KIC 009045401

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 ($S_\oplus$)
009045401-01	OBS	No	0.606375	131.521422	95.9	1.090	10.3	10.7	1.48	6348	1.71	14876.85
009045401-02	OBS	No	0.606377	132.119452	278.2	7.277	10.1	24.3	1.48	6348	2.47	14876.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009045401-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009045401-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

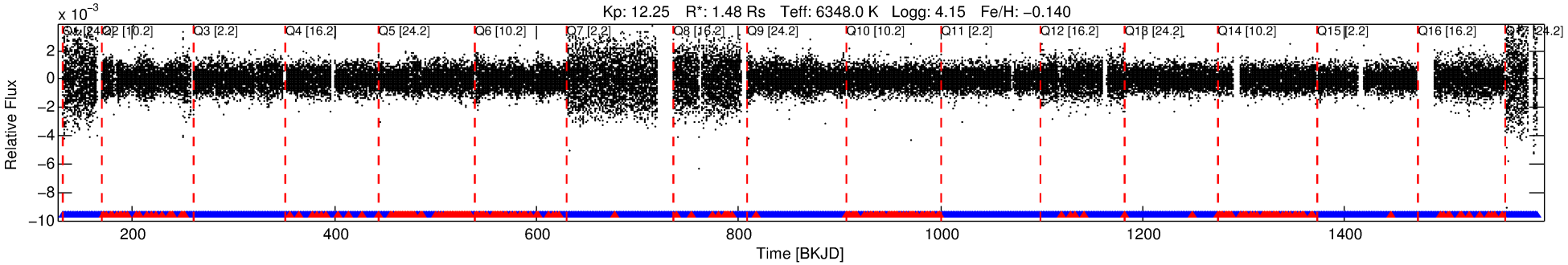
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

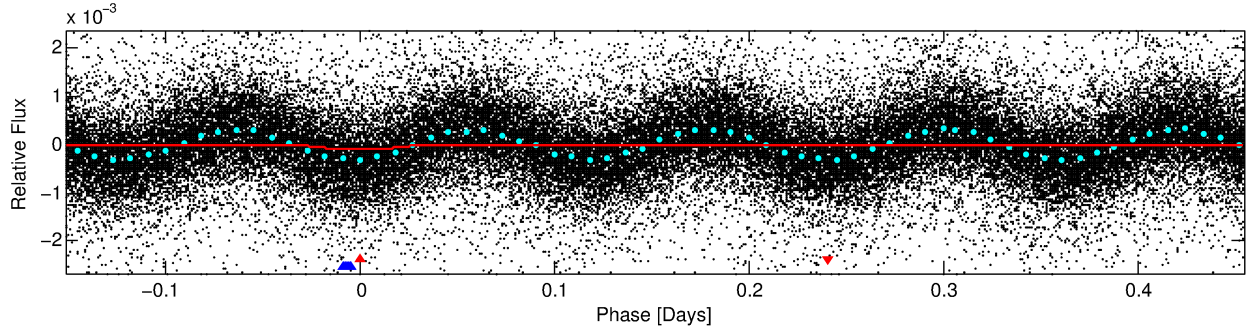
Ephemeris Match Information For 009045401-01

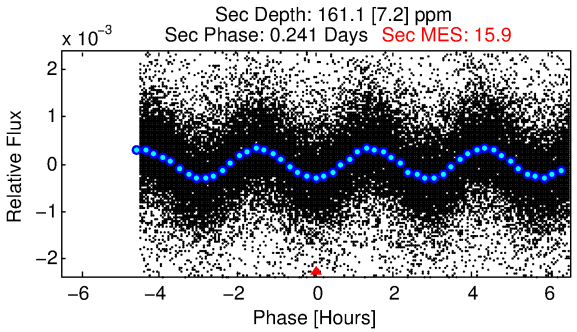
No Significant Match Found

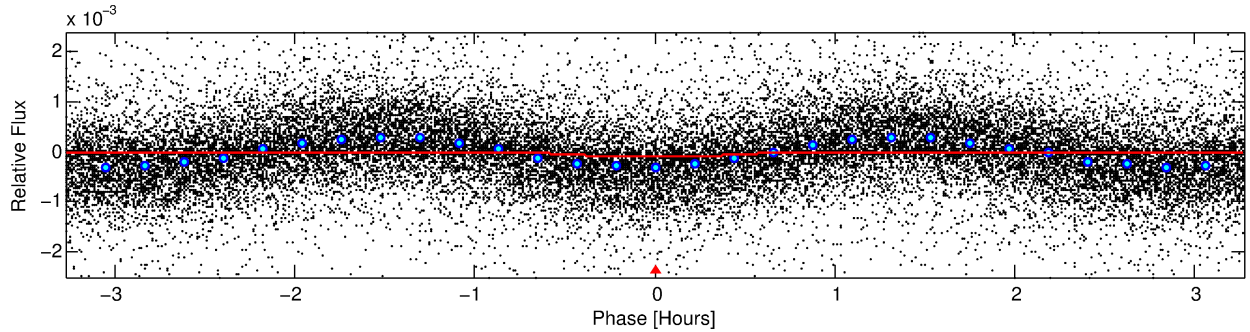
DV One-Page Summary

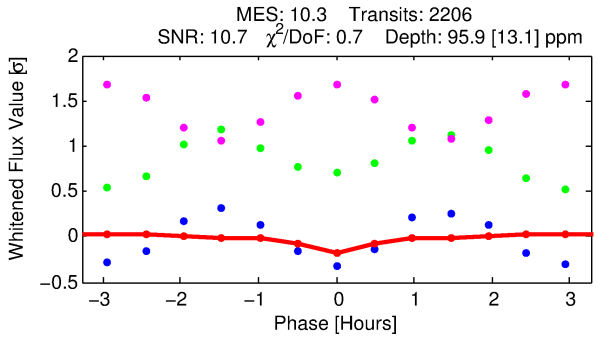
KIC: 9045401 Candidate: 1 of 2 Period: 0.606 d

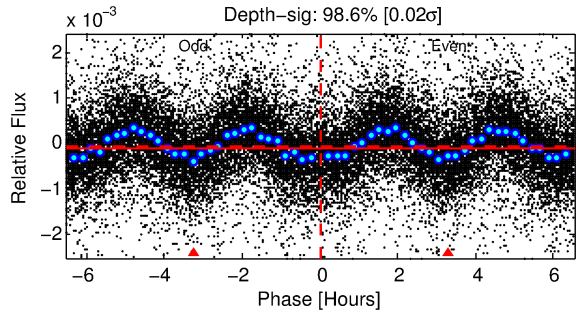


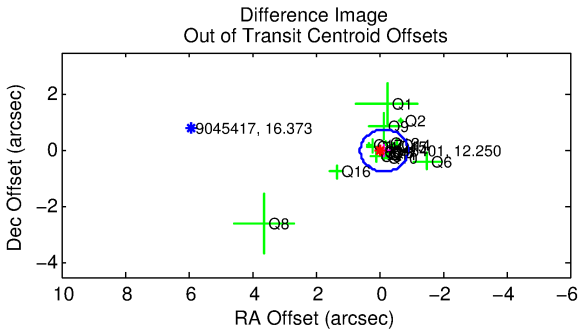












DV Fit Results:

Period = 0.60638 [0.00001] d
Epoch = 131.5214 [0.0016] BKJD
Rp/R* = 0.0106 [0.0055]
a/R* = 2.16 [4.89]
b = 0.90 [0.61]

Seff = 14876.85 [6034.16]
Teq = 2816 [286] K
Rp = 1.71 [1.03] Re
a = 0.0146 [0.0038] AU

Ag = 6.48 [7.19] [0.76σ]
Teffp = 6948 [1815] K [2.25σ]

DV Diagnostic Results:

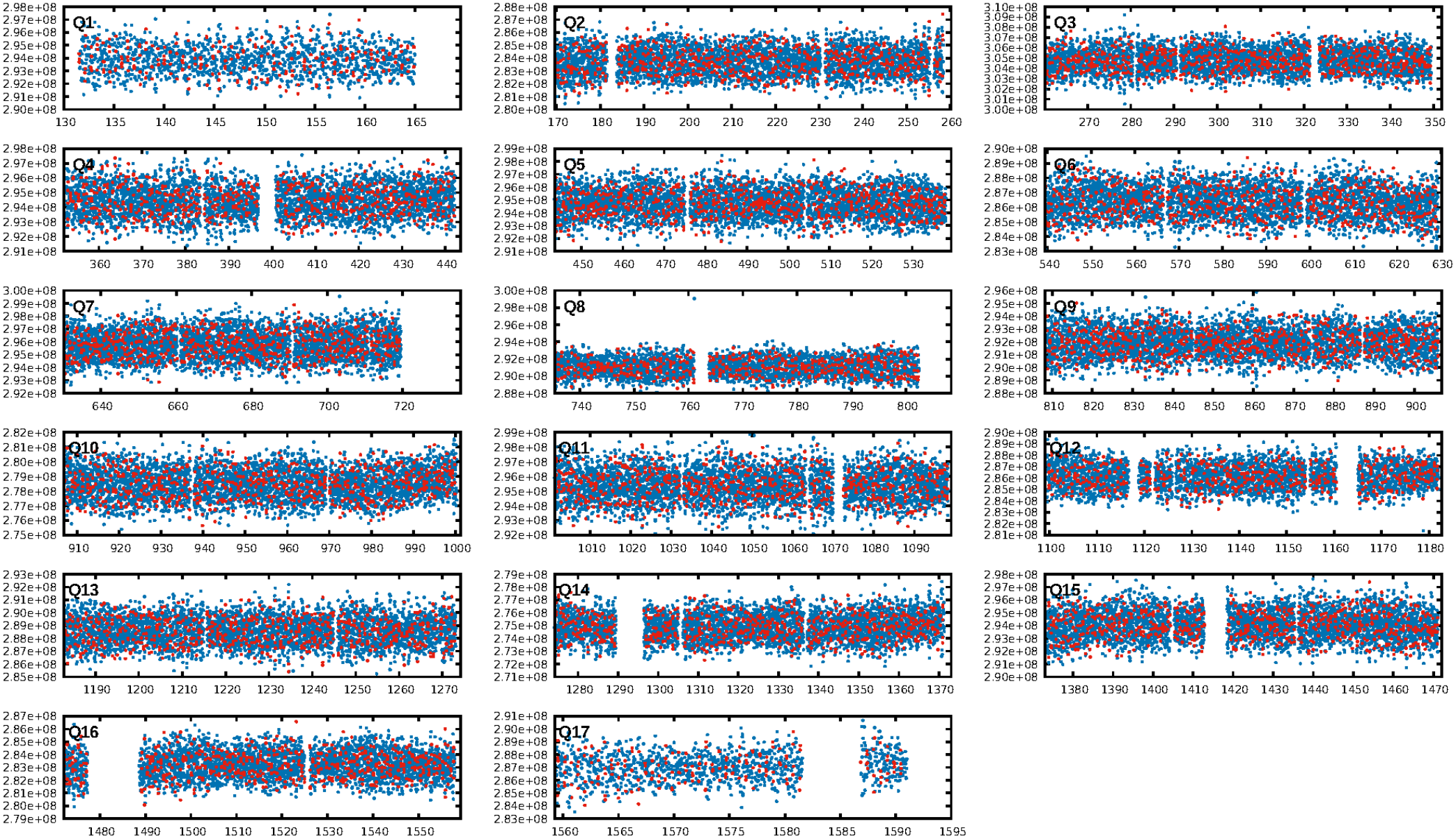
ShortPeriod−sig: N/A
LongPeriod−sig: 0.0% [0.00σ]
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: N/A
RollingBand−fgt: 0.87 [1829/2106]
GhostDiagnostic−chr: 20.16

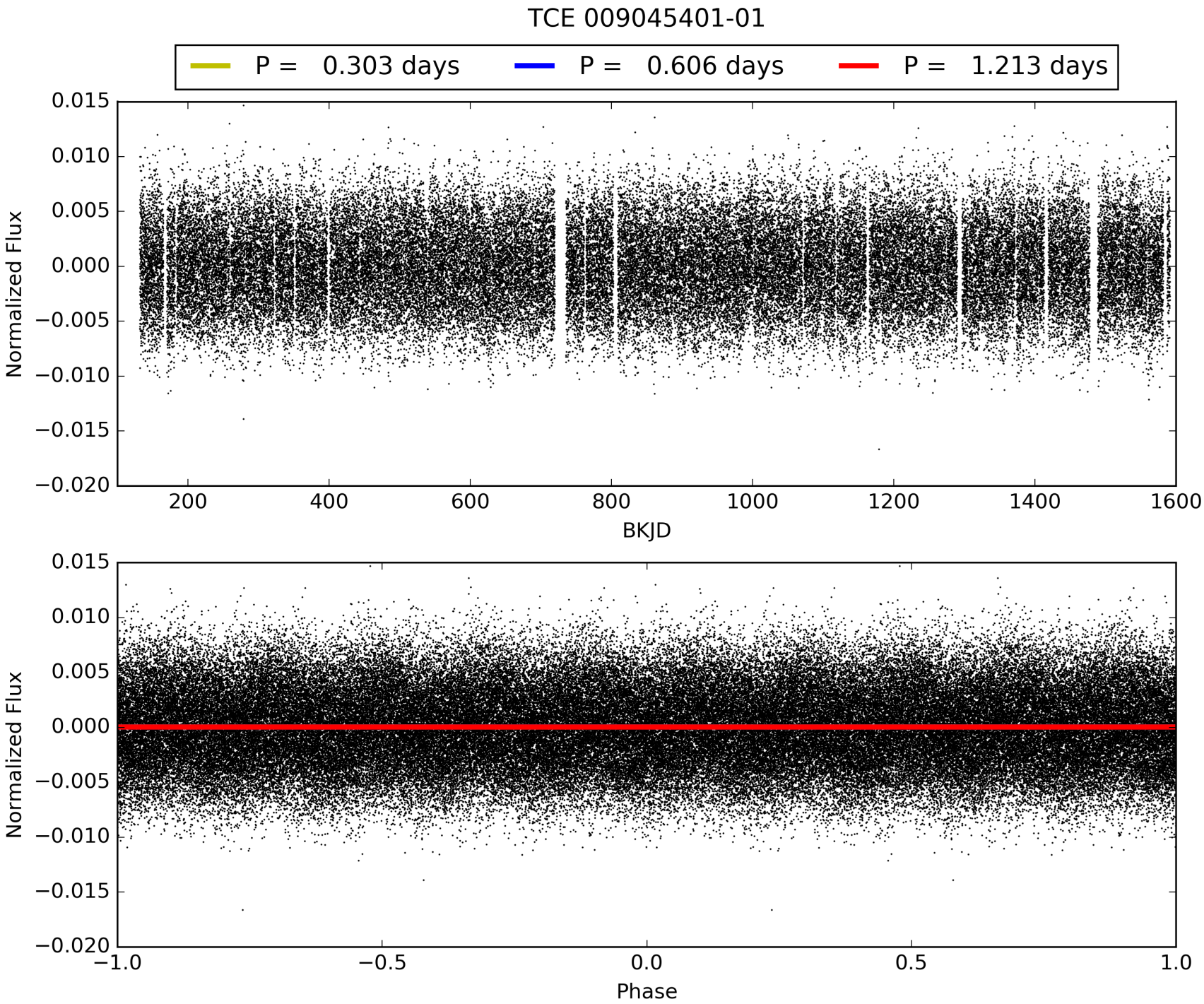
Centroid−sig: 0.1%
Centroid−so: 0.399 arcsec [1.75σ]
OotOffset−rm: 0.143 arcsec [0.57σ]
KicOffset−rm: 0.091 arcsec [0.34σ]
OotOffset−st: 4/4/4/5 [17]
KicOffset−st: 4/4/4/5 [17]
DiffImageQuality−fgm: 0.94 [16/17]
DiffImageOverlap−fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 22:27:29 Z

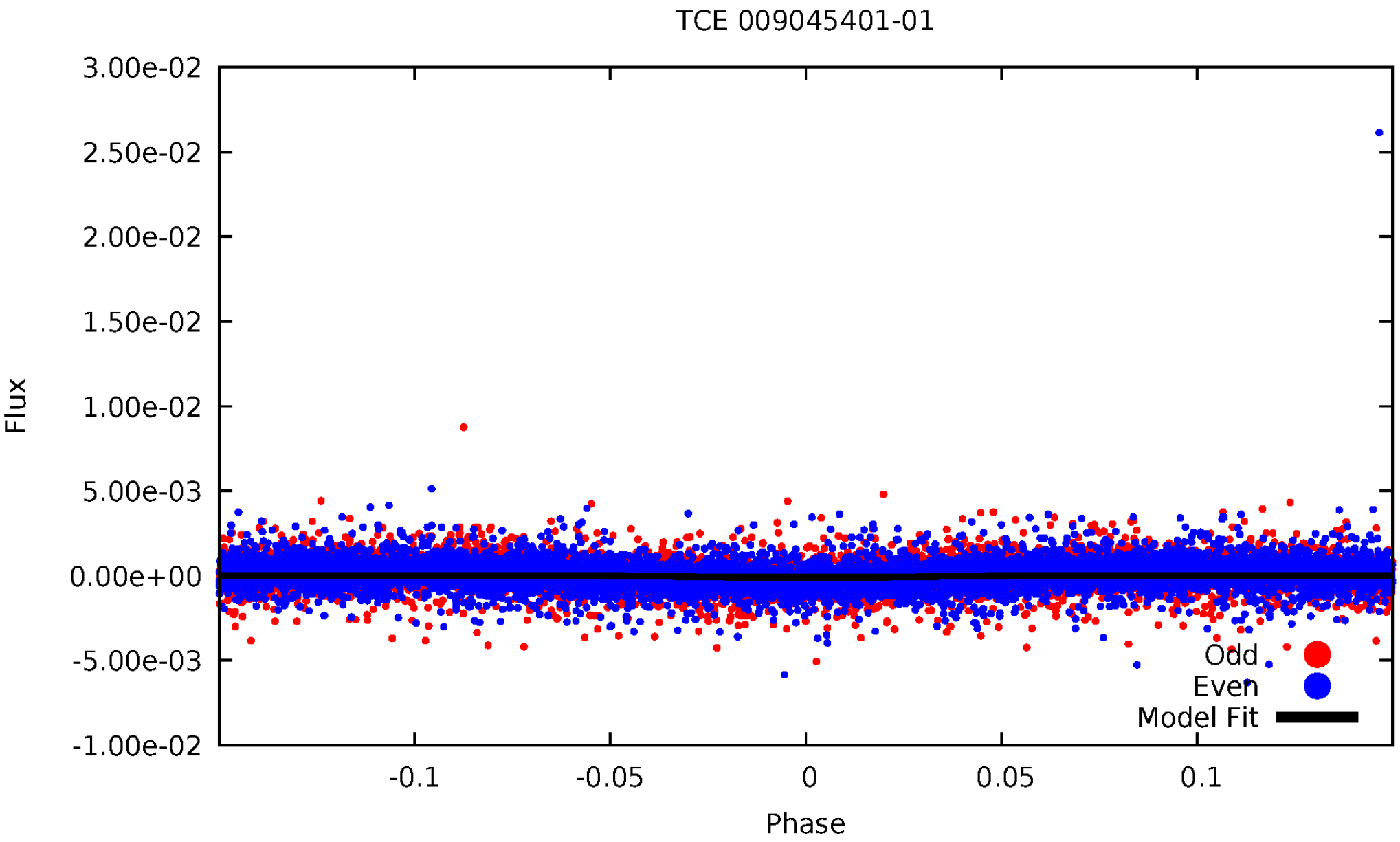
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009045401-01, PDC Light Curves

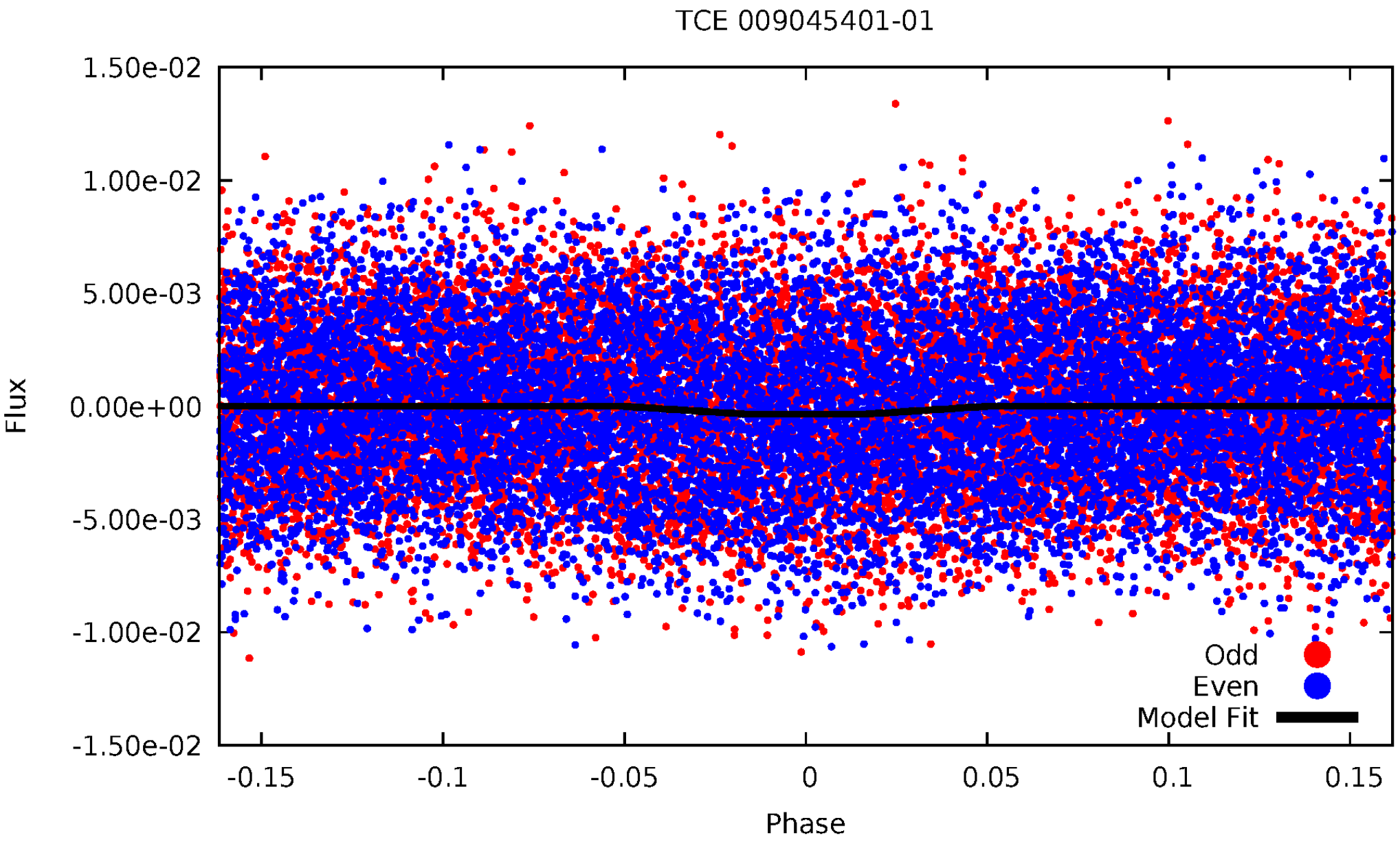



TCE 009045401-01
P = 0.303 days
P = 0.606 days
P = 1.213 days
Normalized Flux
BKJD
Normalized Flux
Phase

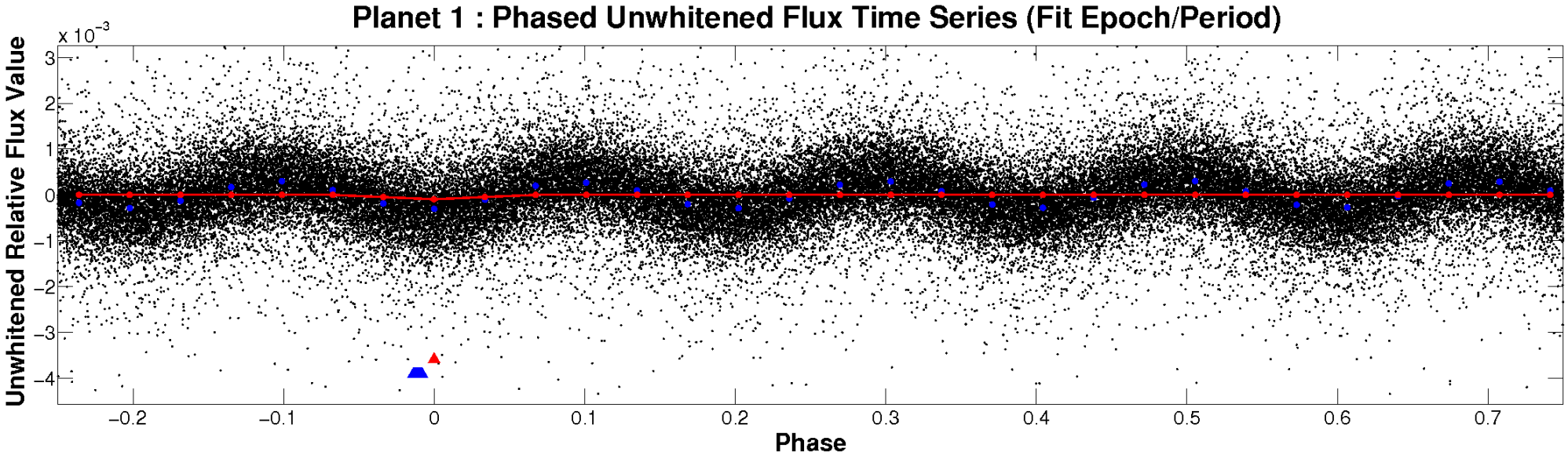
DV Odd/Even

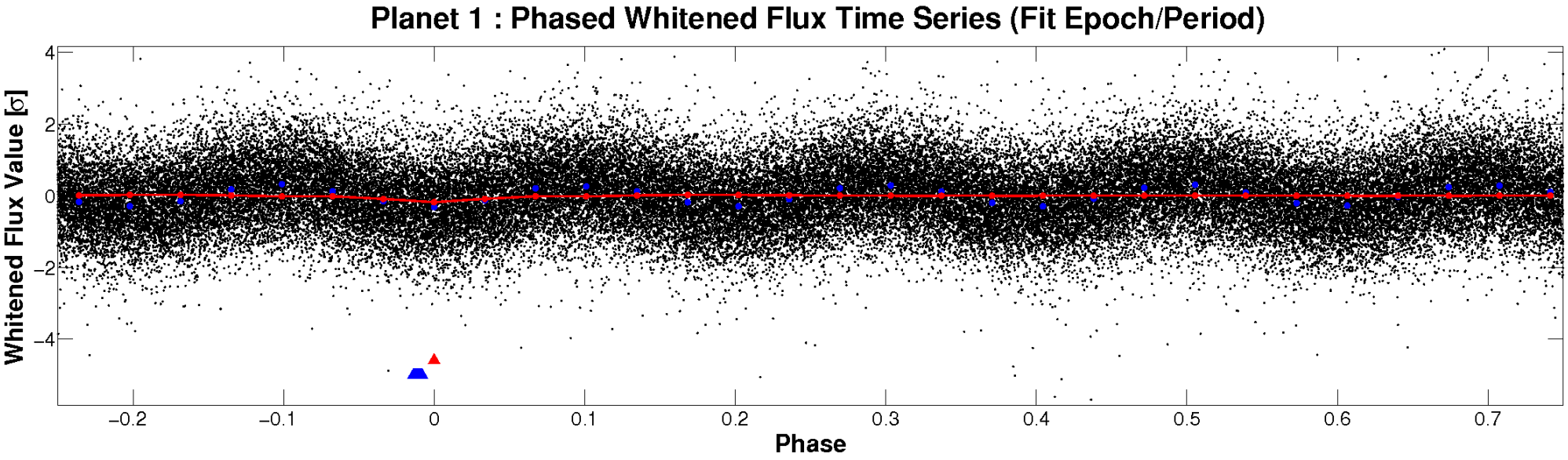

TCE 009045401-01
3.00e-02
2.50e-02
2.00e-02
1.50e-02
1.00e-02
5.00e-03
0.00e+00
-5.00e-03
-1.00e-02
Flux
-0.1
-0.05
0
0.05
0.1
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009045401-01
1.50e-02
1.00e-02
5.00e-03
0.00e+00
-5.00e-03
-1.00e-02
-1.50e-02
Flux
-0.15
-0.1
-0.05
0
0.05
0.1
0.15
Phase
Odd
Even
Model Fit

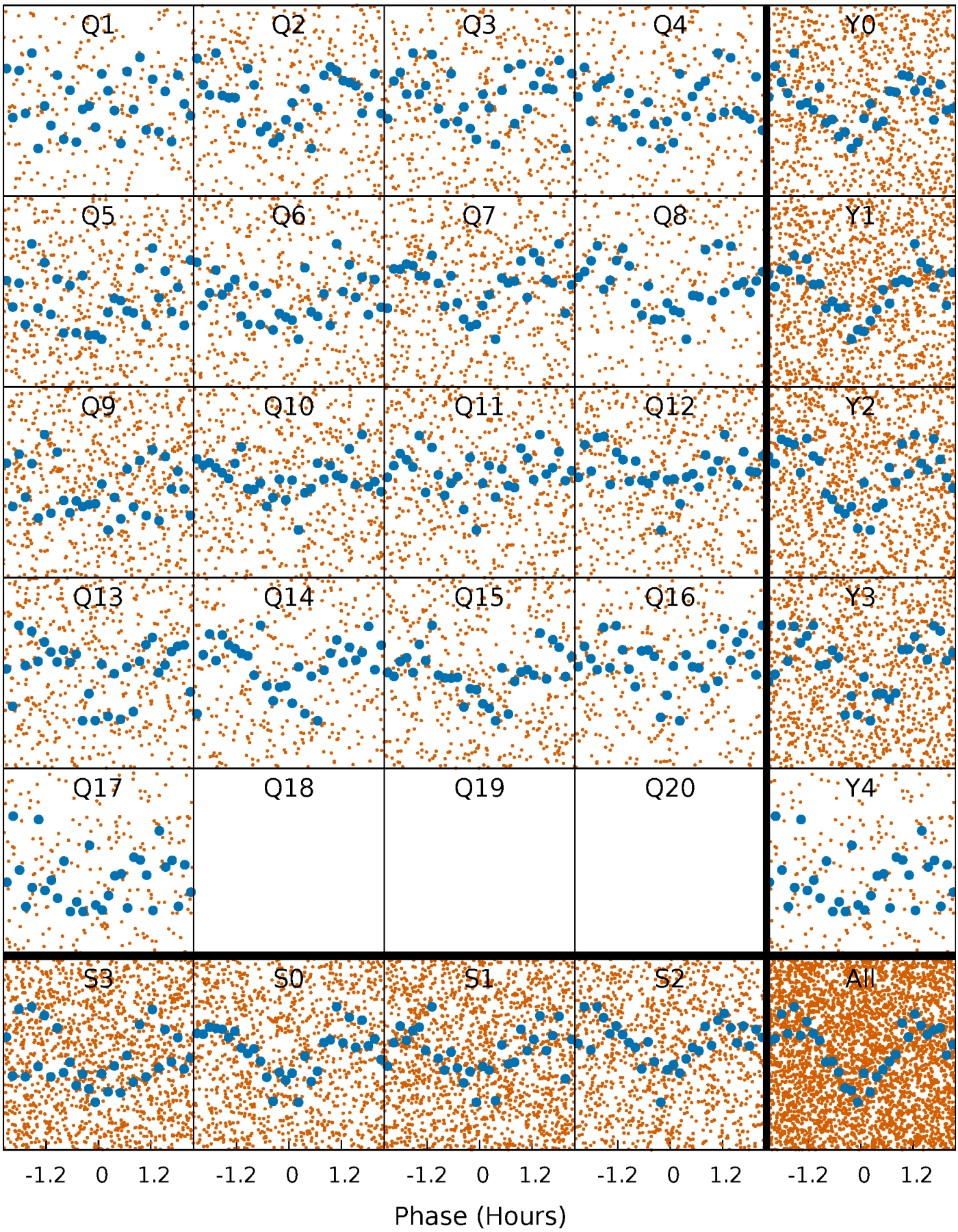
Non-Whitened Vs. Whitened Light Curve





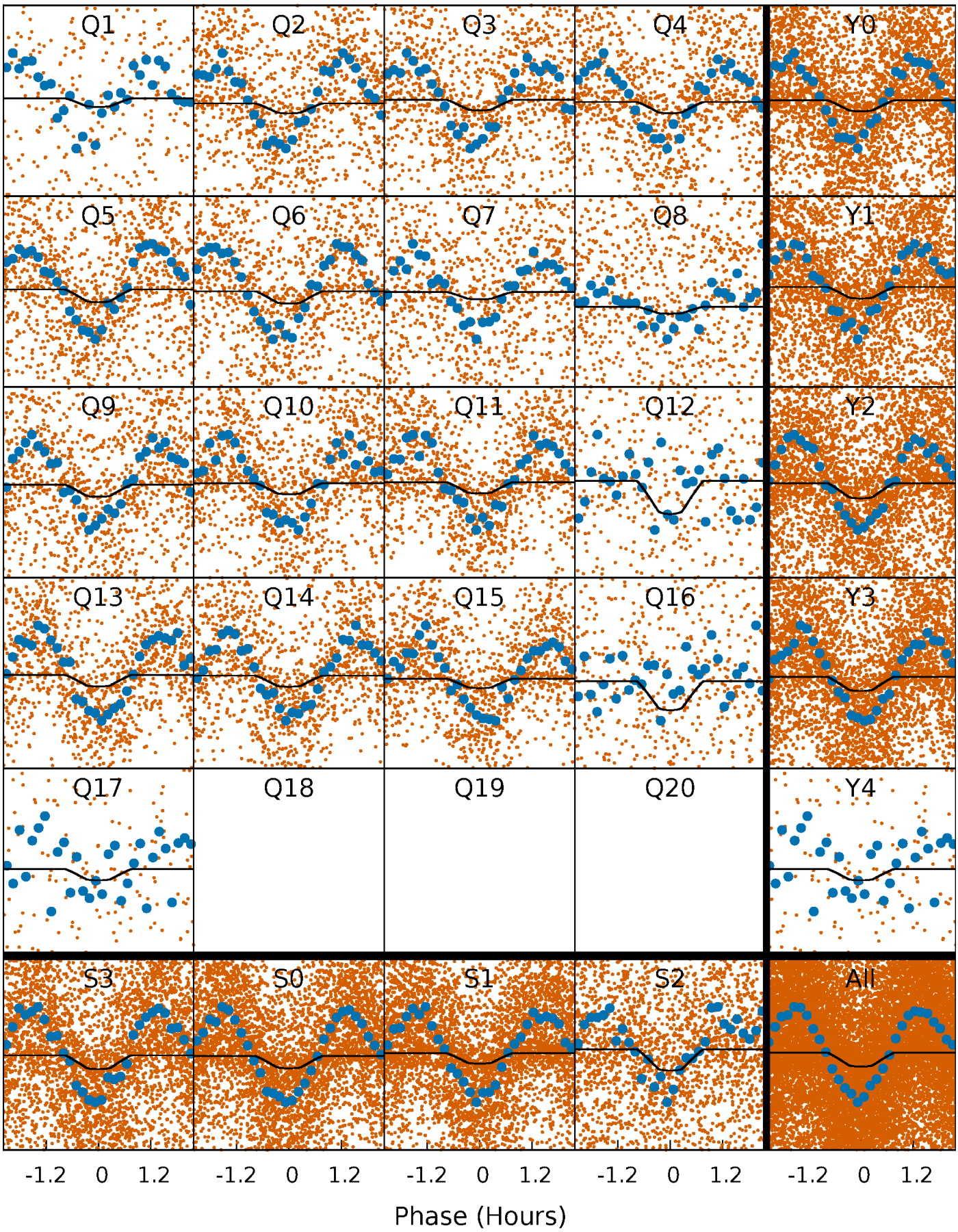
PDC Quarter-Phased Transit Curves

TCE 009045401-01 P= 0.606375 Days T_0=131.521422 (BKJD)



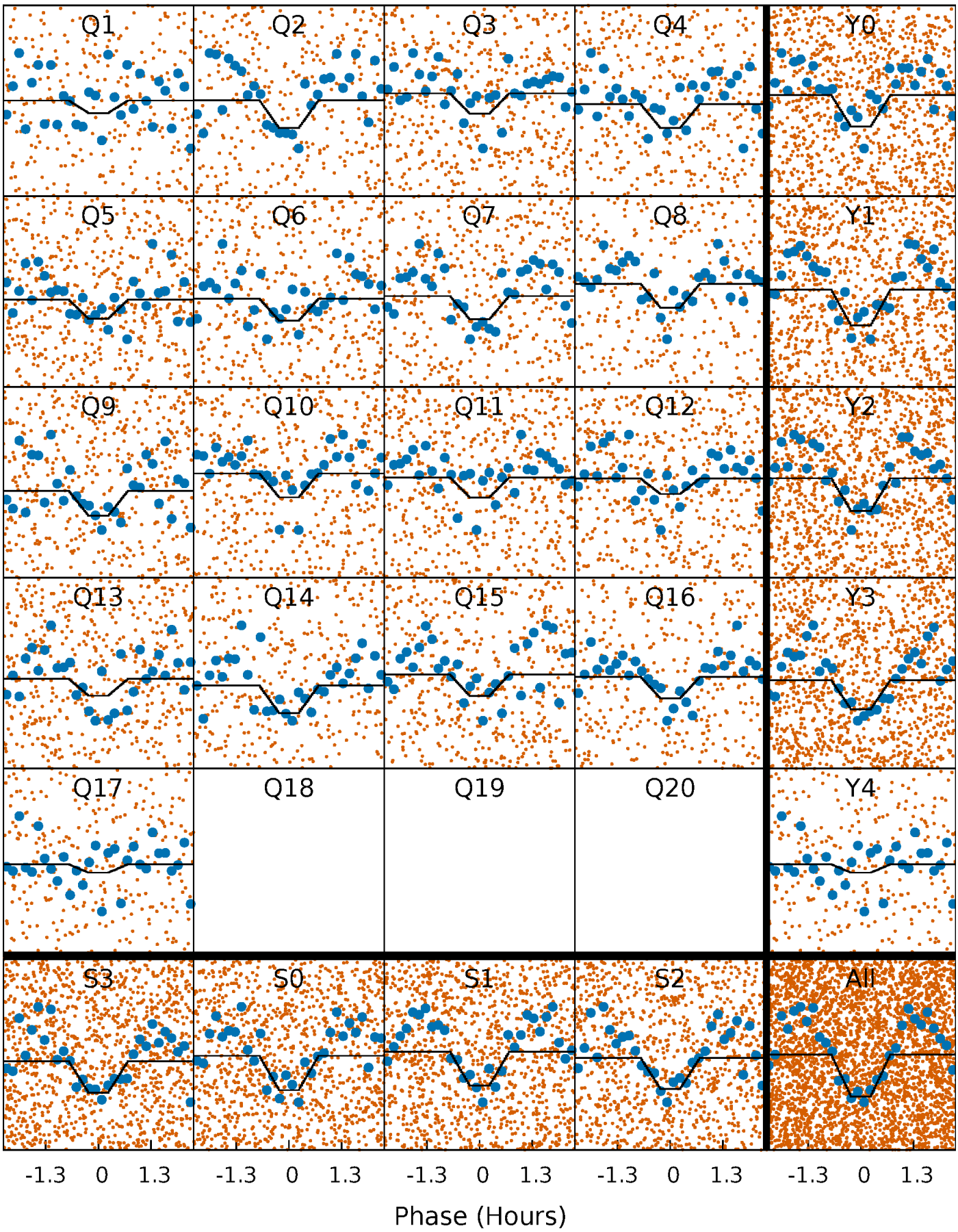
DV Quarter-Phased Transit Curves

TCE 009045401-01 P= 0.606375 Days T_0=131.521422 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

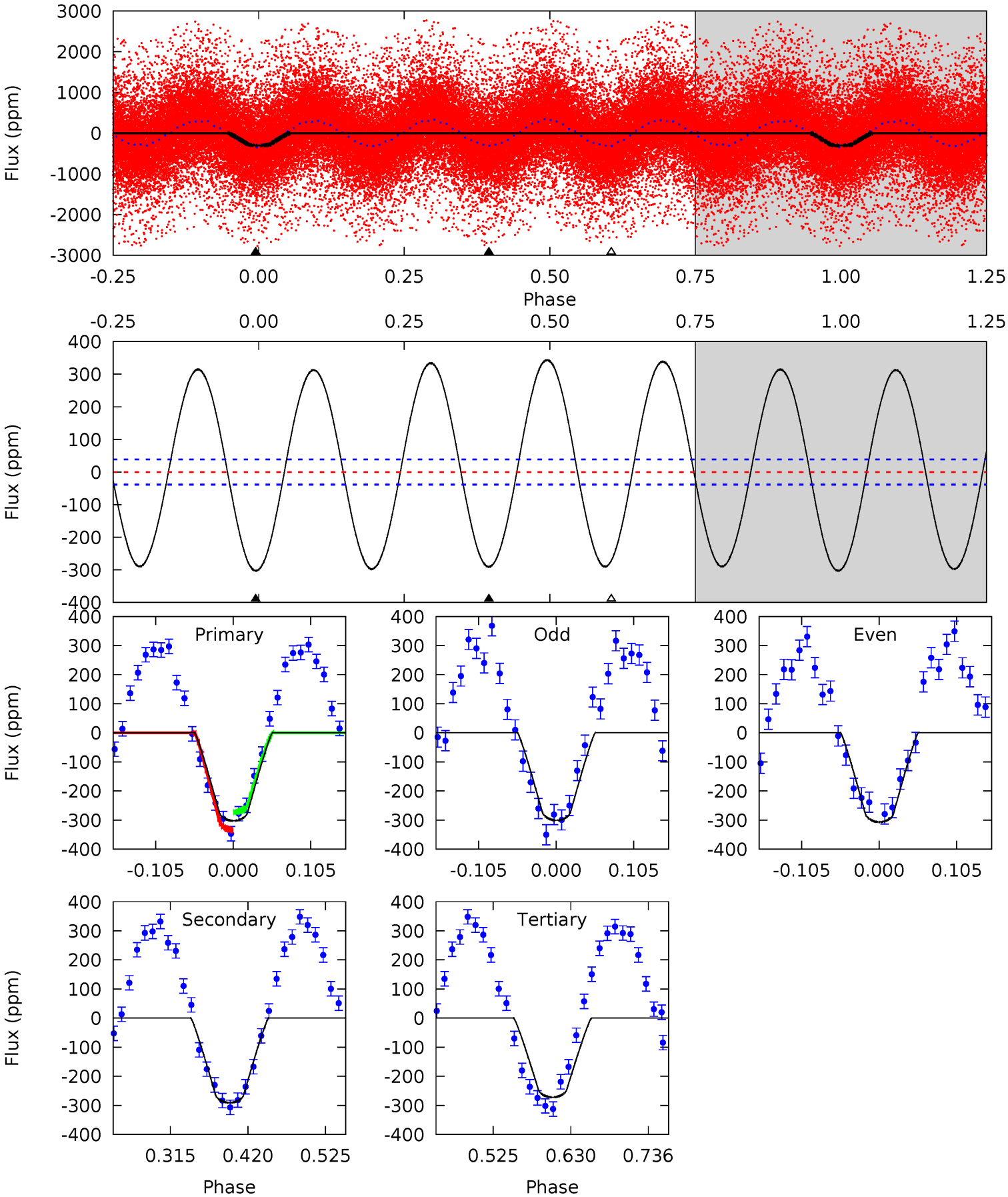
TCE 009045401-01 P= 0.606378 Days T_0=131.515545 (BKJD)



DV Model-Shift Uniqueness Test

009045401-01, P = 0.606375 Days, E = 130.915047 Days

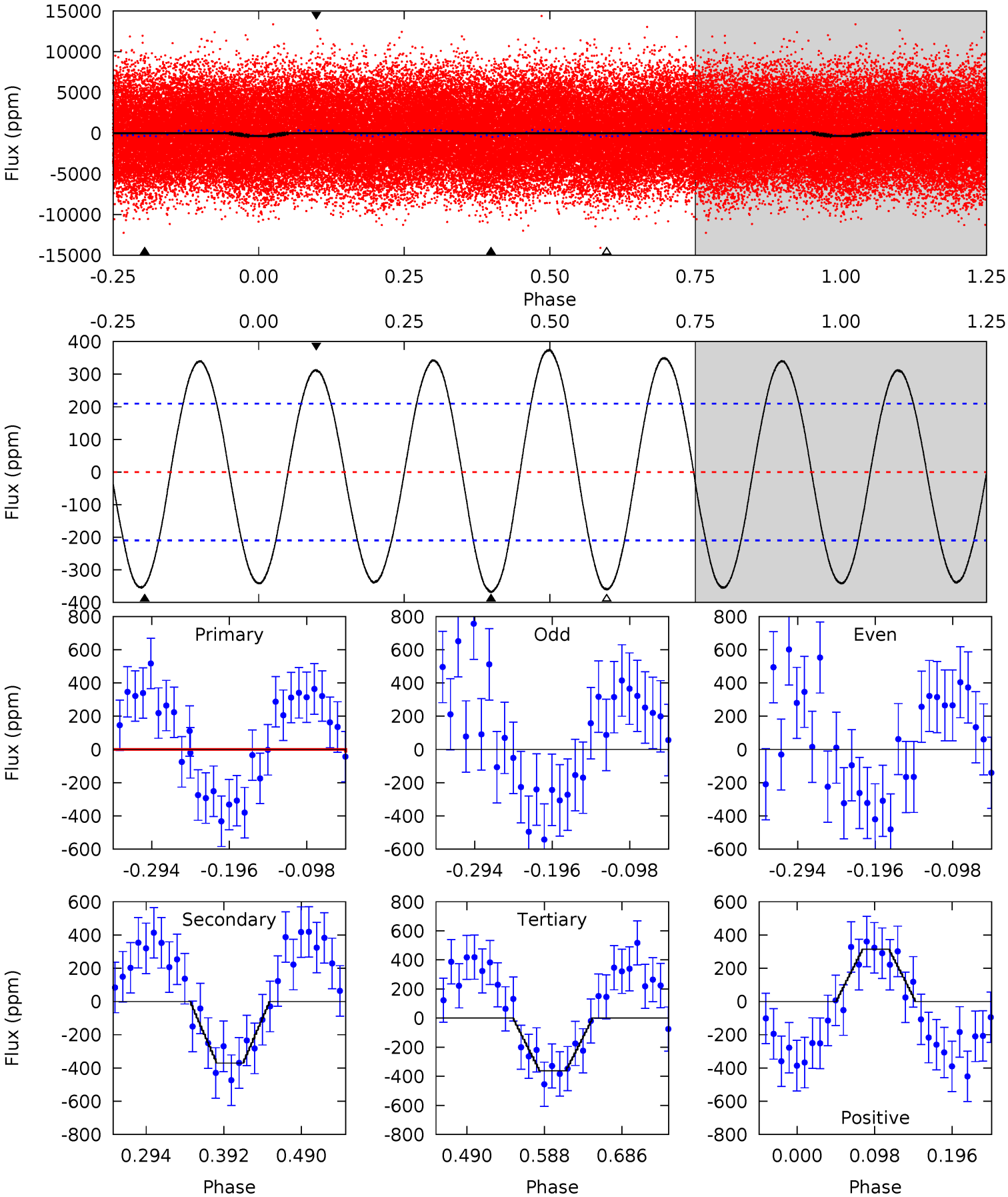
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.7	34.3	32.1	0	4.55	1.62	25.5	3.59	35.7	2.20	34.3	0.36	0.99	0.53	3.78



Alt Model-Shift Uniqueness Test

009045401-01, P = 0.606378 Days, E = 130.909167 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.61	8.08	7.90	6.84	4.57	1.65	5.31	-0.29	0.76	0.18	1.23	0.74	0.92	0.50	0.10



Stellar Parameters For KIC 009045401

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	M($M_\odot$)	$p_\star$ (g·cm^{-3})
	6348^{+151}_{-189}	$4.152^{+0.214}_{-0.175}$	$-0.140^{+0.250}_{-0.300}$	$1.476^{+0.456}_{-0.373}$	$1.126^{+0.194}_{-0.141}$	$0.493^{+0.585}_{-0.230}$
	+2%/-3%	+5%/-4%	+179%/-214%	+31%/-25%	+17%/-13%	+119%/-47%
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 009045401-01 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-291±8	$1.77^{+0.87}_{-0.90}$	3912^{+314}_{-257}	8059^{+5649}_{-1669}	11^{+35}_{-6}
Alt.	-371±46	$2.96^{+1.04}_{-0.89}$	3909^{+312}_{-271}	6308^{+1380}_{-814}	$4.963^{+5.026}_{-2.282}$

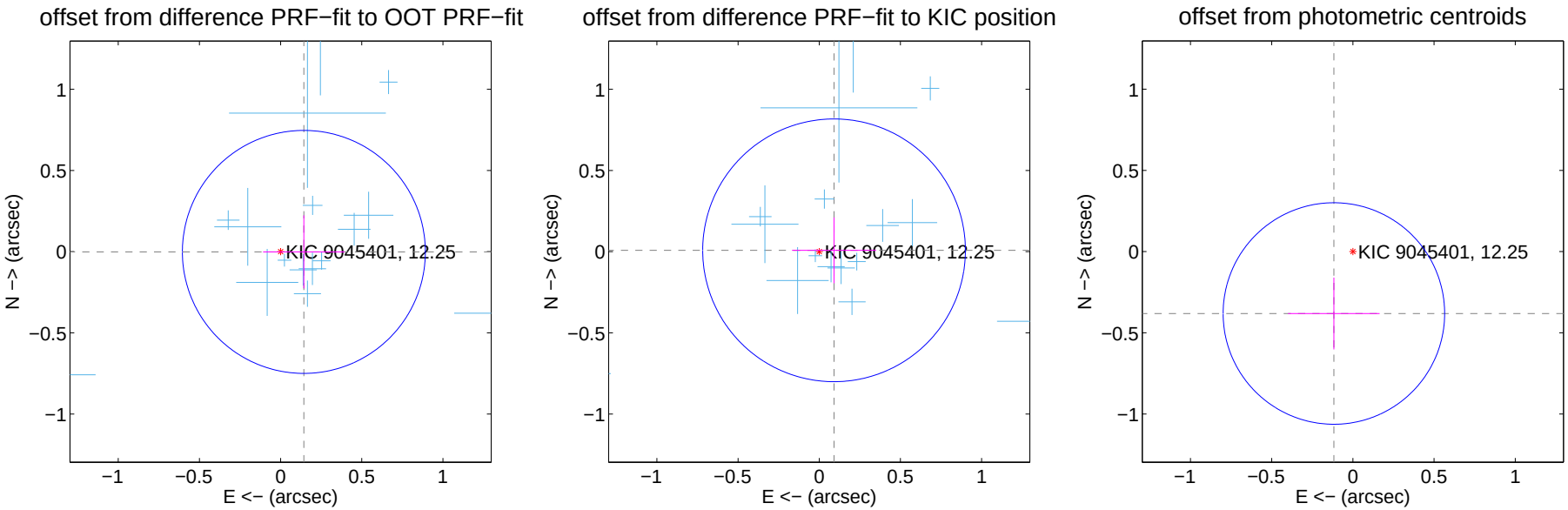
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

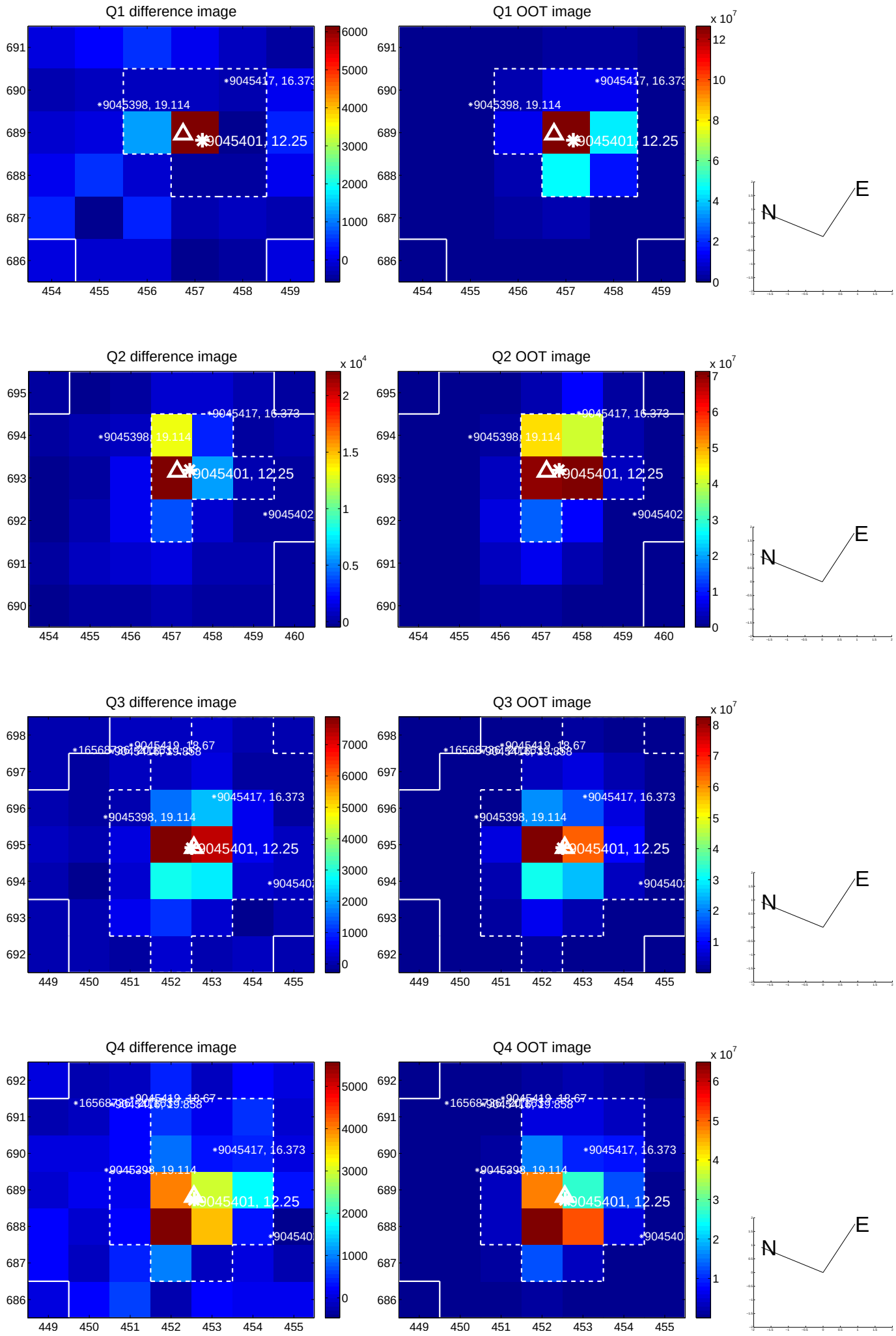
Supplemental centroid analysis for 009045401-01. Kepler magnitude: 12.25. Transit SNR 10.71
There are 16 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.143 ± 0.249	0.57	-0.143 ± 0.251	-0.001 ± 0.225
PRF-fit source offset from KIC position	0.091 ± 0.270	0.34	-0.091 ± 0.259	0.008 ± 0.202
photometric centroid source offset	0.40 ± 0.23	1.75	0.12 ± 0.28	-0.38 ± 0.22

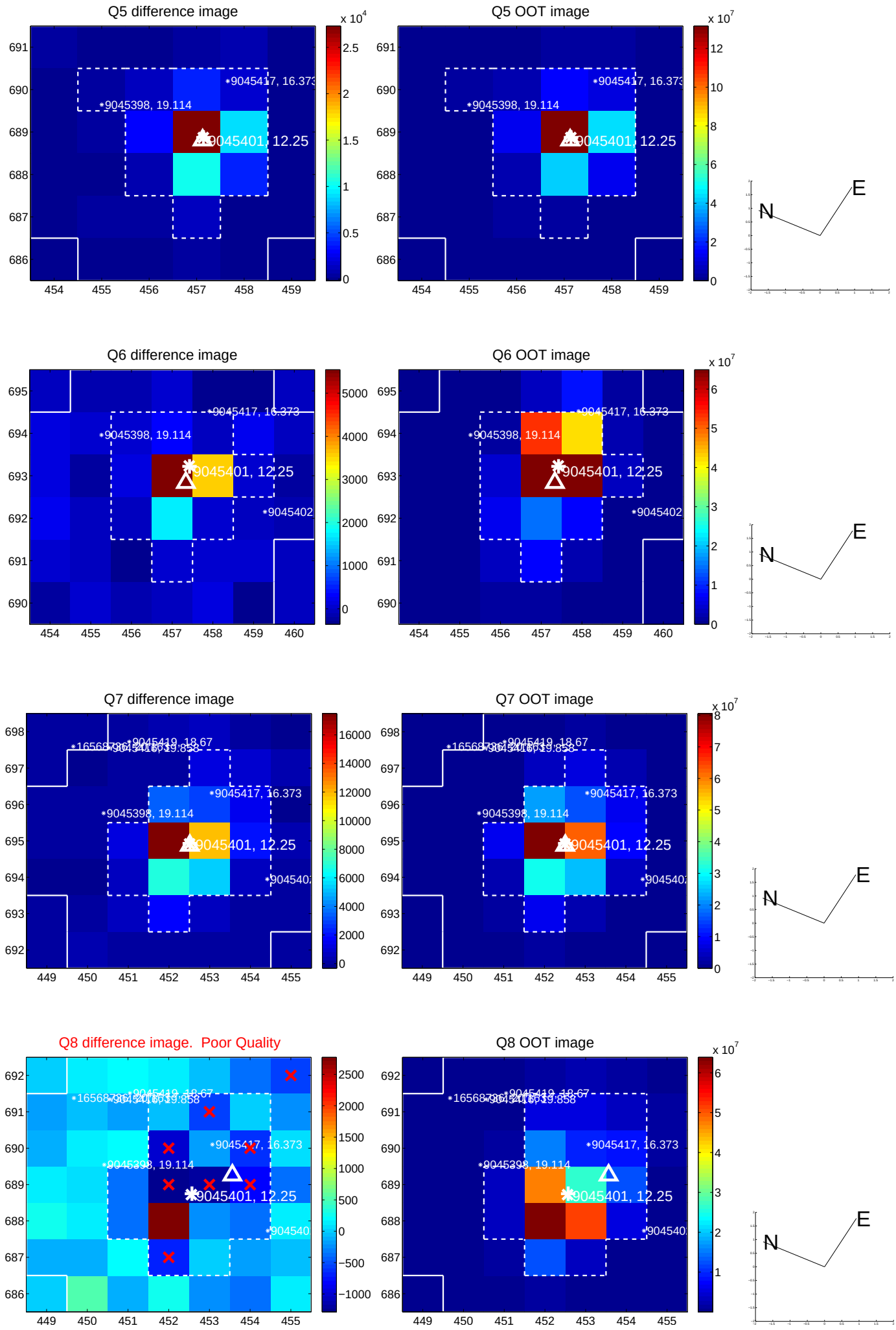


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

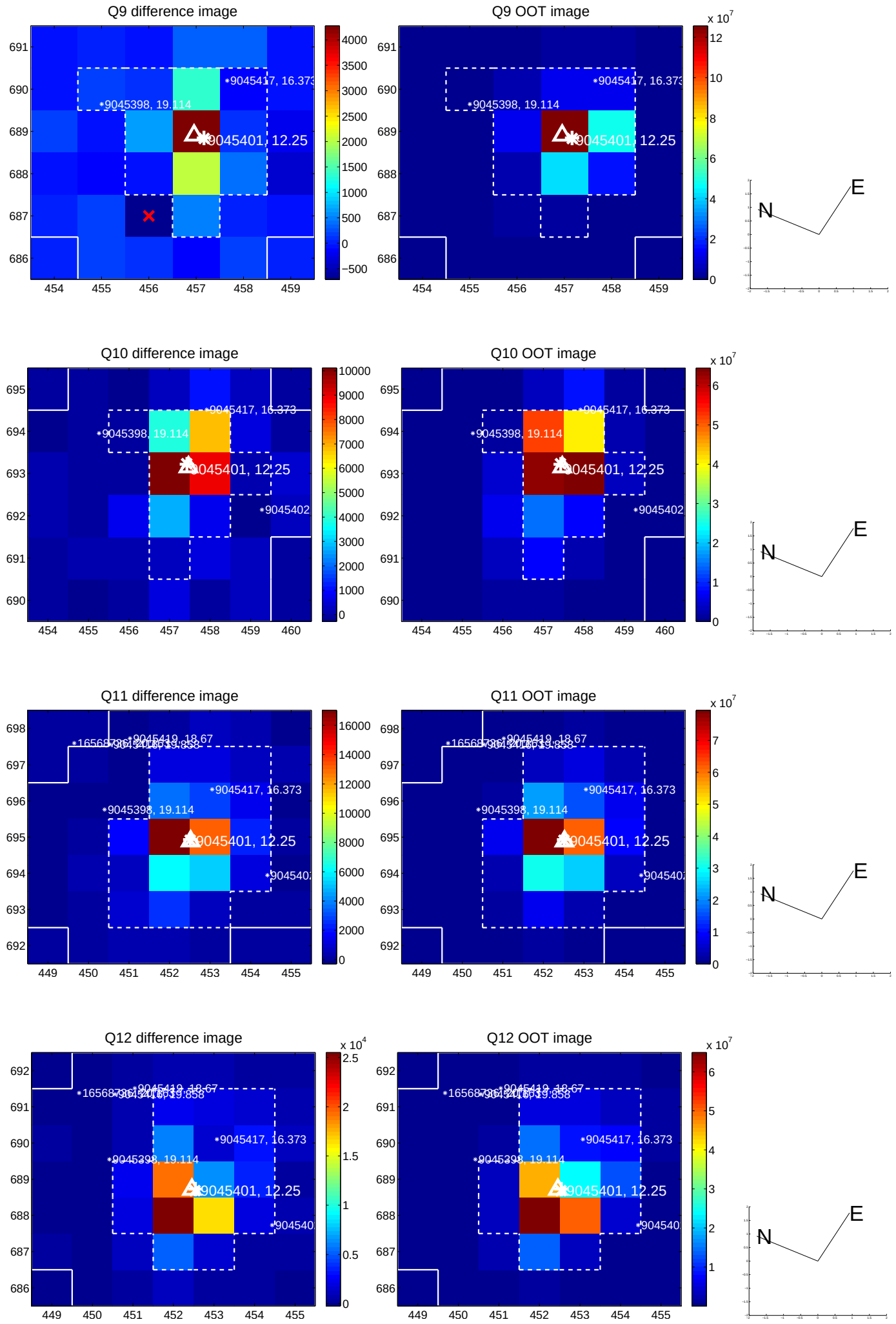
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



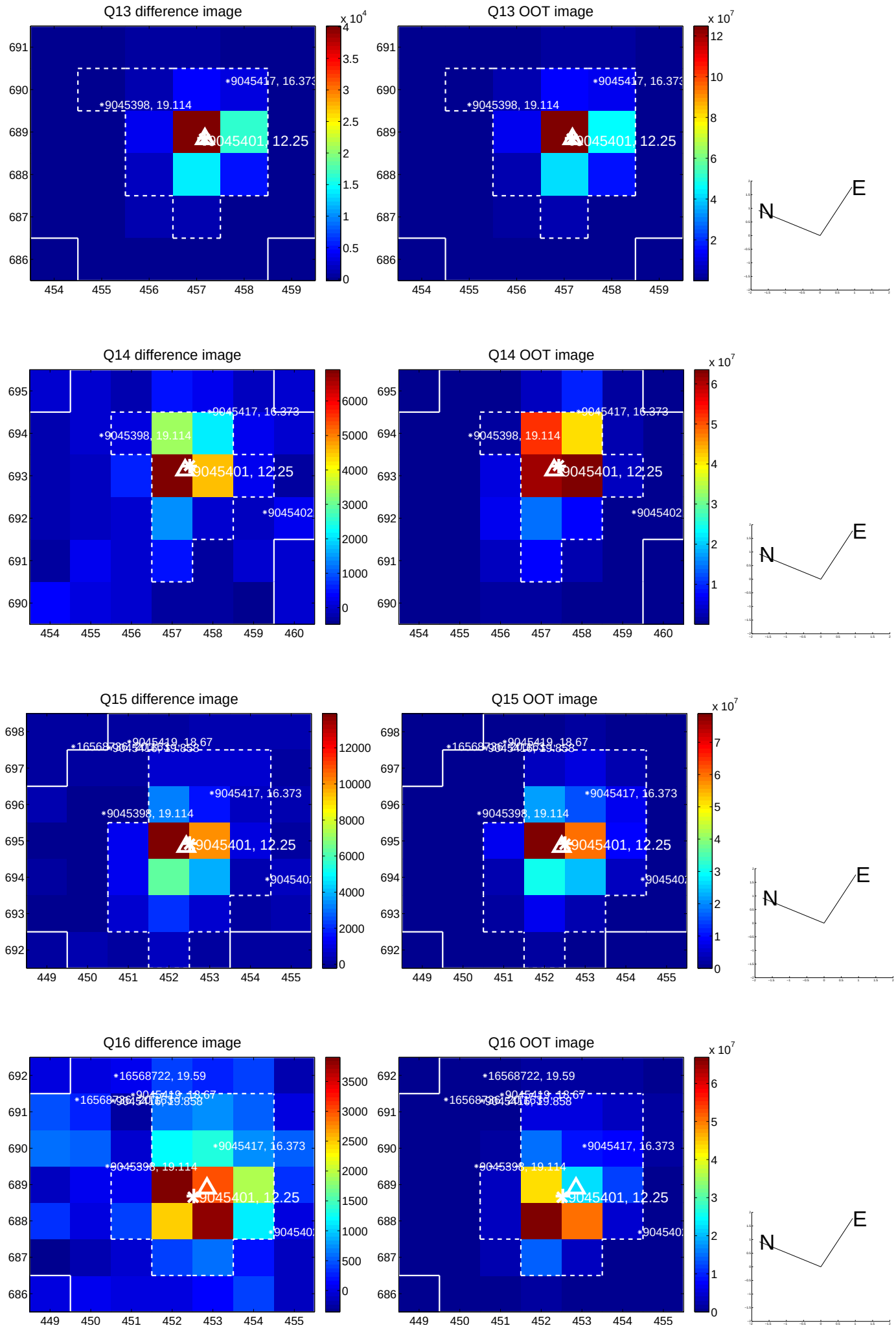
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



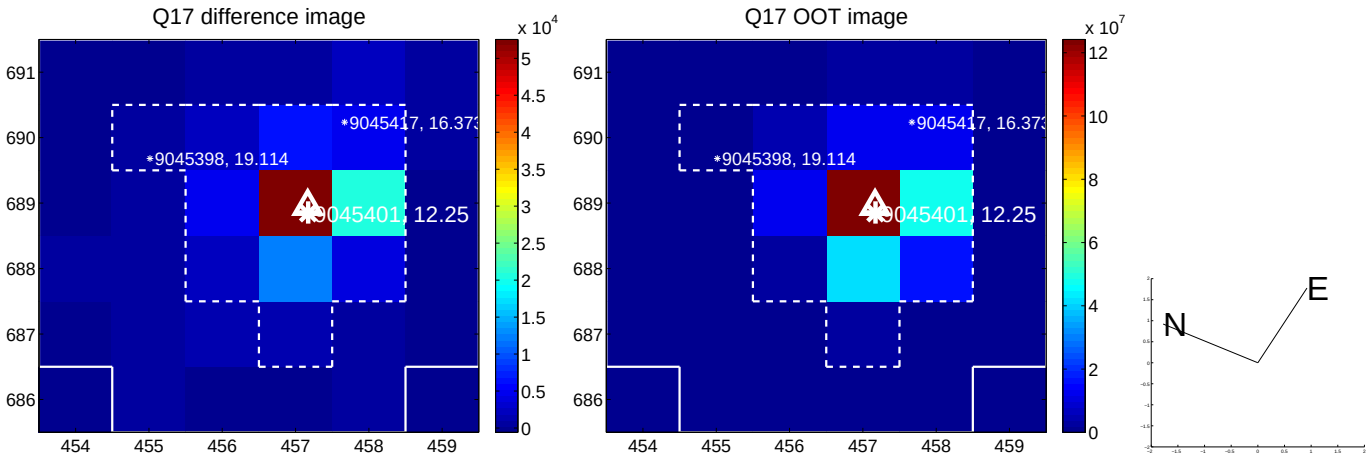
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

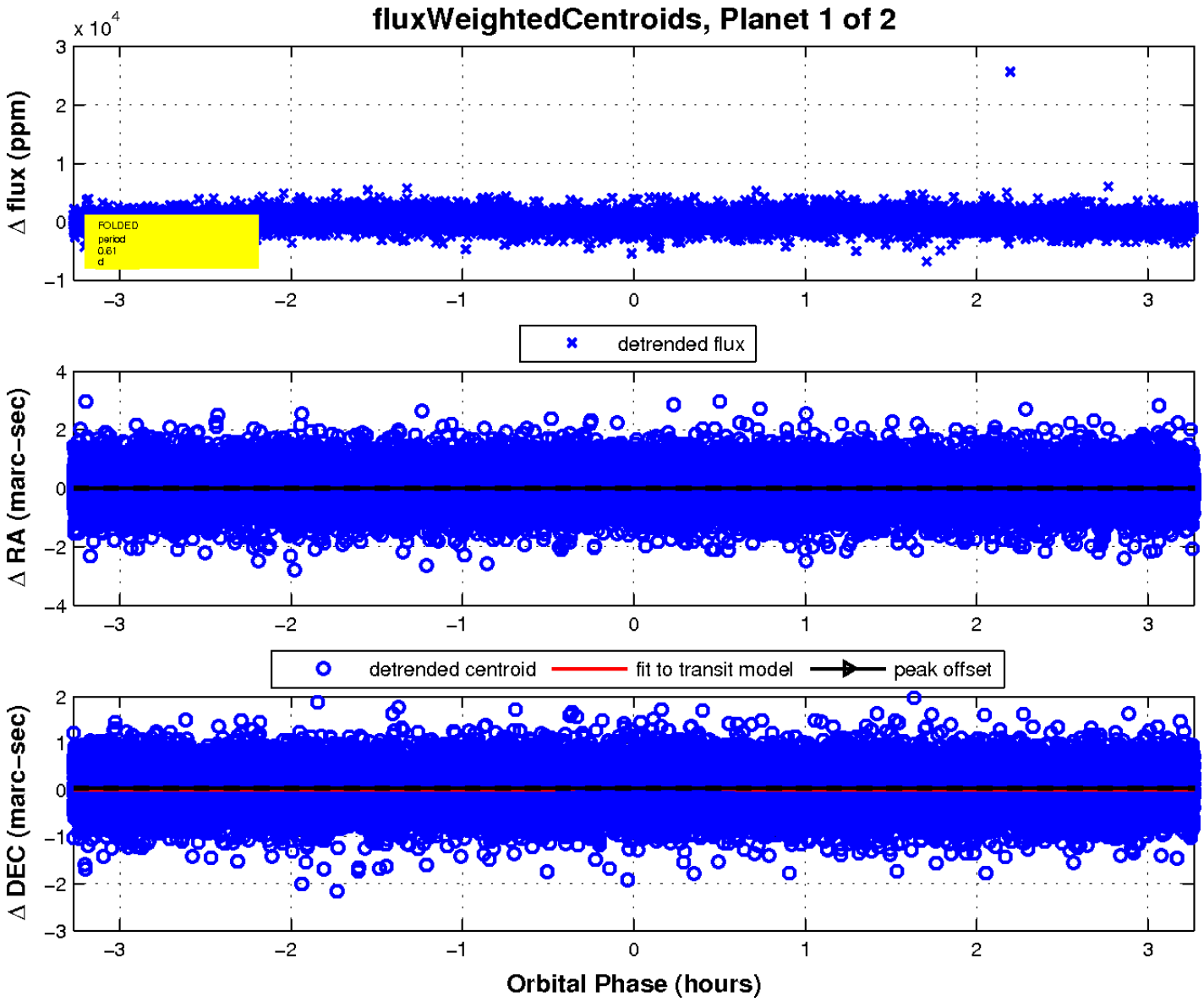


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

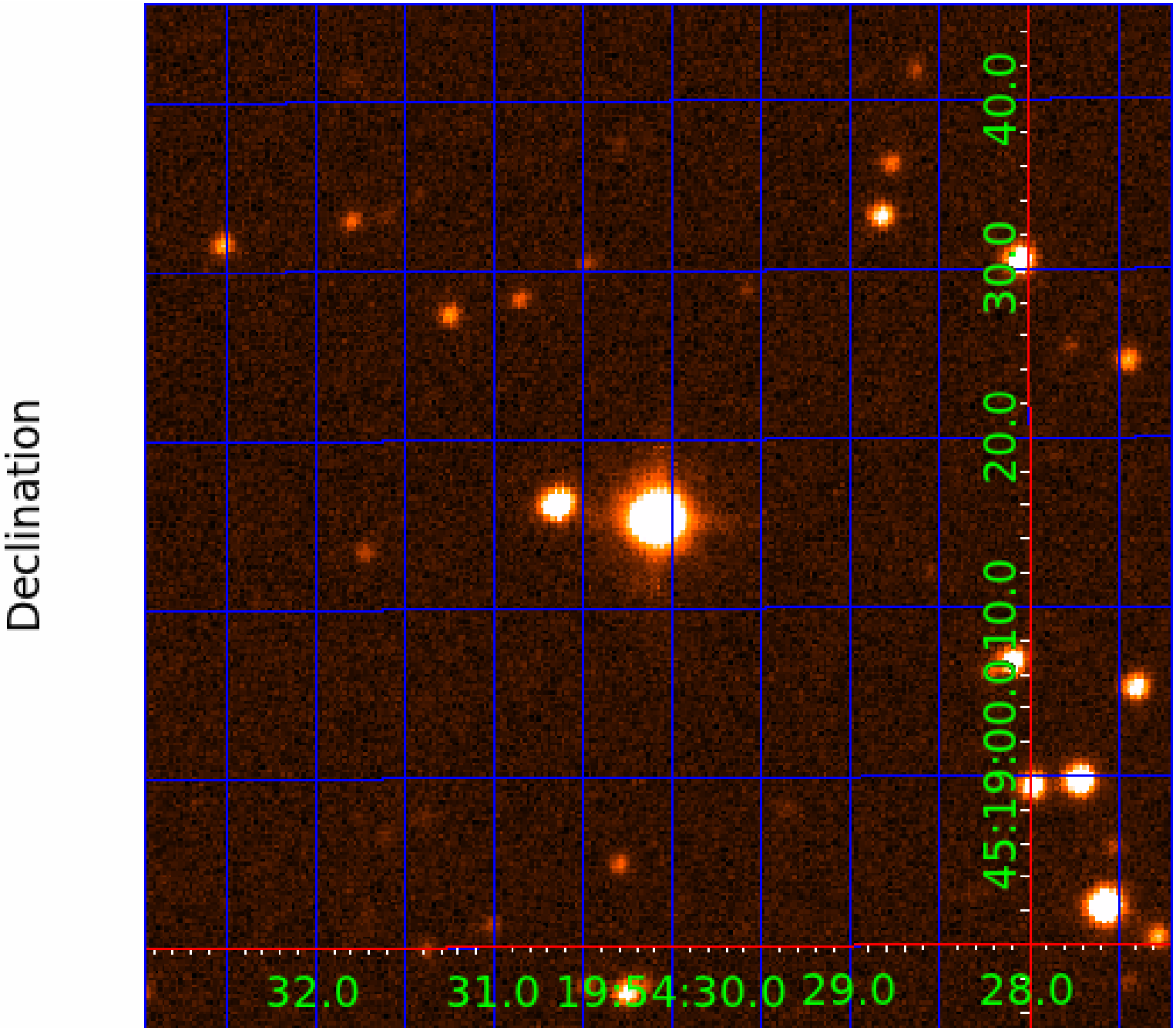


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image



KIC 009045401

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 ($S_\oplus$)
009045401-01	OBS	No	0.606375	131.521422	95.9	1.090	10.3	10.7	1.48	6348	1.71	14876.85
009045401-02	OBS	No	0.606377	132.119452	278.2	7.277	10.1	24.3	1.48	6348	2.47	14876.81

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009045401-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009045401-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

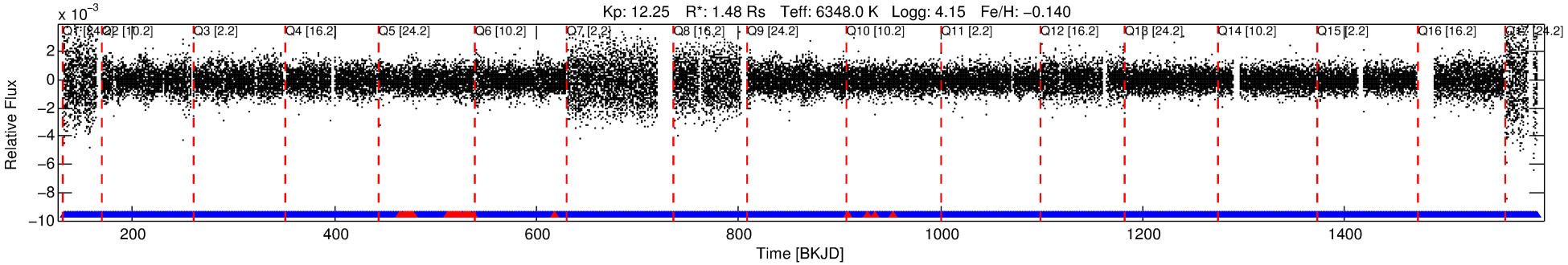
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

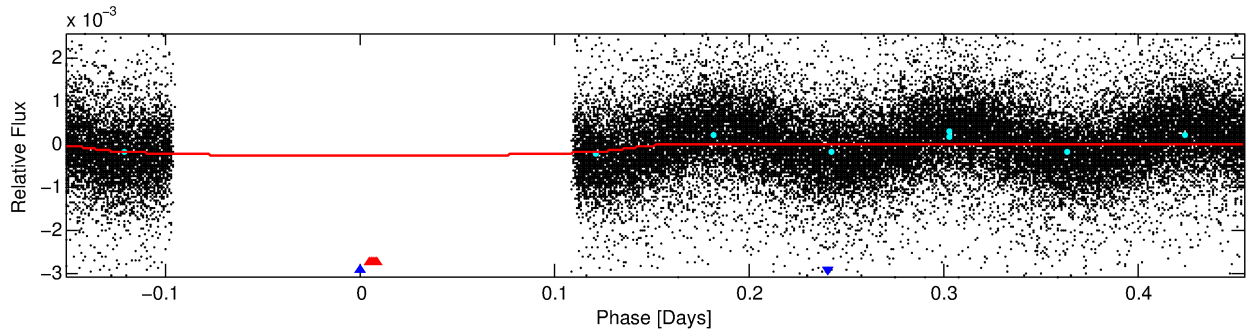
Ephemeris Match Information For 009045401-02

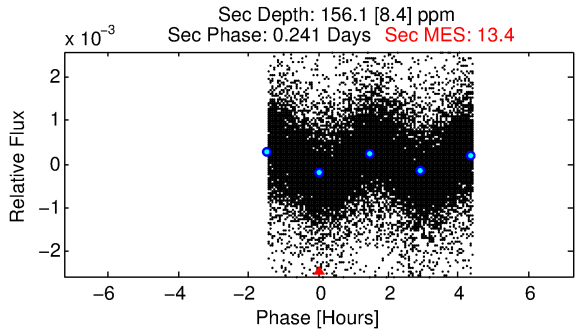
No Significant Match Found

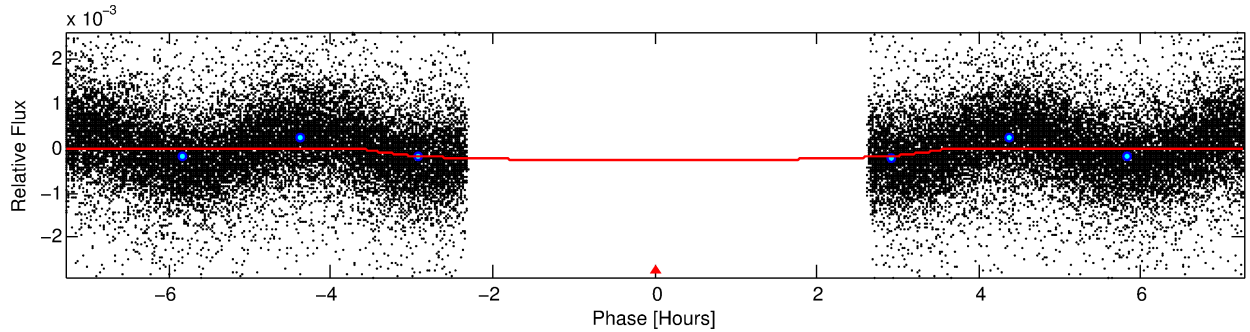
DV One-Page Summary

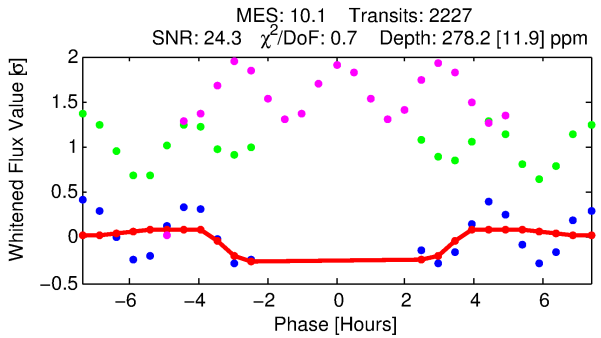
KIC: 9045401 Candidate: 2 of 2 Period: 0.606 d

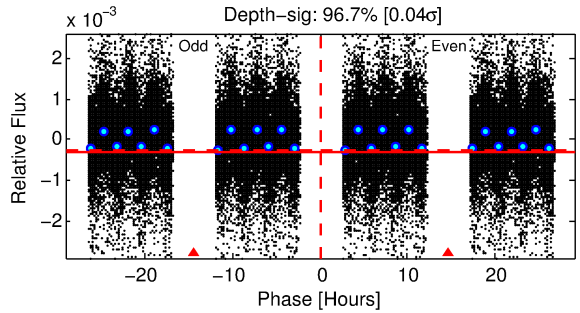


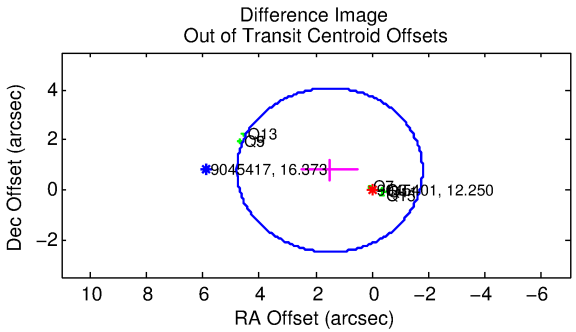












DV Fit Results:

Period = 0.60638 [0.00000] d
Epoch = 132.1195 [0.0012] BKJD
Rp/R* = 0.0153 [0.0009]
a/R* = 1.01 [0.00]
b = 0.03 [9.95]

Seff = 14876.81 [6034.14]
Teq = 2816 [286] K
Rp = 2.47 [0.78] Re
a = 0.0146 [0.0038] AU

Ag = 3.00 [1.23] [1.63σ]
Teffp = 5732 [252] K [7.65σ]

DV Diagnostic Results:

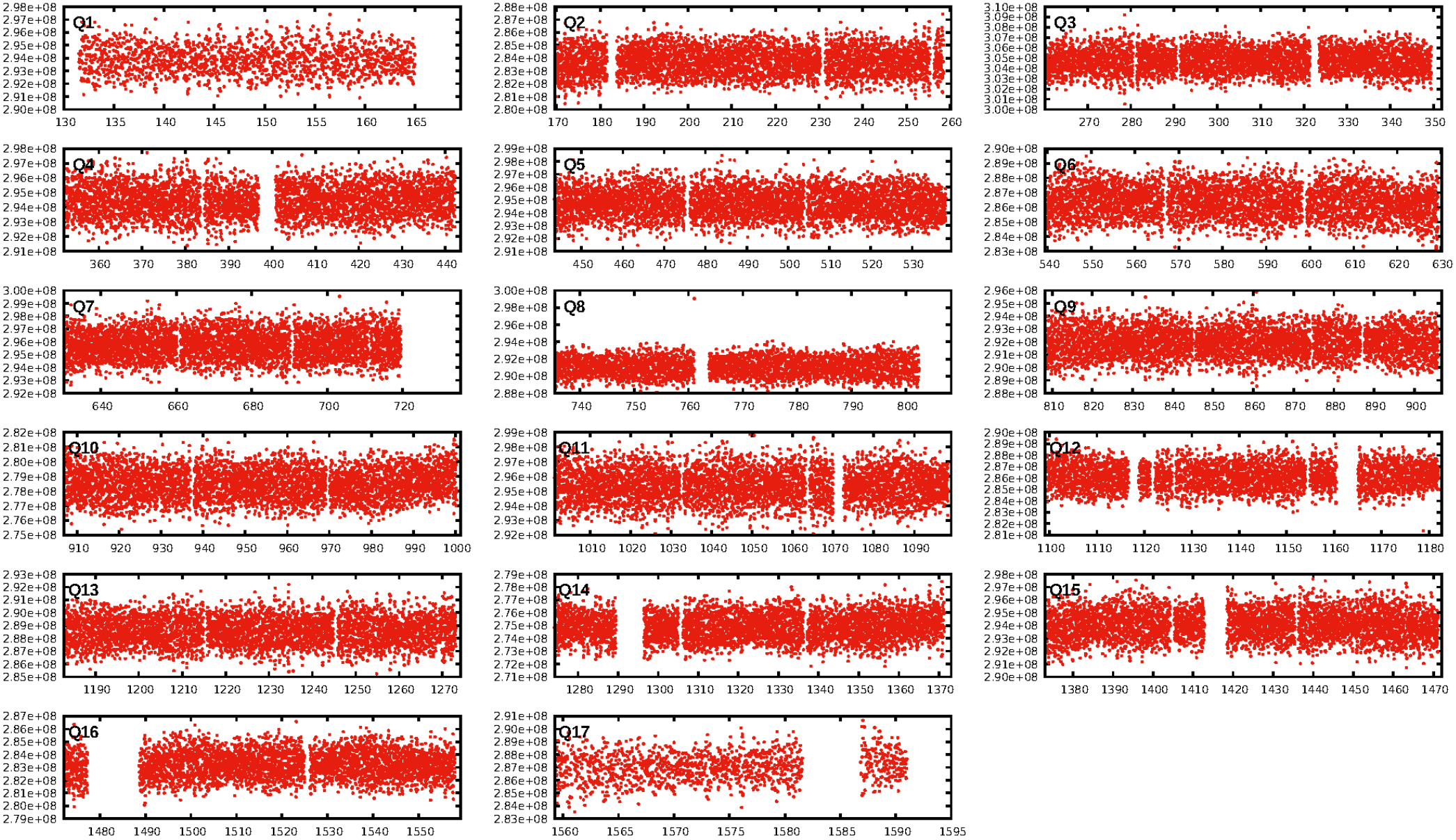
ShortPeriod−sig: 0.0% [0.00σ]
LongPeriod−sig: N/A
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: N/A
RollingBand−fgt: 0.98 [2083/2126]
GhostDiagnostic−chr: 2.215

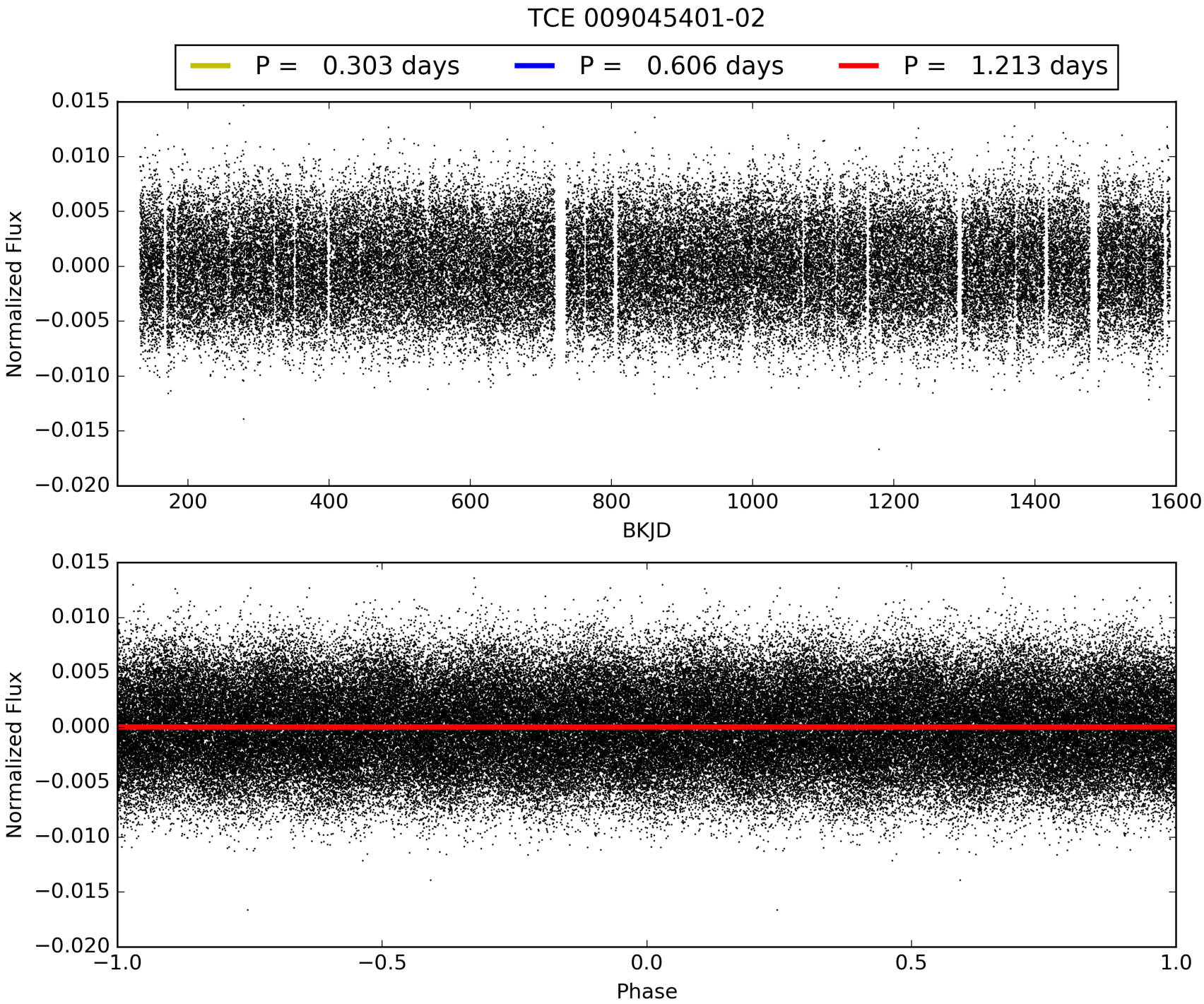
Centroid−sig: 0.0%
Centroid−so: 0.191 arcsec [4.68σ]
OotOffset−rm: 1.687 arcsec [1.54σ]
KicOffset−rm: 1.738 arcsec [1.78σ]
OotOffset−st: 0/4/0/3 [7]
KicOffset−st: 0/4/0/3 [7]
DiffImageQuality−fgm: 0.00 [0/7]
DiffImageOverlap−fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 22:27:44 Z

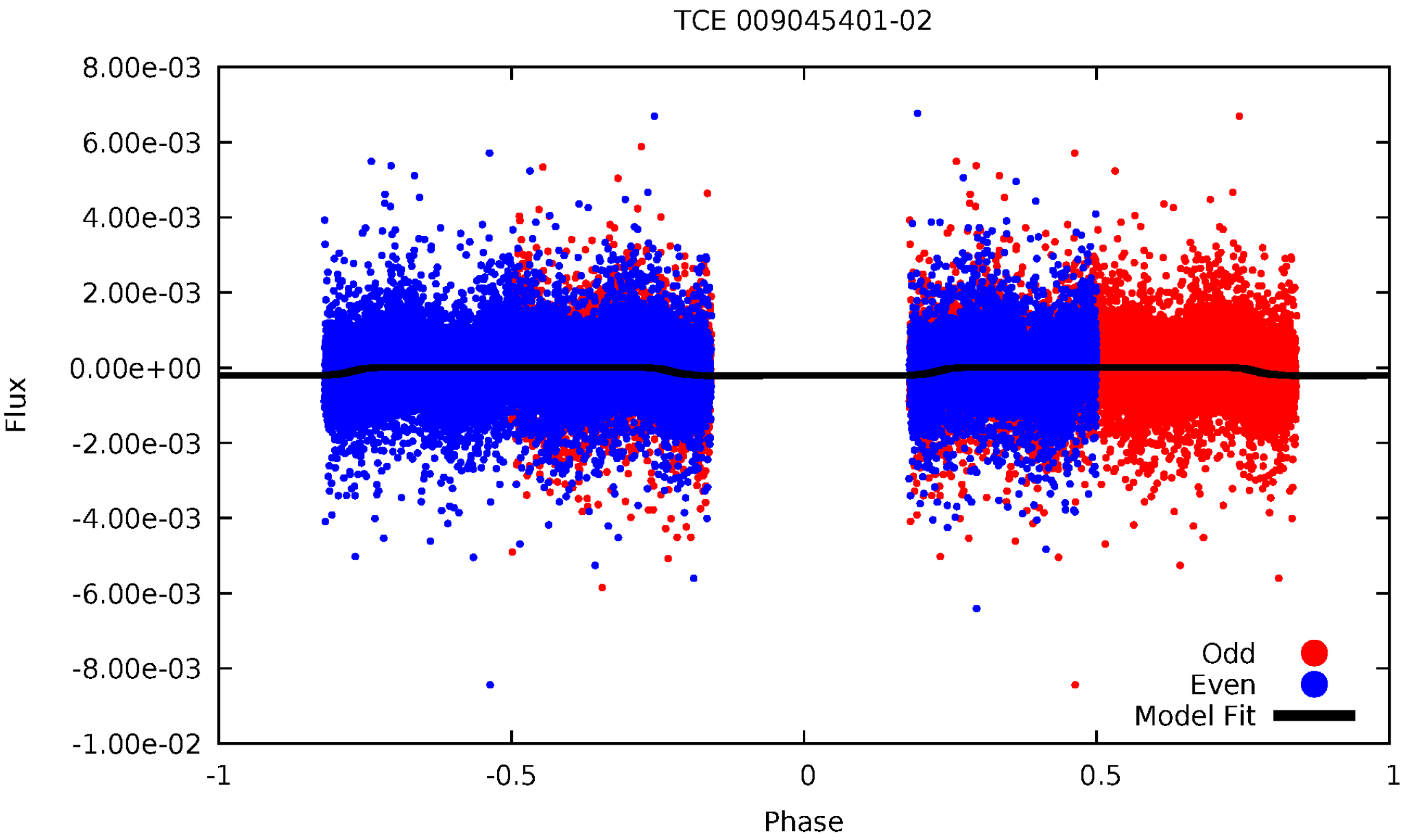
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009045401-02, PDC Light Curves

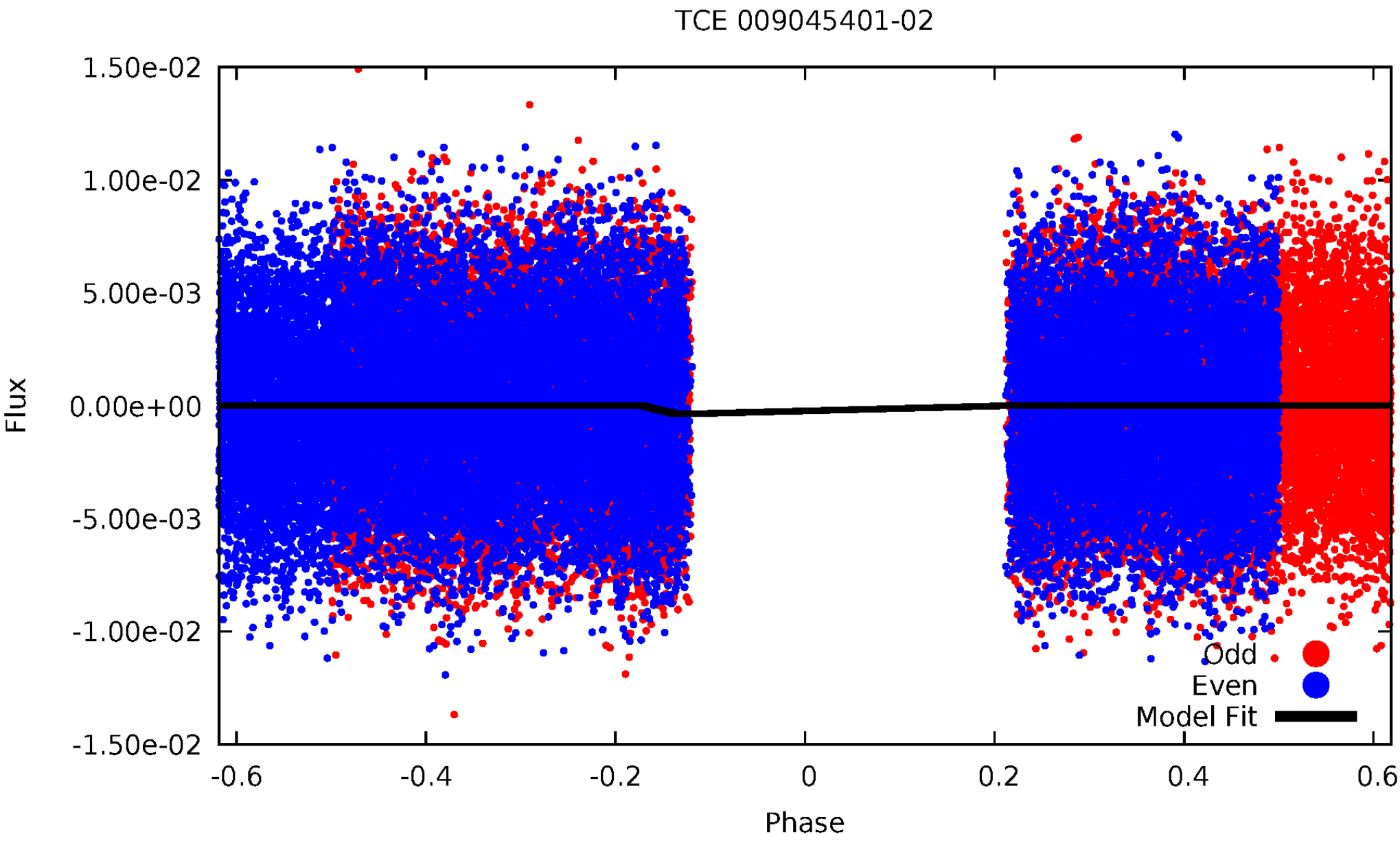



TCE 009045401-02
P = 0.303 days
P = 0.606 days
P = 1.213 days
Normalized Flux
BKJD
Normalized Flux
Phase

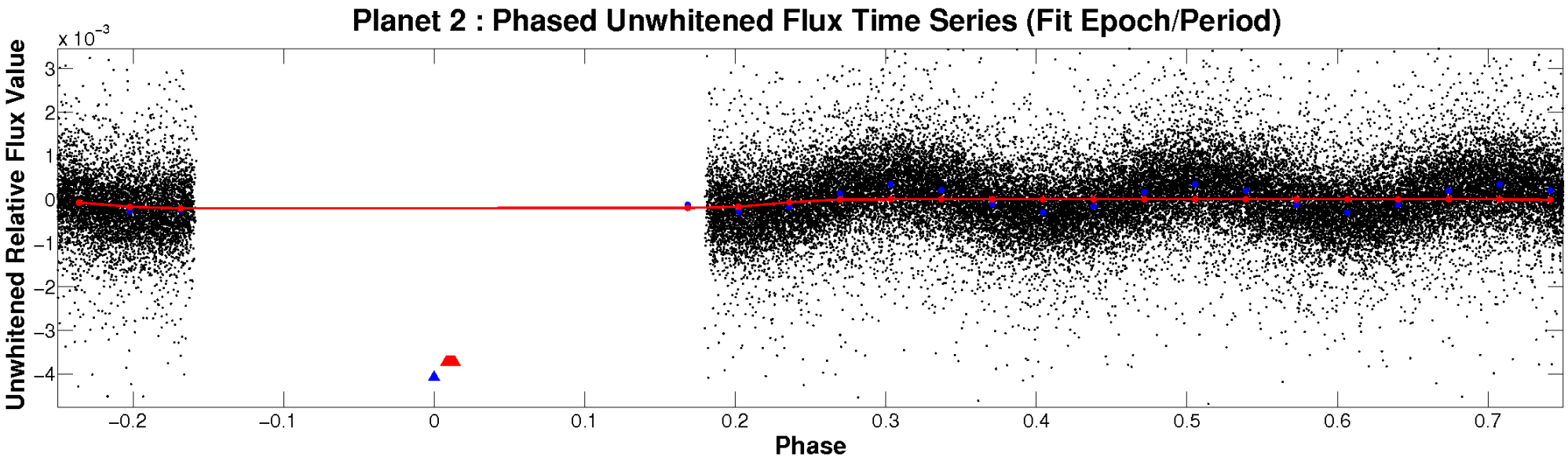
DV Odd/Even

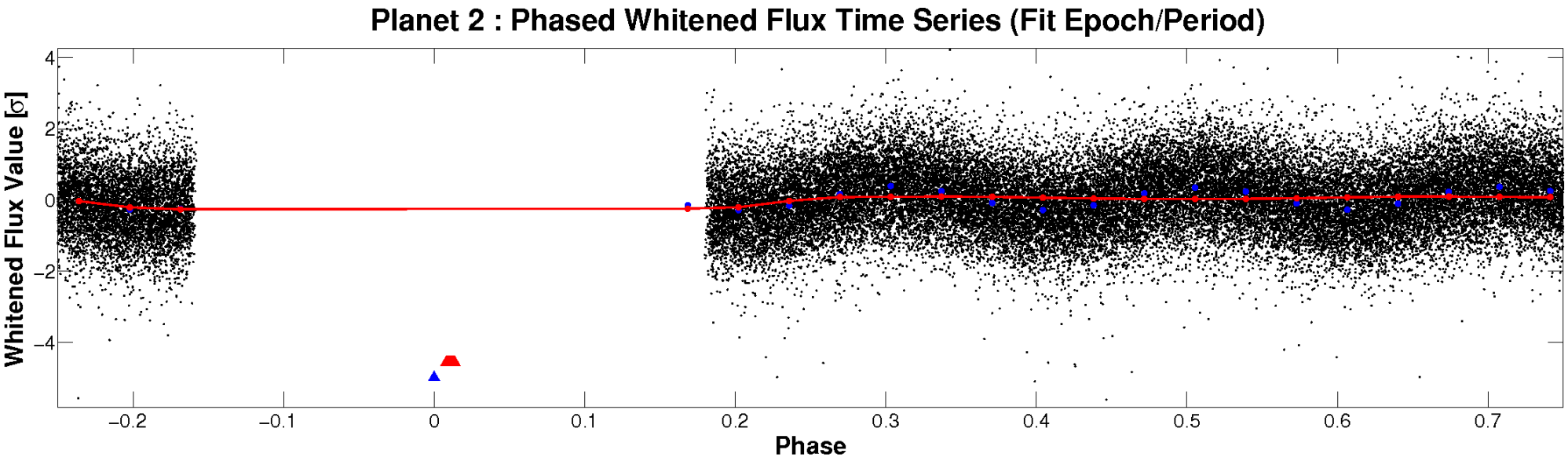

TCE 009045401-02
8.00e-03
6.00e-03
4.00e-03
2.00e-03
0.00e+00
-2.00e-03
-4.00e-03
-6.00e-03
-8.00e-03
-1.00e-02
Flux
-1
-0.5
0
0.5
1
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009045401-02
1.50e-02
1.00e-02
5.00e-03
0.00e+00
-5.00e-03
-1.00e-02
-1.50e-02
Flux
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
Phase
Odd
Even
Model Fit

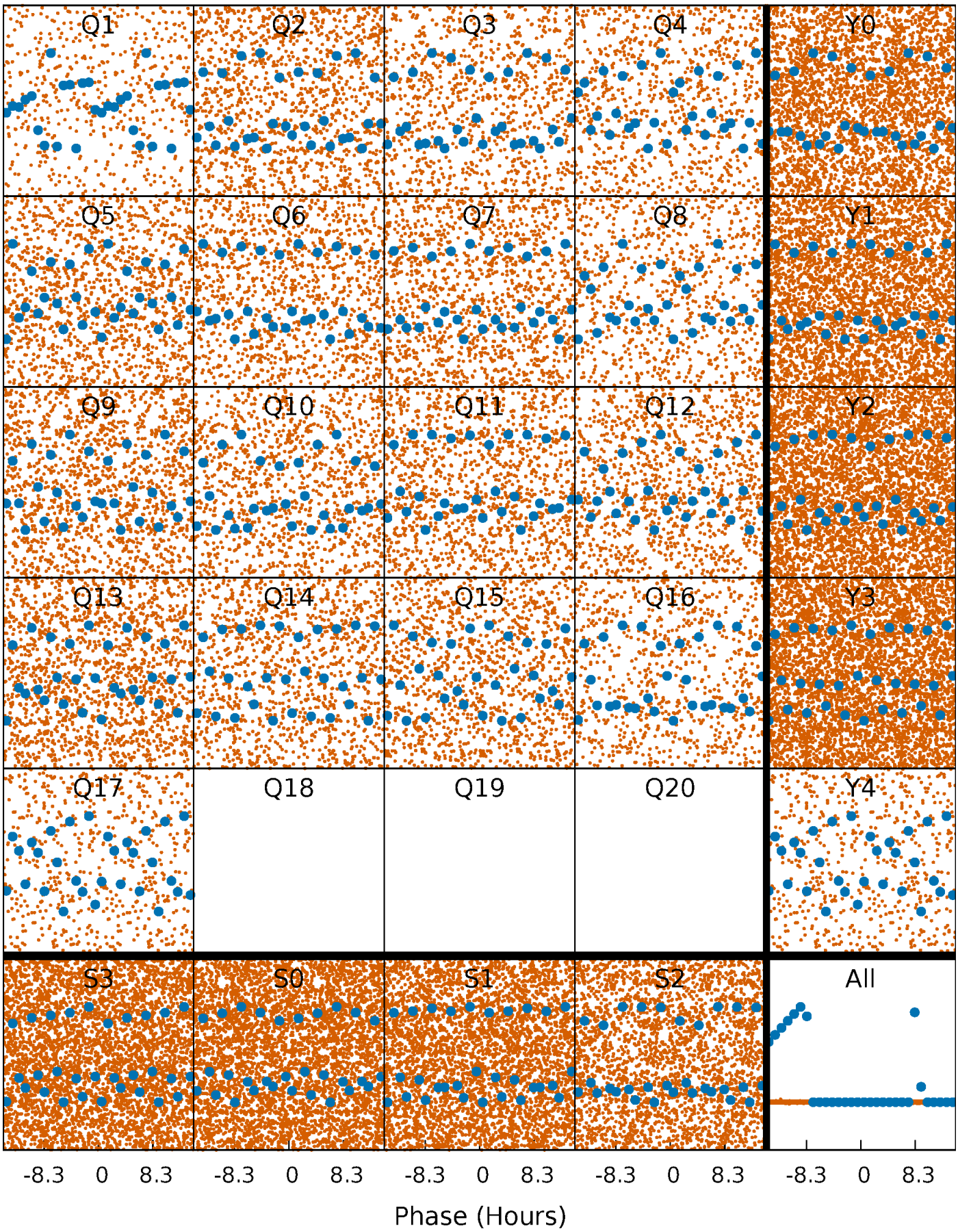
Non-Whitened Vs. Whitened Light Curve





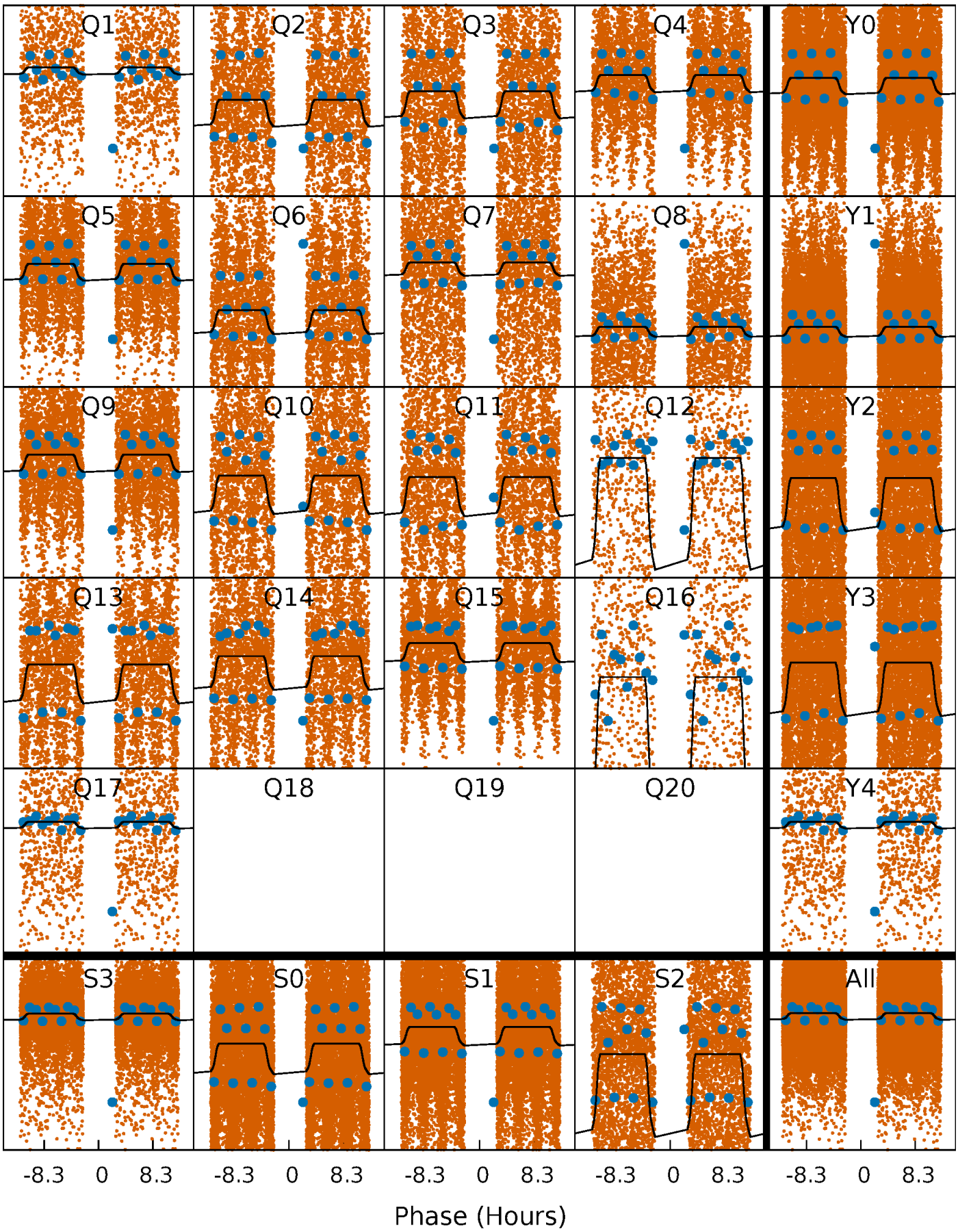
PDC Quarter-Phased Transit Curves

TCE 009045401-02 P= 0.606377 Days T_0=132.119452 (BKJD)



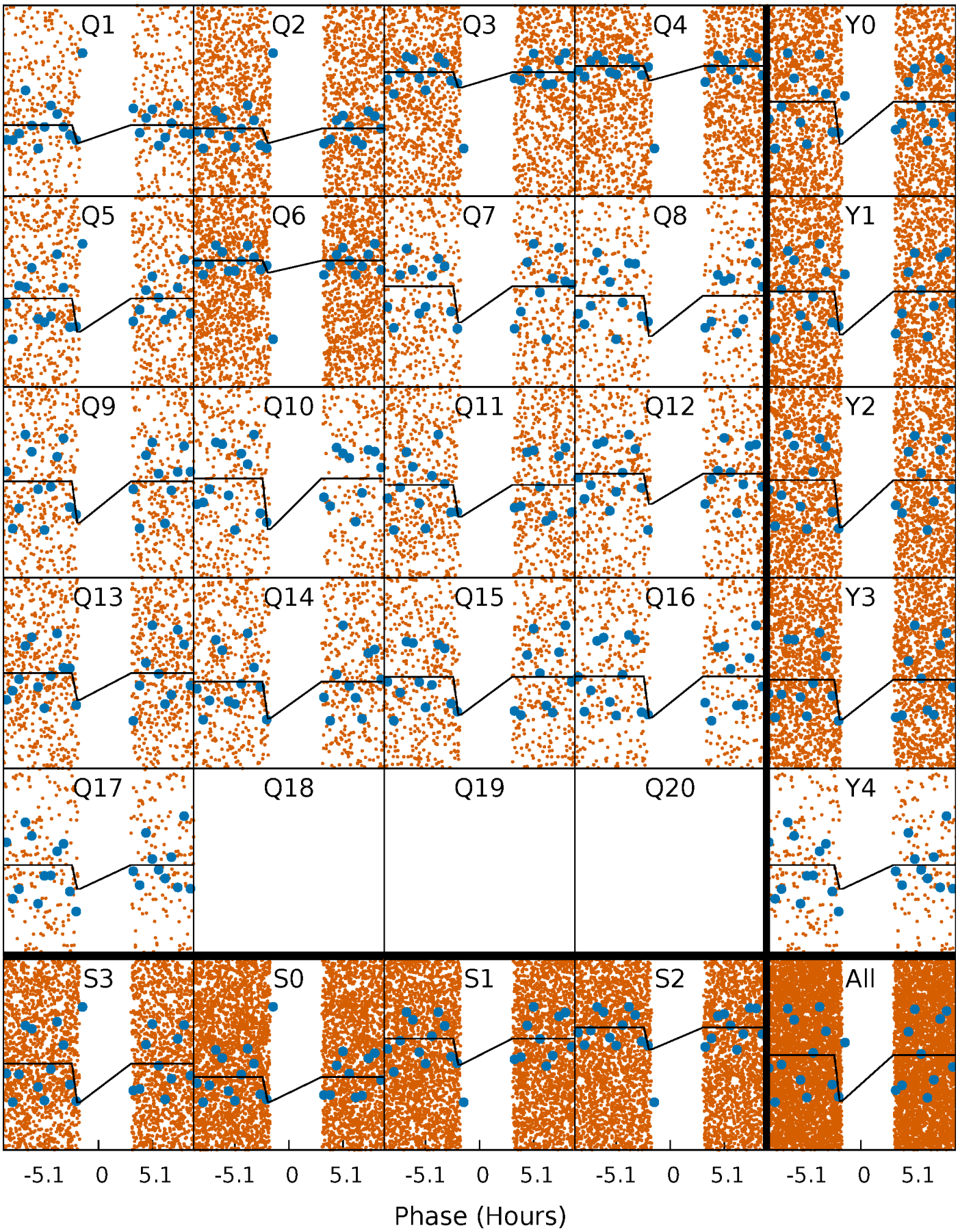
DV Quarter-Phased Transit Curves

TCE 009045401-02 P= 0.606377 Days T_0=132.119452 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

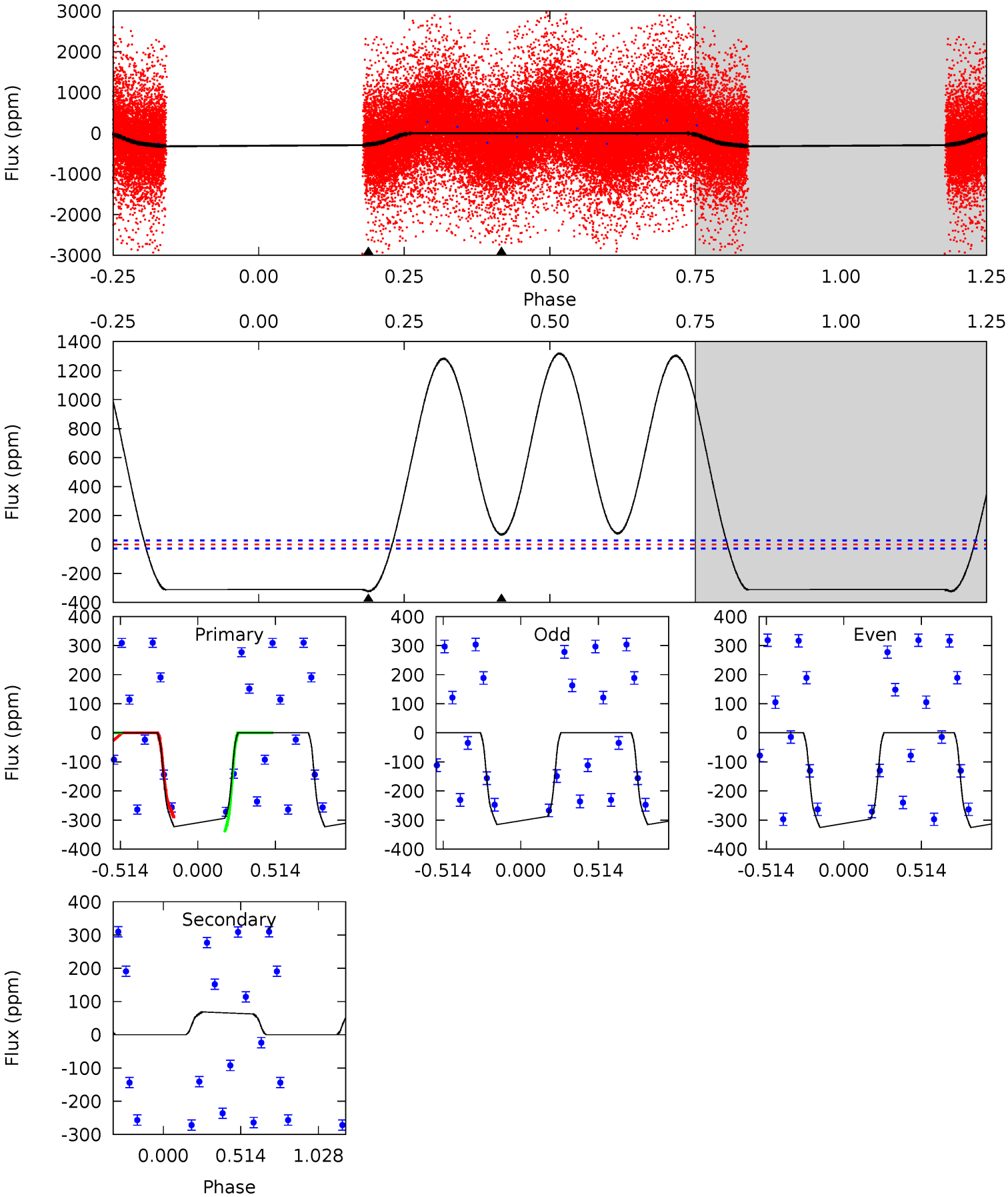
TCE 009045401-02 P= 0.606378 Days T_0=132.095957 (BKJD)



DV Model-Shift Uniqueness Test

009045401-02, P = 0.606377 Days, E = 131.513075 Days

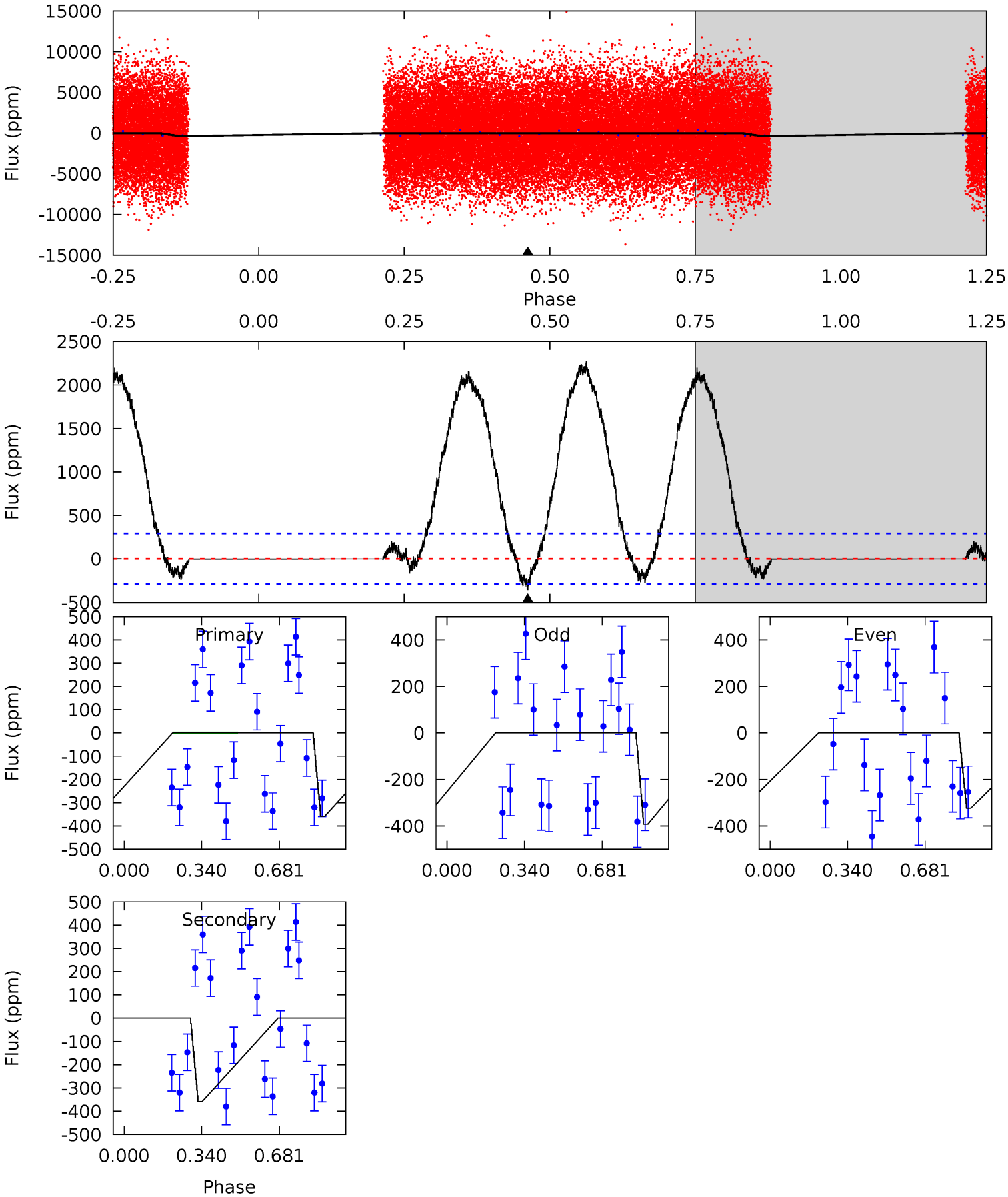
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
48.3	-10.3	0	0	4.21	0.65	41.2	48.3	48.3	-10.3	-10.3	0.75	0.97	0.80	3.68



Alt Model-Shift Uniqueness Test

009045401-02, P = 0.606378 Days, E = 131.489579 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.27	5.27	0	0	4.30	0.95	5.73	5.27	5.27	5.27	5.27	0.51	0	0.86	0



Stellar Parameters For KIC 009045401

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	6348^{+151}_{-189}	$4.152^{+0.214}_{-0.175}$	$-0.140^{+0.250}_{-0.300}$	$1.476^{+0.456}_{-0.373}$	$1.126^{+0.194}_{-0.141}$	$0.493^{+0.585}_{-0.230}$
	+2%/-3%	+5%/-4%	+179%/-214%	+31%/-25%	+17%/-13%	+119%/-47%
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 009045401-02 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	69±7	$2.47^{+0.43}_{-0.37}$	3915^{+292}_{-292}	-4982^{+182}_{-182}	$-1.311^{+0.349}_{-0.499}$
Alt.	-358±68	$3.02^{+0.55}_{-0.45}$	3910^{+309}_{-288}	6232^{+409}_{-412}	$4.613^{+2.028}_{-1.370}$

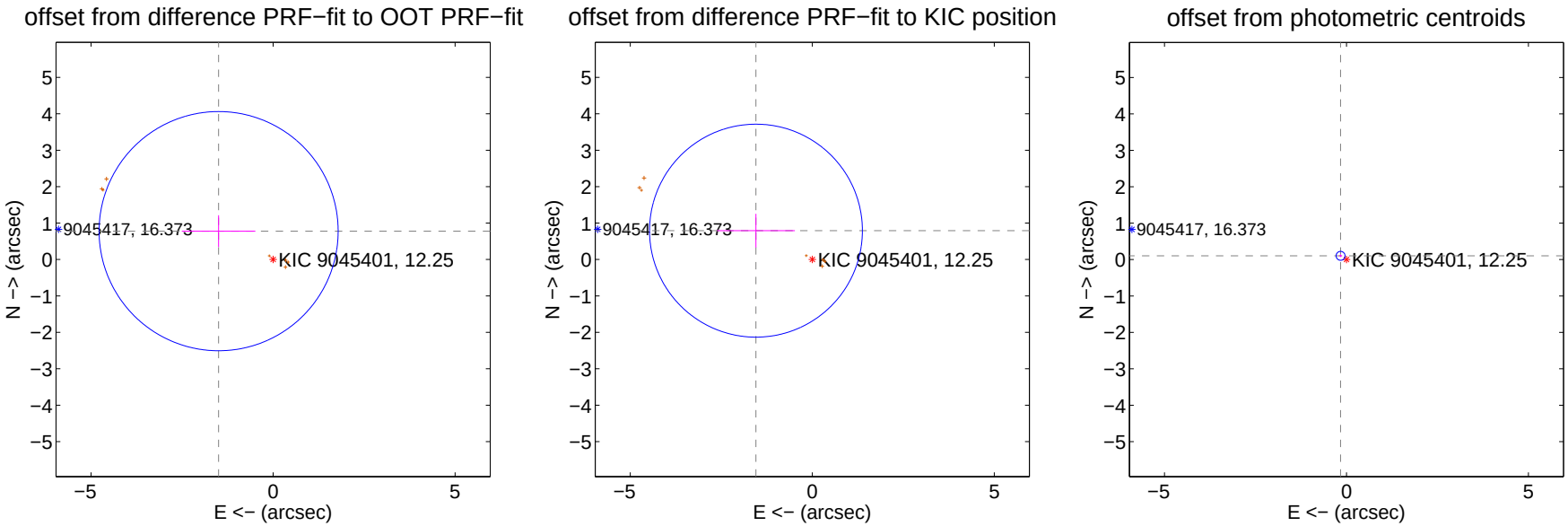
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

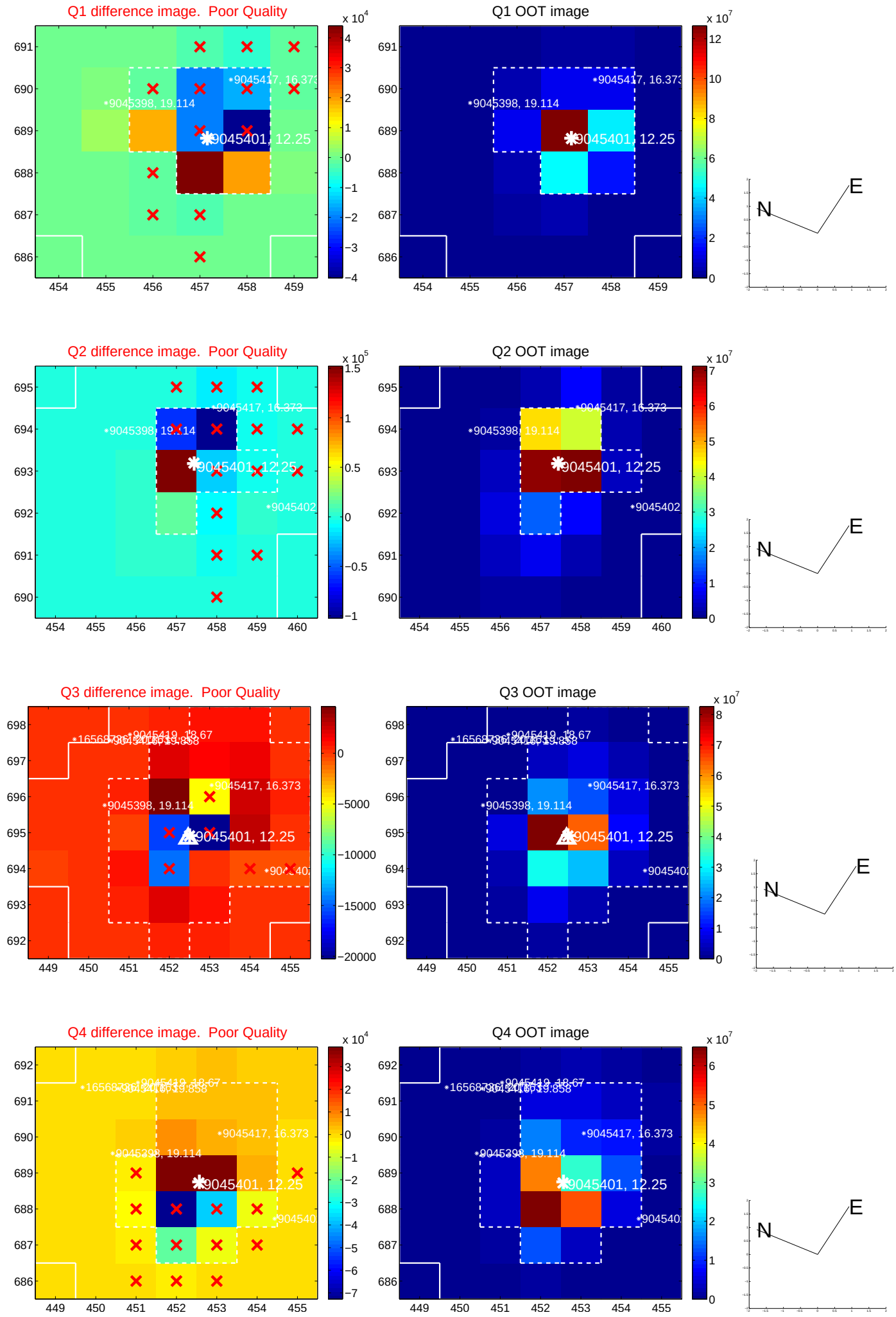
Supplemental centroid analysis for 009045401-02. Kepler magnitude: 12.25. Transit SNR 24.31
There are 0 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.687 ± 1.095	1.54	1.496 ± 1.010	0.778 ± 0.437
PRF-fit source offset from KIC position	1.738 ± 0.975	1.78	1.547 ± 1.069	0.792 ± 0.463
photometric centroid source offset	0.19 ± 0.04	4.68	0.16 ± 0.04	0.10 ± 0.03

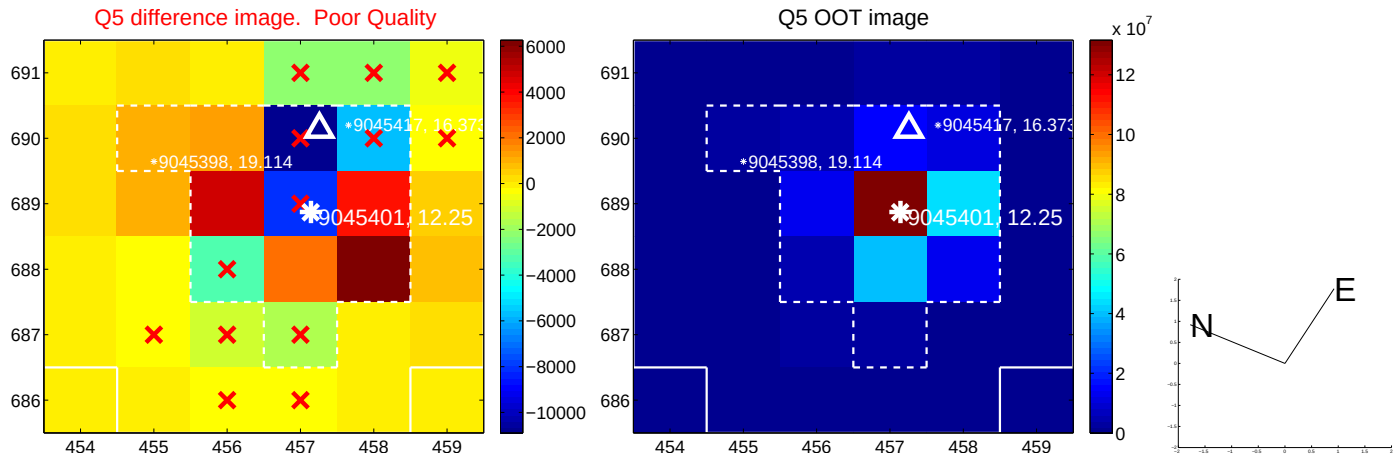


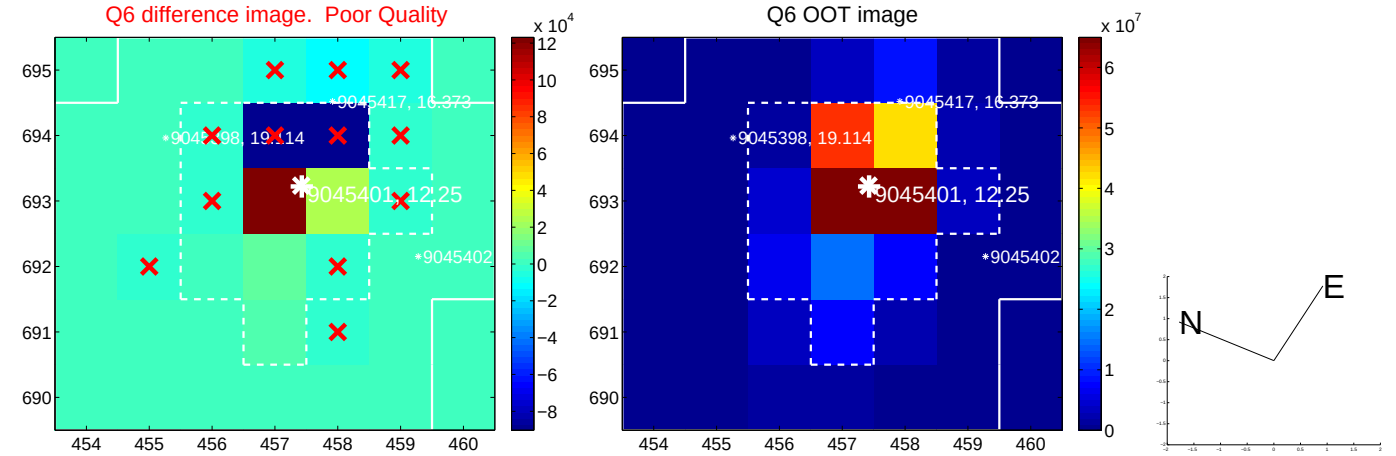
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

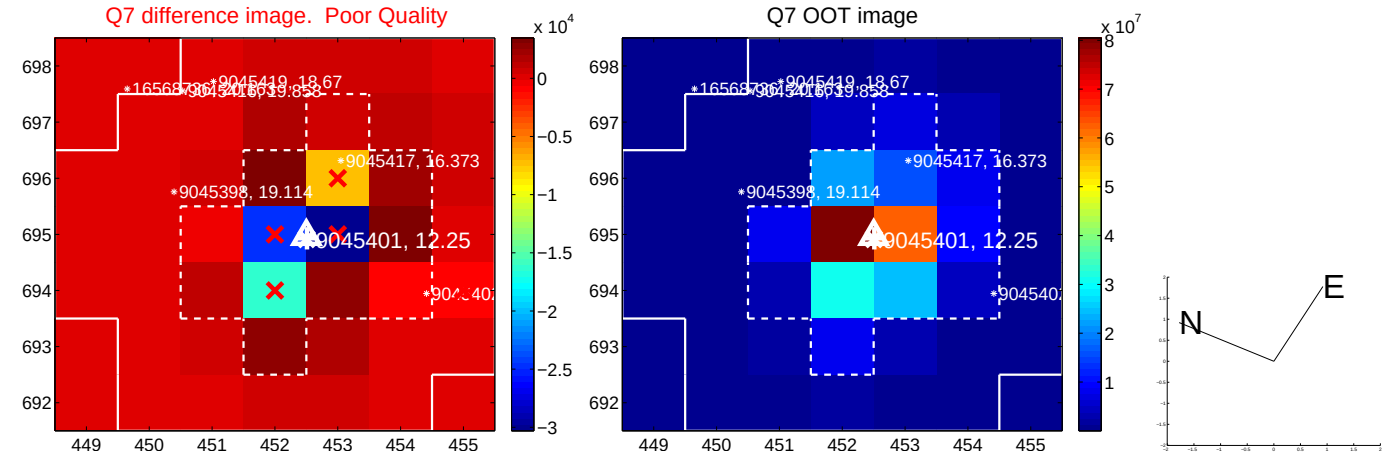
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

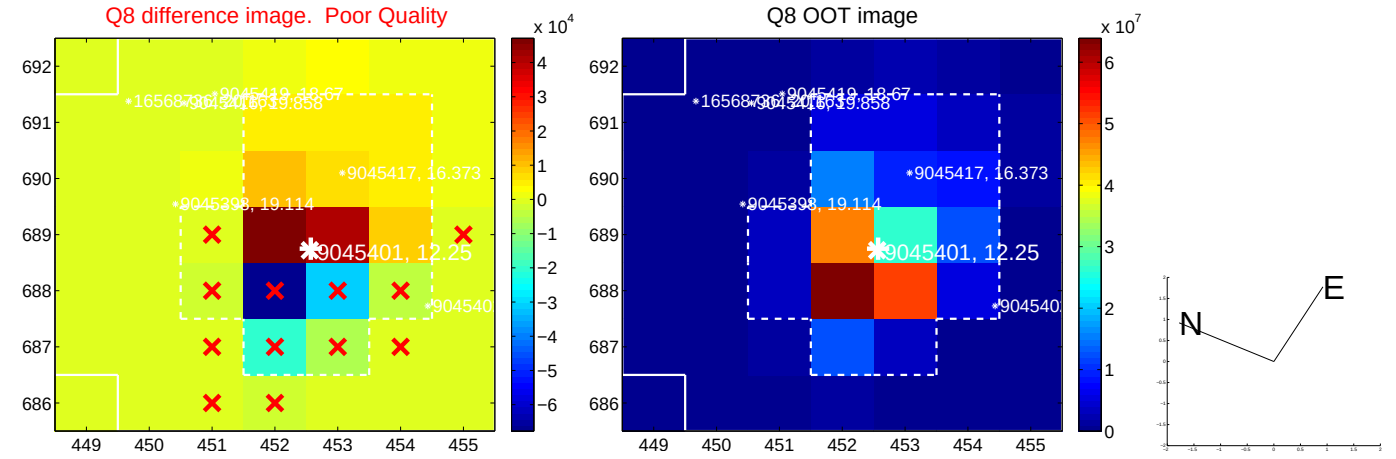


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

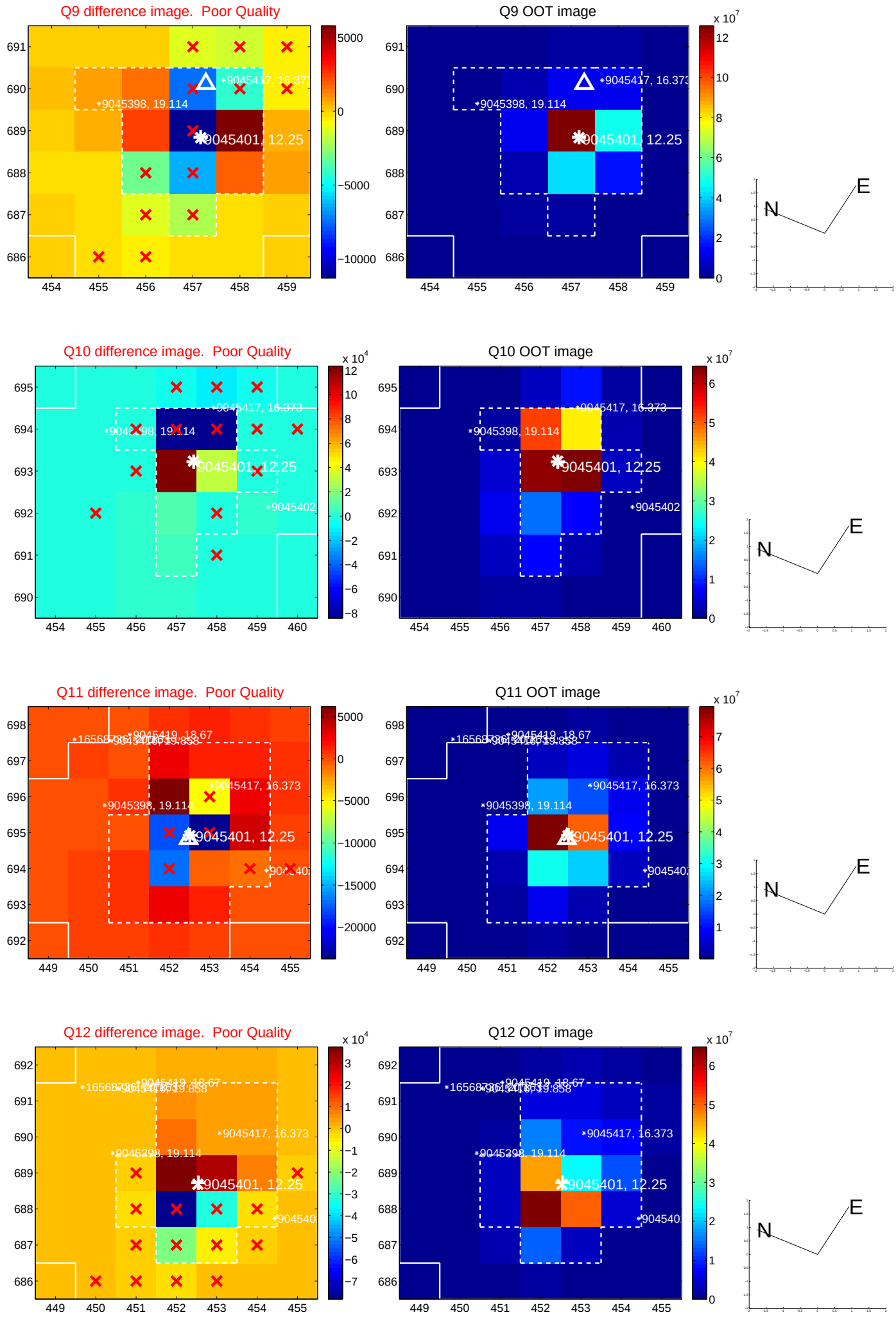




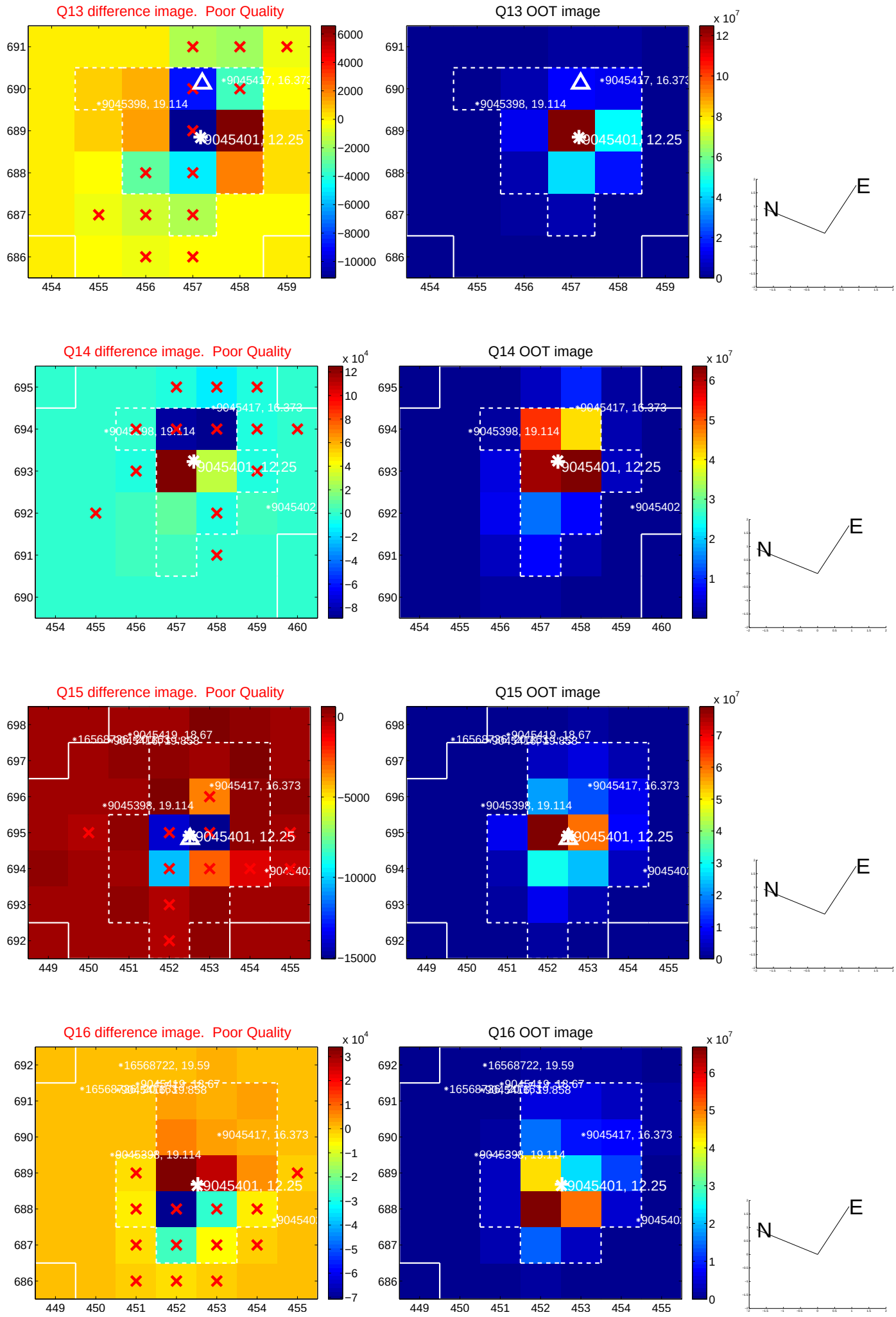




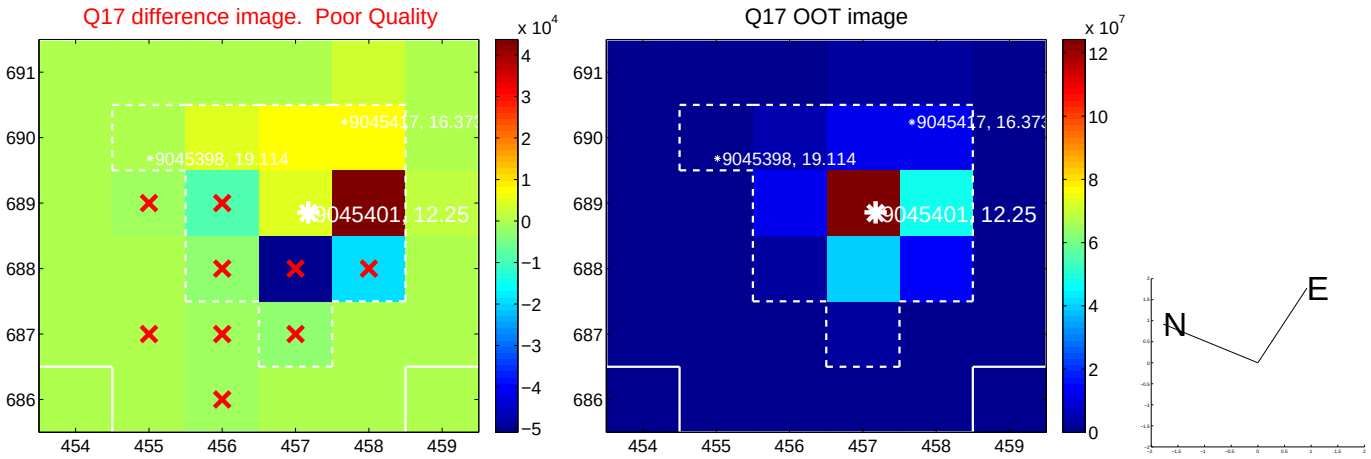
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

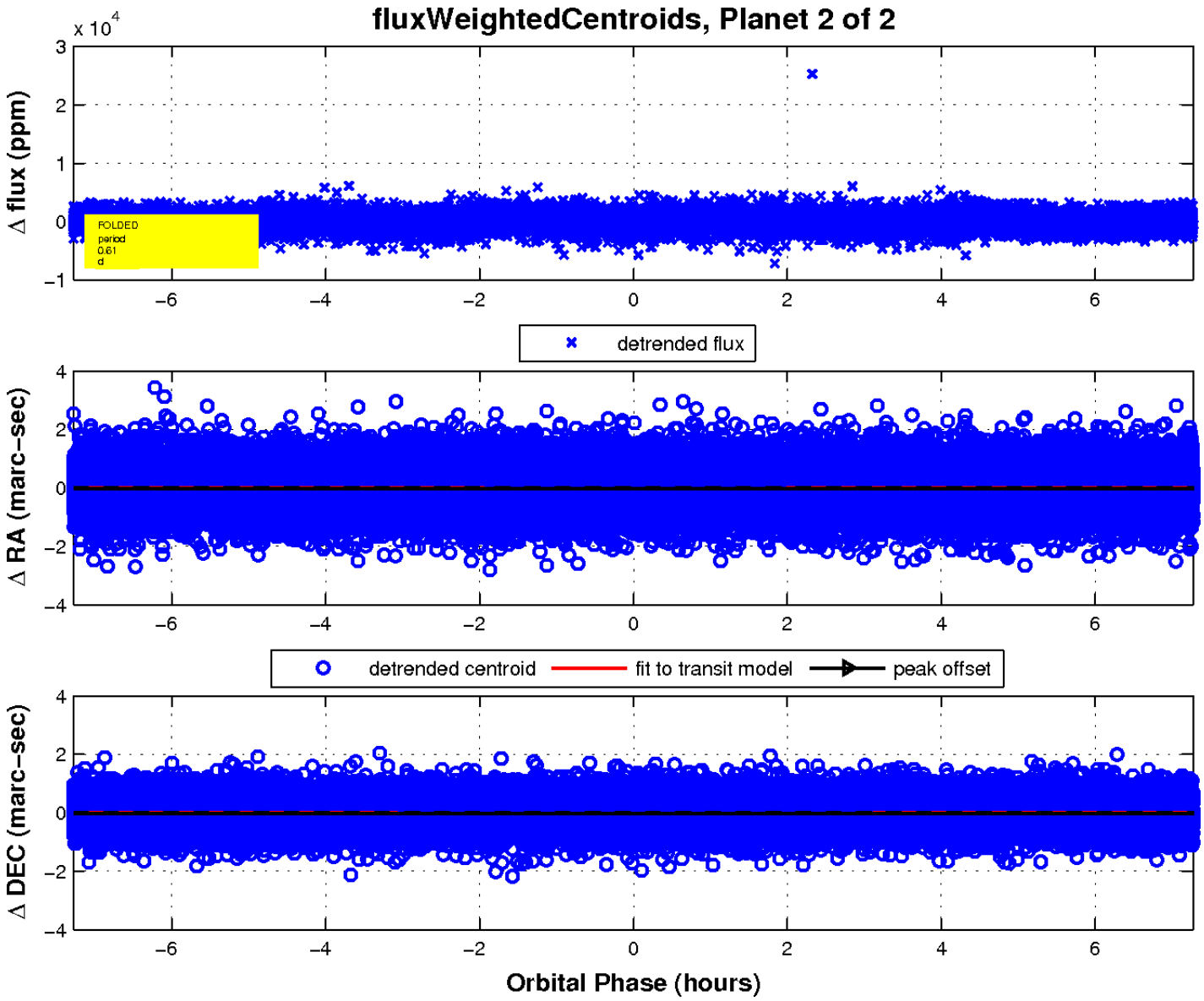
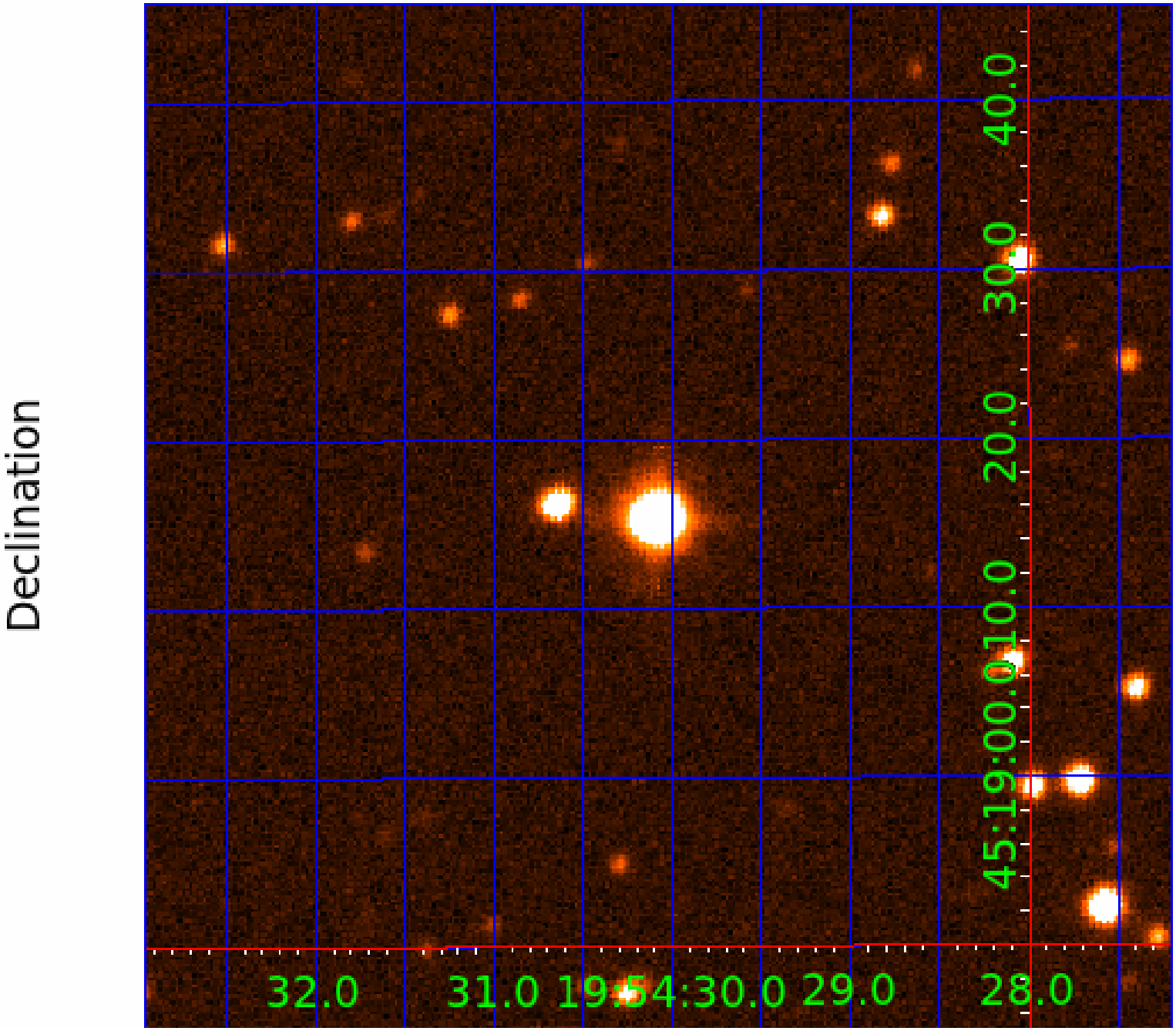


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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





UKIRT Image