KIC 008977559

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 ($S_\oplus$)
008977559-01	OBS	No	2.410428	133.254764	111.0	10.353	9.0	10.8	2.50	5934	3.10	5302.32
008977559-02	OBS	No	241.438349	288.180403	1317.9	25.283	8.8	5.5	2.50	5934	10.79	11.40
008977559-03	OBS	No	395.311941	173.088521	549.9	15.735	8.7	3.9	2.50	5934	6.95	5.91
008977559-04	OBS	No	271.606901	292.295304	2482.3	17.395	7.3	8.9	2.50	5934	15.21	9.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008977559-01	OBS	FP	0.00	1	0	0	0	LPP_DV
008977559-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008977559-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008977559-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS

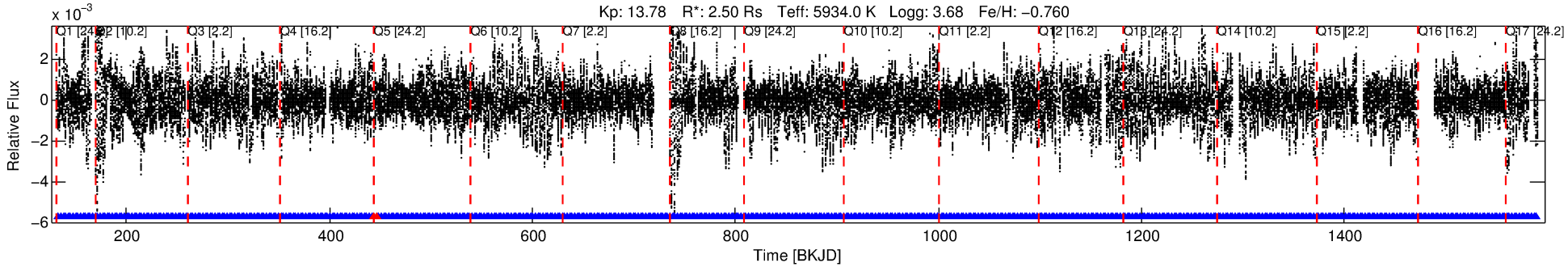
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

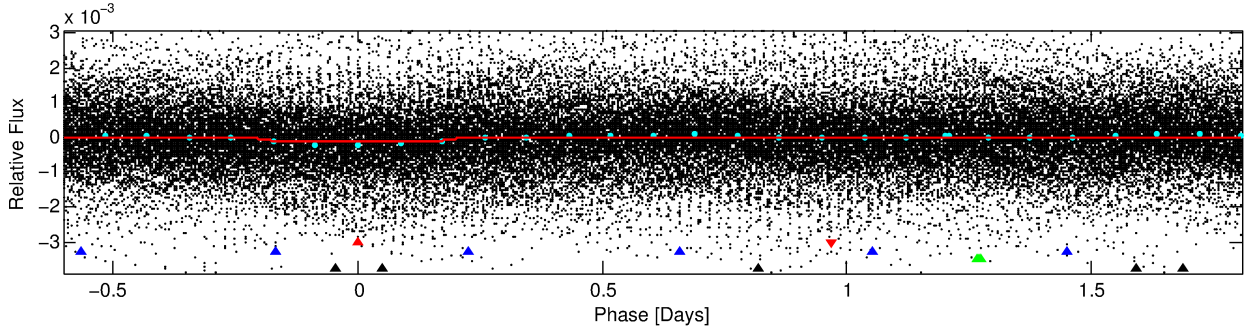
Ephemeris Match Information For 008977559-01

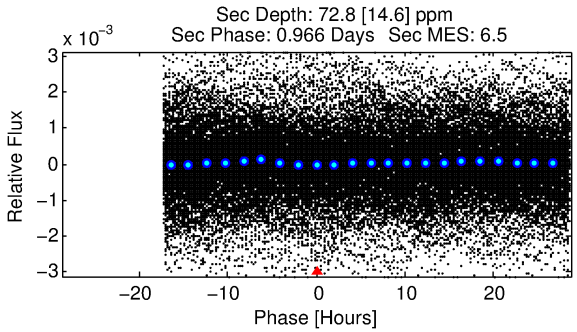
No Significant Match Found

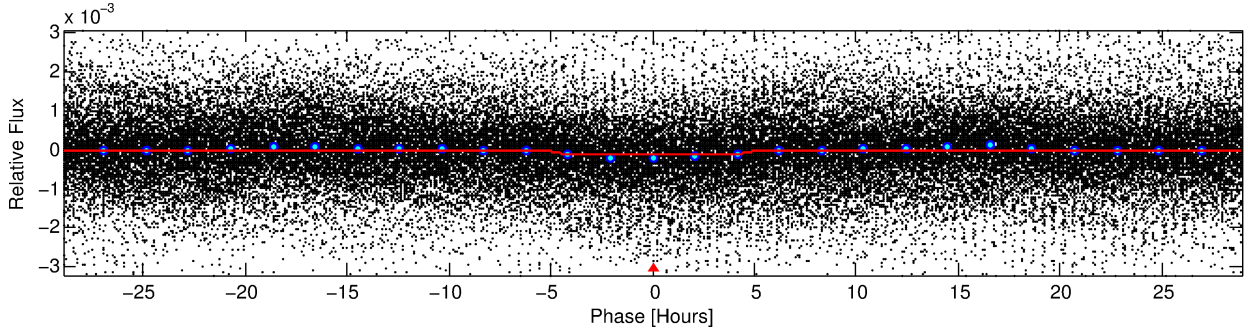
DV One-Page Summary

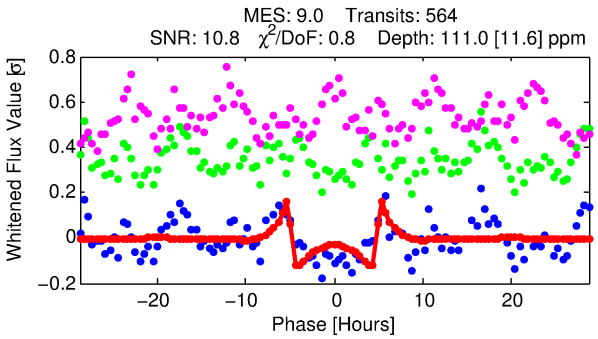
KIC: 8977559 Candidate: 1 of 4 Period: 2.410 d

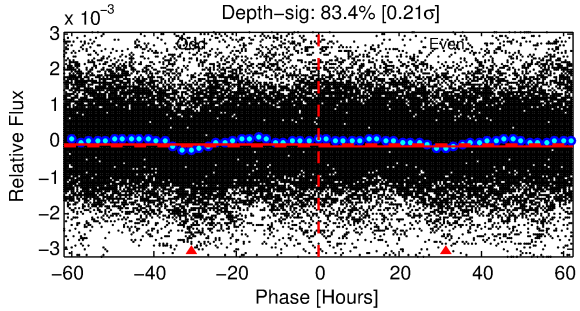


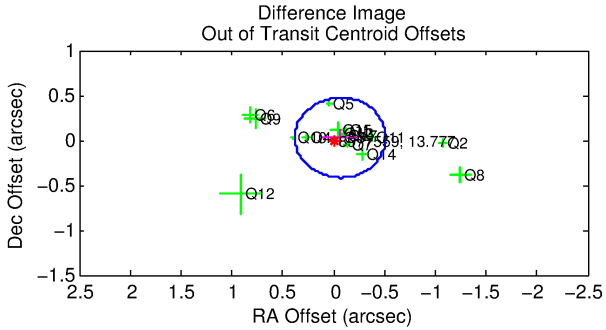












DV Fit Results:

Period = 2.41043 [0.00001] d
Epoch = 133.2548 [0.0027] BKJD
Rp/R* = 0.0113 [0.0008]
a/R* = 1.25 [0.11]
b = 0.90 [0.05]

Seff = 5302.32 [6591.83]
Teq = 2176 [676] K
Rp = 3.09 [2.05] Re
a = 0.0362 [0.0263] AU

Ag = 5.49 [6.91] [0.65σ]
Teffp = 5149 [367] K [3.86σ]

DV Diagnostic Results:

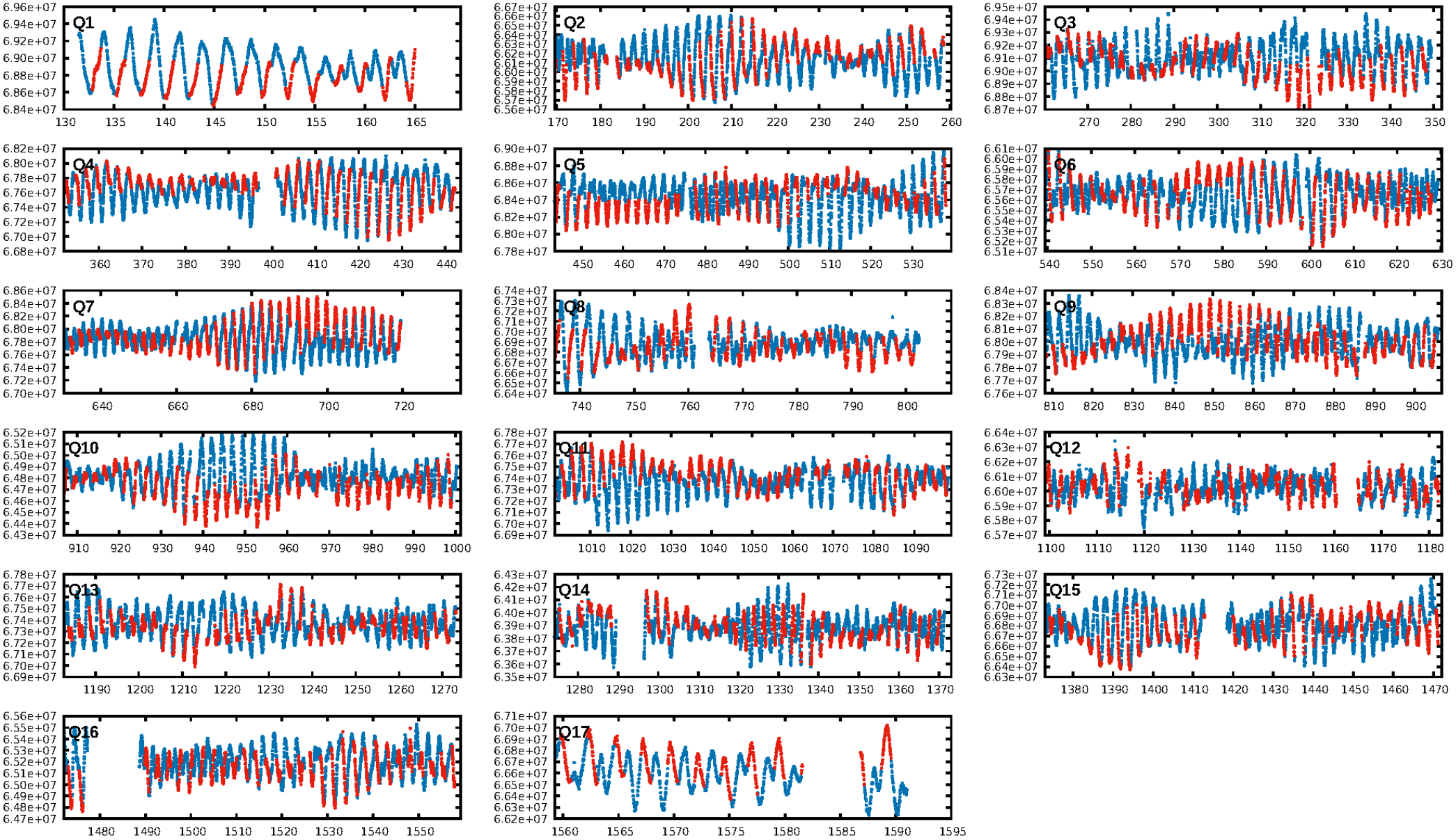
ShortPeriod−sig: N/A
LongPeriod−sig: 100.0% [209.98σ]
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: 3.86e−12
RollingBand−fgt: 1.00 [537/539]
GhostDiagnostic−chr: 1.263

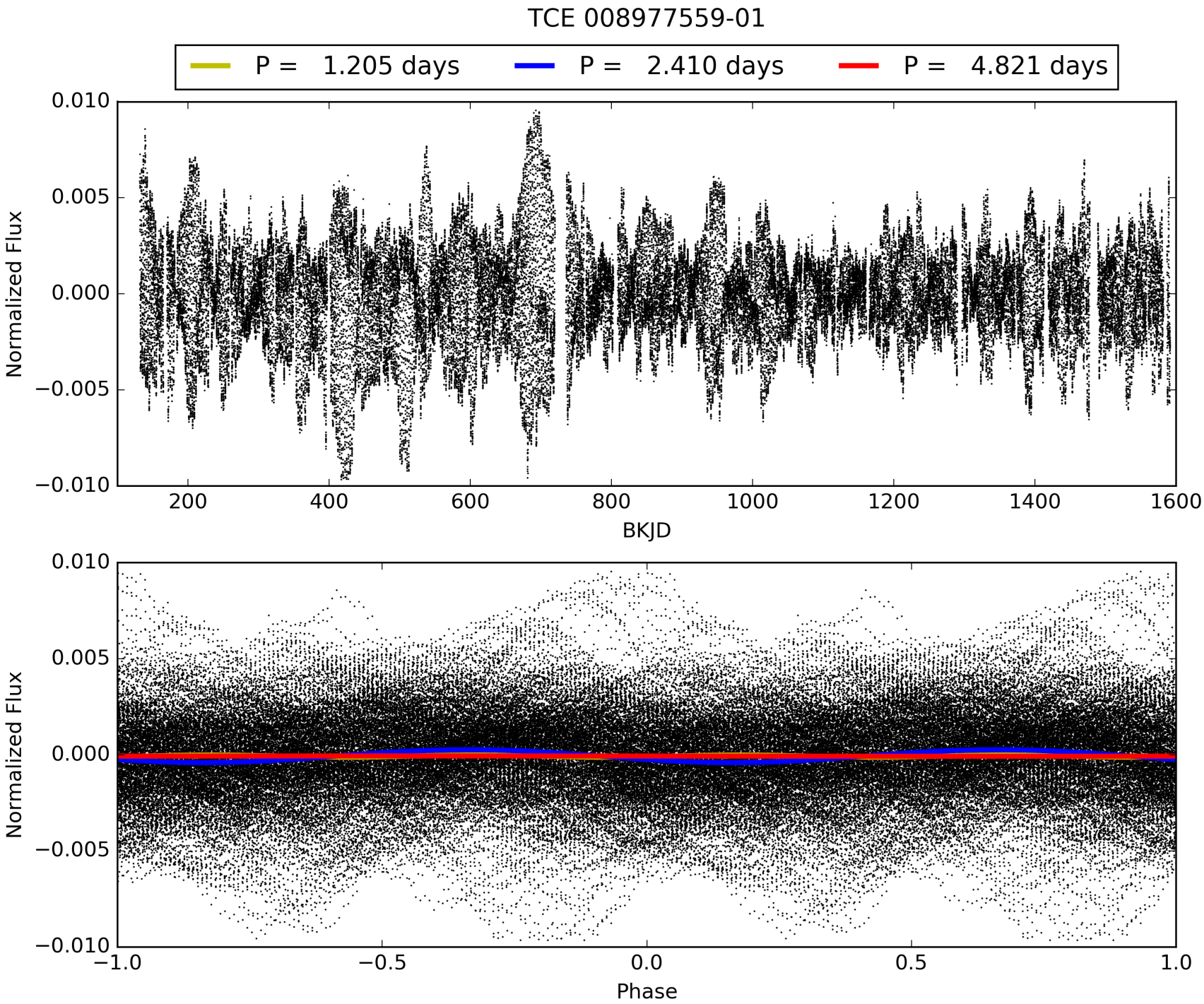
Centroid−sig: 79.6%
Centroid−so: 0.094 arcsec [0.29σ]
OotOffset−rm: 0.072 arcsec [0.48σ]
KicOffset−rm: 0.115 arcsec [1.06σ]
OotOffset−st: 4/4/3/5 [16]
KicOffset−st: 4/4/3/5 [16]
DiffImageQuality−fgm: 0.62 [10/16]
DiffImageOverlap−fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 10:59:42 Z

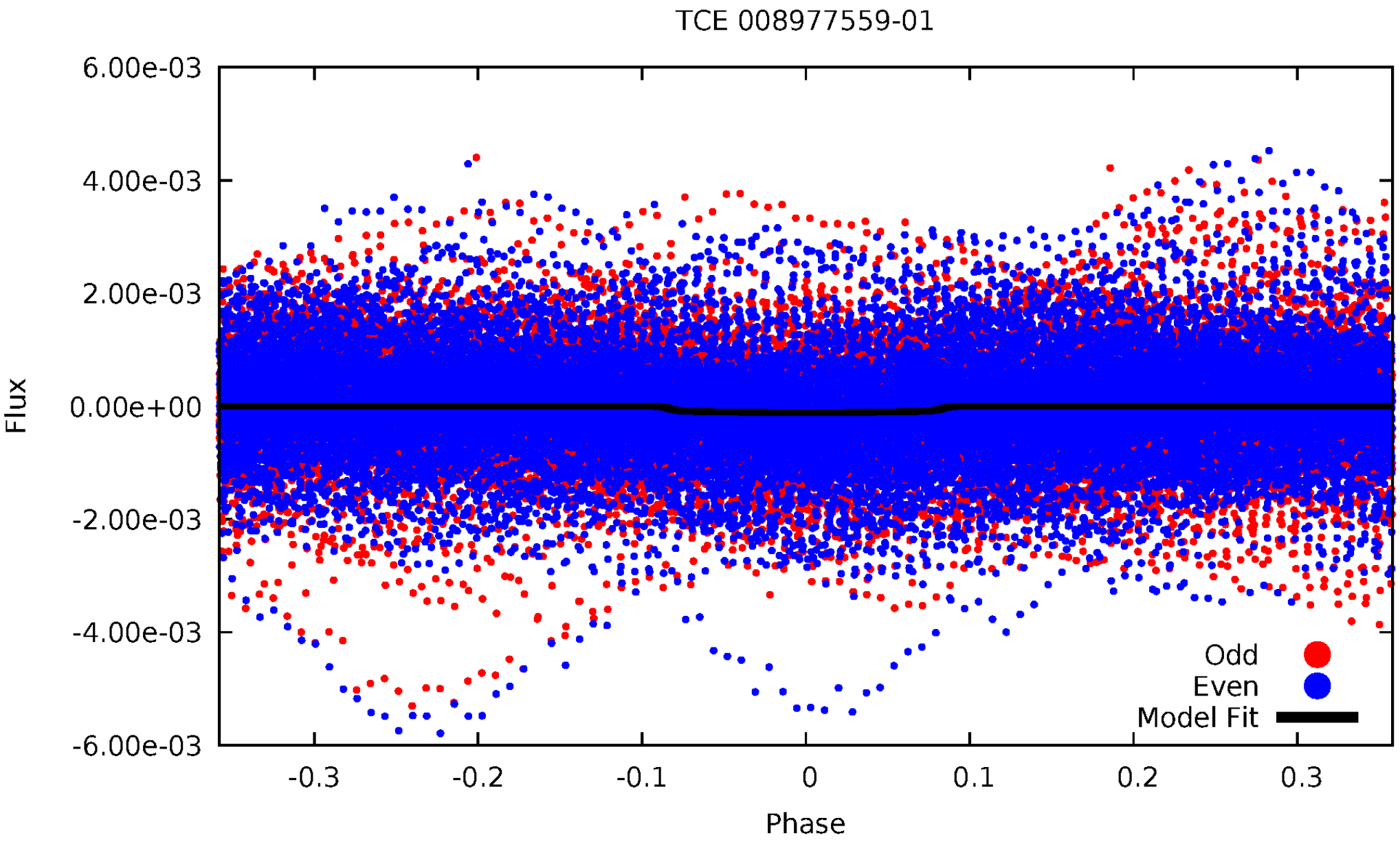
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008977559-01, PDC Light Curves

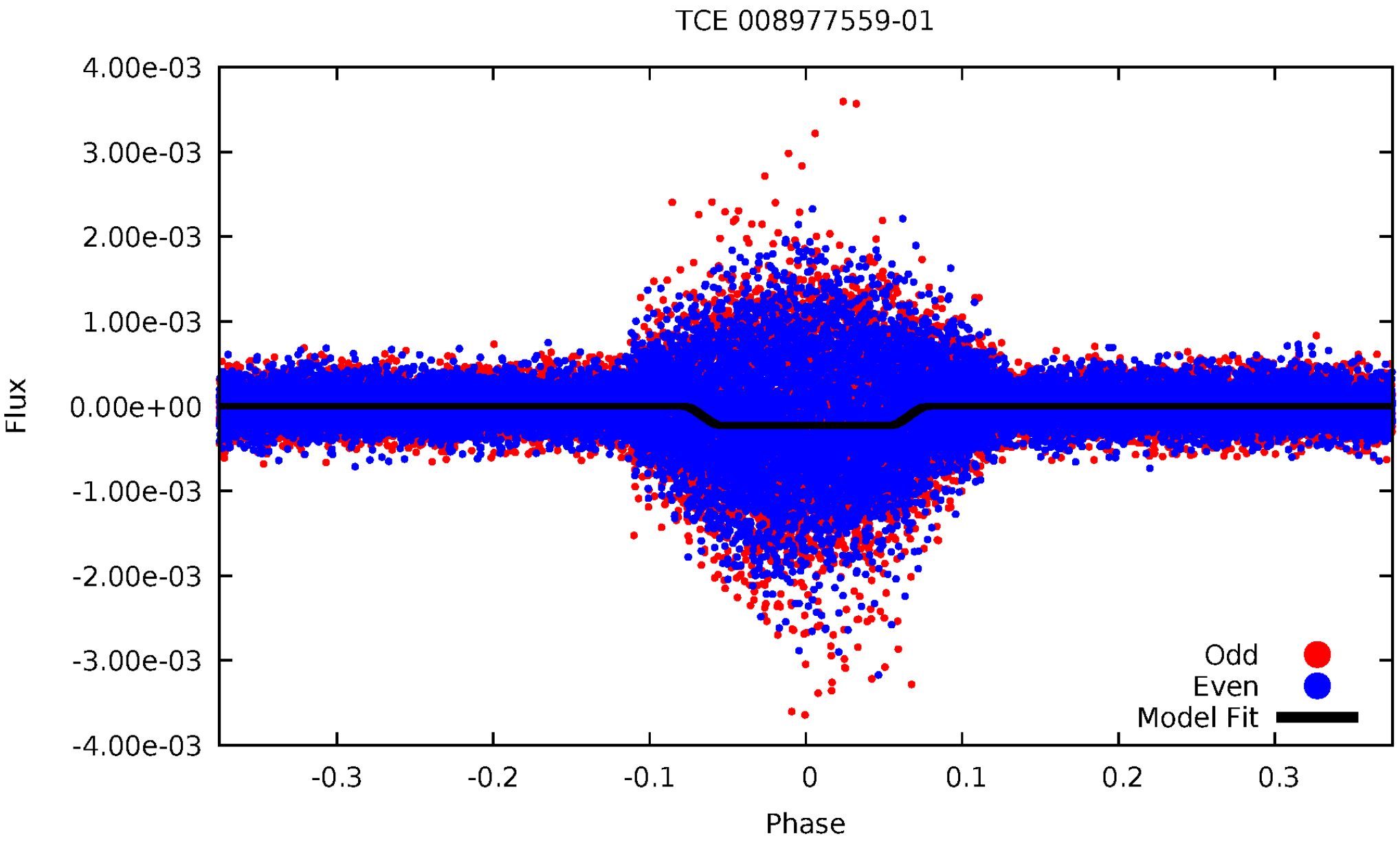



TCE 008977559-01
P = 1.205 days
P = 2.410 days
P = 4.821 days
Normalized Flux
0.010
0.005
0.000
−0.005
−0.010
200
400
600
800
1000
1200
1400
1600
BKJD
Normalized Flux
0.010
0.005
0.000
−0.005
−0.010
−1.0
−0.5
0.0
0.5
1.0
Phase

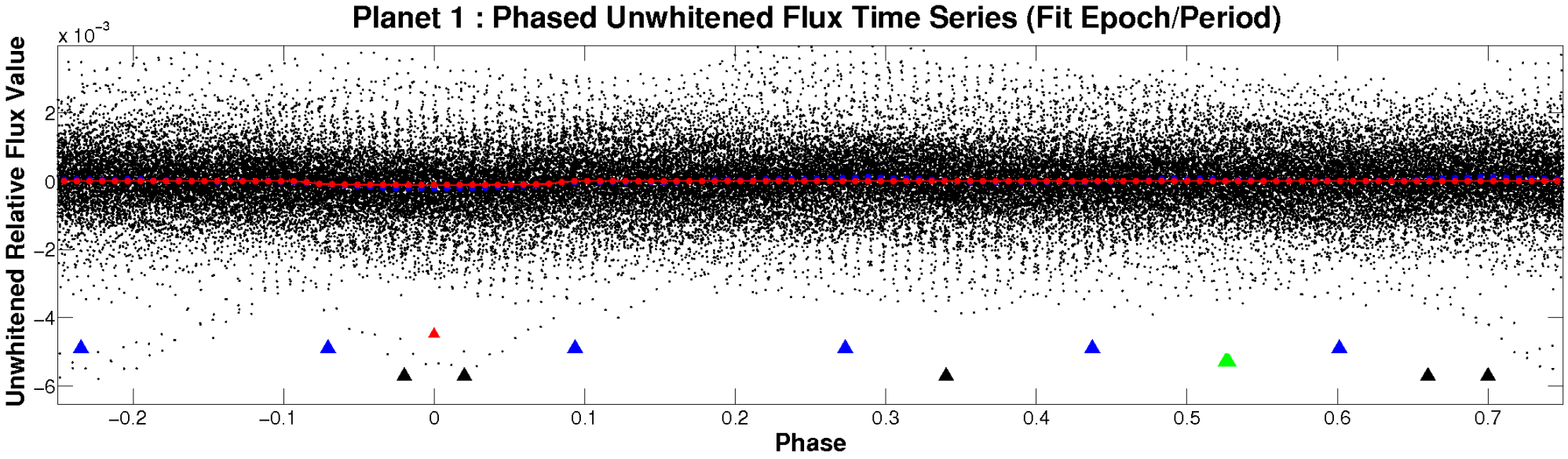
DV Odd/Even

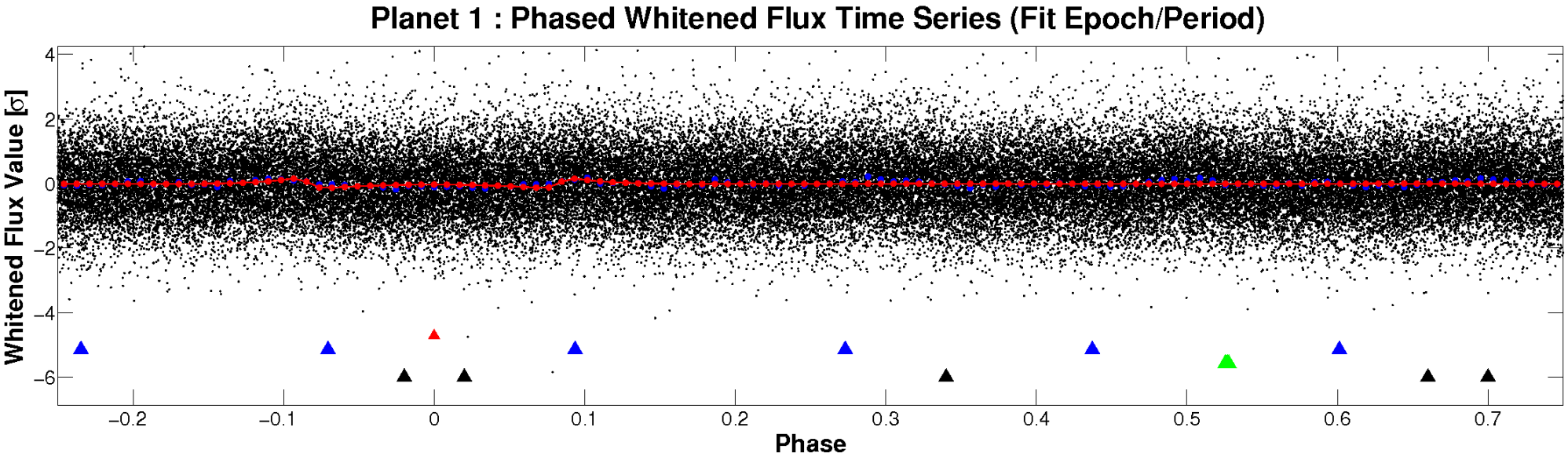

TCE 008977559-01
6.00e-03
4.00e-03
2.00e-03
0.00e+00
-2.00e-03
-4.00e-03
-6.00e-03
Flux
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 008977559-01
4.00e-03
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
-4.00e-03
Flux
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
Phase
Odd
Even
Model Fit

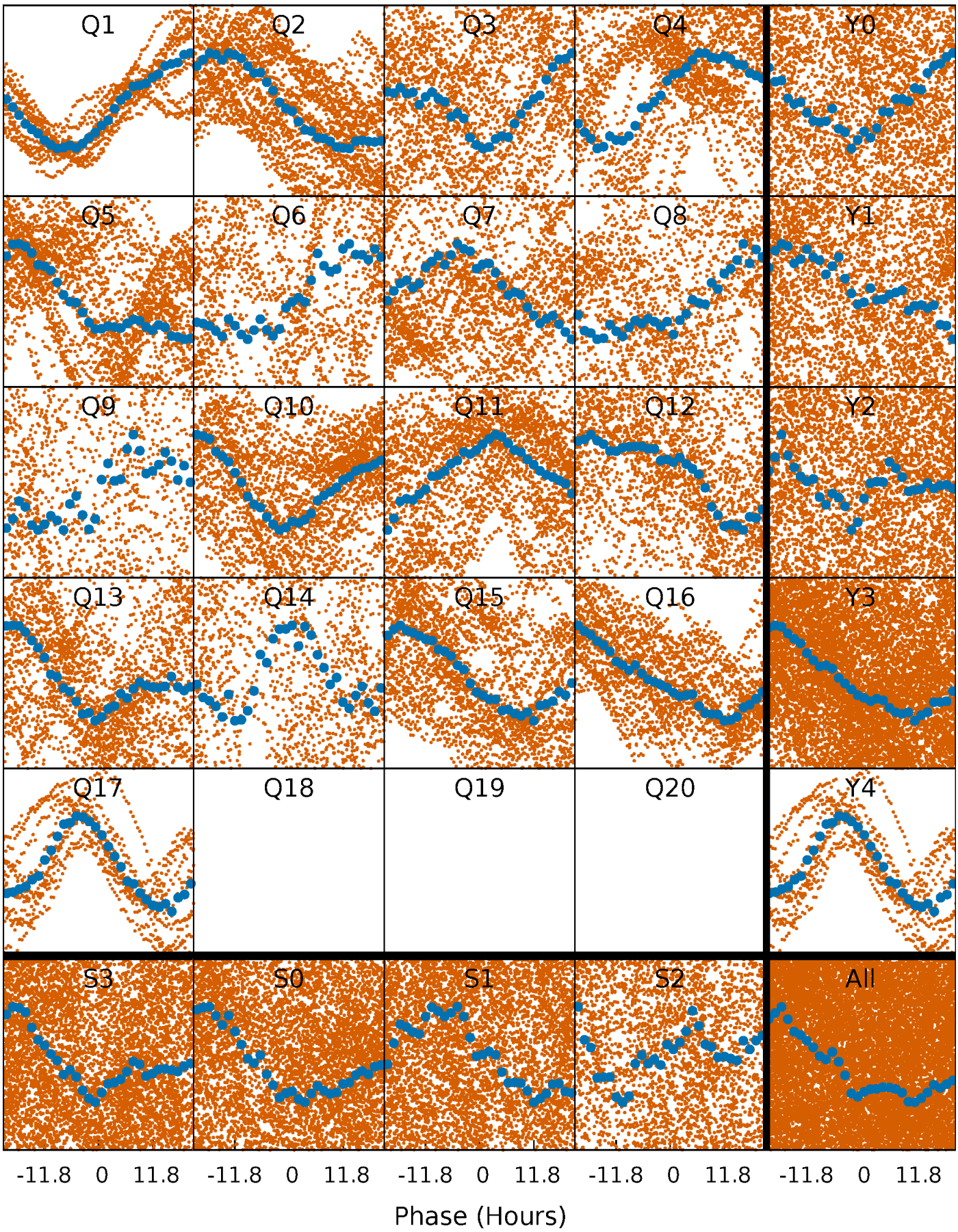
Non-Whitened Vs. Whitened Light Curve





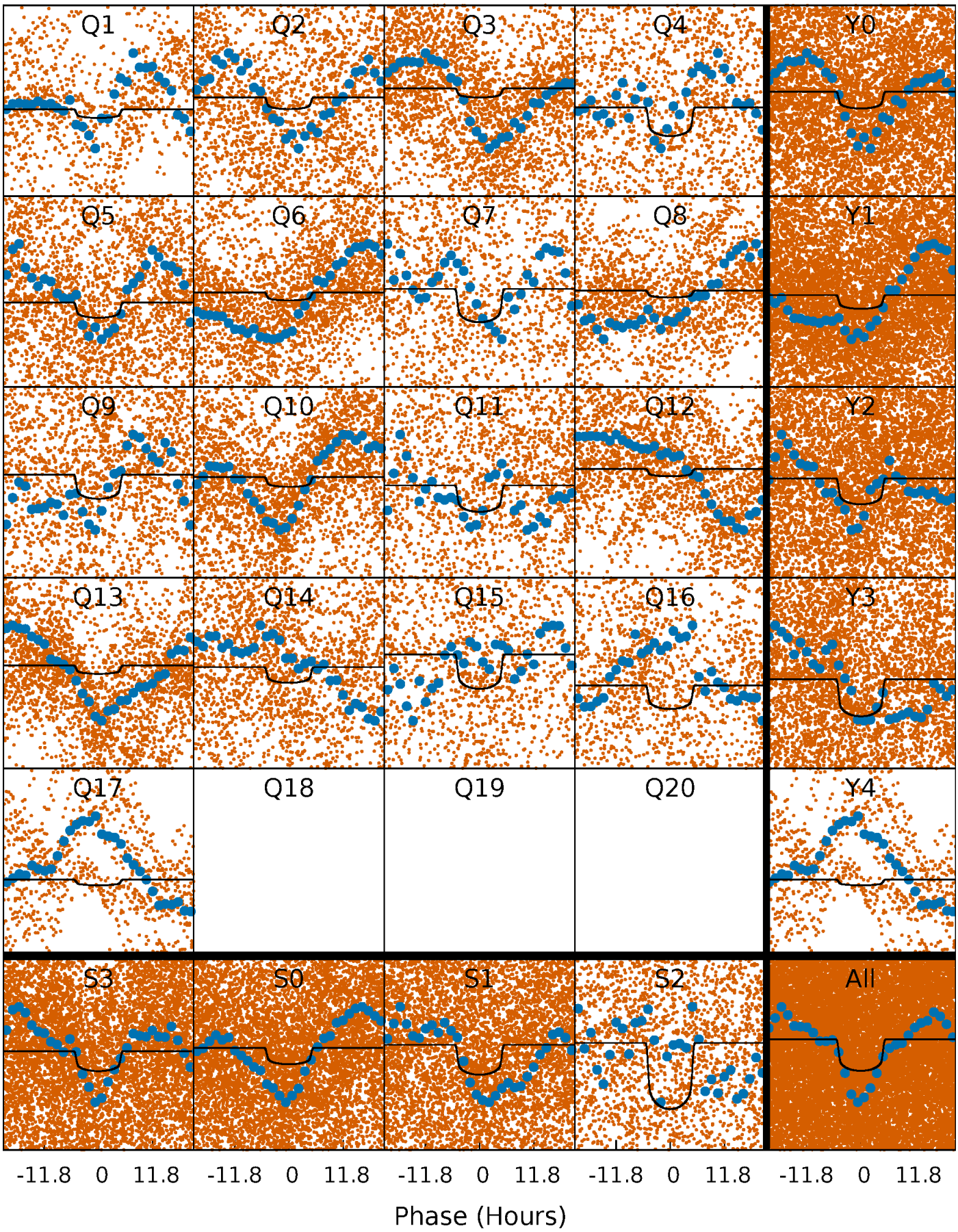
PDC Quarter-Phased Transit Curves

TCE 008977559-01 P= 2.410428 Days T_0=133.254764 (BKJD)



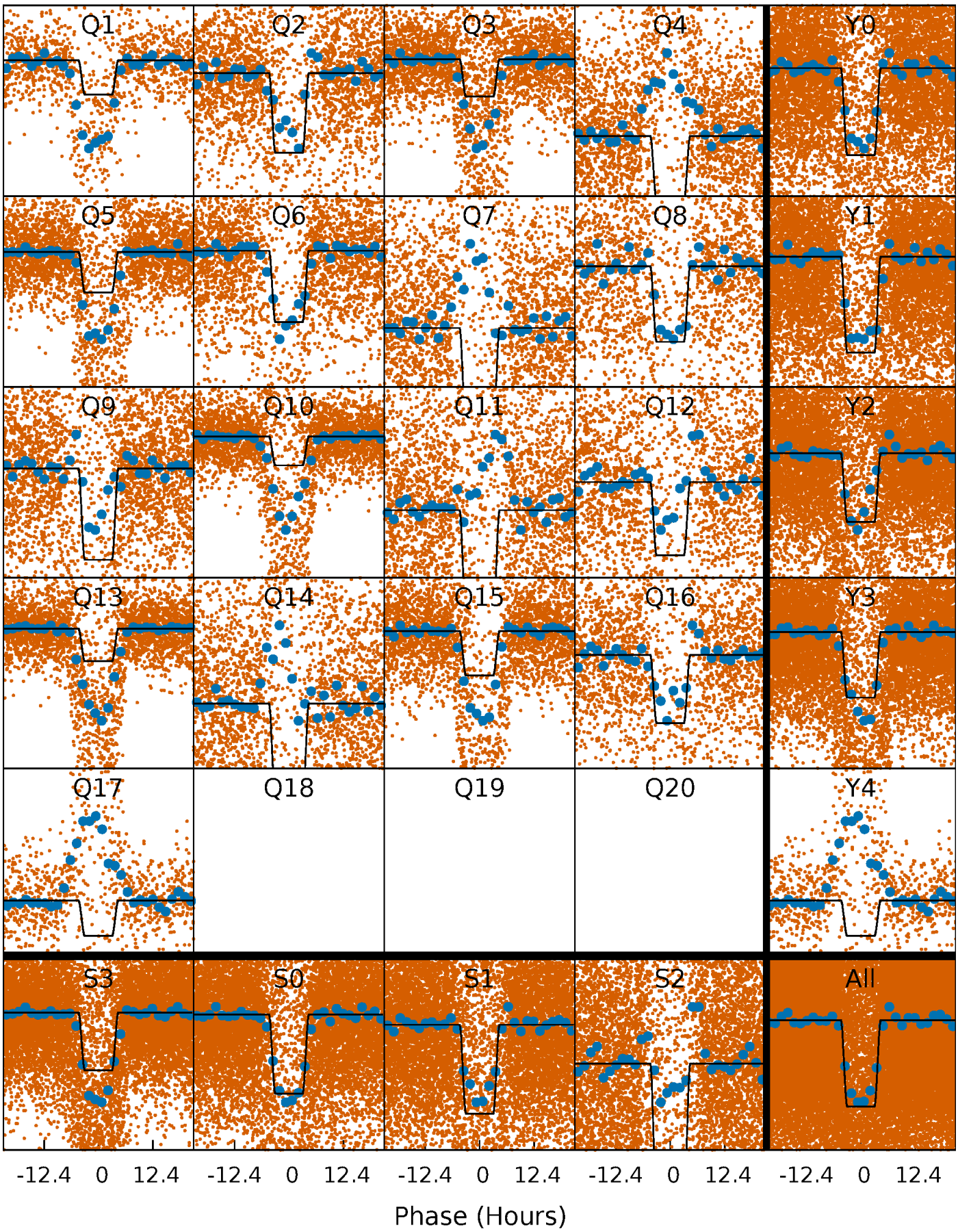
DV Quarter-Phased Transit Curves

TCE 008977559-01 P= 2.410428 Days T_0=133.254764 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

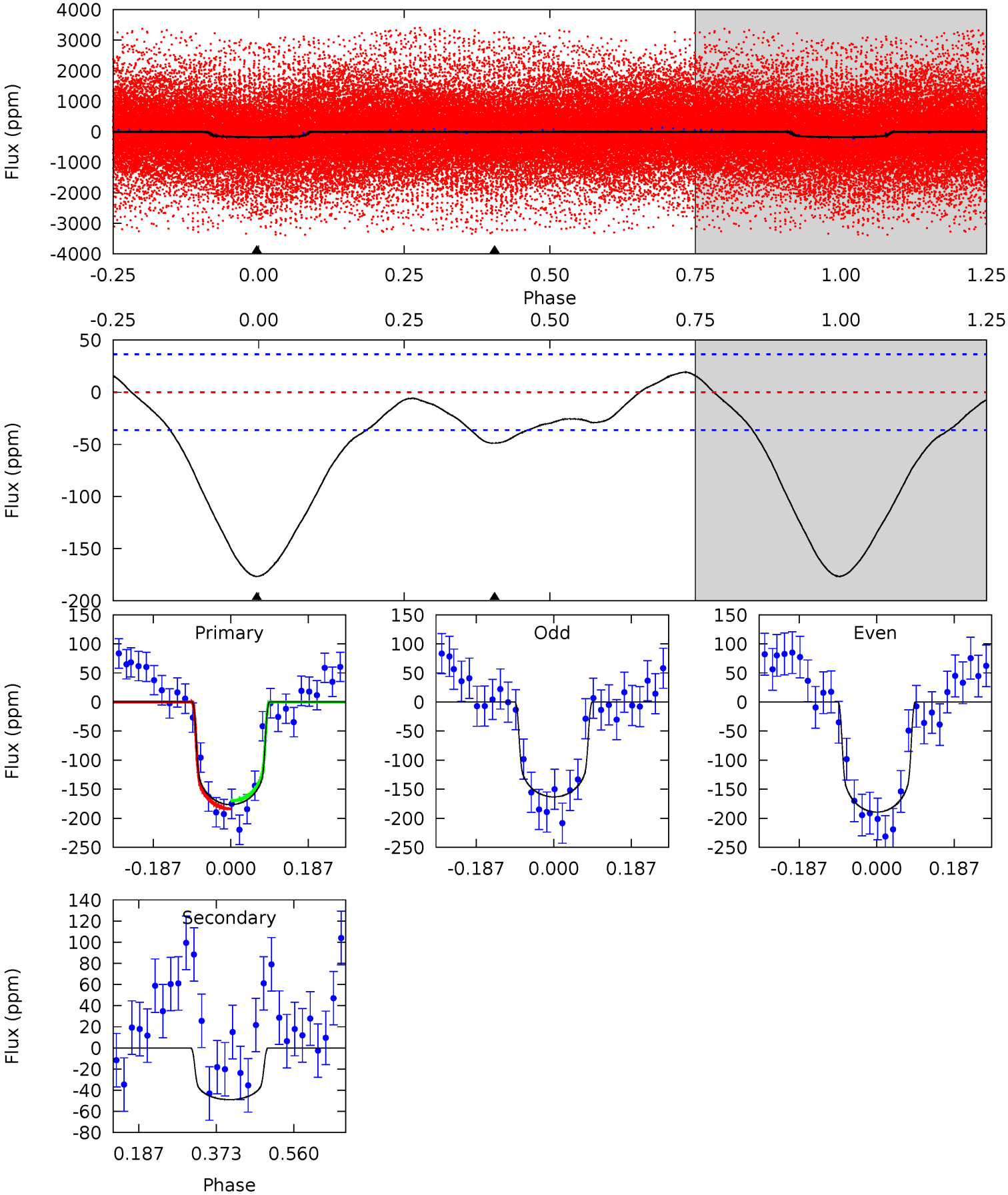
TCE 008977559-01 P= 2.410384 Days T_0=133.258791 (BKJD)



DV Model-Shift Uniqueness Test

008977559-01, P = 2.410428 Days, E = 130.844336 Days

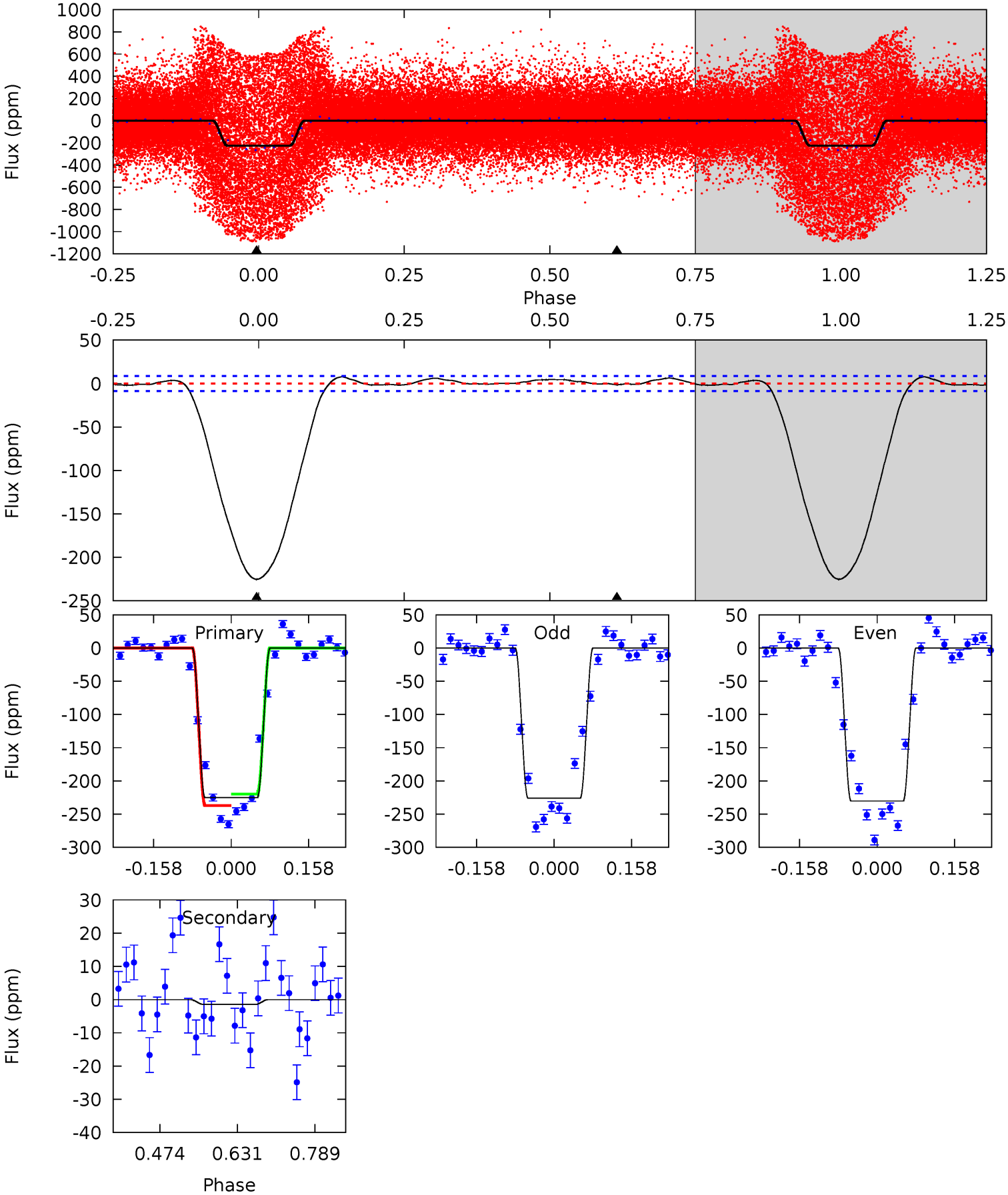
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.6	5.97	0	0	4.43	1.32	2.04	21.6	21.6	5.97	5.97	1.61	1.31	0.10	0.85



Alt Model-Shift Uniqueness Test

008977559-01, P = 2.410384 Days, E = 130.848407 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
114.2	0.73	0	0	4.47	1.41	1.15	114.2	114.2	0.73	0.73	1.07	0.78	0.03	0



Stellar Parameters For KIC 008977559

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5934^{+209}_{-188}	$3.679^{+0.752}_{-0.188}$	$-0.760^{+0.300}_{-0.250}$	$2.503^{+0.707}_{-1.650}$	$1.090^{+0.177}_{-0.288}$	$0.098^{+1.541}_{-0.045}$
	+4%/-3%	+20%/-5%	+39%/-33%	+28%/-66%	+16%/-26%	+1575%/-45%
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 008977559-01 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-49±8	$3.00^{+0.61}_{-1.00}$	3001^{+268}_{-518}	4720^{+272}_{-263}	$4.044^{+4.530}_{-1.462}$
Alt.	-1±2	$3.89^{+0.87}_{-1.44}$	2975^{+300}_{-569}	-2957^{+548}_{-245}	$0.074^{+0.138}_{-0.099}$

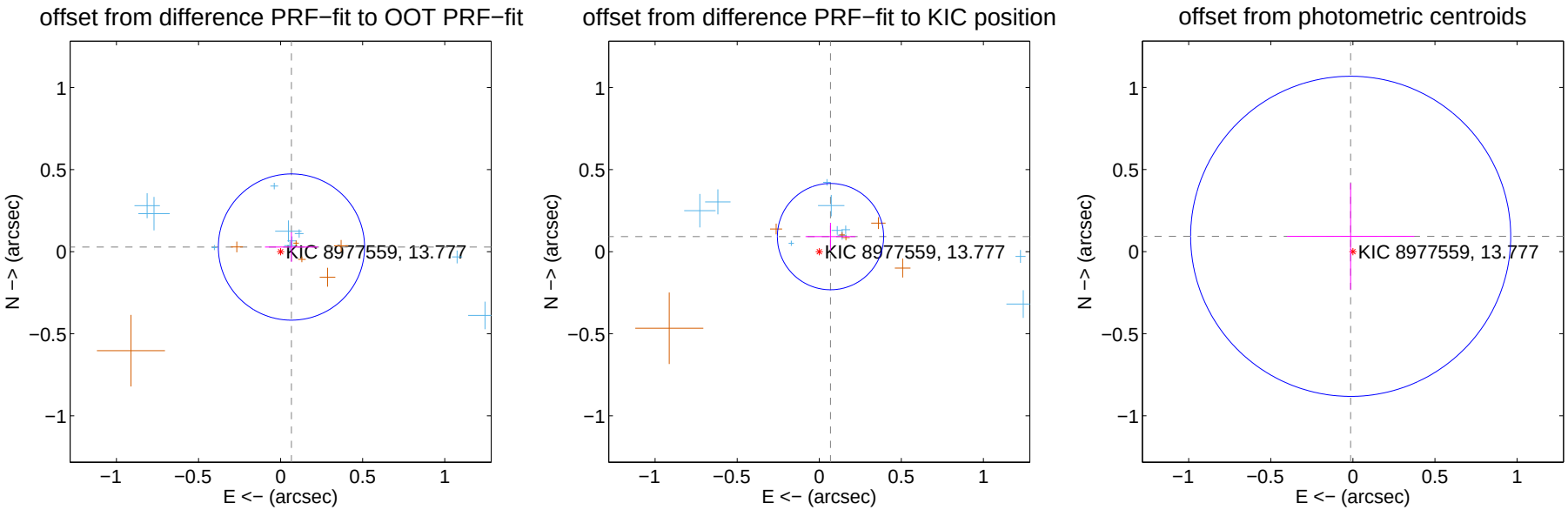
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

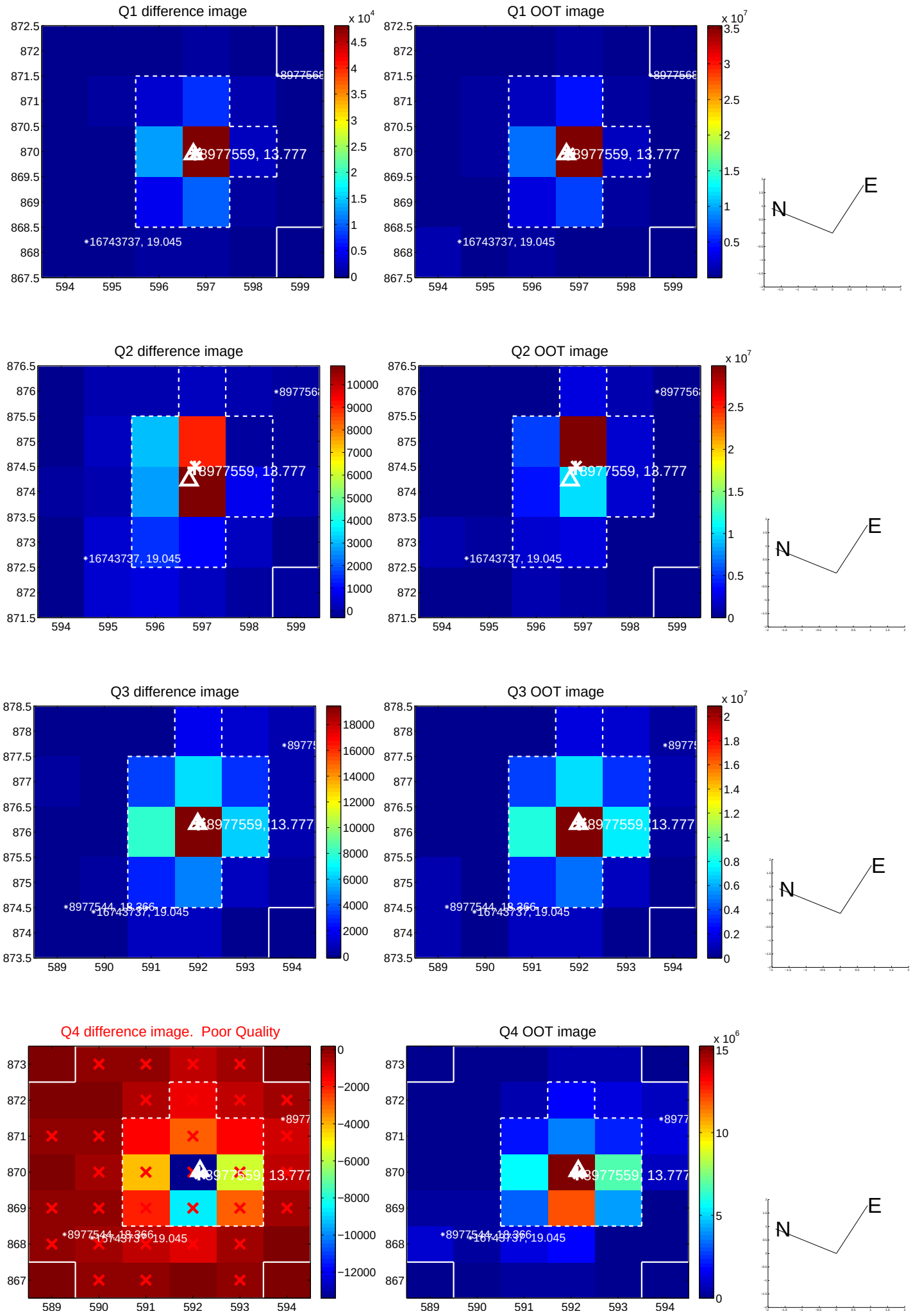
Supplemental centroid analysis for 008977559-01. Kepler magnitude: 13.78. Transit SNR 10.82
There are 10 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.072 ± 0.148	0.48	-0.066 ± 0.161	0.028 ± 0.090
PRF-fit source offset from KIC position	0.115 ± 0.108	1.06	-0.069 ± 0.152	0.092 ± 0.084
photometric centroid source offset	0.09 ± 0.32	0.29	0.01 ± 0.39	0.09 ± 0.32

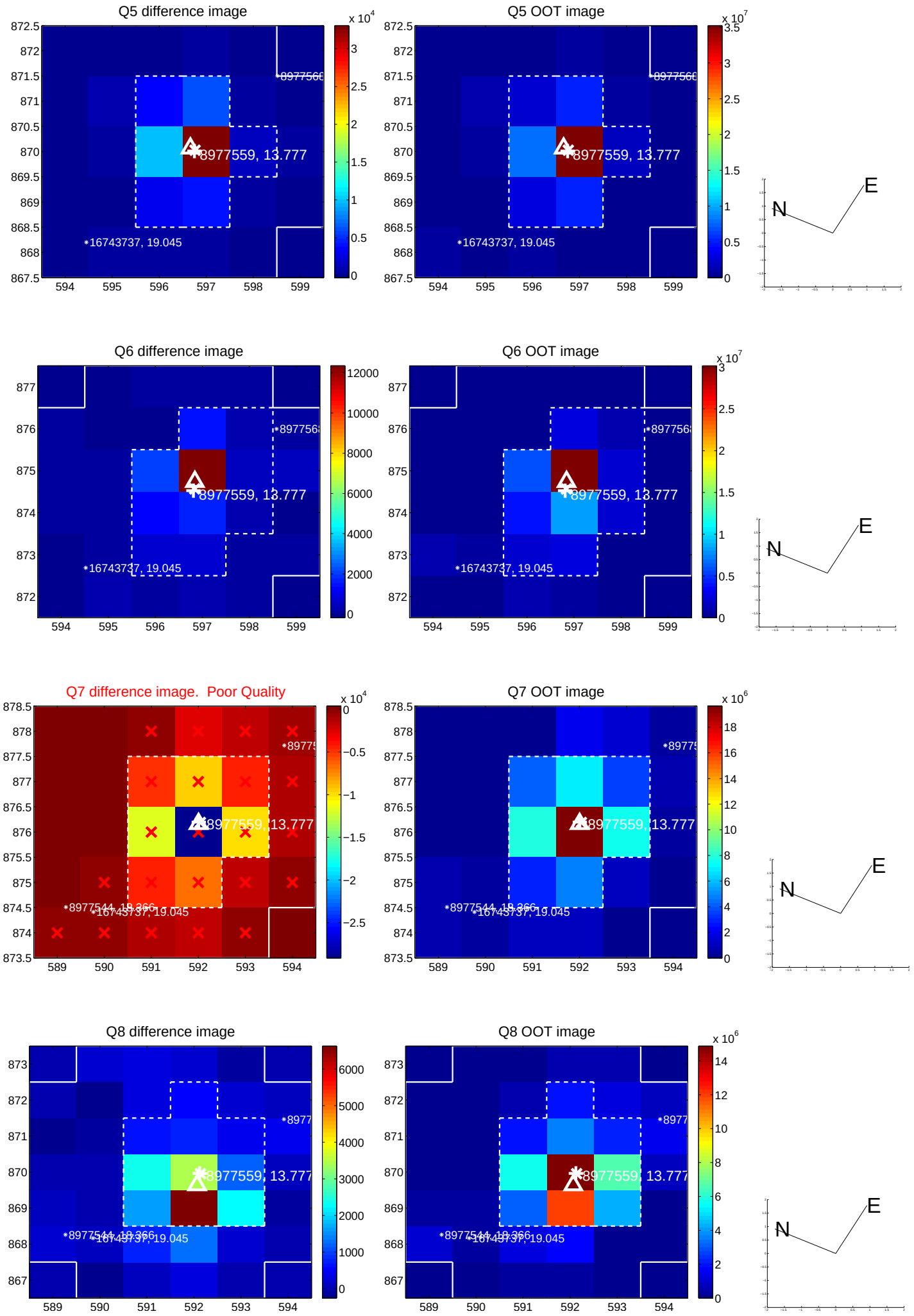


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

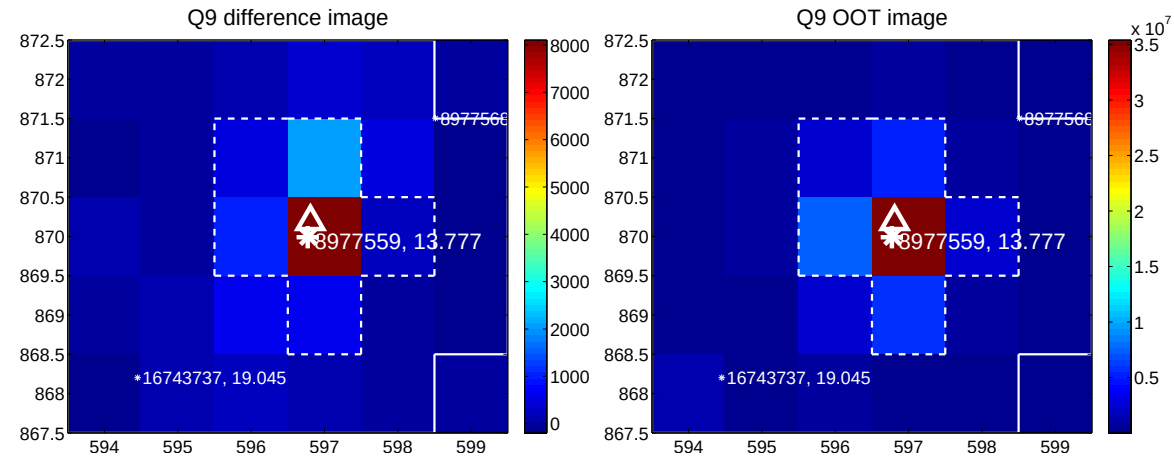
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

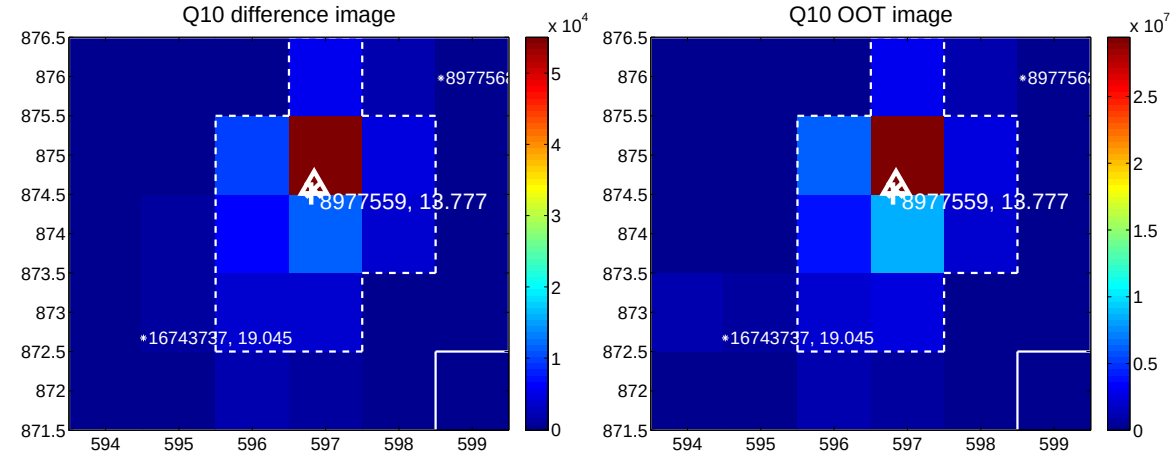


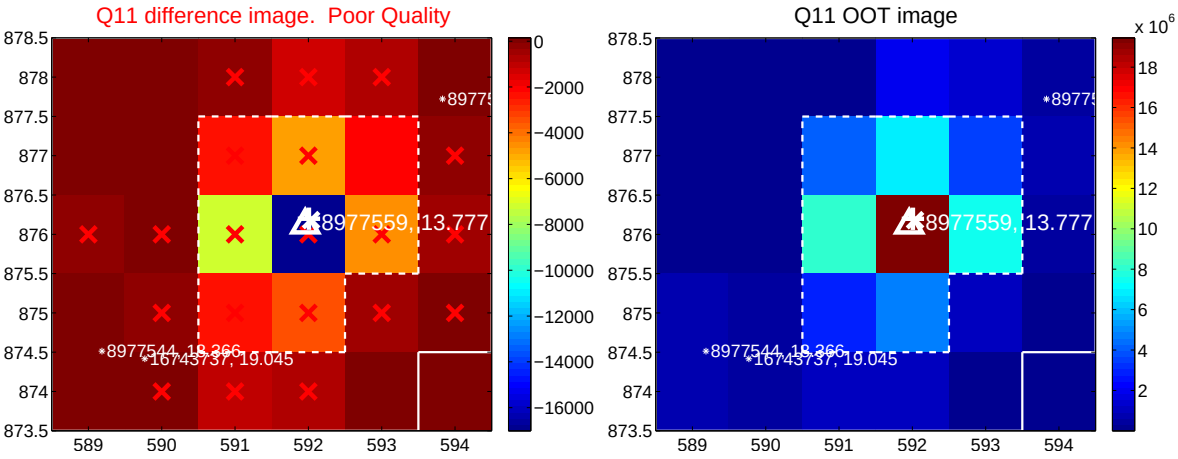
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

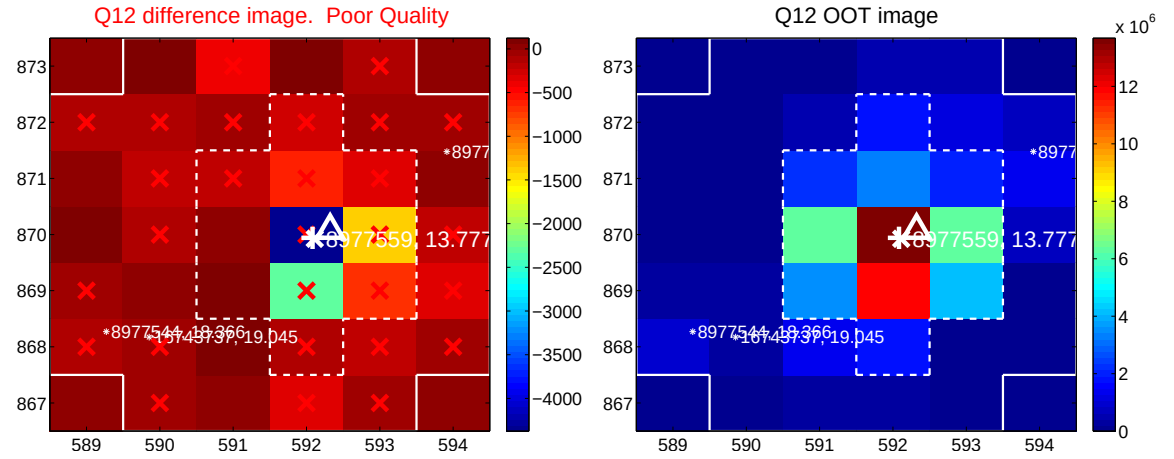


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

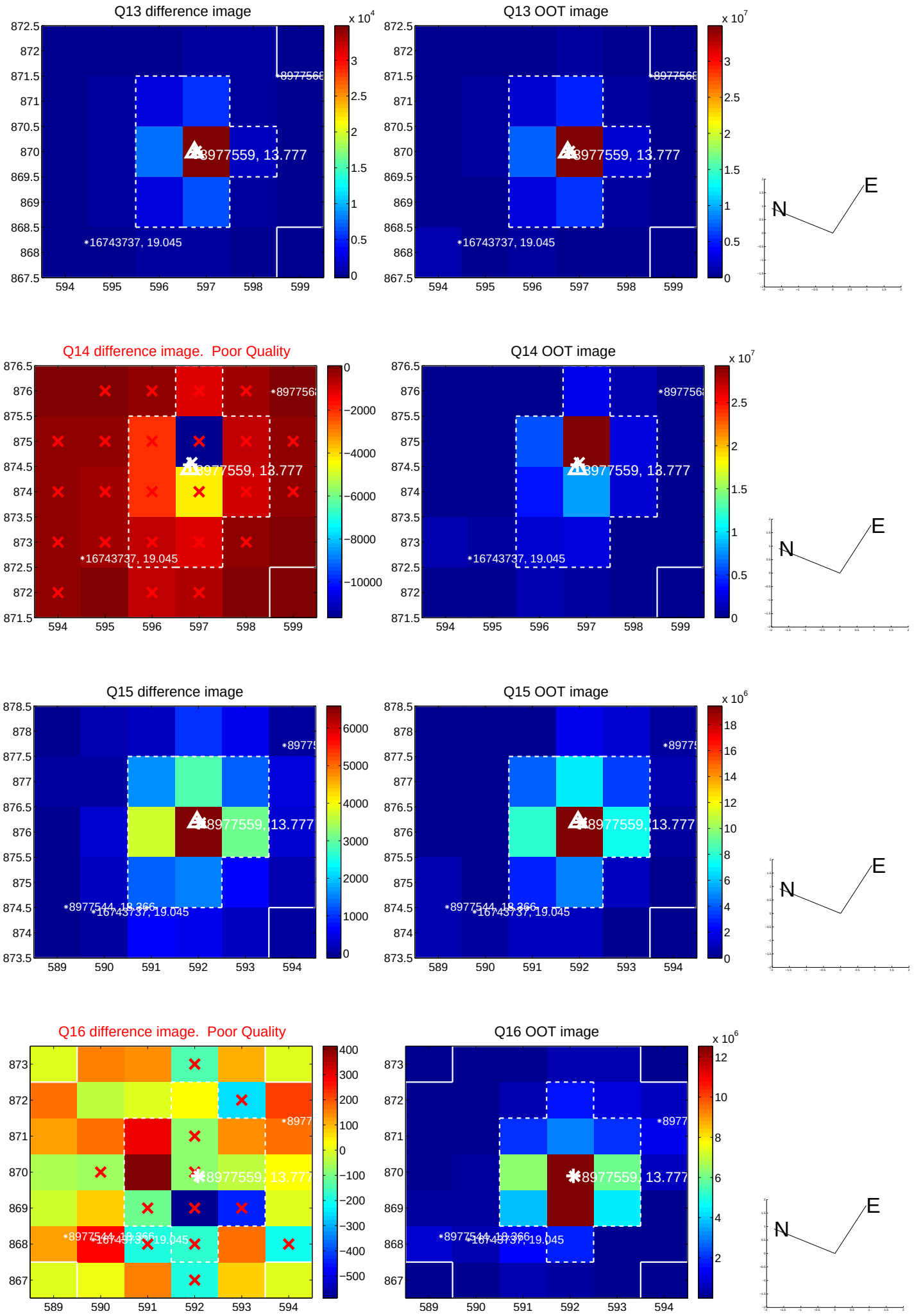




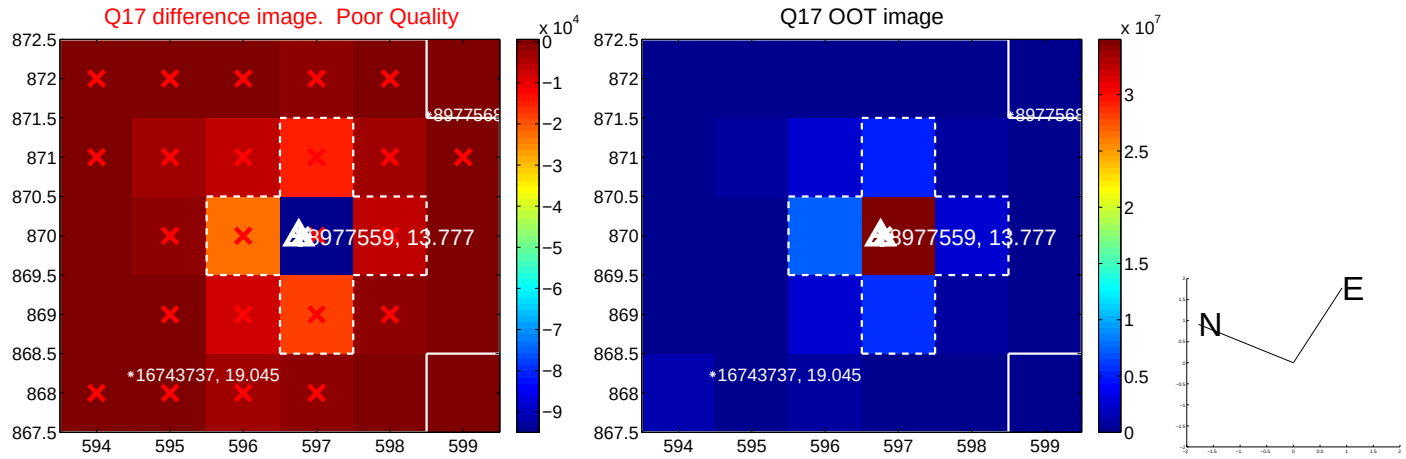


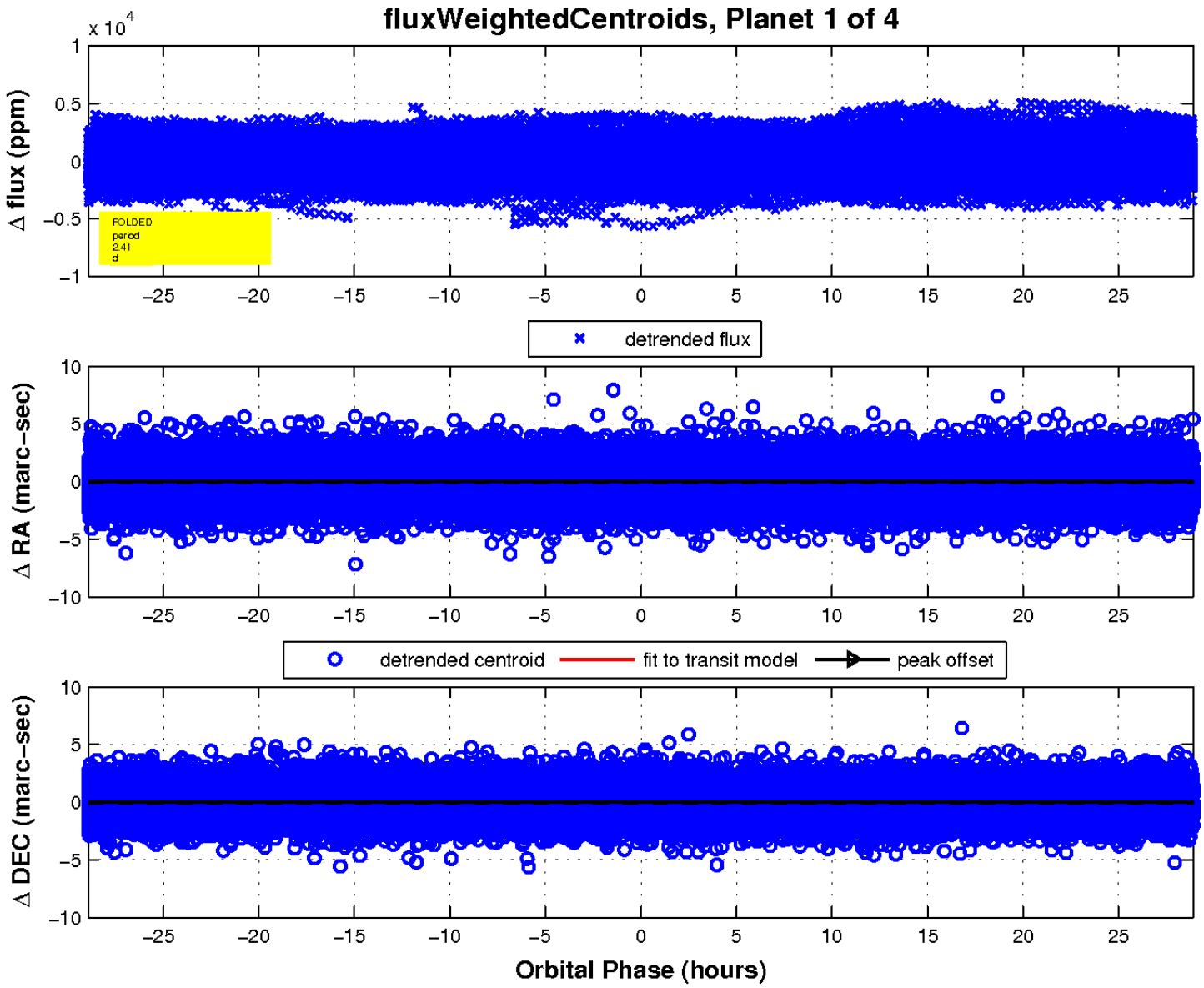


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

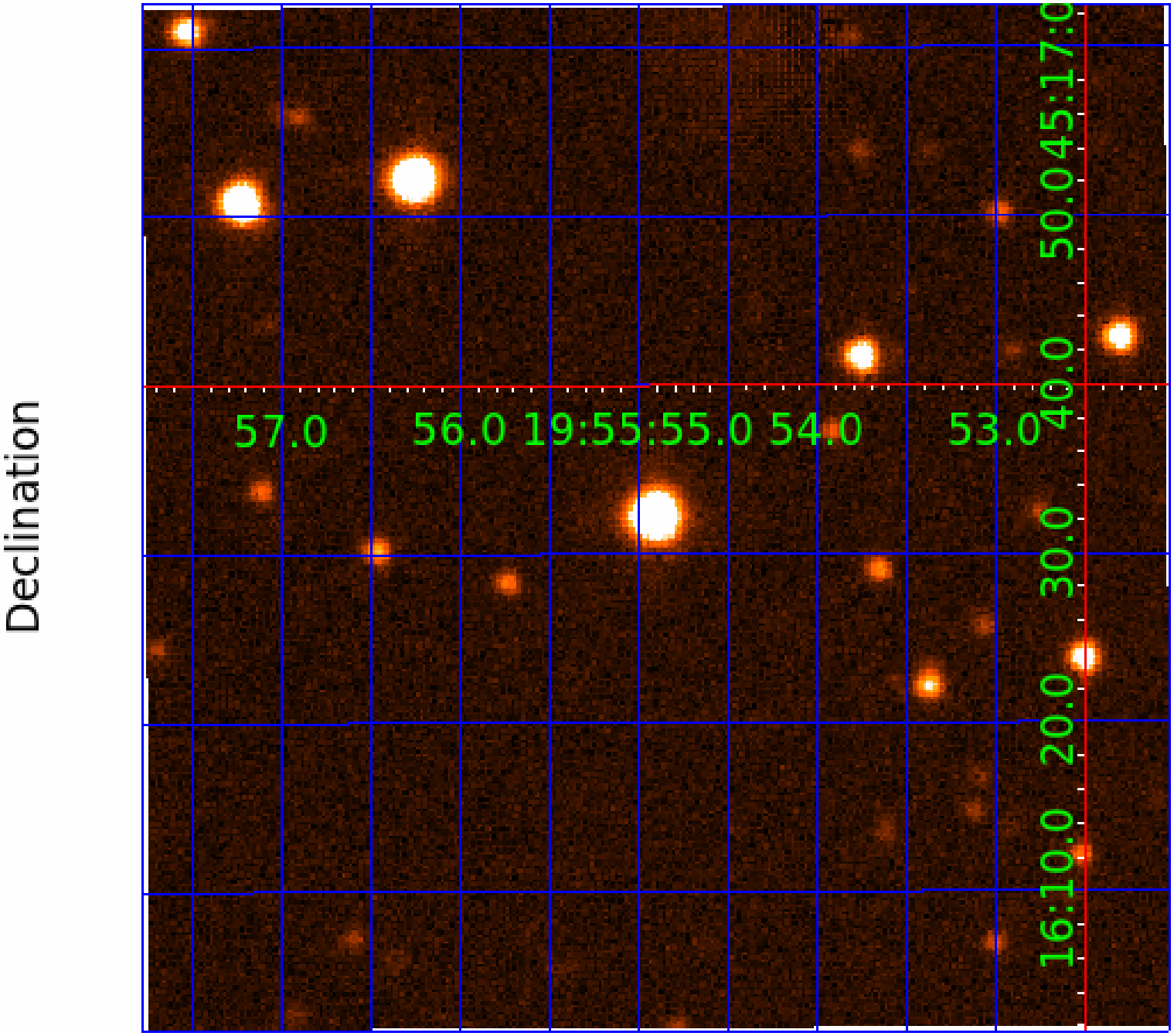


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image


Declination
57.0
56.0
19:55:55.0
54.0
53.0
16:10.0
20.0
30.0
40.0
50.0
45:17:0

KIC 008977559

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 ($S_\oplus$)
008977559-01	OBS	No	2.410428	133.254764	111.0	10.353	9.0	10.8	2.50	5934	3.10	5302.32
008977559-02	OBS	No	241.438349	288.180403	1317.9	25.283	8.8	5.5	2.50	5934	10.79	11.40
008977559-03	OBS	No	395.311941	173.088521	549.9	15.735	8.7	3.9	2.50	5934	6.95	5.91
008977559-04	OBS	No	271.606901	292.295304	2482.3	17.395	7.3	8.9	2.50	5934	15.21	9.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008977559-01	OBS	FP	0.00	1	0	0	0	LPP_DV
008977559-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008977559-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008977559-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS

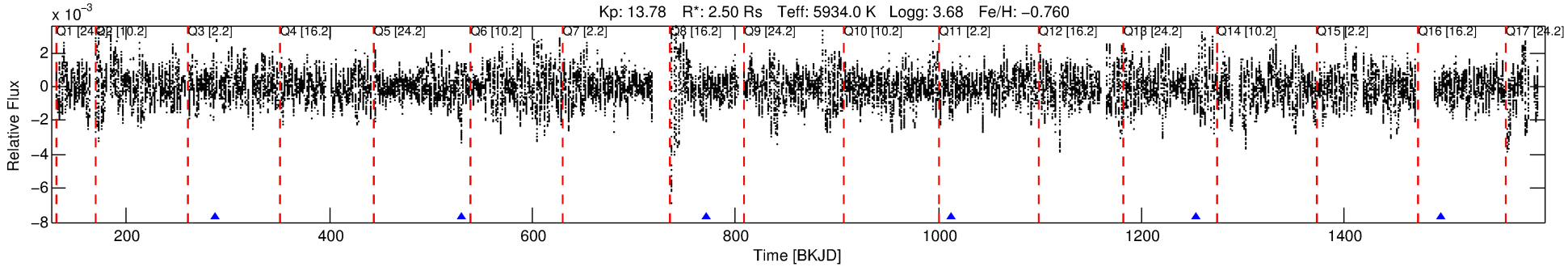
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

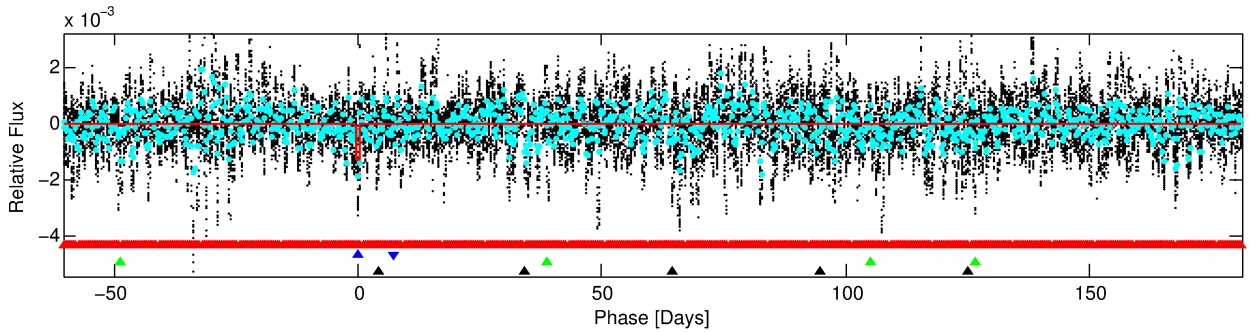
Ephemeris Match Information For 008977559-02

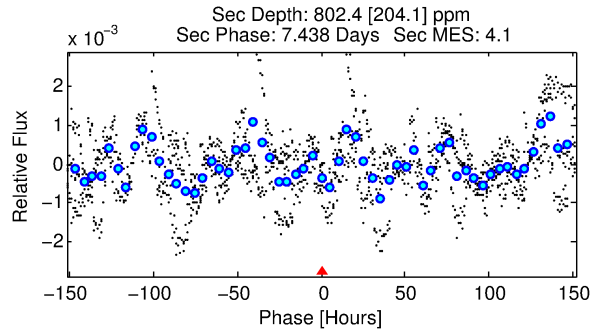
No Significant Match Found

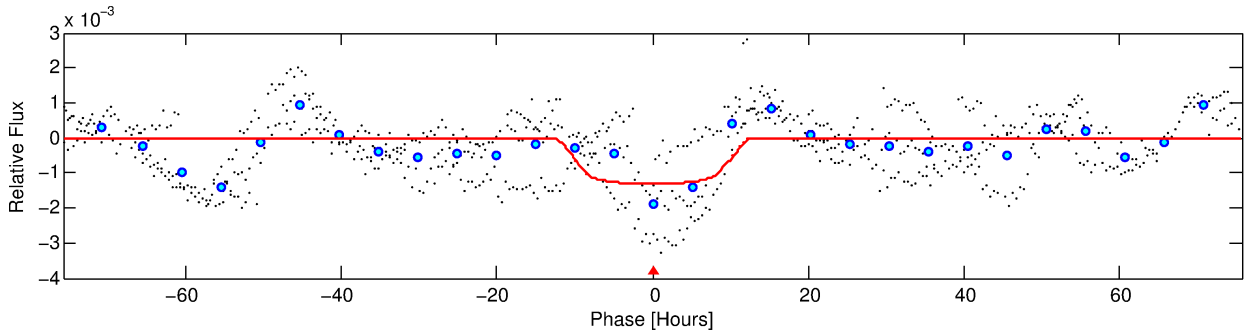
DV One-Page Summary

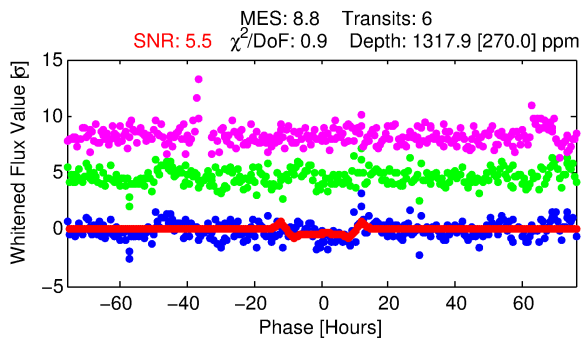
KIC: 8977559 Candidate: 2 of 4 Period: 241.438 d

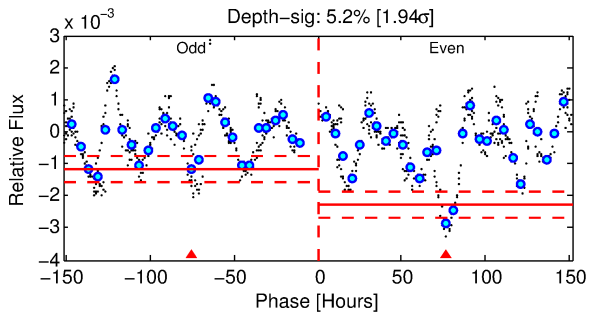


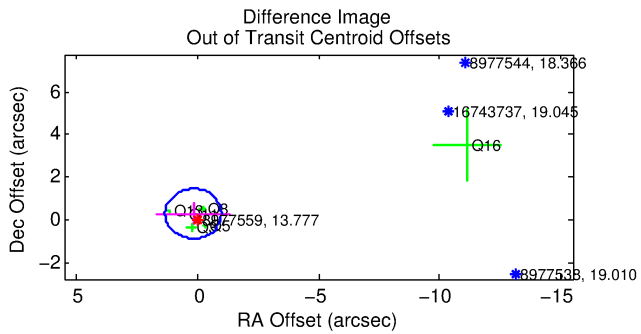












DV Fit Results:

Period = 241.43835 [0.01096] d
Epoch = 288.1804 [0.0284] BKJD
Rp/R* = 0.0395 [0.0042]
a/R* = 36.53 [3.53]
b = 0.91 [0.02]

Seff = 11.40 [14.17]
Teq = 469 [146] K
Rp = 10.79 [7.20] Re
a = 0.7814 [0.5669] AU

Ag = 2315.77 [2960.82] [0.78σ]
Teffp = 5025 [451] K [9.62σ]

DV Diagnostic Results:

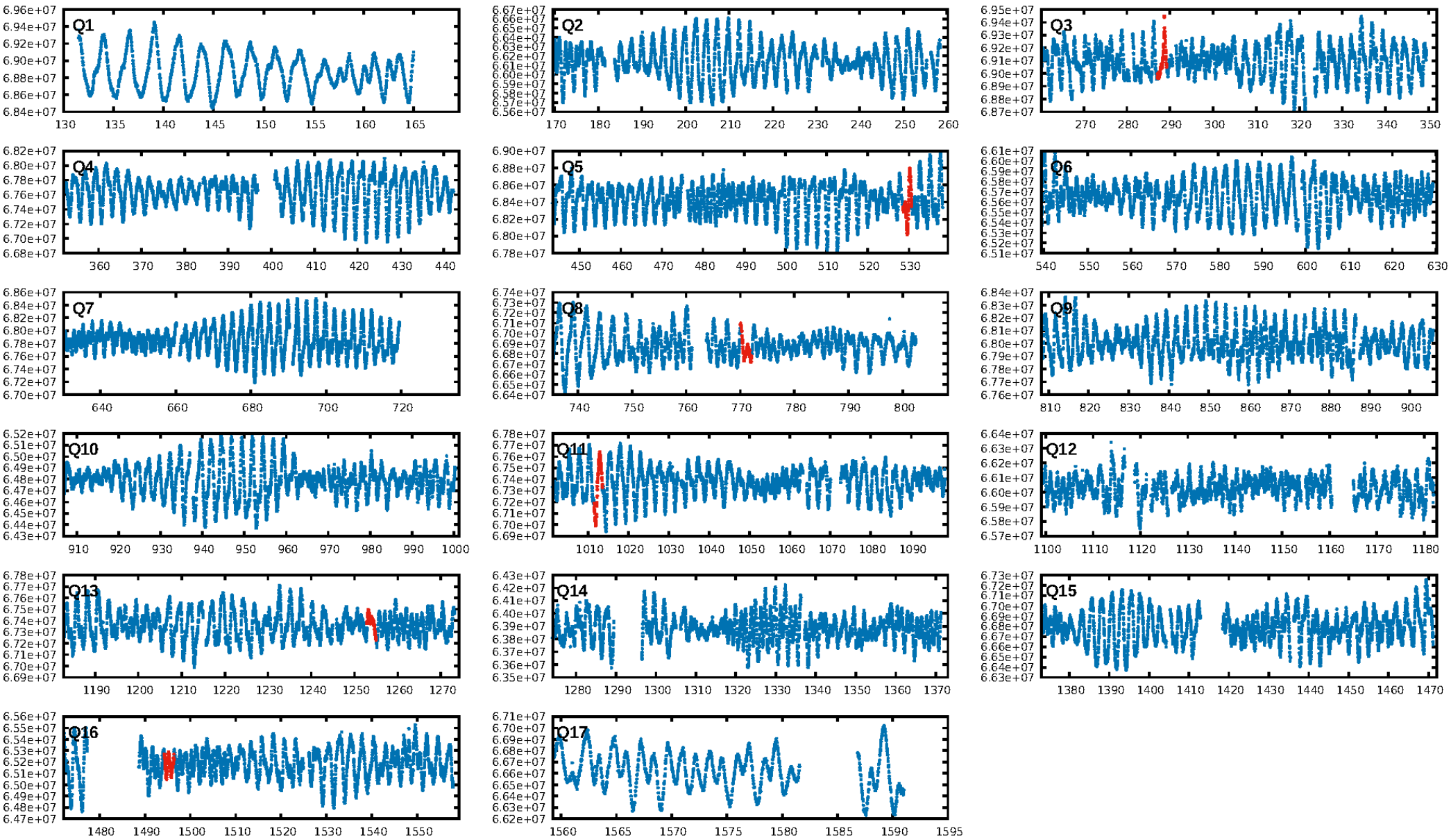
ShortPeriod−sig: 100.0% [209.98σ]
LongPeriod−sig: 100.0% [23.59σ]
ModelChiSquare2−sig: 2.3%
ModelChiSquareGof−sig: 100.0%
Bootstrap−pfa: 5.05e−10
RollingBand−fgt: 1.00 [6/6]
GhostDiagnostic−chr: −1.997

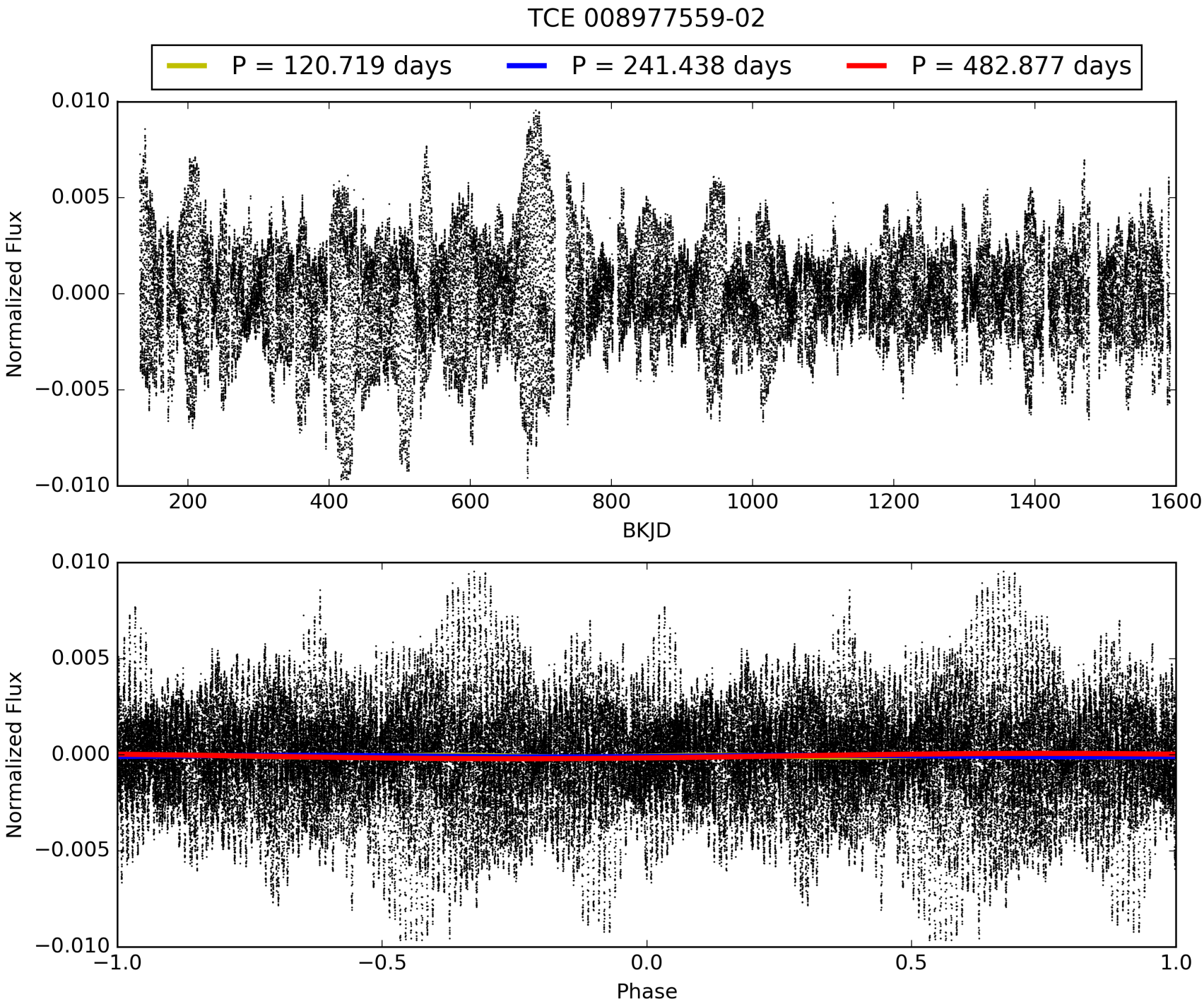
Centroid−sig: 2.3%
Centroid−so: 0.531 arcsec [2.34σ]
OotOffset−rm: 0.349 arcsec [0.90σ]
KicOffset−rm: 0.447 arcsec [1.60σ]
OotOffset−st: 0/2/2/2 [6]
KicOffset−st: 0/2/2/2 [6]
DiffImageQuality−fgm: 0.33 [2/6]
DiffImageOverlap−fno: 0.00 [0/6]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 10:59:53 Z

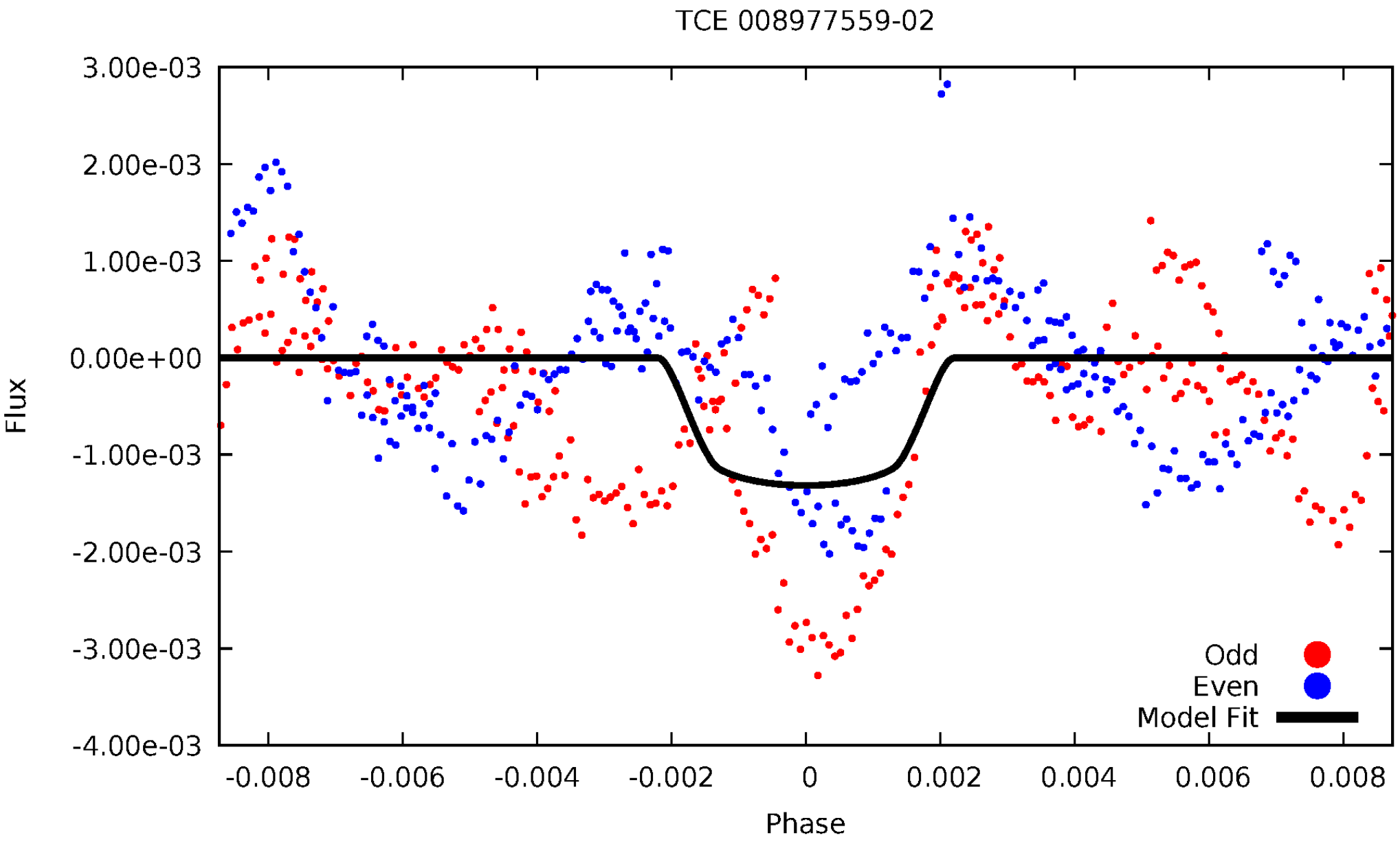
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008977559-02, PDC Light Curves

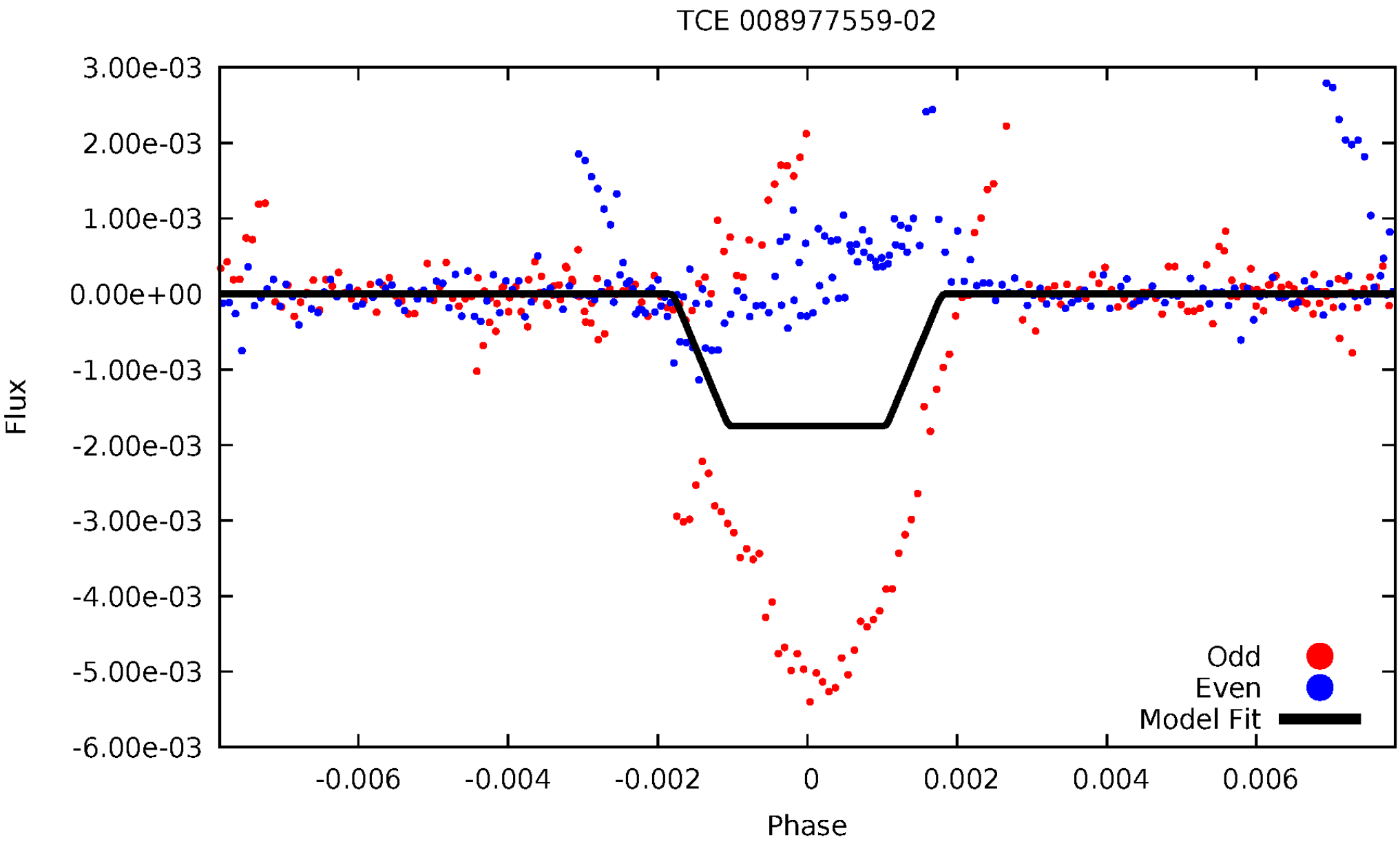



TCE 008977559-02
P = 120.719 days
P = 241.438 days
P = 482.877 days
Normalized Flux
0.010
0.005
0.000
−0.005
−0.010
200
400
600
800
1000
1200
1400
1600
BKJD
Normalized Flux
0.010
0.005
0.000
−0.005
−0.010
−1.0
−0.5
0.0
0.5
1.0
Phase

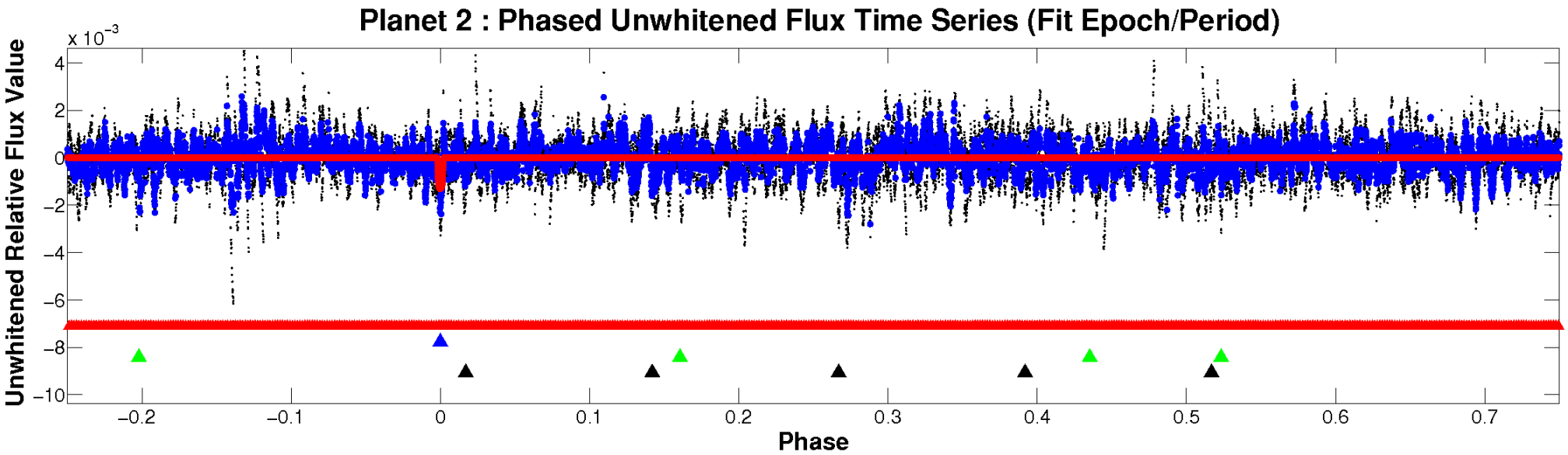
DV Odd/Even

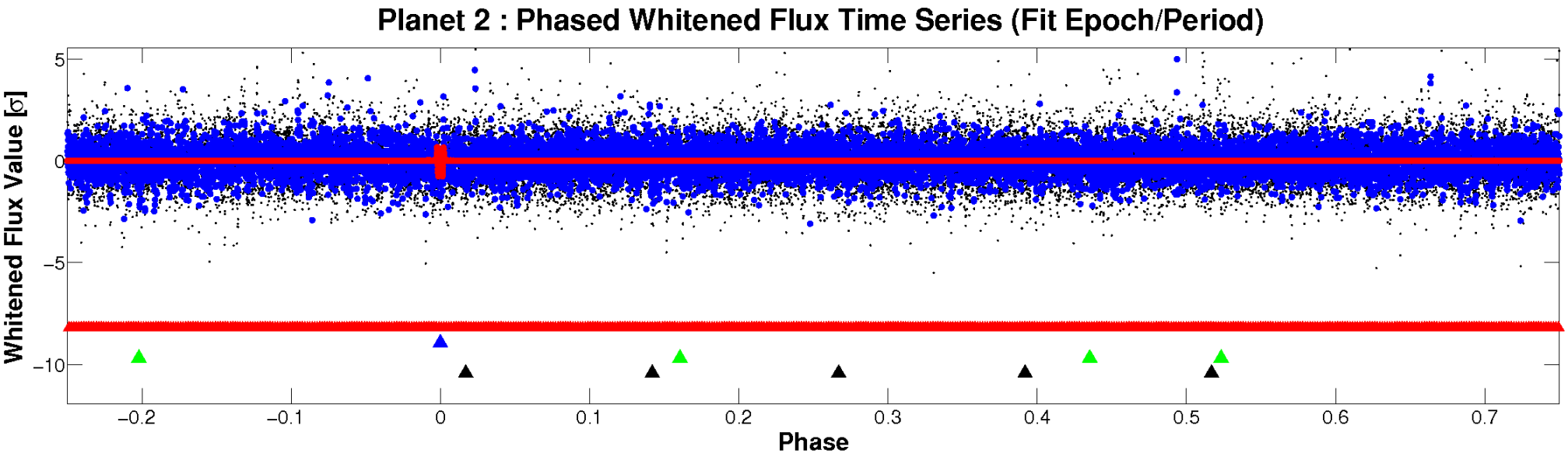

TCE 008977559-02
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
-4.00e-03
Flux
-0.008
-0.006
-0.004
-0.002
0
0.002
0.004
0.006
0.008
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 008977559-02
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
-4.00e-03
-5.00e-03
-6.00e-03
Flux
-0.006
-0.004
-0.002
0
0.002
0.004
0.006
Phase
Odd
Even
Model Fit

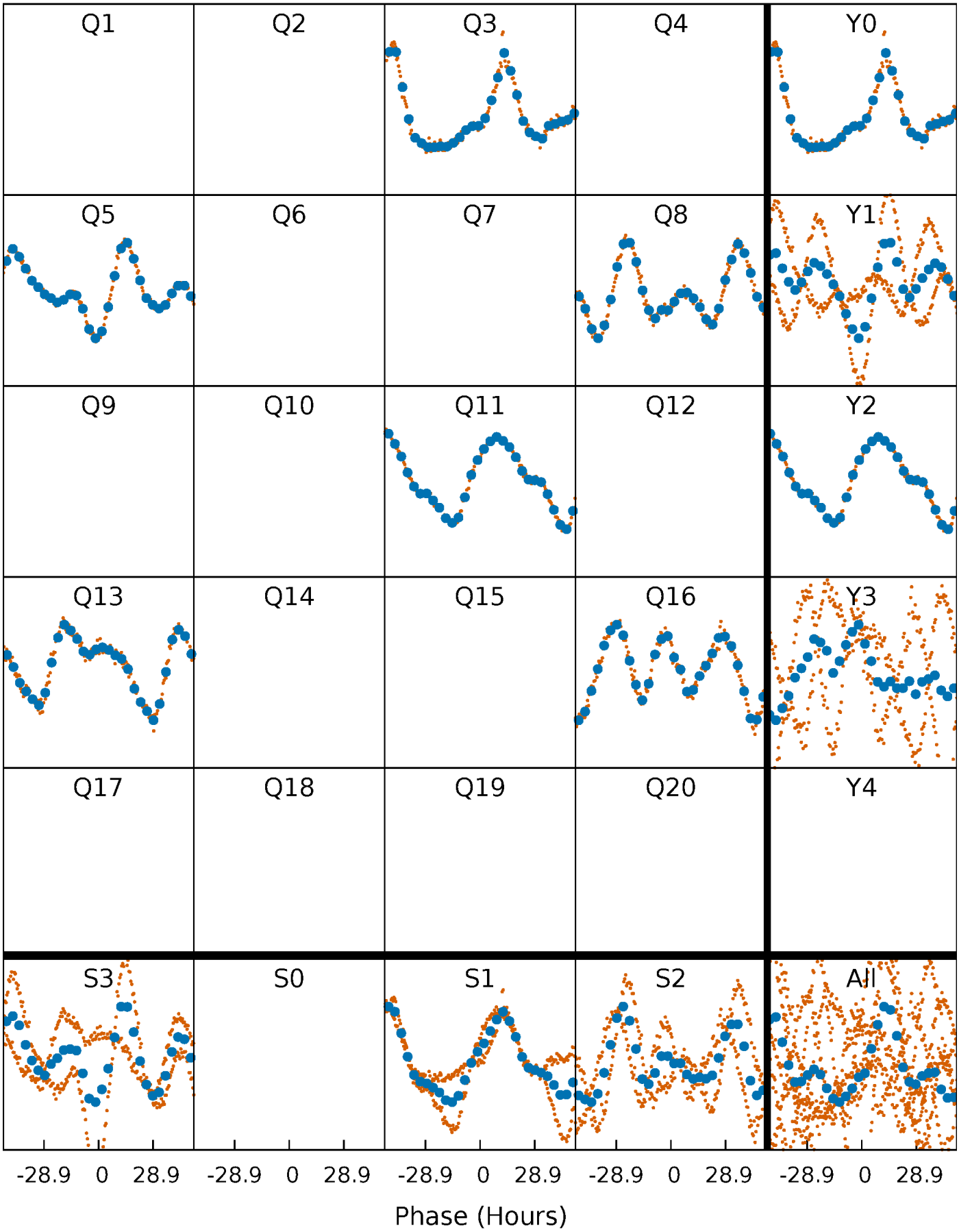
Non-Whitened Vs. Whitened Light Curve





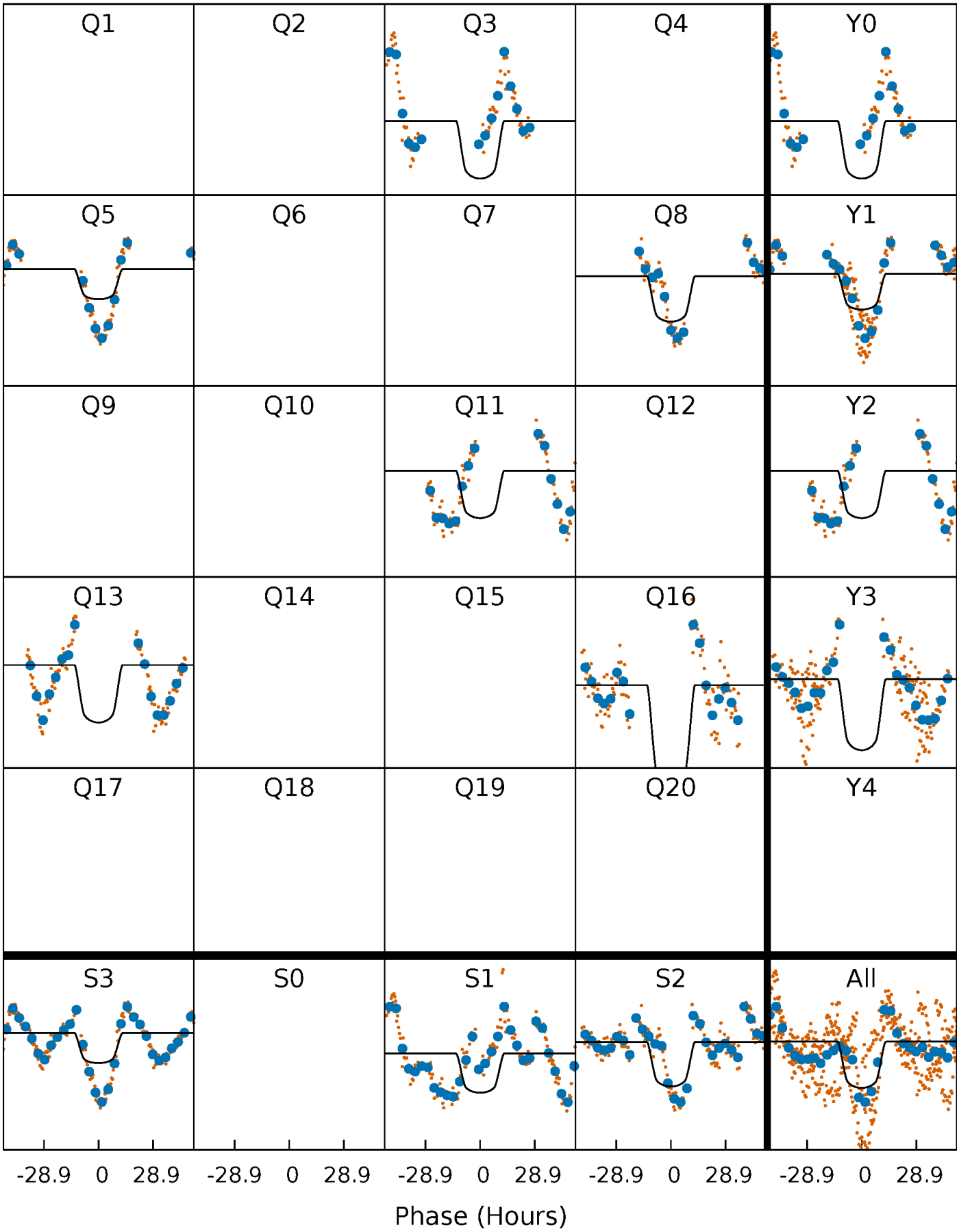
PDC Quarter-Phased Transit Curves

TCE 008977559-02 P=241.438349 Days T_0=288.180403 (BKJD)



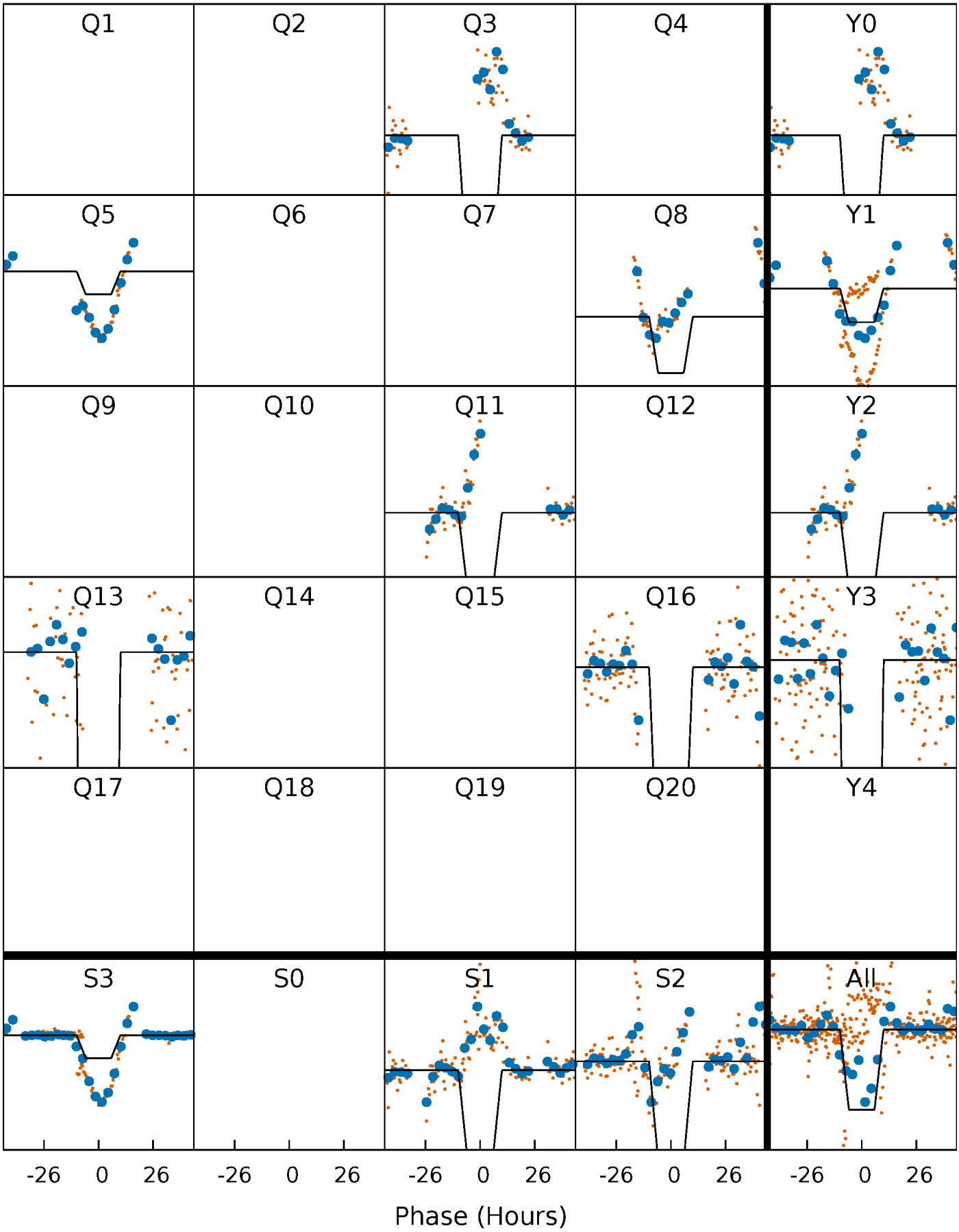
DV Quarter-Phased Transit Curves

TCE 008977559-02 P=241.438349 Days T_0=288.180403 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

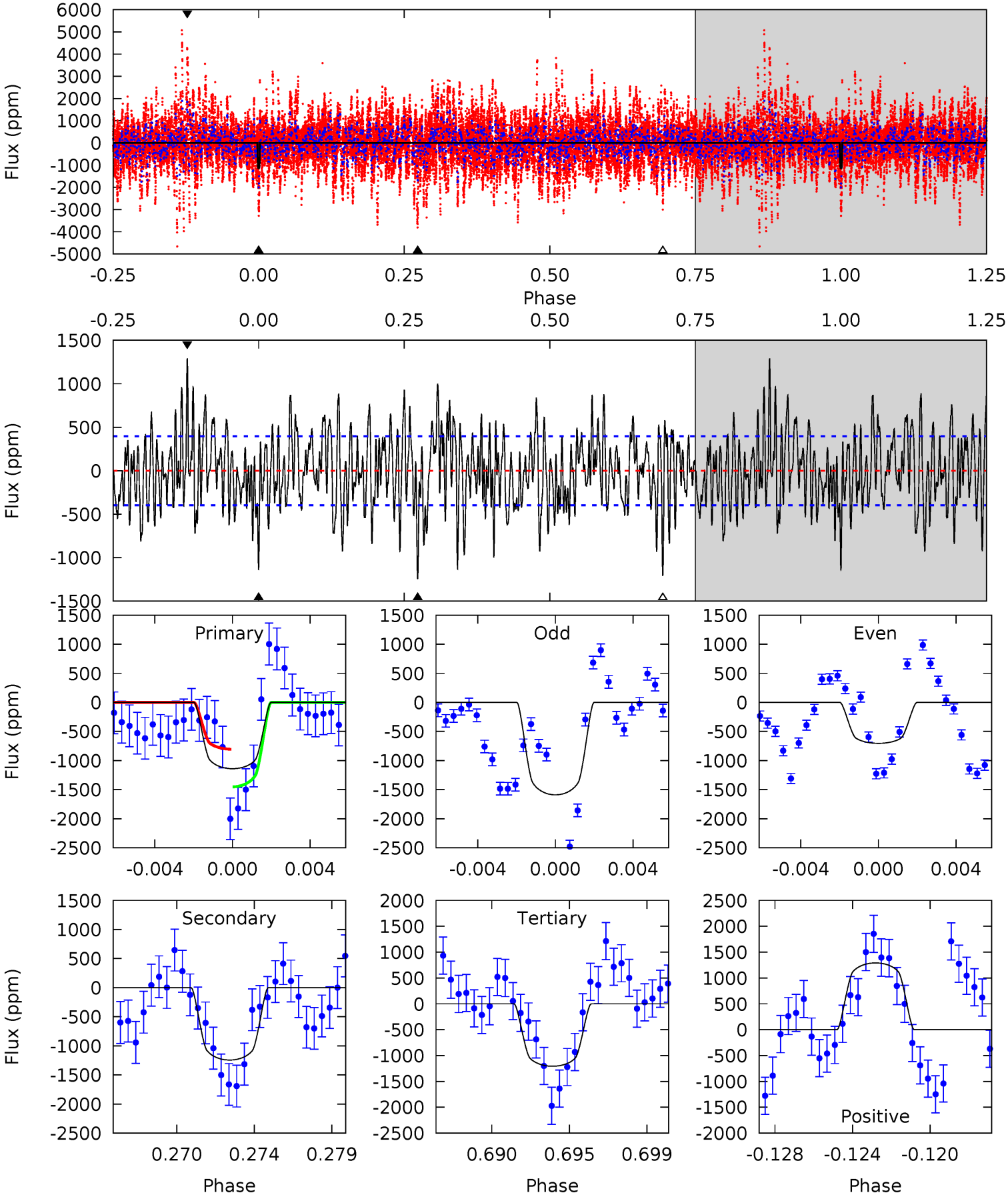
TCE 008977559-02 P=241.368022 Days T_0=288.285367 (BKJD)



DV Model-Shift Uniqueness Test

008977559-02, P = 241.438349 Days, E = 46.742054 Days

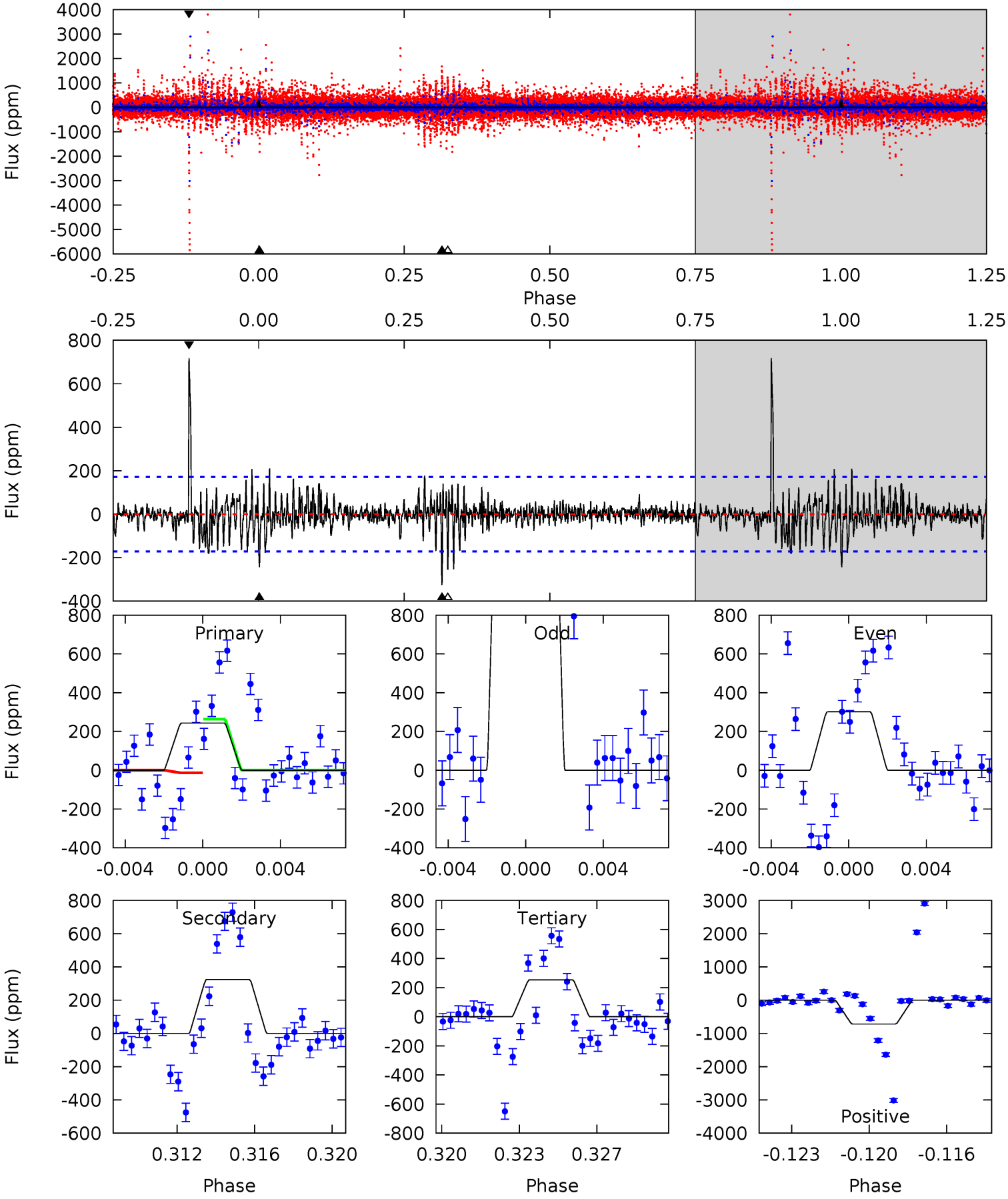
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.9	16.2	15.7	16.9	5.18	2.85	4.94	-0.86	-1.98	0.49	-0.63	5.72	33.7	0.51	4.23



Alt Model-Shift Uniqueness Test

008977559-02, P = 241.368022 Days, E = 46.917345 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	9.84	7.74	21.8	5.22	2.91	1.59	-0.34	-14.4	2.10	-12.0	41.2	49.5	0.69	4.05



Stellar Parameters For KIC 008977559

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5934^{+209}_{-188}	$3.679^{+0.752}_{-0.188}$	$-0.760^{+0.300}_{-0.250}$	$2.503^{+0.707}_{-1.650}$	$1.090^{+0.177}_{-0.288}$	$0.098^{+1.541}_{-0.045}$
	+4%/-3%	+20%/-5%	+39%/-33%	+28%/-66%	+16%/-26%	+1575%/-45%
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 008977559-02 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1244±77	$10.19^{+2.63}_{-3.57}$	640^{+67}_{-114}	5635^{+390}_{-310}	4057^{+4964}_{-1520}
Alt.	-324±33	$10.68^{+2.83}_{-3.51}$	641^{+67}_{-115}	4171^{+218}_{-193}	951^{+1083}_{-356}

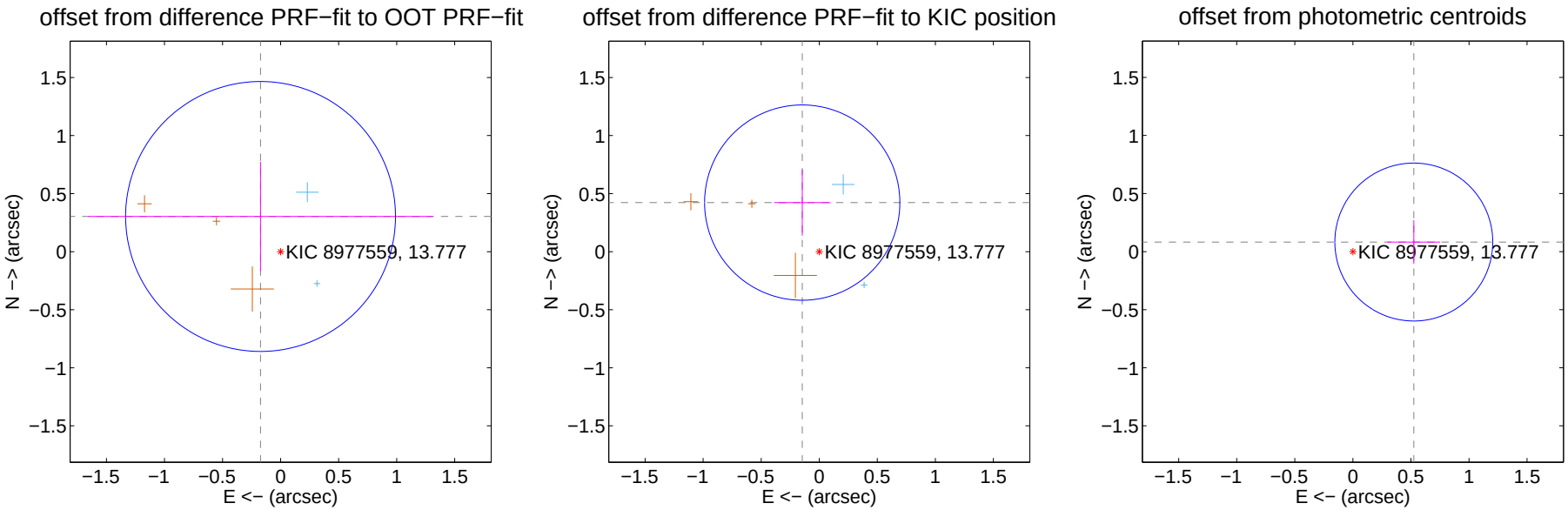
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

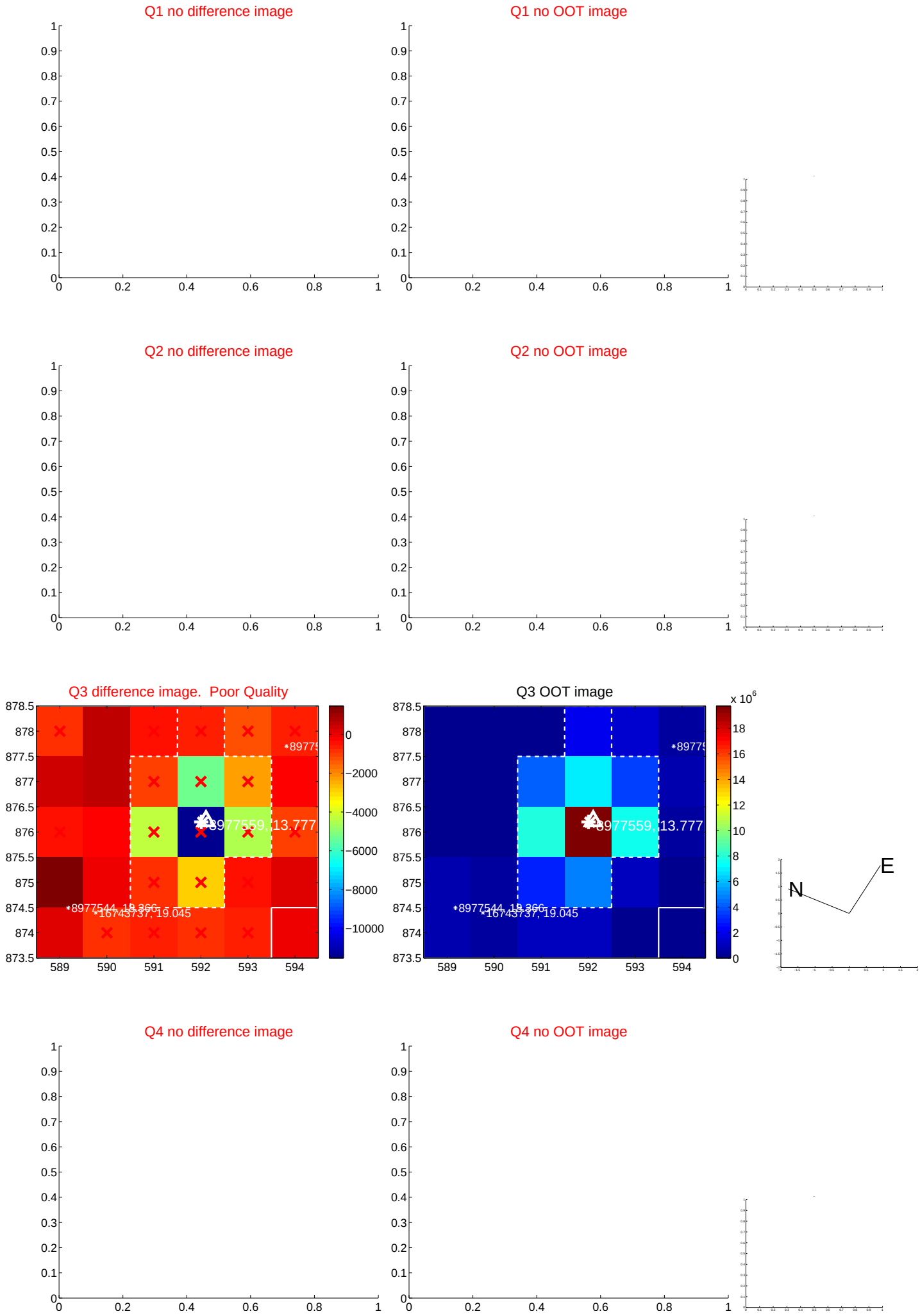
Supplemental centroid analysis for 008977559-02. Kepler magnitude: 13.78. Transit SNR 5.46
There are 2 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.349 ± 0.387	0.90	0.173 ± 1.485	0.303 ± 0.470
PRF-fit source offset from KIC position	0.447 ± 0.280	1.60	0.147 ± 0.243	0.423 ± 0.285
photometric centroid source offset	0.53 ± 0.23	2.34	-0.52 ± 0.23	0.08 ± 0.19

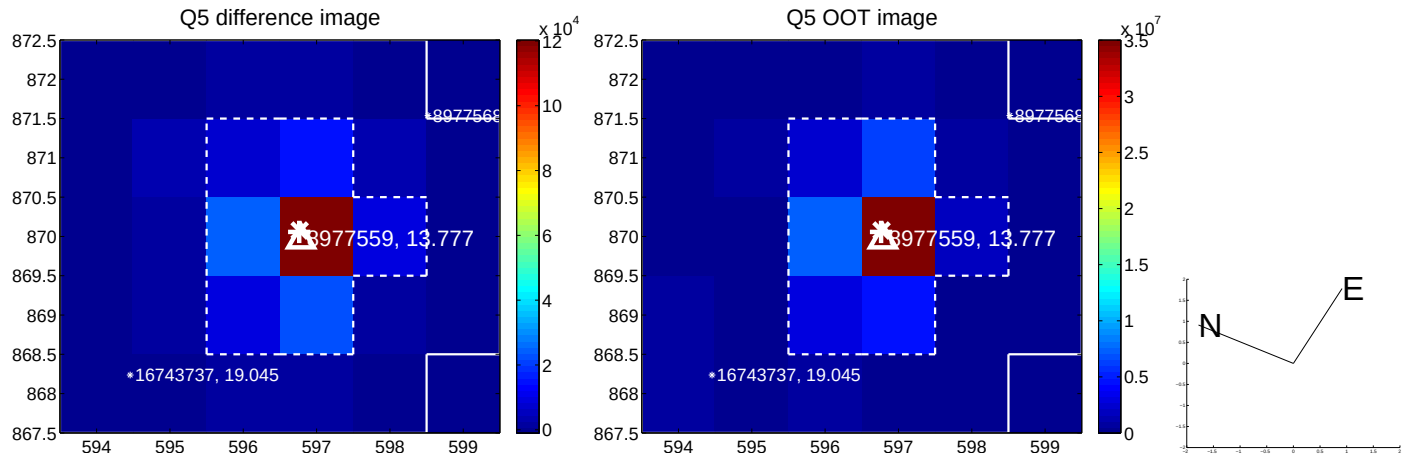


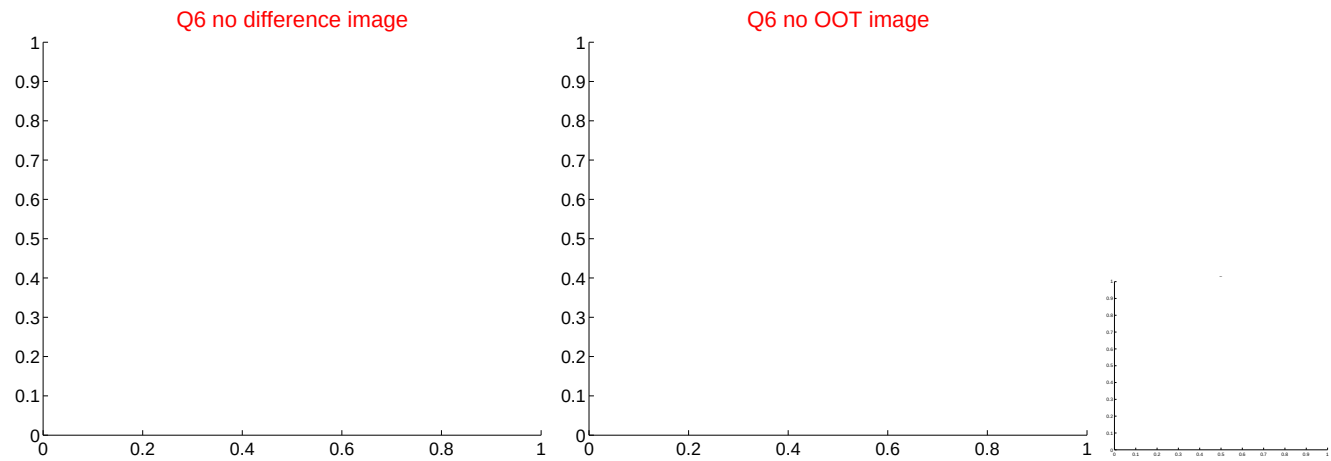
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

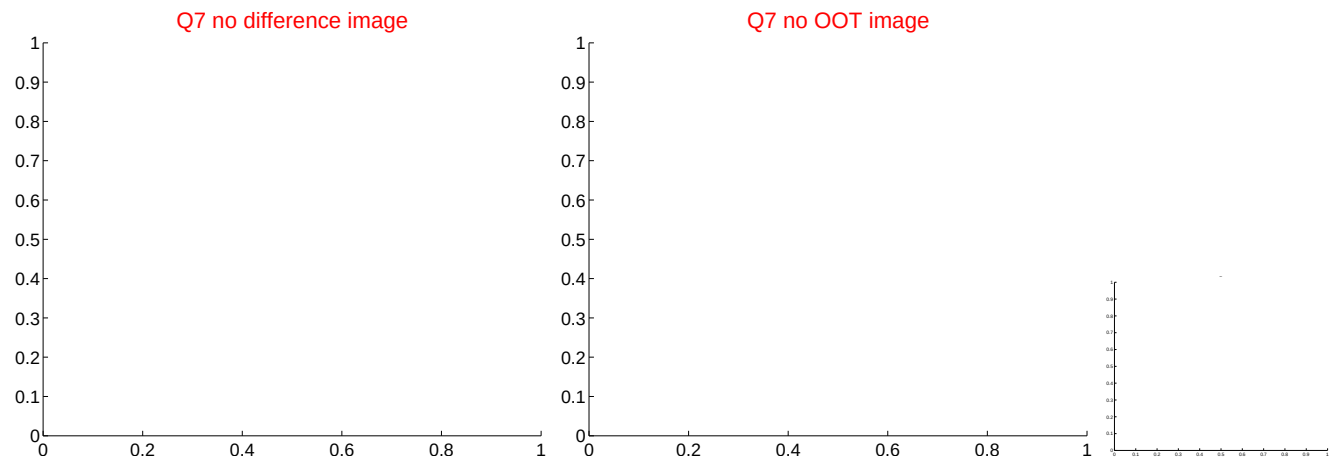
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

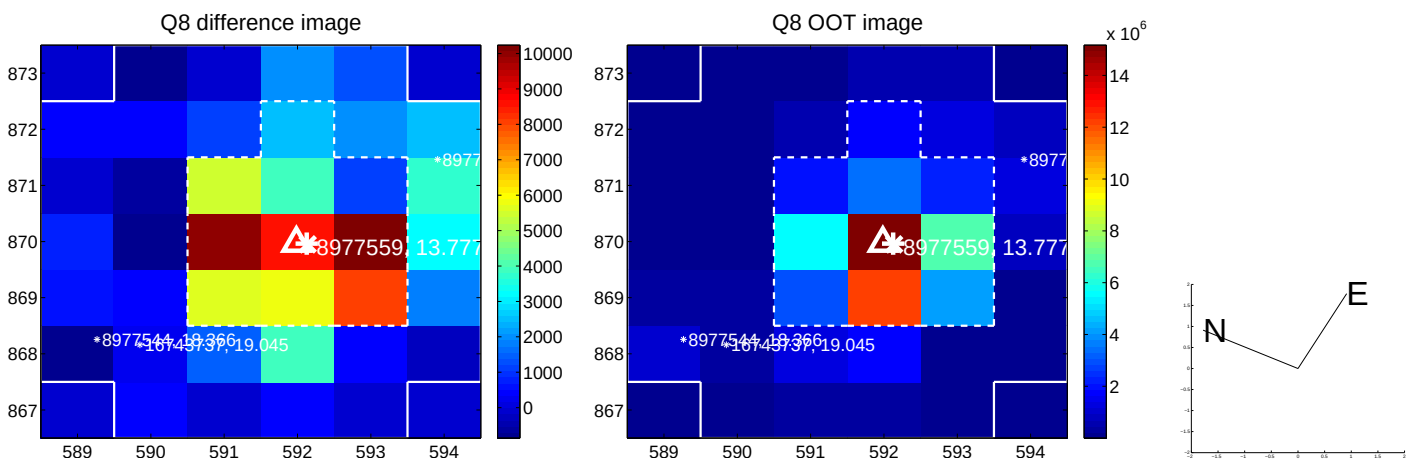


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

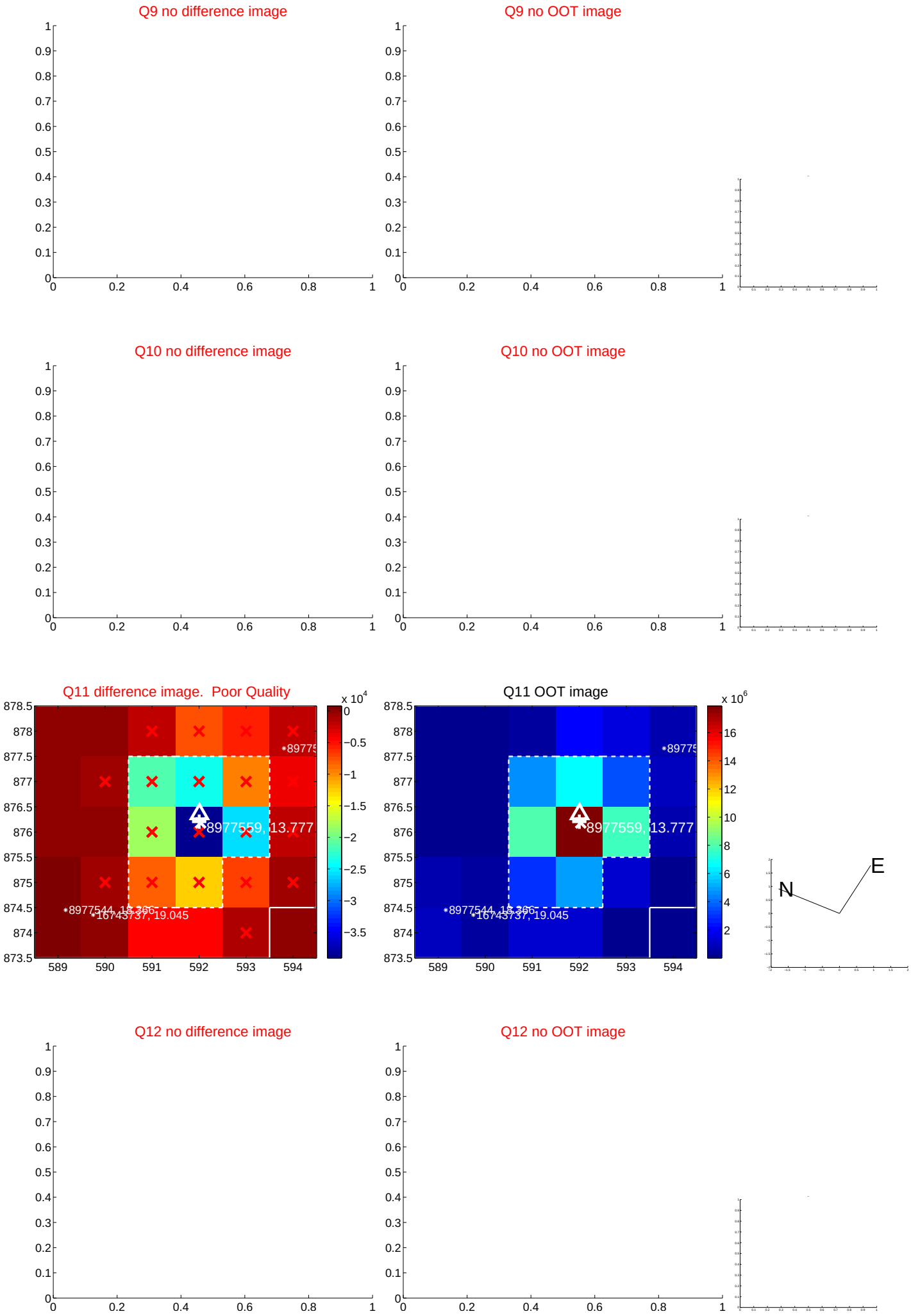




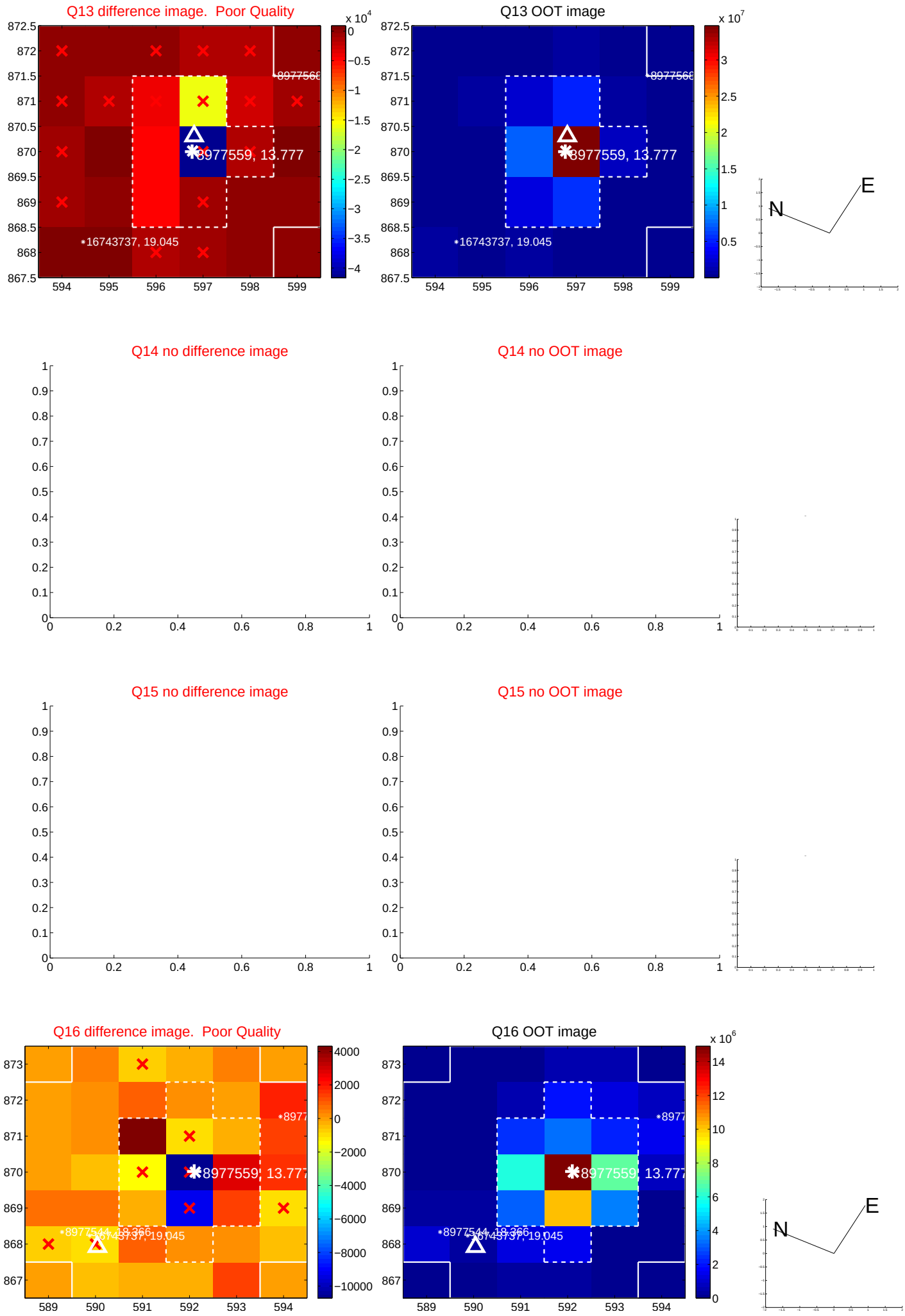




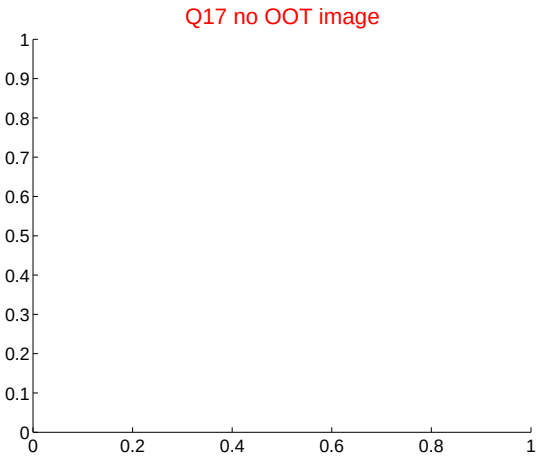
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

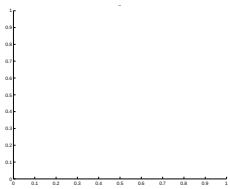


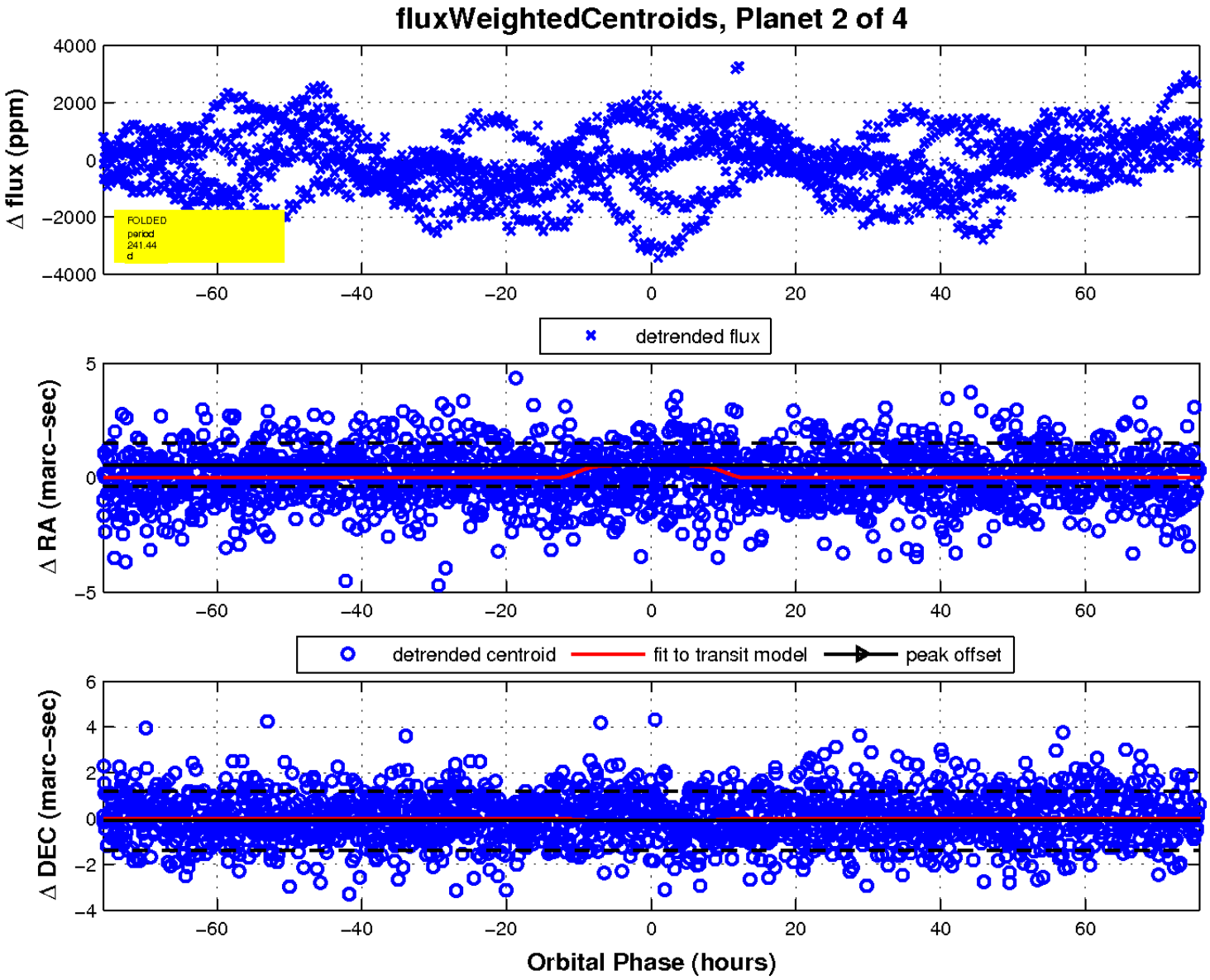
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



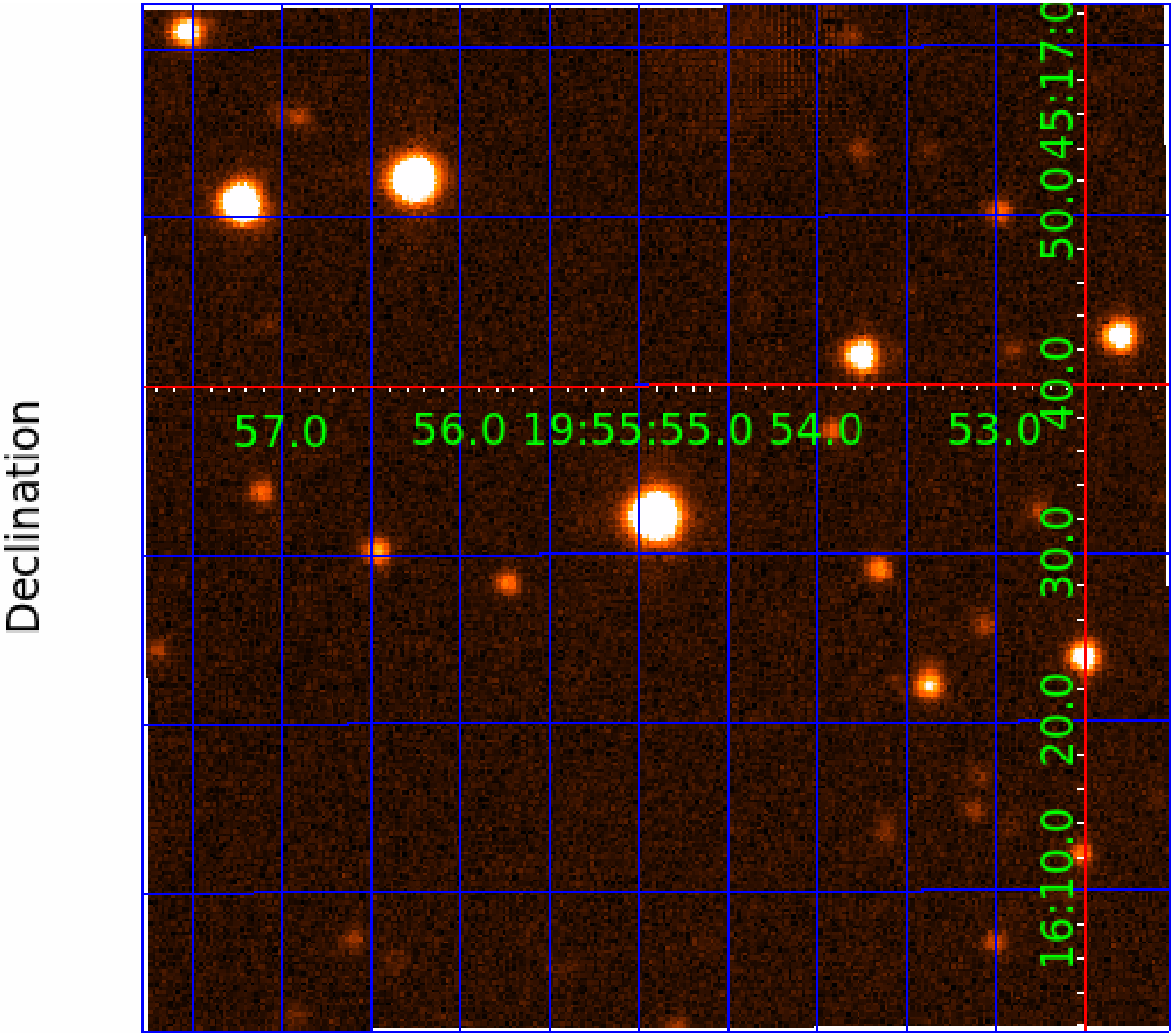
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.







UKIRT Image


Declination
57.0
56.0
19:55:55.0
54.0
53.0
16:10.0
20.0
30.0
40.0
50.0
45:17:0

KIC 008977559

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 ($S_\oplus$)
008977559-01	OBS	No	2.410428	133.254764	111.0	10.353	9.0	10.8	2.50	5934	3.10	5302.32
008977559-02	OBS	No	241.438349	288.180403	1317.9	25.283	8.8	5.5	2.50	5934	10.79	11.40
008977559-03	OBS	No	395.311941	173.088521	549.9	15.735	8.7	3.9	2.50	5934	6.95	5.91
008977559-04	OBS	No	271.606901	292.295304	2482.3	17.395	7.3	8.9	2.50	5934	15.21	9.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008977559-01	OBS	FP	0.00	1	0	0	0	LPP_DV
008977559-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008977559-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008977559-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS

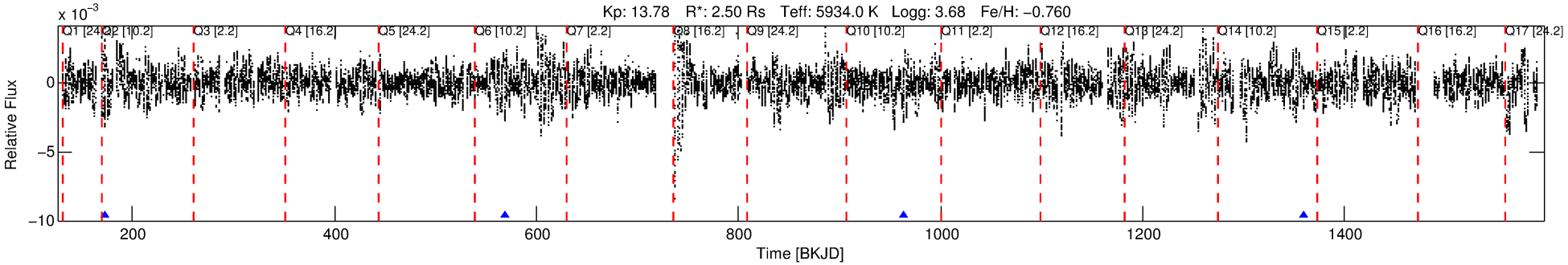
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

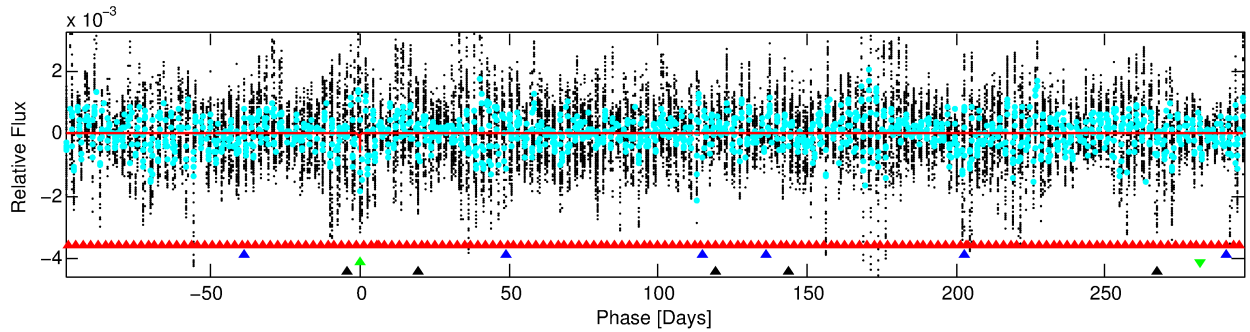
Ephemeris Match Information For 008977559-03

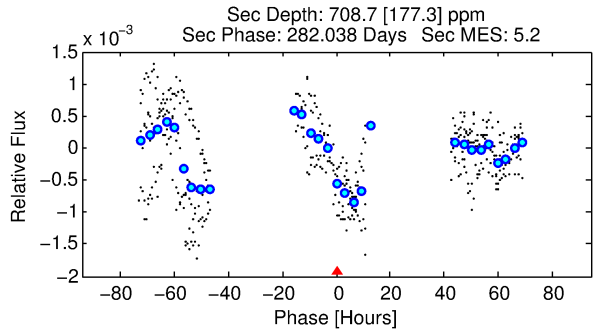
No Significant Match Found

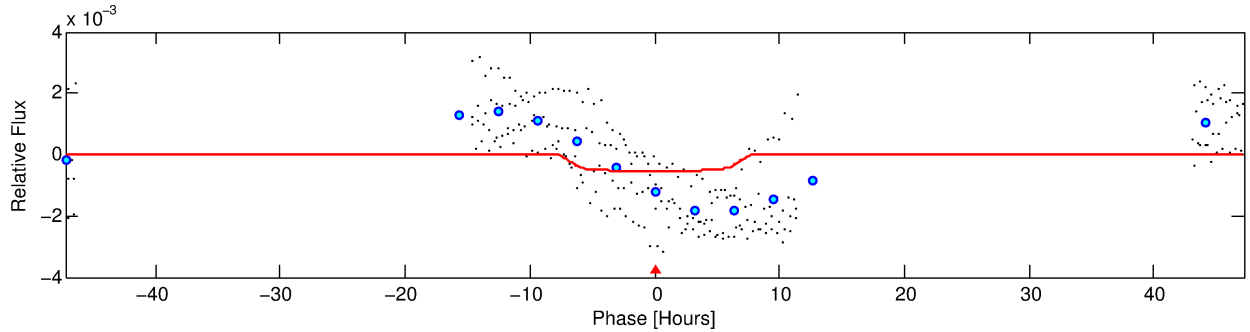
DV One-Page Summary

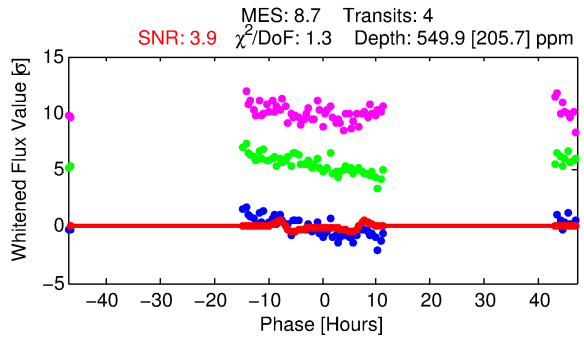
KIC: 8977559 Candidate: 3 of 4 Period: 395.312 d

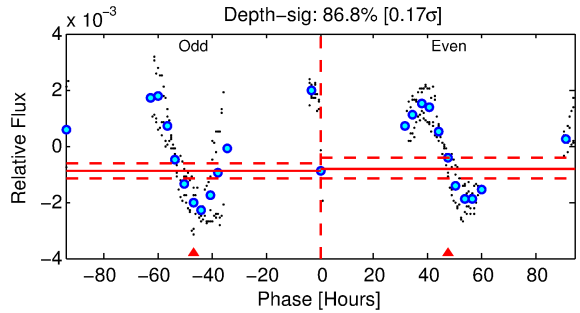


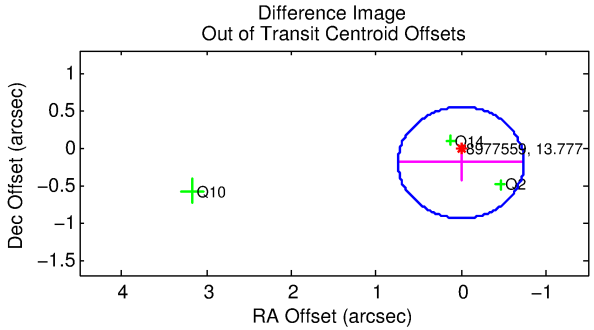












DV Fit Results:

Period = 395.31194 [0.01389] d
Epoch = 173.0885 [0.0299] BKJD
Rp/R* = 0.0255 [0.0053]
a/R* = 90.79 [25.15]
b = 0.91 [0.05]

Seff = 5.91 [7.34]
Teq = 398 [124] K
Rp = 6.95 [4.80] Re
a = 1.0855 [0.7875] AU

Ag = 9503.38 [12605.71] [0.75σ]
Teffp = 6068 [764] K [7.33σ]

DV Diagnostic Results:

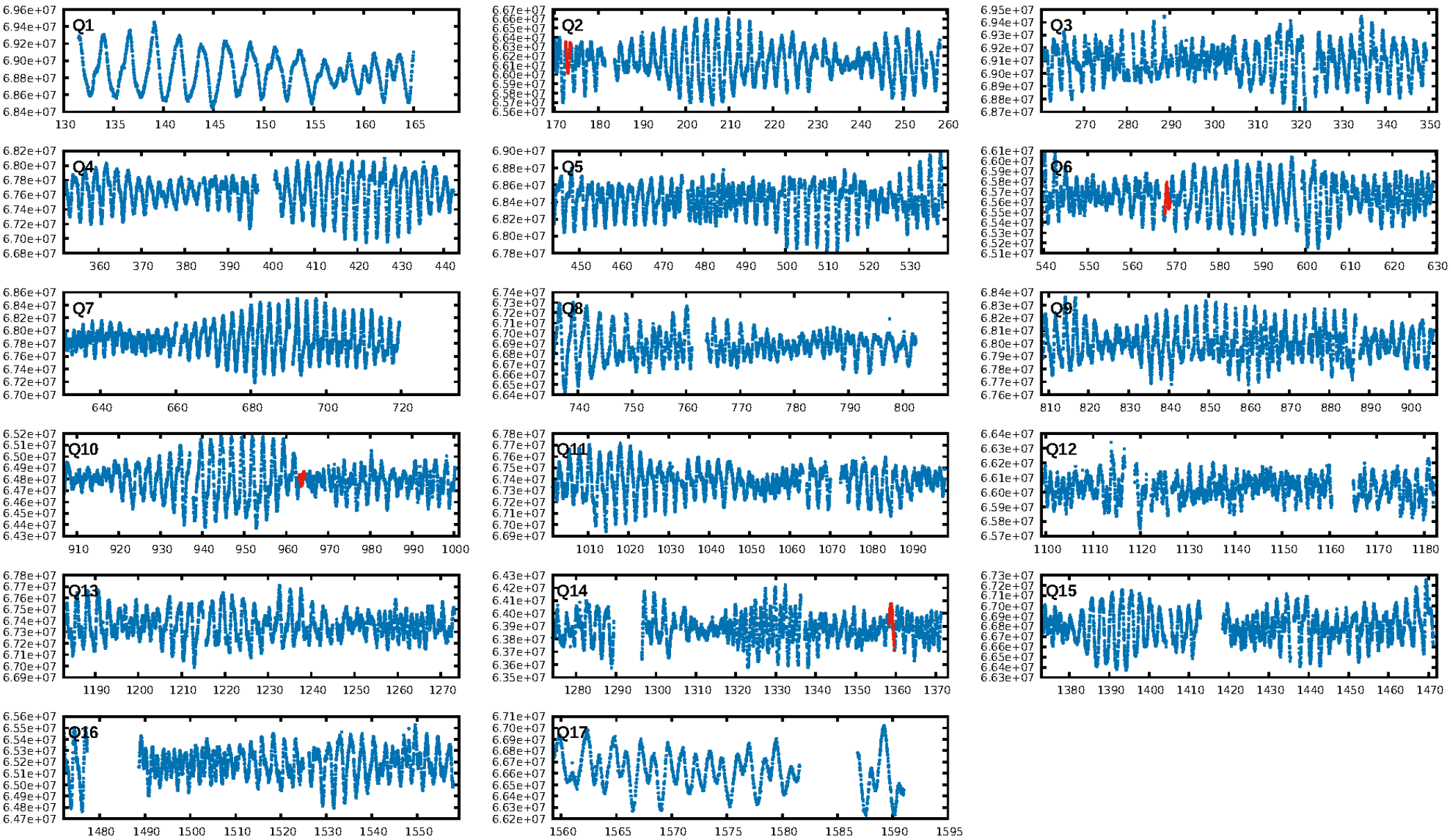
ShortPeriod−sig: 100.0% [126.58σ]
LongPeriod−sig: N/A
ModelChiSquare2−sig: 0.1%
ModelChiSquareGof−sig: 96.4%
Bootstrap−pfa: 2.17e−09
RollingBand−fgt: 1.00 [4/4]
GhostDiagnostic−chr: −2.241

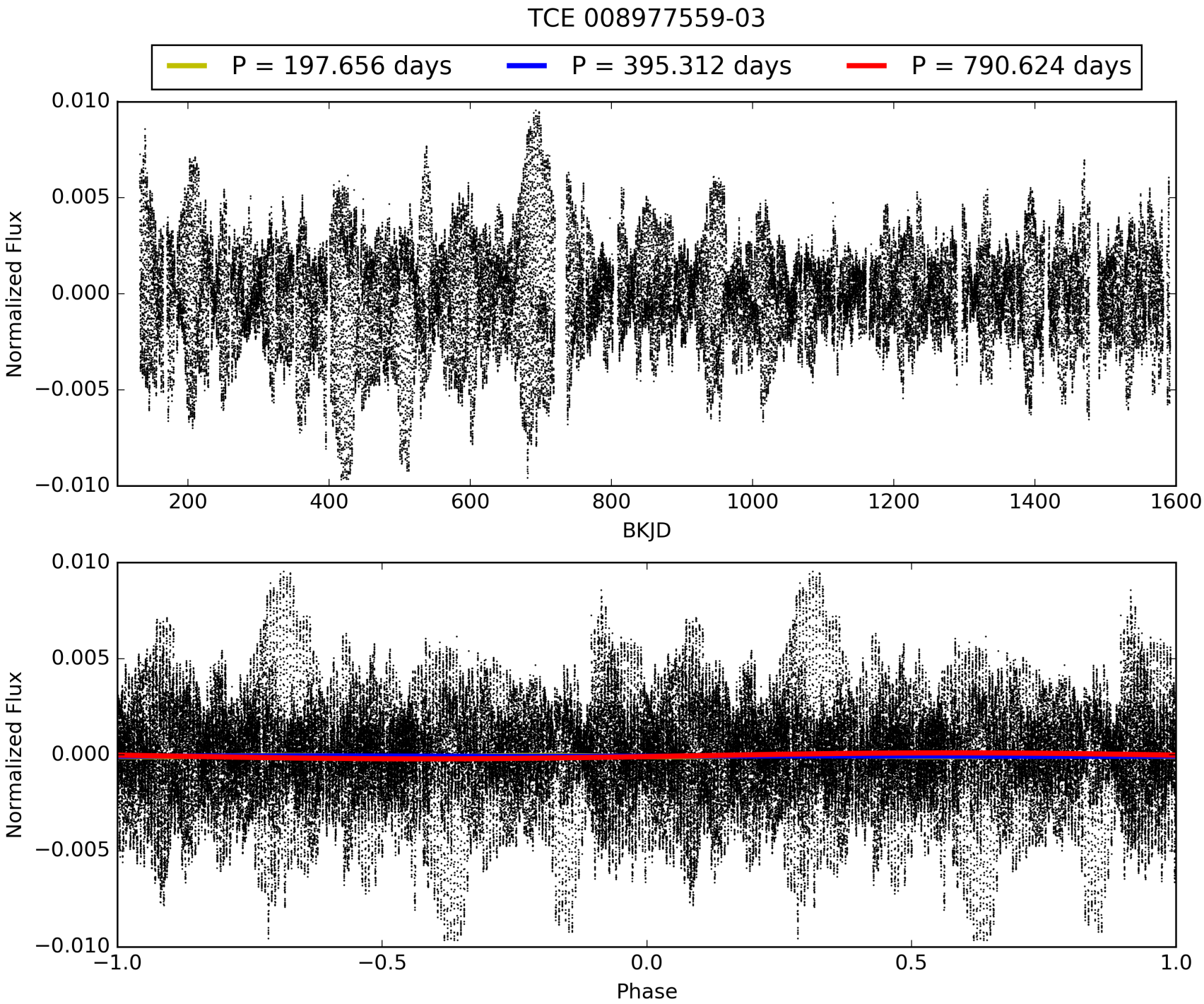
Centroid−sig: 0.2%
Centroid−so: 1.514 arcsec [1.88σ]
OotOffset−rm: 0.200 arcsec [0.81σ]
KicOffset−rm: 0.127 arcsec [0.41σ]
OotOffset−st: 3/0/0/0 [3]
KicOffset−st: 3/0/0/0 [3]
DiffImageQuality−fgm: 0.33 [1/3]
DiffImageOverlap−fno: 0.00 [0/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 10:59:59 Z

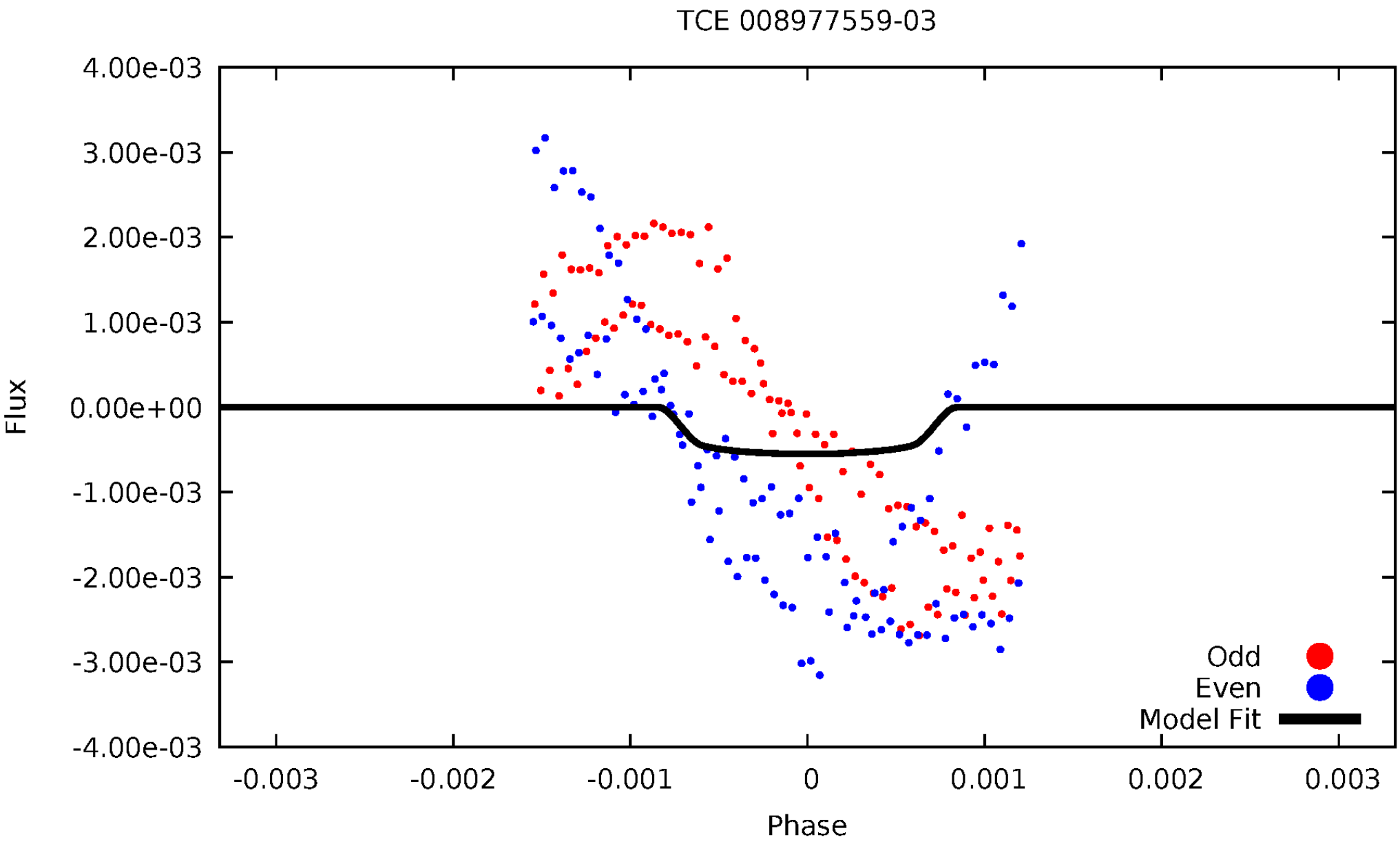
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008977559-03, PDC Light Curves

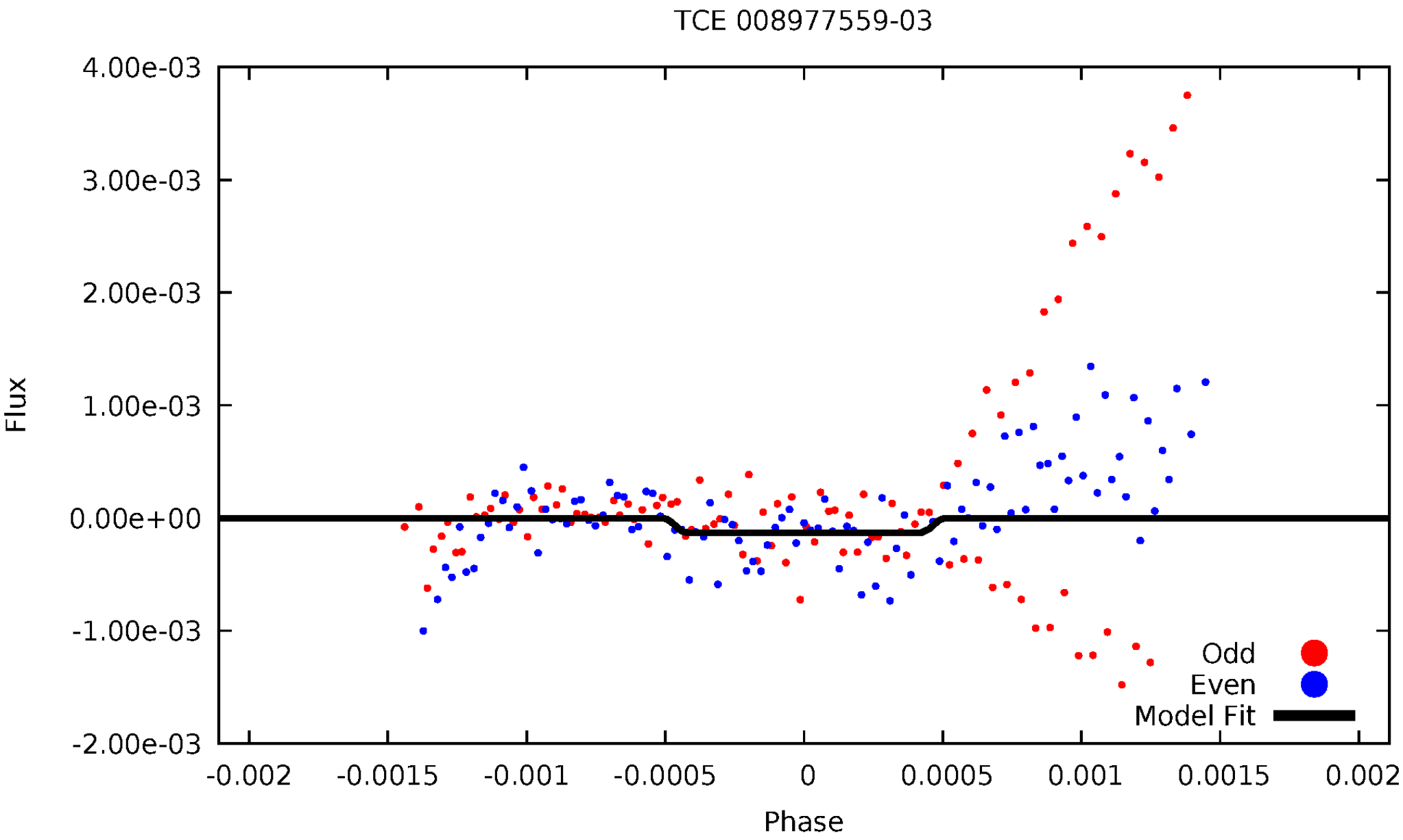



TCE 008977559-03
P = 197.656 days
P = 395.312 days
P = 790.624 days
Normalized Flux
0.010
0.005
0.000
−0.005
−0.010
200
400
600
800
1000
1200
1400
1600
BKJD
Normalized Flux
0.010
0.005
0.000
−0.005
−0.010
−1.0
−0.5
0.0
0.5
1.0
Phase

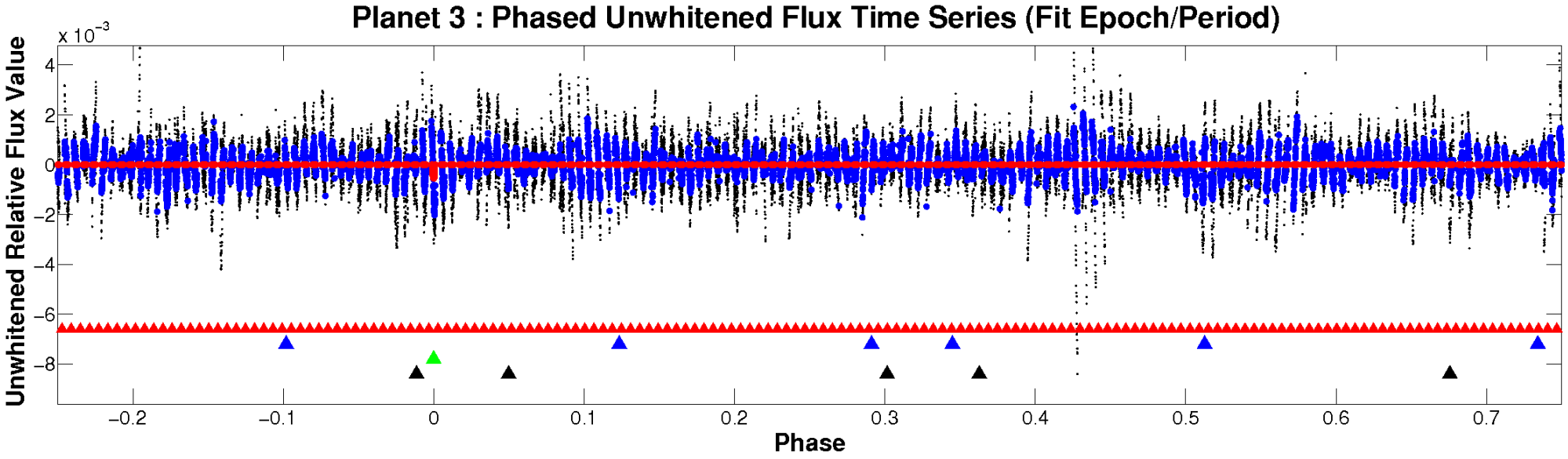
DV Odd/Even

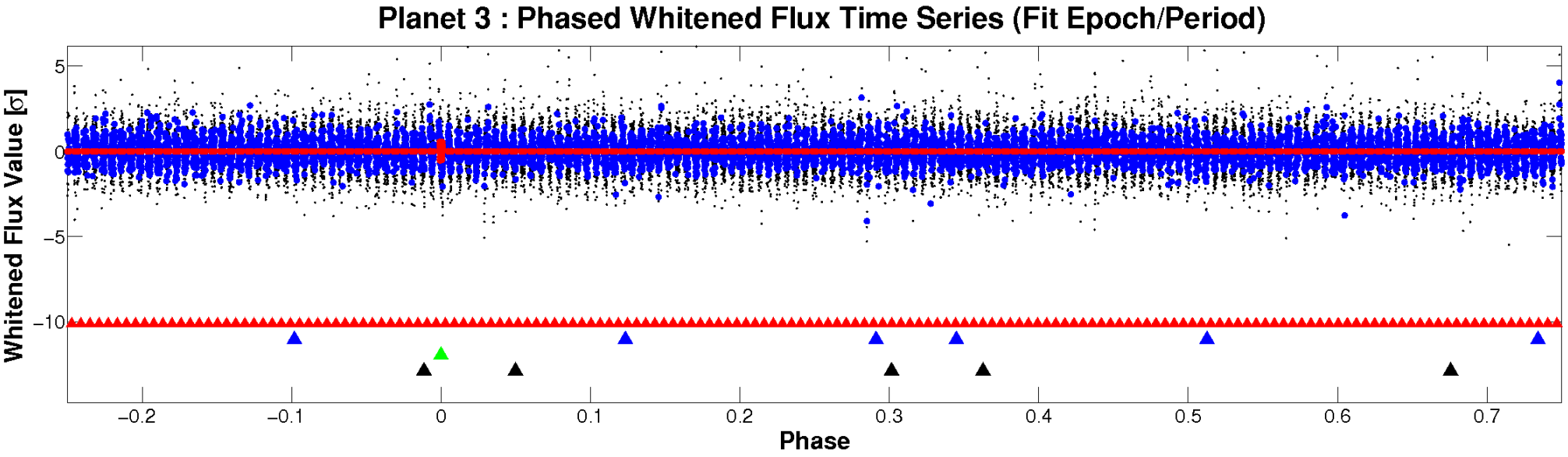

TCE 008977559-03
4.00e-03
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
-4.00e-03
Flux
-0.003
-0.002
-0.001
0
0.001
0.002
0.003
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 008977559-03
4.00e-03
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
Flux
-0.002
-0.0015
-0.001
-0.0005
0
0.0005
0.001
0.0015
0.002
Phase
Odd
Even
Model Fit

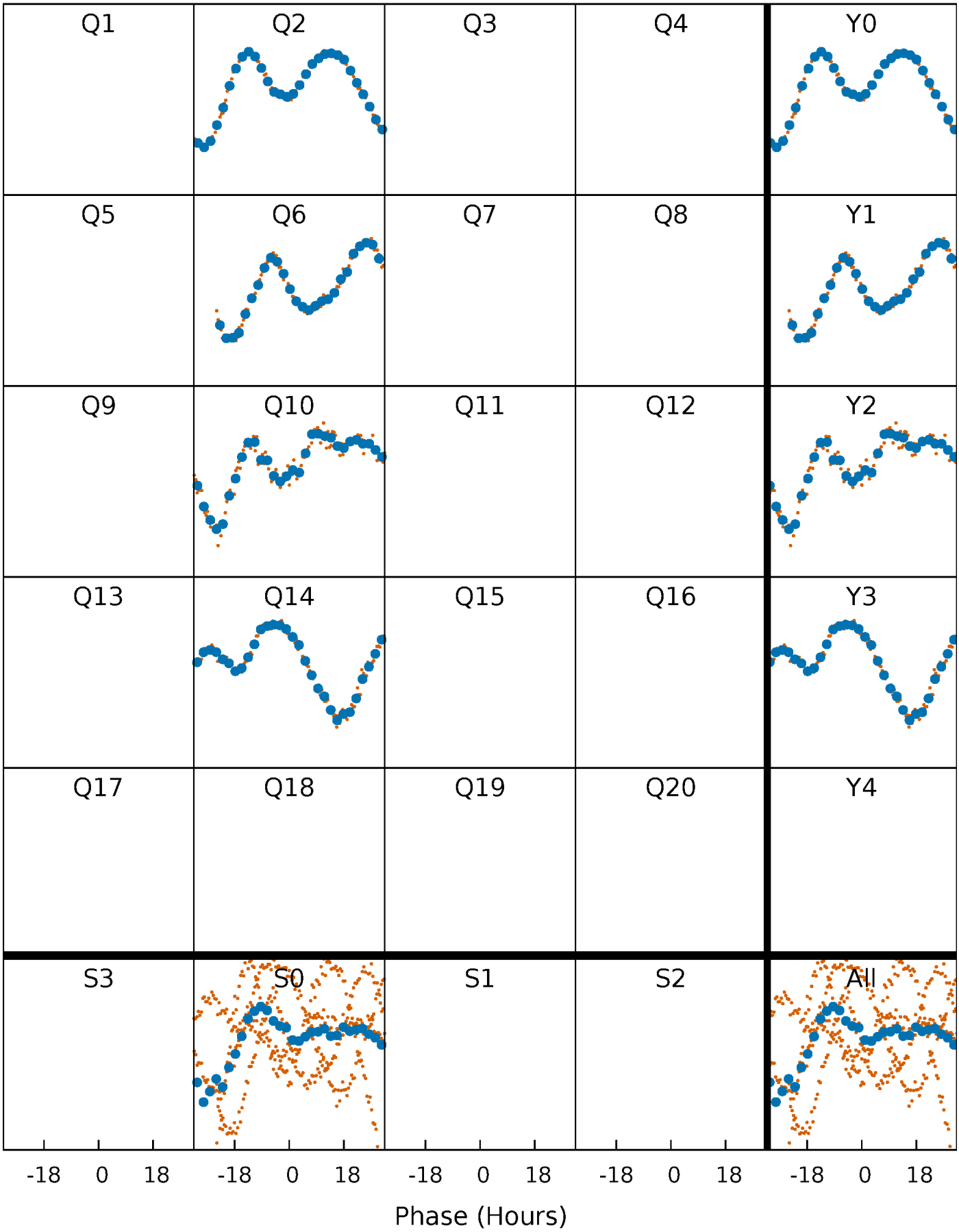
Non-Whitened Vs. Whitened Light Curve





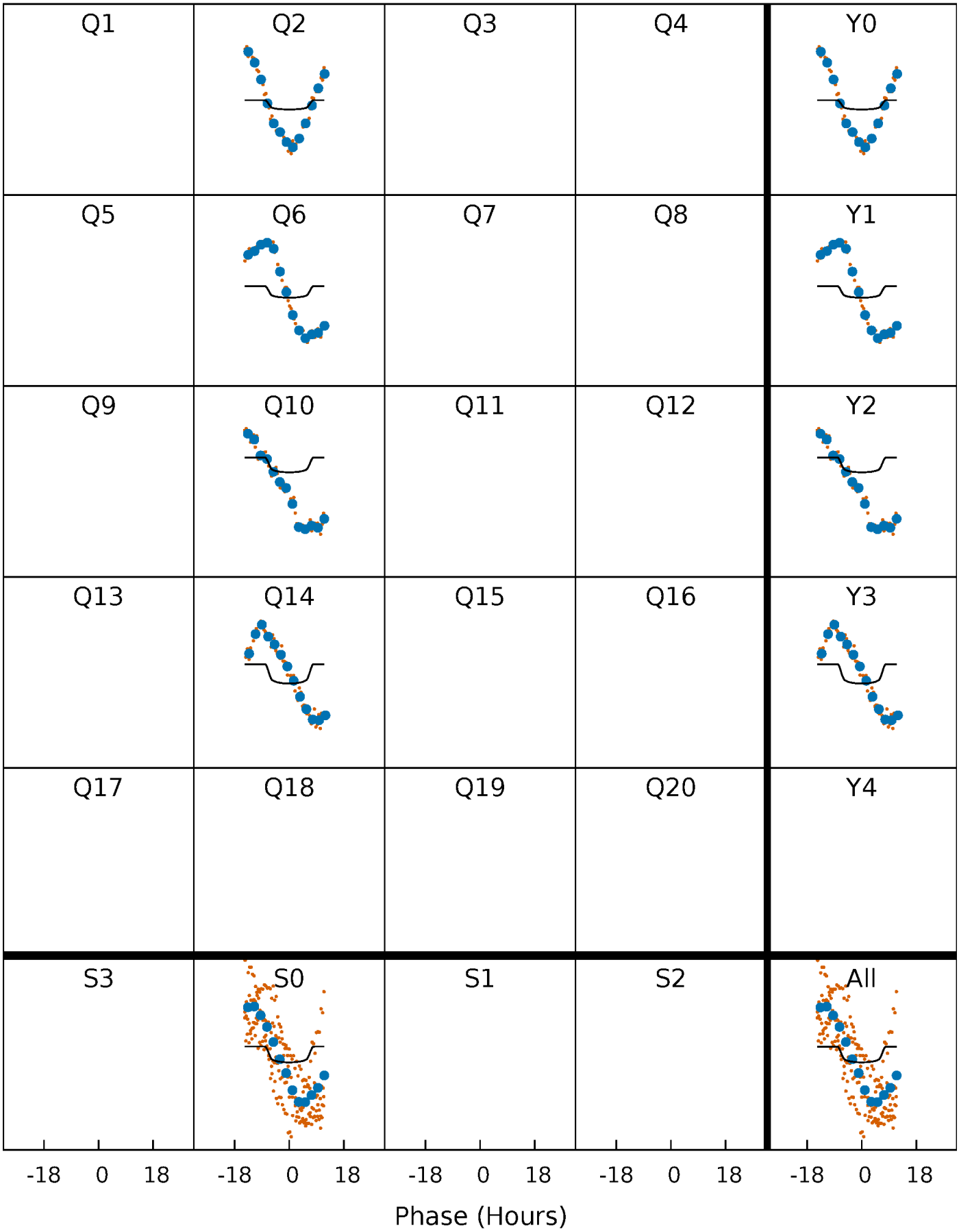
PDC Quarter-Phased Transit Curves

TCE 008977559-03 P=395.311941 Days T_0=173.088520 (BKJD)



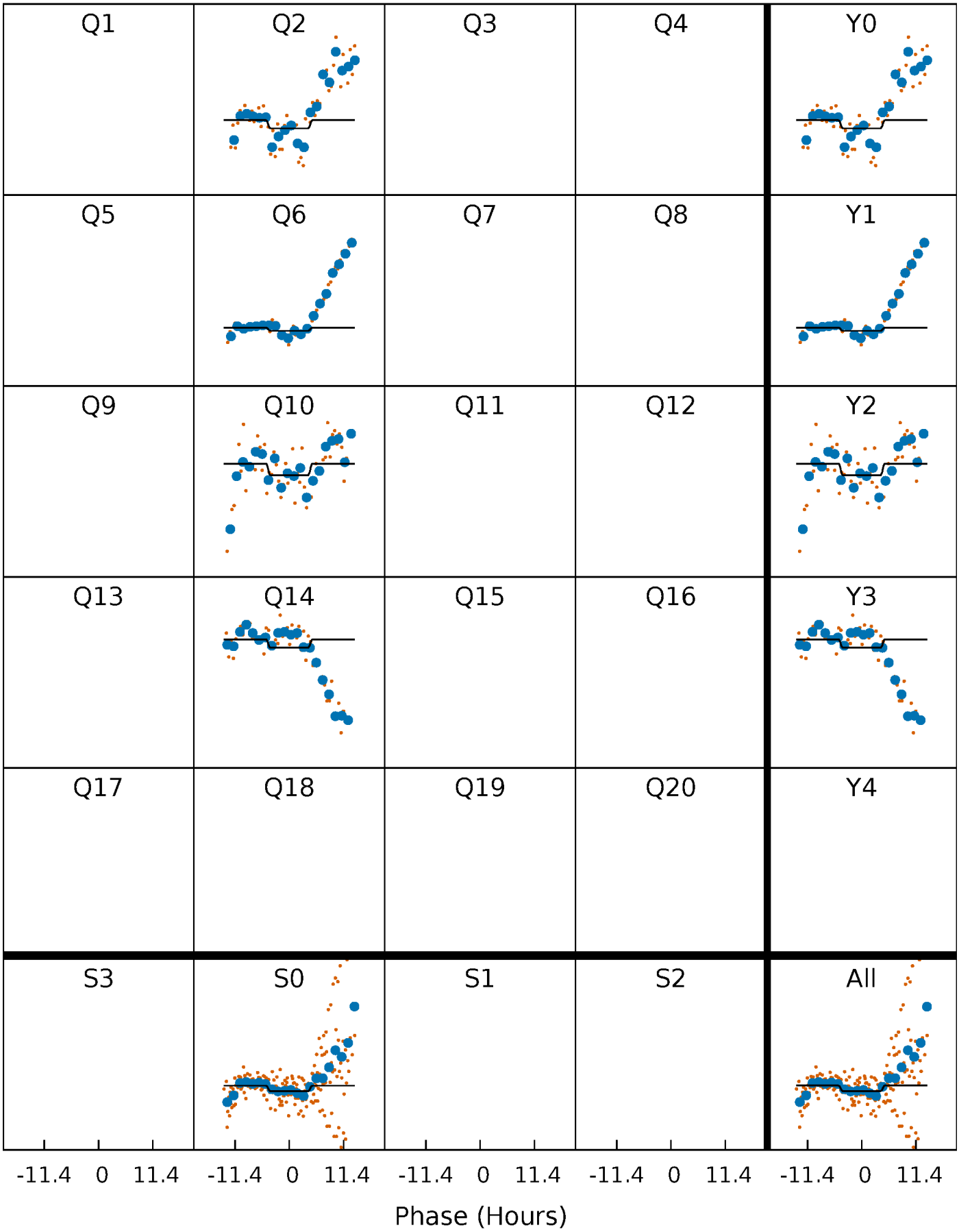
DV Quarter-Phased Transit Curves

TCE 008977559-03 P=395.311941 Days T_0=173.088520 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

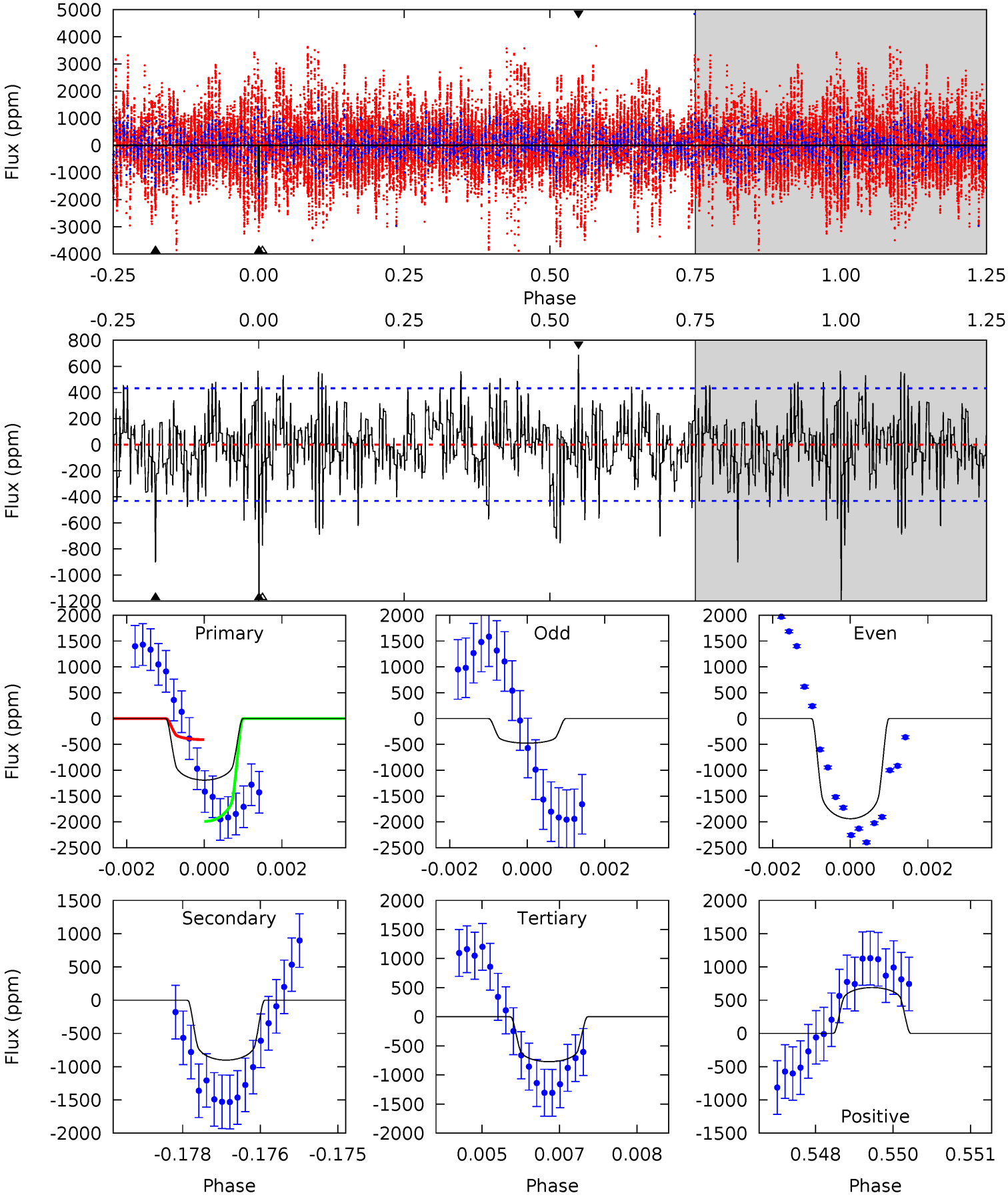
TCE 008977559-03 P=395.334897 Days T_0=172.993662 (BKJD)



DV Model-Shift Uniqueness Test

008977559-03, P = 395.311941 Days, E = 173.088520 Days

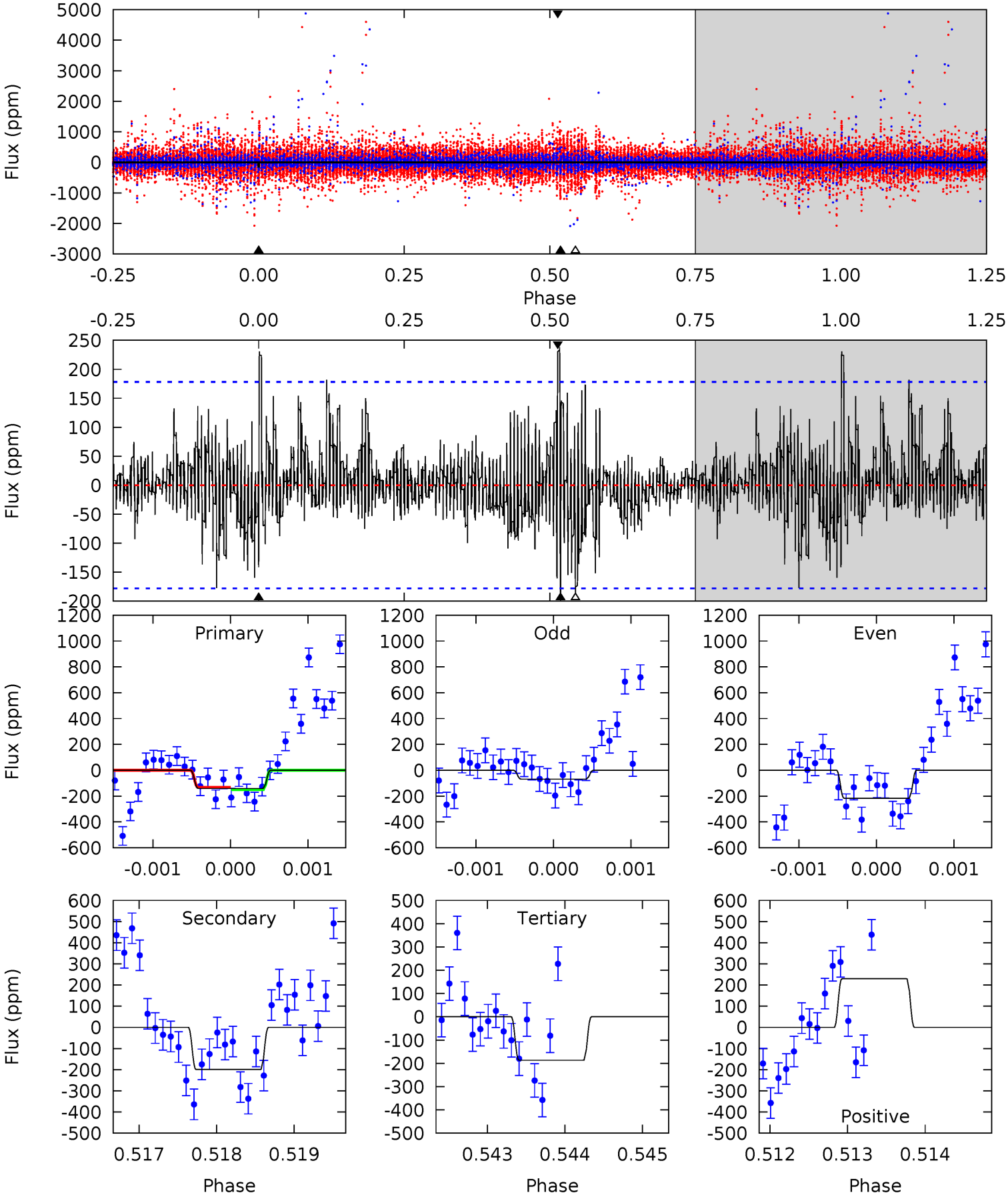
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.8	11.2	9.58	8.56	5.36	3.14	2.74	5.20	6.23	1.61	2.64	8.62	1.02	0.37	9.83



Alt Model-Shift Uniqueness Test

008977559-03, P = 395.334897 Days, E = 172.993662 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.33	6.09	5.72	7.05	5.45	3.29	1.40	-1.39	-2.73	0.37	-0.96	1.78	0.87	0.54	0.27



Stellar Parameters For KIC 008977559

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5934^{+209}_{-188}	$3.679^{+0.752}_{-0.188}$	$-0.760^{+0.300}_{-0.250}$	$2.503^{+0.707}_{-1.650}$	$1.090^{+0.177}_{-0.288}$	$0.098^{+1.541}_{-0.045}$
	+4%/-3%	+20%/-5%	+39%/-33%	+28%/-66%	+16%/-26%	+1575%/-45%
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 008977559-03 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-902±81	$6.39^{+2.40}_{-2.41}$	542^{+55}_{-92}	6397^{+922}_{-580}	14380^{+20795}_{-6599}
Alt.	-199±33	$2.76^{+1.80}_{-1.39}$	540^{+60}_{-91}	6435^{+2841}_{-1031}	16929^{+48905}_{-10899}

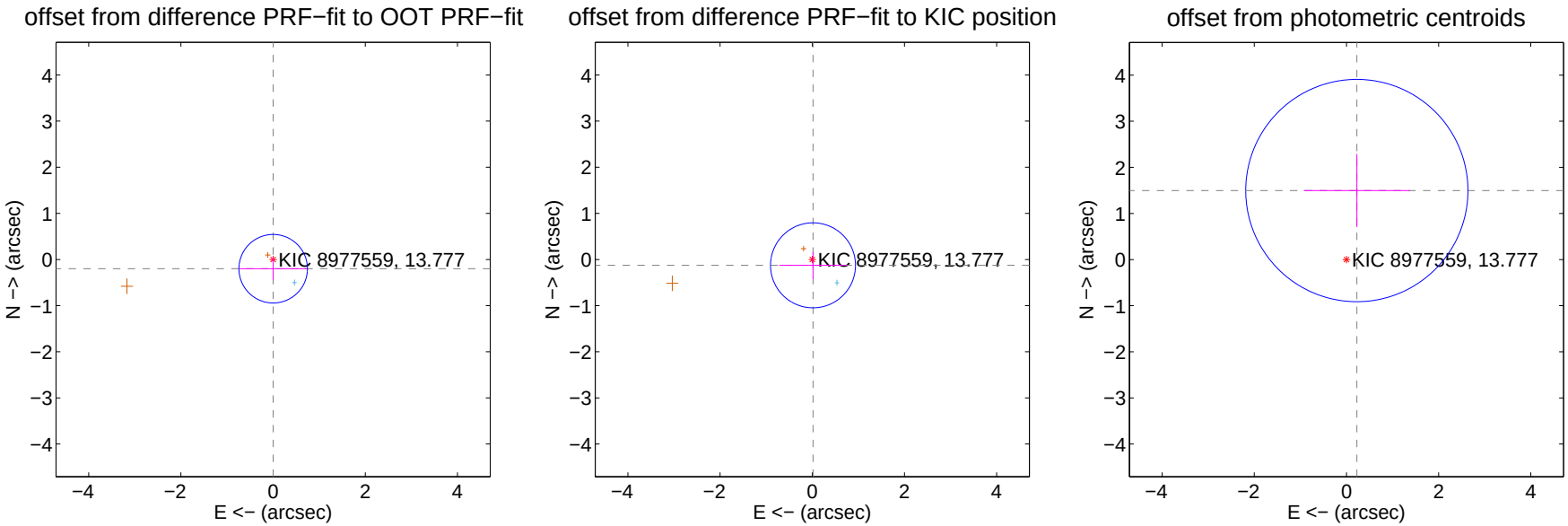
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

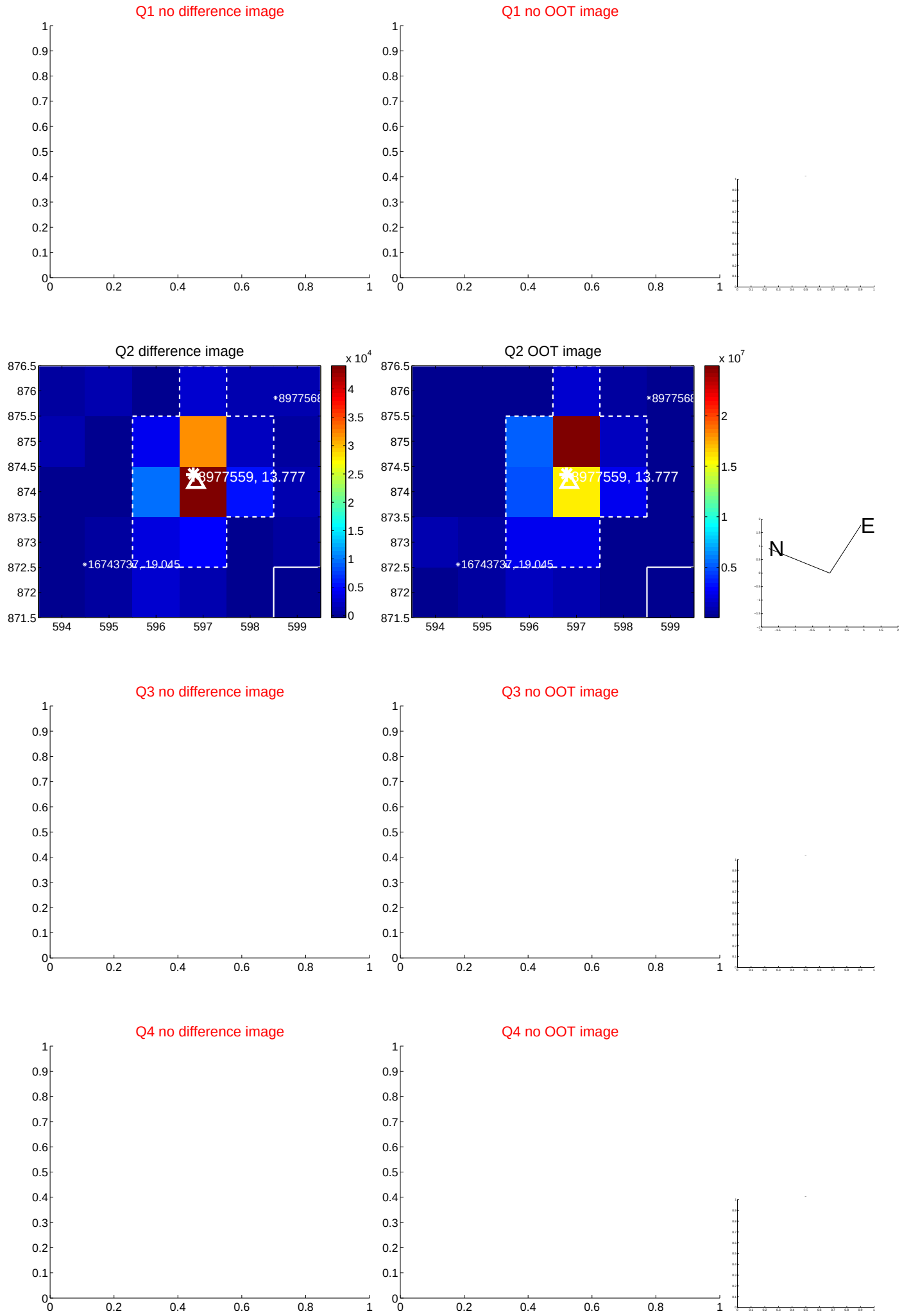
Supplemental centroid analysis for 008977559-03. Kepler magnitude: 13.78. Transit SNR 3.87
There are 1 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.200 ± 0.248	0.81	-0.002 ± 0.747	-0.200 ± 0.248
PRF-fit source offset from KIC position	0.127 ± 0.307	0.41	-0.016 ± 0.732	-0.126 ± 0.296
photometric centroid source offset	1.51 ± 0.80	1.88	-0.23 ± 1.15	1.50 ± 0.79

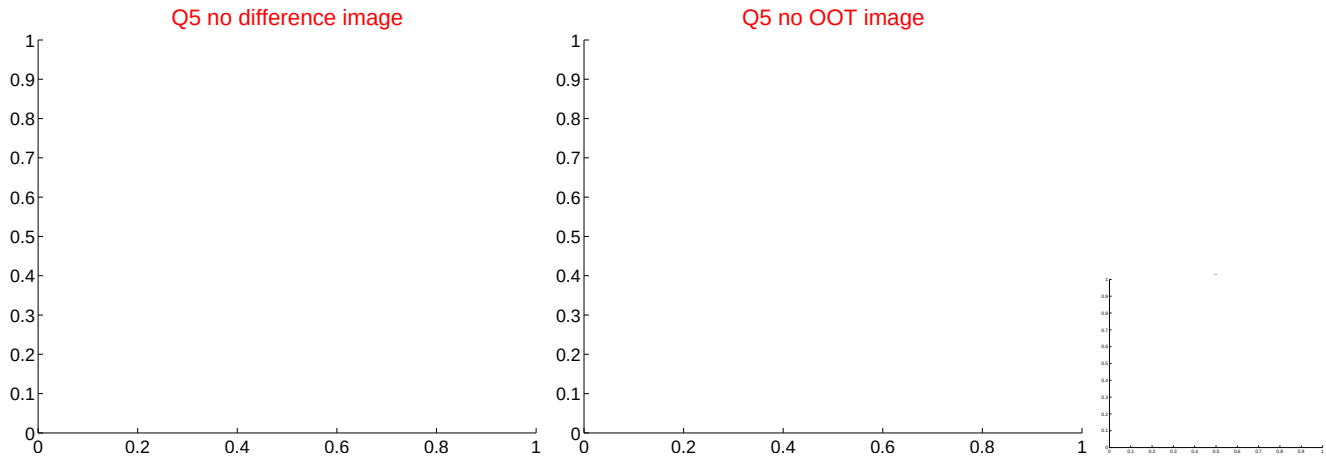


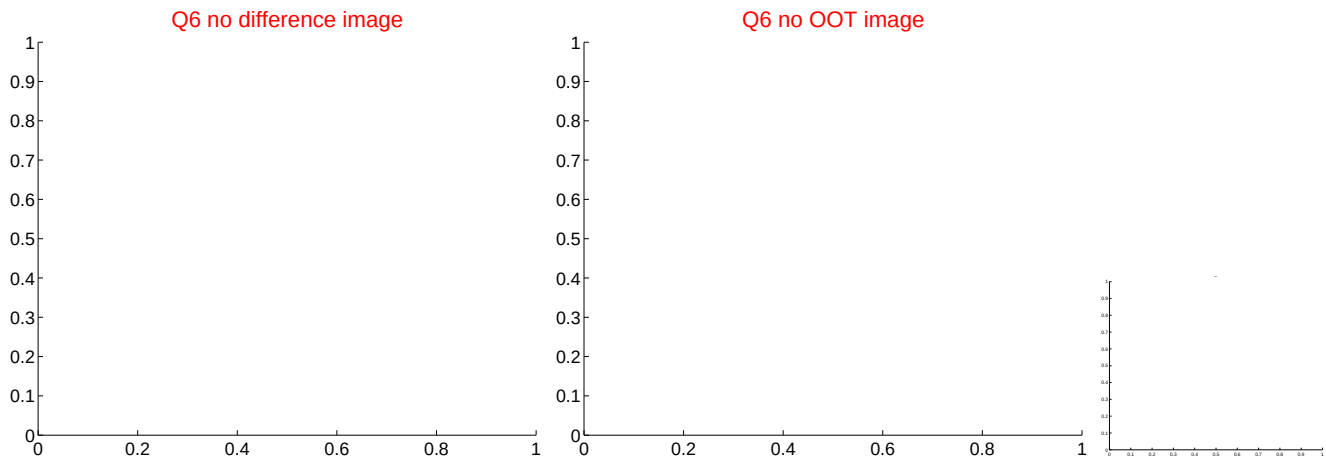
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

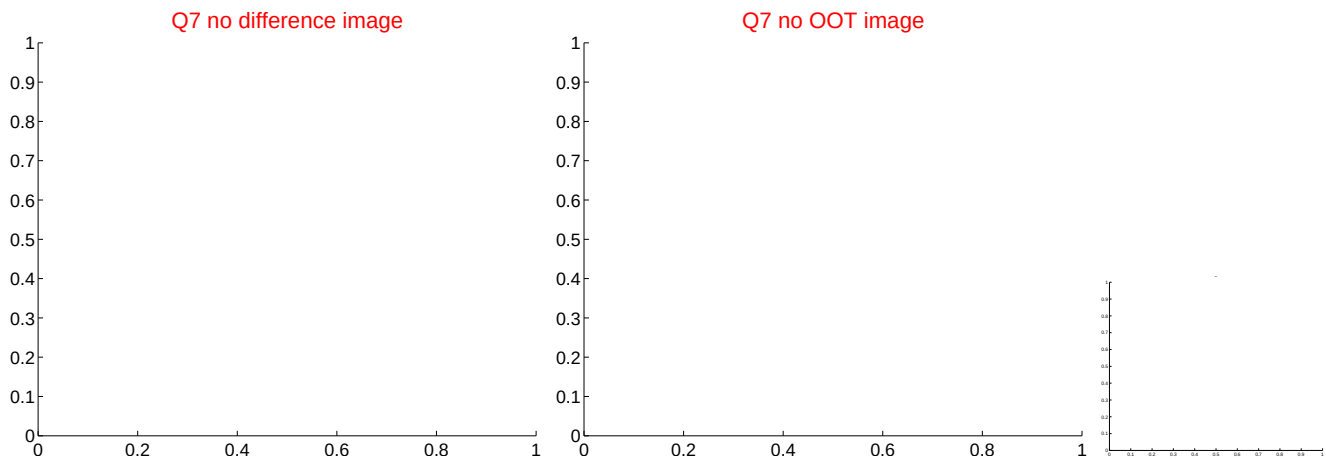
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

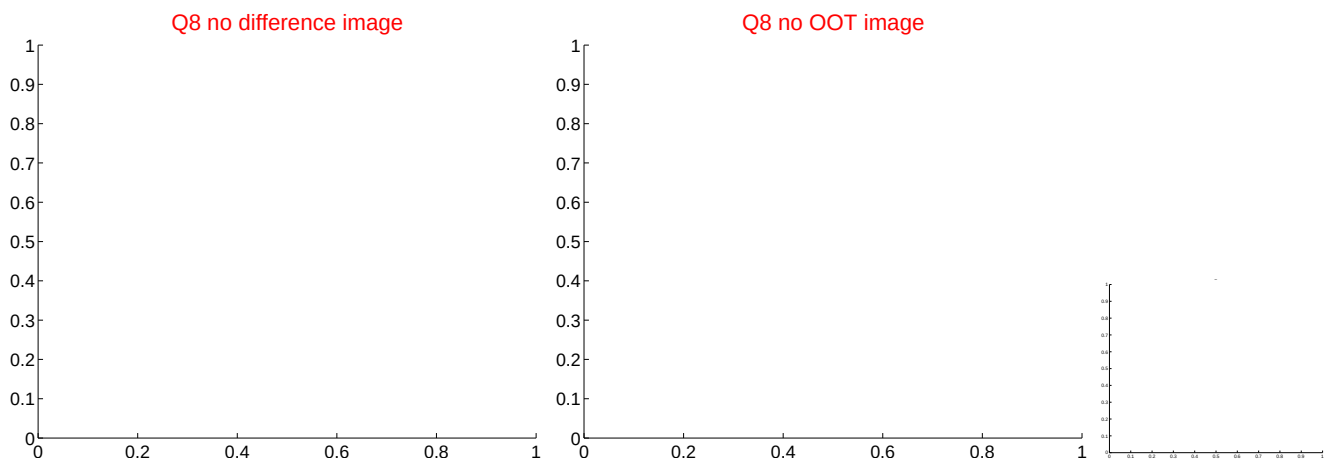


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

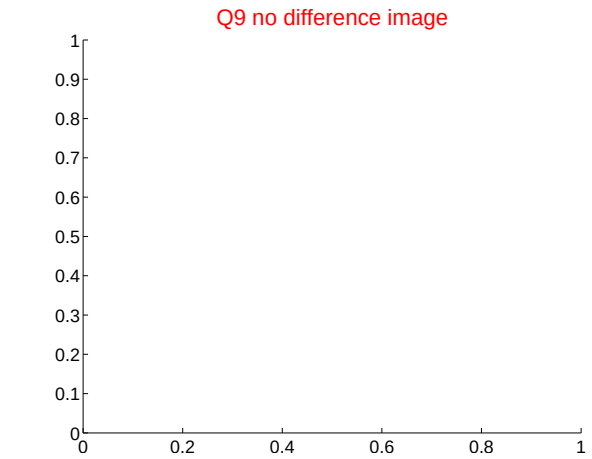


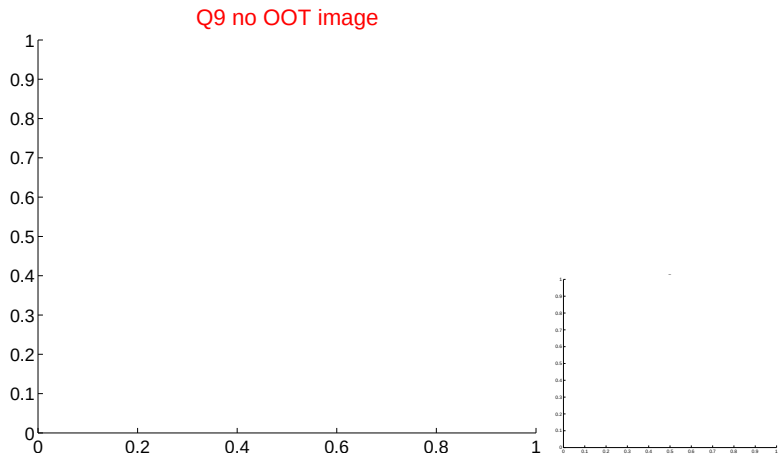


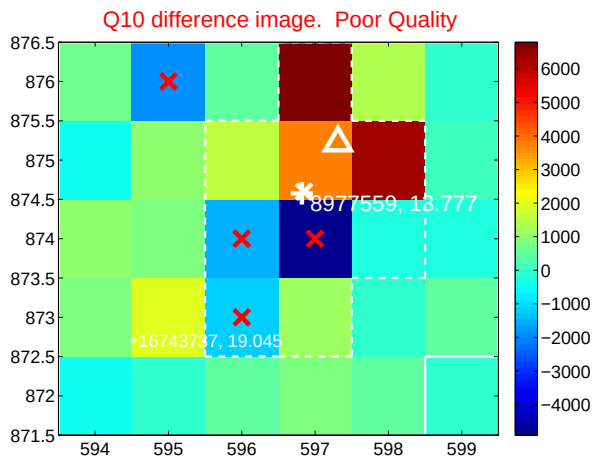


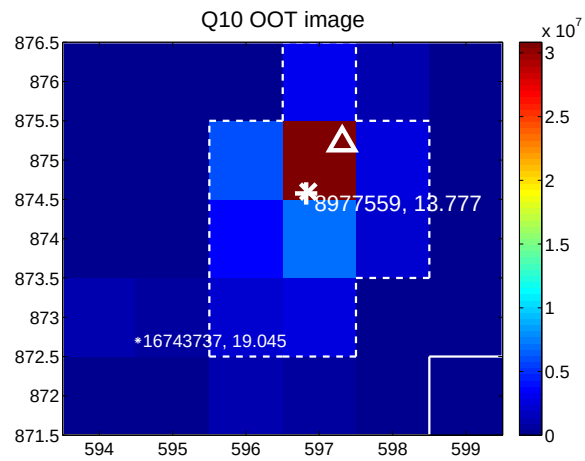


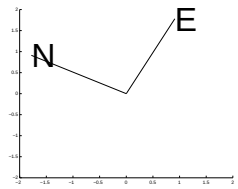
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

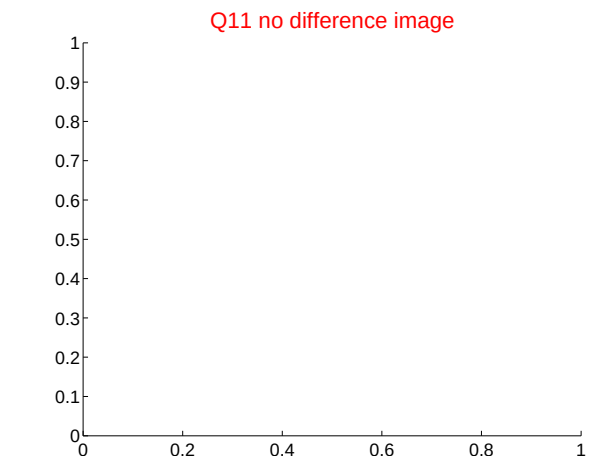


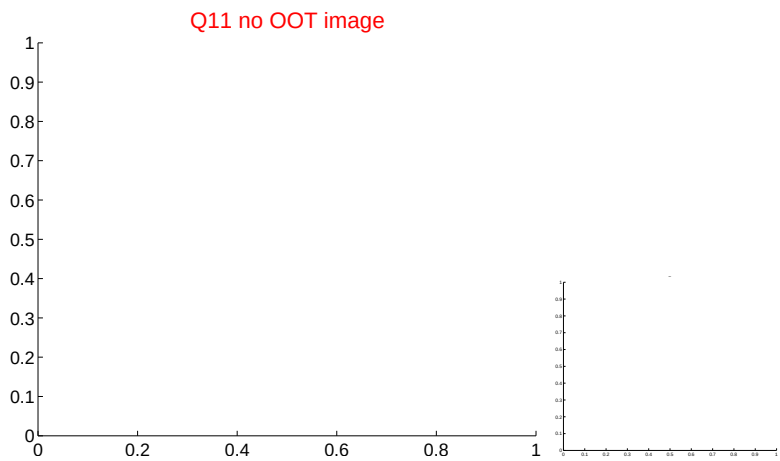


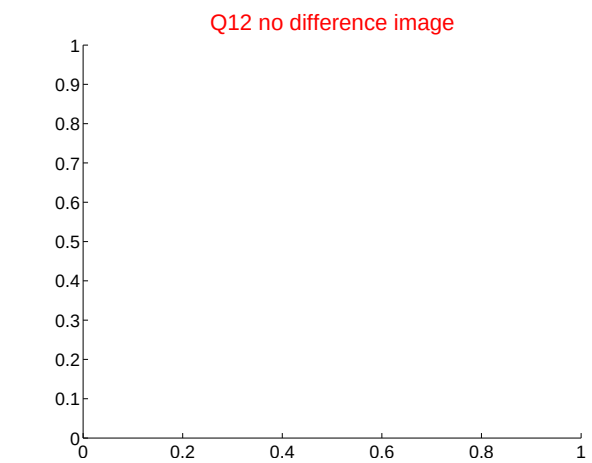


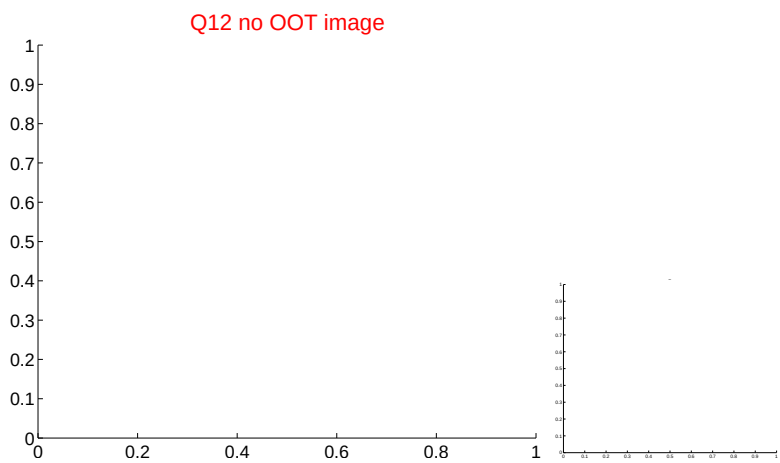




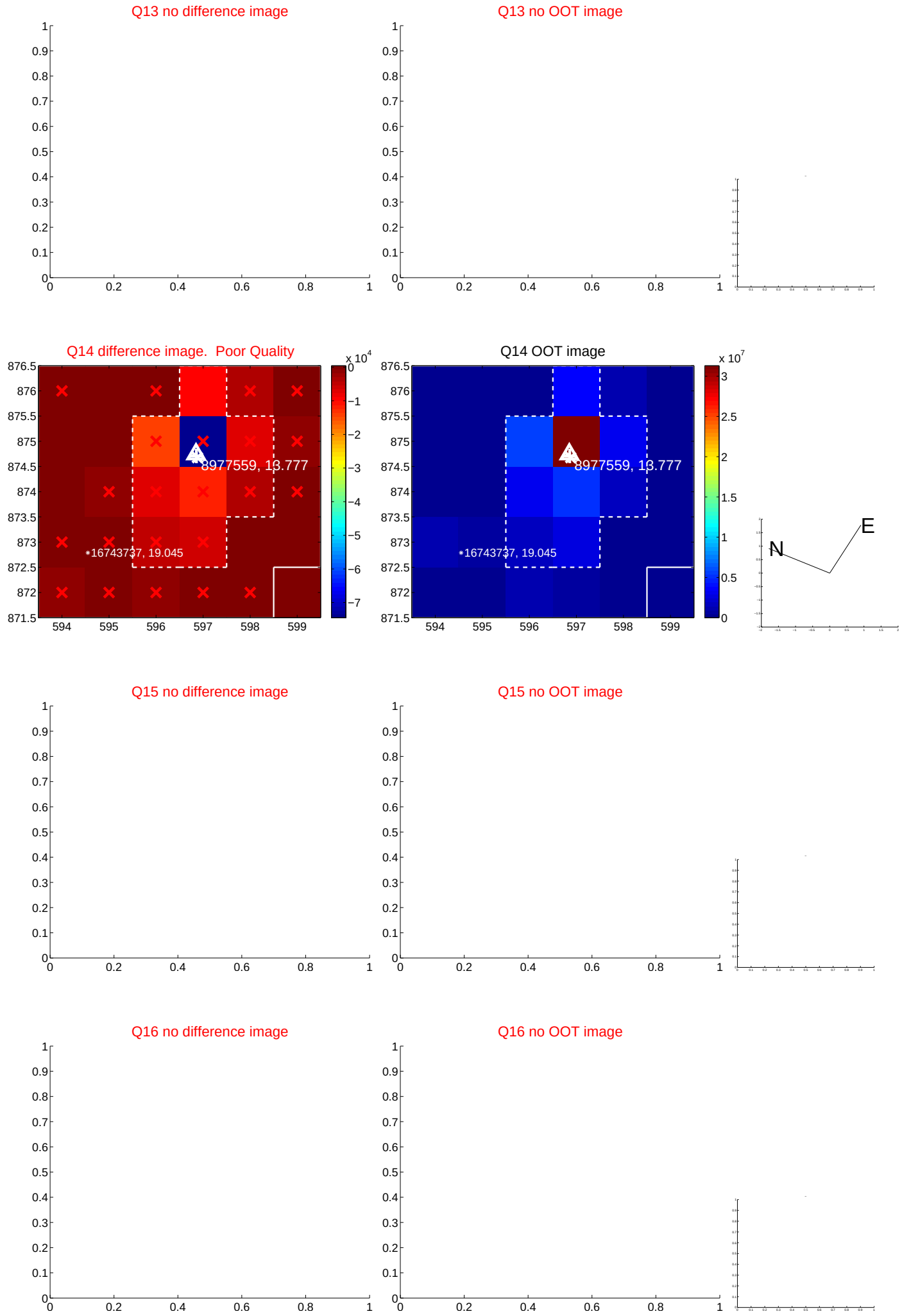




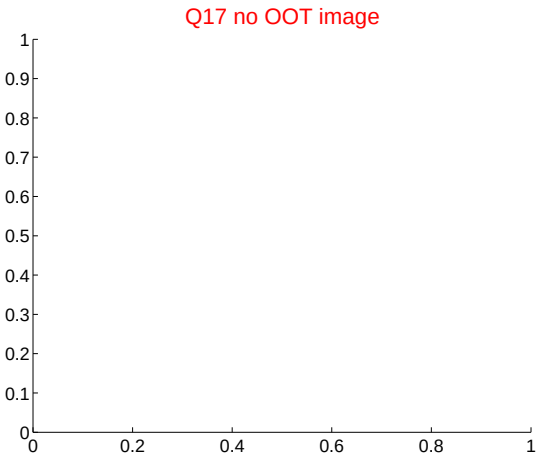


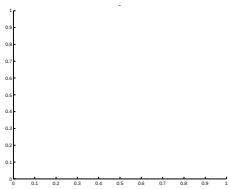


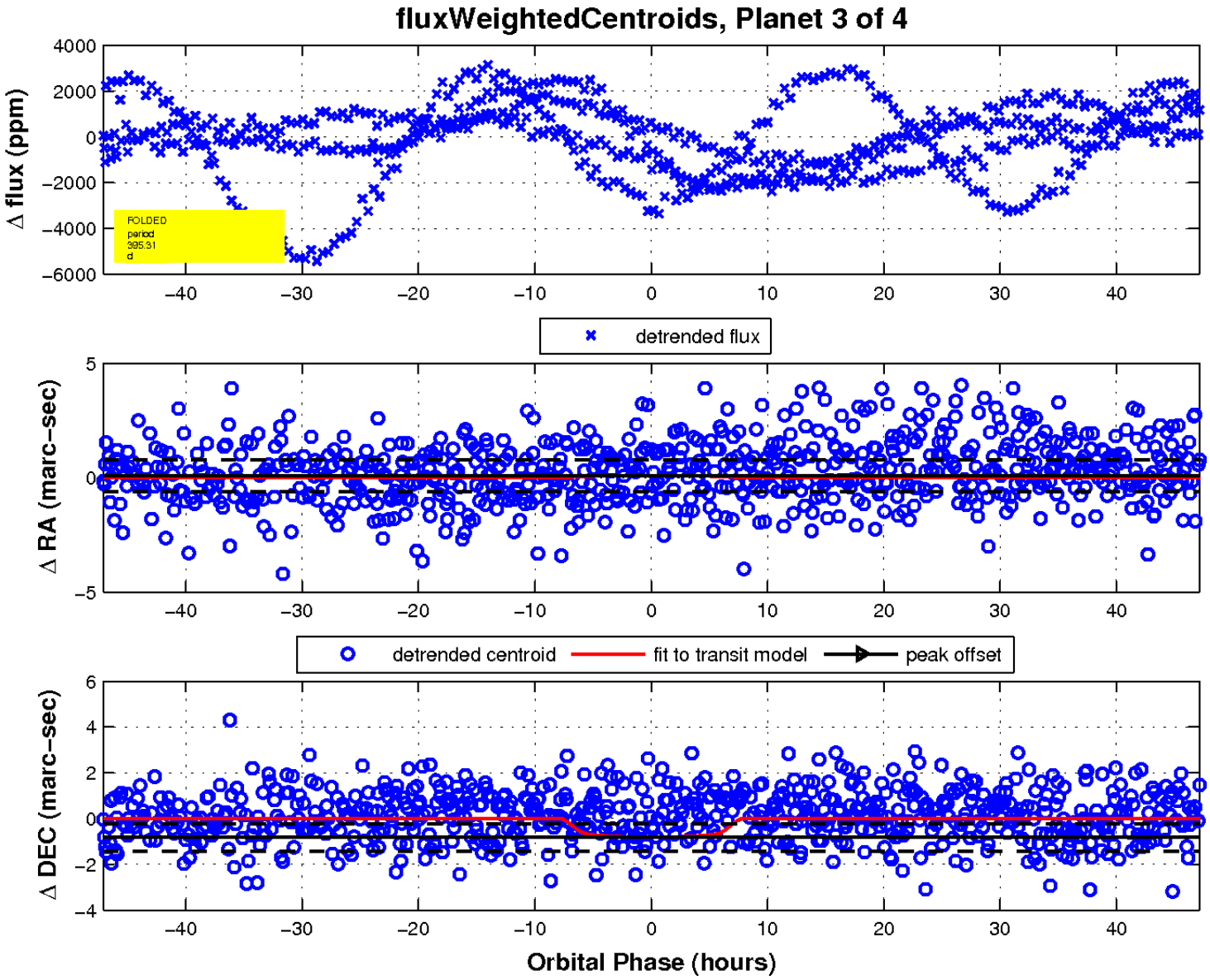
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



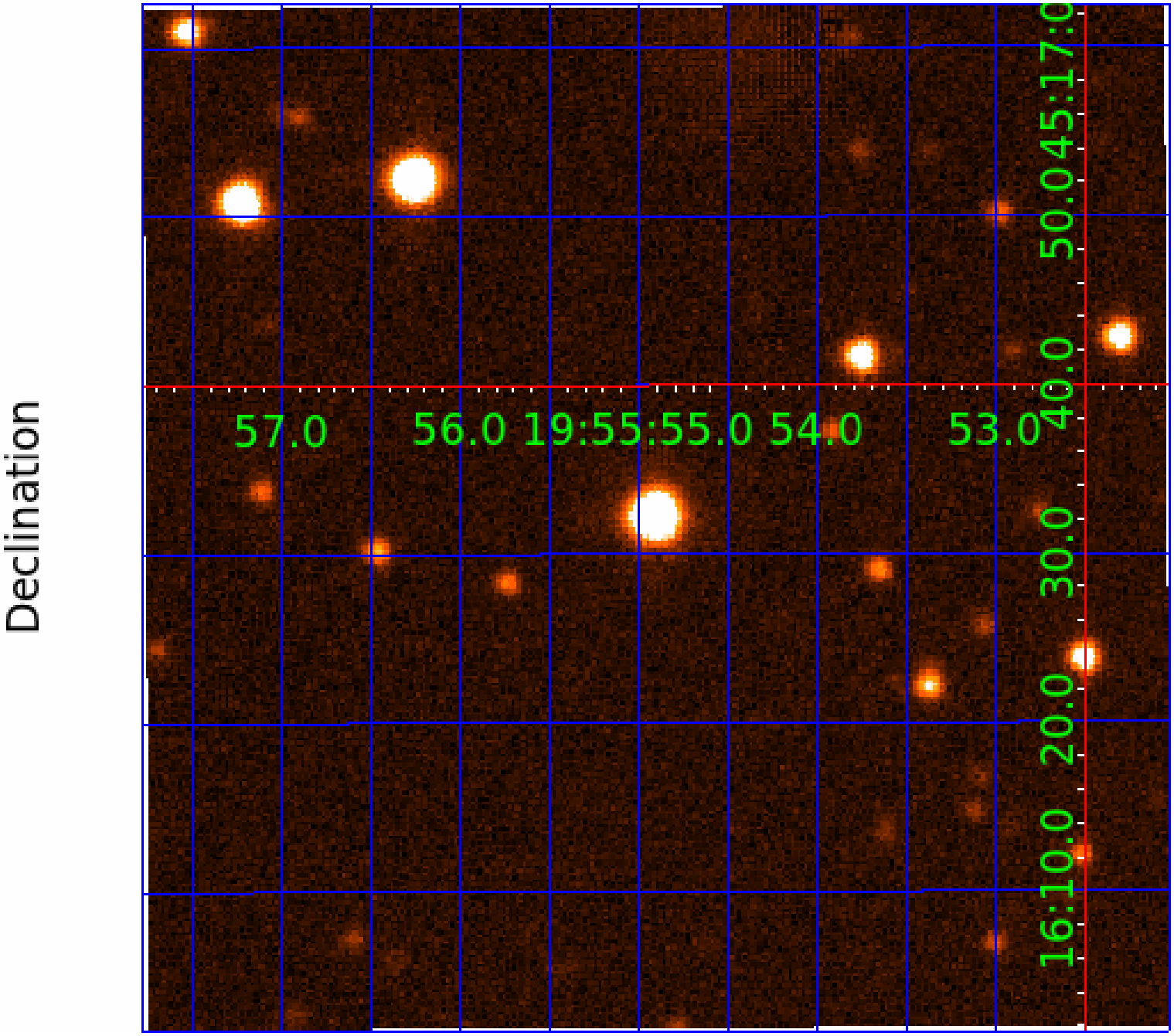
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.







UKIRT Image


Declination
57.0
56.0
19:55:55.0
54.0
53.0
16:10.0
20.0
30.0
40.0
50.0
45:17:0

KIC 008977559

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 ($S_\oplus$)
008977559-01	OBS	No	2.410428	133.254764	111.0	10.353	9.0	10.8	2.50	5934	3.10	5302.32
008977559-02	OBS	No	241.438349	288.180403	1317.9	25.283	8.8	5.5	2.50	5934	10.79	11.40
008977559-03	OBS	No	395.311941	173.088521	549.9	15.735	8.7	3.9	2.50	5934	6.95	5.91
008977559-04	OBS	No	271.606901	292.295304	2482.3	17.395	7.3	8.9	2.50	5934	15.21	9.74

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008977559-01	OBS	FP	0.00	1	0	0	0	LPP_DV
008977559-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
008977559-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008977559-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS

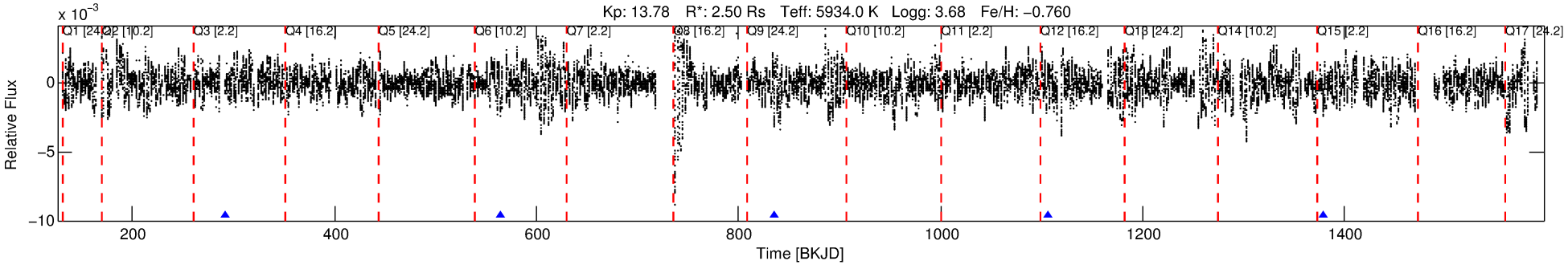
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

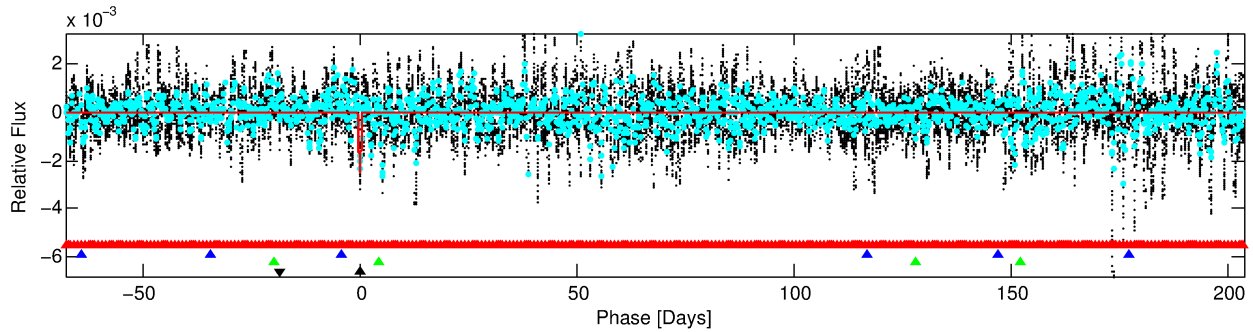
Ephemeris Match Information For 008977559-04

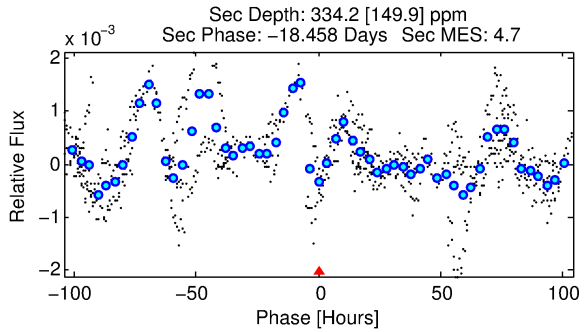
No Significant Match Found

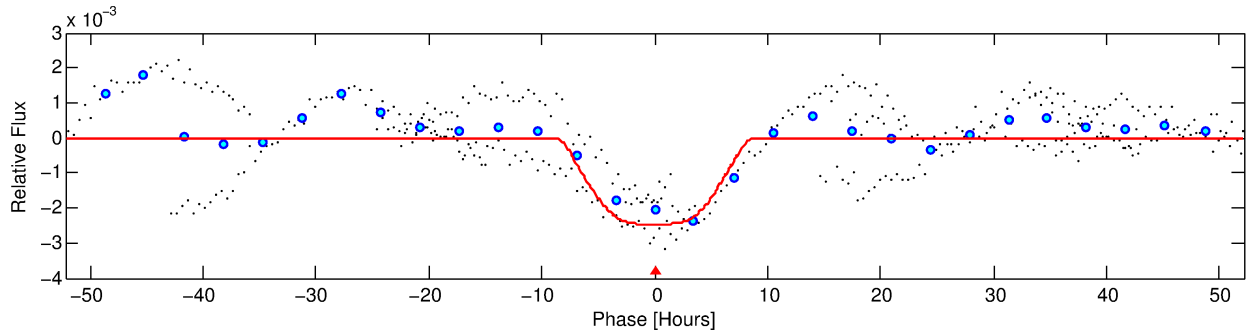
DV One-Page Summary

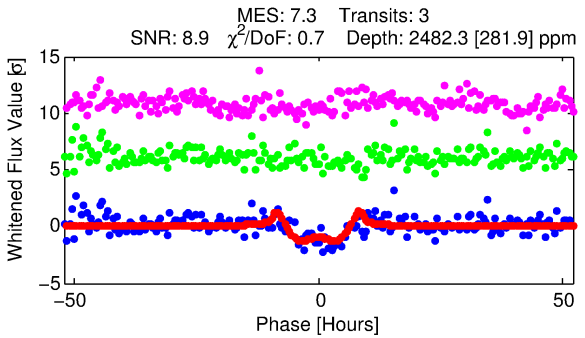
KIC: 8977559 Candidate: 4 of 4 Period: 271.607 d

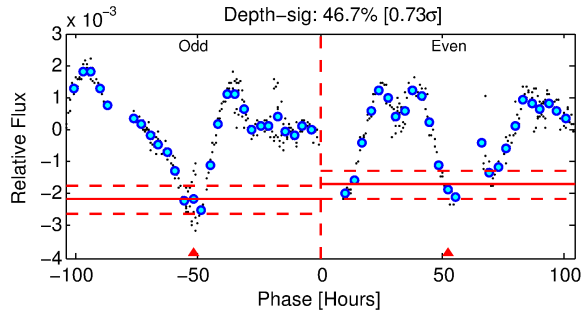


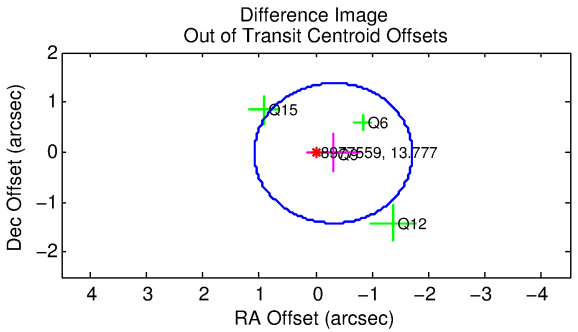












DV Fit Results:

Period = 271.60690 [0.00915] d
Epoch = 292.2953 [0.0241] BKJD
Rp/R* = 0.0557 [0.0033]
a/R* = 59.27 [3.39]
b = 0.93 [0.01]

Seff = 9.74 [12.11]
Teq = 450 [140] K
Rp = 15.21 [10.07] Re
a = 0.8452 [0.6132] AU

Ag = 567.53 [748.75] [0.76σ]
Teffp = 3400 [412] K [6.78σ]

DV Diagnostic Results:

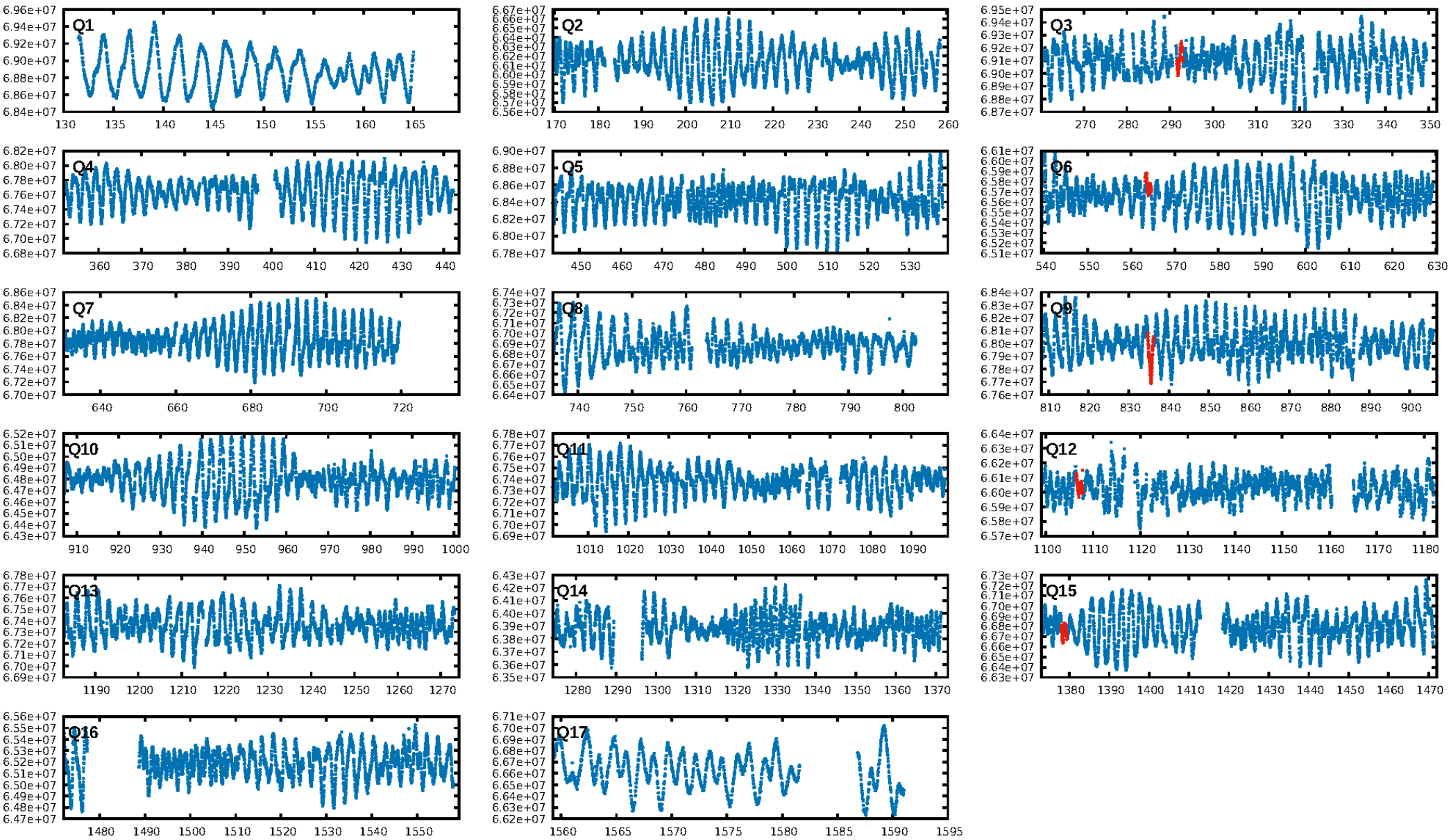
ShortPeriod−sig: 100.0% [23.59σ]
LongPeriod−sig: 100.0% [126.58σ]
ModelChiSquare2−sig: 94.3%
ModelChiSquareGof−sig: 100.0%
Bootstrap−pfa: 2.40e−07
RollingBand−fgt: 1.00 [3/3]
GhostDiagnostic−chr: −0.6883

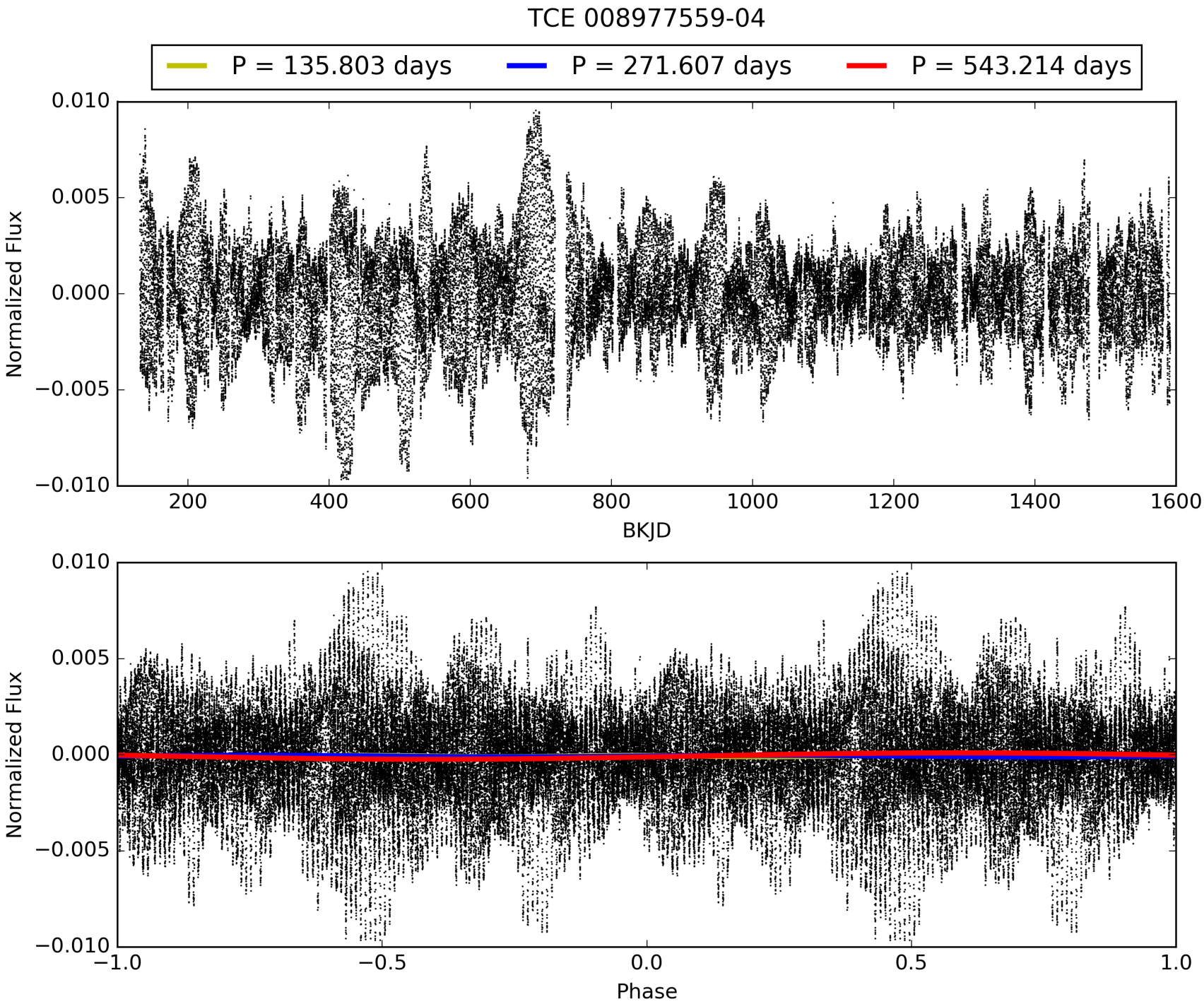
Centroid−sig: 60.2%
Centroid−so: 0.162 arcsec [0.95σ]
OotOffset−rm: 0.312 arcsec [0.67σ]
KicOffset−rm: 0.357 arcsec [1.11σ]
OotOffset−st: 1/1/1/1 [4]
KicOffset−st: 1/1/1/1 [4]
DiffImageQuality−fgm: 0.75 [3/4]
DiffImageOverlap−fno: 0.00 [0/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 11:00:04 Z

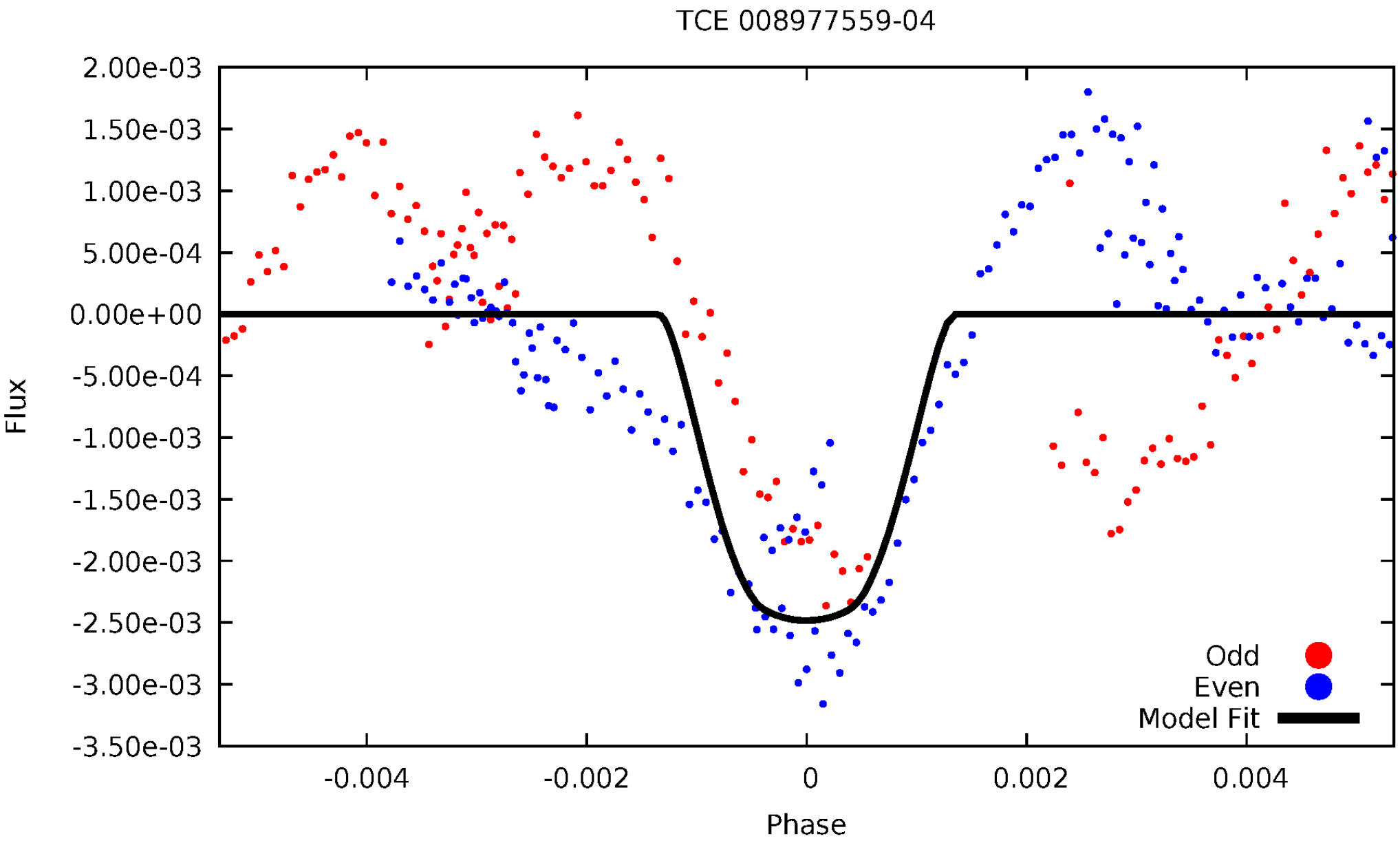
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 008977559-04, PDC Light Curves

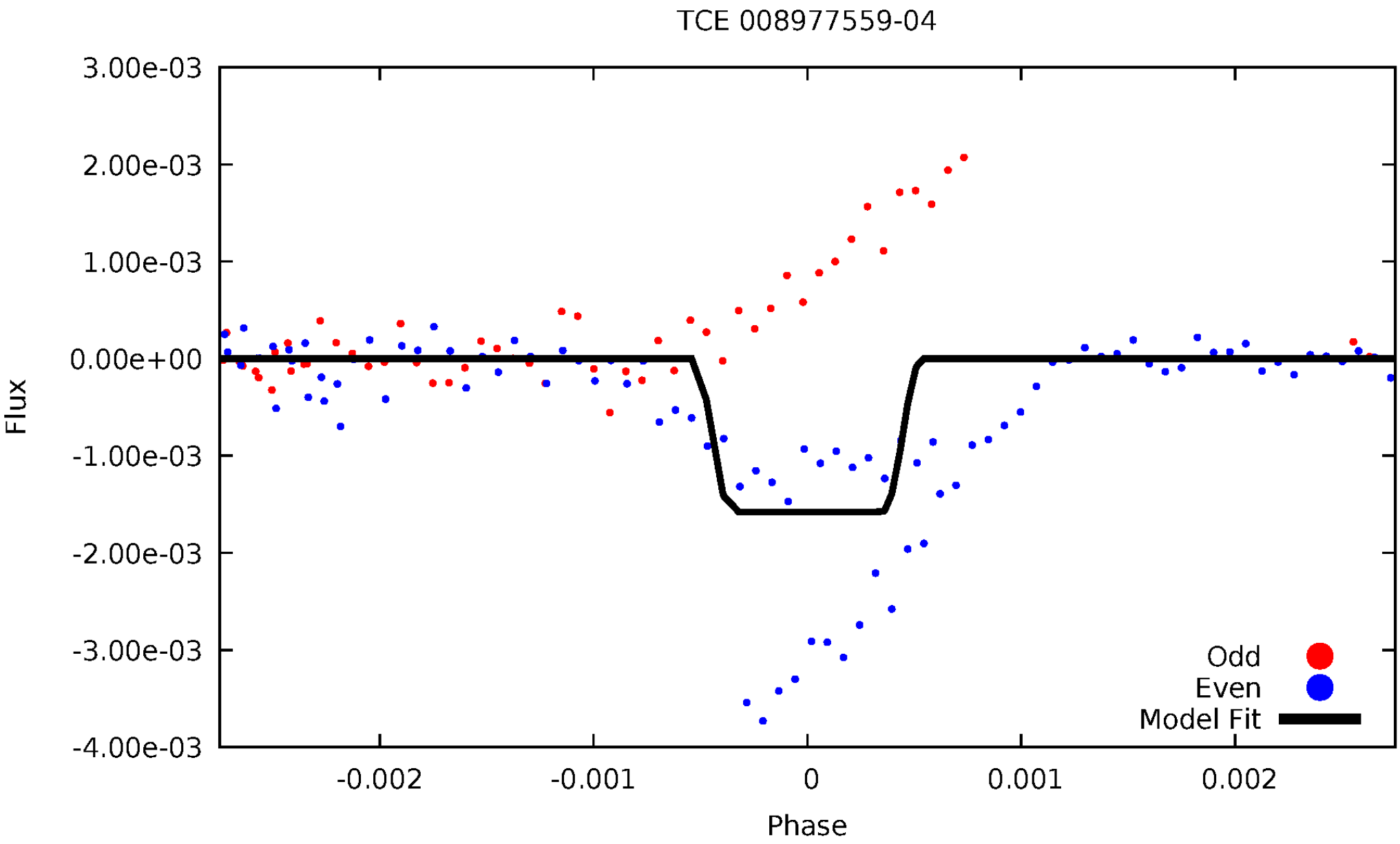



TCE 008977559-04
P = 135.803 days
P = 271.607 days
P = 543.214 days
Normalized Flux
0.010
0.005
0.000
−0.005
−0.010
200
400
600
800
1000
1200
1400
1600
BKJD
Normalized Flux
0.010
0.005
0.000
−0.005
−0.010
−1.0
−0.5
0.0
0.5
1.0
Phase

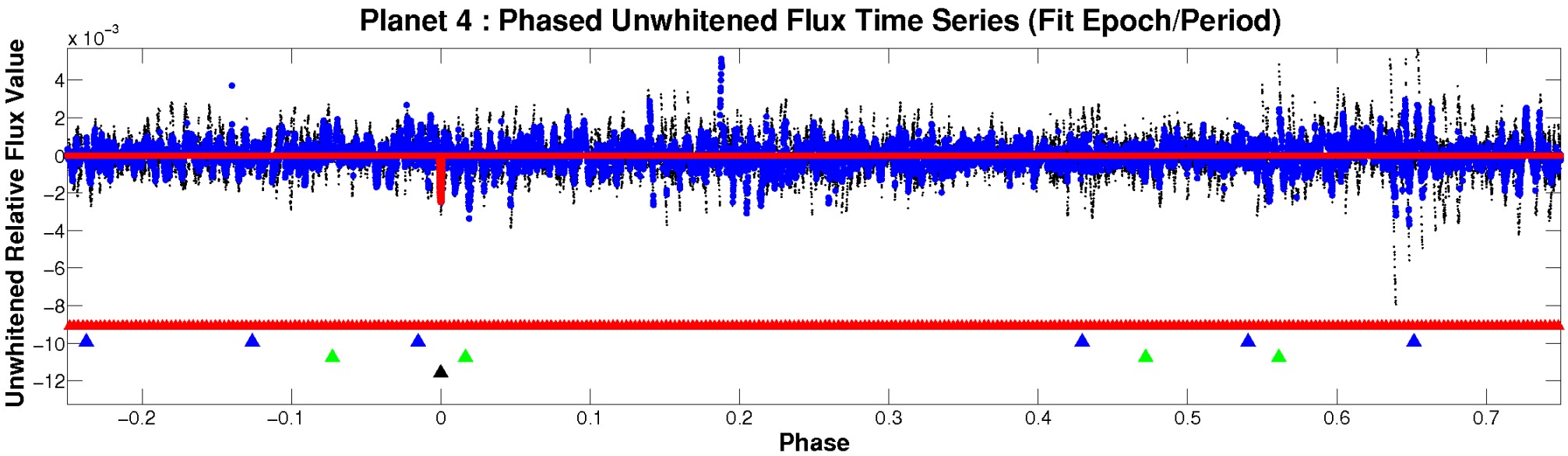
DV Odd/Even

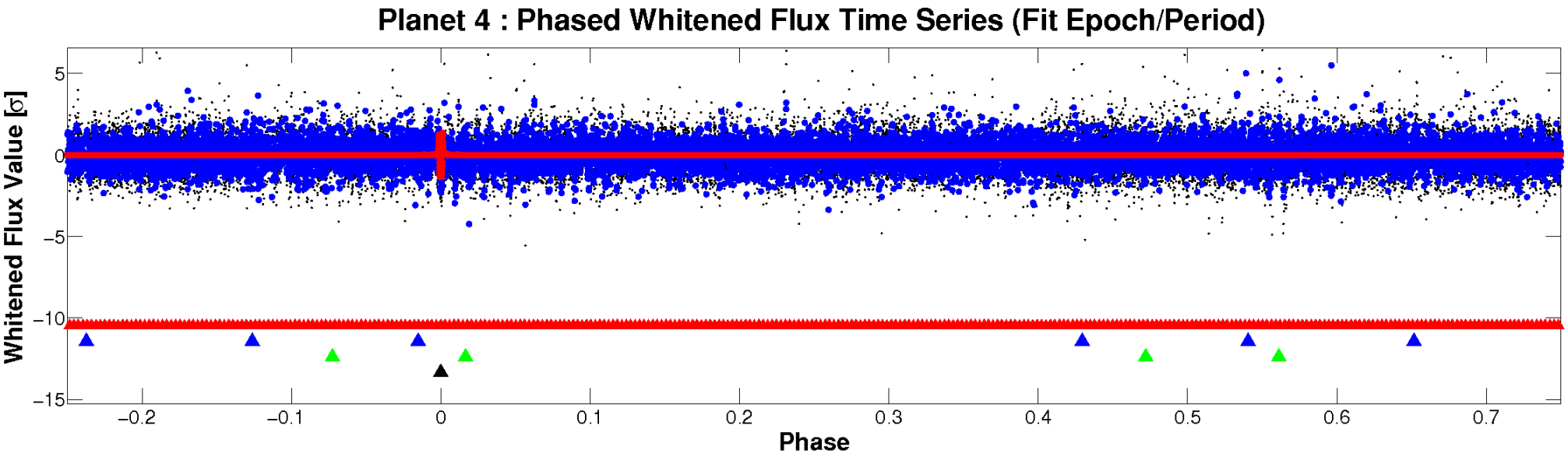

TCE 008977559-04
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
-2.50e-03
-3.00e-03
-3.50e-03
Flux
-0.004
-0.002
0
0.002
0.004
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 008977559-04
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
-4.00e-03
Flux
-0.002
-0.001
0
0.001
0.002
Phase
Odd
Even
Model Fit

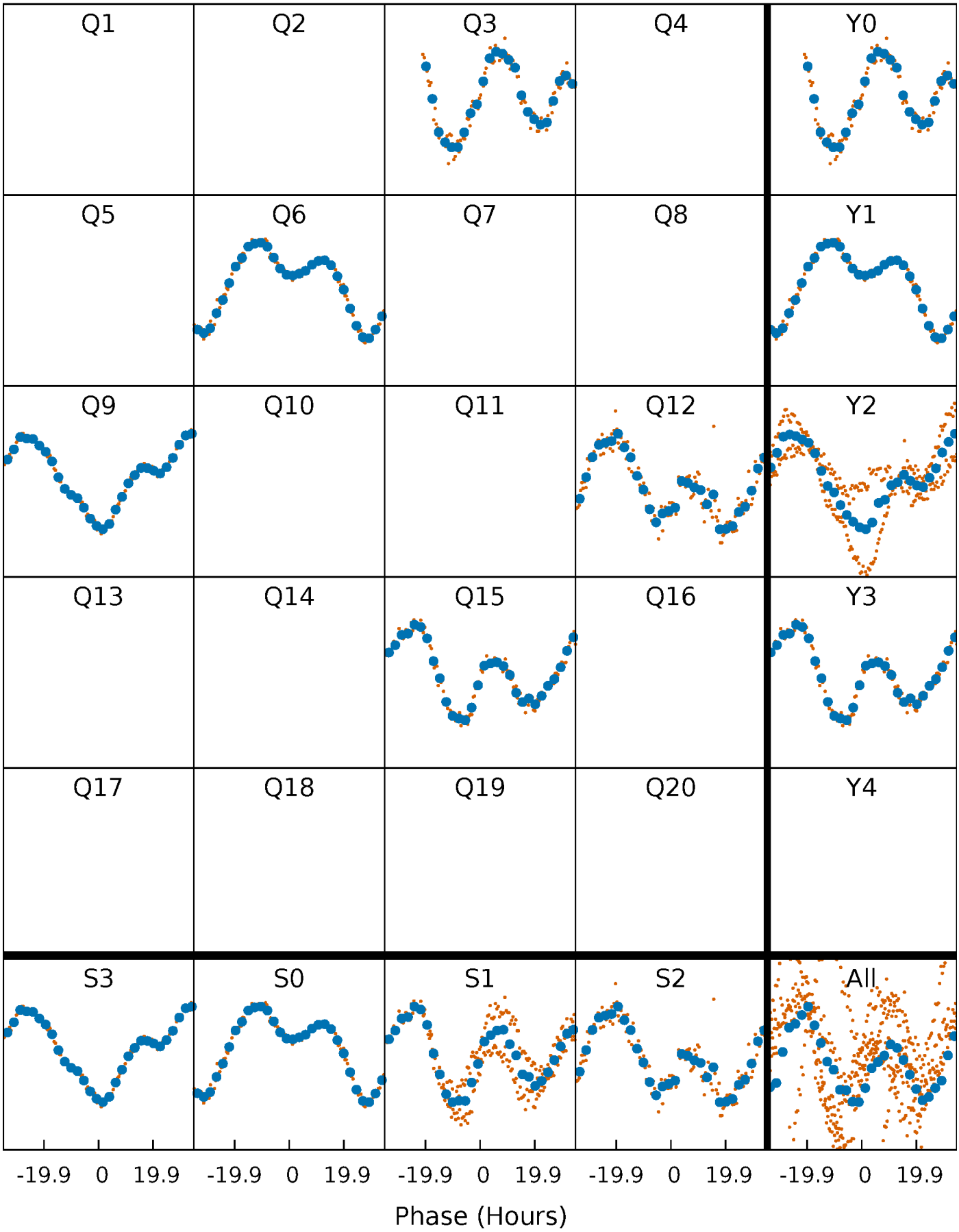
Non-Whitened Vs. Whitened Light Curve





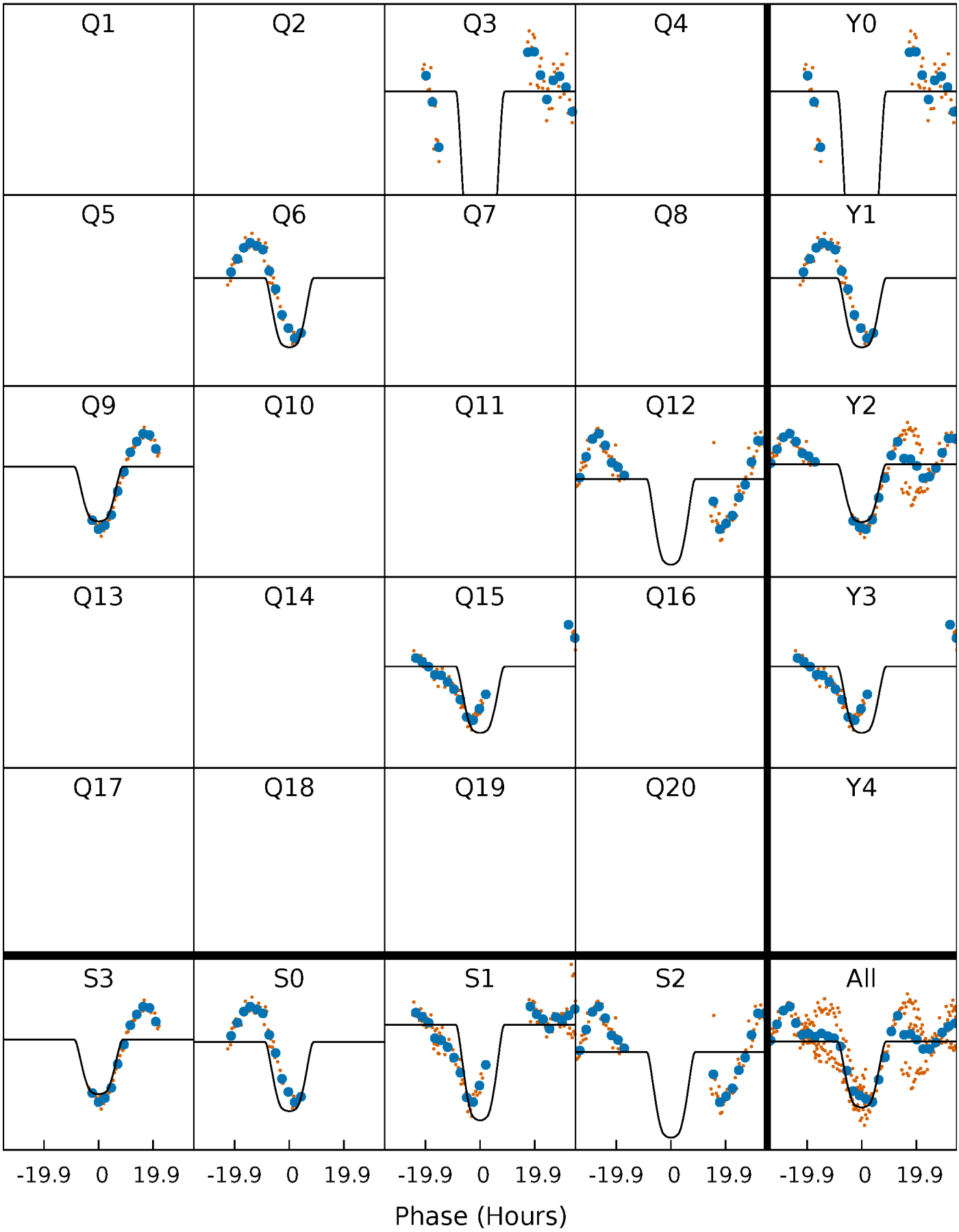
PDC Quarter-Phased Transit Curves

TCE 008977559-04 P=271.606901 Days T_0=292.295304 (BKJD)



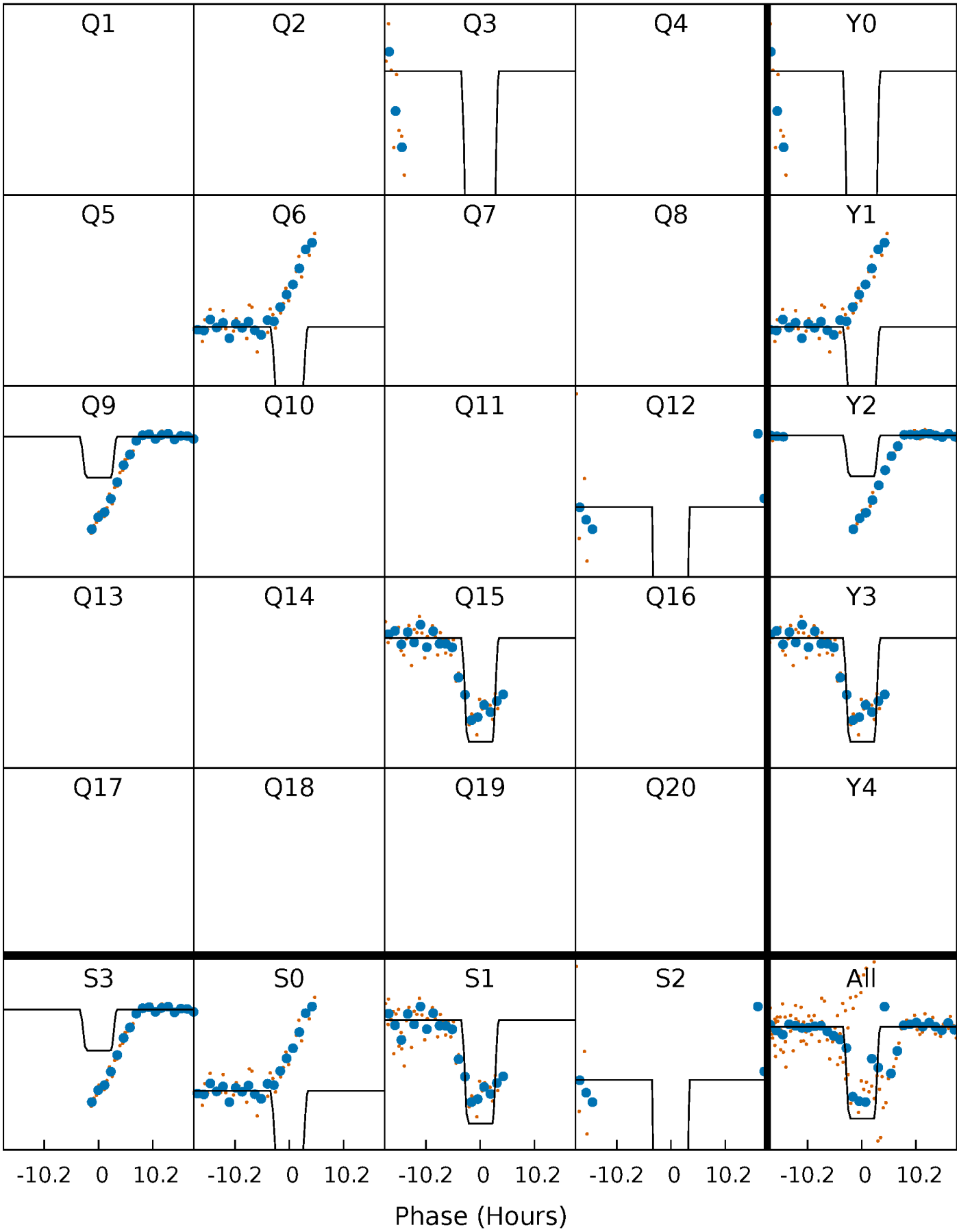
DV Quarter-Phased Transit Curves

TCE 008977559-04 P=271.606901 Days T_0=292.295304 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

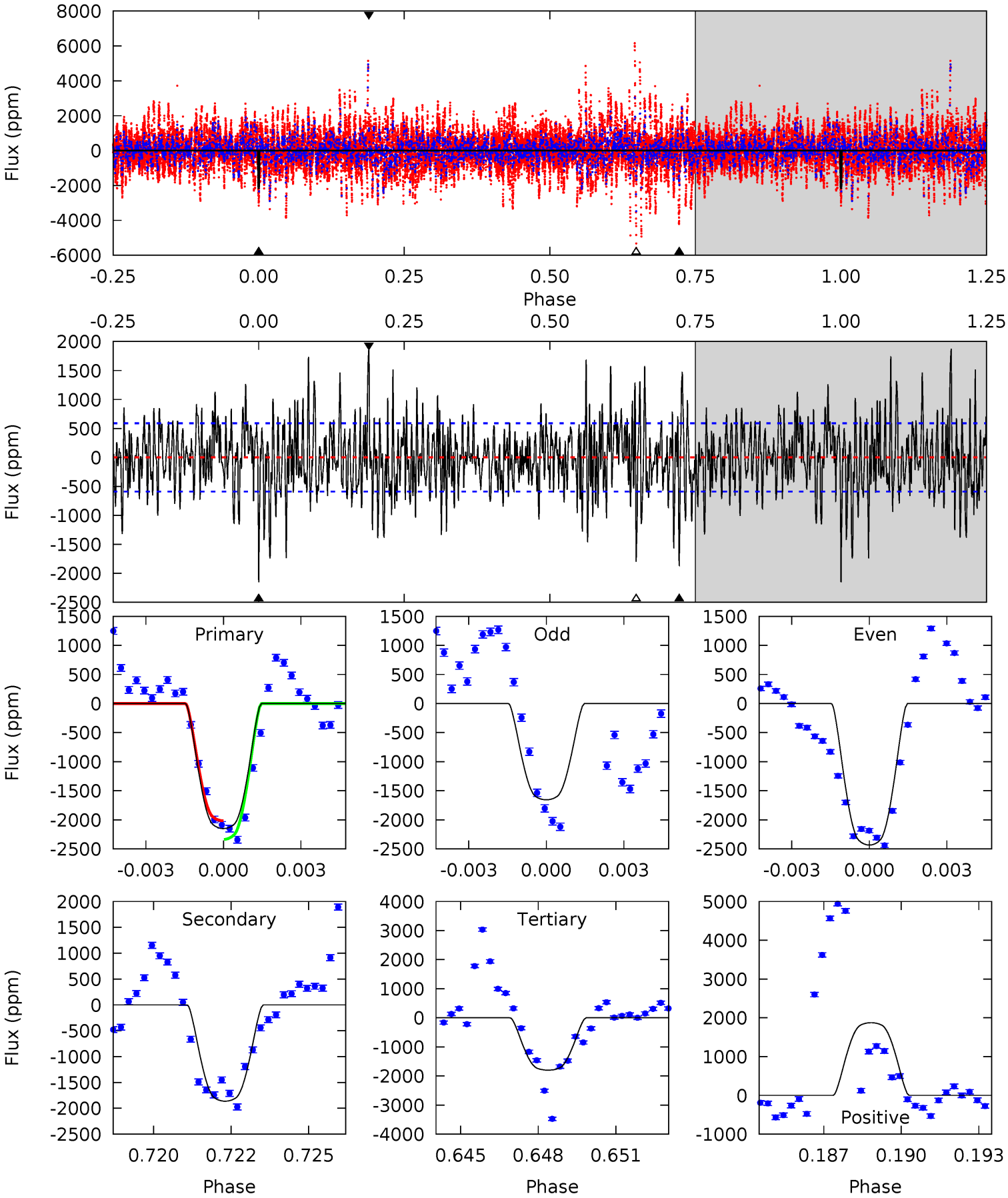
TCE 008977559-04 P=271.589257 Days T_0=292.264382 (BKJD)



DV Model-Shift Uniqueness Test

008977559-04, P = 271.606901 Days, E = 20.688403 Days

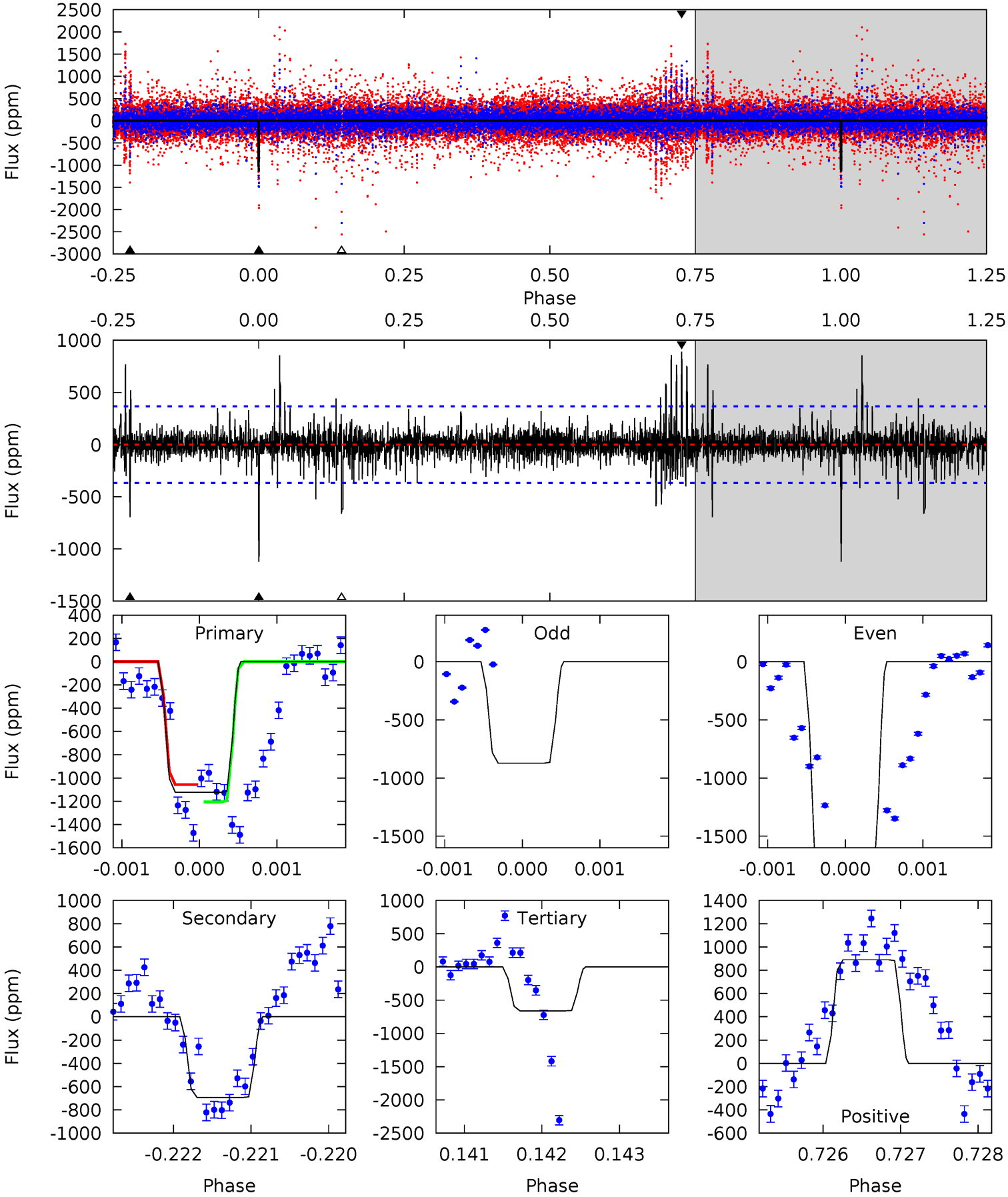
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.3	16.7	16.1	16.8	5.27	2.99	4.49	3.15	2.48	0.56	-0.11	3.29	1.07	0.47	1.42



Alt Model-Shift Uniqueness Test

008977559-04, P = 271.589257 Days, E = 20.675125 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.7	10.3	9.81	13.2	5.45	3.29	1.58	6.86	3.46	0.48	-2.92	10.5	0.97	0.44	1.11



Stellar Parameters For KIC 008977559

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5934^{+209}_{-188}	$3.679^{+0.752}_{-0.188}$	$-0.760^{+0.300}_{-0.250}$	$2.503^{+0.707}_{-1.650}$	$1.090^{+0.177}_{-0.288}$	$0.098^{+1.541}_{-0.045}$
	+4%/-3%	+20%/-5%	+39%/-33%	+28%/-66%	+16%/-26%	+1575%/-45%
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 008977559-04 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1862±112	$14.81^{+2.97}_{-4.82}$	621^{+61}_{-102}	5286^{+222}_{-212}	3347^{+3733}_{-990}
Alt.	-693±67	$10.44^{+2.30}_{-3.50}$	622^{+57}_{-110}	4942^{+251}_{-239}	2536^{+2955}_{-855}

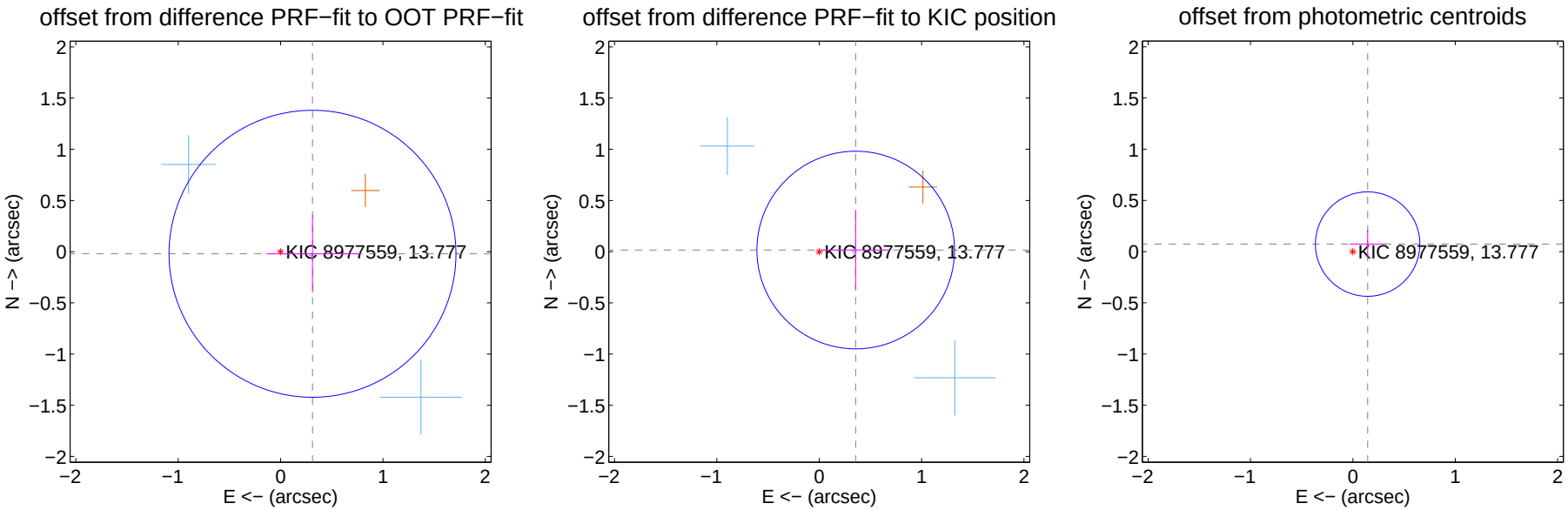
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

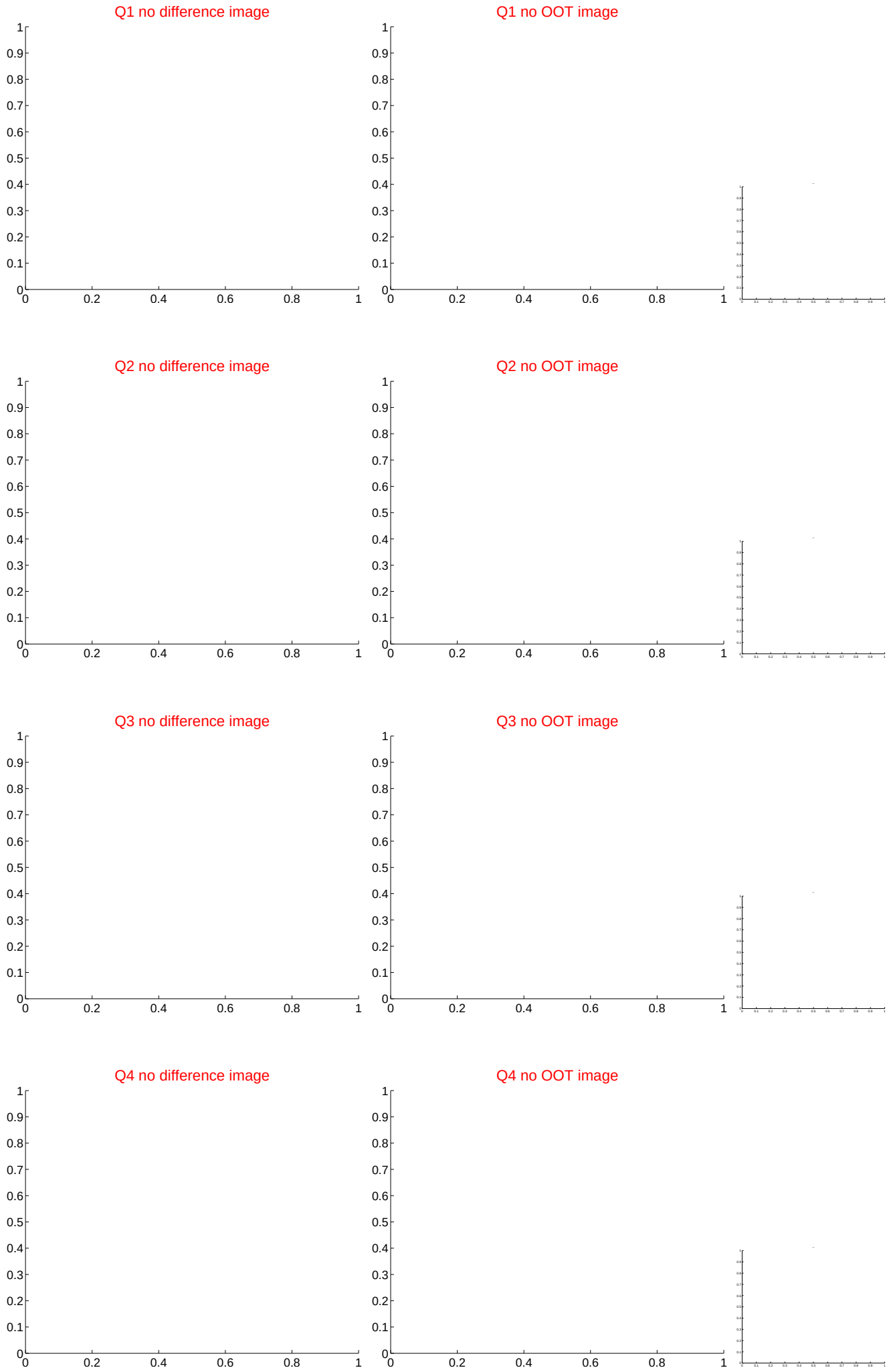
Supplemental centroid analysis for 008977559-04. Kepler magnitude: 13.78. Transit SNR 8.86
There are 3 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.312 ± 0.467	0.67	-0.312 ± 0.450	-0.021 ± 0.379
PRF-fit source offset from KIC position	0.357 ± 0.322	1.11	-0.356 ± 0.331	0.016 ± 0.393
photometric centroid source offset	0.16 ± 0.17	0.95	-0.14 ± 0.18	0.07 ± 0.14

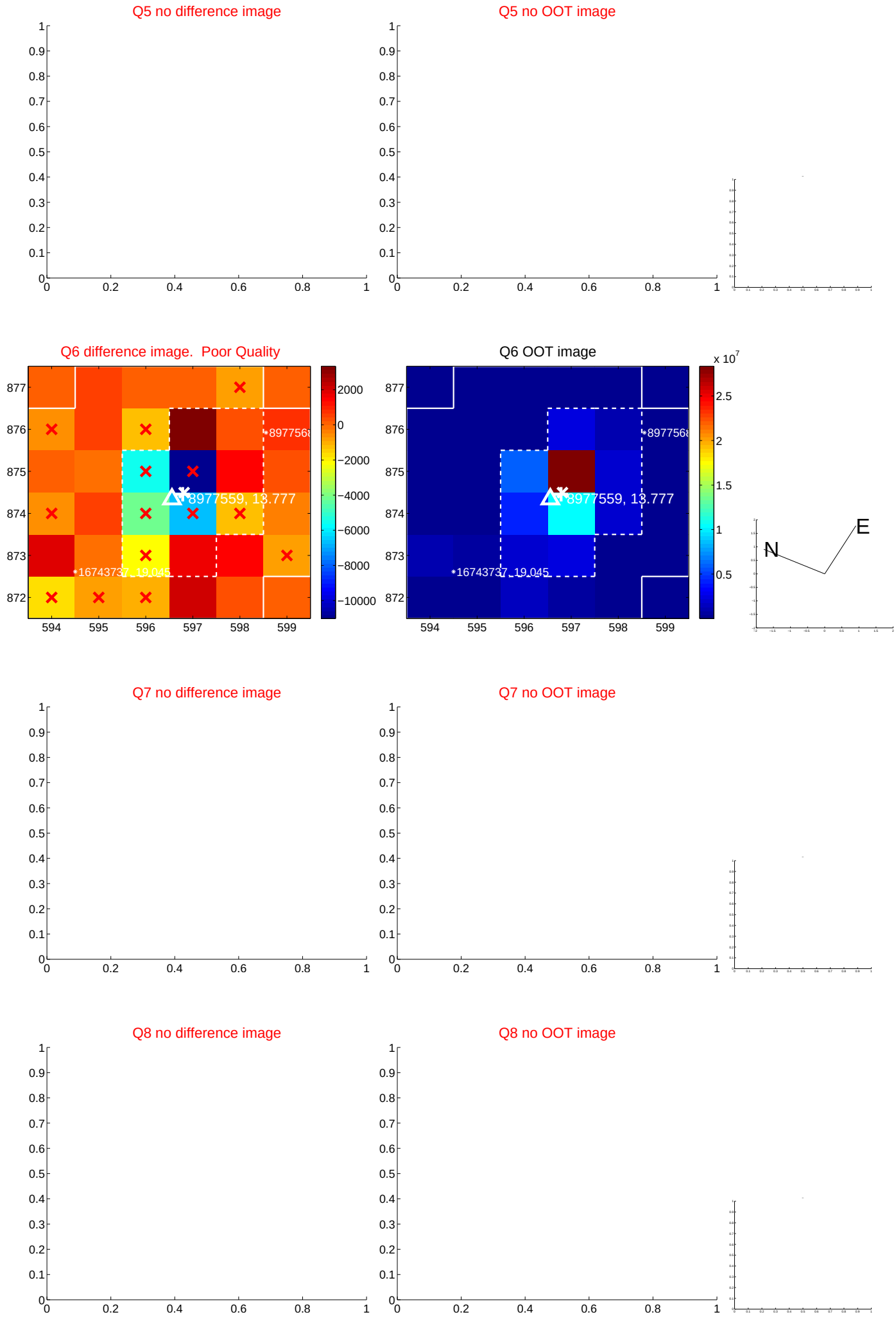


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

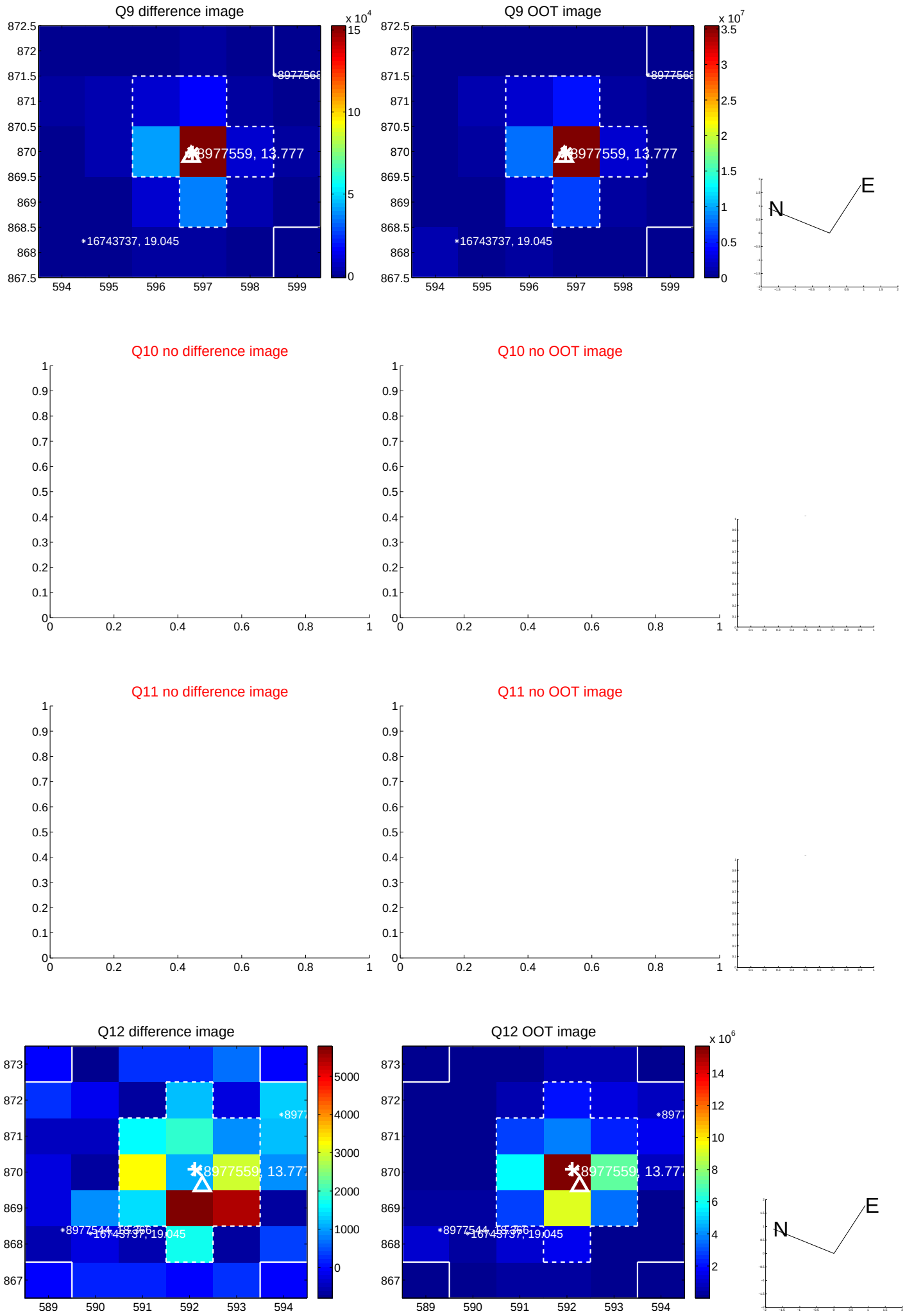
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



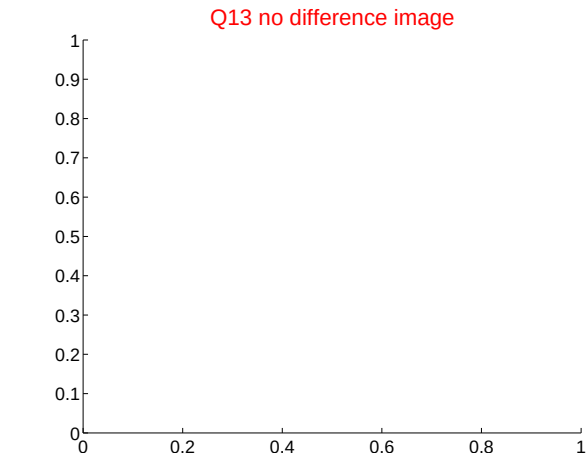
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

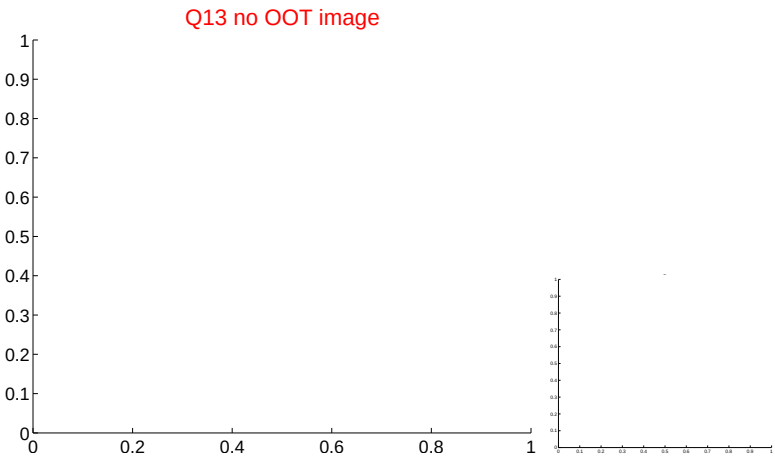


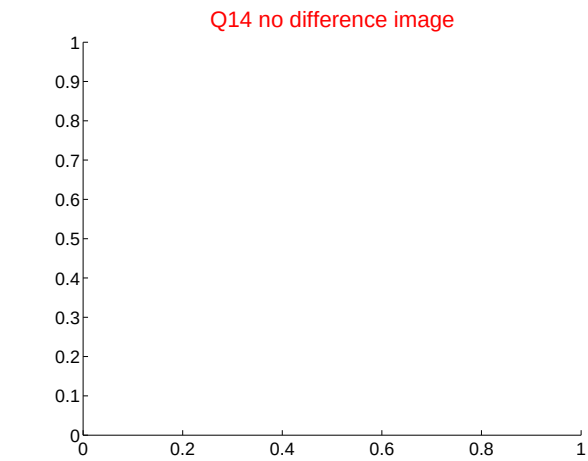
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

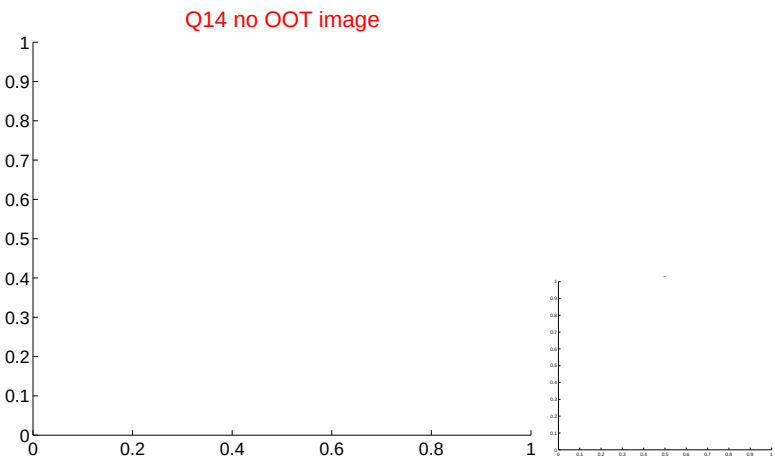


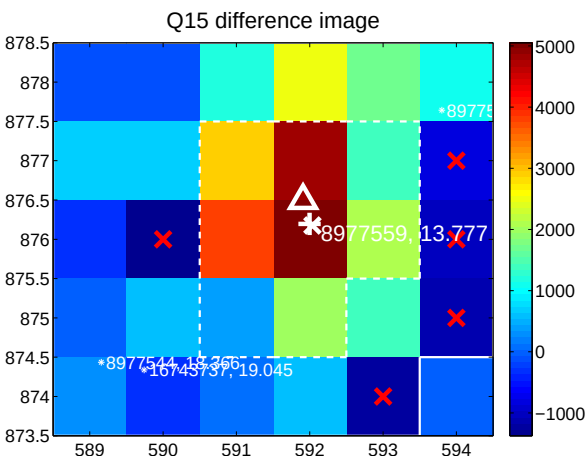
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

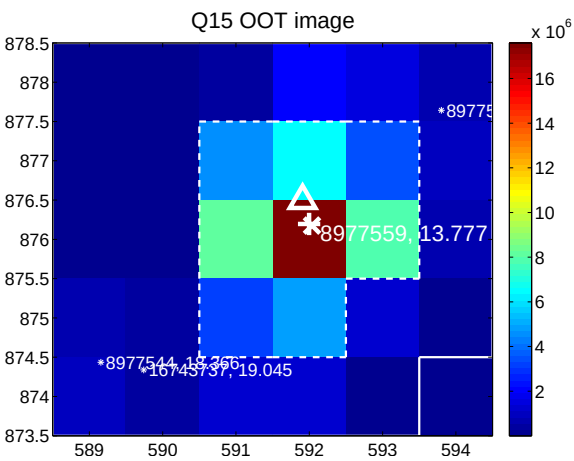


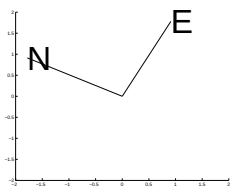


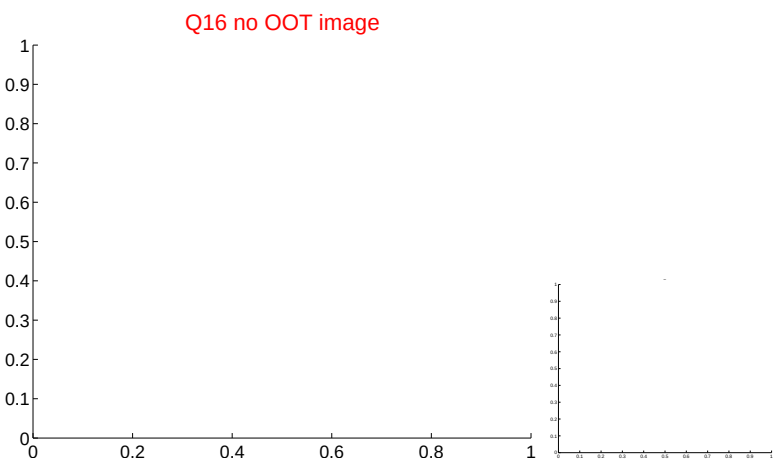




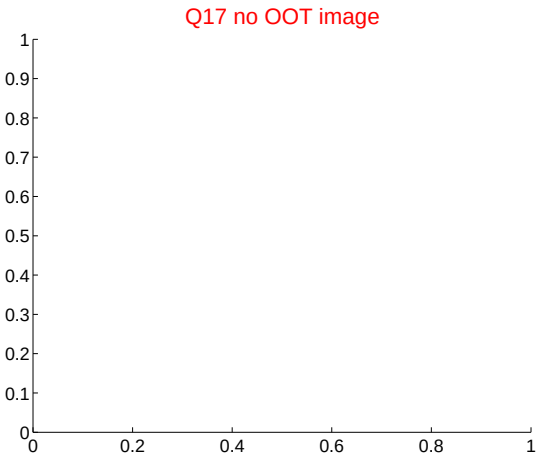


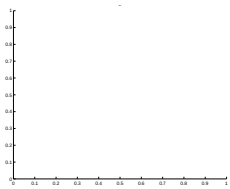


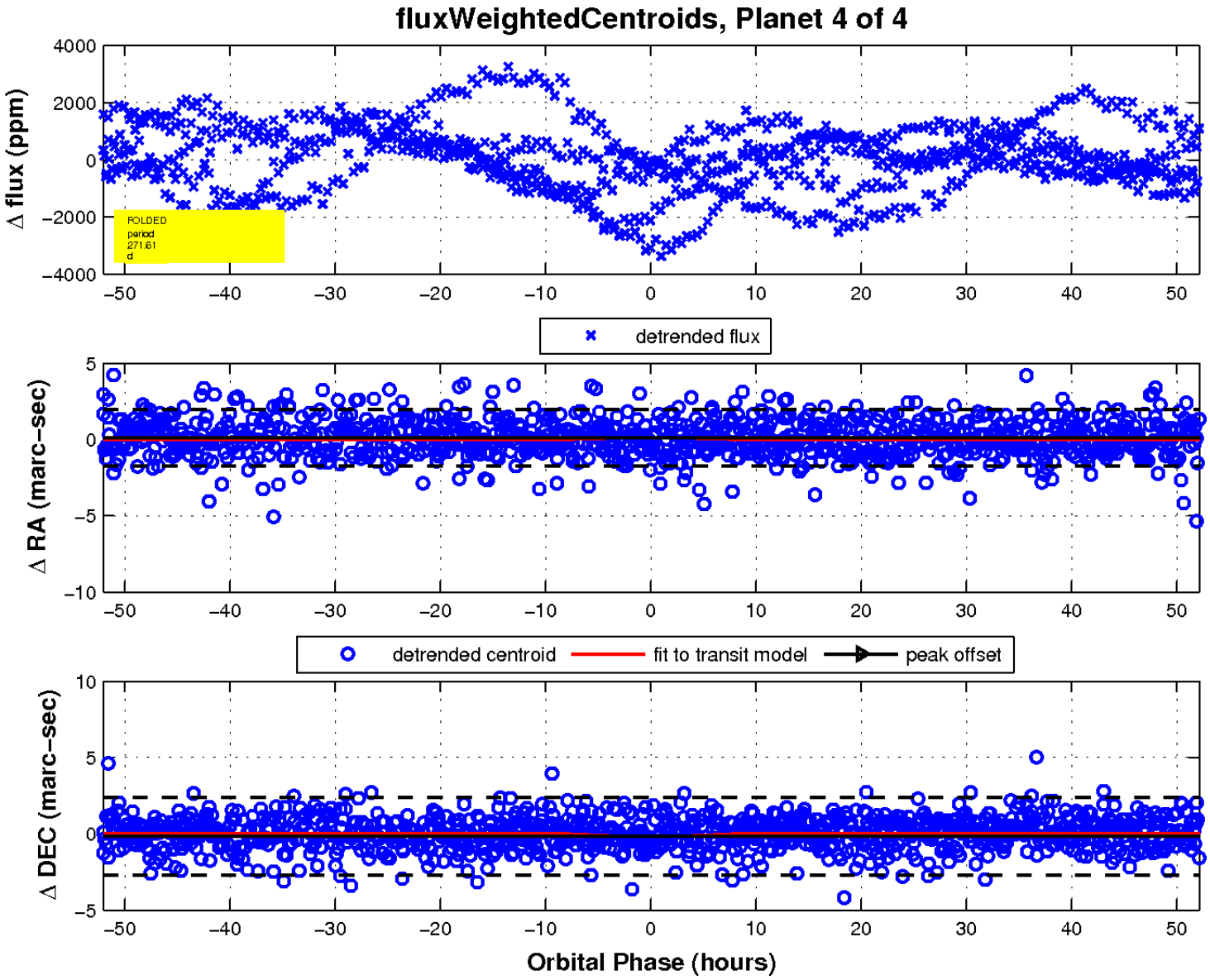




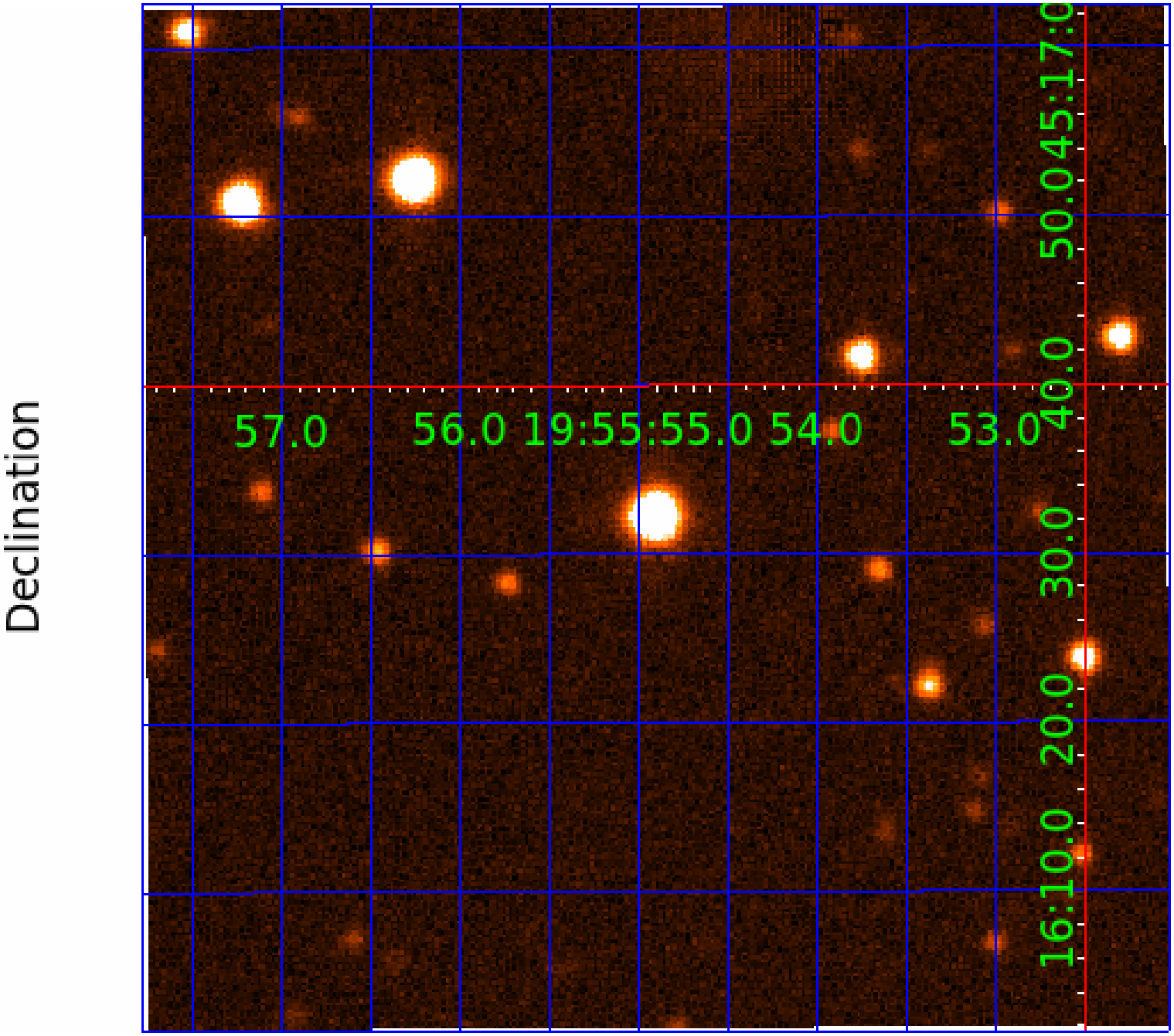
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.







UKIRT Image


Declination
57.0
56.0
19:55:55.0
54.0
53.0
16:10.0
20.0
30.0
40.0
50.0
45:17:0