

KIC 009237305

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})
009237305-02	OBS	No	309.745220	331.156710	446.8	11.424	14.5	7.3	5.83	5210	16.82	16.95
009237305-03	OBS	No	533.907810	431.829581	730.9	4.763	15.2	12.2	5.83	5210	19.76	8.20
009237305-04	OBS	No	396.734868	458.543019	469.1	12.690	13.9	6.7	5.83	5210	12.73	12.19
009237305-05	OBS	No	358.810042	254.916869	1.7	9.592	14.3	0.0	5.83	5210	0.97	13.94
009237305-07	OBS	No	539.570067	250.332031	489.1	5.265	9.6	7.9	5.83	5210	14.88	8.09
009237305-08	OBS	No	562.143737	369.334395	439.5	12.259	9.9	6.4	5.83	5210	12.35	7.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009237305-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—HALO_GHOST
009237305-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
009237305-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
009237305-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

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

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

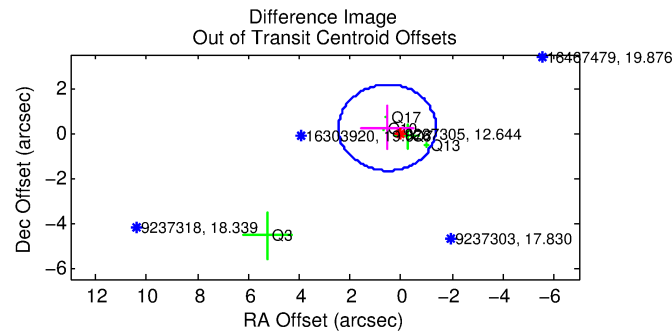
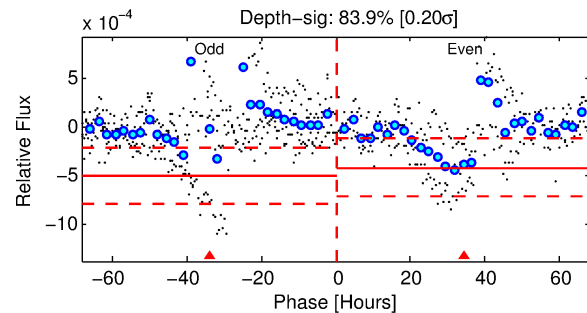
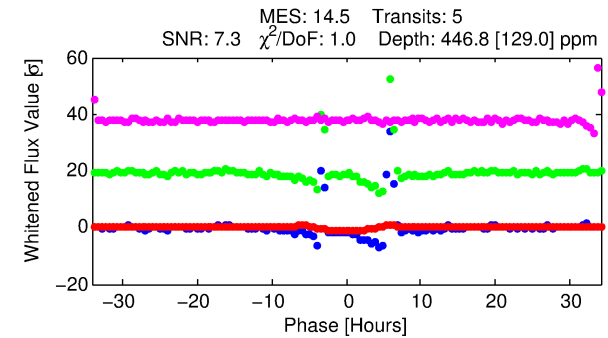
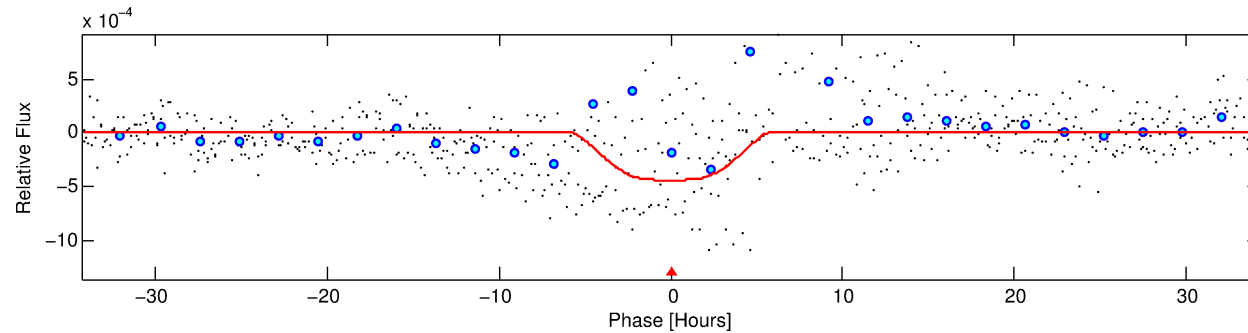
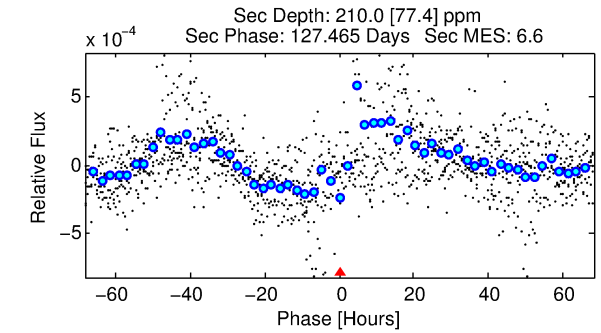
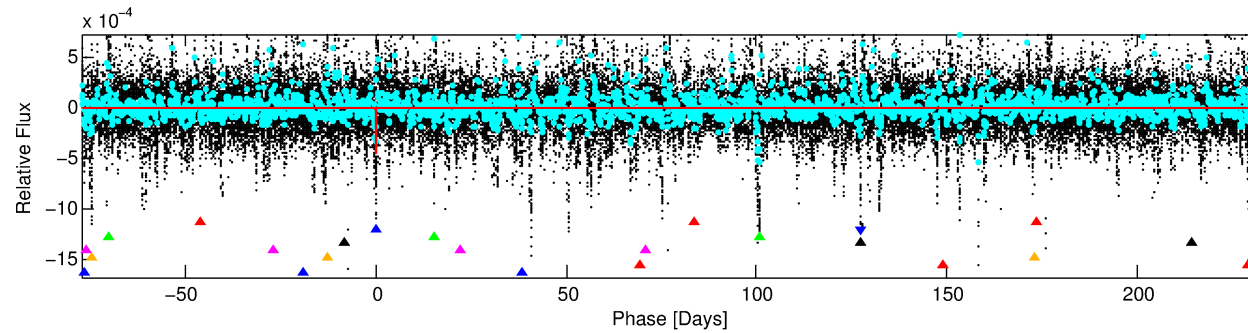
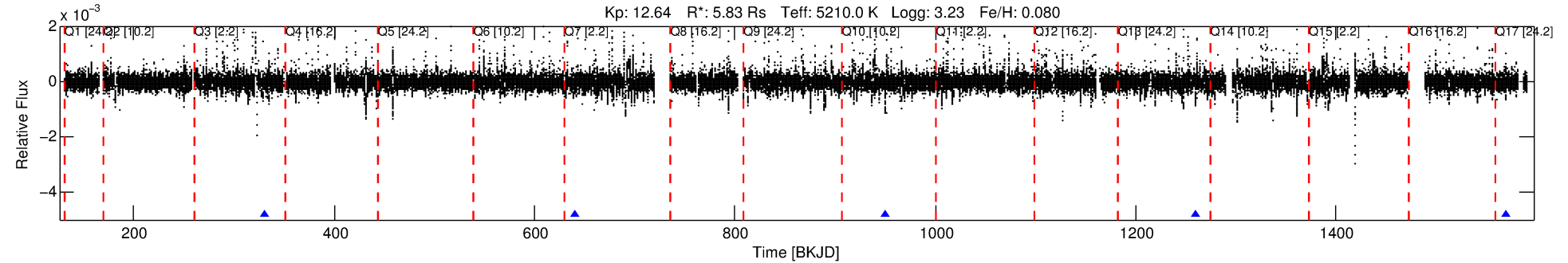
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009237305-02

No Significant Match Found

DV One-Page Summary

KIC: 9237305 Candidate: 2 of 8 Period: 309.745 d



DV Fit Results:

Period = 309.74522 [0.01435] d
Epoch = 331.1567 [0.0378] BKJD
Rp/R* = 0.0264 [0.0045]
a/R* = 70.77 [16.40]
b = 0.97 [0.02]
Seff = 16.95 [18.25]
Teq = 517 [139] K
Rp = 16.82 [11.58] Re
a = 1.1500 [0.7555] AU
Ag = 540.26 [635.79] [0.85 σ]
Teffp = 3857 [508] K [6.34 σ]

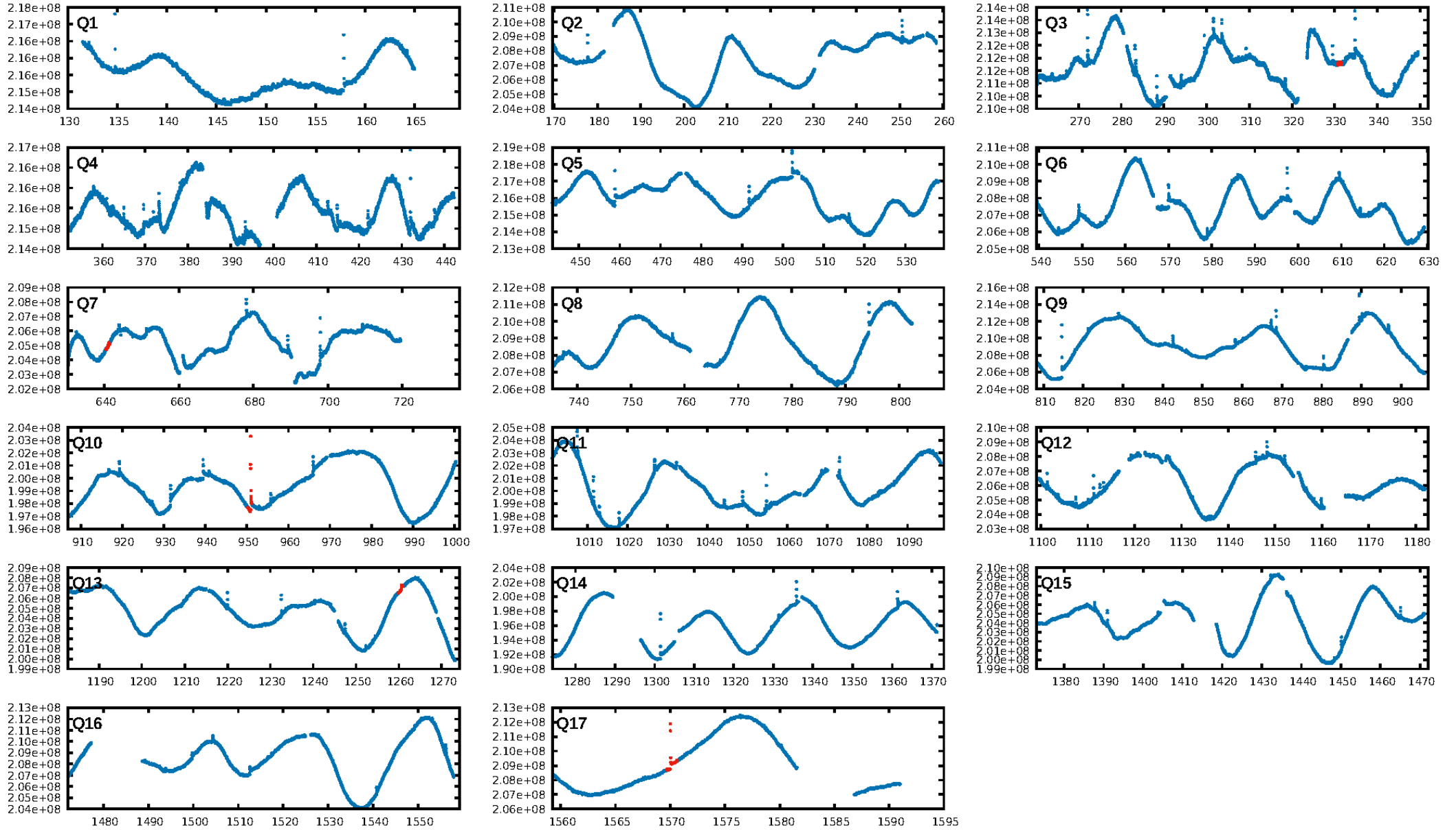
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [78.94 σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 98.2%
Bootstrap-pfa: 1.42e-14
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.131
Centroid-sig: N/A
Centroid-so: 0.287 arcsec [0.61 σ]
OotOffset-rm: 0.591 arcsec [0.92 σ]
KicOffset-rm: 0.638 arcsec [1.01 σ]
OotOffset-st: 1/2/0/2 [5]
KicOffset-st: 1/2/0/2 [5]
DiffImageQuality-fgm: 0.60 [3/5]
DiffImageOverlap-fno: 1.00 [5/5]

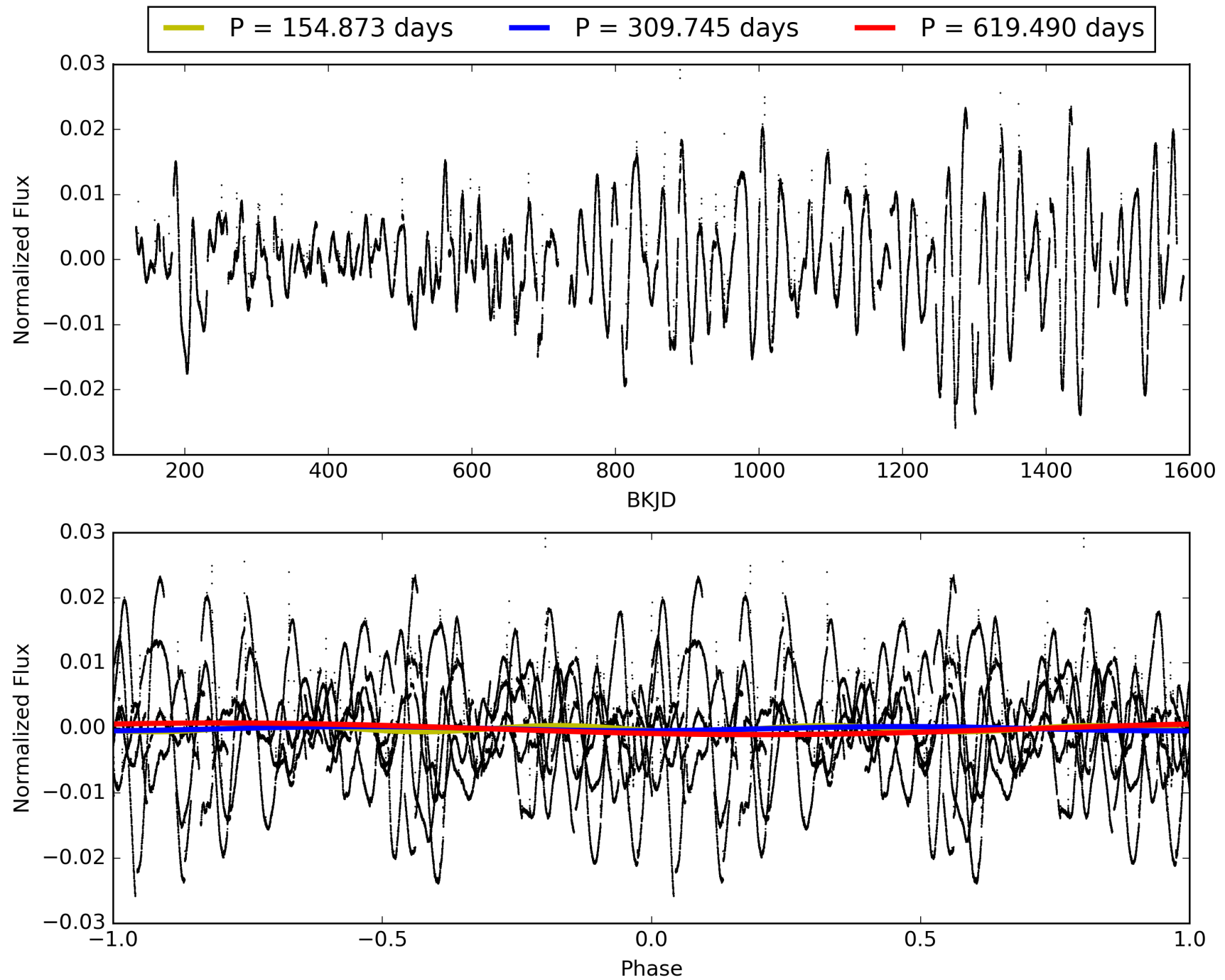
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:33:15 Z

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

TCE 009237305-02, PDC Light Curves

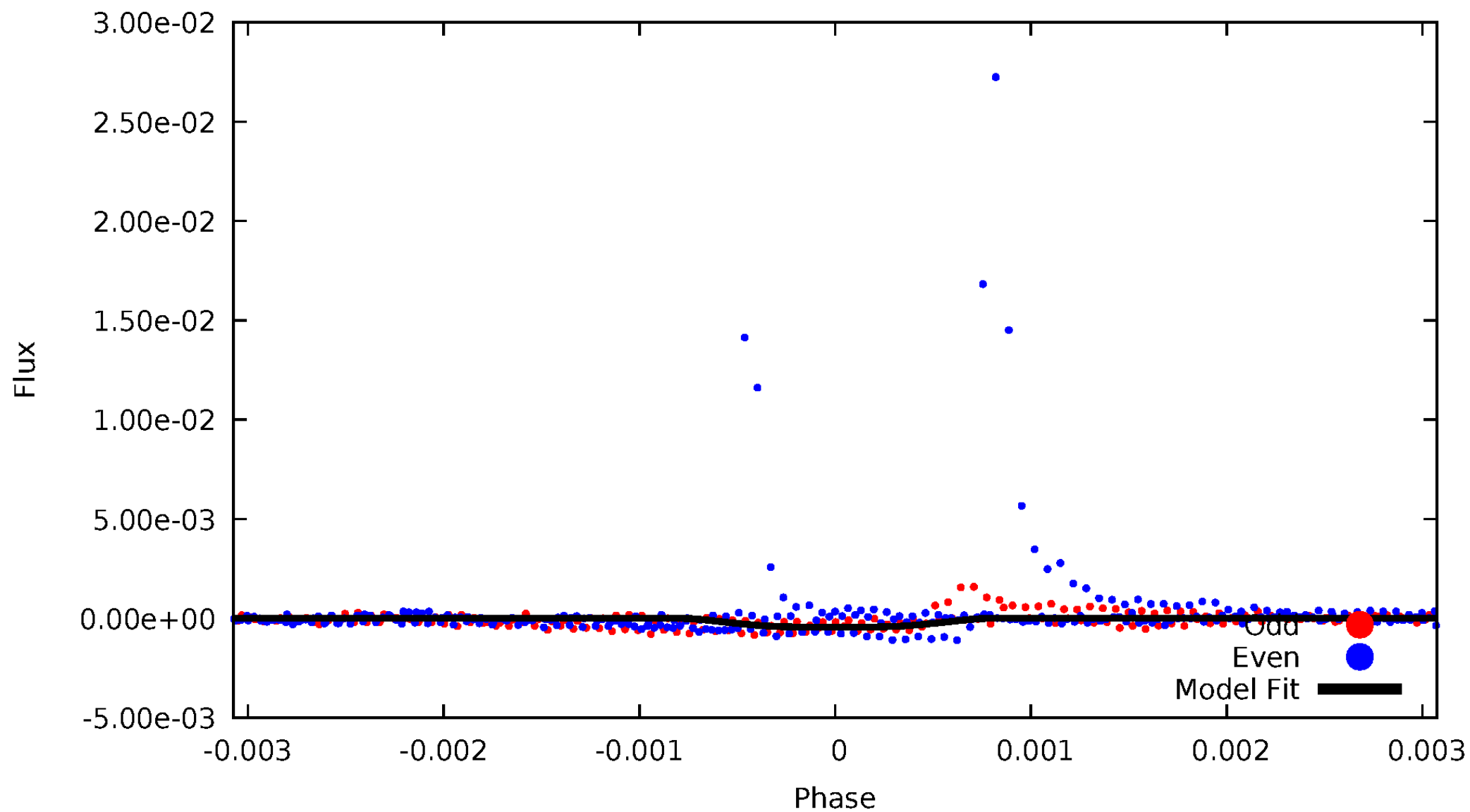


TCE 009237305-02



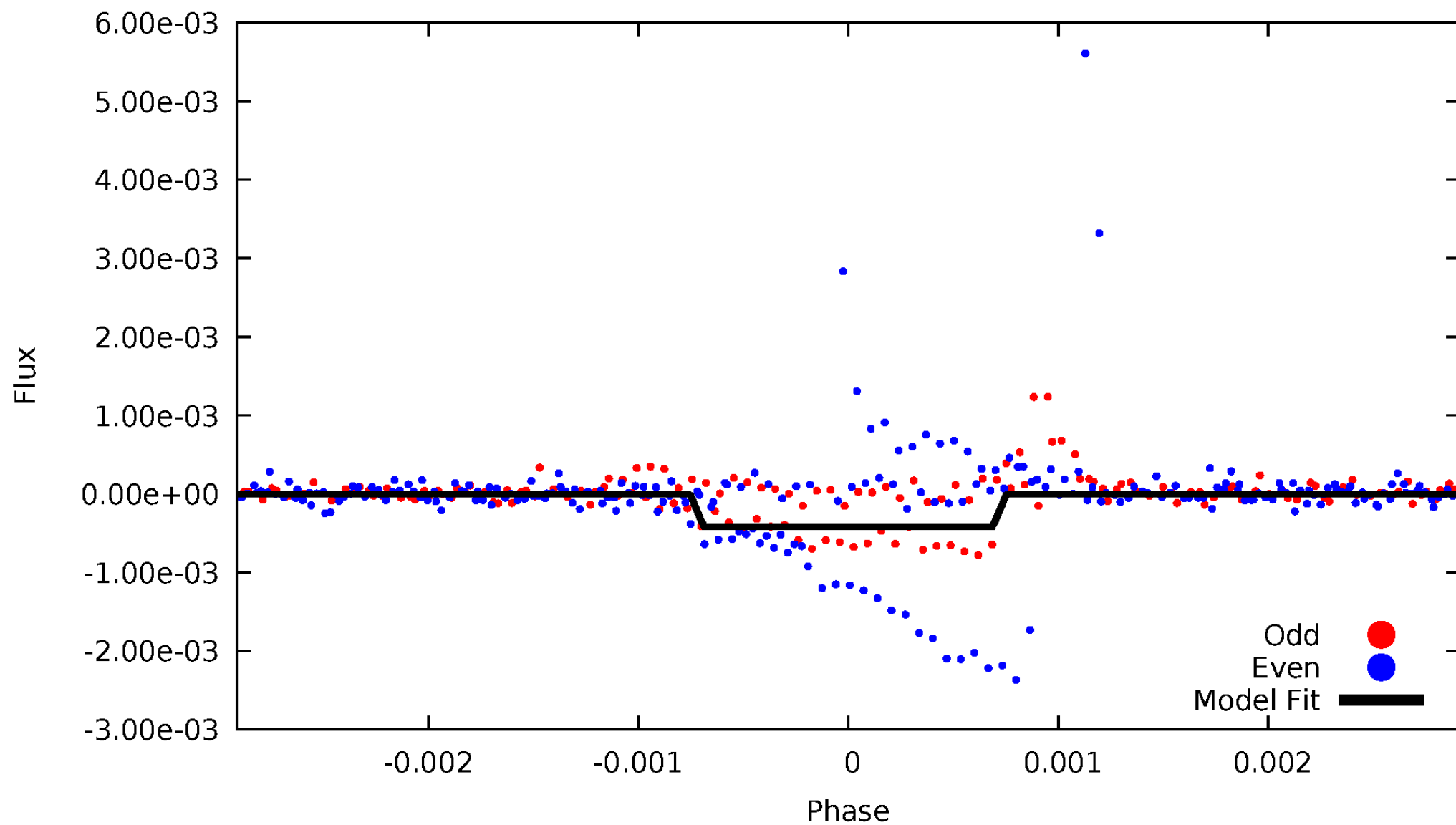
DV Odd/Even

TCE 009237305-02



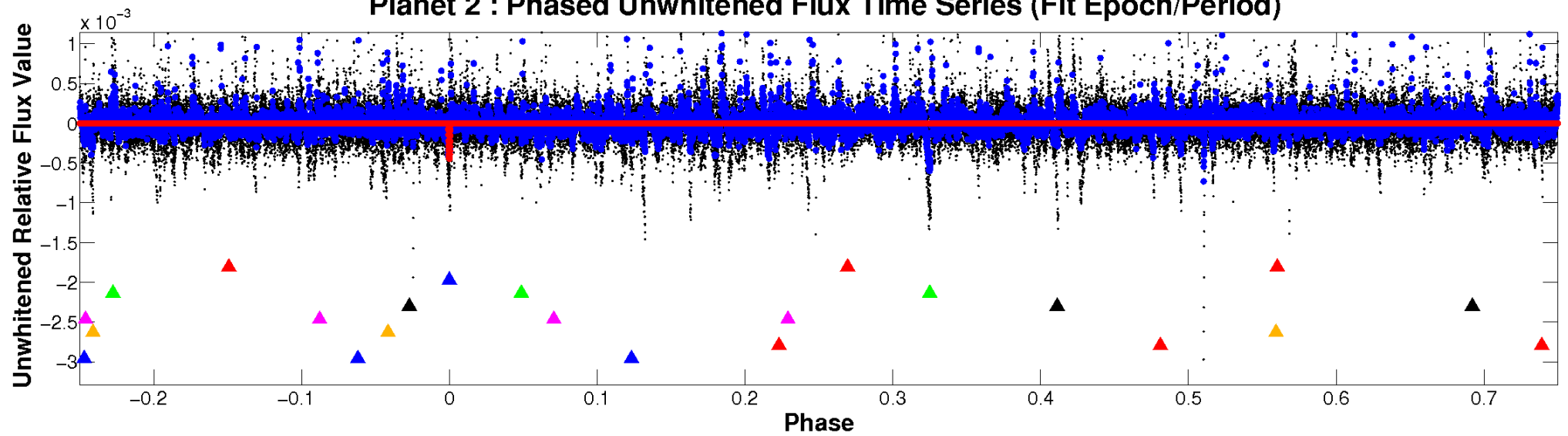
ALT Odd/Even

TCE 009237305-02

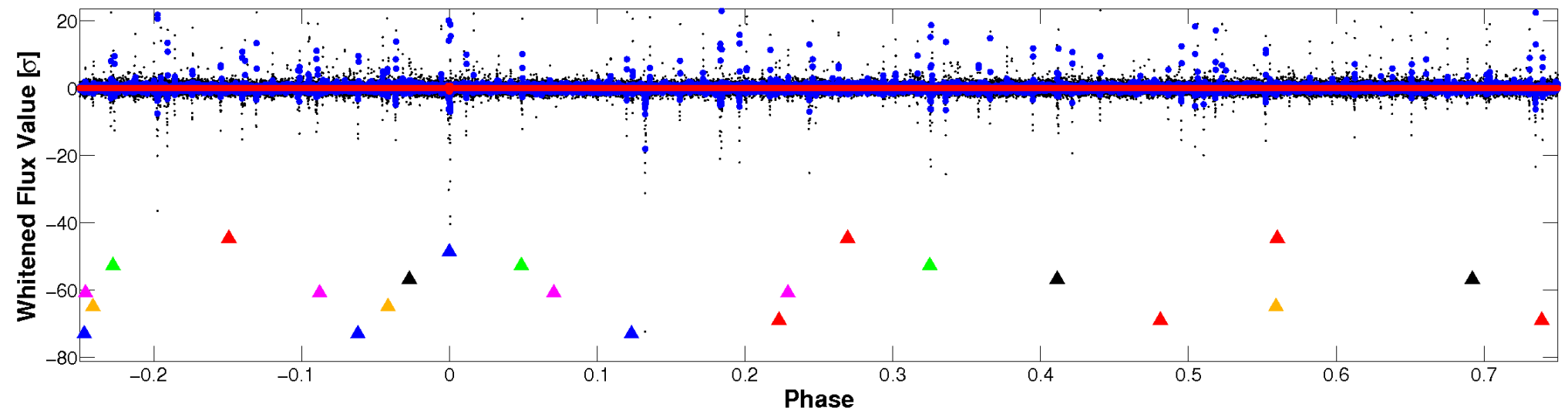


Non-Whitened Vs. Whitened Light Curve

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

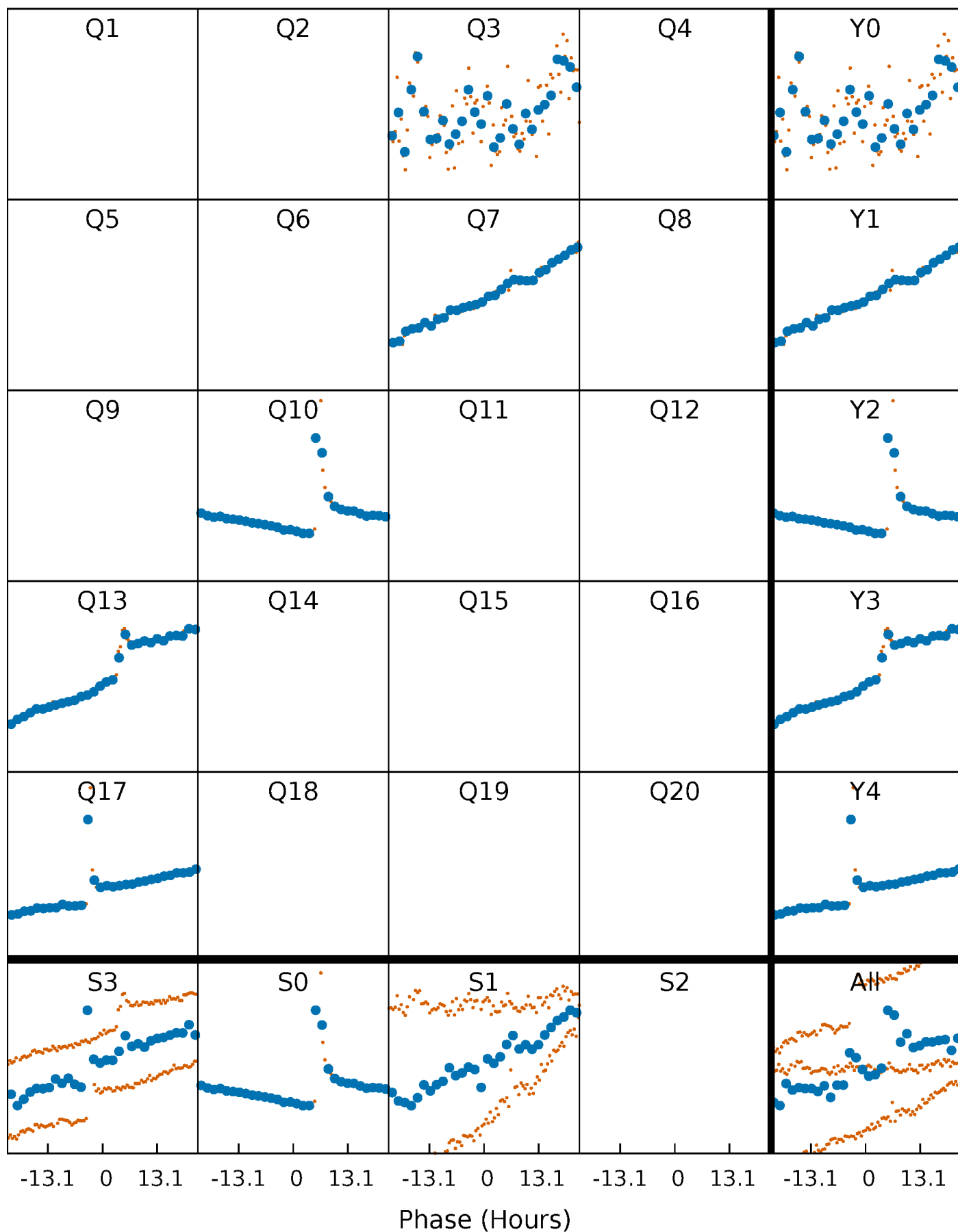


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



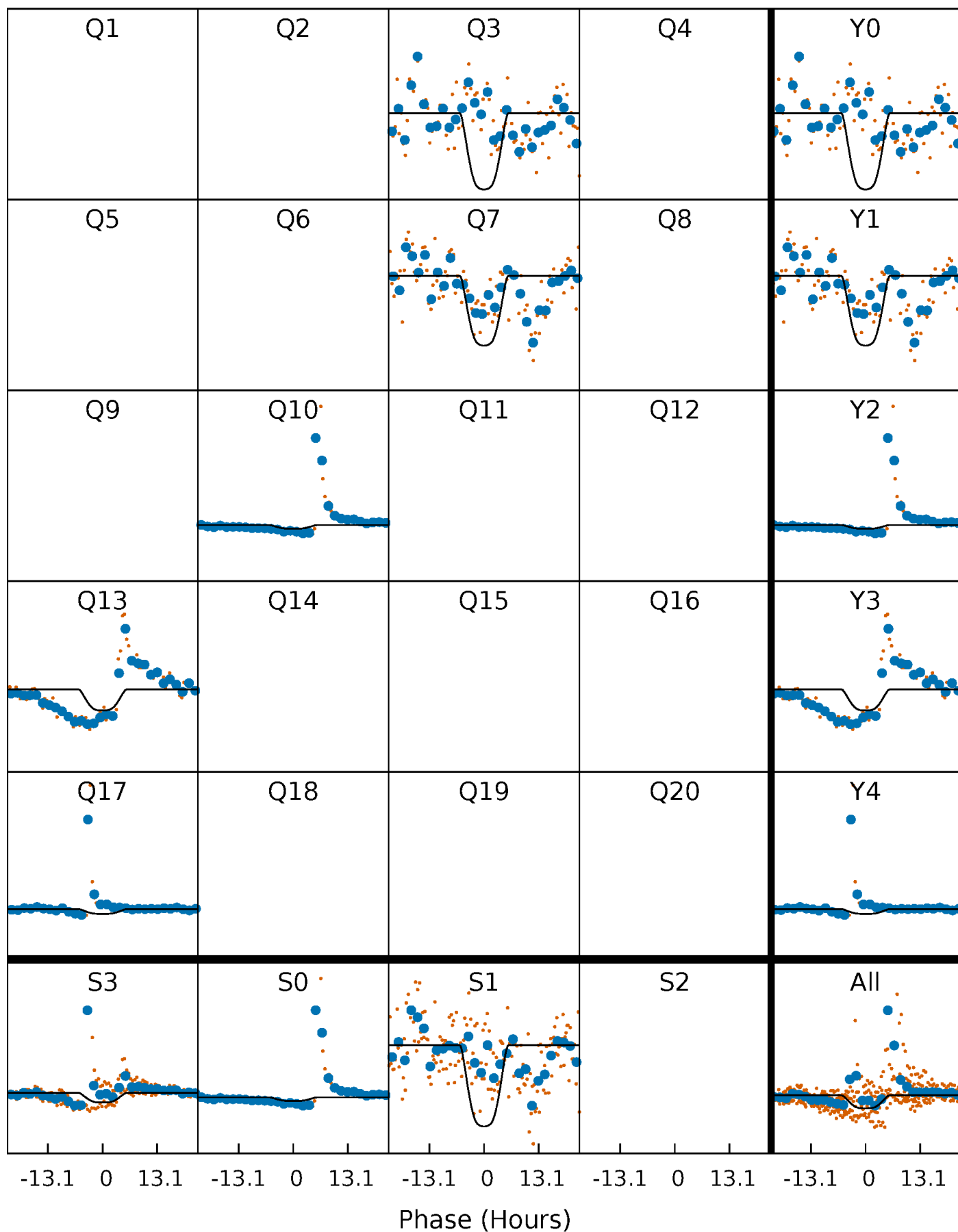
PDC Quarter-Phased Transit Curves

TCE 009237305-02 P=309.745220 Days $T_0=331.156710$ (BKJD)



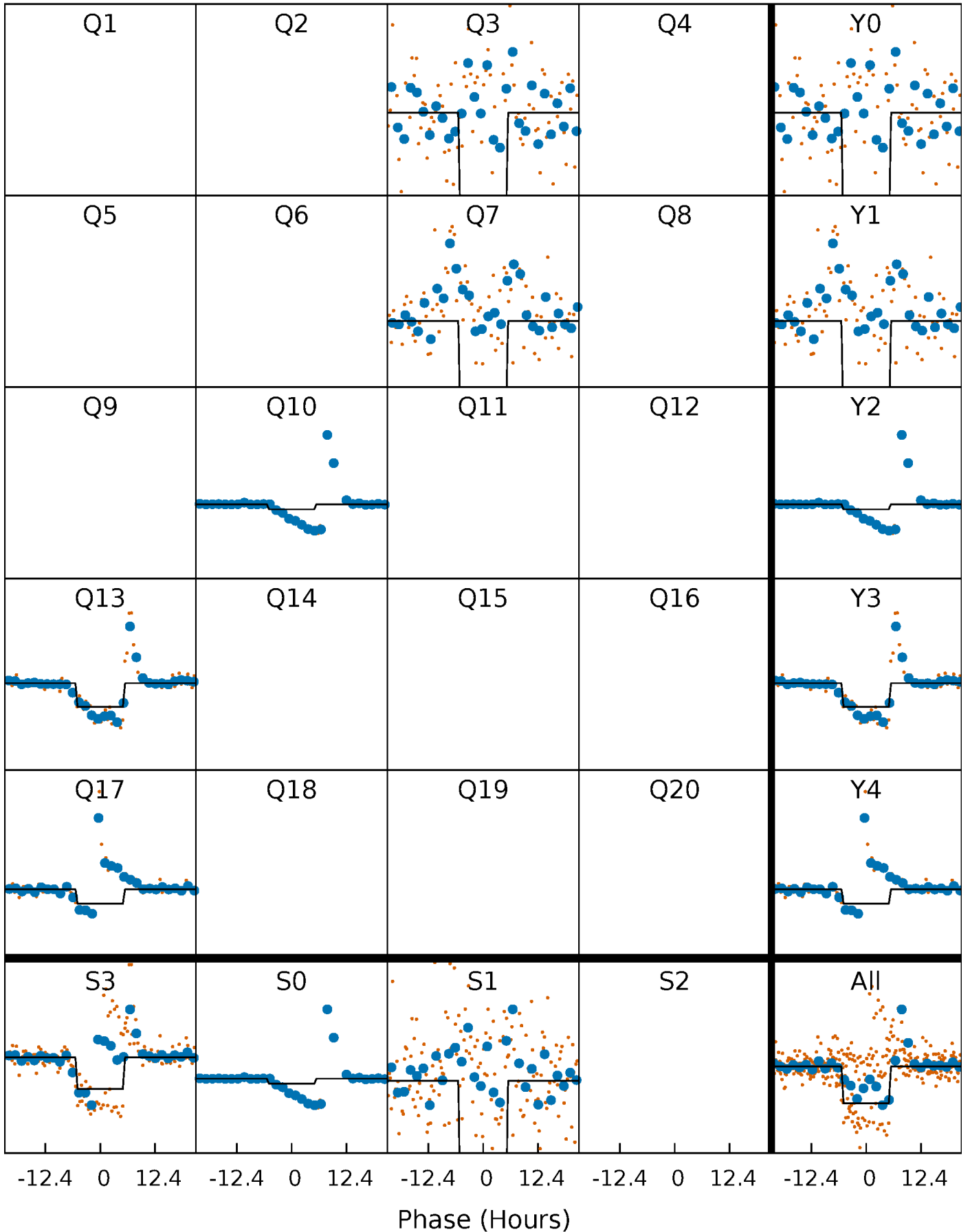
DV Quarter-Phased Transit Curves

TCE 009237305-02 $P=309.745220$ Days $T_0=331.156710$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

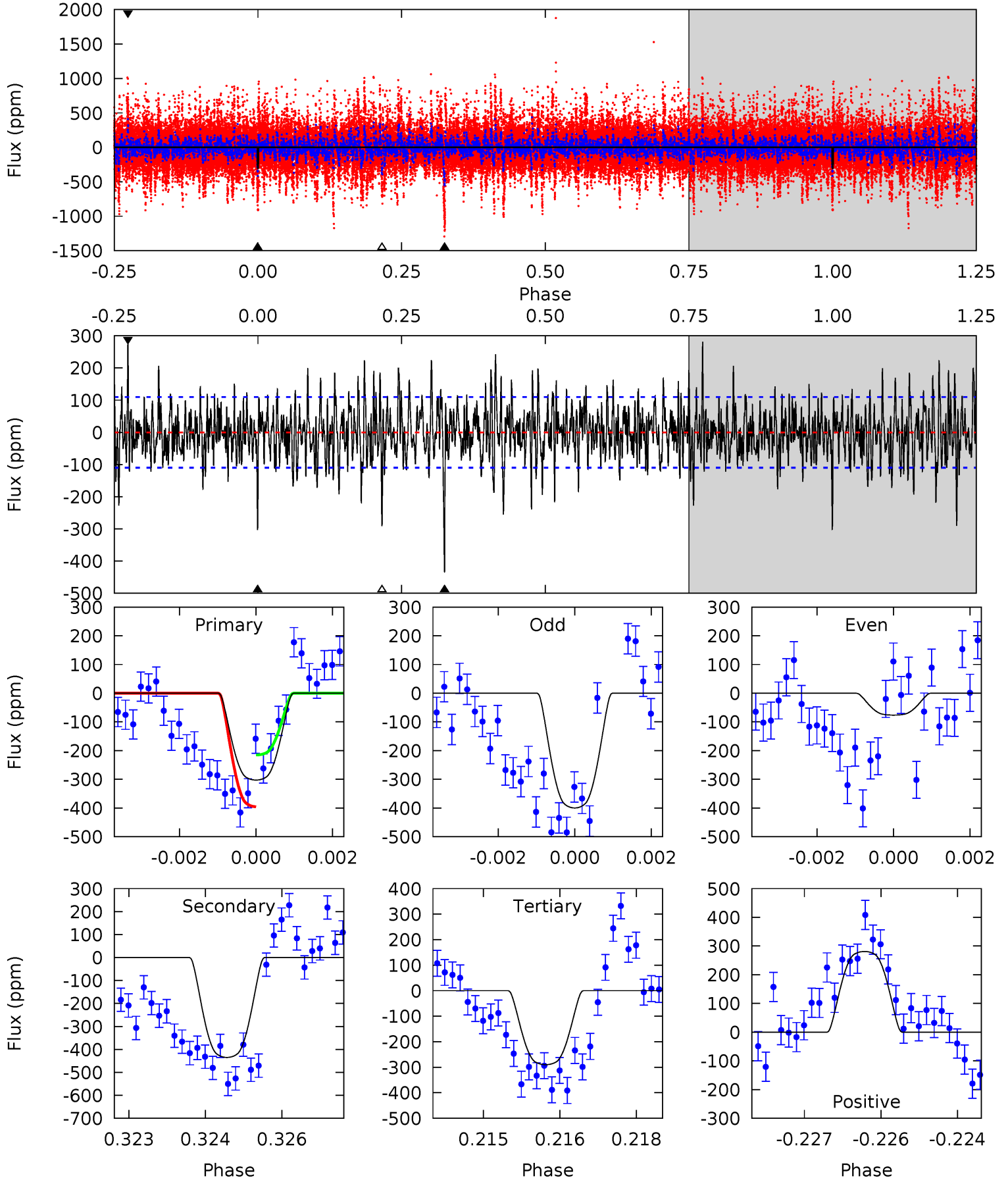
TCE 009237305-02 P=309.725091 Days $T_0=331.142610$ (BKJD)



DV Model-Shift Uniqueness Test

009237305-02, P = 309.745220 Days, E = 21.411490 Days

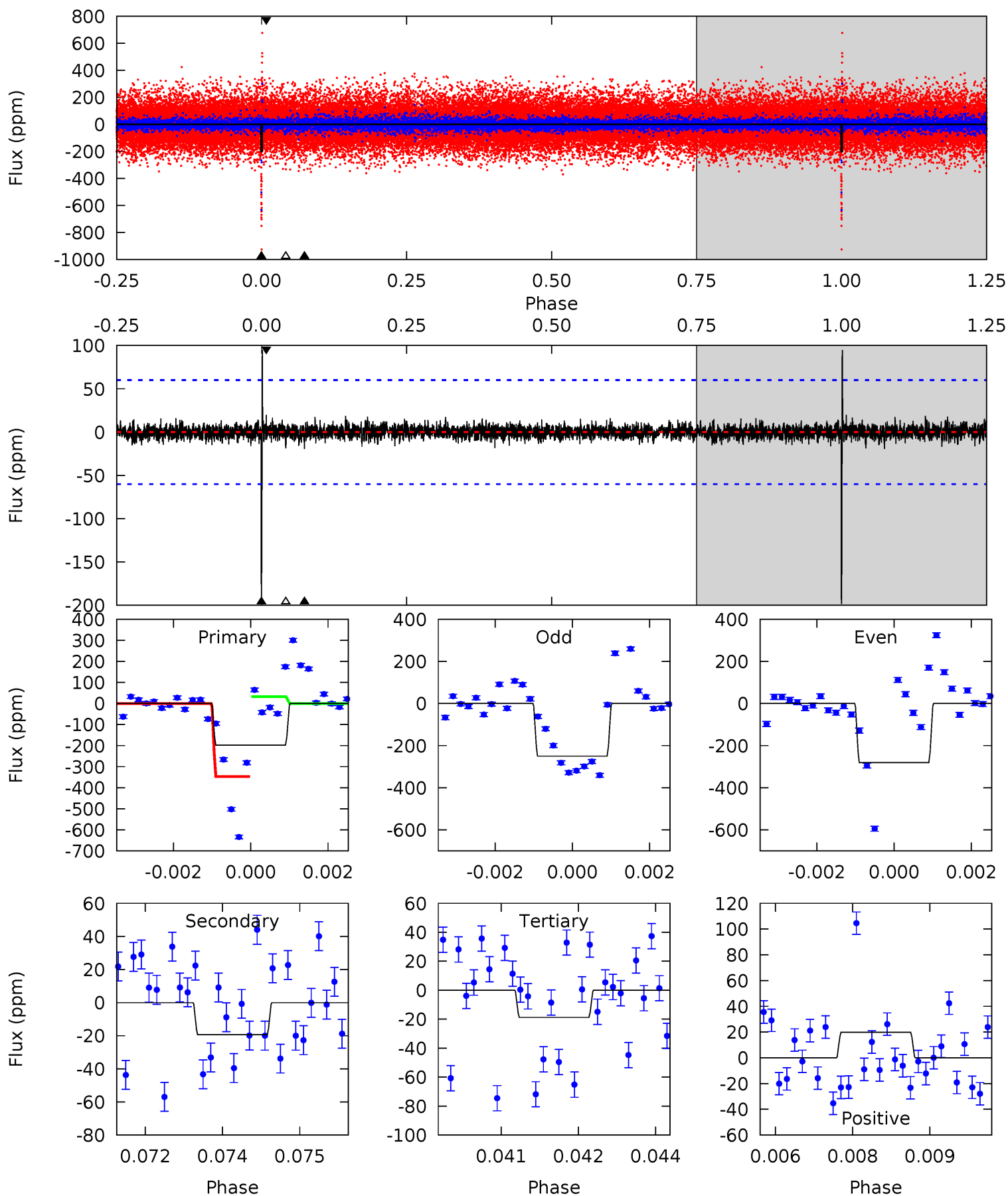
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.8	21.2	14.1	13.7	5.37	3.15	3.36	0.63	1.05	7.09	7.51	7.10	-0.17	0.39	4.42



Alt Model-Shift Uniqueness Test

009237305-02, P = 309.725091 Days, E = 21.417519 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.7	1.73	1.68	1.77	5.38	3.17	0.42	16.1	16.0	0.05	-0.04	1.49	-7.72	0.32	13.4



Stellar Parameters For KIC 009237305

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5210^{+186}_{-207}	$3.232^{+0.630}_{-0.210}$	$0.080^{+0.250}_{-0.350}$	$5.828^{+1.555}_{-3.888}$	$2.115^{+0.500}_{-1.083}$	$0.015^{+0.170}_{-0.007}$
	+4%/-4%	+19%/-6%	+312%/-438%	+27%/-67%	+24%/-51%	+1130%/-46%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009237305-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-435 ± 20	$15.81^{+5.20}_{-5.43}$	706^{+75}_{-114}	4716^{+425}_{-330}	1305^{+1311}_{-540}
Alt.	-19 ± 11	$12.36^{+4.72}_{-4.72}$	710^{+73}_{-114}	3032^{+320}_{-387}	90^{+151}_{-59}

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 $A_{obs} \gg 1.0$

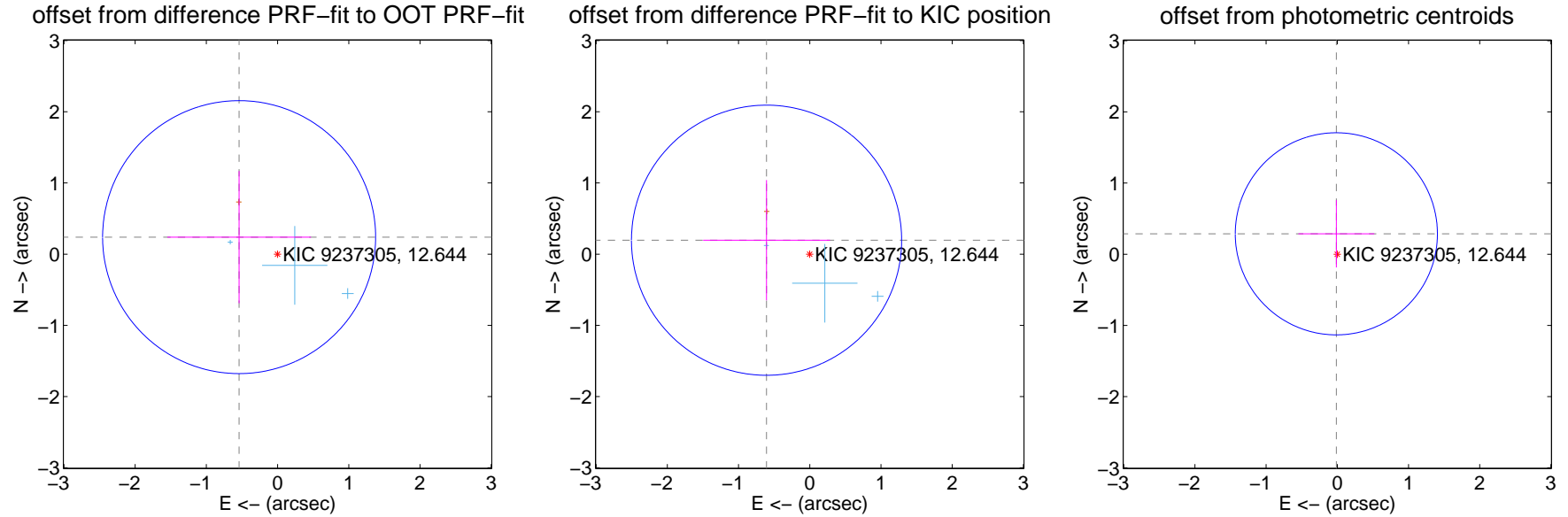
DV Centroid Data

Supplemental centroid analysis for 009237305-02. Kepler magnitude: 12.64. Transit SNR 7.33

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.591 ± 0.639	0.92	0.540 ± 1.009	0.239 ± 0.927
PRF-fit source offset from KIC position	0.638 ± 0.632	1.01	0.607 ± 0.890	0.196 ± 0.844
photometric centroid source offset	0.29 ± 0.47	0.61	0.01 ± 0.53	0.29 ± 0.47



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



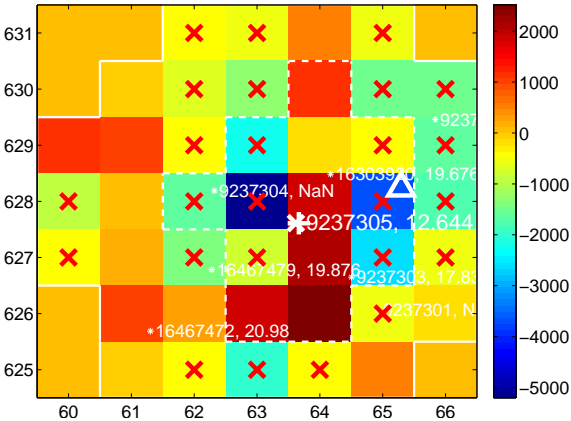
Q2 no difference image



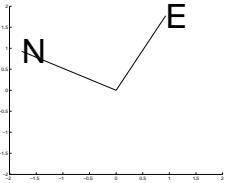
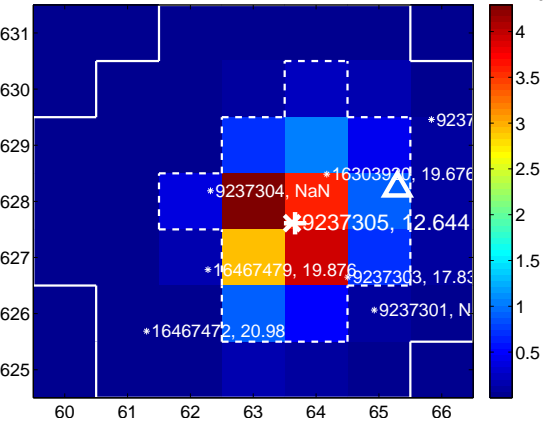
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



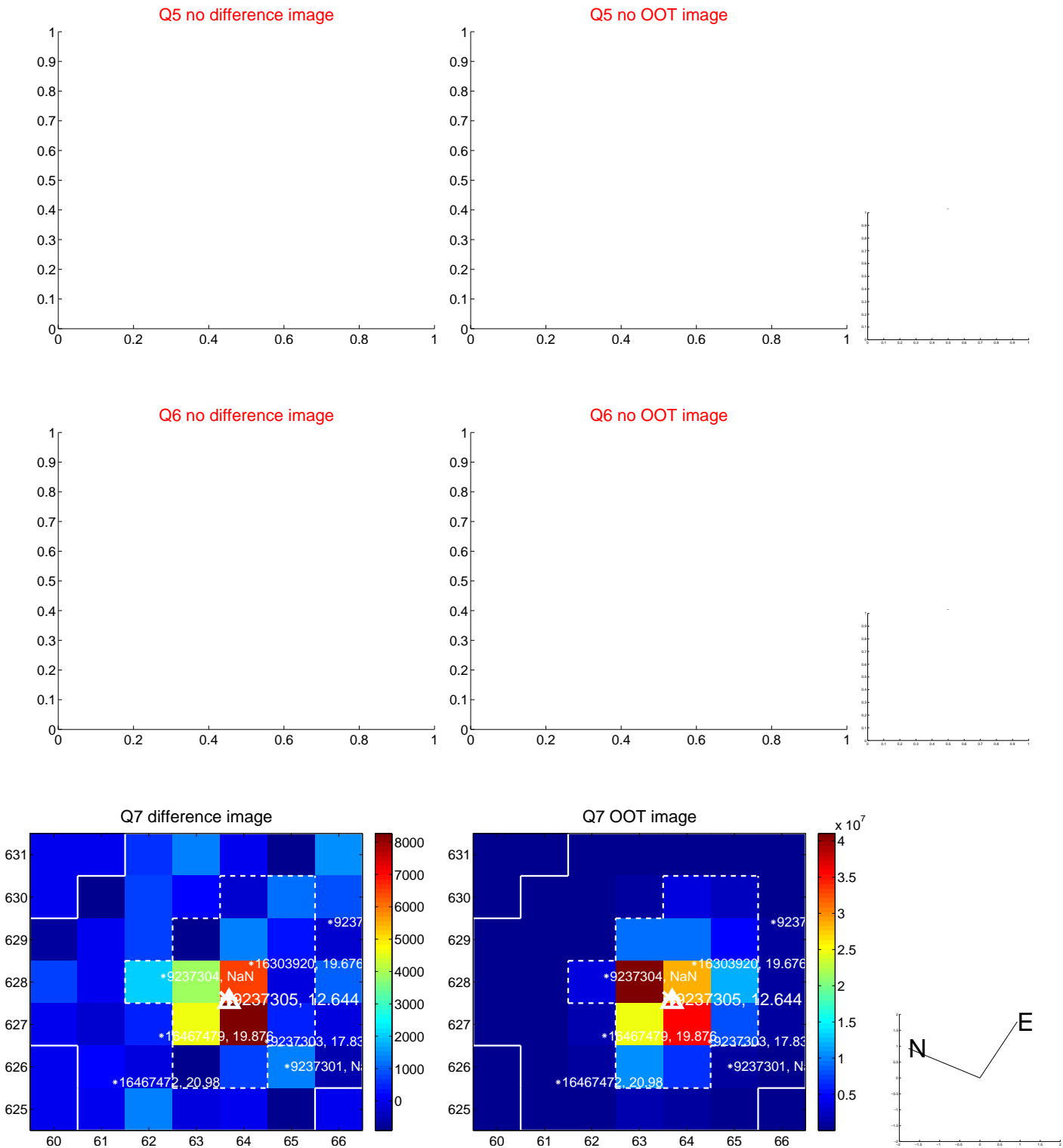
Q4 no difference image



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.

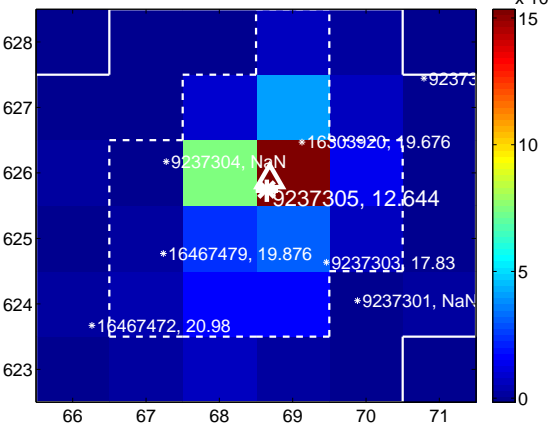
Q9 no difference image



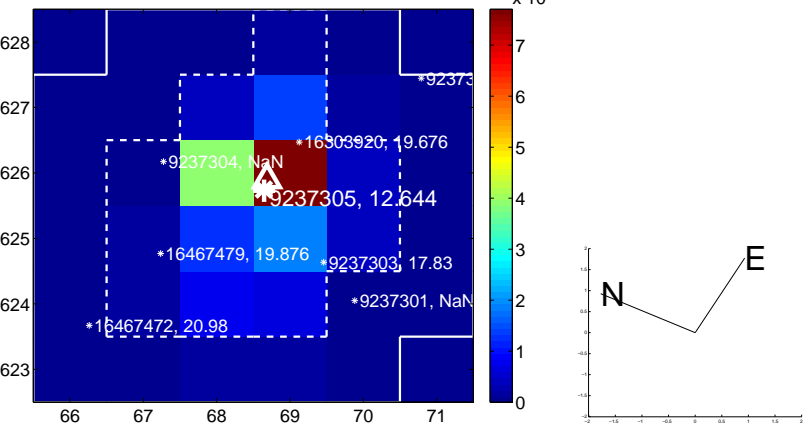
Q9 no OOT image



Q10 difference image



Q10 OOT image



Q11 no difference image



Q11 no OOT image



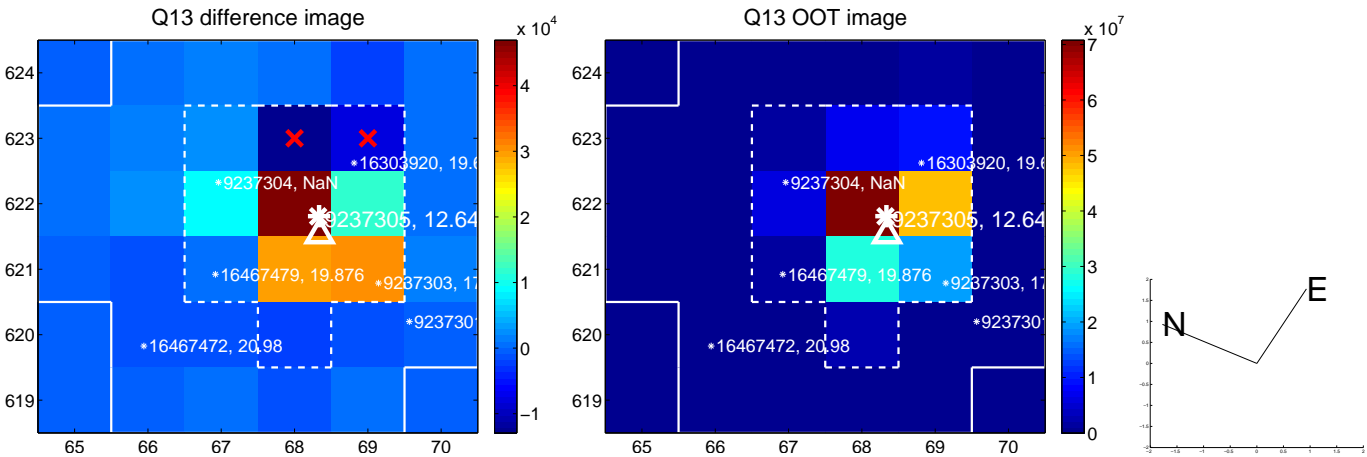
Q12 no difference image



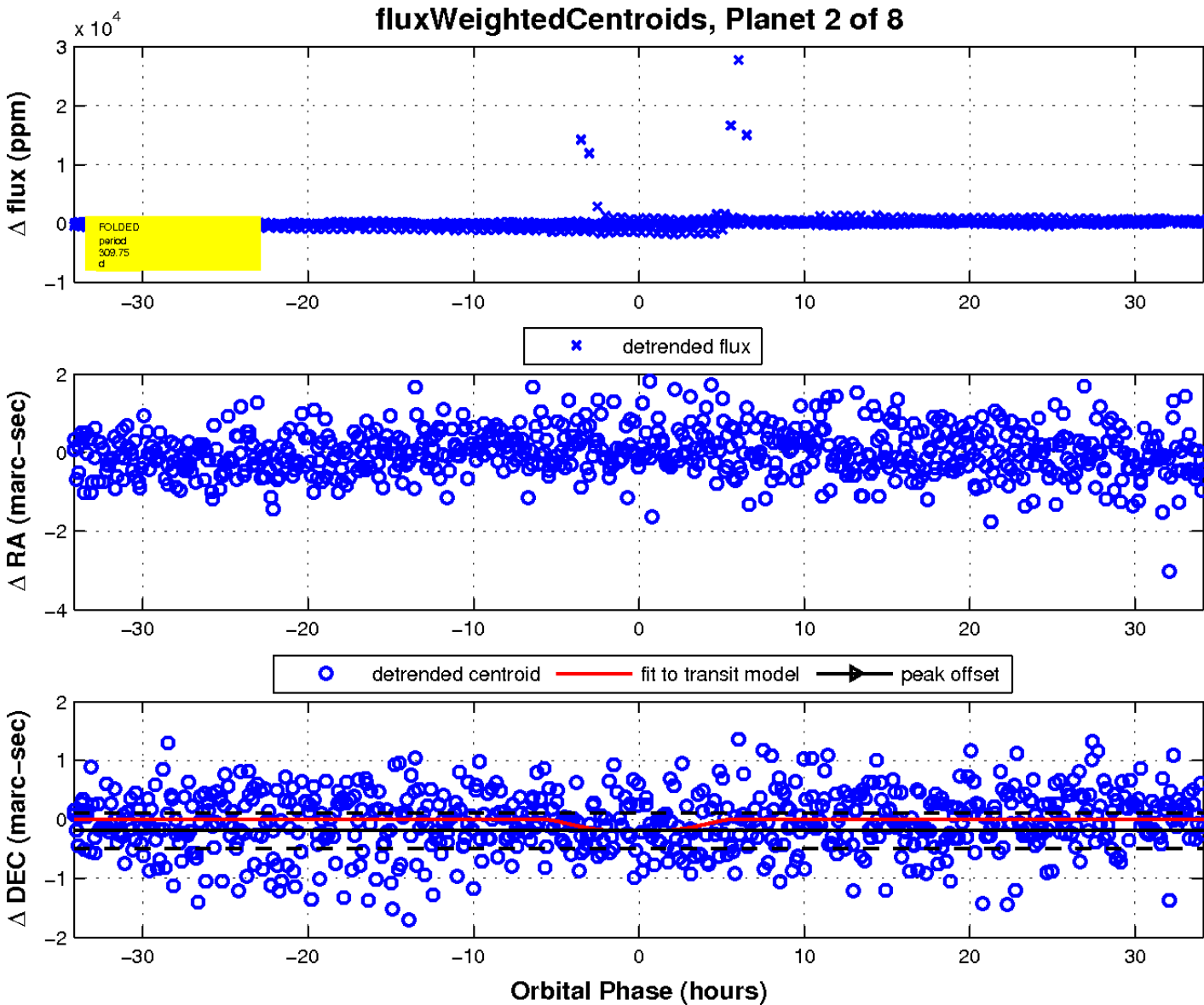
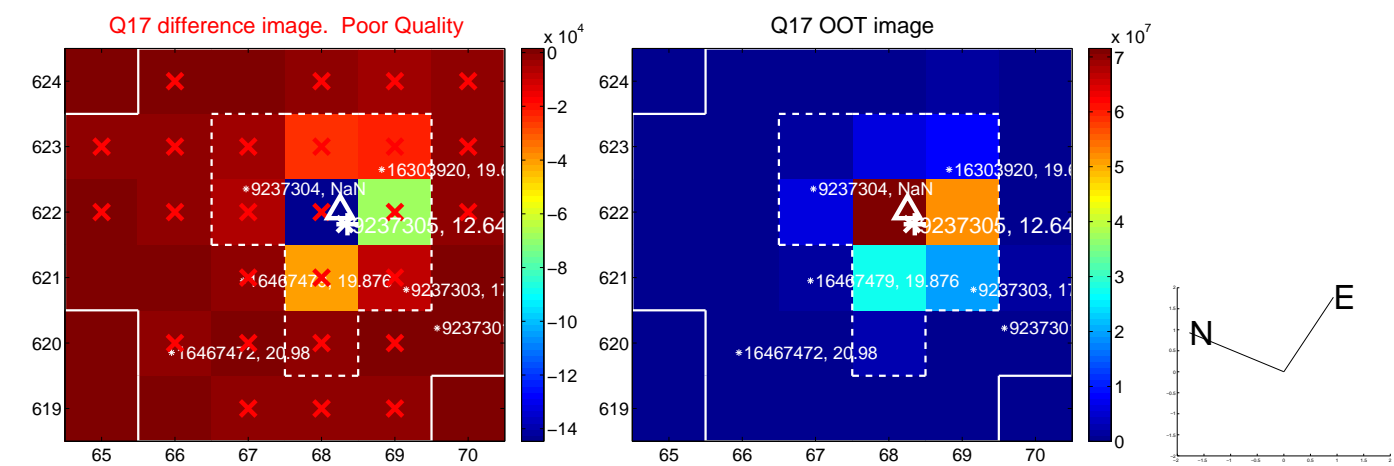
Q12 no OOT image



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

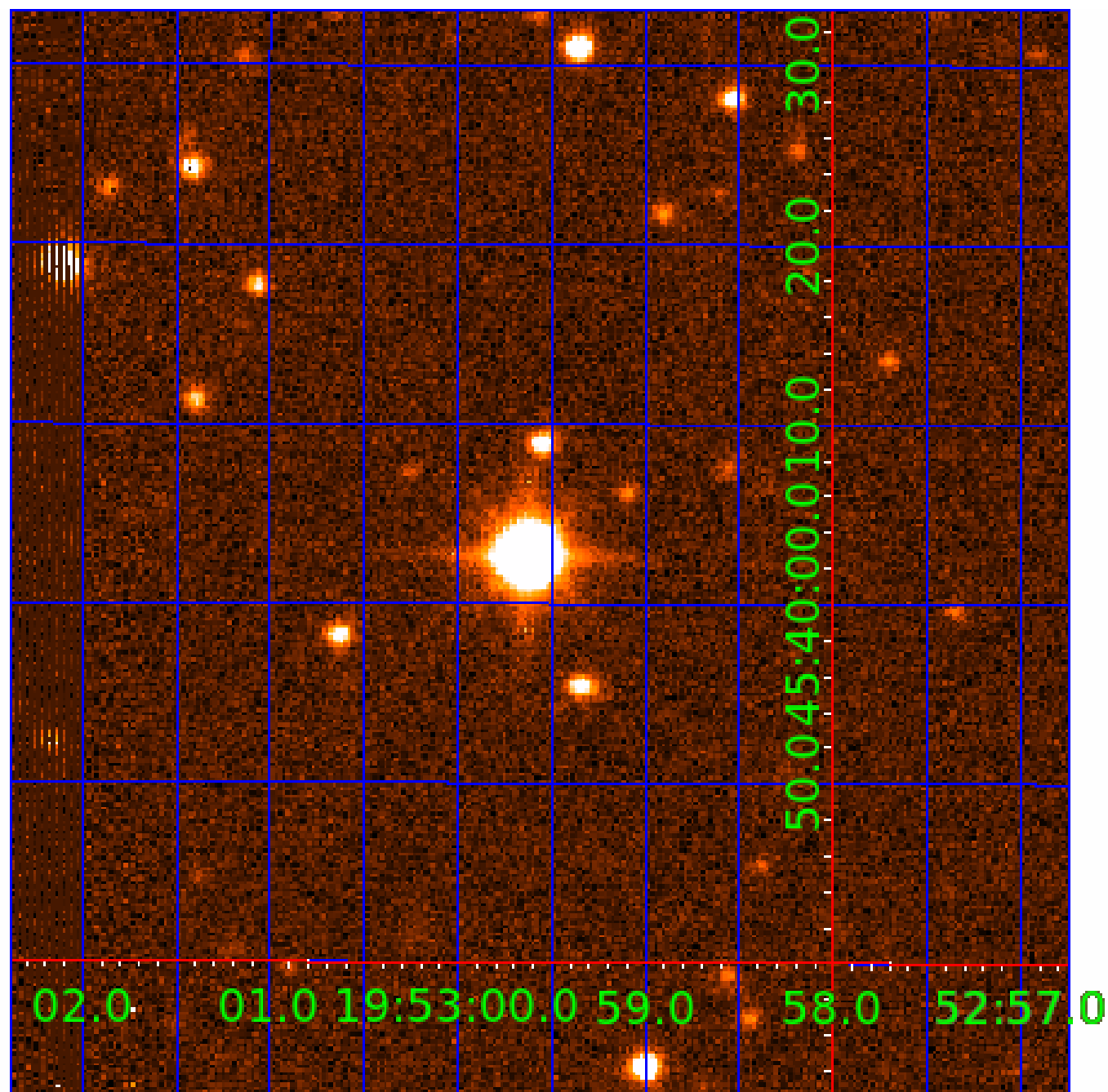


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009237305

Q1-17 DR25 TCE Parameters

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009237305-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
009237305-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
009237305-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

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

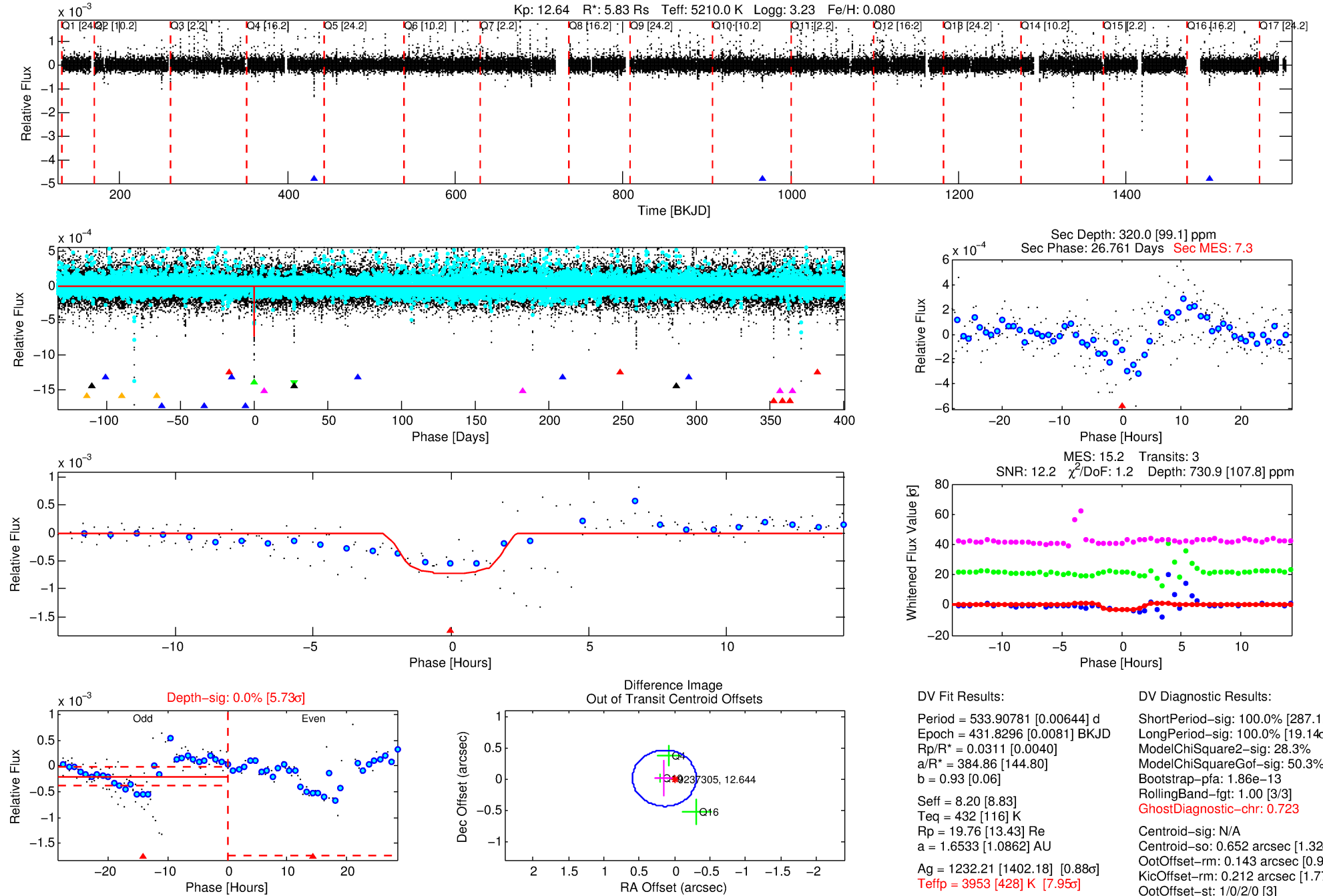
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009237305-03

No Significant Match Found

DV One-Page Summary

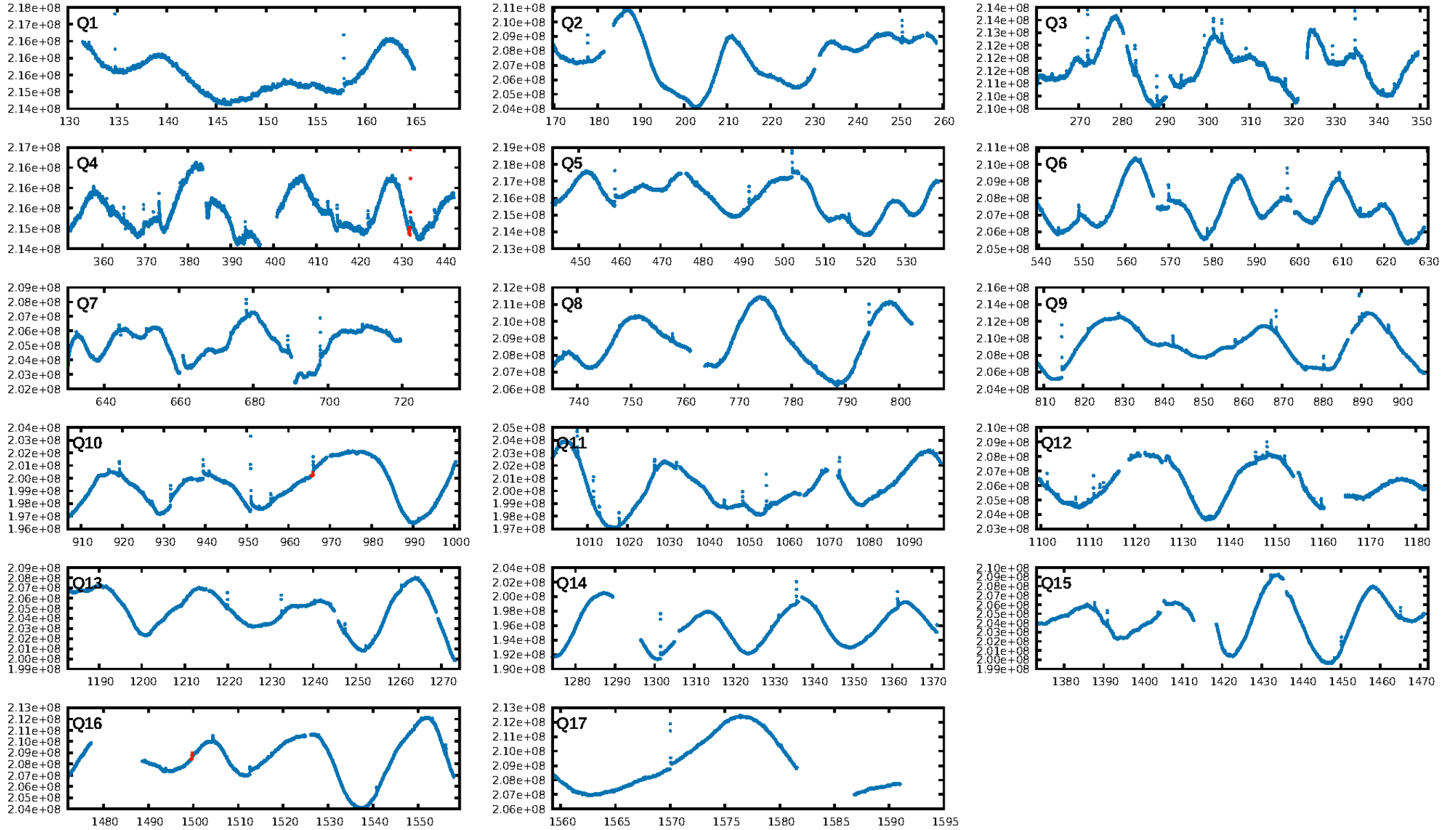
KIC: 9237305 Candidate: 3 of 8 Period: 533.908 d



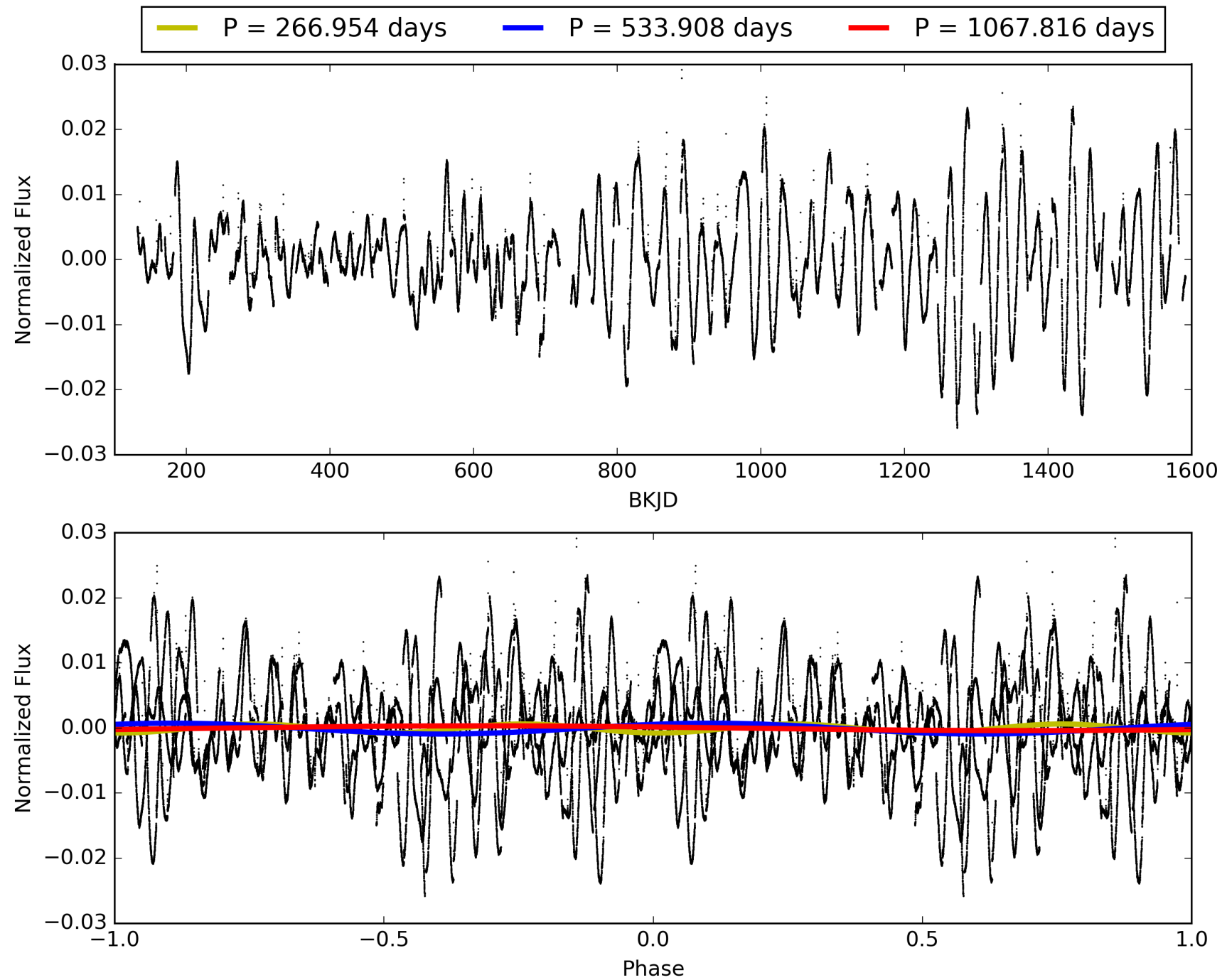
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:33:32 Z

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

TCE 009237305-03, PDC Light Curves

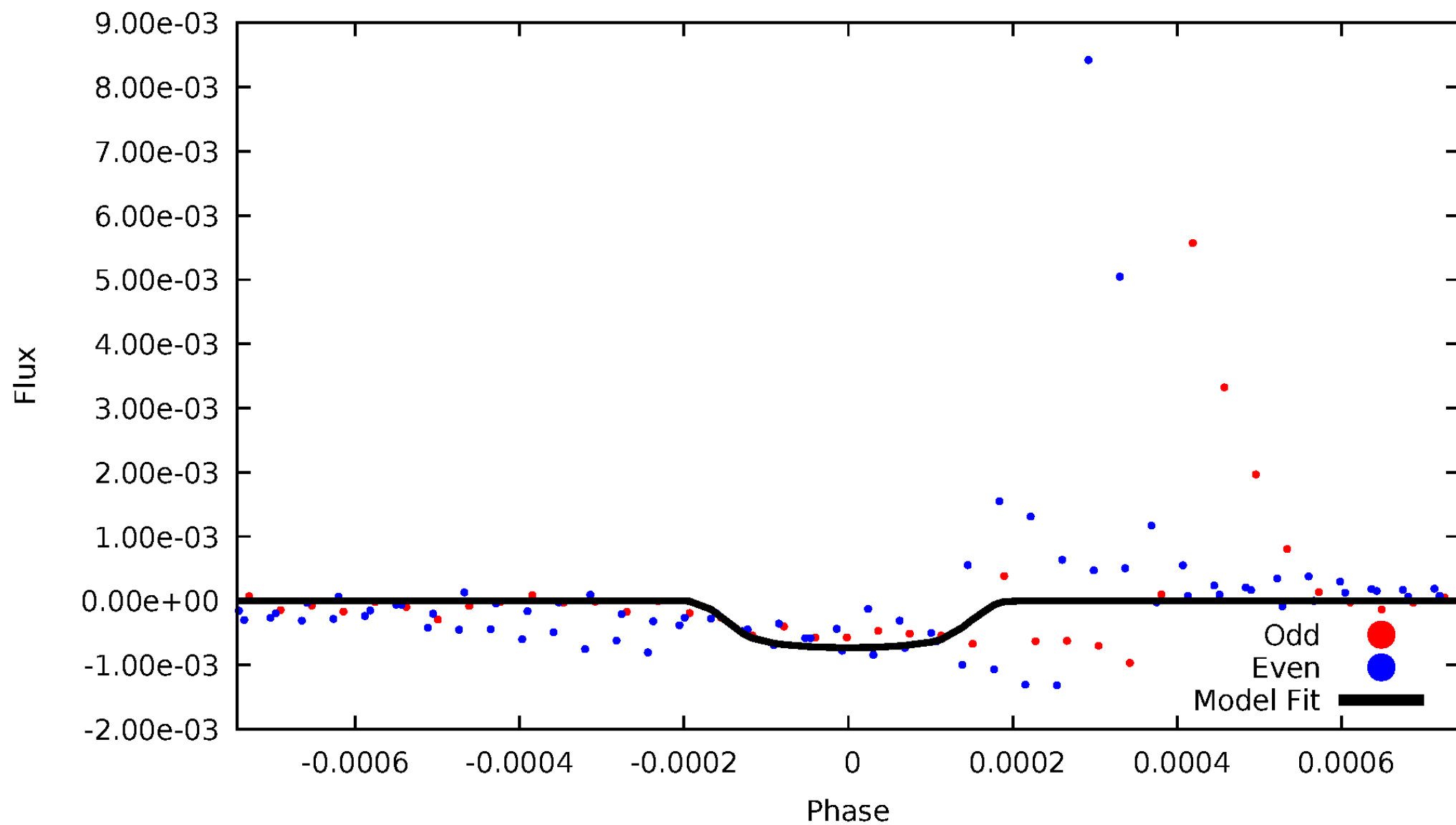


TCE 009237305-03



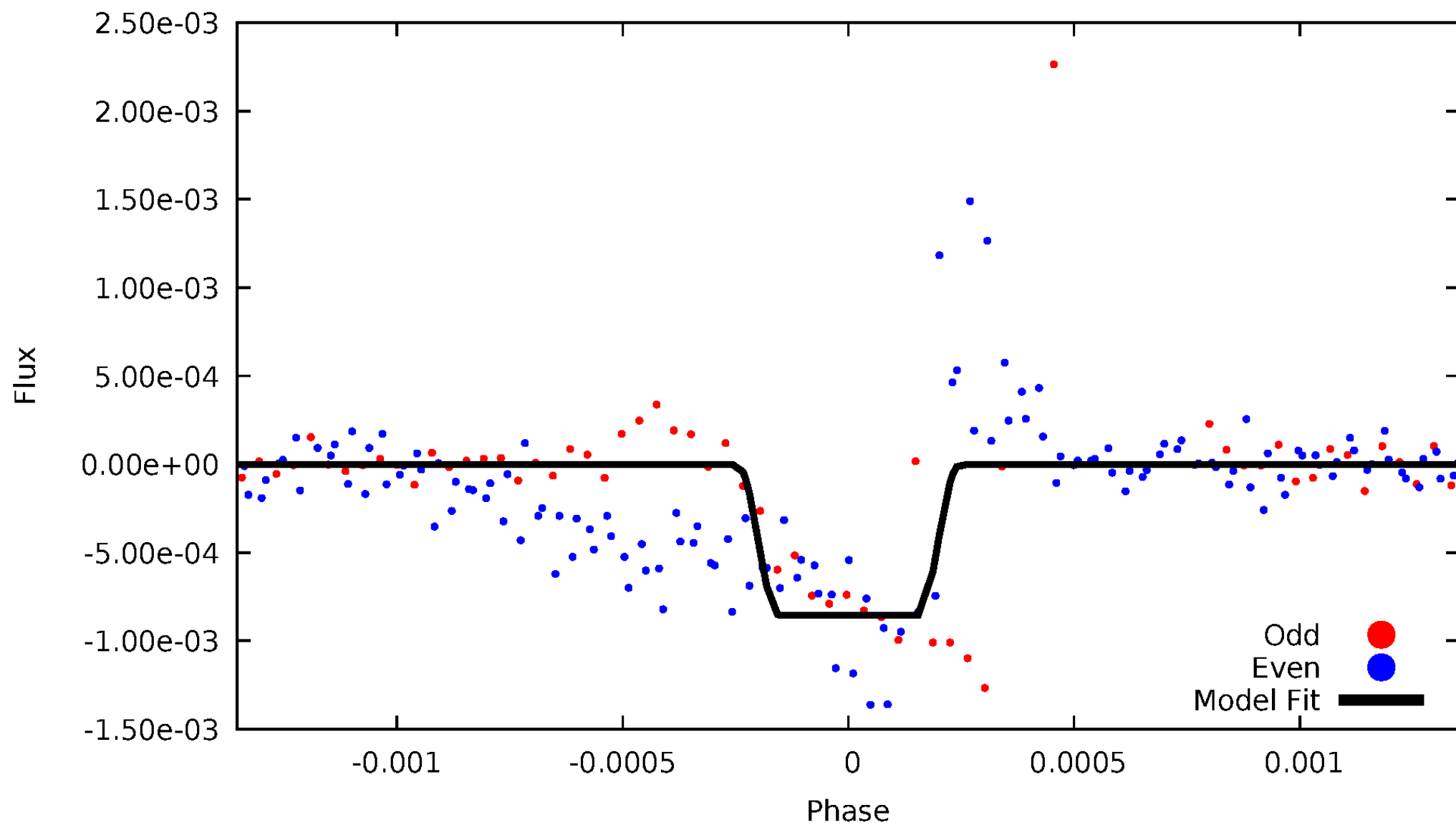
DV Odd/Even

TCE 009237305-03



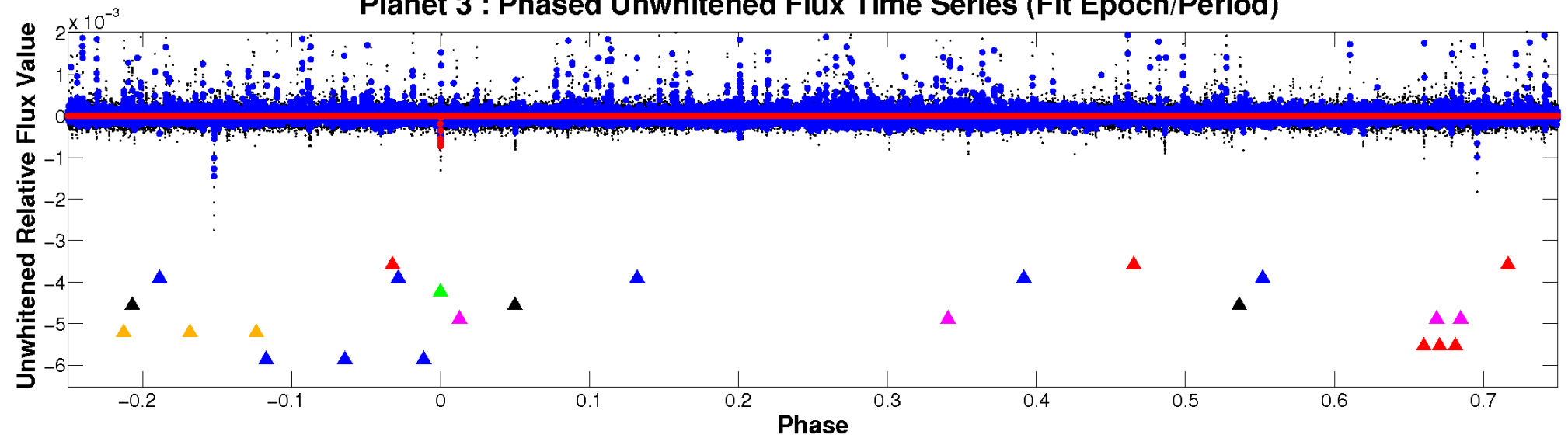
ALT Odd/Even

TCE 009237305-03

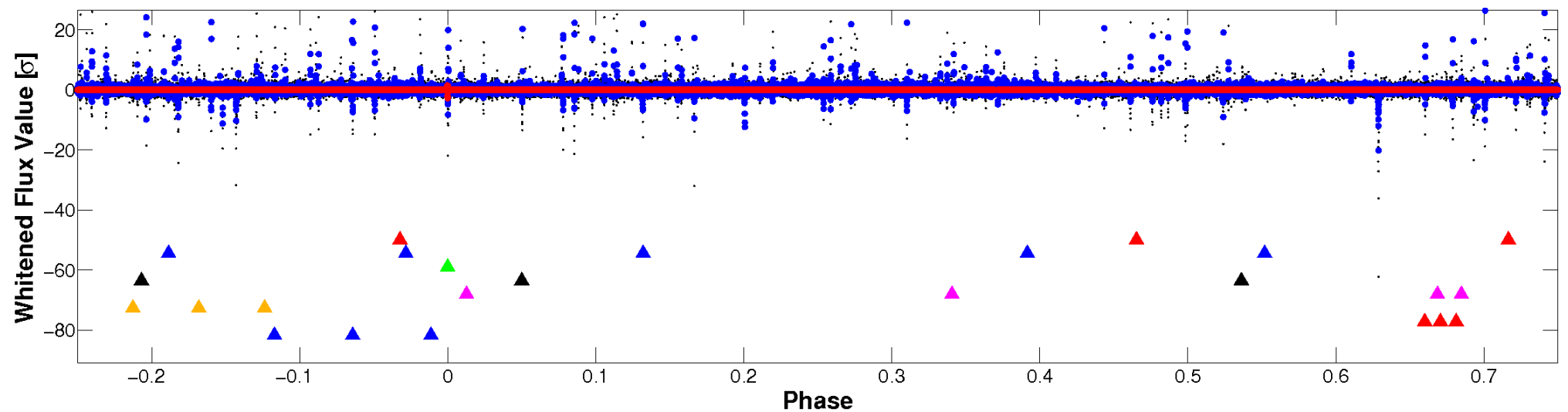


Non-Whitened Vs. Whitened Light Curve

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

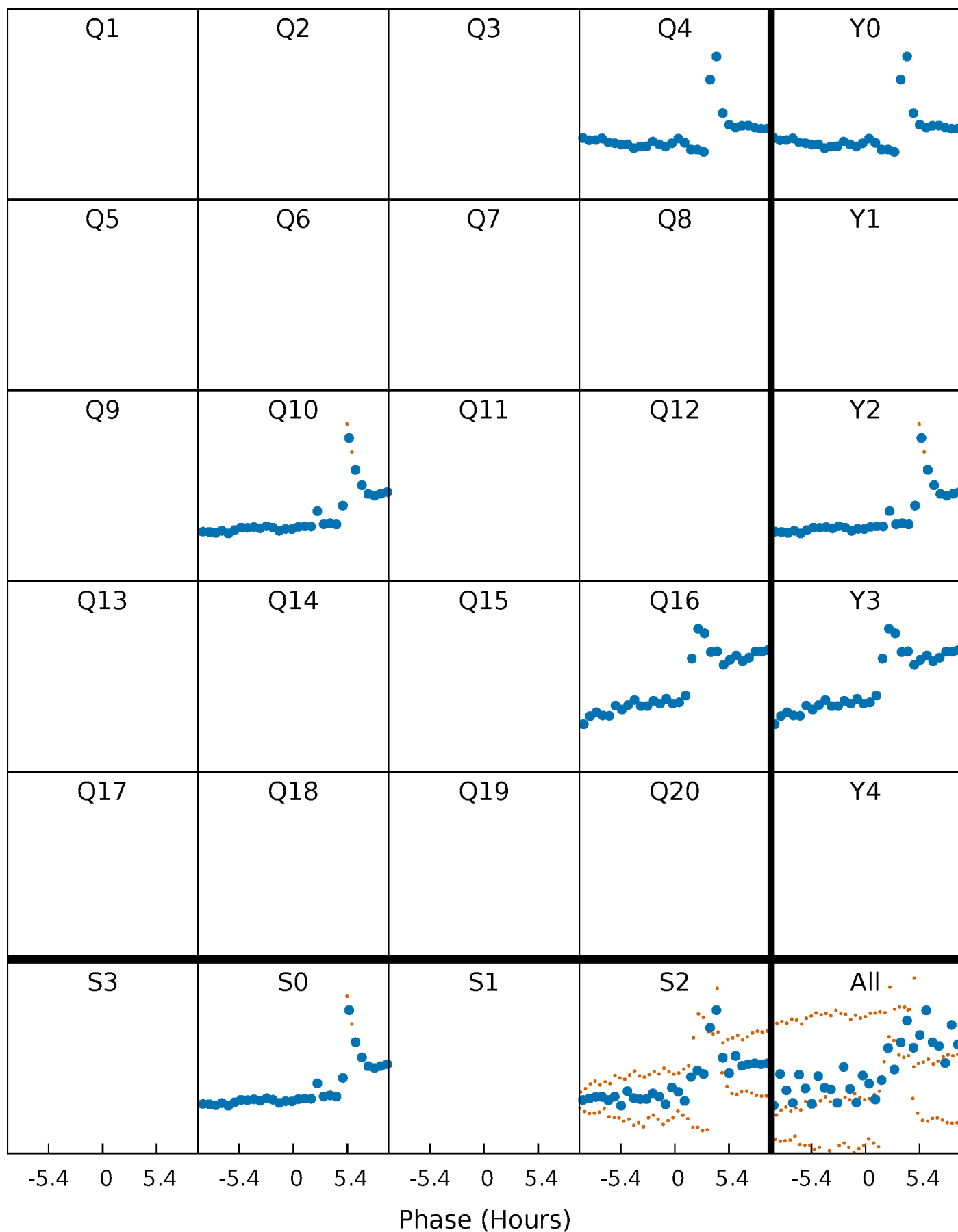


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



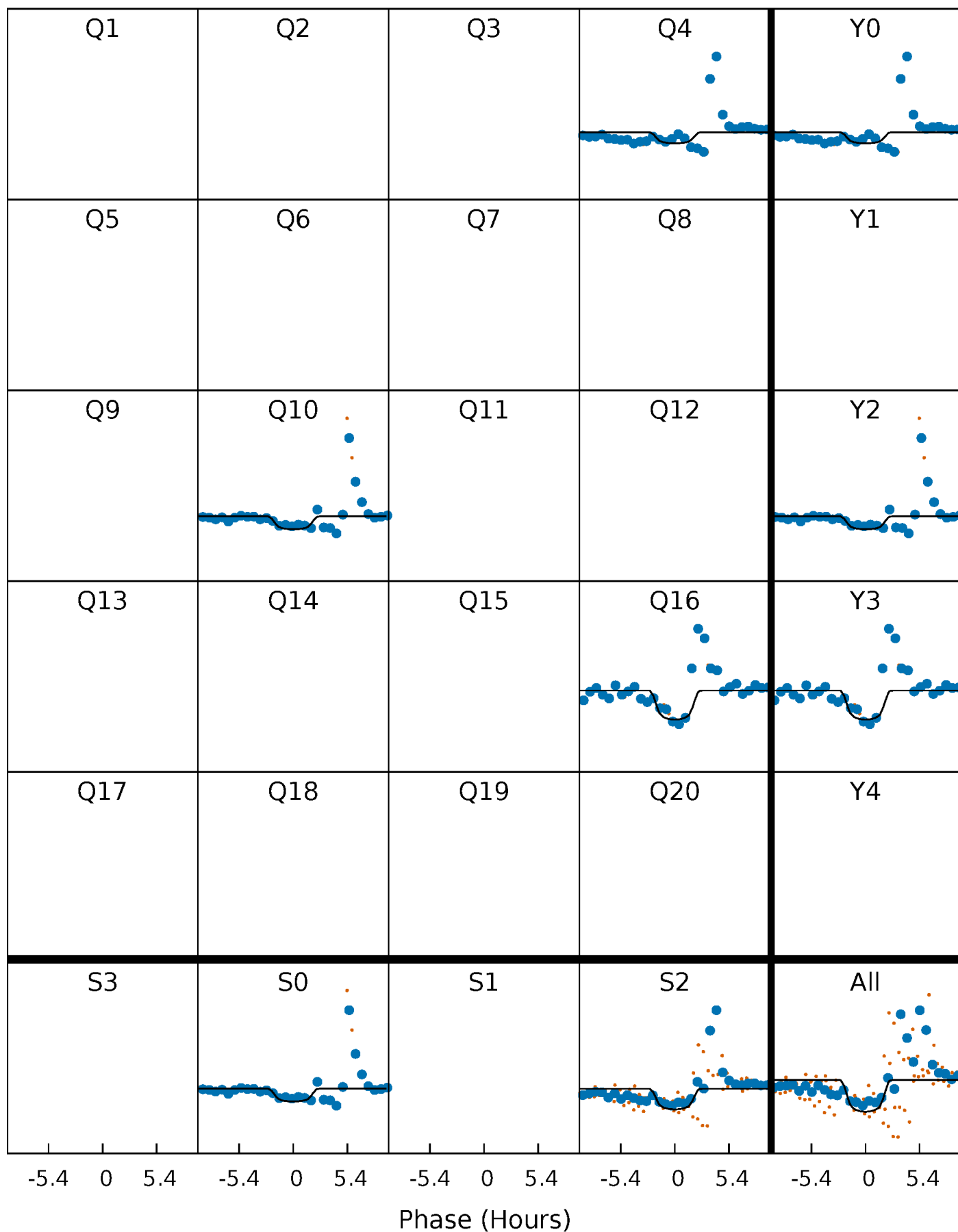
PDC Quarter-Phased Transit Curves

TCE 009237305-03 P=533.907810 Days $T_0=431.829581$ (BKJD)



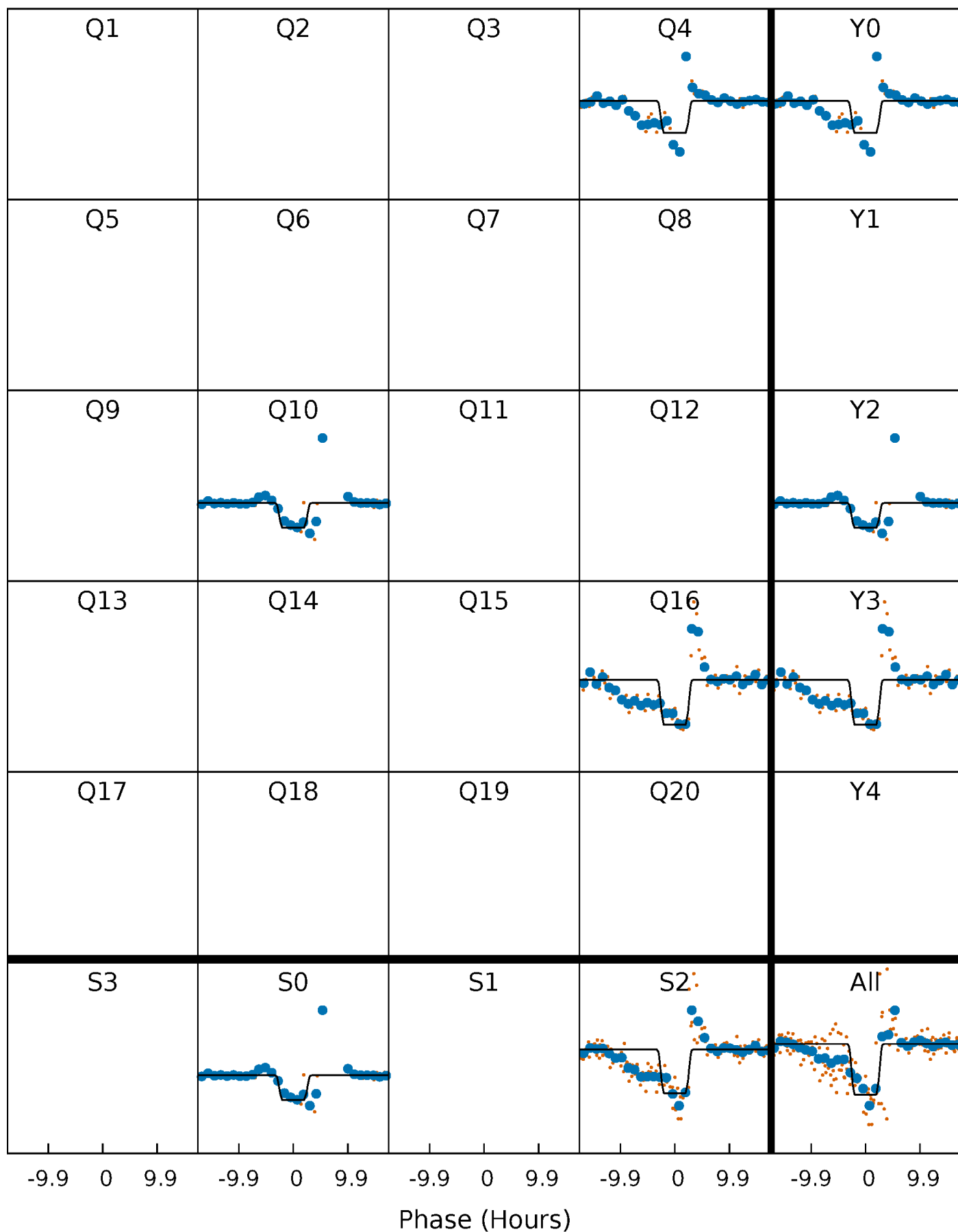
DV Quarter-Phased Transit Curves

TCE 009237305-03 $P=533.907810$ Days $T_0=431.829581$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

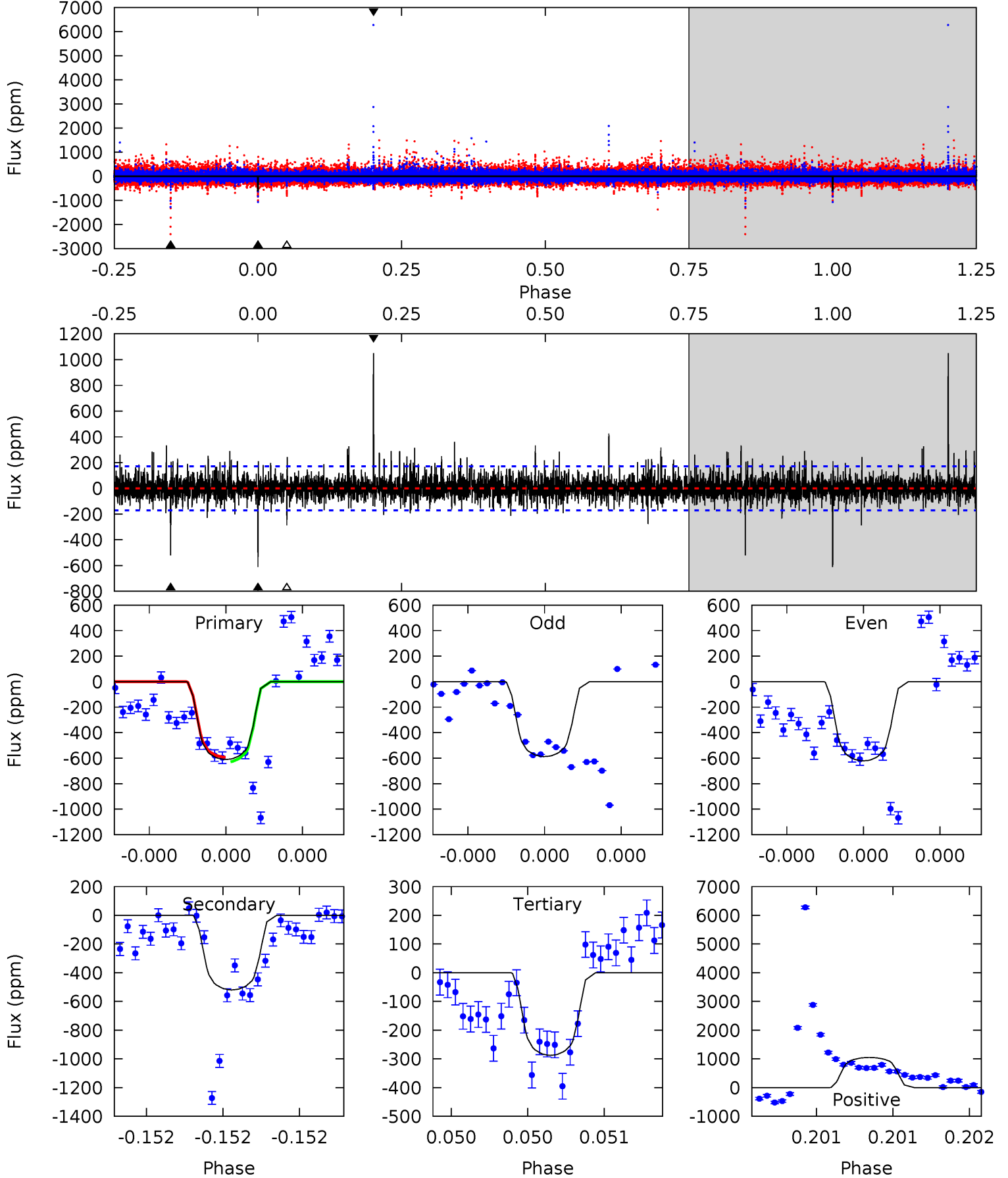
TCE 009237305-03 $P=533.840377$ Days $T_0=431.918576$ (BKJD)



DV Model-Shift Uniqueness Test

009237305-03, P = 533.907810 Days, E = 431.829581 Days

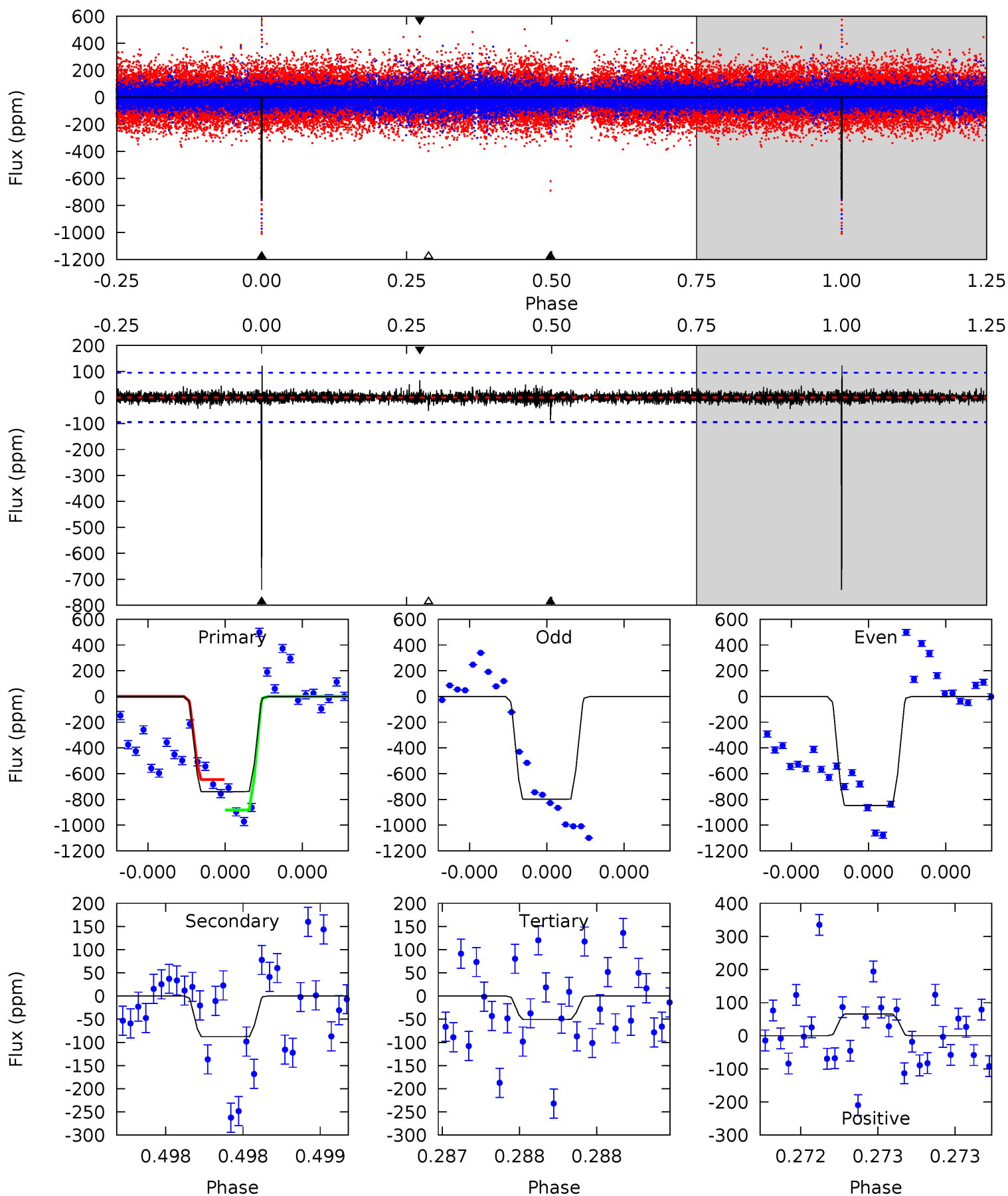
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.0	17.0	9.44	34.4	5.62	3.55	2.15	10.6	-14.4	7.61	-17.4	0.34	1.00	0.63	0.58



Alt Model-Shift Uniqueness Test

009237305-03, P = 533.840377 Days, E = 431.918576 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
43.5	5.15	2.98	3.85	5.57	3.48	0.61	40.5	39.6	2.17	1.30	1.36	1.02	0.14	6.81



Stellar Parameters For KIC 009237305

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5210^{+186}_{-207}	$3.232^{+0.630}_{-0.210}$	$0.080^{+0.250}_{-0.350}$	$5.828^{+1.555}_{-3.888}$	$2.115^{+0.500}_{-1.083}$	$0.015^{+0.170}_{-0.007}$
	+4%/-4%	+19%/-6%	+312%/-438%	+27%/-67%	+24%/-51%	+1130%/-46%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009237305-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-520 ± 30	$18.95^{+5.34}_{-6.77}$	589^{+63}_{-92}	4575^{+325}_{-249}	2246^{+2626}_{-848}
Alt.	-88 ± 17	$18.25^{+4.83}_{-5.85}$	598^{+57}_{-90}	3415^{+212}_{-179}	410^{+381}_{-162}

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

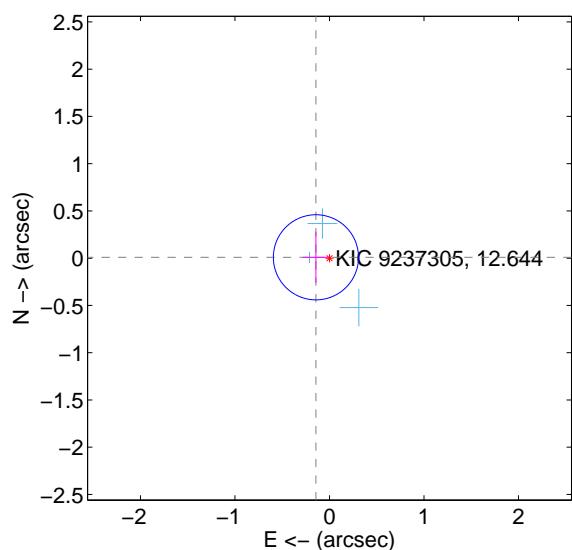
Supplemental centroid analysis for 009237305-03. Kepler magnitude: 12.64. Transit SNR 12.24

There are 3 quarters with good PRF difference image offsets

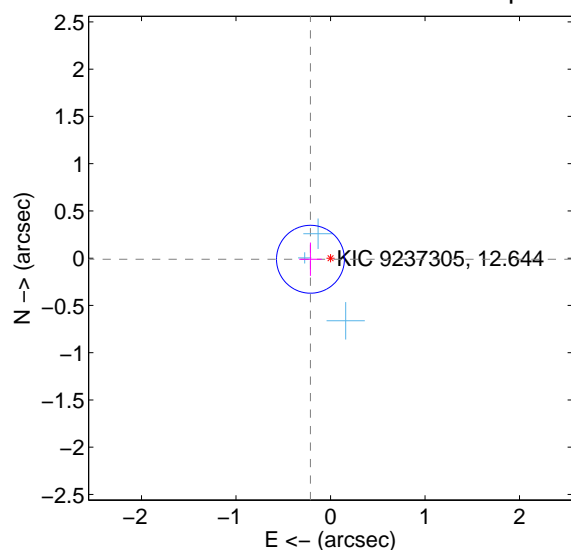
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.143 ± 0.150	0.96	0.143 ± 0.138	0.009 ± 0.271
PRF-fit source offset from KIC position	0.212 ± 0.120	1.77	0.212 ± 0.120	-0.011 ± 0.176
photometric centroid source offset	0.65 ± 0.49	1.32	-0.02 ± 0.71	-0.65 ± 0.49

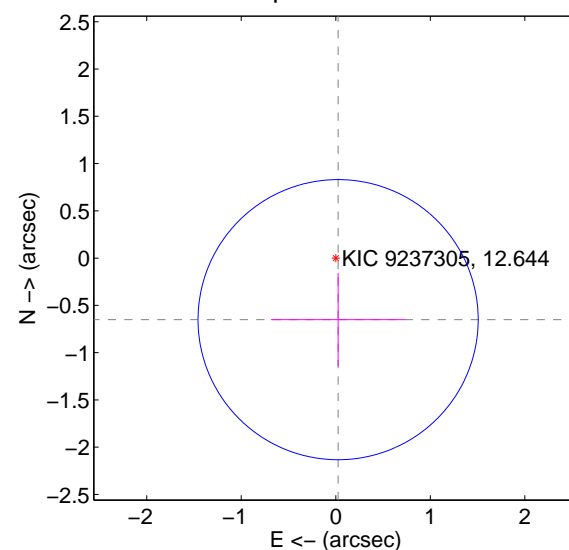
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



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



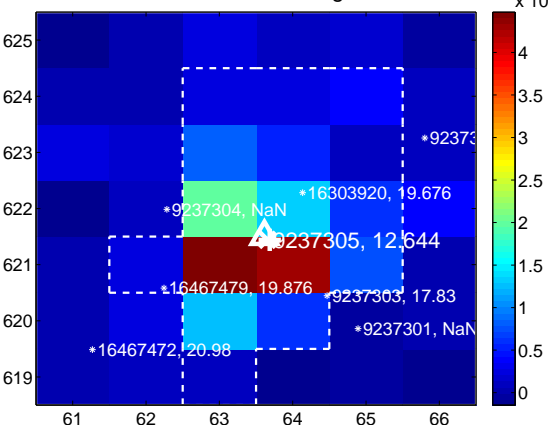
Q3 no difference image



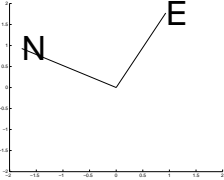
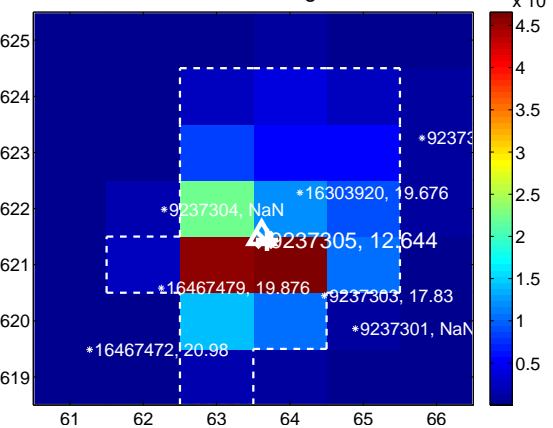
Q3 no OOT image



Q4 difference image



Q4 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.

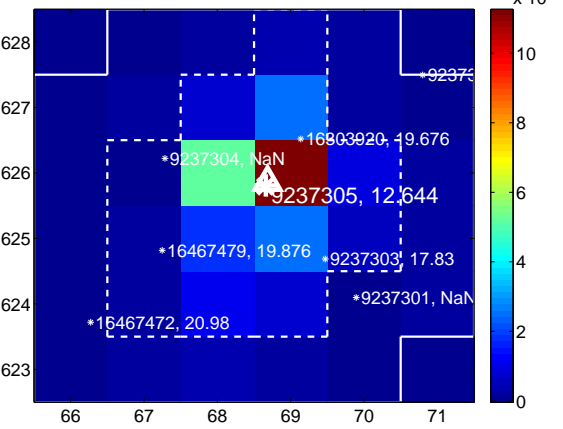
Q9 no difference image



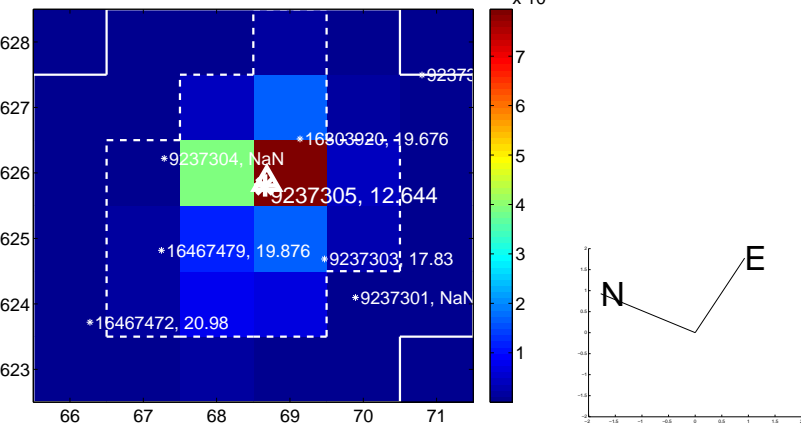
Q9 no OOT image



Q10 difference image



Q10 OOT image



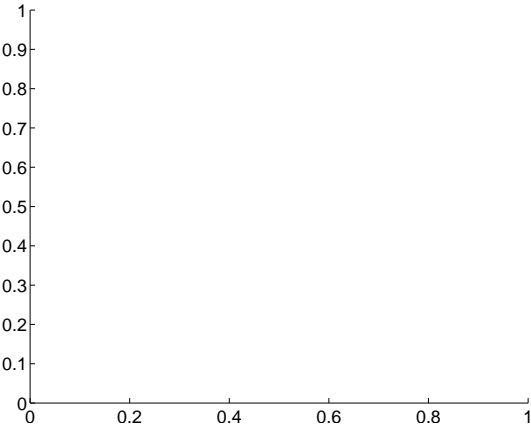
Q11 no difference image



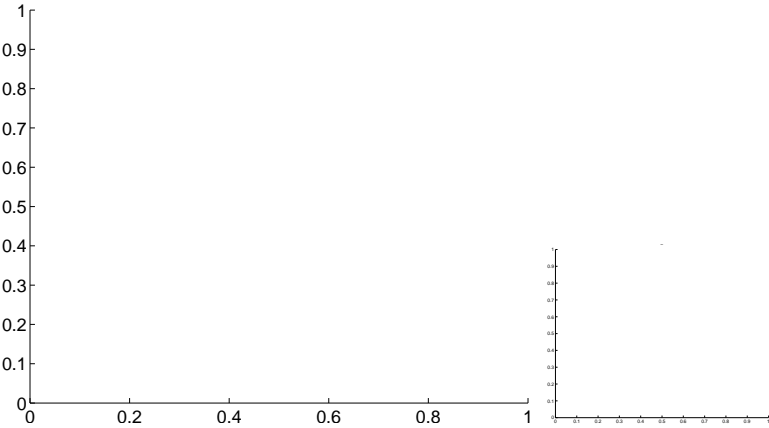
Q11 no OOT image



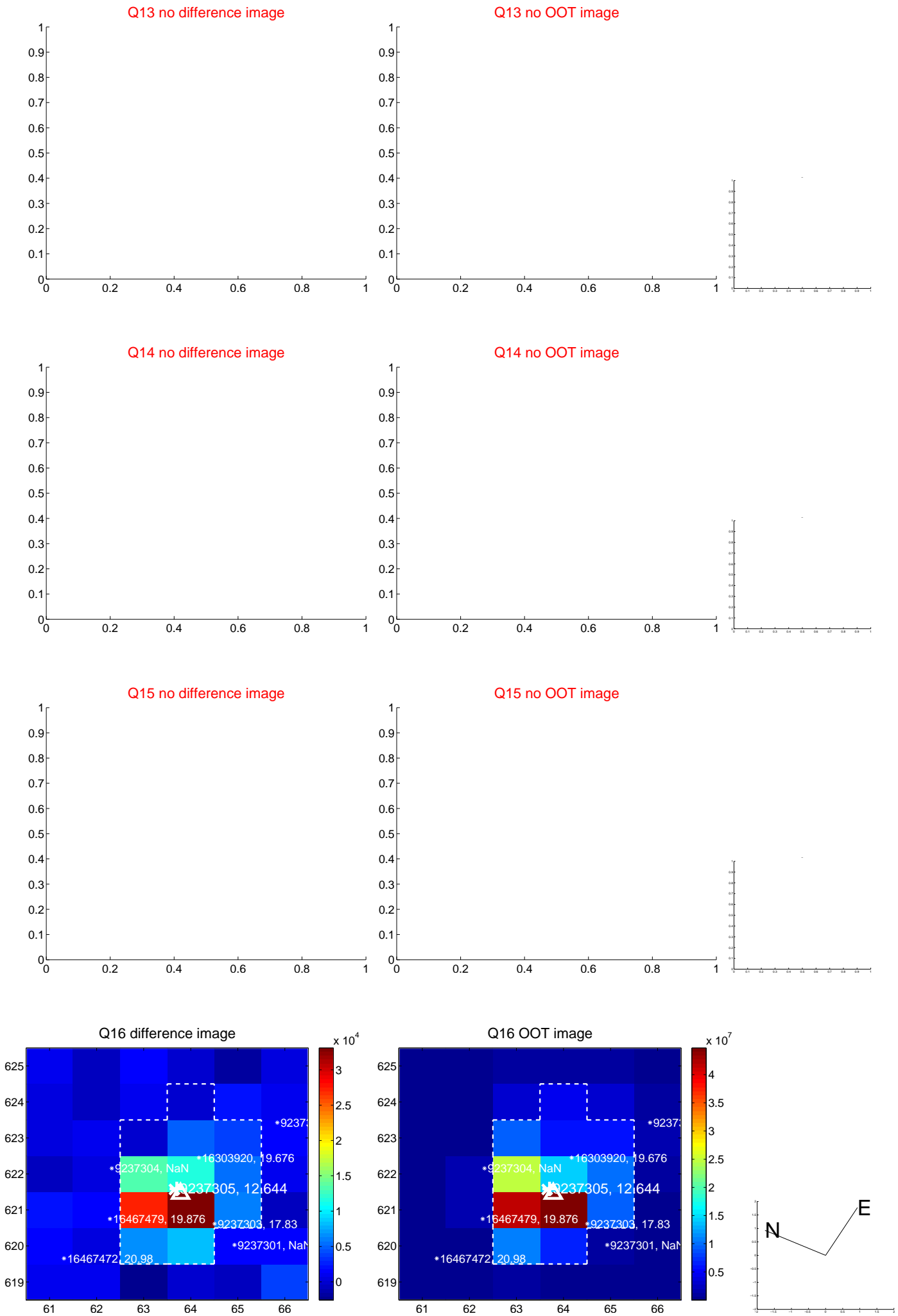
Q12 no difference image



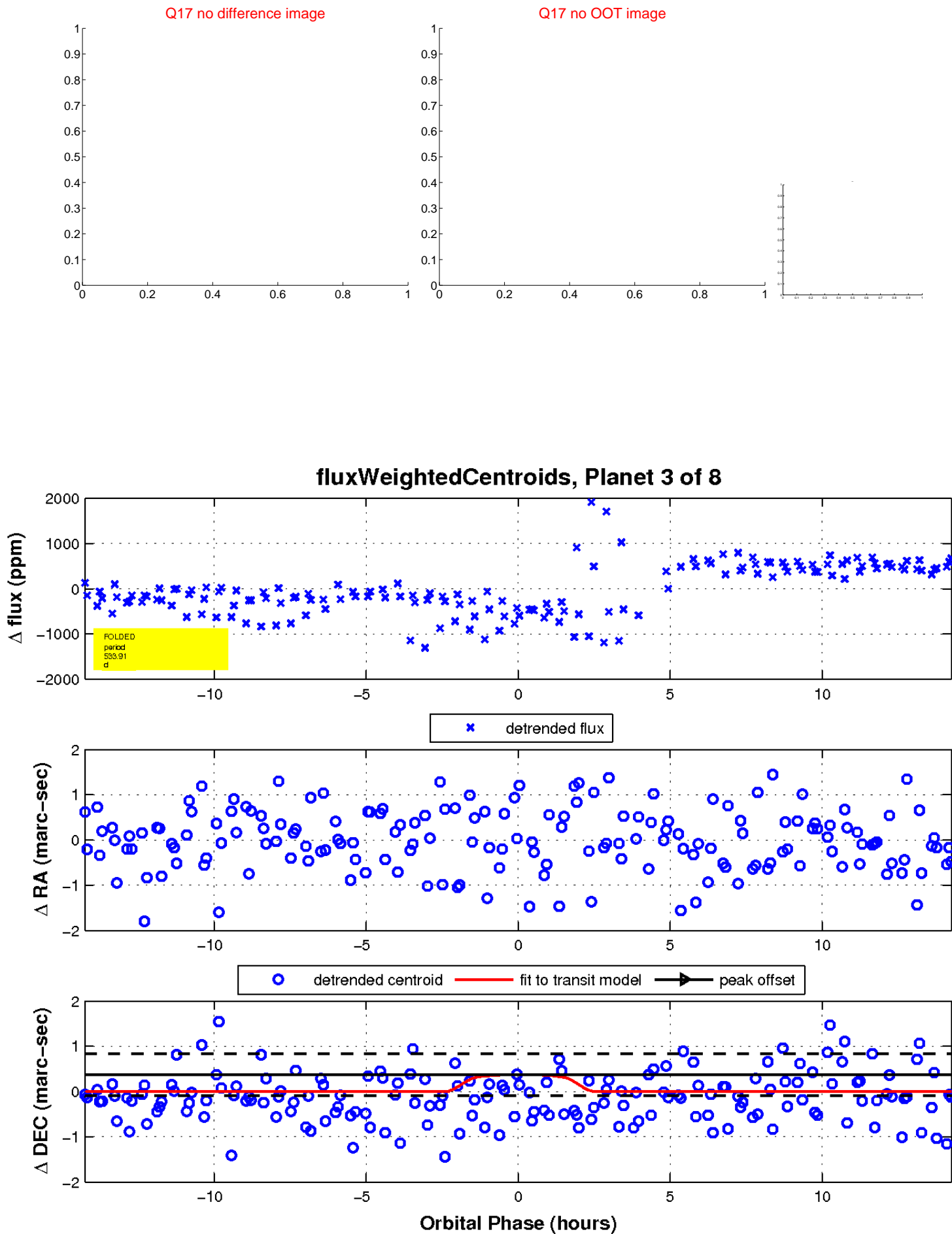
Q12 no OOT image



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

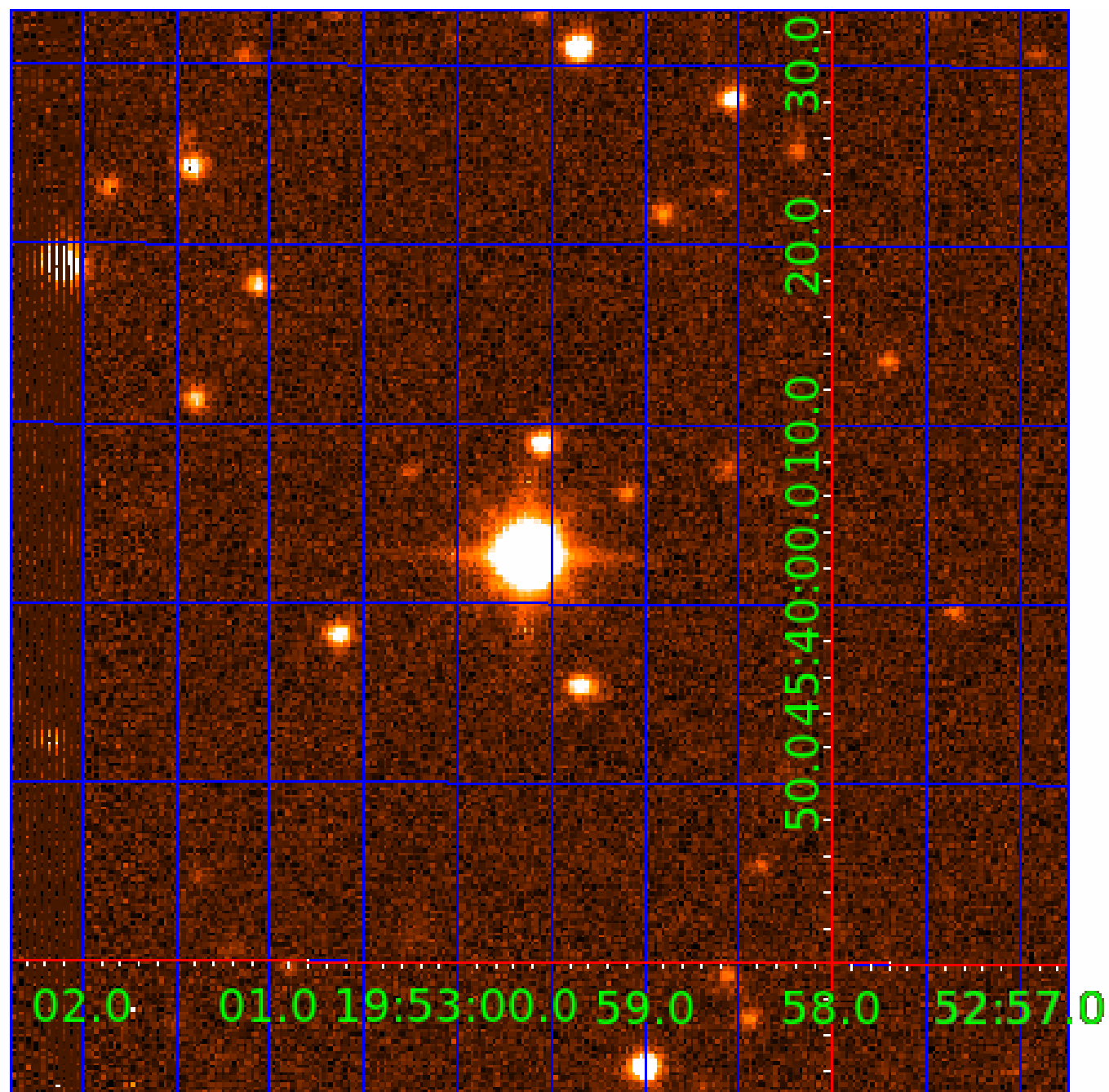


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009237305

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})
009237305-02	OBS	No	309.745220	331.156710	446.8	11.424	14.5	7.3	5.83	5210	16.82	16.95
009237305-03	OBS	No	533.907810	431.829581	730.9	4.763	15.2	12.2	5.83	5210	19.76	8.20
009237305-04	OBS	No	396.734868	458.543019	469.1	12.690	13.9	6.7	5.83	5210	12.73	12.19
009237305-05	OBS	No	358.810042	254.916869	1.7	9.592	14.3	0.0	5.83	5210	0.97	13.94
009237305-07	OBS	No	539.570067	250.332031	489.1	5.265	9.6	7.9	5.83	5210	14.88	8.09
009237305-08	OBS	No	562.143737	369.334395	439.5	12.259	9.9	6.4	5.83	5210	12.35	7.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009237305-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—HALO_GHOST
009237305-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
009237305-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
009237305-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

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

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

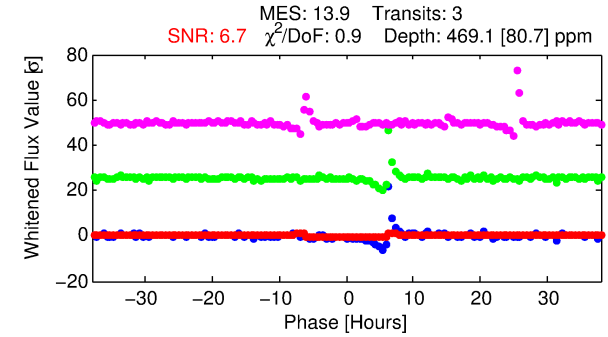
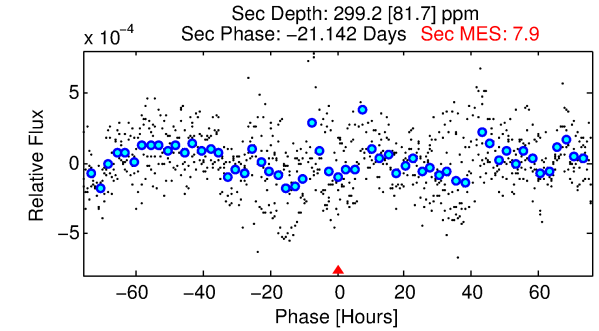
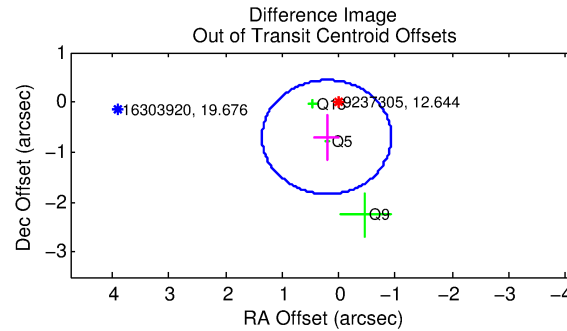
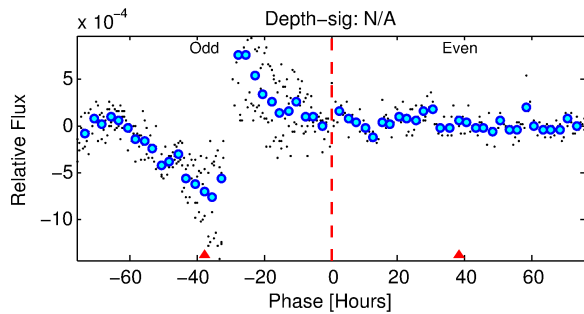
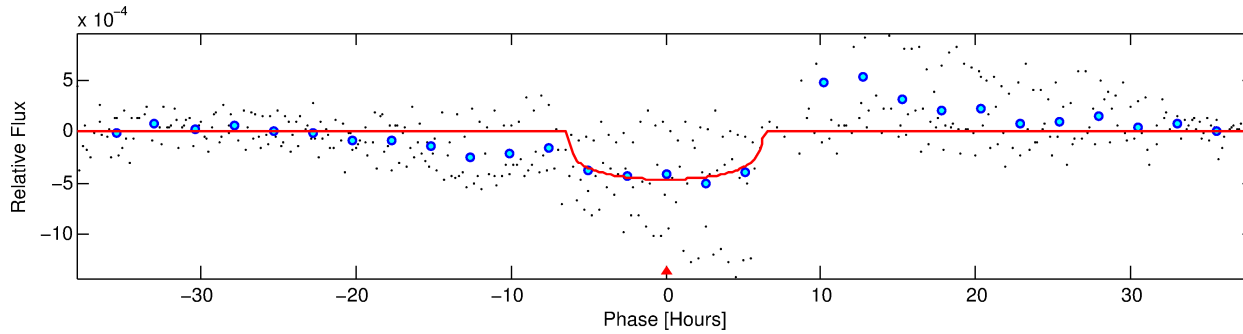
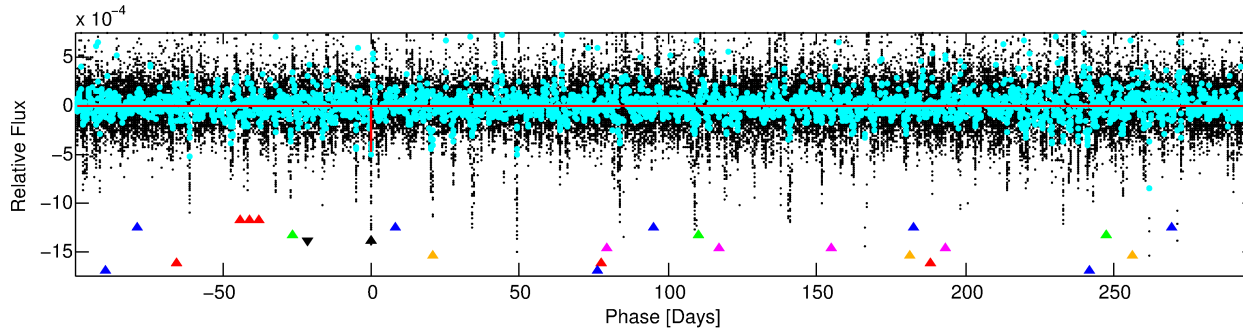
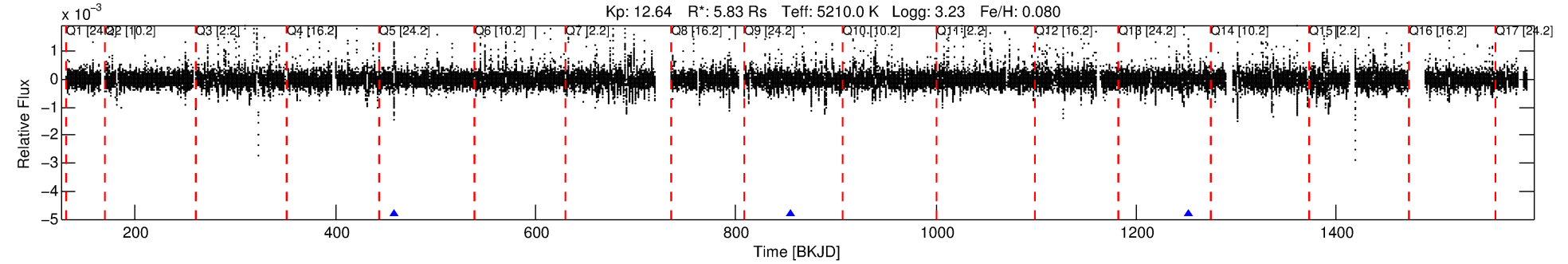
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009237305-04

No Significant Match Found

DV One-Page Summary

KIC: 9237305 Candidate: 4 of 8 Period: 396.735 d



DV Fit Results:

Period = 396.73487 [0.00859] d
Epoch = 458.5430 [0.0104] BKJD
Rp/R* = 0.0200 [0.0125]
a/R* = 214.80 [498.08]
b = 0.48 [3.73]
Seff = 12.19 [13.12]
Teq = 476 [128] K
Rp = 12.73 [11.62] Re
a = 1.3564 [0.8911] AU
Ag = 1867.08 [3101.67] [0.60 σ]
Teffp = 4842 [1556] K [2.80 σ]

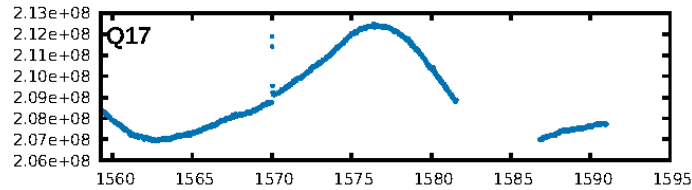
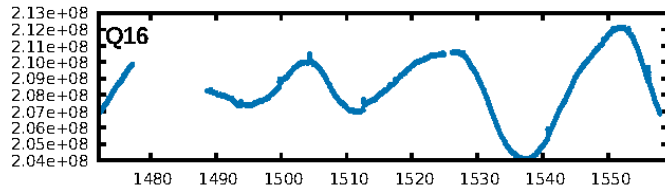
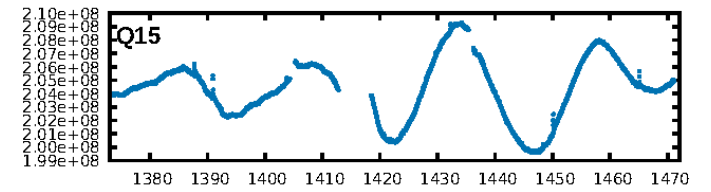
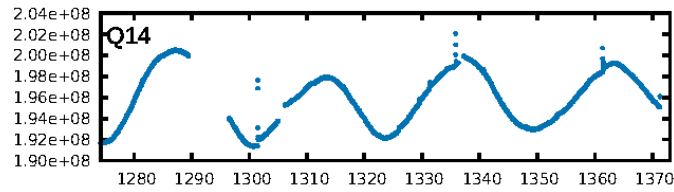
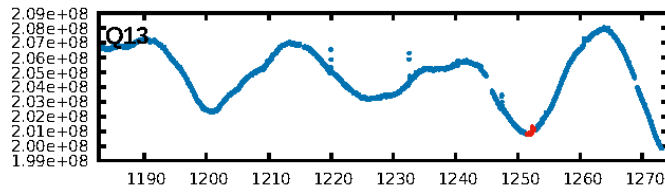
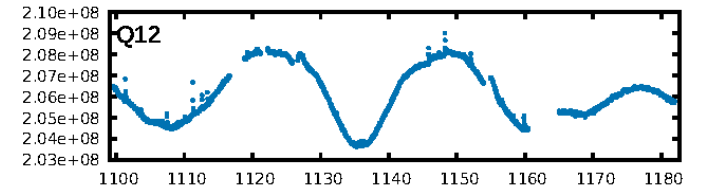
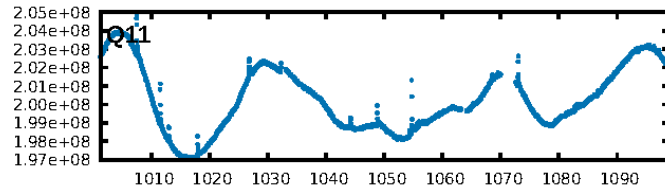
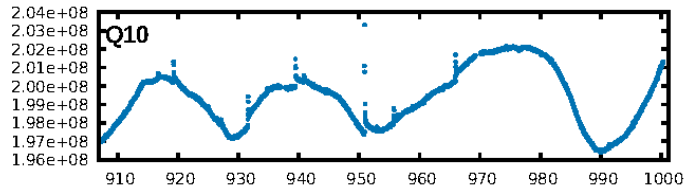
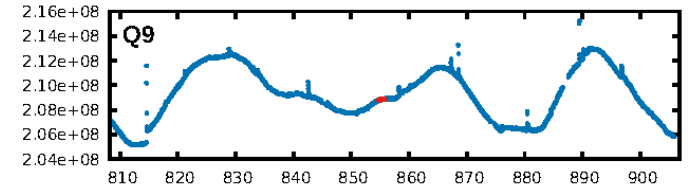
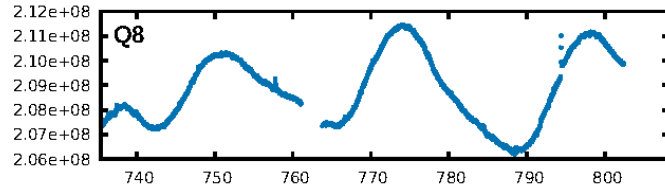
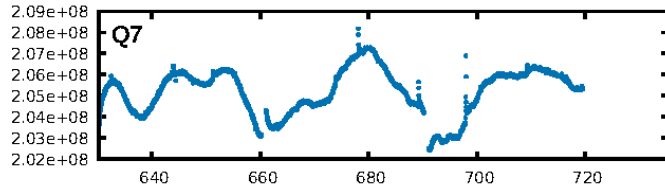
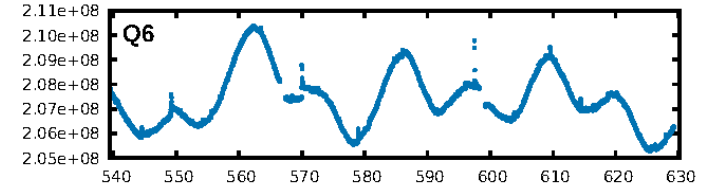
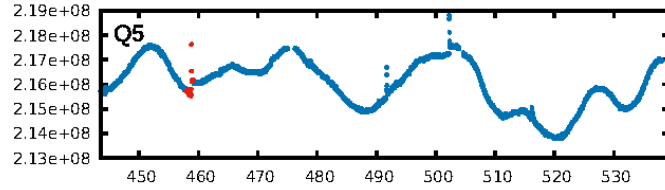
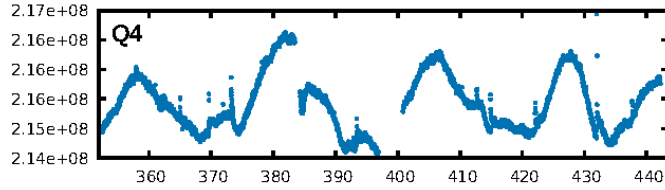
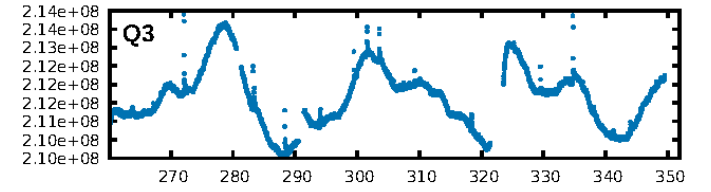
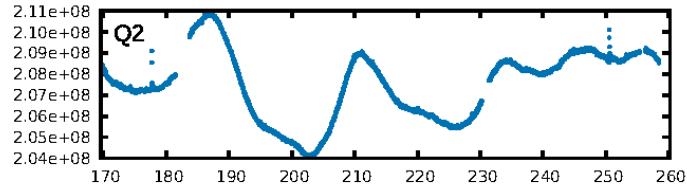
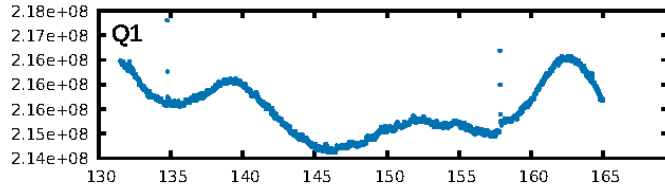
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [57.22 σ]
LongPeriod-sig: 100.0% [4.49 σ]
ModelChiSquare2-sig: 0.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.57e-12
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.355
Centroid-sig: N/A
Centroid-so: 0.198 arcsec [0.36 σ]
OotOffset-rm: 0.731 arcsec [1.92 σ]
KicOffset-rm: 0.837 arcsec [2.31 σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

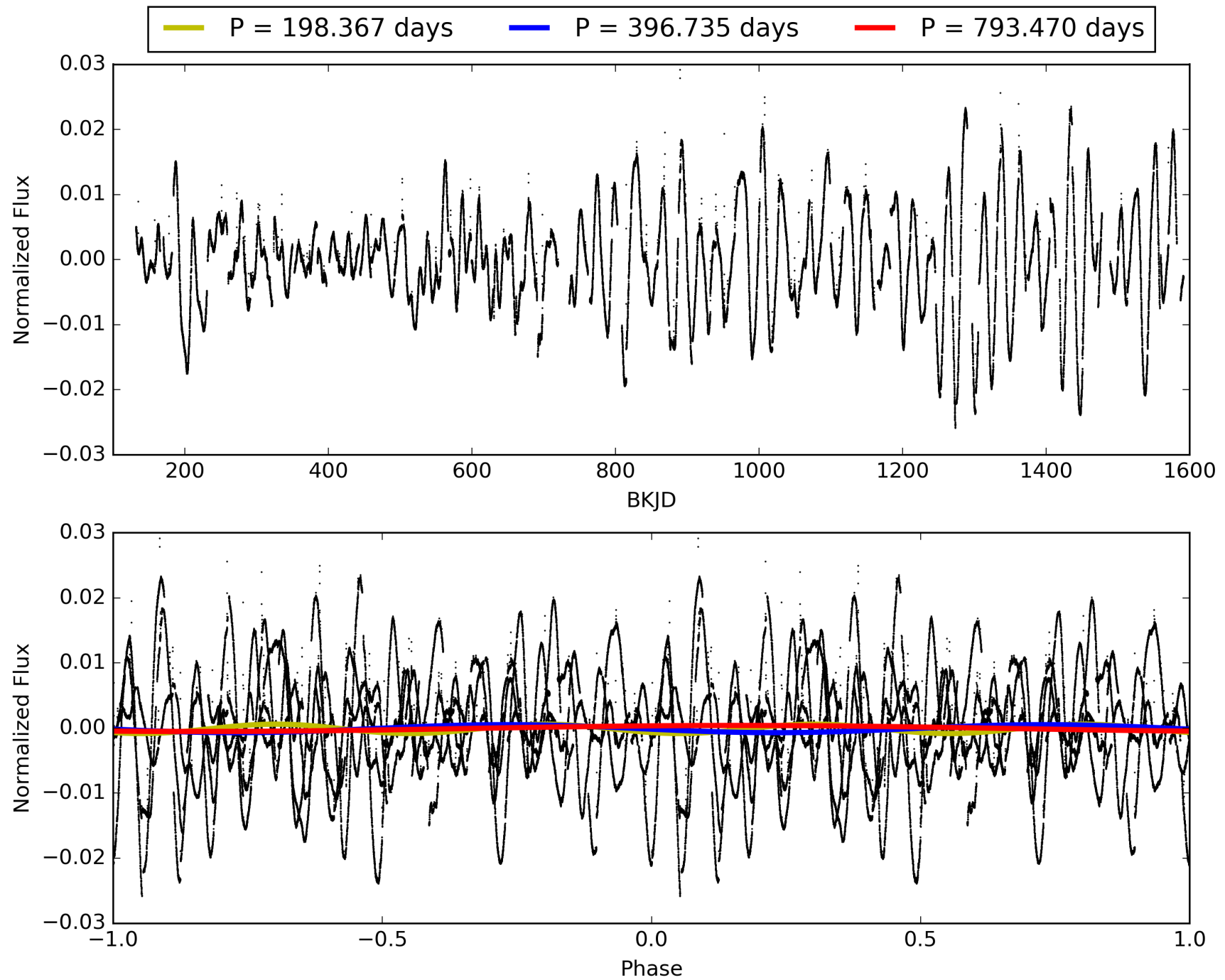
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:33:41 Z

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

TCE 009237305-04, PDC Light Curves

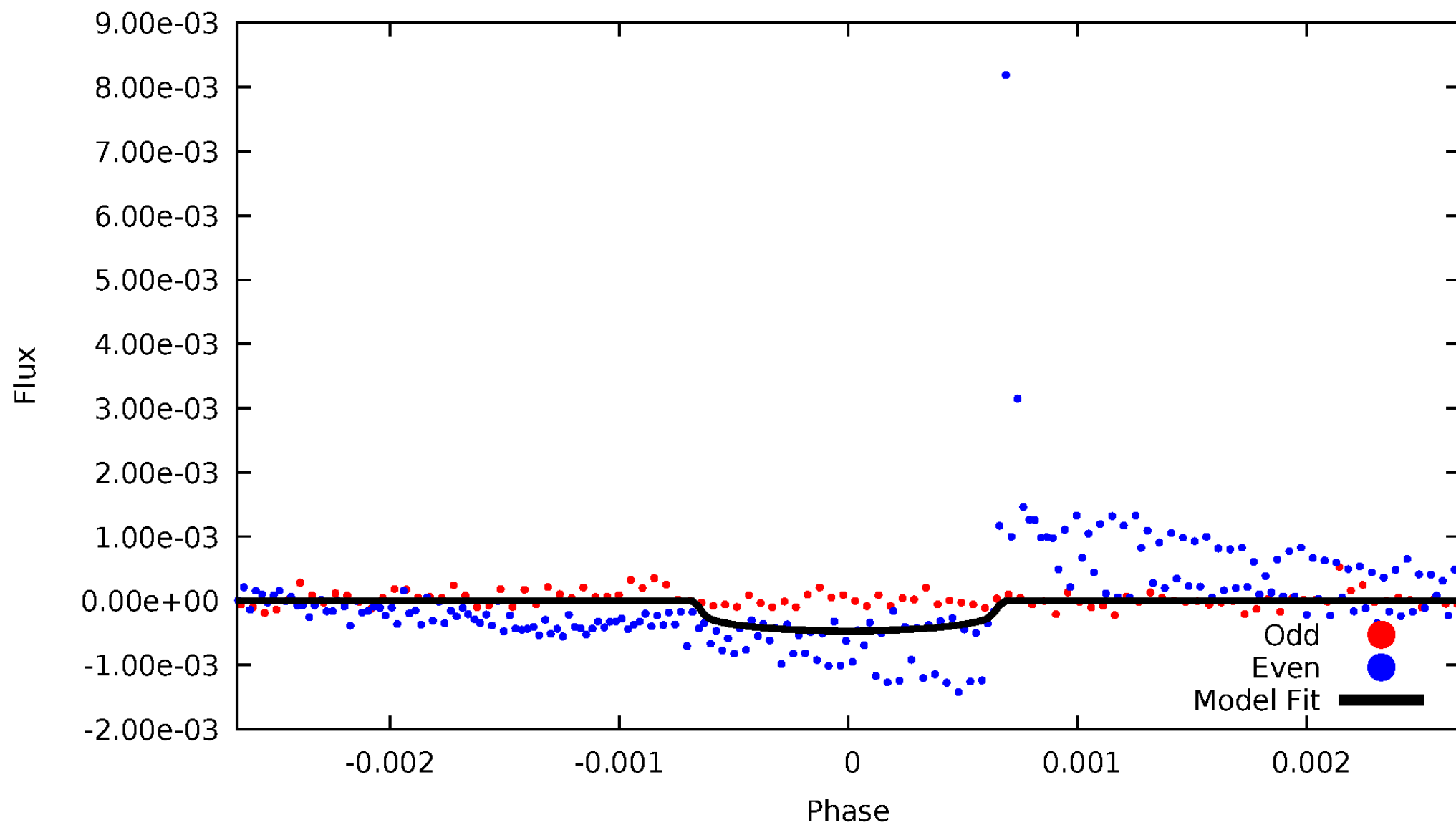


TCE 009237305-04



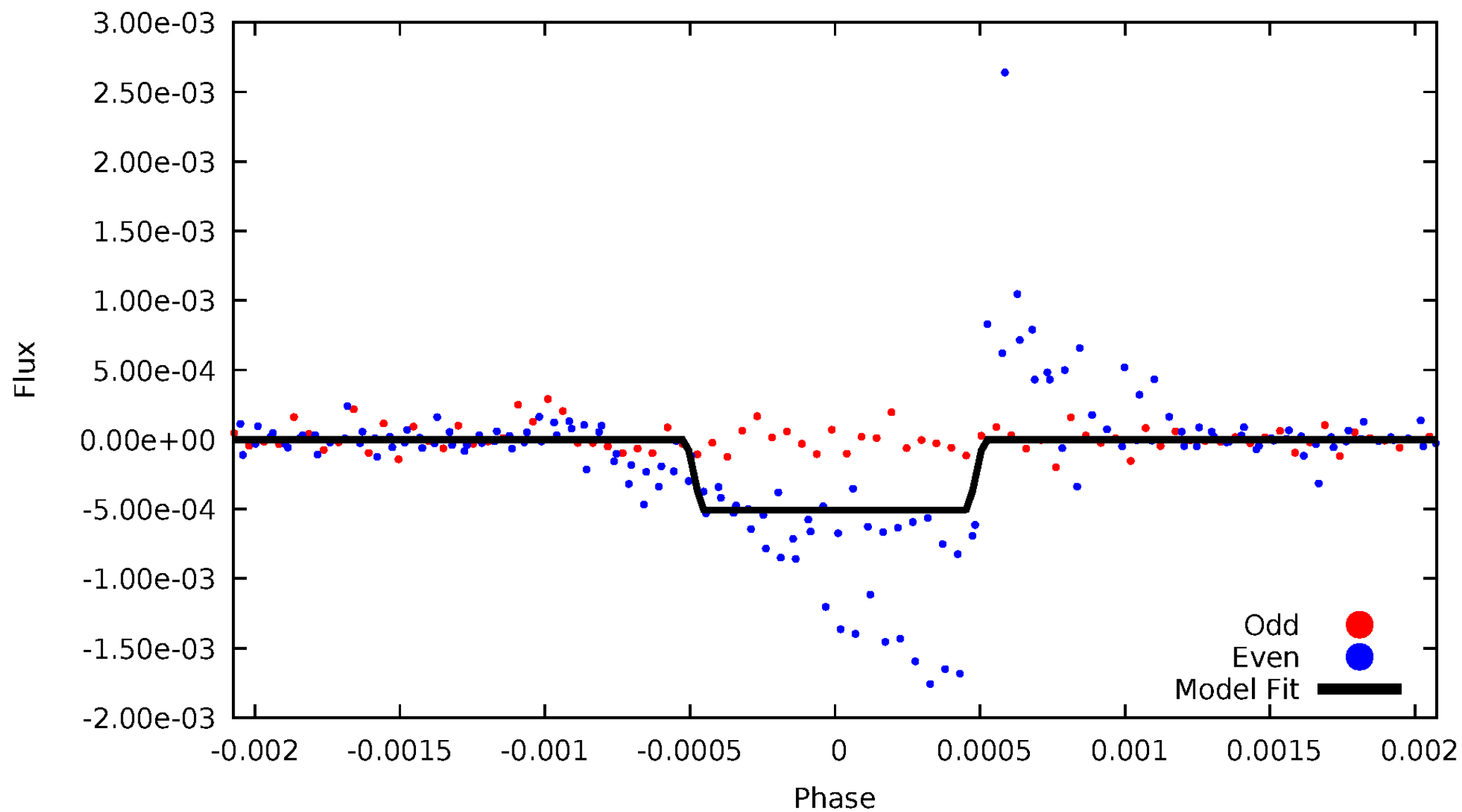
DV Odd/Even

TCE 009237305-04



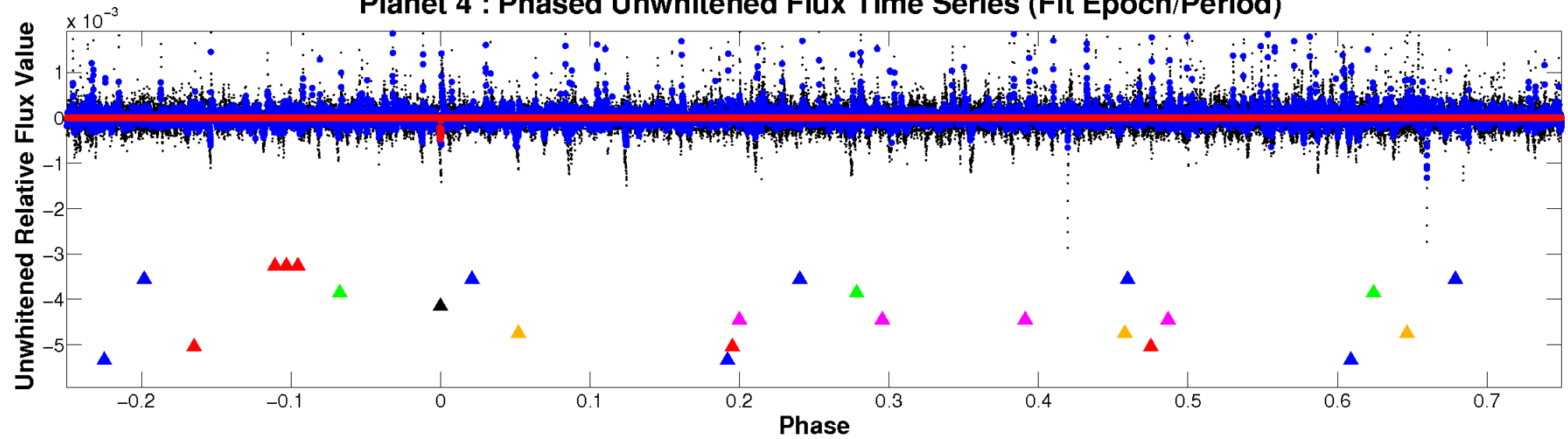
ALT Odd/Even

TCE 009237305-04

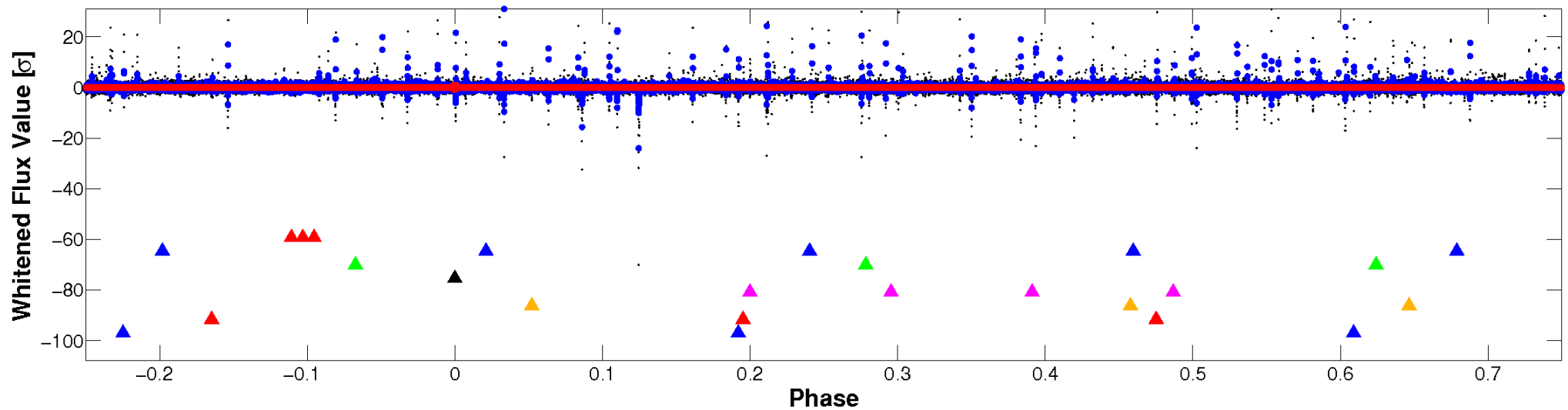


Non-Whitened Vs. Whitened Light Curve

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

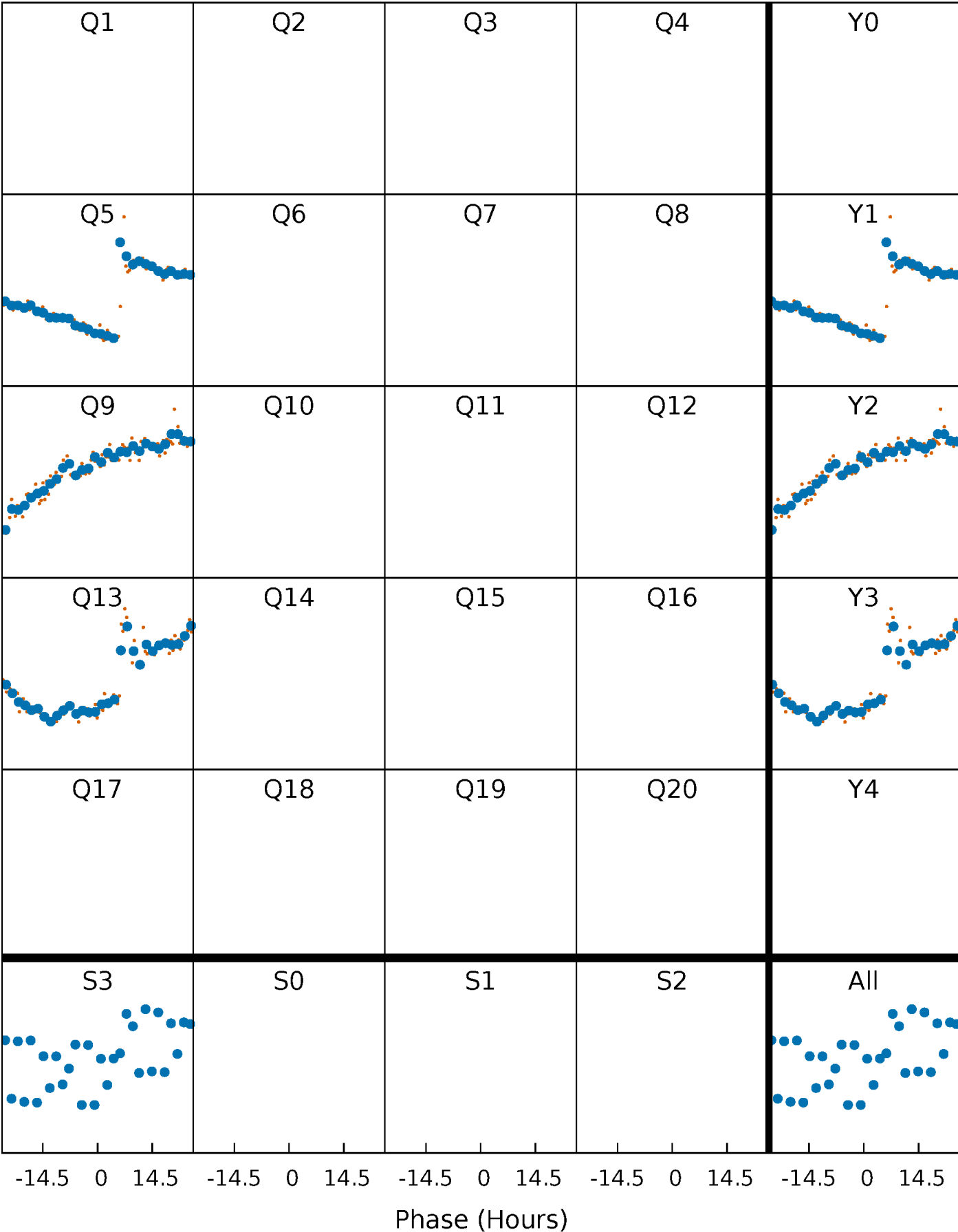


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



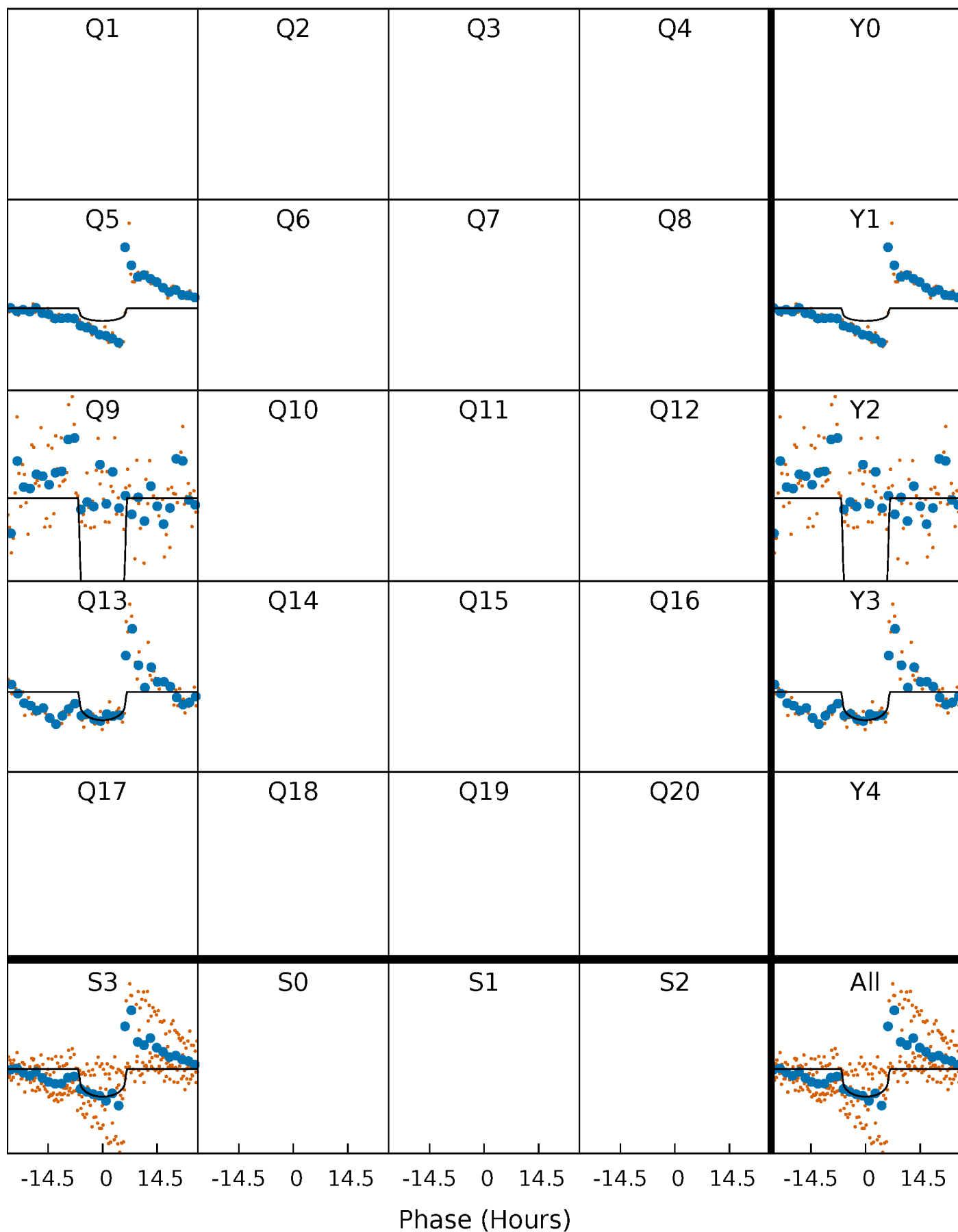
PDC Quarter-Phased Transit Curves

TCE 009237305-04 P=396.734868 Days $T_0=458.543019$ (BKJD)



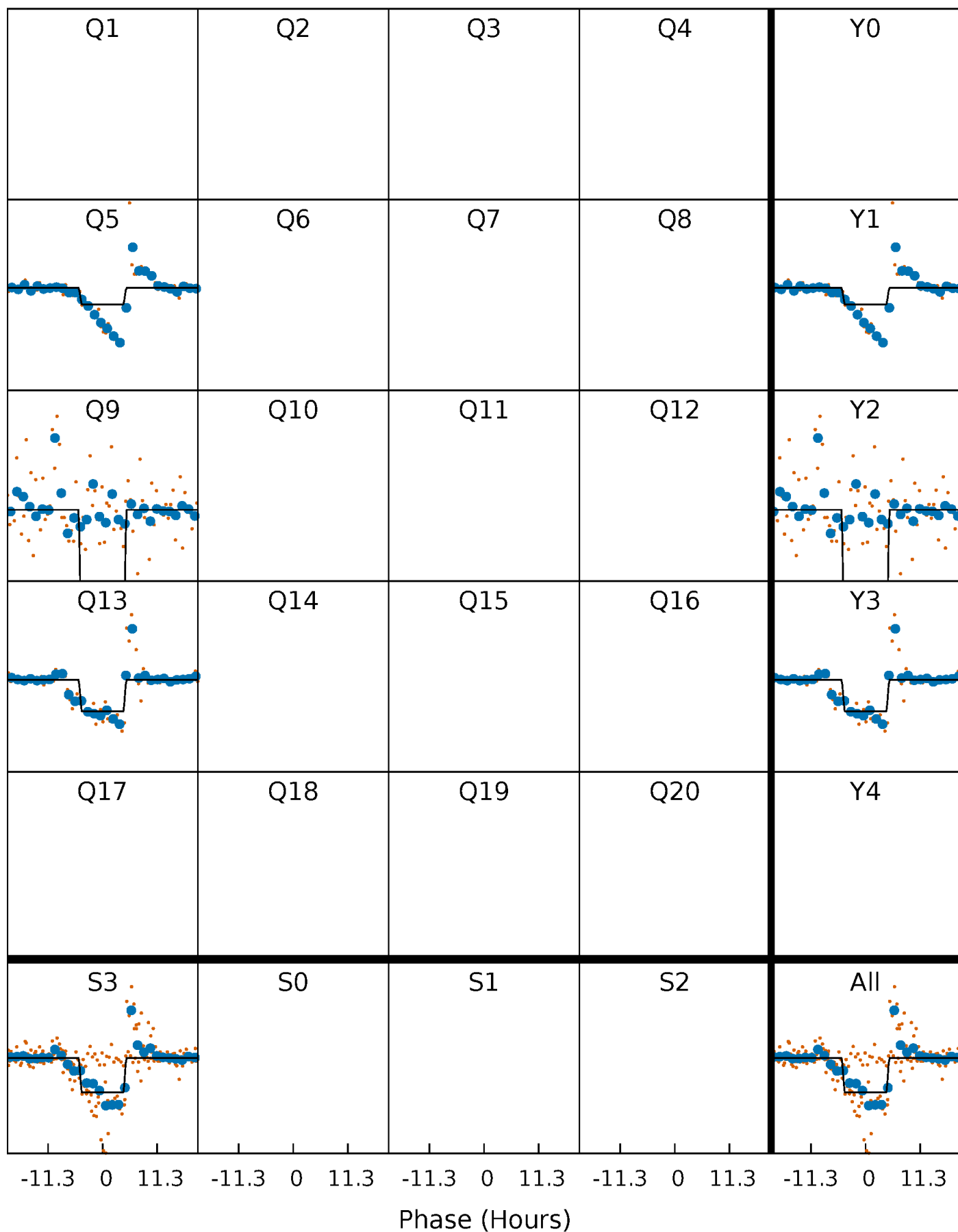
DV Quarter-Phased Transit Curves

TCE 009237305-04 $P=396.734868$ Days $T_0=458.543019$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

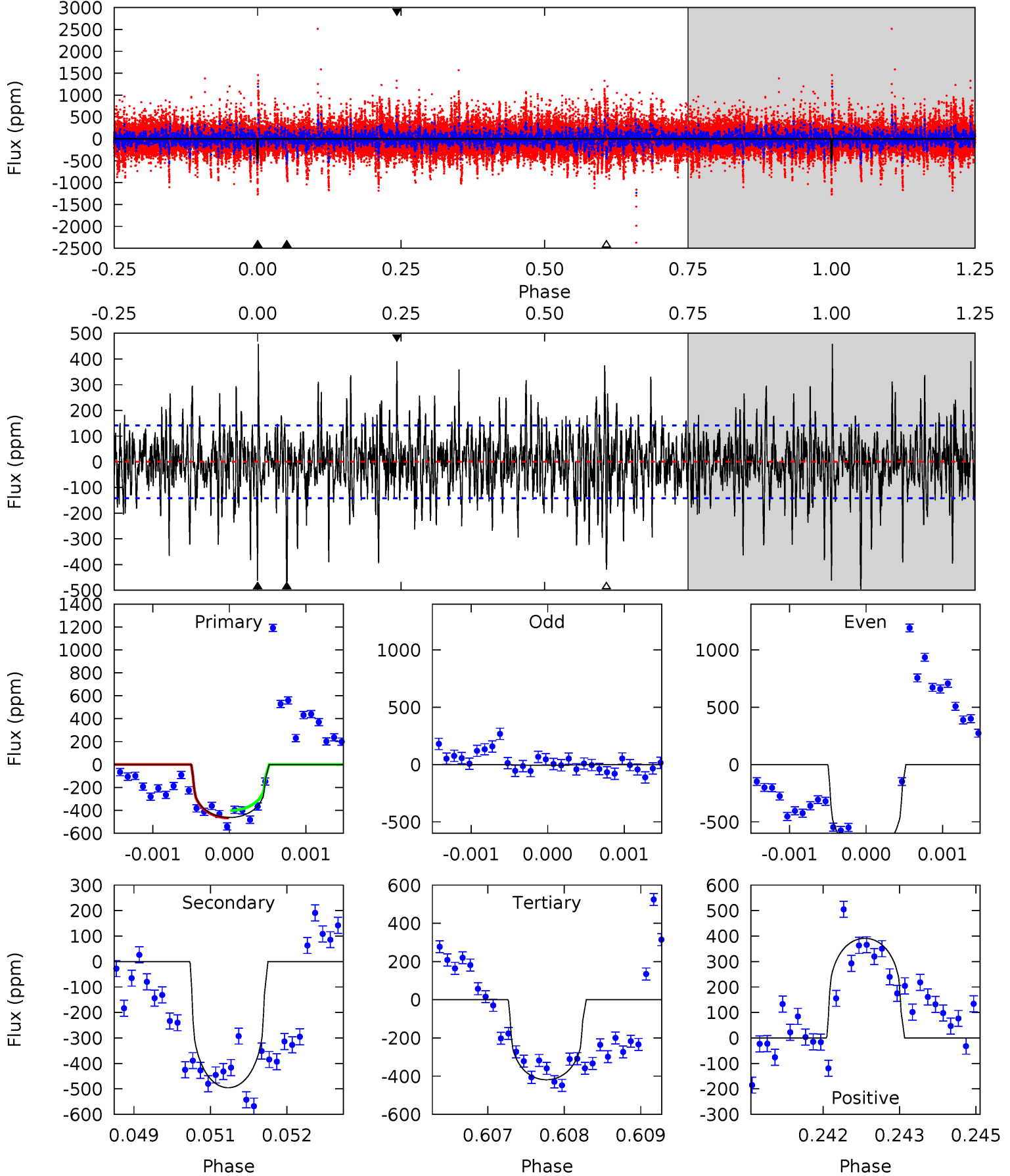
TCE 009237305-04 $P=396.731190$ Days $T_0=458.603535$ (BKJD)



DV Model-Shift Uniqueness Test

009237305-04, P = 396.734868 Days, E = 61.808151 Days

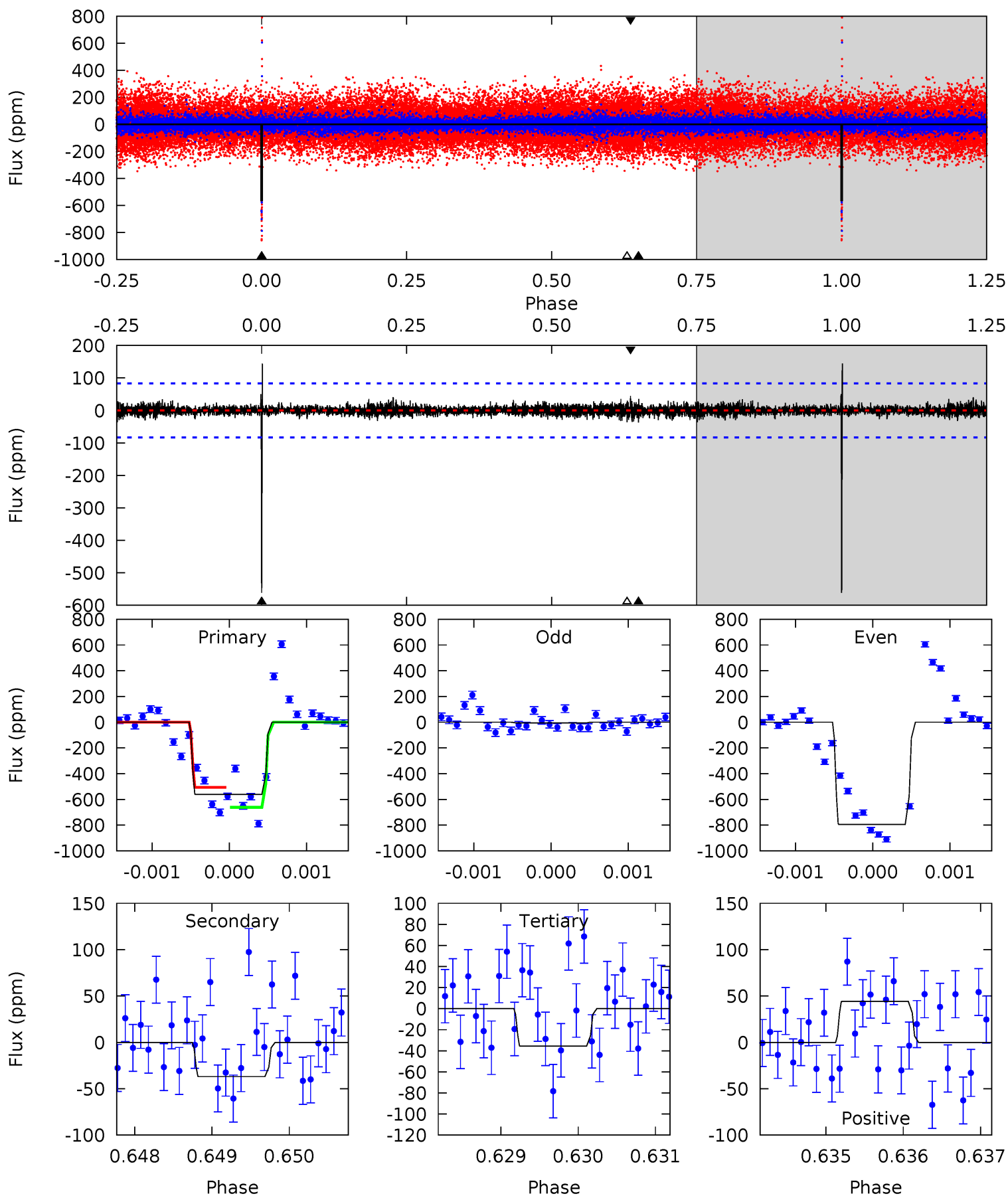
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.6	18.9	15.9	14.9	5.40	3.20	3.88	1.66	2.71	2.92	3.97	11.7	1.12	0.48	1.22



Alt Model-Shift Uniqueness Test

009237305-04, P = 396.731190 Days, E = 61.872345 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.8	2.42	2.33	2.89	5.45	3.29	0.55	34.4	33.9	0.08	-0.48	32.5	0.97	0.20	0



Stellar Parameters For KIC 009237305

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5210^{+186}_{-207}	$3.232^{+0.630}_{-0.210}$	$0.080^{+0.250}_{-0.350}$	$5.828^{+1.555}_{-3.888}$	$2.115^{+0.500}_{-1.083}$	$0.015^{+0.170}_{-0.007}$
	+4%/-4%	+19%/-6%	+312%/-438%	+27%/-67%	+24%/-51%	+1130%/-46%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009237305-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-495 ± 26	$11.43^{+8.74}_{-6.56}$	651^{+67}_{-100}	5421^{+2711}_{-967}	3740^{+15647}_{-2485}
Alt.	-37 ± 15	$13.87^{+9.41}_{-7.98}$	659^{+68}_{-104}	3187^{+886}_{-409}	184^{+837}_{-122}

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

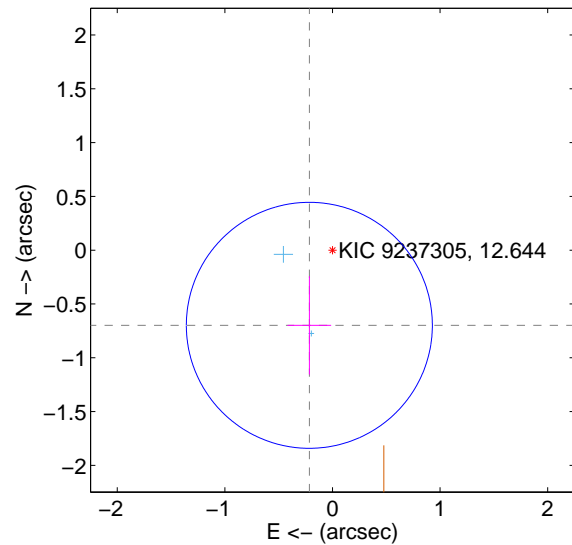
Supplemental centroid analysis for 009237305-04. Kepler magnitude: 12.64. Transit SNR 6.74

There are 2 quarters with good PRF difference image offsets

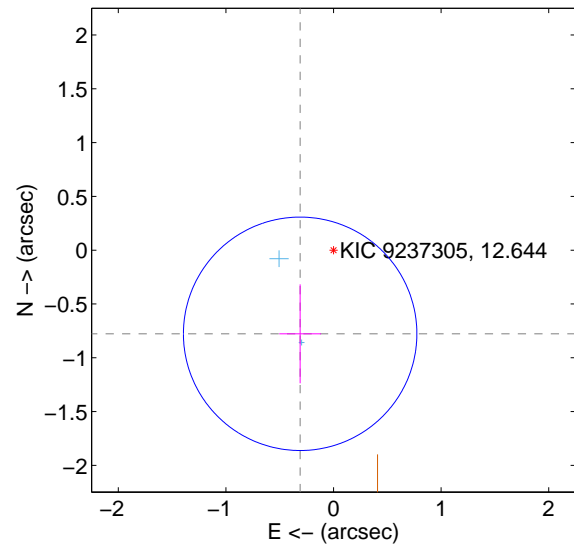
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.731 ± 0.381	1.92	0.215 ± 0.203	-0.698 ± 0.456
PRF-fit source offset from KIC position	0.837 ± 0.361	2.31	0.310 ± 0.194	-0.777 ± 0.460
photometric centroid source offset	0.20 ± 0.55	0.36	0.20 ± 0.55	0.01 ± 0.52

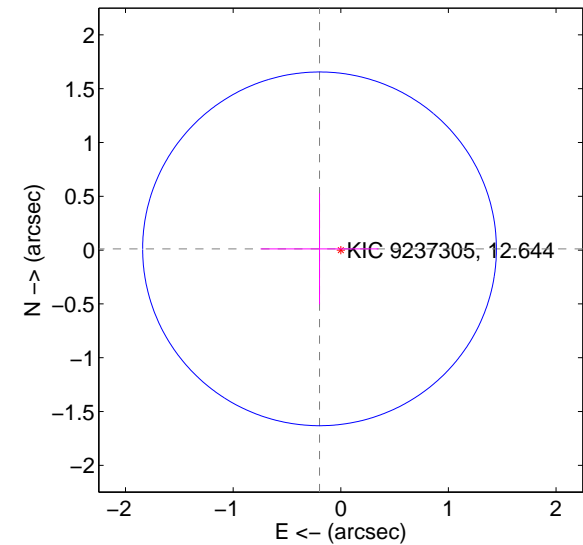
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

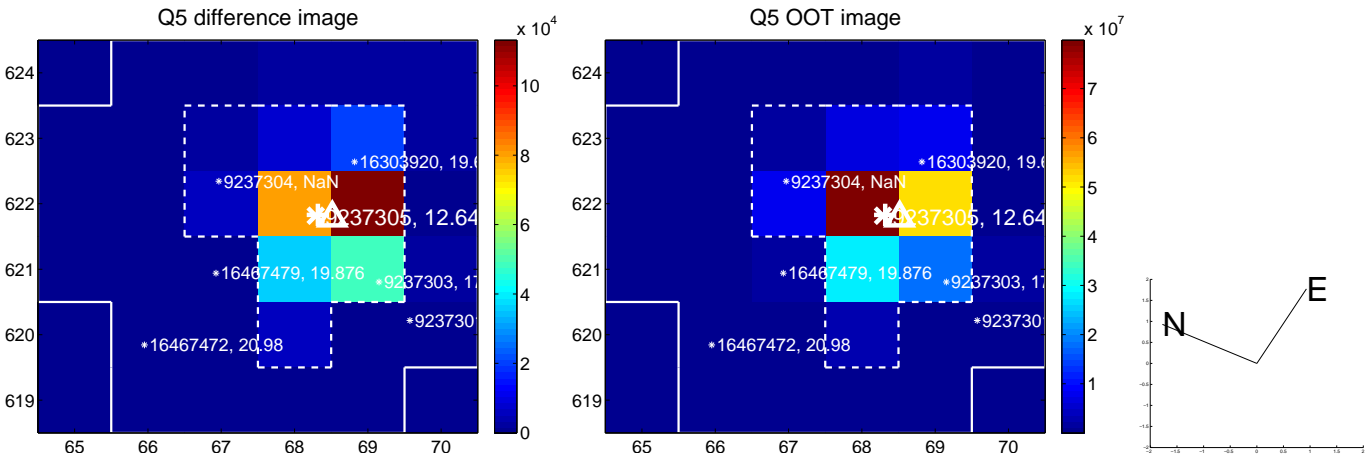


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

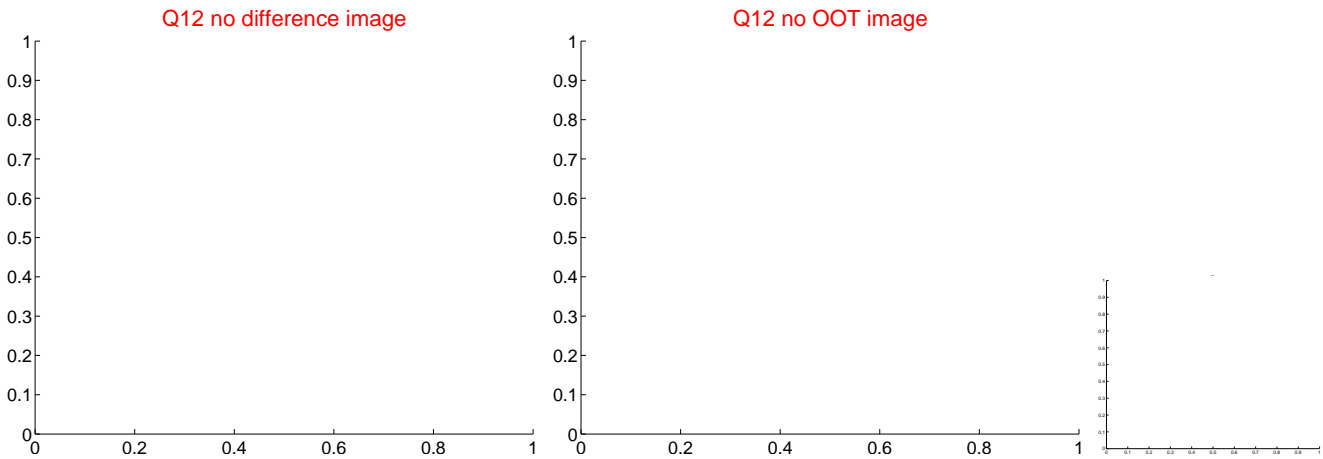
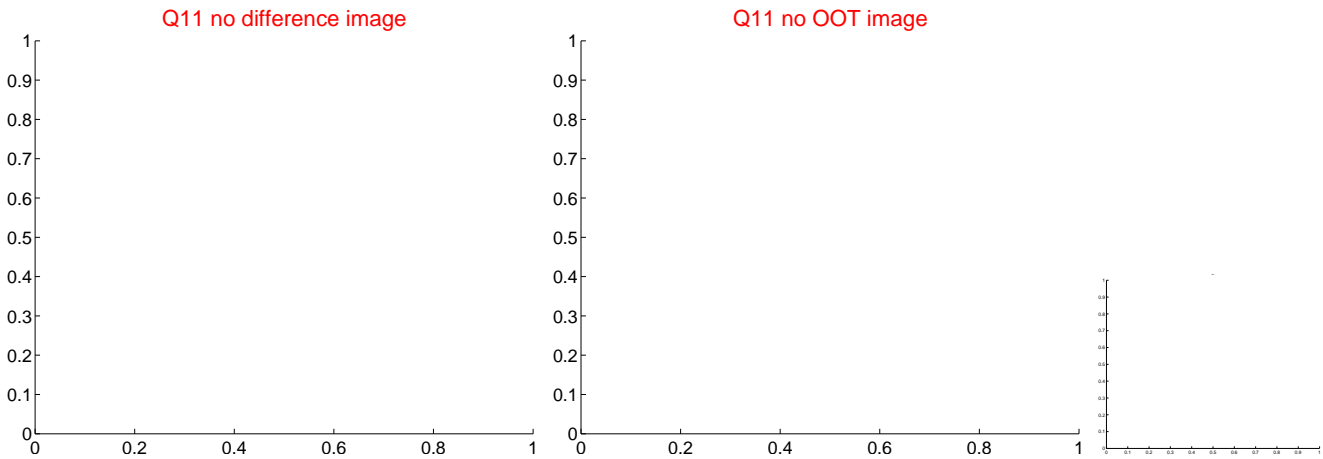
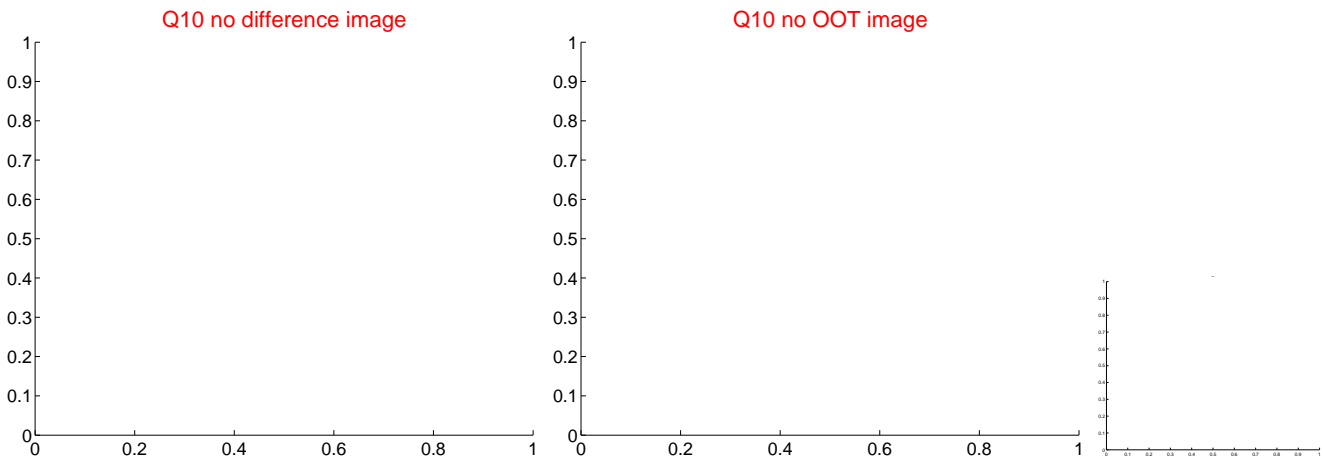
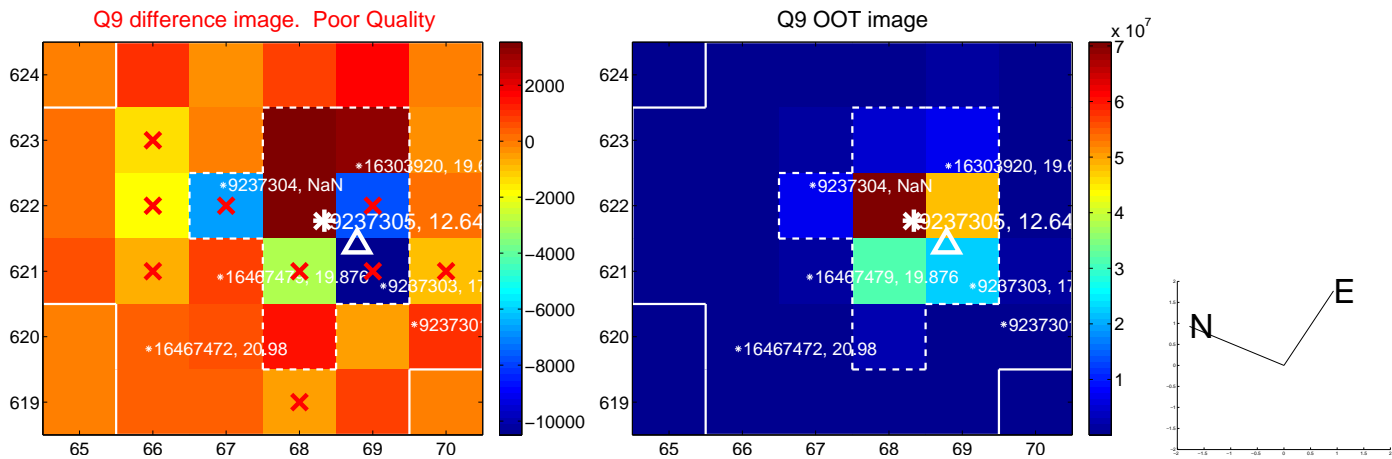
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



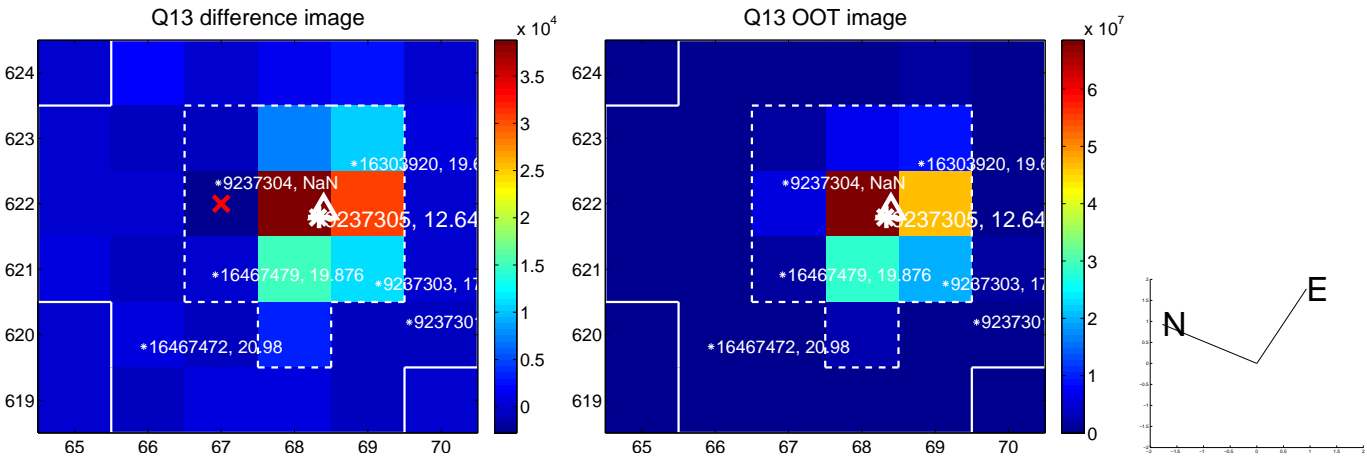
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



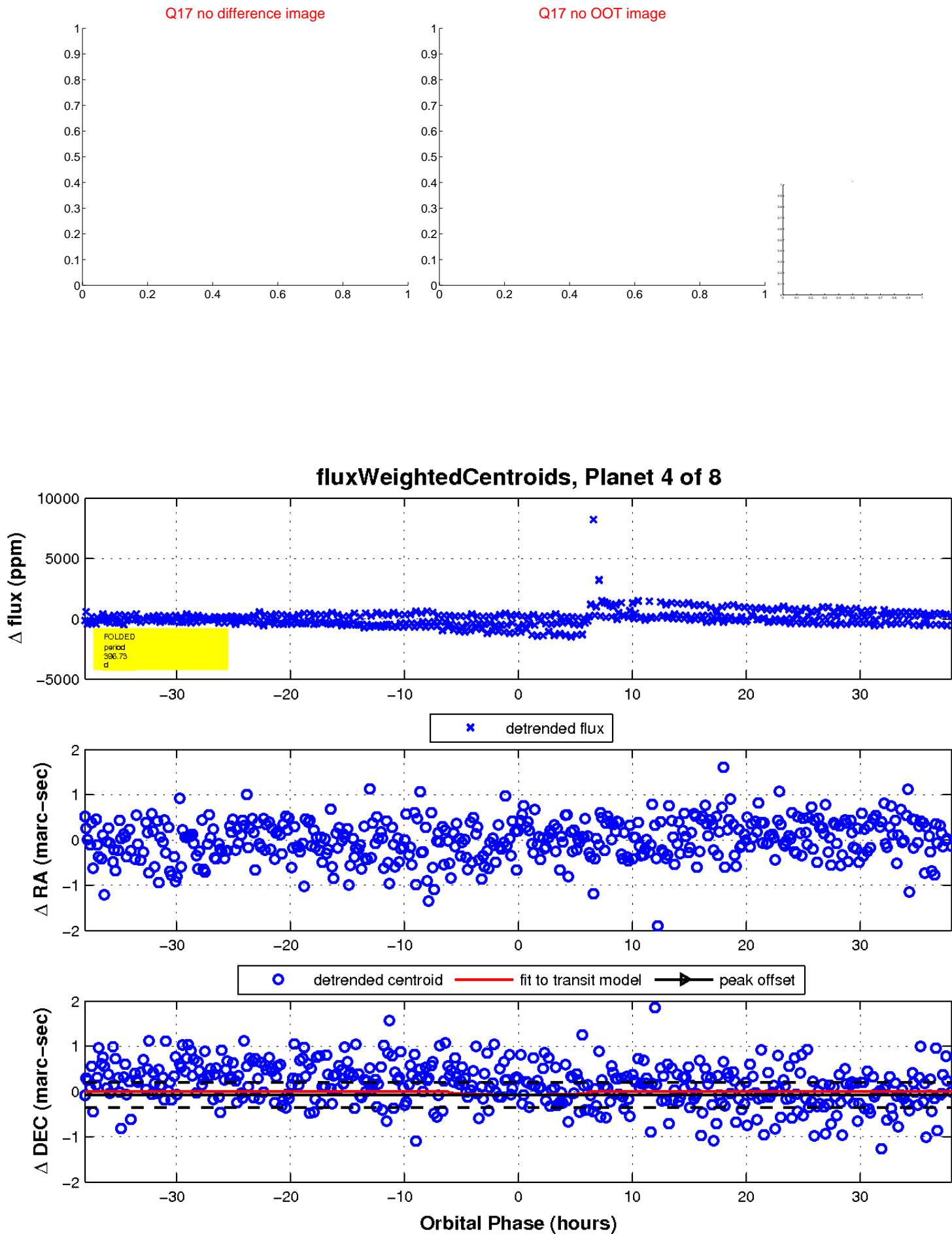
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

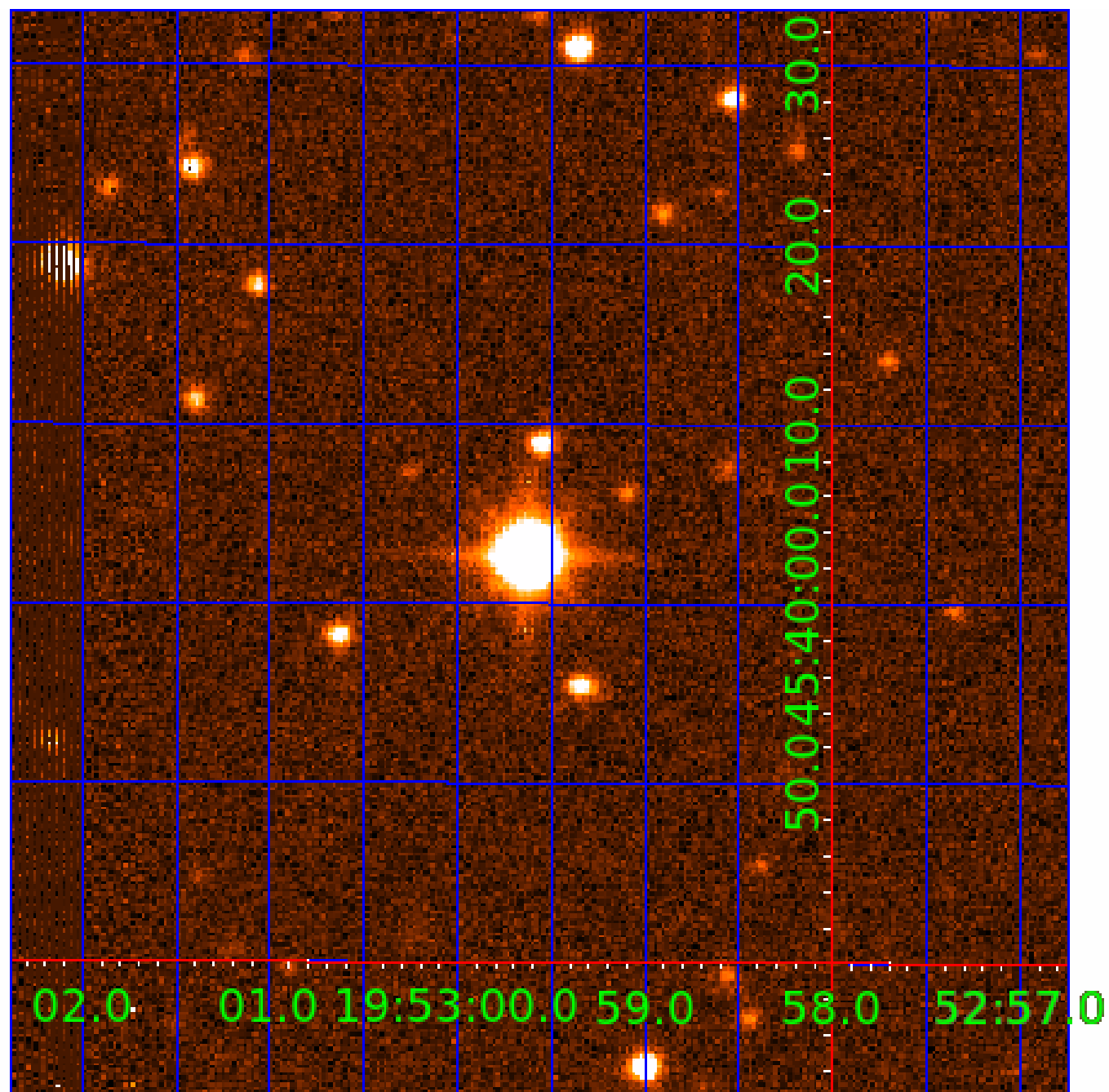


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009237305

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})
009237305-02	OBS	No	309.745220	331.156710	446.8	11.424	14.5	7.3	5.83	5210	16.82	16.95
009237305-03	OBS	No	533.907810	431.829581	730.9	4.763	15.2	12.2	5.83	5210	19.76	8.20
009237305-04	OBS	No	396.734868	458.543019	469.1	12.690	13.9	6.7	5.83	5210	12.73	12.19
009237305-05	OBS	No	358.810042	254.916869	1.7	9.592	14.3	0.0	5.83	5210	0.97	13.94
009237305-07	OBS	No	539.570067	250.332031	489.1	5.265	9.6	7.9	5.83	5210	14.88	8.09
009237305-08	OBS	No	562.143737	369.334395	439.5	12.259	9.9	6.4	5.83	5210	12.35	7.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009237305-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—HALO_GHOST
009237305-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
009237305-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
009237305-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

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

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

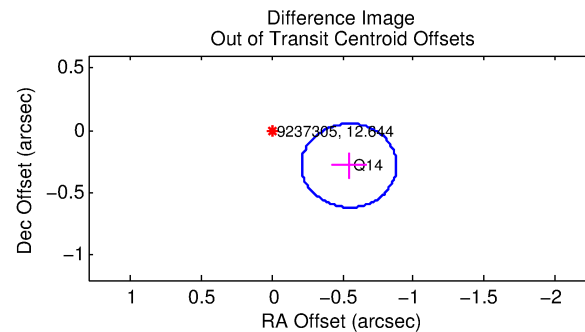
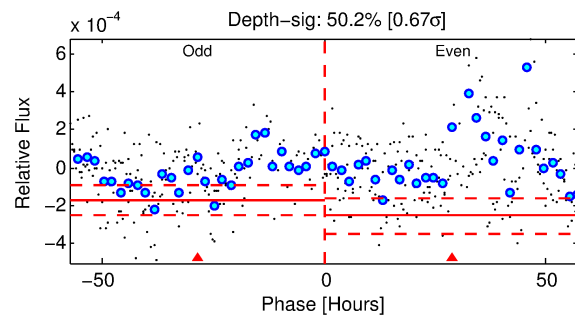
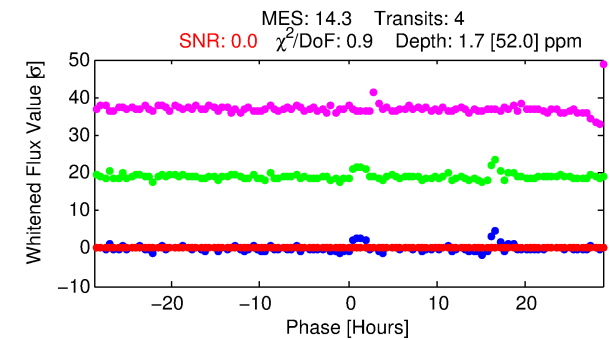
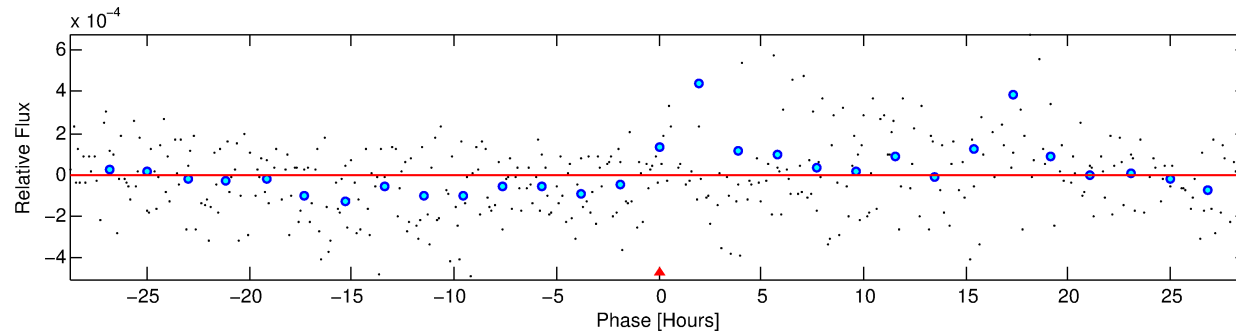
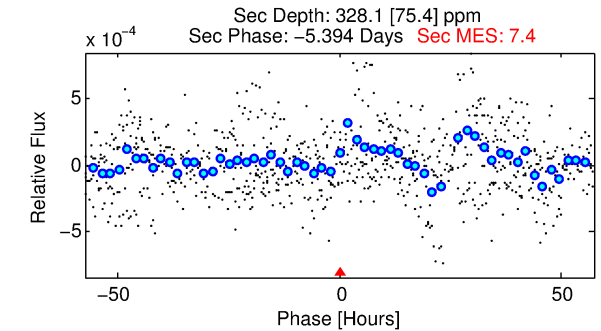
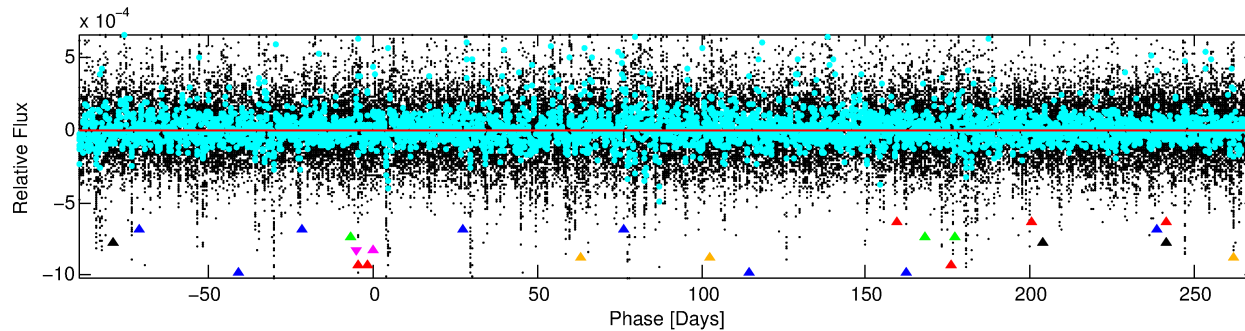
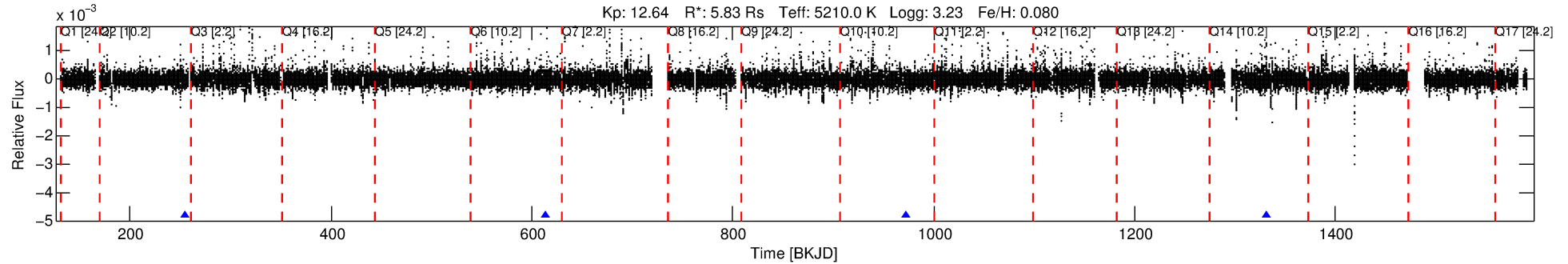
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009237305-05

No Significant Match Found

DV One-Page Summary

KIC: 9237305 Candidate: 5 of 8 Period: 358.810 d



DV Fit Results:

Period = 358.81004 [0.74847] d
Epoch = 254.9169 [1.4692] BKJD
Rp/R* = 0.0015 [0.0329]
a/R* = 100.07 [7188.83]
b = 0.94 [8.87]
Seff = 13.93 [15.00]
Teq = 493 [133] K
Rp = 0.97 [20.91] Re
a = 1.2685 [0.8334] AU
Ag = 308321.65 [13284584.26] [0.02]
Teffp = 17949 [193283] K [0.09 σ]

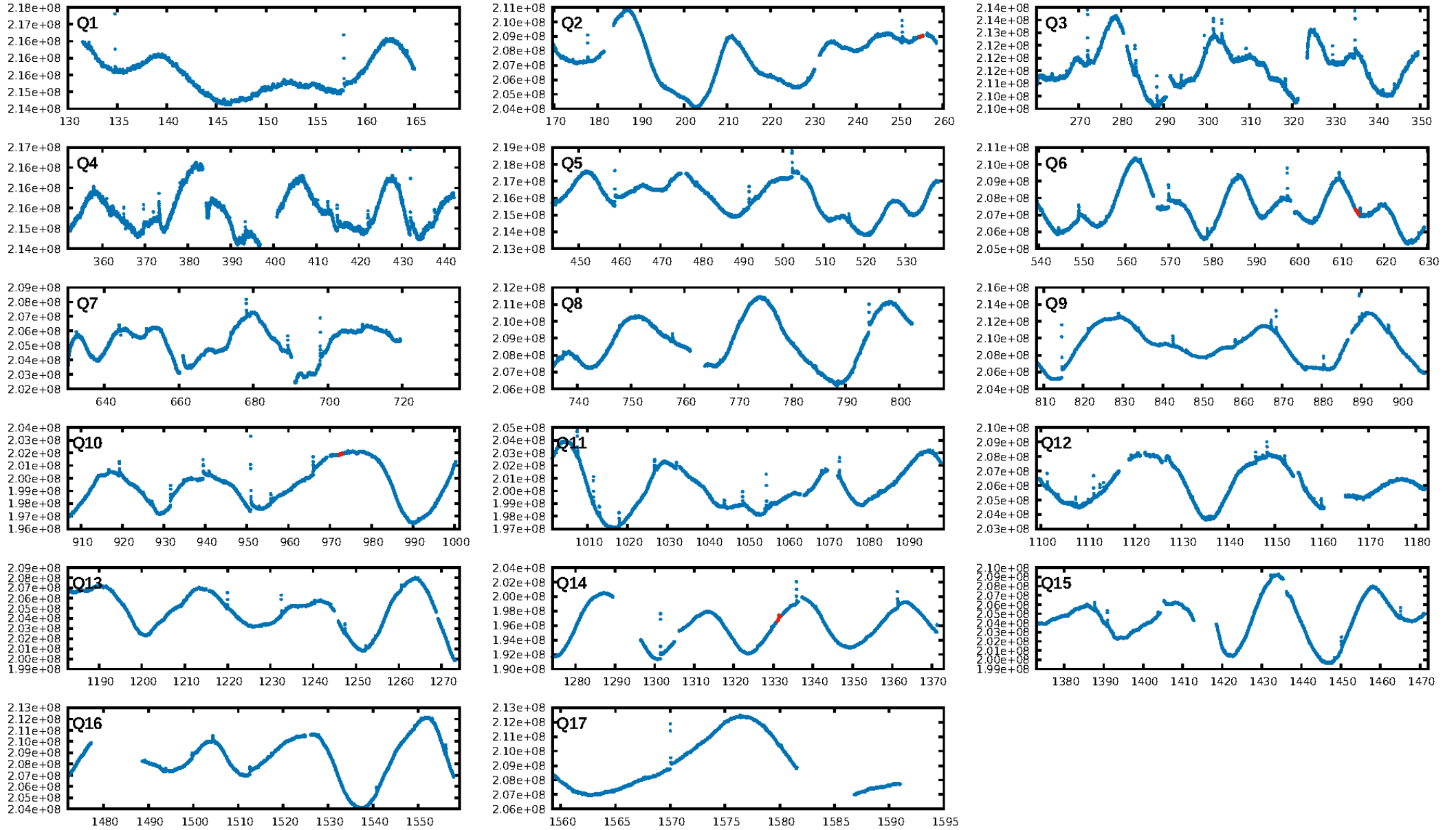
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [78.94 σ]
LongPeriod-sig: 100.0% [57.22 σ]
ModelChiSquare2-sig: 24.6%
ModelChiSquareGof-sig: 99.2%
Bootstrap-pfa: 7.05e-14
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: N/A
Centroid-sig: N/A
Centroid-so: N/A
OotOffset-rm: 0.614 arcsec [5.50 σ]
KicOffset-rm: 0.644 arcsec [5.80 σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/0/0/0 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [3/3]

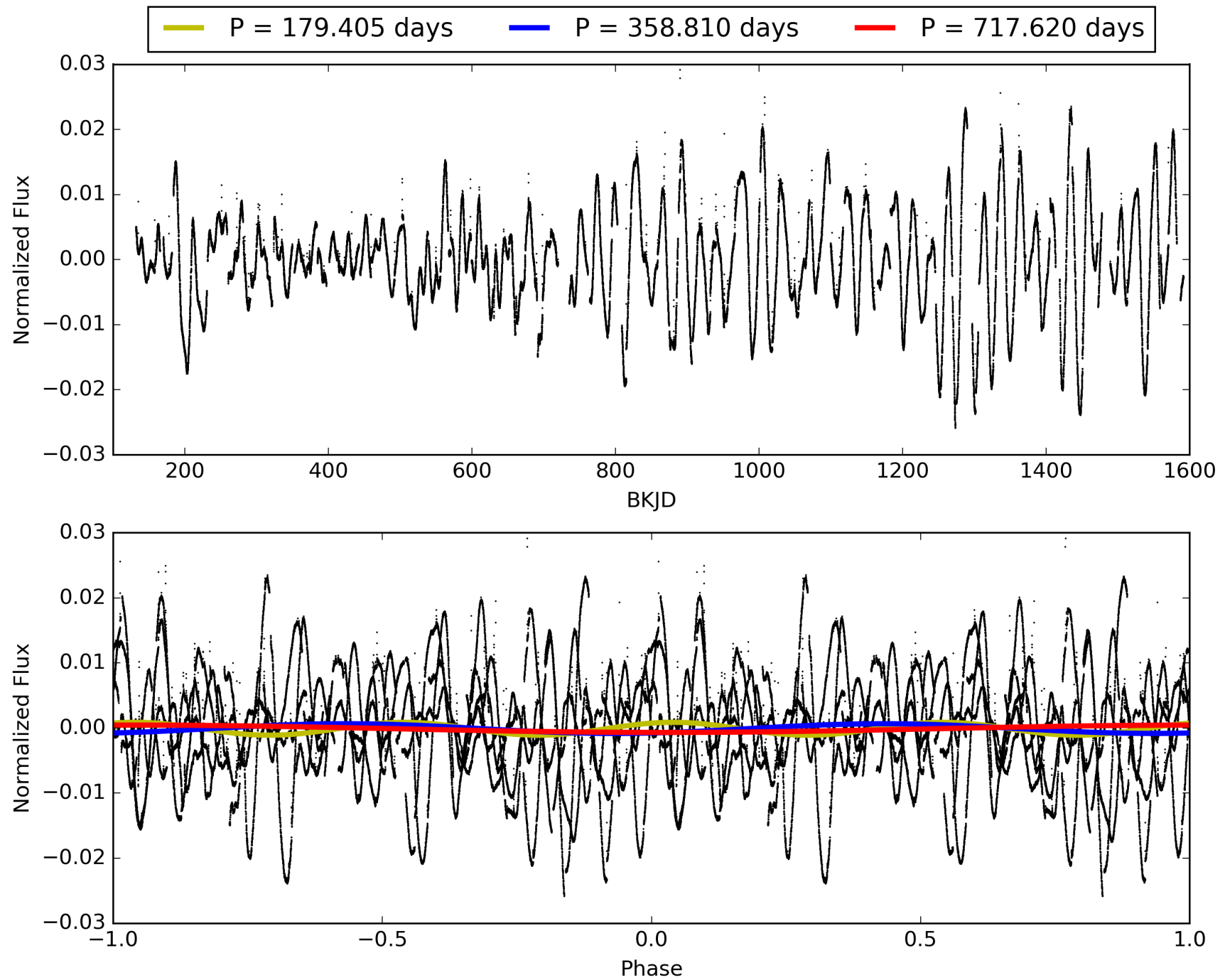
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:33:50 Z

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

TCE 009237305-05, PDC Light Curves

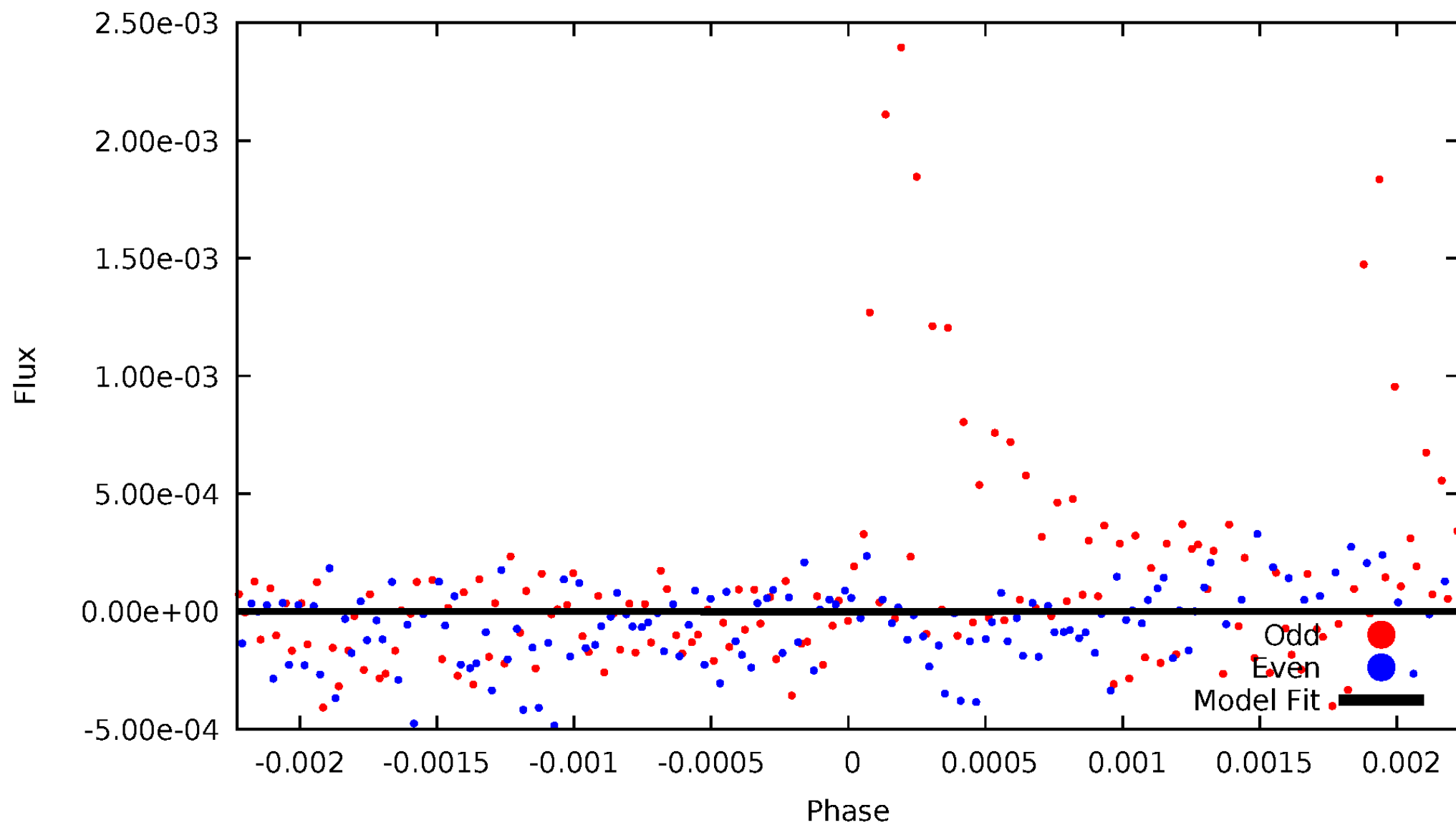


TCE 009237305-05



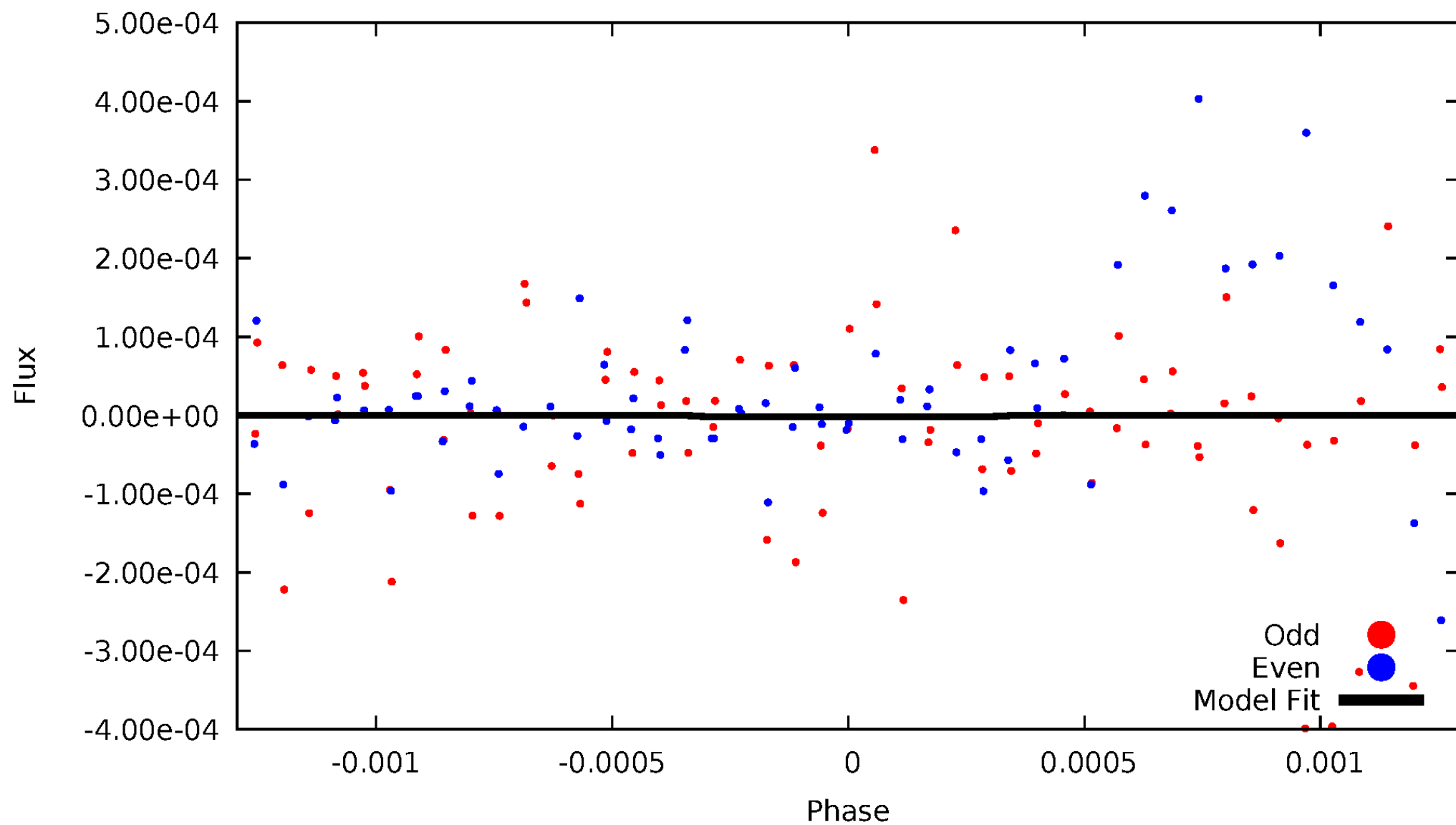
DV Odd/Even

TCE 009237305-05



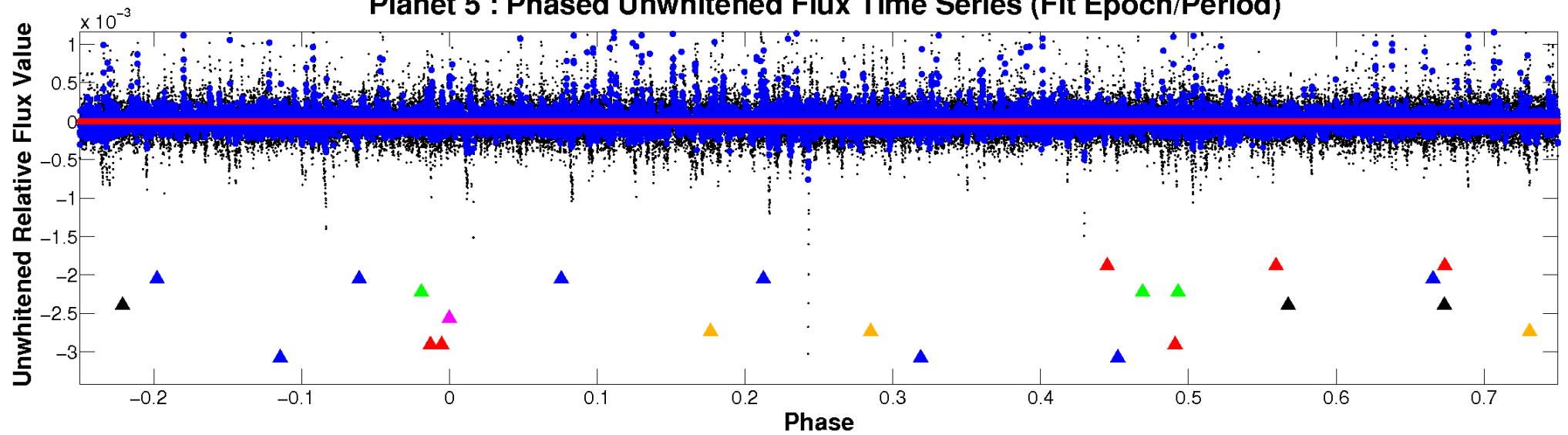
ALT Odd/Even

TCE 009237305-05

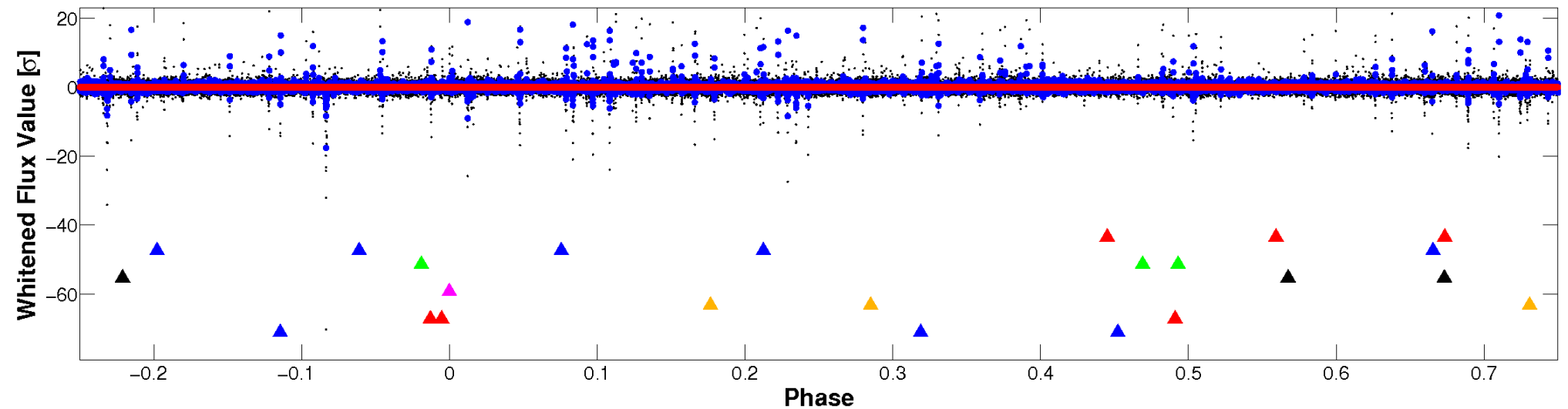


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

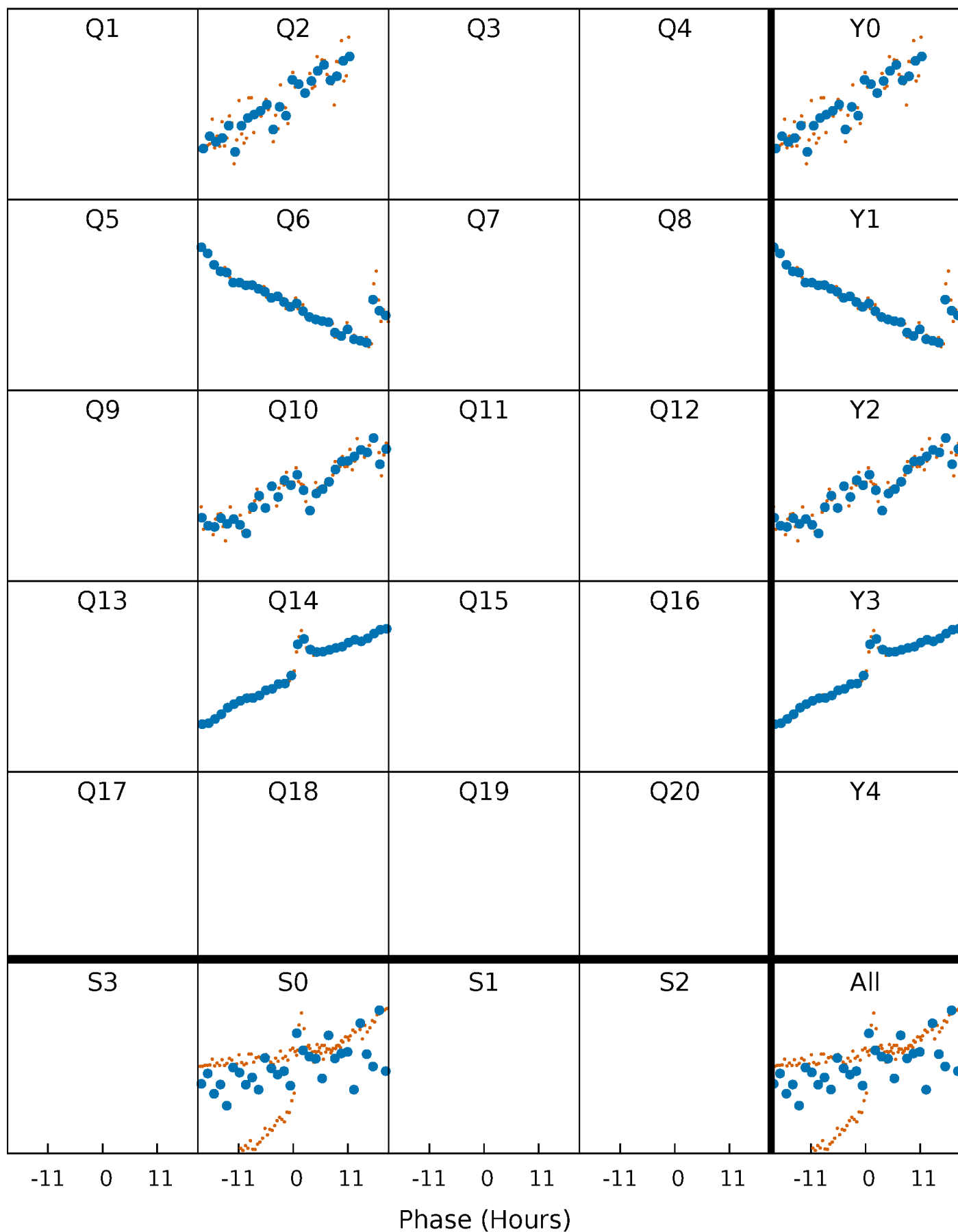


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



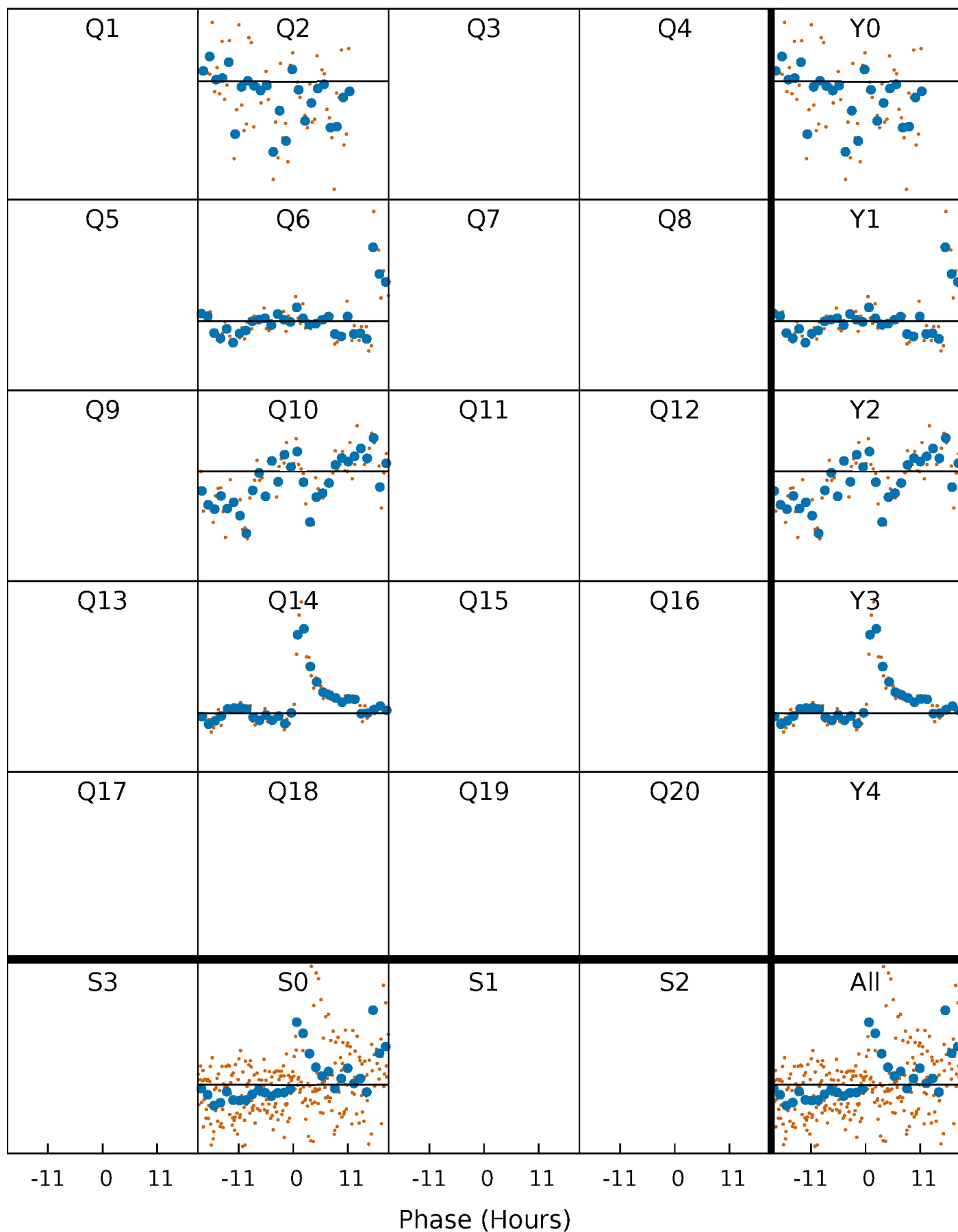
PDC Quarter-Phased Transit Curves

TCE 009237305-05 $P=358.810042$ Days $T_0=254.916869$ (BKJD)



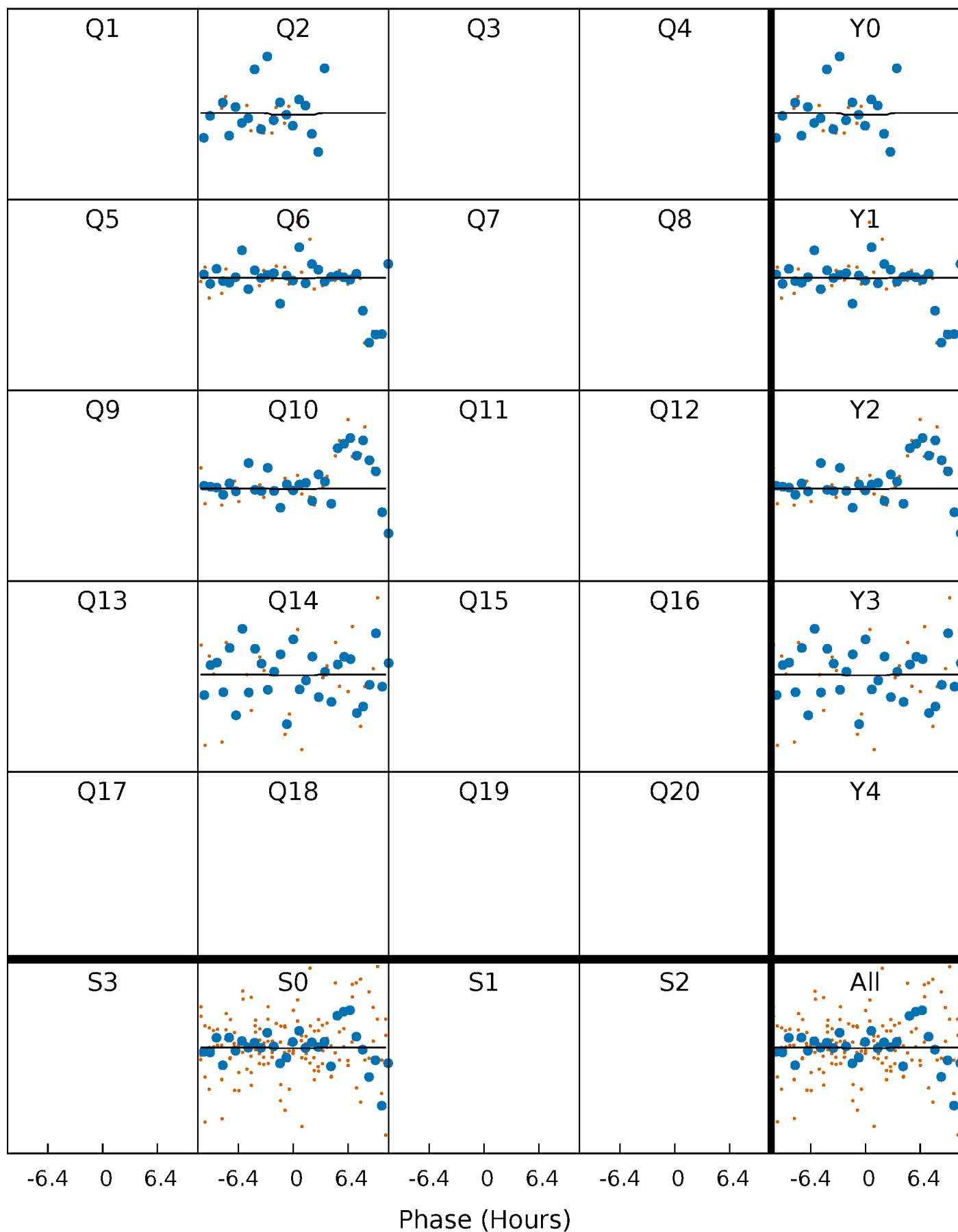
DV Quarter-Phased Transit Curves

TCE 009237305-05 $P=358.810042$ Days $T_0=254.916869$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

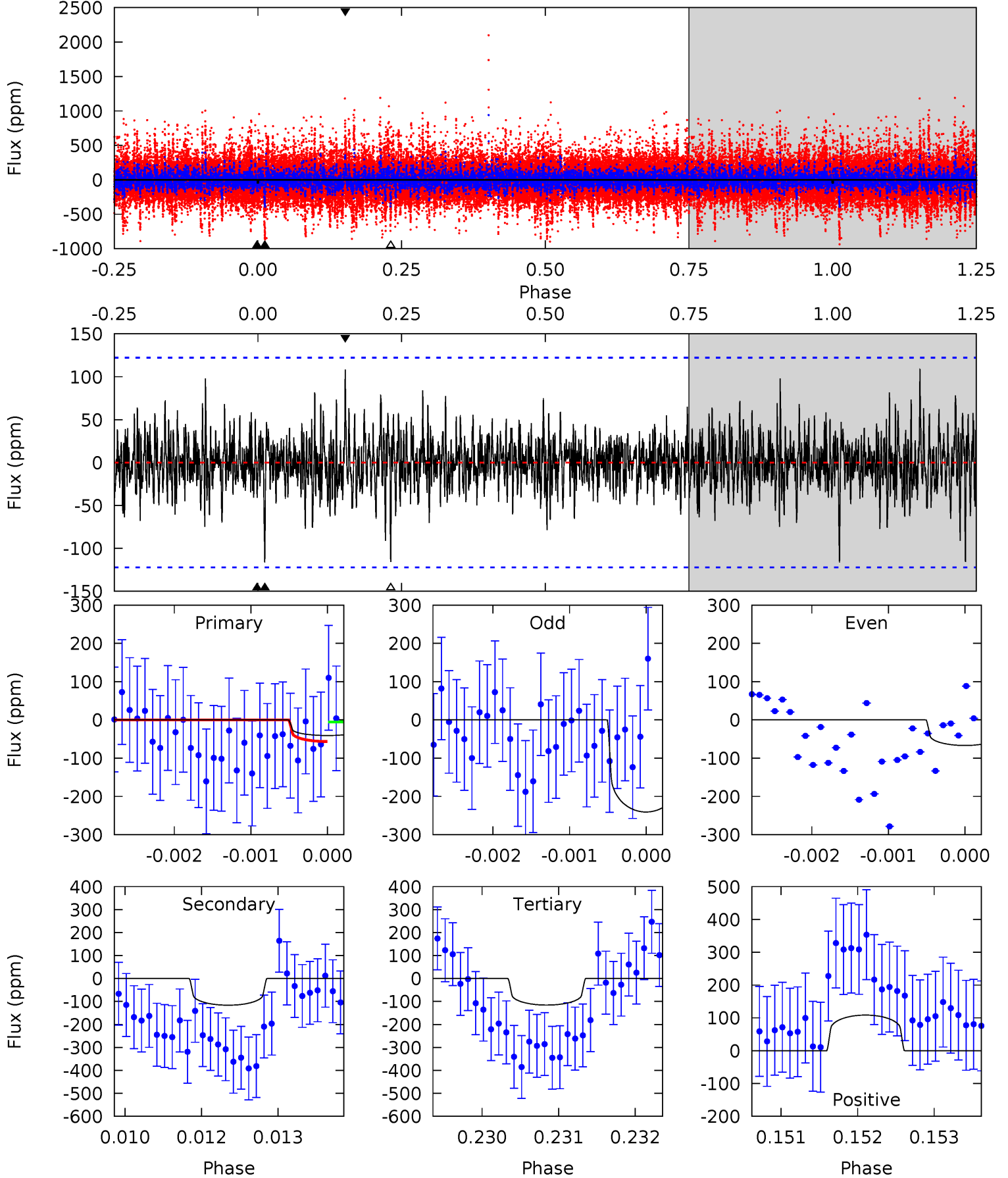
TCE 009237305-05 $P=358.486377$ Days $T_0=255.240811$ (BKJD)



DV Model-Shift Uniqueness Test

009237305-05, P = 358.810042 Days, E = 254.916869 Days

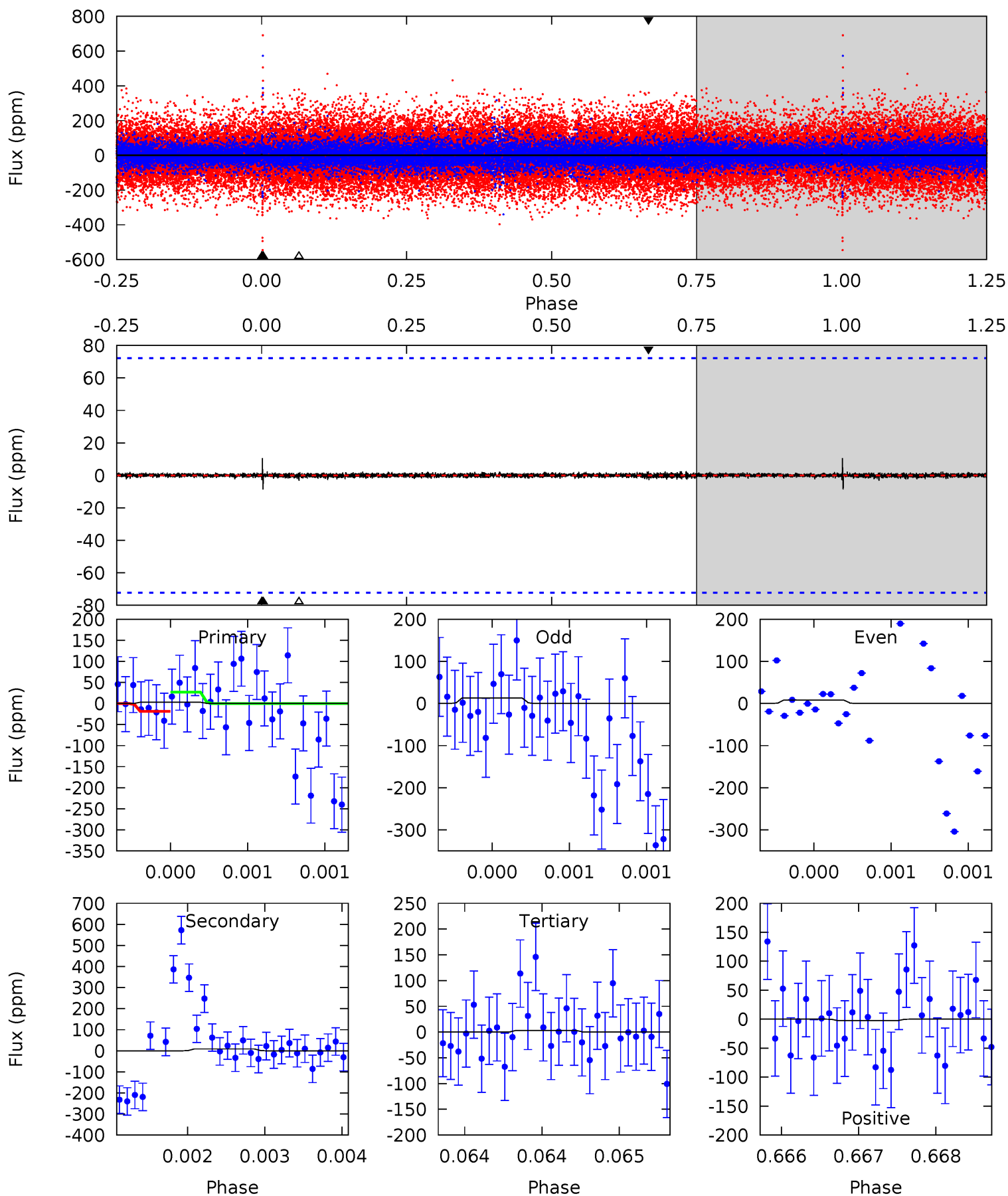
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.81	5.17	5.14	4.82	5.43	3.25	1.10	-3.32	-3.01	0.03	0.35	3.57	782.3	0.48	1.14



Alt Model-Shift Uniqueness Test

009237305-05, $P = 358.486377$ Days, $E = 255.240811$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.22	0.66	0.24	0.19	5.50	3.37	0.05	-0.02	0.03	0.41	0.47	0.18	-0.34	0.55	0.30



Stellar Parameters For KIC 009237305

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5210^{+186}_{-207}	$3.232^{+0.630}_{-0.210}$	$0.080^{+0.250}_{-0.350}$	$5.828^{+1.555}_{-3.888}$	$2.115^{+0.500}_{-1.083}$	$0.015^{+0.170}_{-0.007}$
	+4%/-4%	+19%/-6%	+312%/-438%	+27%/-67%	+24%/-51%	+1130%/-46%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009237305-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-116 ± 23	$13.00^{+15.72}_{-9.18}$	676^{+69}_{-101}	3848^{+2558}_{-800}	612^{+6313}_{-495}
Alt.	-9 ± 13	$12.45^{+17.66}_{-9.25}$	675^{+66}_{-105}	2456^{+1202}_{-4896}	25^{+416}_{-48}

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 $A_{obs} \gg 1.0$

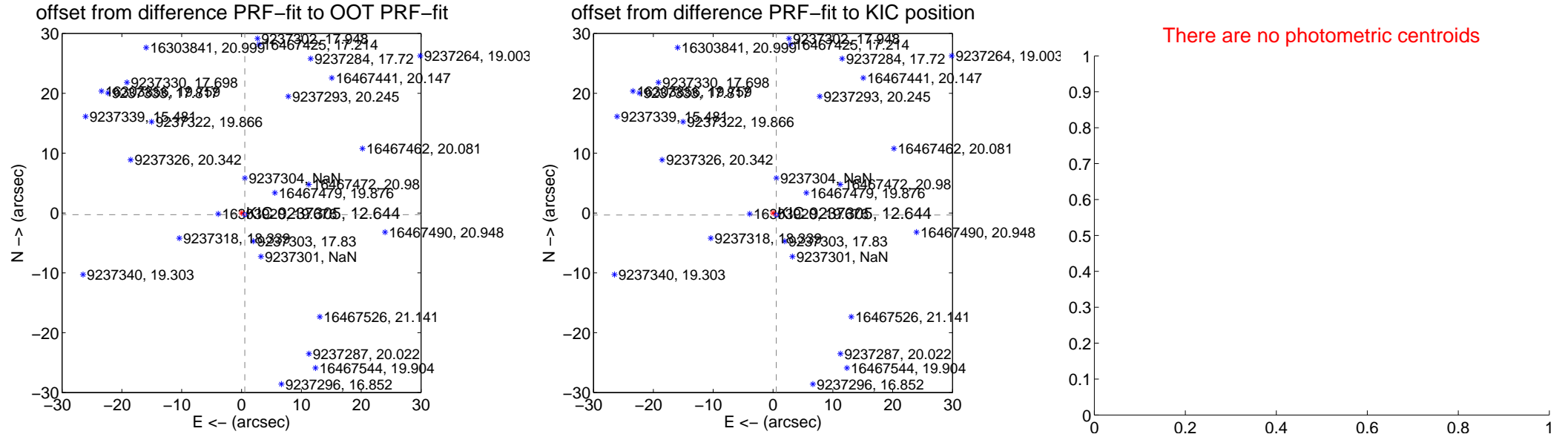
DV Centroid Data

Supplemental centroid analysis for 009237305-05. Kepler magnitude: 12.64. Transit SNR 0.03

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.614 ± 0.112	5.50	-0.545 ± 0.115	-0.283 ± 0.100
PRF-fit source offset from KIC position	0.644 ± 0.111	5.80	-0.552 ± 0.115	-0.333 ± 0.100
photometric centroid source offset	—	—	—	—



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.

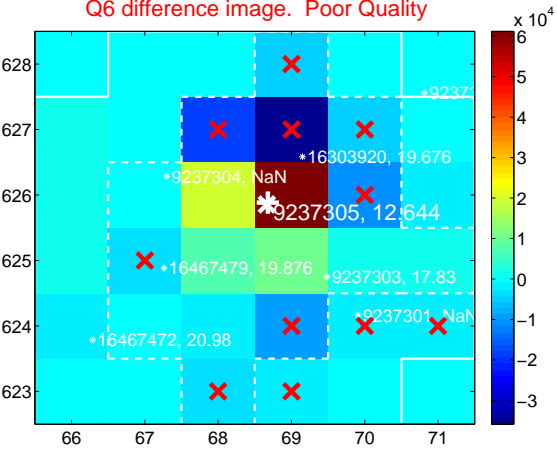
Q5 no difference image



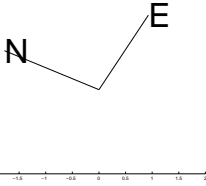
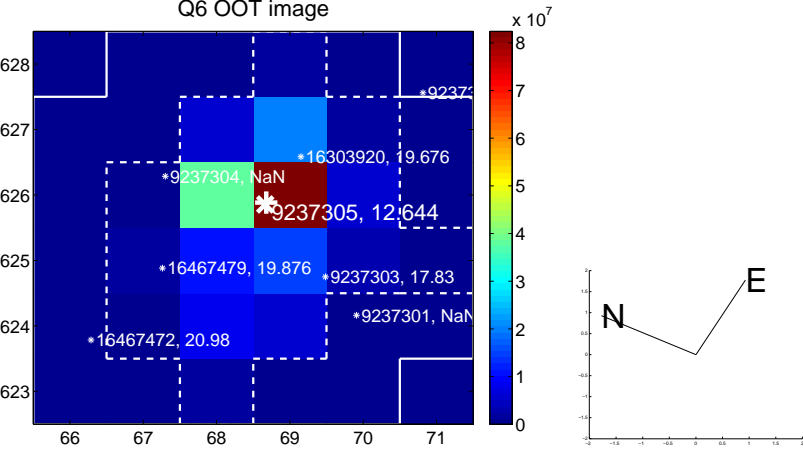
Q5 no OOT image



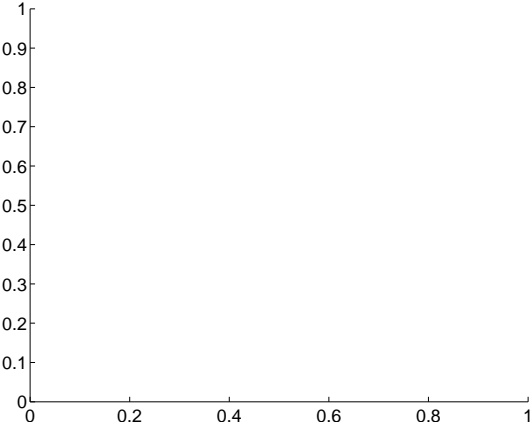
Q6 difference image. Poor Quality



Q6 OOT image



Q7 no difference image



Q7 no OOT image



Q8 no difference image



Q8 no OOT image

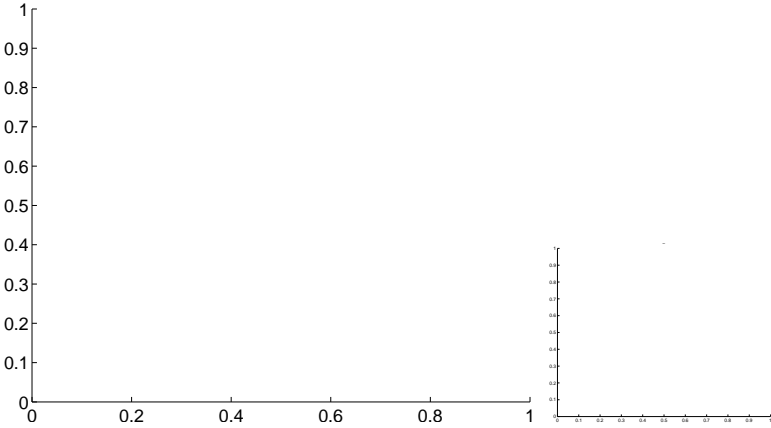


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

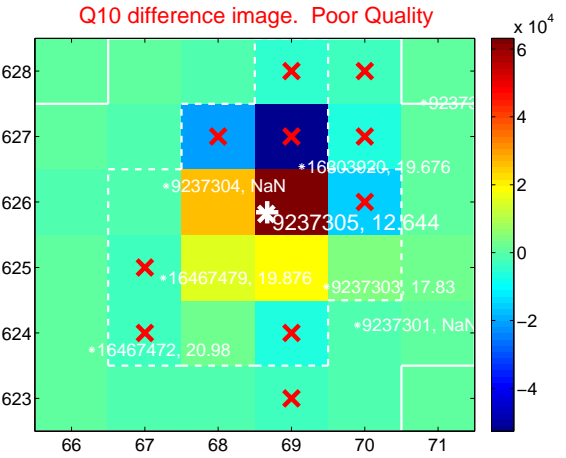
Q9 no difference image



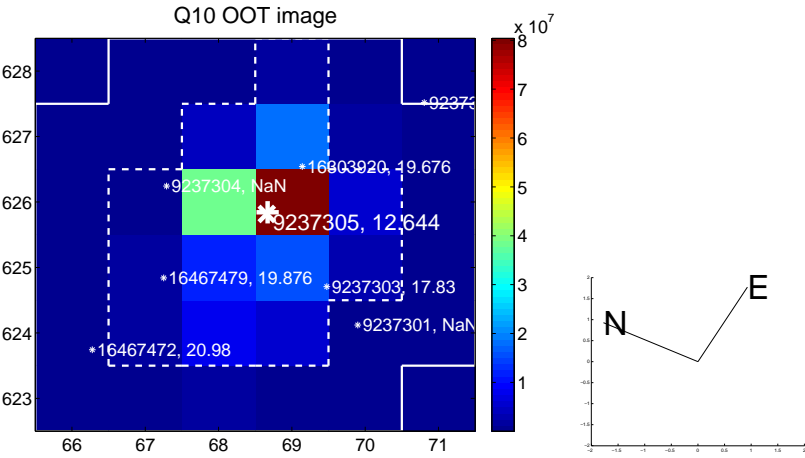
Q9 no OOT image



Q10 difference image. Poor Quality



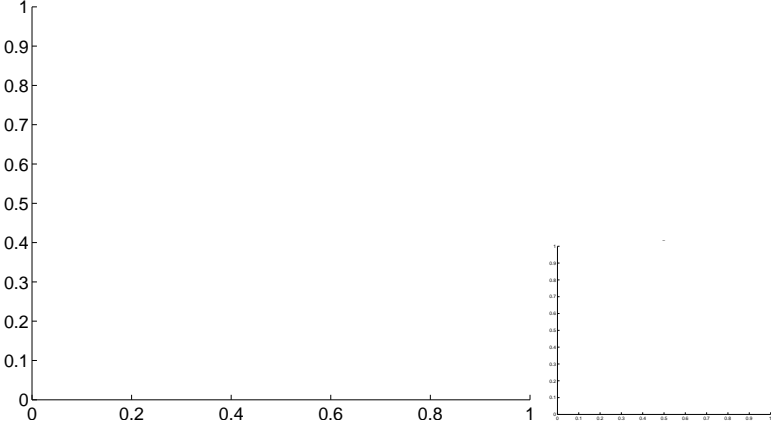
Q10 OOT image



Q11 no difference image



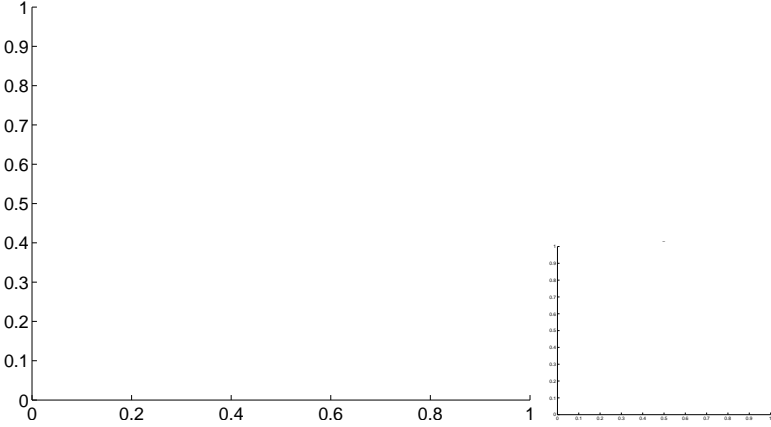
Q11 no OOT image



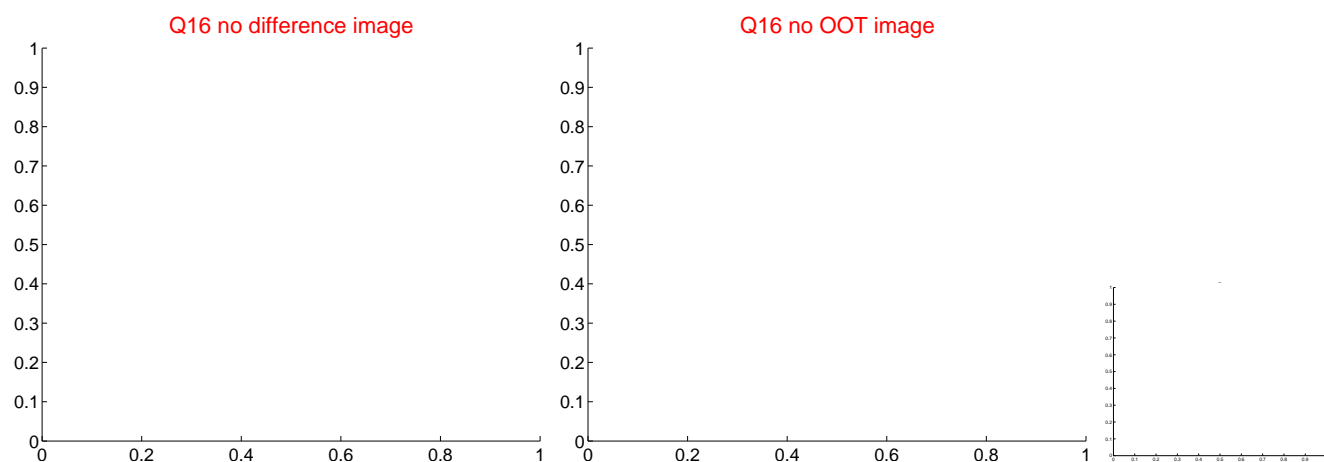
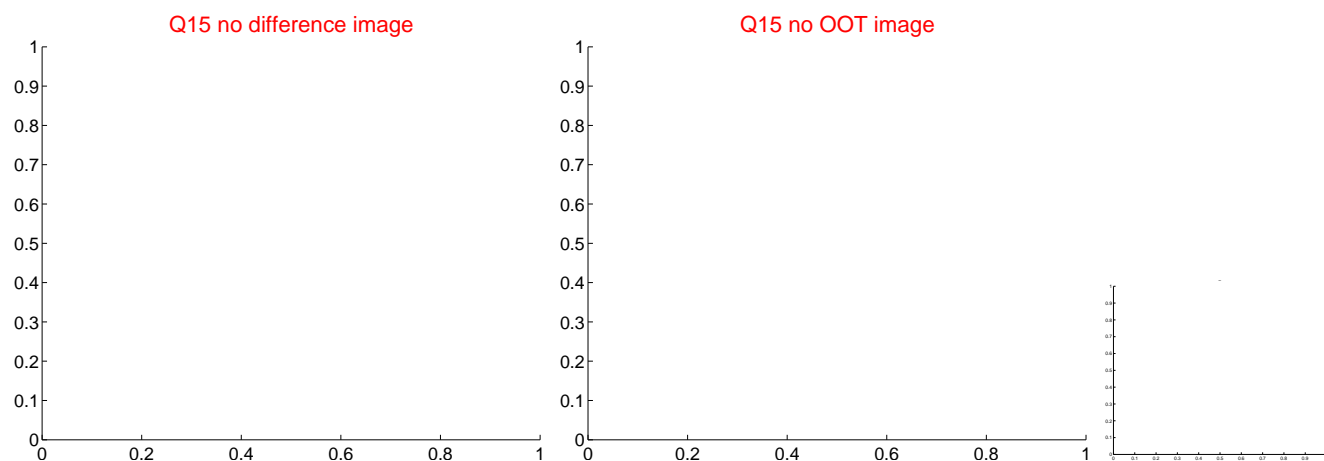
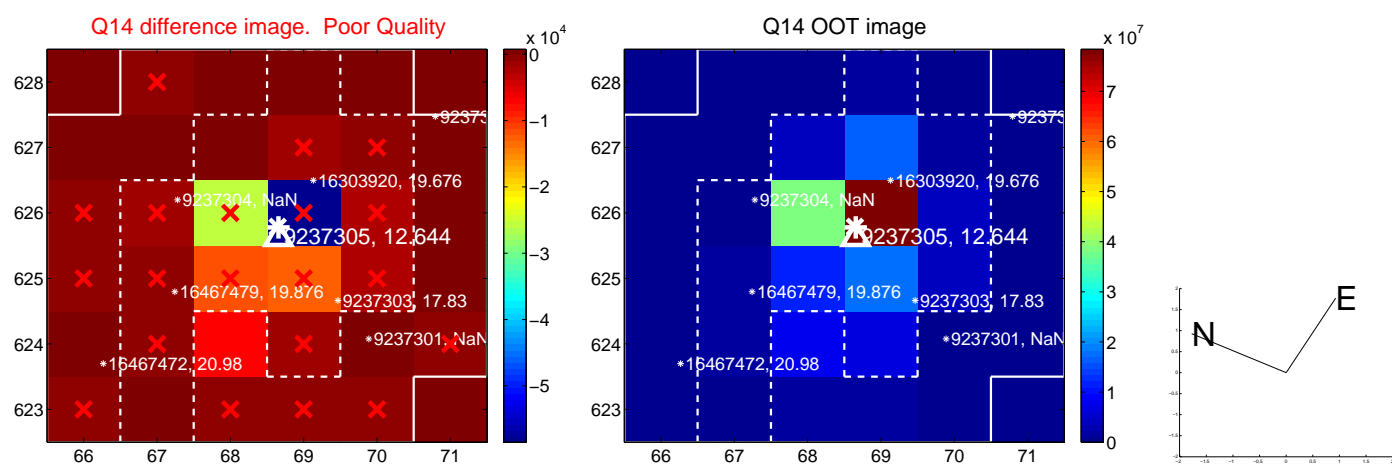
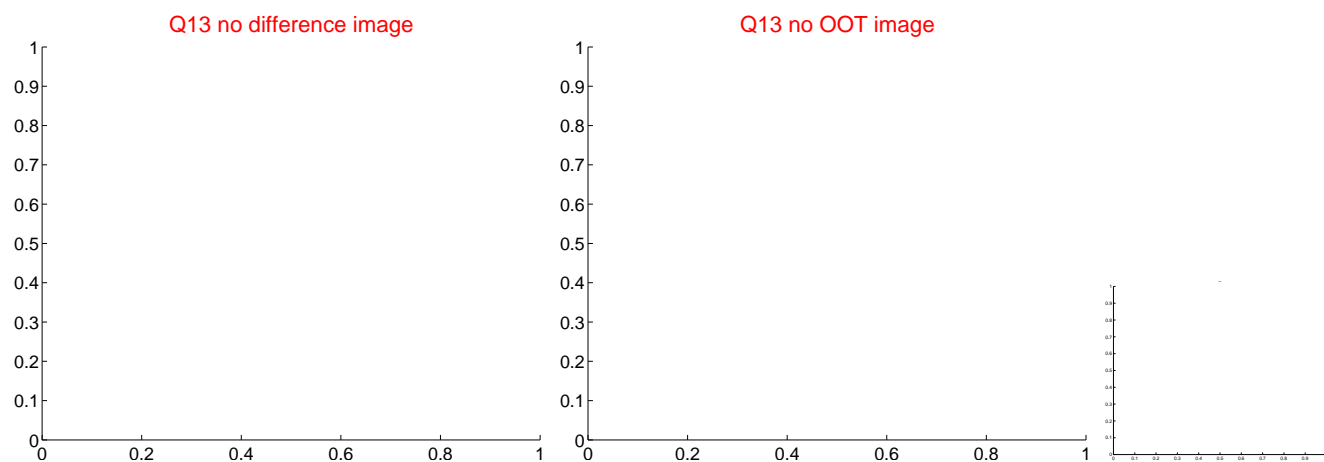
Q12 no difference image



Q12 no OOT image



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



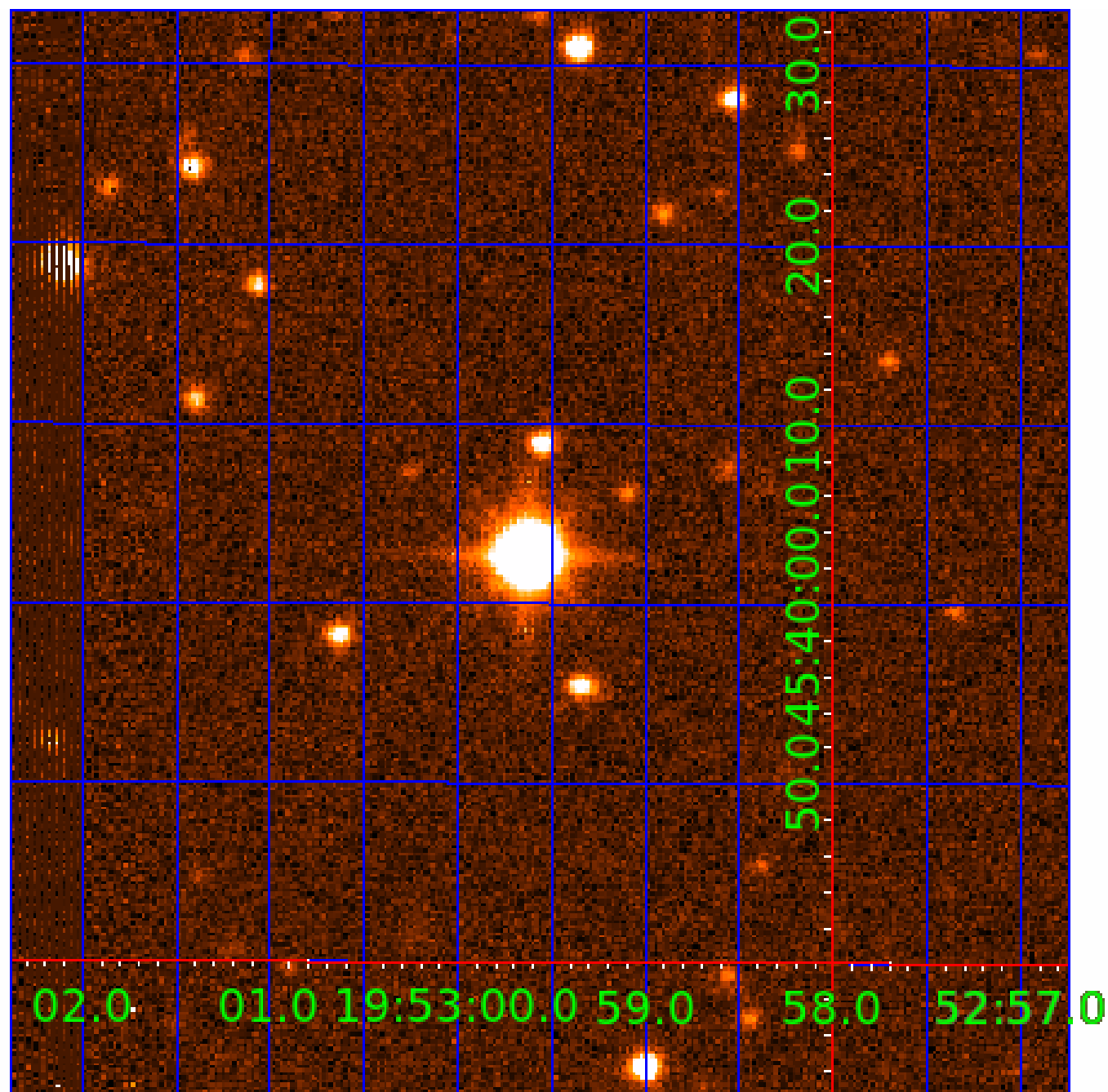
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination



KIC 009237305

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})
009237305-02	OBS	No	309.745220	331.156710	446.8	11.424	14.5	7.3	5.83	5210	16.82	16.95
009237305-03	OBS	No	533.907810	431.829581	730.9	4.763	15.2	12.2	5.83	5210	19.76	8.20
009237305-04	OBS	No	396.734868	458.543019	469.1	12.690	13.9	6.7	5.83	5210	12.73	12.19
009237305-05	OBS	No	358.810042	254.916869	1.7	9.592	14.3	0.0	5.83	5210	0.97	13.94
009237305-07	OBS	No	539.570067	250.332031	489.1	5.265	9.6	7.9	5.83	5210	14.88	8.09
009237305-08	OBS	No	562.143737	369.334395	439.5	12.259	9.9	6.4	5.83	5210	12.35	7.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009237305-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—HALO_GHOST
009237305-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
009237305-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
009237305-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

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

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

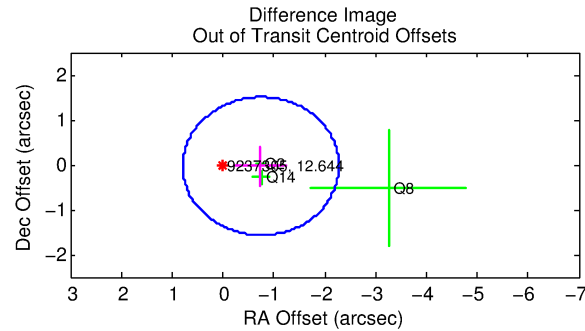
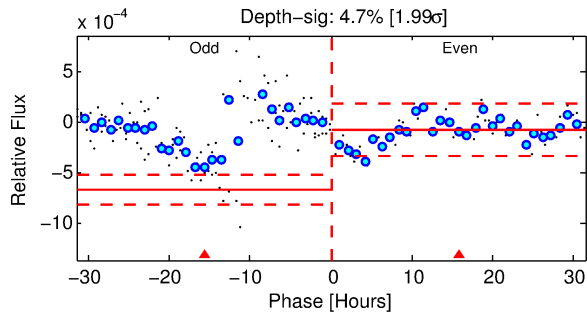
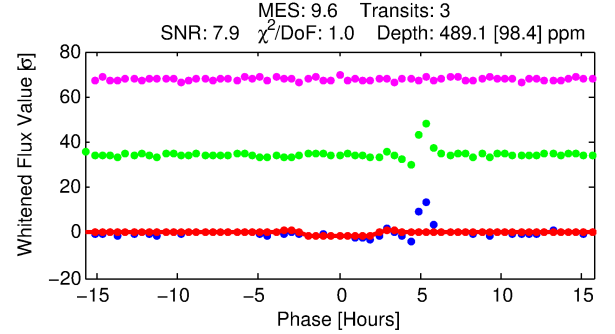
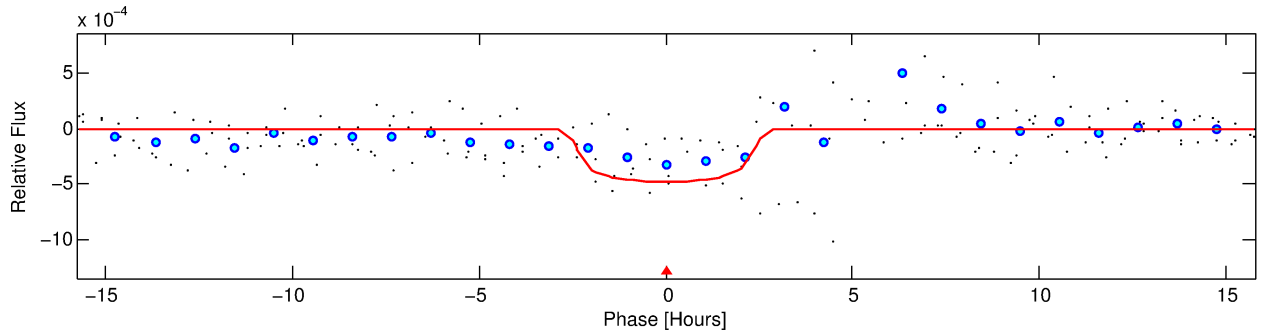
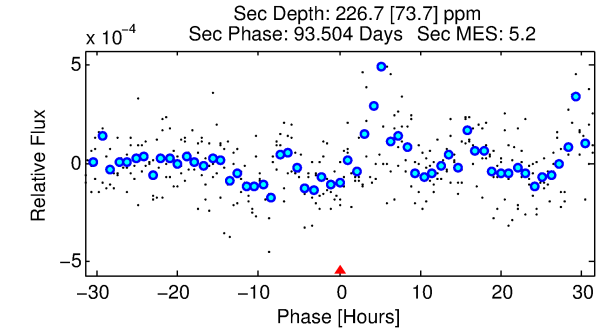
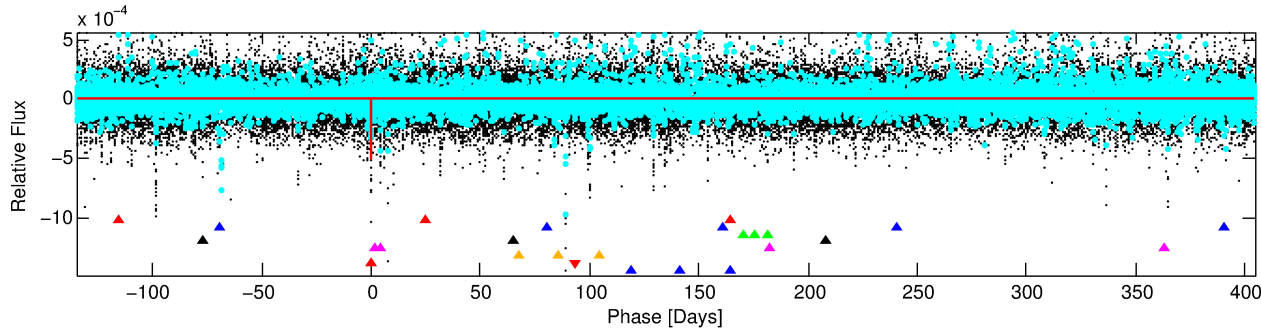
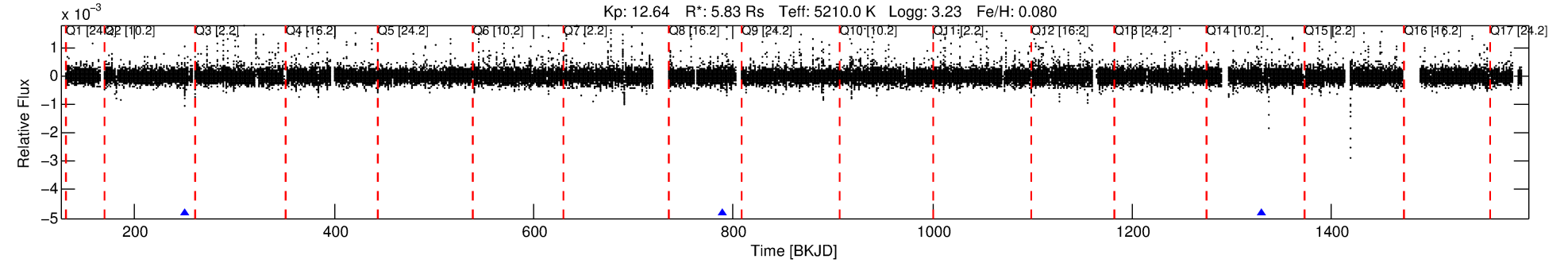
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009237305-07

No Significant Match Found

DV One-Page Summary

KIC: 9237305 Candidate: 7 of 8 Period: 539.570 d



DV Fit Results:

Period = 539.57007 [0.00733] d
Epoch = 250.3320 [0.0101] BKJD
Rp/R* = 0.0234 [0.0240]
a/R* = 445.43 [1791.63]
b = 0.85 [1.34]
Seff = 8.09 [8.71]
Teq = 430 [116] K
Rp = 14.88 [18.18] Re
a = 1.6650 [1.0938] AU
Ag = 1561.19 [3637.89] [0.43σ]
Teffp = 4179 [2172] K [1.72σ]

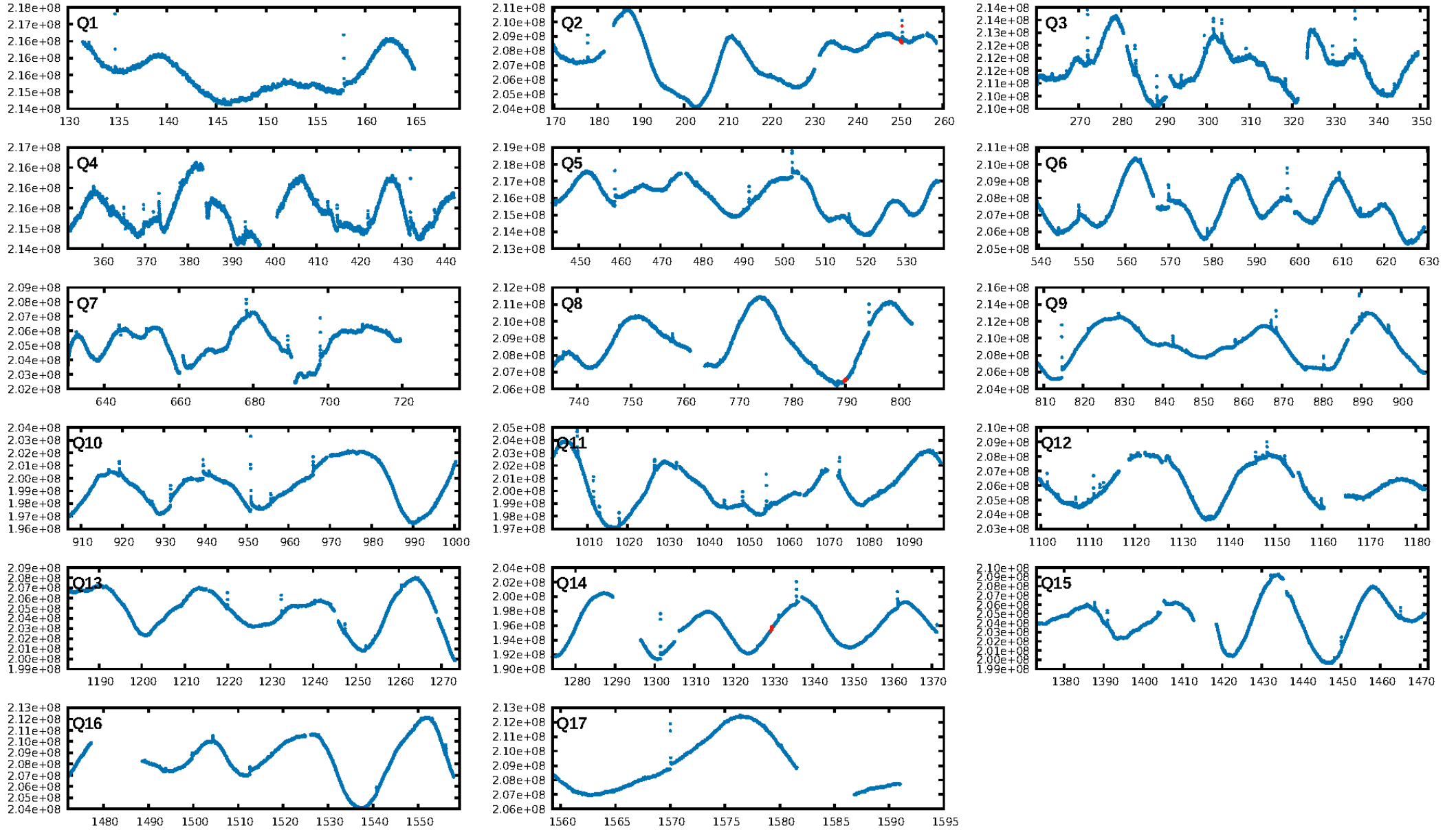
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [19.14σ]
LongPeriod-sig: 100.0% [66.91σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 69.9%
Bootstrap-pfa: 1.47e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.211
Centroid-sig: N/A
Centroid-so: 0.937 arcsec [1.05σ]
OotOffset-rm: 0.747 arcsec [1.46σ]
OotOffset-st: 2/0/1/0 [3]
KicOffset-rm: 0.645 arcsec [0.92σ]
KicOffset-st: 2/0/1/0 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 1.00 [3/3]

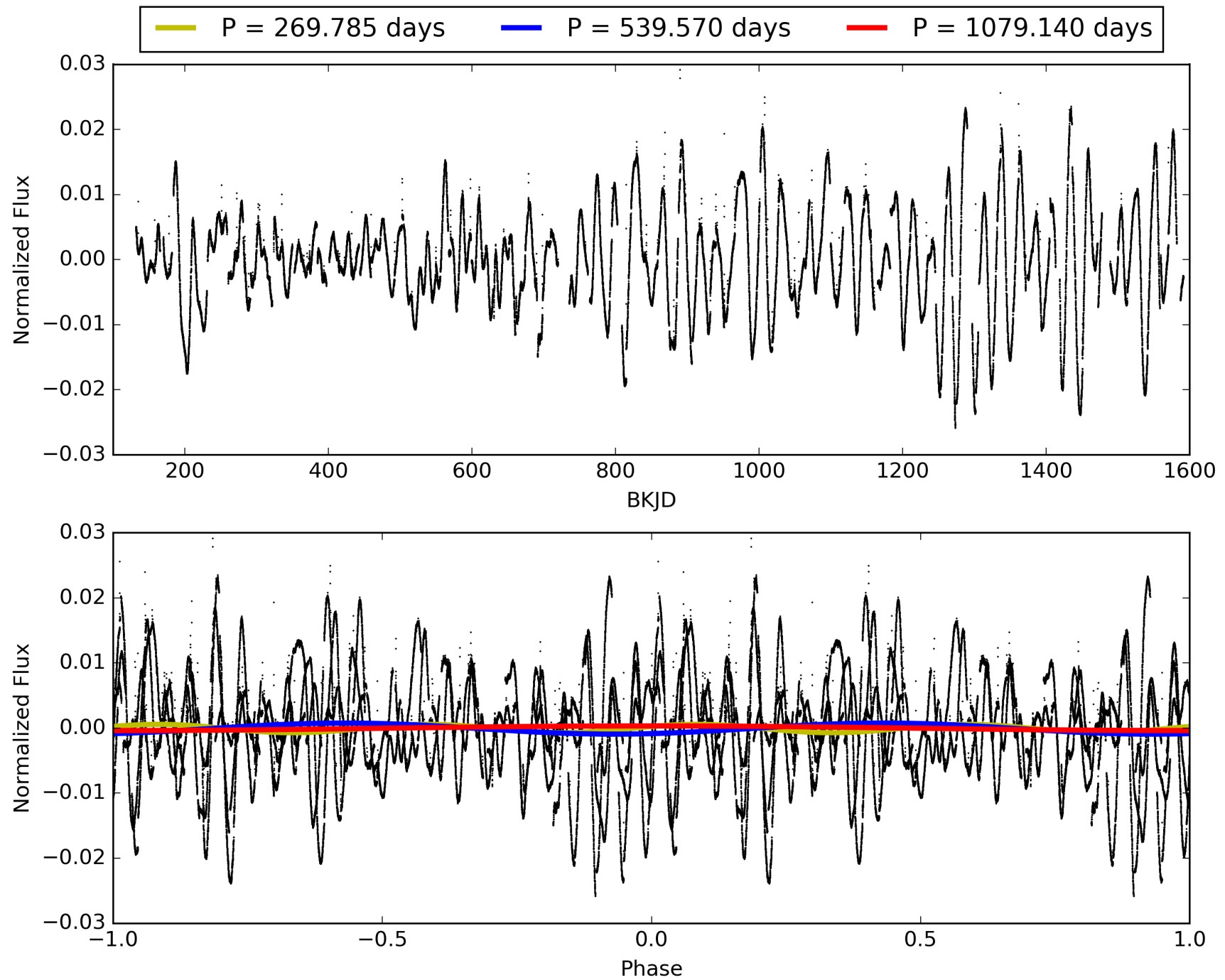
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:34:26 Z

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

TCE 009237305-07, PDC Light Curves

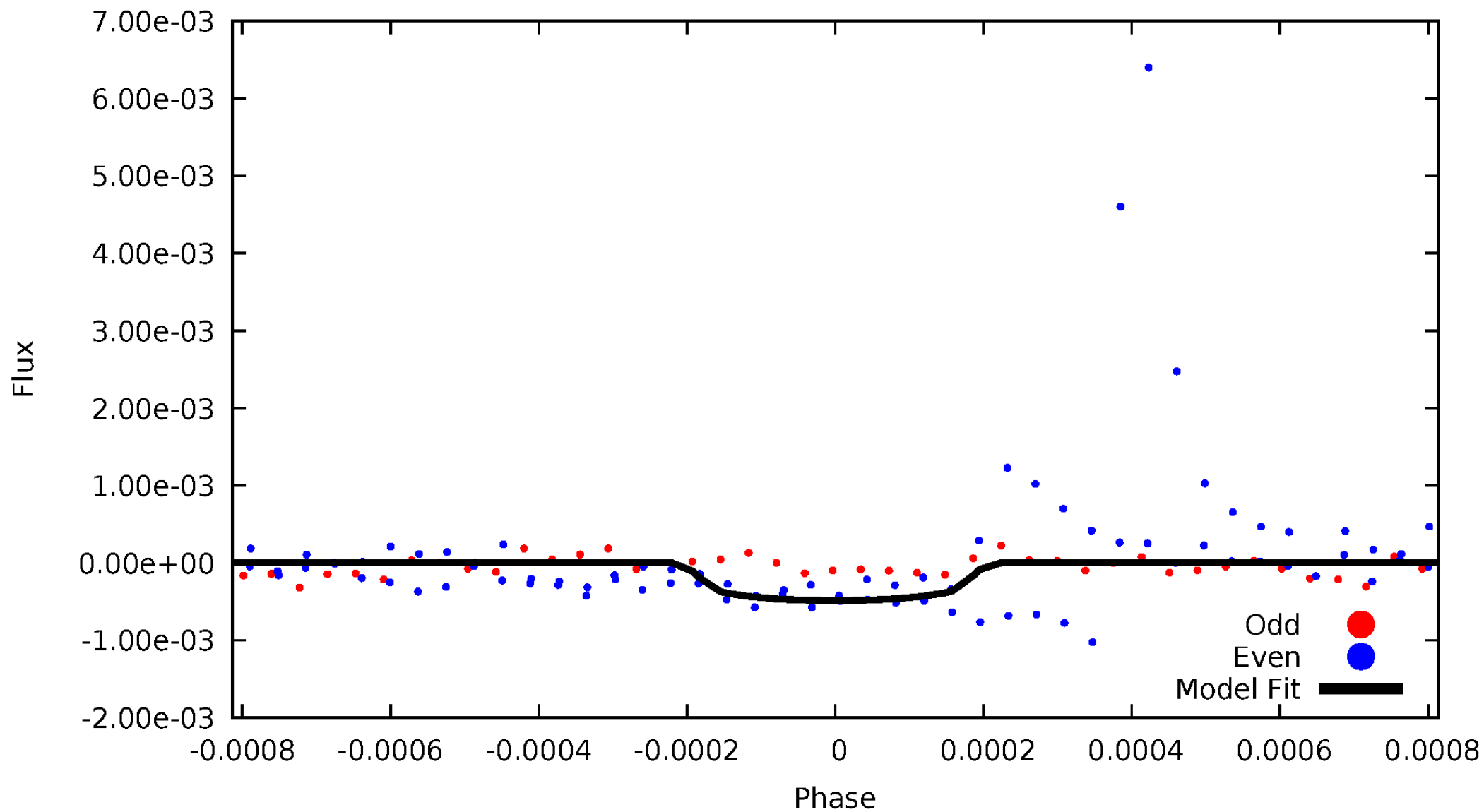


TCE 009237305-07



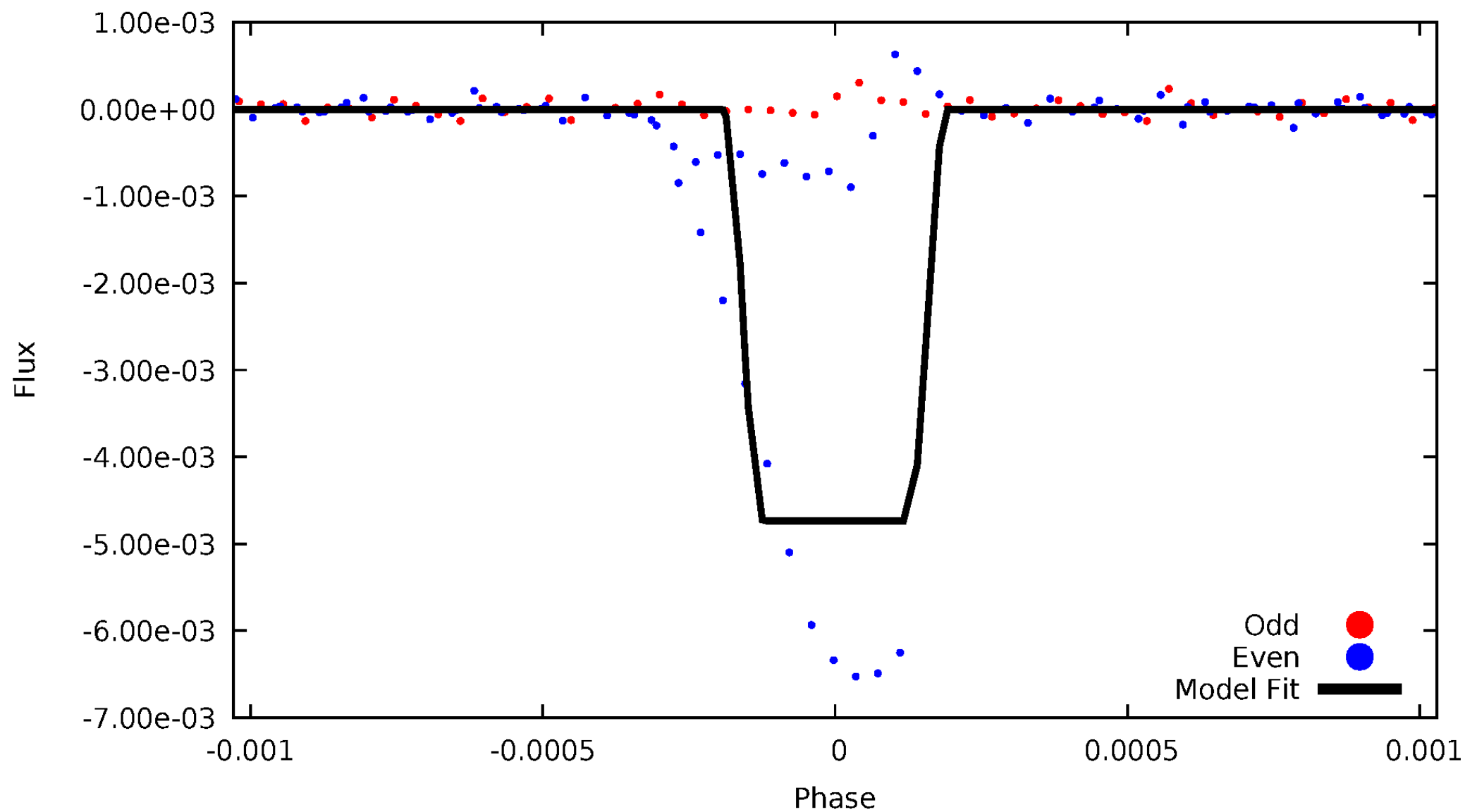
DV Odd/Even

TCE 009237305-07



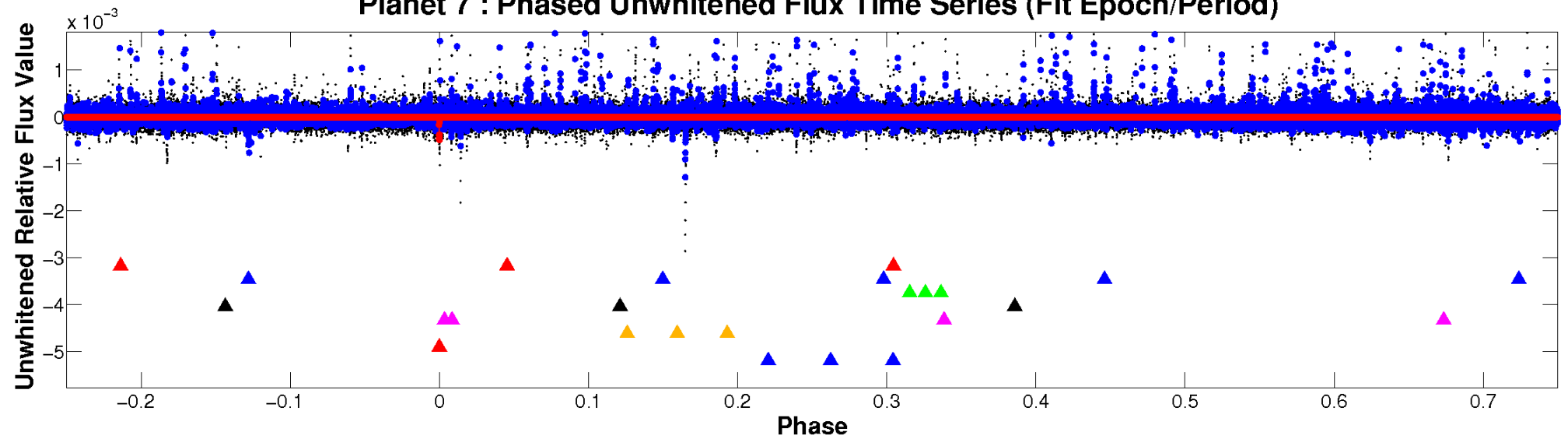
ALT Odd/Even

TCE 009237305-07

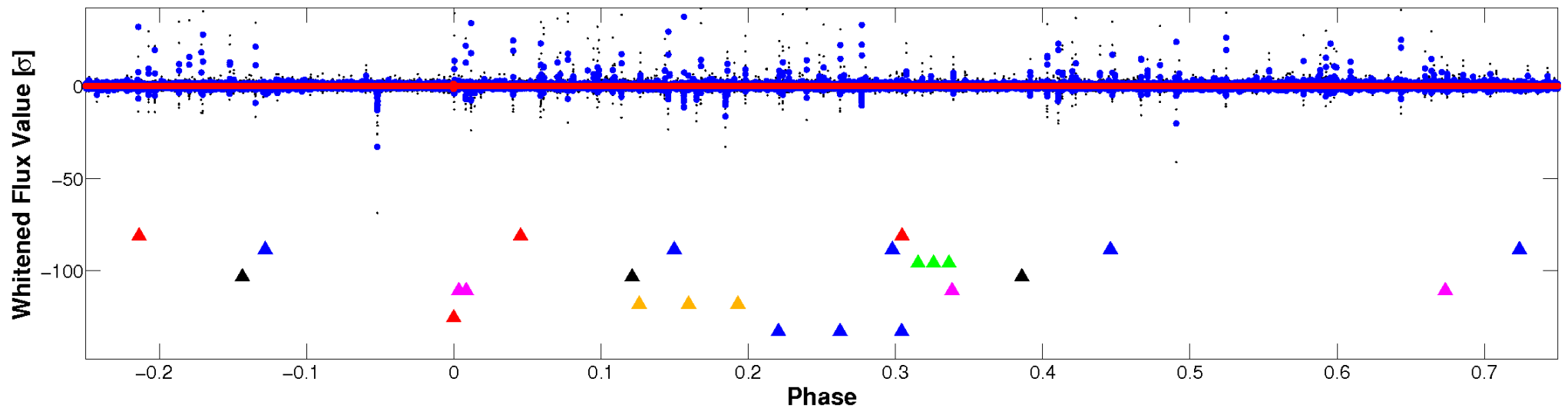


Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

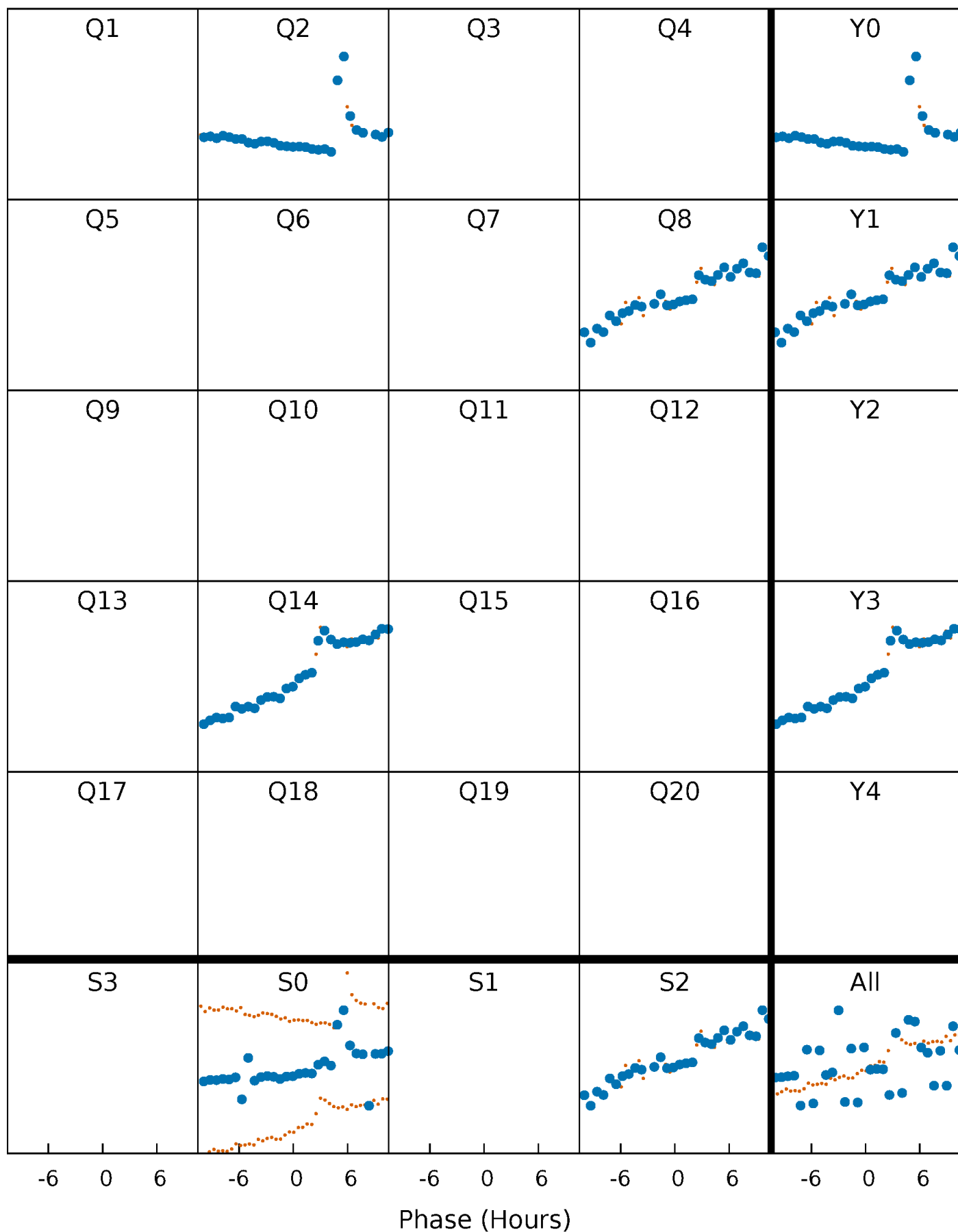


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



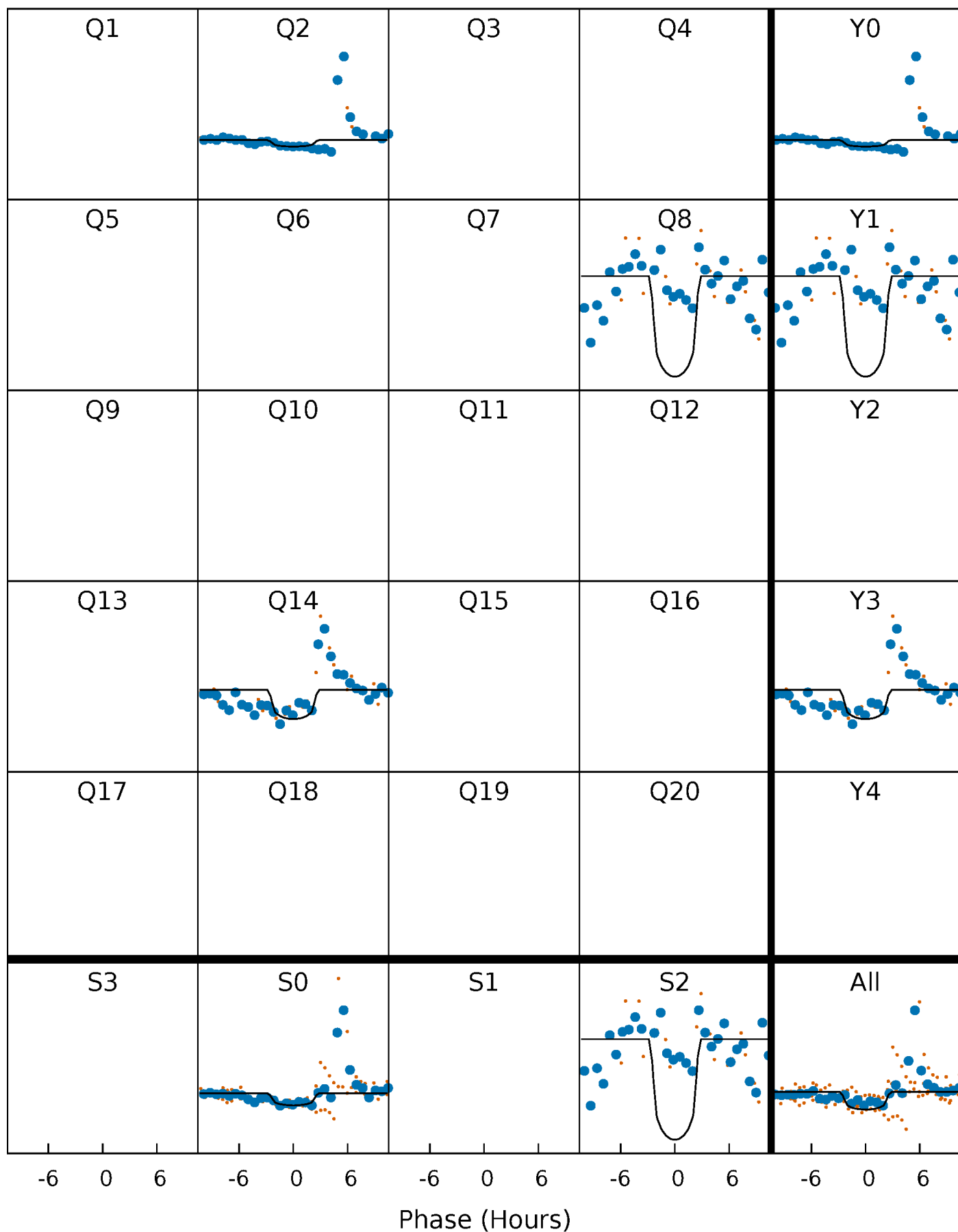
PDC Quarter-Phased Transit Curves

TCE 009237305-07 $P=539.570067$ Days $T_0=250.332031$ (BKJD)



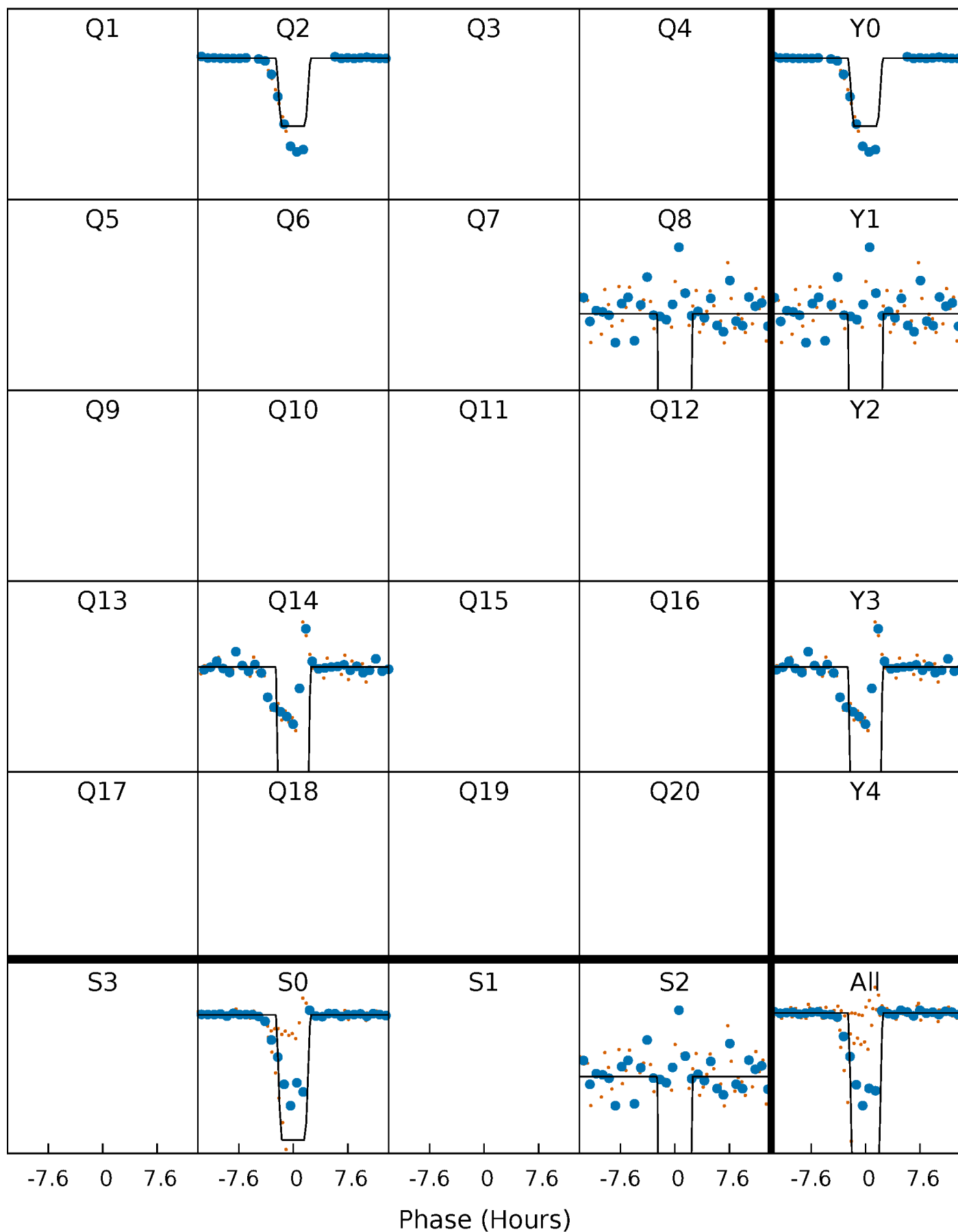
DV Quarter-Phased Transit Curves

TCE 009237305-07 $P=539.570067$ Days $T_0=250.332031$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

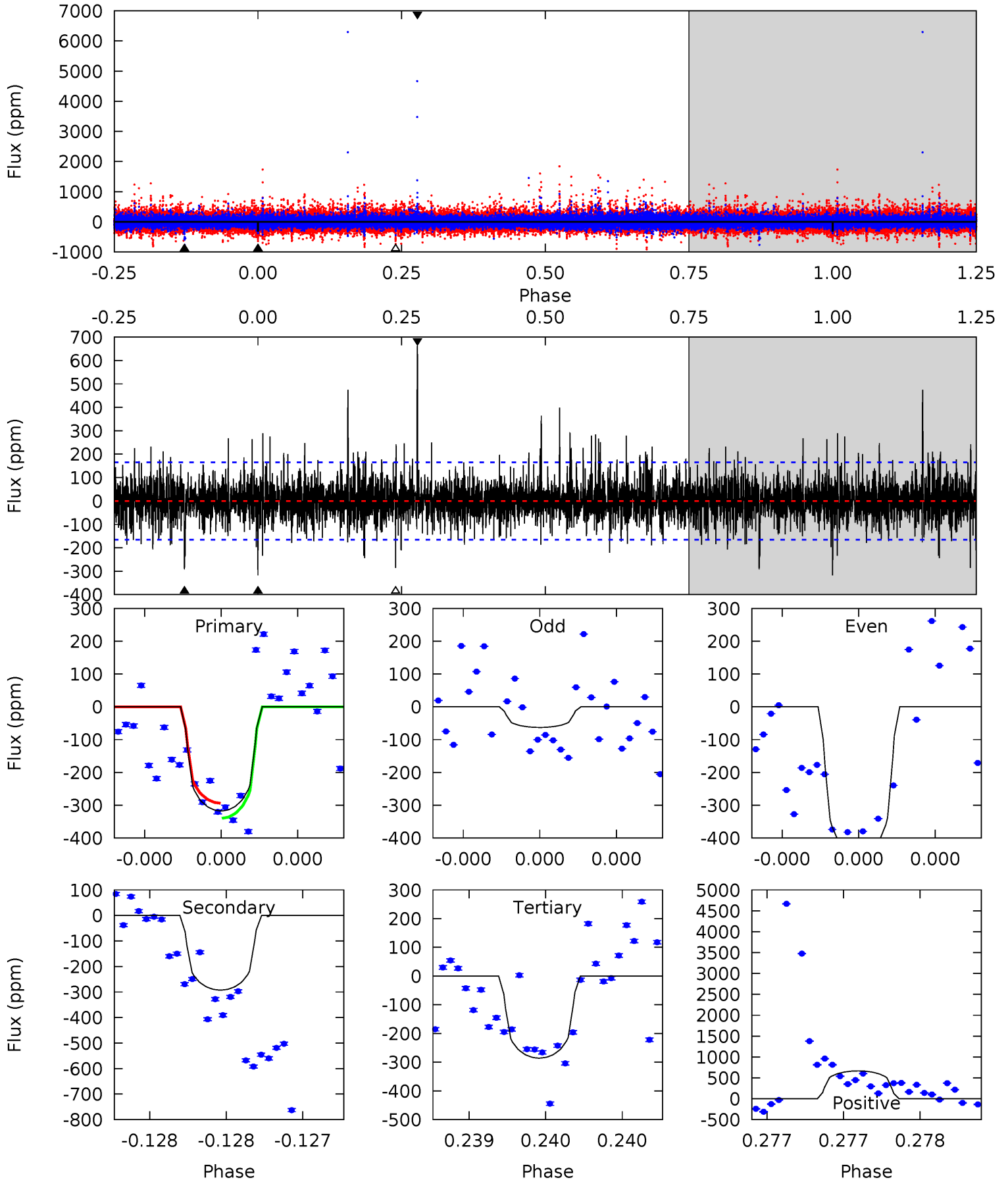
TCE 009237305-07 P=539.541341 Days $T_0=250.459417$ (BKJD)



DV Model-Shift Uniqueness Test

009237305-07, P = 539.570067 Days, E = 250.332031 Days

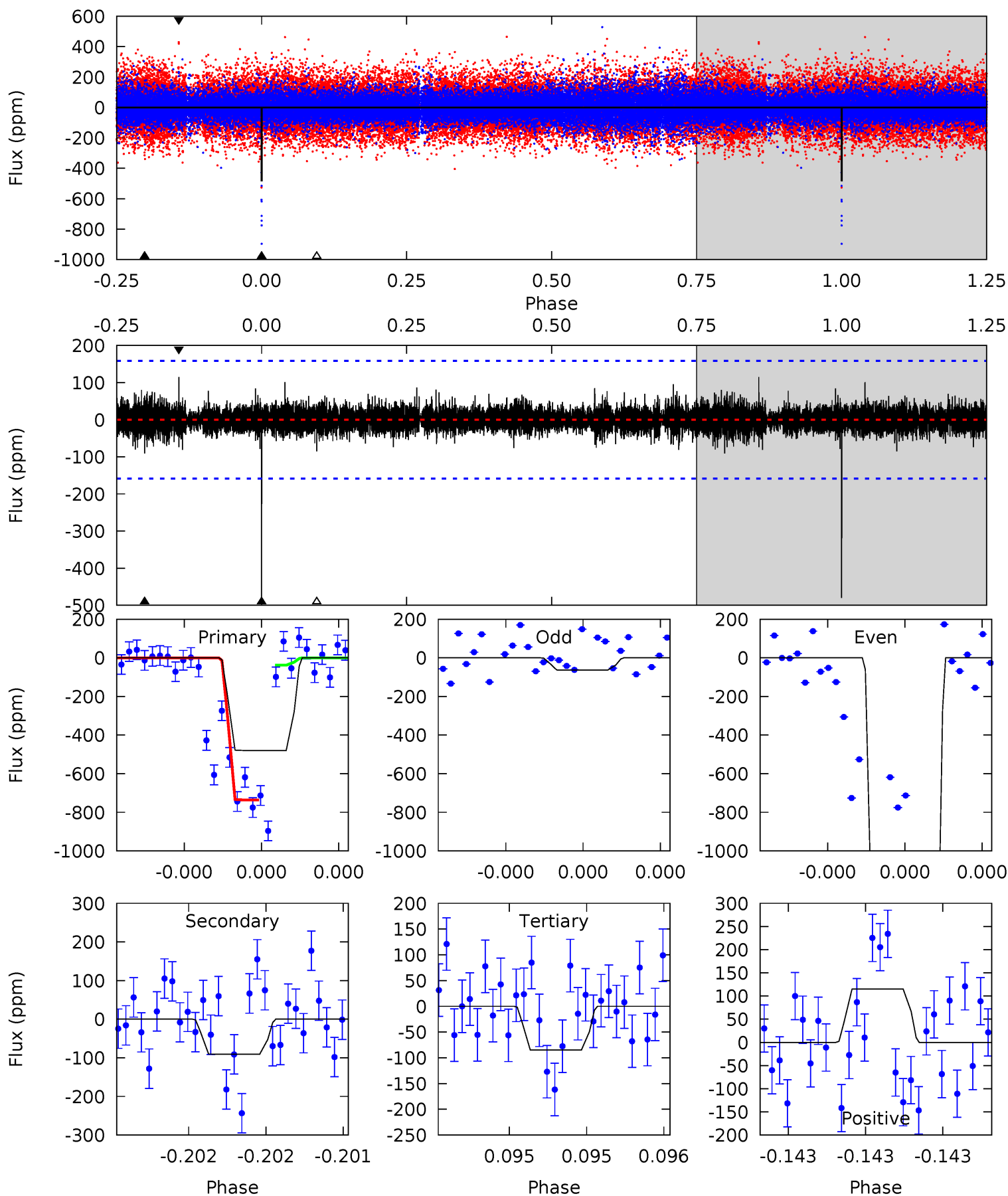
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.8	9.92	9.70	22.6	5.60	3.53	2.16	1.07	-11.8	0.22	-12.7	3.82	0.85	0.68	0.78



Alt Model-Shift Uniqueness Test

009237305-07, P = 539.541341 Days, E = 250.459417 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.0	3.21	3.02	4.09	5.63	3.56	0.62	14.0	12.9	0.19	-0.88	66.7	5.02	0.19	0



Stellar Parameters For KIC 009237305

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5210^{+186}_{-207}	$3.232^{+0.630}_{-0.210}$	$0.080^{+0.250}_{-0.350}$	$5.828^{+1.555}_{-3.888}$	$2.115^{+0.500}_{-1.083}$	$0.015^{+0.170}_{-0.007}$
	+4%/-4%	+19%/-6%	+312%/-438%	+27%/-67%	+24%/-51%	+1130%/-46%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009237305-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-293 ± 29	$16.34^{+14.47}_{-10.83}$	591^{+63}_{-93}	4254^{+2300}_{-773}	1683^{+12246}_{-1207}
Alt.	-90 ± 28	$39.67^{+20.78}_{-17.24}$	591^{+60}_{-92}	2688^{+351}_{-230}	82^{+187}_{-47}

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 $A_{obs} \gg 1.0$

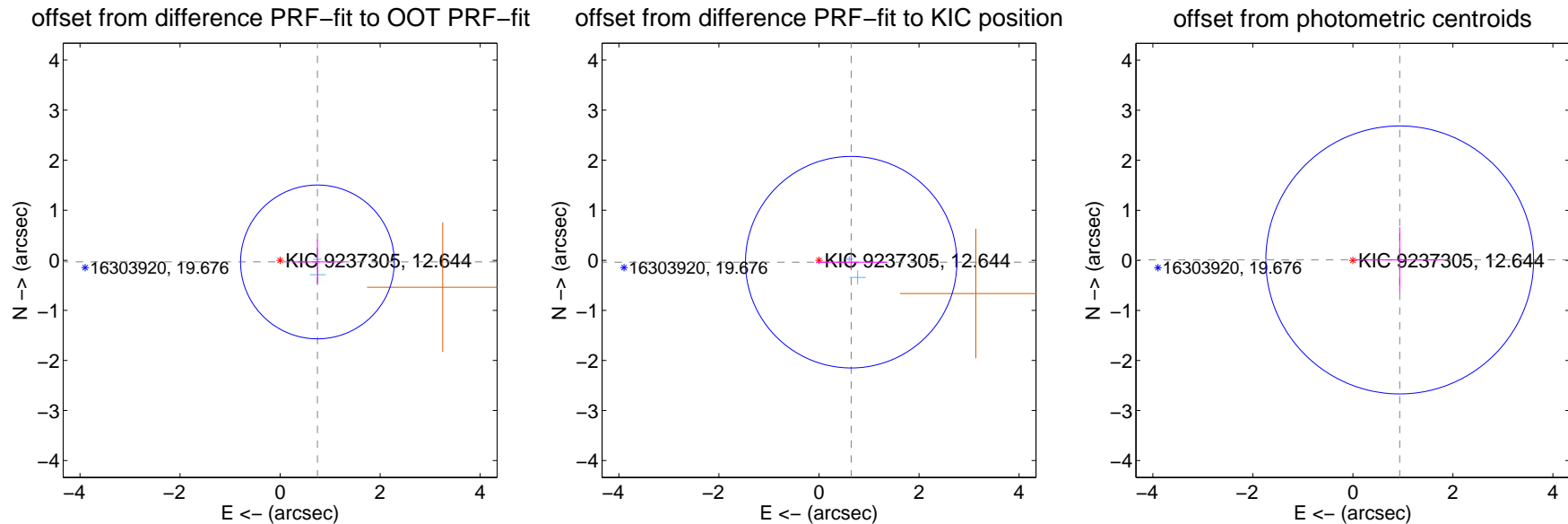
DV Centroid Data

Supplemental centroid analysis for 009237305-07. Kepler magnitude: 12.64. Transit SNR 7.88

There are 2 quarters with good PRF difference image offsets

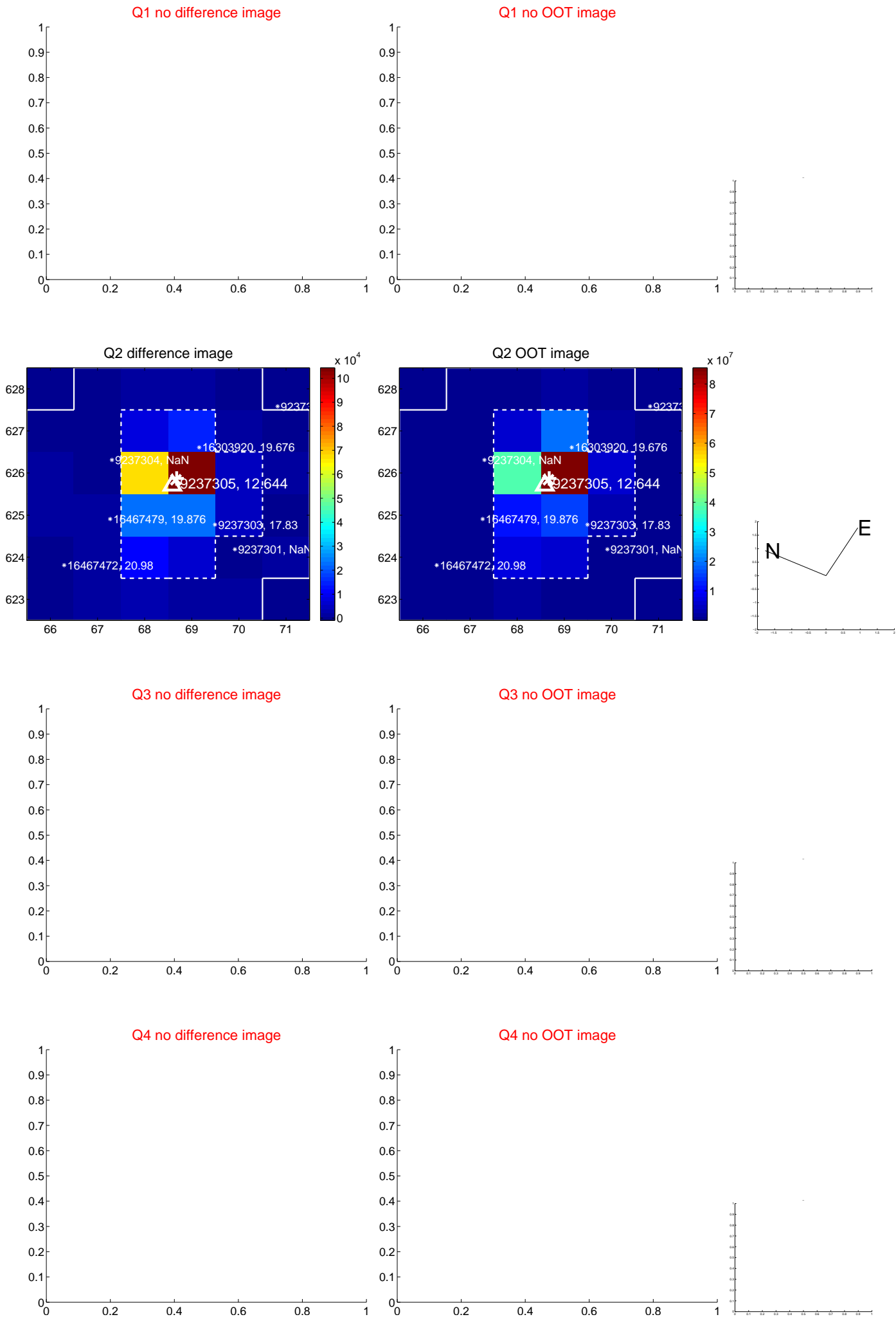
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.747 ± 0.512	1.46	-0.746 ± 0.512	-0.033 ± 0.439
PRF-fit source offset from KIC position	0.645 ± 0.704	0.92	-0.644 ± 0.700	-0.038 ± 0.143
photometric centroid source offset	0.94 ± 0.89	1.05	-0.94 ± 0.89	0.01 ± 0.65



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 no difference image



Q6 no OOT image



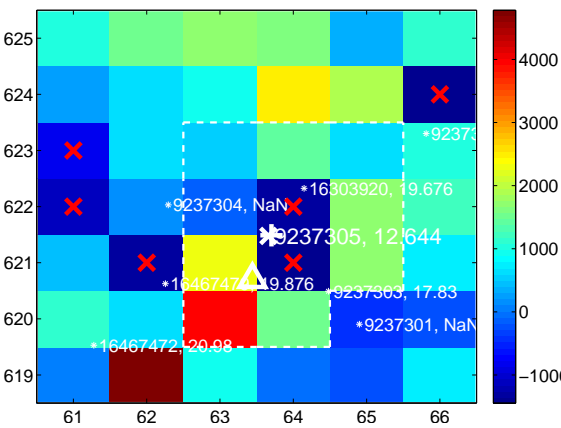
Q7 no difference image



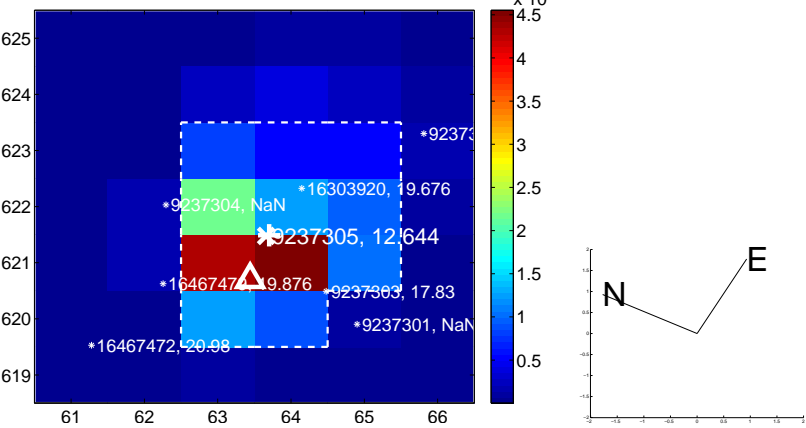
Q7 no OOT image



Q8 difference image. Poor Quality



Q8 OOT image

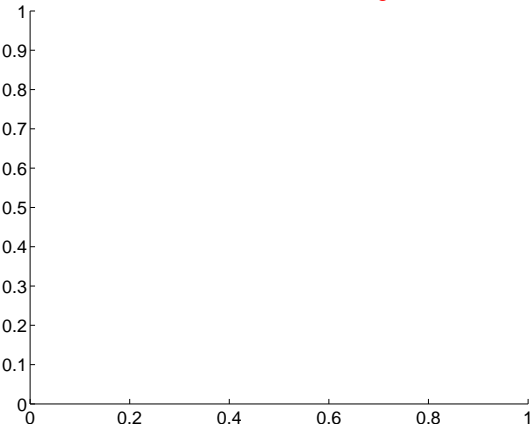


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

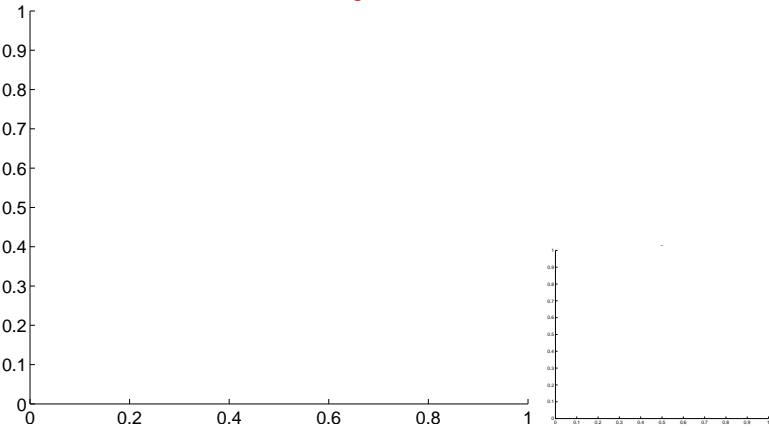


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

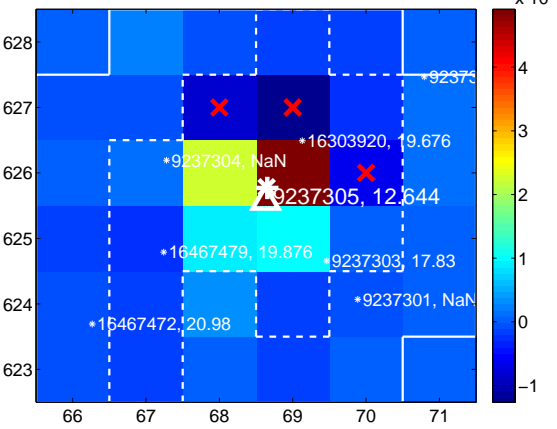
Q13 no difference image



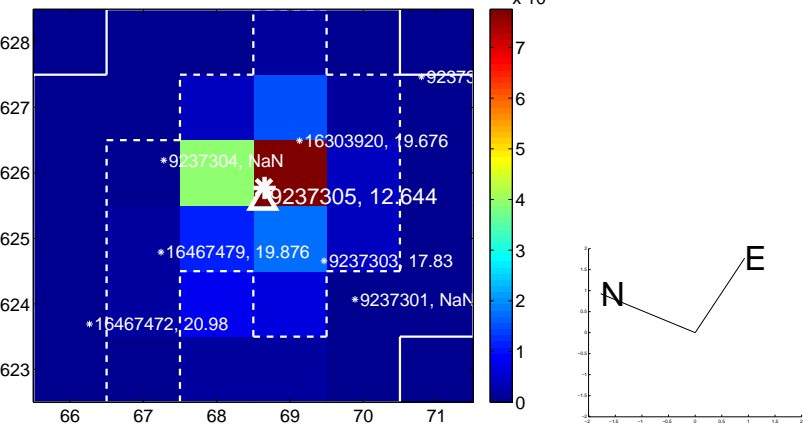
Q13 no OOT image



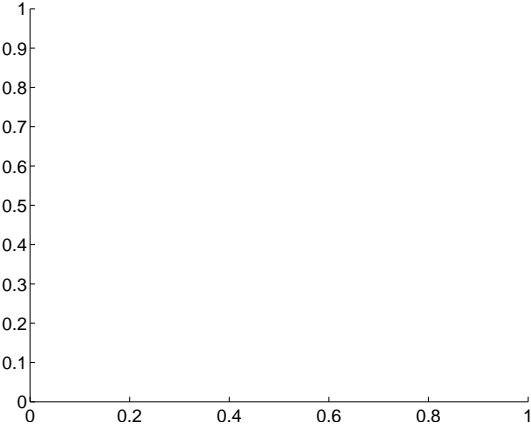
Q14 difference image



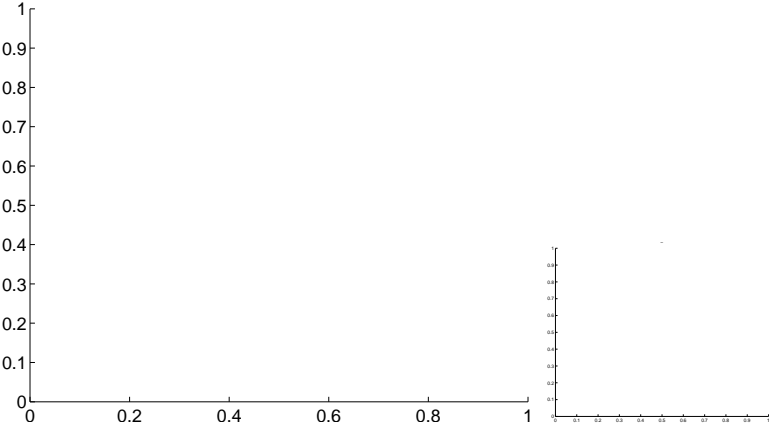
Q14 OOT image



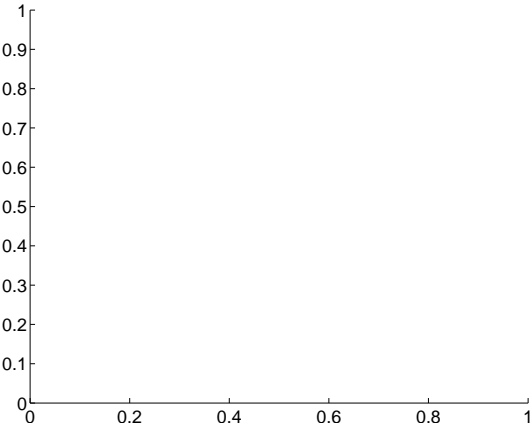
Q15 no difference image



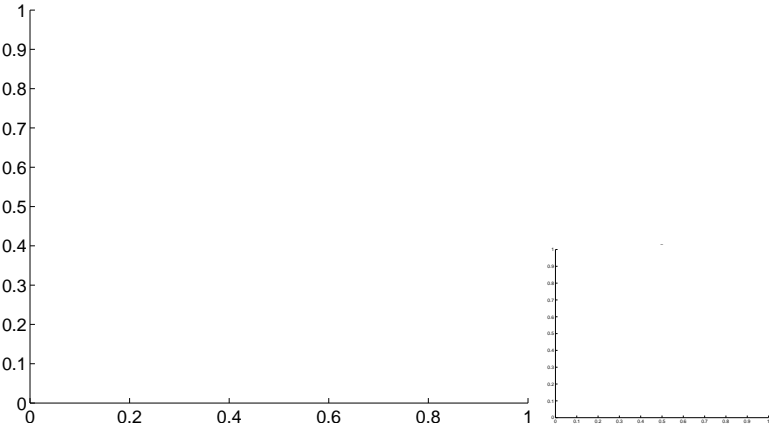
Q15 no OOT image



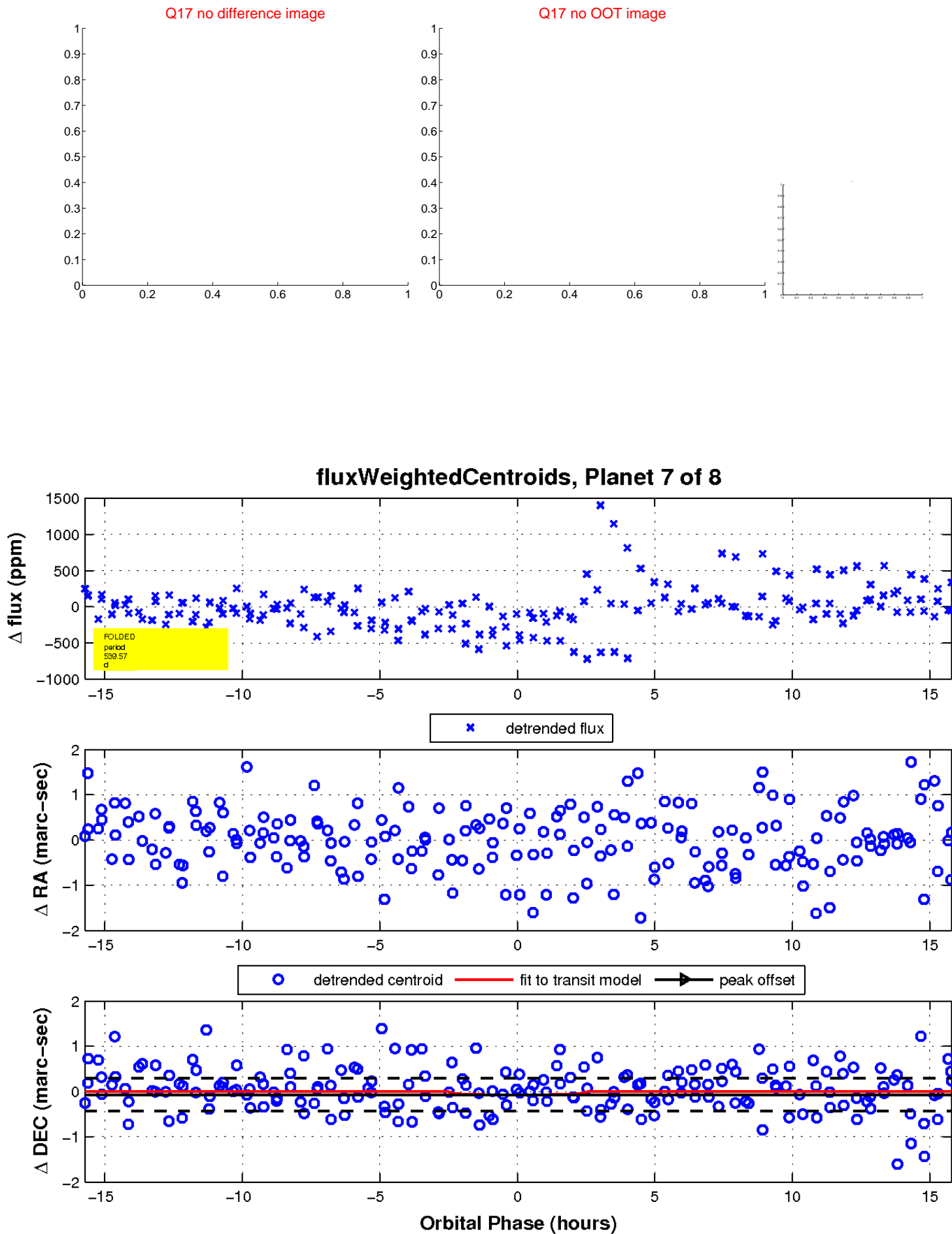
Q16 no difference image



Q16 no OOT image

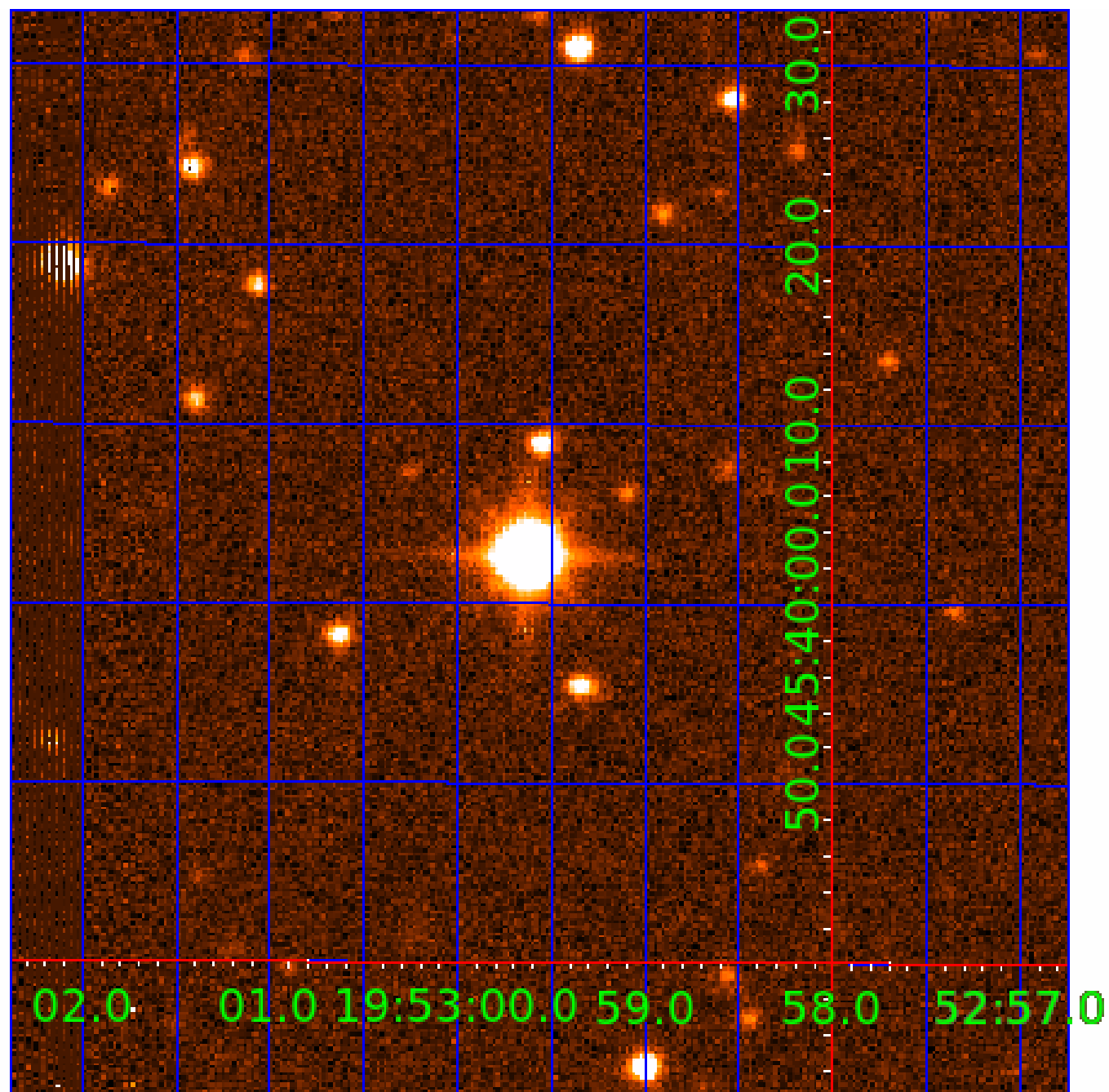


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009237305

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})
009237305-02	OBS	No	309.745220	331.156710	446.8	11.424	14.5	7.3	5.83	5210	16.82	16.95
009237305-03	OBS	No	533.907810	431.829581	730.9	4.763	15.2	12.2	5.83	5210	19.76	8.20
009237305-04	OBS	No	396.734868	458.543019	469.1	12.690	13.9	6.7	5.83	5210	12.73	12.19
009237305-05	OBS	No	358.810042	254.916869	1.7	9.592	14.3	0.0	5.83	5210	0.97	13.94
009237305-07	OBS	No	539.570067	250.332031	489.1	5.265	9.6	7.9	5.83	5210	14.88	8.09
009237305-08	OBS	No	562.143737	369.334395	439.5	12.259	9.9	6.4	5.83	5210	12.35	7.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009237305-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—HALO_GHOST
009237305-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_POS_DV
009237305-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009237305-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
009237305-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS

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

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

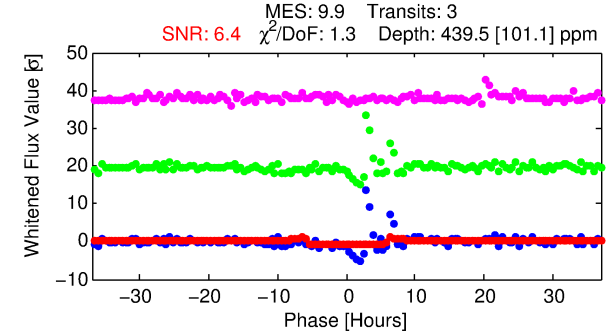
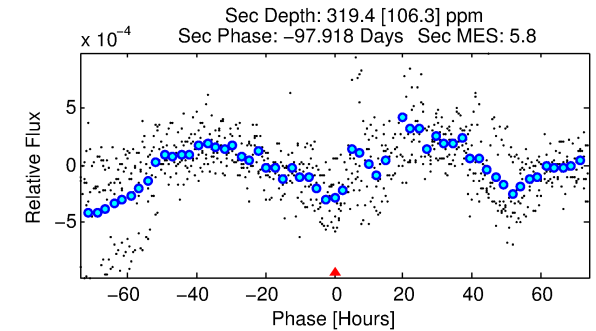
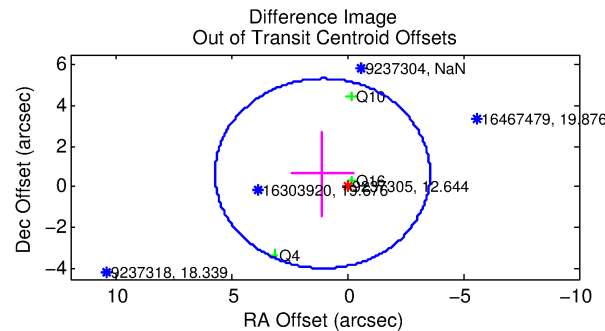
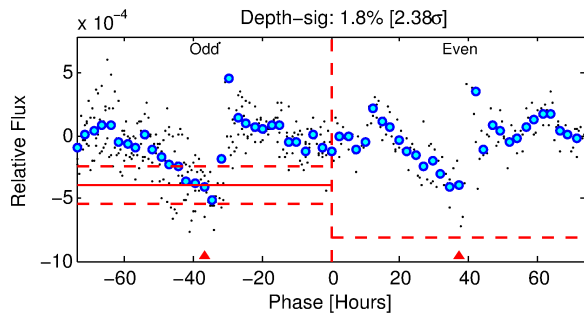
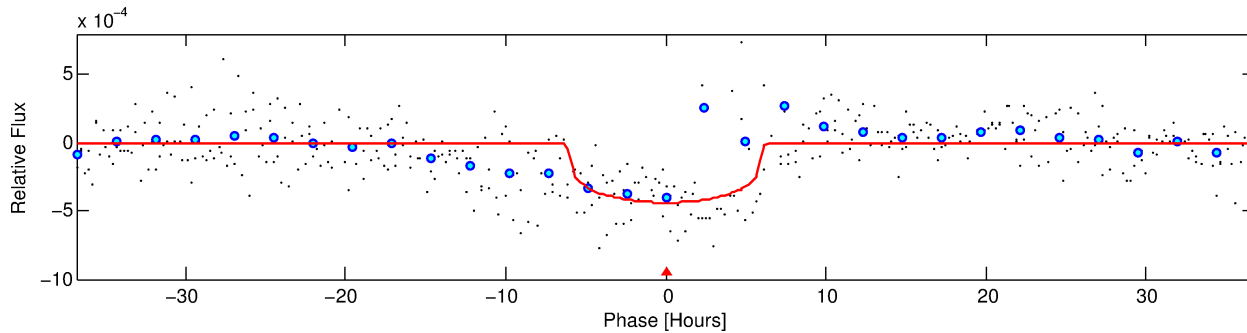
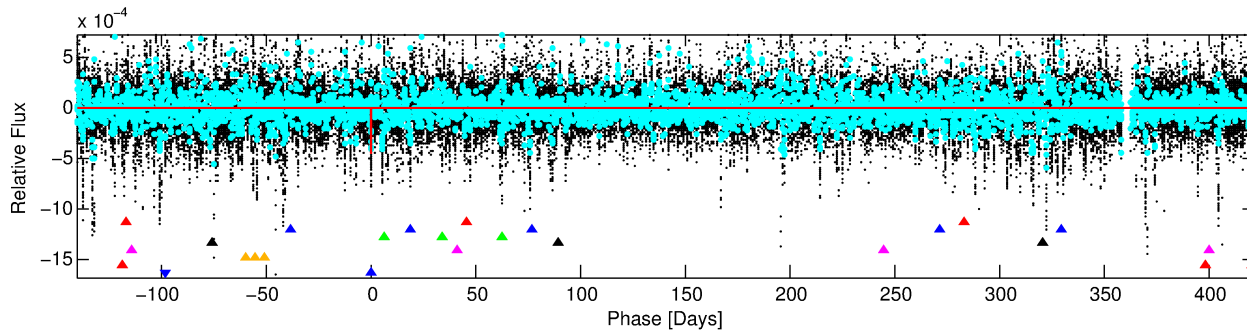
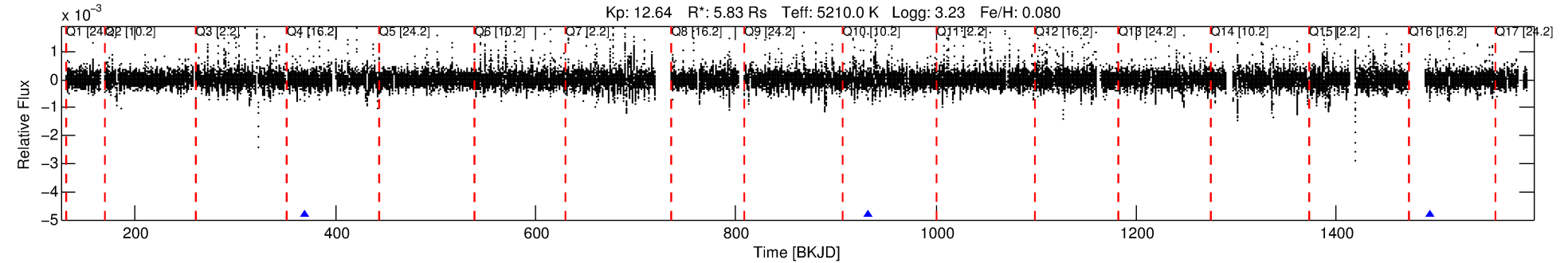
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009237305-08

No Significant Match Found

DV One-Page Summary

KIC: 9237305 Candidate: 8 of 8 Period: 562.144 d



DV Fit Results:

Period = 562.14374 [0.00965] d
Epoch = 369.3344 [0.0113] BKJD
Rp/R* = 0.0194 [0.0173]
a/R* = 313.03 [1016.34]
b = 0.49 [5.07]
Seff = 7.66 [8.24]
Teq = 424 [114] K
Rp = 12.35 [13.75] Re
a = 1.7111 [1.1241] AU
Ag = 3375.34 [7101.97] [0.48 σ]
Teffp = 4999 [2277] K [2.01 σ]

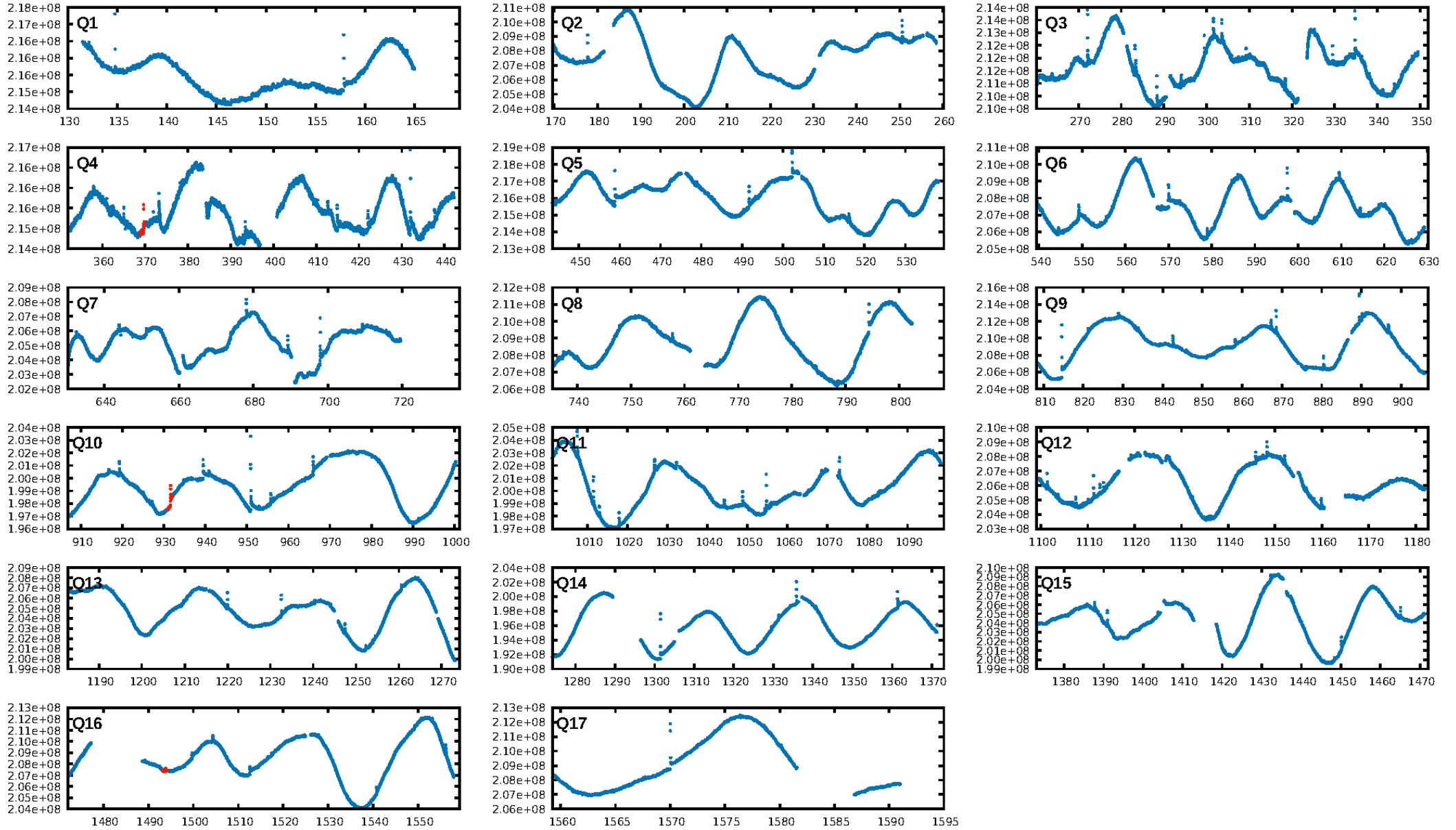
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.39 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 3.6%
ModelChiSquareGof-sig: 80.2%
Bootstrap-pfa: 2.03e-08
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 0.549
Centroid-sig: N/A
Centroid-so: 1.716 arcsec [1.85 σ]
OotOffset-rm: 1.276 arcsec [0.82 σ]
KicOffset-rm: 1.282 arcsec [0.85 σ]
OotOffset-st: 1/0/2/0 [3]
KicOffset-st: 1/0/2/0 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

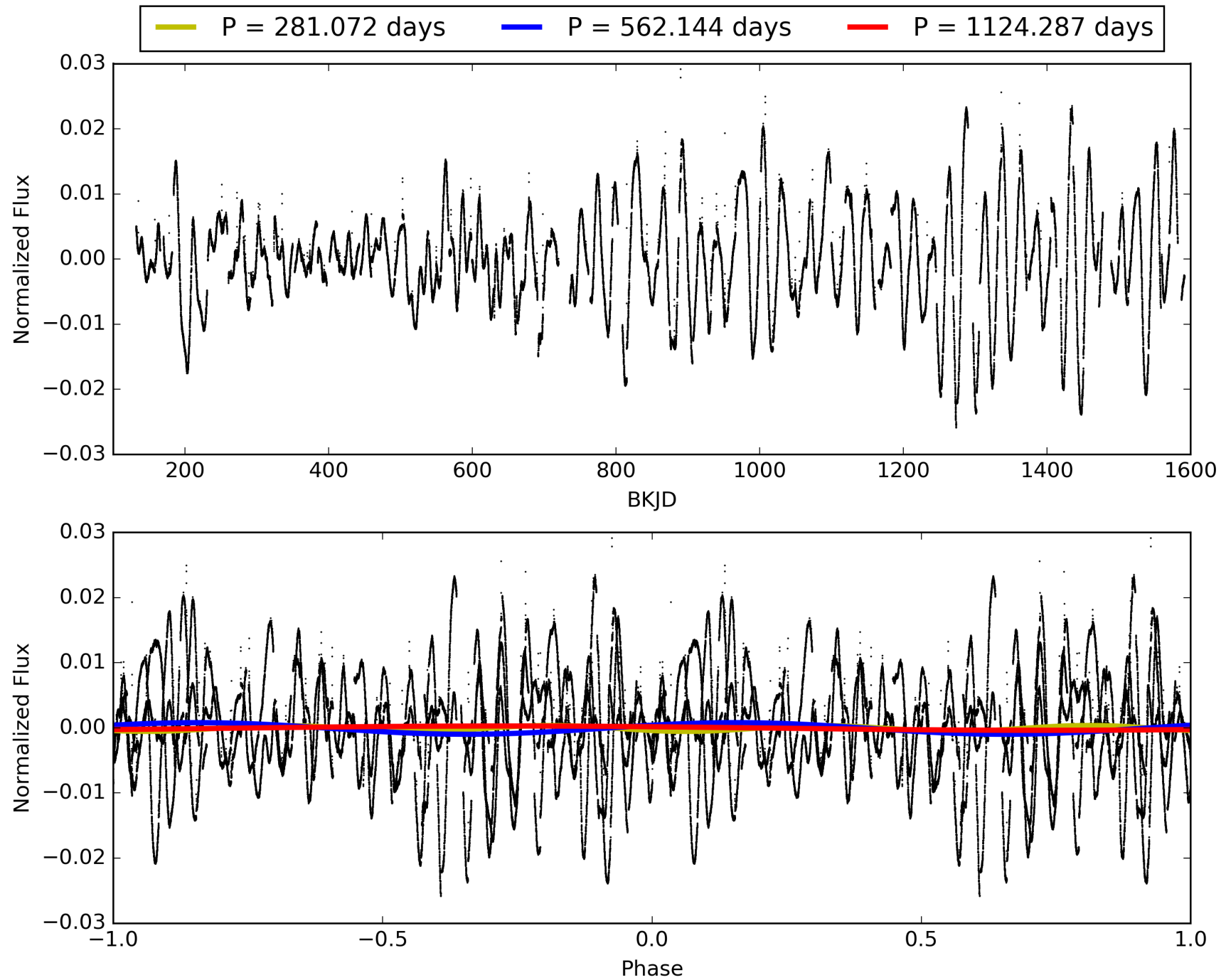
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:34:37 Z

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

TCE 009237305-08, PDC Light Curves

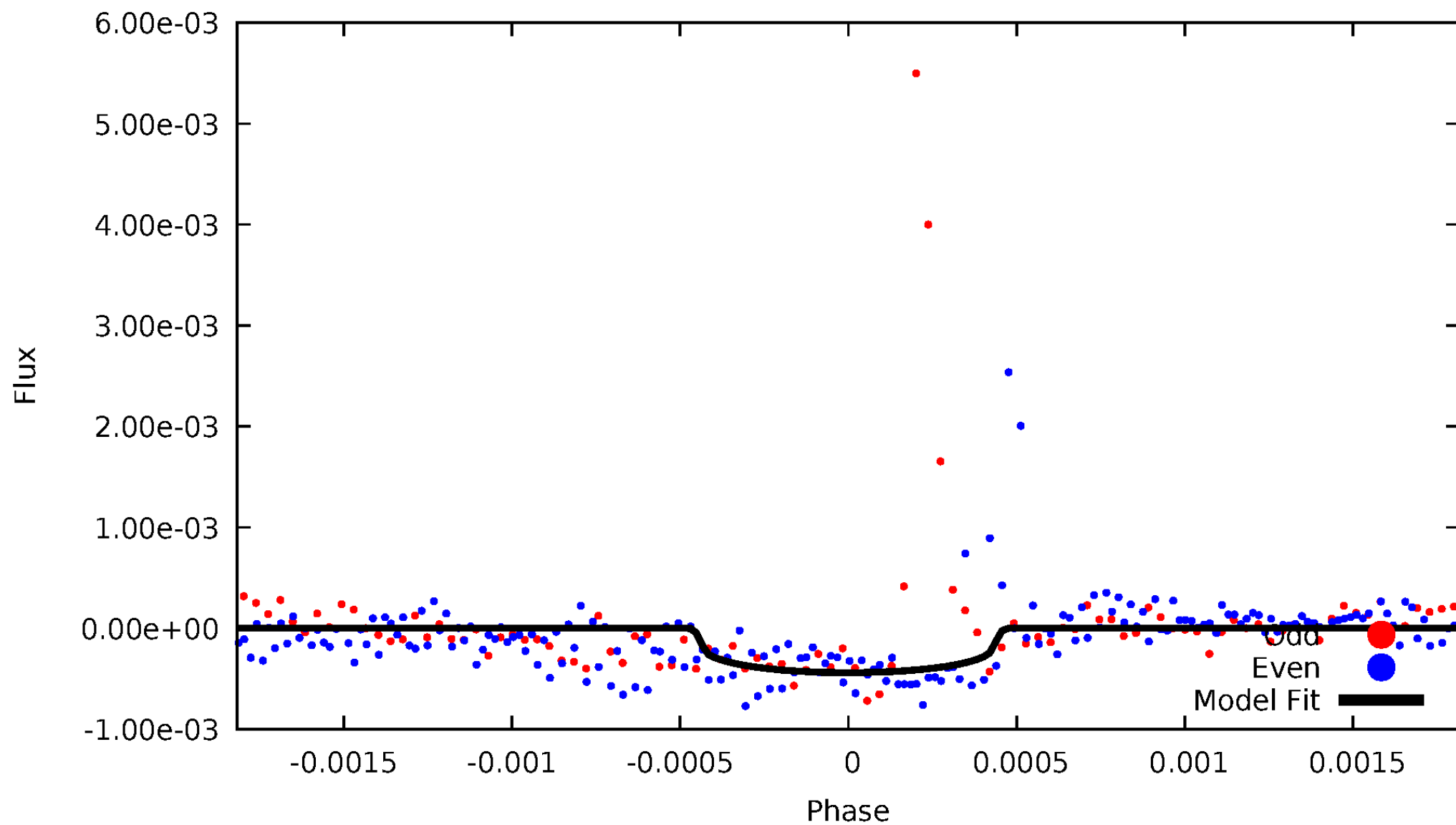


TCE 009237305-08



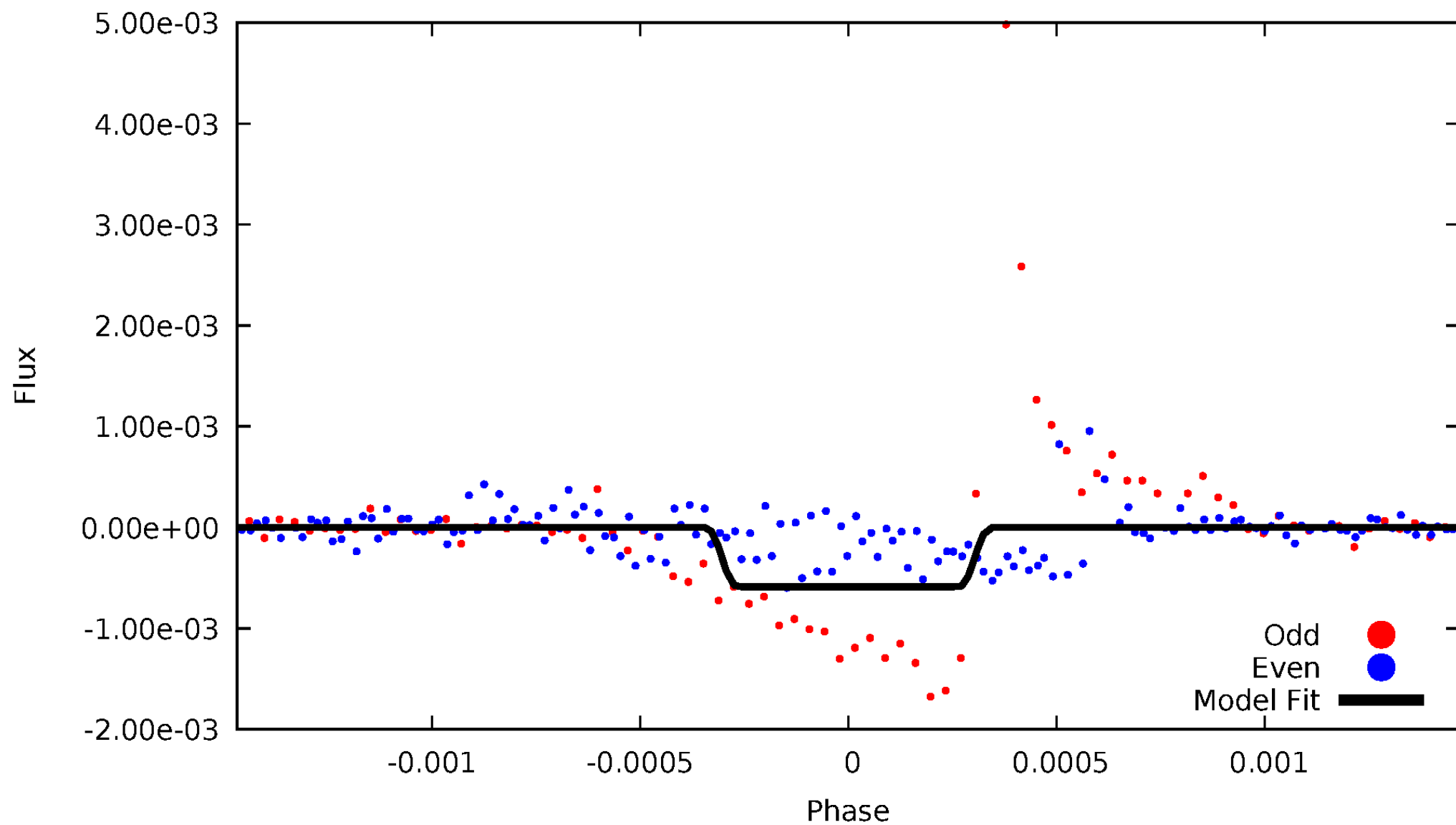
DV Odd/Even

TCE 009237305-08



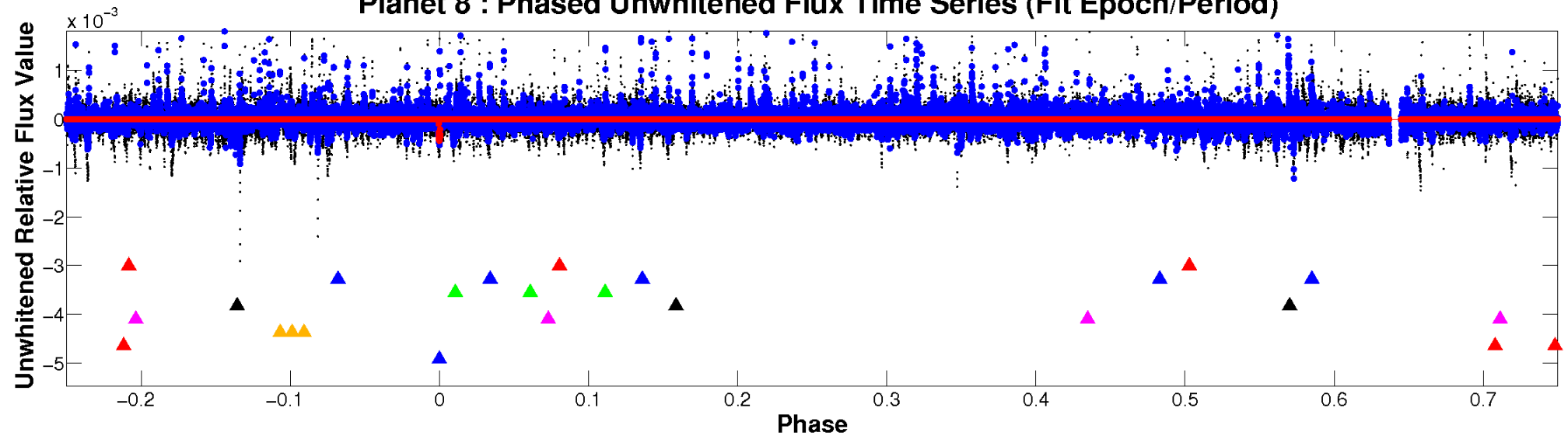
ALT Odd/Even

TCE 009237305-08

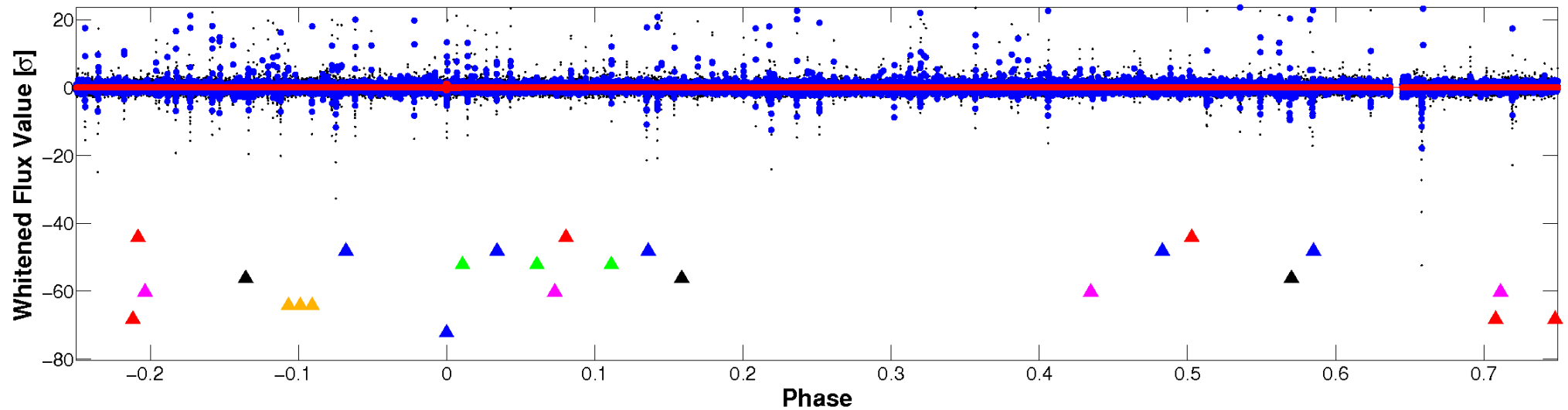


Non-Whitened Vs. Whitened Light Curve

Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

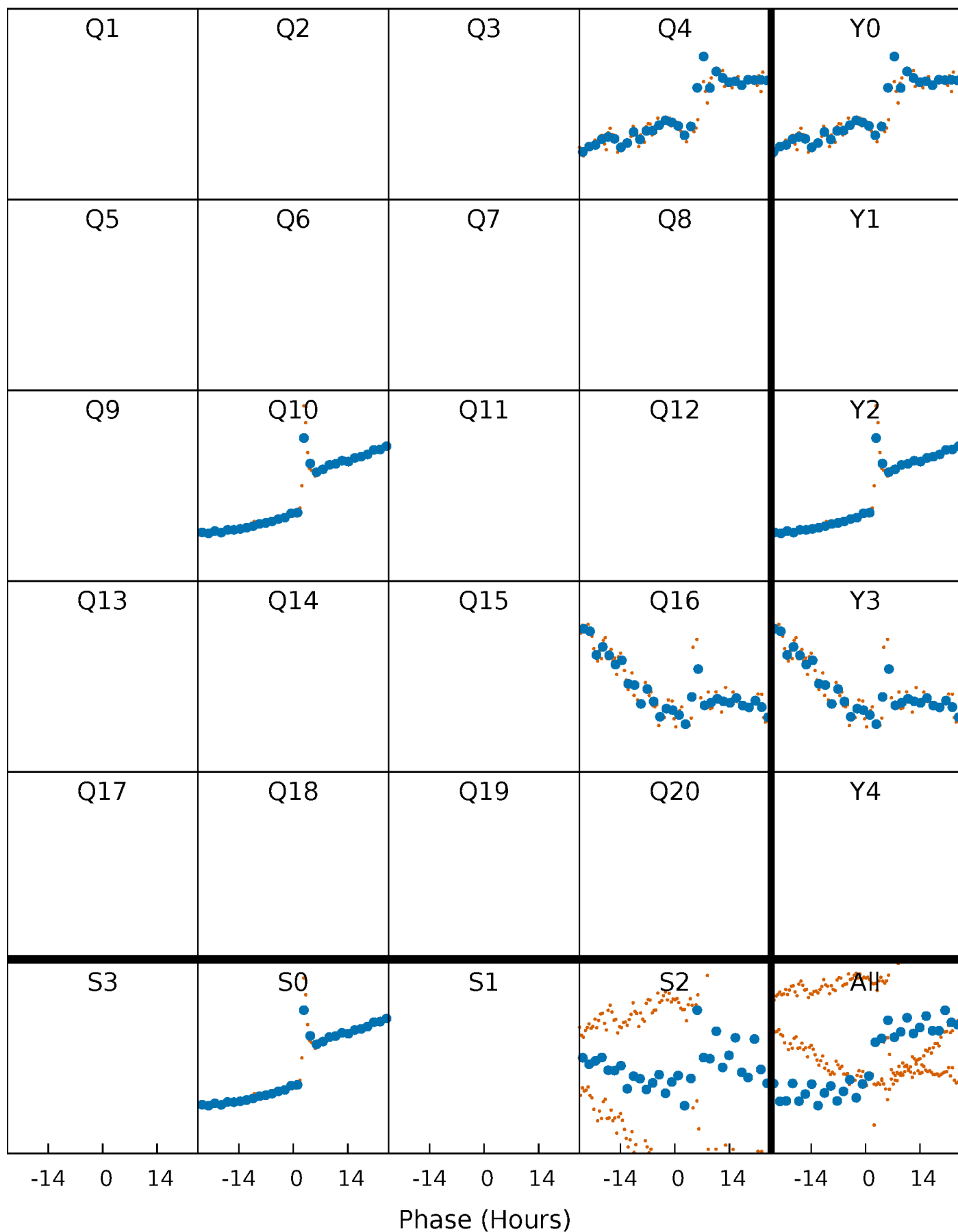


Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



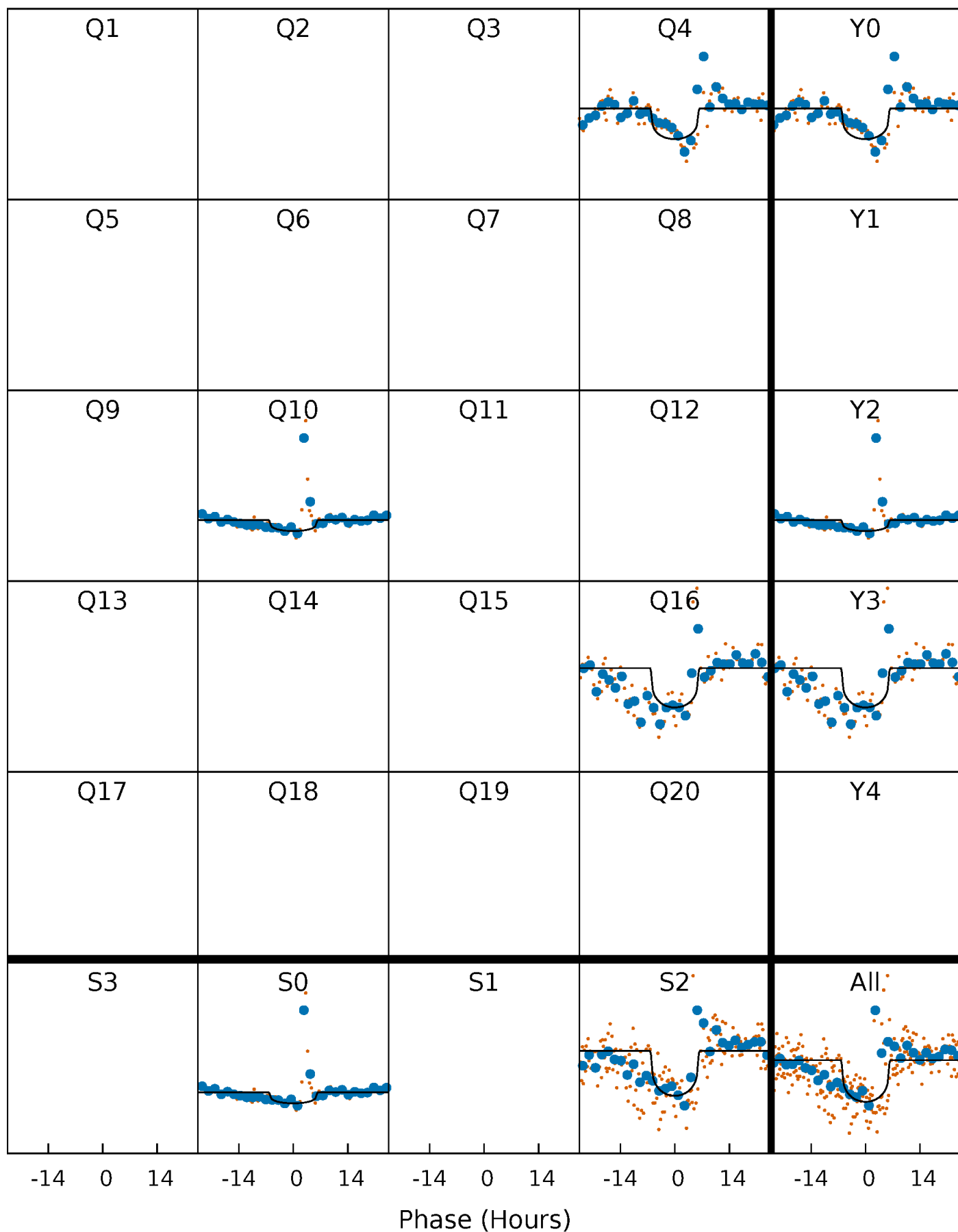
PDC Quarter-Phased Transit Curves

TCE 009237305-08 P=562.143737 Days $T_0=369.334395$ (BKJD)



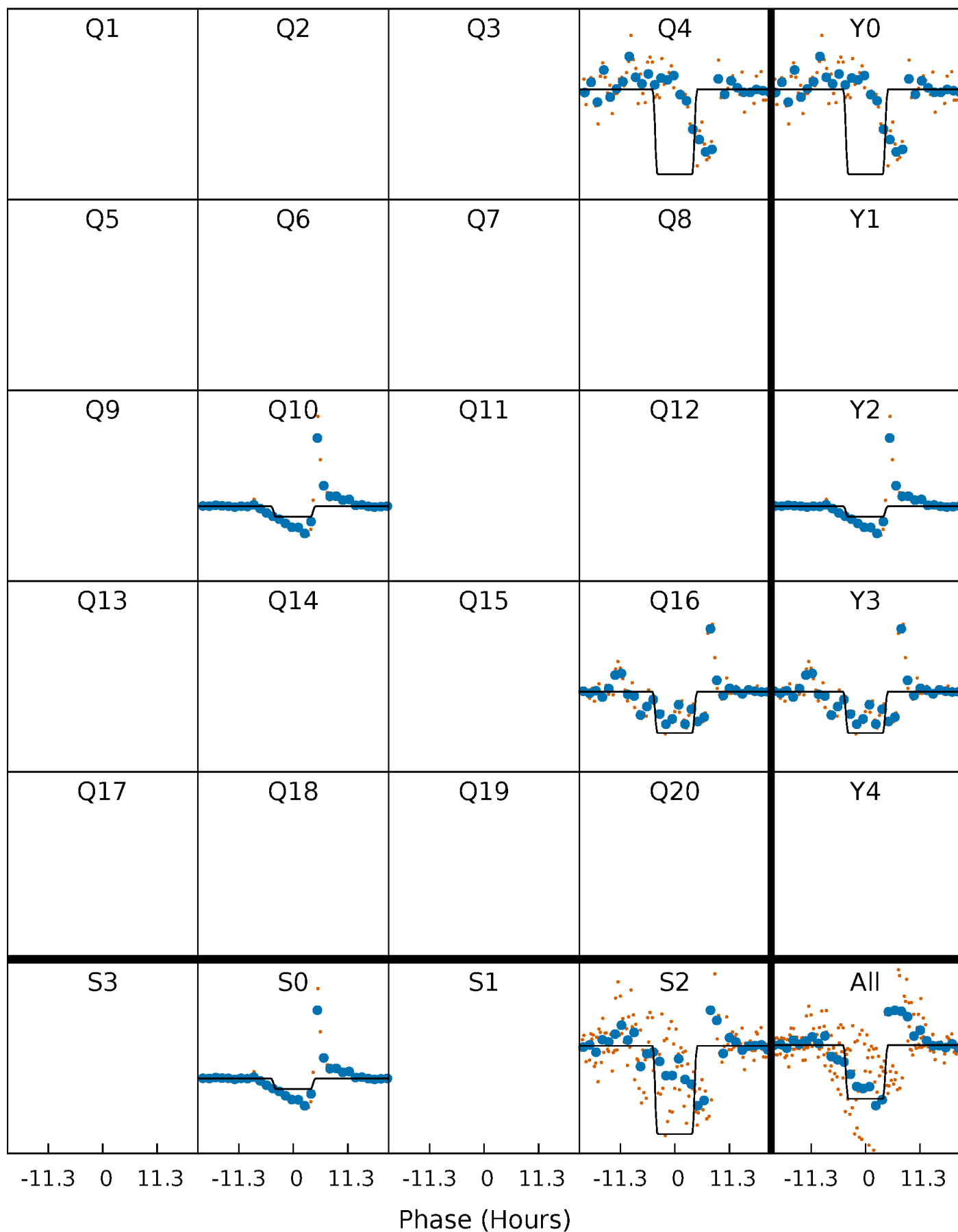
DV Quarter-Phased Transit Curves

TCE 009237305-08 $P=562.143737$ Days $T_0=369.334395$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

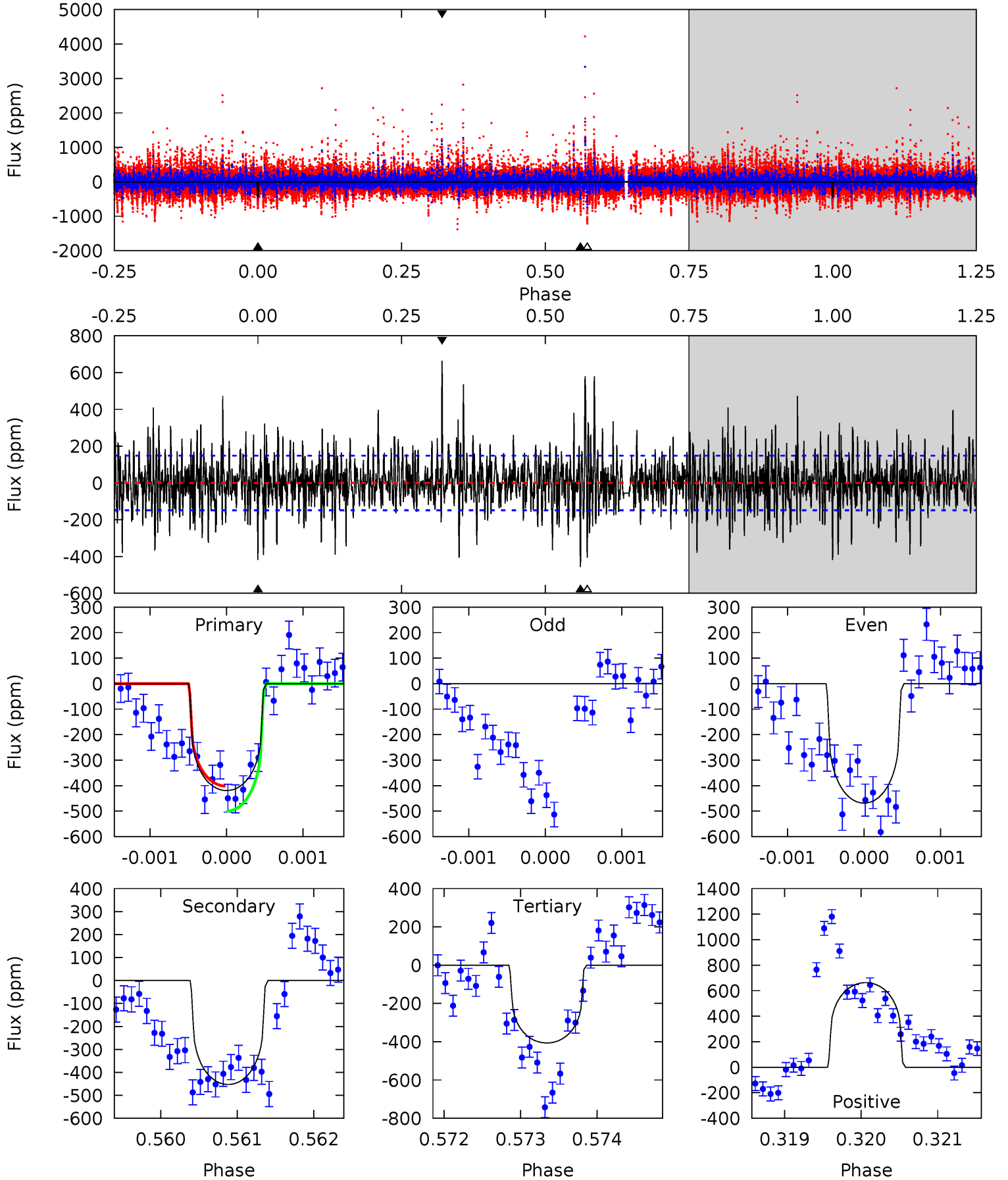
TCE 009237305-08 $P=562.134047$ Days $T_0=369.264732$ (BKJD)



DV Model-Shift Uniqueness Test

009237305-08, P = 562.143737 Days, E = 369.334395 Days

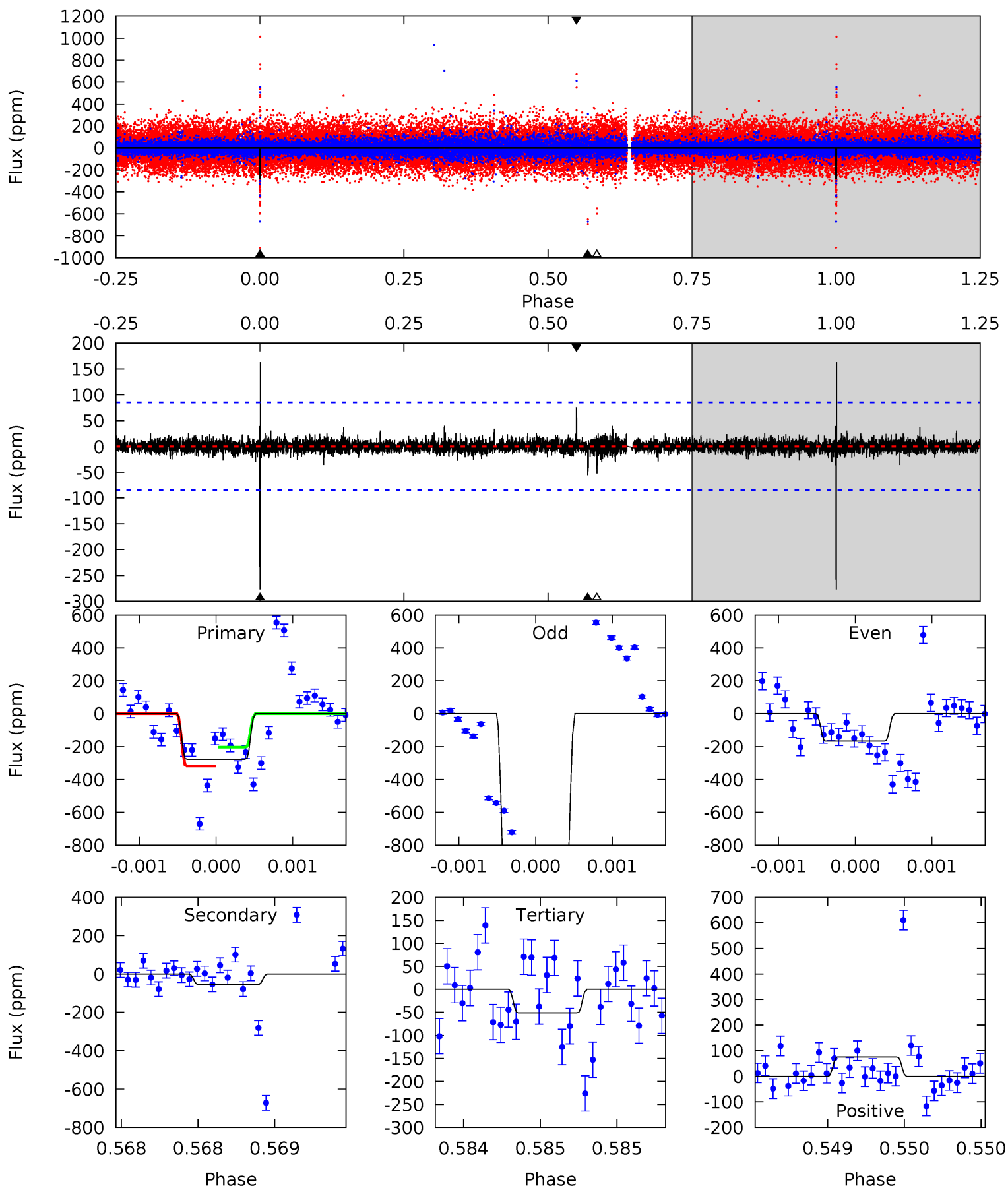
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.4	16.7	14.9	24.4	5.46	3.31	4.14	0.47	-8.98	1.70	-7.74	5.93	0.48	0.59	1.79



Alt Model-Shift Uniqueness Test

009237305-08, P = 562.134047 Days, E = 369.264732 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.0	3.59	3.32	4.91	5.52	3.40	0.47	14.6	13.0	0.27	-1.31	33.8	1.44	0.37	3.50



Stellar Parameters For KIC 009237305

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5210^{+186}_{-207}	$3.232^{+0.630}_{-0.210}$	$0.080^{+0.250}_{-0.350}$	$5.828^{+1.555}_{-3.888}$	$2.115^{+0.500}_{-1.083}$	$0.015^{+0.170}_{-0.007}$
	+4%/-4%	+19%/-6%	+312%/-438%	+27%/-67%	+24%/-51%	+1130%/-46%
Source	PHO1	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 009237305-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-453 ± 27	$12.72^{+11.68}_{-7.79}$	586^{+56}_{-94}	5092^{+2989}_{-1019}	4514^{+25958}_{-3318}
Alt.	-55 ± 15	$15.25^{+12.98}_{-9.05}$	585^{+57}_{-87}	3285^{+1074}_{-467}	368^{+1900}_{-259}

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 $A_{obs} \gg 1.0$

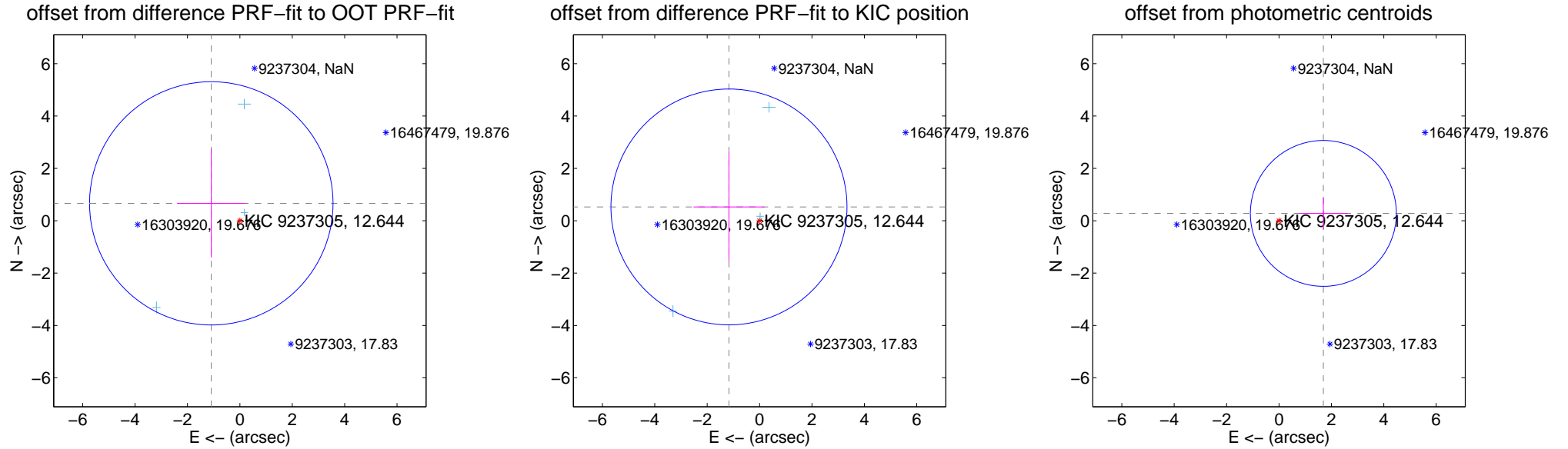
DV Centroid Data

Supplemental centroid analysis for 009237305-08. Kepler magnitude: 12.64. Transit SNR 6.45

There are 3 quarters with good PRF difference image offsets

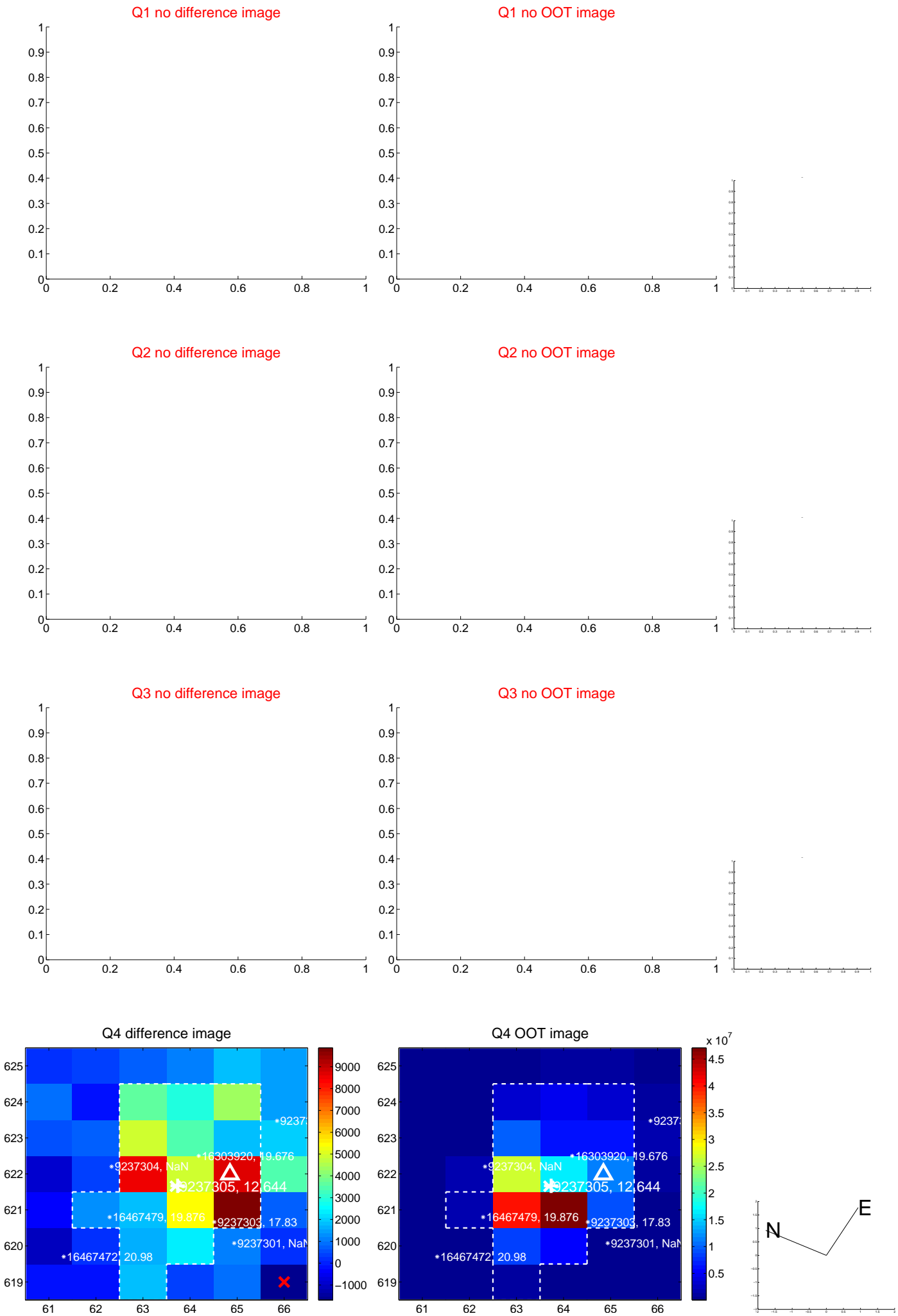
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.276 ± 1.549	0.82	1.090 ± 1.305	0.664 ± 2.068
PRF-fit source offset from KIC position	1.282 ± 1.502	0.85	1.168 ± 1.356	0.527 ± 2.073
photometric centroid source offset	1.72 ± 0.93	1.85	-1.69 ± 0.94	0.28 ± 0.62



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.

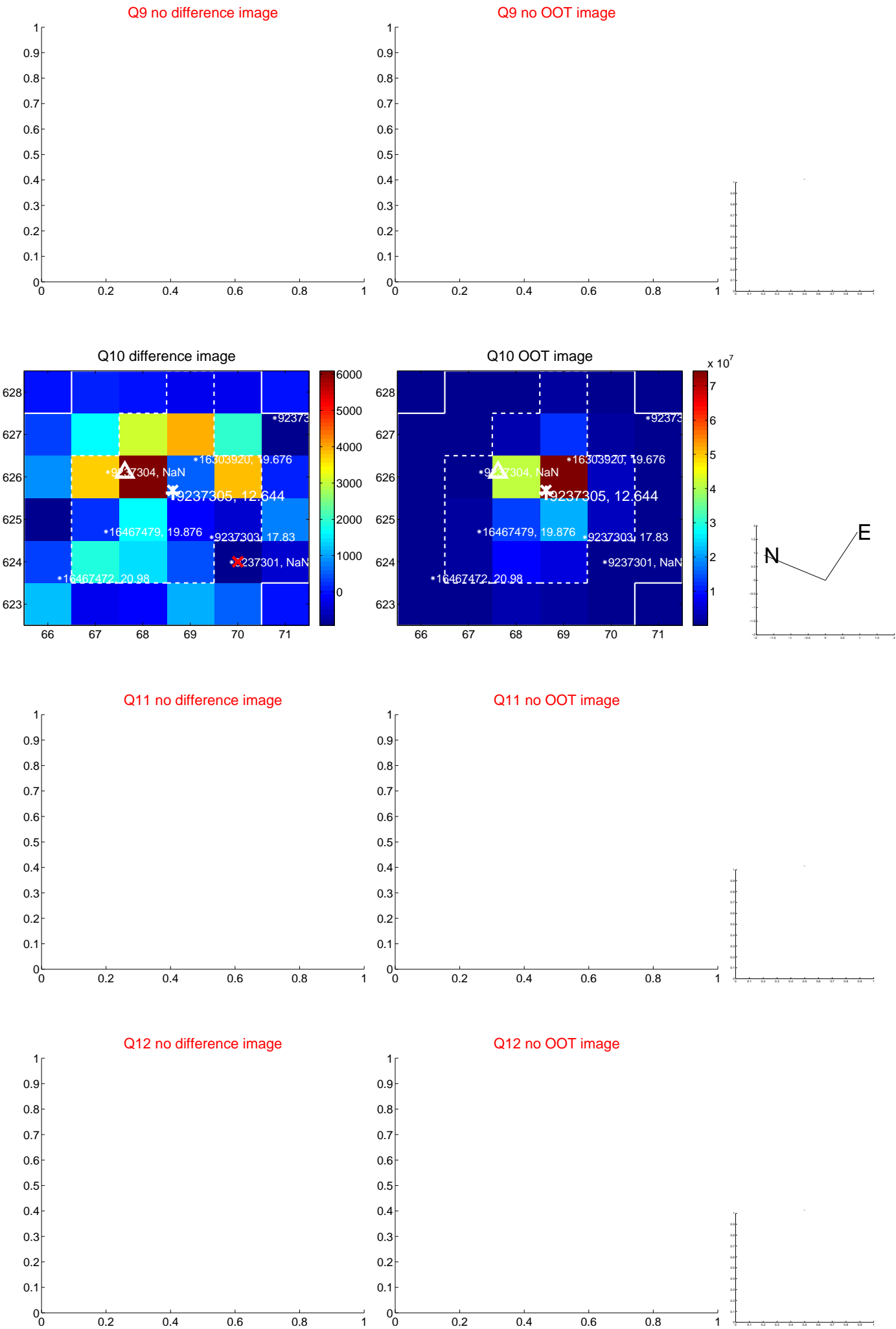
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



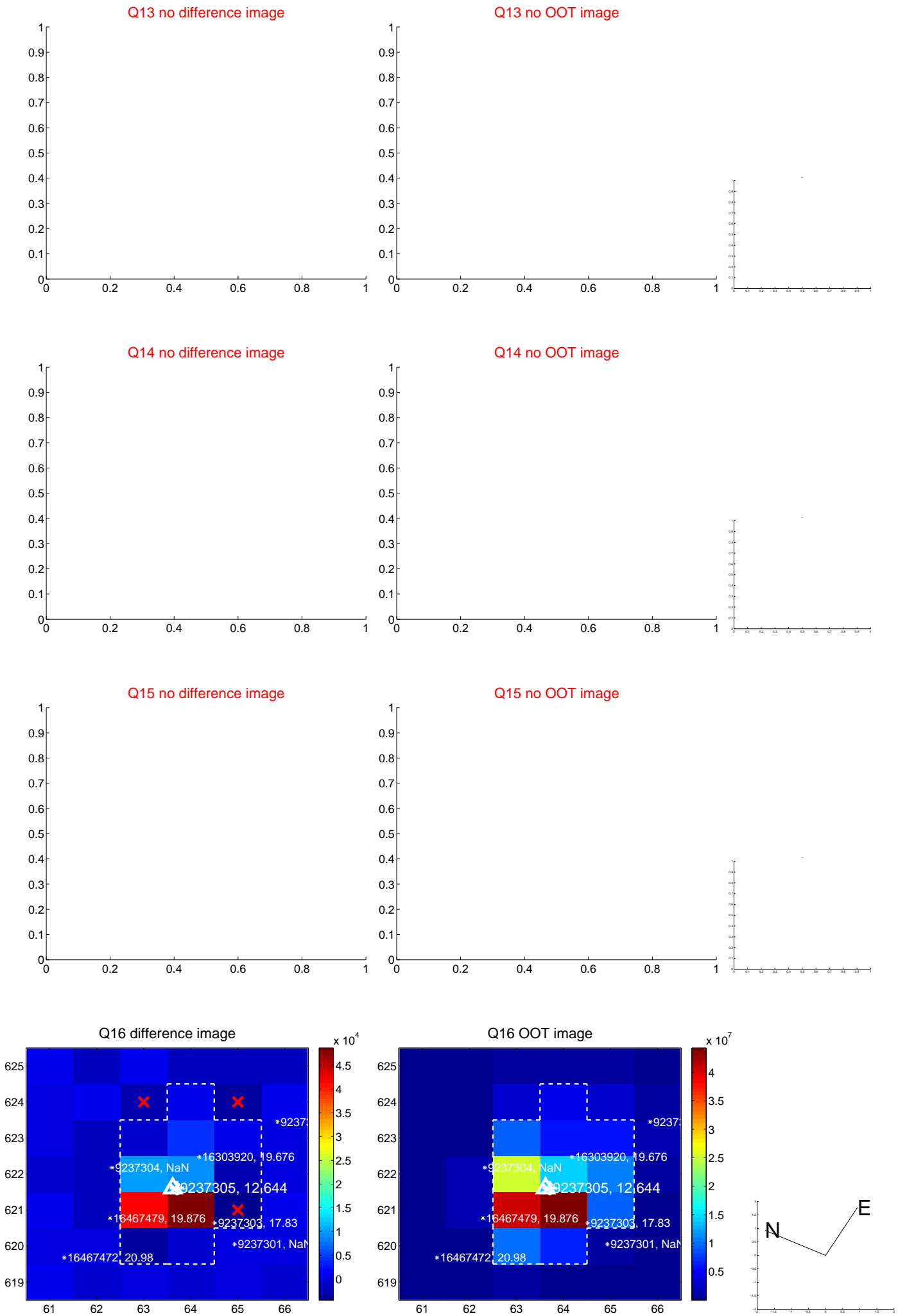
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



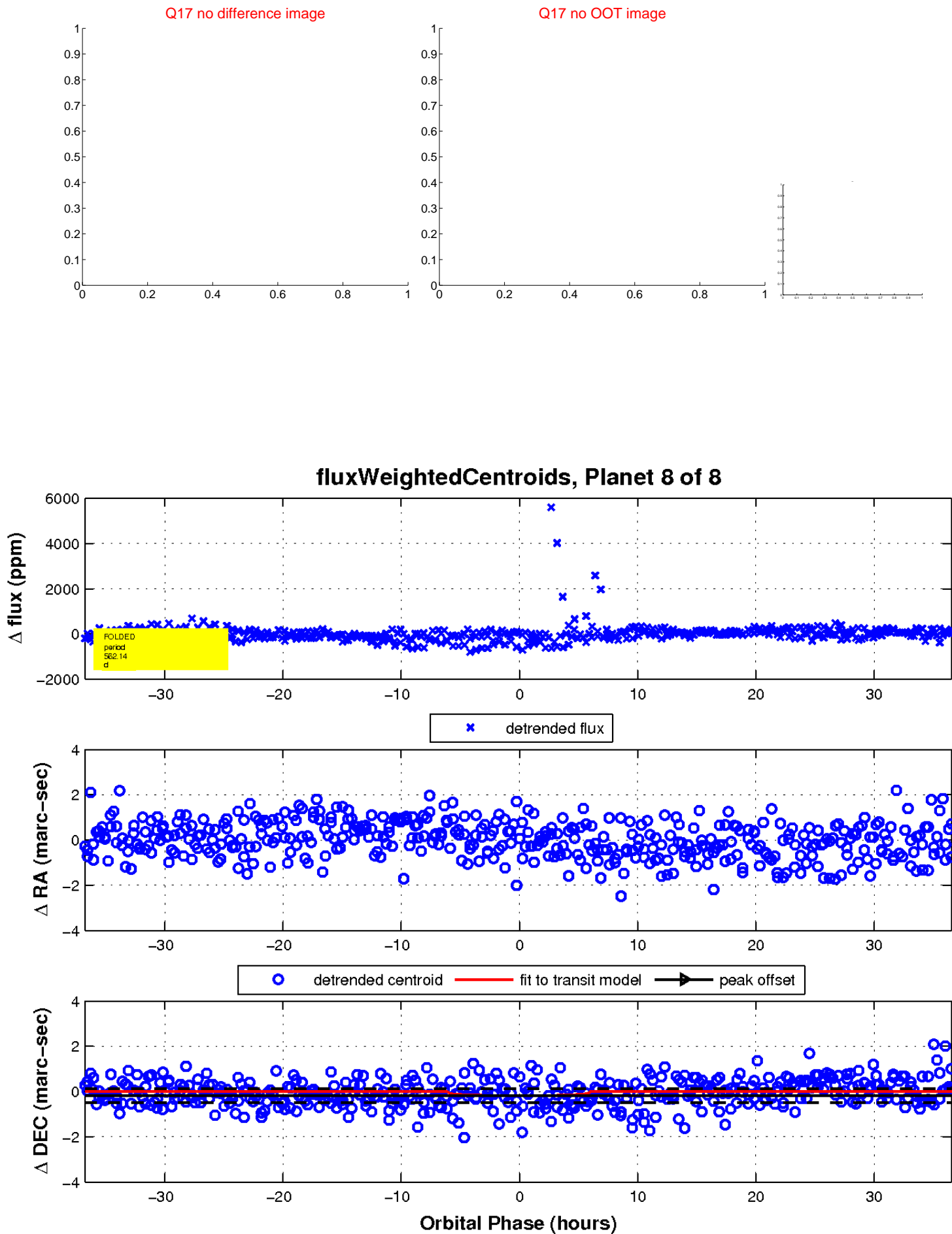
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

