

KIC 009101620

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})
009101620-01	OBS	No	605.161304	368.937658	2647.5	4.102	13.1	6.1	0.64	5087	3.66	0.17
009101620-02	OBS	No	358.807662	272.536881	3308.9	12.031	9.6	6.7	0.64	5087	4.01	0.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009101620-01	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
009101620-02	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

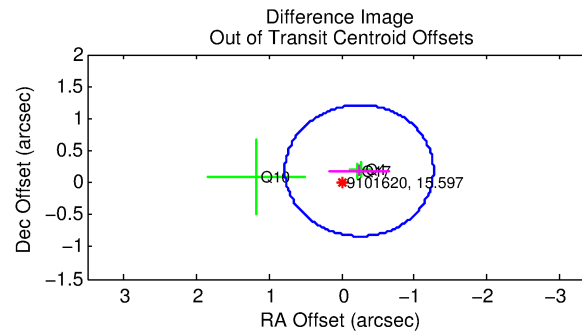
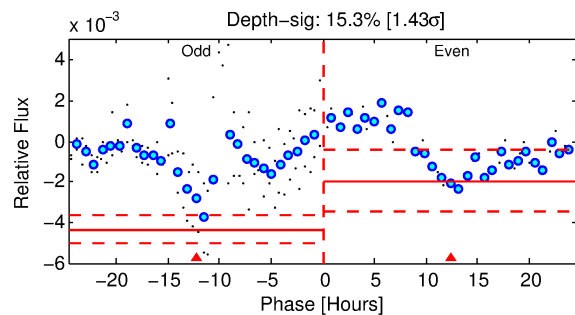
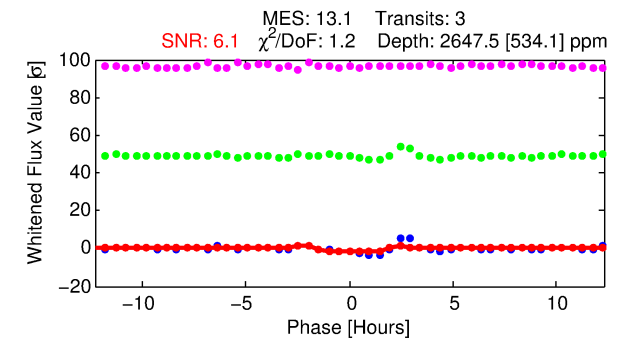
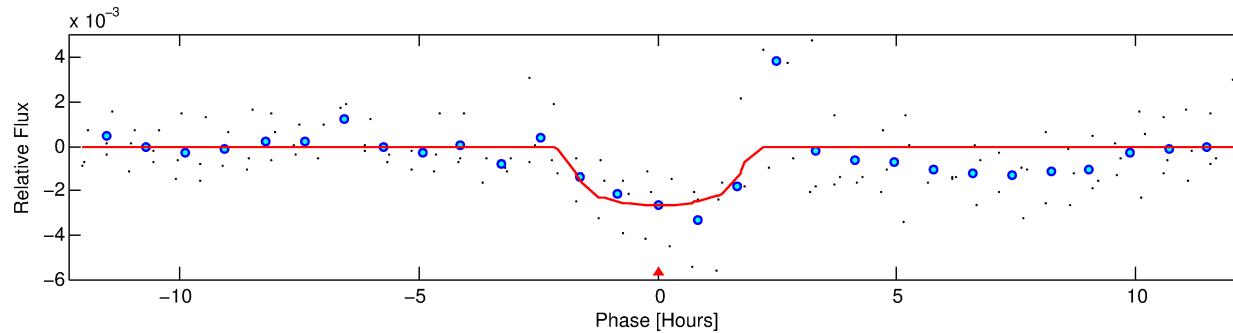
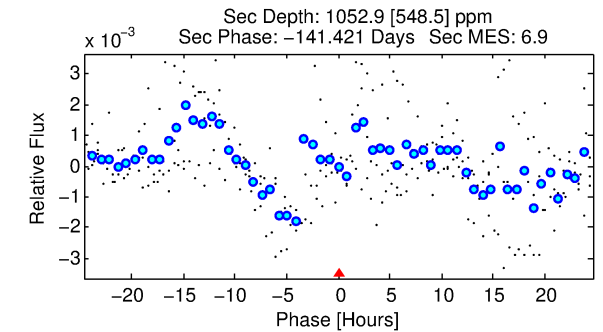
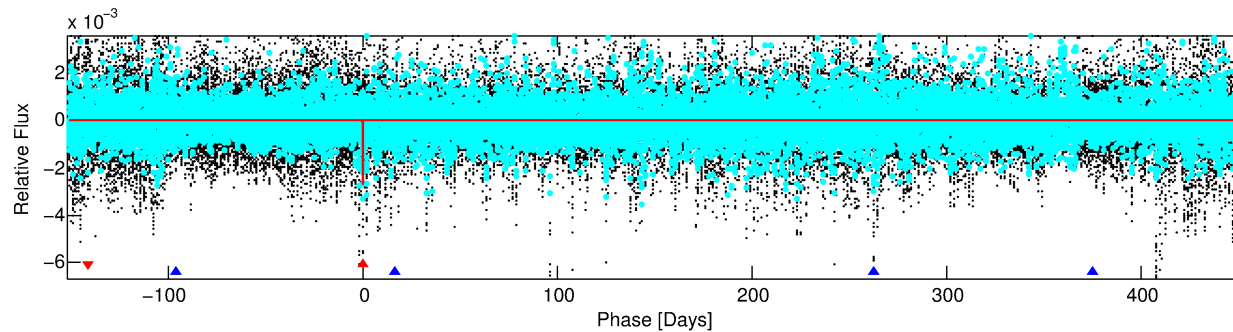
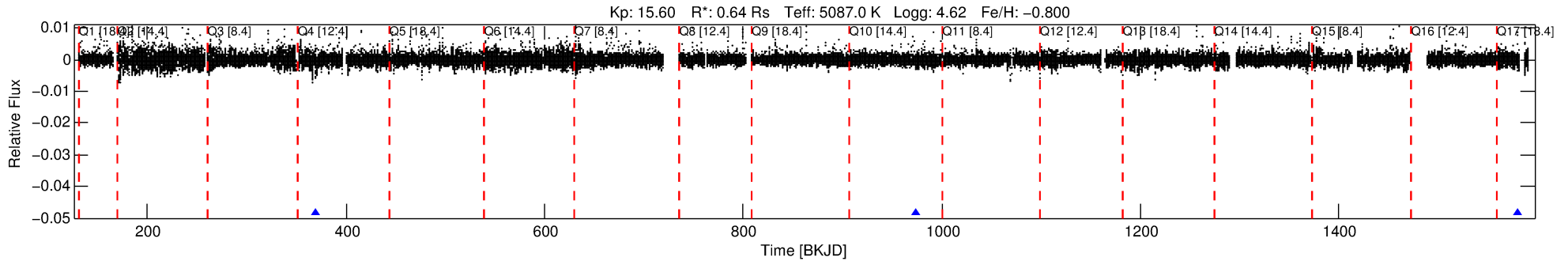
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009101620-01

No Significant Match Found

DV One-Page Summary

KIC: 9101620 Candidate: 1 of 2 Period: 605.161 d



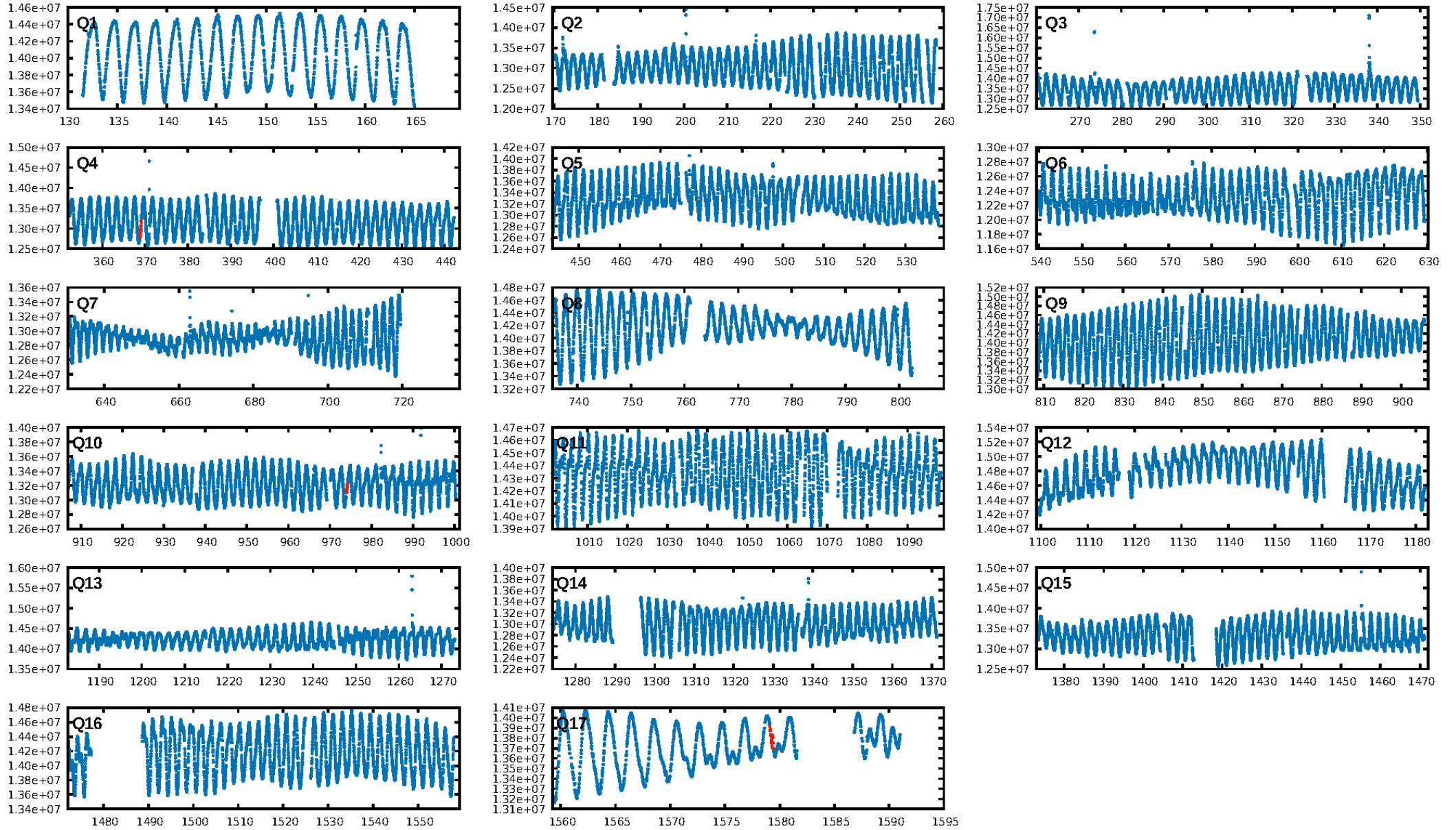
DV Fit Results:

Period = 605.16130 [0.00571] d
Epoch = 368.9377 [0.0087] BKJD
Rp/R* = 0.0524 [0.0226]
a/R* = 780.30 [1237.22]
b = 0.79 [0.75]
Seff = 0.17 [0.03]
Teq = 164 [7] K
Rp = 3.66 [1.61] Re
a = 1.1988 [0.0936] AU
Ag = 62255.68 [63164.35] [0.99σ]
Teffp = 4005 [1016] K [3.78σ]

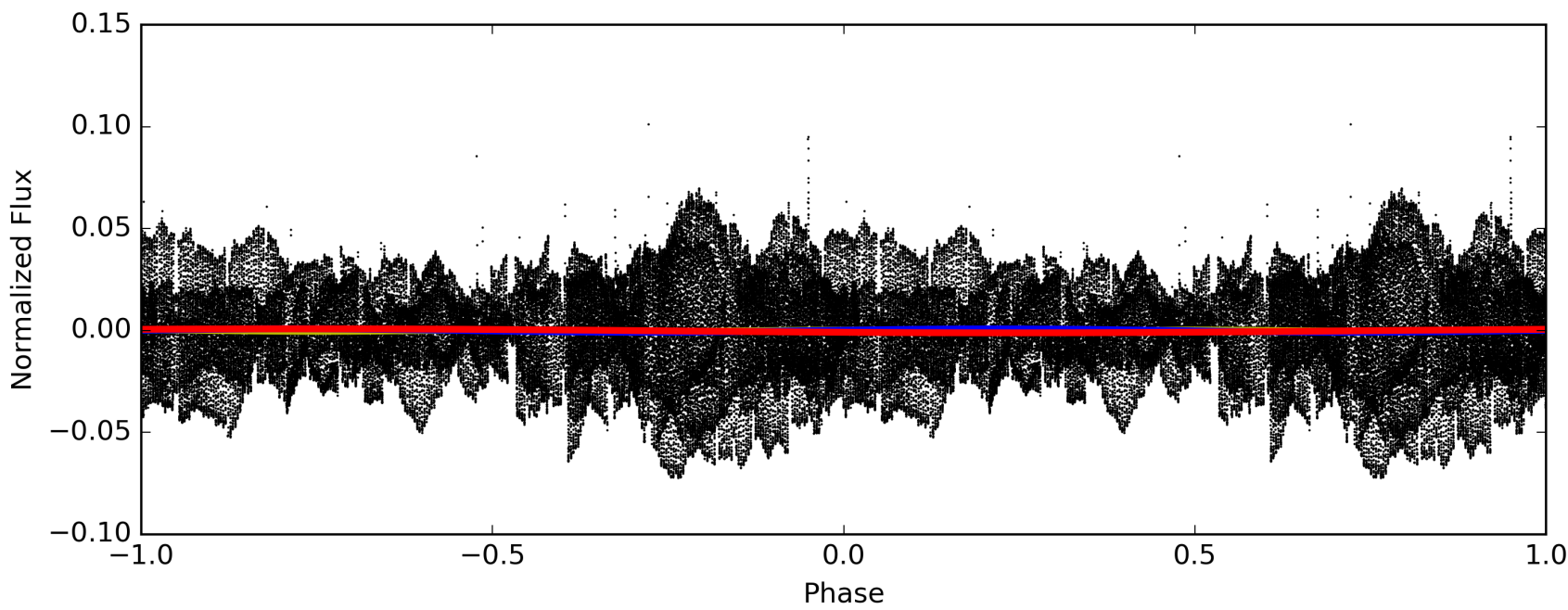
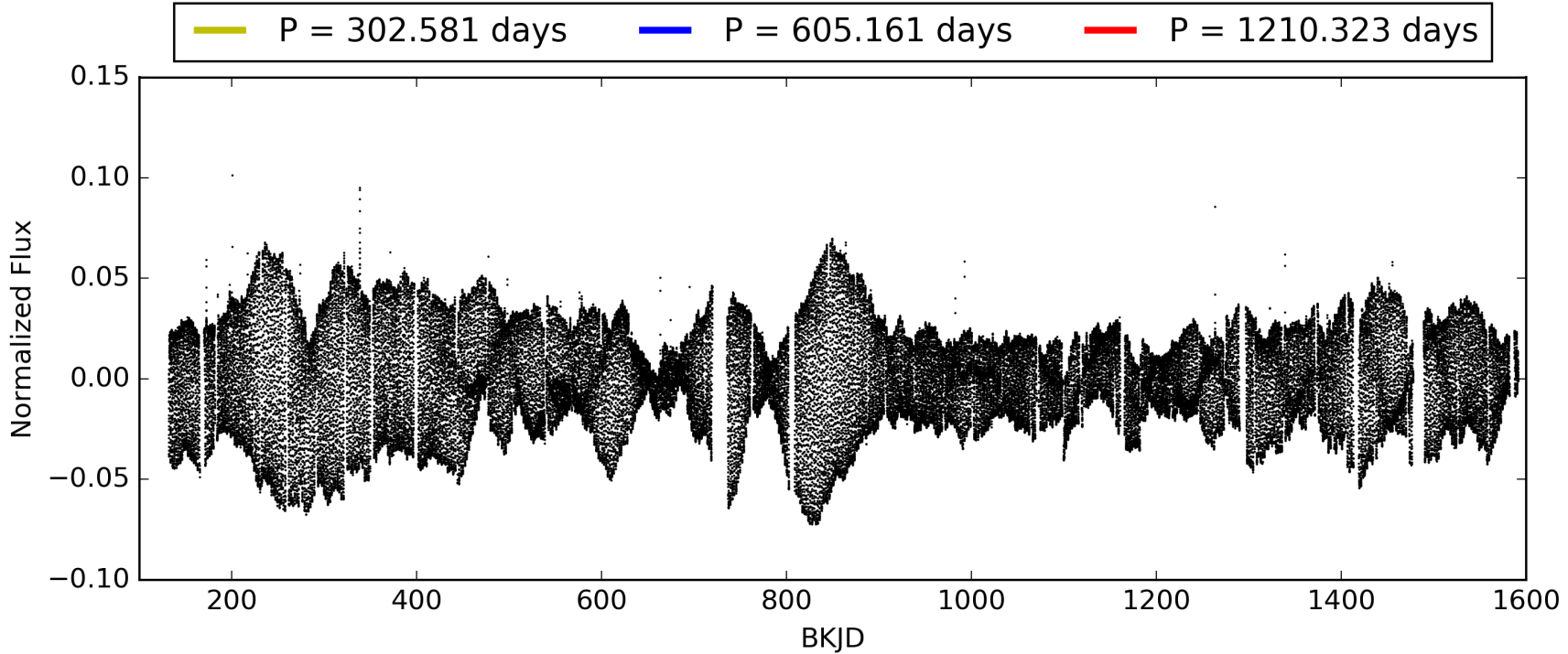
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [465.16σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.6%
ModelChiSquareGof-sig: 84.3%
Bootstrap-pfa: 7.34e-12
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -1.262
Centroid-sig: 6.5%
Centroid-so: 1.282 arcsec [1.25σ]
OotOffset-rm: 0.308 arcsec [0.90σ]
KicOffset-rm: 0.278 arcsec [1.05σ]
OotOffset-st: 1/0/1/1 [3]
KicOffset-st: 1/0/1/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

TCE 009101620-01, PDC Light Curves

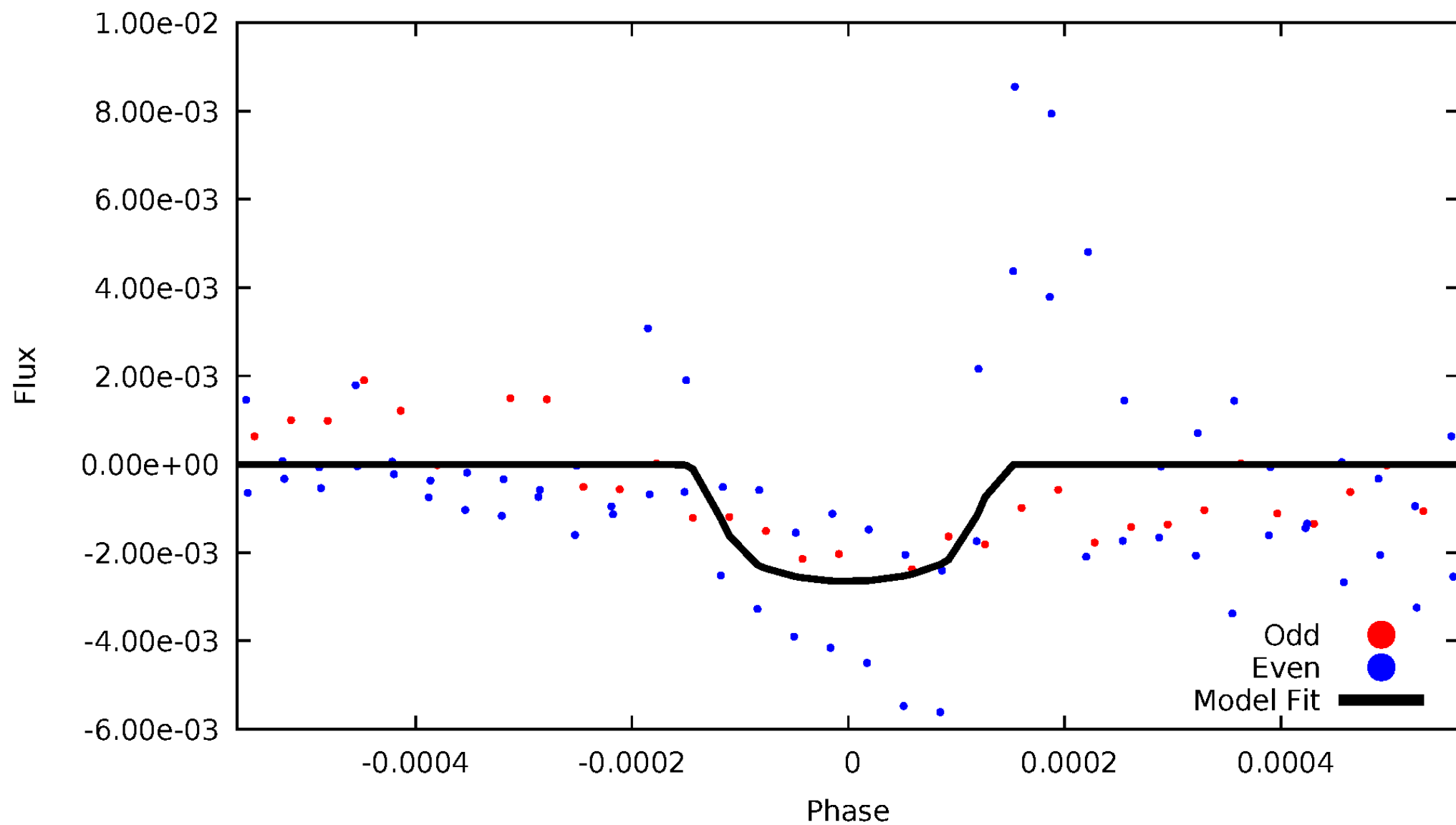


TCE 009101620-01



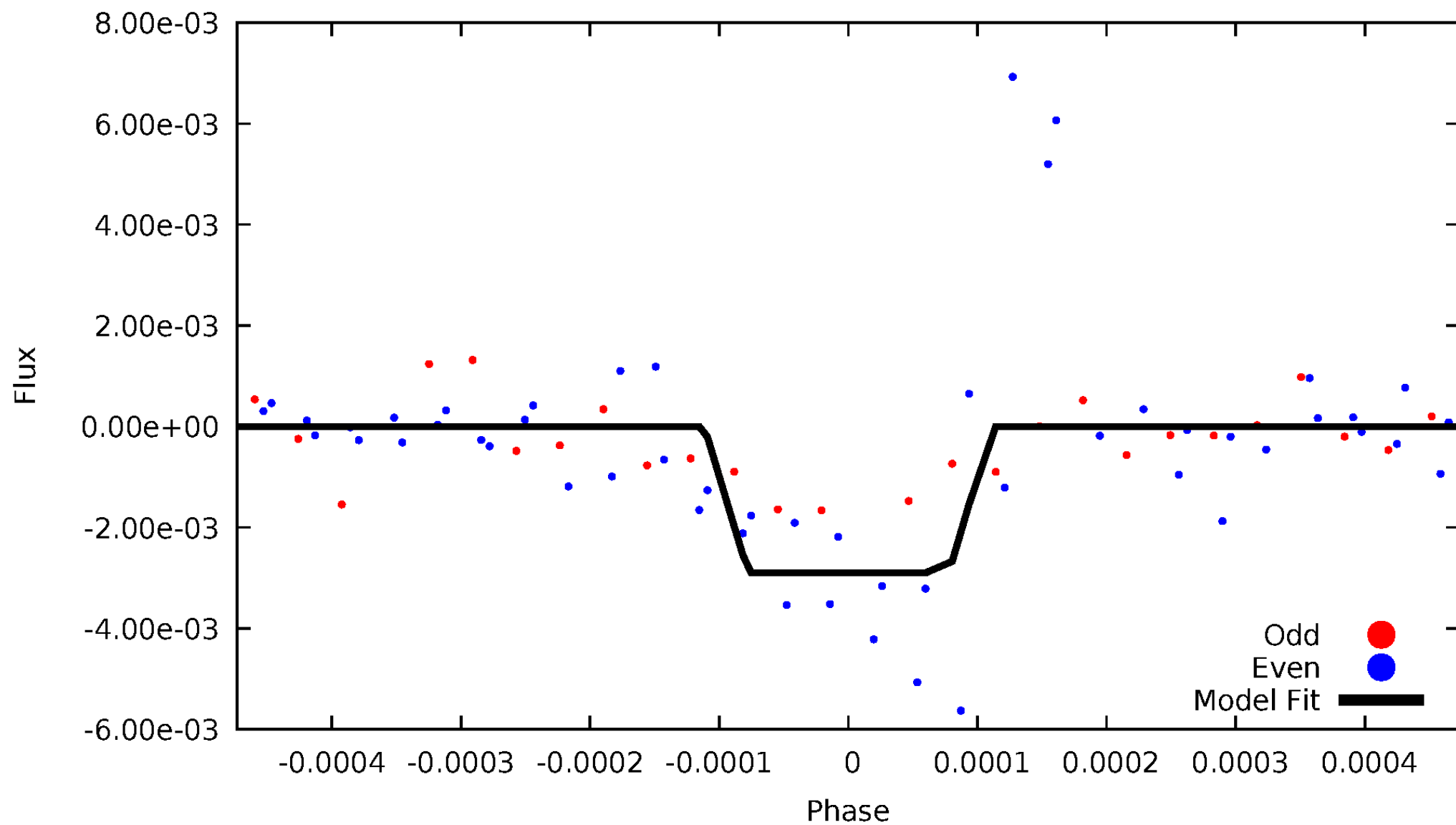
DV Odd/Even

TCE 009101620-01



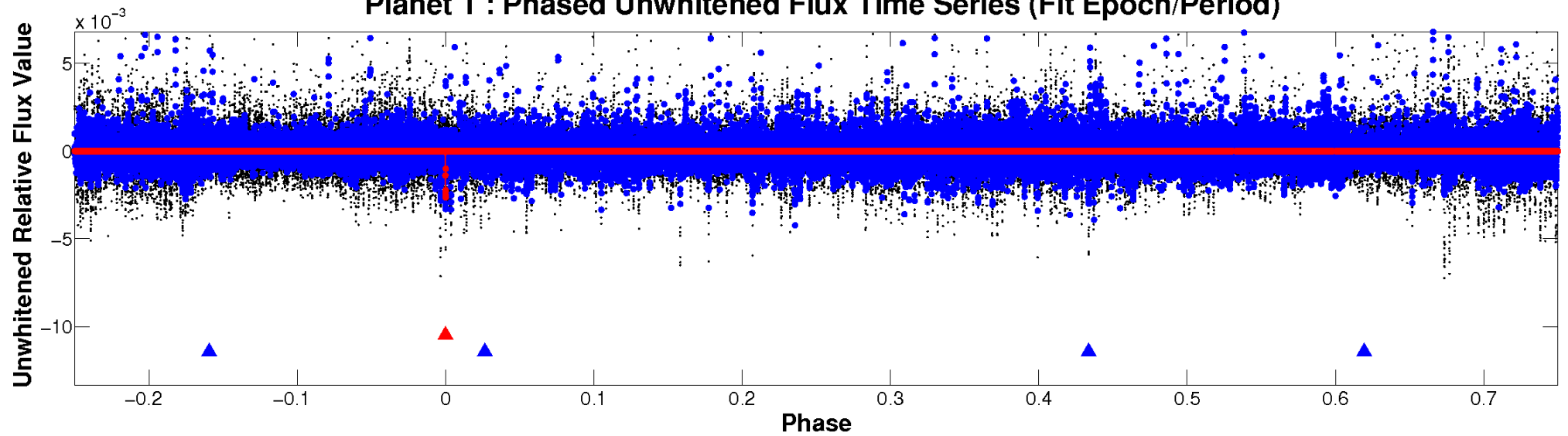
ALT Odd/Even

TCE 009101620-01

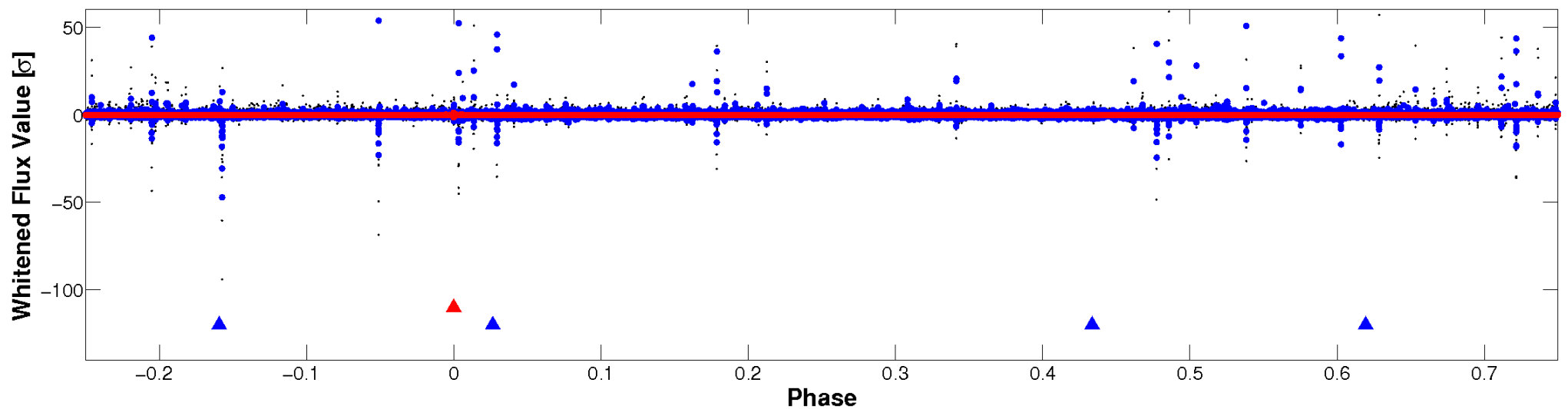


Non-Whitened Vs. Whitened Light Curve

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

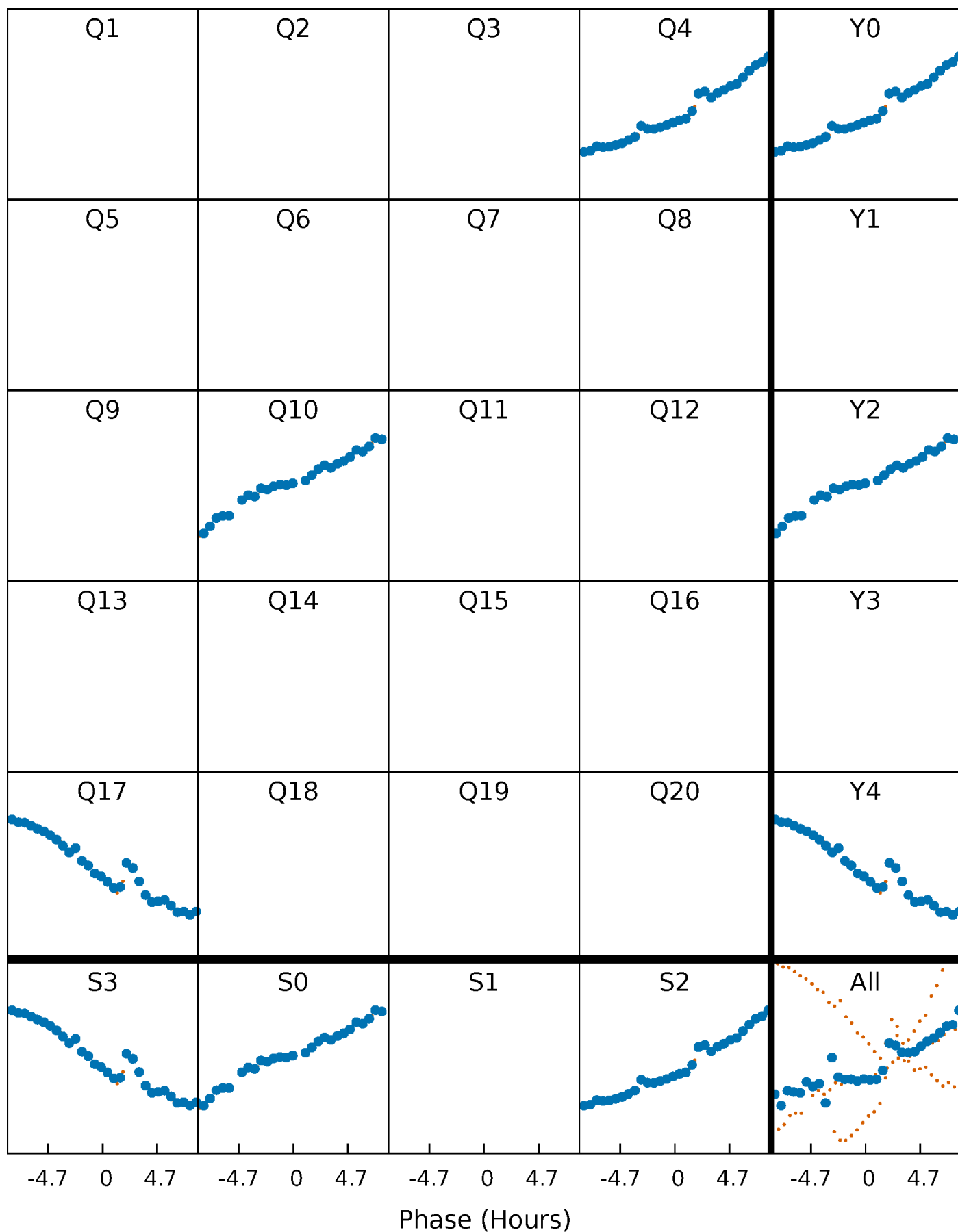


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 009101620-01 P=605.161304 Days $T_0=368.937658$ (BKJD)



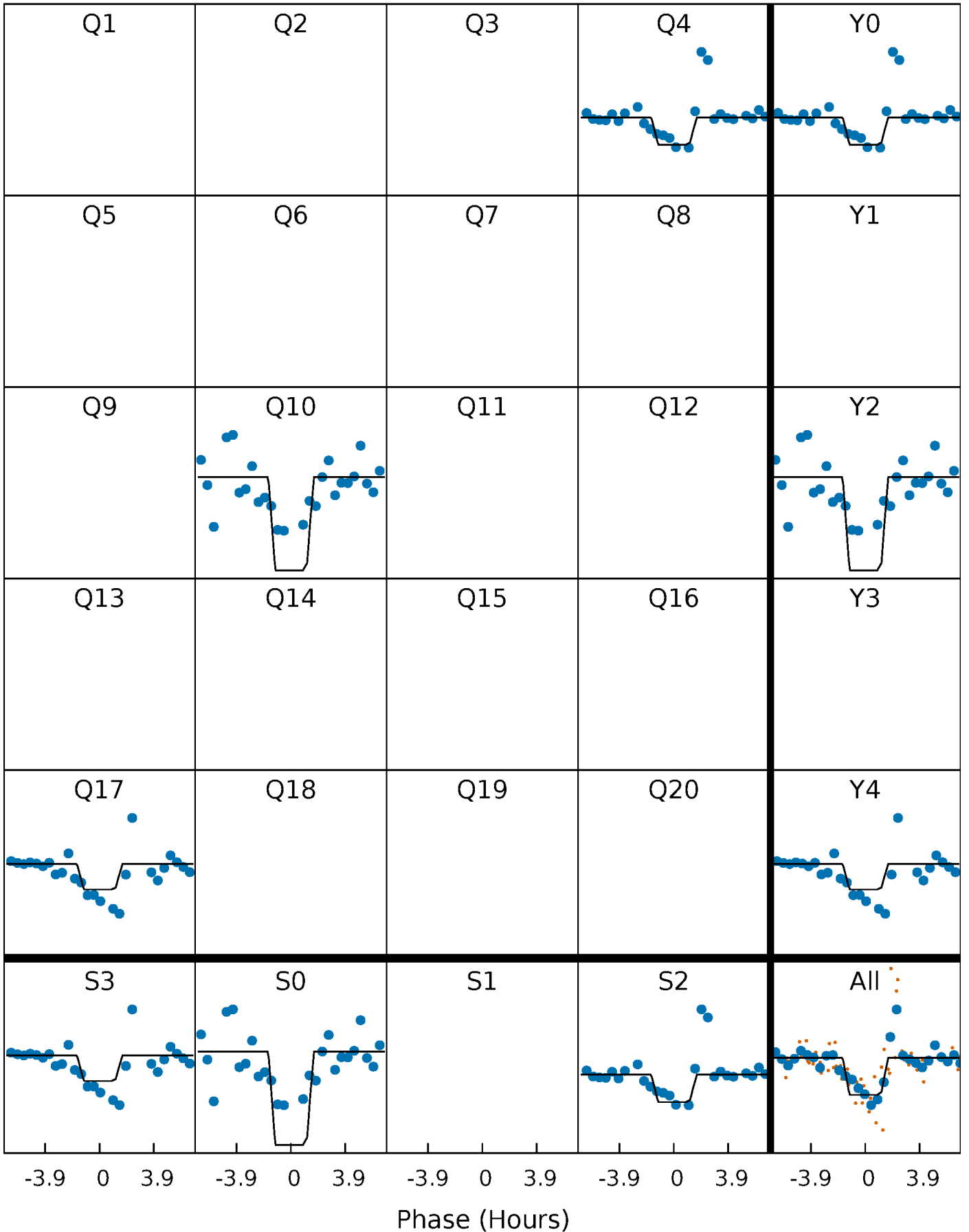
DV Quarter-Phased Transit Curves

TCE 009101620-01 P=605.161304 Days $T_0=368.937658$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

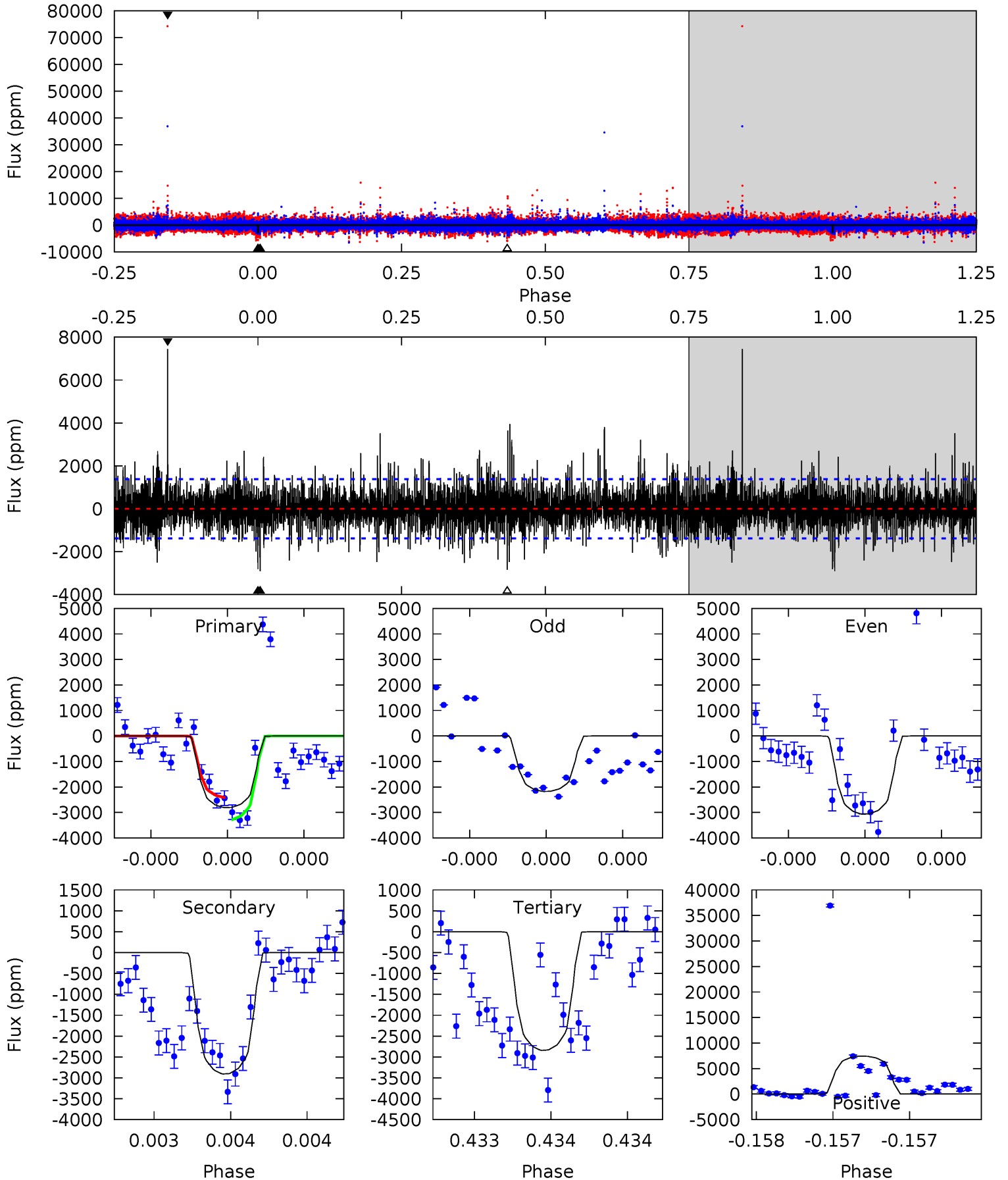
TCE 009101620-01 P=605.153502 Days $T_0=368.952835$ (BKJD)



DV Model-Shift Uniqueness Test

009101620-01, P = 605.161304 Days, E = 368.937658 Days

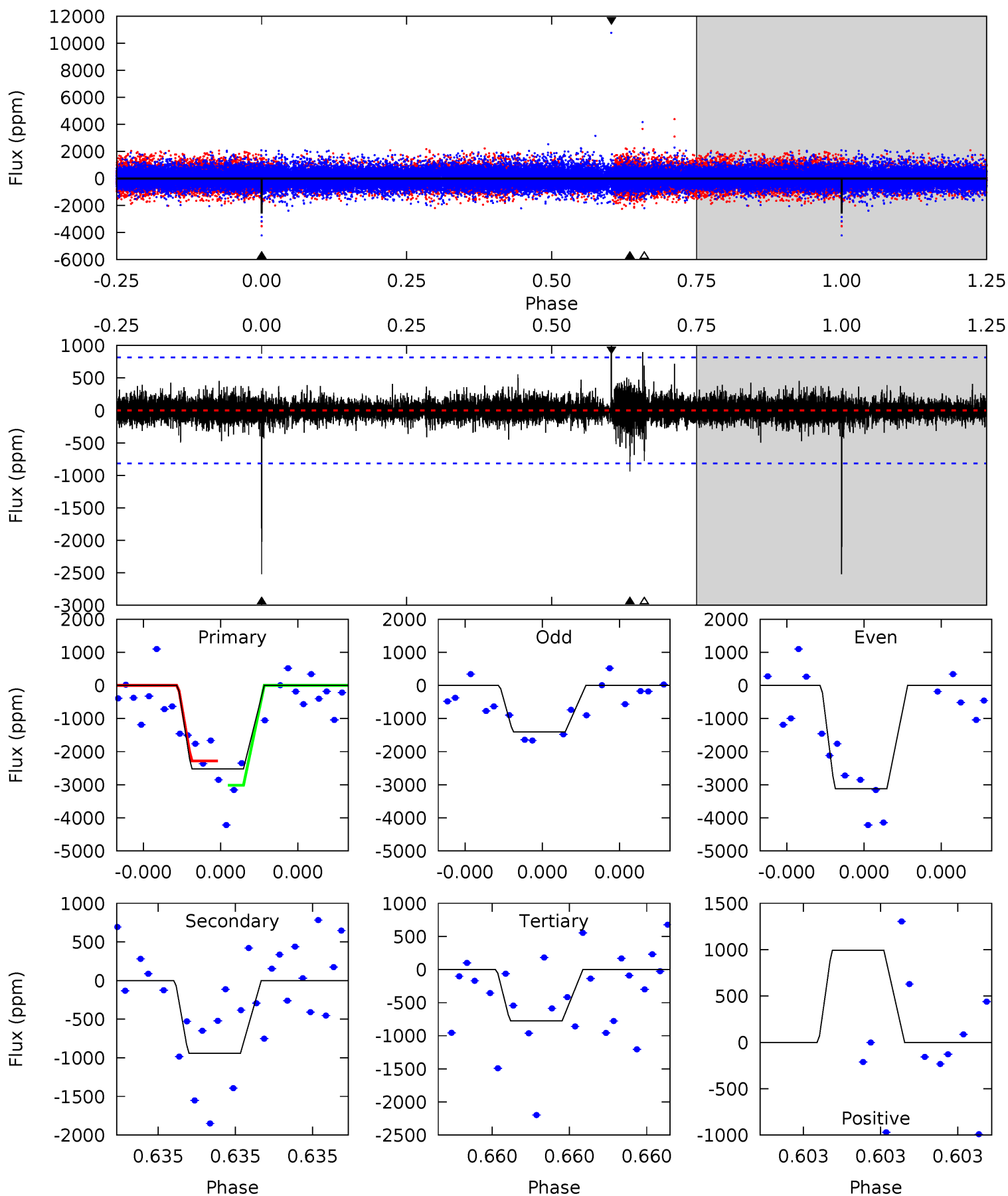
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.5	11.9	11.6	30.4	5.66	3.61	2.84	-0.13	-18.9	0.27	-18.5	1.27	1.27	0.72	1.80



Alt Model-Shift Uniqueness Test

009101620-01, P = 605.153502 Days, E = 368.952835 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.7	6.60	5.44	6.97	5.73	3.72	0.71	12.3	10.7	1.16	-0.37	5.98	1.16	0.28	2.47



Stellar Parameters For KIC 009101620

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5087^{+153}_{-153}	$4.623^{+0.066}_{-0.039}$	$-0.800^{+0.300}_{-0.300}$	$0.640^{+0.057}_{-0.057}$	$0.627^{+0.064}_{-0.028}$	$3.372^{+0.865}_{-0.516}$
	+3%/-3%	+1%/-1%	+37%/-37%	+9%/-9%	+10%/-4%	+26%/-15%
Source	PHO1	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 009101620-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-2907 ± 245	$3.63^{+1.58}_{-1.57}$	228^{+8}_{-8}	5187^{+1516}_{-743}	$176815^{+351804}_{-89256}$
Alt.	-940 ± 143	$3.79^{+1.66}_{-1.57}$	228^{+8}_{-8}	4069^{+951}_{-474}	$51885^{+106081}_{-26598}$

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

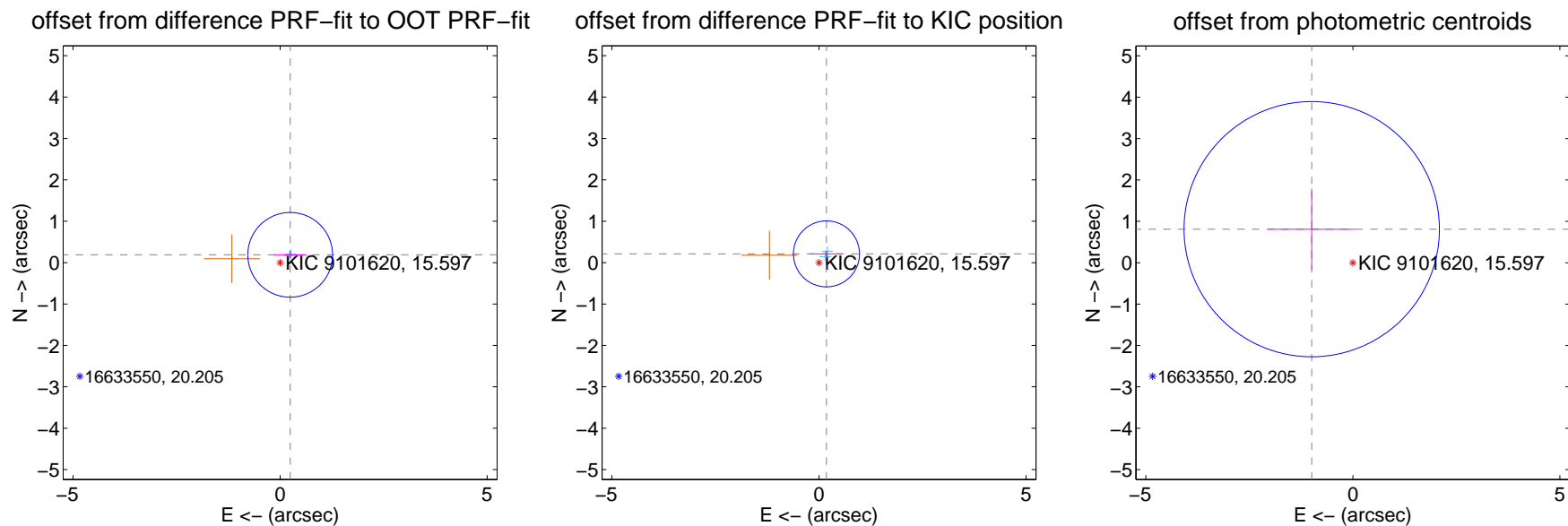
DV Centroid Data

Supplemental centroid analysis for 009101620-01. Kepler magnitude: 15.60. Transit SNR 6.11

There are 2 quarters with good PRF difference image offsets

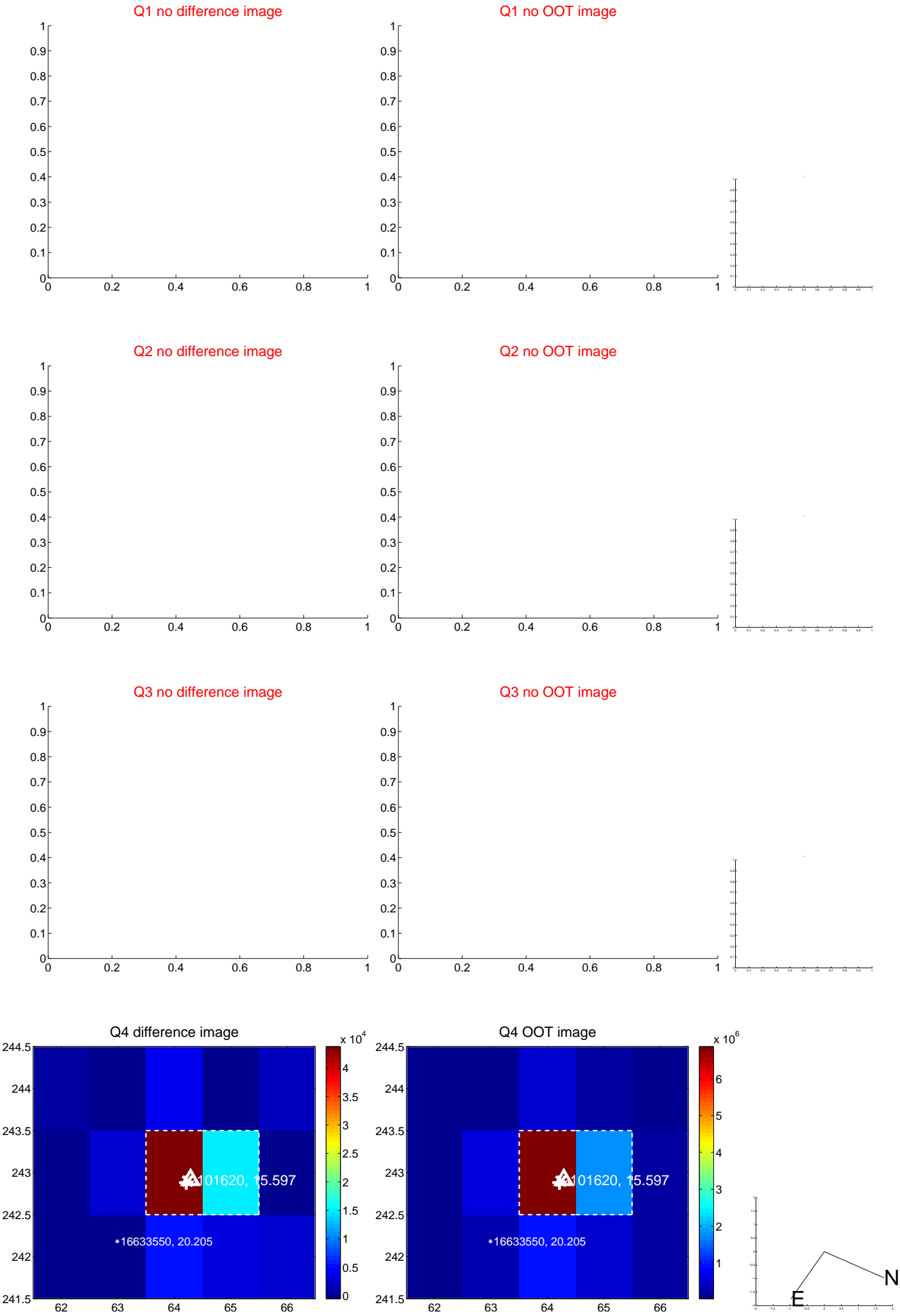
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.308 ± 0.341	0.90	-0.243 ± 0.403	0.188 ± 0.074
PRF-fit source offset from KIC position	0.278 ± 0.266	1.05	-0.180 ± 0.400	0.212 ± 0.070
photometric centroid source offset	1.28 ± 1.03	1.25	0.99 ± 1.06	0.81 ± 0.98



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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

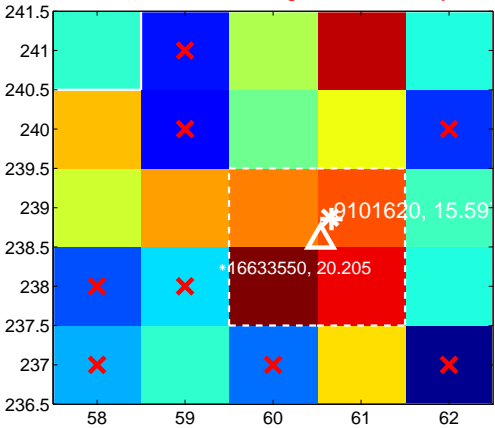
Q9 no difference image



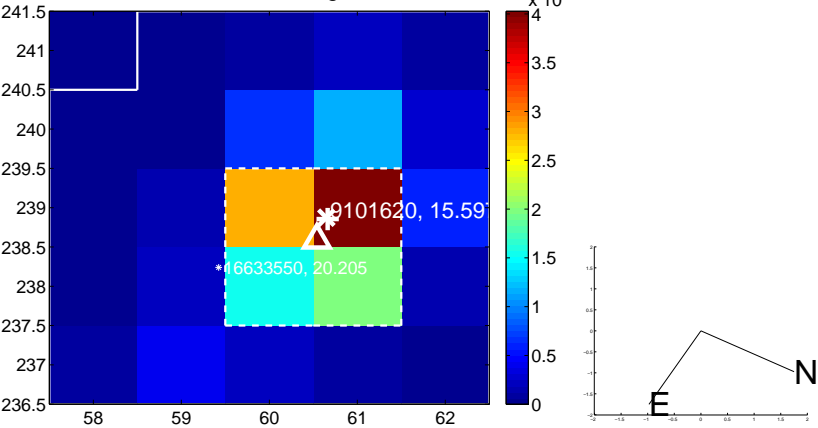
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



Q11 no difference image



Q11 no OOT image



Q12 no difference image



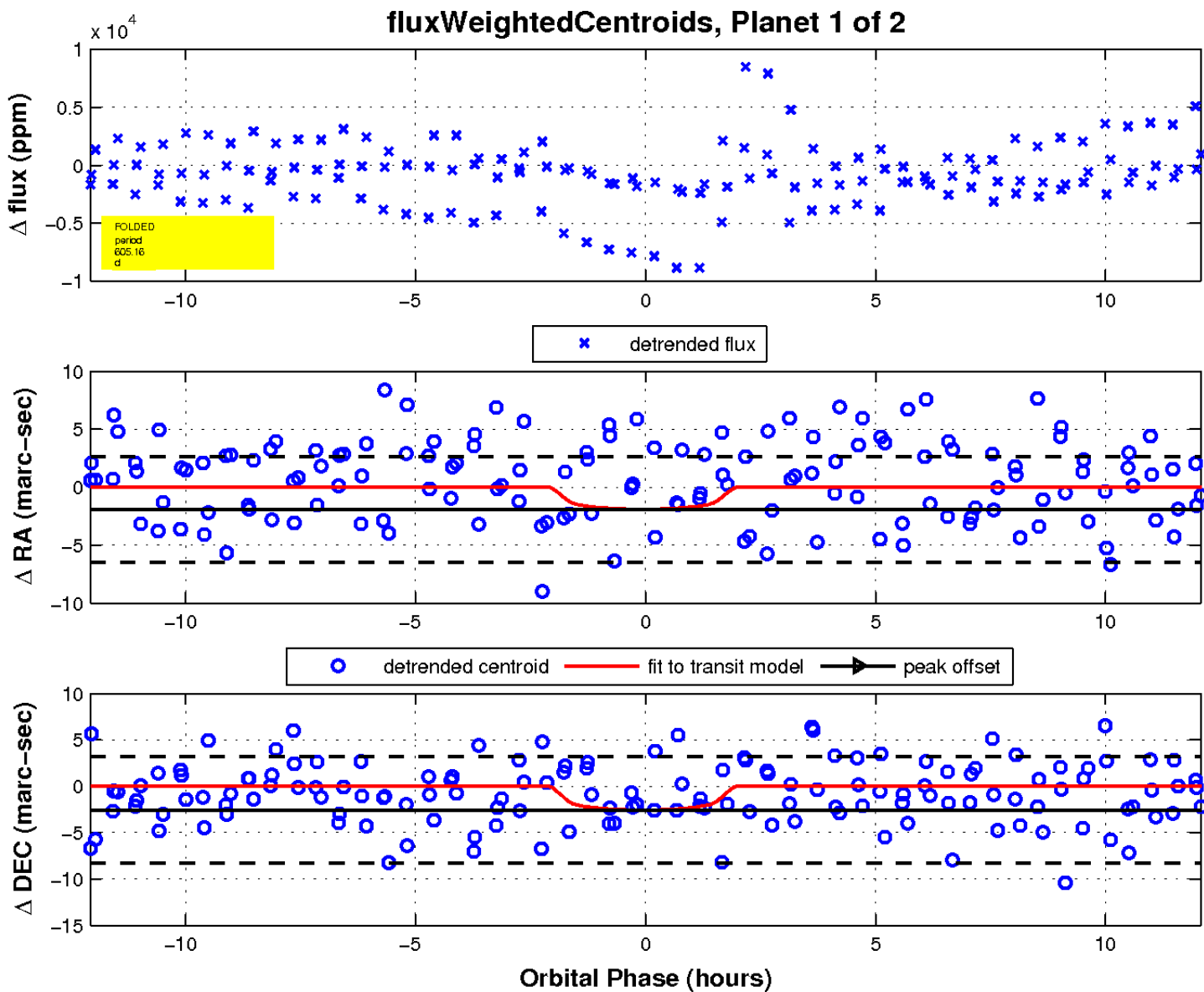
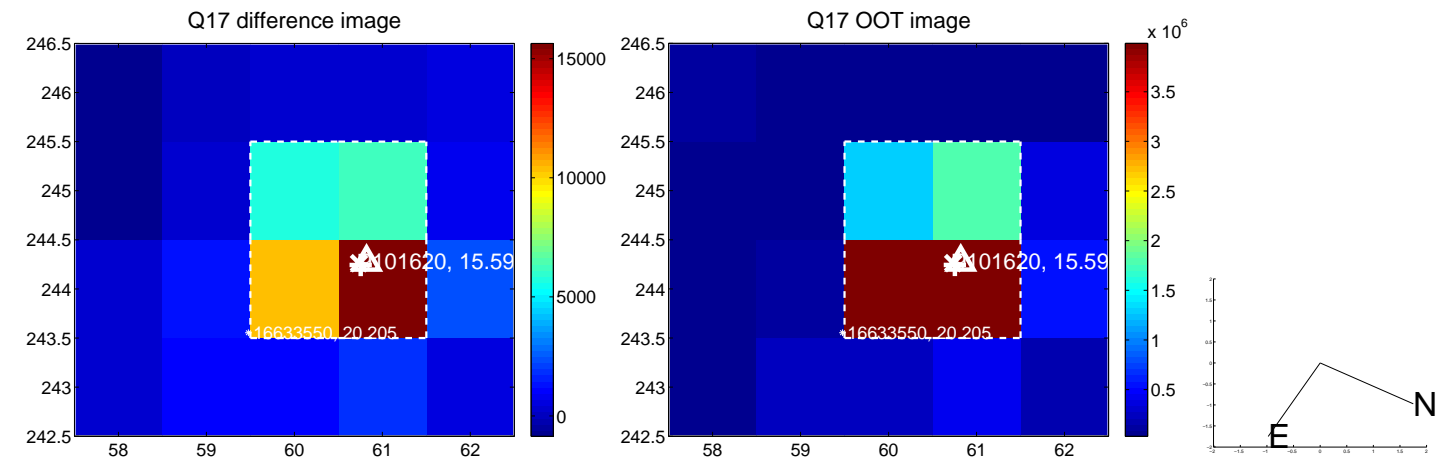
Q12 no OOT image



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

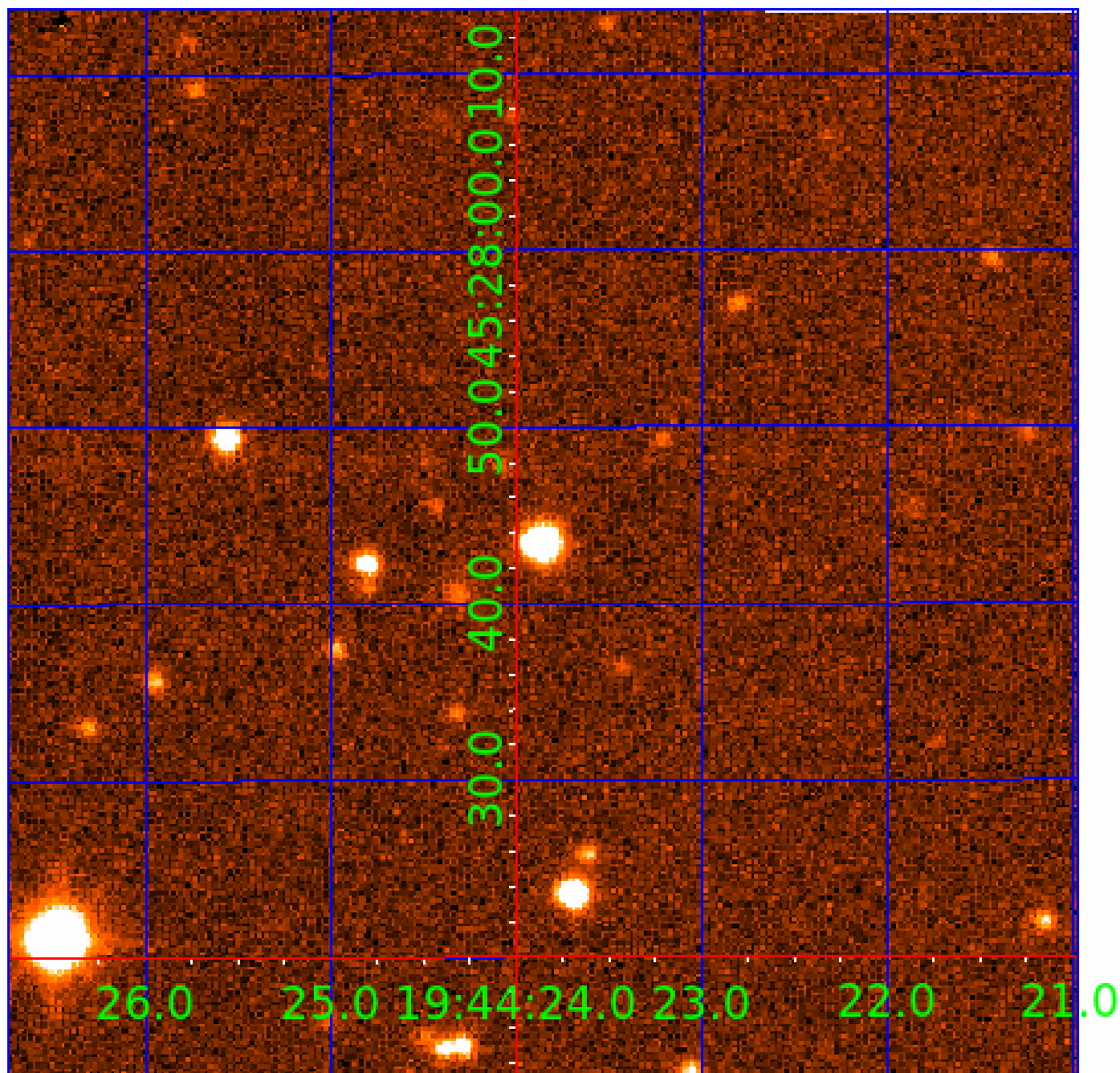


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009101620

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})
009101620-01	OBS	No	605.161304	368.937658	2647.5	4.102	13.1	6.1	0.64	5087	3.66	0.17
009101620-02	OBS	No	358.807662	272.536881	3308.9	12.031	9.6	6.7	0.64	5087	4.01	0.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009101620-01	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
009101620-02	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST

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

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

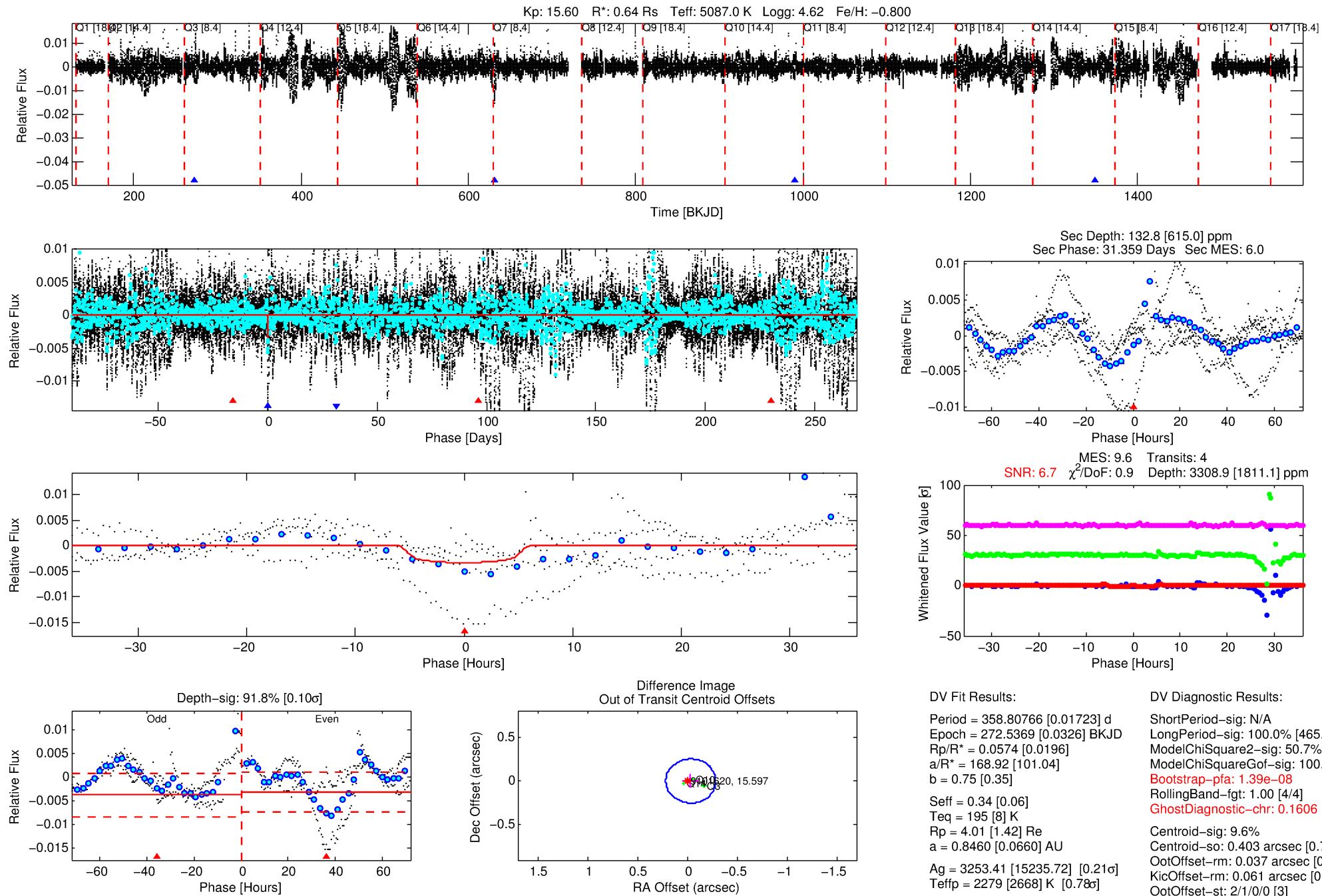
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009101620-02

No Significant Match Found

DV One-Page Summary

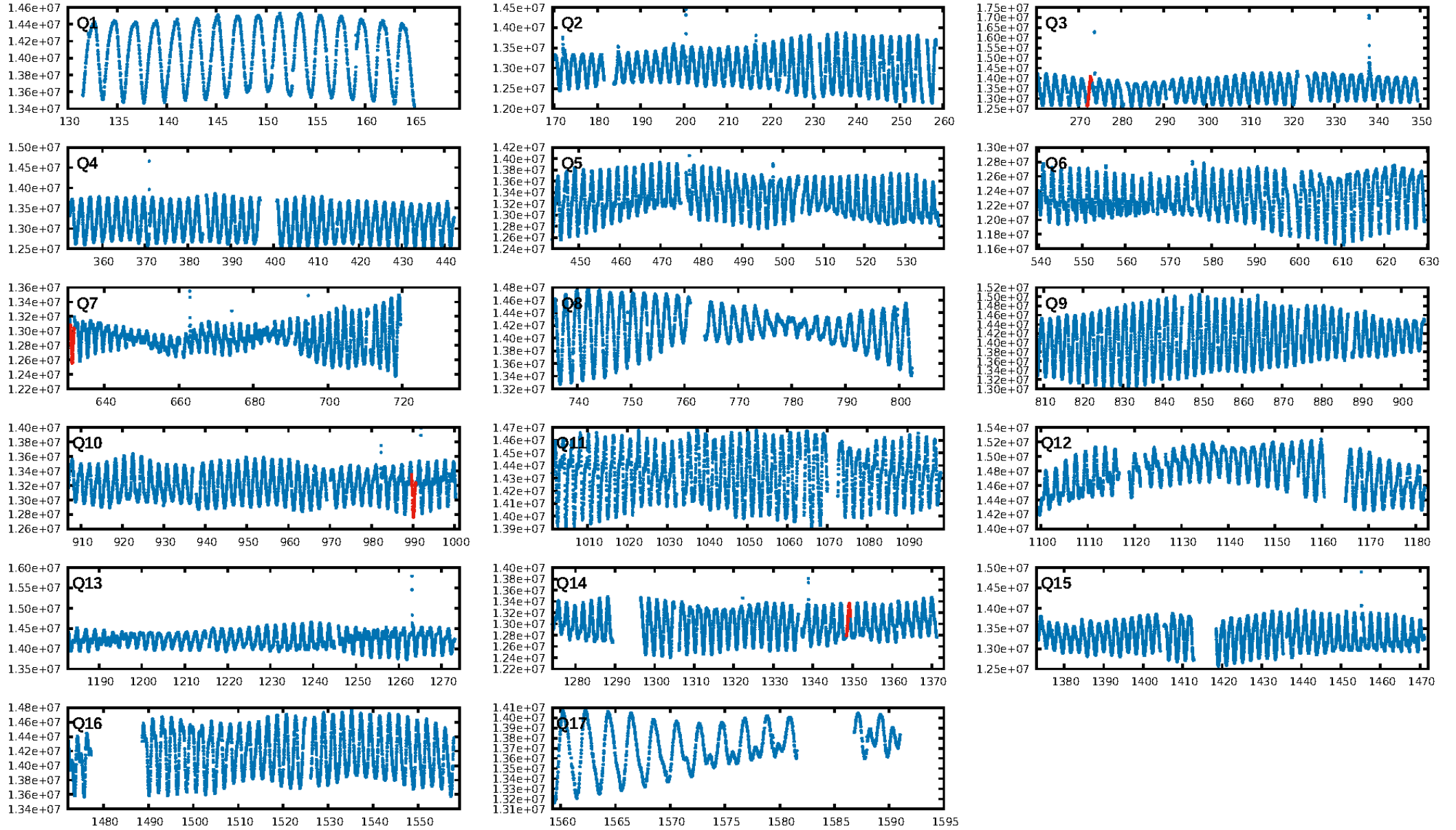
KIC: 9101620 Candidate: 2 of 2 Period: 358.808 d



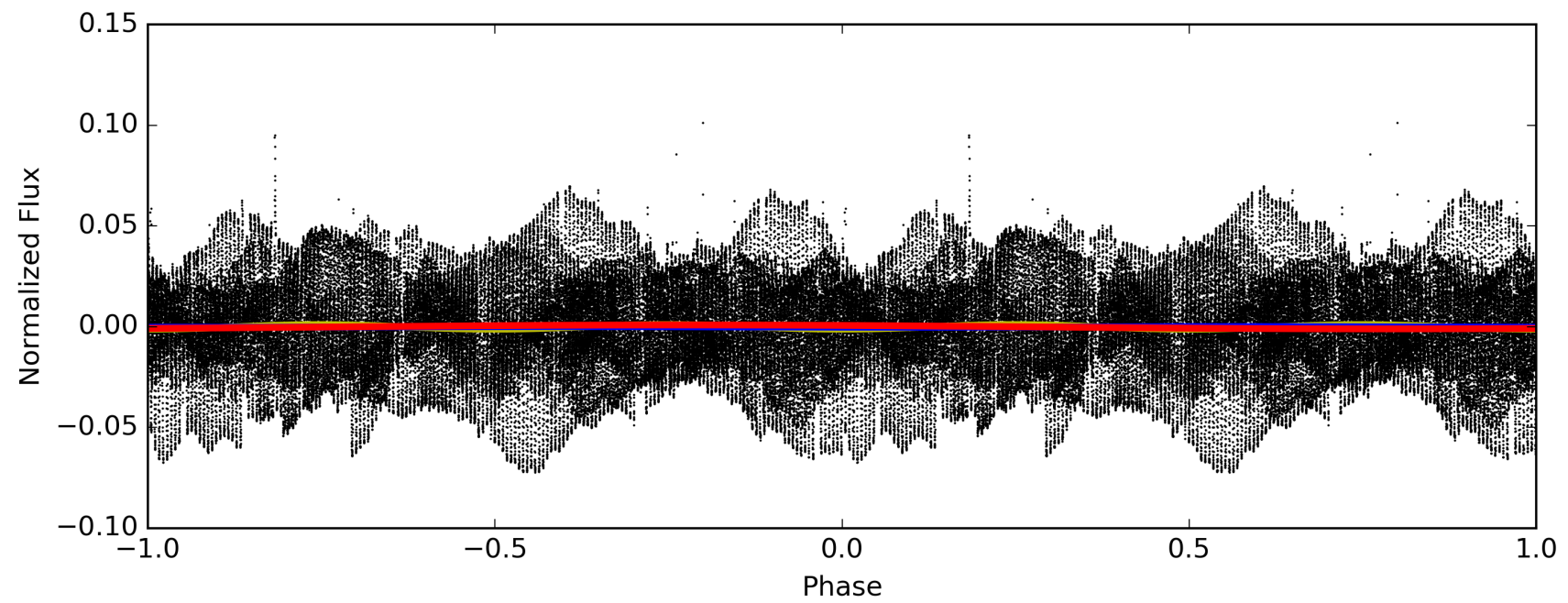
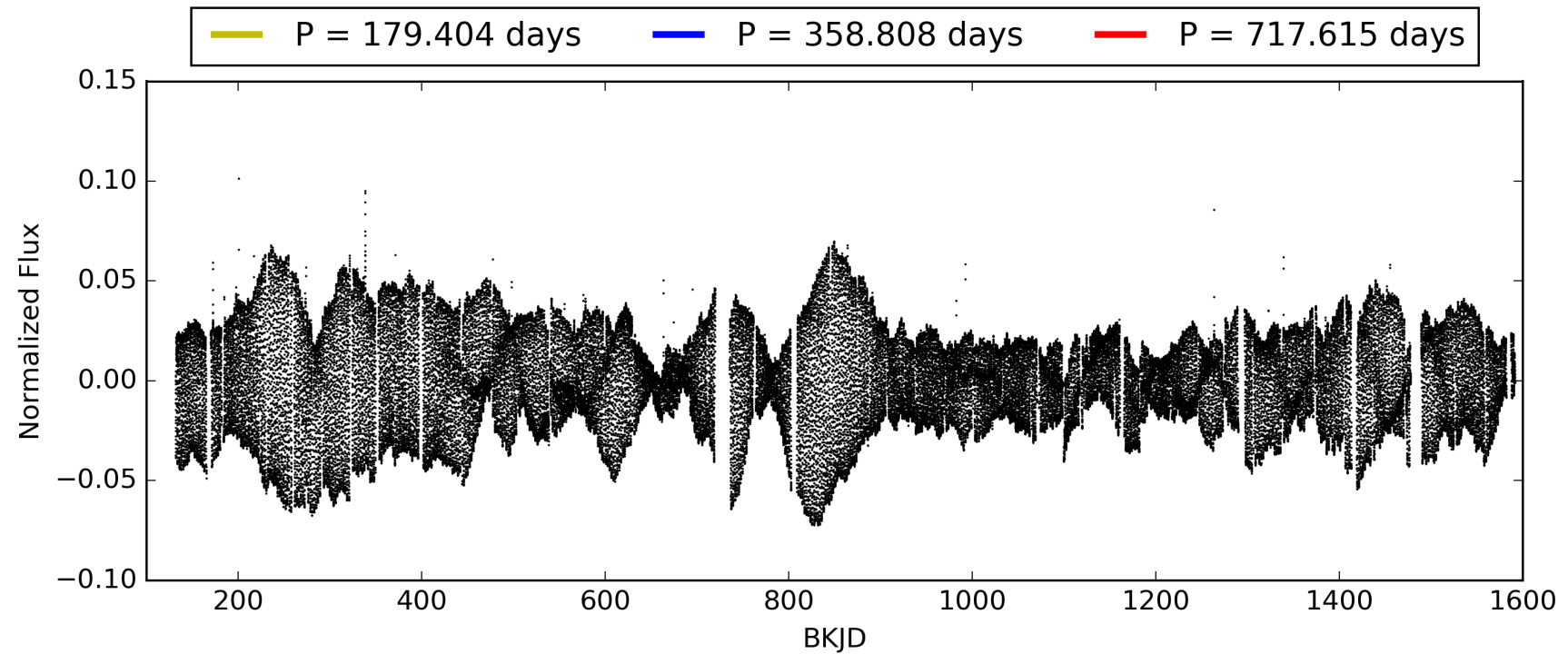
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 10:47:08 Z

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

TCE 009101620-02, PDC Light Curves

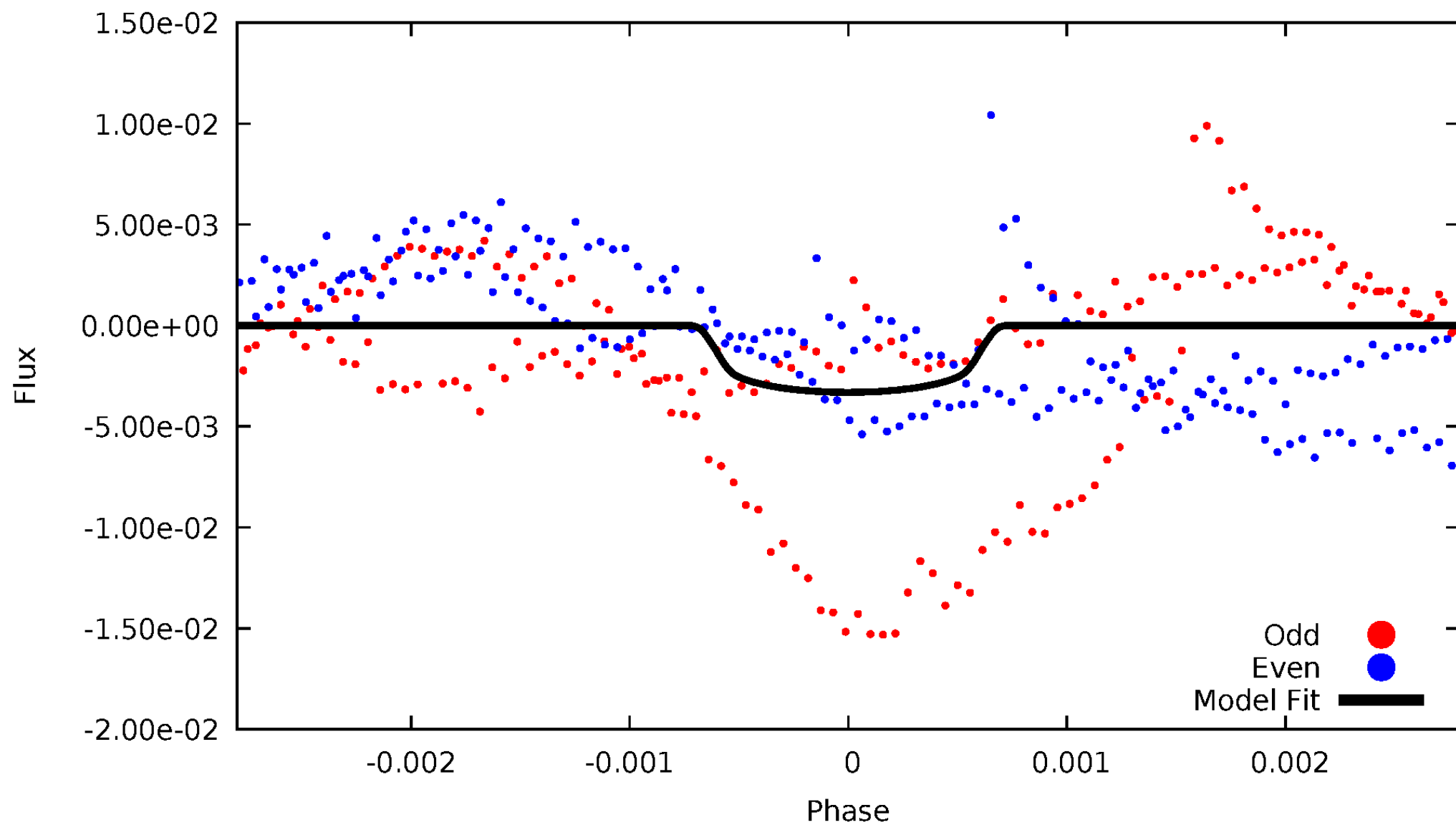


TCE 009101620-02



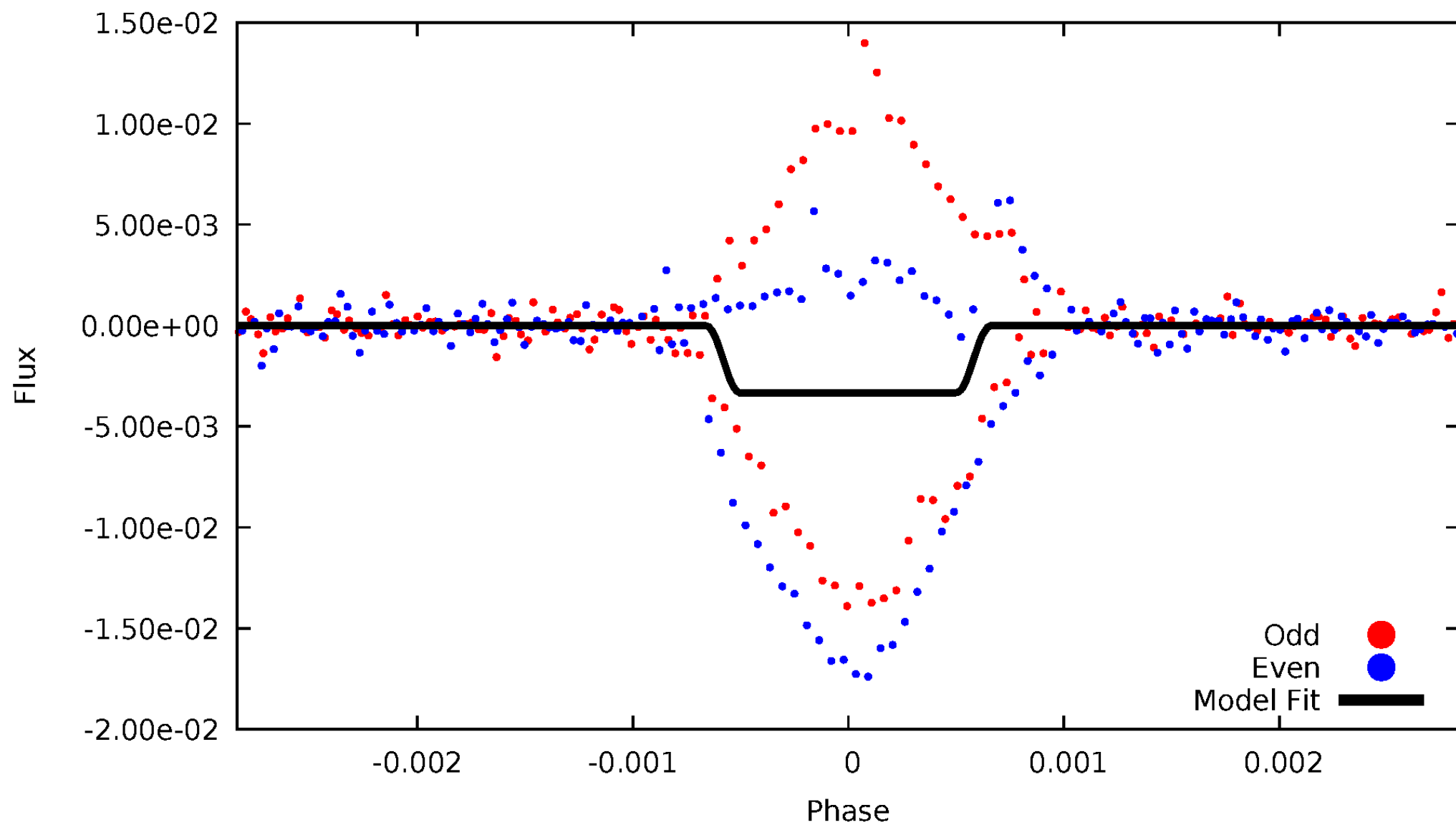
DV Odd/Even

TCE 009101620-02



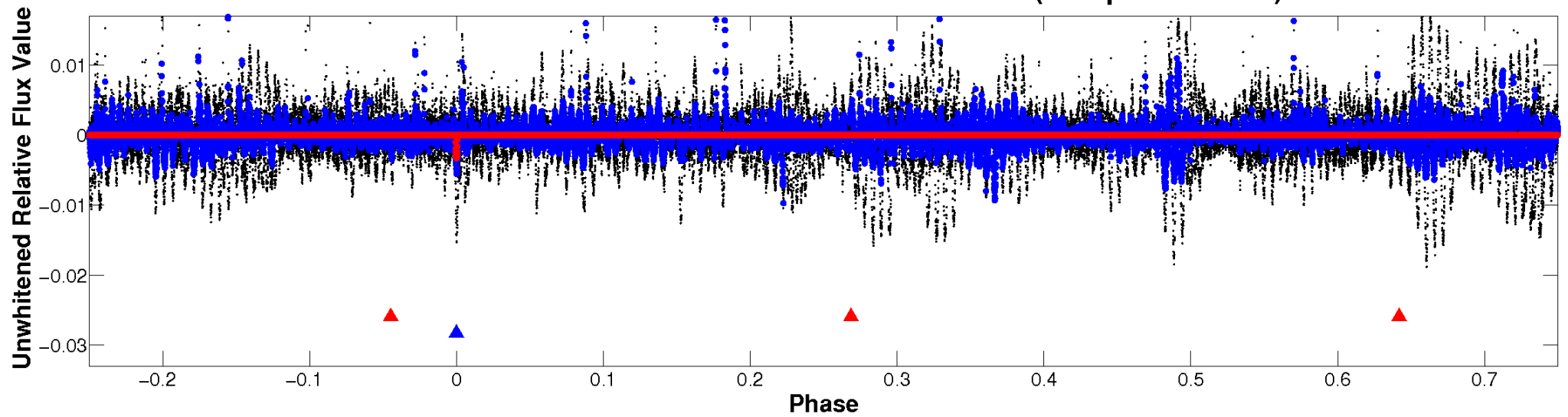
ALT Odd/Even

TCE 009101620-02

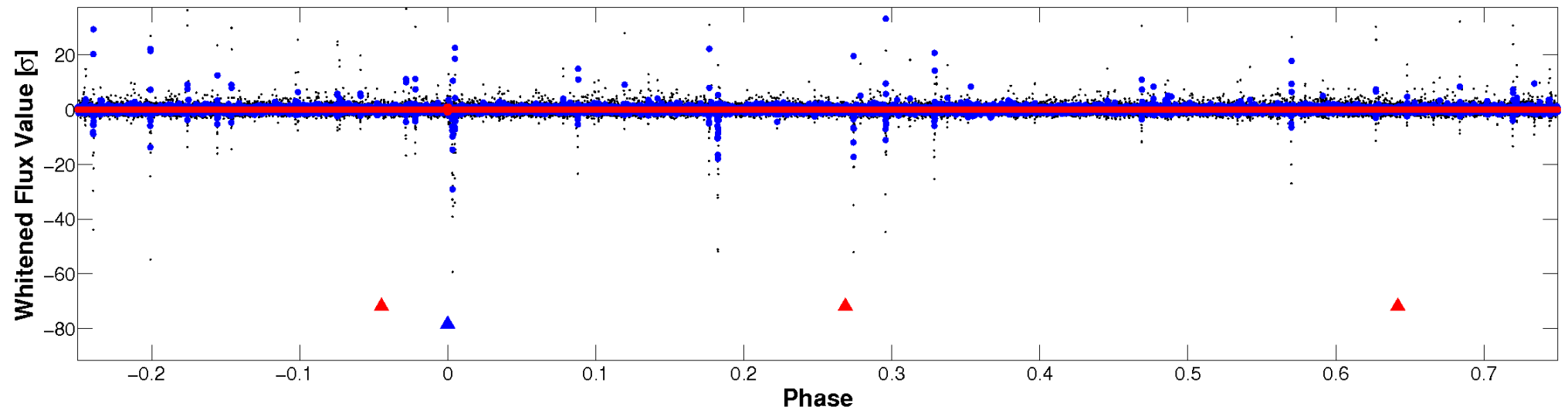


Non-Whitened Vs. Whitened Light Curve

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

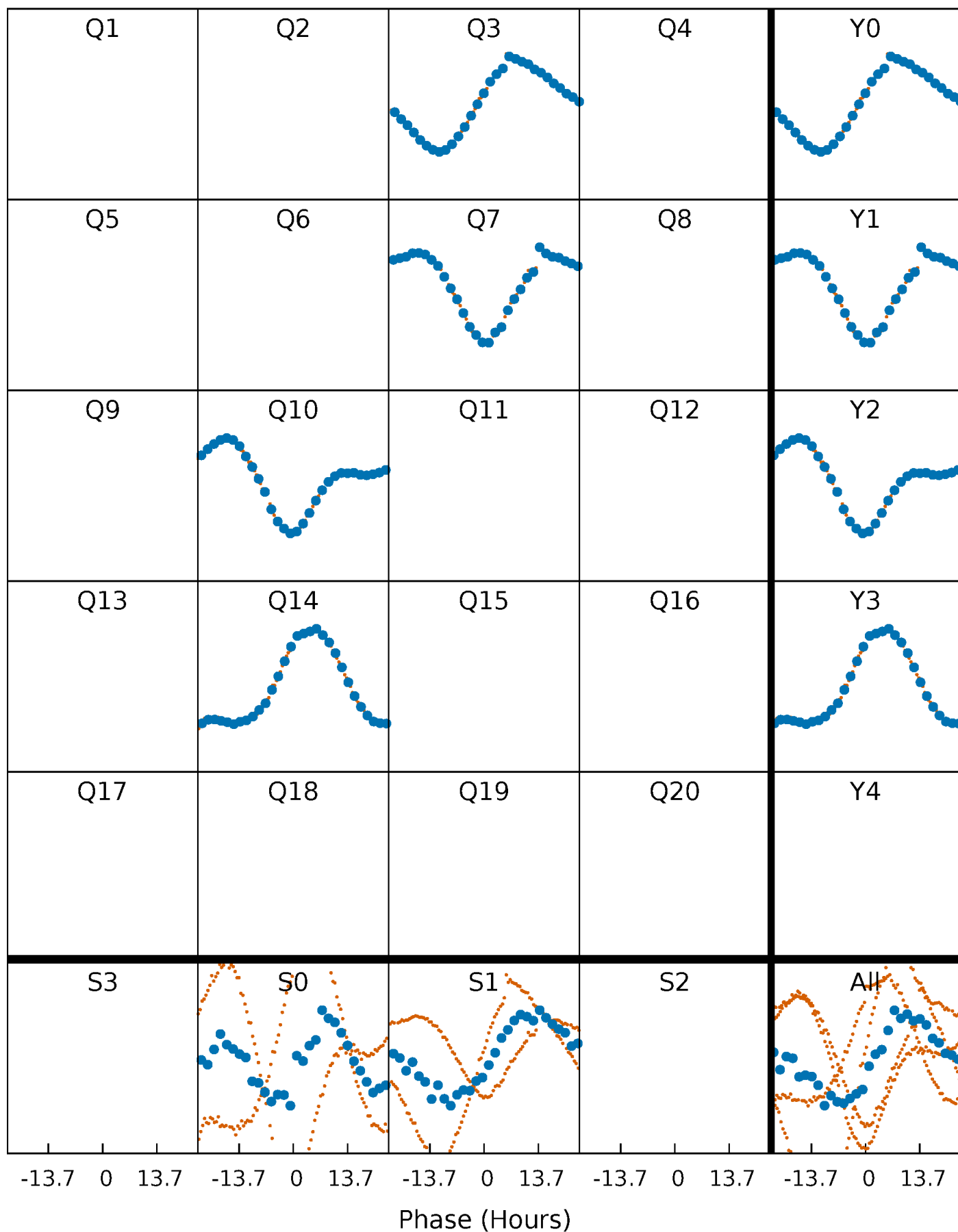


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



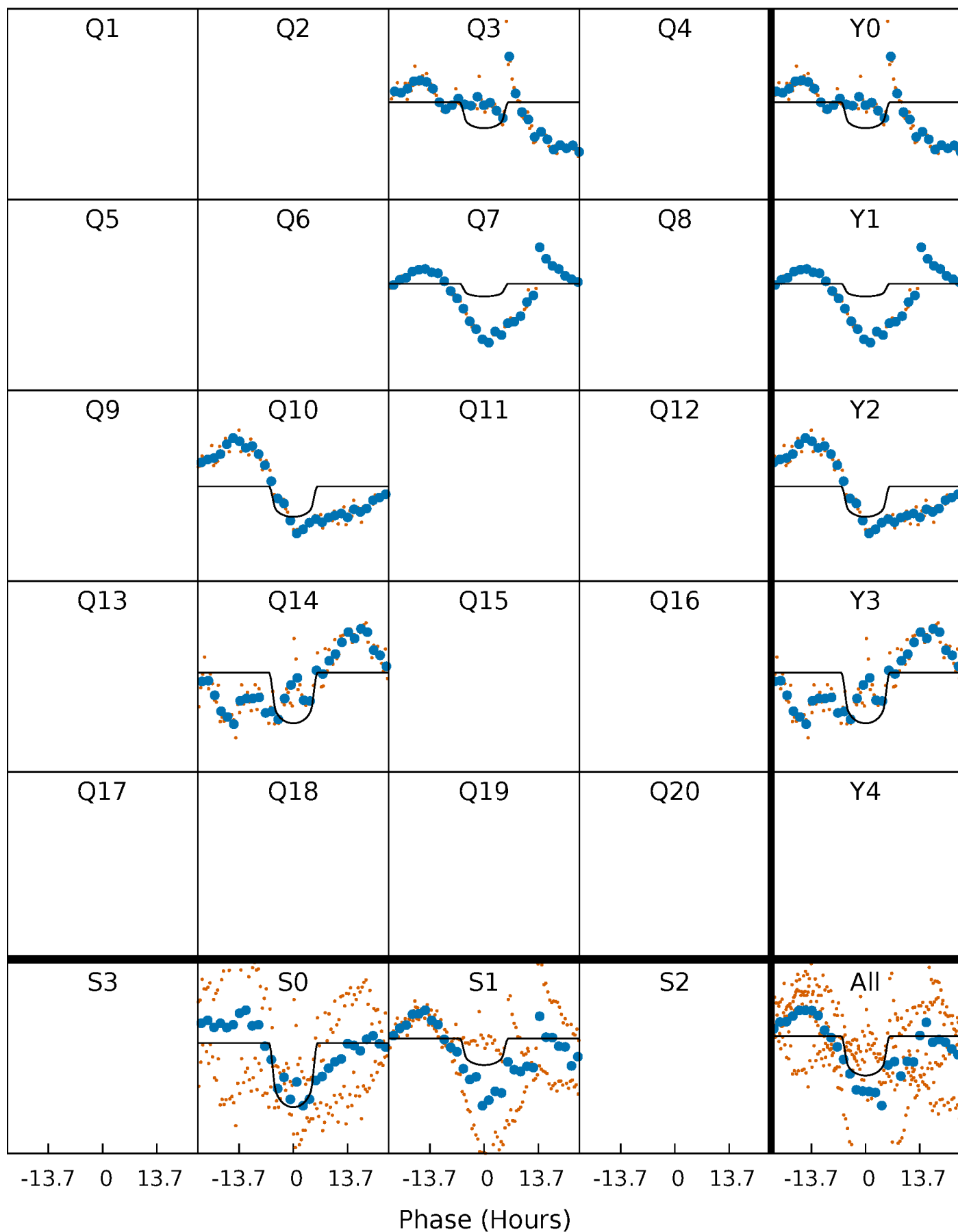
PDC Quarter-Phased Transit Curves

TCE 009101620-02 P=358.807662 Days $T_0=272.536881$ (BKJD)



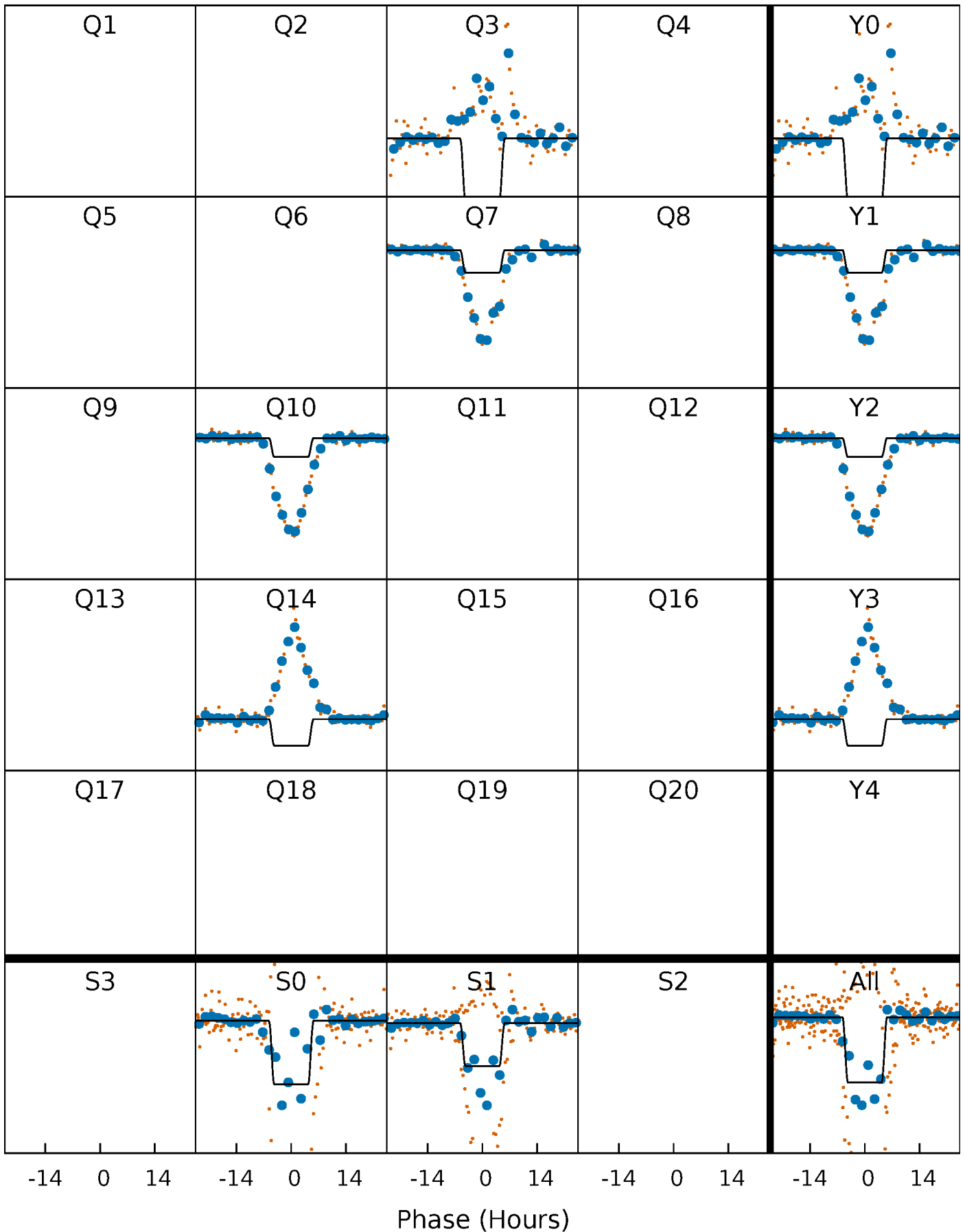
DV Quarter-Phased Transit Curves

TCE 009101620-02 P=358.807662 Days $T_0=272.536881$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

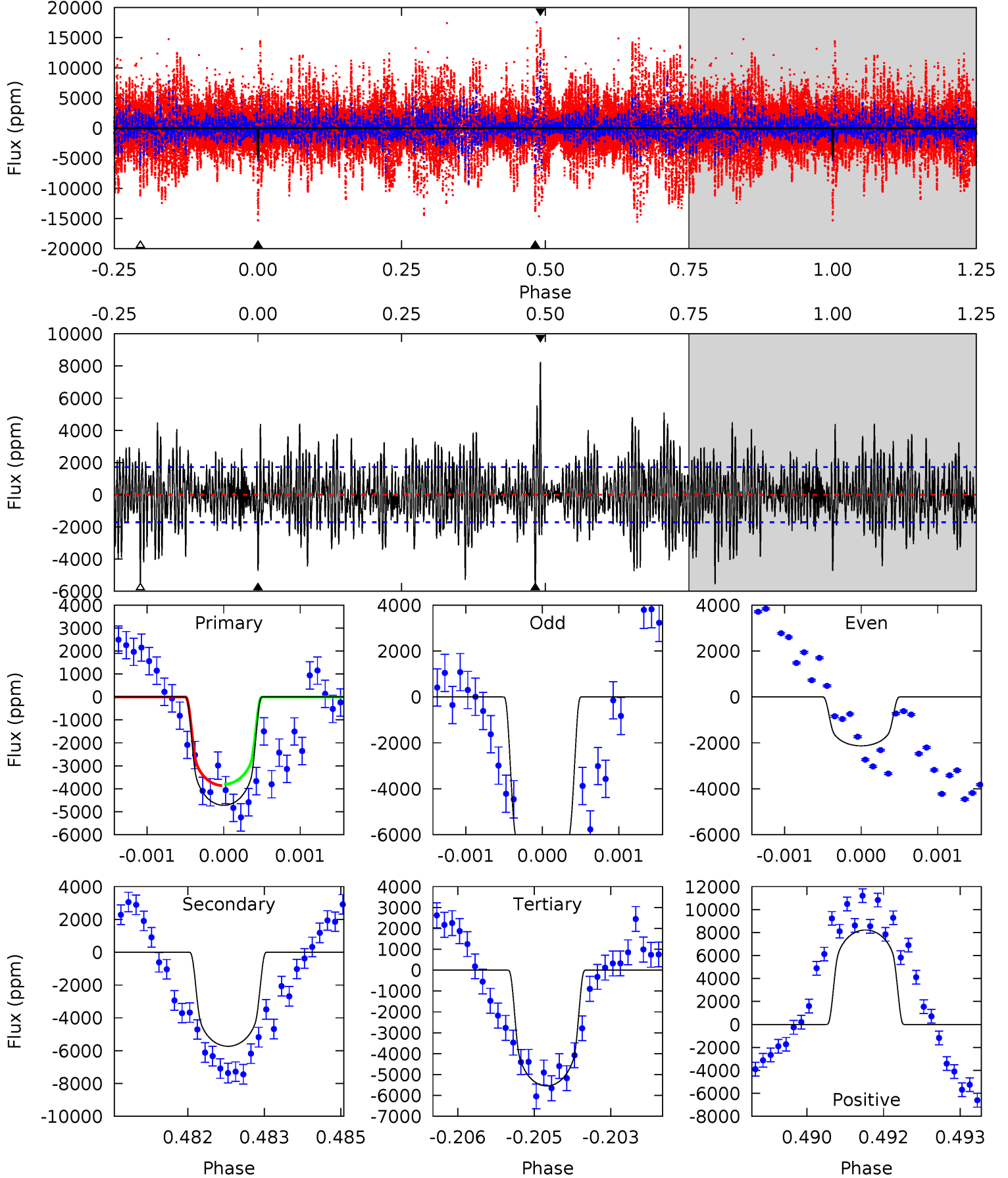
TCE 009101620-02 P=358.799691 Days $T_0=272.542400$ (BKJD)



DV Model-Shift Uniqueness Test

009101620-02, P = 358.807662 Days, E = 272.536881 Days

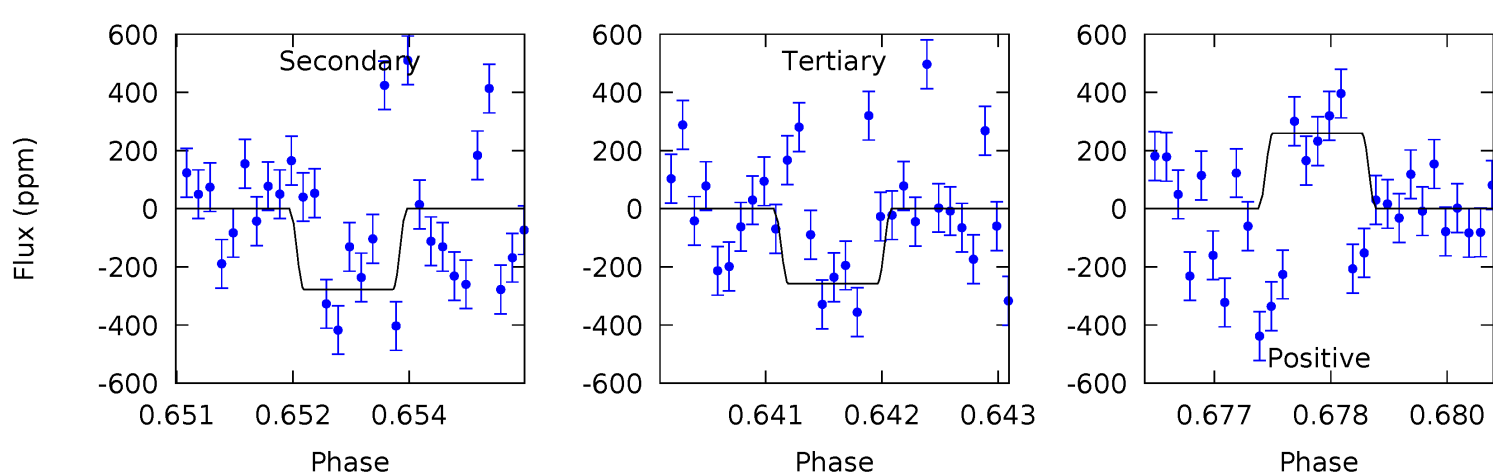
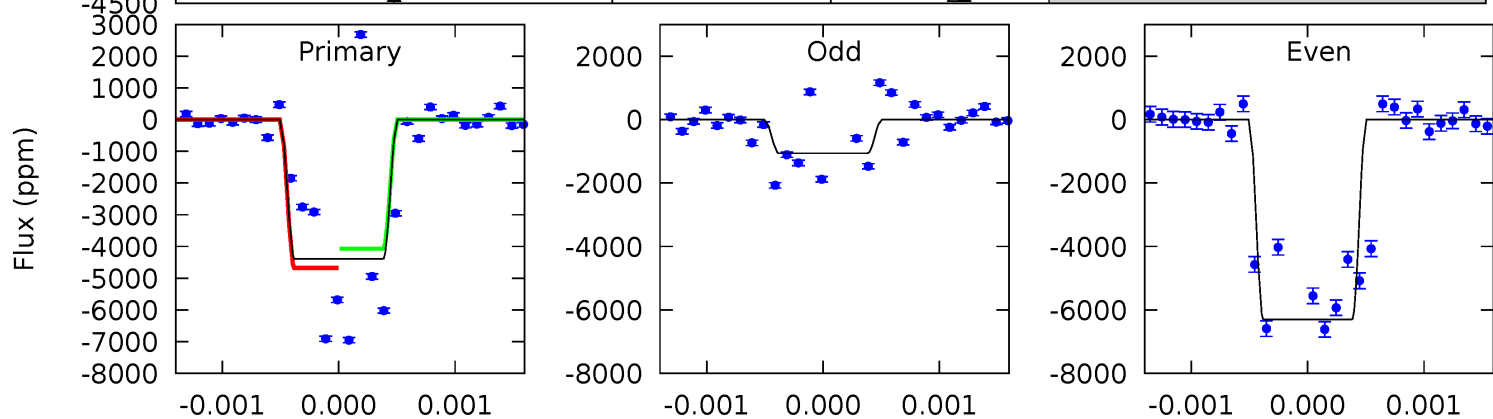
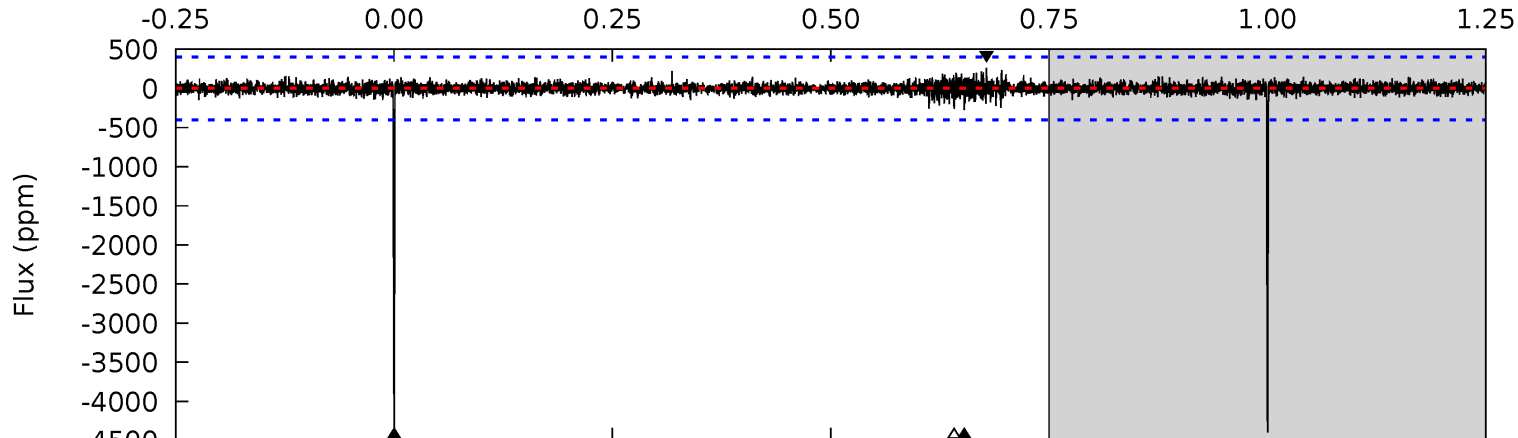
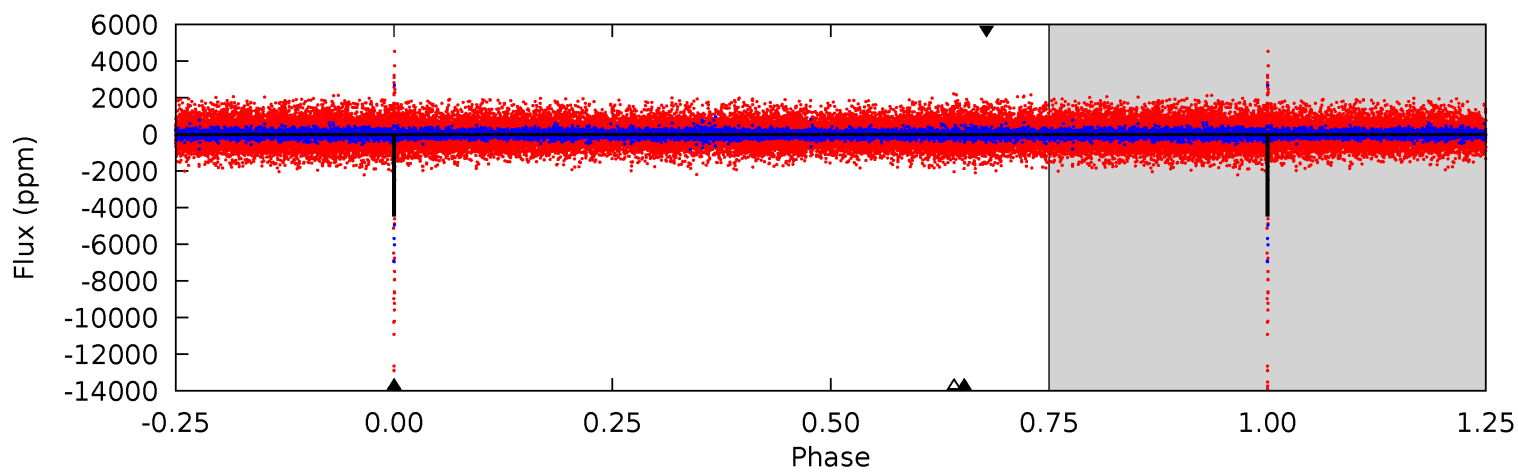
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.8	18.0	17.4	25.8	5.39	3.19	4.81	-2.58	-11.0	0.59	-7.82	8.34	1.82	0.59	0



Alt Model-Shift Uniqueness Test

009101620-02, P = 358.799691 Days, E = 272.542400 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
59.1	3.73	3.47	3.49	5.40	3.21	0.59	55.7	55.6	0.26	0.24	46.6	0.82	0.06	3.99



Stellar Parameters For KIC 009101620

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5087^{+153}_{-153}	$4.623^{+0.066}_{-0.039}$	$-0.800^{+0.300}_{-0.300}$	$0.640^{+0.057}_{-0.057}$	$0.627^{+0.064}_{-0.028}$	$3.372^{+0.865}_{-0.516}$
	+3%/-3%	+1%/-1%	+37%/-37%	+9%/-9%	+10%/-4%	+26%/-15%
Source	PHO1	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 009101620-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-5731 ± 319	$3.99^{+1.32}_{-1.41}$	272^{+10}_{-11}	5777^{+1433}_{-715}	$145820^{+203677}_{-64630}$
Alt.	-278 ± 74	$3.99^{+1.31}_{-1.43}$	271^{+10}_{-10}	3259^{+524}_{-311}	6858^{+10368}_{-3362}

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

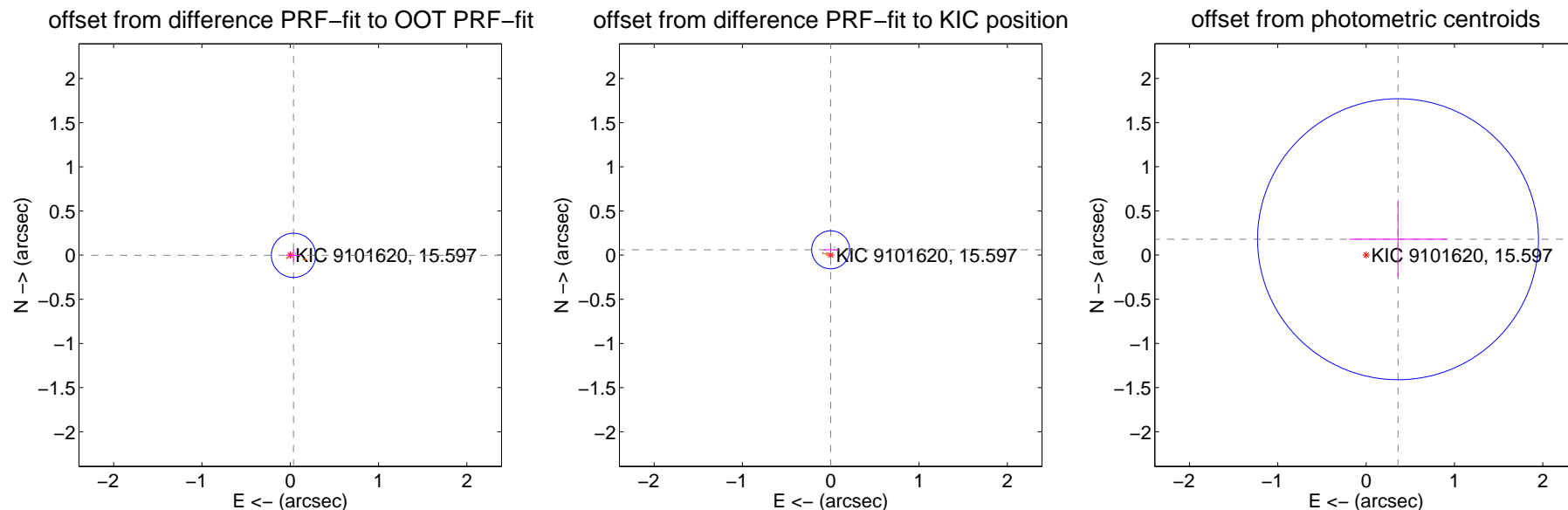
DV Centroid Data

Supplemental centroid analysis for 009101620-02. Kepler magnitude: 15.60. Transit SNR 6.73

There are 1 quarters with good PRF difference image offsets

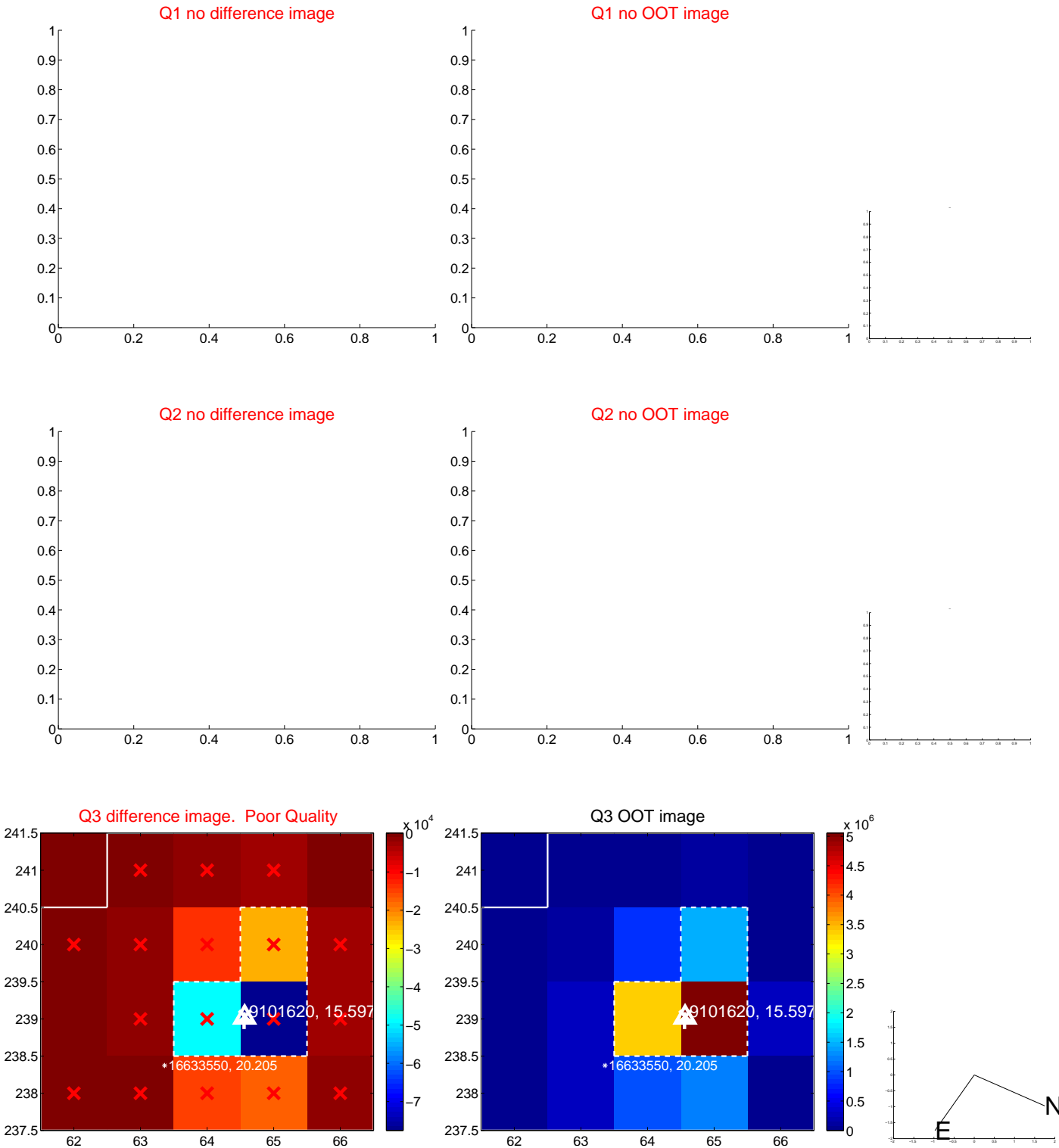
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.037 ± 0.084	0.44	-0.037 ± 0.084	-0.002 ± 0.069
PRF-fit source offset from KIC position	0.061 ± 0.072	0.85	0.000 ± 0.081	0.061 ± 0.072
photometric centroid source offset	0.40 ± 0.53	0.76	-0.36 ± 0.55	0.18 ± 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.

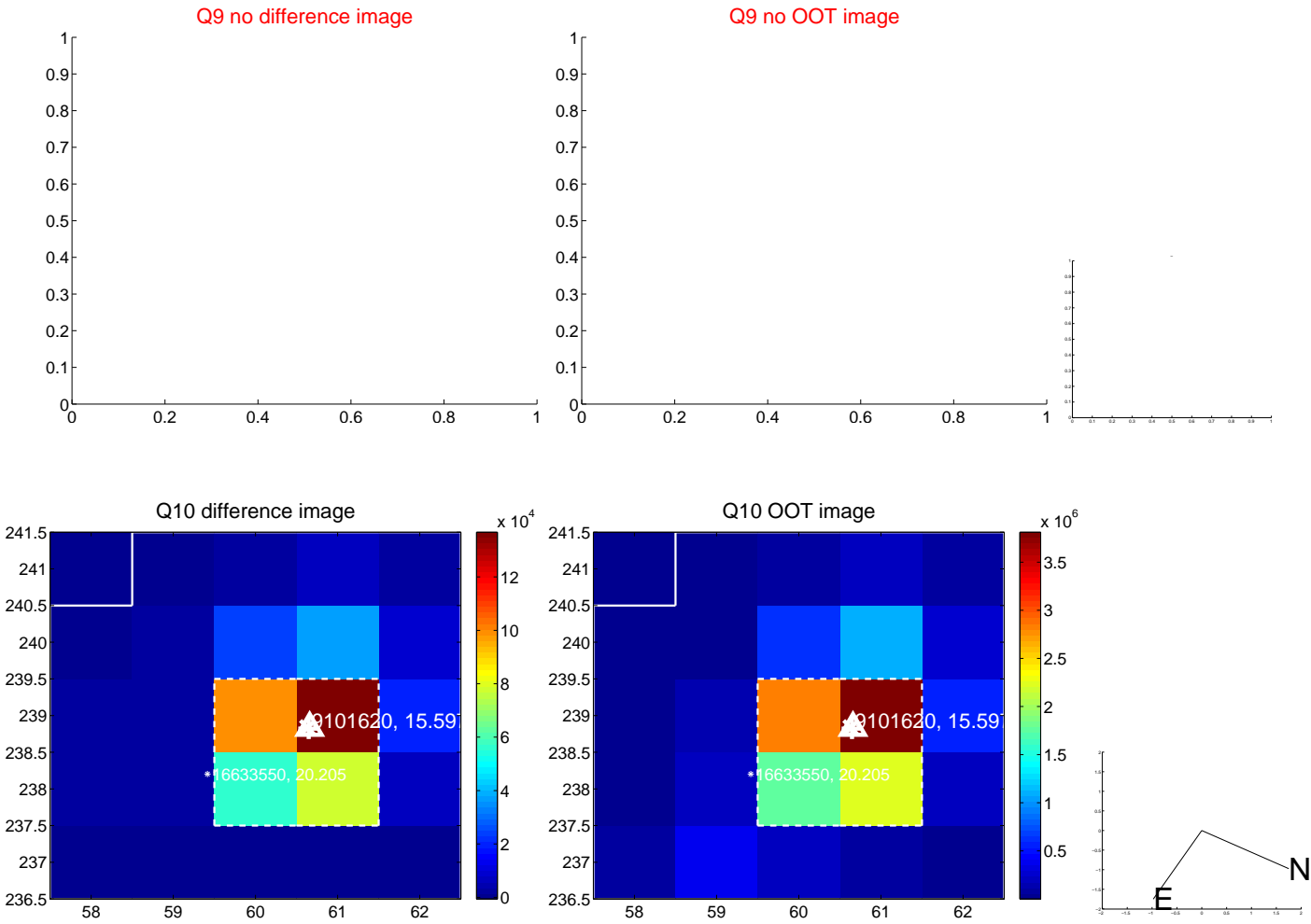
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



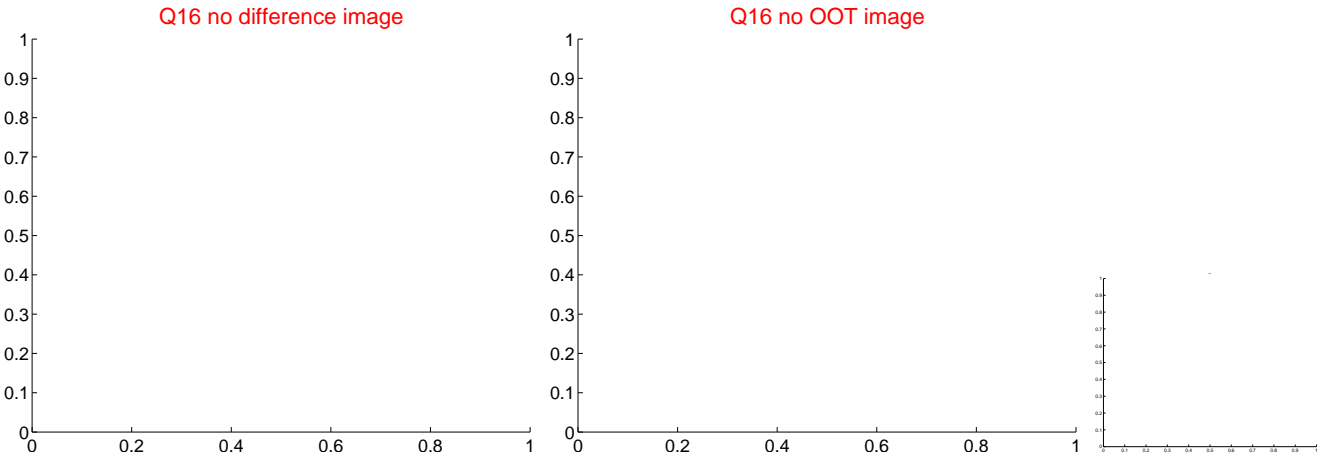
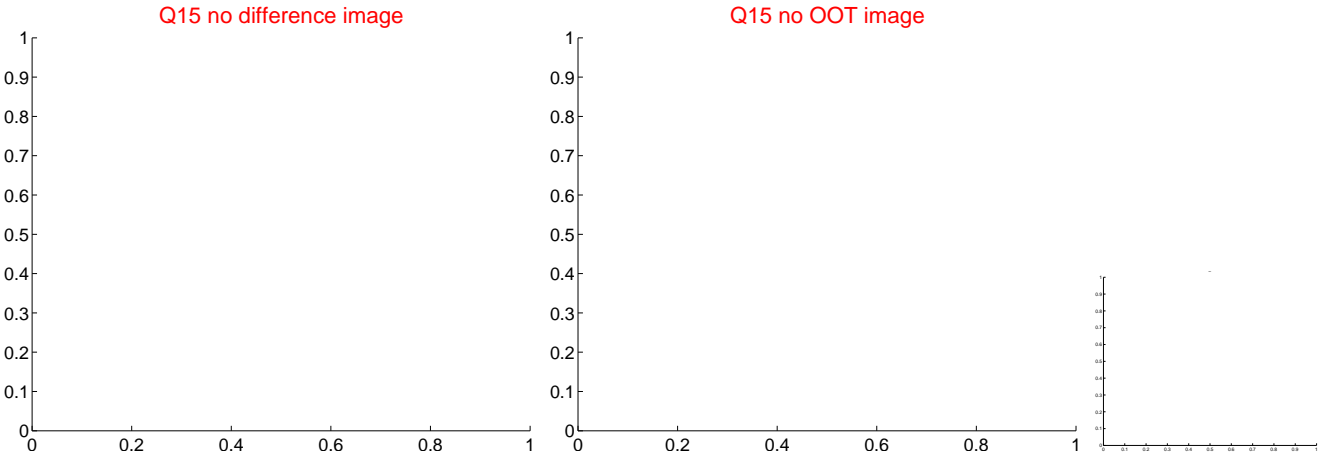
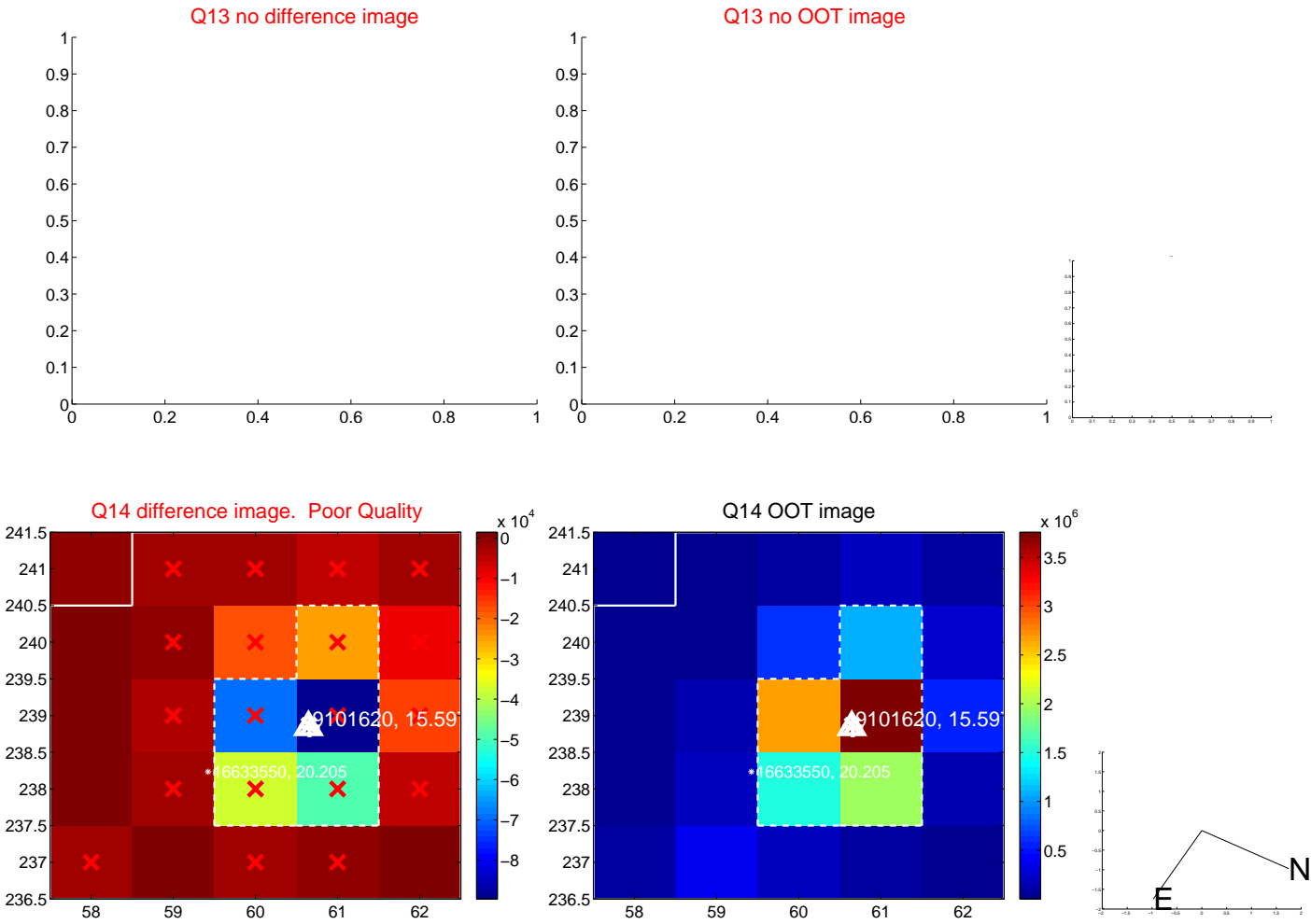
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



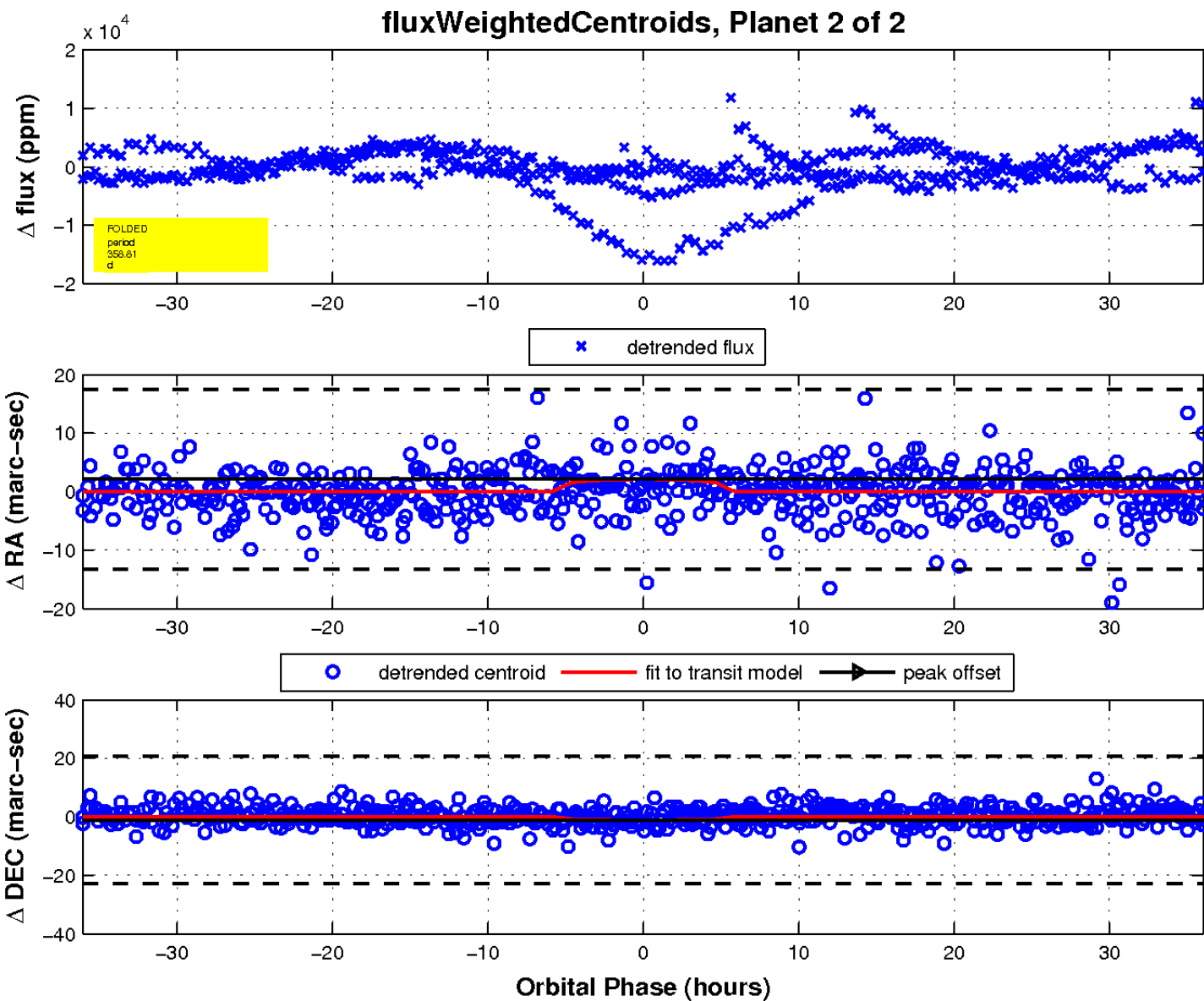
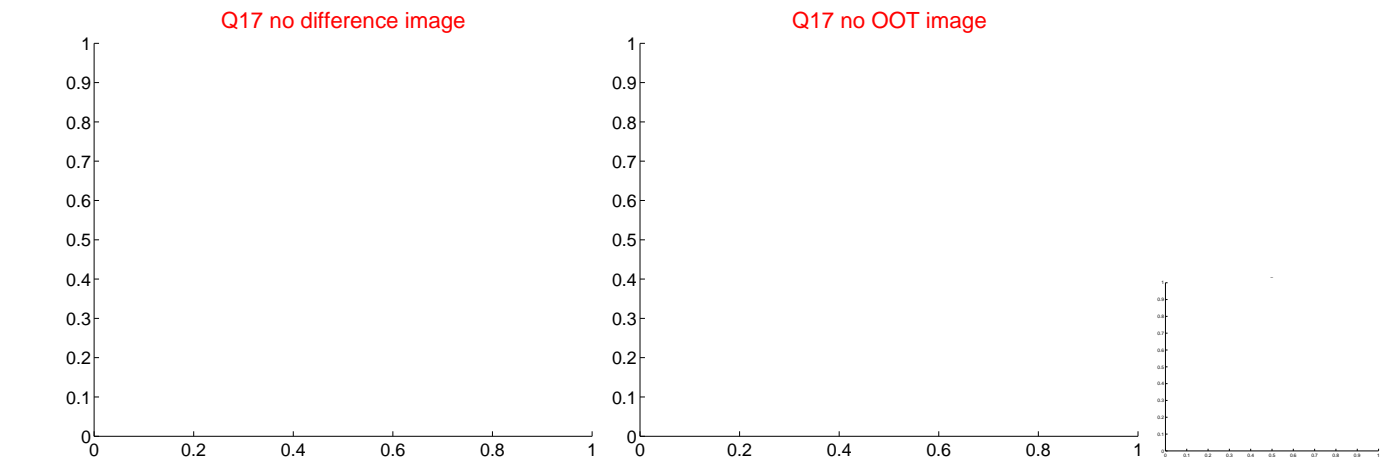
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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UKIRT Image

Declination

