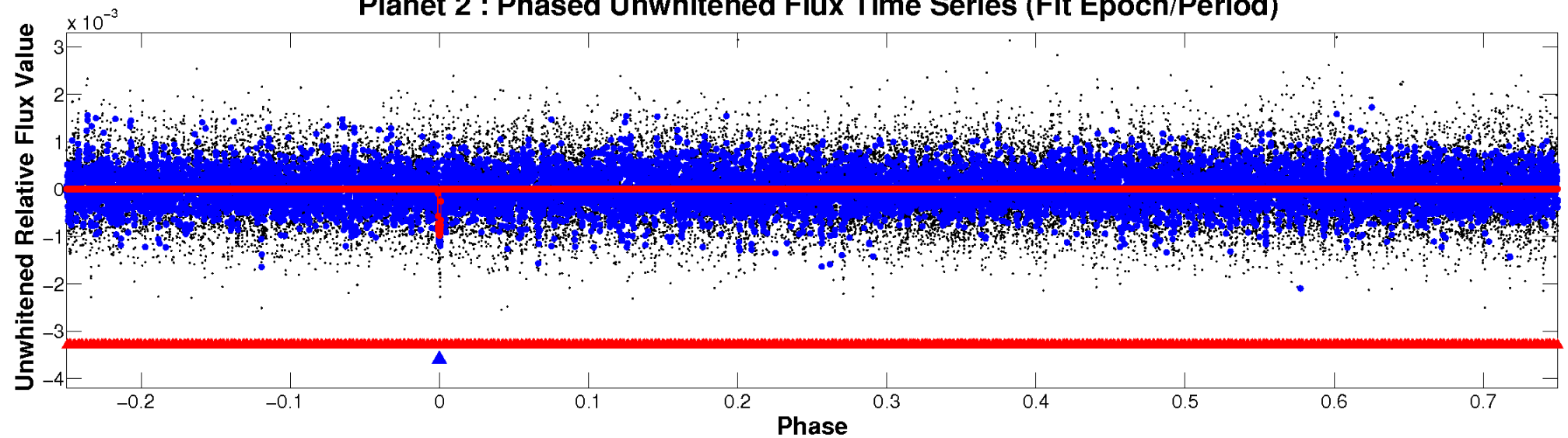
ALT Odd/Even

TCE 002708445-02

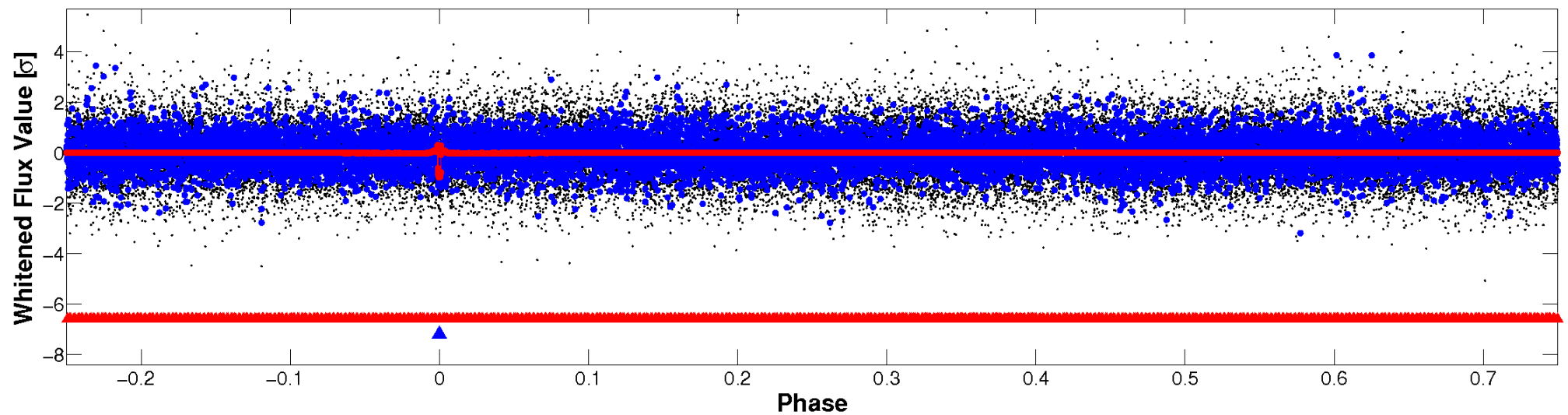


Non-Whitened Vs. Whitened Light Curve

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



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



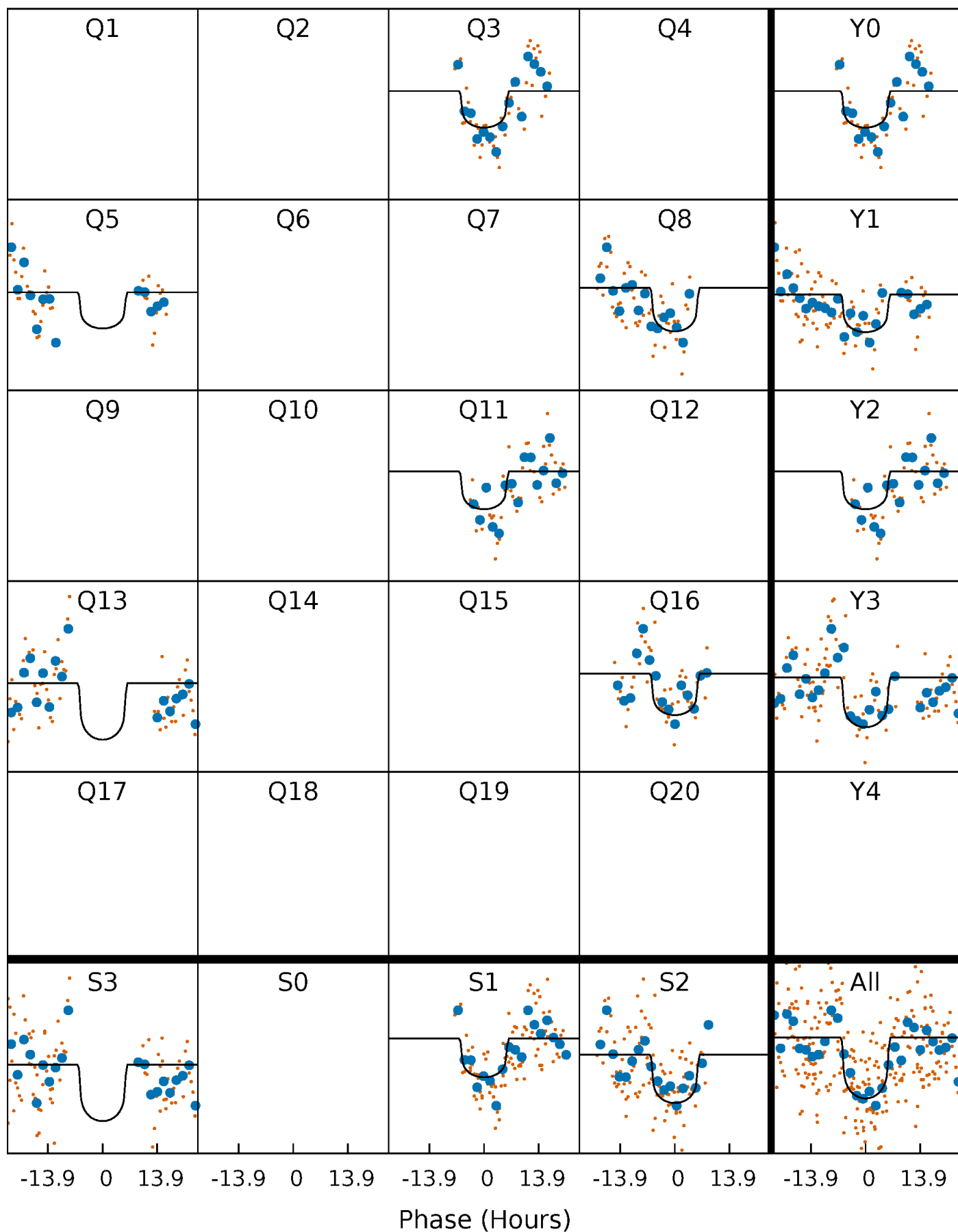
PDC Quarter-Phased Transit Curves

TCE 002708445-02 P=239.502428 Days $T_0=297.986280$ (BKJD)



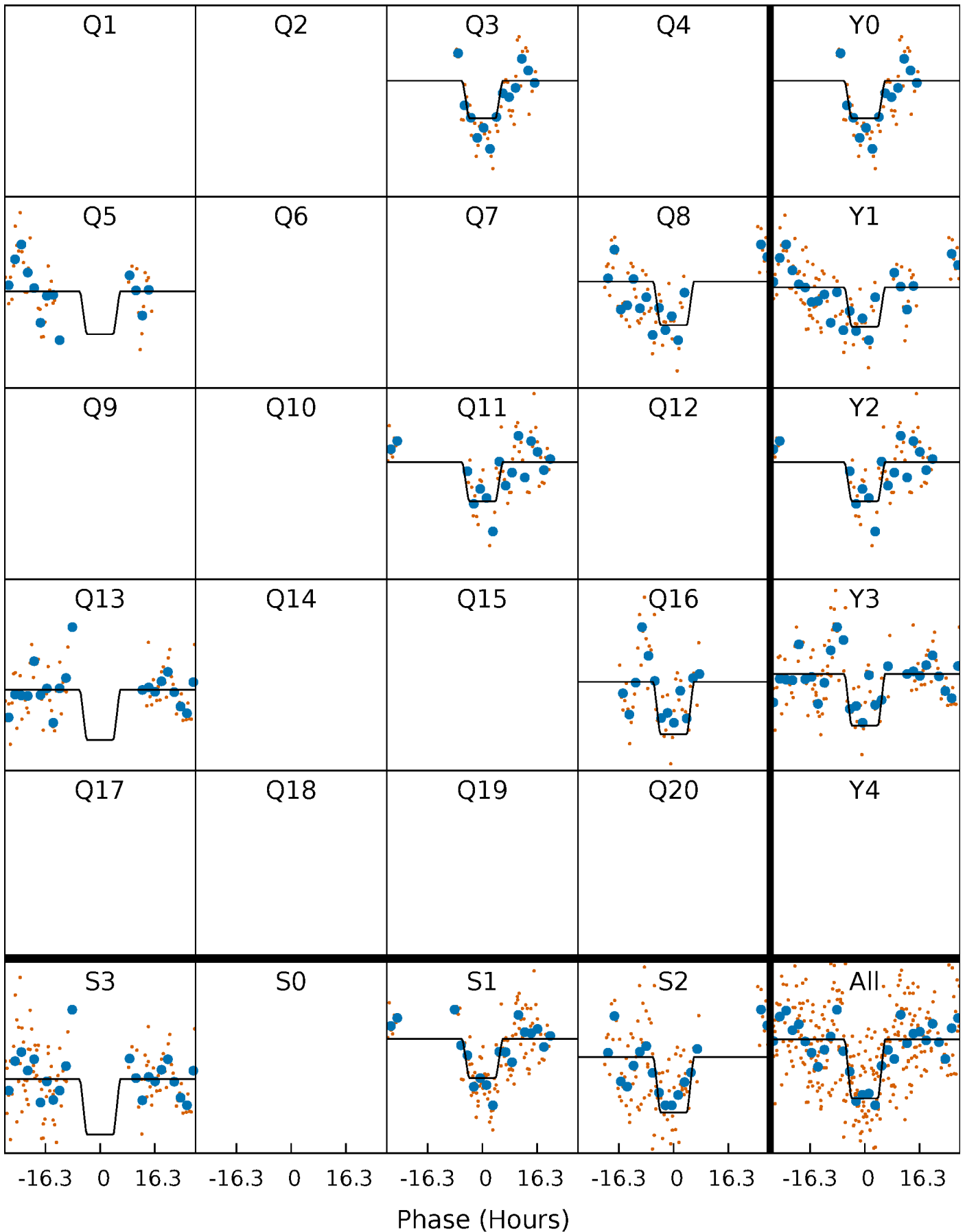
DV Quarter-Phased Transit Curves

TCE 002708445-02 $P=239.502428$ Days $T_0=297.986280$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

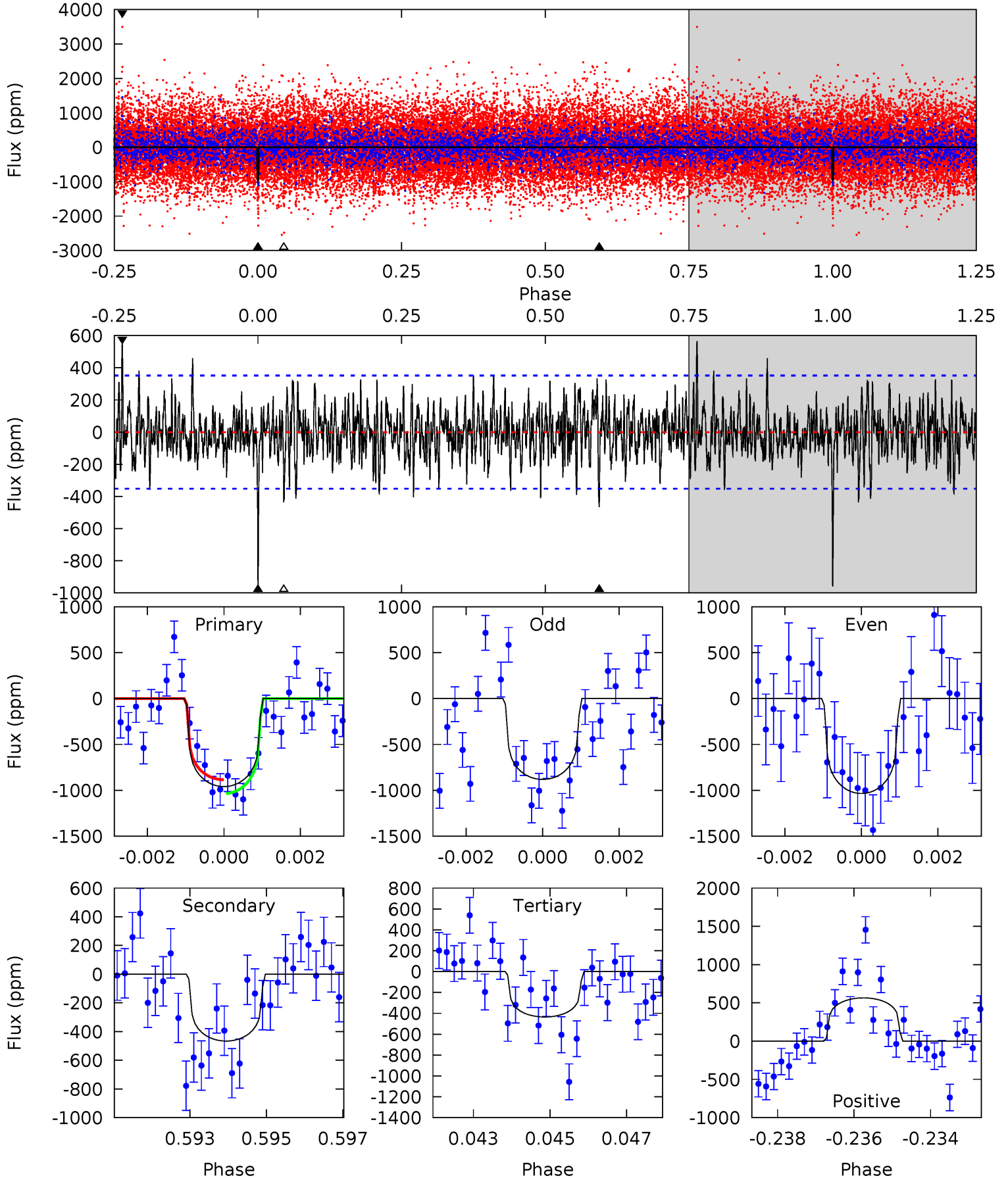
TCE 002708445-02 P=239.501757 Days $T_0=298.019177$ (BKJD)



DV Model-Shift Uniqueness Test

002708445-02, P = 239.502428 Days, E = 58.483852 Days

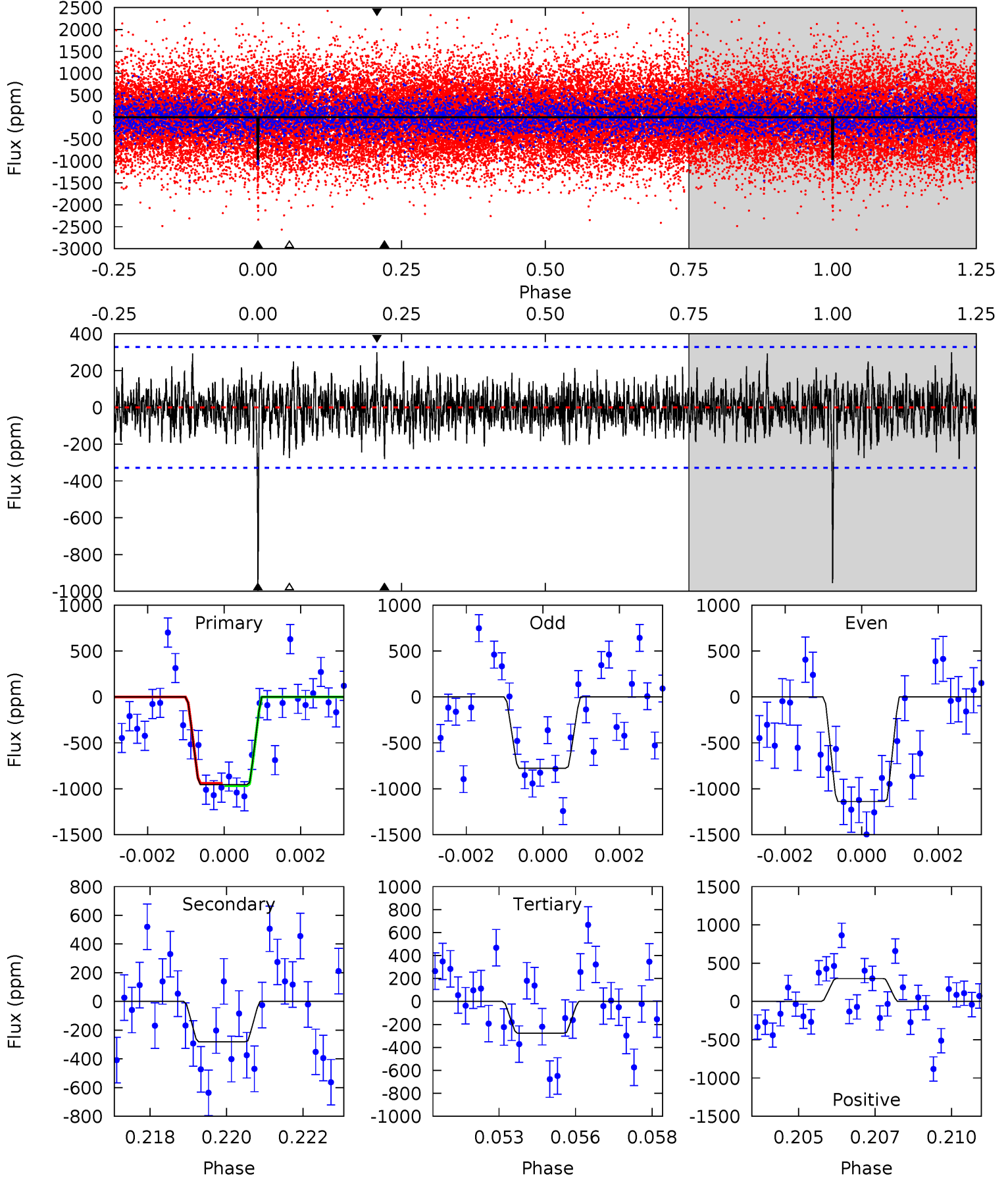
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	7.05	6.58	8.55	5.31	3.07	1.94	7.92	5.95	0.46	-1.50	1.16	0.97	0.37	1.14



Alt Model-Shift Uniqueness Test

002708445-02, P = 239.501757 Days, E = 58.517420 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.4	4.54	4.47	4.85	5.31	3.07	1.30	11.0	10.6	0.08	-0.31	2.94	1.03	0.24	0.21



Stellar Parameters For KIC 002708445

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5086^{+143}_{-104}	$2.660^{+0.030}_{-0.030}$	$-1.140^{+0.300}_{-0.350}$	$6.860^{+1.569}_{-0.174}$	$0.784^{+0.371}_{-0.016}$	$0.003^{+0.000}_{-0.001}$
	+3%/-2%	+1%/-1%	+26%/-31%	+23%/-3%	+47%/-2%	+9%/-22%
Source	PHO1	AST71	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 002708445-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-466 ± 66	$22.87^{+8.60}_{-8.45}$	983^{+29}_{-21}	4430^{+997}_{-493}	238^{+381}_{-116}
Alt.	-281 ± 62	$23.81^{+8.48}_{-9.23}$	984^{+33}_{-24}	3998^{+794}_{-423}	135^{+224}_{-65}

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

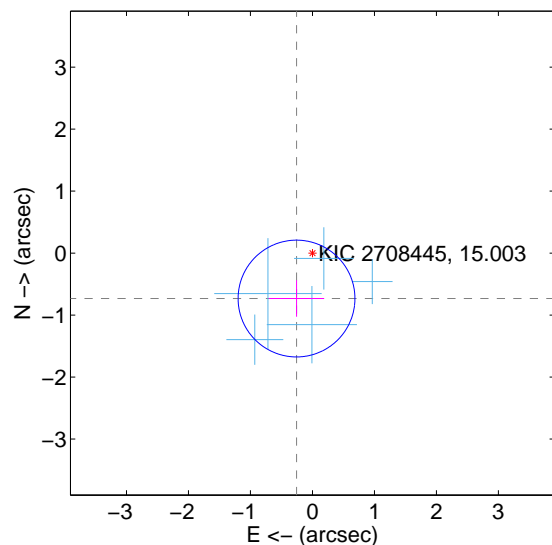
Supplemental centroid analysis for 002708445-02. Kepler magnitude: 15.00. Transit SNR 8.26

There are 5 quarters with good PRF difference image offsets

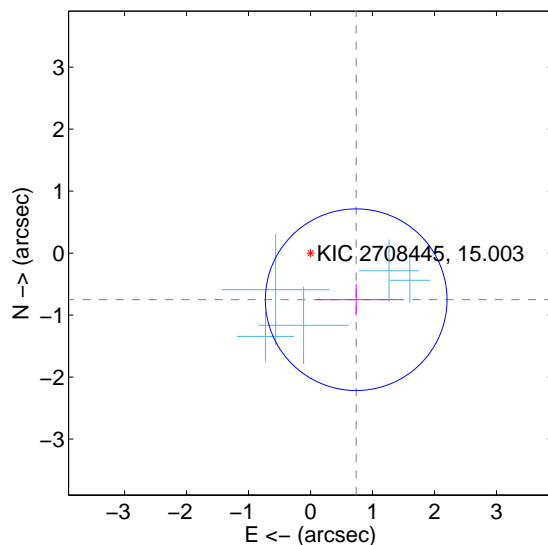
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.777 ± 0.314	2.47	0.257 ± 0.446	-0.733 ± 0.294
PRF-fit source offset from KIC position	1.053 ± 0.489	2.16	-0.737 ± 0.649	-0.752 ± 0.252
photometric centroid source offset	1.20 ± 0.68	1.76	-1.19 ± 0.69	-0.15 ± 0.52

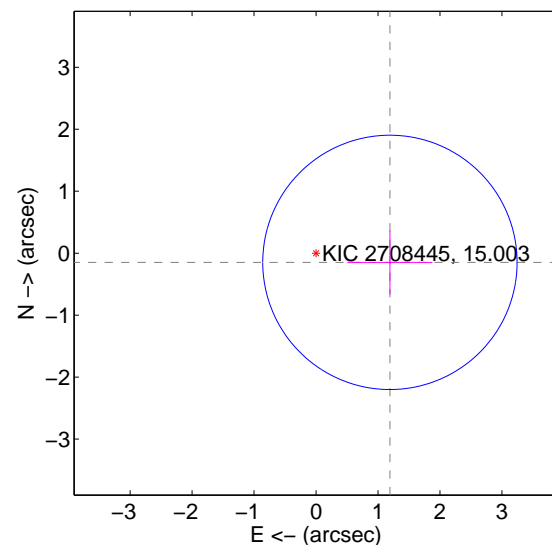
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

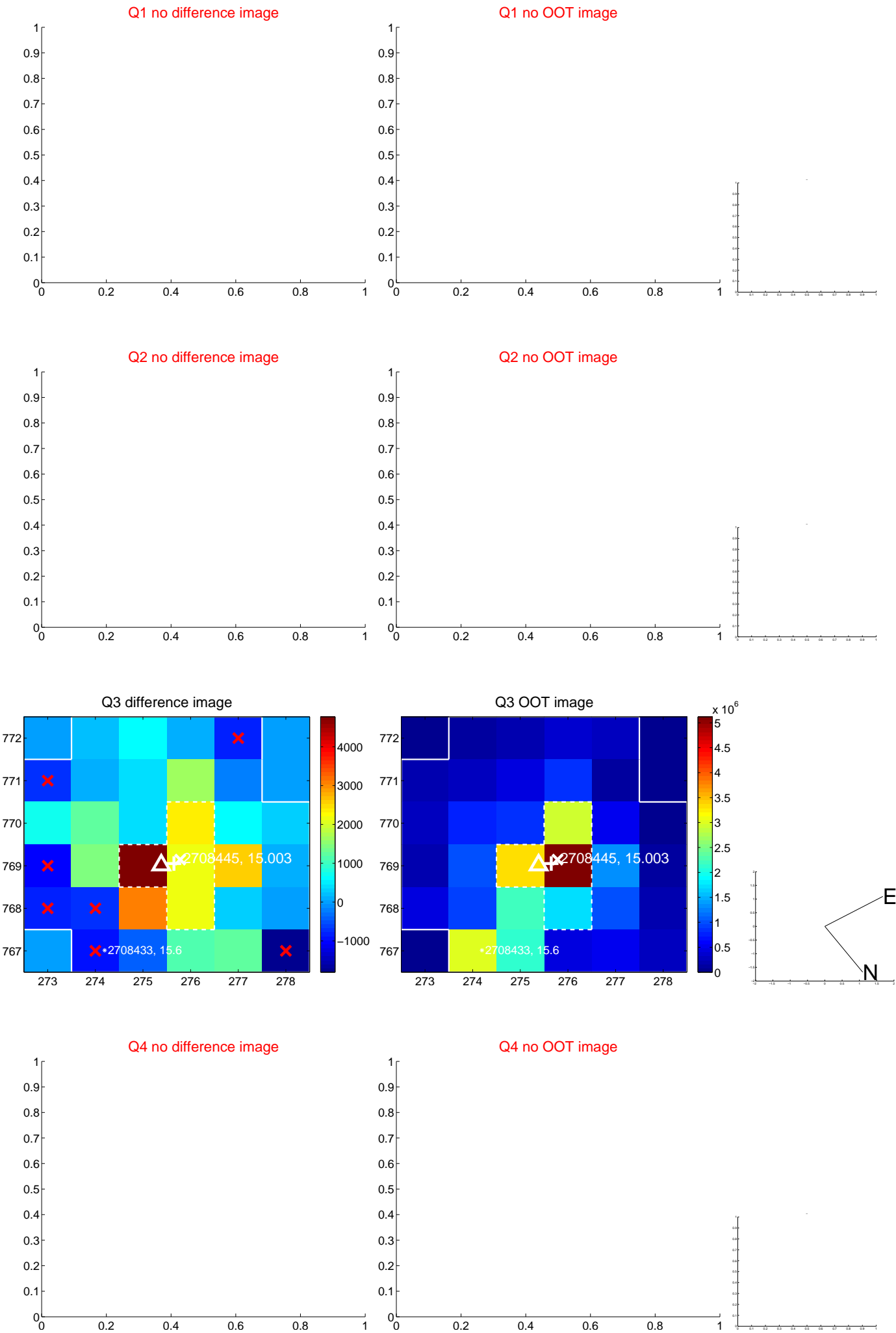


offset from photometric centroids

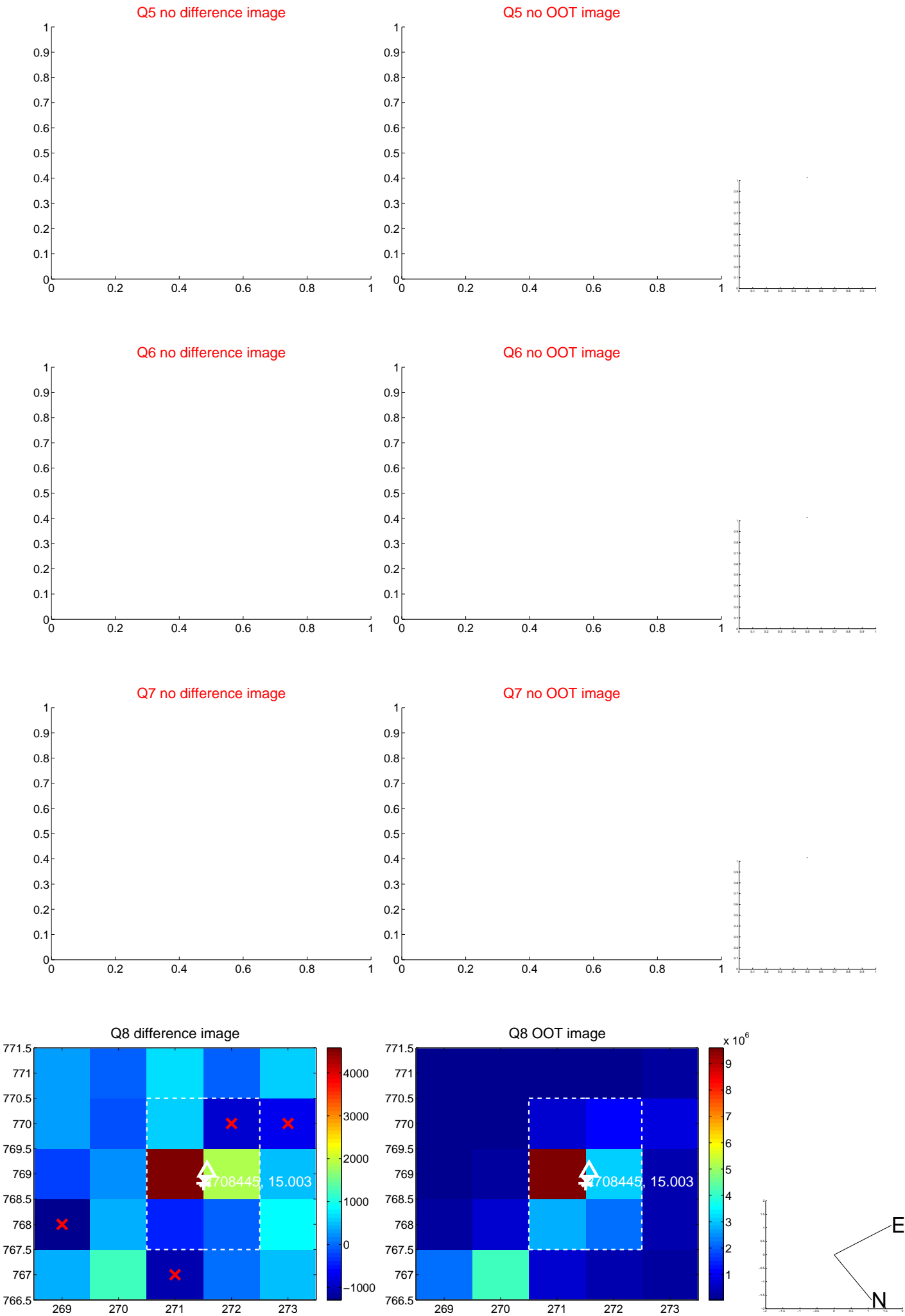


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

Q9 no difference image



Q9 no OOT image



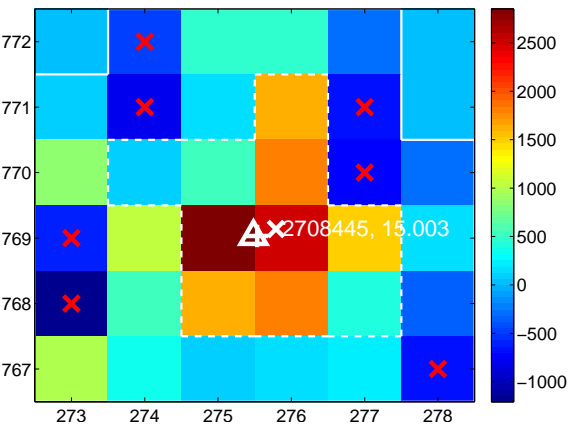
Q10 no difference image



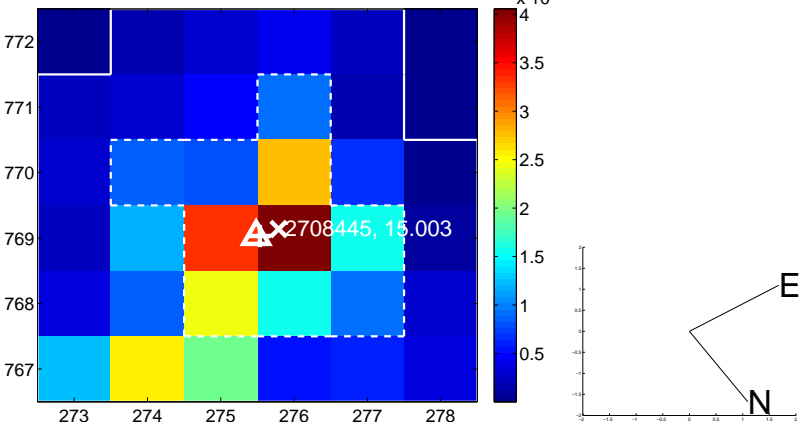
Q10 no OOT image



Q11 difference image



Q11 OOT image



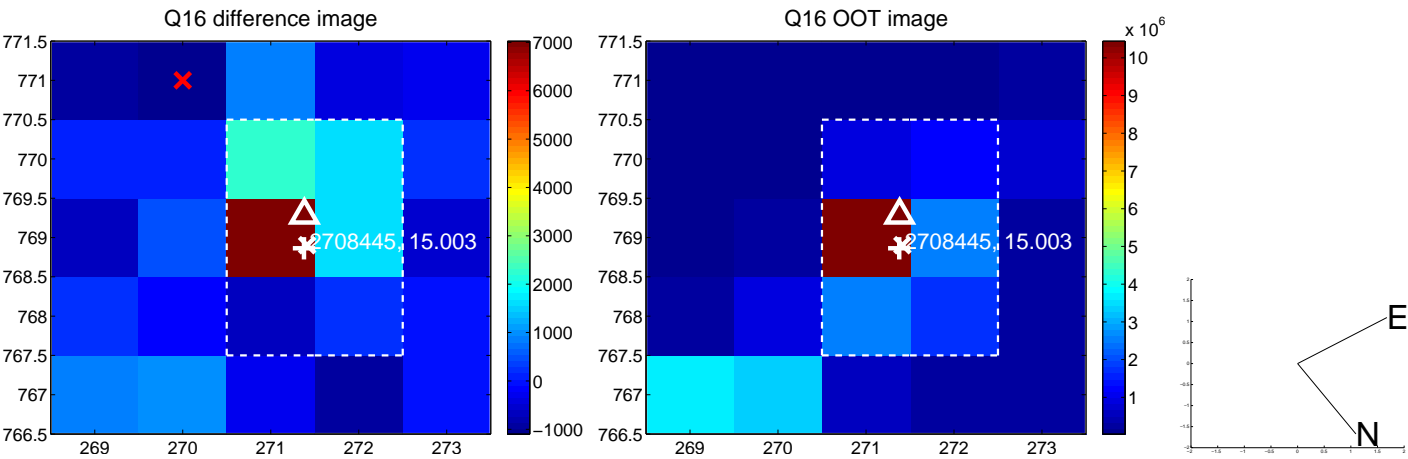
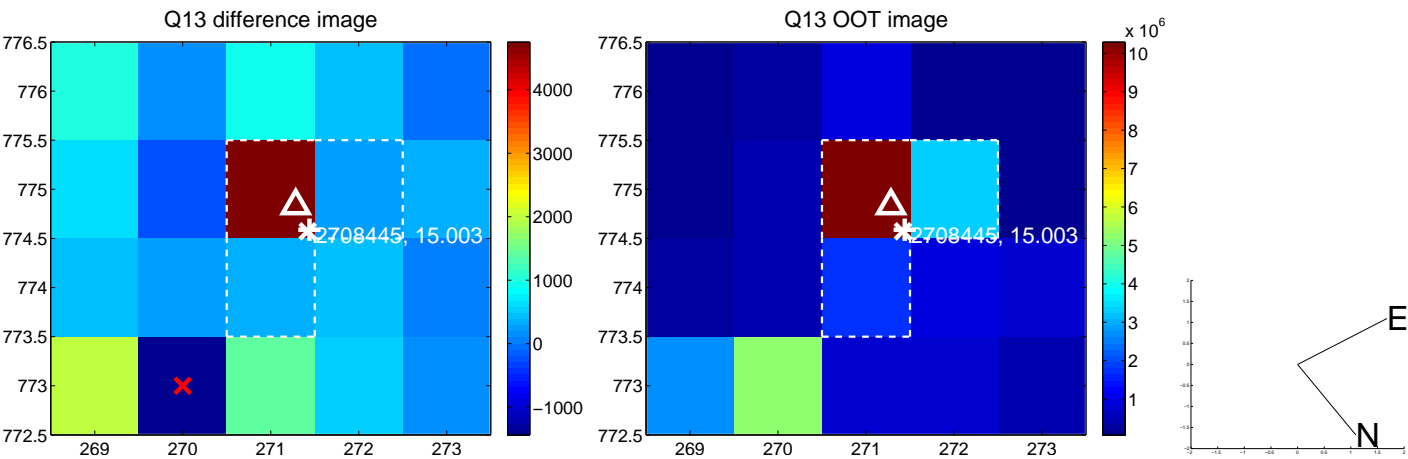
Q12 no difference image



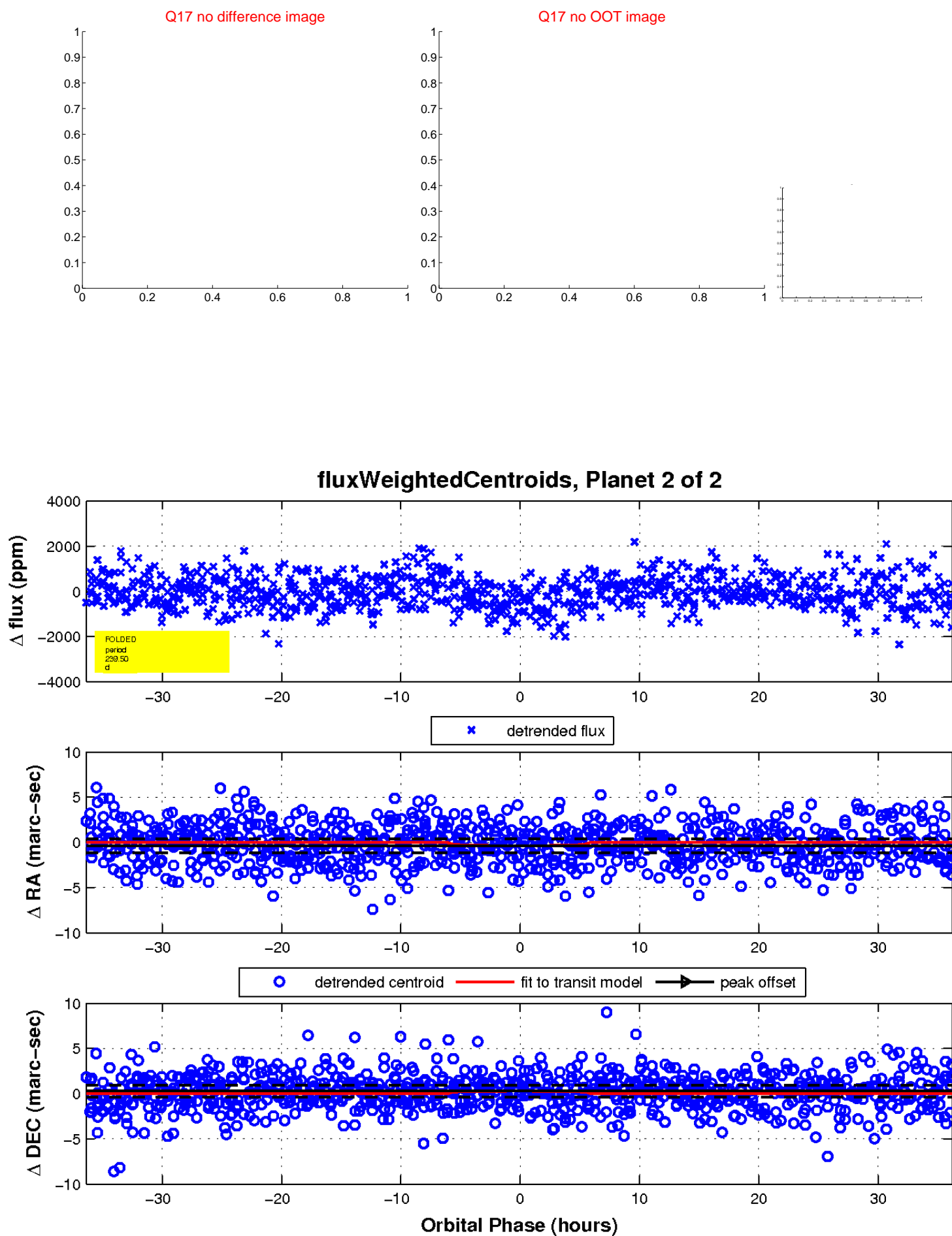
Q12 no OOT image



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

