KIC 008959087

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 ($S_\oplus$)
008959087-01	OBS	No	506.366848	266.864381	1328.9	4.681	16.8	4.5	0.89	5451	3.25	0.45
008959087-02	OBS	No	460.738745	406.818911	524.6	1.077	12.1	2.4	0.89	5451	2.65	0.51
008959087-03	OBS	No	534.275018	161.600124	1517.0	8.393	14.2	3.8	0.89	5451	3.40	0.41
008959087-04	OBS	No	507.167770	553.113232	731.8	6.000	12.1	-1.0	0.89	5451	2.37	0.45

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008959087-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
008959087-02	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—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008959087-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008959087-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

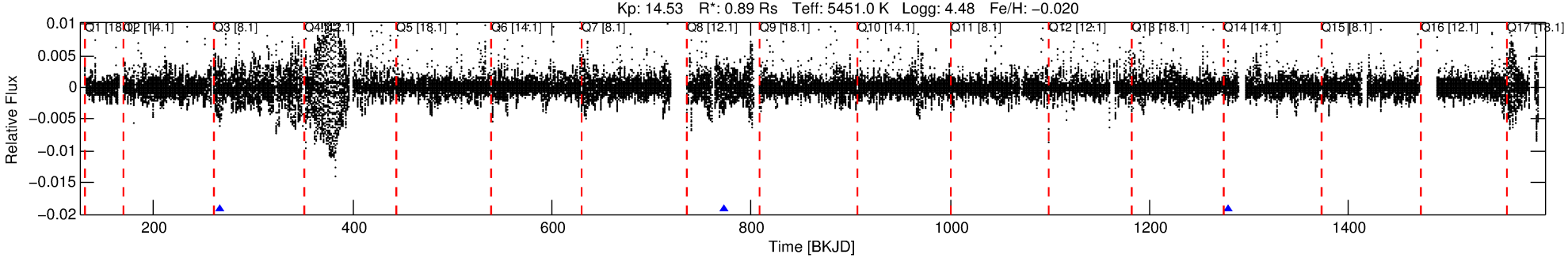
Ephemeris Match Information For 008959087-01

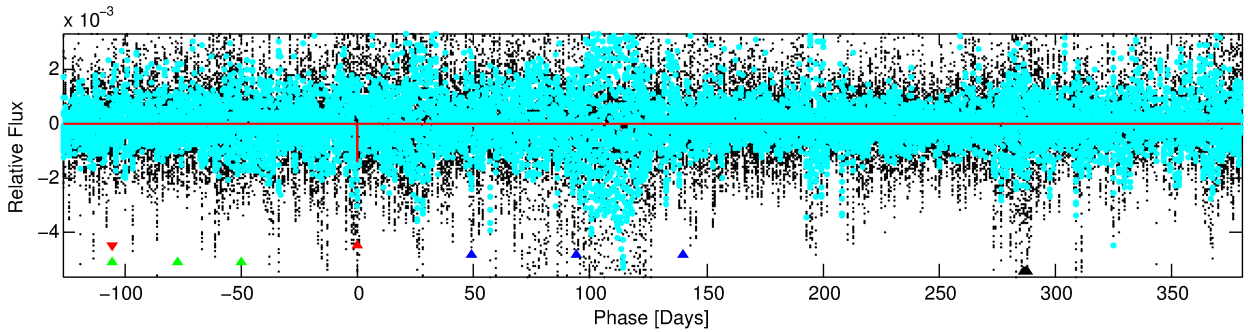
No Significant Match Found

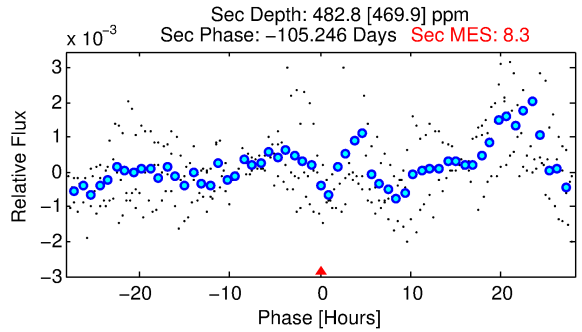
DV One-Page Summary

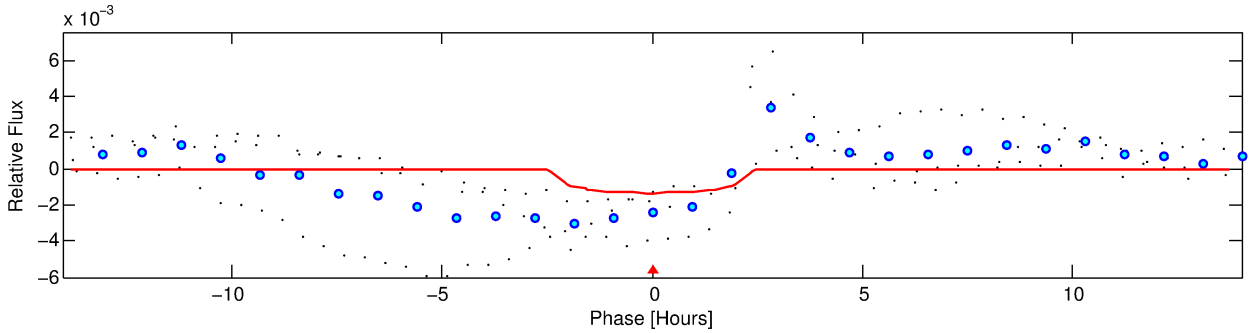
KIC: 8959087 Candidate: 1 of 4 Period: 506.367 d

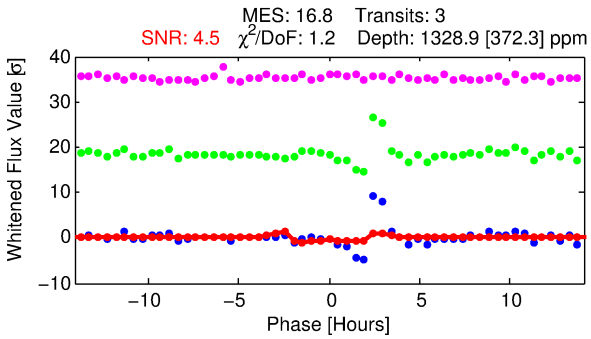
Kp: 14.53 R*: 0.89 Rs Teff: 5451.0 K Logg: 4.48 Fe/H: −0.020

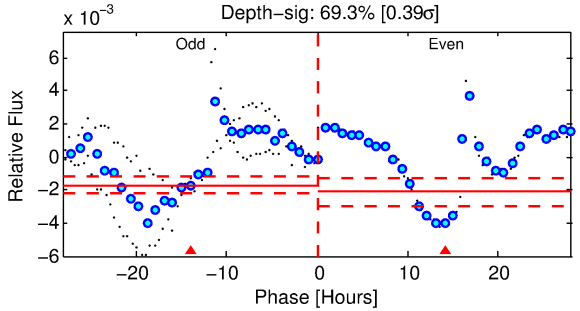


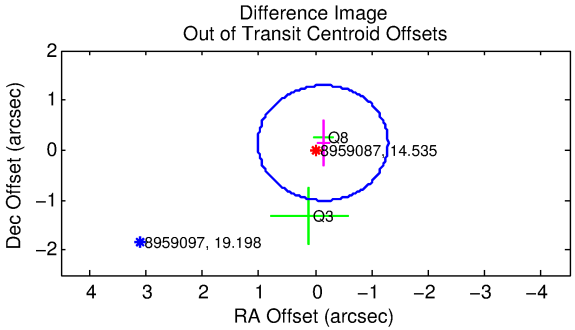












DV Fit Results:

Period = 506.36685 [0.00845] d
Epoch = 266.8644 [0.0110] BKJD
Rp/R* = 0.0334 [0.0440]
a/R* = 796.74 [4028.96]
b = 0.37 [11.82]

Seff = 0.45 [0.13]
Teq = 208 [16] K
Rp = 3.25 [4.34] Re
a = 1.1865 [0.2205] AU

Ag = 35502.52 [100263.02] [0.35σ]
Teffp = 4423 [3111] K [1.35σ]

DV Diagnostic Results:

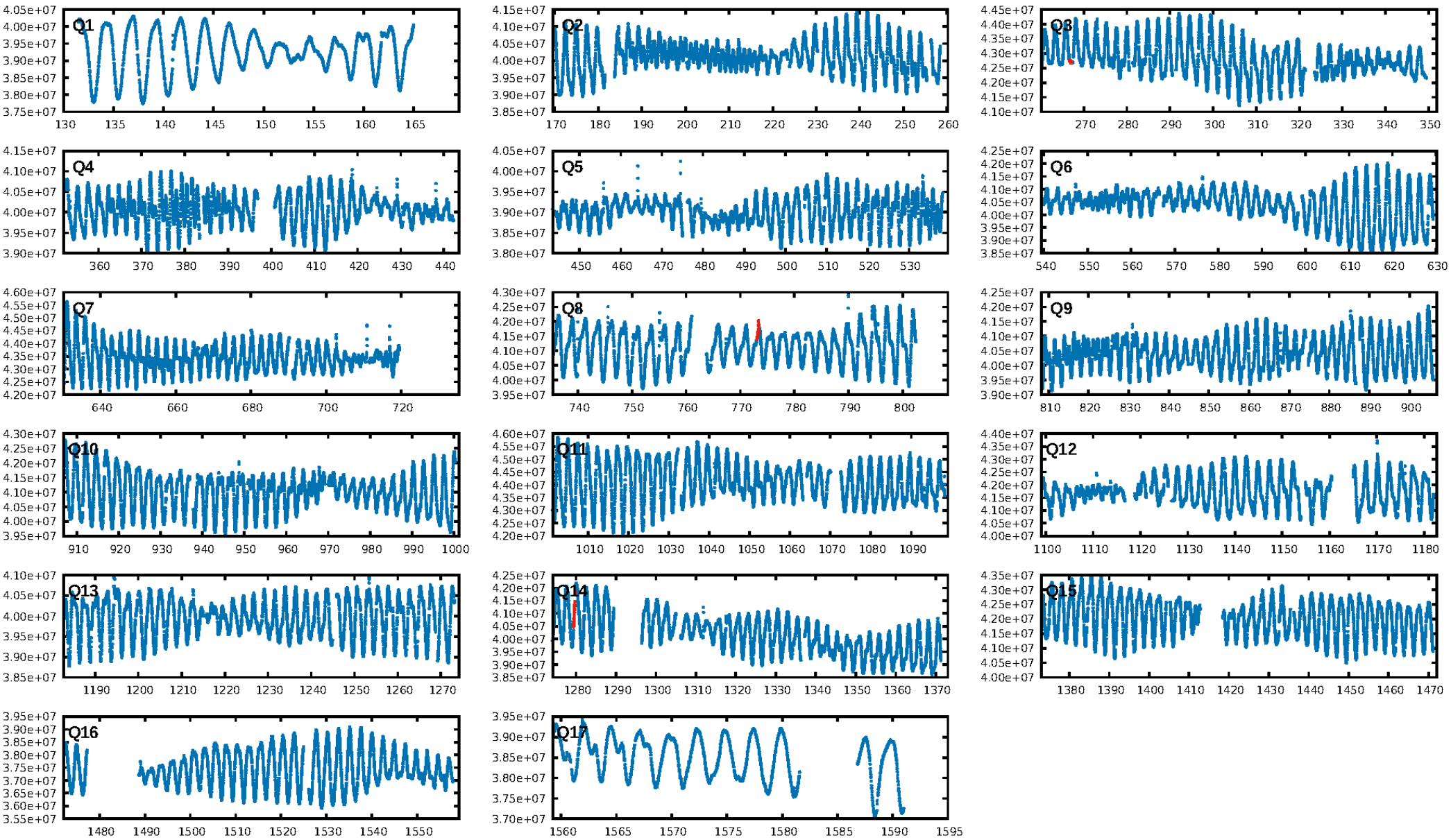
ShortPeriod−sig: 100.0% [228.01σ]
LongPeriod−sig: 98.8% [2.53σ]
ModelChiSquare2−sig: 34.6%
ModelChiSquareGof−sig: 88.2%
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [3/3]
GhostDiagnostic−chr: −0.07361

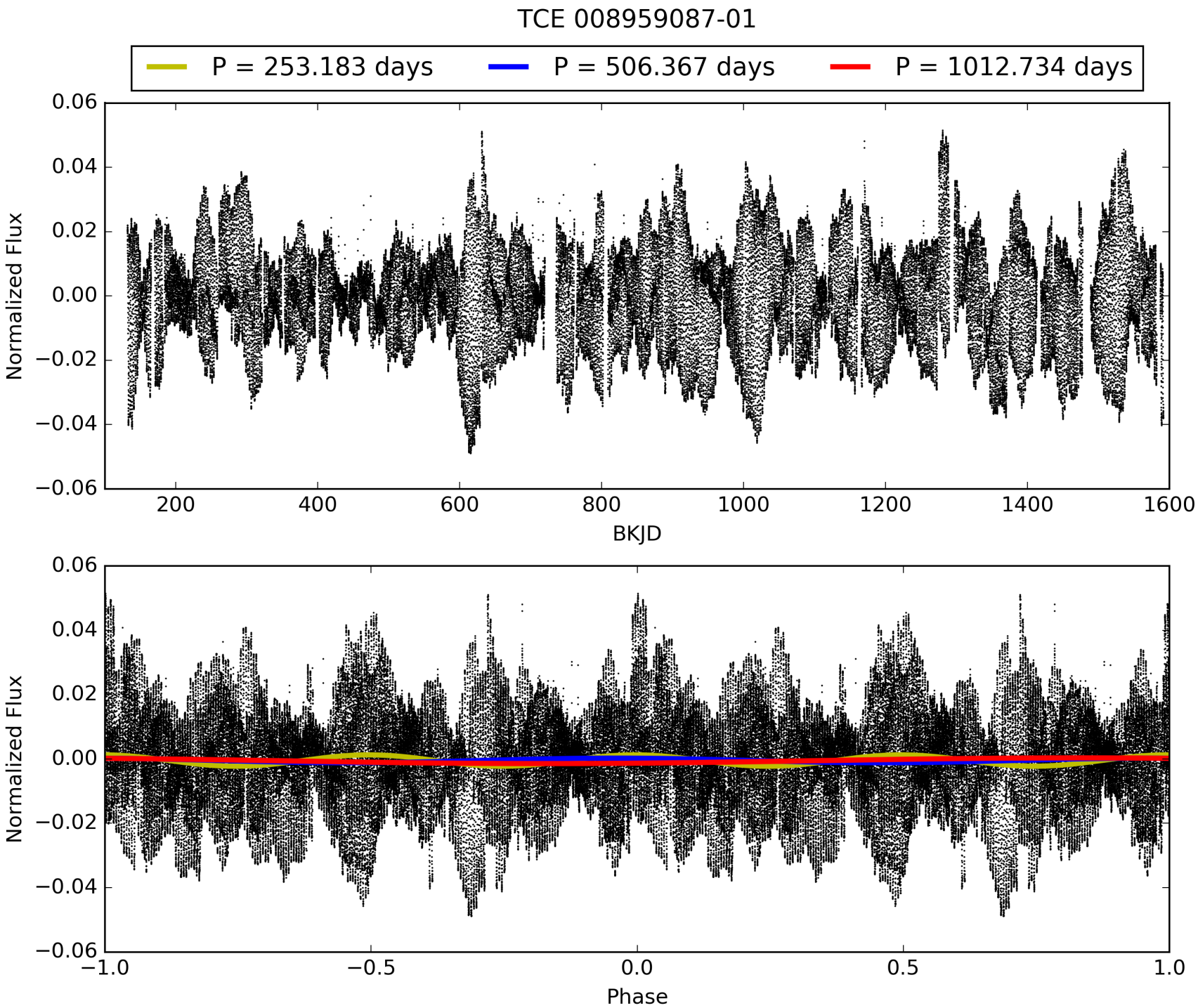
Centroid−sig: 51.7%
Centroid−so: 0.252 arcsec [0.45σ]
OotOffset−rm: 0.200 arcsec [0.52σ]
KicOffset−rm: 0.291 arcsec [0.84σ]
OotOffset−st: 0/1/1/0 [2]
KicOffset−st: 0/1/1/0 [2]
DiffImageQuality−fgm: 0.50 [1/2]
DiffImageOverlap−fno: 1.00 [2/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 23:16:49 Z

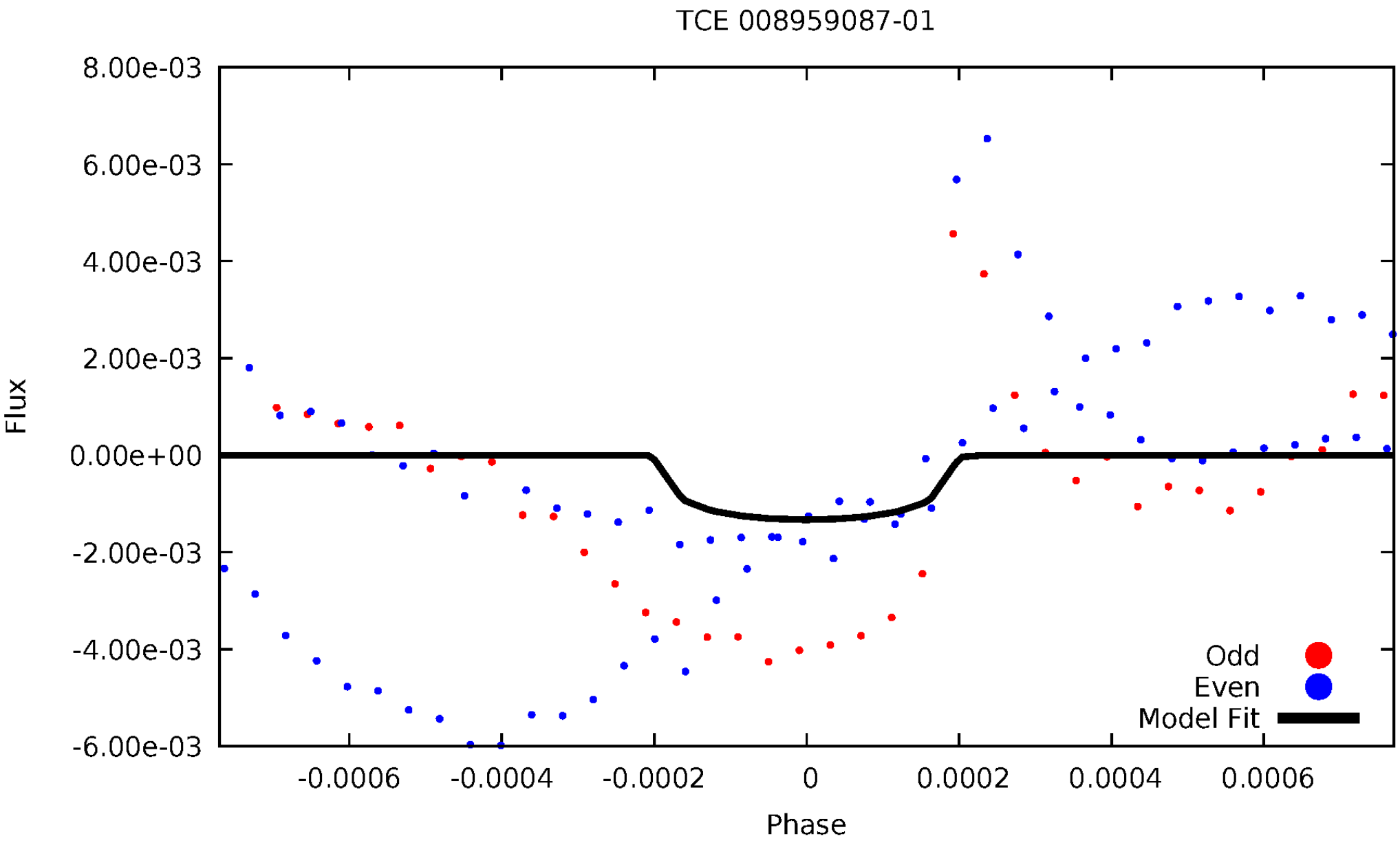
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008959087-01, PDC Light Curves




TCE 008959087-01
P = 253.183 days
P = 506.367 days
P = 1012.734 days
Normalized Flux
BKJD
Normalized Flux
Phase

DV Odd/Even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6.00e-03
4.00e-03
2.00e-03
0.00e+00
-2.00e-03
-4.00e-03
-6.00e-03
Flux
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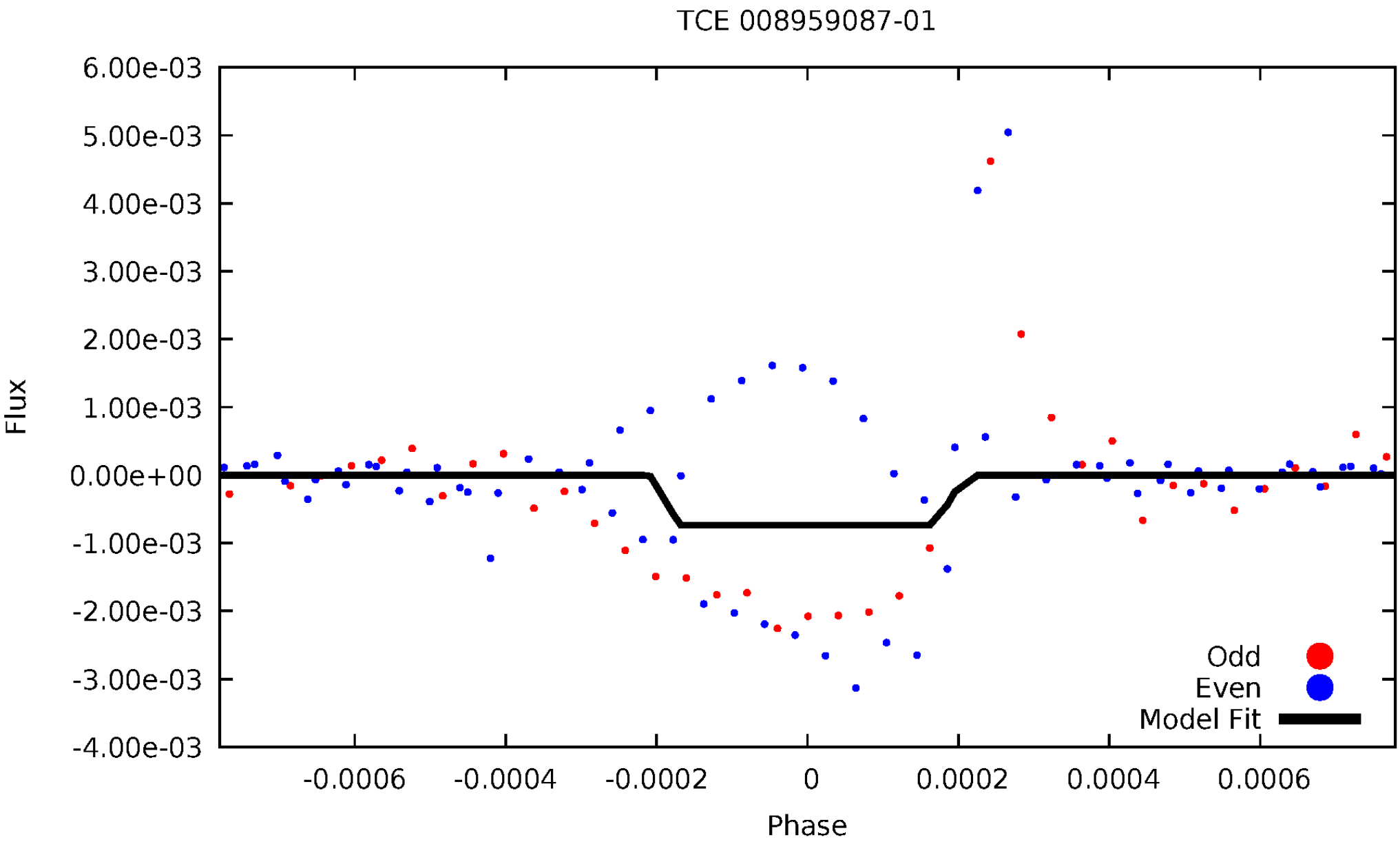
-0.0004
-0.0002
0
0.0002
0.0004
0.0006
Phase
Odd
Even
Model Fit

ALT Odd/Even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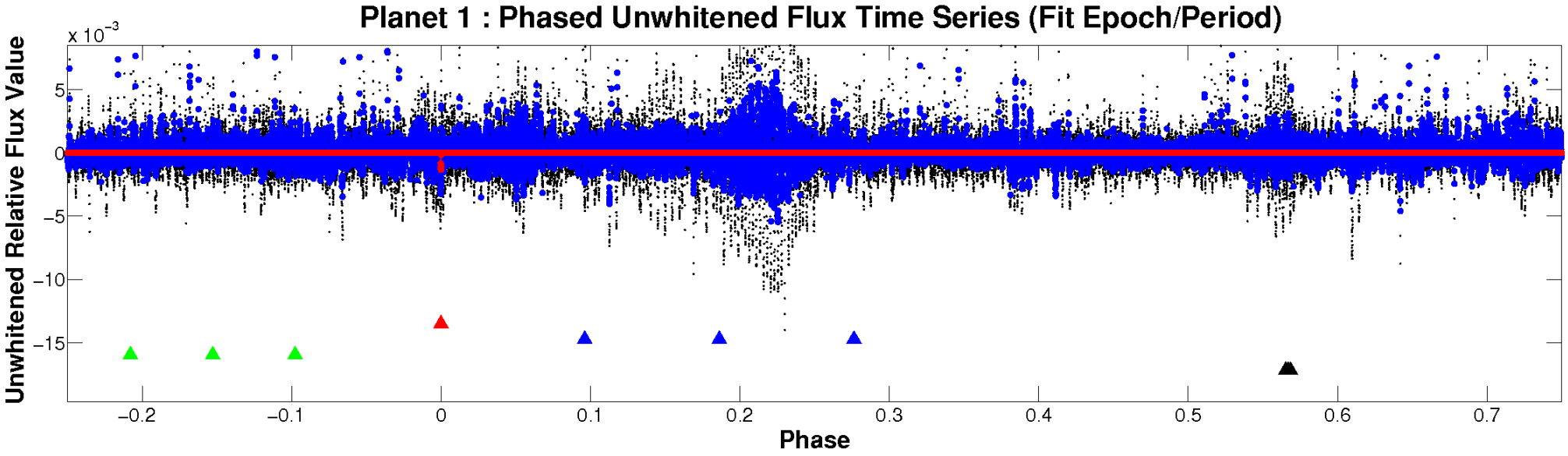
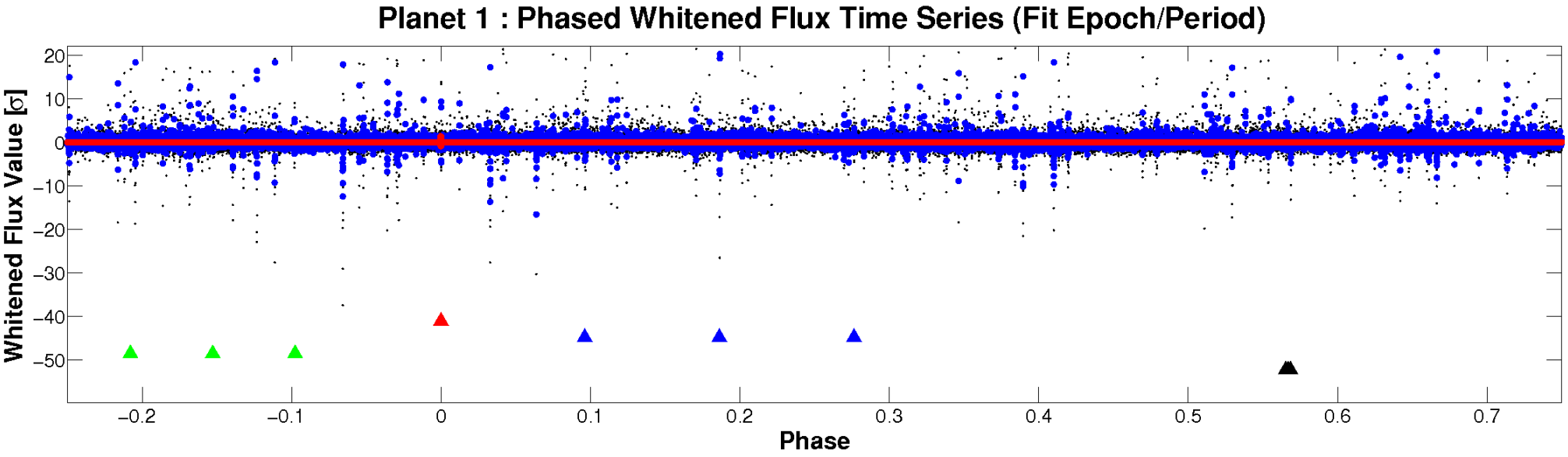
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
-4.00e-03
Flux
-0.0006
-0.0004
-0.0002
0
0.0002
0.0004
0.0006
Phase
Odd
Even
Model Fit

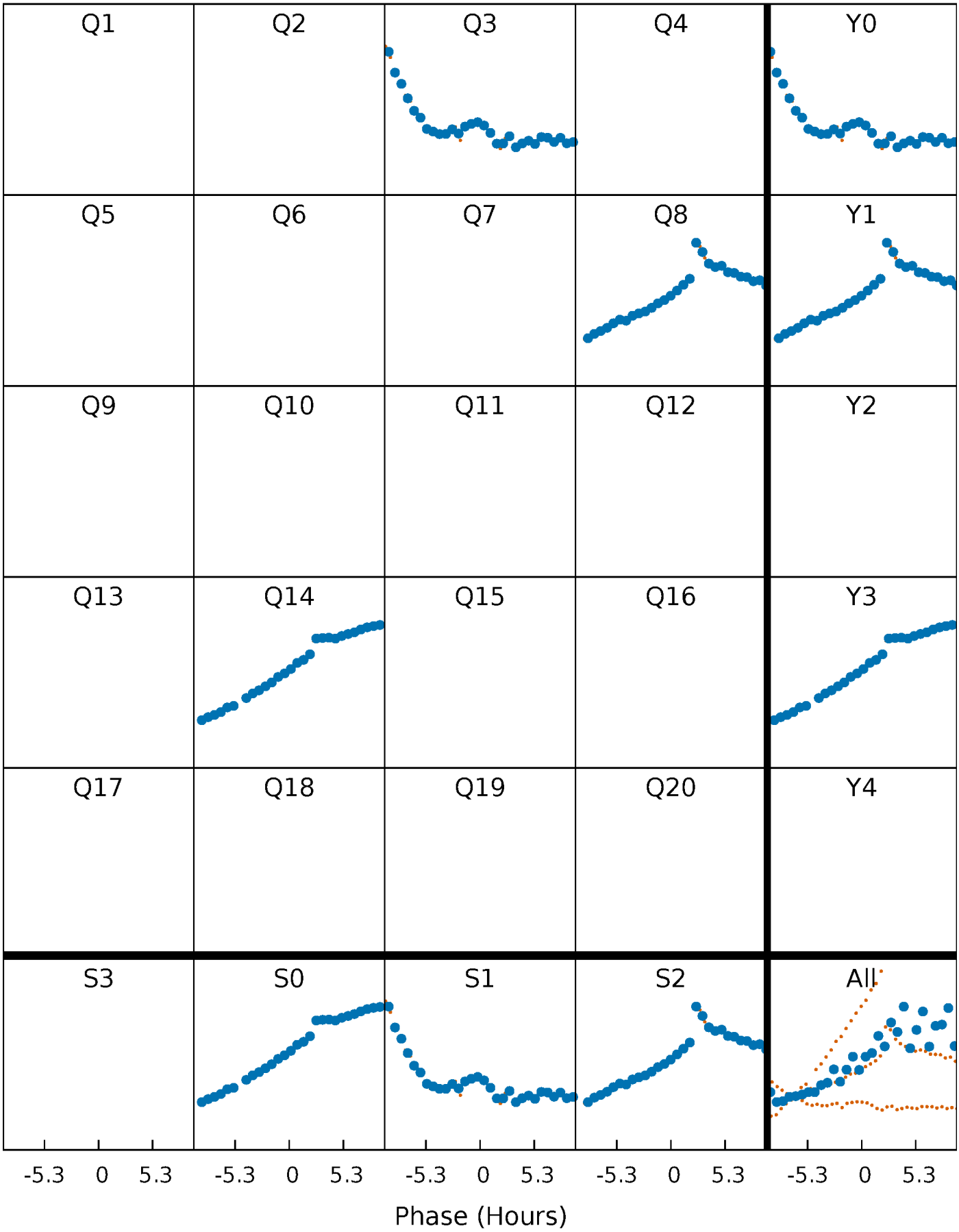
Non-Whitened Vs. Whitened Light Curve





PDC Quarter-Phased Transit Curves

TCE 008959087-01 P=506.366848 Days T_0=266.864380 (BKJD)



DV Quarter-Phased Transit Curves

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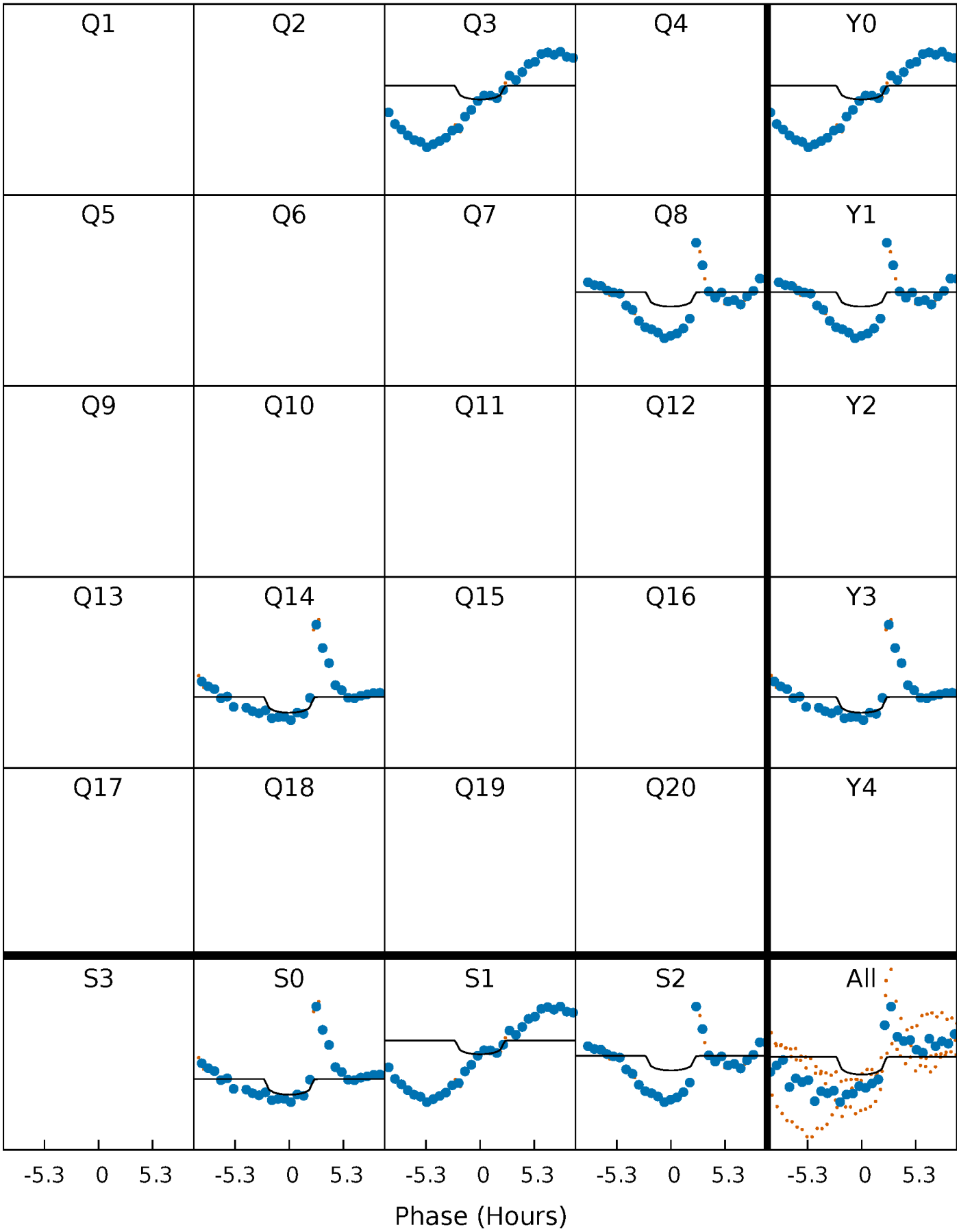
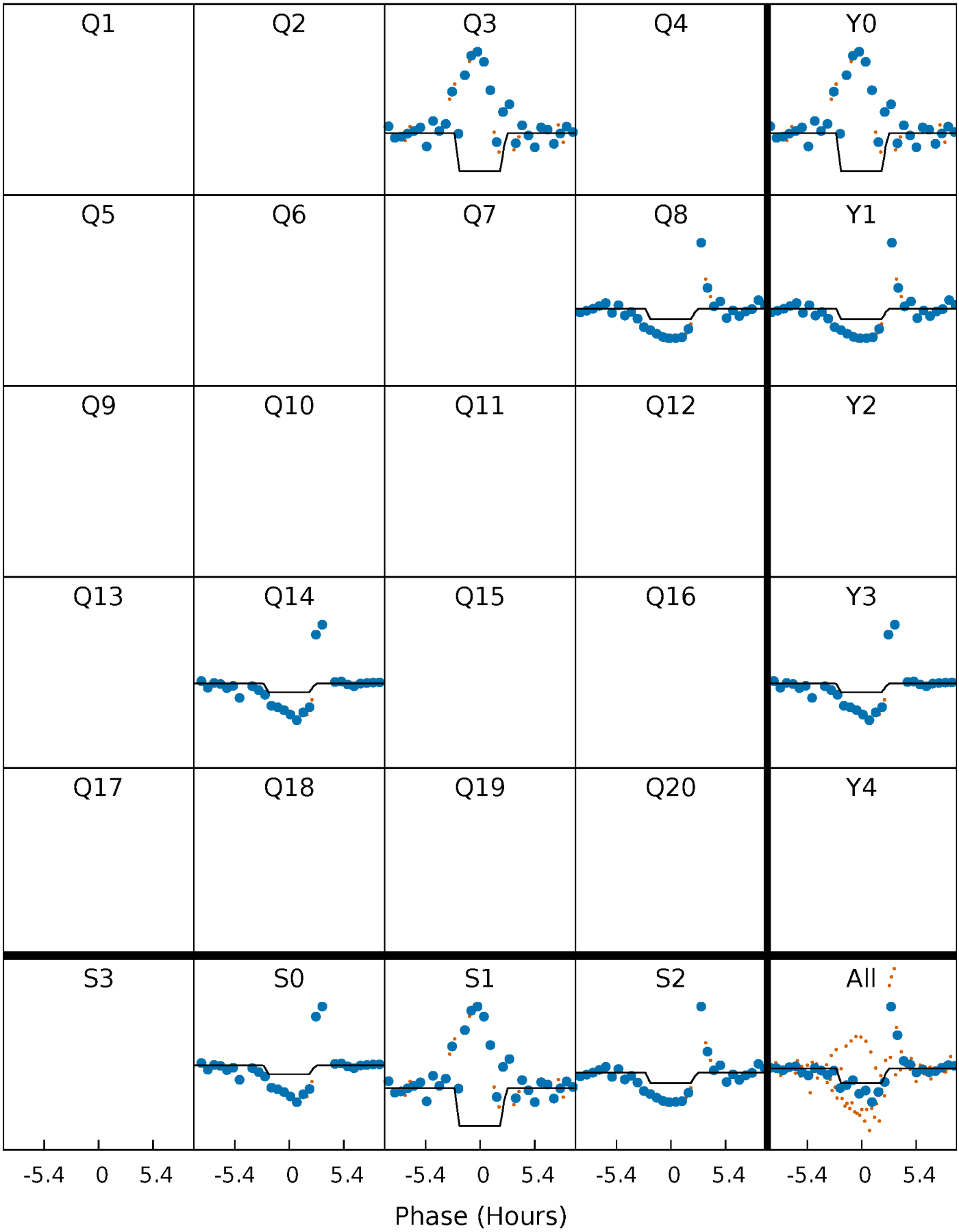


Alt. Detrend Quarter-Phased Transit Curves

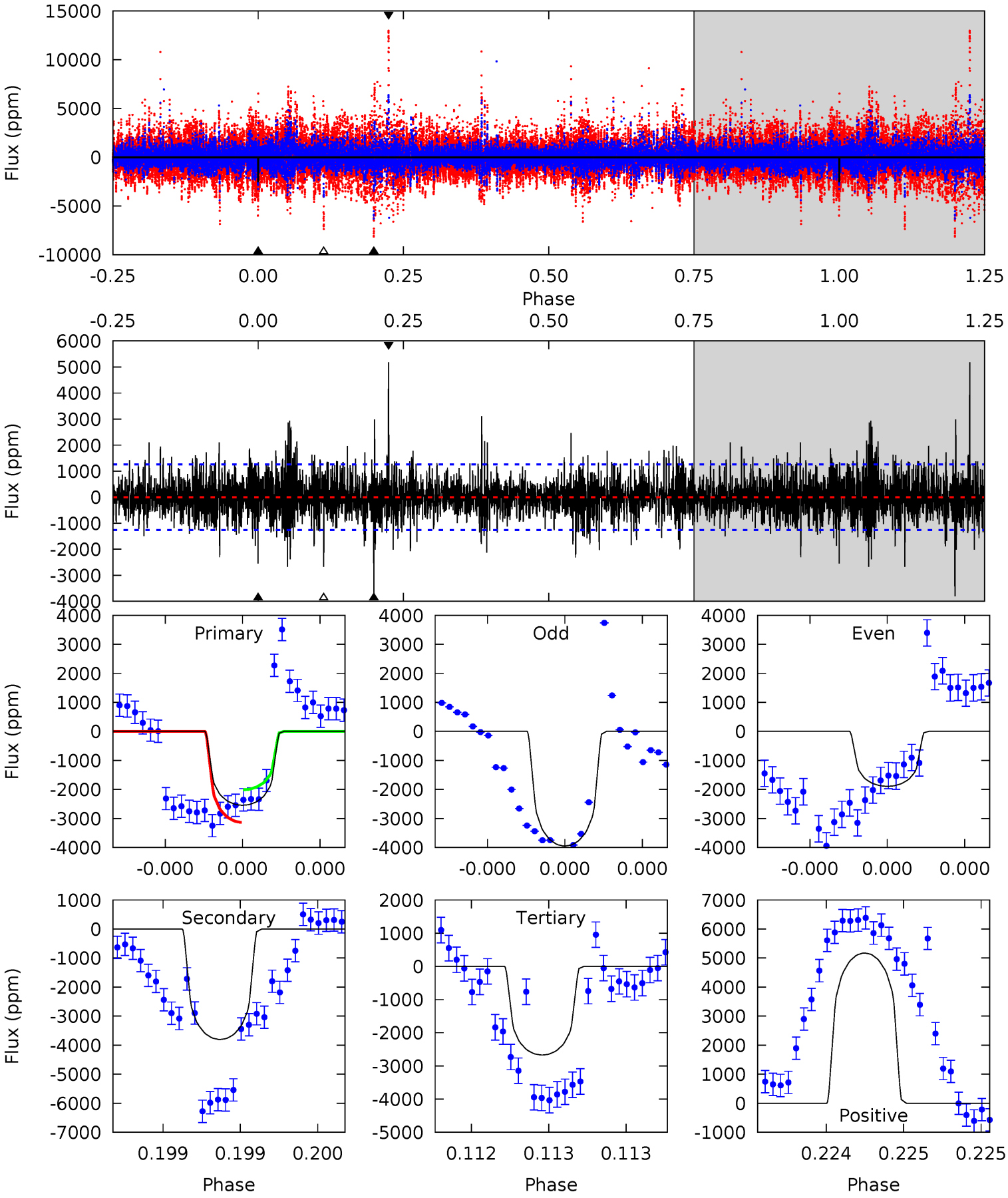
TCE 008959087-01 P=506.357239 Days T_0=266.868878 (BKJD)



DV Model-Shift Uniqueness Test

008959087-01, P = 506.366848 Days, E = 266.864380 Days

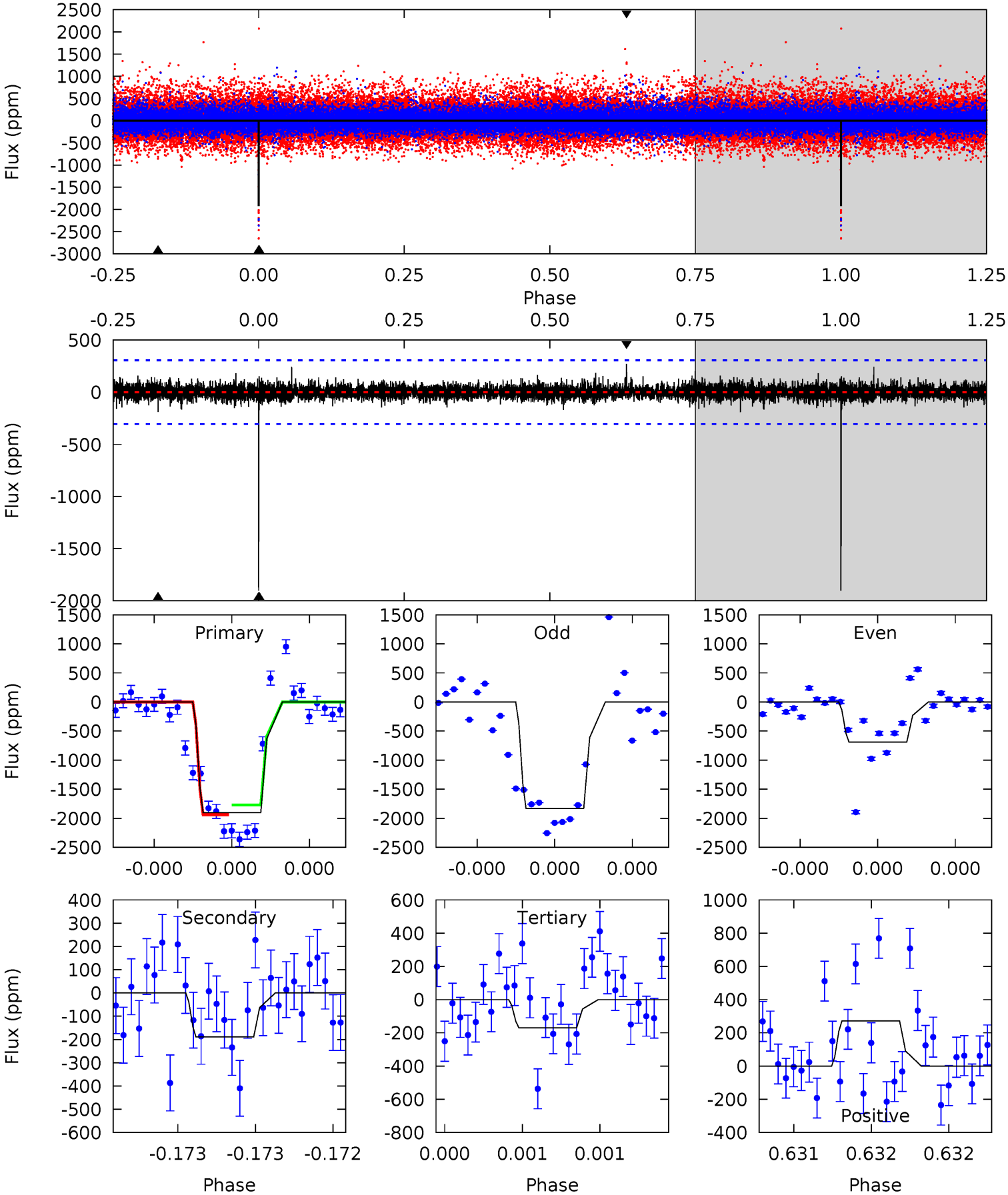
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	16.9	11.9	23.0	5.60	3.52	2.67	-0.56	-11.7	5.03	-6.09	3.42	1.24	0.58	2.48



Alt Model-Shift Uniqueness Test

008959087-01, P = 506.357239 Days, E = 266.868878 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
34.8	3.46	3.11	4.96	5.60	3.52	0.68	31.7	29.8	0.35	-1.50	10.7	0.60	0.12	0



Stellar Parameters For KIC 008959087

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5451^{+164}_{-164}	$4.477^{+0.081}_{-0.150}$	$-0.020^{+0.250}_{-0.300}$	$0.891^{+0.195}_{-0.105}$	$0.868^{+0.099}_{-0.074}$	$1.731^{+0.594}_{-0.727}$
	+3%/-3%	+2%/-3%	+1250%/-1500%	+22%/-12%	+11%/-9%	+34%/-42%
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 008959087-01 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-3804±225	$4.73^{+3.82}_{-2.94}$	294^{+17}_{-14}	6142^{+5437}_{-1401}	$132756^{+781468}_{-92866}$
Alt.	-189±55	$4.23^{+3.87}_{-2.70}$	293^{+18}_{-13}	3552^{+1634}_{-657}	8001^{+53861}_{-5952}

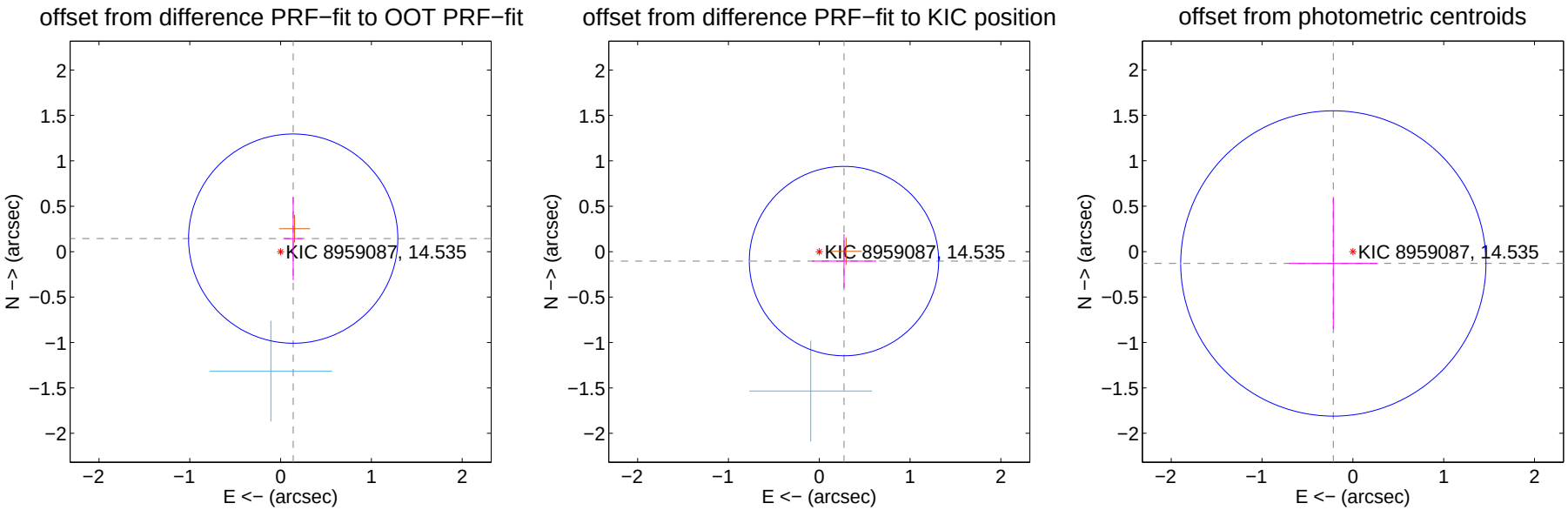
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

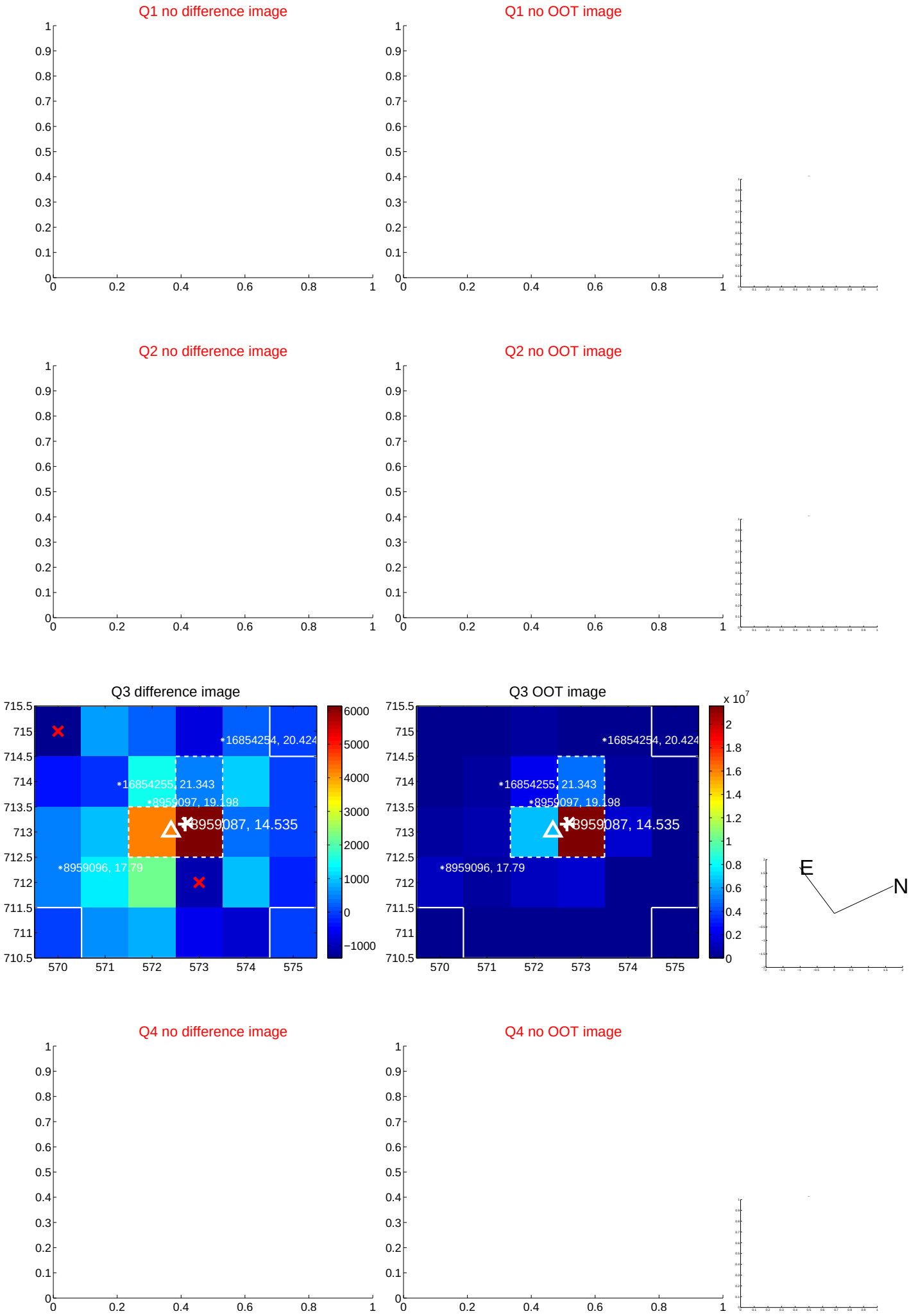
Supplemental centroid analysis for 008959087-01. Kepler magnitude: 14.54. Transit SNR 4.54
There are 1 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.200 ± 0.384	0.52	-0.139 ± 0.101	0.144 ± 0.458
PRF-fit source offset from KIC position	0.291 ± 0.347	0.84	-0.272 ± 0.354	-0.103 ± 0.295
photometric centroid source offset	0.25 ± 0.56	0.45	0.22 ± 0.49	-0.13 ± 0.72

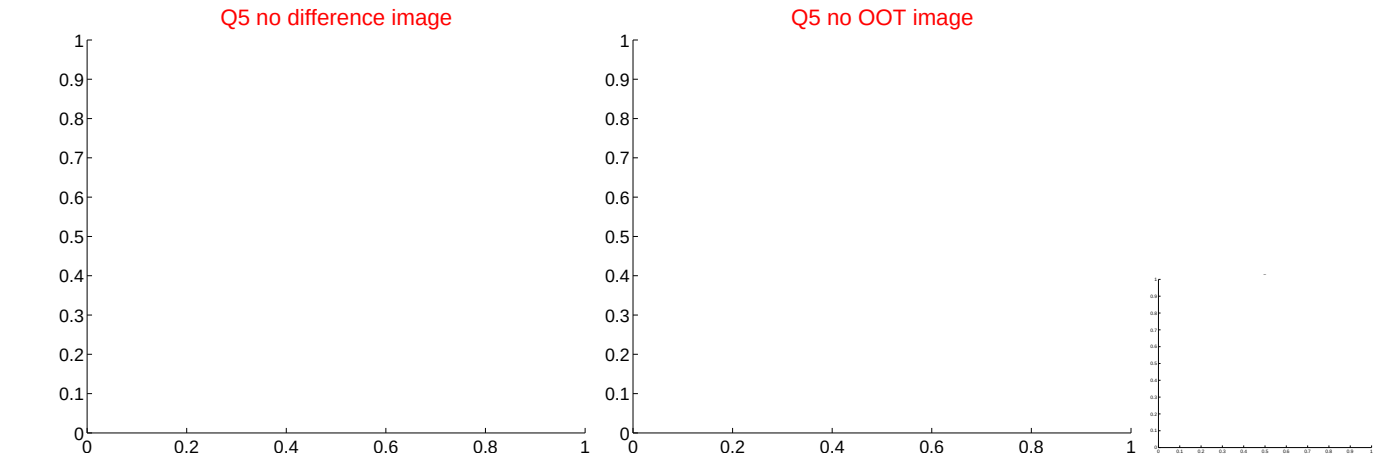


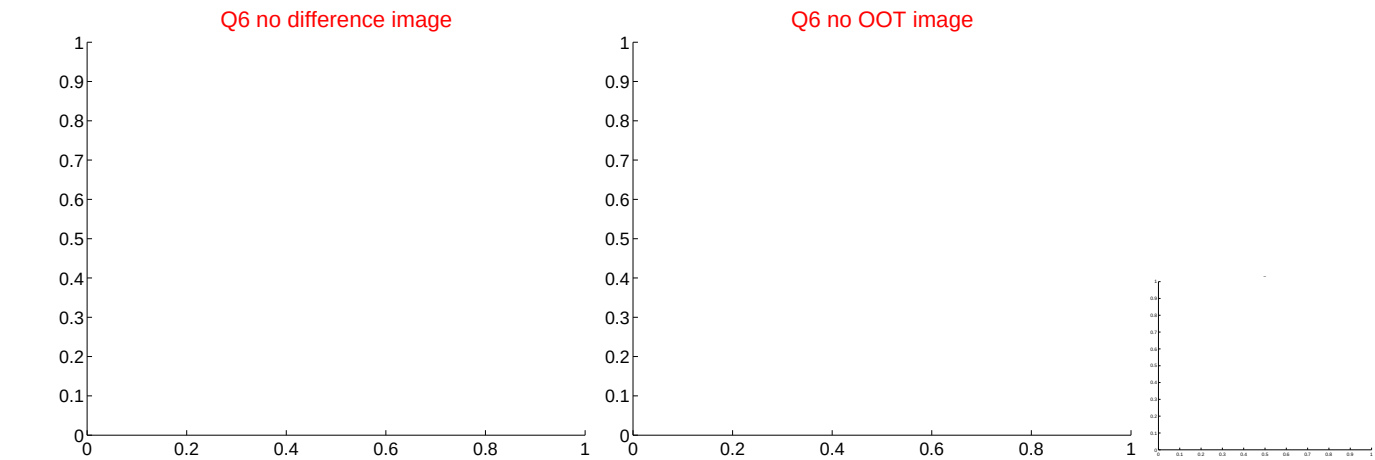
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

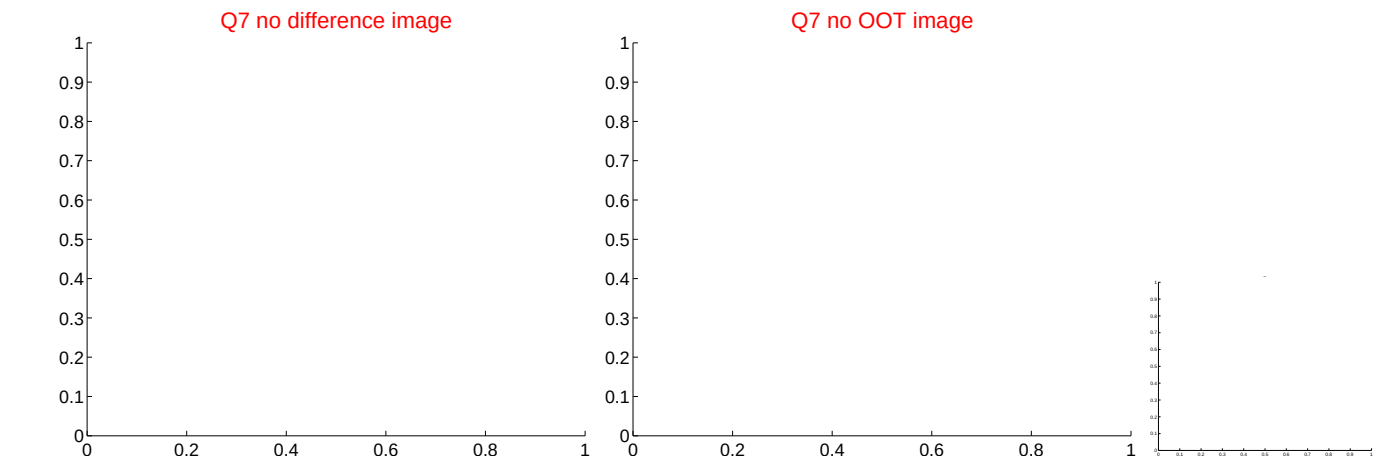
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

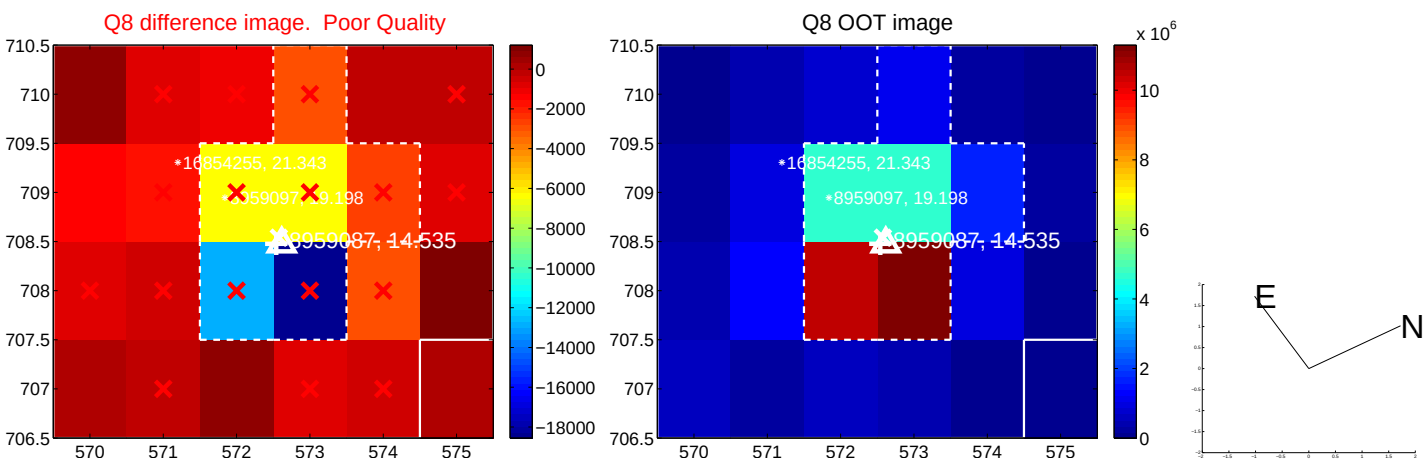


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

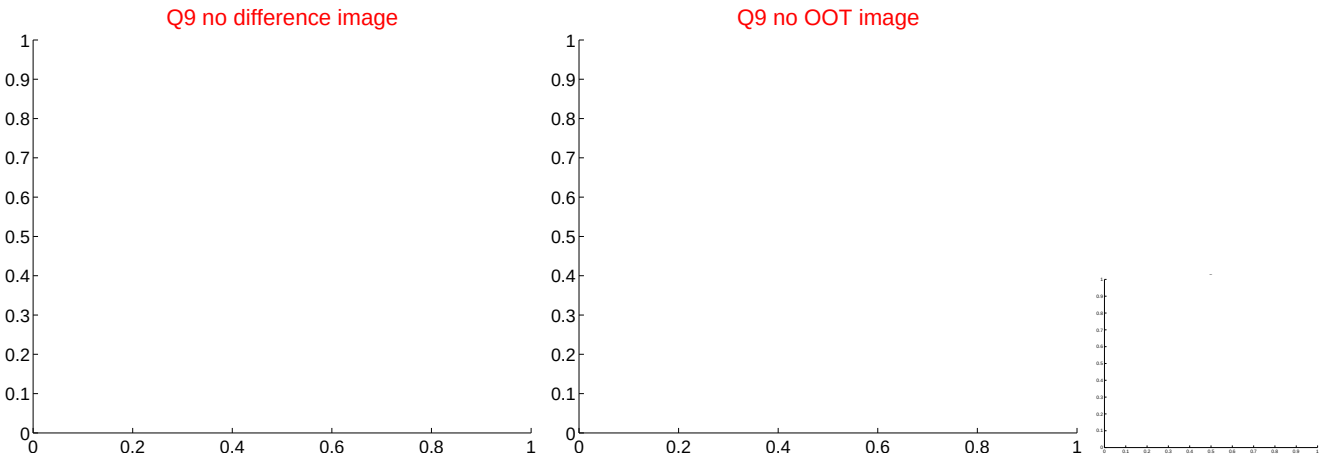


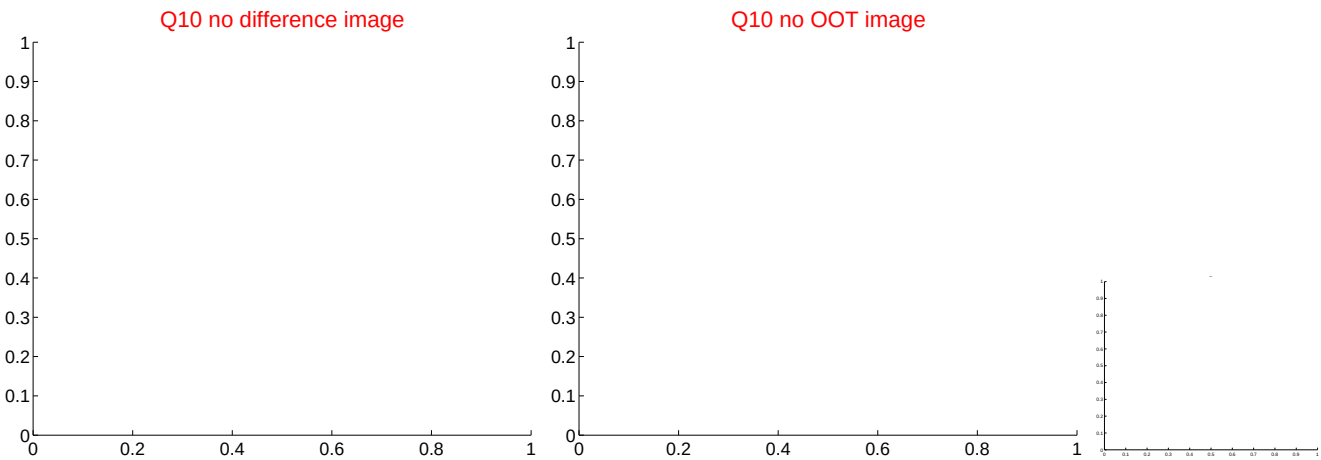


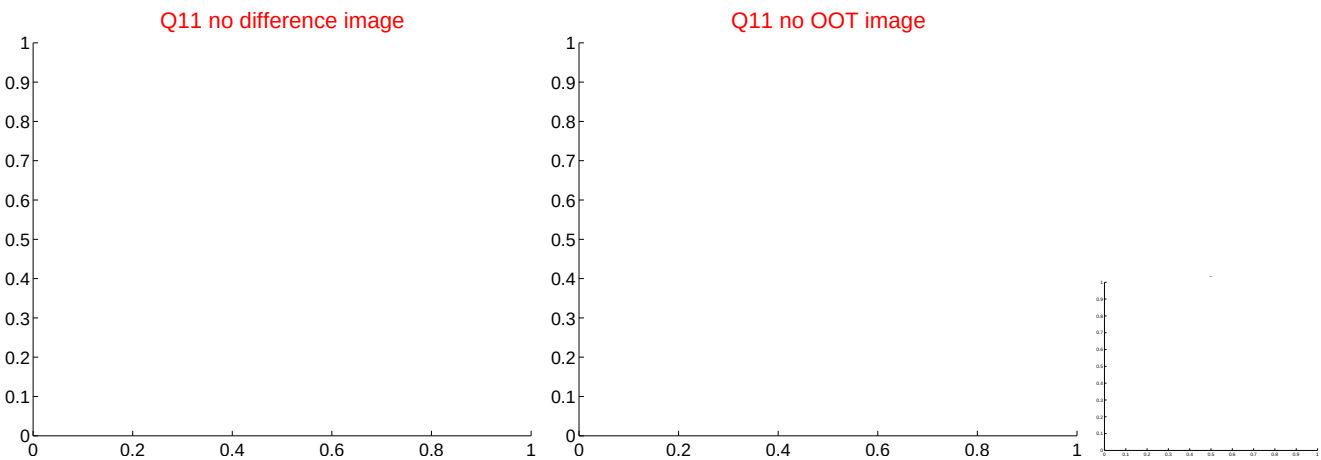


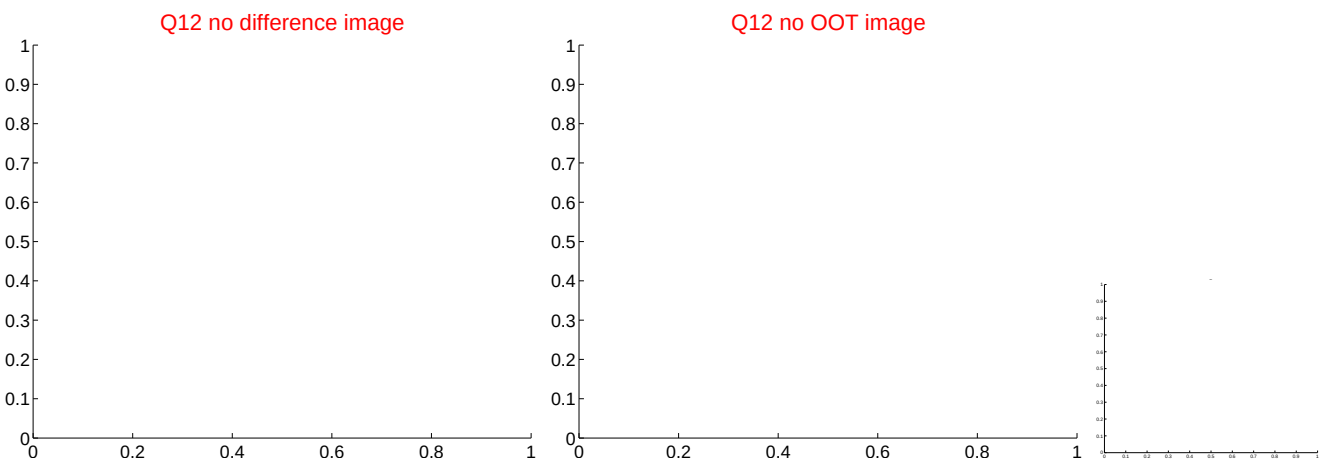


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

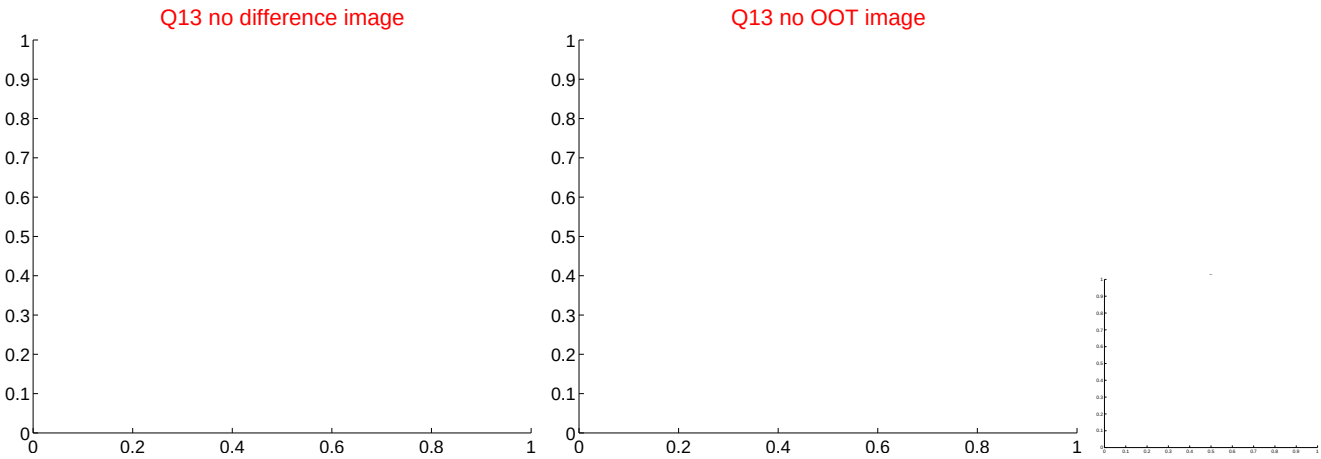


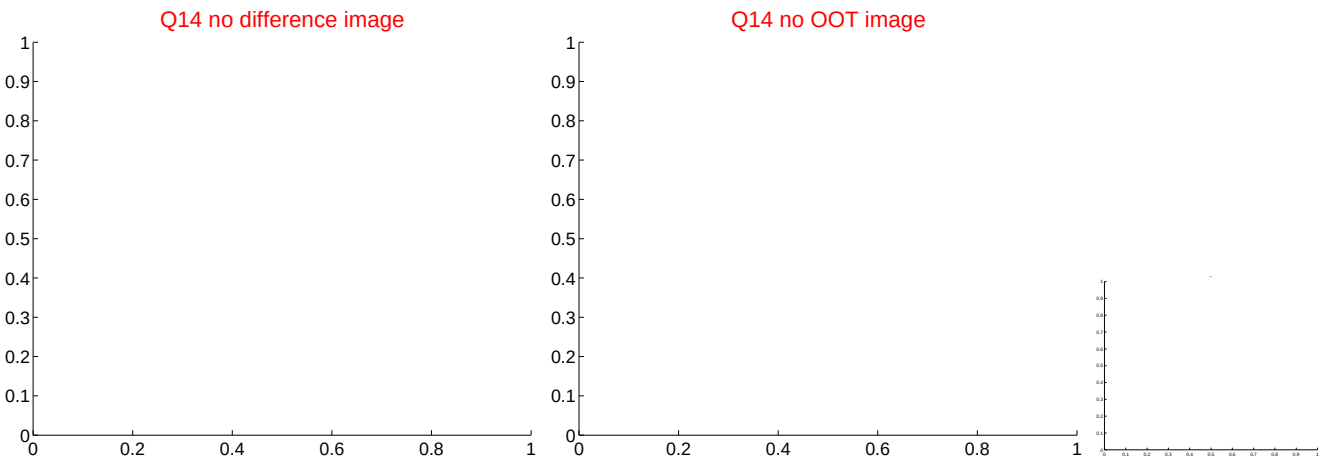


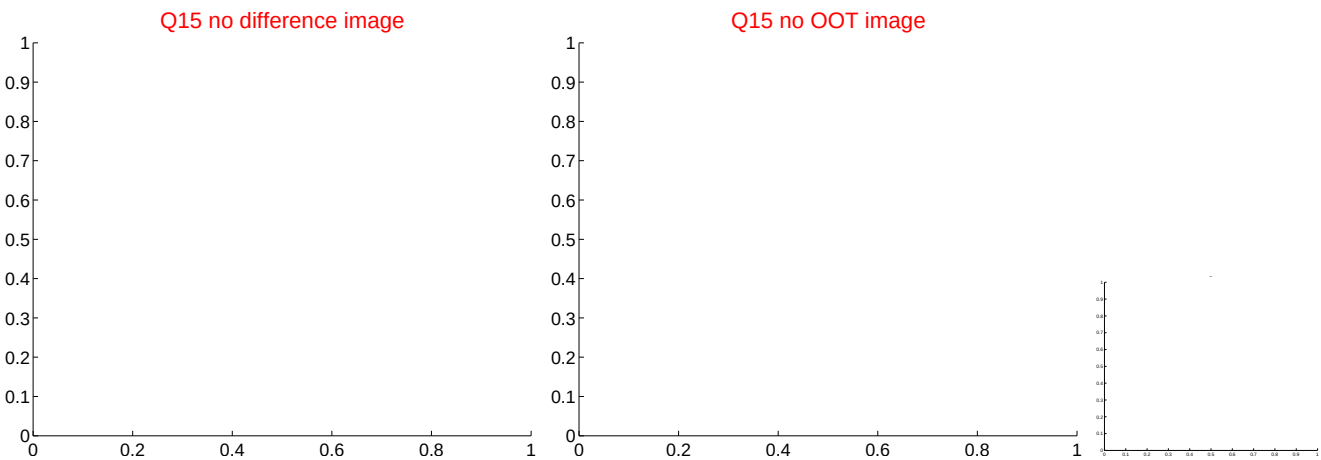


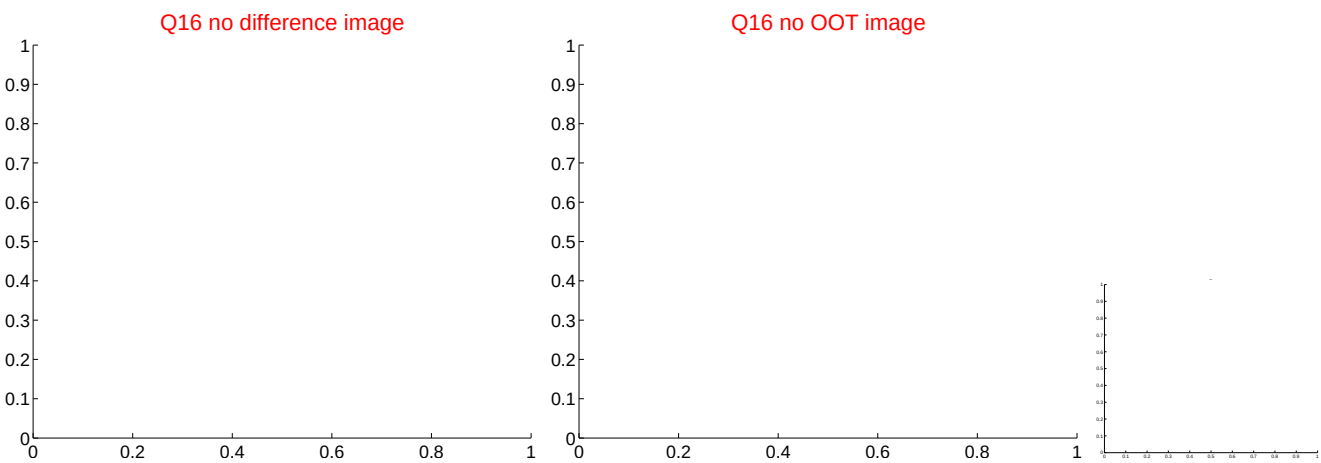


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

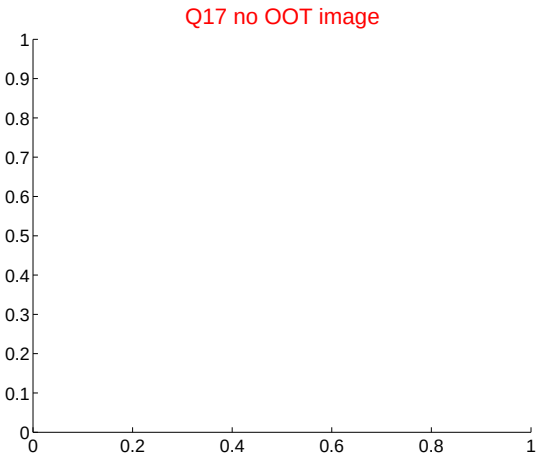


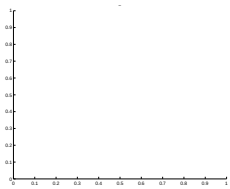


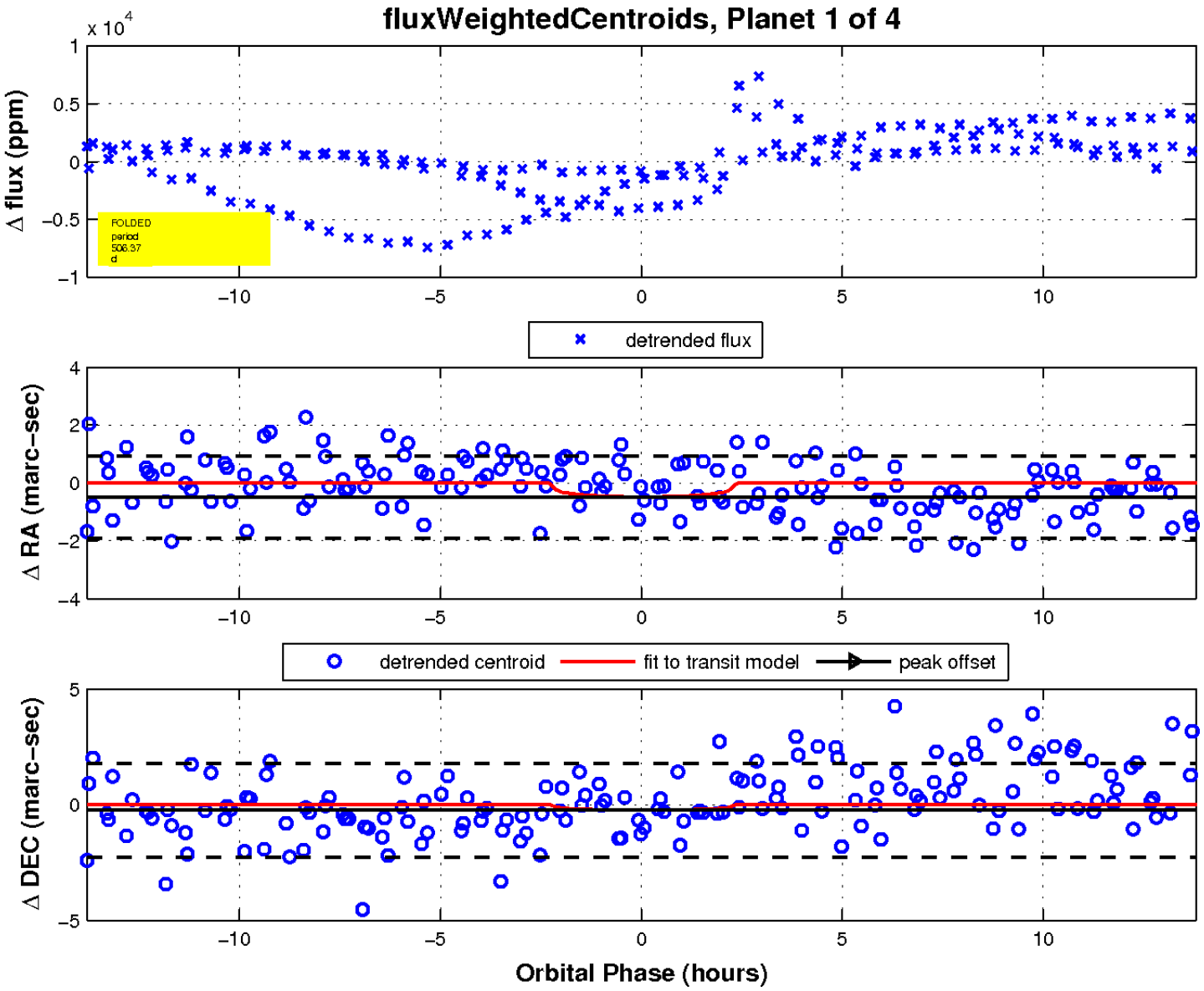




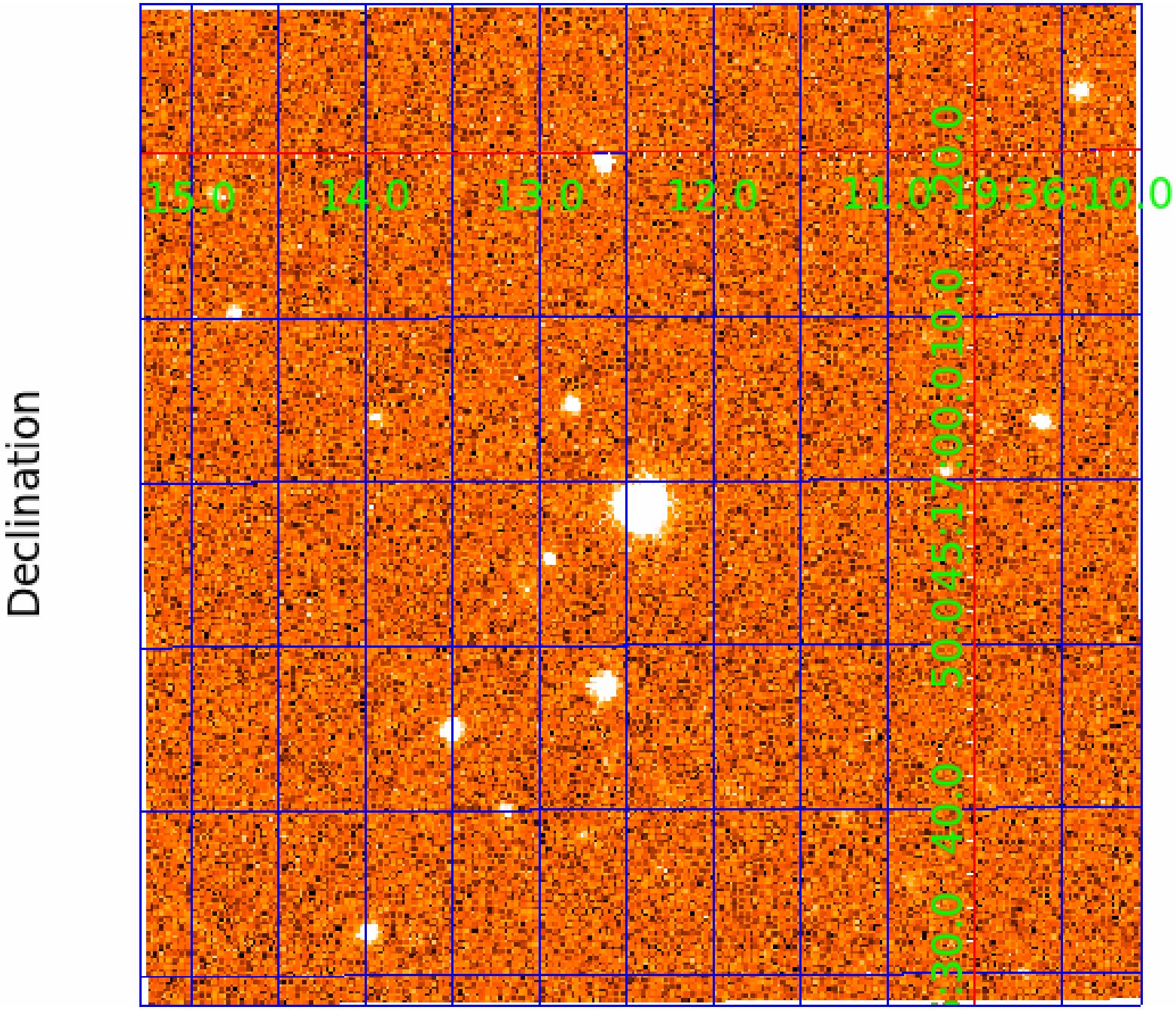
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.







UKIRT Image


15.0
14.0
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40.0
30.0
Declination

KIC 008959087

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 ($S_\oplus$)
008959087-01	OBS	No	506.366848	266.864381	1328.9	4.681	16.8	4.5	0.89	5451	3.25	0.45
008959087-02	OBS	No	460.738745	406.818911	524.6	1.077	12.1	2.4	0.89	5451	2.65	0.51
008959087-03	OBS	No	534.275018	161.600124	1517.0	8.393	14.2	3.8	0.89	5451	3.40	0.41
008959087-04	OBS	No	507.167770	553.113232	731.8	6.000	12.1	-1.0	0.89	5451	2.37	0.45

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008959087-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
008959087-02	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—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008959087-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008959087-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

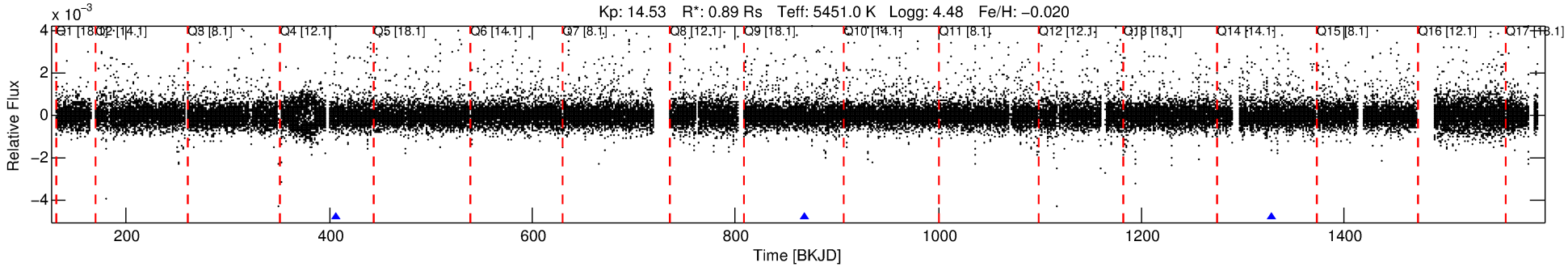
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

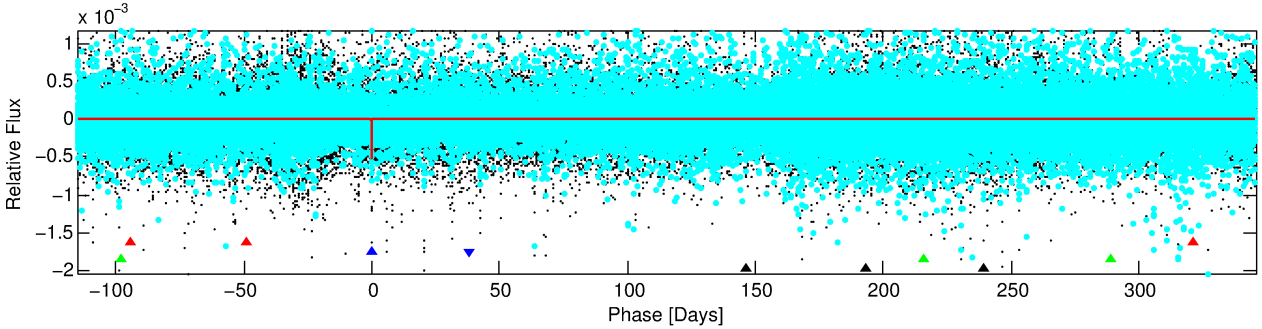
Ephemeris Match Information For 008959087-02

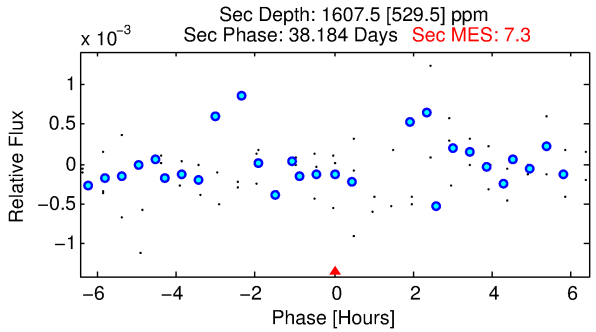
No Significant Match Found

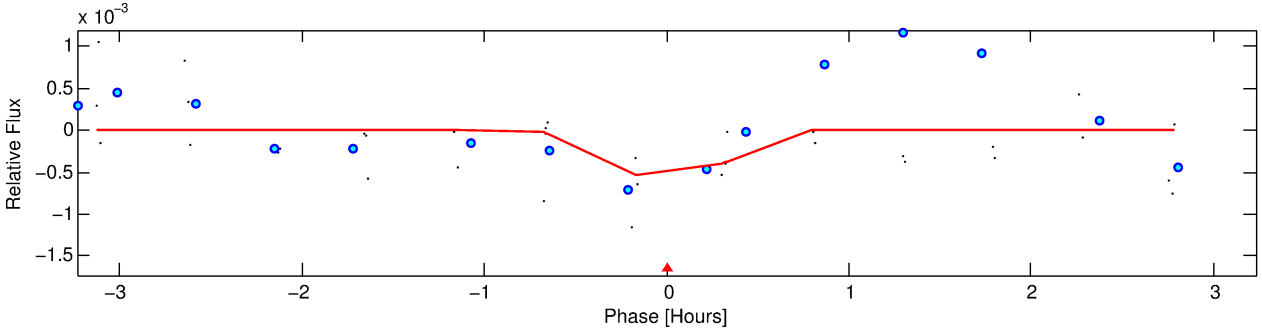
DV One-Page Summary

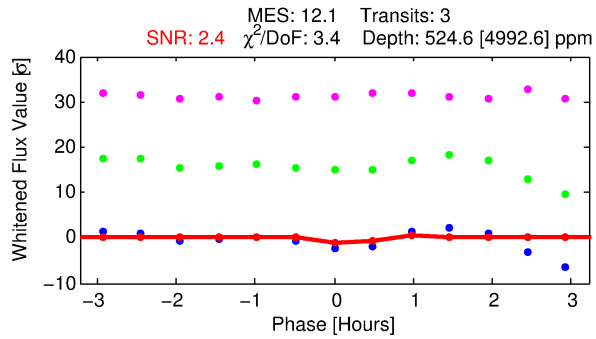
KIC: 8959087 Candidate: 2 of 4 Period: 460.739 d

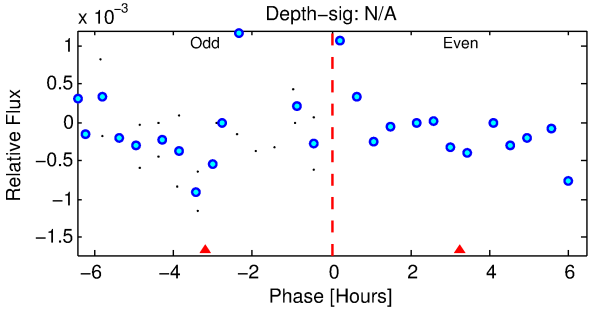


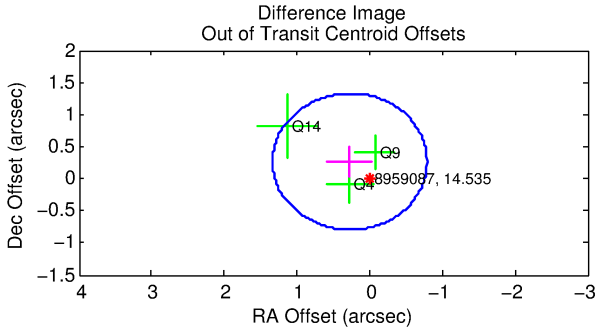












DV Fit Results:

Period = 460.73875 [0.03039] d
Epoch = 406.8189 [0.0433] BKJD
Rp/R* = 0.0273 [0.5772]
a/R* = 1399.18 [91292.30]
b = 0.93 [10.48]

Seff = 0.51 [0.15]
Teq = 215 [16] K
Rp = 2.65 [56.13] Re
a = 1.1141 [0.2071] AU

Ag = 156341.04 [6623446.91] [0.02σ]
Teffp = 6612 [70026] K [0.09σ]

DV Diagnostic Results:

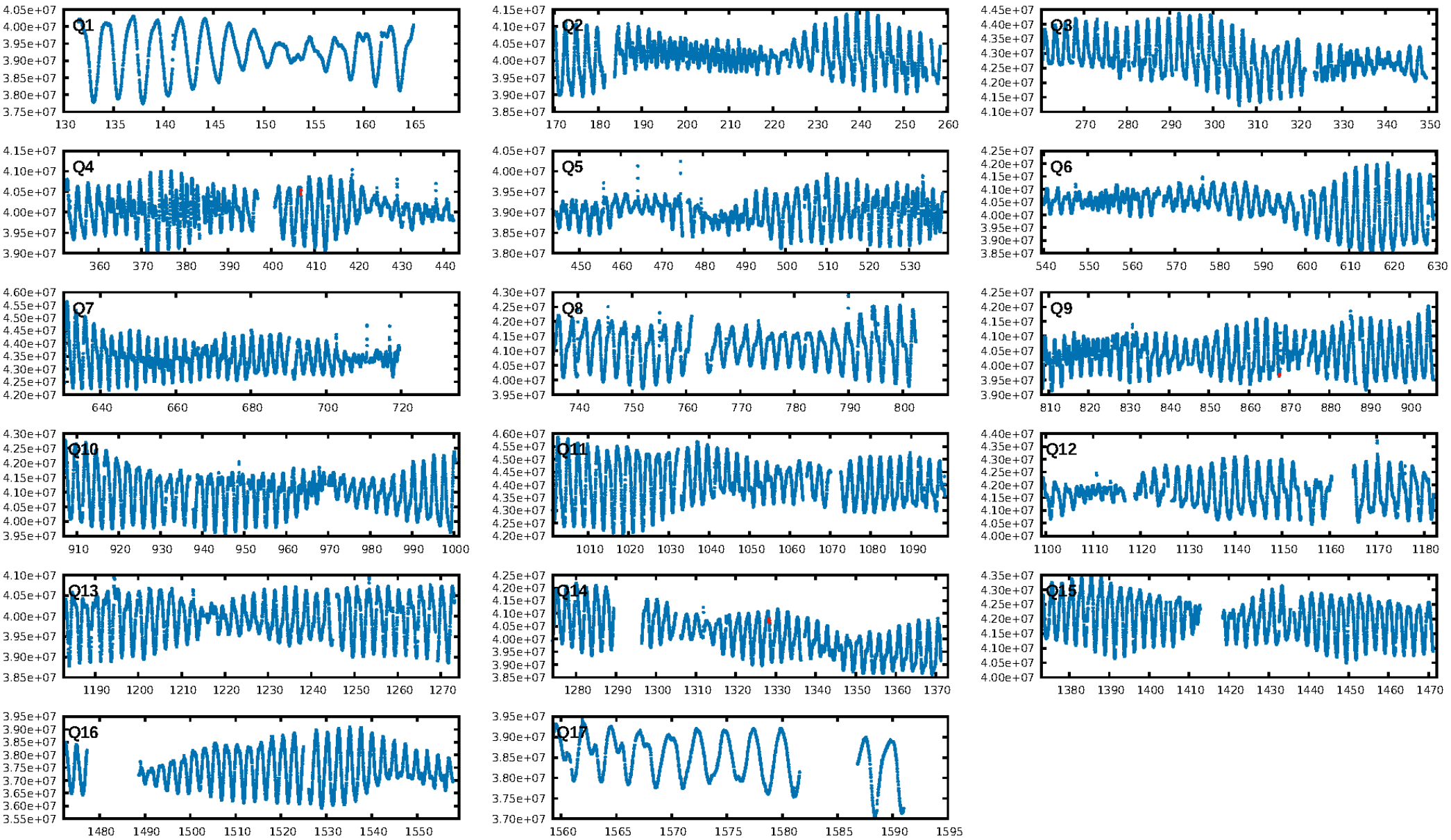
ShortPeriod−sig: N/A
LongPeriod−sig: 100.0% [228.01σ]
ModelChiSquare2−sig: 19.1%
ModelChiSquareGof−sig: 47.5%
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [3/3]
GhostDiagnostic−chr: 0.4743

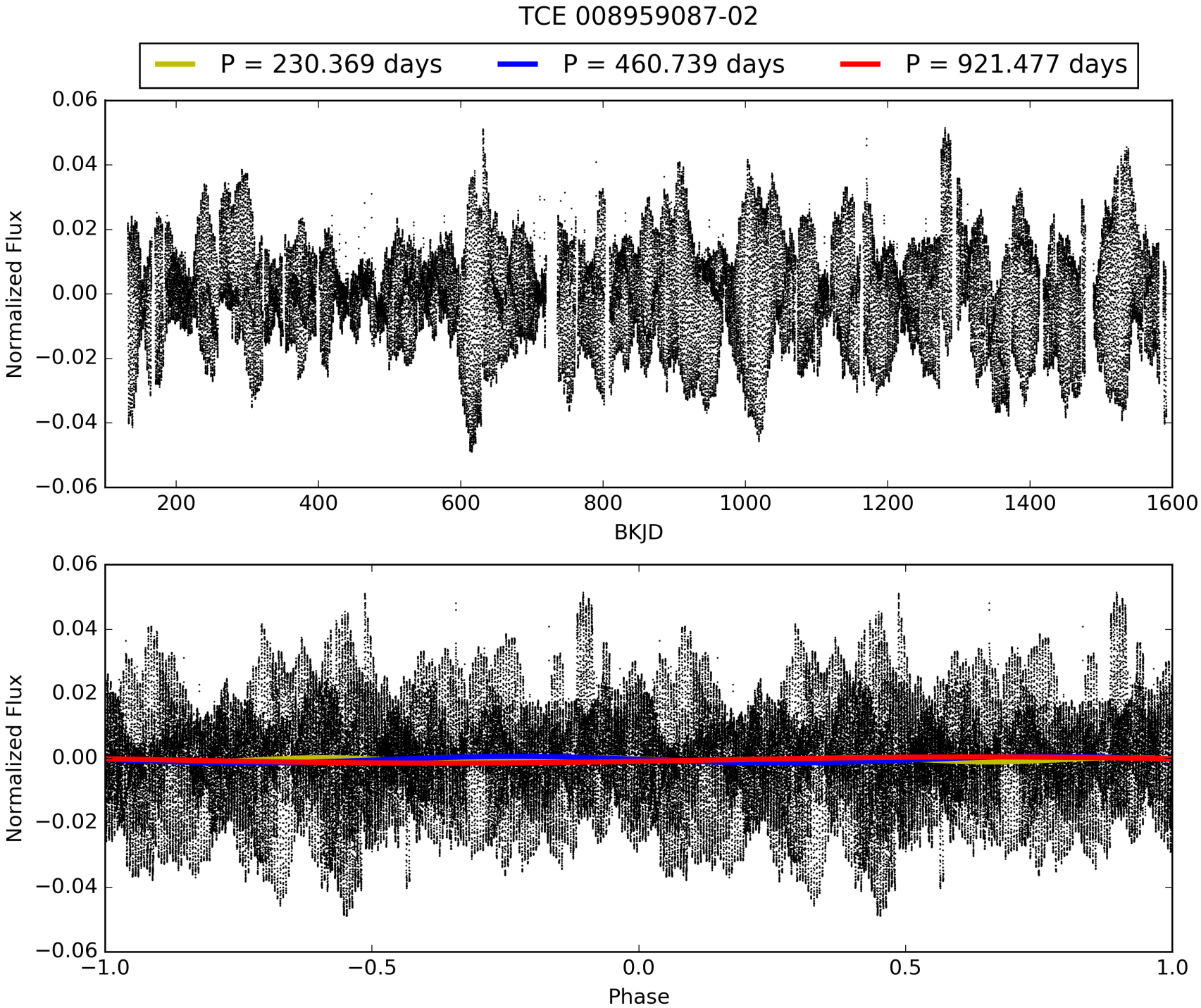
Centroid−sig: 80.9%
Centroid−so: 1.521 arcsec [0.55σ]
OotOffset−rm: 0.381 arcsec [1.08σ]
KicOffset−rm: 0.151 arcsec [0.46σ]
OotOffset−st: 1/0/1/1 [3]
KicOffset−st: 1/0/1/1 [3]
DiffImageQuality−fgm: 0.33 [1/3]
DiffImageOverlap−fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 23:17:36 Z

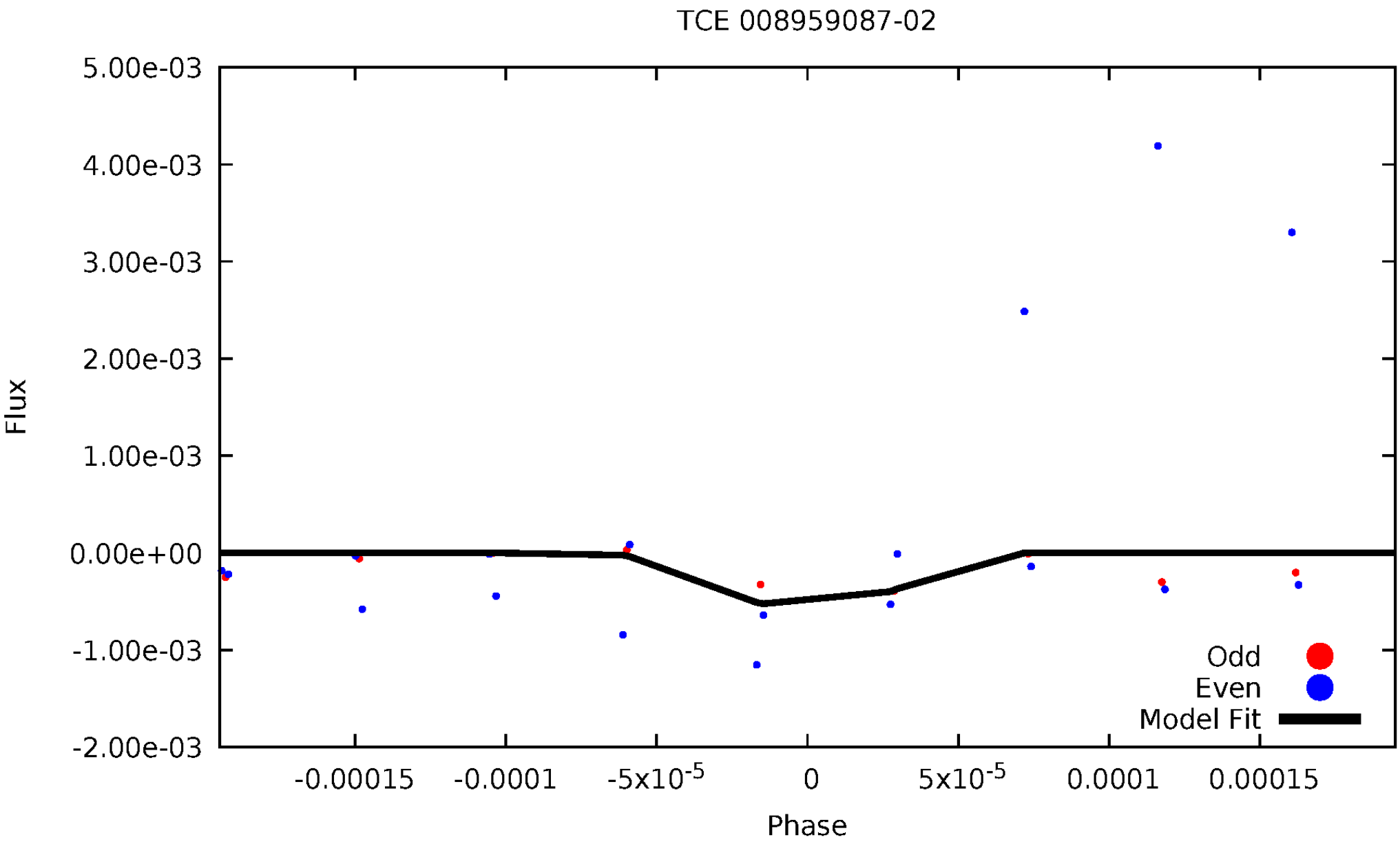
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008959087-02, PDC Light Curves

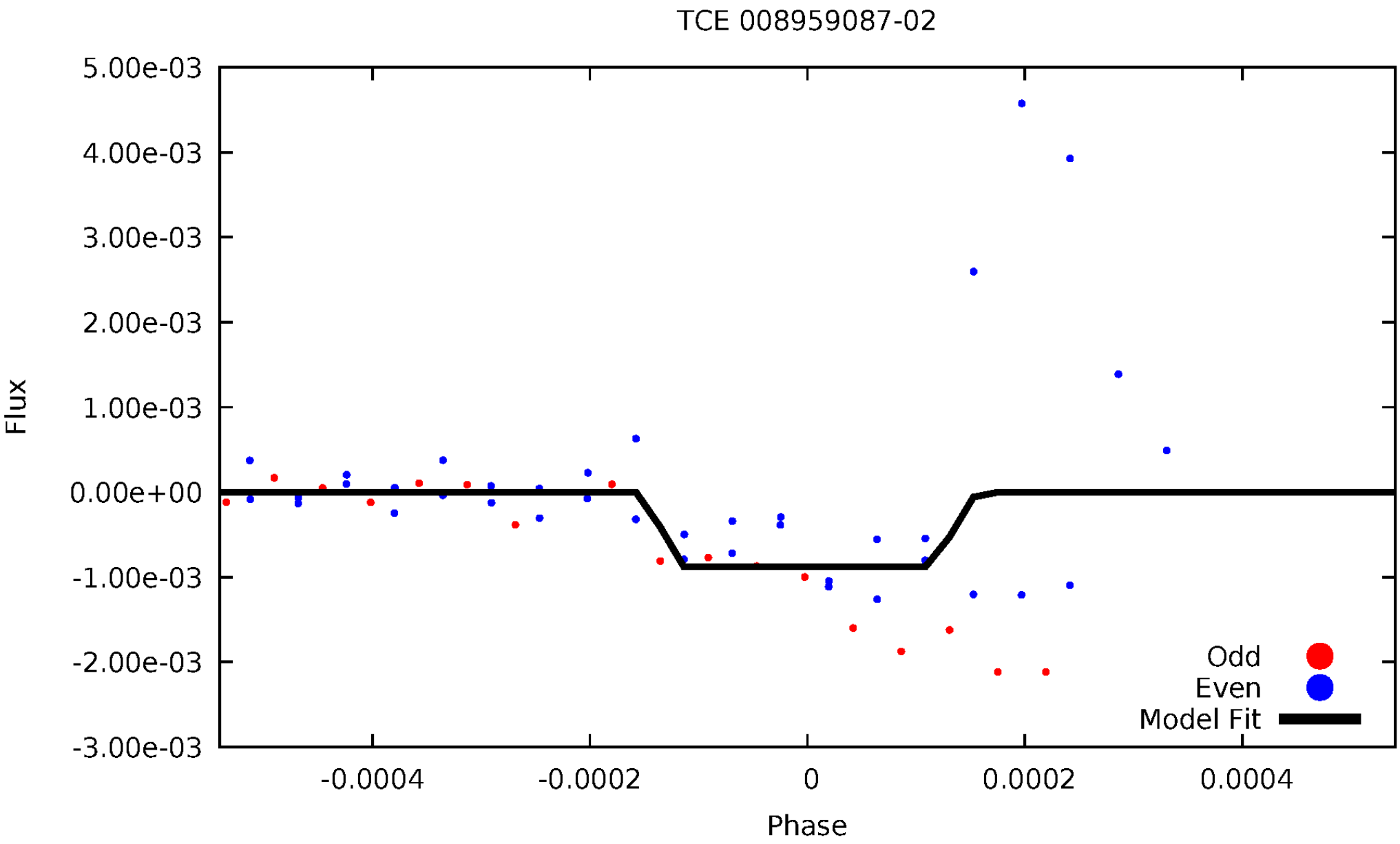



TCE 008959087-02
P = 230.369 days
P = 460.739 days
P = 921.477 days
Normalized Flux
BKJD
Normalized Flux
Phase

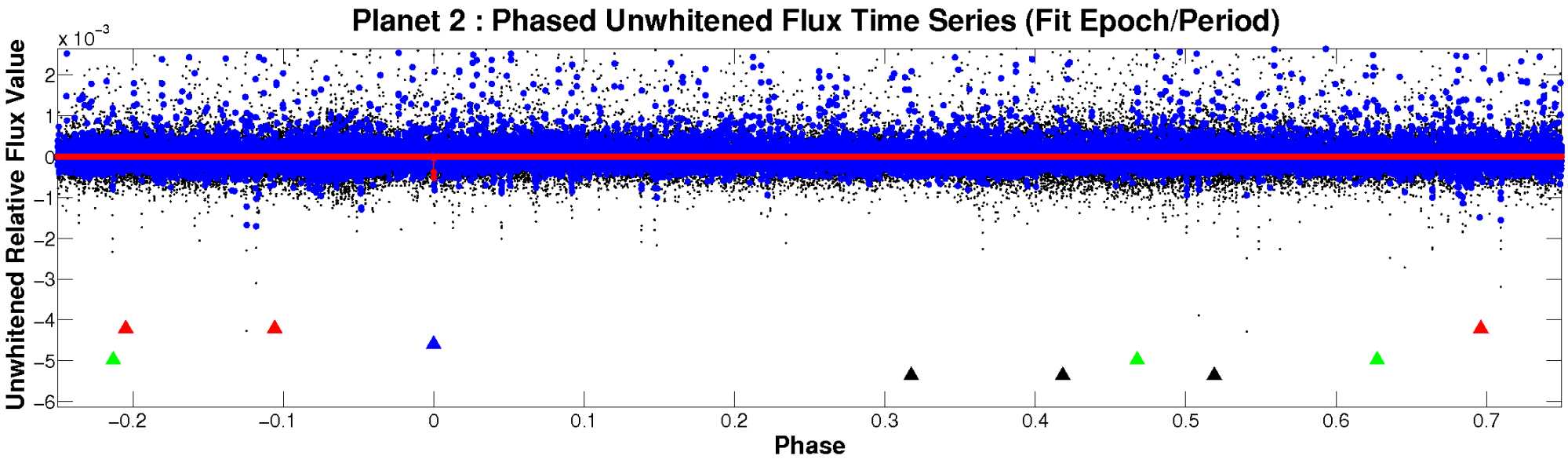
DV Odd/Even

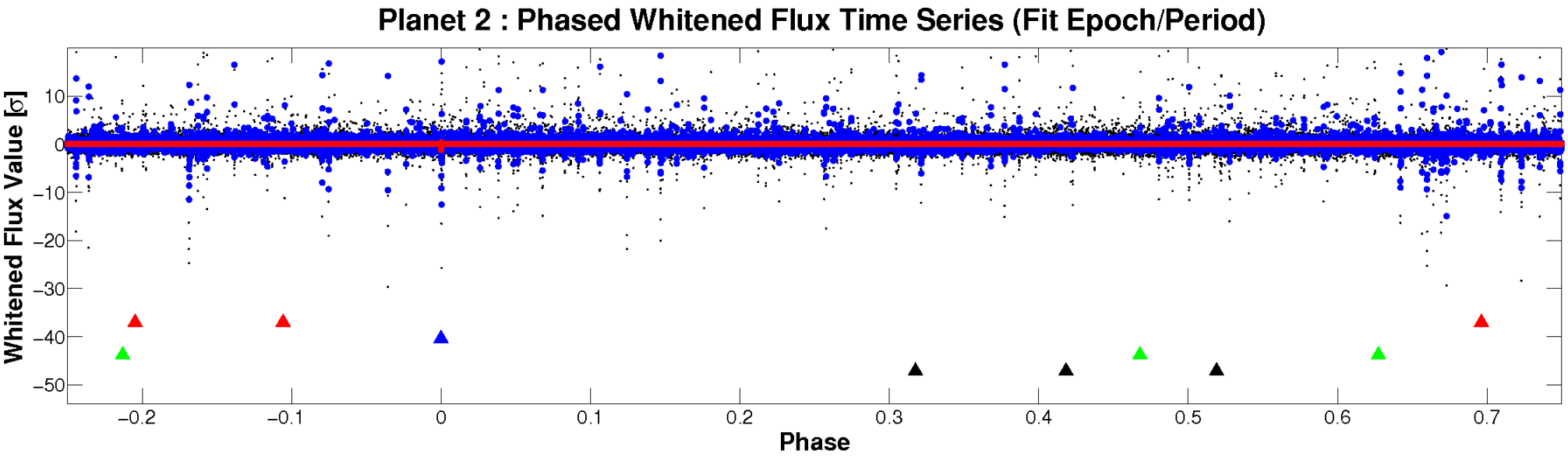

TCE 008959087-02
5.00e-03
4.00e-03
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
Flux
-0.00015
-0.0001
-5x10-5
0
5x10-5
0.0001
0.00015
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 008959087-02
5.00e-03
4.00e-03
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
Flux
-0.0004
-0.0002
0
0.0002
0.0004
Phase
Odd
Even
Model Fit

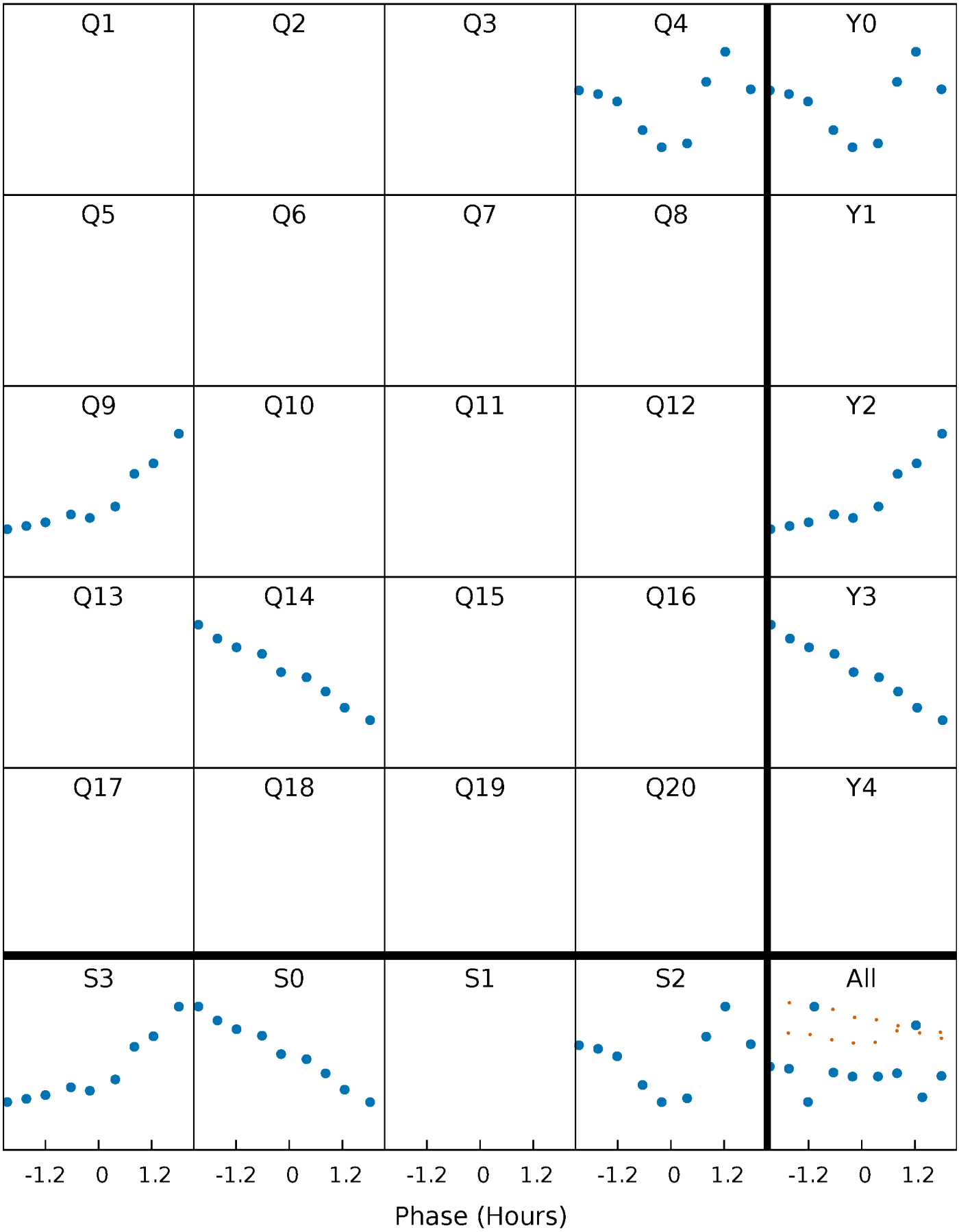
Non-Whitened Vs. Whitened Light Curve





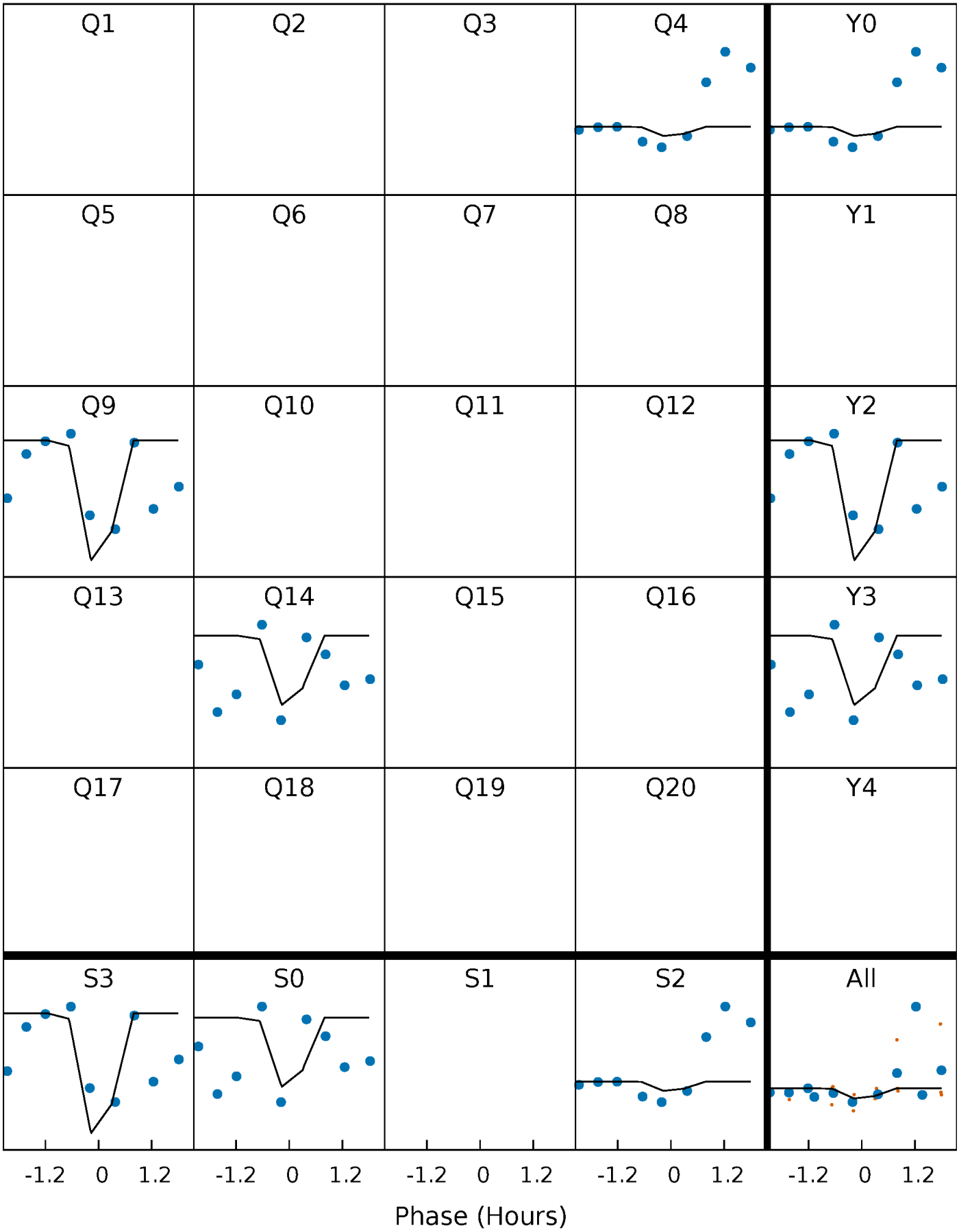
PDC Quarter-Phased Transit Curves

TCE 008959087-02 P=460.738745 Days T_0=406.818911 (BKJD)



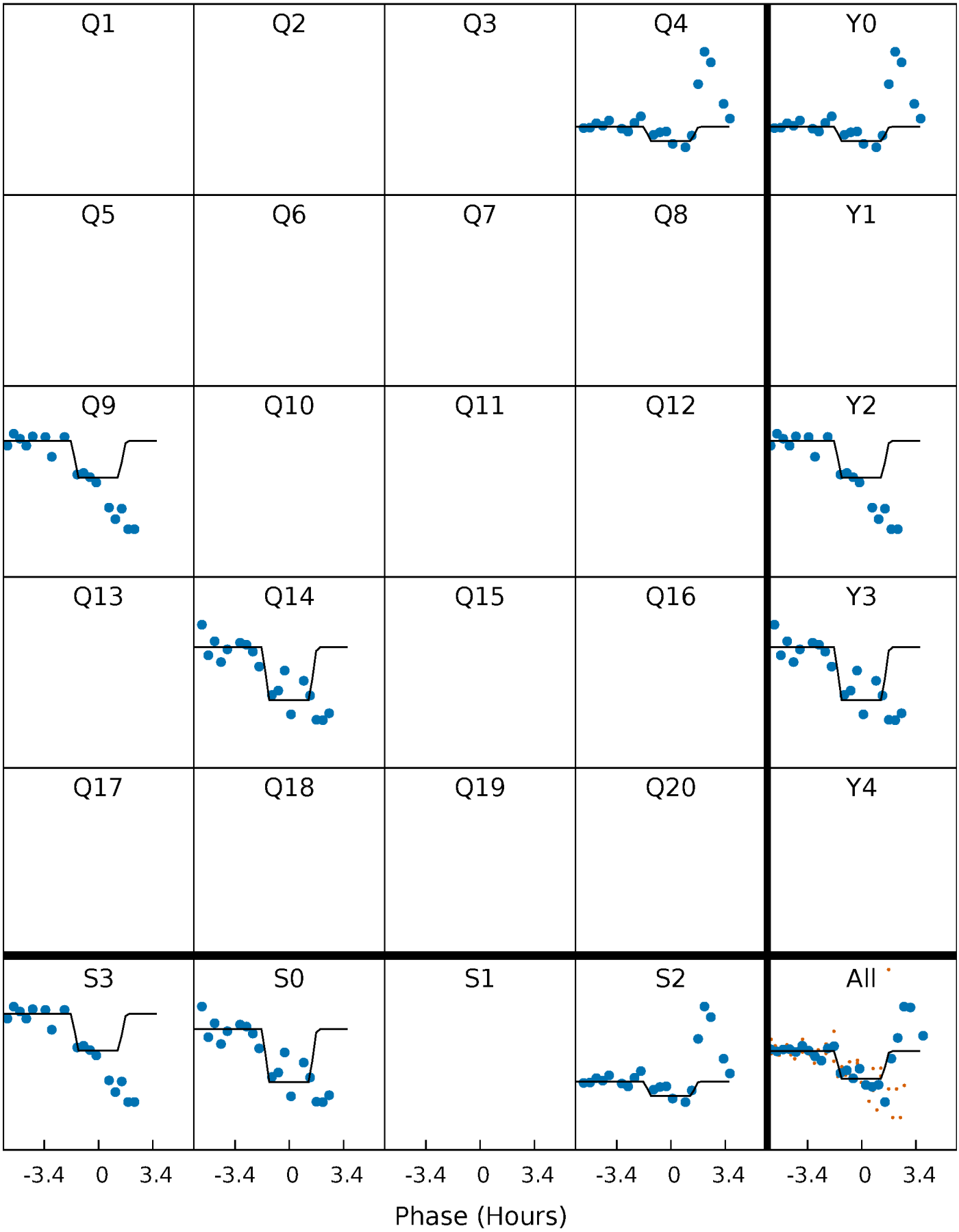
DV Quarter-Phased Transit Curves

TCE 008959087-02 P=460.738745 Days T_0=406.818911 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

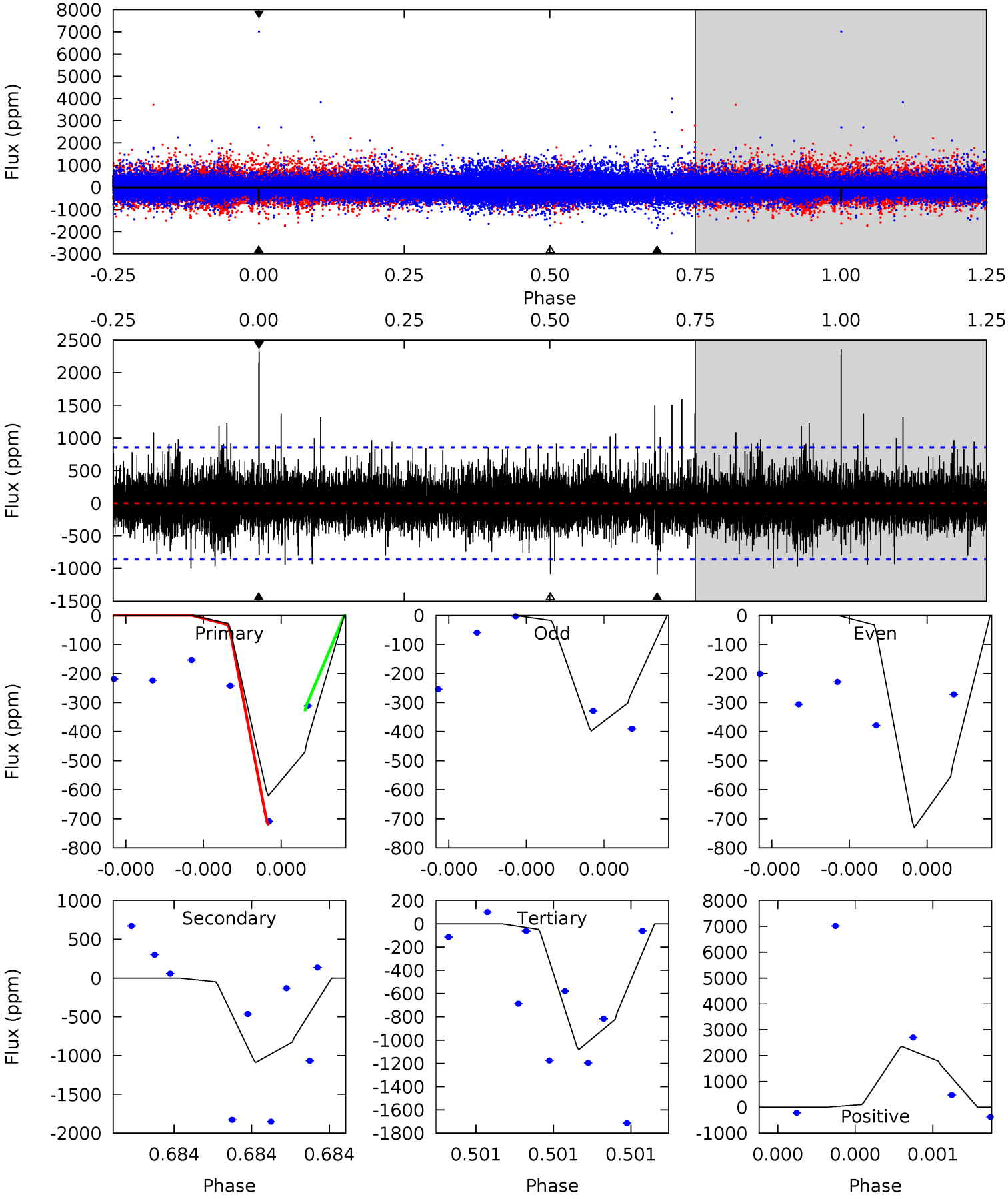
TCE 008959087-02 P=460.749533 Days T_0=406.781635 (BKJD)



DV Model-Shift Uniqueness Test

008959087-02, P = 460.738745 Days, E = 406.818911 Days

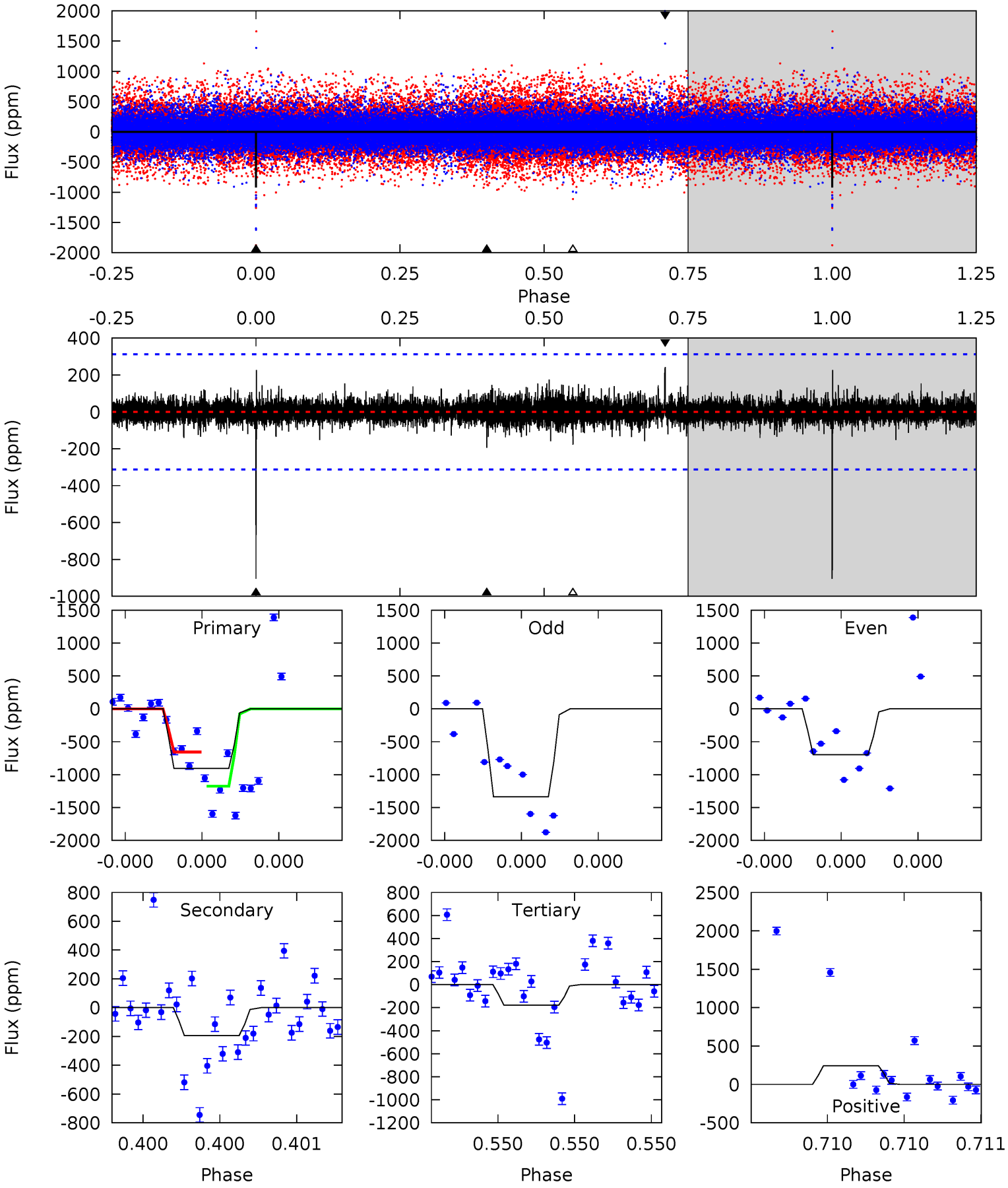
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.24	7.43	7.39	16.1	5.87	3.92	1.42	-3.15	-11.9	0.04	-8.66	0.67	1.44	0.68	1.29



Alt Model-Shift Uniqueness Test

008959087-02, P = 460.749533 Days, E = 406.781635 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.4	3.51	3.23	4.41	5.66	3.61	0.63	13.1	12.0	0.28	-0.90	4.94	1.22	0.21	4.73



Stellar Parameters For KIC 008959087

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5451^{+164}_{-164}	$4.477^{+0.081}_{-0.150}$	$-0.020^{+0.250}_{-0.300}$	$0.891^{+0.195}_{-0.105}$	$0.868^{+0.099}_{-0.074}$	$1.731^{+0.594}_{-0.727}$
	+3%/-3%	+2%/-3%	+1250%/-1500%	+22%/-12%	+11%/-9%	+34%/-42%
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 008959087-02 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1088±146	$37.20^{+44.87}_{-26.37}$	303^{+19}_{-14}	2475^{+1048}_{-416}	532^{+5920}_{-425}
Alt.	-194±55	$42.23^{+45.75}_{-30.44}$	303^{+18}_{-14}	1989^{+669}_{-277}	74^{+911}_{-58}

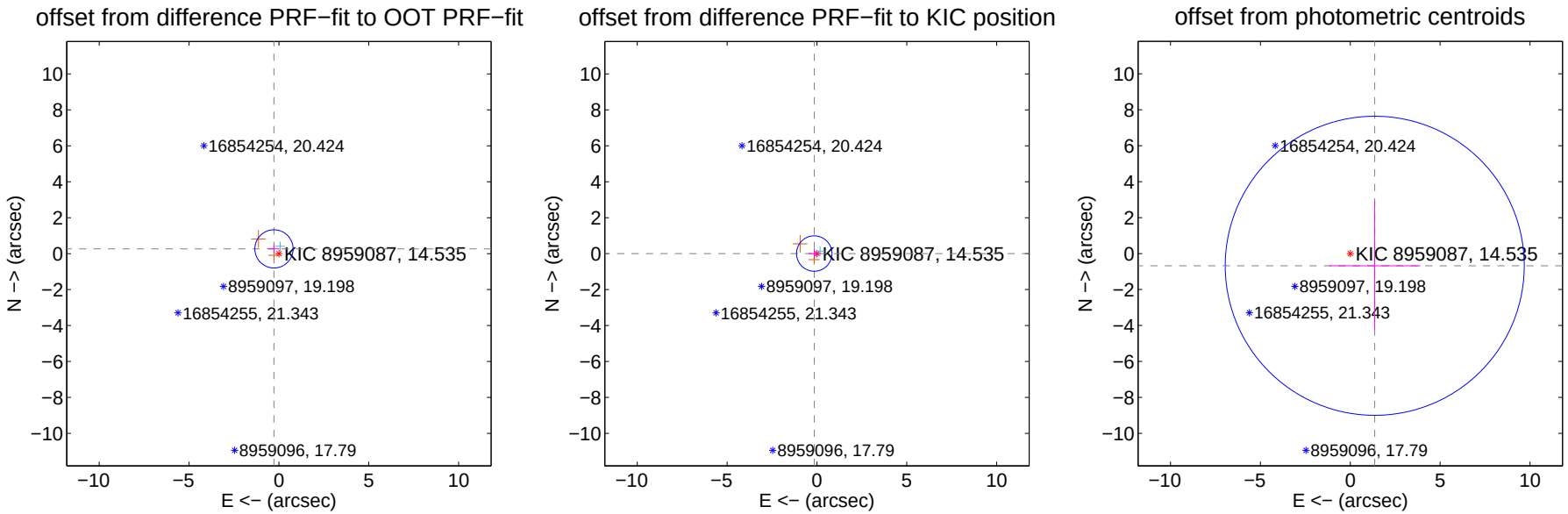
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

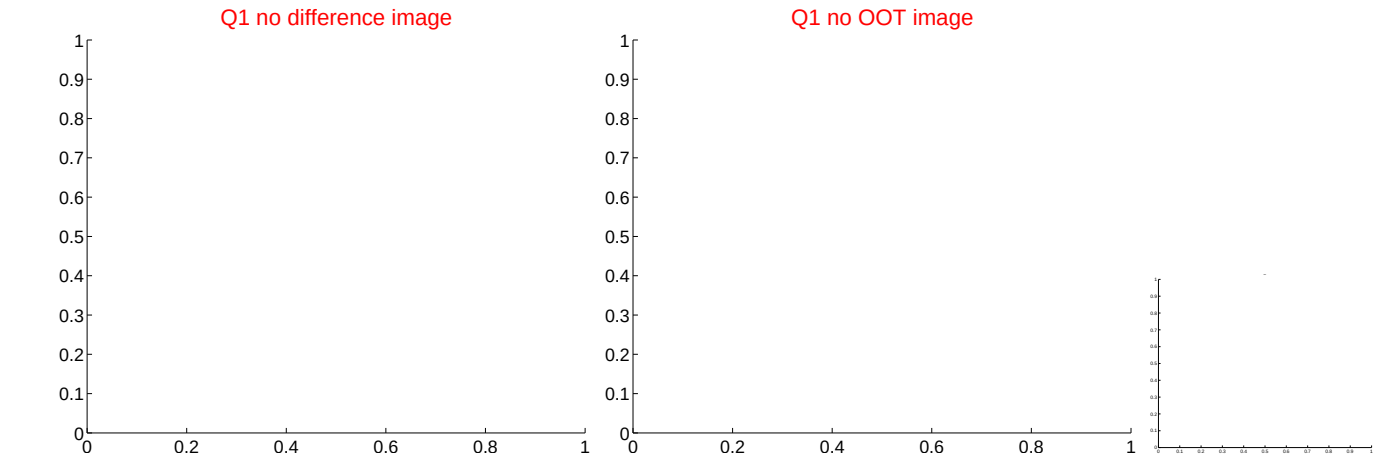
Supplemental centroid analysis for 008959087-02. Kepler magnitude: 14.54. Transit SNR 2.37
There are 1 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.34 arcsec

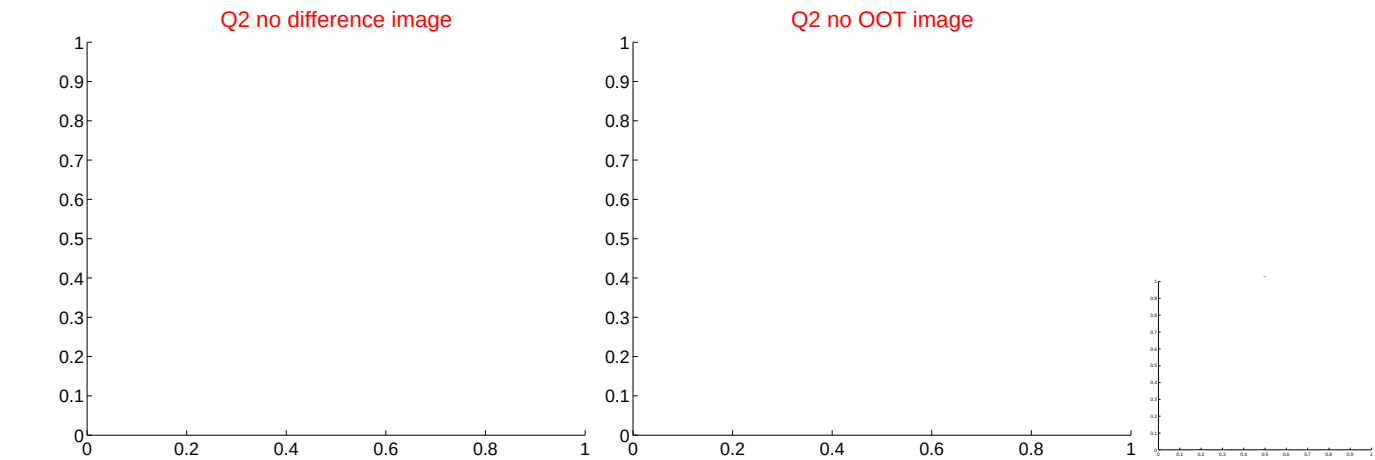
	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.381 ± 0.354	1.08	0.274 ± 0.313	0.265 ± 0.222
PRF-fit source offset from KIC position	0.151 ± 0.328	0.46	0.150 ± 0.328	0.006 ± 0.254
photometric centroid source offset	1.52 ± 2.77	0.55	-1.36 ± 2.53	-0.68 ± 3.58

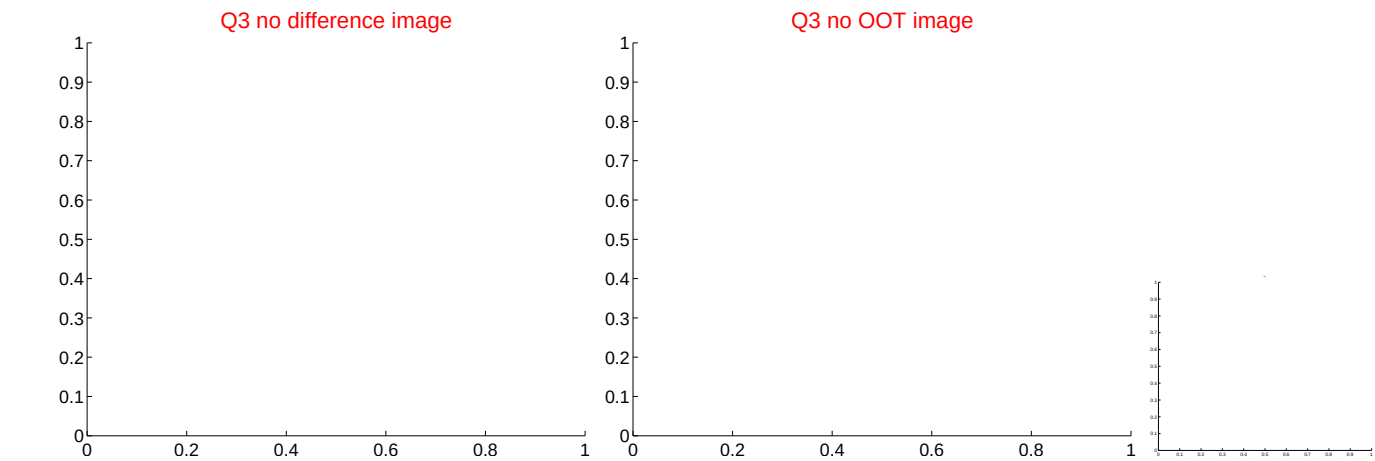


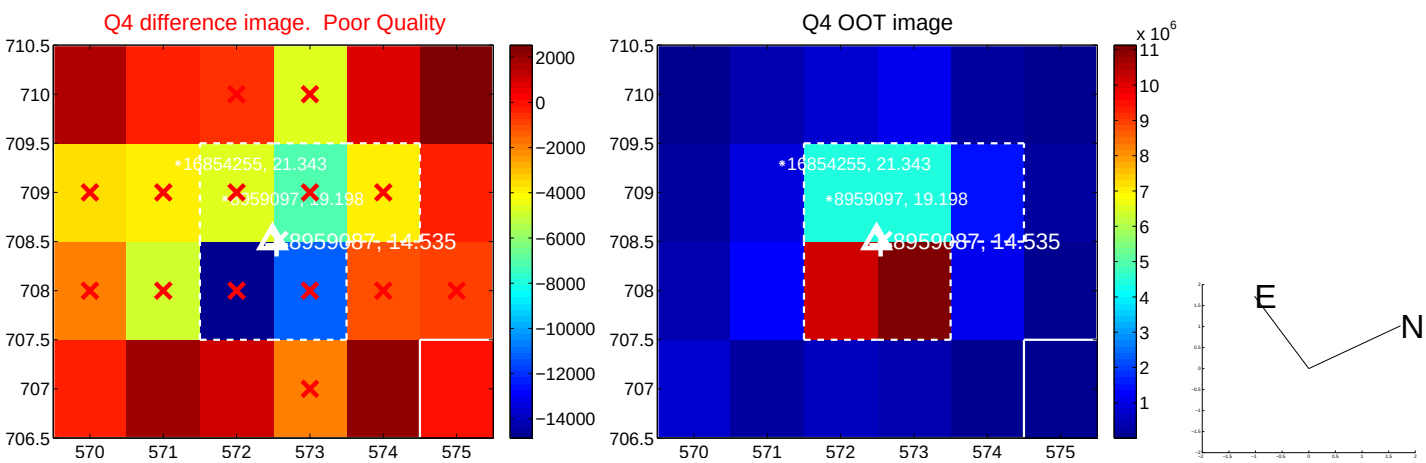
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

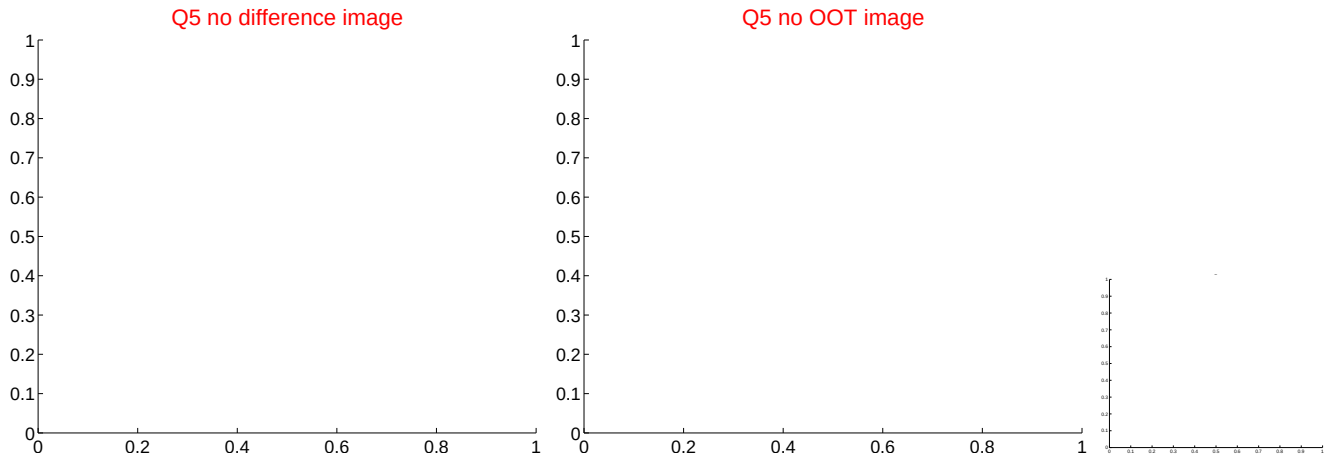


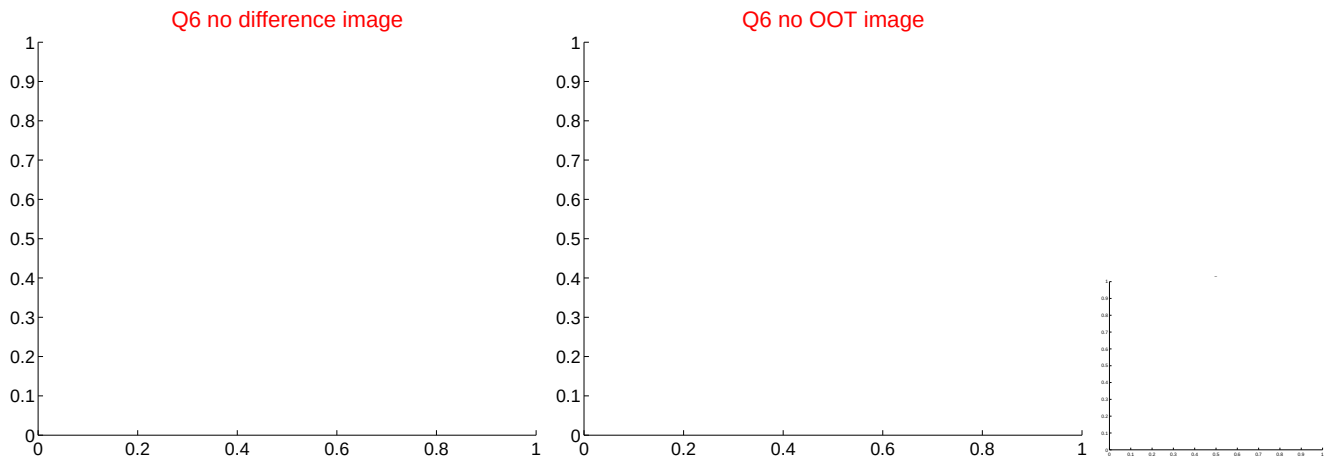


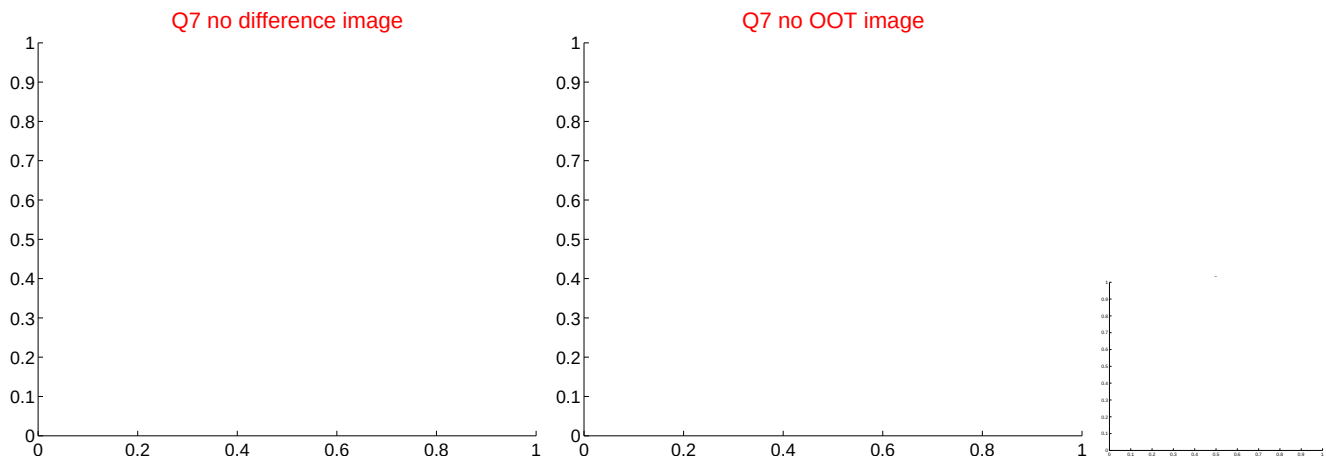


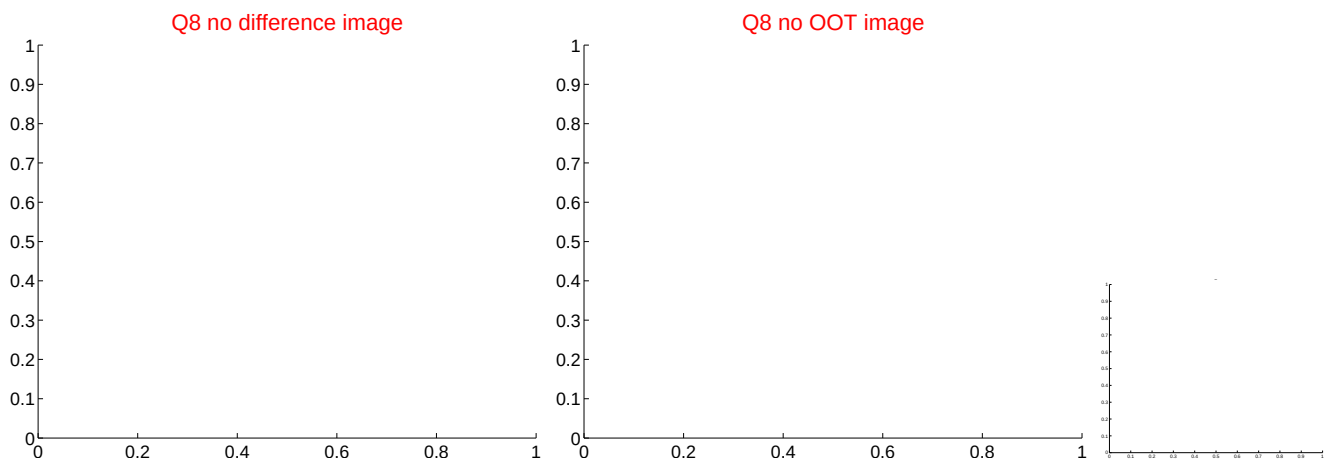


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

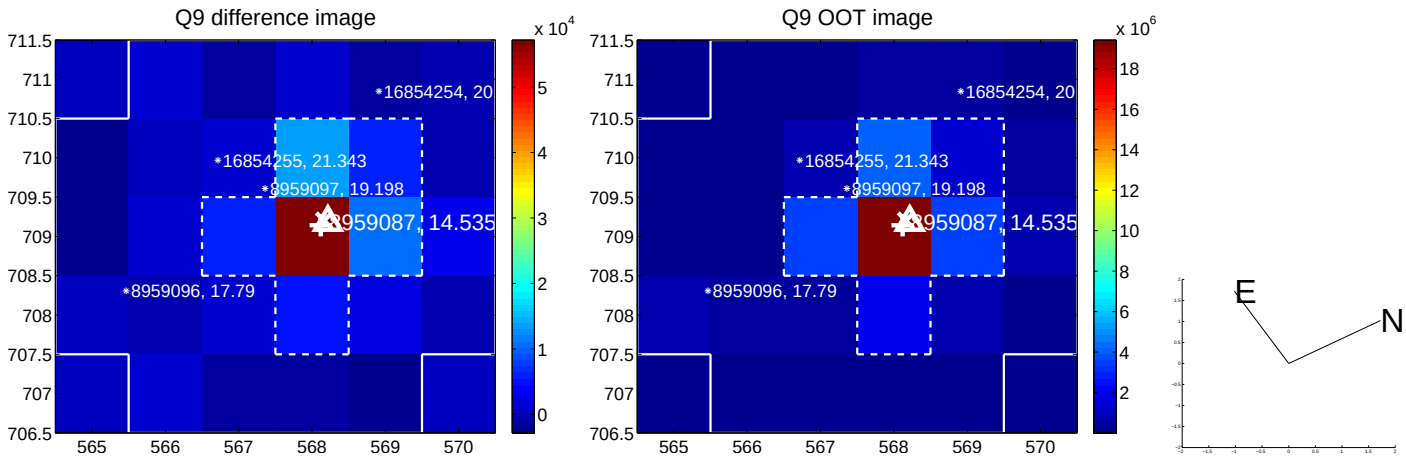


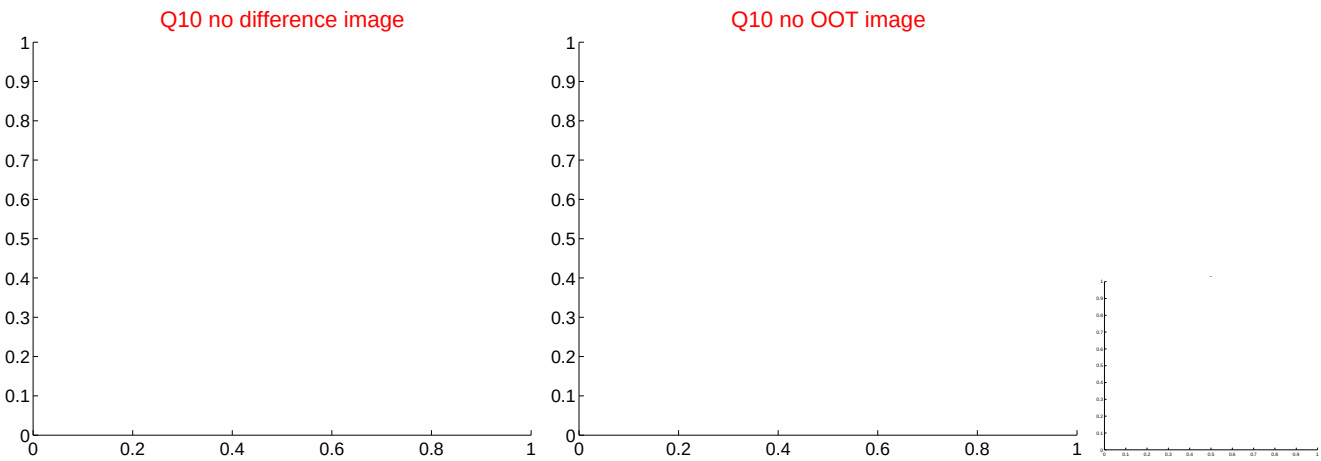


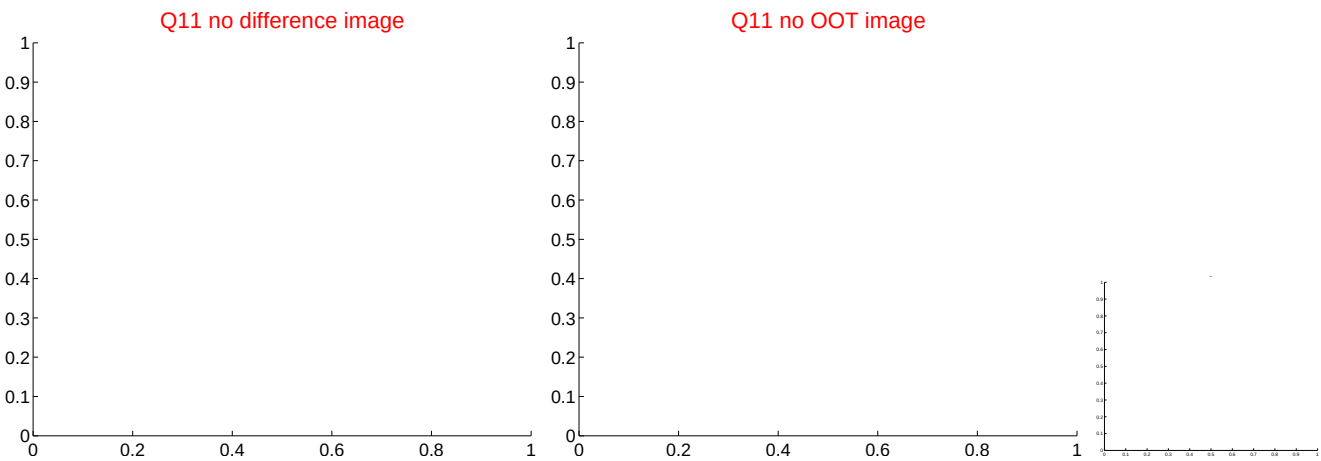


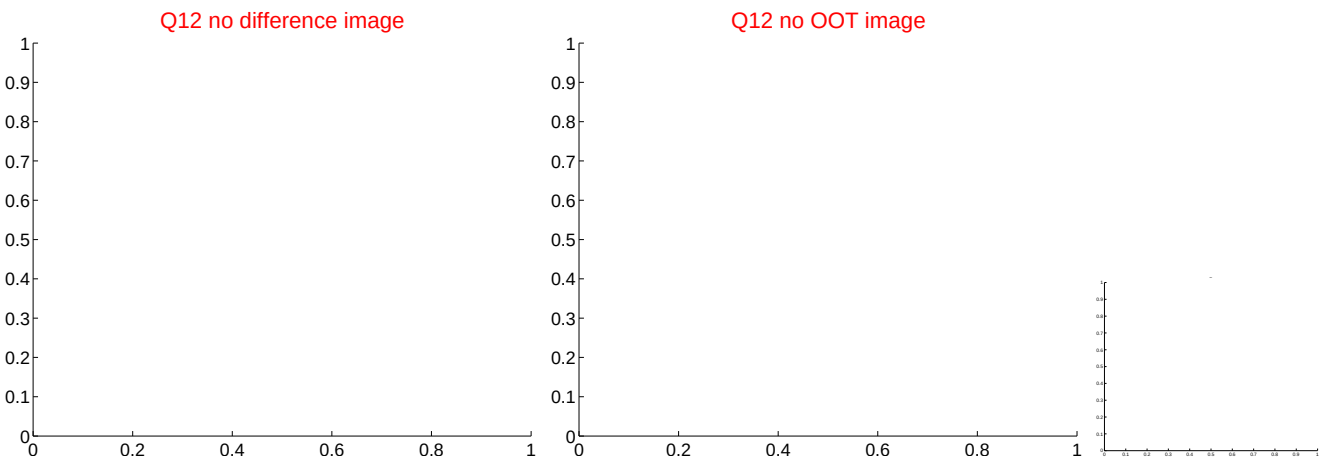


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

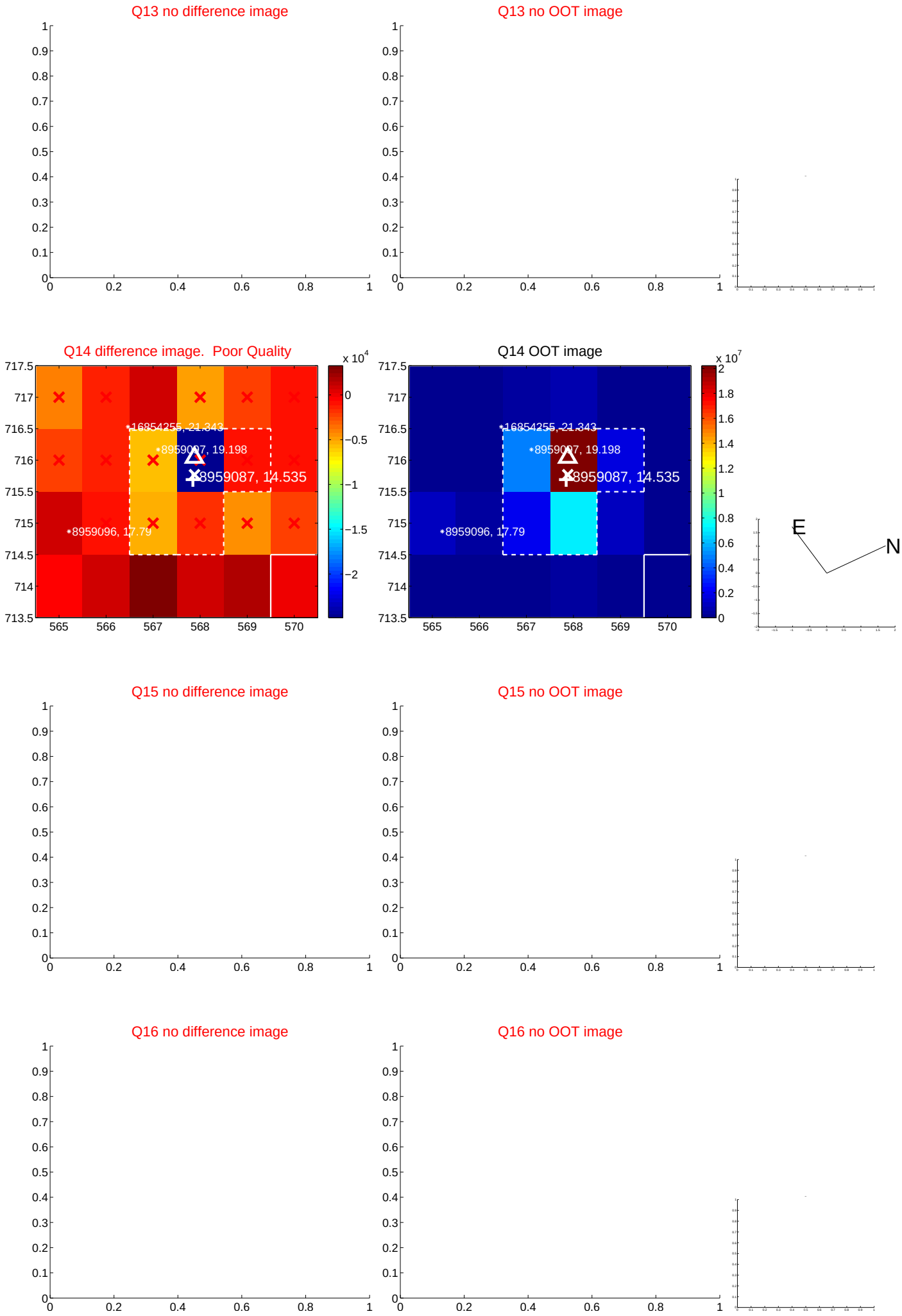




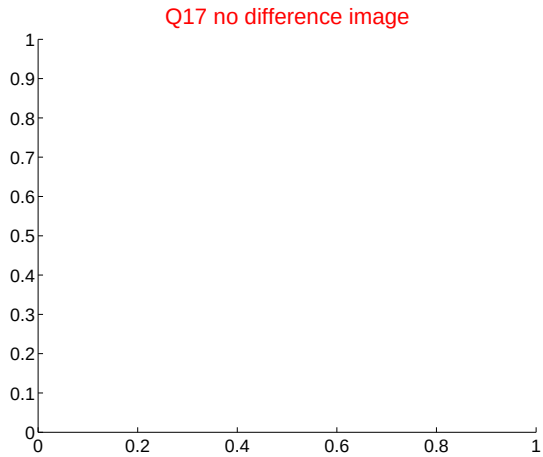


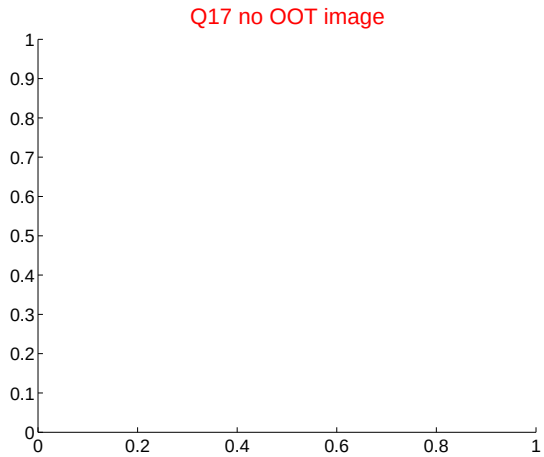


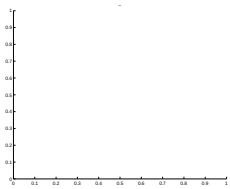
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

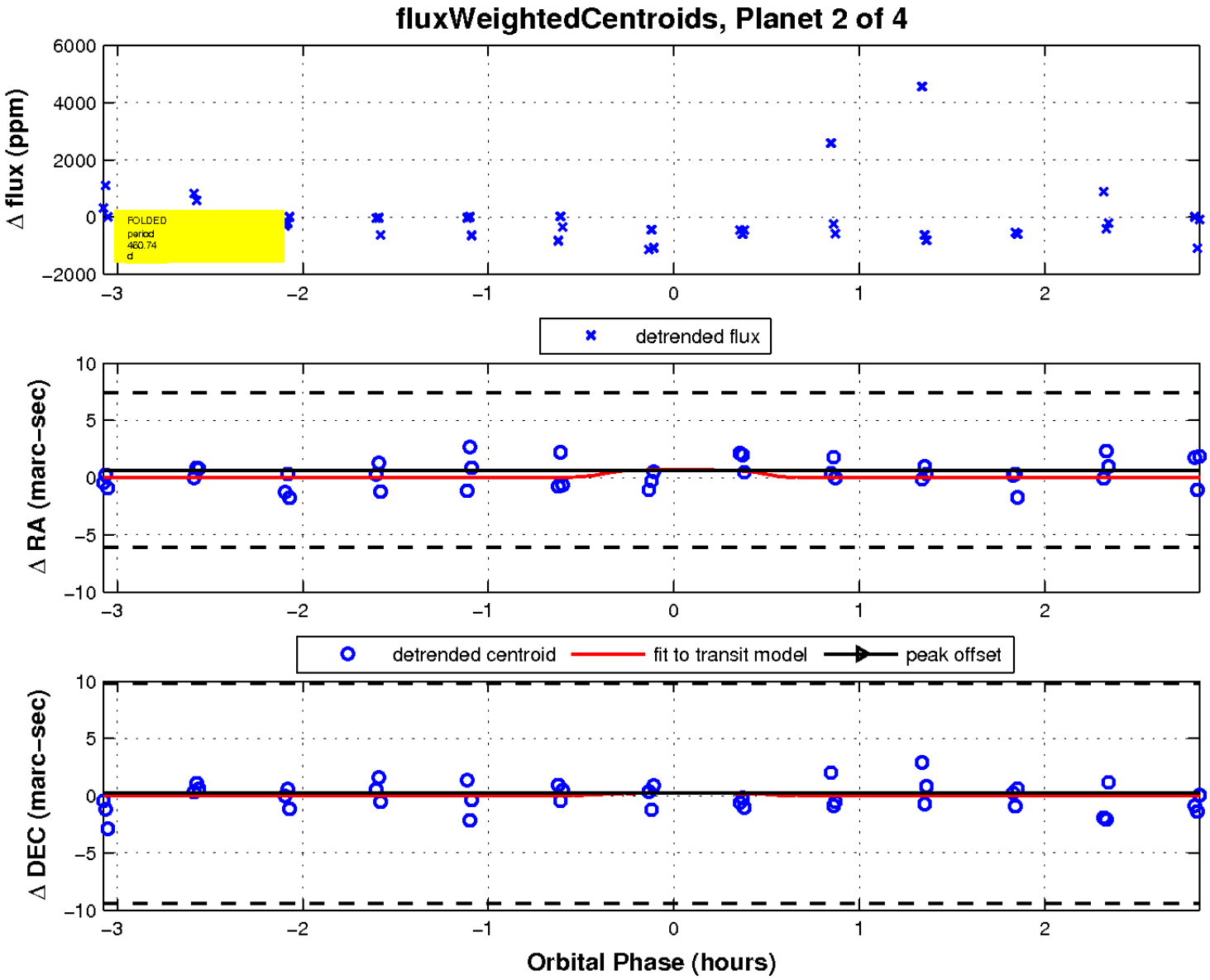


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

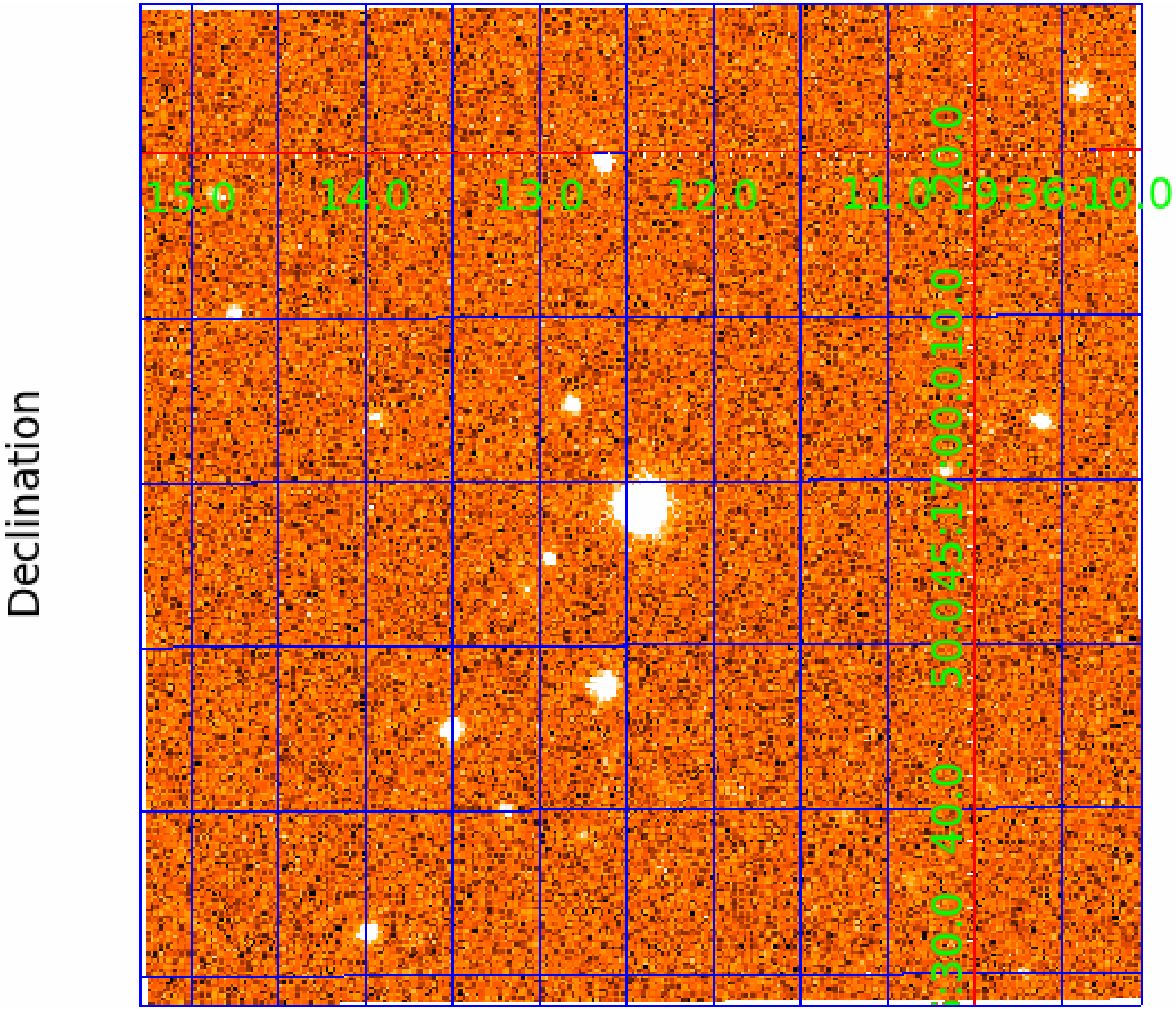








UKIRT Image


15.0
14.0
13.0
12.0
11.0
19:36:10.0
50:45:17.00:01:0.0
40.0
30.0
Declination

KIC 008959087

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 ($S_\oplus$)
008959087-01	OBS	No	506.366848	266.864381	1328.9	4.681	16.8	4.5	0.89	5451	3.25	0.45
008959087-02	OBS	No	460.738745	406.818911	524.6	1.077	12.1	2.4	0.89	5451	2.65	0.51
008959087-03	OBS	No	534.275018	161.600124	1517.0	8.393	14.2	3.8	0.89	5451	3.40	0.41
008959087-04	OBS	No	507.167770	553.113232	731.8	6.000	12.1	-1.0	0.89	5451	2.37	0.45

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008959087-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
008959087-02	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—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008959087-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008959087-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

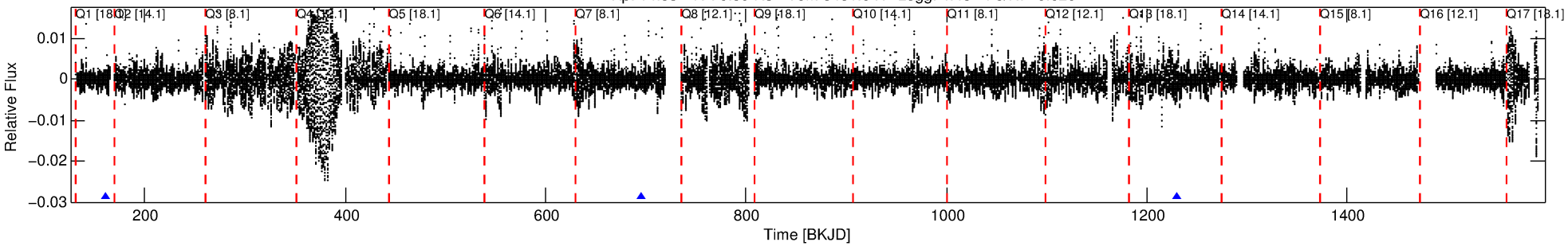
Ephemeris Match Information For 008959087-03

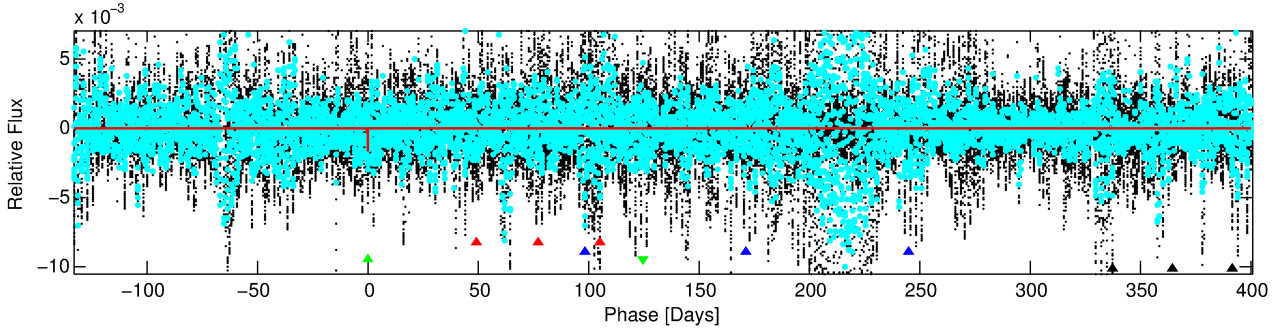
No Significant Match Found

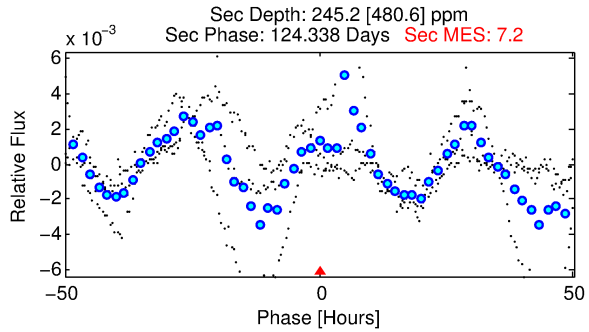
DV One-Page Summary

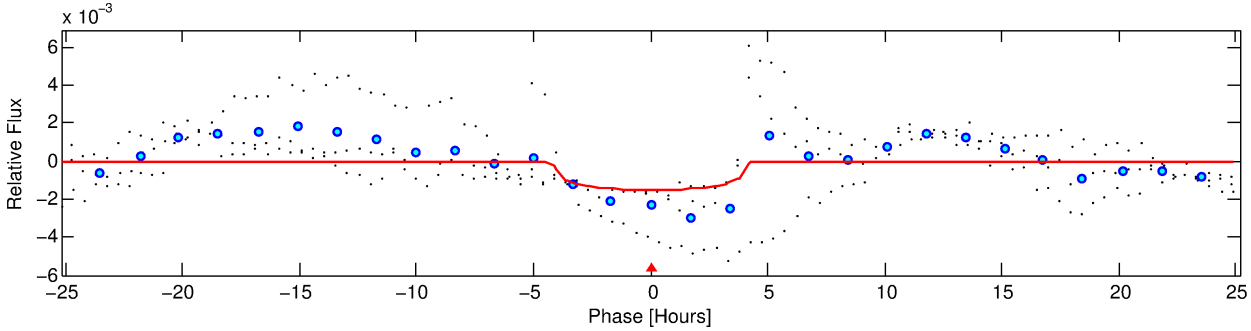
KIC: 8959087 Candidate: 3 of 4 Period: 534.275 d

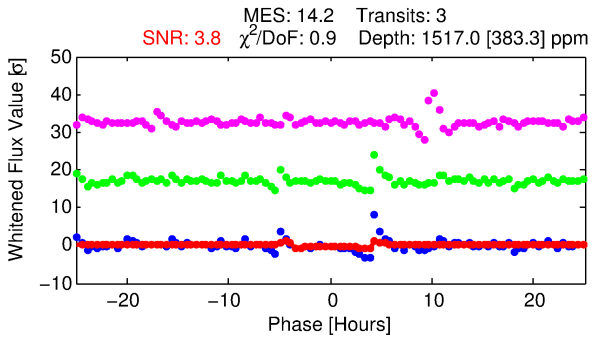
Kp: 14.53 R*: 0.89 Rs Teff: 5451.0 K Logg: 4.48 Fe/H: −0.020

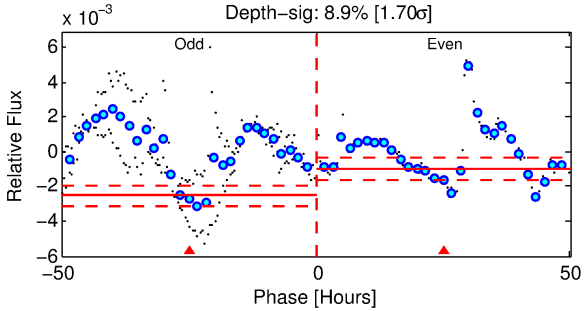


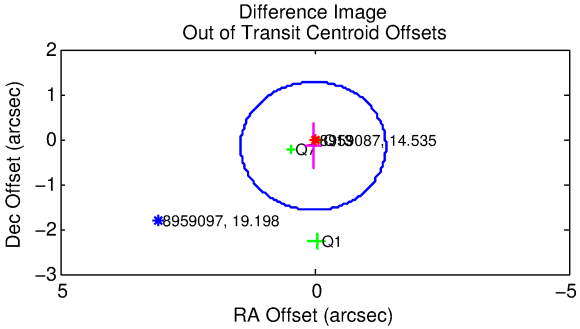












DV Fit Results:

Period = 534.27502 [0.00573] d
Epoch = 161.6001 [0.0072] BKJD
Rp/R* = 0.0350 [0.0278]
a/R* = 503.28 [1505.24]
b = 0.02 [194.96]

Seff = 0.42 [0.12]
Teq = 205 [15] K
Rp = 3.40 [2.80] Re
a = 1.2297 [0.2285] AU

Ag = 17614.20 [44708.12] [0.39σ]
Teffp = 3646 [2303] K [1.49σ]

DV Diagnostic Results:

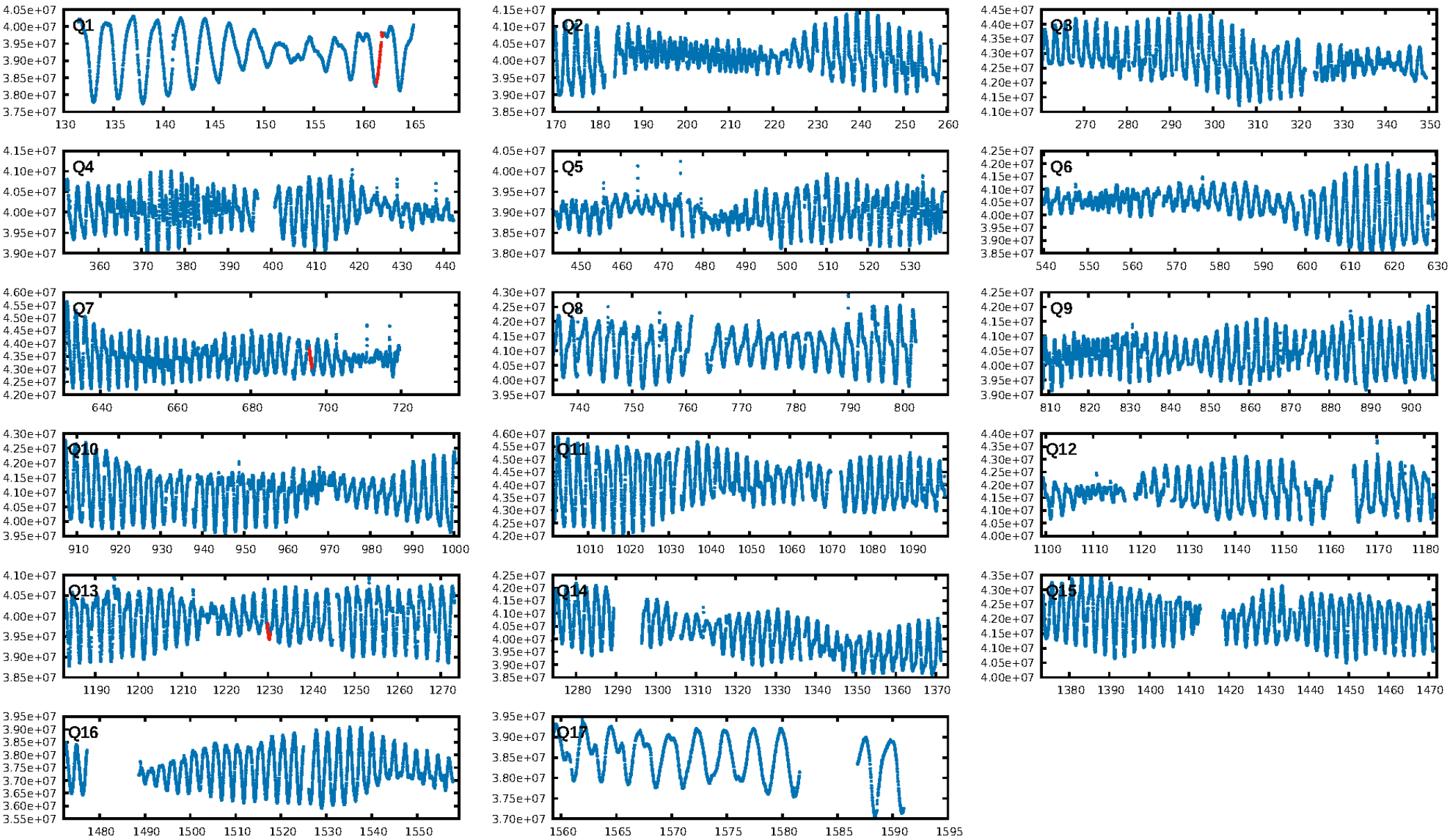
ShortPeriod−sig: 100.0% [63.06σ]
LongPeriod−sig: N/A
ModelChiSquare2−sig: 47.5%
ModelChiSquareGof−sig: 99.6%
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [2/2]
GhostDiagnostic−chr: 1.04

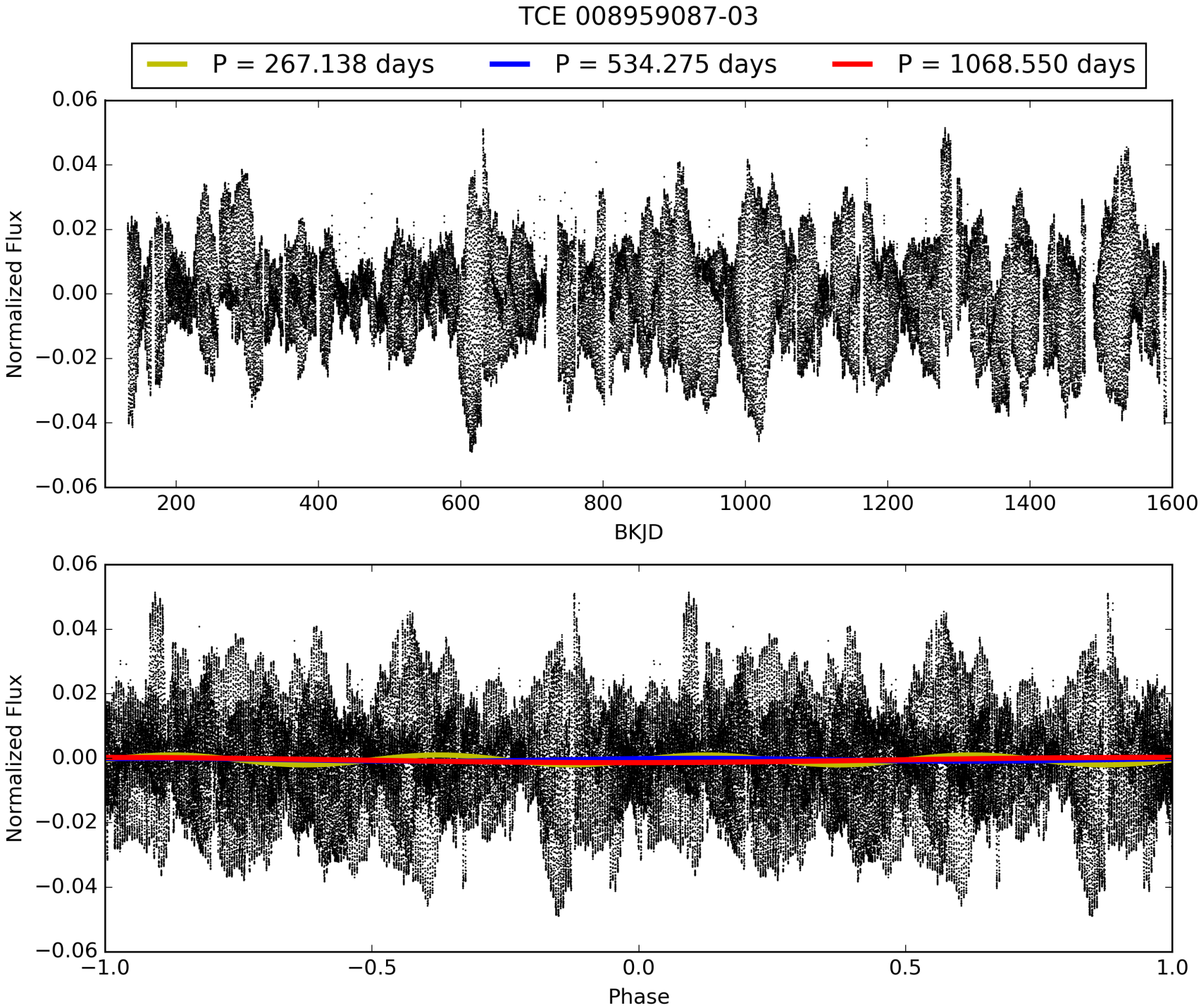
Centroid−sig: 22.0%
Centroid−so: 0.456 arcsec [0.81σ]
OotOffset−rm: 0.154 arcsec [0.32σ]
KicOffset−rm: 0.427 arcsec [0.98σ]
OotOffset−st: 0/1/0/2 [3]
KicOffset−st: 0/1/0/2 [3]
DiffImageQuality−fgm: 0.67 [2/3]
DiffImageOverlap−fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 23:17:50 Z

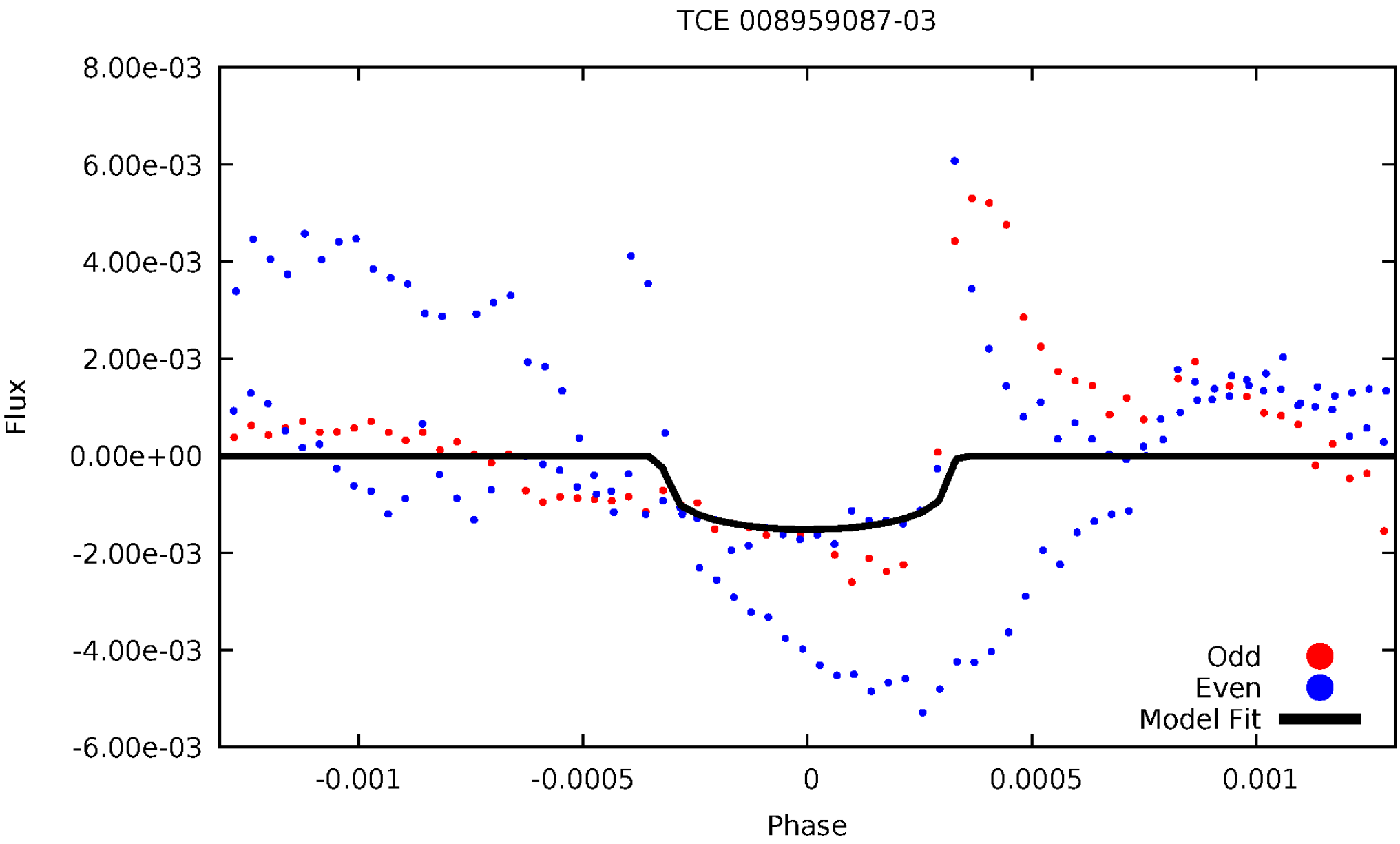
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008959087-03, PDC Light Curves

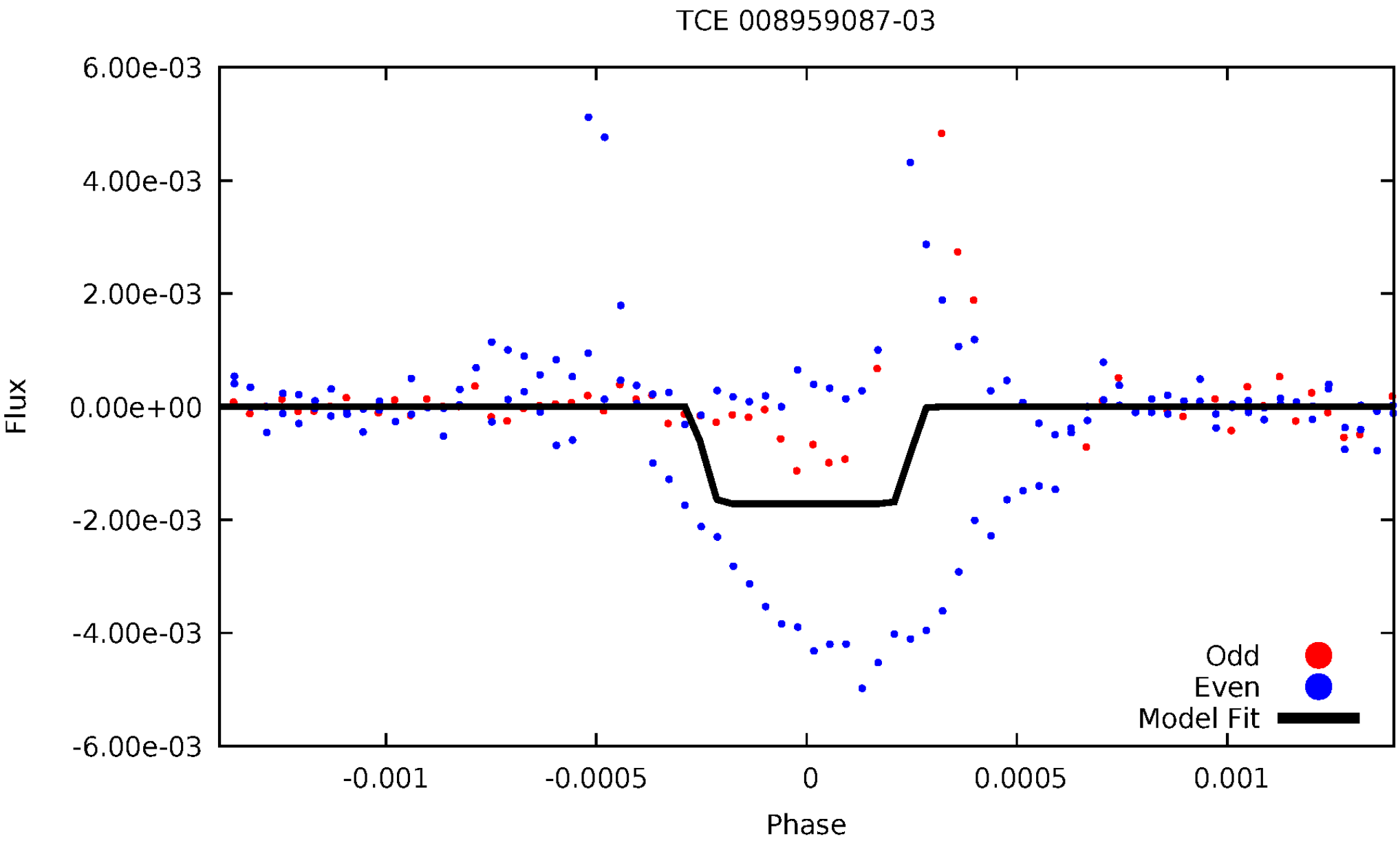



TCE 008959087-03
P = 267.138 days
P = 534.275 days
P = 1068.550 days
Normalized Flux
BKJD
Phase

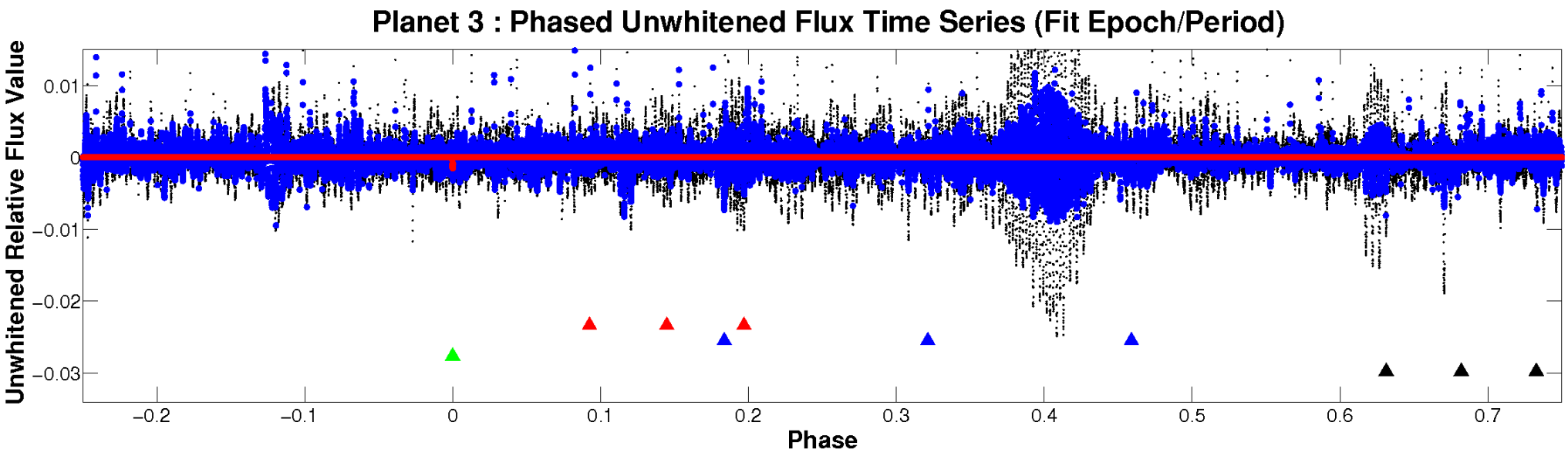
DV Odd/Even

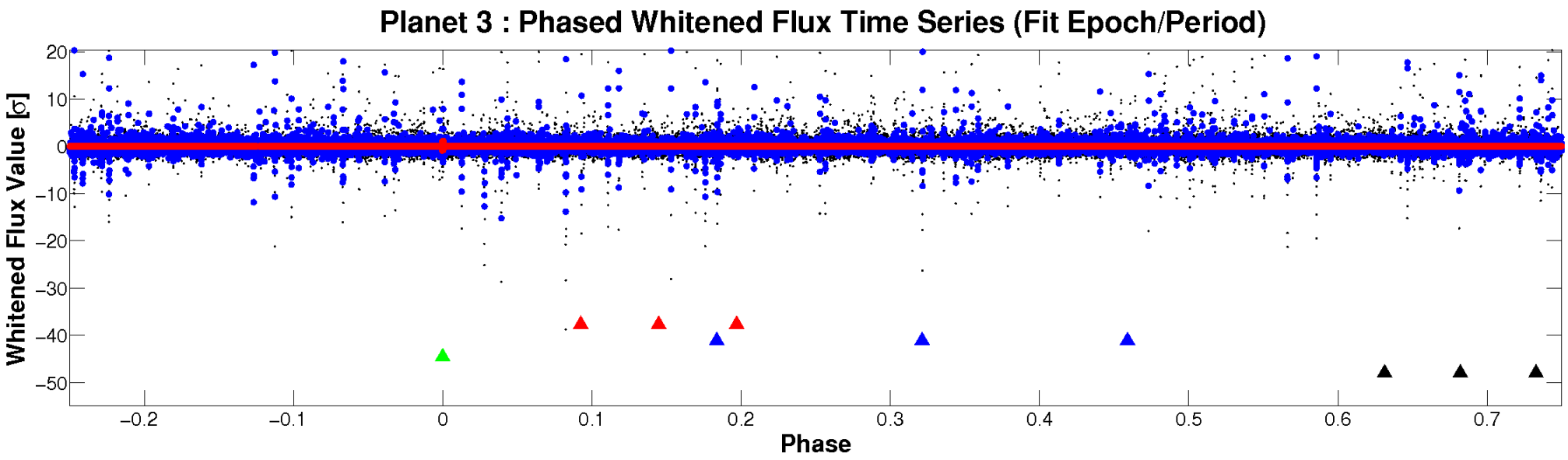

TCE 008959087-03
8.00e-03
6.00e-03
4.00e-03
2.00e-03
0.00e+00
-2.00e-03
-4.00e-03
-6.00e-03
Flux
-0.001
-0.0005
0
0.0005
0.001
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 008959087-03
6.00e-03
4.00e-03
2.00e-03
0.00e+00
-2.00e-03
-4.00e-03
-6.00e-03
Flux
-0.001
-0.0005
0
0.0005
0.001
Phase
Odd
Even
Model Fit

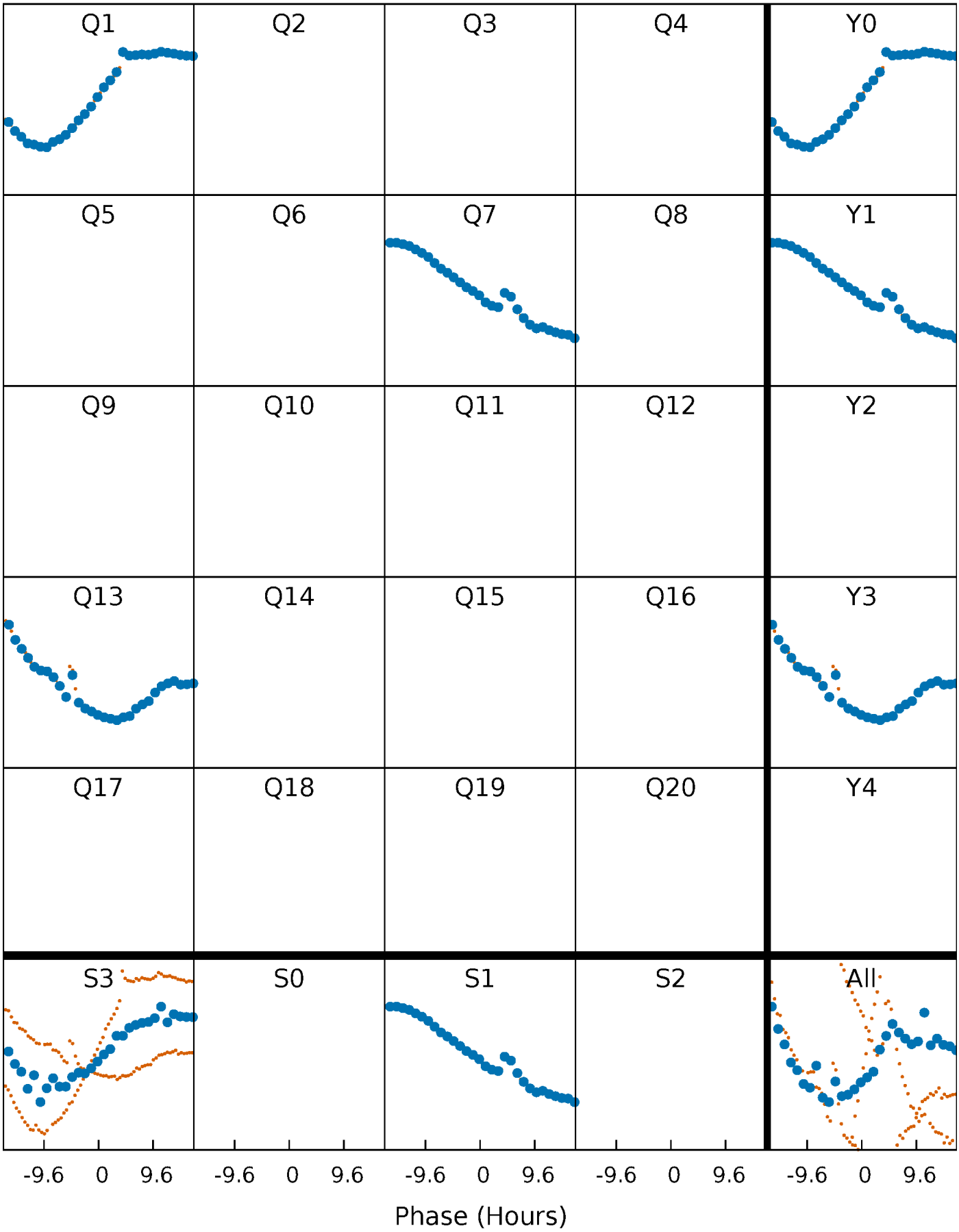
Non-Whitened Vs. Whitened Light Curve





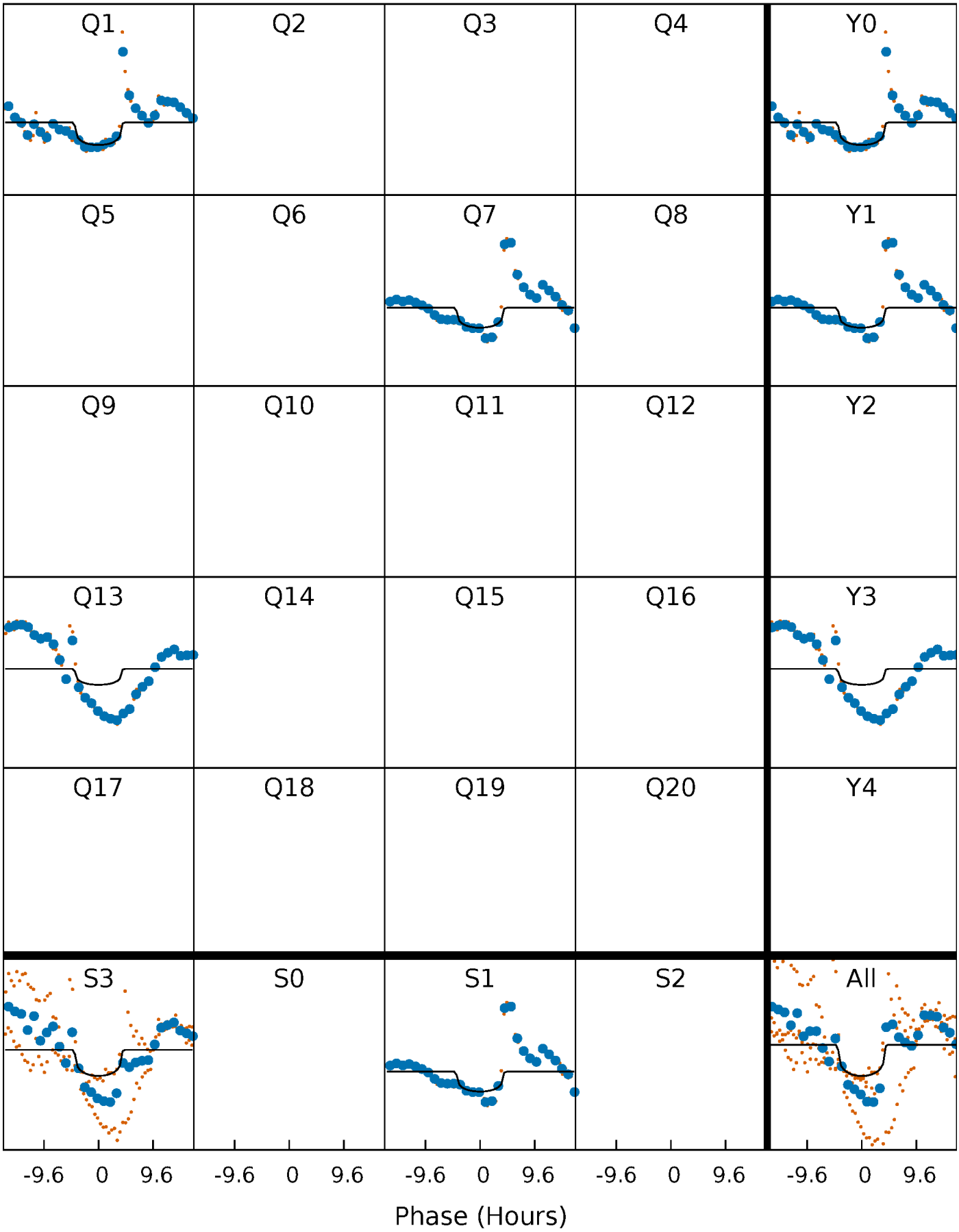
PDC Quarter-Phased Transit Curves

TCE 008959087-03 P=534.275018 Days T_0=161.600124 (BKJD)



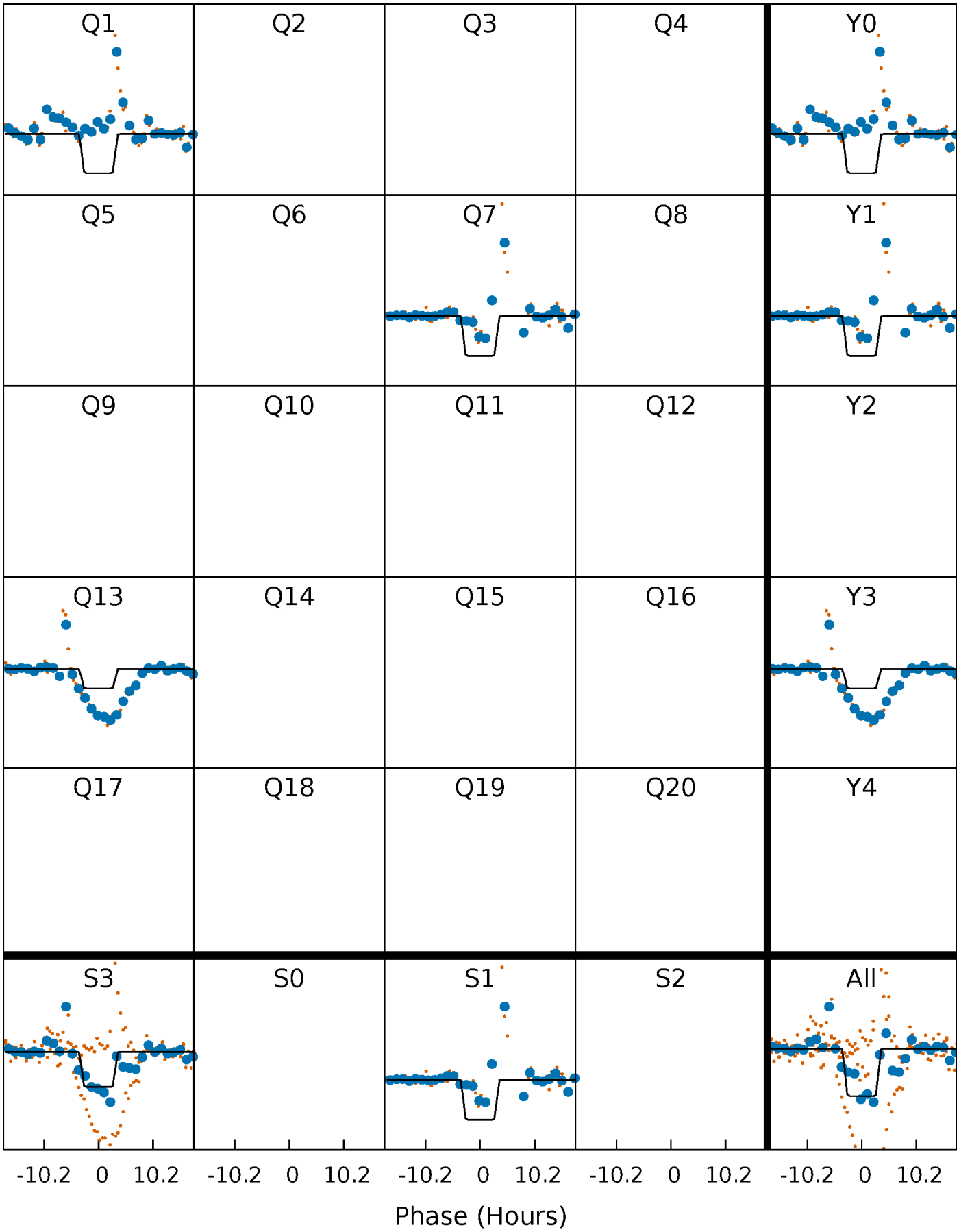
DV Quarter-Phased Transit Curves

TCE 008959087-03 P=534.275018 Days T_0=161.600124 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

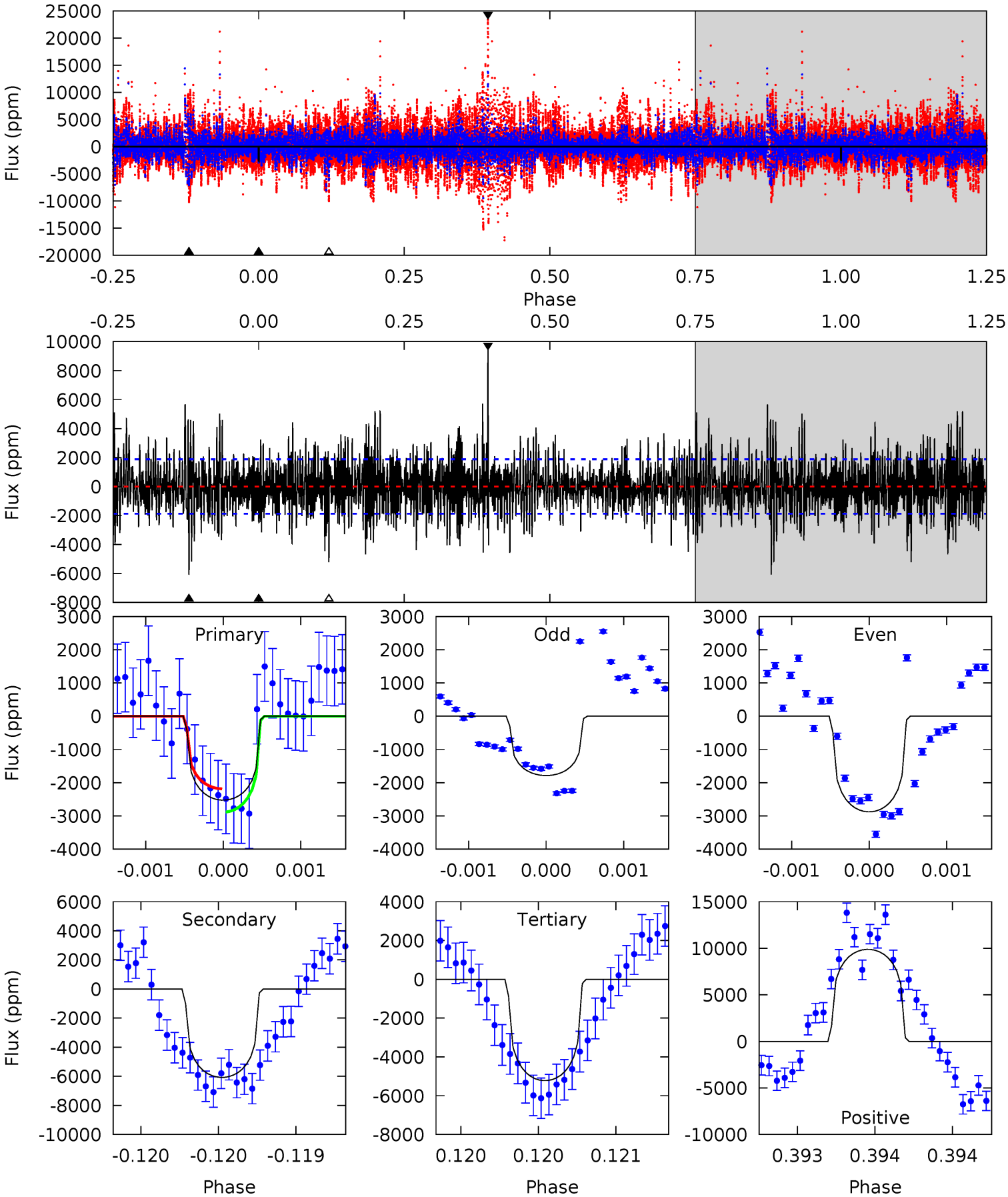
TCE 008959087-03 P=534.276293 Days T_0=161.664350 (BKJD)



DV Model-Shift Uniqueness Test

008959087-03, P = 534.275018 Days, E = 161.600124 Days

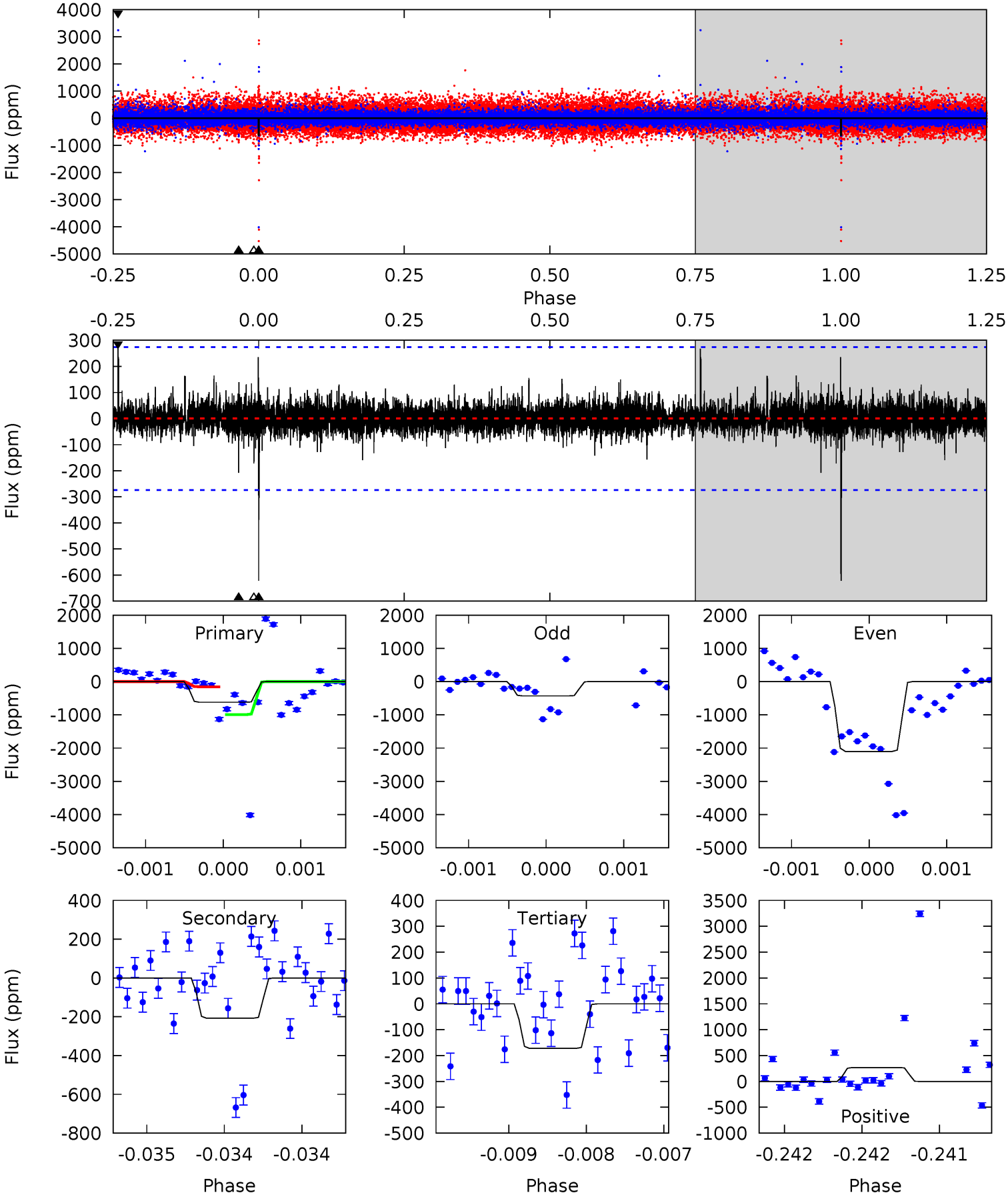
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.42	17.8	15.3	29.0	5.52	3.39	4.18	-7.92	-21.6	2.51	-11.2	1.33	1.41	0.62	1.04



Alt Model-Shift Uniqueness Test

008959087-03, P = 534.276293 Days, E = 161.664350 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.6	4.20	3.48	5.42	5.55	3.44	0.63	9.09	7.16	0.71	-1.22	18.0	3.01	0.30	0



Stellar Parameters For KIC 008959087

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5451^{+164}_{-164}	$4.477^{+0.081}_{-0.150}$	$-0.020^{+0.250}_{-0.300}$	$0.891^{+0.195}_{-0.105}$	$0.868^{+0.099}_{-0.074}$	$1.731^{+0.594}_{-0.727}$
	+3%/-3%	+2%/-3%	+1250%/-1500%	+22%/-12%	+11%/-9%	+34%/-42%
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 008959087-03 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-6075±340	$3.98^{+2.60}_{-2.34}$	289^{+17}_{-14}	7849^{+7554}_{-2003}	$326949^{+1536018}_{-210471}$
Alt.	-207±49	$4.39^{+2.66}_{-2.33}$	289^{+17}_{-14}	3558^{+1151}_{-479}	8884^{+31845}_{-5507}

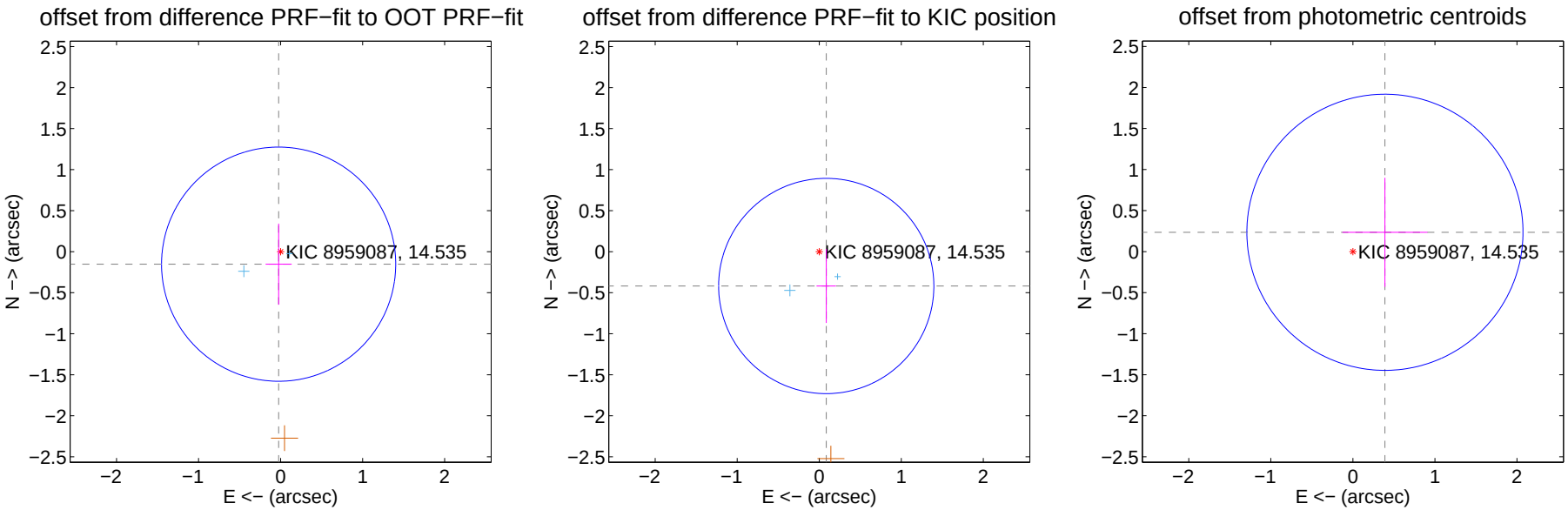
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

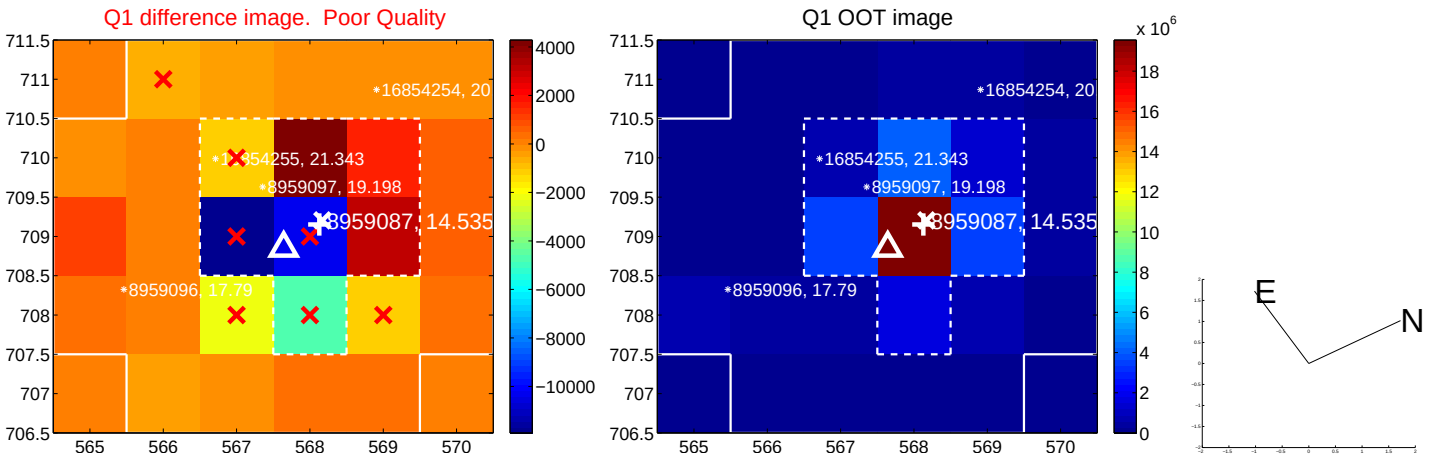
Supplemental centroid analysis for 008959087-03. Kepler magnitude: 14.54. Transit SNR 3.82
There are 2 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

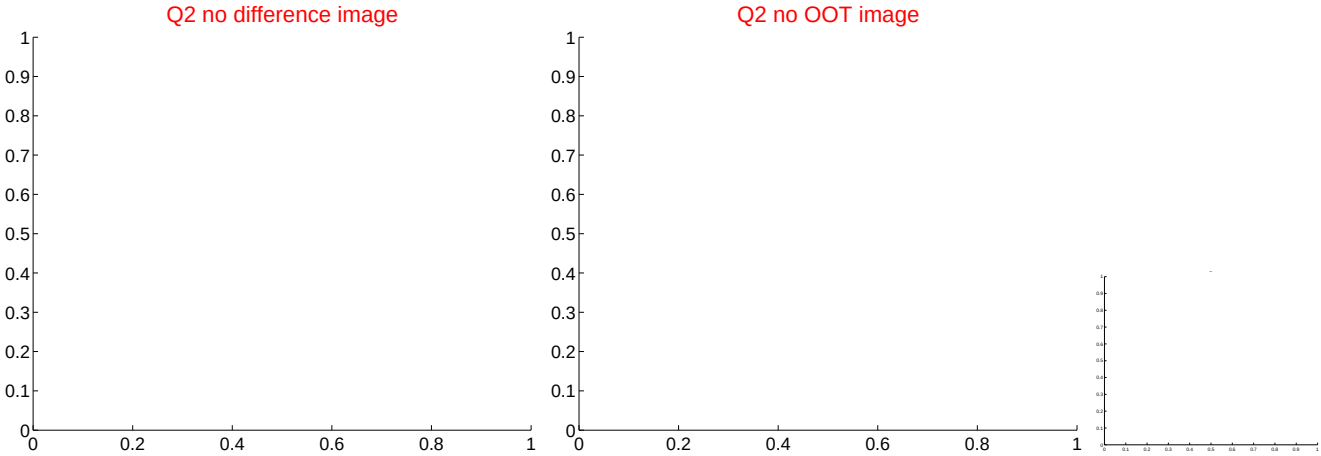
	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.154 ± 0.476	0.32	0.024 ± 0.159	-0.152 ± 0.494
PRF-fit source offset from KIC position	0.427 ± 0.437	0.98	-0.085 ± 0.119	-0.418 ± 0.450
photometric centroid source offset	0.46 ± 0.56	0.81	-0.39 ± 0.52	0.24 ± 0.66

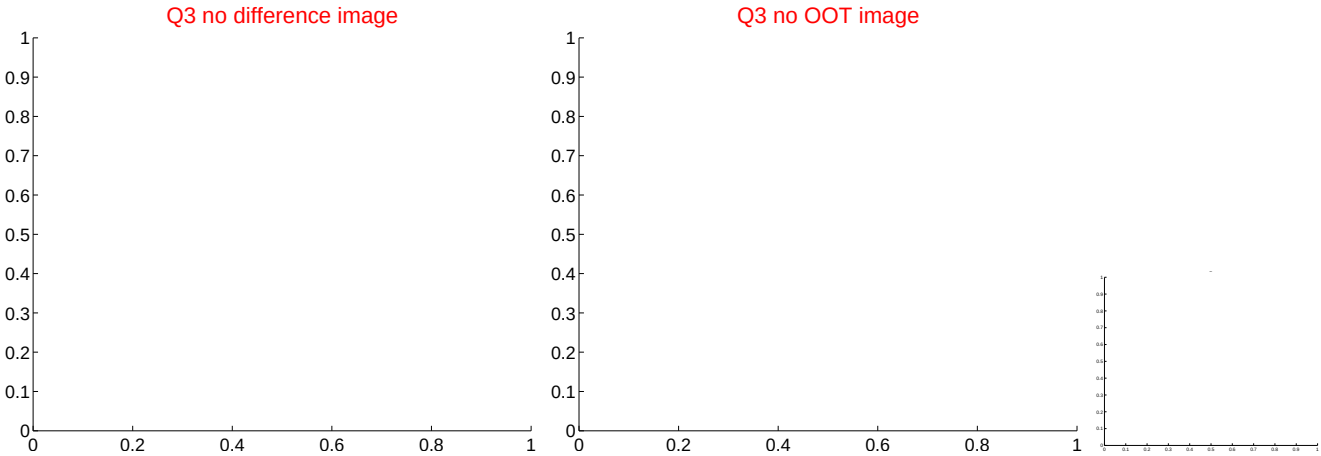


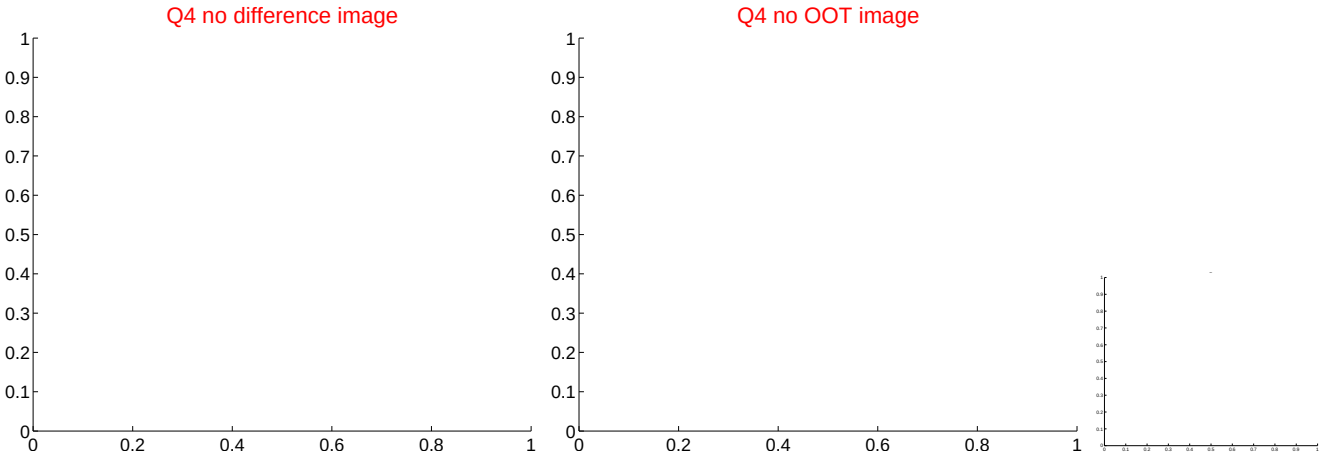
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

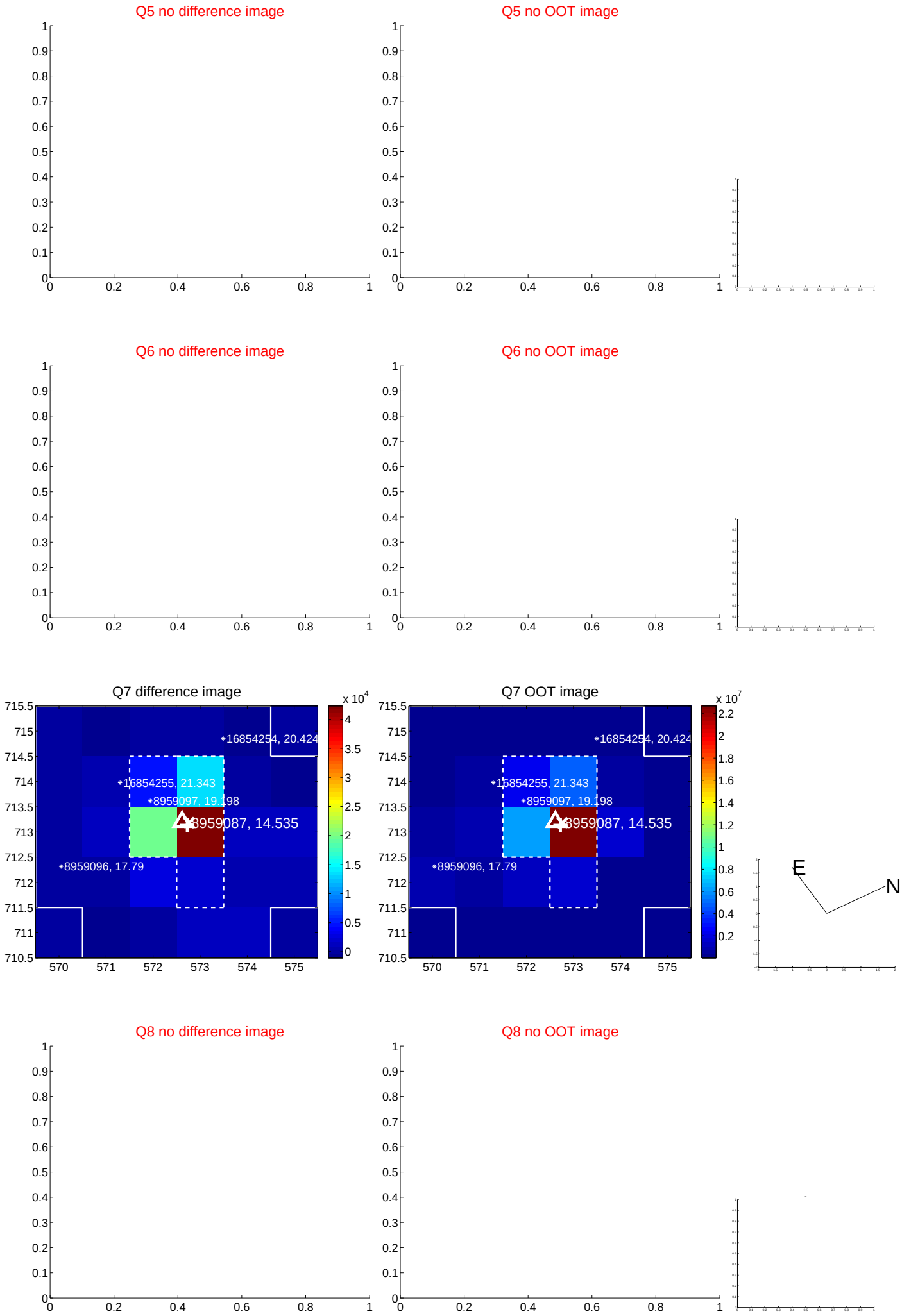




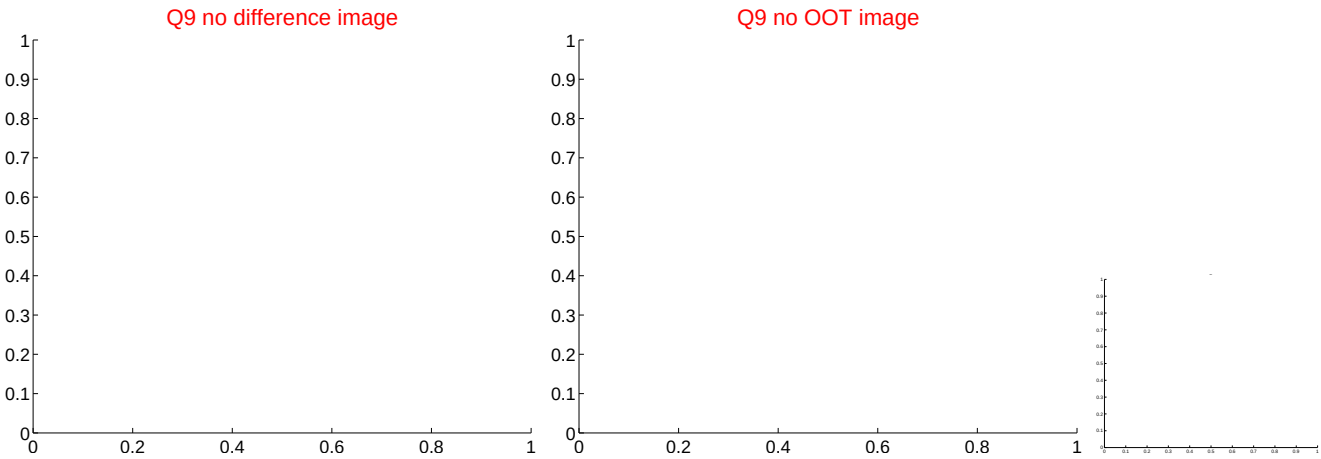


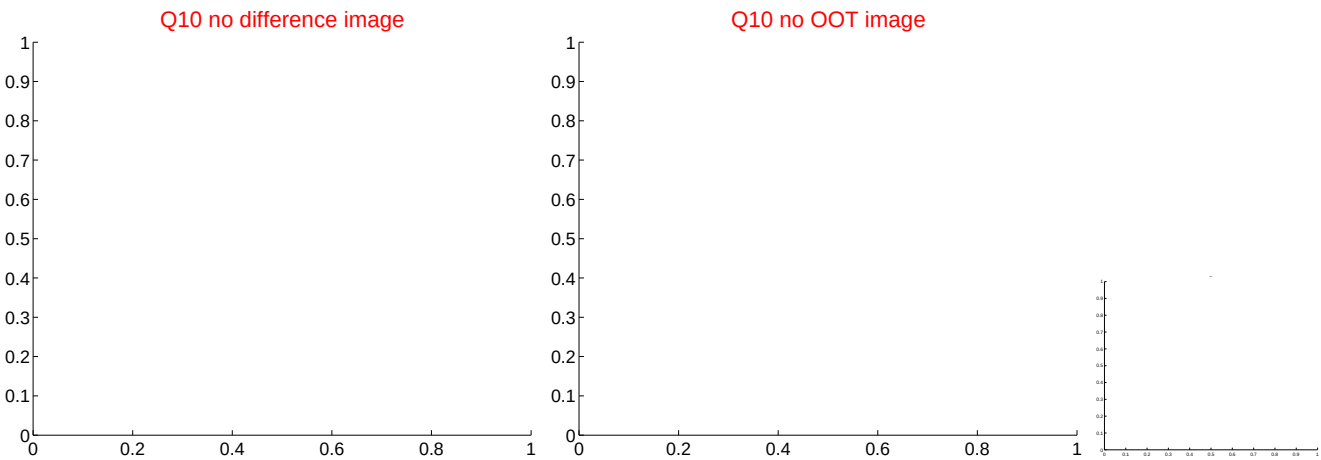


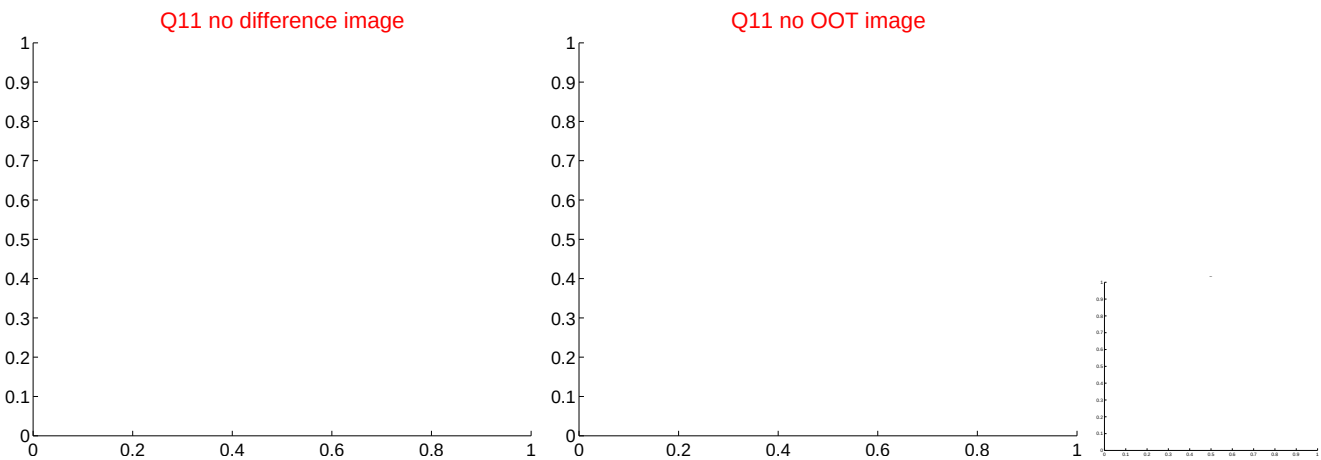
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

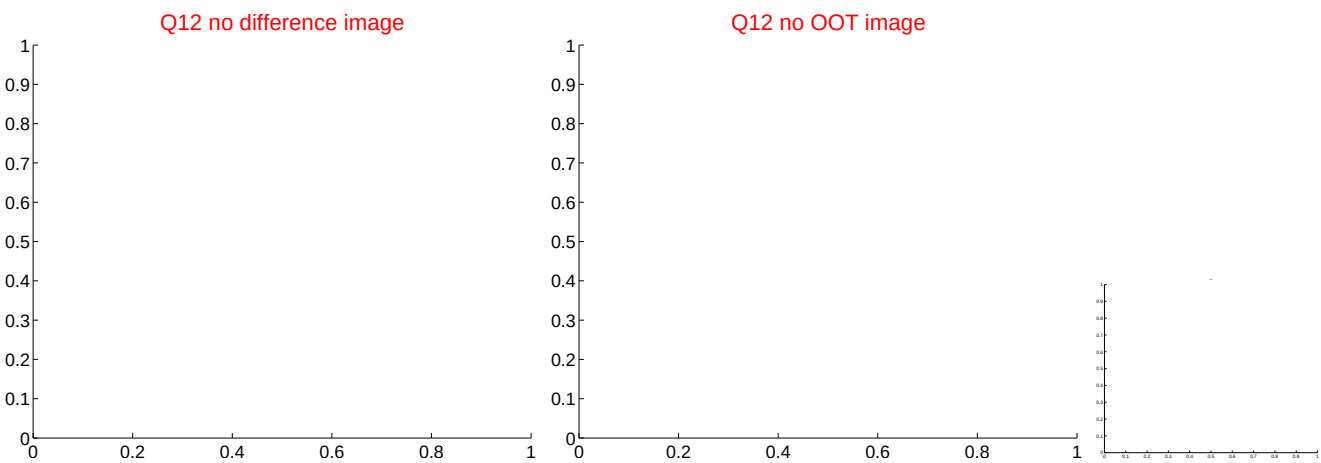


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

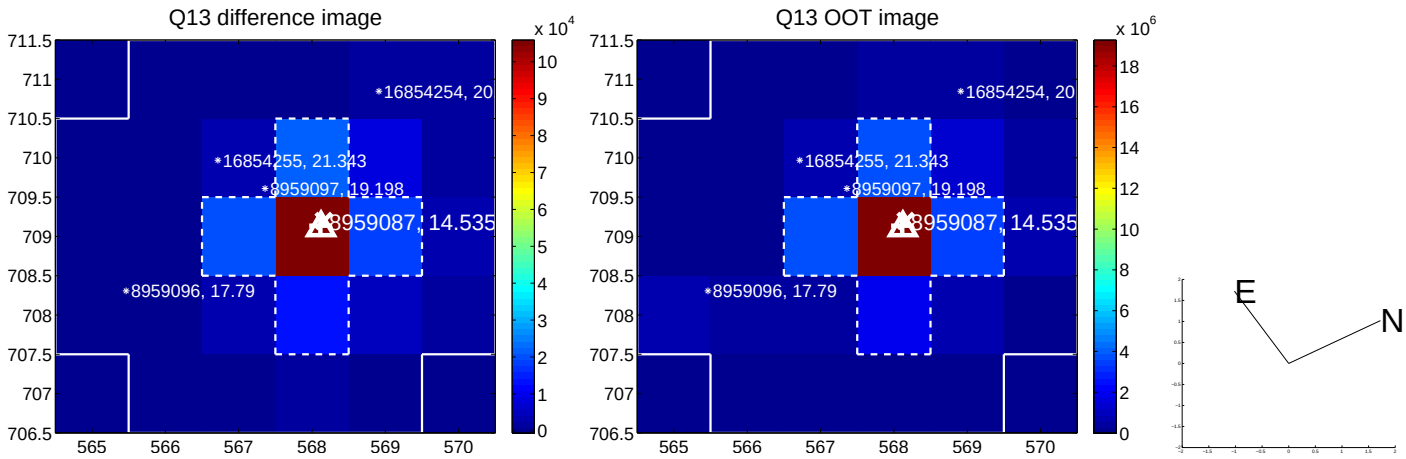


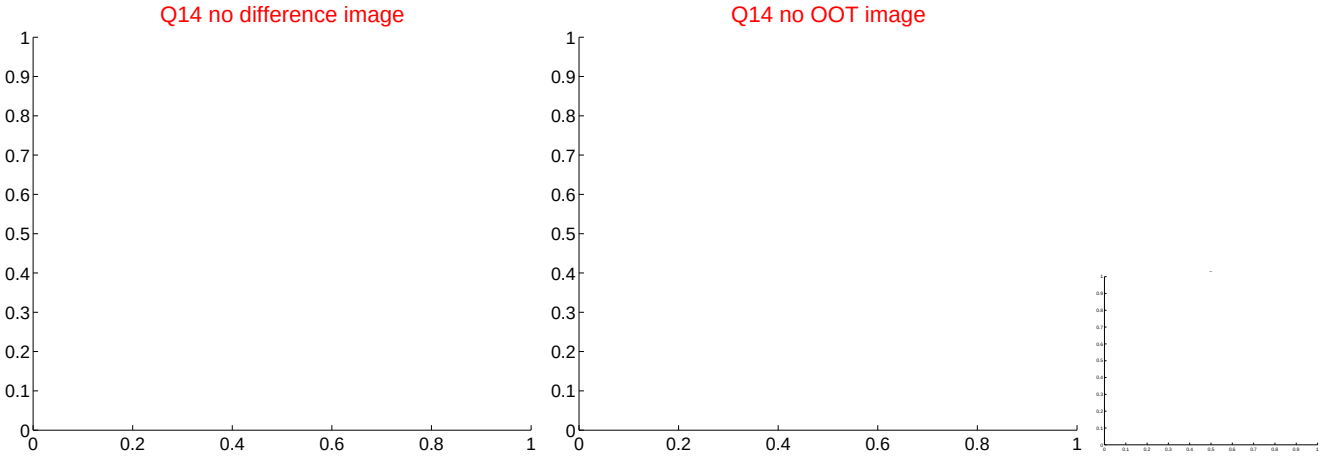


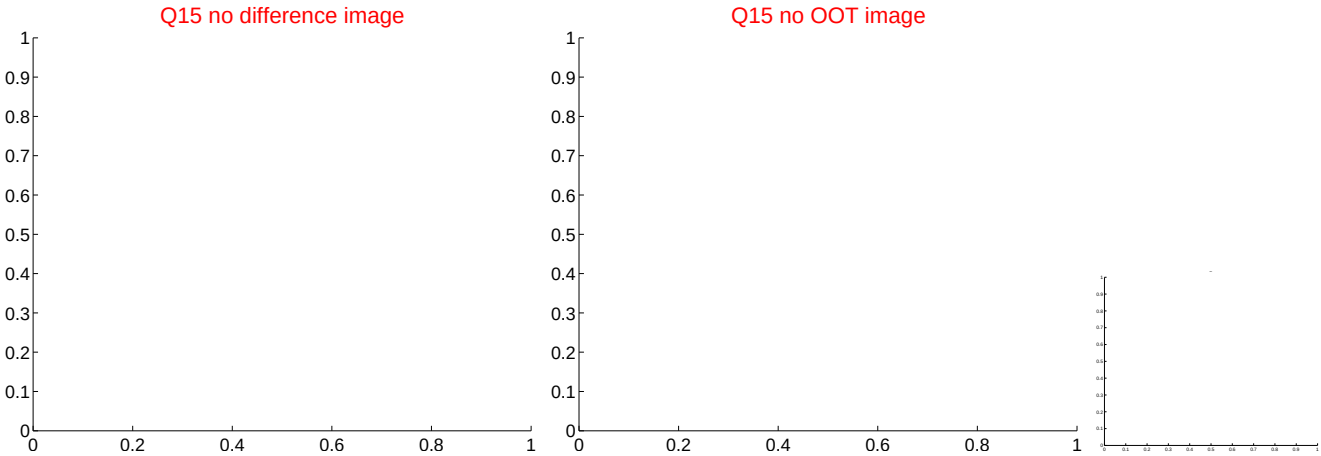


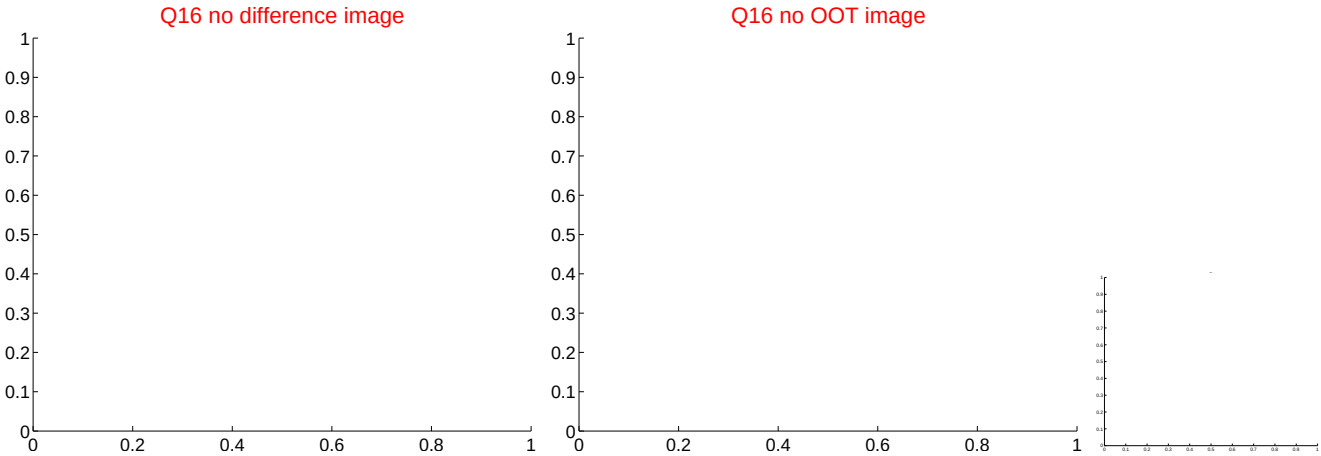


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

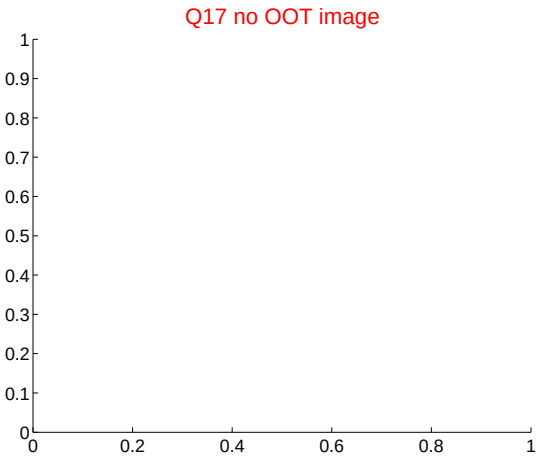


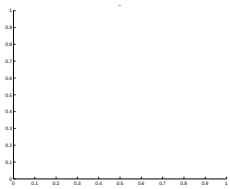


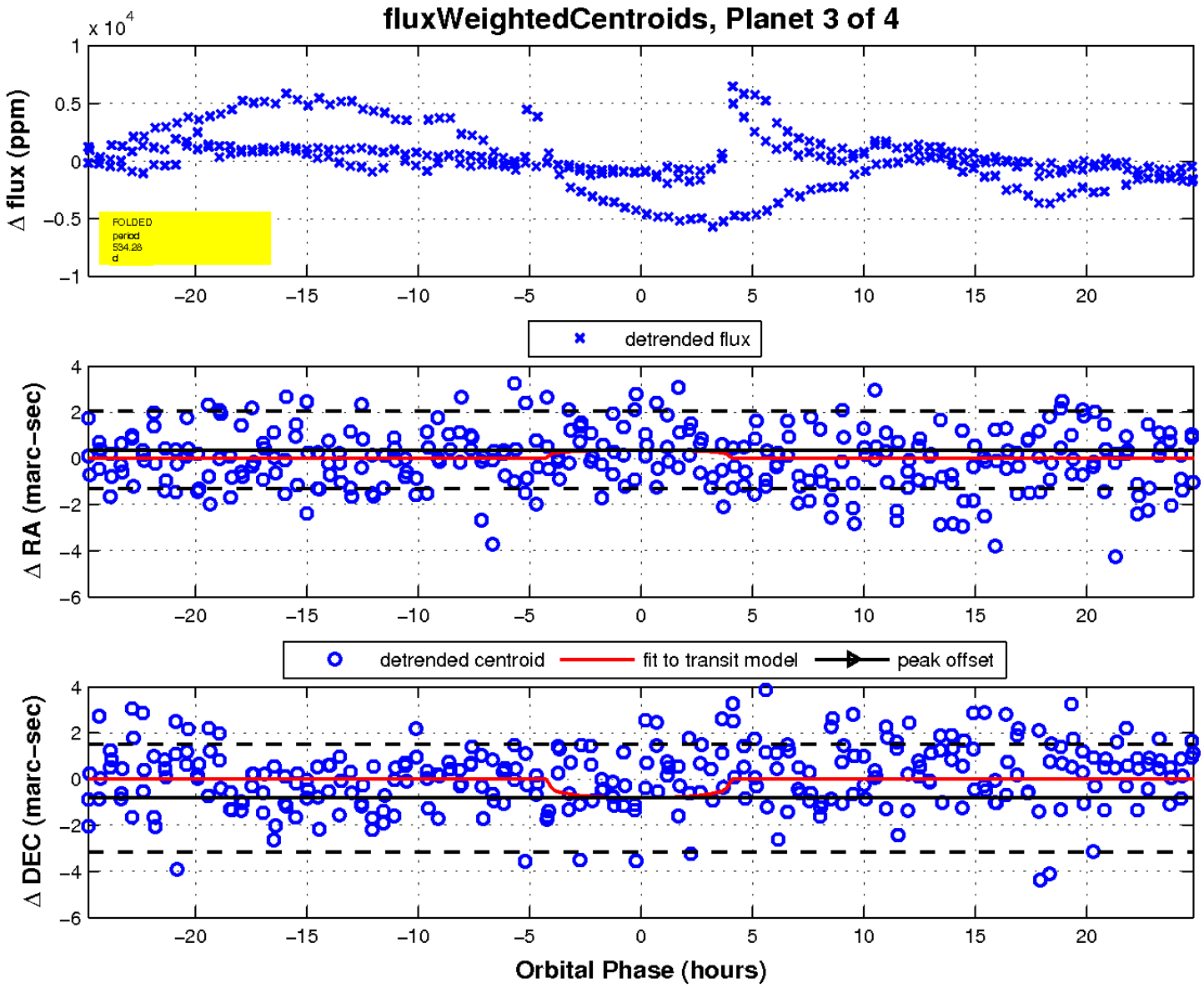




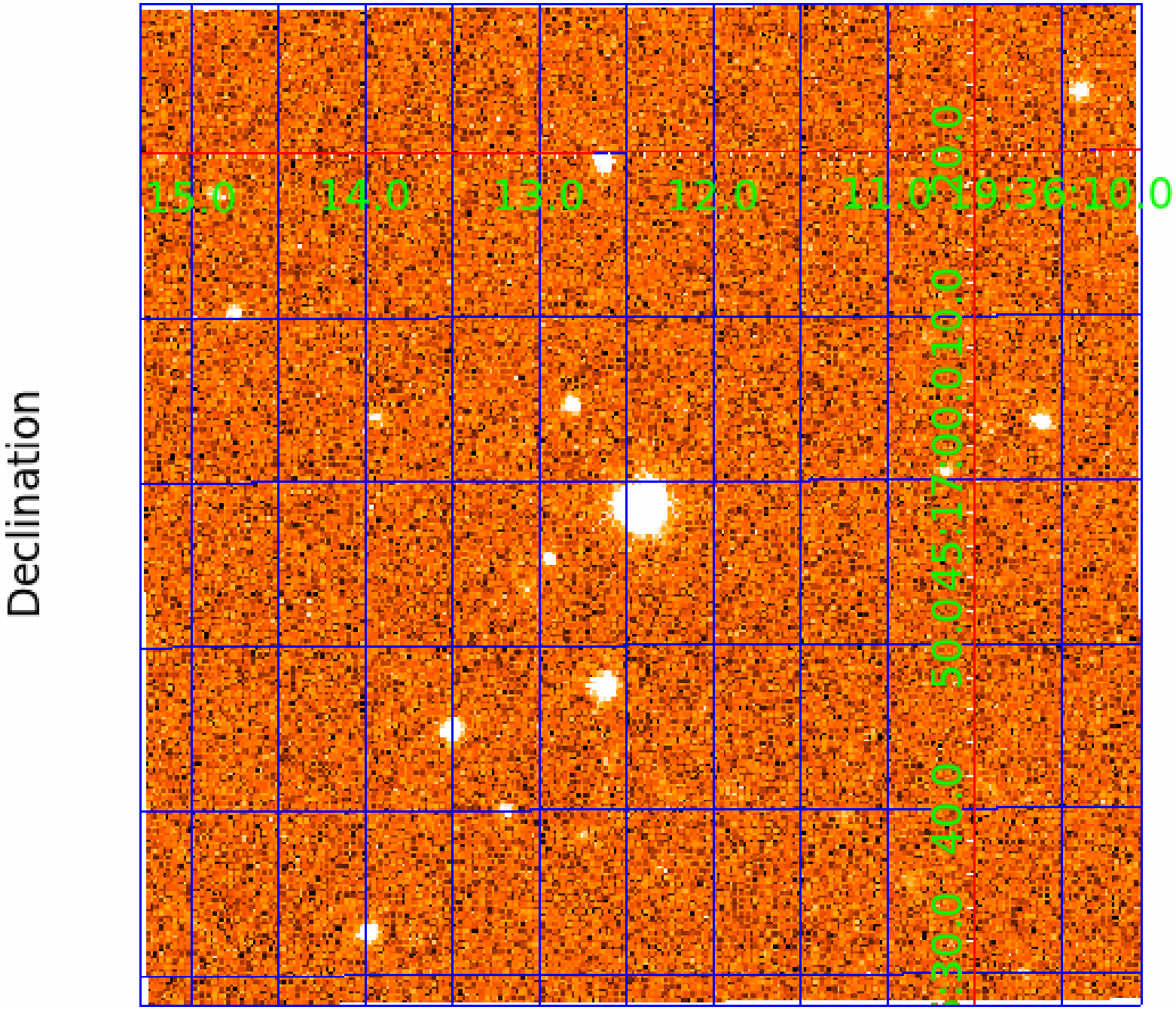
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.







UKIRT Image


15.0
14.0
13.0
12.0
11.0
19:36:10.0
50:45:17.00:01:0.0
40.0
30.0
Declination

KIC 008959087

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 ($S_\oplus$)
008959087-01	OBS	No	506.366848	266.864381	1328.9	4.681	16.8	4.5	0.89	5451	3.25	0.45
008959087-02	OBS	No	460.738745	406.818911	524.6	1.077	12.1	2.4	0.89	5451	2.65	0.51
008959087-03	OBS	No	534.275018	161.600124	1517.0	8.393	14.2	3.8	0.89	5451	3.40	0.41
008959087-04	OBS	No	507.167770	553.113232	731.8	6.000	12.1	-1.0	0.89	5451	2.37	0.45

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008959087-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_FEW_DIFFS—HALO_GHOST
008959087-02	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—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008959087-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008959087-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

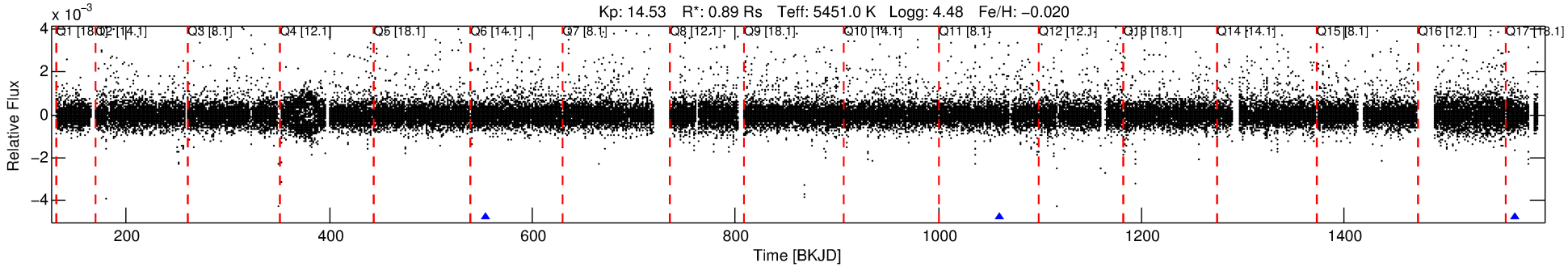
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

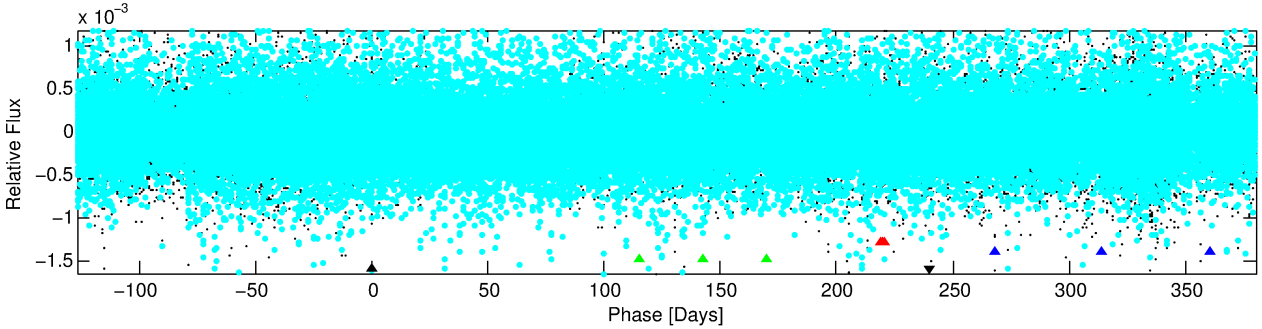
Ephemeris Match Information For 008959087-04

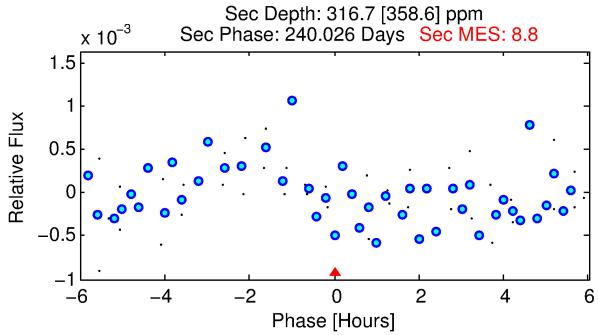
No Significant Match Found

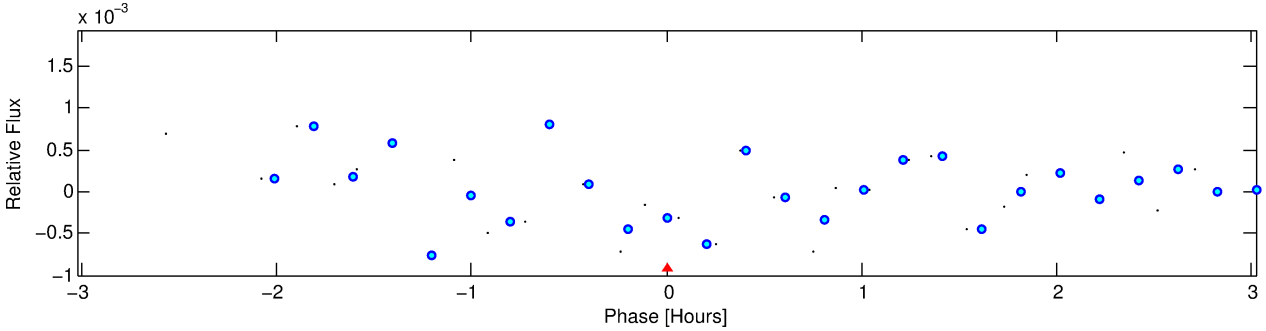
DV One-Page Summary

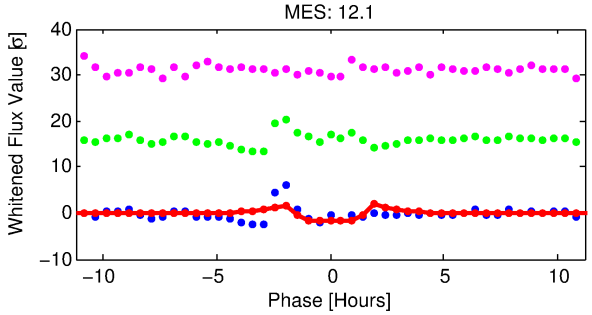
KIC: 8959087 Candidate: 4 of 4 Period: 507.168 d

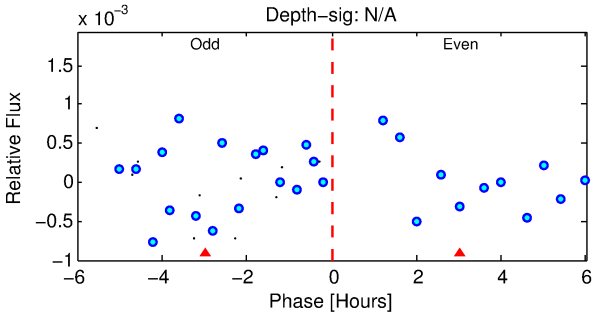


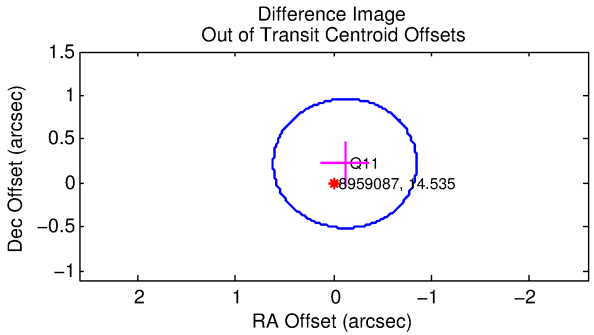












TPS TCE Results:

Period = 507.16777 d
Epoch = 553.1132 BKJD

DV fit results are unavailable

DV Diagnostic Results:

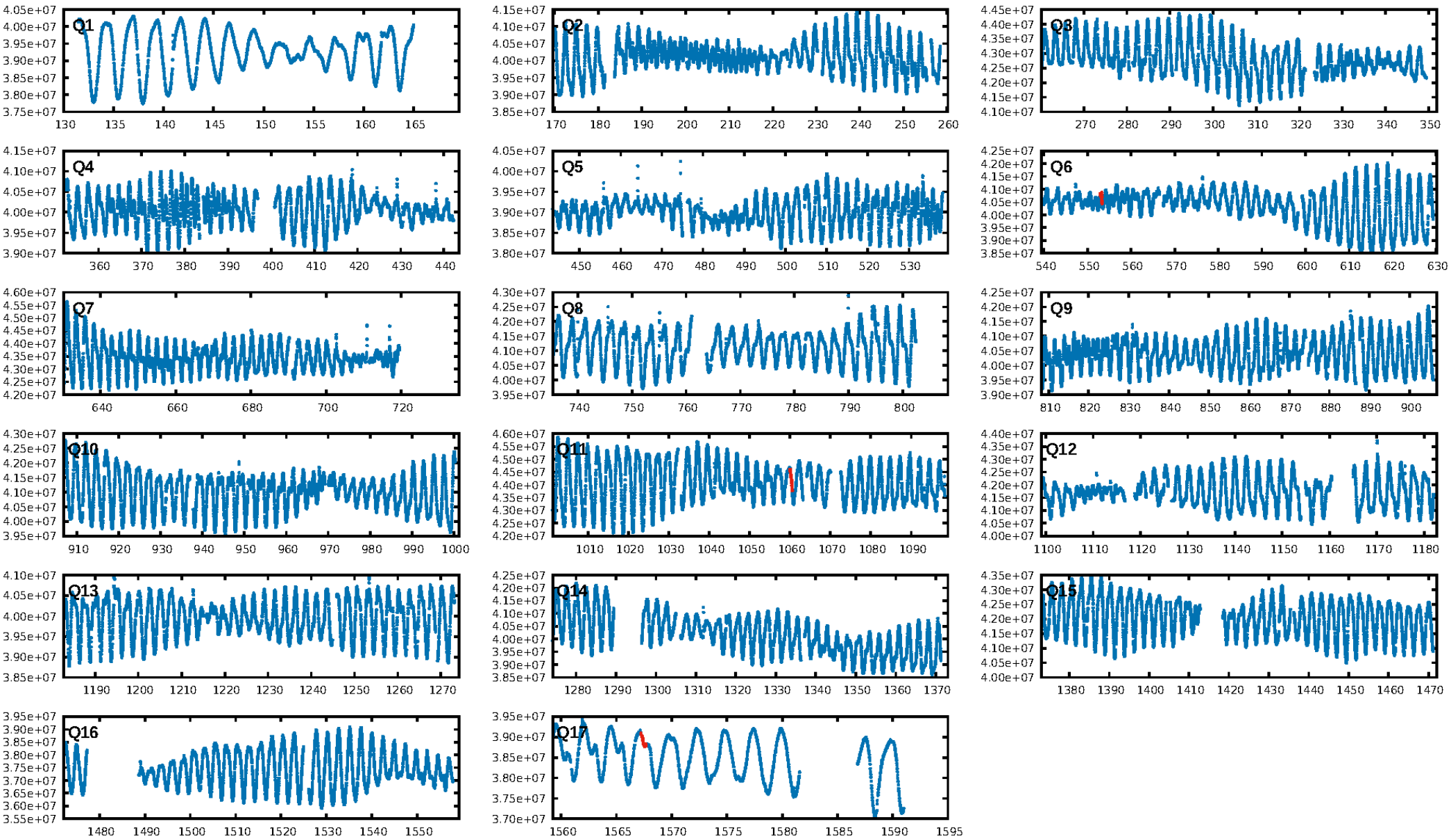
ShortPeriod−sig: 98.8% [2.53σ]
LongPeriod−sig: 100.0% [63.06σ]
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [2/2]
GhostDiagnostic−chr: 0.7968

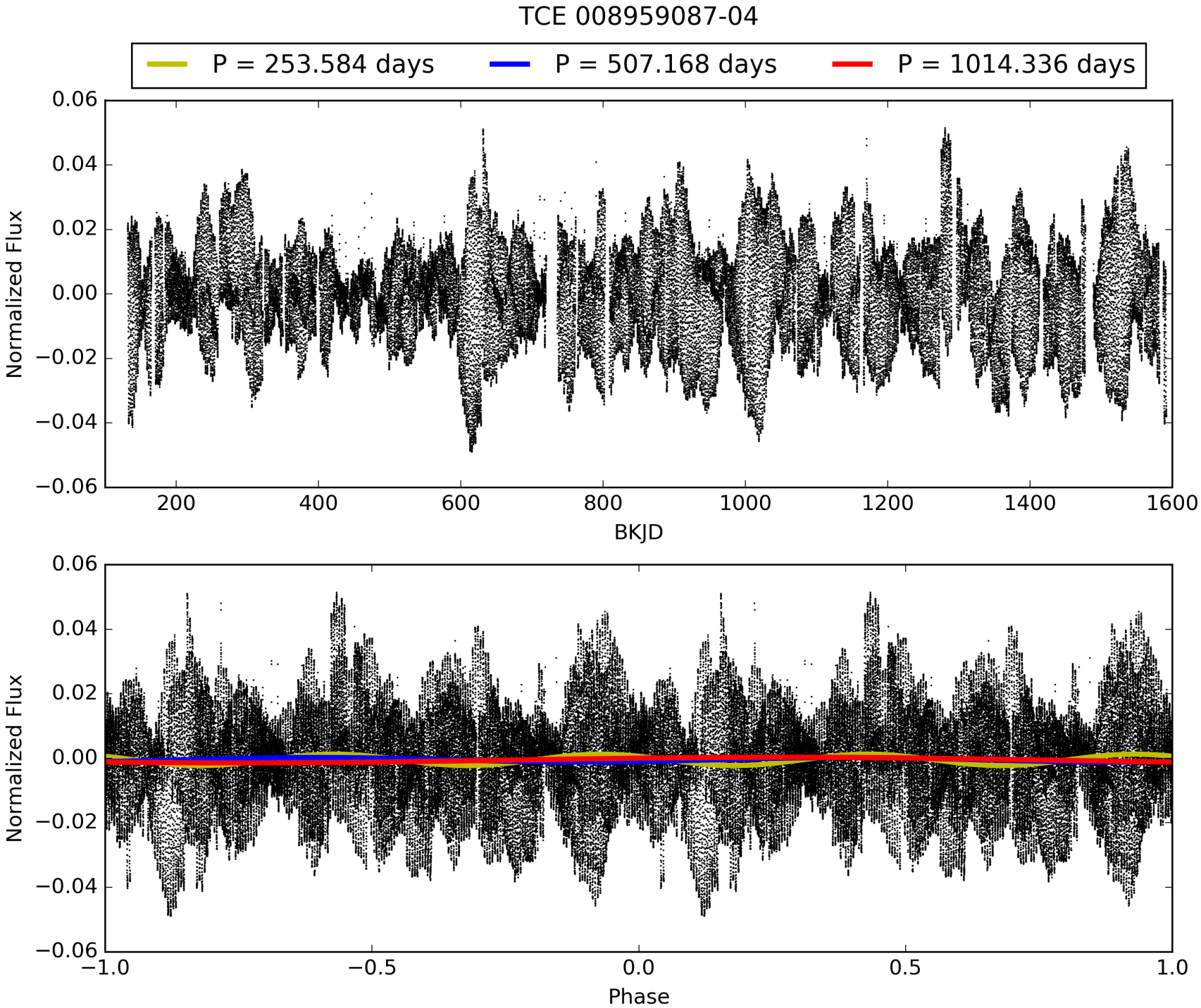
Centroid−sig: 32.3%
Centroid−so: 9.109 arcsec [0.57σ]
OotOffset−rm: 0.256 arcsec [1.04σ]
KicOffset−rm: 0.189 arcsec [0.79σ]
OotOffset−st: 0/1/0/0 [1]
KicOffset−st: 0/1/0/0 [1]
DiffImageQuality−fgm: 1.00 [1/1]
DiffImageOverlap−fno: 1.00 [2/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 23:18:45 Z

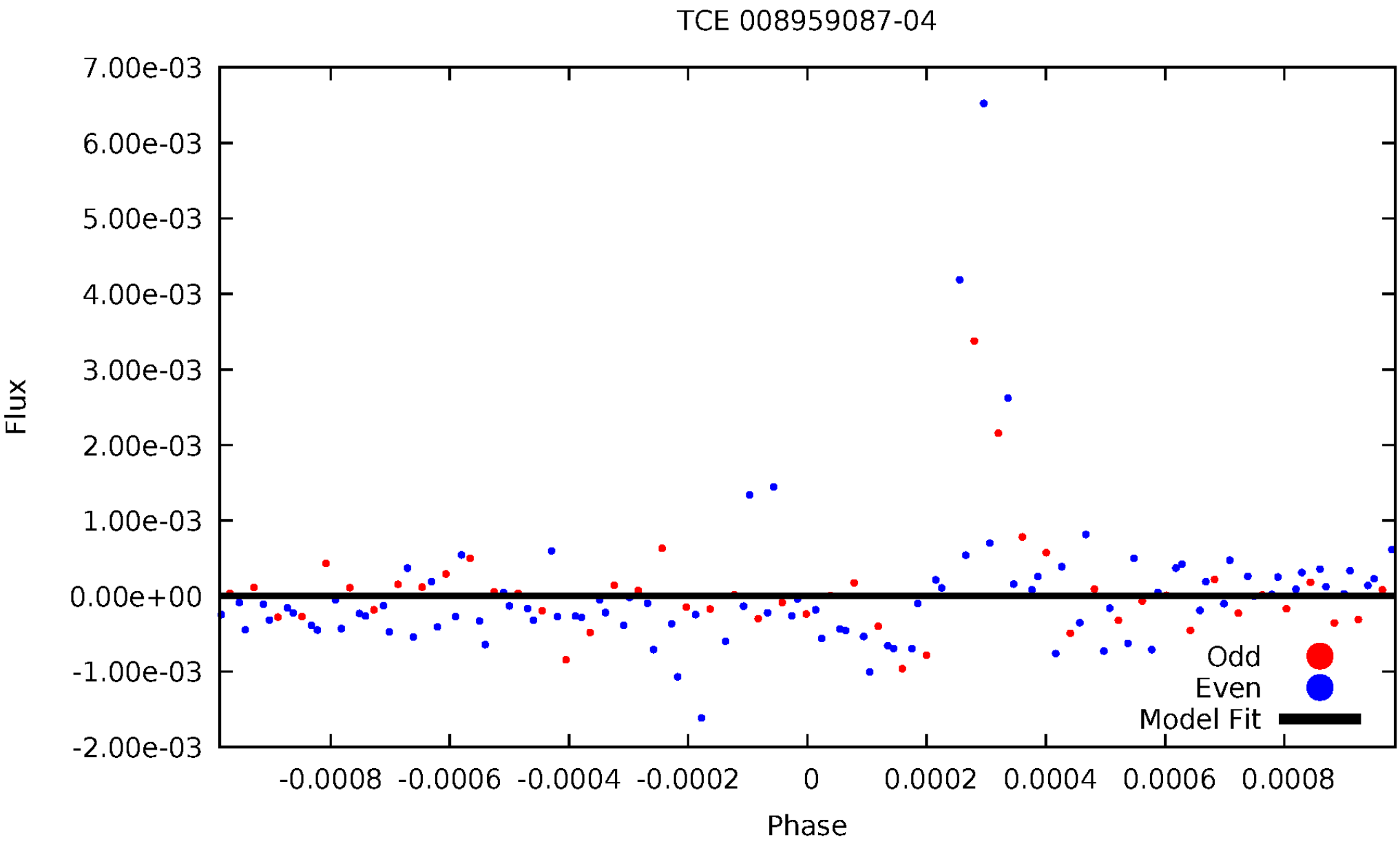
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008959087-04, PDC Light Curves

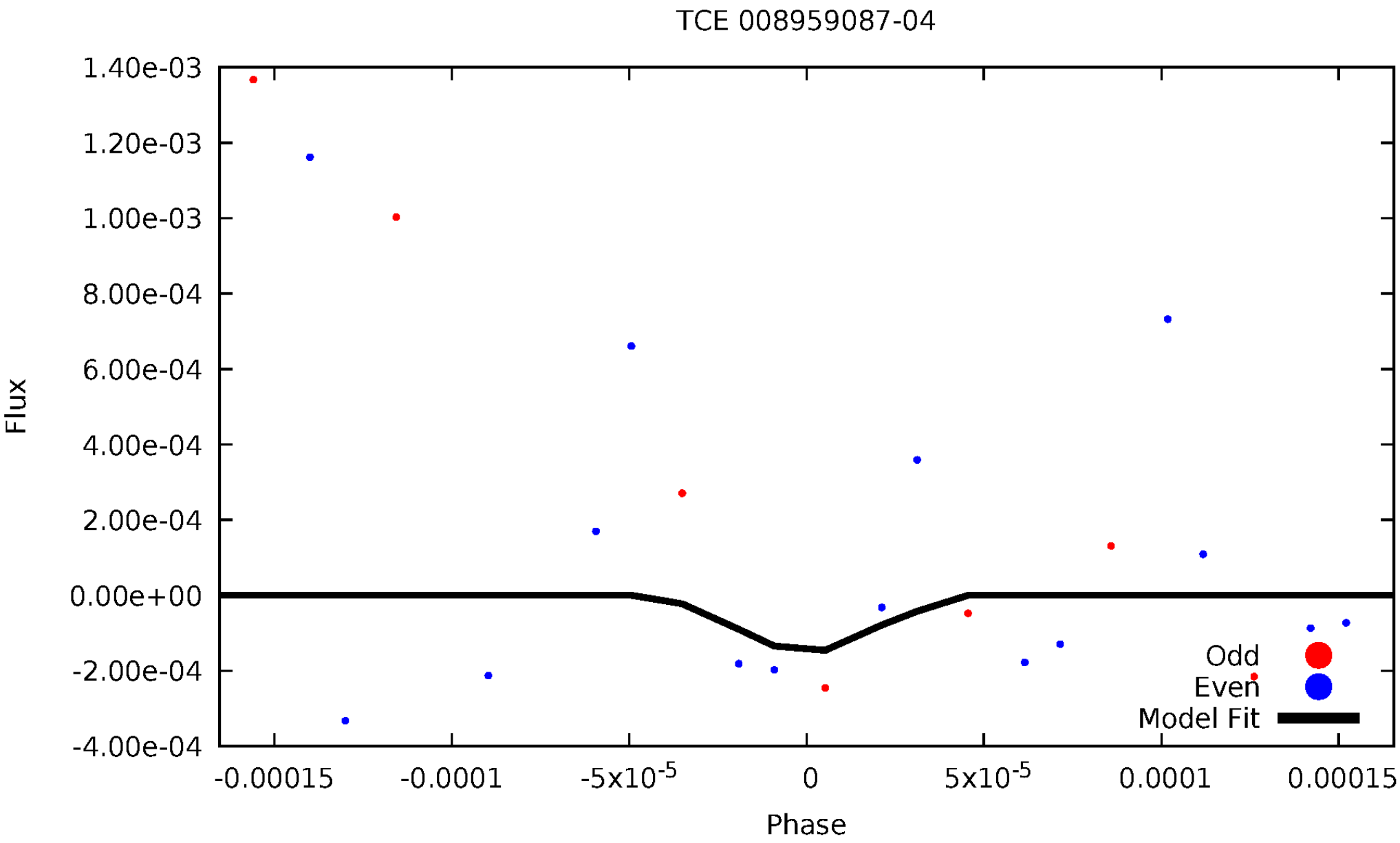



TCE 008959087-04
P = 253.584 days
P = 507.168 days
P = 1014.336 days
Normalized Flux
BKJD
Phase

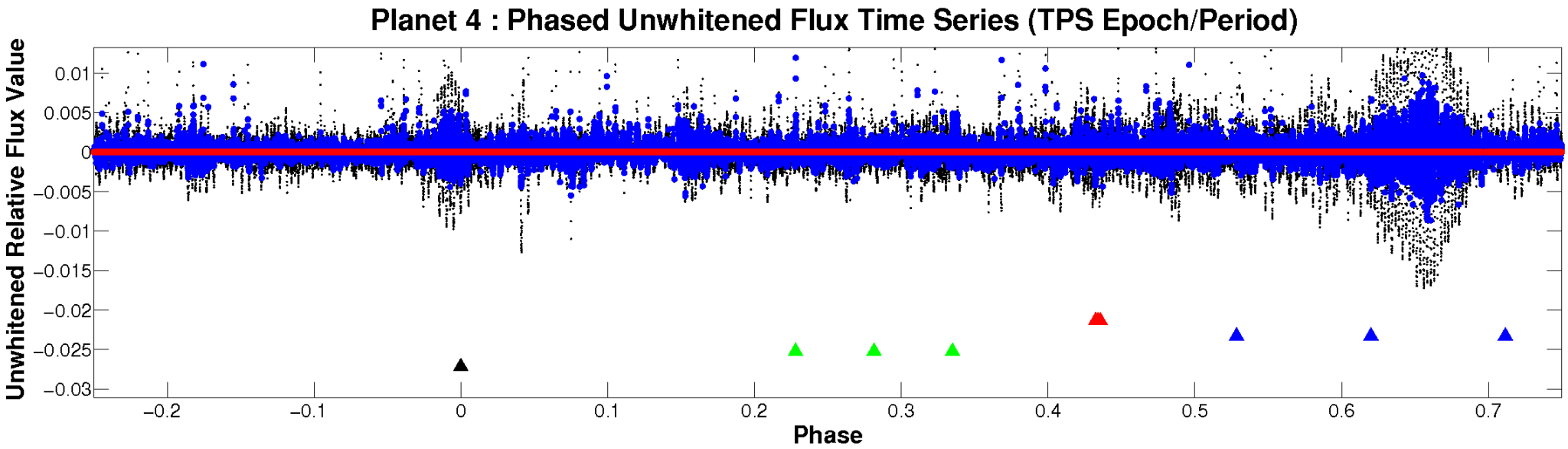
DV Odd/Even

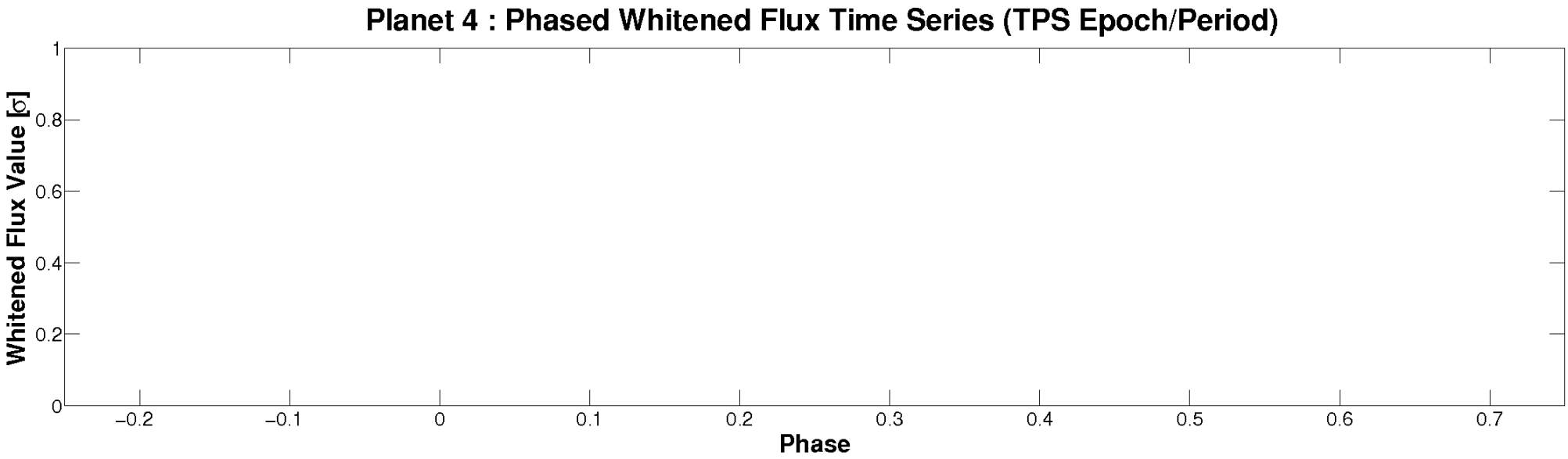

TCE 008959087-04
7.00e-03
6.00e-03
5.00e-03
4.00e-03
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
Flux
-0.0008
-0.0006
-0.0004
-0.0002
0
0.0002
0.0004
0.0006
0.0008
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 008959087-04
1.40e-03
1.20e-03
1.00e-03
8.00e-04
6.00e-04
4.00e-04
2.00e-04
0.00e+00
-2.00e-04
-4.00e-04
Flux
-0.00015
-0.0001
-5x10-5
0
5x10-5
0.0001
0.00015
Phase
Odd
Even
Model Fit

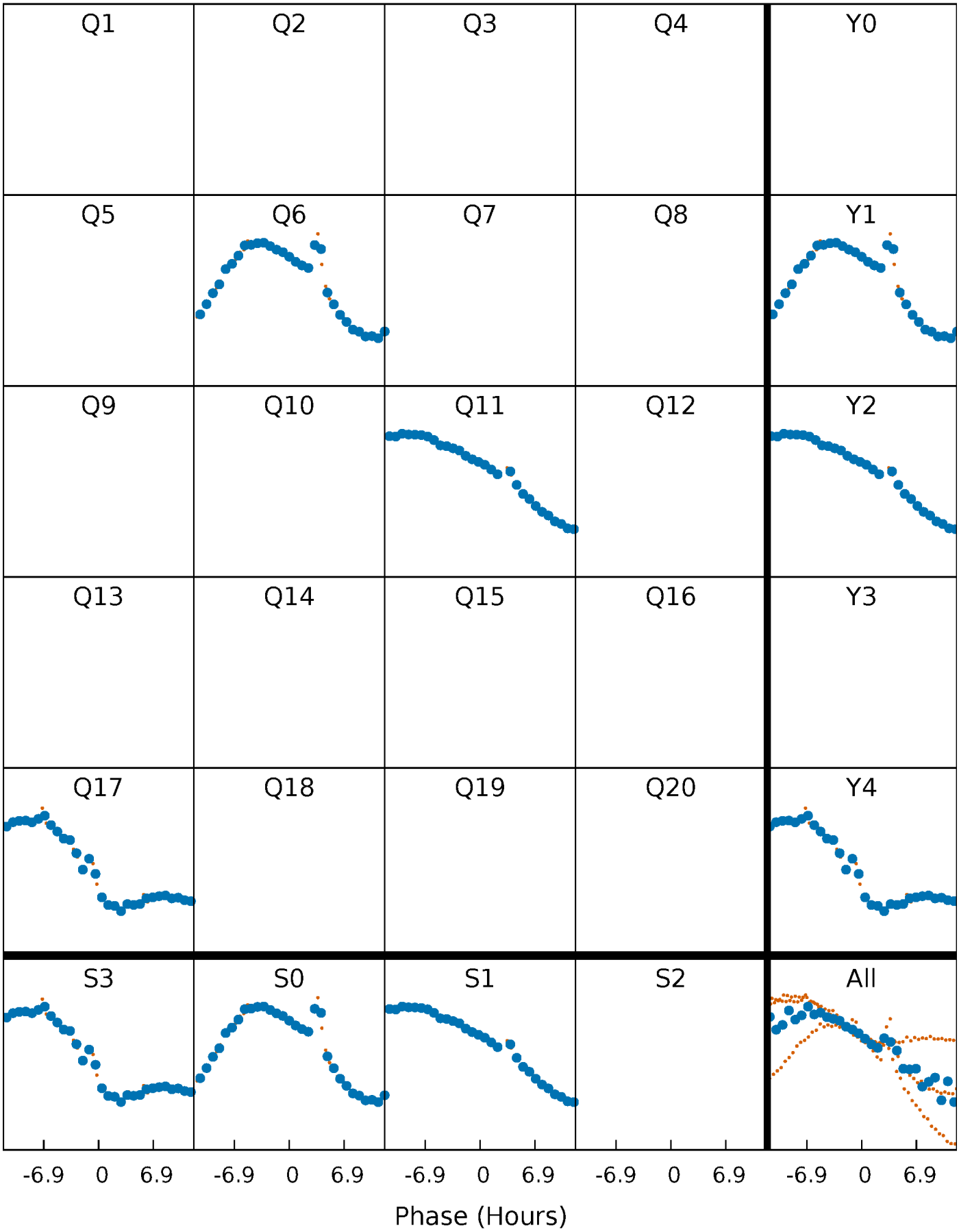
Non-Whitened Vs. Whitened Light Curve





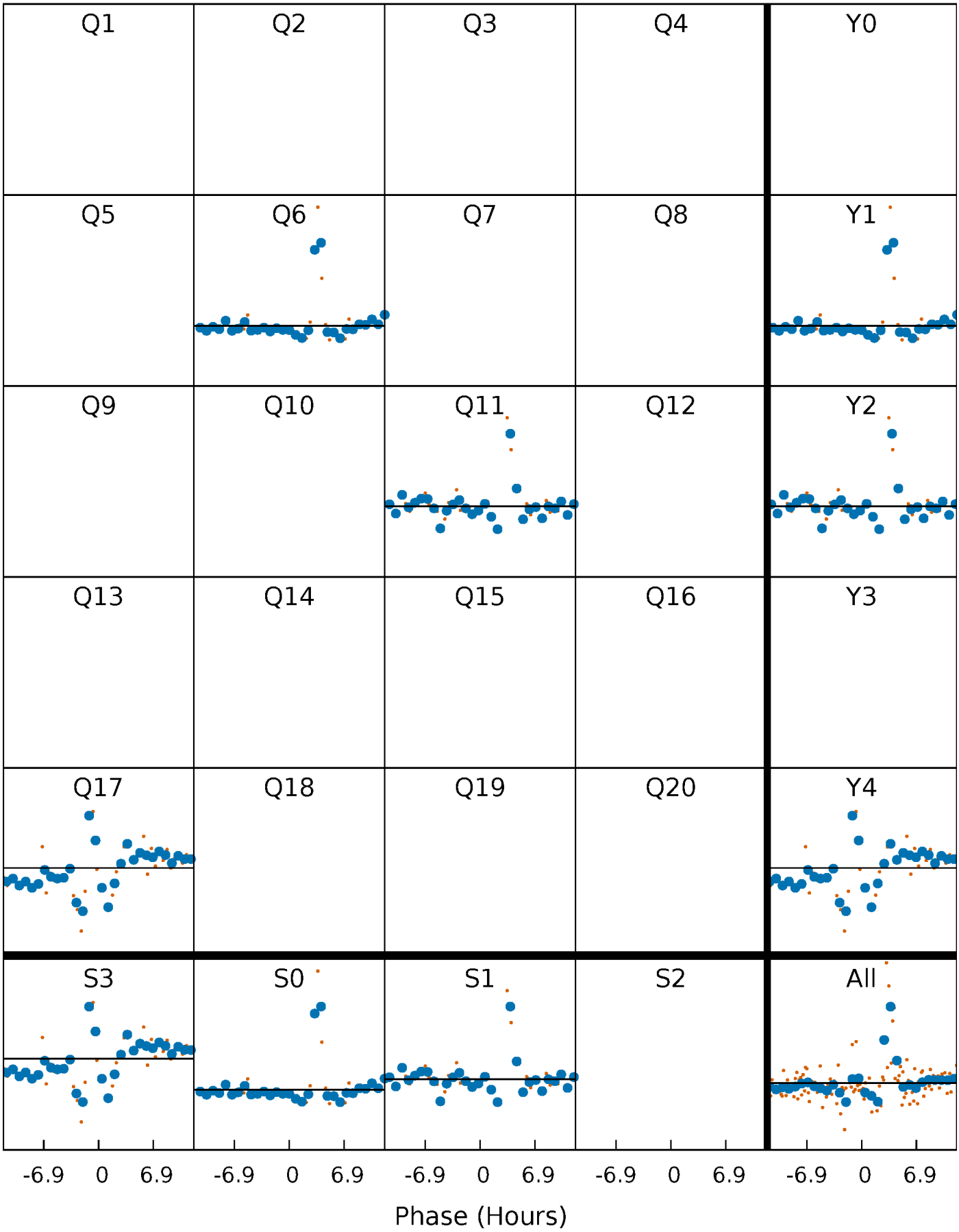
PDC Quarter-Phased Transit Curves

TCE 008959087-04 P=507.167770 Days T_0=553.113232 (BKJD)



DV Quarter-Phased Transit Curves

TCE 008959087-04 P=507.167770 Days T_0=553.113232 (BKJD)



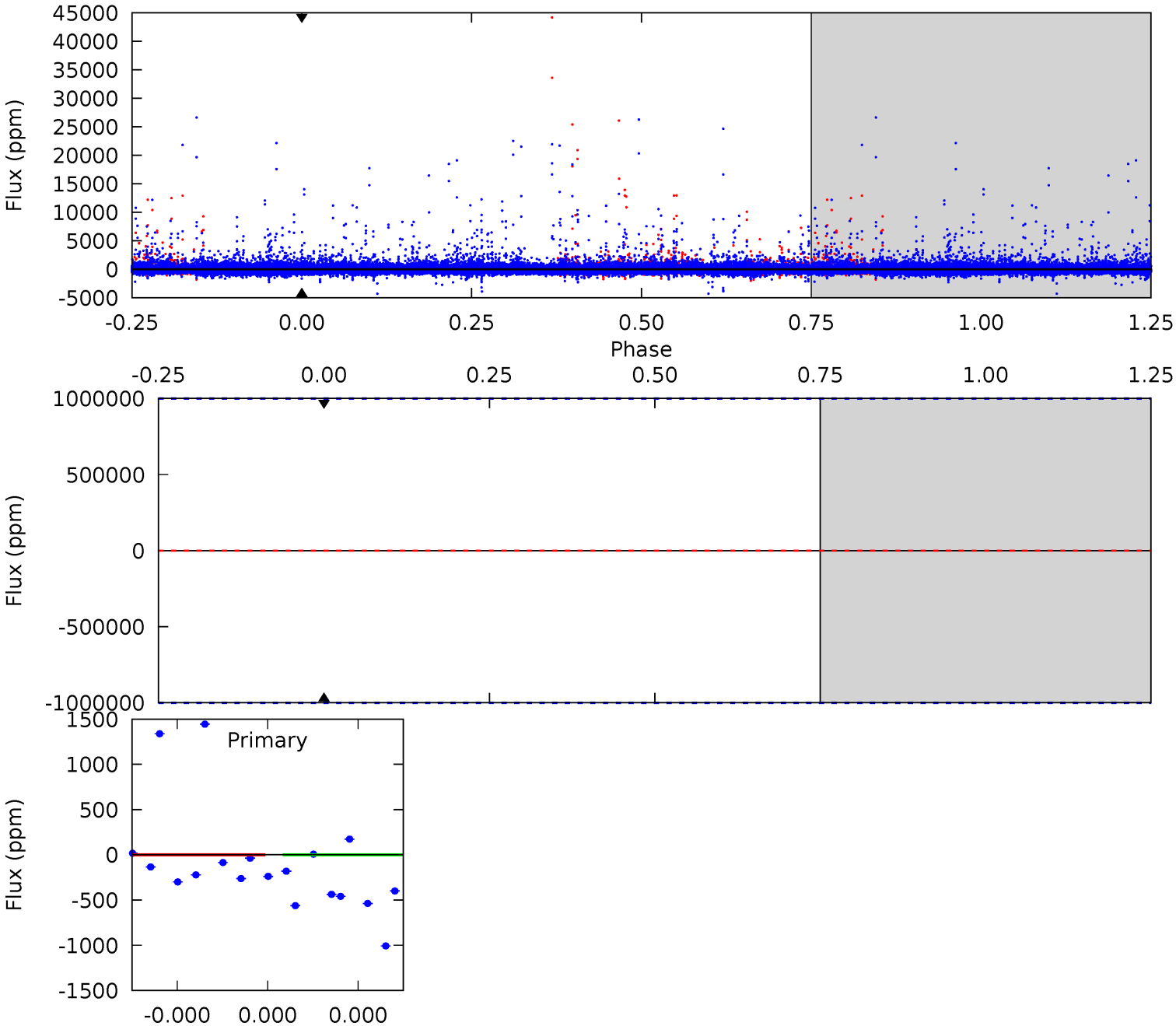
Alt. Detrend Quarter-Phased Transit Curves

TCE 008959087-04 P=507.167770 Days T_0=553.375142 (BKJD)

DV Model-Shift Uniqueness Test

008959087-04, P = 507.167770 Days, E = 45.945462 Days

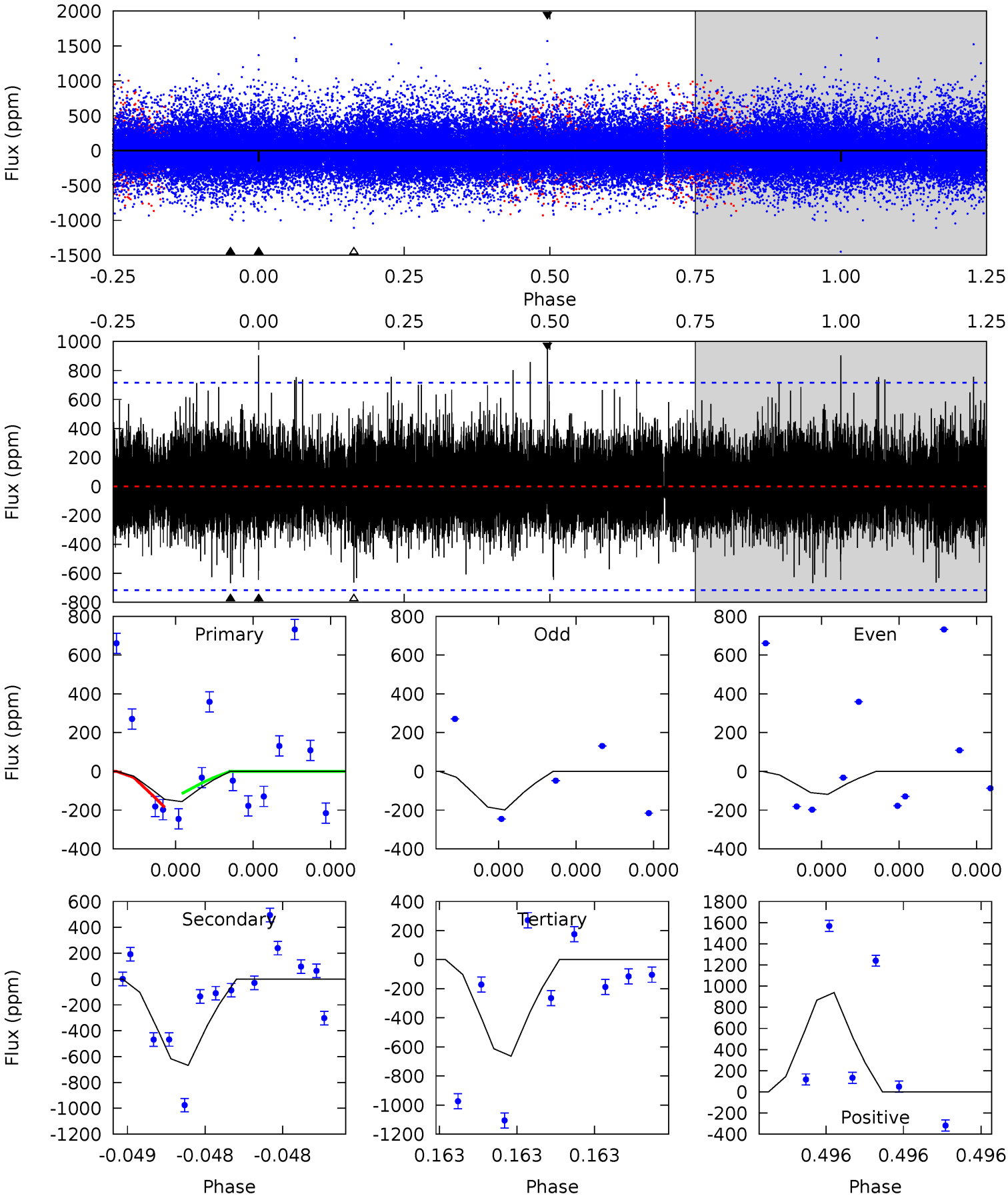
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

008959087-04, P = 507.167770 Days, E = 46.207372 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.29	5.53	5.49	7.77	5.92	4.00	1.18	-4.20	-6.48	0.04	-2.24	0.28	0.82	0.58	0.26



Stellar Parameters For KIC 008959087

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5451^{+164}_{-164}	$4.477^{+0.081}_{-0.150}$	$-0.020^{+0.250}_{-0.300}$	$0.891^{+0.195}_{-0.105}$	$0.868^{+0.099}_{-0.074}$	$1.731^{+0.594}_{-0.727}$
	+3%/-3%	+2%/-3%	+1250%/-1500%	+22%/-12%	+11%/-9%	+34%/-42%
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 008959087-04 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0±1000000	$8.18^{+7.67}_{-5.48}$	293^{+17}_{-14}	2406^{+13397}_{-17942}	$371^{+1822860}_{-1928651}$
Alt.	-668±121	$6.88^{+8.24}_{-4.75}$	293^{+17}_{-14}	3688^{+2303}_{-761}	$10479^{+104610}_{-8256}$

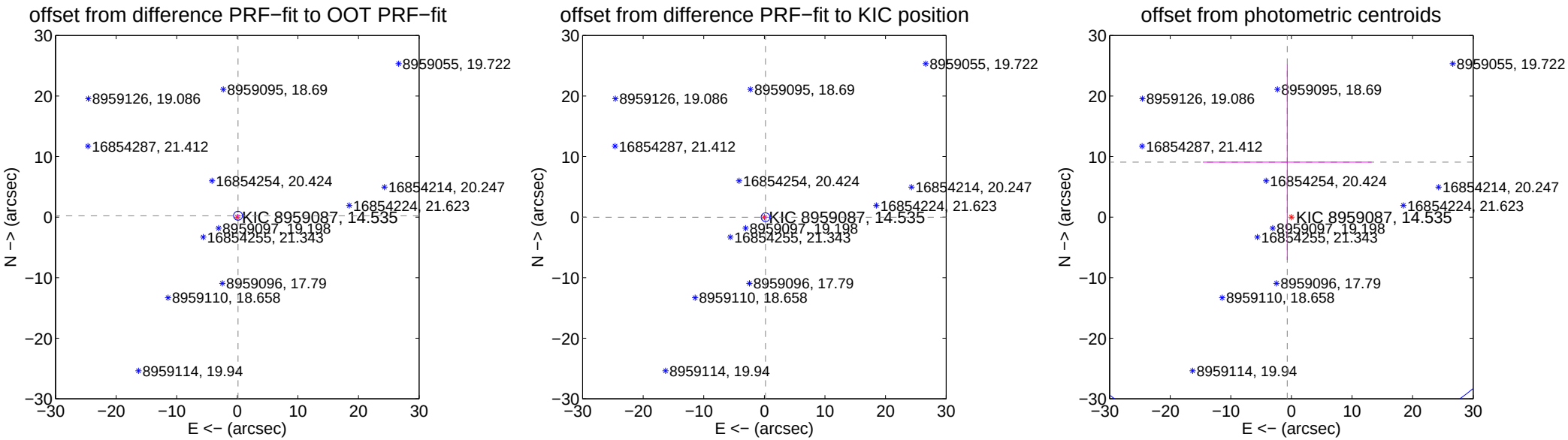
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

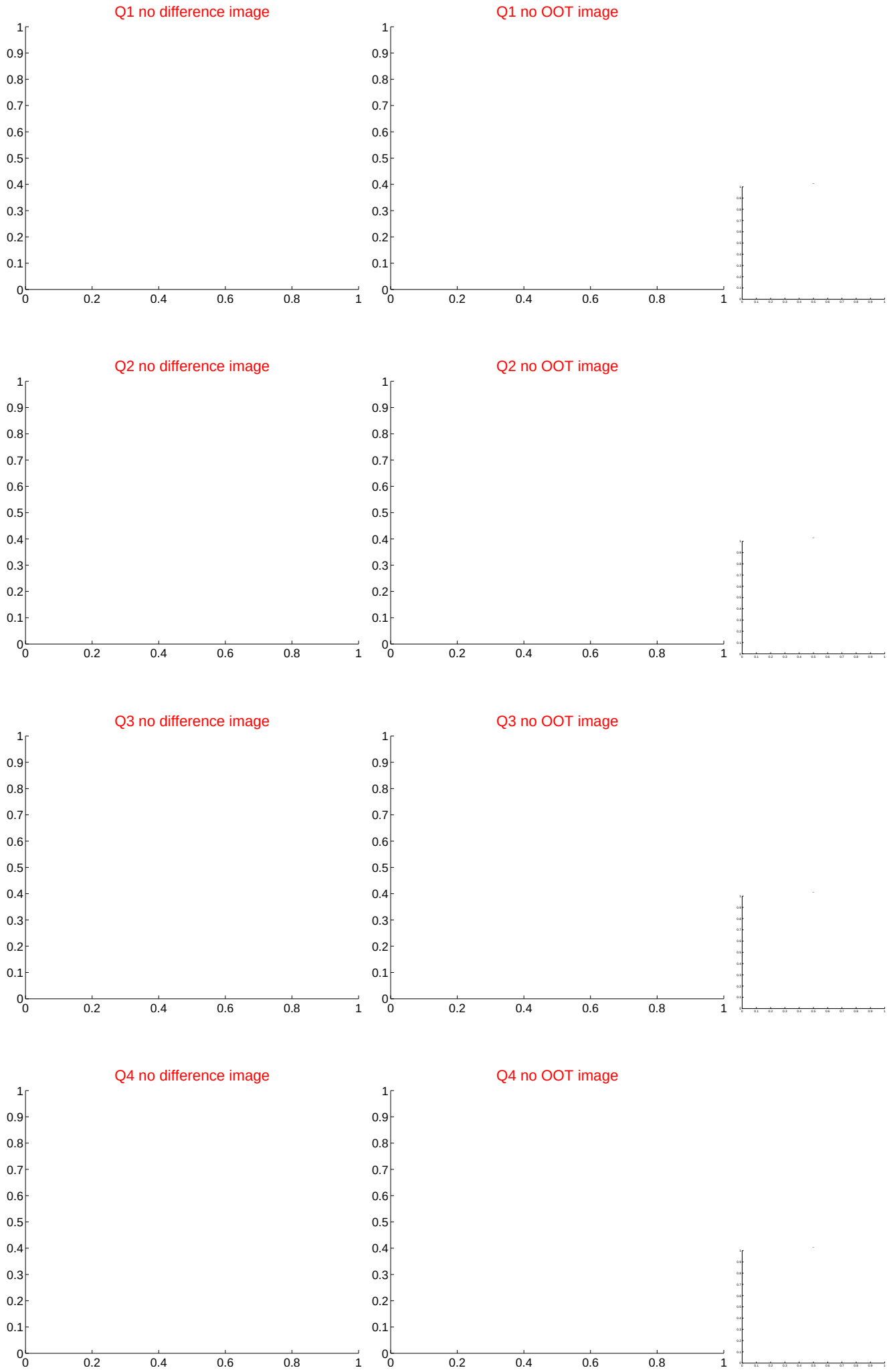
Supplemental centroid analysis for 008959087-04. Kepler magnitude: 14.54. Transit SNR -1.00
There are 1 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.256 ± 0.245	1.04	-0.119 ± 0.239	0.226 ± 0.246
PRF-fit source offset from KIC position	0.189 ± 0.239	0.79	-0.188 ± 0.239	-0.018 ± 0.246
photometric centroid source offset	9.11 ± 16.12	0.57	0.69 ± 13.92	9.08 ± 16.13

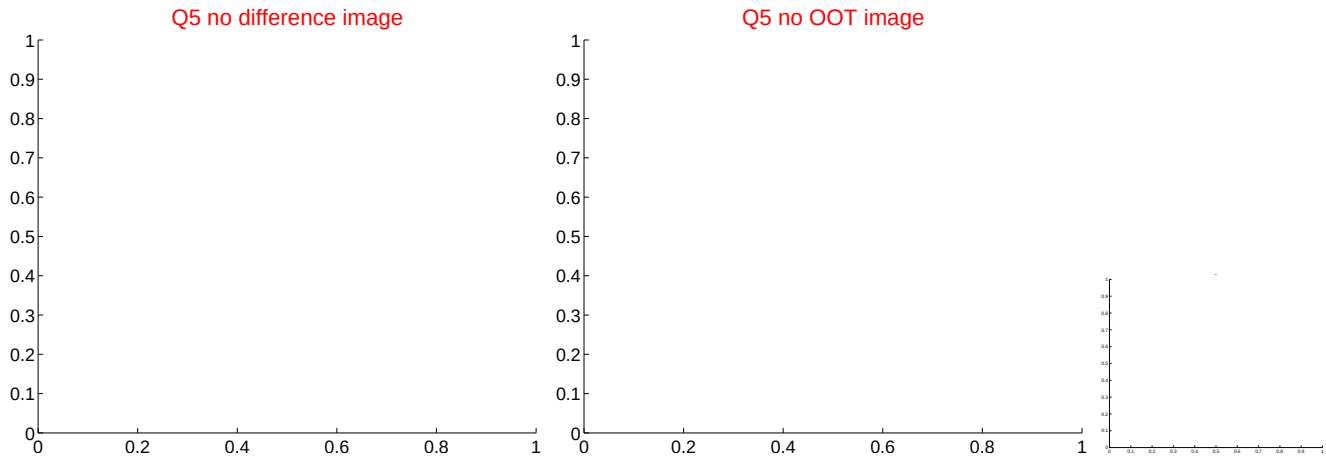


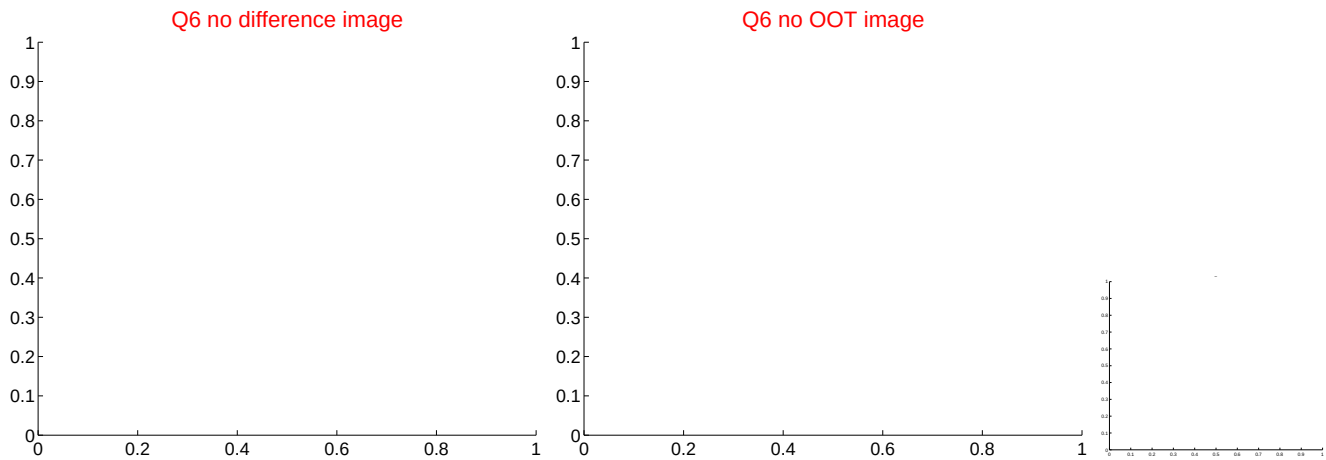
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

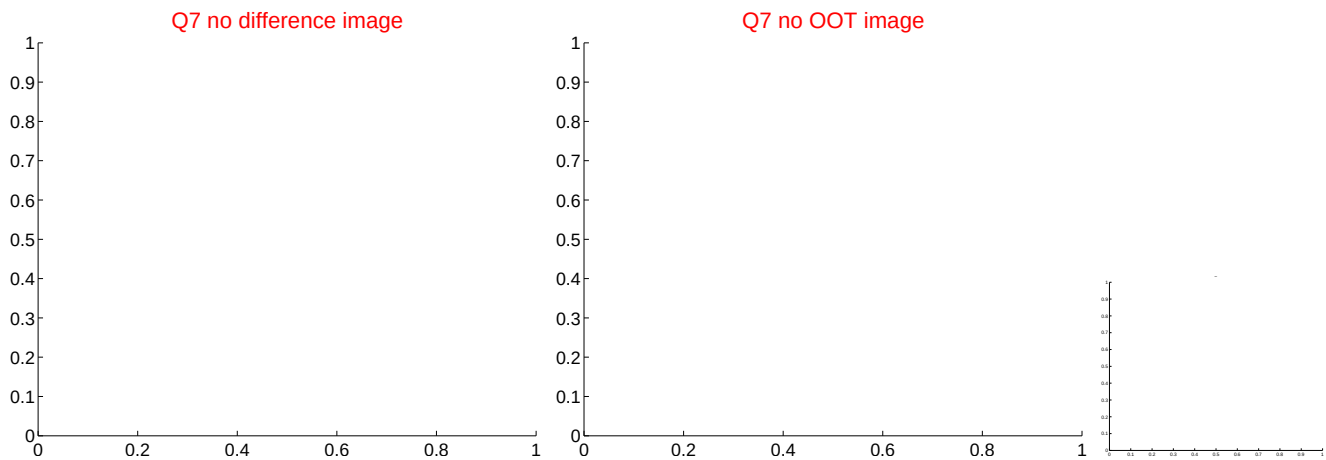
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

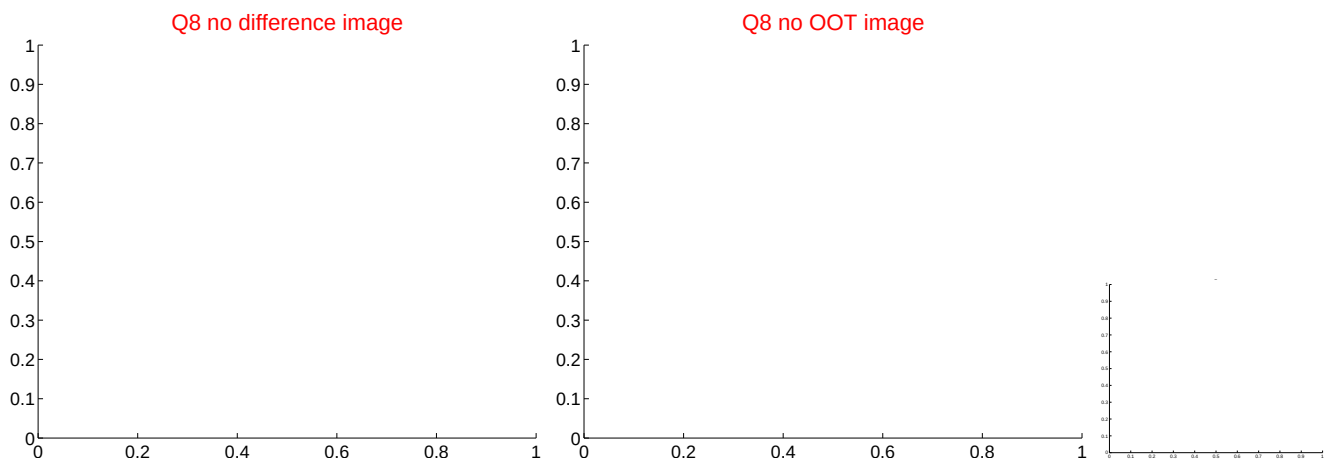


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

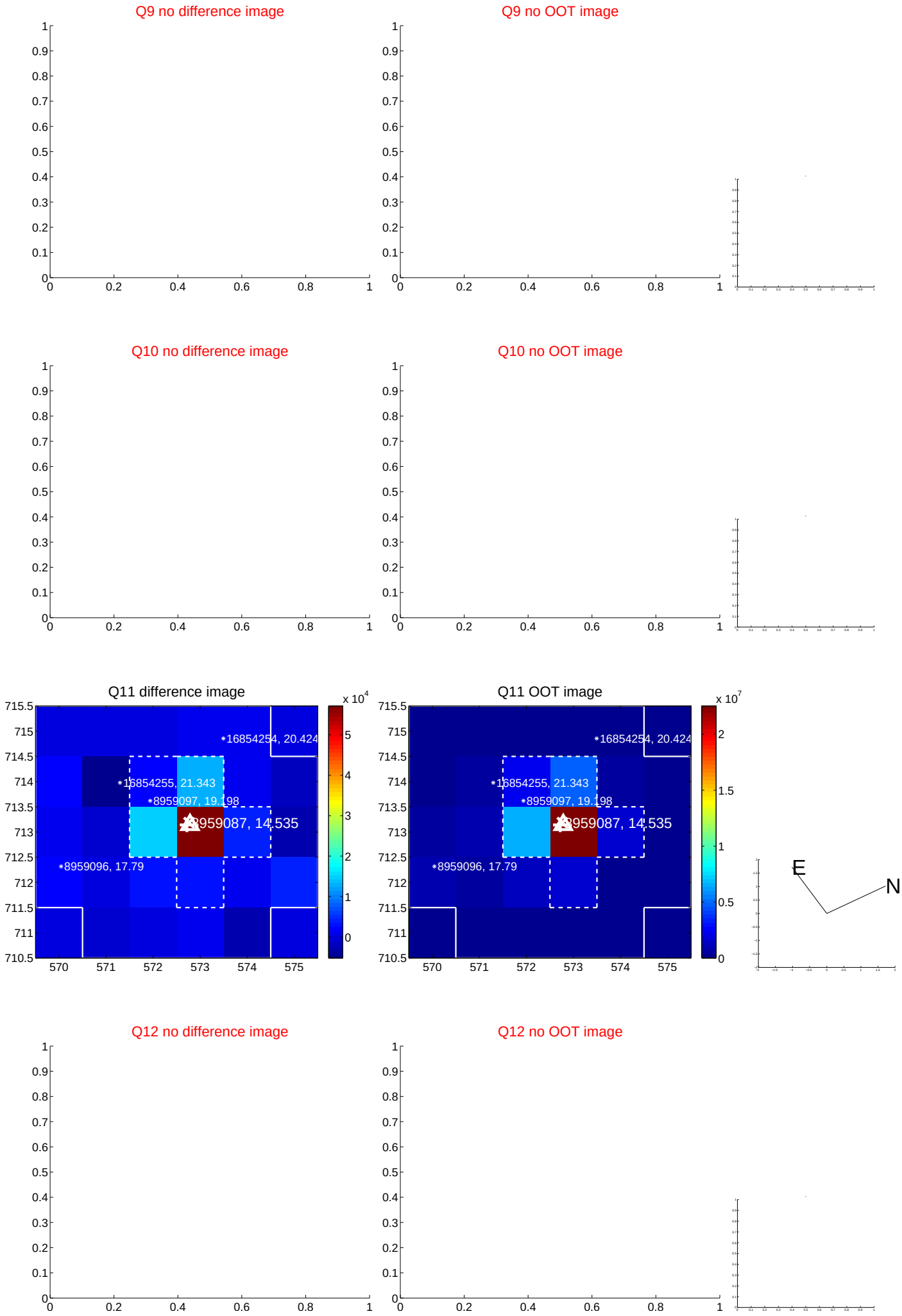




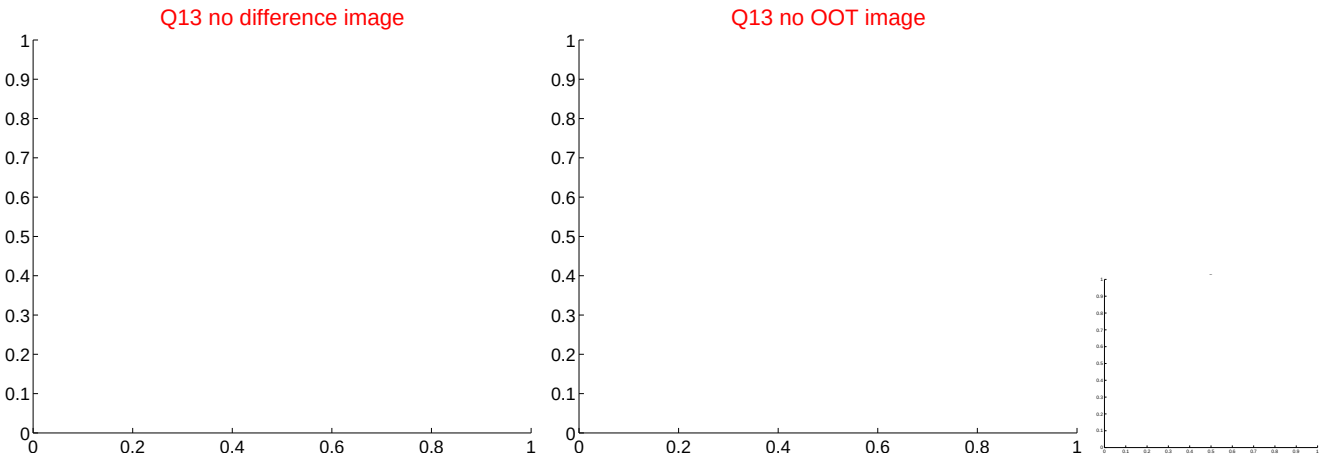


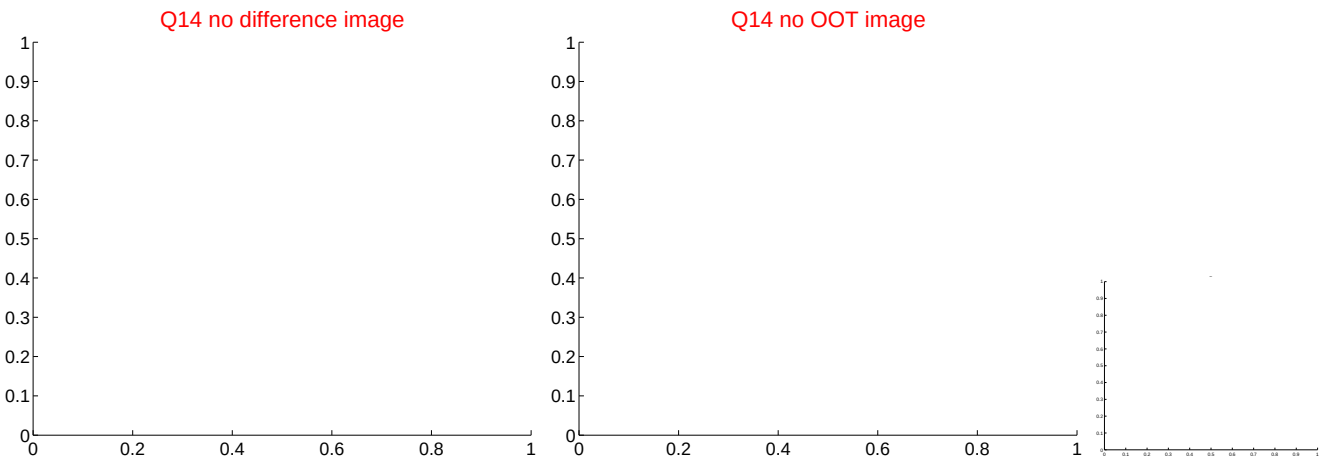


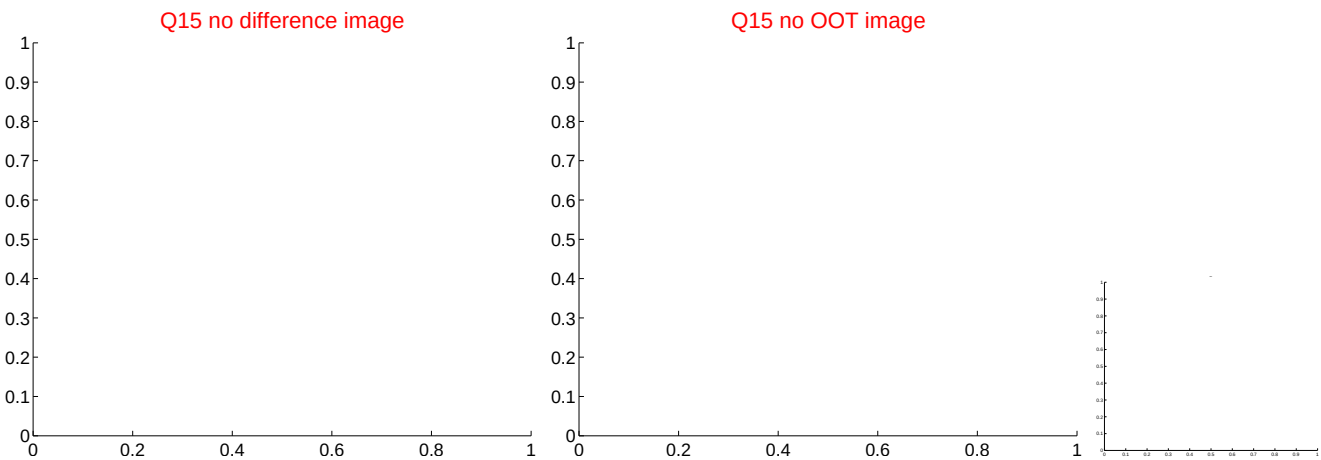
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

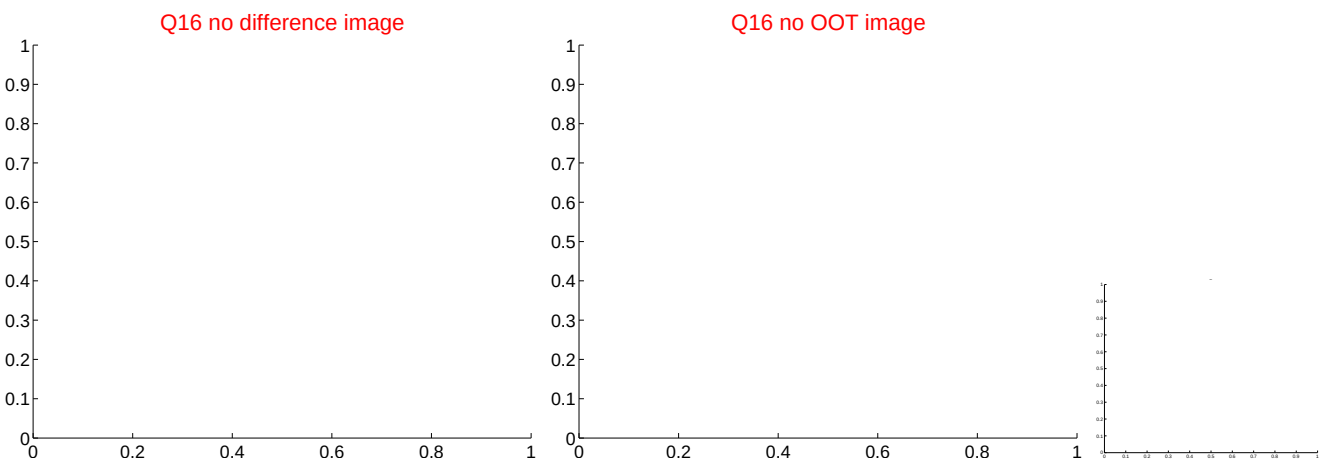


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

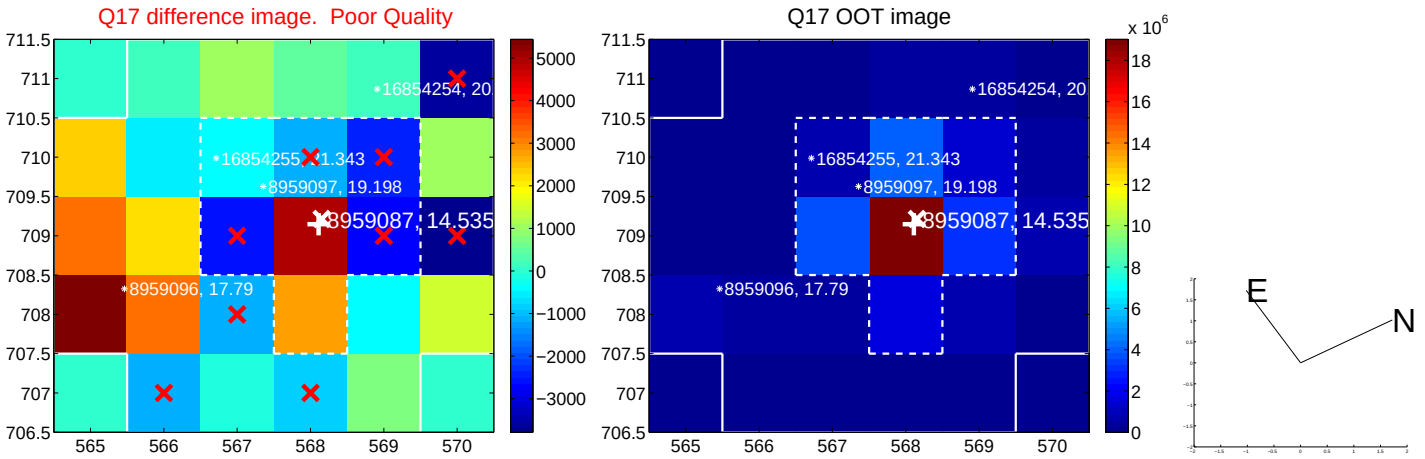


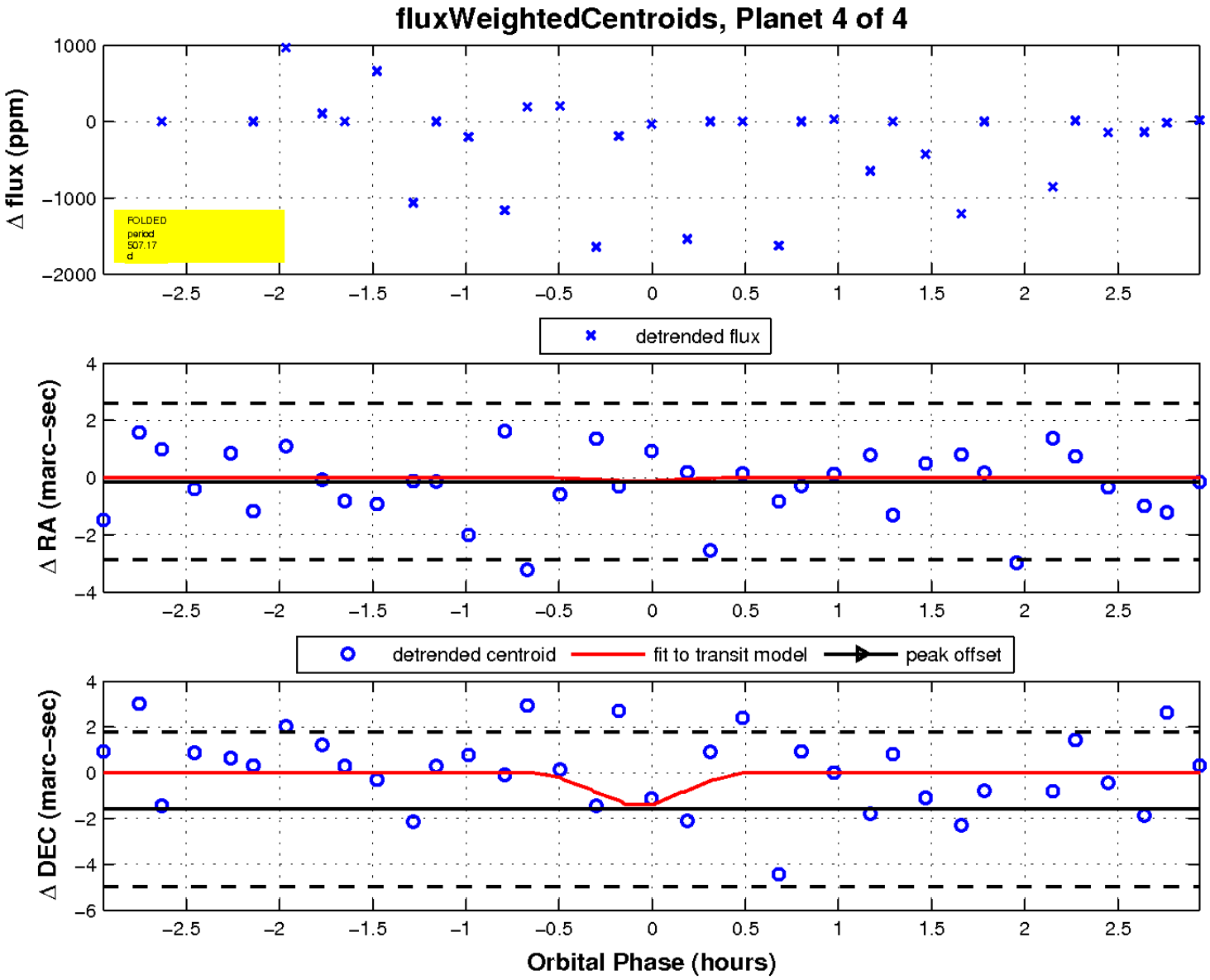




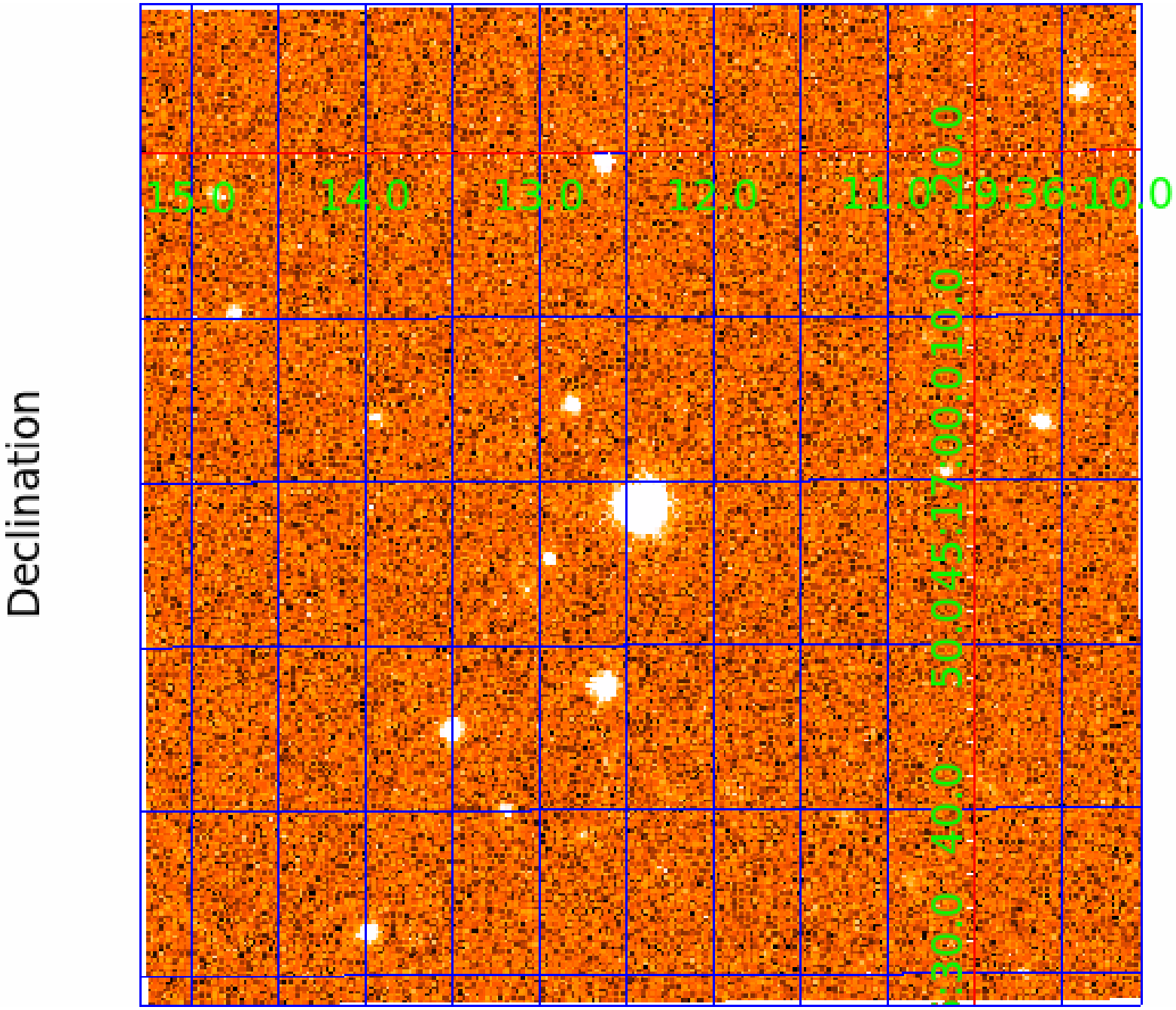


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image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