

KIC 009153621

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})
009153621-01	OBS	No	305.792393	169.768756	18483.3	54.784	32.0	66.0	9.01	4781	118.20	42.86
009153621-02	OBS	No	305.808659	220.315246	96.2	15.000	7.5	-1.0	9.01	4781	8.53	42.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009153621-01	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—CENT_FEW_DIFFS
009153621-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—SAME_NTL_PERIOD—CENT_NOFITS

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

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

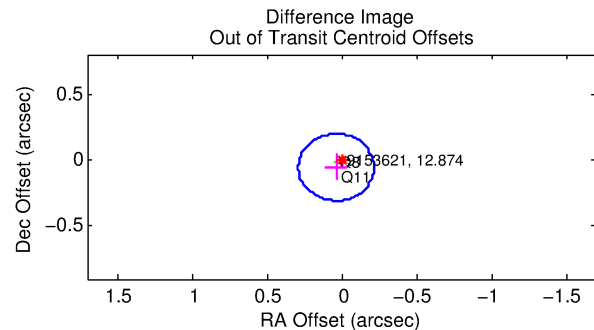
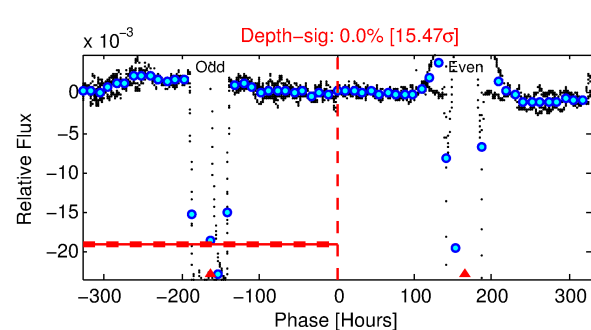
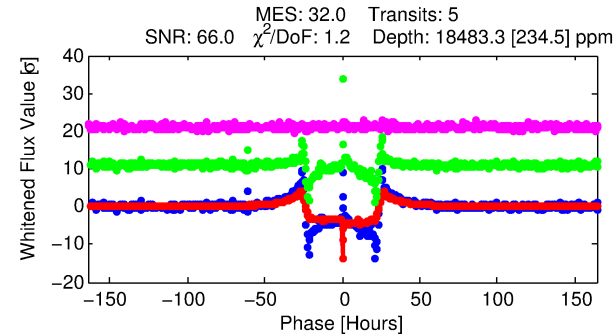
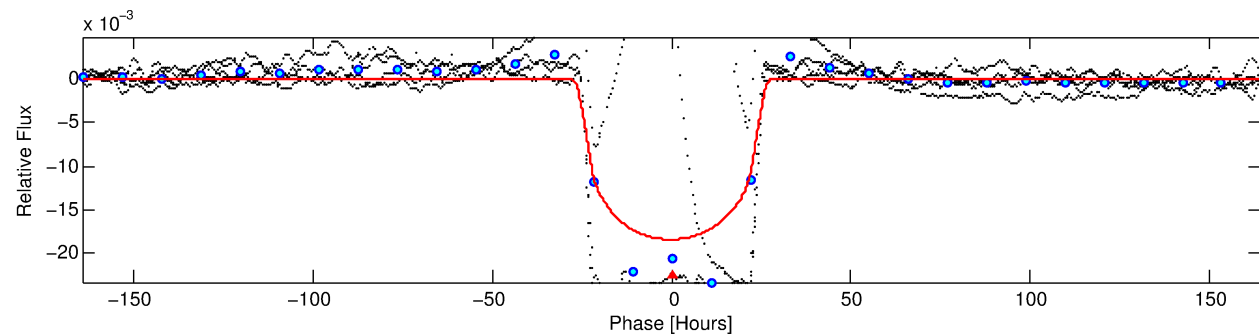
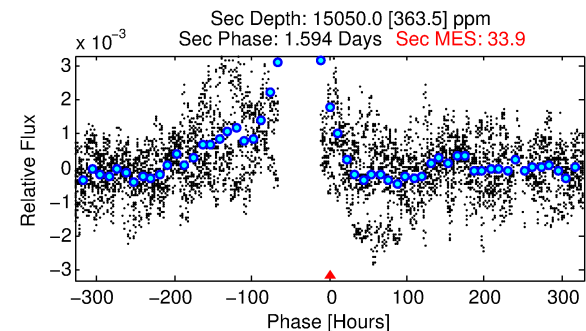
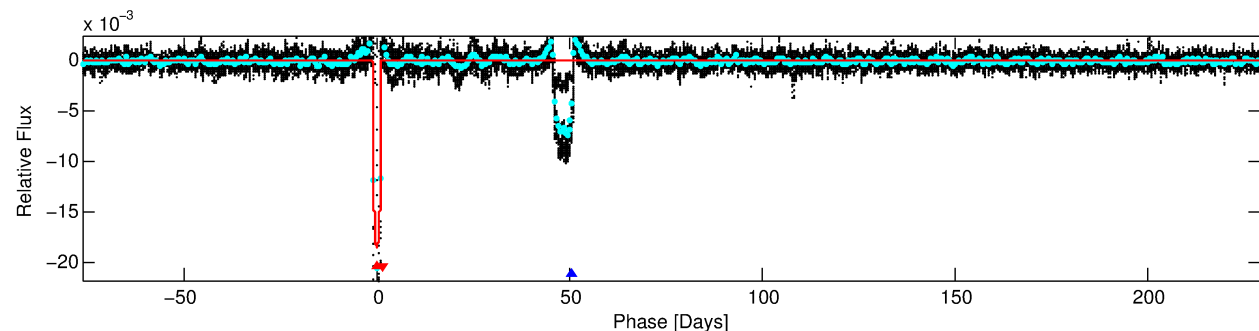
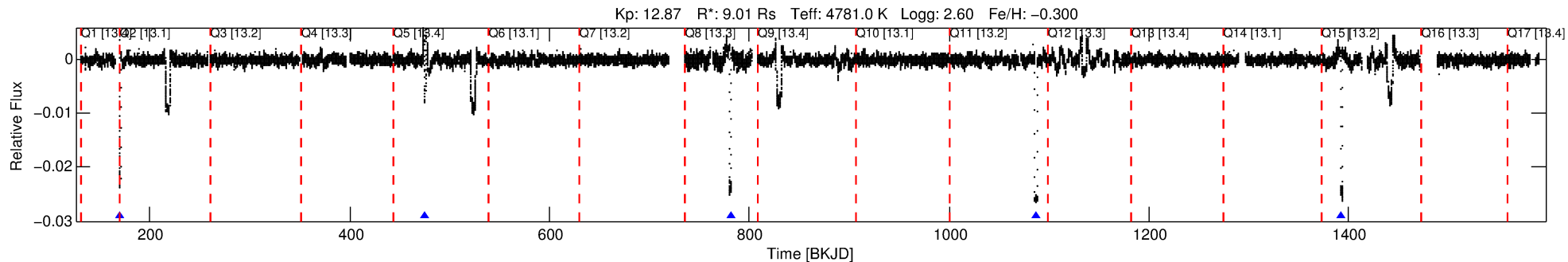
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009153621-01

No Significant Match Found

DV One-Page Summary

KIC: 9153621 Candidate: 1 of 2 Period: 305.792 d



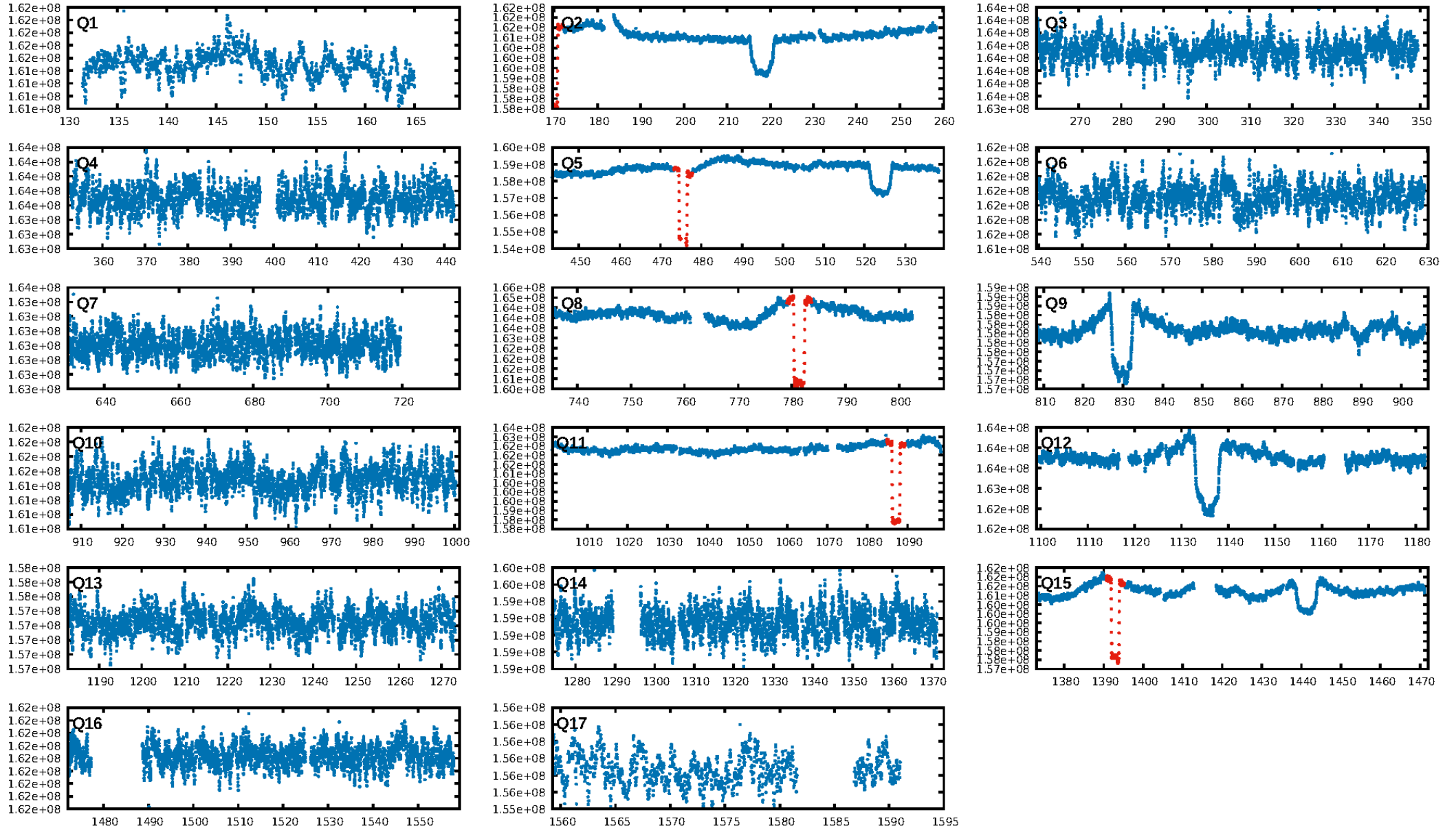
DV Fit Results:

Period = 305.79239 [0.00233] d
Epoch = 169.7688 [0.0061] BKJD
Rp/R* = 0.1203 [0.0010]
a/R* = 47.77 [0.77]
b = 0.01 [2.91]
Seff = 42.86 [11.81]
Teff = 652 [45] K
Rp = 118.20 [28.75] Re
a = 0.9411 [0.1830] AU
Ag = 524.87 [142.09] [3.69σ]
Teffp = 4828 [80] K [45.62σ]

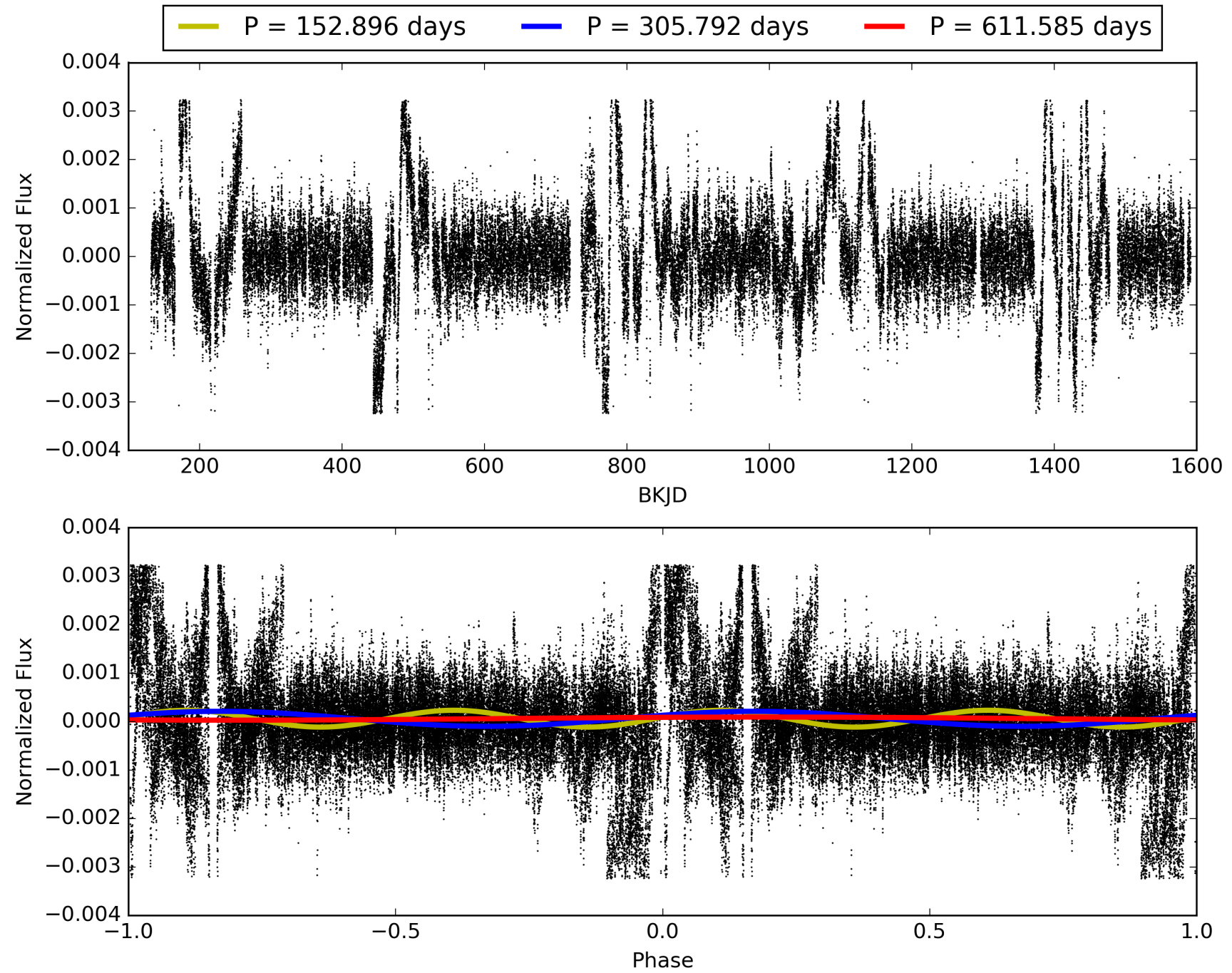
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.5% [0.01σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.39e-99
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 1.033
Centroid-sig: 0.0%
Centroid-so: 0.271 arcsec [10.18σ]
OotOffset-rm: 0.066 arcsec [0.78σ]
OotOffset-st: 0/1/1/0 [2]
KicOffset-rm: 0.039 arcsec [0.58σ]
KicOffset-st: 0/1/1/0 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

TCE 009153621-01, PDC Light Curves

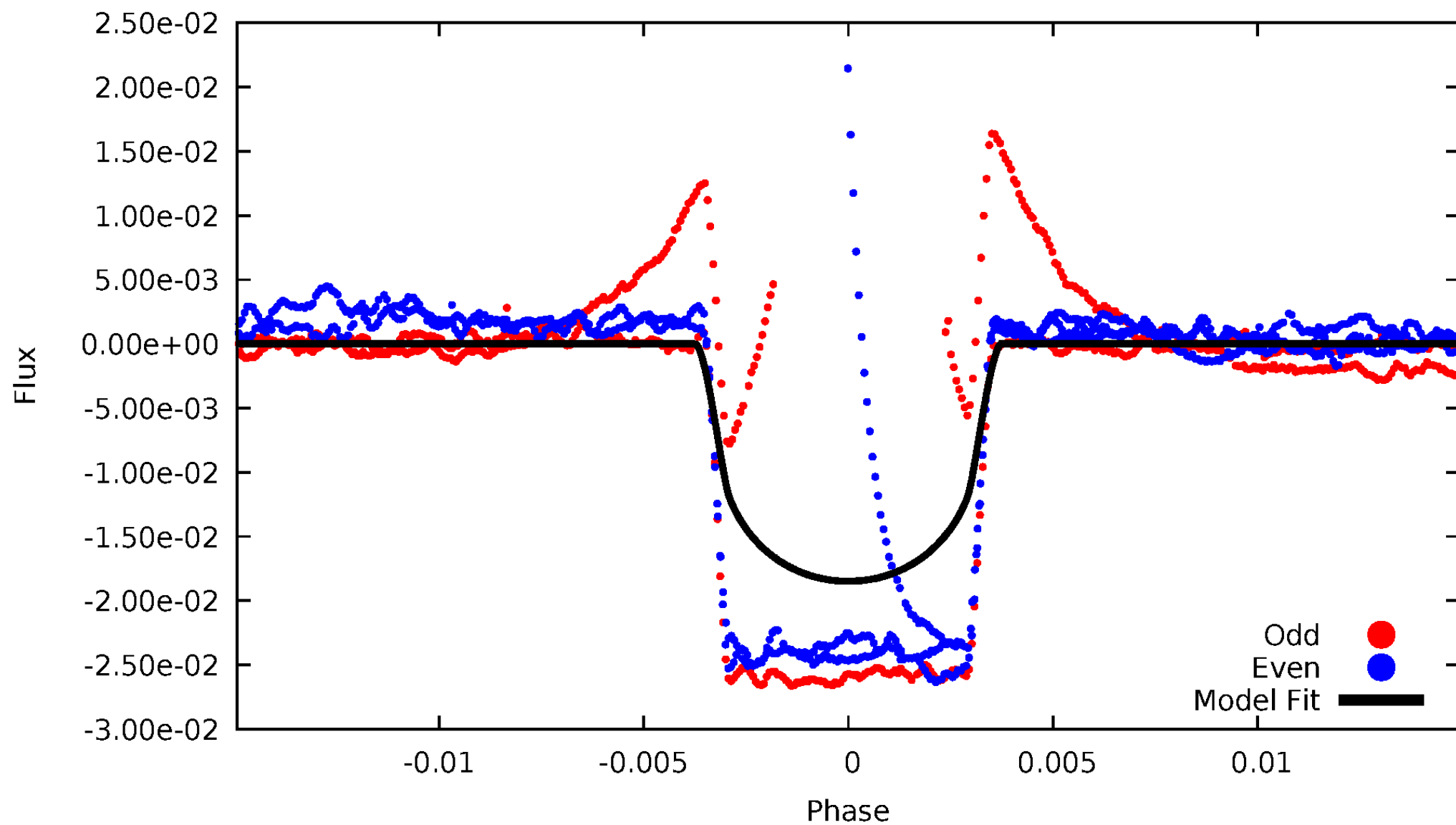


TCE 009153621-01



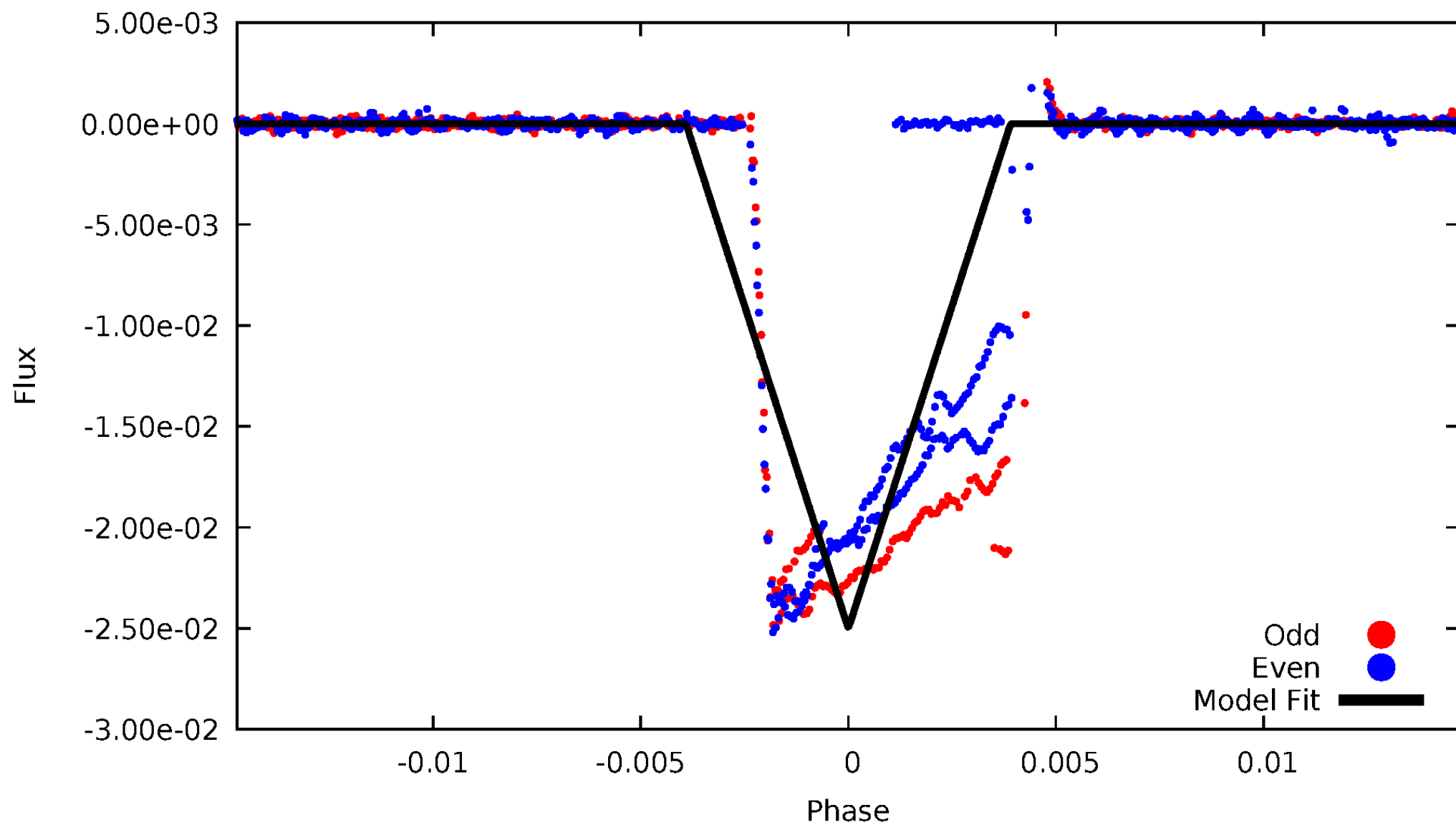
DV Odd/Even

TCE 009153621-01



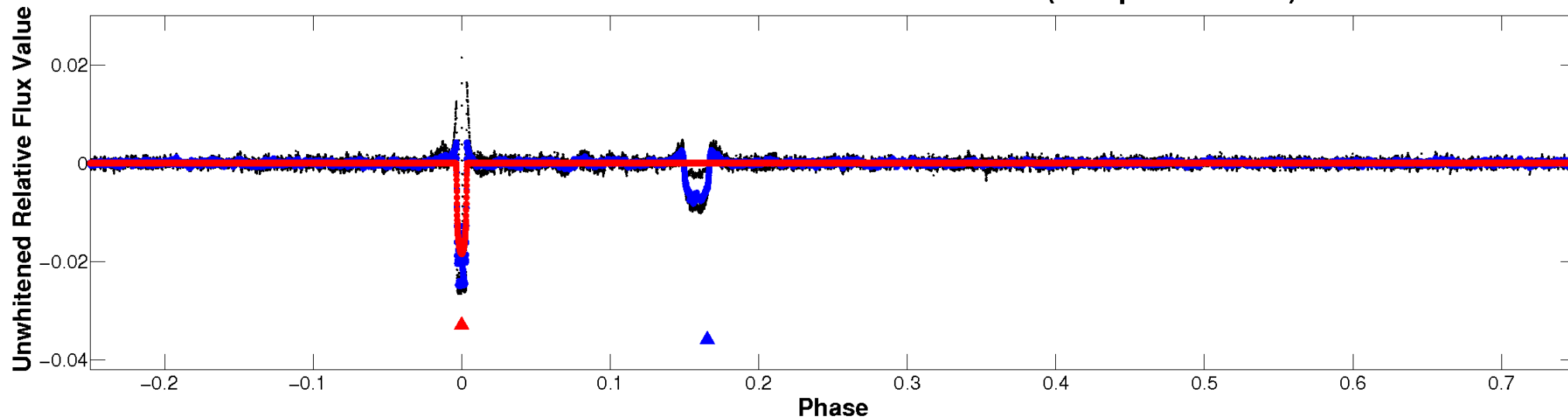
ALT Odd/Even

TCE 009153621-01

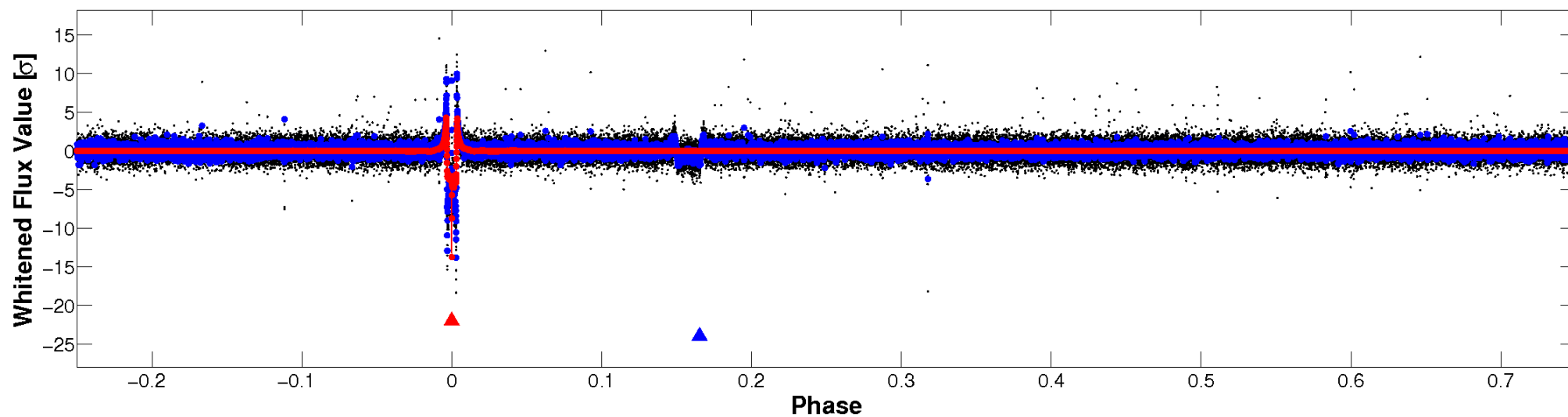


Non-Whitened Vs. Whitened Light Curve

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

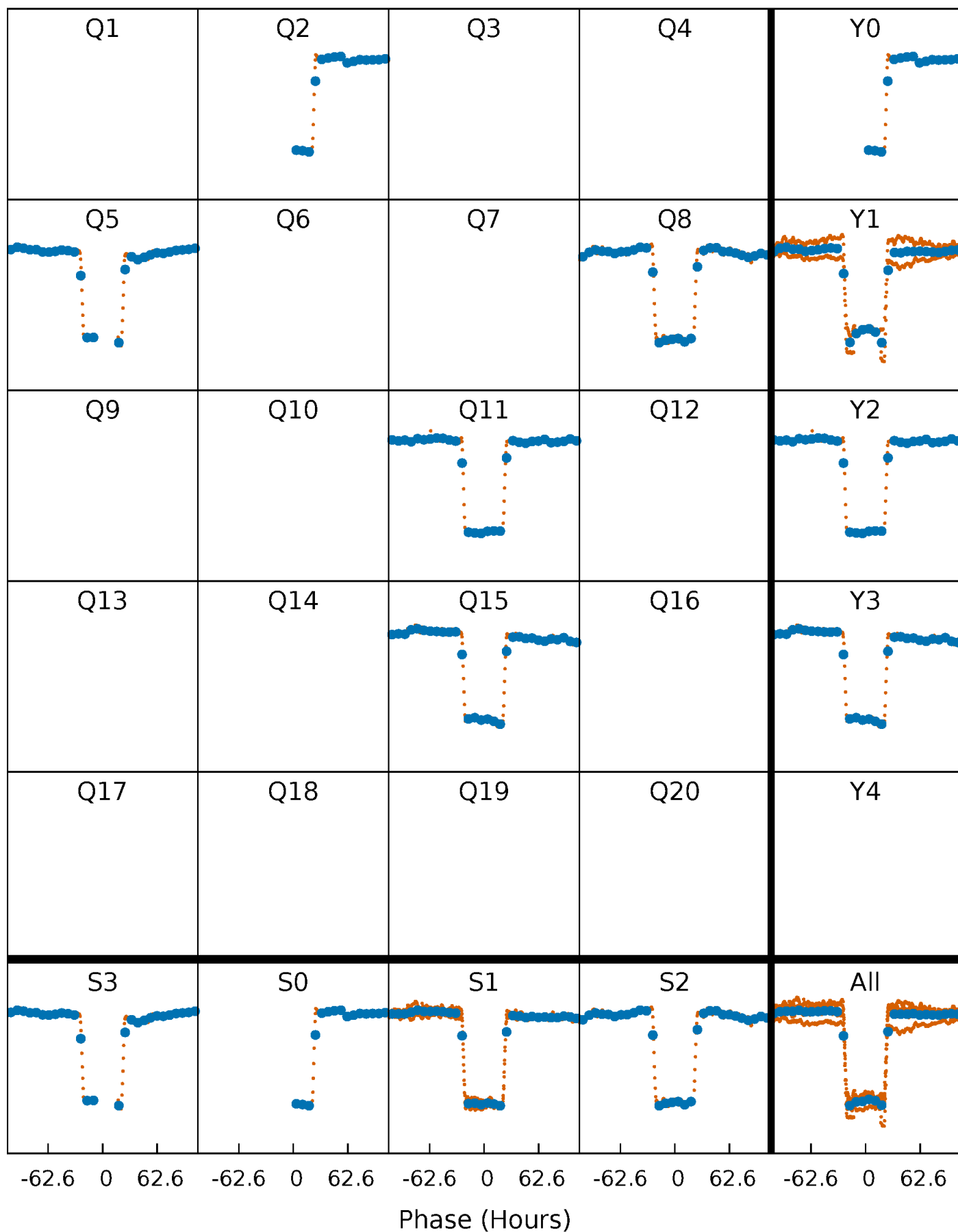


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



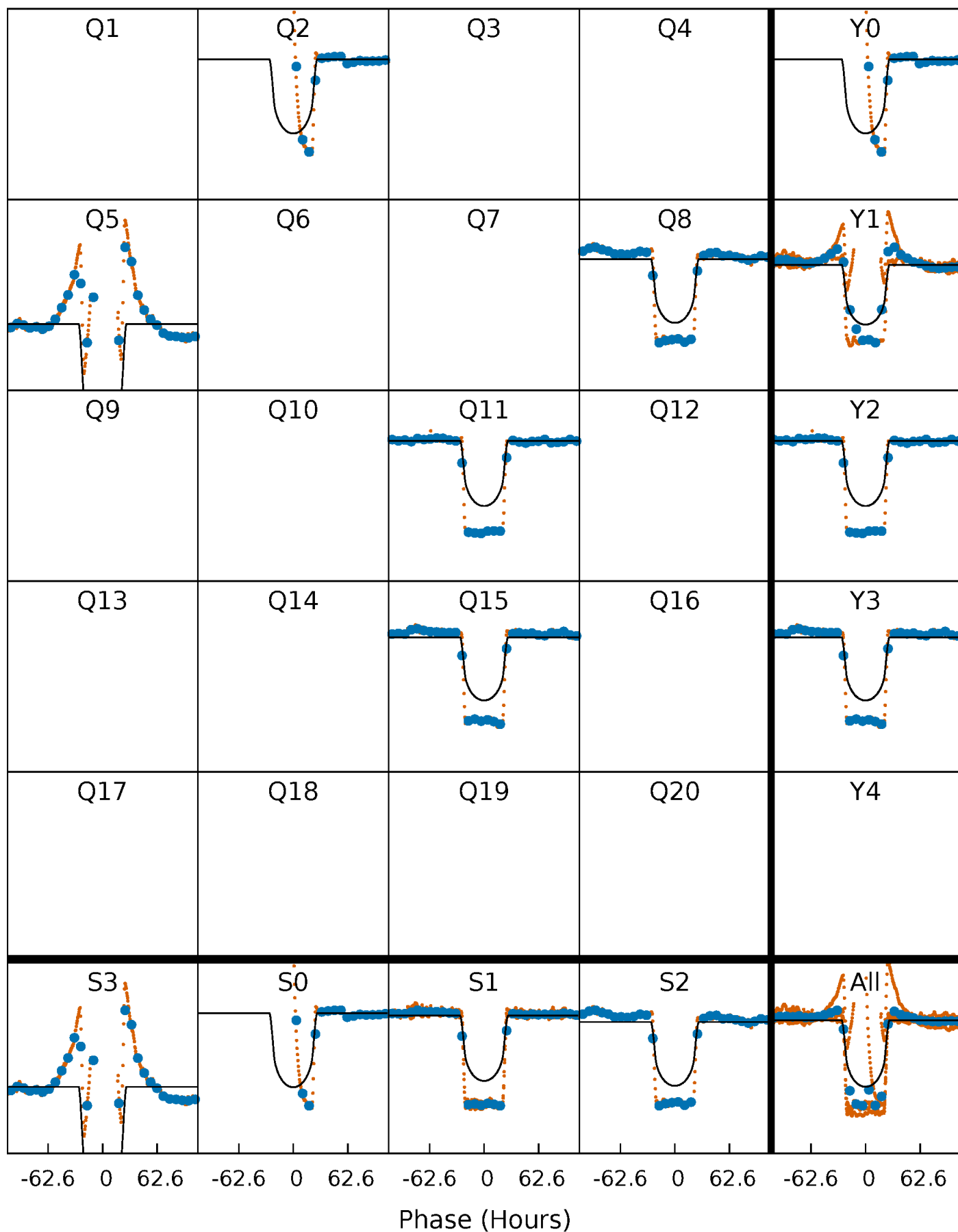
PDC Quarter-Phased Transit Curves

TCE 009153621-01 P=305.792393 Days $T_0=169.768756$ (BKJD)



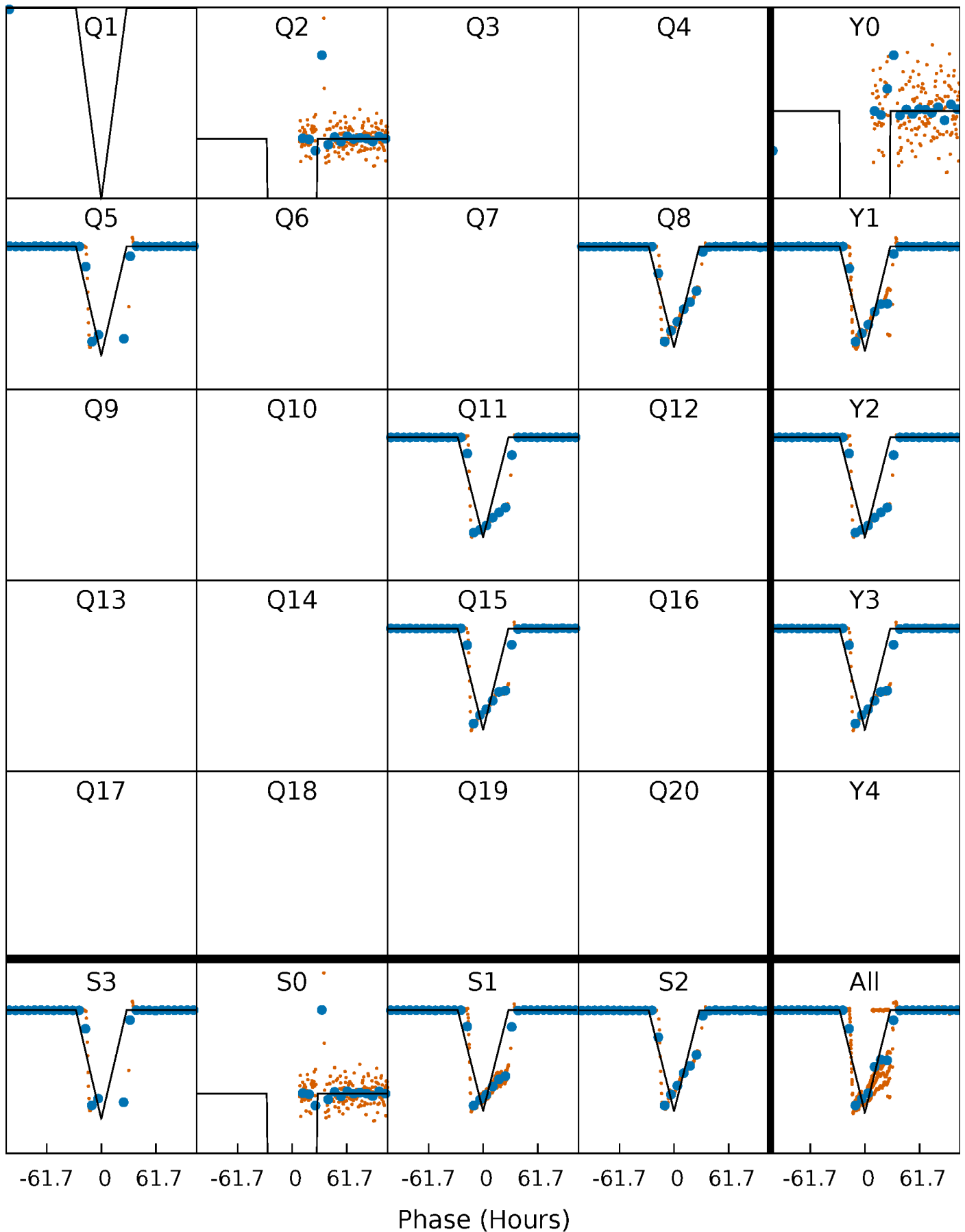
DV Quarter-Phased Transit Curves

TCE 009153621-01 P=305.792393 Days $T_0=169.768756$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

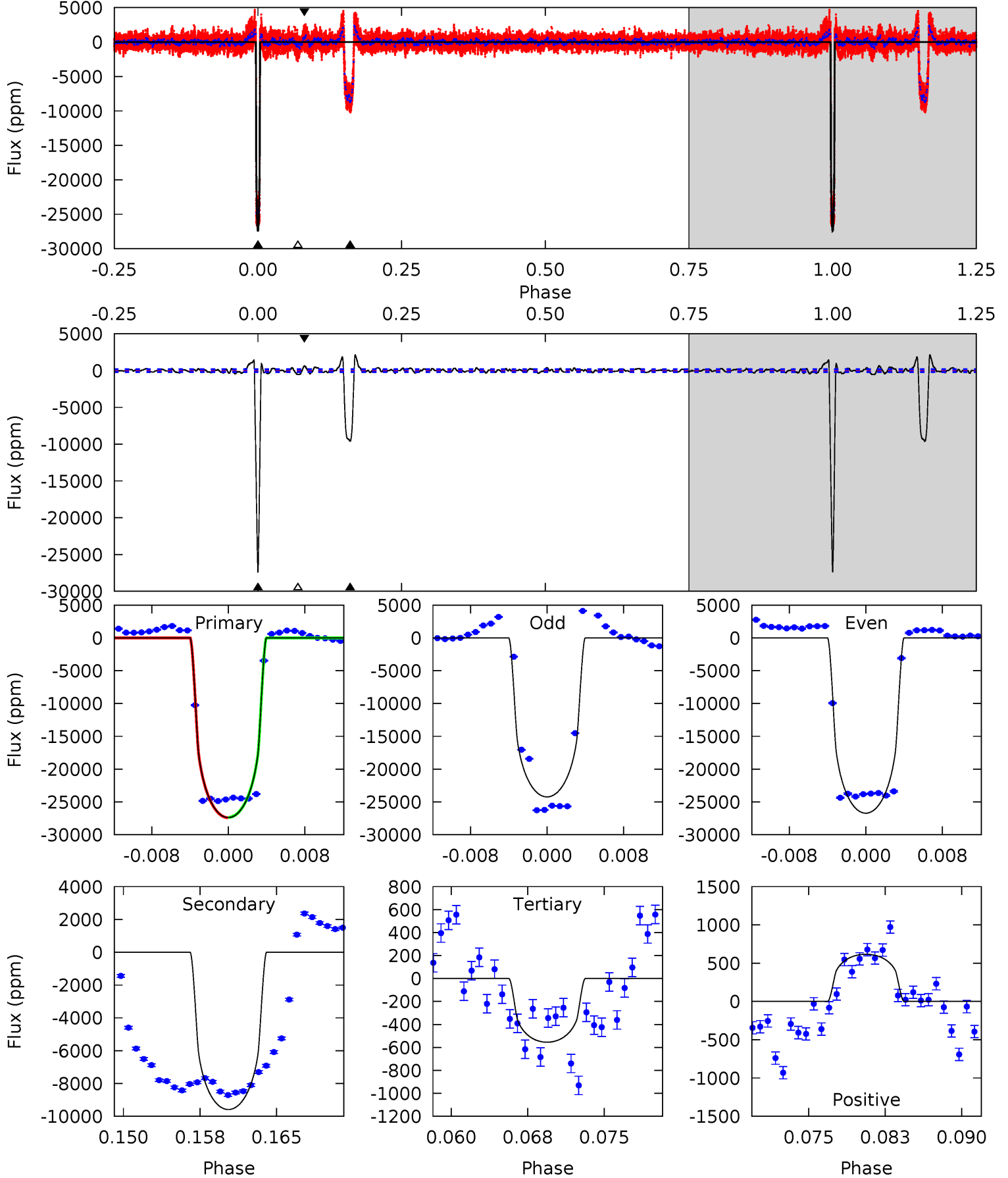
TCE 009153621-01 P=305.795037 Days $T_0=169.417275$ (BKJD)



DV Model-Shift Uniqueness Test

009153621-01, P = 305.792393 Days, E = 169.768756 Days

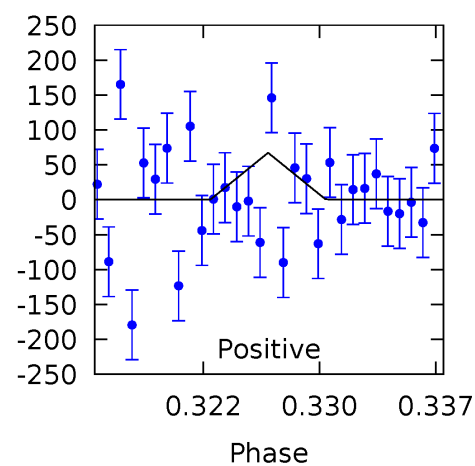
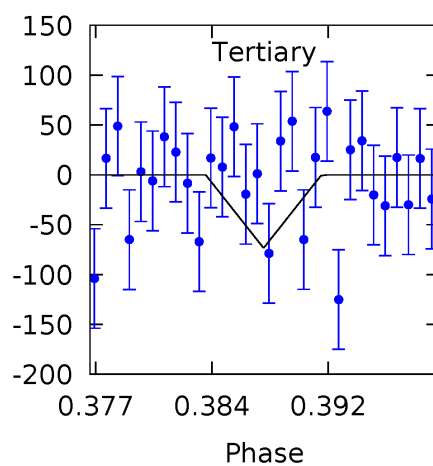
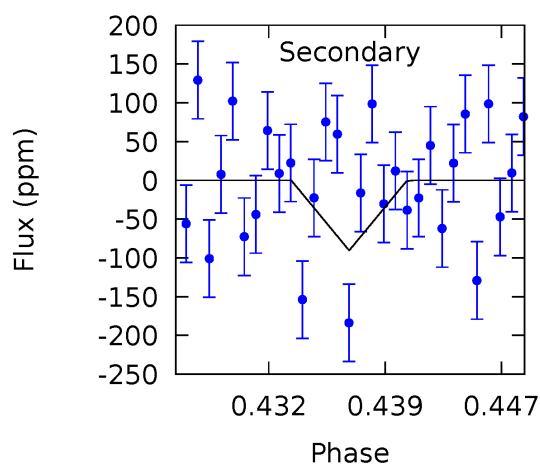
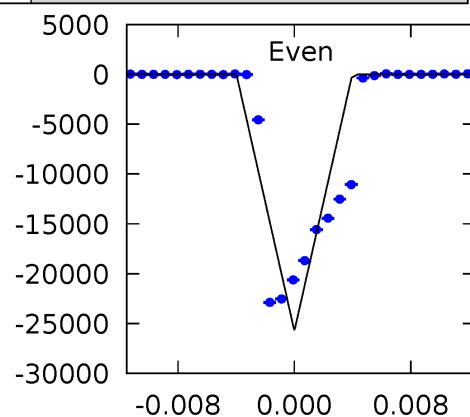
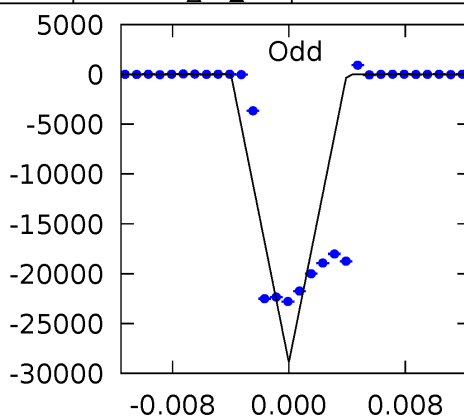
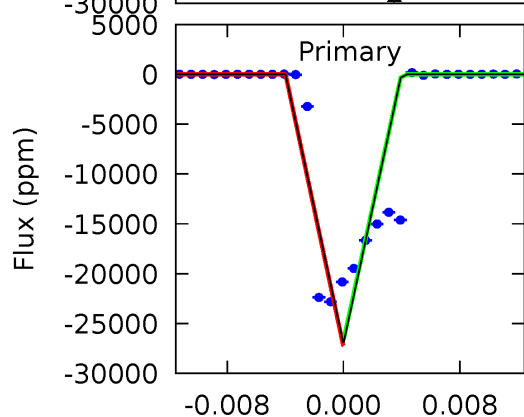
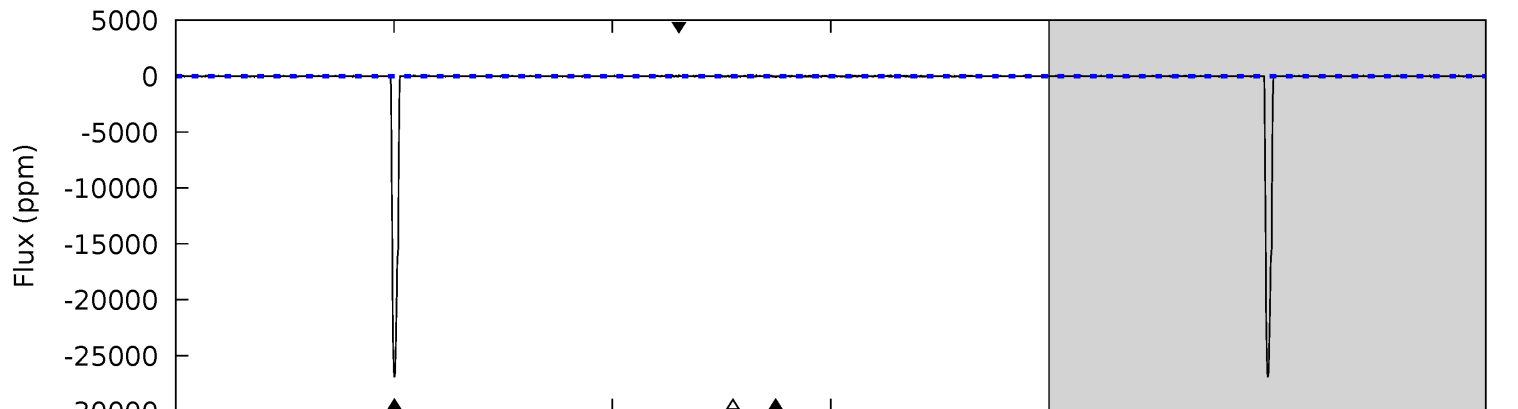
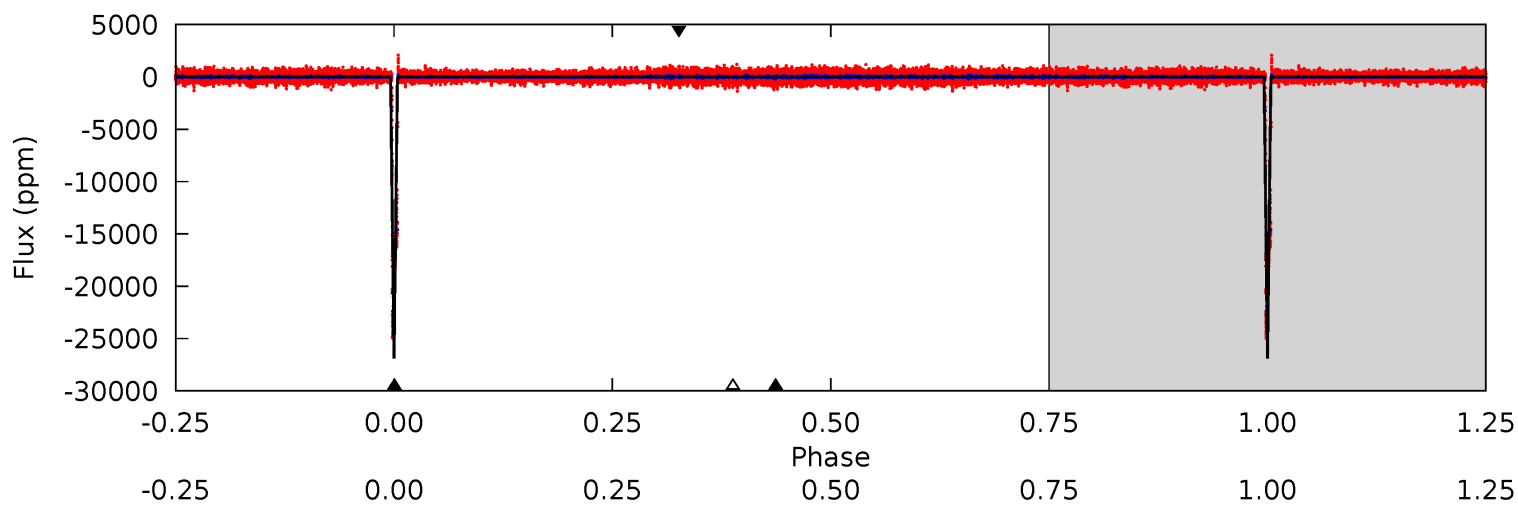
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
715.3	250.4	14.5	16.1	5.08	2.67	11.3	700.8	699.2	235.9	234.3	34.1	0.76	0.07	0



Alt Model-Shift Uniqueness Test

009153621-01, P = 305.795037 Days, E = 169.417275 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1668	5.59	4.54	4.15	5.07	2.66	0.97	1664	1664	1.05	1.43	109.1	0.82	0.00	19.2



Stellar Parameters For KIC 009153621

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4781^{+64}_{-71}	$2.604^{+0.140}_{-0.126}$	$-0.300^{+0.150}_{-0.100}$	$9.005^{+2.189}_{-1.592}$	$1.189^{+0.320}_{-0.240}$	$0.002^{+0.002}_{-0.001}$
	+1%/-1%	+5%/-5%	+50%/-33%	+24%/-18%	+27%/-20%	+67%/-40%
Source	SPE74	SPE74	SPE74	DSEP		

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

Secondary Eclipse Parameters for KIC 009153621-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-9588 ± 38	$117.06^{+17.55}_{-13.14}$	908^{+46}_{-45}	4420^{+53}_{-59}	341^{+81}_{-57}
Alt.	-90 ± 16	$159.10^{+23.47}_{-18.29}$	909^{+45}_{-43}	2065^{+43}_{-54}	$1.736^{+0.528}_{-0.408}$

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

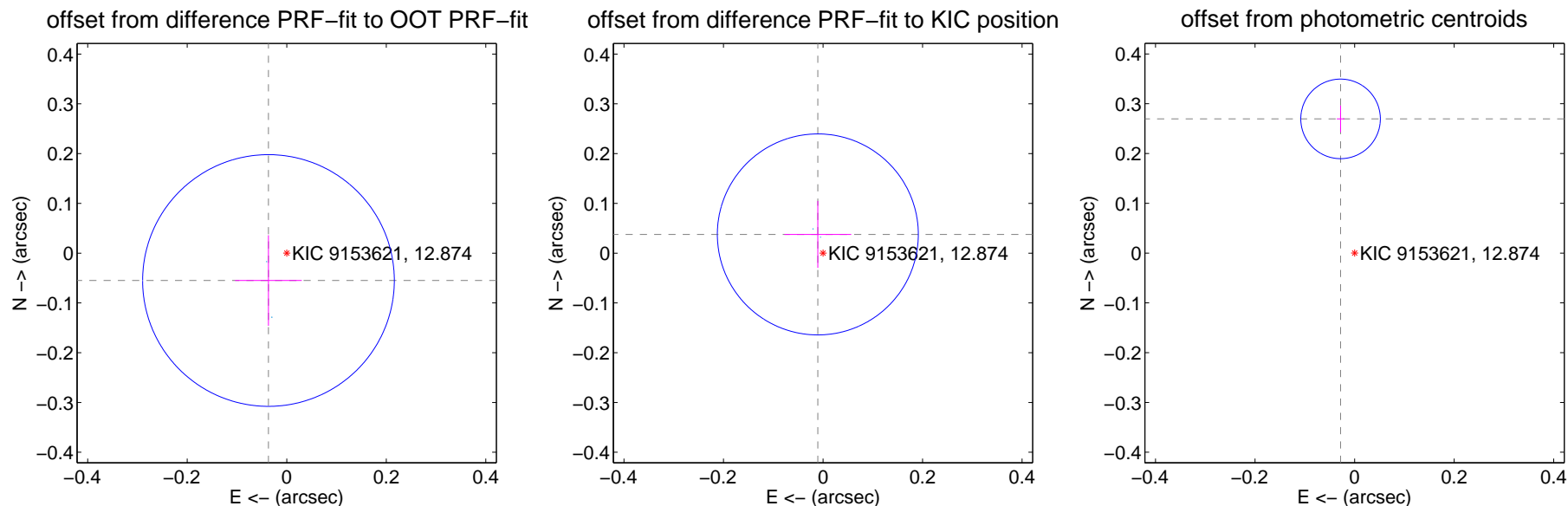
DV Centroid Data

Supplemental centroid analysis for 009153621-01. Kepler magnitude: 12.87. Transit SNR 66.01

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.066 ± 0.084	0.78	0.037 ± 0.067	-0.055 ± 0.091
PRF-fit source offset from KIC position	0.039 ± 0.067	0.58	0.010 ± 0.067	0.038 ± 0.067
photometric centroid source offset	0.27 ± 0.03	10.18	0.03 ± 0.01	0.27 ± 0.03

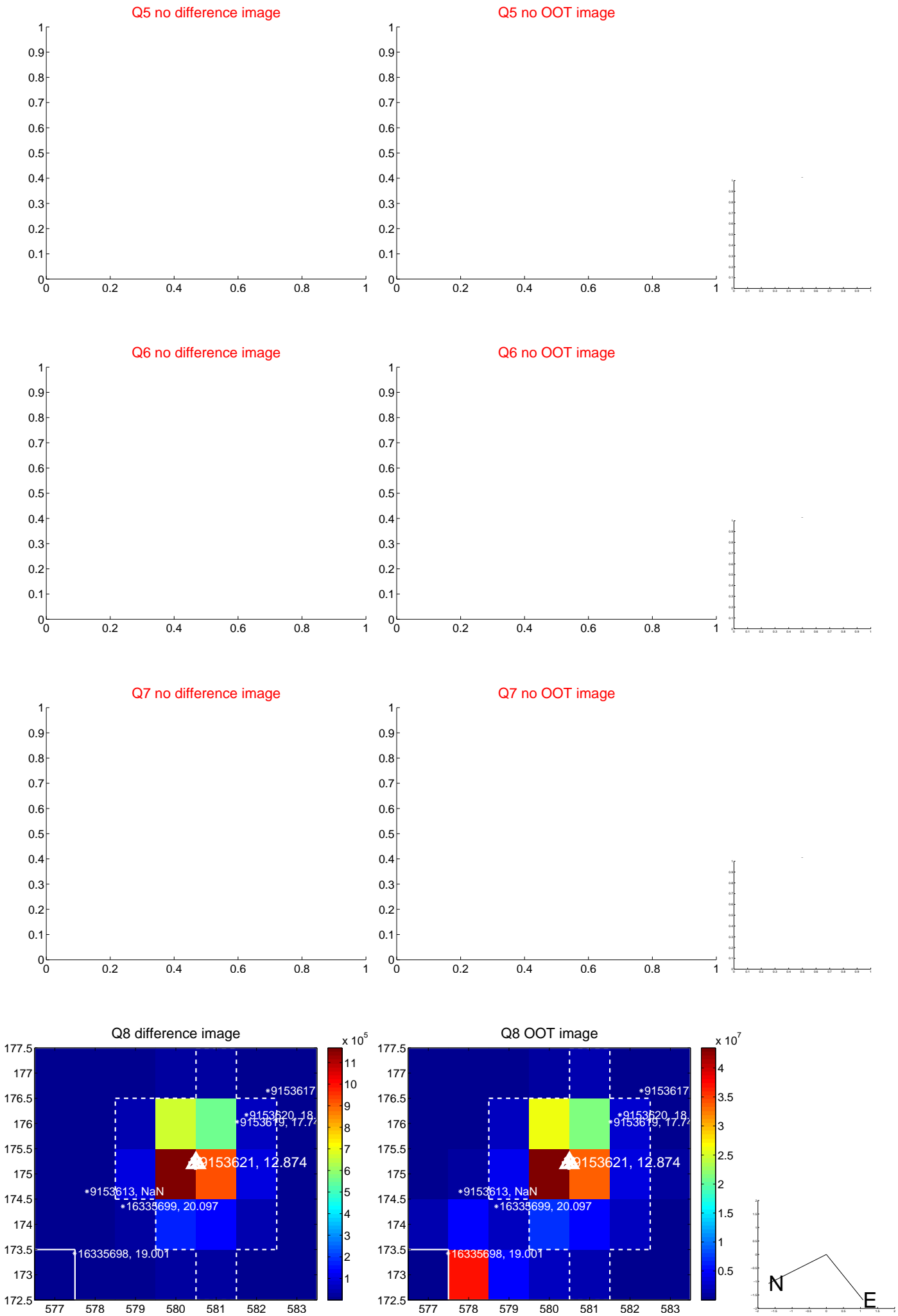


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

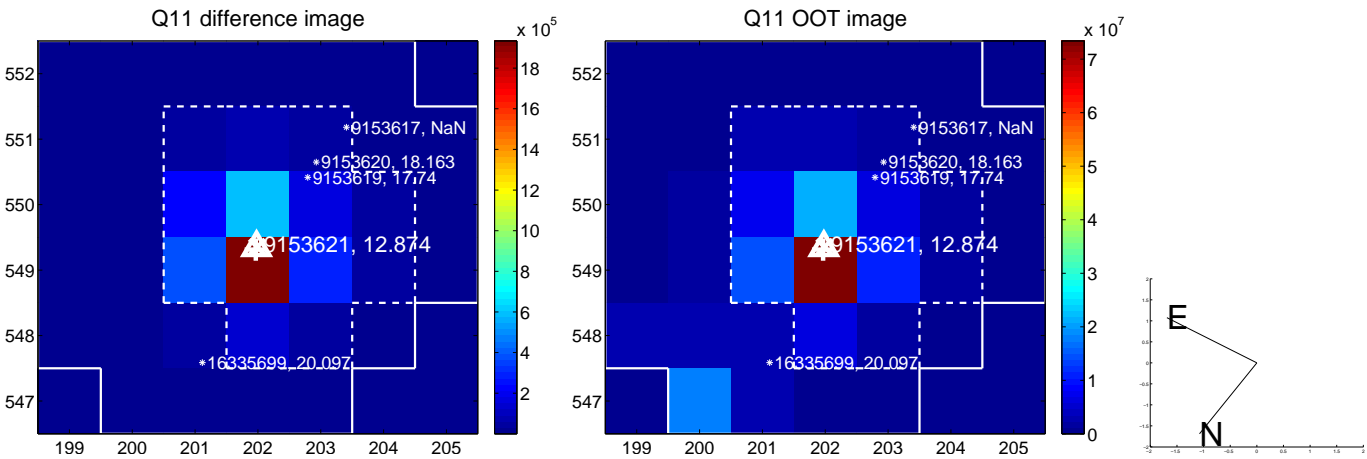
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



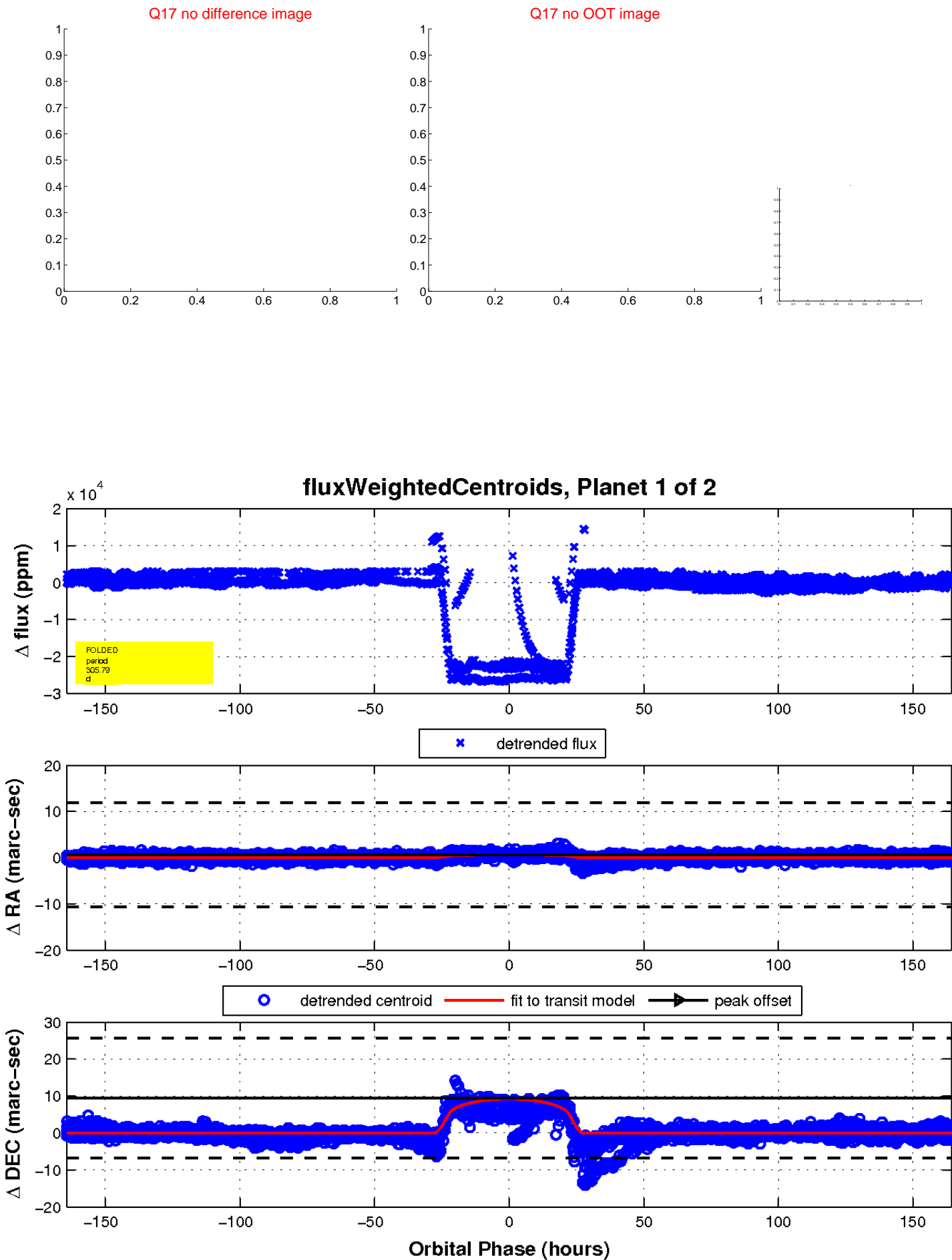
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

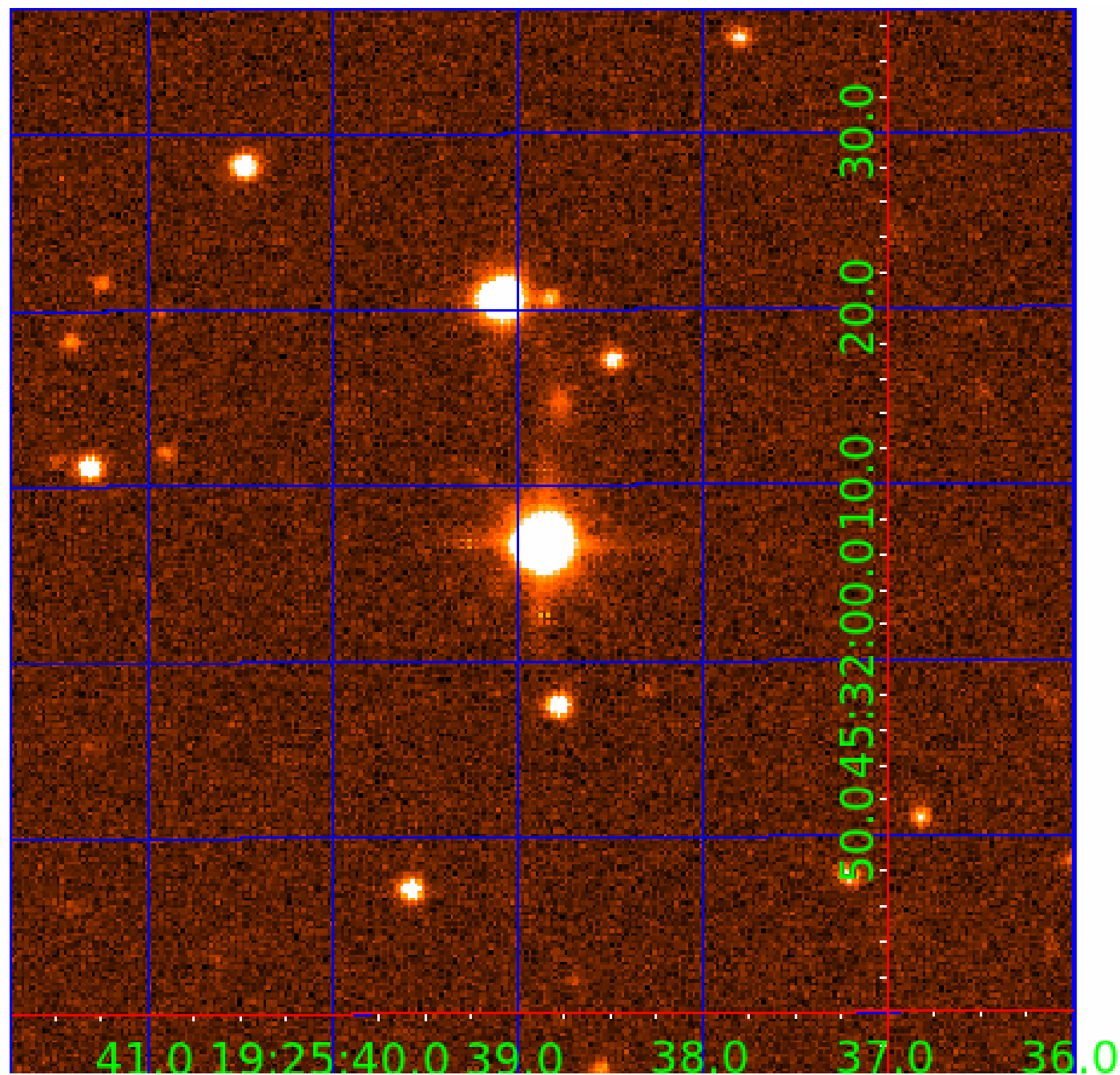


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009153621

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})
009153621-01	OBS	No	305.792393	169.768756	18483.3	54.784	32.0	66.0	9.01	4781	118.20	42.86
009153621-02	OBS	No	305.808659	220.315246	96.2	15.000	7.5	-1.0	9.01	4781	8.53	42.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009153621-01	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—CENT_FEW_DIFFS
009153621-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—SAME_NTL_PERIOD—CENT_NOFITS

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

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

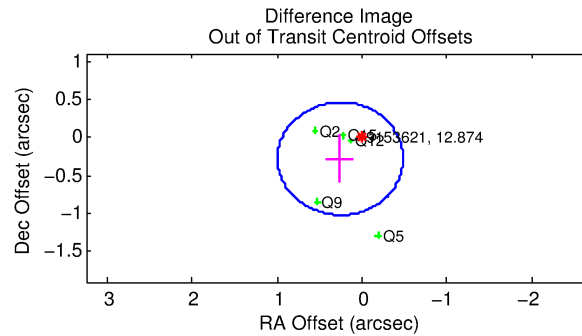
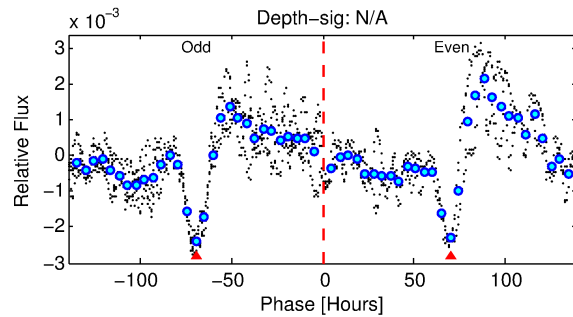
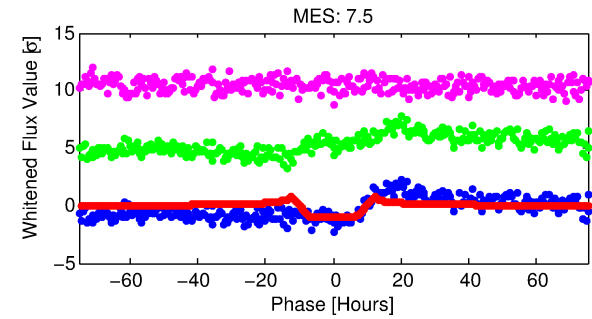
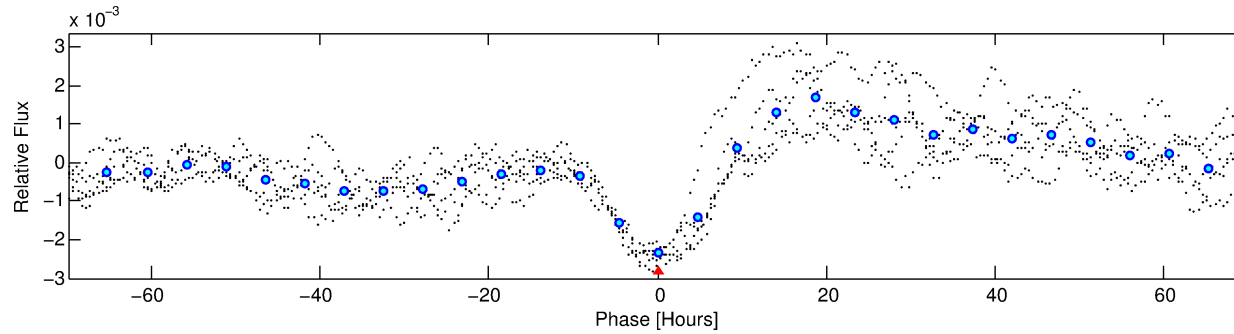
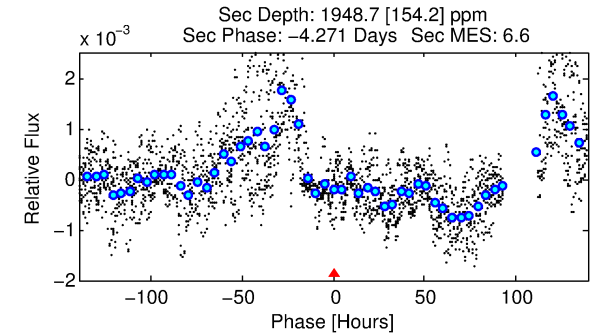
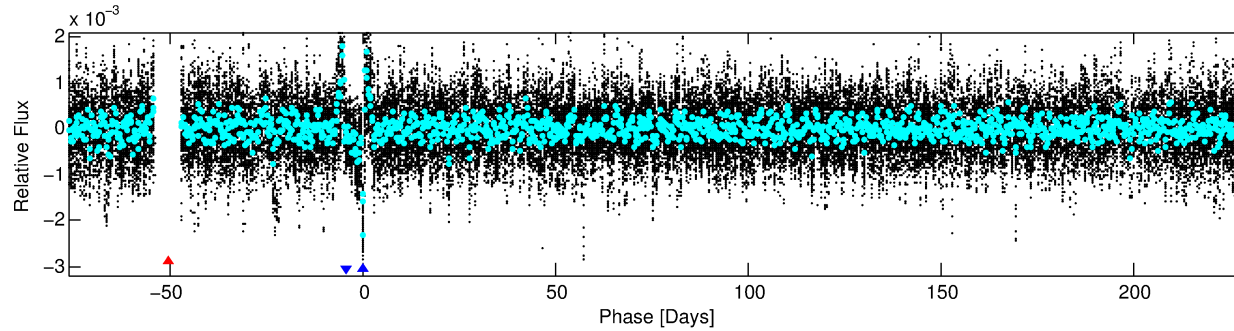
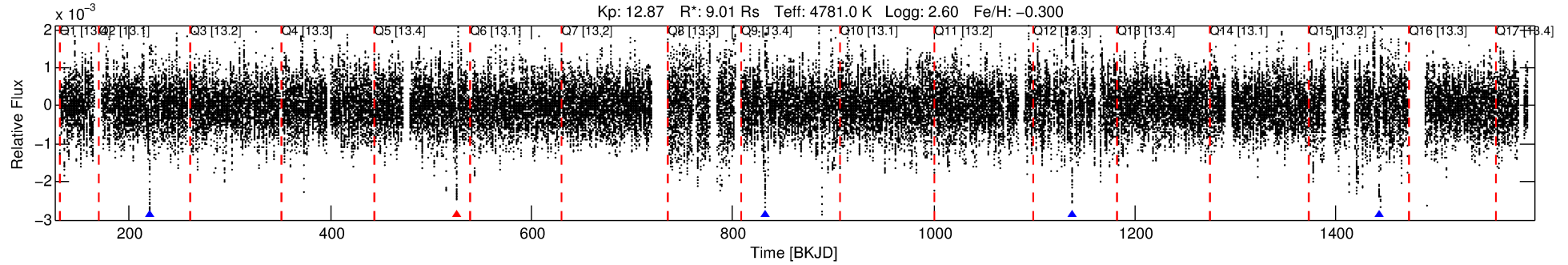
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009153621-02

No Significant Match Found

DV One-Page Summary

KIC: 9153621 Candidate: 2 of 2 Period: 305.809 d



TPS TCE Results:

Period = 305.80866 d
Epoch = 220.3152 BKJD

DV fit results are unavailable

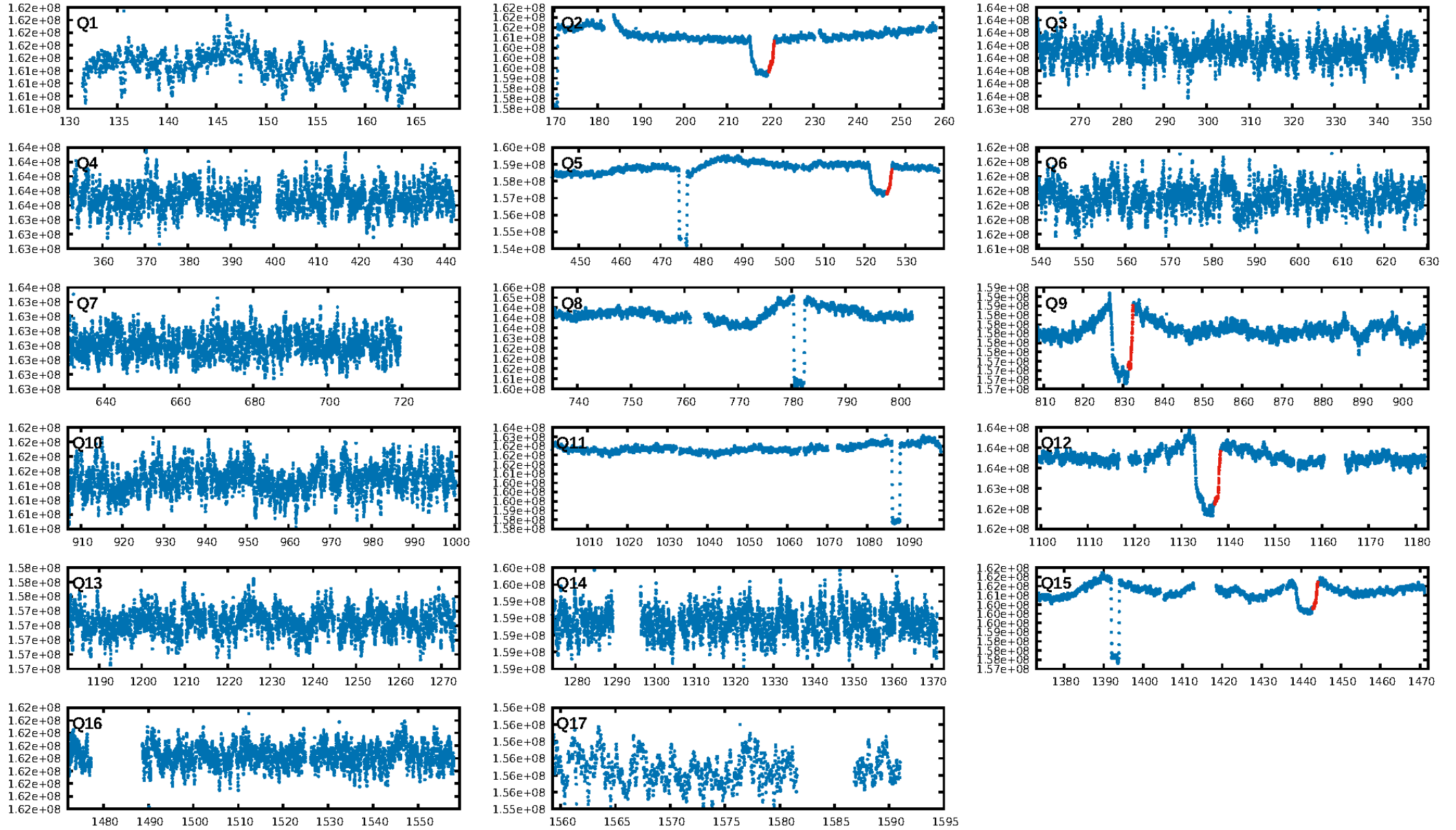
DV Diagnostic Results:

ShortPeriod-sig: 0.5% [0.01 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.81e-10
RollingBand-fgt: 0.80 [4/5]
GhostDiagnostic-chr: 2.059
Centroid-sig: 44.1%
Centroid-so: 0.735 arcsec [3.01 σ]
OotOffset-rm: 0.378 arcsec [1.53 σ]
KicOffset-rm: 0.317 arcsec [1.28 σ]
OotOffset-st: 1/1/1/2 [5]
KicOffset-st: 1/1/1/2 [5]
DiffImageQuality-fgm: 1.00 [5/5]
DiffImageOverlap-fno: 1.00 [5/5]

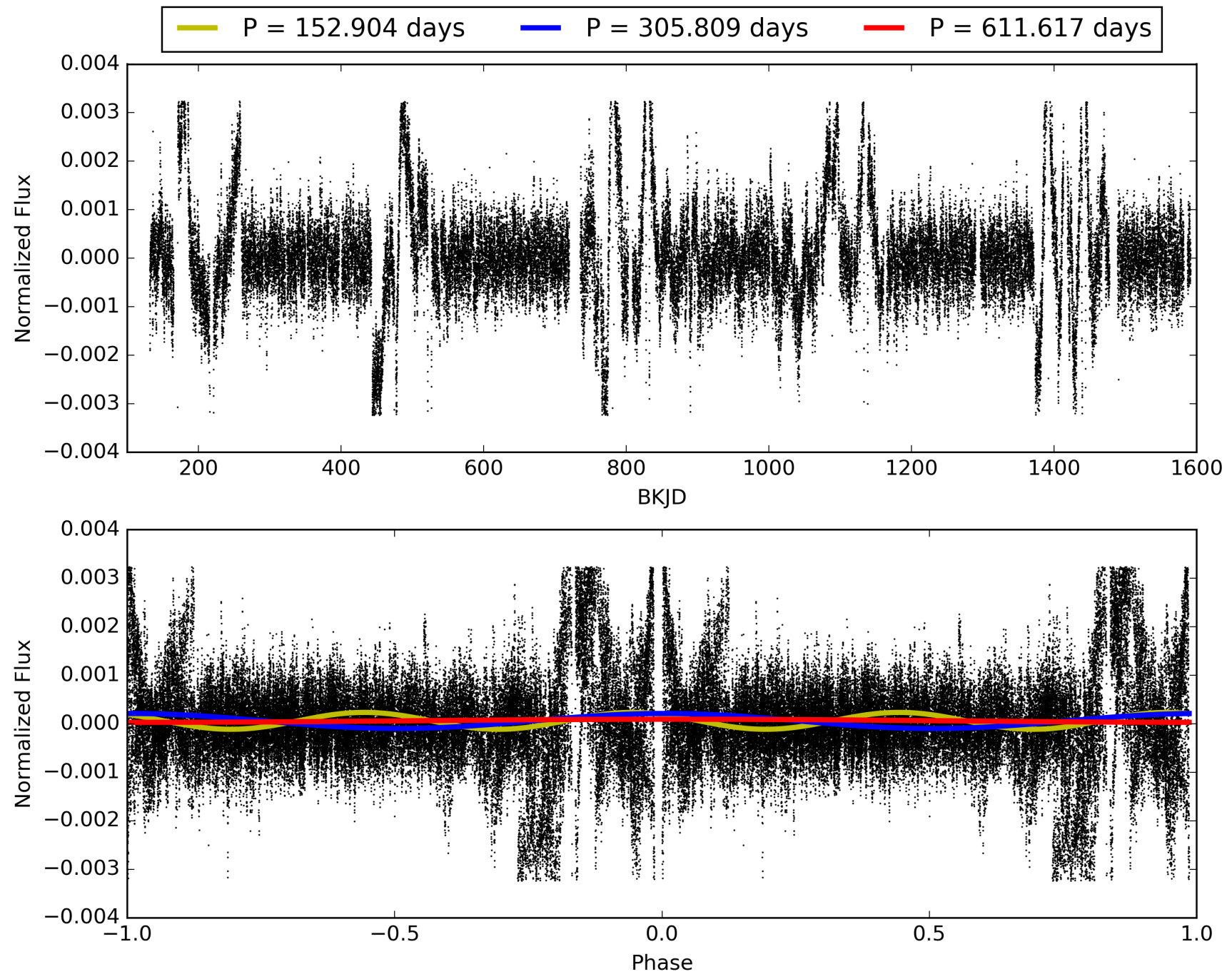
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 19:13:39 Z

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

TCE 009153621-02, PDC Light Curves

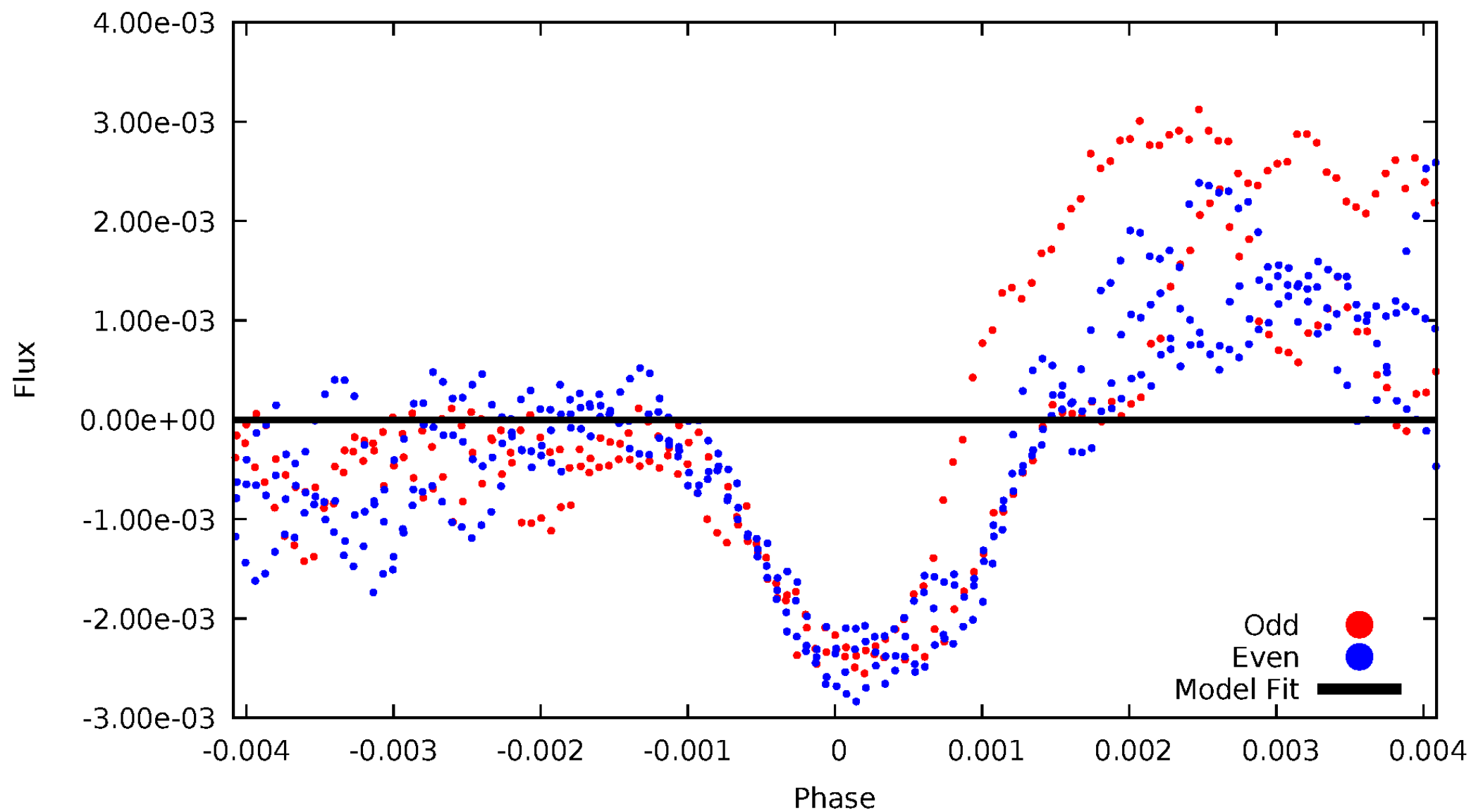


TCE 009153621-02



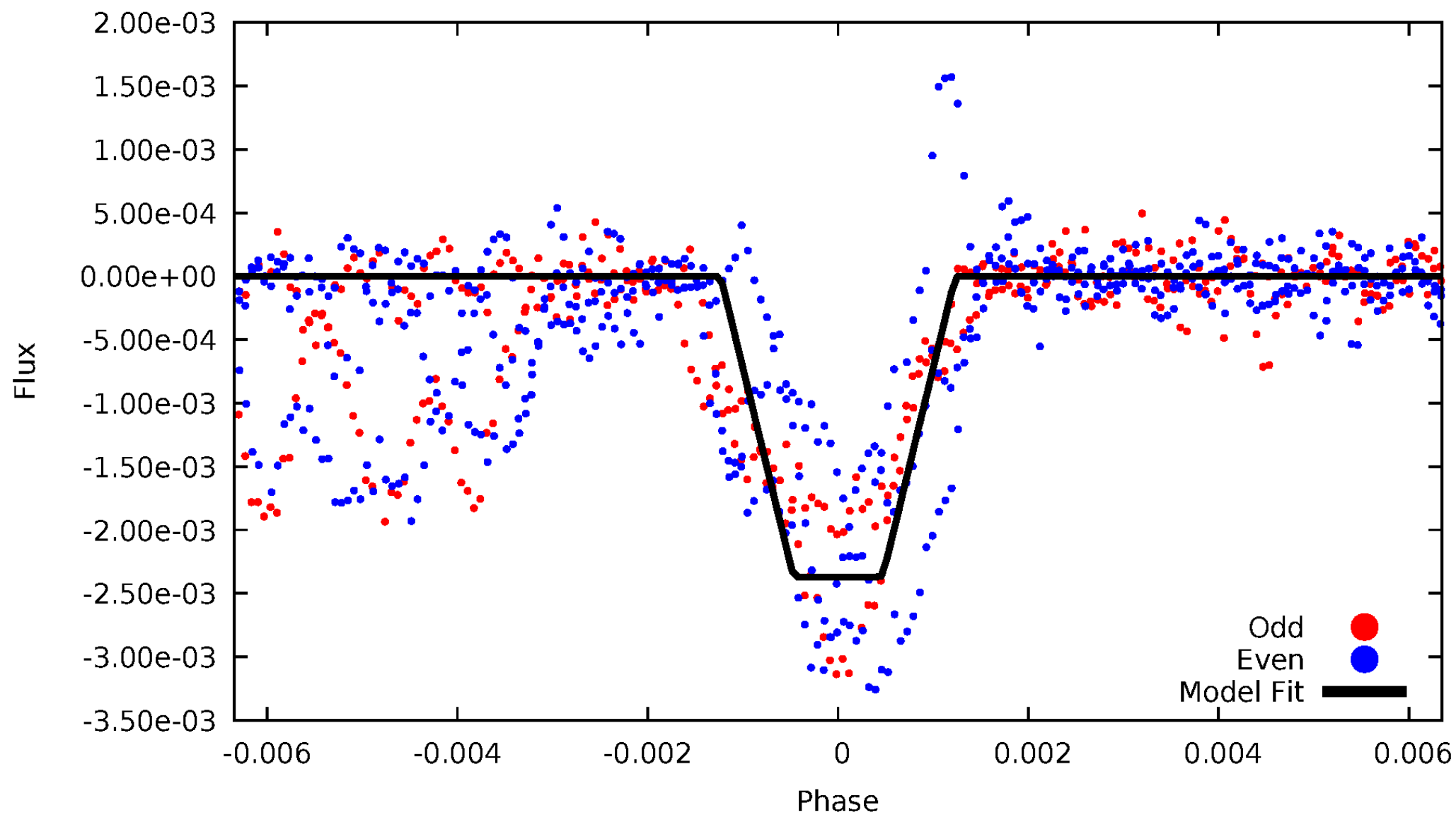
DV Odd/Even

TCE 009153621-02



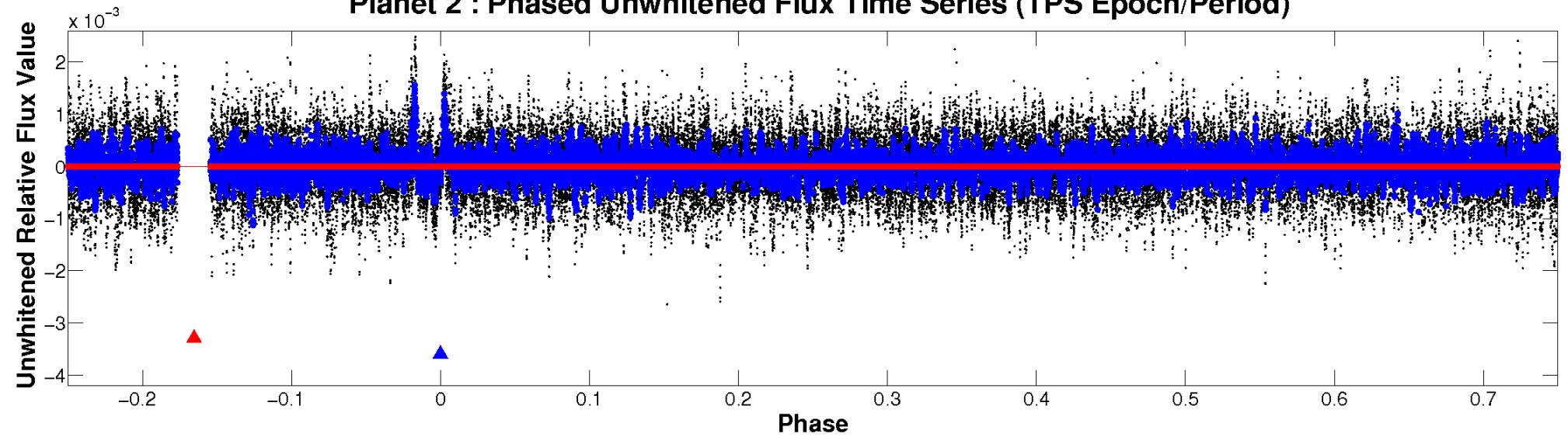
ALT Odd/Even

TCE 009153621-02



Non-Whitened Vs. Whitened Light Curve

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

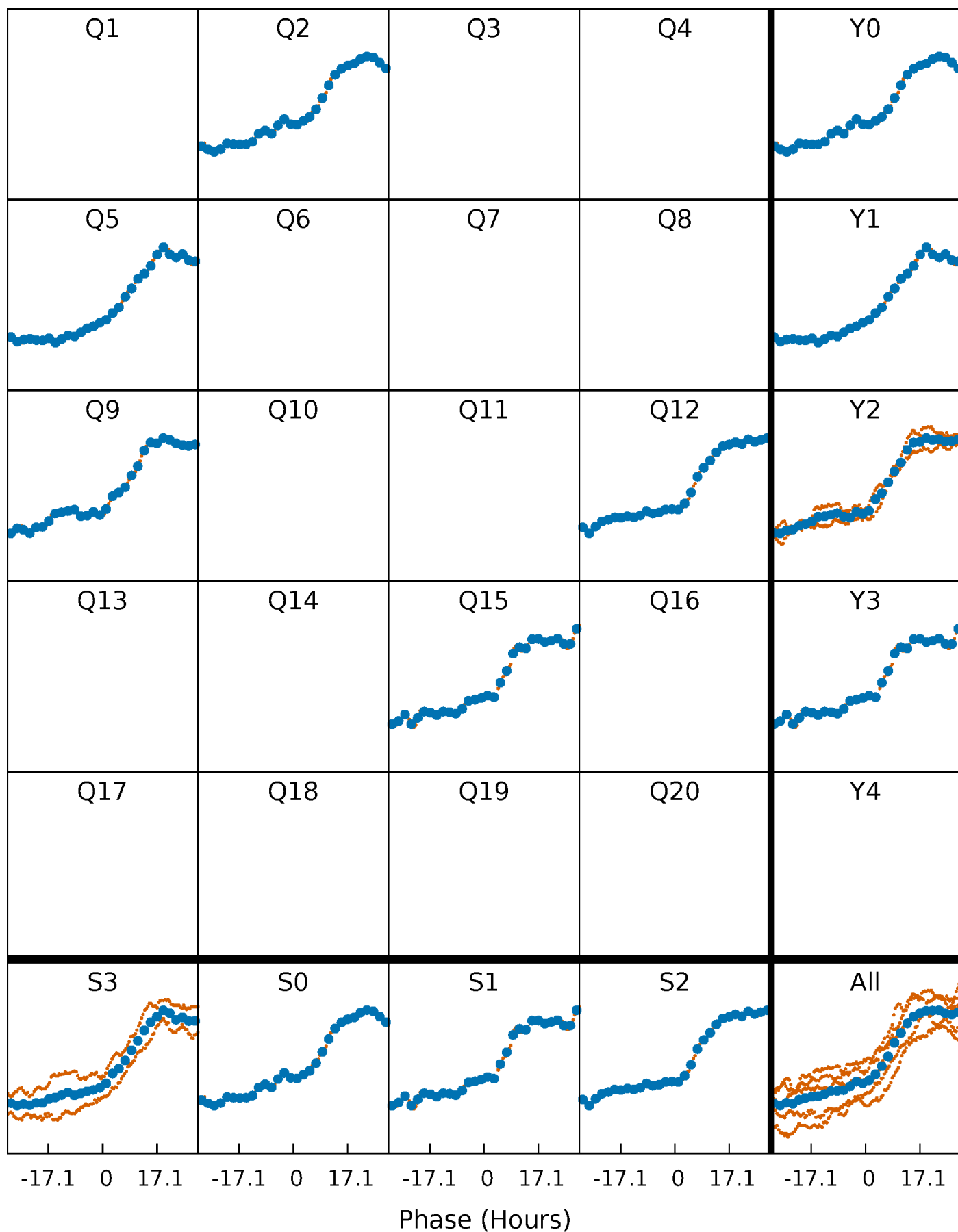


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



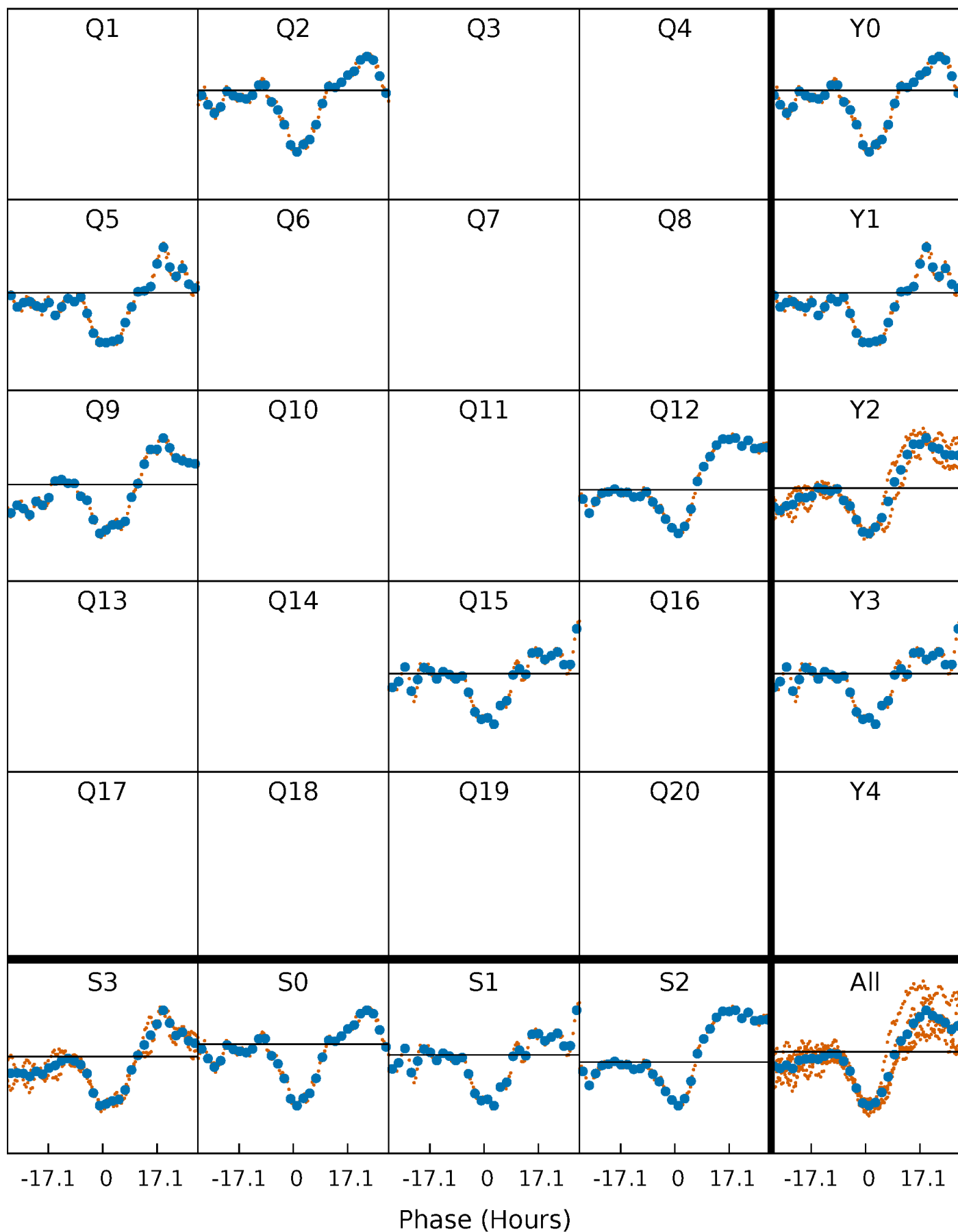
PDC Quarter-Phased Transit Curves

TCE 009153621-02 $P=305.808659$ Days $T_0=220.315246$ (BKJD)



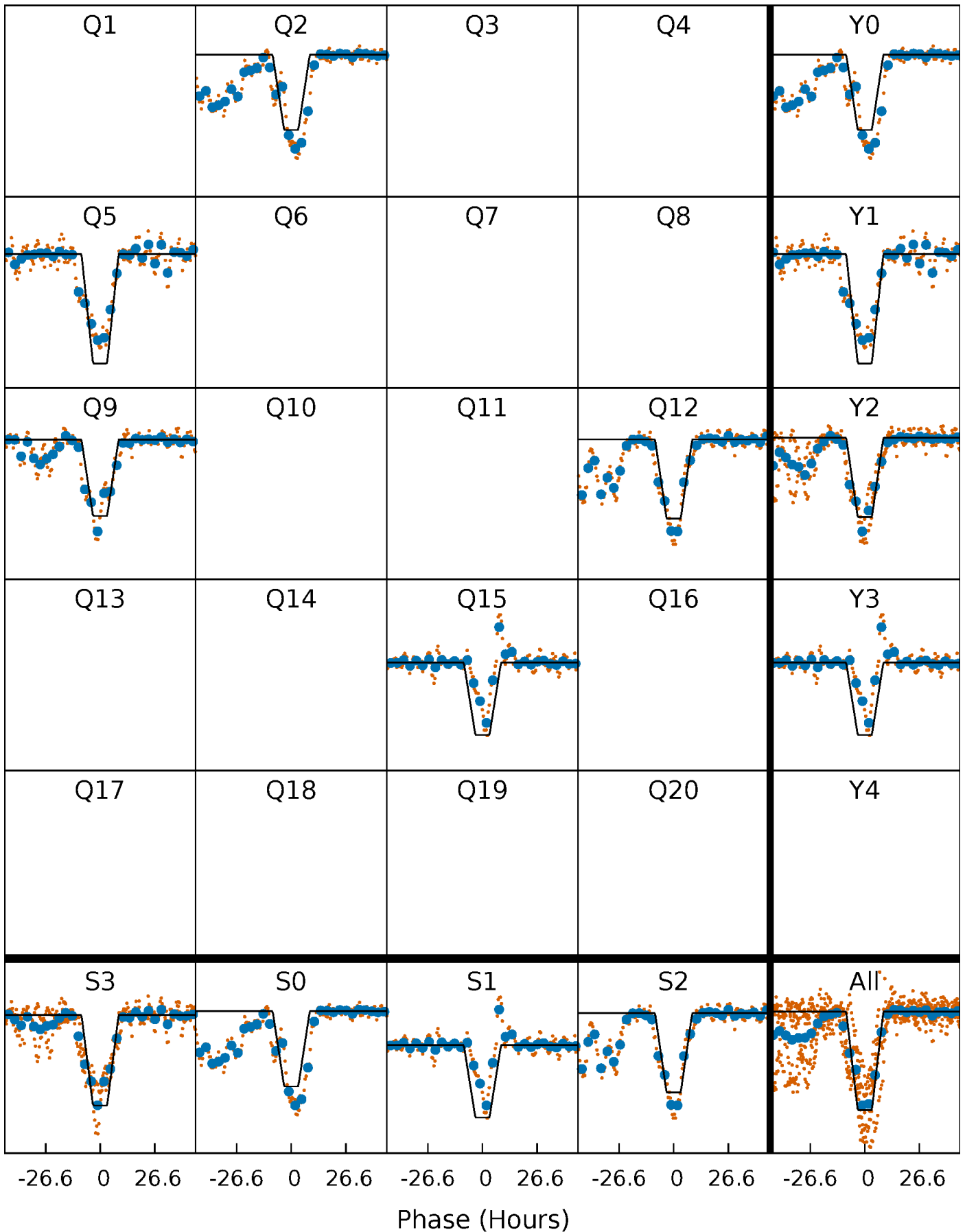
DV Quarter-Phased Transit Curves

TCE 009153621-02 $P=305.808659$ Days $T_0=220.315246$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

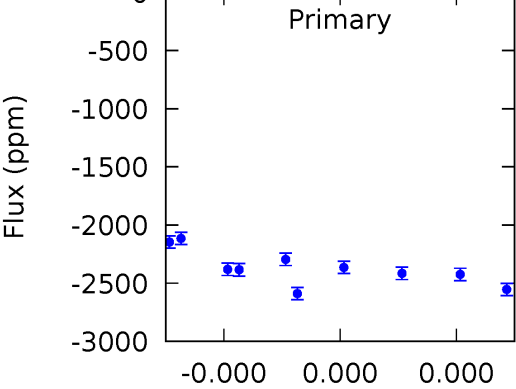
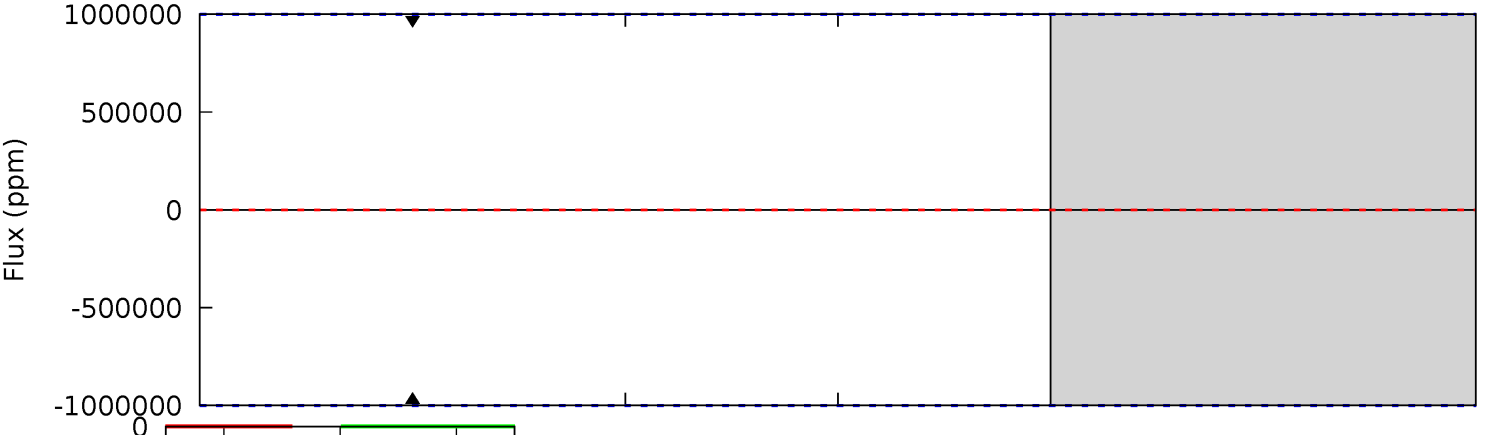
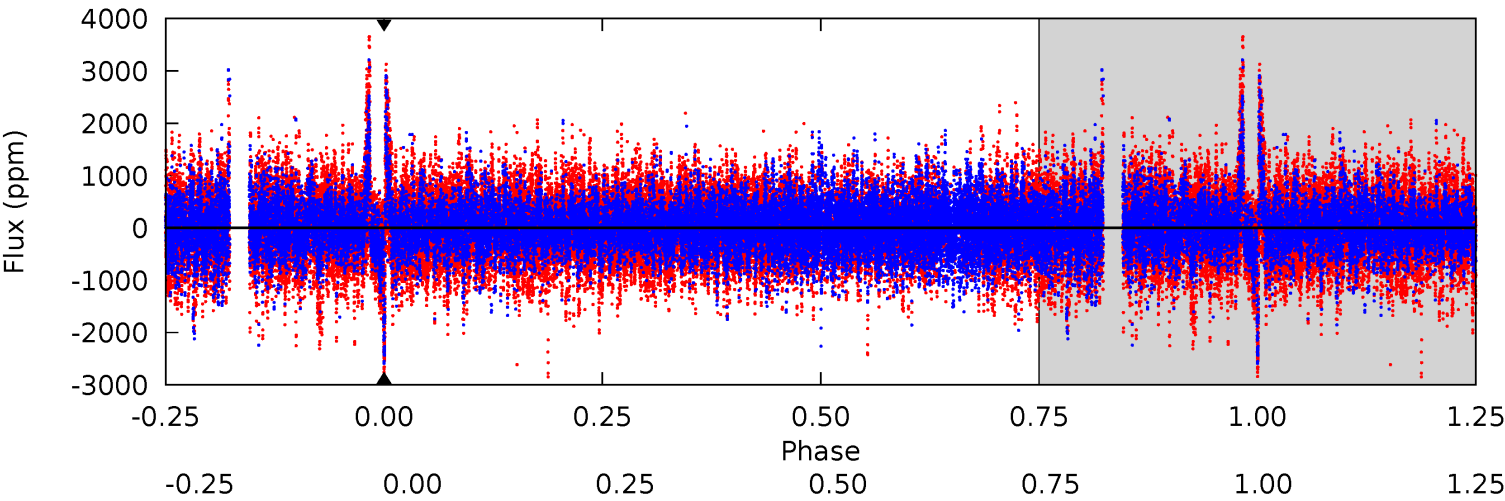
TCE 009153621-02 P=305.808659 Days $T_0=220.382460$ (BKJD)



DV Model-Shift Uniqueness Test

009153621-02, P = 305.808659 Days, E = 220.315246 Days

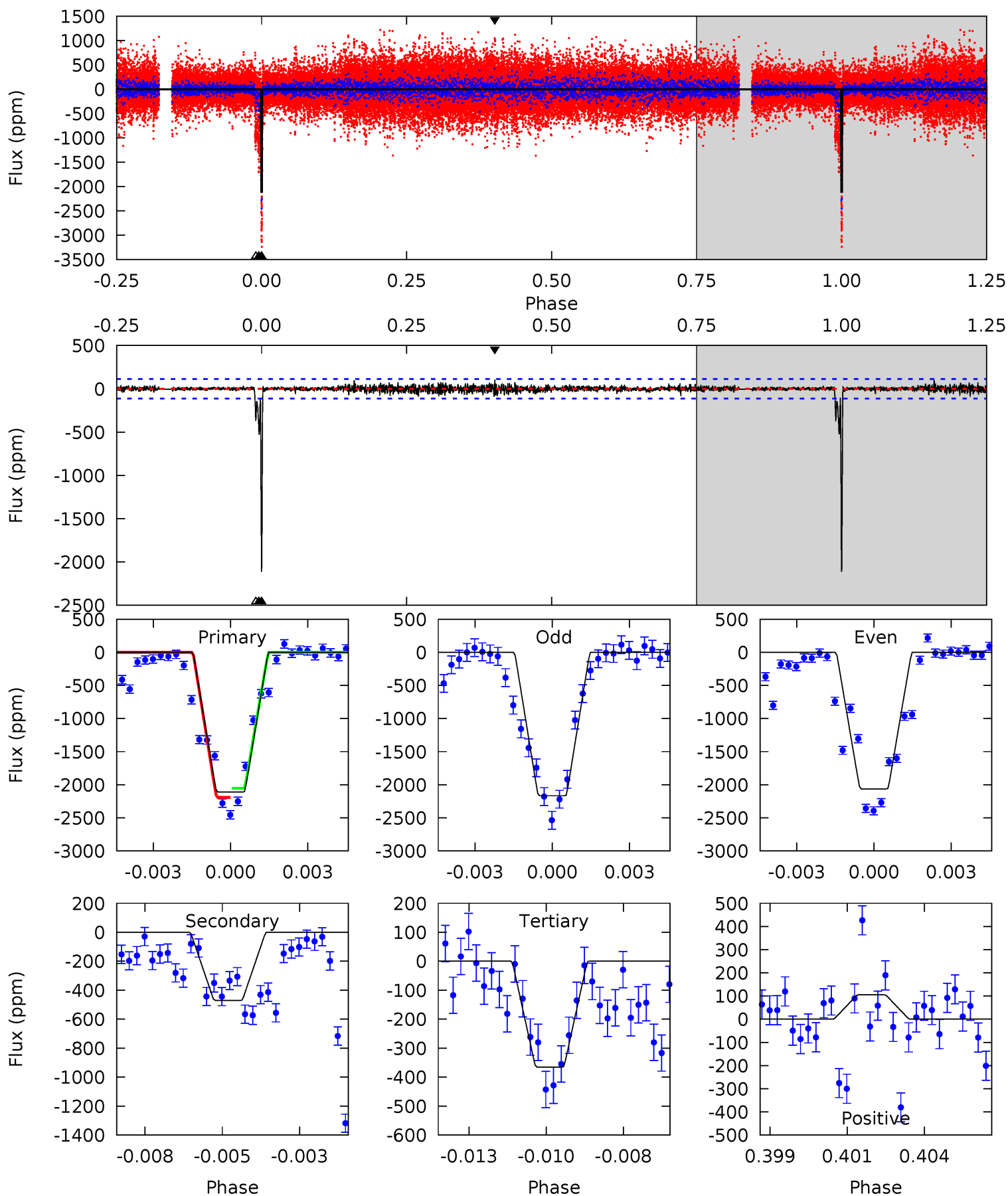
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009153621-02, P = 305.808659 Days, E = 220.382460 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
99.3	22.1	17.2	4.95	5.28	3.02	1.22	82.1	94.4	4.95	17.2	2.45	0.92	0.05	3.25



Stellar Parameters For KIC 009153621

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4781^{+64}_{-71}	$2.604^{+0.140}_{-0.126}$	$-0.300^{+0.150}_{-0.100}$	$9.005^{+2.189}_{-1.592}$	$1.189^{+0.320}_{-0.240}$	$0.002^{+0.002}_{-0.001}$
	+1%/-1%	+5%/-5%	+50%/-33%	+24%/-18%	+27%/-20%	+67%/-40%
Source	SPE74	SPE74	SPE74	DSEP		

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

Secondary Eclipse Parameters for KIC 009153621-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$69.01^{+76.75}_{-49.03}$	909^{+49}_{-49}	3753^{+11937}_{-16195}	130^{+24901}_{-15144}
Alt.	-470 ± 21	$85.26^{+84.22}_{-57.51}$	908^{+50}_{-42}	2994^{+1308}_{-494}	32^{+281}_{-24}

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

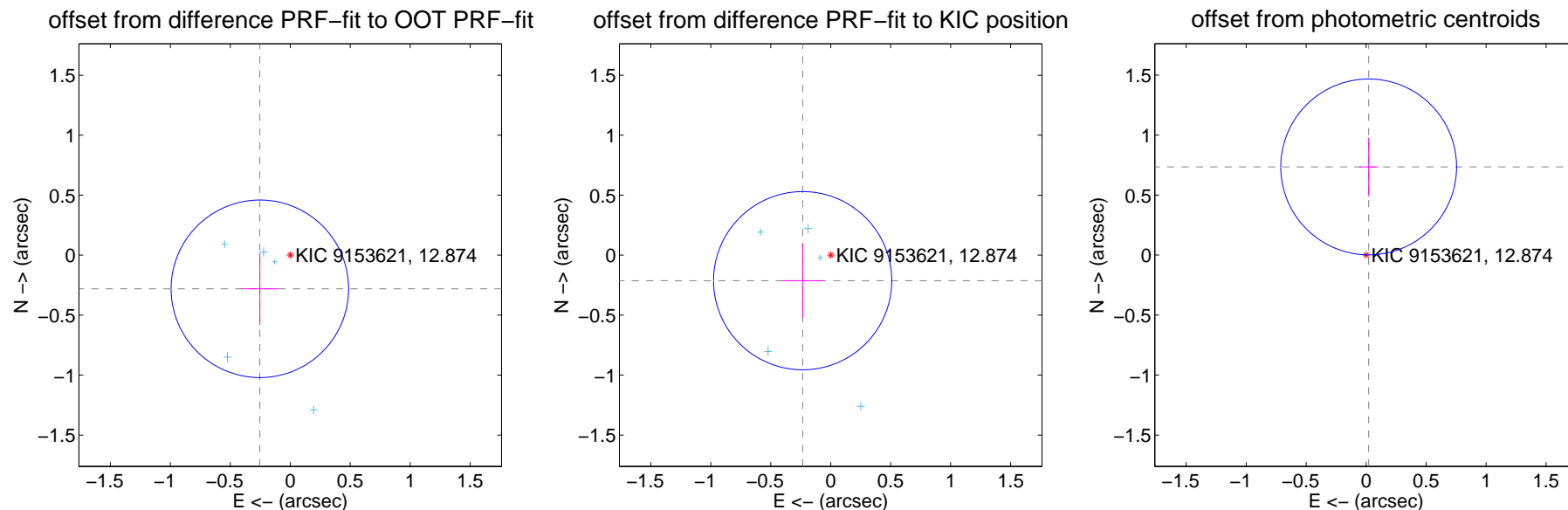
DV Centroid Data

Supplemental centroid analysis for 009153621-02. Kepler magnitude: 12.87. Transit SNR -1.00

There are 5 quarters with good PRF difference image offsets

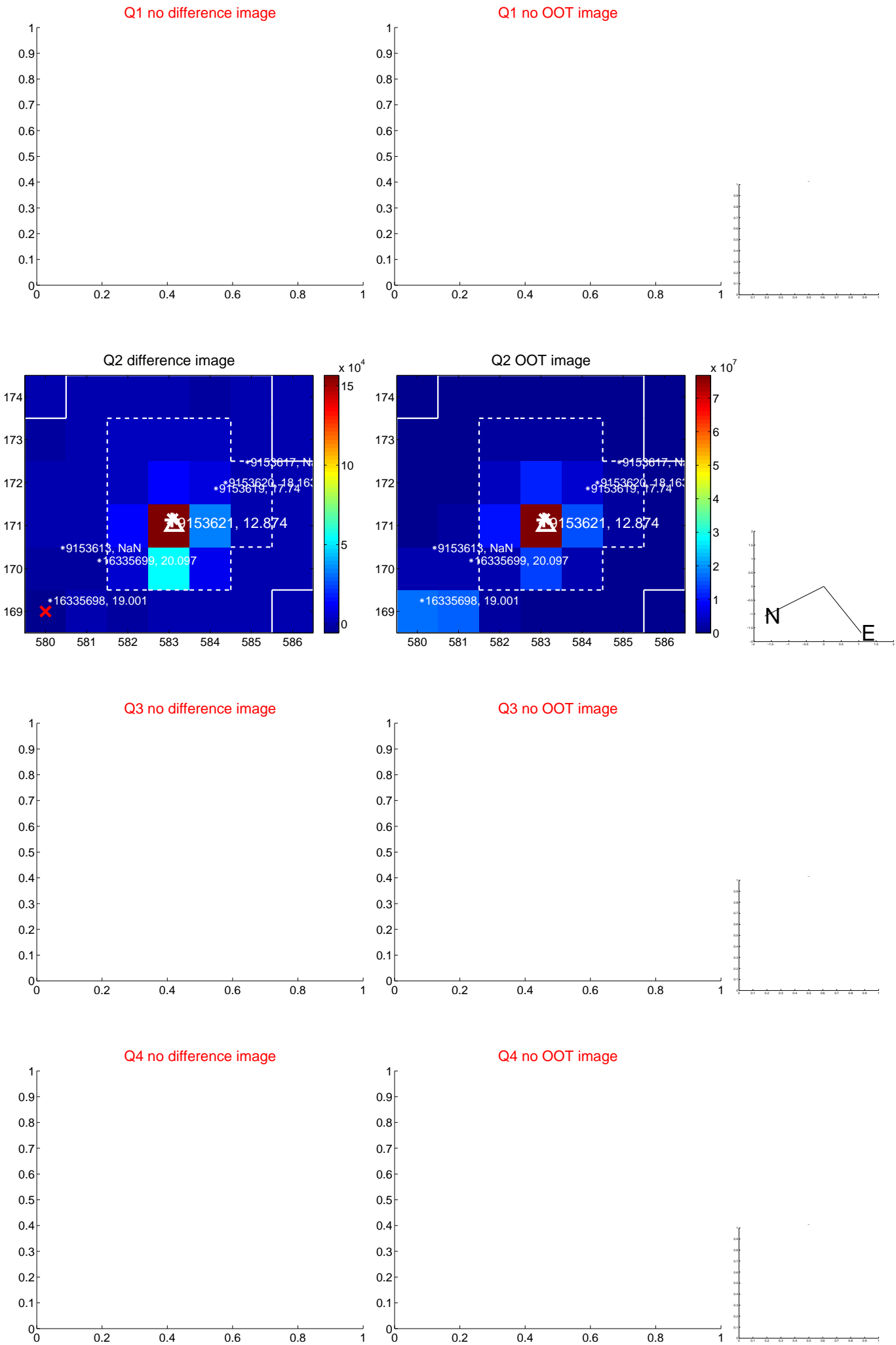
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.378 ± 0.247	1.53	0.254 ± 0.157	-0.281 ± 0.301
PRF-fit source offset from KIC position	0.317 ± 0.248	1.28	0.234 ± 0.175	-0.213 ± 0.314
photometric centroid source offset	0.74 ± 0.24	3.01	-0.02 ± 0.08	0.73 ± 0.24

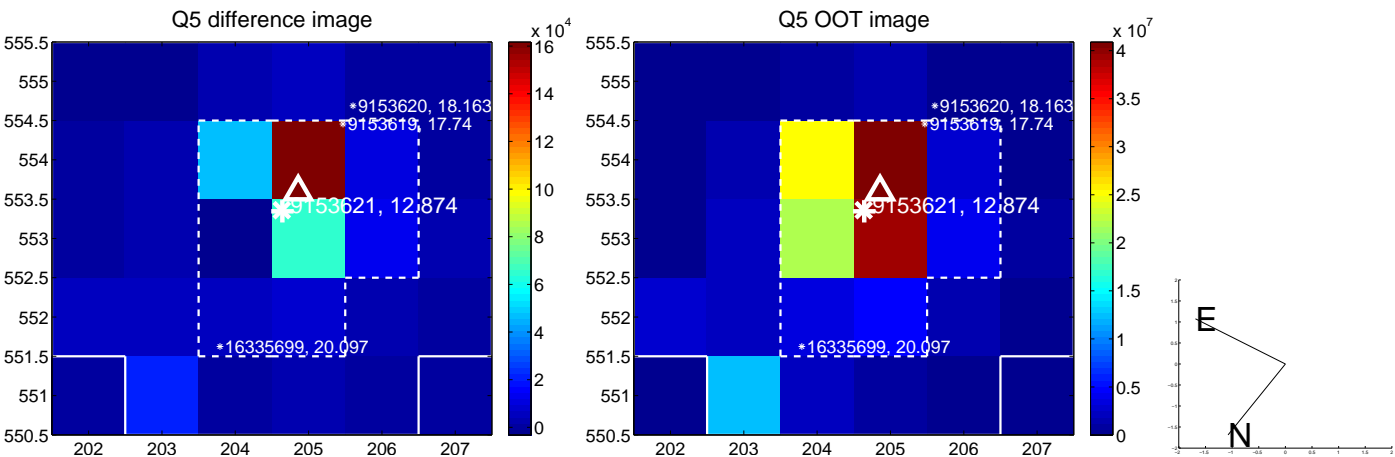


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

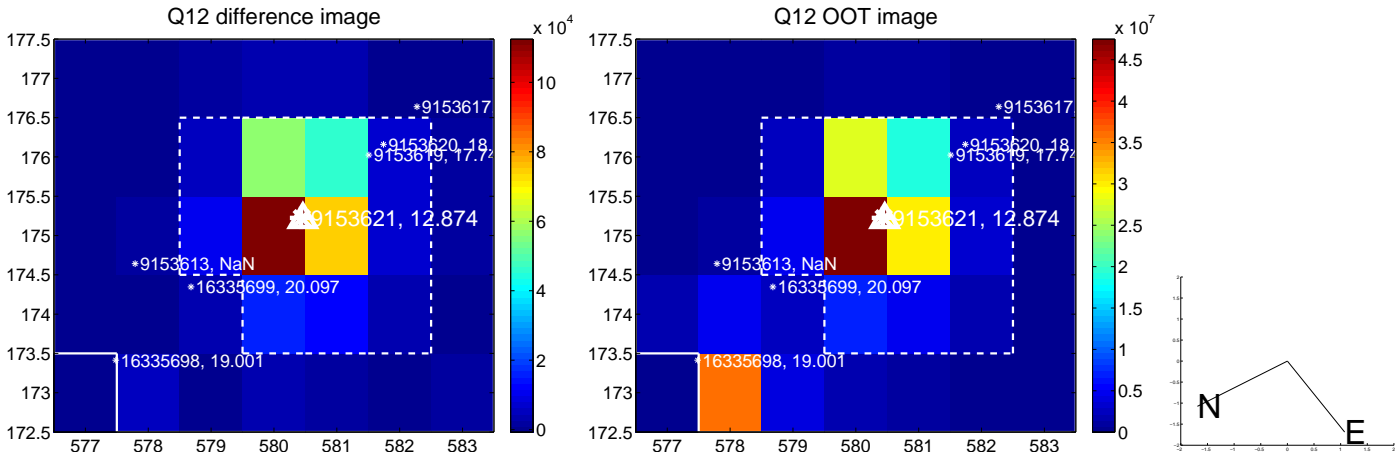
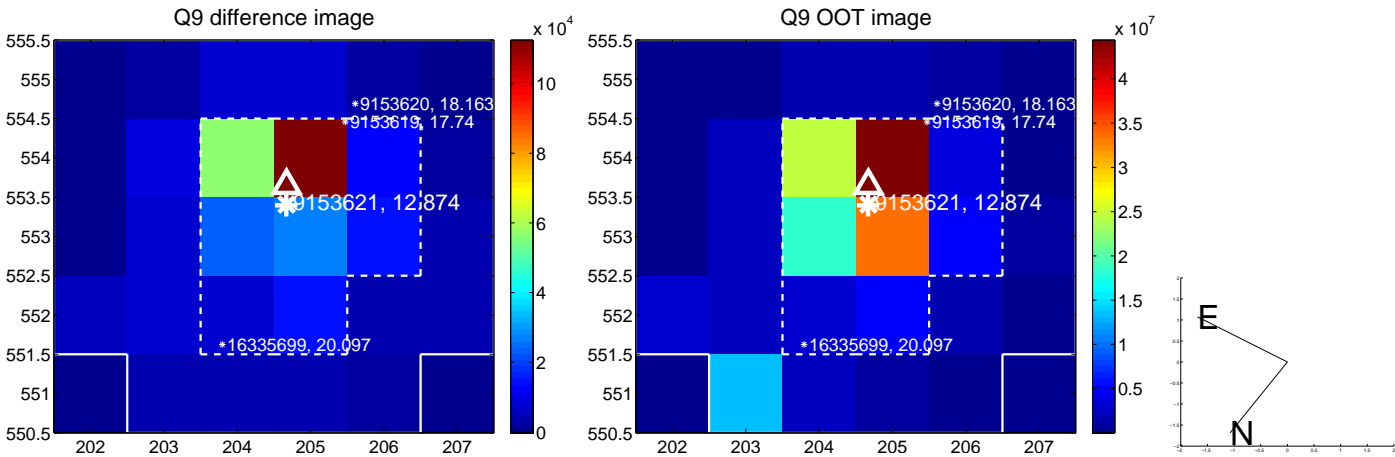
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



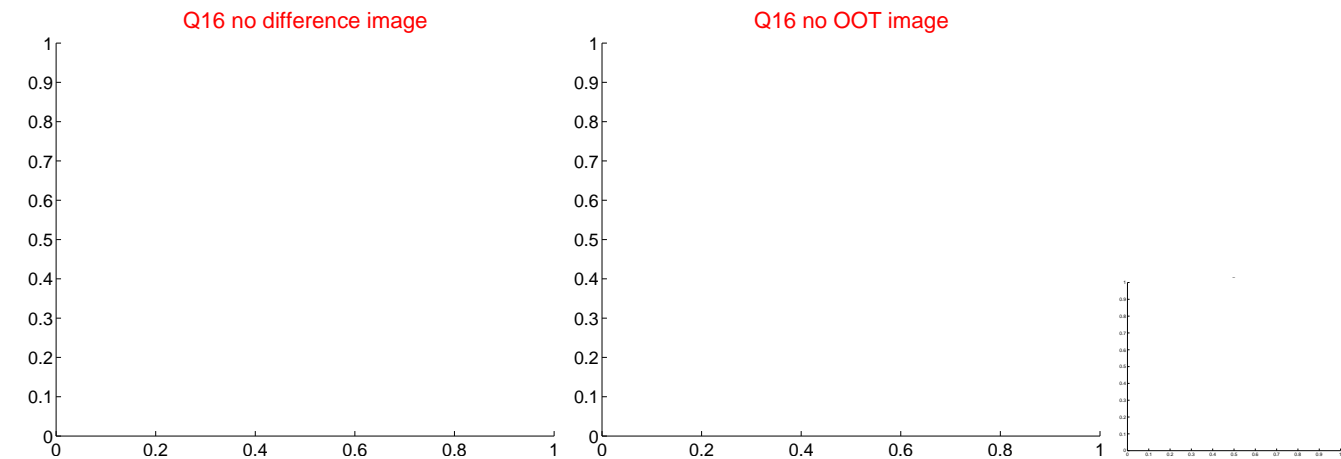
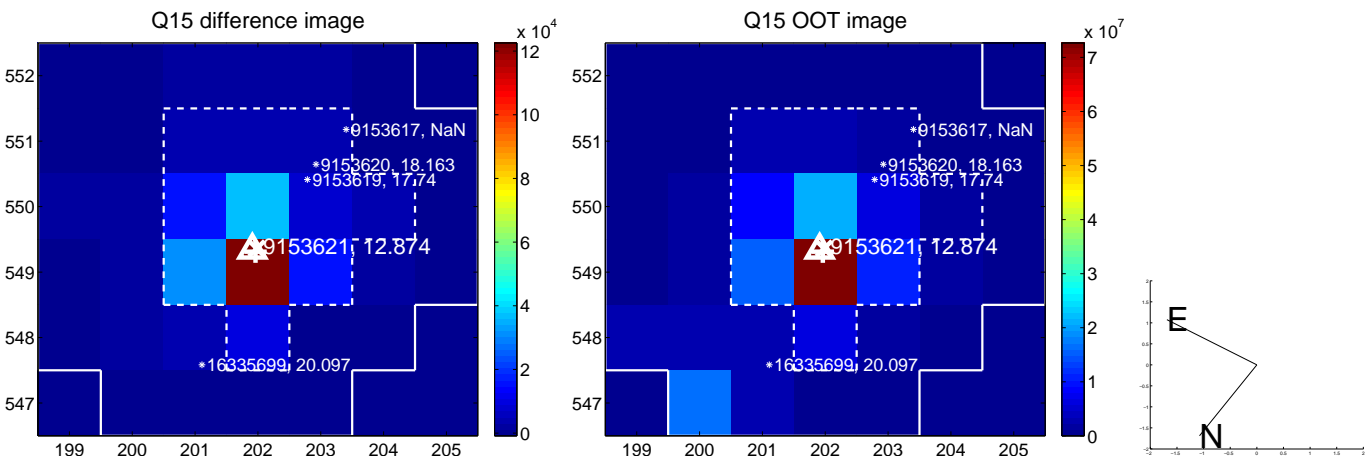
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



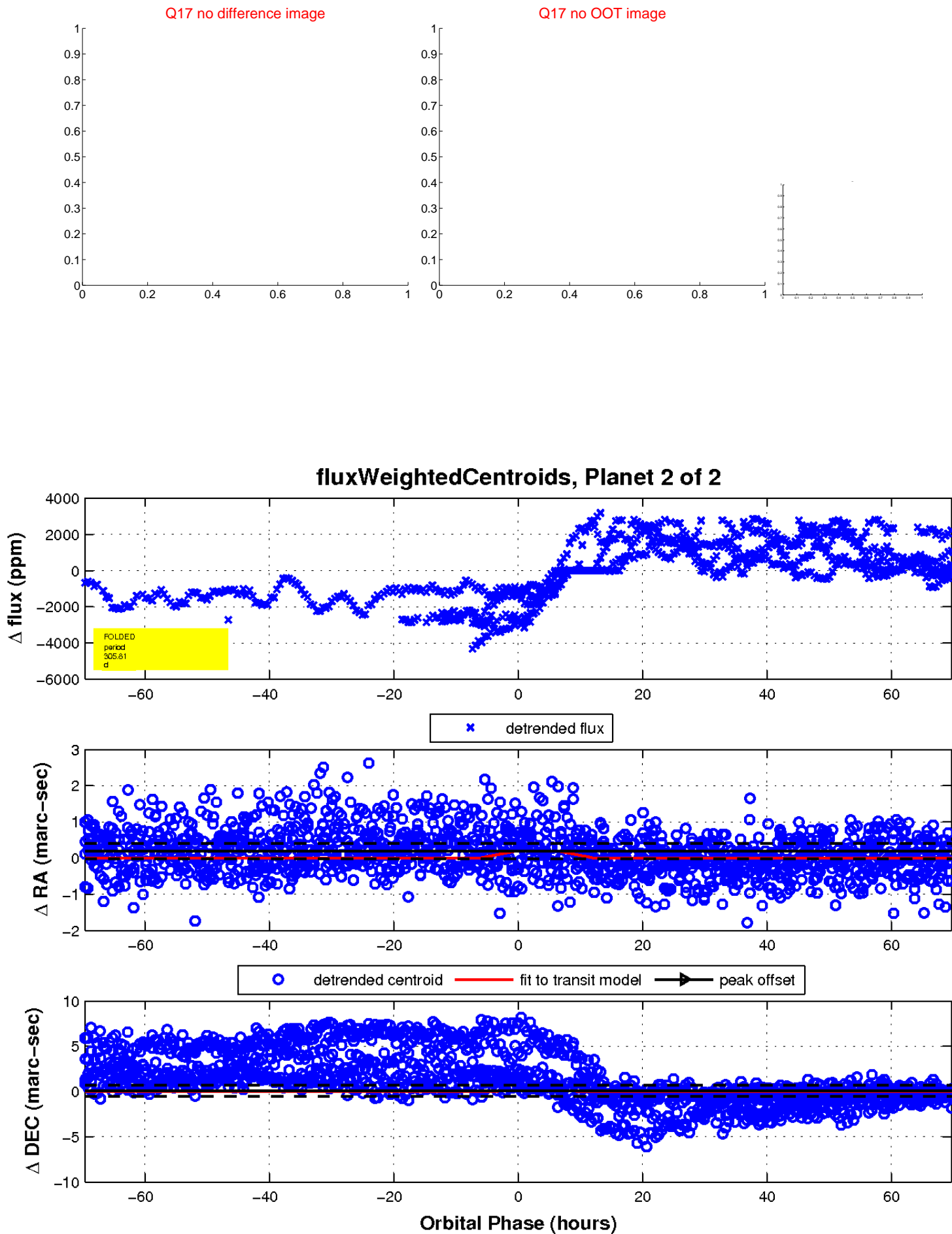
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

