

KIC 009777062

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})
009777062-01	OBS	7229.01	19.230023	132.580350	266674.8	4.500	10816.0	-1.0	2.92	7703	81.12	811.74
009777062-02	OBS	No	19.230025	144.110884	33727.4	8.699	1299.0	1436.7	2.92	7703	91.36	811.74
009777062-03	OBS	No	351.203348	151.966233	1480.7	19.227	384.4	16.3	2.92	7703	12.55	16.88
009777062-04	OBS	No	596.033323	305.339289	8867.3	3.500	341.0	-1.0	2.92	7703	27.81	8.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009777062-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
009777062-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009777062-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009777062-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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 009777062-01

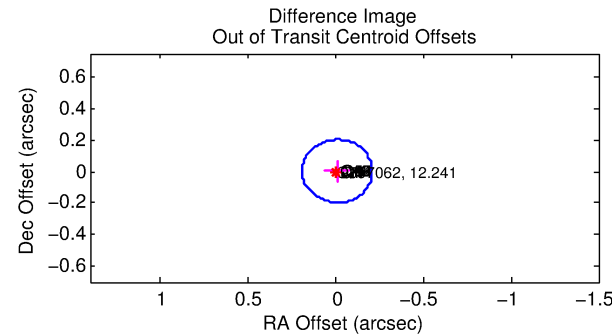
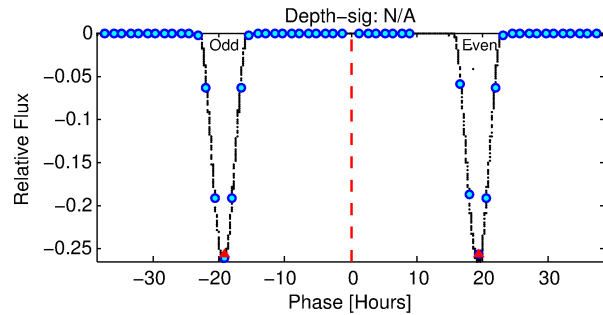
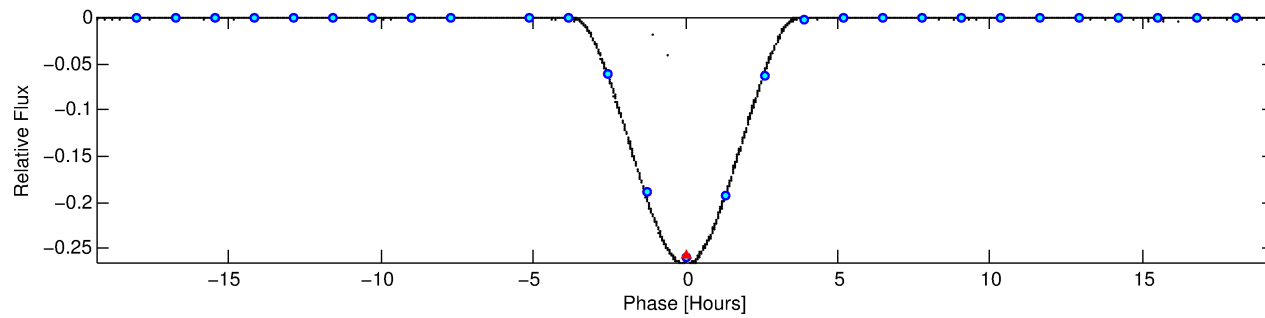
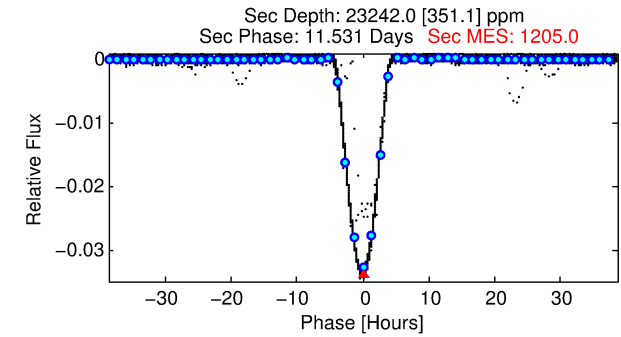
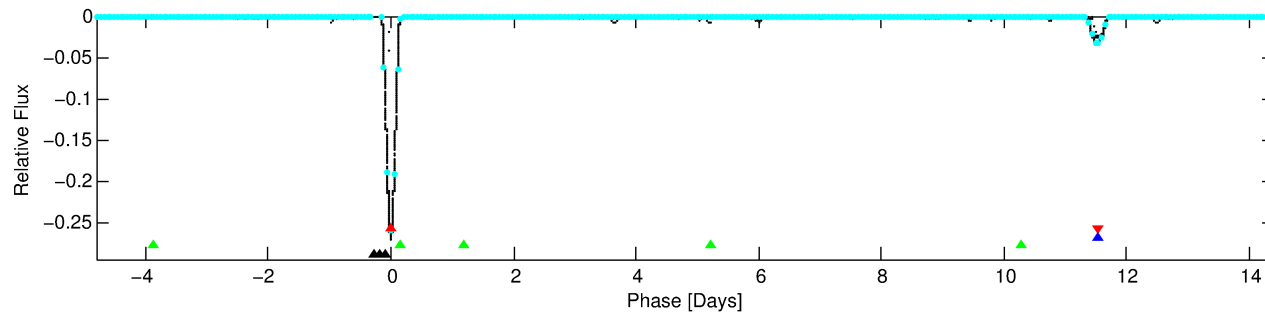
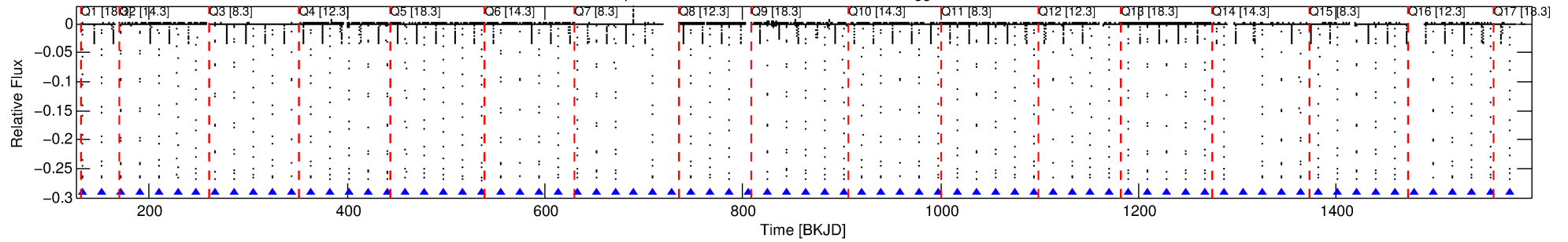
No Significant Match Found

DV One-Page Summary

KIC: 9777062 Candidate: 1 of 4 Period: 19.230 d

KOI: K07229.01 Corr: 0.799

Kp: 12.24 R*: 2.92 Rs Teff: 7703.0 K Logg: 3.84 Fe/H: 0.360



TPS TCE Results:

Period = 19.23002 d
Epoch = 132.5804 BKJD

DV fit results are unavailable

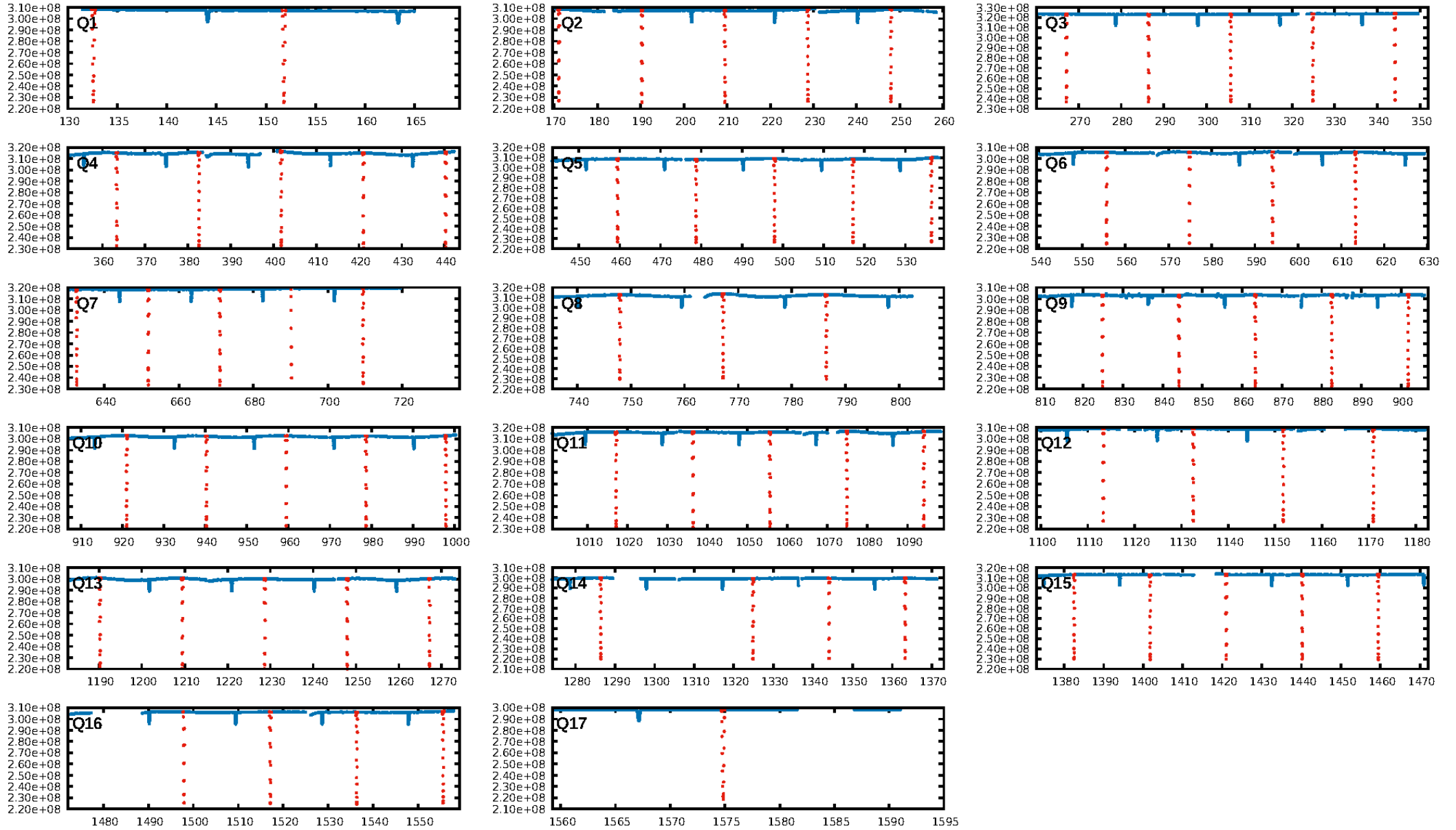
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [69/69]
GhostDiagnostic-chr: 2.883
Centroid-sig: 0.0%
Centroid-so: 0.029 arcsec [141.47σ]
OotOffset-rm: 0.010 arcsec [0.15σ]
KicOffset-rm: 0.084 arcsec [1.24σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

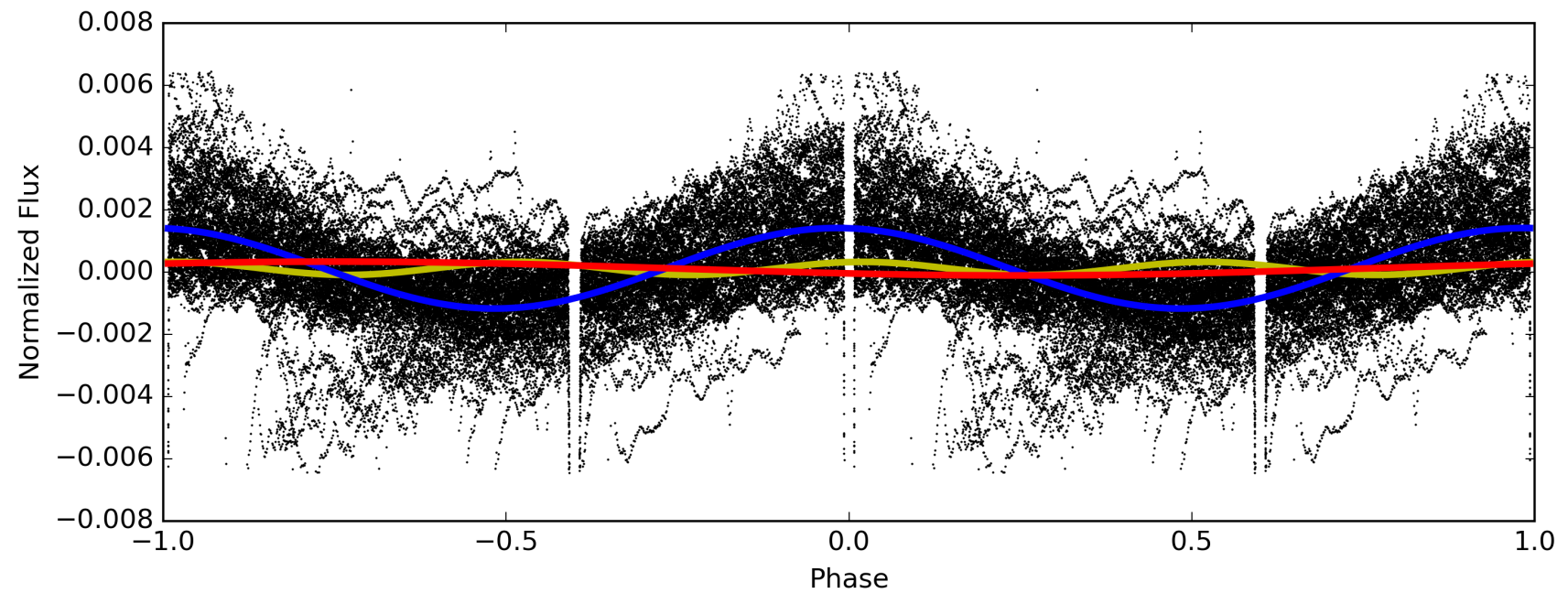
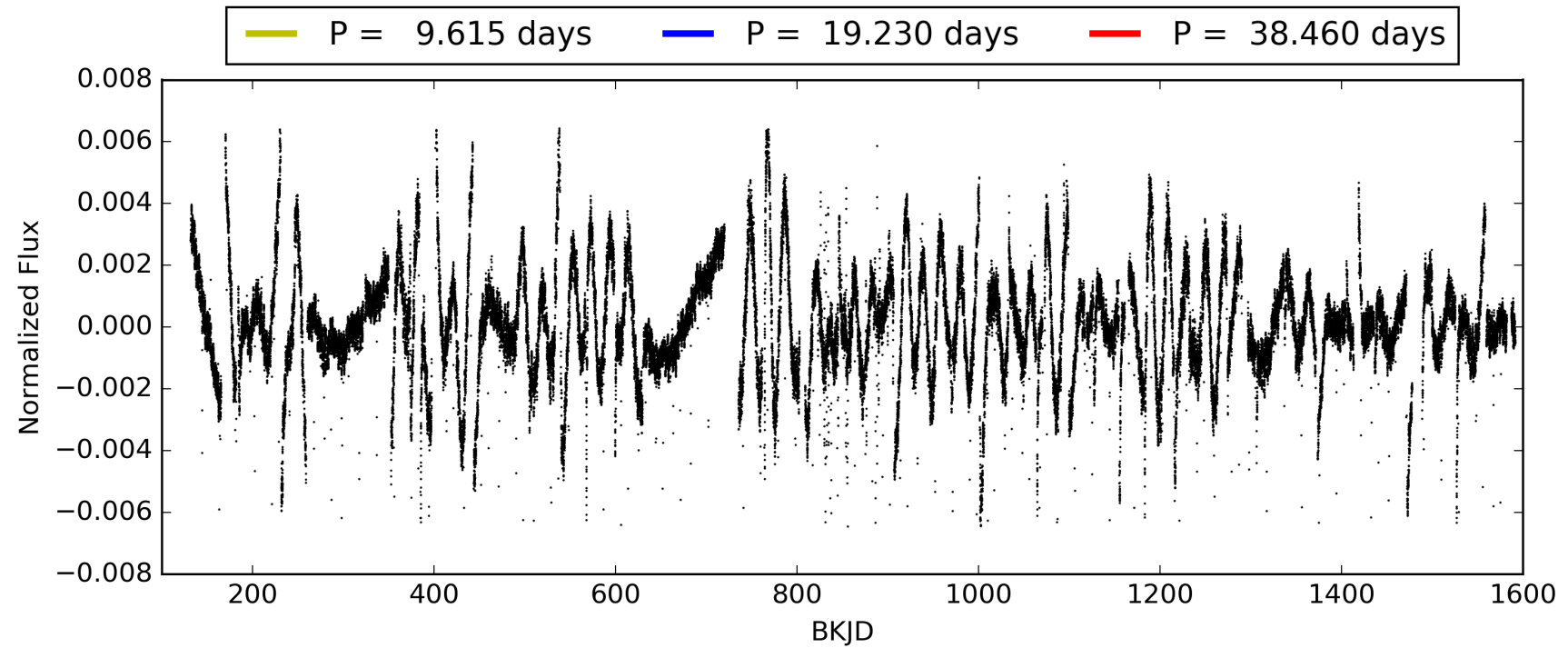
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:05:25 Z

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

TCE 009777062-01, PDC Light Curves

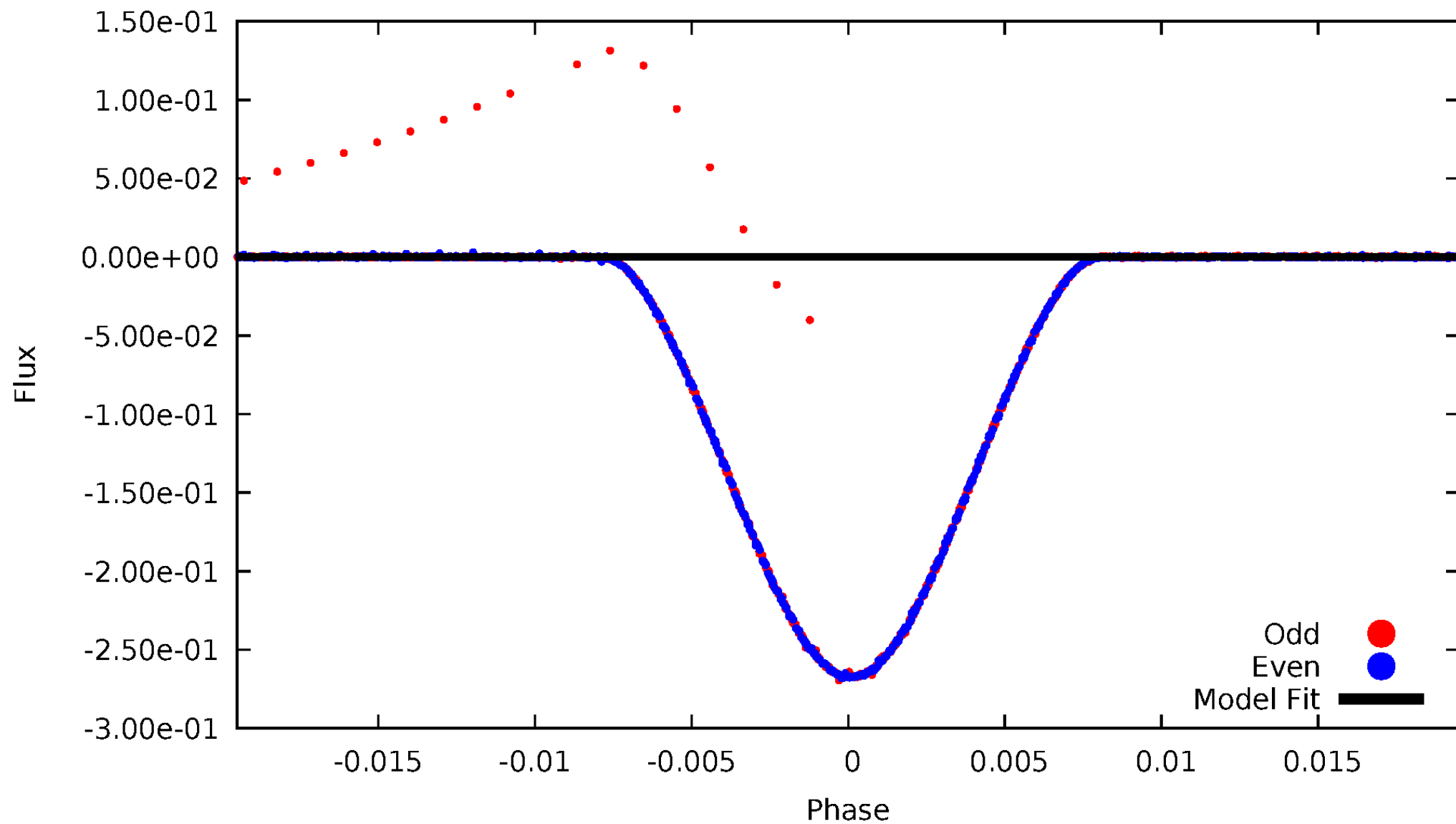


TCE 009777062-01



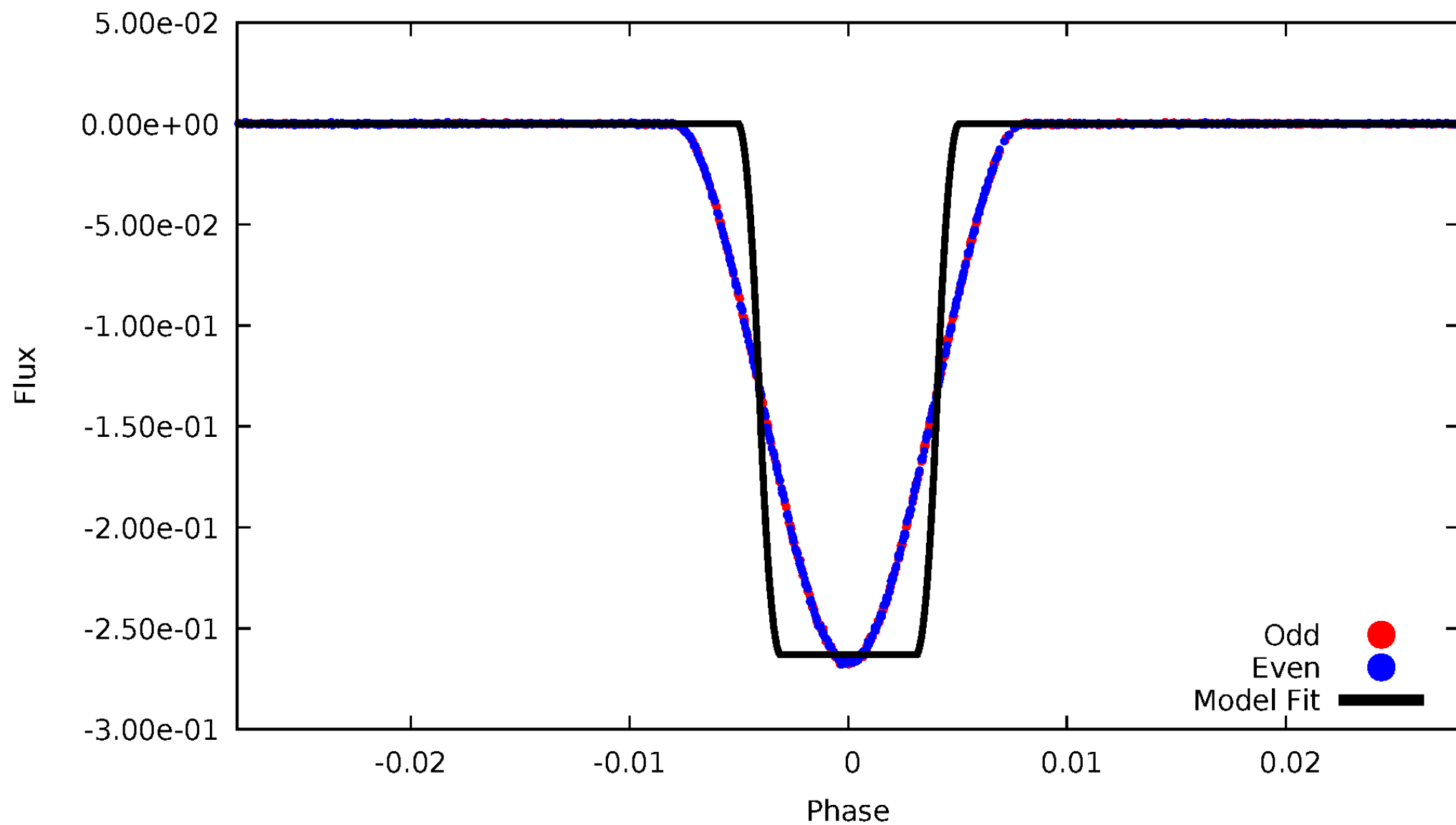
DV Odd/Even

TCE 009777062-01



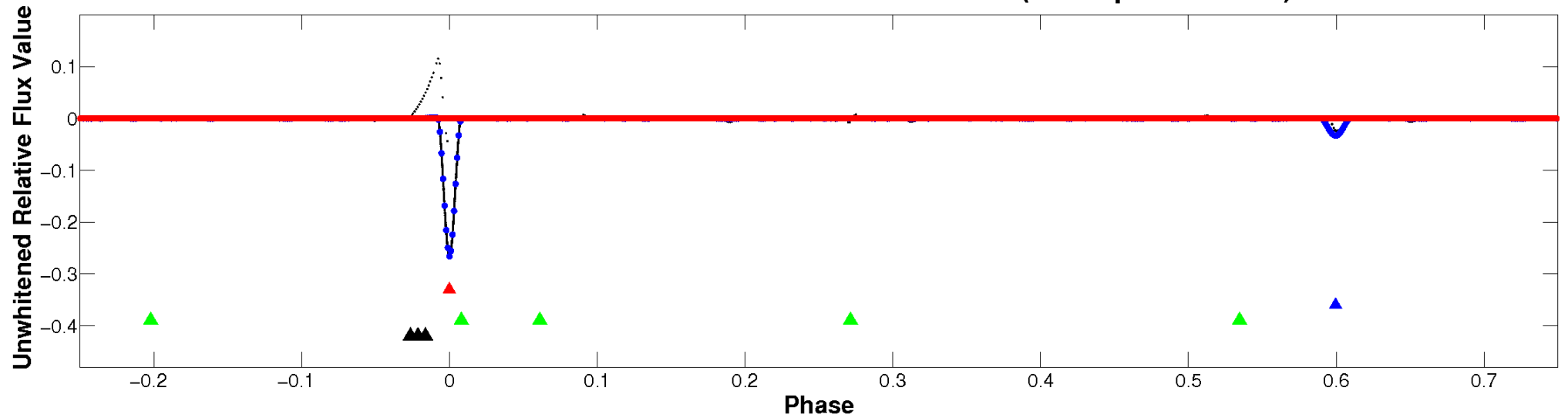
ALT Odd/Even

TCE 009777062-01



Non-Whitened Vs. Whitened Light Curve

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

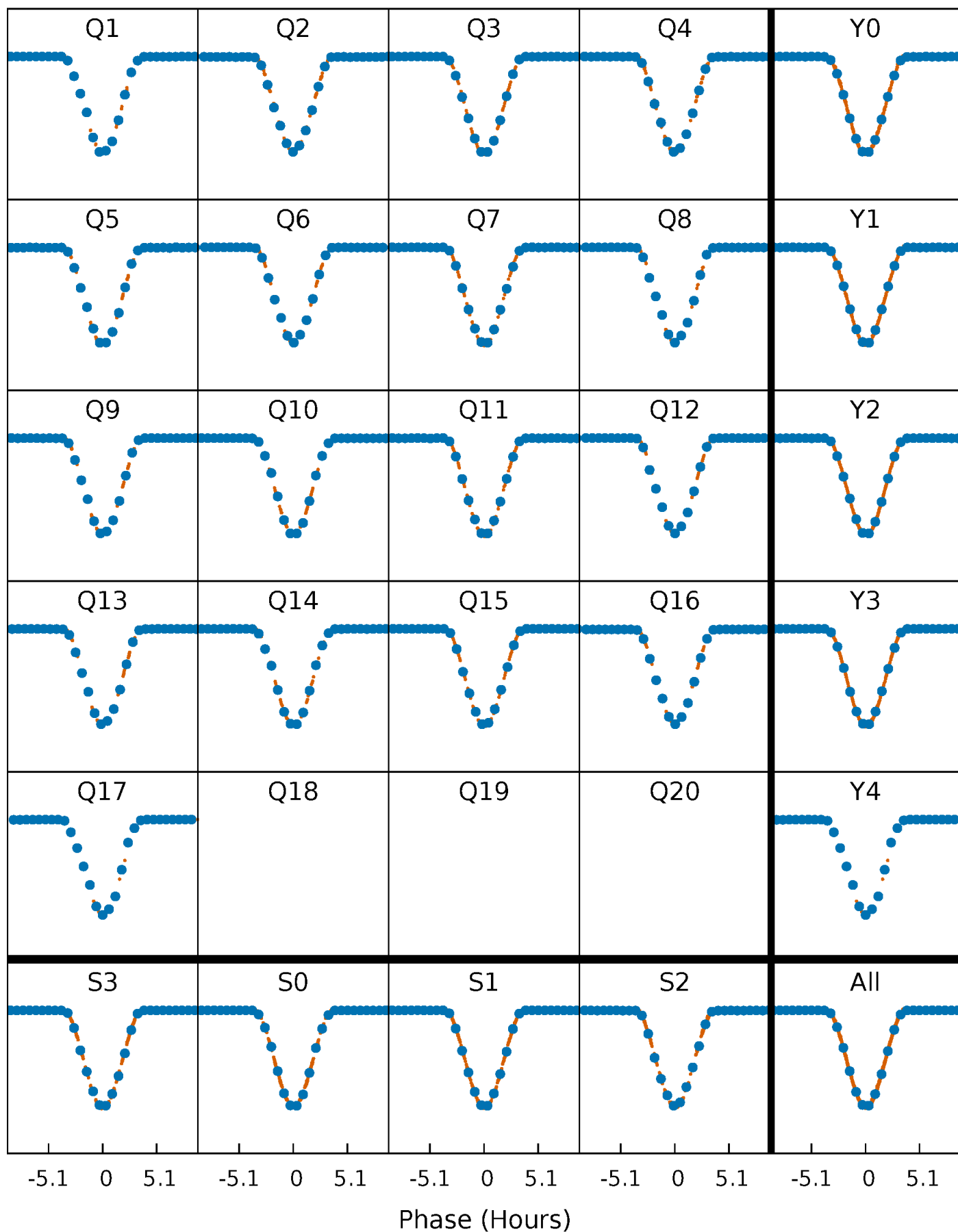


Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)



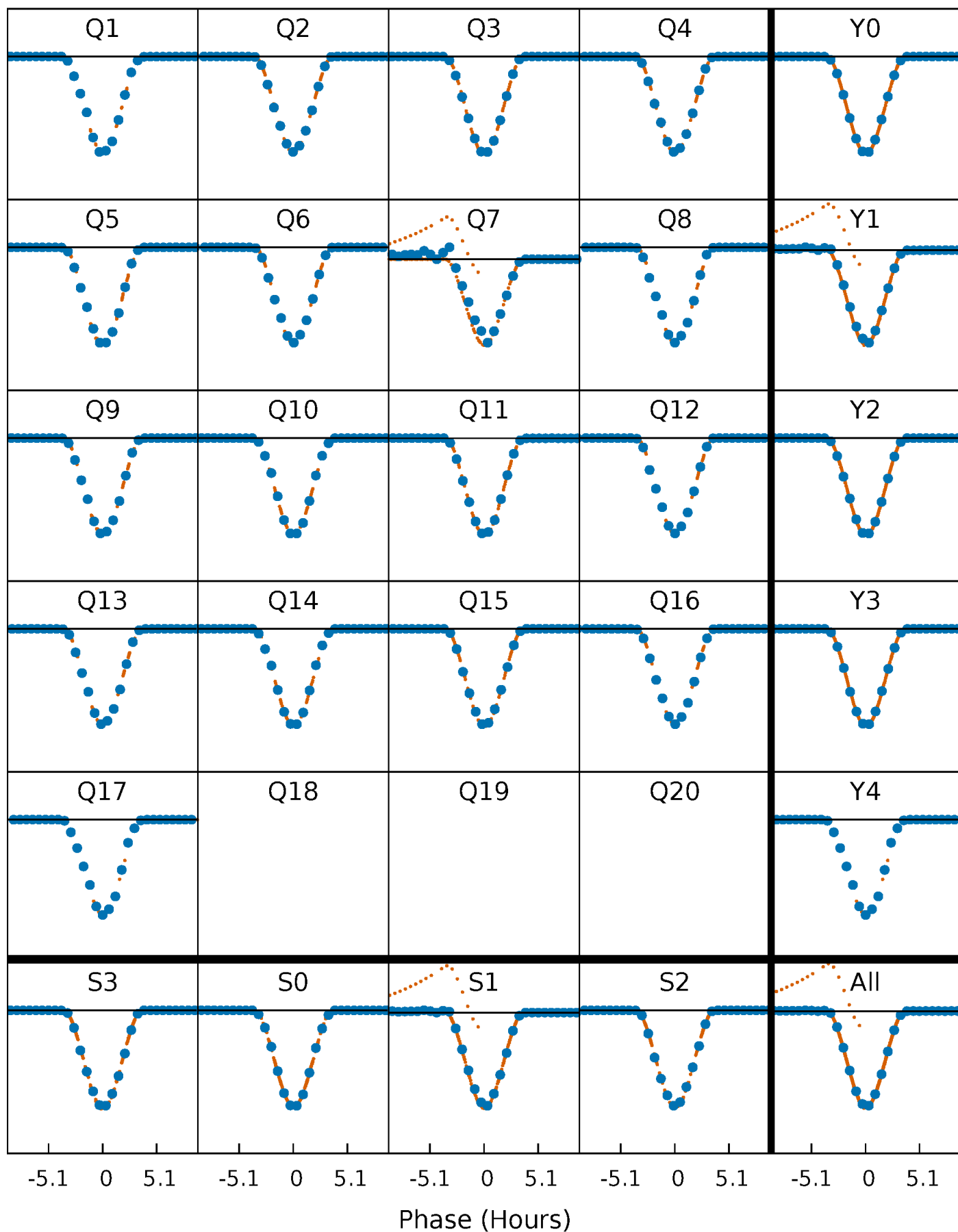
PDC Quarter-Phased Transit Curves

TCE 009777062-01 P= 19.230023 Days $T_0=132.580350$ (BKJD)



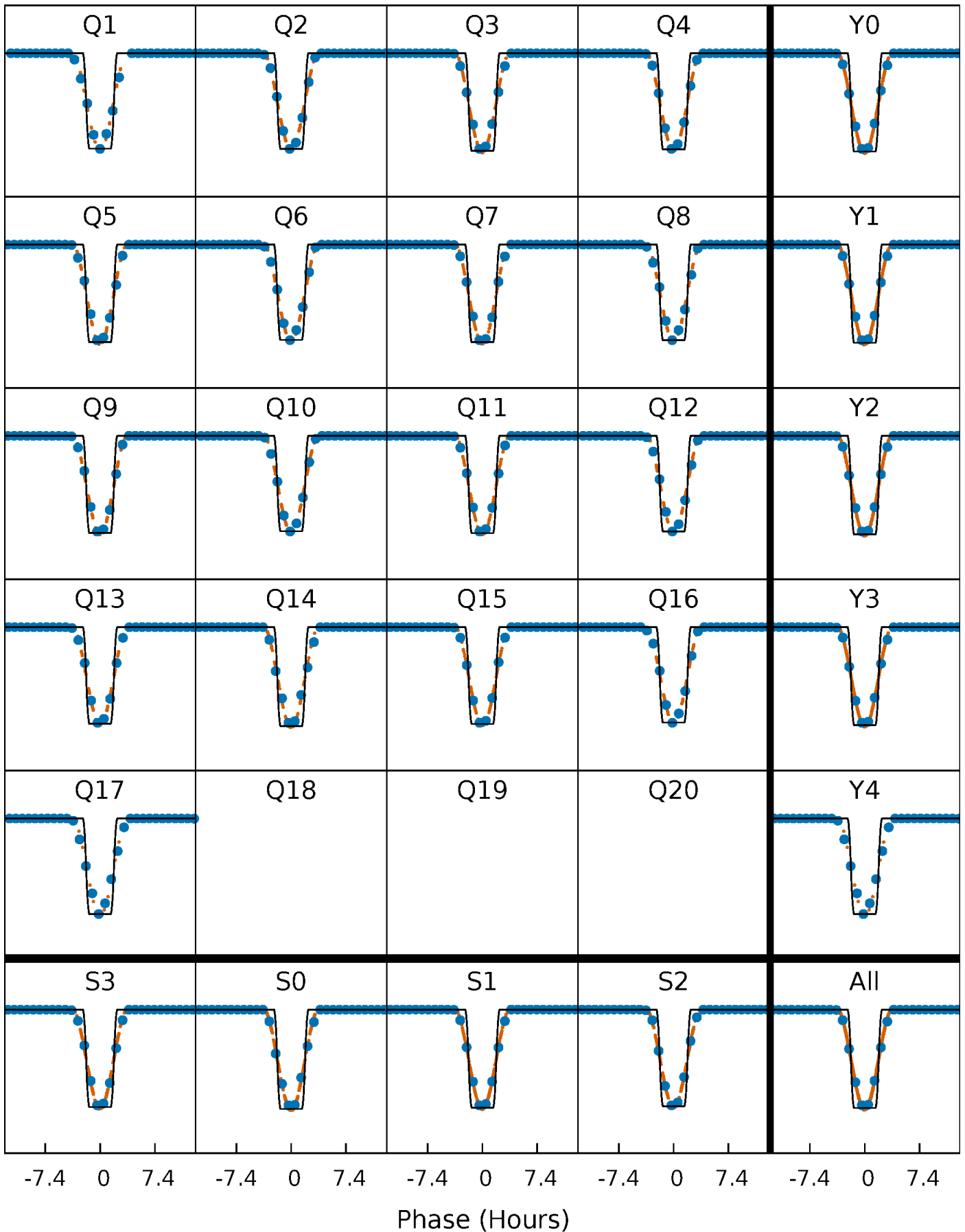
DV Quarter-Phased Transit Curves

TCE 009777062-01 P= 19.230023 Days $T_0=132.580350$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

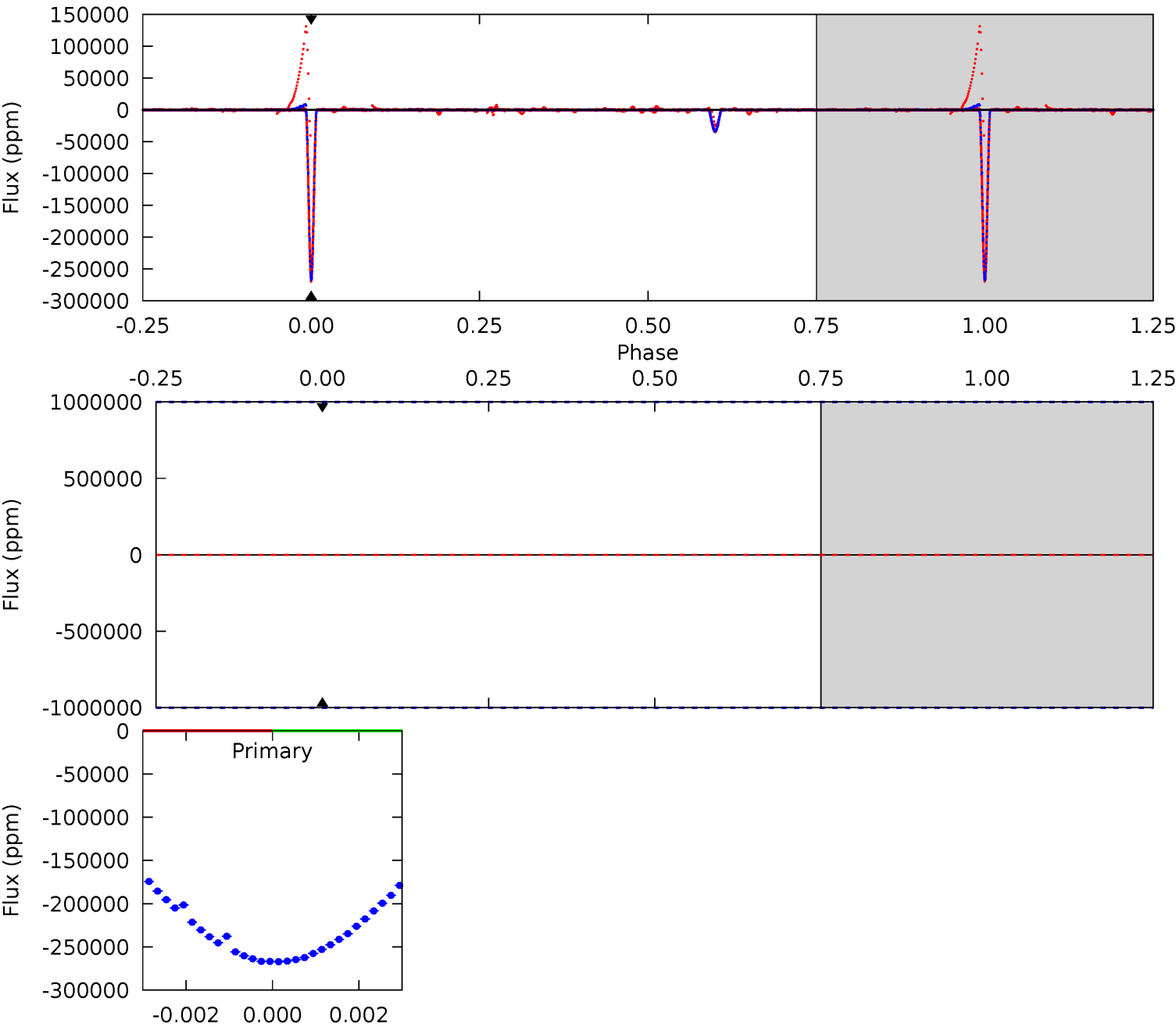
TCE 009777062-01 P= 19.230023 Days $T_0=132.581973$ (BKJD)



DV Model-Shift Uniqueness Test

009777062-01, P = 19.230023 Days, E = 113.350327 Days

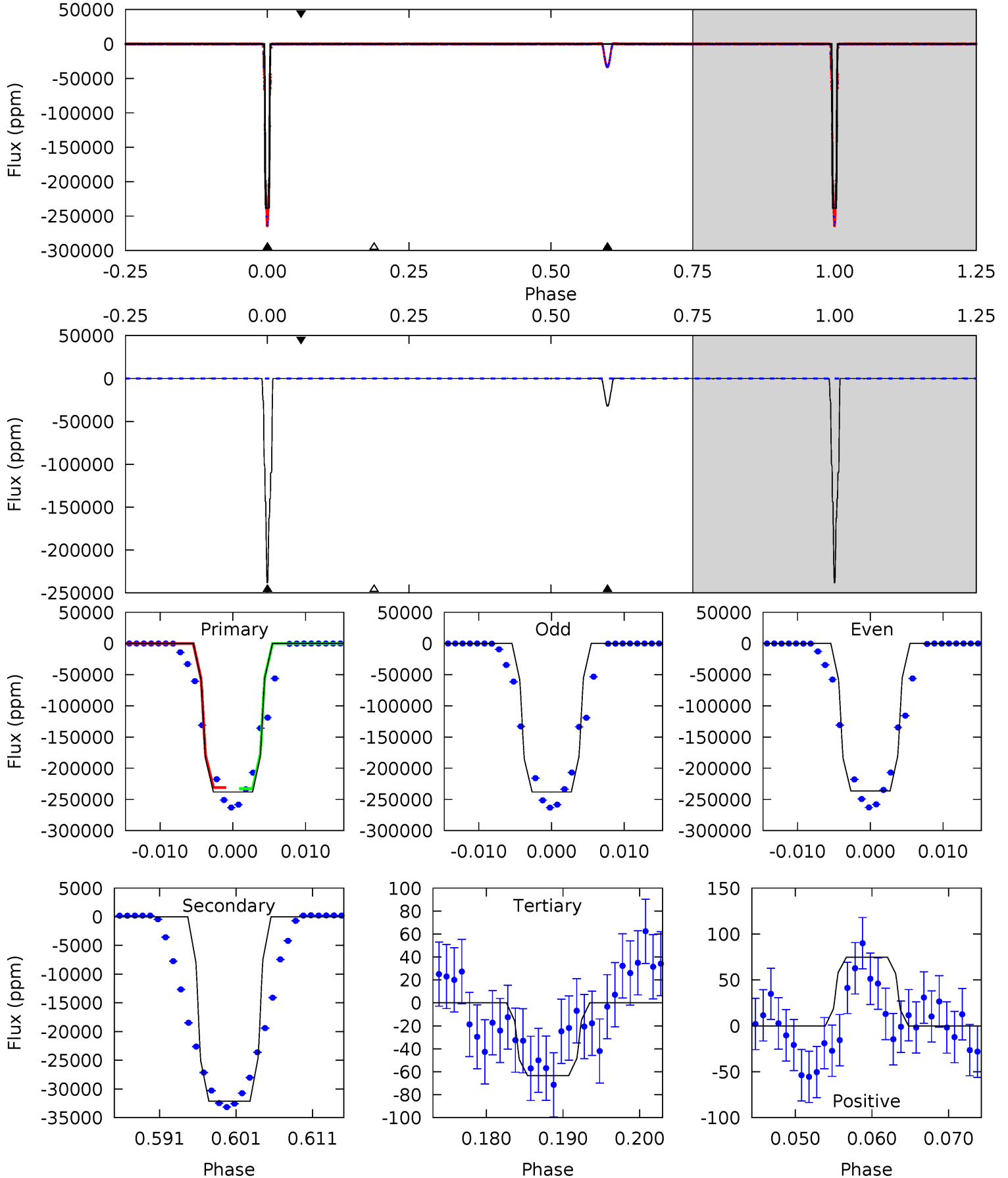
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009777062-01, P = 19.230023 Days, E = 113.351950 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18400	2481	4.90	5.76	5.03	2.58	2.97	18395	18395	2476	2475	65.4	1.00	0.00	0



Stellar Parameters For KIC 009777062

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7703^{+217}_{-372}	$3.844^{+0.267}_{-0.164}$	$0.360^{+0.100}_{-0.350}$	$2.916^{+0.805}_{-0.984}$	$2.165^{+0.257}_{-0.440}$	$0.123^{+0.217}_{-0.051}$
	+3%/-5%	+7%/-4%	+28%/-97%	+28%/-34%	+12%/-20%	+176%/-42%
Source	KIC0	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 009777062-01 / KOI 7229.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$77.95^{+34.59}_{-33.07}$	1877^{+146}_{-165}	-3614^{+13005}_{-5206}	$-5.107^{+361.665}_{-324.585}$
Alt.	-32115 ± 13	$157.60^{+43.74}_{-38.98}$	1874^{+161}_{-160}	4649^{+457}_{-352}	24^{+18}_{-9}

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 $A_{obs} \gg 1.0$

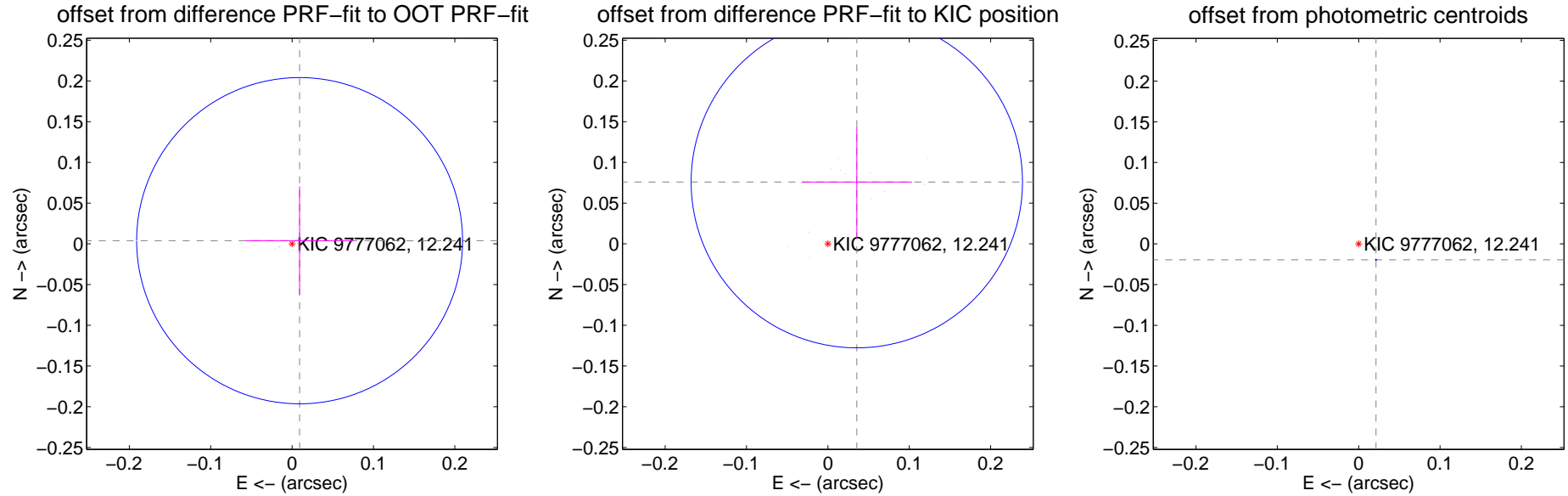
DV Centroid Data

Supplemental centroid analysis for 009777062-01. Kepler magnitude: 12.24. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

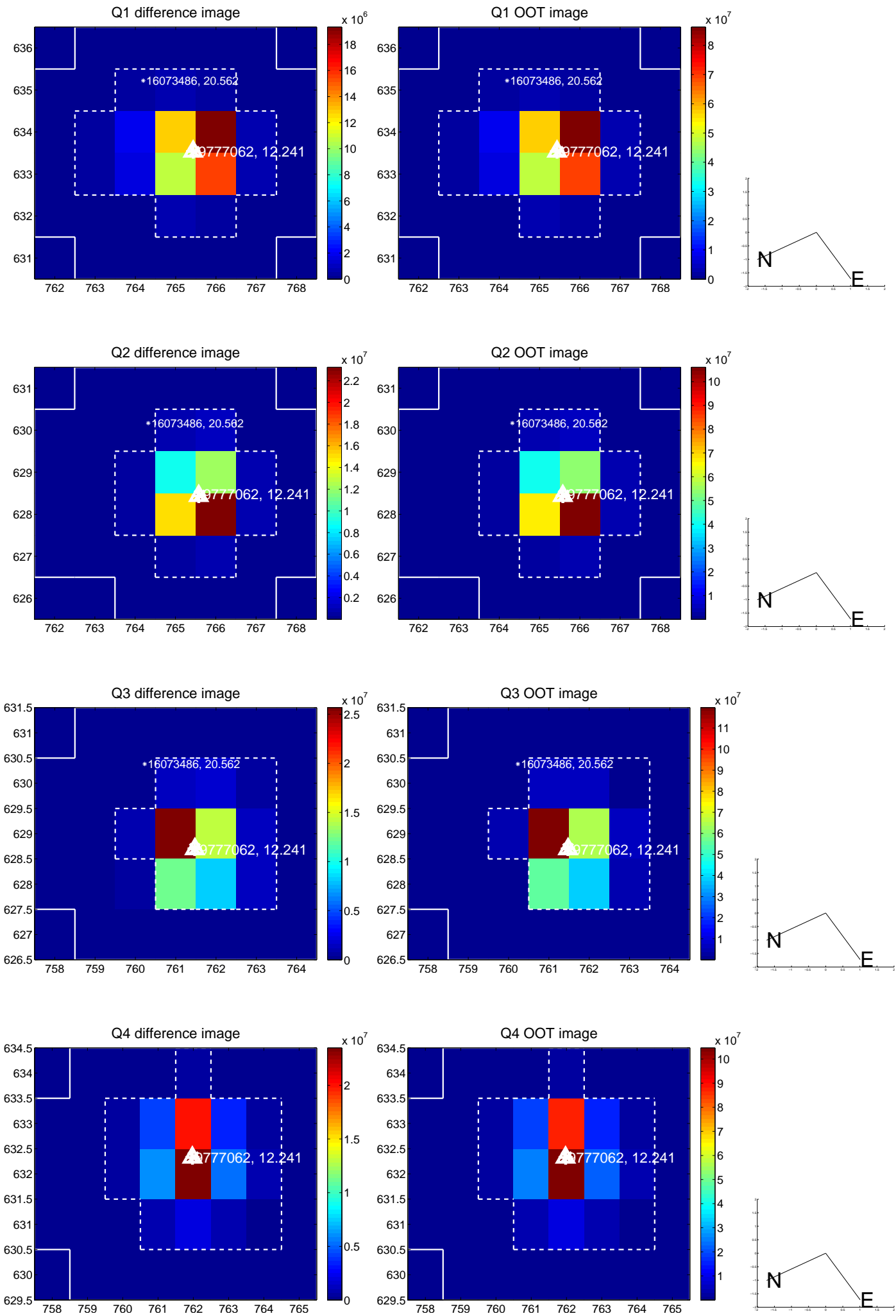
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.010 ± 0.067	0.15	-0.009 ± 0.067	0.004 ± 0.067
PRF-fit source offset from KIC position	0.084 ± 0.068	1.24	-0.036 ± 0.068	0.076 ± 0.067
photometric centroid source offset	0.03 ± 0.00	141.47	-0.02 ± 0.00	-0.02 ± 0.00

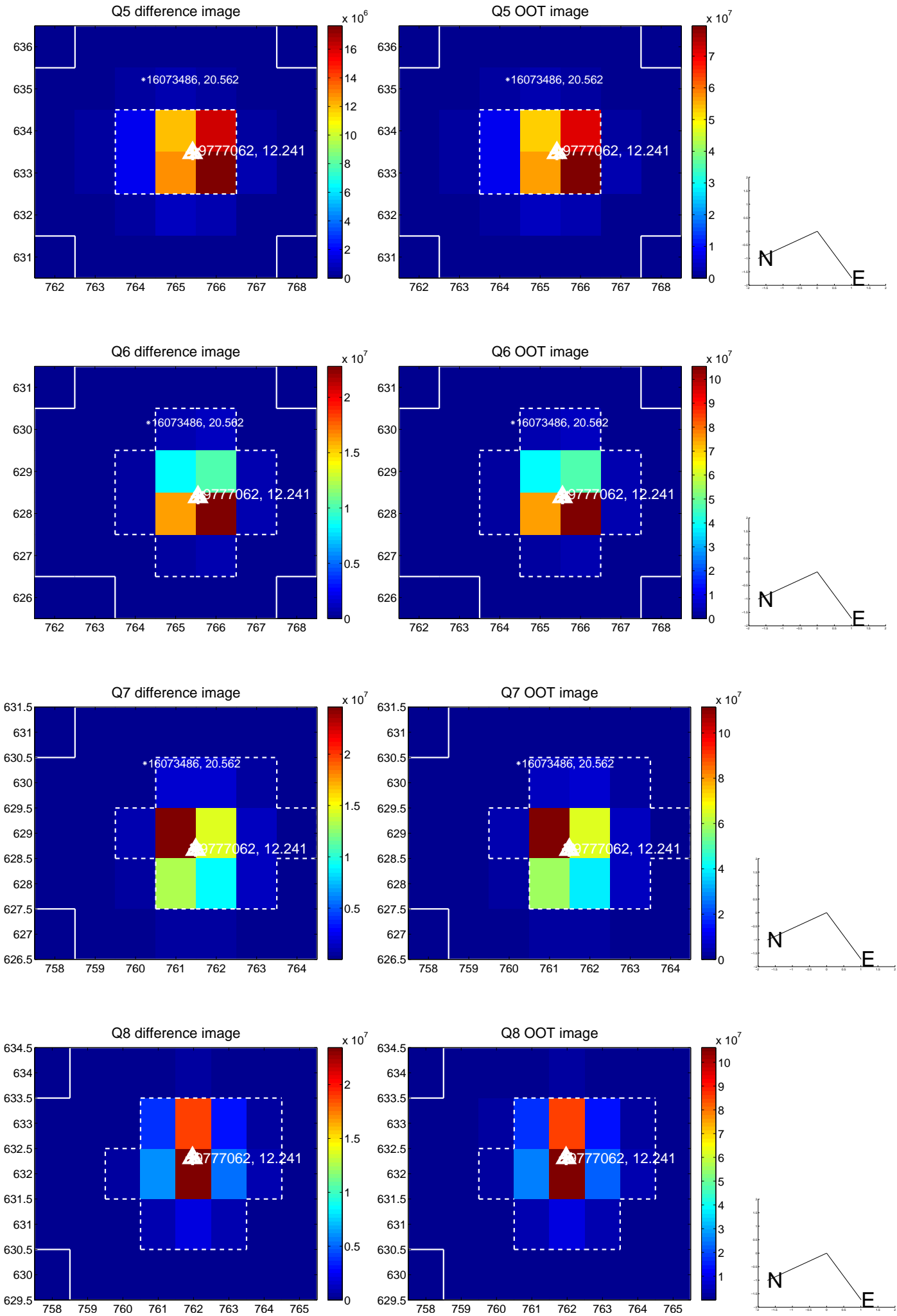


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

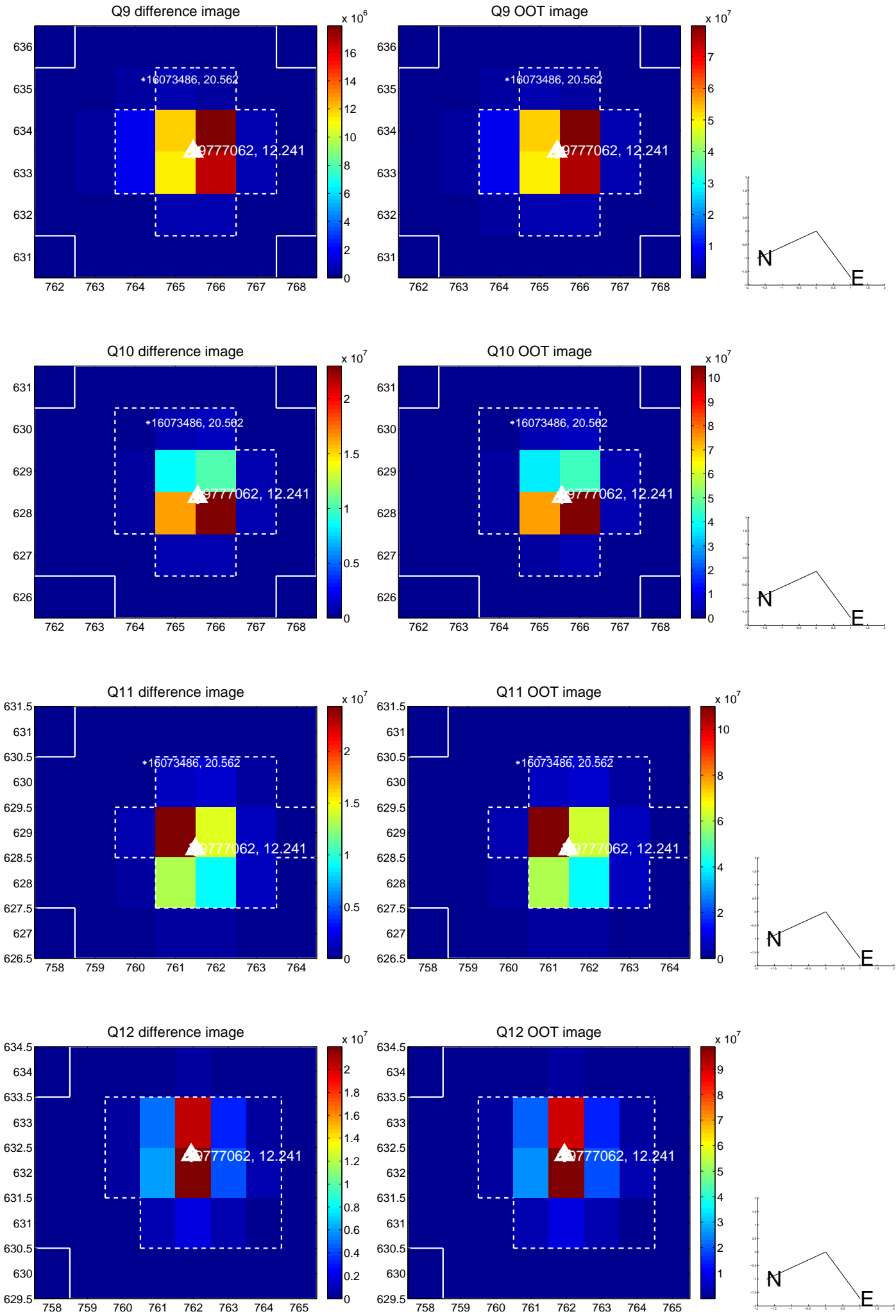
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



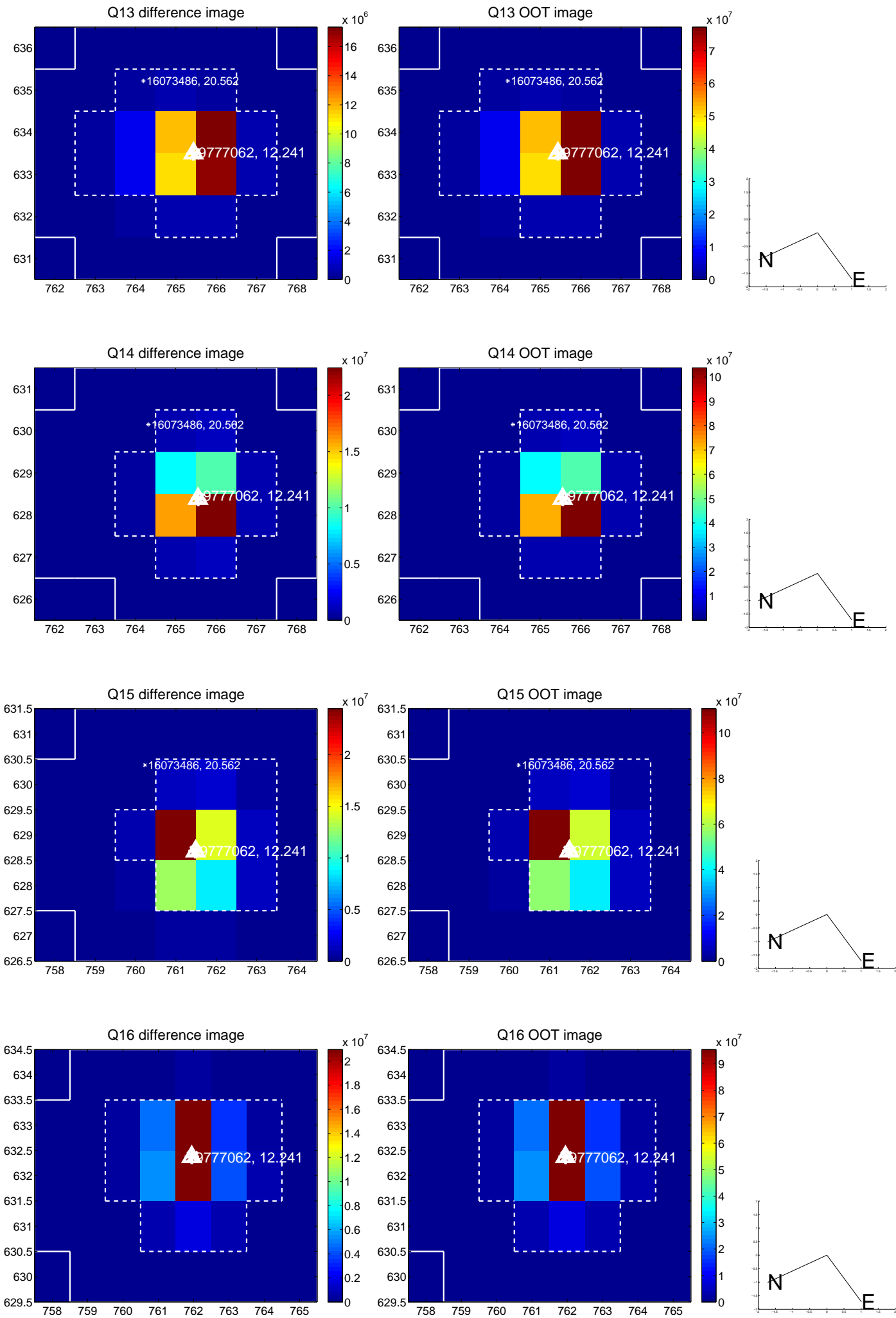
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



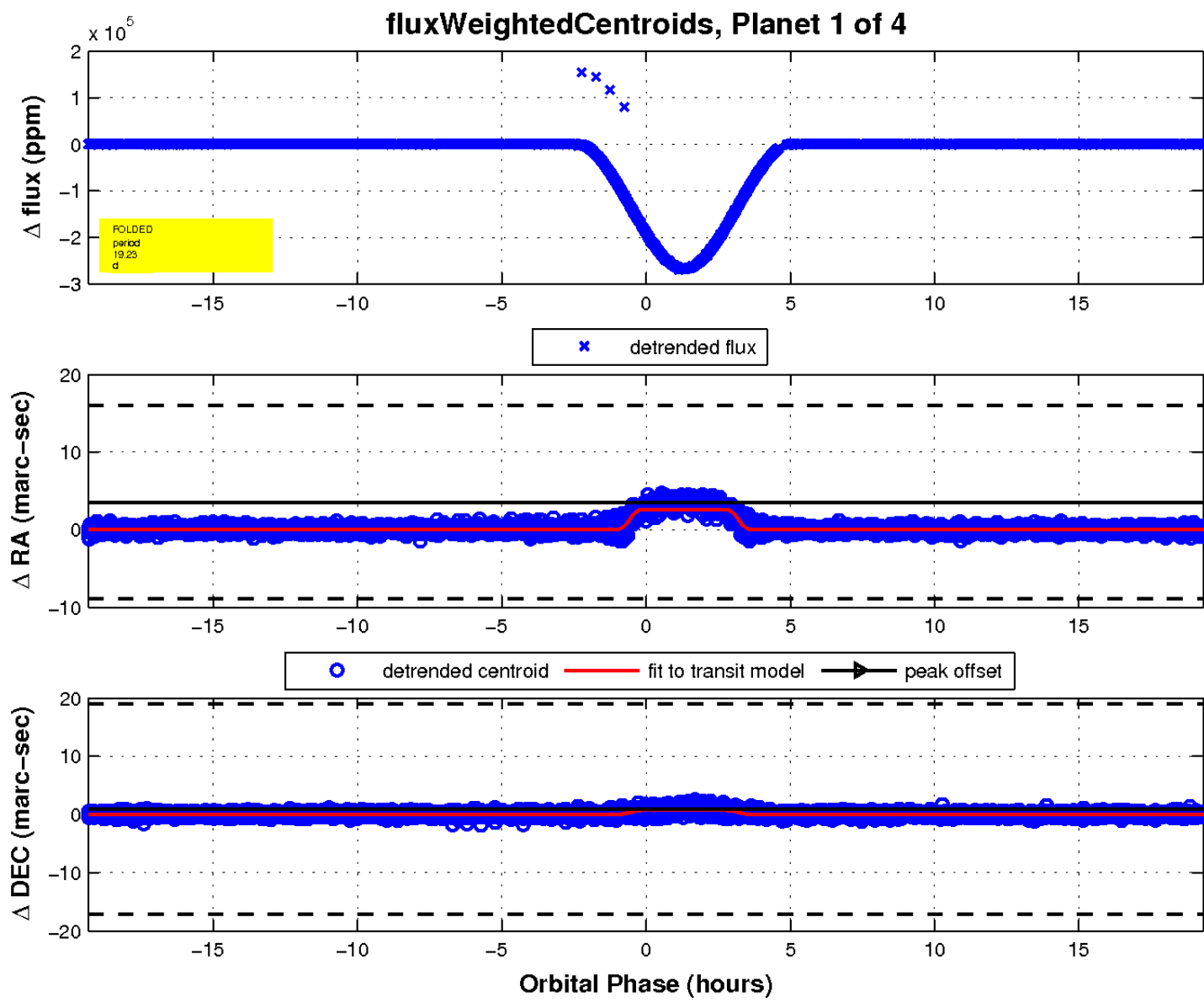
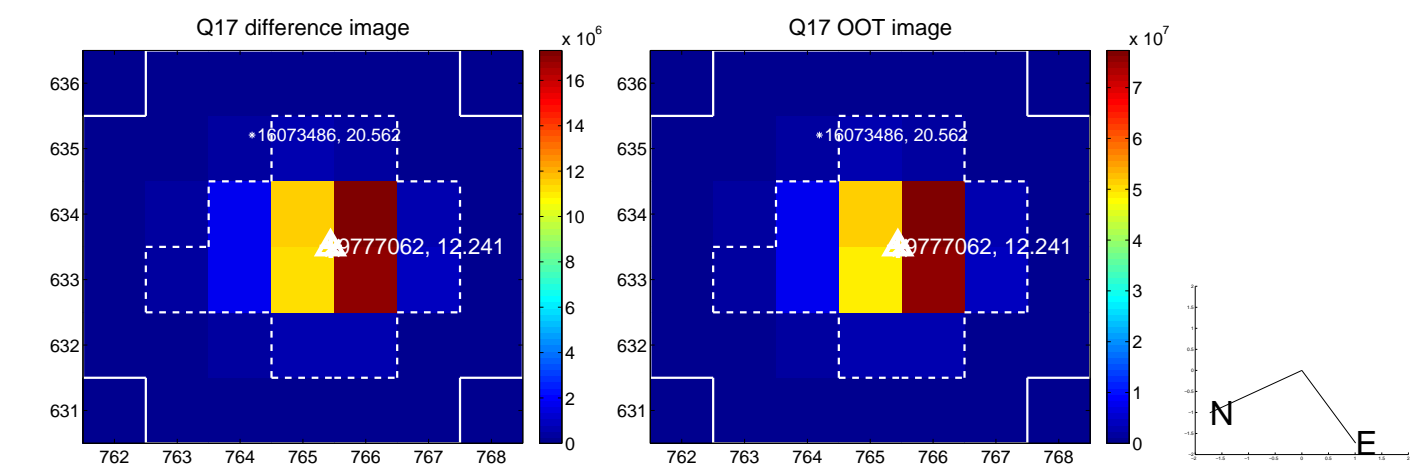
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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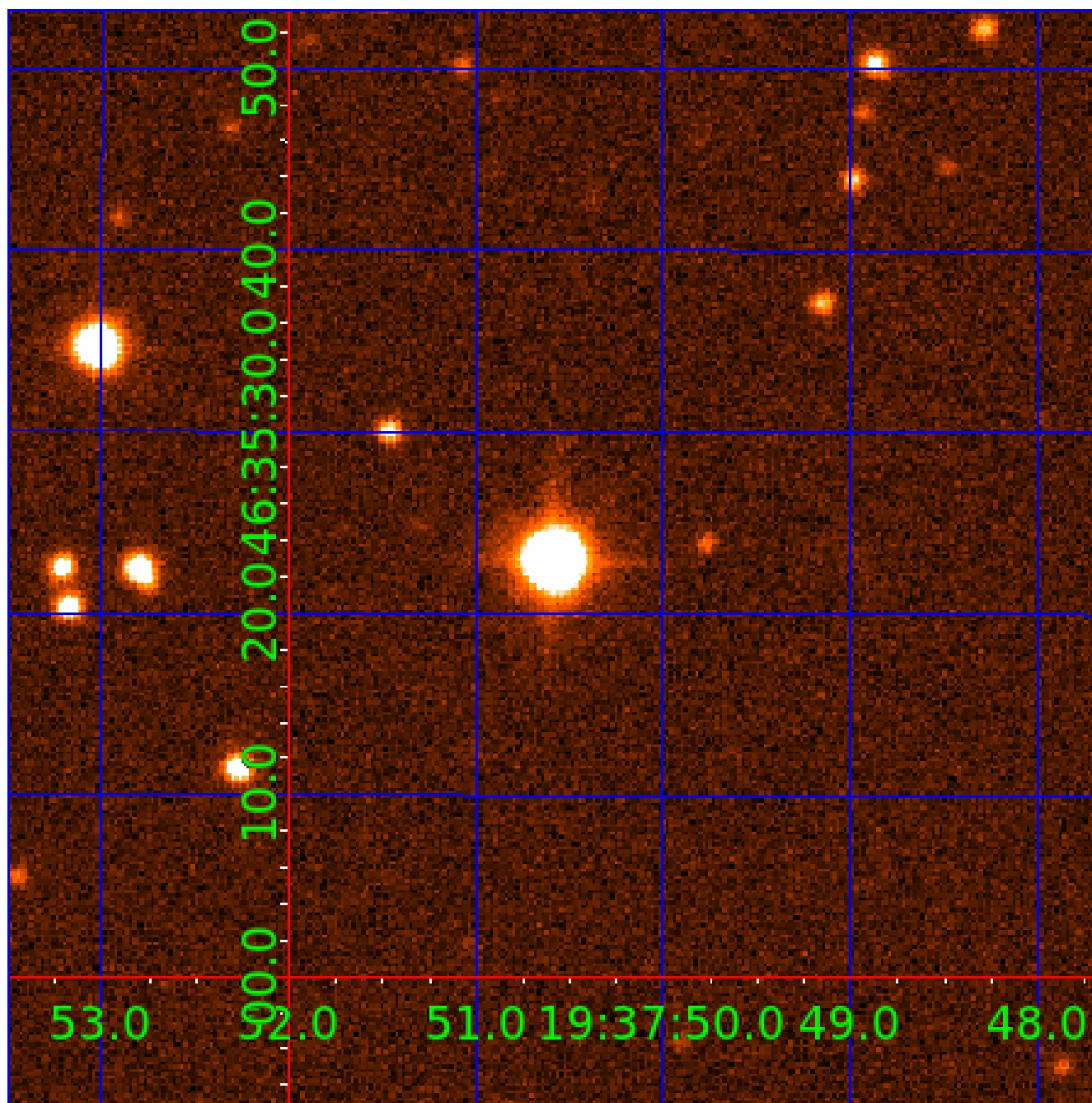


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009777062

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})
009777062-01	OBS	7229.01	19.230023	132.580350	266674.8	4.500	10816.0	-1.0	2.92	7703	81.12	811.74
009777062-02	OBS	No	19.230025	144.110884	33727.4	8.699	1299.0	1436.7	2.92	7703	91.36	811.74
009777062-03	OBS	No	351.203348	151.966233	1480.7	19.227	384.4	16.3	2.92	7703	12.55	16.88
009777062-04	OBS	No	596.033323	305.339289	8867.3	3.500	341.0	-1.0	2.92	7703	27.81	8.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009777062-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
009777062-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009777062-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009777062-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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 009777062-02

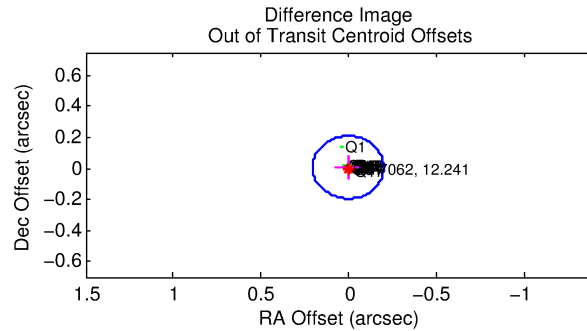
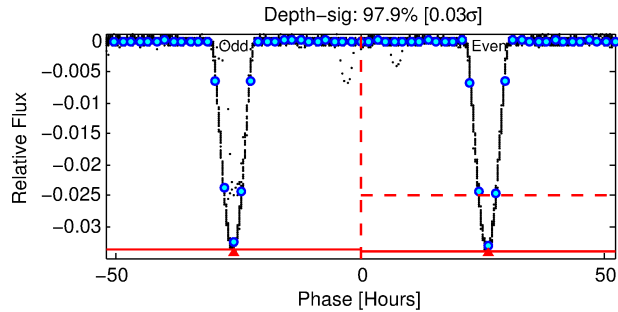
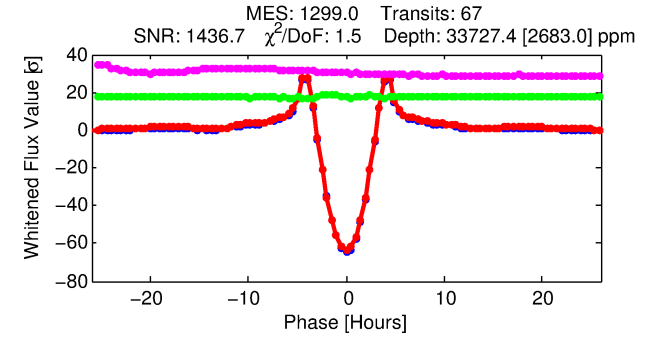
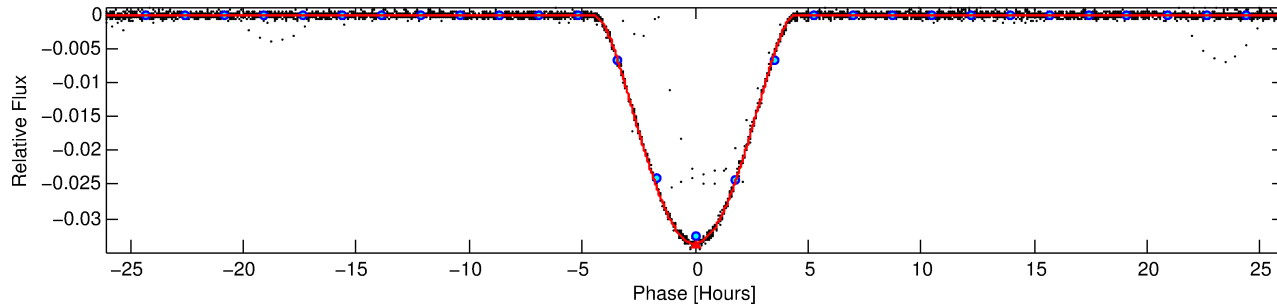
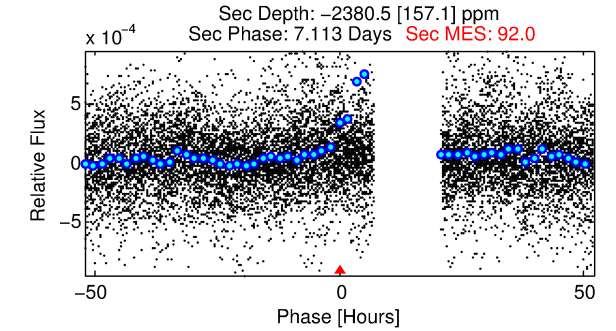
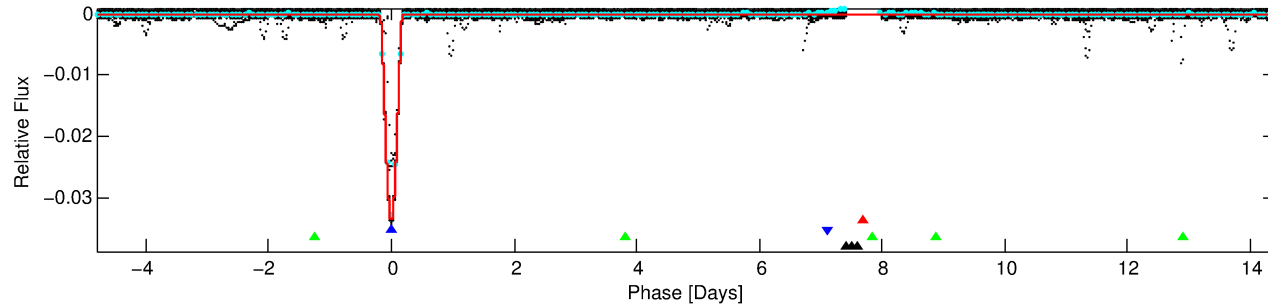
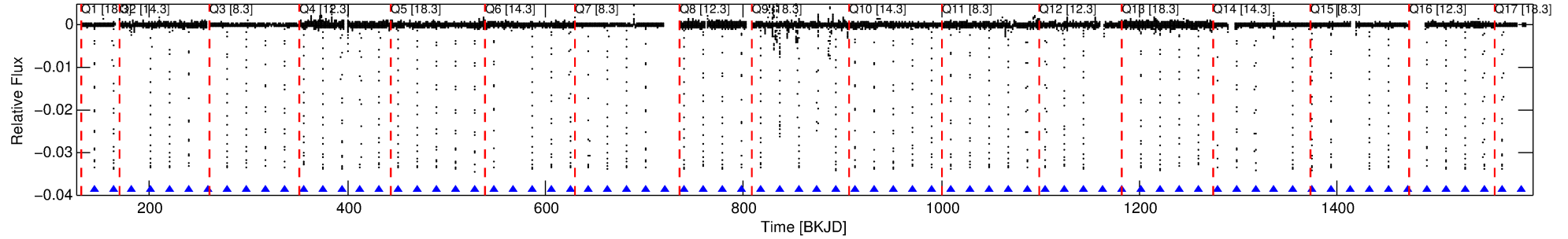
No Significant Match Found

DV One-Page Summary

KIC: 9777062 Candidate: 2 of 4 Period: 19.230 d

KOI: K07229 Corr: No Ephemeris Match

Kp: 12.24 R*: 2.92 Rs Teff: 7703.0 K Logg: 3.84 Fe/H: 0.360



DV Fit Results:

Period = 19.23002 [0.00000] d
Epoch = 144.1109 [0.0001] BKJD
Rp/R* = 0.2871 [0.0060]
a/R* = 13.73 [0.02]
b = 1.00 [0.02]
Seff = 811.74 [410.64]
Teq = 1361 [172] K
Rp = 91.36 [30.89] Re
a = 0.1818 [0.0553] AU
Ag = N/A
Teffp = N/A

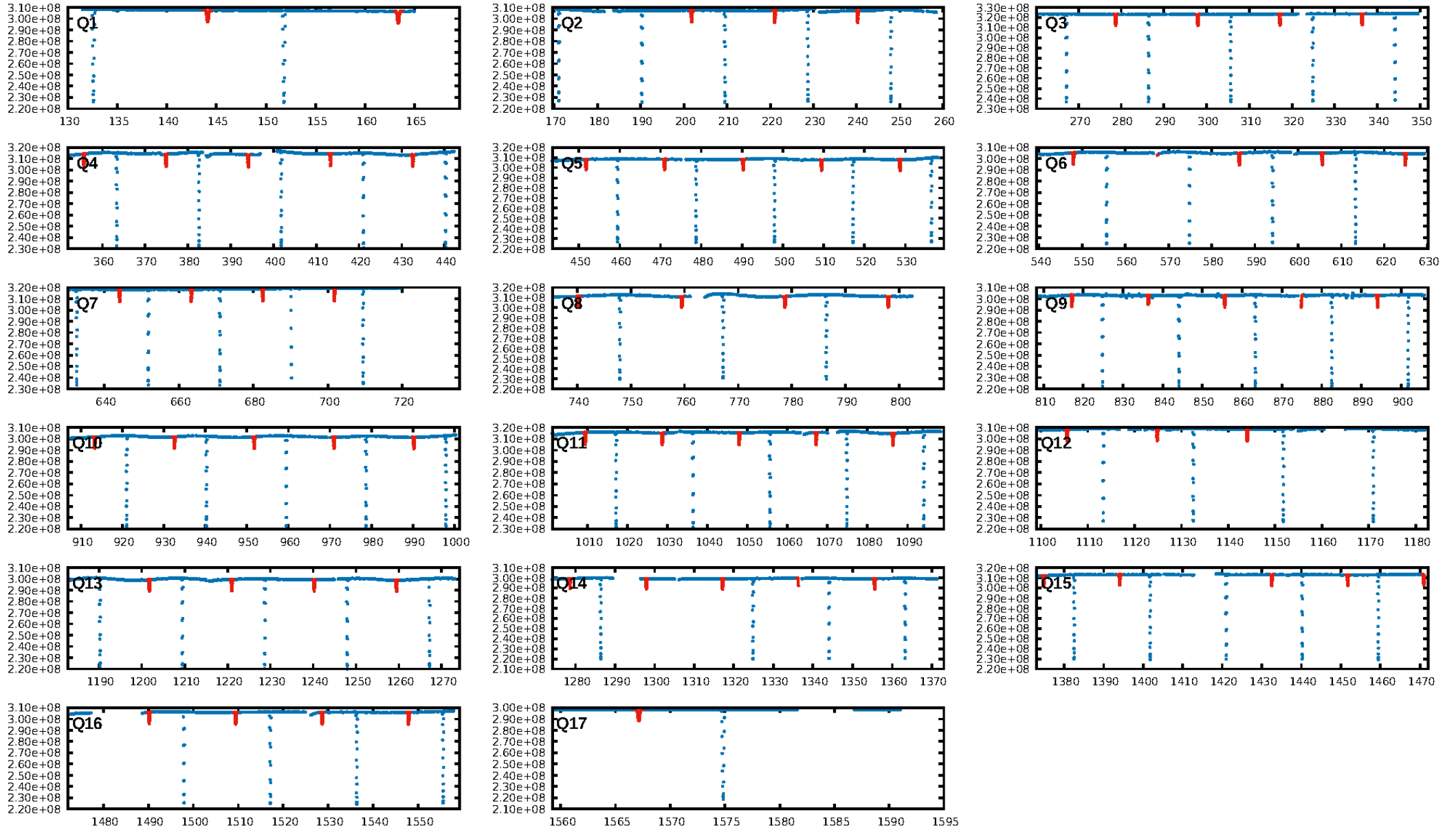
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: 100.0% [377.54σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 40.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [64/64]
GhostDiagnostic-chr: 5.12
Centroid-sig: 0.0%
Centroid-so: 0.021 arcsec [16.64σ]
OotOffset-rm: 0.009 arcsec [0.14σ]
KicOffset-rm: 0.091 arcsec [1.33σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

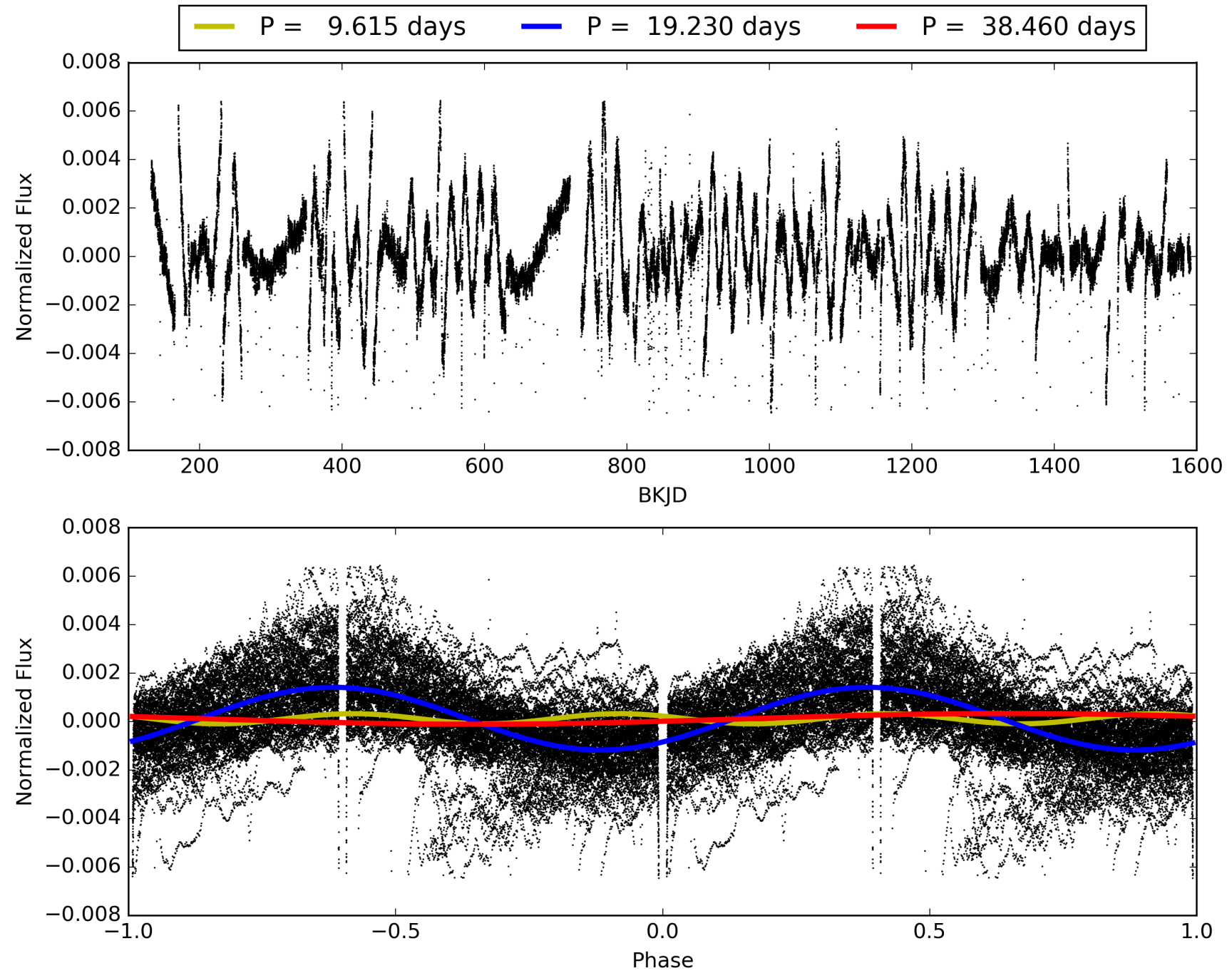
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:05:29 Z

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

TCE 009777062-02, PDC Light Curves

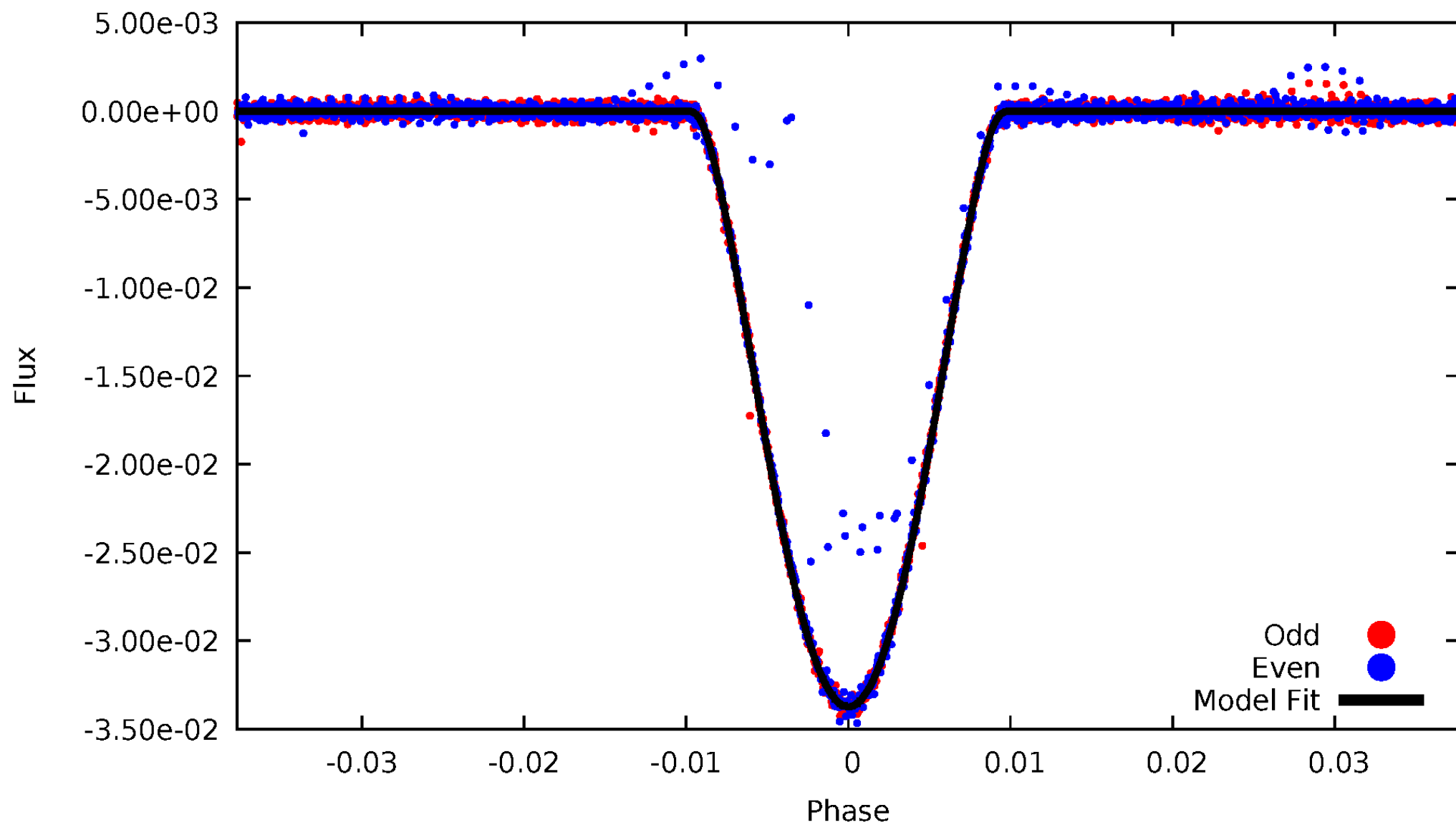


TCE 009777062-02



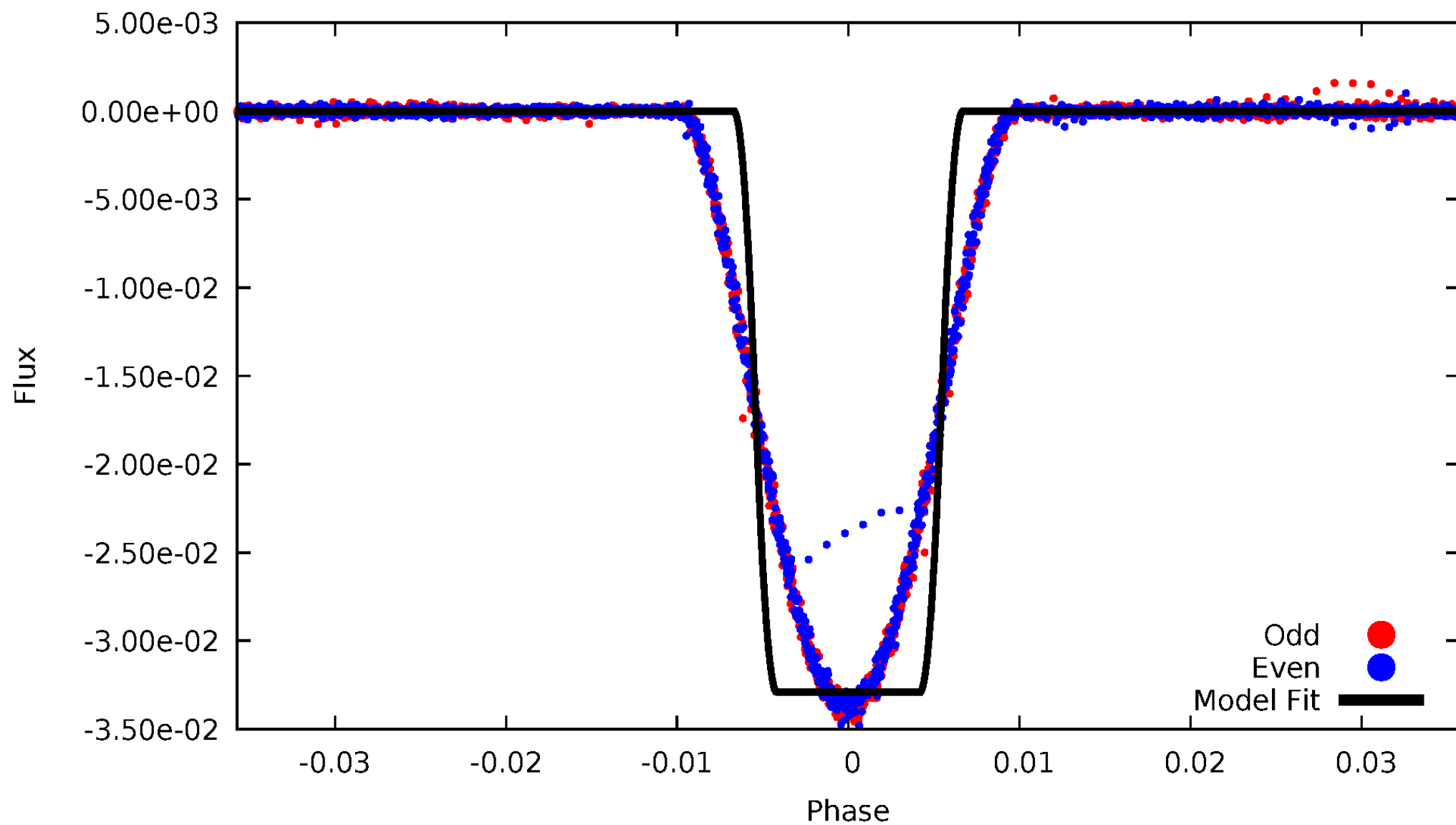
DV Odd/Even

TCE 009777062-02



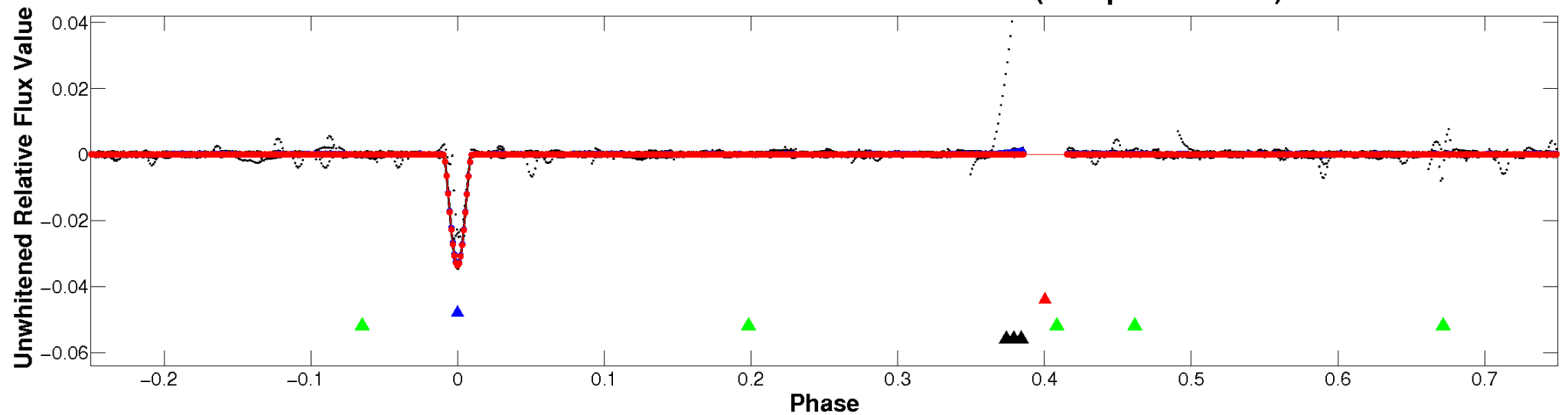
ALT Odd/Even

TCE 009777062-02

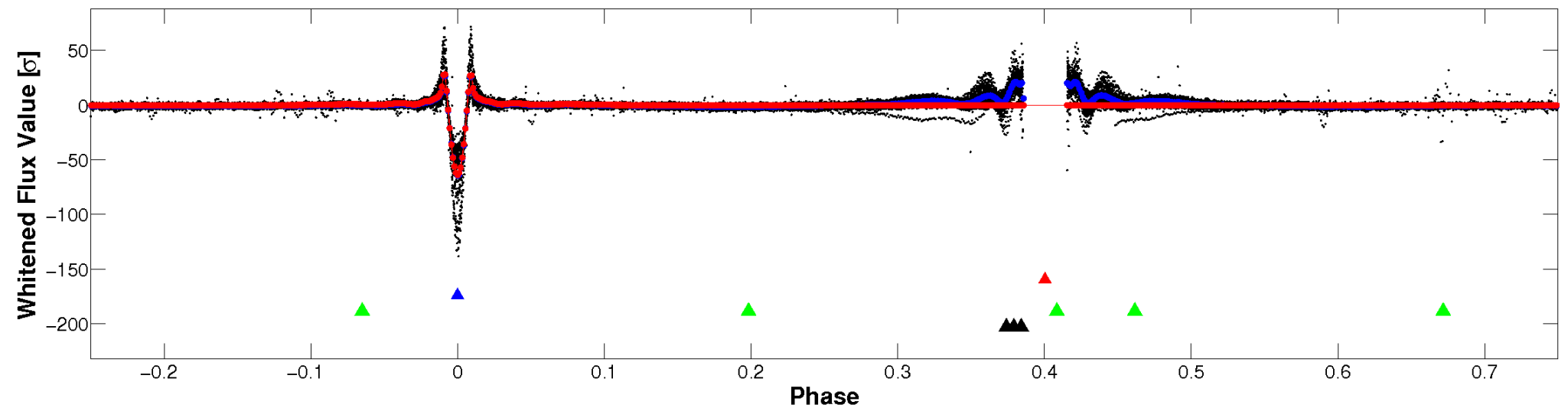


Non-Whitened Vs. Whitened Light Curve

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

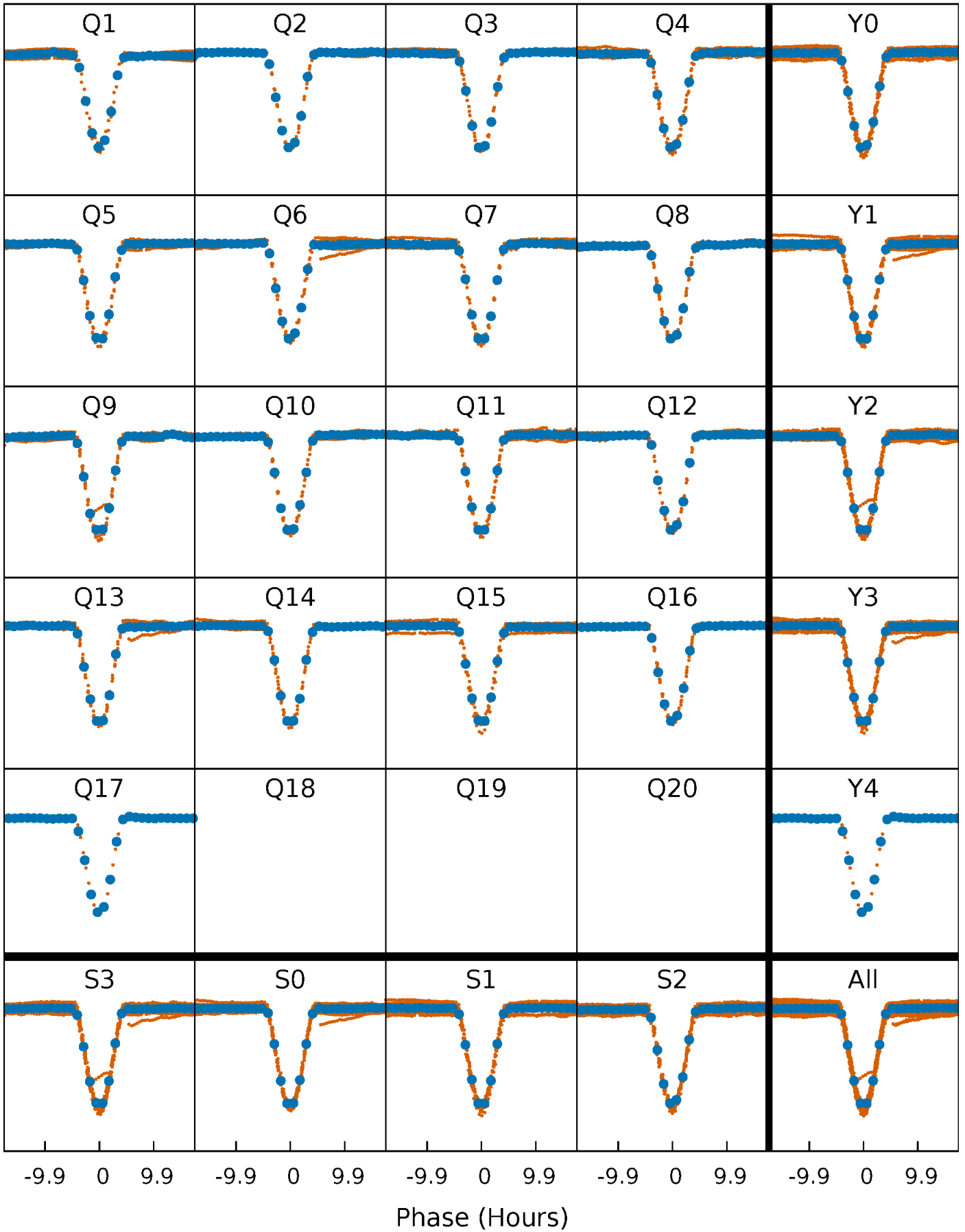


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



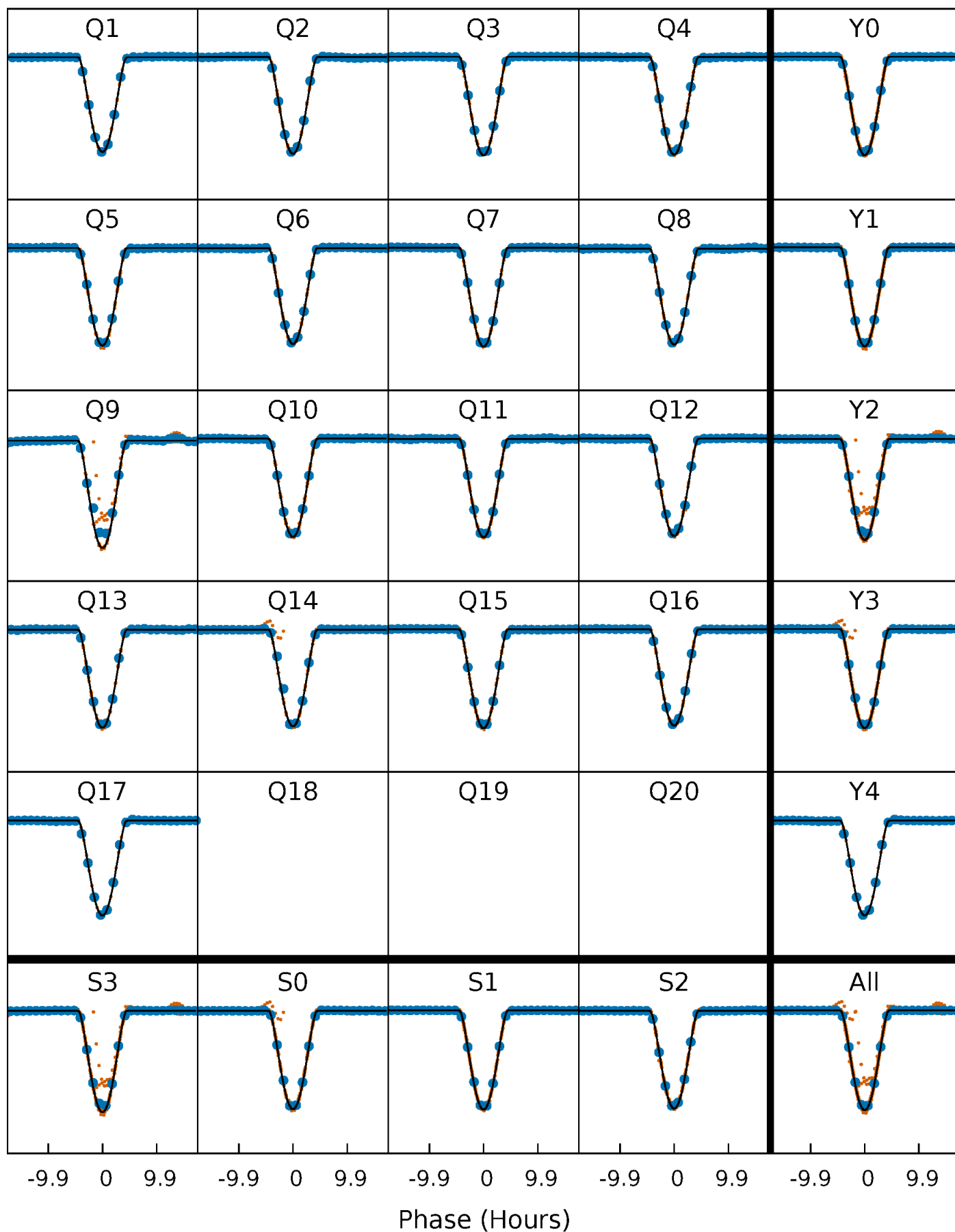
PDC Quarter-Phased Transit Curves

TCE 009777062-02 P= 19.230025 Days $T_0=144.110884$ (BKJD)



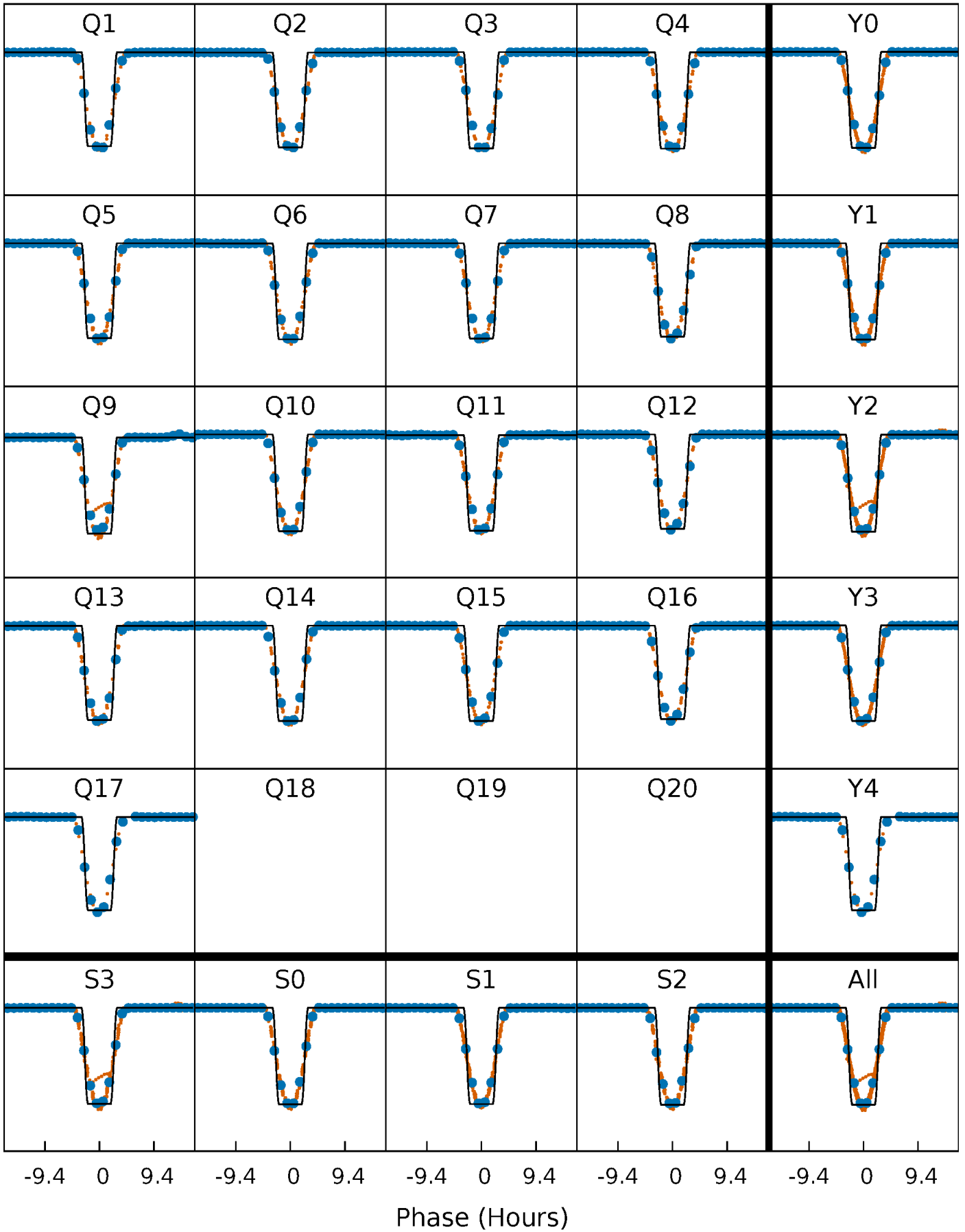
DV Quarter-Phased Transit Curves

TCE 009777062-02 P= 19.230025 Days $T_0=144.110884$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

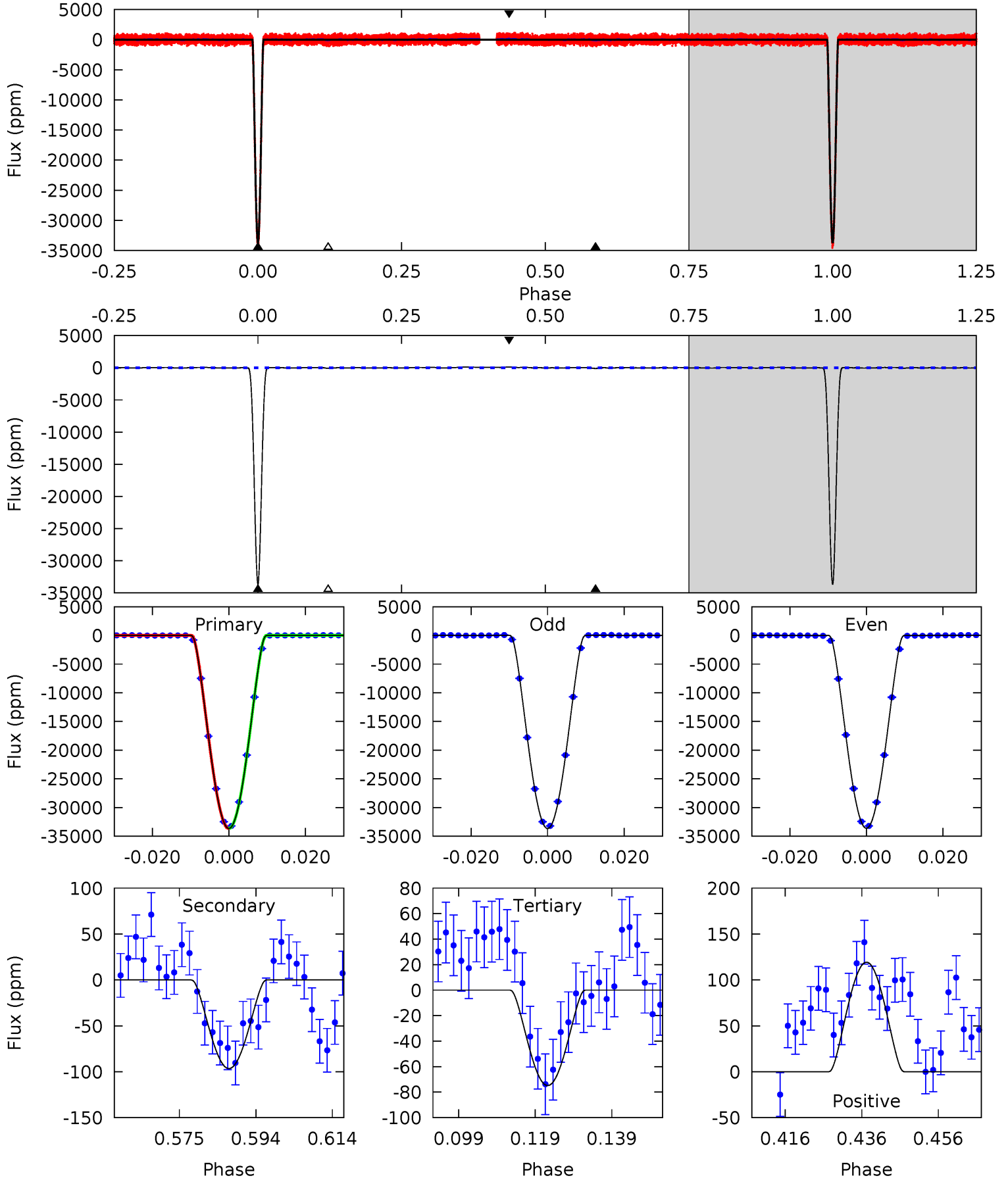
TCE 009777062-02 P= 19.230139 Days $T_0=144.106859$ (BKJD)



DV Model-Shift Uniqueness Test

009777062-02, P = 19.230025 Days, E = 124.880859 Days

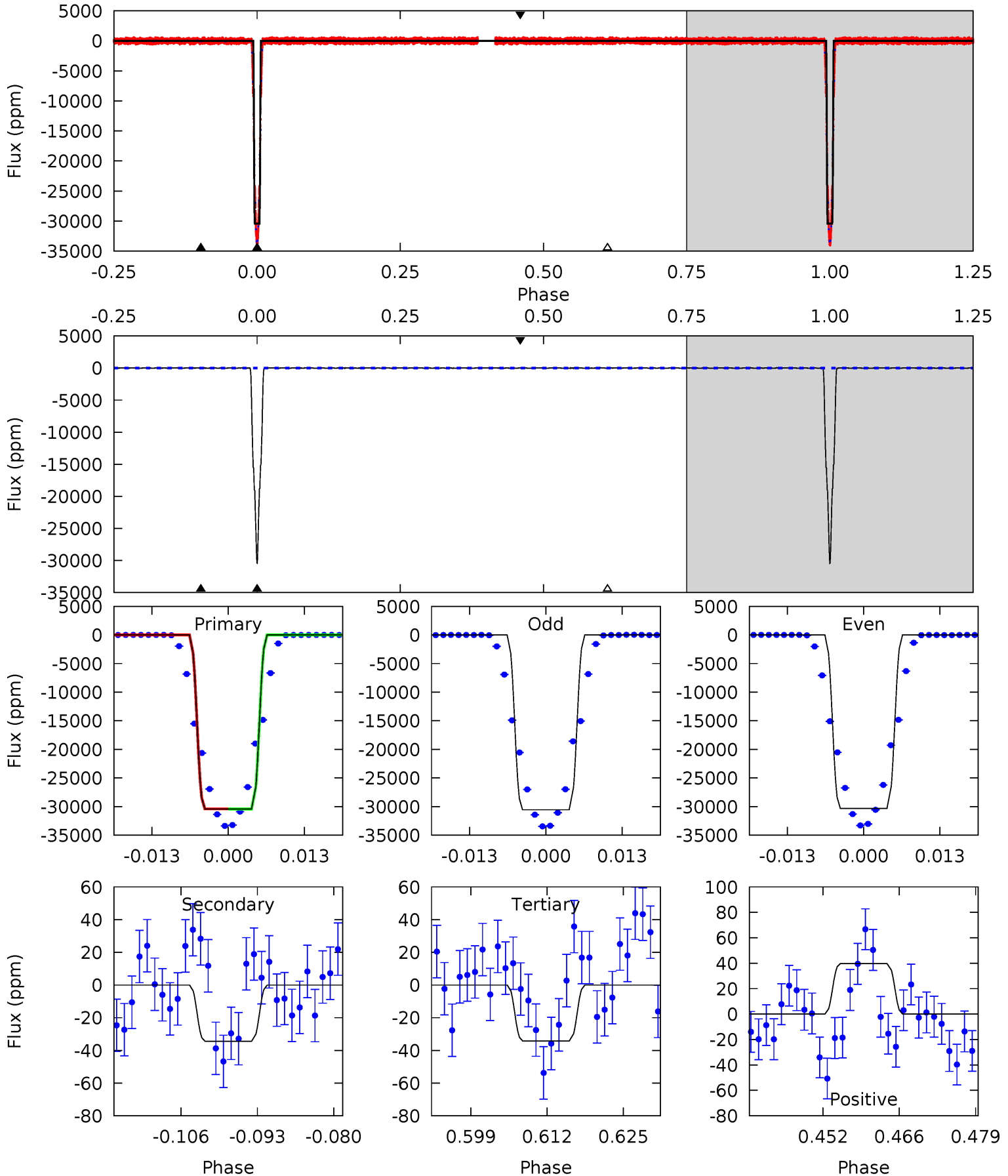
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4140	11.9	9.21	14.7	4.89	2.33	4.75	4131	4125	2.66	-2.80	2.73	0.98	0.00	1.31



Alt Model-Shift Uniqueness Test

009777062-02, P = 19.230139 Days, E = 124.876720 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4136	4.67	4.65	5.40	4.97	2.48	1.59	4131	4130	0.03	-0.73	15.9	1.00	0.00	1.82



Stellar Parameters For KIC 009777062

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7703^{+217}_{-372}	$3.844^{+0.267}_{-0.164}$	$0.360^{+0.100}_{-0.350}$	$2.916^{+0.805}_{-0.984}$	$2.165^{+0.257}_{-0.440}$	$0.123^{+0.217}_{-0.051}$
	+3%/-5%	+7%/-4%	+28%/-97%	+28%/-34%	+12%/-20%	+176%/-42%
Source	KIC0	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 009777062-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-96 ± 8	$90.25^{+14.48}_{-16.55}$	1860^{+175}_{-165}	-2077^{+3705}_{-190}	$0.215^{+0.094}_{-0.055}$
Alt.	-34 ± 7	$56.84^{+9.06}_{-10.00}$	1871^{+155}_{-164}	-2134^{+379}_{-164}	$0.196^{+0.084}_{-0.062}$

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 $A_{obs} \gg 1.0$

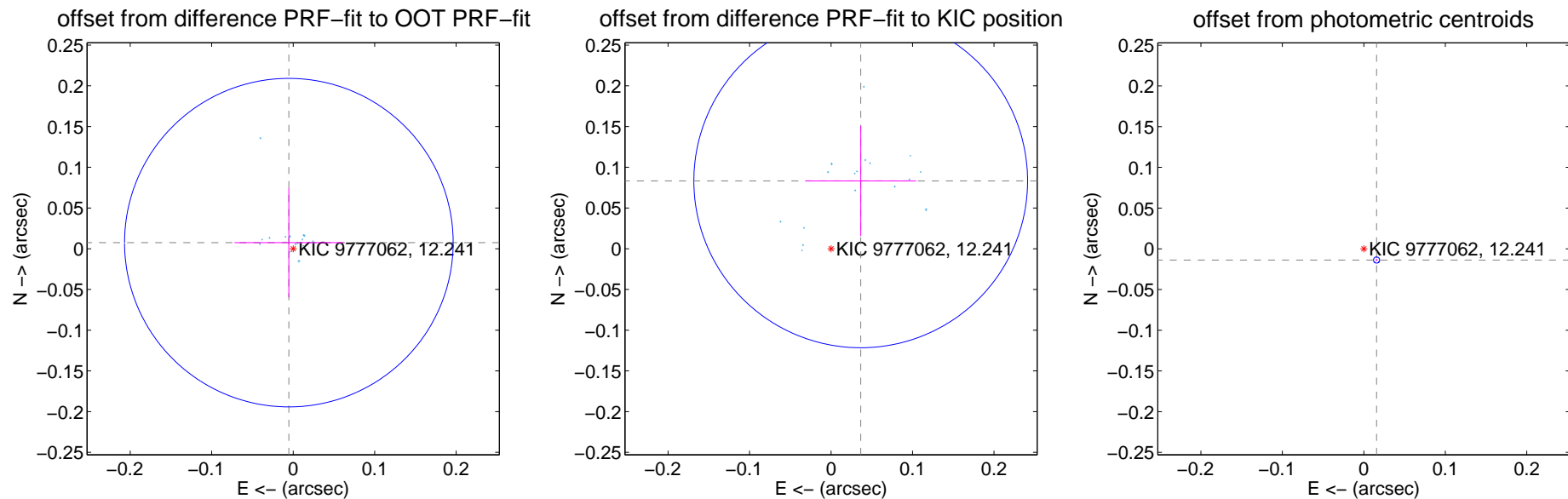
DV Centroid Data

Supplemental centroid analysis for 009777062-02. Kepler magnitude: 12.24. Transit SNR 1436.73

There are 17 quarters with good PRF difference image offsets

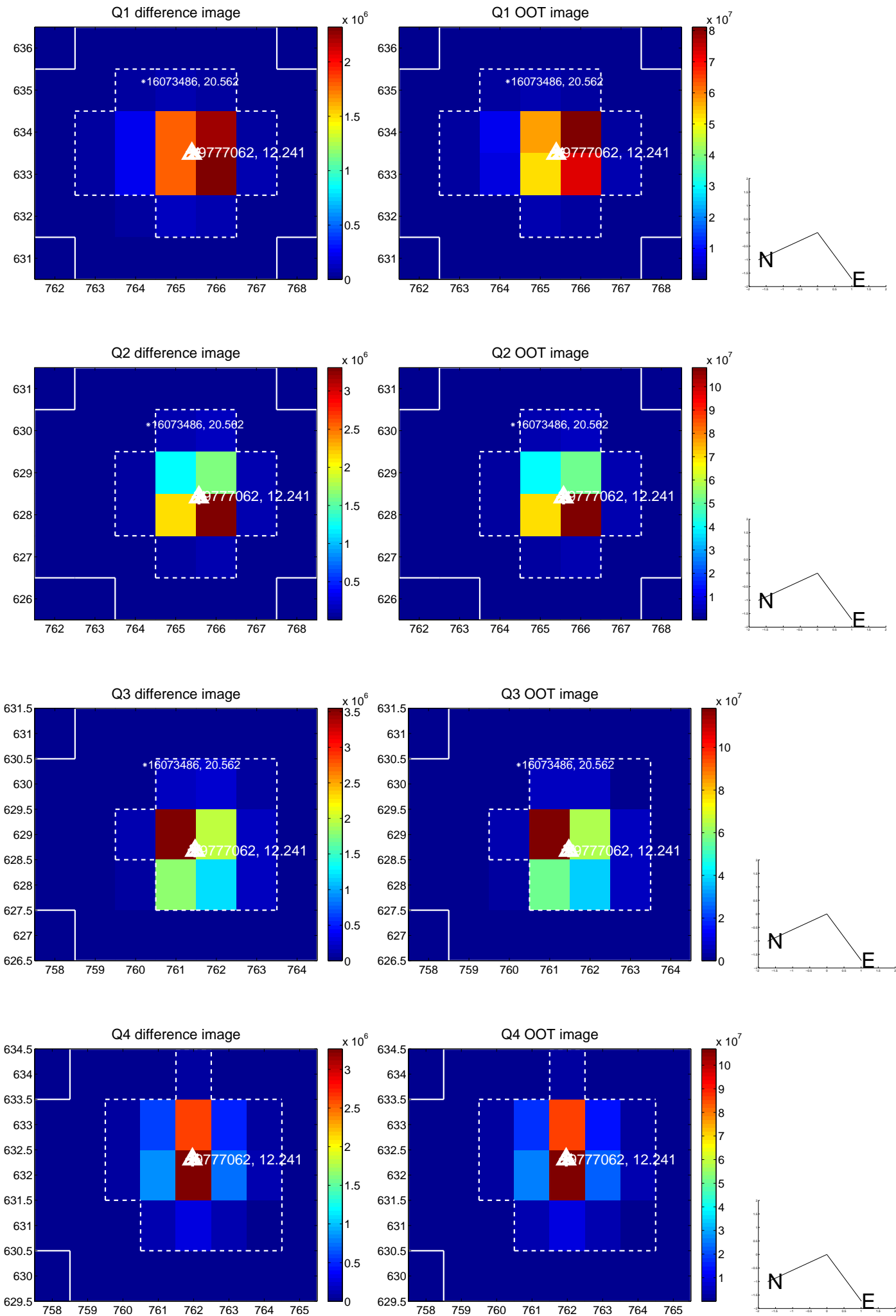
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.009 ± 0.067	0.14	0.005 ± 0.067	0.007 ± 0.067
PRF-fit source offset from KIC position	0.091 ± 0.068	1.33	-0.036 ± 0.068	0.083 ± 0.068
photometric centroid source offset	0.02 ± 0.00	16.64	-0.02 ± 0.00	-0.01 ± 0.00

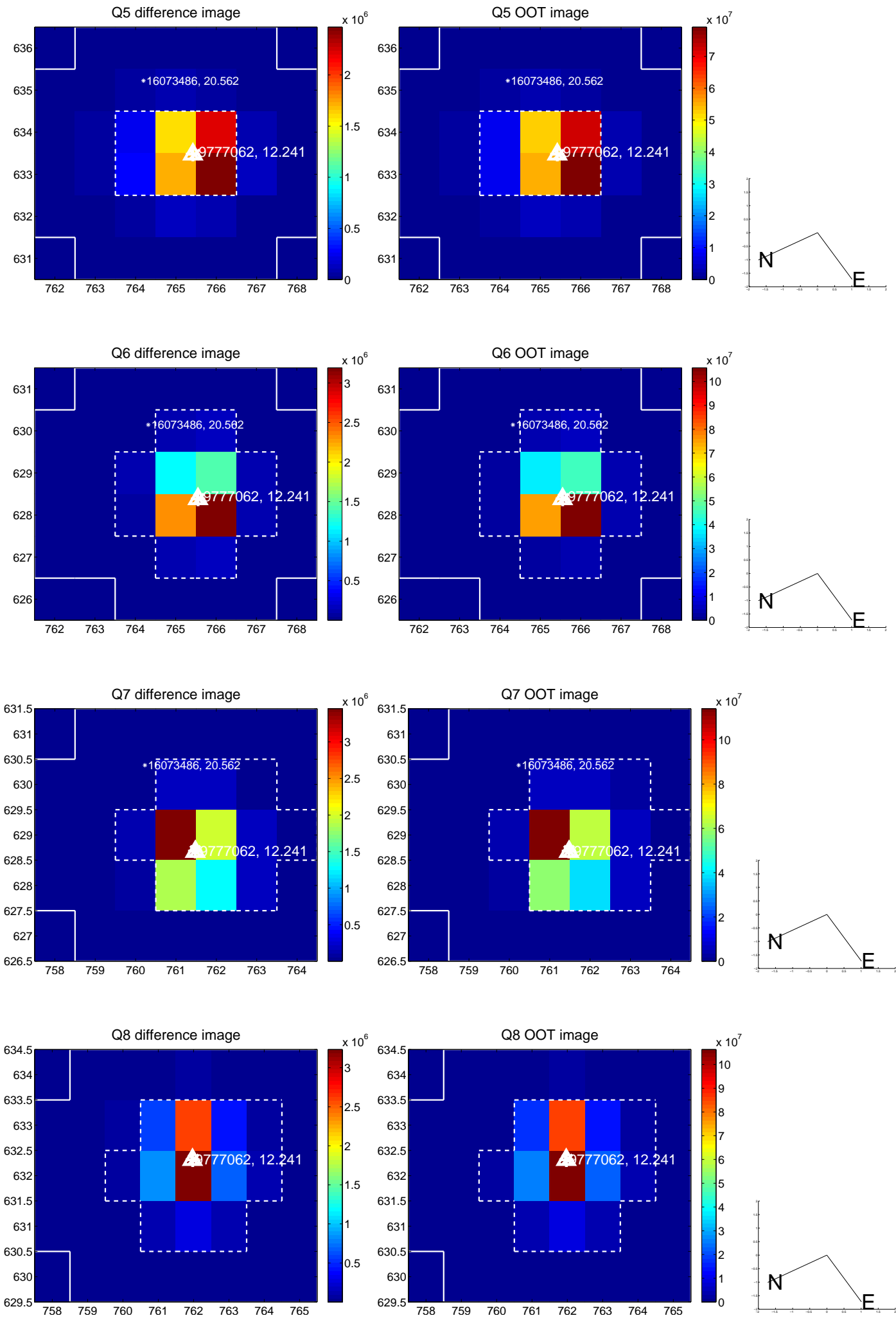


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

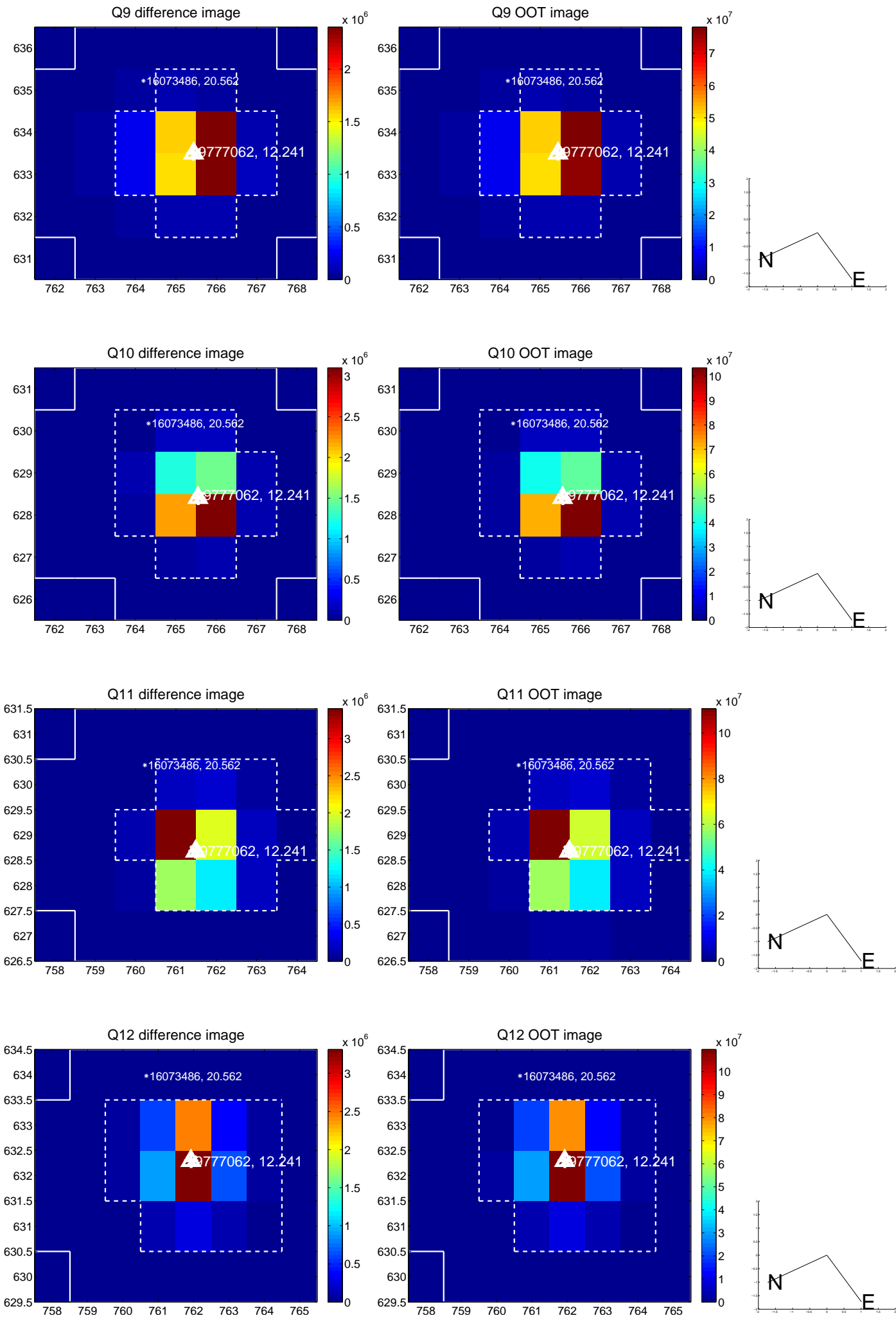
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



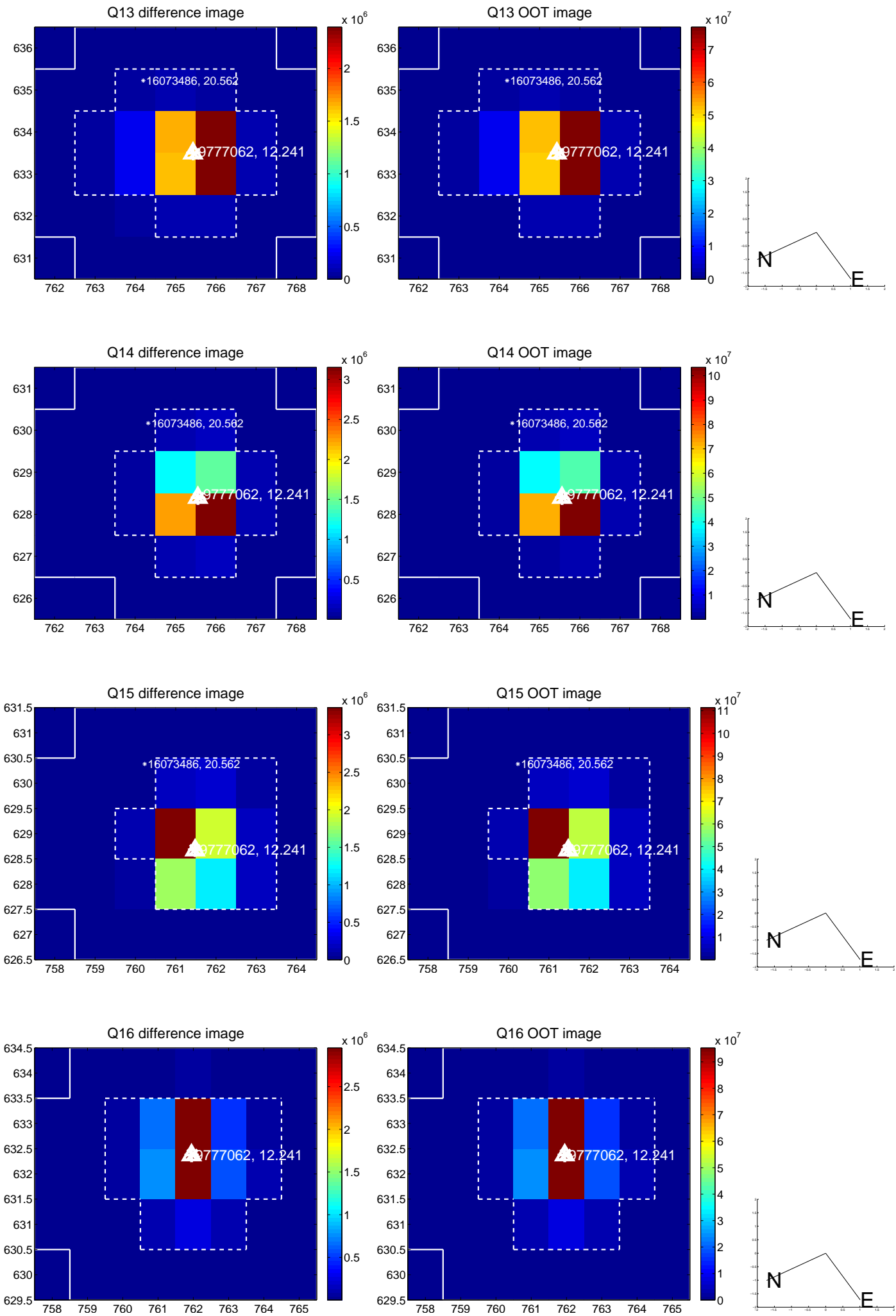
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



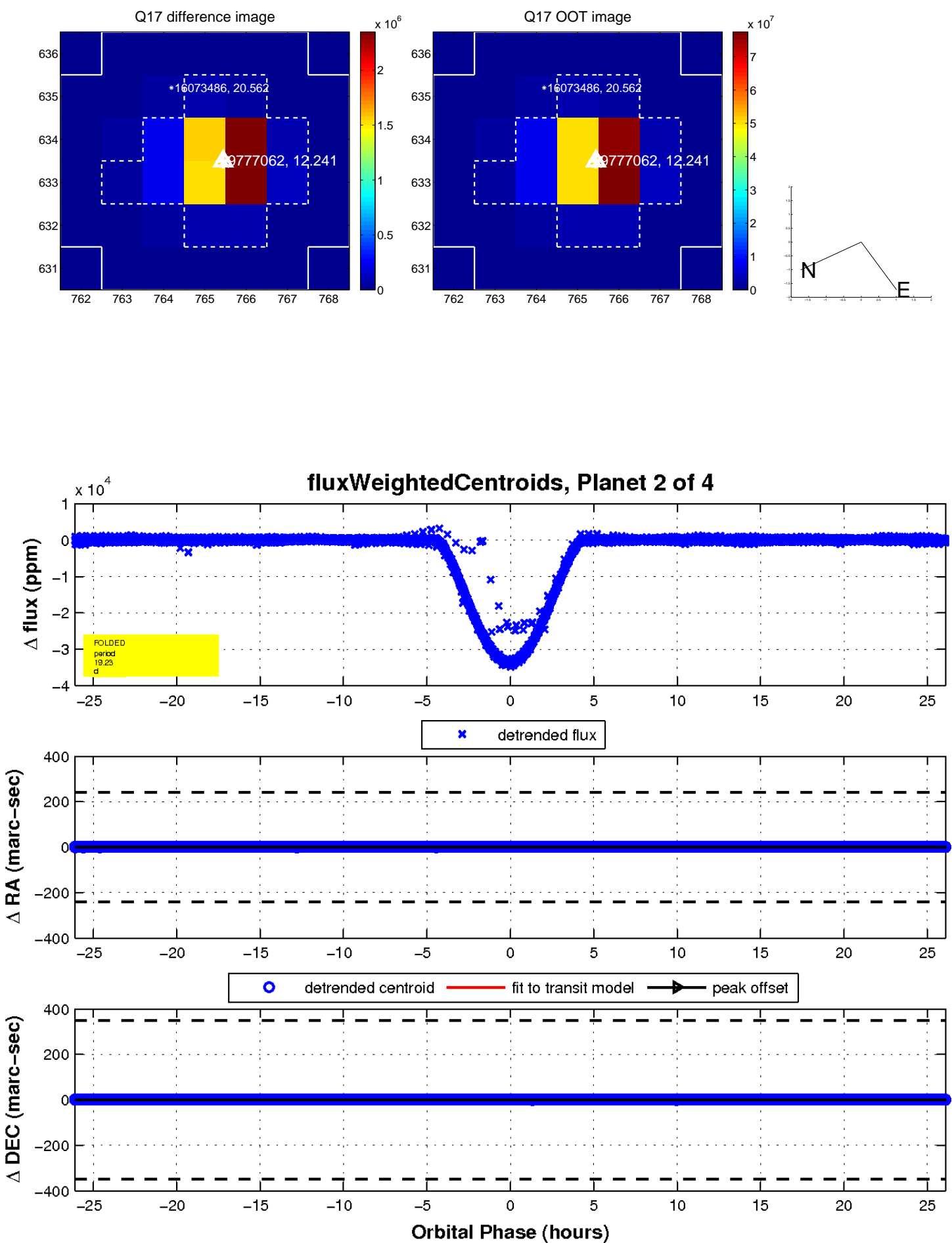
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

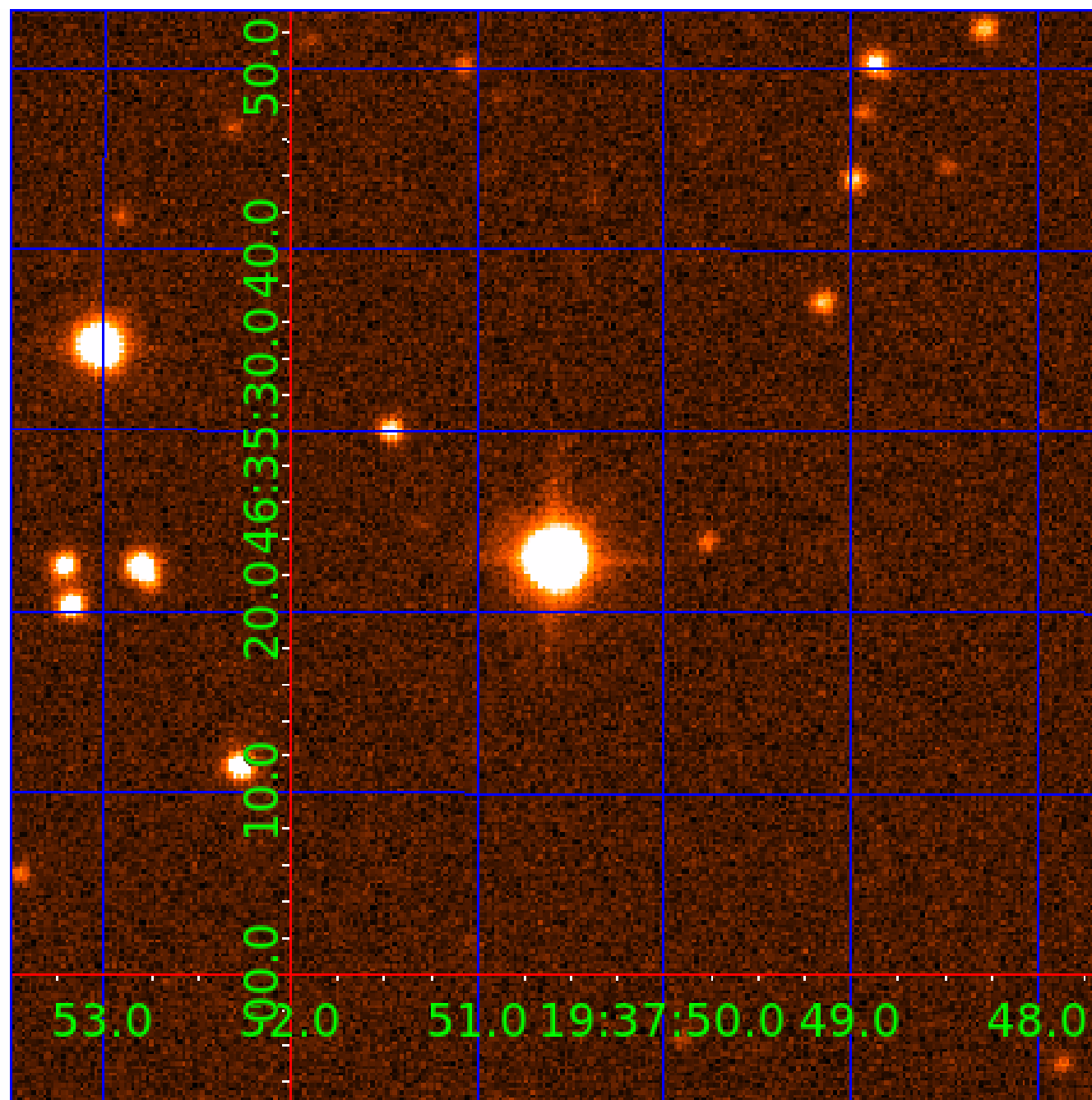


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009777062

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})
009777062-01	OBS	7229.01	19.230023	132.580350	266674.8	4.500	10816.0	-1.0	2.92	7703	81.12	811.74
009777062-02	OBS	No	19.230025	144.110884	33727.4	8.699	1299.0	1436.7	2.92	7703	91.36	811.74
009777062-03	OBS	No	351.203348	151.966233	1480.7	19.227	384.4	16.3	2.92	7703	12.55	16.88
009777062-04	OBS	No	596.033323	305.339289	8867.3	3.500	341.0	-1.0	2.92	7703	27.81	8.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009777062-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
009777062-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009777062-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009777062-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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 009777062-03

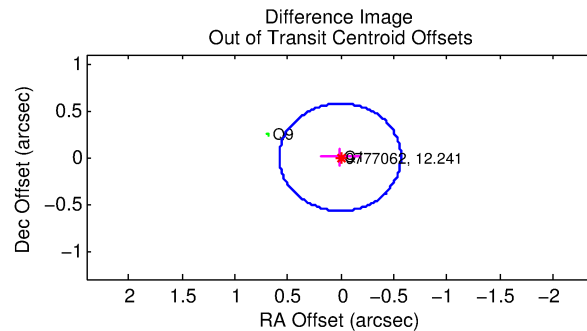
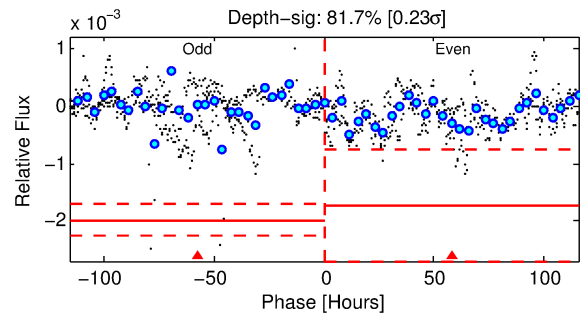
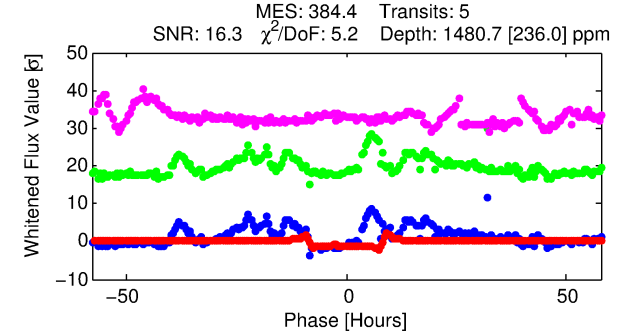
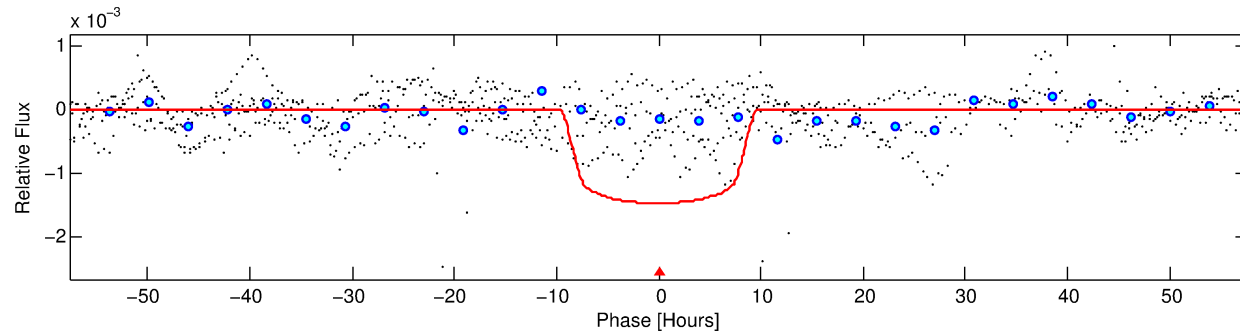
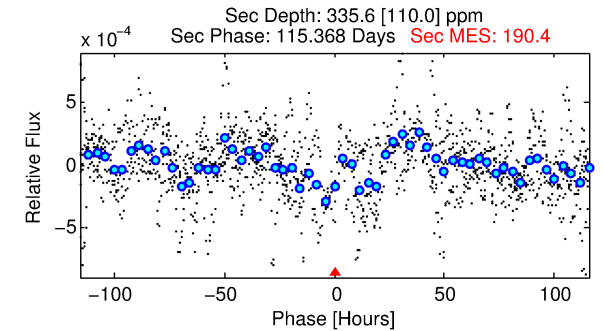
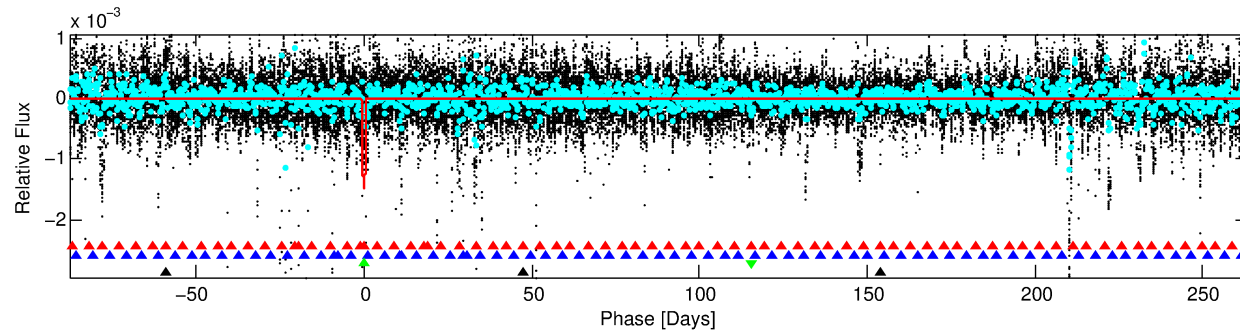
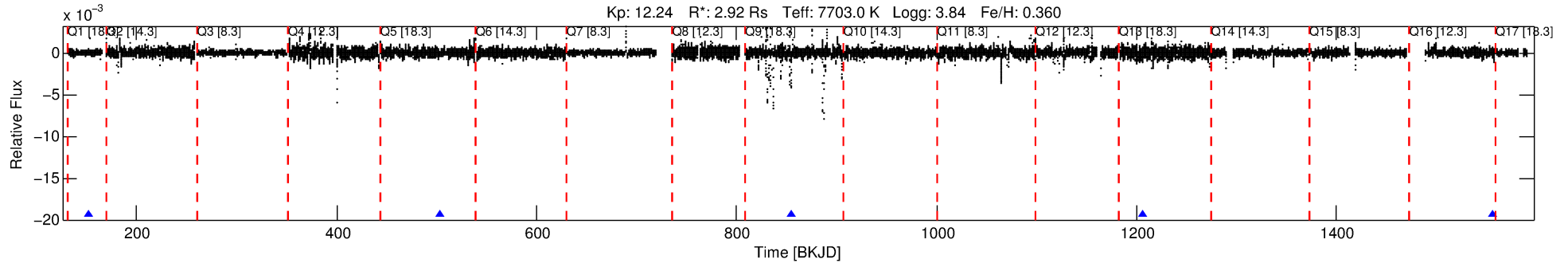
No Significant Match Found

DV One-Page Summary

KIC: 9777062 Candidate: 3 of 4 Period: 351.203 d

KOI: K07229 Corr: No Ephemeris Match

Kp: 12.24 R*: 2.92 Rs Teff: 7703.0 K Logg: 3.84 Fe/H: 0.360



DV Fit Results:

Period = 351.20335 [0.00538] d
Epoch = 151.9662 [0.0144] BKJD
Rp/R* = 0.0394 [0.0033]
a/R* = 86.68 [10.85]
b = 0.83 [0.05]
Seff = 16.88 [8.54]
Teq = 517 [65] K
Rp = 12.55 [4.36] Re
a = 1.2607 [0.3836] AU
Ag = 1863.61 [1109.02] [1.68σ]
Teffp = 5250 [546] K [8.61σ]

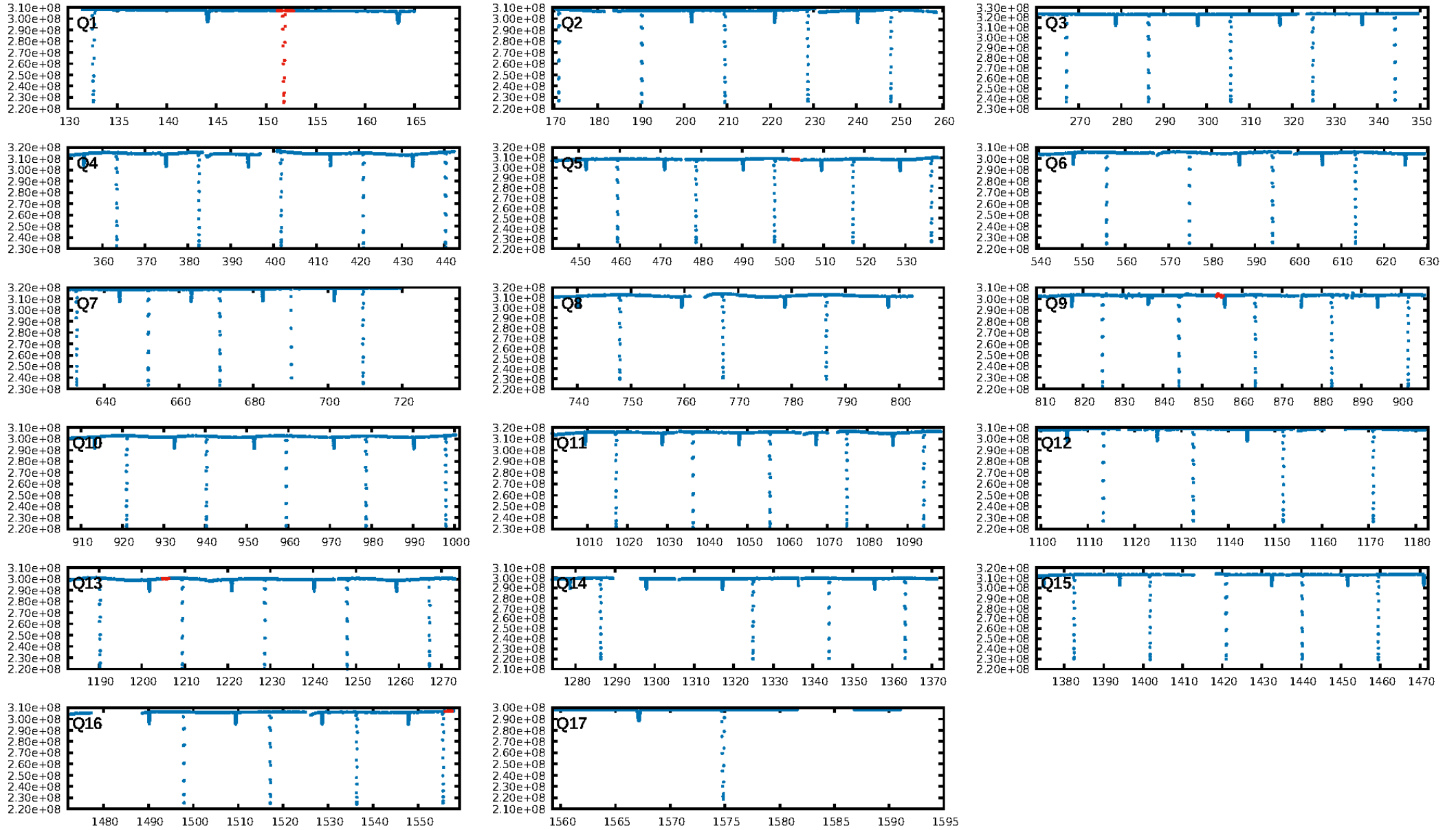
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [377.54σ]
LongPeriod-sig: 100.0% [300.67σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -59.22
Centroid-sig: 2.4%
Centroid-so: 0.096 arcsec [1.43σ]
OotOffset-rm: 0.005 arcsec [0.03σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-rm: 0.096 arcsec [0.80σ]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 0.00 [0/2]

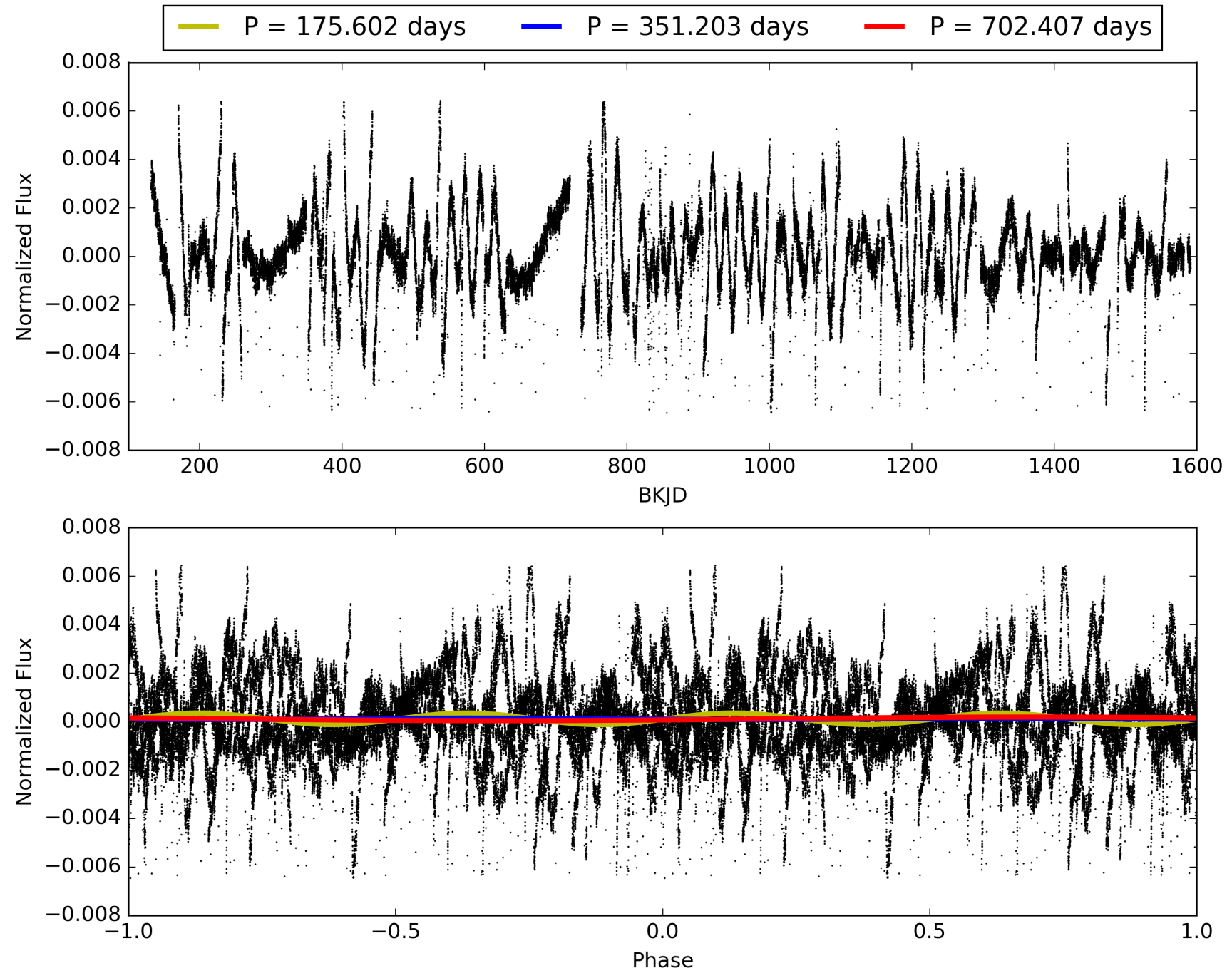
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:05:35 Z

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

TCE 009777062-03, PDC Light Curves

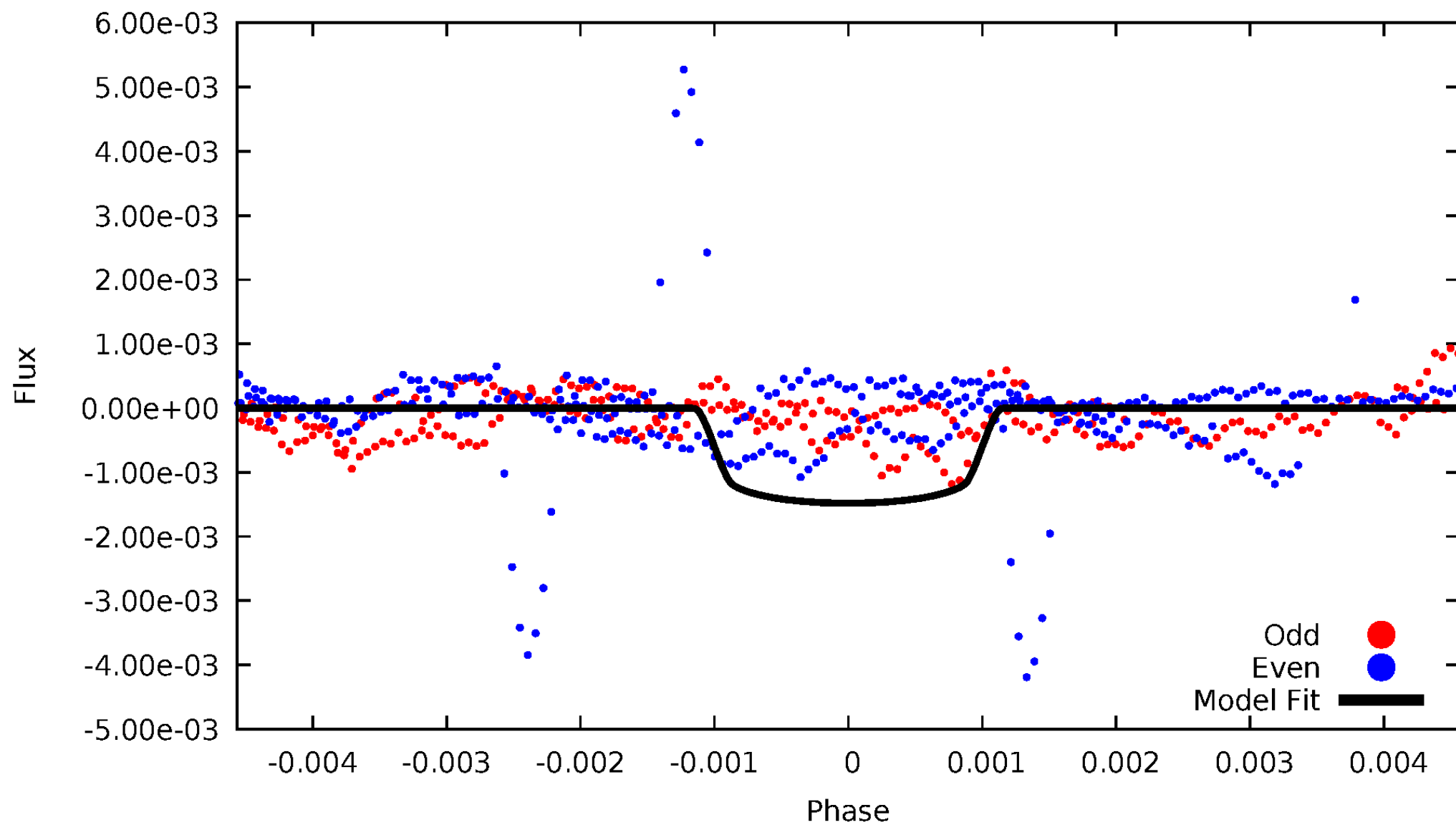


TCE 009777062-03



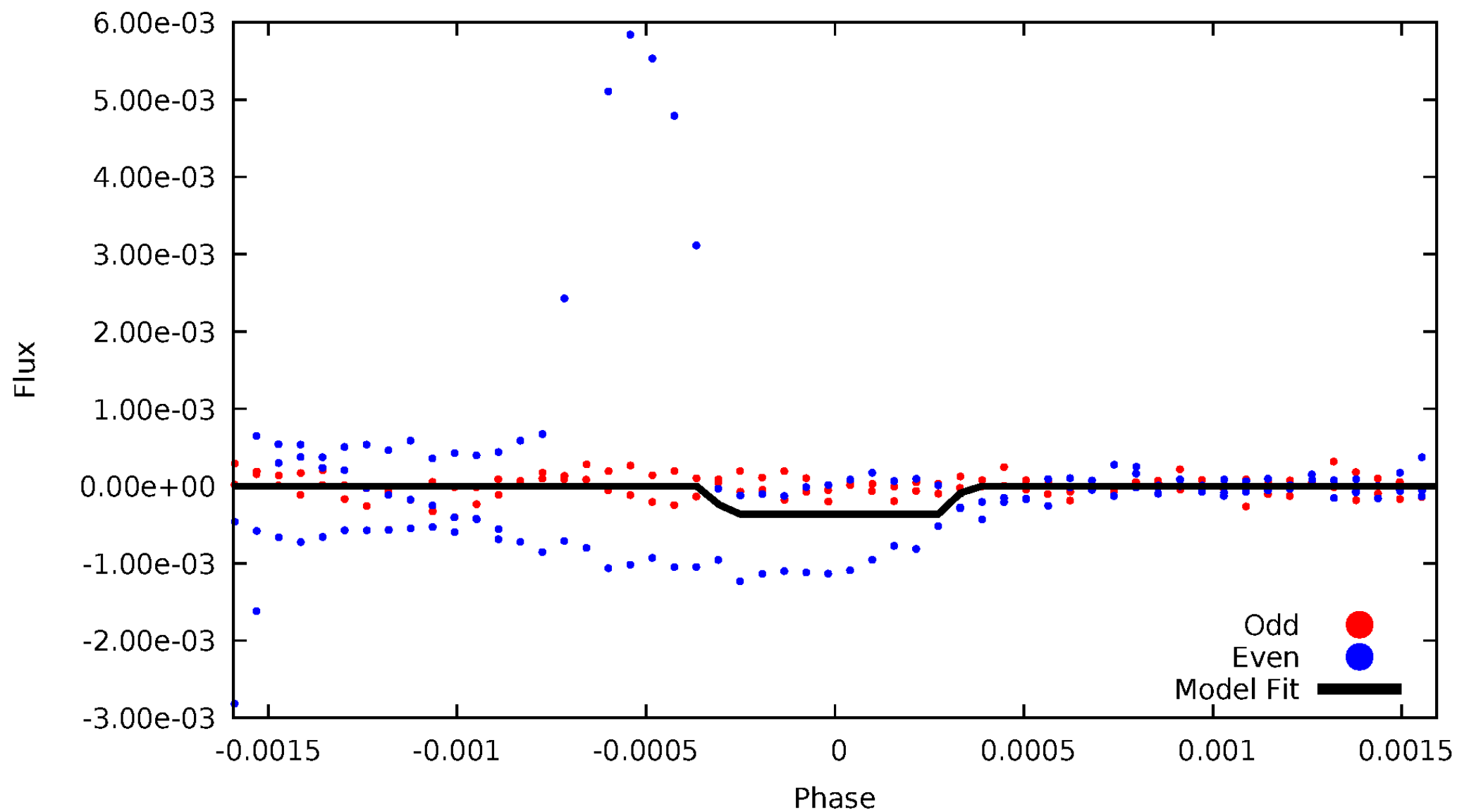
DV Odd/Even

TCE 009777062-03



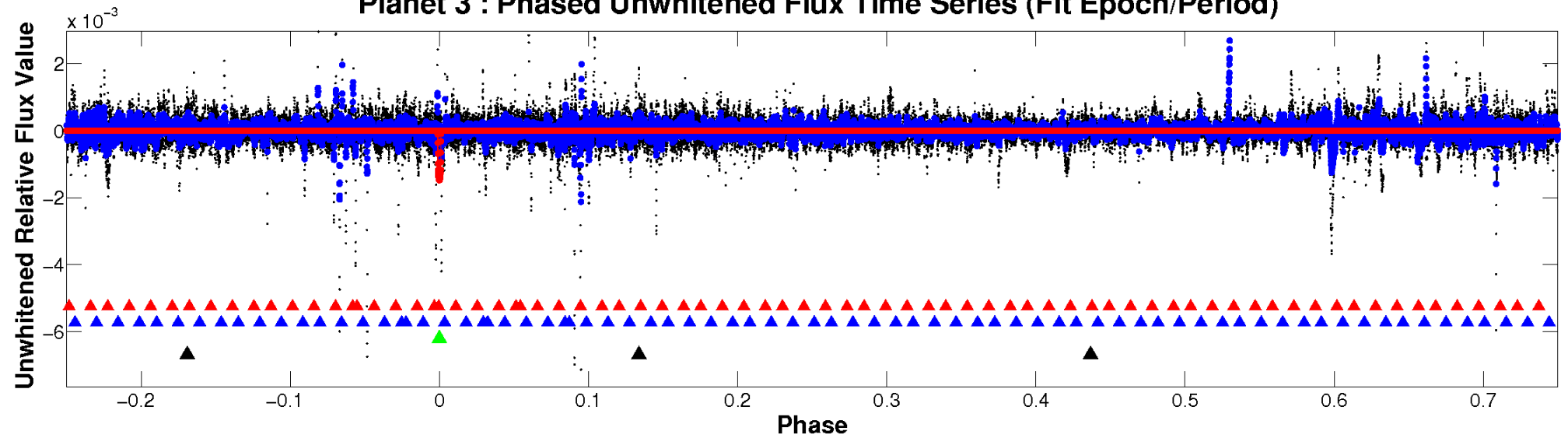
ALT Odd/Even

TCE 009777062-03

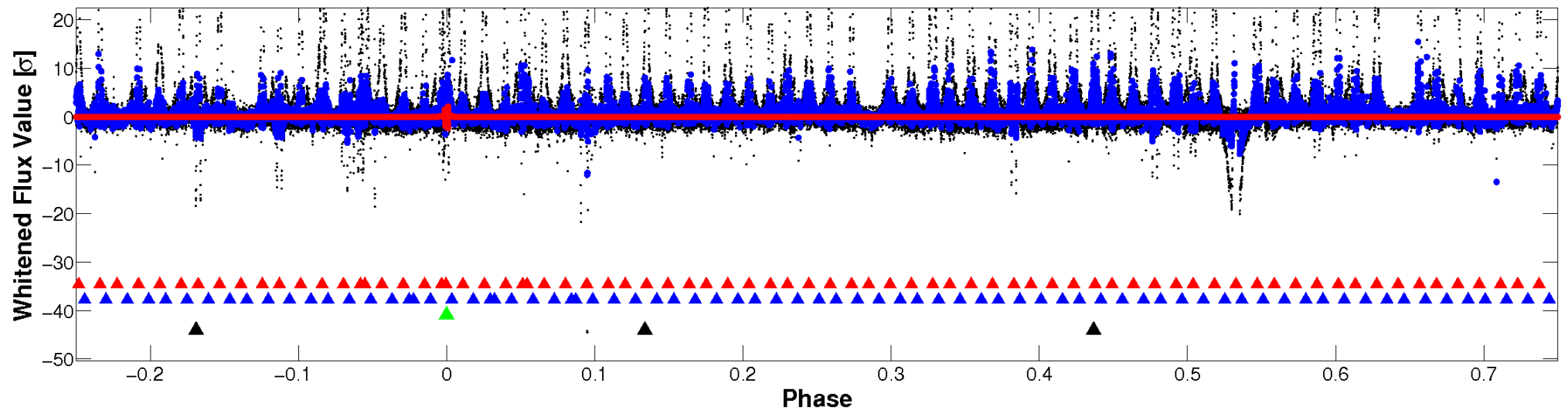


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

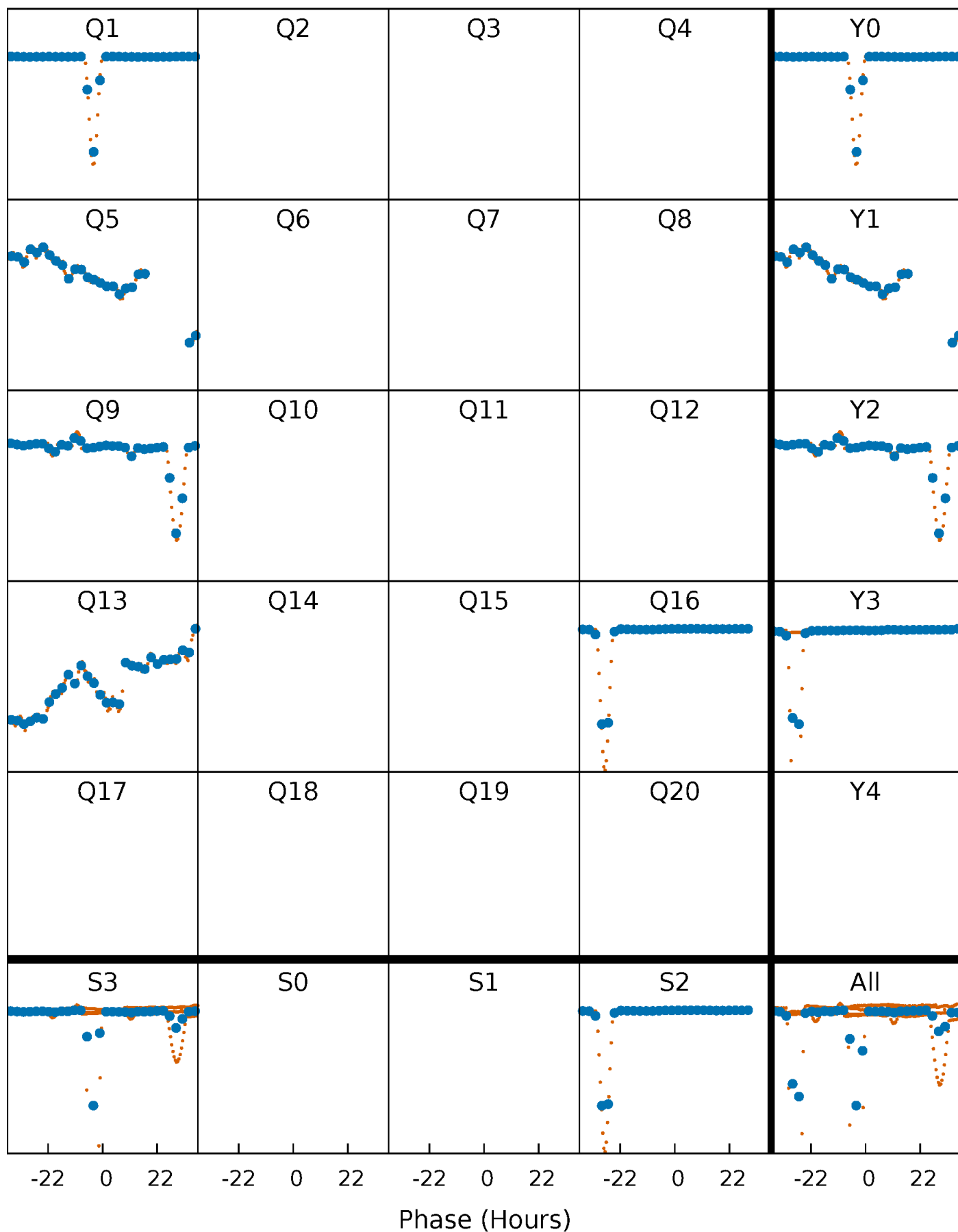


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



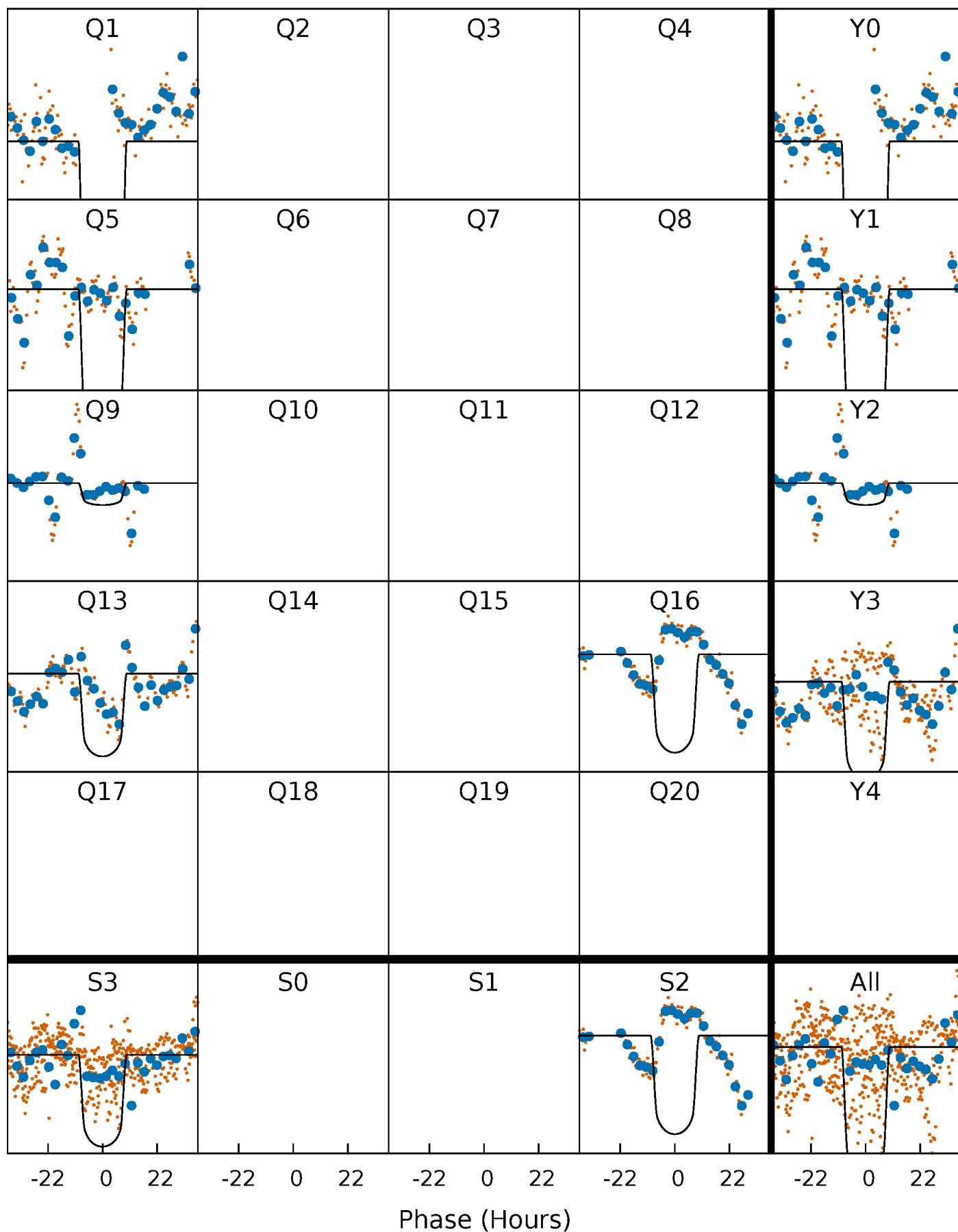
PDC Quarter-Phased Transit Curves

TCE 009777062-03 P=351.203348 Days $T_0=151.966233$ (BKJD)



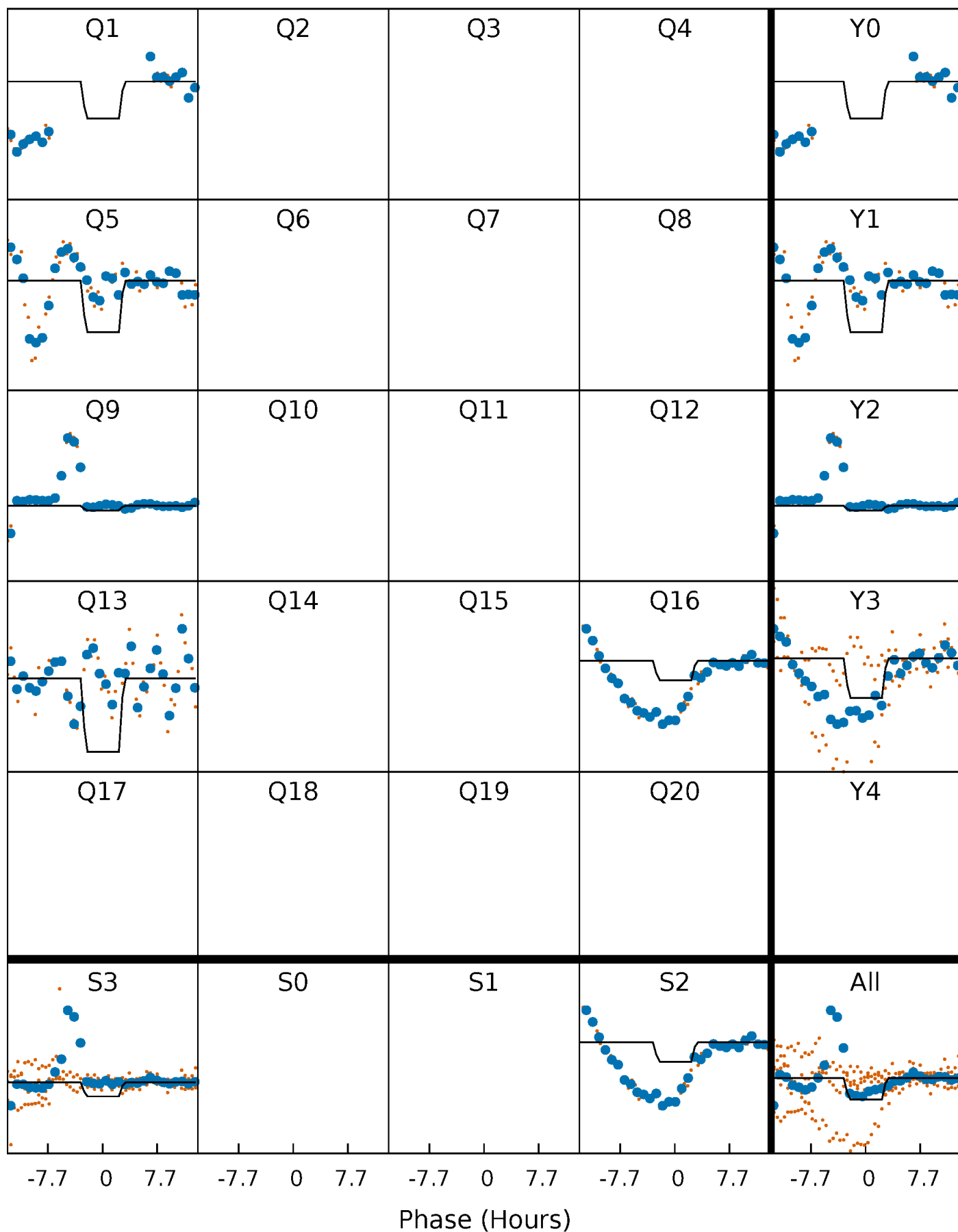
DV Quarter-Phased Transit Curves

TCE 009777062-03 $P=351.203348$ Days $T_0=151.966233$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

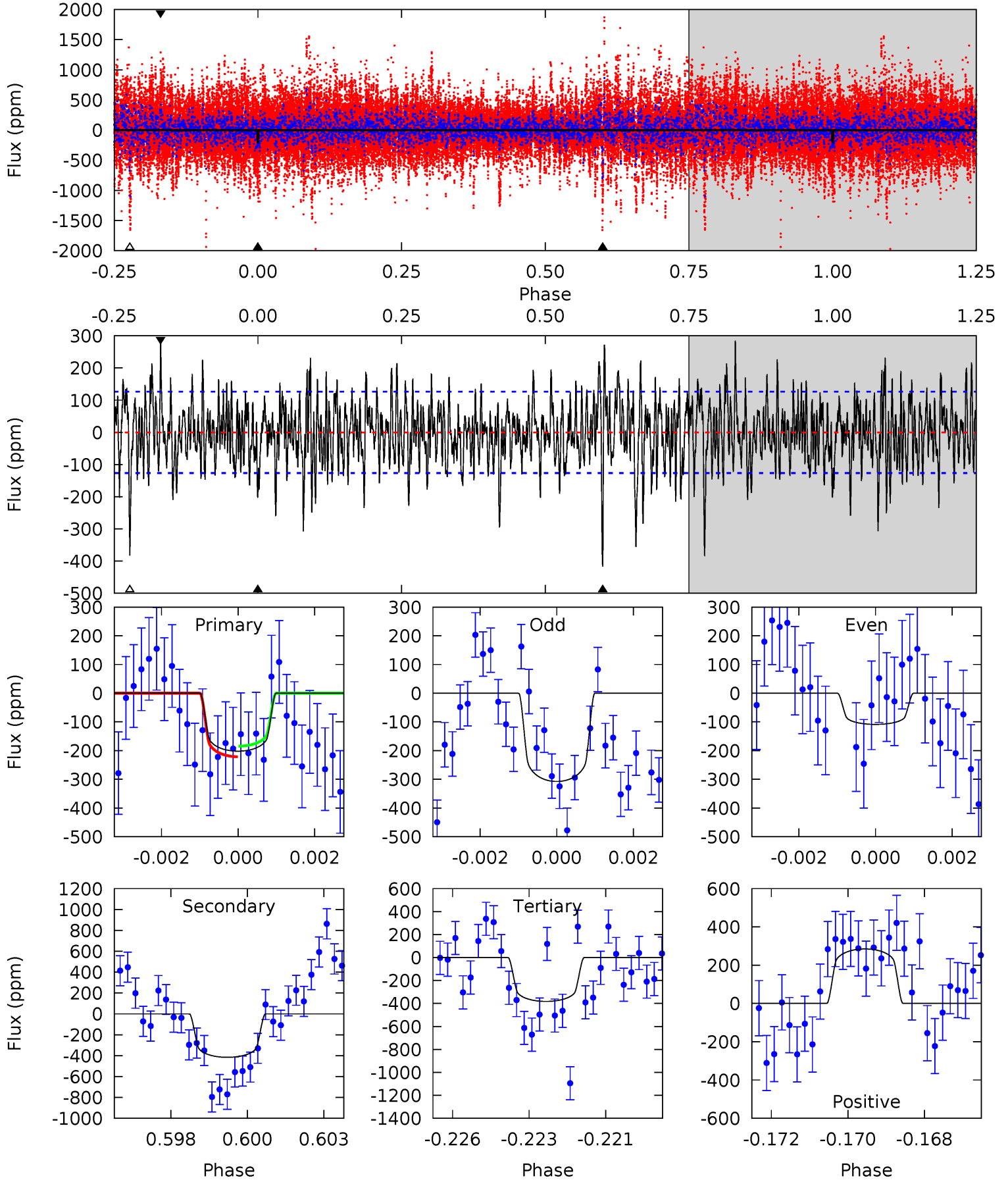
TCE 009777062-03 $P=351.150729$ Days $T_0=151.829802$ (BKJD)



DV Model-Shift Uniqueness Test

009777062-03, P = 351.203348 Days, E = 151.966233 Days

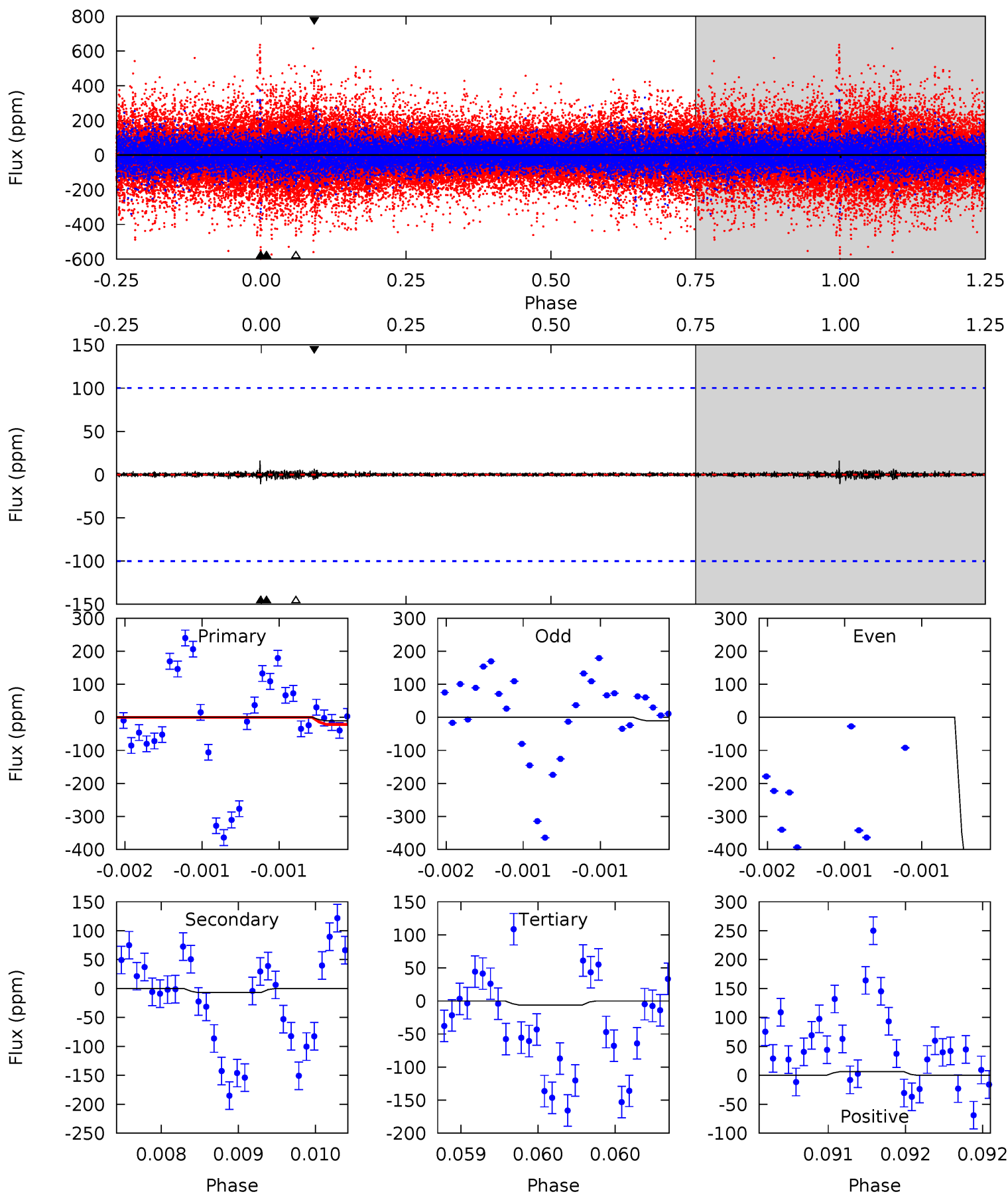
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.47	17.4	16.0	11.9	5.30	3.04	3.61	-7.56	-3.47	1.41	5.50	3.60	1.72	0.41	0.77



Alt Model-Shift Uniqueness Test

009777062-03, P = 351.150729 Days, E = 151.829802 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.60	0.39	0.34	0.36	5.53	3.41	0.07	0.26	0.24	0.04	0.02	15.3	9.99	0.60	0.58



Stellar Parameters For KIC 009777062

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7703^{+217}_{-372}	$3.844^{+0.267}_{-0.164}$	$0.360^{+0.100}_{-0.350}$	$2.916^{+0.805}_{-0.984}$	$2.165^{+0.257}_{-0.440}$	$0.123^{+0.217}_{-0.051}$
	+3%/-5%	+7%/-4%	+28%/-97%	+28%/-34%	+12%/-20%	+176%/-42%
Source	KIC0	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 009777062-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-416 ± 24	$12.35^{+2.42}_{-2.17}$	714^{+59}_{-64}	5434^{+291}_{-296}	2358^{+1052}_{-662}
Alt.	-7 ± 18	$5.89^{+1.58}_{-1.41}$	709^{+59}_{-64}	3274^{+890}_{-6935}	147^{+499}_{-444}

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 $A_{obs} \gg 1.0$

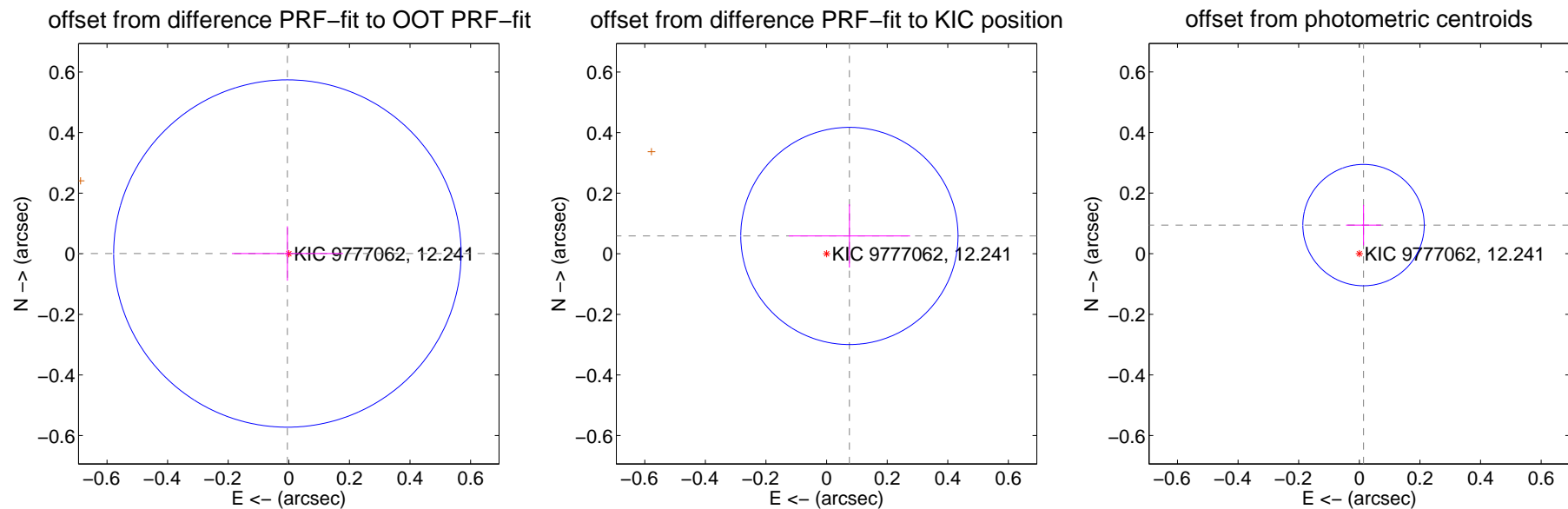
DV Centroid Data

Supplemental centroid analysis for 009777062-03. Kepler magnitude: 12.24. Transit SNR 16.27

There are 1 quarters with good PRF difference image offsets

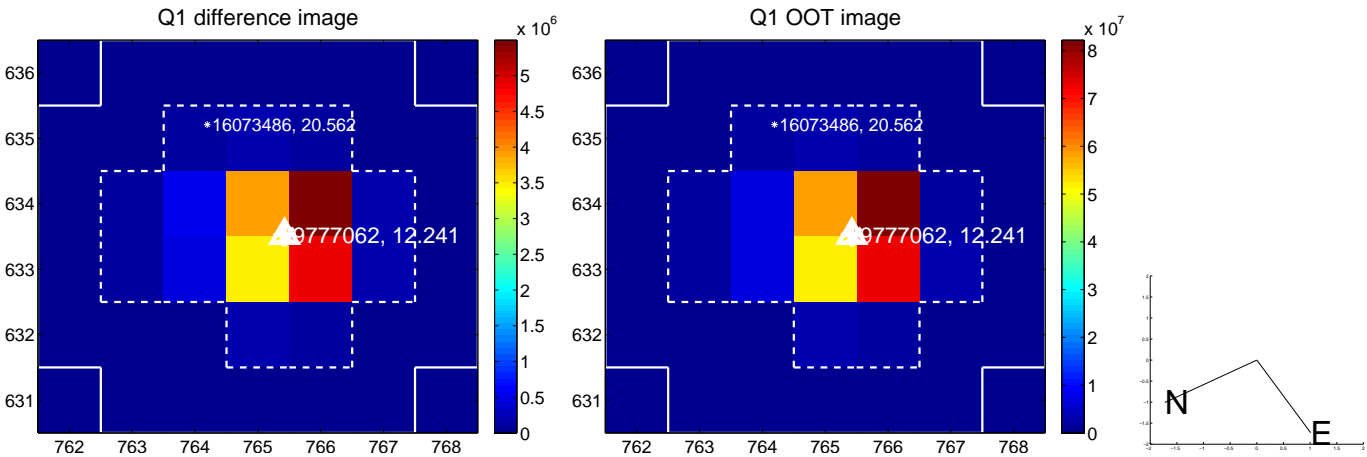
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.005 ± 0.191	0.03	0.005 ± 0.183	0.001 ± 0.090
PRF-fit source offset from KIC position	0.096 ± 0.120	0.80	-0.075 ± 0.200	0.059 ± 0.104
photometric centroid source offset	0.10 ± 0.07	1.43	-0.01 ± 0.06	0.09 ± 0.07



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.

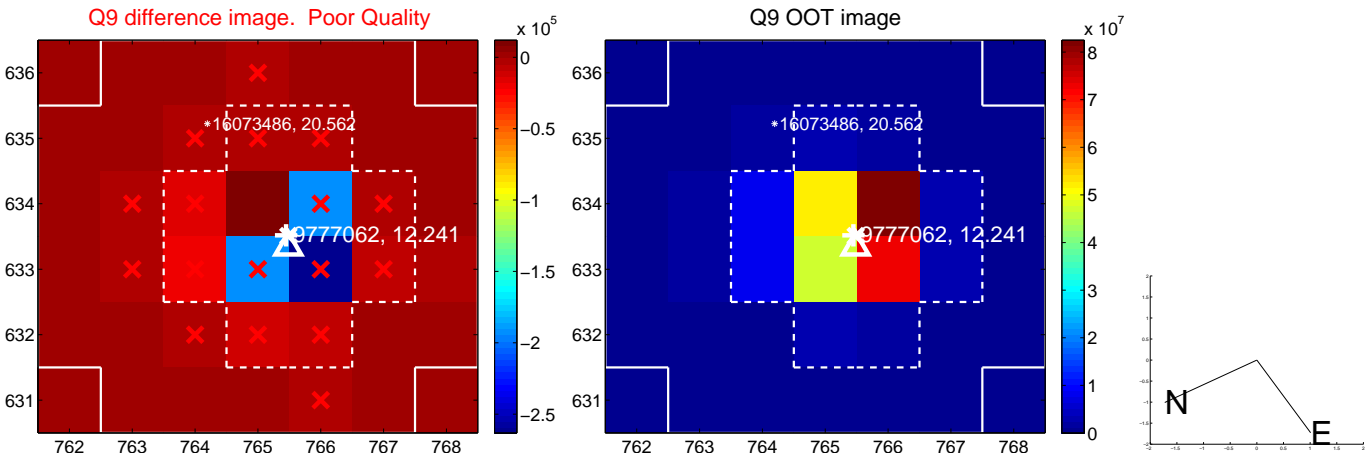
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



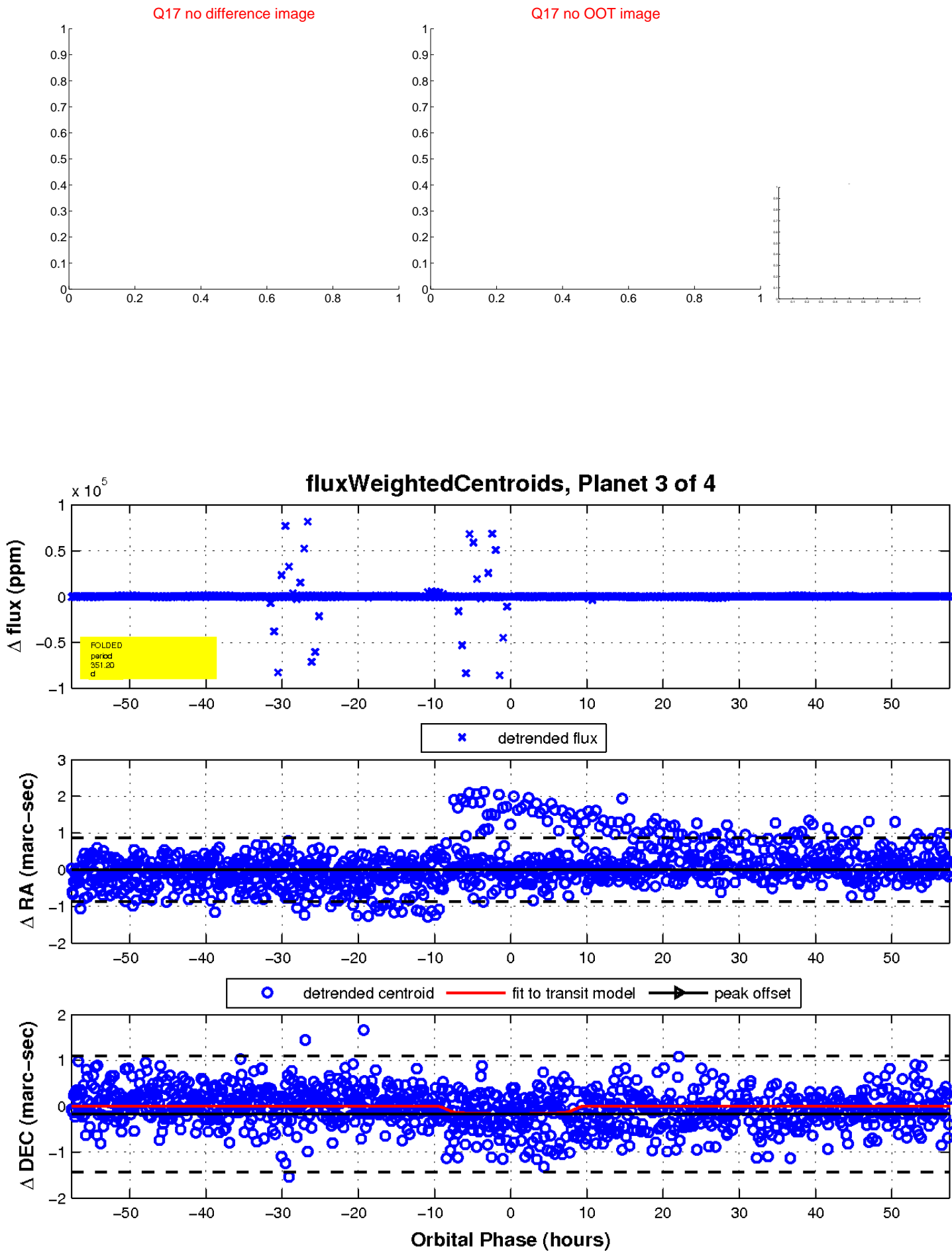
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

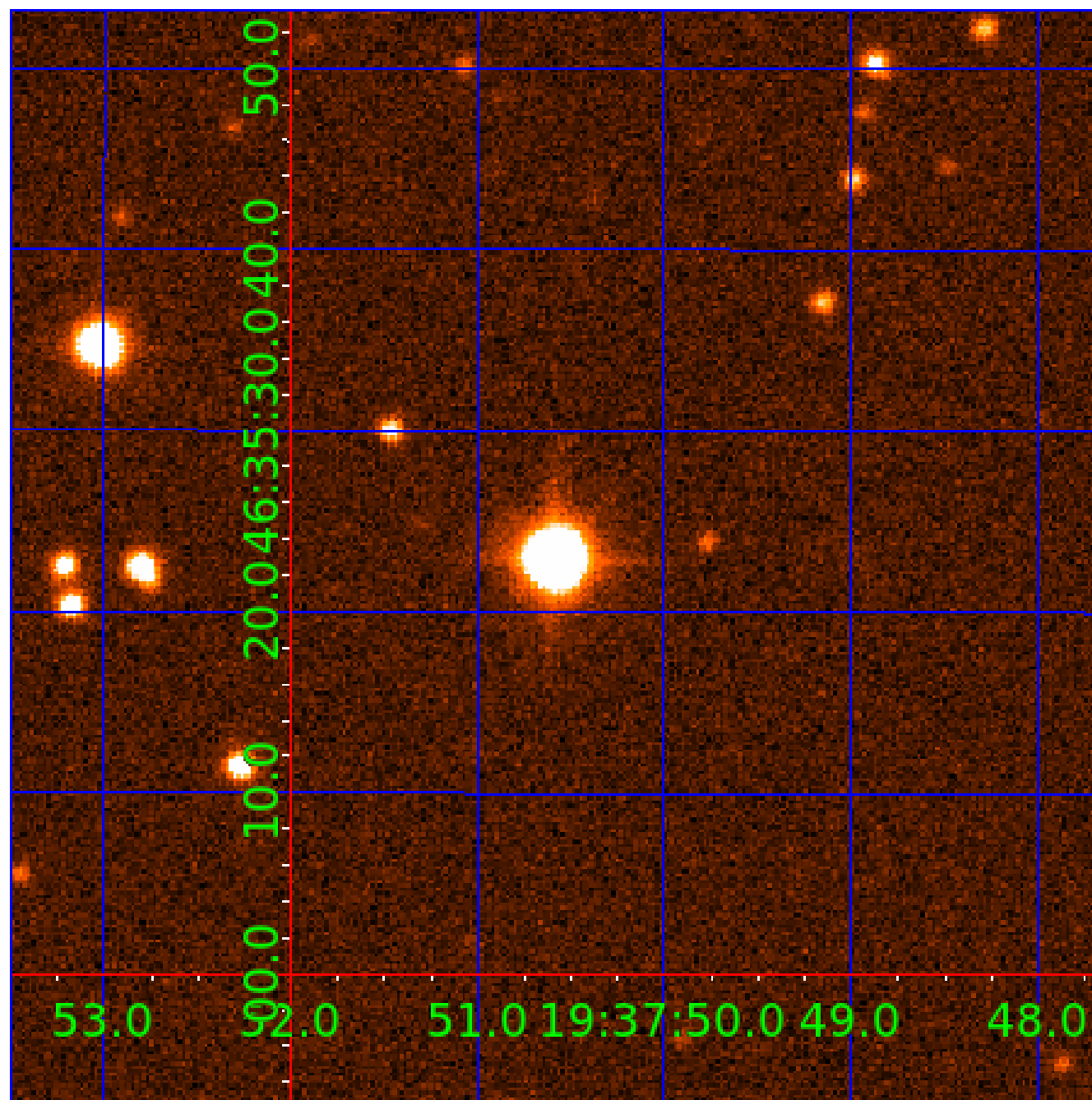


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009777062

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})
009777062-01	OBS	7229.01	19.230023	132.580350	266674.8	4.500	10816.0	-1.0	2.92	7703	81.12	811.74
009777062-02	OBS	No	19.230025	144.110884	33727.4	8.699	1299.0	1436.7	2.92	7703	91.36	811.74
009777062-03	OBS	No	351.203348	151.966233	1480.7	19.227	384.4	16.3	2.92	7703	12.55	16.88
009777062-04	OBS	No	596.033323	305.339289	8867.3	3.500	341.0	-1.0	2.92	7703	27.81	8.34

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009777062-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_ALT—MOD_ODDEVEN_ALT—HAS_SEC_TCE—CENT_NOFITS
009777062-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
009777062-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009777062-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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 009777062-04

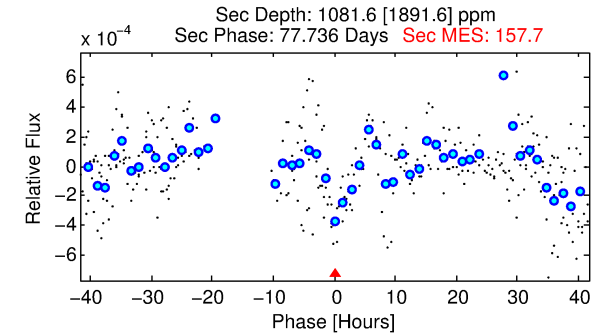
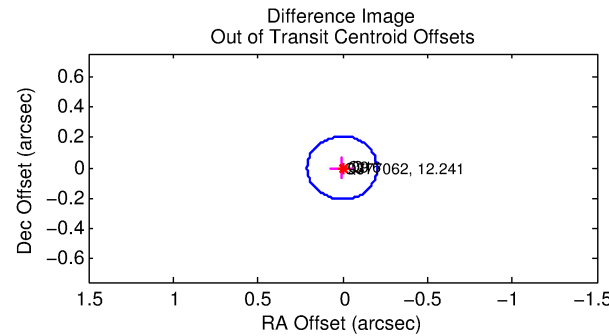
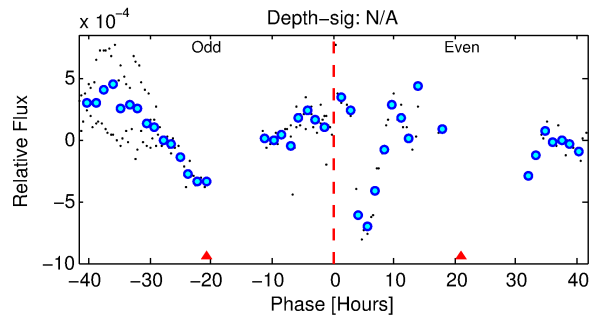
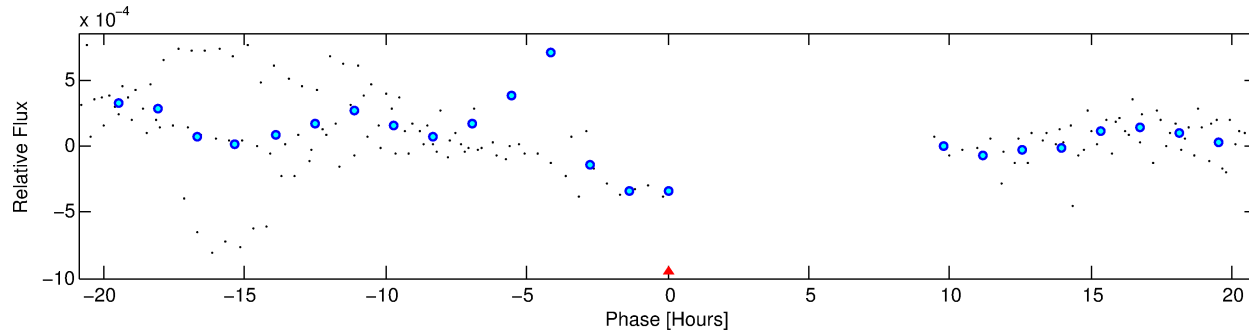
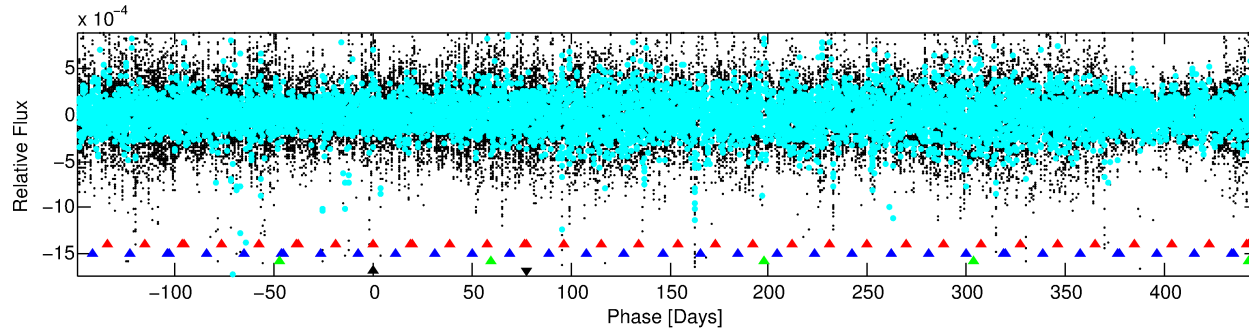
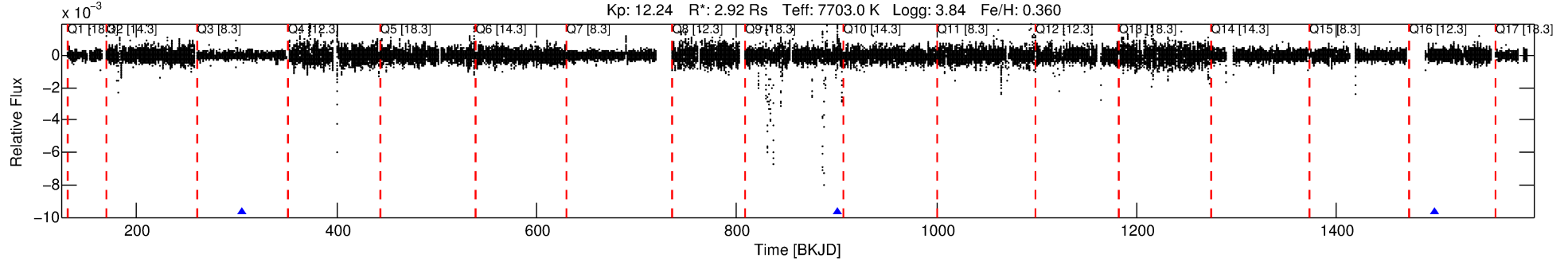
No Significant Match Found

DV One-Page Summary

KIC: 9777062 Candidate: 4 of 4 Period: 596.033 d

KOI: K07229 Corr: No Ephemeris Match

Kp: 12.24 R*: 2.92 Rs Teff: 7703.0 K Logg: 3.84 Fe/H: 0.360



TPS TCE Results:

Period = 596.03332 d
Epoch = 305.3393 BKJD

DV fit results are unavailable

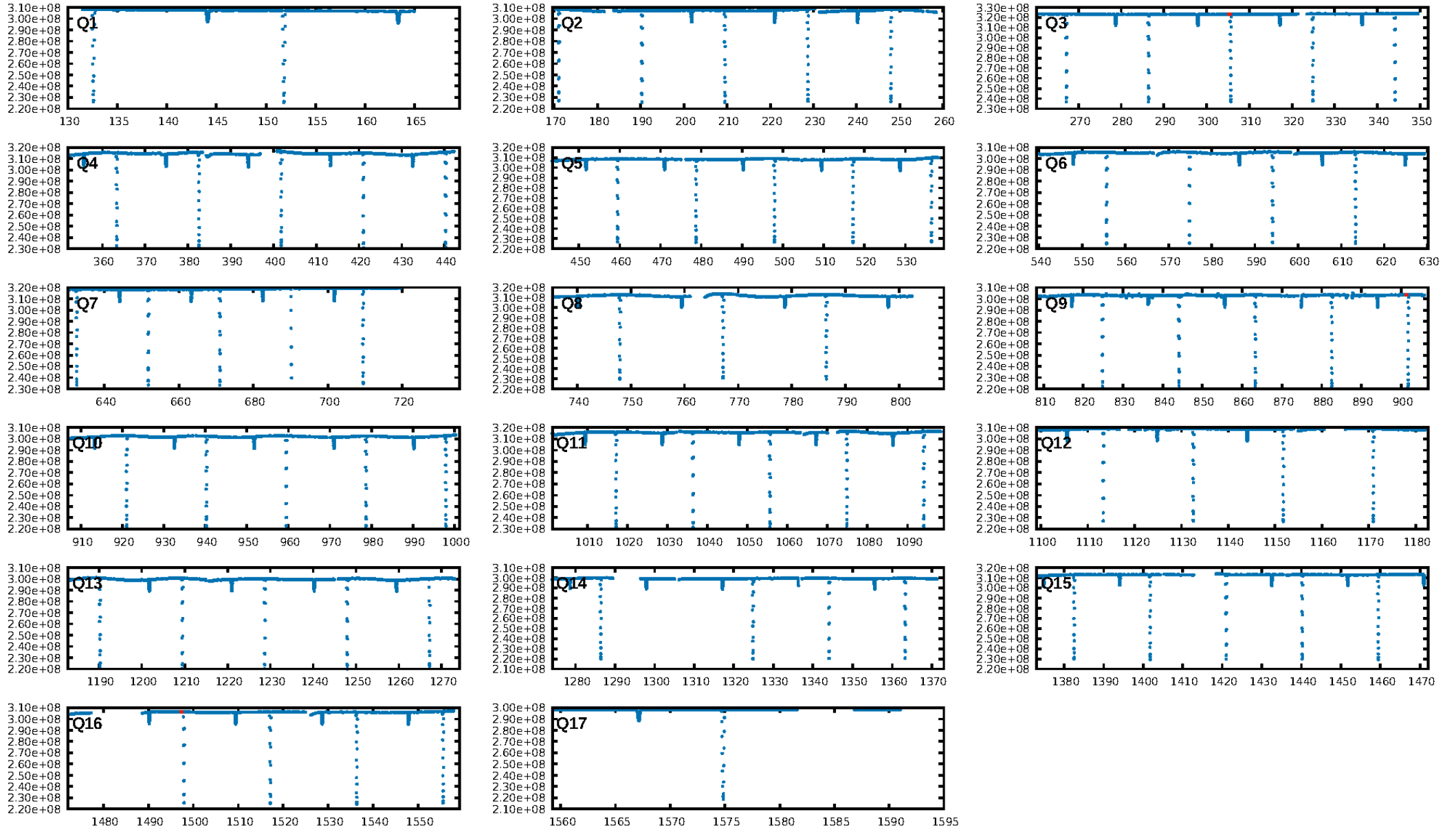
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [300.67σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.6845
Centroid-sig: 0.1%
Centroid-so: 2.297 arcsec [6.68σ]
OotOffset-rm: 0.004 arcsec [0.06σ]
KicOffset-rm: 0.035 arcsec [0.44σ]
OotOffset-st: 0/1/1/1 [3]
KicOffset-st: 0/1/1/1 [3]
DiffImageQuality-fgm: 0.33 [1/3]
DiffImageOverlap-fno: 0.00 [0/3]

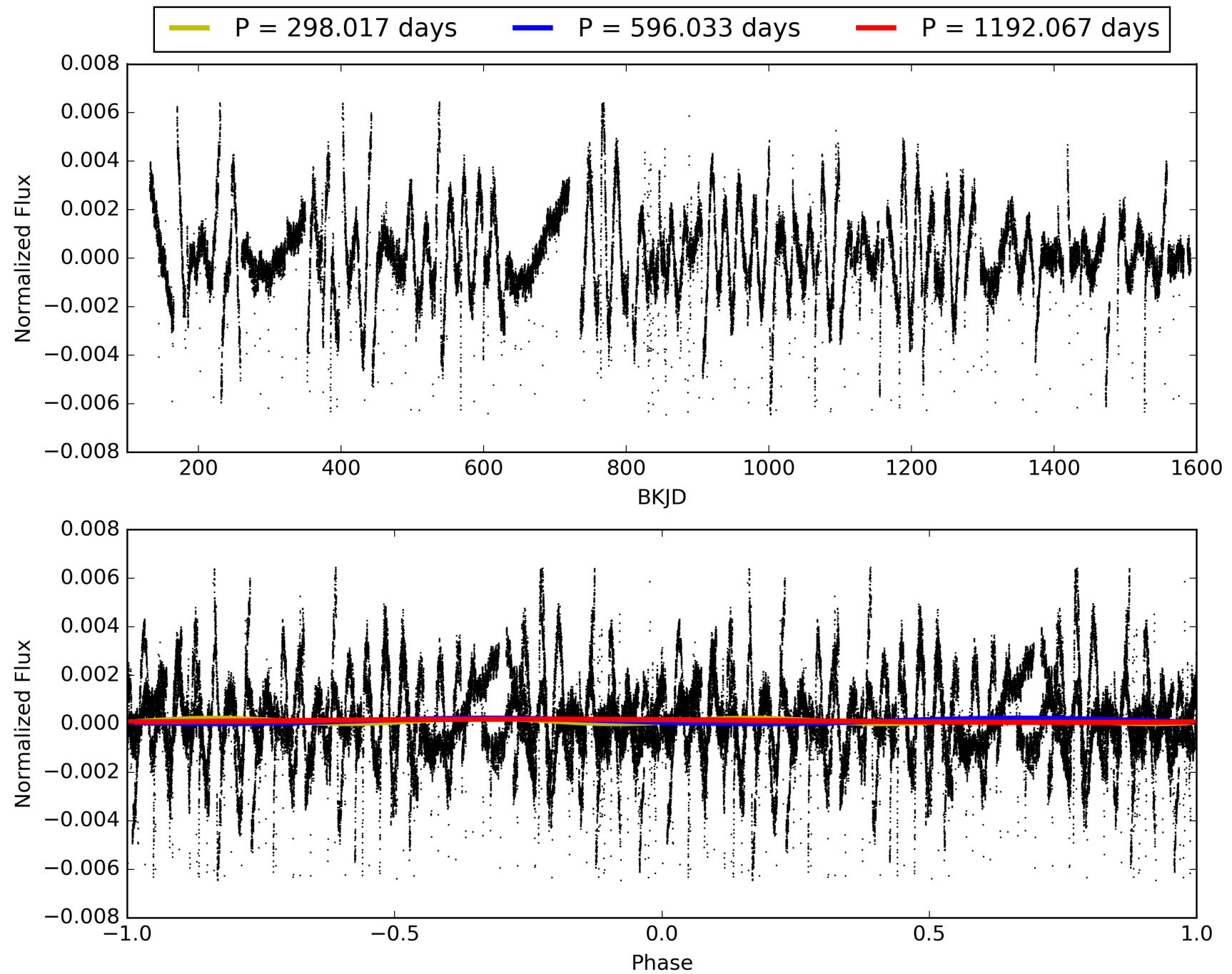
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:05:48 Z

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

TCE 009777062-04, PDC Light Curves

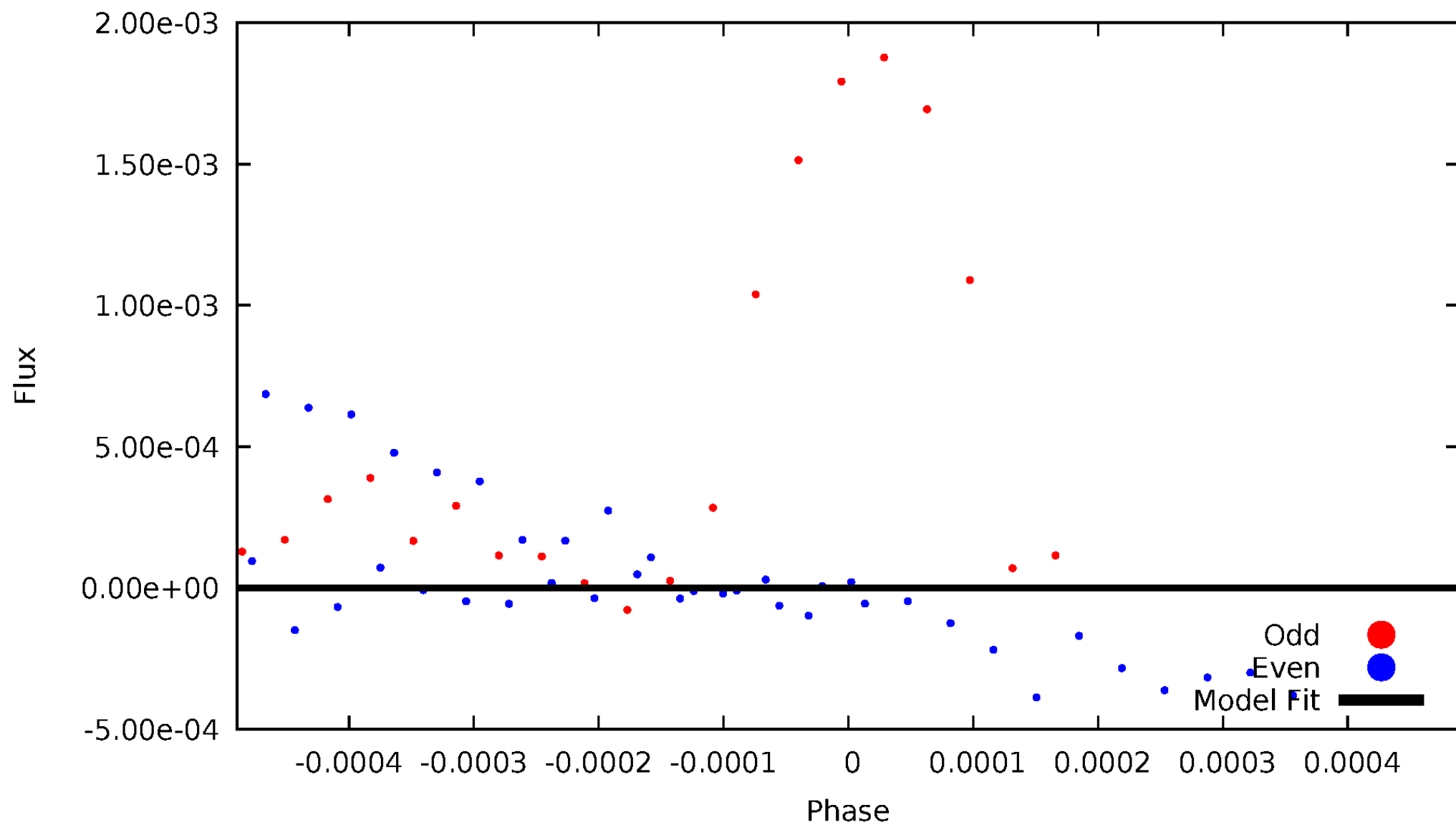


TCE 009777062-04



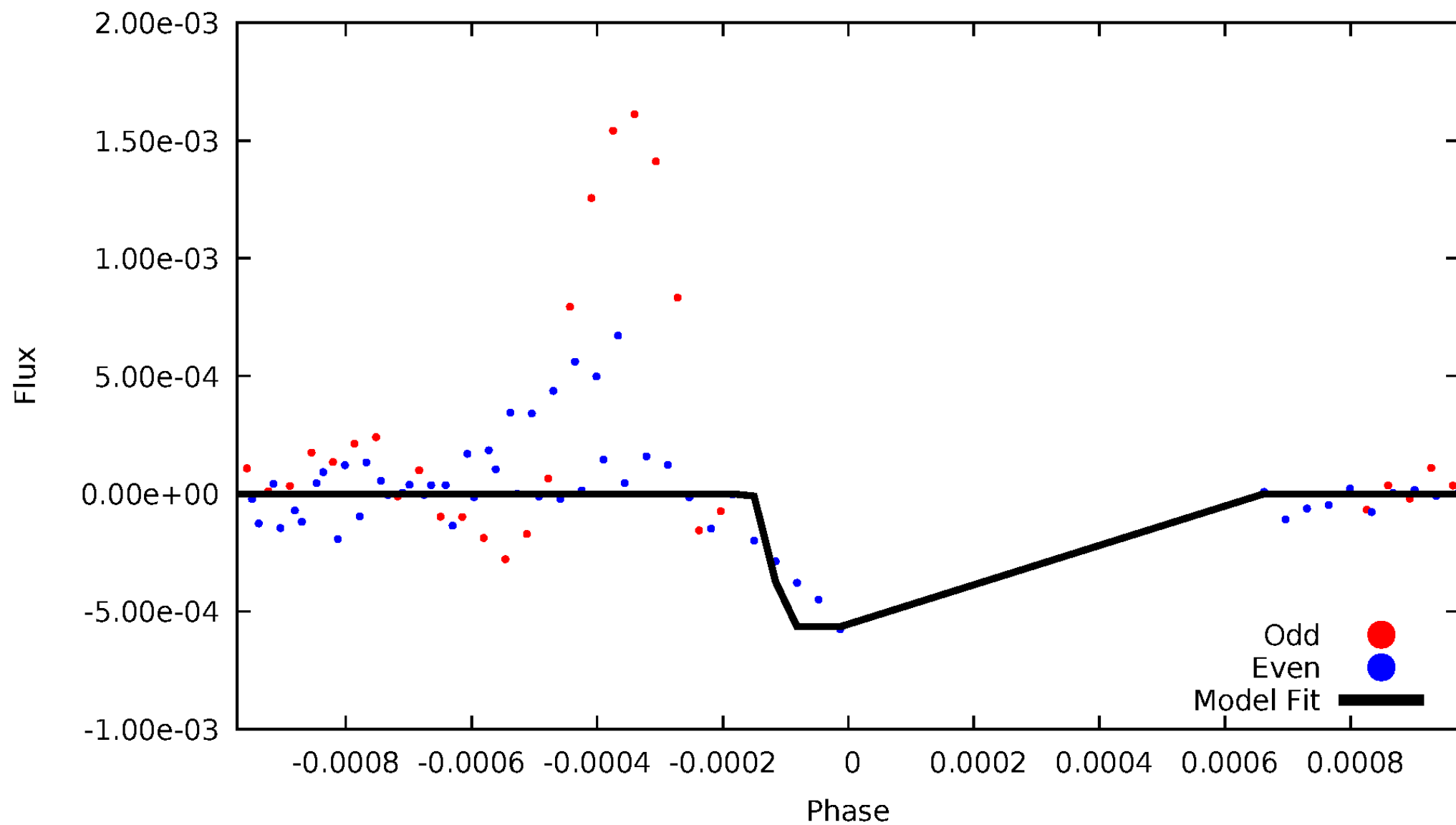
DV Odd/Even

TCE 009777062-04



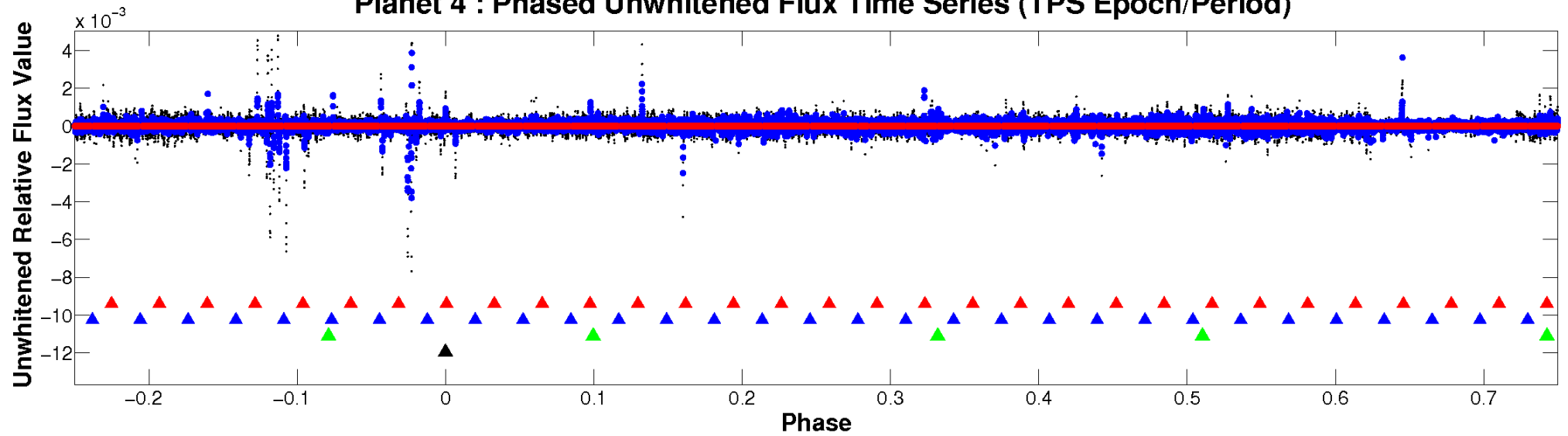
ALT Odd/Even

TCE 009777062-04



Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)

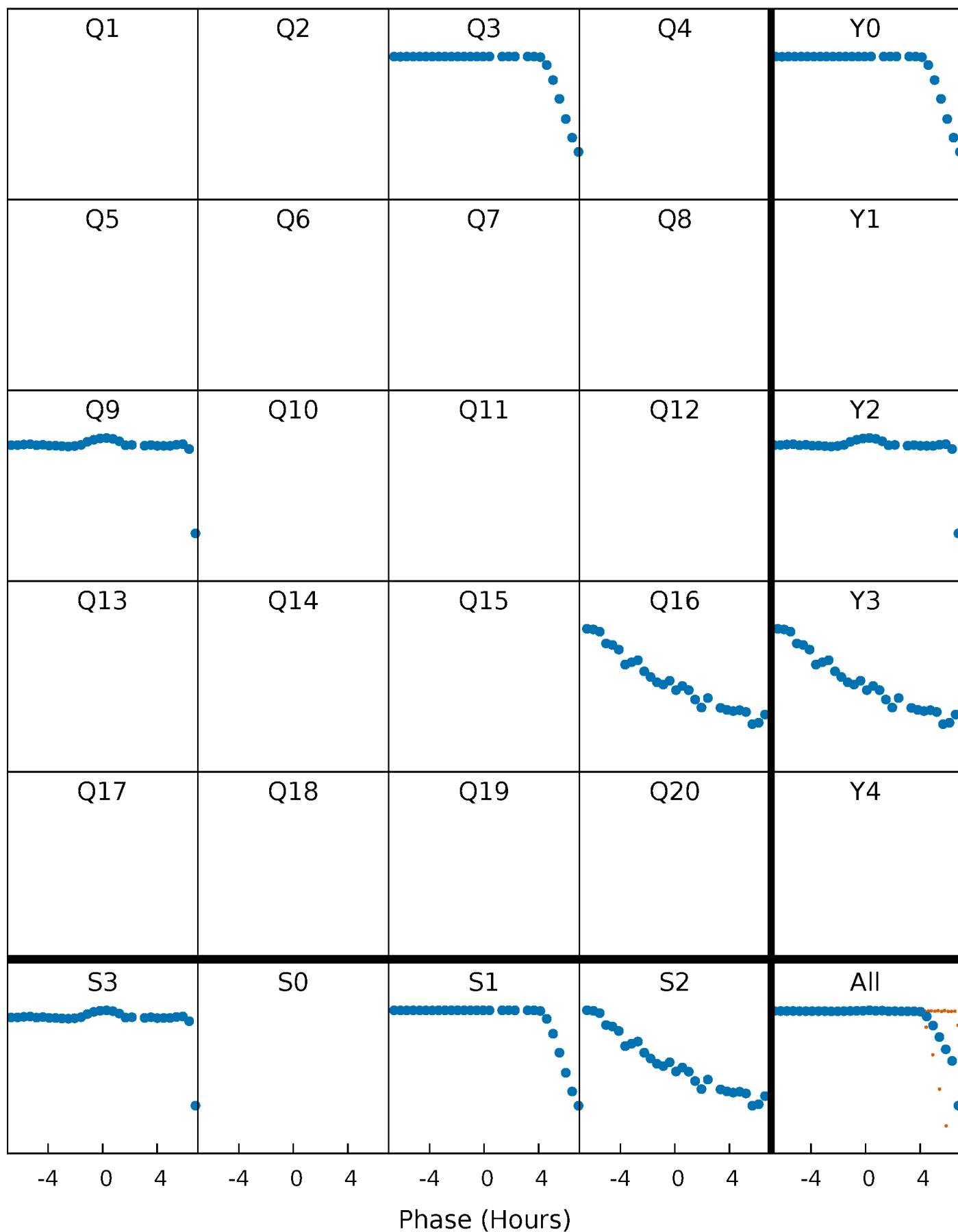


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



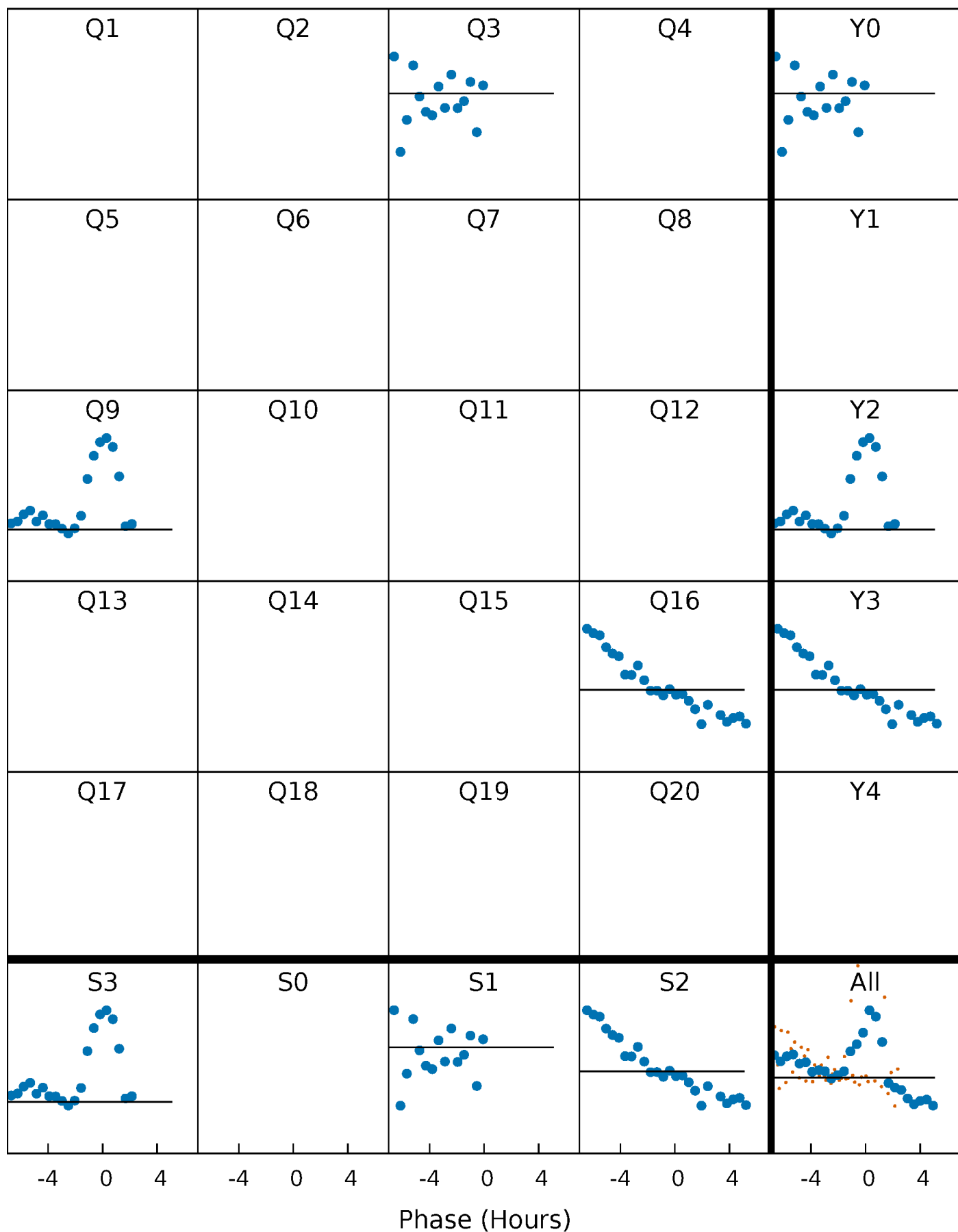
PDC Quarter-Phased Transit Curves

TCE 009777062-04 P=596.033323 Days $T_0=305.339289$ (BKJD)



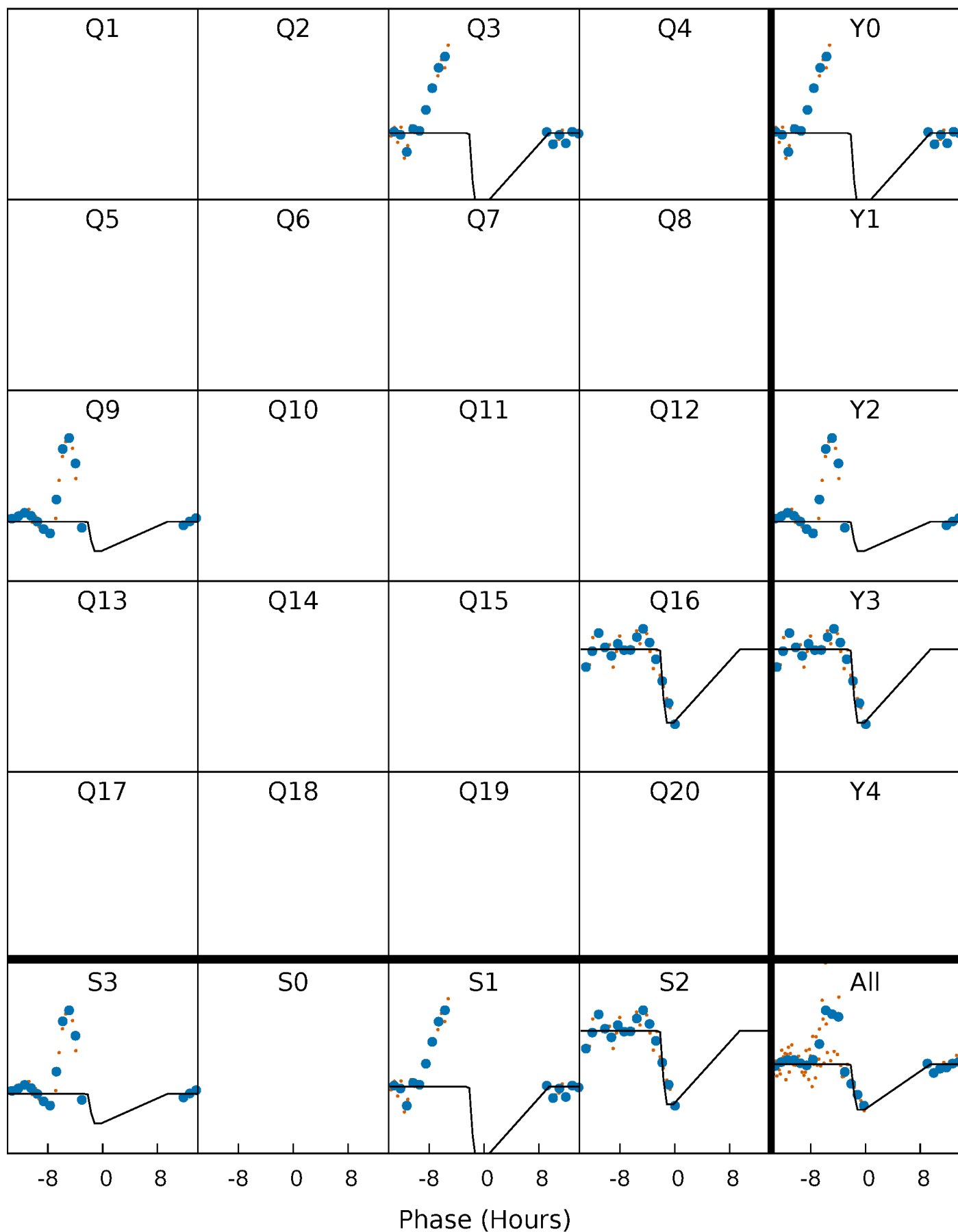
DV Quarter-Phased Transit Curves

TCE 009777062-04 $P=596.033323$ Days $T_0=305.339289$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

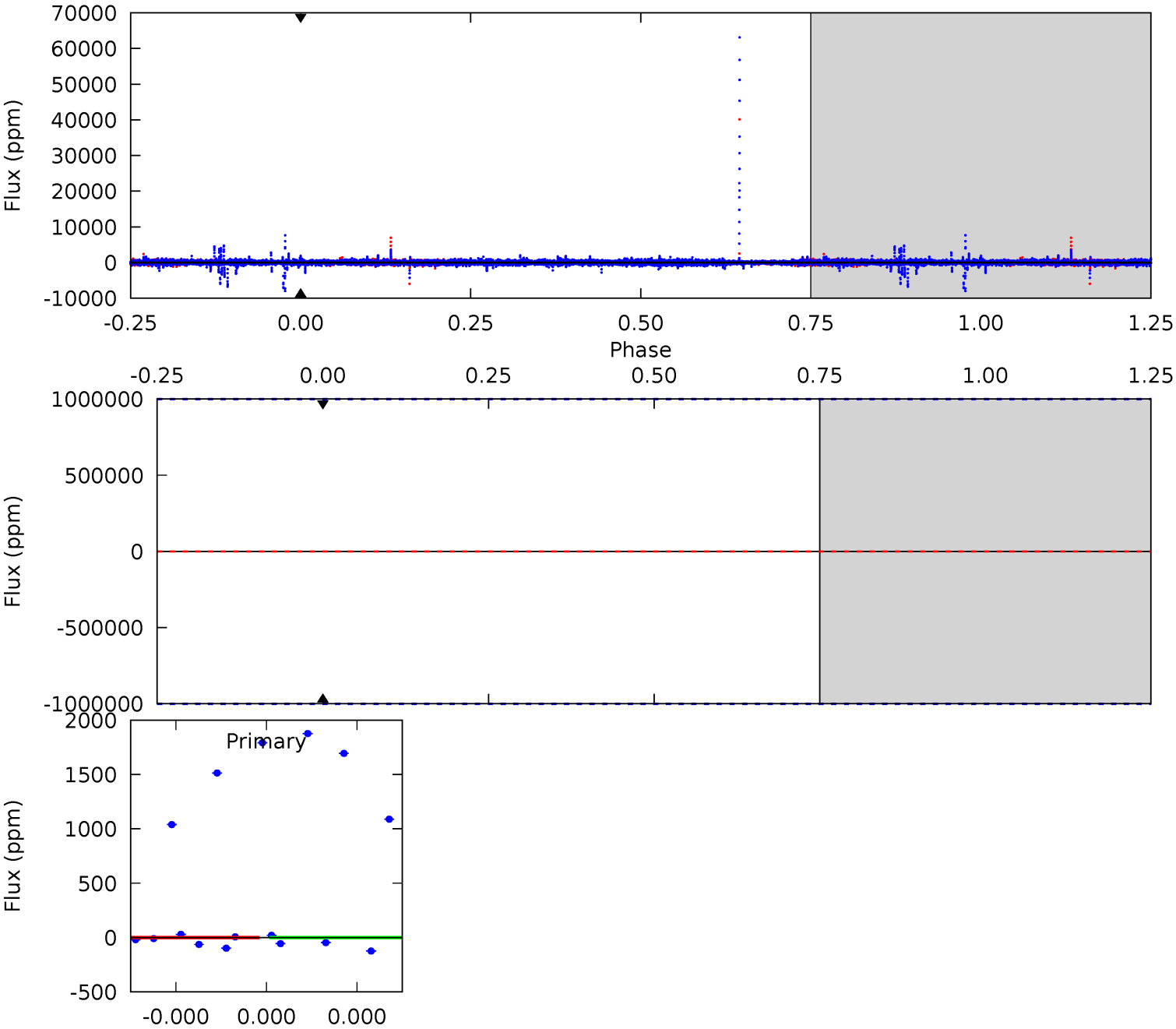
TCE 009777062-04 P=596.033323 Days $T_0=305.559313$ (BKJD)



DV Model-Shift Uniqueness Test

009777062-04, P = 596.033323 Days, E = 305.339289 Days

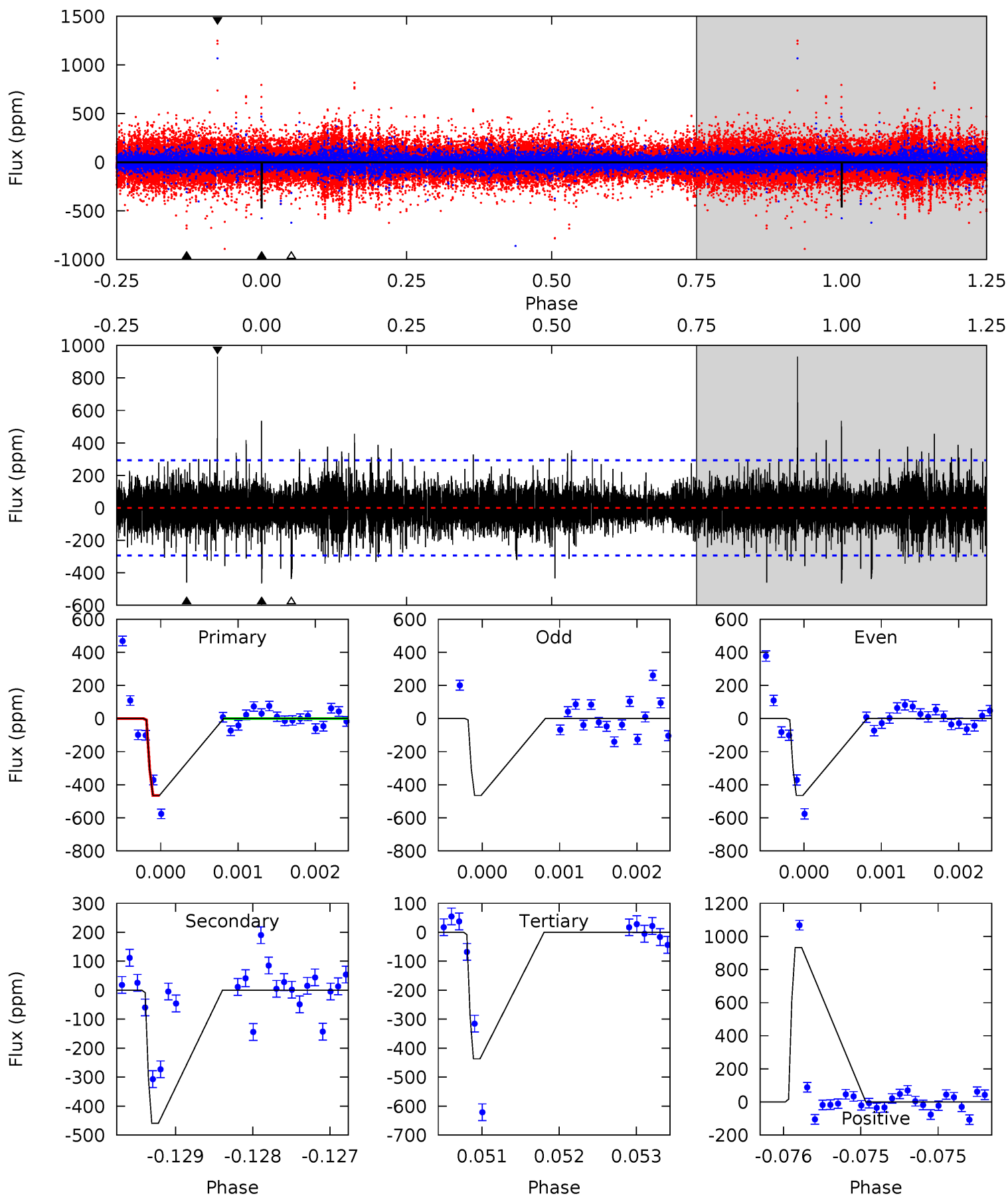
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009777062-04, P = 596.033323 Days, E = 305.559313 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.69	8.60	8.18	17.4	5.49	3.35	1.23	0.51	-8.75	0.42	-8.84	0.00	0	0.67	0



Stellar Parameters For KIC 009777062

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7703^{+217}_{-372}	$3.844^{+0.267}_{-0.164}$	$0.360^{+0.100}_{-0.350}$	$2.916^{+0.805}_{-0.984}$	$2.165^{+0.257}_{-0.440}$	$0.123^{+0.217}_{-0.051}$
	+3%/-5%	+7%/-4%	+28%/-97%	+28%/-34%	+12%/-20%	+176%/-42%
Source	KIC0	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 009777062-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$32.32^{+31.14}_{-21.17}$	595^{+47}_{-55}	-4429^{+27783}_{-19544}	$-1397.301^{+278344.168}_{-257902.448}$
Alt.	-460 ± 53	$24.00^{+24.54}_{-16.36}$	595^{+45}_{-57}	4134^{+2681}_{-840}	1360^{+12817}_{-1033}

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

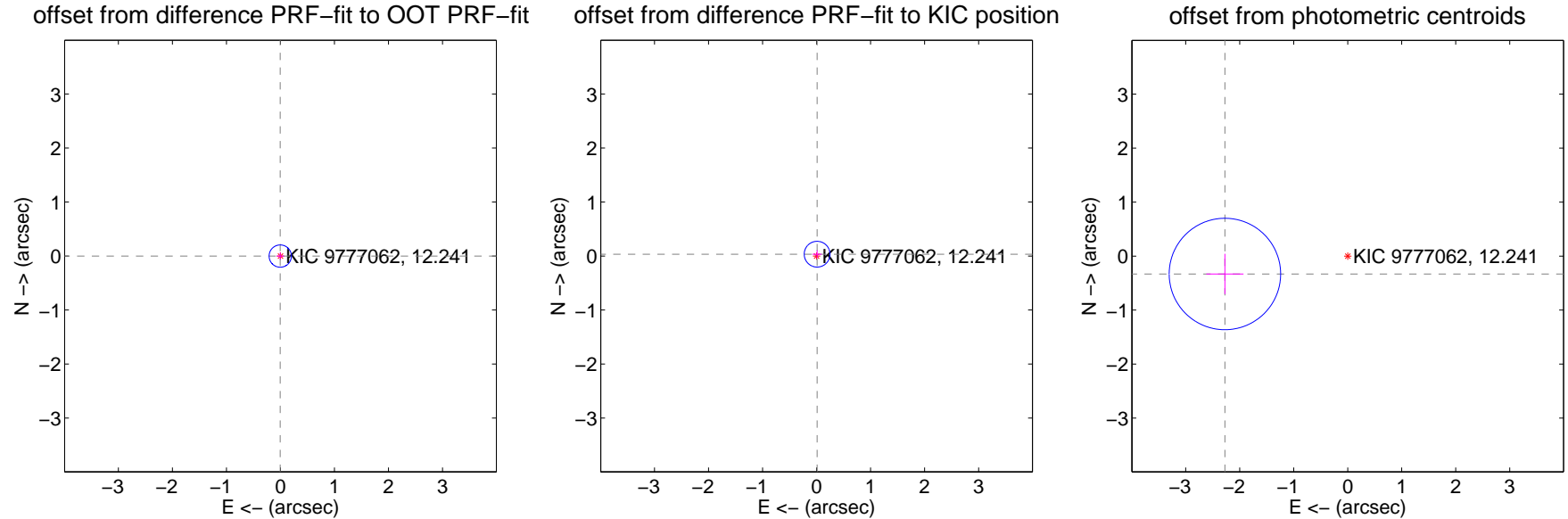
DV Centroid Data

Supplemental centroid analysis for 009777062-04. Kepler magnitude: 12.24. Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.004 ± 0.069	0.06	0.004 ± 0.069	-0.001 ± 0.067
PRF-fit source offset from KIC position	0.035 ± 0.080	0.44	-0.010 ± 0.086	0.034 ± 0.073
photometric centroid source offset	2.30 ± 0.34	6.68	2.27 ± 0.34	-0.33 ± 0.37



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.

Q1 no difference image



Q1 no OOT image



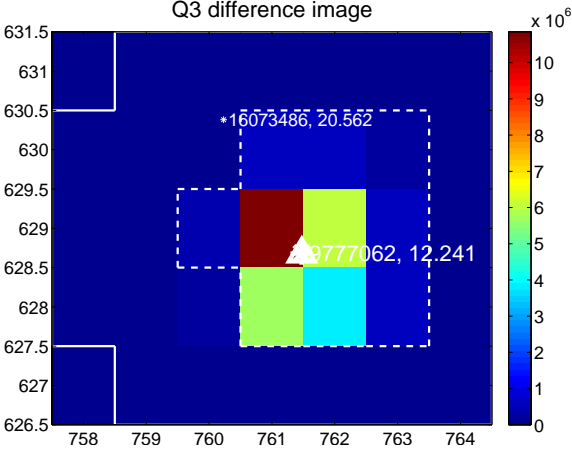
Q2 no difference image



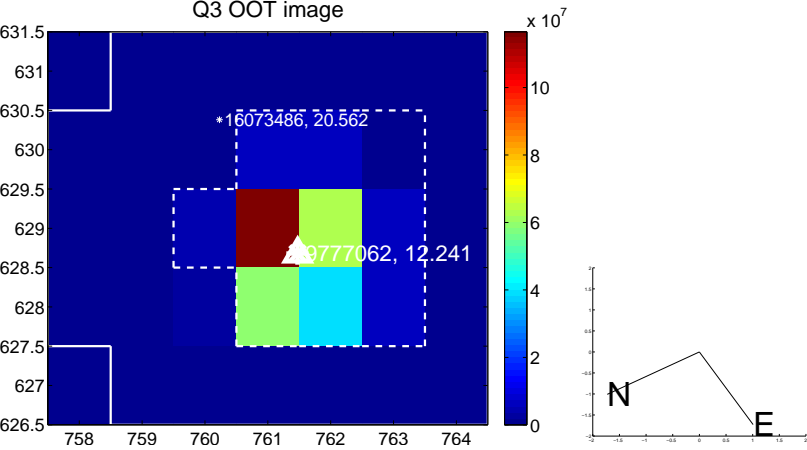
Q2 no OOT image



Q3 difference image



Q3 OOT image



Q4 no difference image



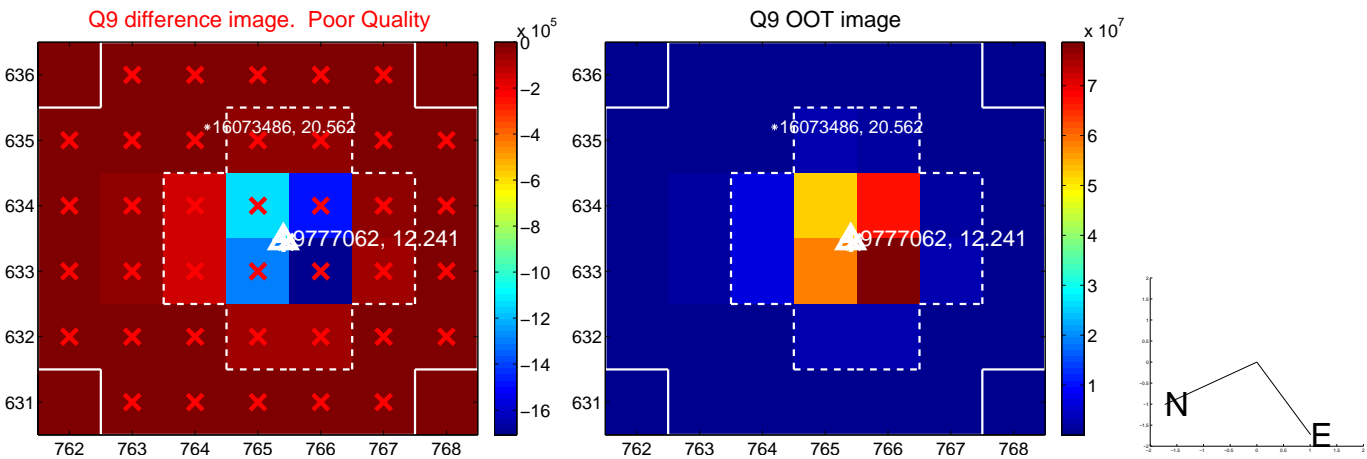
Q4 no OOT image



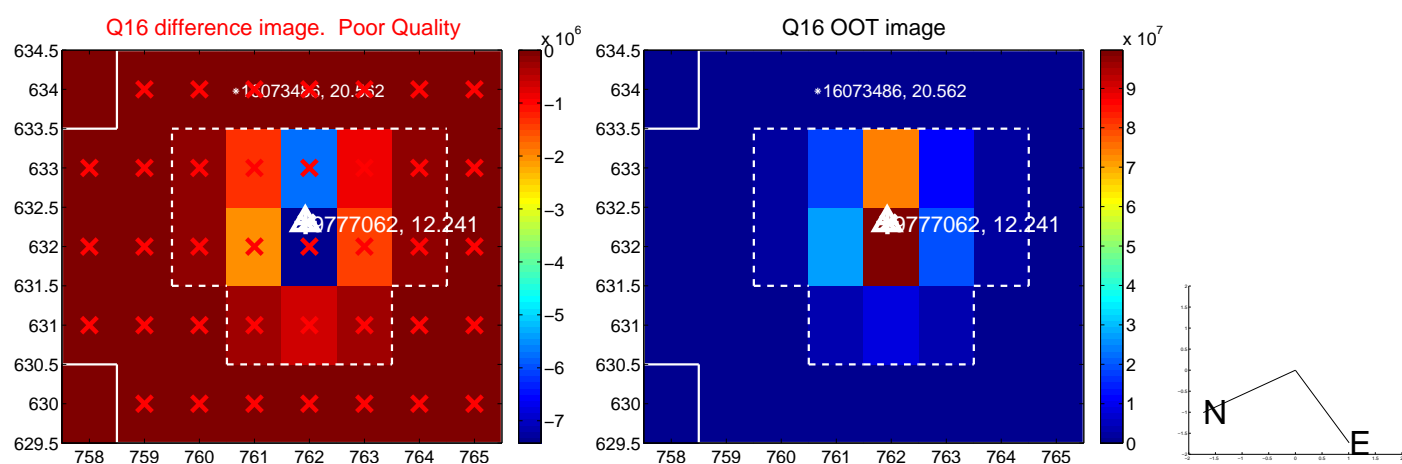
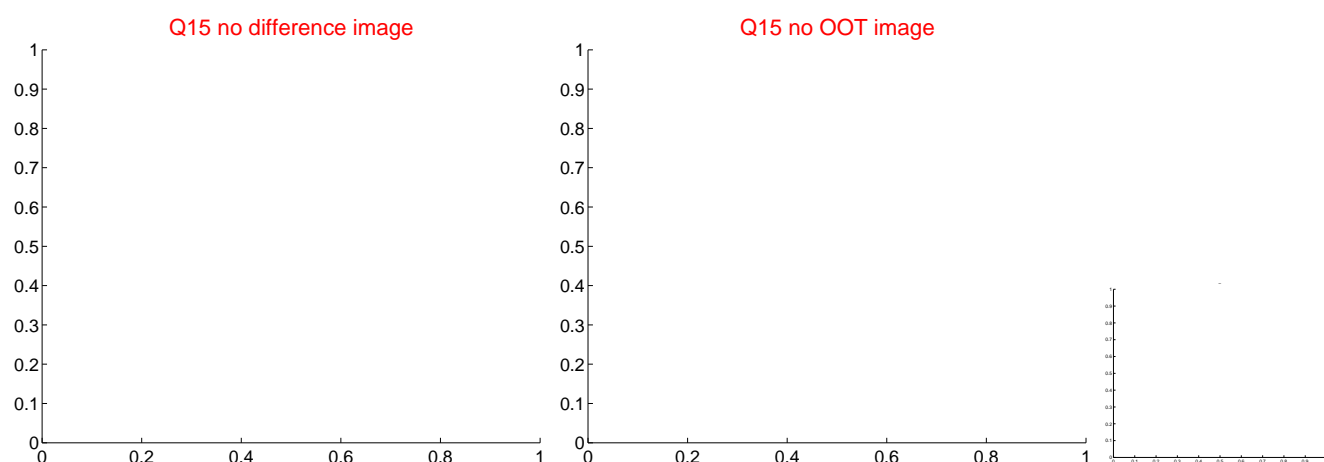
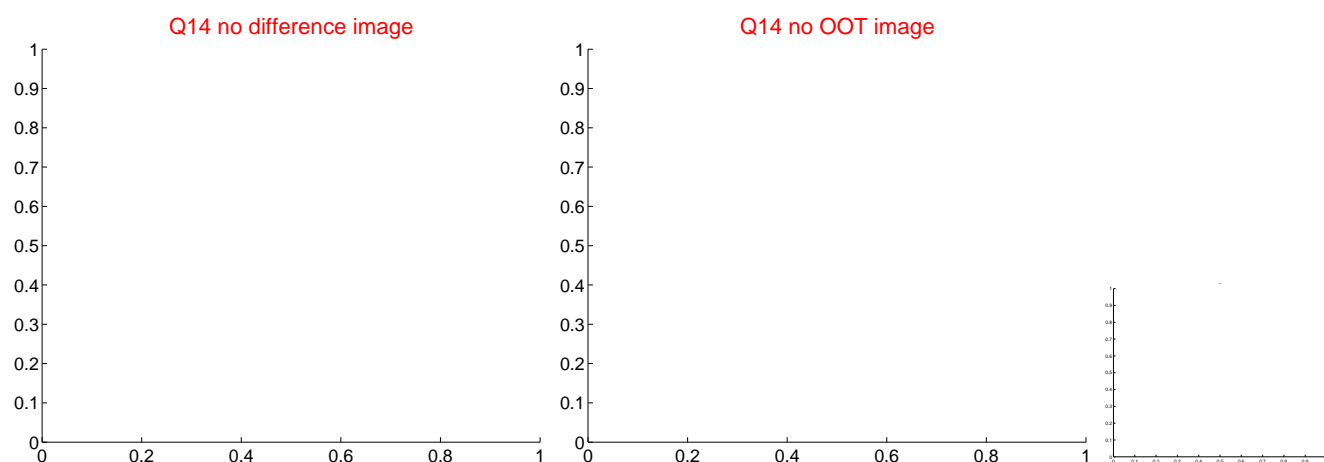
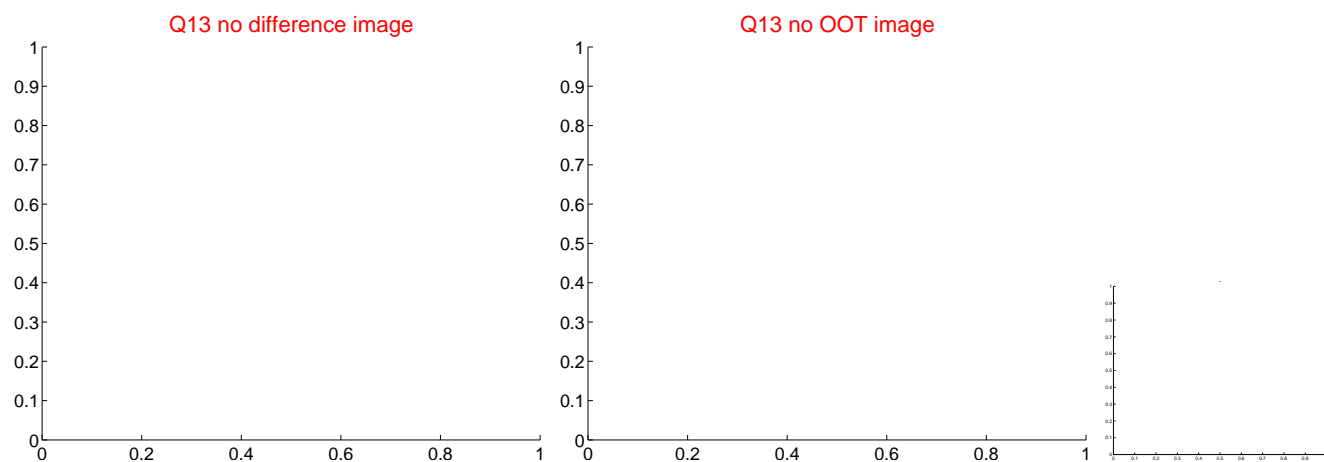
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



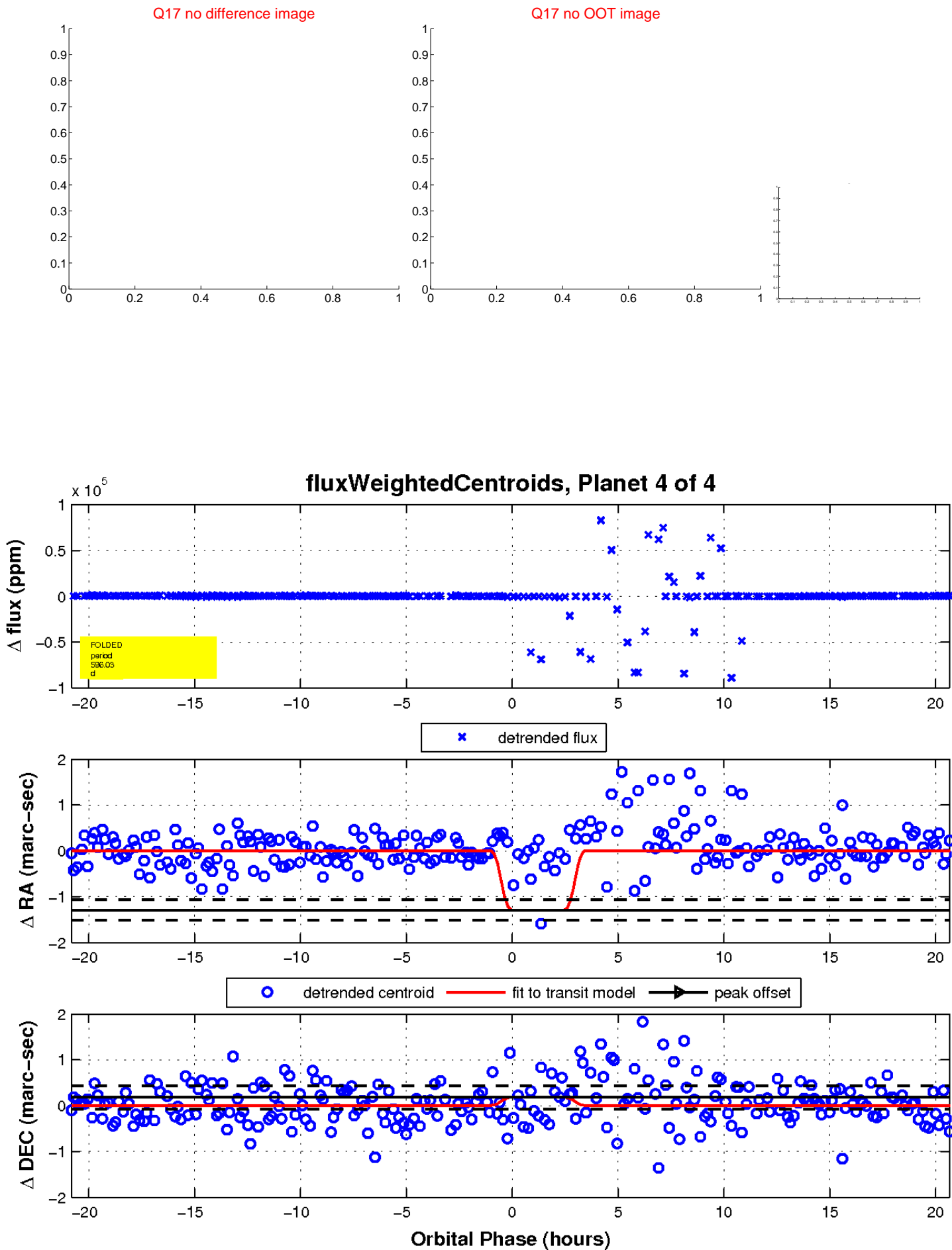
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

