KIC 009222516

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 ($S_\oplus$)
009222516-01	OBS	4492.01	0.639375	131.898841	68.1	0.537	9.2	17.6	1.20	6607	1.21	10272.00
009222516-02	OBS	No	0.639377	131.576225	60.4	0.582	9.9	16.5	1.20	6607	1.12	10271.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009222516-01	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET
009222516-02	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_UNRESOLVED_OFFSET

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.

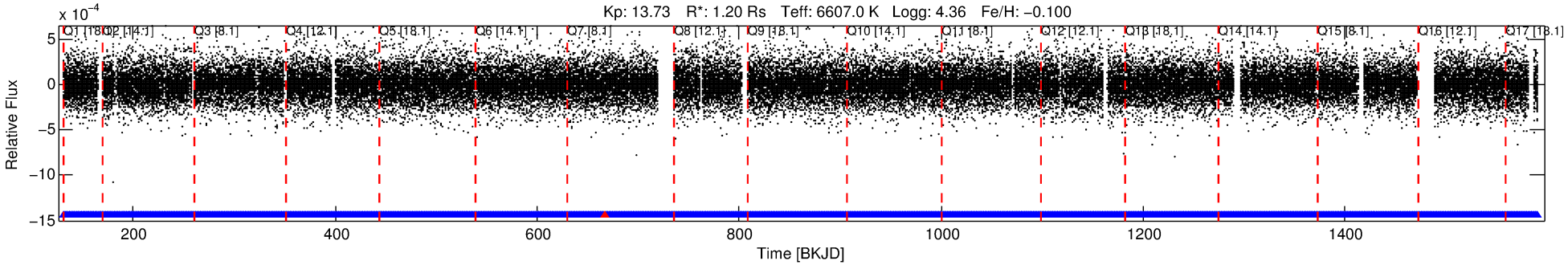
Ephemeris Match Information For 009222516-01

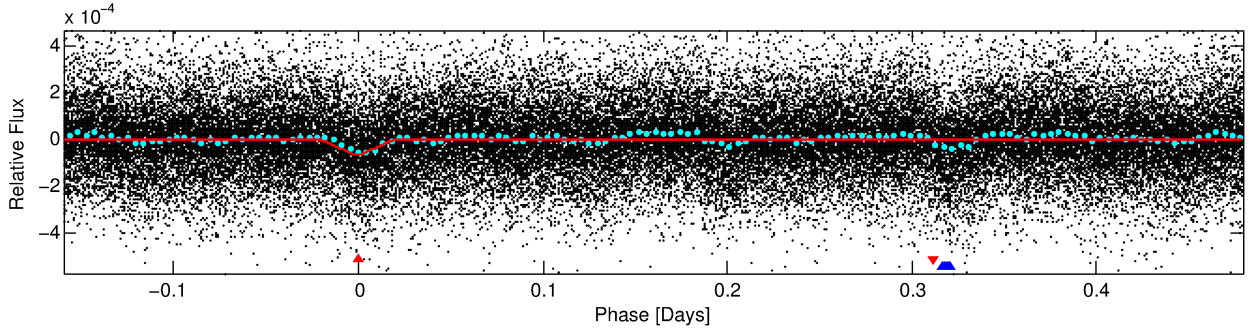
No Significant Match Found

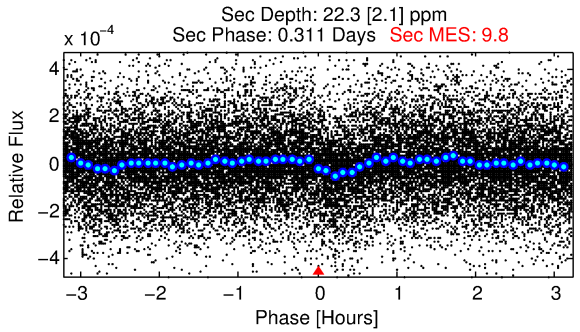
DV One-Page Summary

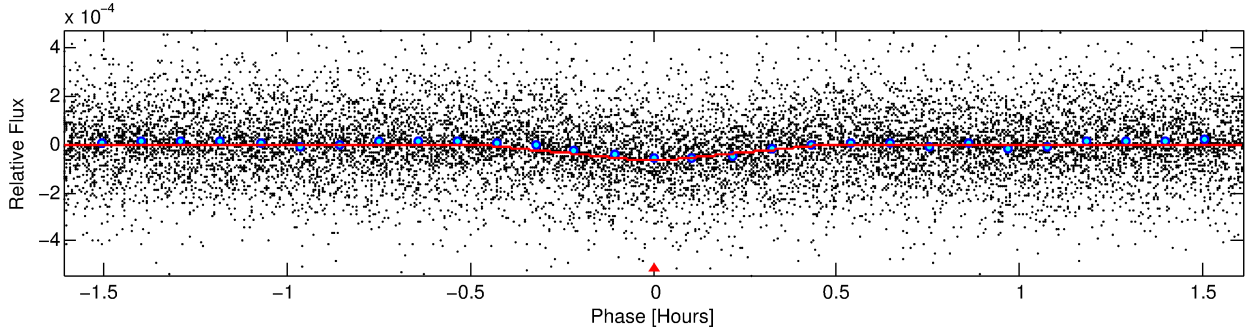
KIC: 9222516 Candidate: 1 of 2 Period: 0.639 d
KOI: K04492 Corr: No Ephemeris Match

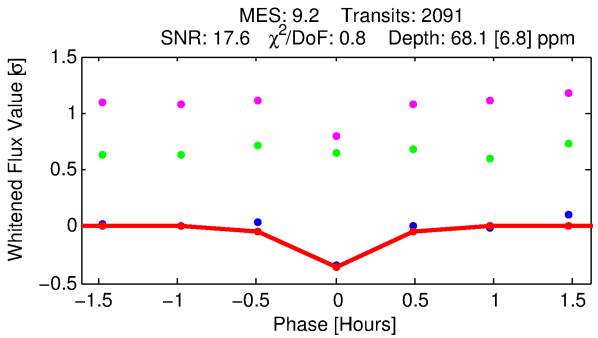
Kp: 13.73 R*: 1.20 Rs Teff: 6607.0 K Logg: 4.36 Fe/H: −0.100

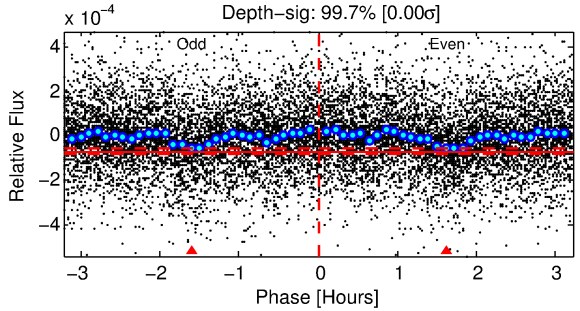


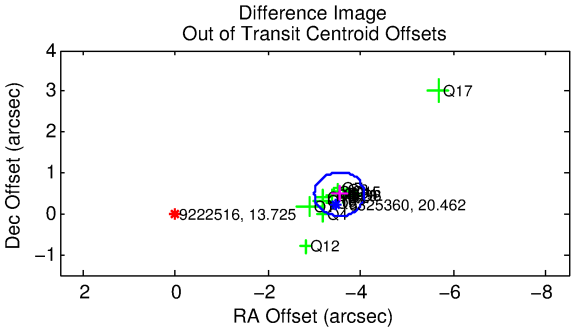












DV Fit Results:

Period = 0.63937 [0.00001] d
Epoch = 131.8988 [0.0007] BKJD
Rp/R* = 0.0092 [0.0014]
a/R* = 4.20 [3.44]
b = 0.90 [0.18]

Seff = 10272.00 [4477.02]
Teq = 2567 [280] K
Rp = 1.21 [0.46] Re
a = 0.0155 [0.0045] AU

Ag = 2.03 [1.07] [0.96σ]
Teffp = 4740 [417] K [4.32σ]

DV Diagnostic Results:

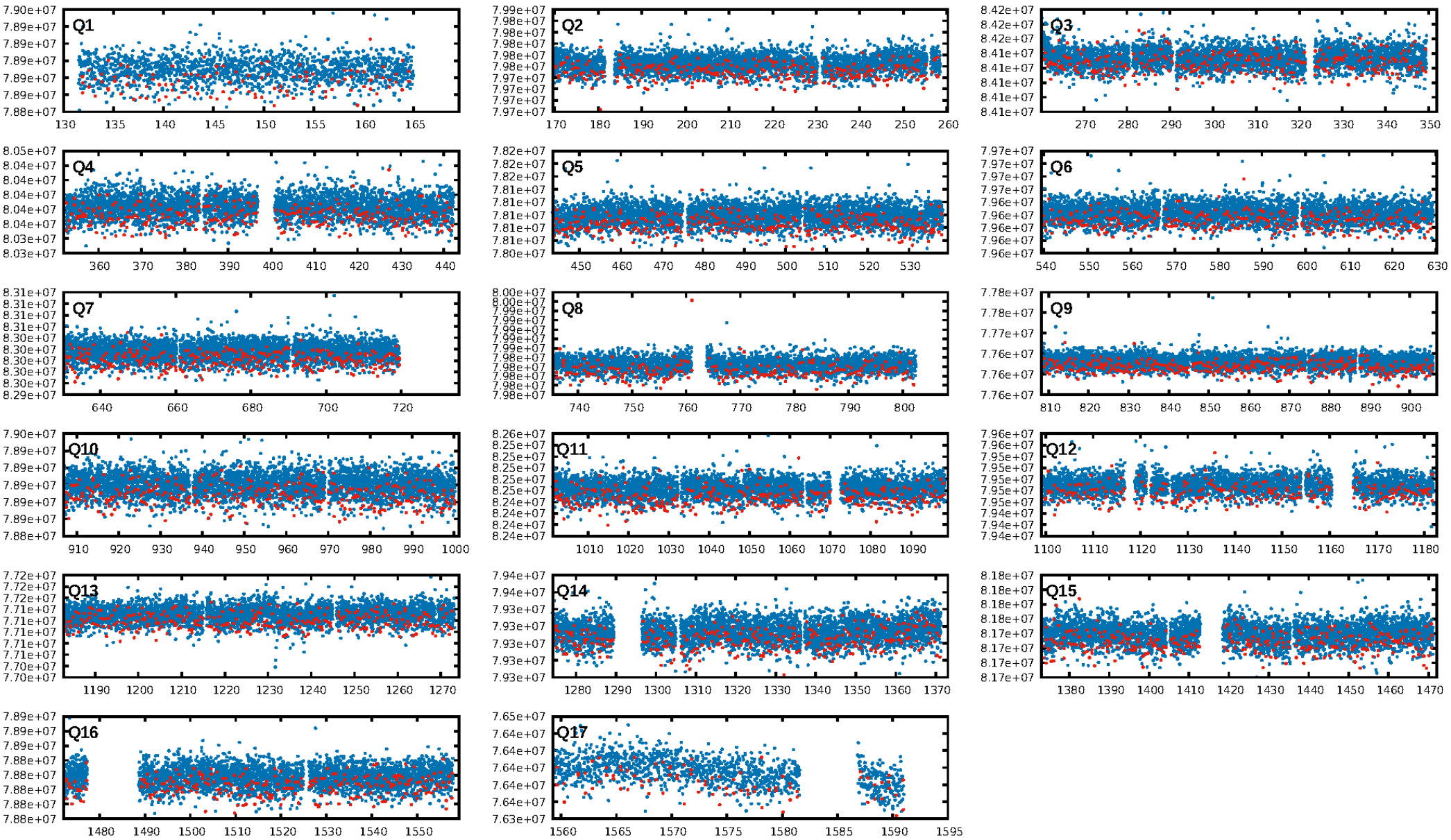
ShortPeriod−sig: N/A
LongPeriod−sig: 0.0% [0.00σ]
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: 5.96e−29
RollingBand−fgt: 1.00 [1997/1998]
GhostDiagnostic−chr: 0.5915

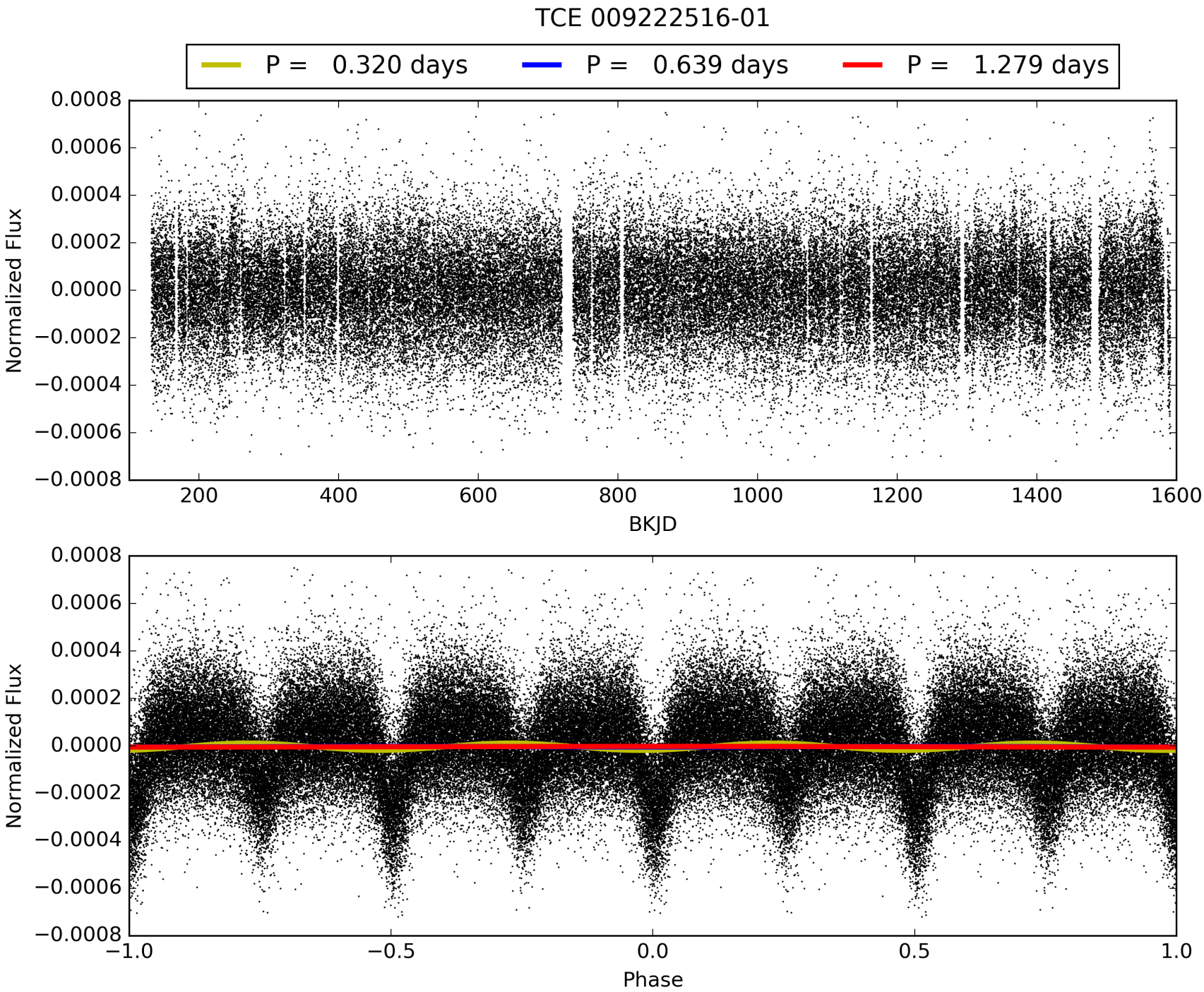
Centroid−sig: 0.0%
Centroid−so: 5.026 arcsec [8.77σ]
OotOffset−rm: 3.570 arcsec [19.89σ]
KicOffset−rm: 3.578 arcsec [20.47σ]
OotOffset−st: 4/4/4/5 [17]
KicOffset−st: 4/4/4/5 [17]
DiffImageQuality−fgm: 1.00 [17/17]
DiffImageOverlap−fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 07:10:36 Z

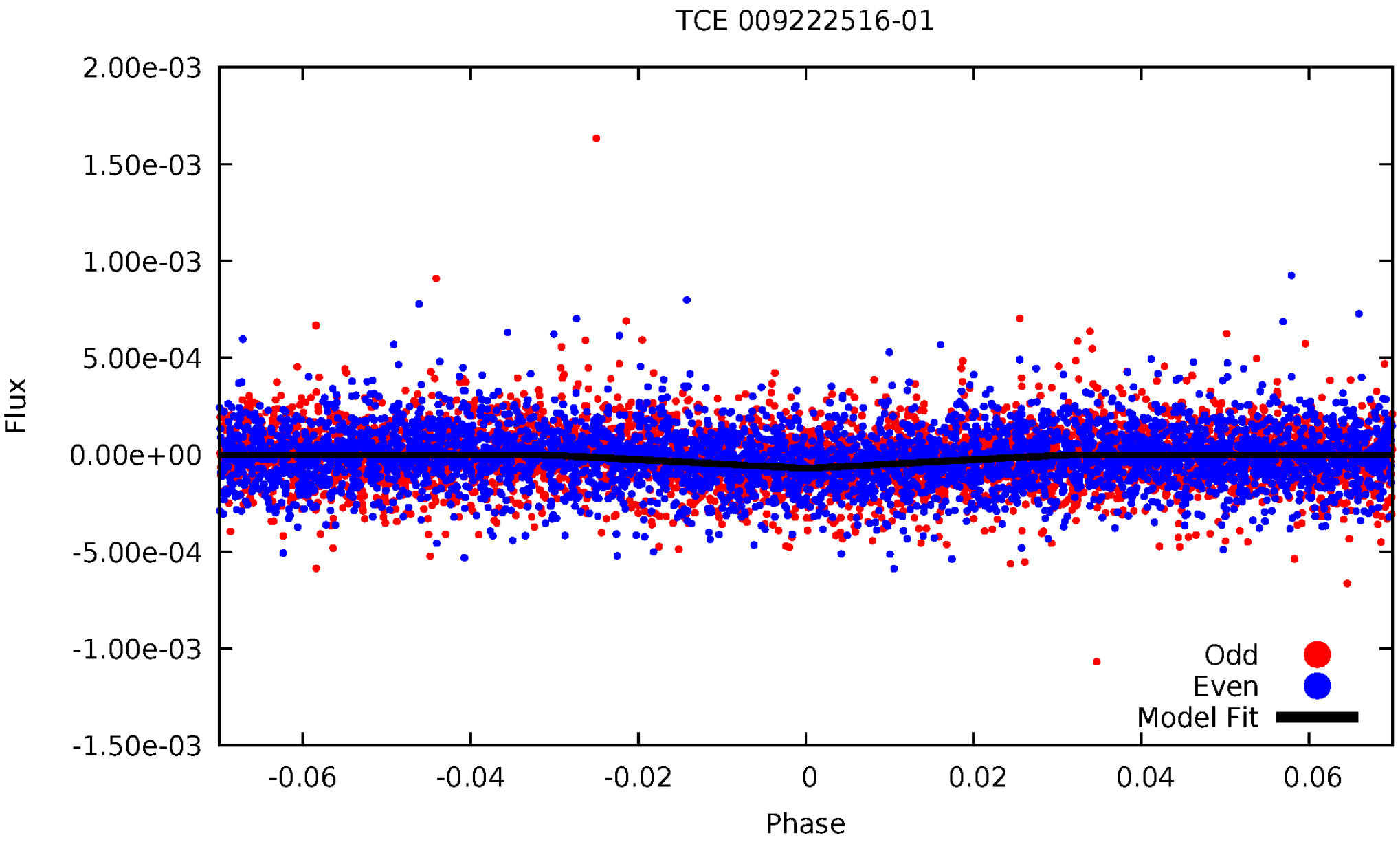
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009222516-01, PDC Light Curves

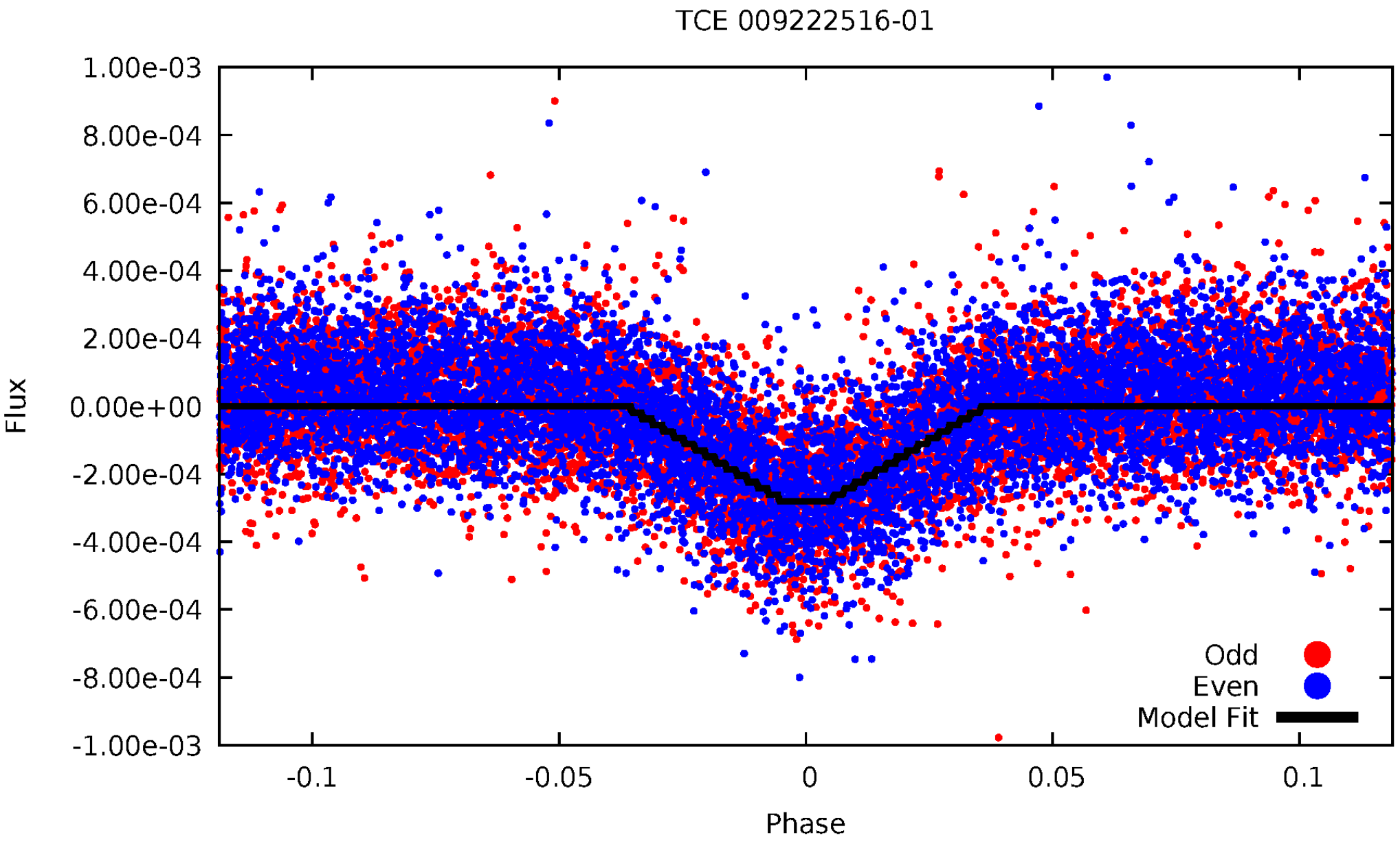



TCE 009222516-01
P = 0.320 days
P = 0.639 days
P = 1.279 days
Normalized Flux
BKJD
Normalized Flux
Phase

DV Odd/Even


TCE 009222516-01
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
Flux
-0.06
-0.04
-0.02
0
0.02
0.04
0.06
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009222516-01
1.00e-03
8.00e-04
6.00e-04
4.00e-04
2.00e-04
0.00e+00
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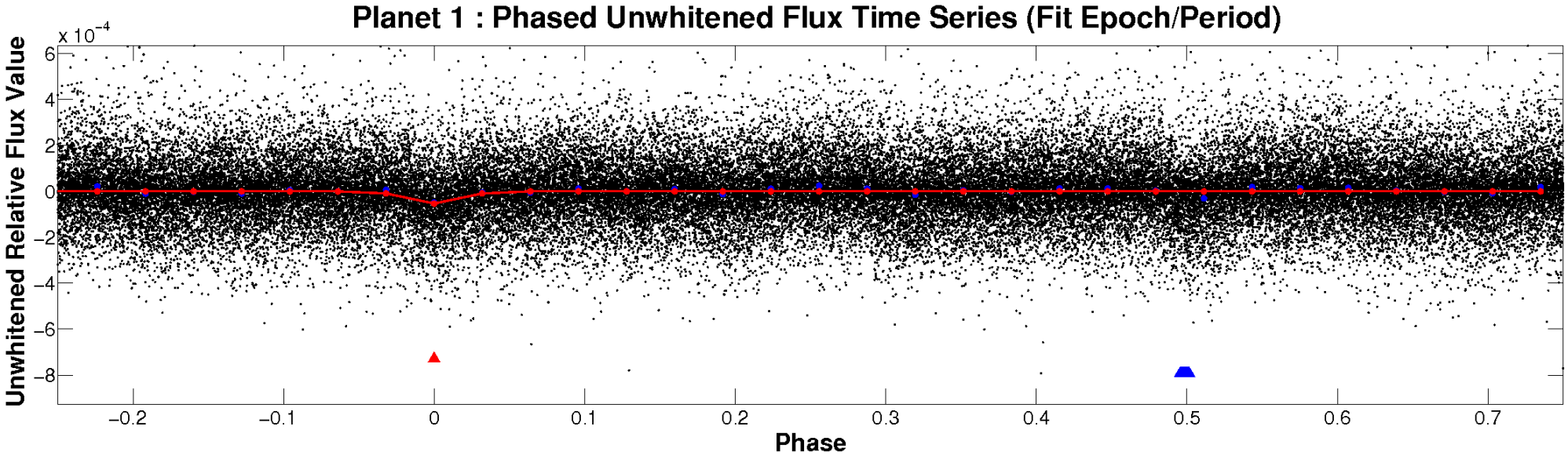
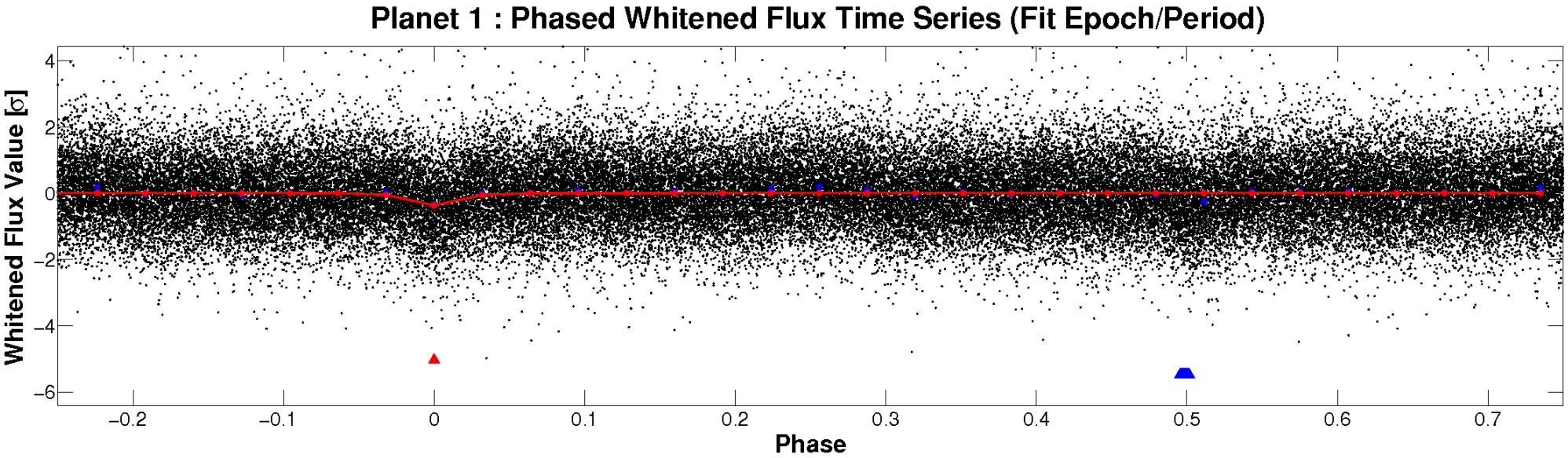
-4.00e-04
-6.00e-04
-8.00e-04
-1.00e-03
Flux
-0.1
-0.05
0
0.05
0.1
Phase
Odd
Even
Model Fit

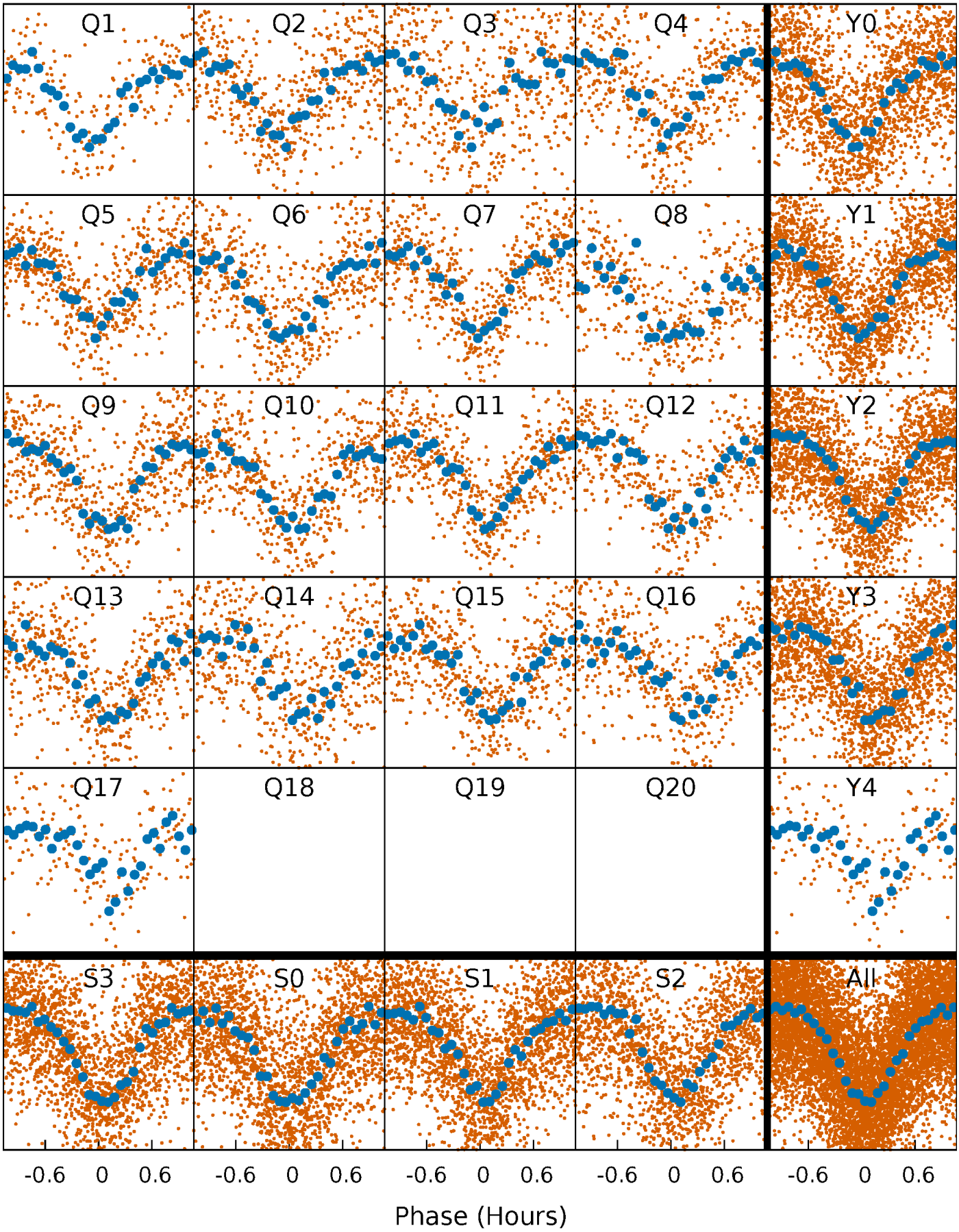
Non-Whitened Vs. Whitened Light Curve





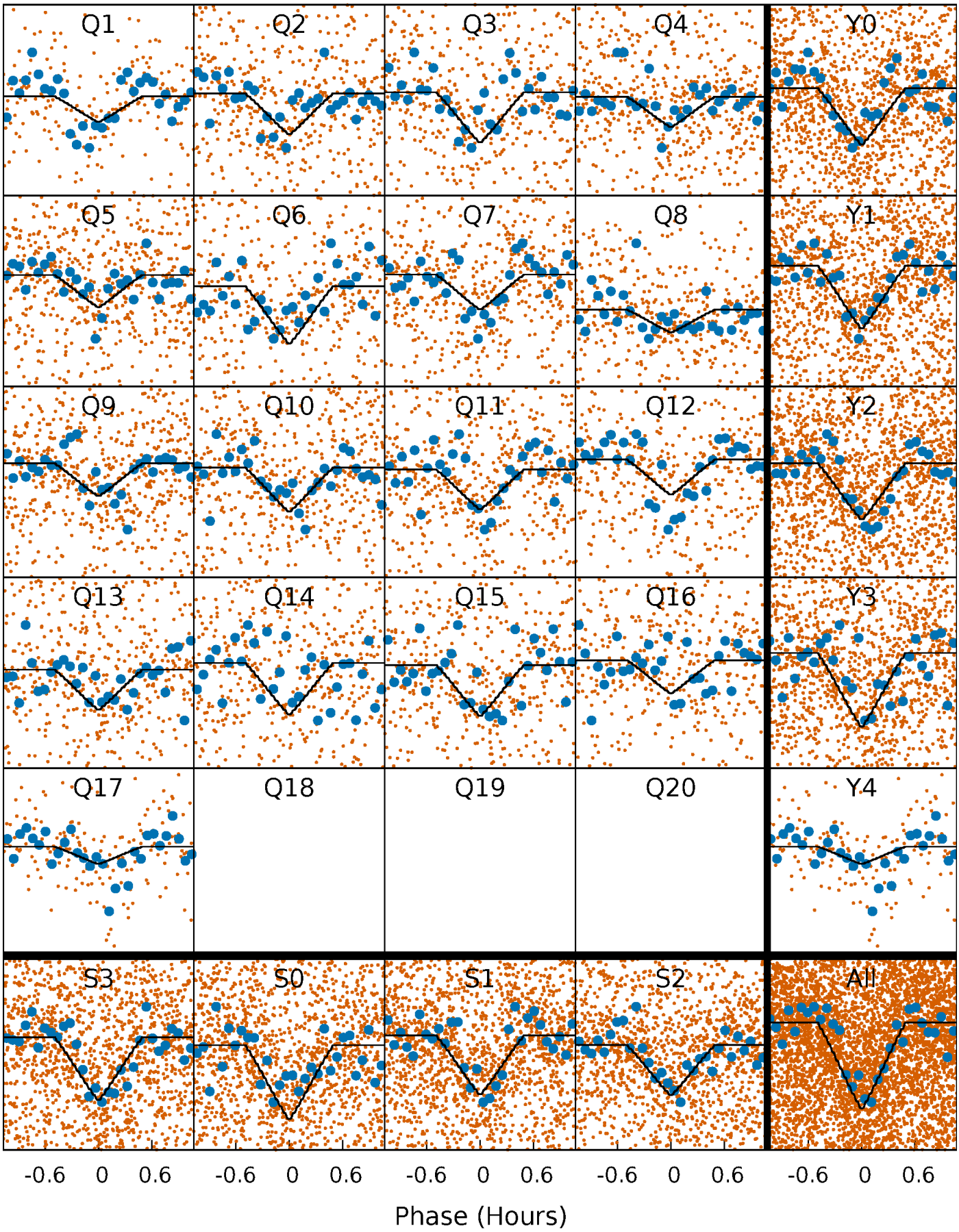
PDC Quarter-Phased Transit Curves

TCE 009222516-01 P= 0.639375 Days T_0=131.898841 (BKJD)



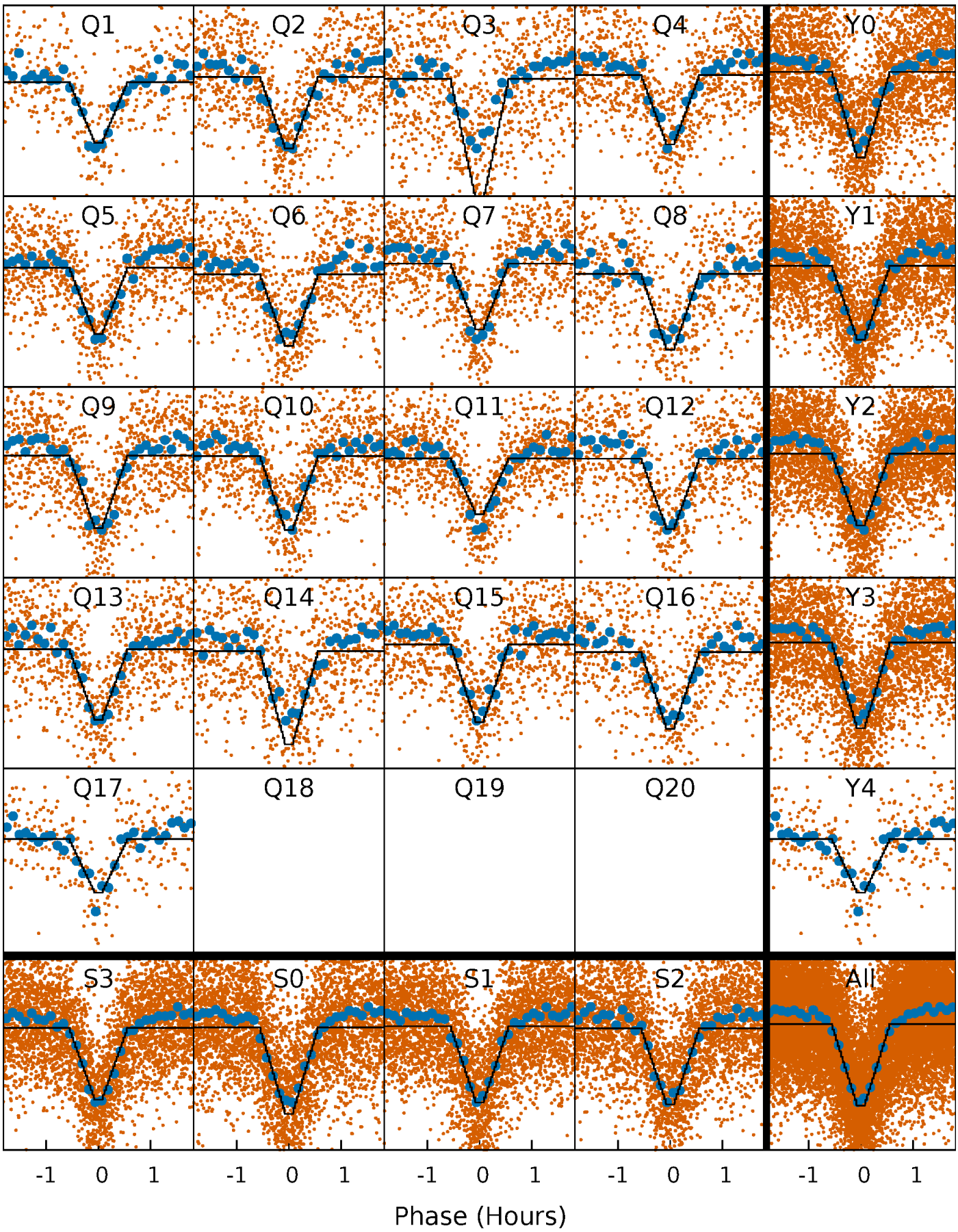
DV Quarter-Phased Transit Curves

TCE 009222516-01 P= 0.639375 Days T_0=131.898841 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

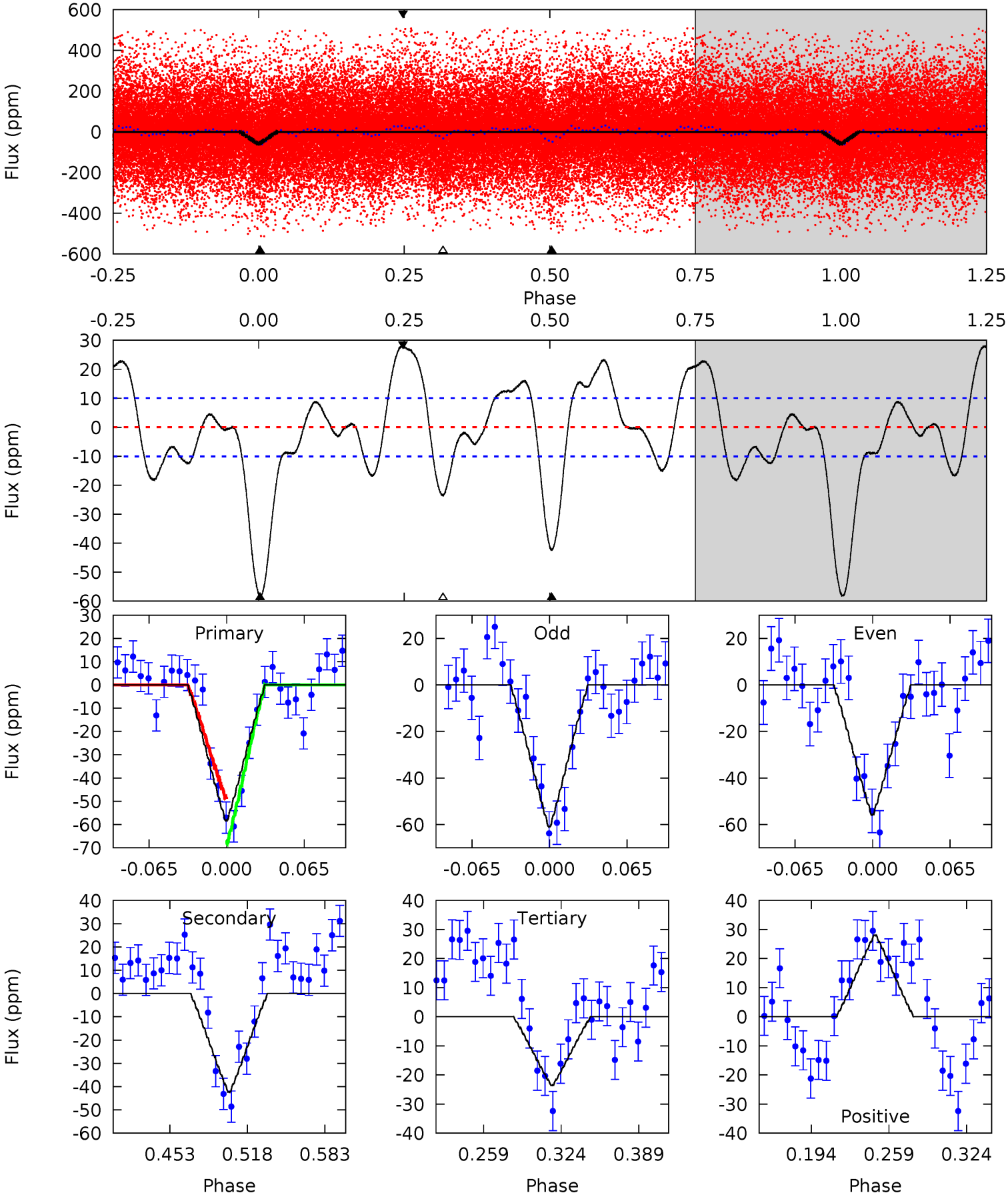
TCE 009222516-01 P= 0.639380 Days T_0=131.895683 (BKJD)



DV Model-Shift Uniqueness Test

009222516-01, P = 0.639375 Days, E = 131.259466 Days

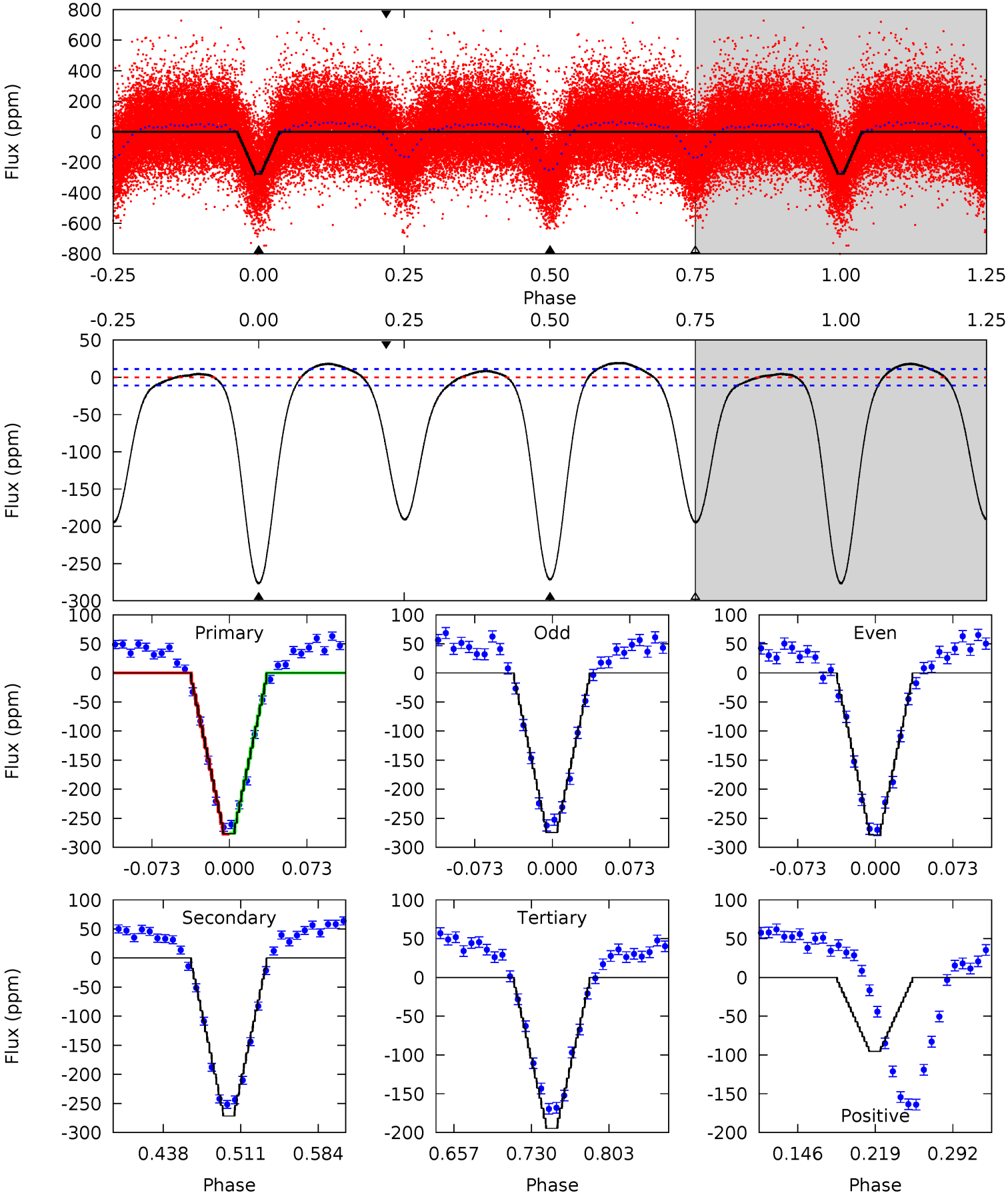
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.0	19.6	10.9	13.0	4.66	1.85	5.92	16.1	14.0	8.72	6.64	1.18	0.97	0.32	4.63



Alt Model-Shift Uniqueness Test

009222516-01, P = 0.639380 Days, E = 131.256303 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
116.5	114.4	82.0	-40.2	4.63	1.79	26.6	34.5	156.8	32.4	154.7	0.90	1.01	0.07	0.40



Stellar Parameters For KIC 009222516

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	6607^{+161}_{-221}	$4.363^{+0.056}_{-0.224}$	$-0.100^{+0.250}_{-0.300}$	$1.204^{+0.419}_{-0.140}$	$1.224^{+0.187}_{-0.168}$	$0.988^{+0.292}_{-0.528}$
	+2%/-3%	+1%/-5%	+250%/-300%	+35%/-12%	+15%/-14%	+30%/-53%
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 009222516-01 / KOI 4492.01

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-42±2	$1.26^{+0.30}_{-0.22}$	3663^{+293}_{-185}	5436^{+510}_{-403}	$3.449^{+1.710}_{-1.102}$
Alt.	-272±2	$2.30^{+0.39}_{-0.32}$	3665^{+276}_{-179}	6467^{+411}_{-363}	$6.674^{+2.097}_{-1.705}$

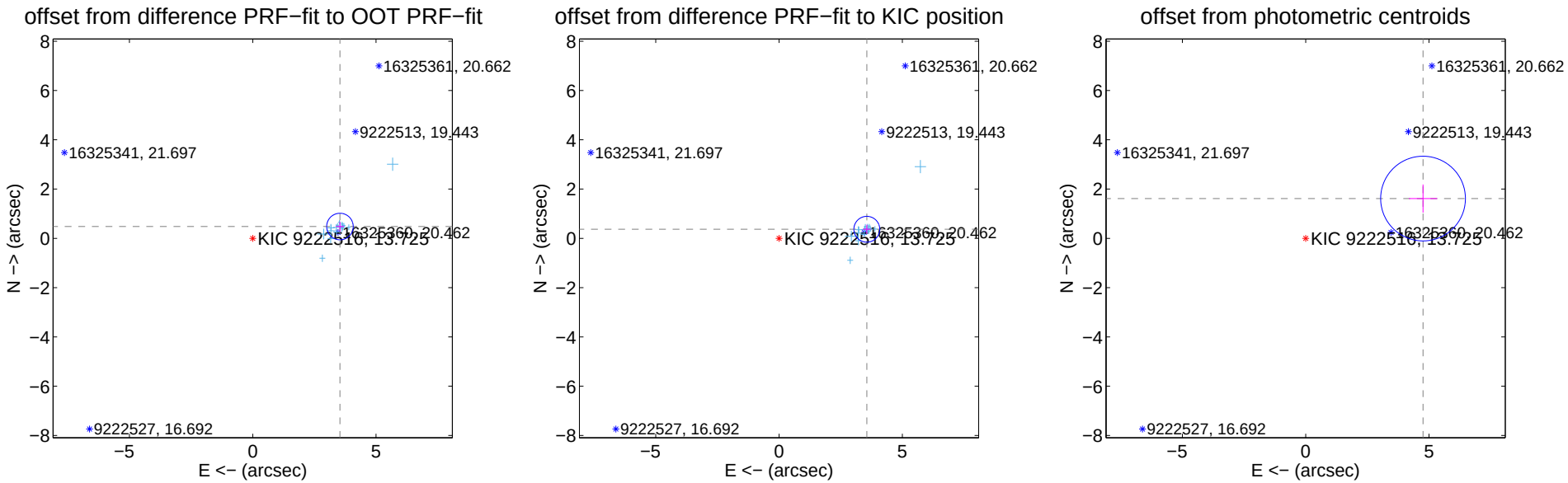
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

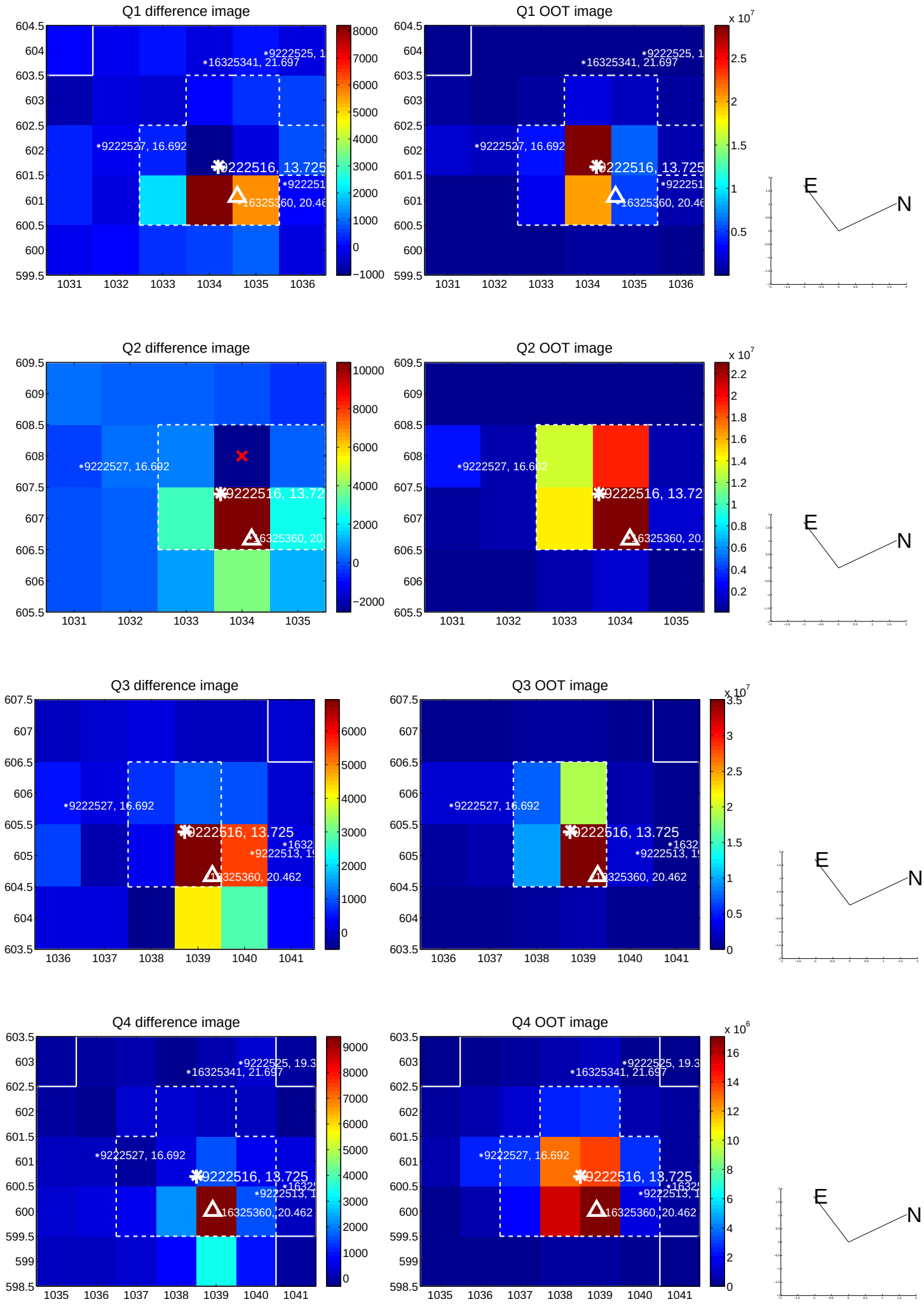
Supplemental centroid analysis for 009222516-01. Kepler magnitude: 13.72. Transit SNR 17.57
There are 17 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.570 ± 0.180	19.89	-3.538 ± 0.160	0.480 ± 0.185
PRF-fit source offset from KIC position	3.578 ± 0.175	20.47	-3.559 ± 0.160	0.369 ± 0.184
photometric centroid source offset	5.03 ± 0.57	8.77	-4.76 ± 0.57	1.61 ± 0.57

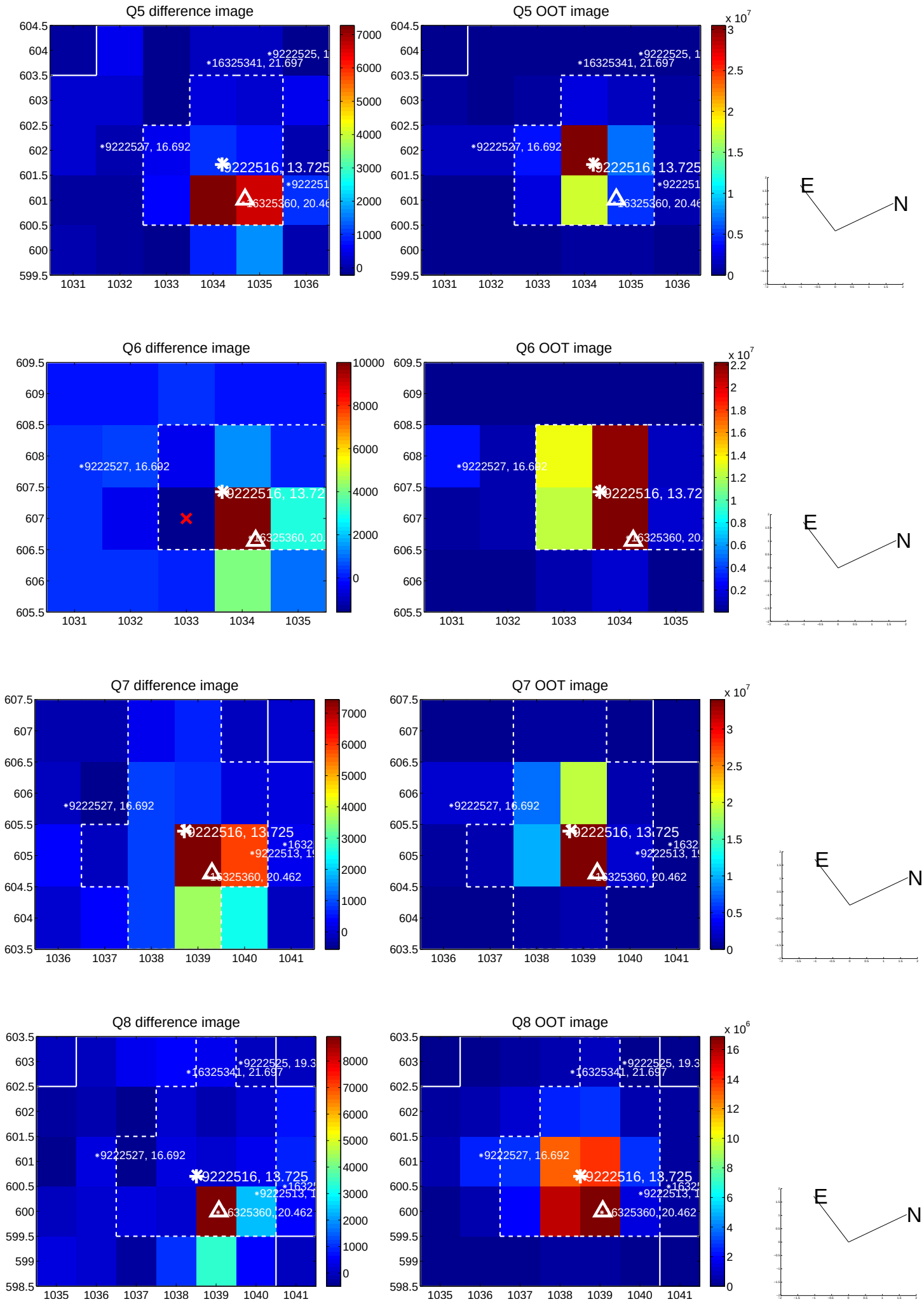


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

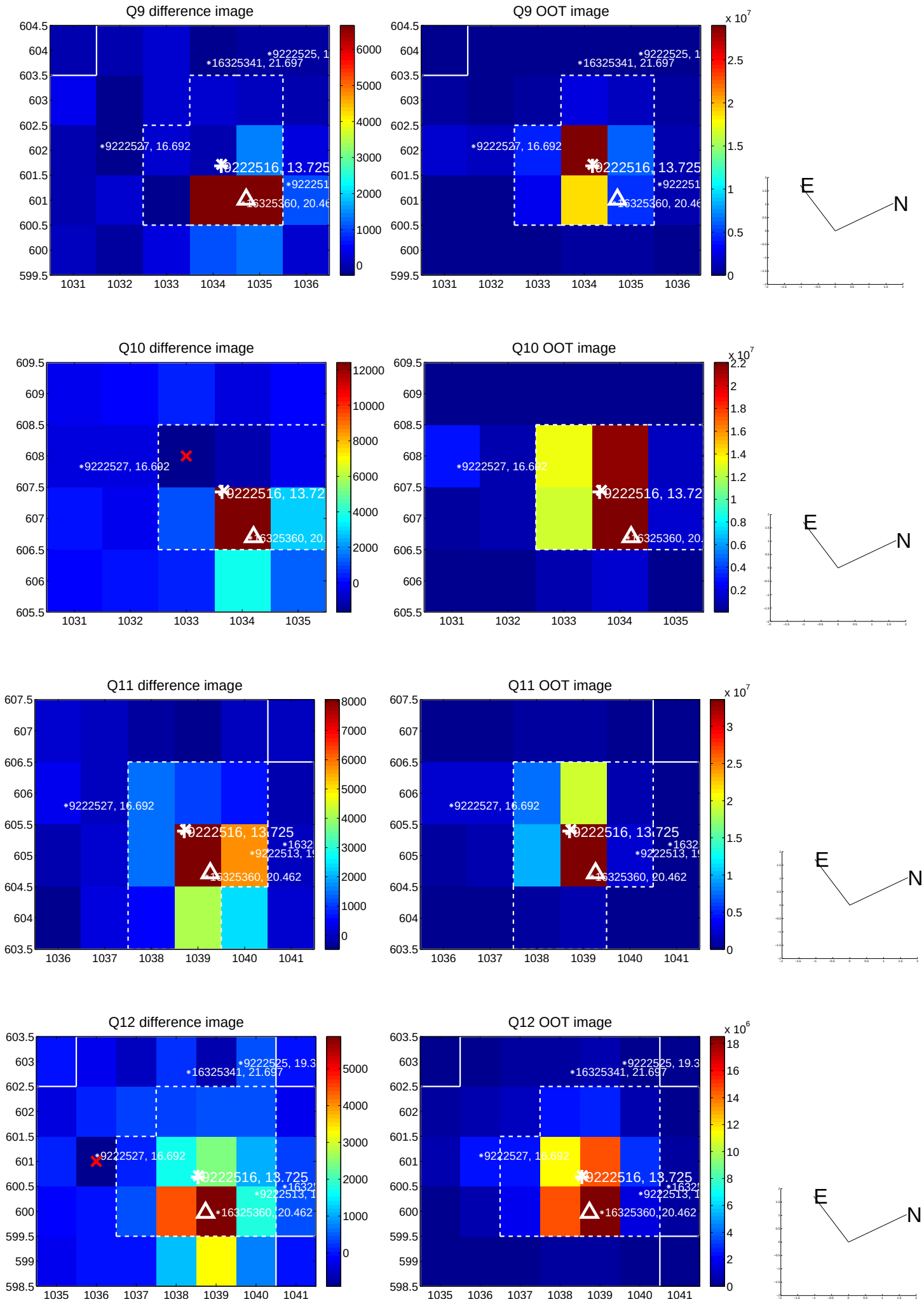
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



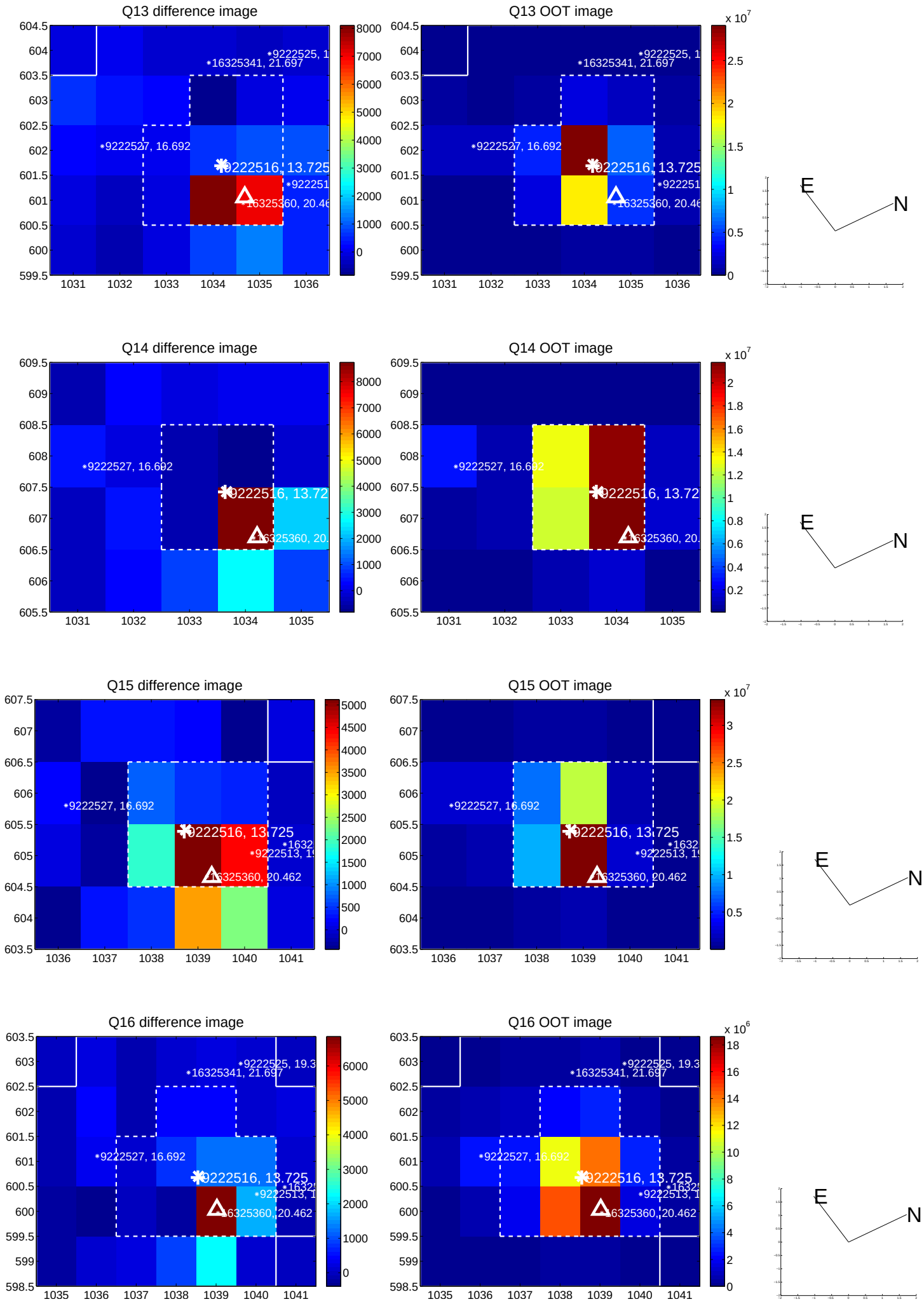
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



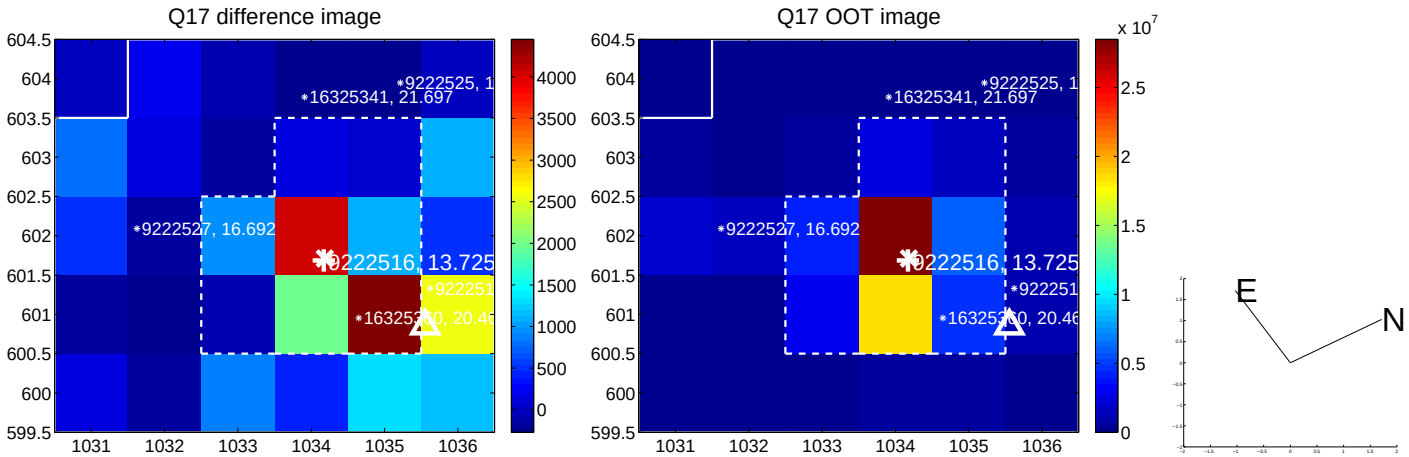
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

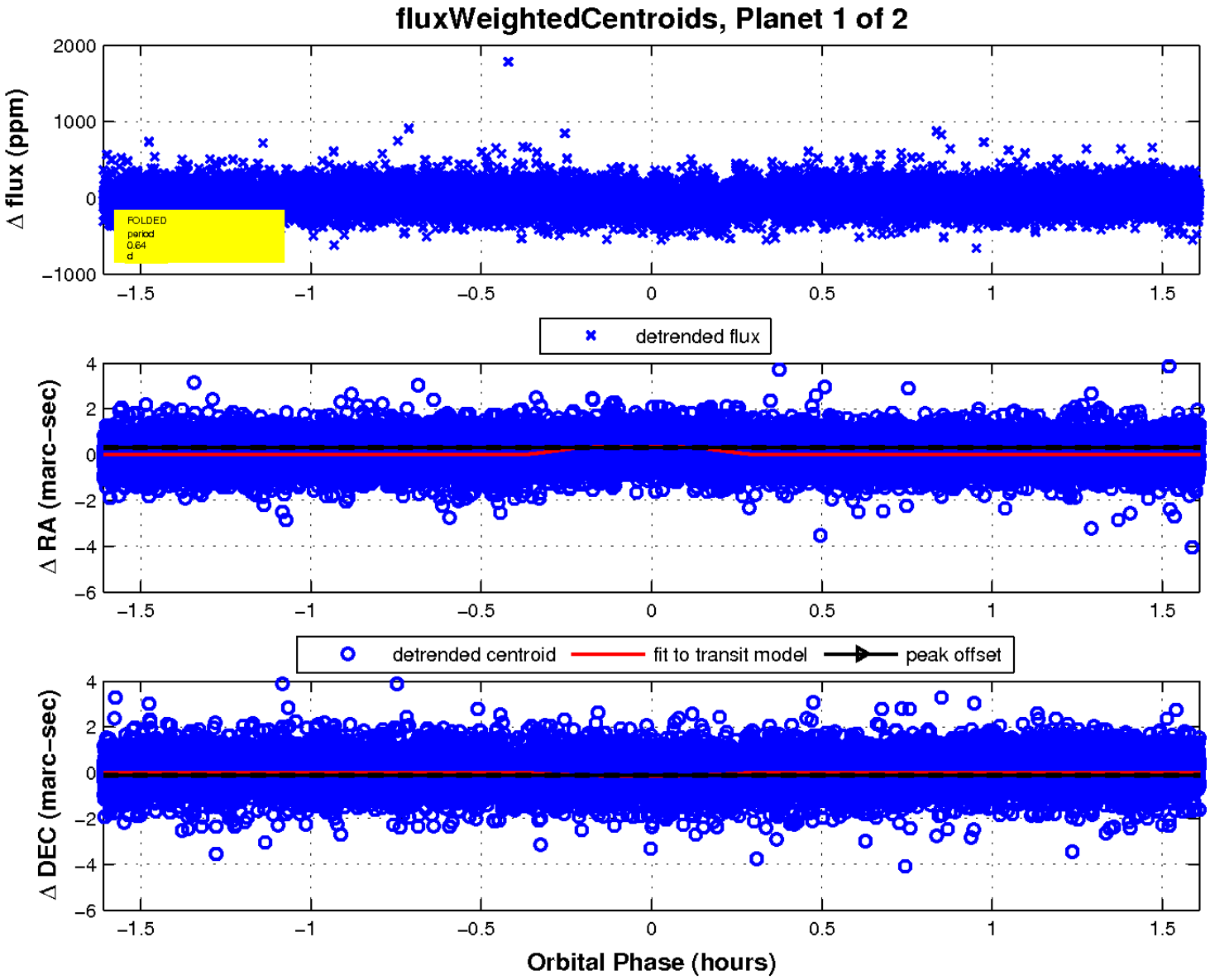


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

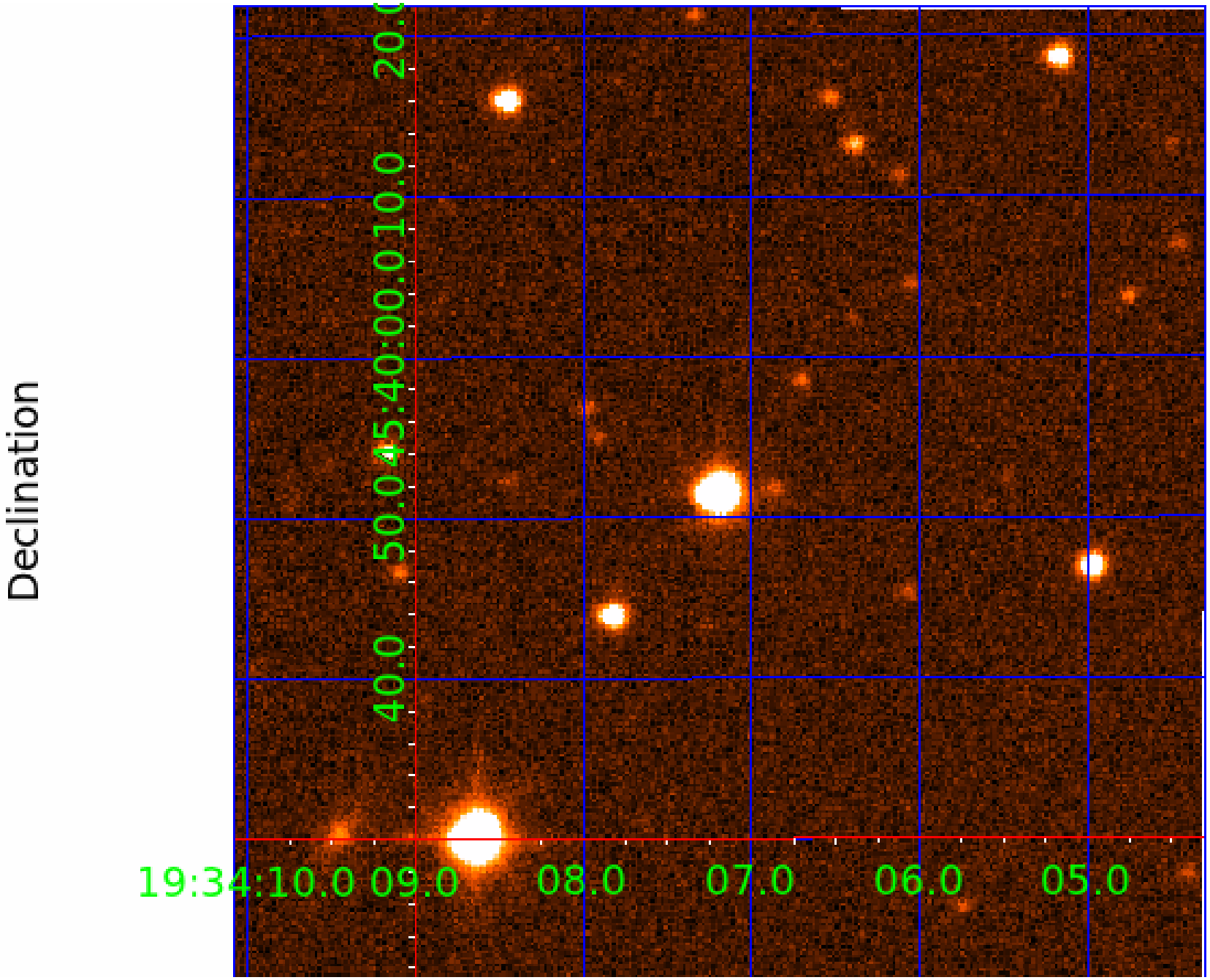


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image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05.0

KIC 009222516

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 ($S_\oplus$)
009222516-01	OBS	4492.01	0.639375	131.898841	68.1	0.537	9.2	17.6	1.20	6607	1.21	10272.00
009222516-02	OBS	No	0.639377	131.576225	60.4	0.582	9.9	16.5	1.20	6607	1.12	10271.97

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009222516-01	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET
009222516-02	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_UNRESOLVED_OFFSET

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.

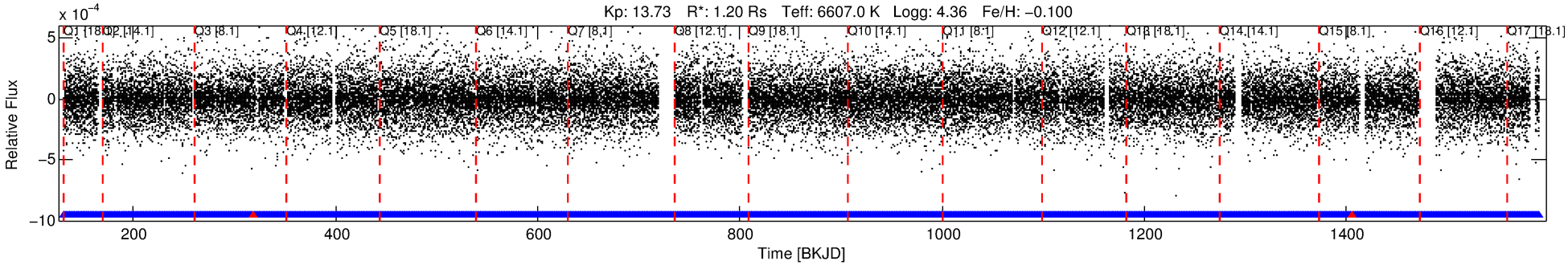
Ephemeris Match Information For 009222516-02

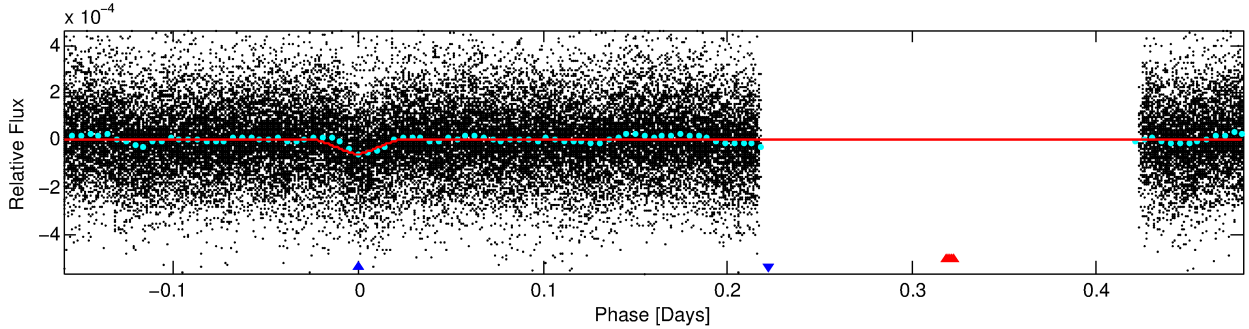
No Significant Match Found

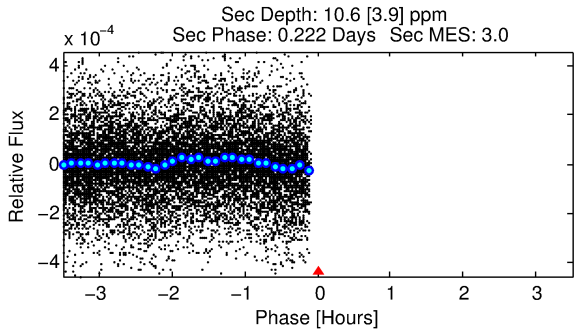
DV One-Page Summary

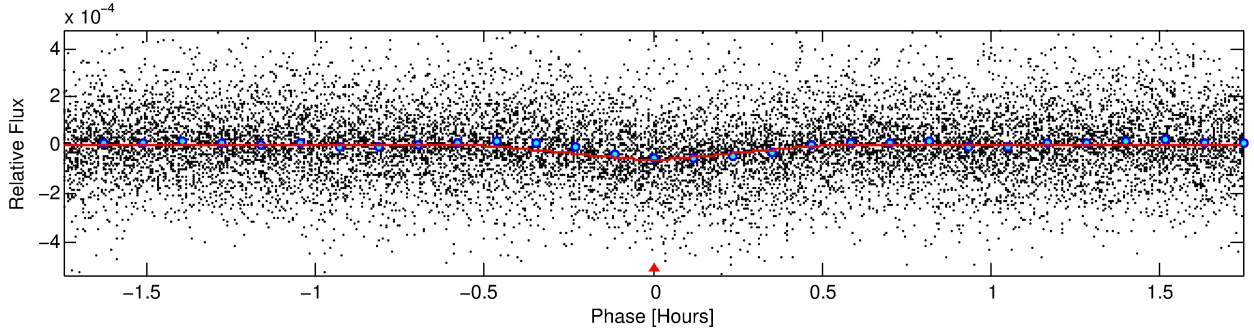
KIC: 9222516 Candidate: 2 of 2 Period: 0.639 d
KOI: K04492 Corr: No Ephemeris Match

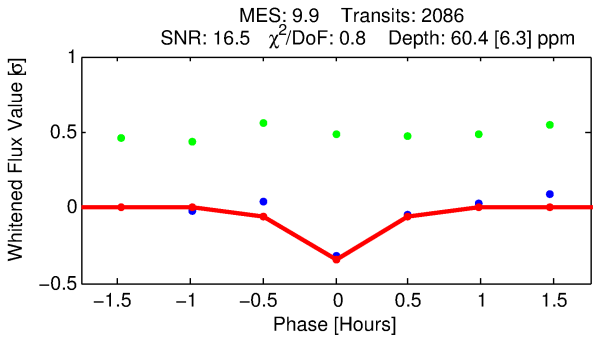
Kp: 13.73 R*: 1.20 Rs Teff: 6607.0 K Logg: 4.36 Fe/H: −0.100

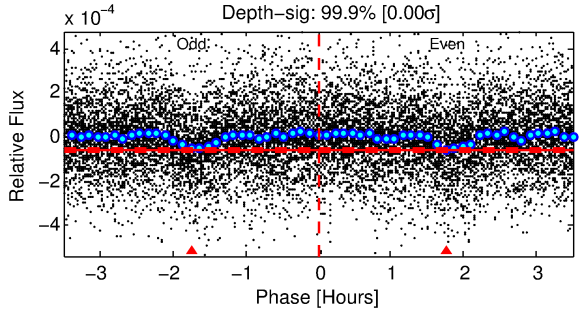


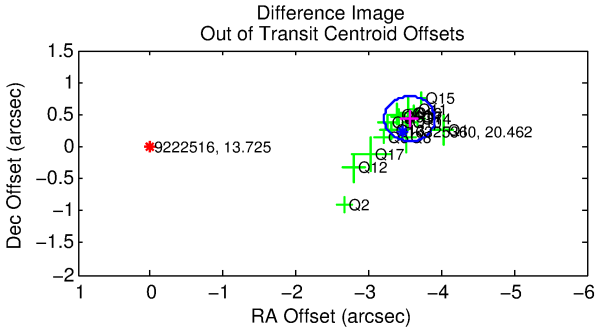












DV Fit Results:

Period = 0.63938 [0.00001] d
Epoch = 131.5762 [0.0008] BKJD
Rp/R* = 0.0086 [0.0015]
a/R* = 3.91 [3.46]
b = 0.90 [0.20]

Seff = 10271.97 [4477.00]
Teq = 2567 [280] K
Rp = 1.12 [0.44] Re
a = 0.0155 [0.0045] AU

Ag = 1.11 [0.72] [0.15σ]
Teffp = 4072 [528] K [2.52σ]

DV Diagnostic Results:

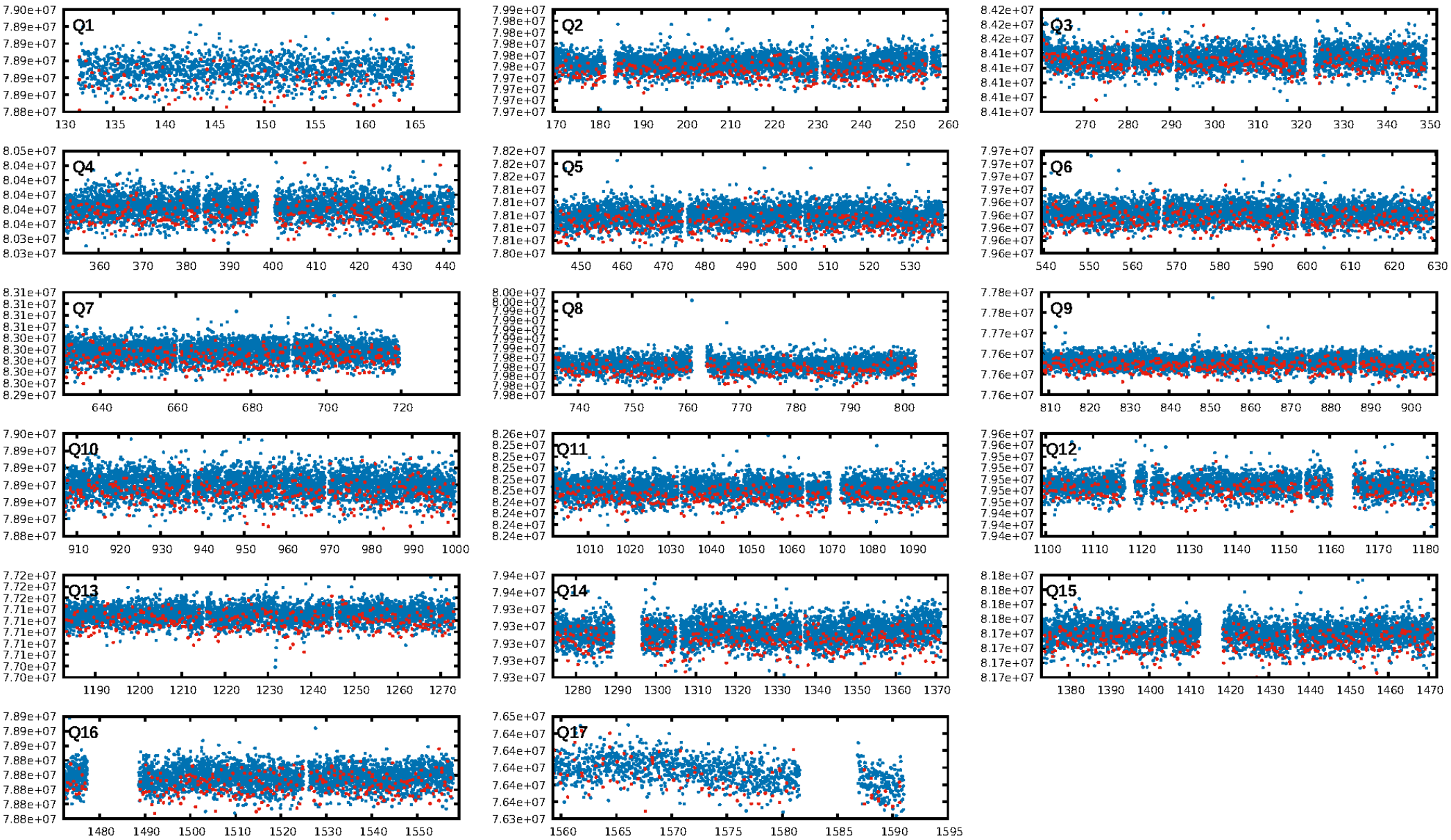
ShortPeriod−sig: 0.0% [0.00σ]
LongPeriod−sig: N/A
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: 5.57e−32
RollingBand−fgt: 1.00 [1989/1991]
GhostDiagnostic−chr: 1.692

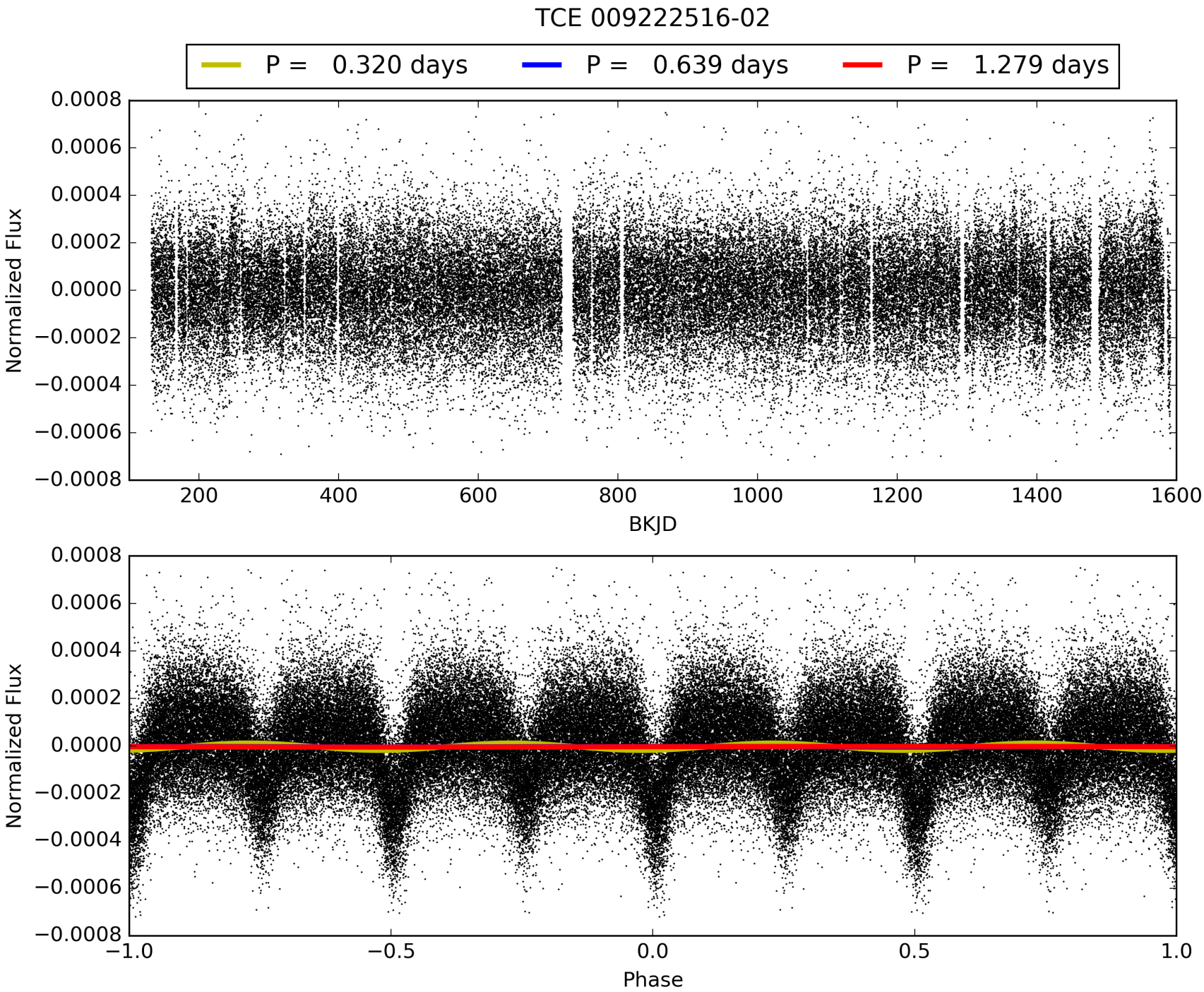
Centroid−sig: 0.0%
Centroid−so: 4.050 arcsec [6.68σ]
OotOffset−rm: 3.584 arcsec [30.82σ]
KicOffset−rm: 3.599 arcsec [32.39σ]
OotOffset−st: 4/4/4/5 [17]
KicOffset−st: 4/4/4/5 [17]
DiffImageQuality−fgm: 1.00 [17/17]
DiffImageOverlap−fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01−Feb−2016 07:10:44 Z

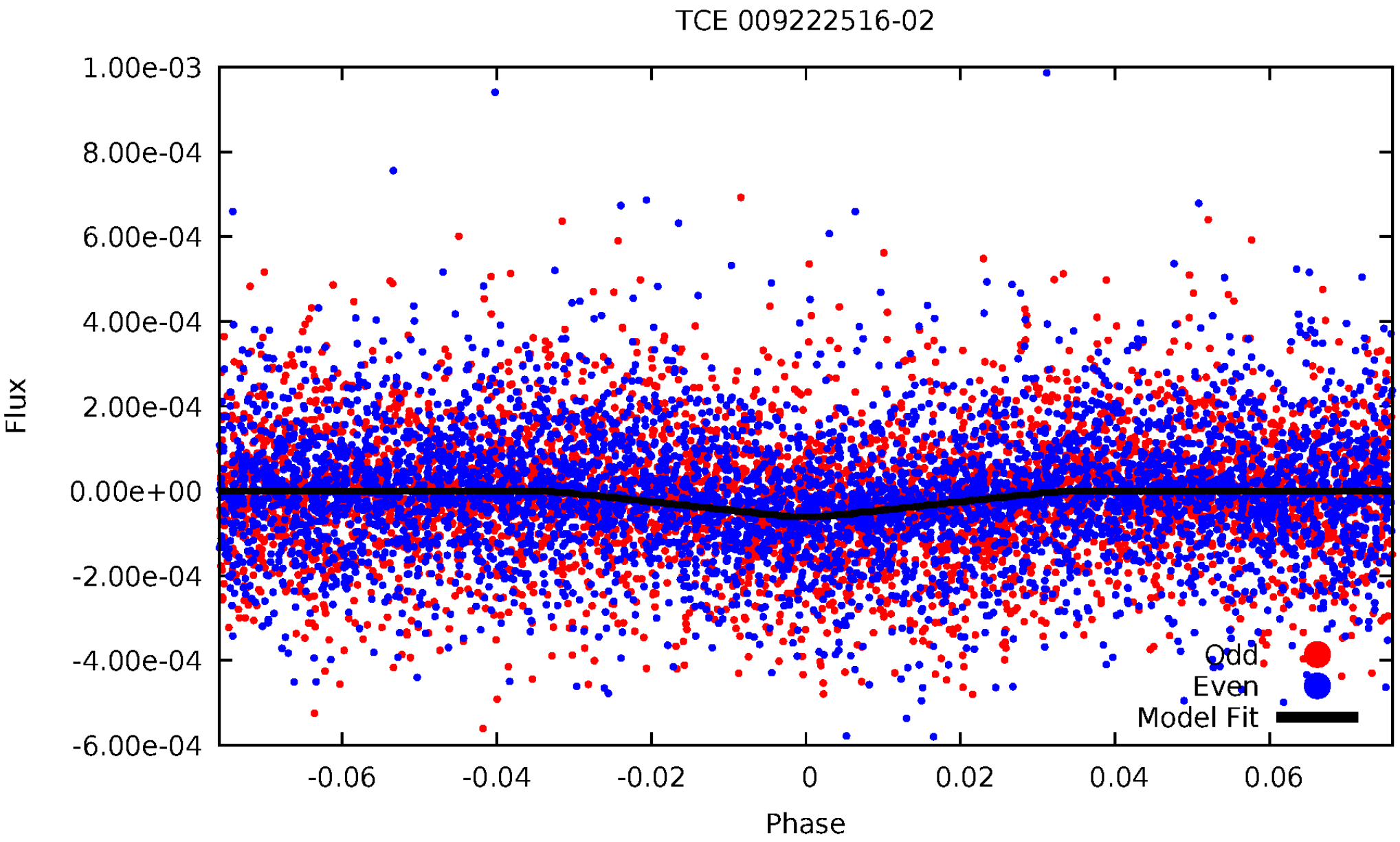
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009222516-02, PDC Light Curves

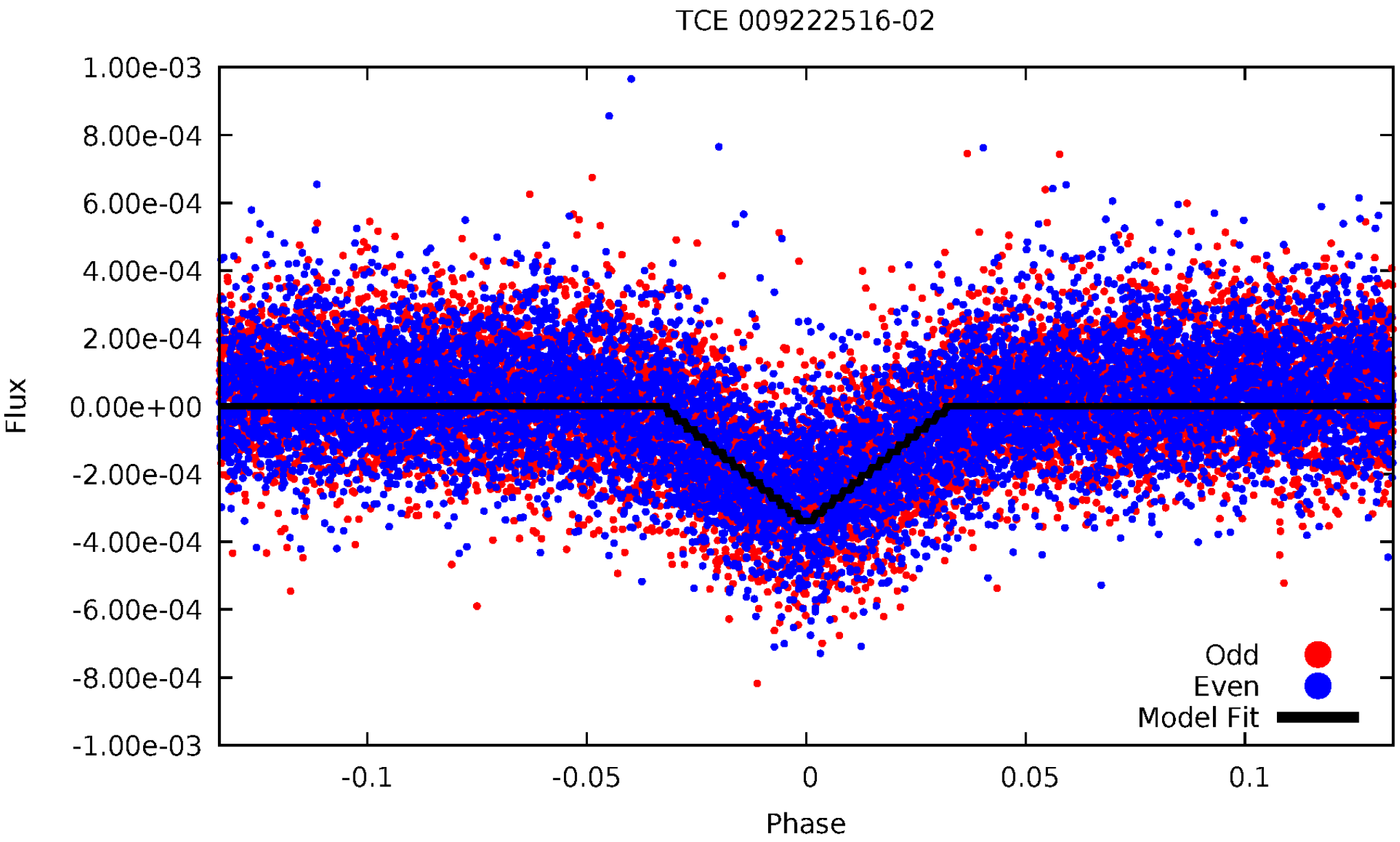



TCE 009222516-02
P = 0.320 days
P = 0.639 days
P = 1.279 days
Normalized Flux
BKJD
Normalized Flux
Phase

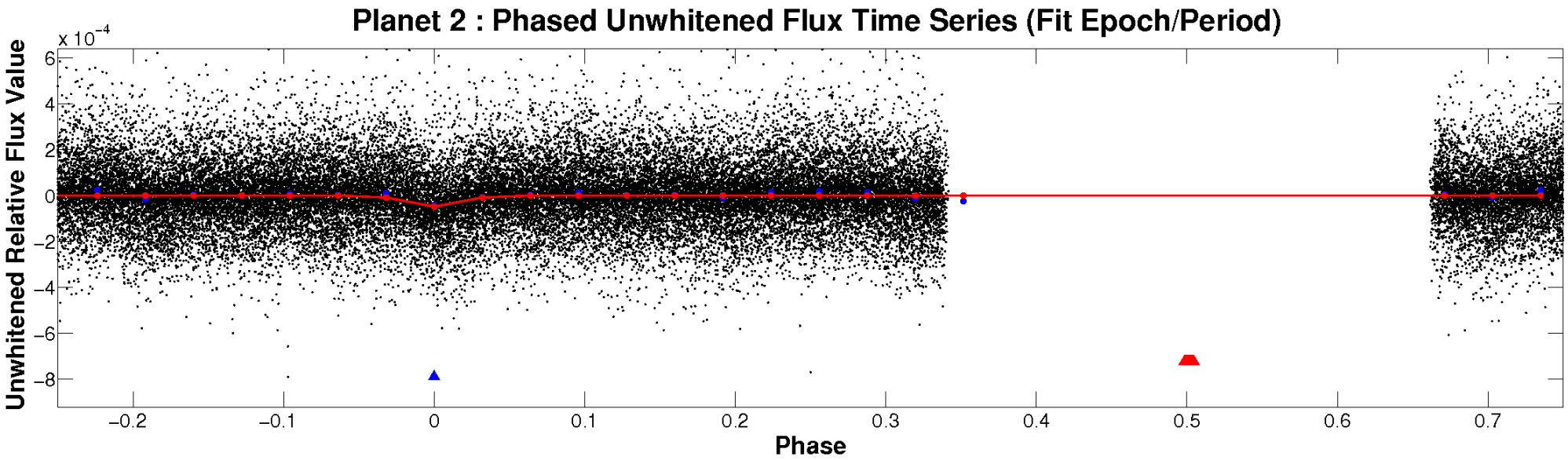
DV Odd/Even

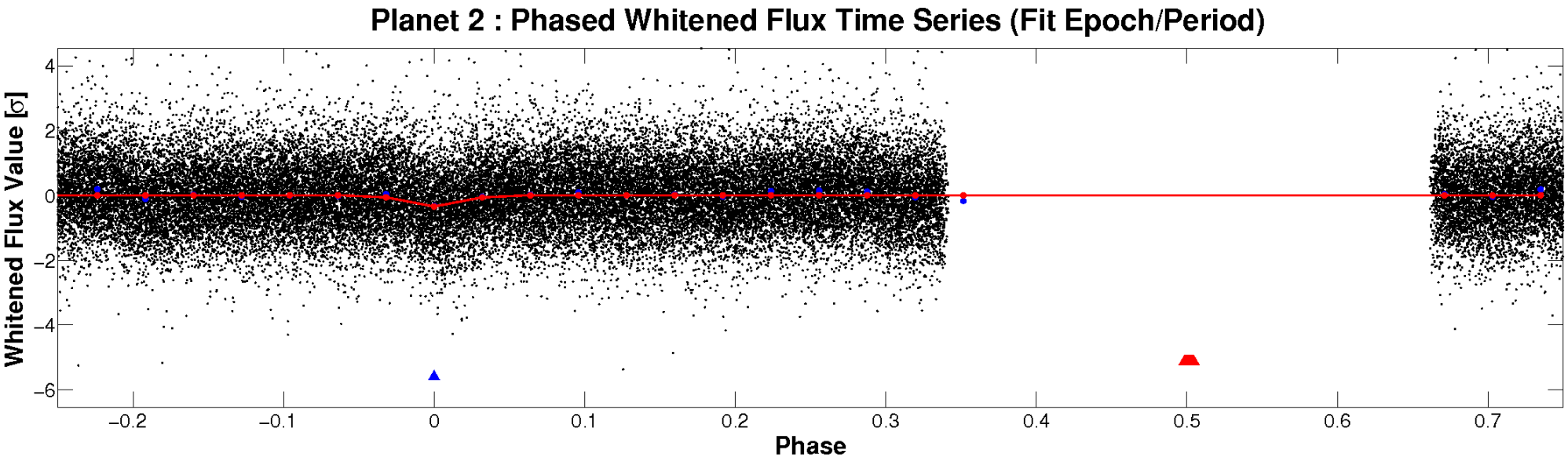

TCE 009222516-02
1.00e-03
8.00e-04
6.00e-04
4.00e-04
2.00e-04
0.00e+00
-2.00e-04
-4.00e-04
-6.00e-04
Flux
-0.06
-0.04
-0.02
0
0.02
0.04
0.06
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 009222516-02
1.00e-03
8.00e-04
6.00e-04
4.00e-04
2.00e-04
0.00e+00
-2.00e-04
-4.00e-04
-6.00e-04
-8.00e-04
-1.00e-03
Flux
-0.1
-0.05
0
0.05
0.1
Phase
Odd
Even
Model Fit

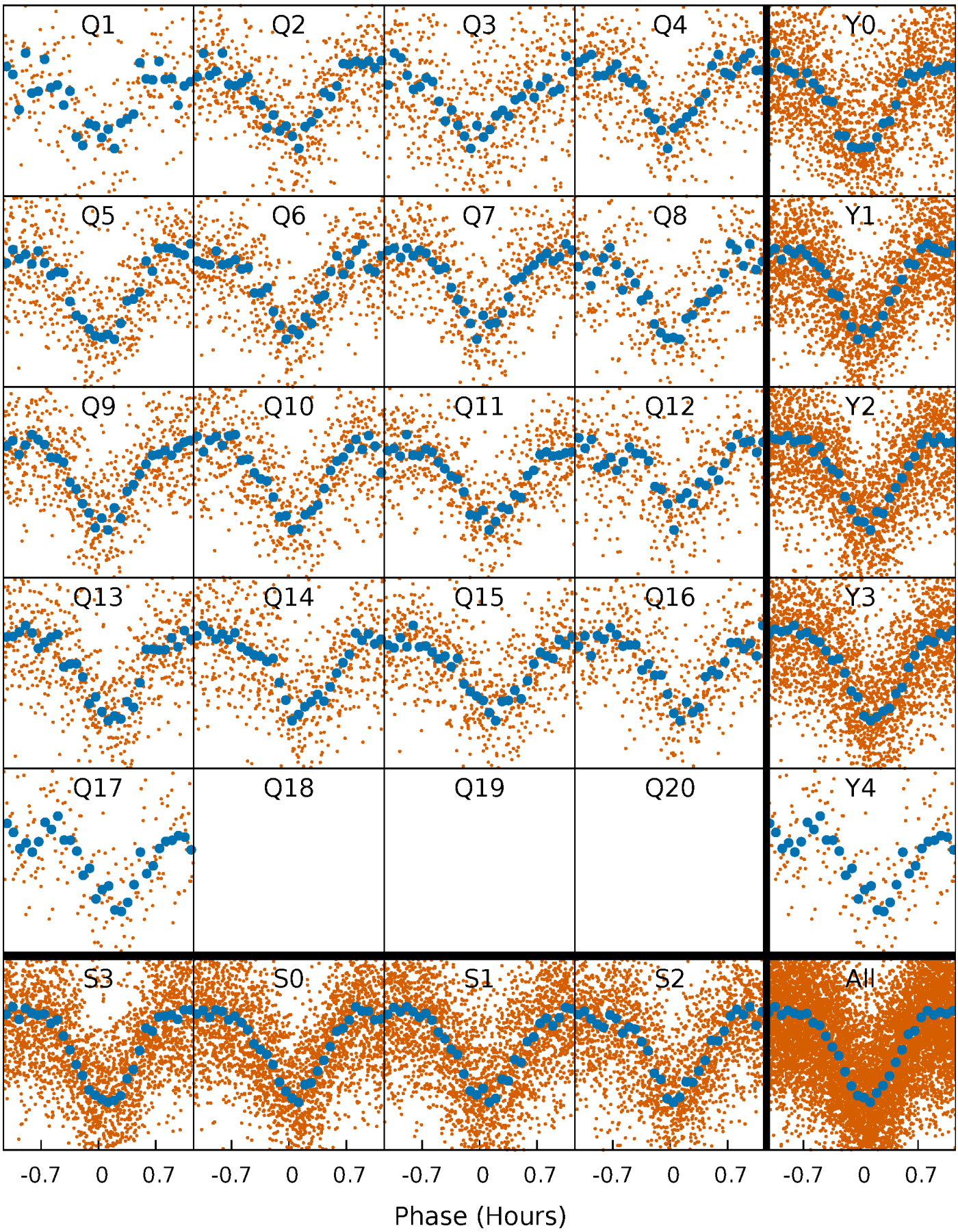
Non-Whitened Vs. Whitened Light Curve





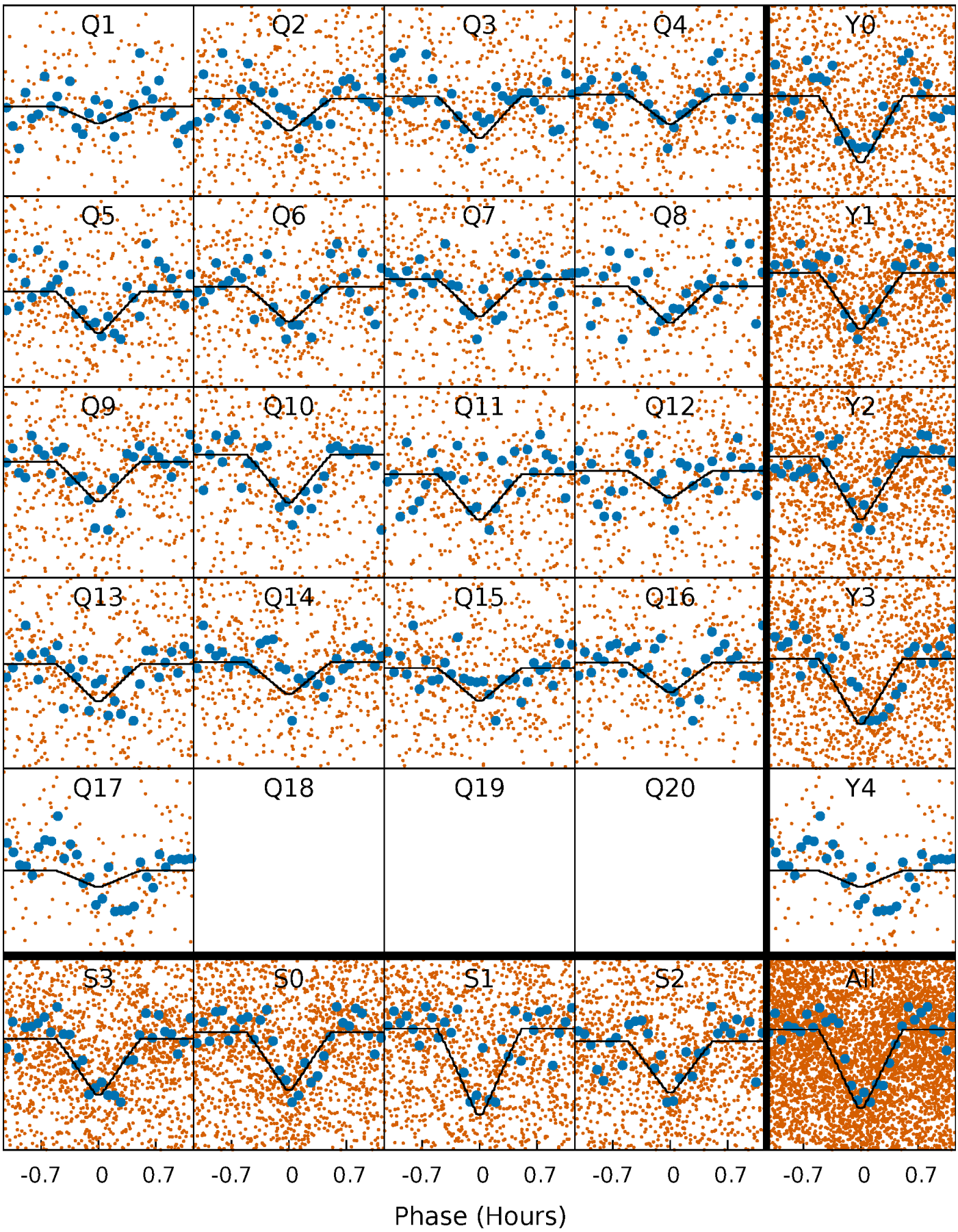
PDC Quarter-Phased Transit Curves

TCE 009222516-02 P= 0.639377 Days T_0=131.576225 (BKJD)



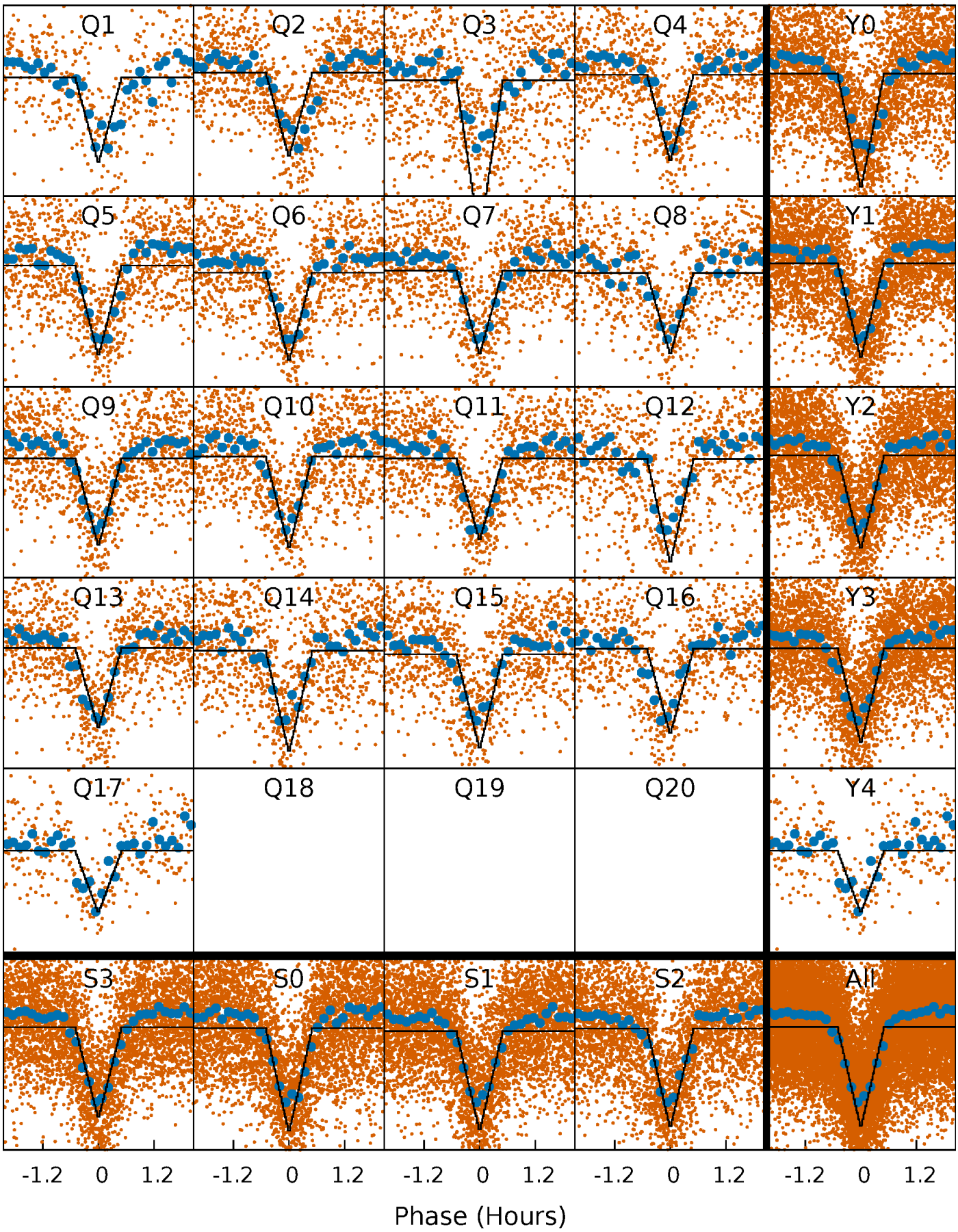
DV Quarter-Phased Transit Curves

TCE 009222516-02 P= 0.639377 Days T_0=131.576225 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

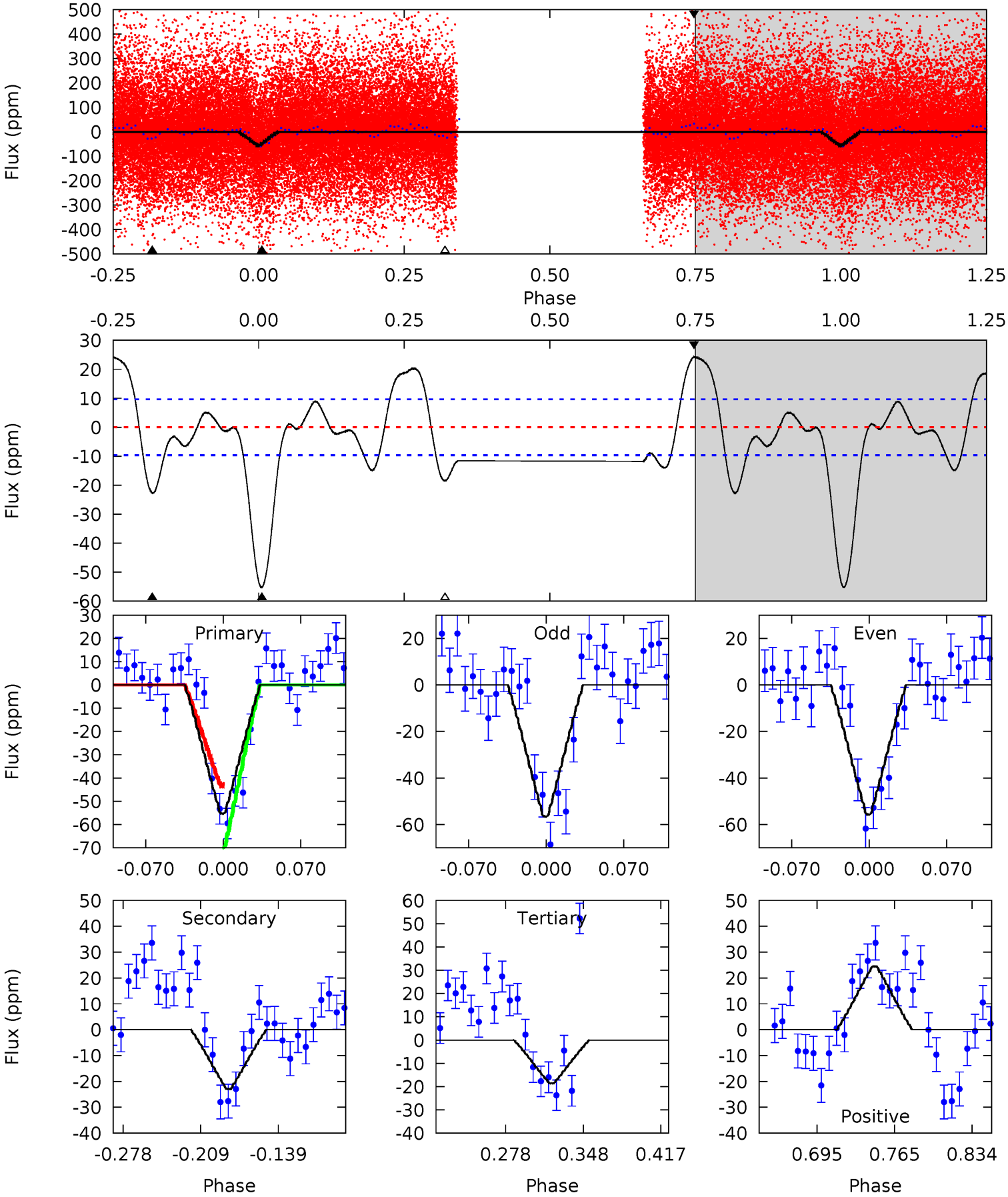
TCE 009222516-02 P= 0.639385 Days T_0=131.569942 (BKJD)



DV Model-Shift Uniqueness Test

009222516-02, P = 0.639377 Days, E = 130.936848 Days

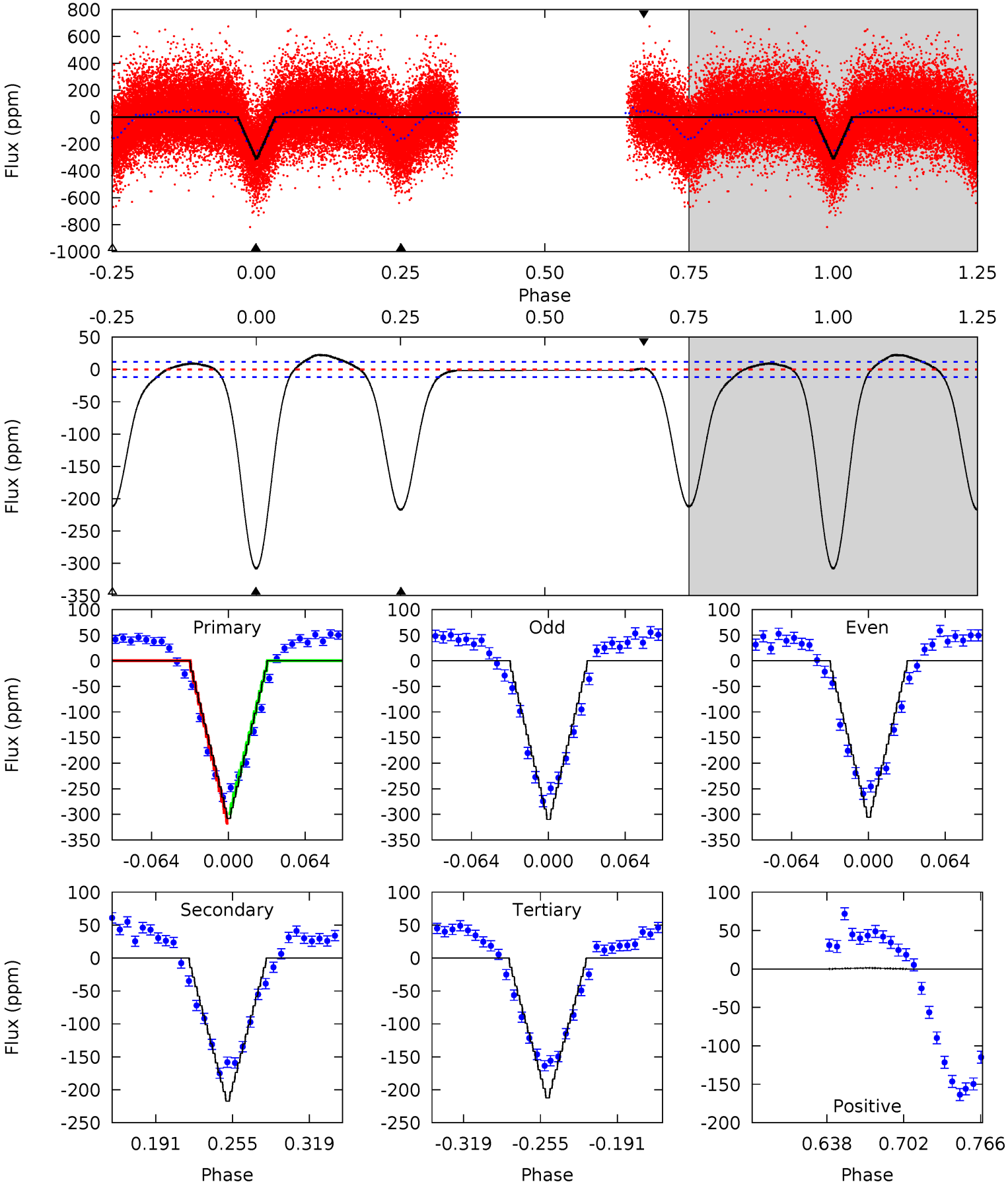
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.7	11.0	8.95	11.8	4.64	1.82	5.52	17.7	14.9	2.09	-0.73	0.21	0.94	0.31	6.44



Alt Model-Shift Uniqueness Test

009222516-02, P = 0.639385 Days, E = 130.930557 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
121.8	85.9	83.9	0.54	4.66	1.85	25.7	37.9	121.2	1.99	85.4	0.85	0.99	0.07	3.61



Stellar Parameters For KIC 009222516

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	6607^{+161}_{-221}	$4.363^{+0.056}_{-0.224}$	$-0.100^{+0.250}_{-0.300}$	$1.204^{+0.419}_{-0.140}$	$1.224^{+0.187}_{-0.168}$	$0.988^{+0.292}_{-0.528}$
	+2%/-3%	+1%/-5%	+250%/-300%	+35%/-12%	+15%/-14%	+30%/-53%
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 009222516-02 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-23±2	$1.19^{+0.27}_{-0.23}$	3650^{+307}_{-170}	4832^{+480}_{-373}	$2.120^{+1.065}_{-0.715}$
Alt.	-217±3	$2.53^{+0.49}_{-0.31}$	3662^{+304}_{-174}	5779^{+299}_{-267}	$4.411^{+1.209}_{-1.164}$

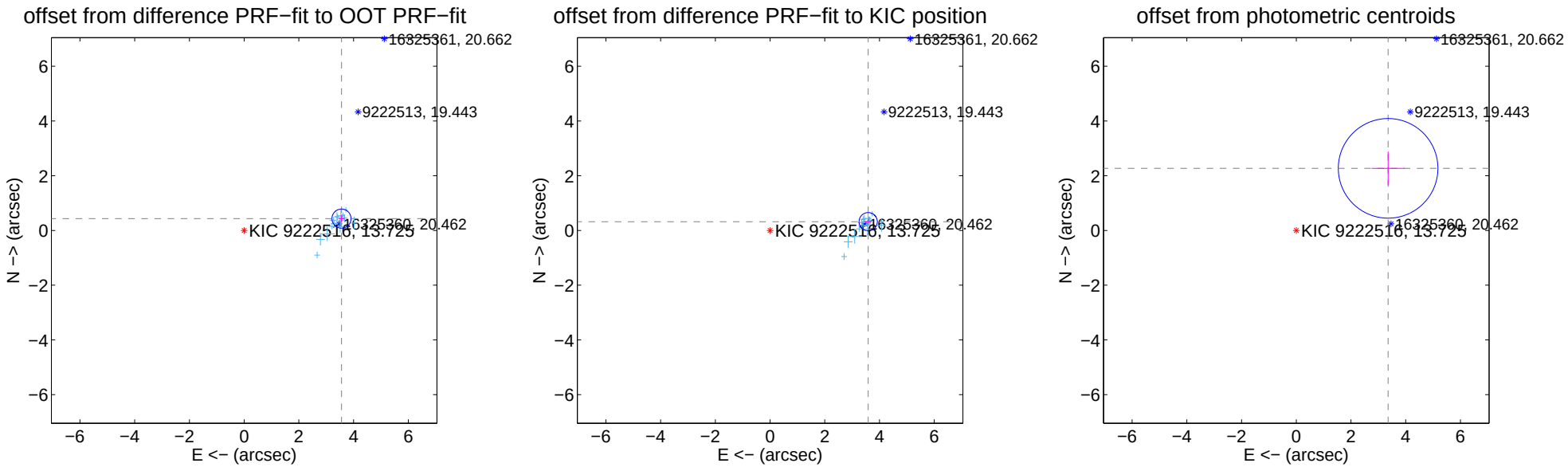
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

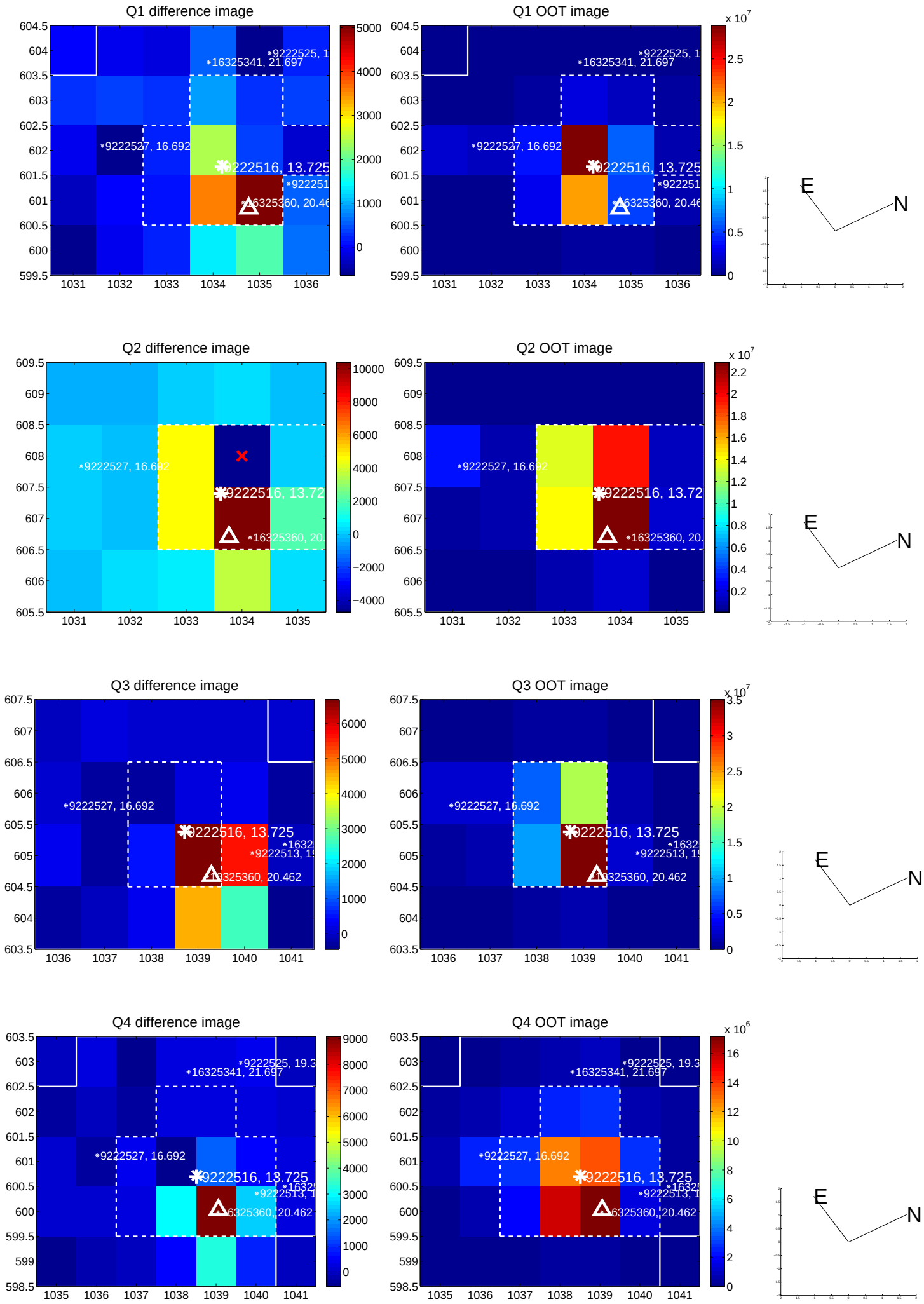
Supplemental centroid analysis for 009222516-02. Kepler magnitude: 13.72. Transit SNR 16.54
There are 17 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.584 ± 0.116	30.82	-3.557 ± 0.108	0.433 ± 0.120
PRF-fit source offset from KIC position	3.599 ± 0.111	32.39	-3.585 ± 0.106	0.320 ± 0.115
photometric centroid source offset	4.05 ± 0.61	6.68	-3.36 ± 0.60	2.27 ± 0.61

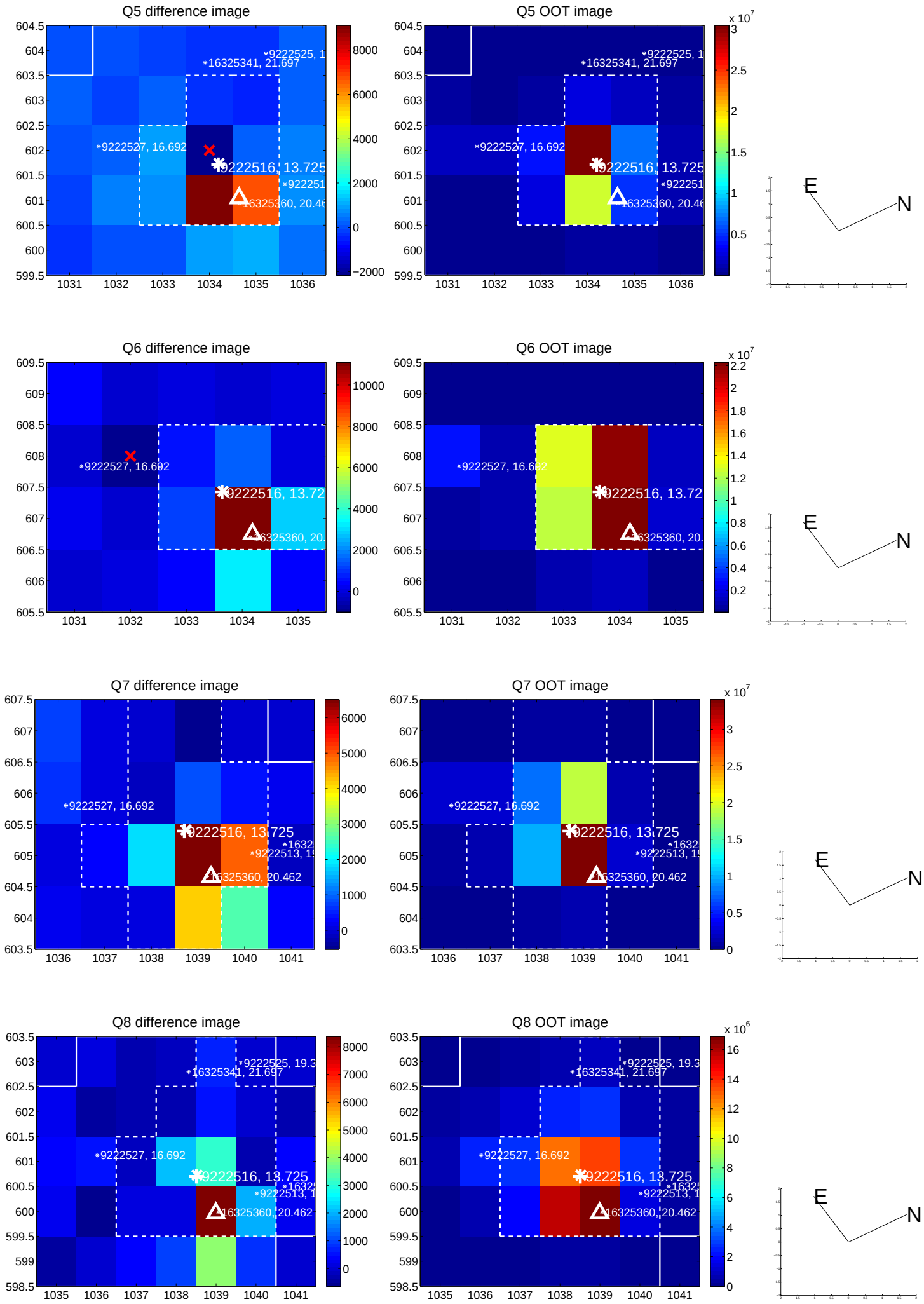


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

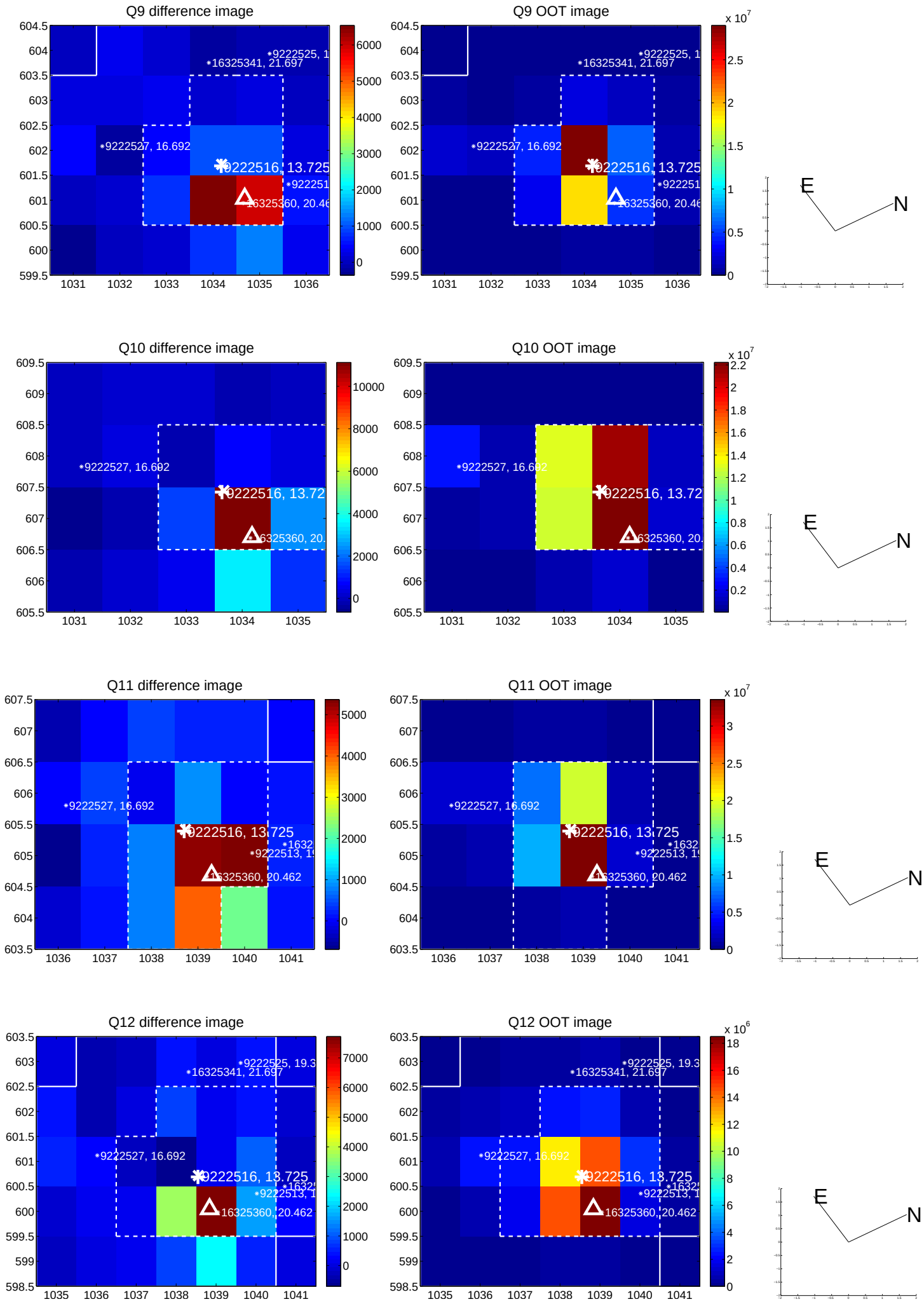
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



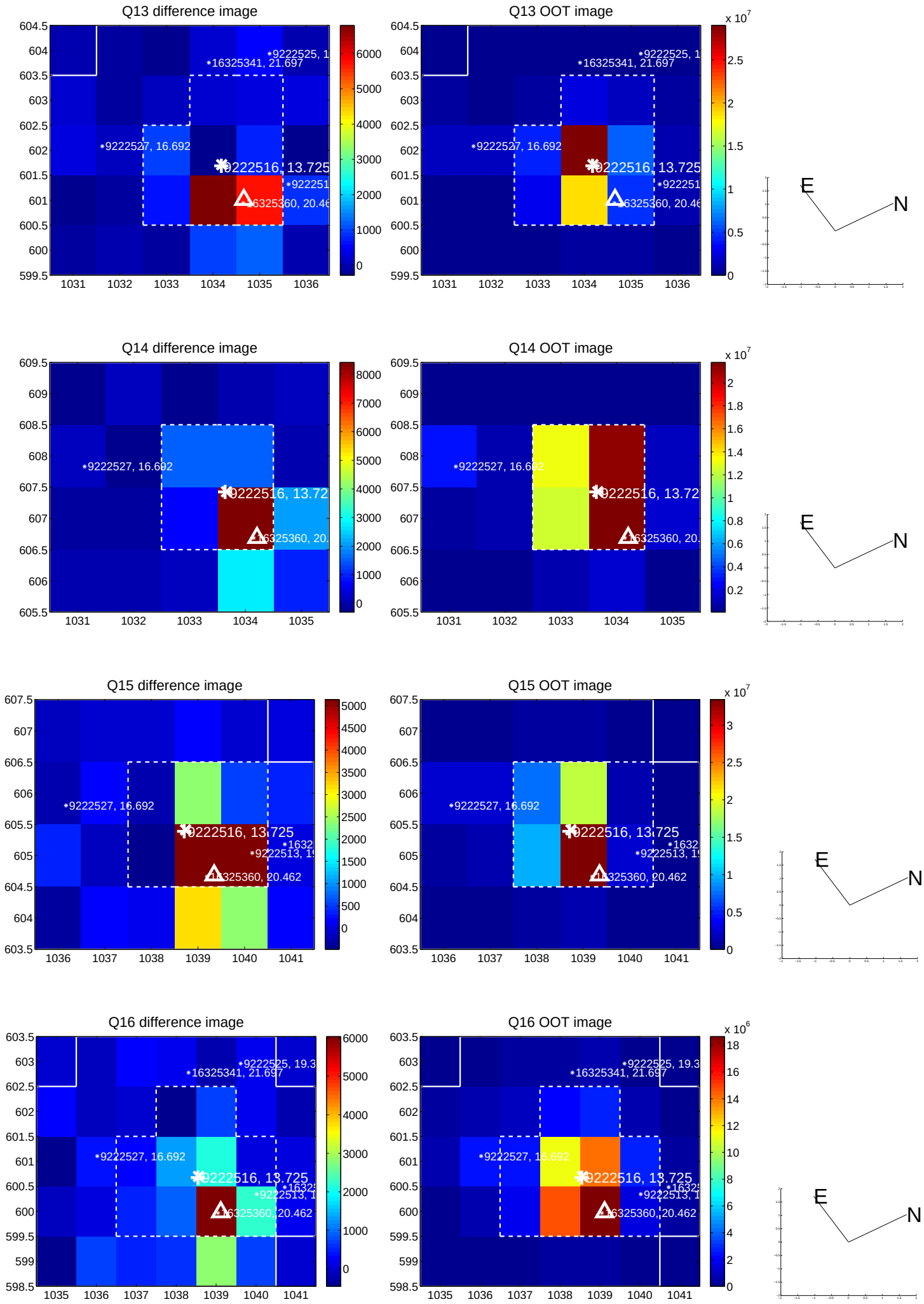
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



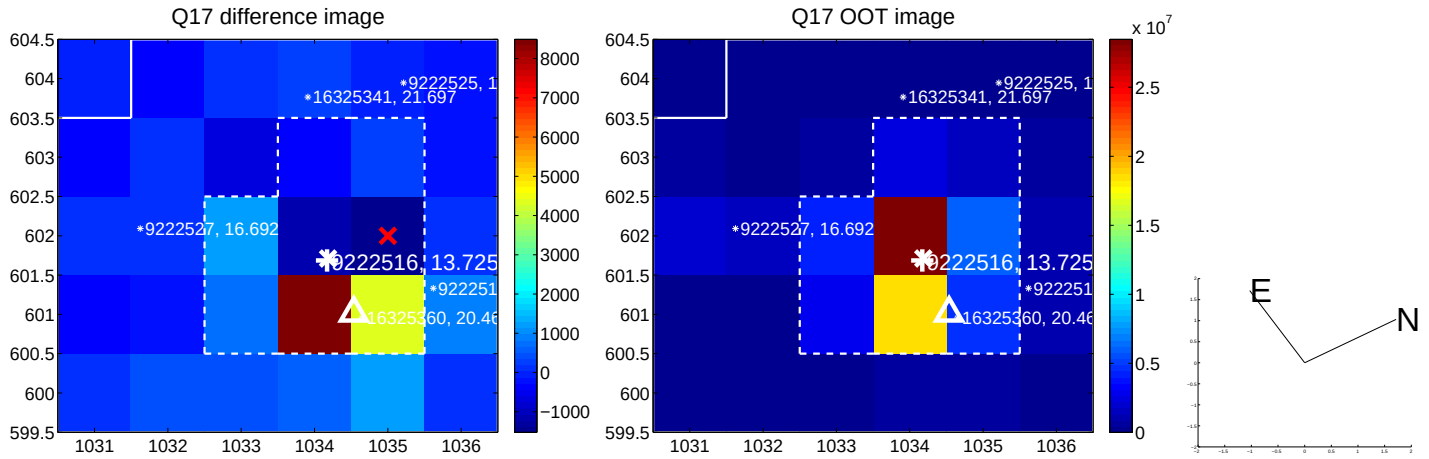
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

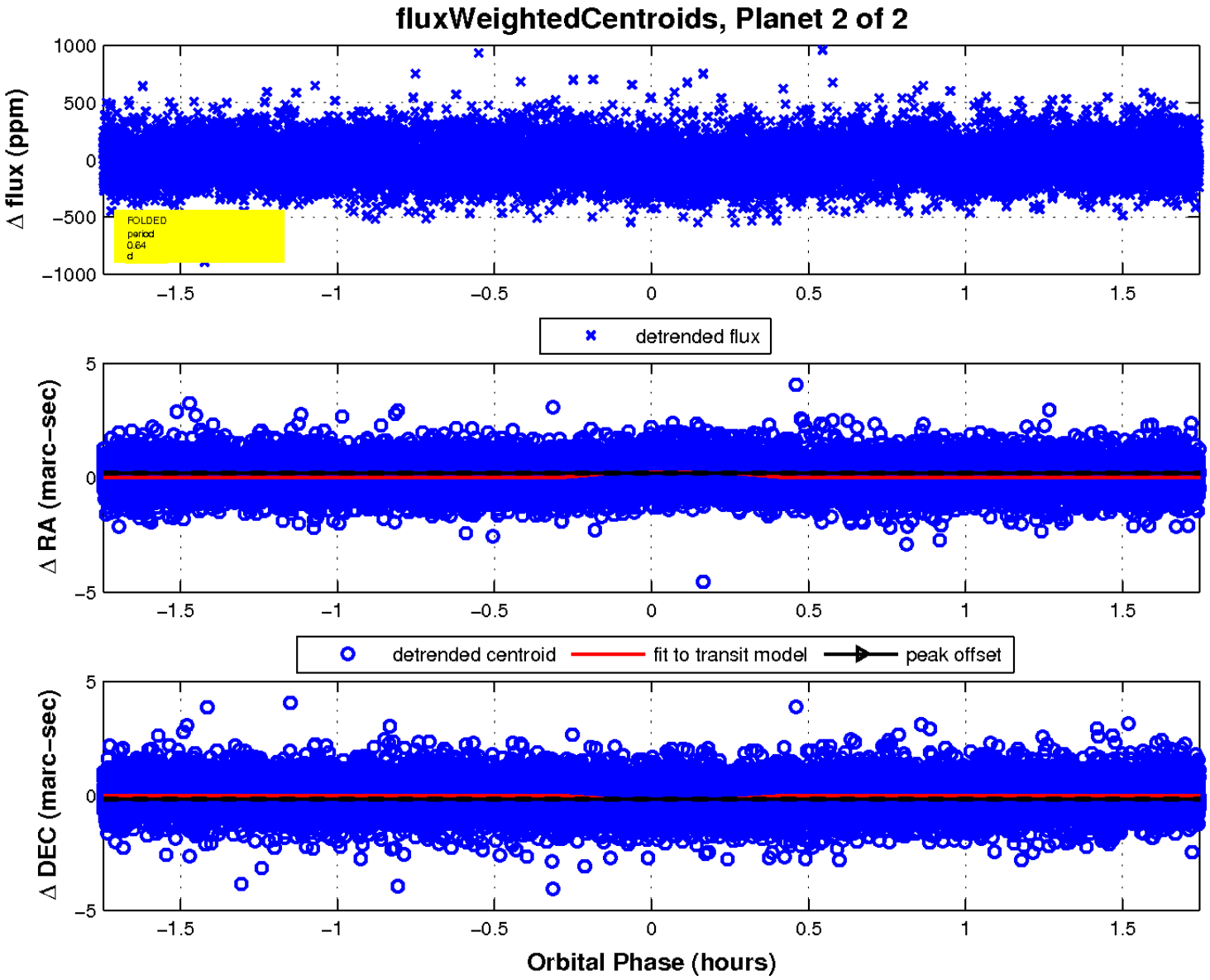


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

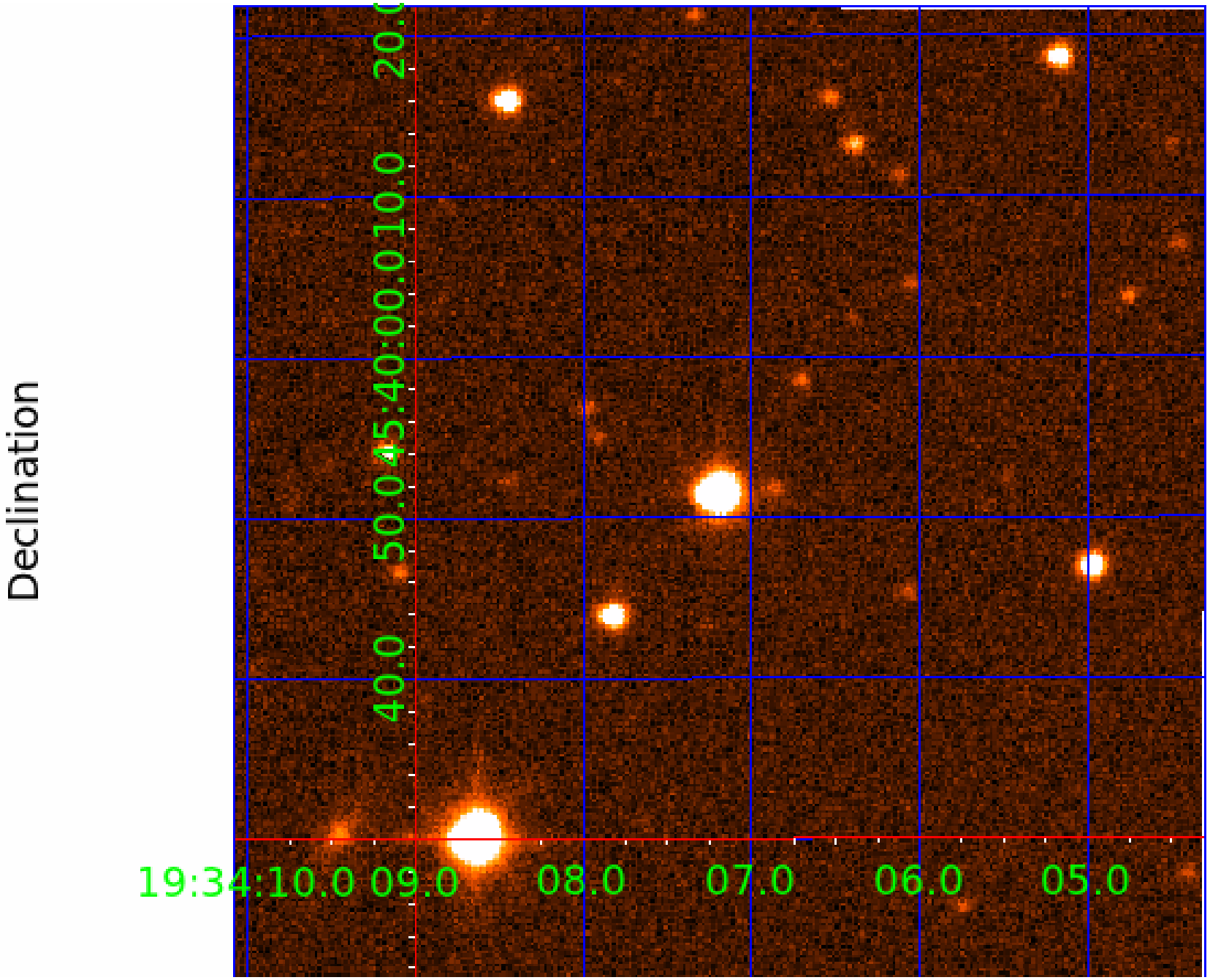


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image


Declination
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