

KIC 005870047

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})
005870047-01	OBS	No	477.731463	138.404144	4051.1	7.465	18.1	9.4	155.63	3262	1607.92	1594.61
005870047-02	OBS	No	358.351882	184.273897	2583.1	26.046	13.2	16.6	155.63	3262	1650.68	2339.66
005870047-03	OBS	No	312.083808	322.206716	7322.9	6.317	17.3	15.8	155.63	3262	1379.34	2813.23
005870047-04	OBS	No	327.813178	271.638310	499.8	3.000	16.0	-1.0	155.63	3262	319.99	2634.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005870047-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005870047-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005870047-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
005870047-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

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

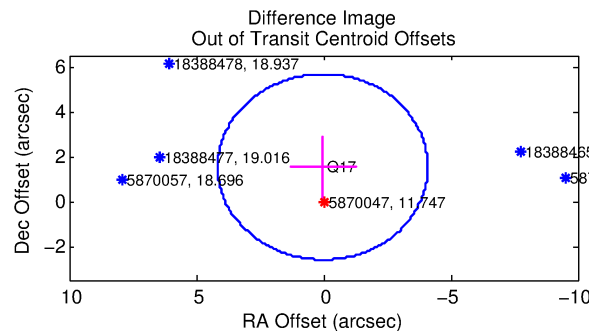
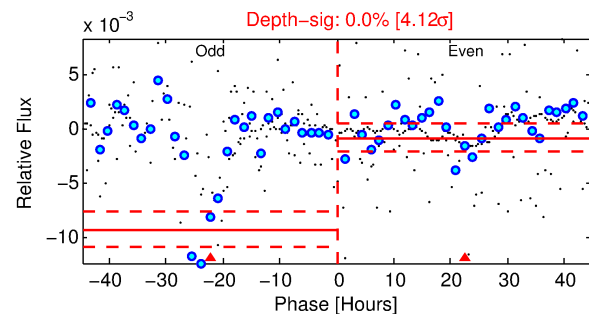
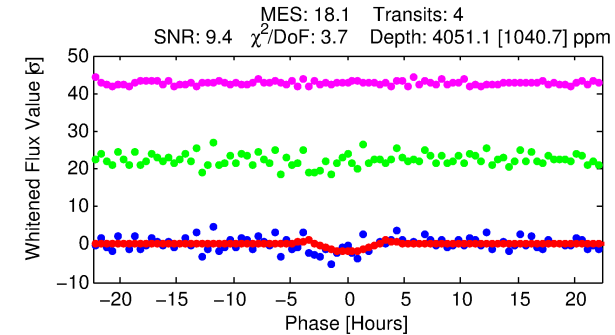
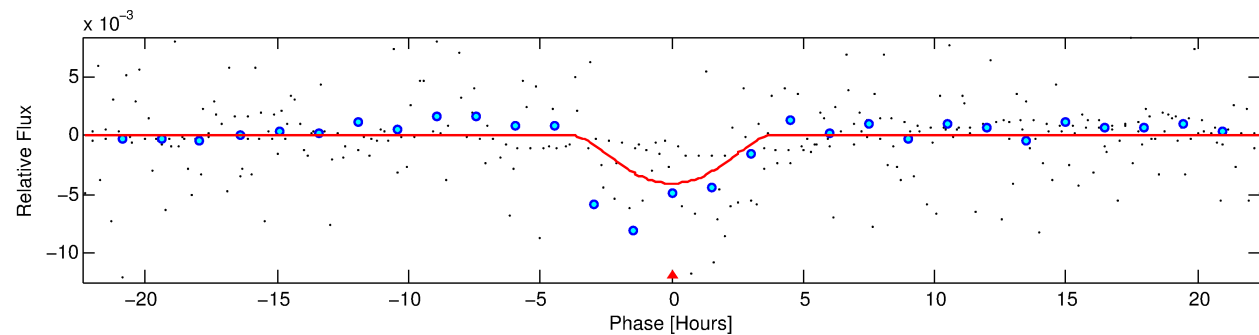
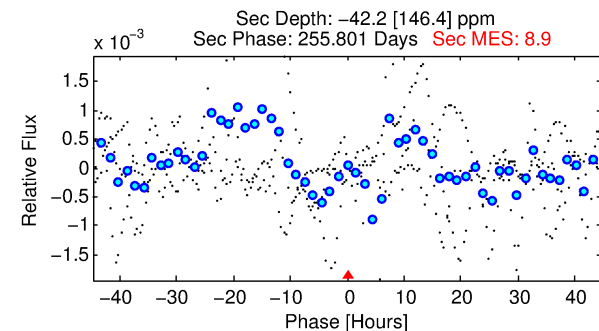
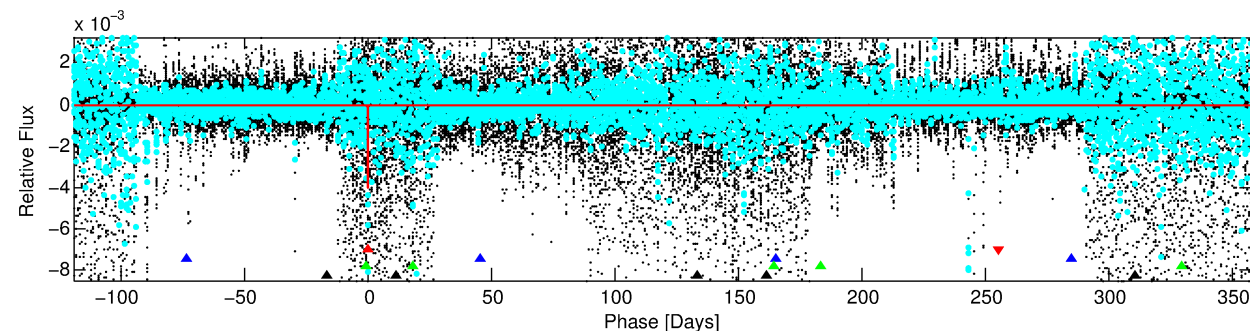
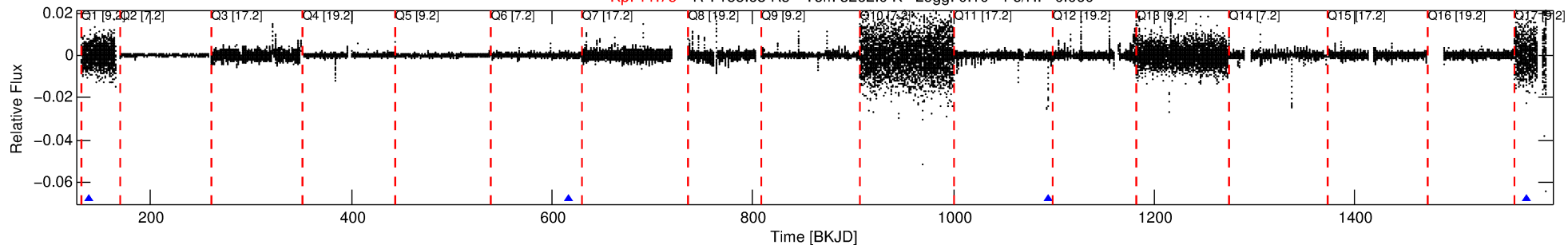
Ephemeris Match Information For 005870047-01

No Significant Match Found

DV One-Page Summary

KIC: 5870047 Candidate: 1 of 4 Period: 477.731 d

Kp: 11.75 R*: 155.63 Rs Teff: 3262.0 K Logg: 0.10 Fe/H: -0.060



DV Fit Results:

Period = 477.73146 [0.01407] d
Epoch = 138.4041 [0.0218] BKJD
Rp/R* = 0.0947 [0.1131]
a/R* = 257.61 [72.47]
b = 0.96 [0.19]
Seff = 1594.61 [561.83]
Teq = 1611 [142] K
Rp = 1607.92 [1942.46] Re
a = 1.2413 [0.2367] AU
Ag = N/A
Teffp = N/A

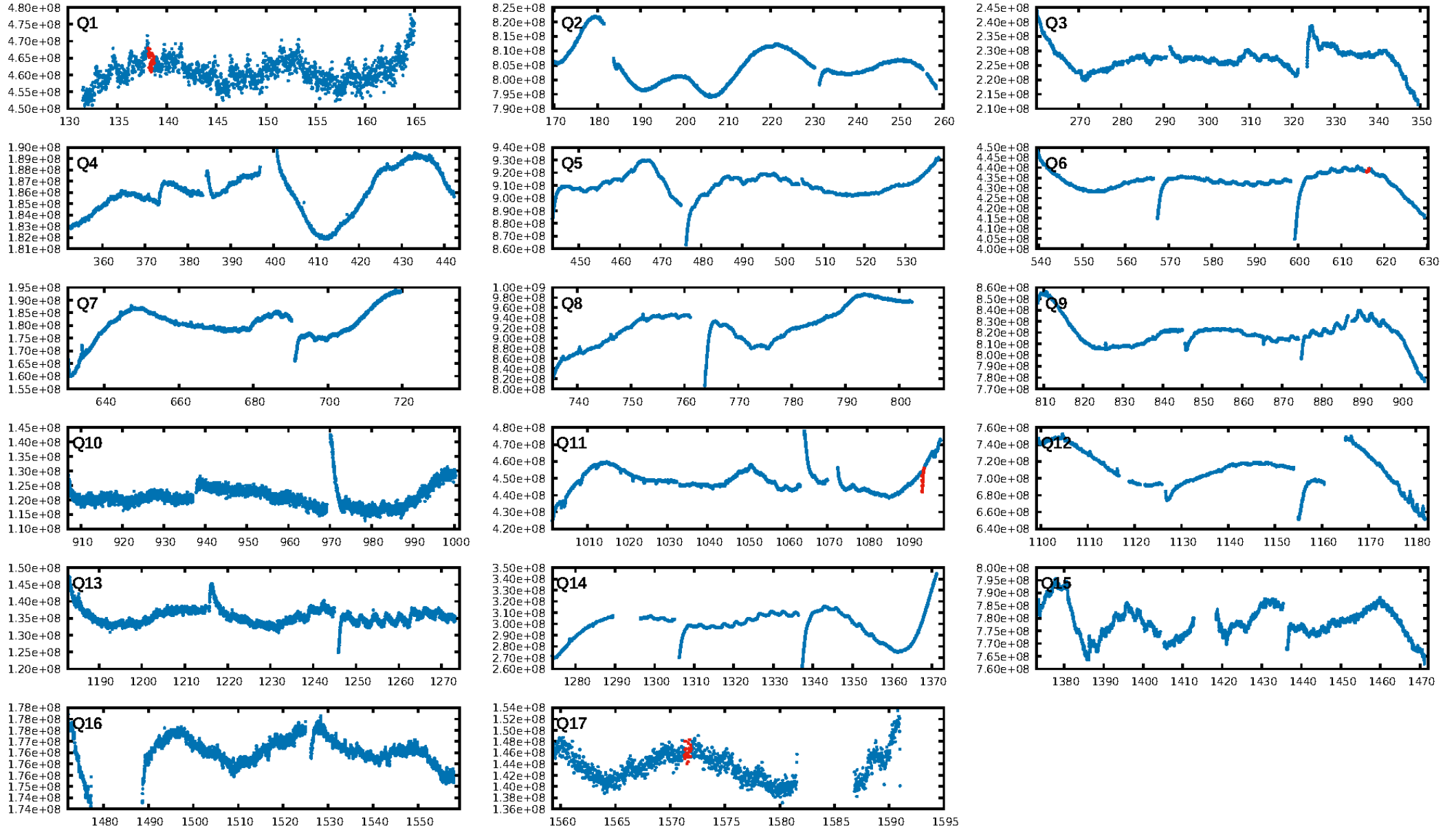
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [105.74σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: -12.3
Centroid-sig: 20.9%
Centroid-so: 0.124 arcsec [1.64σ]
OotOffset-rm: 1.529 arcsec [1.11σ]
KicOffset-rm: 1.278 arcsec [0.93σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [3/3]

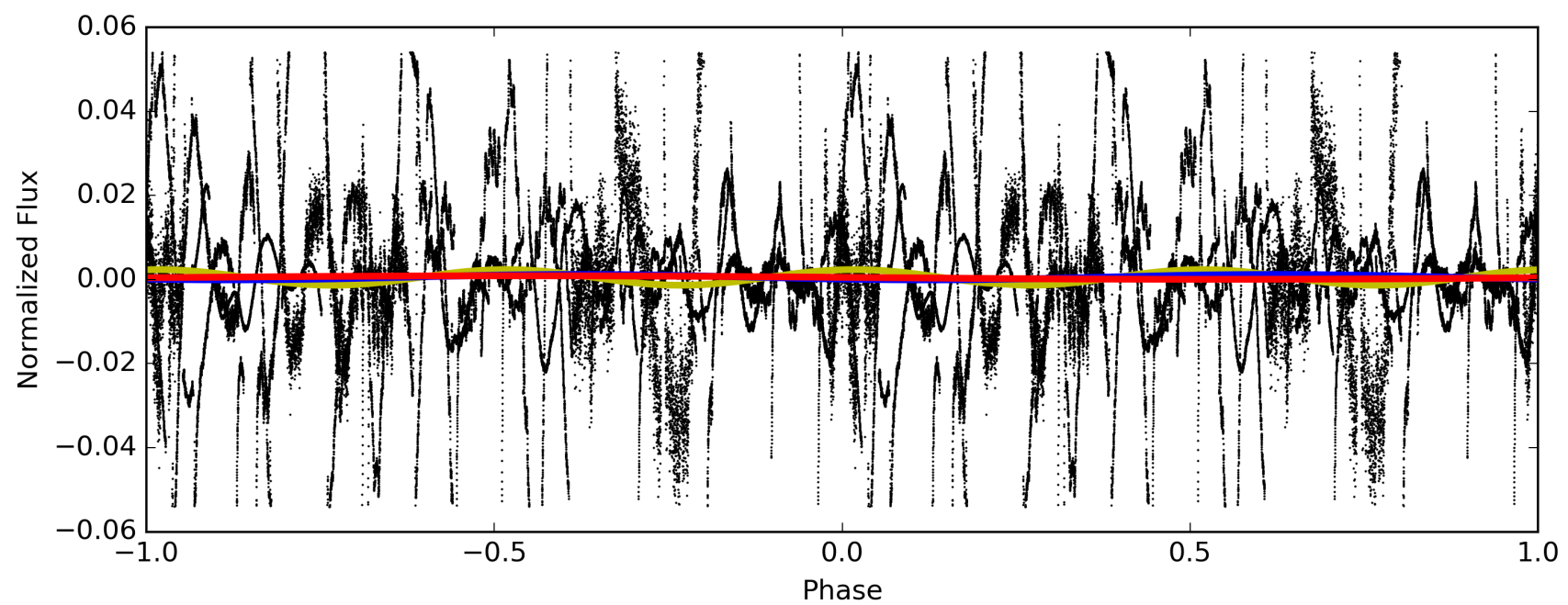
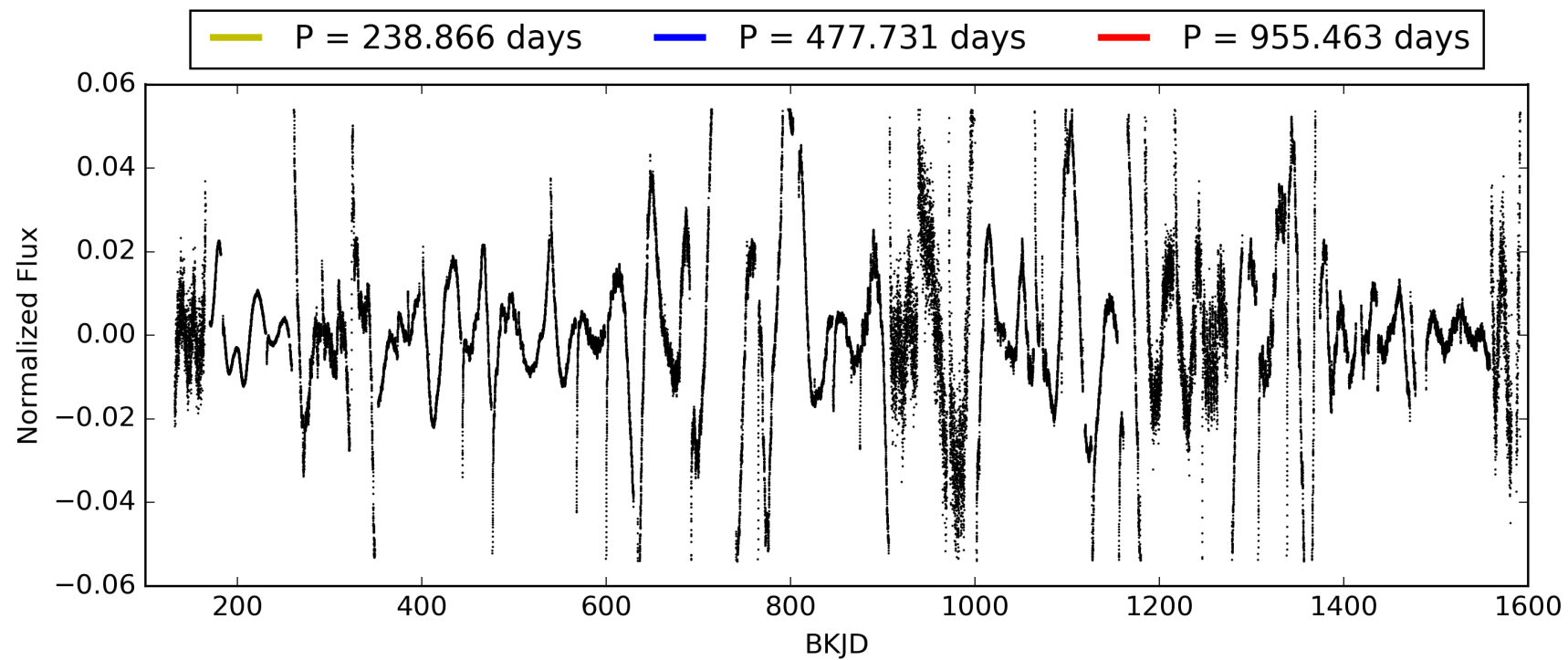
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 005870047-01, PDC Light Curves

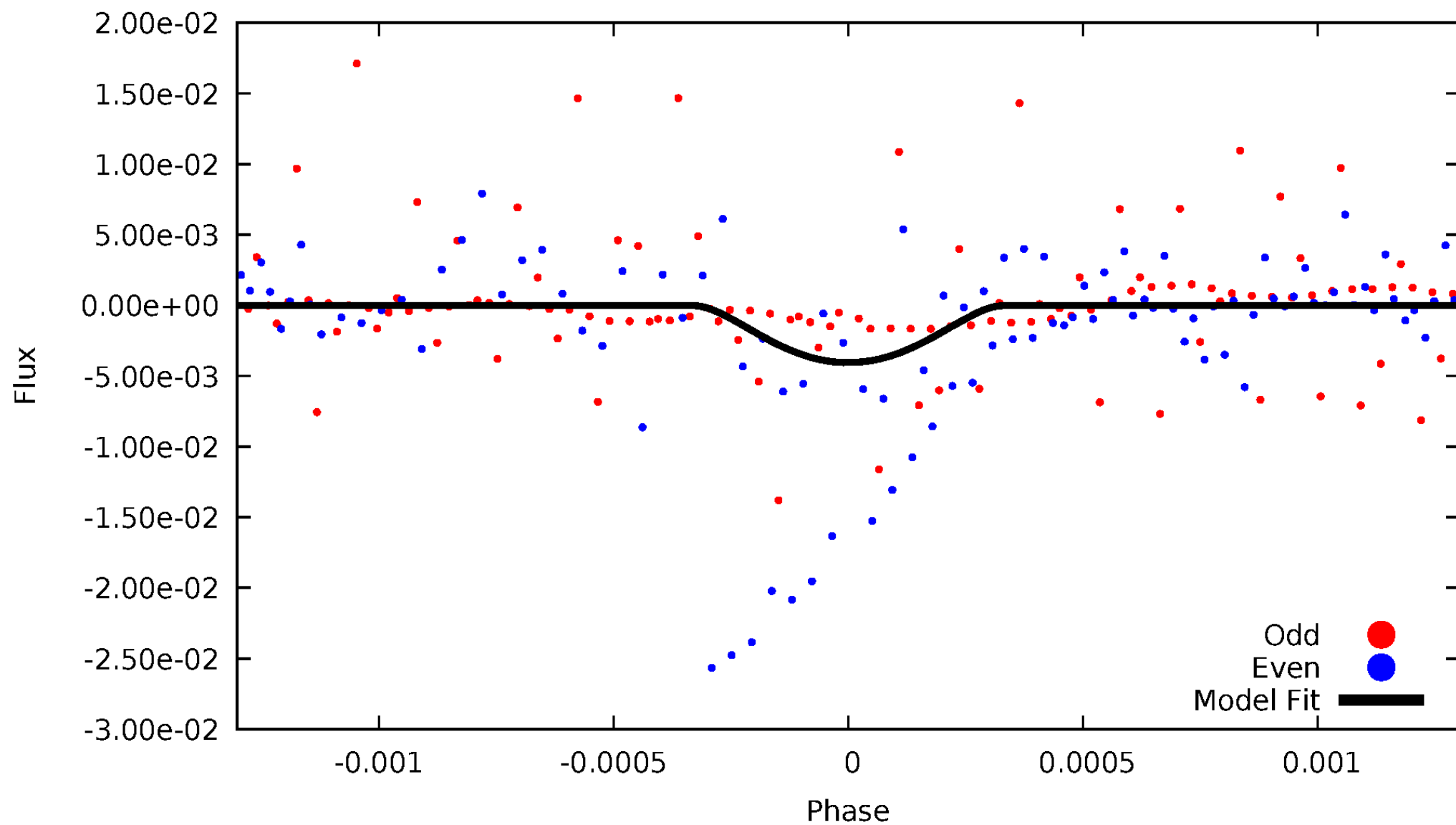


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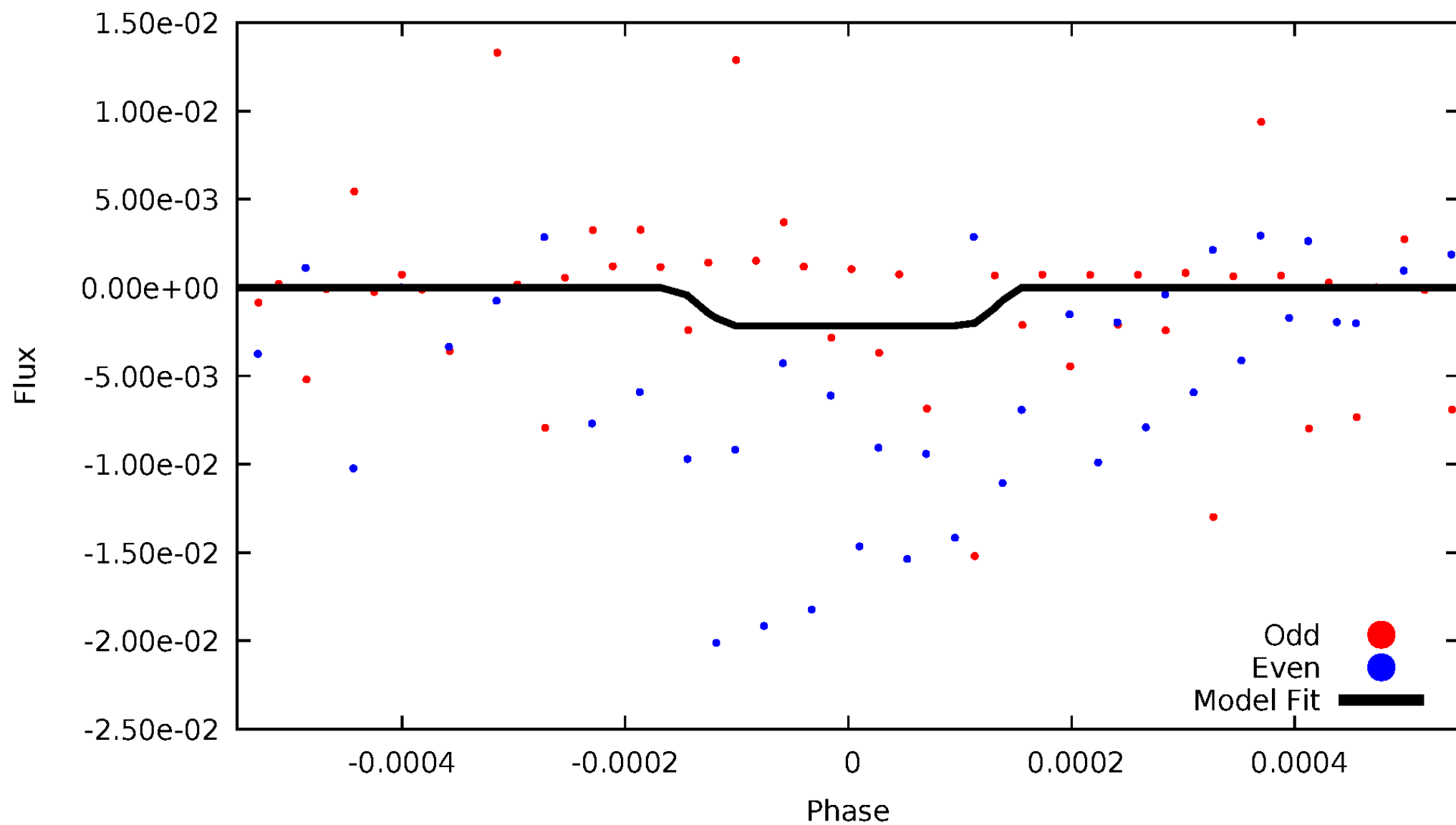
DV Odd/Even

TCE 005870047-01



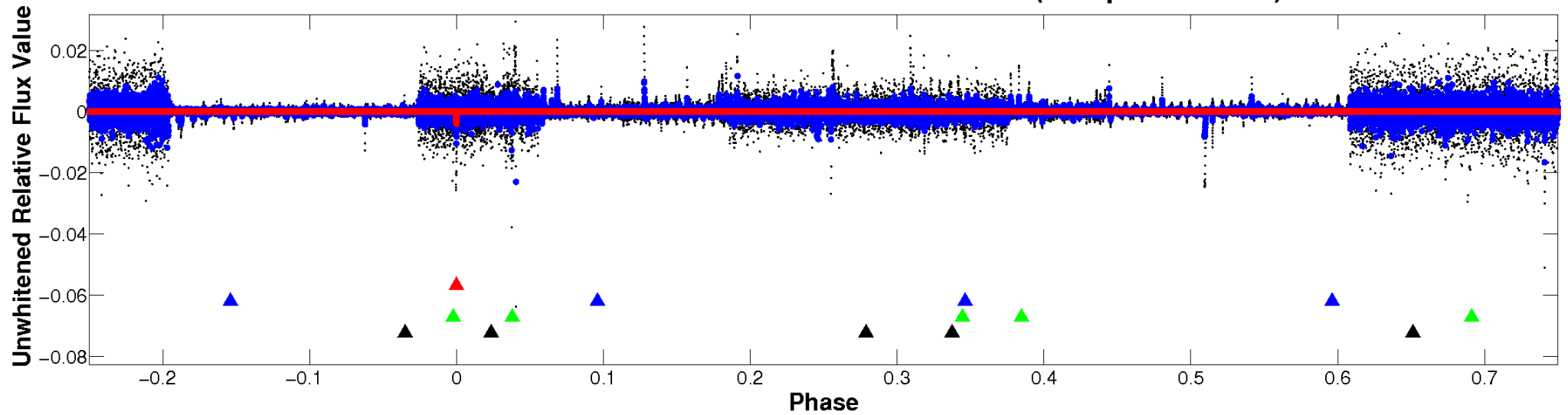
ALT Odd/Even

TCE 005870047-01

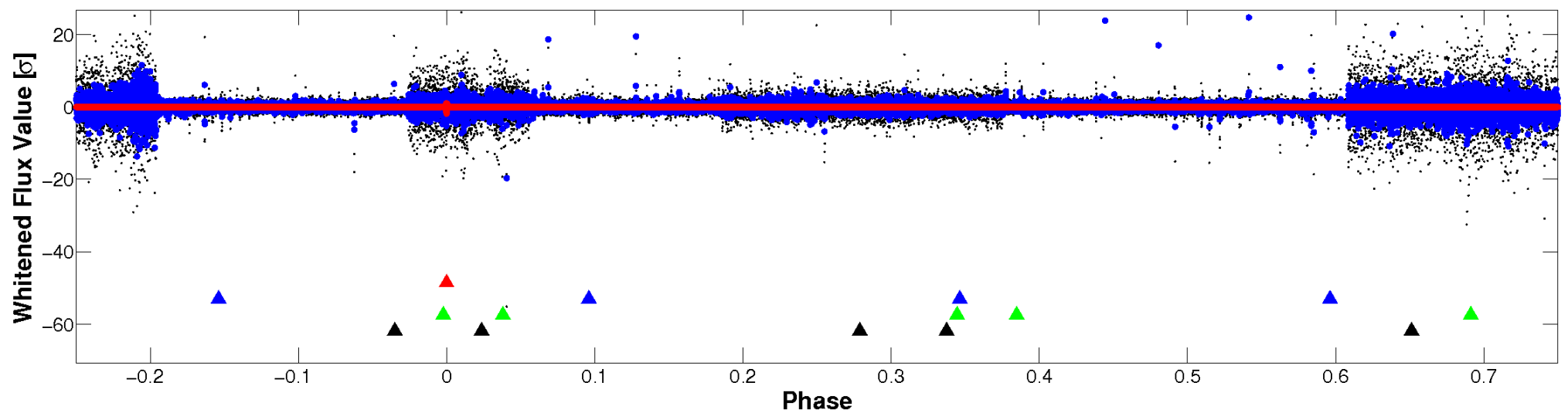


Non-Whitened Vs. Whitened Light Curve

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

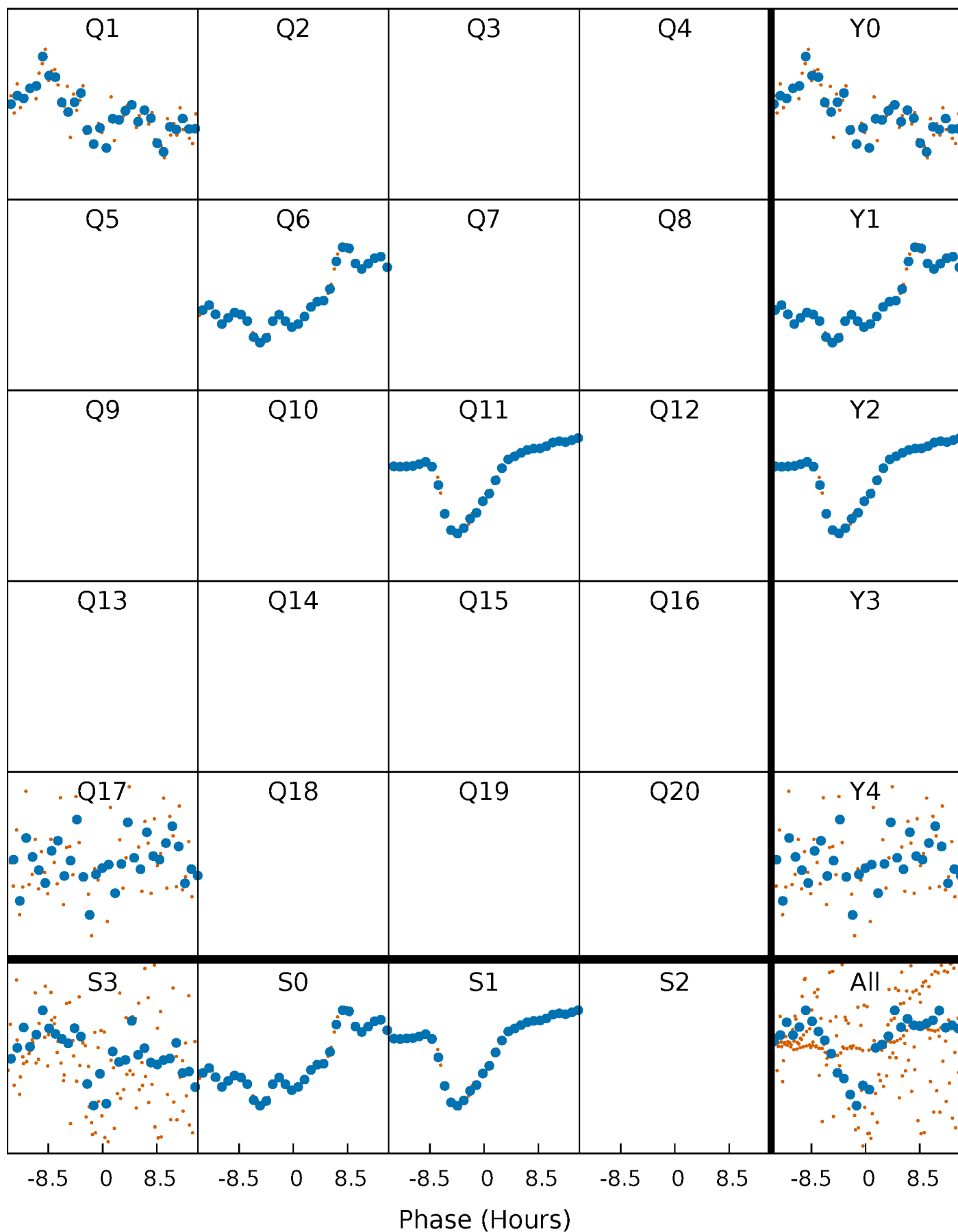


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



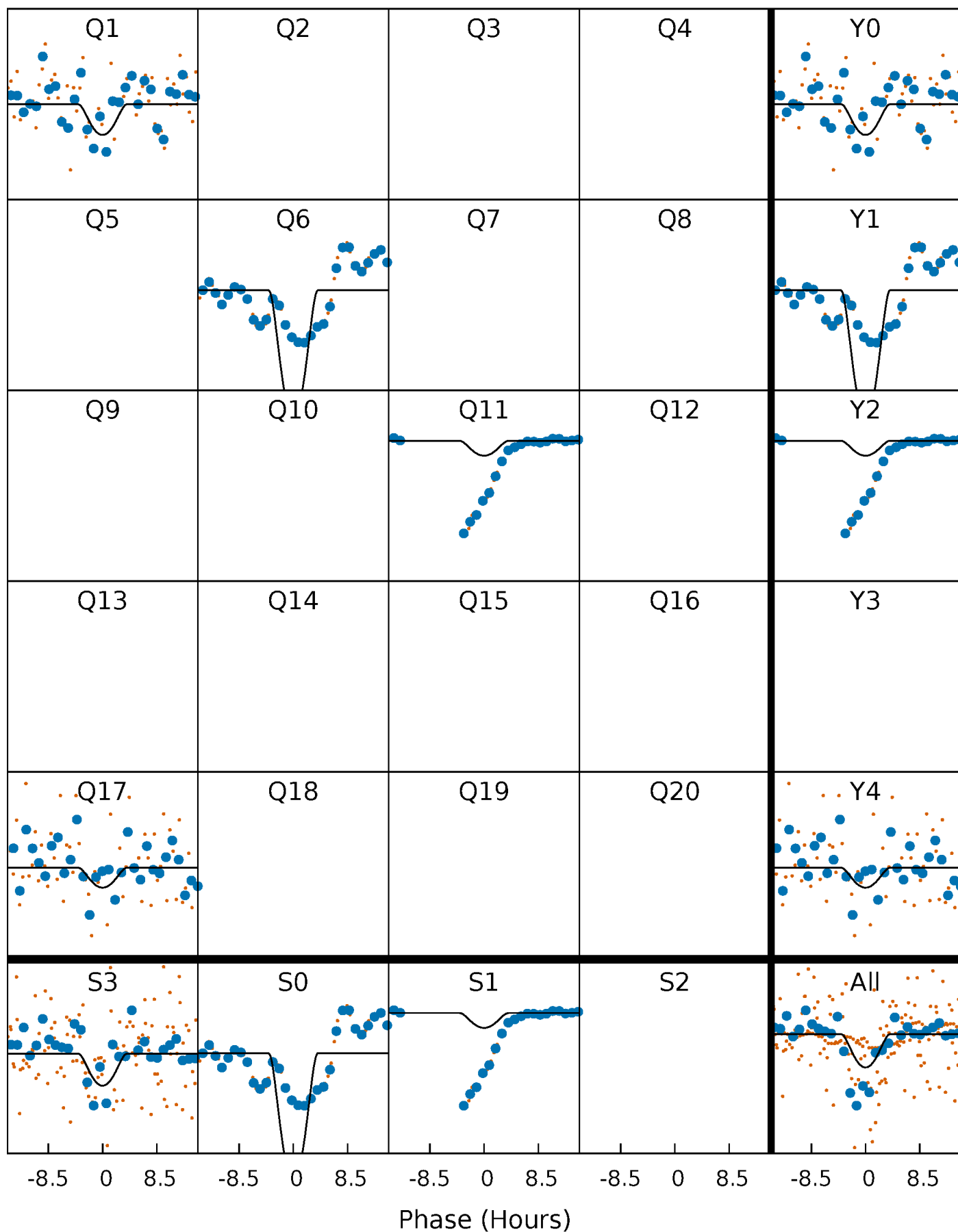
PDC Quarter-Phased Transit Curves

TCE 005870047-01 P=477.731463 Days $T_0=138.404144$ (BKJD)



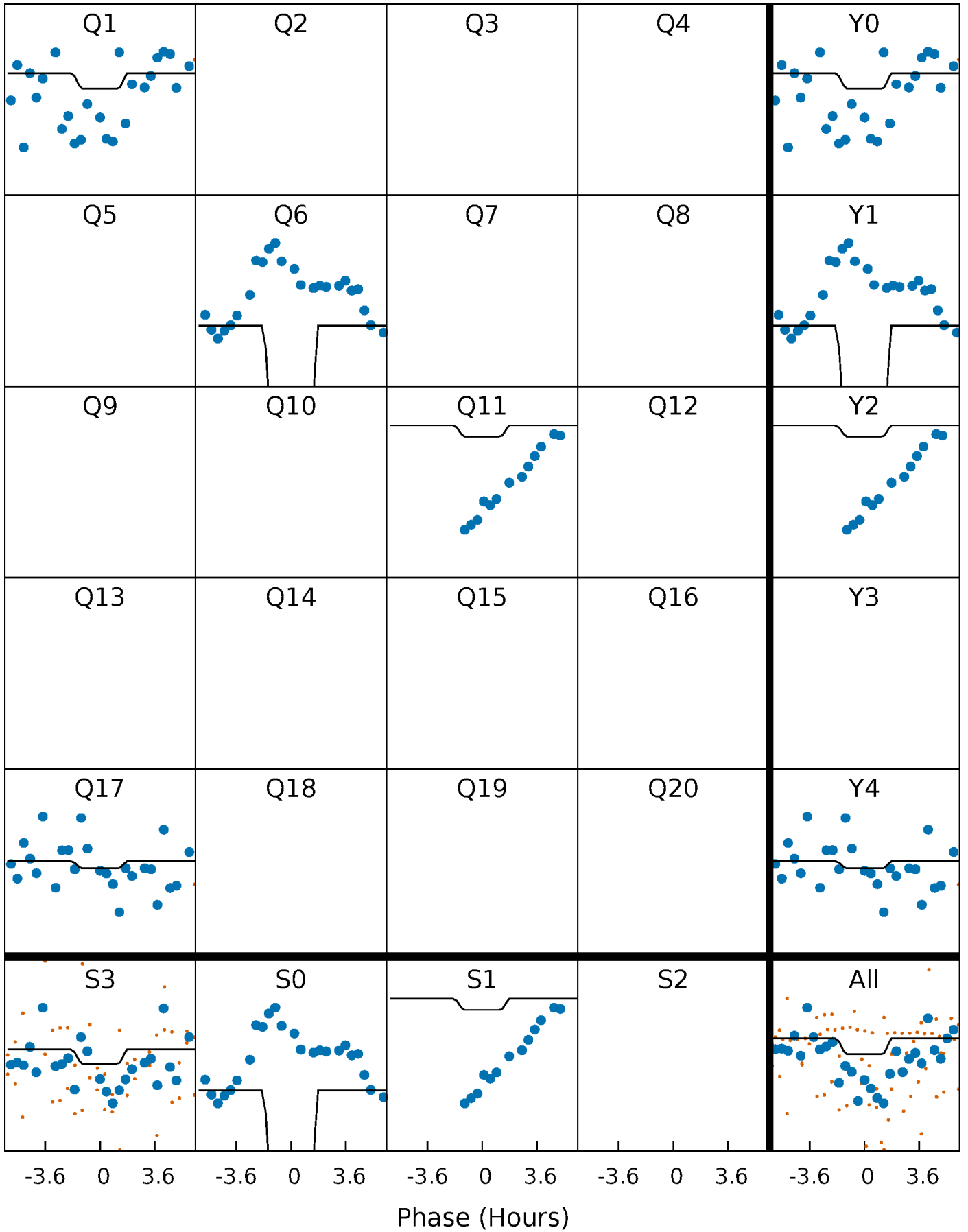
DV Quarter-Phased Transit Curves

TCE 005870047-01 P=477.731463 Days $T_0=138.404144$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

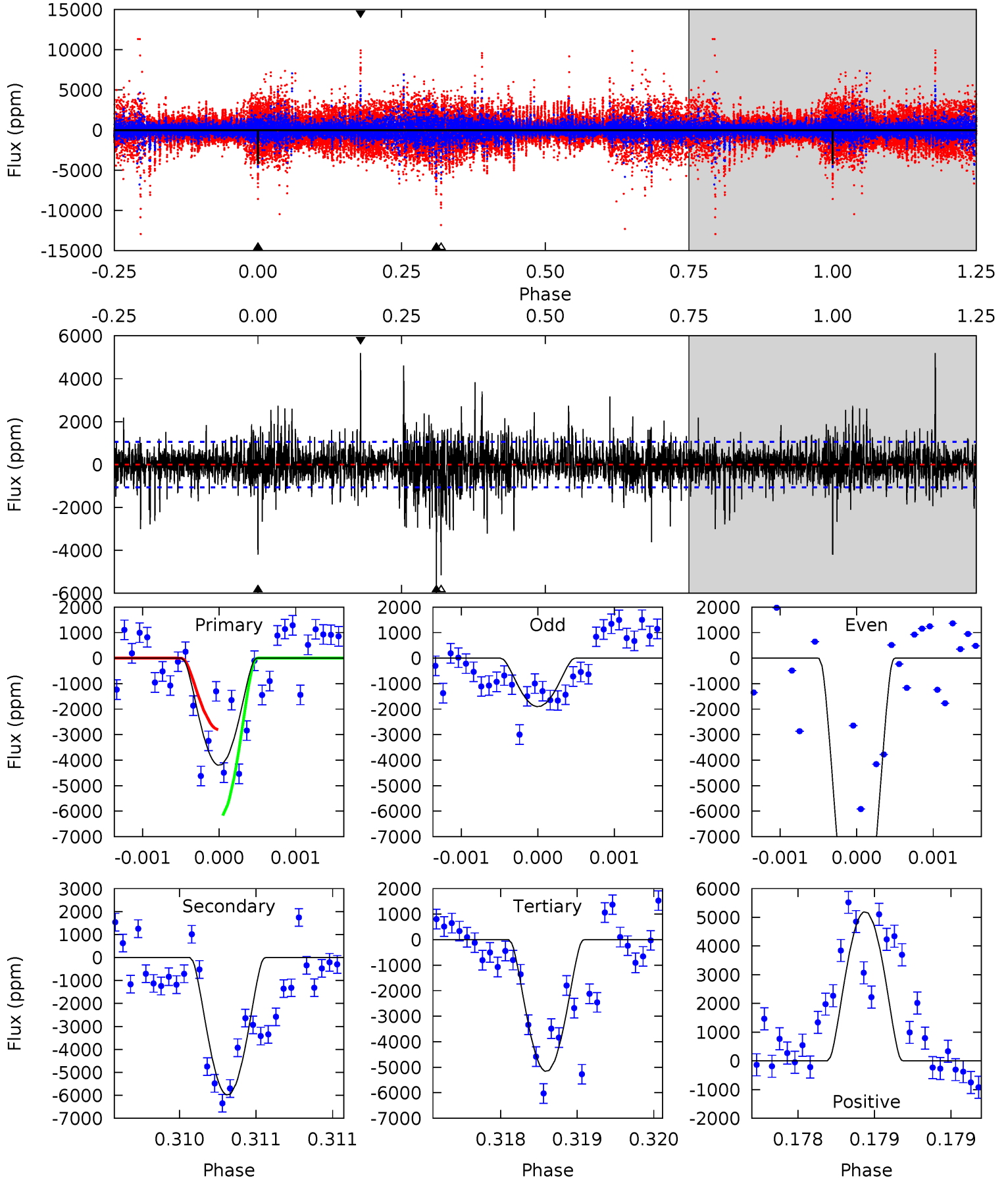
TCE 005870047-01 P=477.688955 Days $T_0=138.406538$ (BKJD)



DV Model-Shift Uniqueness Test

005870047-01, P = 477.731463 Days, E = 138.404144 Days

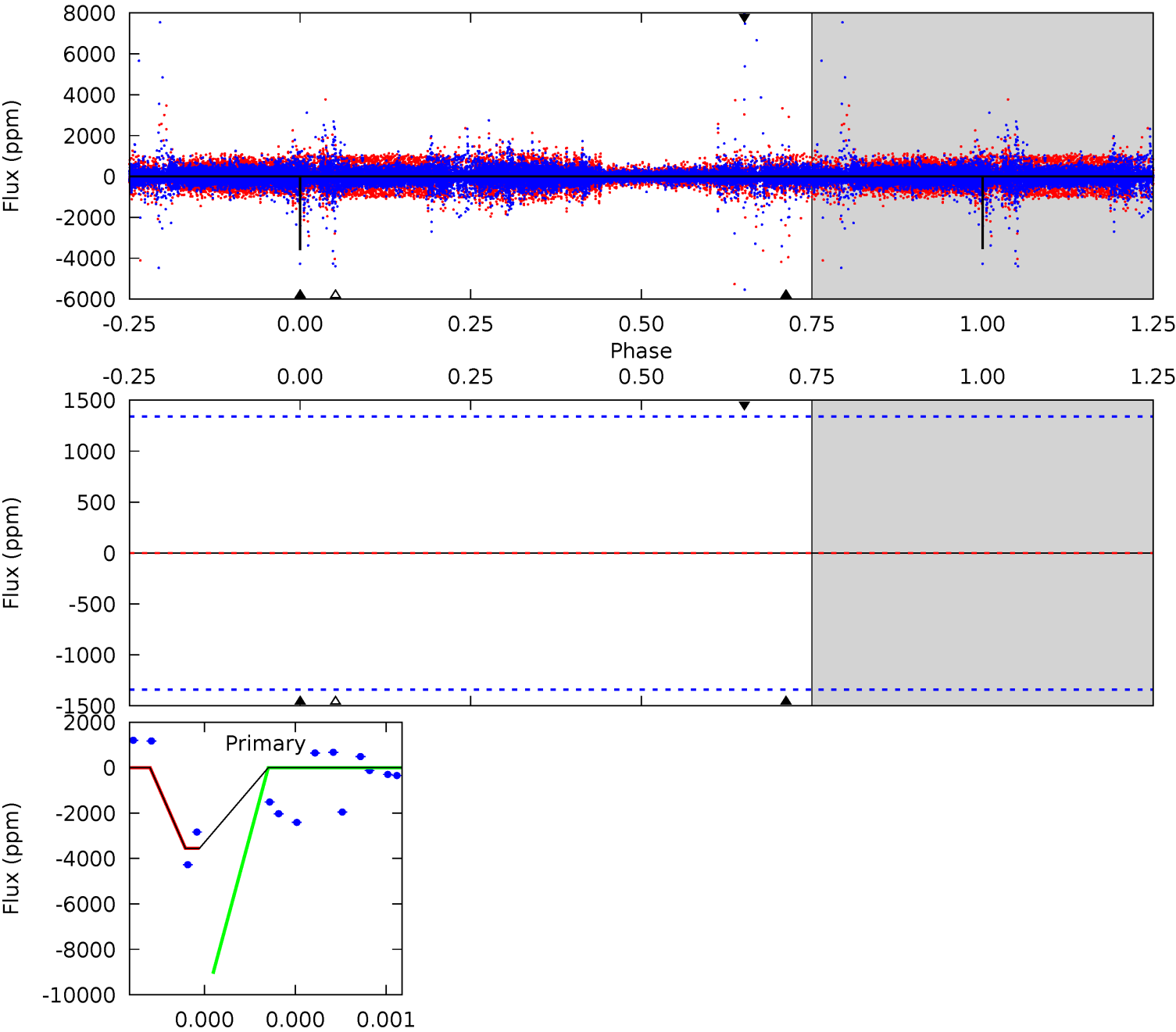
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.8	31.1	26.8	27.0	5.52	3.40	3.57	-5.00	-5.16	4.29	4.13	18.5	2.02	0.46	8.34



Alt Model-Shift Uniqueness Test

005870047-01, P = 477.688955 Days, E = 138.406538 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	5.67	3.63	0	0	0	0	0	21.5	1.49	0	13.2



Stellar Parameters For KIC 005870047

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3262^{+117}_{-78}	$0.102^{+0.195}_{-0.065}$	$-0.060^{+0.250}_{-0.150}$	$155.634^{+7.354}_{-27.576}$	$1.118^{+0.207}_{-0.128}$	$0.000^{+0.000}_{-0.000}$
	+4%/-2%	+191%/-64%	+417%/-250%	+5%/-18%	+19%/-11%	+88%/-15%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 005870047-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-5982 ± 192	$2023.65^{+1716.09}_{-1306.37}$	2226^{+98}_{-108}	2771^{+1185}_{-718}	$1.268^{+9.047}_{-0.891}$
Alt.	-0 ± 236	$1554.32^{+1607.25}_{-1084.22}$	2222^{+101}_{-109}	-2392^{+169}_{-183}	$0.000^{+0.123}_{-0.206}$

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 $A_{obs} \gg 1.0$

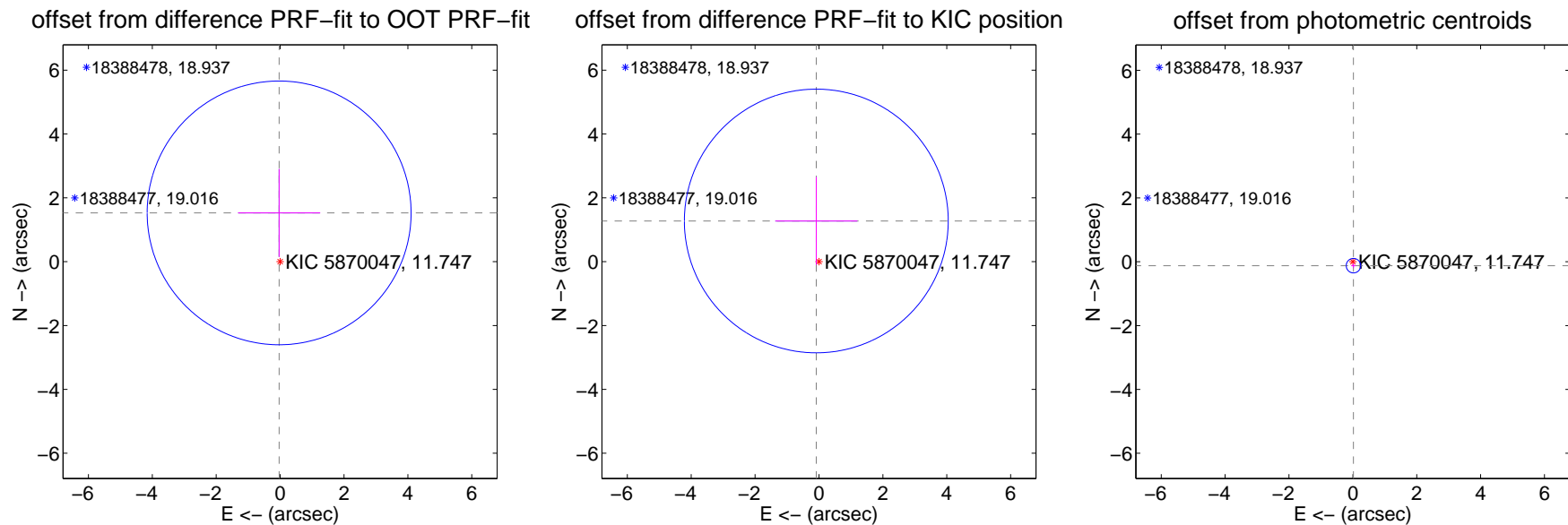
DV Centroid Data

Supplemental centroid analysis for 005870047-01. **Kepler magnitude: 11.75.** Transit SNR 9.37

There are 1 quarters with good PRF difference image offsets

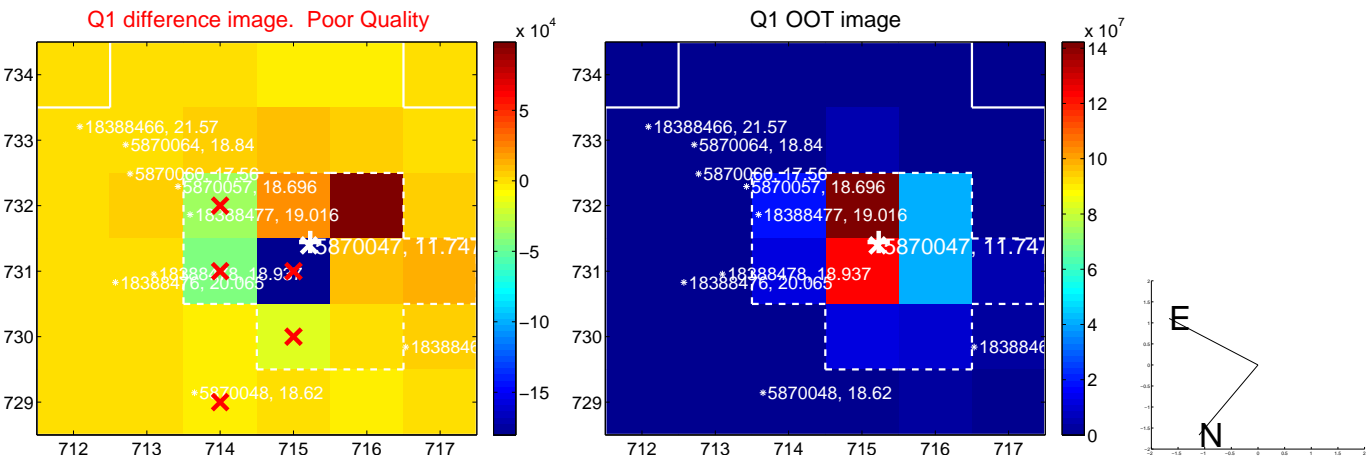
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.529 ± 1.377	1.11	0.031 ± 1.284	1.529 ± 1.377
PRF-fit source offset from KIC position	1.278 ± 1.377	0.93	0.084 ± 1.284	1.275 ± 1.377
photometric centroid source offset	0.12 ± 0.08	1.64	-0.02 ± 0.07	-0.12 ± 0.08

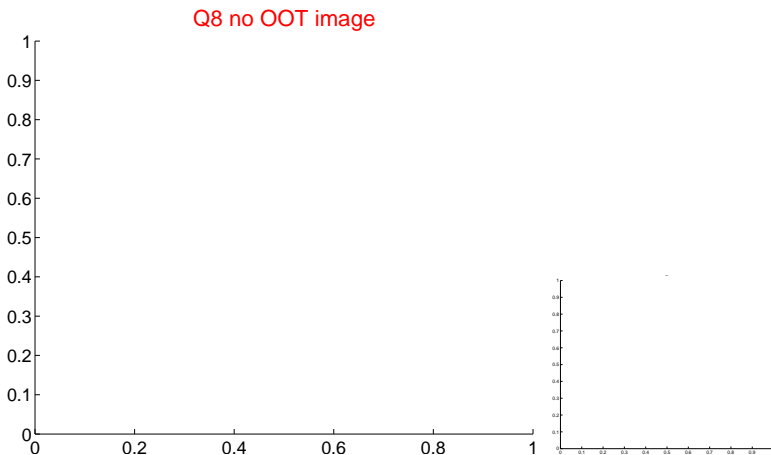
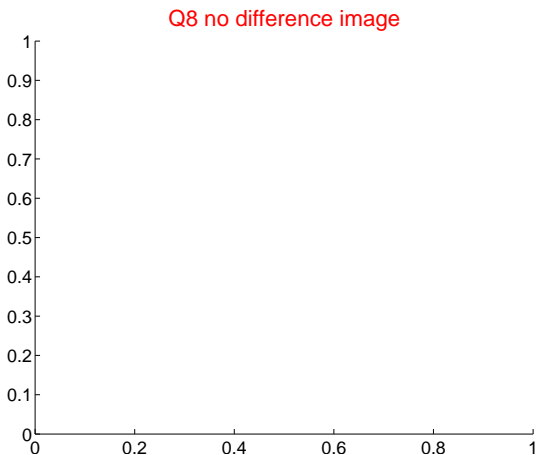
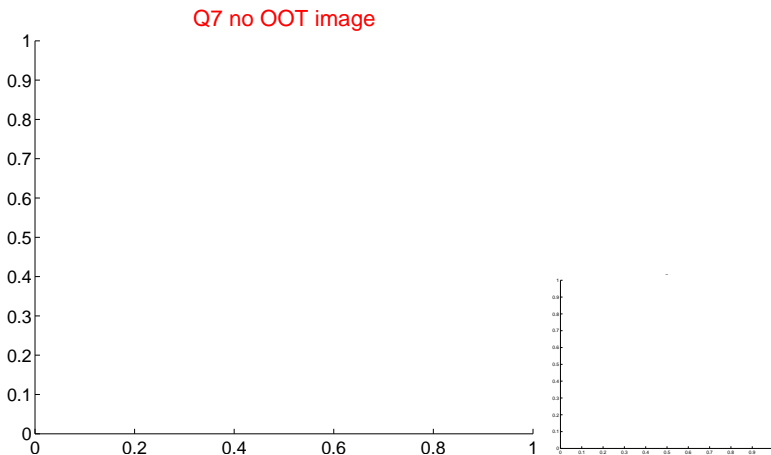
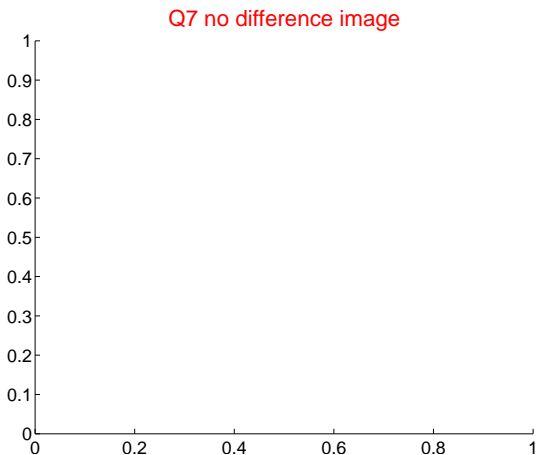
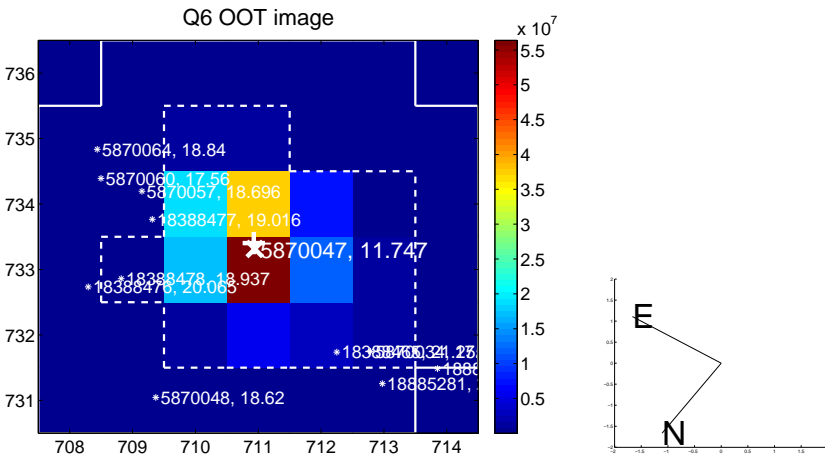
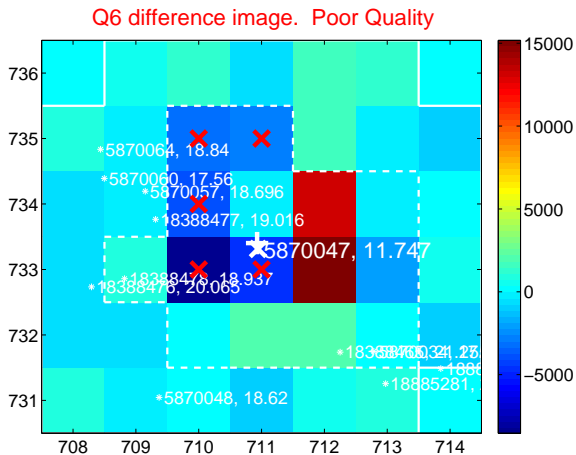
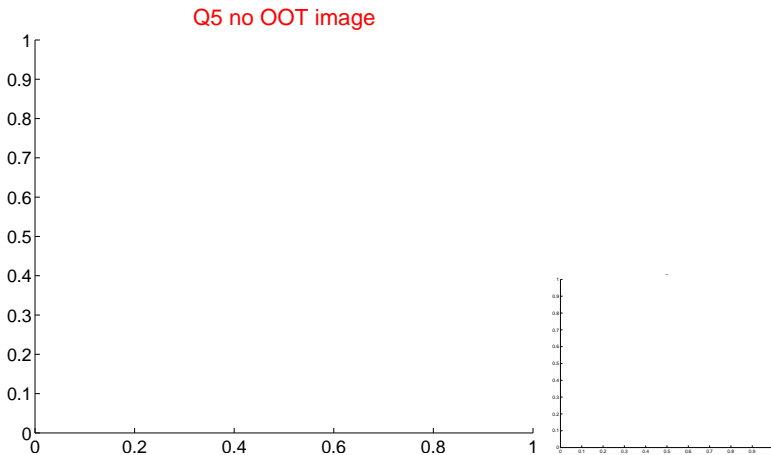
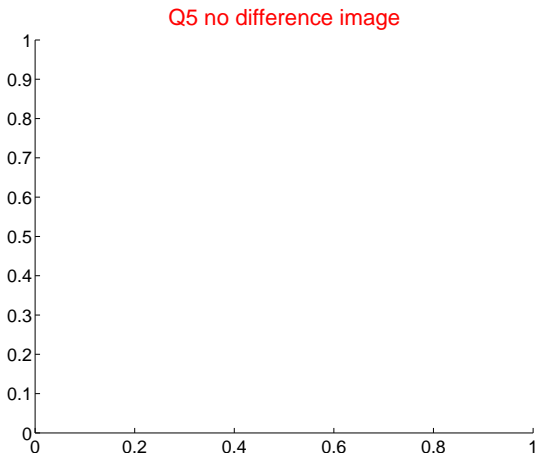


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



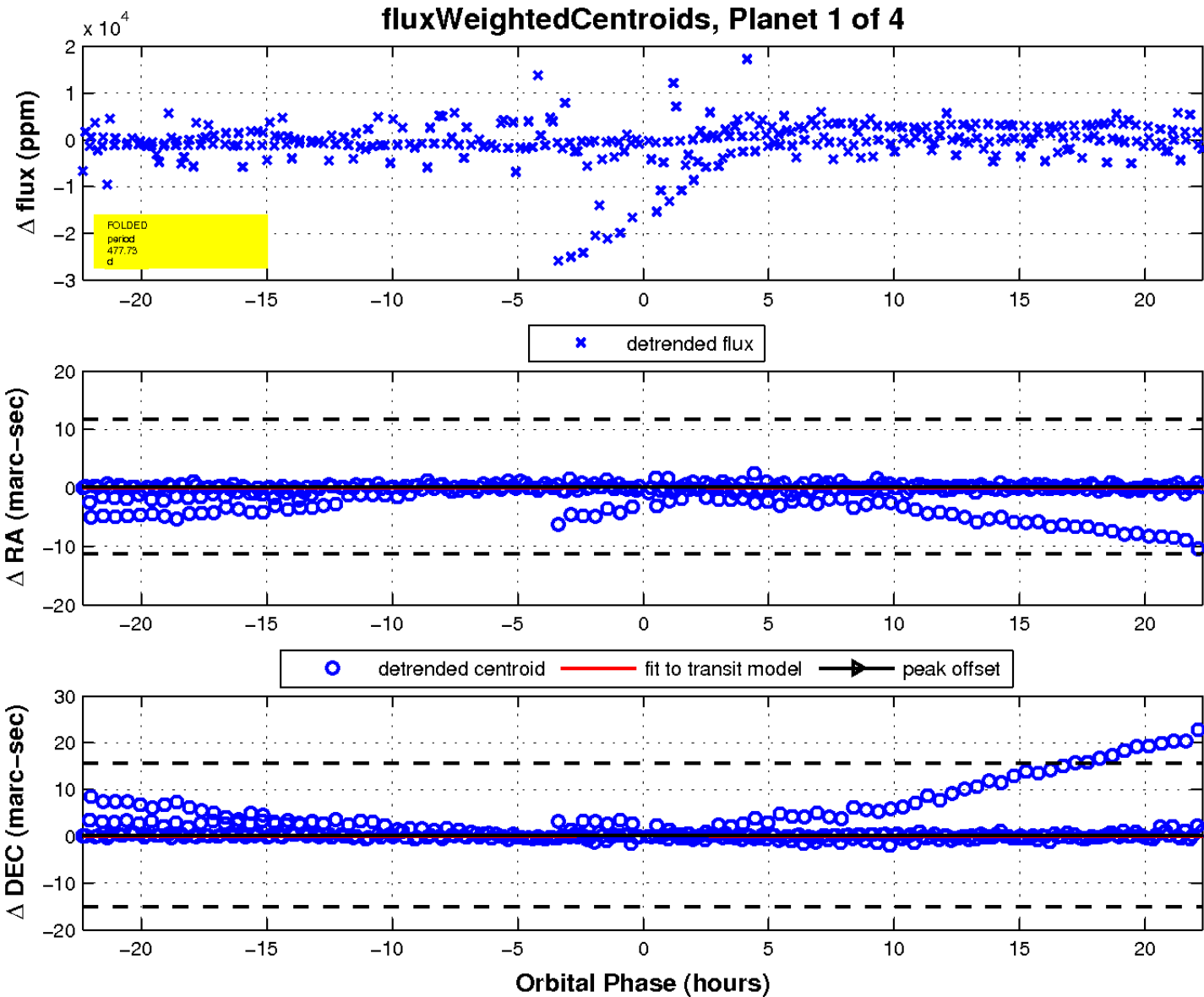
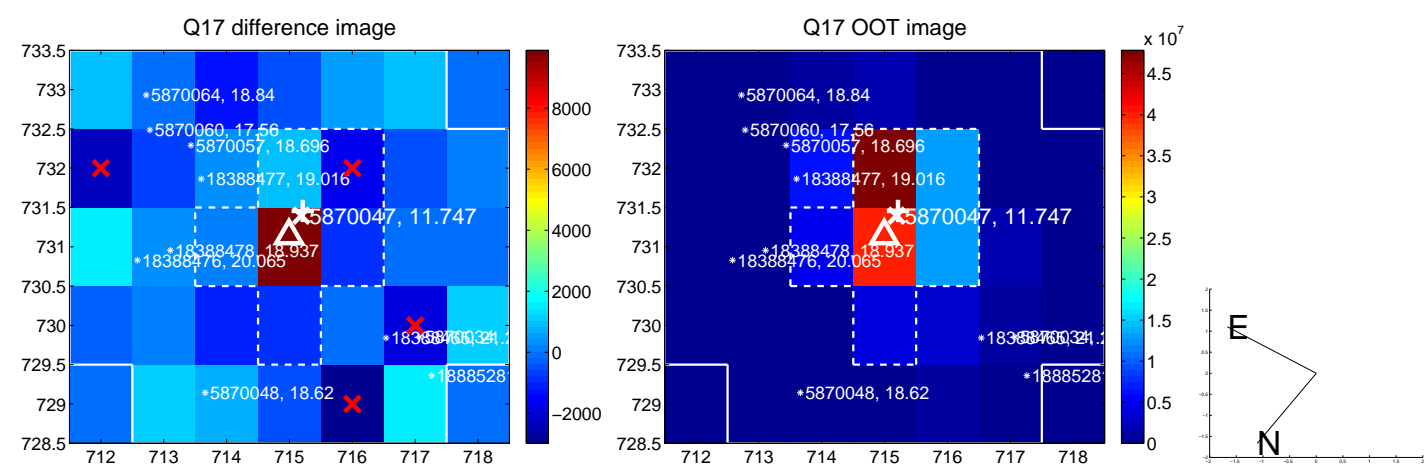
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



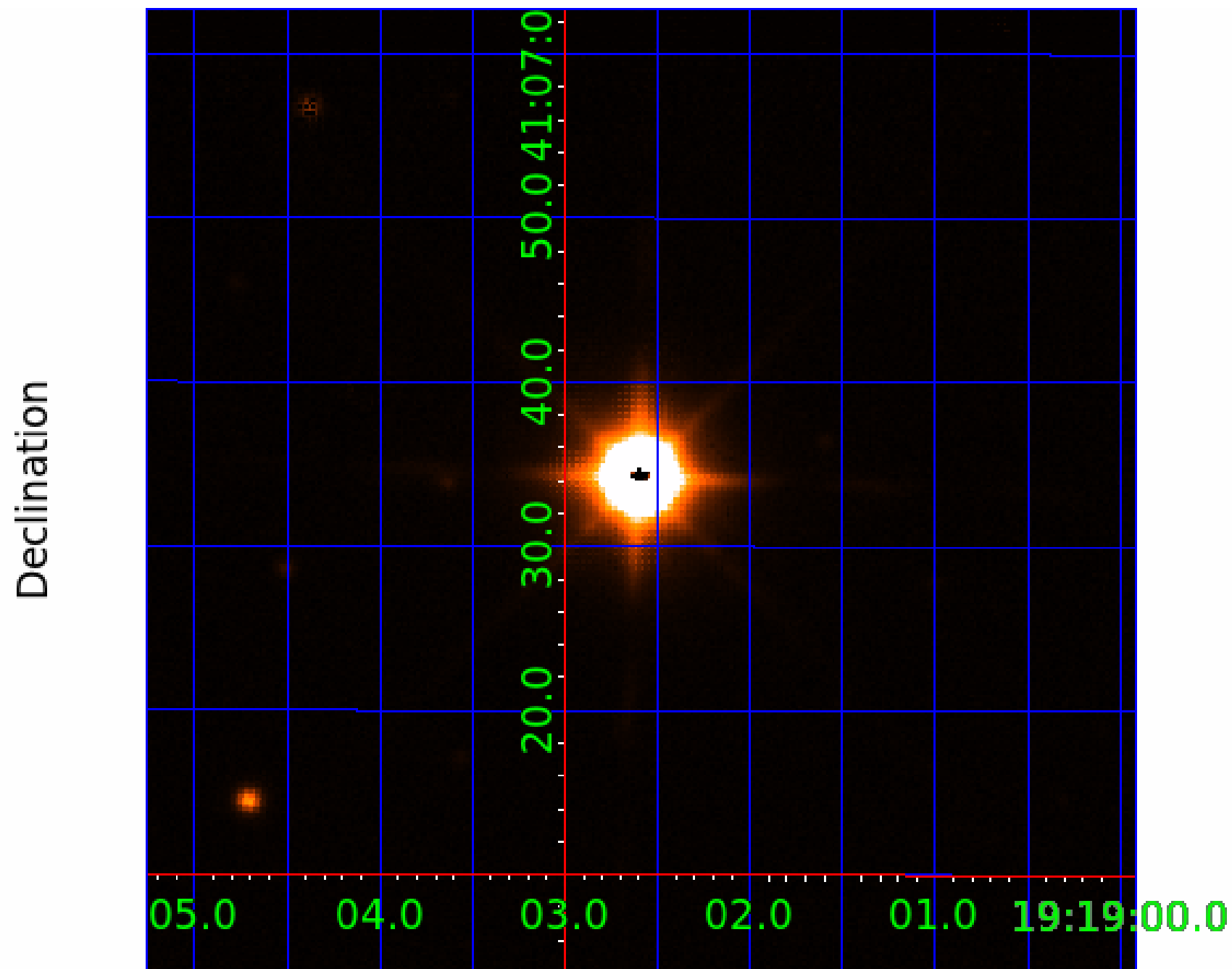
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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UKIRT Image



KIC 005870047

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})
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005870047-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005870047-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005870047-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
005870047-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

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

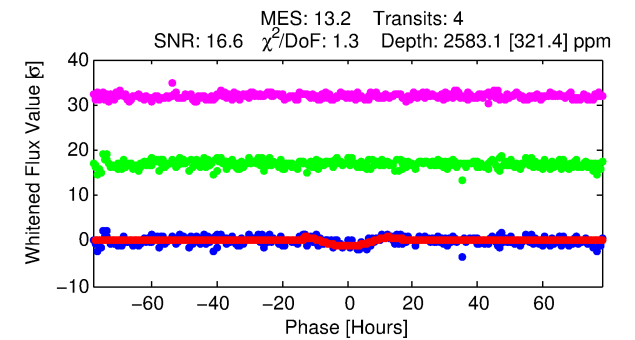
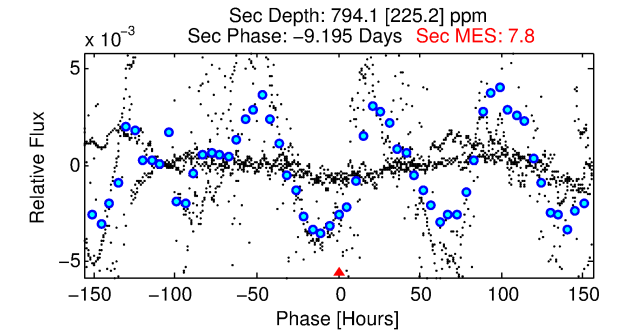
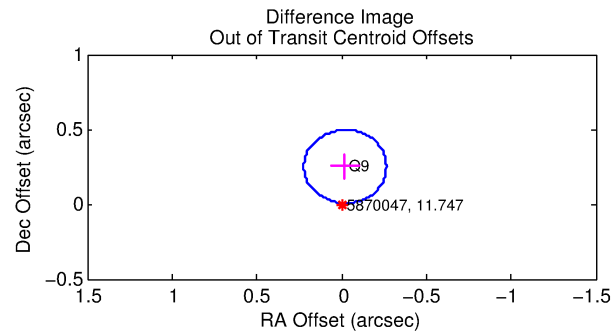
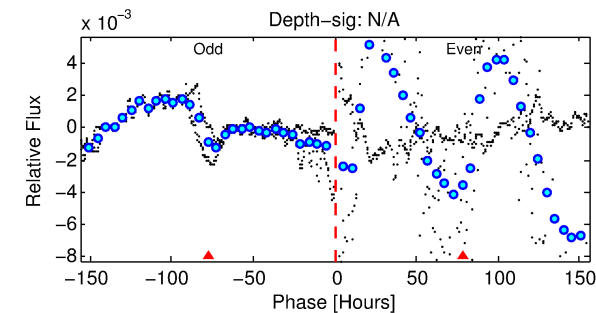
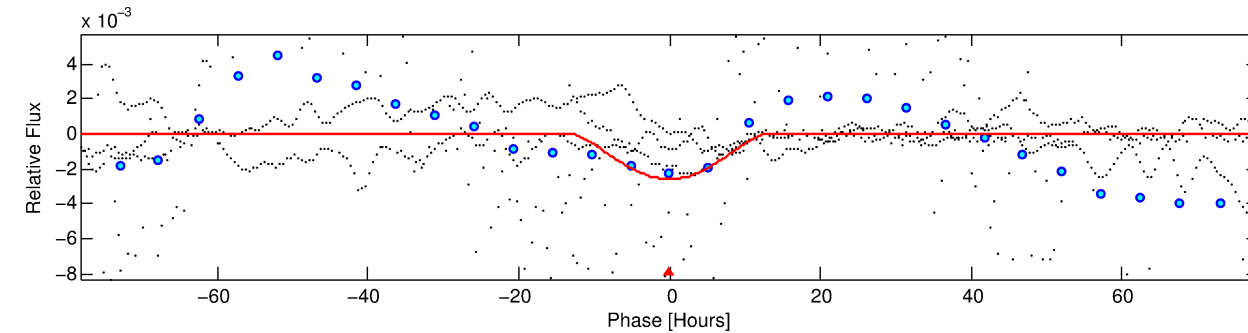
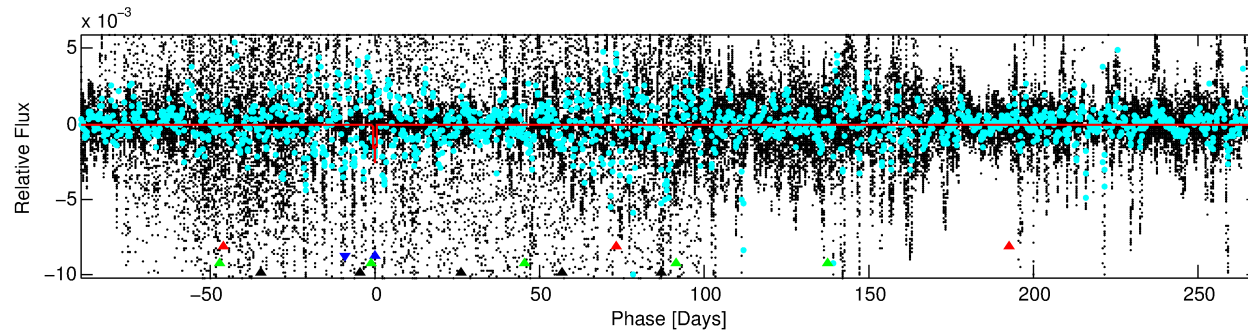
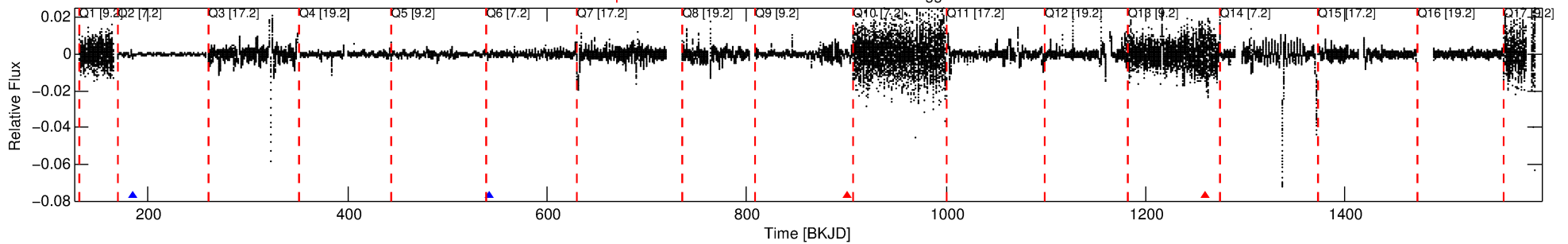
Ephemeris Match Information For 005870047-02

No Significant Match Found

DV One-Page Summary

KIC: 5870047 Candidate: 2 of 4 Period: 358.352 d

Kp: 11.75 R*: 155.63 Rs Teff: 3262.0 K Logg: 0.10 Fe/H: -0.060



DV Fit Results:

Period = 358.35188 [0.02528] d
Epoch = 184.2739 [0.0150] BKJD
Rp/R* = 0.0972 [0.1392]
a/R* = 47.87 [12.37]
b = 1.00 [0.20]
Seff = 2339.66 [824.34]
Teq = 1773 [156] K
Rp = 1650.69 [2382.20] Re
a = 1.0248 [0.1954] AU
Ag = 0.17 [0.49] [-1.71σ]
Teffp = 1756 [1266] K [-0.01σ]

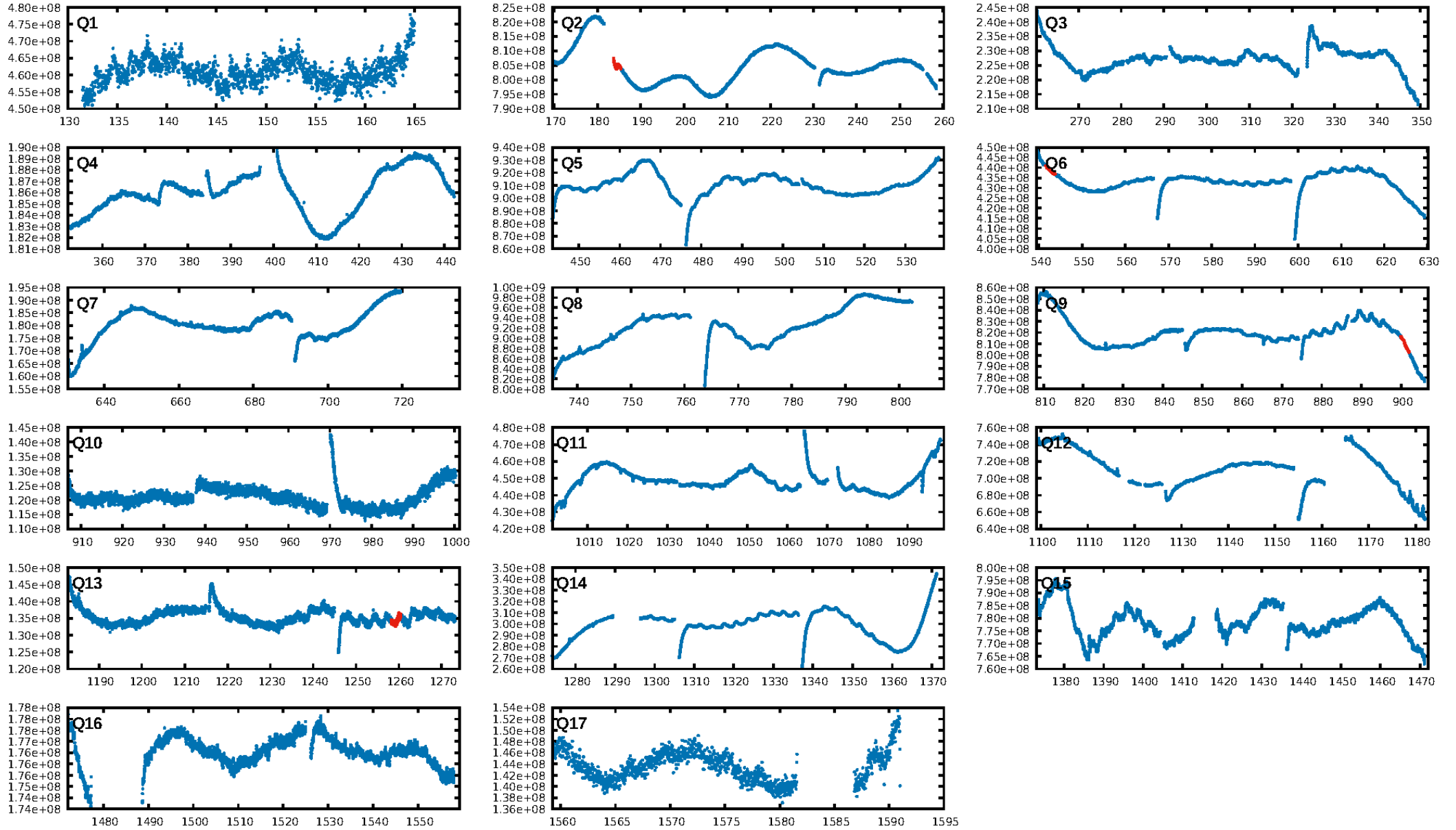
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [27.95σ]
LongPeriod-sig: 100.0% [105.74σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 83.9%
Bootstrap-pfa: N/A
RollingBand-fgt: 0.50 [2/4]
GhostDiagnostic-chr: -1.136
Centroid-sig: 9.9%
Centroid-so: 0.573 arcsec [1.37σ]
OotOffset-rm: 0.251 arcsec [3.09σ]
KicOffset-rm: 0.079 arcsec [0.97σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 0.67 [2/3]

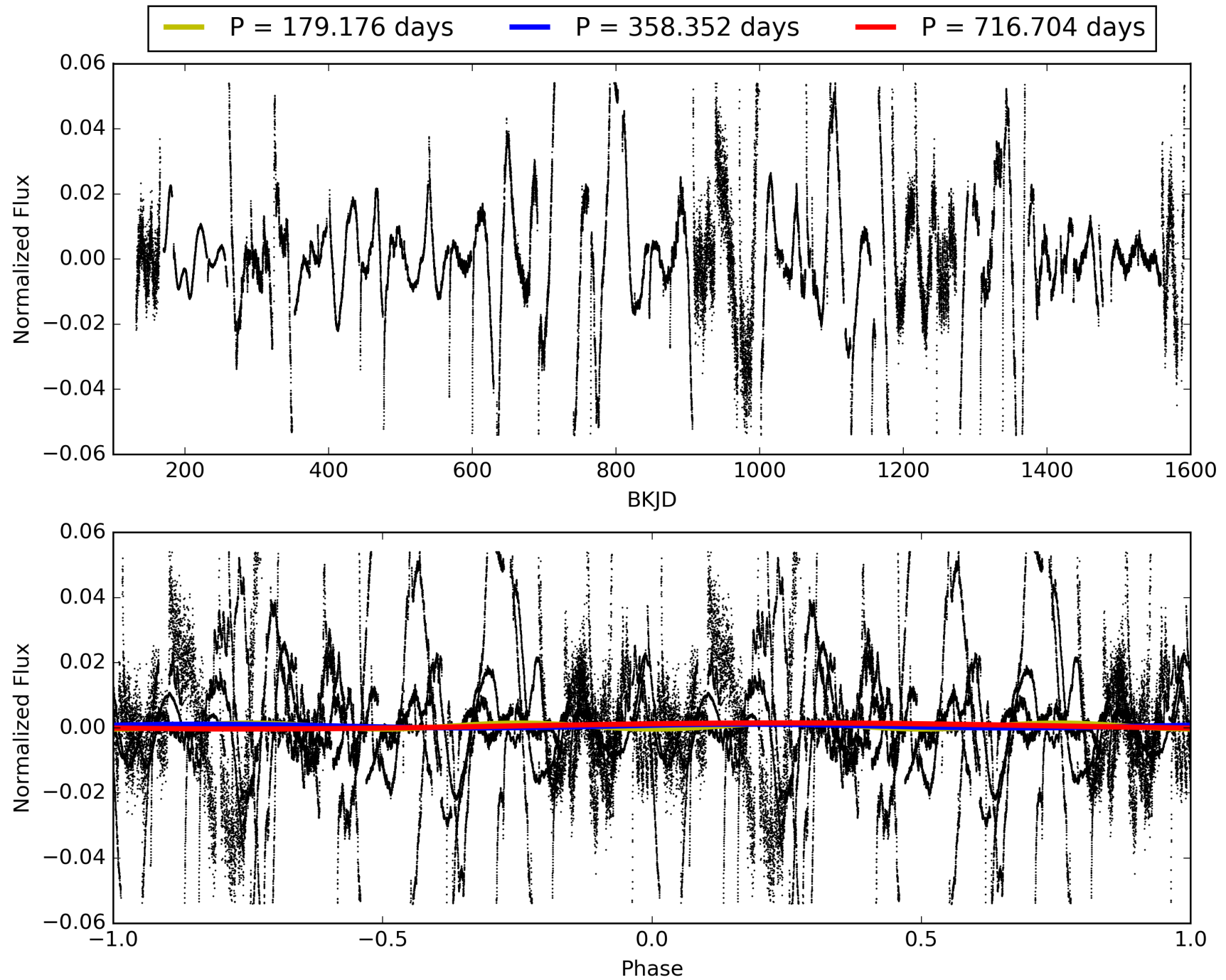
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:26:12 Z

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

TCE 005870047-02, PDC Light Curves

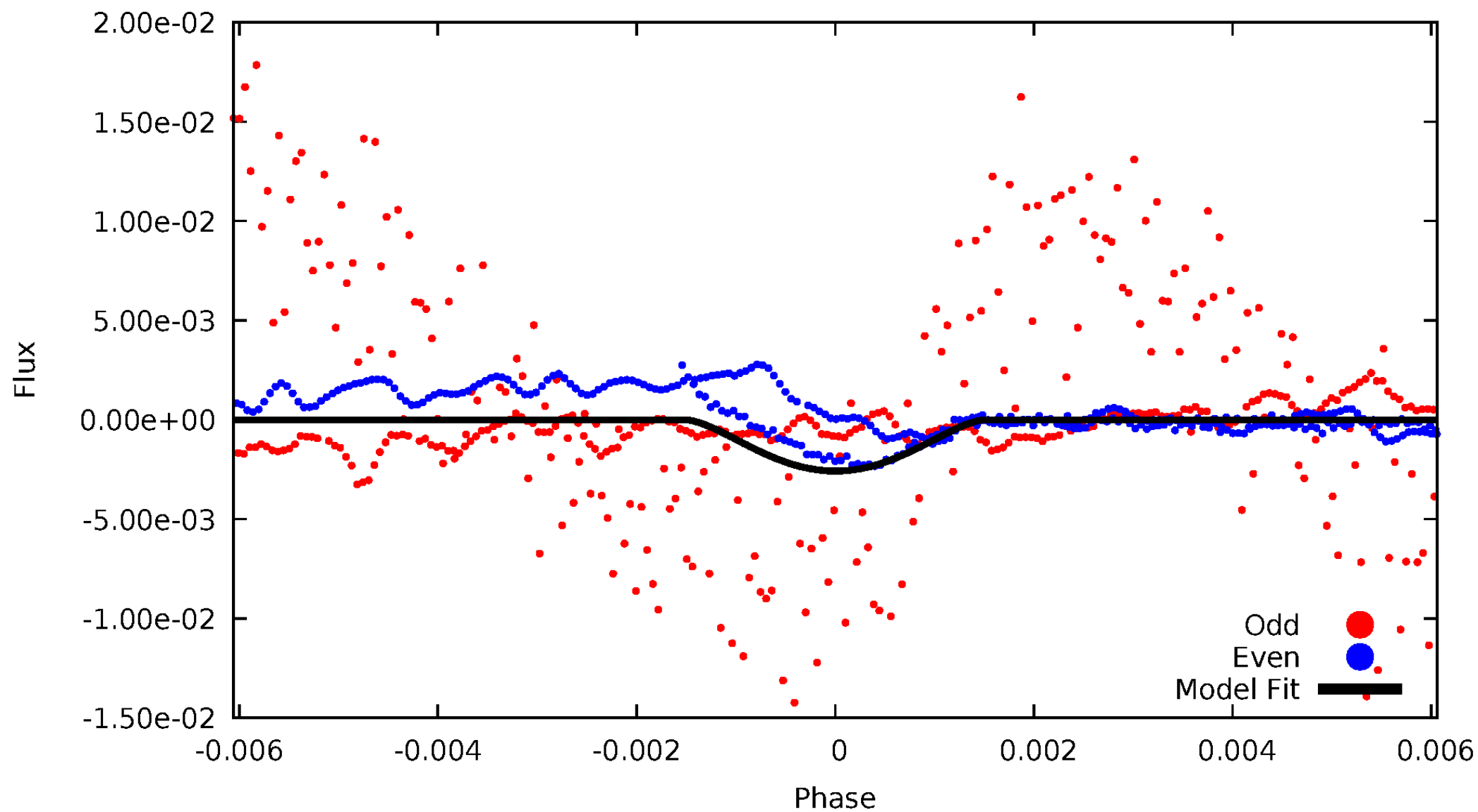


TCE 005870047-02



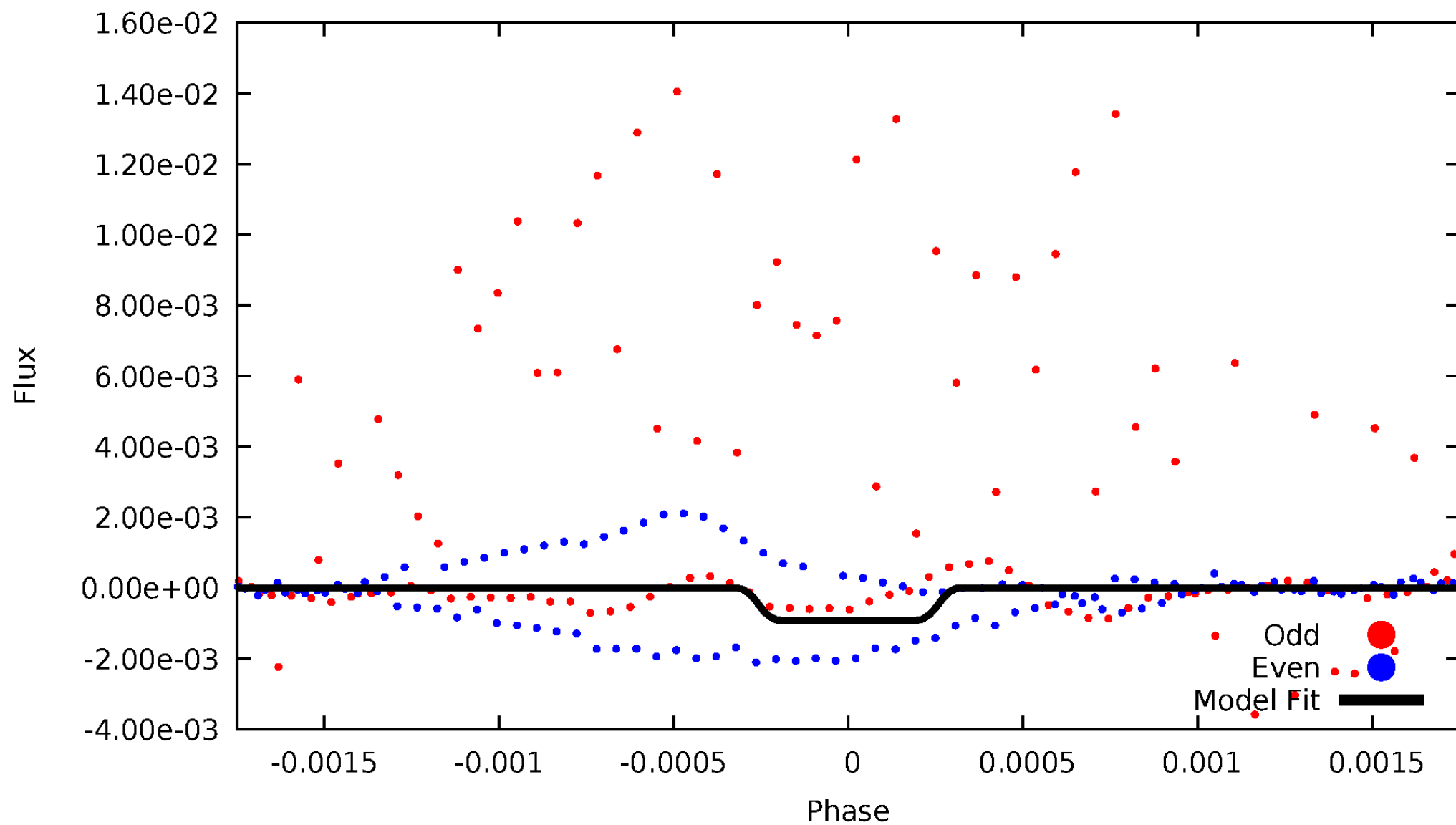
DV Odd/Even

TCE 005870047-02



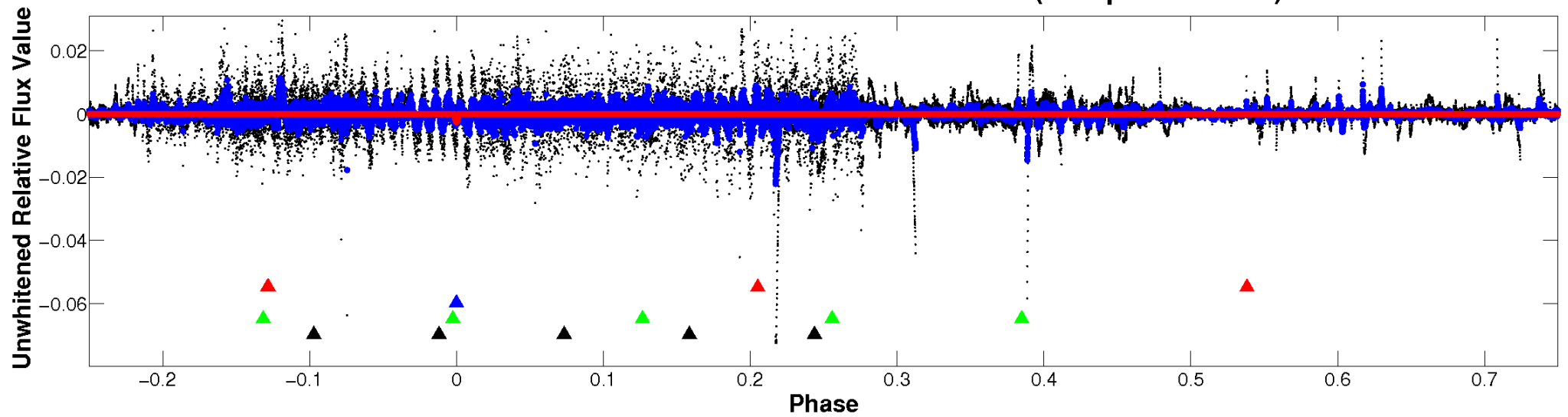
ALT Odd/Even

TCE 005870047-02

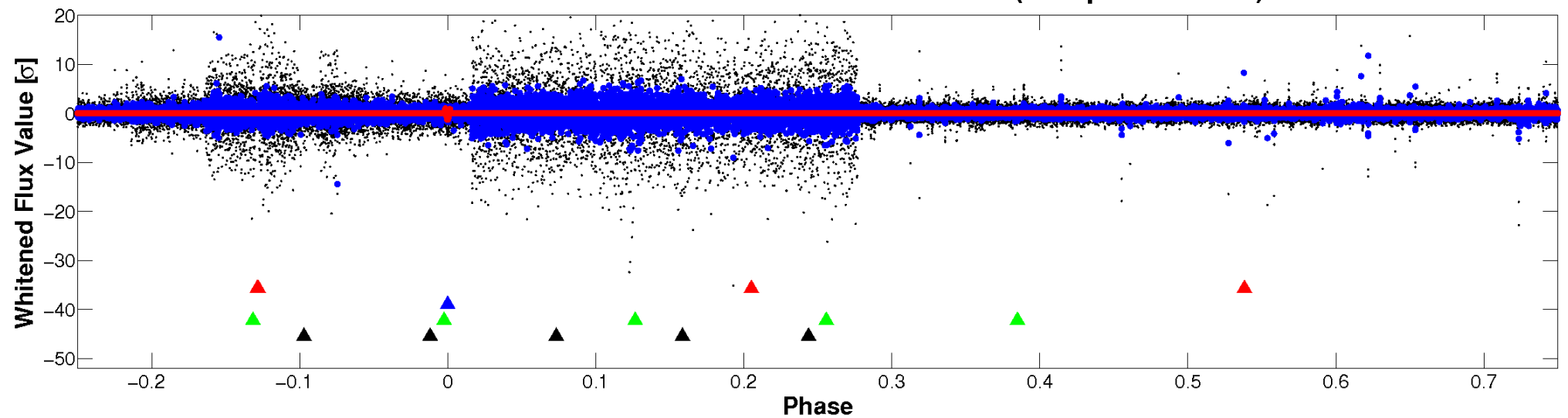


Non-Whitened Vs. Whitened Light Curve

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

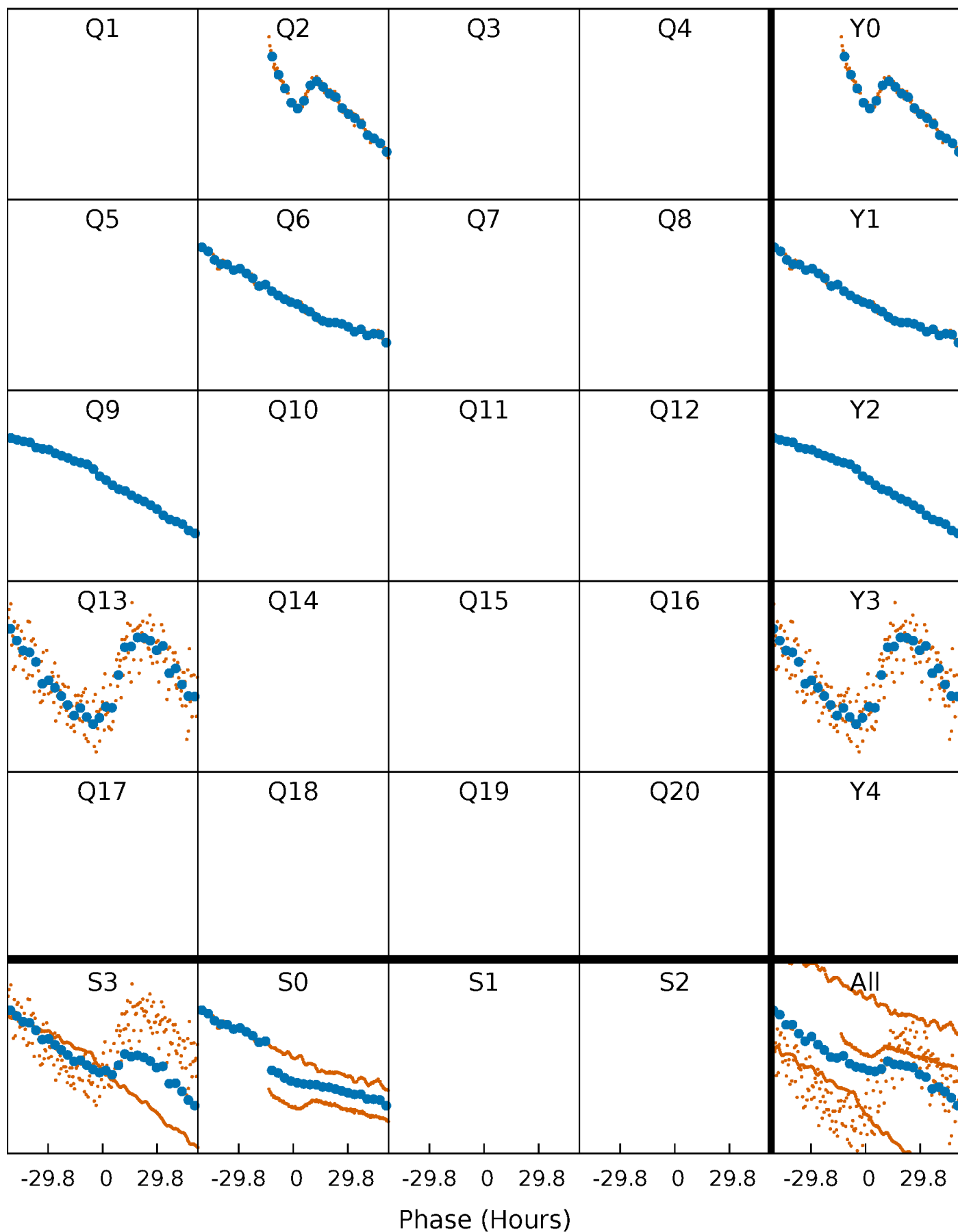


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



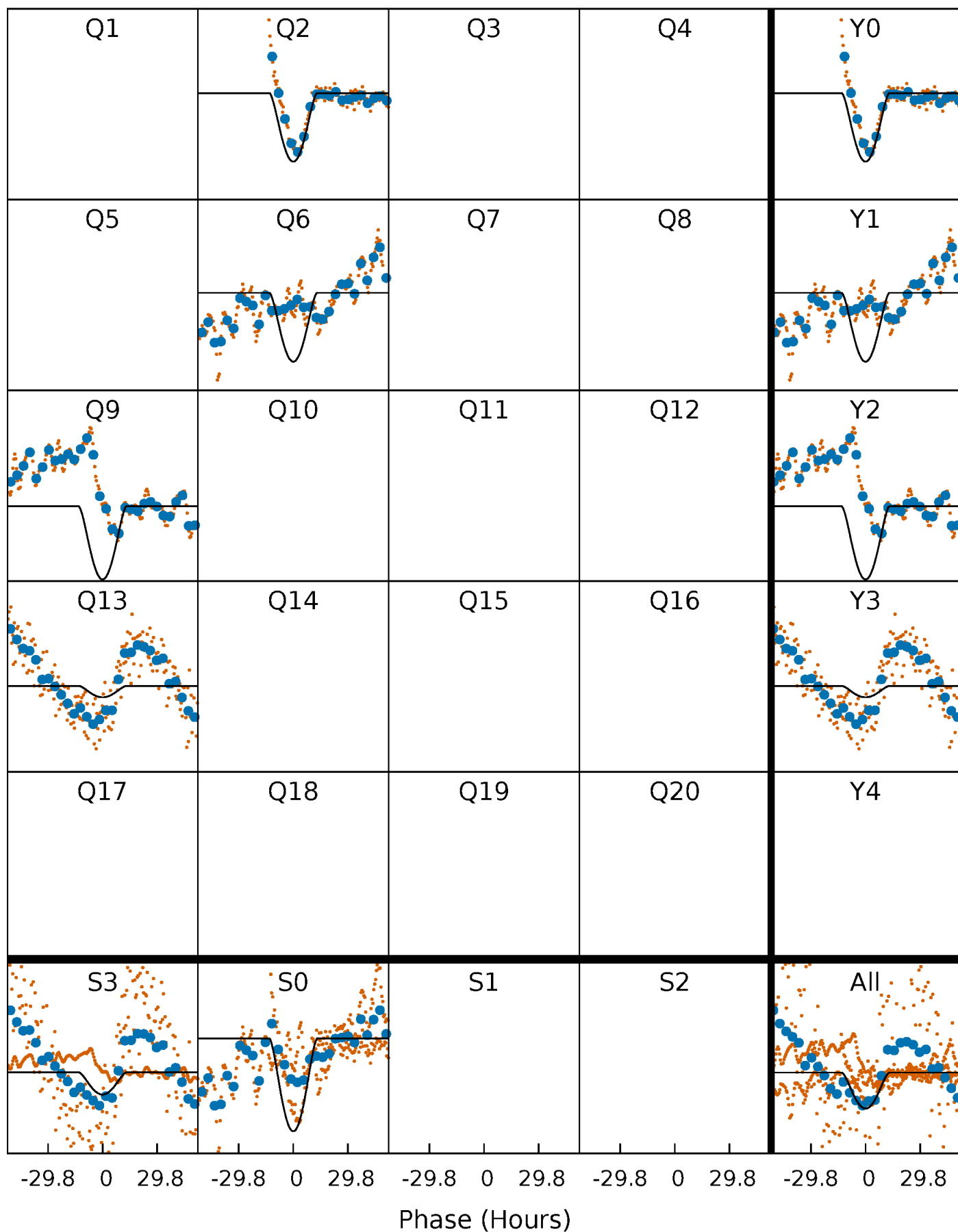
PDC Quarter-Phased Transit Curves

TCE 005870047-02 P=358.351882 Days $T_0=184.273897$ (BKJD)



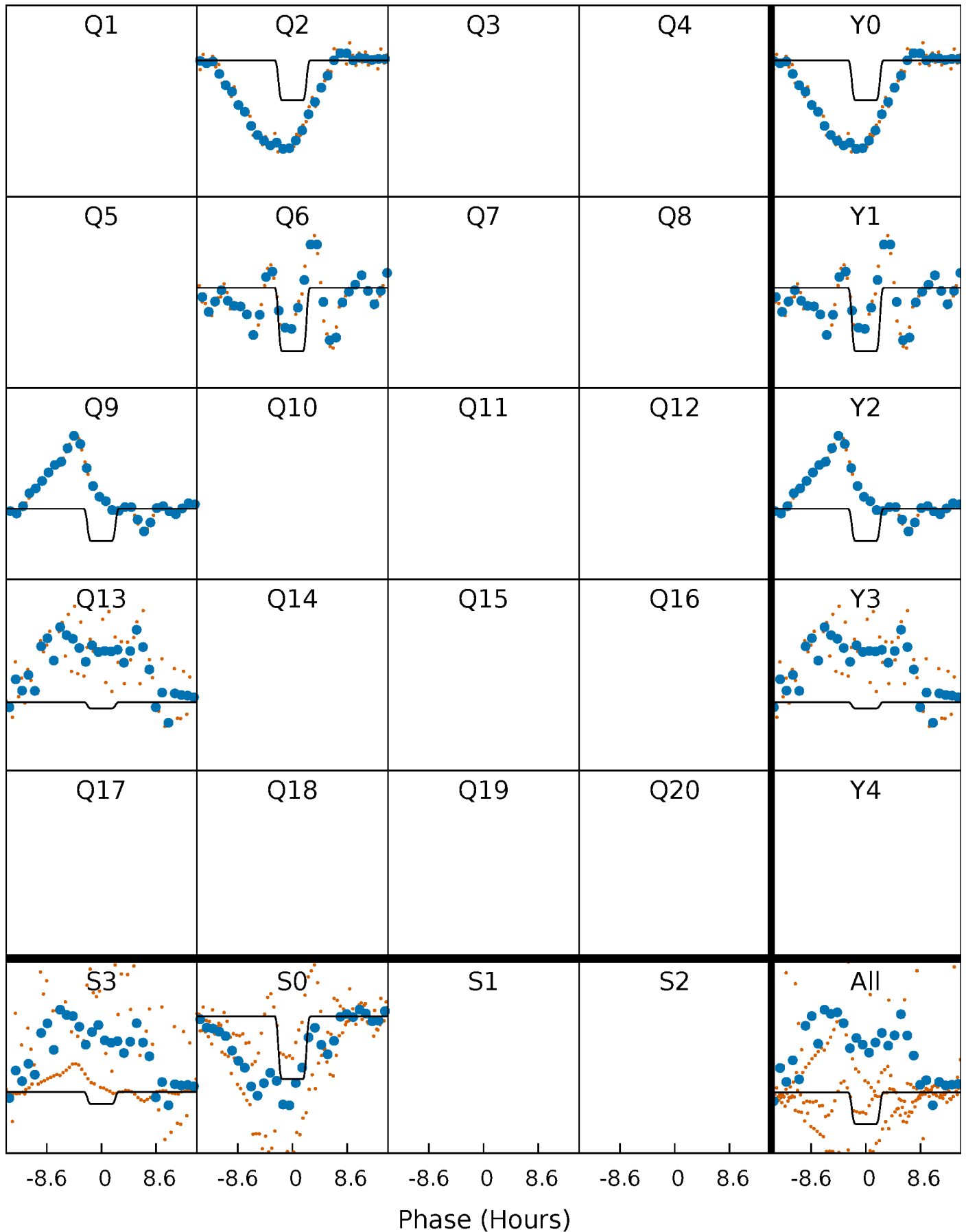
DV Quarter-Phased Transit Curves

TCE 005870047-02 P=358.351882 Days $T_0=184.273897$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

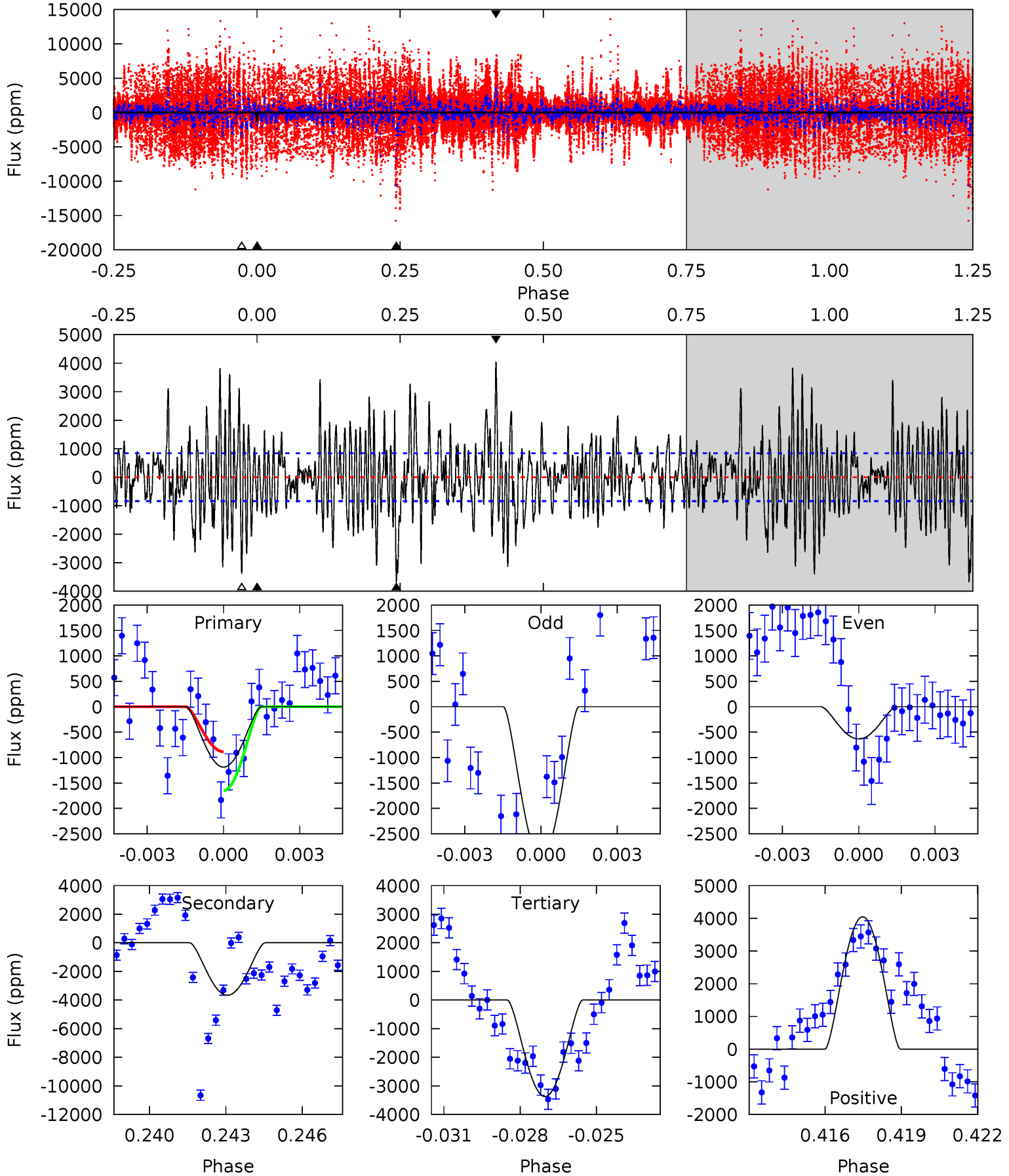
TCE 005870047-02 $P=358.227552$ Days $T_0=184.429851$ (BKJD)



DV Model-Shift Uniqueness Test

005870047-02, P = 358.351882 Days, E = 184.273897 Days

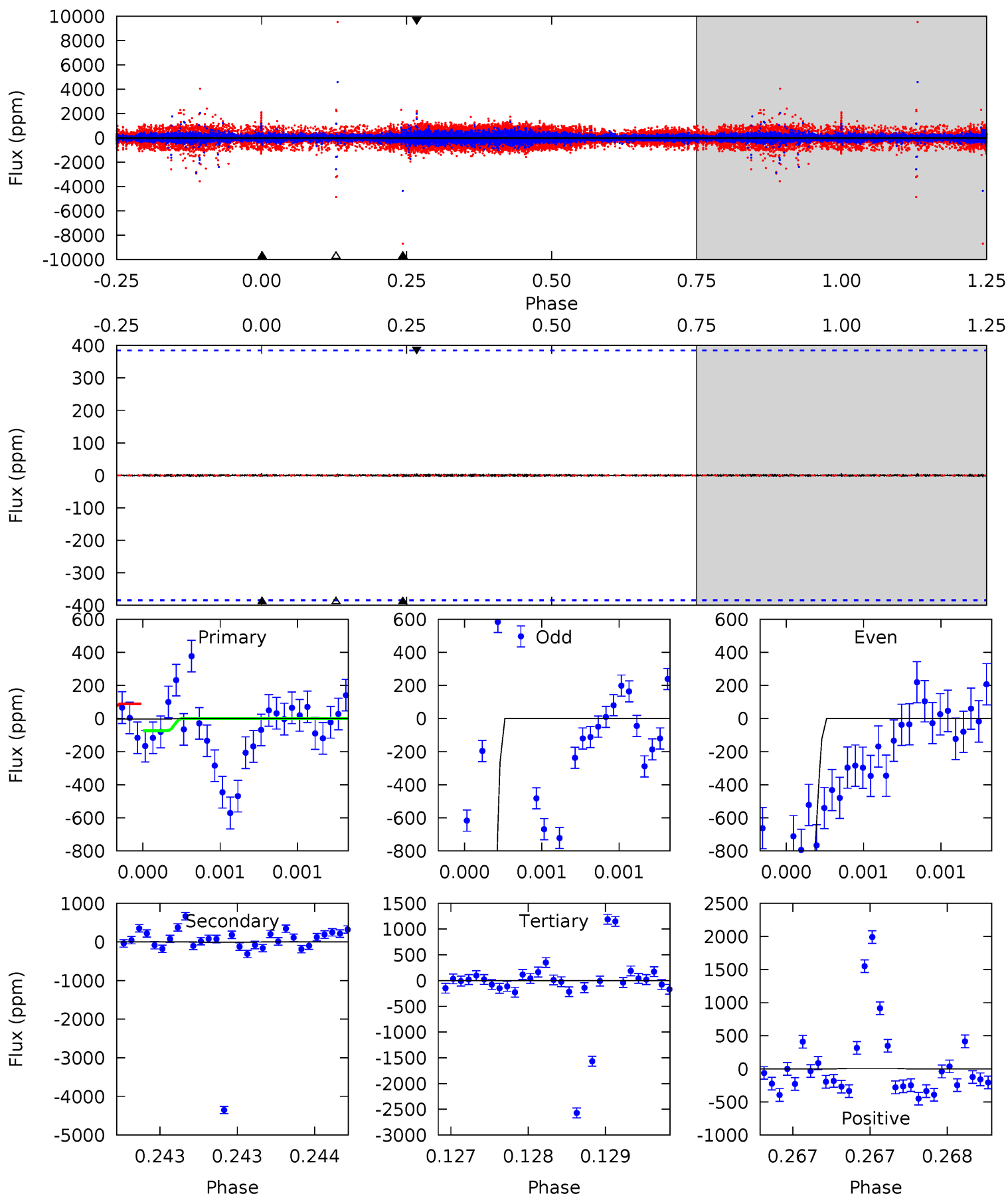
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.40	22.8	21.0	25.2	5.25	2.96	6.59	-13.6	-17.8	1.81	-2.39	5.52	1.99	0.52	2.37



Alt Model-Shift Uniqueness Test

005870047-02, P = 358.227552 Days, E = 184.429851 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.04	0.06	0.04	0.07	5.53	3.42	0.01	-0.01	-0.03	0.01	-0.02	6.32	-306.8	0.58	0.11



Stellar Parameters For KIC 005870047

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3262^{+117}_{-78}	$0.102^{+0.195}_{-0.065}$	$-0.060^{+0.250}_{-0.150}$	$155.634^{+7.354}_{-27.576}$	$1.118^{+0.207}_{-0.128}$	$0.000^{+0.000}_{-0.000}$
	+4%/-2%	+191%/-64%	+417%/-250%	+5%/-18%	+19%/-11%	+88%/-15%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 005870047-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3663 ± 160	$2378.61^{+2008.18}_{-1586.10}$	2442^{+103}_{-124}	2119^{+1356}_{-4477}	$0.377^{+3.137}_{-0.265}$
Alt.	-4 ± 70	$1767.90^{+1610.39}_{-1230.99}$	2452^{+115}_{-122}	-2501^{+96}_{-99}	$0.000^{+0.027}_{-0.016}$

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

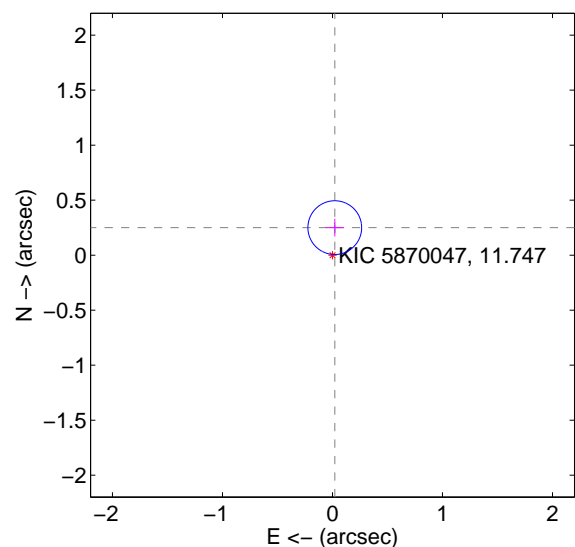
Supplemental centroid analysis for 005870047-02. **Kepler magnitude: 11.75.** Transit SNR 16.64

There are 1 quarters with good PRF difference image offsets

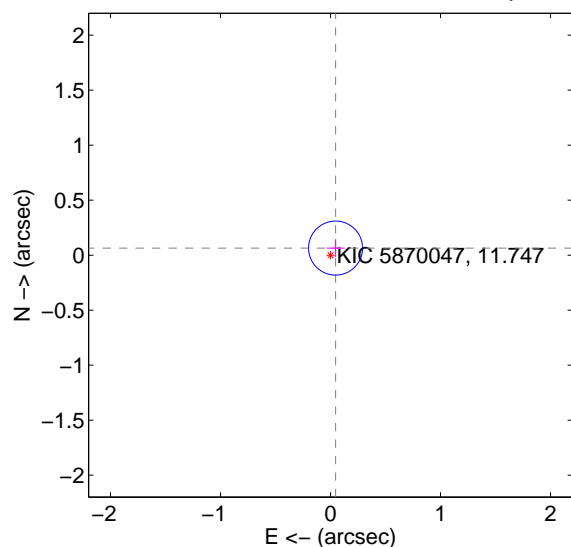
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.251 ± 0.081	3.09	-0.021 ± 0.083	0.250 ± 0.081
PRF-fit source offset from KIC position	0.079 ± 0.082	0.97	-0.046 ± 0.083	0.064 ± 0.081
photometric centroid source offset	0.57 ± 0.42	1.37	0.31 ± 0.37	-0.48 ± 0.44

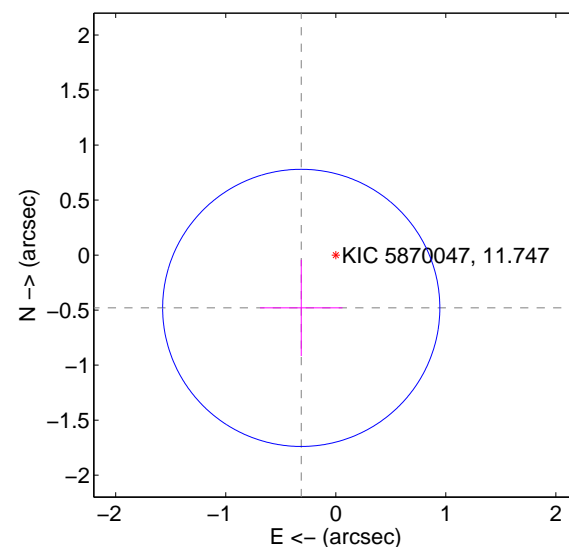
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

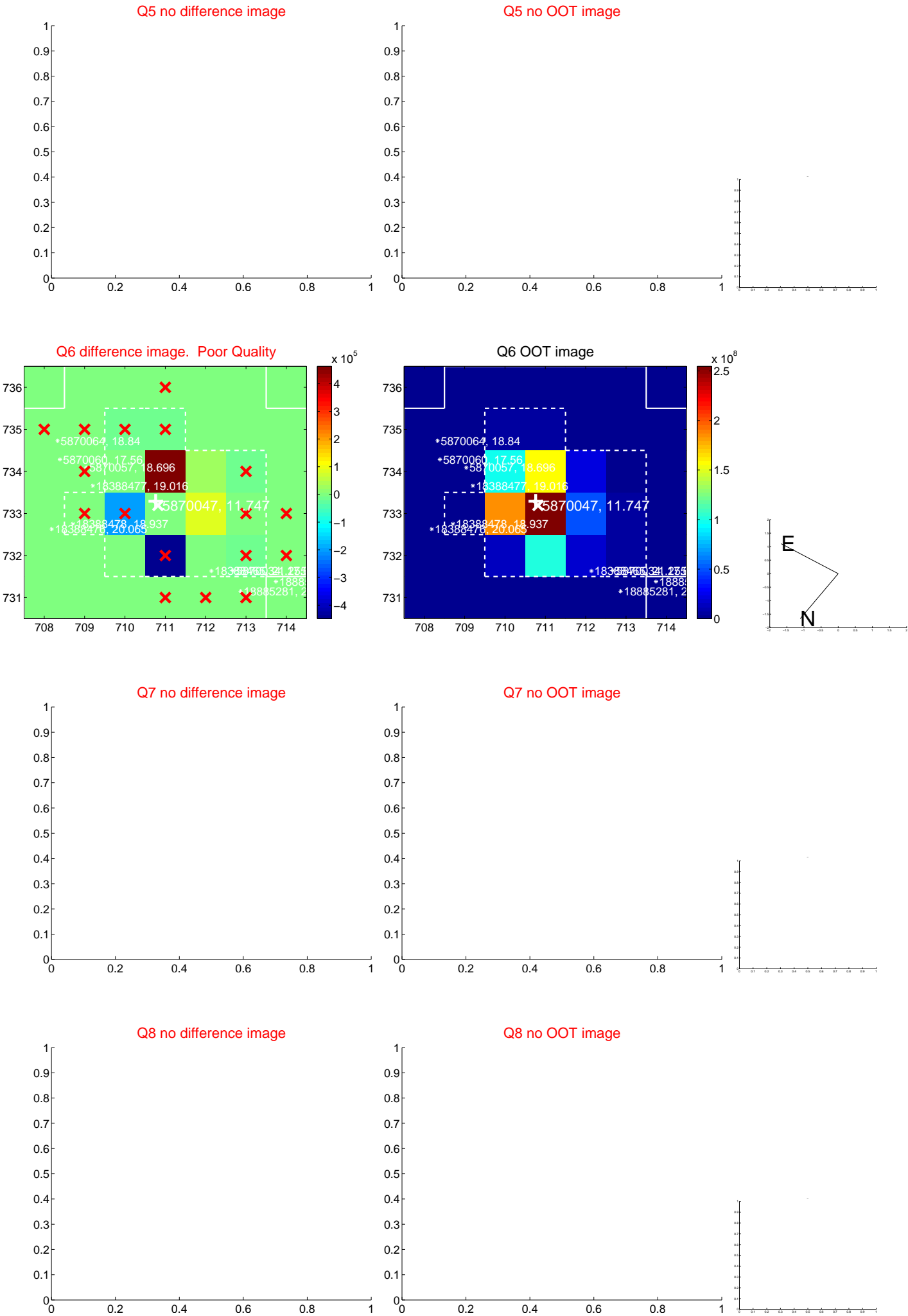


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

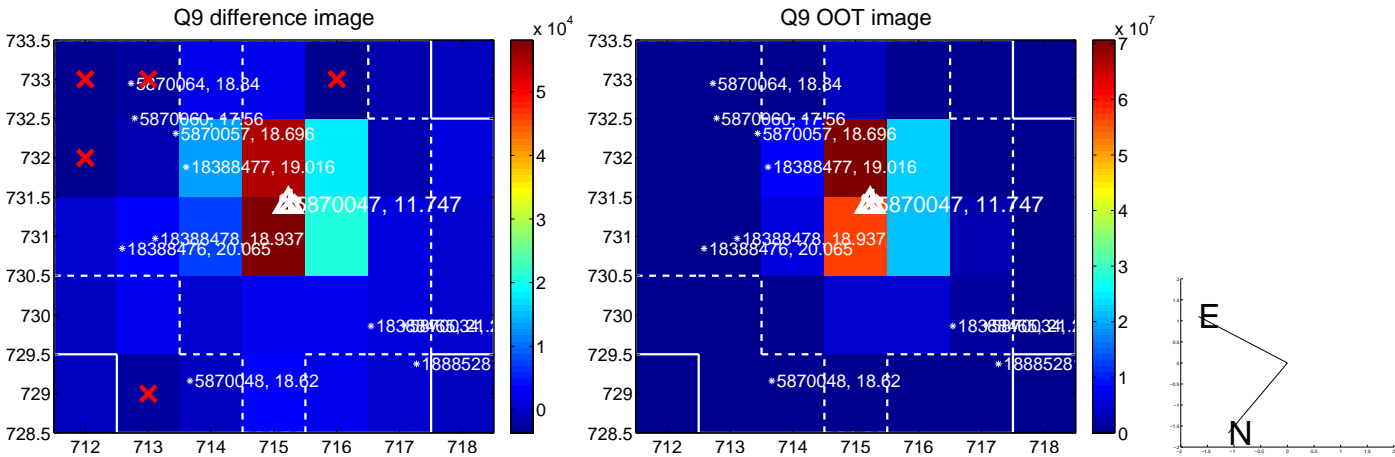
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



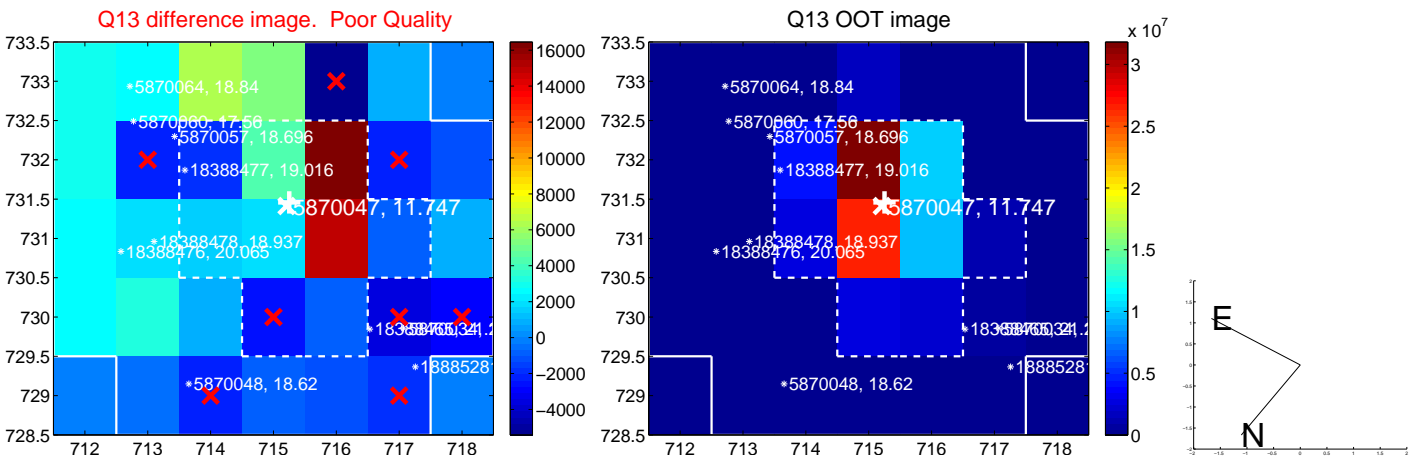
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



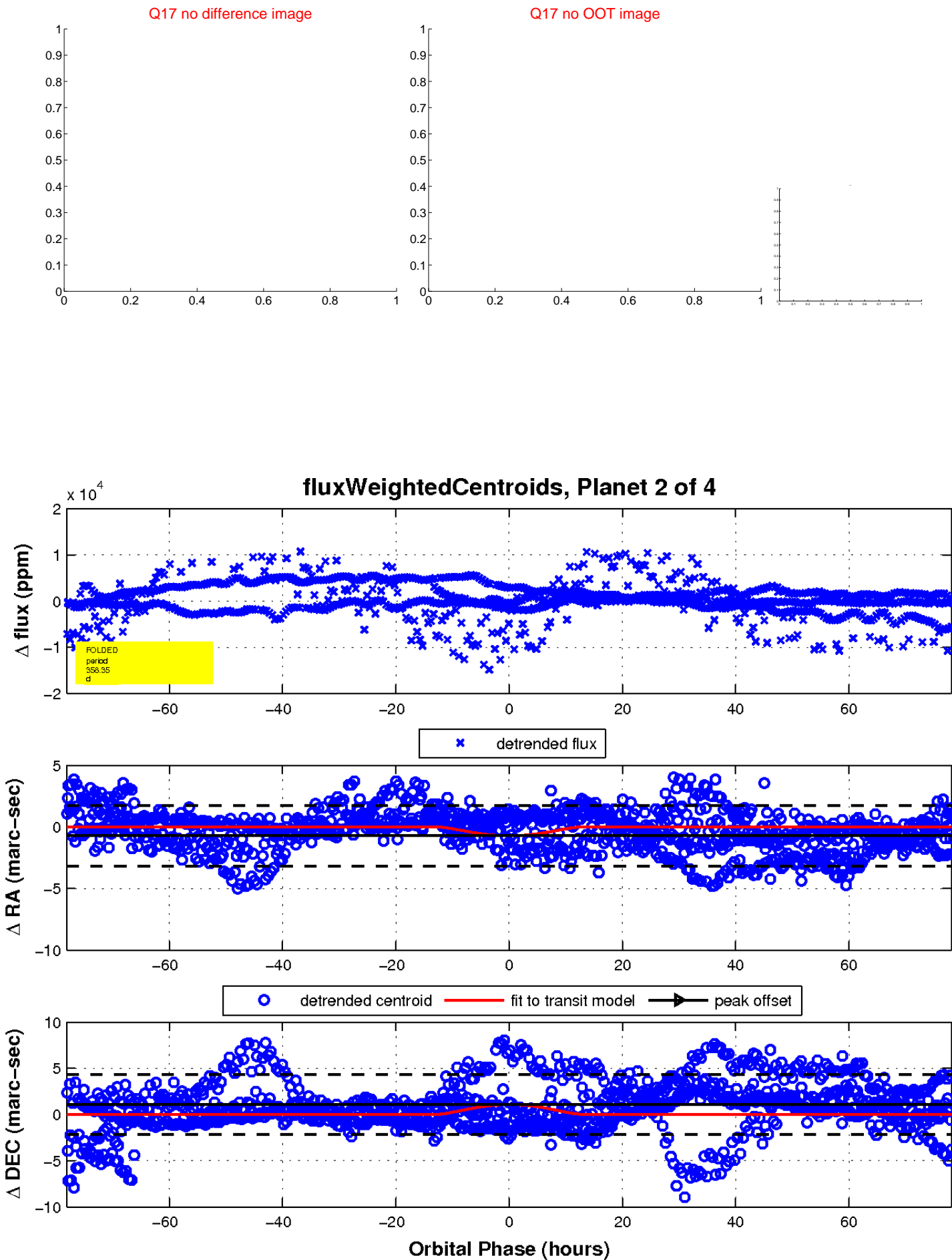
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



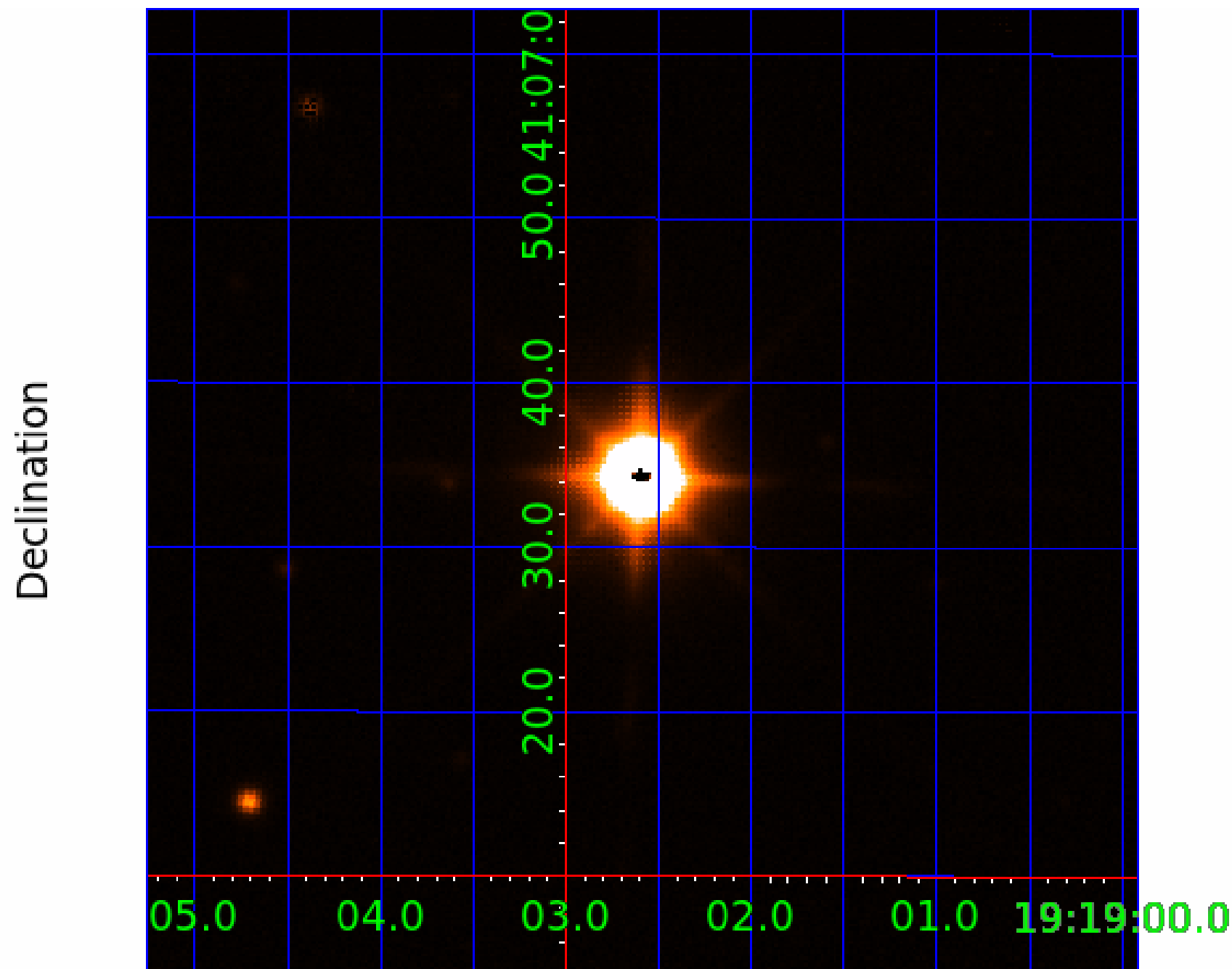
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



UKIRT Image



KIC 005870047

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})
005870047-01	OBS	No	477.731463	138.404144	4051.1	7.465	18.1	9.4	155.63	3262	1607.92	1594.61
005870047-02	OBS	No	358.351882	184.273897	2583.1	26.046	13.2	16.6	155.63	3262	1650.68	2339.66
005870047-03	OBS	No	312.083808	322.206716	7322.9	6.317	17.3	15.8	155.63	3262	1379.34	2813.23
005870047-04	OBS	No	327.813178	271.638310	499.8	3.000	16.0	-1.0	155.63	3262	319.99	2634.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005870047-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005870047-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005870047-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
005870047-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

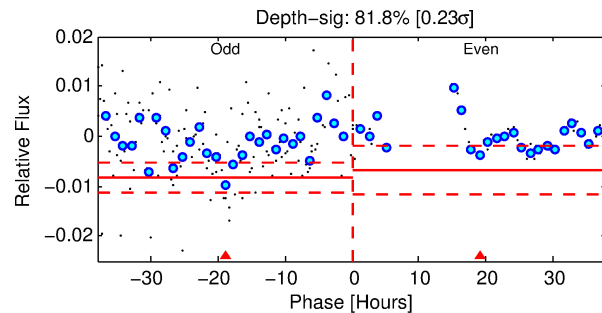
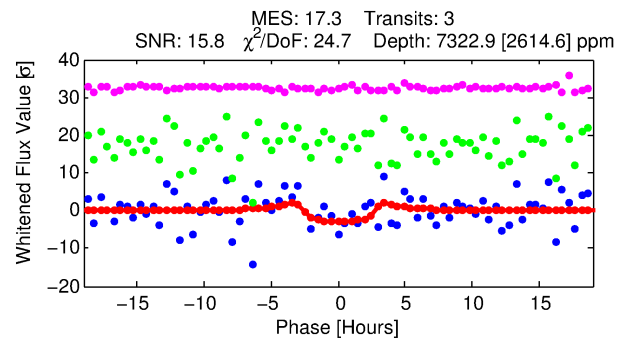
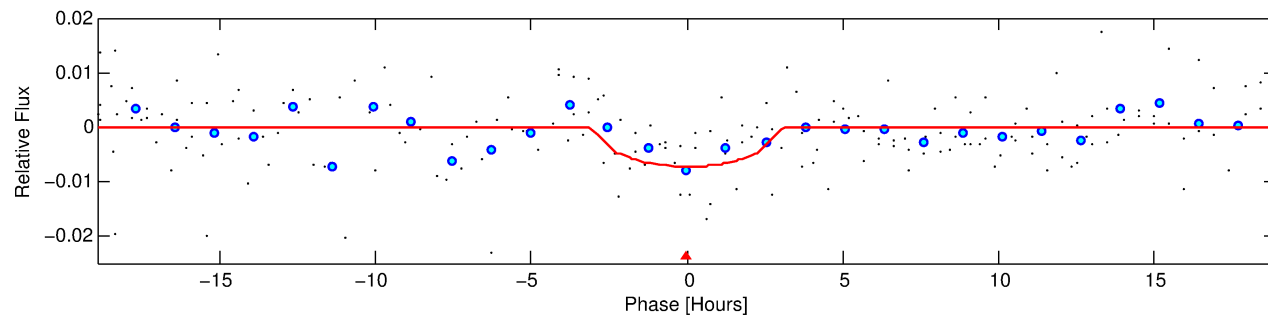
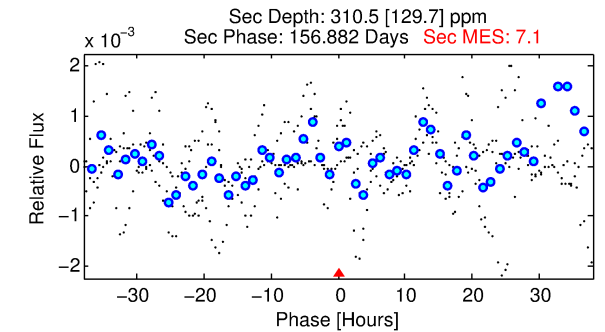
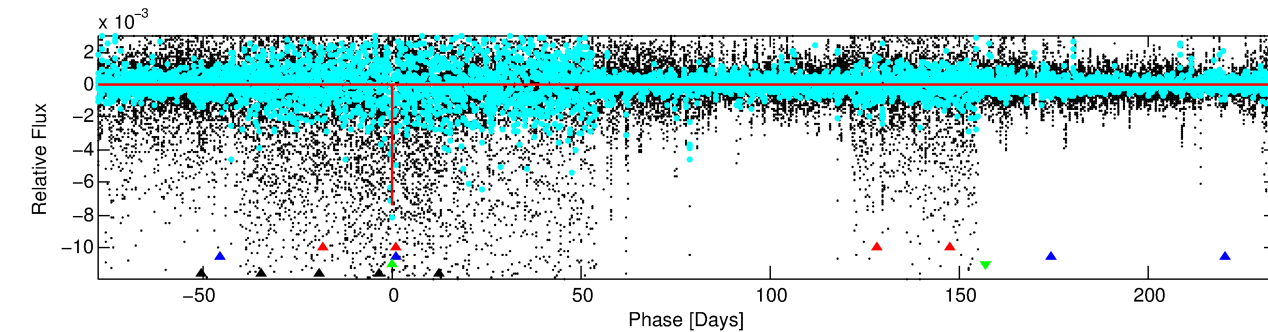
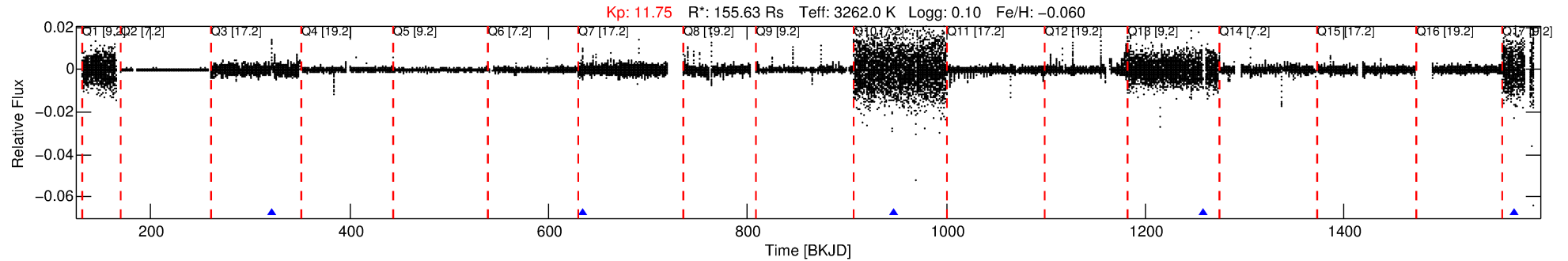
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005870047-03

No Significant Match Found

DV One-Page Summary

KIC: 5870047 Candidate: 3 of 4 Period: 312.084 d



DV Fit Results:

Period = 312.08381 [0.01406] d
Epoch = 322.2067 [0.0376] BKJD
Rp/R* = 0.0812 [0.0862]
a/R* = 330.52 [741.02]
b = 0.63 [2.21]
Seff = 2813.23 [991.19]
Teq = 1857 [164] K
Rp = 1379.34 [1483.56] Re
a = 0.9346 [0.1782] AU
Ag = 0.08 [0.17] [-5.38σ]
Teffp = 1519 [823] K [-0.40σ]

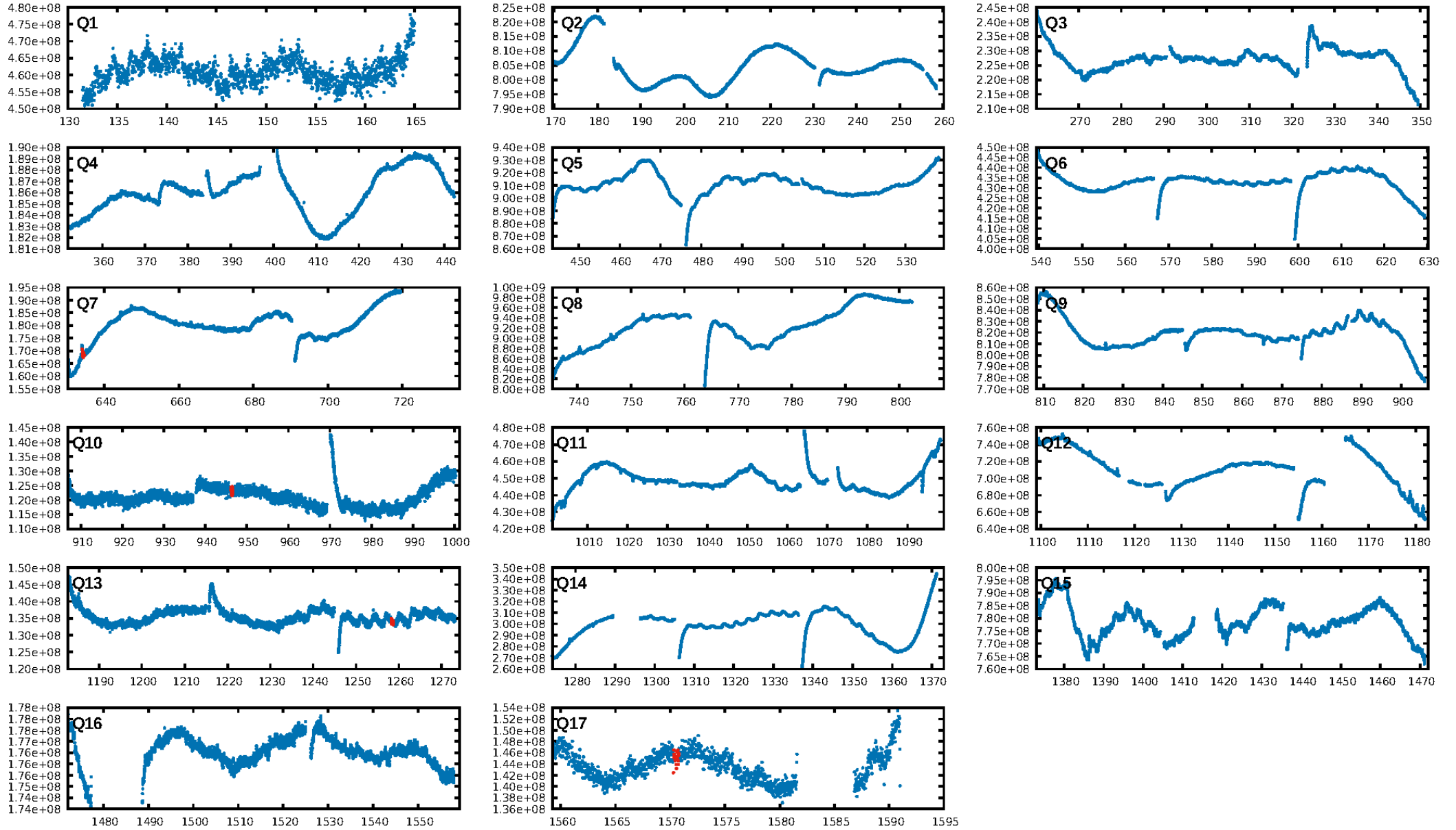
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [53.98σ]
ModelChiSquare2-sig: 15.7%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 0.1778
Centroid-sig: 94.7%
Centroid-so: 0.064 arcsec [1.27σ]
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 0.67 [2/3]

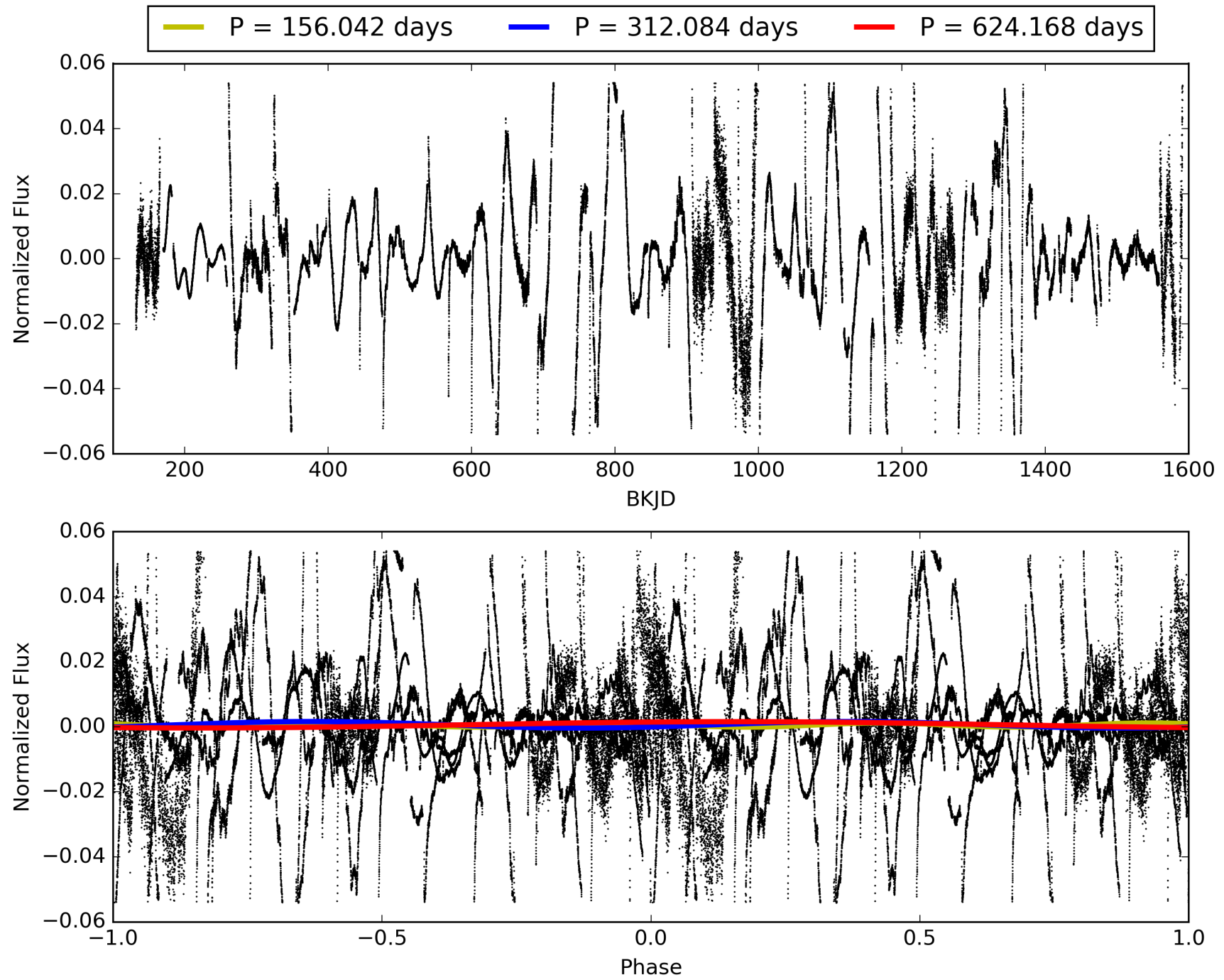
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:26:21 Z

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

TCE 005870047-03, PDC Light Curves

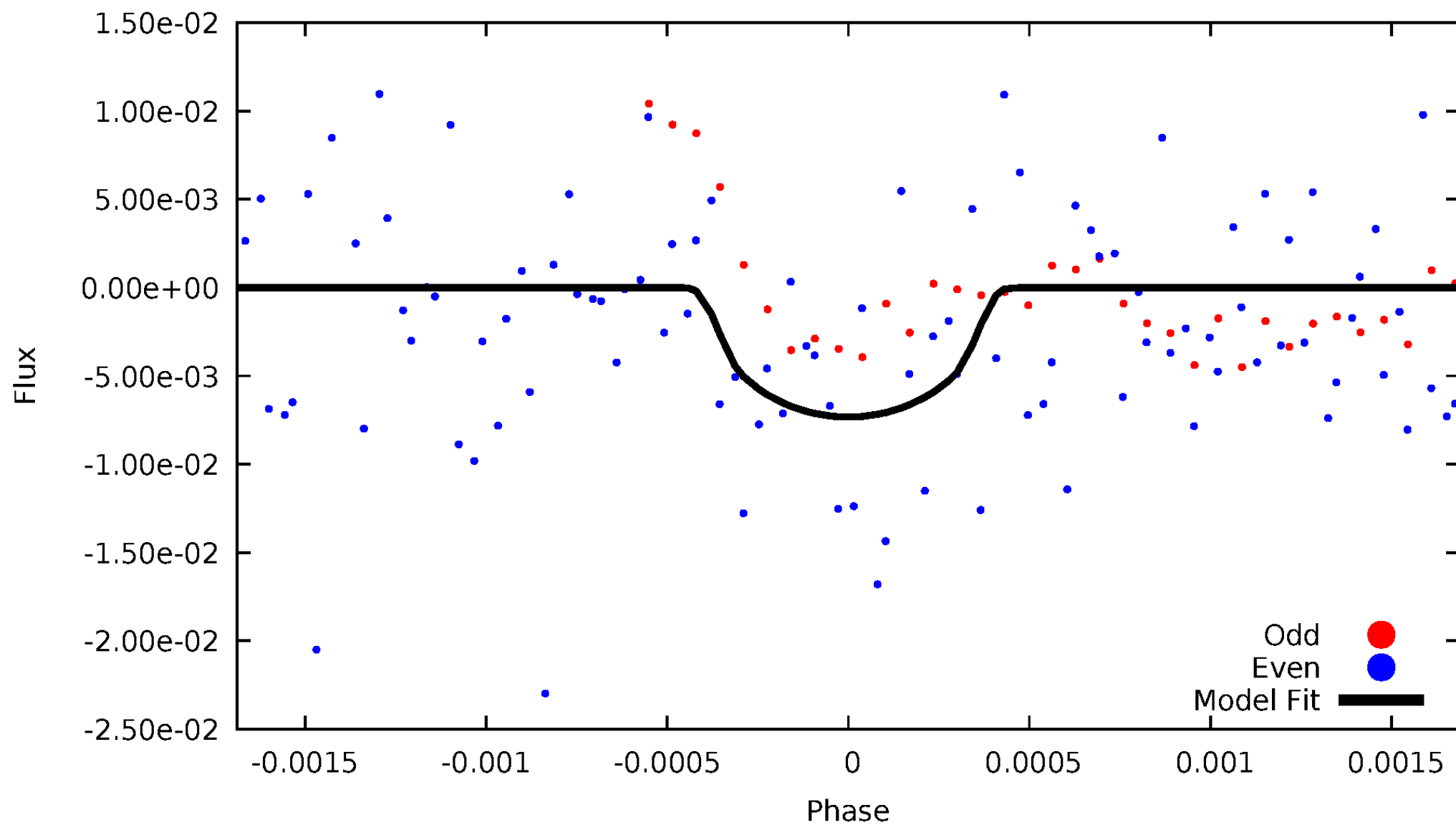


TCE 005870047-03



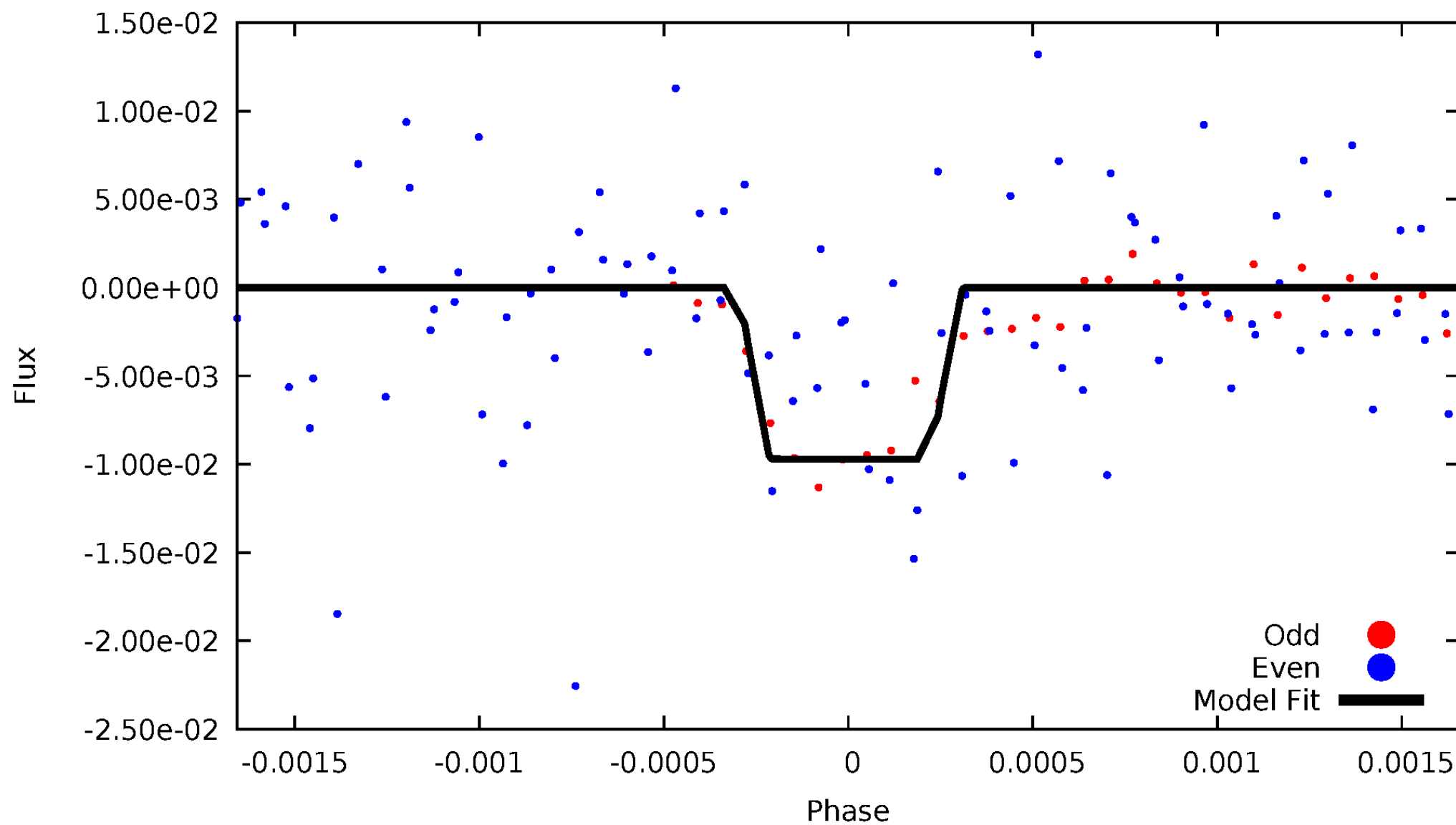
DV Odd/Even

TCE 005870047-03



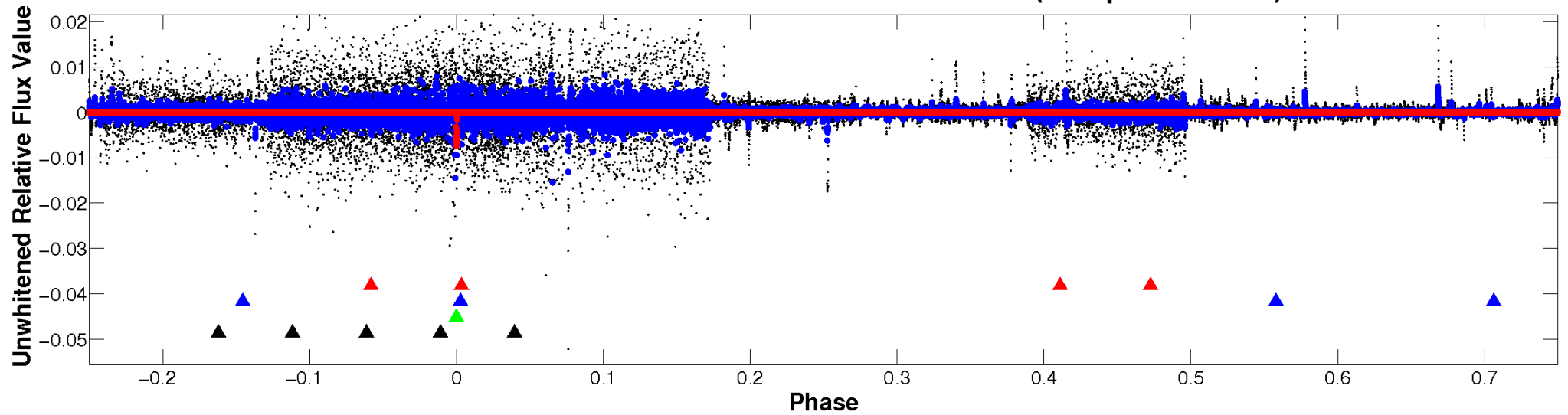
ALT Odd/Even

TCE 005870047-03

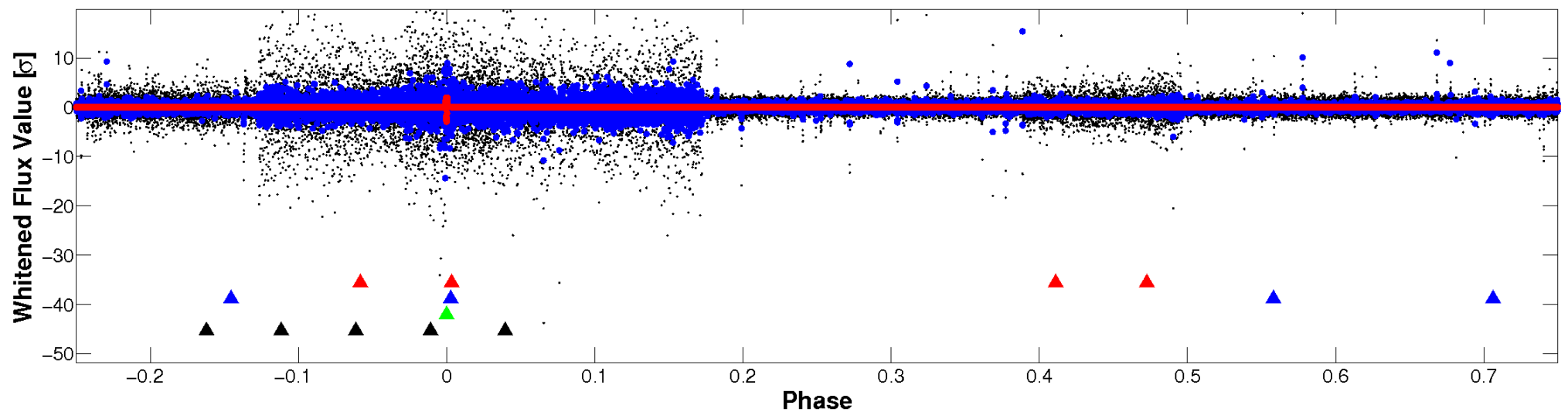


Non-Whitened Vs. Whitened Light Curve

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

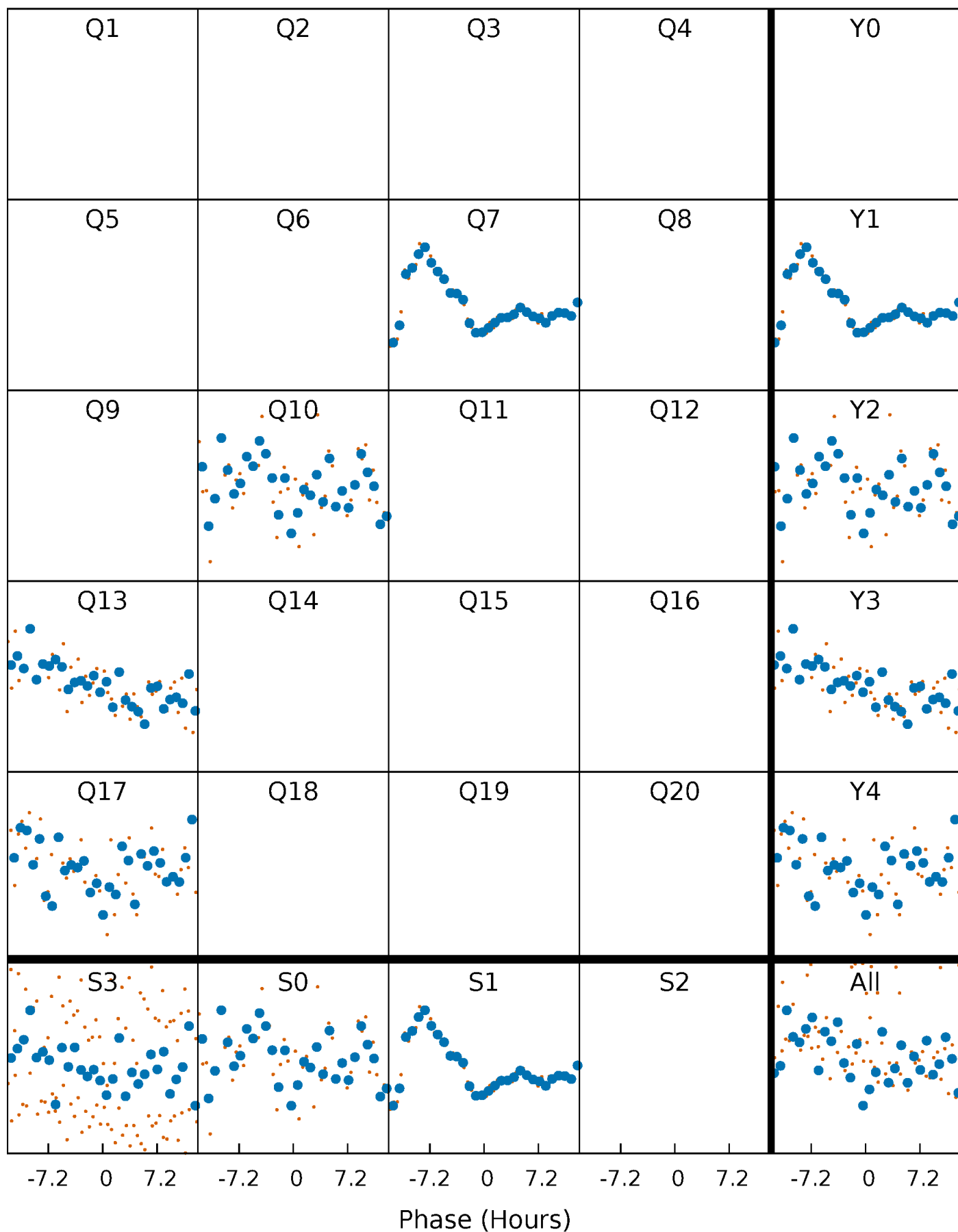


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



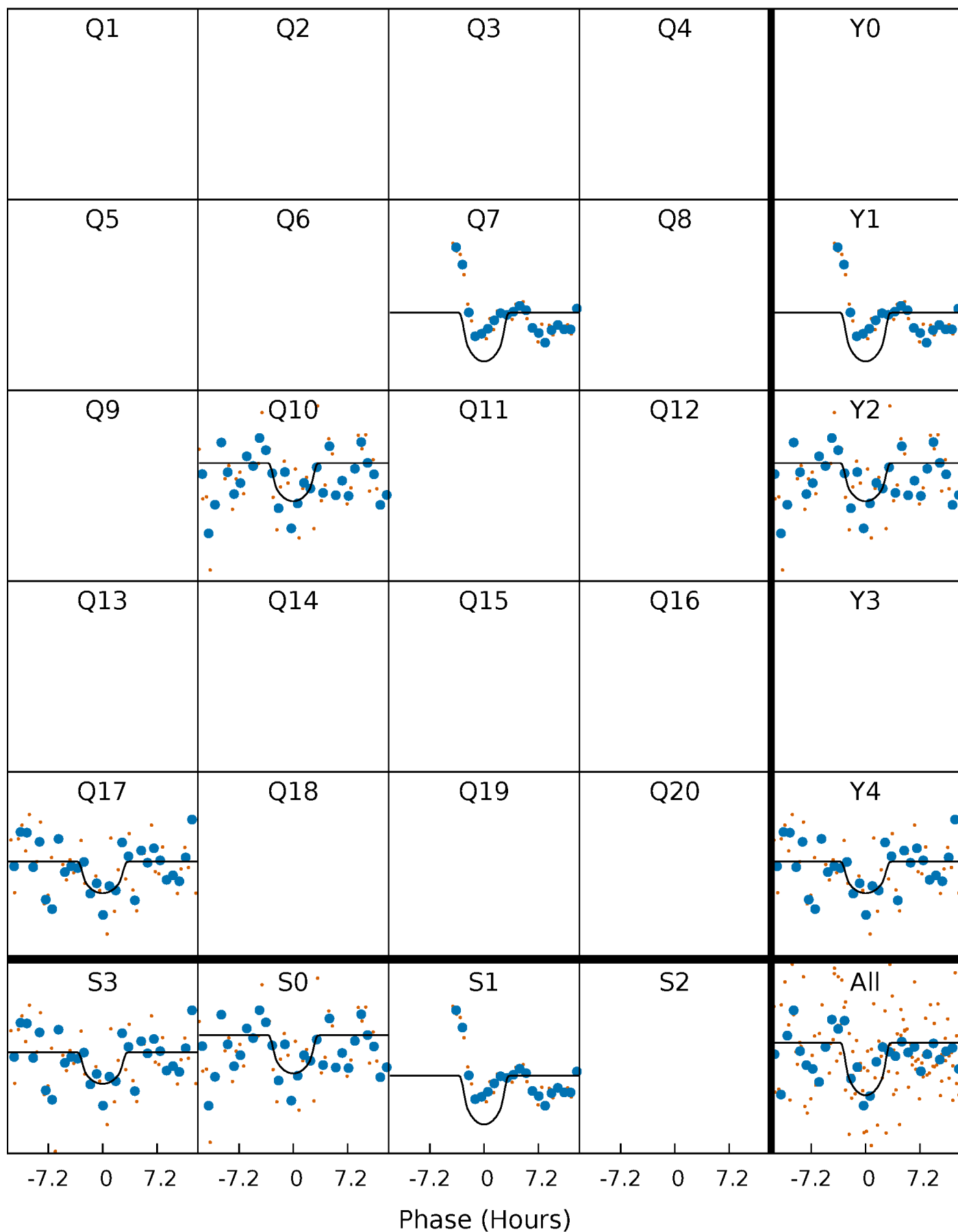
PDC Quarter-Phased Transit Curves

TCE 005870047-03 $P=312.083808$ Days $T_0=322.206716$ (BKJD)



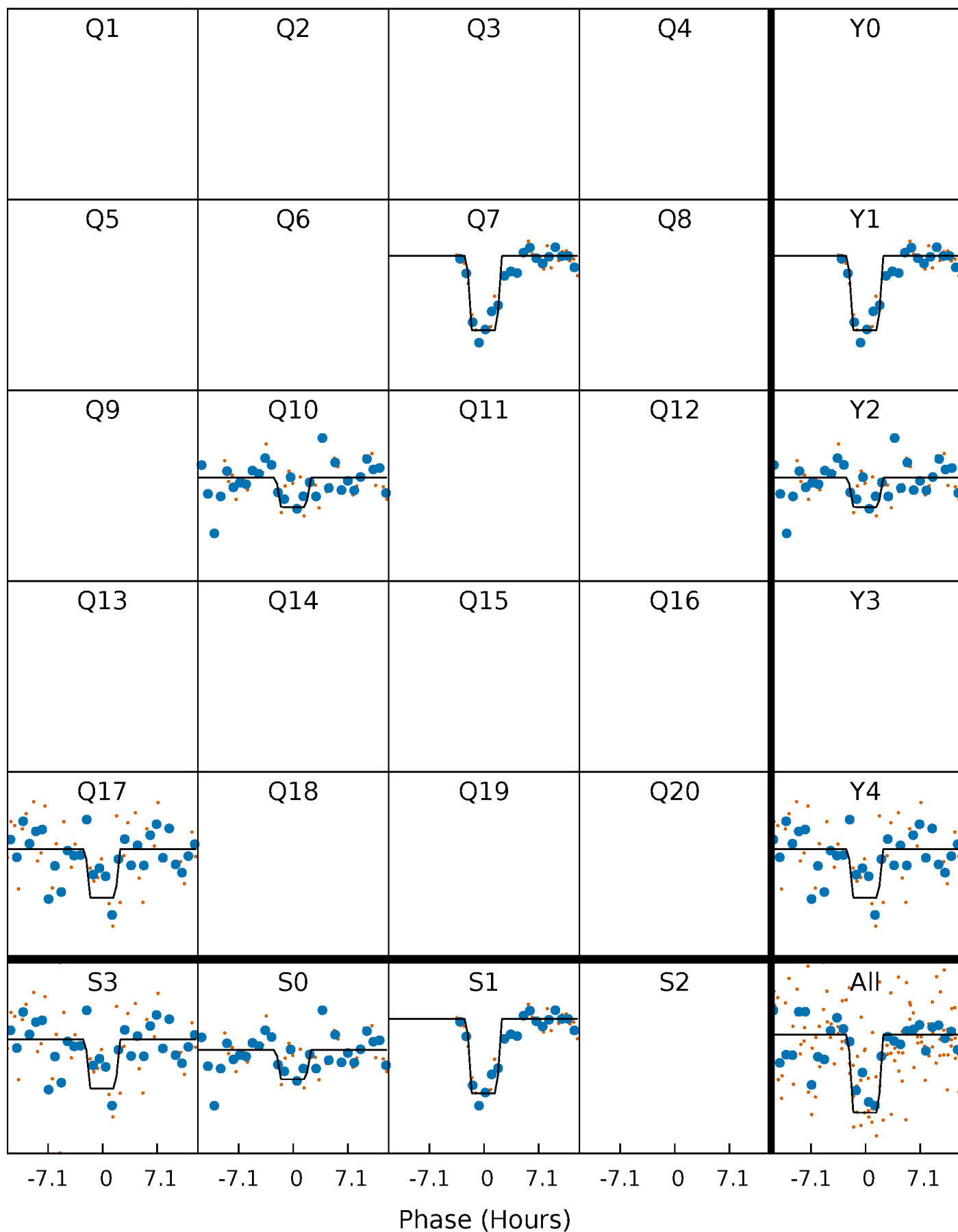
DV Quarter-Phased Transit Curves

TCE 005870047-03 P=312.083808 Days $T_0=322.206716$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

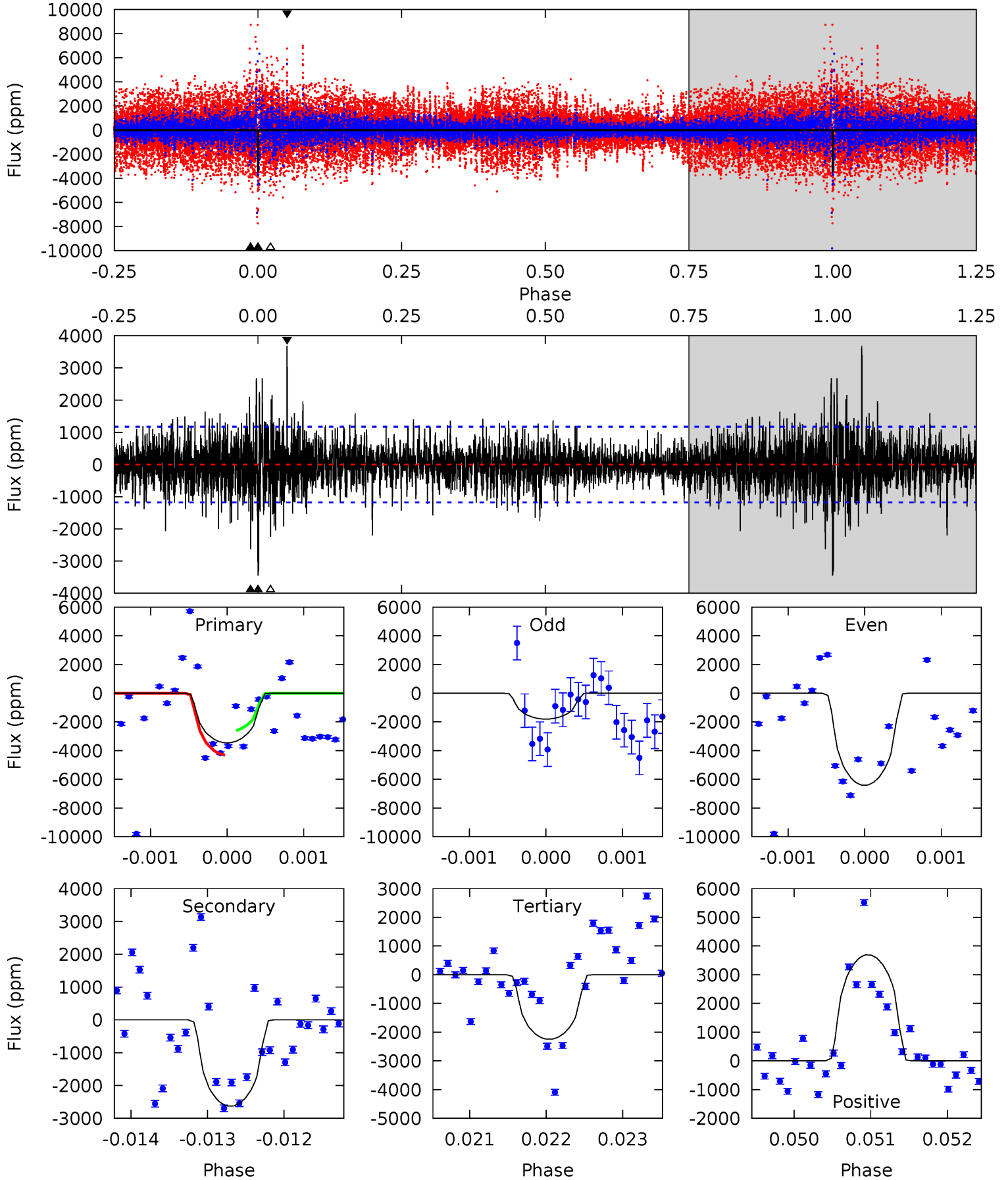
TCE 005870047-03 P=312.081762 Days $T_0=322.184667$ (BKJD)



DV Model-Shift Uniqueness Test

005870047-03, P = 312.083808 Days, E = 10.122908 Days

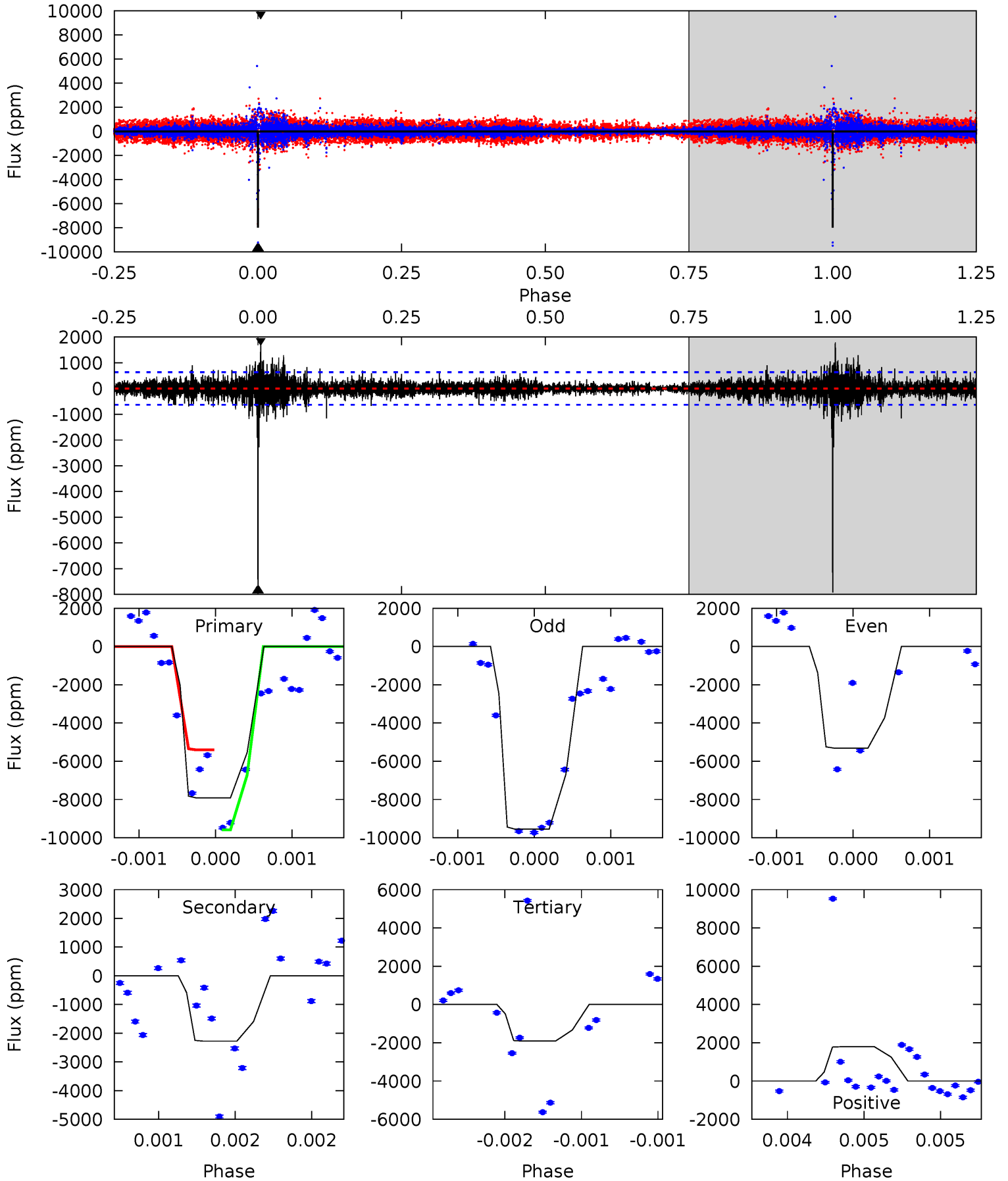
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.1	12.2	10.4	17.1	5.48	3.33	2.24	5.63	-1.09	1.78	-4.93	8.97	0.76	0.52	3.58



Alt Model-Shift Uniqueness Test

005870047-03, P = 312.081762 Days, E = 10.102905 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
69.3	19.9	16.7	15.7	5.54	3.43	1.38	52.6	53.6	3.22	4.22	7.84	1.16	0.18	17.2



Stellar Parameters For KIC 005870047

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3262^{+117}_{-78}	$0.102^{+0.195}_{-0.065}$	$-0.060^{+0.250}_{-0.150}$	$155.634^{+7.354}_{-27.576}$	$1.118^{+0.207}_{-0.128}$	$0.000^{+0.000}_{-0.000}$
	+4%/-2%	+191%/-64%	+417%/-250%	+5%/-18%	+19%/-11%	+88%/-15%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 005870047-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-2622 ± 215	$1661.24^{+1307.59}_{-1028.06}$	2564^{+113}_{-125}	2392^{+1179}_{-4768}	$0.473^{+2.797}_{-0.328}$
Alt.	-2276 ± 114	$1790.35^{+1346.14}_{-1073.51}$	2562^{+113}_{-146}	2064^{+1217}_{-4483}	$0.346^{+1.863}_{-0.233}$

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 $A_{obs} \gg 1.0$

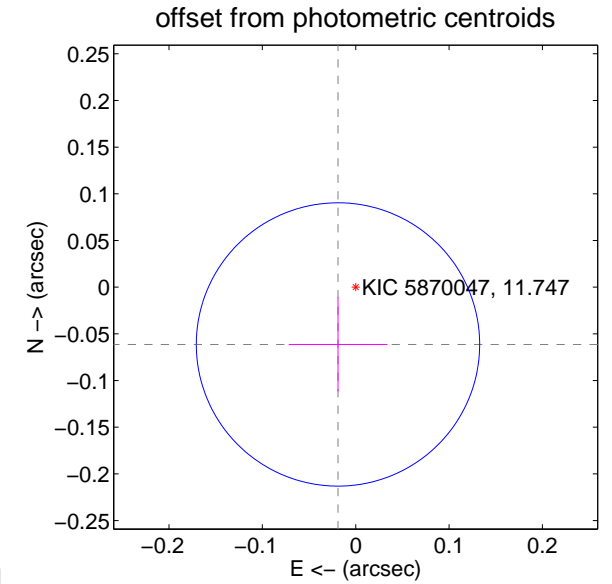
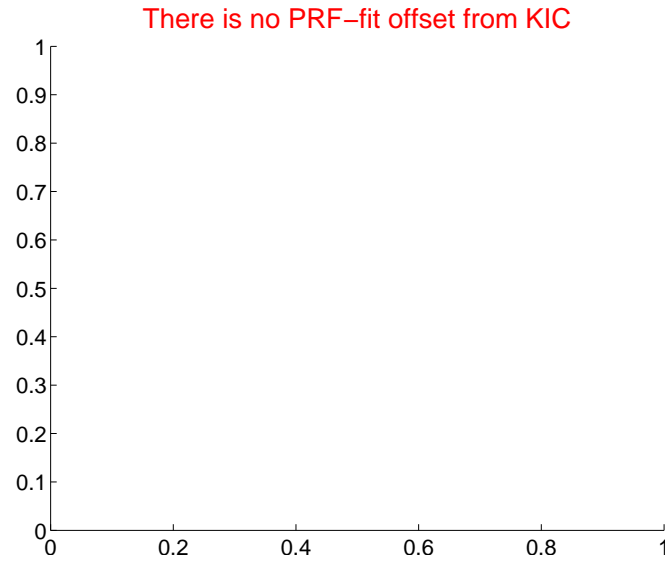
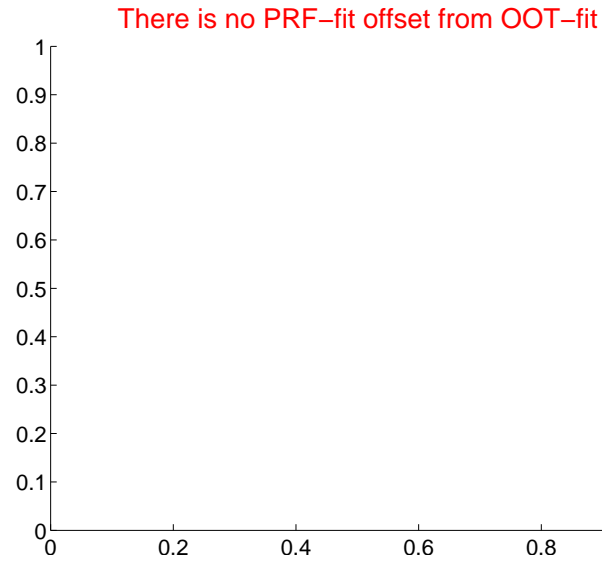
DV Centroid Data

Supplemental centroid analysis for 005870047-03. **Kepler magnitude: 11.75.** Transit SNR 15.81

There are 0 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	0.06 ± 0.05	1.27	0.02 ± 0.05	-0.06 ± 0.05



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.

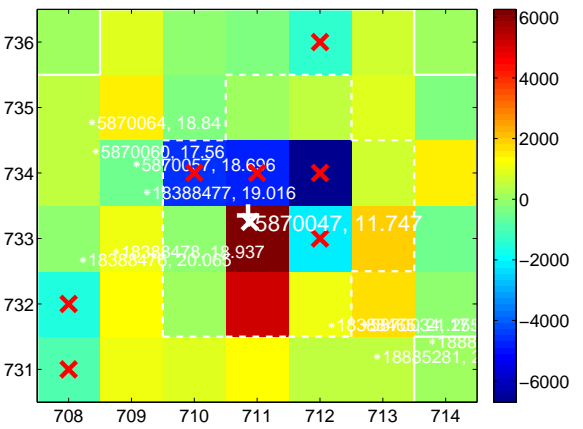
Q9 no difference image



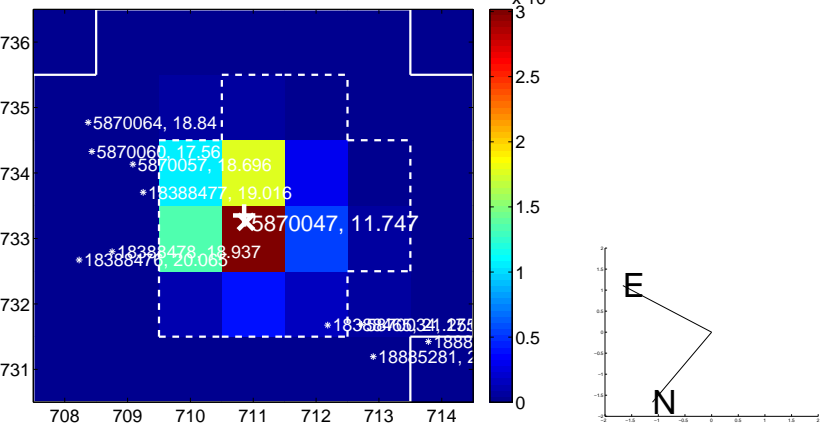
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



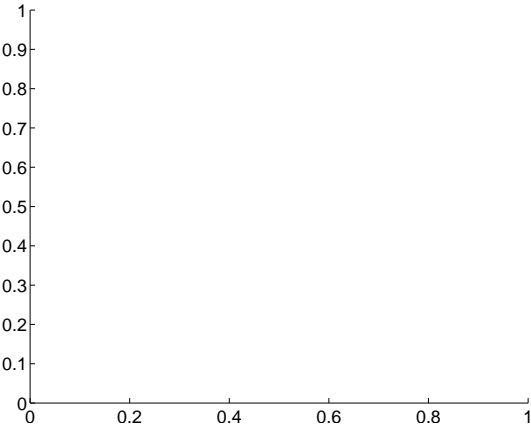
Q11 no difference image



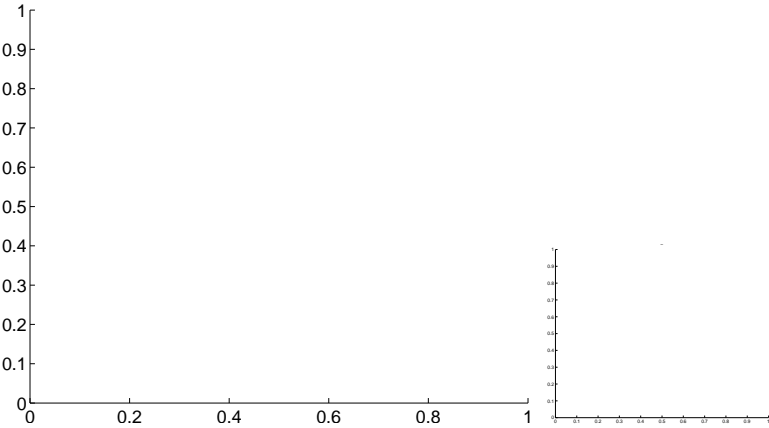
Q11 no OOT image



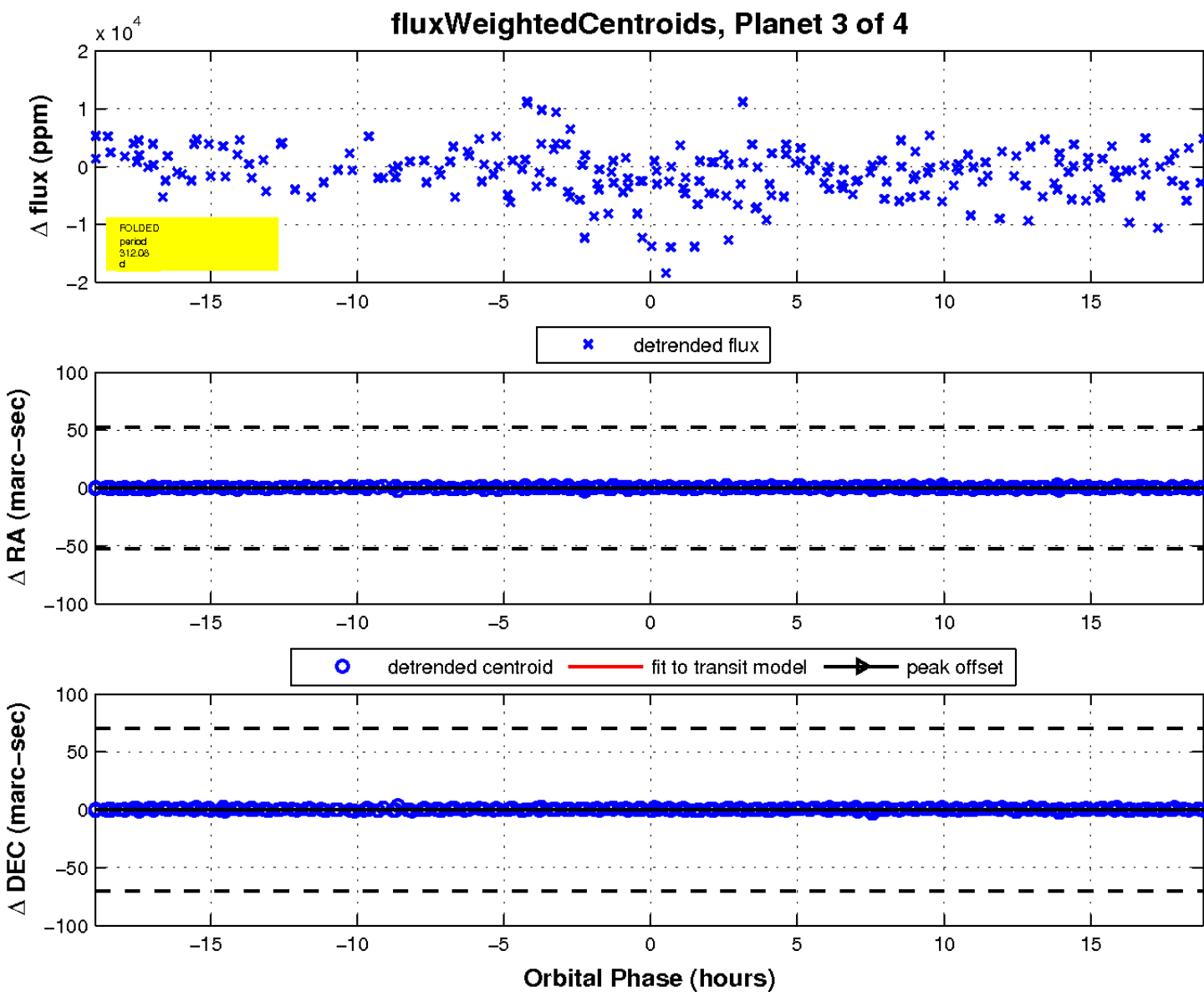
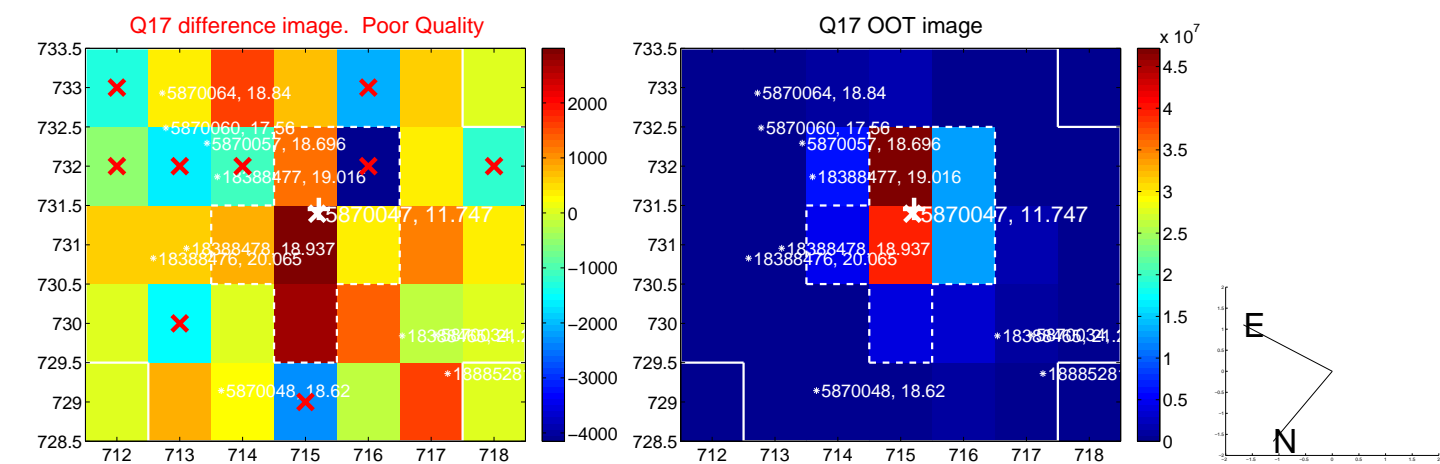
Q12 no difference image



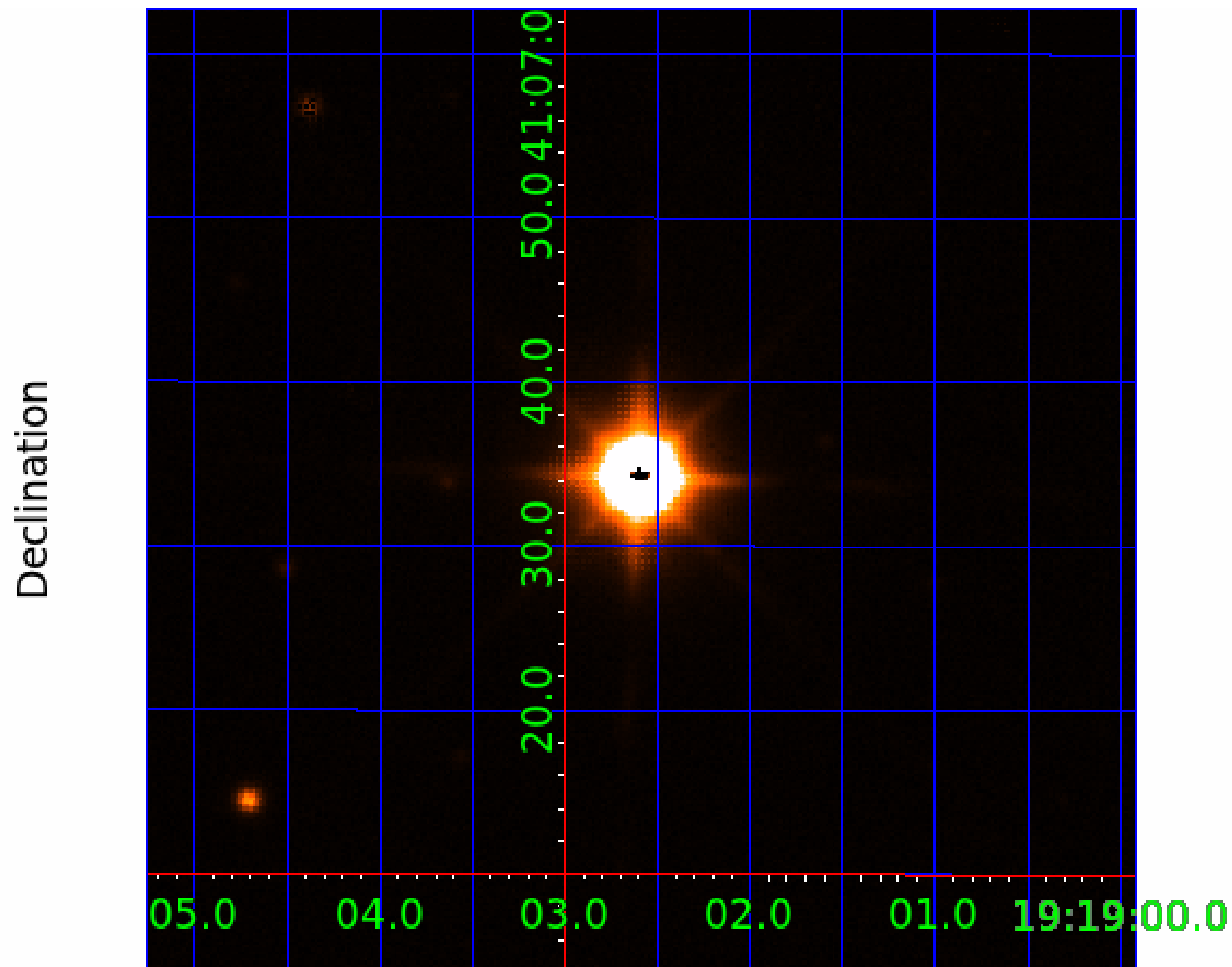
Q12 no OOT image



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



UKIRT Image



KIC 005870047

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})
005870047-01	OBS	No	477.731463	138.404144	4051.1	7.465	18.1	9.4	155.63	3262	1607.92	1594.61
005870047-02	OBS	No	358.351882	184.273897	2583.1	26.046	13.2	16.6	155.63	3262	1650.68	2339.66
005870047-03	OBS	No	312.083808	322.206716	7322.9	6.317	17.3	15.8	155.63	3262	1379.34	2813.23
005870047-04	OBS	No	327.813178	271.638310	499.8	3.000	16.0	-1.0	155.63	3262	319.99	2634.70

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005870047-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005870047-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_ZUMA—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
005870047-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST
005870047-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

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

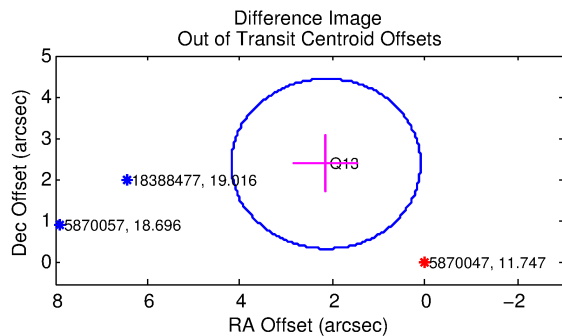
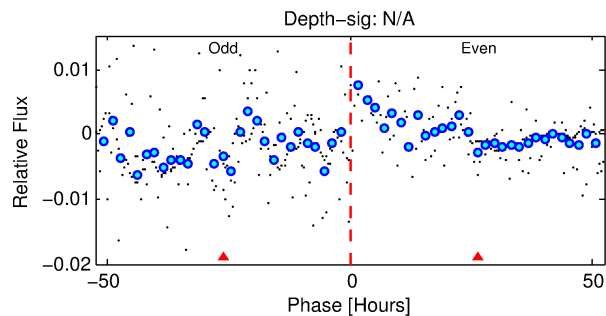
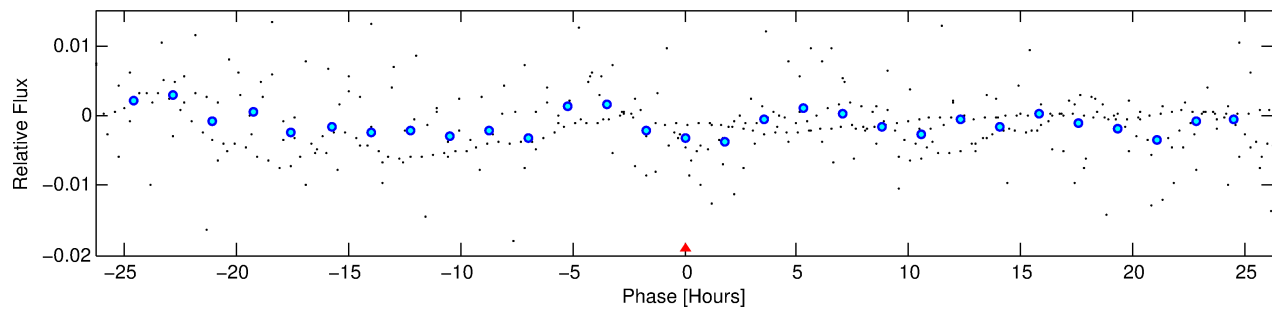
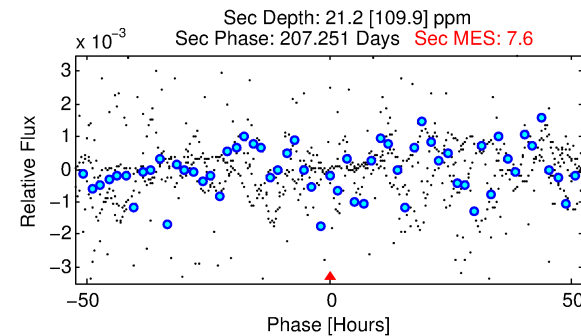
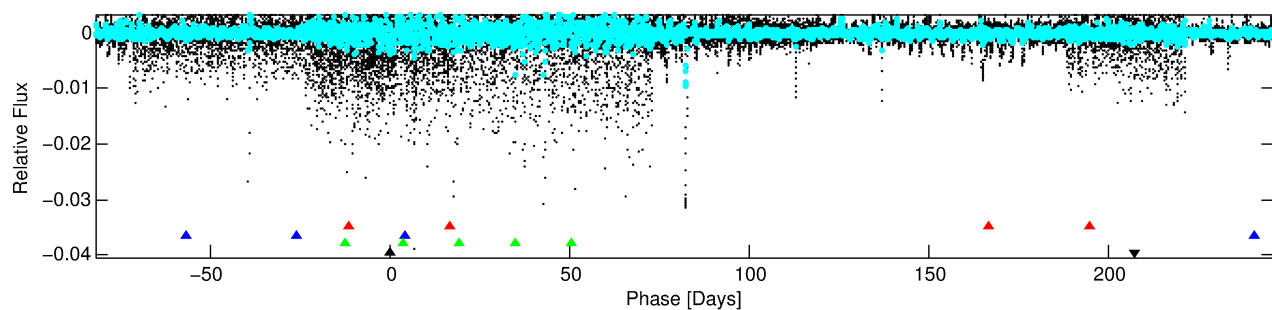
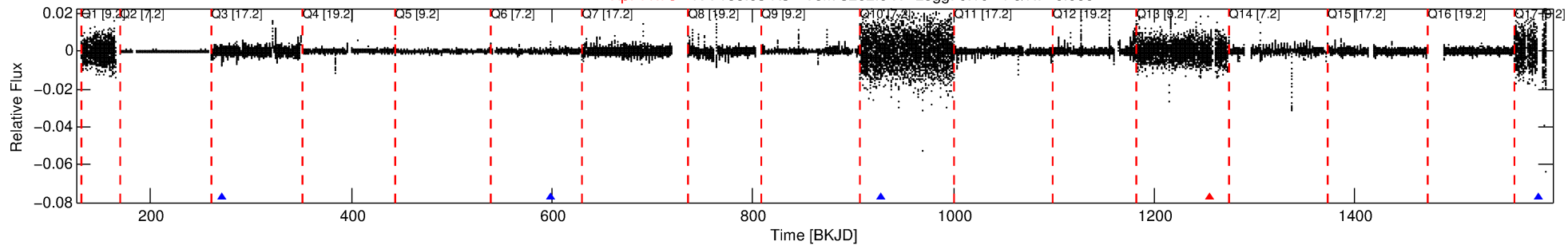
Ephemeris Match Information For 005870047-04

No Significant Match Found

DV One-Page Summary

KIC: 5870047 Candidate: 4 of 4 Period: 327.813 d

Kp: 11.75 R*: 155.63 Rs Teff: 3262.0 K Logg: 0.10 Fe/H: -0.060



TPS TCE Results:

Period = 327.81318 d
Epoch = 271.6383 BKJD

DV fit results are unavailable

DV Diagnostic Results:

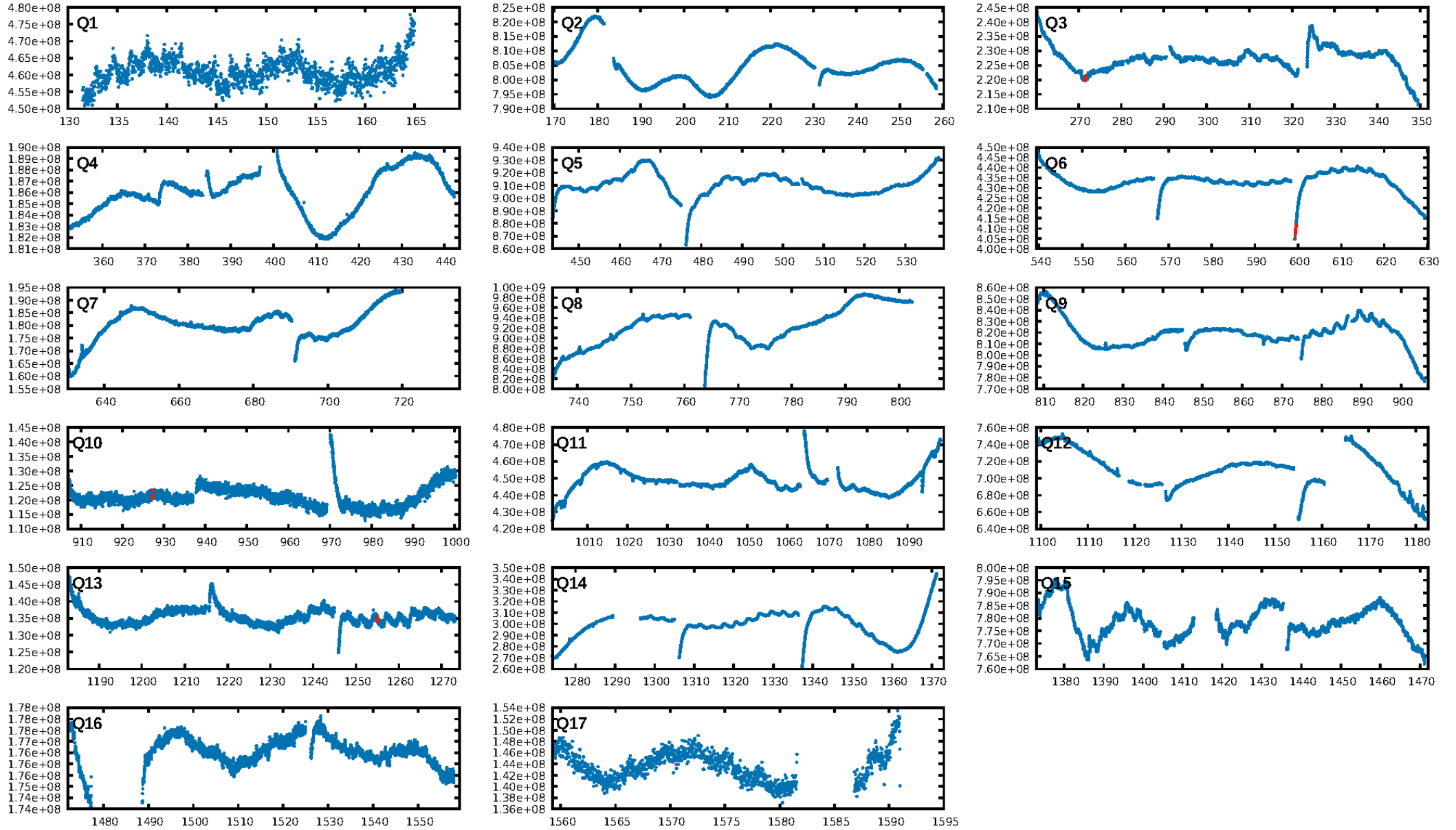
ShortPeriod-sig: 100.0% [53.98 σ]
LongPeriod-sig: 100.0% [27.95 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 0.75 [3/4]
GhostDiagnostic-chr: 1.236

Centroid-sig: 39.2%
Centroid-so: 0.079 arcsec [6.01 σ]
OotOffset-rm: 3.215 arcsec [4.72 σ]
KicOffset-rm: 3.012 arcsec [4.42 σ]
OotOffset-st: 0/0/0/1 [1]
KicOffset-st: 0/0/0/1 [1]
DiffImageQuality-fgm: 0.00 [0/1]
DiffImageOverlap-fno: 1.00 [2/2]

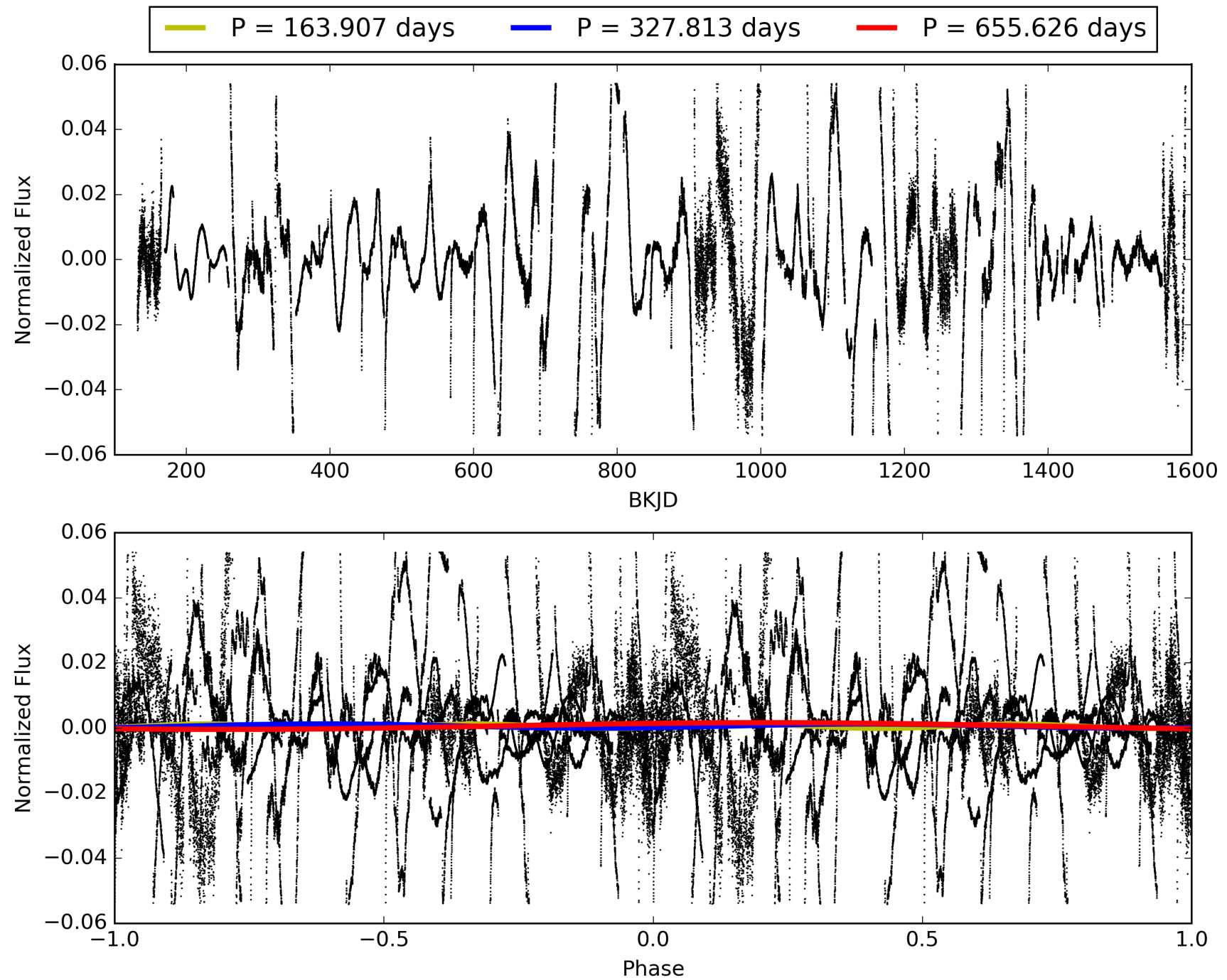
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 01:26:30 Z

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

TCE 005870047-04, PDC Light Curves

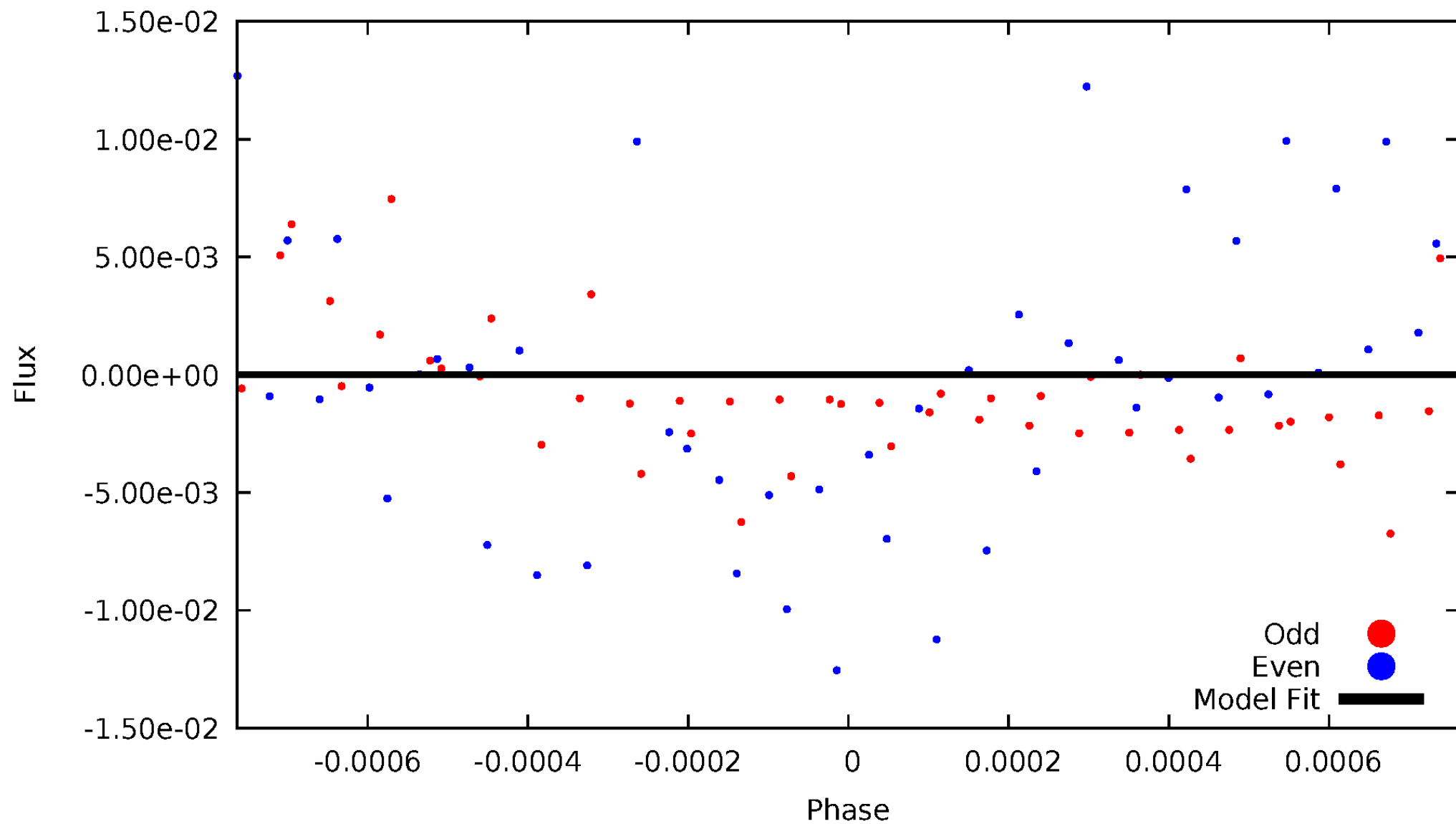


TCE 005870047-04



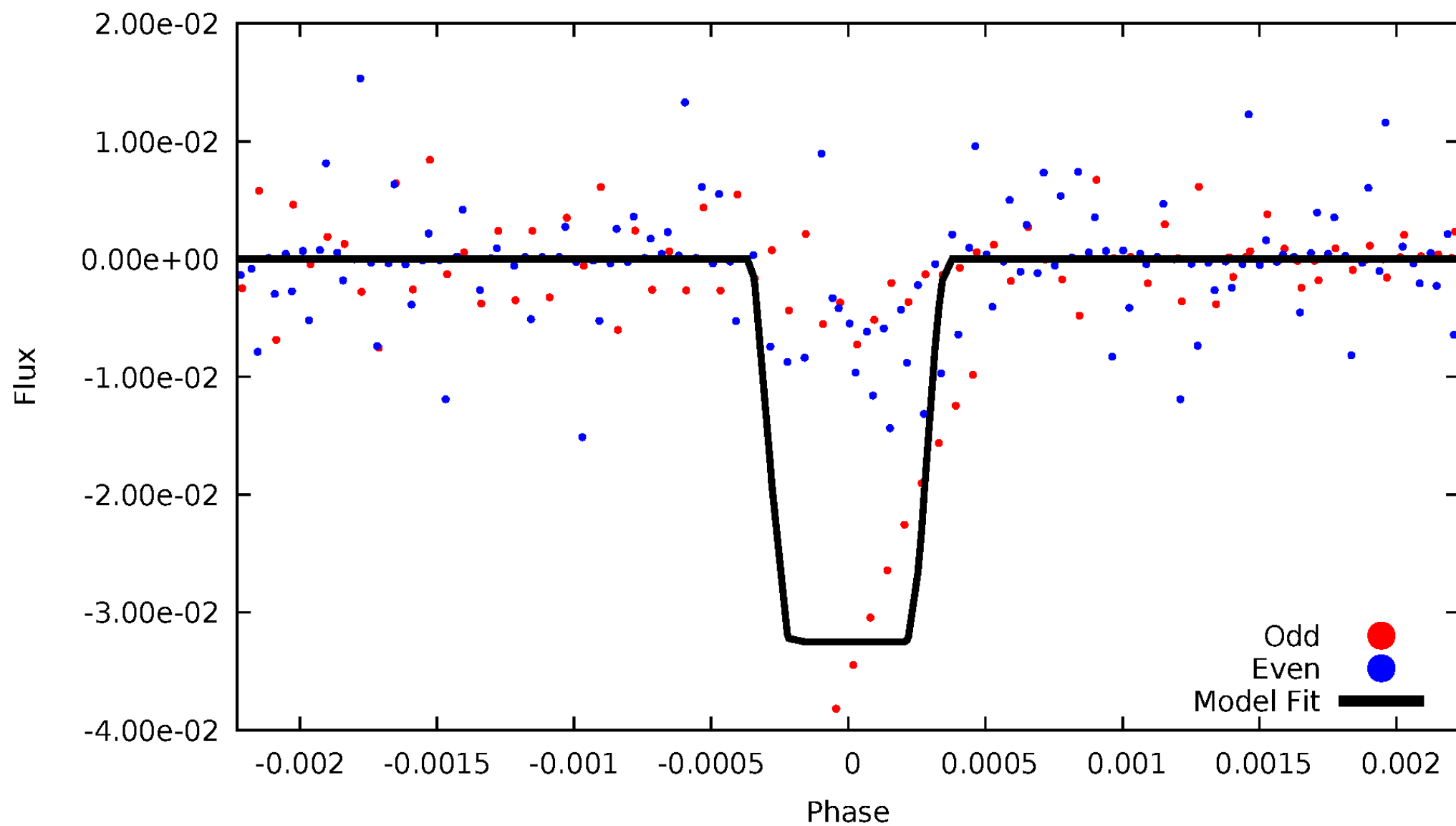
DV Odd/Even

TCE 005870047-04



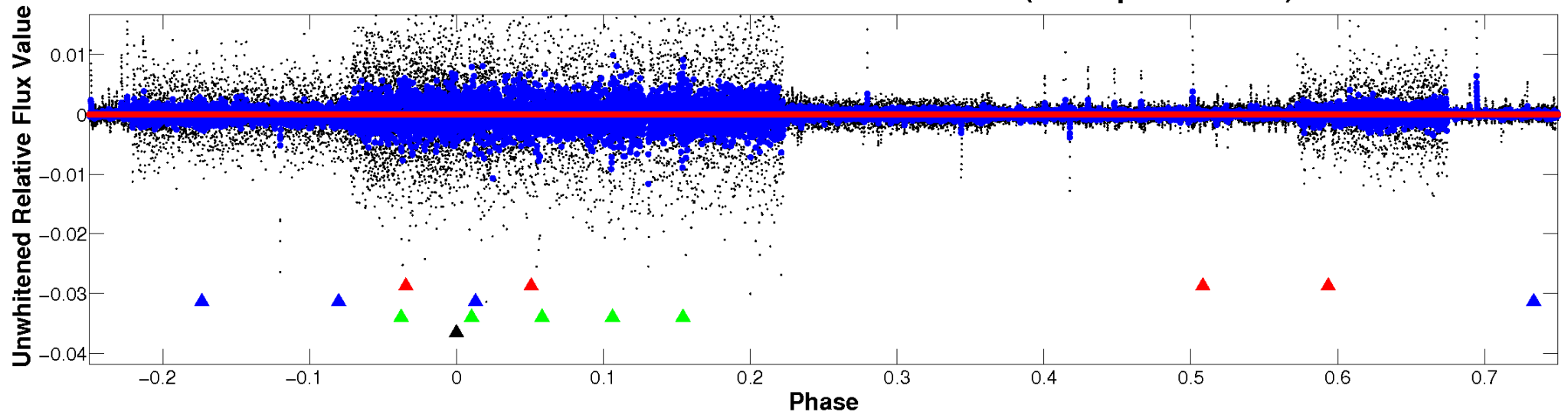
ALT Odd/Even

TCE 005870047-04



Non-Whitened Vs. Whitened Light Curve

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

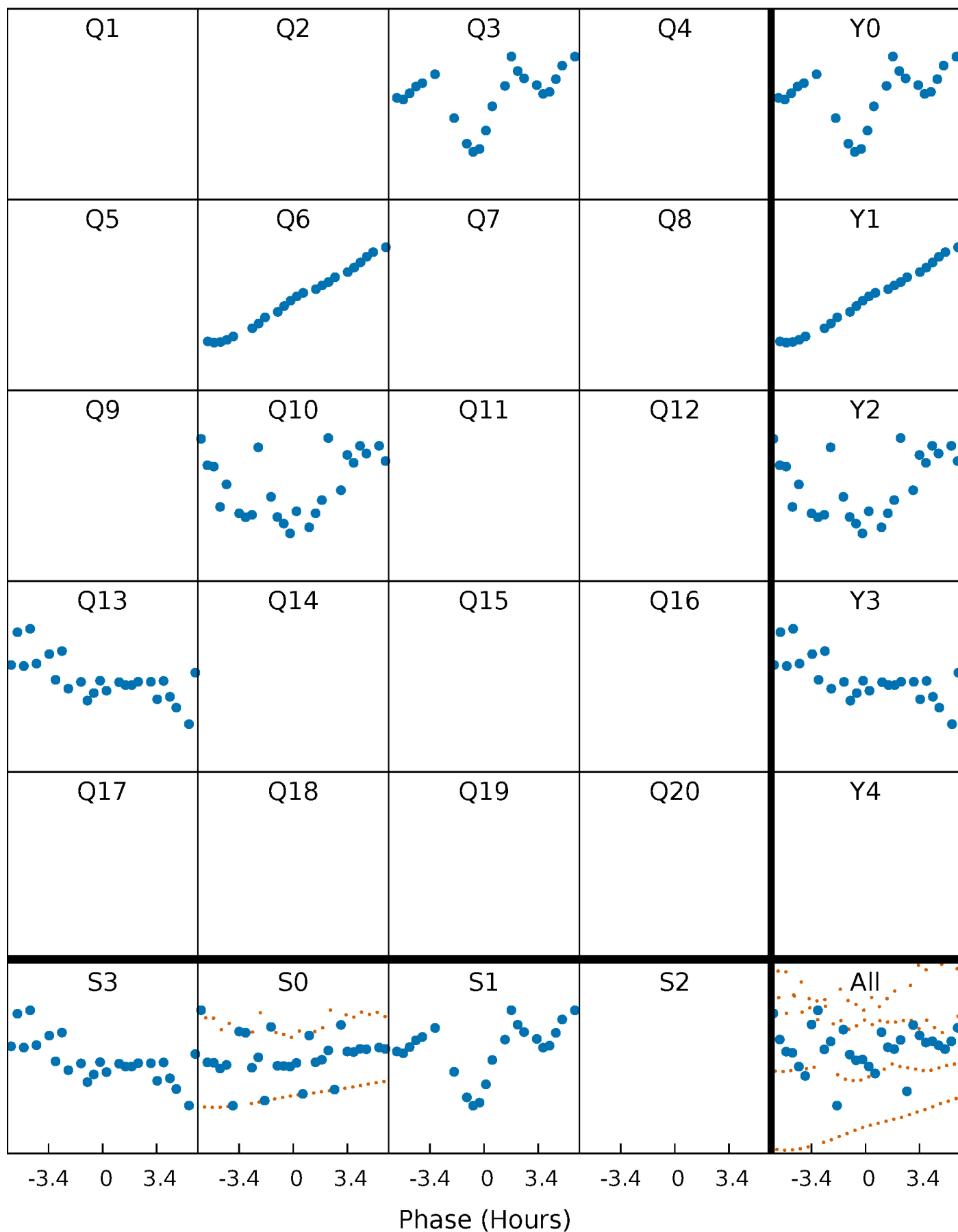


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



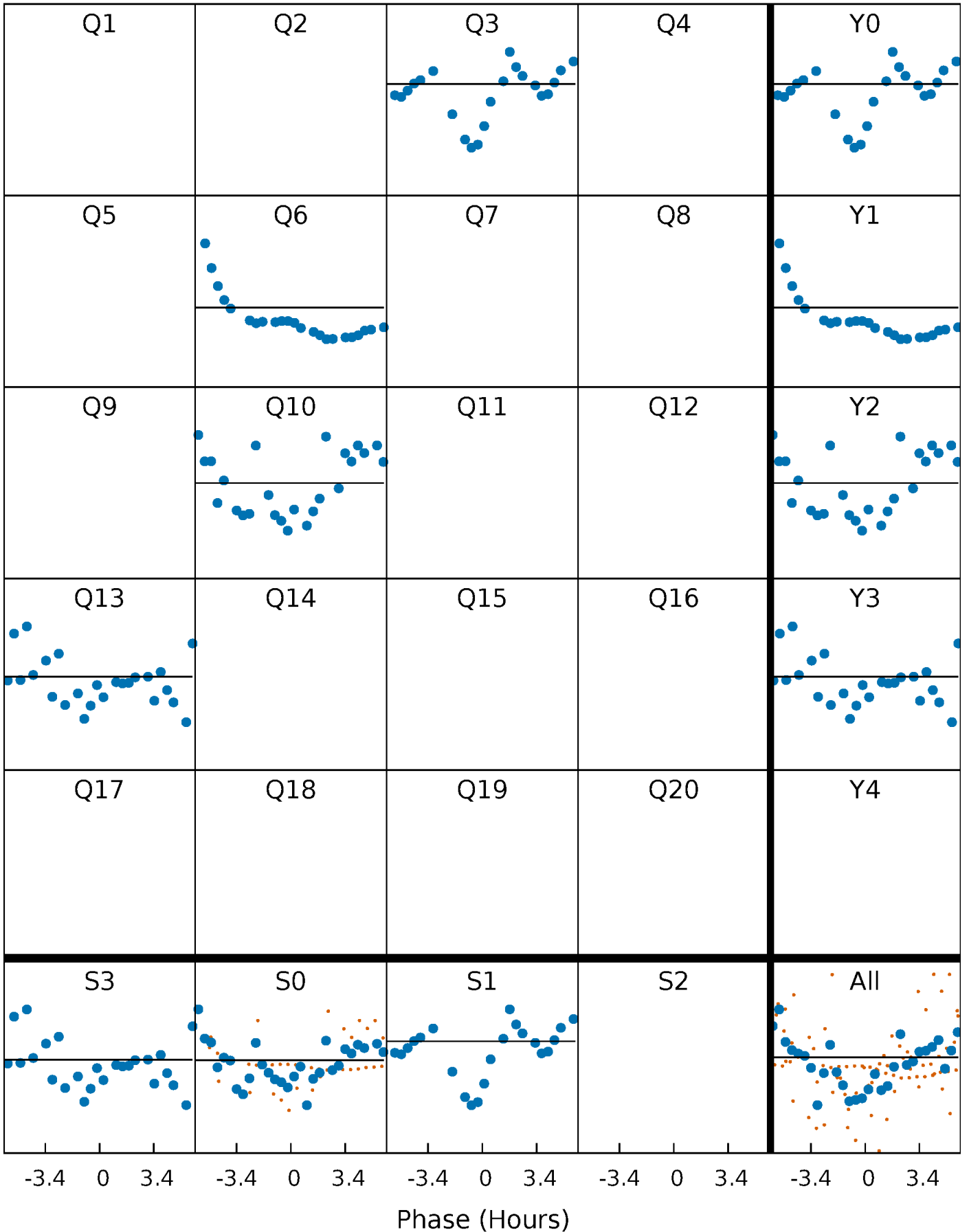
PDC Quarter-Phased Transit Curves

TCE 005870047-04 $P=327.813178$ Days $T_0=271.638310$ (BKJD)



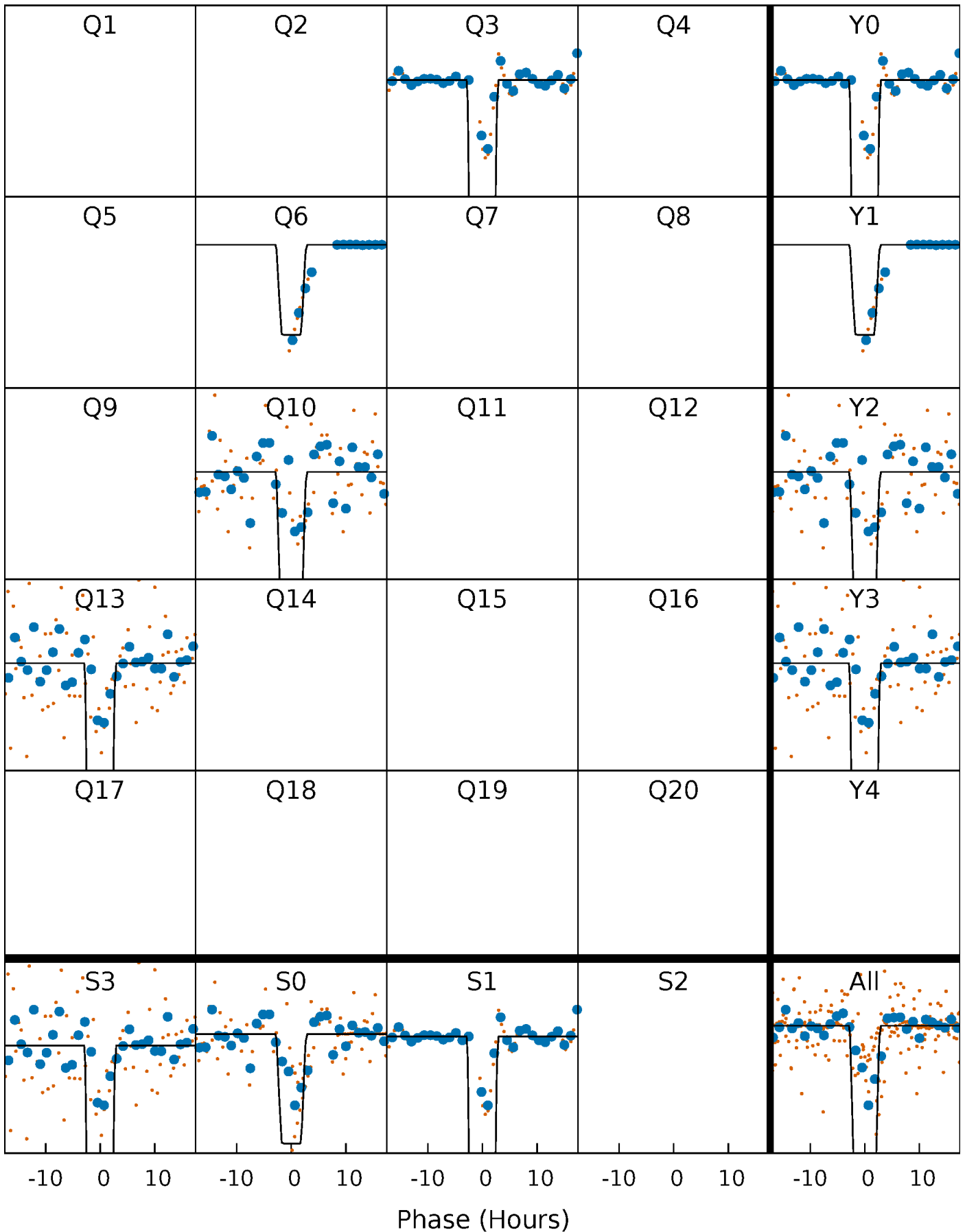
DV Quarter-Phased Transit Curves

TCE 005870047-04 $P=327.813178$ Days $T_0=271.638310$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

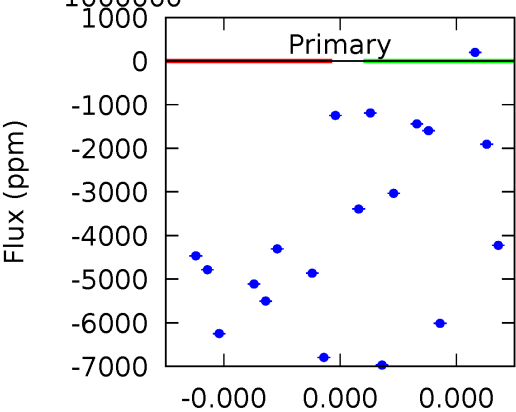
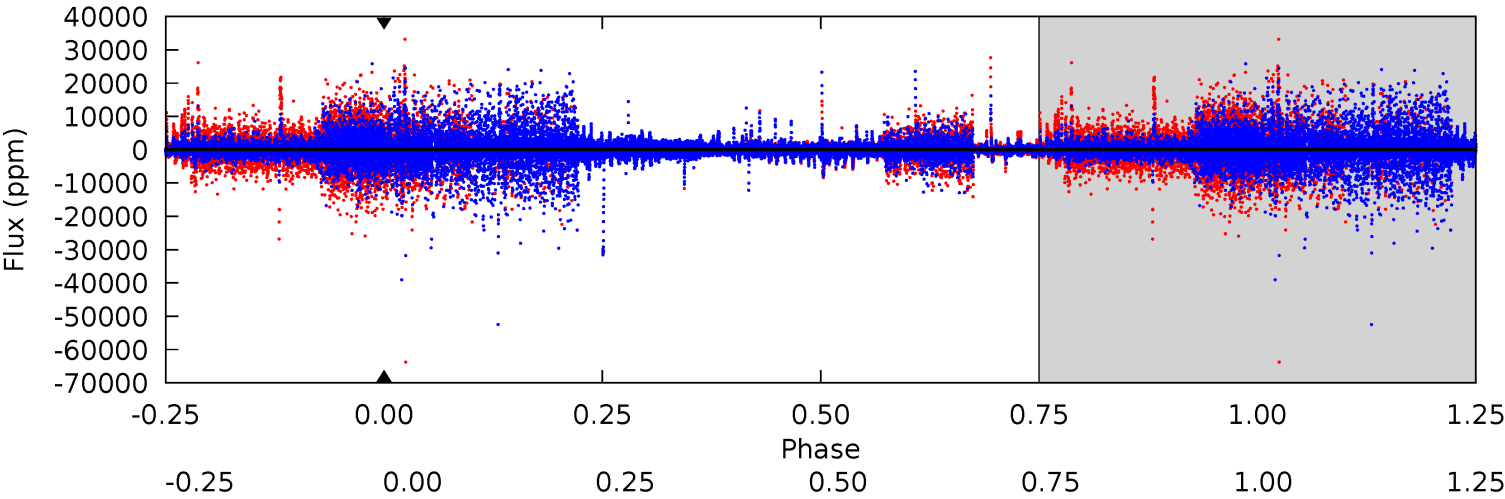
TCE 005870047-04 $P=327.813178$ Days $T_0=271.583851$ (BKJD)



DV Model-Shift Uniqueness Test

005870047-04, P = 327.813178 Days, E = 271.638310 Days

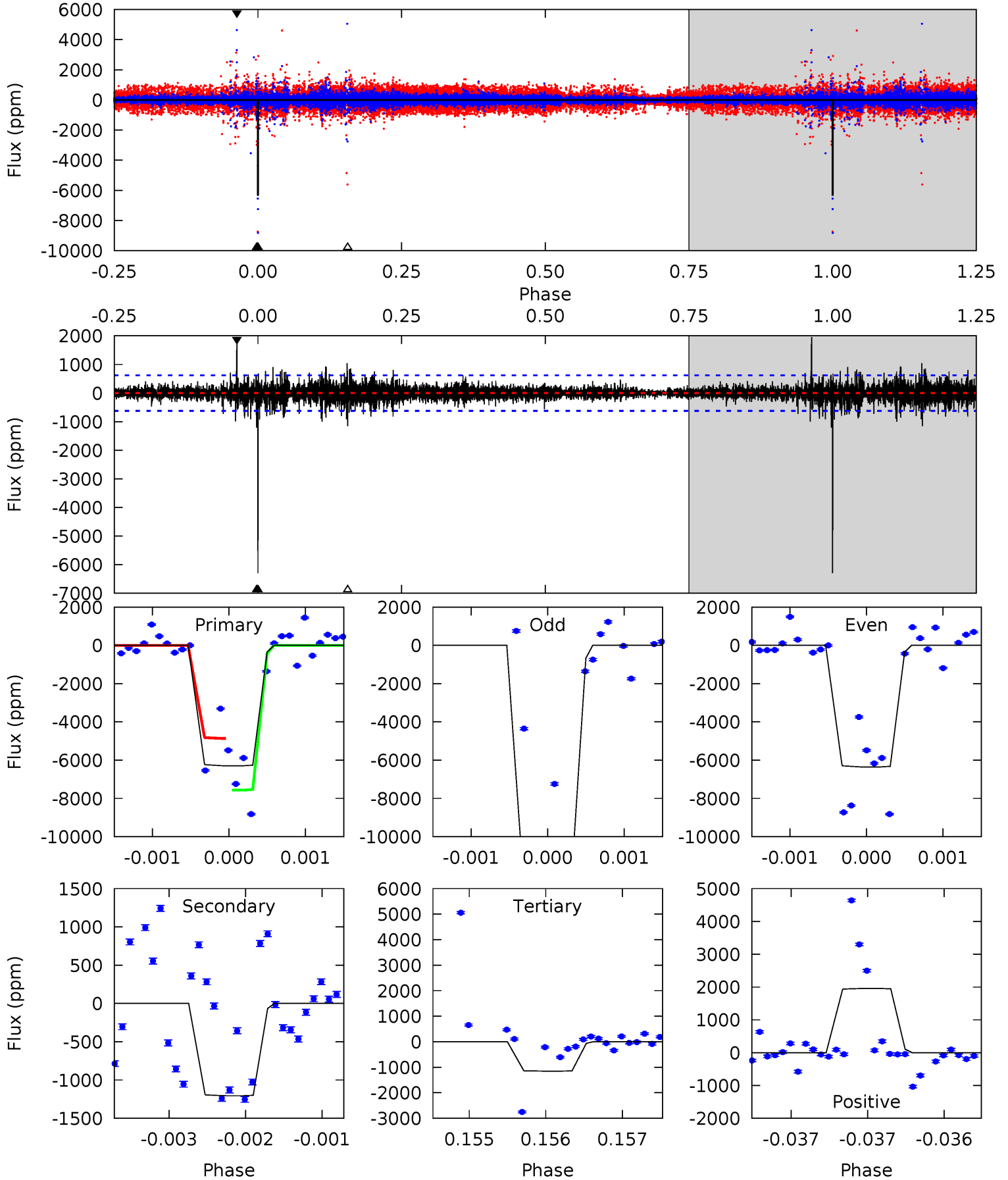
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

005870047-04, P = 327.813178 Days, E = 271.583851 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
55.8	10.7	10.2	17.3	5.52	3.39	1.24	45.6	38.5	0.50	-6.65	13.5	1.83	0.24	12.0



Stellar Parameters For KIC 005870047

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3262^{+117}_{-78}	$0.102^{+0.195}_{-0.065}$	$-0.060^{+0.250}_{-0.150}$	$155.634^{+7.354}_{-27.576}$	$1.118^{+0.207}_{-0.128}$	$0.000^{+0.000}_{-0.000}$
	+4%/-2%	+191%/-64%	+417%/-250%	+5%/-18%	+19%/-11%	+88%/-15%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 005870047-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$1244.79^{+1338.31}_{-850.11}$	2528^{+116}_{-124}	-2640^{+8891}_{-3581}	$-0.149^{+52.925}_{-54.136}$
Alt.	-1205 ± 113	$3072.98^{+1722.67}_{-1648.90}$	2517^{+120}_{-141}	-2434^{+4197}_{-121}	$0.065^{+0.249}_{-0.037}$

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

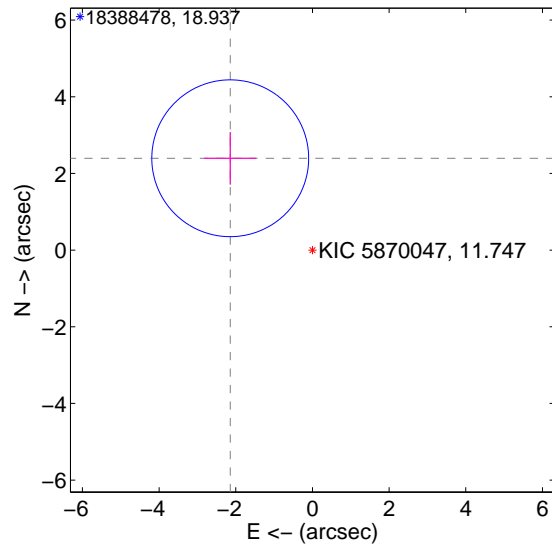
Supplemental centroid analysis for 005870047-04. **Kepler magnitude: 11.75.** Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

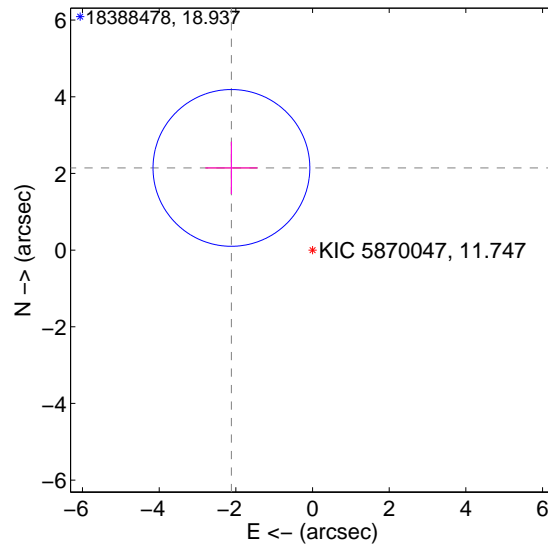
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.215 ± 0.682	4.72	2.145 ± 0.679	2.396 ± 0.684
PRF-fit source offset from KIC position	3.012 ± 0.682	4.42	2.116 ± 0.679	2.144 ± 0.684
photometric centroid source offset	0.08 ± 0.01	6.01	0.03 ± 0.01	-0.07 ± 0.01

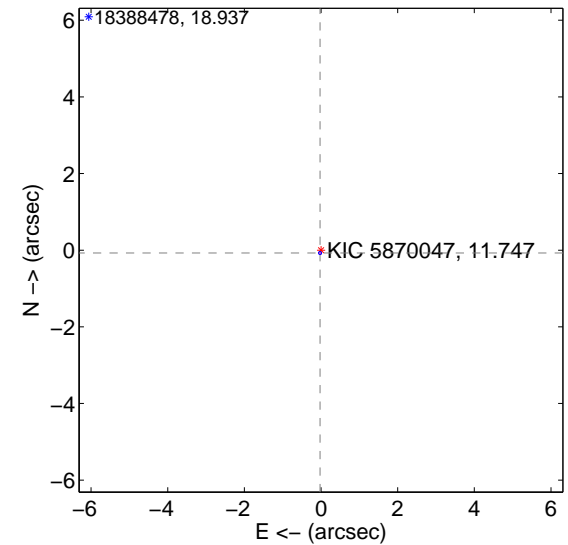
offset from difference PRF-fit to OOT PRF-fit



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.

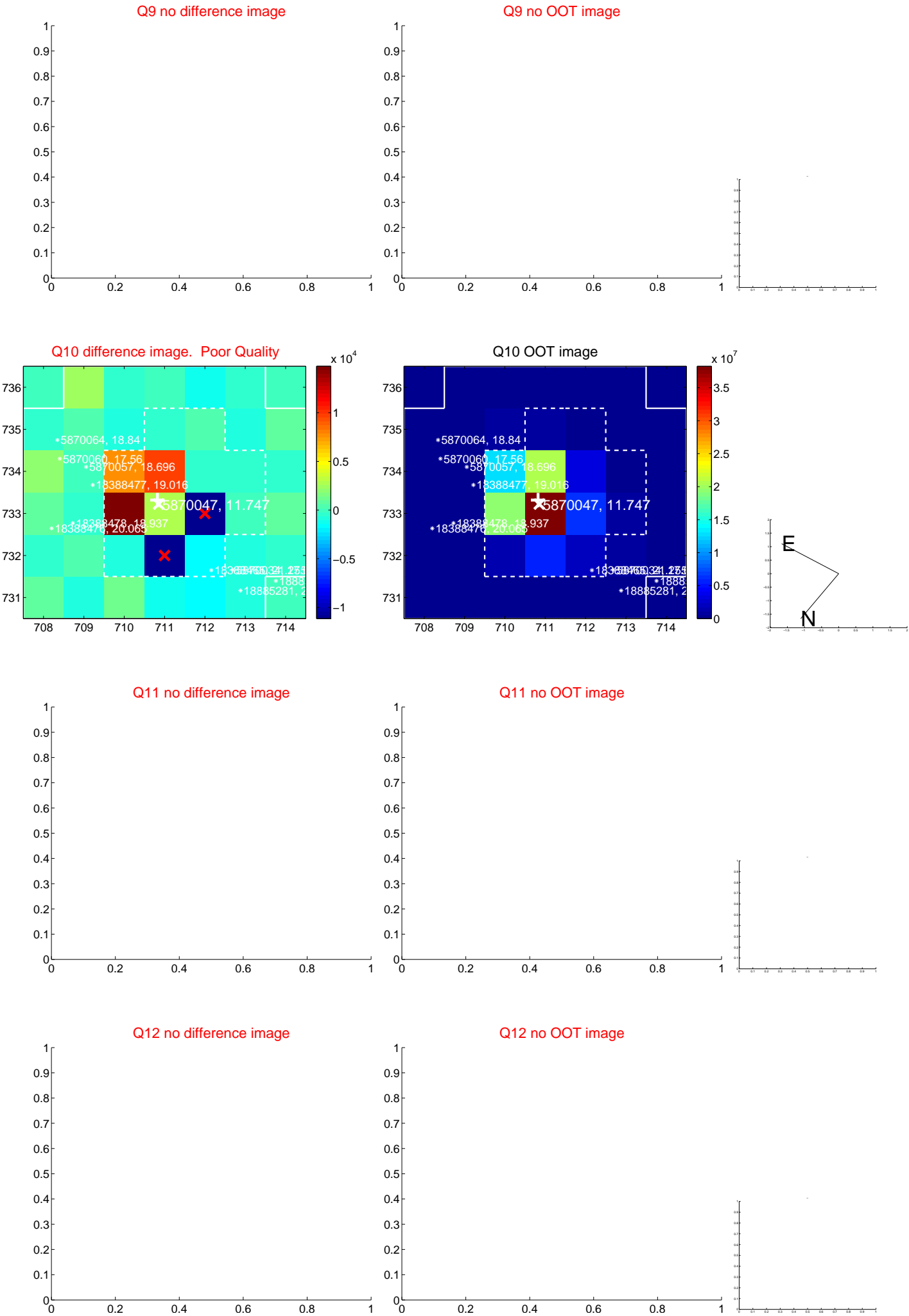
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



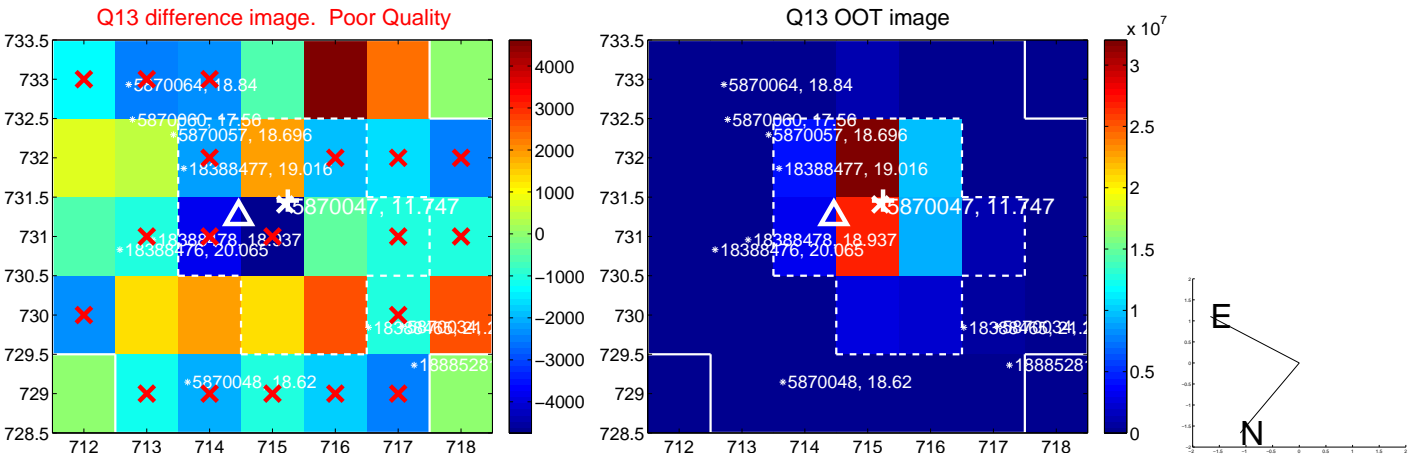
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



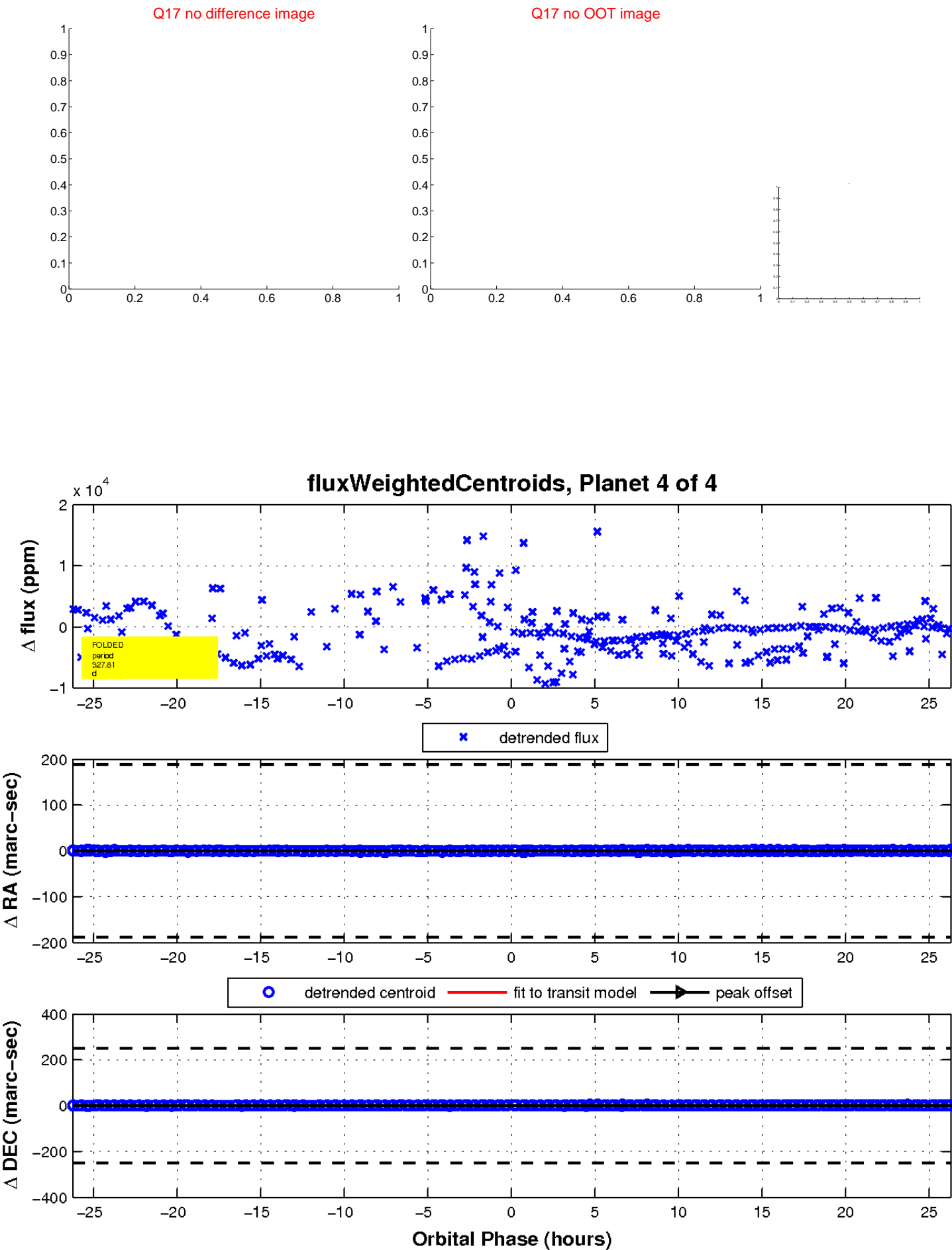
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

