

KIC 004356708

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})
004356708-01	OBS	No	471.589835	277.053170	429.0	9.168	11.5	5.9	1.60	6287	3.58	2.54
004356708-02	OBS	No	472.346304	583.726160	414.1	14.347	11.4	5.1	1.60	6287	3.45	2.53

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004356708-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004356708-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

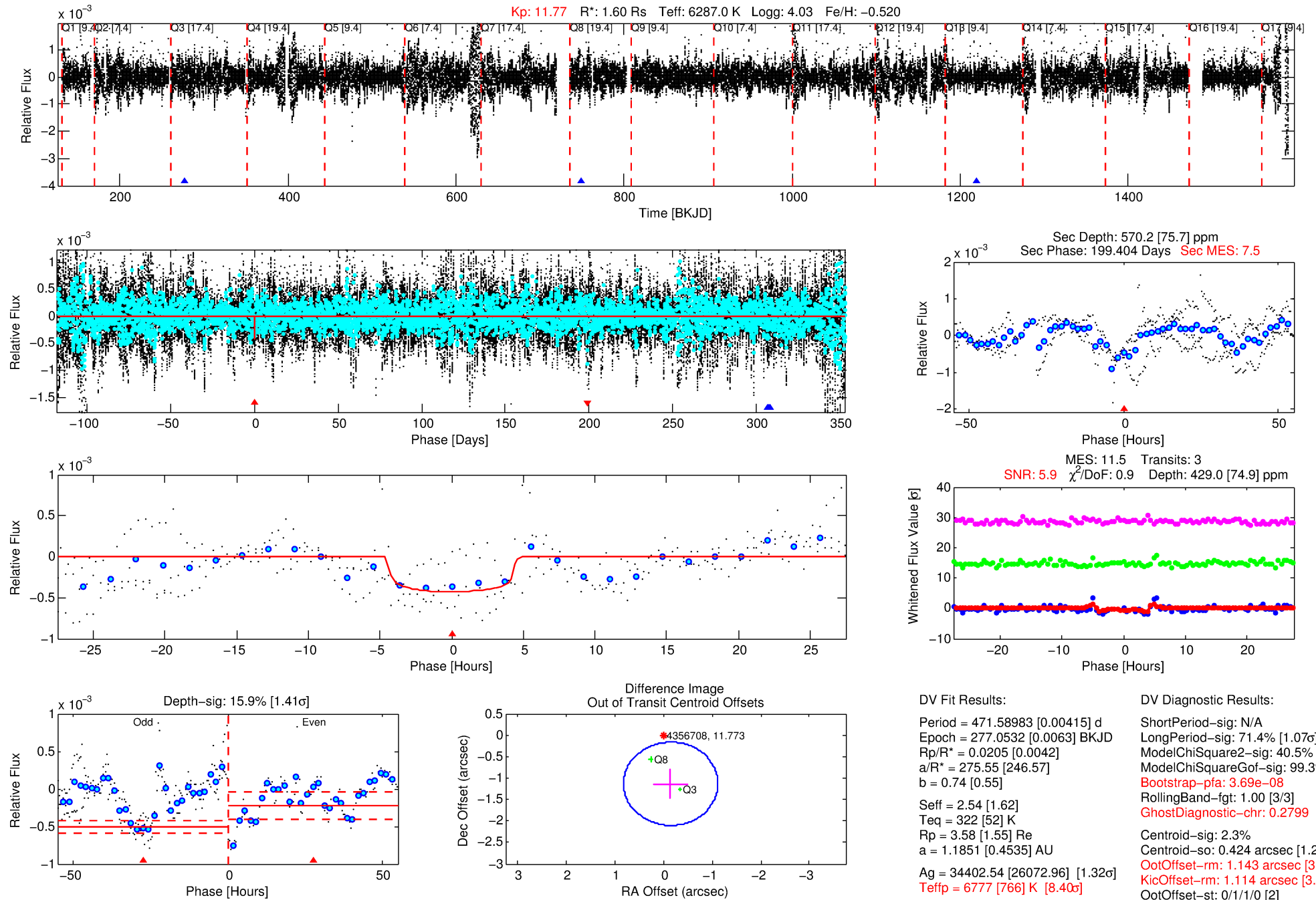
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004356708-01

No Significant Match Found

DV One-Page Summary

KIC: 4356708 Candidate: 1 of 2 Period: 471.590 d



DV Fit Results:

Period = 471.58983 [0.00415] d
 Epoch = 277.0532 [0.0063] BKJD
 Rp/R* = 0.0205 [0.0042]
 a/R* = 275.55 [246.57]
 b = 0.74 [0.55]
 Seff = 2.54 [1.62]
 Teq = 322 [52] K
 Rp = 3.58 [1.55] Re
 a = 1.1851 [0.4535] AU
 Ag = 34402.54 [26072.96] [1.32σ]
 T_{eff} = 6777 [766] K [8.40σ]

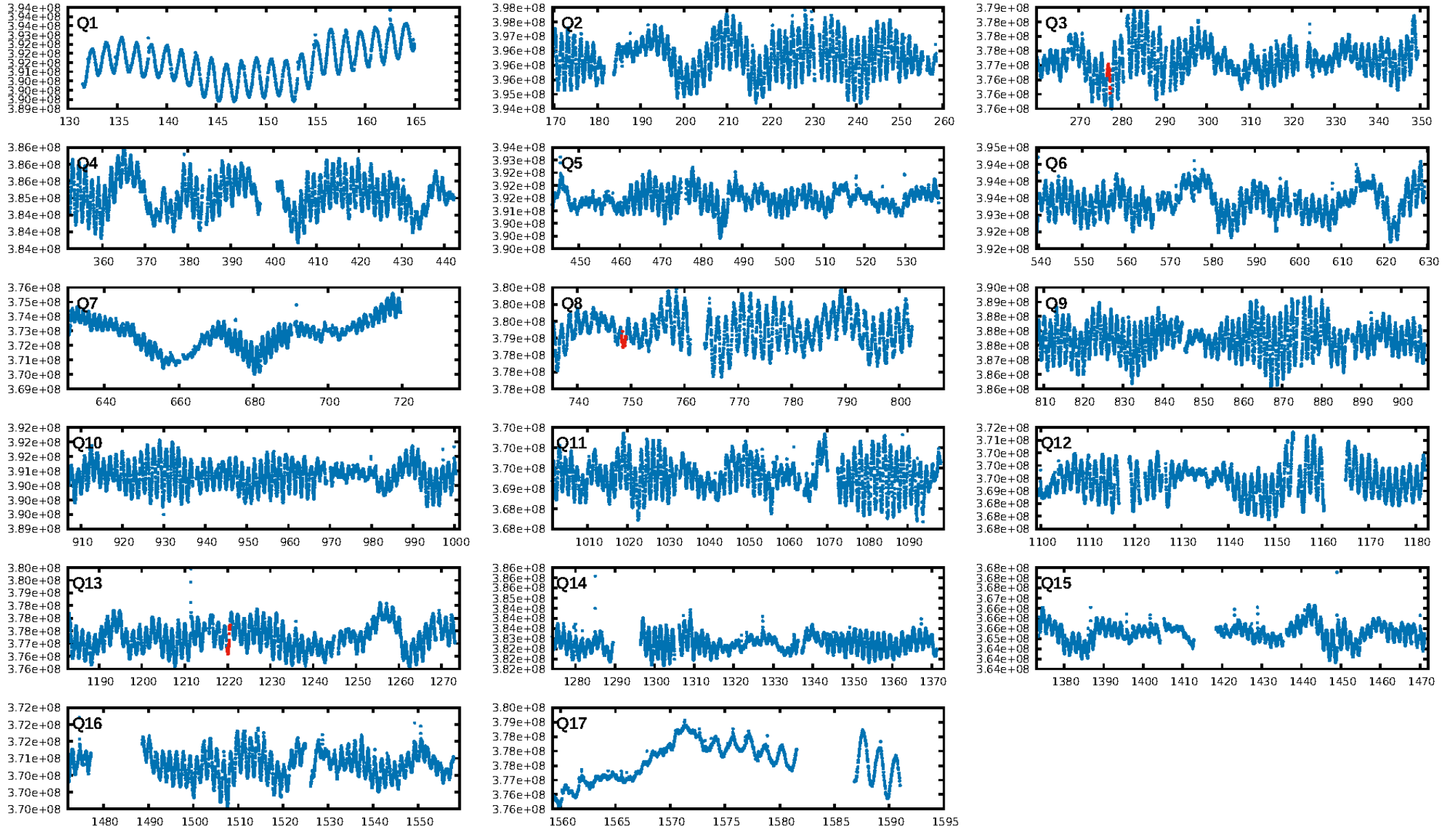
DV Diagnostic Results:

ShortPeriod-sig: N/A
 LongPeriod-sig: 71.4% [1.07σ]
 ModelChiSquare2-sig: 40.5%
 ModelChiSquareGof-sig: 99.3%
 Bootstrap-pfa: 3.69e-08
 RollingBand-fgt: 1.00 [3/3]
 GhostDiagnostic-chr: 0.2799
 Centroid-sig: 2.3%
 Centroid-so: 0.424 arcsec [1.21σ]
 OotOffset-rm: 1.143 arcsec [3.53σ]
 KicOffset-rm: 1.114 arcsec [3.88σ]
 OotOffset-st: 0/1/1/0 [2]
 KicOffset-st: 0/1/1/0 [2]
 DiffImageQuality-fgm: 0.50 [1/2]
 DiffImageOverlap-fno: 1.00 [2/2]

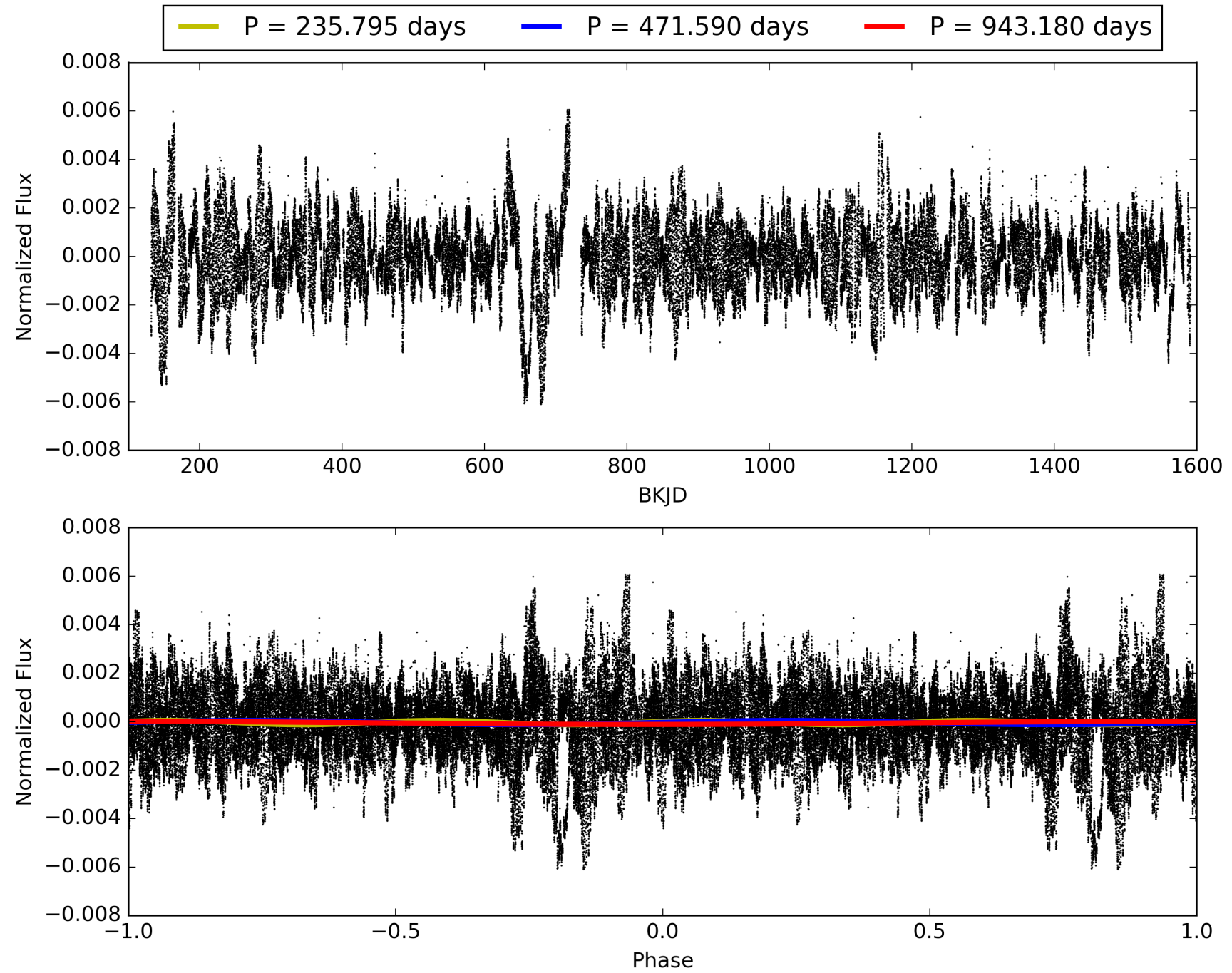
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 00:48:34 Z

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

TCE 004356708-01, PDC Light Curves

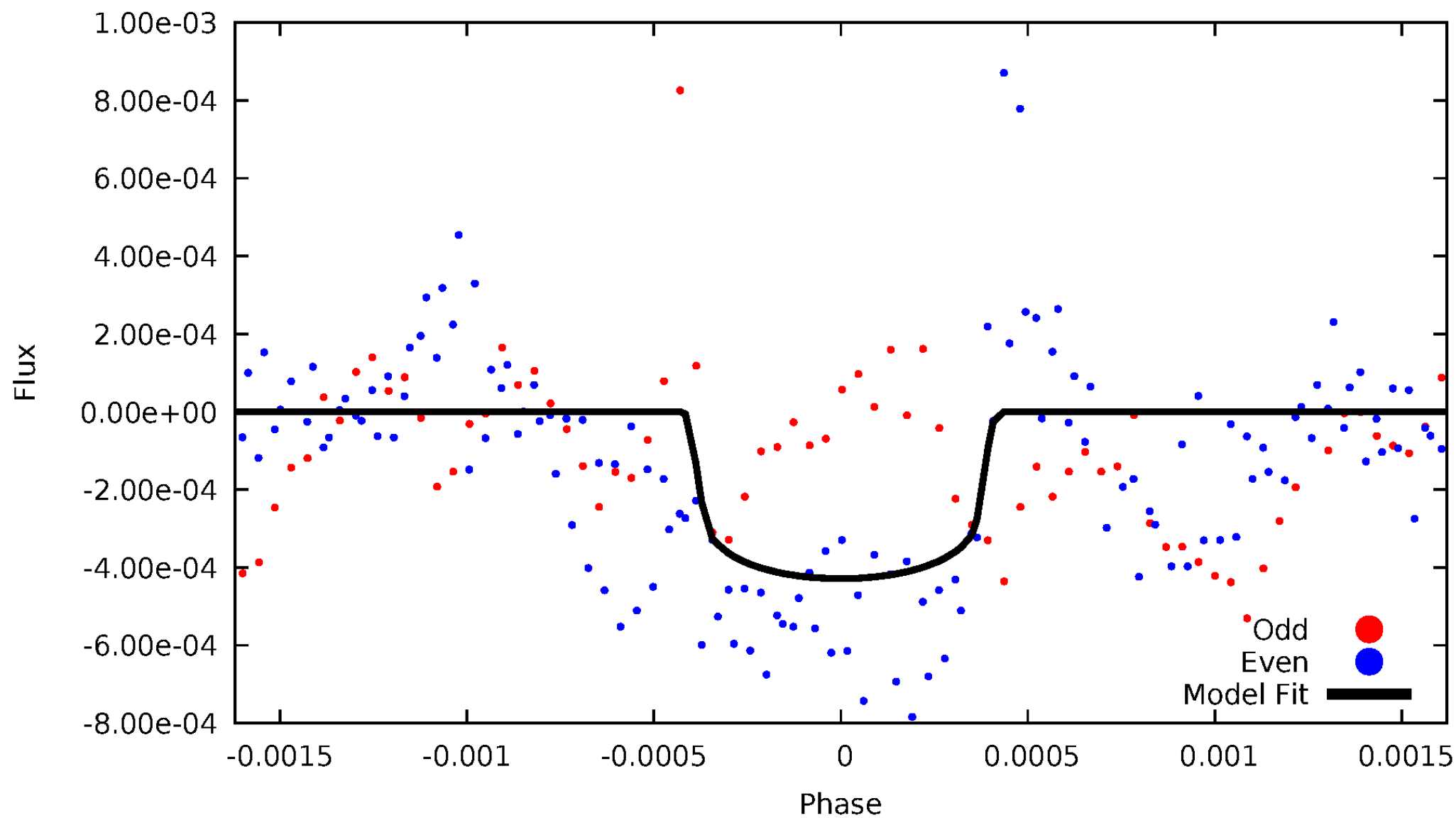


TCE 004356708-01



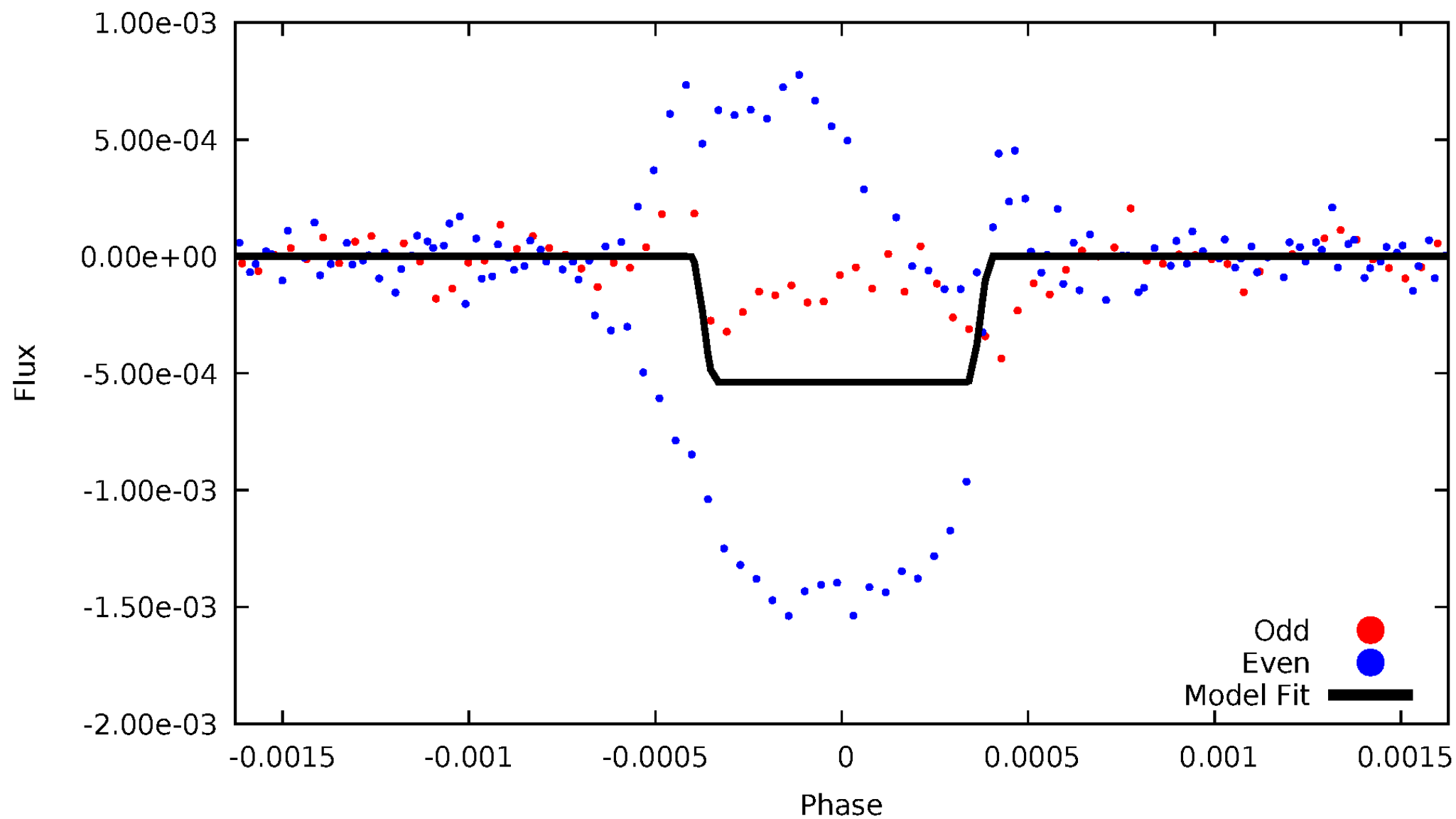
DV Odd/Even

TCE 004356708-01



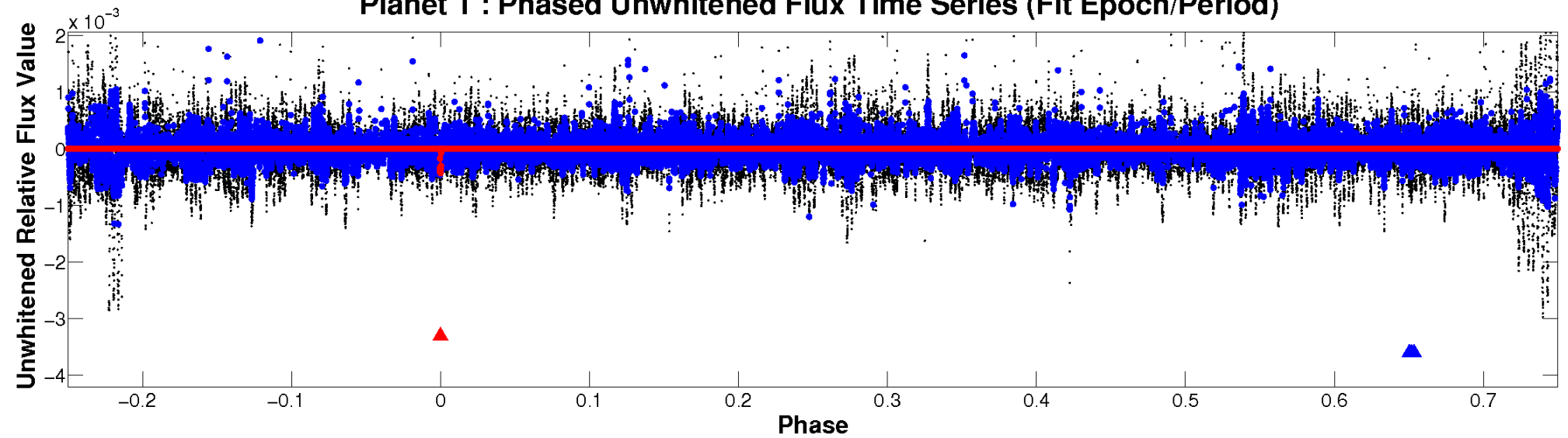
ALT Odd/Even

TCE 004356708-01

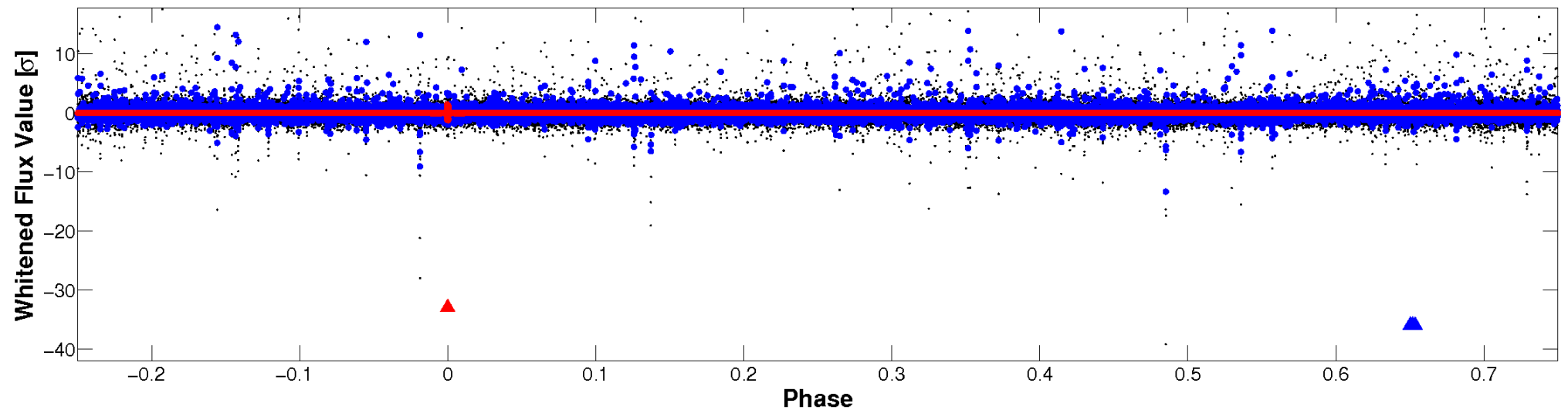


Non-Whitened Vs. Whitened Light Curve

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

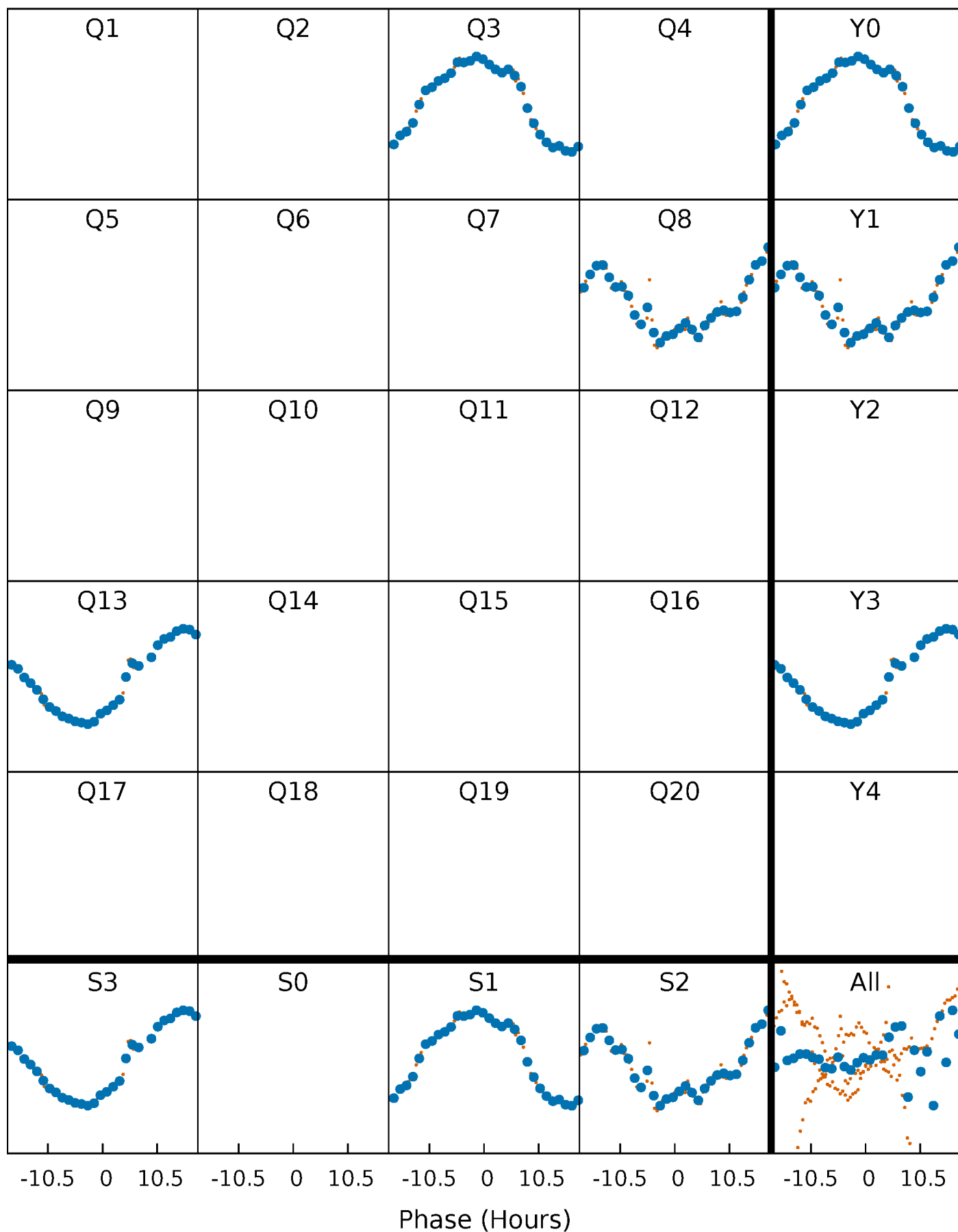


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



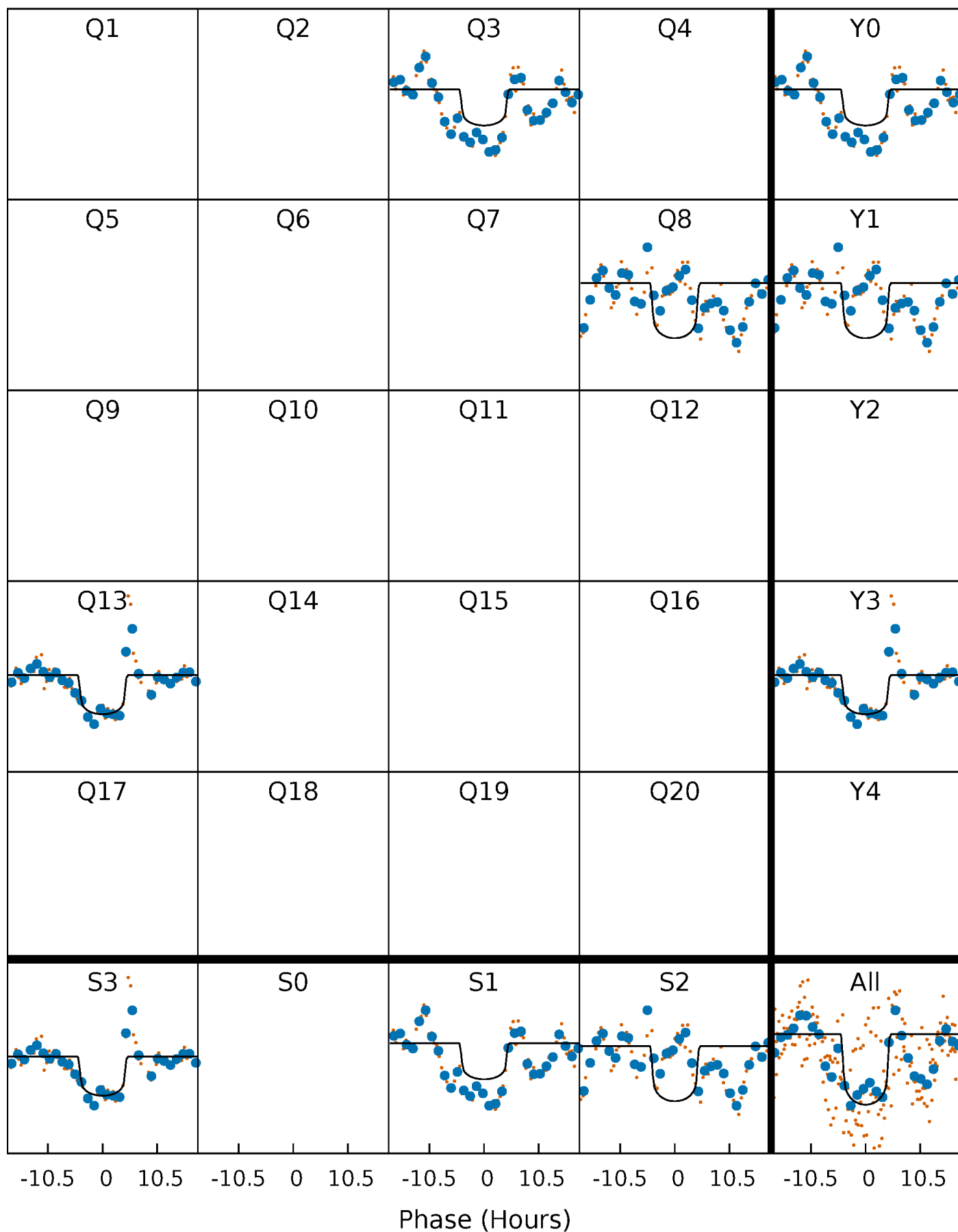
PDC Quarter-Phased Transit Curves

TCE 004356708-01 P=471.589835 Days $T_0=277.053170$ (BKJD)



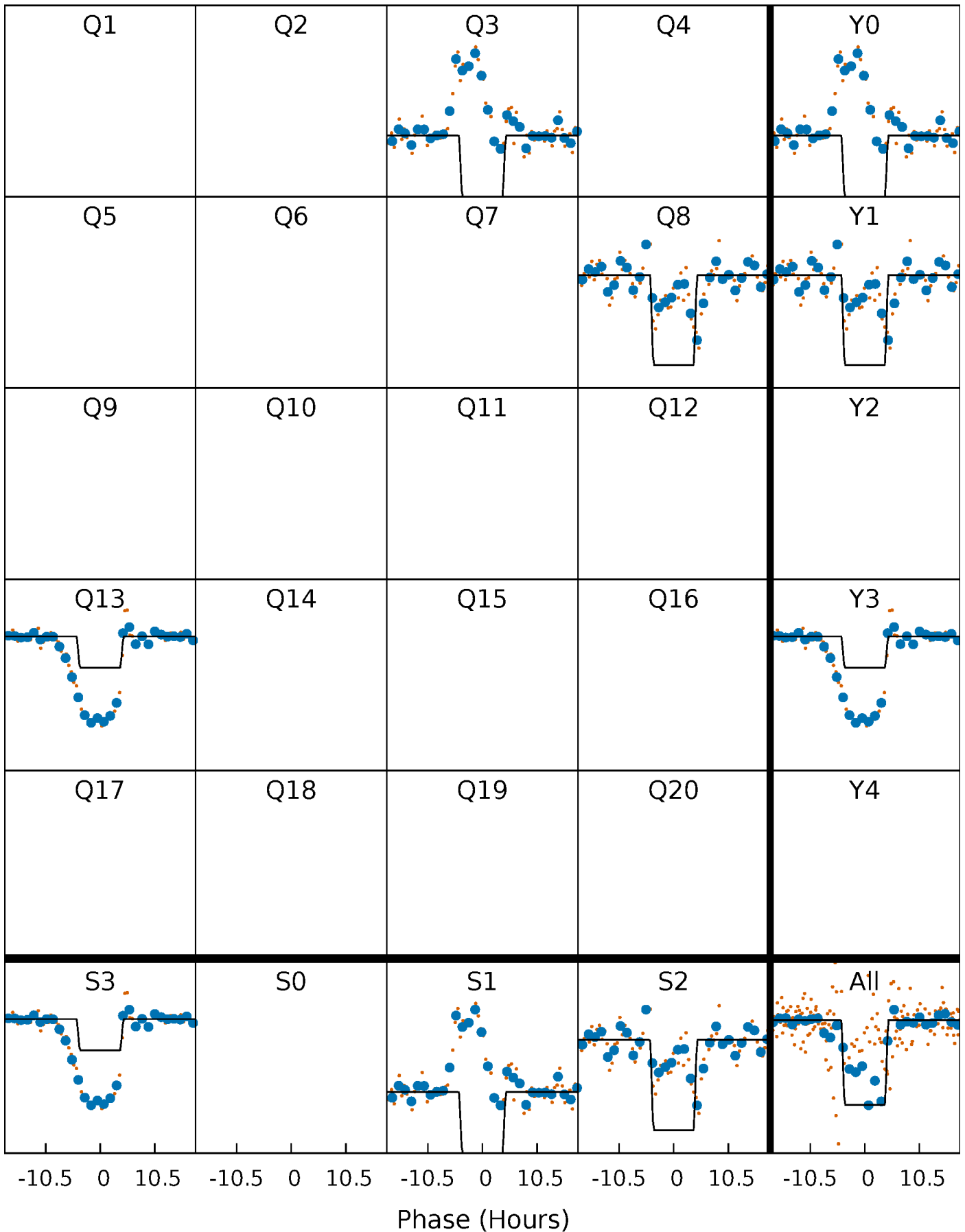
DV Quarter-Phased Transit Curves

TCE 004356708-01 P=471.589835 Days $T_0=277.053170$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

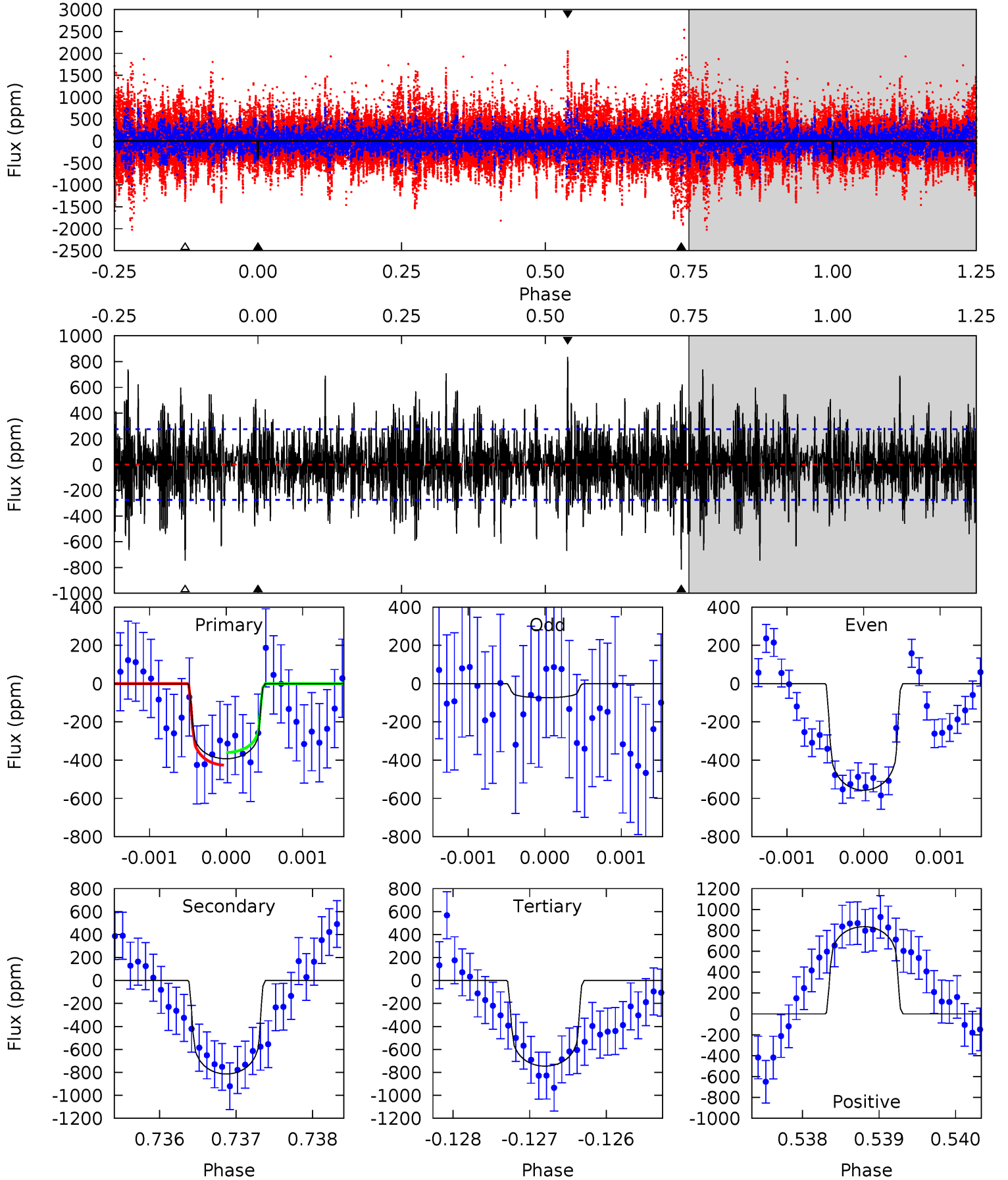
TCE 004356708-01 P=471.592942 Days $T_0=277.053970$ (BKJD)



DV Model-Shift Uniqueness Test

004356708-01, P = 471.589835 Days, E = 277.053170 Days

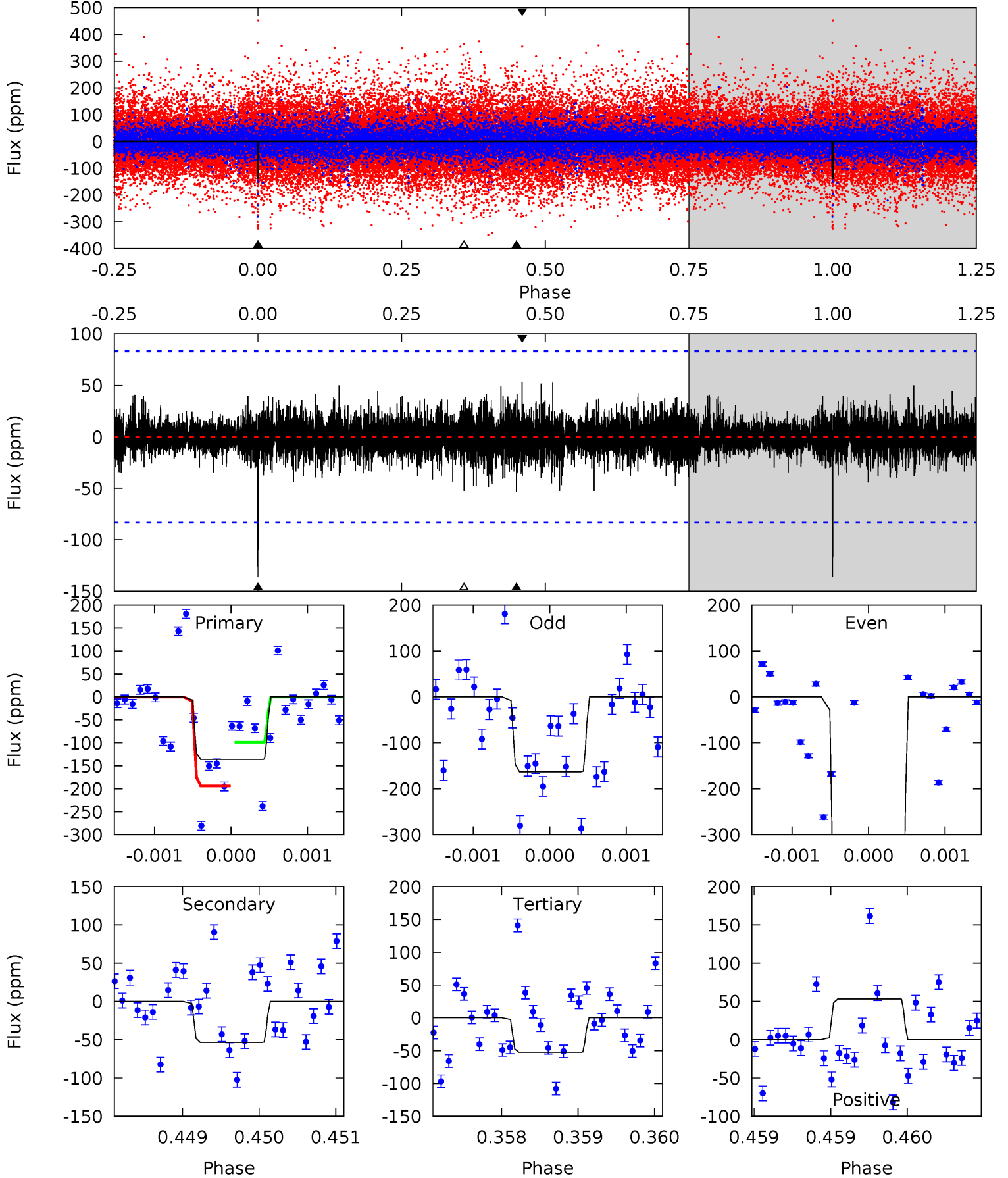
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.82	16.2	14.9	16.6	5.48	3.34	3.99	-7.04	-8.82	1.36	-0.42	4.07	0.88	0.51	0.66



Alt Model-Shift Uniqueness Test

004356708-01, P = 471.592942 Days, E = 277.053970 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.01	3.54	3.47	3.53	5.50	3.36	0.75	5.54	5.48	0.07	0.01	19.0	2.33	0.28	3.10



Stellar Parameters For KIC 004356708

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6287^{+199}_{-222}	$4.031^{+0.371}_{-0.159}$	$-0.520^{+0.300}_{-0.300}$	$1.596^{+0.408}_{-0.612}$	$0.998^{+0.156}_{-0.142}$	$0.346^{+0.978}_{-0.152}$
	+3%/-4%	+9%/-4%	+58%/-58%	+26%/-38%	+16%/-14%	+283%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 004356708-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-814 ± 50	$3.40^{+1.02}_{-0.95}$	440^{+38}_{-50}	7504^{+1089}_{-837}	55275^{+48395}_{-23375}
Alt.	-53 ± 15	$3.91^{+1.12}_{-1.04}$	444^{+38}_{-48}	3863^{+350}_{-286}	2679^{+2356}_{-1155}

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 $A_{obs} \gg 1.0$

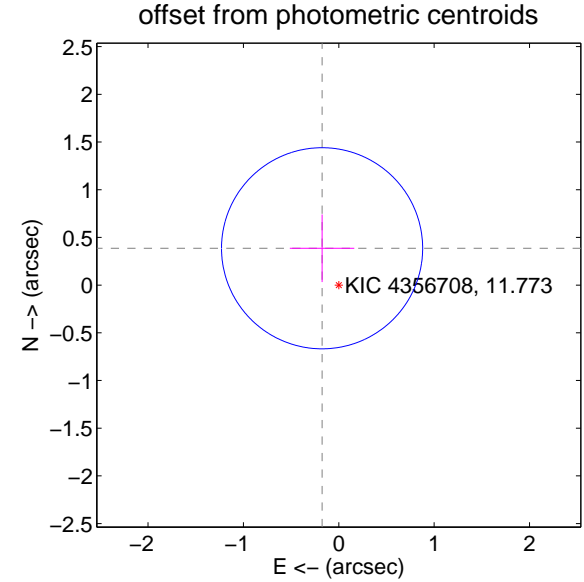
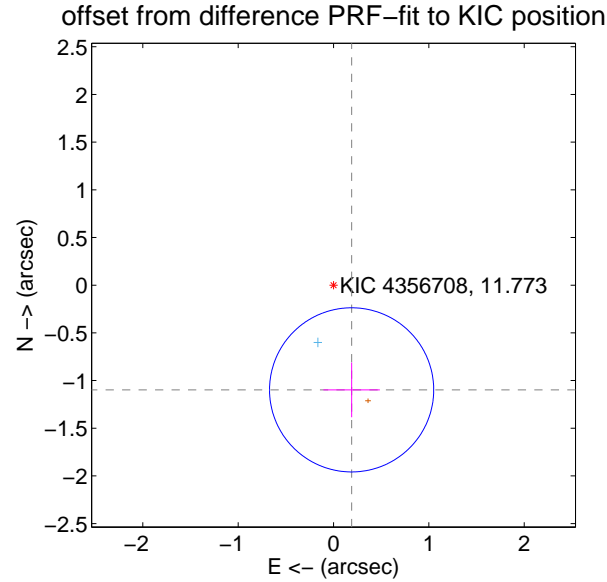
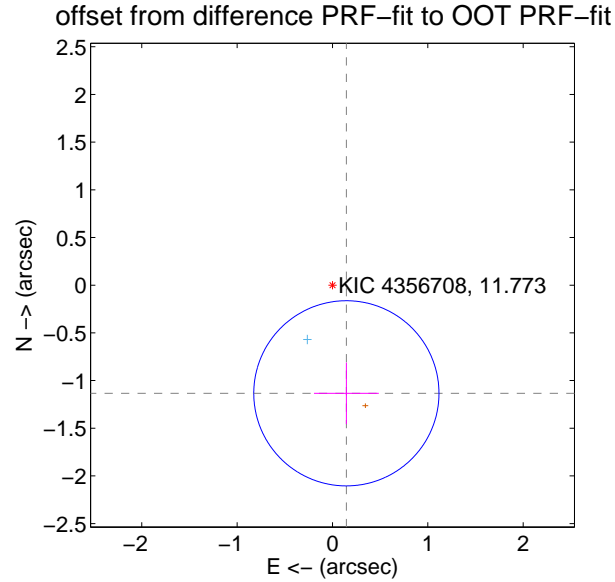
DV Centroid Data

Supplemental centroid analysis for 004356708-01. **Kepler magnitude: 11.77.** Transit SNR 5.86

There are 1 quarters with good PRF difference image offsets

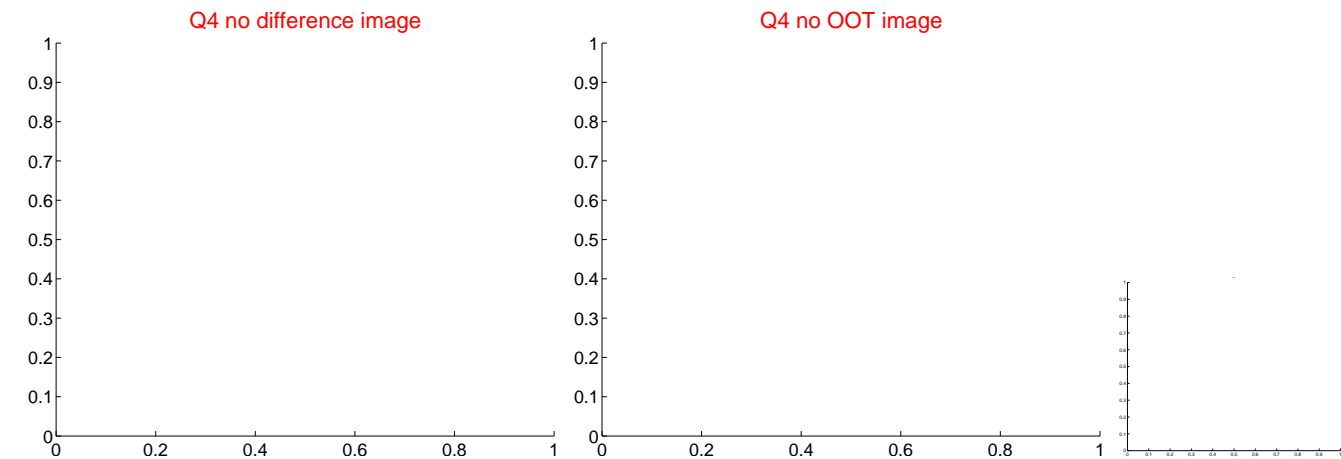
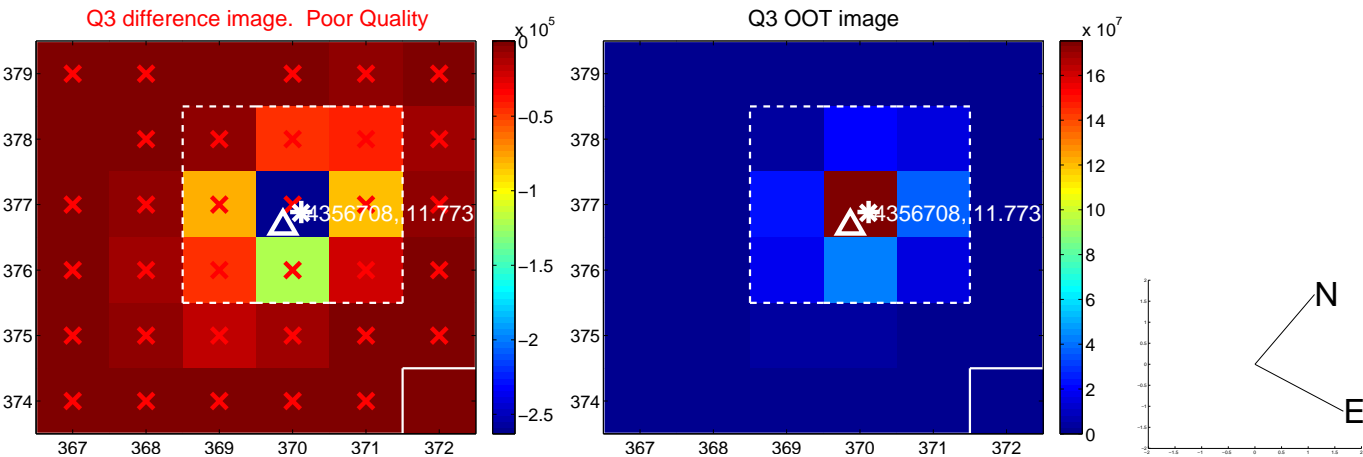
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.143 ± 0.324	3.53	-0.146 ± 0.340	-1.134 ± 0.323
PRF-fit source offset from KIC position	1.114 ± 0.287	3.88	-0.190 ± 0.296	-1.098 ± 0.287
photometric centroid source offset	0.42 ± 0.35	1.21	0.17 ± 0.34	0.39 ± 0.35

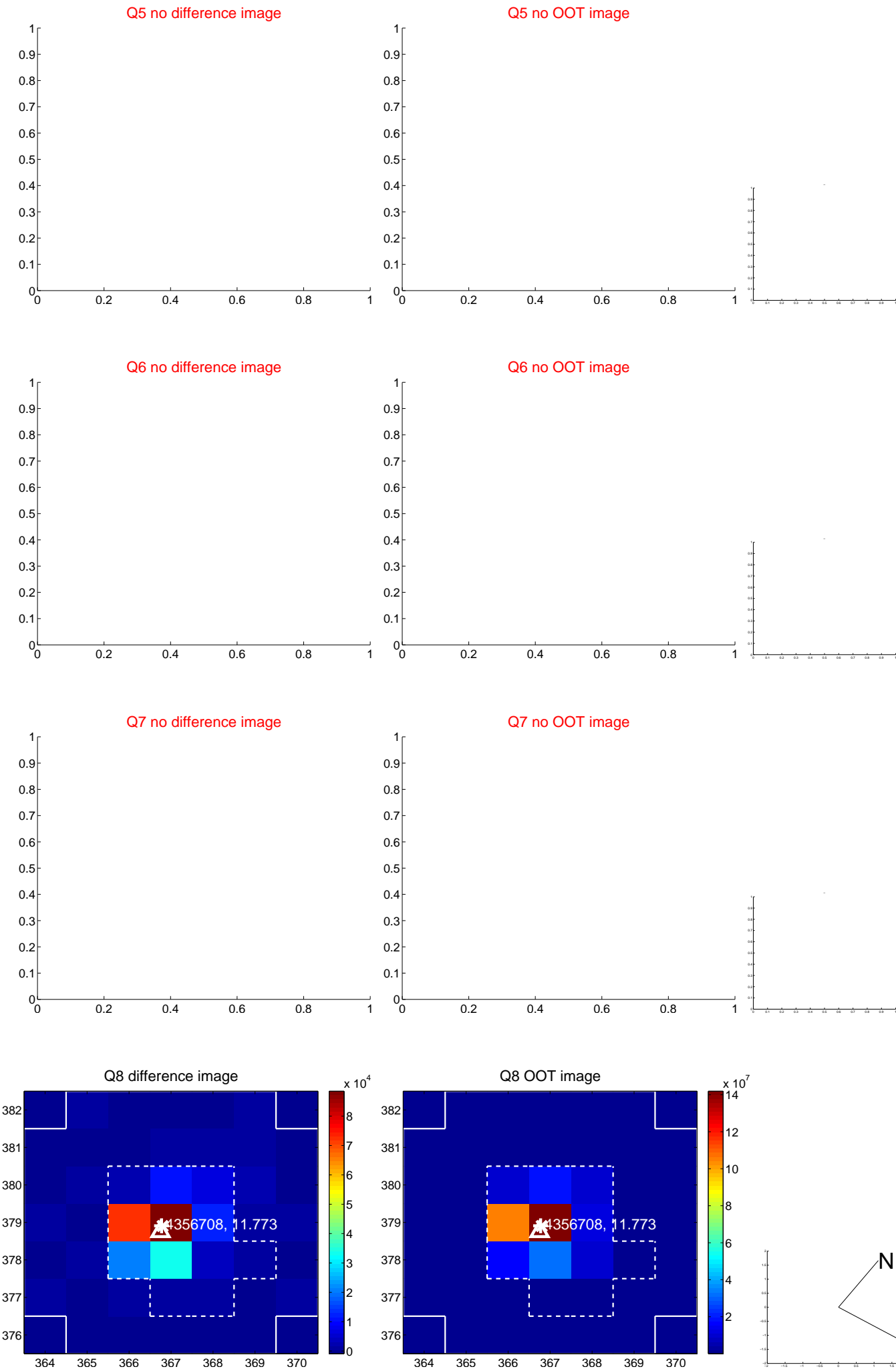


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



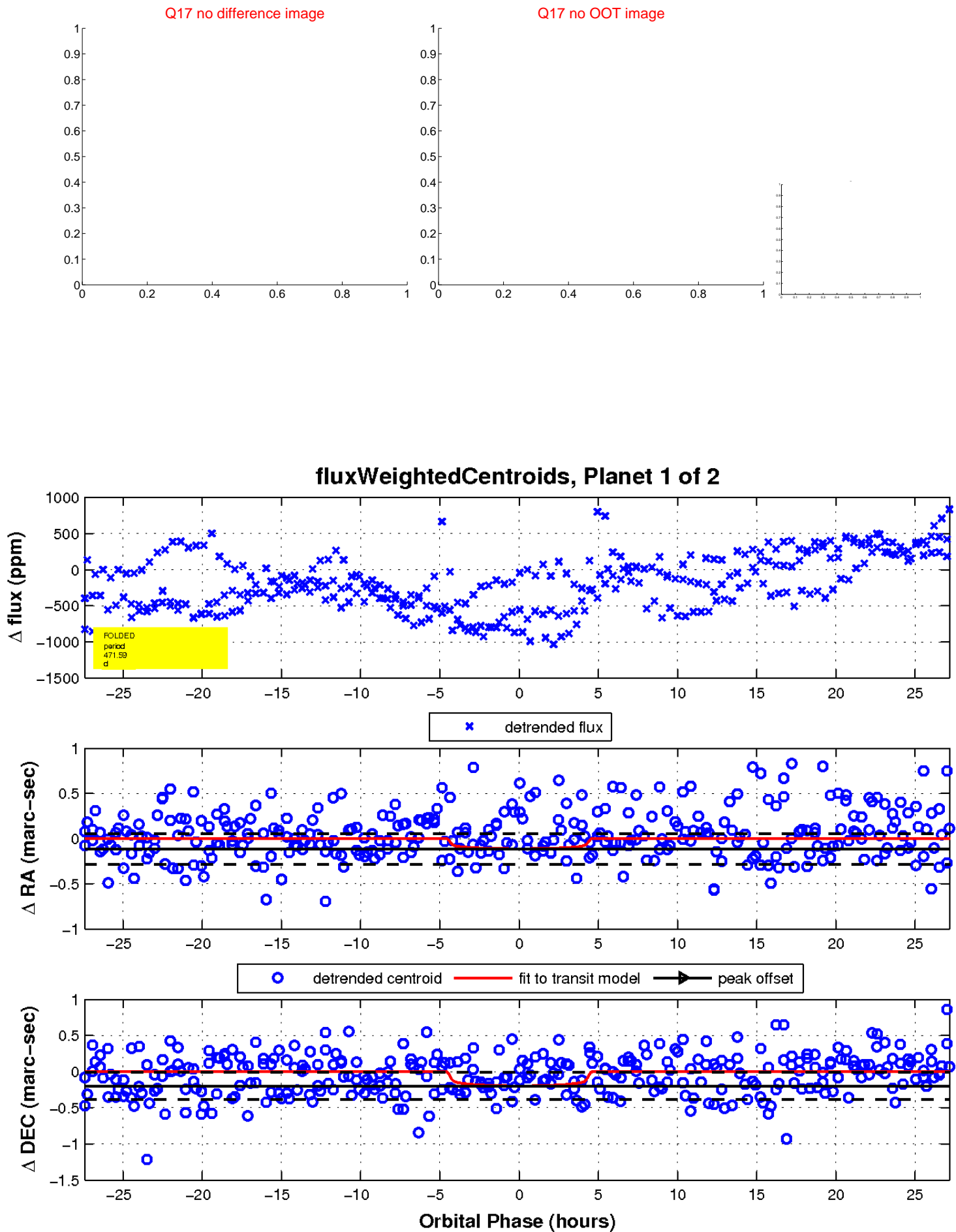
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

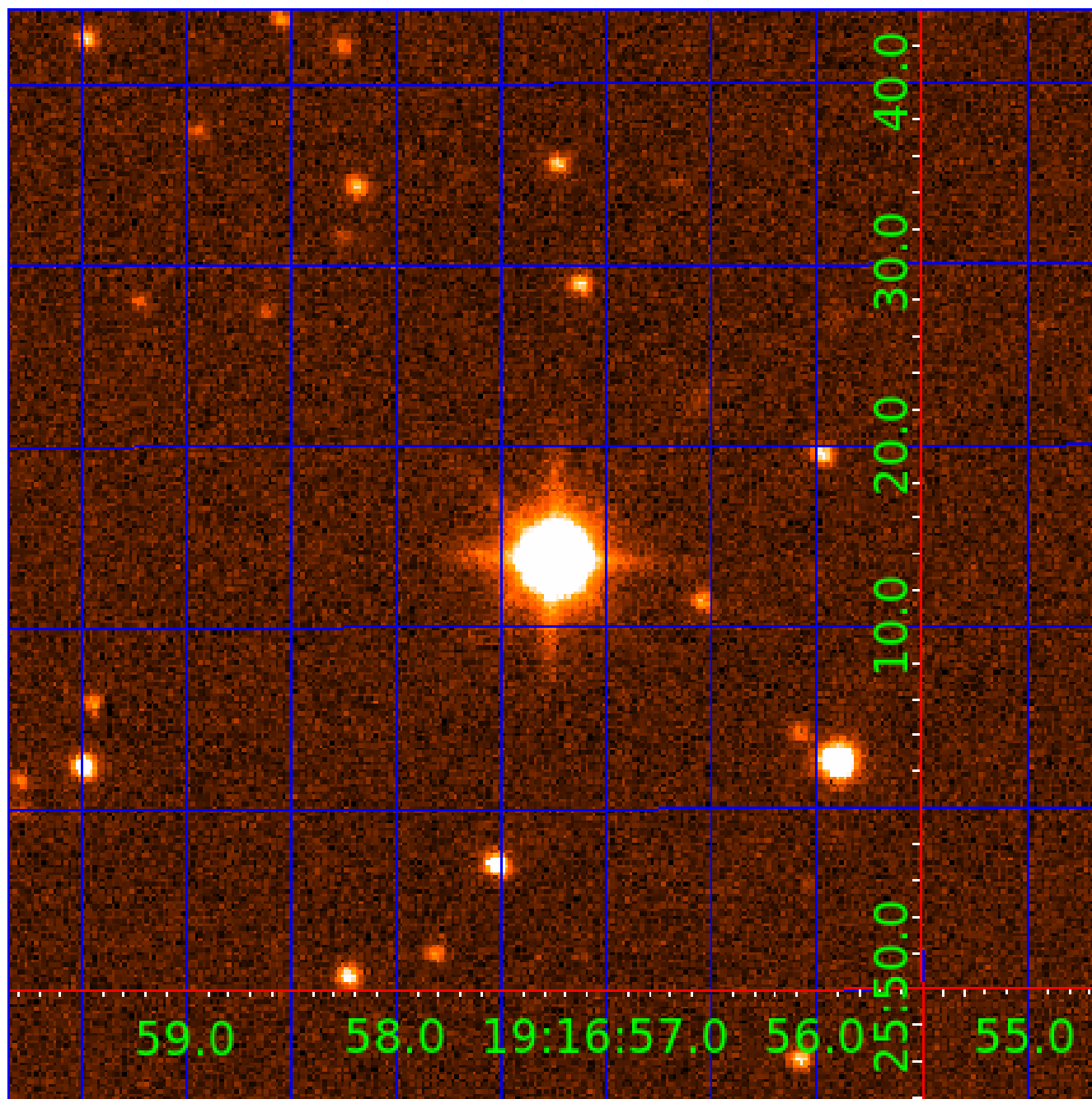


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004356708

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})
004356708-01	OBS	No	471.589835	277.053170	429.0	9.168	11.5	5.9	1.60	6287	3.58	2.54
004356708-02	OBS	No	472.346304	583.726160	414.1	14.347	11.4	5.1	1.60	6287	3.45	2.53

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004356708-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004356708-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

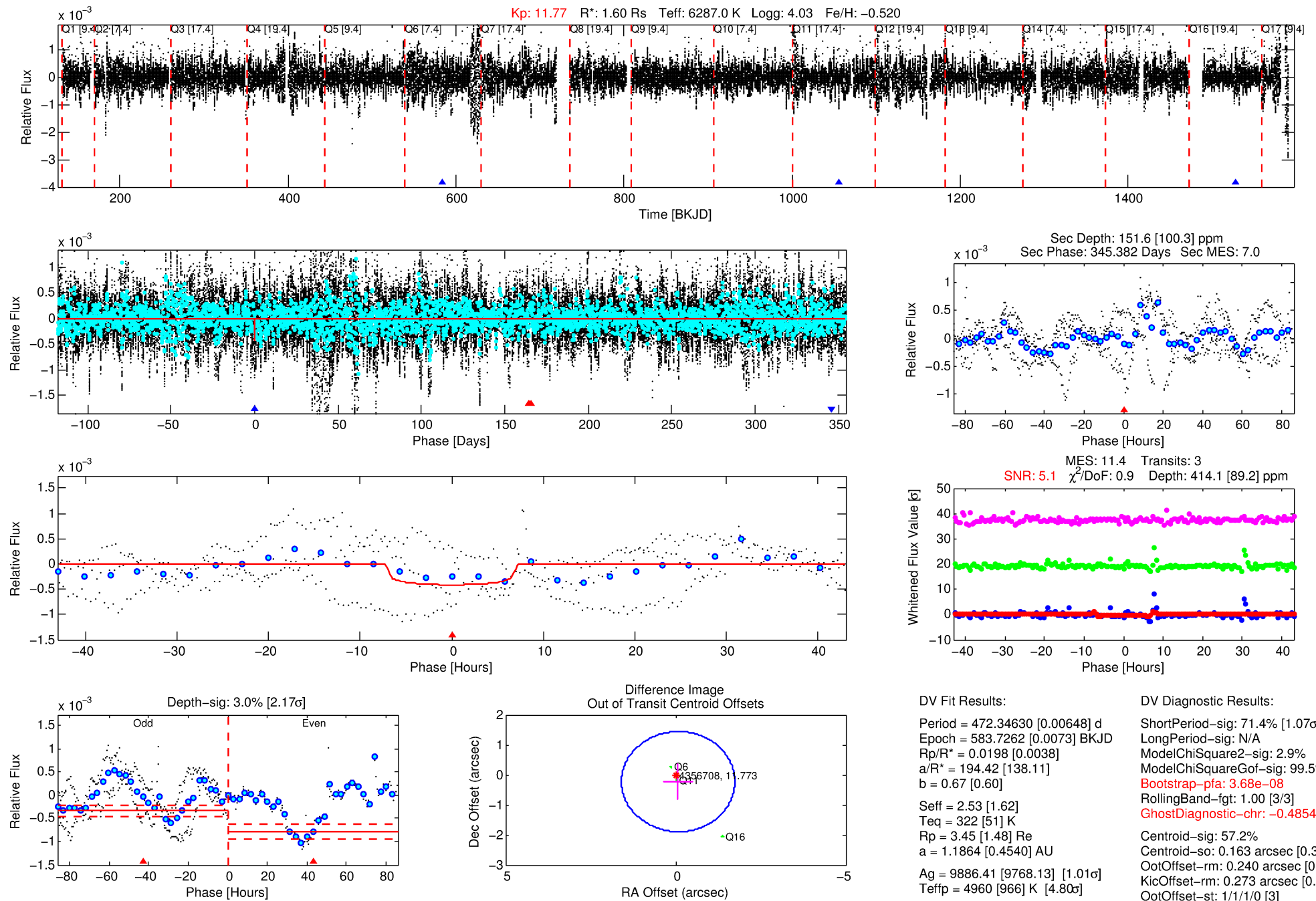
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004356708-02

No Significant Match Found

DV One-Page Summary

KIC: 4356708 Candidate: 2 of 2 Period: 472.346 d



DV Fit Results:

Period = 472.34630 [0.00648] d
Epoch = 583.7262 [0.0073] BKJD
Rp/R* = 0.0198 [0.0038]
a/R* = 194.42 [138.11]
b = 0.67 [0.60]
Seff = 2.53 [1.62]
Teq = 322 [51] K
Rp = 3.45 [1.48] Re
a = 1.1864 [0.4540] AU
Ag = 9886.41 [9768.13] [1.01σ]
Teffp = 4960 [966] K [4.80σ]

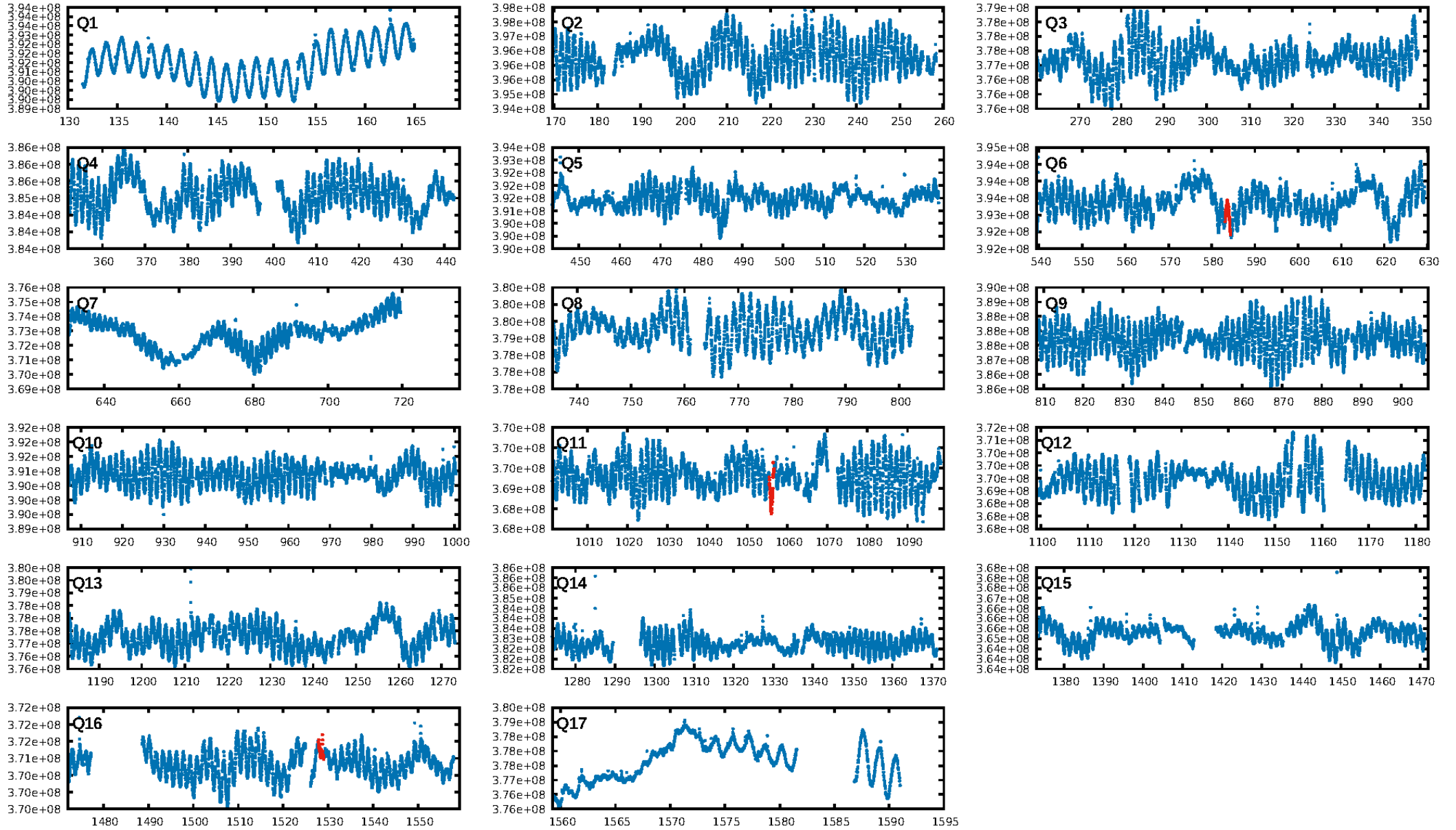
DV Diagnostic Results:

ShortPeriod-sig: 71.4% [1.07σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 2.9%
ModelChiSquareGof-sig: 99.5%
Bootstrap-pfa: 3.68e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -0.4854
Centroid-sig: 57.2%
Centroid-so: 0.163 arcsec [0.39σ]
OotOffset-rm: 0.240 arcsec [0.43σ]
KicOffset-rm: 0.273 arcsec [0.42σ]
OotOffset-st: 1/1/1/0 [3]
KicOffset-st: 1/1/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

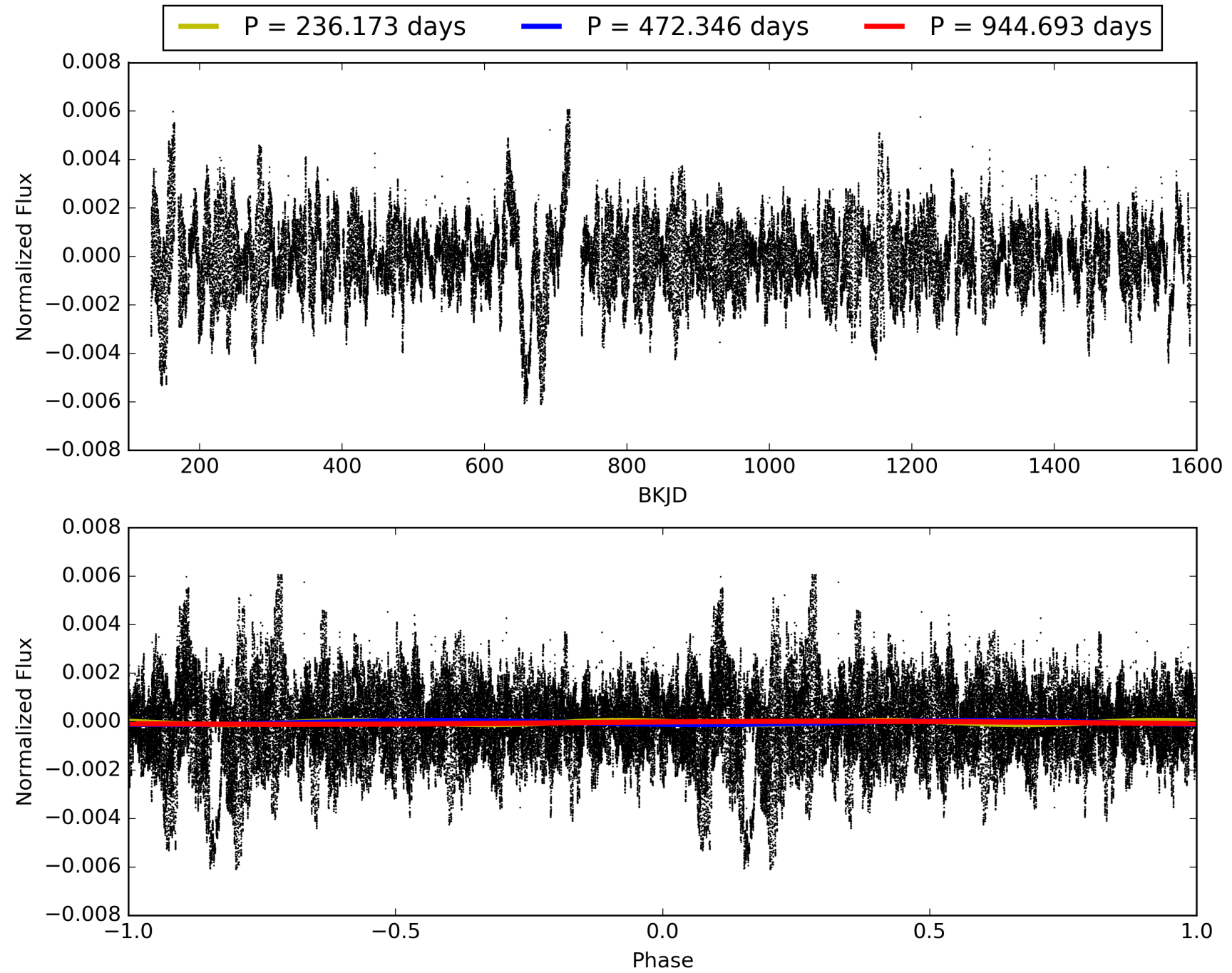
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 00:48:44 Z

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

TCE 004356708-02, PDC Light Curves

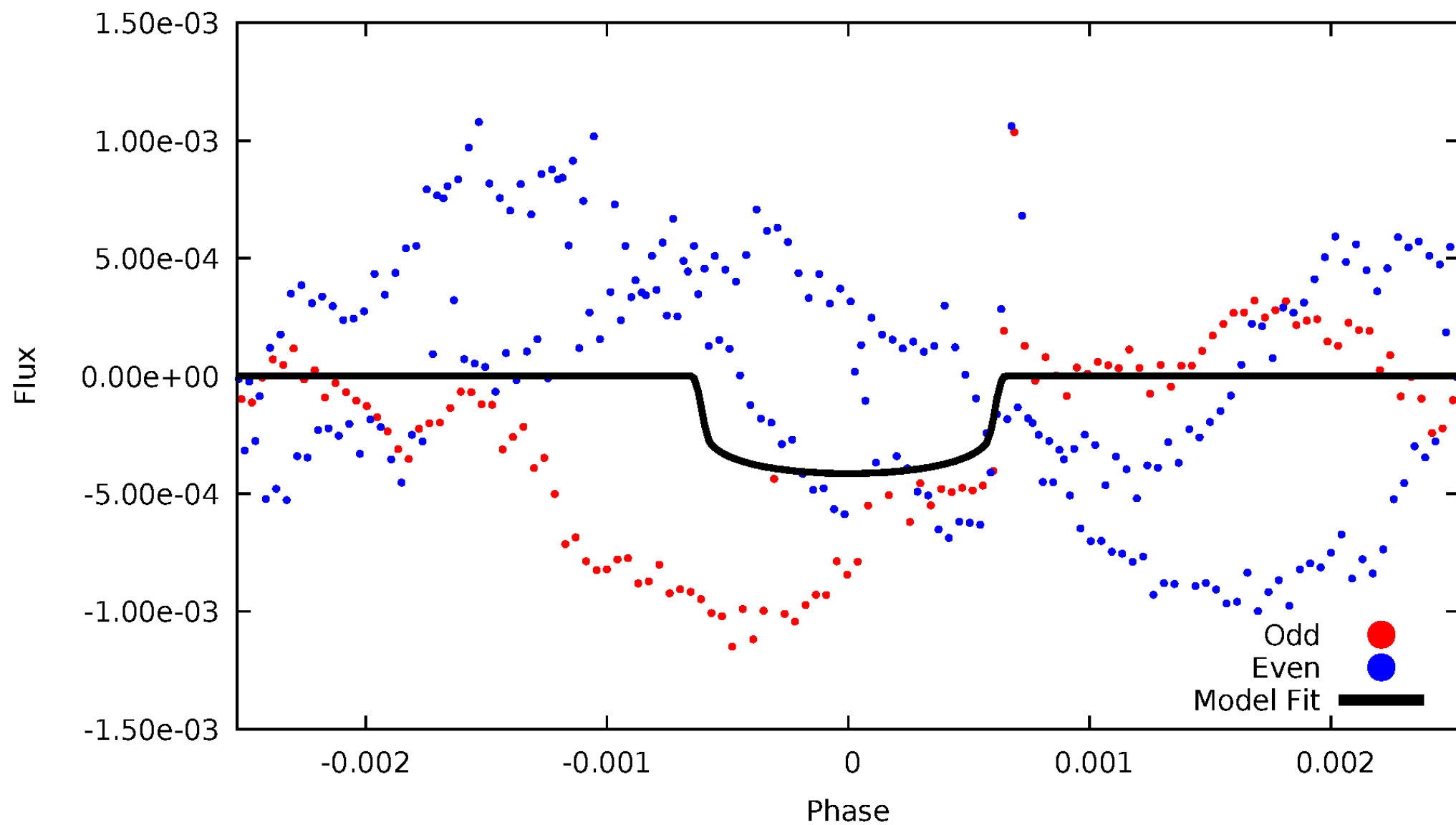


TCE 004356708-02



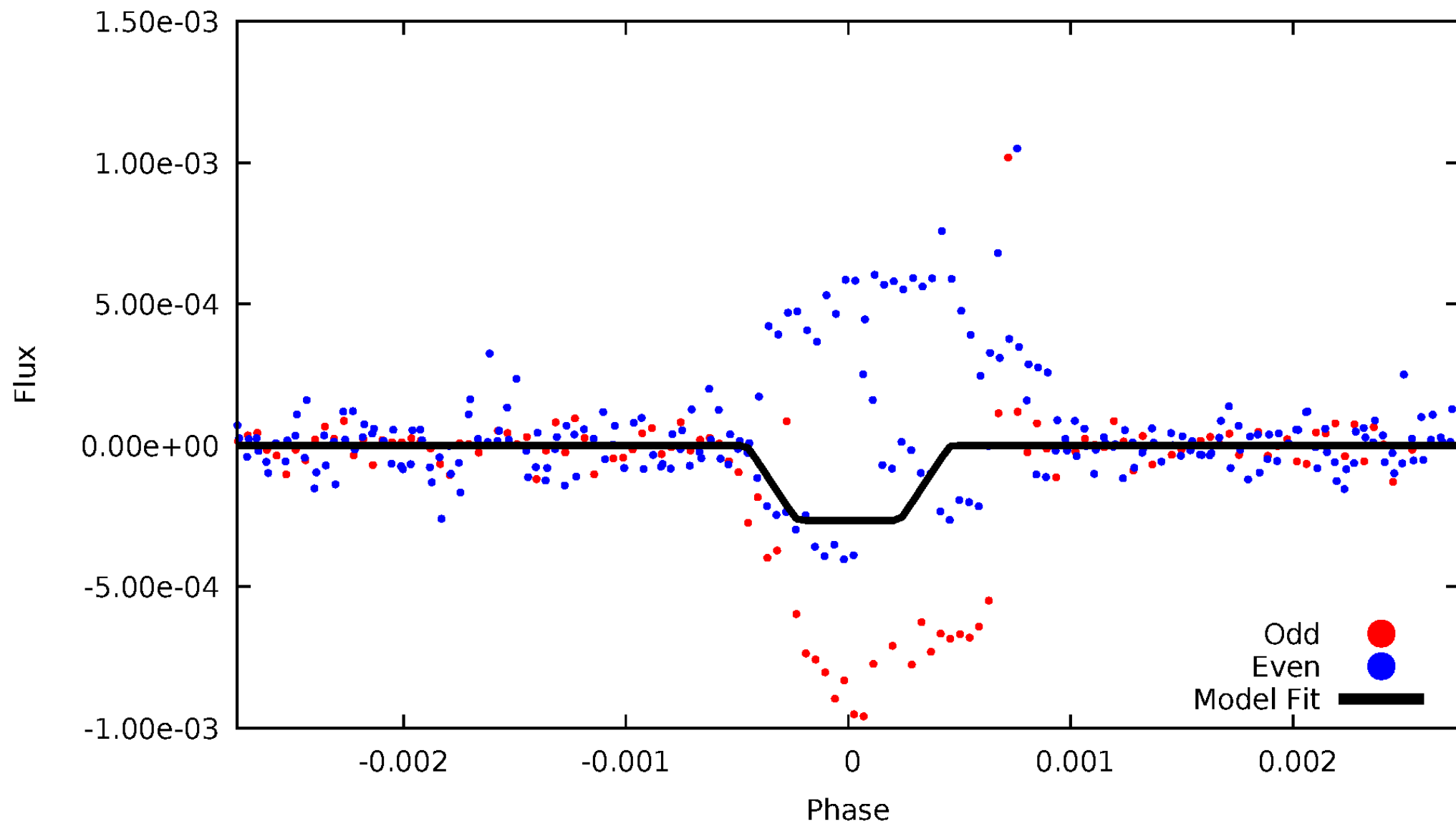
DV Odd/Even

TCE 004356708-02



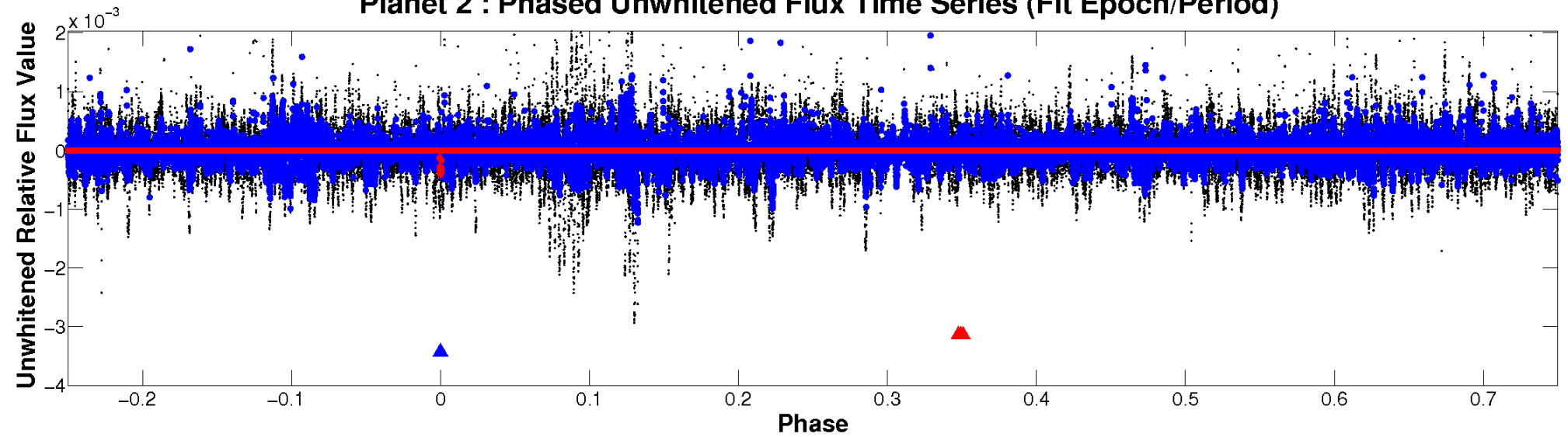
ALT Odd/Even

TCE 004356708-02

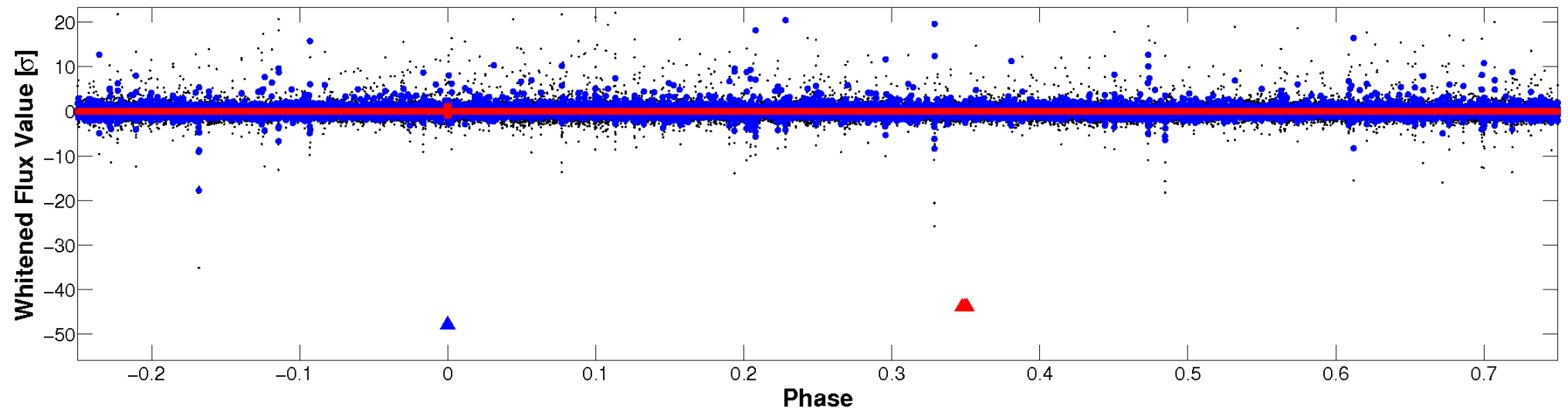


Non-Whitened Vs. Whitened Light Curve

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

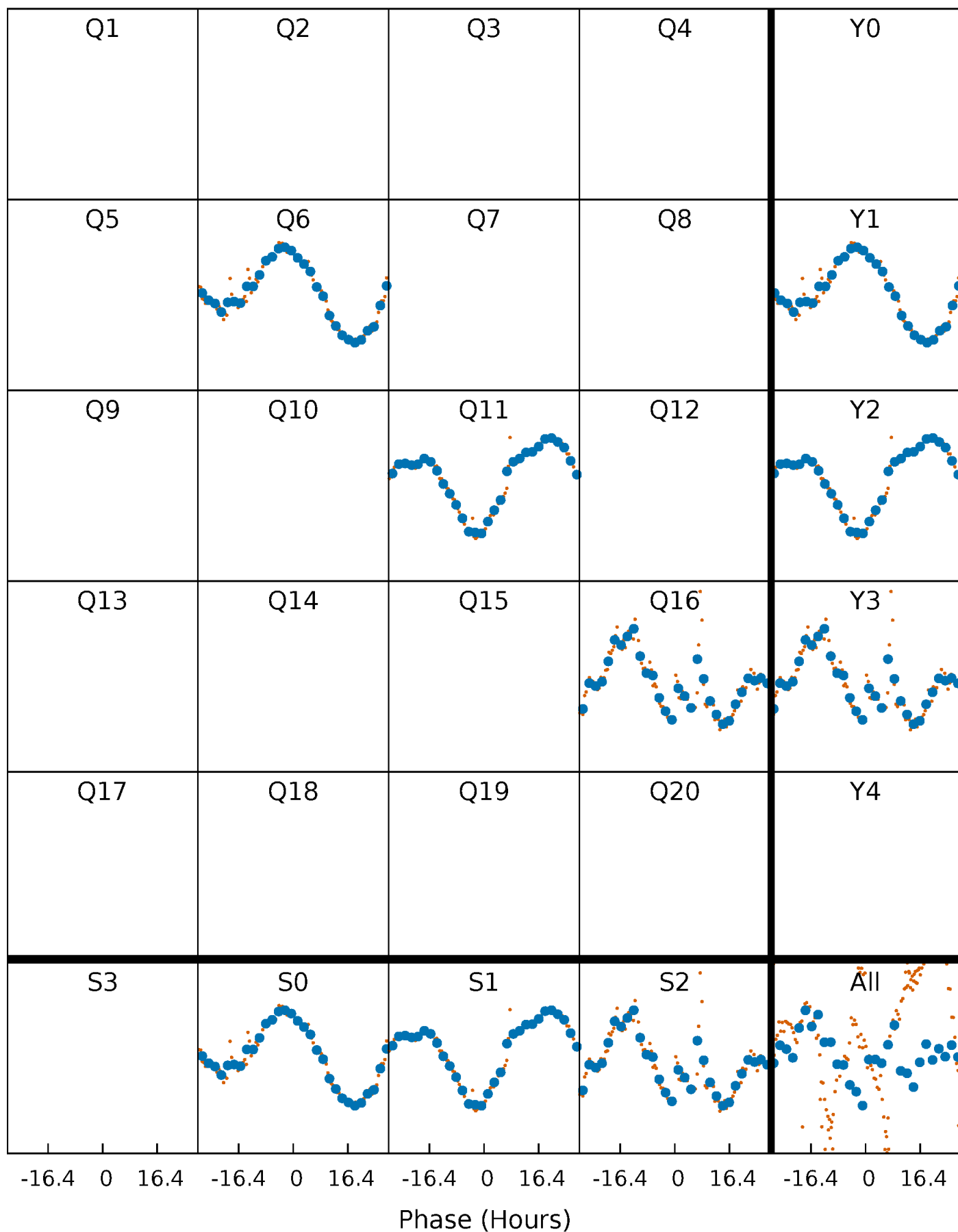


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



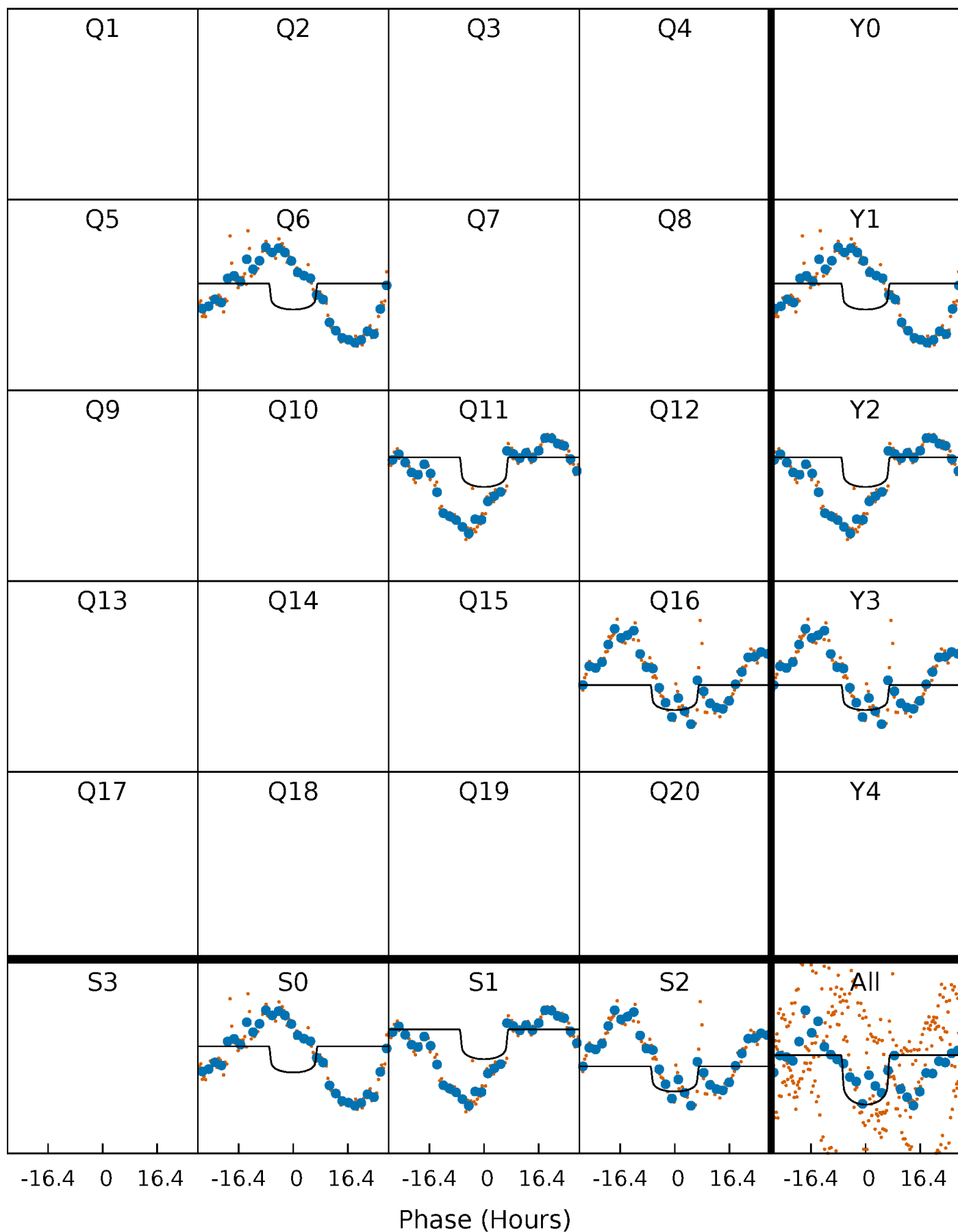
PDC Quarter-Phased Transit Curves

TCE 004356708-02 $P=472.346304$ Days $T_0=583.726160$ (BKJD)



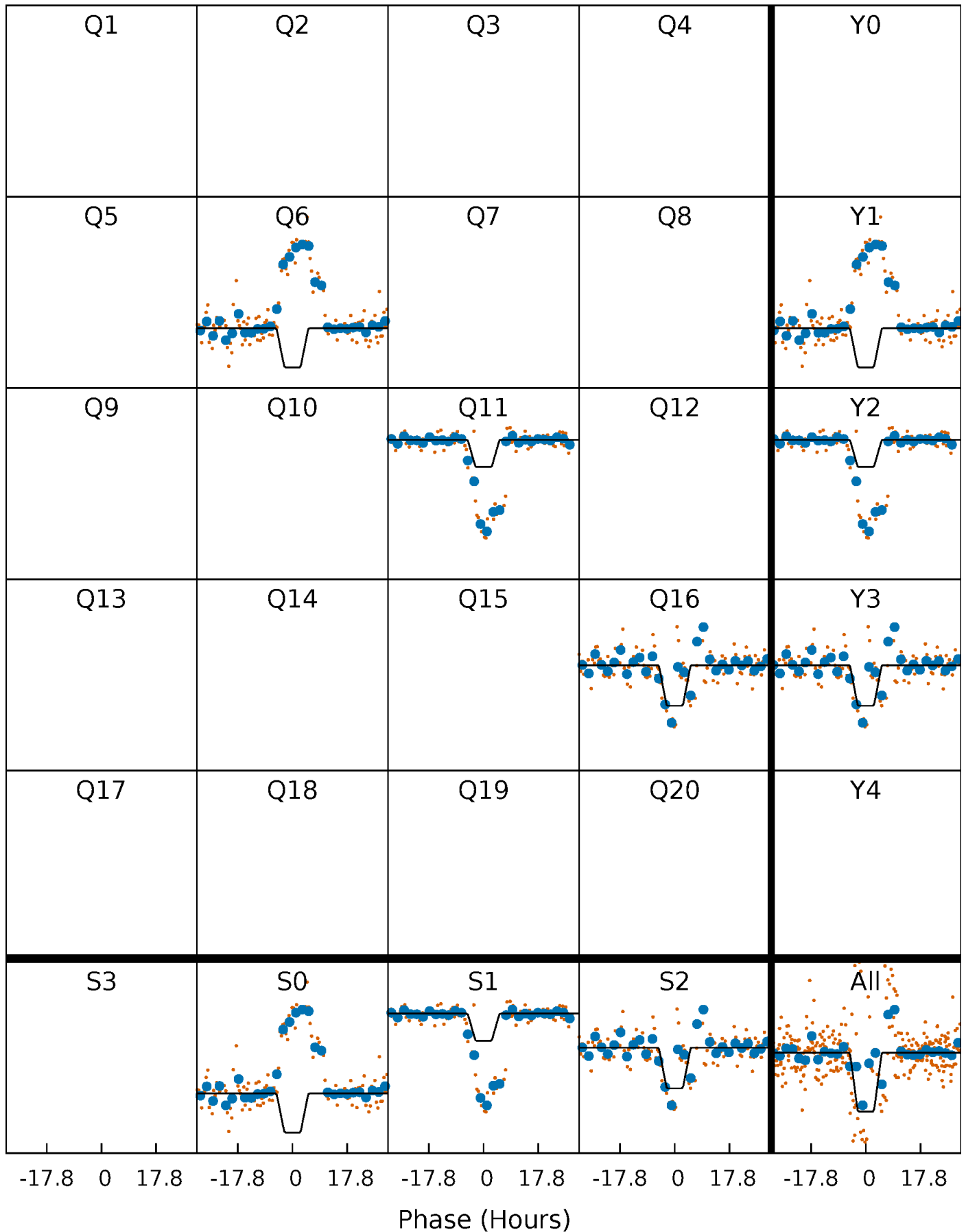
DV Quarter-Phased Transit Curves

TCE 004356708-02 $P=472.346304$ Days $T_0=583.726160$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

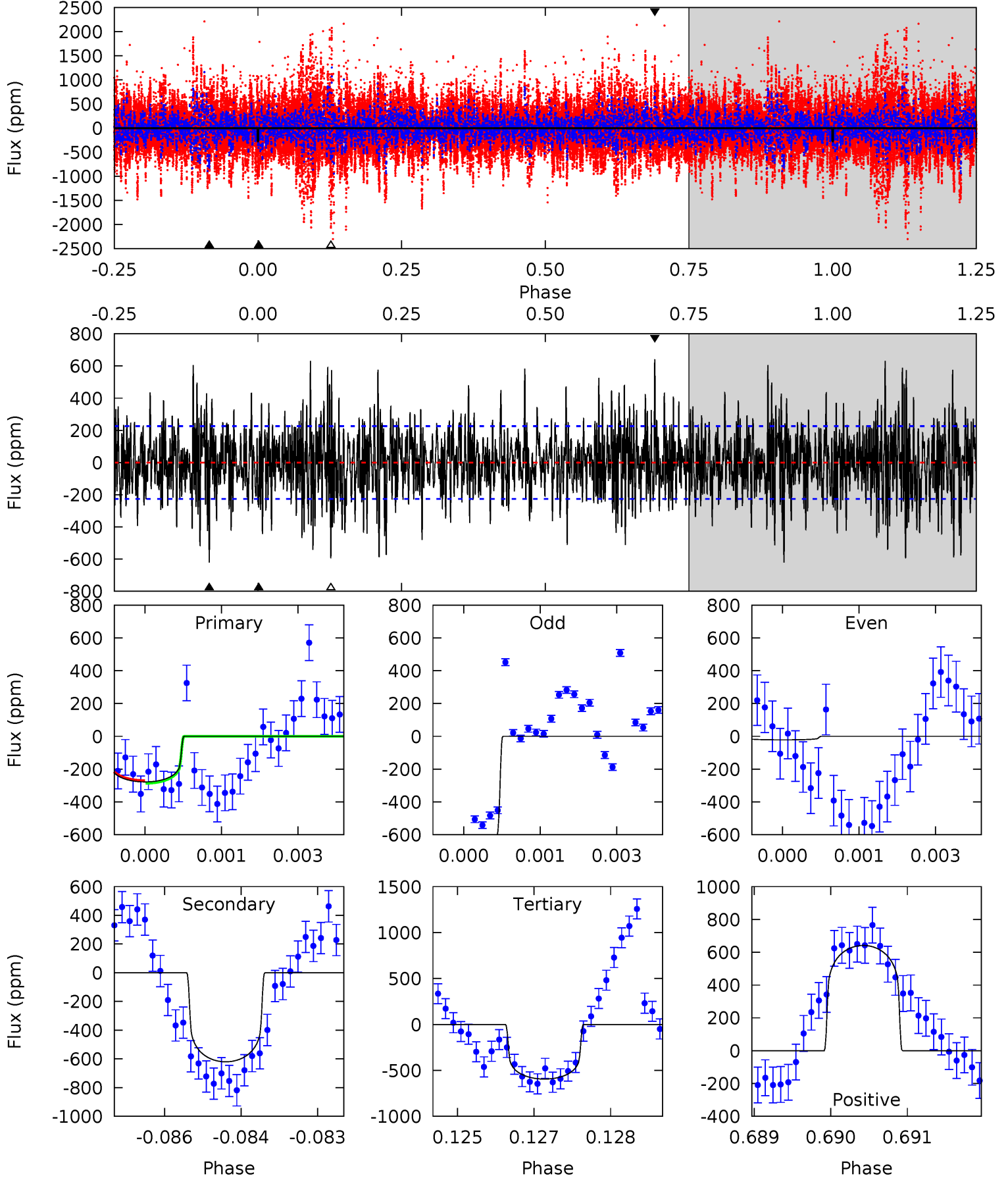
TCE 004356708-02 $P=472.342173$ Days $T_0=583.715920$ (BKJD)



DV Model-Shift Uniqueness Test

004356708-02, P = 472.346304 Days, E = 111.379856 Days

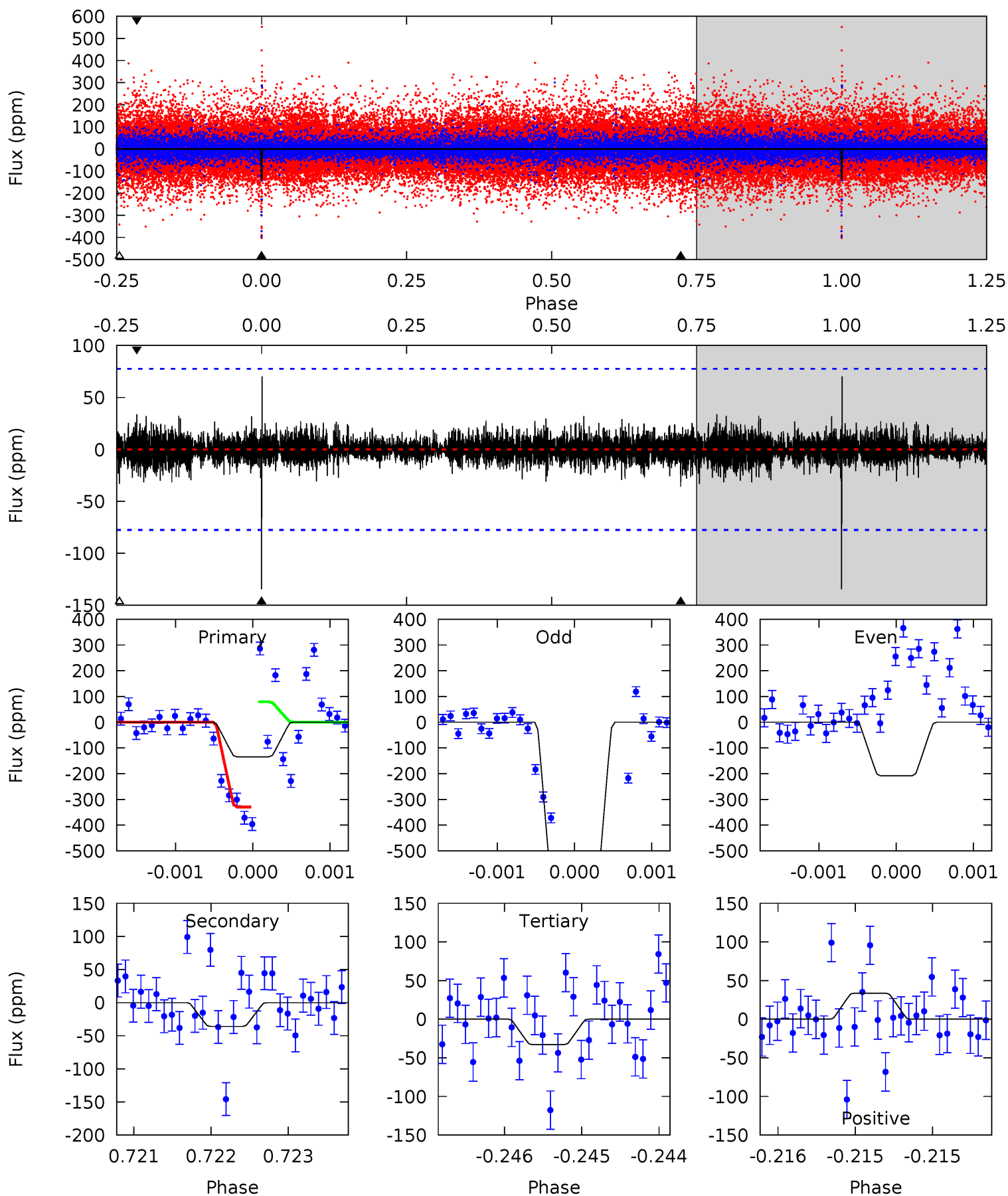
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.65	14.8	14.2	15.3	5.41	3.22	4.19	-7.56	-8.68	0.61	-0.50	9.13	0.80	0.51	0.19



Alt Model-Shift Uniqueness Test

004356708-02, P = 472.342173 Days, E = 111.373747 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.48	2.53	2.32	2.37	5.46	3.31	0.54	7.16	7.11	0.21	0.16	30.7	0.72	0.34	0



Stellar Parameters For KIC 004356708

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6287^{+199}_{-222}	$4.031^{+0.371}_{-0.159}$	$-0.520^{+0.300}_{-0.300}$	$1.596^{+0.408}_{-0.612}$	$0.998^{+0.156}_{-0.142}$	$0.346^{+0.978}_{-0.152}$
	+3%/-4%	+9%/-4%	+58%/-58%	+26%/-38%	+16%/-14%	+283%/-44%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 004356708-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-620 ± 42	$3.33^{+0.88}_{-0.95}$	442^{+34}_{-47}	7080^{+1006}_{-642}	44351^{+40925}_{-17349}
Alt.	-36 ± 14	$2.68^{+0.90}_{-0.76}$	441^{+38}_{-45}	4094^{+538}_{-455}	3727^{+4450}_{-1917}

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

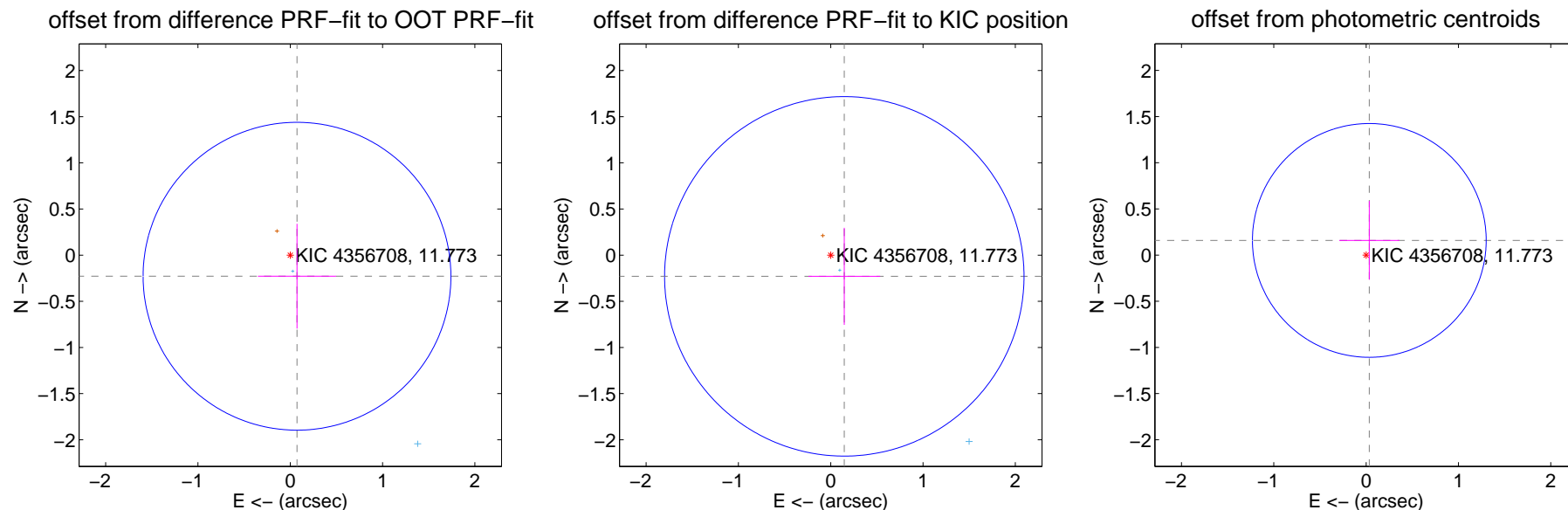
DV Centroid Data

Supplemental centroid analysis for 004356708-02. **Kepler magnitude: 11.77.** Transit SNR 5.15

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.240 ± 0.556	0.43	-0.073 ± 0.423	-0.228 ± 0.568
PRF-fit source offset from KIC position	0.273 ± 0.649	0.42	-0.147 ± 0.389	-0.230 ± 0.526
photometric centroid source offset	0.16 ± 0.42	0.39	-0.03 ± 0.33	0.16 ± 0.43

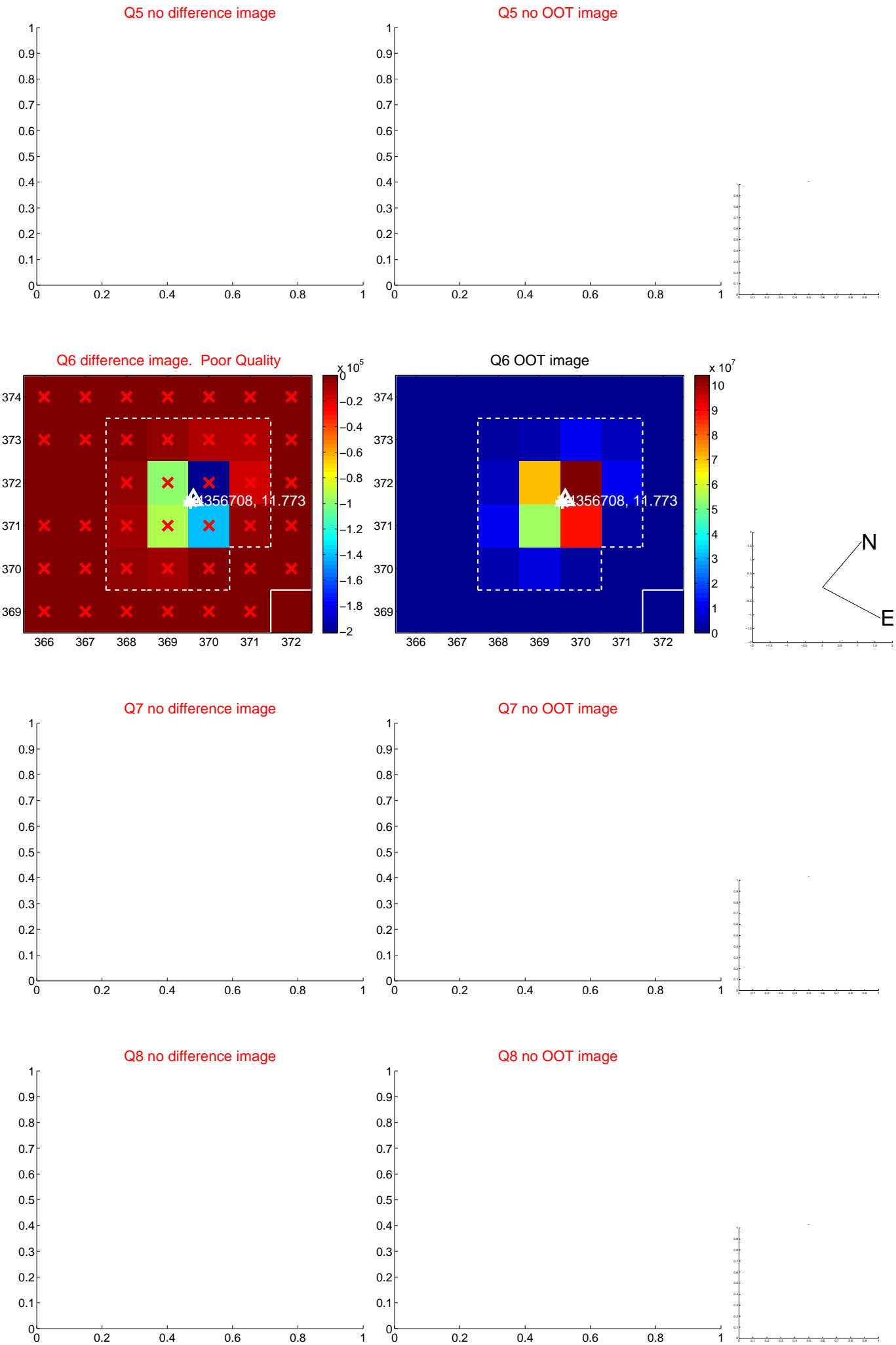


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

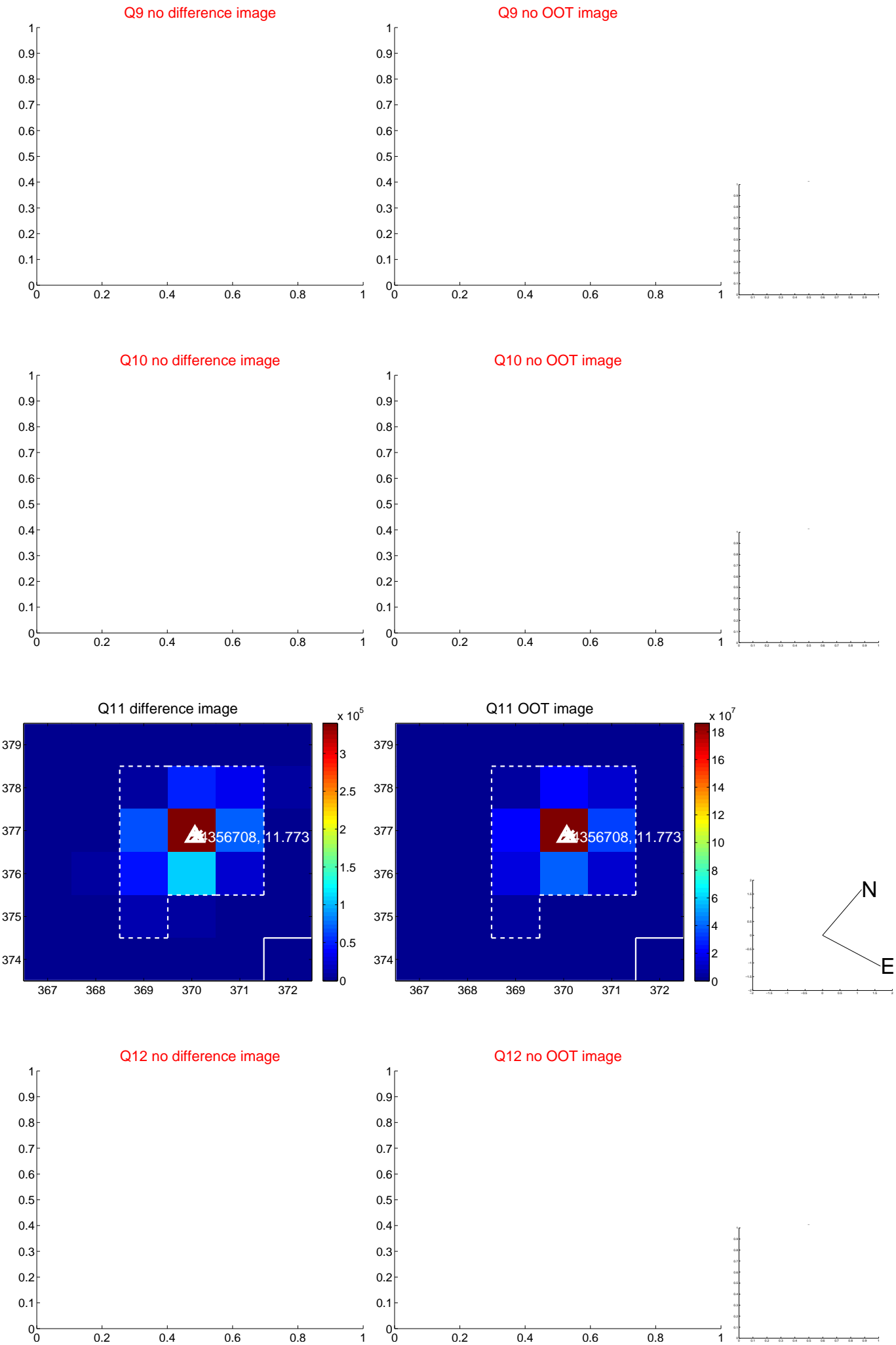
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



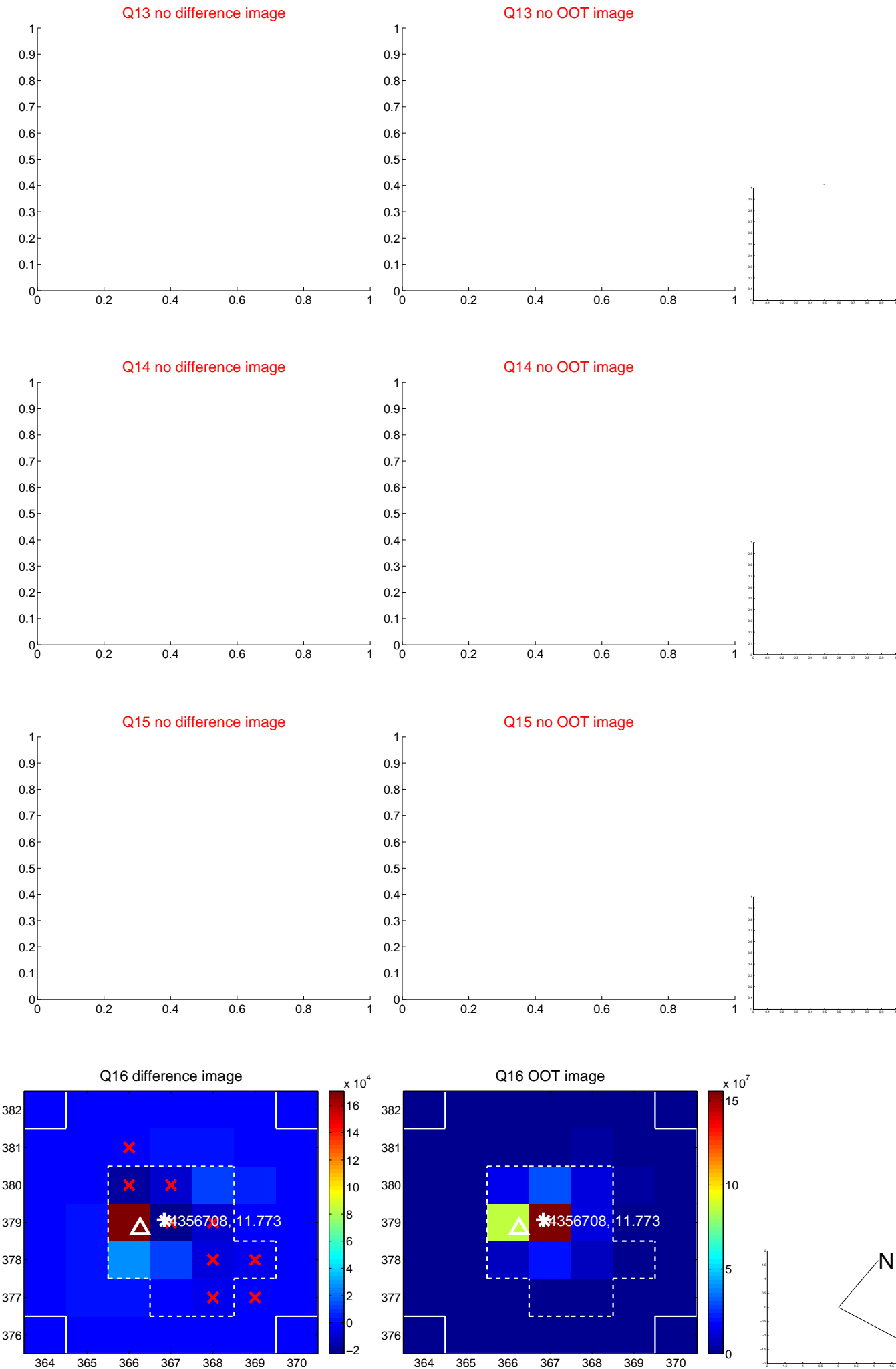
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



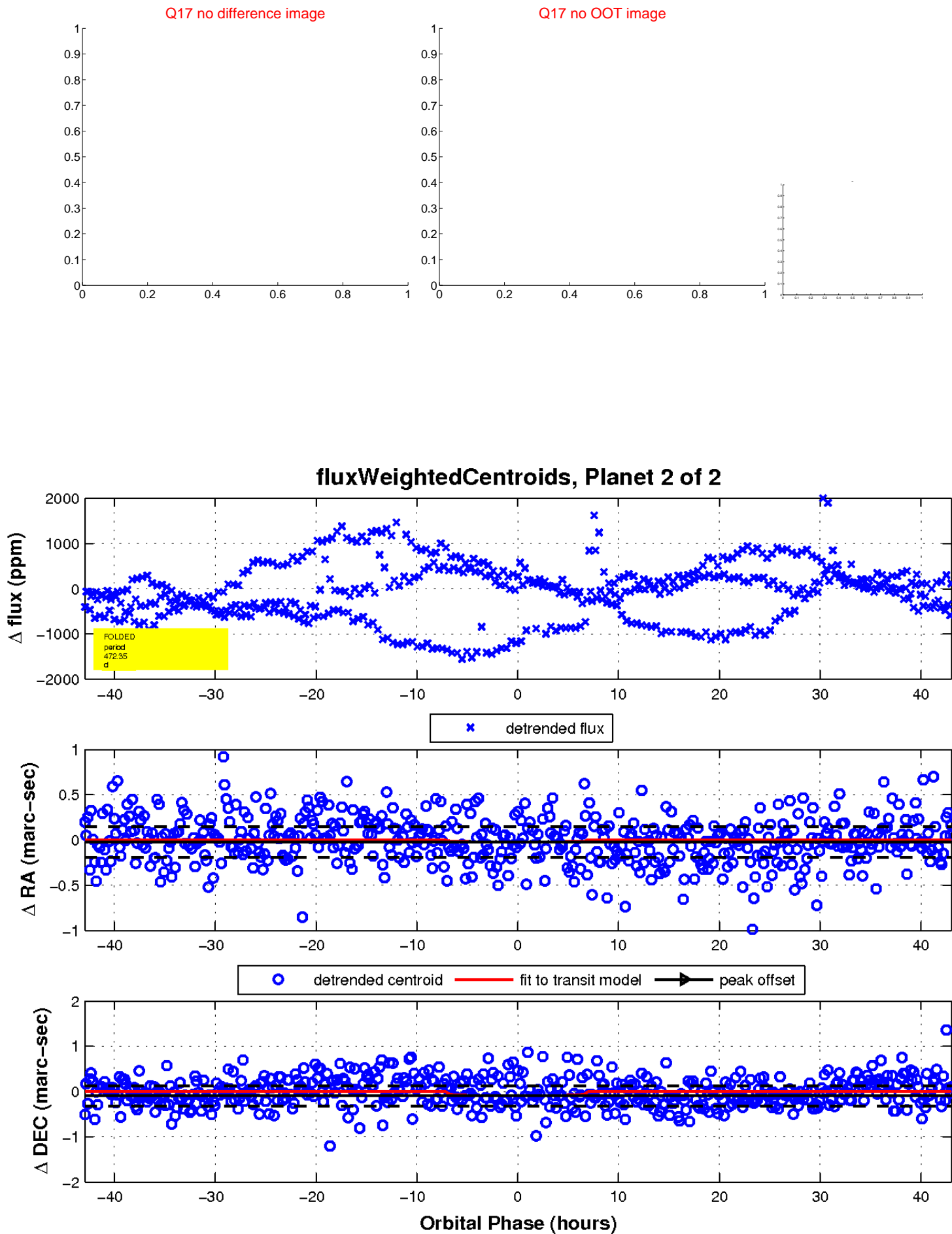
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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UKIRT Image

Declination

