KIC 009073007

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 ($S_\oplus$)
009073007-01	OBS	No	1.337177	131.569445	255.2	8.050	10.1	10.4	1.76	6748	5.38	8404.58
009073007-02	OBS	No	0.942105	132.297138	386.6	6.608	13.5	17.5	1.76	6748	3.71	13406.08

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009073007-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
009073007-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—CENT_SATURATED

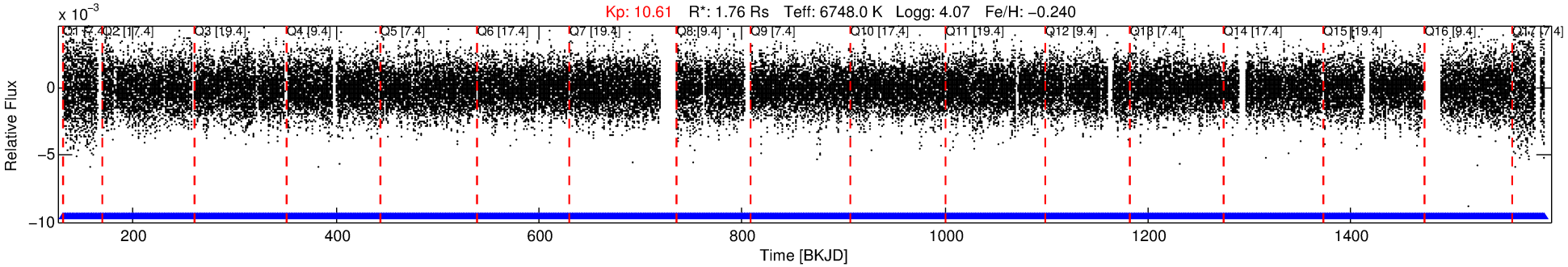
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

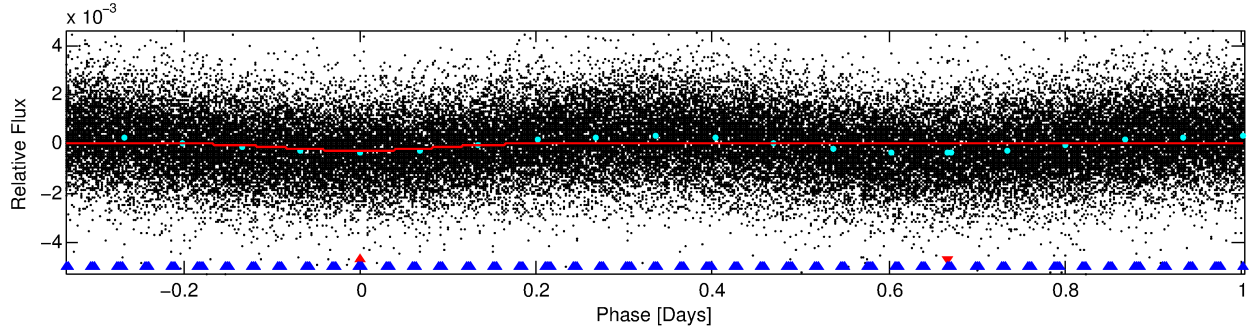
Ephemeris Match Information For 009073007-01

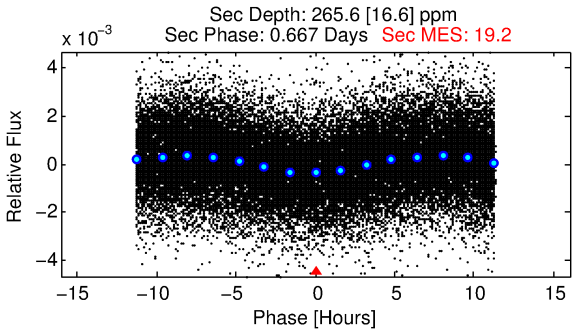
No Significant Match Found

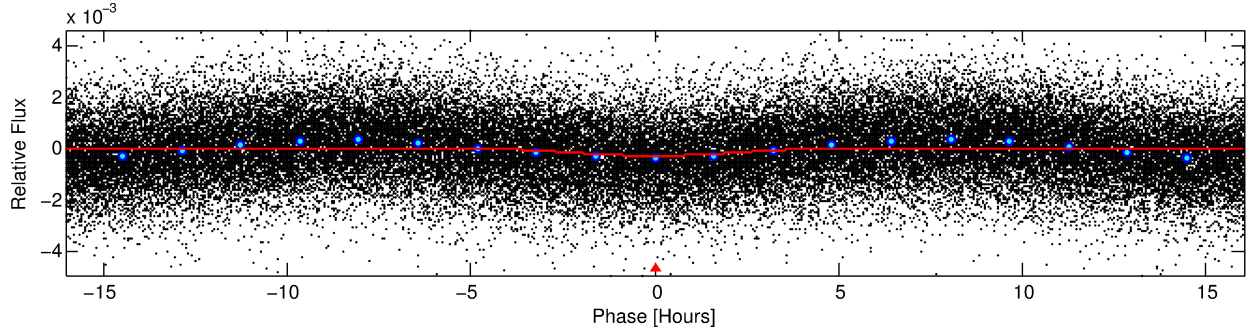
DV One-Page Summary

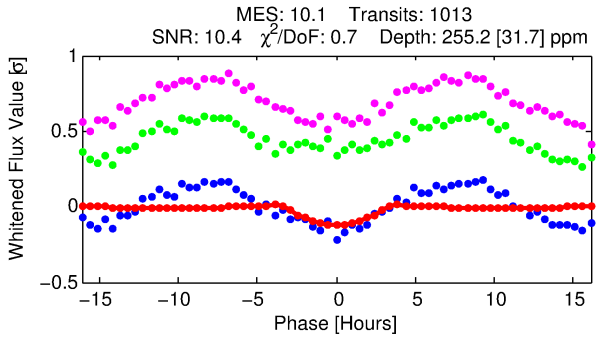
KIC: 9073007 Candidate: 1 of 2 Period: 1.337 d

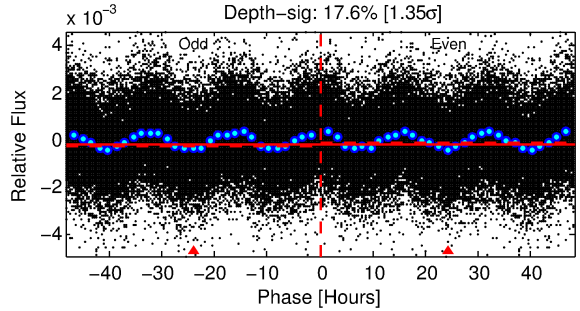


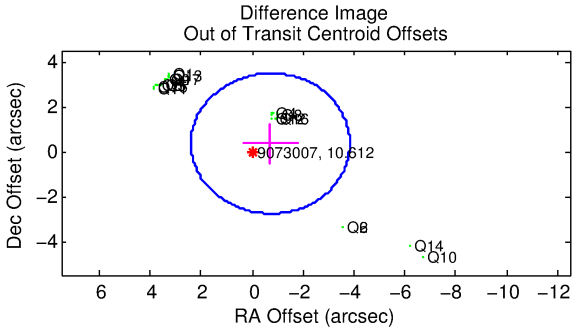












DV Fit Results:

Period = 1.33718 [0.00002] d
Epoch = 131.5694 [0.0116] BKJD
Rp/R* = 0.0280 [0.0434]
a/R* = 1.06 [0.02]
b = 1.00 [0.07]

Seff = 8404.58 [3851.39]
Teq = 2441 [280] K
Rp = 5.37 [8.49] Re
a = 0.0262 [0.0072] AU

Ag = 3.47 [10.86] [0.23σ]
Teffp = 5151 [4002] K [0.68σ]

DV Diagnostic Results:

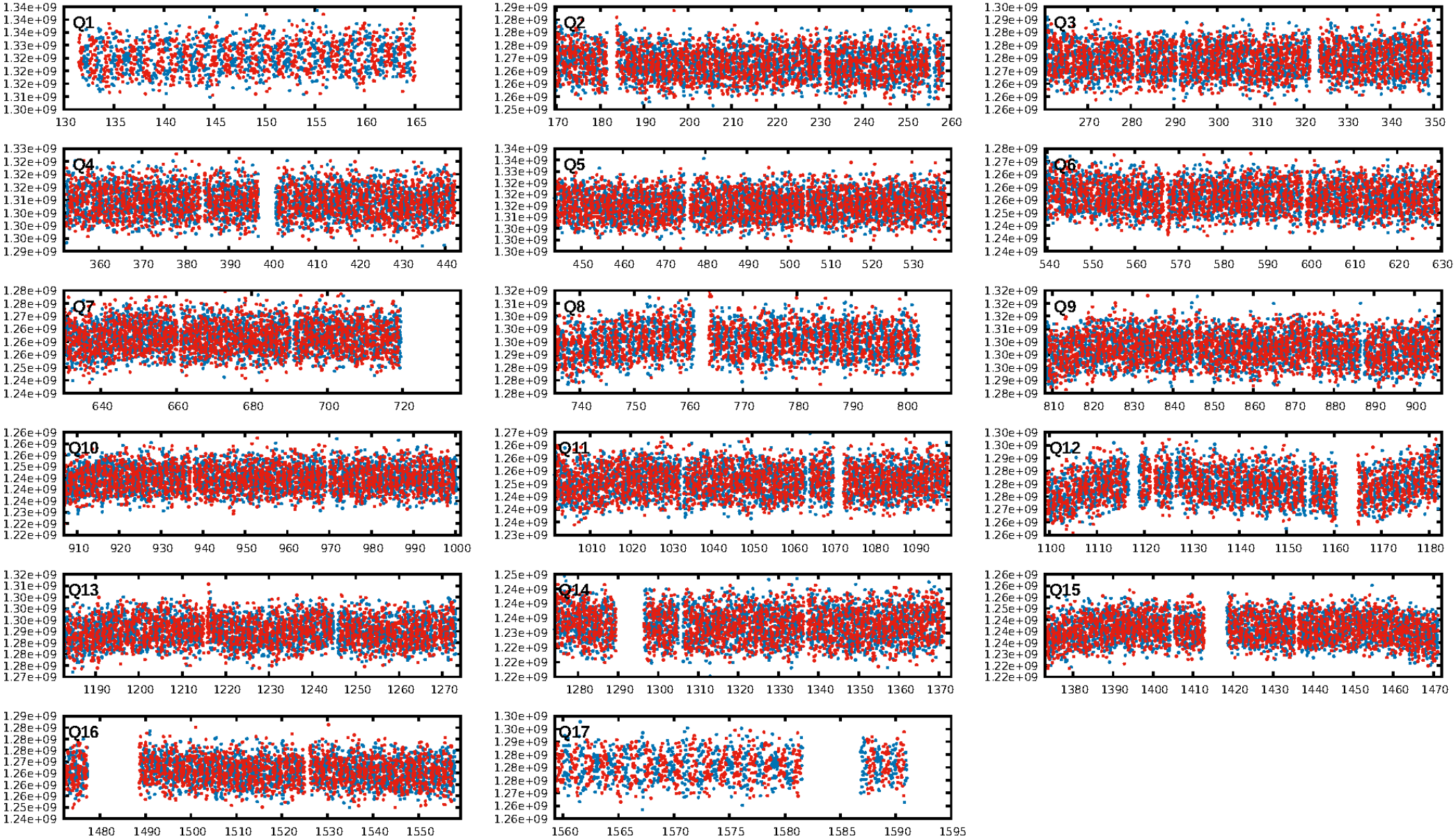
ShortPeriod−sig: 63.7% [0.91σ]
LongPeriod−sig: N/A
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [967/967]
GhostDiagnostic−chr: 1.21

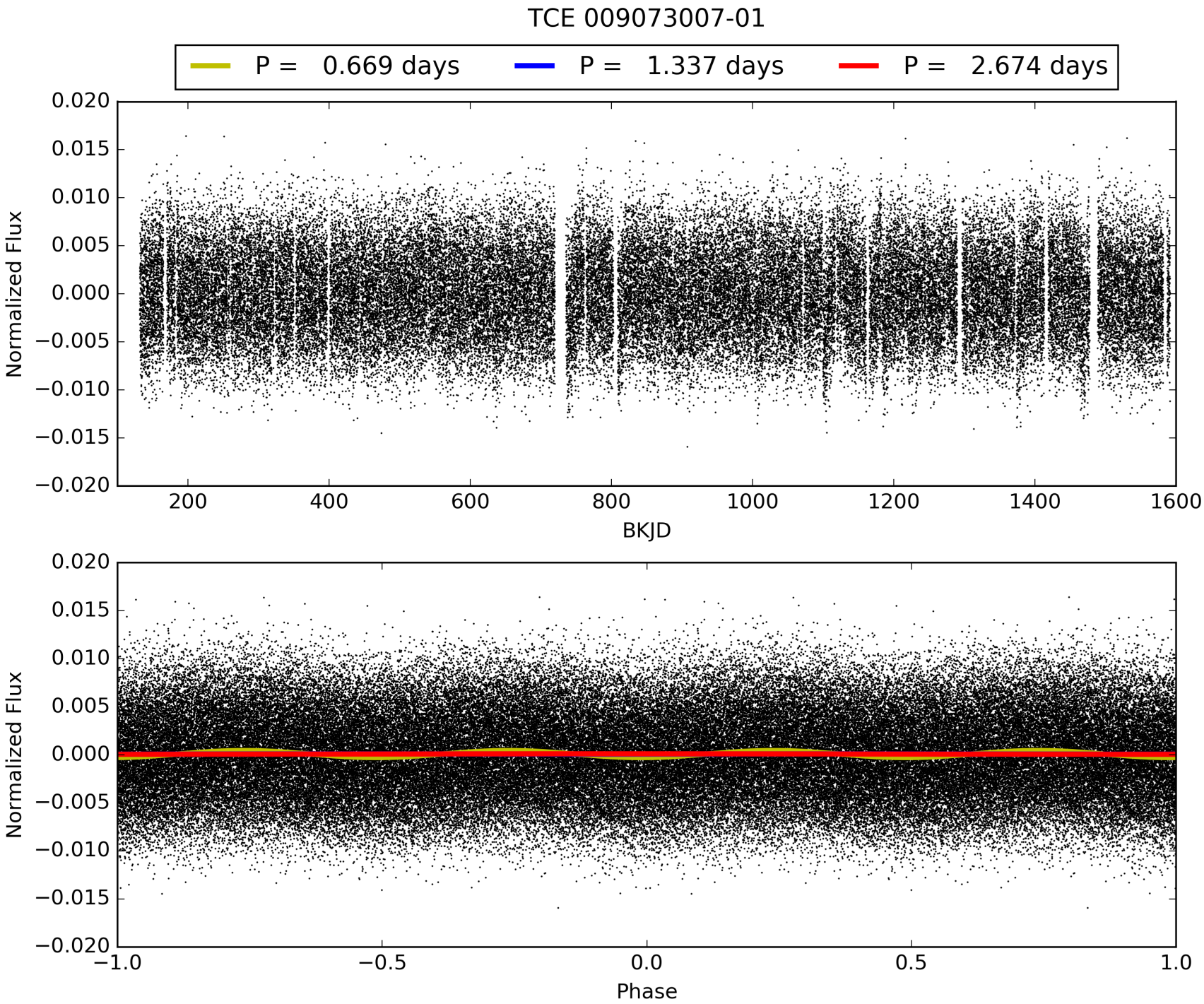
Centroid−sig: 0.0%
Centroid−so: 0.540 arcsec [6.58σ]
OotOffset−rm: 0.804 arcsec [0.77σ]
KicOffset−rm: 2.664 arcsec [3.98σ]
OotOffset−st: 4/4/4/5 [17]
KicOffset−st: 4/4/4/5 [17]
DiffImageQuality−fgm: 0.06 [1/17]
DiffImageOverlap−fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02−Feb−2016 05:44:51 Z

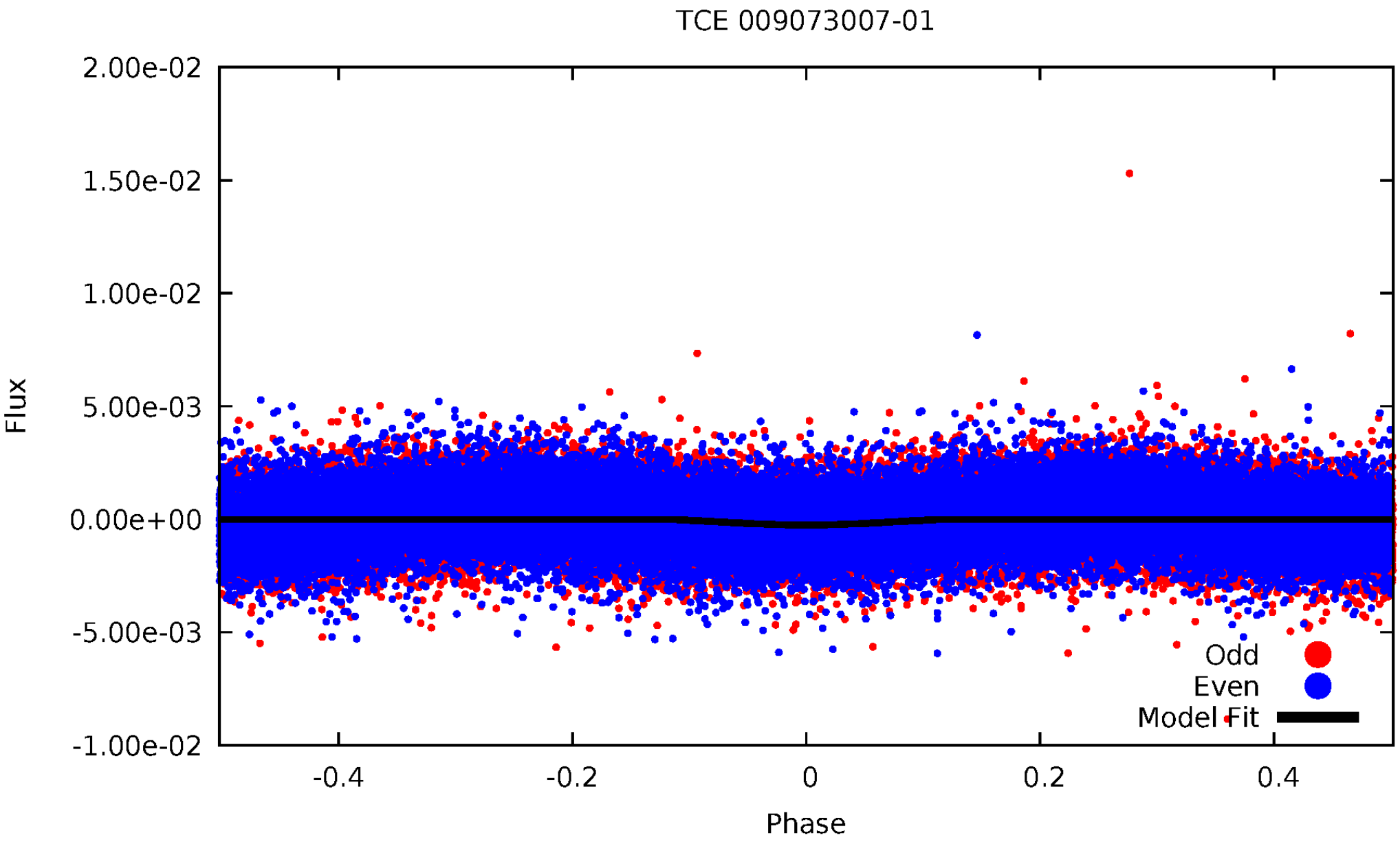
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009073007-01, PDC Light Curves

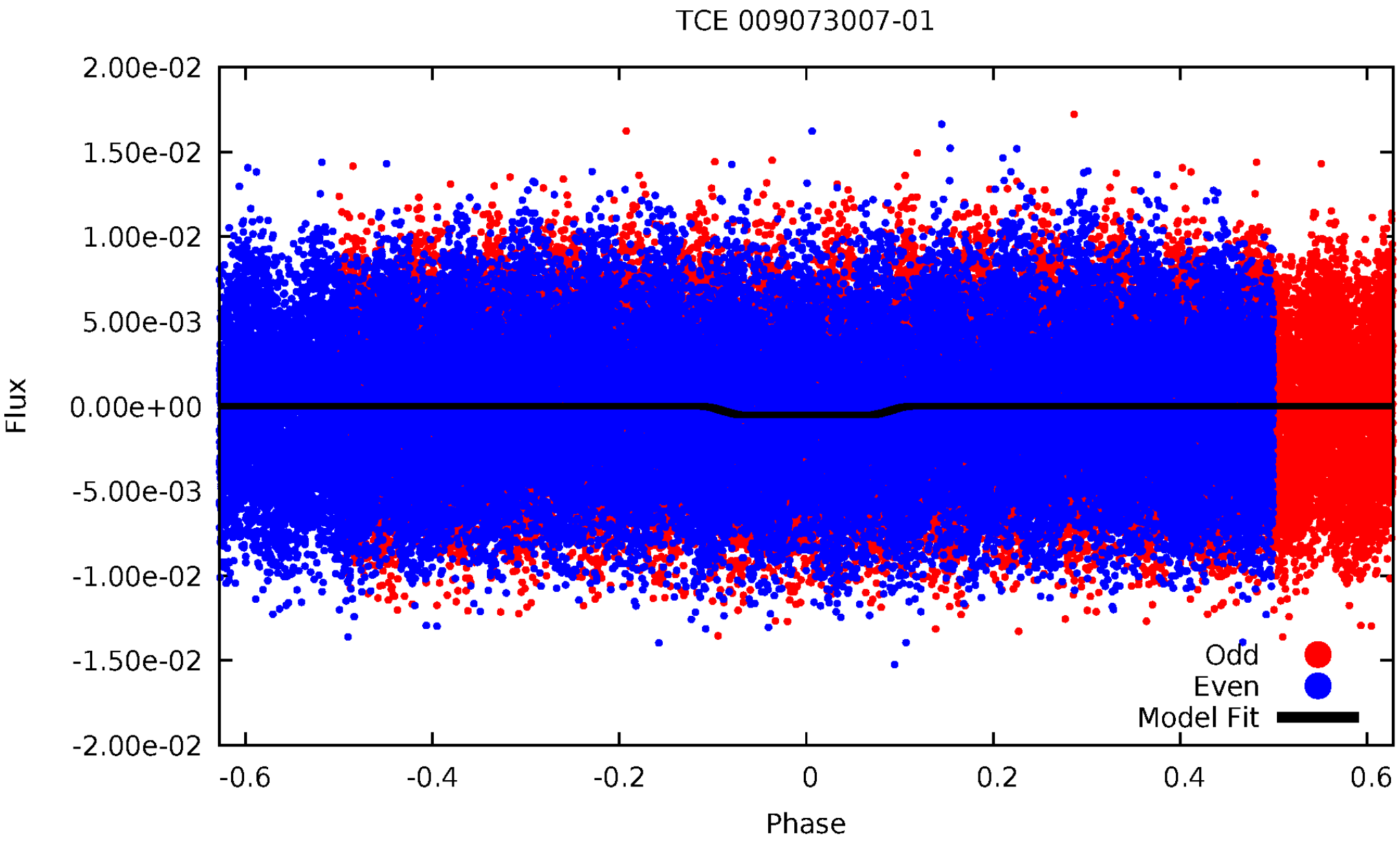



TCE 009073007-01
P = 0.669 days
P = 1.337 days
P = 2.674 days
Normalized Flux
BKJD
Normalized Flux
Phase

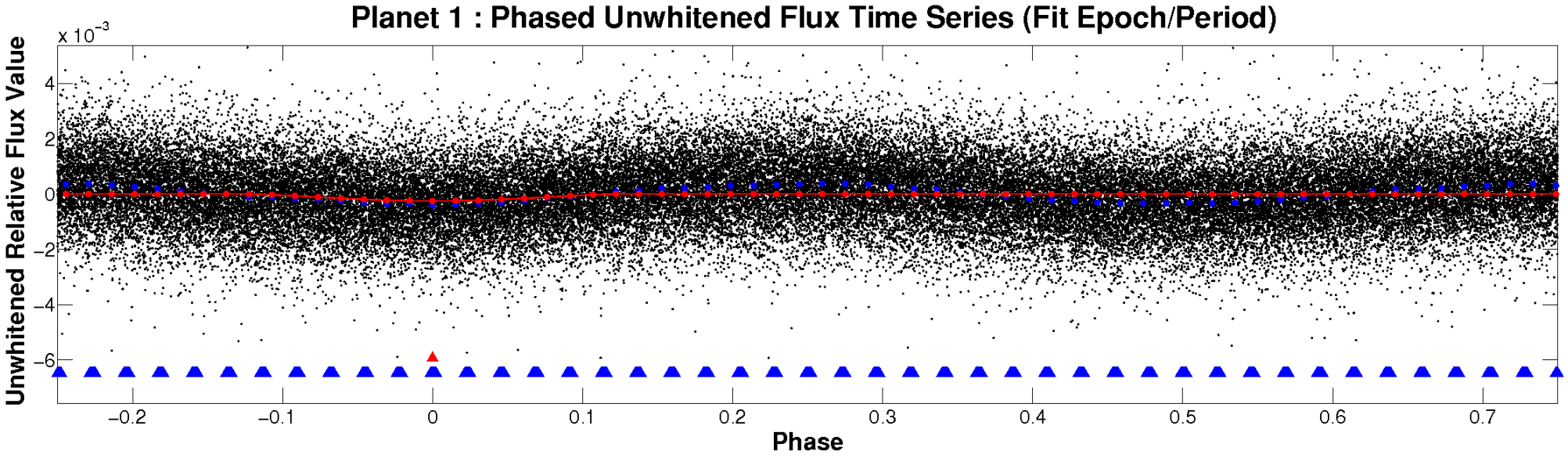
DV Odd/Even

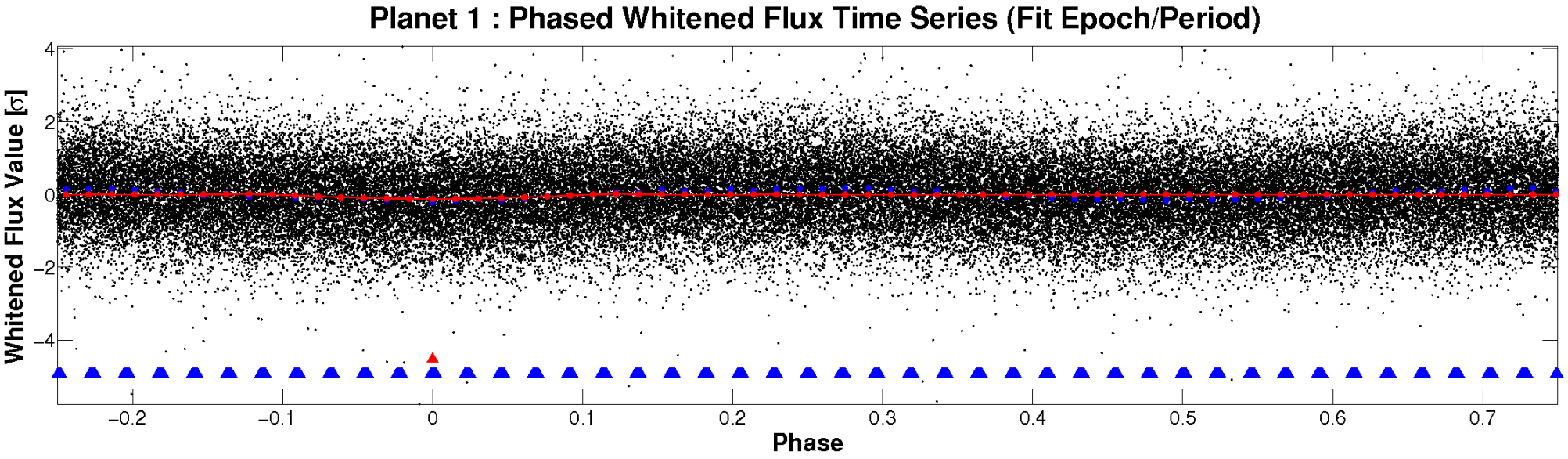

TCE 009073007-01
2.00e-02
1.50e-02
1.00e-02
5.00e-03
0.00e+00
-5.00e-03
-1.00e-02
Flux
-0.4
-0.2
0
0.2
0.4
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009073007-01
2.00e-02
1.50e-02
1.00e-02
5.00e-03
0.00e+00
-5.00e-03
-1.00e-02
-1.50e-02
-2.00e-02
Flux
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
Phase
Odd
Even
Model Fit

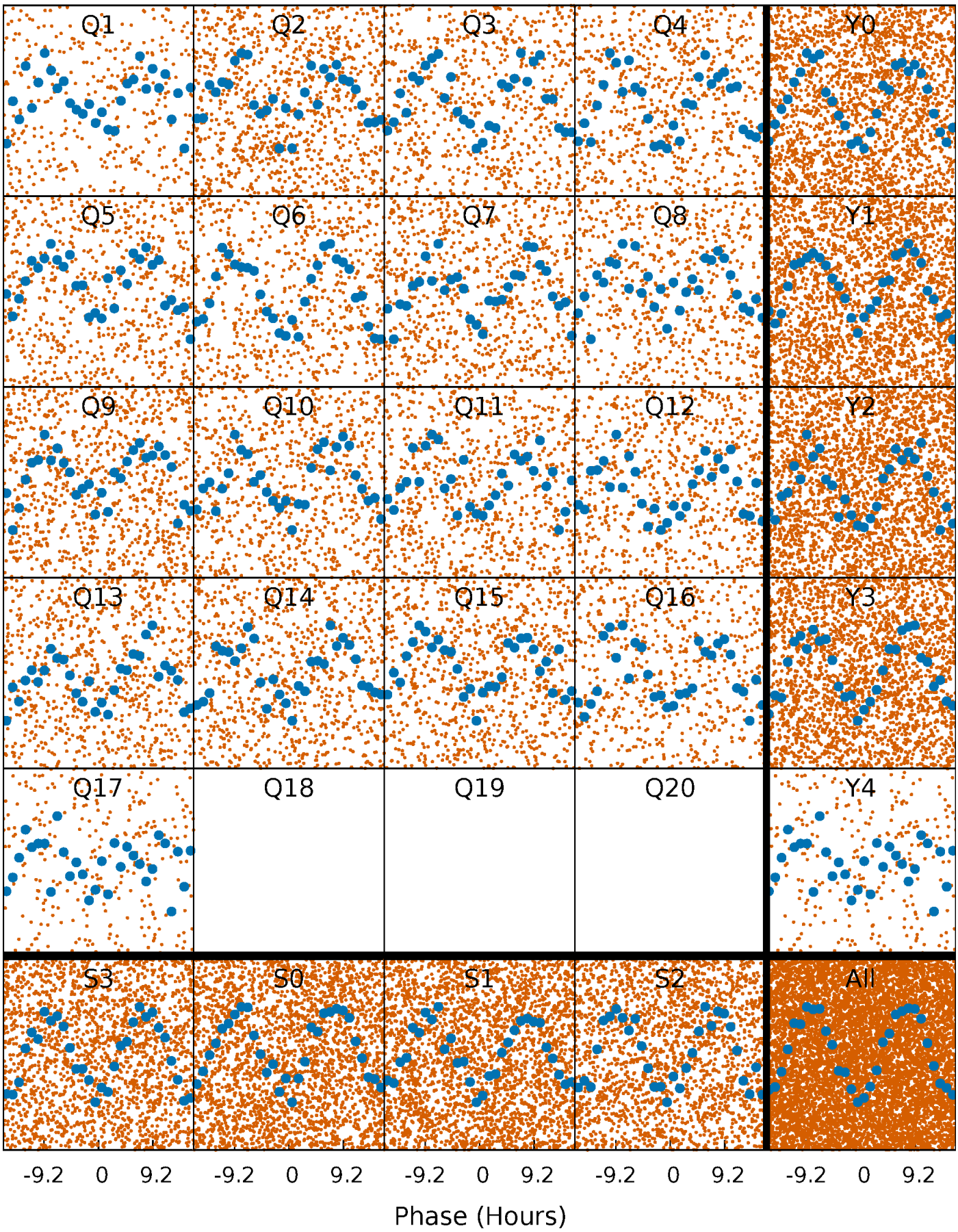
Non-Whitened Vs. Whitened Light Curve





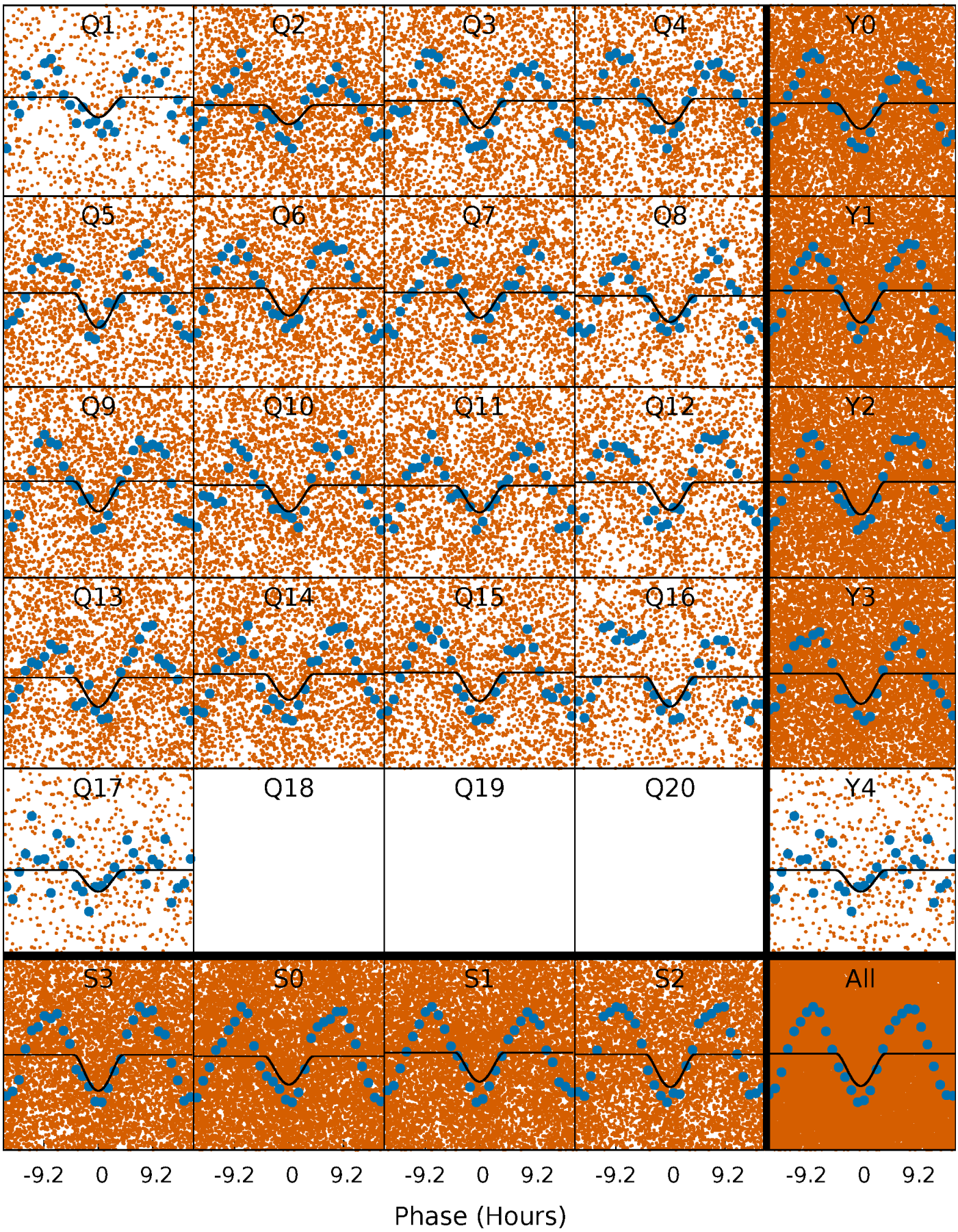
PDC Quarter-Phased Transit Curves

TCE 009073007-01 P= 1.337177 Days T_0=131.569445 (BKJD)



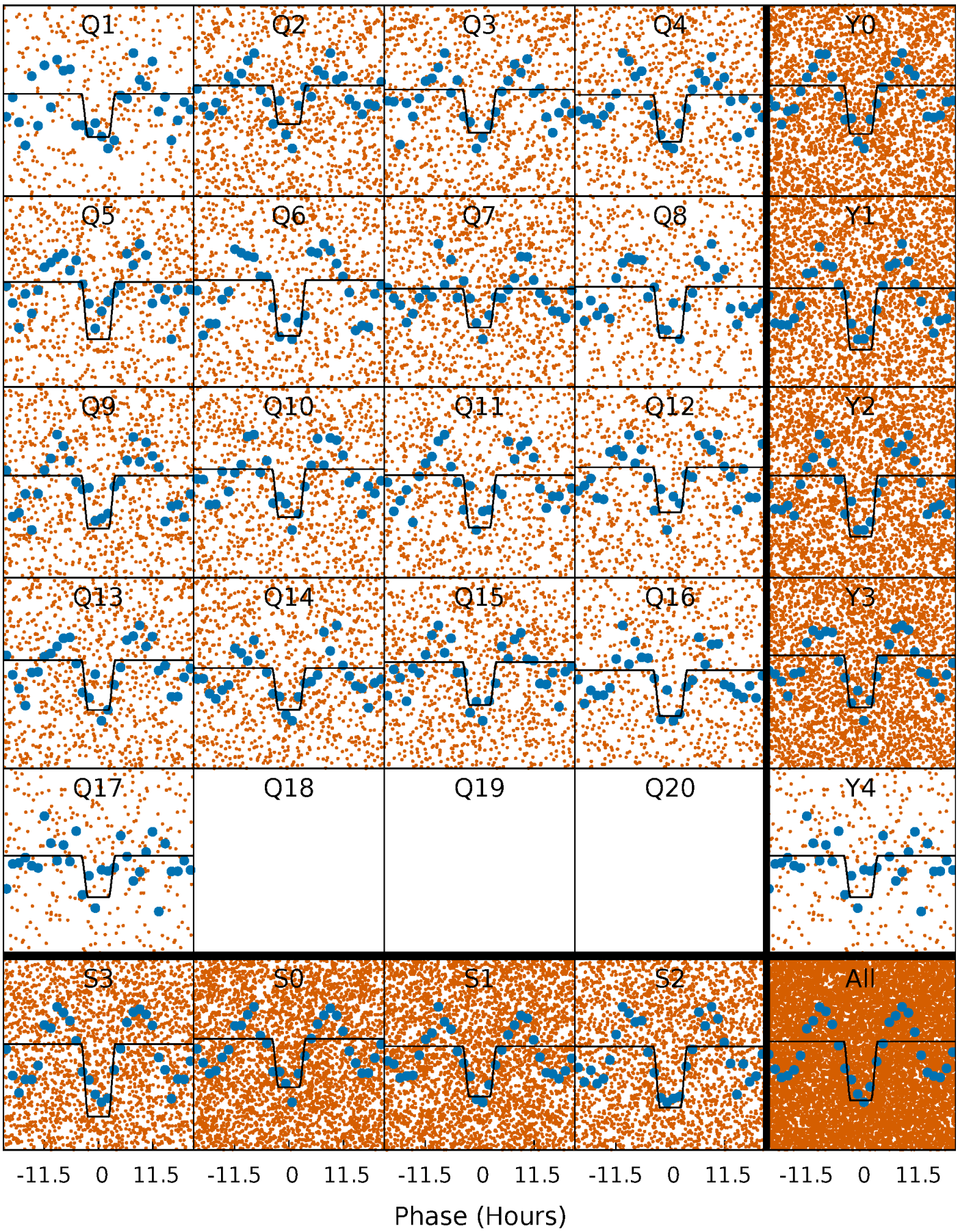
DV Quarter-Phased Transit Curves

TCE 009073007-01 P= 1.337177 Days T_0=131.569445 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

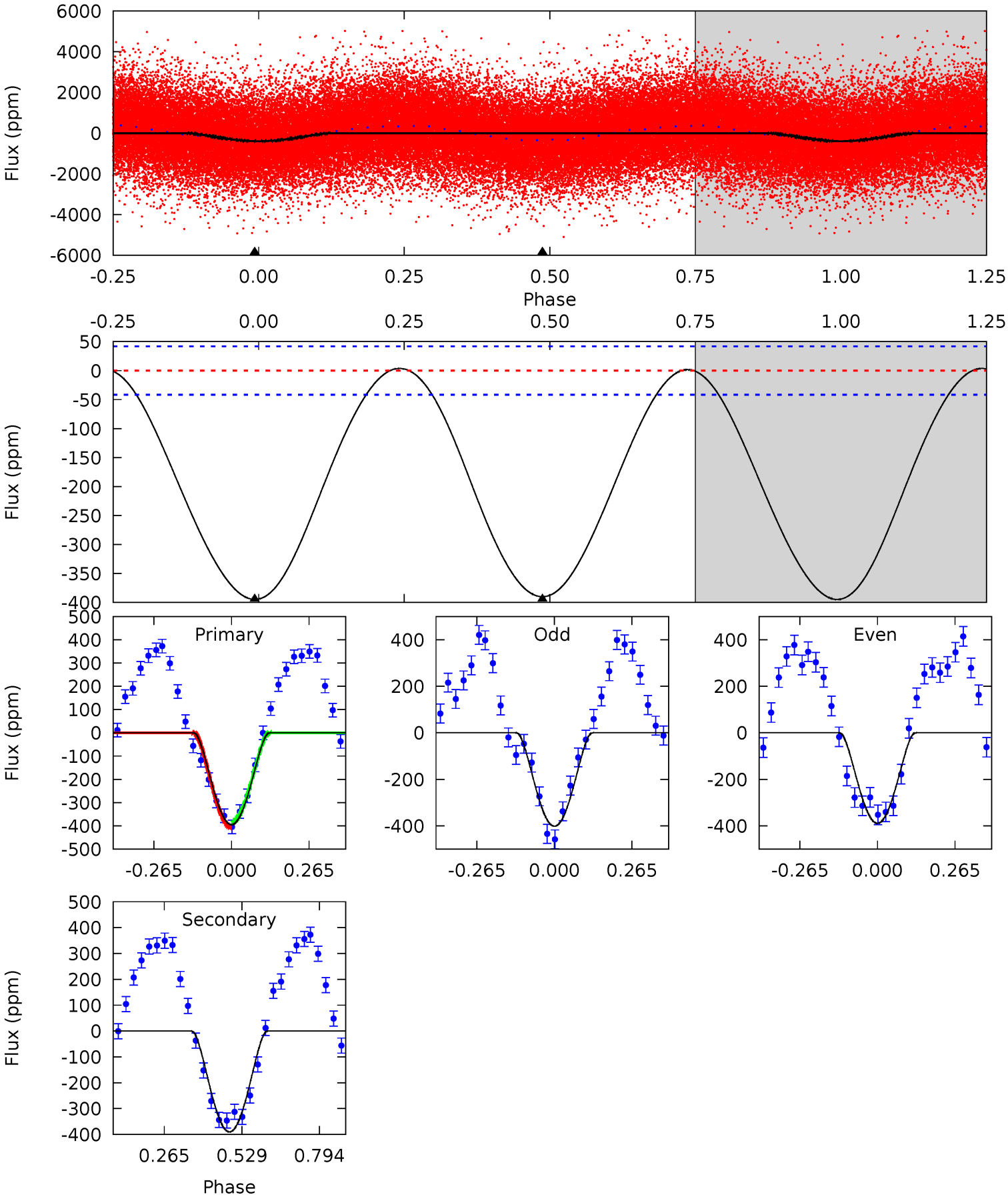
TCE 009073007-01 P= 1.337177 Days T_0=131.555771 (BKJD)



DV Model-Shift Uniqueness Test

009073007-01, P = 1.337177 Days, E = 130.232268 Days

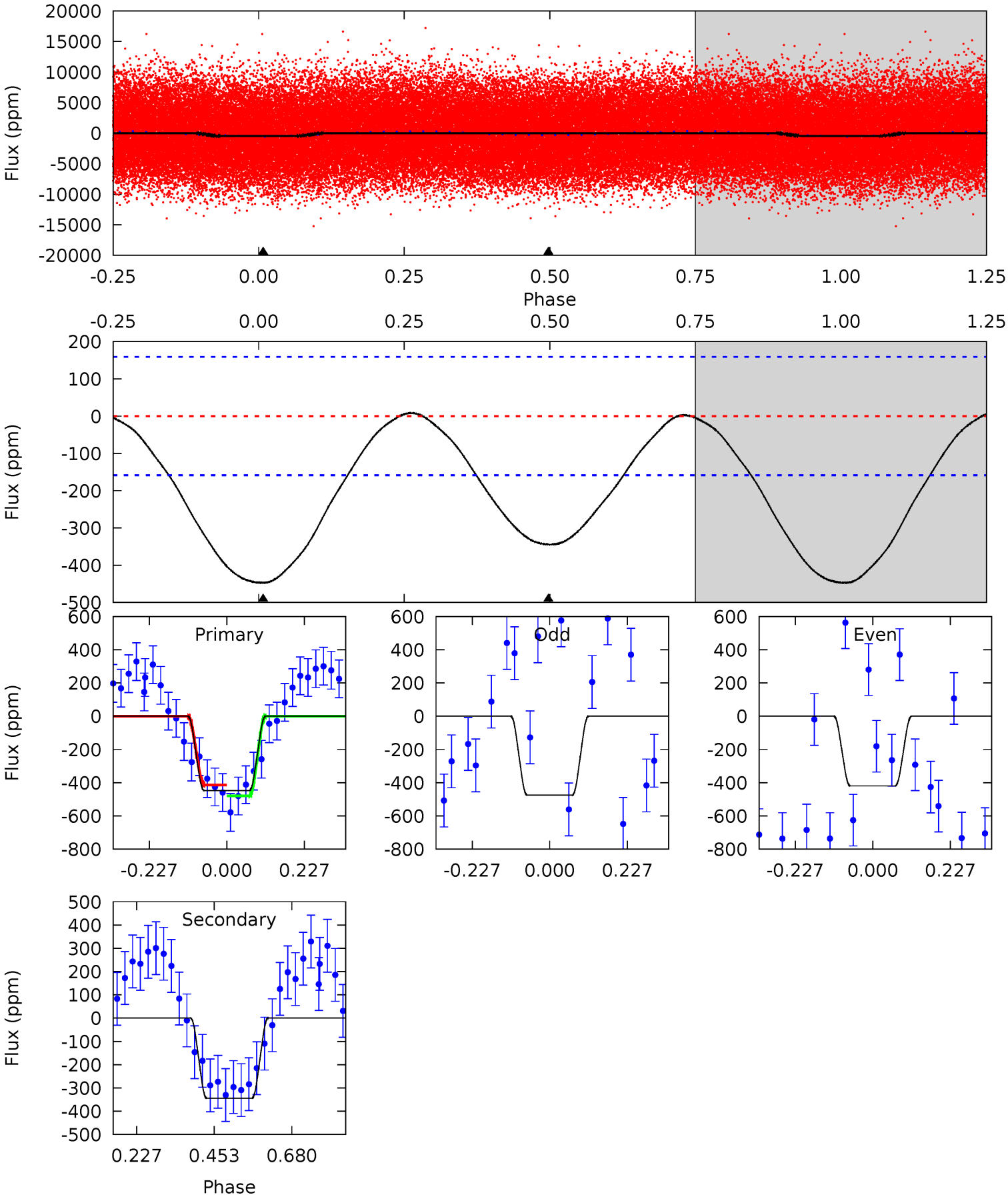
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
41.2	40.8	0	0	4.36	1.12	0.43	41.2	41.2	40.8	40.8	0.66	1.06	0.01	1.32



Alt Model-Shift Uniqueness Test

009073007-01, P = 1.337177 Days, E = 130.218594 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	9.51	0	0	4.39	1.21	0.32	12.4	12.4	9.51	9.51	0.76	0.99	0.02	0.90



Stellar Parameters For KIC 009073007

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	6748^{+189}_{-284}	$4.073^{+0.246}_{-0.164}$	$-0.240^{+0.300}_{-0.300}$	$1.761^{+0.522}_{-0.522}$	$1.341^{+0.183}_{-0.252}$	$0.346^{+0.527}_{-0.157}$
	+3%/-4%	+6%/-4%	+125%/-125%	+30%/-30%	+14%/-19%	+152%/-45%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009073007-01 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-390±10	$7.81^{+7.40}_{-5.33}$	3369^{+284}_{-306}	4602^{+3647}_{-1213}	$2.468^{+20.773}_{-1.813}$
Alt.	-344±36	$7.06^{+7.59}_{-4.83}$	3357^{+282}_{-331}	4664^{+3540}_{-1369}	$2.573^{+22.789}_{-1.961}$

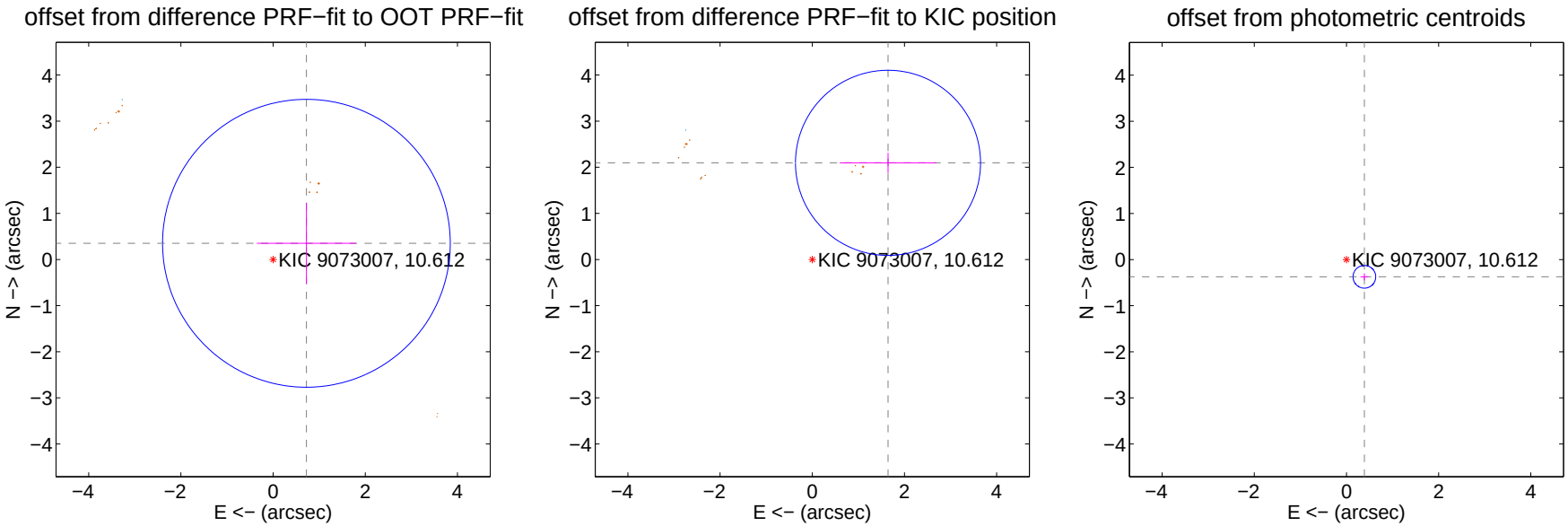
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

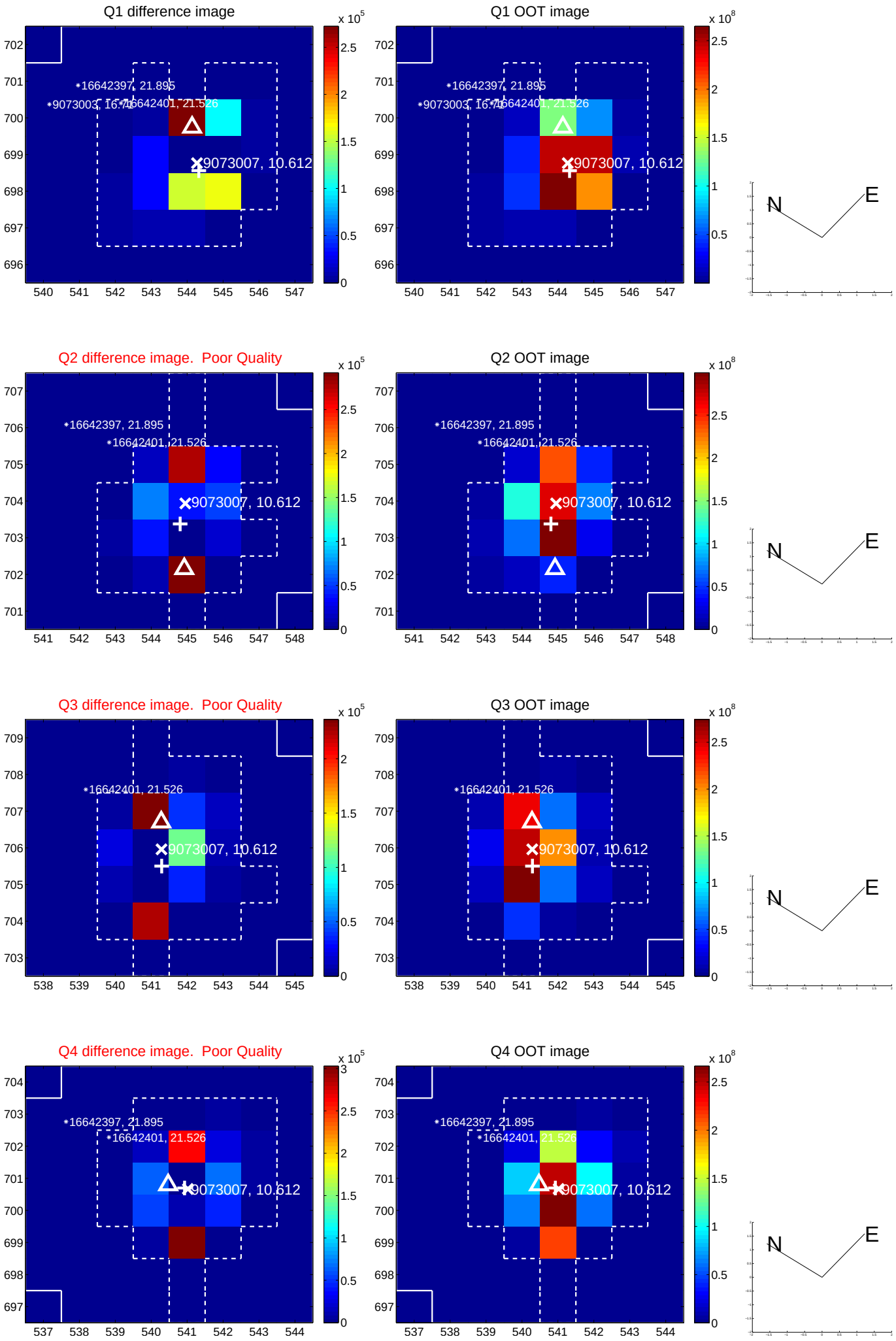
Supplemental centroid analysis for 009073007-01. Kepler magnitude: 10.61. Transit SNR 10.40
There are 1 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.94 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.804 ± 1.041	0.77	-0.723 ± 1.075	0.352 ± 0.880
PRF-fit source offset from KIC position	2.664 ± 0.669	3.98	-1.643 ± 1.049	2.096 ± 0.217
photometric centroid source offset	0.54 ± 0.08	6.58	-0.39 ± 0.09	-0.37 ± 0.08

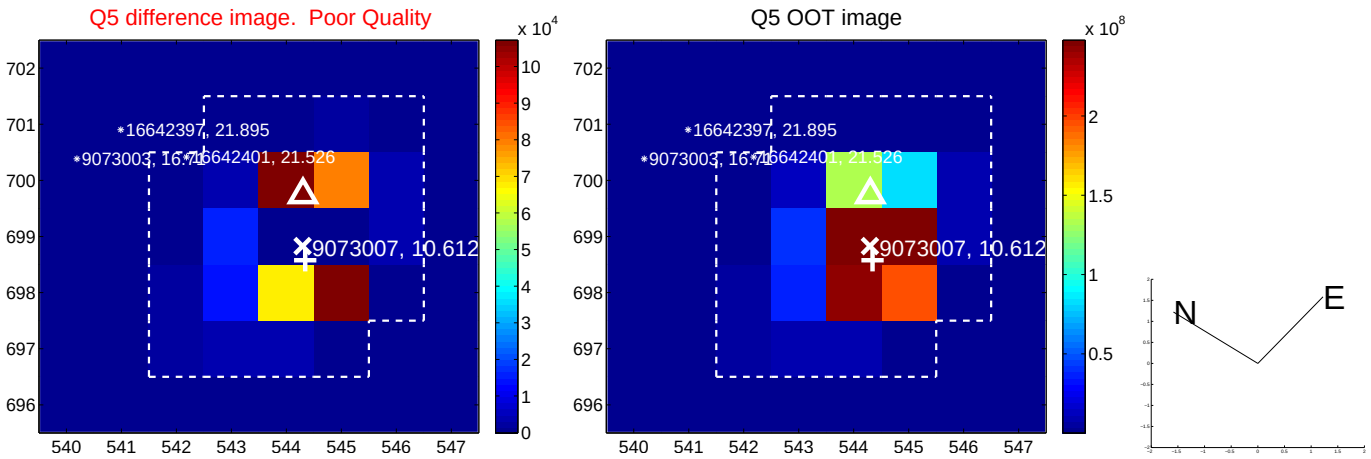


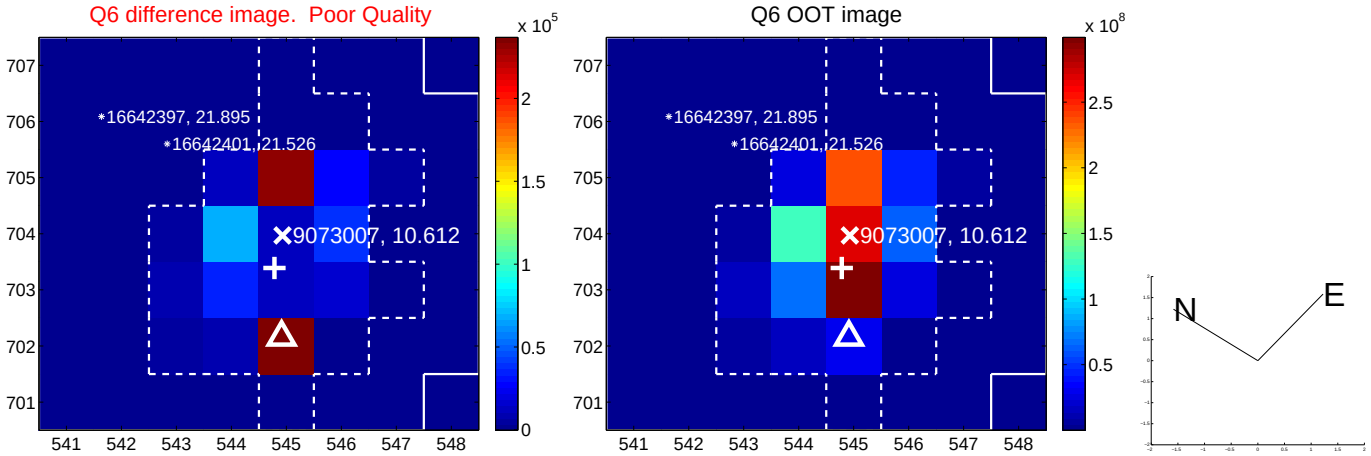
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs $> 15,000,000$ are from the UKIRT catalog.

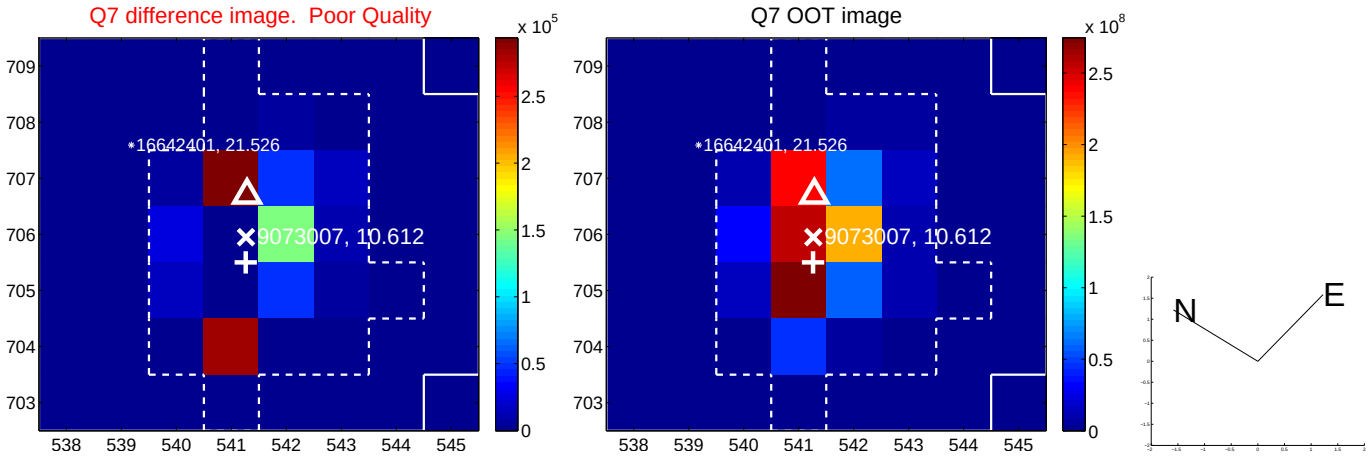
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

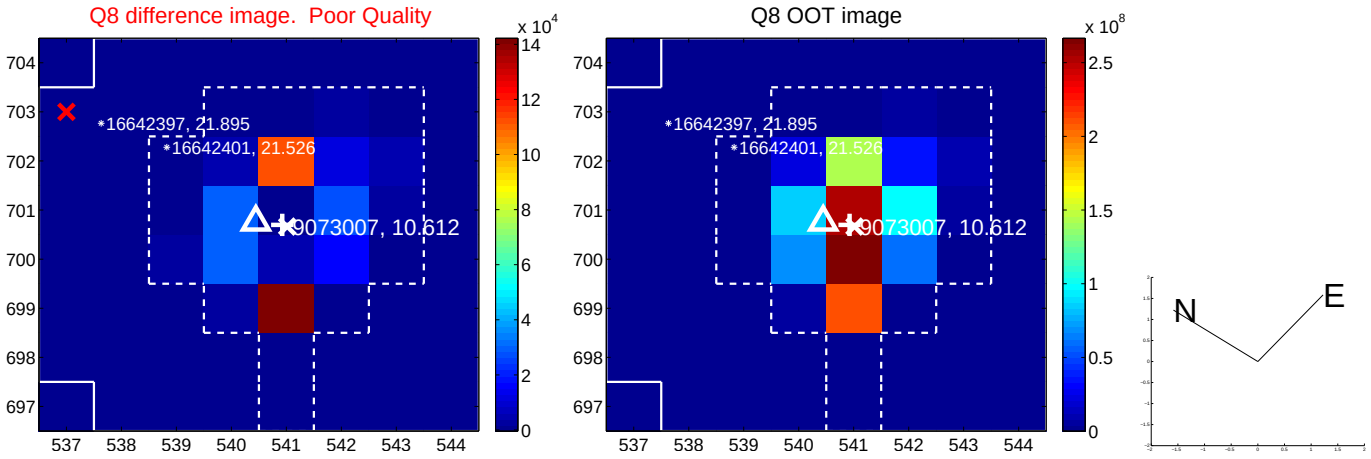


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

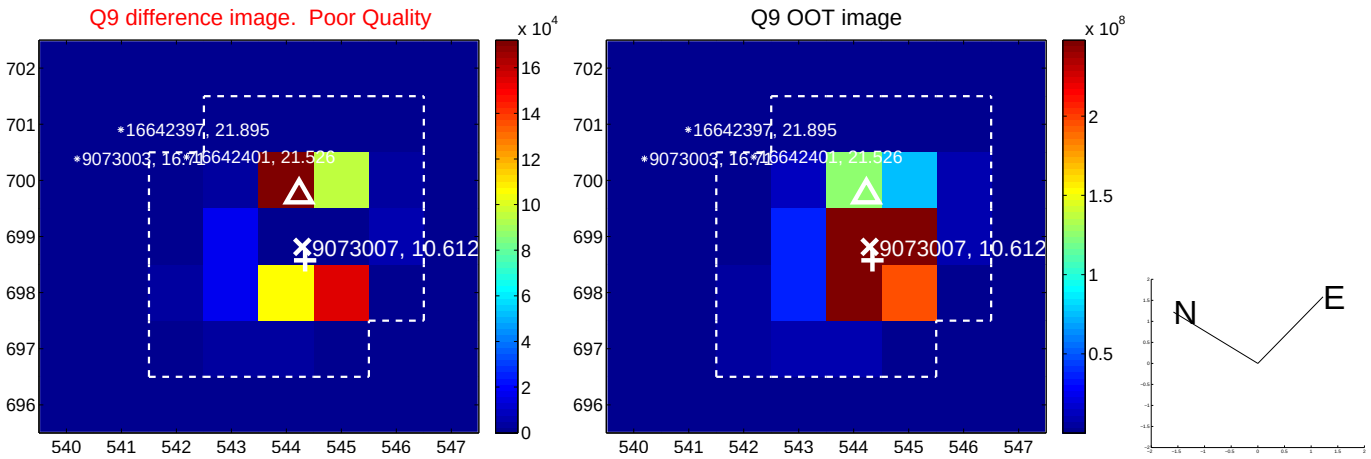


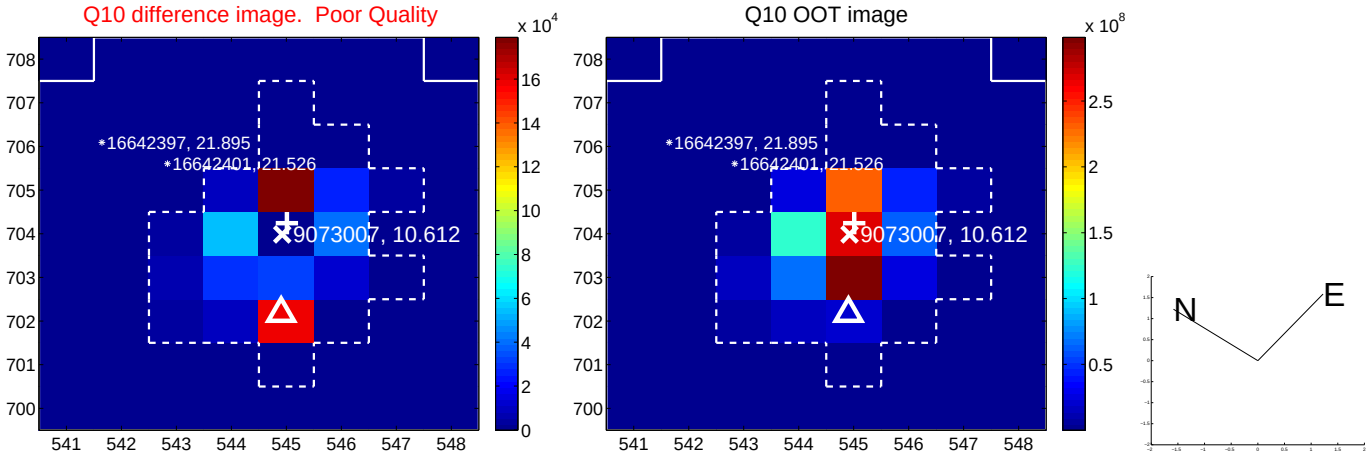


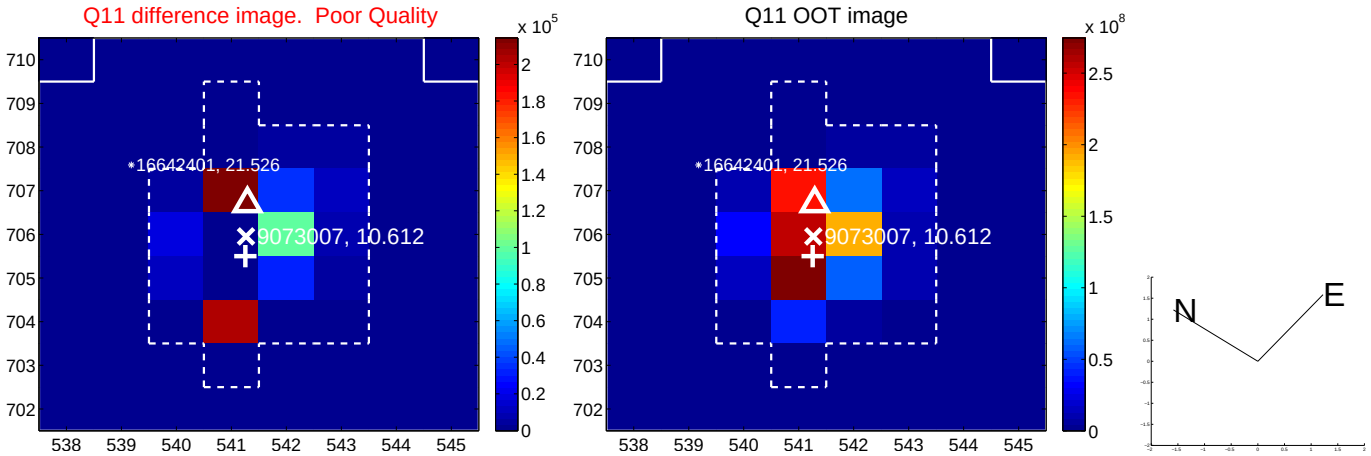


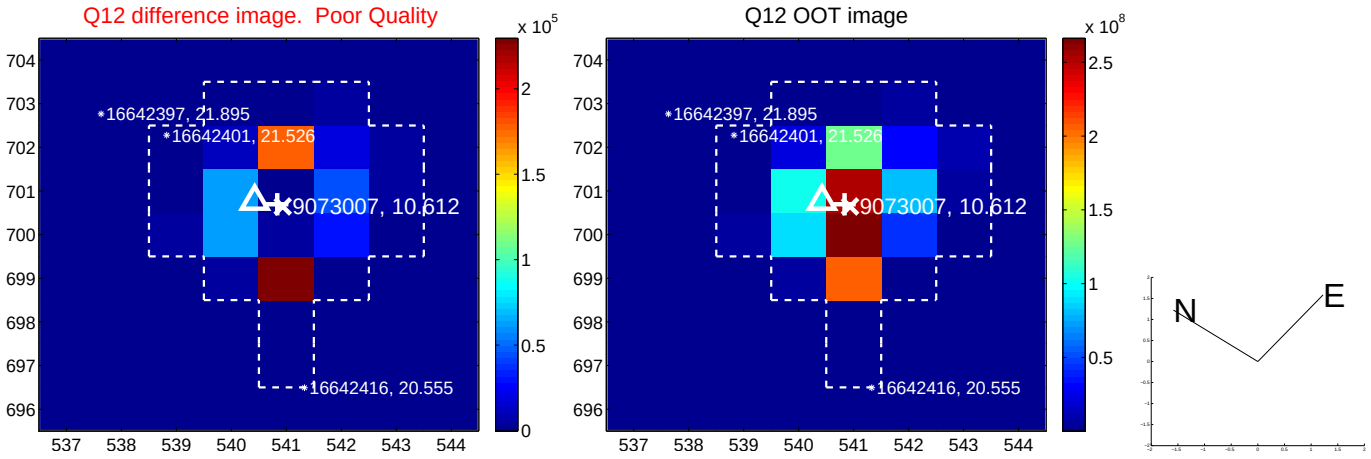


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

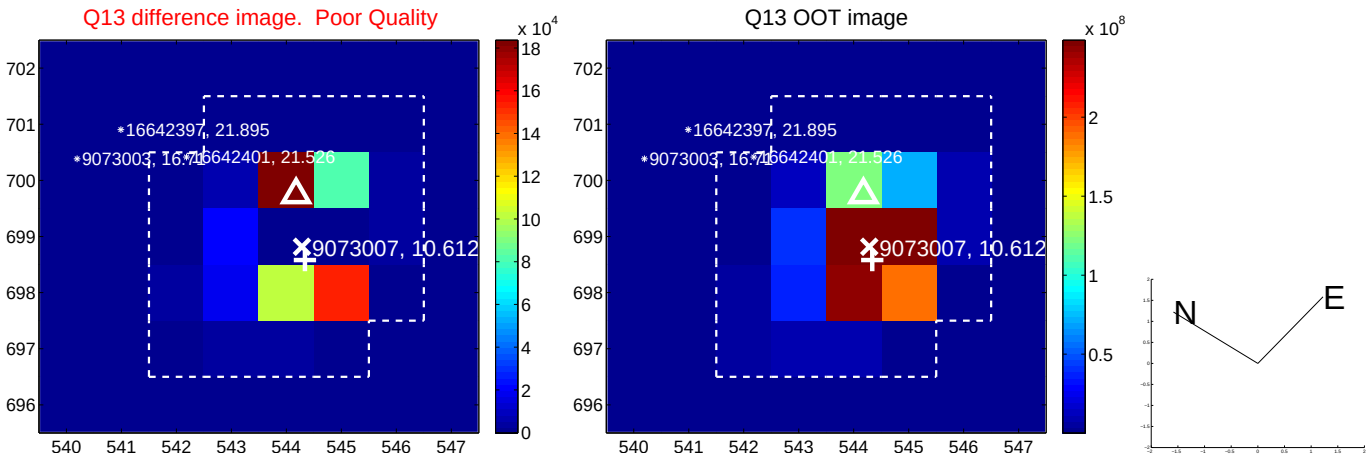


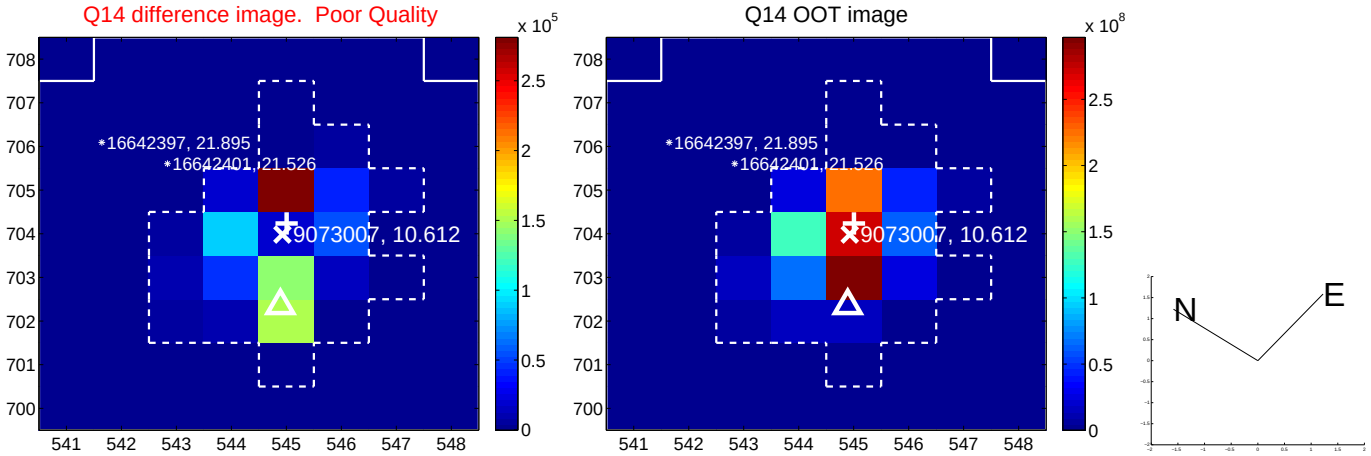


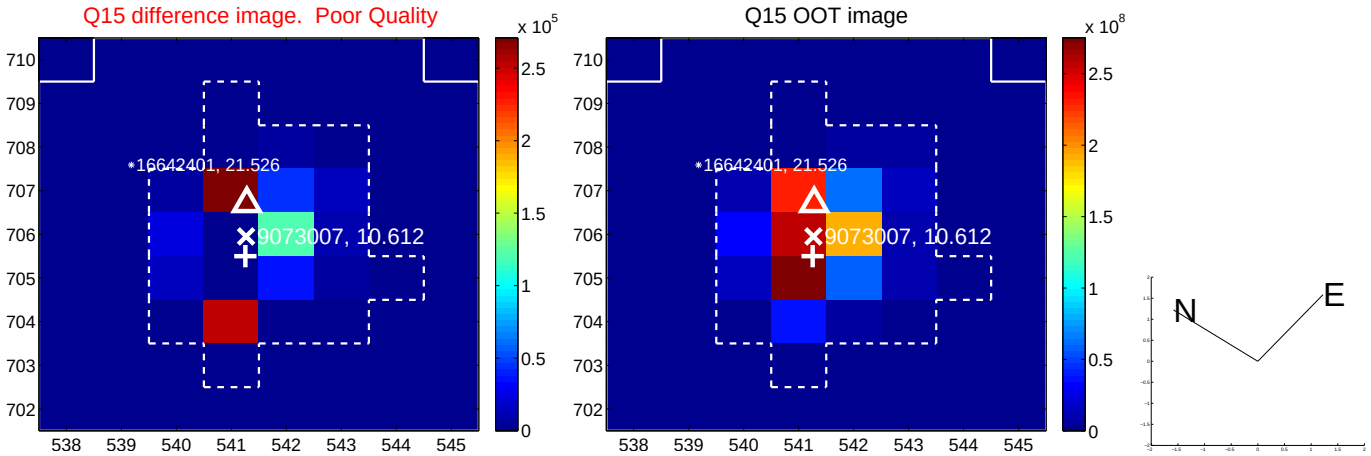


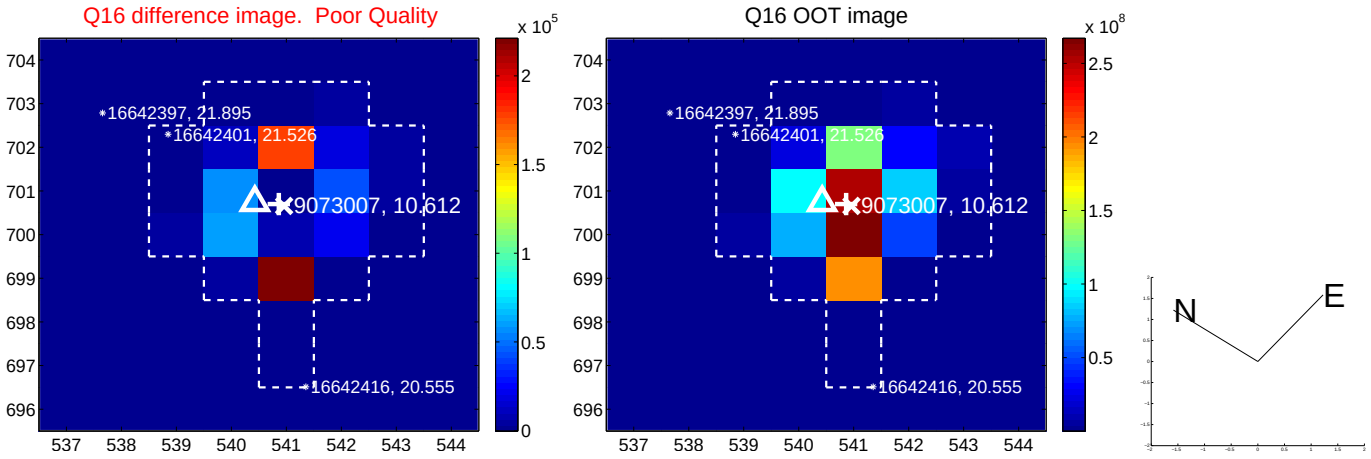


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

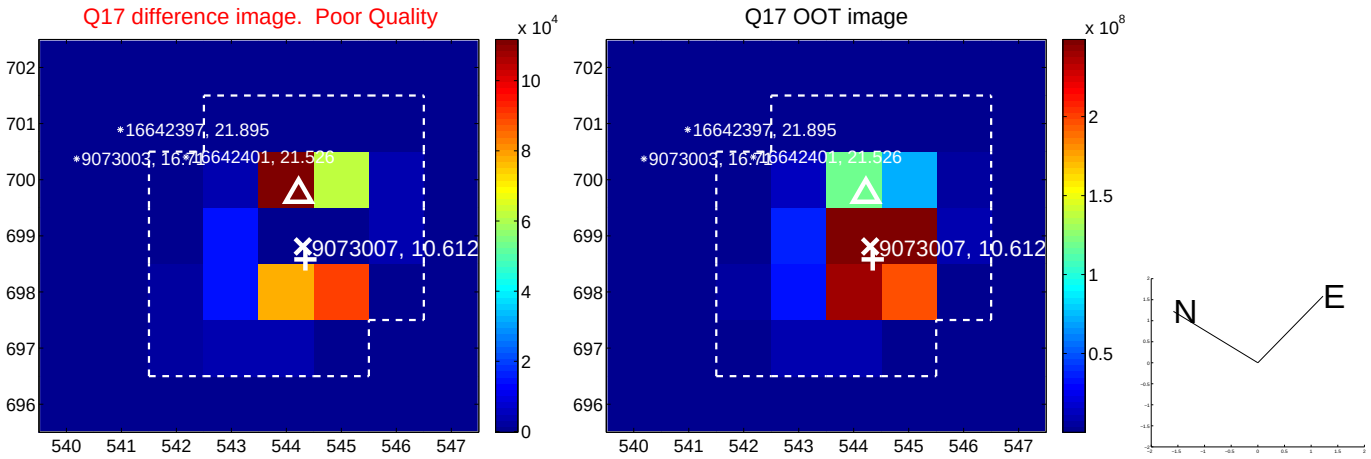


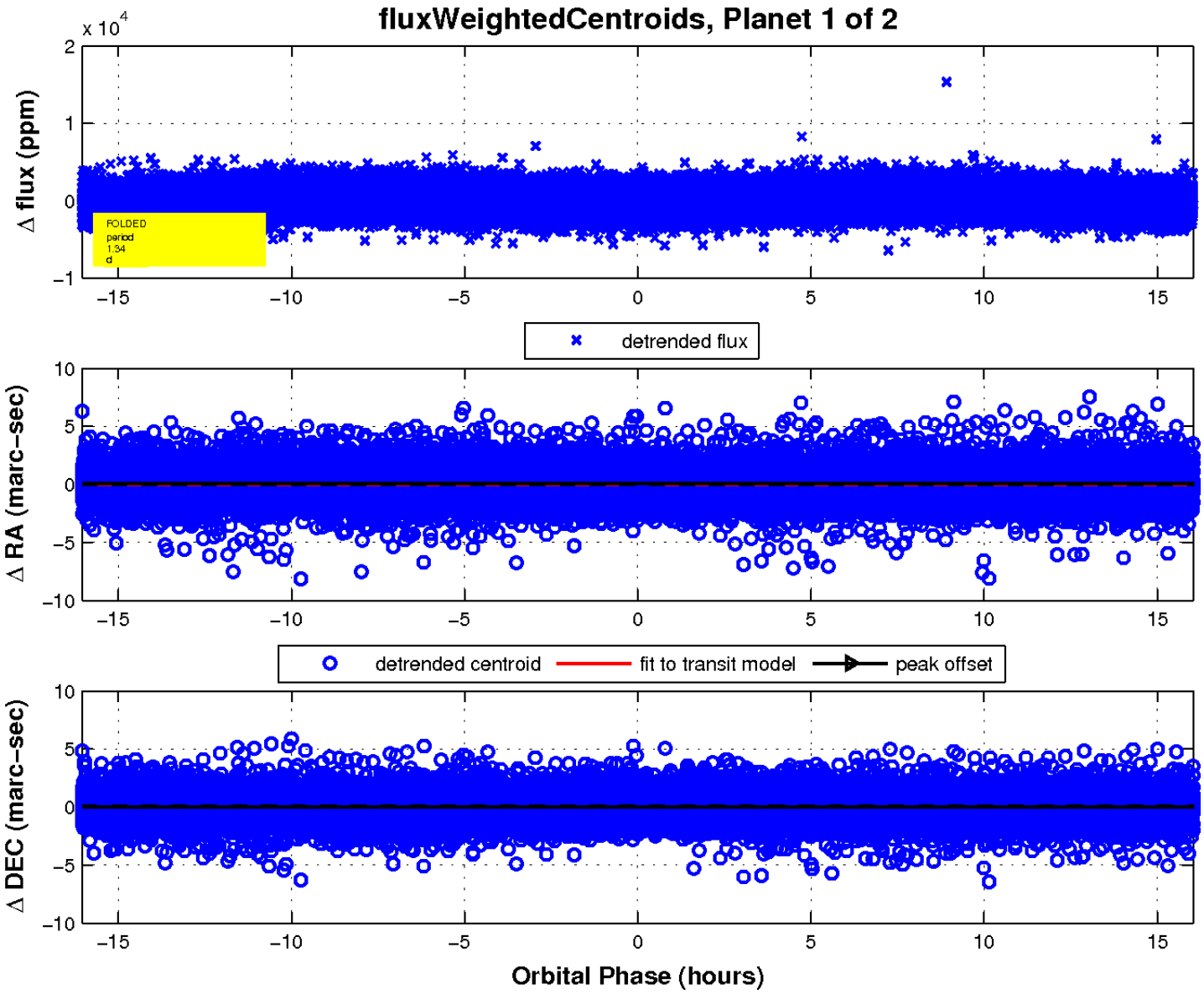




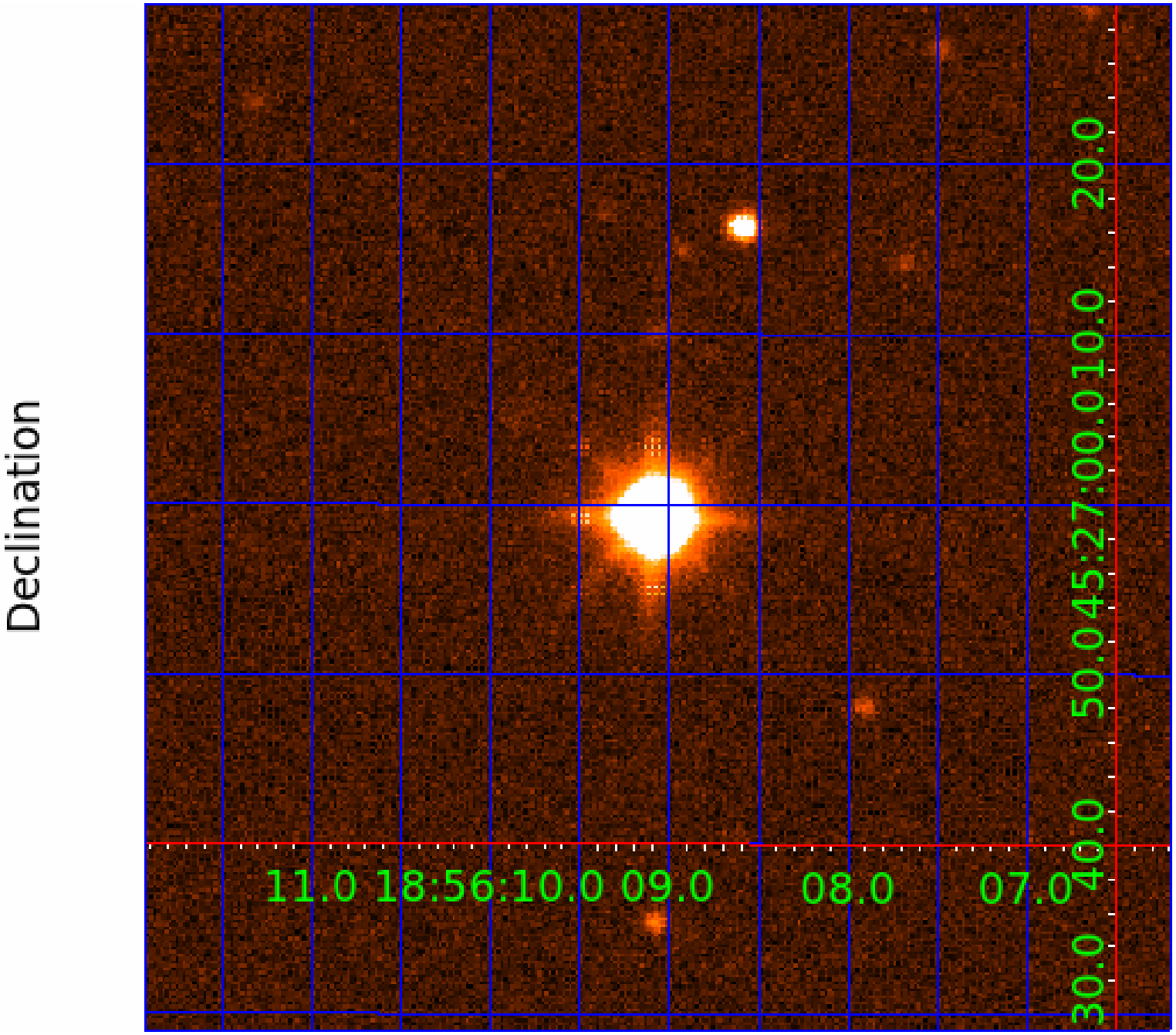


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image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08.0
07.0
30.0
40.0
50.0 45:27:00.0 10.0
20.0

KIC 009073007

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_\star$ ($R_\odot$)	$T_\star$ (K)	R_p ($R_\oplus$)	S_p ($S_\oplus$)
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009073007-02	OBS	No	0.942105	132.297138	386.6	6.608	13.5	17.5	1.76	6748	3.71	13406.08

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009073007-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
009073007-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—CENT_SATURATED

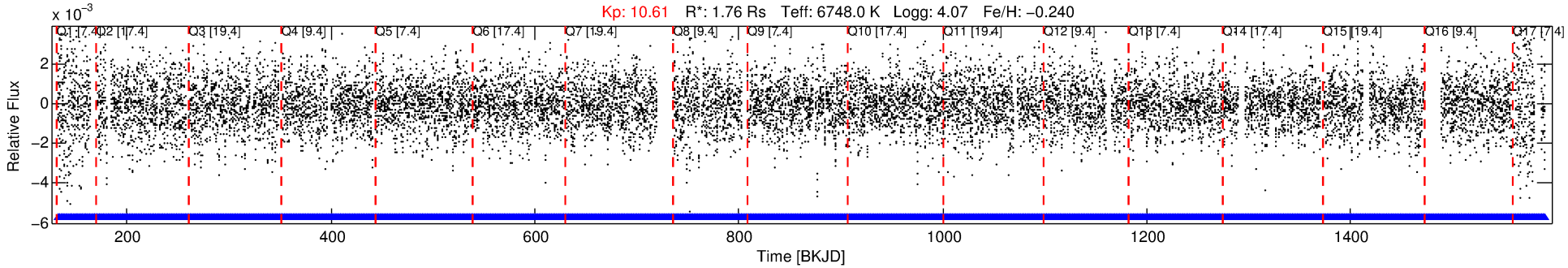
Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

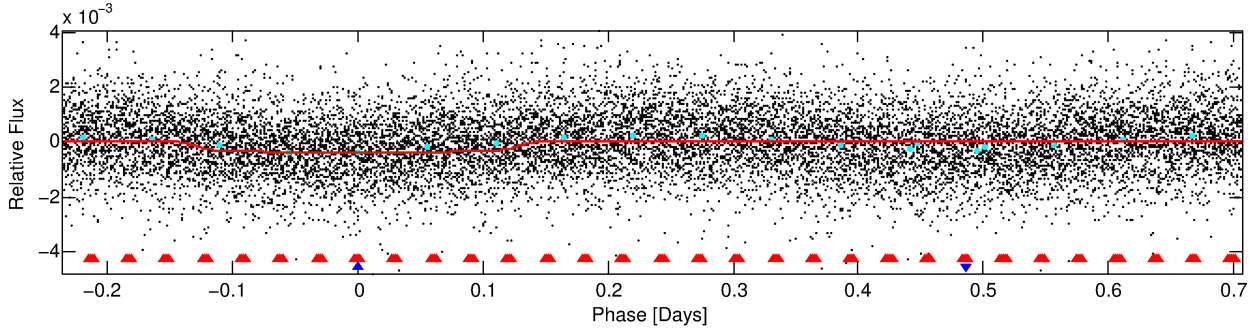
Ephemeris Match Information For 009073007-02

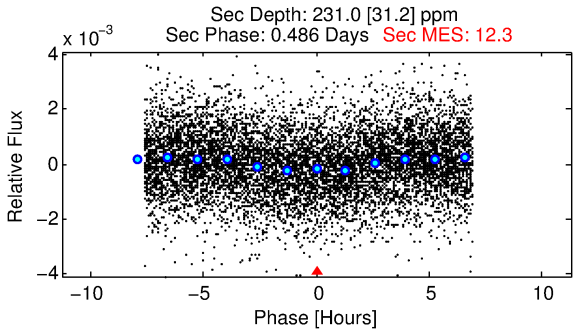
No Significant Match Found

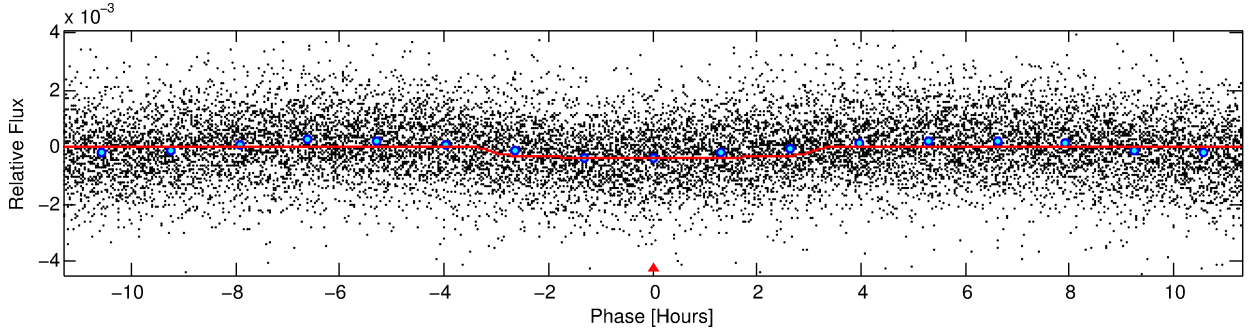
DV One-Page Summary

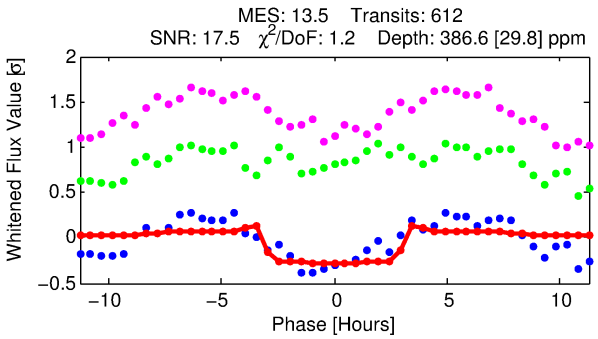
KIC: 9073007 Candidate: 2 of 2 Period: 0.942 d

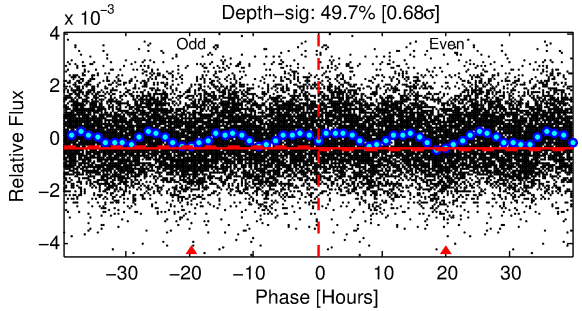


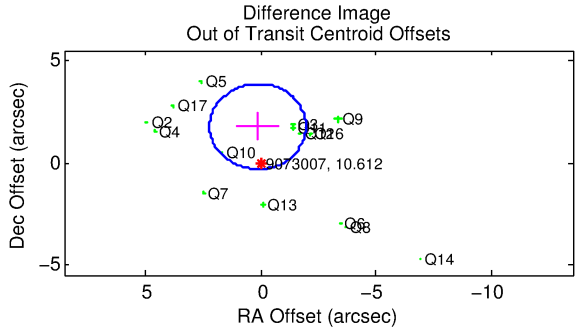












DV Fit Results:

Period = 0.94210 [0.00001] d
Epoch = 132.2971 [0.0028] BKJD
Rp/R* = 0.0193 [0.0035]
a/R* = 1.16 [0.30]
b = 0.71 [0.71]

Seff = 13406.08 [6143.32]
Teq = 2744 [314] K
Rp = 3.71 [1.29] Re
a = 0.0207 [0.0057] AU

Ag = 3.96 [2.28] [1.30σ]
Teffp = 5984 [632] K [4.59σ]

DV Diagnostic Results:

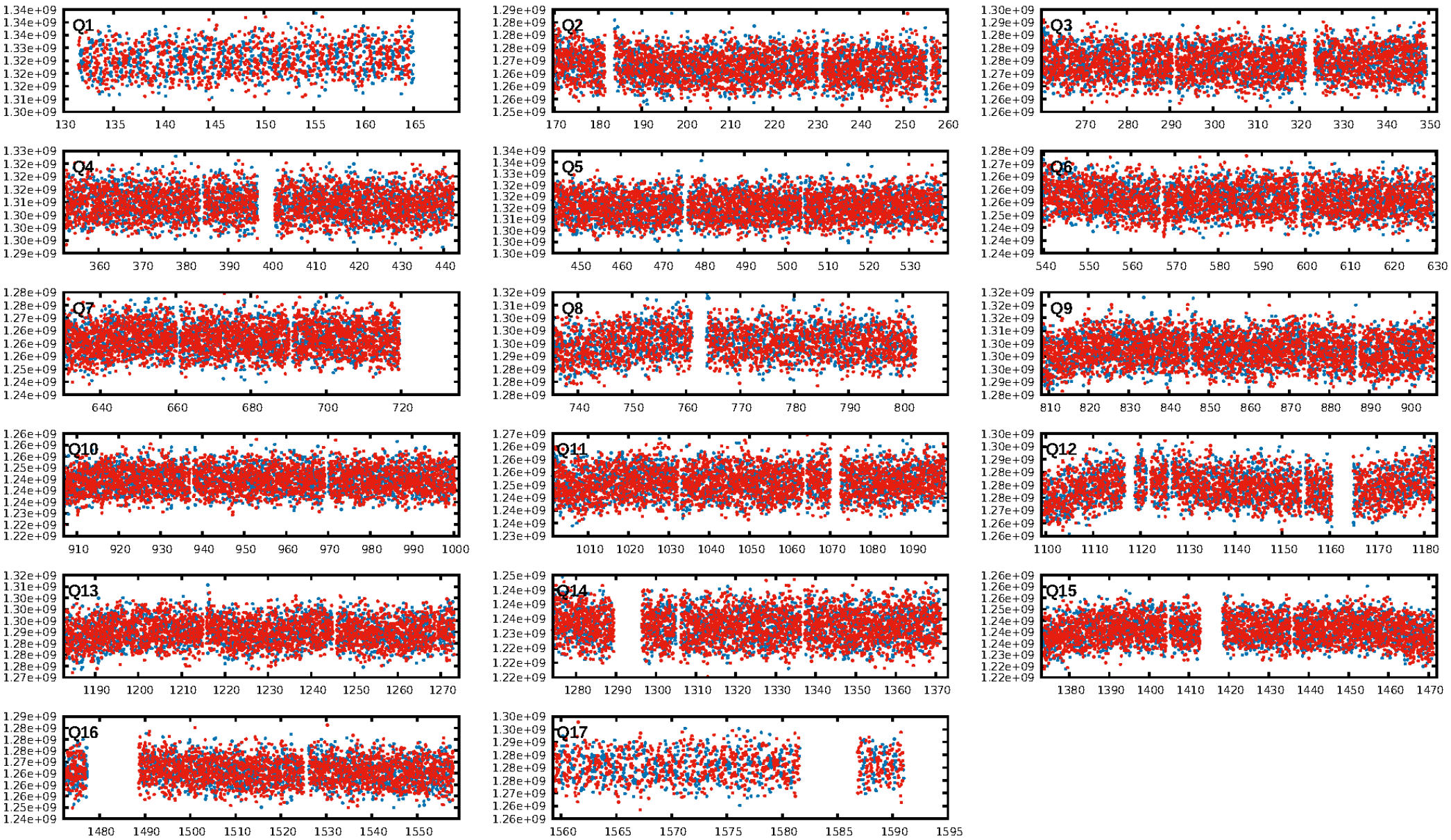
ShortPeriod−sig: N/A
LongPeriod−sig: 63.7% [0.91σ]
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: N/A
RollingBand−fgt: 1.00 [584/584]
GhostDiagnostic−chr: 0.5279

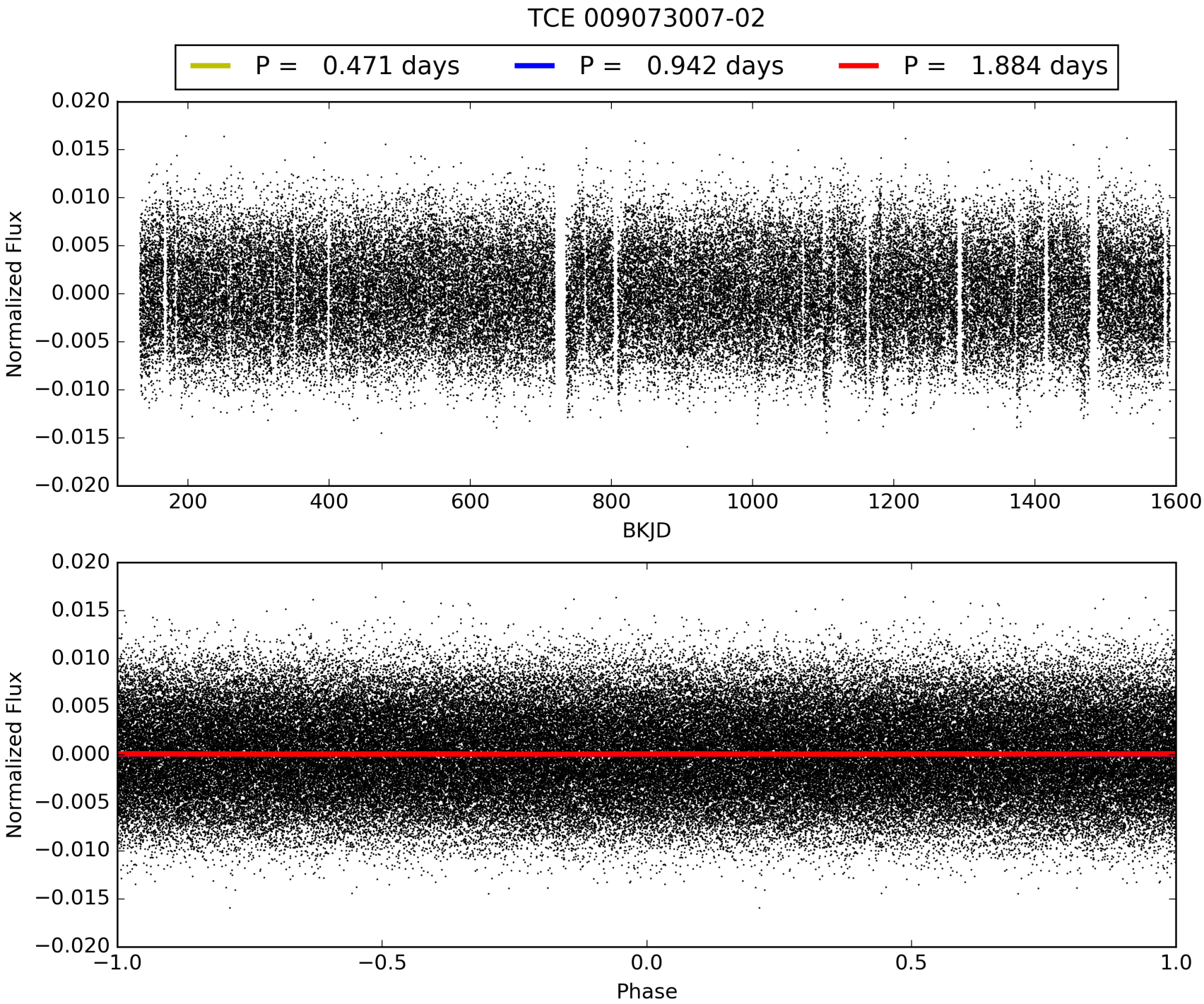
Centroid−sig: 21.9%
Centroid−so: 0.353 arcsec [9.82σ]
OotOffset−rm: 1.769 arcsec [2.54σ]
KicOffset−rm: 1.538 arcsec [2.84σ]
OotOffset−st: 4/3/4/5 [16]
KicOffset−st: 4/3/4/5 [16]
DiffImageQuality−fgm: 0.31 [5/16]
DiffImageOverlap−fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02−Feb−2016 05:45:07 Z

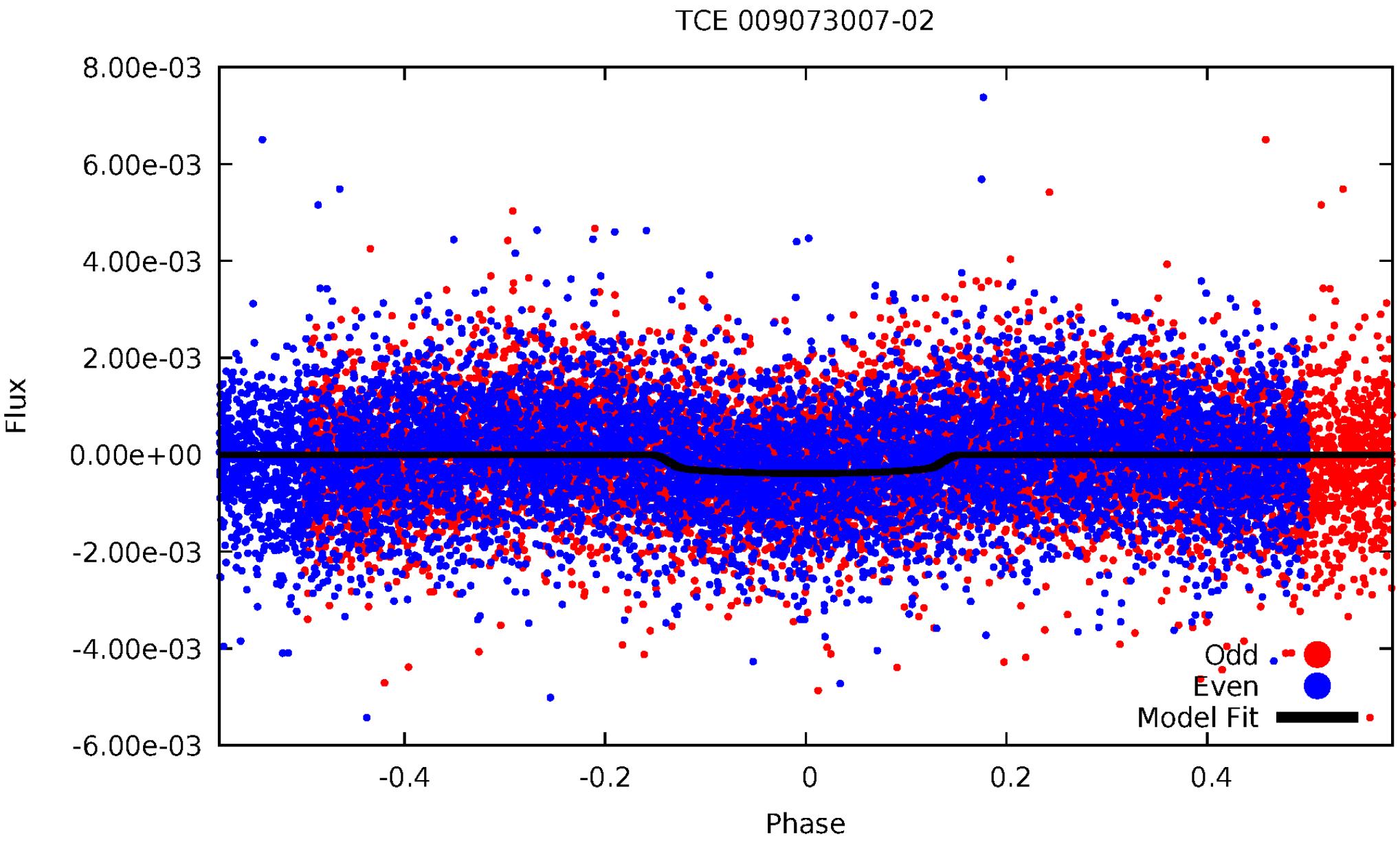
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009073007-02, PDC Light Curves

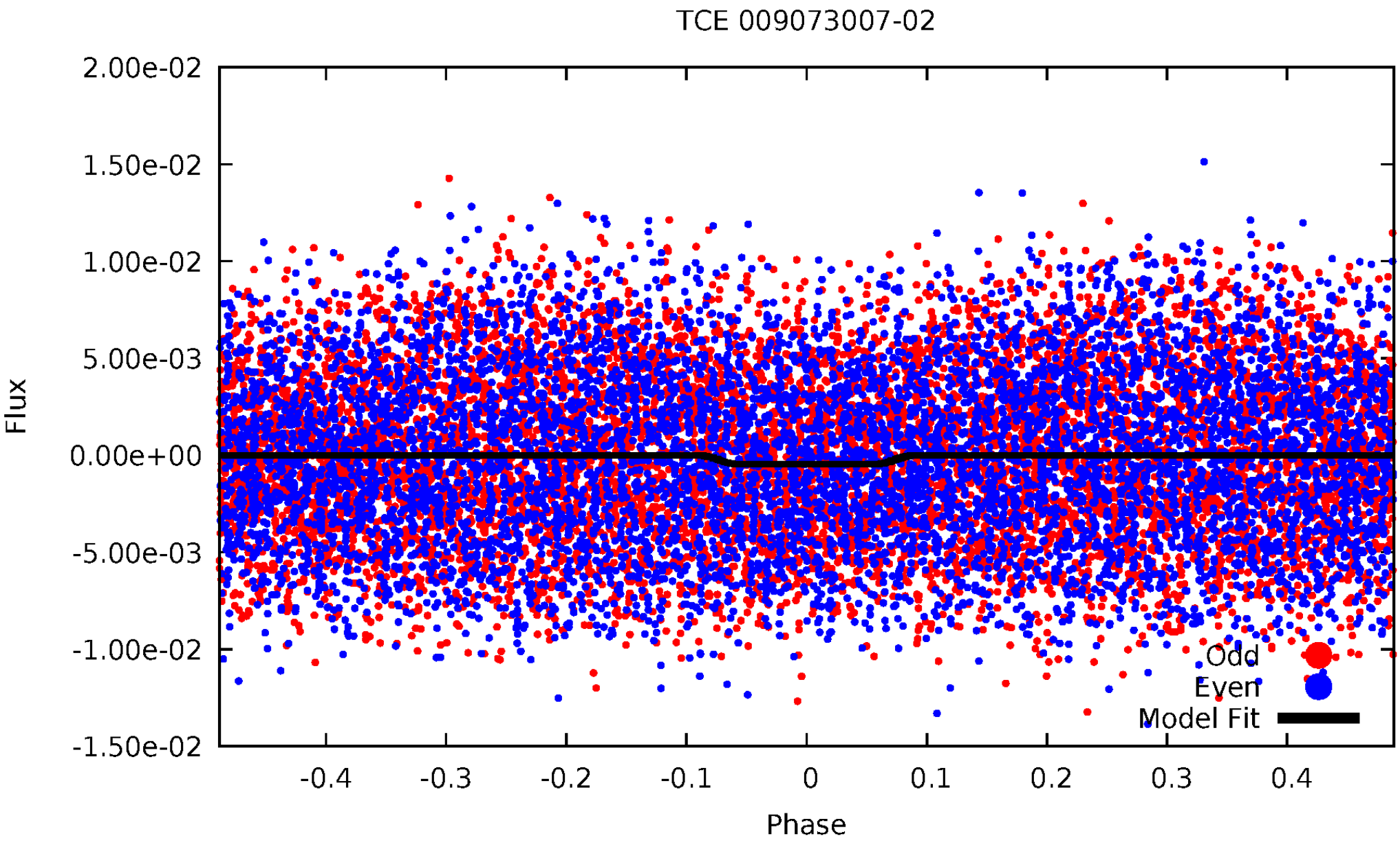



TCE 009073007-02
P = 0.471 days
P = 0.942 days
P = 1.884 days
Normalized Flux
BKJD
Normalized Flux
Phase

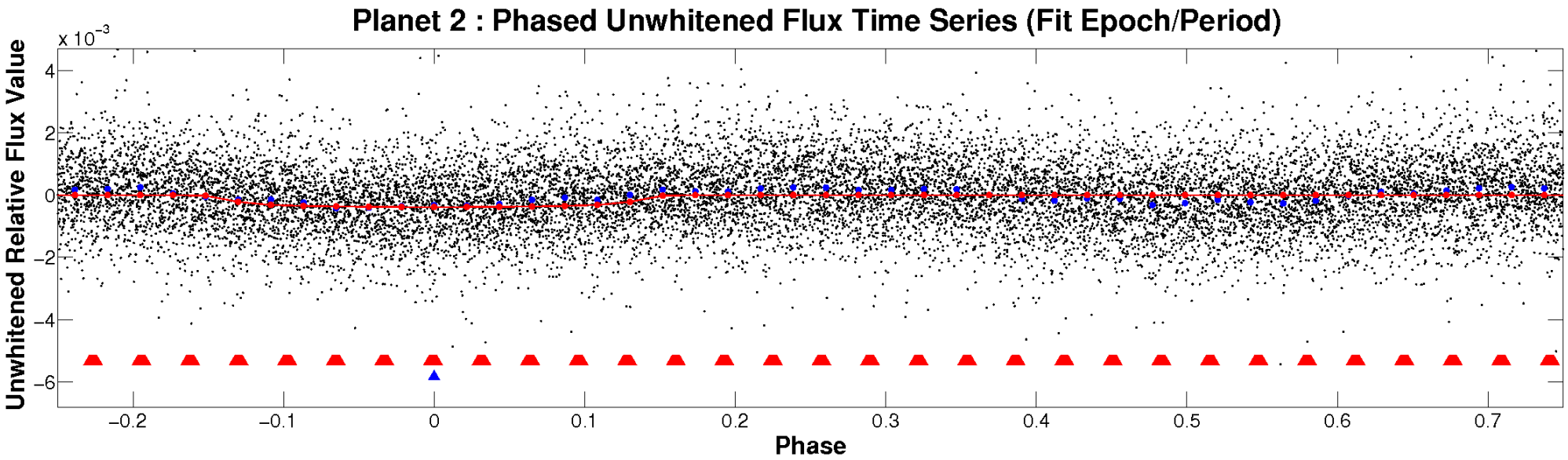
DV Odd/Even

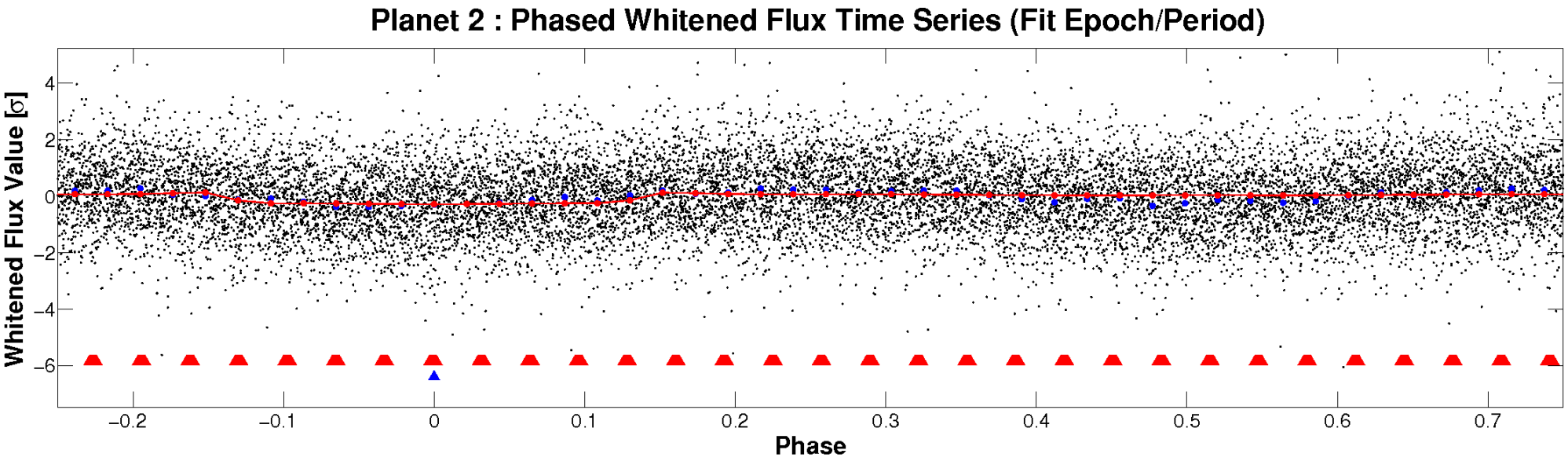

TCE 009073007-02
8.00e-03
6.00e-03
4.00e-03
2.00e-03
0.00e+00
-2.00e-03
-4.00e-03
-6.00e-03
Flux
-0.4
-0.2
0
0.2
0.4
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009073007-02
2.00e-02
1.50e-02
1.00e-02
5.00e-03
0.00e+00
-5.00e-03
-1.00e-02
-1.50e-02
Flux
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
Phase
Odd
Even
Model Fit

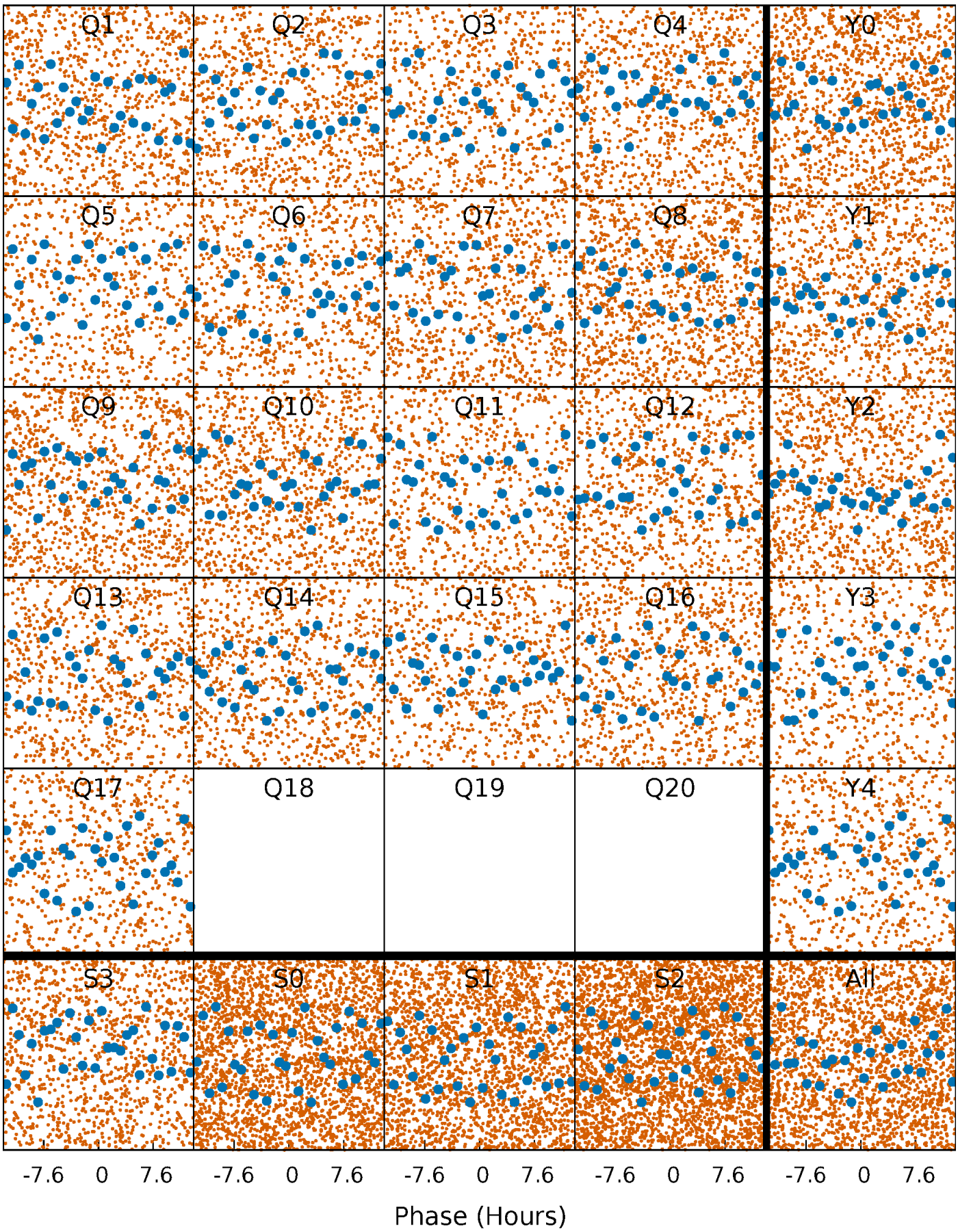
Non-Whitened Vs. Whitened Light Curve





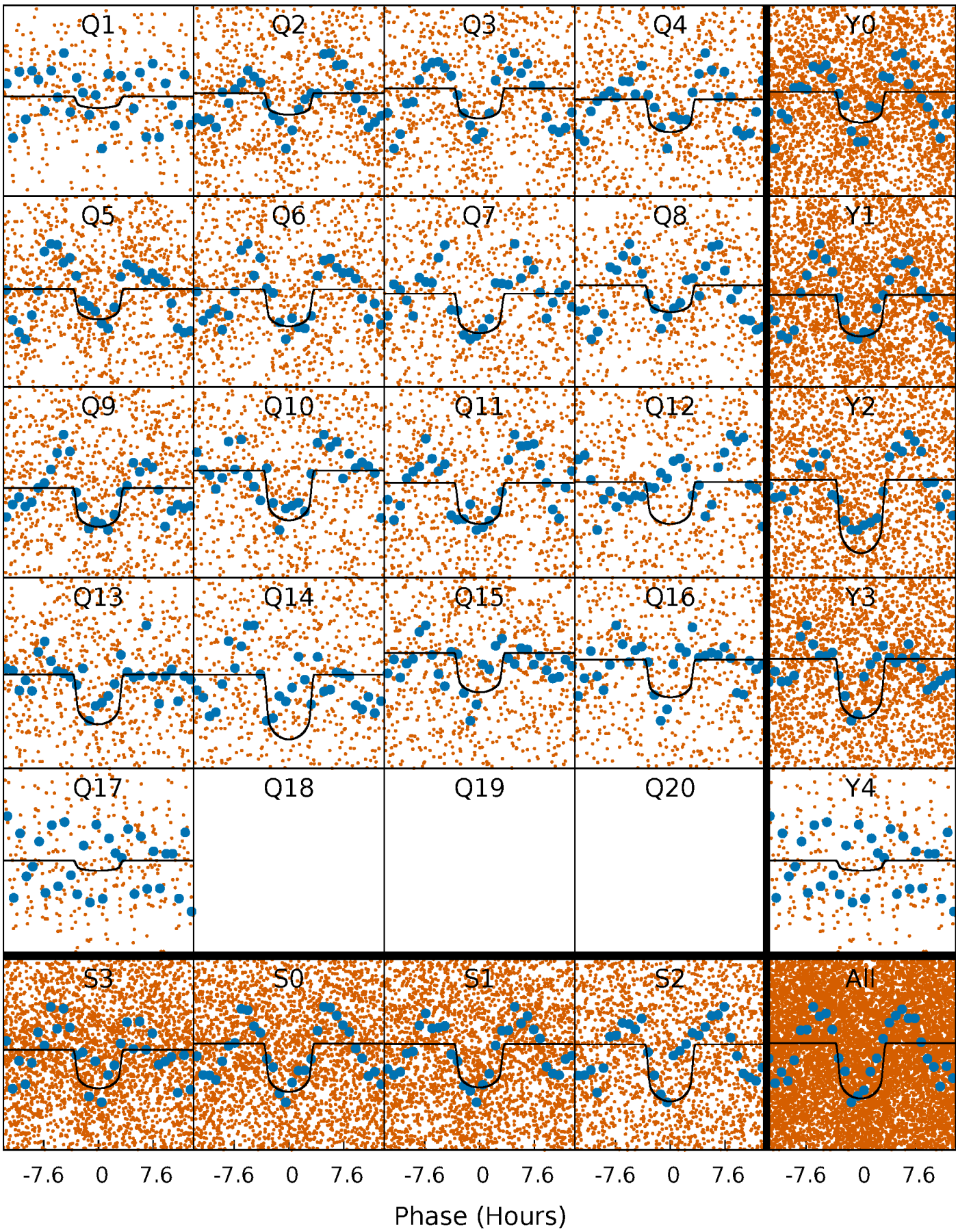
PDC Quarter-Phased Transit Curves

TCE 009073007-02 P= 0.942105 Days T_0=132.297138 (BKJD)



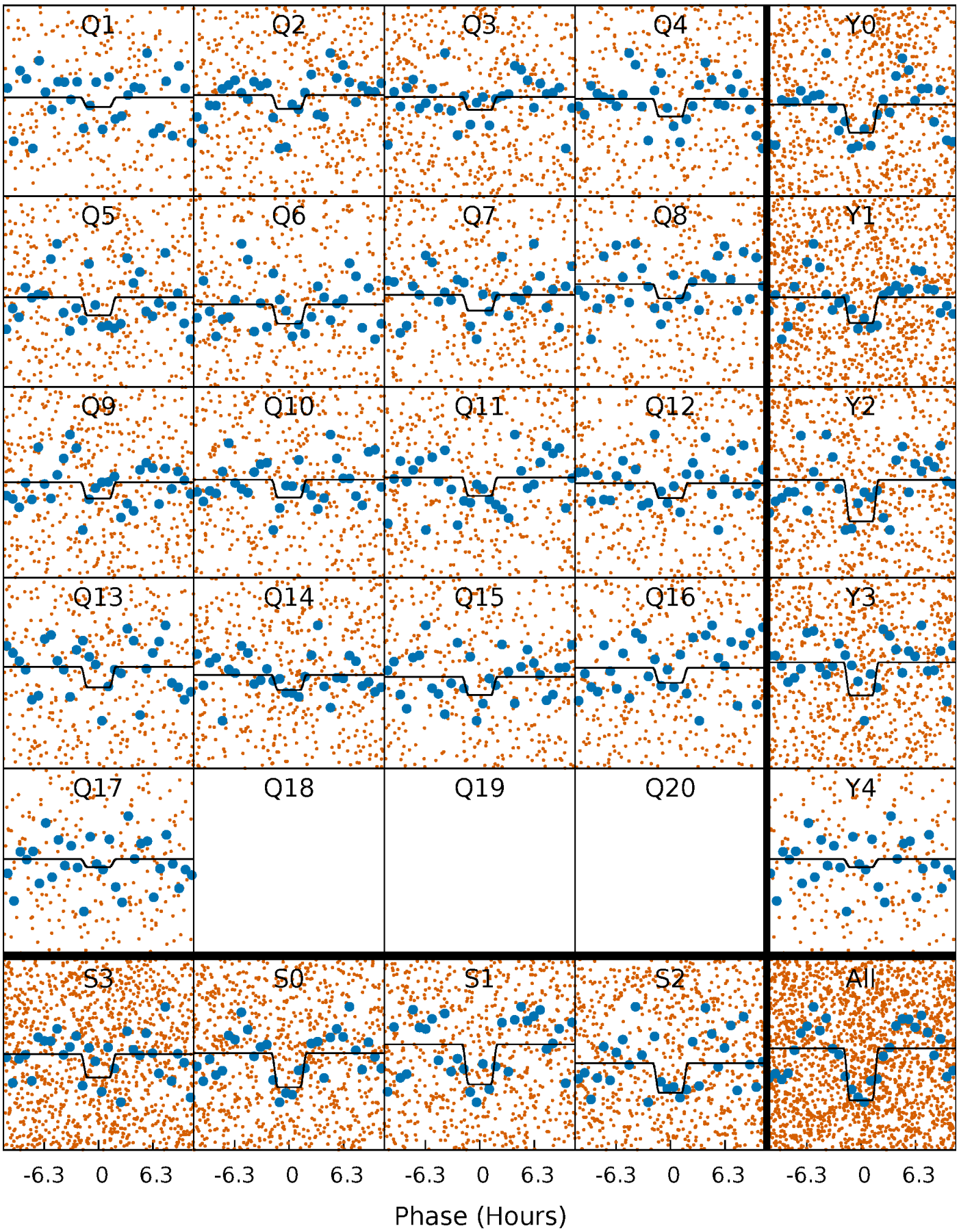
DV Quarter-Phased Transit Curves

TCE 009073007-02 P= 0.942105 Days T_0=132.297138 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

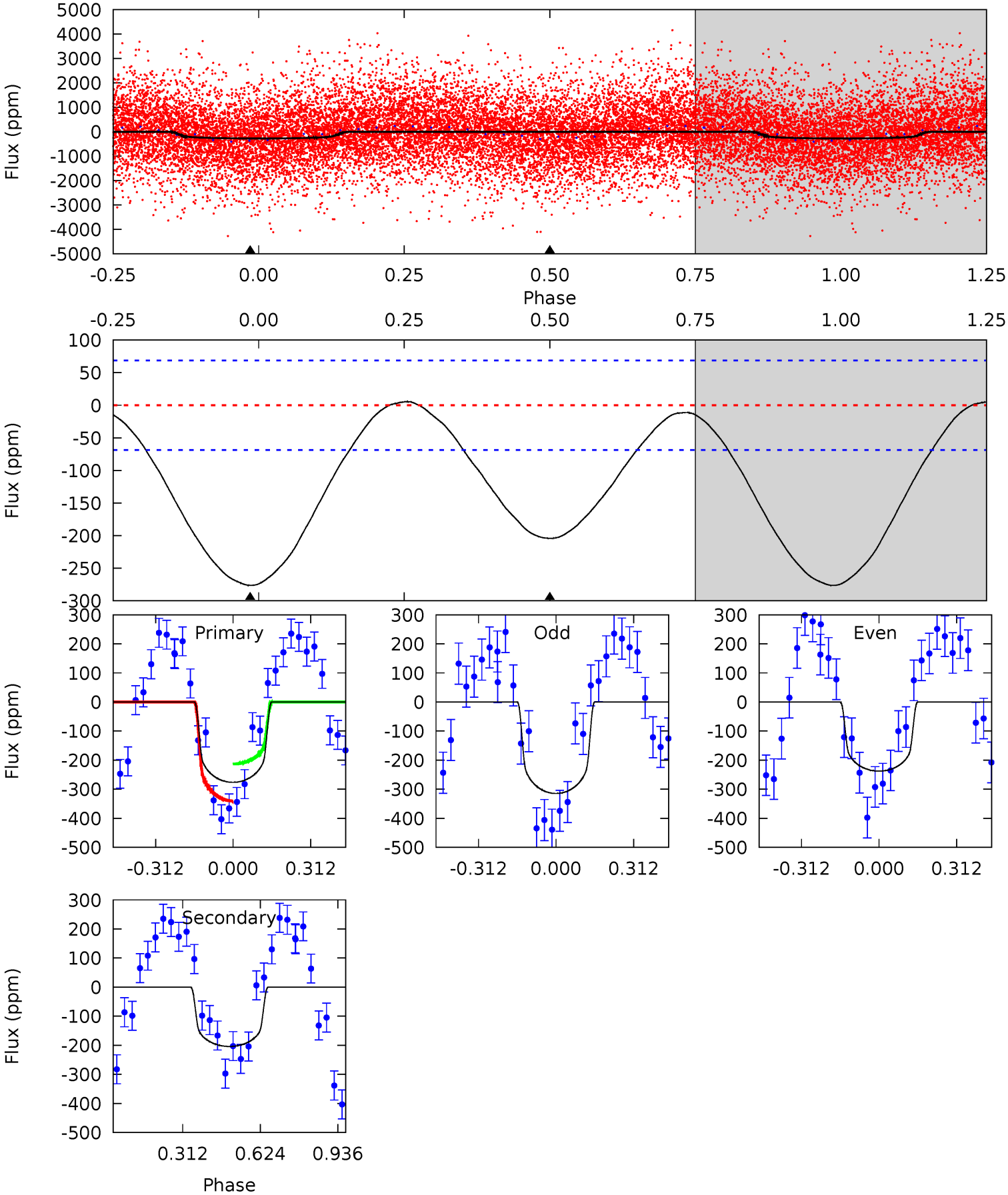
TCE 009073007-02 P= 0.942060 Days T_0=132.296168 (BKJD)



DV Model-Shift Uniqueness Test

009073007-02, P = 0.942105 Days, E = 131.355033 Days

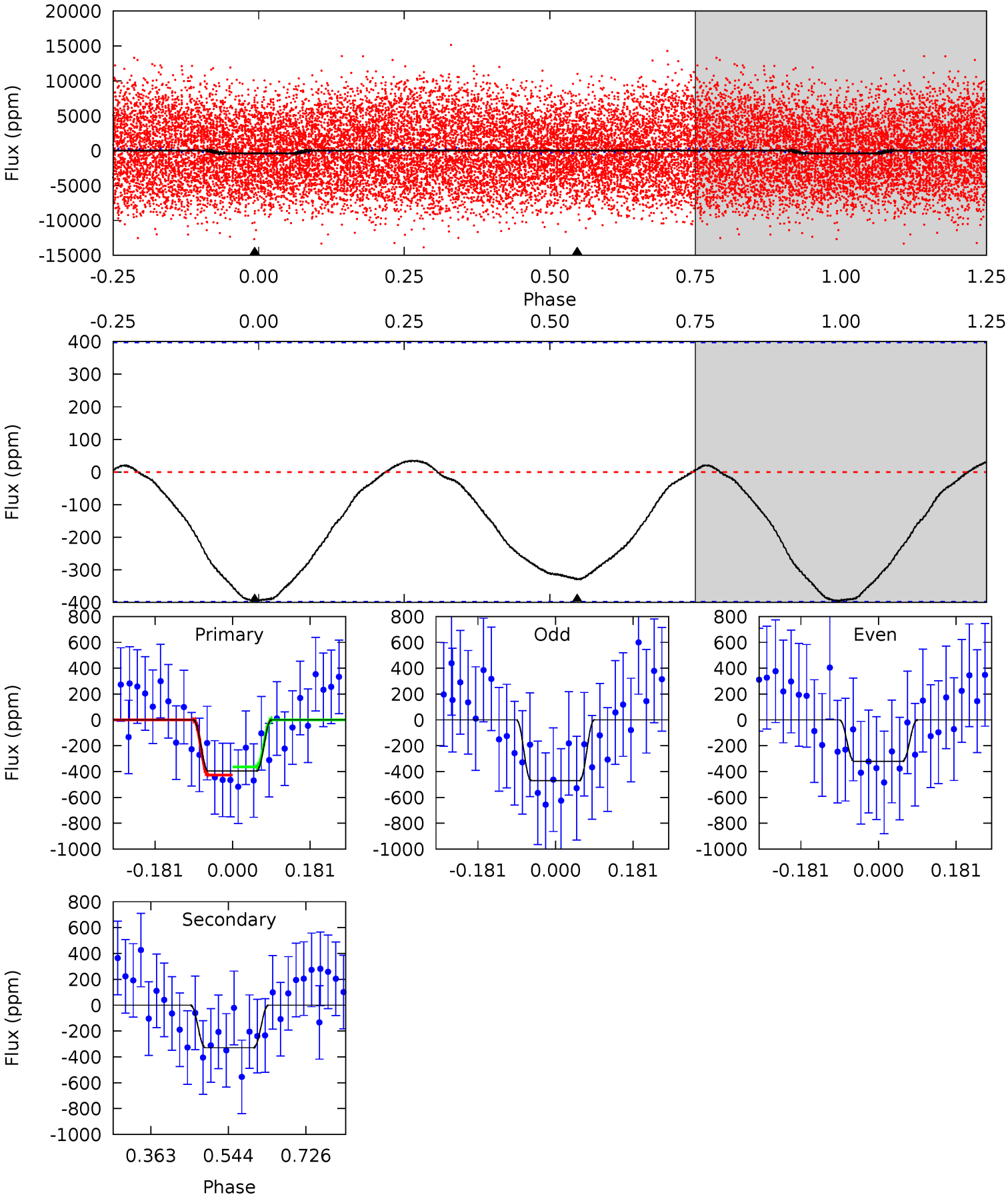
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.4	12.8	0	0	4.32	1.01	0.51	17.4	17.4	12.8	12.8	2.39	0.72	0.02	4.13



Alt Model-Shift Uniqueness Test

009073007-02, P = 0.942060 Days, E = 131.354108 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.41	3.67	0	0	4.44	1.34	0.30	4.41	4.41	3.67	3.67	0.83	0.91	0.08	0.35



Stellar Parameters For KIC 009073007

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	6748^{+189}_{-284}	$4.073^{+0.246}_{-0.164}$	$-0.240^{+0.300}_{-0.300}$	$1.761^{+0.522}_{-0.522}$	$1.341^{+0.183}_{-0.252}$	$0.346^{+0.527}_{-0.157}$
	+3%/-4%	+6%/-4%	+125%/-125%	+30%/-30%	+14%/-19%	+152%/-45%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009073007-02 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-204±16	$3.61^{+0.97}_{-0.91}$	3779^{+299}_{-325}	5678^{+643}_{-517}	$3.646^{+2.786}_{-1.319}$
Alt.	-329±90	$3.94^{+0.96}_{-0.85}$	3767^{+305}_{-319}	6045^{+830}_{-687}	$4.753^{+3.822}_{-1.975}$

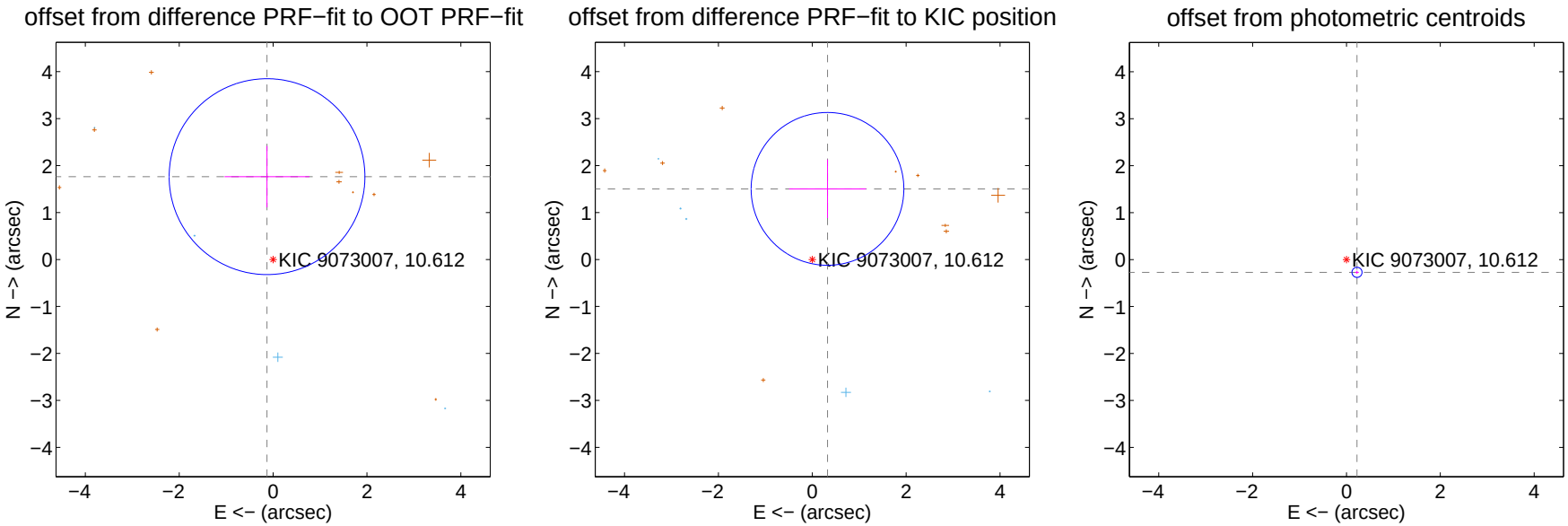
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

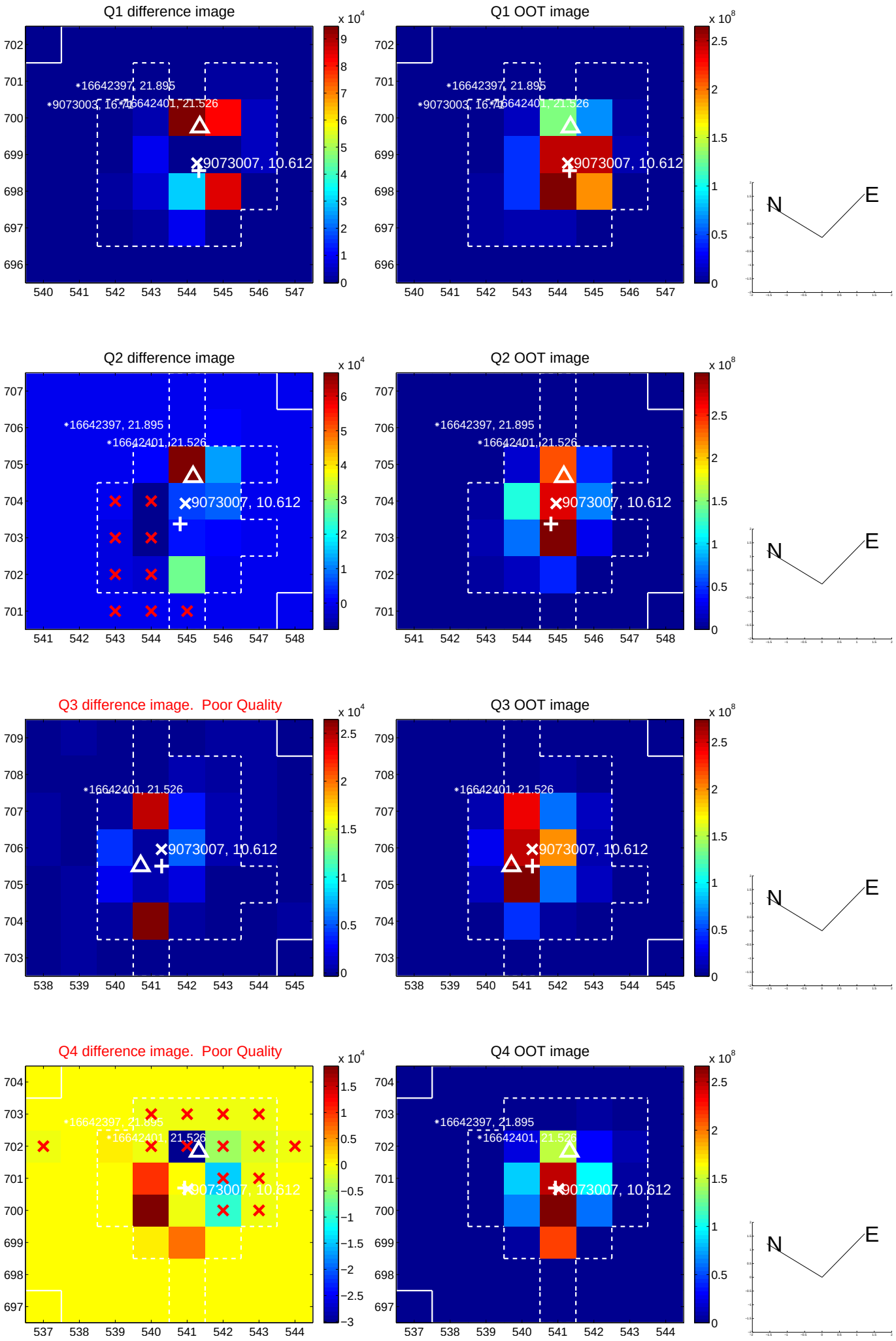
Supplemental centroid analysis for 009073007-02. Kepler magnitude: 10.61. Transit SNR 17.52
There are 5 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.94 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.769 ± 0.695	2.54	0.129 ± 0.904	1.764 ± 0.653
PRF-fit source offset from KIC position	1.538 ± 0.542	2.84	-0.324 ± 0.818	1.503 ± 0.623
photometric centroid source offset	0.35 ± 0.04	9.82	-0.22 ± 0.04	-0.27 ± 0.03

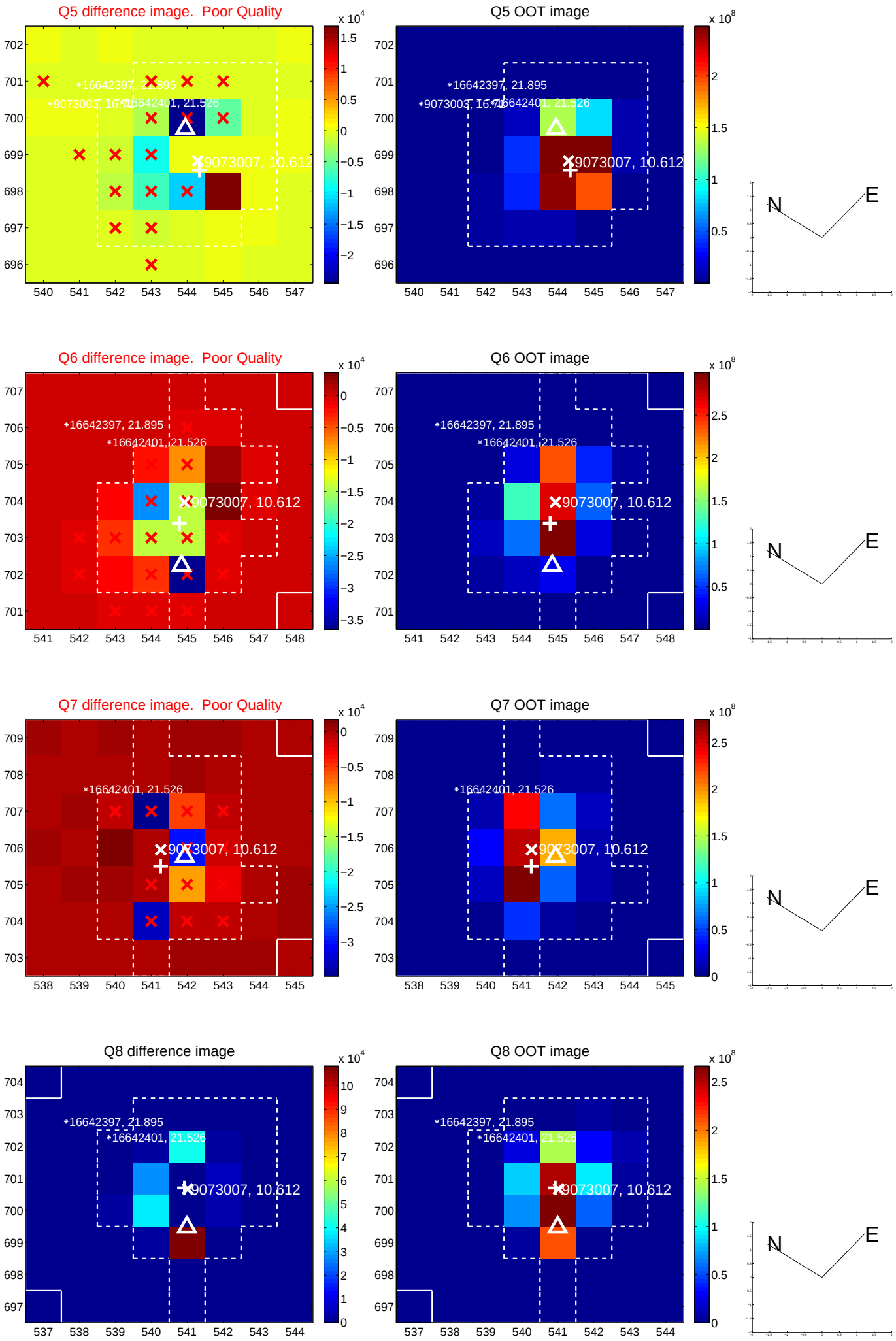


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

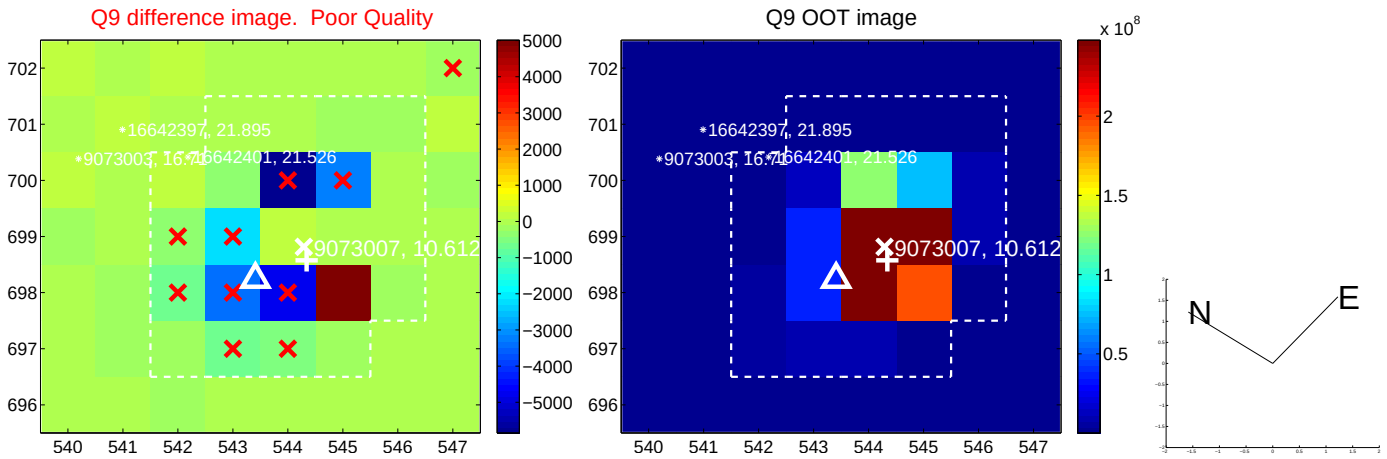
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

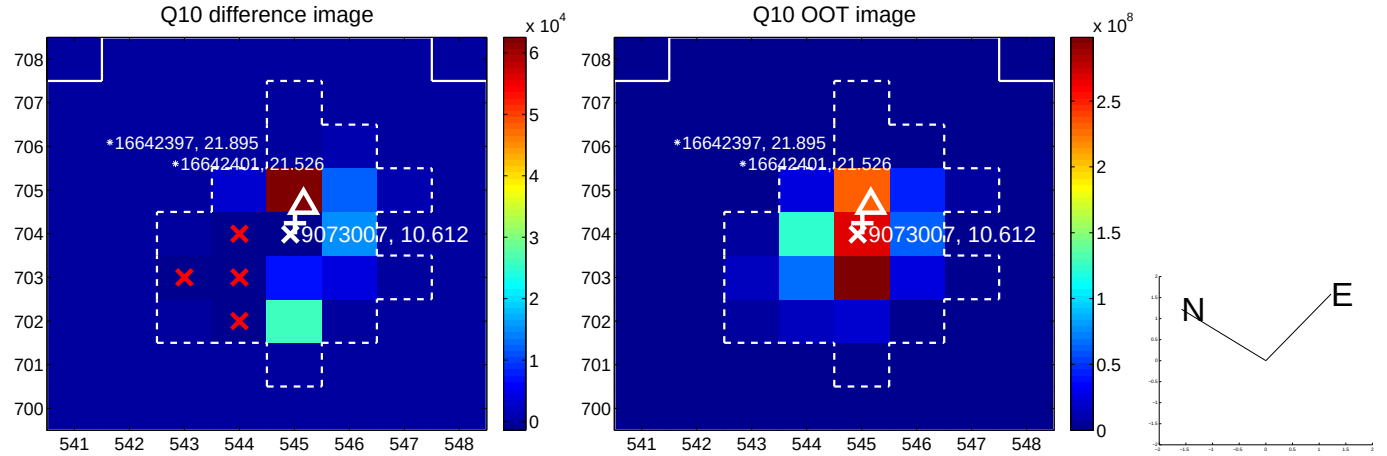


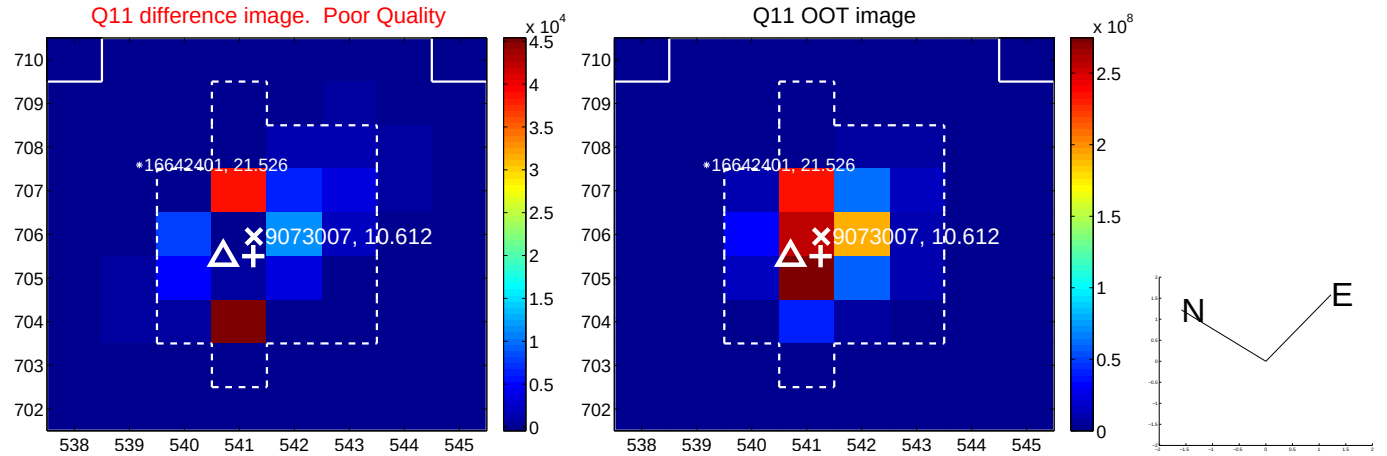
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

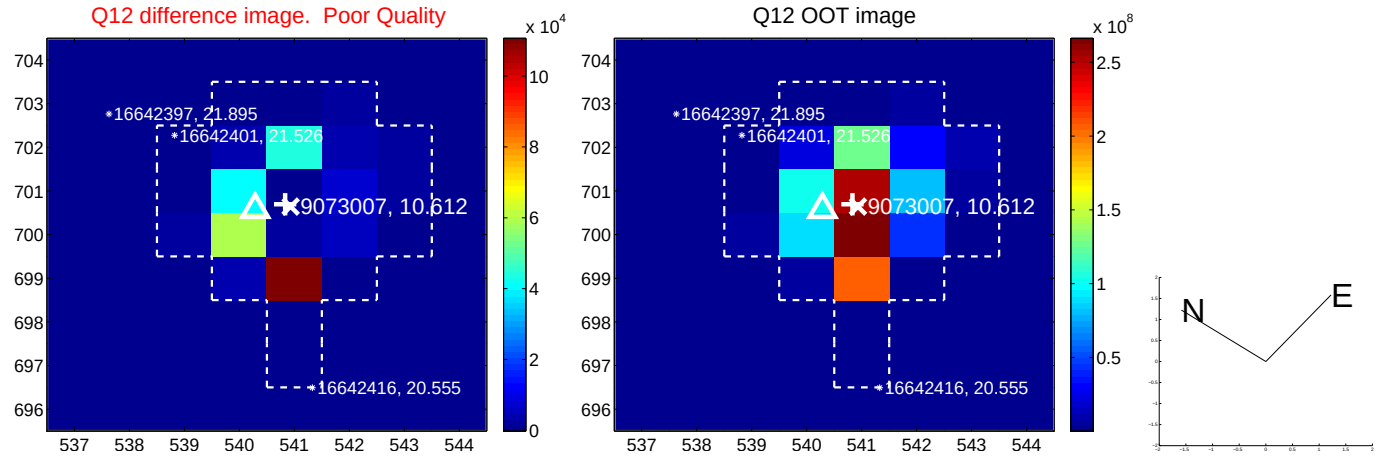


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

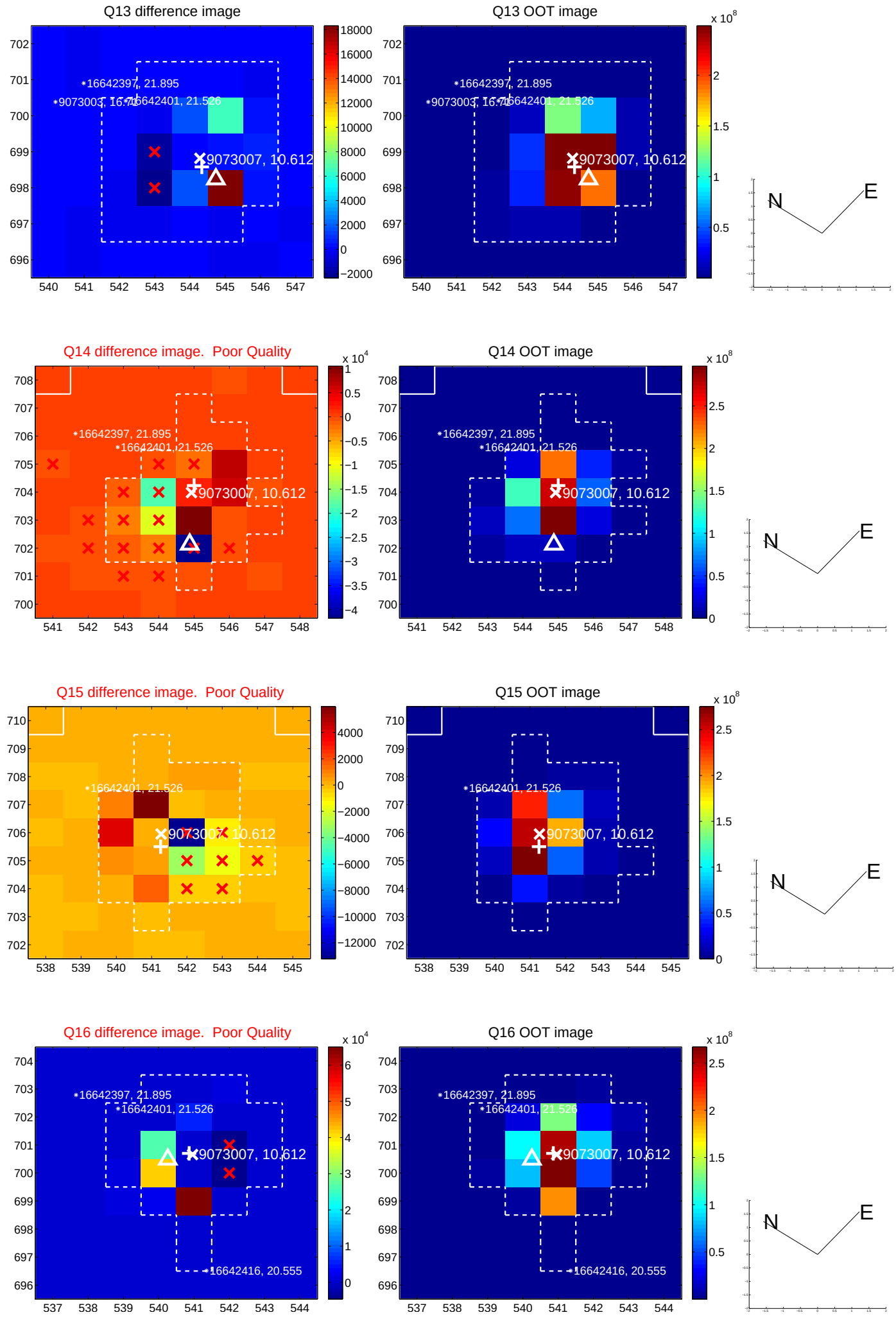




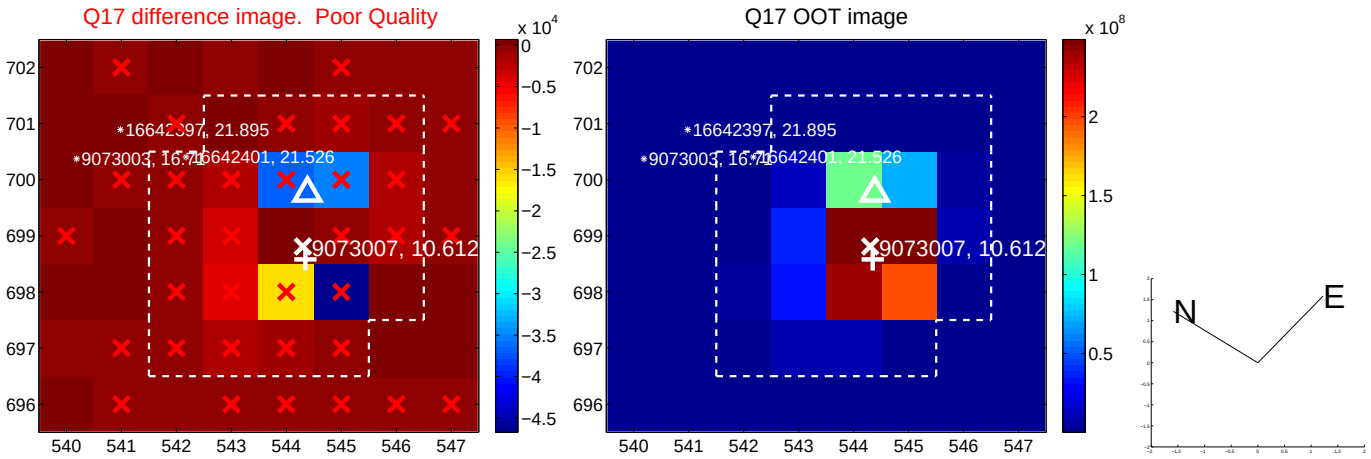


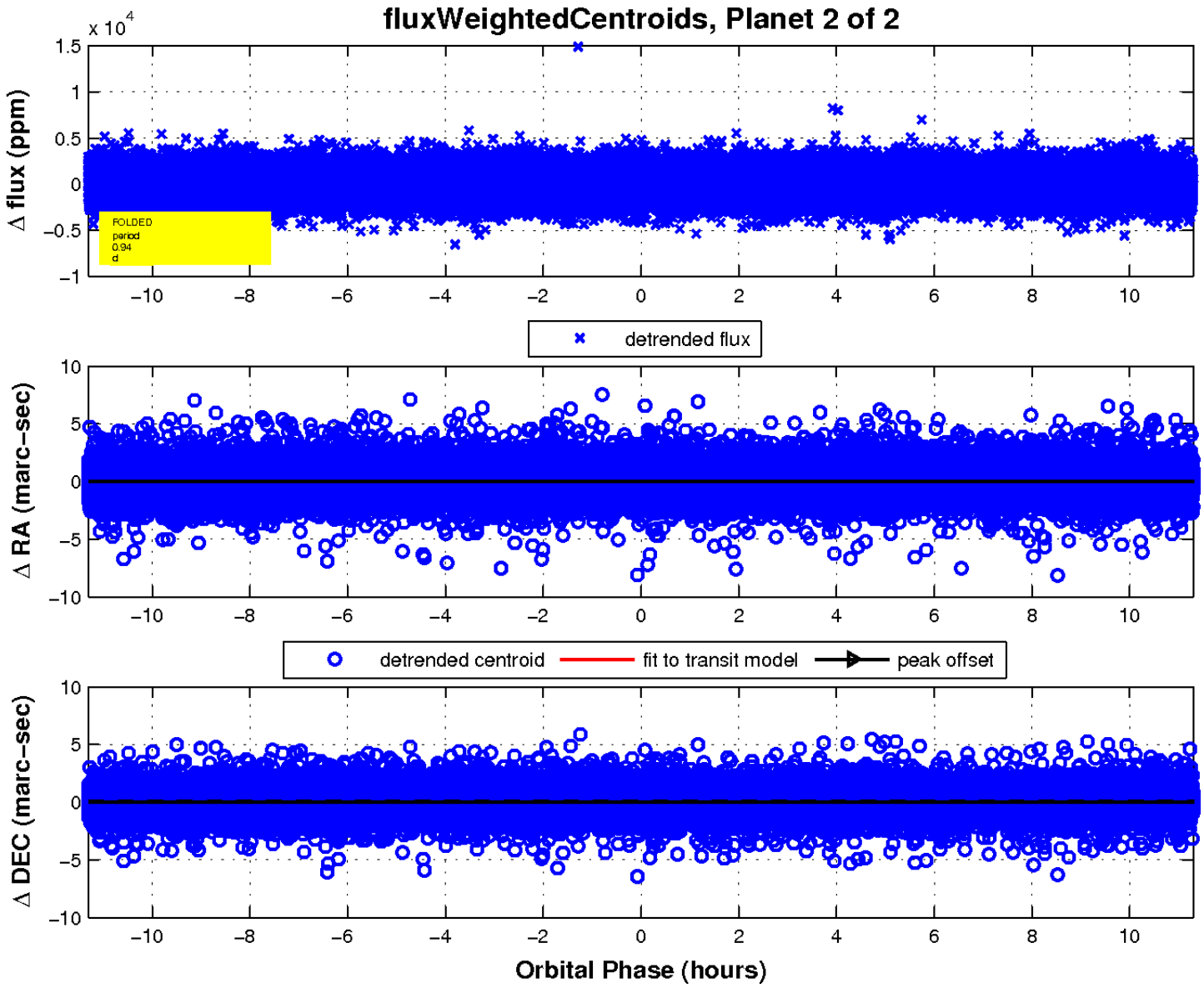


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

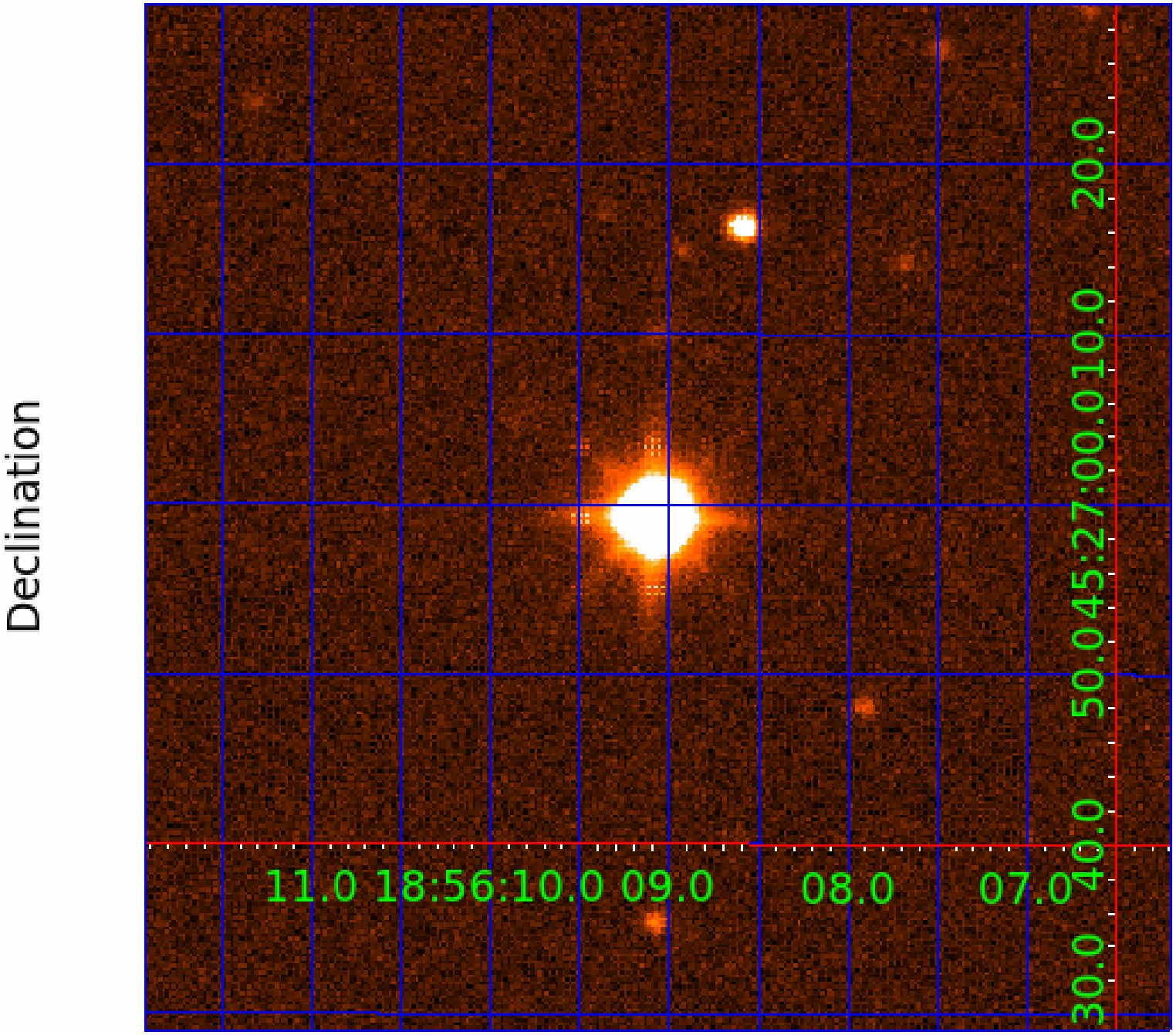


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image


Declination
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08.0
07.0
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20.0