

KIC 010931512

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})
010931512-01	OBS	No	3.780743	132.397897	35.7	15.357	8.0	6.4	1.08	6509	0.67	773.99
010931512-02	OBS	No	3.780370	134.463524	76.9	12.647	11.0	12.9	1.08	6509	1.29	774.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010931512-01	OBS	FP	0.00	1	0	0	1	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS—EPHEM_MATCH
010931512-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

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

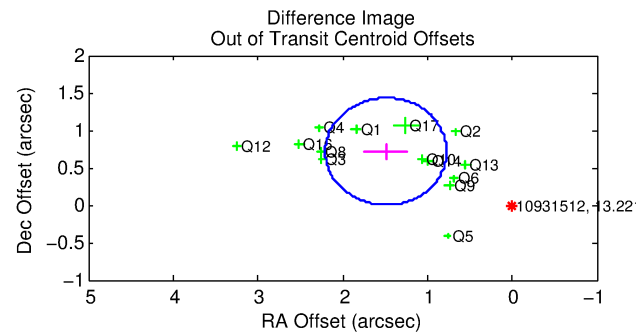
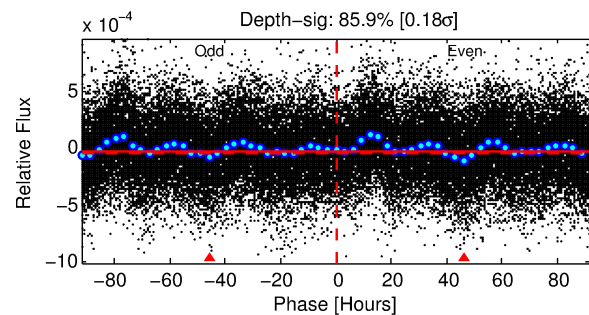
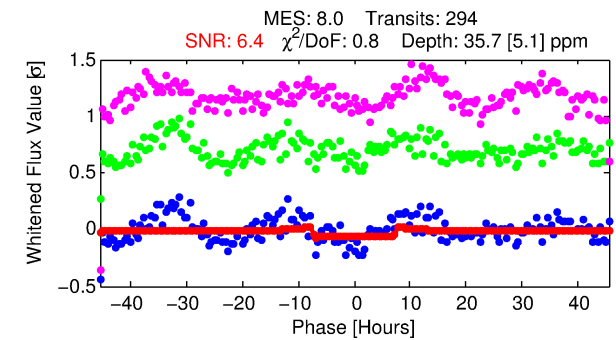
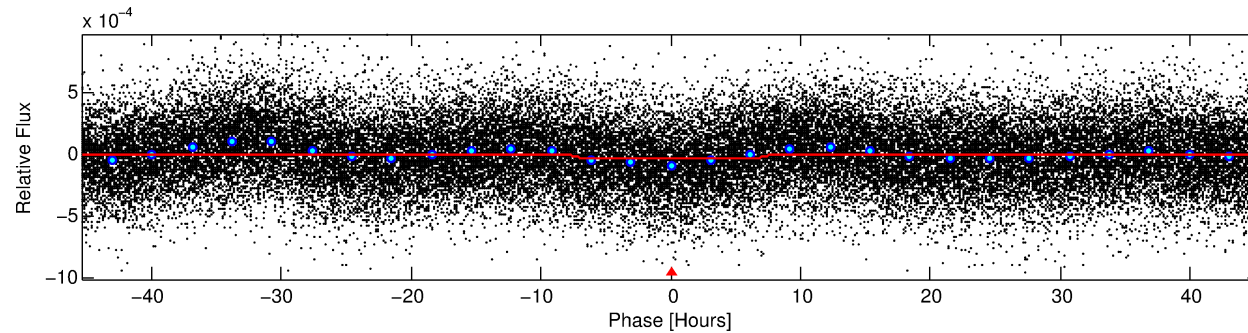
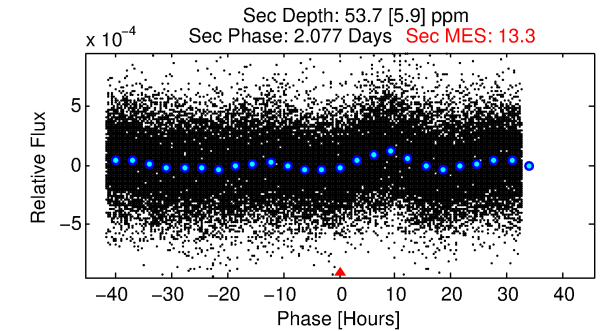
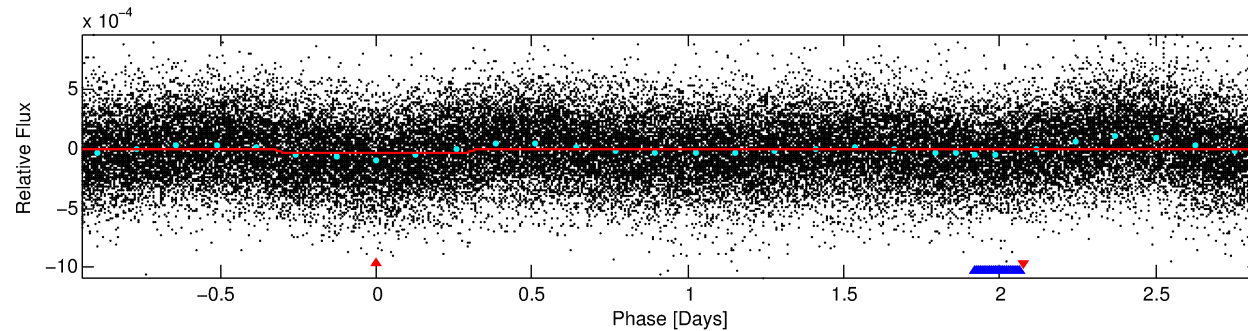
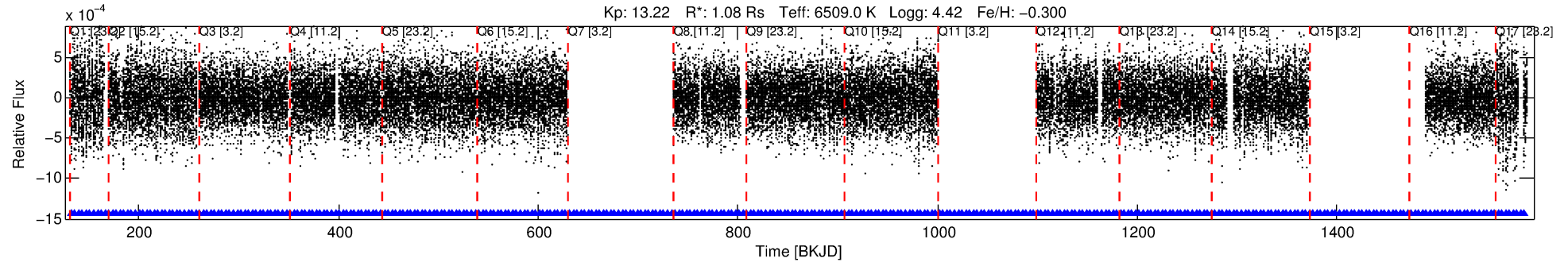
Ephemeris Match Information For 010931512-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist (μ)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
010931512-01	10931512	010931507-01	10931507	1:1	5.0	2	0	13.78	13.22	3.03	Direct-PRF	0	2.54	4.99

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 10931512 Candidate: 1 of 2 Period: 3.781 d



DV Fit Results:

Period = 3.78074 [0.00006] d
Epoch = 132.3979 [0.0102] BKJD
Rp/R* = 0.0057 [0.0022]
a/R* = 1.76 [2.52]
b = 0.54 [2.83]
Seff = 773.98 [307.98]
Teq = 1345 [134] K
Rp = 0.67 [0.33] Re
a = 0.0493 [0.0128] AU
Ag = 159.69 [138.79] [1.14σ]
Teffp = 7392 [1462] K [4.12σ]

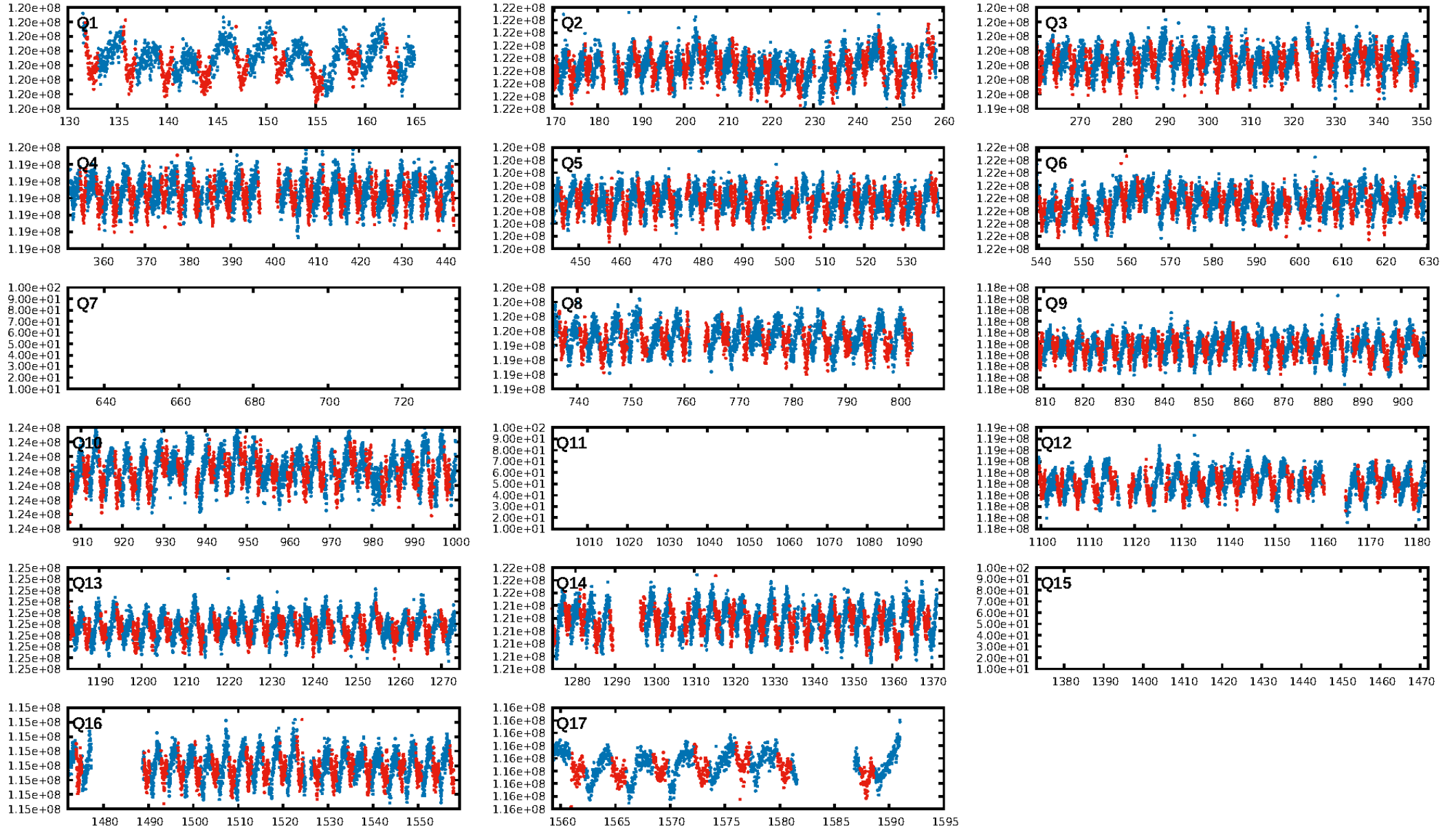
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.66e-24
RollingBand-fgt: 1.00 [278/278]
GhostDiagnostic-chr: 0.5809
Centroid-sig: 0.0%
Centroid-so: 5.923 arcsec [6.43σ]
OotOffset-rm: 1.652 arcsec [6.93σ]
KicOffset-rm: 0.125 arcsec [1.03σ]
OotOffset-st: 4/1/4/5 [14]
KicOffset-st: 4/1/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

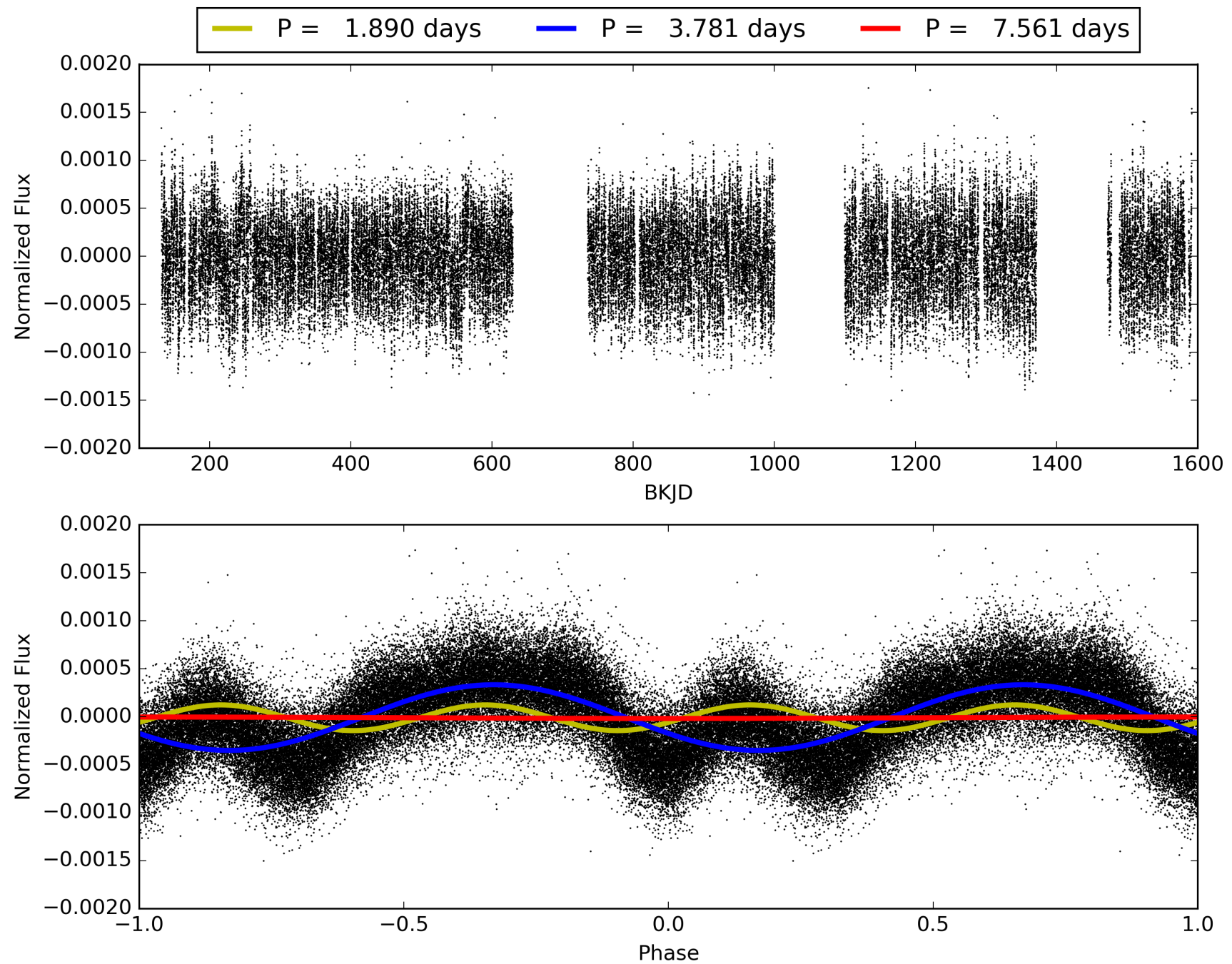
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 05:53:05 Z

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

TCE 010931512-01, PDC Light Curves

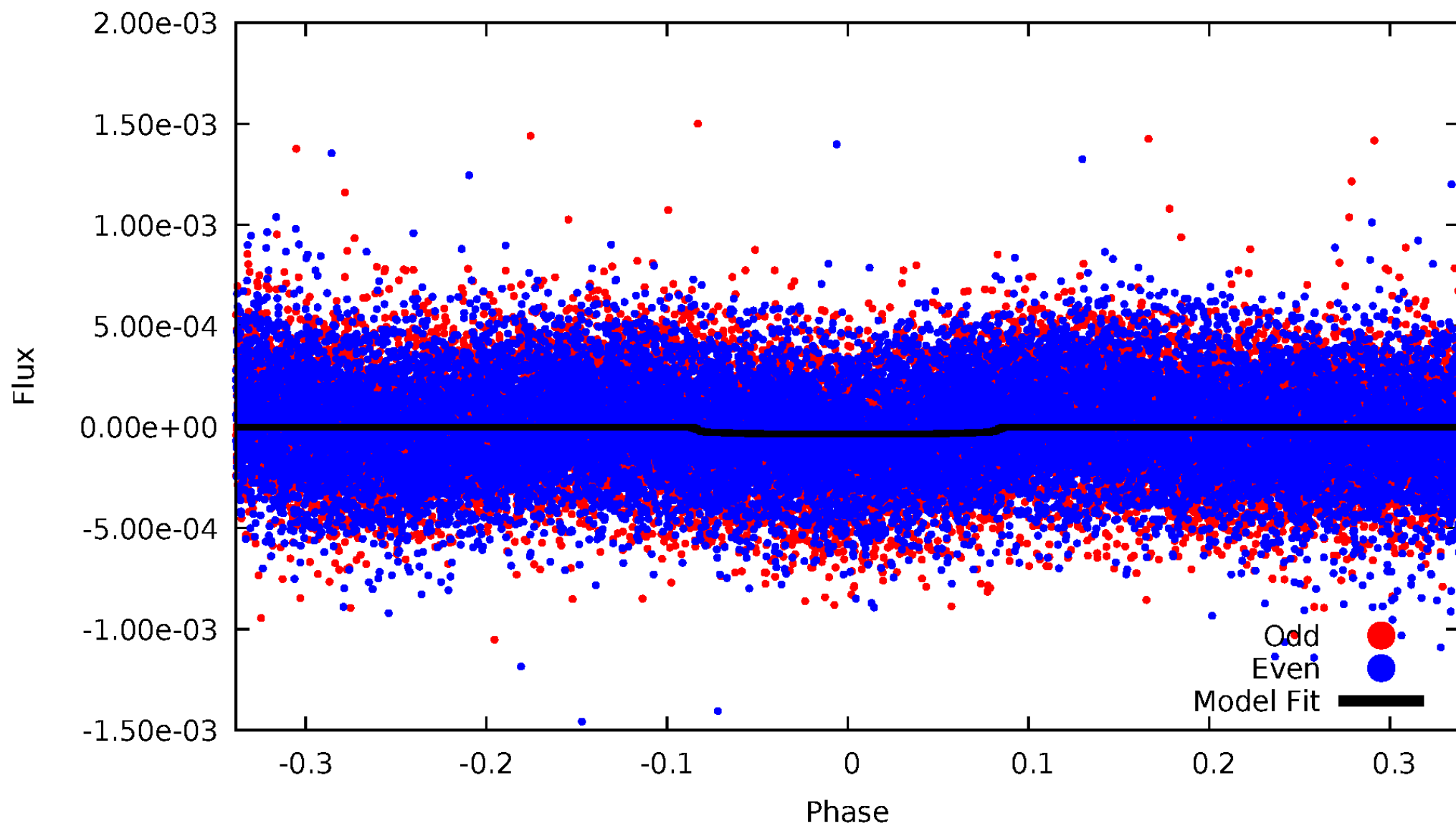


TCE 010931512-01



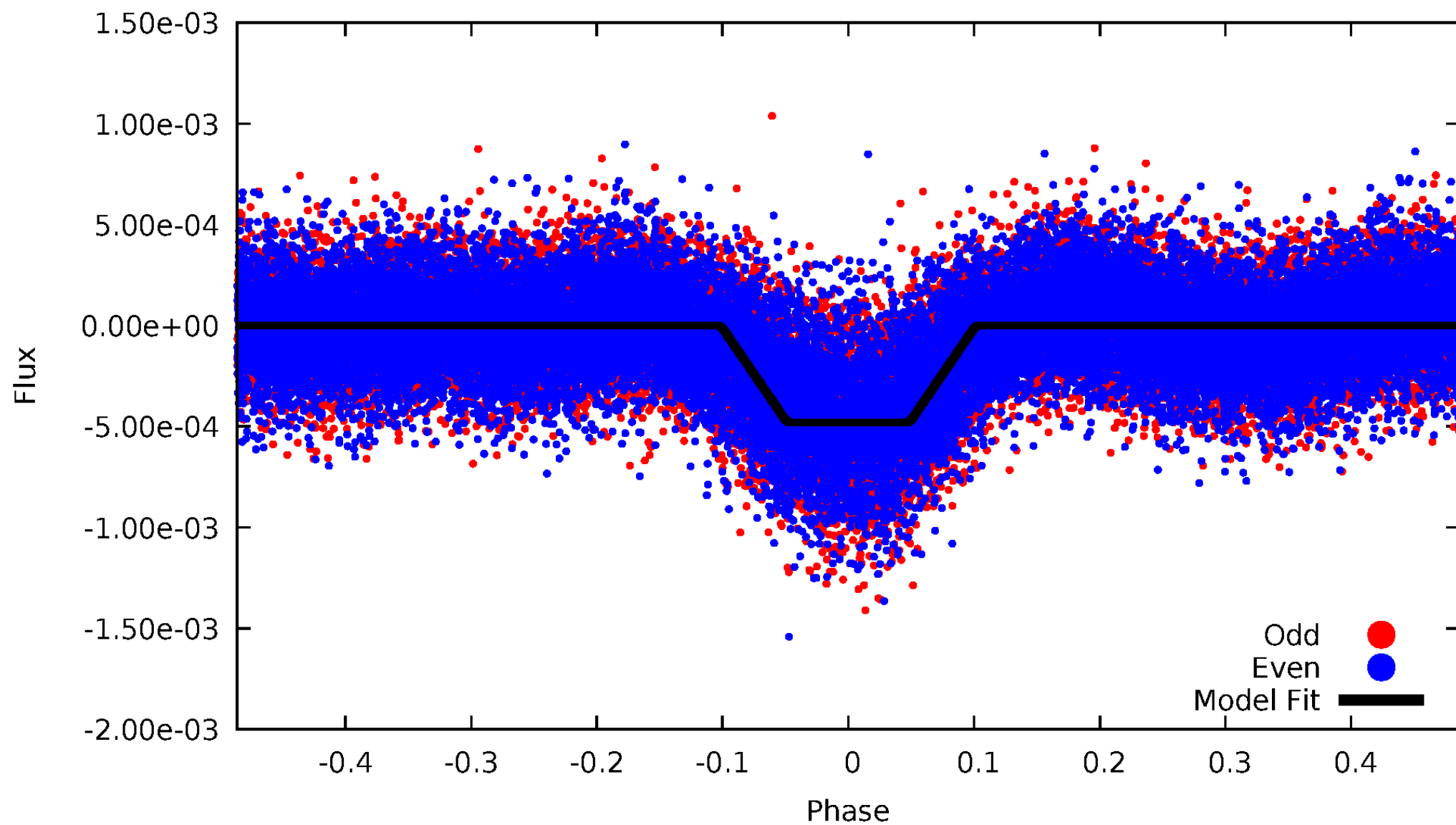
DV Odd/Even

TCE 010931512-01

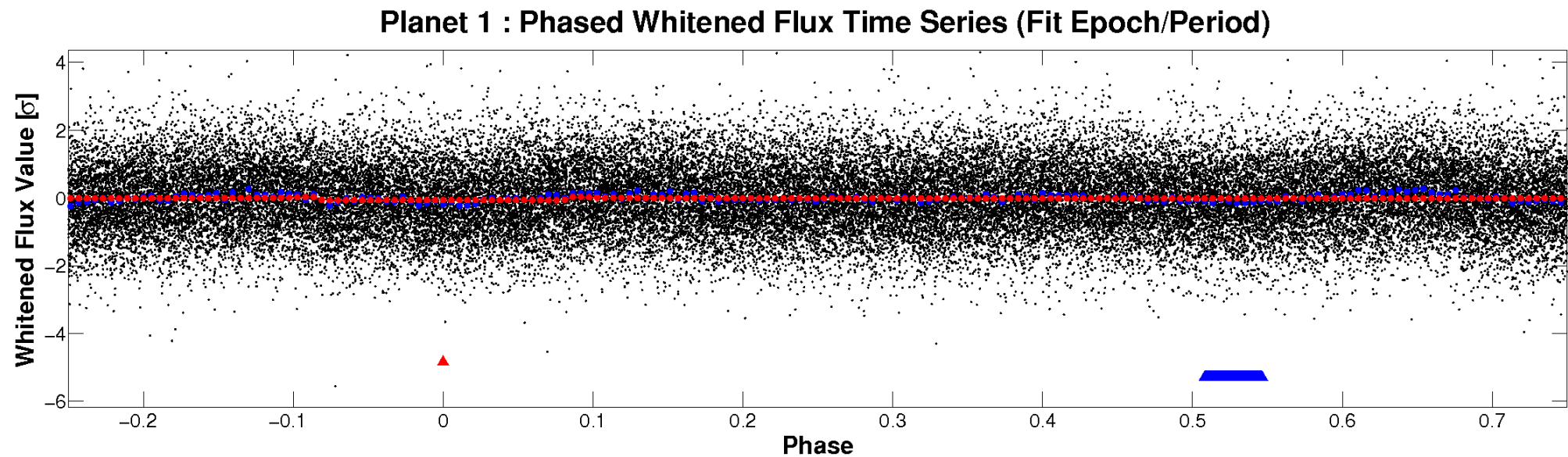
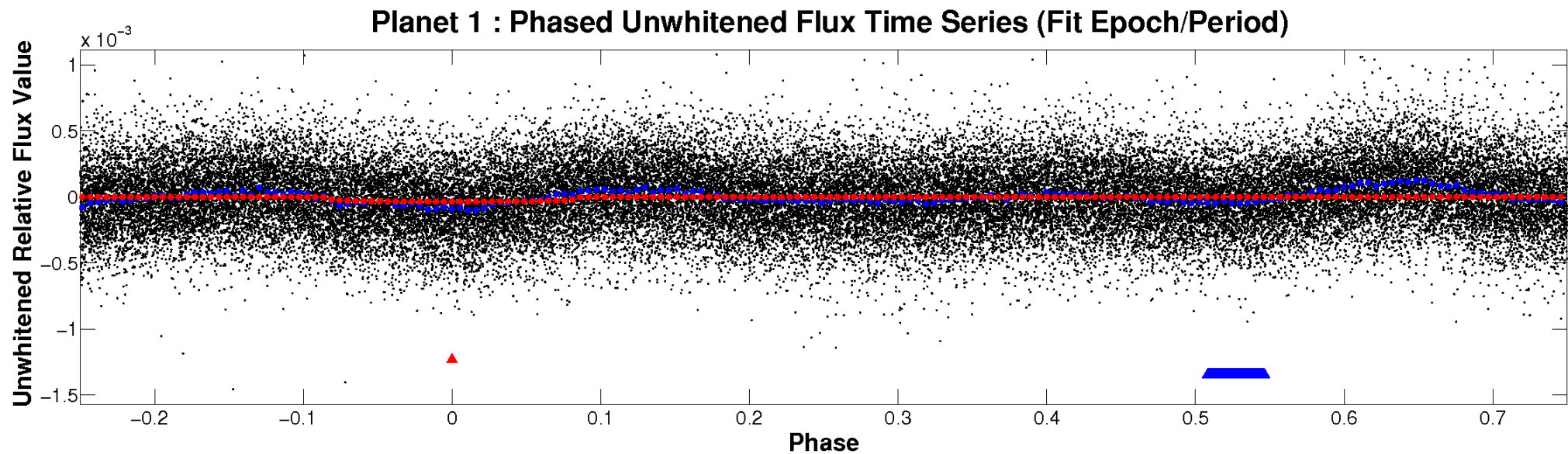


ALT Odd/Even

TCE 010931512-01

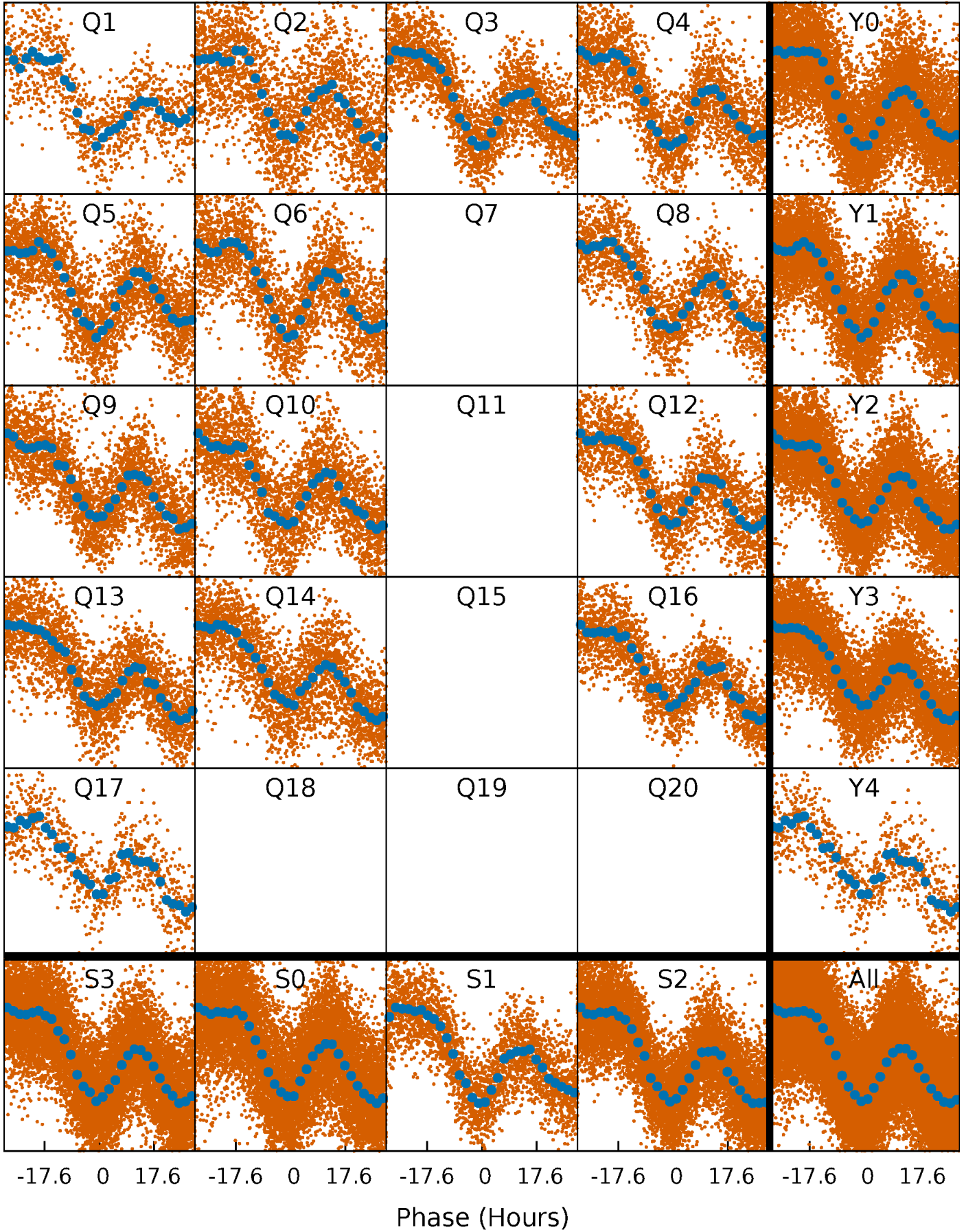


Non-Whitened Vs. Whitened Light Curve



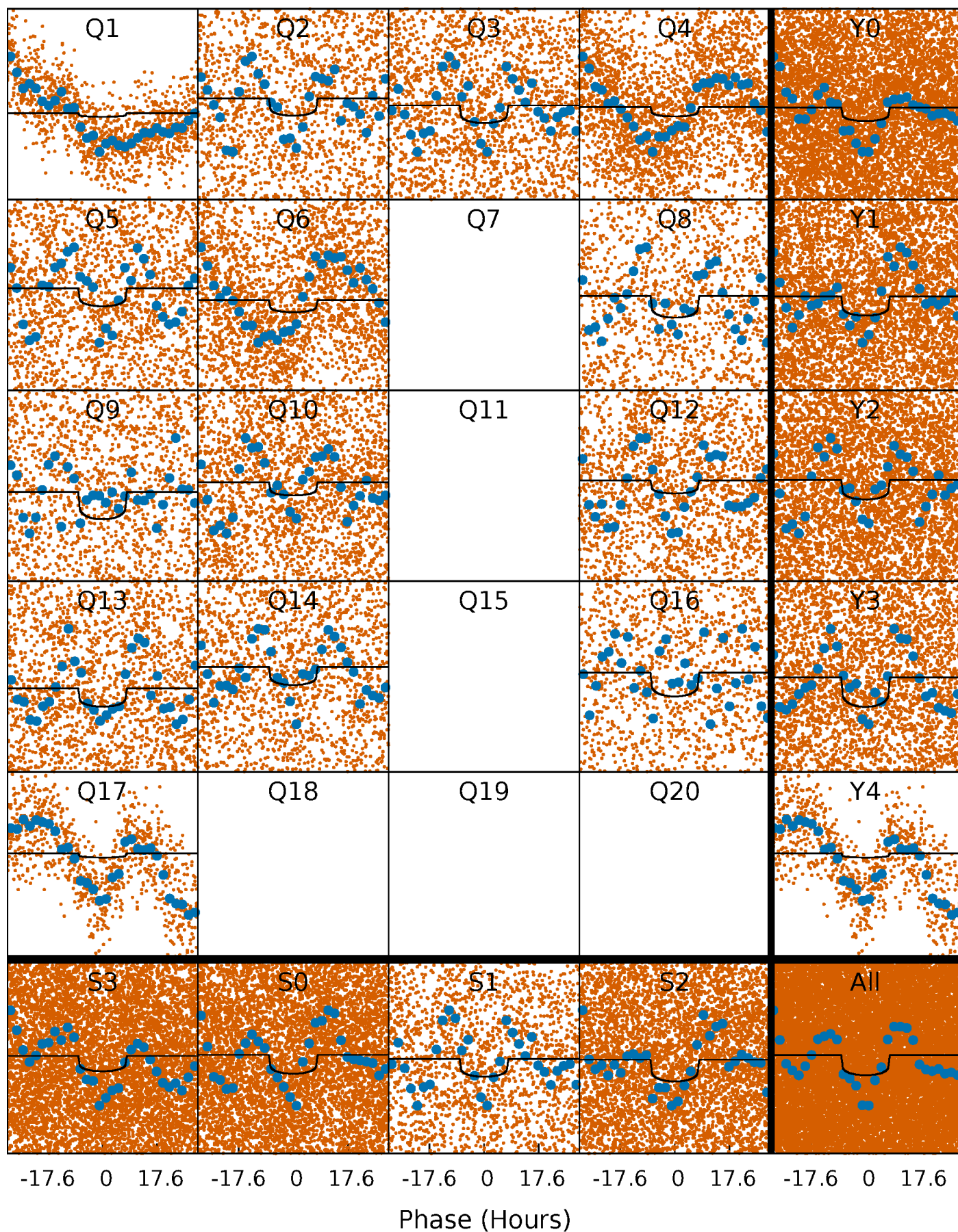
PDC Quarter-Phased Transit Curves

TCE 010931512-01 P= 3.780743 Days $T_0=132.397897$ (BKJD)



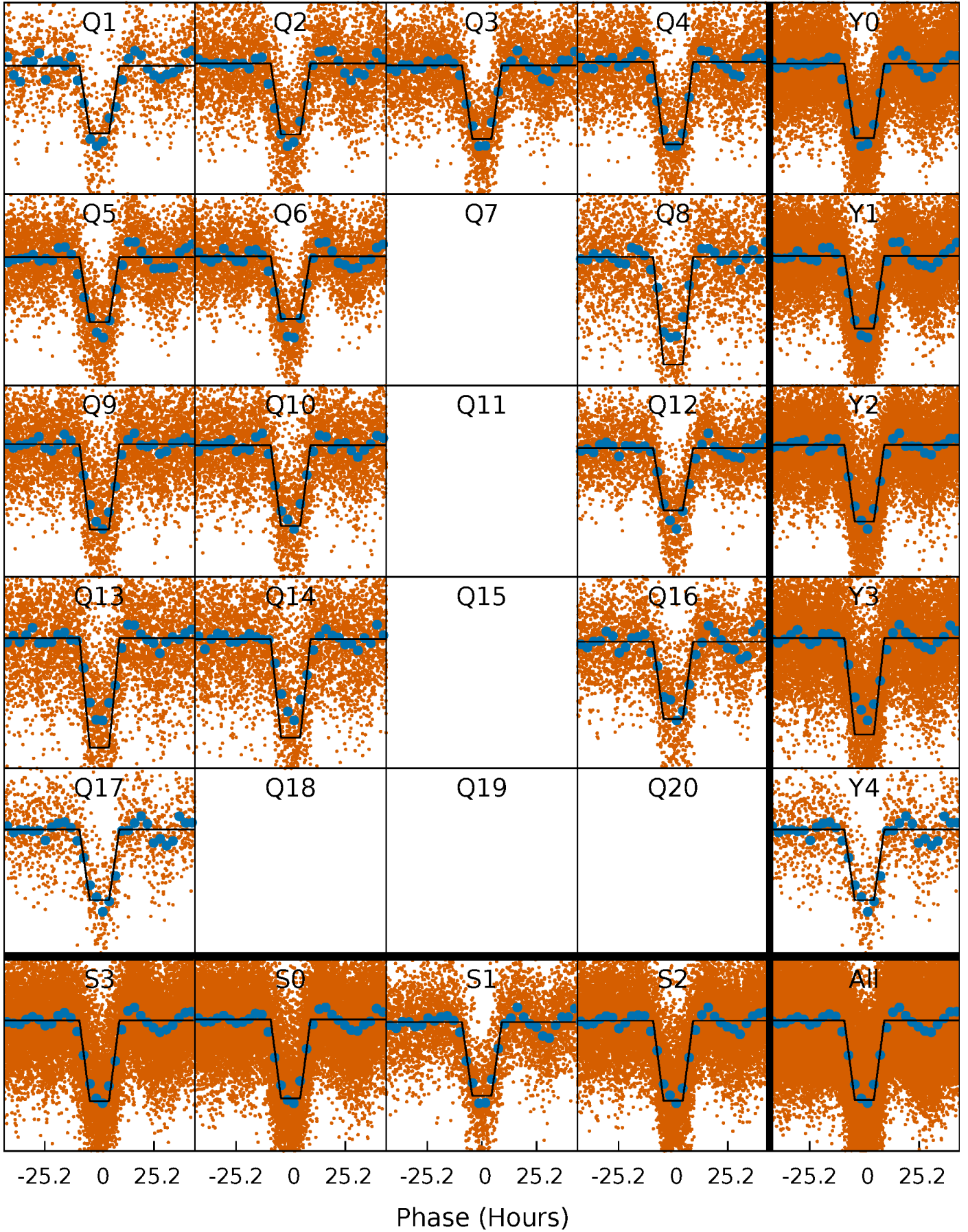
DV Quarter-Phased Transit Curves

TCE 010931512-01 P= 3.780743 Days $T_0=132.397897$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

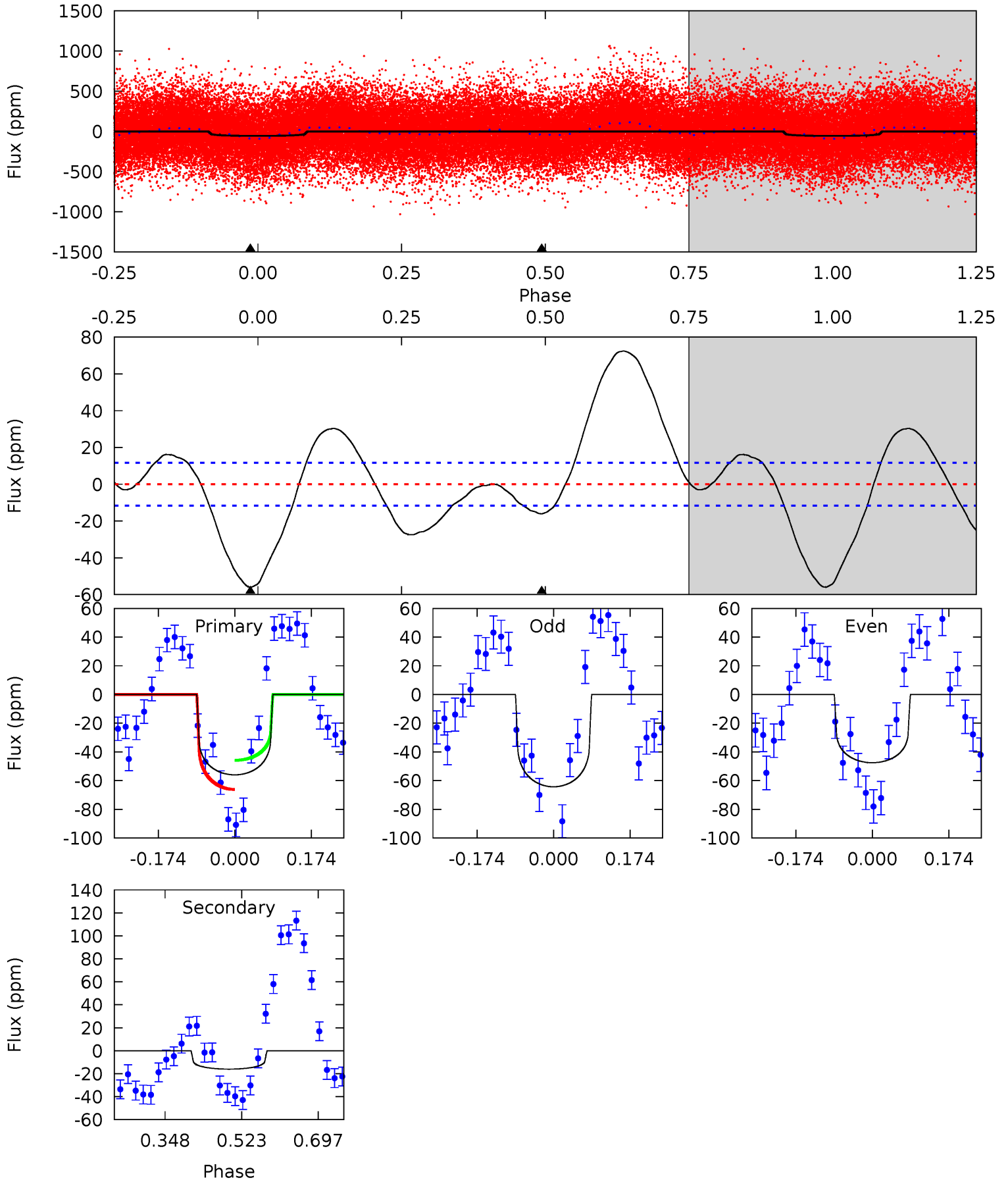
TCE 010931512-01 P= 3.780603 Days $T_0=132.358077$ (BKJD)



DV Model-Shift Uniqueness Test

010931512-01, P = 3.780743 Days, E = 128.617154 Days

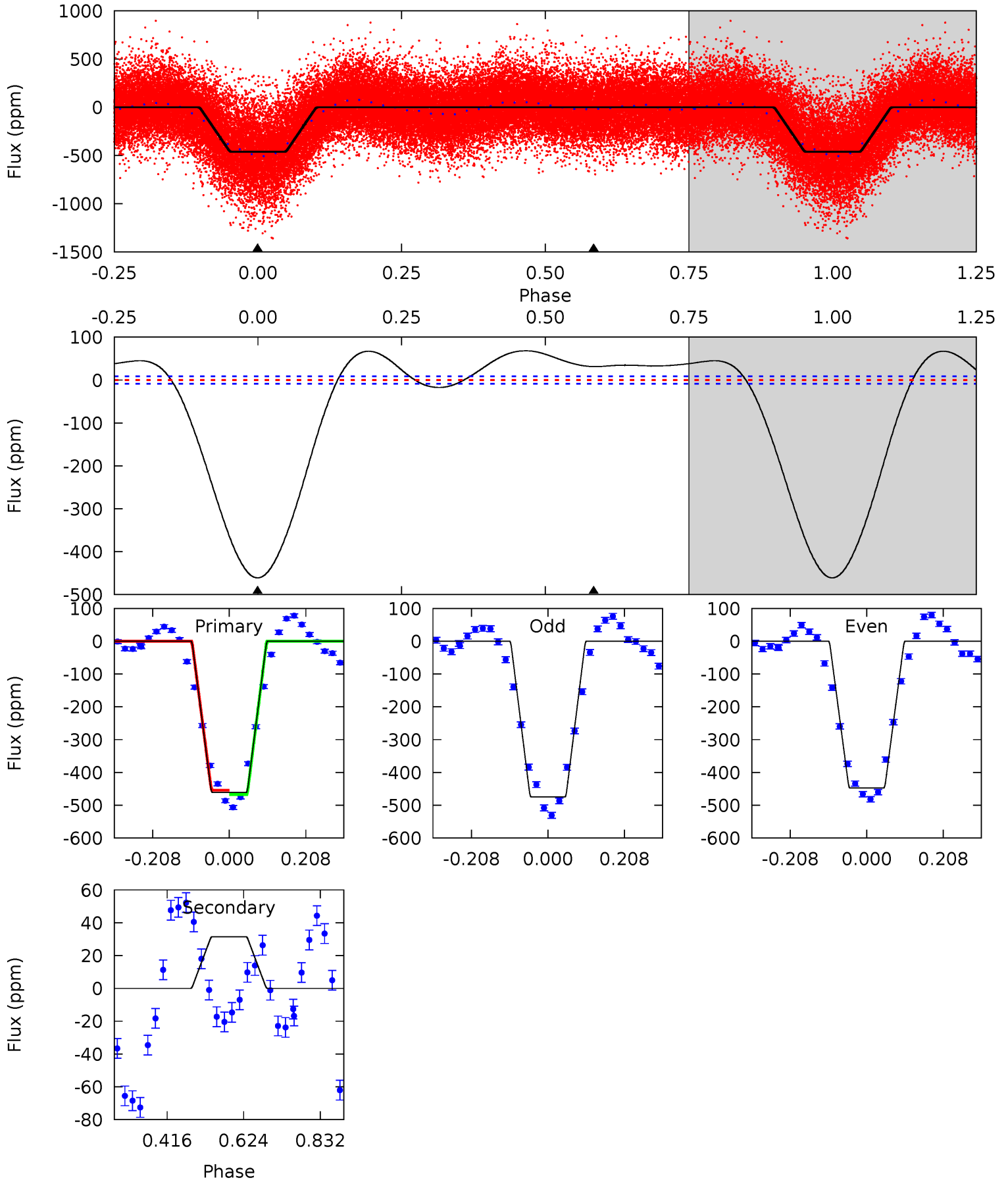
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.3	6.12	0	0	4.45	1.36	8.95	21.3	21.3	6.12	6.12	3.20	1.43	0.56	3.91



Alt Model-Shift Uniqueness Test

010931512-01, P = 3.780603 Days, E = 128.577474 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
234.3	-16.0	0	0	4.41	1.26	12.6	234.3	234.3	-16.0	-16.0	6.93	1.02	0.13	3.43



Stellar Parameters For KIC 010931512

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6509^{+146}_{-194}	$4.418^{+0.052}_{-0.208}$	$-0.300^{+0.250}_{-0.300}$	$1.081^{+0.333}_{-0.111}$	$1.115^{+0.146}_{-0.146}$	$1.245^{+0.333}_{-0.627}$
	+2%/-3%	+1%/-5%	+83%/-100%	+31%/-10%	+13%/-13%	+27%/-50%
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 010931512-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-16 ± 3	$0.72^{+0.29}_{-0.29}$	1921^{+139}_{-90}	5400^{+1561}_{-701}	40^{+67}_{-20}
Alt.	31 ± 2	$2.69^{+0.48}_{-0.36}$	1913^{+132}_{-83}	-3736^{+134}_{-137}	$-5.762^{+1.547}_{-1.806}$

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 $A_{\text{obs}} \gg 1.0$

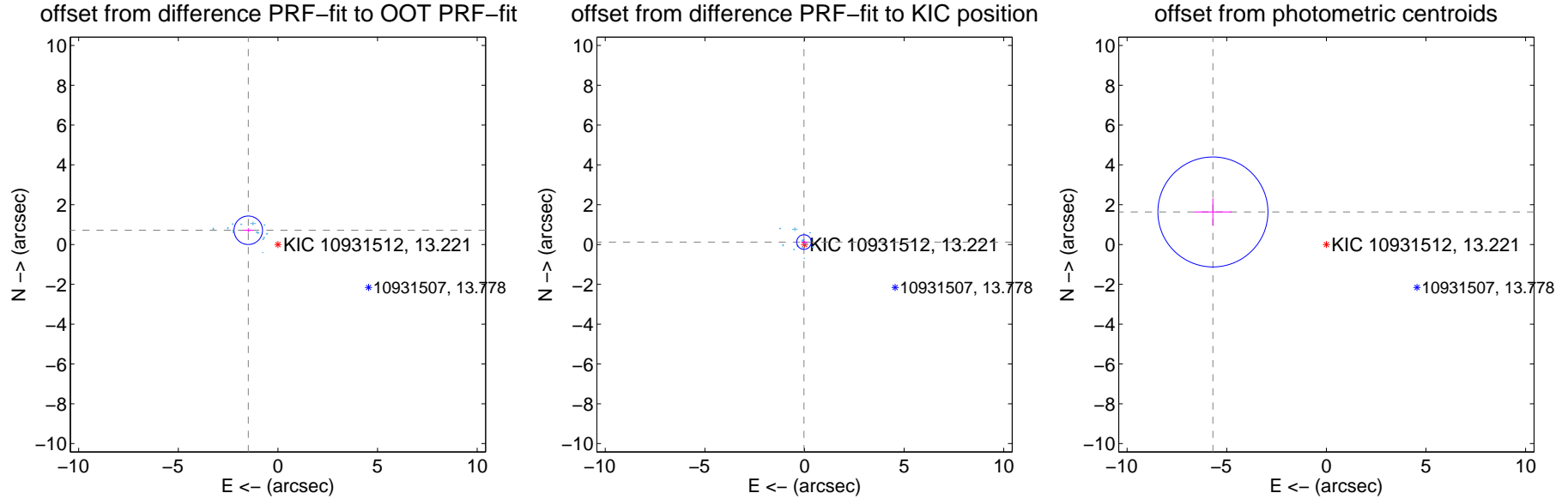
DV Centroid Data

Supplemental centroid analysis for 010931512-01. Kepler magnitude: 13.22. Transit SNR 6.38

There are 14 quarters with good PRF difference image offsets

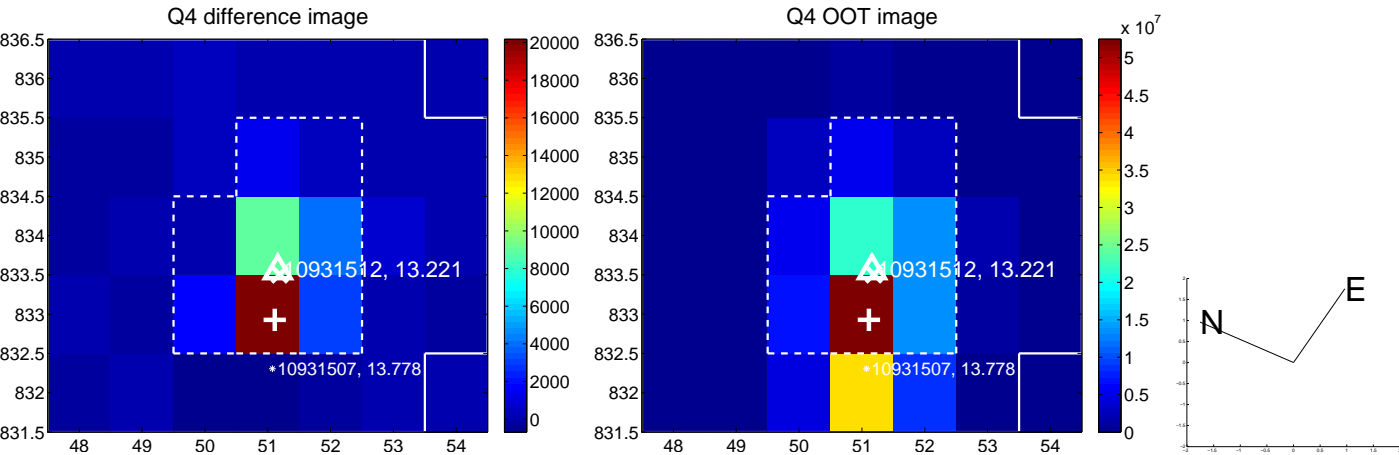
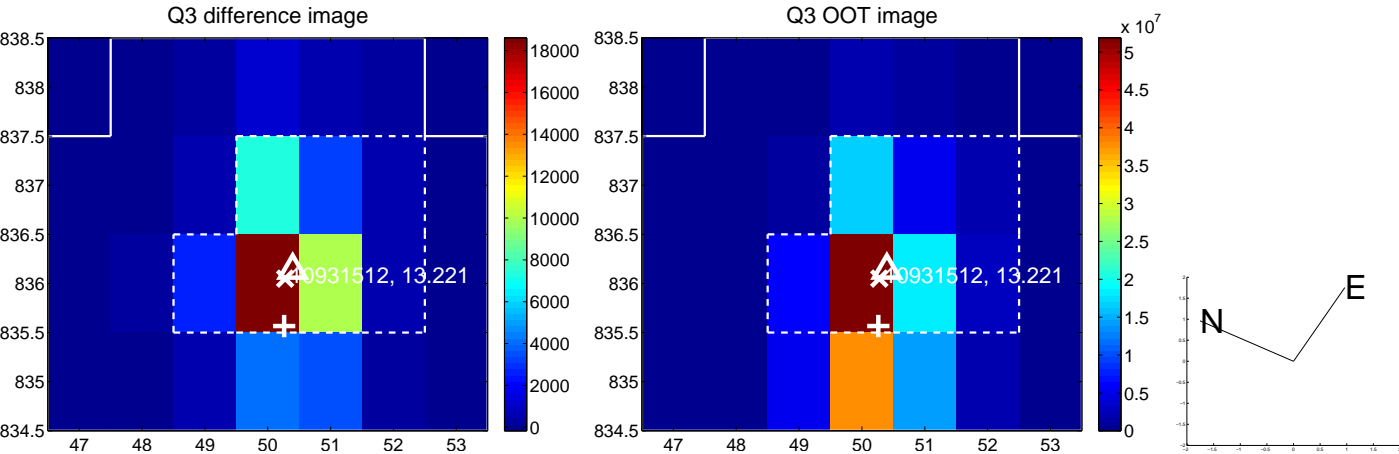
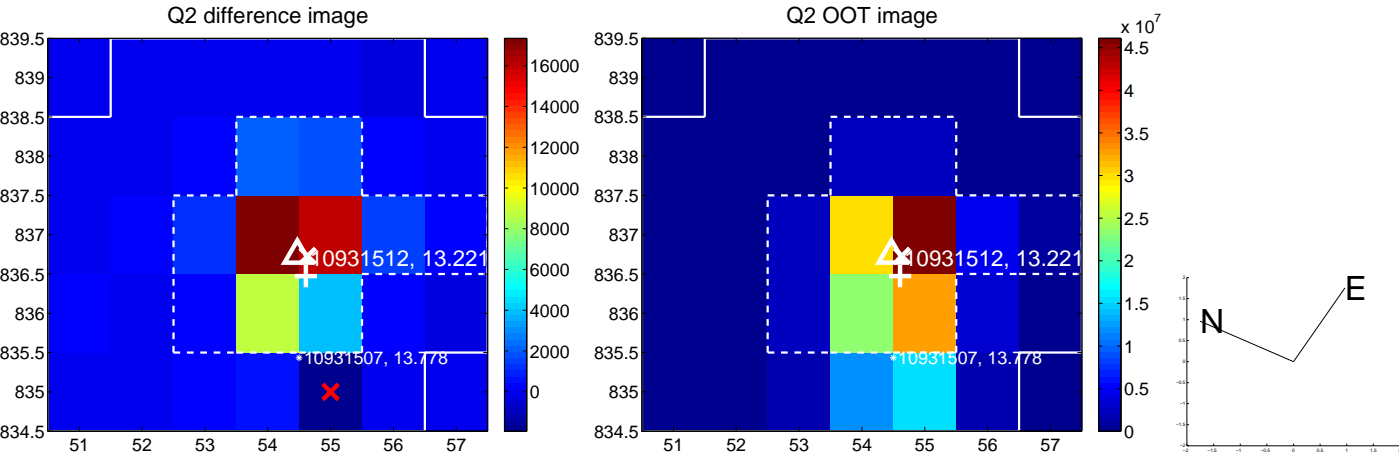
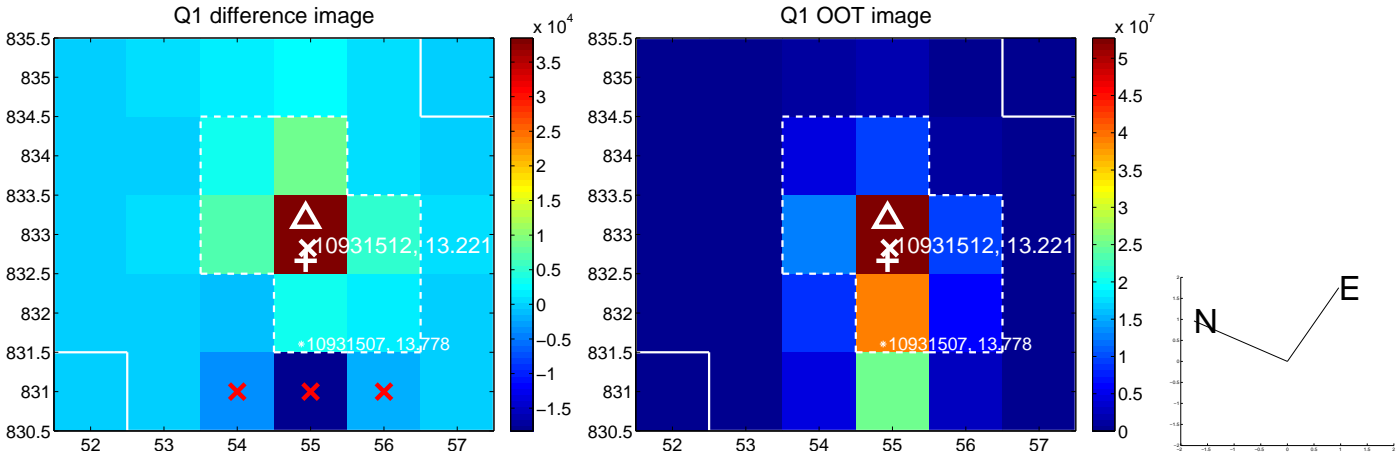
The direct PRF centroid is offset from the target star catalog position by about 0.82 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.652 ± 0.238	6.93	1.489 ± 0.260	0.716 ± 0.107
PRF-fit source offset from KIC position	0.125 ± 0.122	1.03	0.025 ± 0.143	0.123 ± 0.117
photometric centroid source offset	5.92 ± 0.92	6.43	5.69 ± 0.94	1.63 ± 0.69

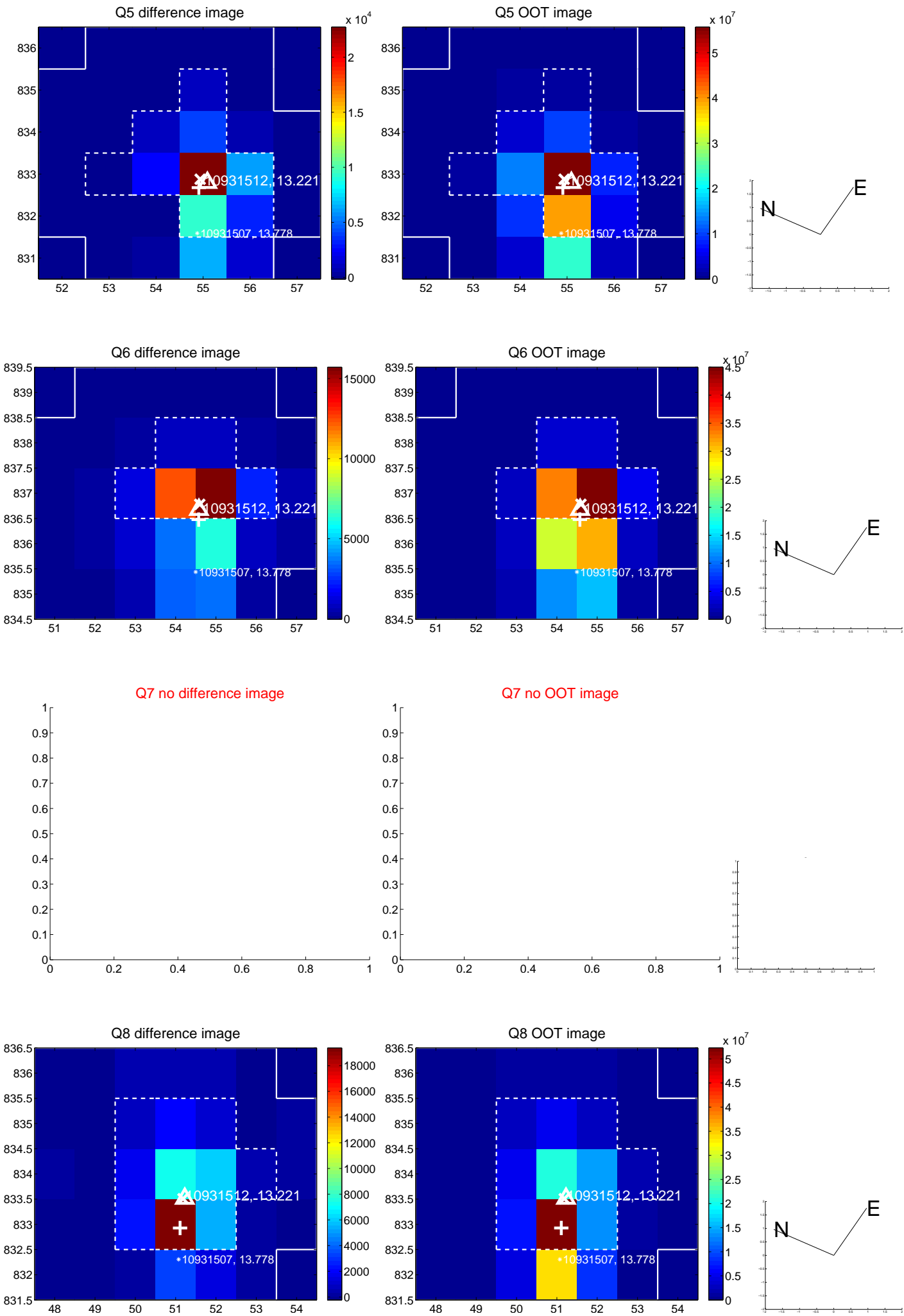


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

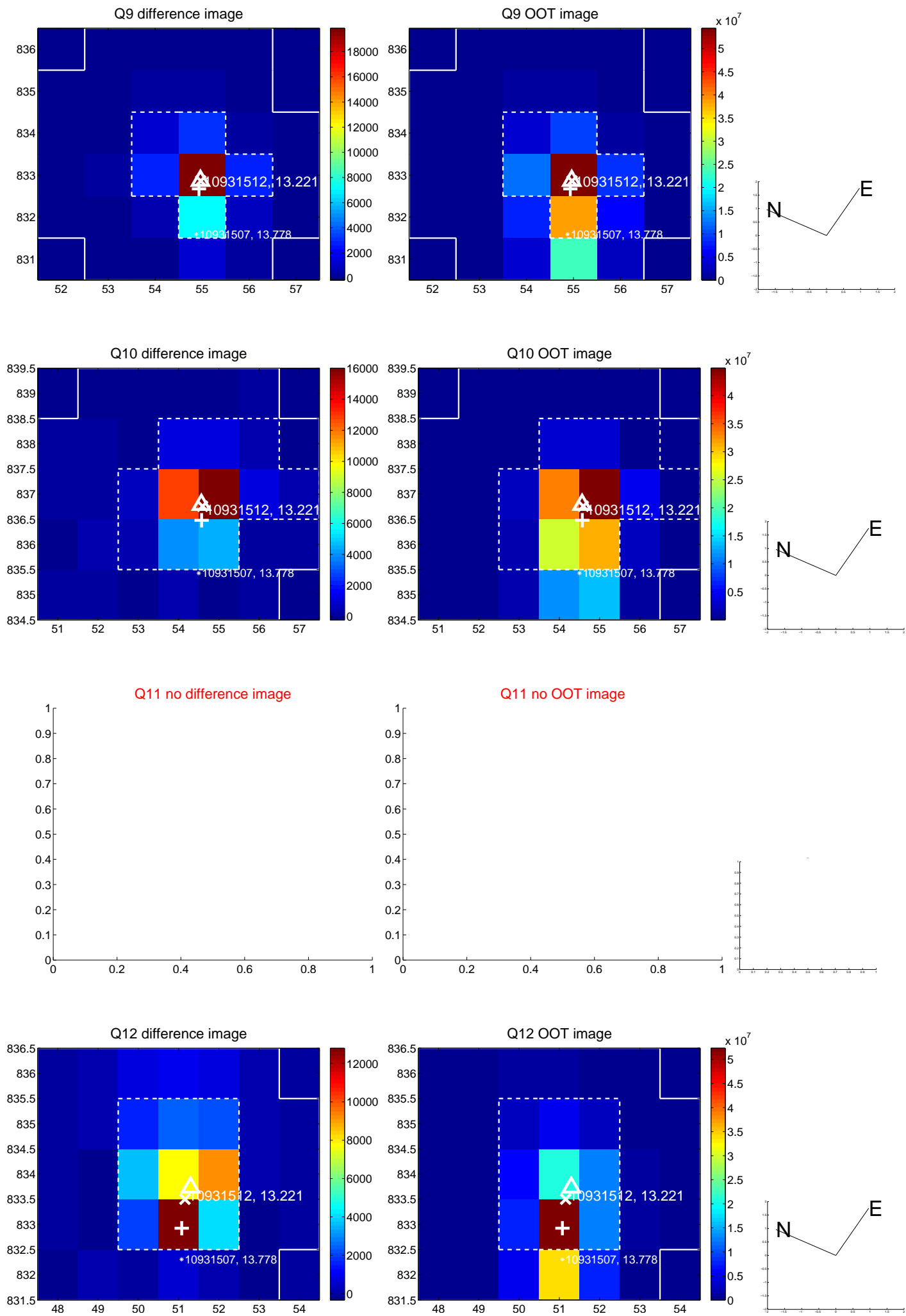
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



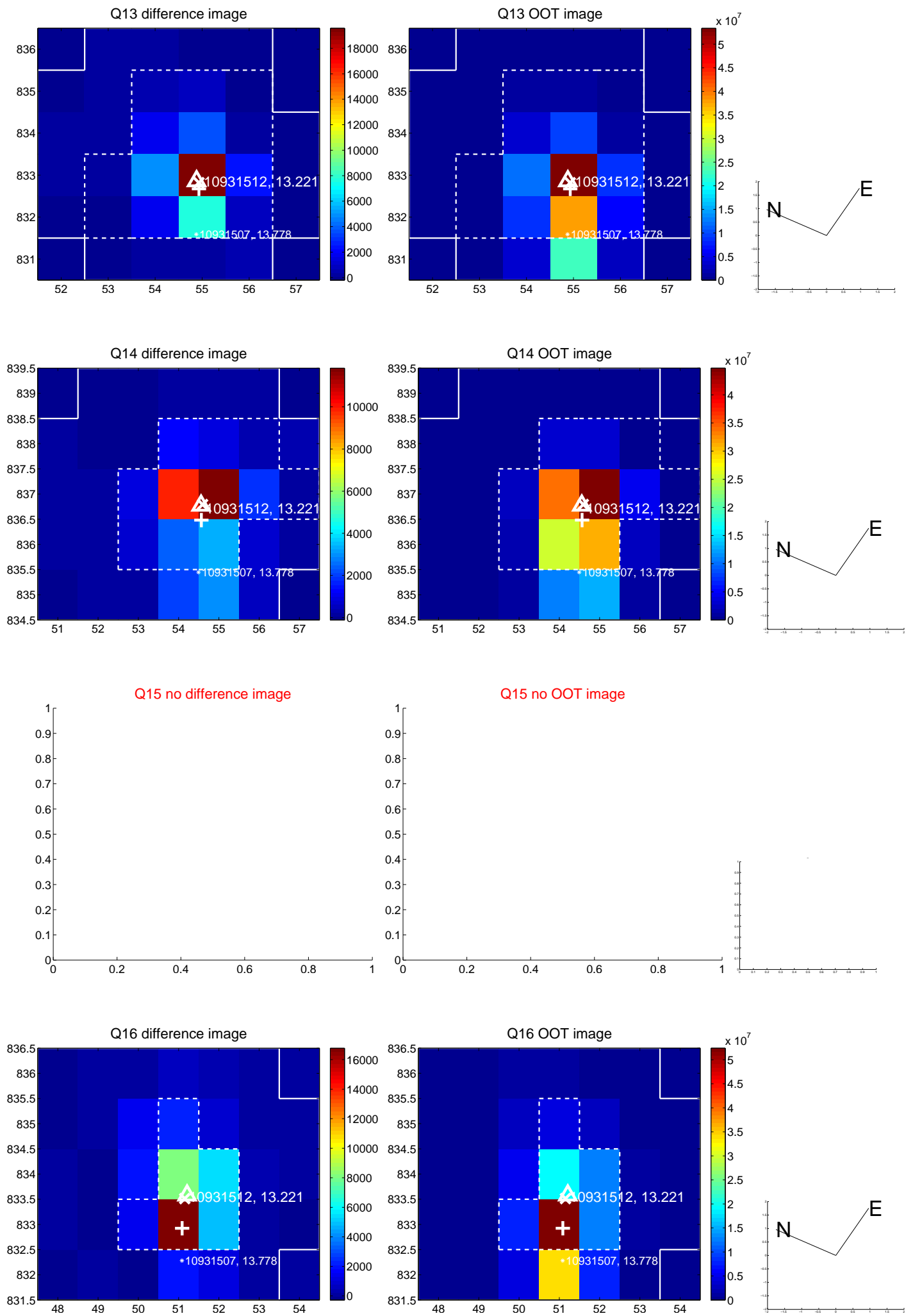
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



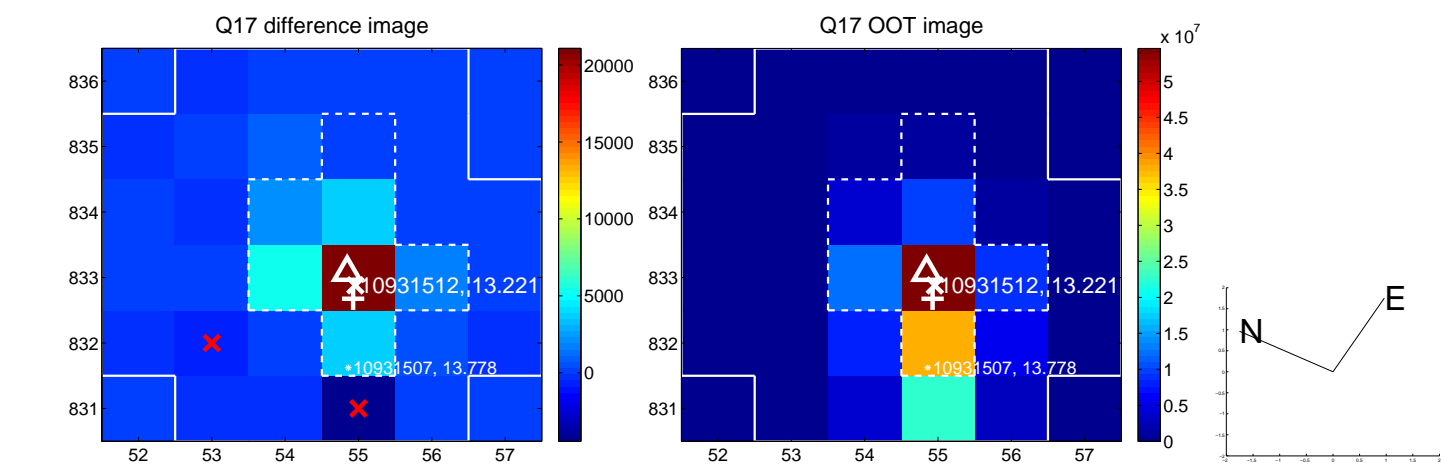
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



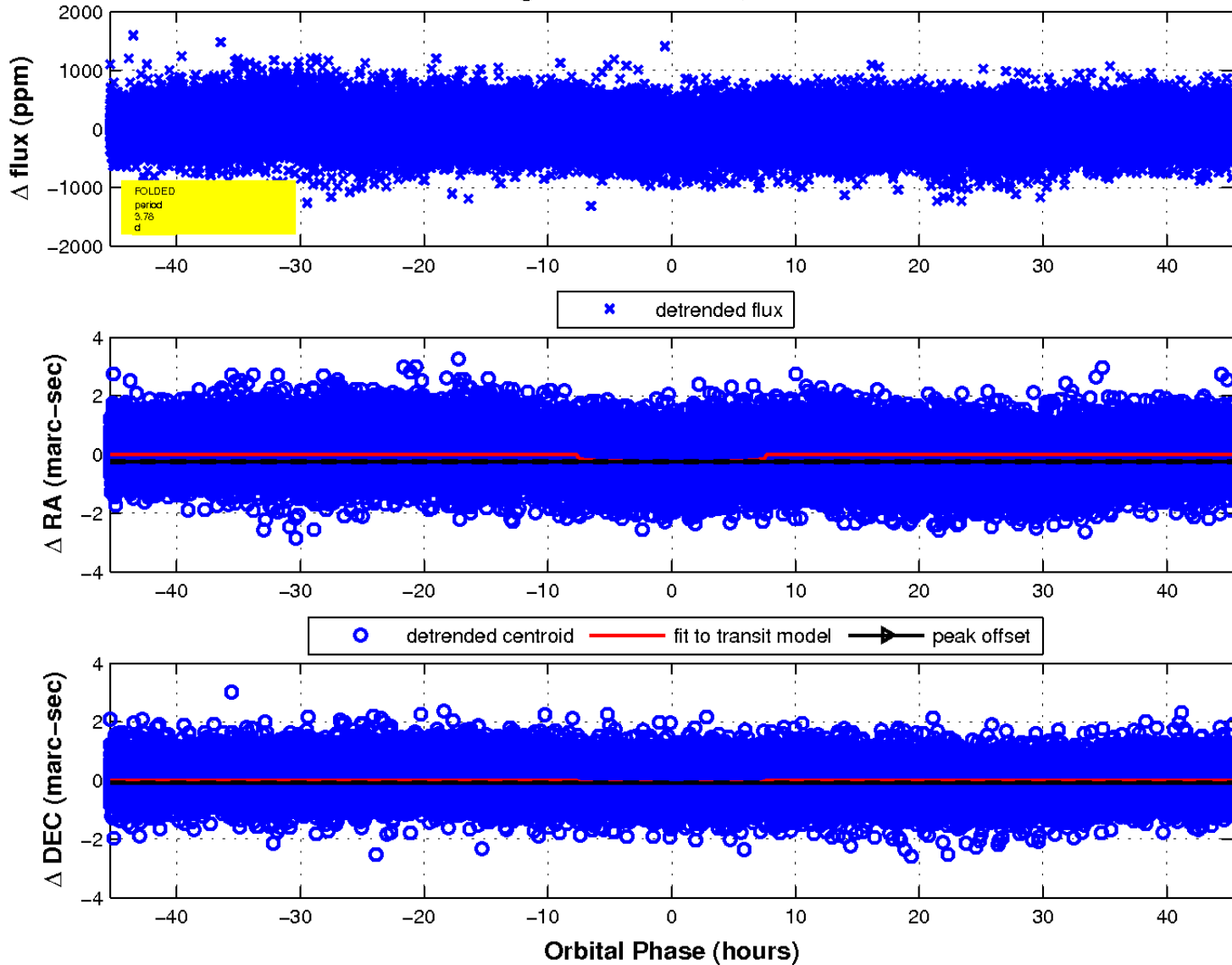
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

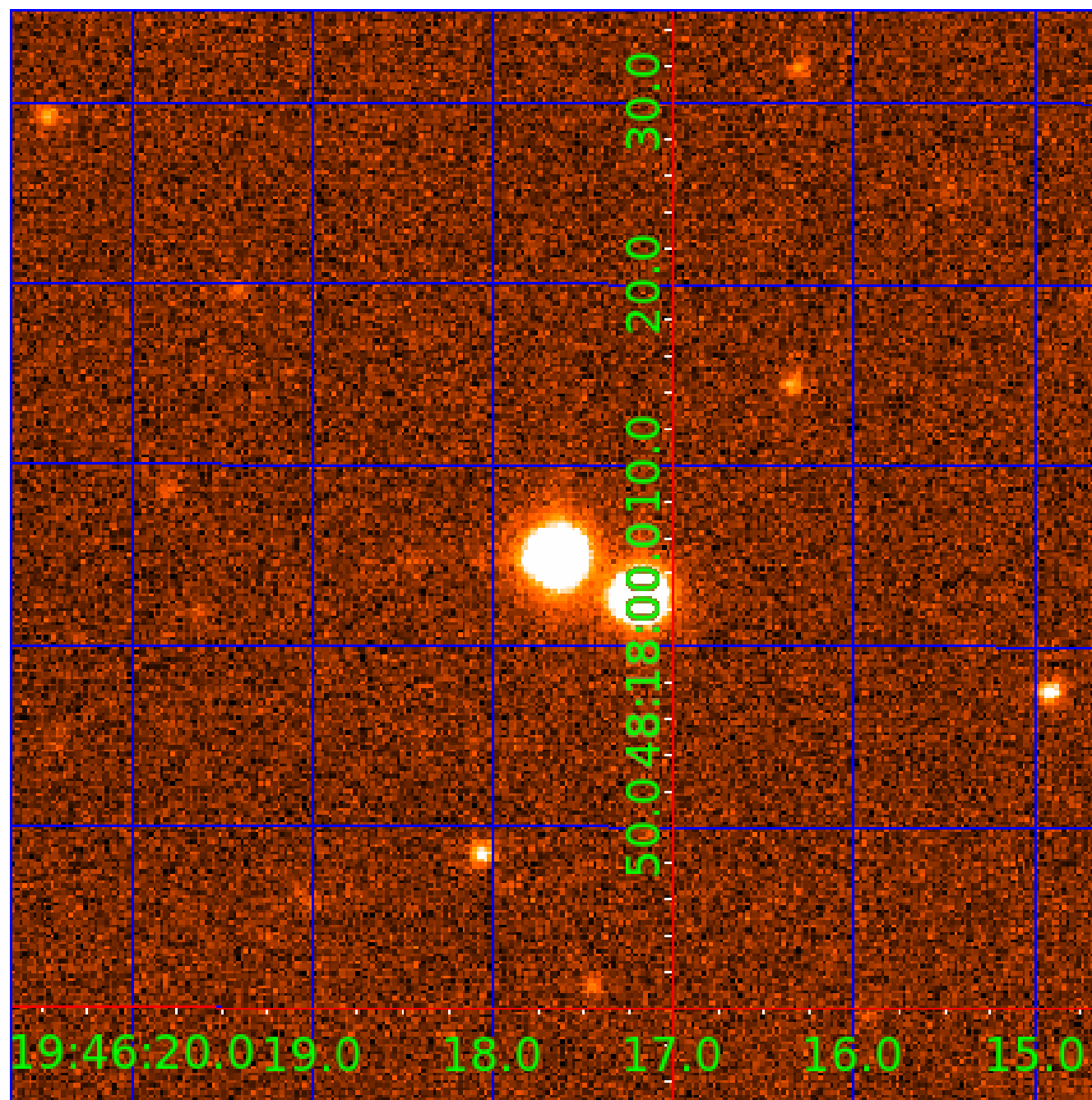


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010931512

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})
010931512-01	OBS	No	3.780743	132.397897	35.7	15.357	8.0	6.4	1.08	6509	0.67	773.99
010931512-02	OBS	No	3.780370	134.463524	76.9	12.647	11.0	12.9	1.08	6509	1.29	774.09

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010931512-01	OBS	FP	0.00	1	0	0	1	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS—EPHEM_MATCH
010931512-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

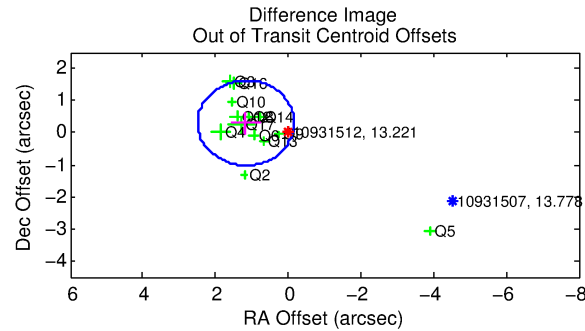
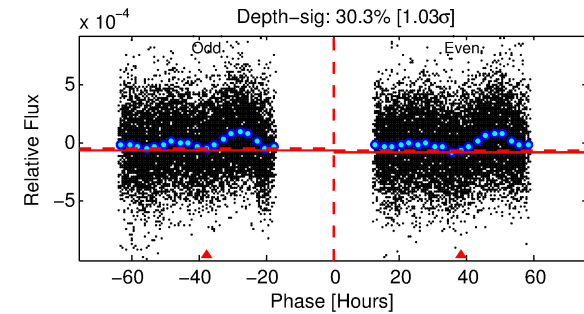
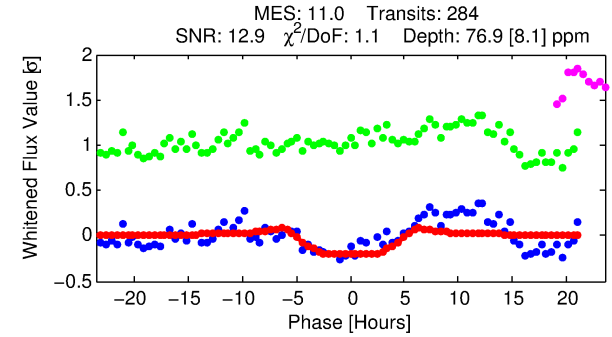
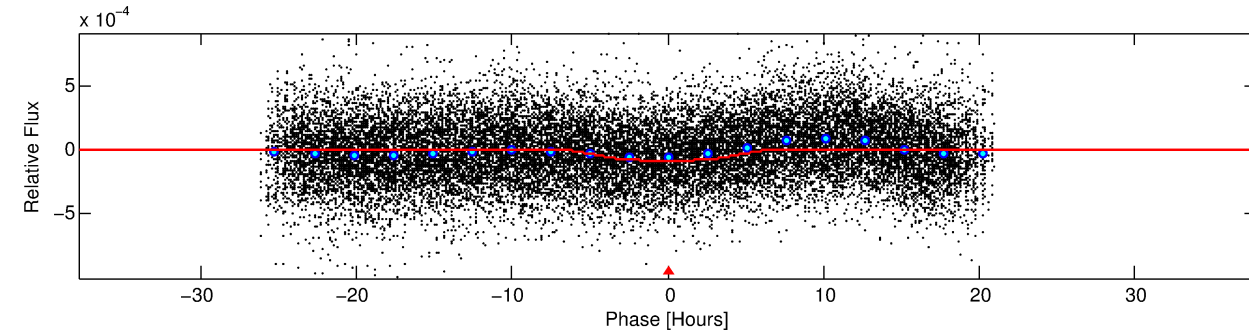
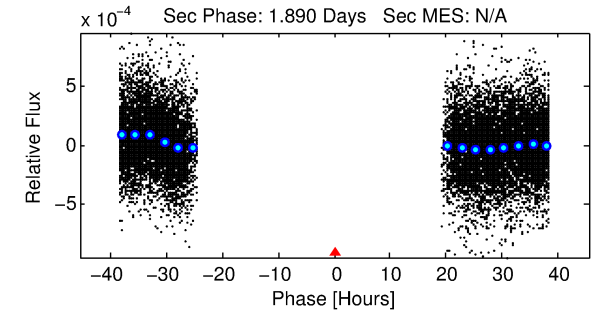
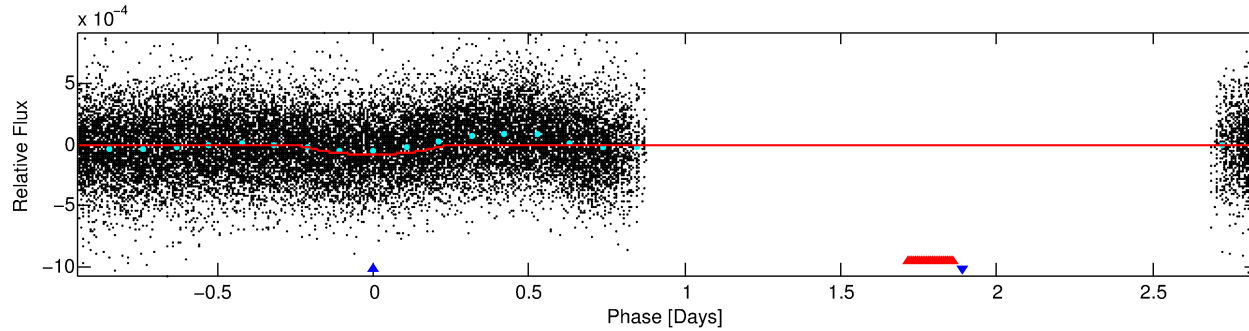
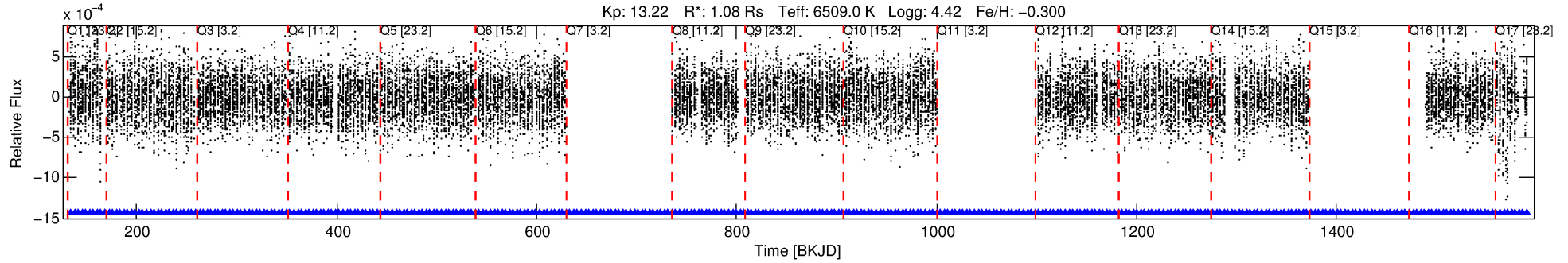
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010931512-02

No Significant Match Found

DV One-Page Summary

KIC: 10931512 Candidate: 2 of 2 Period: 3.780 d



DV Fit Results:

Period = 3.78037 [0.00009] d
Epoch = 134.4635 [0.0176] BKJD
Rp/R* = 0.0109 [0.0007]
a/R* = 1.11 [0.02]
b = 0.99 [0.00]
Seff = 774.09 [308.02]
Teq = 1345 [134] K
Rp = 1.29 [0.41] R_e
a = 0.0493 [0.0128] AU

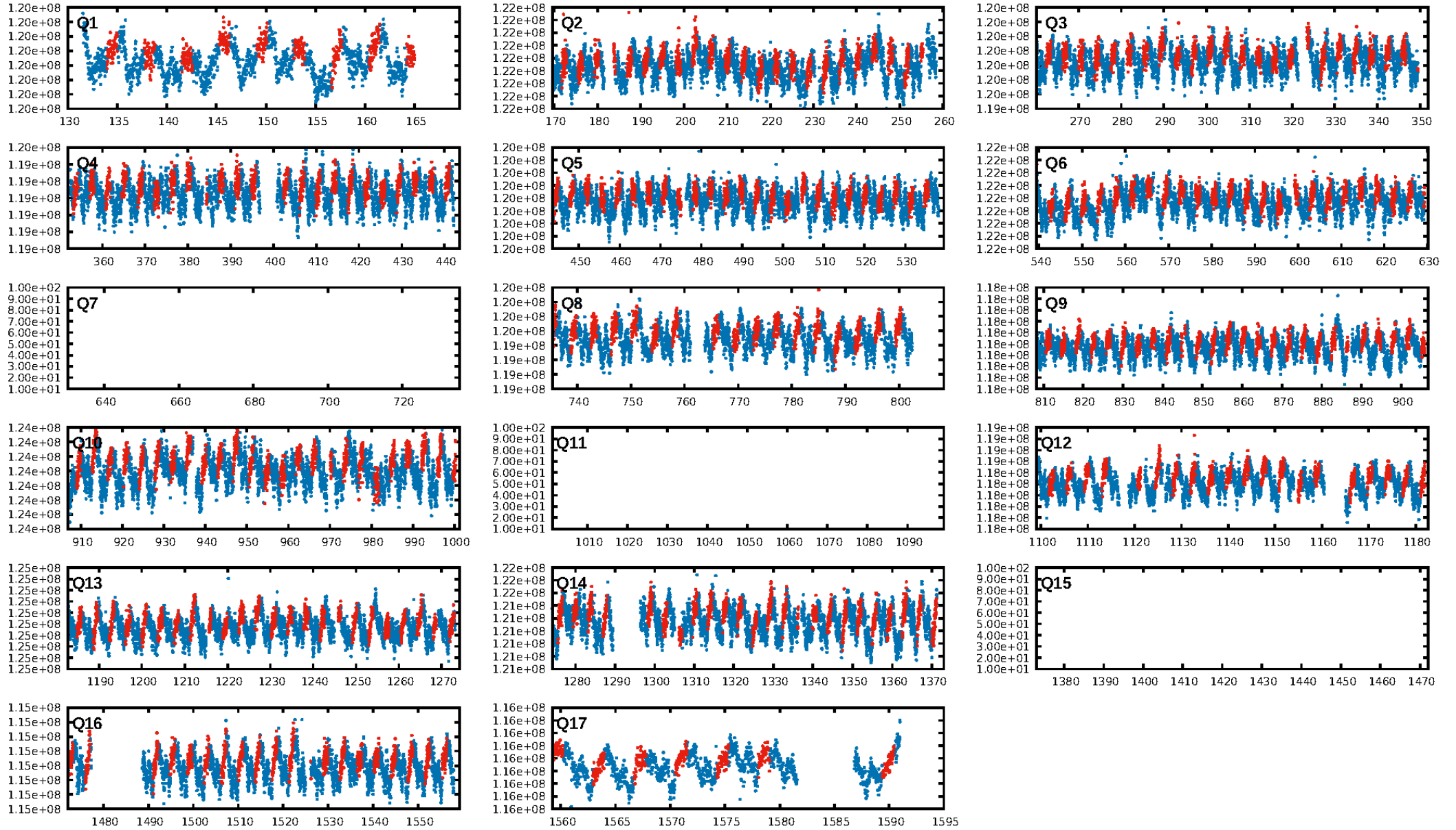
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.35e-15
RollingBand-fgt: 1.00 [268/268]
GhostDiagnostic-chr: 2.213
Centroid-sig: 41.1%
Centroid-so: 1.106 arcsec [2.09σ]
OotOffset-rm: 1.207 arcsec [2.74σ]
KicOffset-rm: 0.160 arcsec [0.37σ]
OotOffset-st: 4/1/4/4 [13]
KicOffset-st: 4/1/4/4 [13]
DiffImageQuality-fgm: 0.00 [0/13]
DiffImageOverlap-fno: 1.00 [14/14]

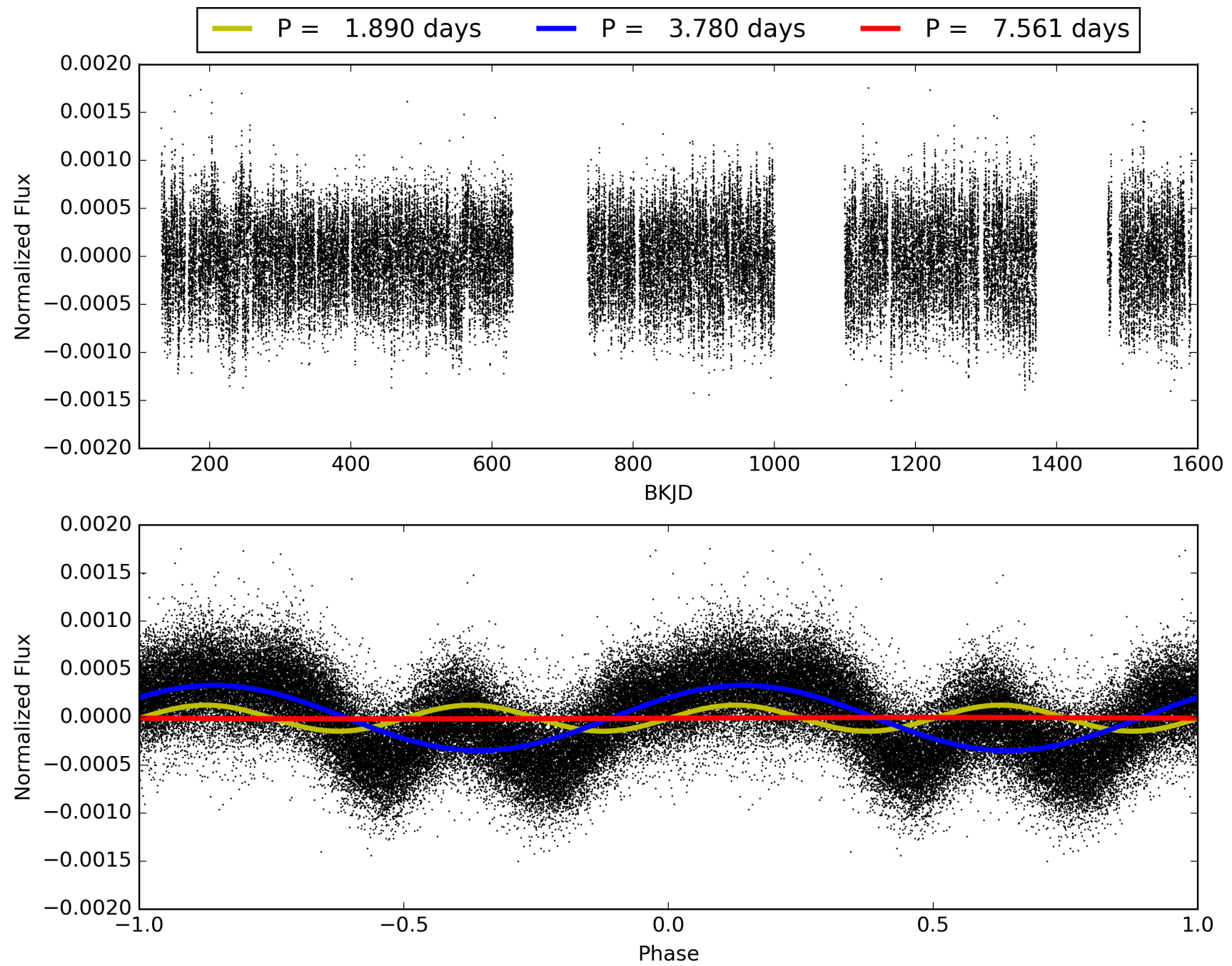
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 05:53:24 Z

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

TCE 010931512-02, PDC Light Curves

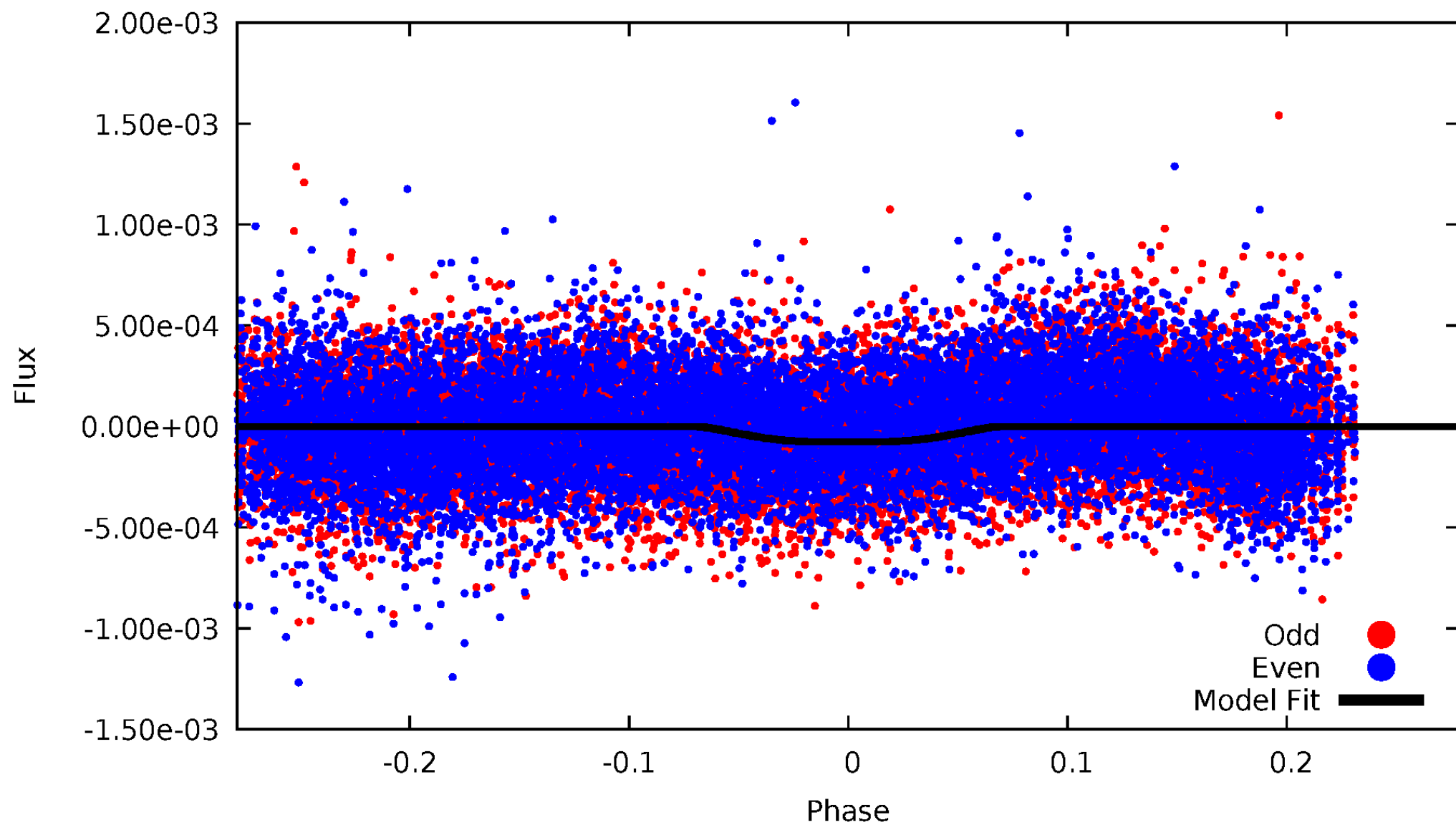


TCE 010931512-02



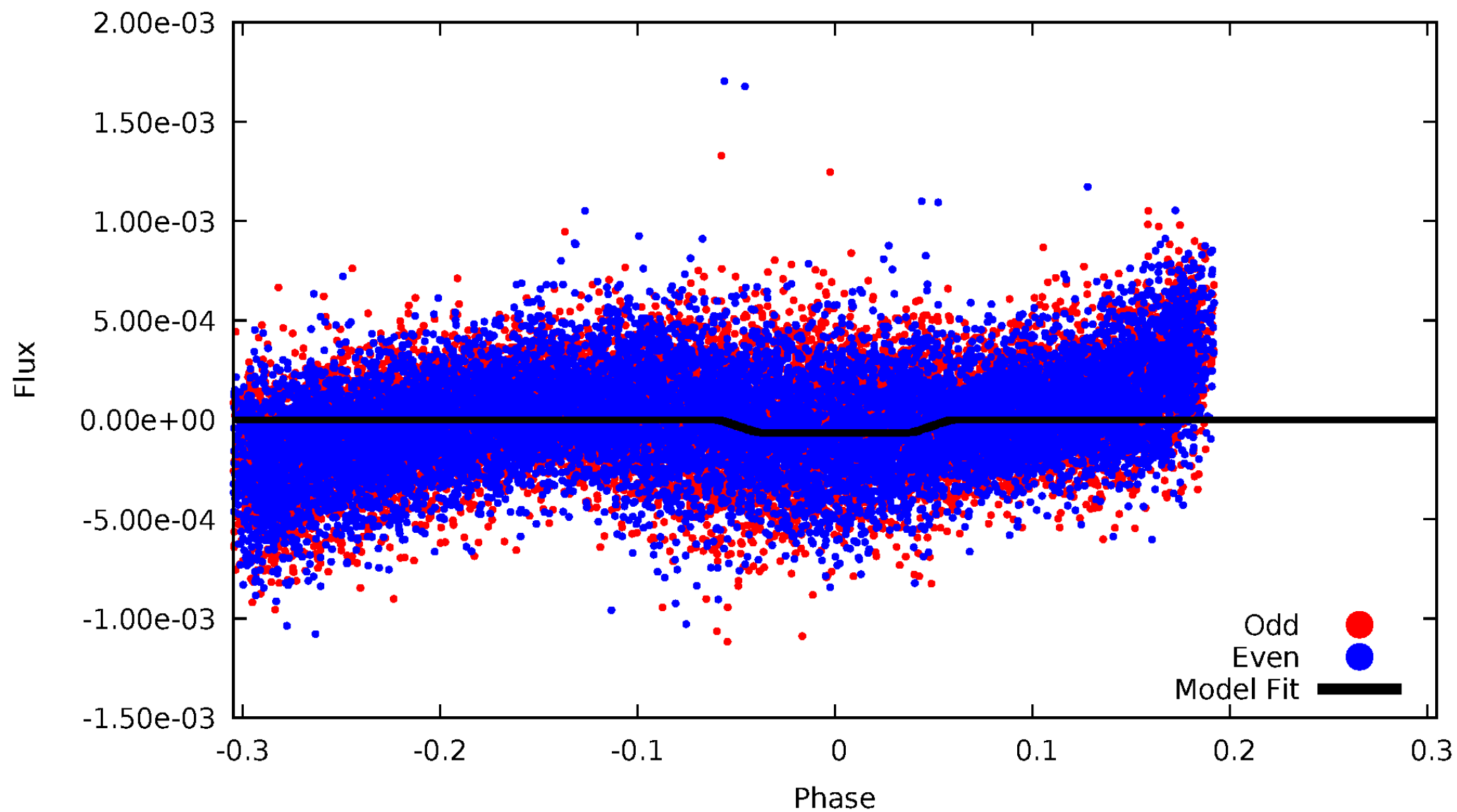
DV Odd/Even

TCE 010931512-02



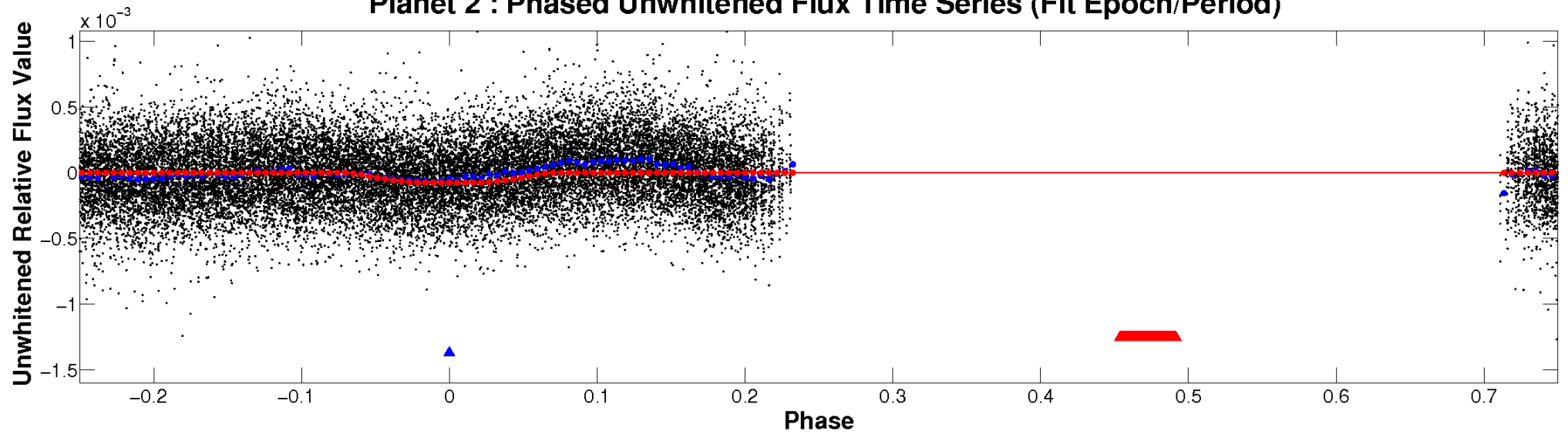
ALT Odd/Even

TCE 010931512-02

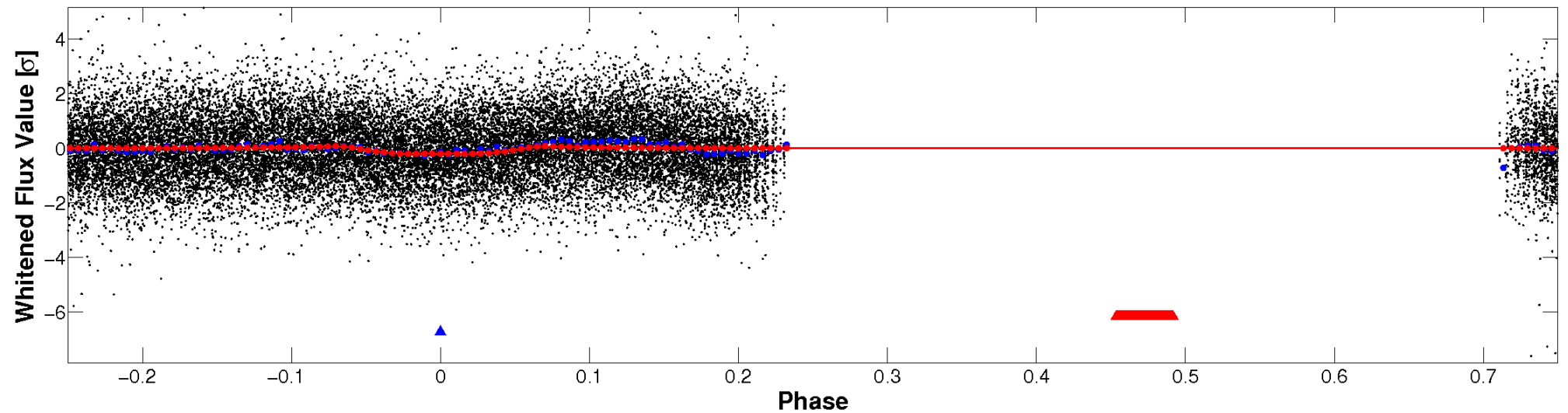


Non-Whitened Vs. Whitened Light Curve

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

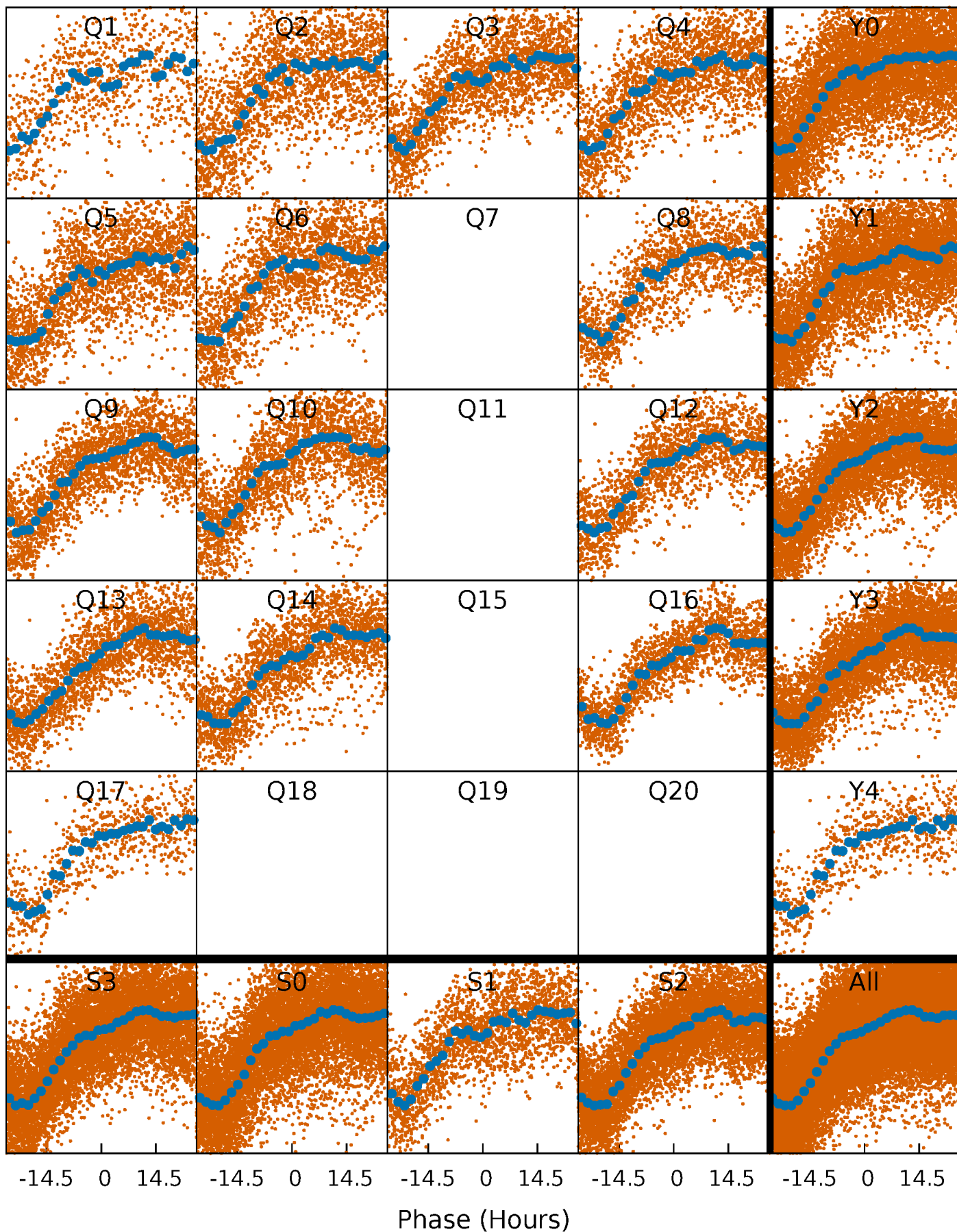


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



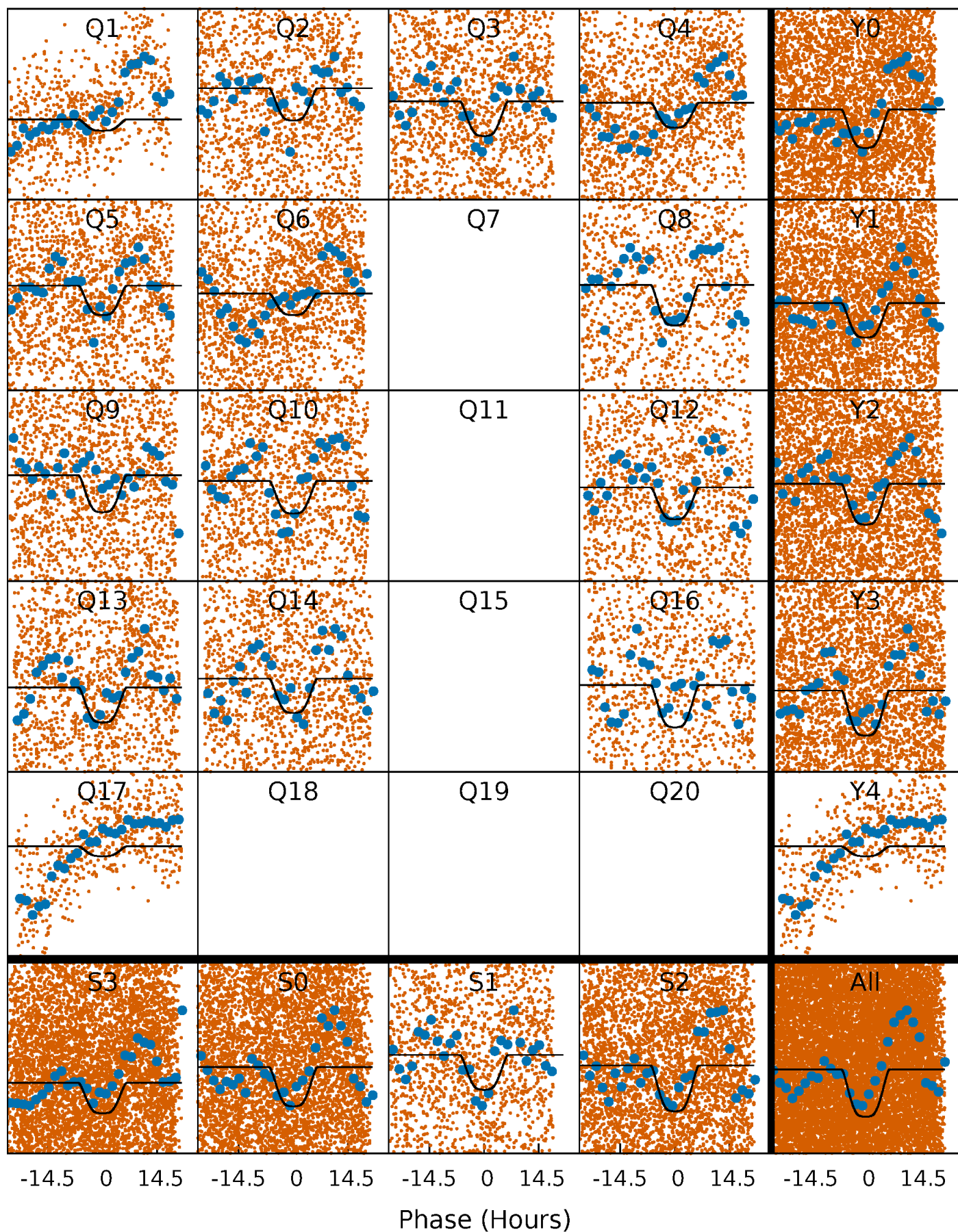
PDC Quarter-Phased Transit Curves

TCE 010931512-02 P= 3.780370 Days $T_0=134.463524$ (BKJD)



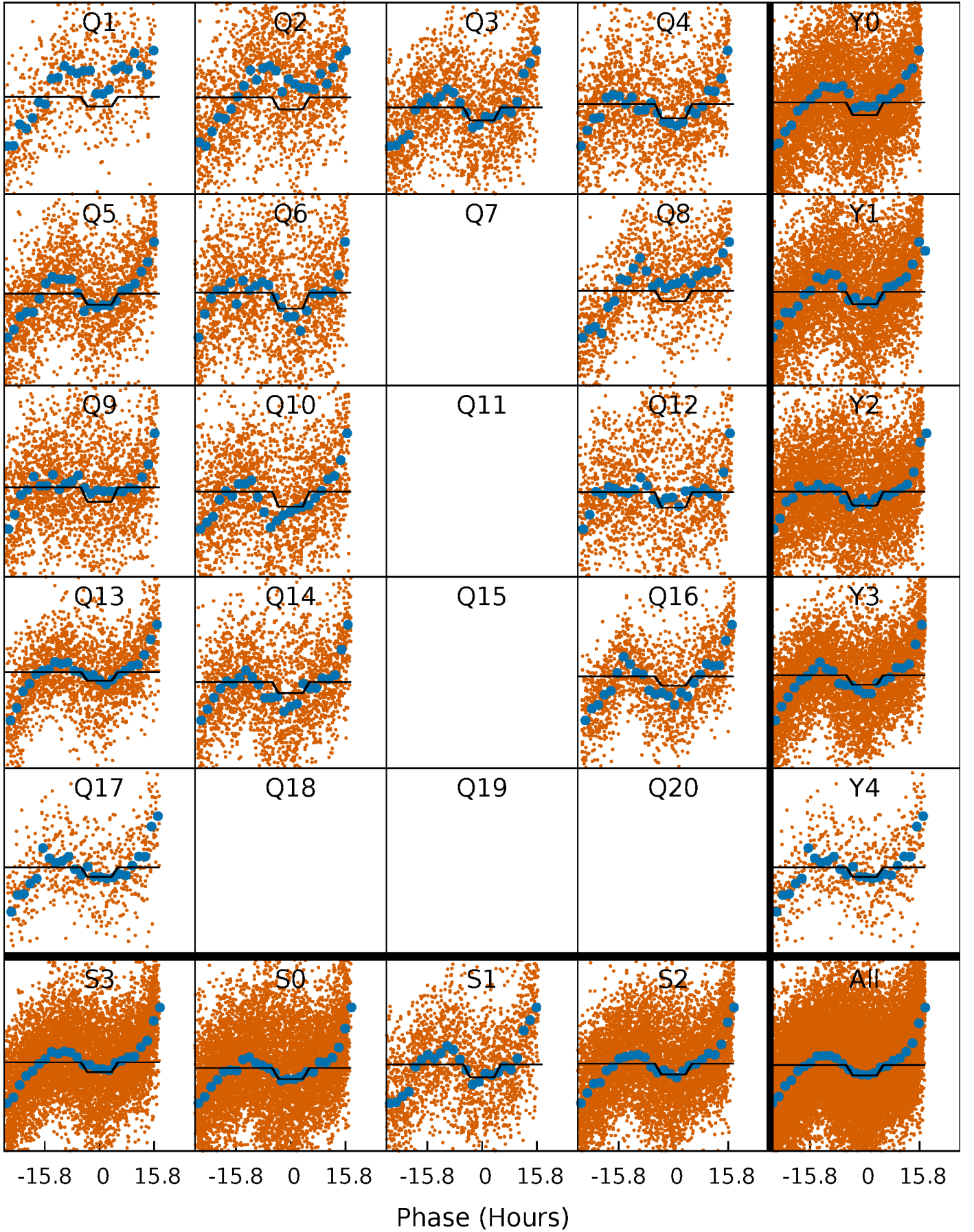
DV Quarter-Phased Transit Curves

TCE 010931512-02 P= 3.780370 Days $T_0=134.463524$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

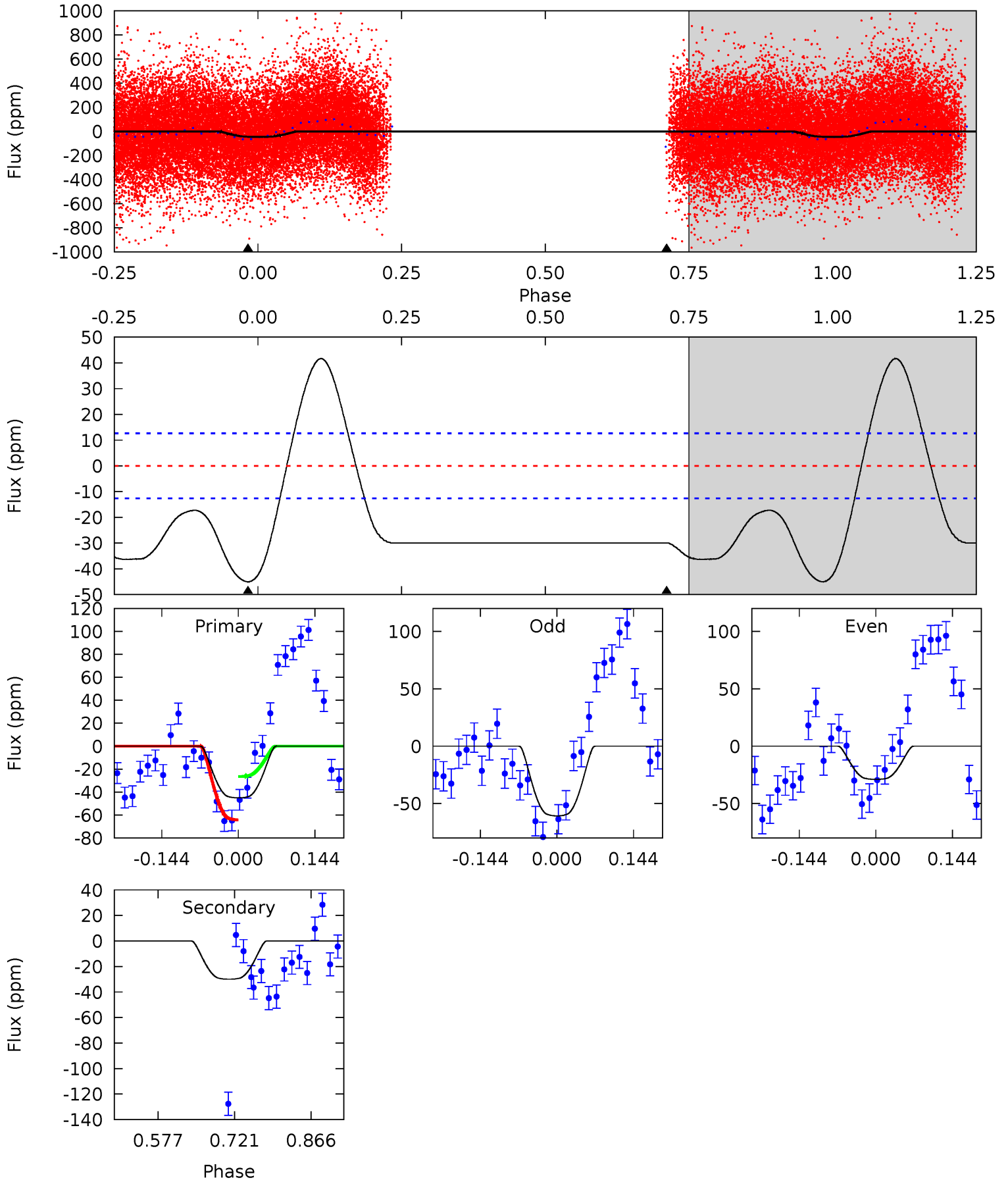
TCE 010931512-02 P= 3.780564 Days $T_0=134.541662$ (BKJD)



DV Model-Shift Uniqueness Test

010931512-02, P = 3.780370 Days, E = 130.683154 Days

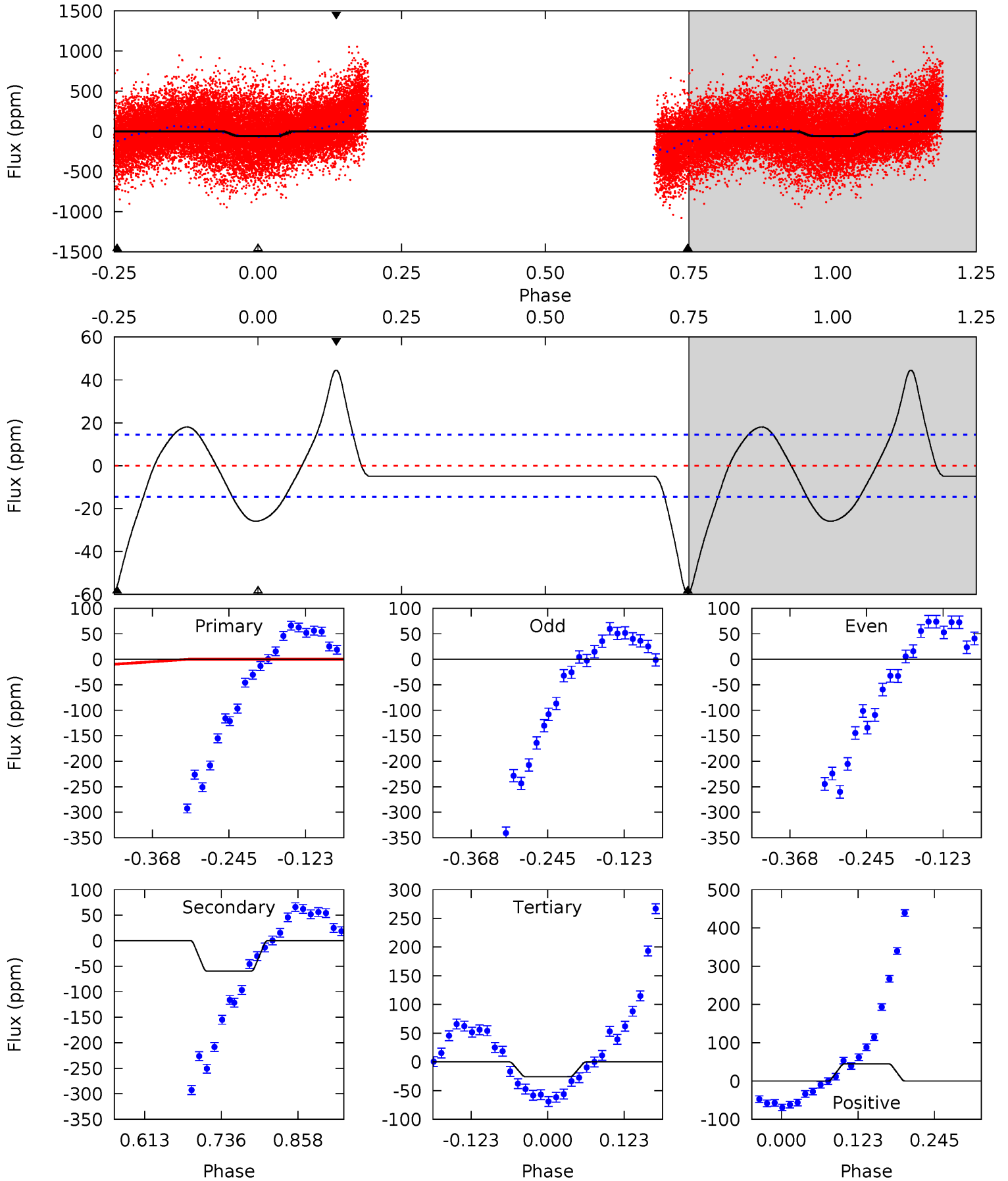
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.0	10.7	0	0	4.49	1.46	7.32	16.0	16.0	10.7	10.7	5.69	1.14	0.48	7.12



Alt Model-Shift Uniqueness Test

010931512-02, P = 3.780564 Days, E = 130.761098 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.5	18.5	8.06	13.9	4.52	1.54	6.35	9.49	3.63	10.5	4.62	1.68	0.82	0.43	0.16



Stellar Parameters For KIC 010931512

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6509^{+146}_{-194}	$4.418^{+0.052}_{-0.208}$	$-0.300^{+0.250}_{-0.300}$	$1.081^{+0.333}_{-0.111}$	$1.115^{+0.146}_{-0.146}$	$1.245^{+0.333}_{-0.627}$
	+2%/-3%	+1%/-5%	+83%/-100%	+31%/-10%	+13%/-13%	+27%/-50%
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 010931512-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-30 ± 3	$1.34^{+0.22}_{-0.14}$	1920^{+142}_{-90}	4716^{+187}_{-174}	22^{+5}_{-6}
Alt.	-59 ± 3	$1.00^{+0.17}_{-0.12}$	1919^{+130}_{-89}	6304^{+333}_{-300}	78^{+22}_{-19}

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 $A_{obs} \gg 1.0$

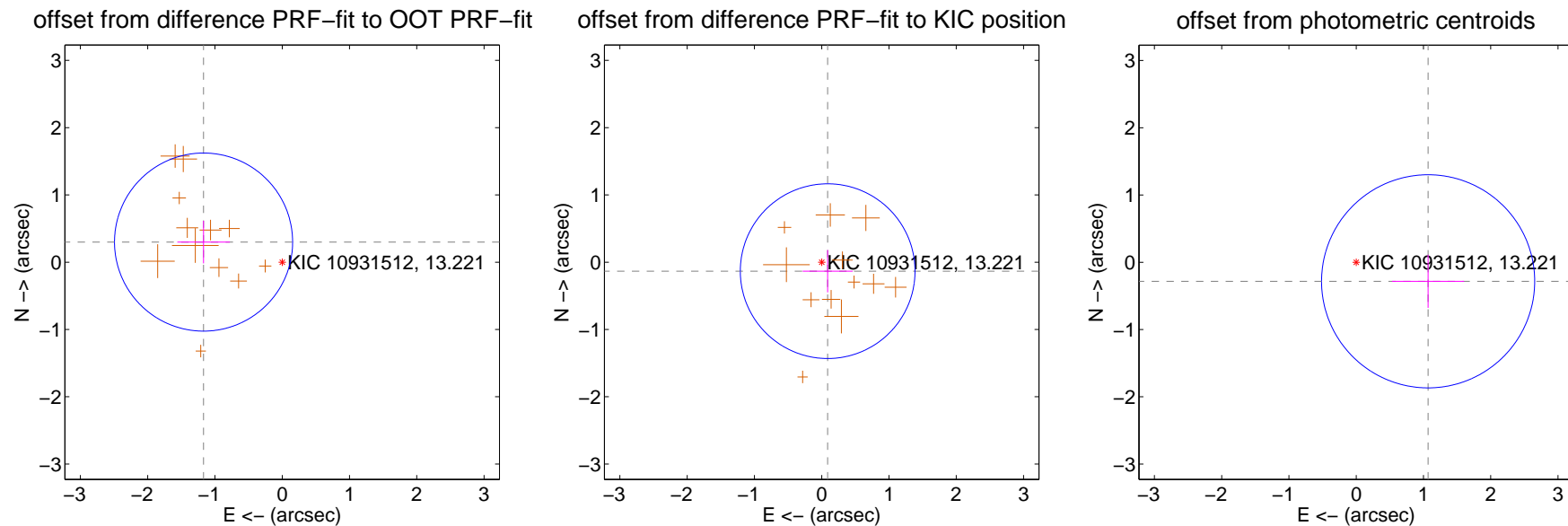
DV Centroid Data

Supplemental centroid analysis for 010931512-02. Kepler magnitude: 13.22. Transit SNR 12.89

There are 0 quarters with good PRF difference image offsets

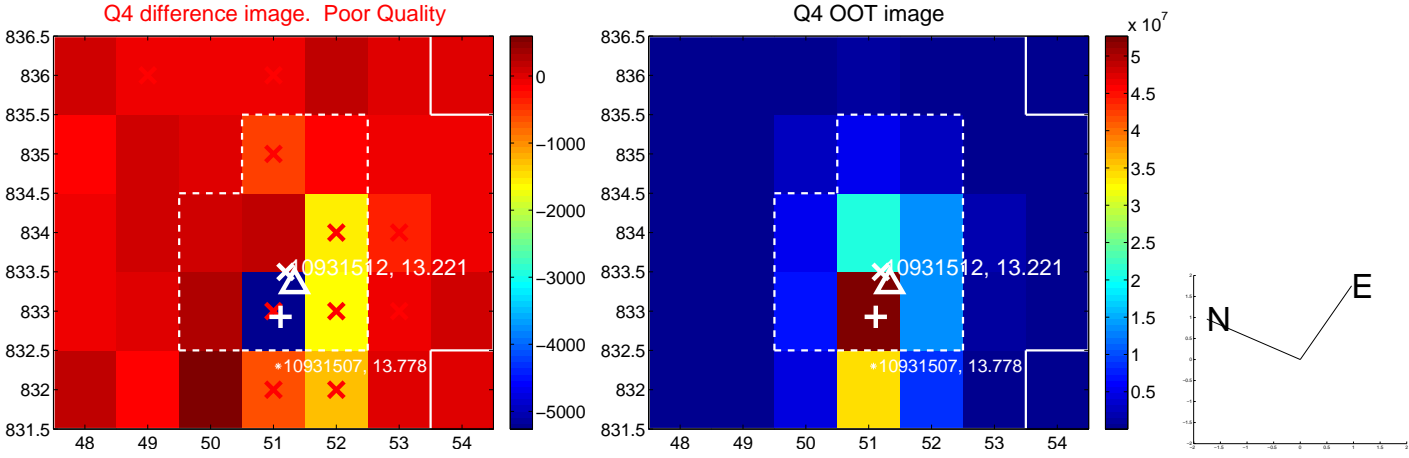
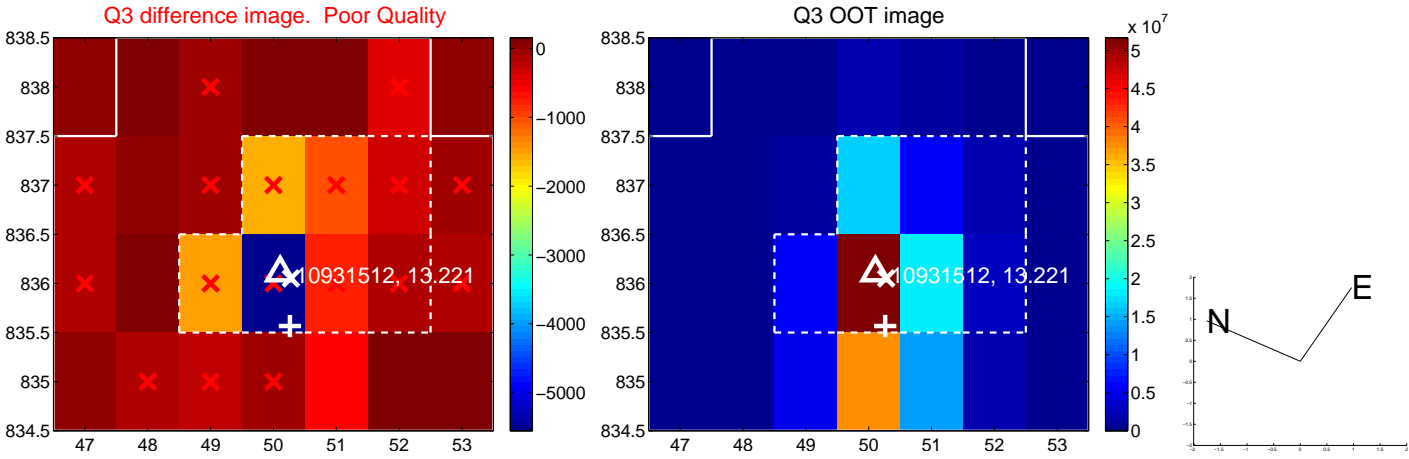
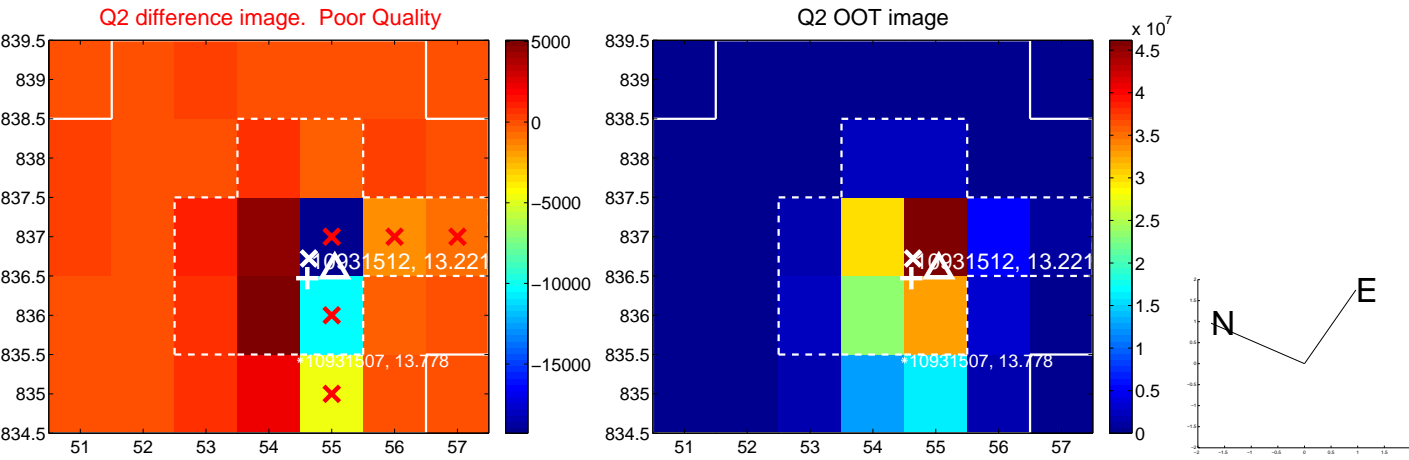
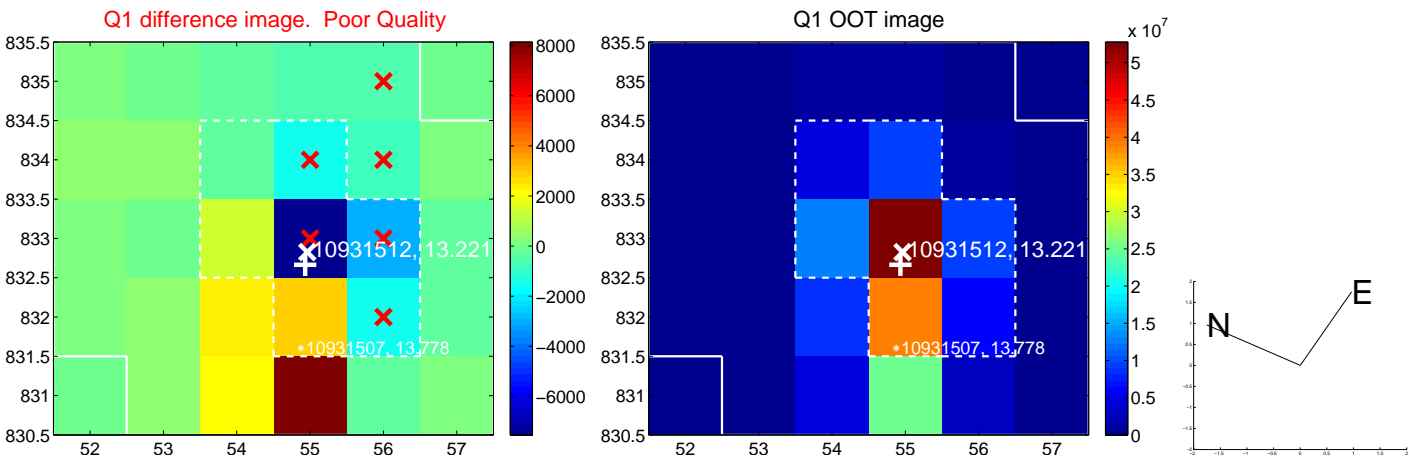
The direct PRF centroid is offset from the target star catalog position by about 0.82 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.207 ± 0.441	2.74	1.169 ± 0.391	0.299 ± 0.317
PRF-fit source offset from KIC position	0.160 ± 0.433	0.37	-0.088 ± 0.372	-0.133 ± 0.315
photometric centroid source offset	1.11 ± 0.53	2.09	-1.07 ± 0.54	-0.28 ± 0.39

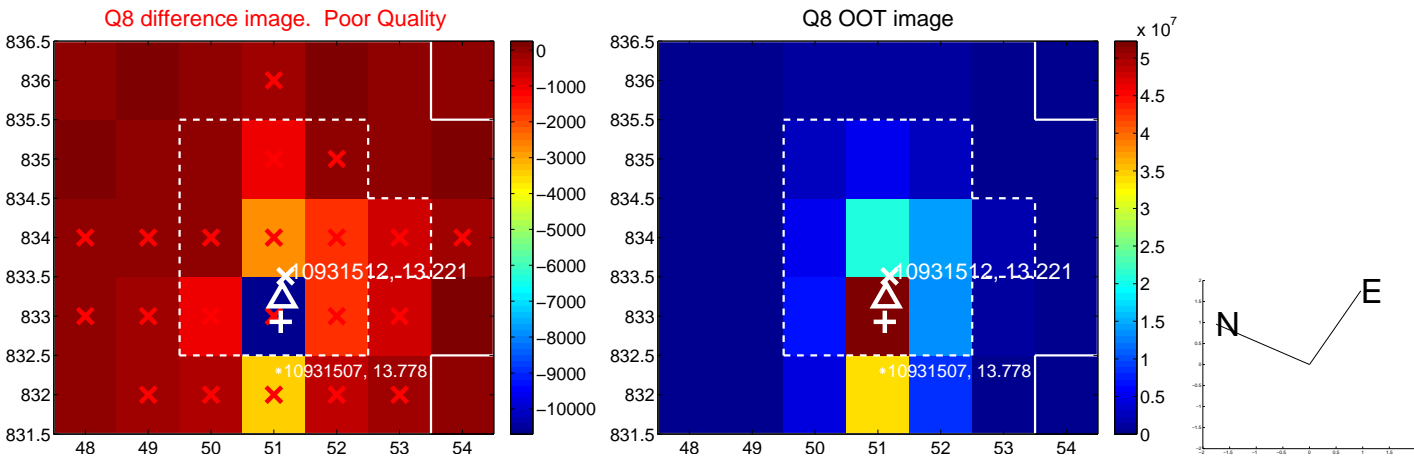
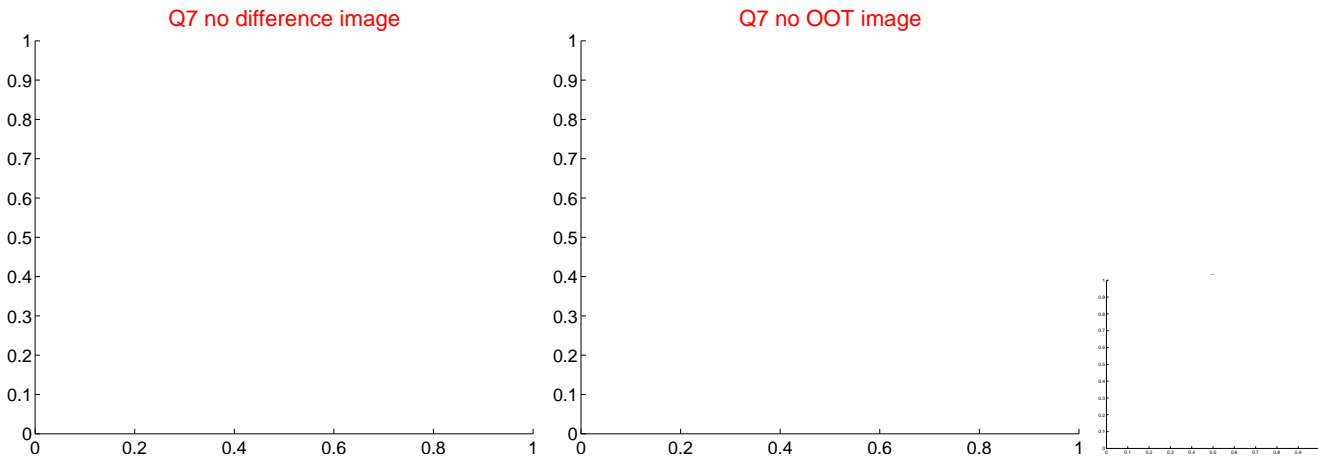
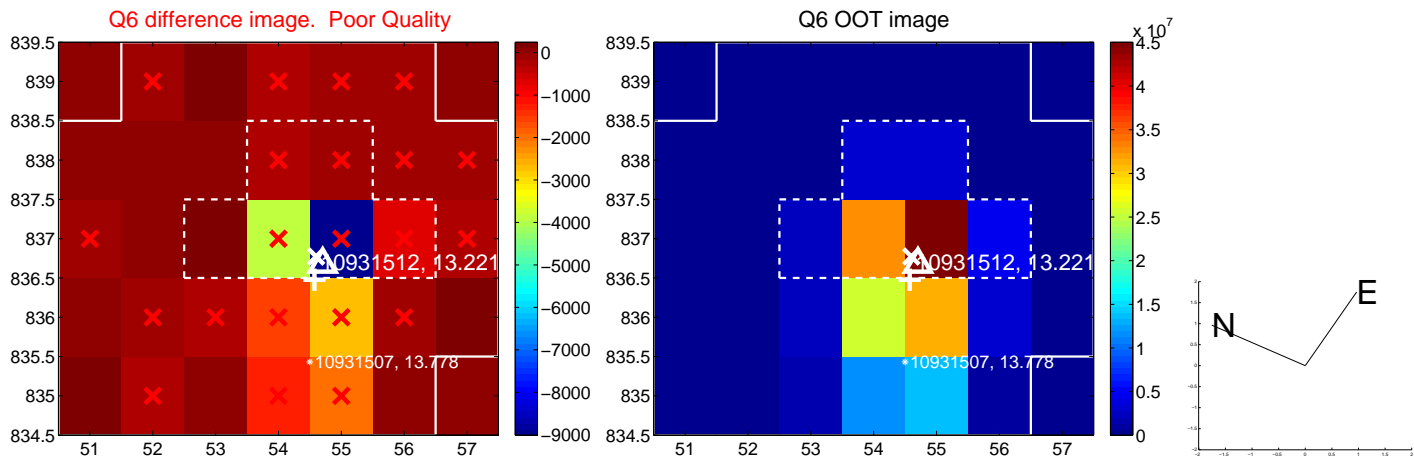
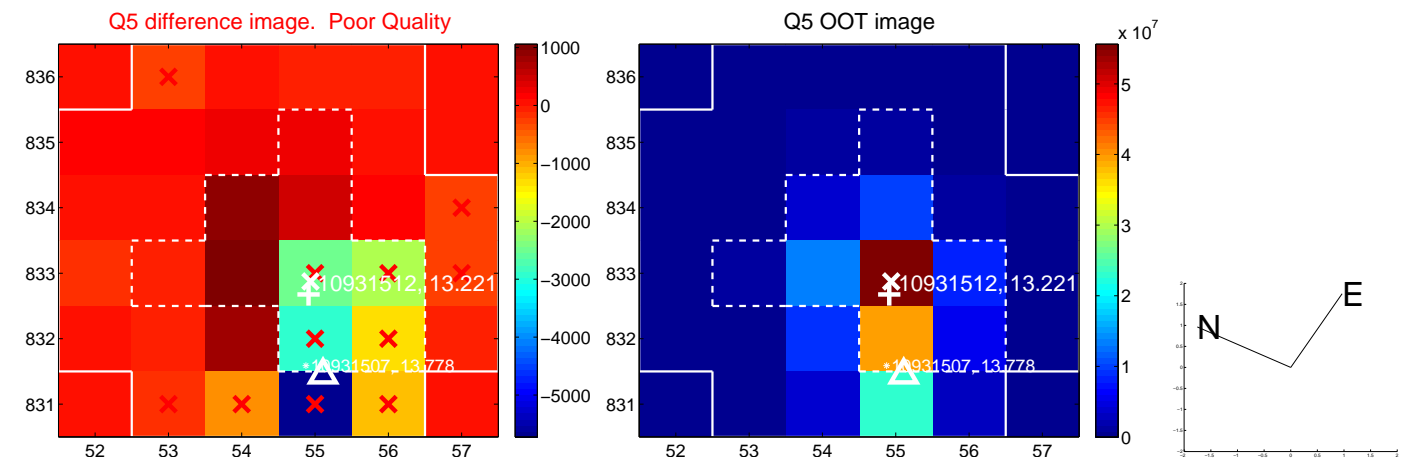


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

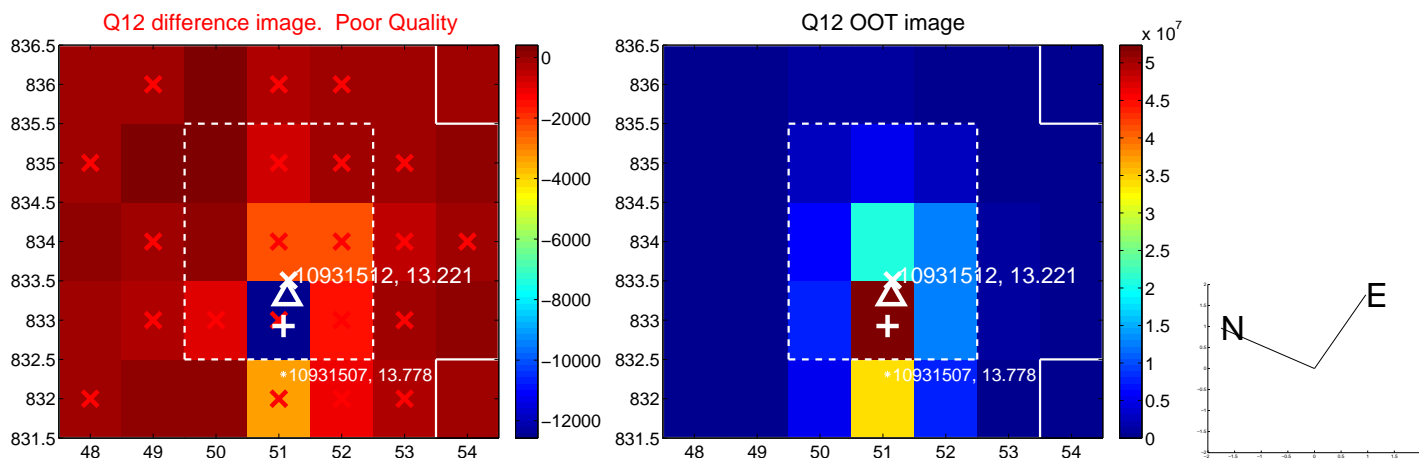
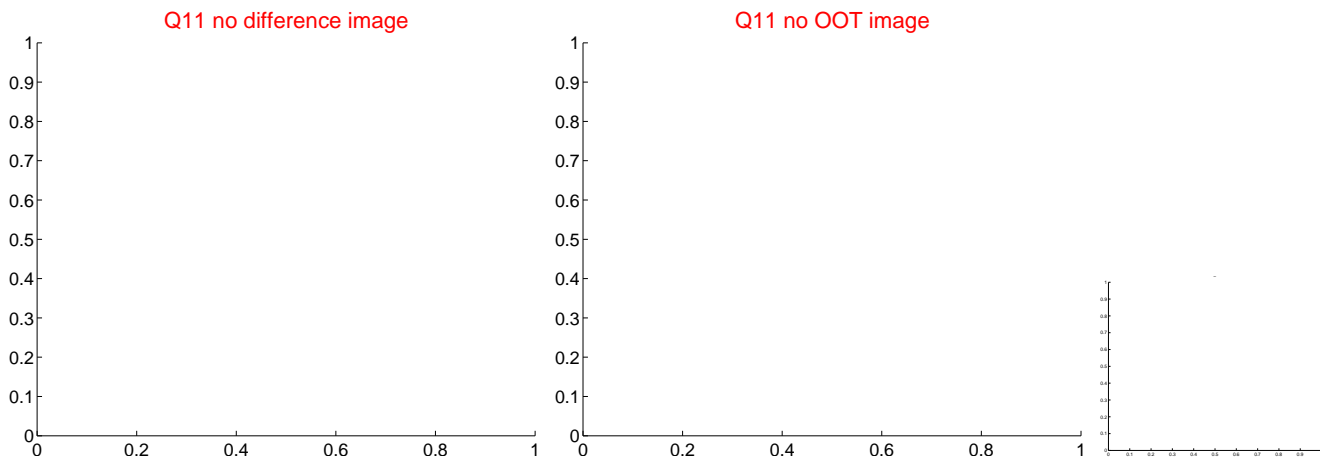
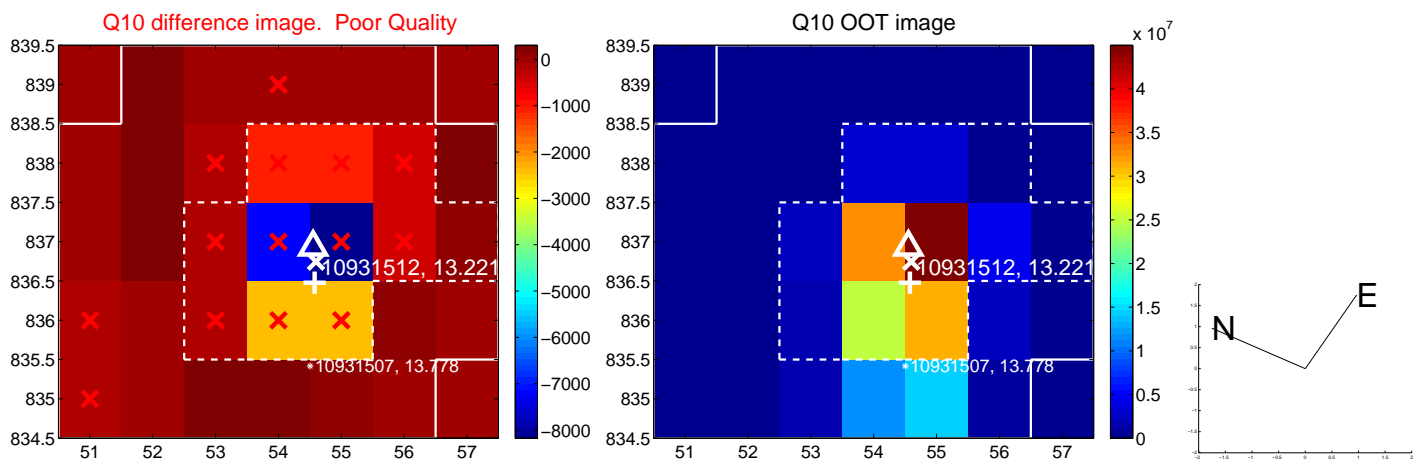
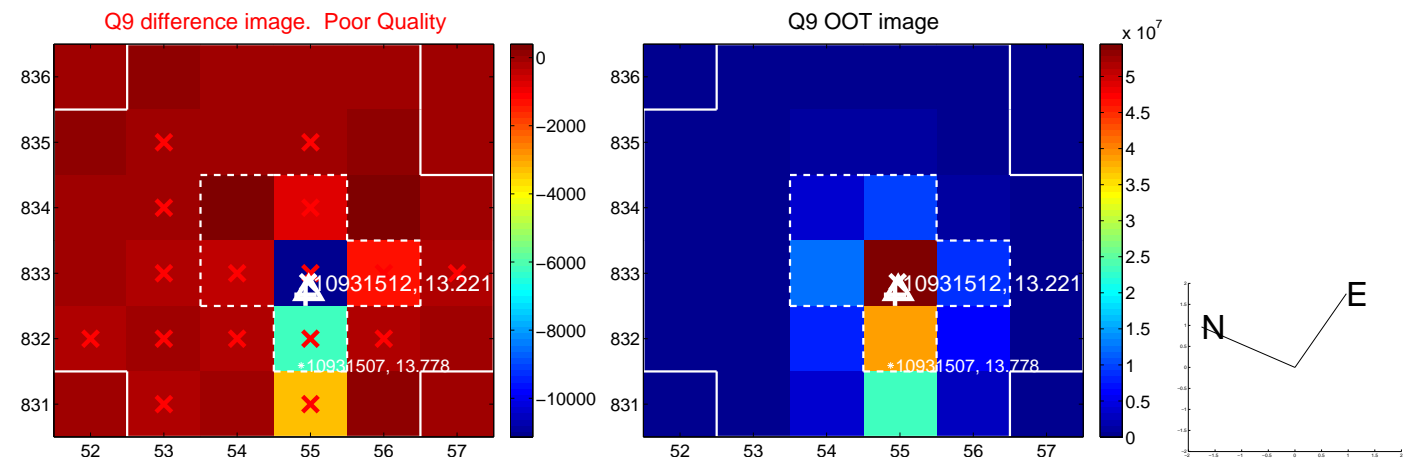
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



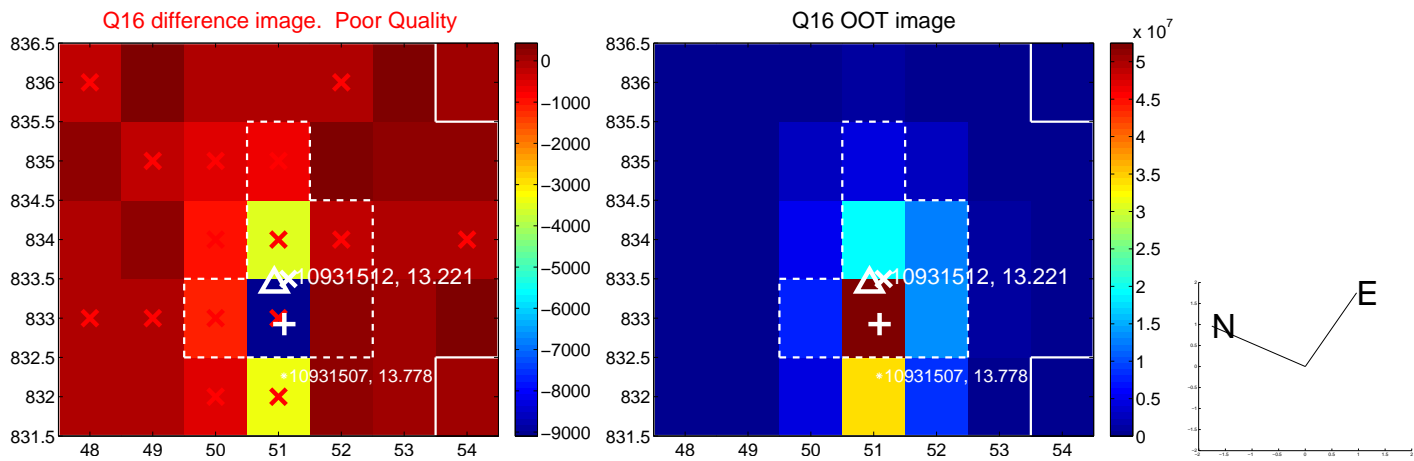
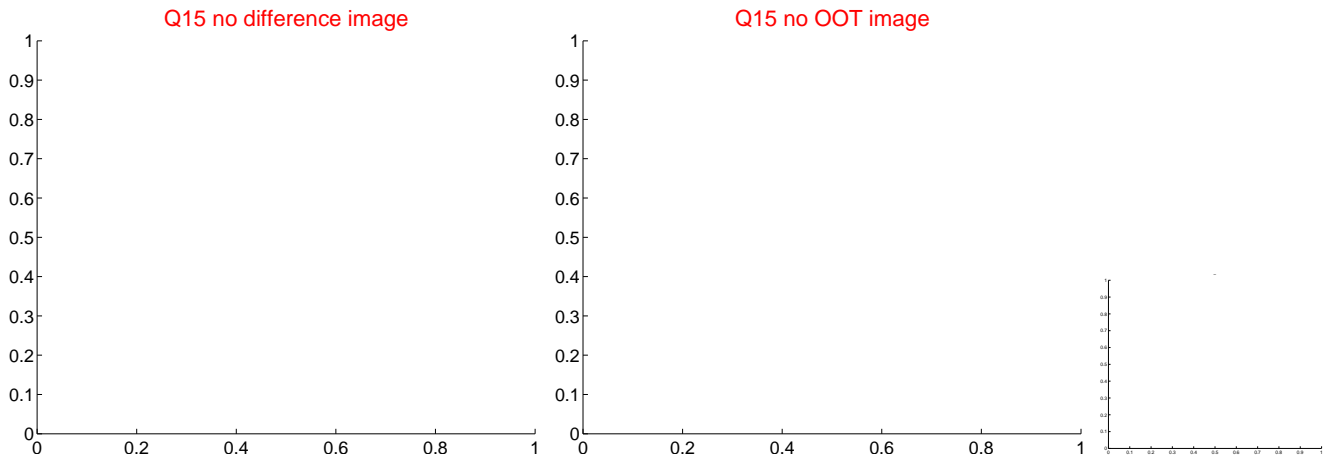
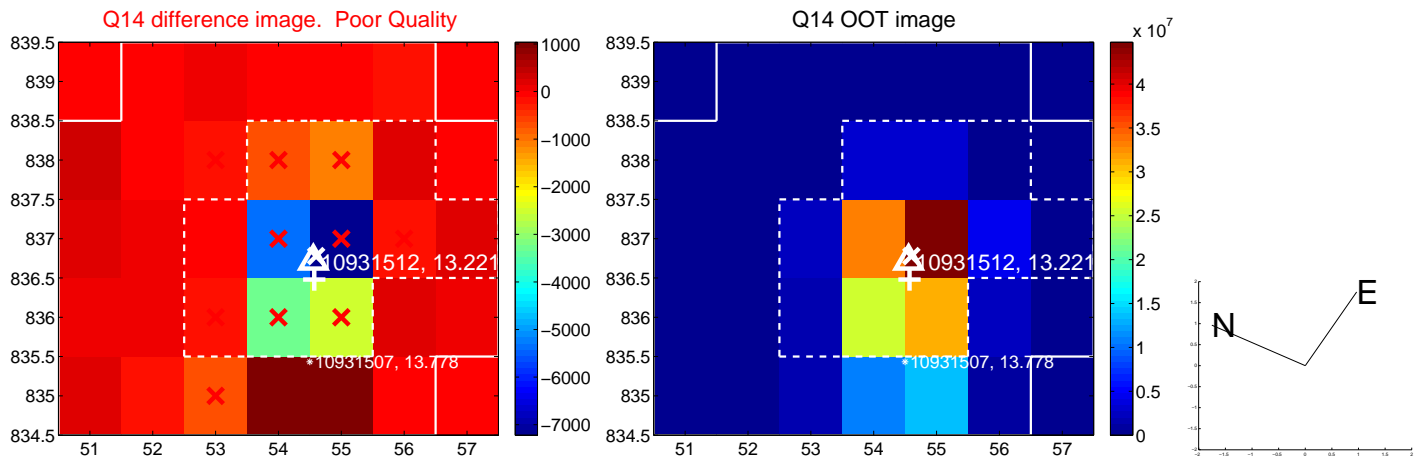
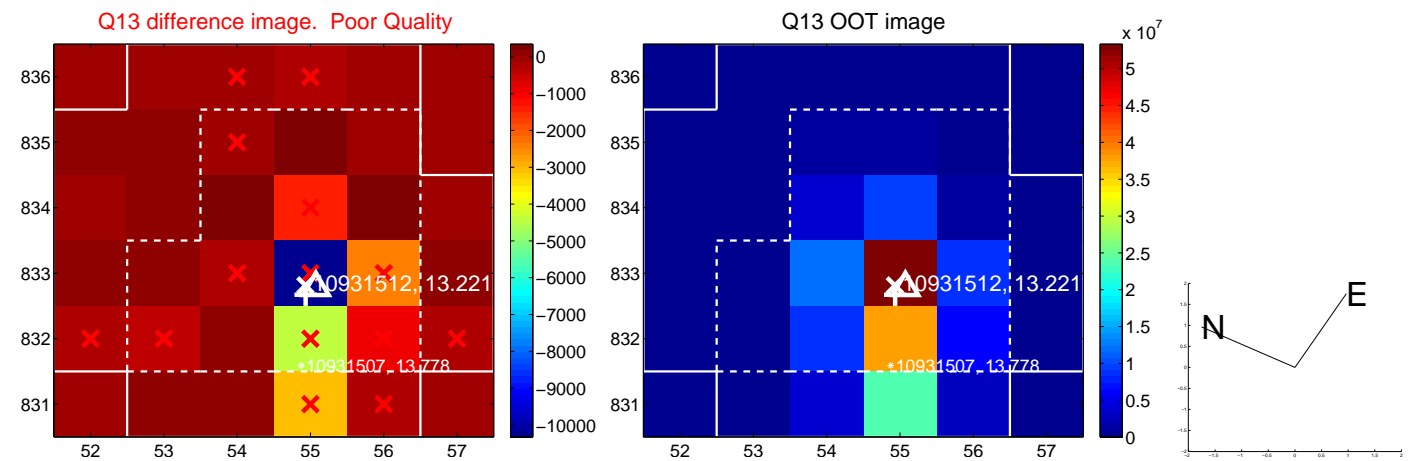
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



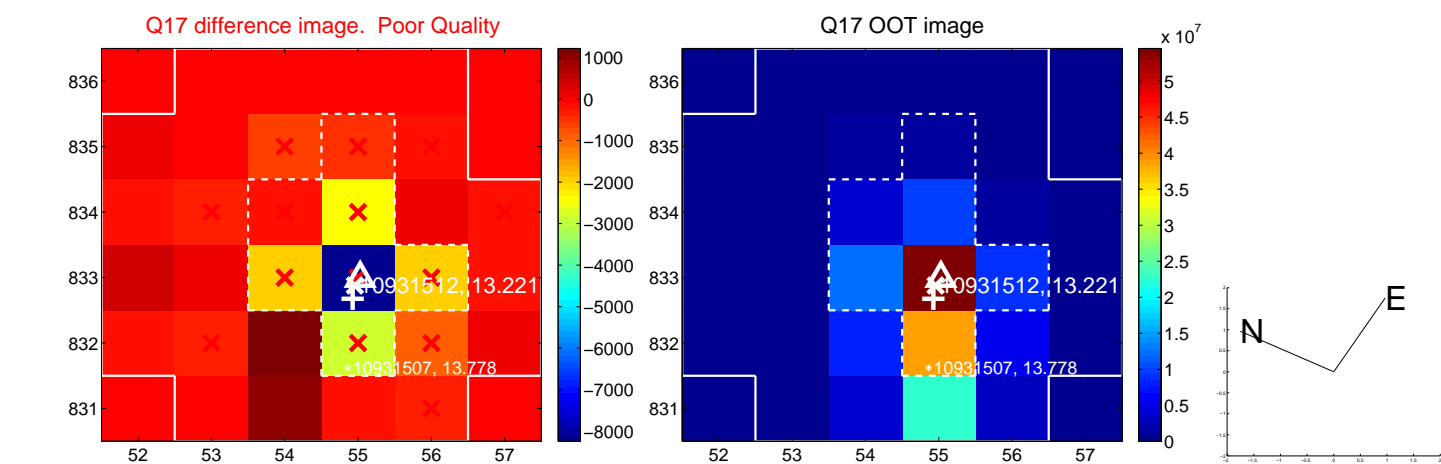
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



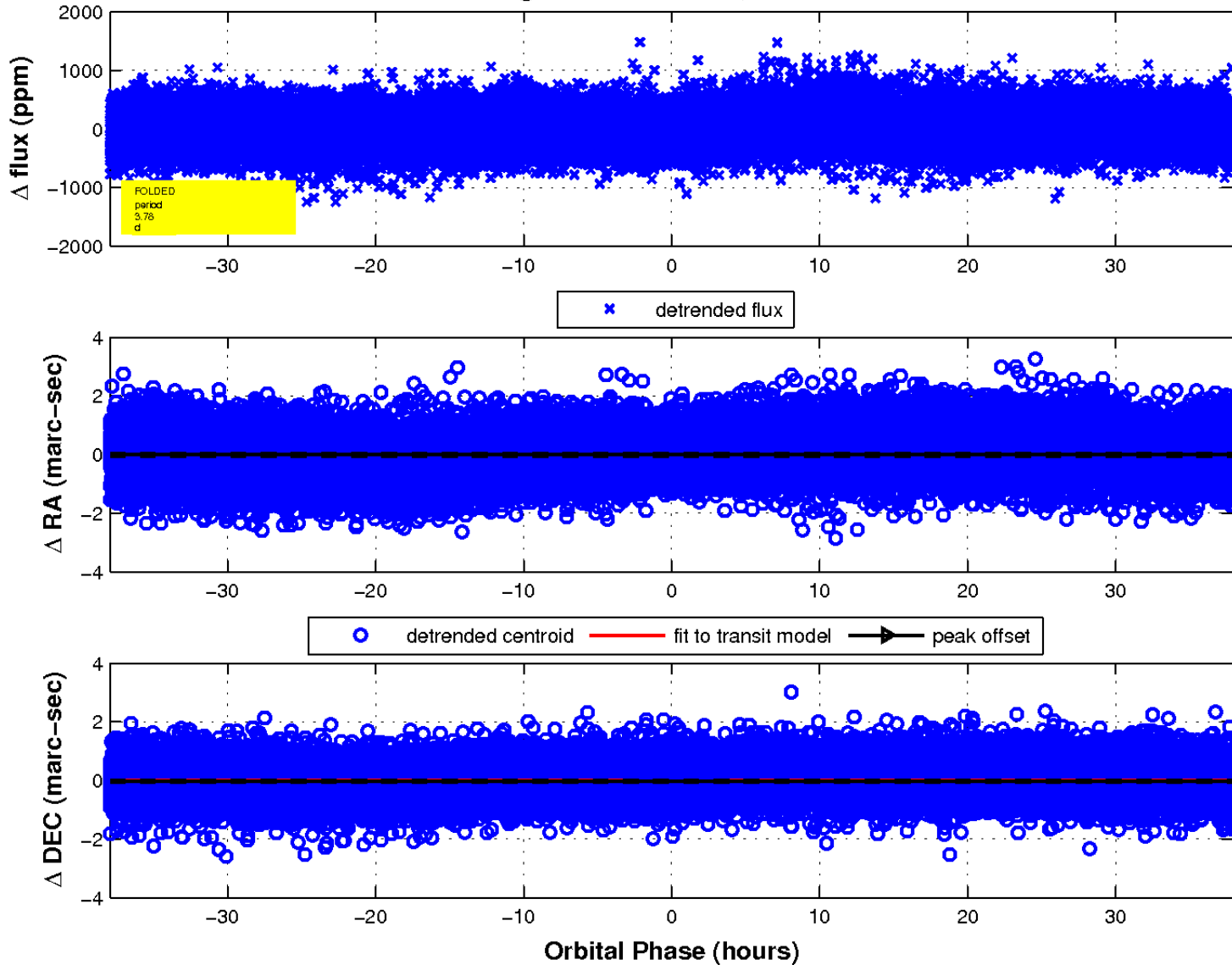
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

