

KIC 007008221

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})
007008221-01	OBS	No	1.285721	132.450125	12.1	9.262	8.9	7.0	3.98	6878	1.45	39501.61
007008221-02	OBS	No	34.043229	138.248068	220.9	1.920	10.8	10.2	3.98	6878	6.72	500.54
007008221-03	OBS	No	29.841817	155.256078	265.1	2.010	11.9	12.1	3.98	6878	7.53	596.64
007008221-04	OBS	No	20.378089	144.091034	251.4	1.486	10.6	10.6	3.98	6878	7.30	992.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007008221-01	OBS	FP	0.00	1	0	0	0	LPP_DV
007008221-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
007008221-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007008221-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

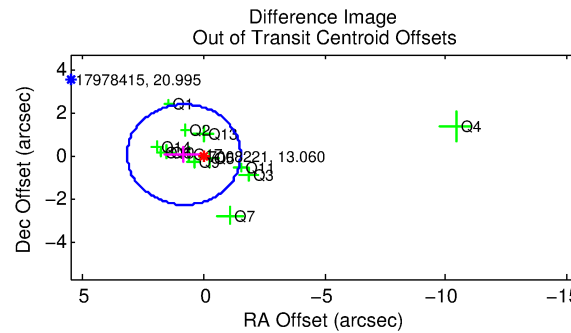
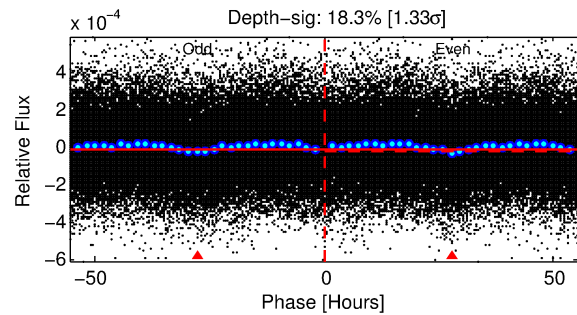
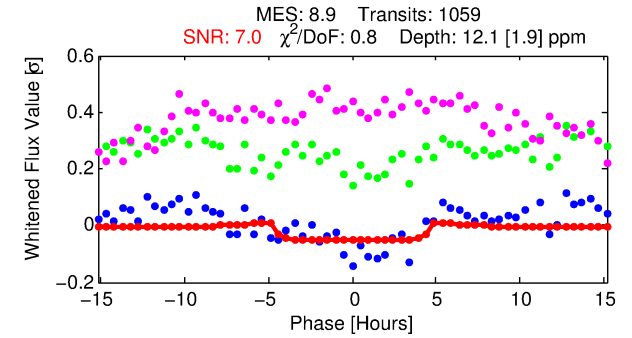
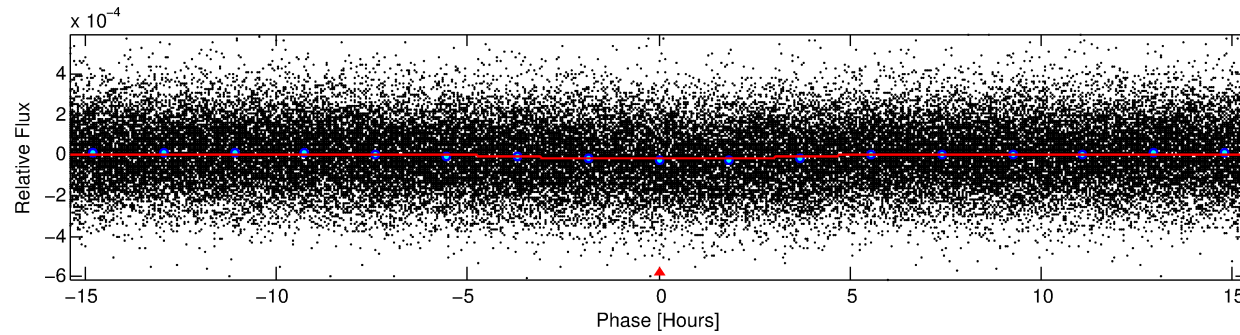
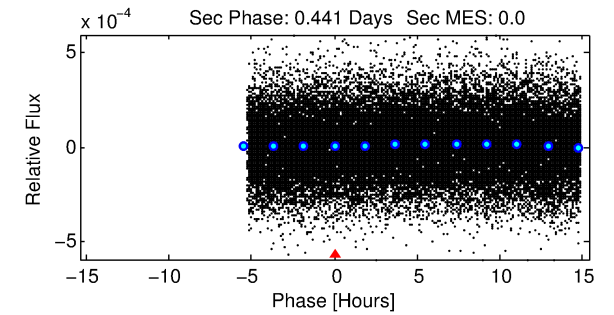
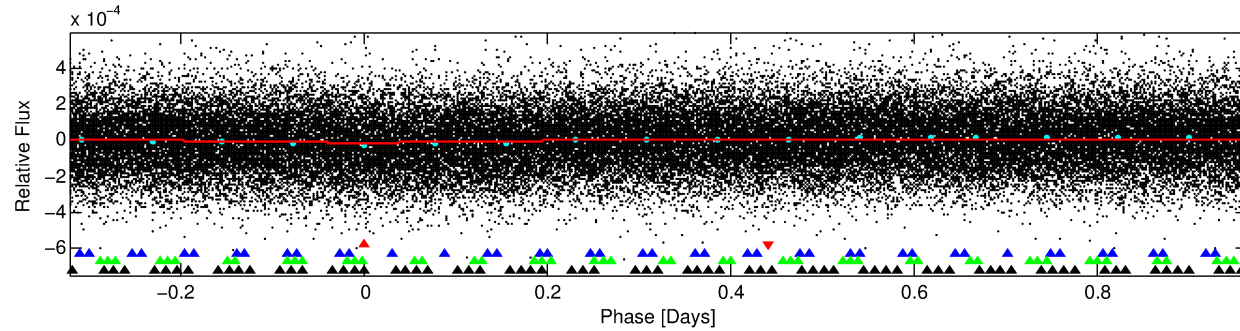
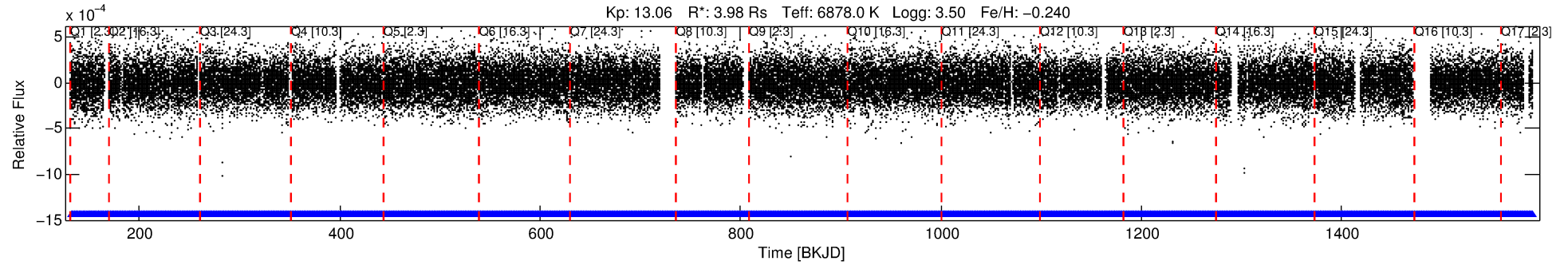
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007008221-01

No Significant Match Found

DV One-Page Summary

KIC: 7008221 Candidate: 1 of 4 Period: 1.286 d



DV Fit Results:

Period = 1.28572 [0.00003] d
Epoch = 132.4501 [0.0094] BKJD
Rp/R* = 0.0033 [0.0032]
a/R* = 1.17 [1.70]
b = 0.58 [6.35]
Seff = 39501.61 [22809.19]
Teff = 3595 [519] K
Rp = 1.45 [1.49] Re
a = 0.0284 [0.0103] AU
Ag = N/A
Teffp = N/A

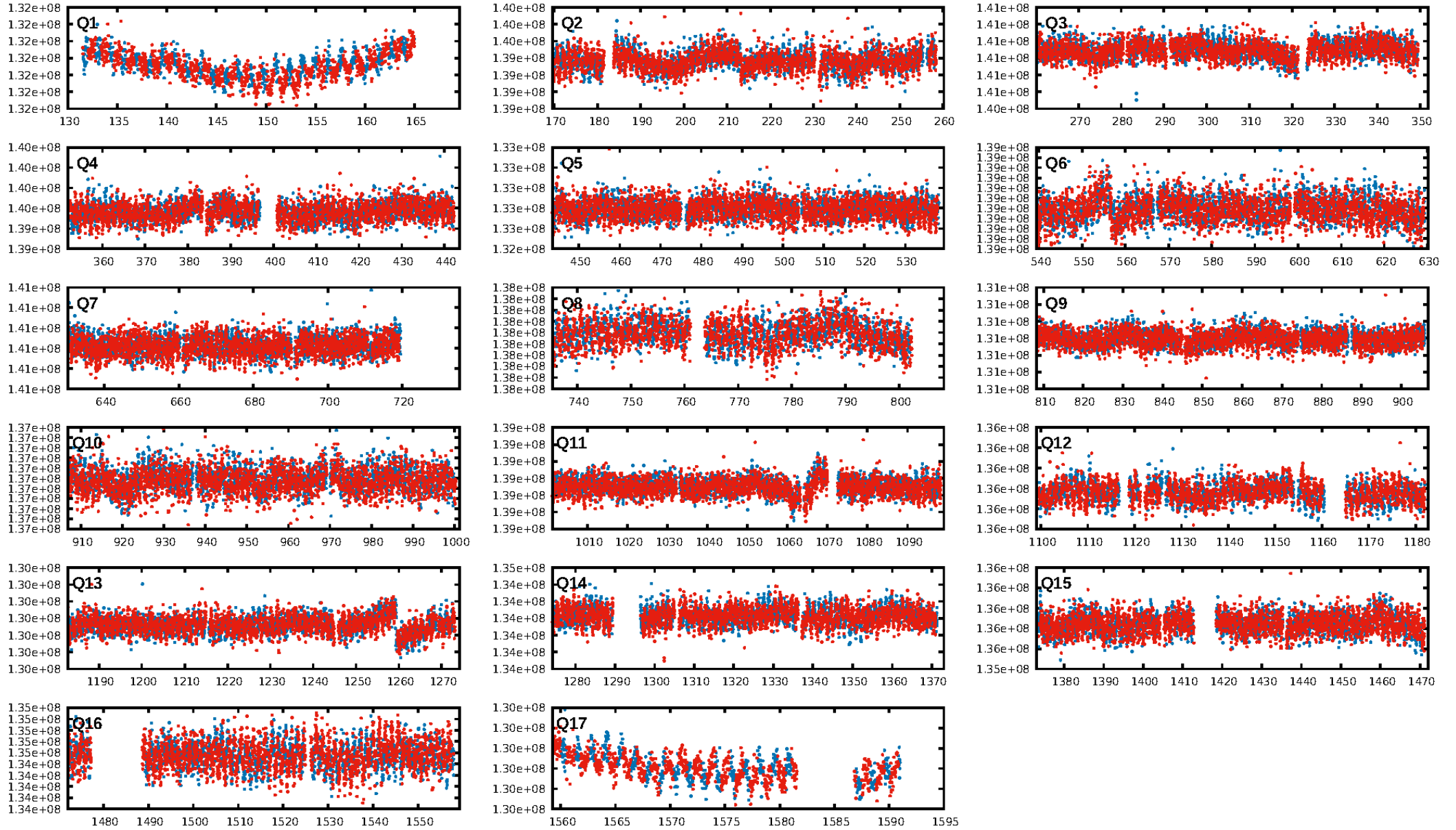
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [48.85σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.08e-26
RollingBand-fgt: 1.00 [1012/1012]
GhostDiagnostic-chr: 2.264
Centroid-sig: 81.0%
Centroid-so: 1.040 arcsec [0.68σ]
OotOffset-rm: 0.808 arcsec [1.03σ]
KicOffset-rm: 0.768 arcsec [0.90σ]
OotOffset-st: 4/3/1/5 [13]
KicOffset-st: 4/3/1/5 [13]
DiffImageQuality-fgm: 0.92 [12/13]
DiffImageOverlap-fno: 1.00 [17/17]

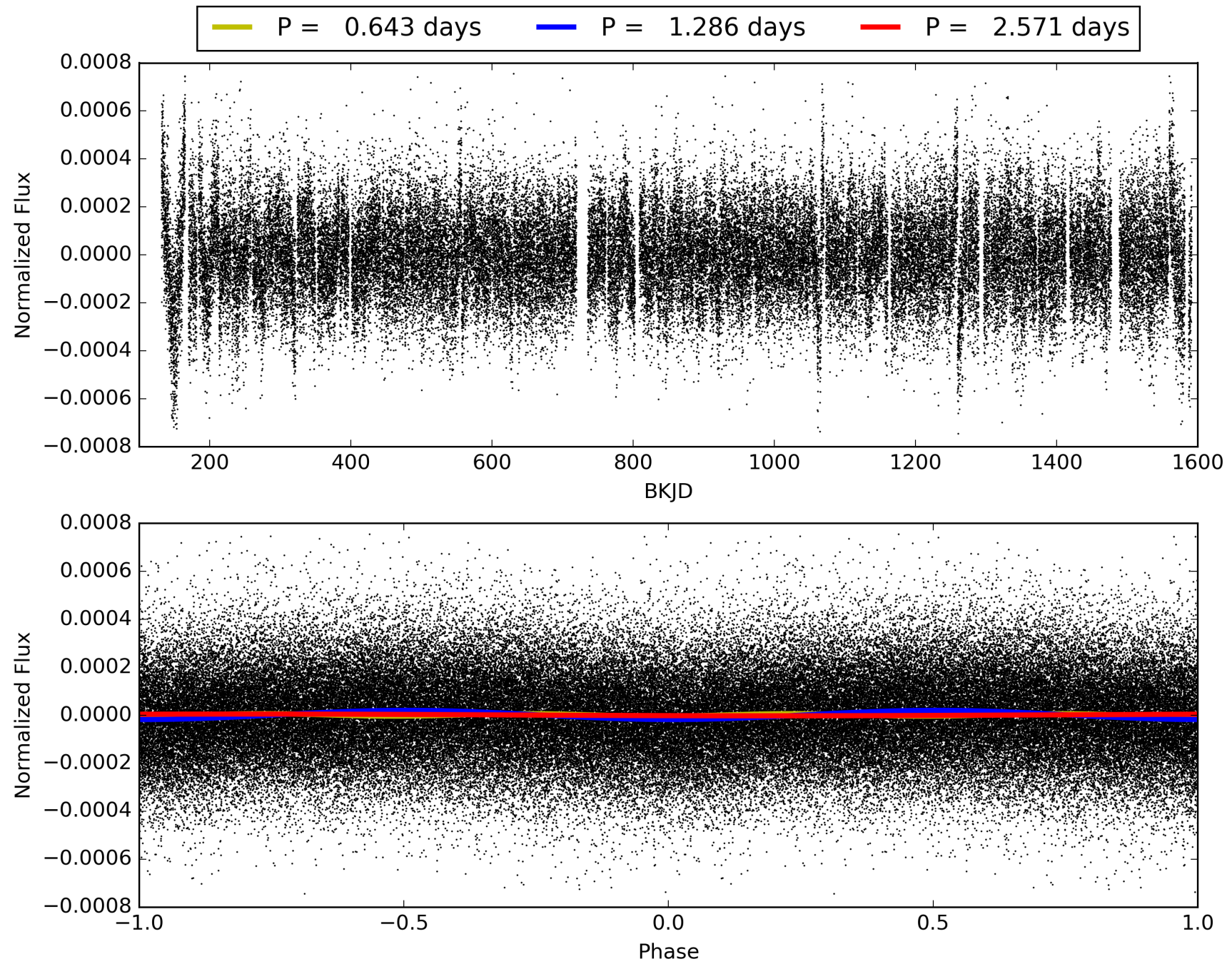
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 007008221-01, PDC Light Curves

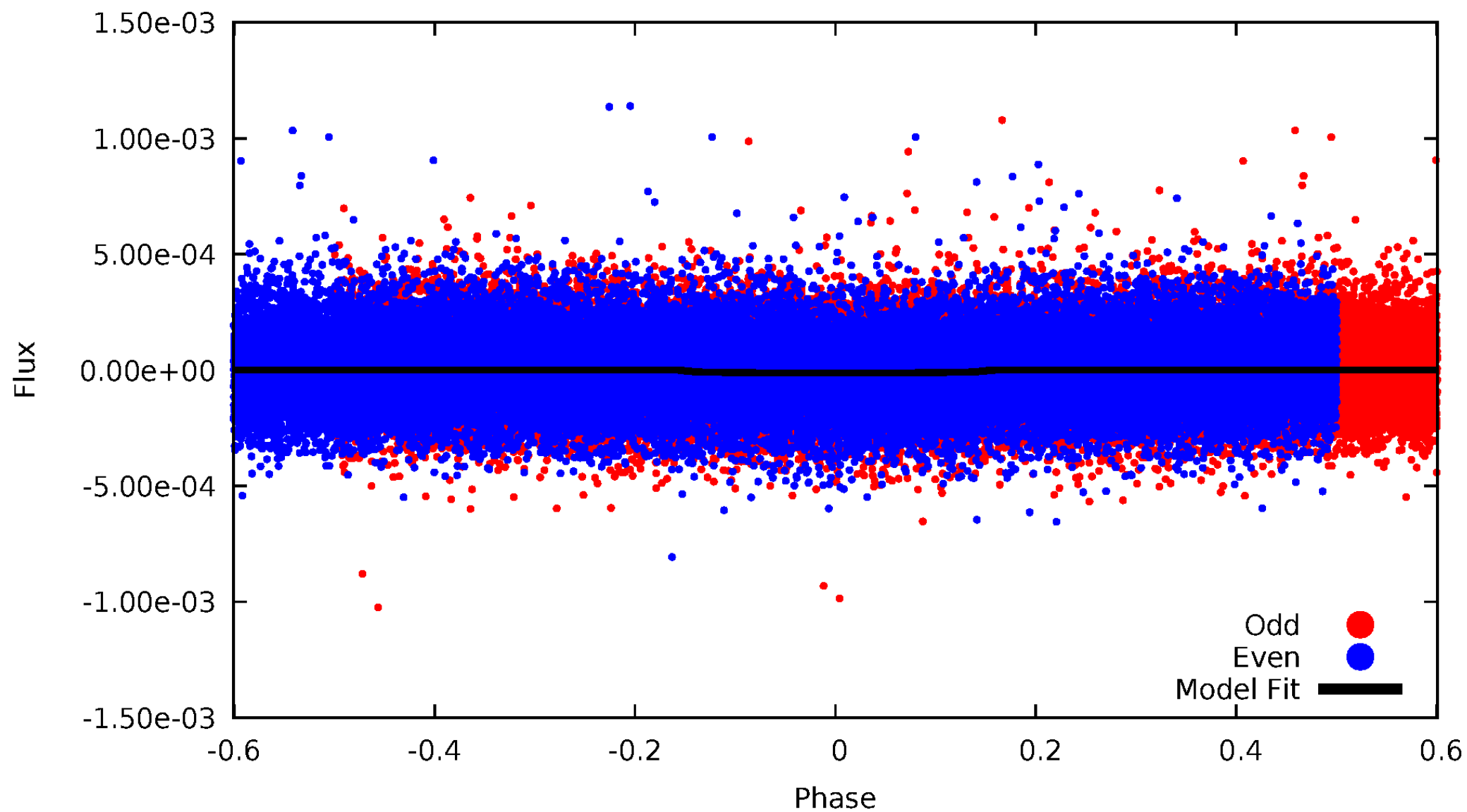


TCE 007008221-01



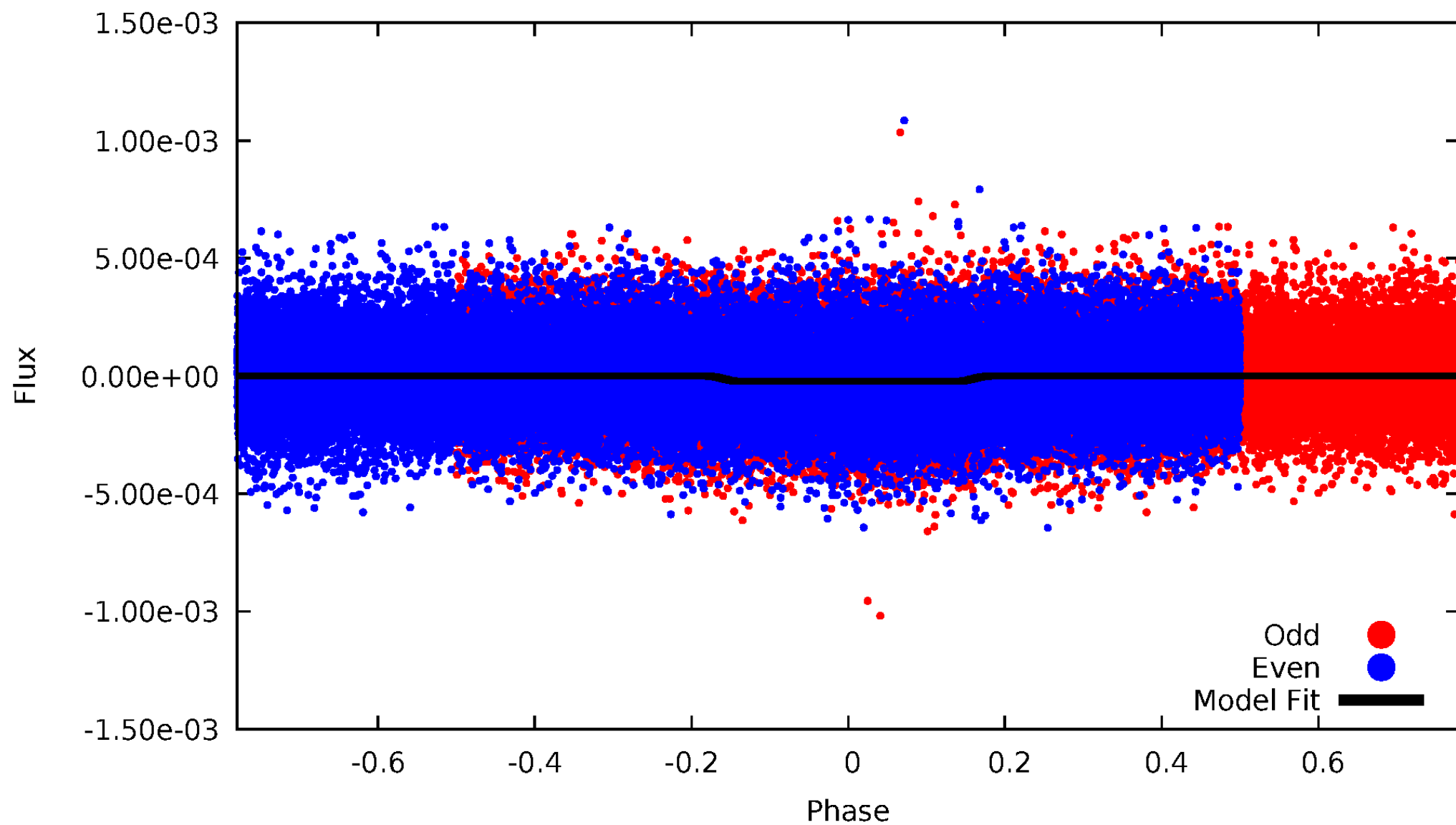
DV Odd/Even

TCE 007008221-01

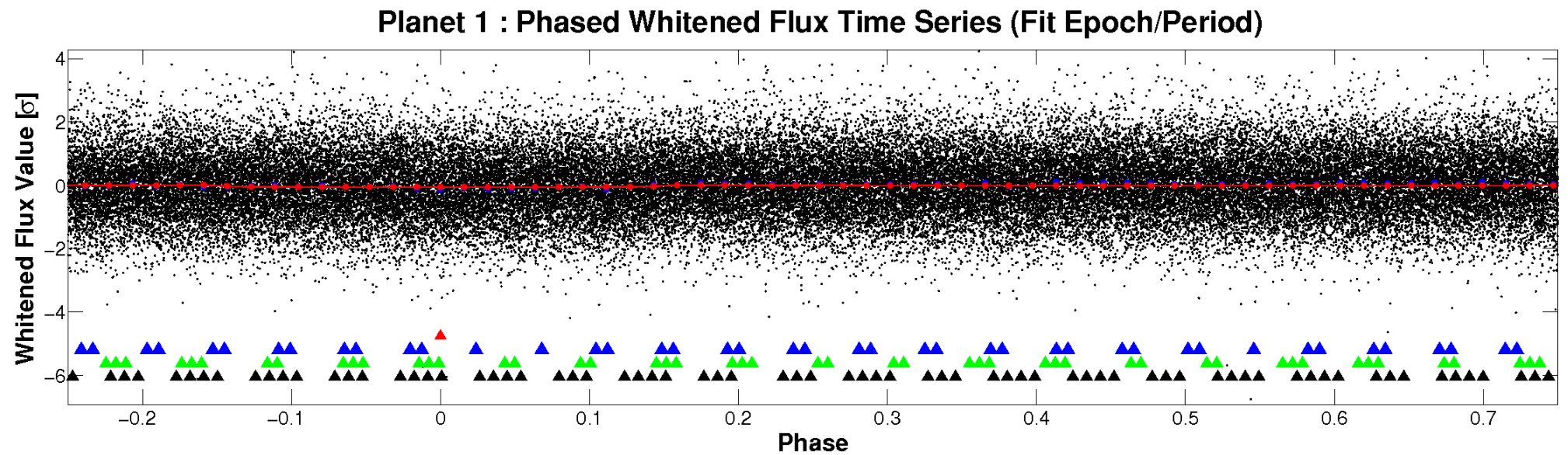
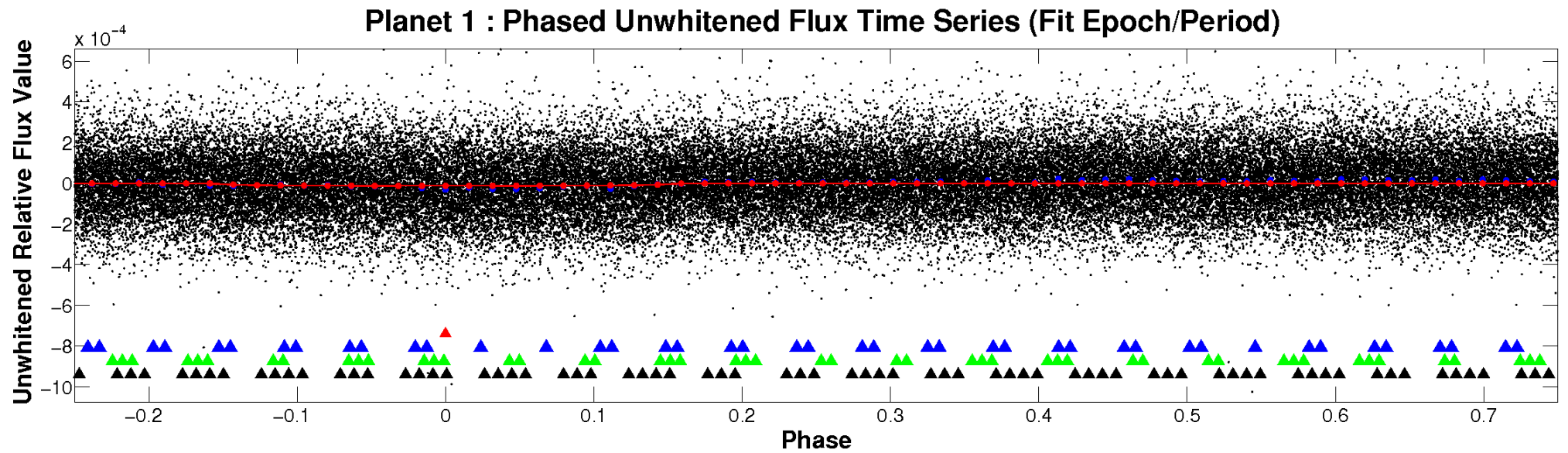


ALT Odd/Even

TCE 007008221-01

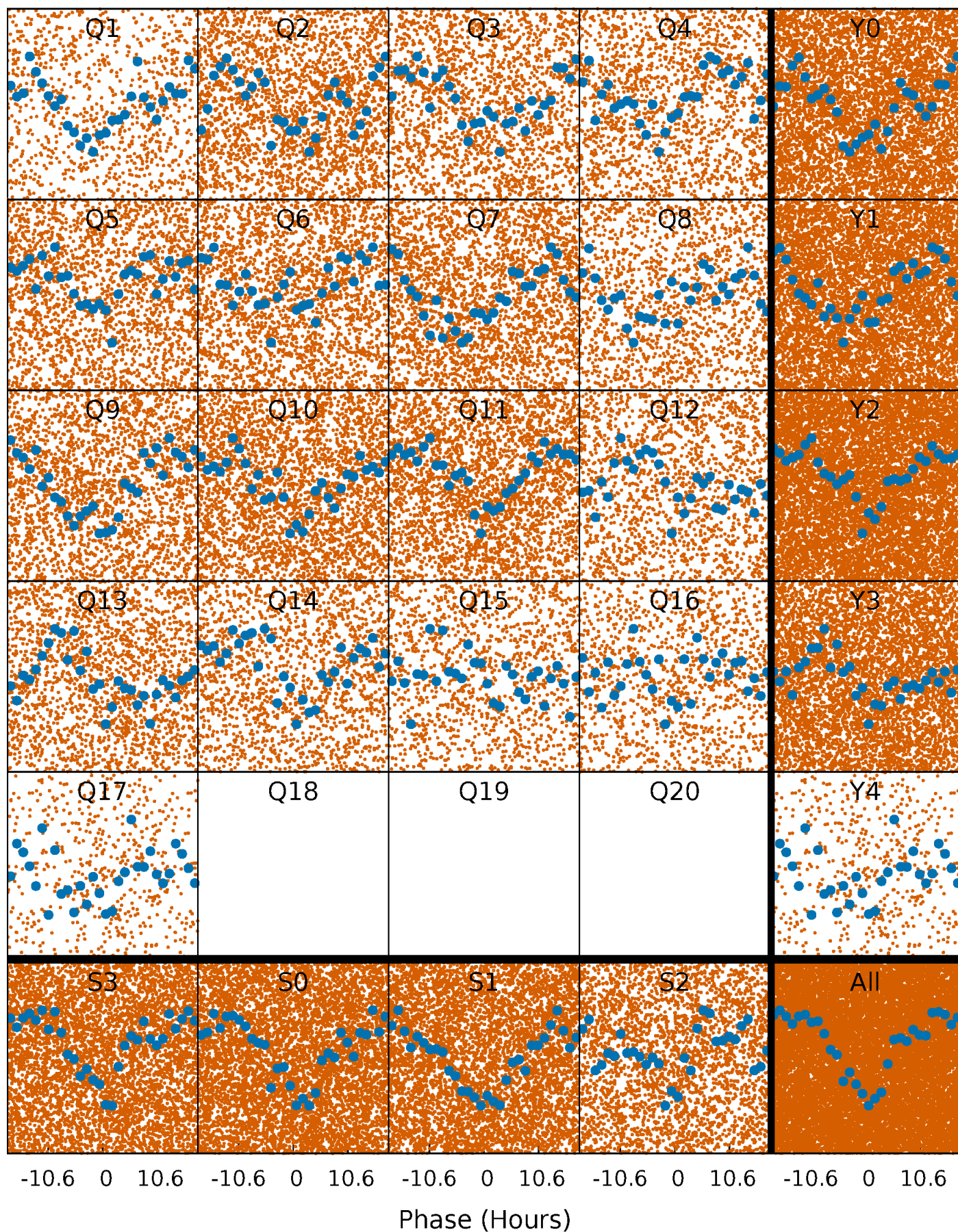


Non-Whitened Vs. Whitened Light Curve



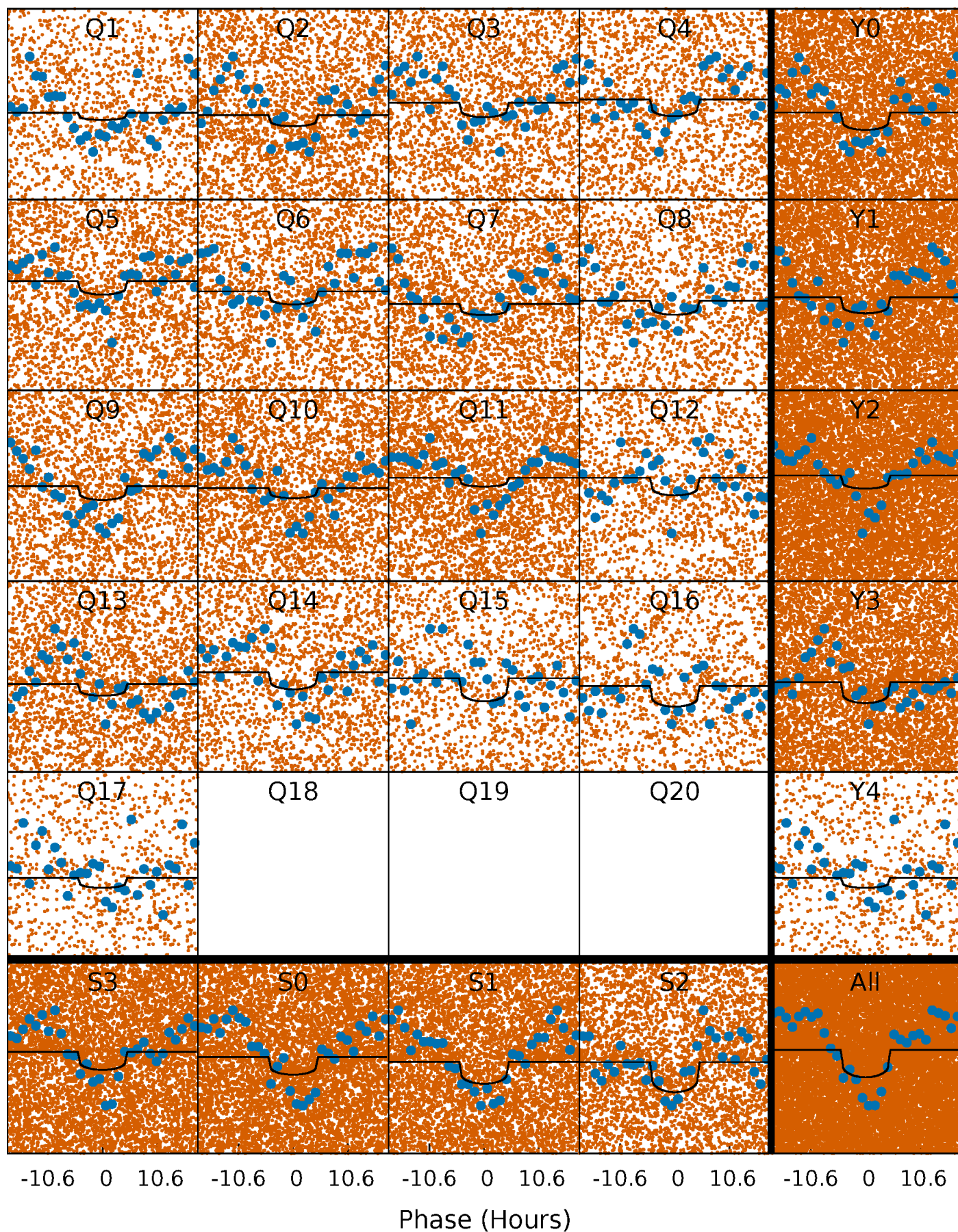
PDC Quarter-Phased Transit Curves

TCE 007008221-01 P= 1.285721 Days $T_0=132.450125$ (BKJD)



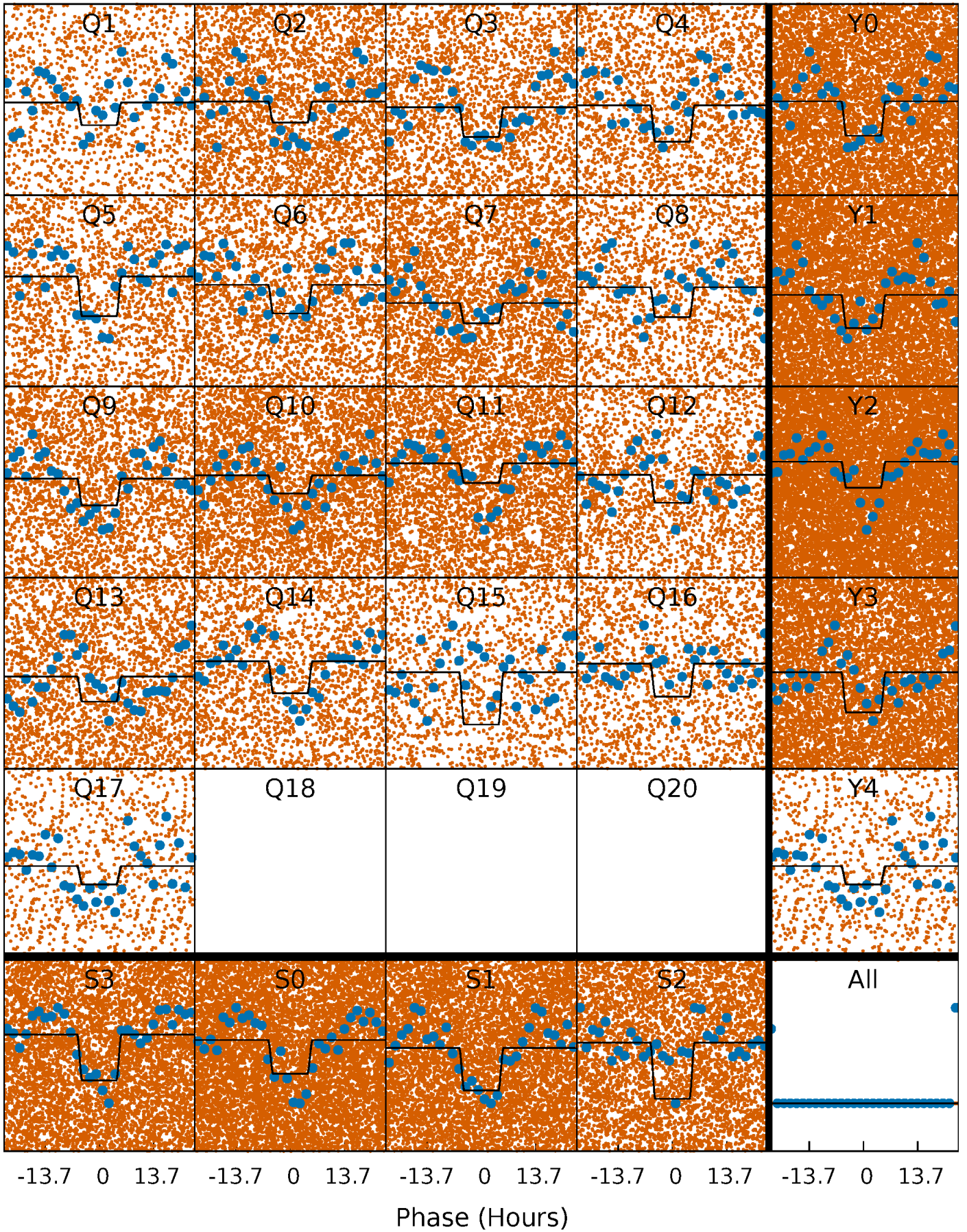
DV Quarter-Phased Transit Curves

TCE 007008221-01 P= 1.285721 Days $T_0=132.450125$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

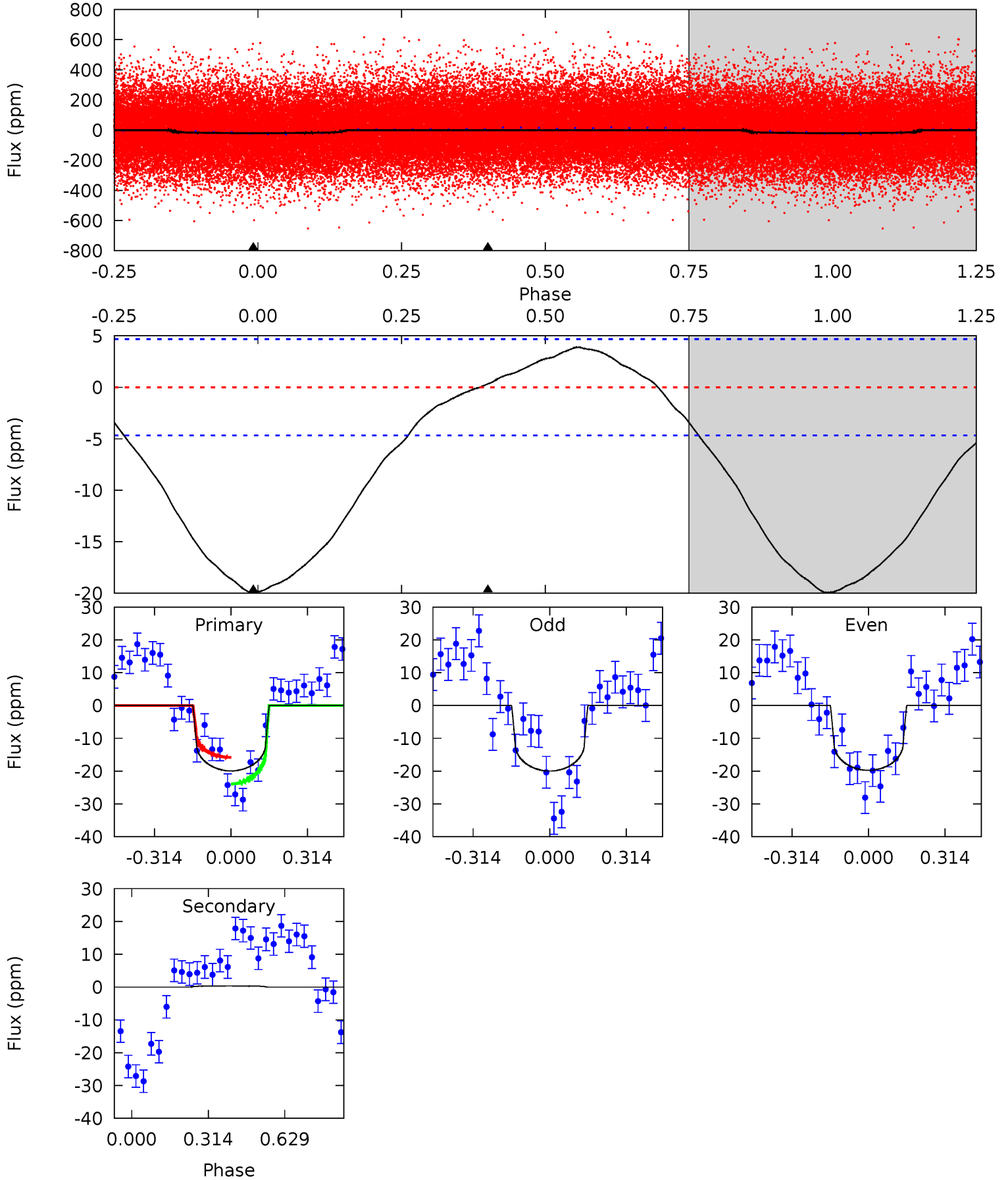
TCE 007008221-01 P= 1.285654 Days $T_0=132.464283$ (BKJD)



DV Model-Shift Uniqueness Test

007008221-01, P = 1.285721 Days, E = 131.164404 Days

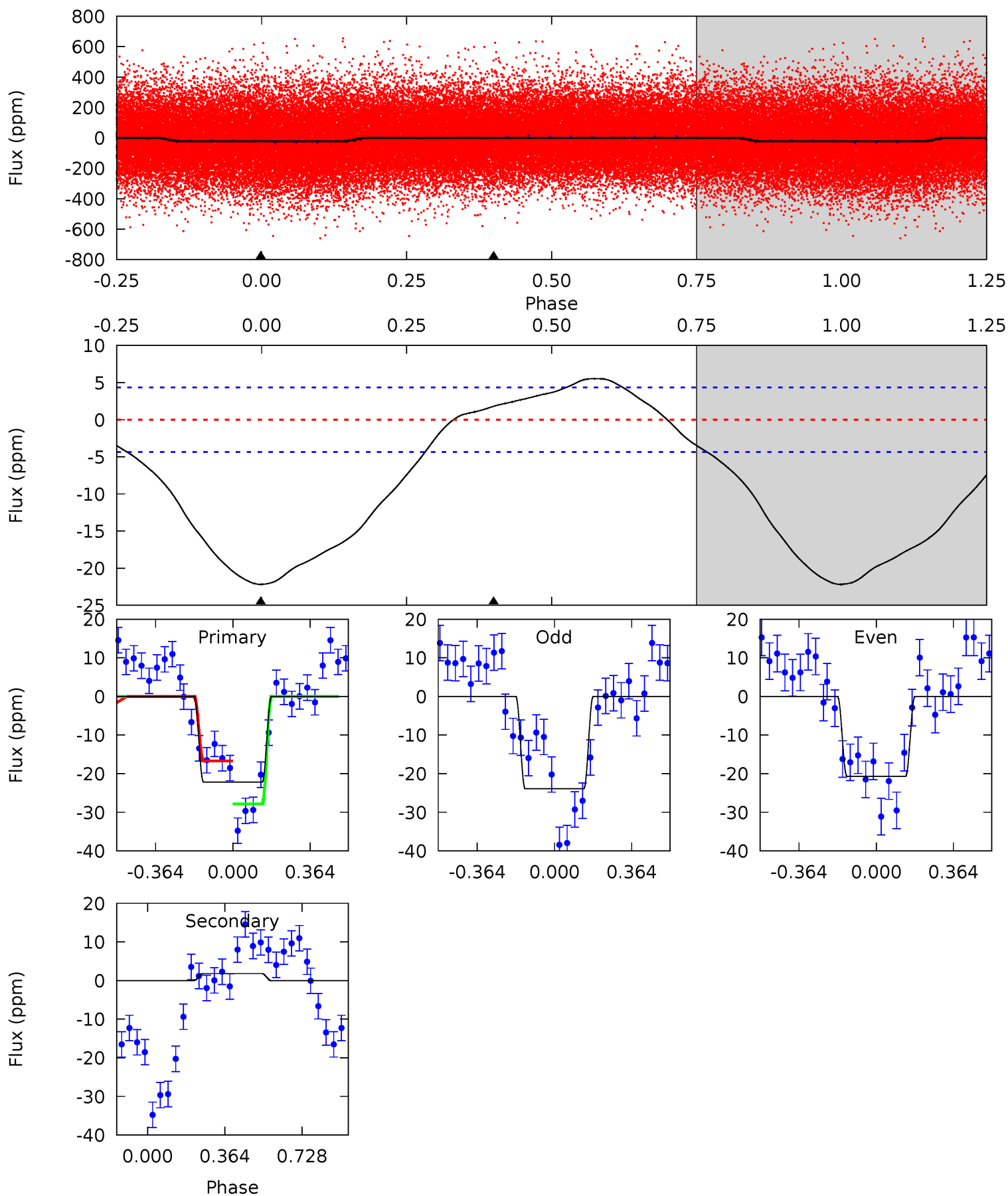
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.4	-0.31	0	0	4.32	1.01	1.42	18.4	18.4	-0.31	-0.31	0.11	0.99	0.16	3.73



Alt Model-Shift Uniqueness Test

007008221-01, P = 1.285654 Days, E = 131.178629 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.9	-1.78	0	0	4.29	0.91	1.98	21.9	21.9	-1.78	-1.78	1.59	0.85	0.20	5.23



Stellar Parameters For KIC 007008221

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6878^{+186}_{-227}	$3.503^{+0.323}_{-0.086}$	$-0.240^{+0.300}_{-0.250}$	$3.982^{+0.372}_{-1.582}$	$1.844^{+0.196}_{-0.364}$	$0.041^{+0.100}_{-0.011}$
	+3%/-3%	+9%/-2%	+125%/-104%	+9%/-40%	+11%/-20%	+244%/-26%
Source	PHO1	FLK73	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 007008221-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1	$1.57^{+1.33}_{-0.99}$	4949^{+250}_{-422}	-4368^{+828}_{-759}	$-0.031^{+0.203}_{-0.429}$
Alt.	2 ± 1	$2.00^{+1.29}_{-1.13}$	4933^{+268}_{-465}	-4666^{+356}_{-949}	$-0.184^{+0.136}_{-0.682}$

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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

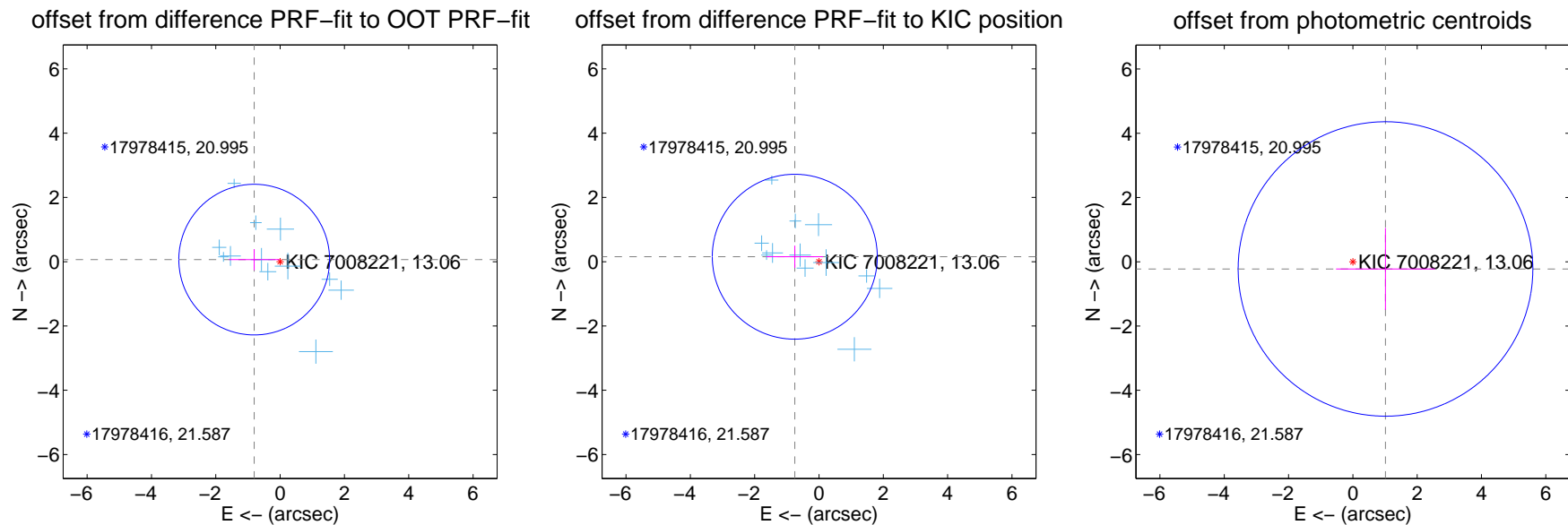
DV Centroid Data

Supplemental centroid analysis for 007008221-01. Kepler magnitude: 13.06. Transit SNR 7.03

There are 12 quarters with good PRF difference image offsets

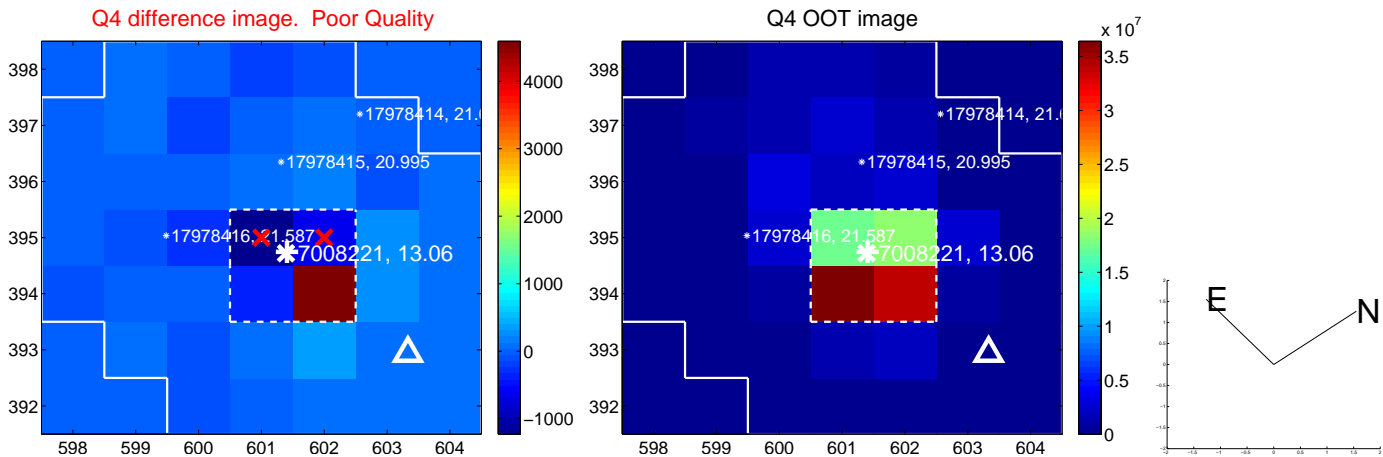
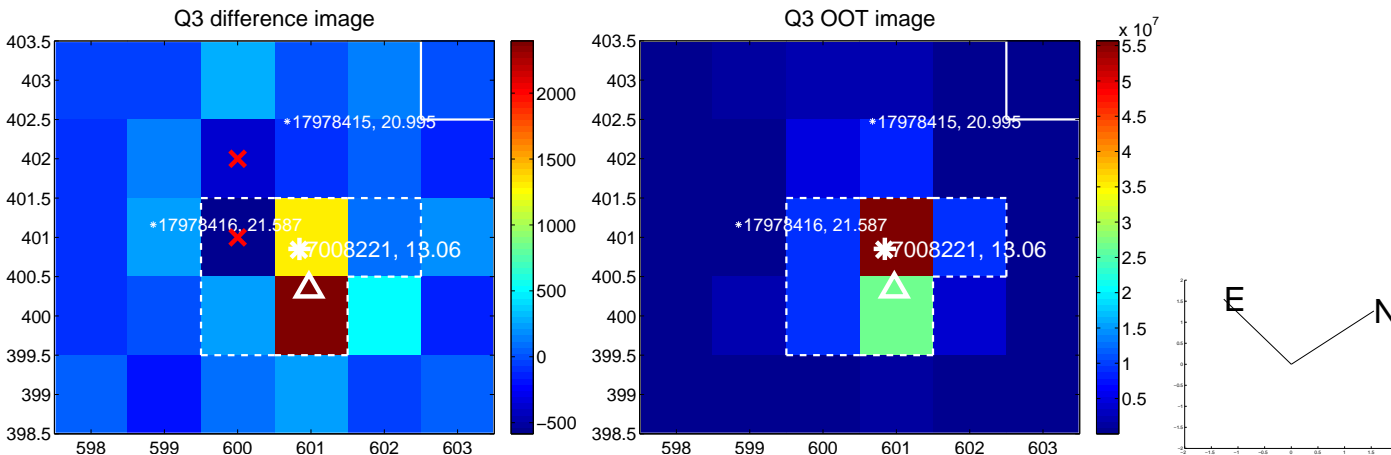
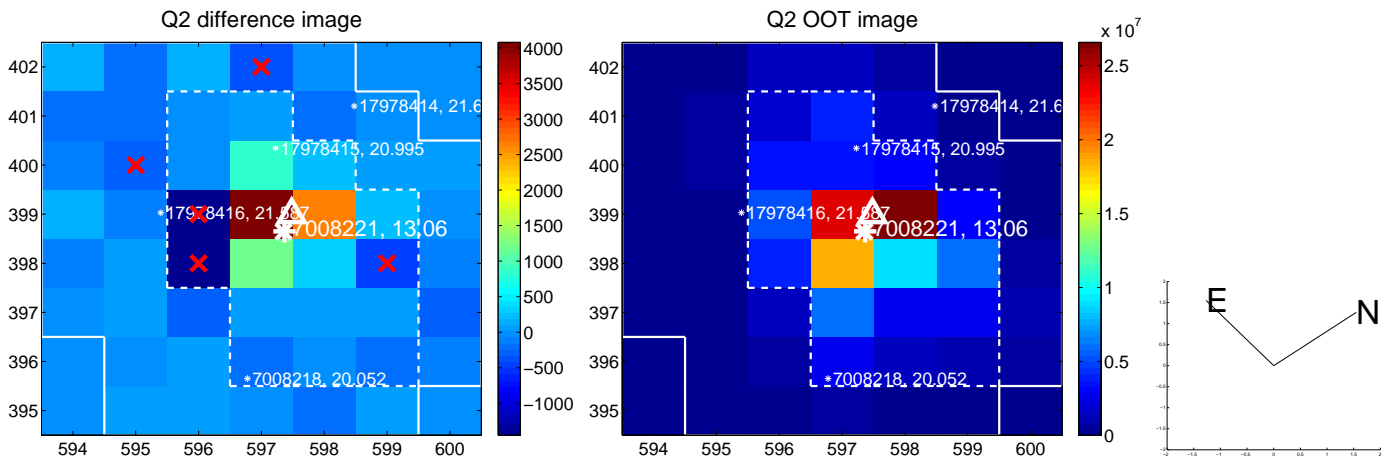
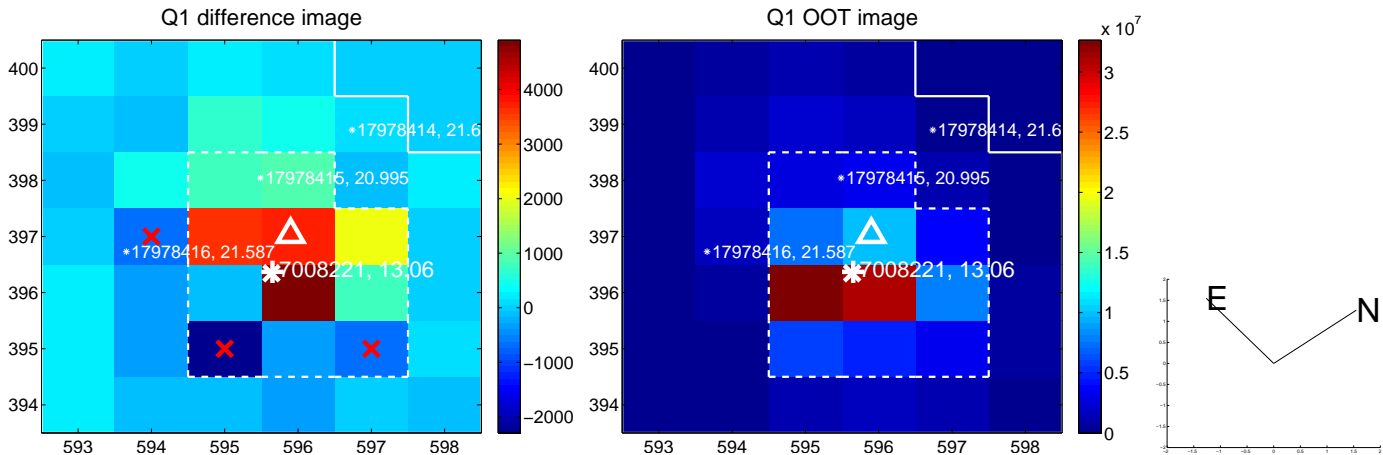
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.808 ± 0.781	1.03	0.805 ± 0.783	0.065 ± 0.327
PRF-fit source offset from KIC position	0.768 ± 0.855	0.90	0.752 ± 0.877	0.155 ± 0.346
photometric centroid source offset	1.04 ± 1.53	0.68	-1.02 ± 1.54	-0.22 ± 1.28

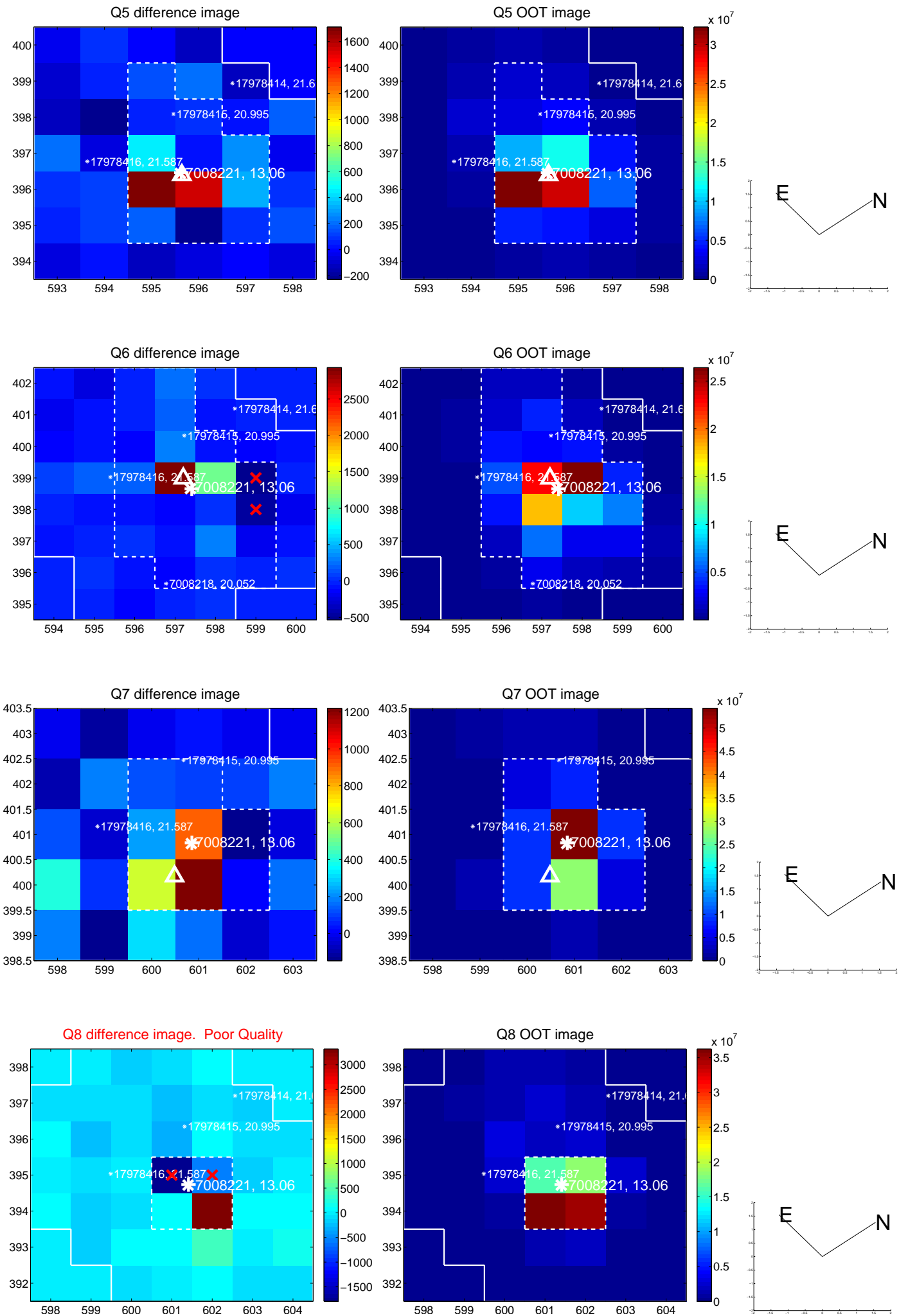


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

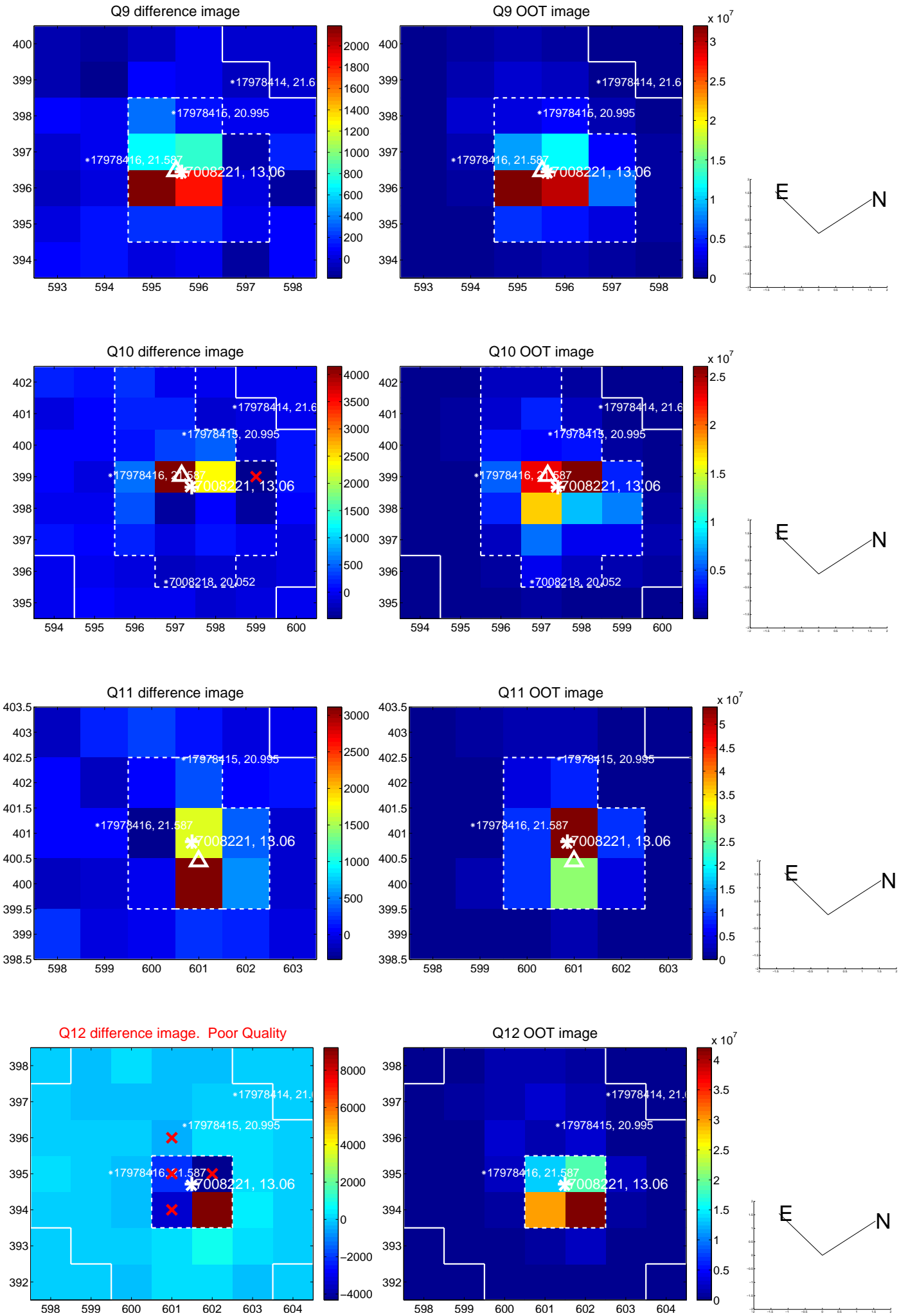
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



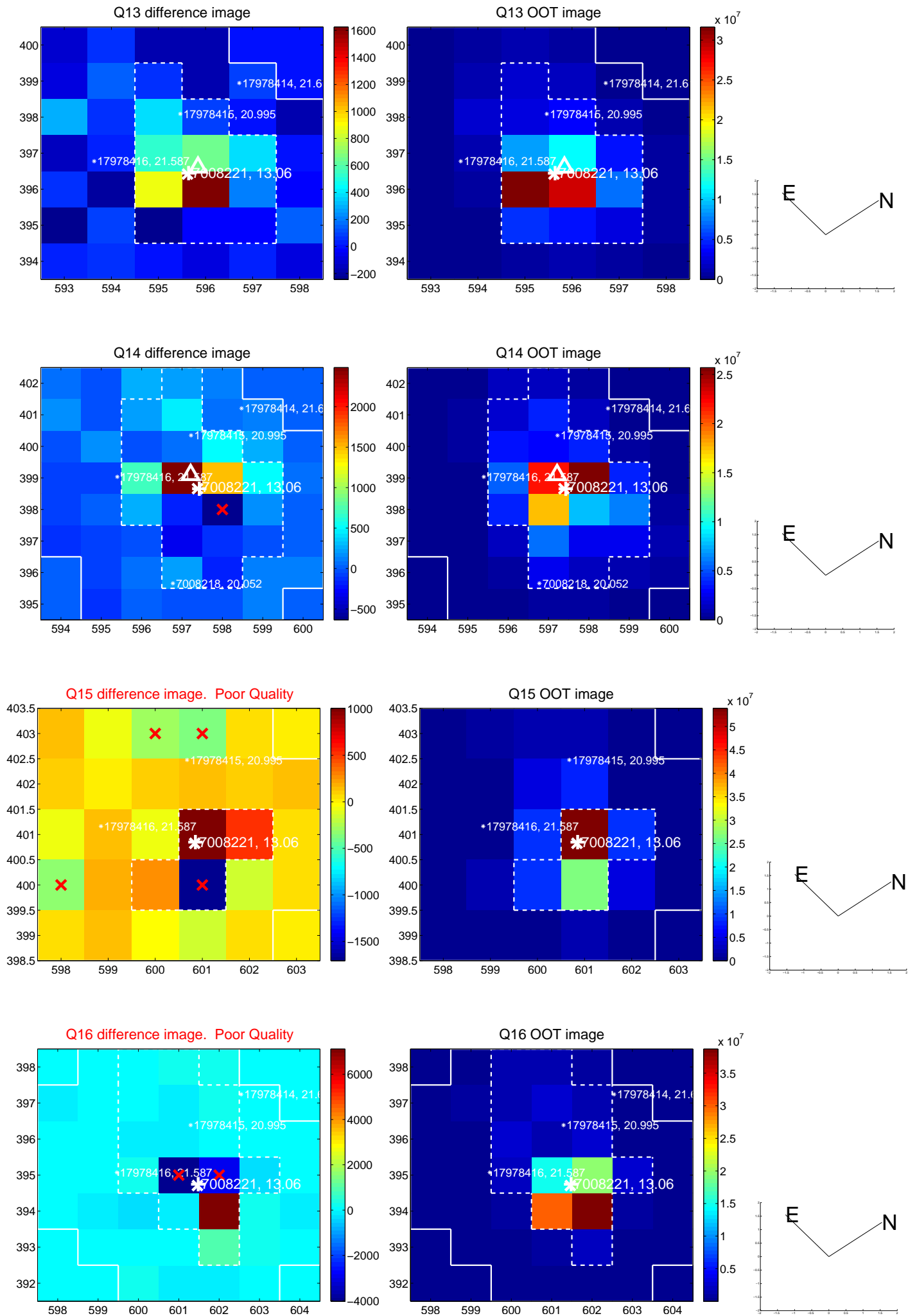
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



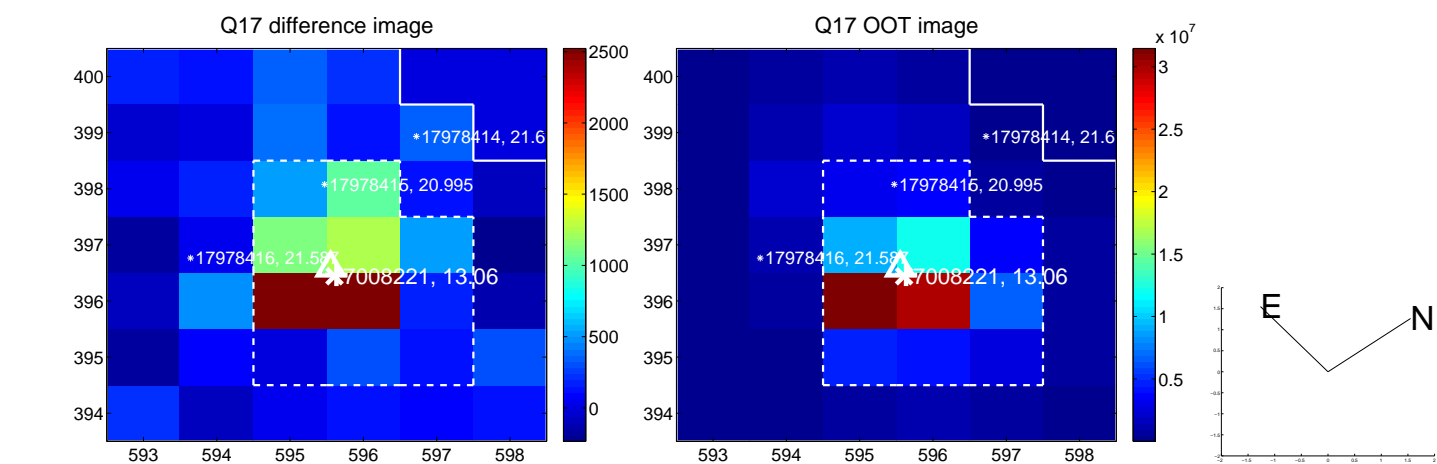
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



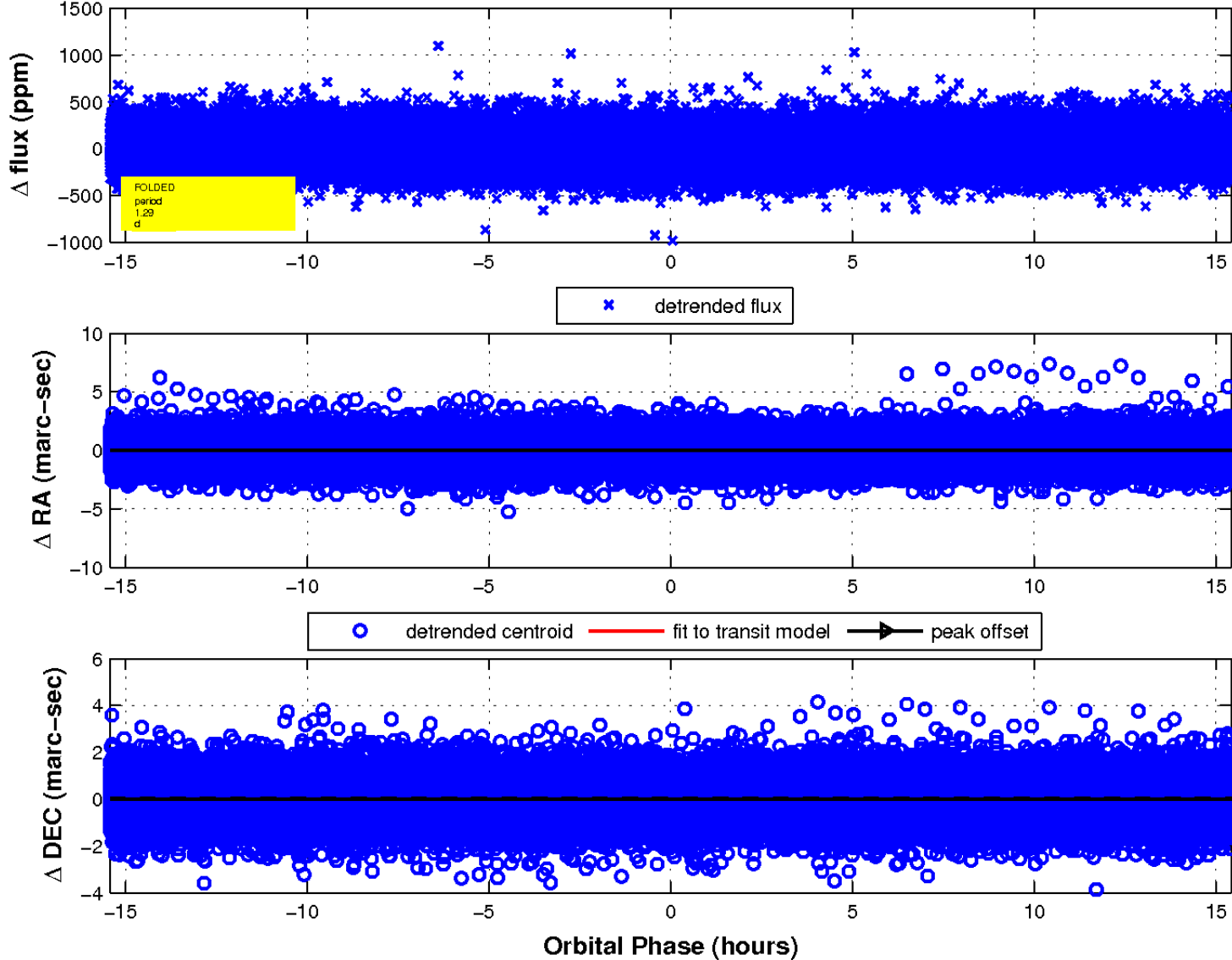
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

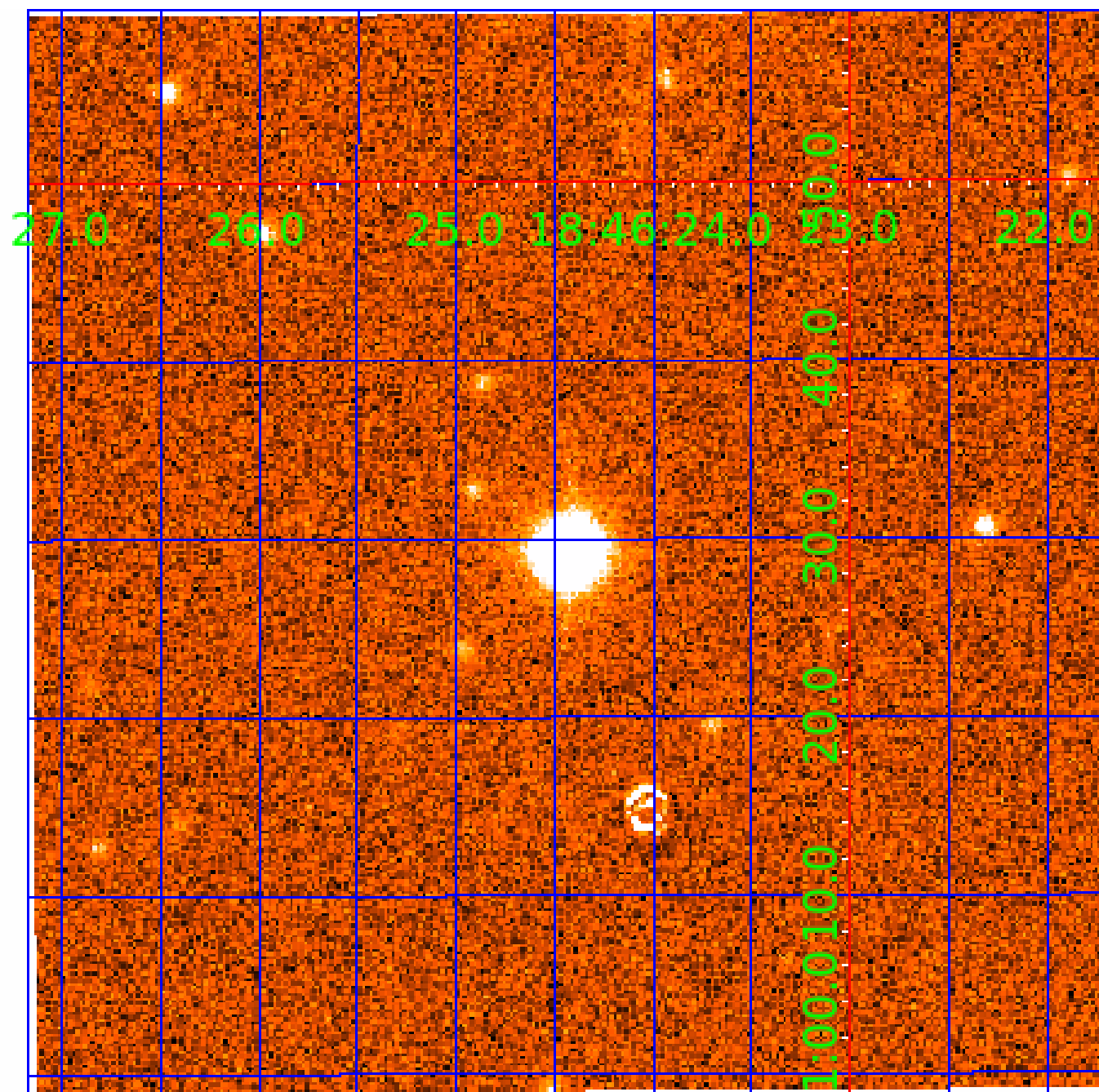


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



KIC 007008221

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})
007008221-01	OBS	No	1.285721	132.450125	12.1	9.262	8.9	7.0	3.98	6878	1.45	39501.61
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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007008221-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
007008221-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007008221-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

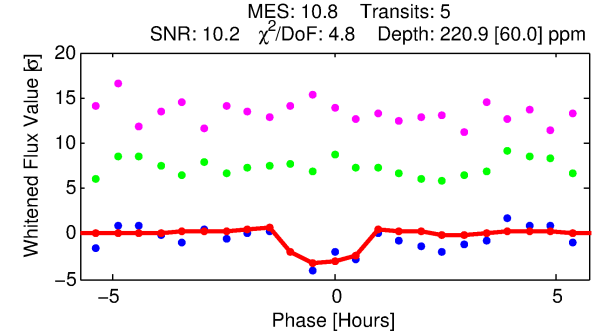
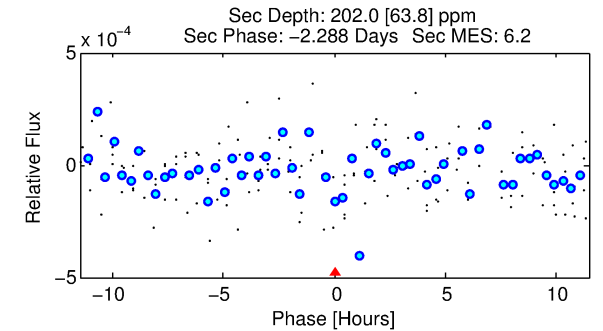
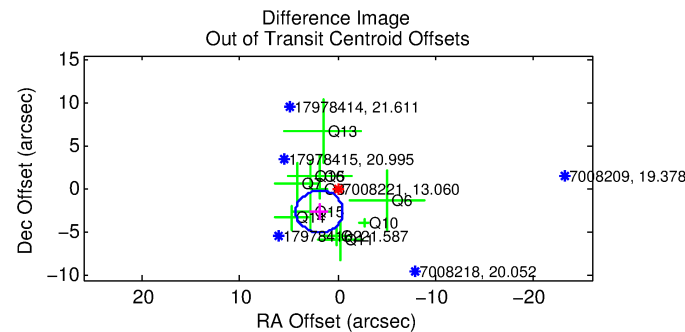
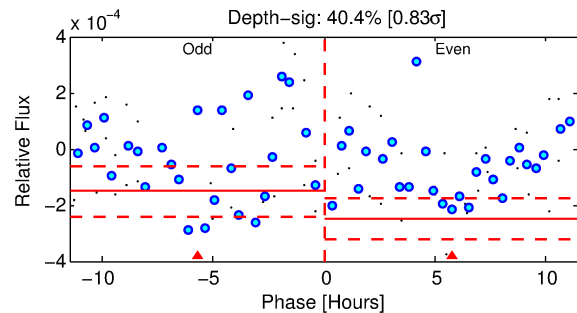
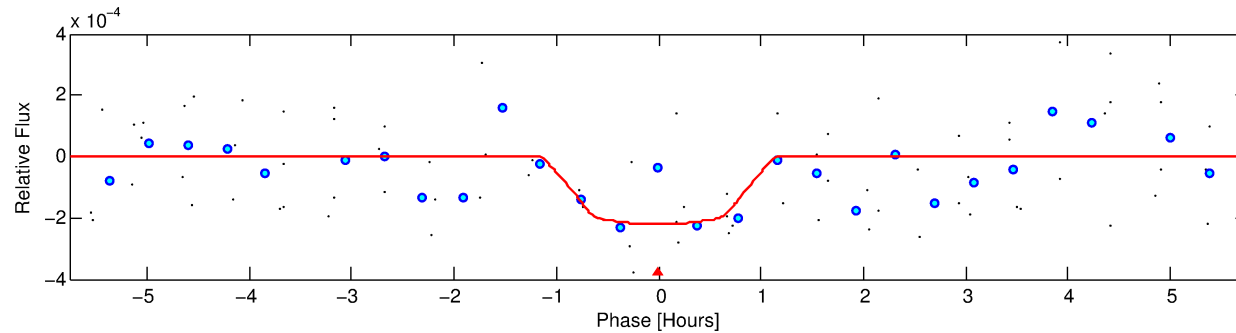
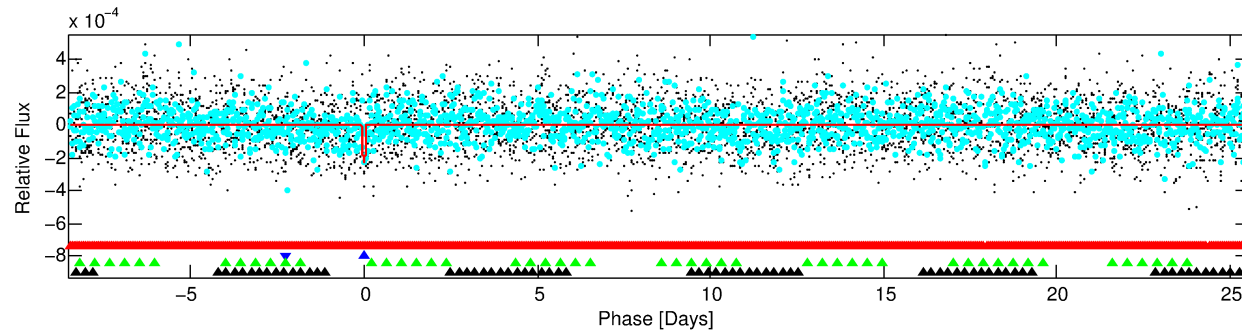
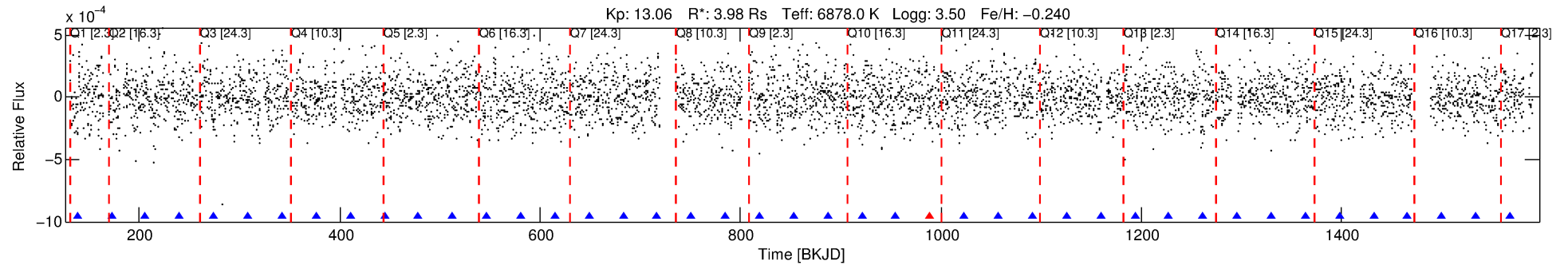
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007008221-02

No Significant Match Found

DV One-Page Summary

KIC: 7008221 Candidate: 2 of 4 Period: 34.043 d



DV Fit Results:

Period = 34.04323 [0.00055] d
Epoch = 138.2481 [0.0110] BKJD
Rp/R* = 0.0155 [0.0182]
a/R* = 73.16 [517.69]
b = 0.86 [2.14]
Seff = 500.54 [289.02]
Teq = 1206 [174] K
Rp = 6.72 [8.34] Re
a = 0.2520 [0.0914] AU
Ag = 156.44 [381.40] [0.41 σ]
Teffp = 6595 [3917] K [1.37 σ]

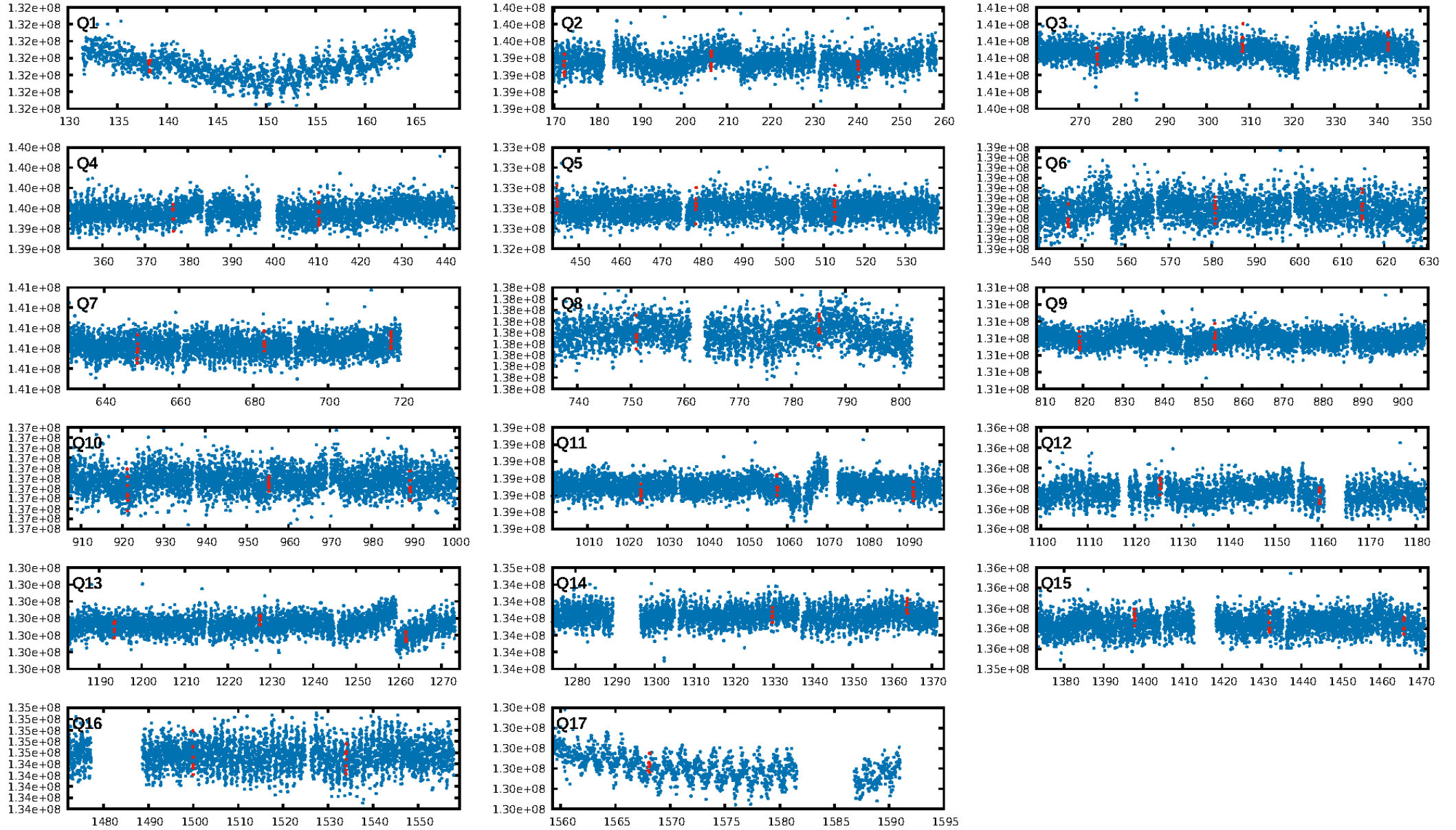
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [36.28 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 2.2%
Bootstrap-pfa: 1.66e-09
RollingBand-fgt: 0.75 [3/4]
GhostDiagnostic-chr: 1.022
Centroid-sig: 7.9%
Centroid-so: 1.139 arcsec [1.41 σ]
OotOffset-rm: 3.184 arcsec [3.94 σ]
KicOffset-rm: 3.105 arcsec [4.22 σ]
OotOffset-st: 4/3/2/2 [11]
KicOffset-st: 4/3/2/2 [11]
DiffImageQuality-fgm: 0.00 [0/11]
DiffImageOverlap-fno: 0.65 [11/17]

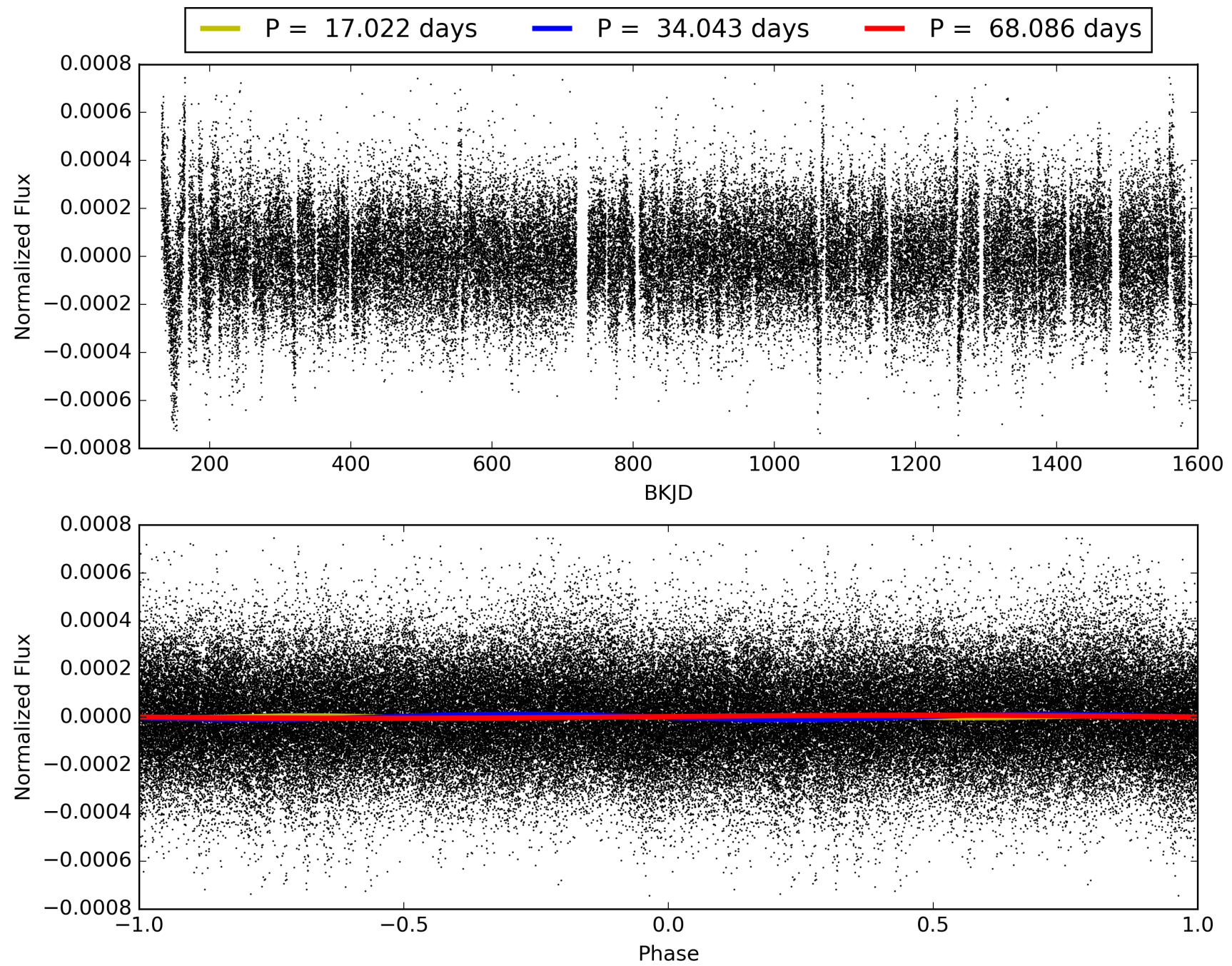
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 22:42:58 Z

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

TCE 007008221-02, PDC Light Curves

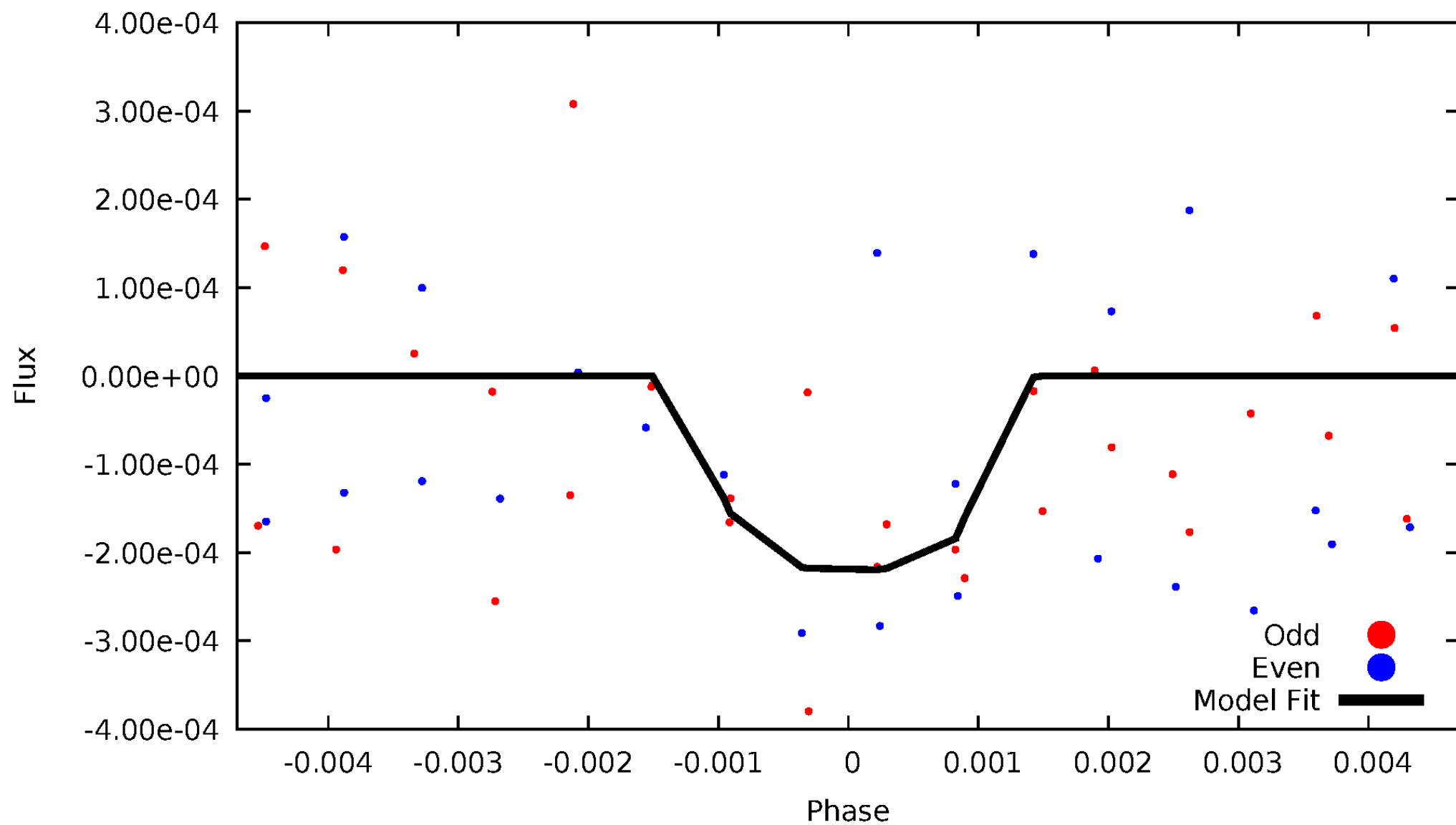


TCE 007008221-02



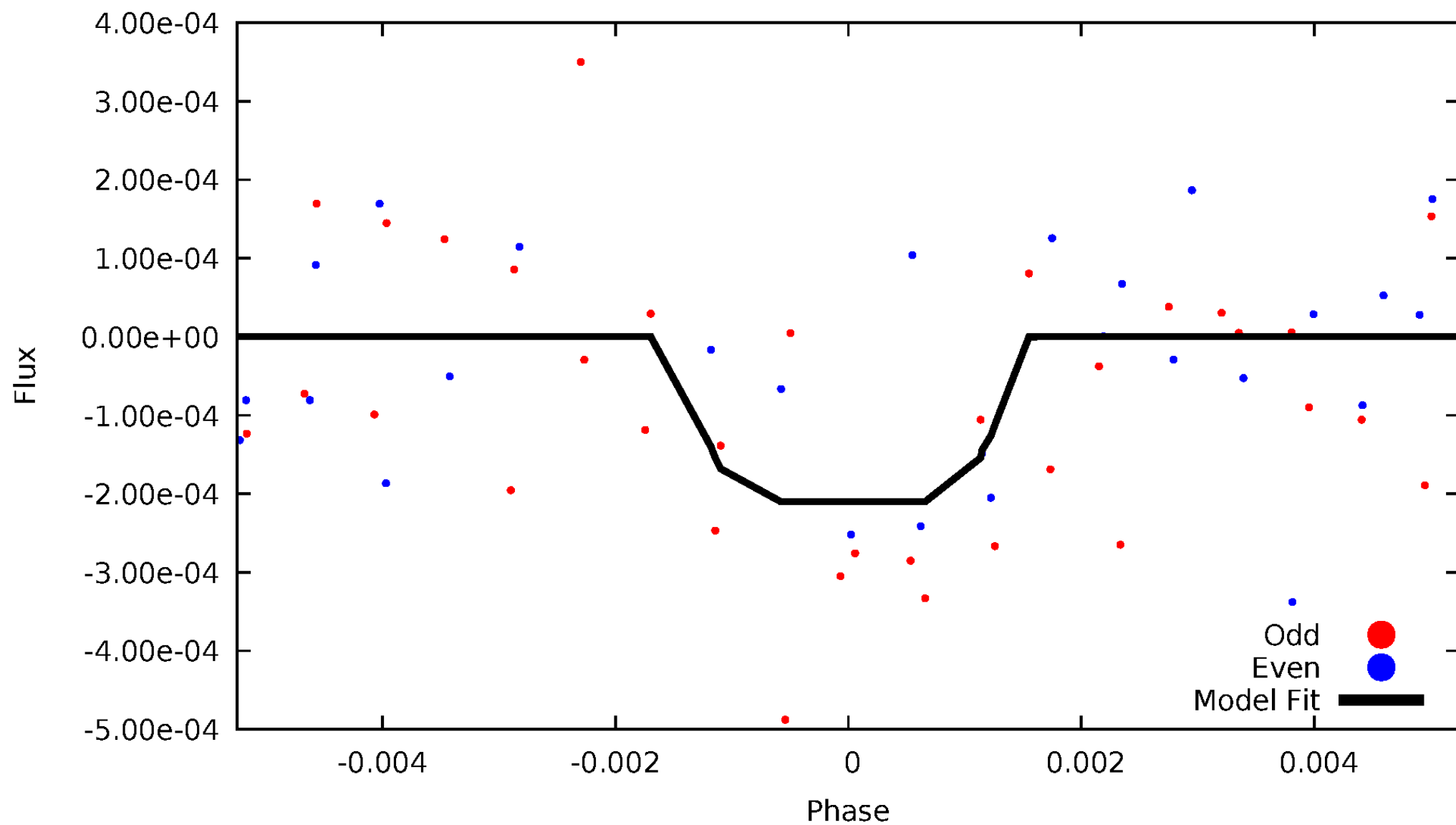
DV Odd/Even

TCE 007008221-02



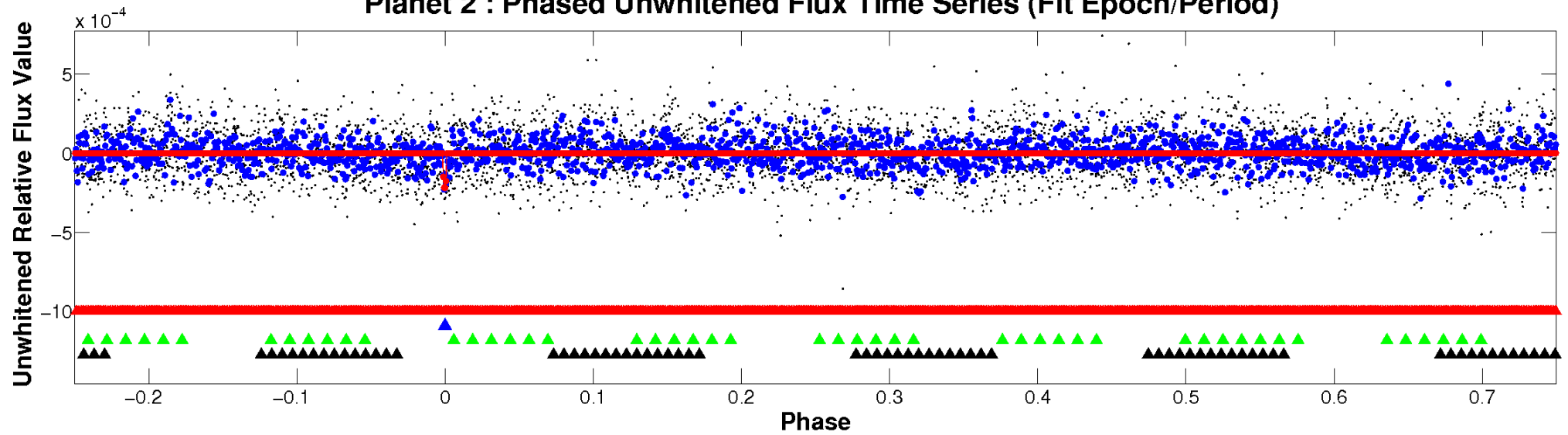
ALT Odd/Even

TCE 007008221-02

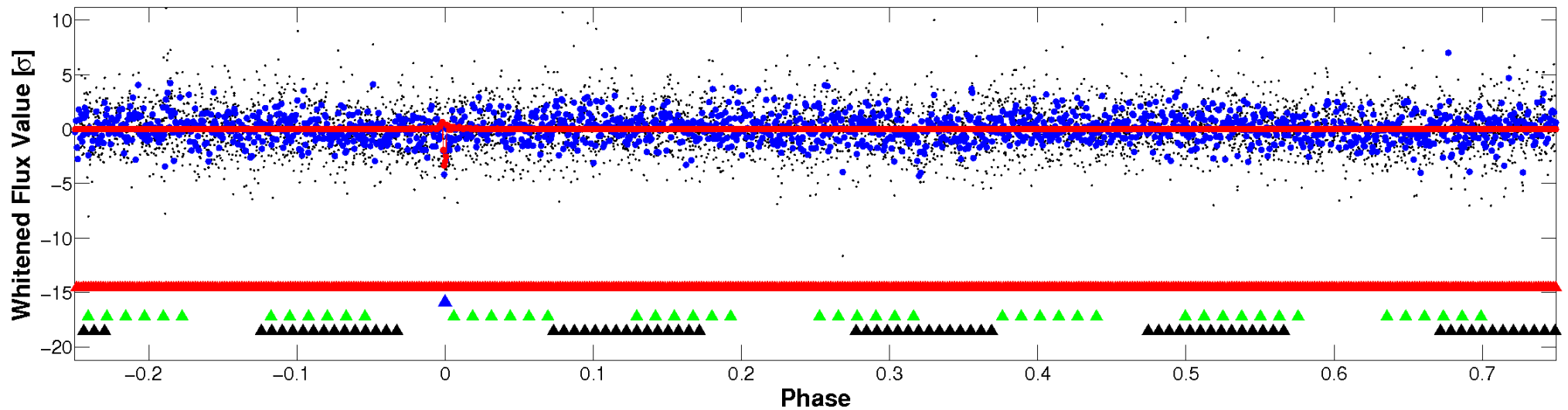


Non-Whitened Vs. Whitened Light Curve

Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

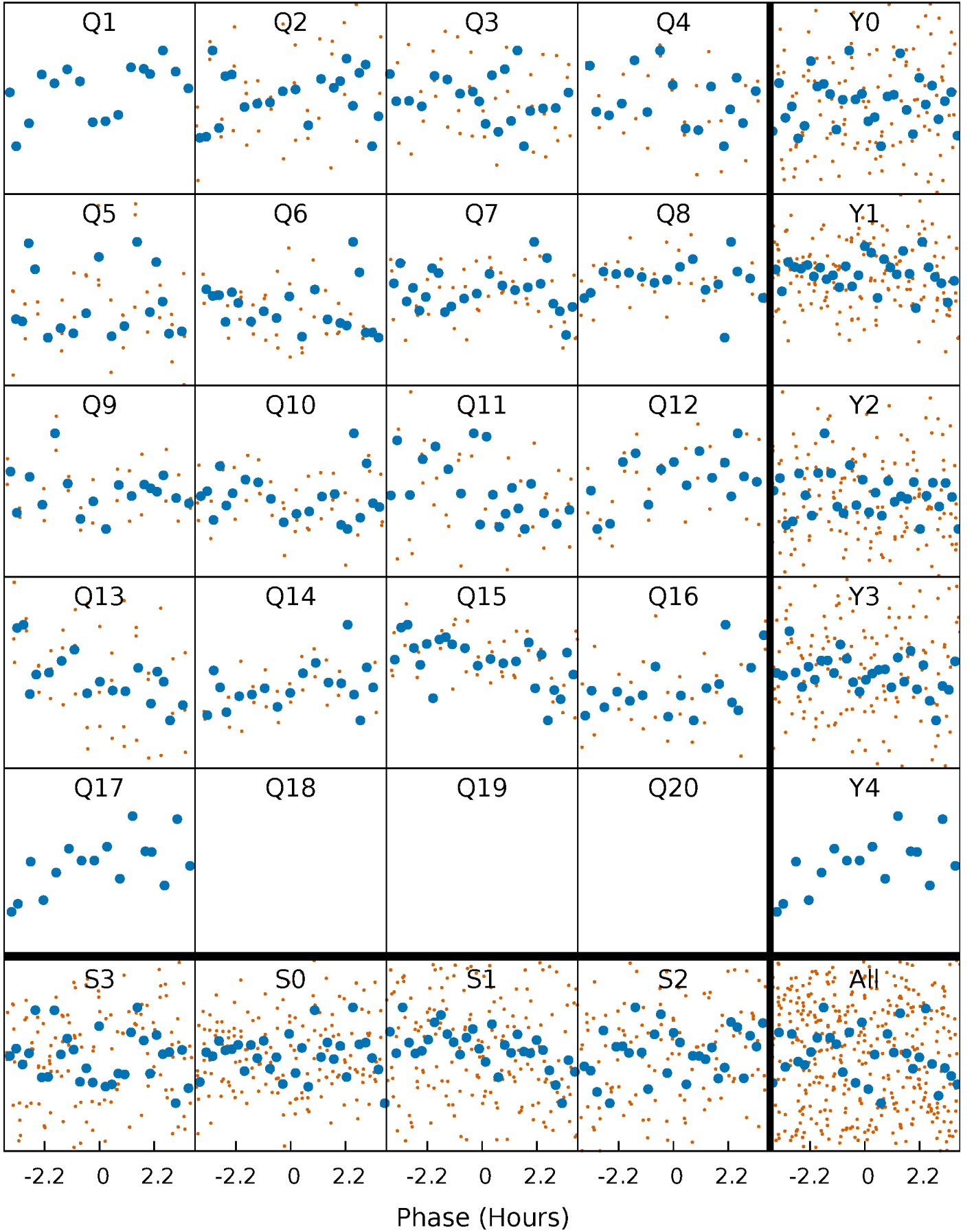


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



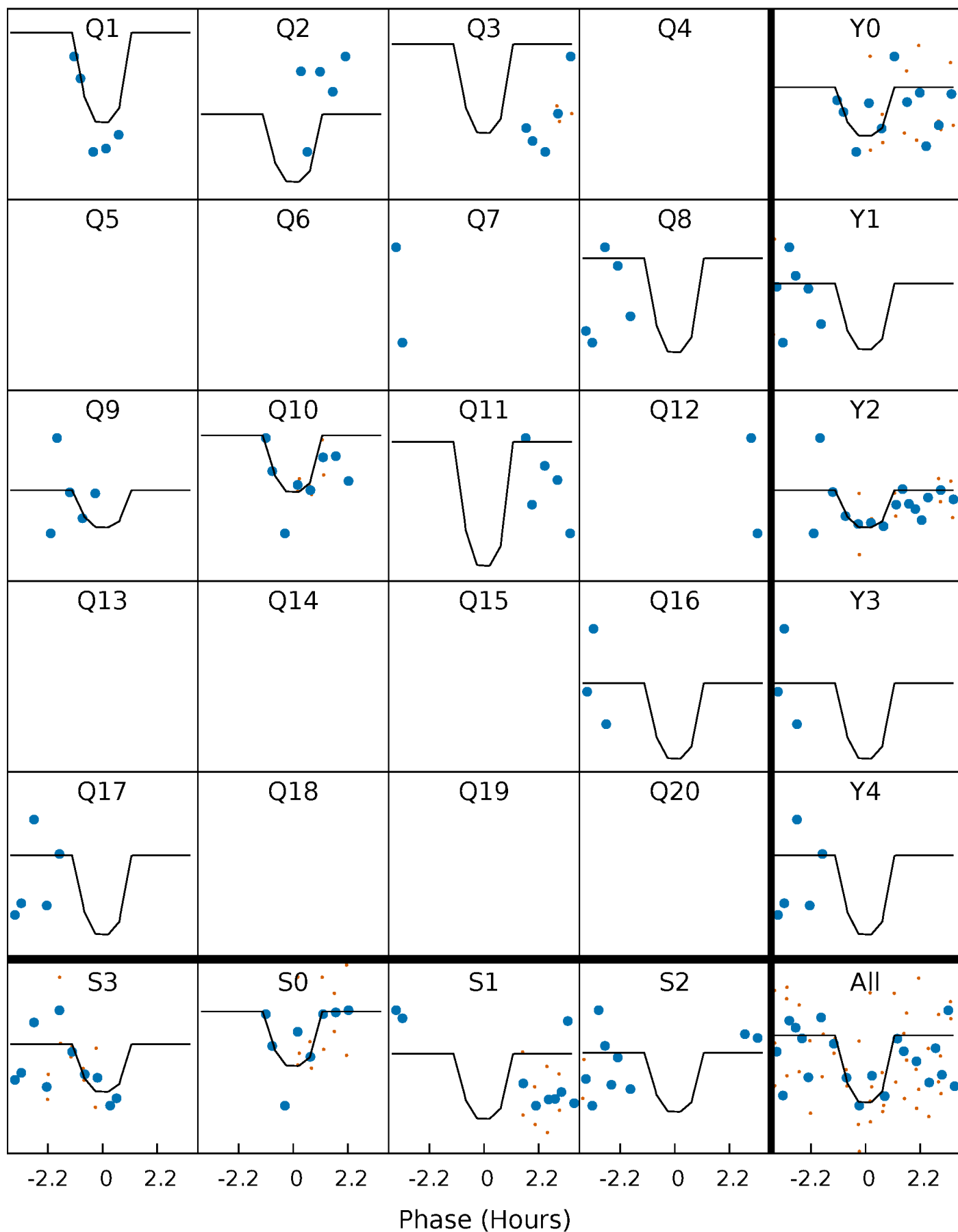
PDC Quarter-Phased Transit Curves

TCE 007008221-02 P= 34.043229 Days $T_0=138.248068$ (BKJD)



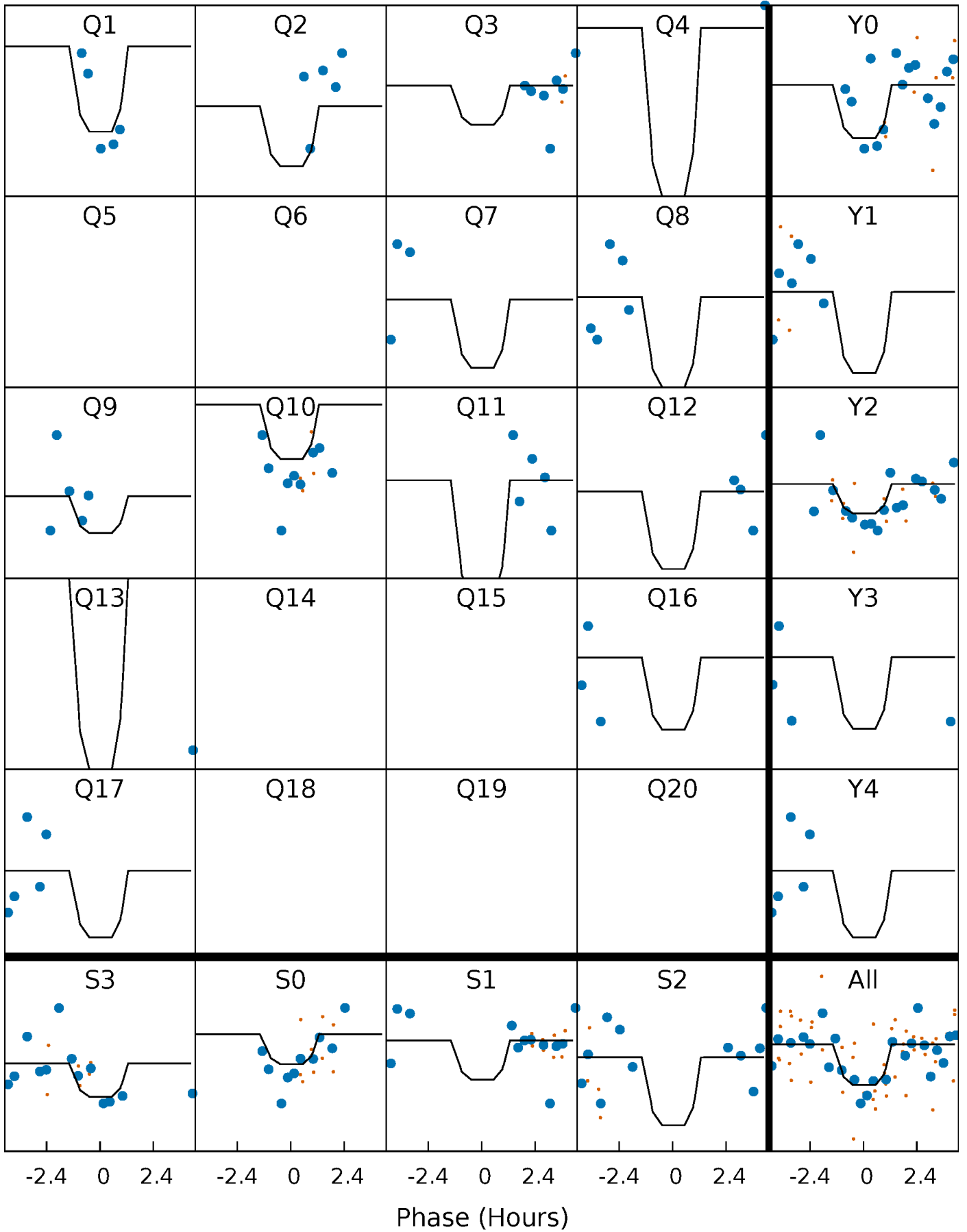
DV Quarter-Phased Transit Curves

TCE 007008221-02 P= 34.043229 Days $T_0=138.248068$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

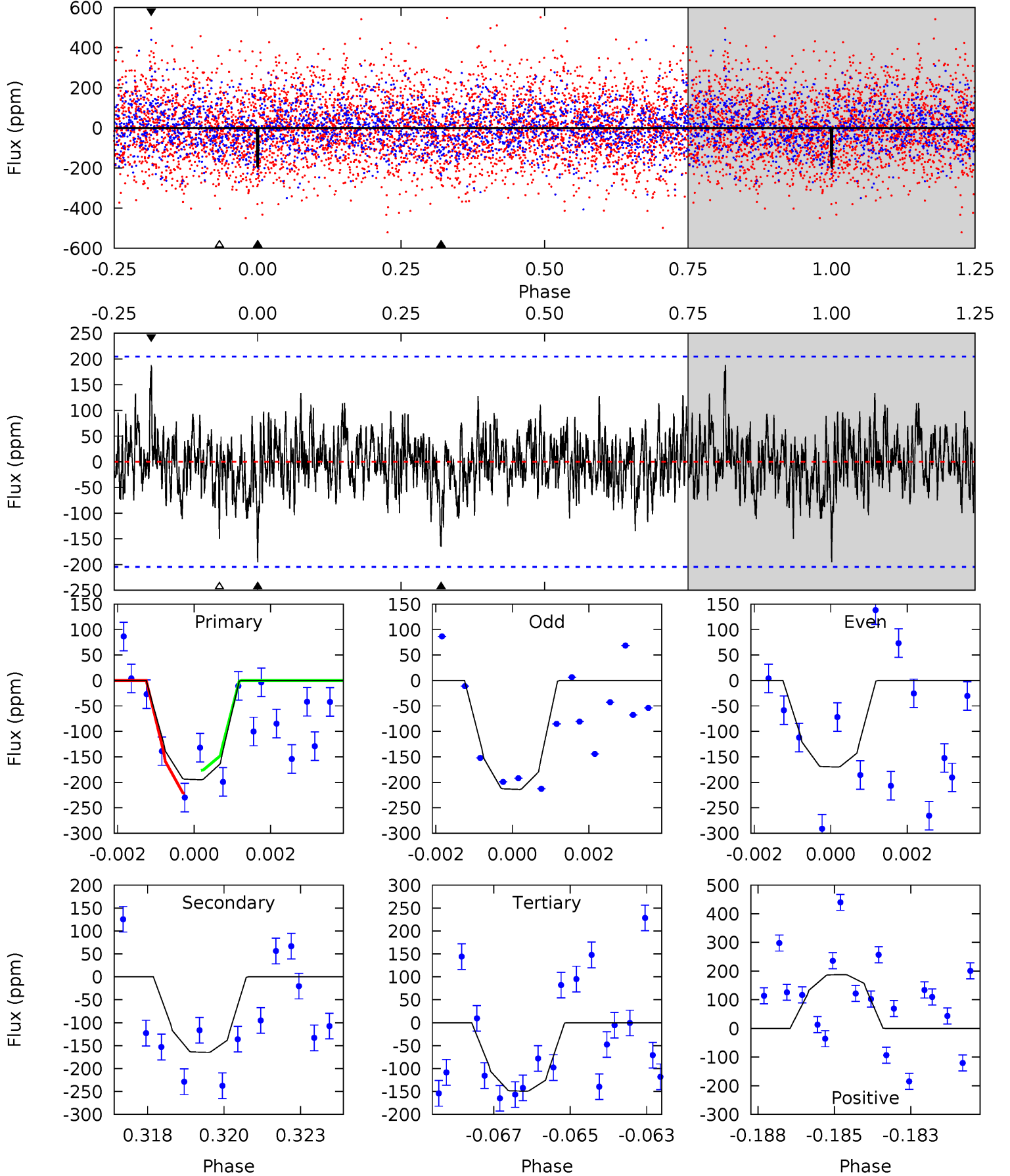
TCE 007008221-02 P= 34.044141 Days $T_0=138.235137$ (BKJD)



DV Model-Shift Uniqueness Test

007008221-02, P = 34.043229 Days, E = 104.204839 Days

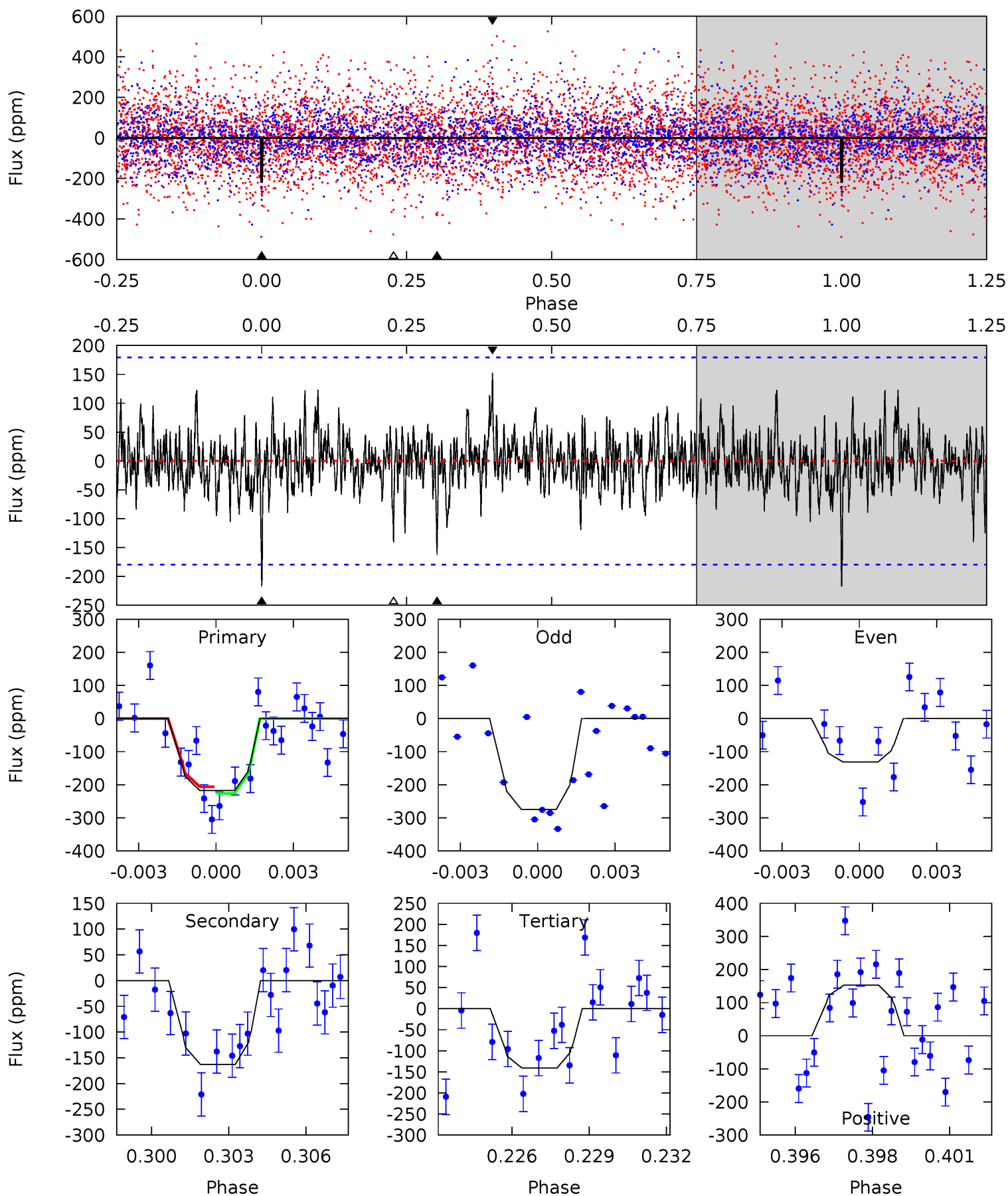
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.05	4.27	3.87	4.86	5.29	3.03	1.16	1.18	0.19	0.40	-0.59	0.56	0.75	0.49	0.53



Alt Model-Shift Uniqueness Test

007008221-02, P = 34.044141 Days, E = 104.190996 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.39	4.77	4.14	4.48	5.27	3.00	1.08	2.24	1.90	0.63	0.29	2.03	0.97	0.41	0.28



Stellar Parameters For KIC 007008221

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6878^{+186}_{-227}	$3.503^{+0.323}_{-0.086}$	$-0.240^{+0.300}_{-0.250}$	$3.982^{+0.372}_{-1.582}$	$1.844^{+0.196}_{-0.364}$	$0.041^{+0.100}_{-0.011}$
	+3%/-3%	+9%/-2%	+125%/-104%	+9%/-40%	+11%/-20%	+244%/-26%
Source	PHO1	FLK73	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 007008221-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-165 ± 39	$8.29^{+6.06}_{-5.32}$	1660^{+88}_{-147}	5413^{+4494}_{-1097}	84^{+590}_{-58}
Alt.	-163 ± 34	$8.08^{+6.91}_{-5.35}$	1659^{+91}_{-136}	5466^{+4868}_{-1212}	86^{+743}_{-62}

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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

DV Centroid Data

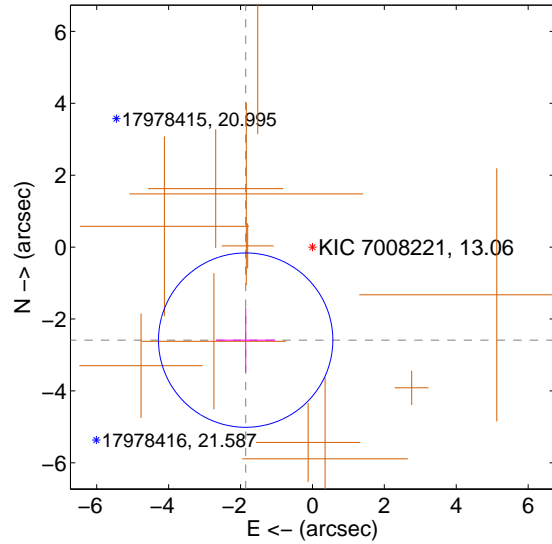
Supplemental centroid analysis for 007008221-02. Kepler magnitude: 13.06. Transit SNR 10.22

There are 0 quarters with good PRF difference image offsets

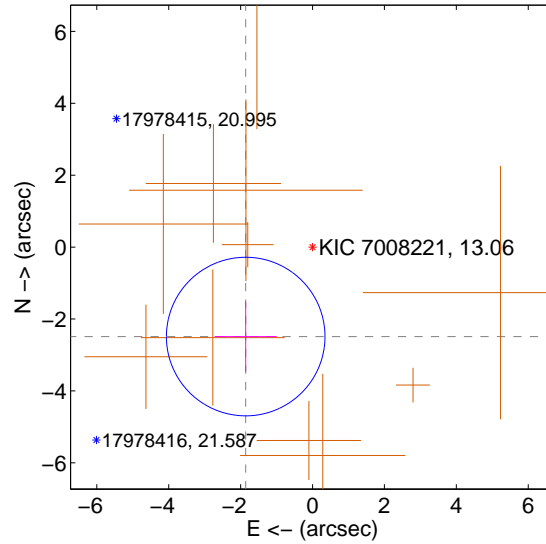
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.184 ± 0.808	3.94	1.856 ± 0.823	-2.587 ± 0.893
PRF-fit source offset from KIC position	3.105 ± 0.735	4.22	1.858 ± 0.867	-2.488 ± 0.975
photometric centroid source offset	1.14 ± 0.81	1.41	-0.74 ± 0.88	0.86 ± 0.75

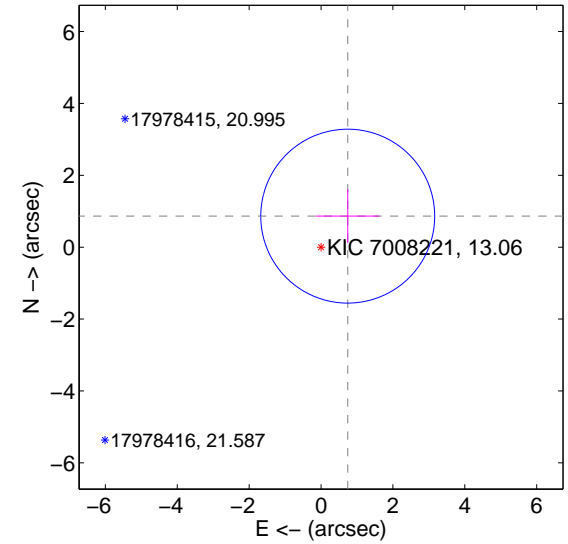
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

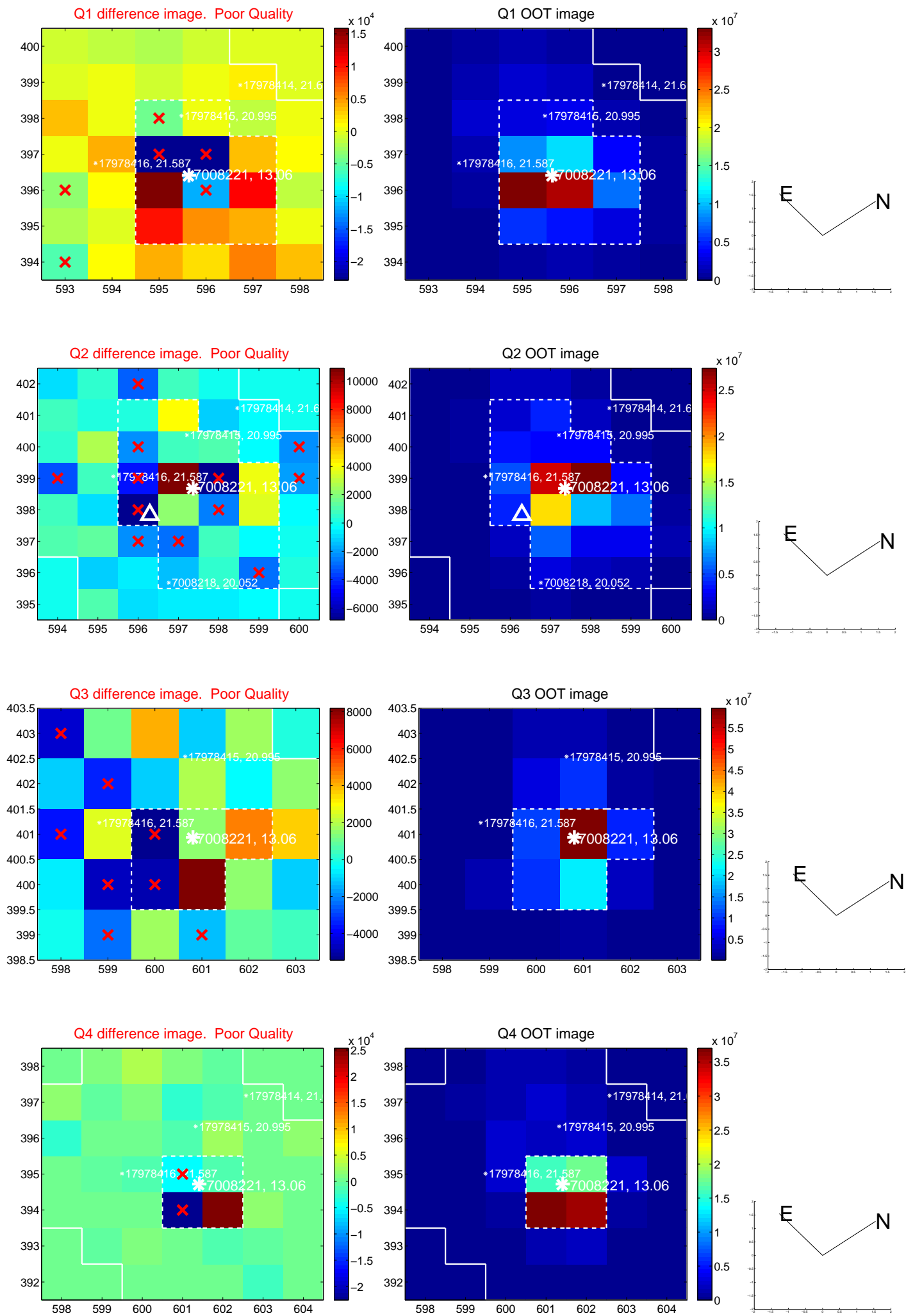


offset from photometric centroids

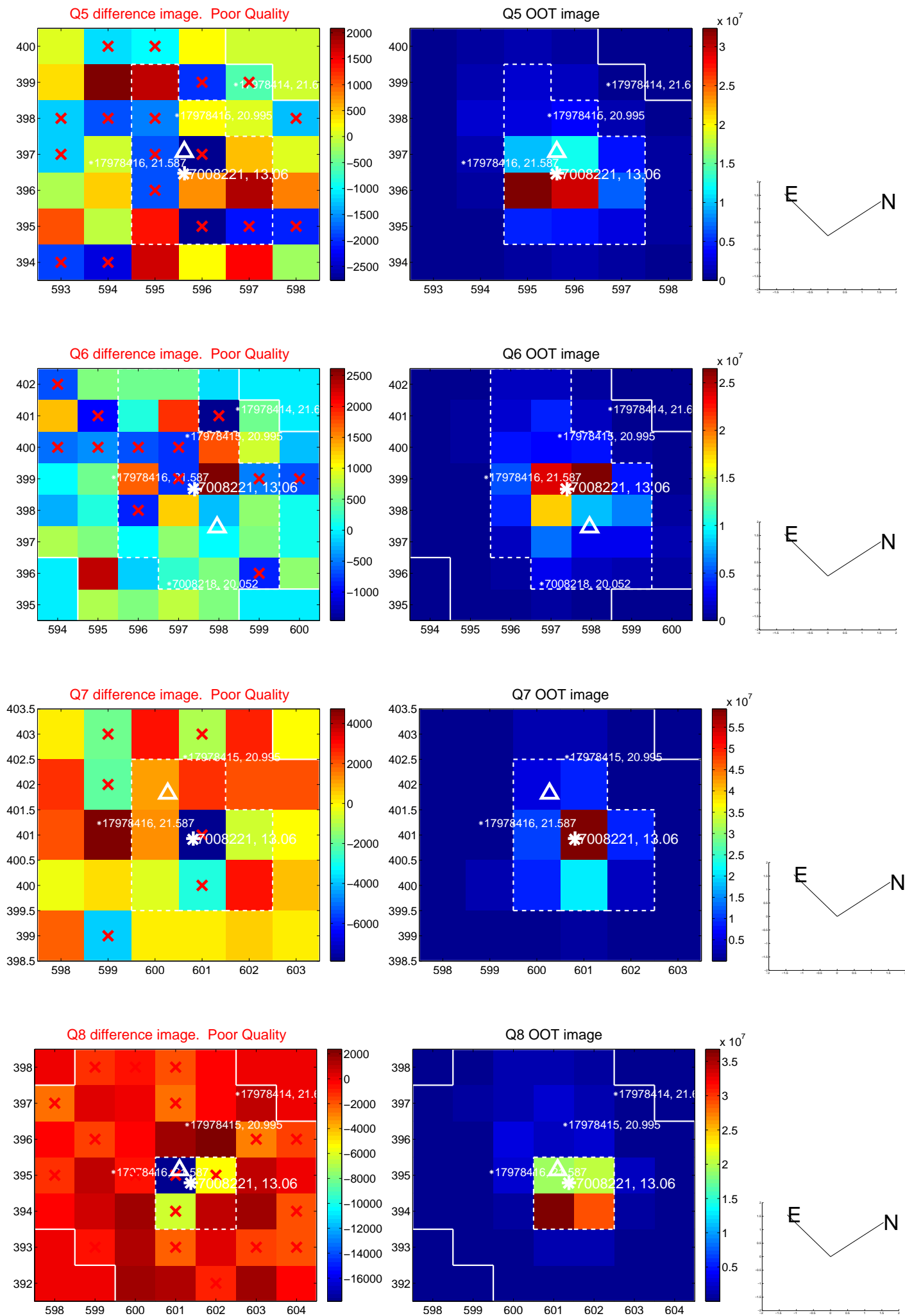


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

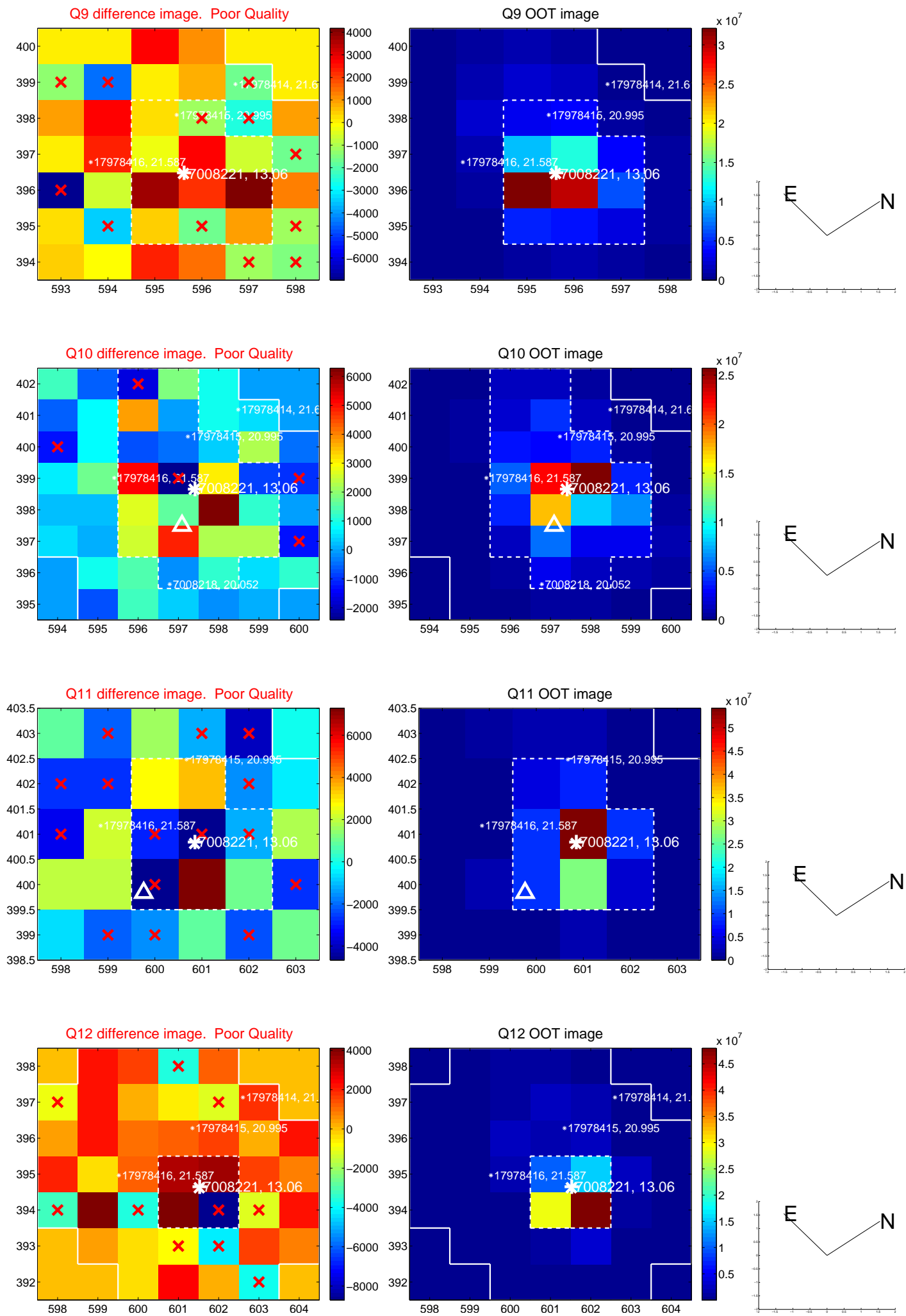
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



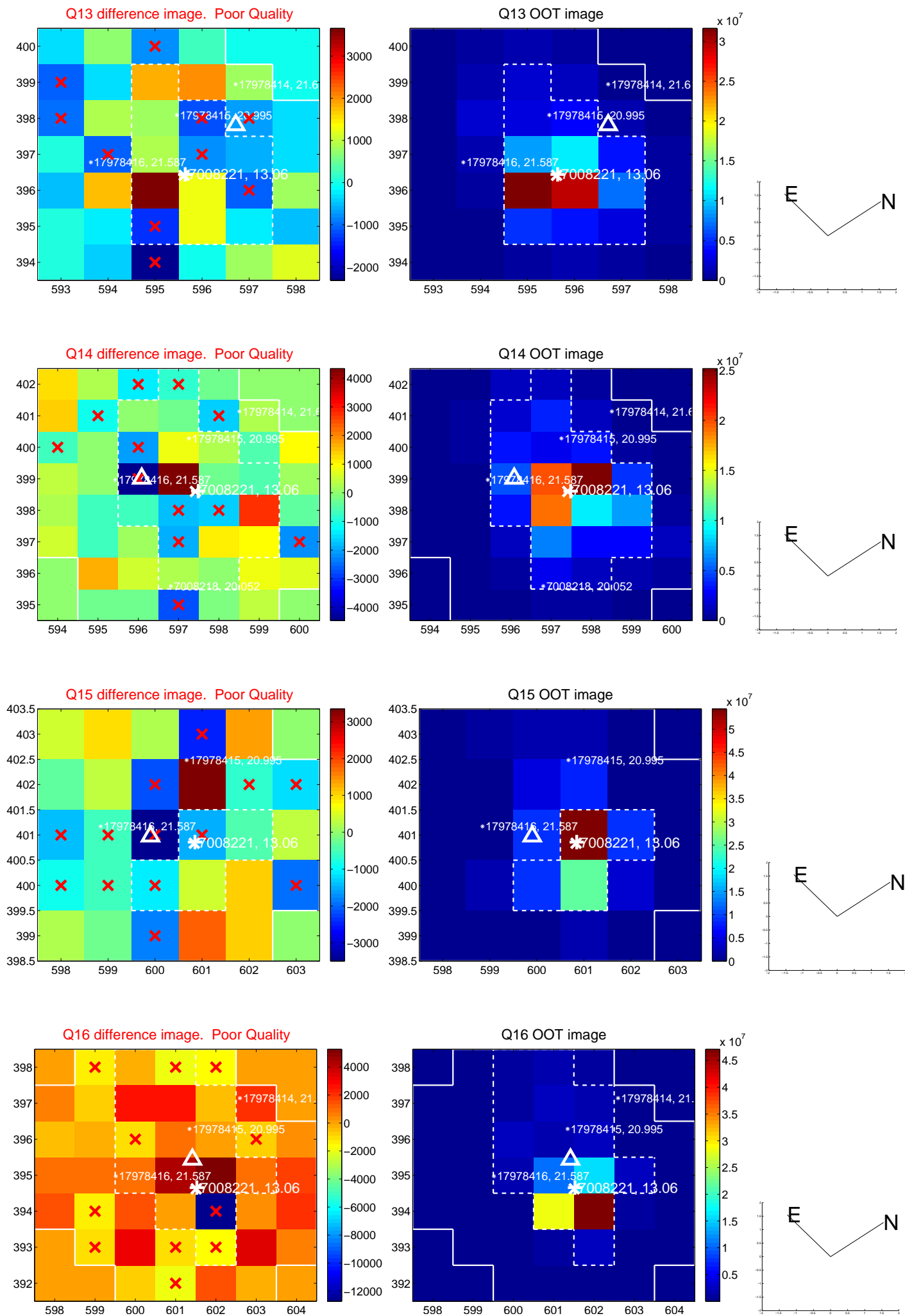
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



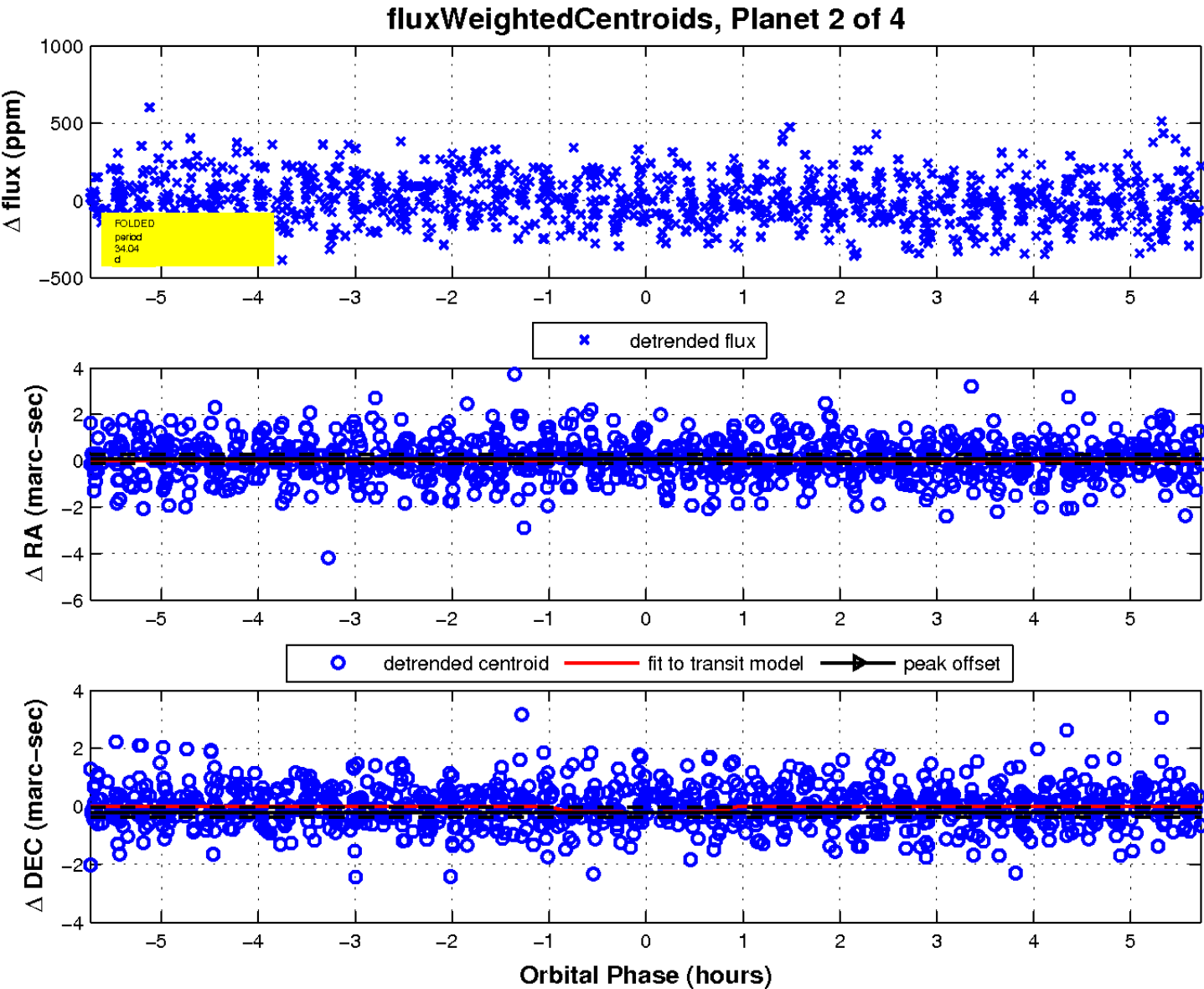
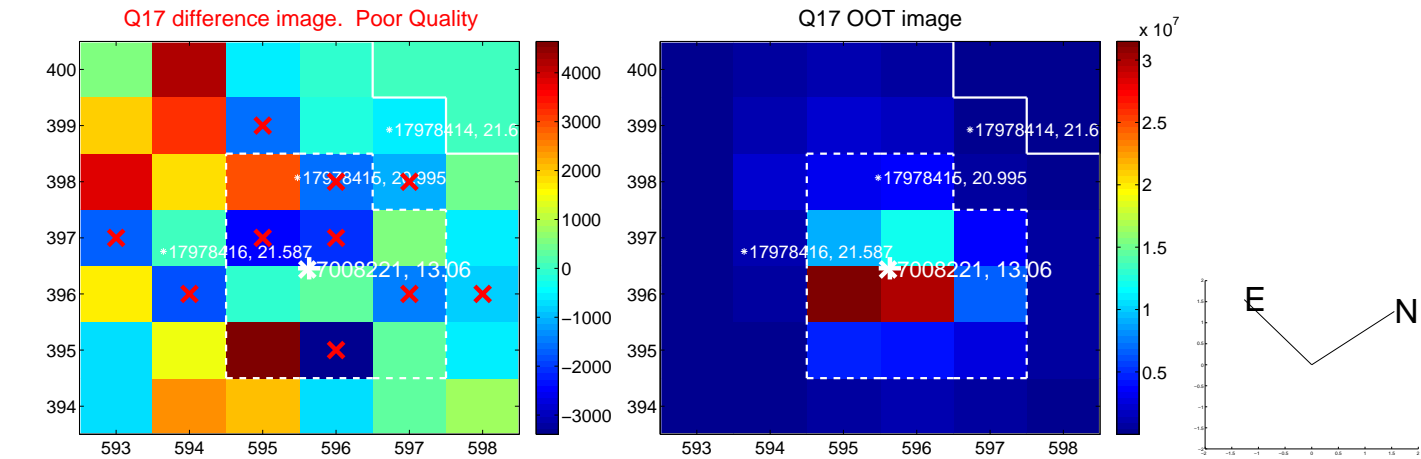
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

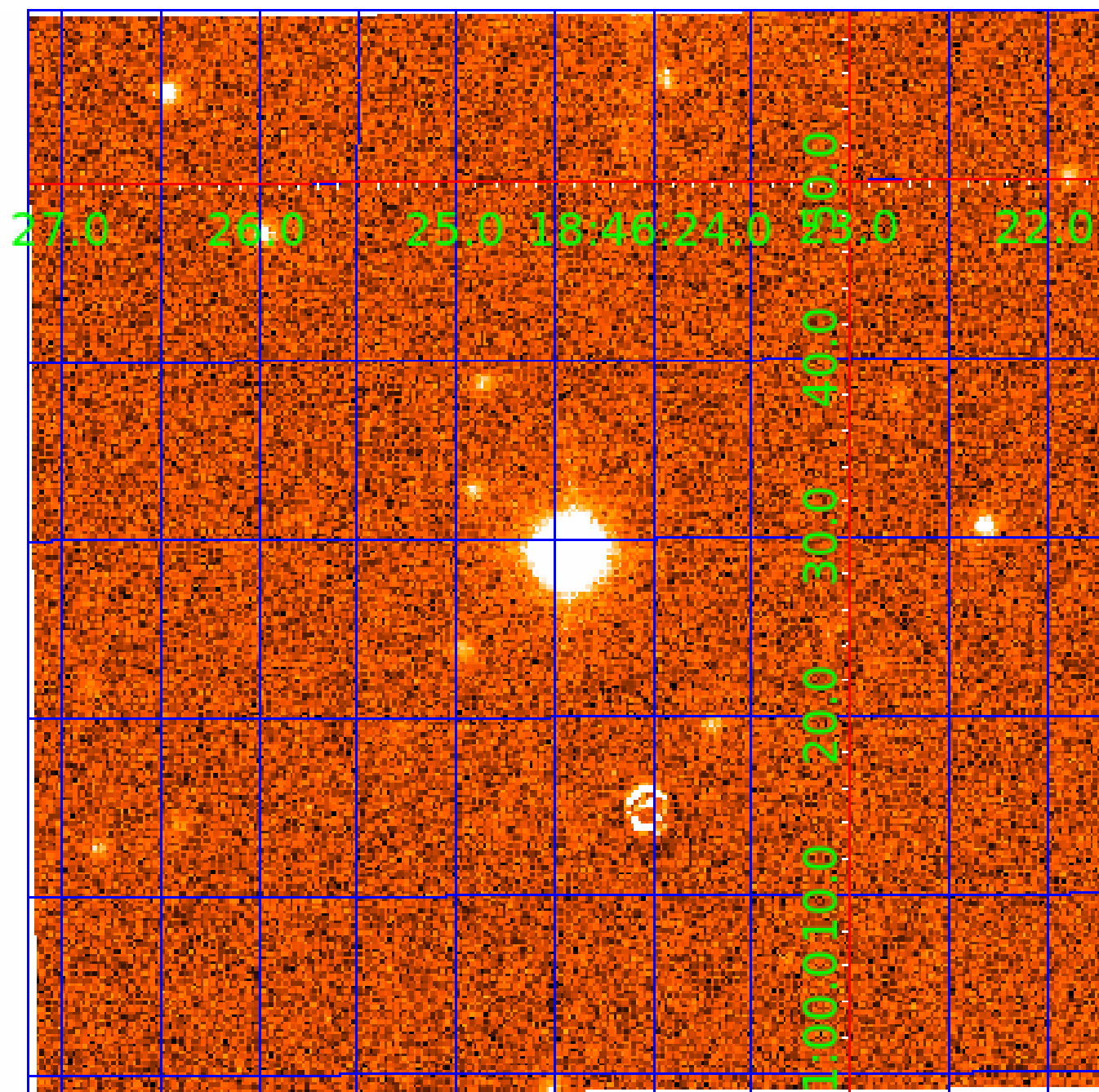


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007008221

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})
007008221-01	OBS	No	1.285721	132.450125	12.1	9.262	8.9	7.0	3.98	6878	1.45	39501.61
007008221-02	OBS	No	34.043229	138.248068	220.9	1.920	10.8	10.2	3.98	6878	6.72	500.54
007008221-03	OBS	No	29.841817	155.256078	265.1	2.010	11.9	12.1	3.98	6878	7.53	596.64
007008221-04	OBS	No	20.378089	144.091034	251.4	1.486	10.6	10.6	3.98	6878	7.30	992.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007008221-01	OBS	FP	0.00	1	0	0	0	LPP_DV
007008221-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
007008221-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007008221-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

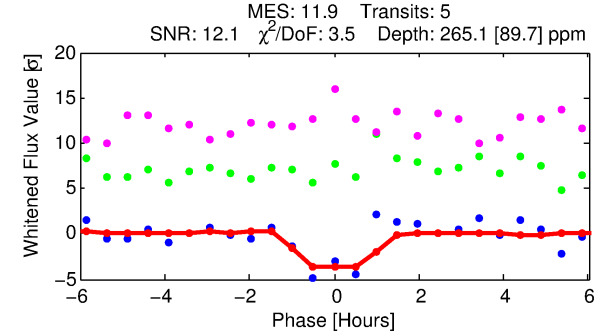
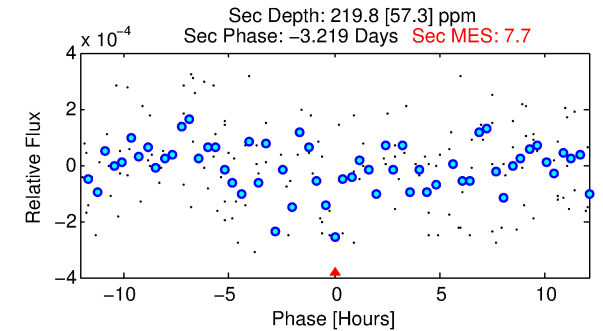
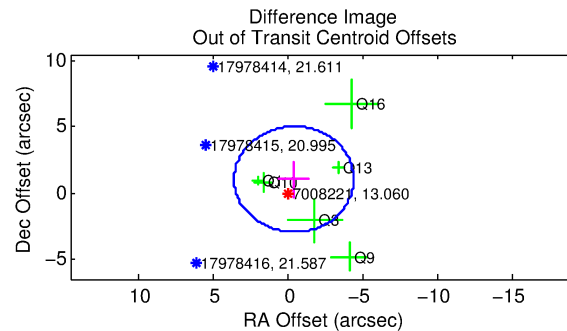
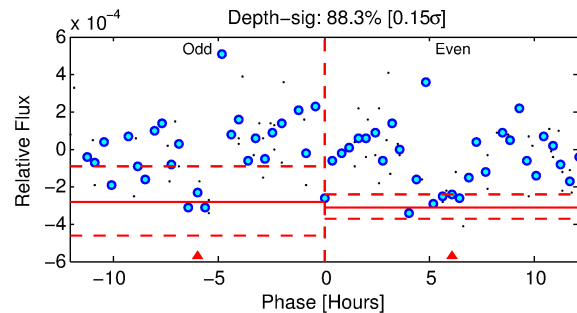
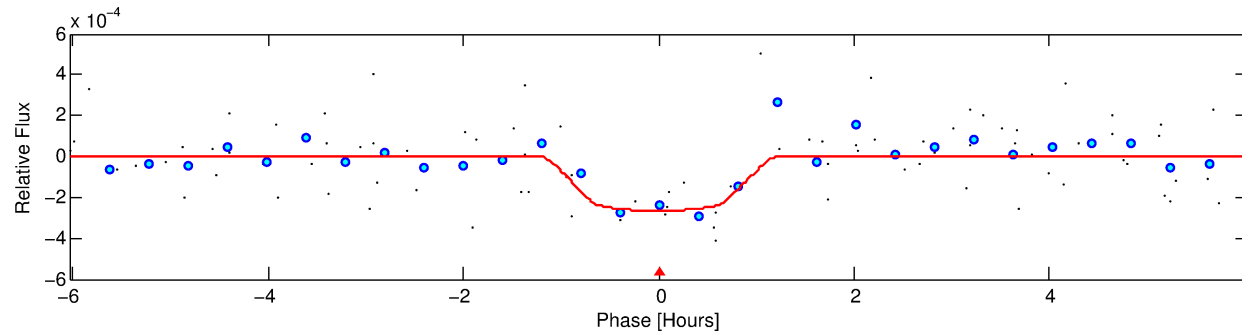
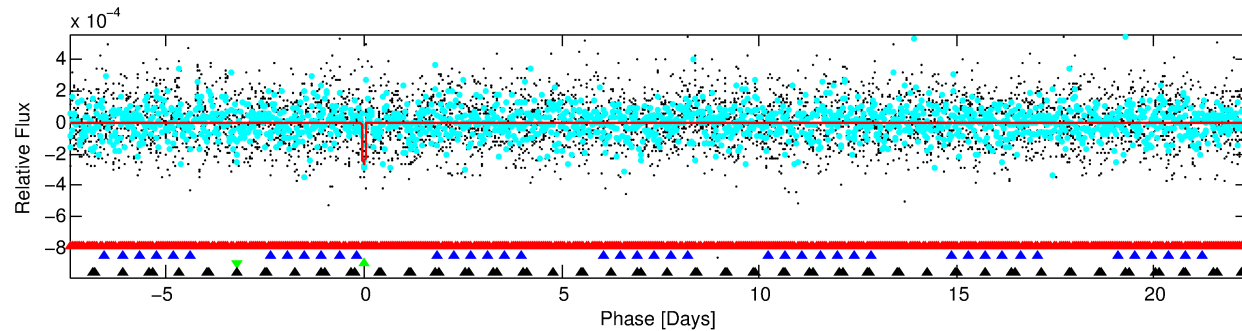
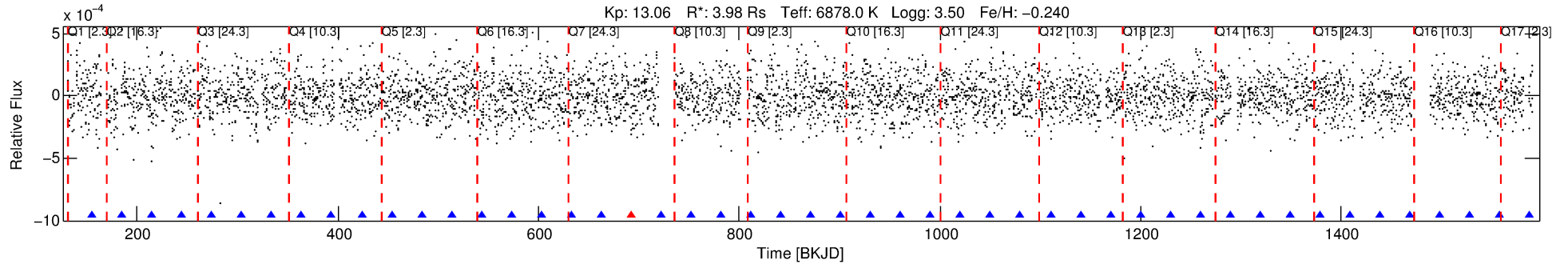
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007008221-03

No Significant Match Found

DV One-Page Summary

KIC: 7008221 Candidate: 3 of 4 Period: 29.842 d



DV Fit Results:

Period = 29.84182 [0.00071] d
Epoch = 155.2561 [0.0184] BKJD
Rp/R* = 0.0173 [0.0726]
a/R* = 54.74 [1392.36]
b = 0.90 [5.72]
Seff = 596.64 [344.51]
Teq = 1260 [182] K
Rp = 7.53 [31.69] Re
a = 0.2308 [0.0837] AU
Ag = 113.78 [956.55] [0.12 σ]
Teffp = 6364 [13346] K [0.38 σ]

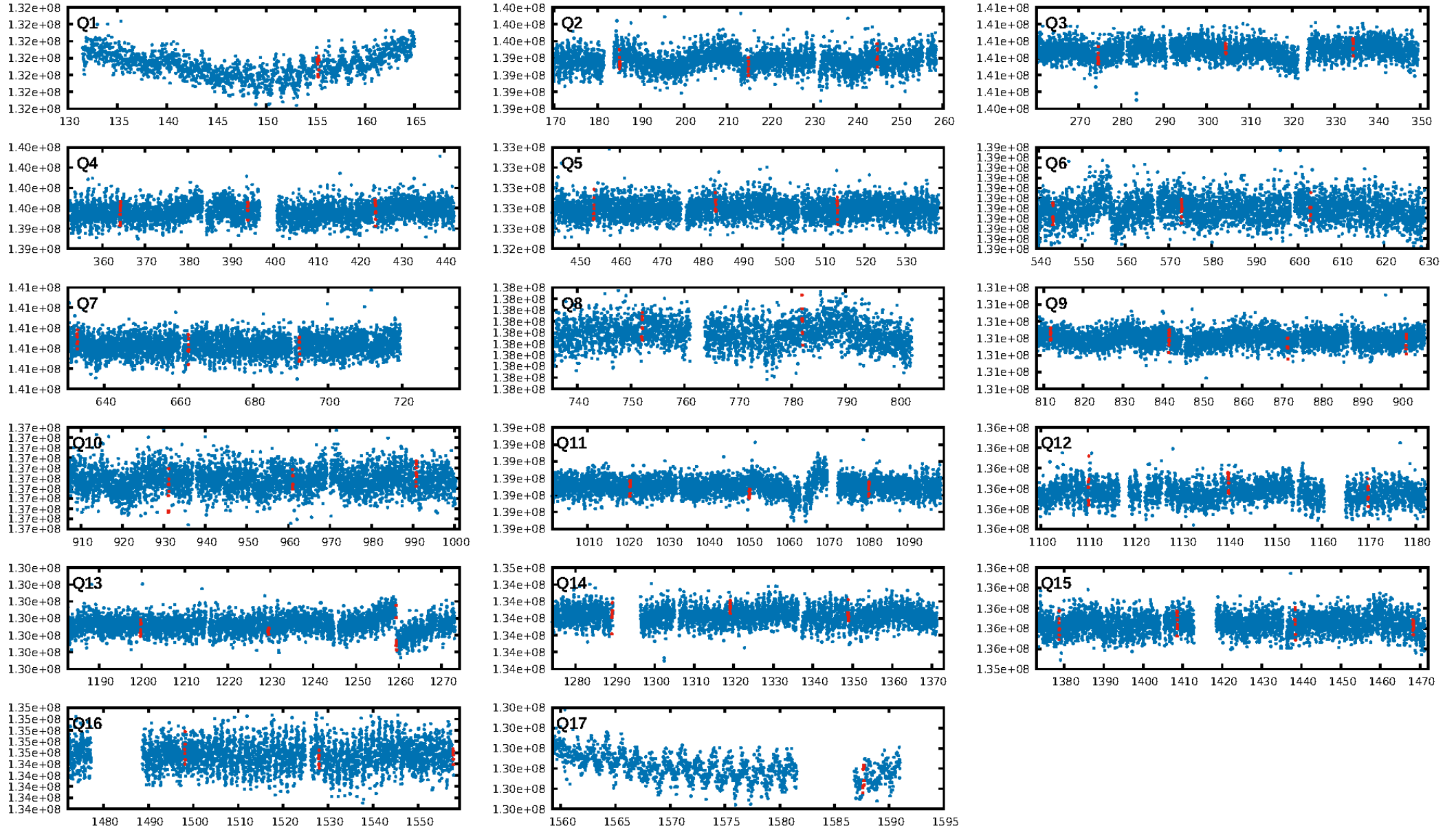
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [90.87 σ]
LongPeriod-sig: 100.0% [36.28 σ]
ModelChiSquare2-sig: 1.1%
ModelChiSquareGof-sig: 69.3%
Bootstrap-pfa: 1.98e-10
RollingBand-fgt: 0.80 [4/5]
GhostDiagnostic-chr: 0.4757
Centroid-sig: 7.0%
Centroid-so: 0.640 arcsec [1.14 σ]
OotOffset-rm: 1.138 arcsec [0.85 σ]
KicOffset-rm: 1.235 arcsec [0.99 σ]
OotOffset-st: 1/1/1/3 [6]
KicOffset-st: 1/1/1/3 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 0.56 [9/16]

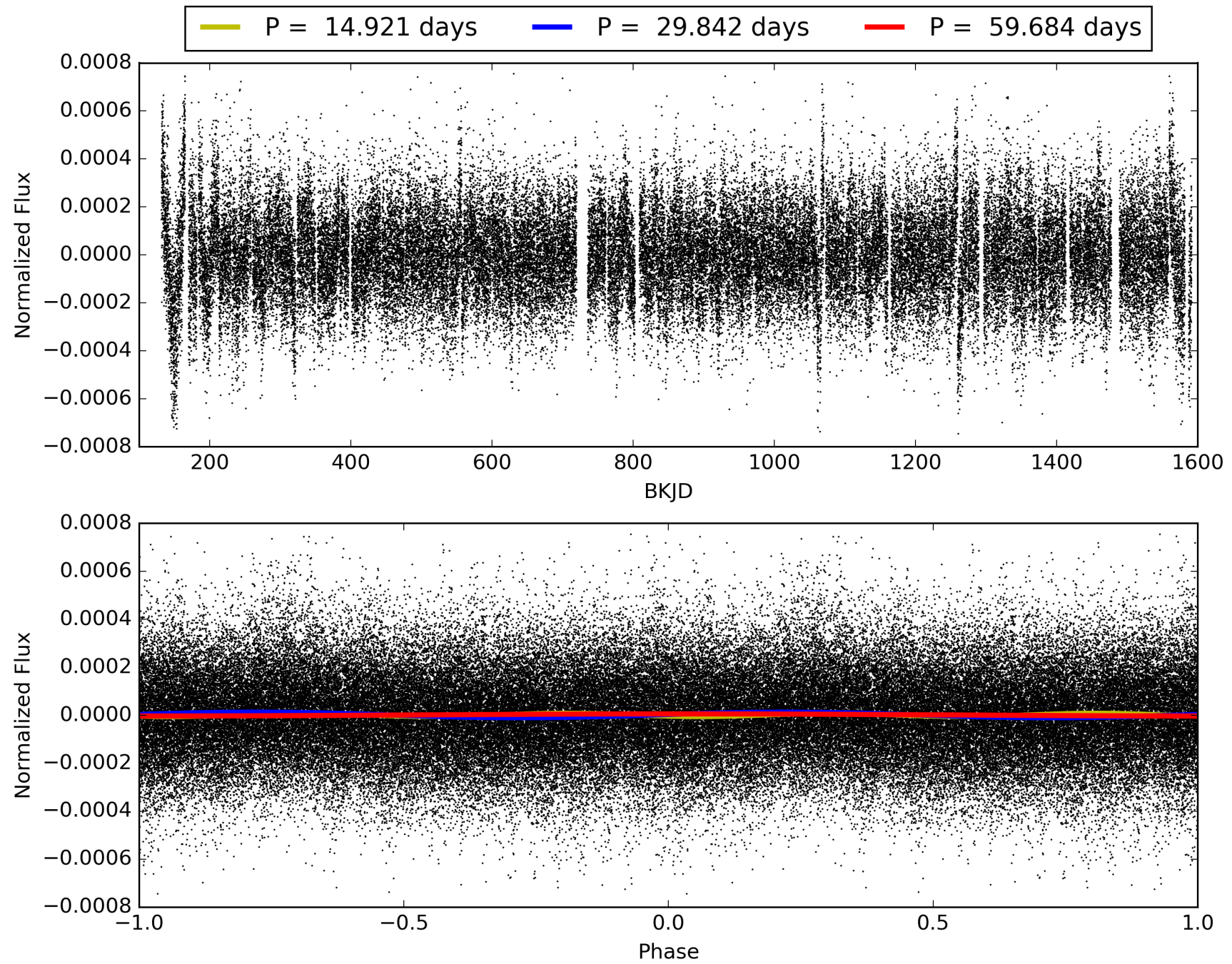
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 22:43:01 Z

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

TCE 007008221-03, PDC Light Curves

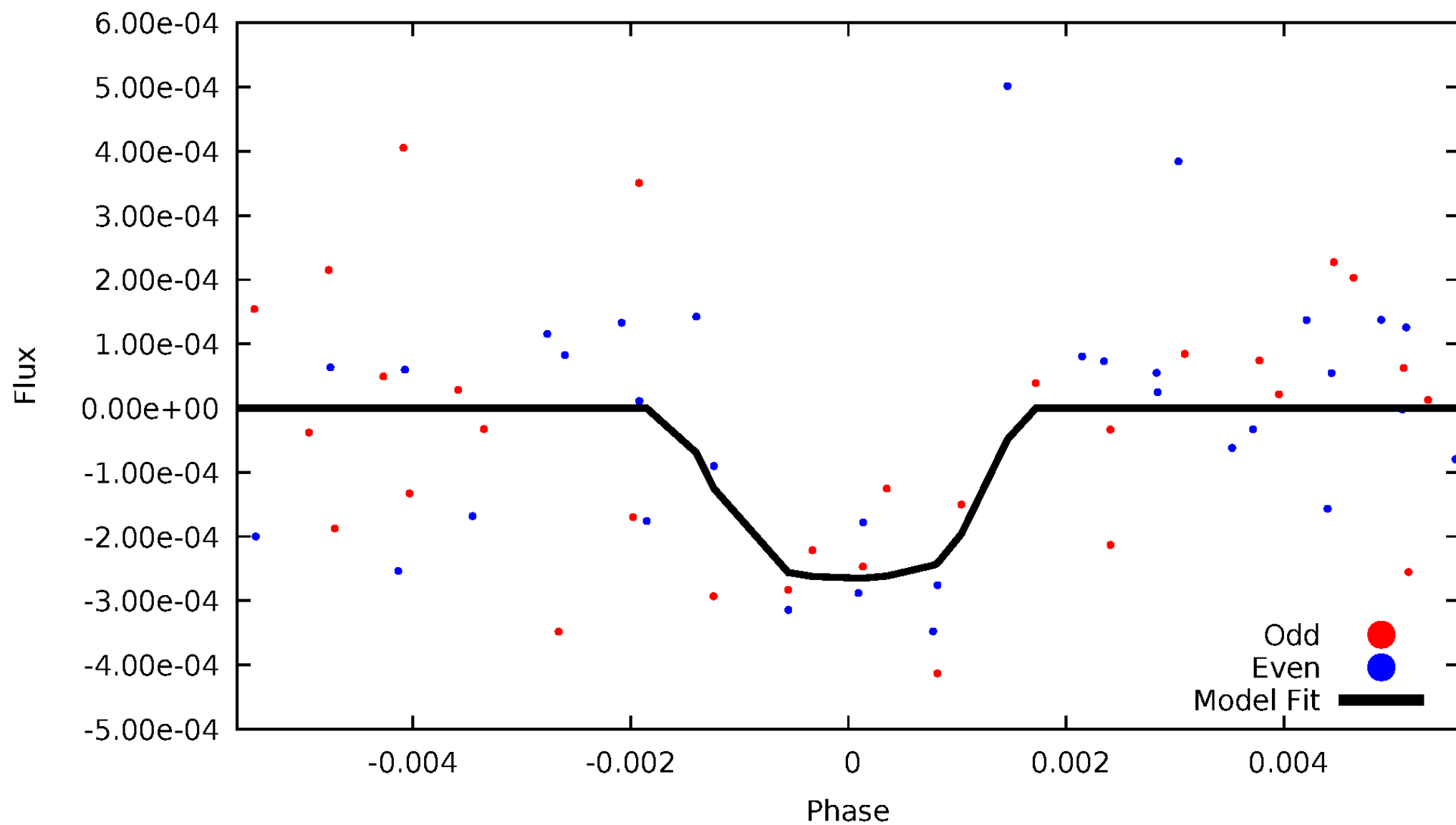


TCE 007008221-03



DV Odd/Even

TCE 007008221-03

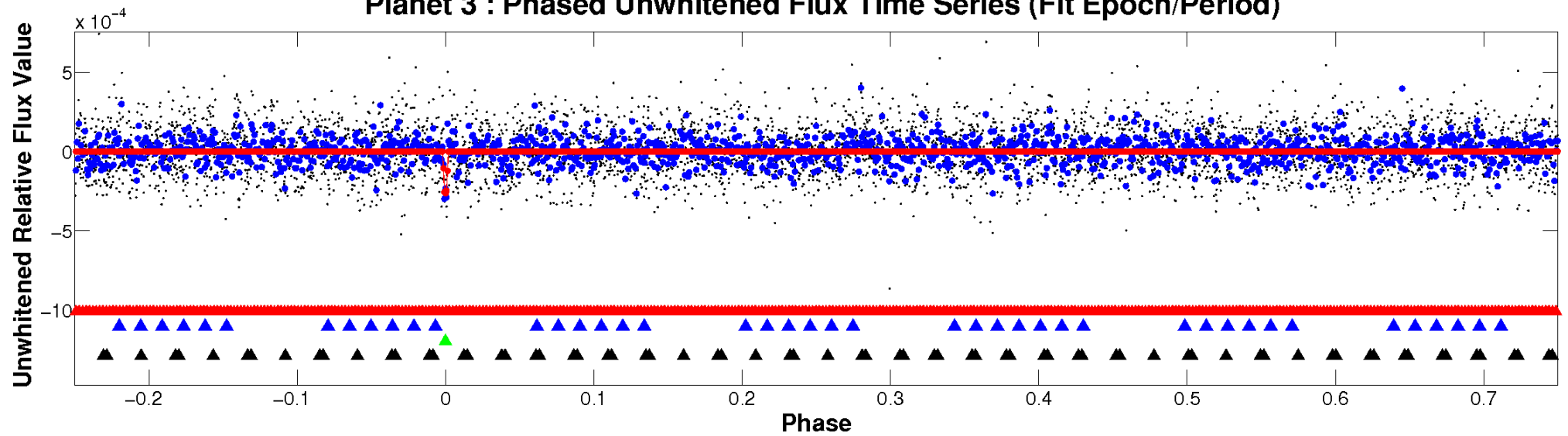


ALT Odd/Even

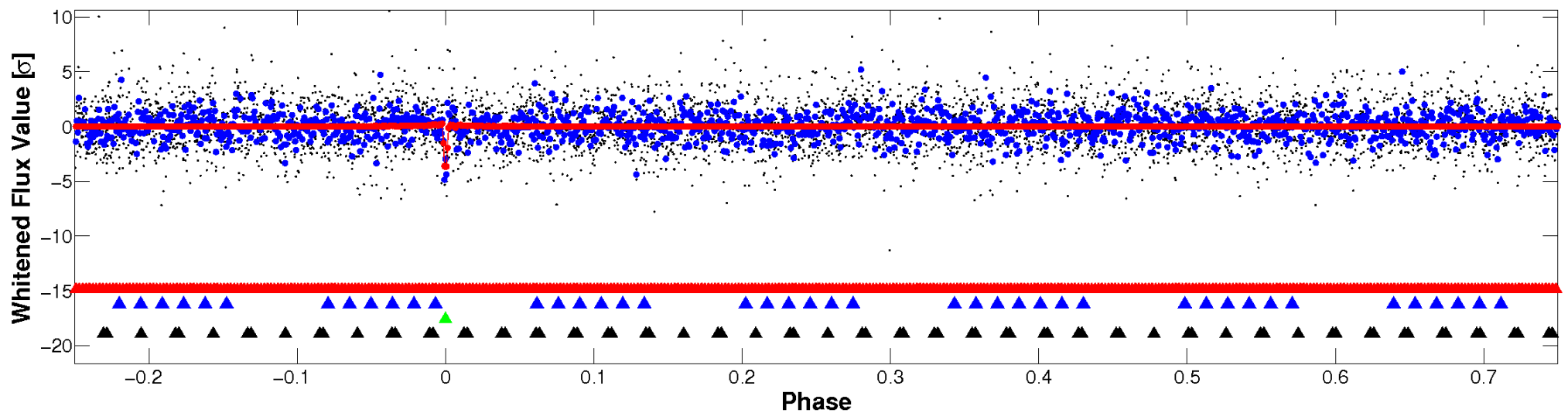
This plot does not exist for this TCE.

Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

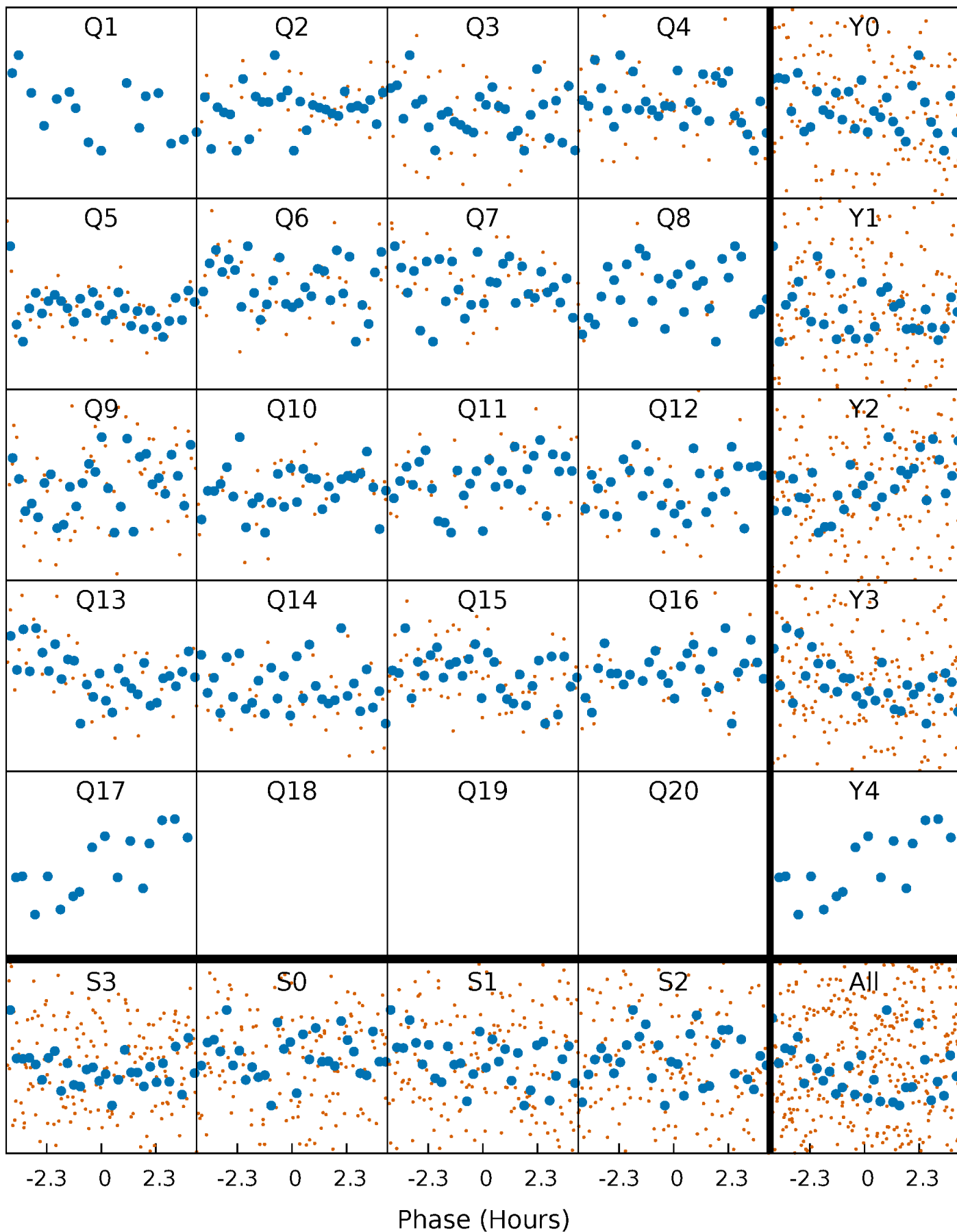


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



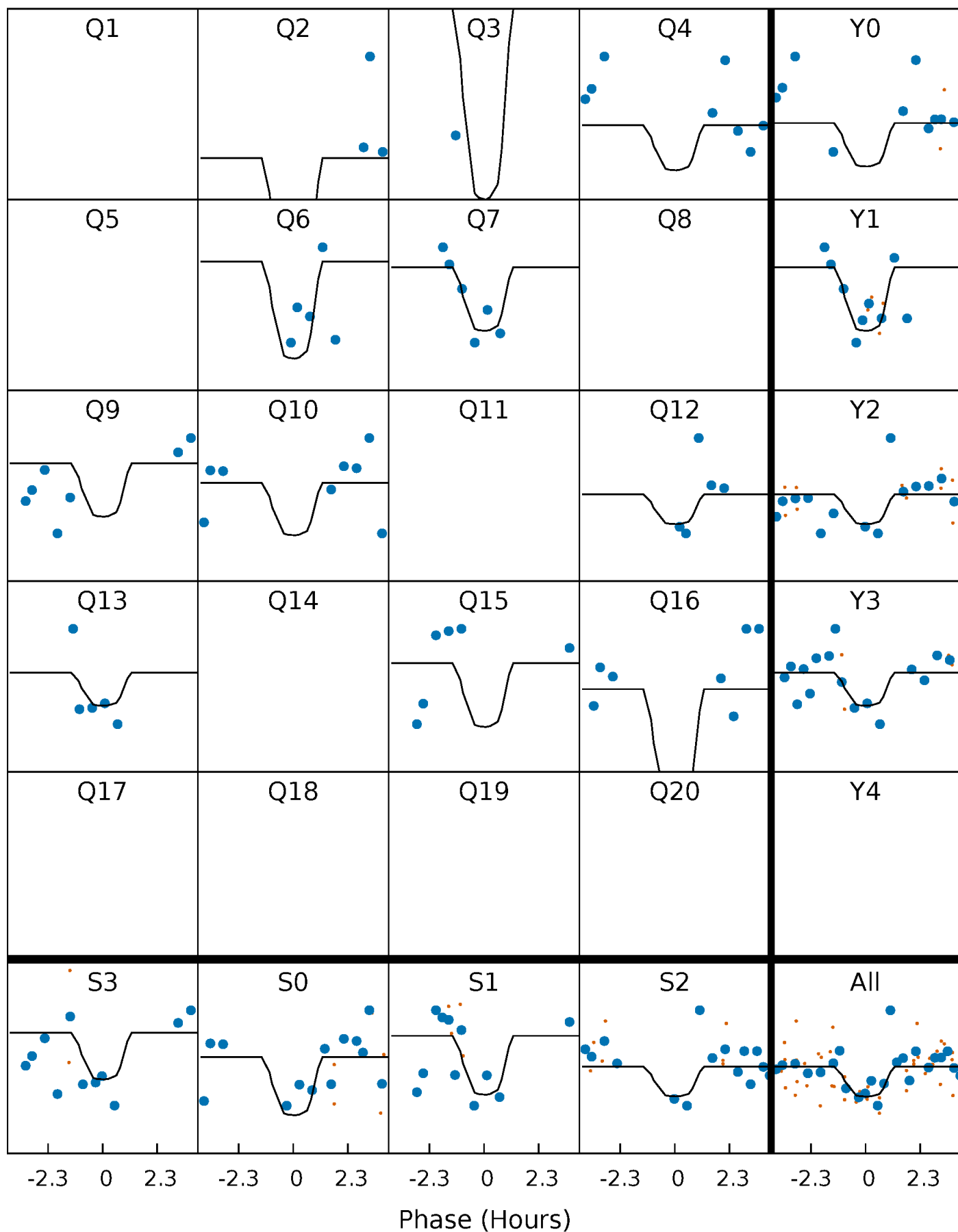
PDC Quarter-Phased Transit Curves

TCE 007008221-03 P= 29.841817 Days $T_0=155.256078$ (BKJD)



DV Quarter-Phased Transit Curves

TCE 007008221-03 P= 29.841817 Days $T_0=155.256078$ (BKJD)

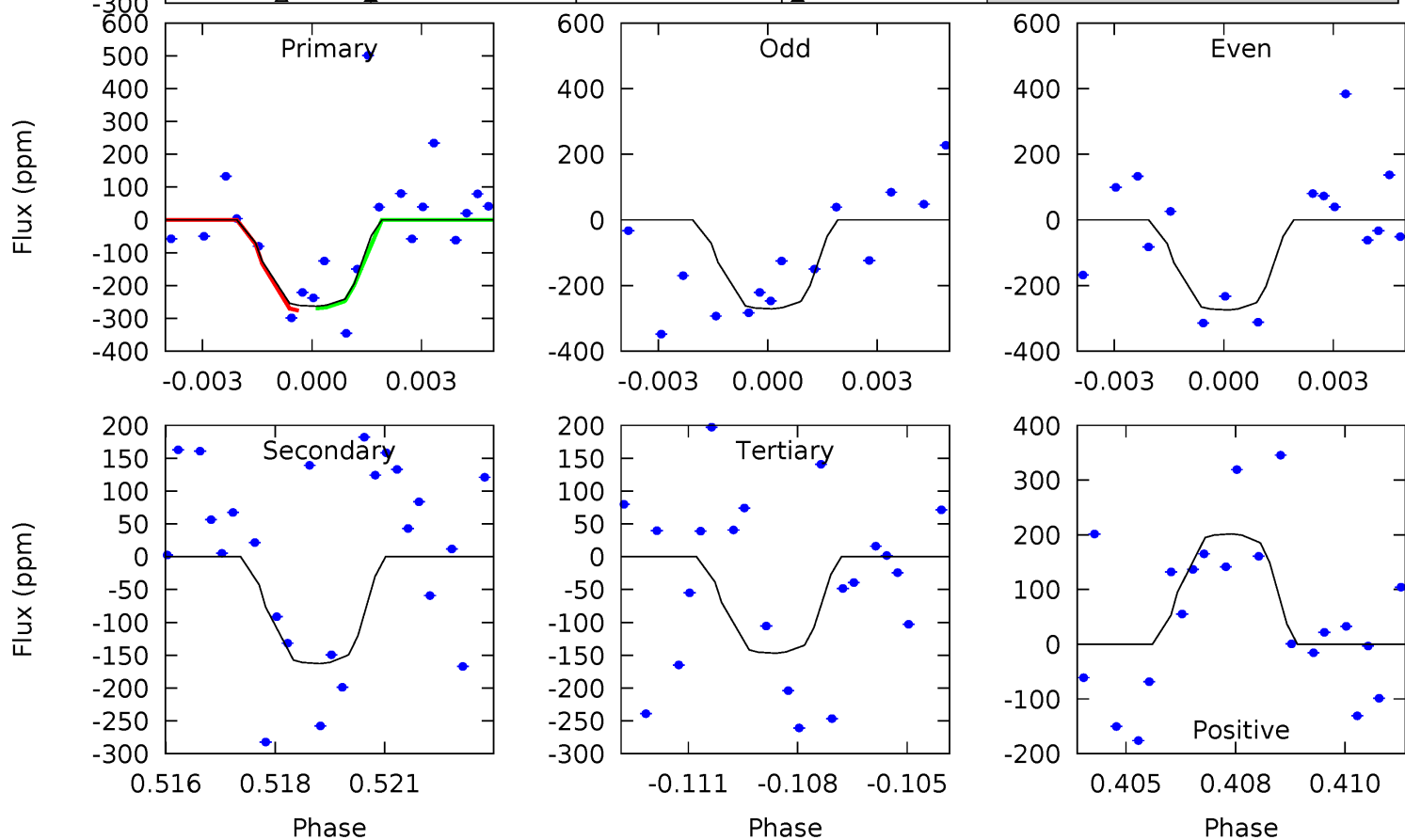
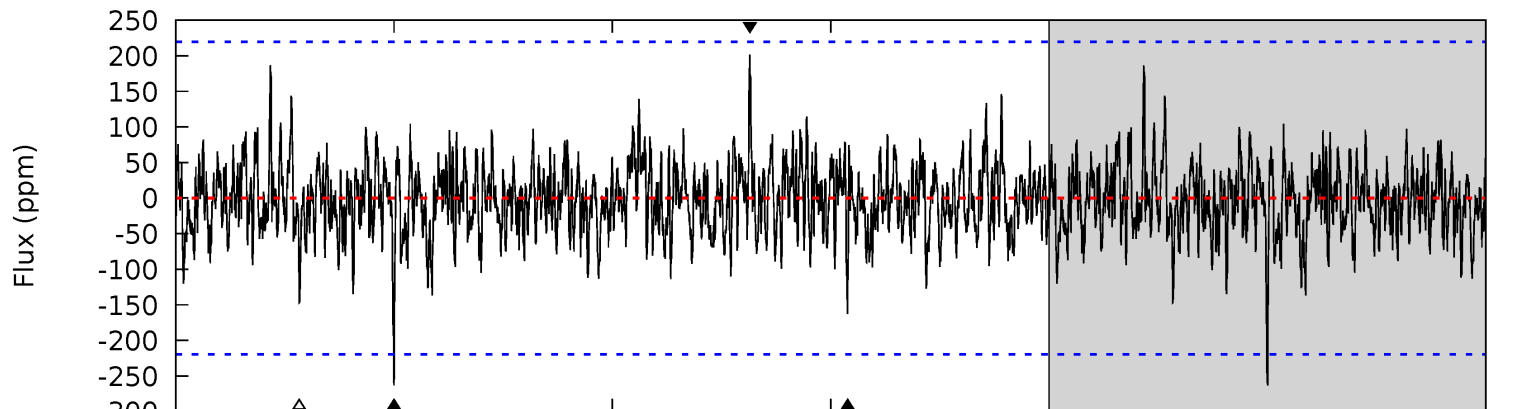
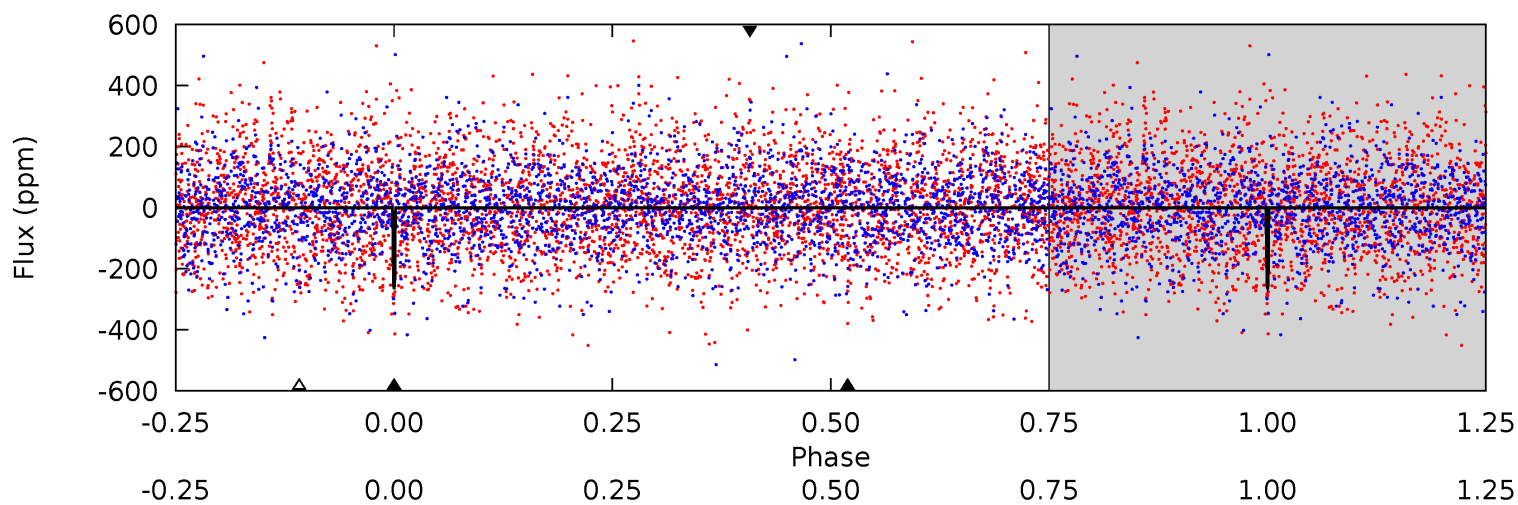


This plot does not exist for this TCE.

DV Model-Shift Uniqueness Test

007008221-03, $P = 29.841817$ Days, $E = 125.414261$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.31	3.90	3.52	4.84	5.27	3.00	1.08	2.78	1.47	0.38	-0.93	0.04	0.99	0.43	0.08



Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

Stellar Parameters For KIC 007008221

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6878^{+186}_{-227}	$3.503^{+0.323}_{-0.086}$	$-0.240^{+0.300}_{-0.250}$	$3.982^{+0.372}_{-1.582}$	$1.844^{+0.196}_{-0.364}$	$0.041^{+0.100}_{-0.011}$
	+3%/-3%	+9%/-2%	+125%/-104%	+9%/-40%	+11%/-20%	+244%/-26%
Source	PHO1	FLK73	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 007008221-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-163 ± 42	$21.82^{+25.81}_{-14.81}$	1733^{+92}_{-142}	3690^{+2157}_{-820}	$9.702^{+82.730}_{-7.642}$
Alt.	N/A	N/A	N/A	N/A	N/A

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 $T_{\text{obs}} \gg T_{\text{max}}$ AND $A_{\text{obs}} \gg 1.0$

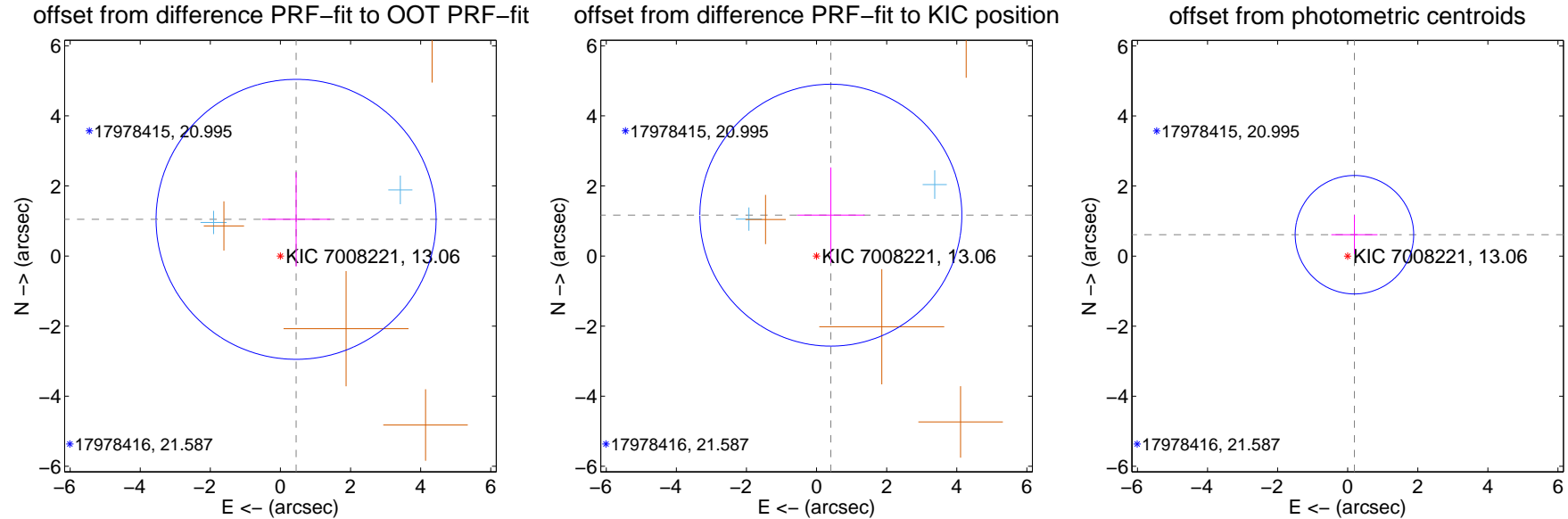
DV Centroid Data

Supplemental centroid analysis for 007008221-03. Kepler magnitude: 13.06. Transit SNR 12.05

There are 2 quarters with good PRF difference image offsets

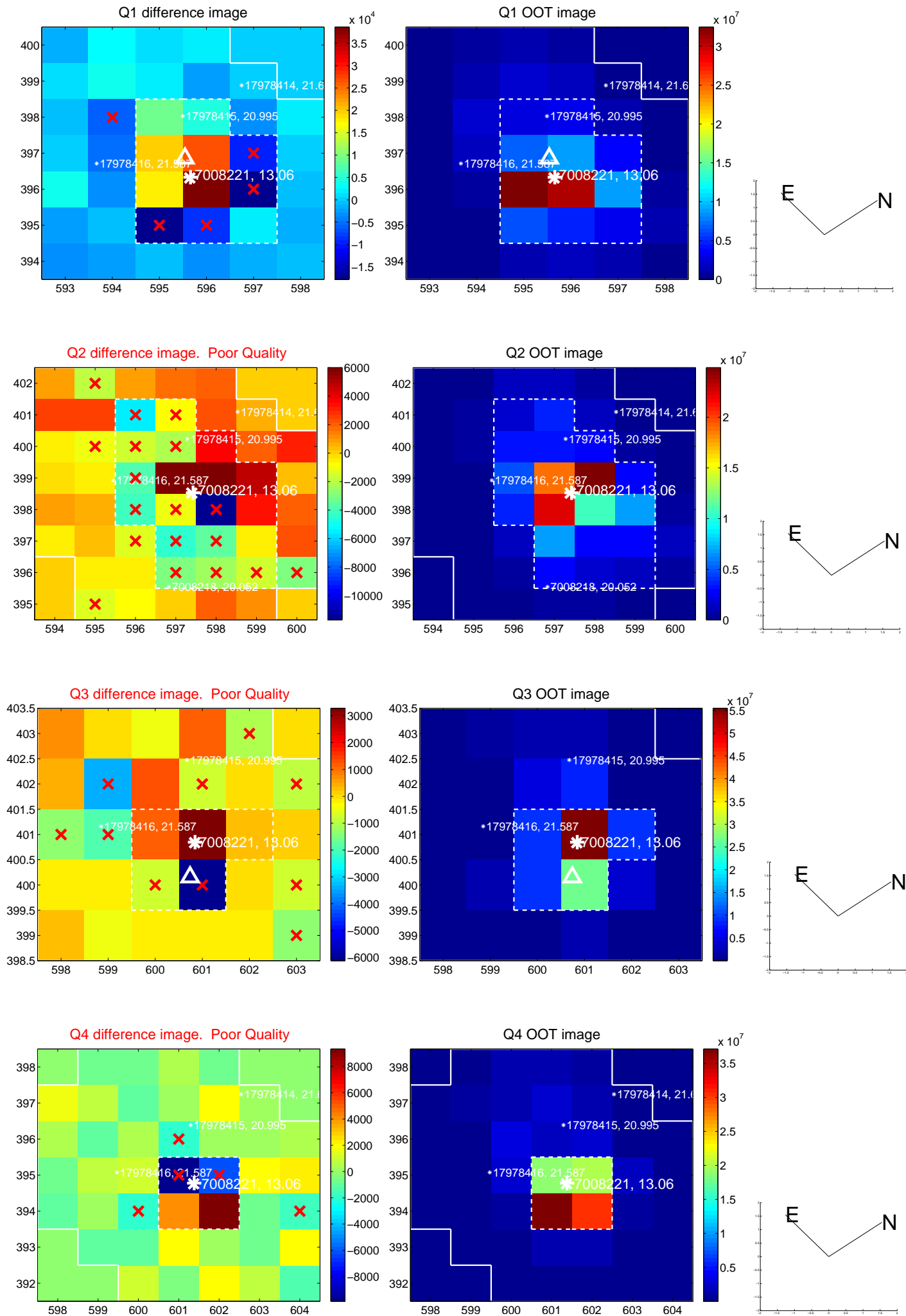
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.138 ± 1.332	0.85	-0.446 ± 0.971	1.047 ± 1.346
PRF-fit source offset from KIC position	1.235 ± 1.246	0.99	-0.407 ± 0.964	1.166 ± 1.361
photometric centroid source offset	0.64 ± 0.56	1.14	-0.19 ± 0.66	0.61 ± 0.55

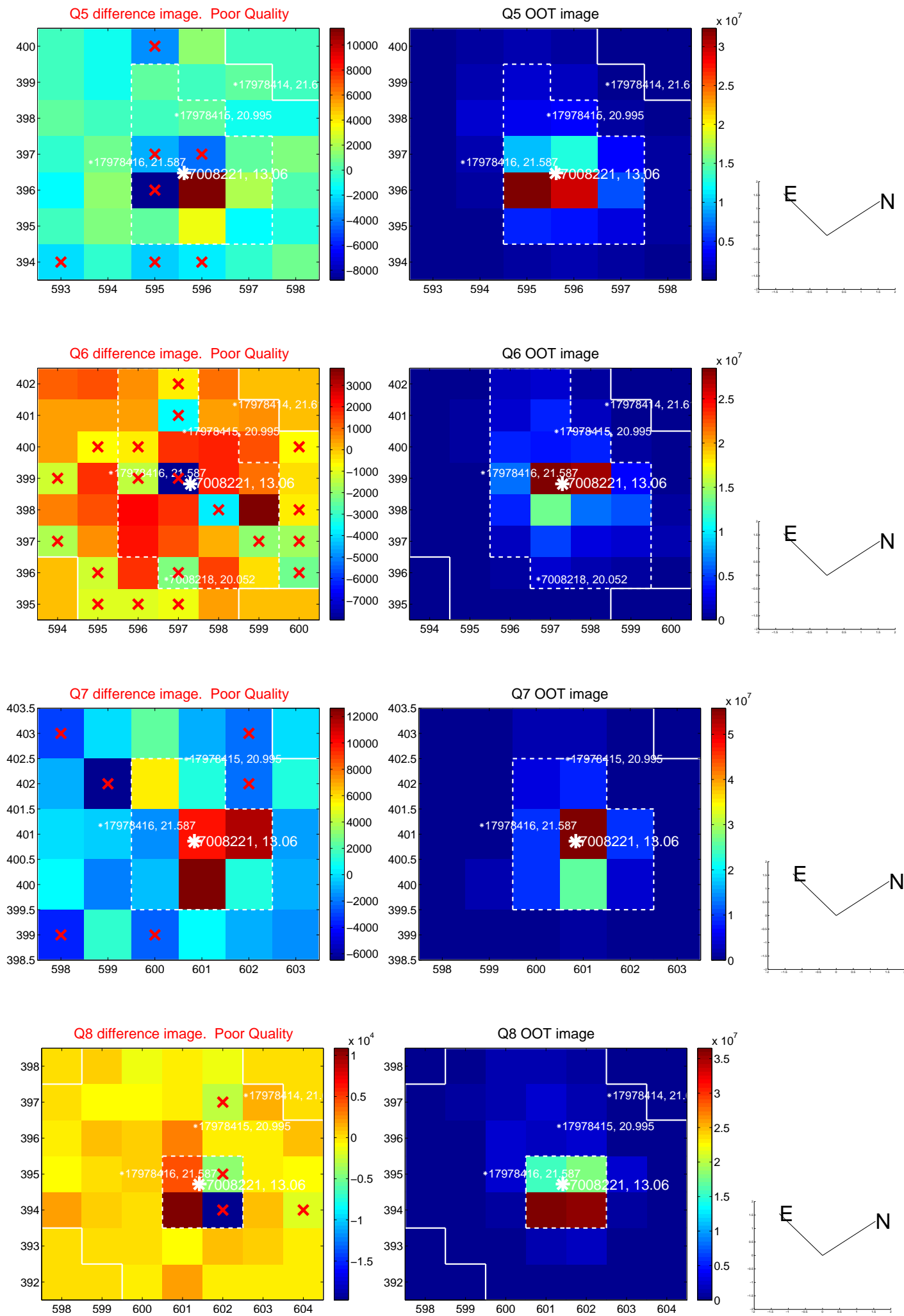


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

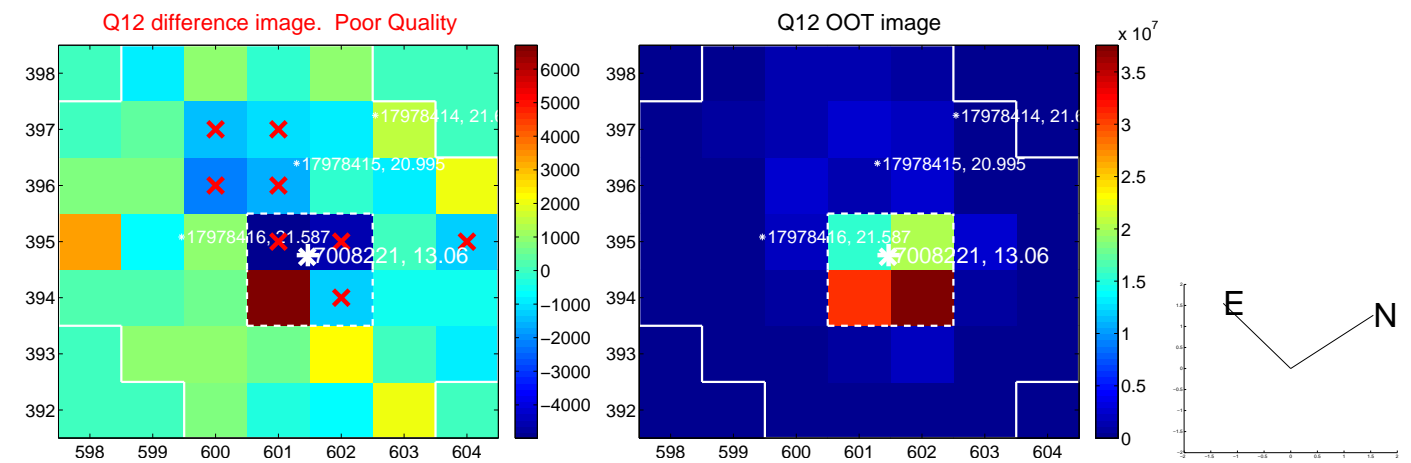
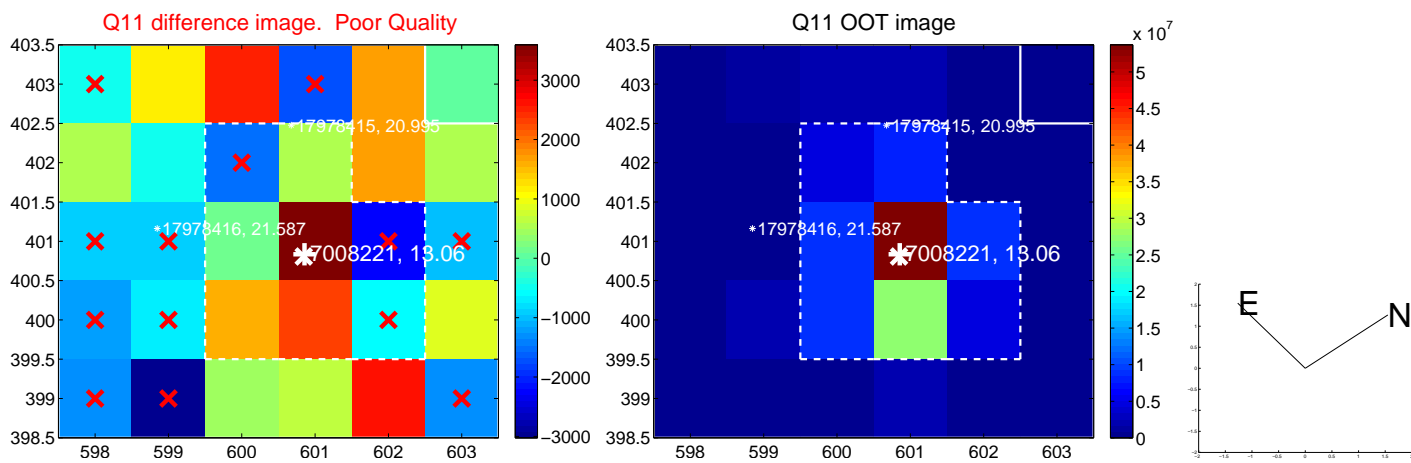
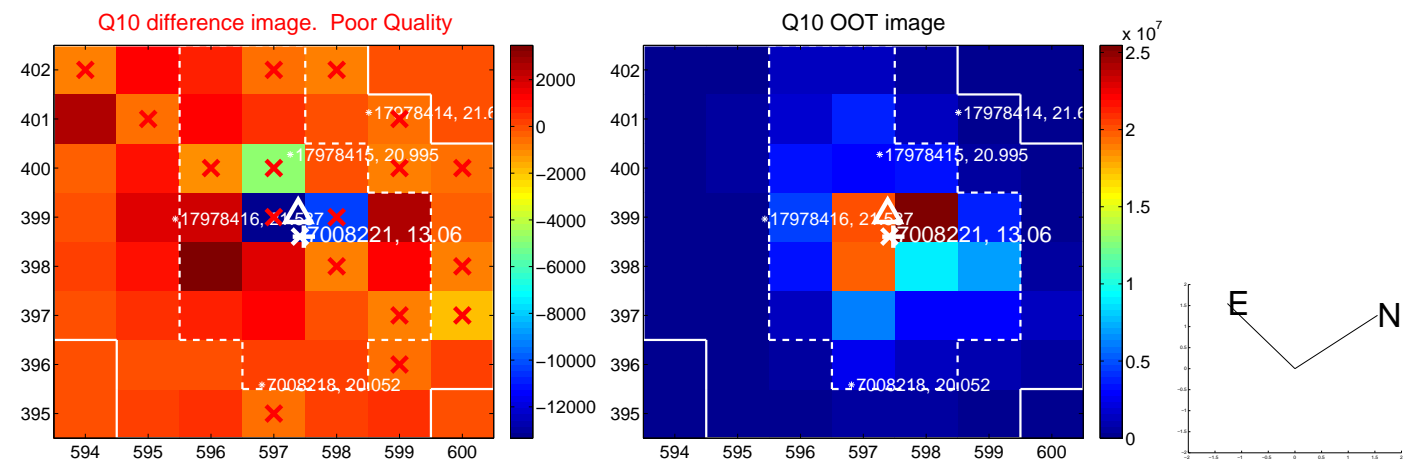
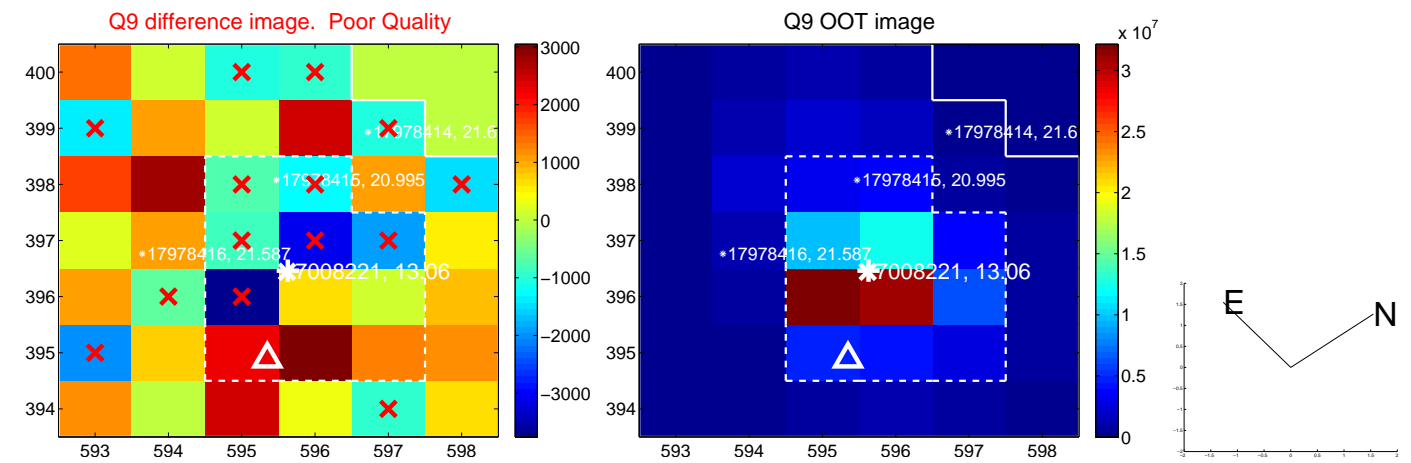
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



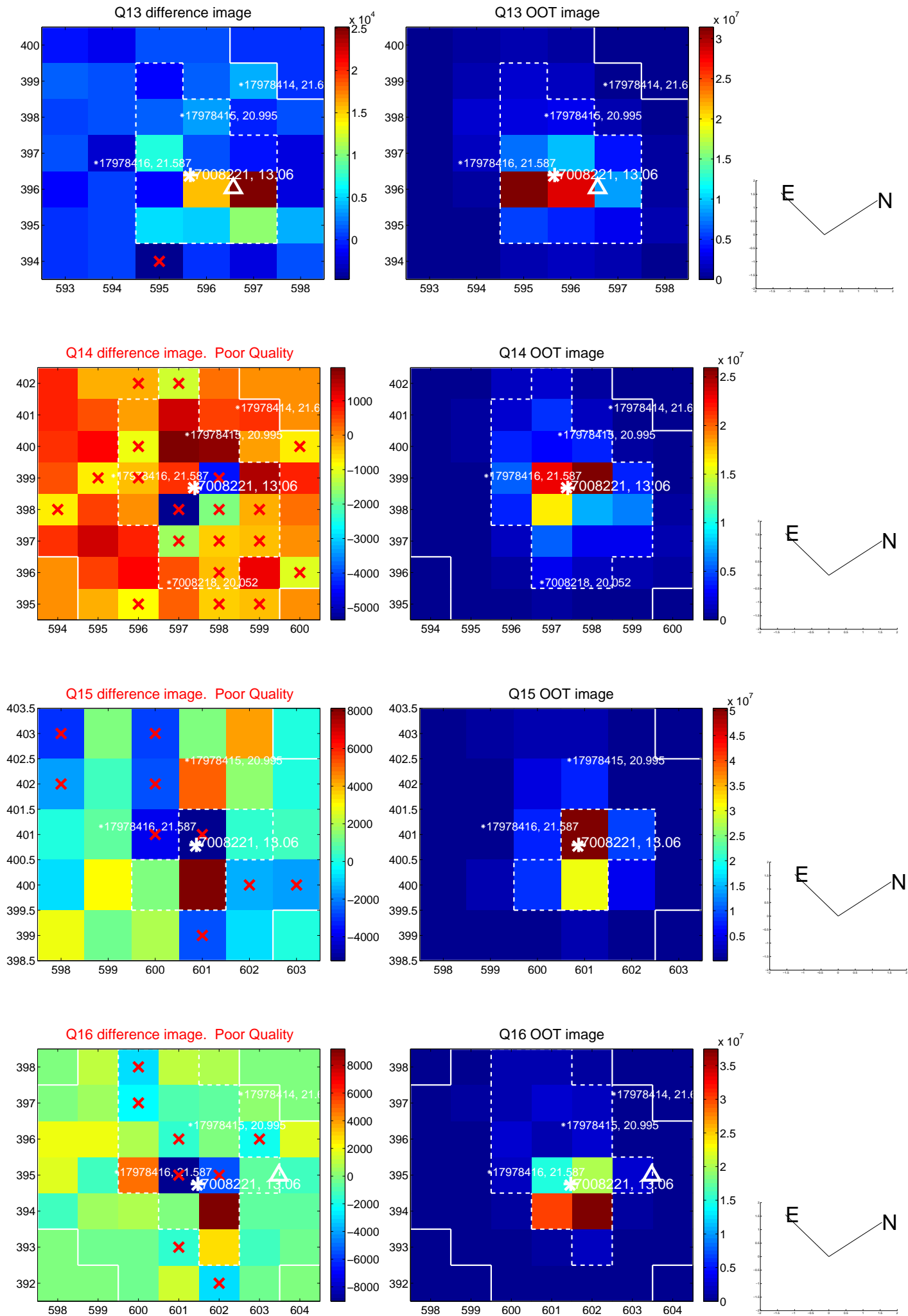
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



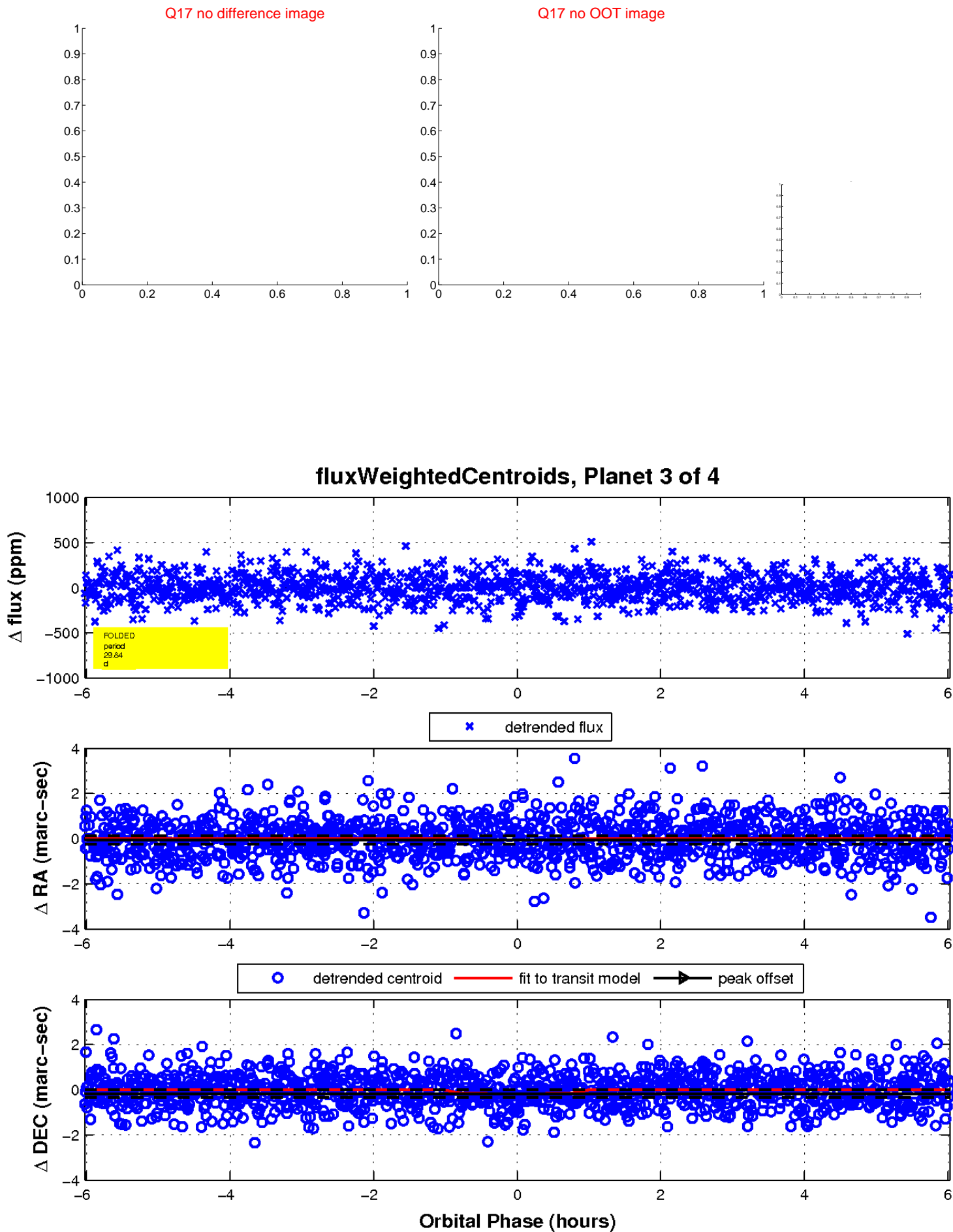
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

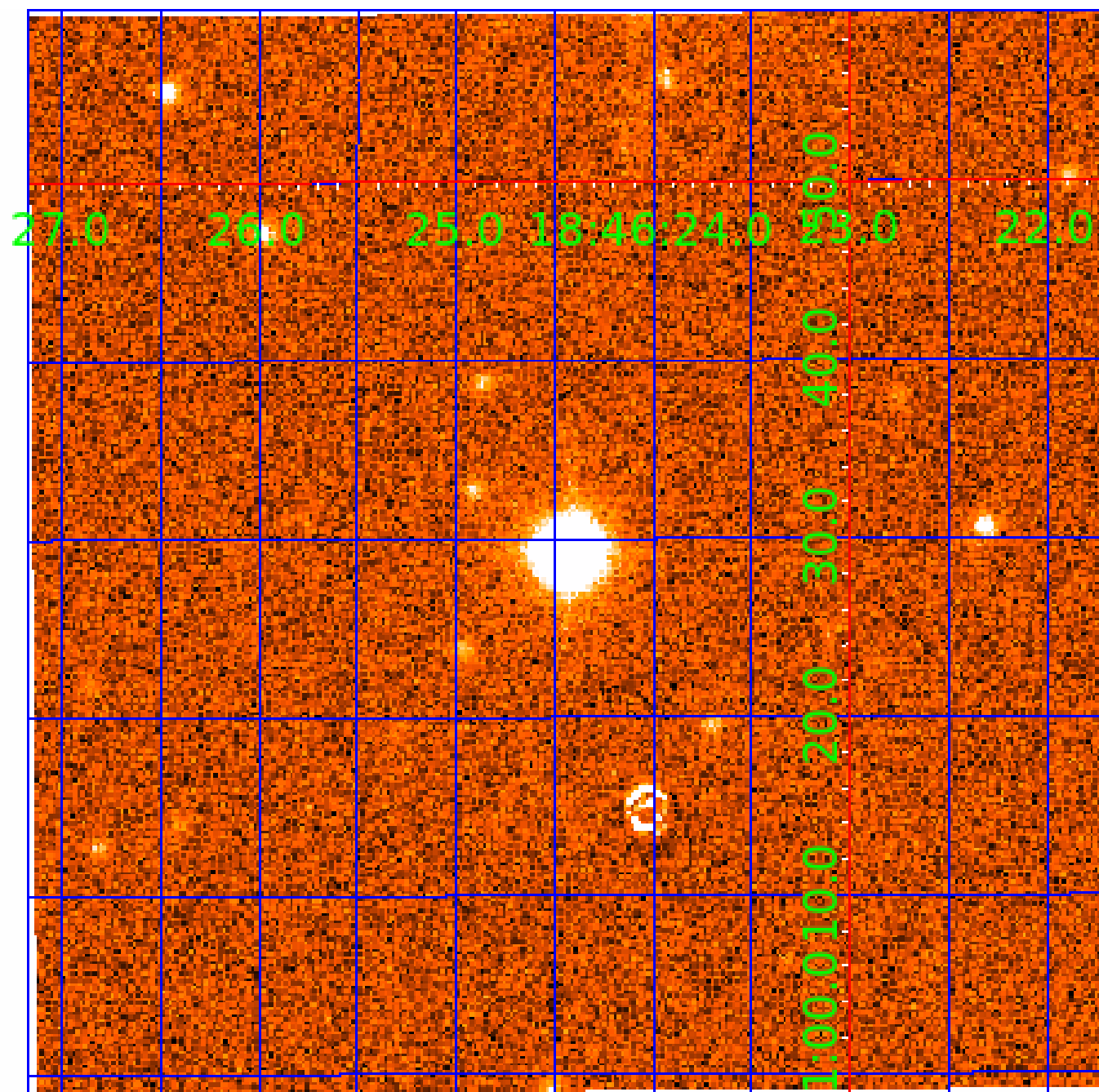


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007008221

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})
007008221-01	OBS	No	1.285721	132.450125	12.1	9.262	8.9	7.0	3.98	6878	1.45	39501.61
007008221-02	OBS	No	34.043229	138.248068	220.9	1.920	10.8	10.2	3.98	6878	6.72	500.54
007008221-03	OBS	No	29.841817	155.256078	265.1	2.010	11.9	12.1	3.98	6878	7.53	596.64
007008221-04	OBS	No	20.378089	144.091034	251.4	1.486	10.6	10.6	3.98	6878	7.30	992.18

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007008221-01	OBS	FP	0.00	1	0	0	0	LPP_DV
007008221-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
007008221-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—CENT_FEW_DIFFS
007008221-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

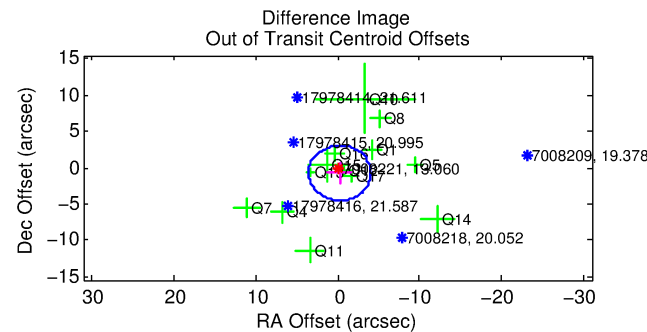
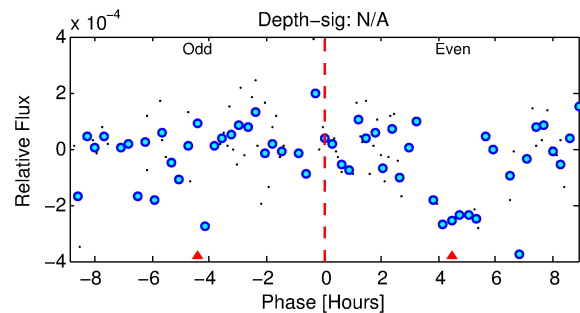
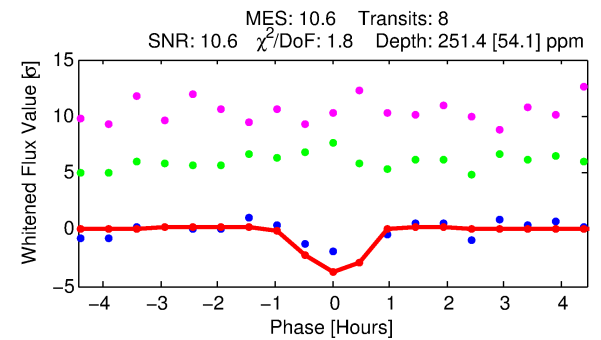
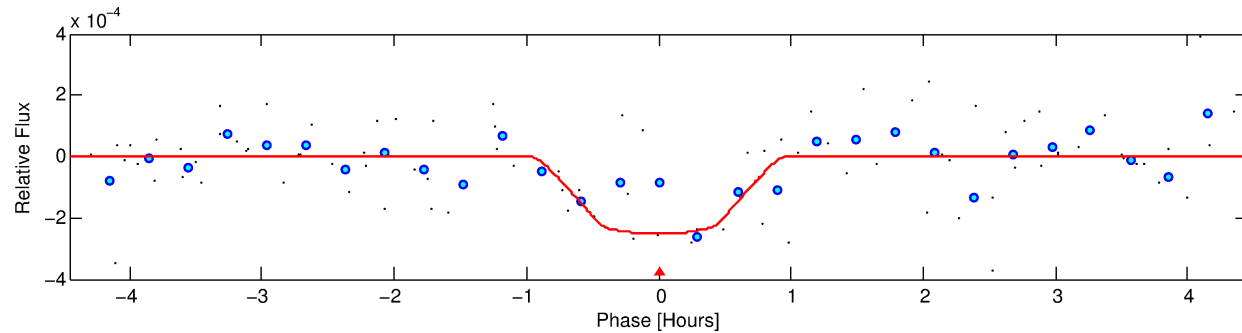
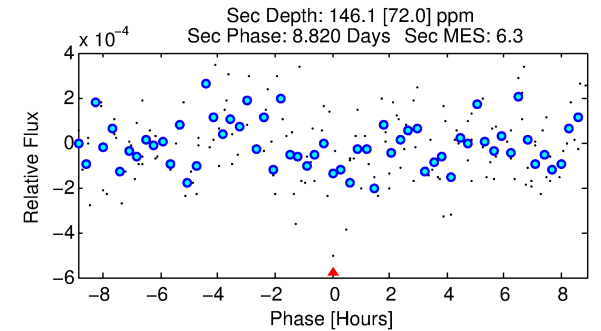
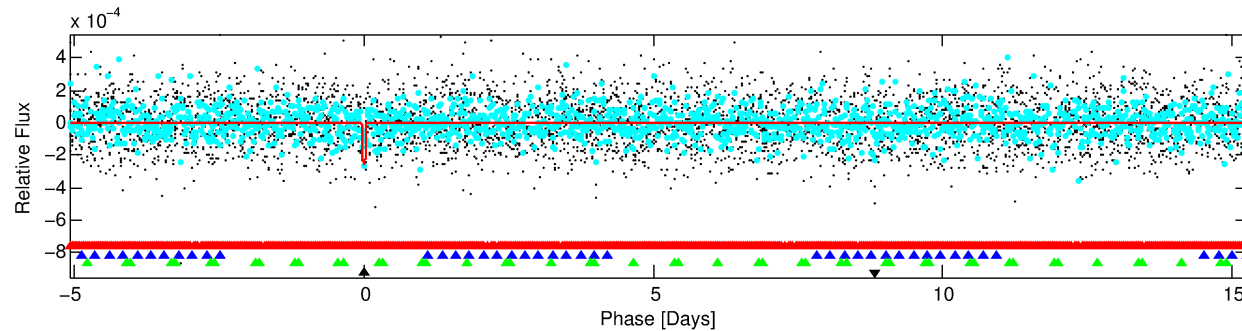
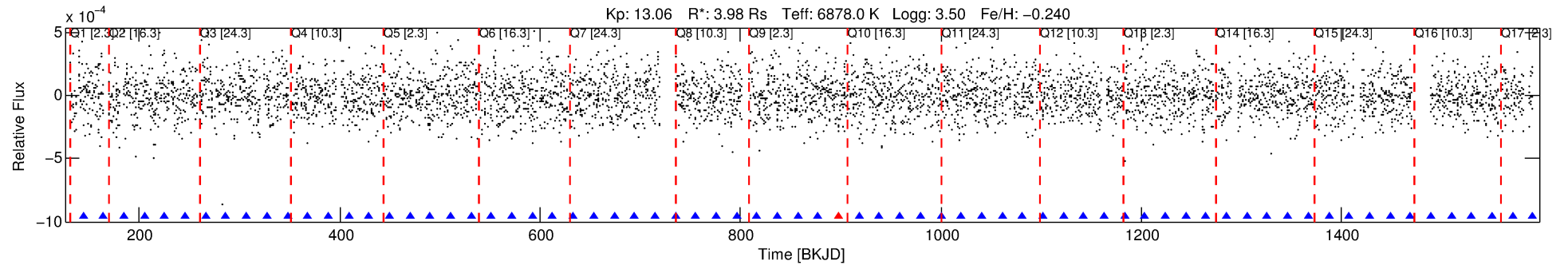
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007008221-04

No Significant Match Found

DV One-Page Summary

KIC: 7008221 Candidate: 4 of 4 Period: 20.378 d



DV Fit Results:

Period = 20.37809 [0.00019] d
Epoch = 144.0910 [0.0061] BKJD
Rp/R* = 0.0168 [0.0359]
a/R* = 51.73 [665.14]
b = 0.89 [3.10]
Seff = 992.18 [572.91]
Teq = 1431 [207] K
Rp = 7.30 [15.86] Re
a = 0.1790 [0.0649] AU
Ag = 48.28 [209.24] [0.23σ]
Teffp = 5832 [6269] K [0.70σ]

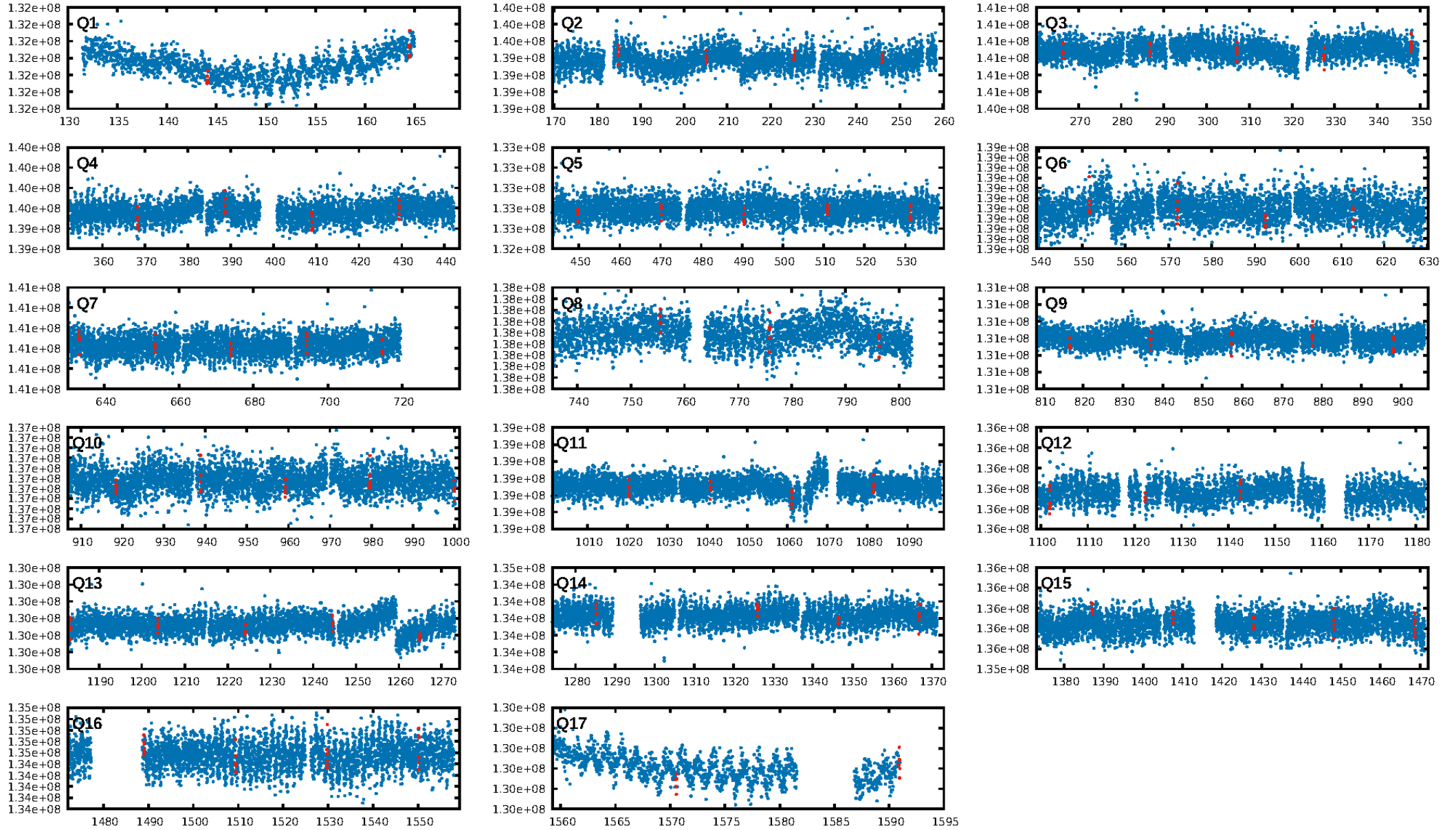
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [48.85σ]
LongPeriod-sig: 100.0% [90.87σ]
ModelChiSquare2-sig: 21.9%
ModelChiSquareGof-sig: 99.9%
Bootstrap-pfa: 2.99e-09
RollingBand-fgt: 0.86 [6/7]
GhostDiagnostic-chr: 0.1603
Centroid-sig: 41.9%
Centroid-so: 0.315 arcsec [0.54σ]
OotOffset-rm: 0.775 arcsec [0.61σ]
KicOffset-rm: 0.648 arcsec [0.47σ]
OotOffset-st: 2/3/4/4 [13]
KicOffset-st: 2/3/4/4 [13]
DiffImageQuality-fgm: 0.31 [4/13]
DiffImageOverlap-fno: 0.76 [13/17]

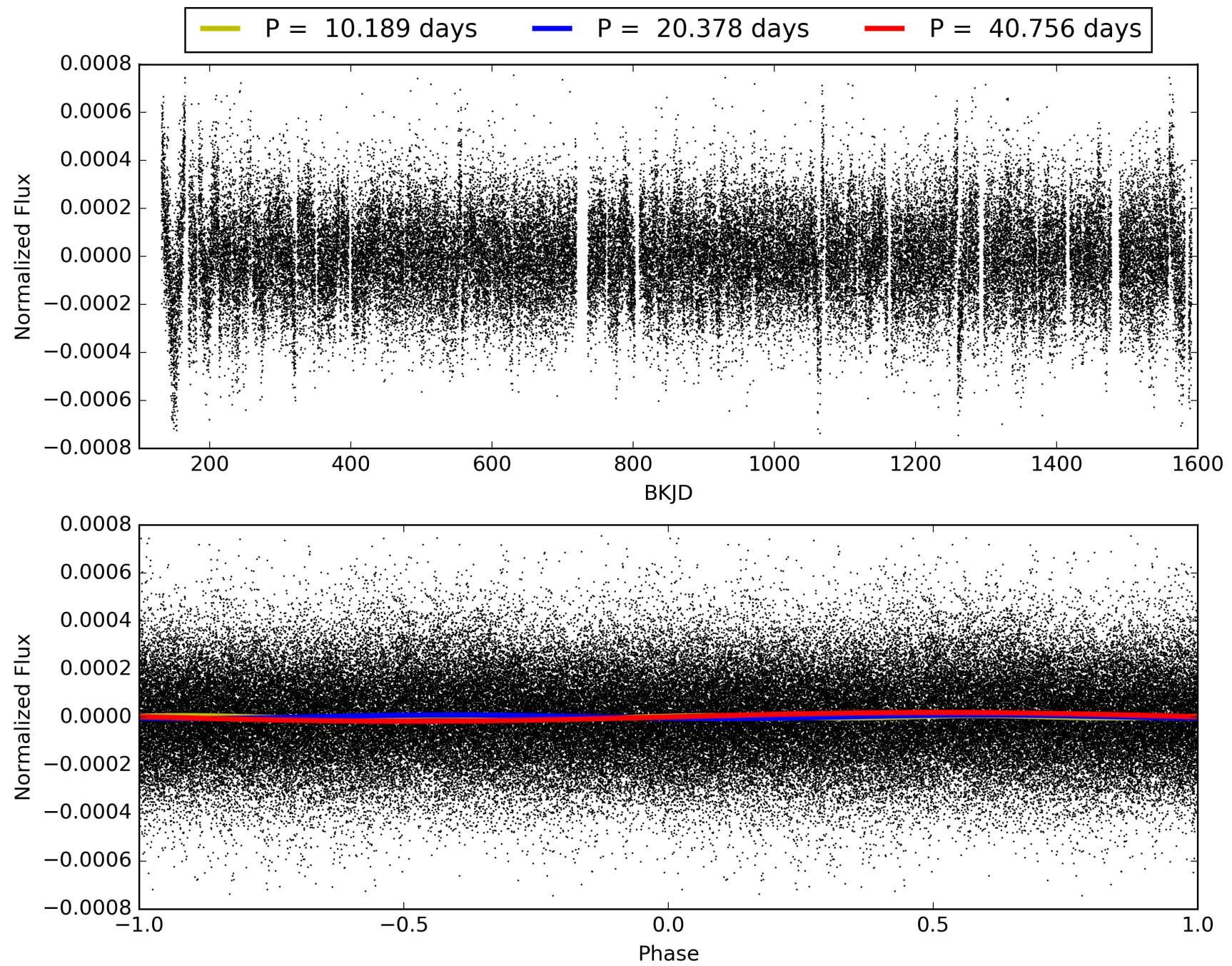
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 22:43:04 Z

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

TCE 007008221-04, PDC Light Curves

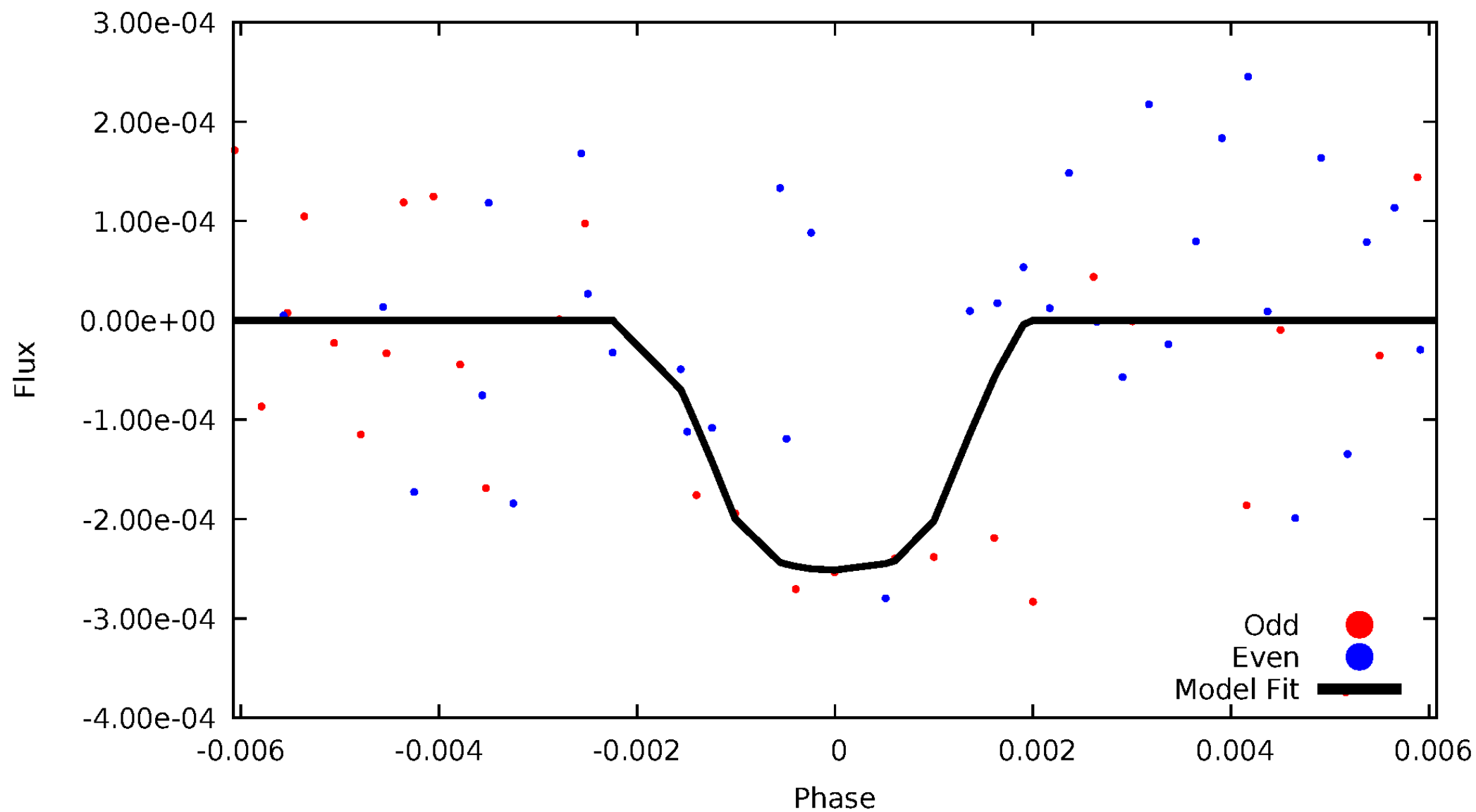


TCE 007008221-04



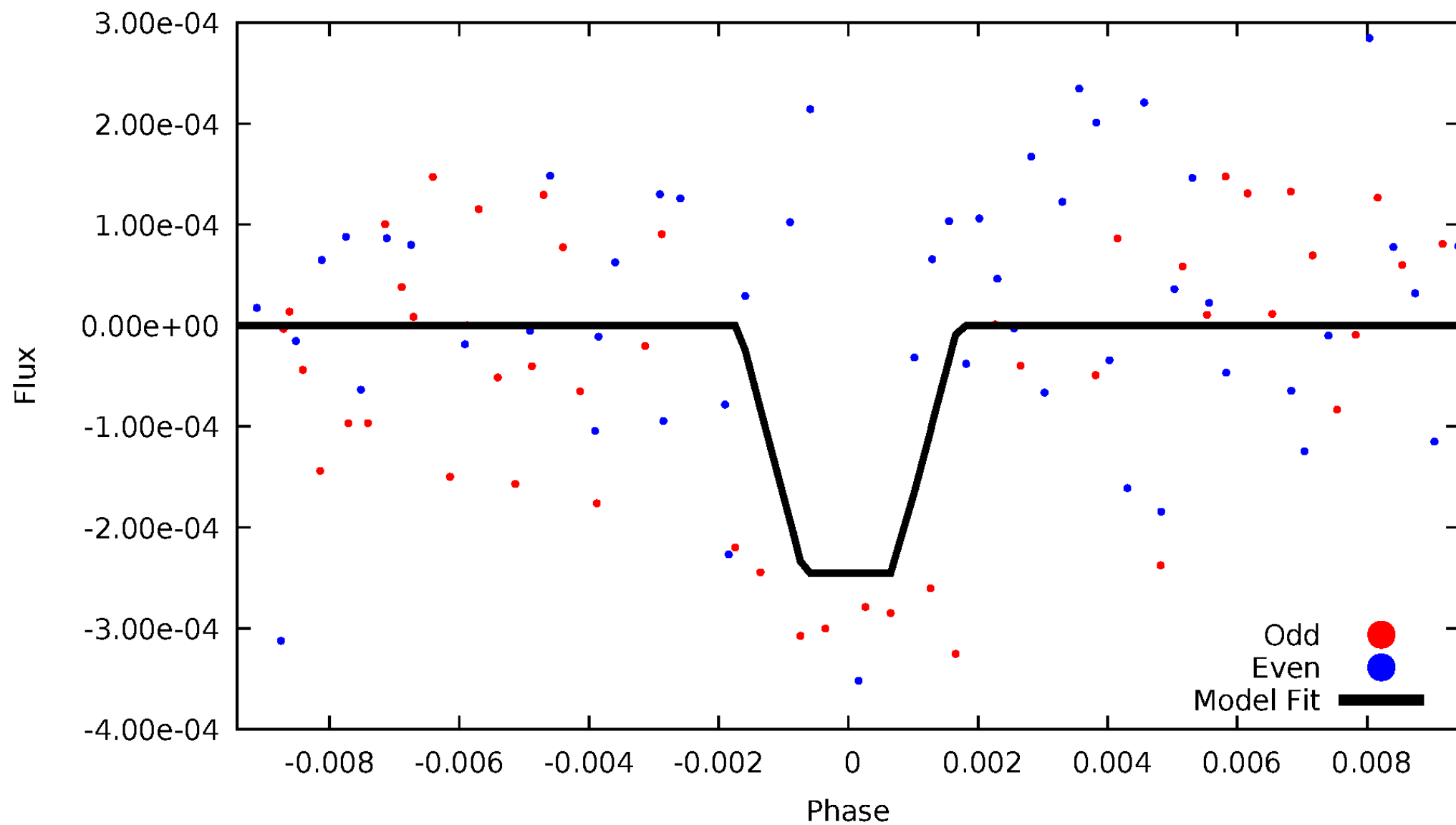
DV Odd/Even

TCE 007008221-04



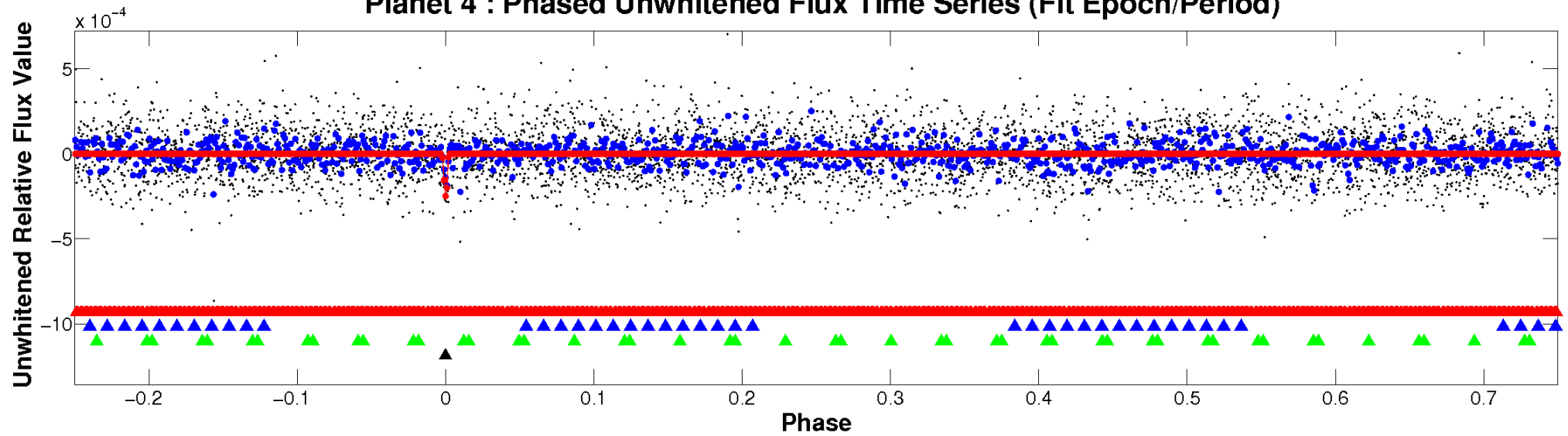
ALT Odd/Even

TCE 007008221-04

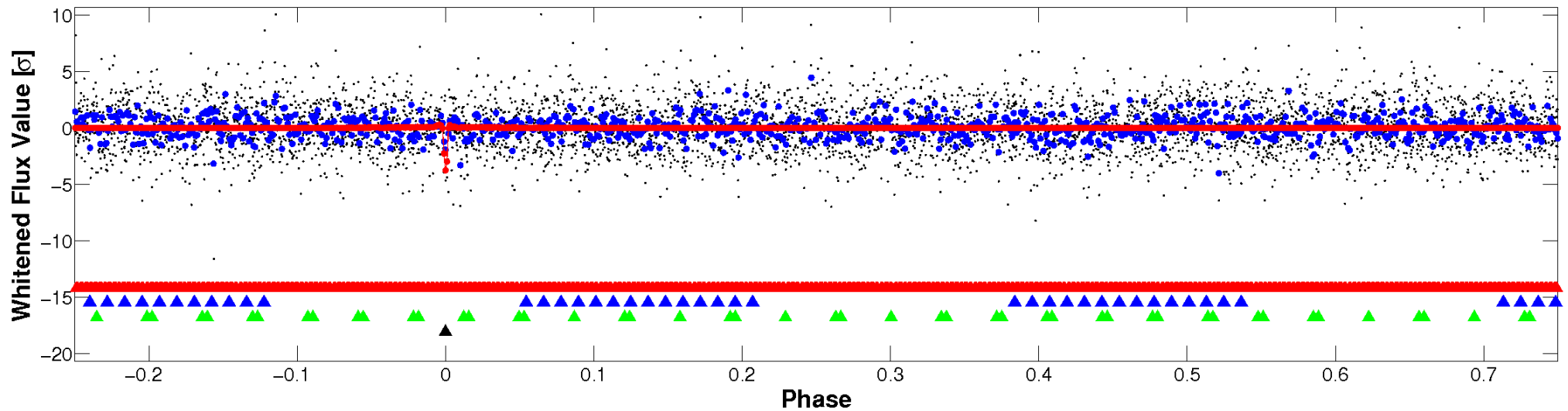


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

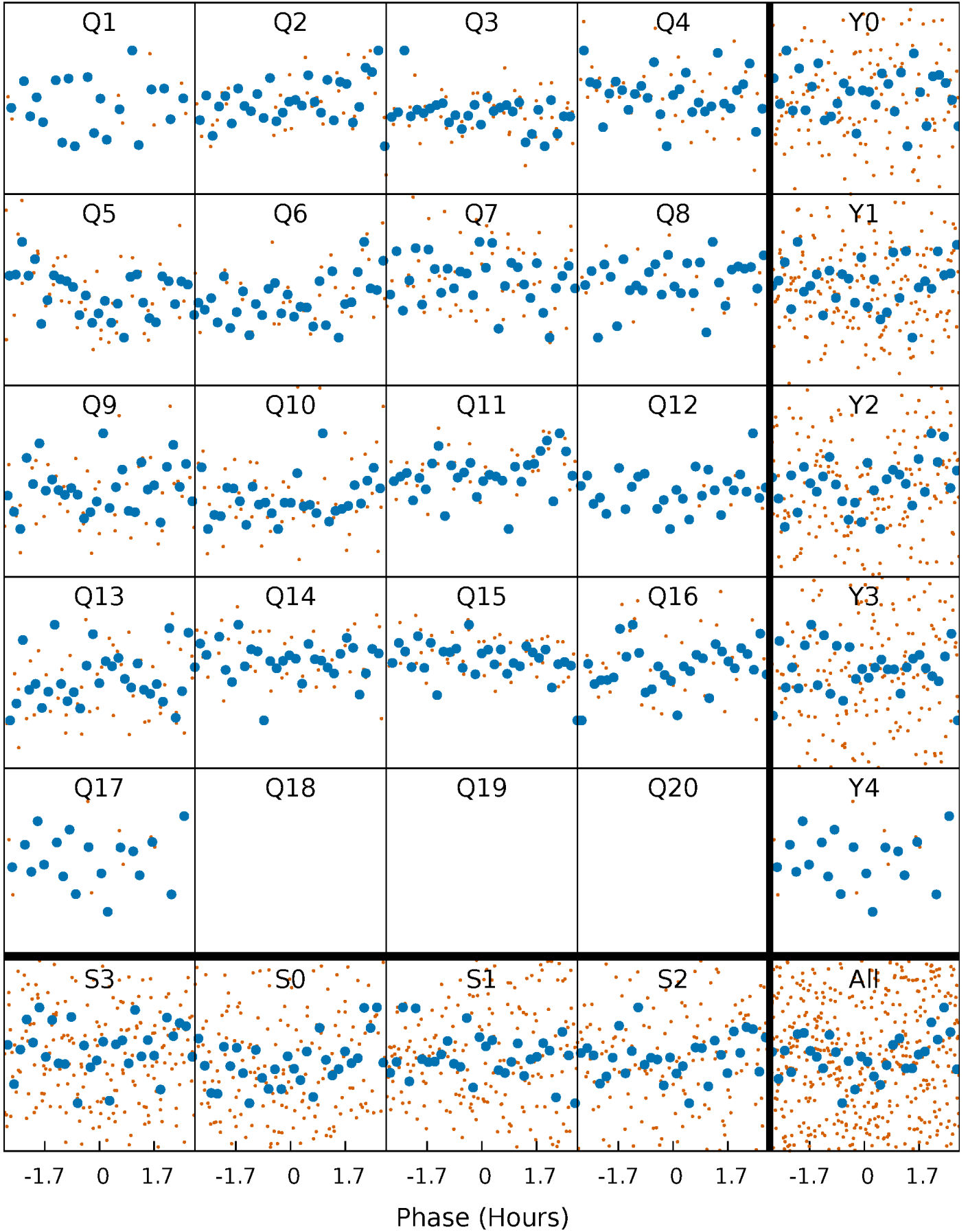


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



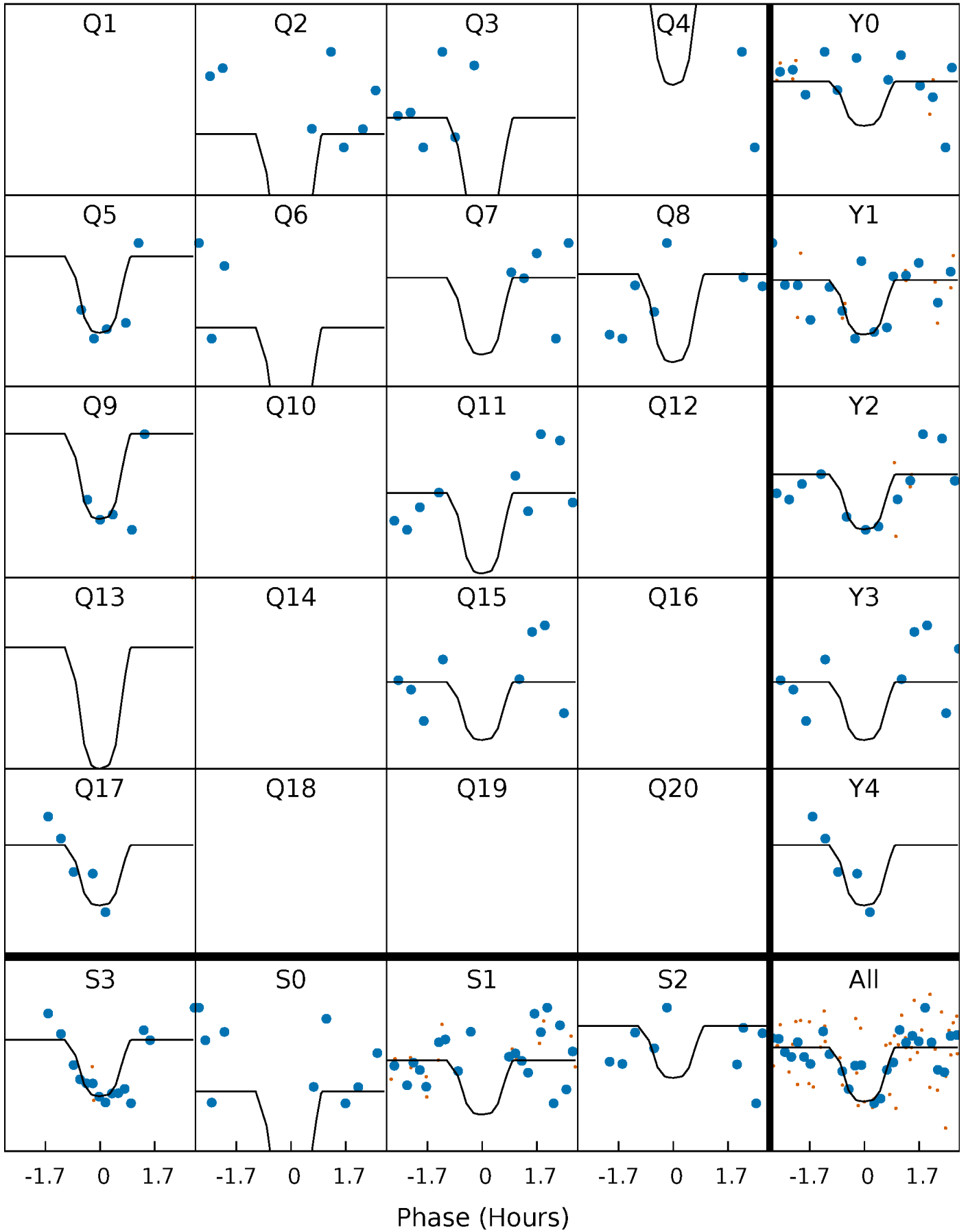
PDC Quarter-Phased Transit Curves

TCE 007008221-04 P= 20.378089 Days $T_0=144.091034$ (BKJD)



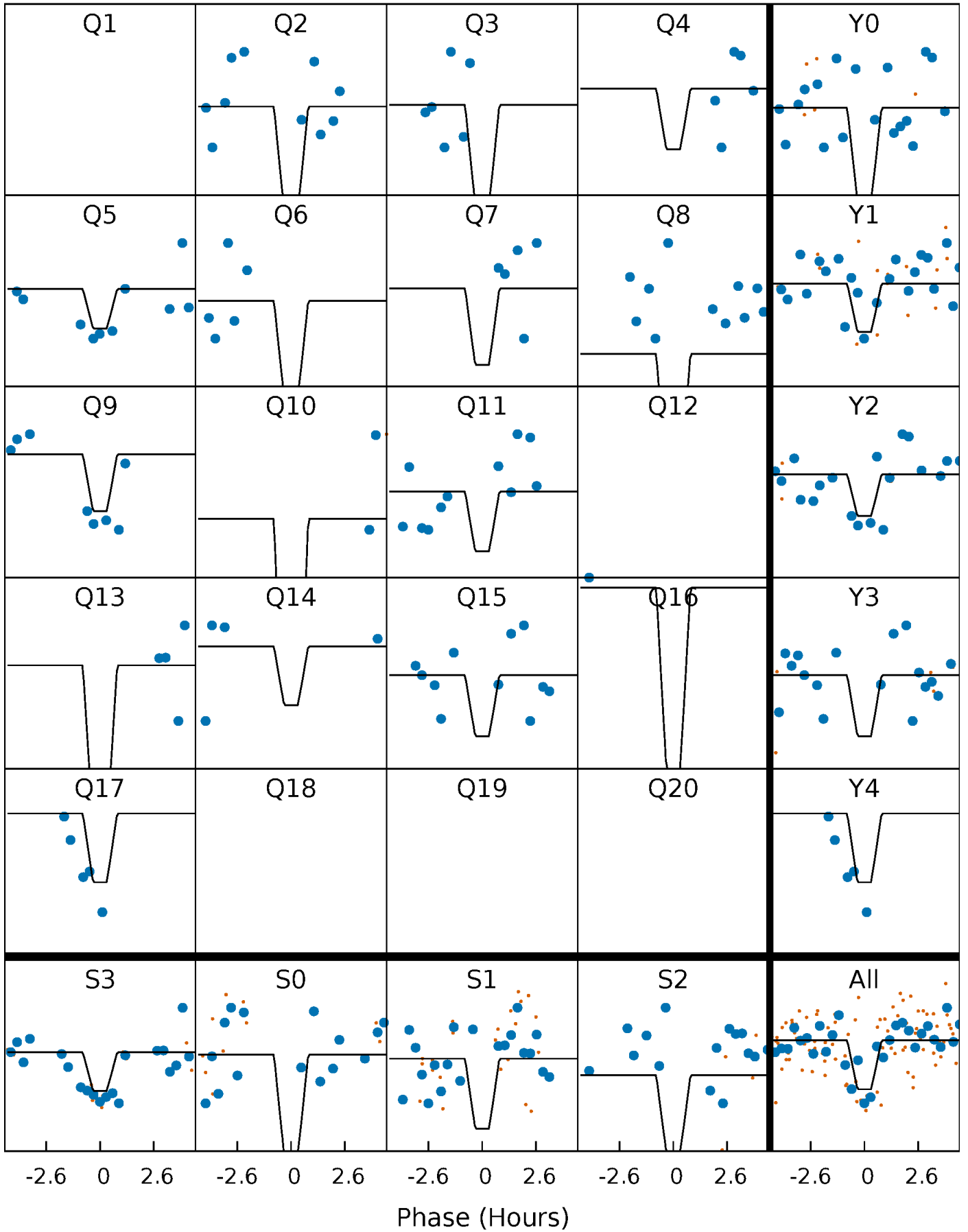
DV Quarter-Phased Transit Curves

TCE 007008221-04 P= 20.378089 Days $T_0=144.091034$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

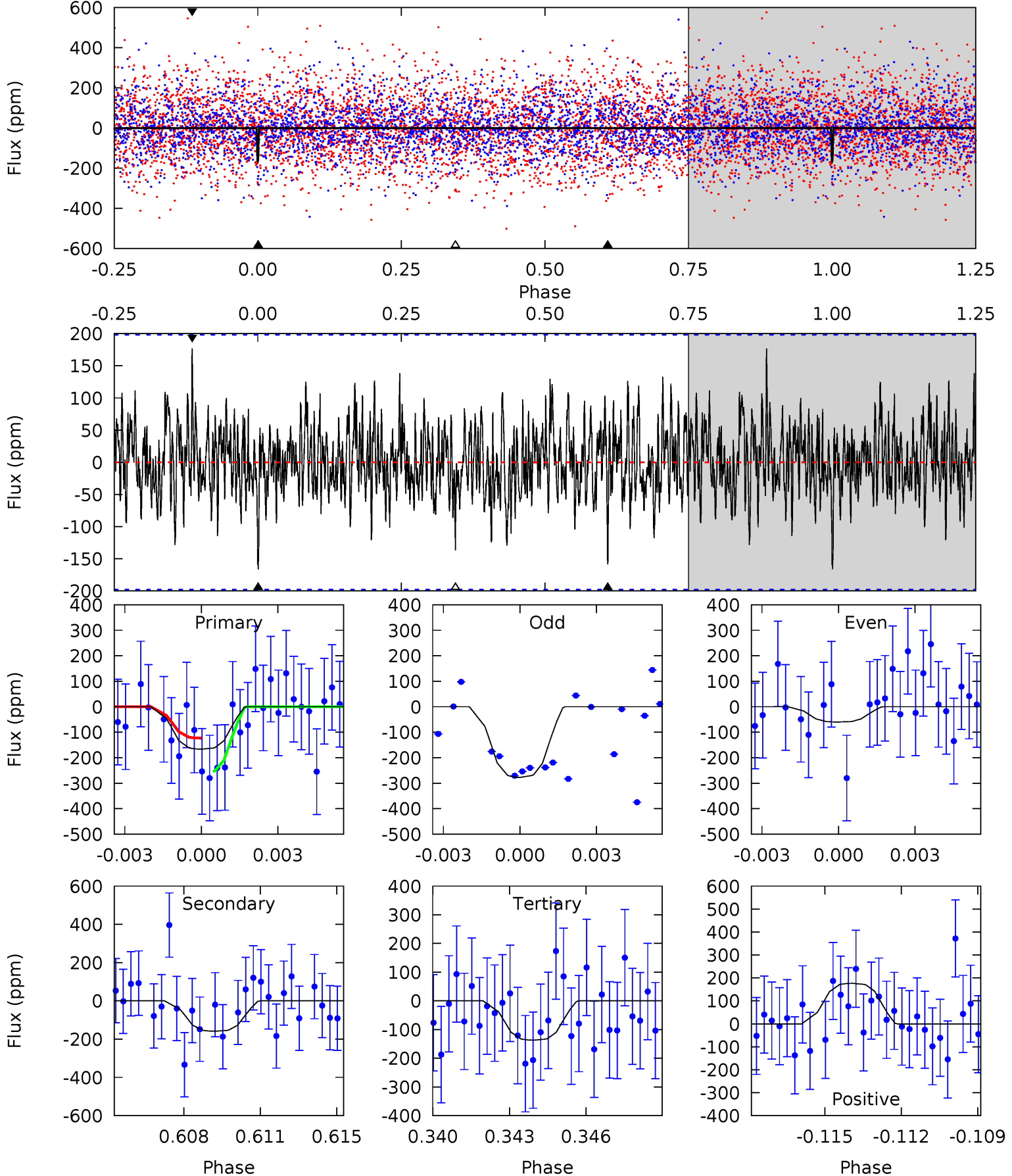
TCE 007008221-04 P= 20.378092 Days $T_0=144.098016$ (BKJD)



DV Model-Shift Uniqueness Test

007008221-04, P = 20.378089 Days, E = 123.712945 Days

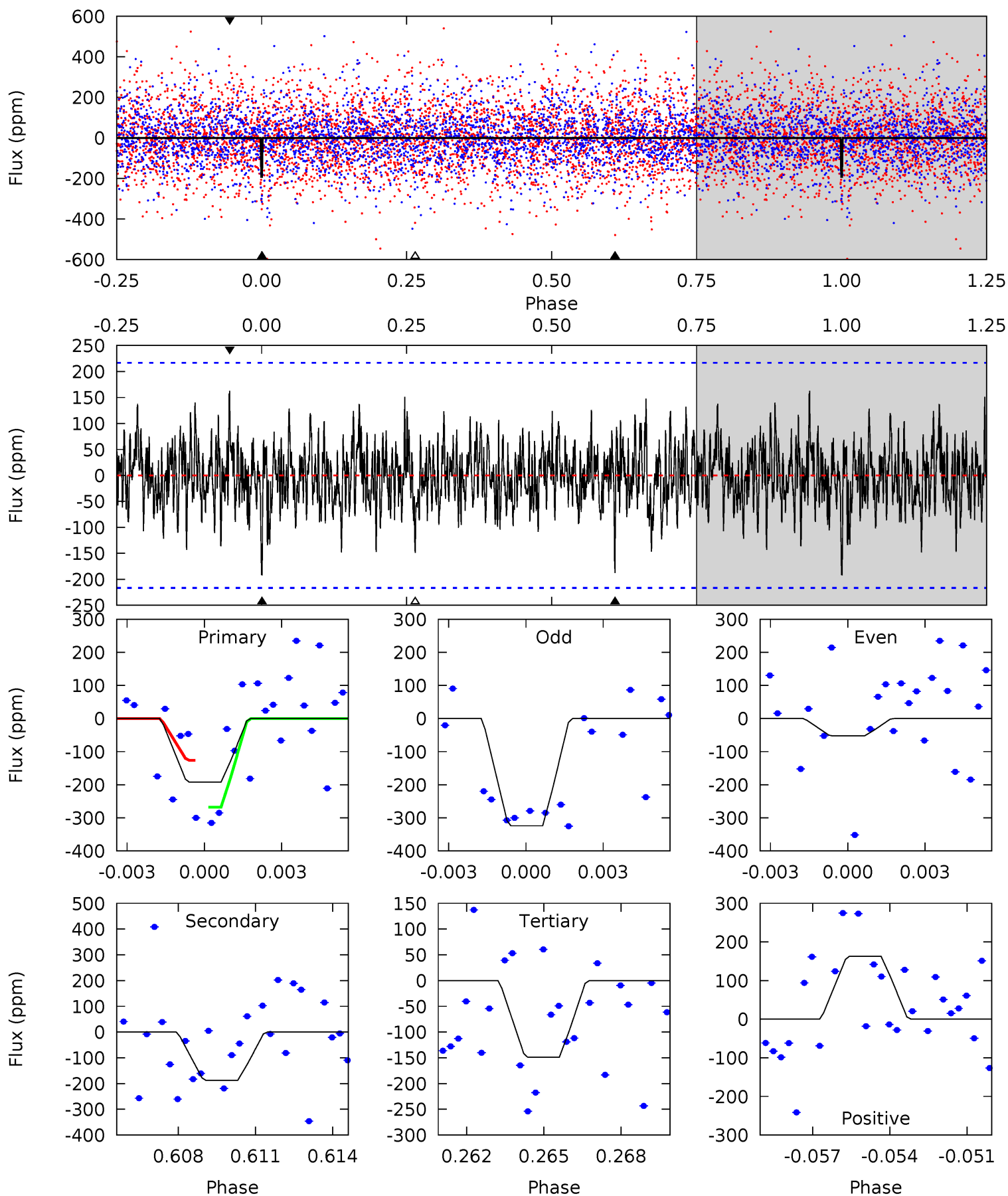
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.39	4.18	3.61	4.66	5.23	2.93	1.24	0.78	-0.27	0.57	-0.48	2.98	0.60	0.51	1.72



Alt Model-Shift Uniqueness Test

007008221-04, P = 20.378092 Days, E = 123.719924 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.66	4.54	3.61	3.94	5.25	2.97	1.20	1.06	0.72	0.94	0.60	3.26	0.59	0.46	1.70



Stellar Parameters For KIC 007008221

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6878^{+186}_{-227}	$3.503^{+0.323}_{-0.086}$	$-0.240^{+0.300}_{-0.250}$	$3.982^{+0.372}_{-1.582}$	$1.844^{+0.196}_{-0.364}$	$0.041^{+0.100}_{-0.011}$
	+3%/-3%	+9%/-2%	+125%/-104%	+9%/-40%	+11%/-20%	+244%/-26%
Source	PHO1	FLK73	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 007008221-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-159 ± 38	$11.89^{+12.68}_{-8.06}$	1969^{+105}_{-176}	4602^{+3704}_{-1102}	19^{+178}_{-15}
Alt.	-187 ± 41	$12.39^{+12.26}_{-7.70}$	1968^{+104}_{-169}	4680^{+2910}_{-1107}	21^{+134}_{-16}

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 $A_{obs} \gg 1.0$

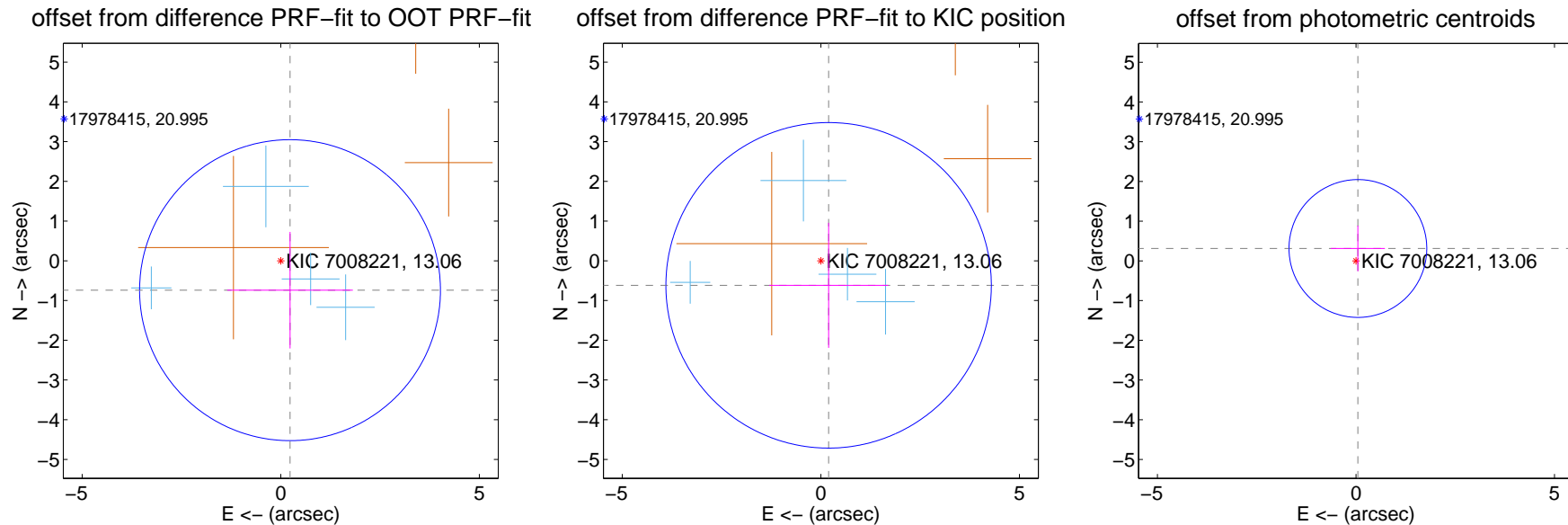
DV Centroid Data

Supplemental centroid analysis for 007008221-04. Kepler magnitude: 13.06. Transit SNR 10.62

There are 4 quarters with good PRF difference image offsets

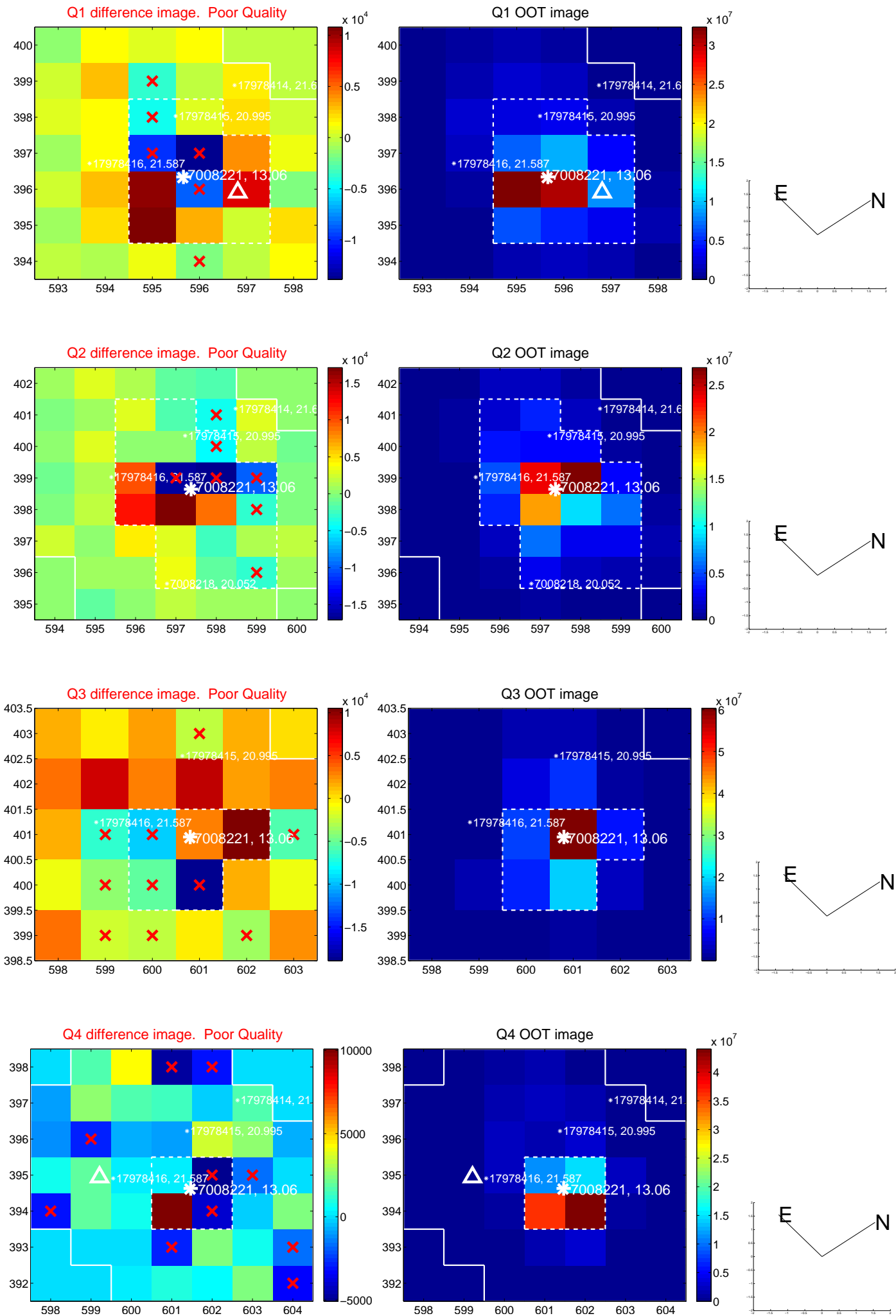
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.775 ± 1.262	0.61	-0.233 ± 1.582	-0.739 ± 1.466
PRF-fit source offset from KIC position	0.648 ± 1.365	0.47	-0.195 ± 1.497	-0.617 ± 1.573
photometric centroid source offset	0.32 ± 0.58	0.54	-0.05 ± 0.68	0.31 ± 0.58

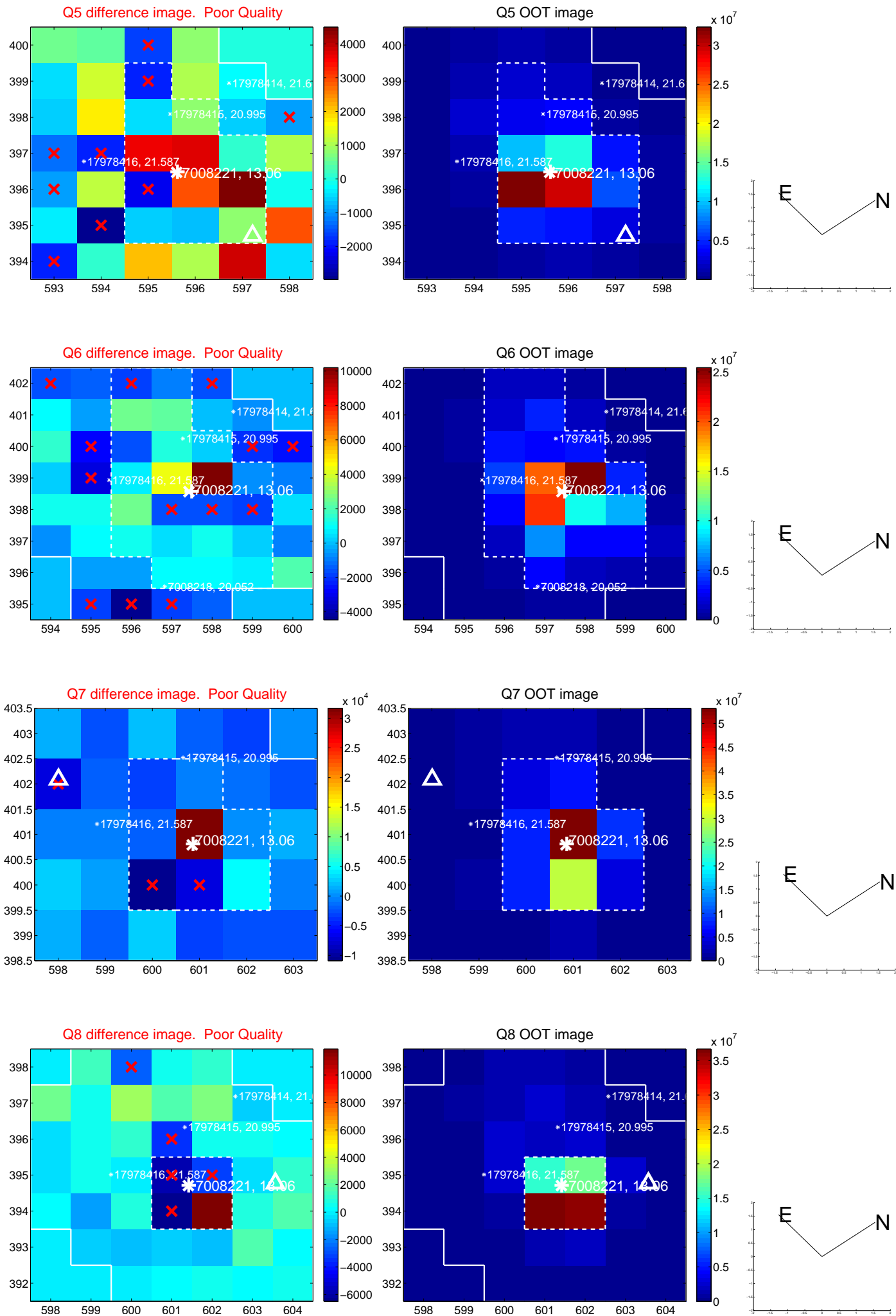


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

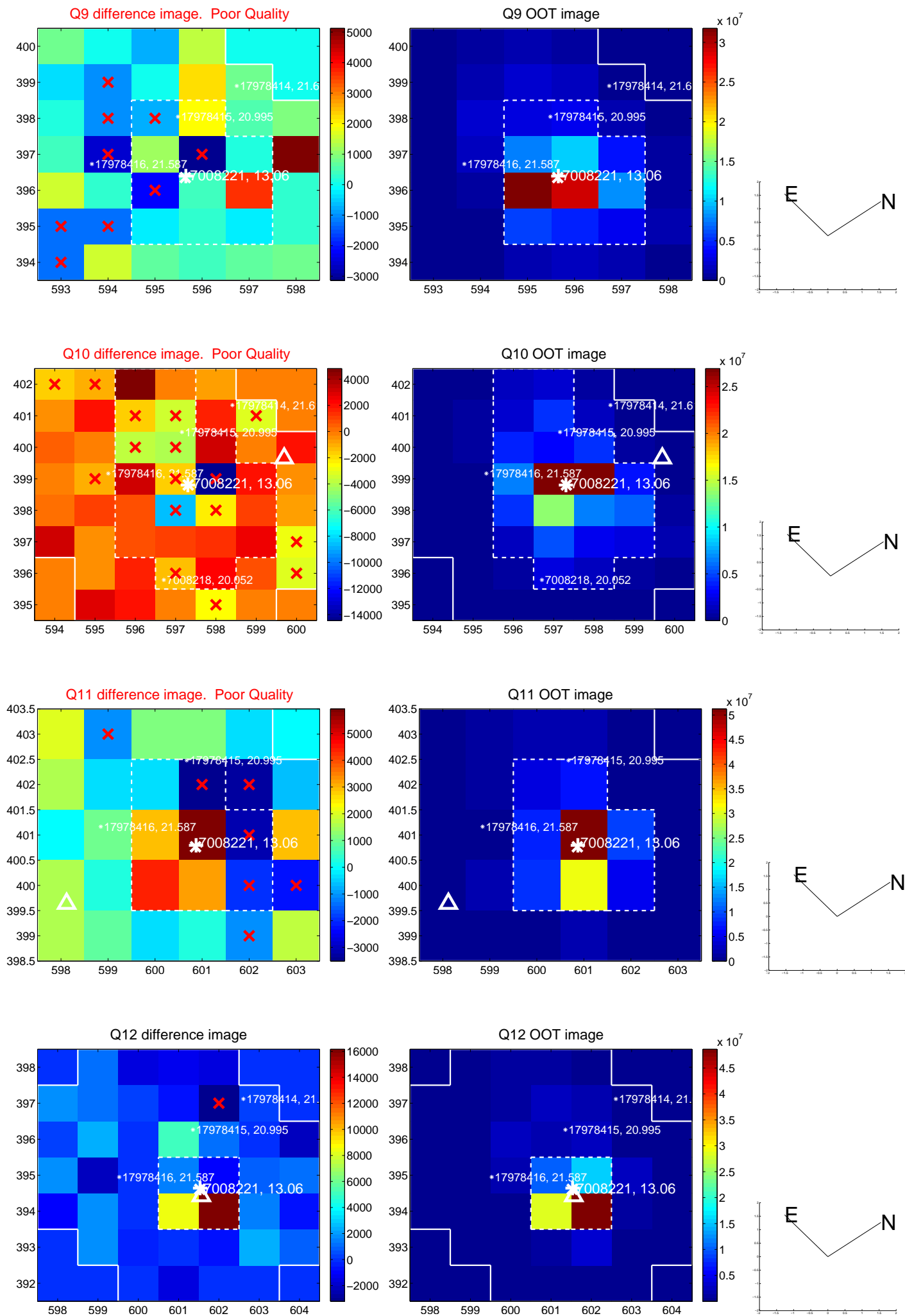
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



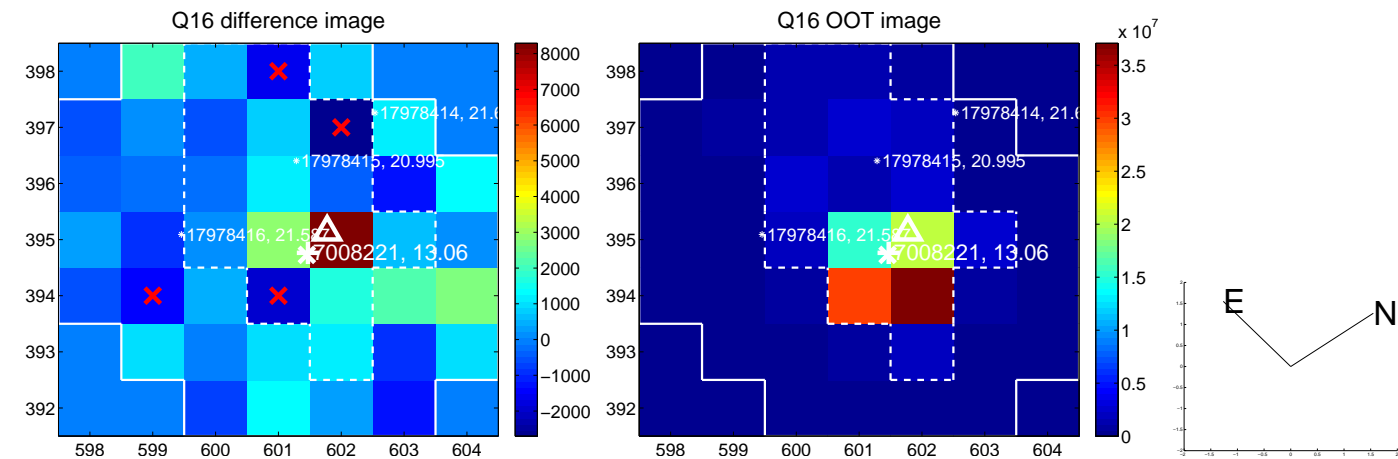
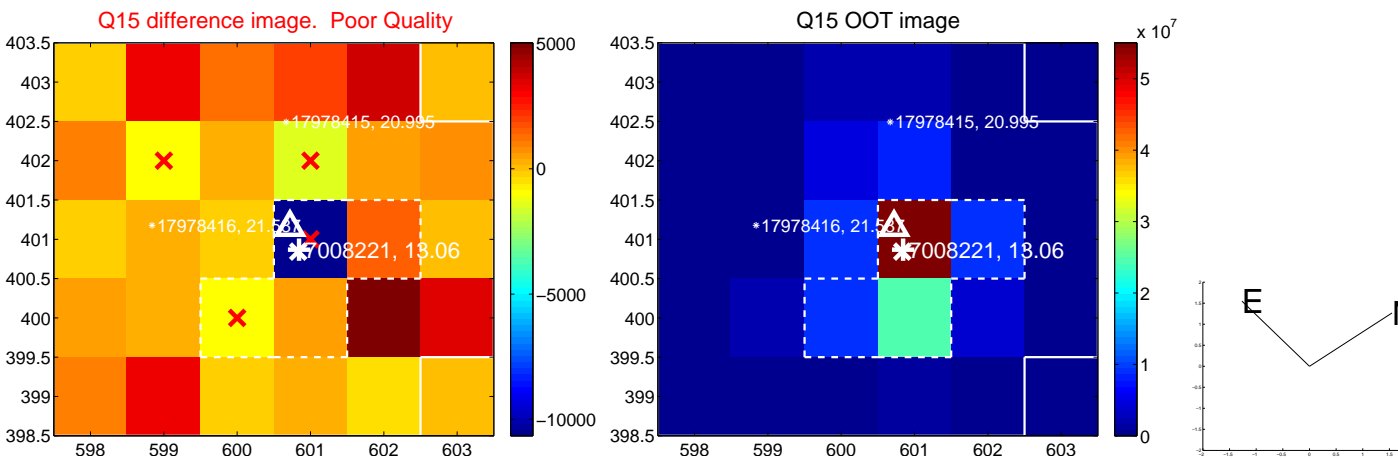
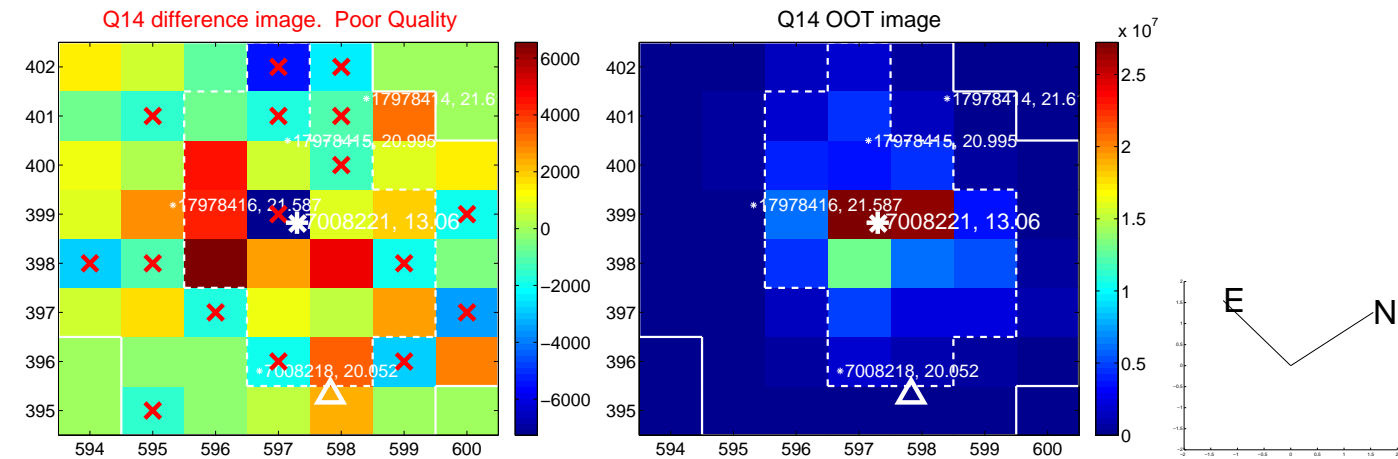
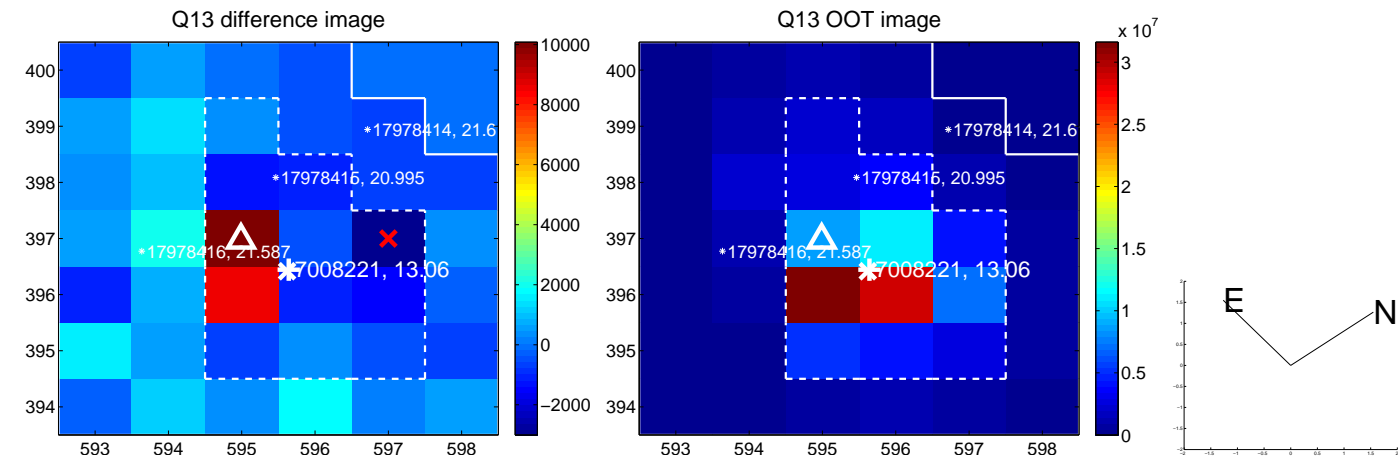
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



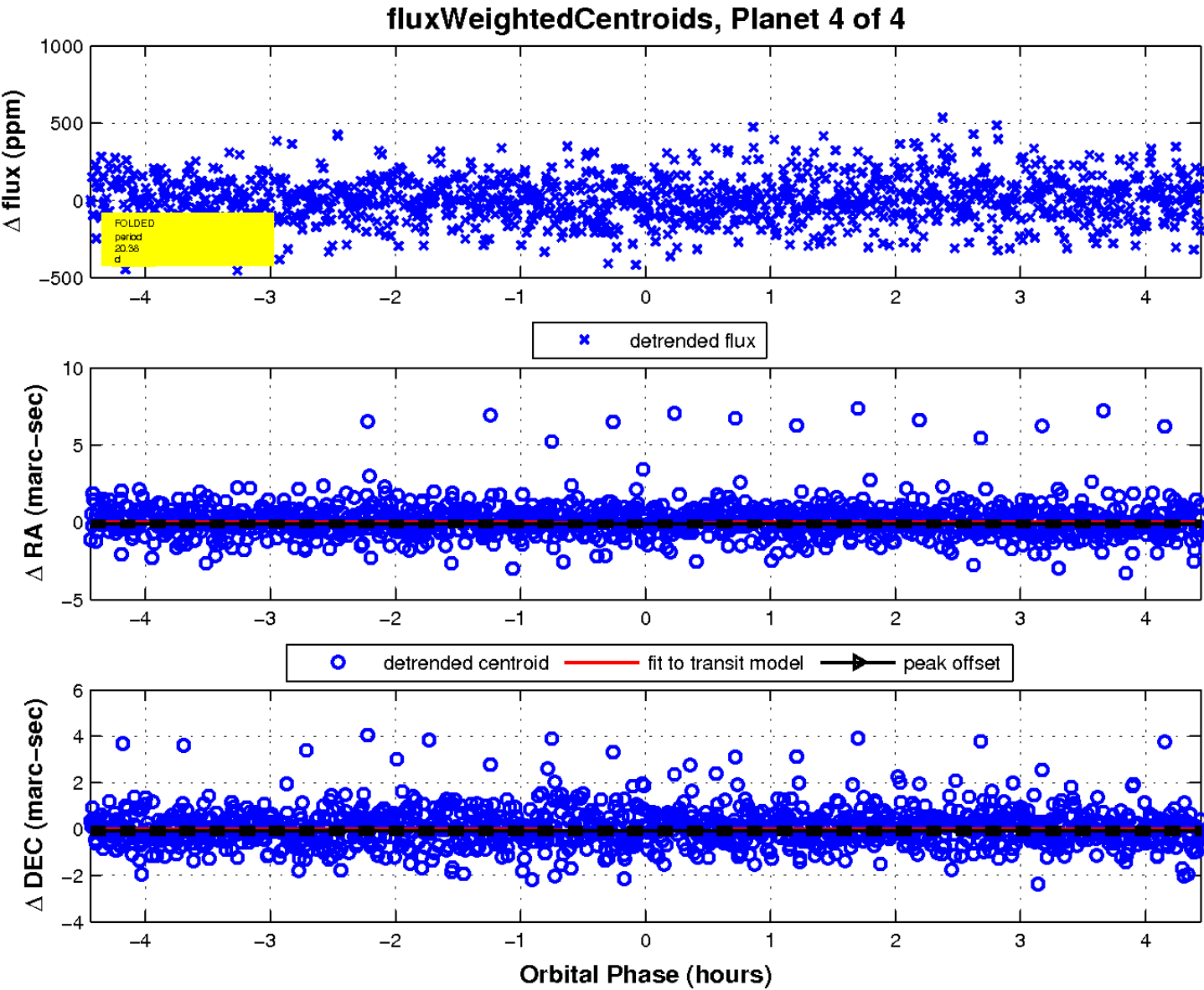
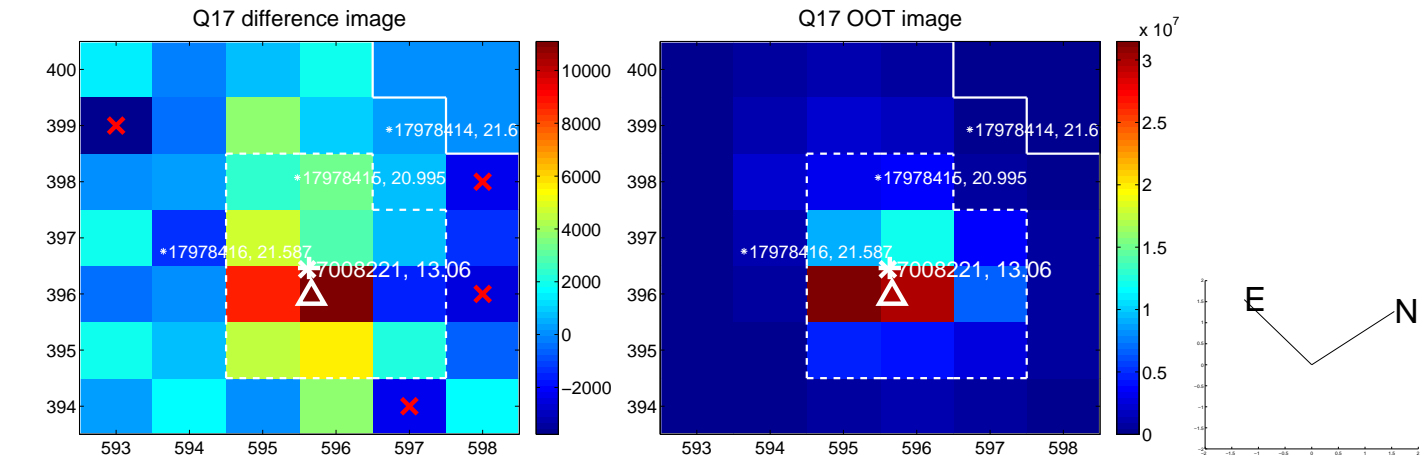
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination

