

KIC 009970396

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})
009970396-01	OBS	No	235.298647	357.532799	55489.5	76.651	144.4	505.4	8.34	4791	189.81	47.99
009970396-02	OBS	No	234.720304	220.526392	244.3	15.000	34.1	-1.0	8.34	4791	12.57	48.15
009970396-03	OBS	No	235.782849	218.326379	333.6	15.000	39.7	-1.0	8.34	4791	14.69	47.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970396-01	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—CENT_SATURATED
009970396-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—CENT_SATURATED—HALO_GHOST
009970396-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—CENT_SATURATED

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 009970396-01

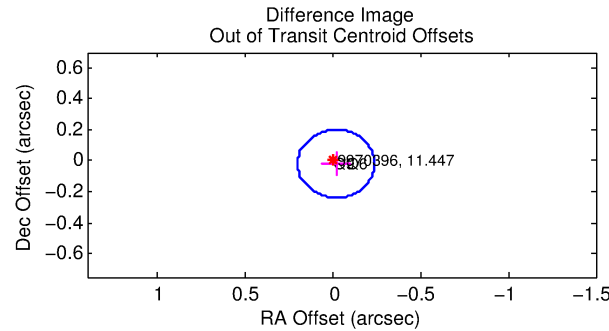
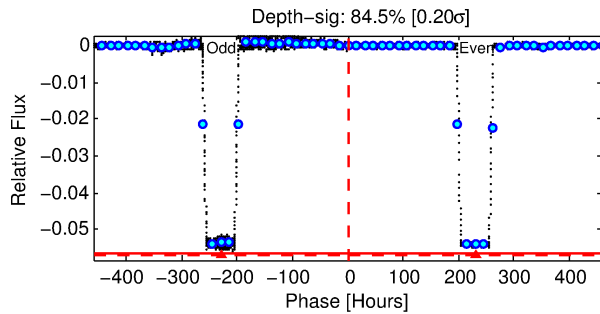
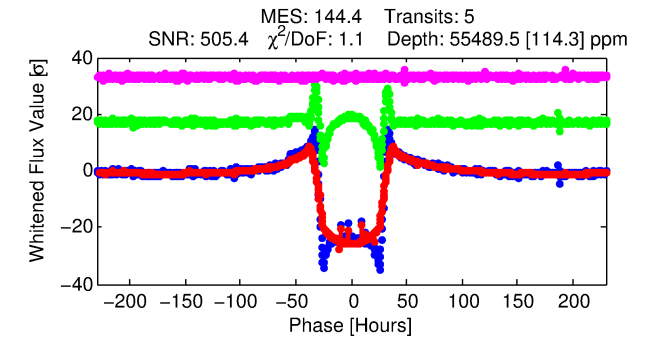
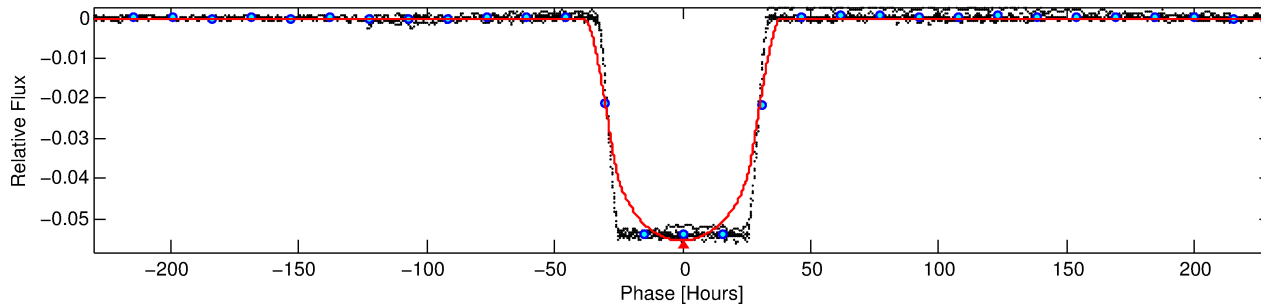
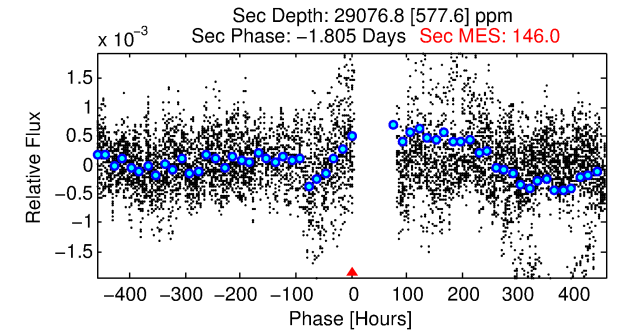
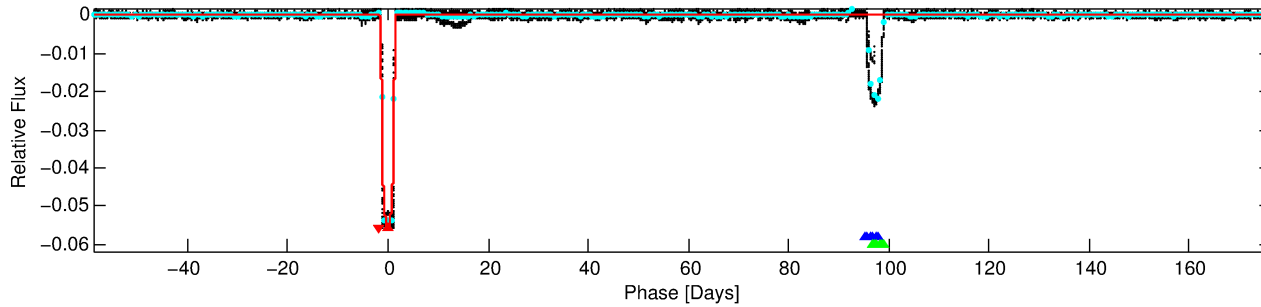
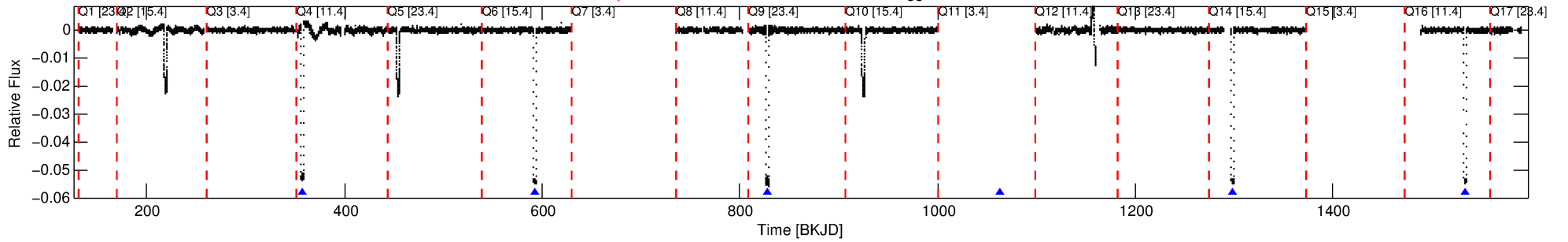
No Significant Match Found

DV One-Page Summary

KIC: 9970396 Candidate: 1 of 3 Period: 235.299 d

KOI: K07606 Corr: No Ephemeris Match

Kp: 11.45 R*: 8.34 Rs Teff: 4791.0 K Logg: 2.73 Fe/H: -0.160



DV Fit Results:

Period = 235.29865 [0.00071] d
Epoch = 357.5328 [0.0023] BKJD
Rp/R* = 0.2086 [0.0004]
a/R* = 28.35 [0.12]
b = 0.01 [0.52]
Seff = 47.99 [13.98]
Teq = 671 [49] K
Rp = 189.82 [41.25] Re
a = 0.8270 [0.1571] AU
Ag = 303.67 [86.81] [3.49σ]
Teffp = 4332 [68] K [43.80σ]

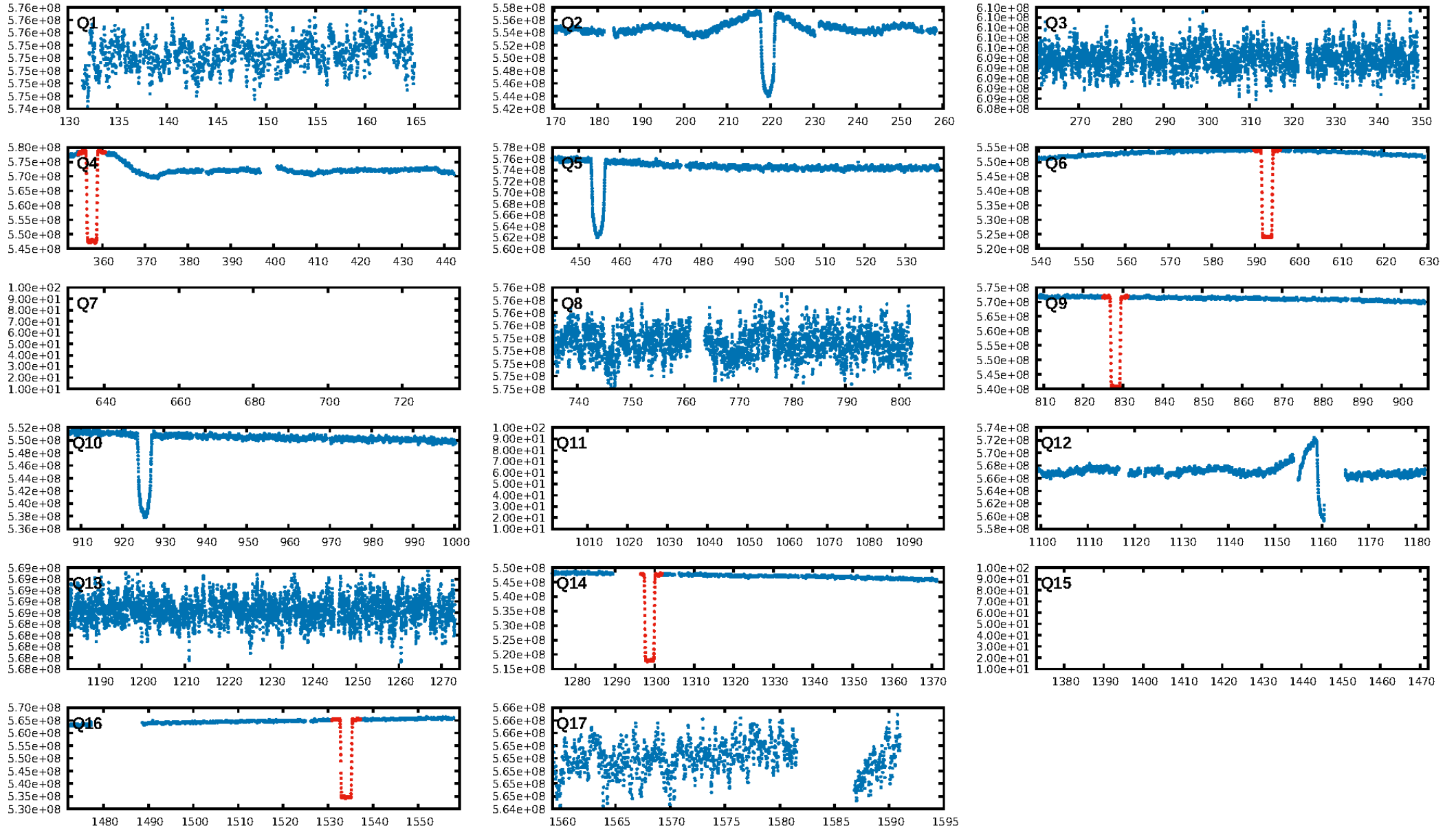
DV Diagnostic Results:

ShortPeriod-sig: 14.1% [0.18σ]
LongPeriod-sig: 11.8% [0.15σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: 1.689
Centroid-sig: 0.0%
Centroid-so: 0.166 arcsec [30.95σ]
OotOffset-rm: 0.027 arcsec [0.37σ]
KicOffset-rm: 0.196 arcsec [2.70σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-st: 1/0/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 1.00 [2/2]

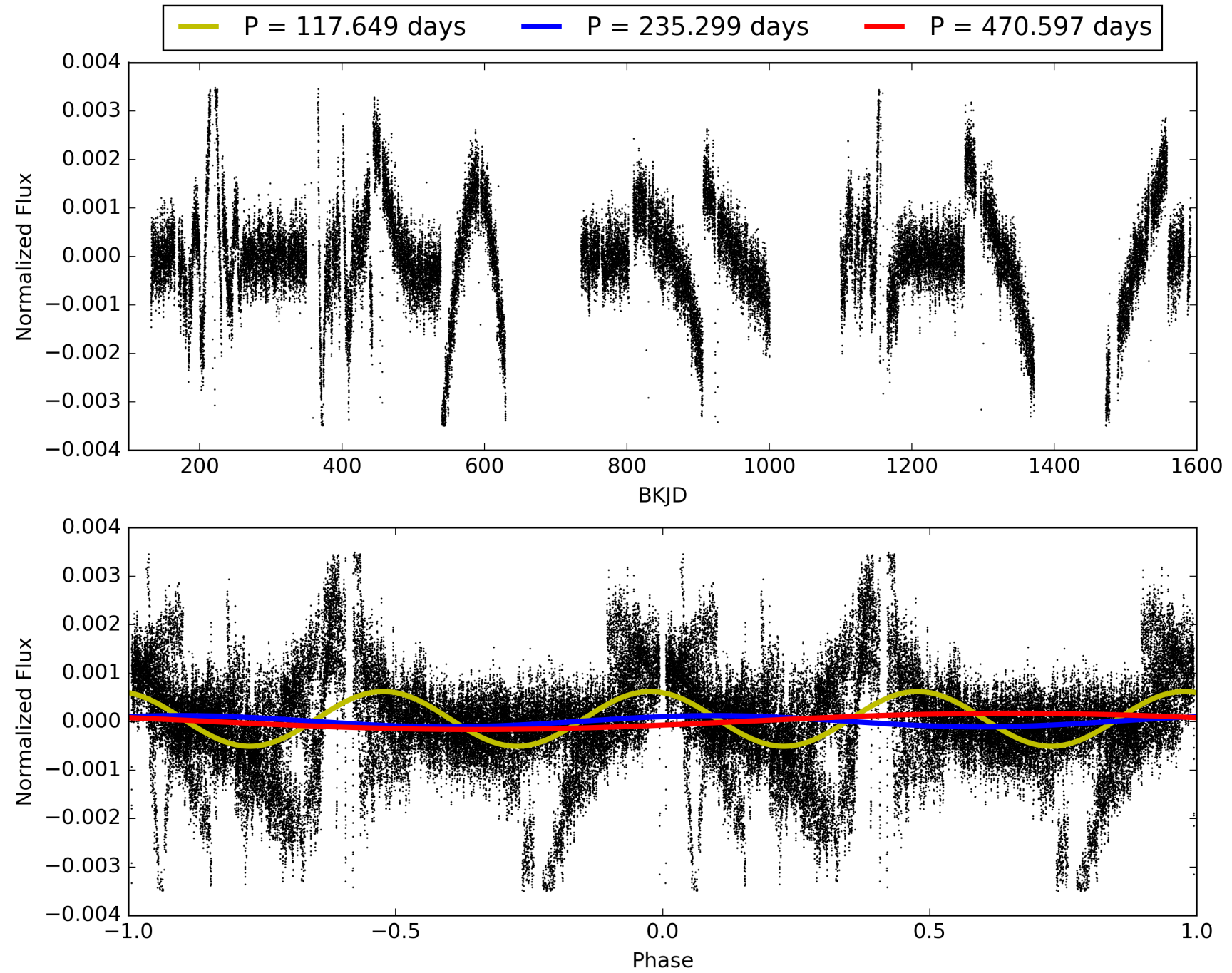
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:06:40 Z

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

TCE 009970396-01, PDC Light Curves

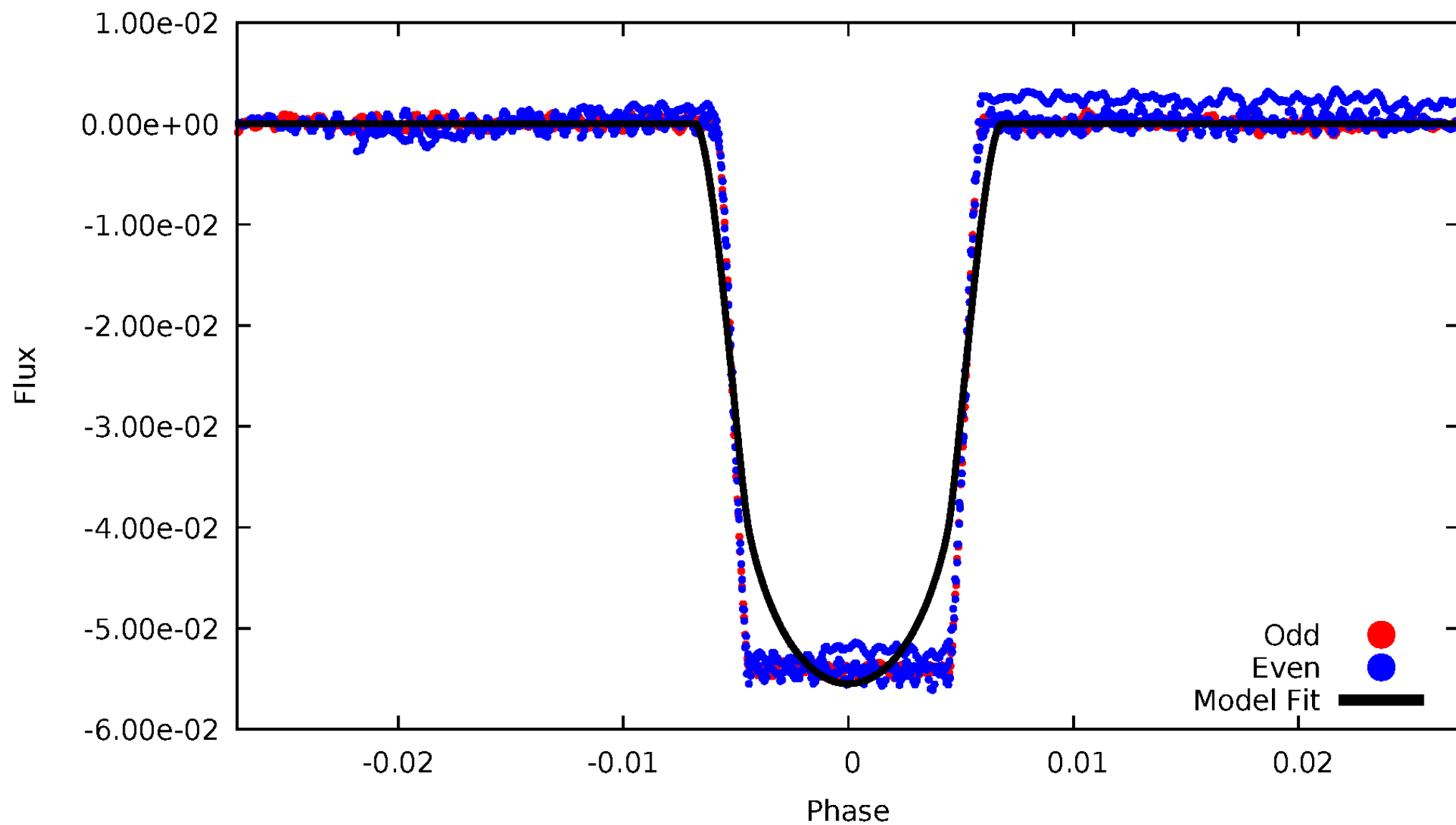


TCE 009970396-01



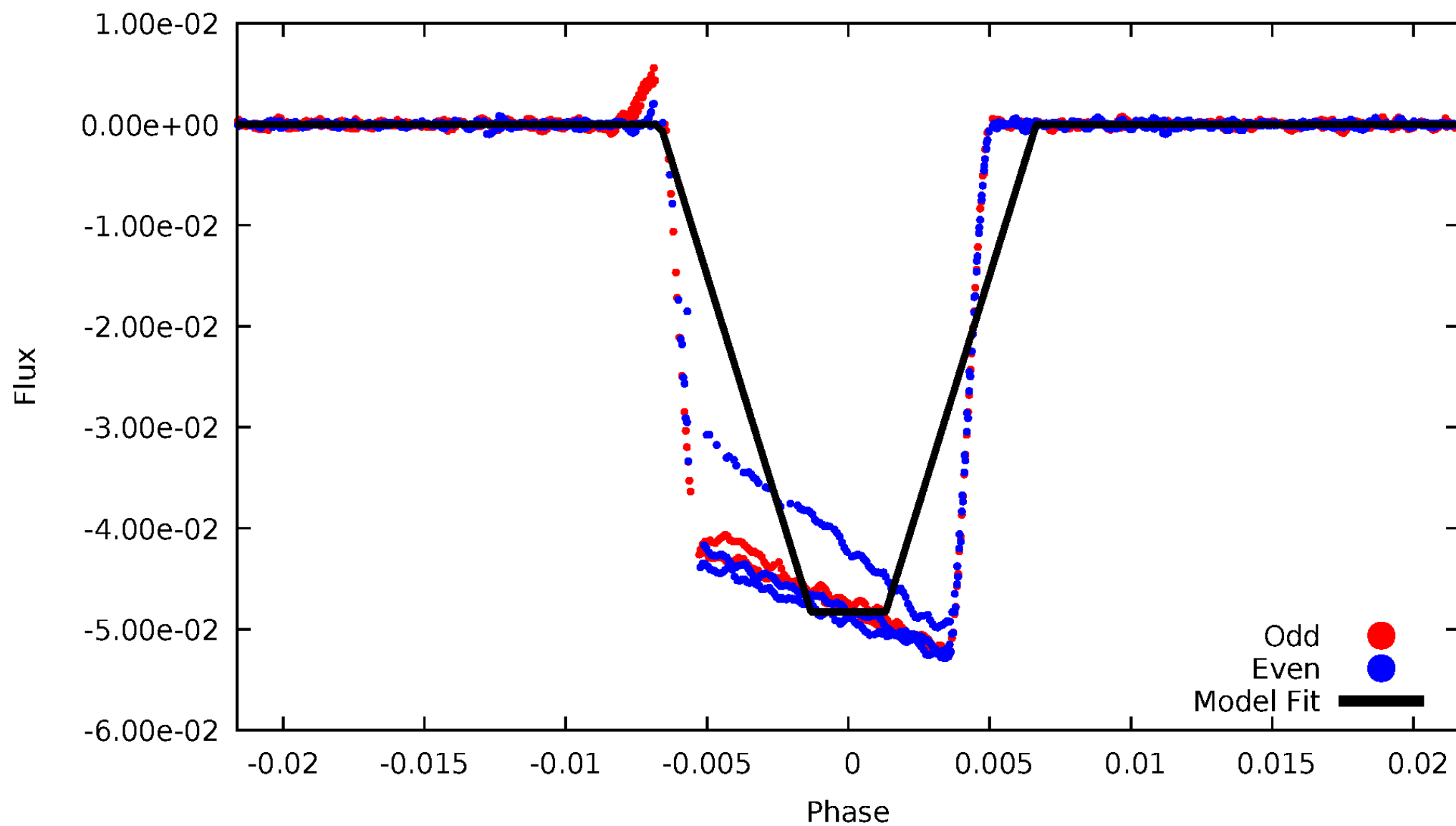
DV Odd/Even

TCE 009970396-01



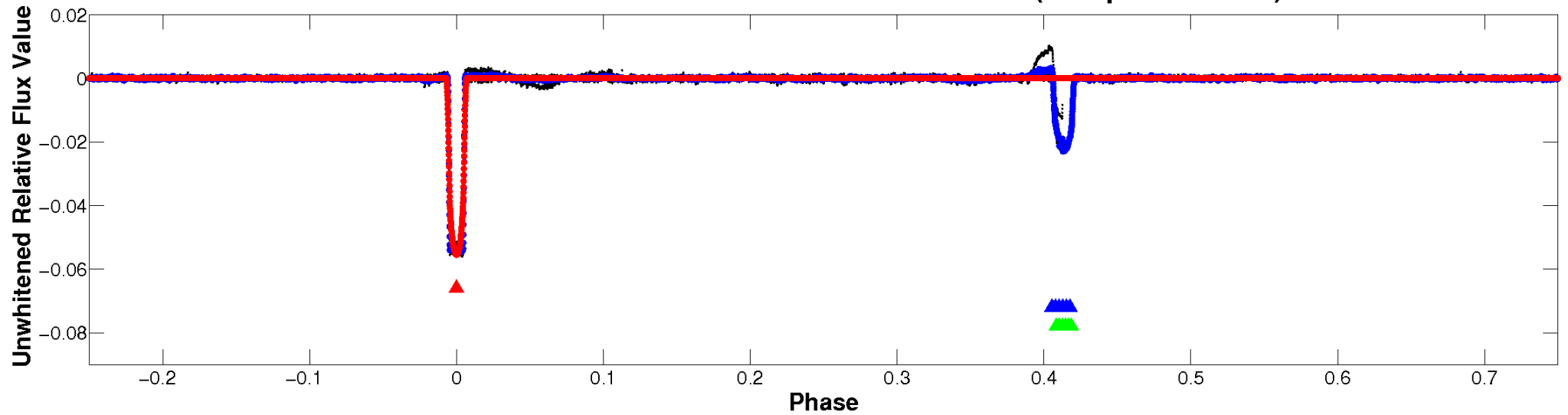
ALT Odd/Even

TCE 009970396-01

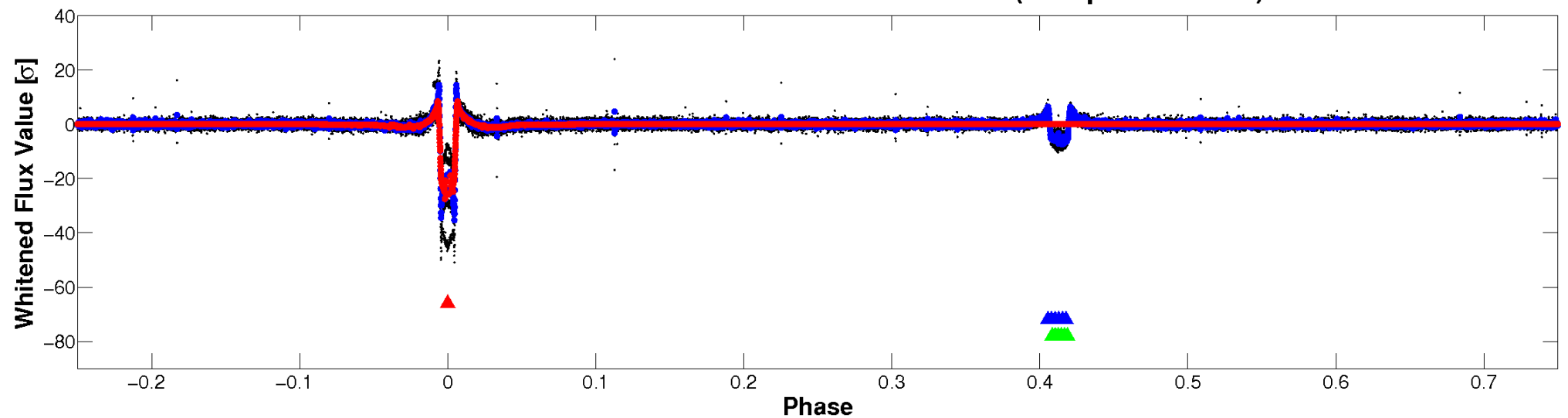


Non-Whitened Vs. Whitened Light Curve

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

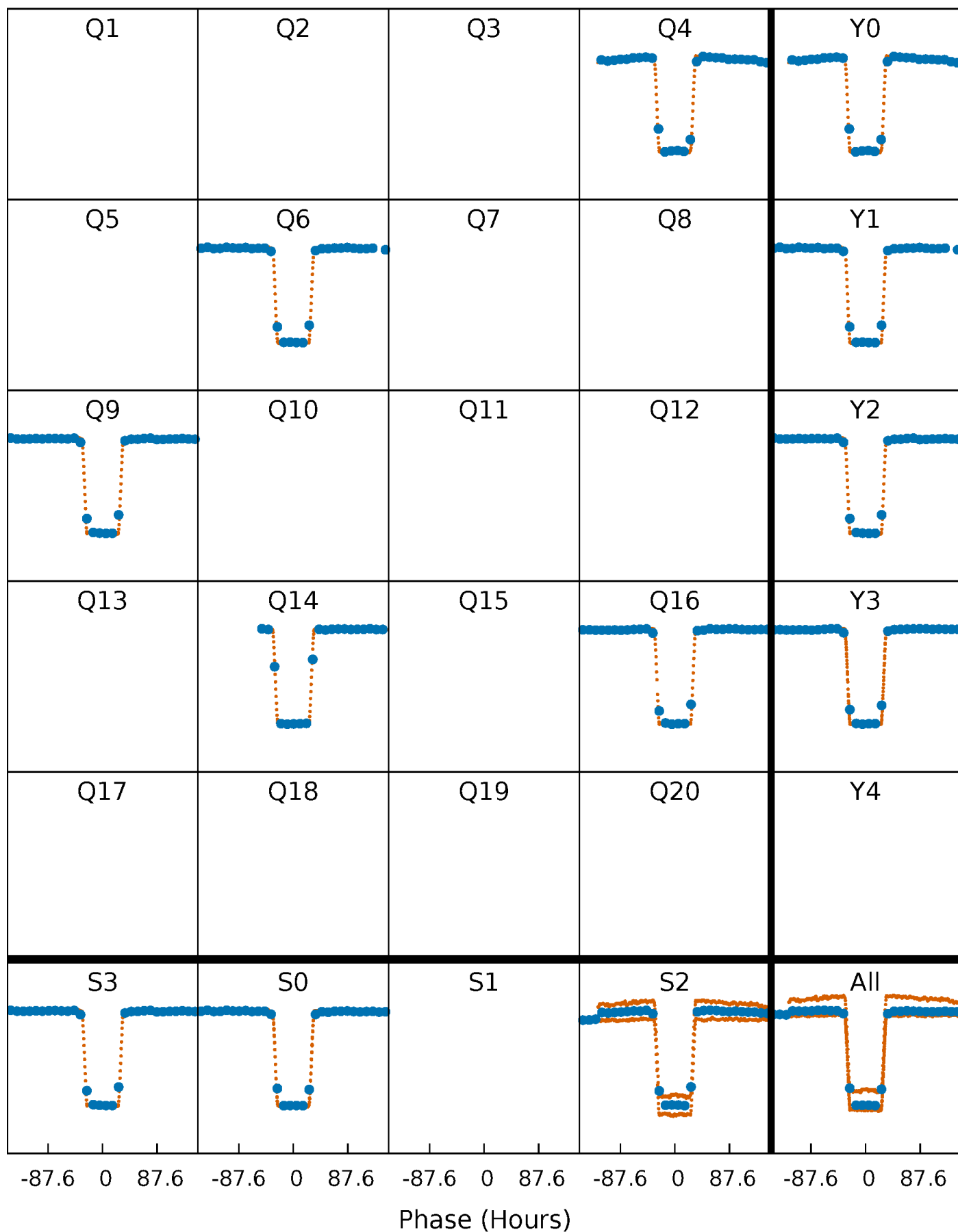


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



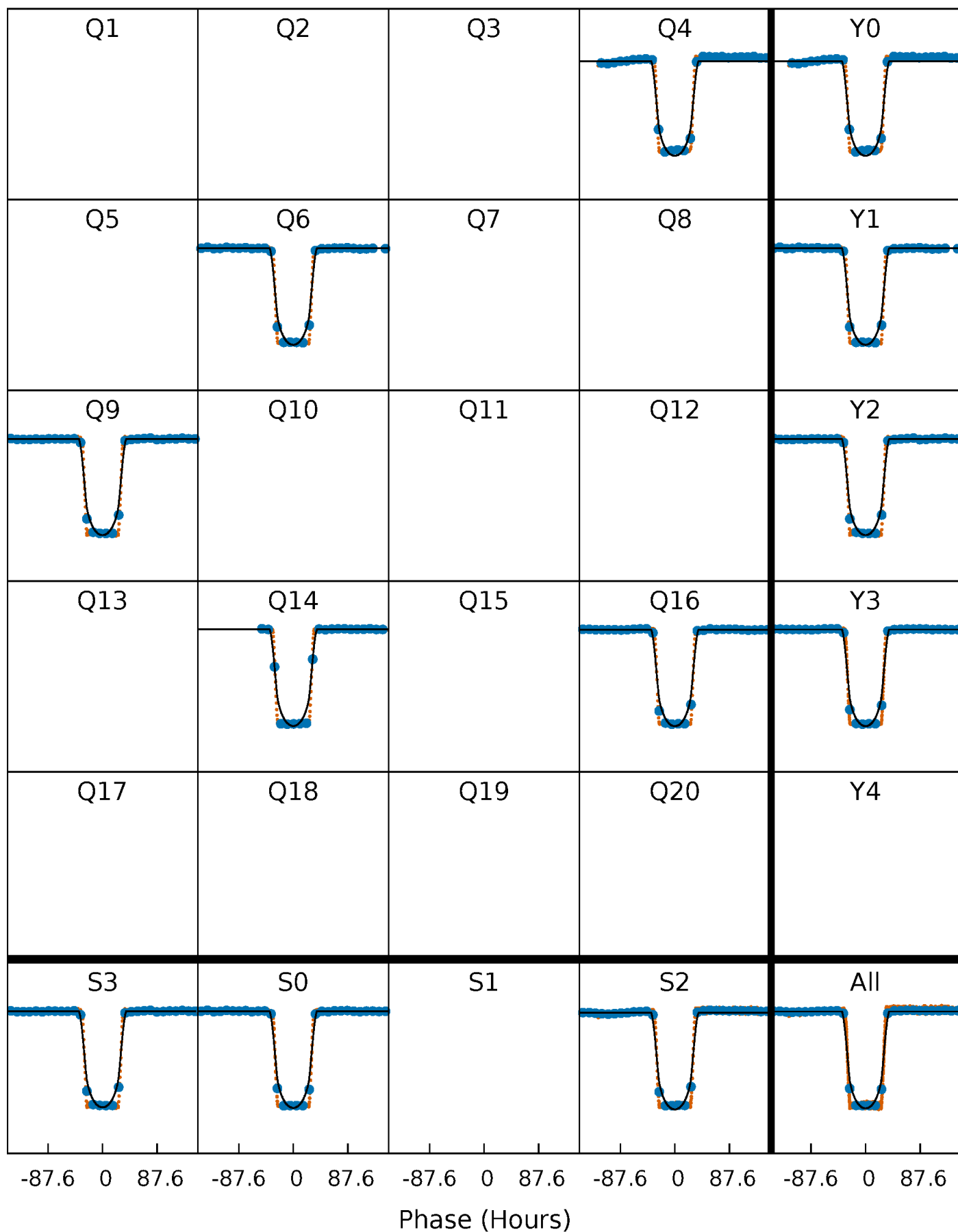
PDC Quarter-Phased Transit Curves

TCE 009970396-01 P=235.298647 Days $T_0=357.532799$ (BKJD)



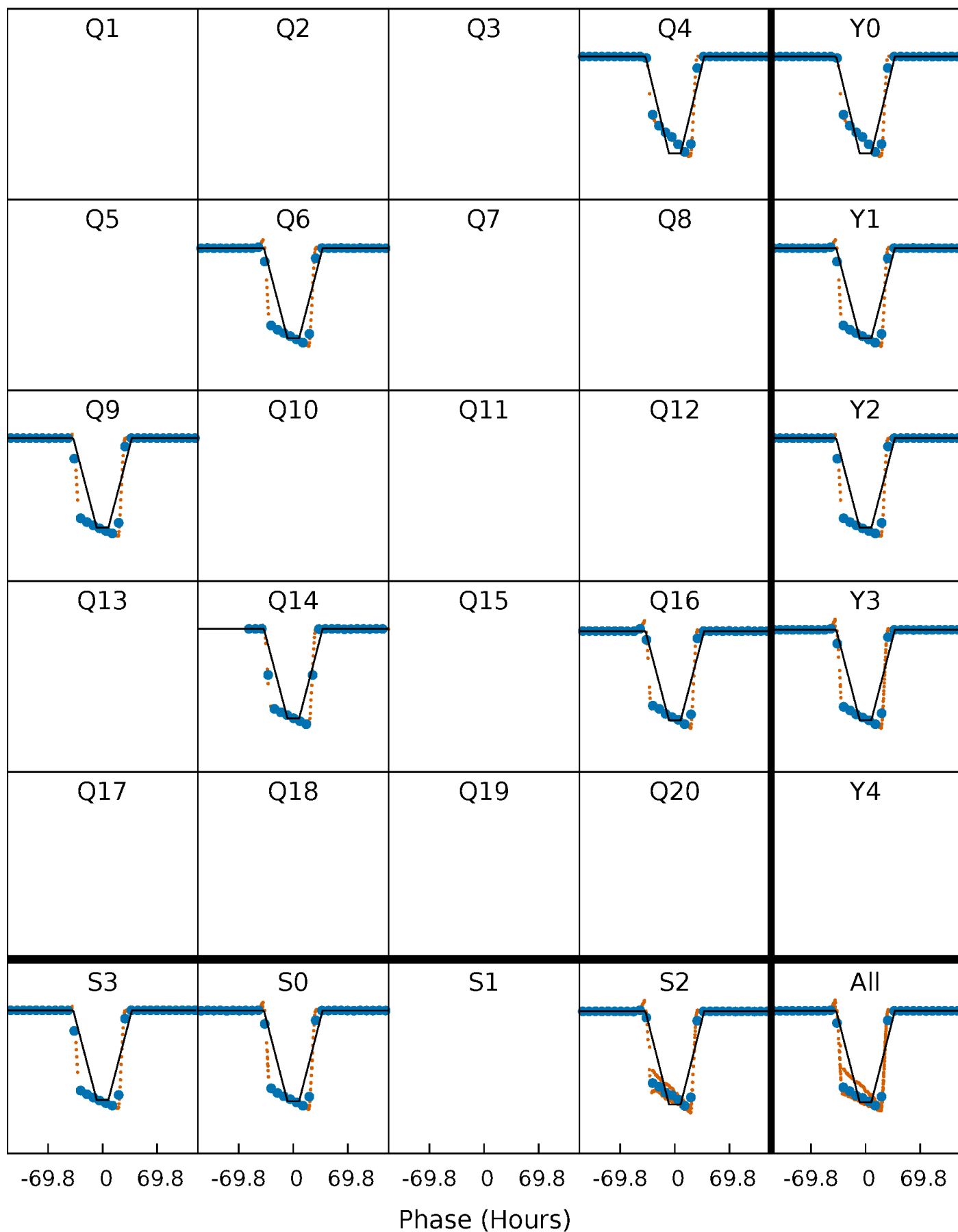
DV Quarter-Phased Transit Curves

TCE 009970396-01 P=235.298647 Days $T_0=357.532799$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

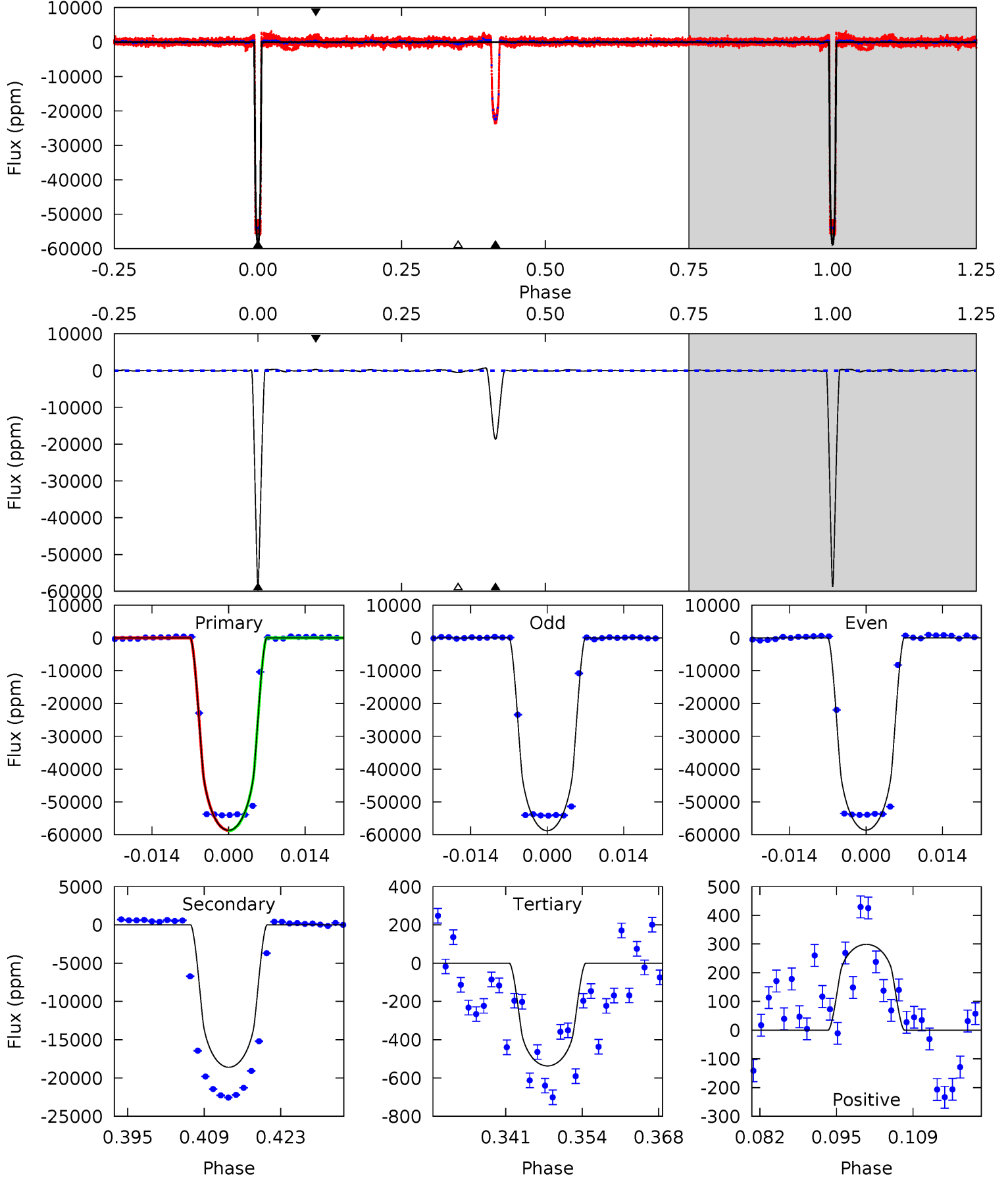
TCE 009970396-01 P=235.299255 Days $T_0=357.743737$ (BKJD)



DV Model-Shift Uniqueness Test

009970396-01, P = 235.298647 Days, E = 122.234152 Days

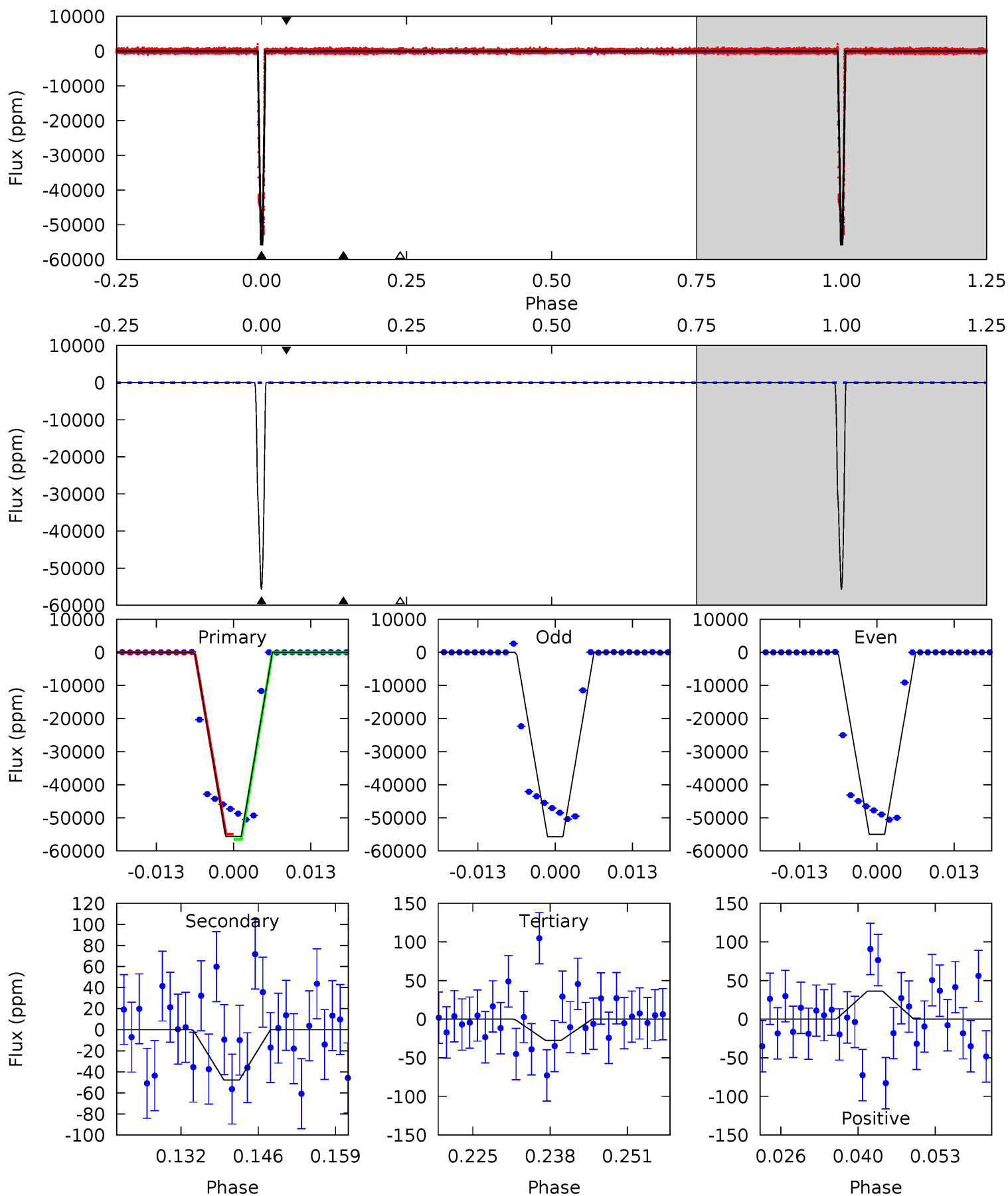
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3266	1035	29.9	16.6	4.97	2.47	7.68	3236	3249	1005	1018	4.39	0.99	0.01	1.08



Alt Model-Shift Uniqueness Test

009970396-01, P = 235.299255 Days, E = 122.444482 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4977	4.28	2.46	3.24	4.97	2.48	0.73	4974	4974	1.81	1.04	31.0	0.98	0.00	66.1



Stellar Parameters For KIC 009970396

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4791^{+64}_{-71}	$2.730^{+0.160}_{-0.145}$	$-0.160^{+0.150}_{-0.100}$	$8.339^{+1.812}_{-1.812}$	$1.361^{+0.227}_{-0.341}$	$0.003^{+0.003}_{-0.001}$
	+1%/-1%	+6%/-5%	+94%/-62%	+22%/-22%	+17%/-25%	+77%/-37%
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 009970396-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-18594 ± 18	$192.11^{+23.11}_{-25.93}$	943^{+50}_{-56}	4085^{+51}_{-56}	193^{+51}_{-35}
Alt.	-48 ± 11	$200.12^{+25.47}_{-23.98}$	937^{+55}_{-52}	1674^{+93}_{-270}	$0.447^{+0.147}_{-0.131}$

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 $A_{obs} \gg 1.0$

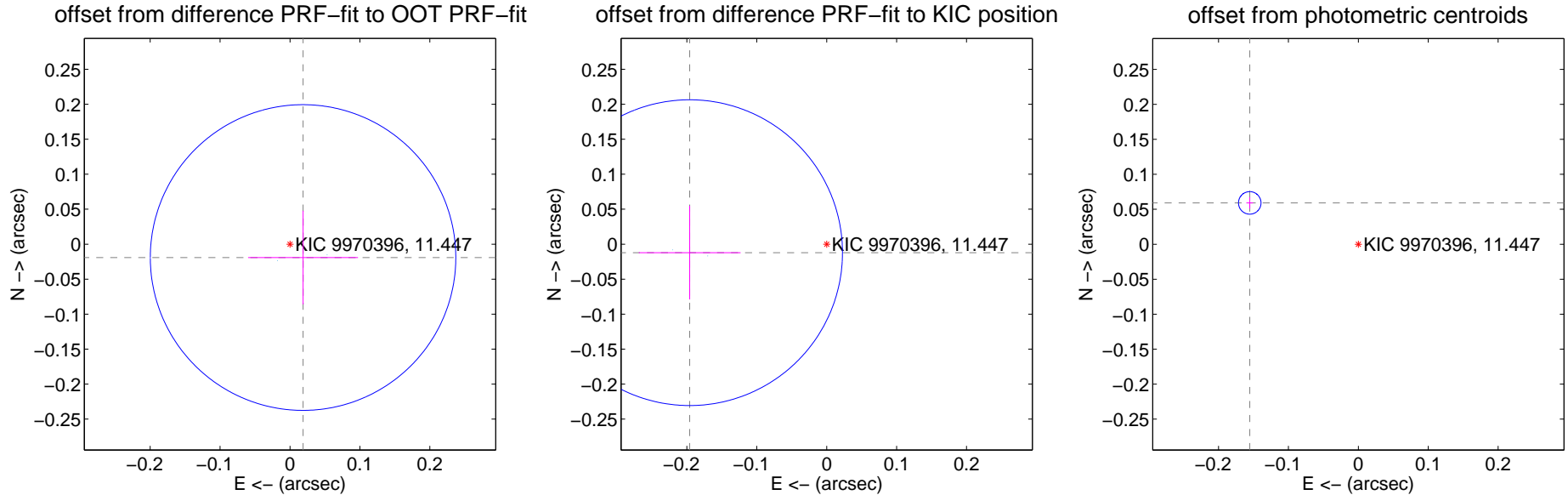
DV Centroid Data

Supplemental centroid analysis for 009970396-01. **Kepler magnitude: 11.45.** Transit SNR 505.39

There are 2 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.027 ± 0.073	0.37	-0.019 ± 0.079	-0.019 ± 0.067
PRF-fit source offset from KIC position	0.196 ± 0.073	2.70	0.196 ± 0.073	-0.012 ± 0.067
photometric centroid source offset	0.17 ± 0.01	30.95	0.16 ± 0.00	0.06 ± 0.01



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.

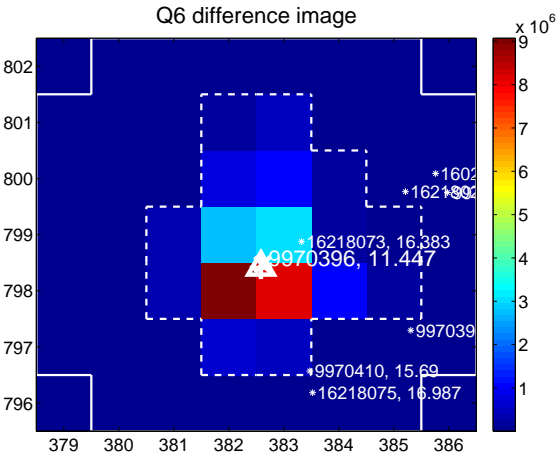
Q5 no difference image



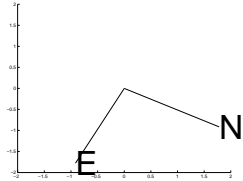
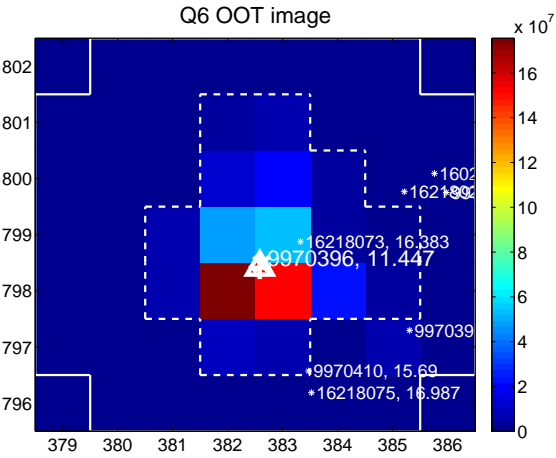
Q5 no OOT image



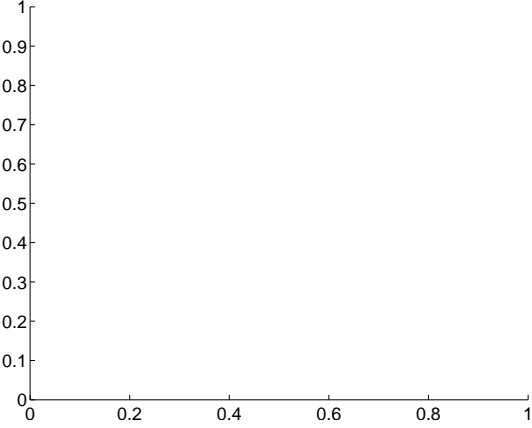
Q6 difference image



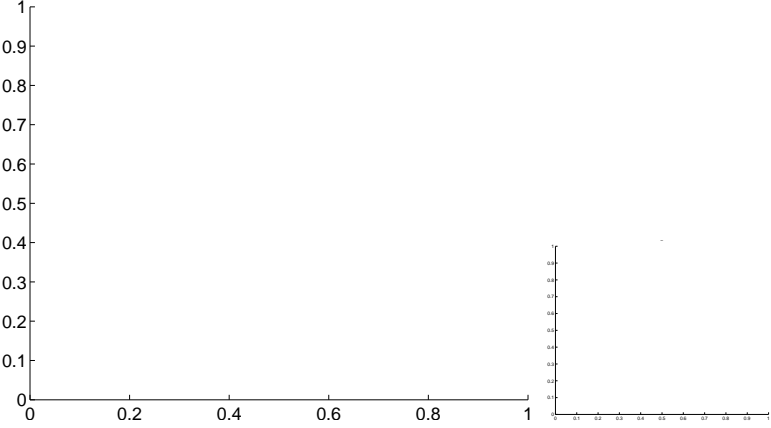
Q6 OOT image



Q7 no difference image



Q7 no OOT image



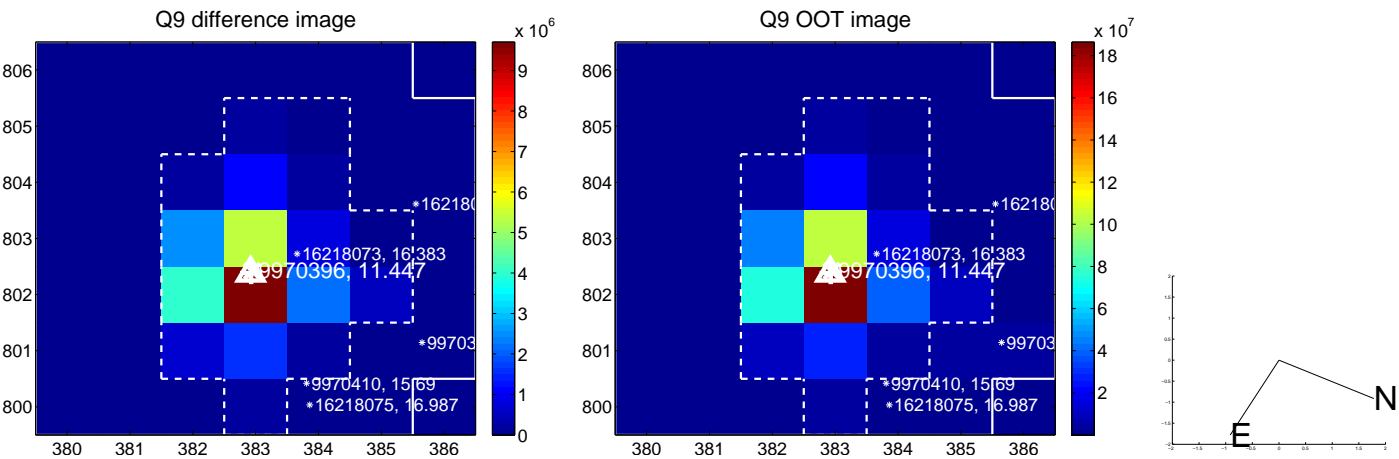
Q8 no difference image



Q8 no OOT image



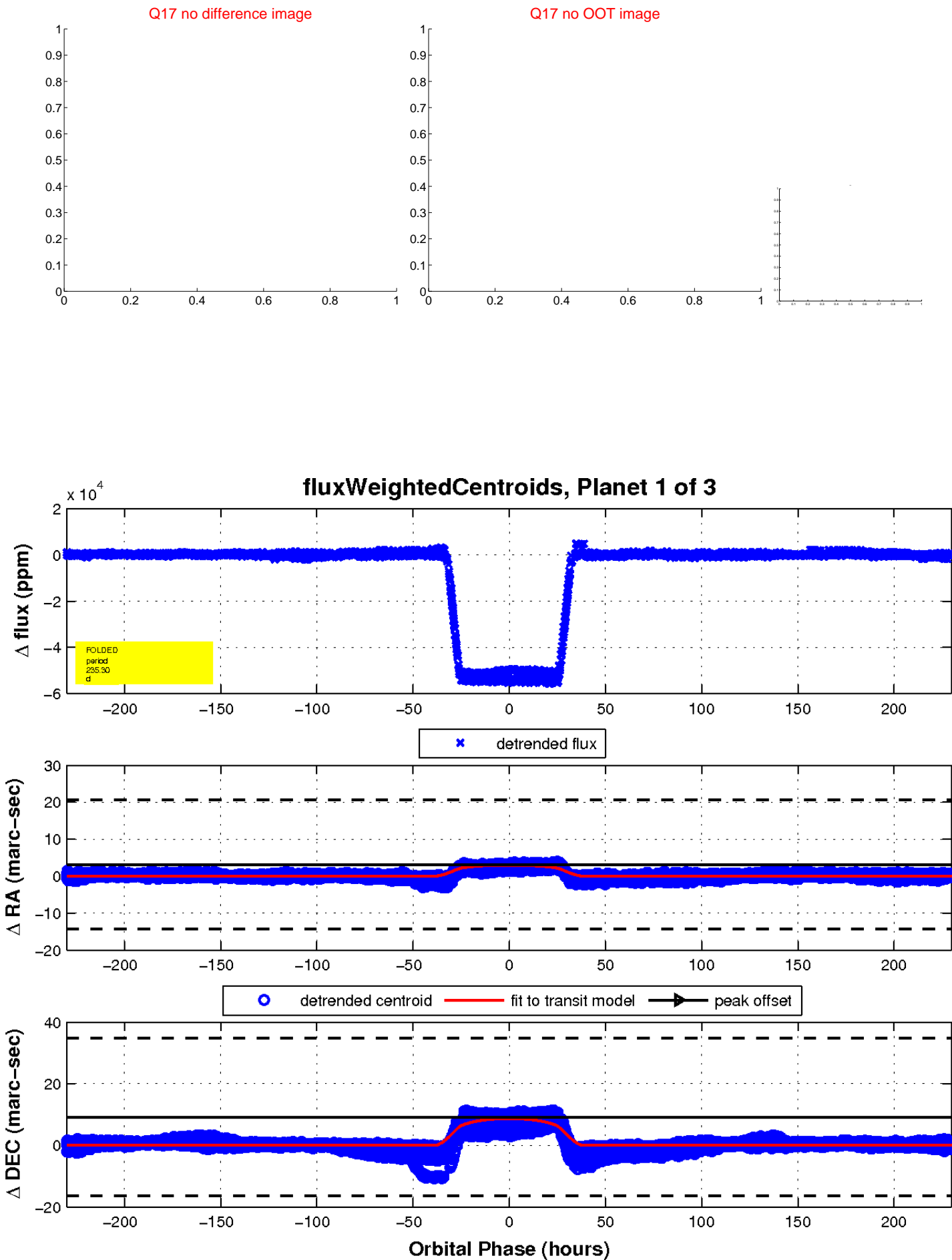
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



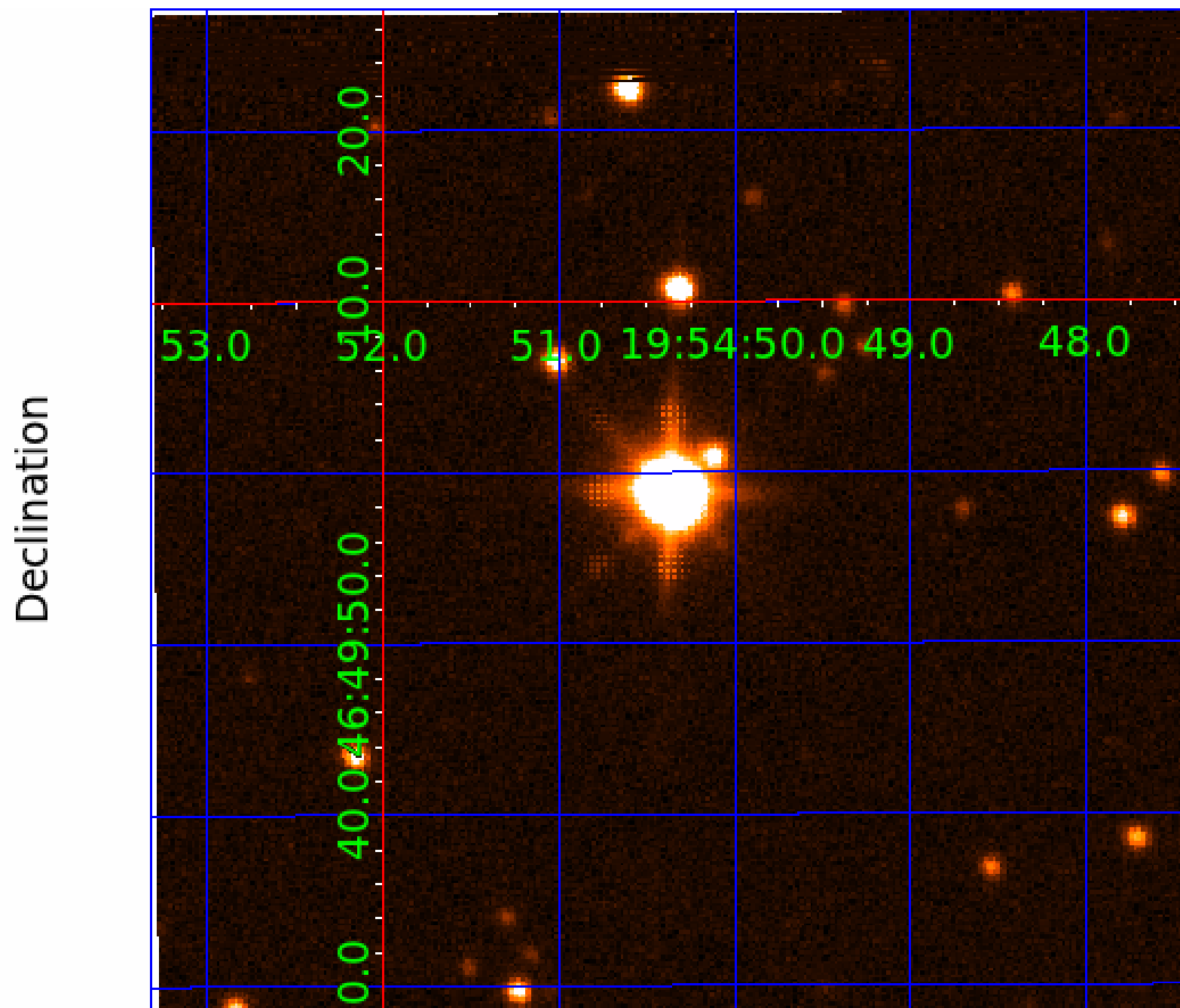
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009970396

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})
009970396-01	OBS	No	235.298647	357.532799	55489.5	76.651	144.4	505.4	8.34	4791	189.81	47.99
009970396-02	OBS	No	234.720304	220.526392	244.3	15.000	34.1	-1.0	8.34	4791	12.57	48.15
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970396-01	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—CENT_SATURATED
009970396-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—CENT_SATURATED—HALO_GHOST
009970396-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—CENT_SATURATED

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 009970396-02

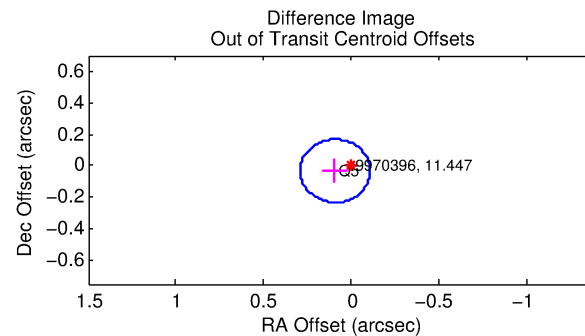
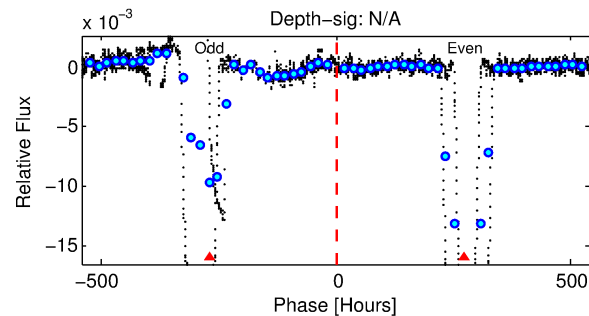
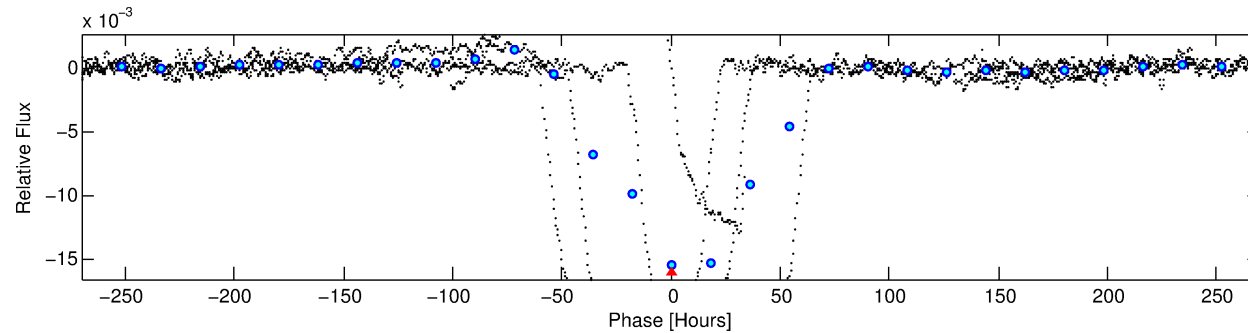
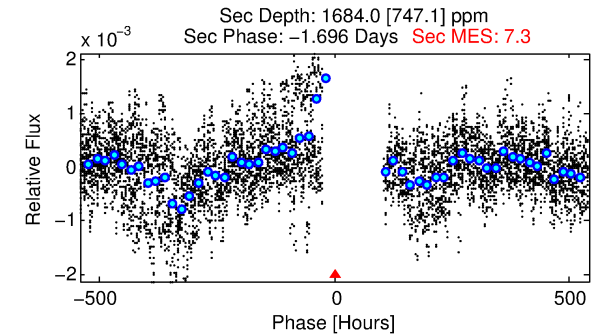
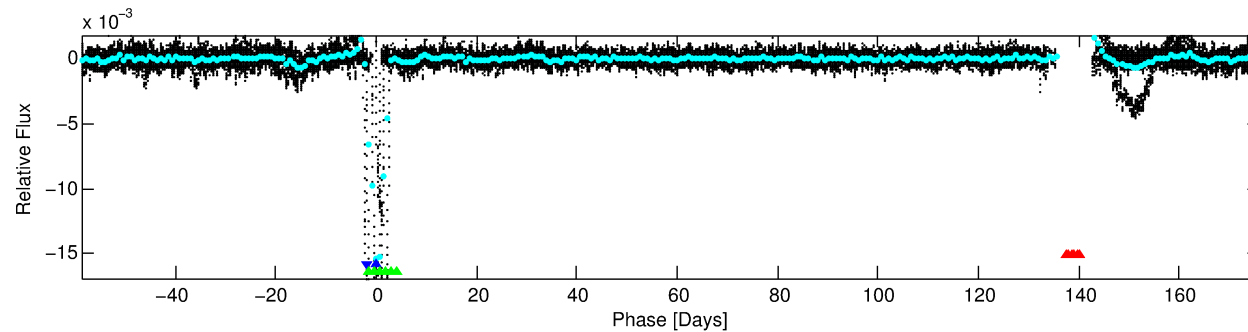
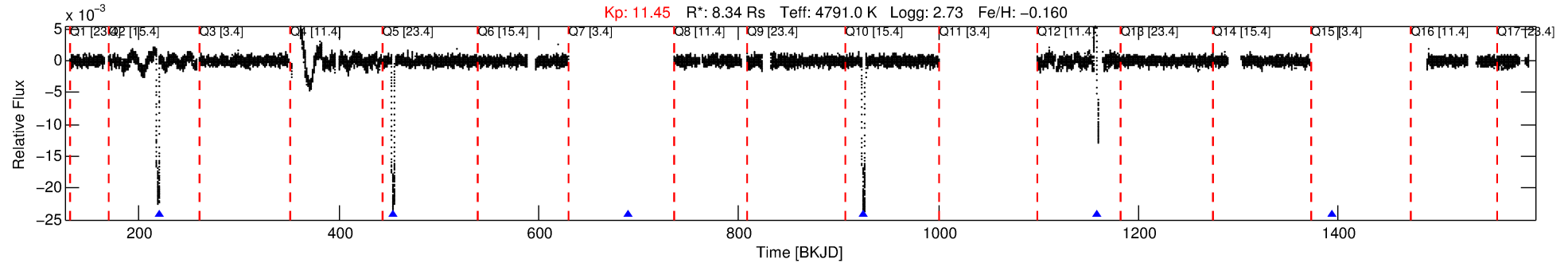
No Significant Match Found

DV One-Page Summary

KIC: 9970396 Candidate: 2 of 3 Period: 234.720 d

KOI: K07606 Corr: No Ephemeris Match

Kp: 11.45 R*: 8.34 Rs Teff: 4791.0 K Logg: 2.73 Fe/H: -0.160



TPS TCE Results:

Period = 234.72030 d
Epoch = 220.5264 BKJD

DV fit results are unavailable

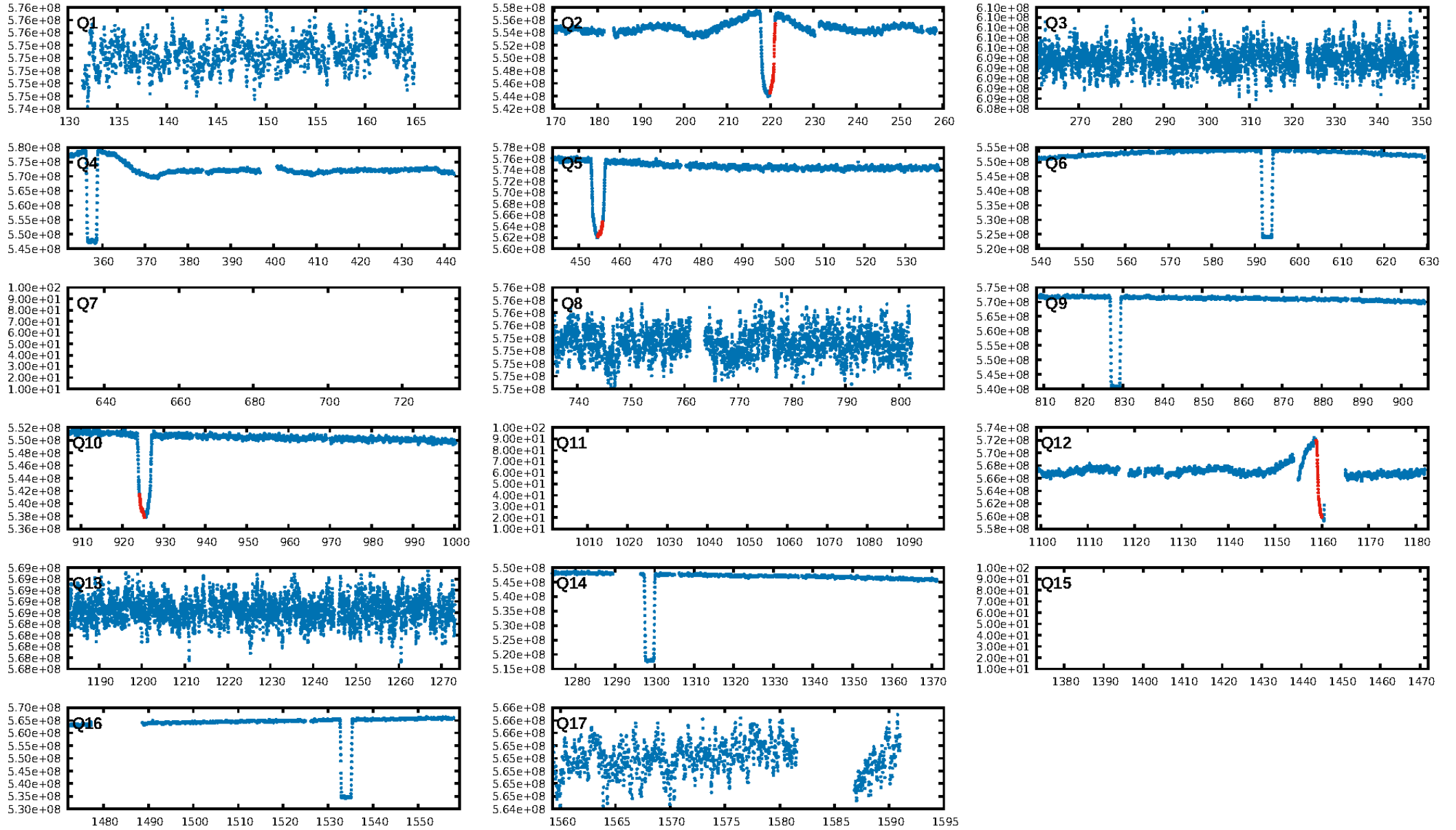
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 14.1% [0.18 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.42e-116
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 0.2219
Centroid-sig: 0.0%
Centroid-so: 0.388 arcsec [10.42 σ]
OotOffset-rm: 0.100 arcsec [1.49 σ]
KicOffset-rm: 0.222 arcsec [3.32 σ]
OotOffset-st: 0/0/0 [1]
KicOffset-st: 0/0/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 0.00 [0/1]

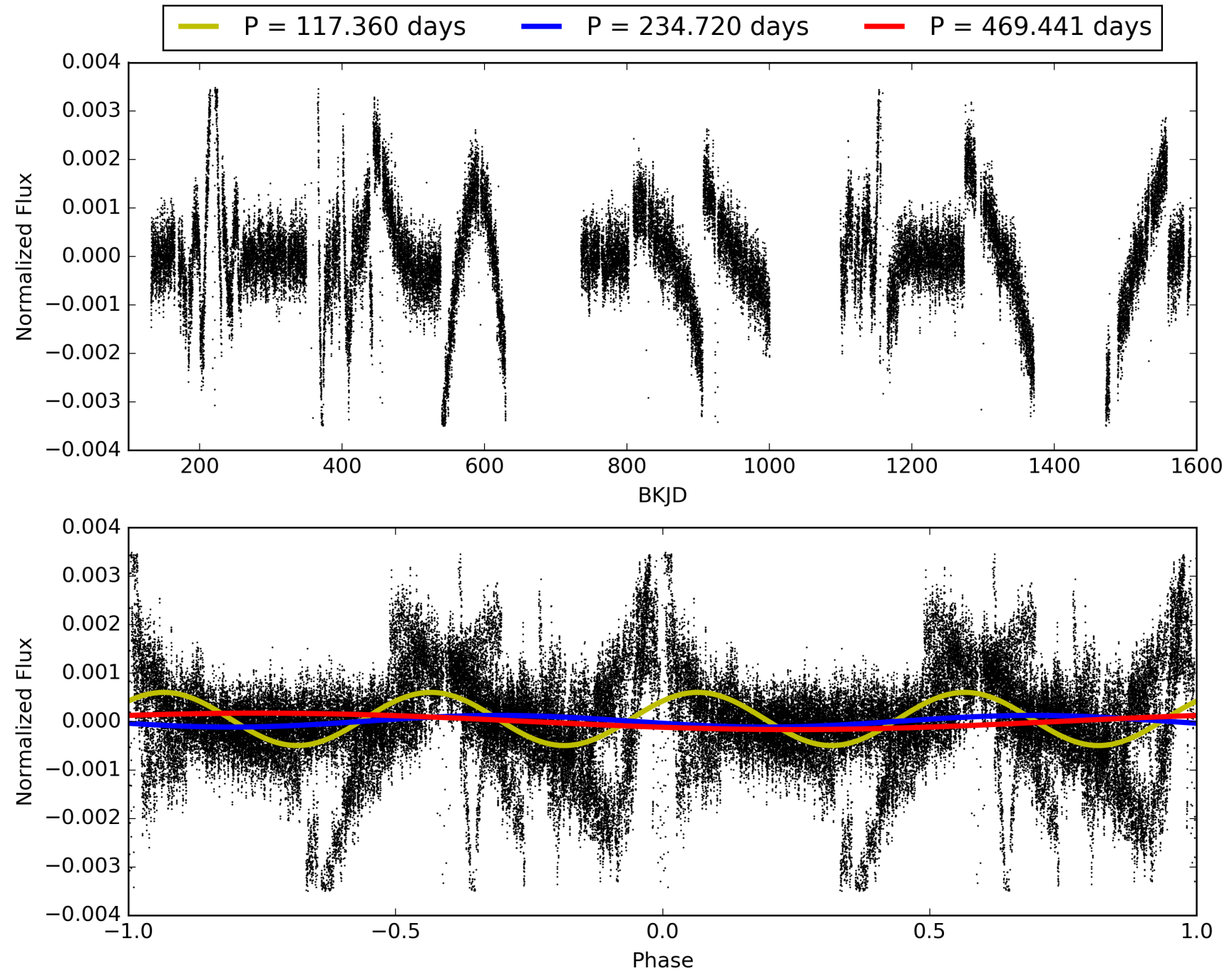
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:06:48 Z

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

TCE 009970396-02, PDC Light Curves

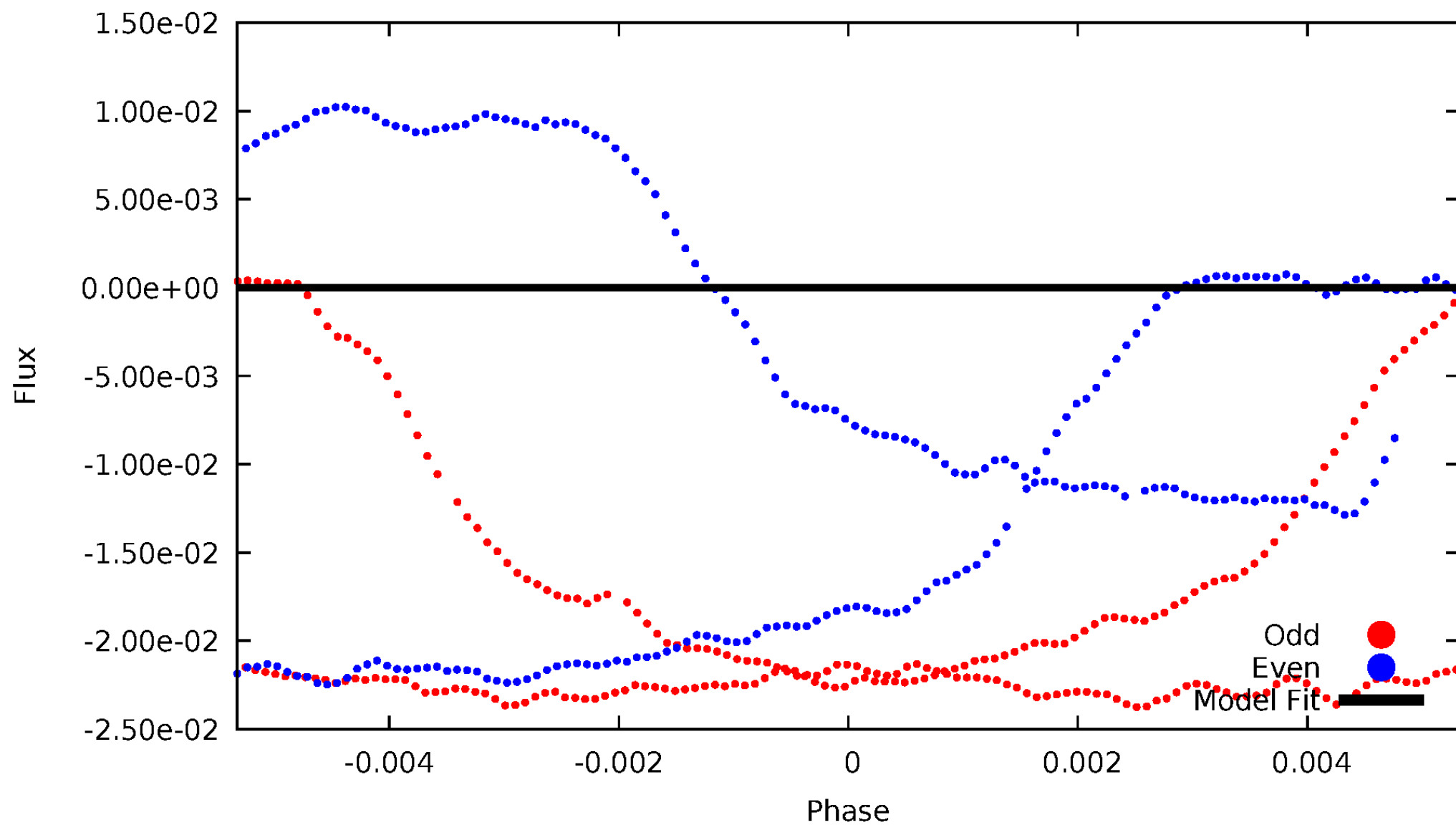


TCE 009970396-02



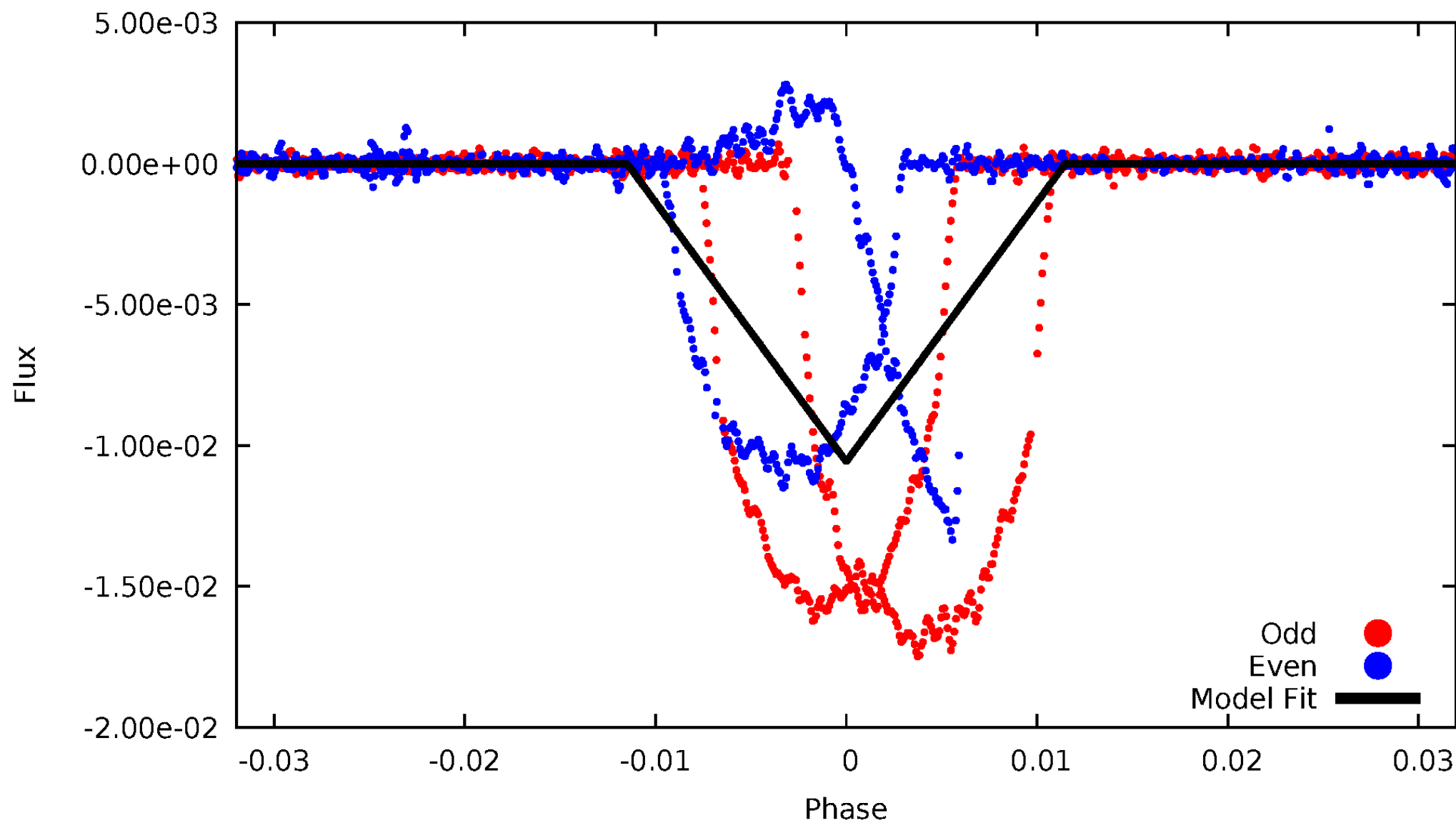
DV Odd/Even

TCE 009970396-02



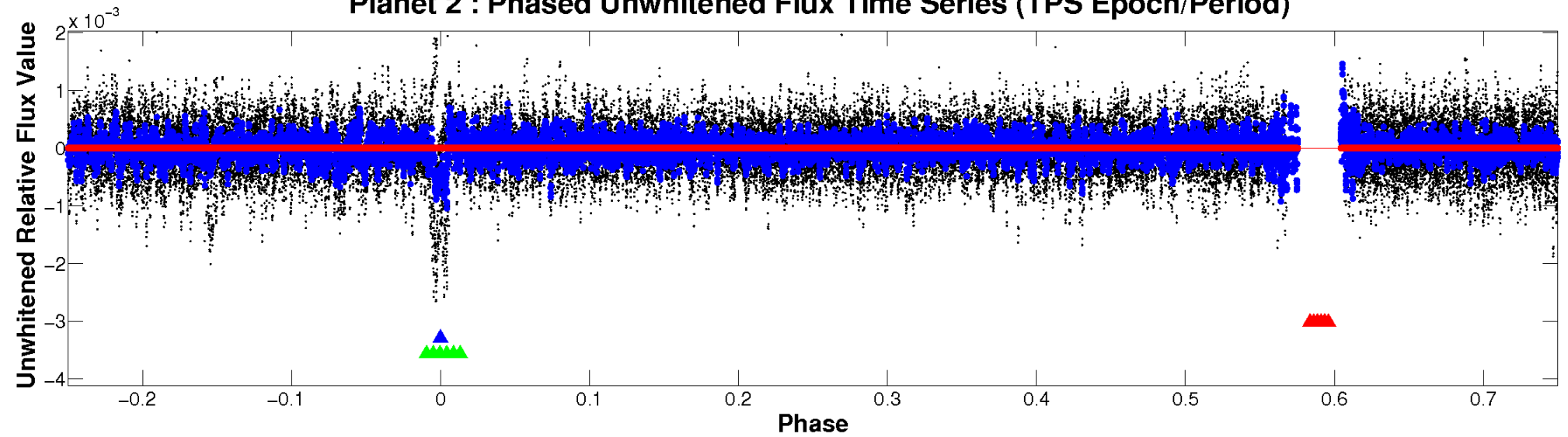
ALT Odd/Even

TCE 009970396-02



Non-Whitened Vs. Whitened Light Curve

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

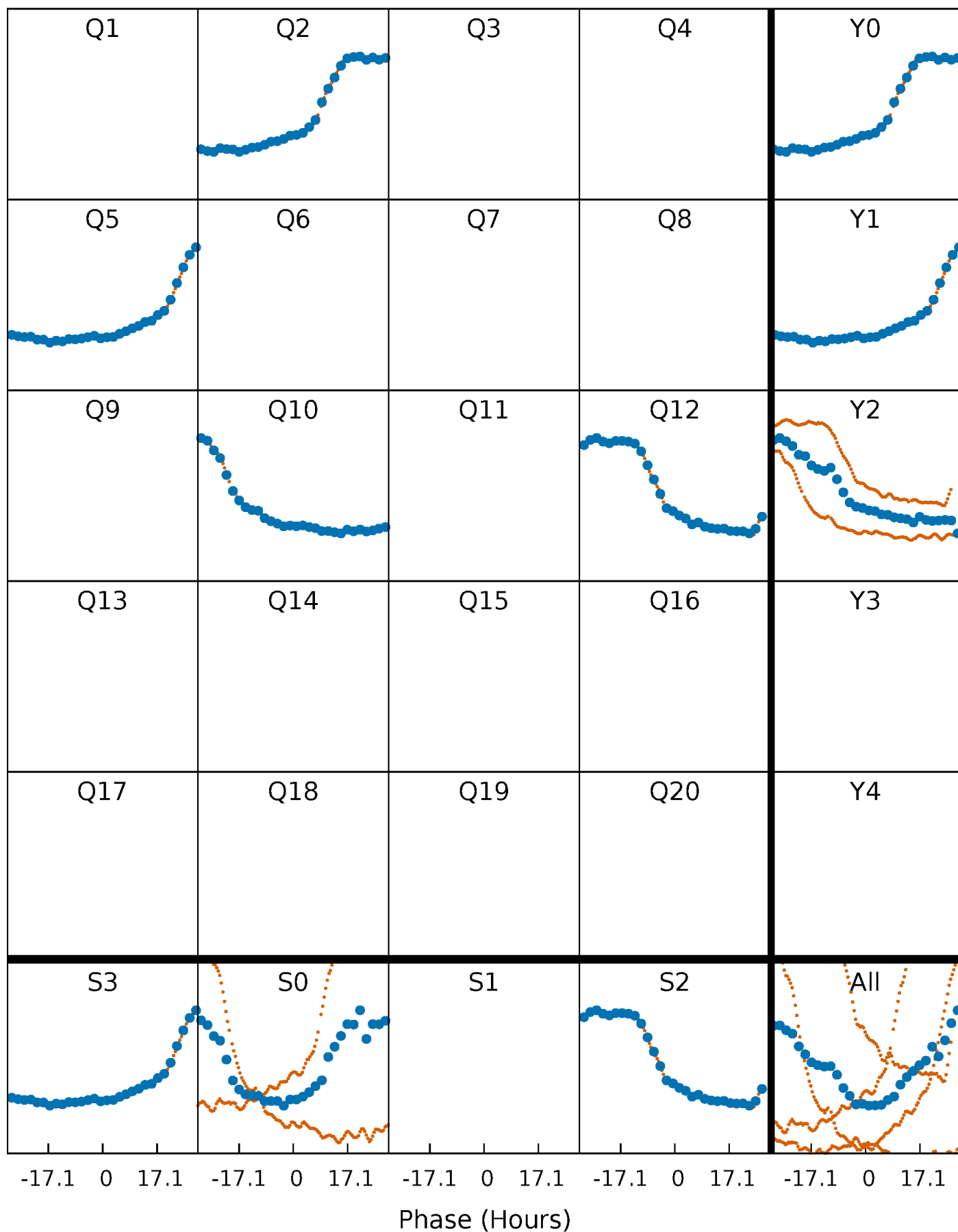


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



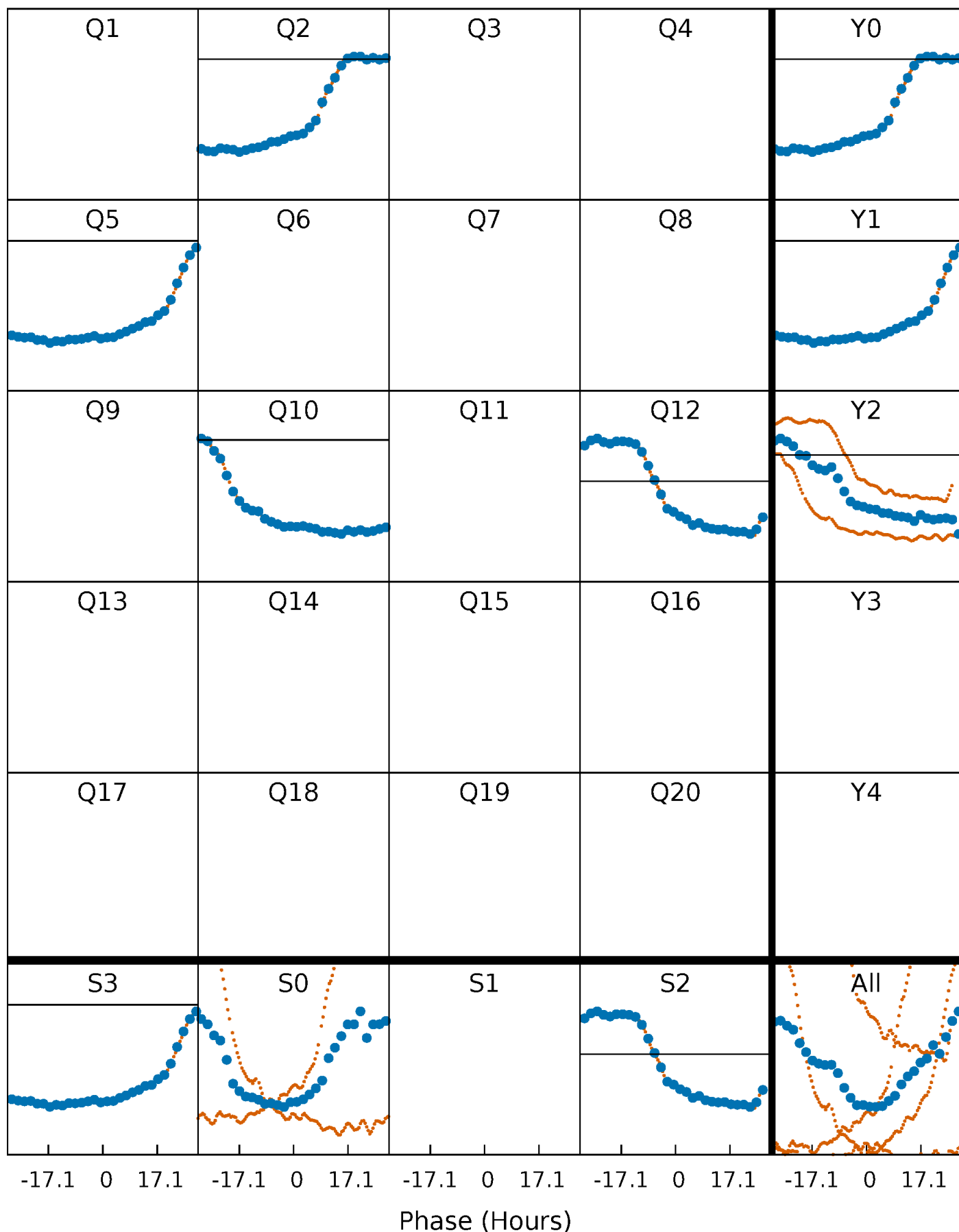
PDC Quarter-Phased Transit Curves

TCE 009970396-02 P=234.720304 Days $T_0=220.526392$ (BKJD)



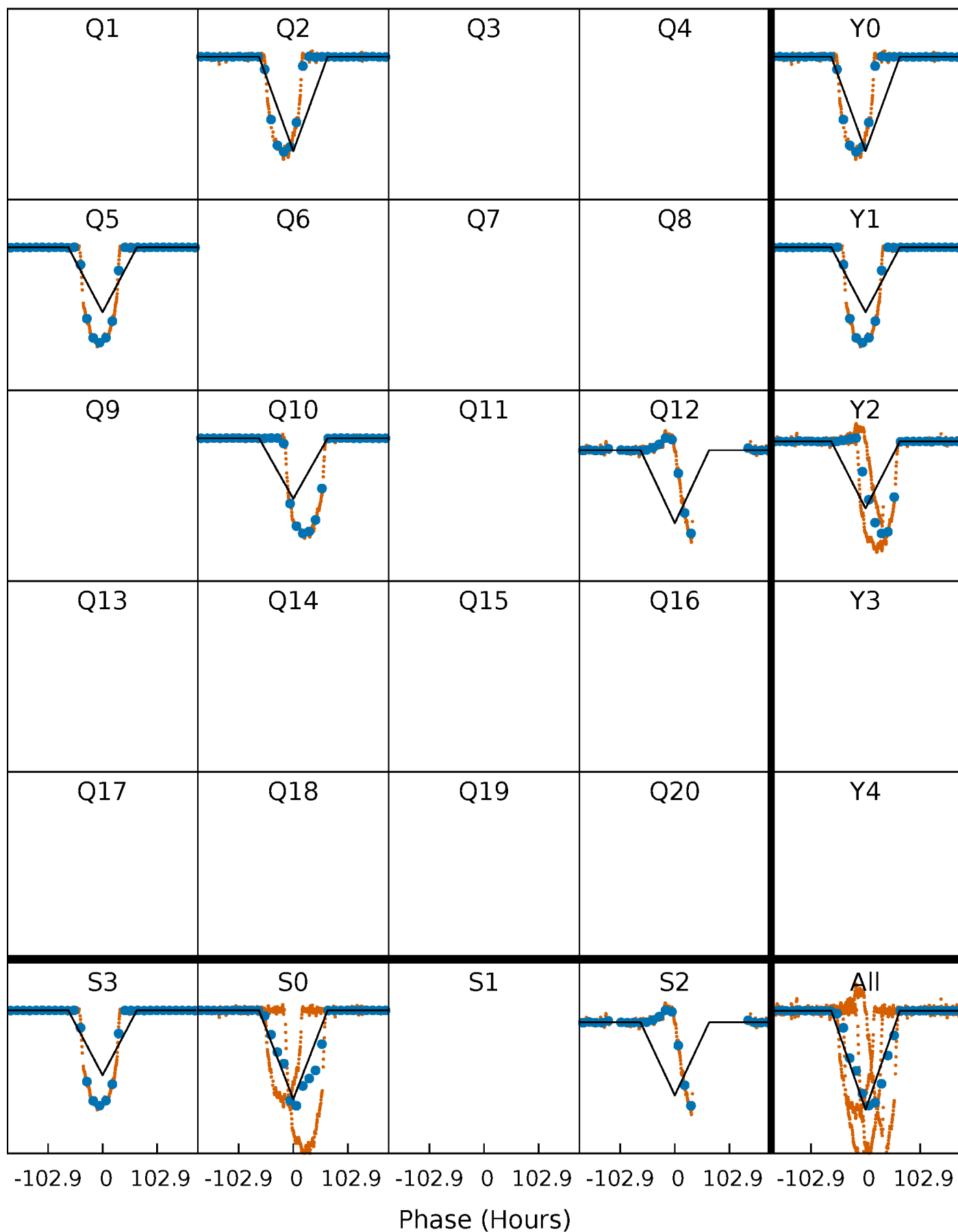
DV Quarter-Phased Transit Curves

TCE 009970396-02 P=234.720304 Days $T_0=220.526392$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

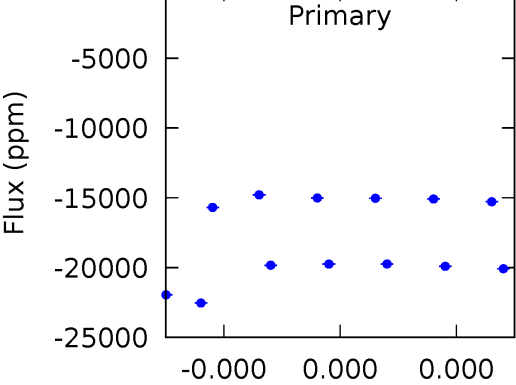
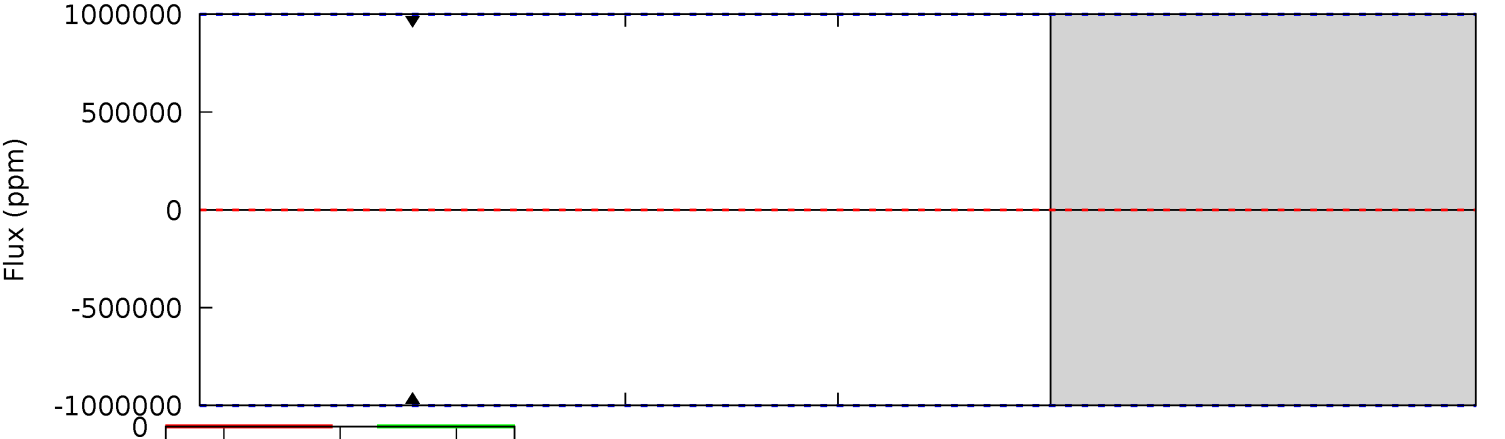
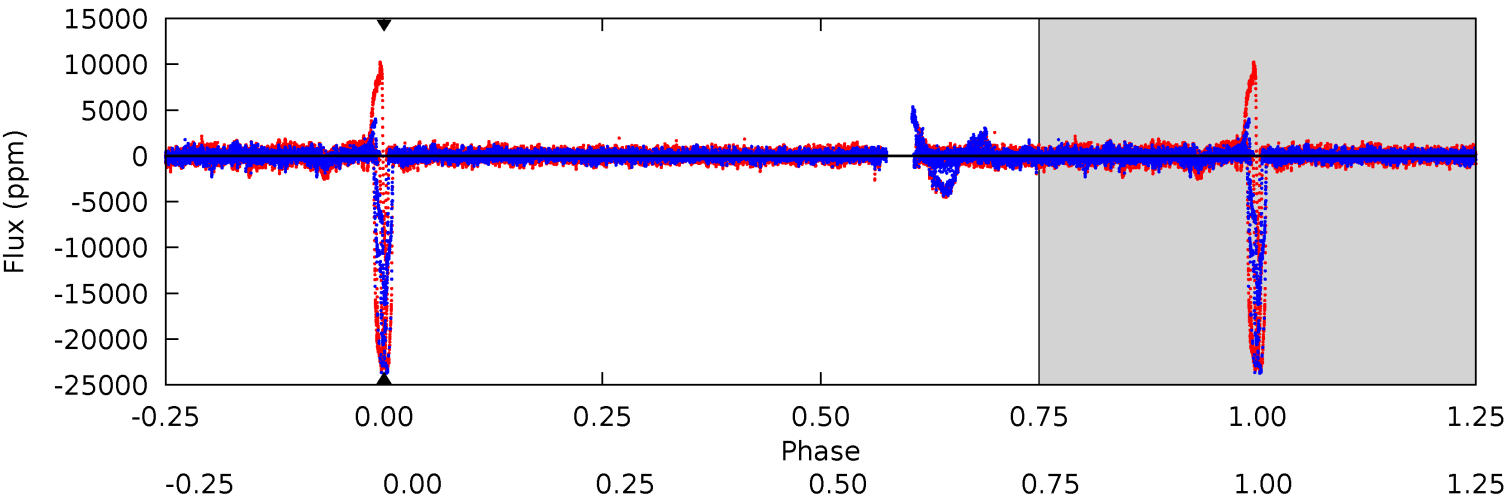
TCE 009970396-02 P=234.720304 Days $T_0=220.236179$ (BKJD)



DV Model-Shift Uniqueness Test

009970396-02, P = 234.720304 Days, E = 220.526392 Days

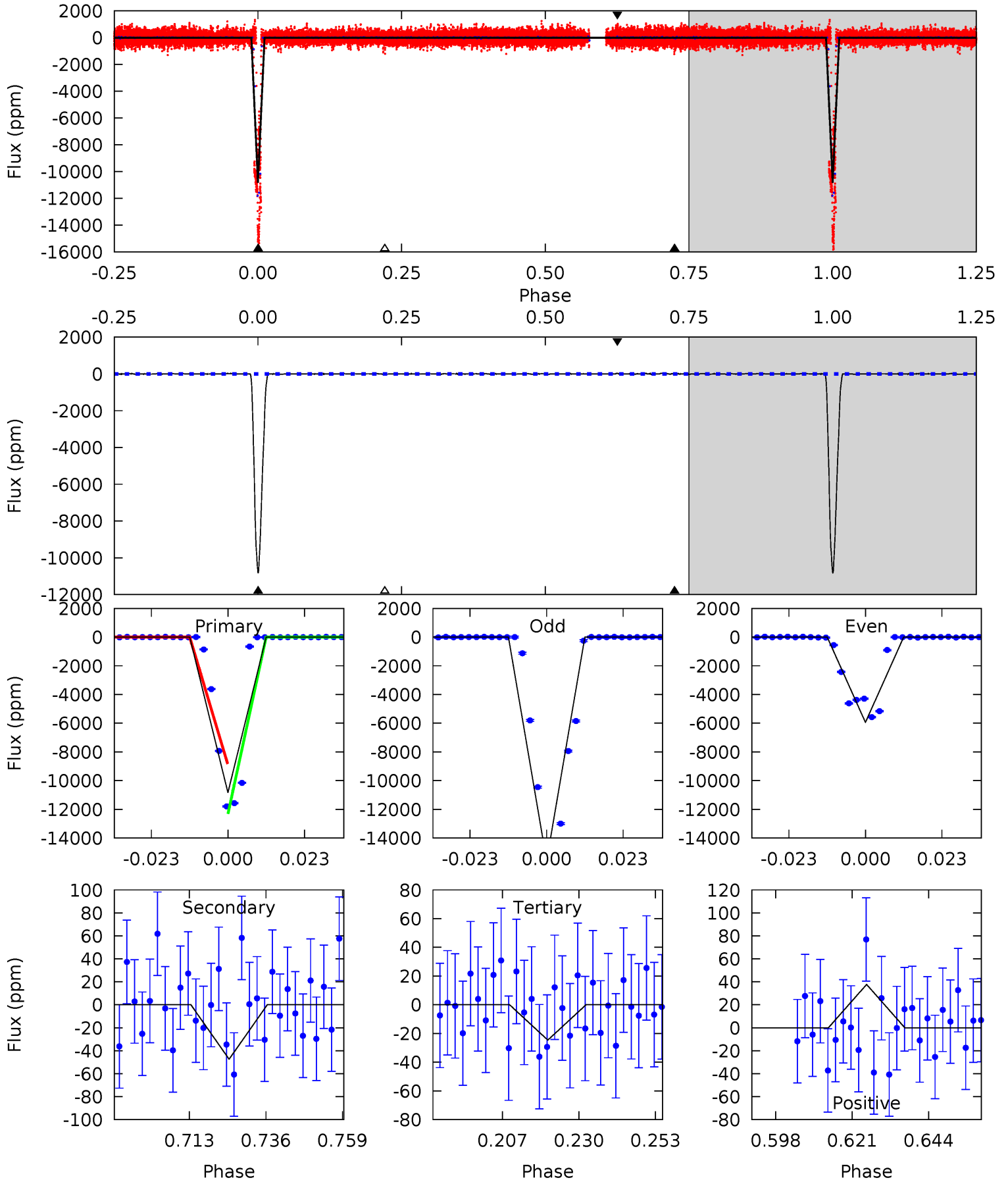
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009970396-02, P = 234.720304 Days, E = 220.236179 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1068	4.67	2.43	3.71	4.86	2.27	0.82	1066	1065	2.25	0.96	575.5	0.89	0.00	0



Stellar Parameters For KIC 009970396

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4791^{+64}_{-71}	$2.730^{+0.160}_{-0.145}$	$-0.160^{+0.150}_{-0.100}$	$8.339^{+1.812}_{-1.812}$	$1.361^{+0.227}_{-0.341}$	$0.003^{+0.003}_{-0.001}$
	+1%/-1%	+6%/-5%	+94%/-62%	+22%/-22%	+17%/-25%	+77%/-37%
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 009970396-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$64.16^{+67.31}_{-46.10}$	938^{+57}_{-54}	-3414^{+17852}_{-10091}	$-77.639^{+15426.451}_{-14980.730}$
Alt.	-47 ± 10	$126.03^{+85.69}_{-77.83}$	941^{+54}_{-56}	1972^{+524}_{-389}	$1.116^{+6.140}_{-0.742}$

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

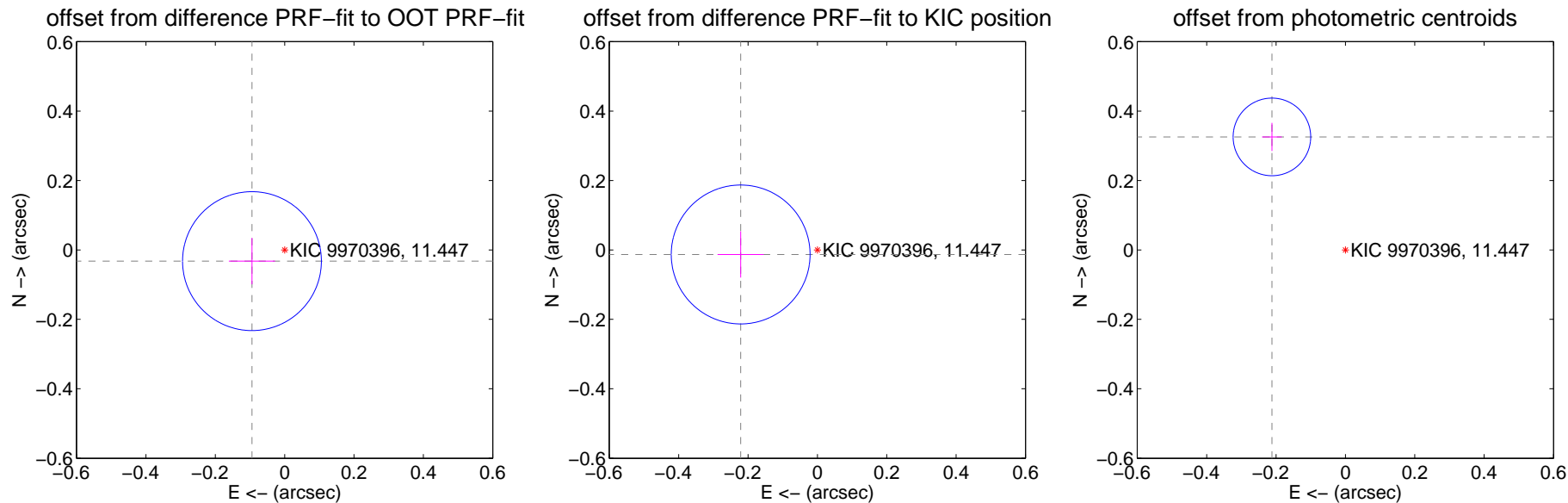
DV Centroid Data

Supplemental centroid analysis for 009970396-02. **Kepler magnitude: 11.45.** 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 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.100 ± 0.067	1.49	0.094 ± 0.067	-0.032 ± 0.067
PRF-fit source offset from KIC position	0.222 ± 0.067	3.32	0.221 ± 0.067	-0.013 ± 0.067
photometric centroid source offset	0.39 ± 0.04	10.42	0.21 ± 0.03	0.33 ± 0.04

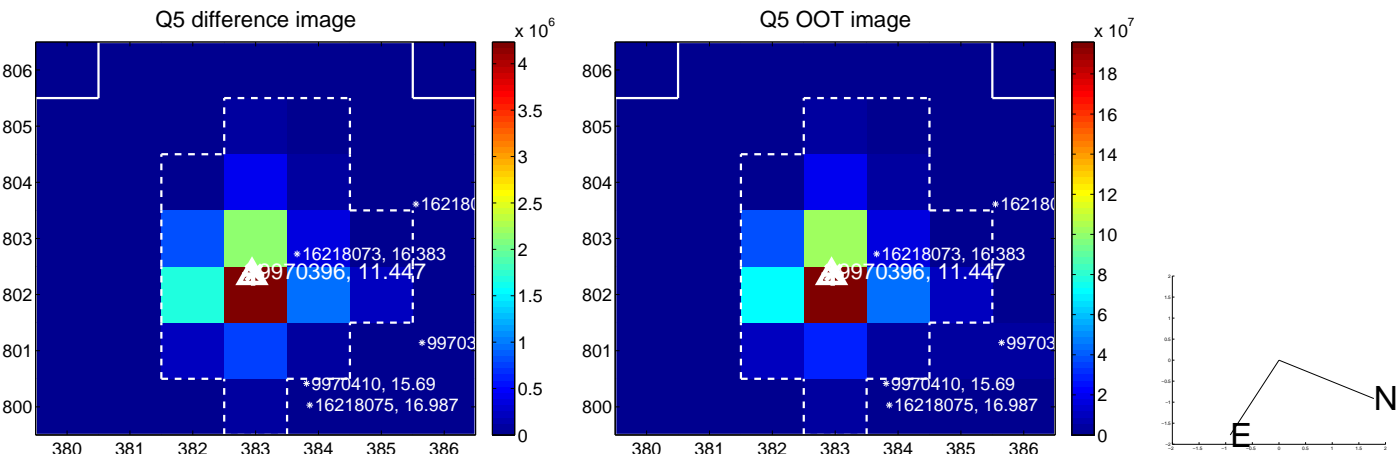


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



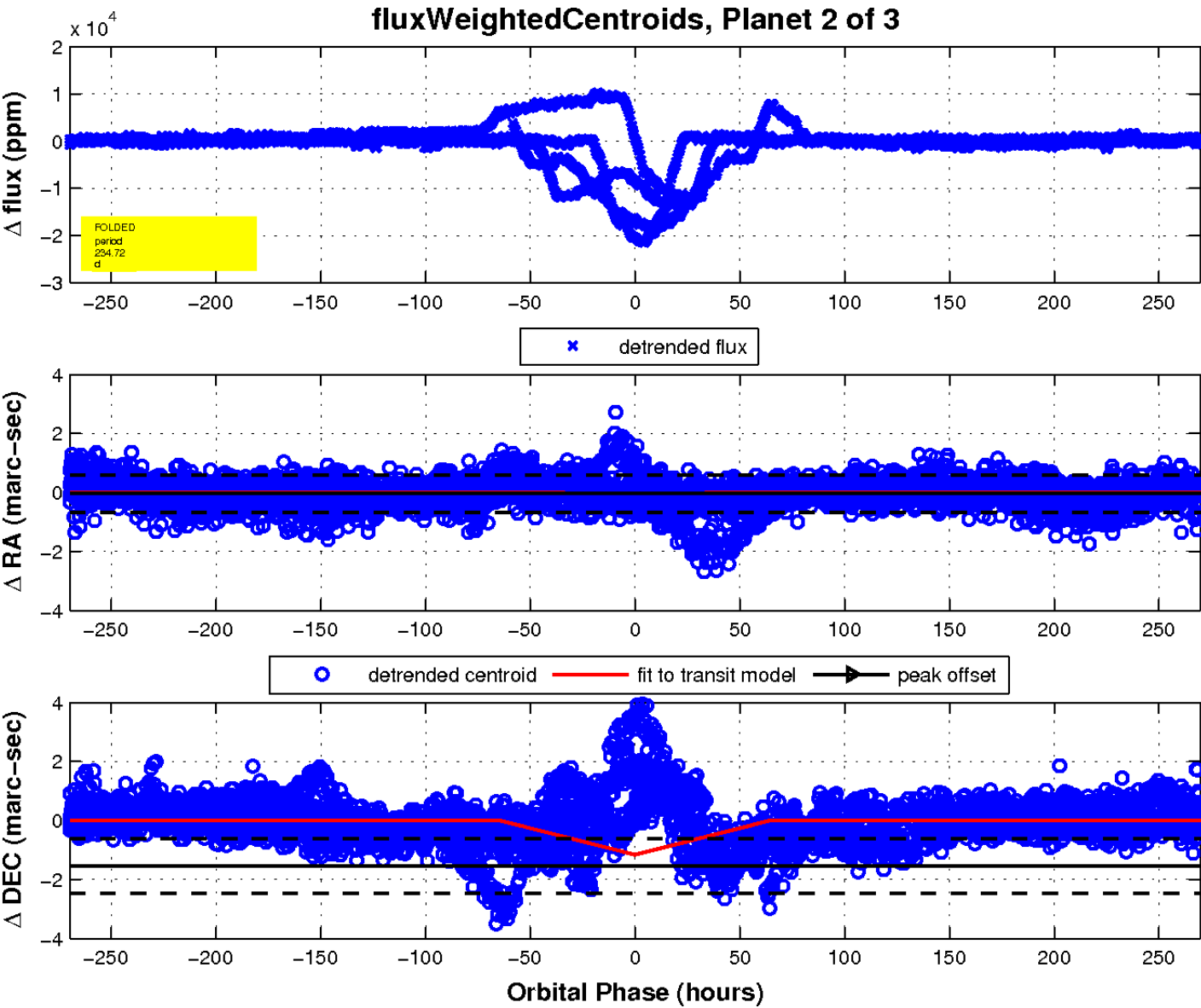
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



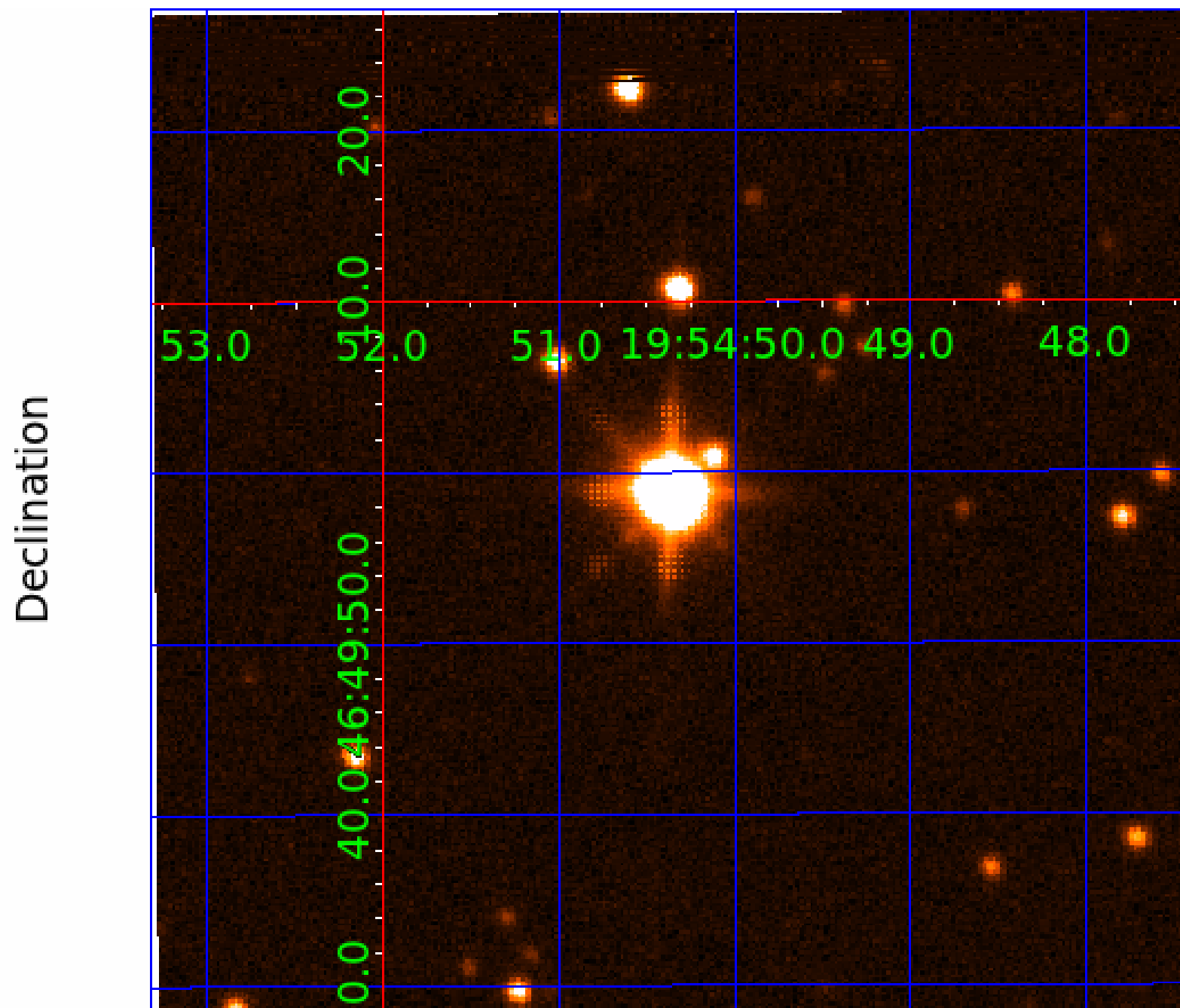
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009970396

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})
009970396-01	OBS	No	235.298647	357.532799	55489.5	76.651	144.4	505.4	8.34	4791	189.81	47.99
009970396-02	OBS	No	234.720304	220.526392	244.3	15.000	34.1	-1.0	8.34	4791	12.57	48.15
009970396-03	OBS	No	235.782849	218.326379	333.6	15.000	39.7	-1.0	8.34	4791	14.69	47.86

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009970396-01	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—CENT_SATURATED
009970396-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—CENT_SATURATED—HALO_GHOST
009970396-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—CENT_SATURATED

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 009970396-03

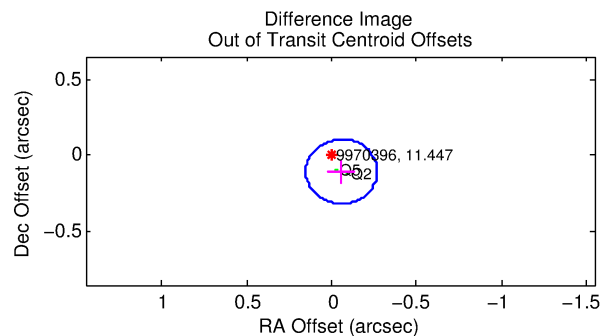
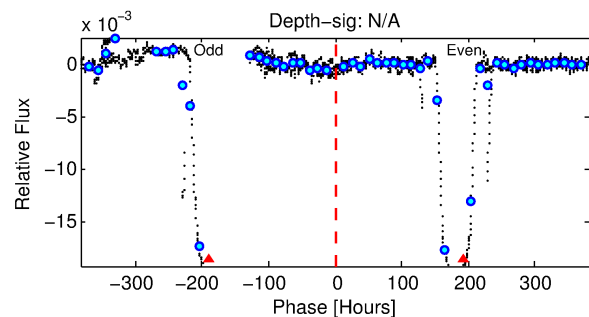
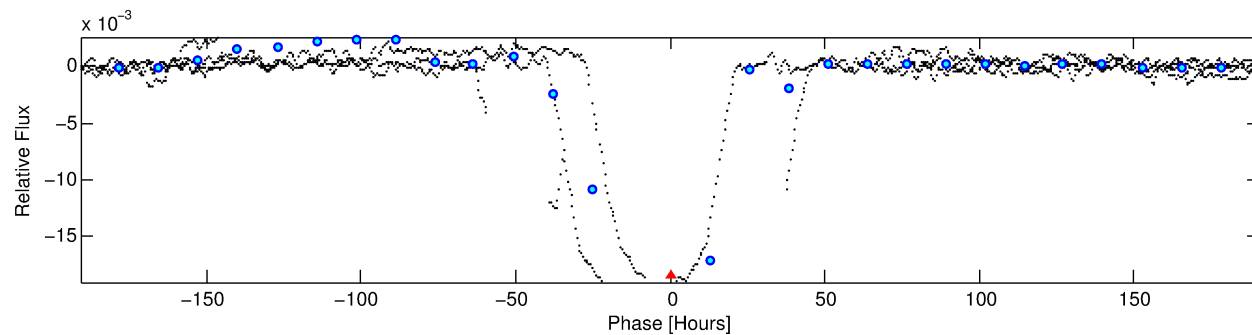
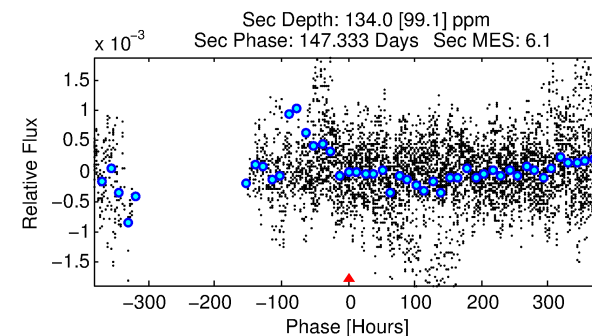
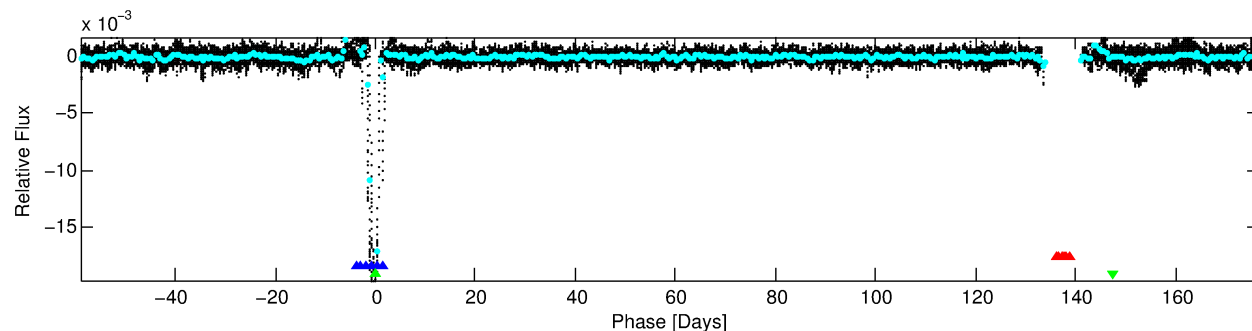
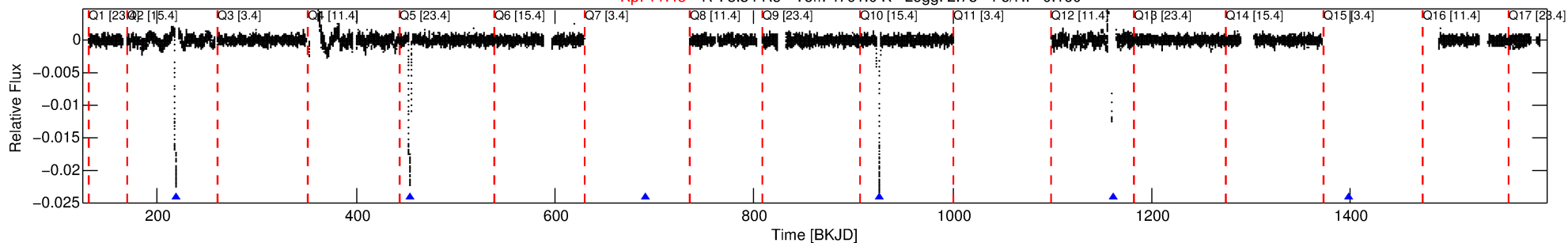
No Significant Match Found

DV One-Page Summary

KIC: 9970396 Candidate: 3 of 3 Period: 235.783 d

KOI: K07606 Corr: No Ephemeris Match

Kp: 11.45 R*: 8.34 Rs Teff: 4791.0 K Logg: 2.73 Fe/H: -0.160



TPS TCE Results:

Period = 235.78285 d
Epoch = 218.3264 BKJD

DV fit results are unavailable

DV Diagnostic Results:

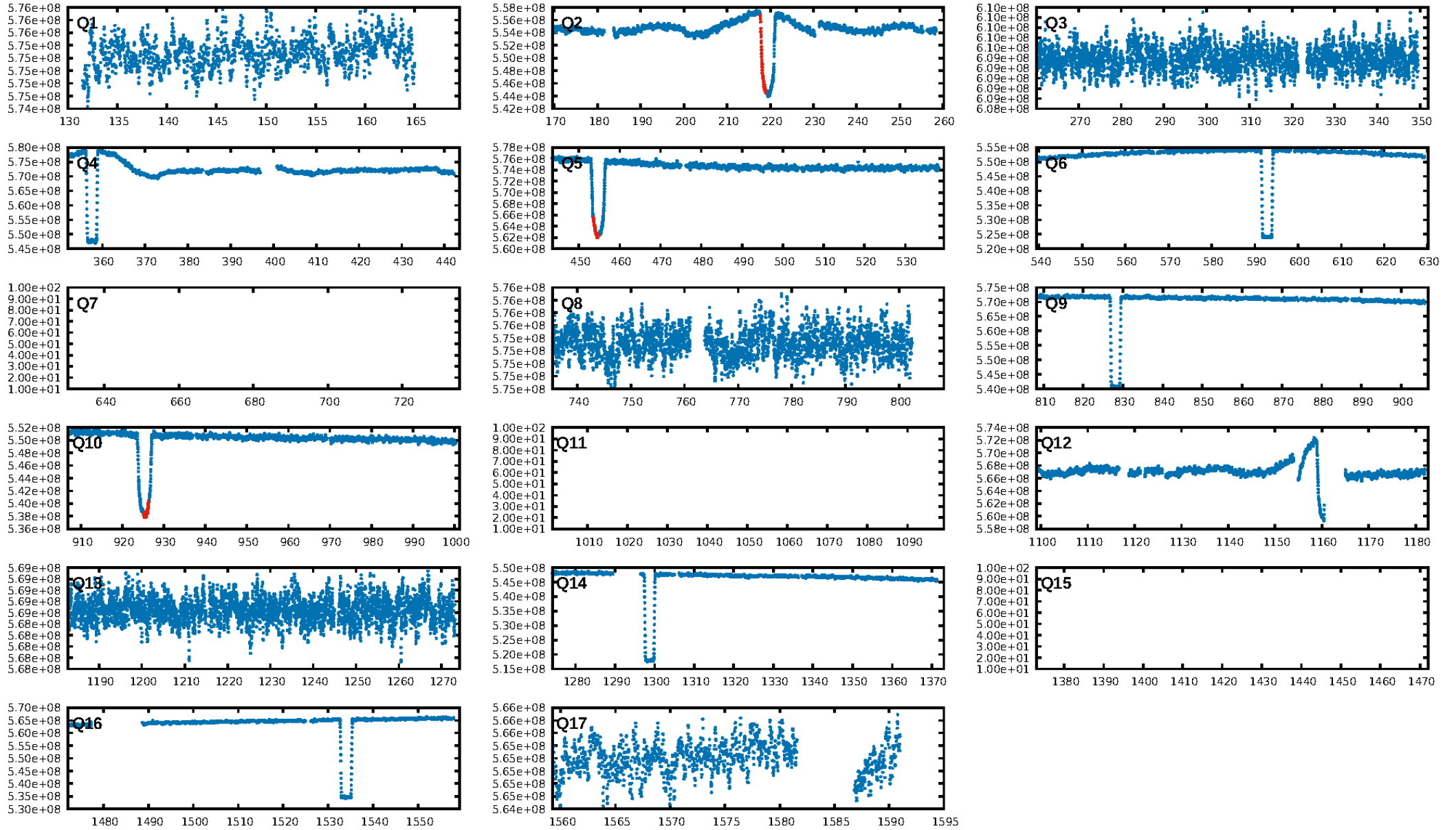
ShortPeriod-sig: 11.8% [0.15 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.11e-154
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.503

Centroid-sig: 0.0%
Centroid-so: 0.199 arcsec [7.78 σ]
OotOffset-rm: 0.120 arcsec [1.71 σ]
KicOffset-rm: 0.159 arcsec [2.08 σ]
OotOffset-st: 1/0/0/1 [2]
KicOffset-st: 1/0/0/1 [2]
DiffImageQuality-fgm: 1.00 [2/2]
DiffImageOverlap-fno: 0.00 [0/2]

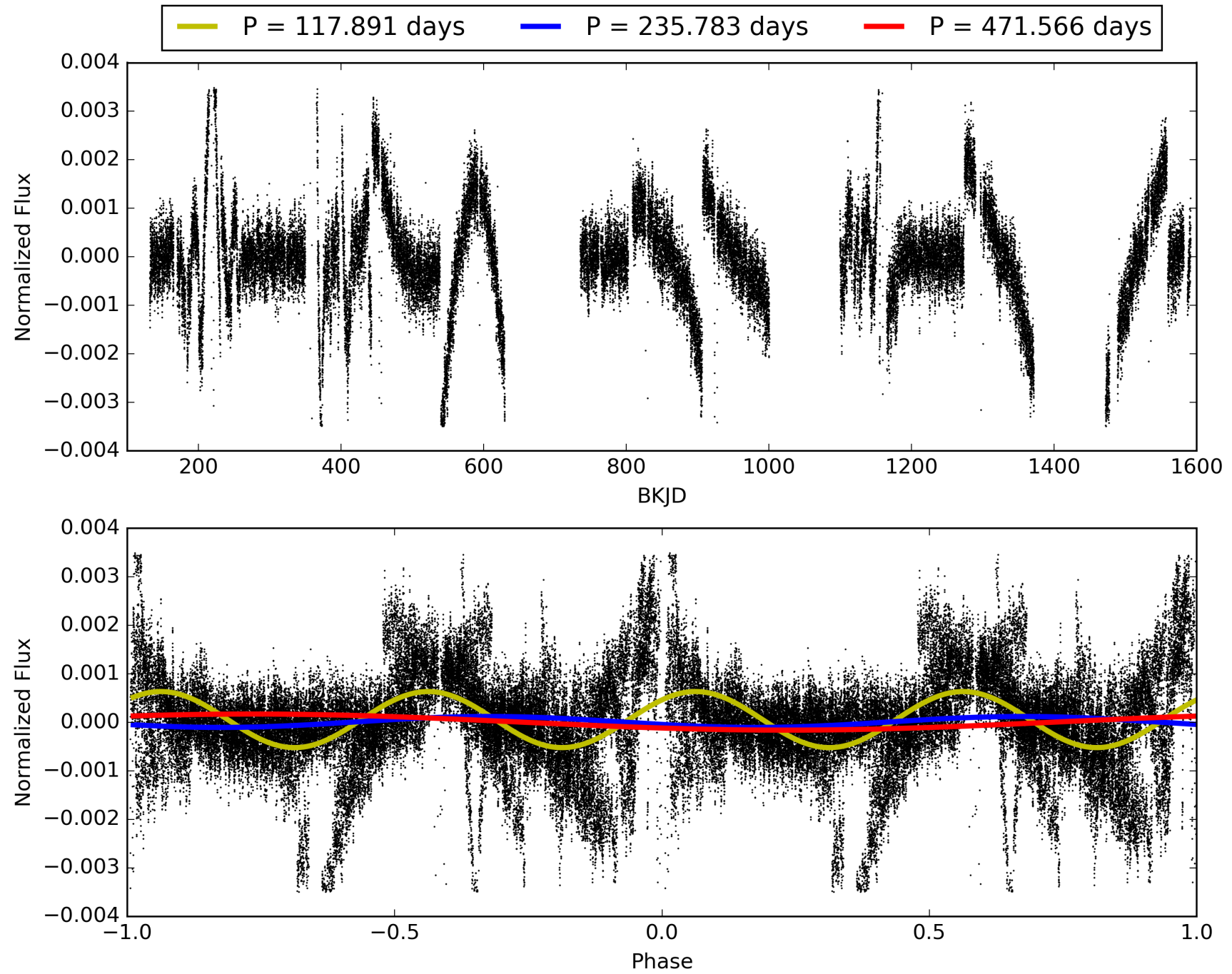
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 12:06:54 Z

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

TCE 009970396-03, PDC Light Curves

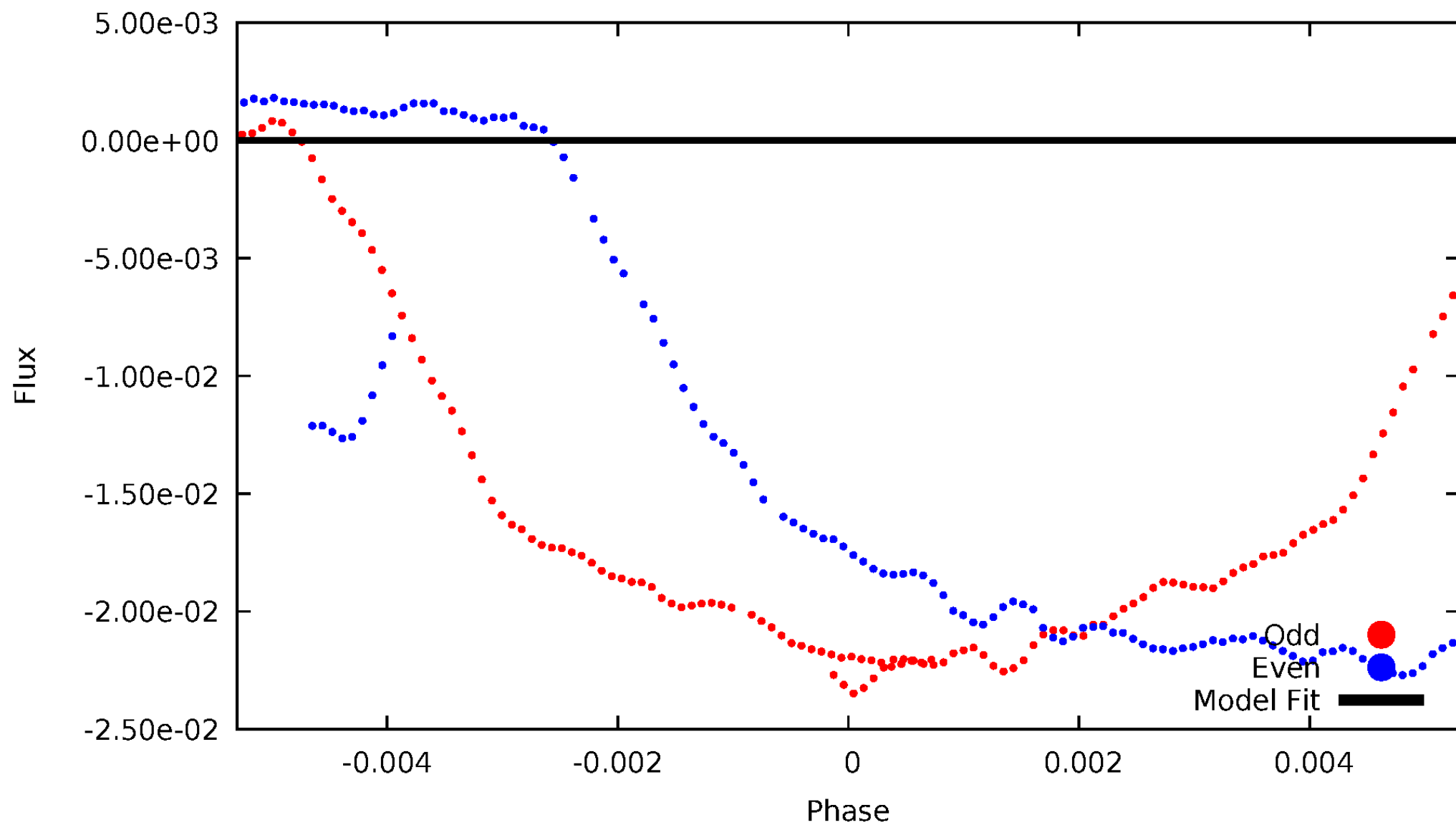


TCE 009970396-03



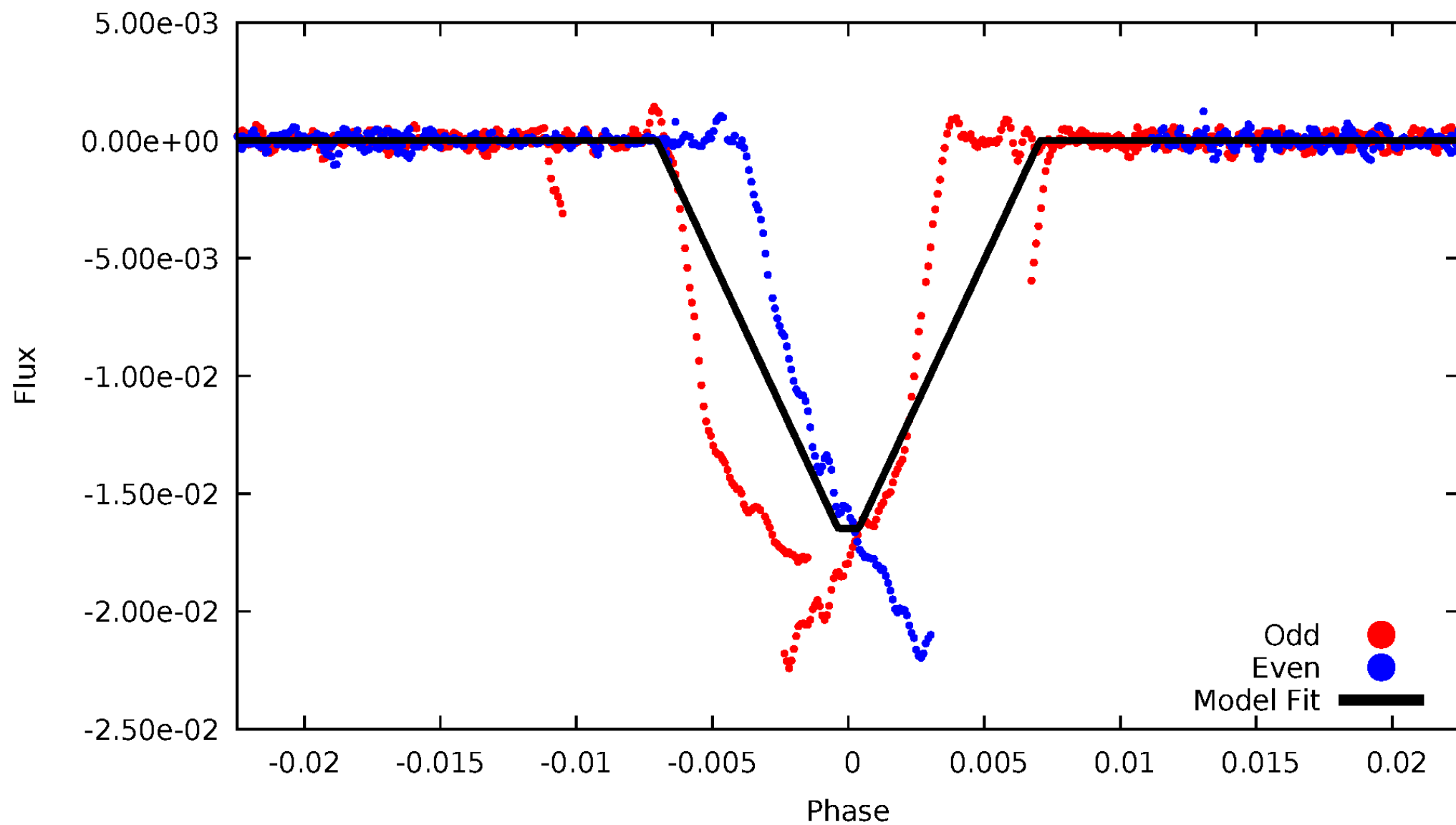
DV Odd/Even

TCE 009970396-03

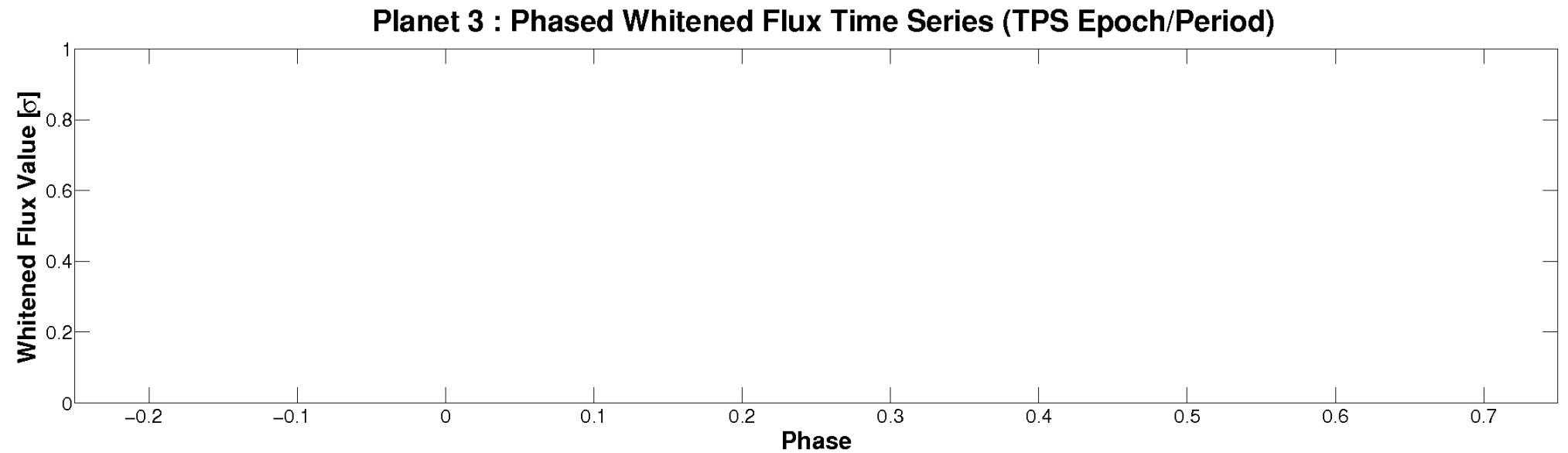
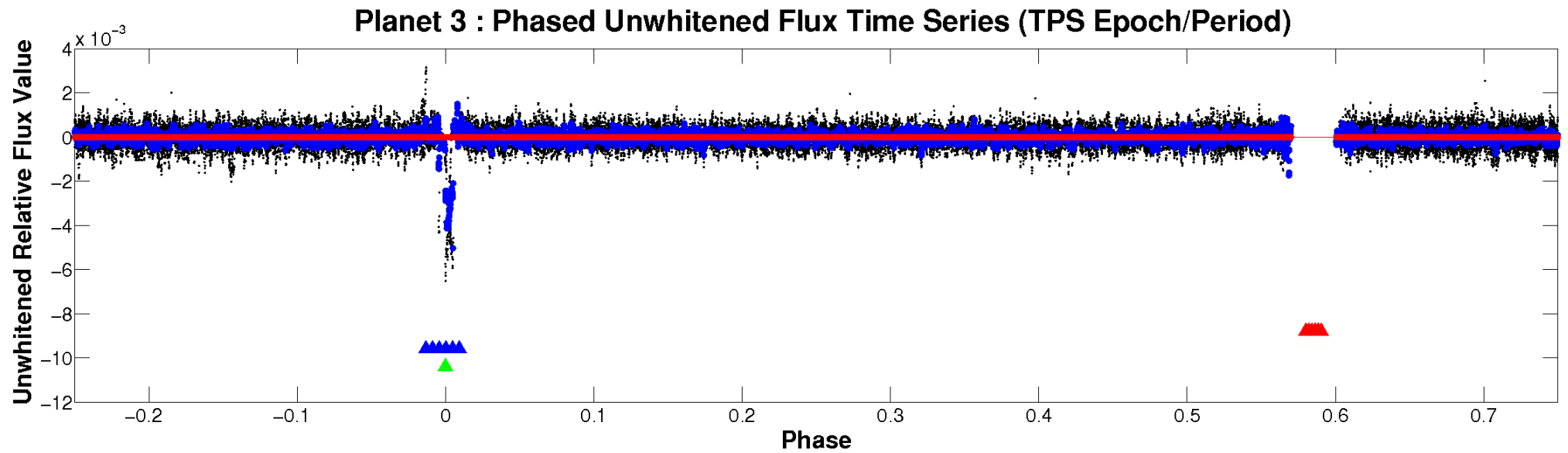


ALT Odd/Even

TCE 009970396-03

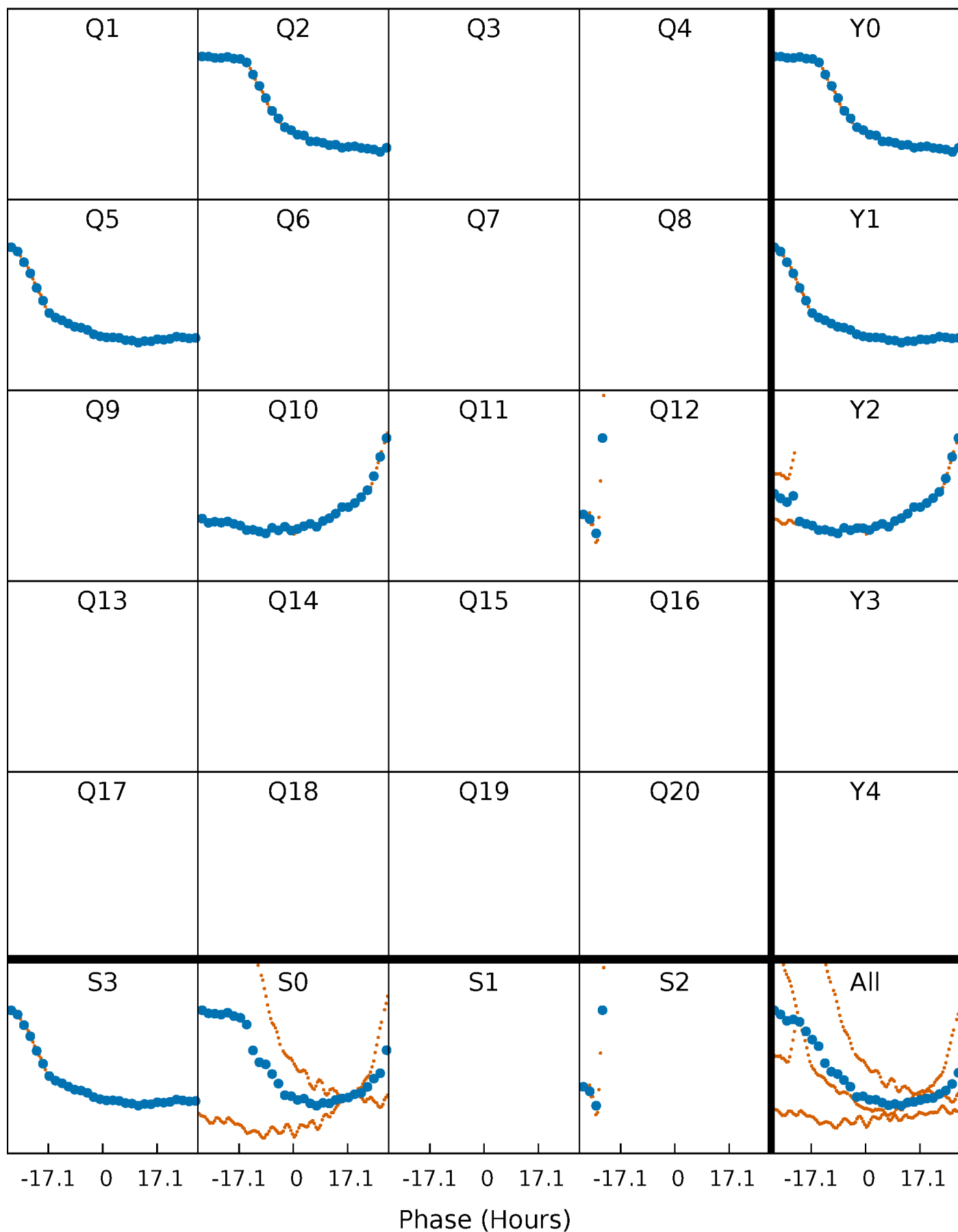


Non-Whitened Vs. Whitened Light Curve



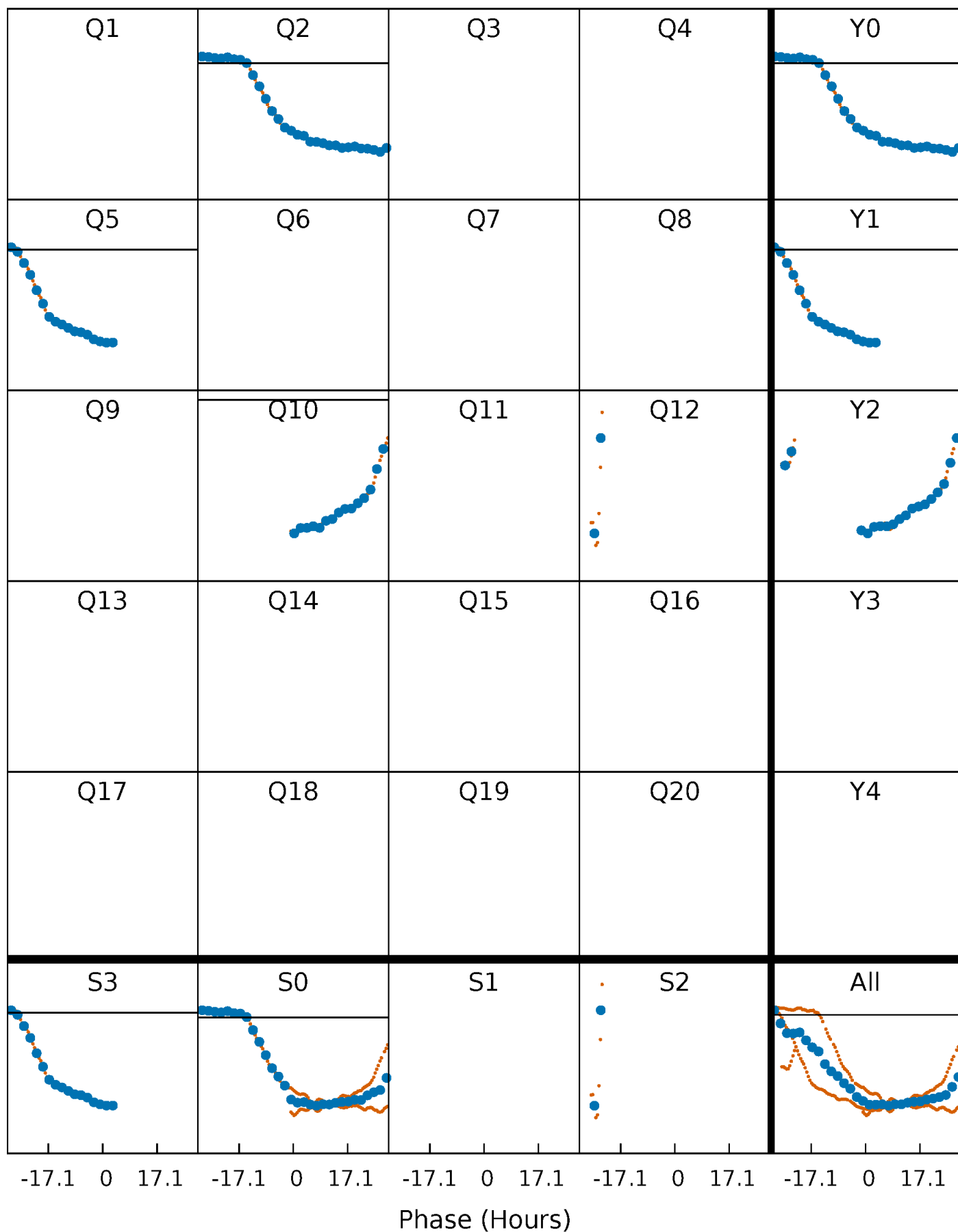
PDC Quarter-Phased Transit Curves

TCE 009970396-03 $P=235.782849$ Days $T_0=218.326379$ (BKJD)



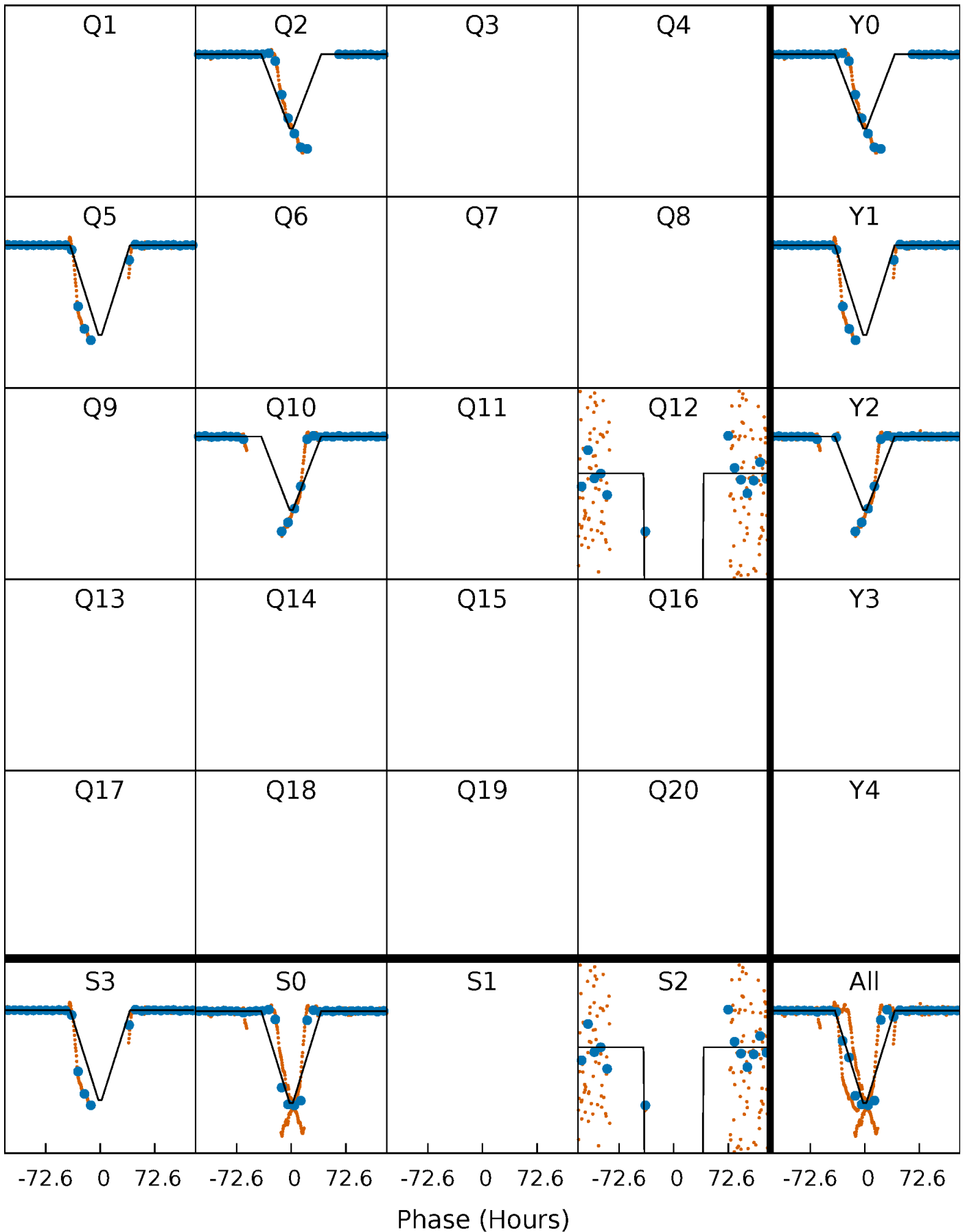
DV Quarter-Phased Transit Curves

TCE 009970396-03 P=235.782849 Days $T_0=218.326379$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

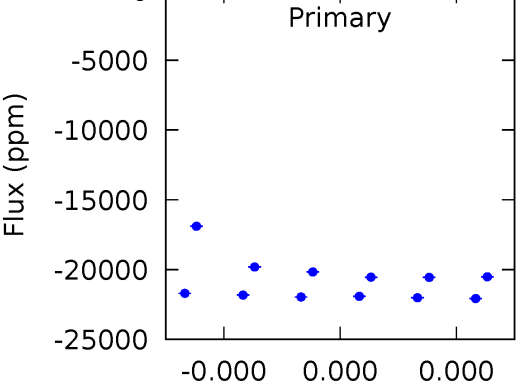
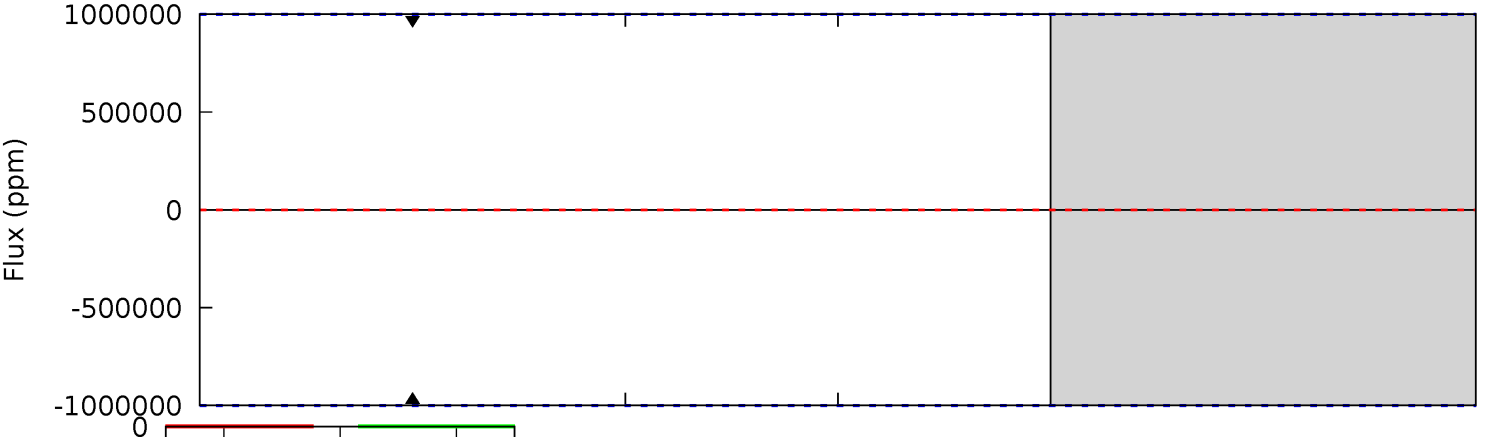
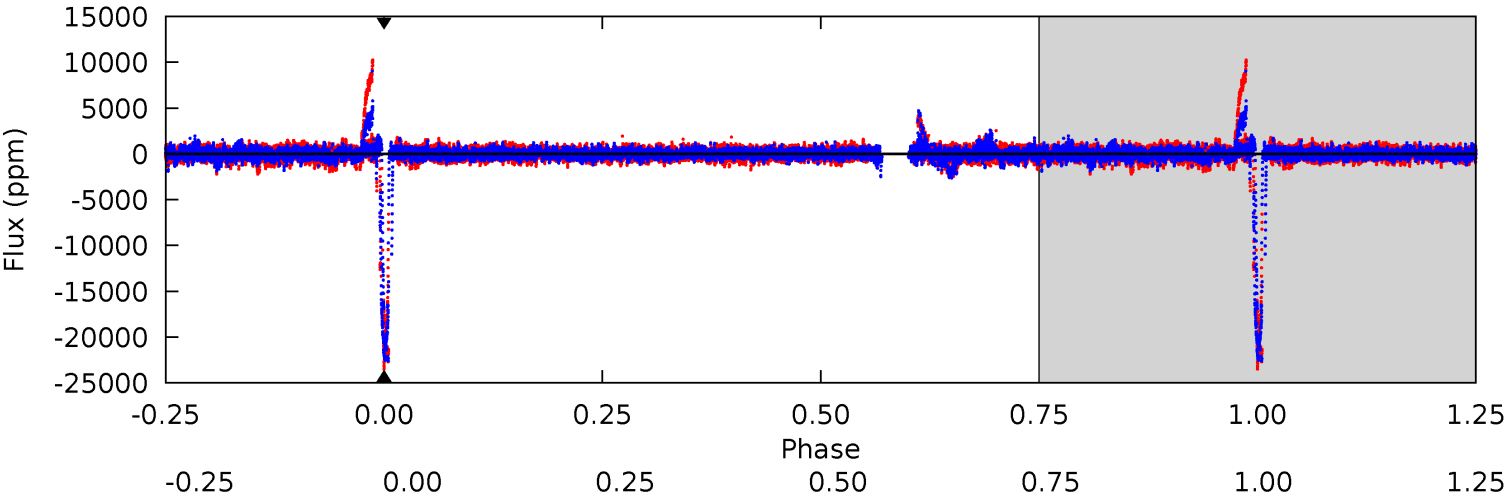
TCE 009970396-03 P=235.782849 Days $T_0=218.850448$ (BKJD)



DV Model-Shift Uniqueness Test

009970396-03, P = 235.782849 Days, E = 218.326379 Days

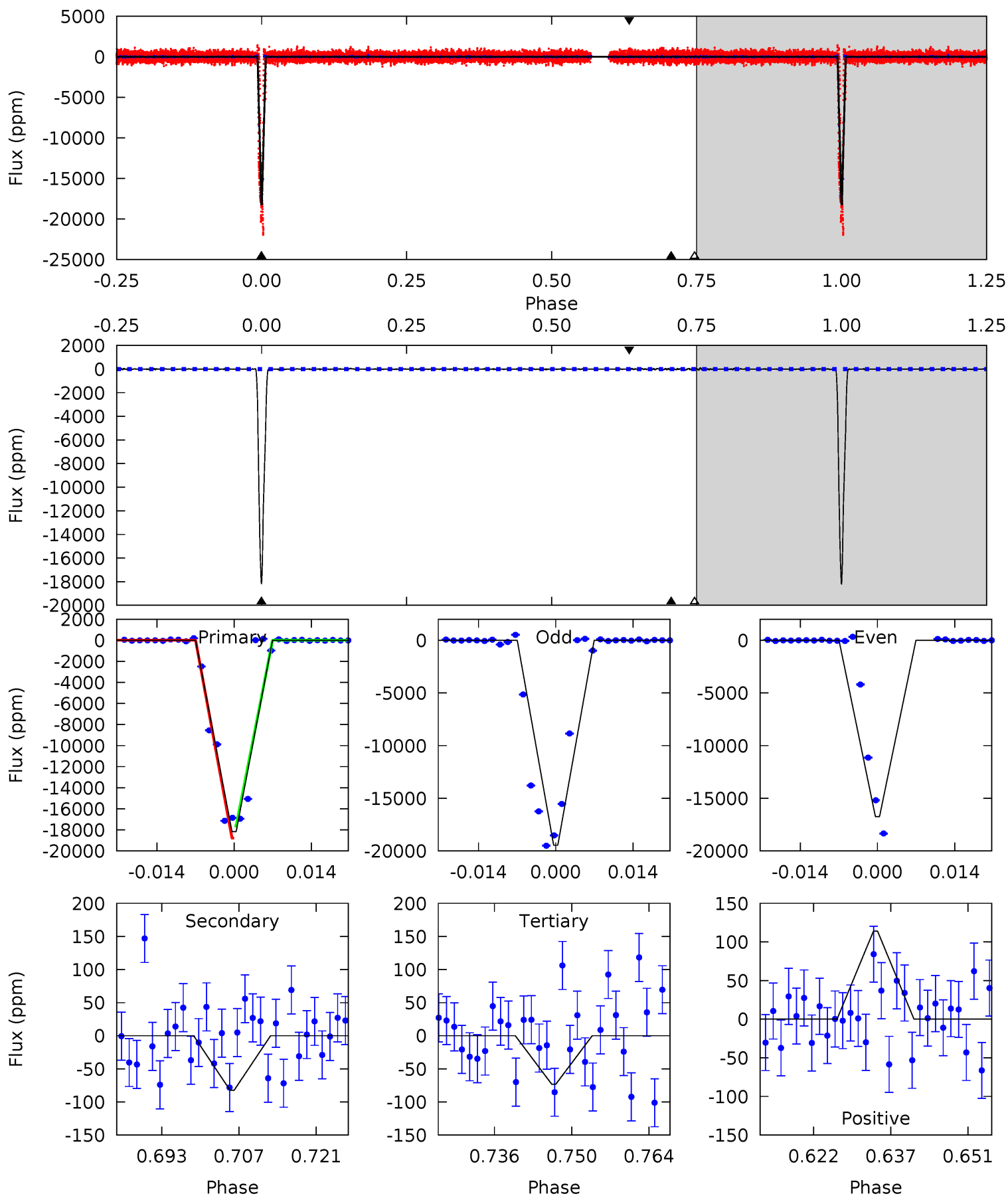
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

009970396-03, P = 235.782849 Days, E = 218.850448 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1073	4.86	4.32	6.73	4.96	2.45	1.13	1069	1067	0.54	-1.87	83.8	0.92	0.01	33.9



Stellar Parameters For KIC 009970396

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4791^{+64}_{-71}	$2.730^{+0.160}_{-0.145}$	$-0.160^{+0.150}_{-0.100}$	$8.339^{+1.812}_{-1.812}$	$1.361^{+0.227}_{-0.341}$	$0.003^{+0.003}_{-0.001}$
	+1%/-1%	+6%/-5%	+94%/-62%	+22%/-22%	+17%/-25%	+77%/-37%
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 009970396-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$64.00^{+74.35}_{-43.42}$	935^{+57}_{-54}	3826^{+9956}_{-17000}	123^{+15969}_{-14208}
Alt.	-82 ± 17	$122.23^{+92.34}_{-74.17}$	936^{+54}_{-55}	2132^{+558}_{-321}	$1.994^{+11.087}_{-1.341}$

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

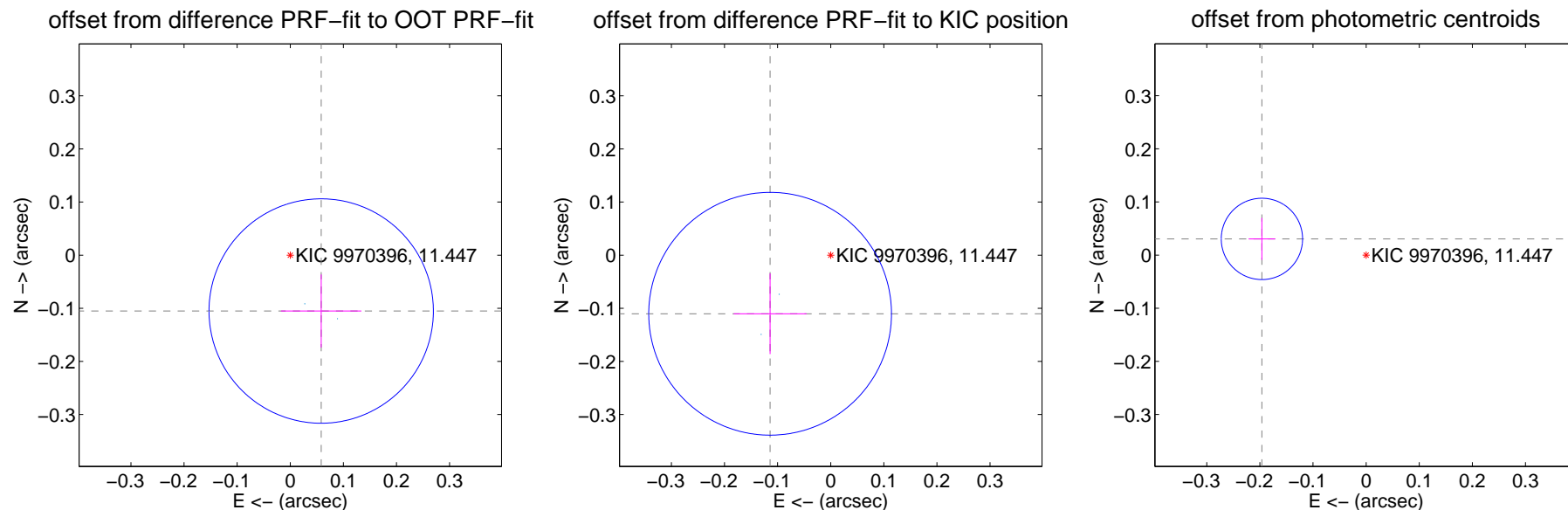
DV Centroid Data

Supplemental centroid analysis for 009970396-03. **Kepler magnitude: 11.45.** Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

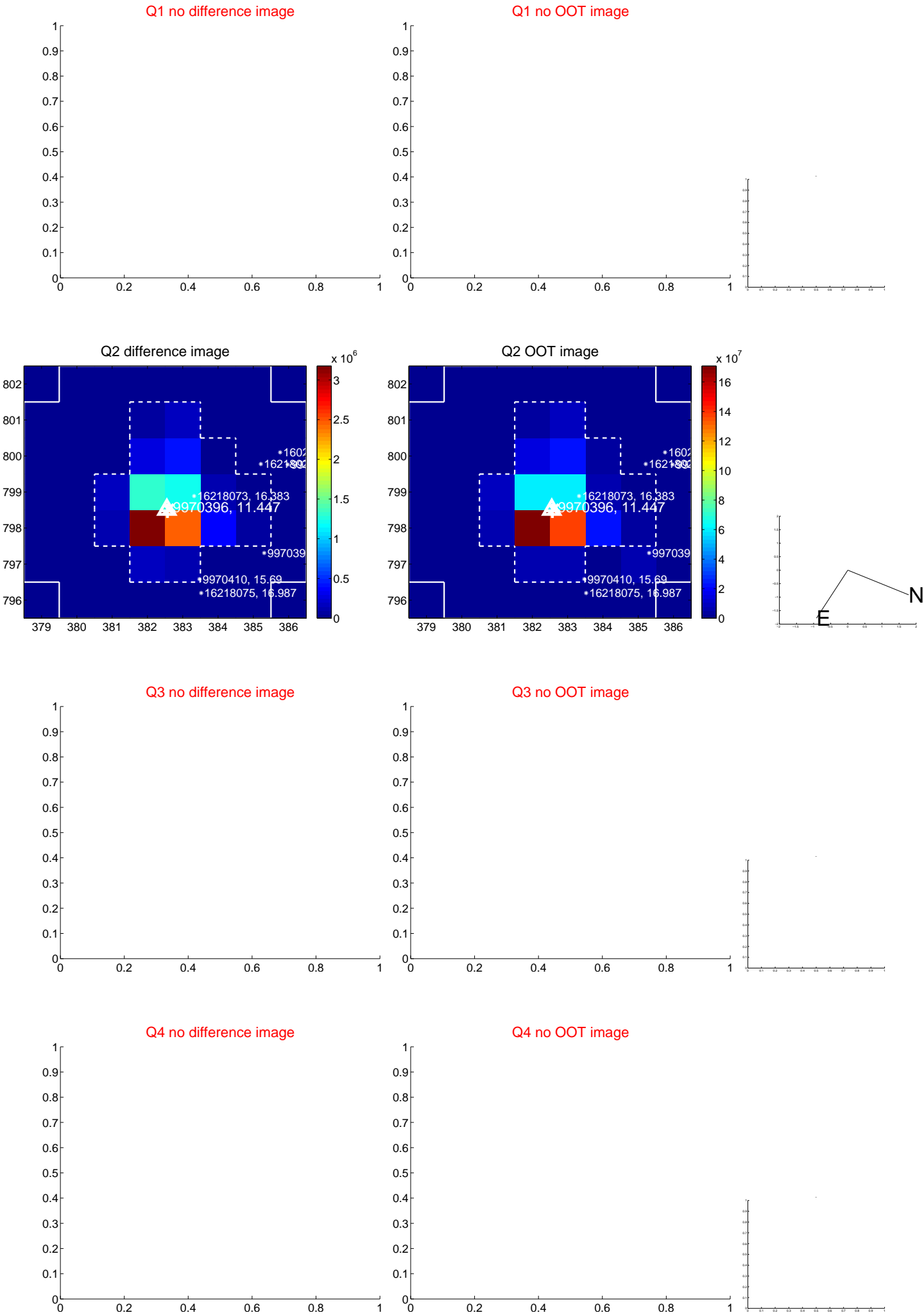
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.120 ± 0.070	1.71	-0.058 ± 0.076	-0.105 ± 0.069
PRF-fit source offset from KIC position	0.159 ± 0.076	2.08	0.114 ± 0.069	-0.110 ± 0.076
photometric centroid source offset	0.20 ± 0.03	7.78	0.20 ± 0.03	0.03 ± 0.04

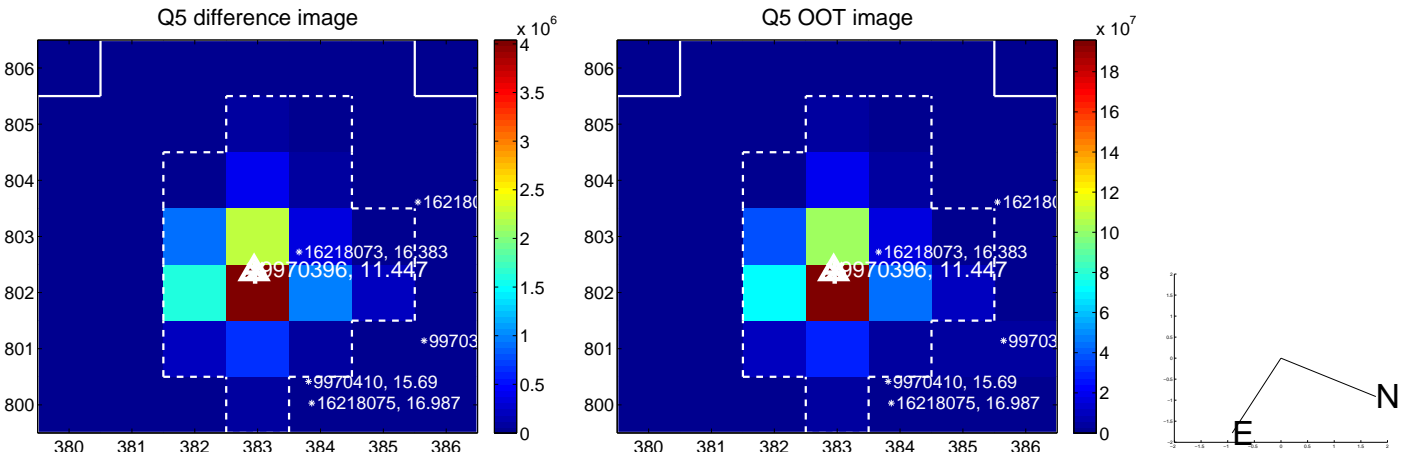


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



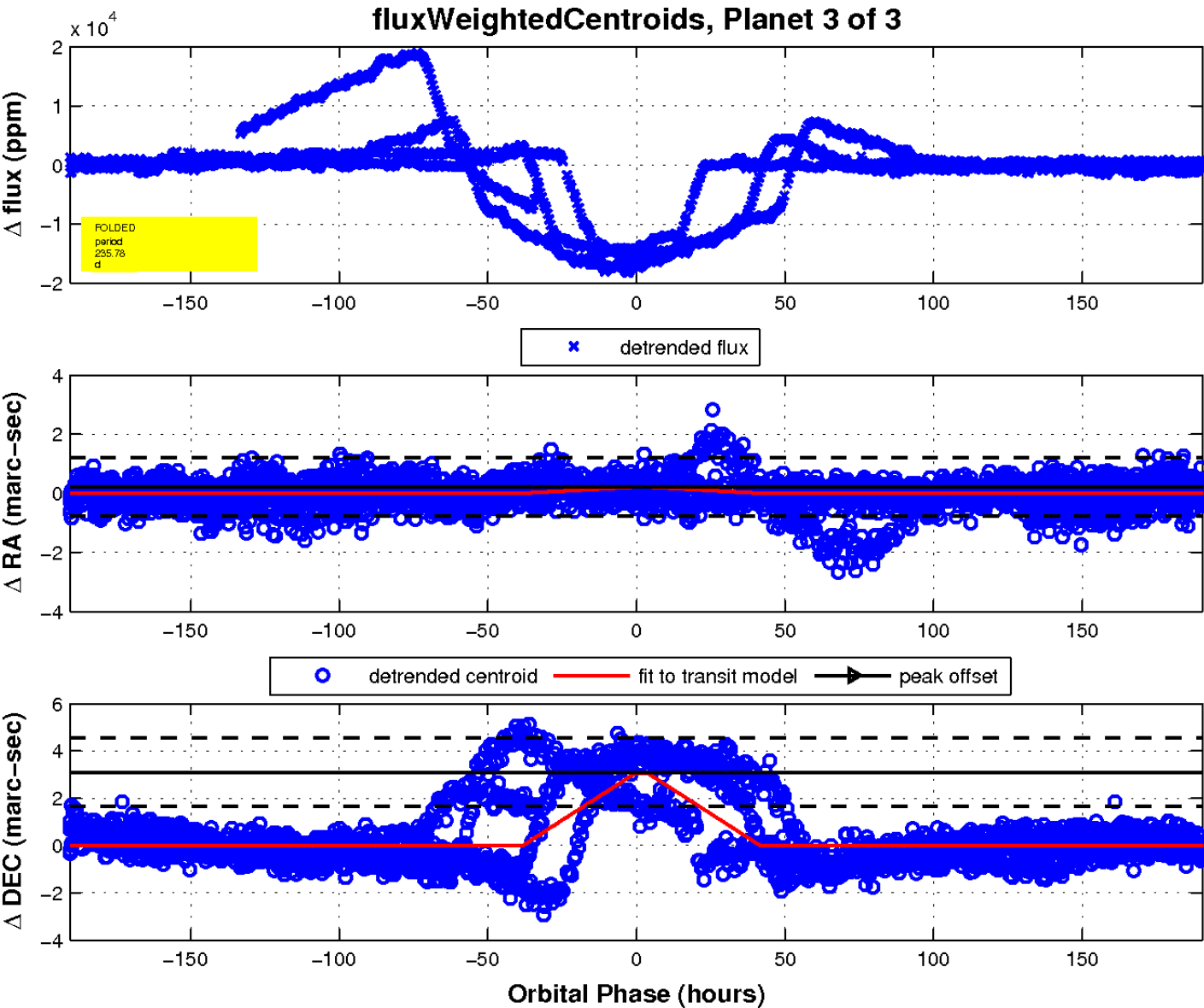
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

