KIC 006508221

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 ($S_\oplus$)
006508221-01	OBS	0416.01	18.207969	149.426691	1596.2	3.960	148.2	146.5	0.74	5176	3.32	21.91
006508221-02	OBS	0416.02	88.255315	153.779831	1115.8	4.542	52.3	50.3	0.74	5176	2.92	2.67
006508221-03	OBS	0416.03	9.747655	139.168048	113.1	3.309	9.2	10.6	0.74	5176	1.54	50.39

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006508221-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006508221-02	OBS	PC	0.77	0	0	0	0	CENT_KIC_POS
006508221-03	OBS	PC	0.98	0	0	0	0	CENT_KIC_POS

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.

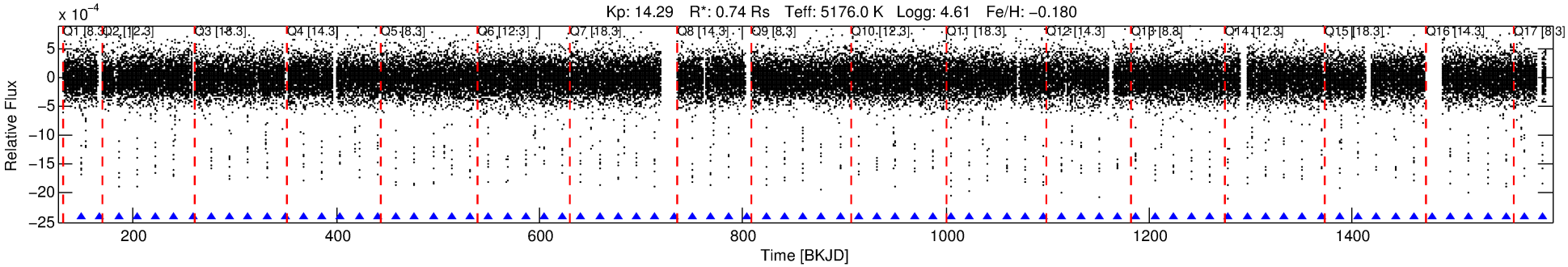
Ephemeris Match Information For 006508221-01

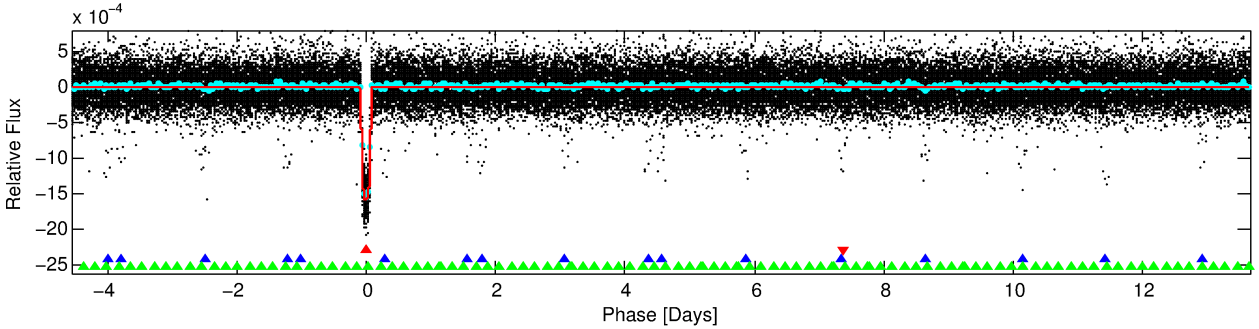
No Significant Match Found

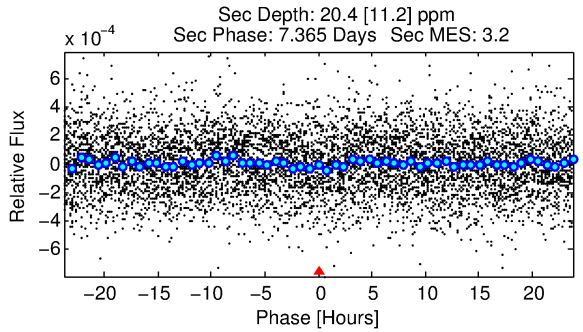
DV One-Page Summary

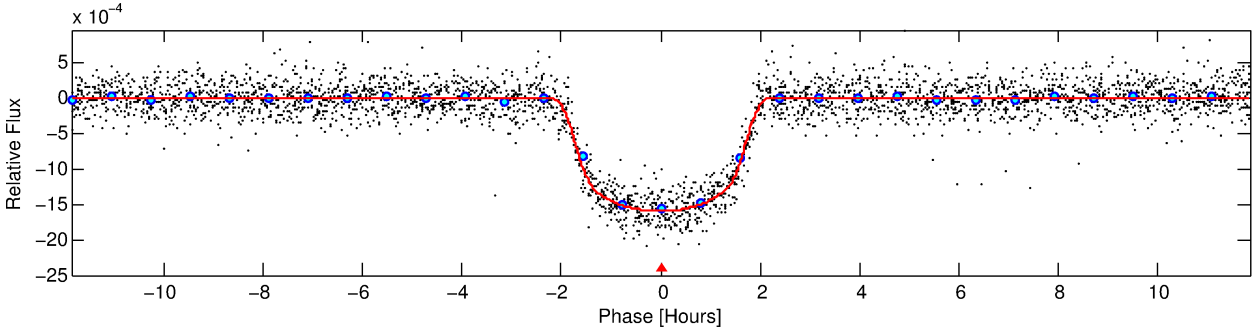
KIC: 6508221 Candidate: 1 of 3 Period: 18.208 d
KOI: K00416.01 Name: Kepler−152b Corr: 0.976

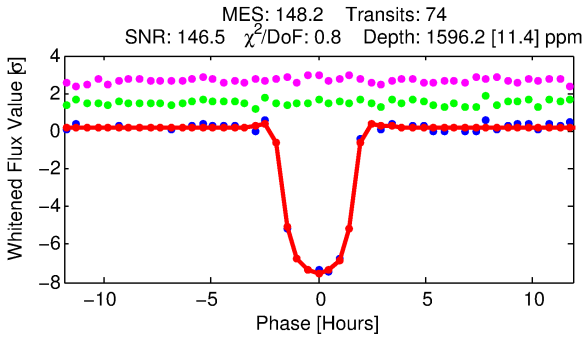
Kp: 14.29 R*: 0.74 Rs Teff: 5176.0 K Logg: 4.61 Fe/H: −0.180

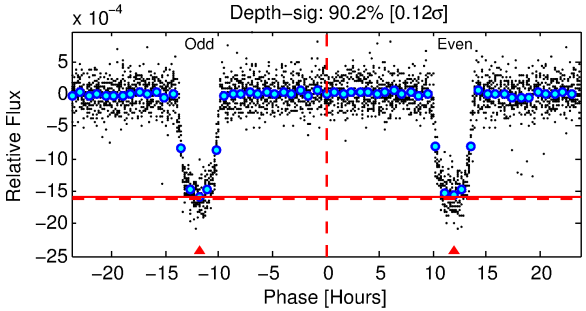


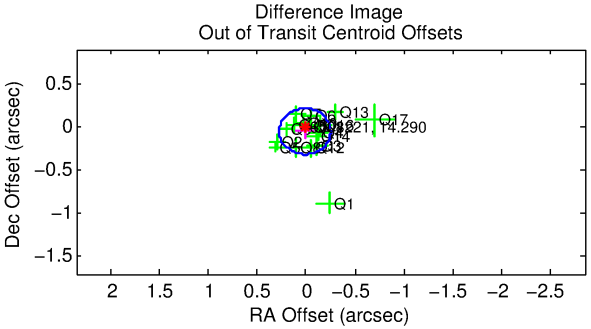












DV Fit Results:

Period = 18.20797 [0.00001] d
Epoch = 149.4267 [0.0006] BKJD
Rp/R* = 0.0413 [0.0010]
a/R* = 22.82 [2.13]
b = 0.81 [0.04]

Seff = 21.91 [2.86]
Teq = 552 [18] K
Rp = 3.32 [0.26] Re
a = 0.1264 [0.0085] AU

Ag = 16.29 [9.11] [1.68σ]
Teffp = 1713 [238] K [4.87σ]

DV Diagnostic Results:

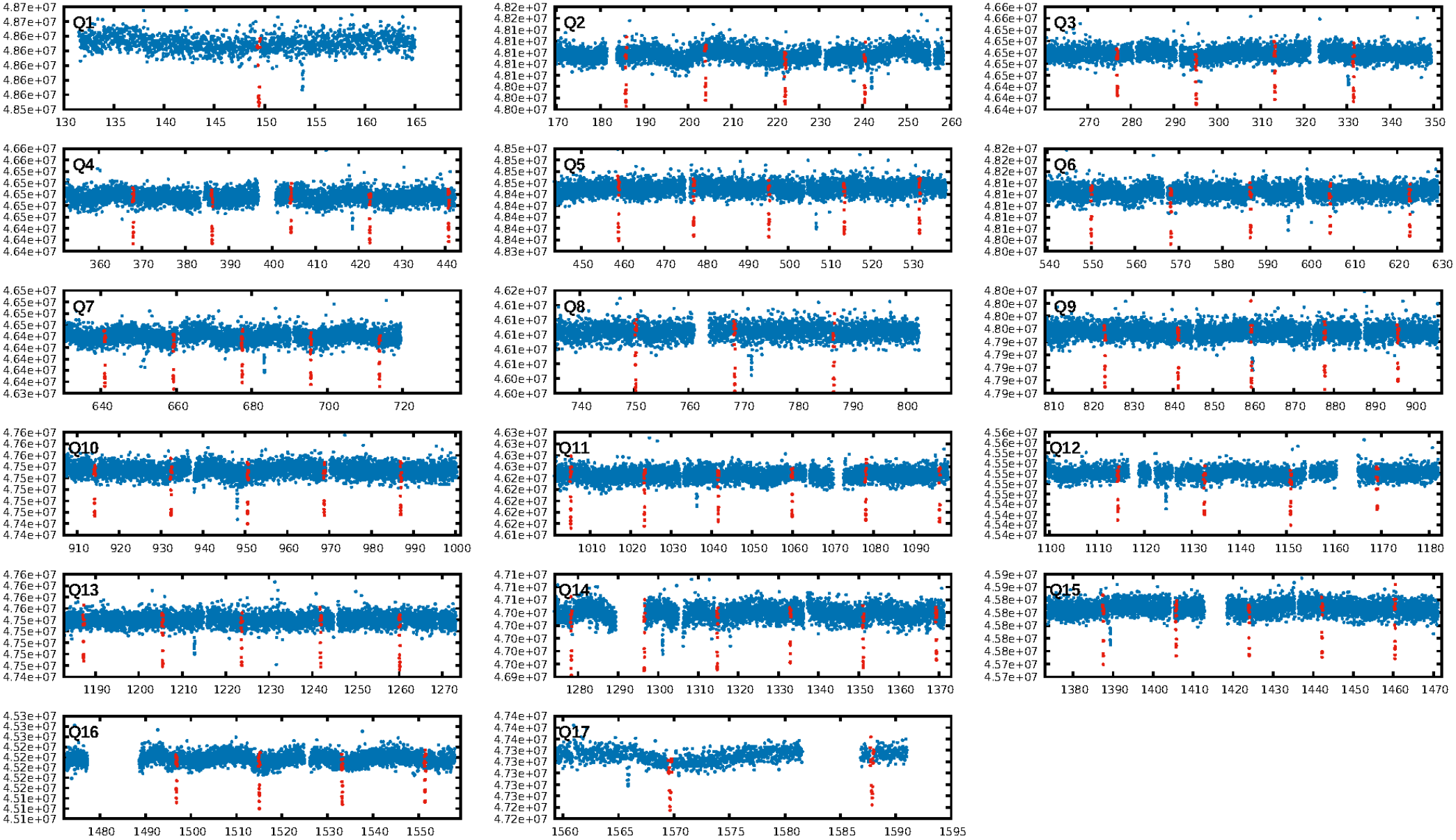
ShortPeriod−sig: 100.0% [39.34σ]
LongPeriod−sig: 100.0% [278.97σ]
ModelChiSquare2−sig: 99.3%
ModelChiSquareGof−sig: 100.0%
Bootstrap−pfa: 0.00e+00
RollingBand−fgt: 1.00 [71/71]
GhostDiagnostic−chr: 6.952

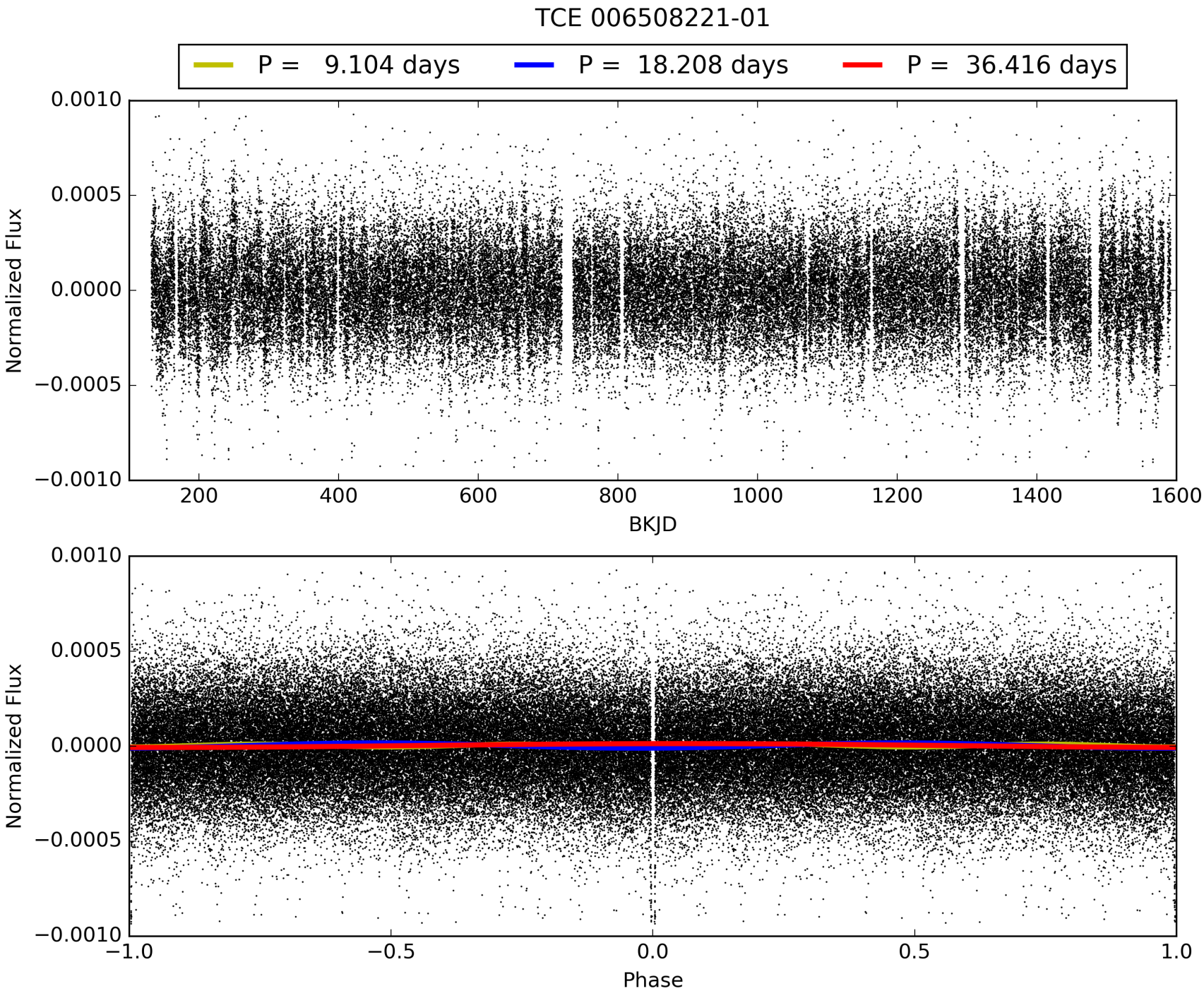
Centroid−sig: 0.0%
Centroid−so: 0.283 arcsec [3.31σ]
OotOffset−rm: 0.052 arcsec [0.59σ]
KicOffset−rm: 0.367 arcsec [4.10σ]
OotOffset−st: 4/4/4/5 [17]
KicOffset−st: 4/4/4/5 [17]
DiffImageQuality−fgm: 1.00 [17/17]
DiffImageOverlap−fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 −− Date Generated: 31−Jan−2016 22:53:06 Z

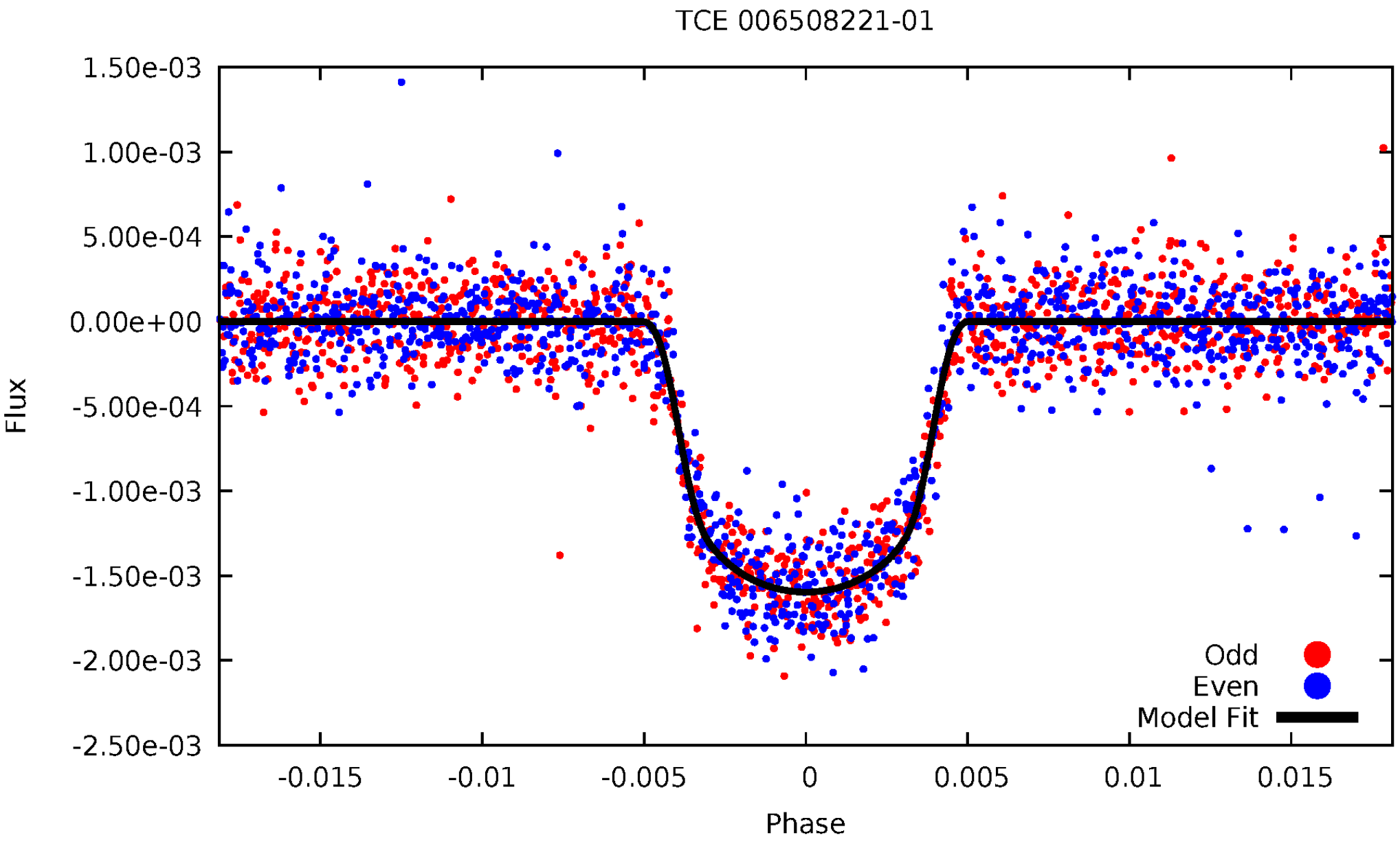
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006508221-01, PDC Light Curves

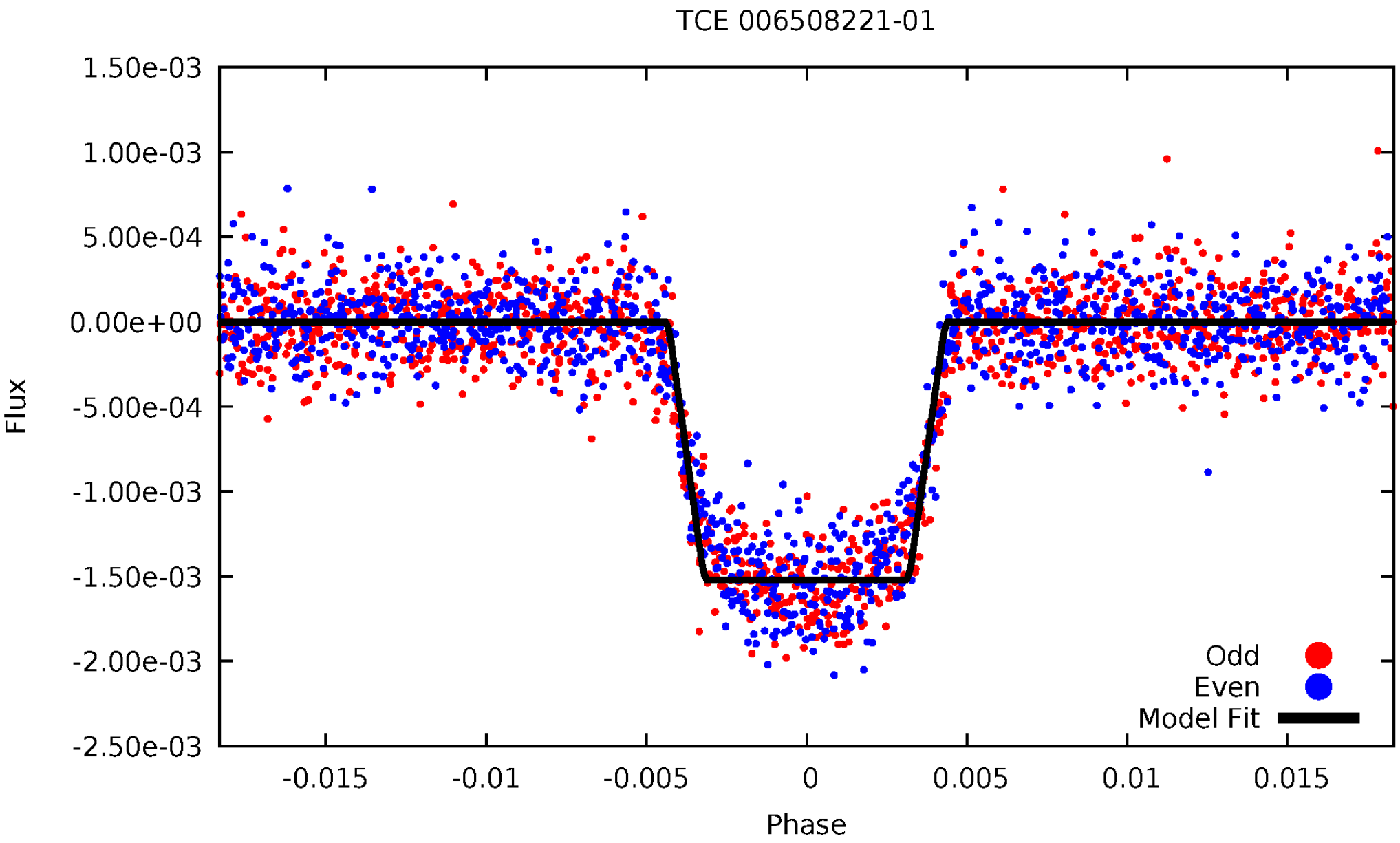



TCE 006508221-01
P = 9.104 days
P = 18.208 days
P = 36.416 days
Normalized Flux
0.0010
0.0005
0.0000
−0.0005
−0.0010
200
400
600
800
1000
1200
1400
1600
BKJD
Normalized Flux
0.0010
0.0005
0.0000
−0.0005
−0.0010
−1.0
−0.5
0.0
0.5
1.0
Phase

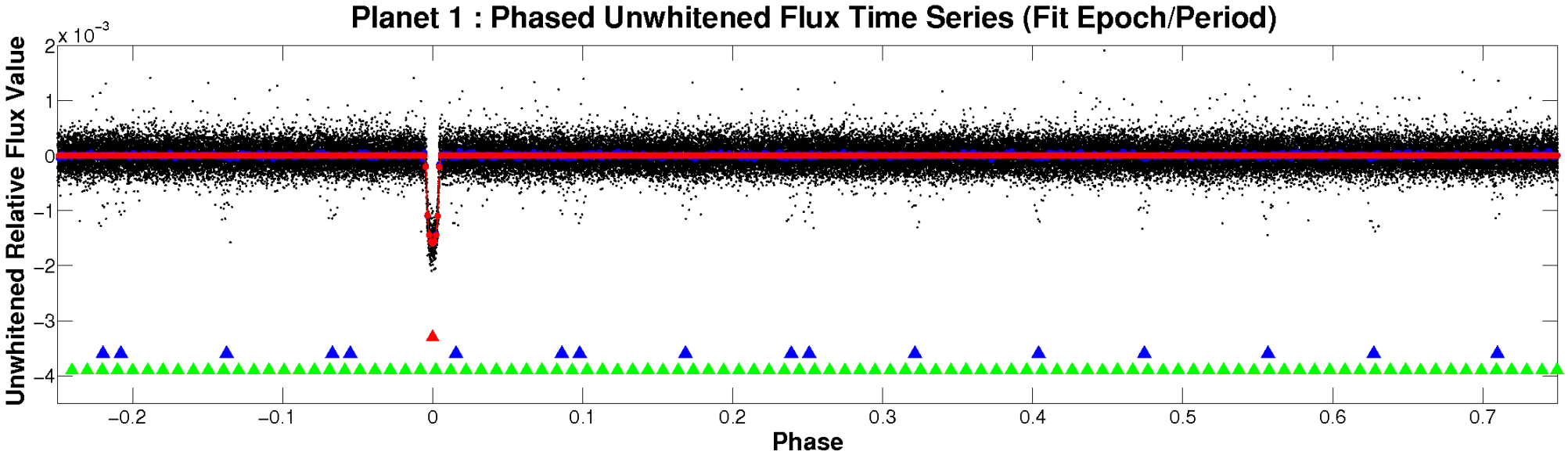
DV Odd/Even

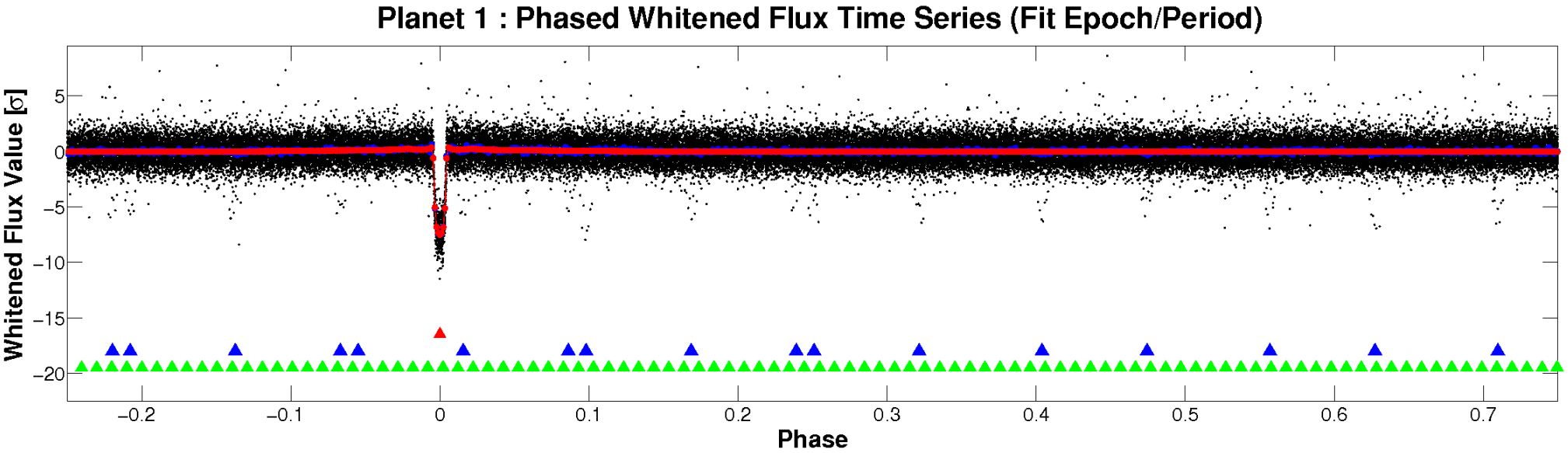

TCE 006508221-01
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
-2.50e-03
Flux
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 006508221-01
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
Flux
-0.015
-0.01
-0.005
0
0.005
0.01
0.015
Phase
Odd
Even
Model Fit

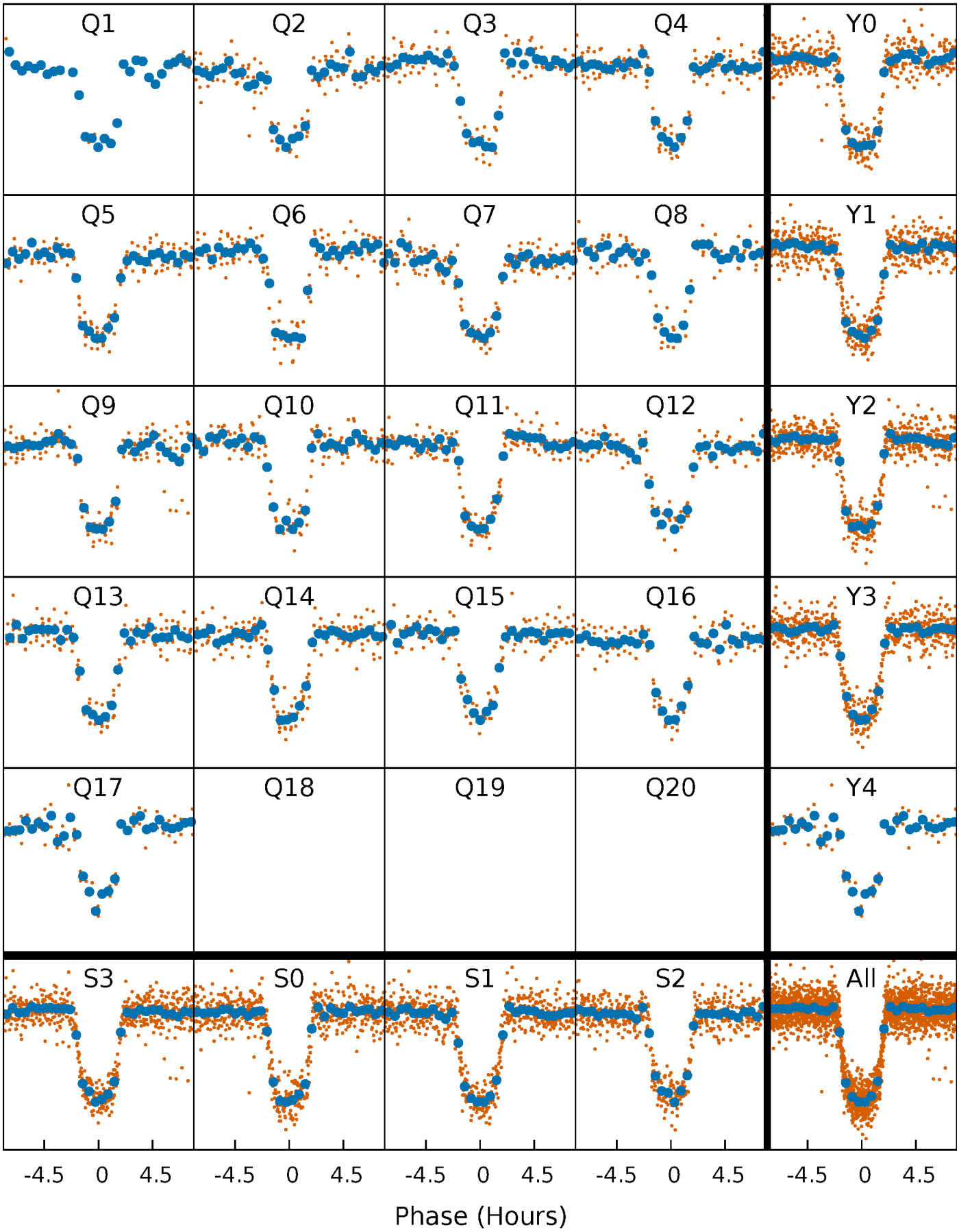
Non-Whitened Vs. Whitened Light Curve





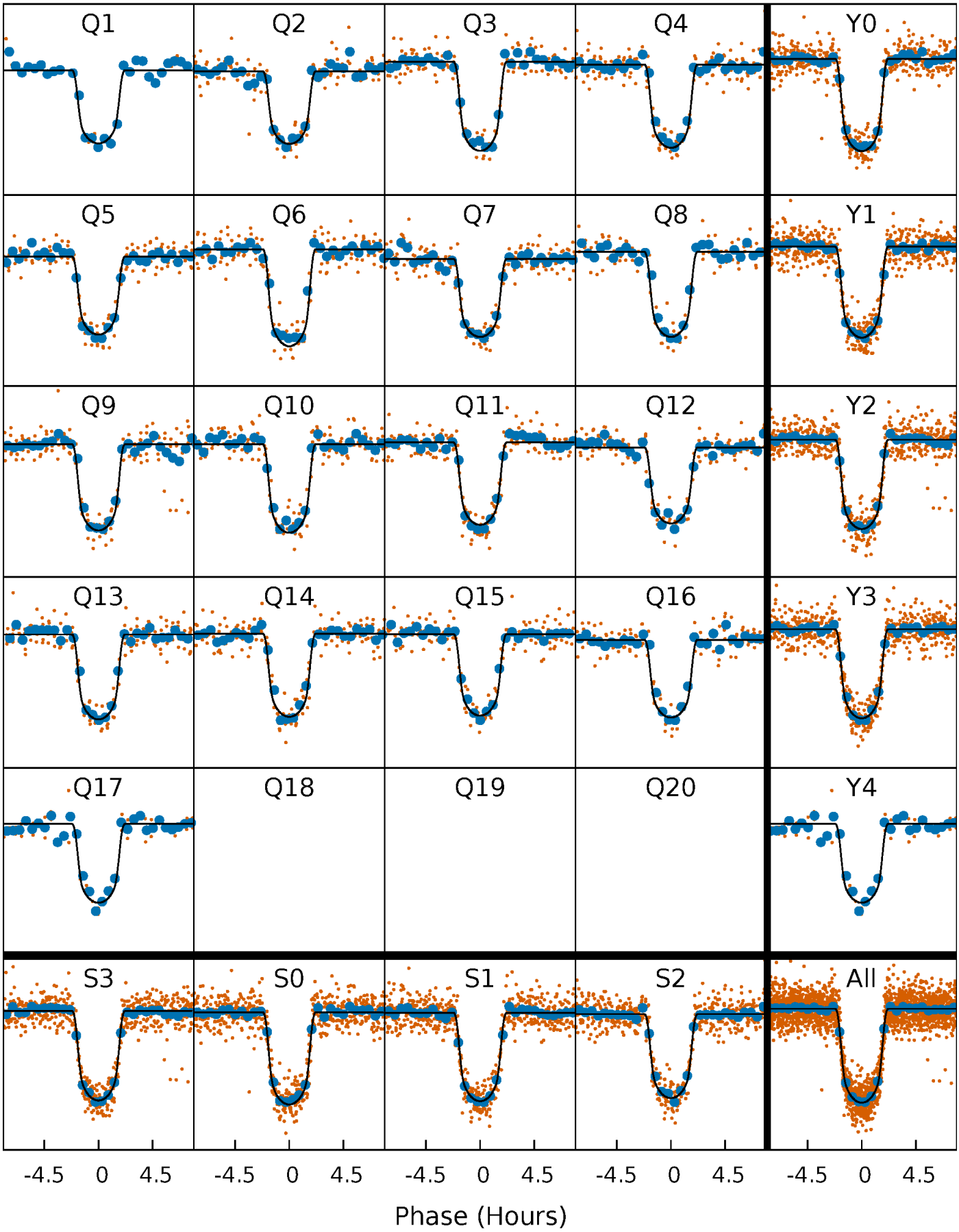
PDC Quarter-Phased Transit Curves

TCE 006508221-01 P= 18.207969 Days T_0=149.426691 (BKJD)



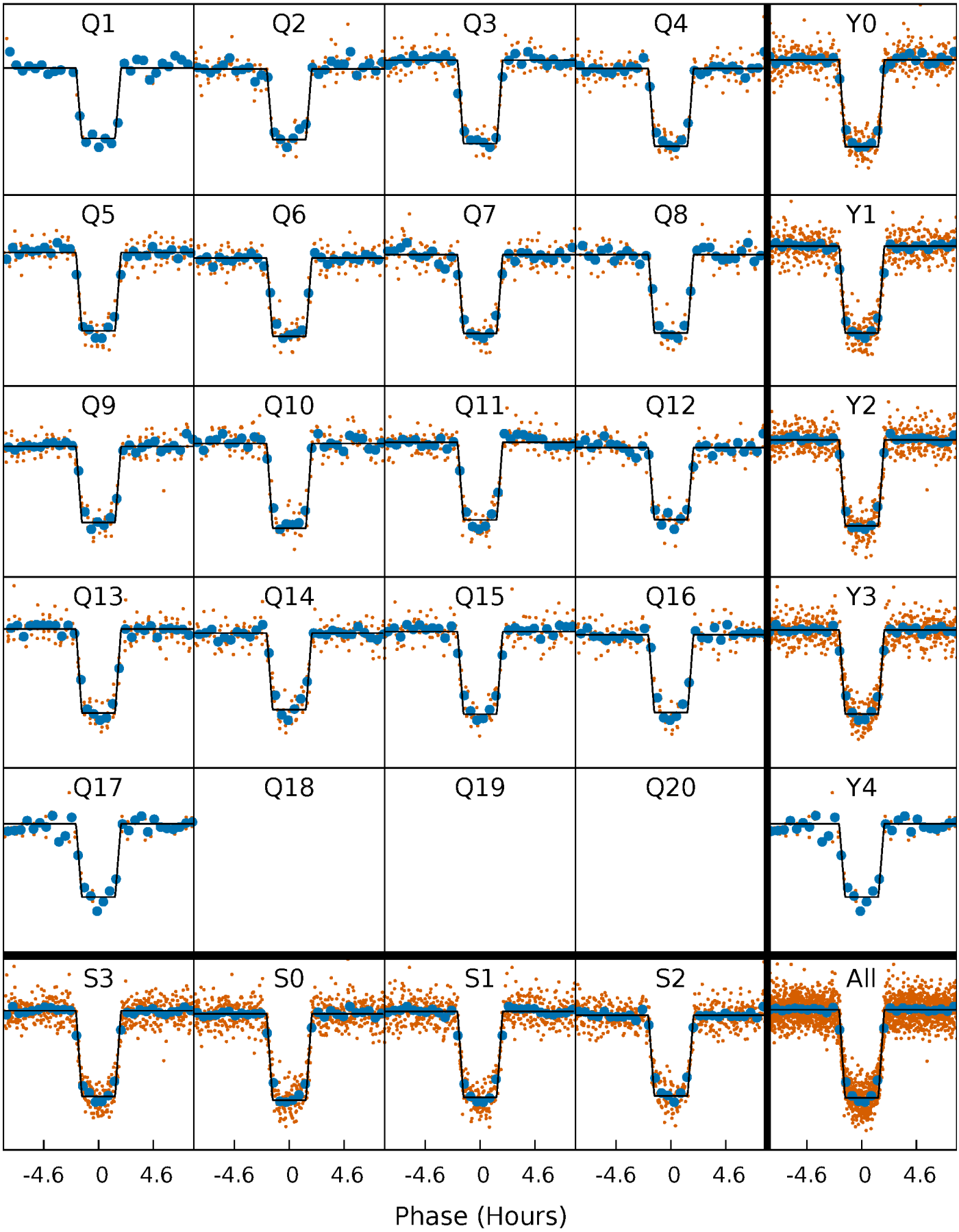
DV Quarter-Phased Transit Curves

TCE 006508221-01 P= 18.207969 Days T_0=149.426691 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

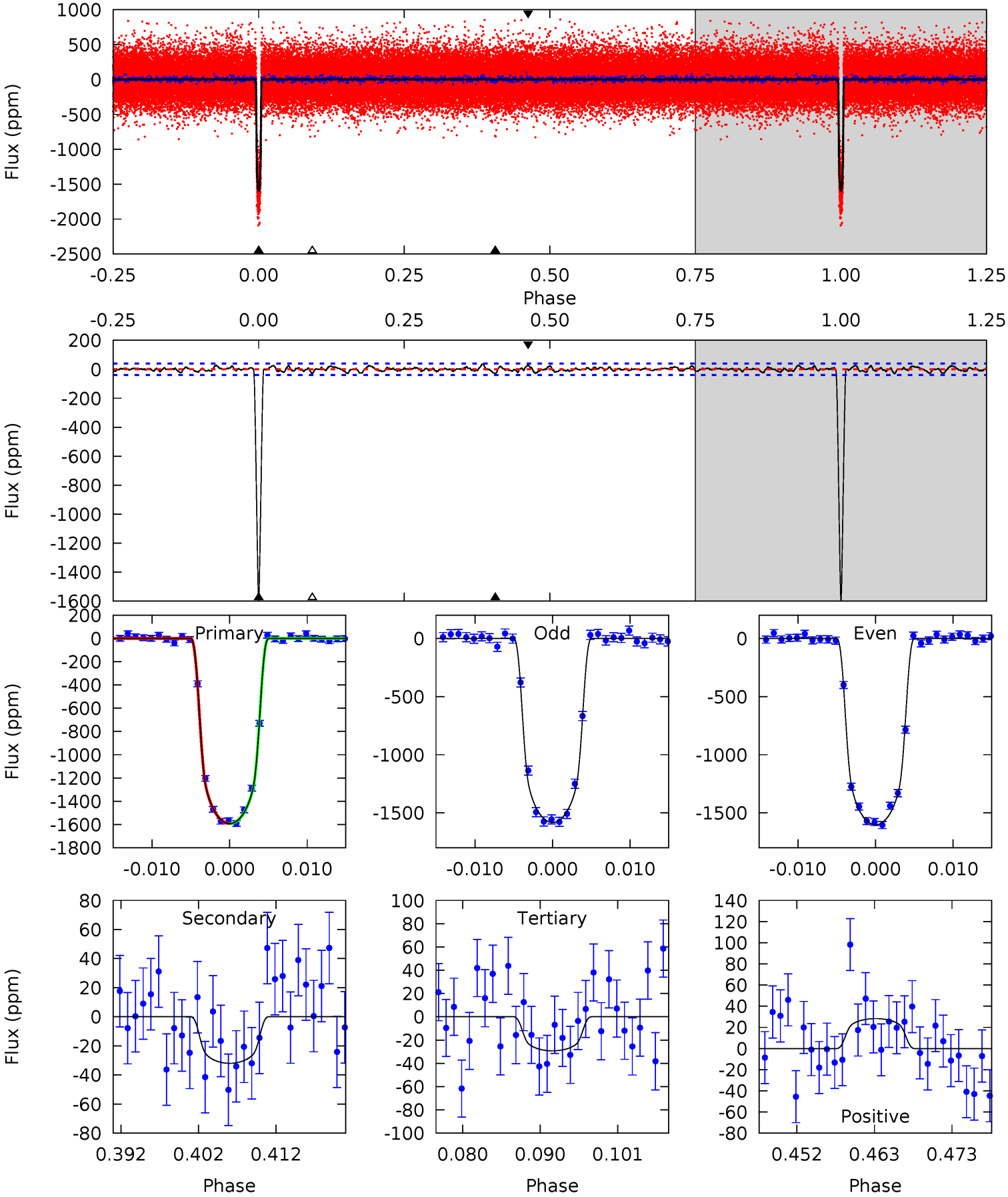
TCE 006508221-01 P= 18.207944 Days T_0=149.427698 (BKJD)



DV Model-Shift Uniqueness Test

006508221-01, P = 18.207969 Days, E = 131.218722 Days

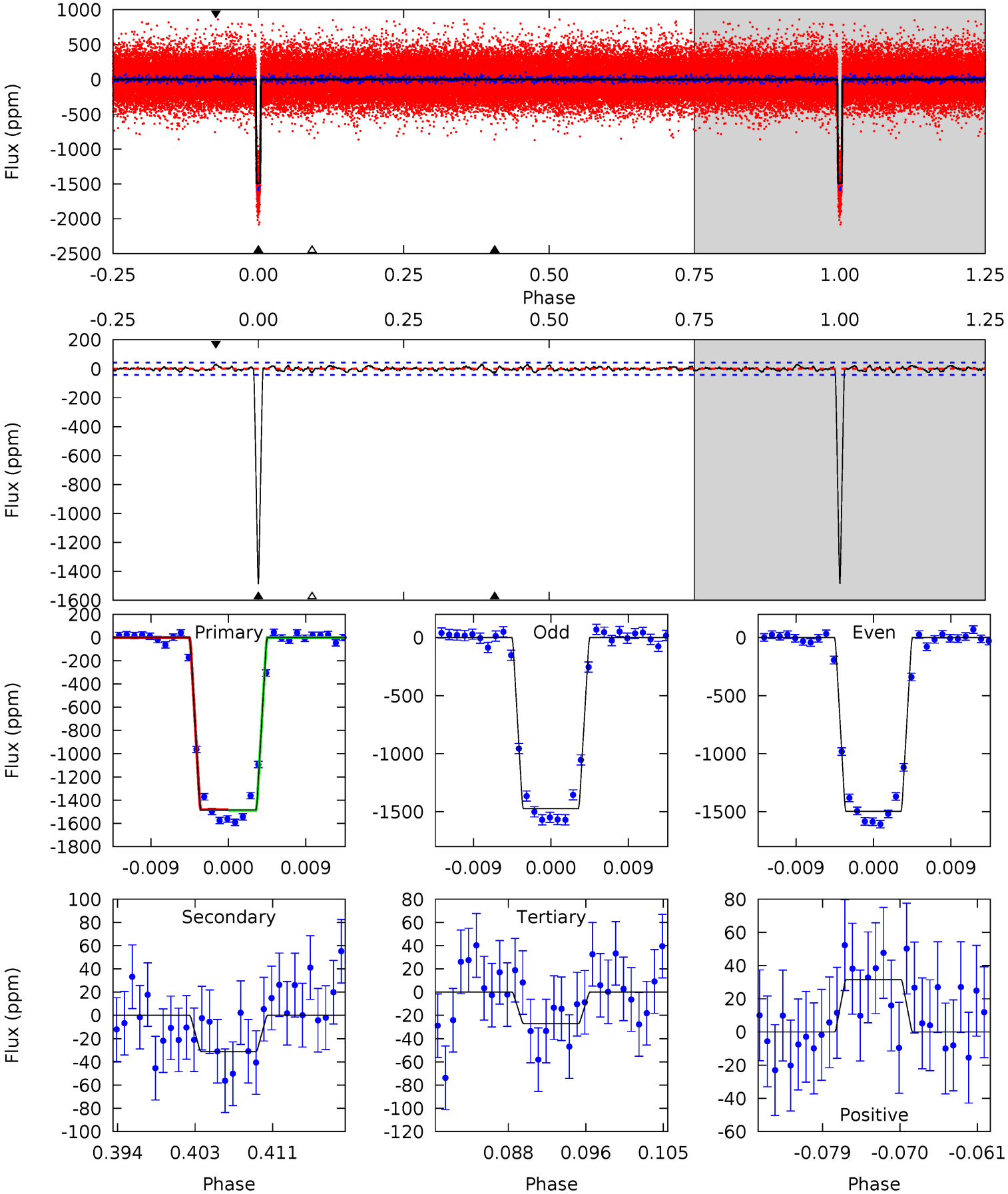
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
200.4	4.03	3.69	3.56	5.03	2.57	1.29	196.8	196.9	0.34	0.47	1.25	1.00	0.02	0.12



Alt Model-Shift Uniqueness Test

006508221-01, P = 18.207944 Days, E = 131.219754 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
174.8	3.67	3.18	3.70	5.05	2.62	1.10	171.6	171.1	0.49	-0.03	1.36	1.01	0.02	0.34



Stellar Parameters For KIC 006508221

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5176^{+102}_{-102}	$4.612^{+0.016}_{-0.060}$	$-0.180^{+0.150}_{-0.150}$	$0.738^{+0.054}_{-0.031}$	$0.826^{+0.035}_{-0.069}$	$2.891^{+0.251}_{-0.575}$
	+2%/-2%	+0%/-1%	+83%/-83%	+7%/-4%	+4%/-8%	+9%/-20%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 006508221-01 / KOI 0416.01

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-32±8	$3.38^{+0.16}_{-0.15}$	778^{+19}_{-18}	2674^{+91}_{-104}	24^{+7}_{-6}
Alt.	-31±8	$3.20^{+0.15}_{-0.14}$	779^{+20}_{-19}	2712^{+98}_{-114}	27^{+8}_{-8}

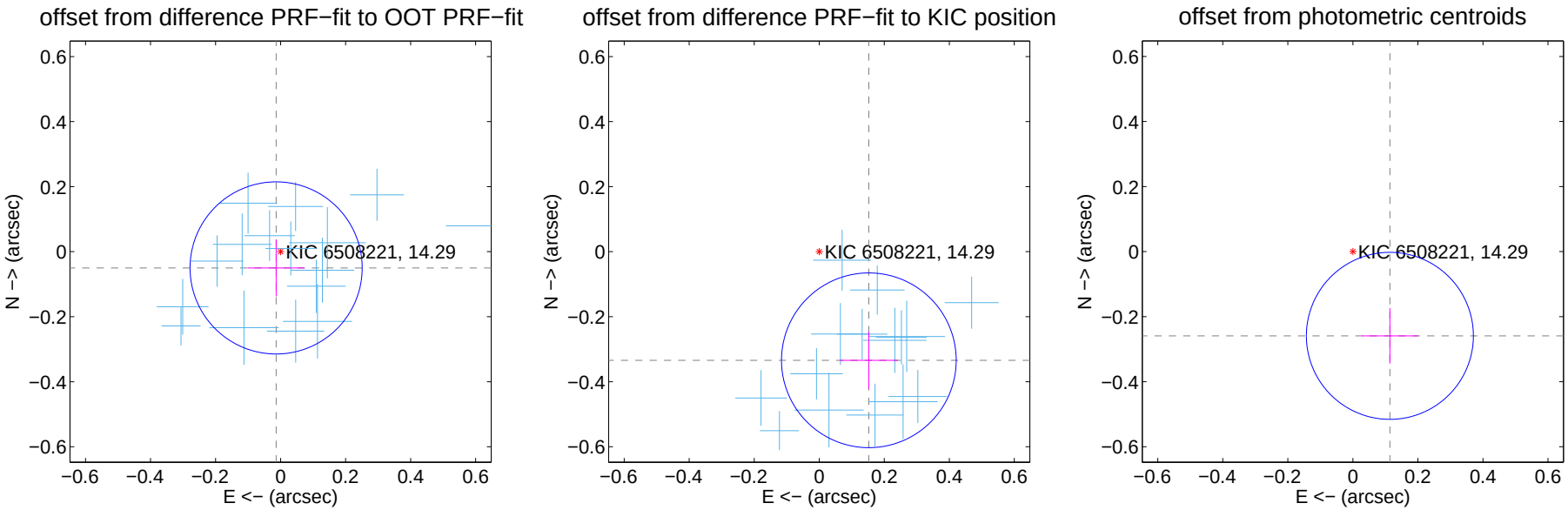
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

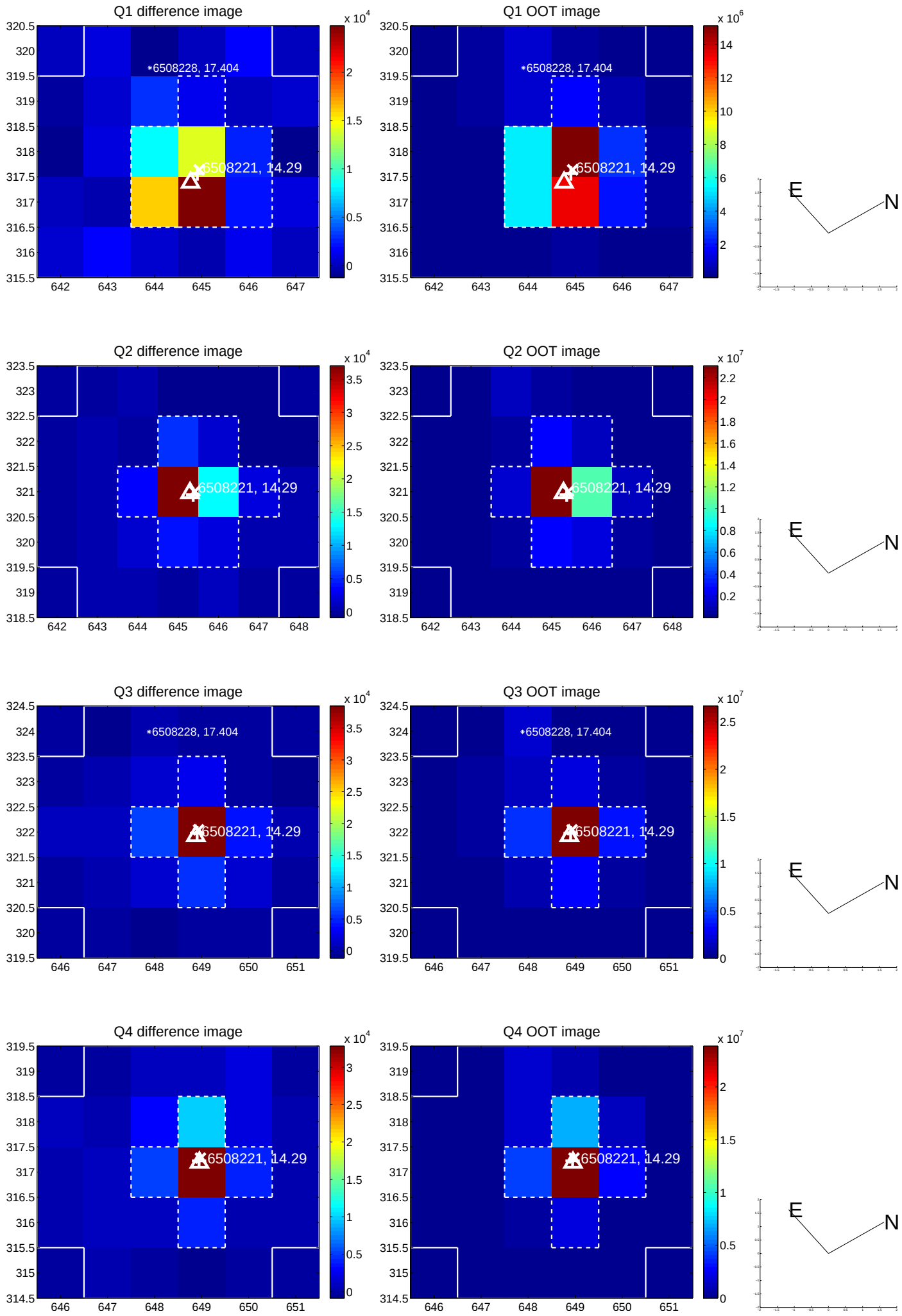
Supplemental centroid analysis for 006508221-01. Kepler magnitude: 14.29. Transit SNR 146.45
There are 17 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.052 ± 0.088	0.59	0.014 ± 0.088	-0.050 ± 0.088
PRF-fit source offset from KIC position	0.367 ± 0.090	4.10	-0.153 ± 0.089	-0.334 ± 0.089
photometric centroid source offset	0.28 ± 0.09	3.31	-0.11 ± 0.09	-0.26 ± 0.09

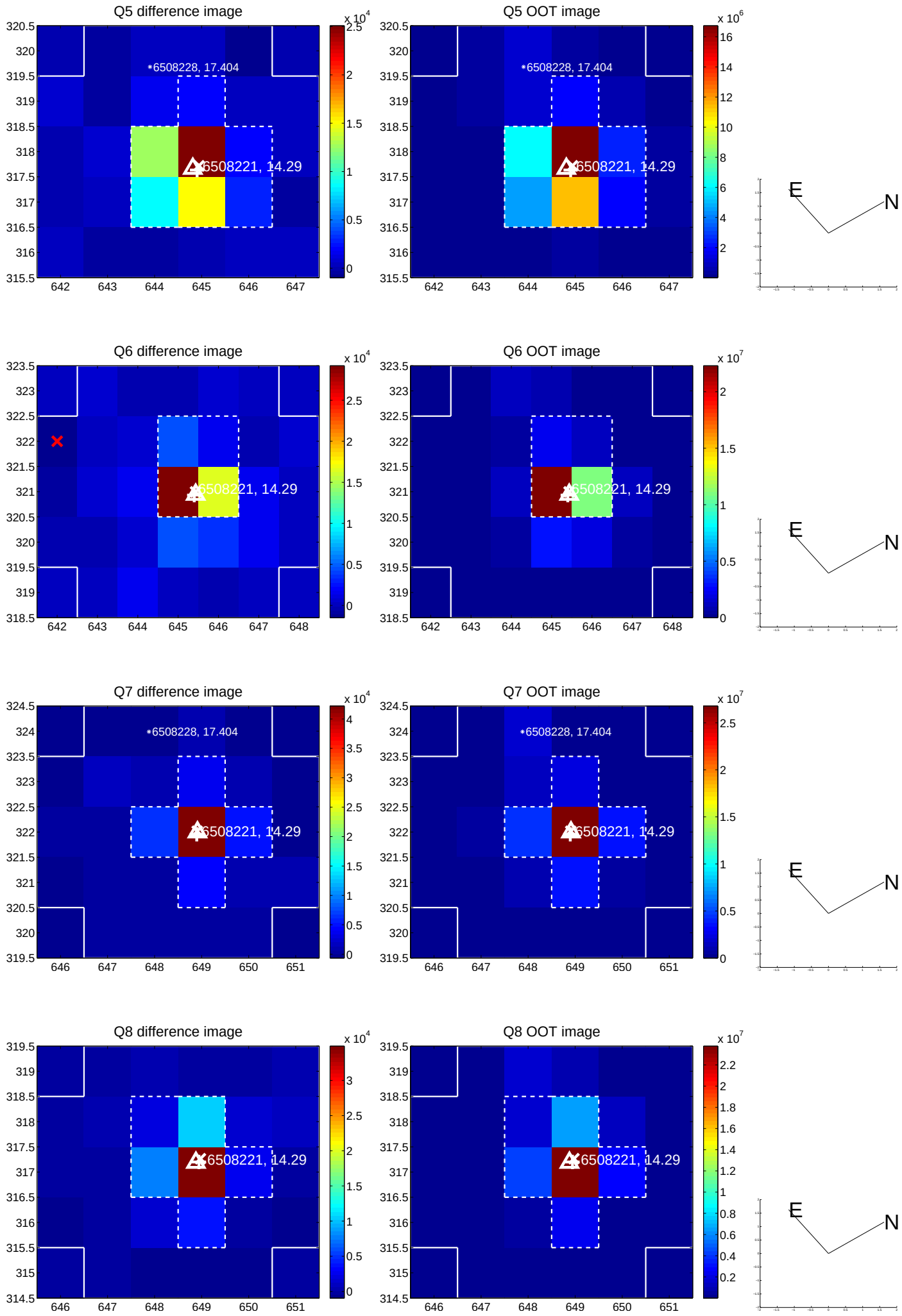


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

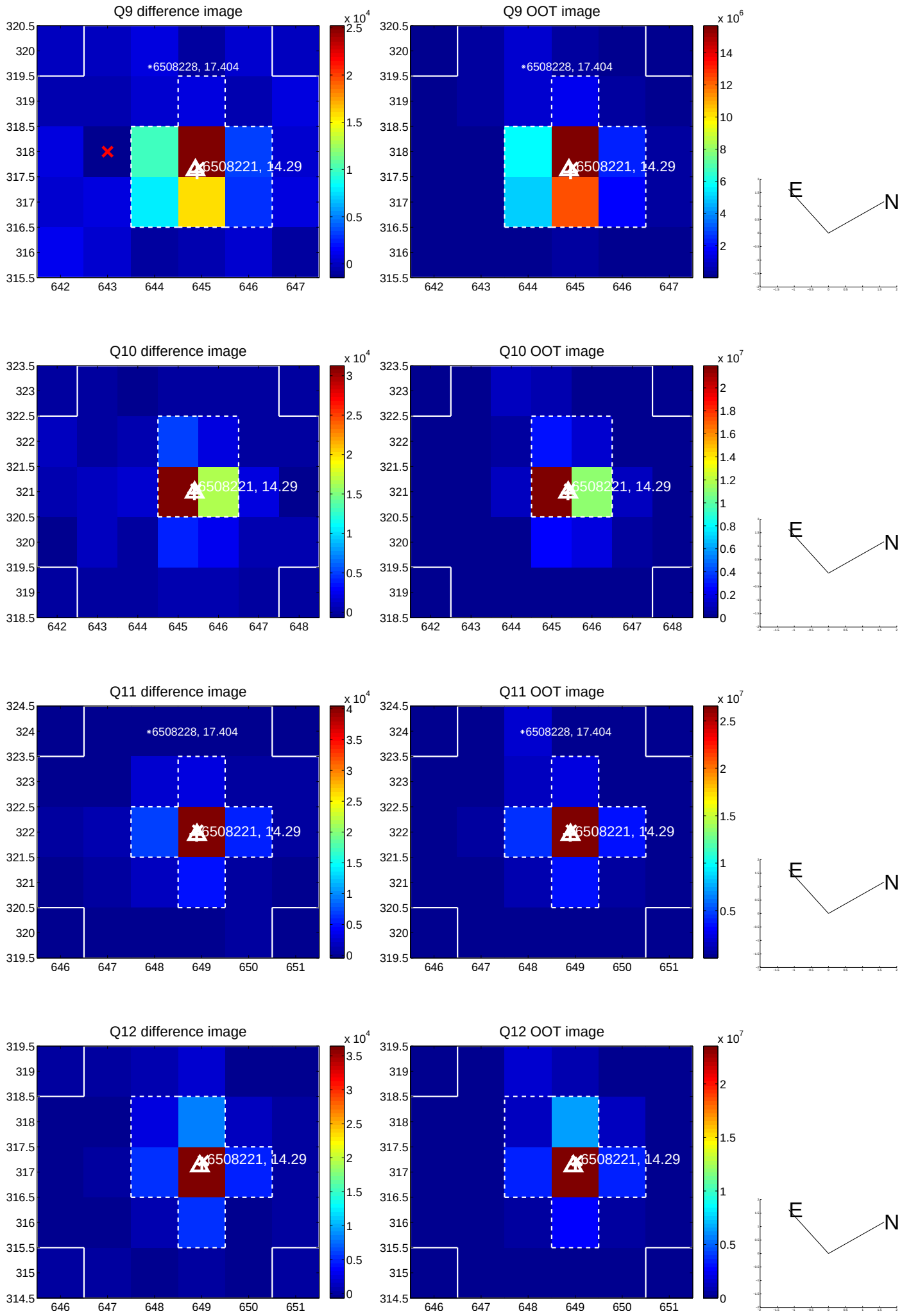
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



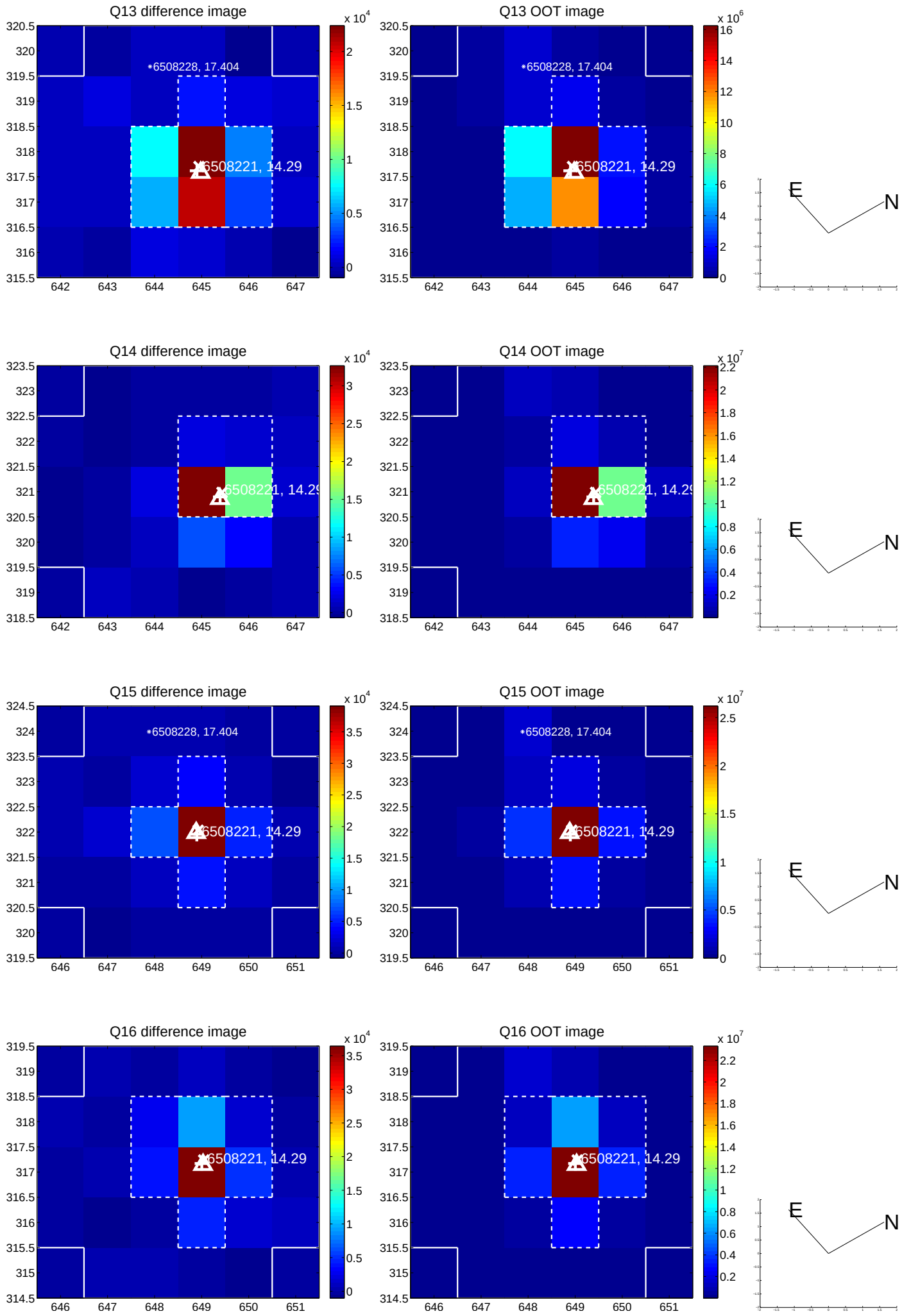
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



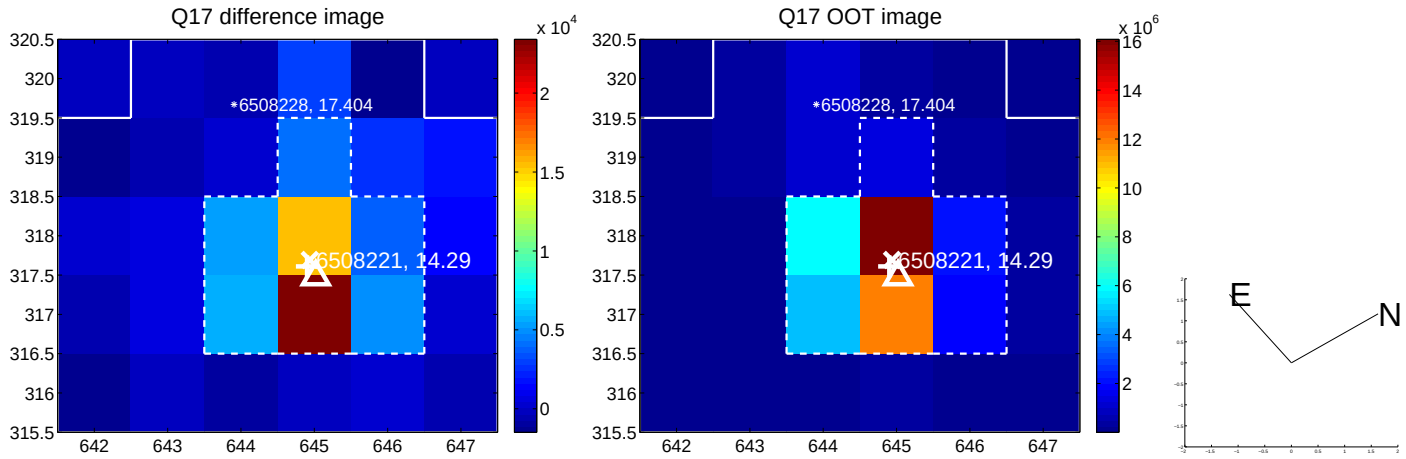
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

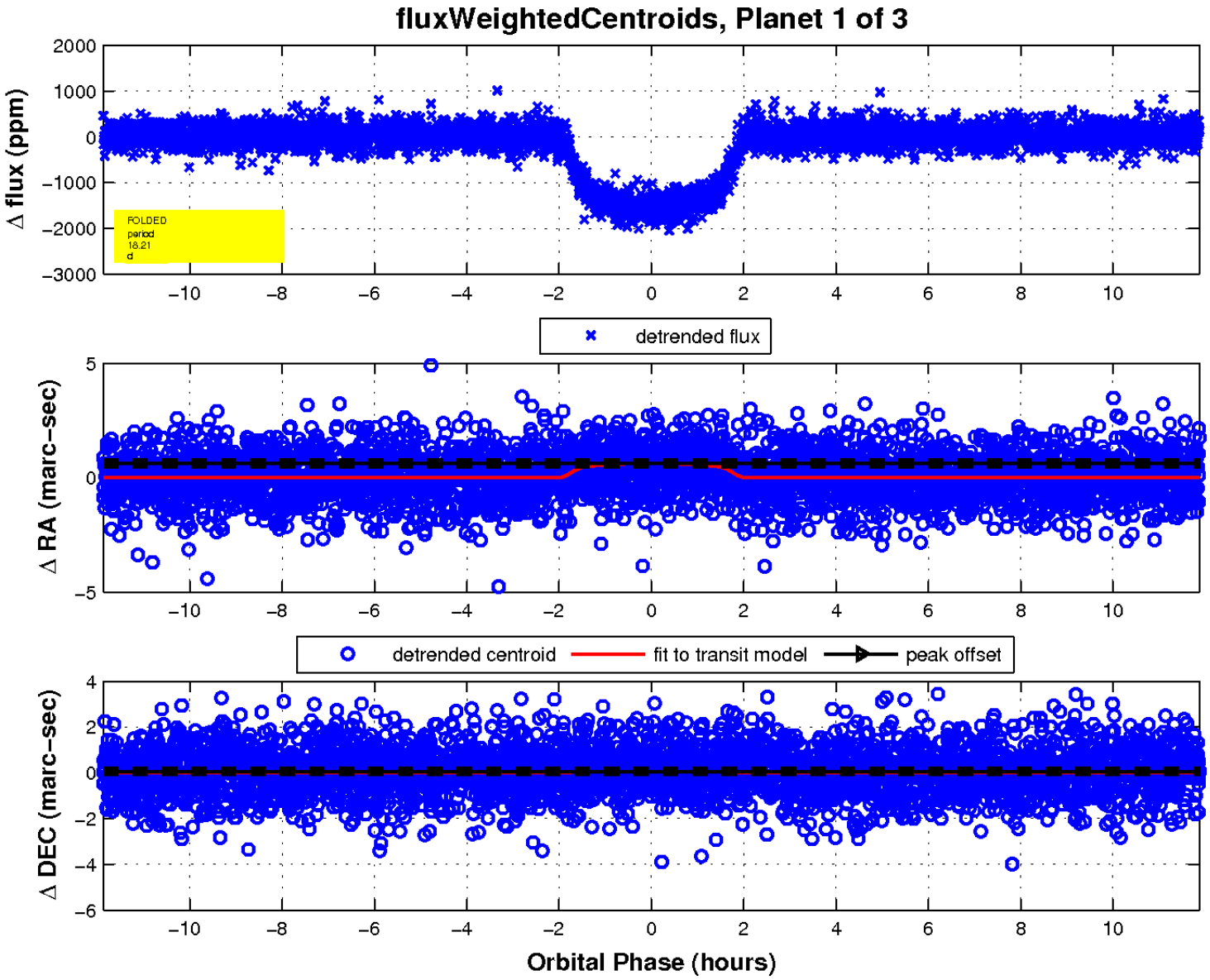


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

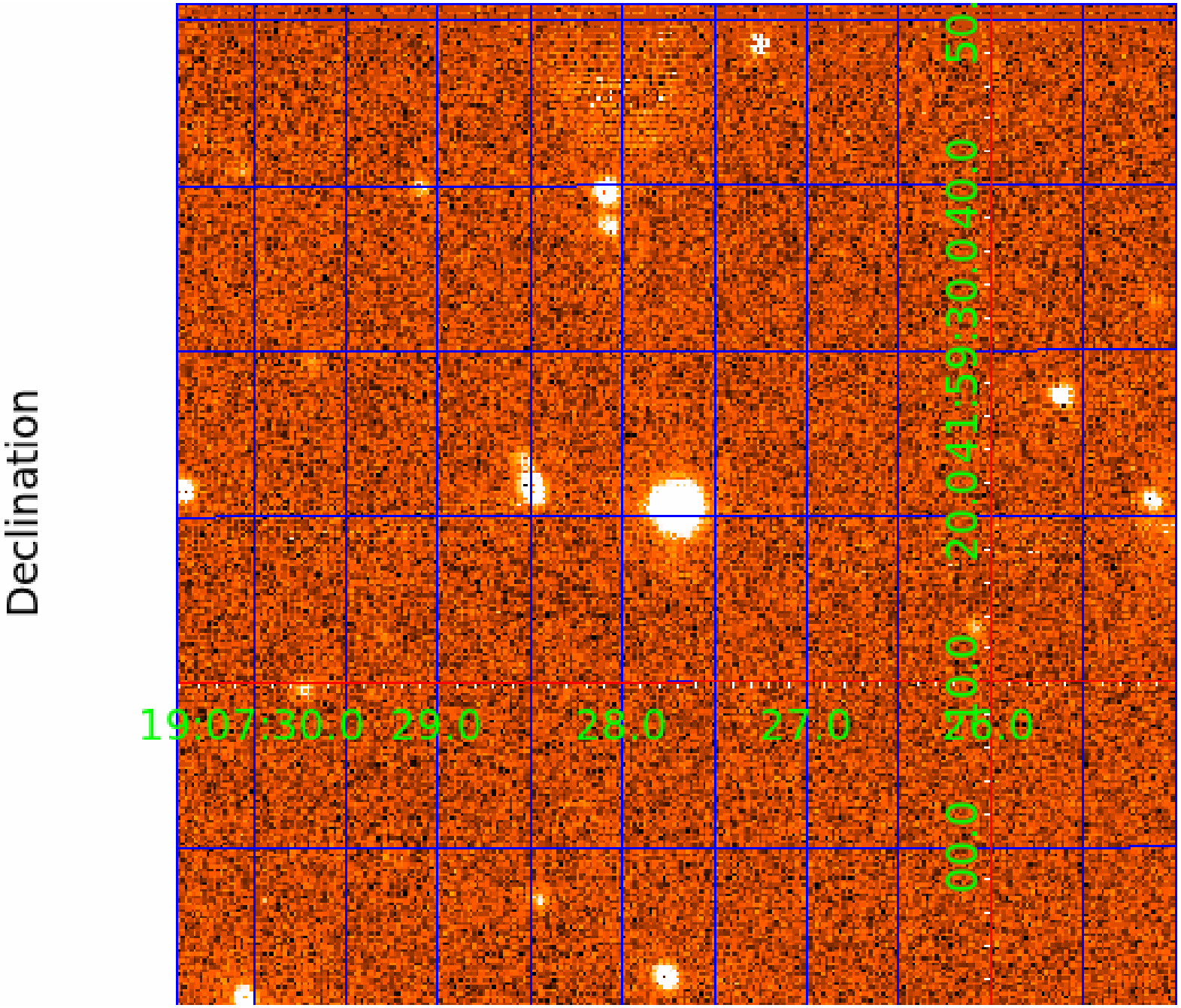


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image



KIC 006508221

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 ($S_\oplus$)
006508221-01	OBS	0416.01	18.207969	149.426691	1596.2	3.960	148.2	146.5	0.74	5176	3.32	21.91
006508221-02	OBS	0416.02	88.255315	153.779831	1115.8	4.542	52.3	50.3	0.74	5176	2.92	2.67
006508221-03	OBS	0416.03	9.747655	139.168048	113.1	3.309	9.2	10.6	0.74	5176	1.54	50.39

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006508221-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006508221-02	OBS	PC	0.77	0	0	0	0	CENT_KIC_POS
006508221-03	OBS	PC	0.98	0	0	0	0	CENT_KIC_POS

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.

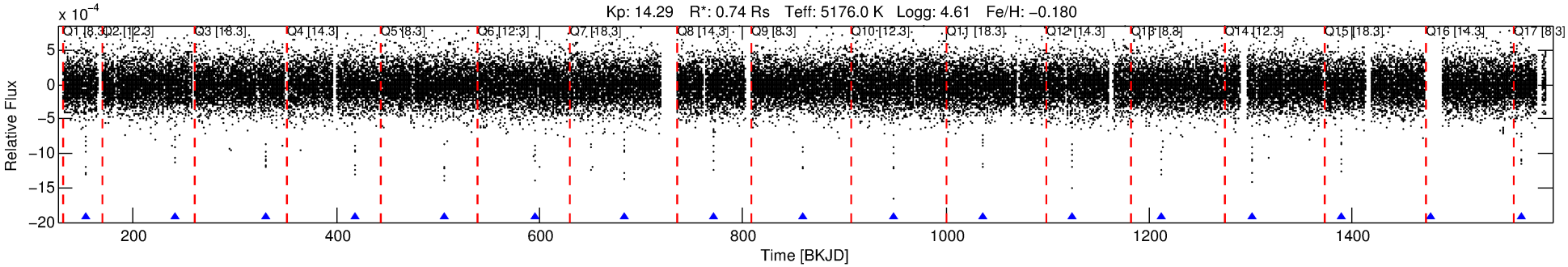
Ephemeris Match Information For 006508221-02

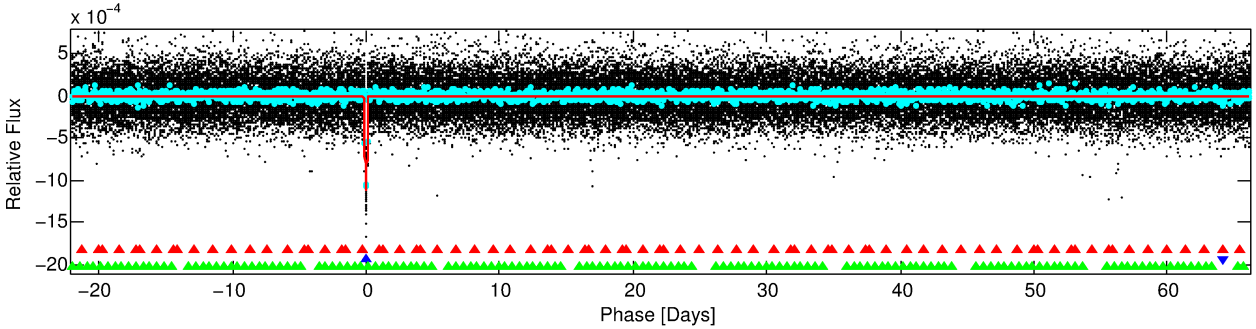
No Significant Match Found

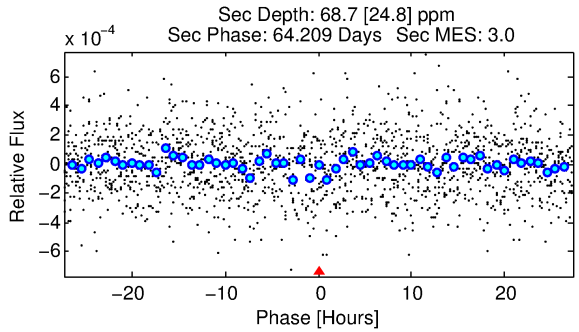
DV One-Page Summary

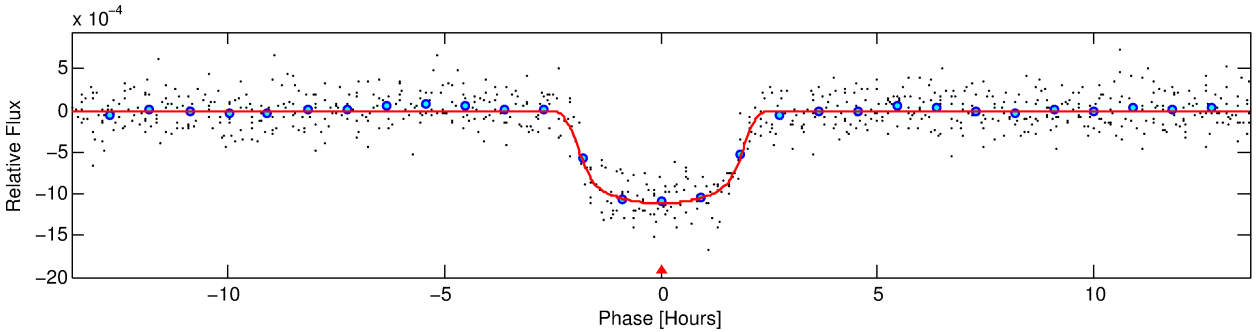
KIC: 6508221 Candidate: 2 of 3 Period: 88.255 d
KOI: K00416.02 Name: Kepler−152c Corr: 0.946

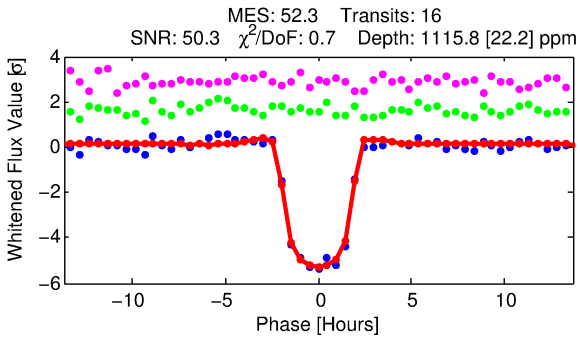
Kp: 14.29 R*: 0.74 Rs Teff: 5176.0 K Logg: 4.61 Fe/H: −0.180

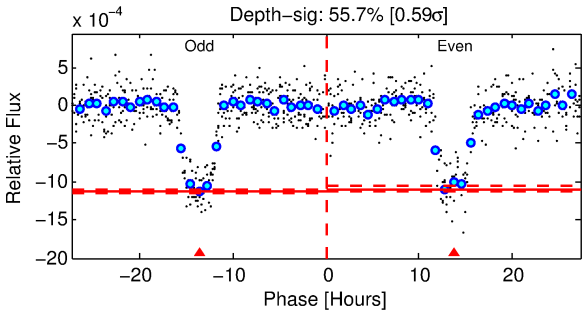


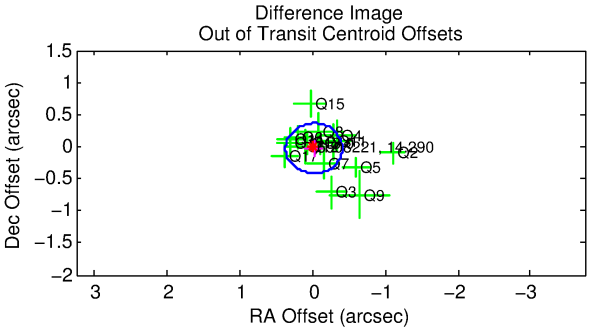












DV Fit Results:

Period = 88.25531 [0.00020] d
Epoch = 153.7798 [0.0019] BKJD
Rp/R* = 0.0363 [0.0015]
a/R* = 80.89 [12.17]
b = 0.88 [0.04]

Seff = 2.67 [0.35]
Teq = 326 [11] K
Rp = 2.93 [0.24] Re
a = 0.3622 [0.0243] AU

Ag = 579.17 [222.82] [2.59σ]
Teffp = 2472 [234] K [9.16σ]

DV Diagnostic Results:

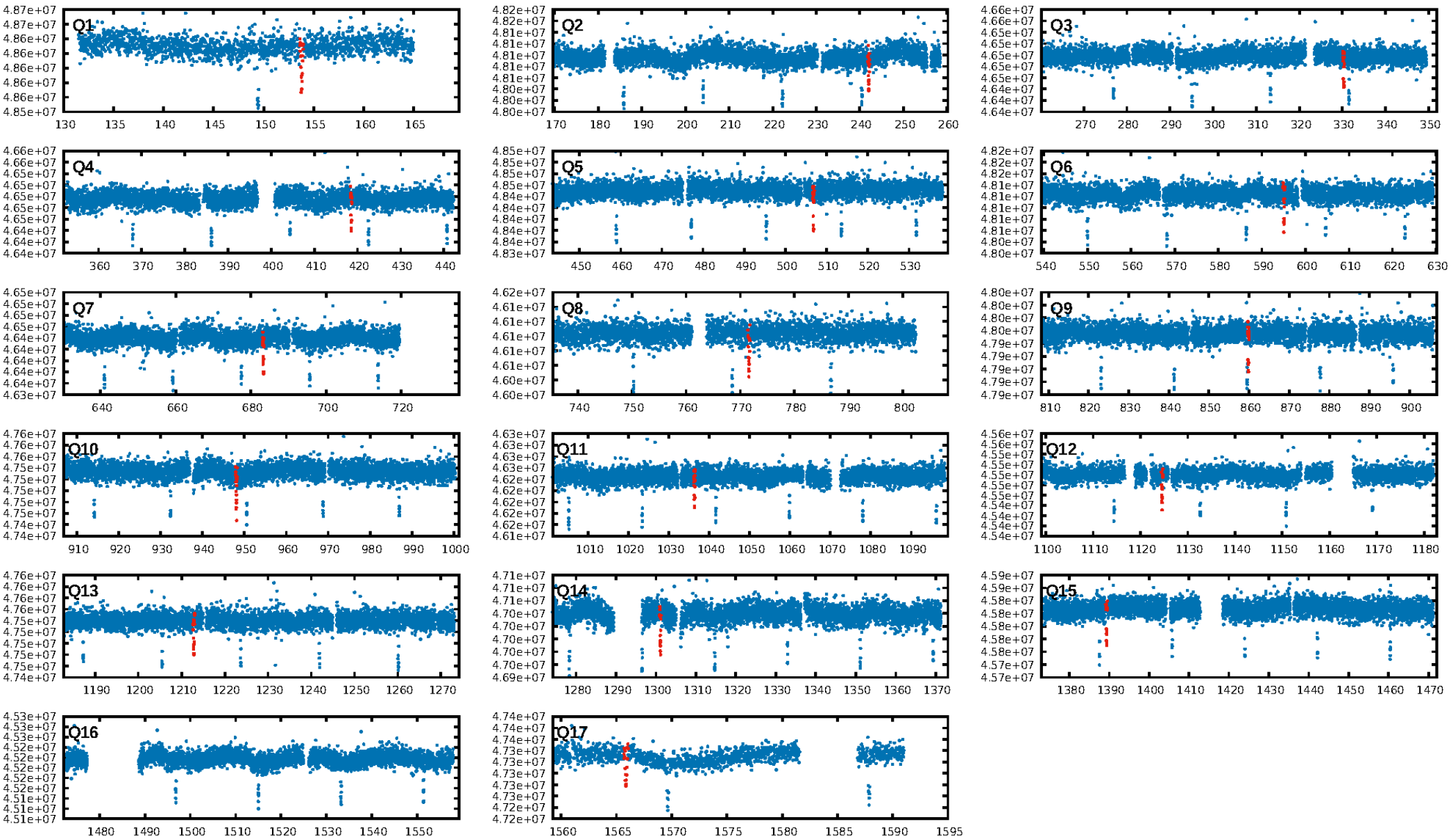
ShortPeriod−sig: 100.0% [278.97σ]
LongPeriod−sig: N/A
ModelChiSquare2−sig: 78.5%
ModelChiSquareGof−sig: 100.0%
Bootstrap−pfa: 0.00e+00
RollingBand−fgt: 1.00 [14/14]
GhostDiagnostic−chr: 6.236

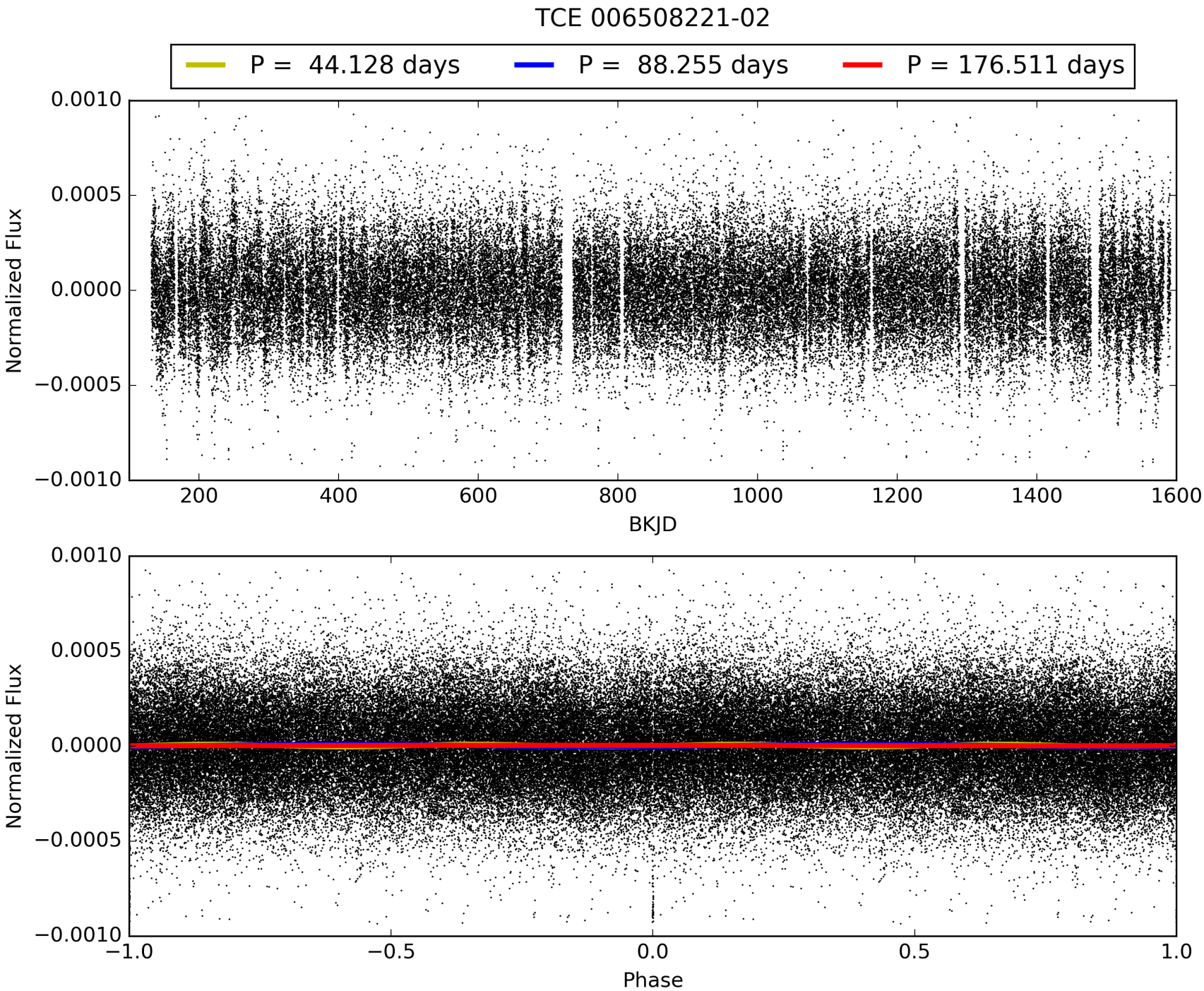
Centroid−sig: 15.4%
Centroid−so: 0.374 arcsec [1.45σ]
OotOffset−rm: 0.033 arcsec [0.25σ]
KicOffset−rm: 0.367 arcsec [2.99σ]
OotOffset−st: 4/4/3/5 [16]
KicOffset−st: 4/4/3/5 [16]
DiffImageQuality−fgm: 1.00 [16/16]
DiffImageOverlap−fno: 0.81 [13/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 −− Date Generated: 31−Jan−2016 22:53:14 Z

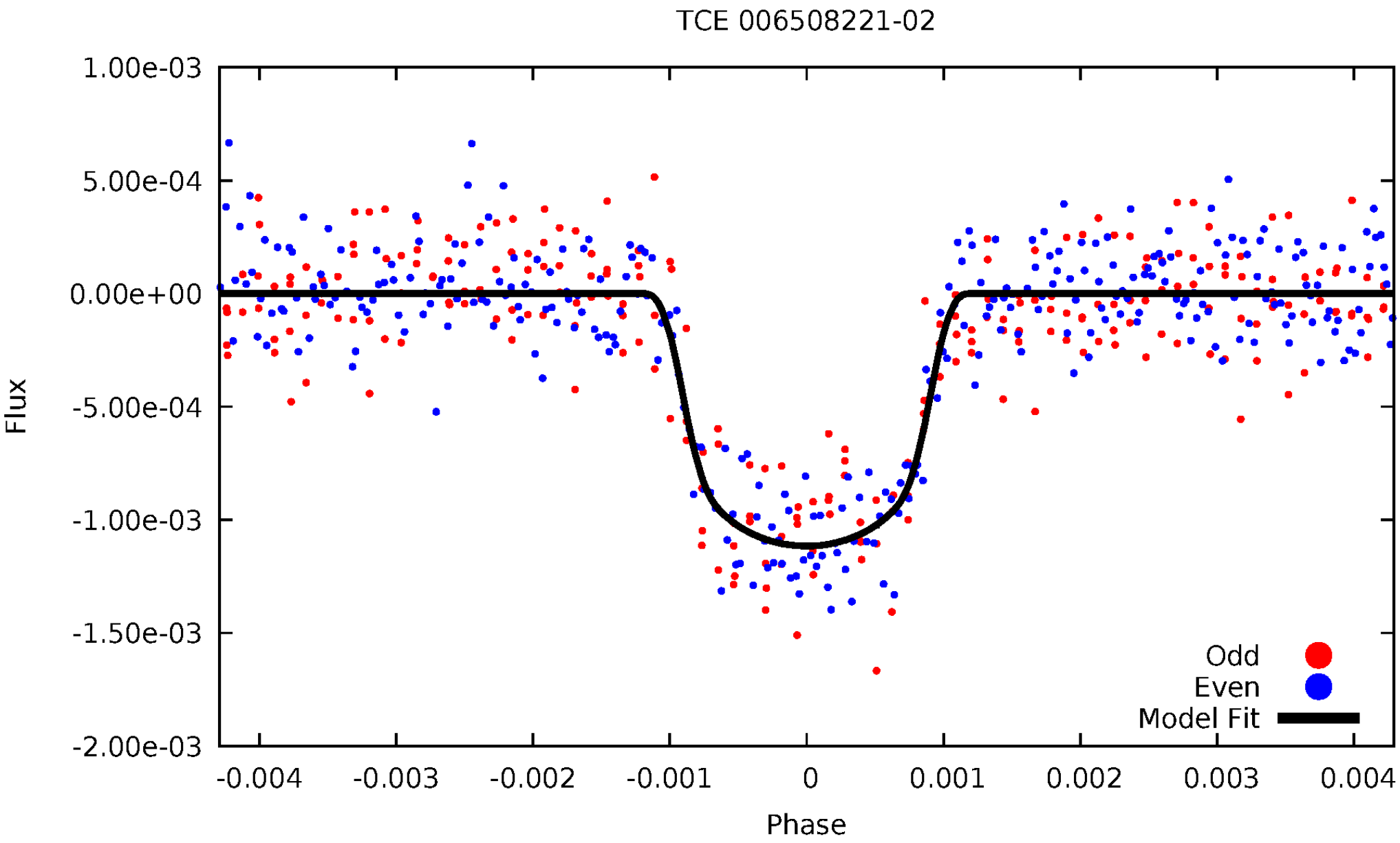
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006508221-02, PDC Light Curves

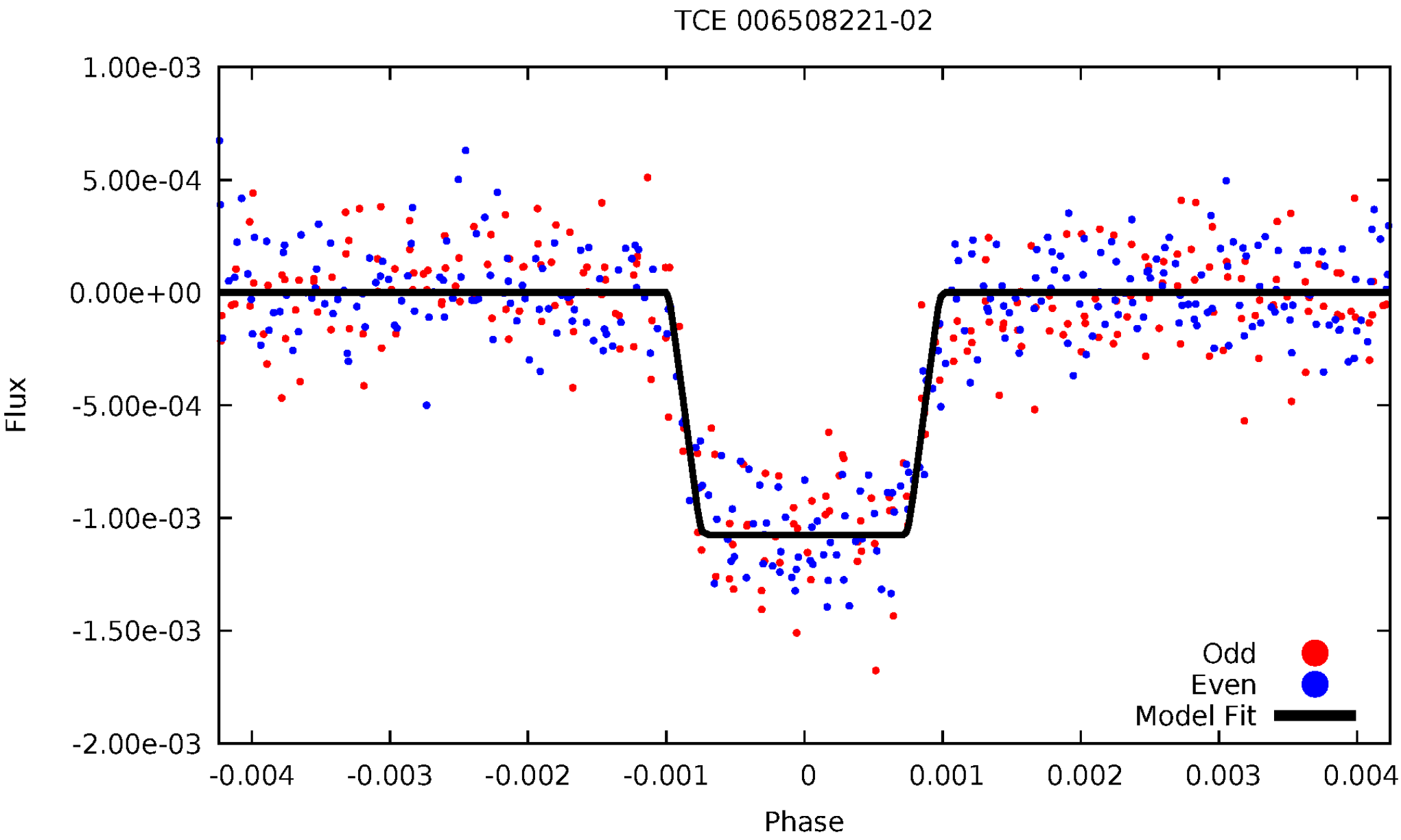



TCE 006508221-02
P = 44.128 days
P = 88.255 days
P = 176.511 days
Normalized Flux
0.0010
0.0005
0.0000
−0.0005
−0.0010
200
400
600
800
1000
1200
1400
1600
BKJD
Normalized Flux
0.0010
0.0005
0.0000
−0.0005
−0.0010
−1.0
−0.5
0.0
0.5
1.0
Phase

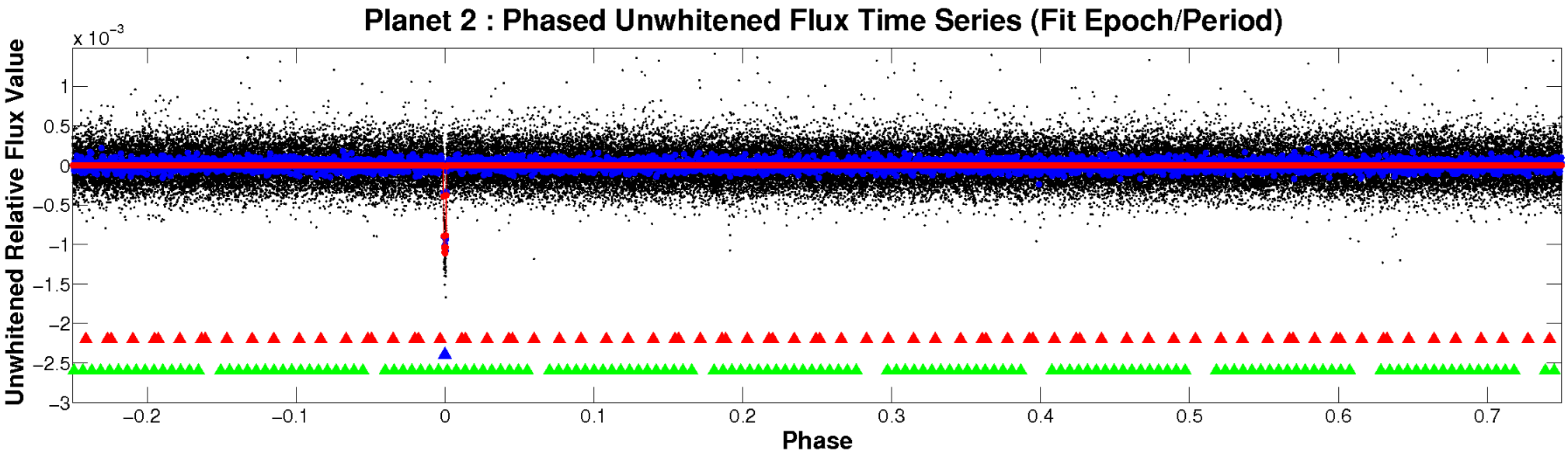
DV Odd/Even

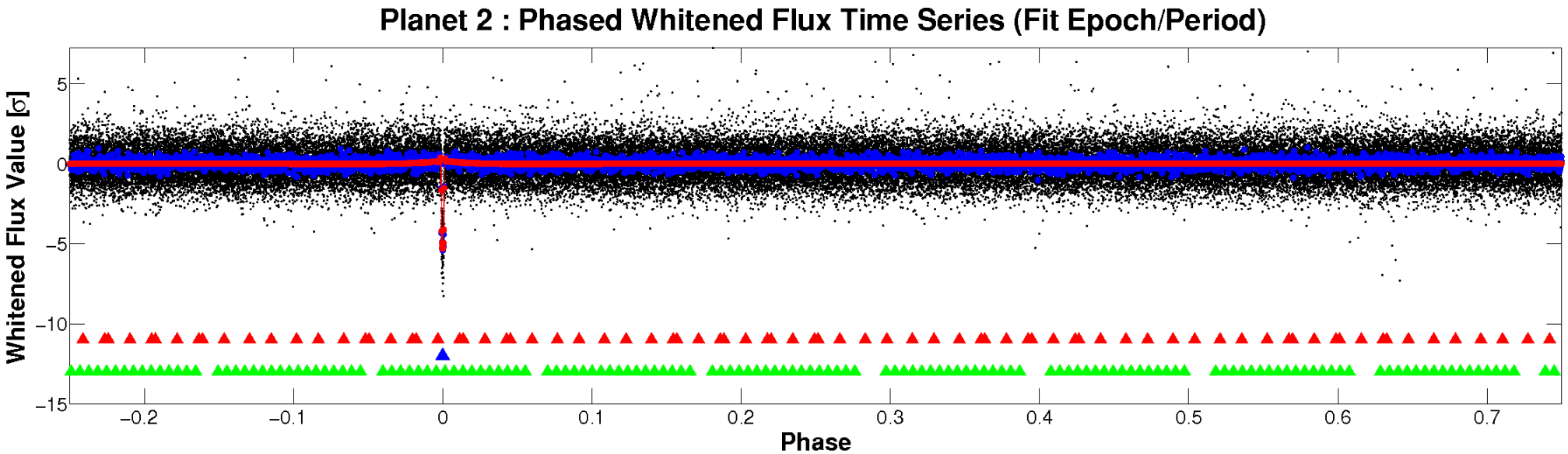

TCE 006508221-02
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
Flux
-0.004
-0.003
-0.002
-0.001
0
0.001
0.002
0.003
0.004
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 006508221-02
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
Flux
-0.004
-0.003
-0.002
-0.001
0
0.001
0.002
0.003
0.004
Phase
Odd
Even
Model Fit

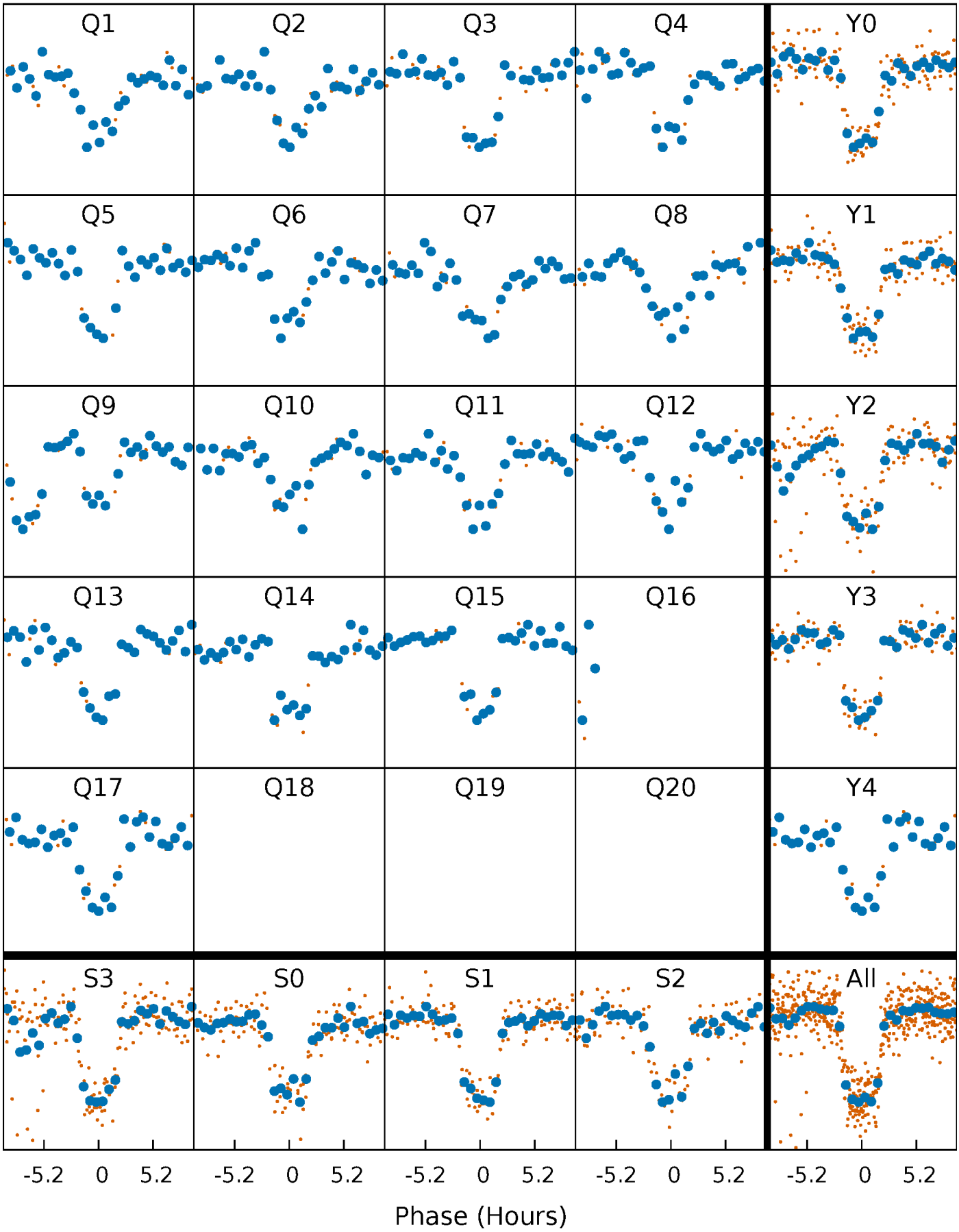
Non-Whitened Vs. Whitened Light Curve





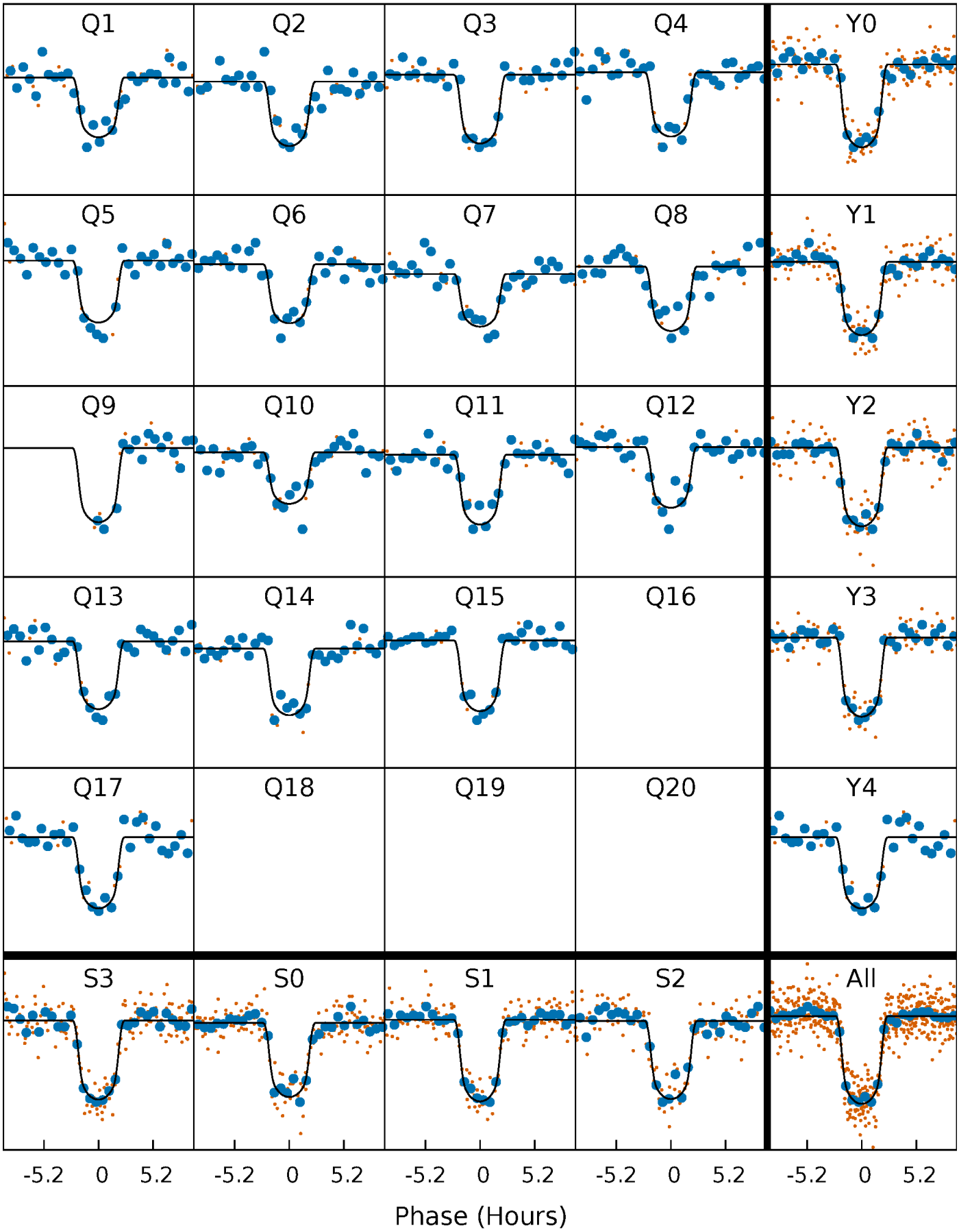
PDC Quarter-Phased Transit Curves

TCE 006508221-02 P= 88.255315 Days T_0=153.779831 (BKJD)



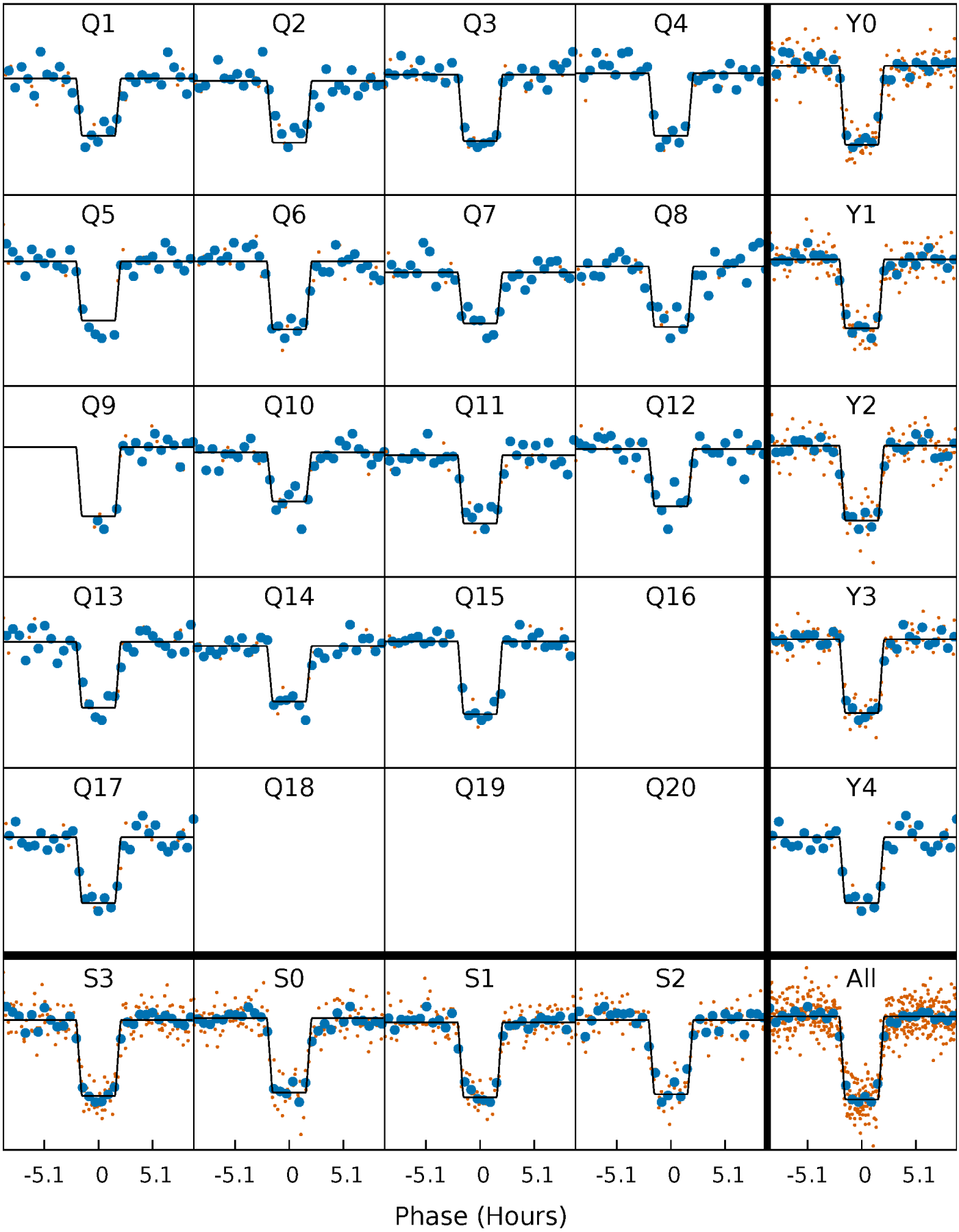
DV Quarter-Phased Transit Curves

TCE 006508221-02 P= 88.255315 Days T_0=153.779831 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

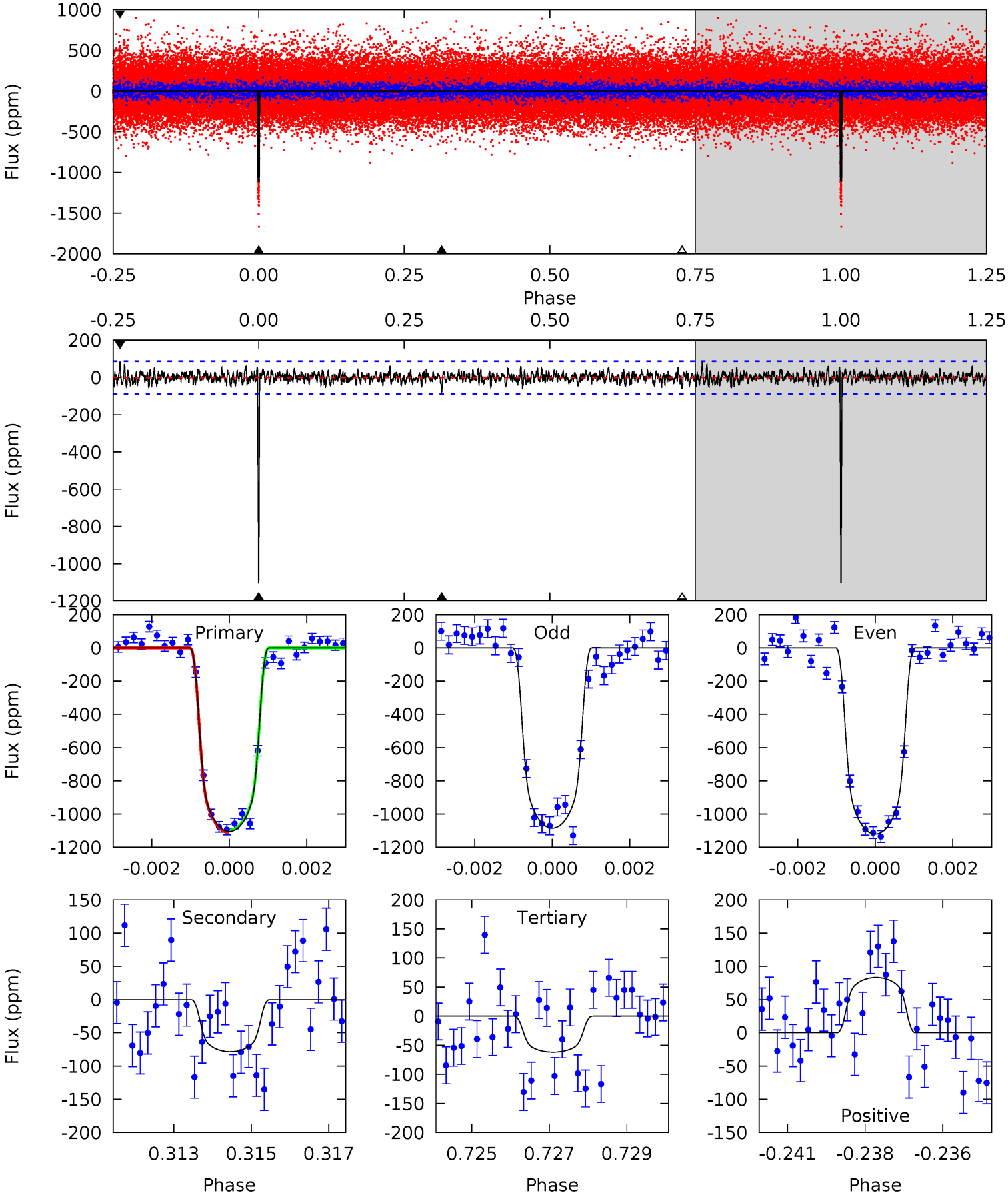
TCE 006508221-02 P= 88.254975 Days T_0=153.782392 (BKJD)



DV Model-Shift Uniqueness Test

006508221-02, P = 88.255315 Days, E = 65.524516 Days

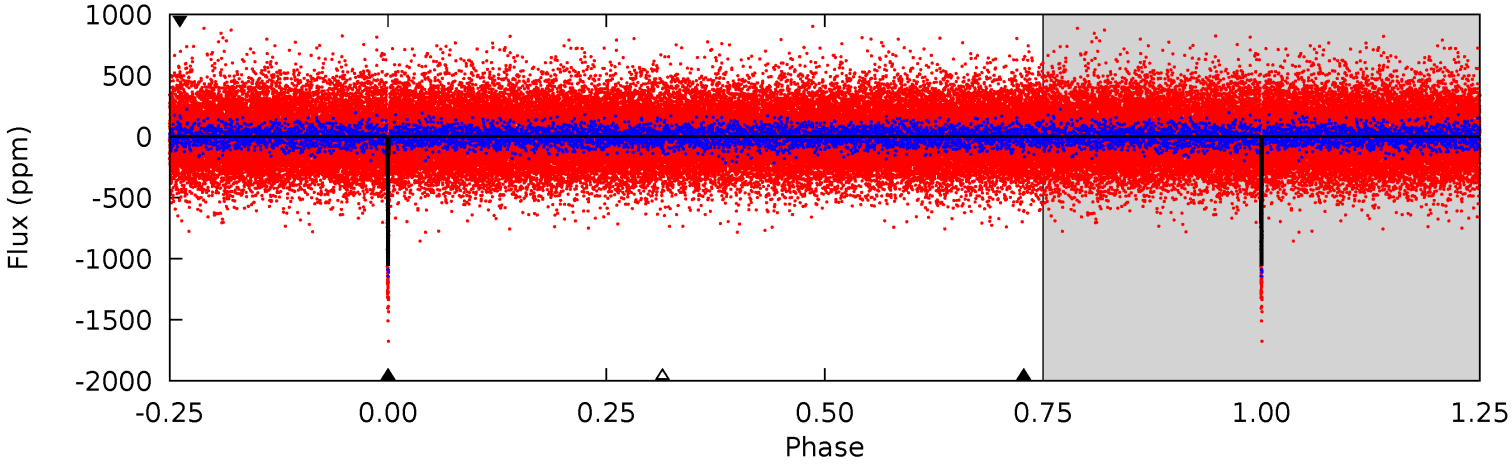
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
67.1	4.77	3.76	5.05	5.30	3.05	1.21	63.3	62.1	1.01	-0.28	1.09	0.98	0.07	0.44

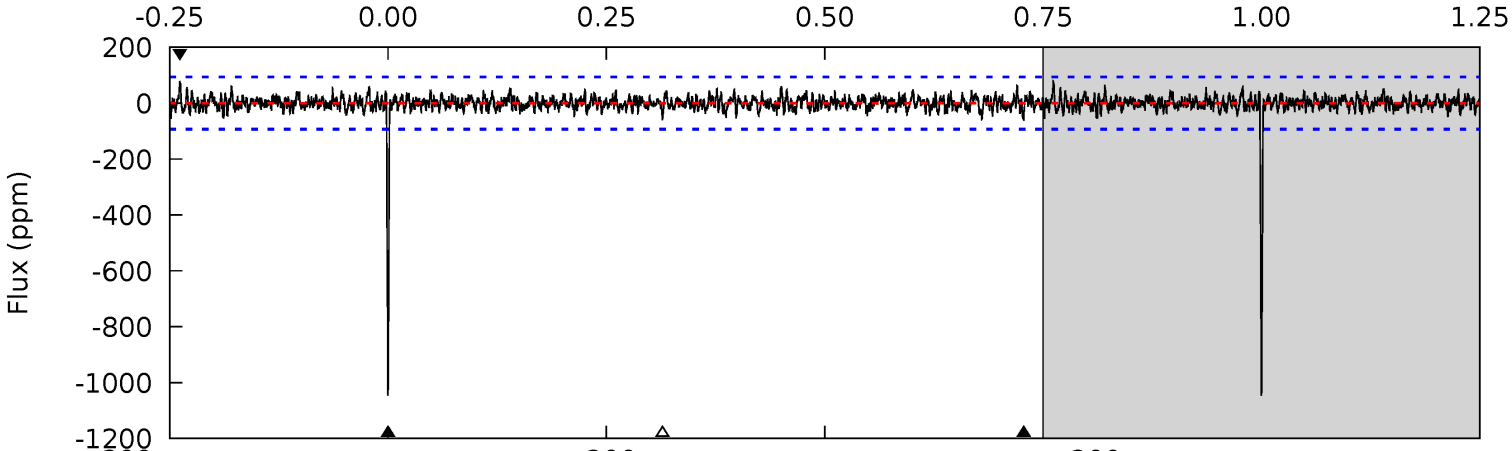


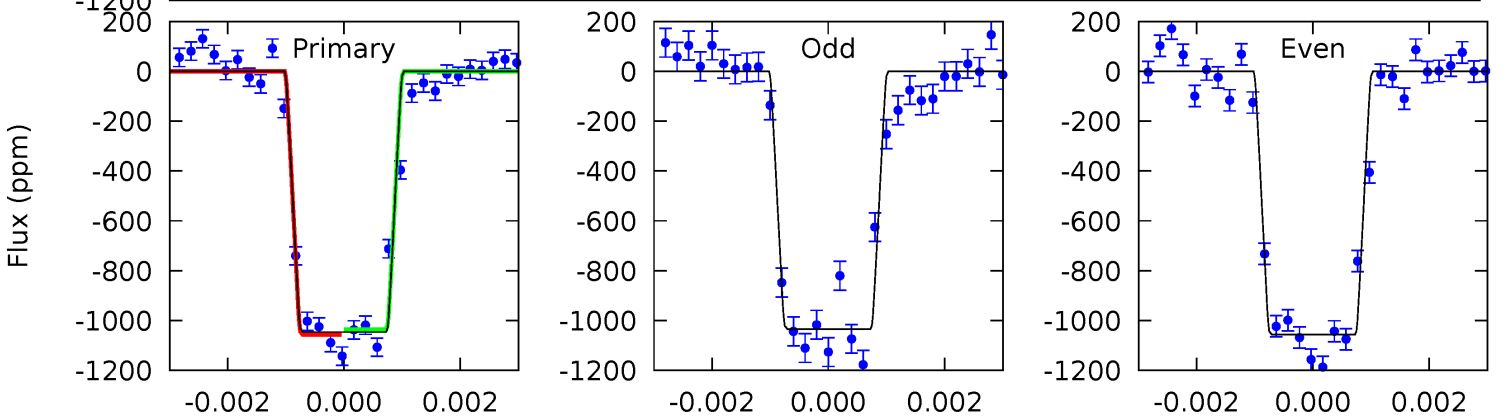
Alt Model-Shift Uniqueness Test

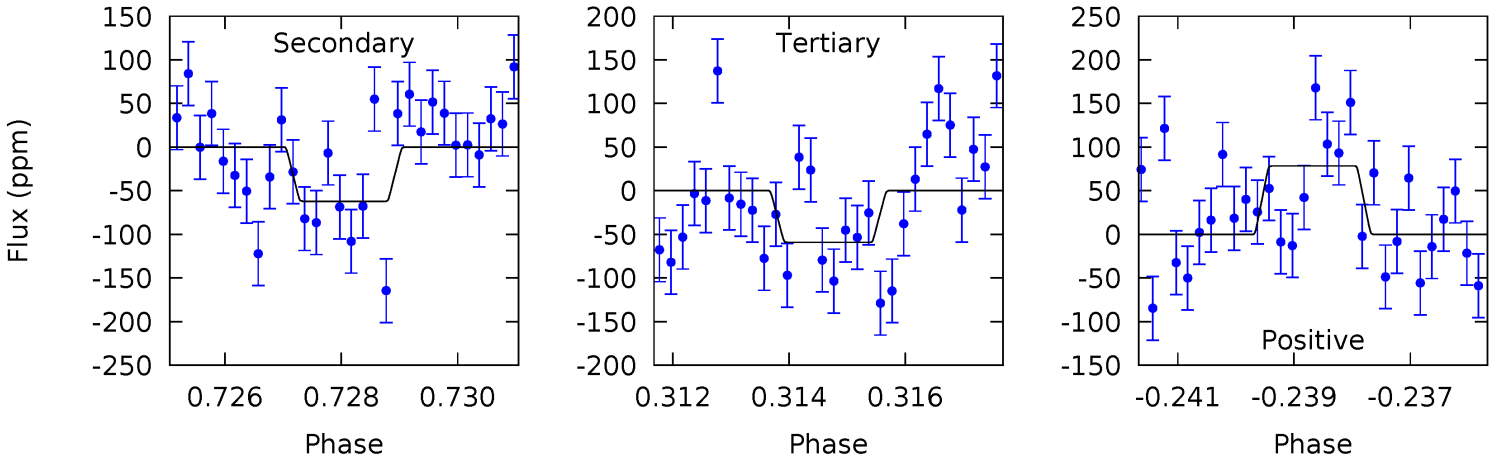
006508221-02, P = 88.254975 Days, E = 65.527417 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
59.5	3.53	3.37	4.46	5.33	3.09	1.05	56.1	55.0	0.16	-0.93	0.64	1.00	0.07	0.63









Stellar Parameters For KIC 006508221

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5176^{+102}_{-102}	$4.612^{+0.016}_{-0.060}$	$-0.180^{+0.150}_{-0.150}$	$0.738^{+0.054}_{-0.031}$	$0.826^{+0.035}_{-0.069}$	$2.891^{+0.251}_{-0.575}$
	+2%/-2%	+0%/-1%	+83%/-83%	+7%/-4%	+4%/-8%	+9%/-20%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 006508221-02 / KOI 0416.02

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-78±16	$2.97^{+0.17}_{-0.17}$	460^{+12}_{-11}	3142^{+100}_{-111}	628^{+156}_{-127}
Alt.	-62±18	$2.68^{+0.17}_{-0.15}$	461^{+11}_{-11}	3131^{+137}_{-154}	616^{+200}_{-174}

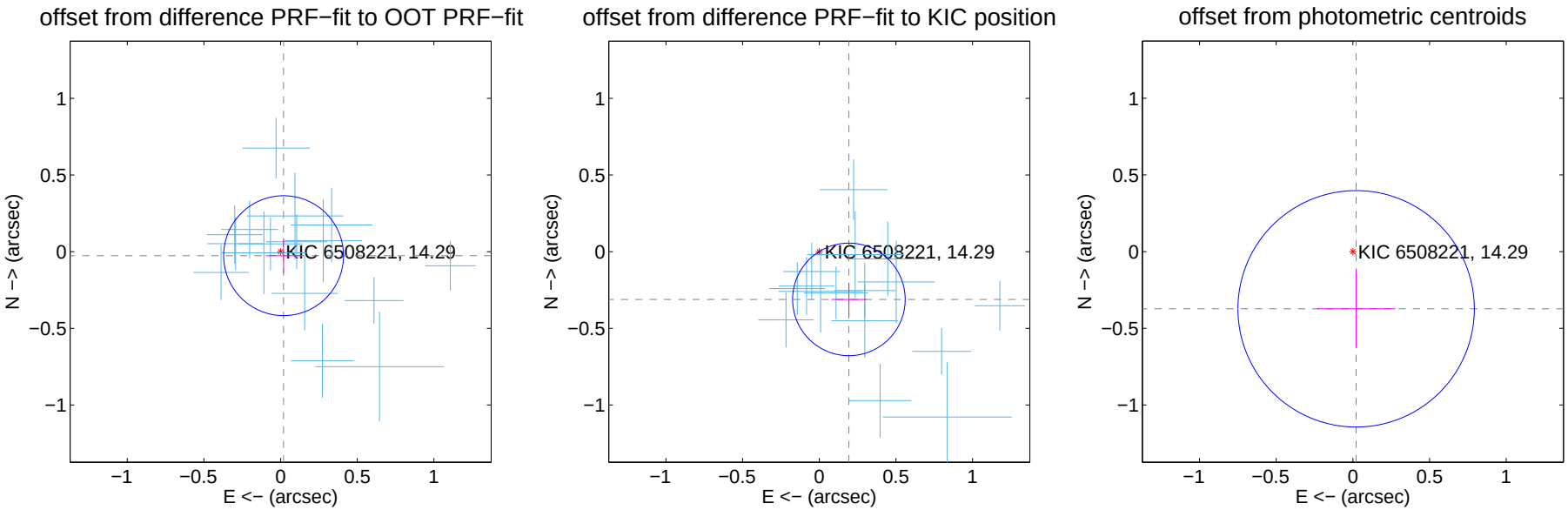
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

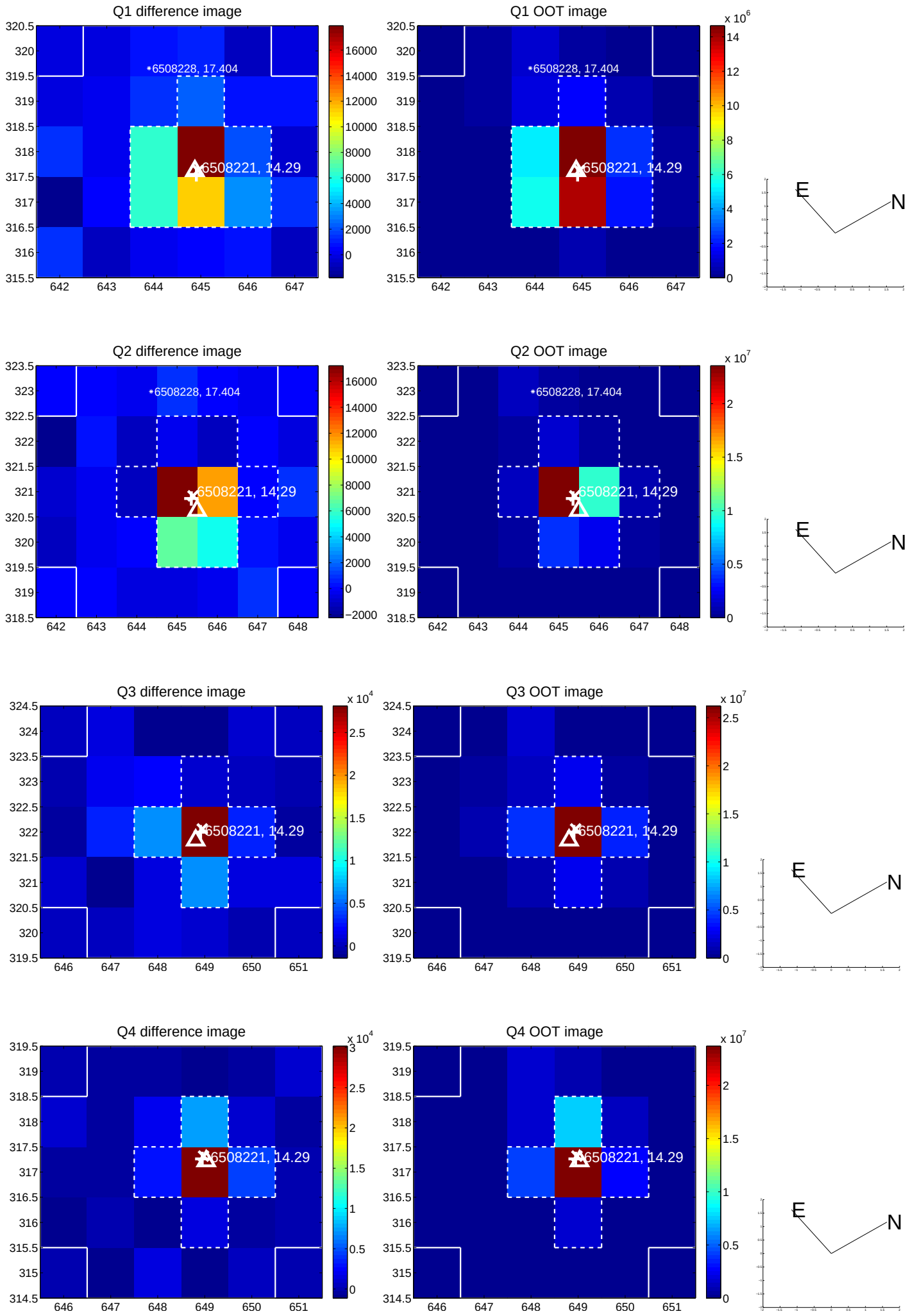
Supplemental centroid analysis for 006508221-02. Kepler magnitude: 14.29. Transit SNR 50.28
There are 16 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.35 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.033 ± 0.130	0.25	-0.019 ± 0.116	-0.026 ± 0.114
PRF-fit source offset from KIC position	0.367 ± 0.122	2.99	-0.193 ± 0.114	-0.311 ± 0.109
photometric centroid source offset	0.37 ± 0.26	1.45	-0.02 ± 0.26	-0.37 ± 0.26

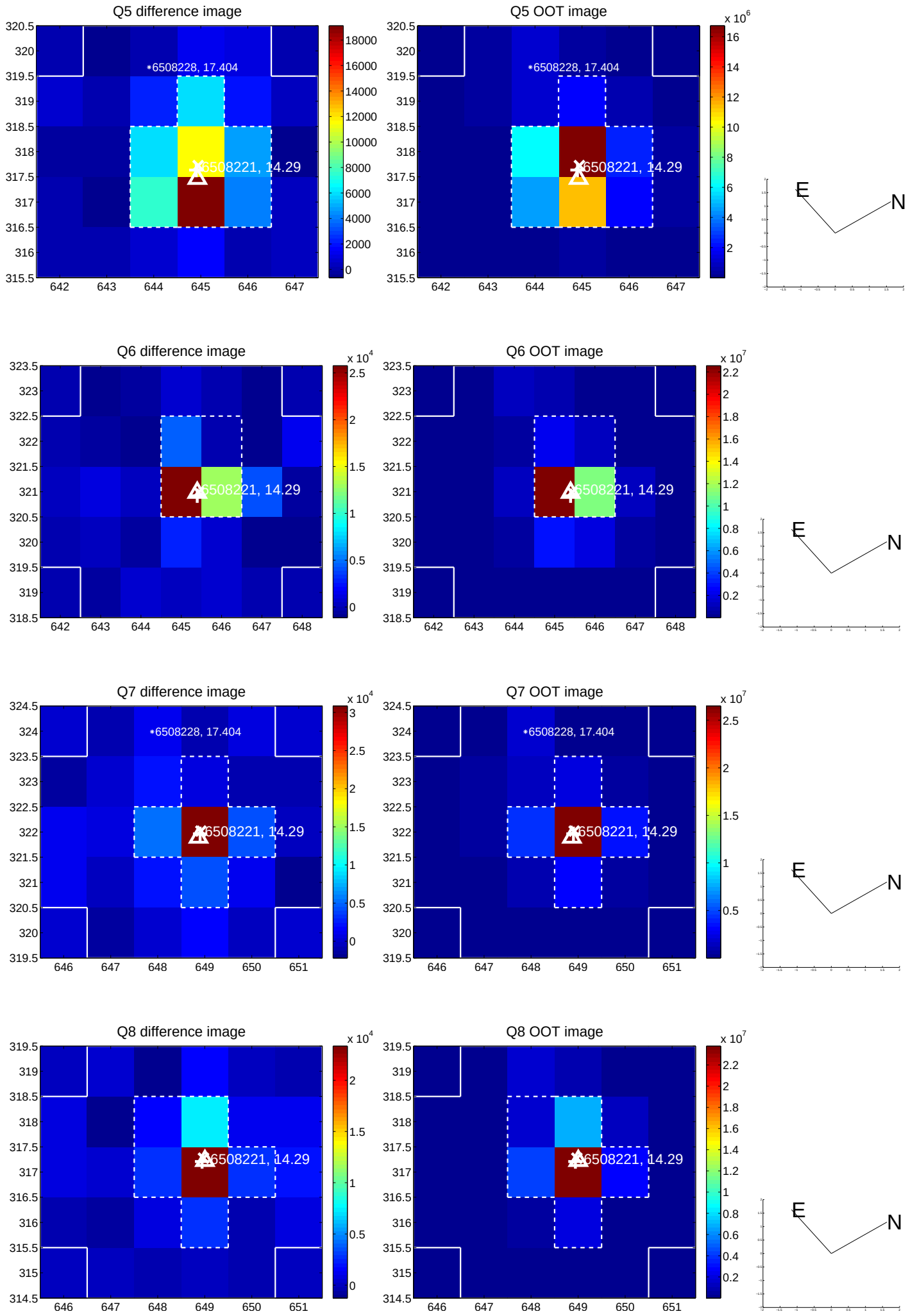


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

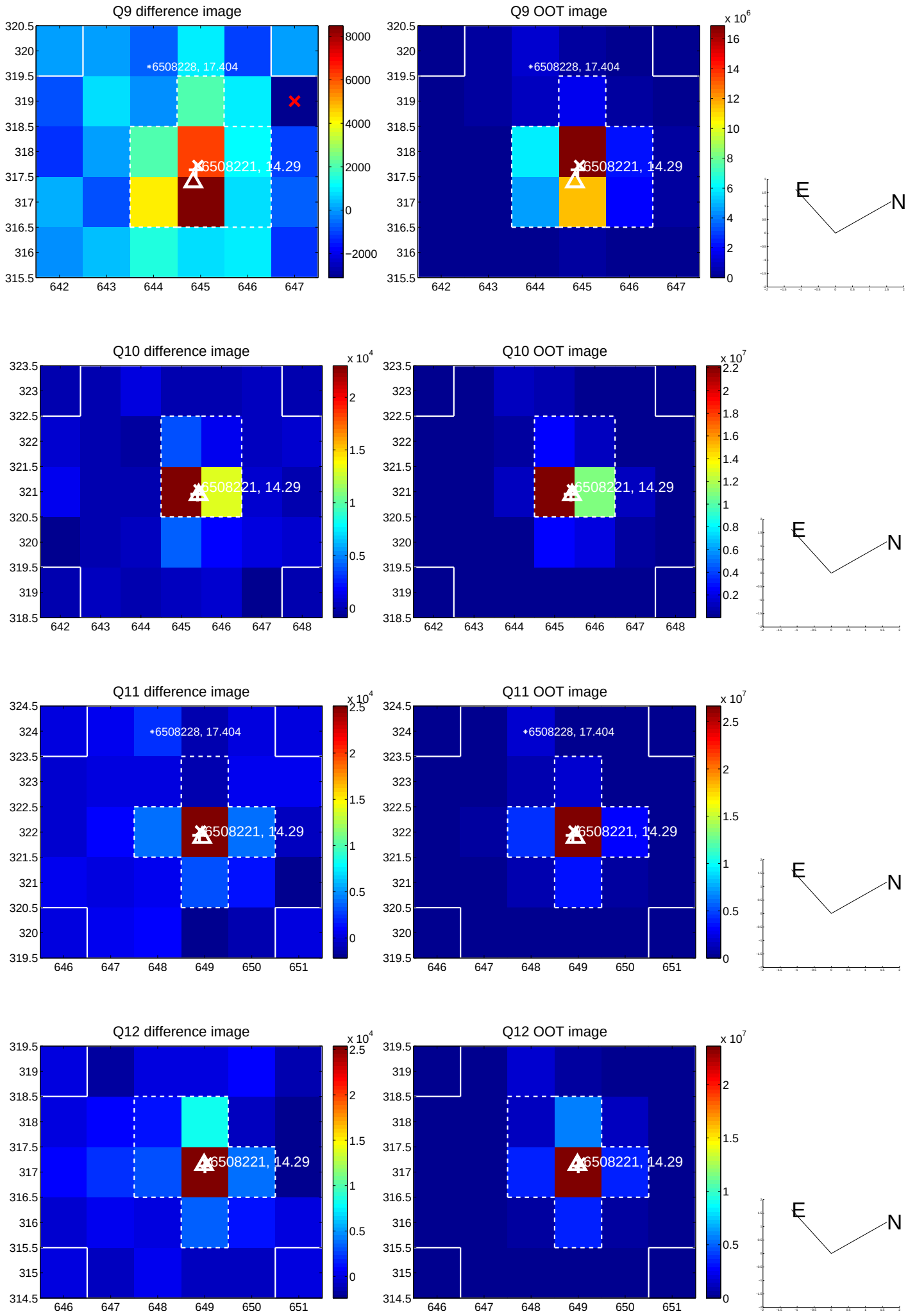
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



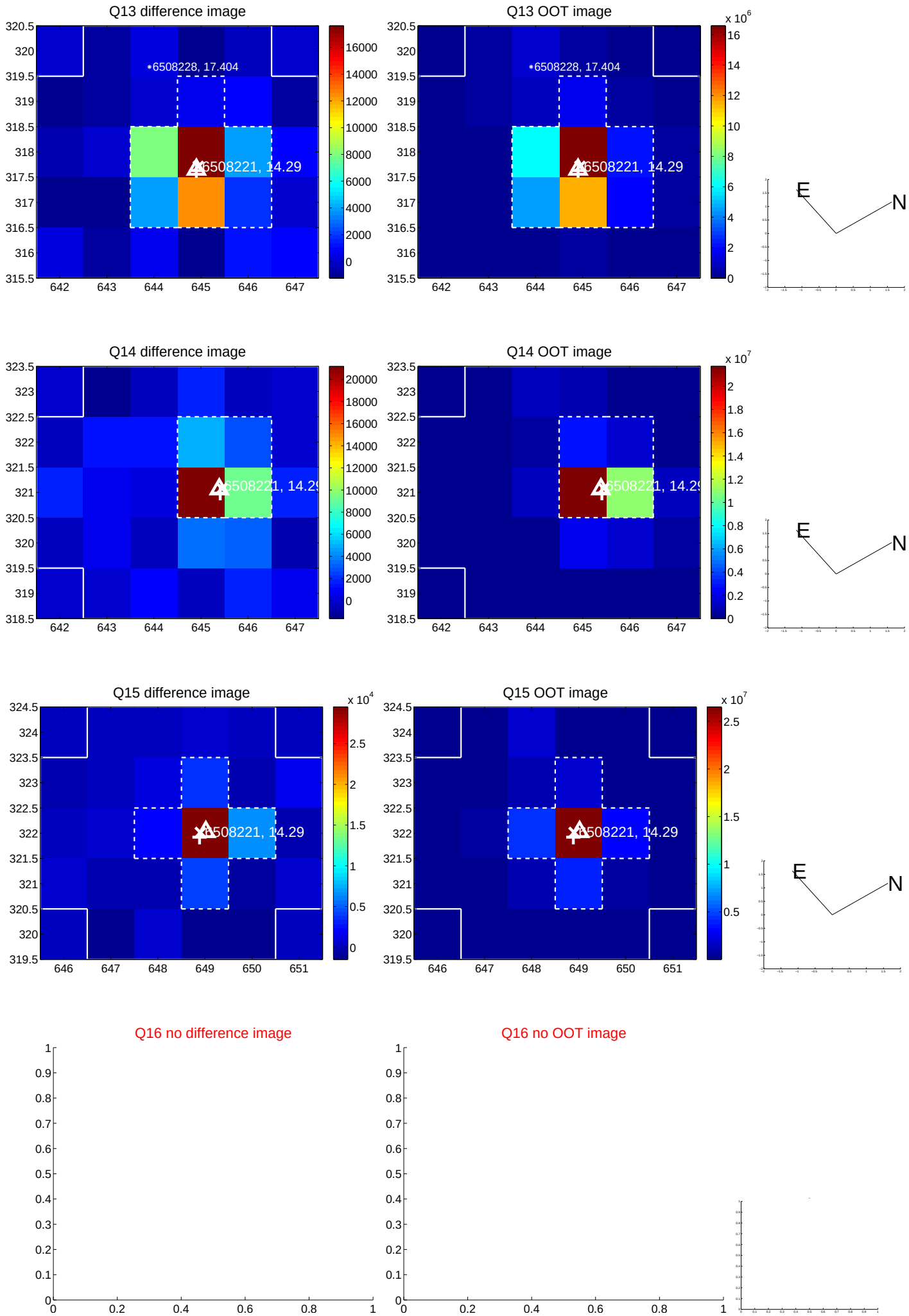
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



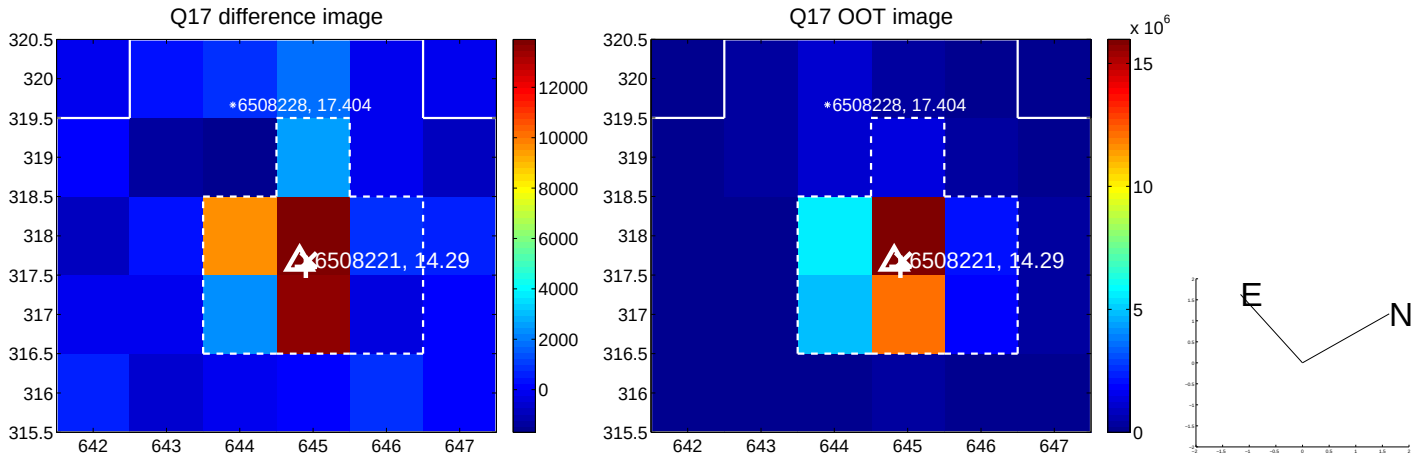
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

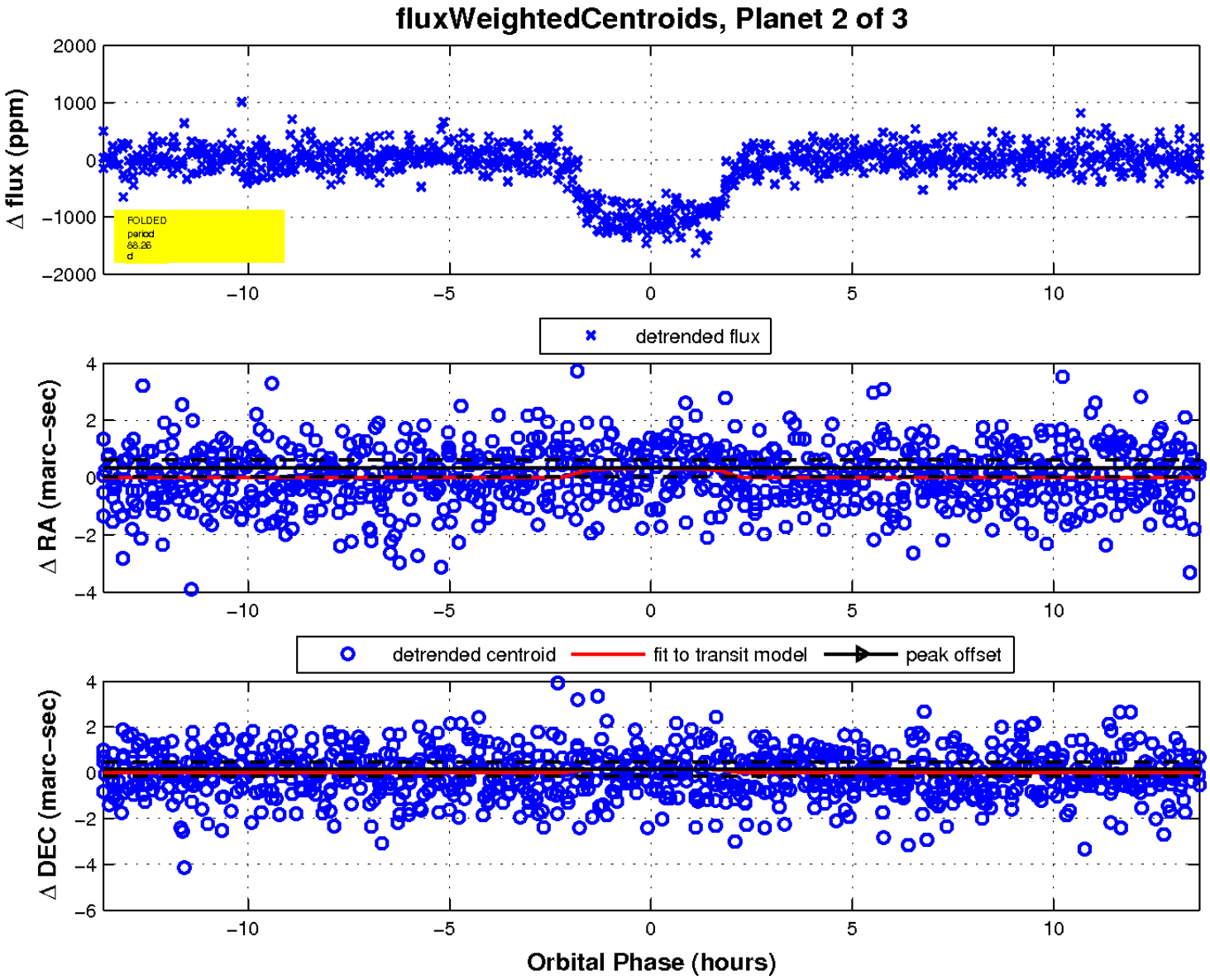


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

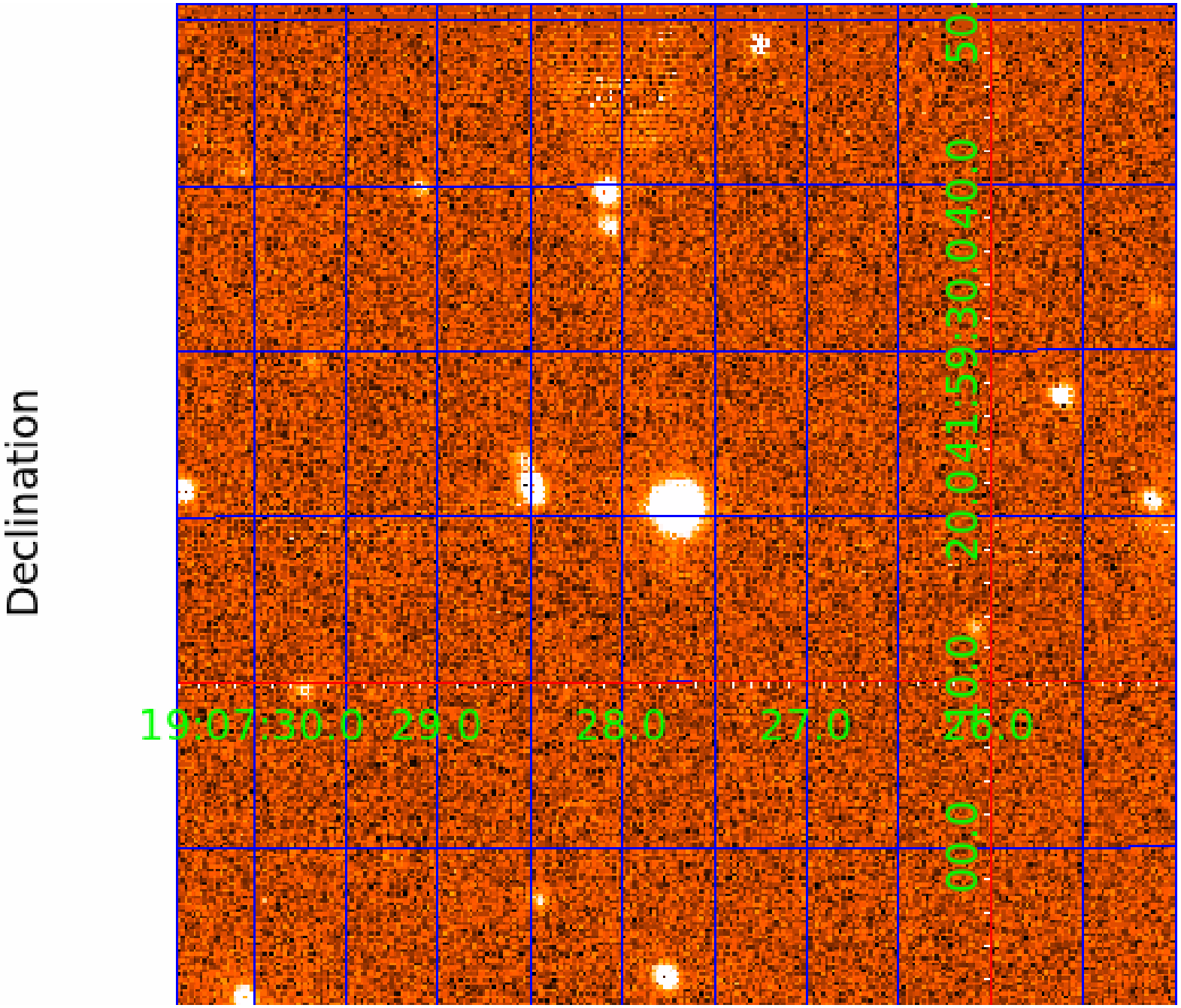


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image



KIC 006508221

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 ($S_\oplus$)
006508221-01	OBS	0416.01	18.207969	149.426691	1596.2	3.960	148.2	146.5	0.74	5176	3.32	21.91
006508221-02	OBS	0416.02	88.255315	153.779831	1115.8	4.542	52.3	50.3	0.74	5176	2.92	2.67
006508221-03	OBS	0416.03	9.747655	139.168048	113.1	3.309	9.2	10.6	0.74	5176	1.54	50.39

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006508221-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
006508221-02	OBS	PC	0.77	0	0	0	0	CENT_KIC_POS
006508221-03	OBS	PC	0.98	0	0	0	0	CENT_KIC_POS

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.

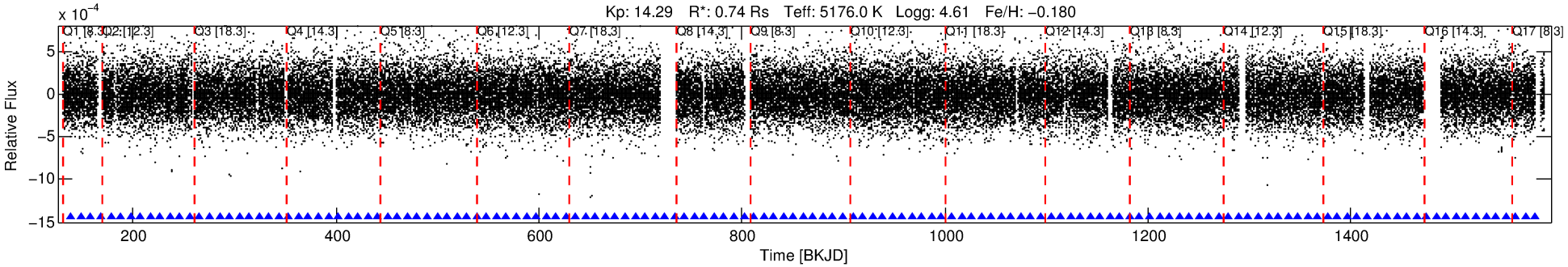
Ephemeris Match Information For 006508221-03

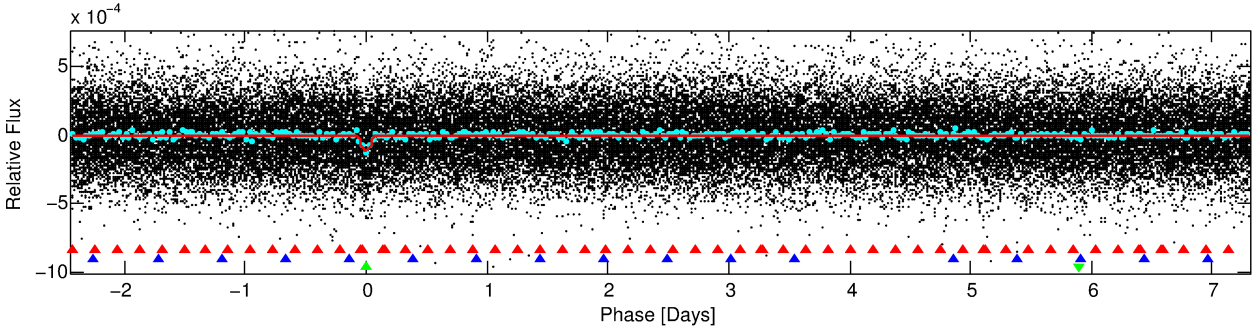
No Significant Match Found

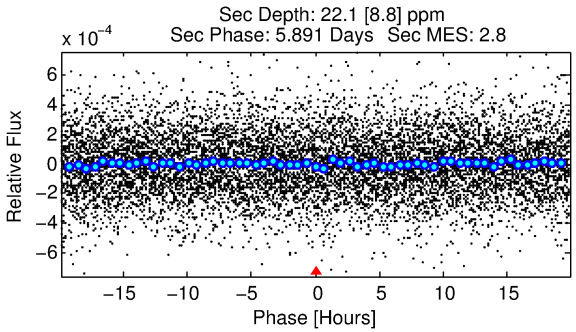
DV One-Page Summary

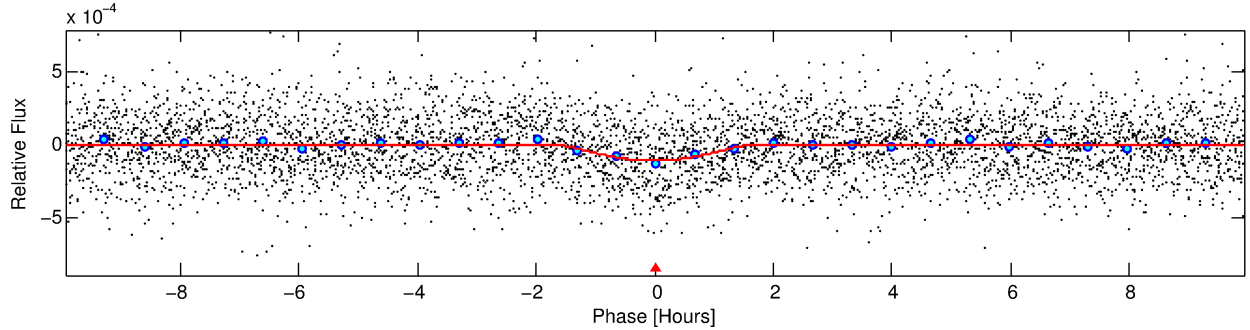
KIC: 6508221 Candidate: 3 of 3 Period: 9.748 d
KOI: K00416.03 Corr: 0.809

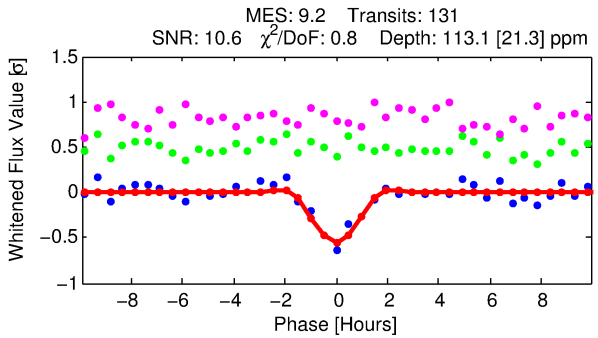
Kp: 14.29 R*: 0.74 Rs Teff: 5176.0 K Logg: 4.61 Fe/H: −0.180

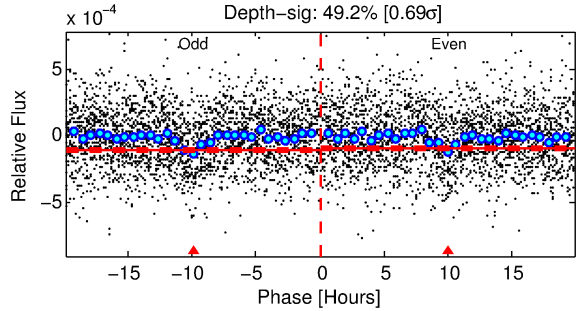


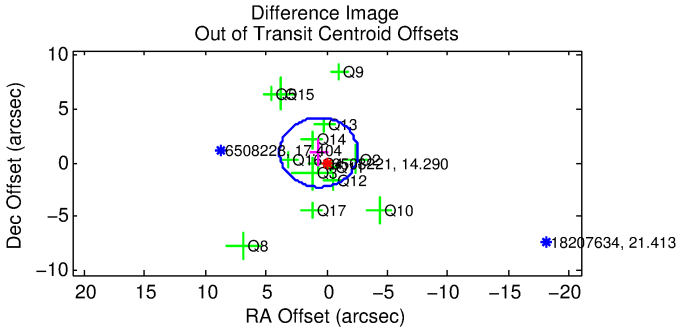












DV Fit Results:

Period = 9.74766 [0.00009] d
Epoch = 139.1680 [0.0076] BKJD
Rp/R* = 0.0191 [0.0529]
a/R* = 4.87 [4.04]
b = 1.00 [0.09]

Seff = 50.39 [6.59]
Teq = 679 [22] K
Rp = 1.54 [4.26] Re
a = 0.0834 [0.0056] AU

Ag = 35.61 [197.79] [0.18σ]
Teffp = 2566 [3562] K [0.53σ]

DV Diagnostic Results:

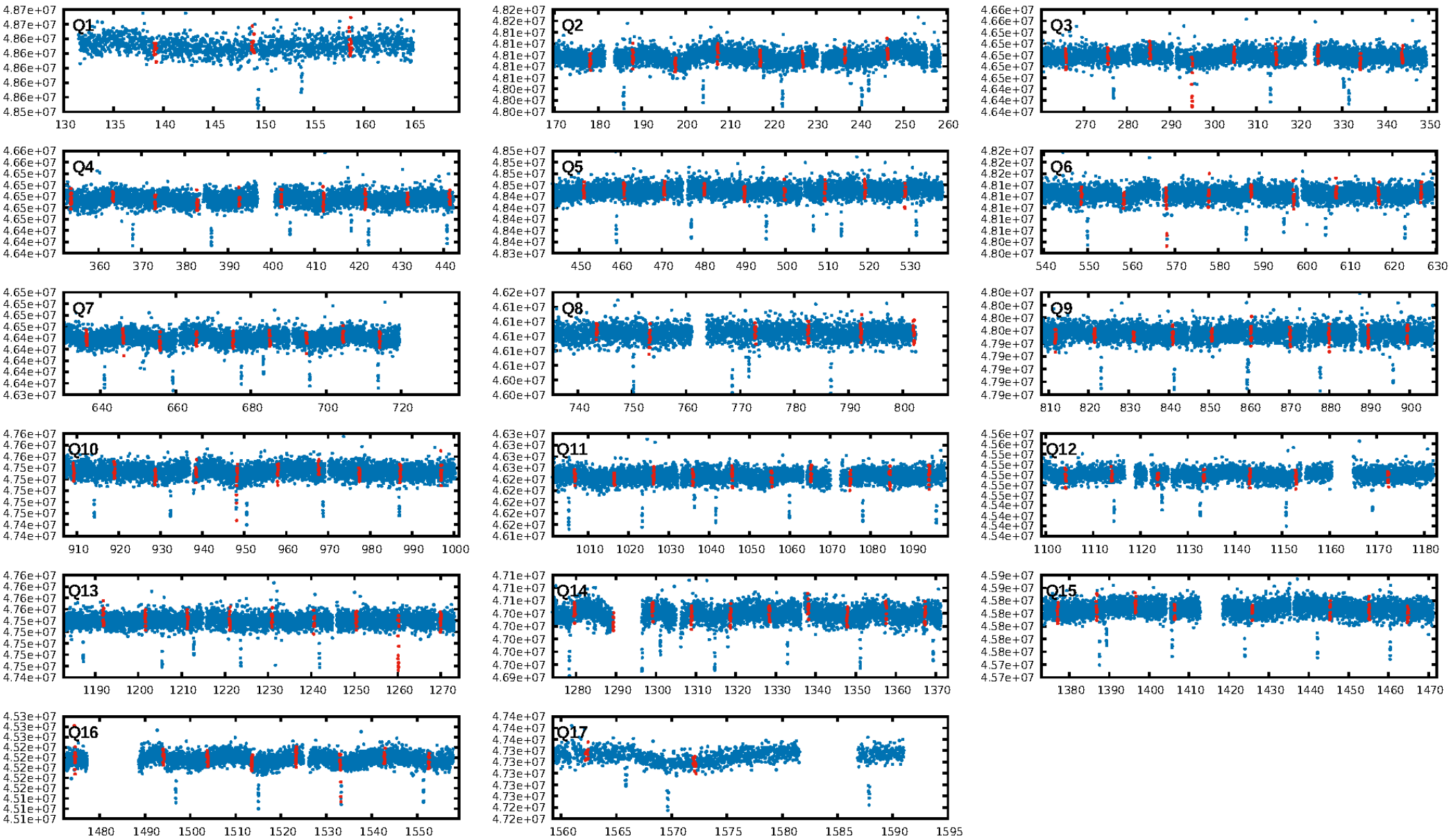
ShortPeriod−sig: N/A
LongPeriod−sig: 100.0% [39.34σ]
ModelChiSquare2−sig: 100.0%
ModelChiSquareGof−sig: 100.0%
Bootstrap−pfa: 2.10e−19
RollingBand−fgt: 1.00 [126/126]
GhostDiagnostic−chr: 2.933

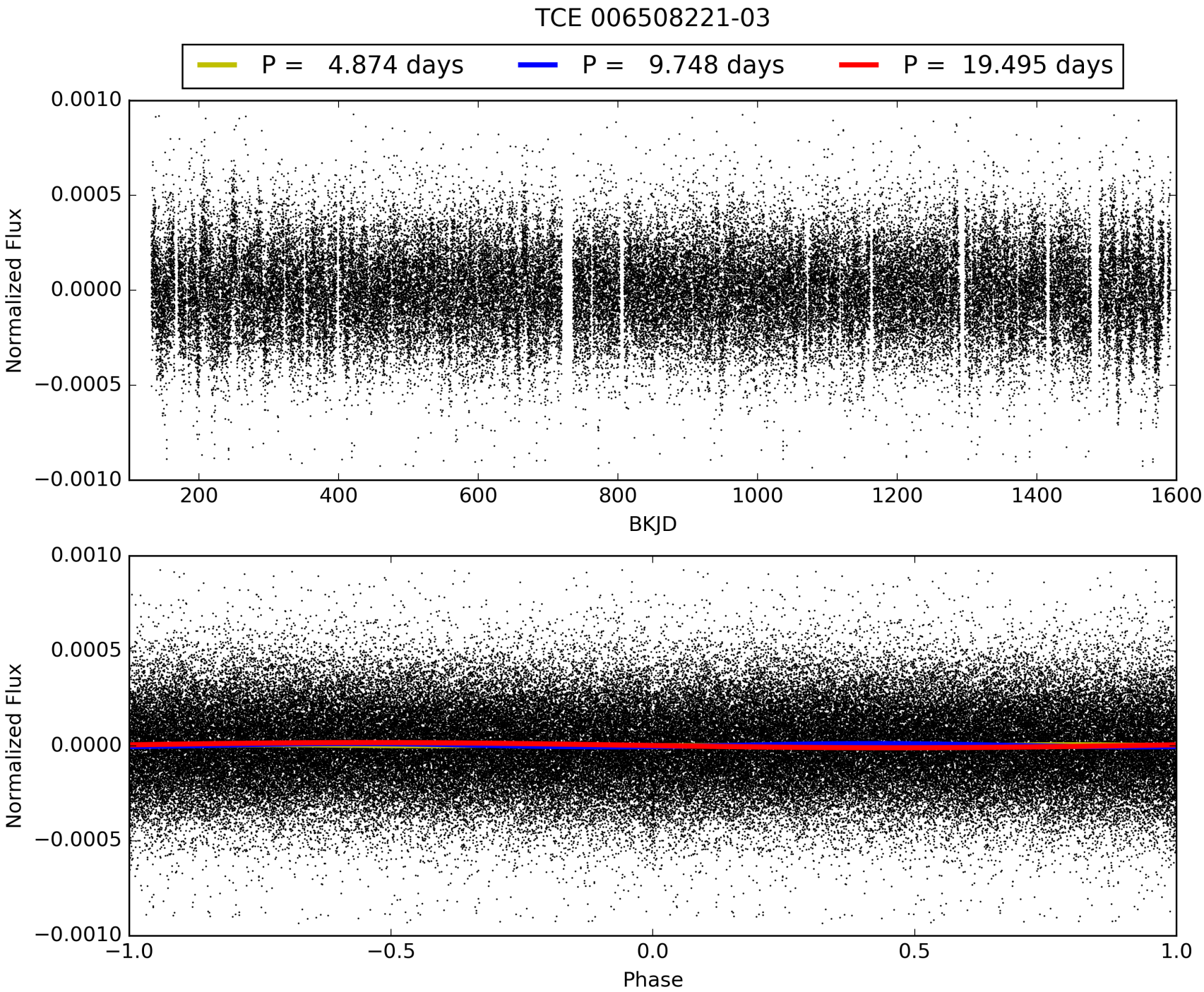
Centroid−sig: 0.8%
Centroid−so: 1.843 arcsec [1.56σ]
OotOffset−rm: 1.156 arcsec [1.07σ]
KicOffset−rm: 0.818 arcsec [0.77σ]
OotOffset−st: 3/3/4/4 [14]
KicOffset−st: 3/3/4/4 [14]
DiffImageQuality−fgm: 0.21 [3/14]
DiffImageOverlap−fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 −− Date Generated: 31−Jan−2016 22:53:20 Z

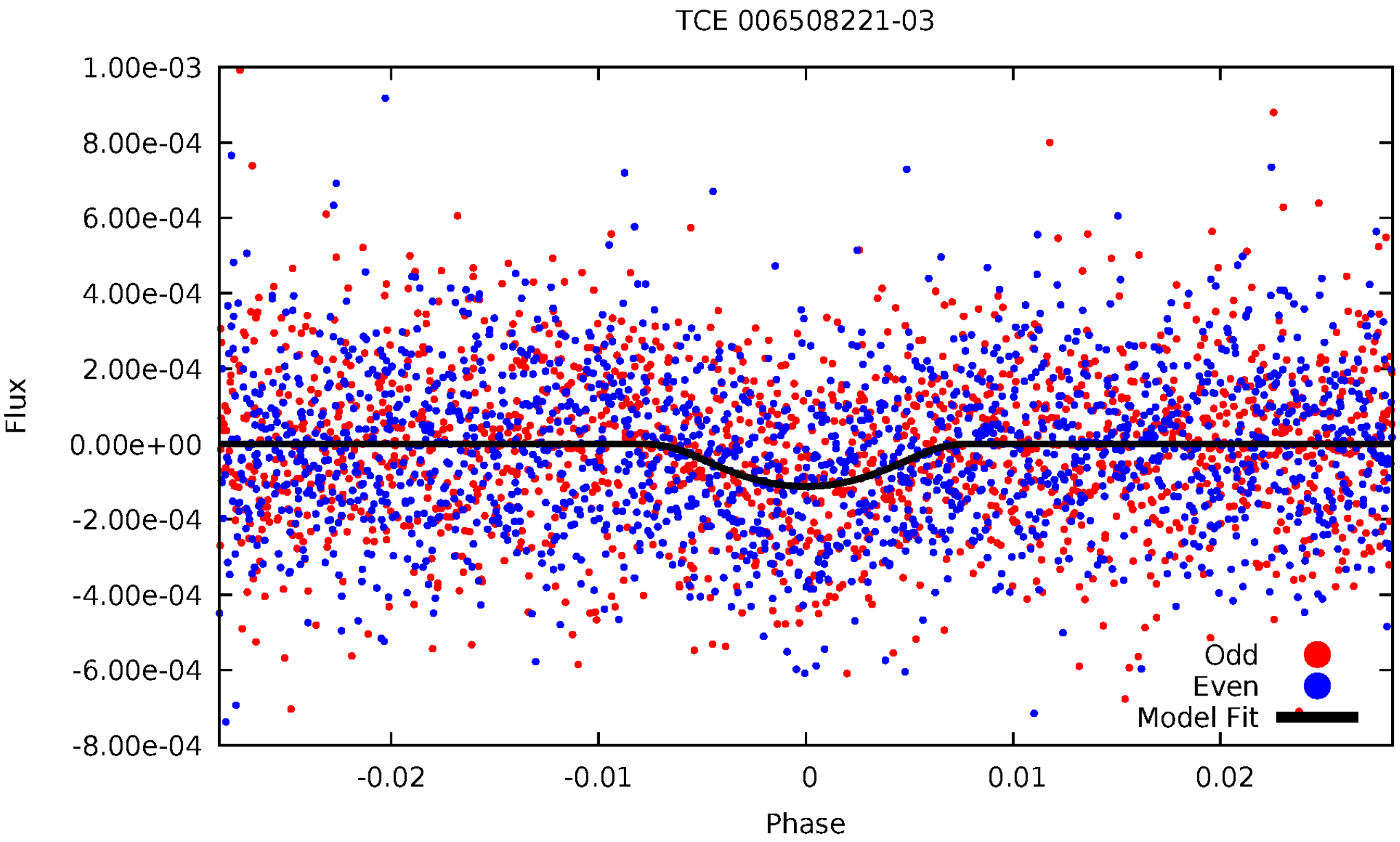
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006508221-03, PDC Light Curves

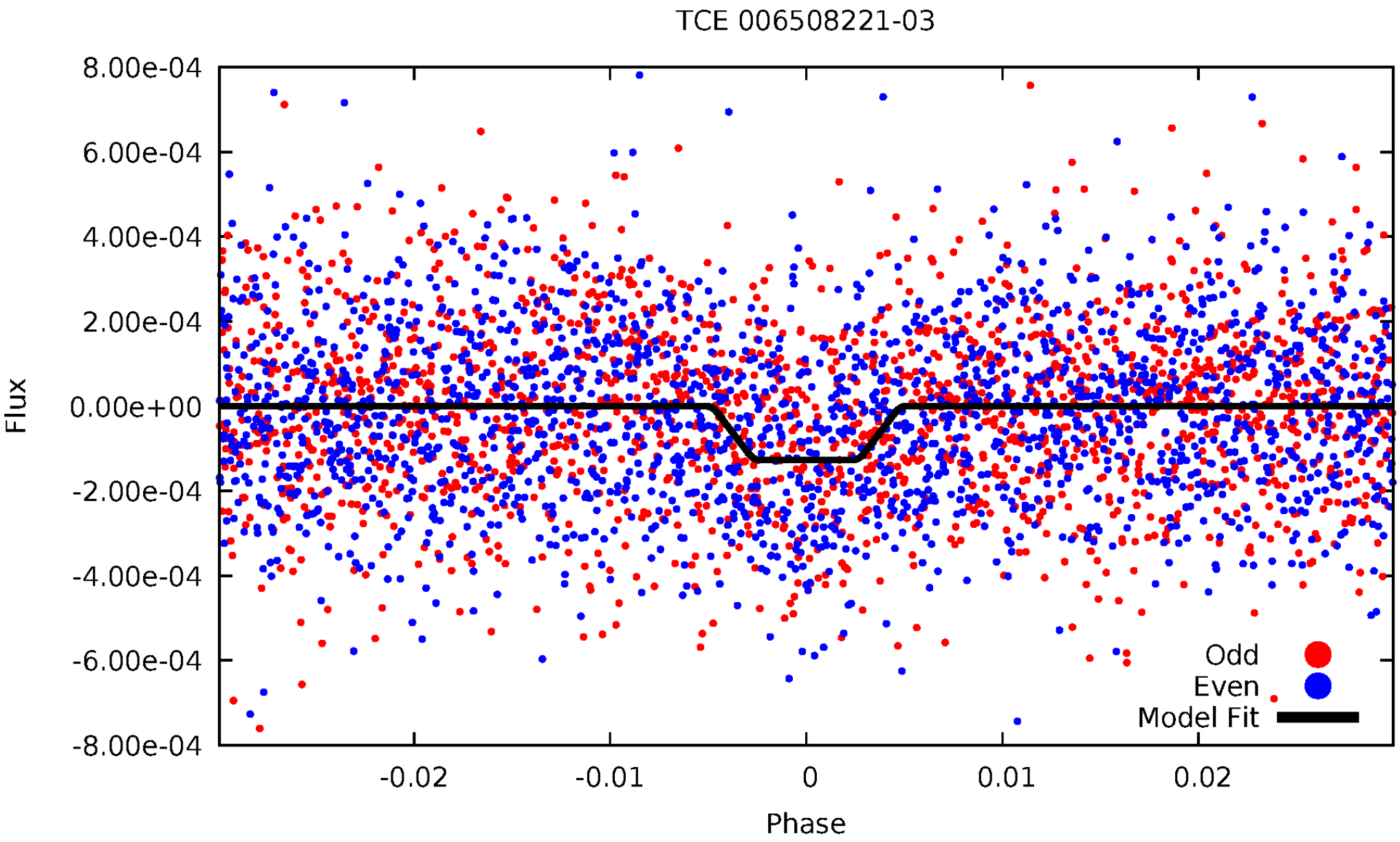



TCE 006508221-03
P = 4.874 days
P = 9.748 days
P = 19.495 days
Normalized Flux
0.0010
0.0005
0.0000
−0.0005
−0.0010
200
400
600
800
1000
1200
1400
1600
BKJD
Normalized Flux
0.0010
0.0005
0.0000
−0.0005
−0.0010
−1.0
−0.5
0.0
0.5
1.0
Phase

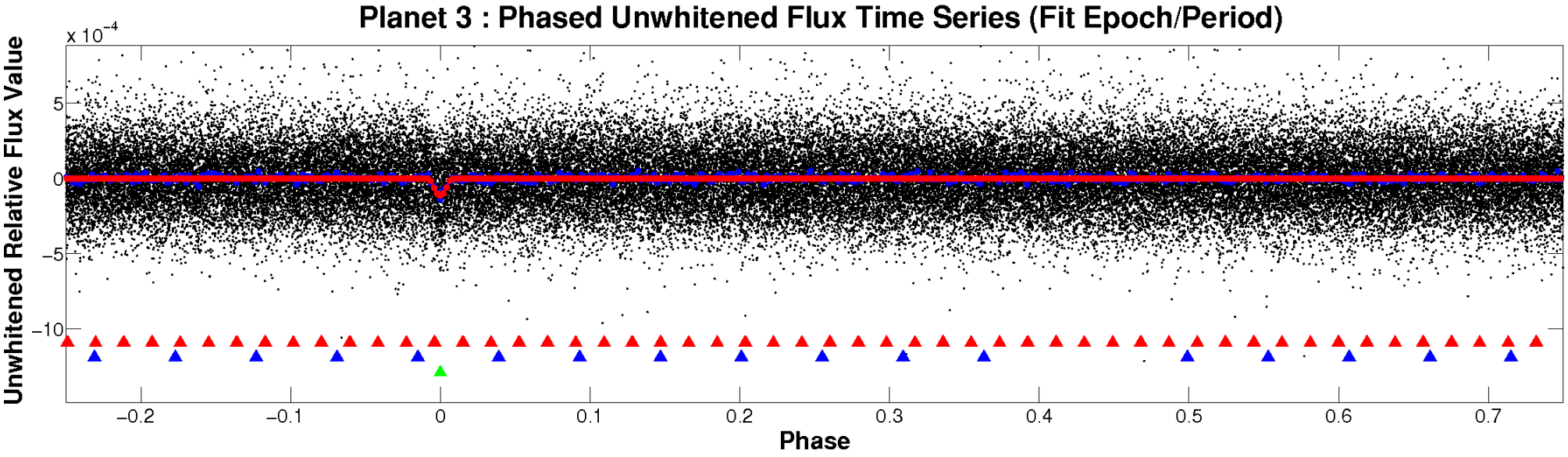
DV Odd/Even

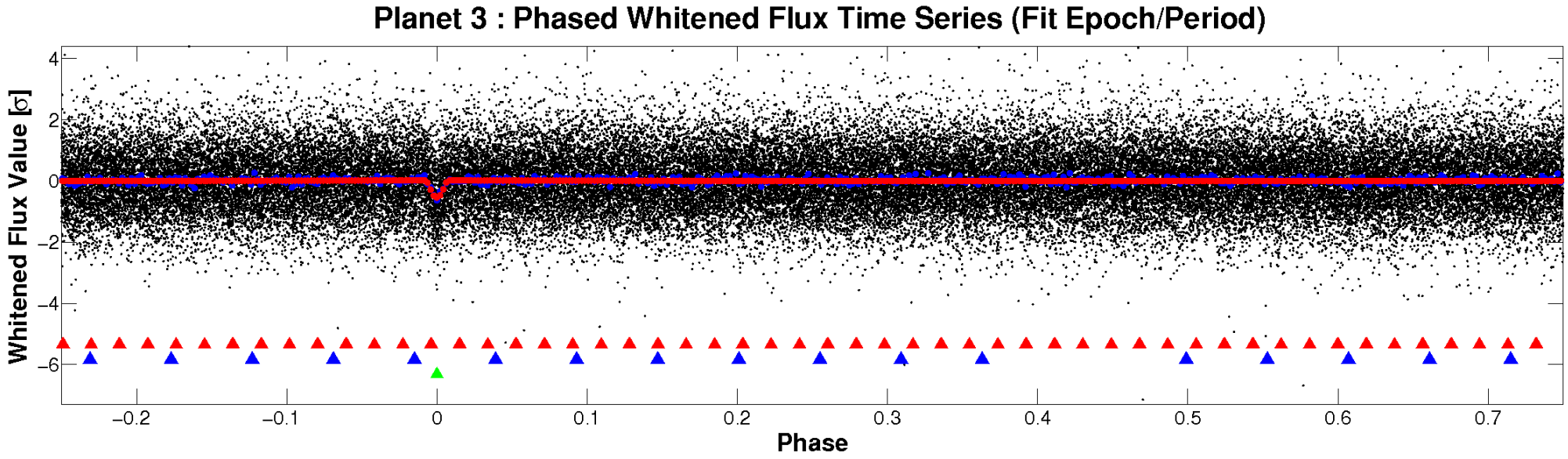

TCE 006508221-03
1.00e-03
8.00e-04
6.00e-04
4.00e-04
2.00e-04
0.00e+00
-2.00e-04
-4.00e-04
-6.00e-04
-8.00e-04
Flux
-0.02
-0.01
0
0.01
0.02
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 006508221-03
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
Flux
-0.02
-0.01
0
0.01
0.02
Phase
Odd
Even
Model Fit

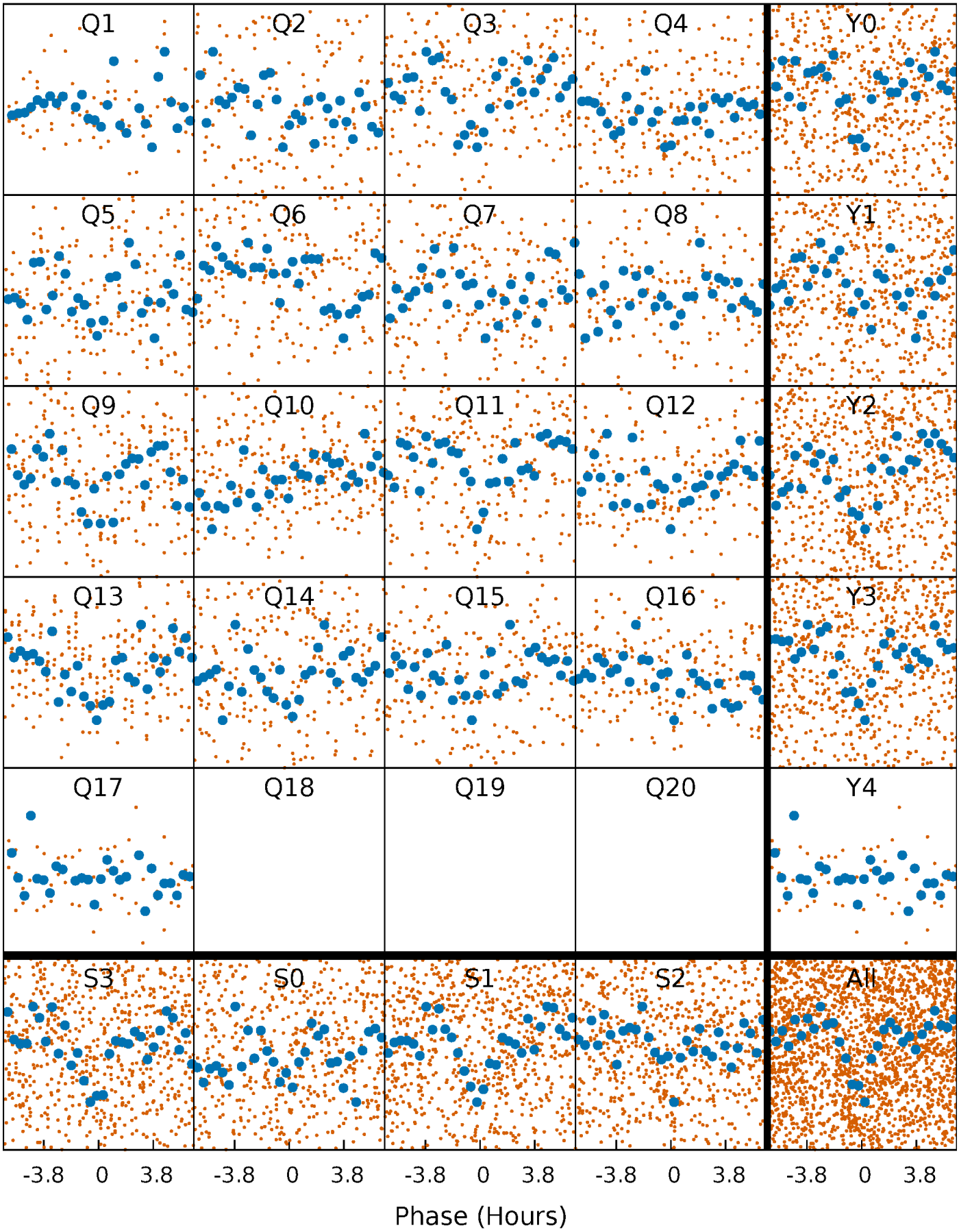
Non-Whitened Vs. Whitened Light Curve





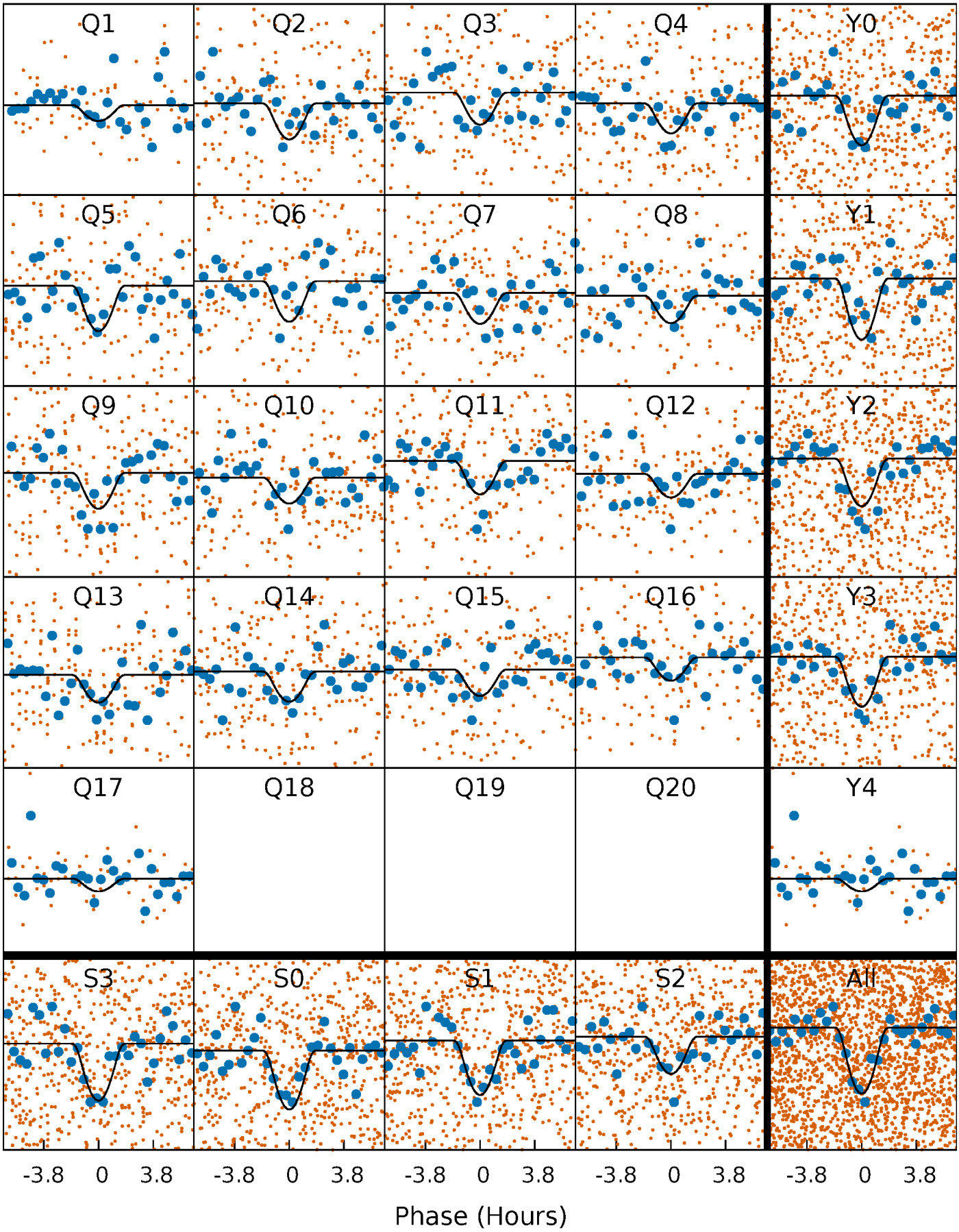
PDC Quarter-Phased Transit Curves

TCE 006508221-03 P= 9.747655 Days T_0=139.168048 (BKJD)



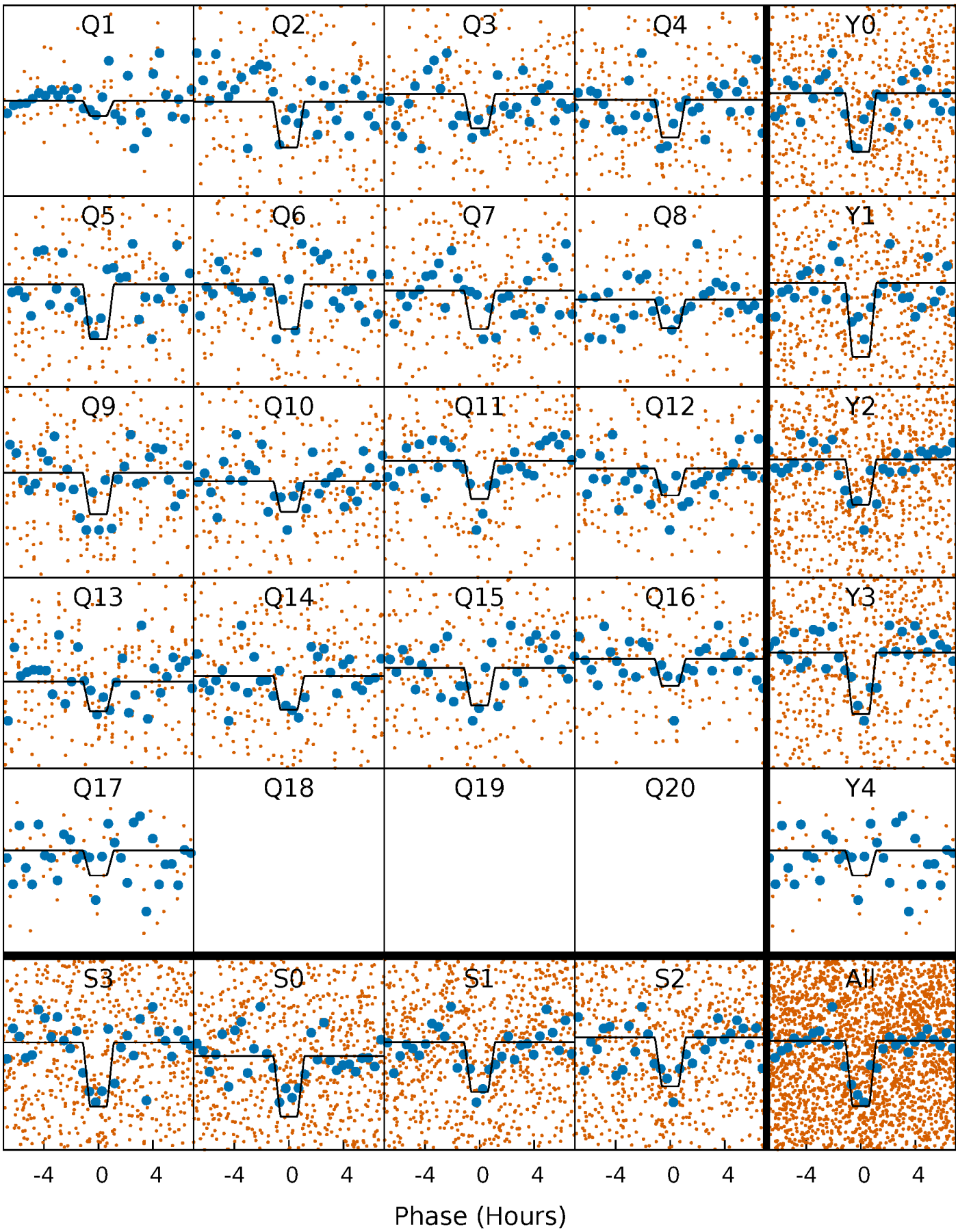
DV Quarter-Phased Transit Curves

TCE 006508221-03 P= 9.747655 Days T_0=139.168048 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

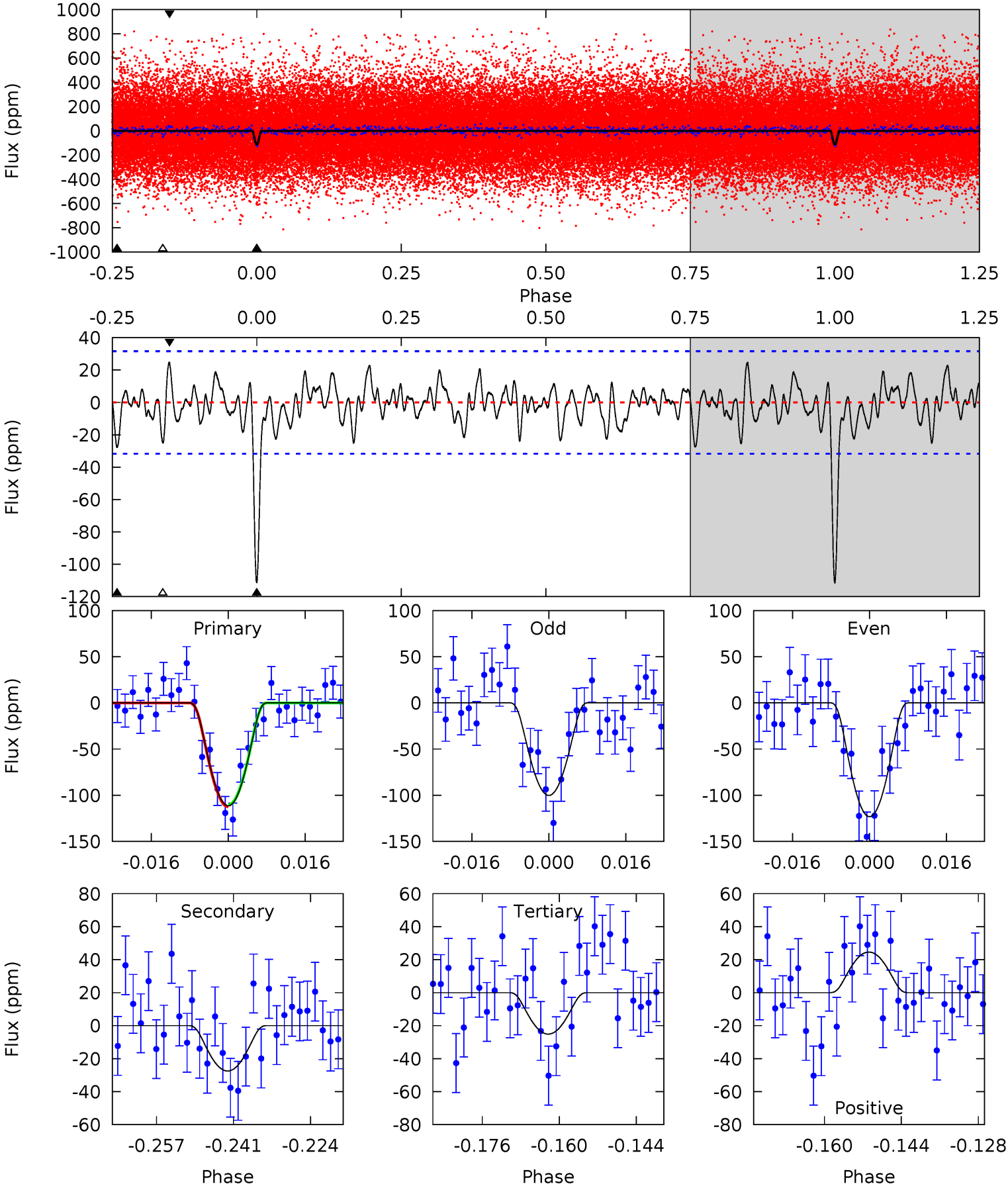
TCE 006508221-03 P= 9.747520 Days T_0=139.177507 (BKJD)



DV Model-Shift Uniqueness Test

006508221-03, P = 9.747655 Days, E = 129.420393 Days

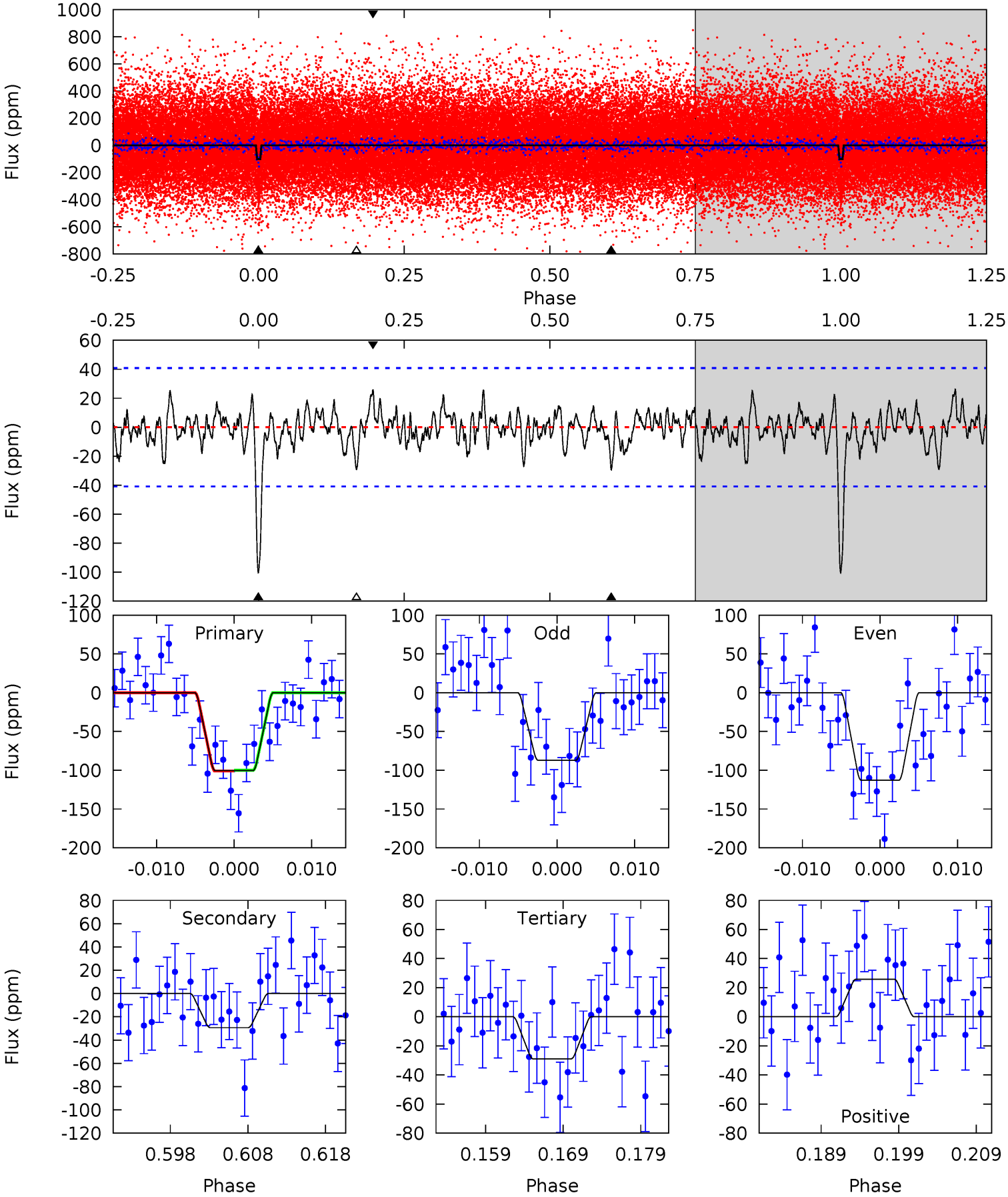
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.4	4.28	3.91	3.83	4.93	2.41	1.40	13.4	13.5	0.37	0.45	1.79	0.94	0.18	0.14



Alt Model-Shift Uniqueness Test

006508221-03, P = 9.747520 Days, E = 129.429987 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	3.61	3.56	3.18	5.03	2.58	1.12	8.80	9.18	0.06	0.43	1.58	1.15	0.20	0.07



Stellar Parameters For KIC 006508221

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	5176^{+102}_{-102}	$4.612^{+0.016}_{-0.060}$	$-0.180^{+0.150}_{-0.150}$	$0.738^{+0.054}_{-0.031}$	$0.826^{+0.035}_{-0.069}$	$2.891^{+0.251}_{-0.575}$
	+2%/-2%	+0%/-1%	+83%/-83%	+7%/-4%	+4%/-8%	+9%/-20%
Source	SPE59	SPE59	SPE59	DSEP		

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

Secondary Eclipse Parameters for KIC 006508221-03 / KOI 0416.03

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-27±6	$3.55^{+3.37}_{-2.41}$	959^{+25}_{-24}	2587^{+1011}_{-415}	$8.529^{+69.445}_{-6.490}$
Alt.	-29±8	$3.36^{+3.39}_{-2.25}$	959^{+27}_{-23}	2633^{+1026}_{-441}	$9.751^{+76.986}_{-7.512}$

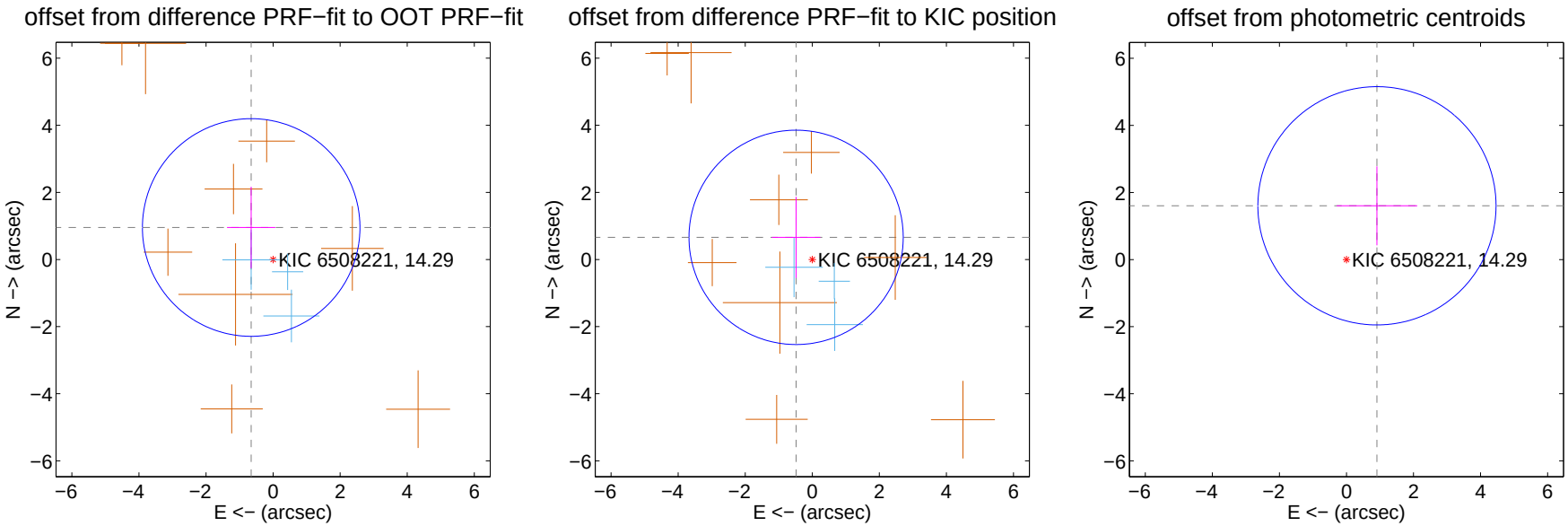
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

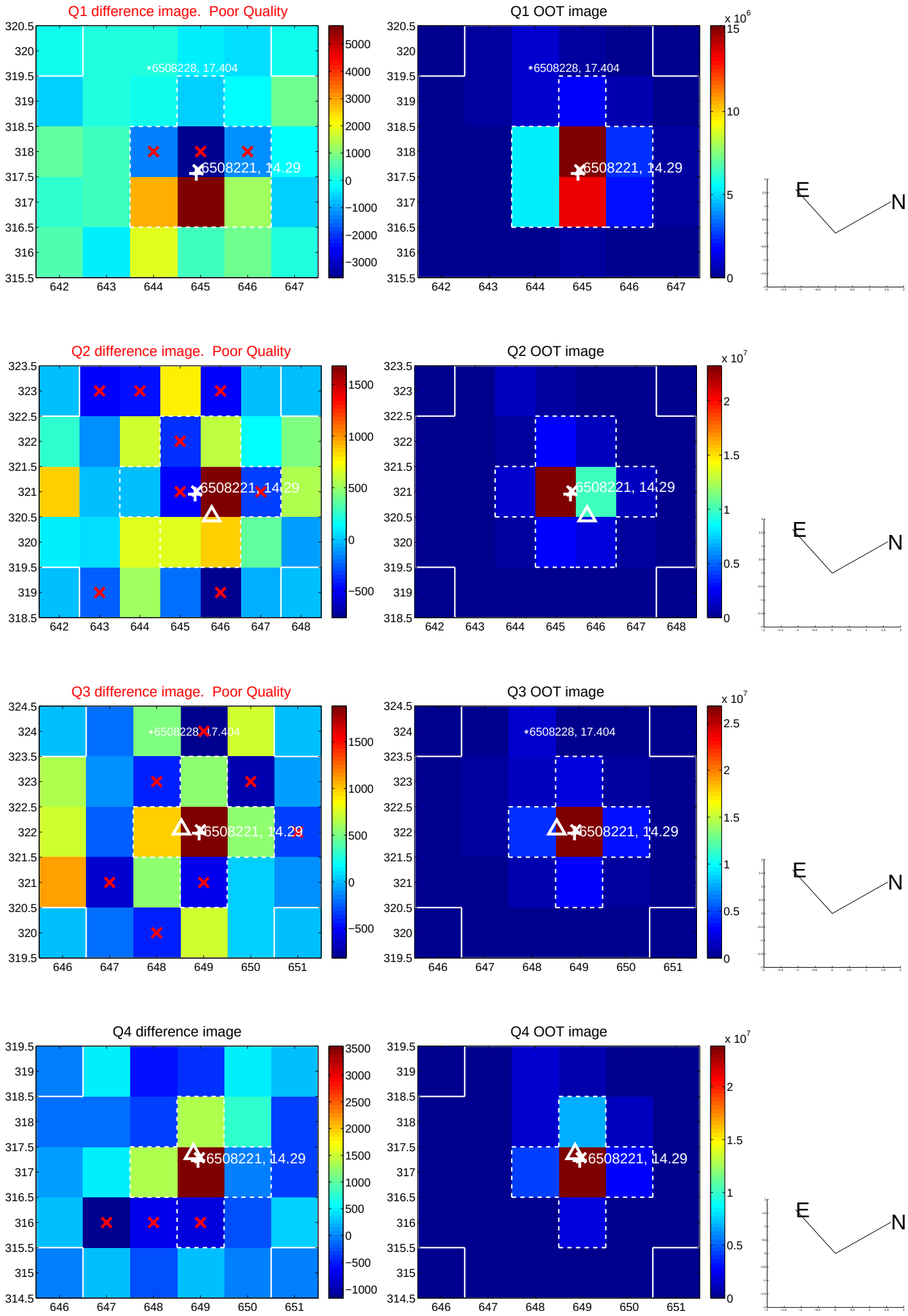
Supplemental centroid analysis for 006508221-03. Kepler magnitude: 14.29. Transit SNR 10.65
There are 3 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.156 ± 1.081	1.07	0.653 ± 0.721	0.954 ± 1.214
PRF-fit source offset from KIC position	0.818 ± 1.065	0.77	0.482 ± 0.722	0.660 ± 1.209
photometric centroid source offset	1.84 ± 1.18	1.56	-0.91 ± 1.20	1.60 ± 1.18

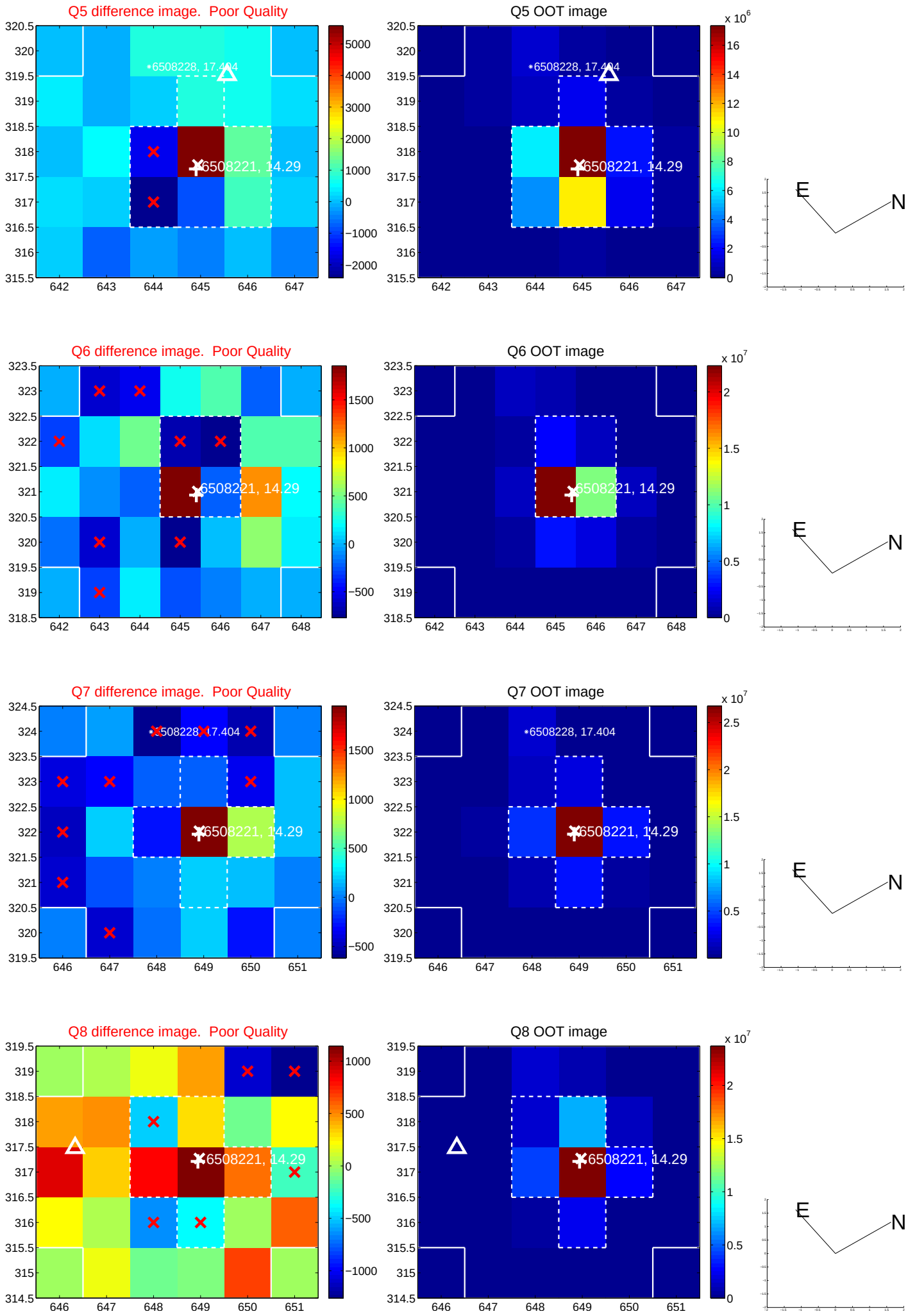


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

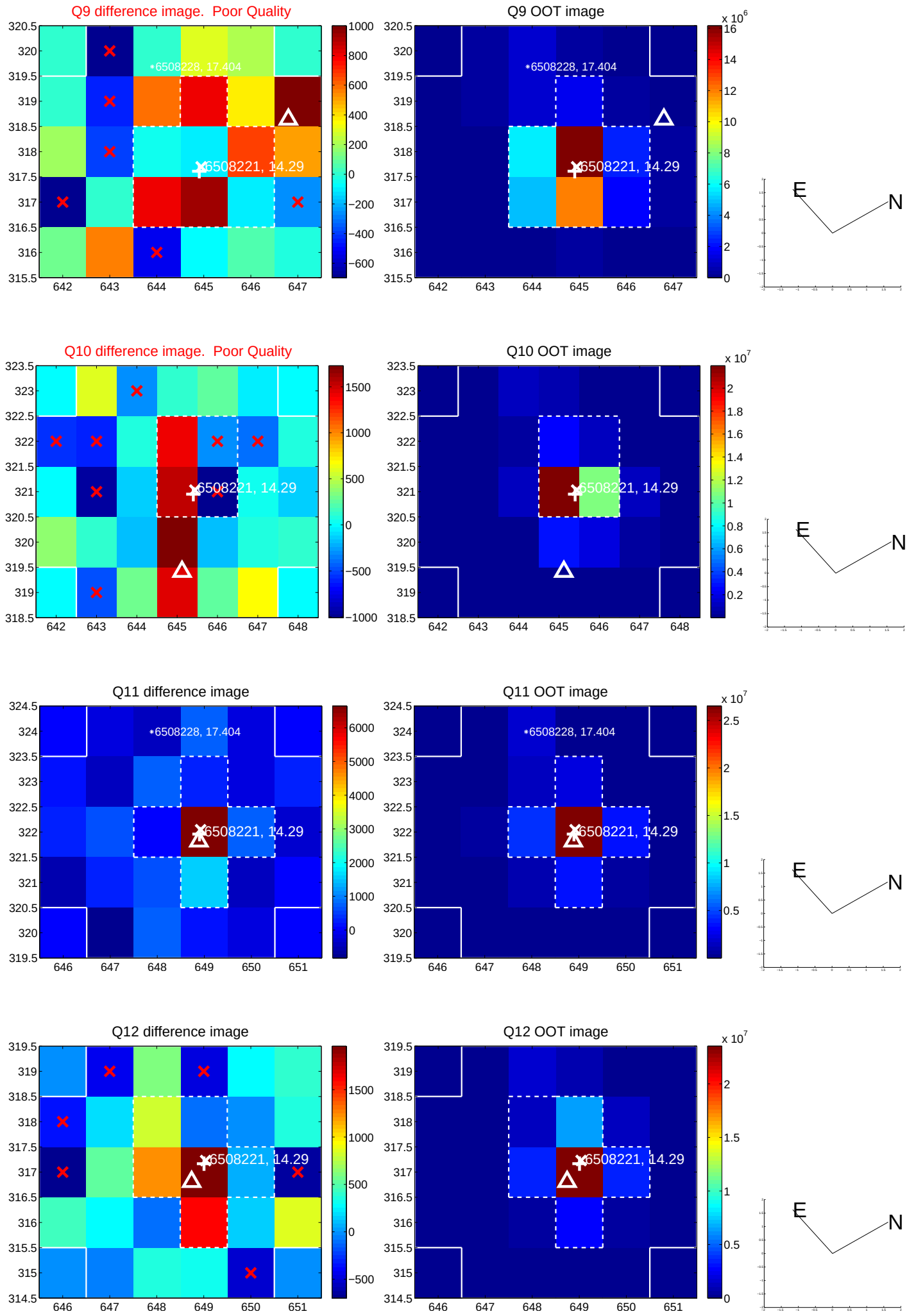
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



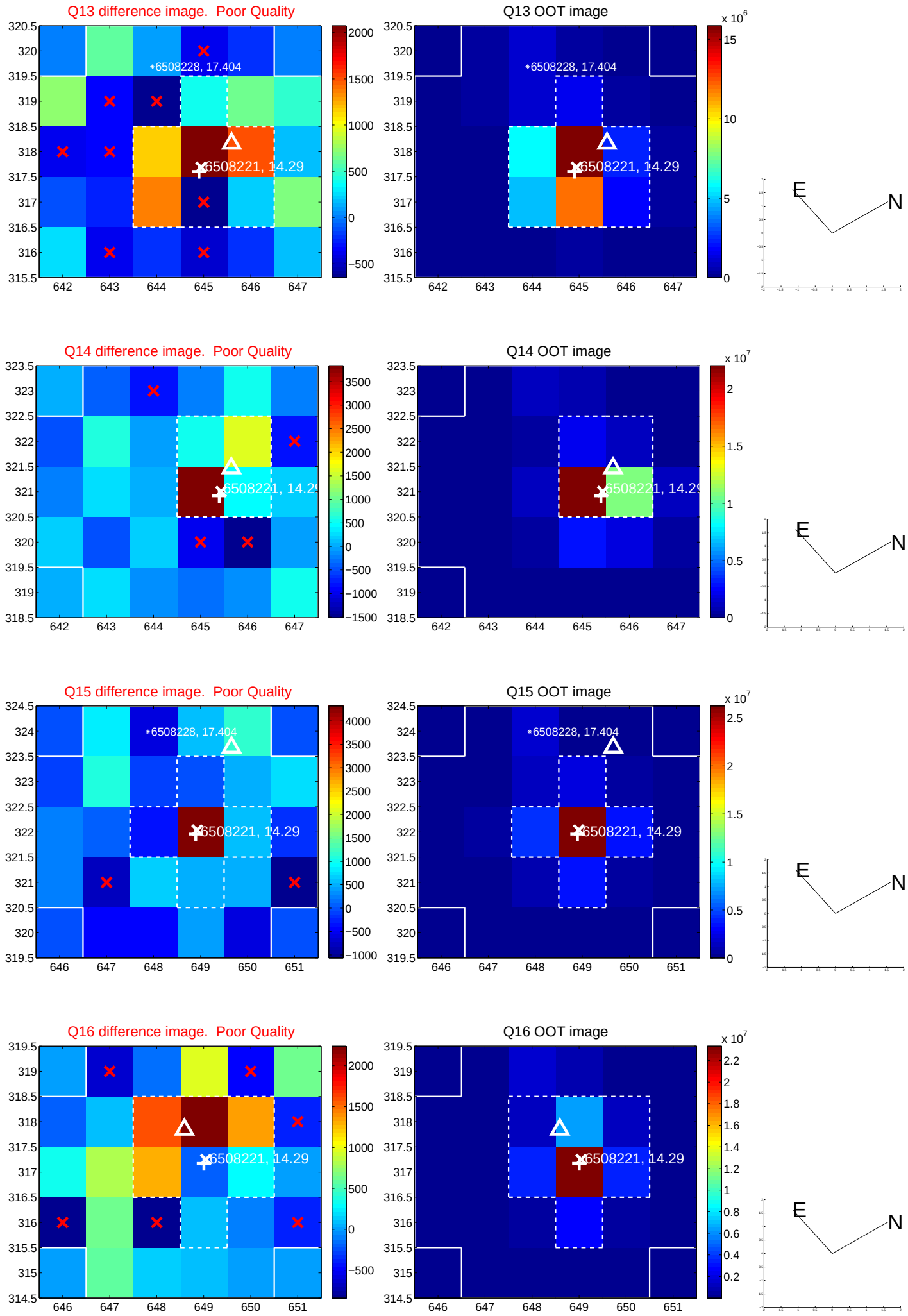
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



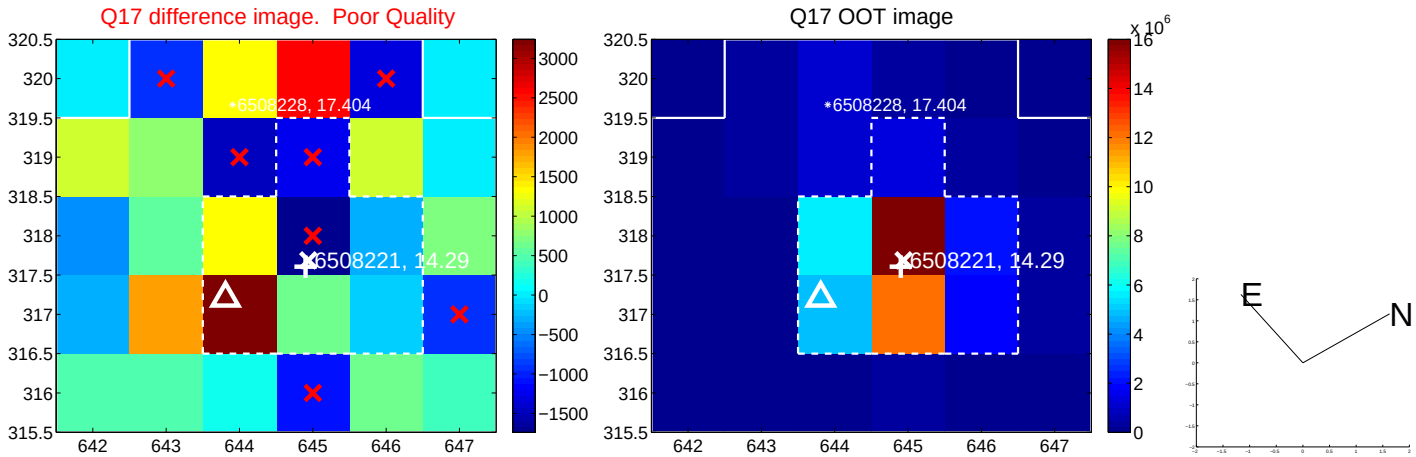
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

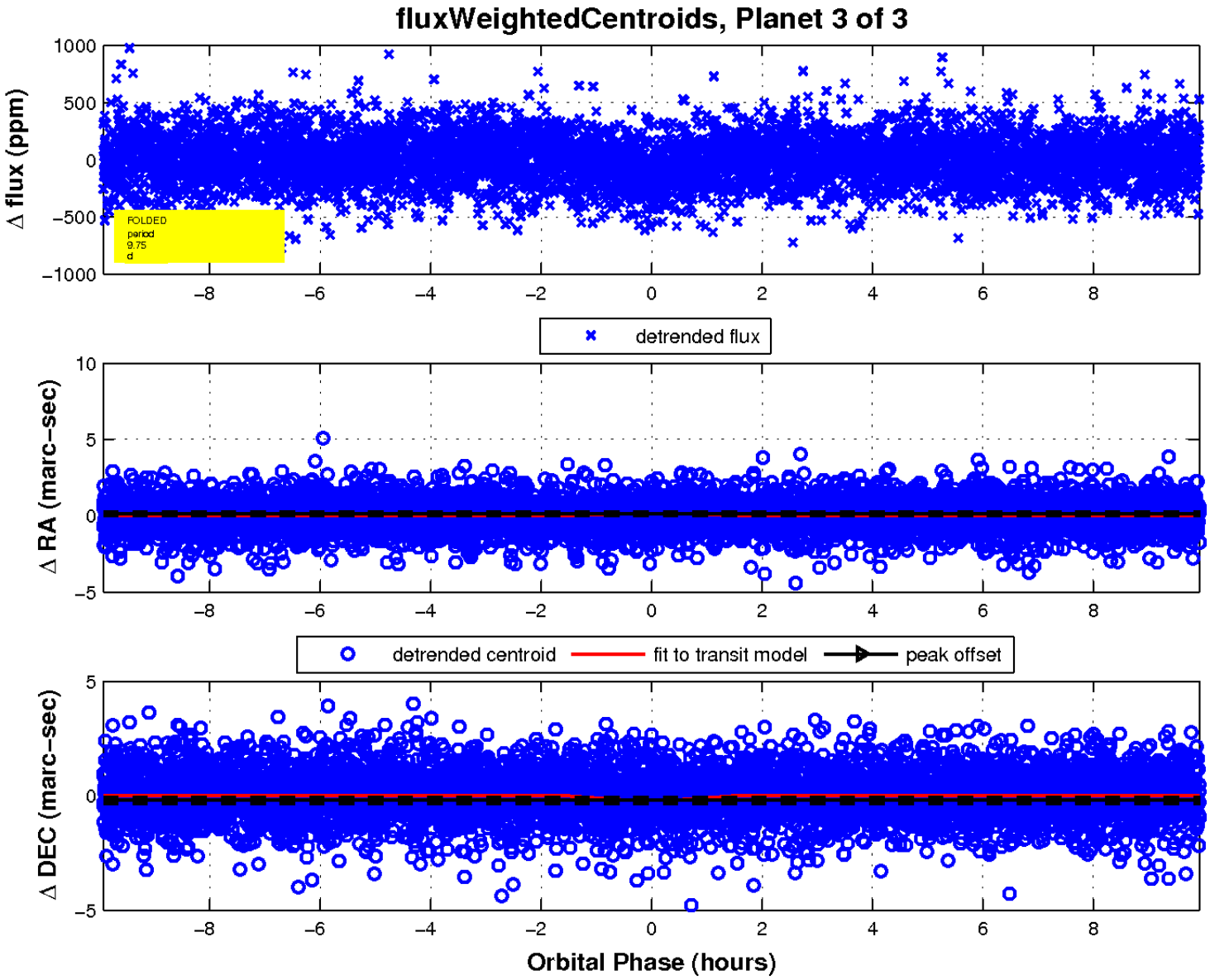
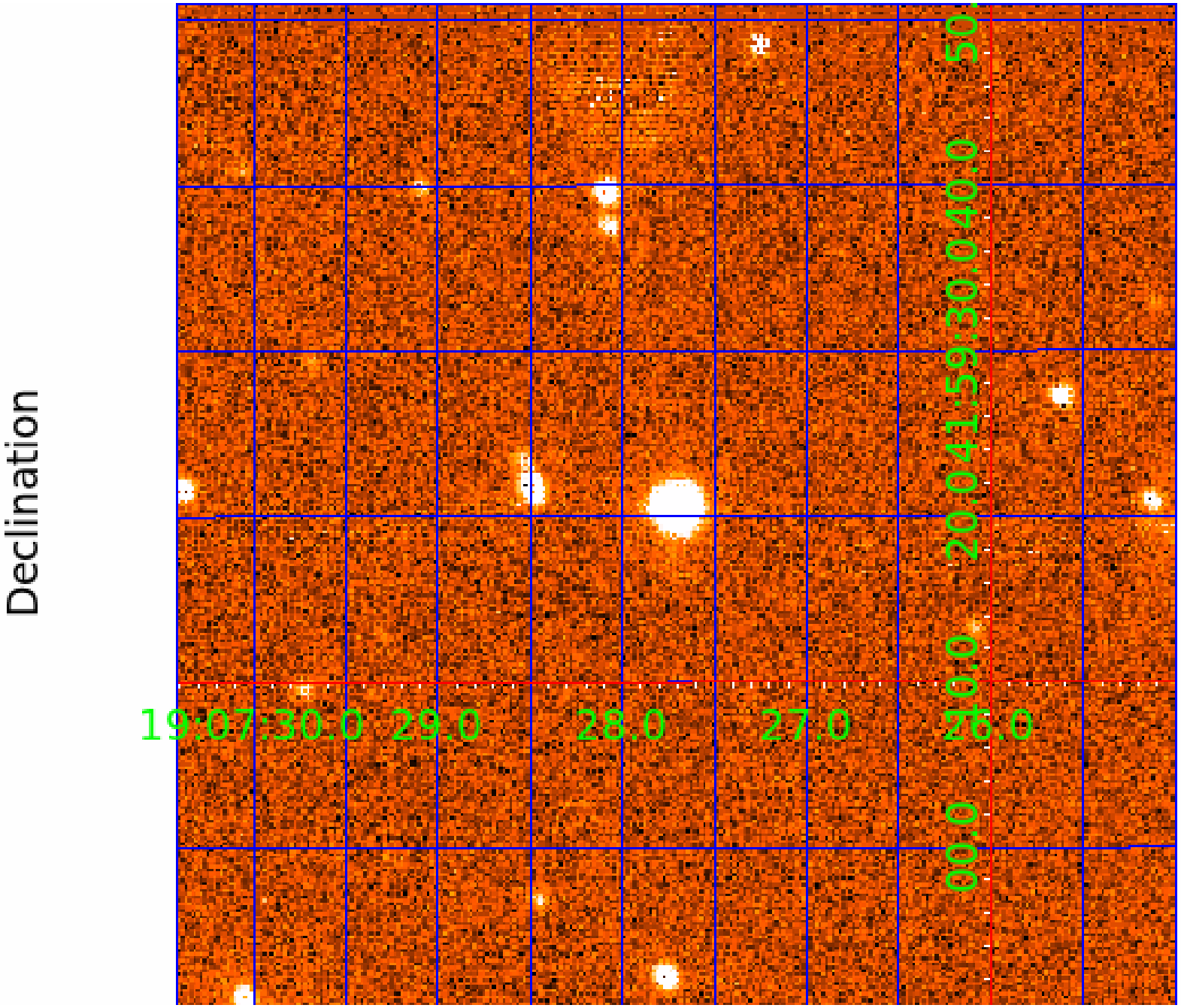


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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





UKIRT Image