

KIC 008222690

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})
008222690-01	OBS	No	2.490983	131.916114	45.4	6.228	9.3	8.5	0.94	6014	0.74	858.82
008222690-02	OBS	No	2.491026	132.862563	51.7	6.570	9.4	10.5	0.94	6014	0.77	858.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008222690-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
008222690-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—HALO_GHOST

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

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

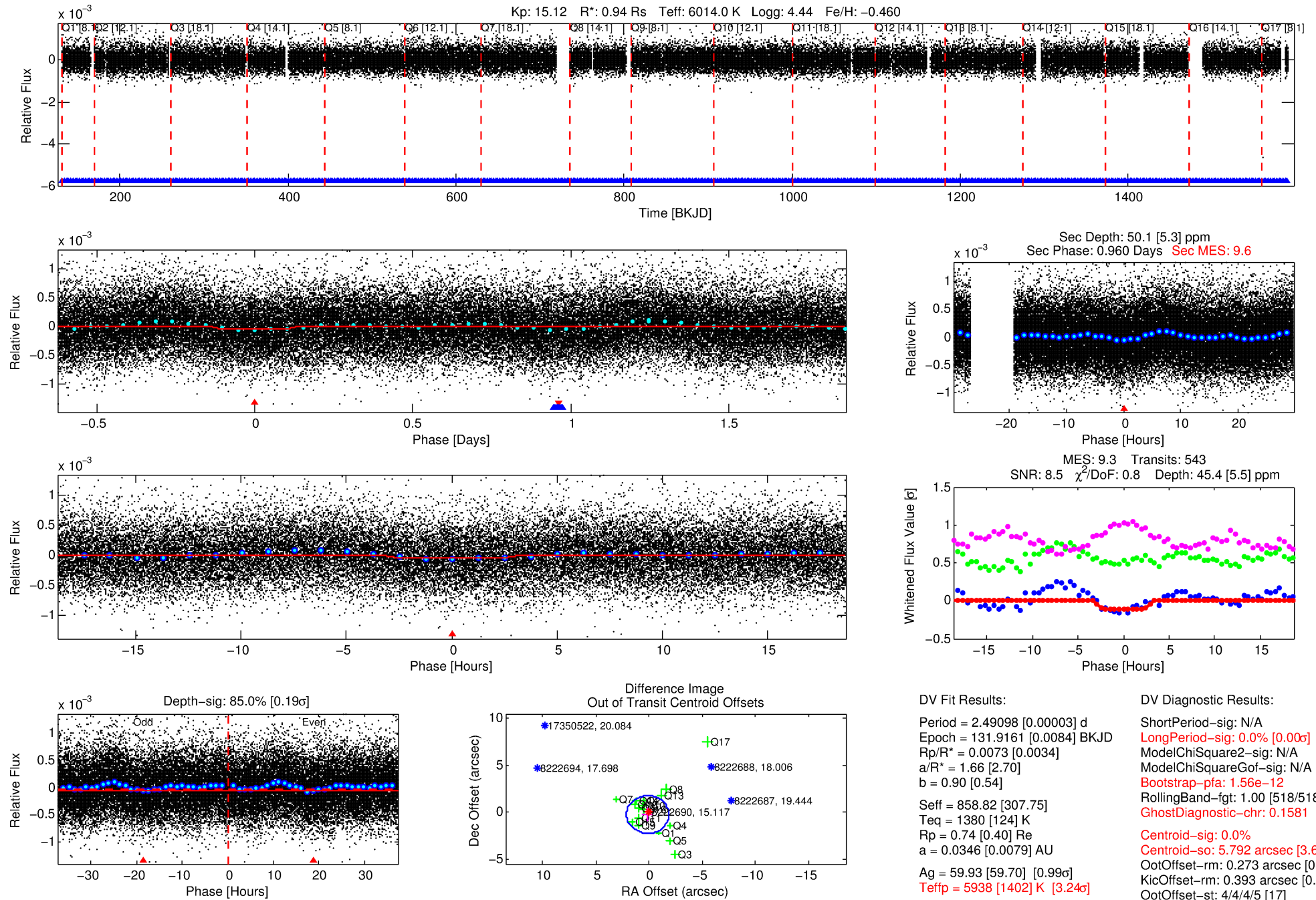
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008222690-01

No Significant Match Found

DV One-Page Summary

KIC: 8222690 Candidate: 1 of 2 Period: 2.491 d



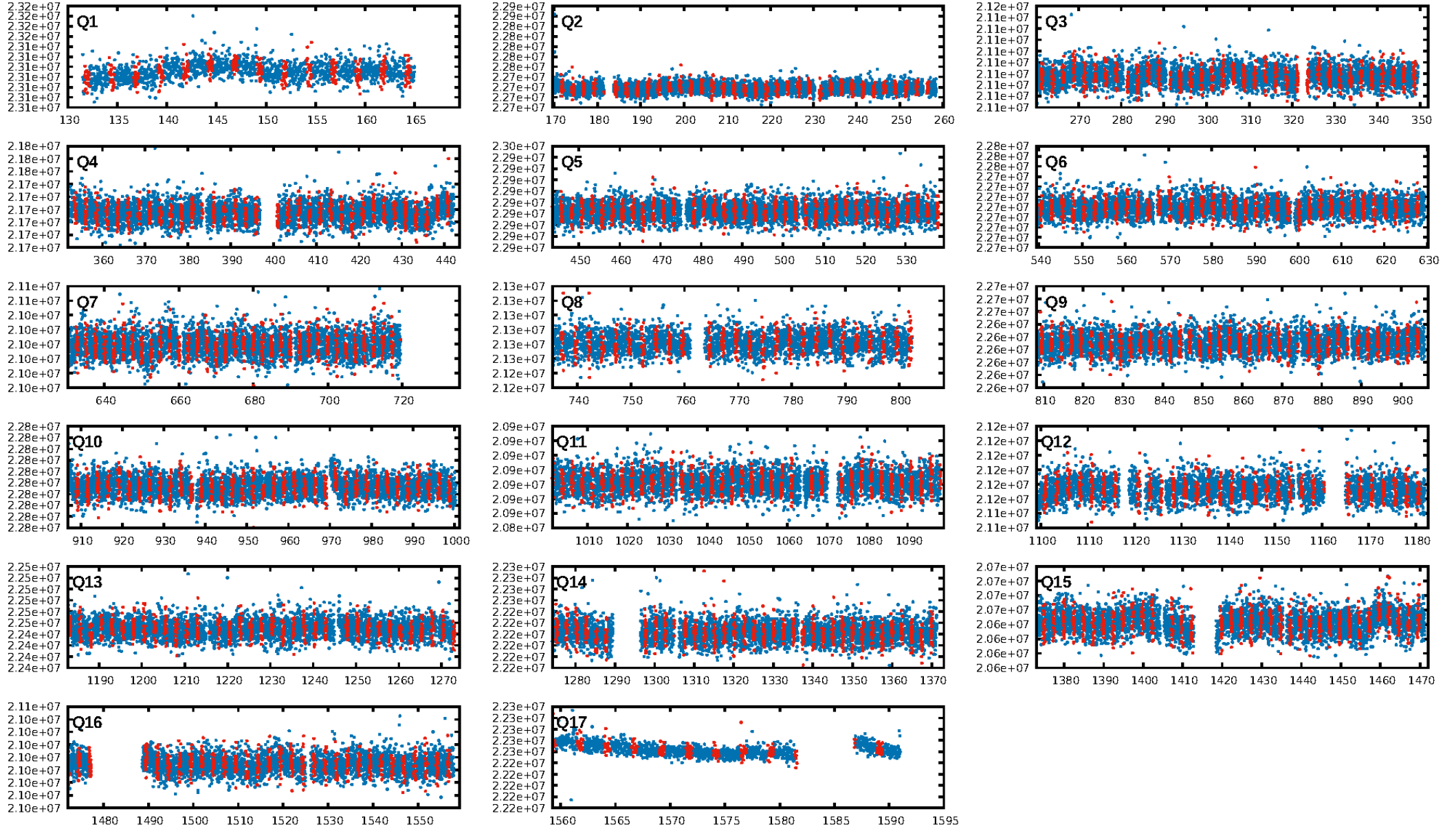
DV Fit Results:

Period = 2.49098 [0.00003] d
Epoch = 131.9161 [0.0084] BKJD
Rp/R* = 0.0073 [0.0034]
a/R* = 1.66 [2.70]
b = 0.90 [0.54]
Seff = 858.82 [307.75]
Teq = 1380 [124] K
Rp = 0.74 [0.40] Re
a = 0.0346 [0.0079] AU
Ag = 59.93 [59.70] [0.99 σ]
Teffp = 5938 [1402] K [3.24 σ]

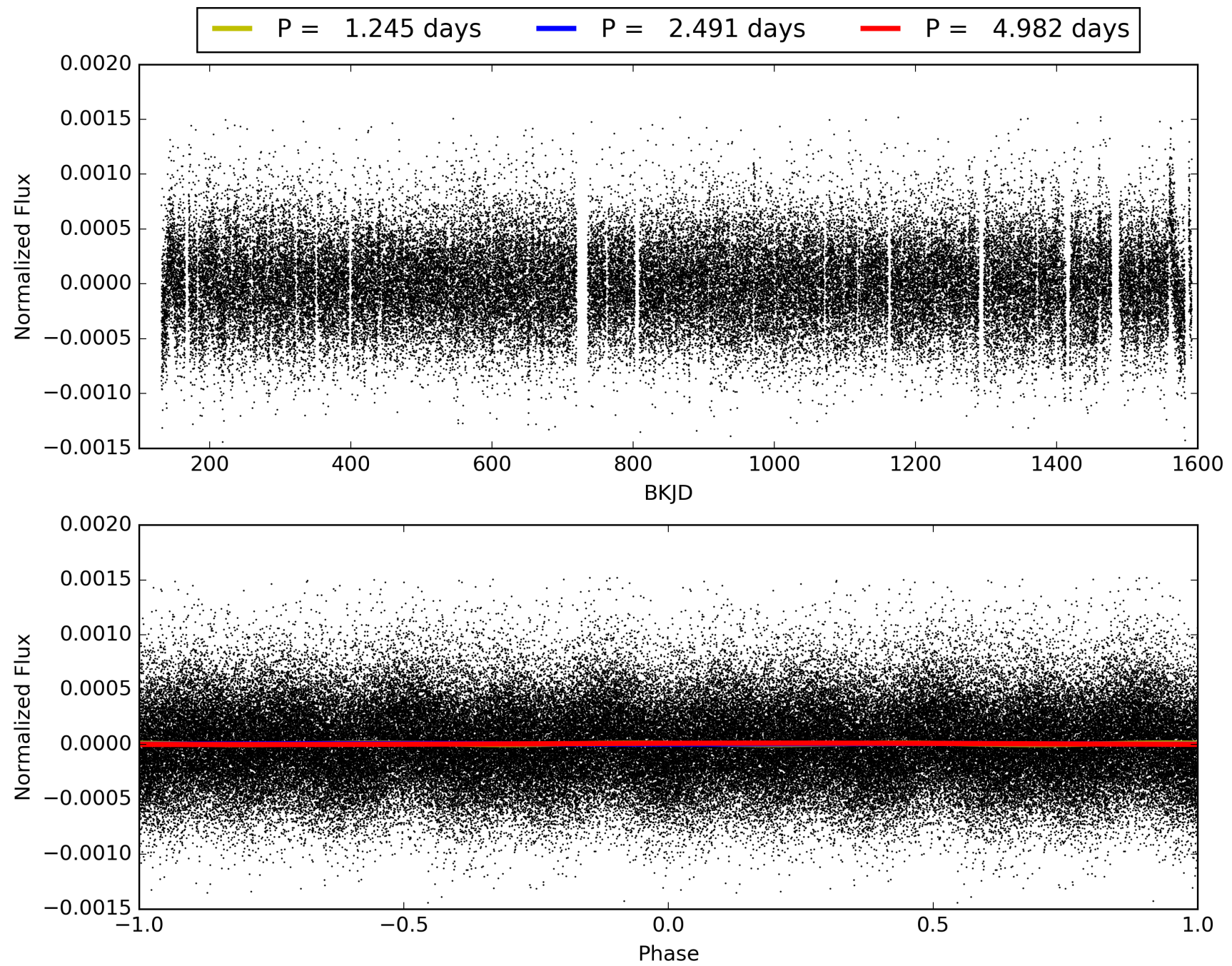
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.56e-12
RollingBand-fgt: 1.00 [518/518]
GhostDiagnostic-chr: 0.1581
Centroid-sig: 0.0%
Centroid-so: 5.792 arcsec [3.60 σ]
OotOffset-rm: 0.273 arcsec [0.41 σ]
KicOffset-rm: 0.393 arcsec [0.61 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.06 [1/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 008222690-01, PDC Light Curves

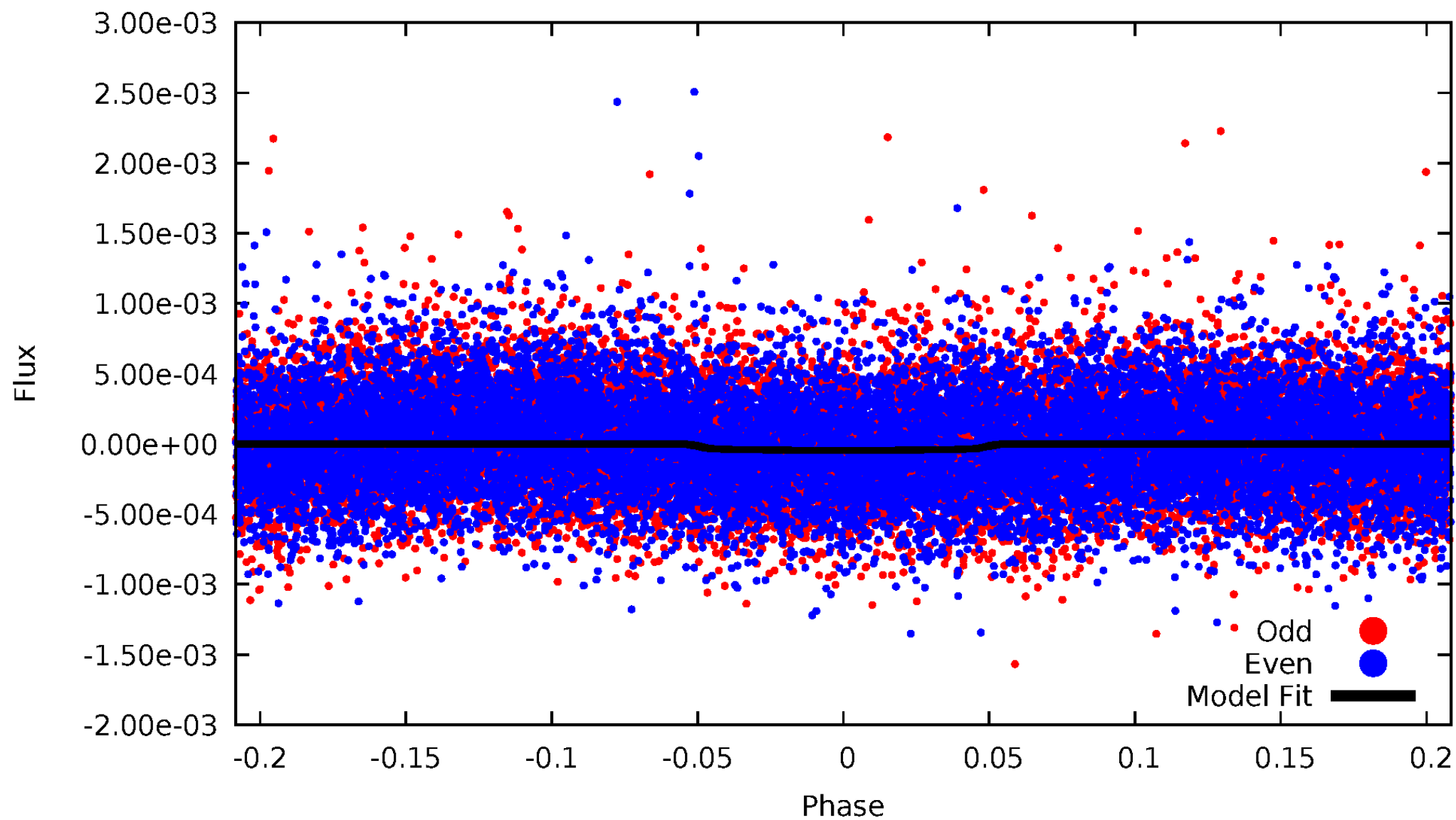


TCE 008222690-01



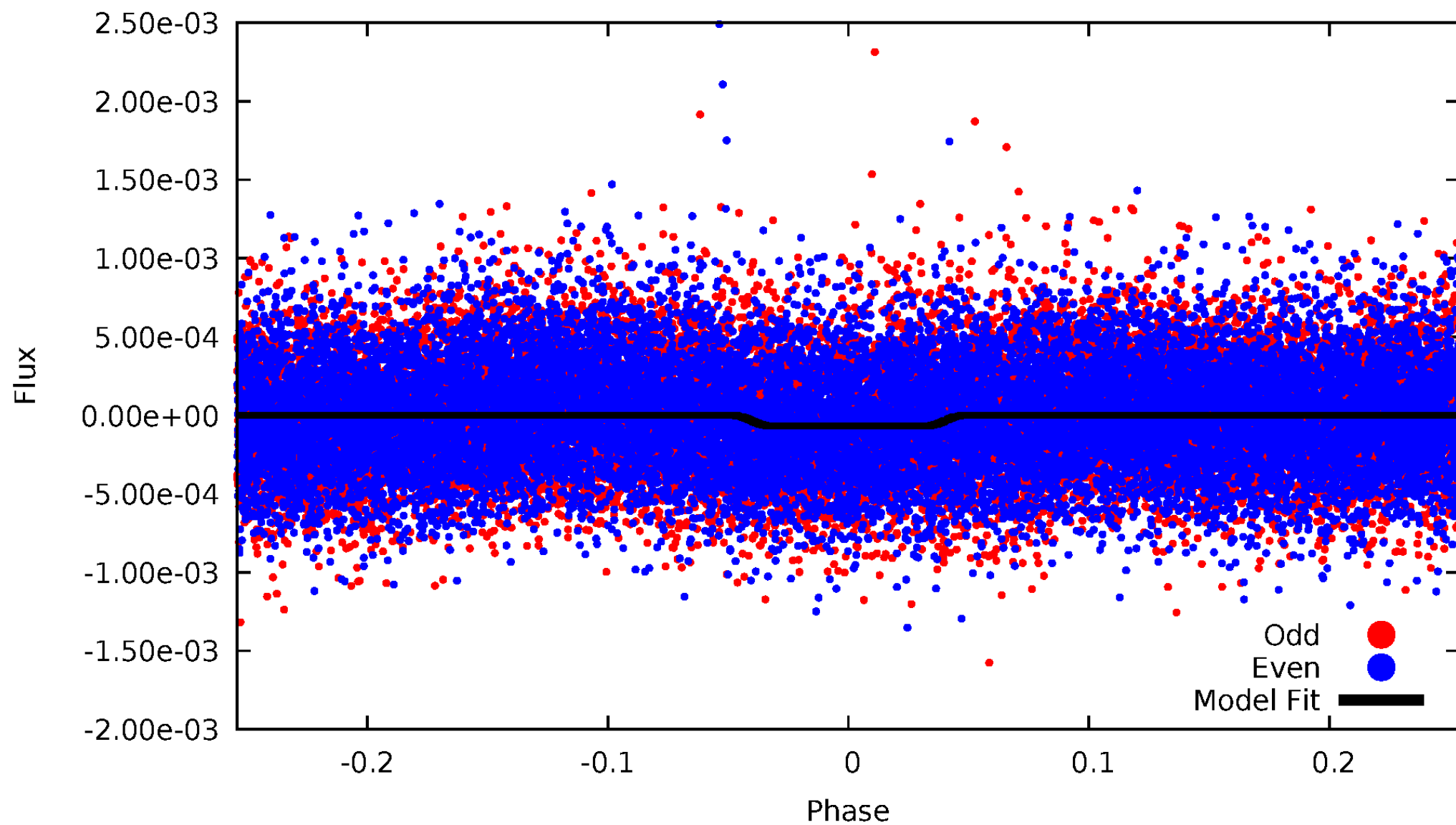
DV Odd/Even

TCE 008222690-01



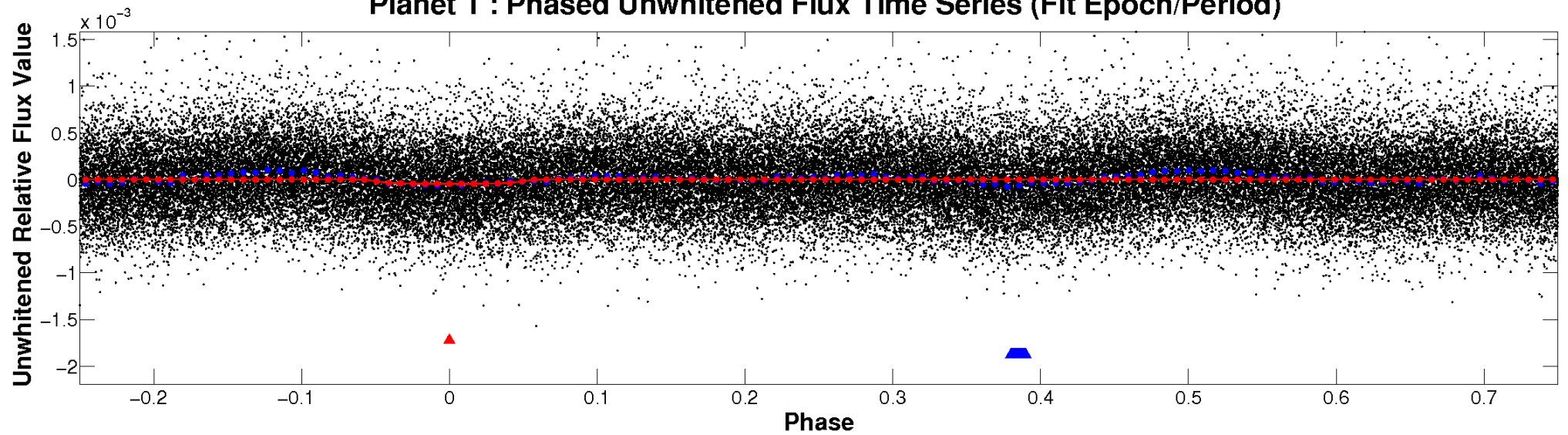
ALT Odd/Even

TCE 008222690-01

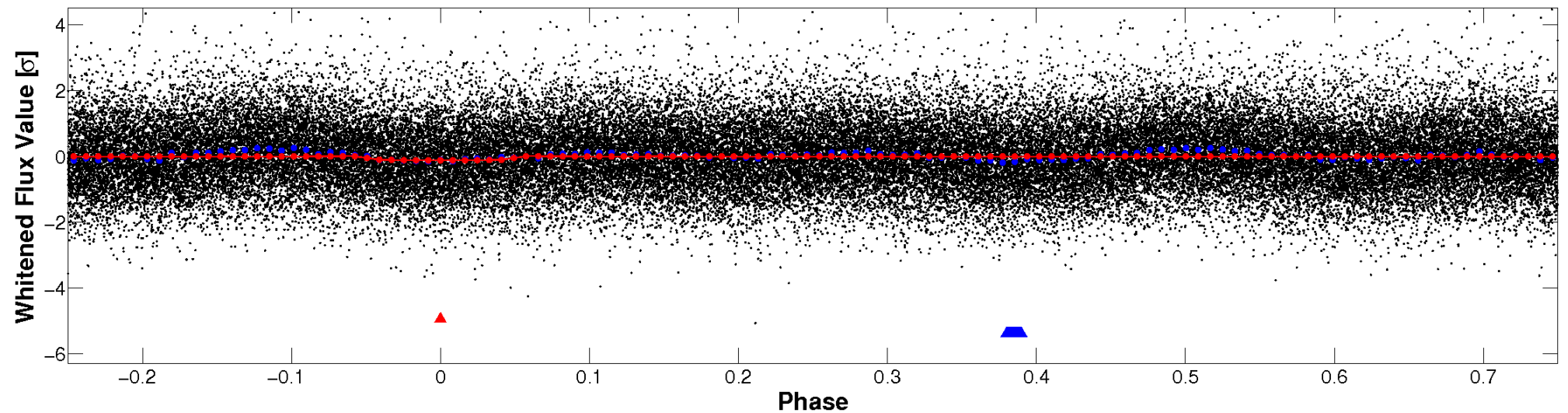


Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

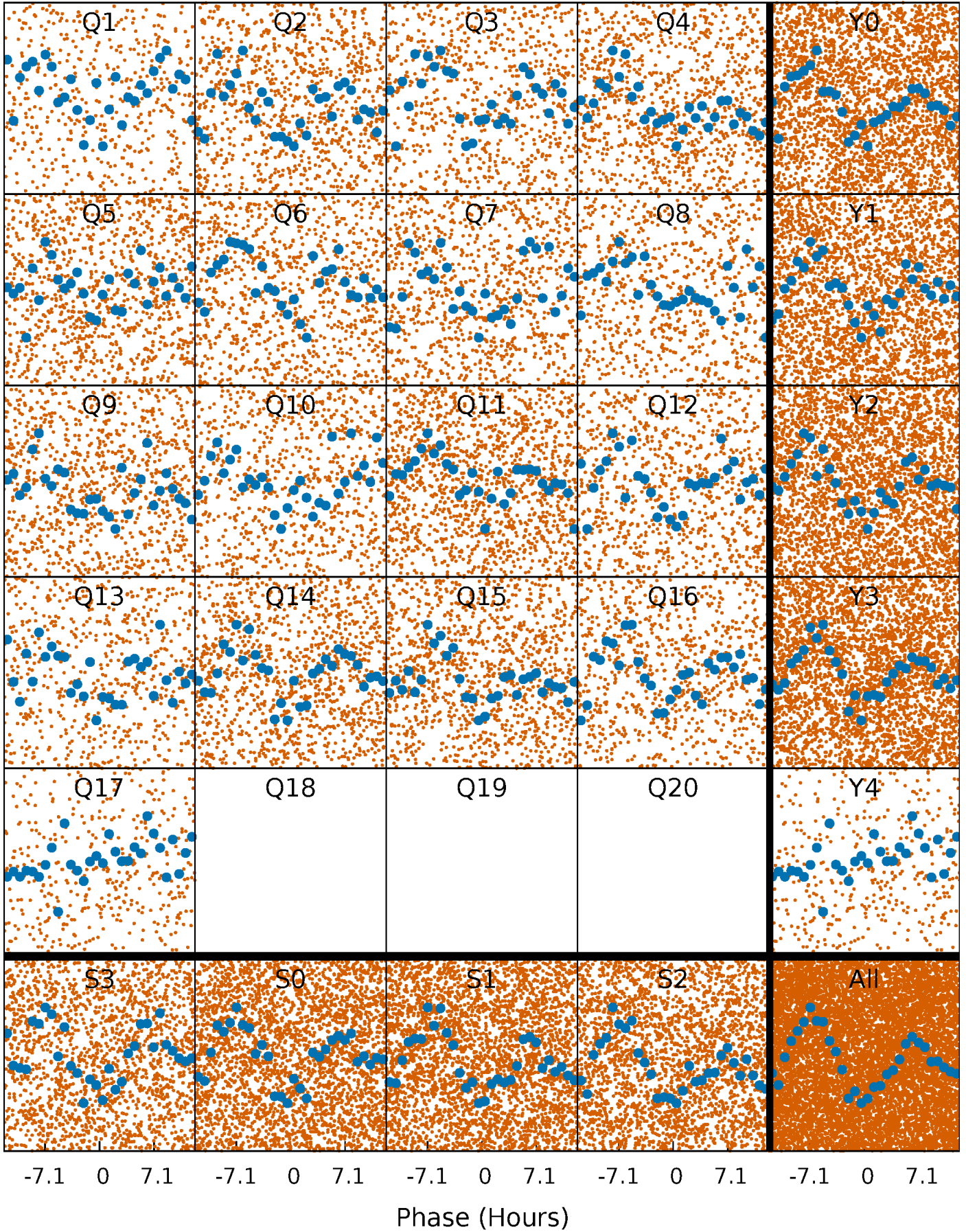


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



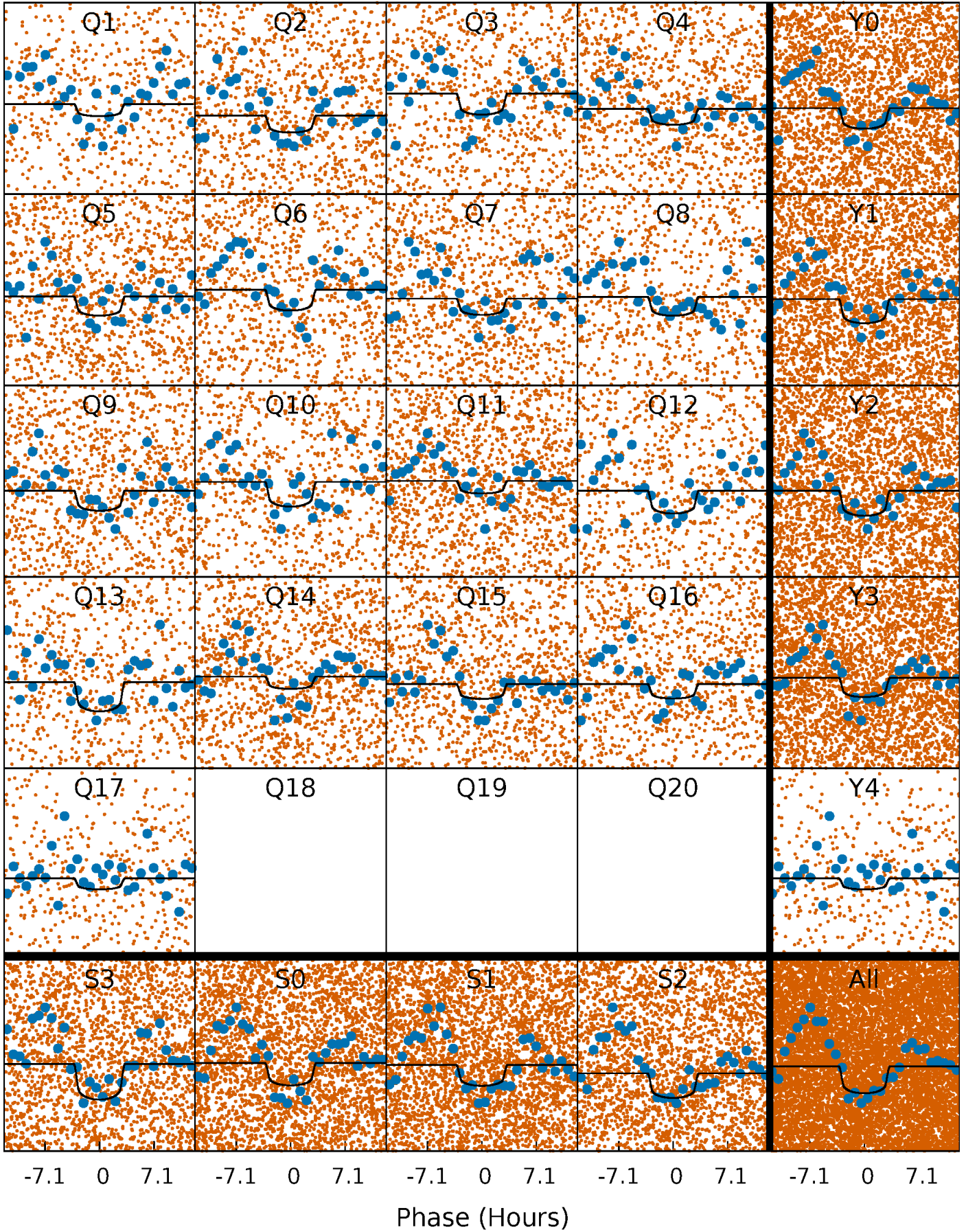
PDC Quarter-Phased Transit Curves

TCE 008222690-01 P= 2.490983 Days $T_0=131.916114$ (BKJD)



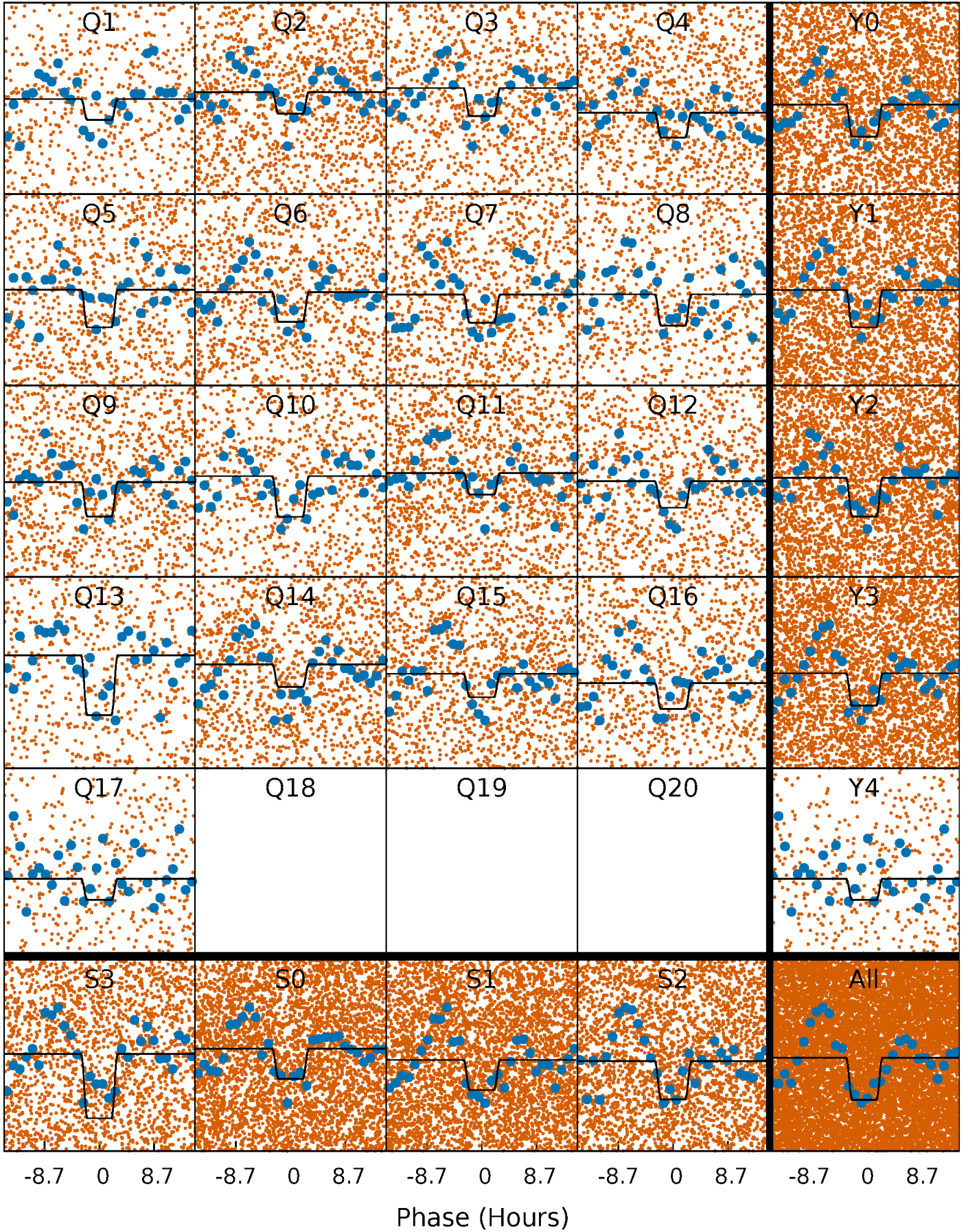
DV Quarter-Phased Transit Curves

TCE 008222690-01 P= 2.490983 Days $T_0=131.916114$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

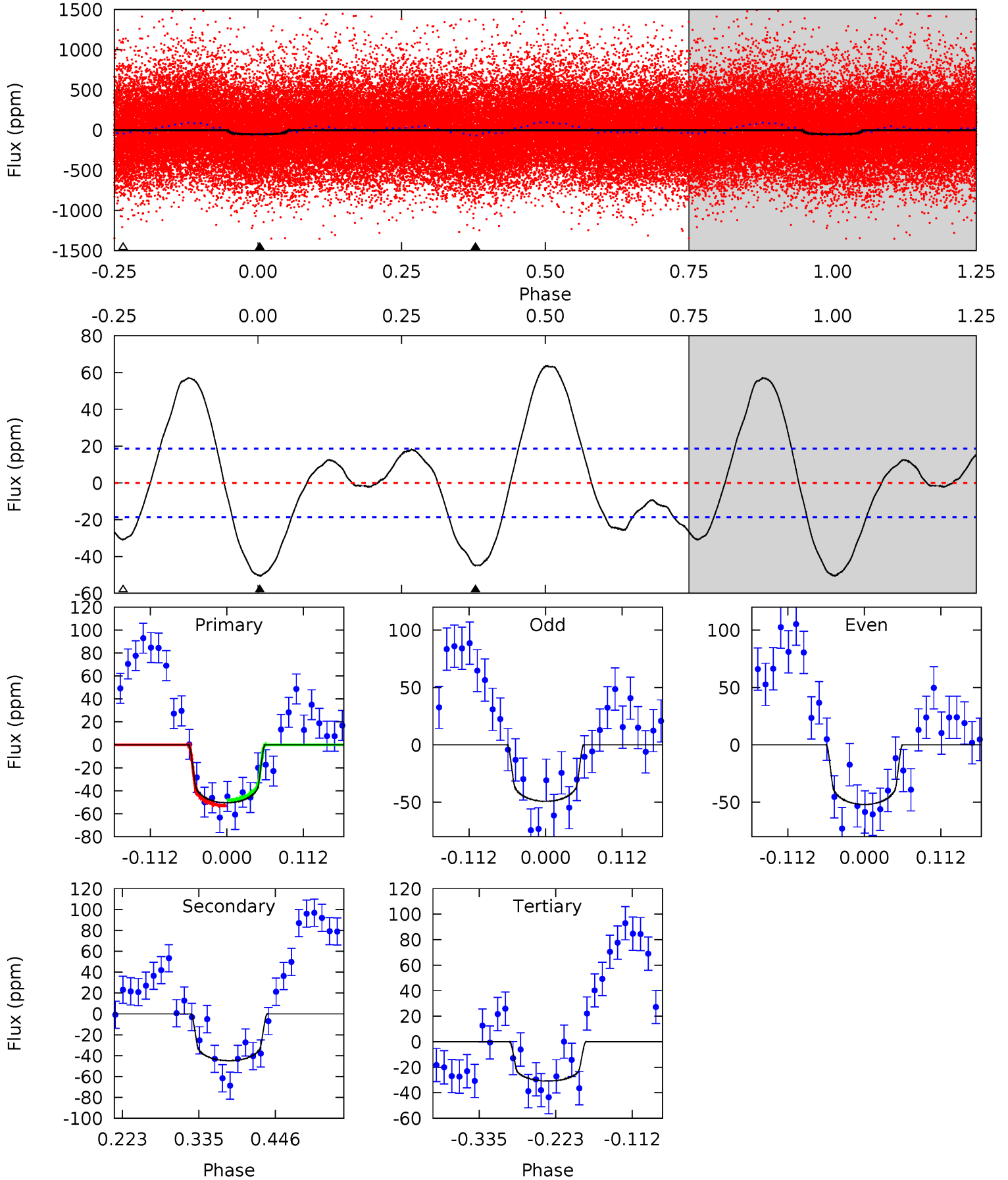
TCE 008222690-01 P= 2.491023 Days $T_0=131.903739$ (BKJD)



DV Model-Shift Uniqueness Test

008222690-01, P = 2.490983 Days, E = 129.425131 Days

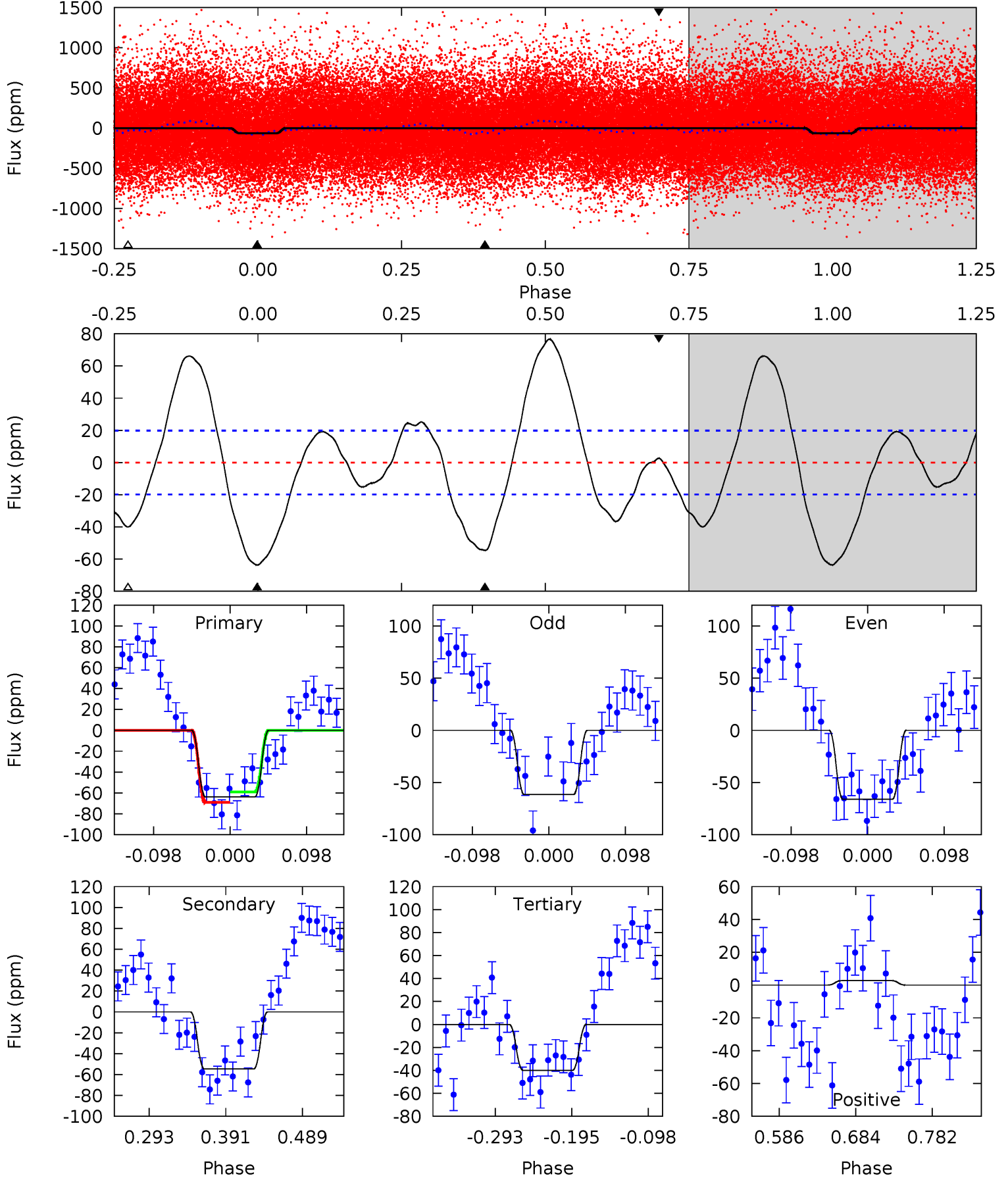
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	10.9	7.50	0	4.54	1.59	6.75	4.79	12.3	3.41	10.9	0.34	1.06	0.56	0.62



Alt Model-Shift Uniqueness Test

008222690-01, P = 2.491023 Days, E = 129.412716 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.7	12.6	9.20	0.63	4.57	1.66	7.31	5.47	14.0	3.37	11.9	0.51	1.05	0.55	1.13



Stellar Parameters For KIC 008222690

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6014^{+179}_{-179}	$4.444^{+0.101}_{-0.188}$	$-0.460^{+0.300}_{-0.300}$	$0.936^{+0.247}_{-0.133}$	$0.889^{+0.110}_{-0.090}$	$1.527^{+0.662}_{-0.742}$
	+3%/-3%	+2%/-4%	+65%/-65%	+26%/-14%	+12%/-10%	+43%/-49%
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 008222690-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-45 ± 4	$0.79^{+0.35}_{-0.35}$	1949^{+139}_{-103}	5708^{+1970}_{-908}	47^{+106}_{-26}
Alt.	-55 ± 4	$0.88^{+0.34}_{-0.33}$	1946^{+142}_{-101}	5681^{+1398}_{-784}	46^{+75}_{-22}

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

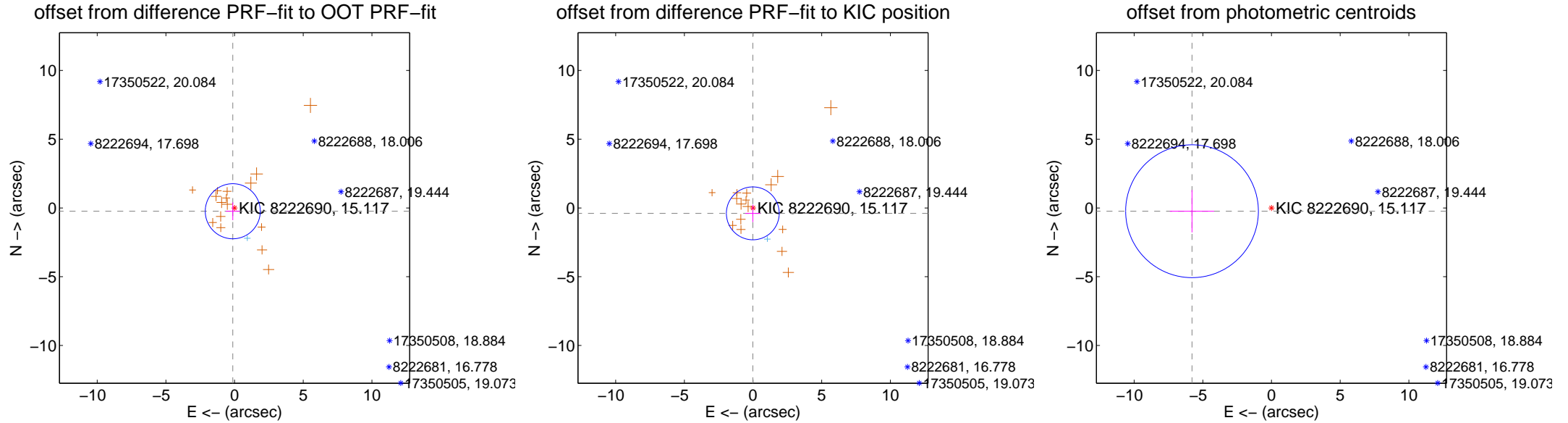
DV Centroid Data

Supplemental centroid analysis for 008222690-01. Kepler magnitude: 15.12. Transit SNR 8.53

There are 1 quarters with good PRF difference image offsets

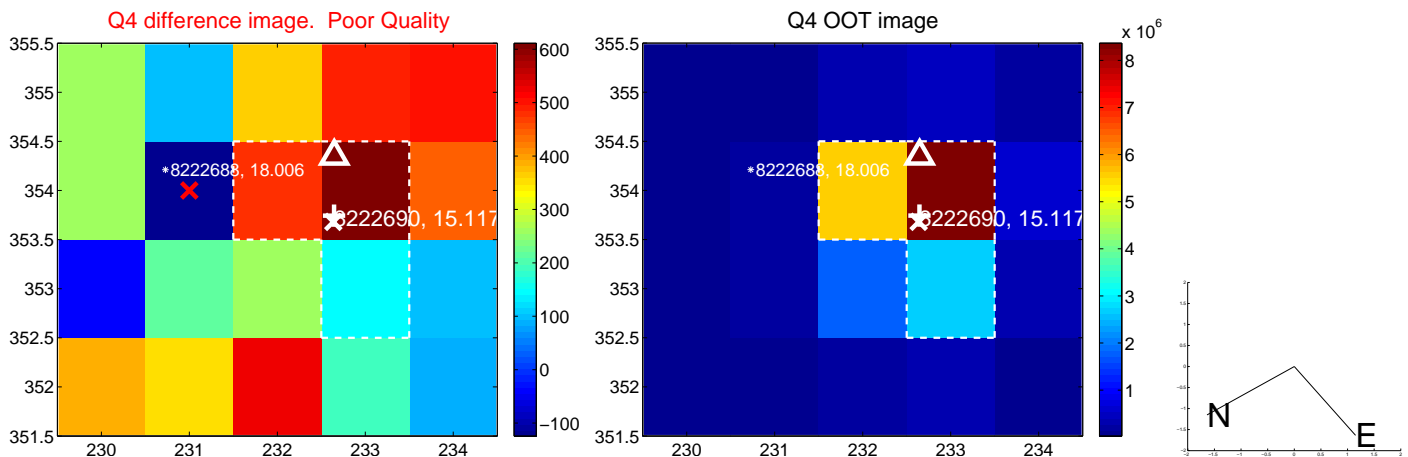
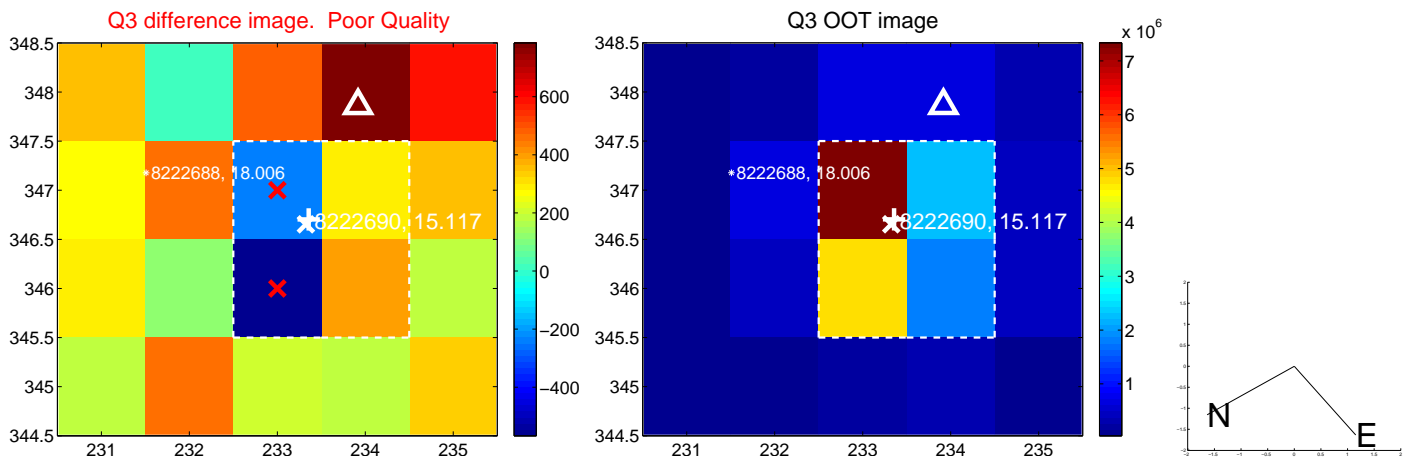
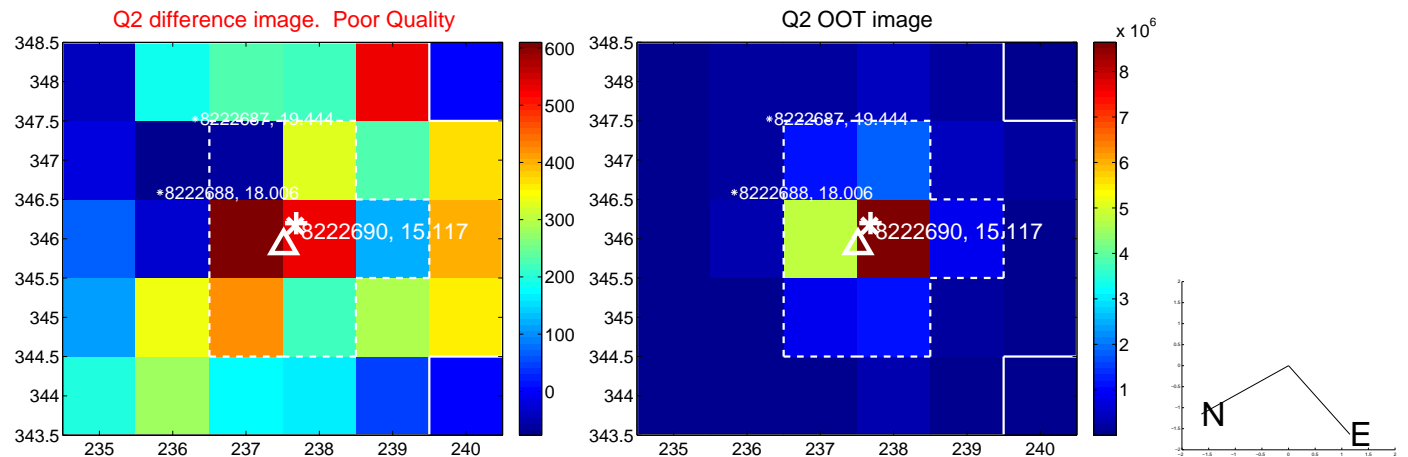
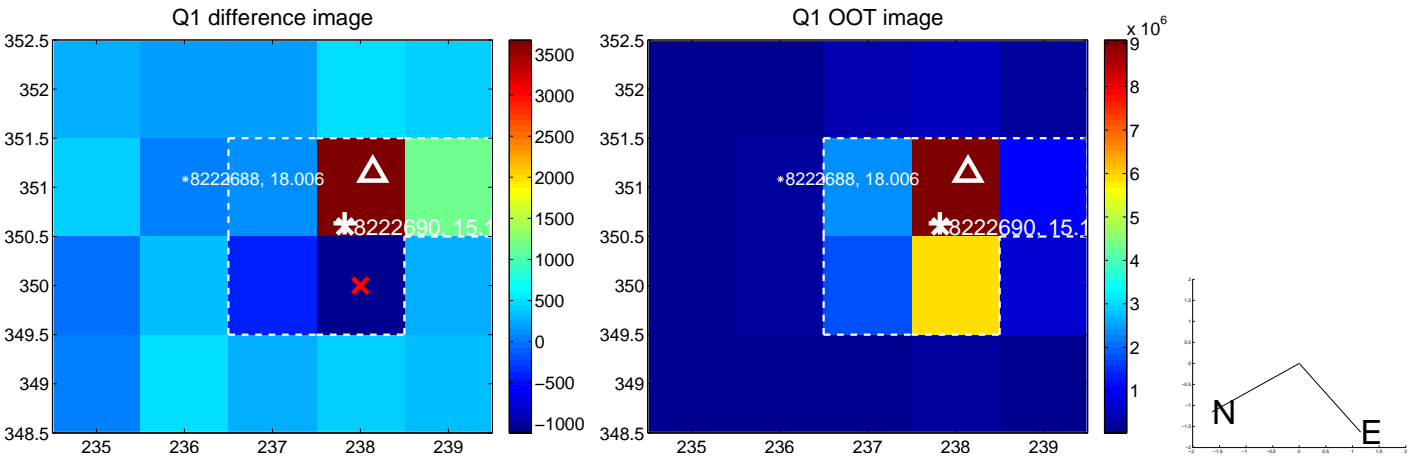
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.273 ± 0.668	0.41	0.132 ± 0.507	-0.239 ± 0.648
PRF-fit source offset from KIC position	0.393 ± 0.641	0.61	0.018 ± 0.548	-0.392 ± 0.633
photometric centroid source offset	5.79 ± 1.61	3.60	5.79 ± 1.61	-0.24 ± 1.54

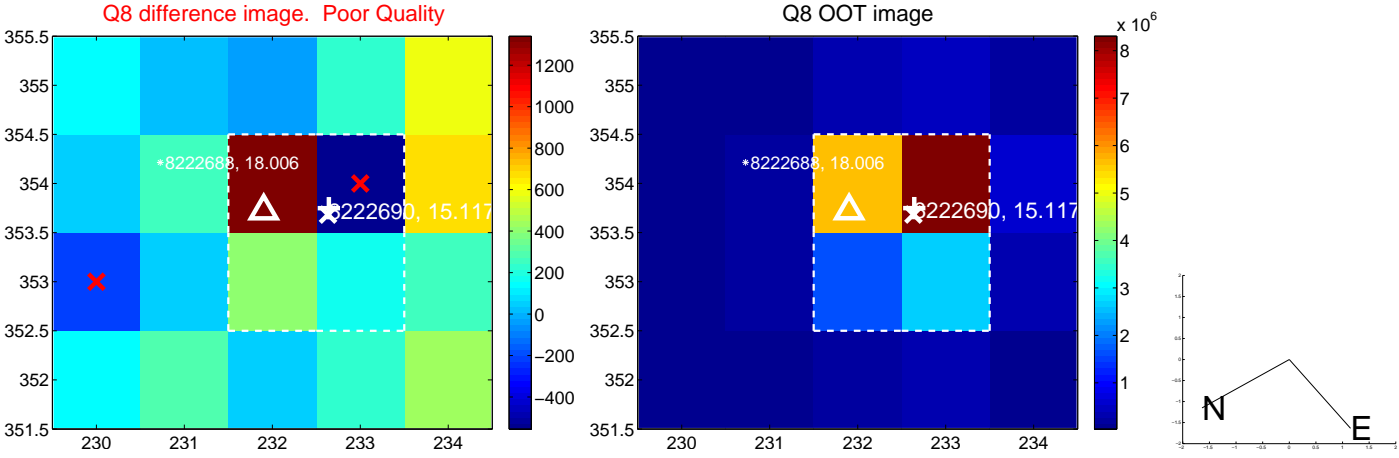
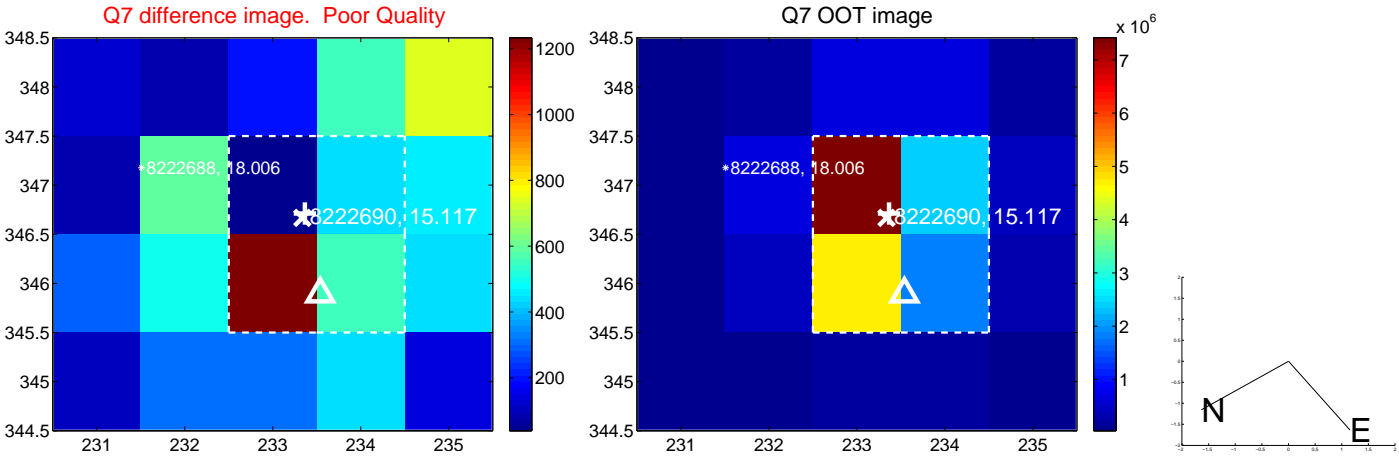
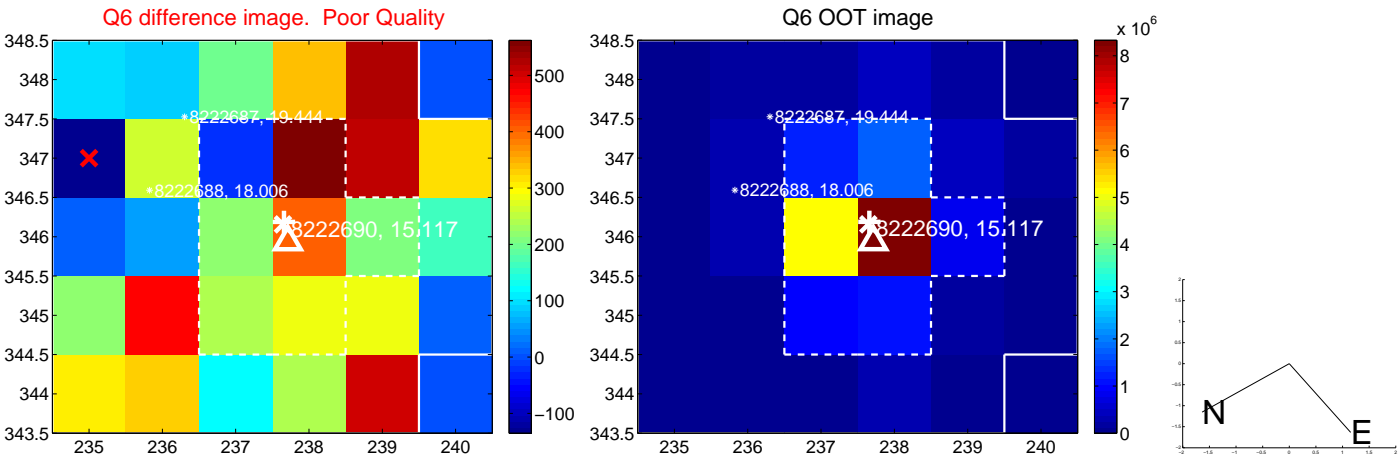
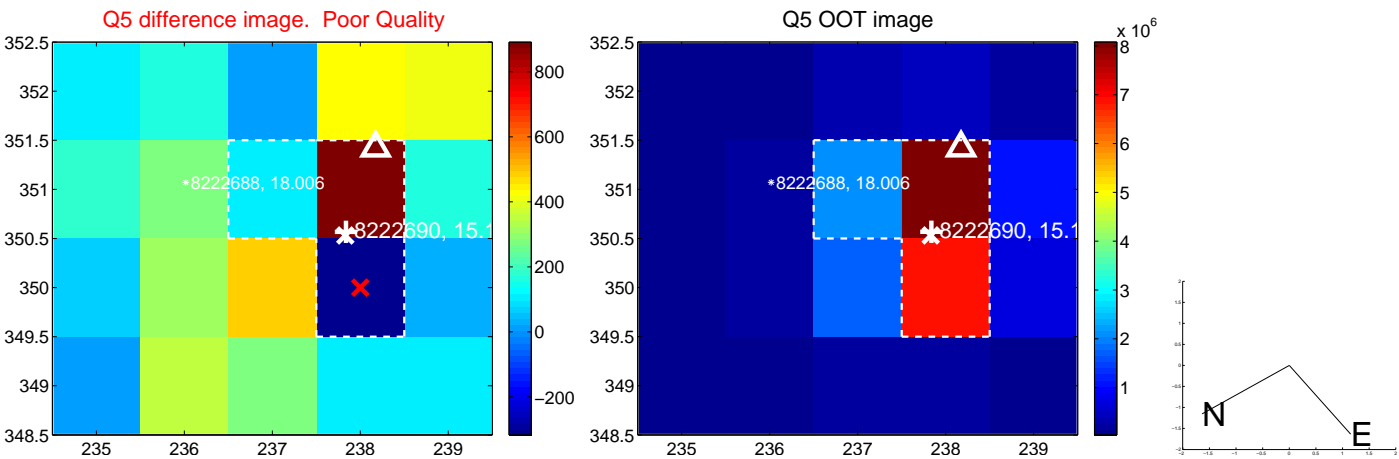


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

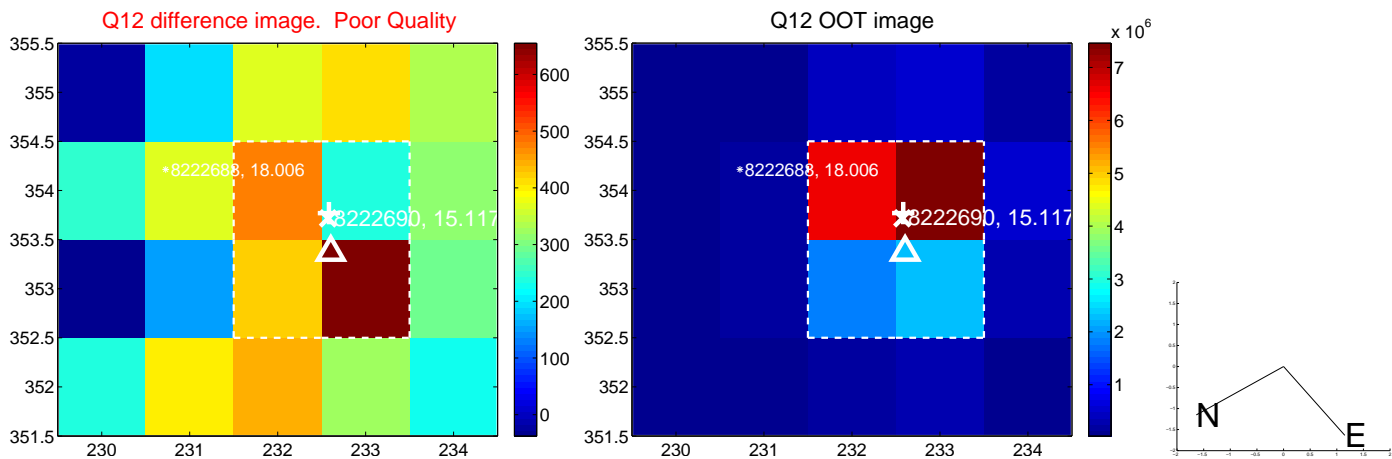
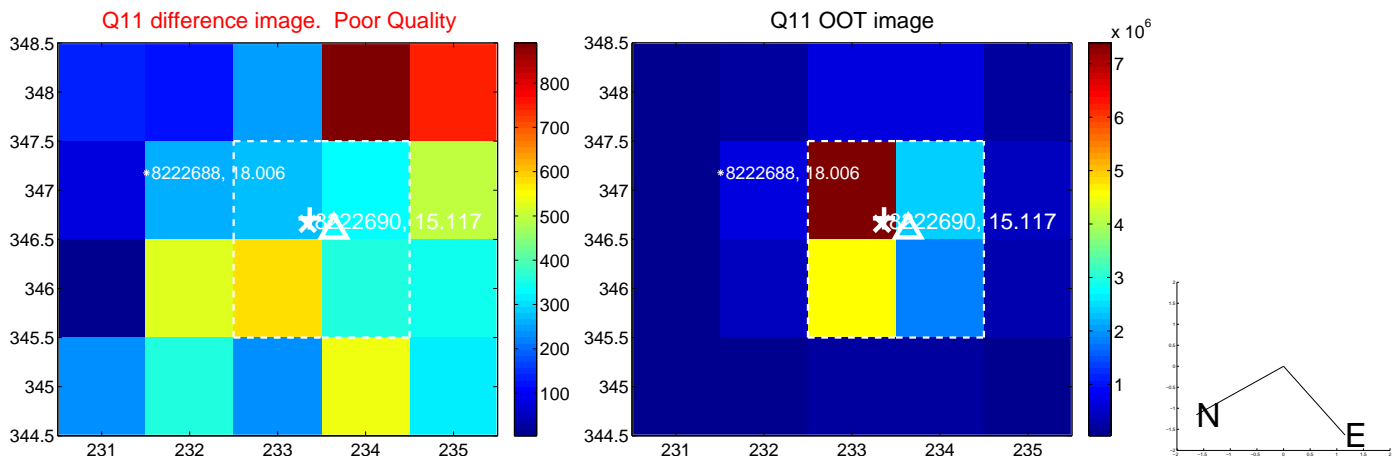
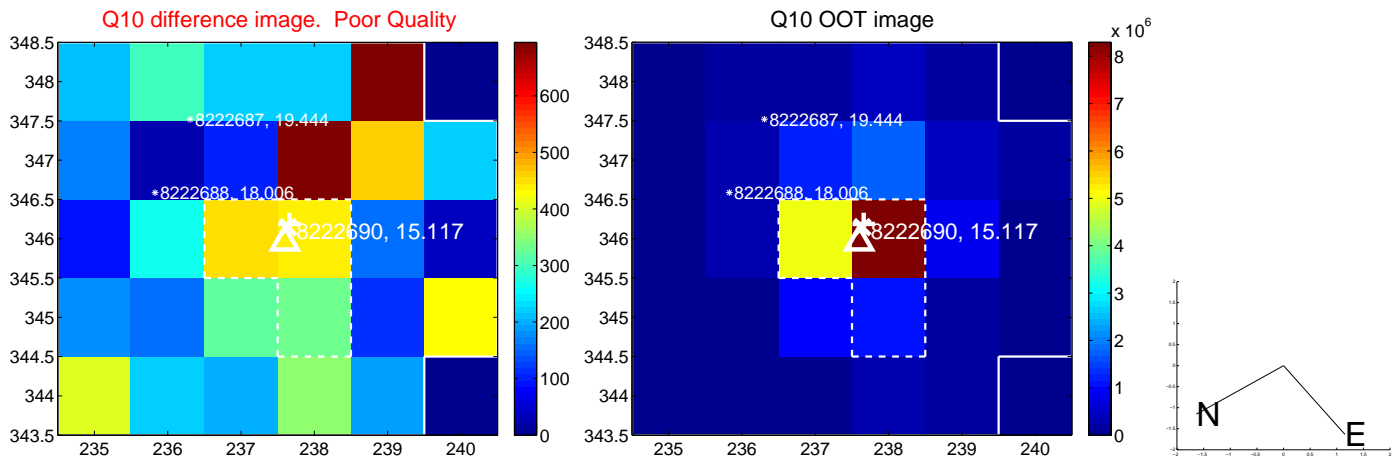
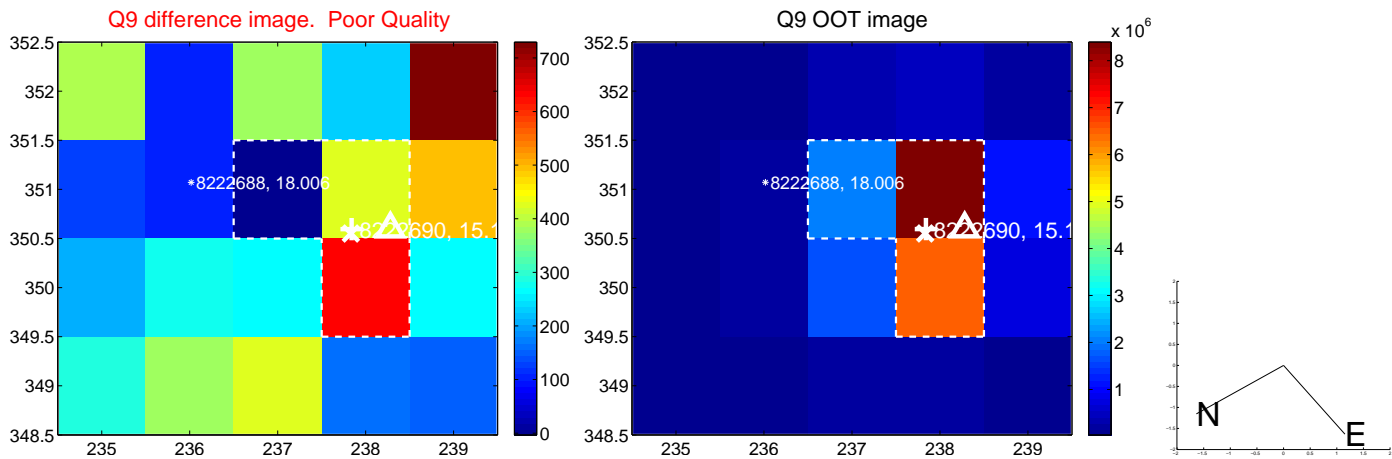
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



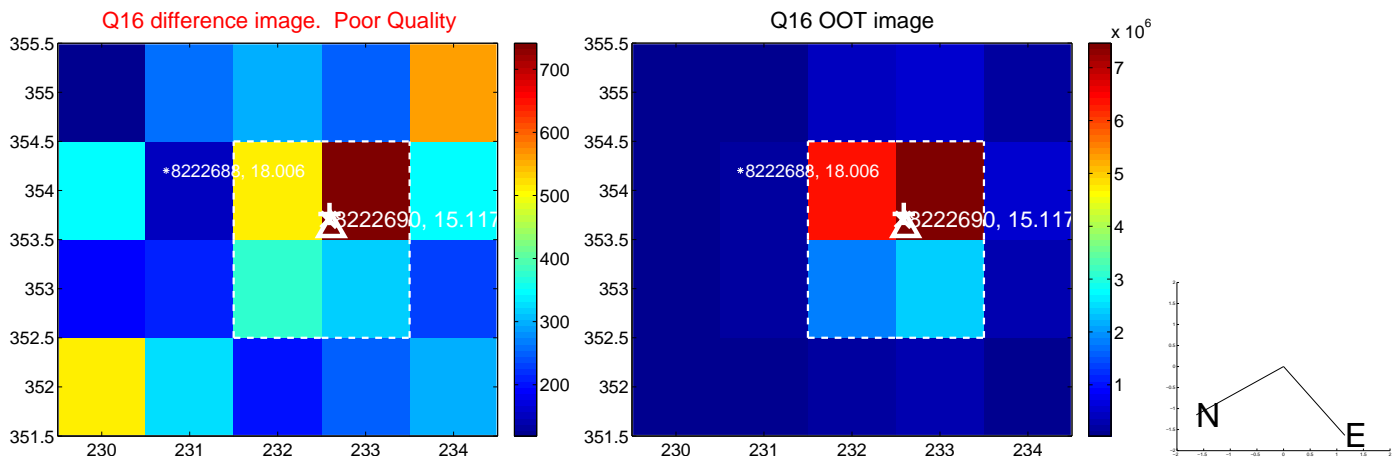
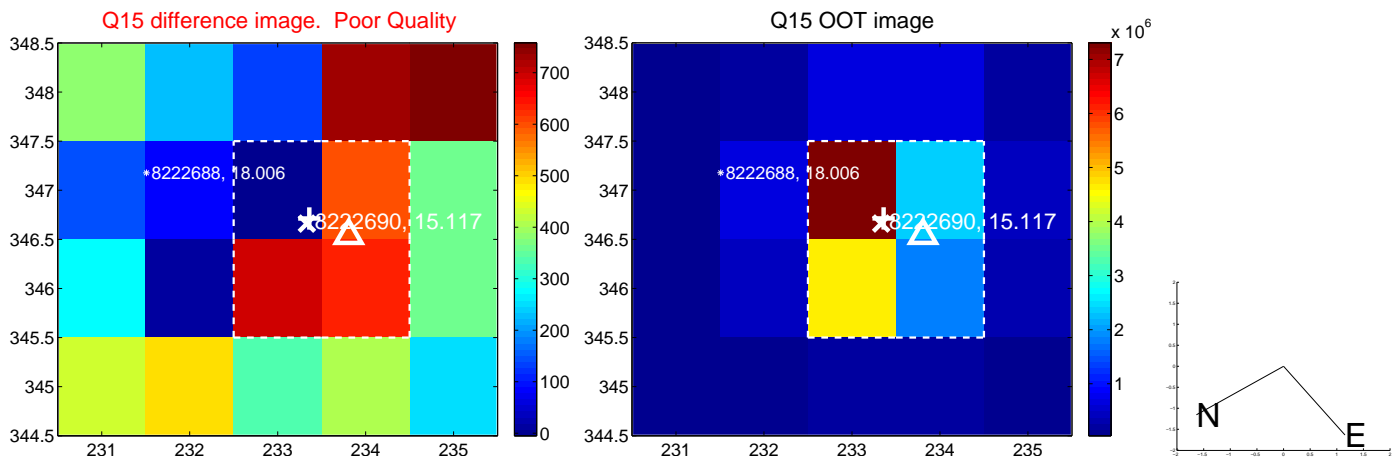
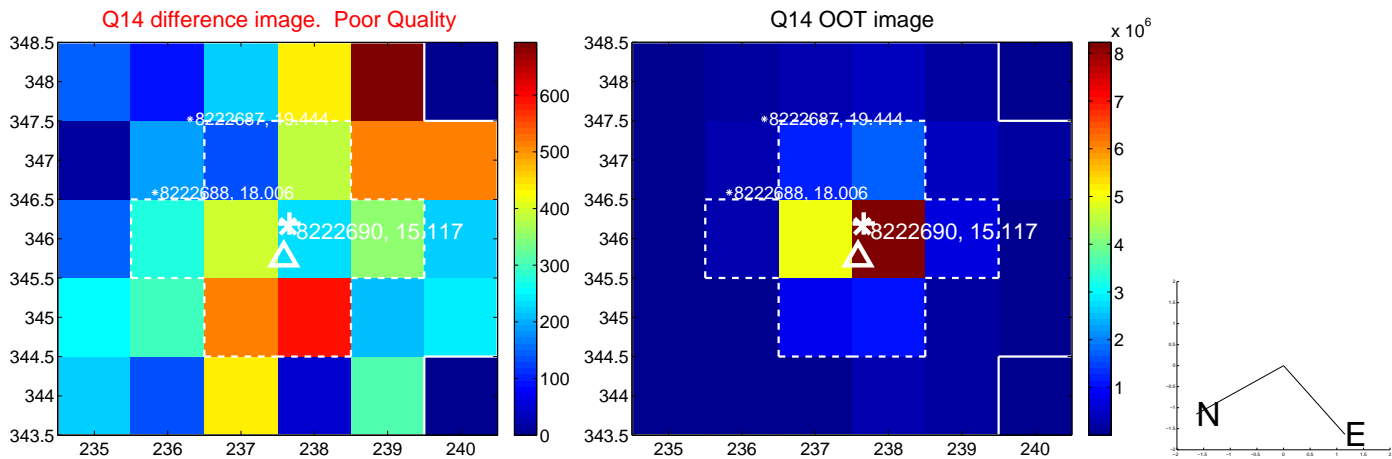
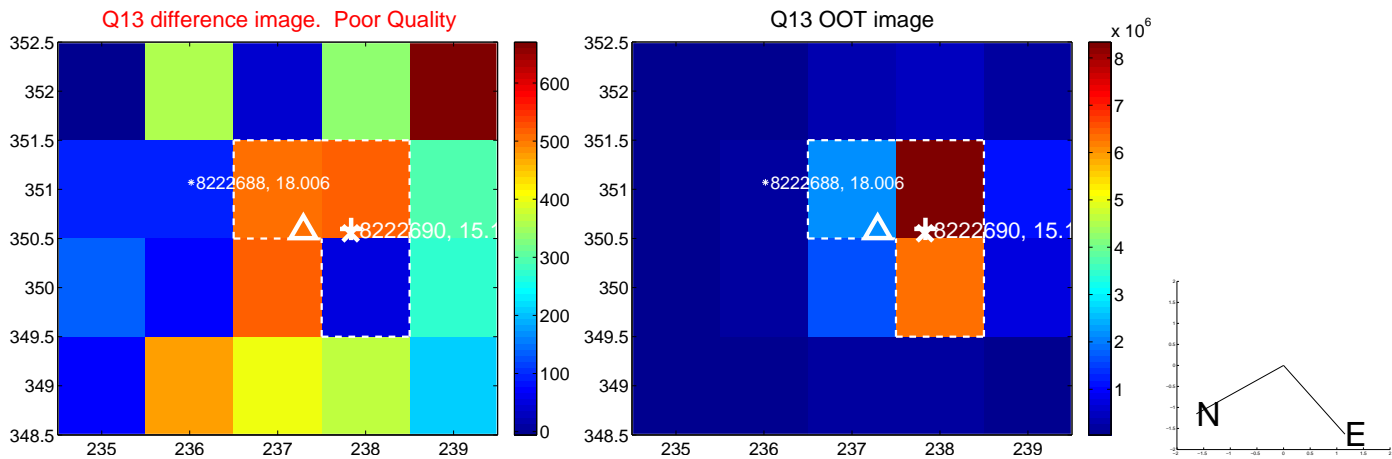
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



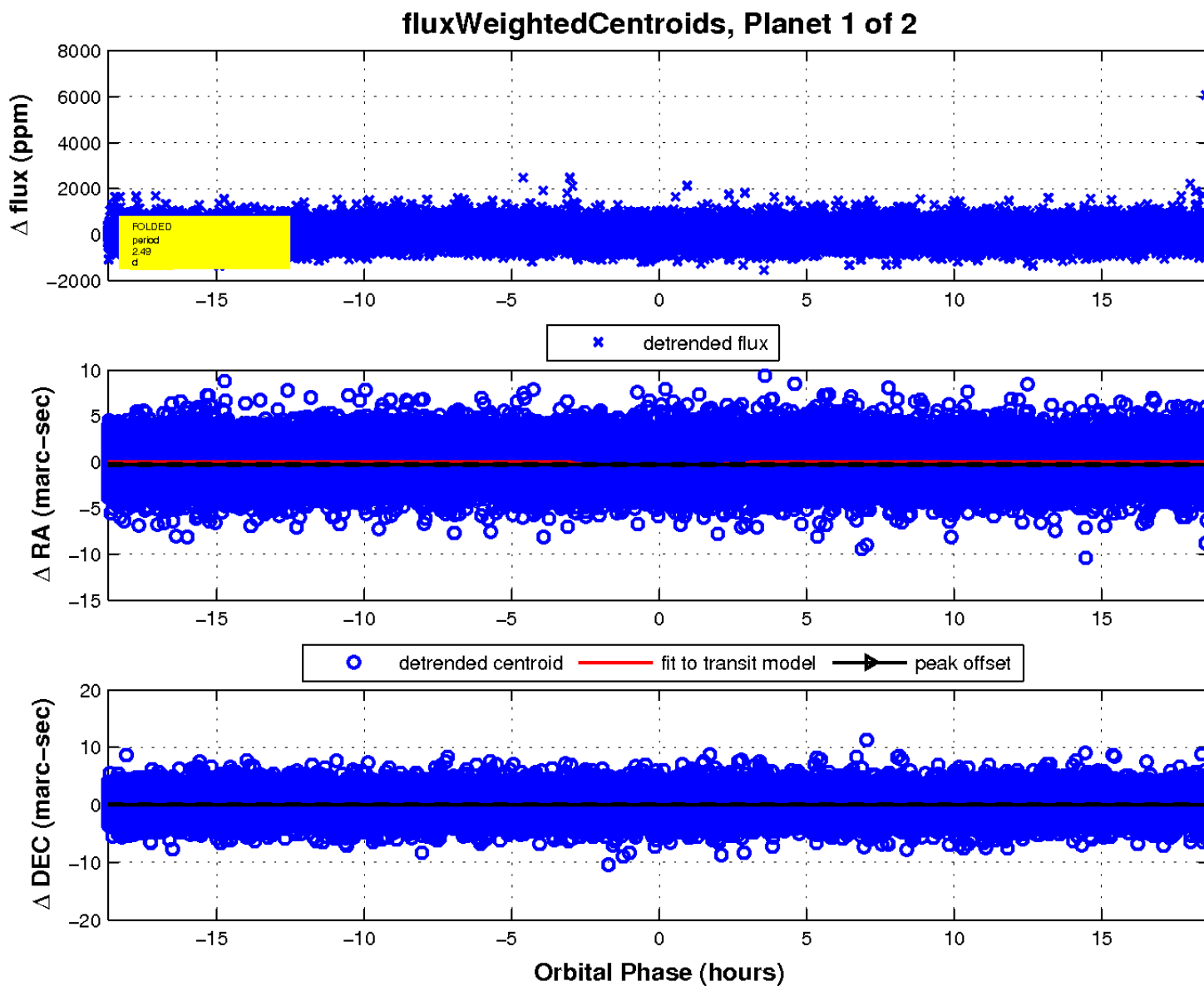
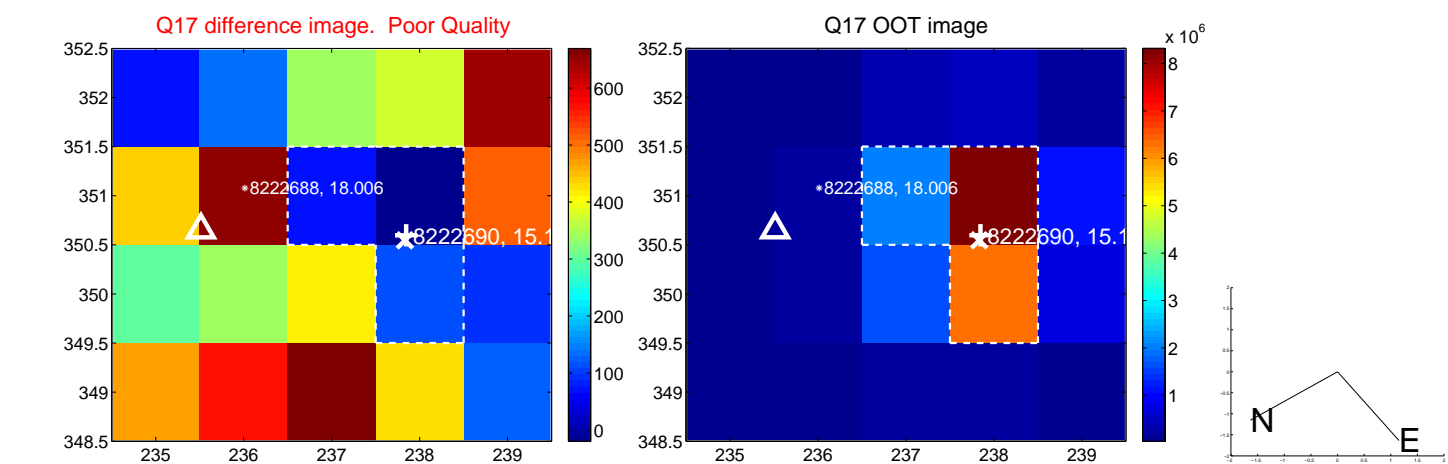
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

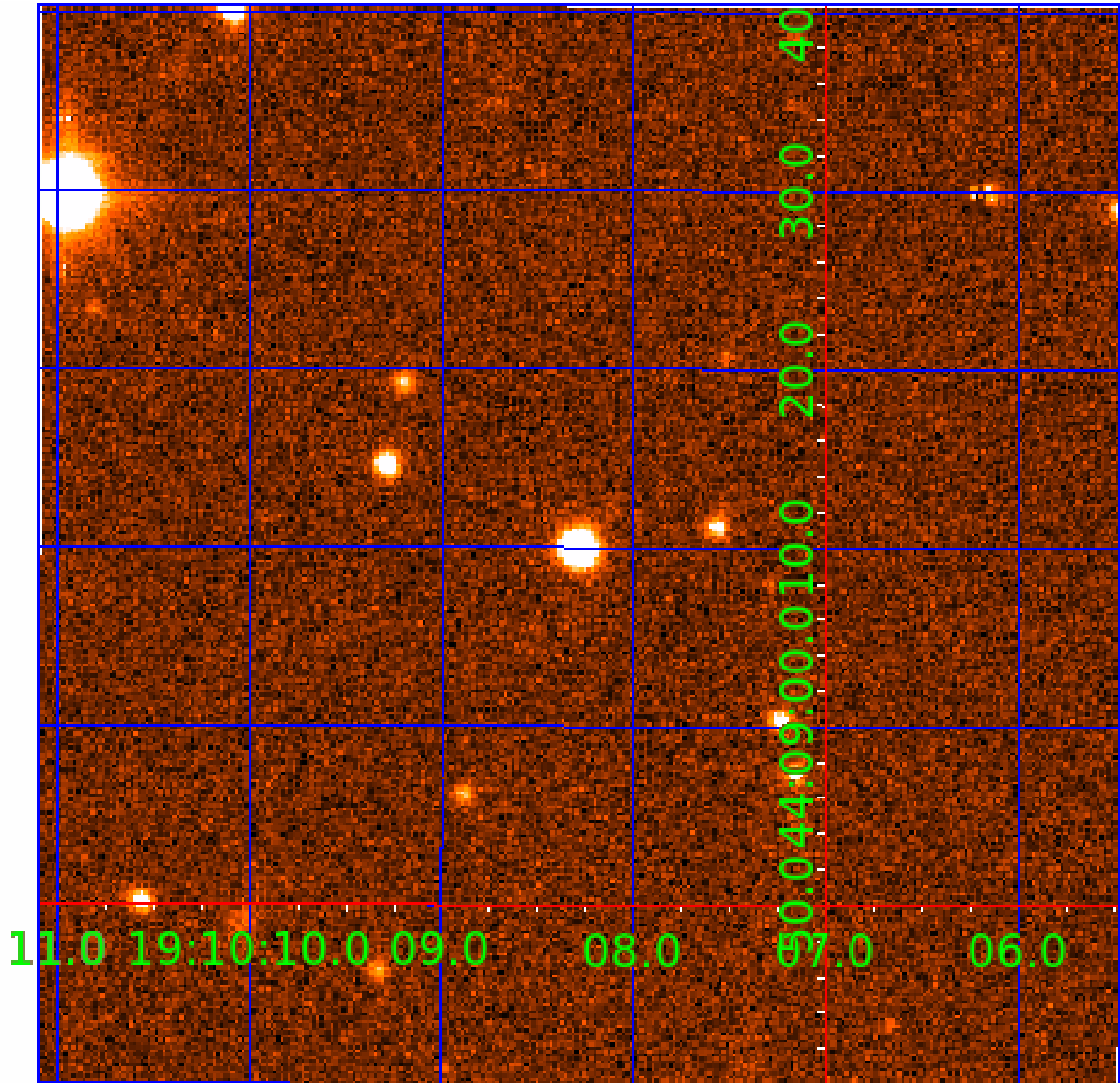


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 008222690

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})
008222690-01	OBS	No	2.490983	131.916114	45.4	6.228	9.3	8.5	0.94	6014	0.74	858.82
008222690-02	OBS	No	2.491026	132.862563	51.7	6.570	9.4	10.5	0.94	6014	0.77	858.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008222690-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
008222690-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—HALO_GHOST

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

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

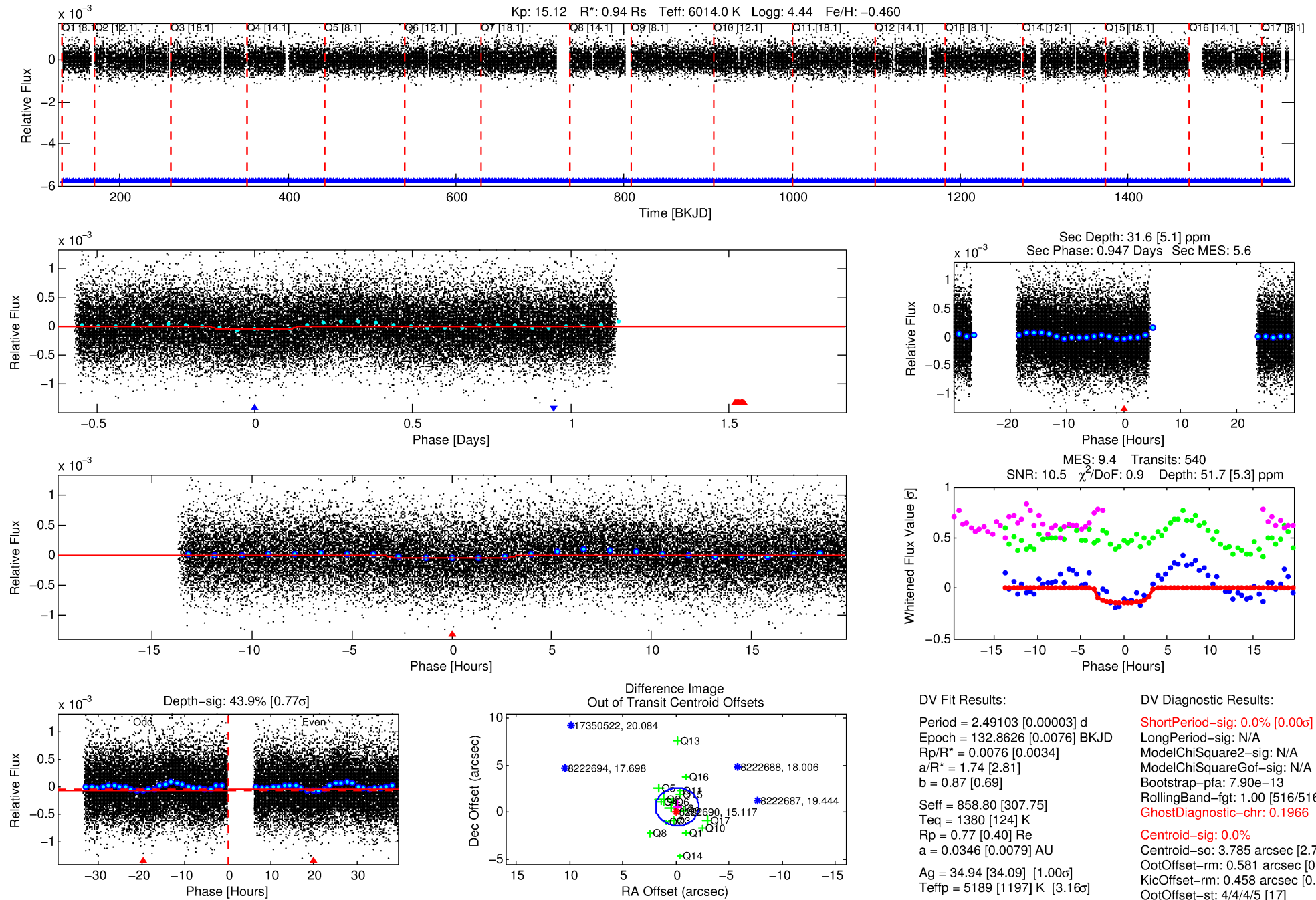
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 008222690-02

No Significant Match Found

DV One-Page Summary

KIC: 8222690 Candidate: 2 of 2 Period: 2.491 d



DV Fit Results:

Period = 2.49103 [0.00003] d
Epoch = 132.8626 [0.0076] BKJD
Rp/R* = 0.0076 [0.0034]
a/R* = 1.74 [2.81]
b = 0.87 [0.69]
Seff = 858.80 [307.75]
Teq = 1380 [124] K
Rp = 0.77 [0.40] Re
a = 0.0346 [0.0079] AU
Ag = 34.94 [34.09] [1.00 σ]
Teffp = 5189 [1197] K [3.16 σ]

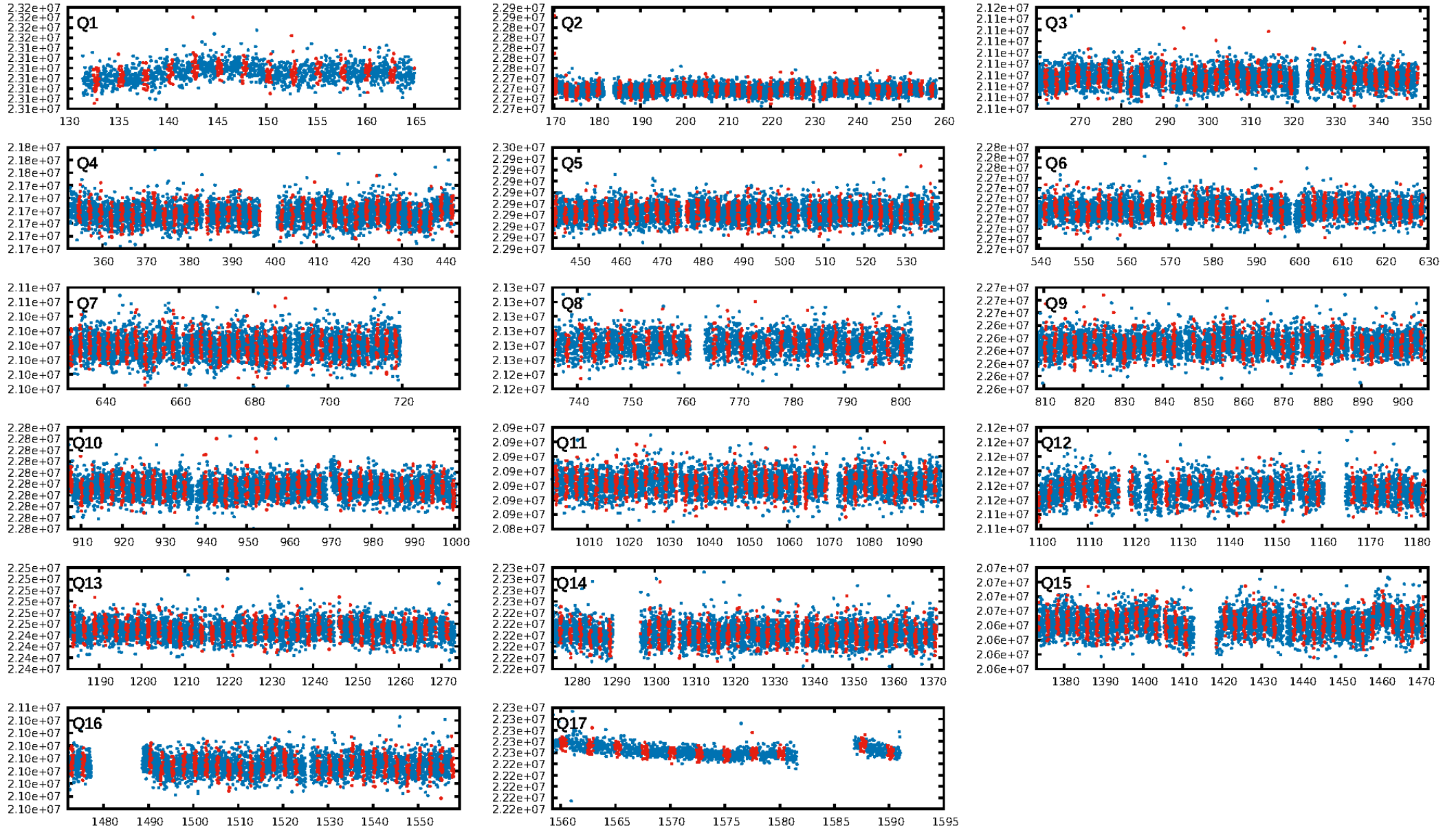
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 7.90e-13
RollingBand-fgt: 1.00 [516/516]
GhostDiagnostic-chr: 0.1966
Centroid-sig: 0.0%
Centroid-so: 3.785 arcsec [2.78 σ]
OotOffset-rm: 0.581 arcsec [0.87 σ]
KicOffset-rm: 0.458 arcsec [0.79 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.06 [1/17]
DiffImageOverlap-fno: 1.00 [17/17]

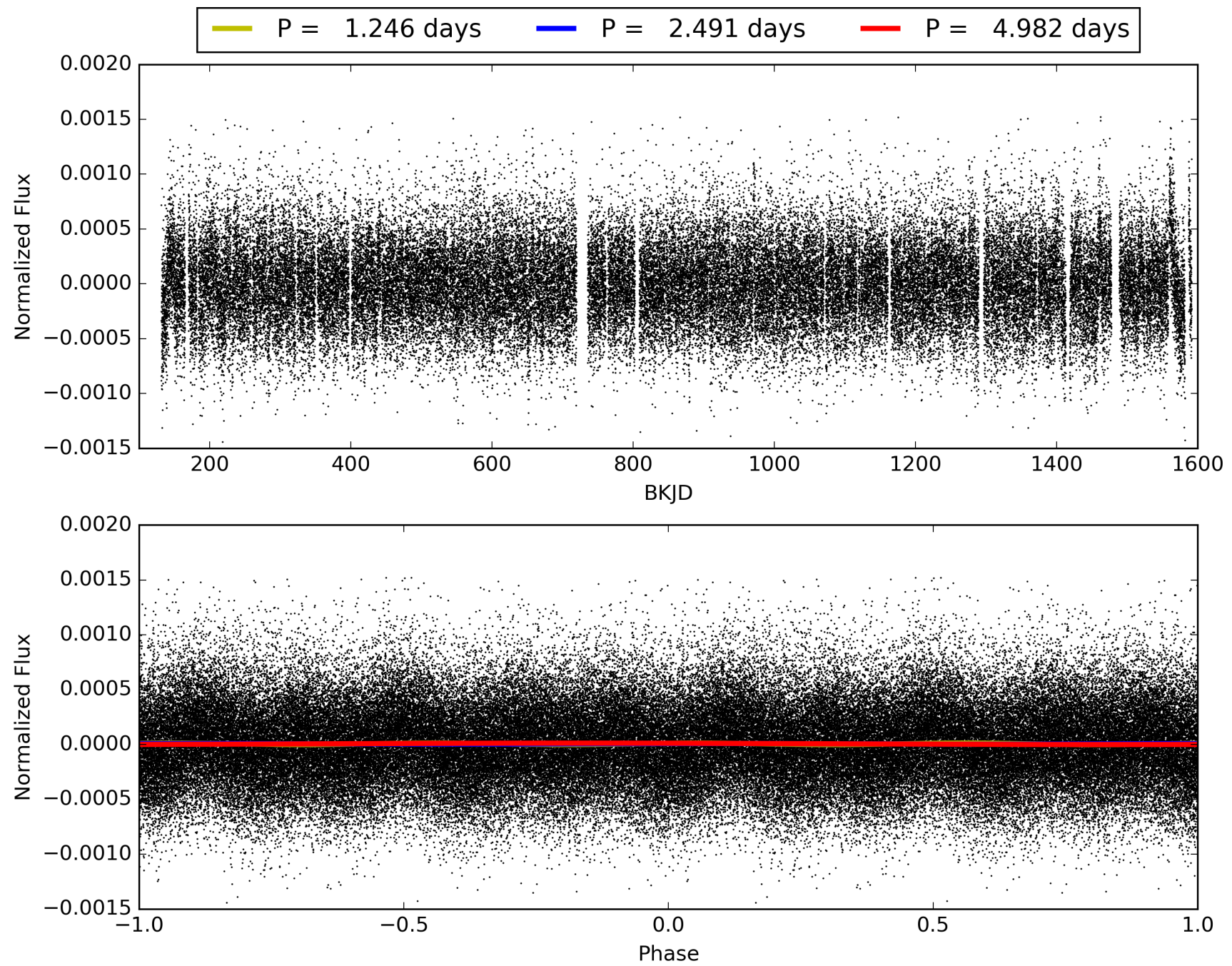
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:04:37 Z

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

TCE 008222690-02, PDC Light Curves

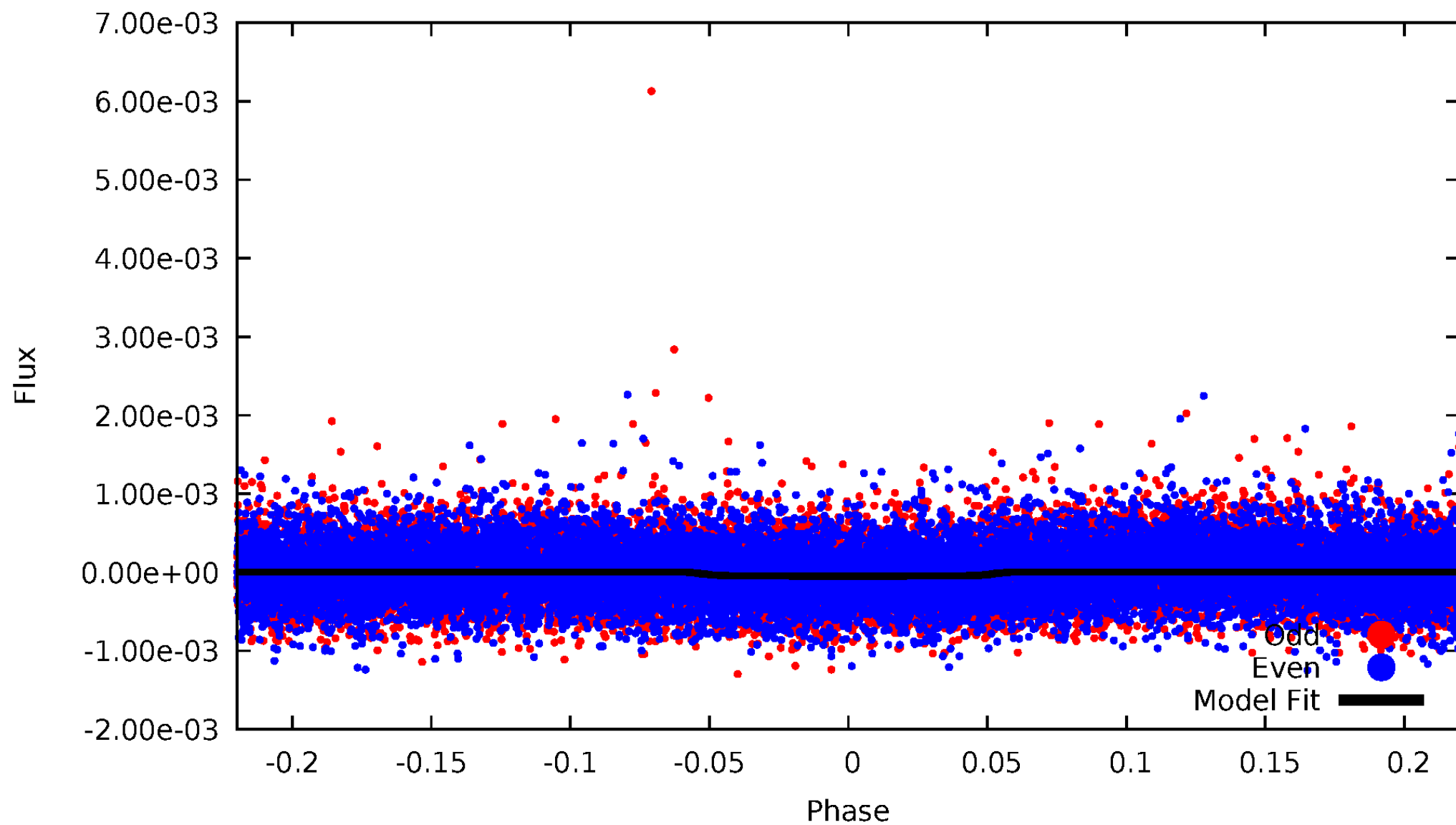


TCE 008222690-02



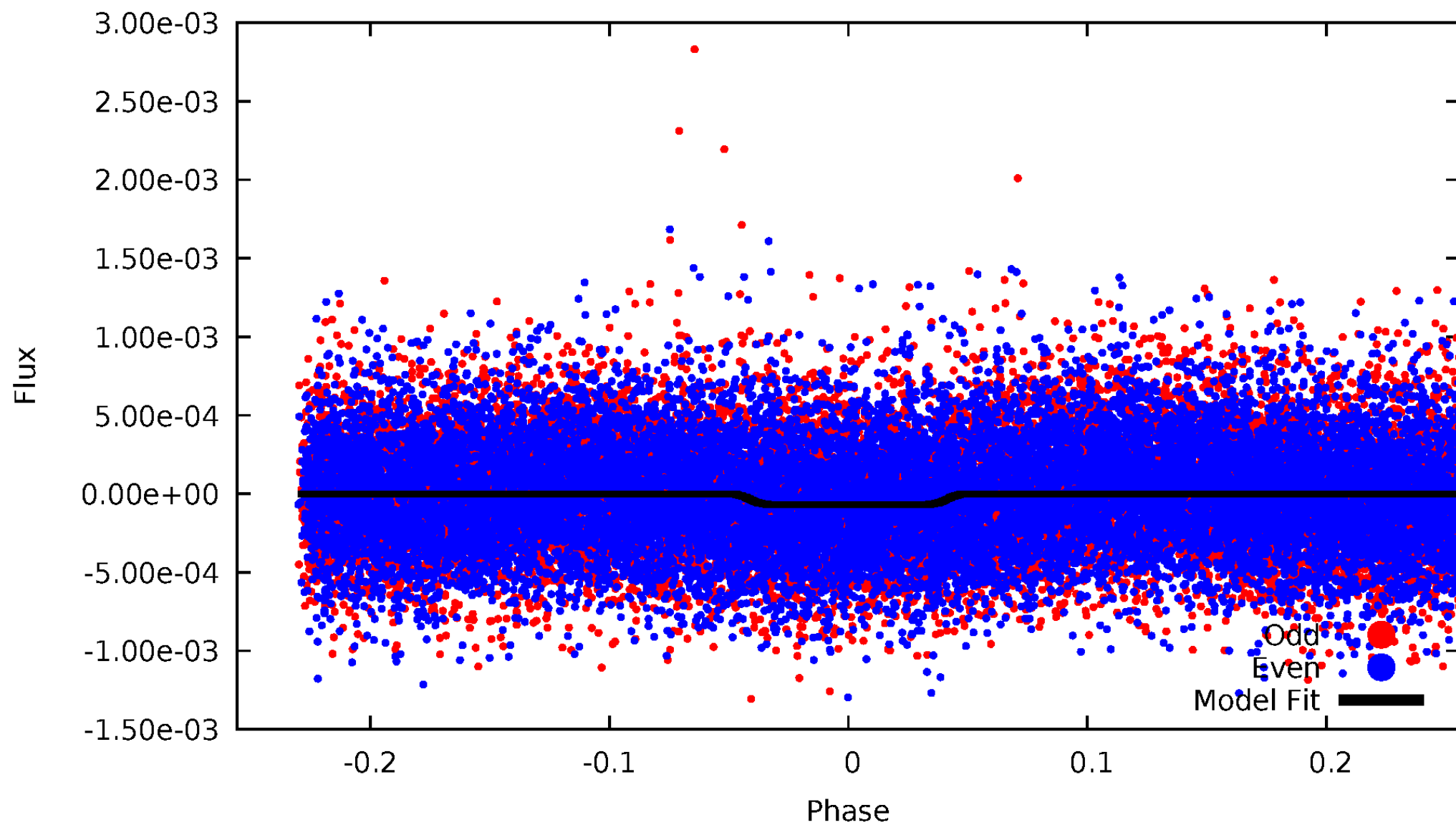
DV Odd/Even

TCE 008222690-02



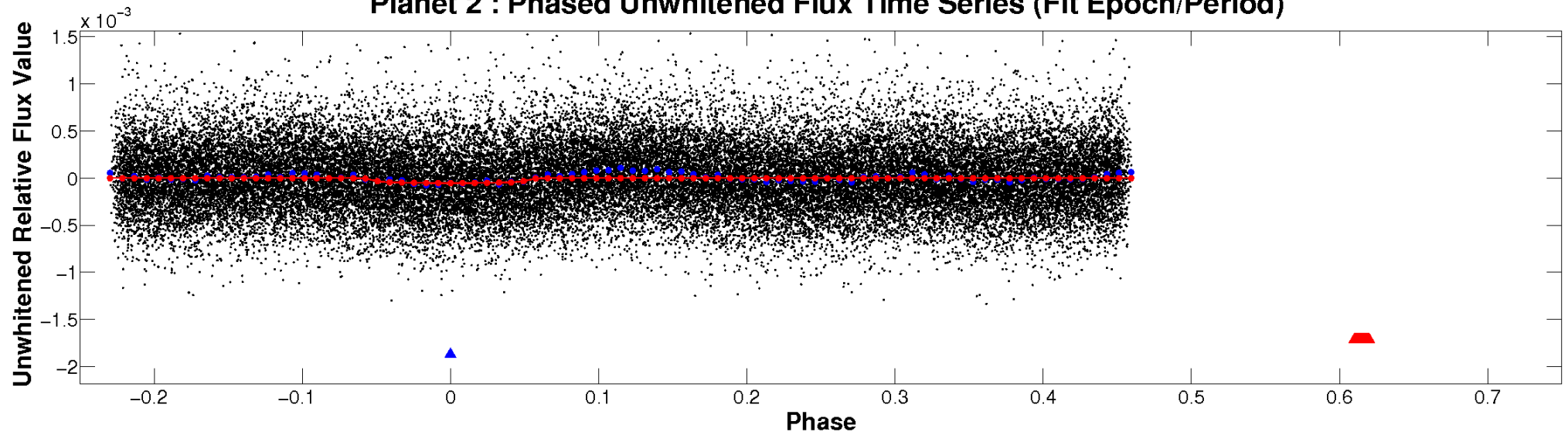
ALT Odd/Even

TCE 008222690-02

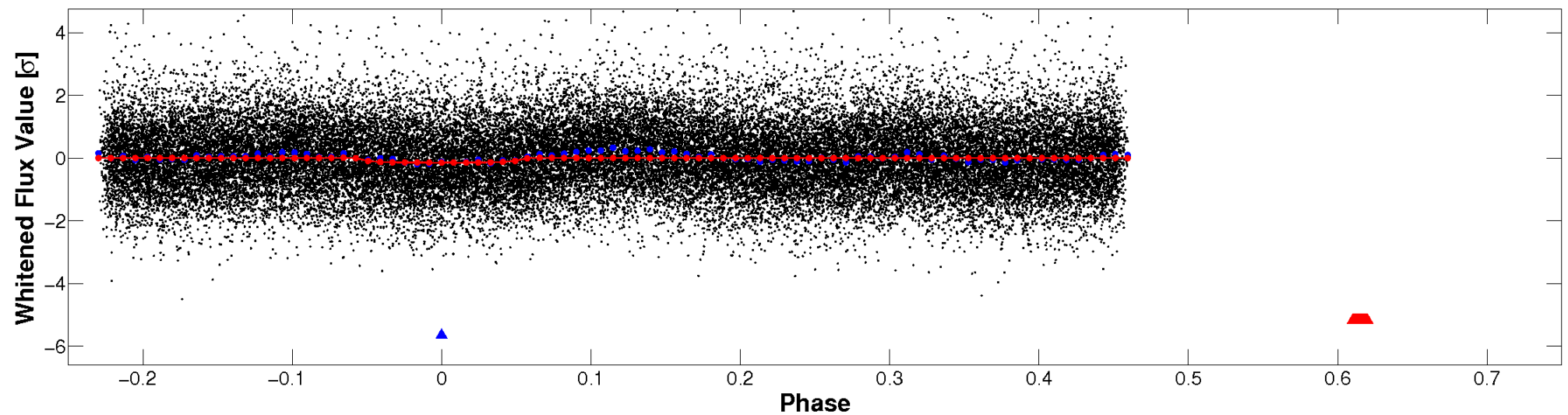


Non-Whitened Vs. Whitened Light Curve

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

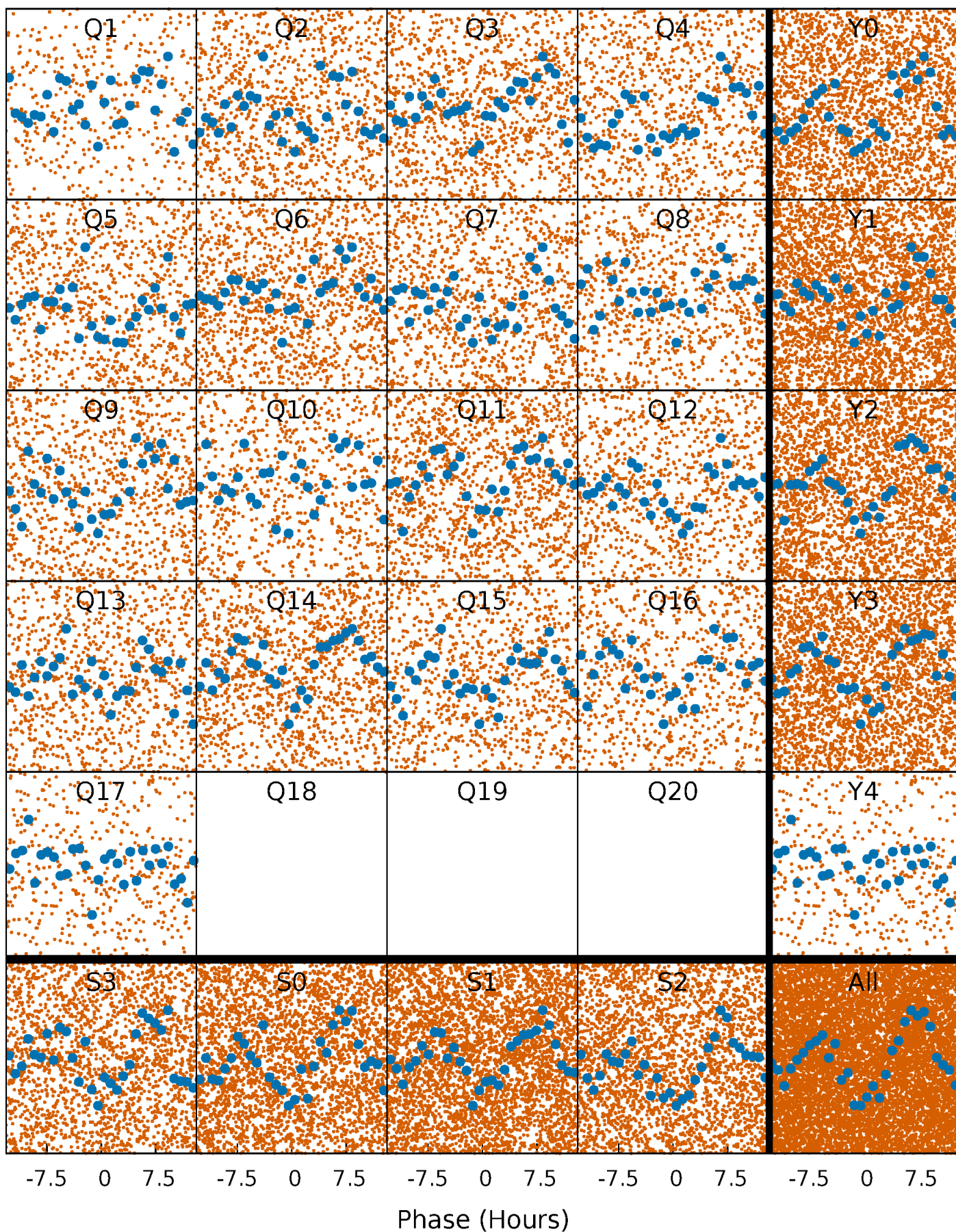


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



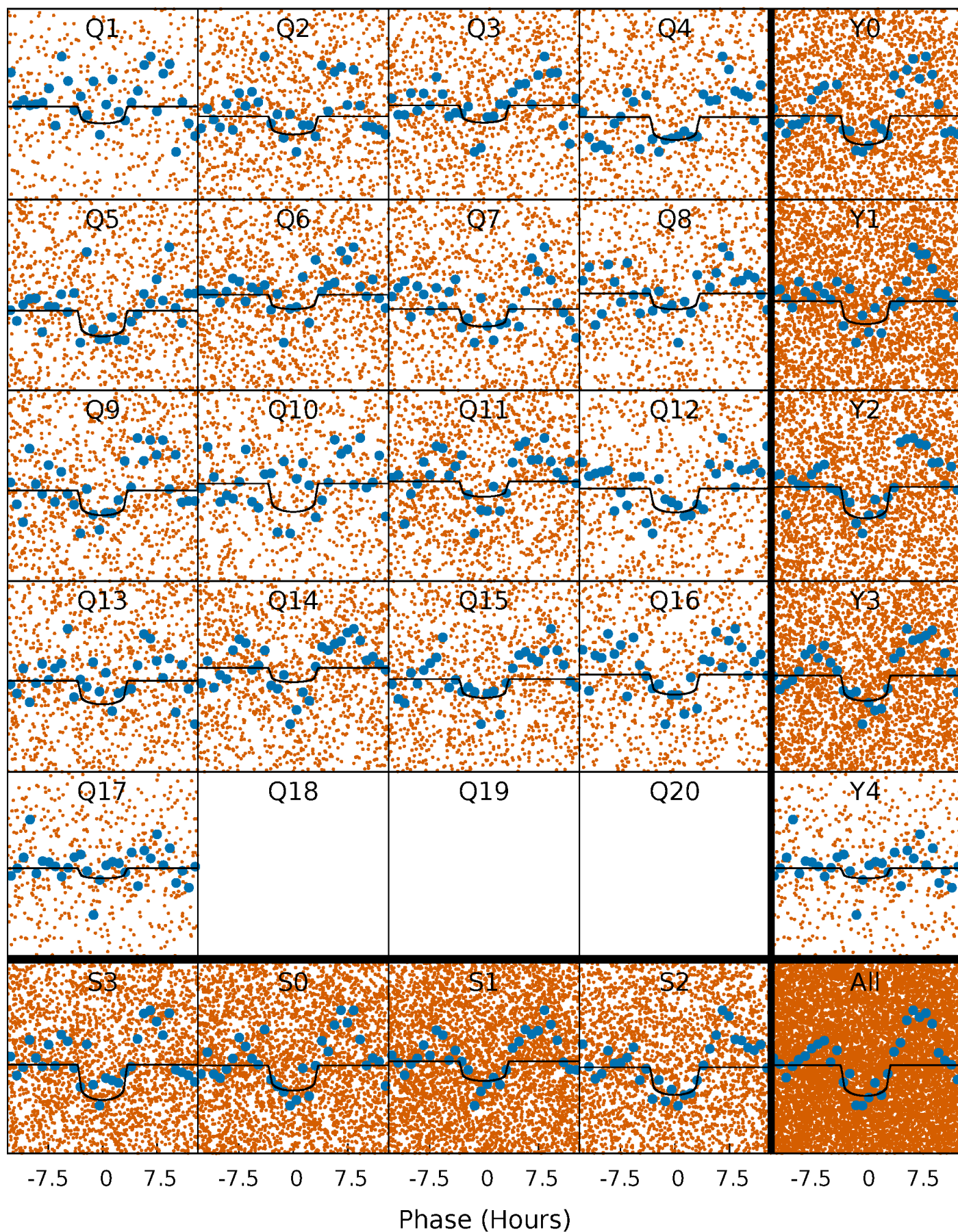
PDC Quarter-Phased Transit Curves

TCE 008222690-02 P= 2.491026 Days $T_0=132.862563$ (BKJD)



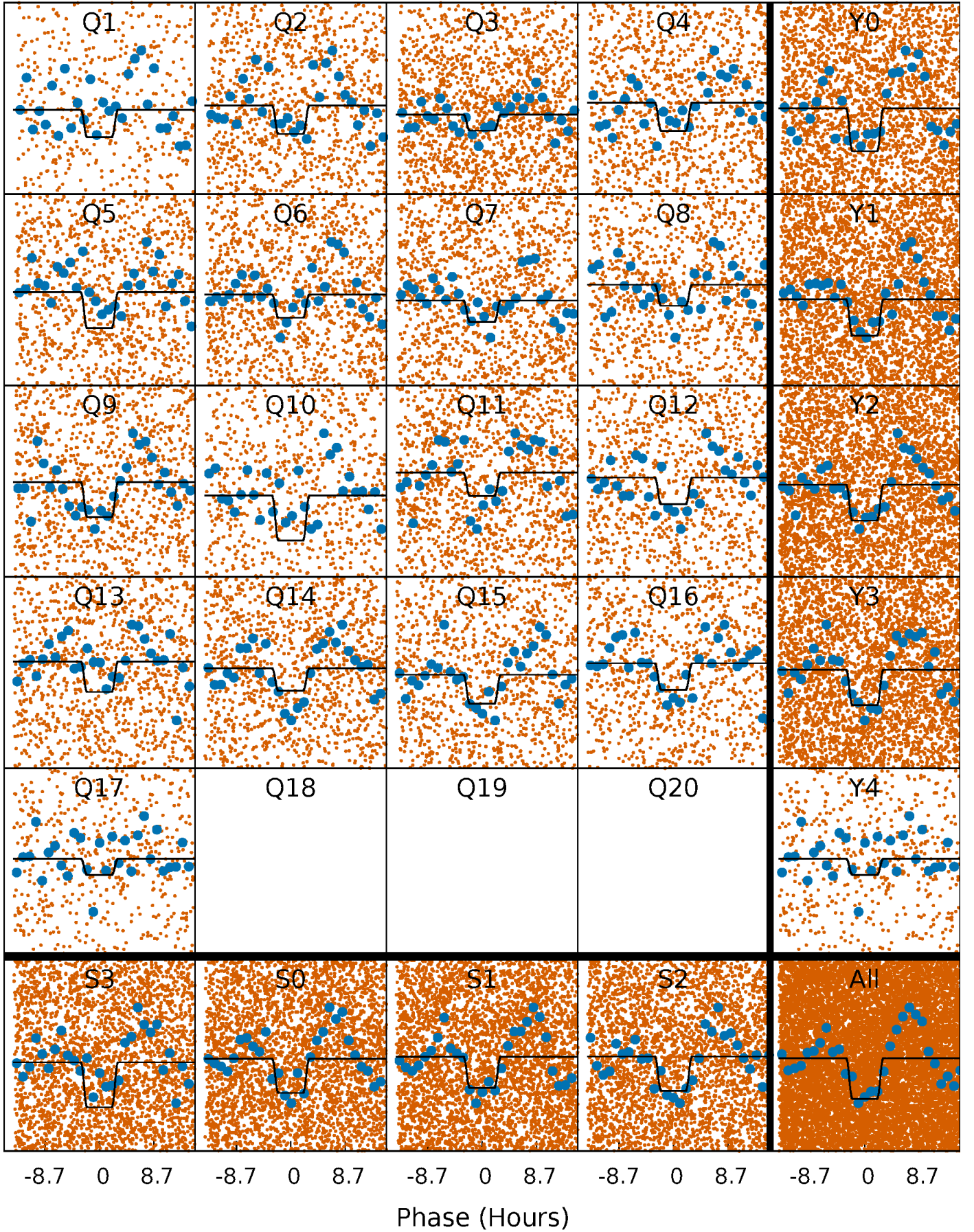
DV Quarter-Phased Transit Curves

TCE 008222690-02 P= 2.491026 Days $T_0=132.862563$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

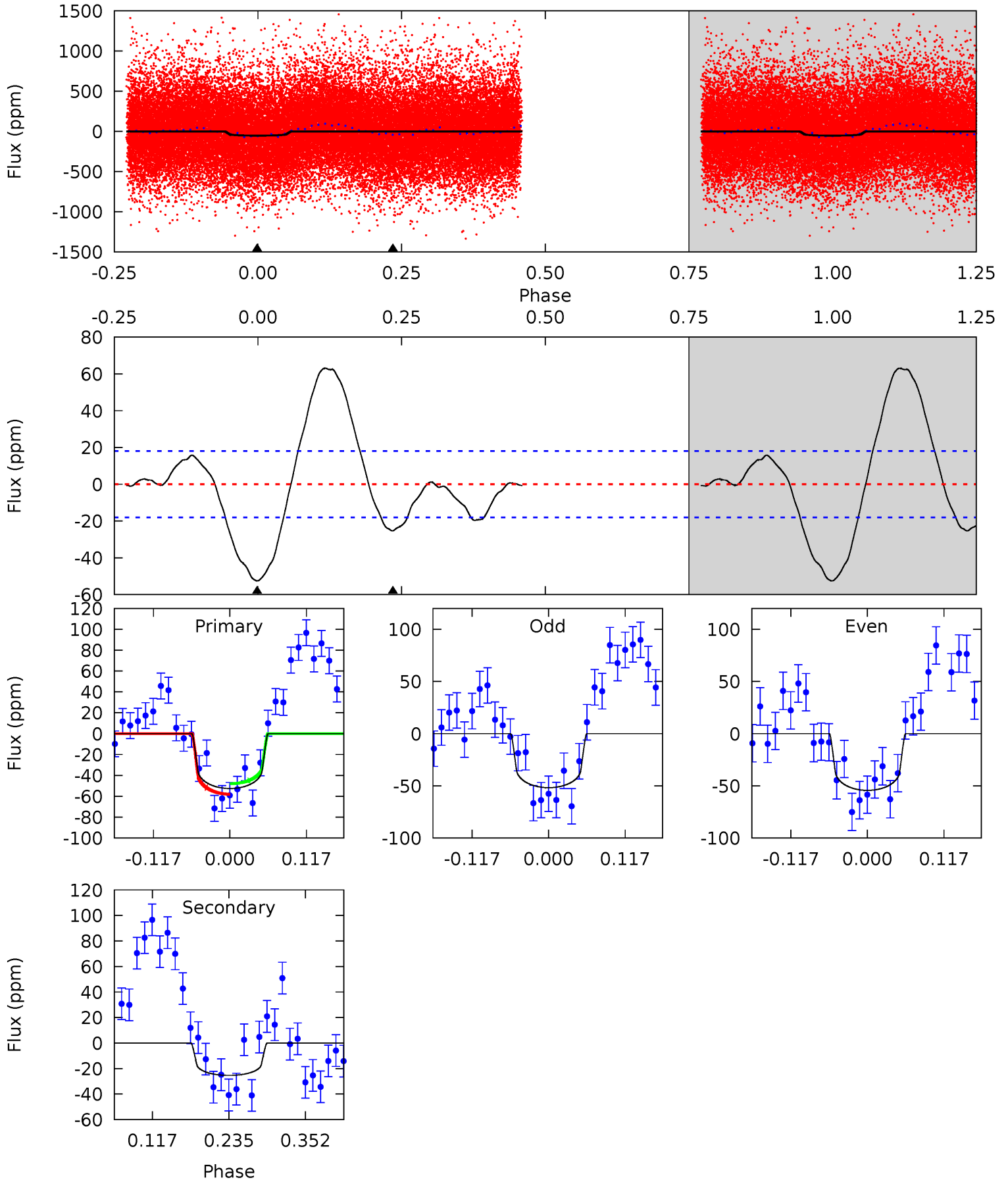
TCE 008222690-02 P= 2.491023 Days $T_0=132.866730$ (BKJD)



DV Model-Shift Uniqueness Test

008222690-02, P = 2.491026 Days, E = 130.371537 Days

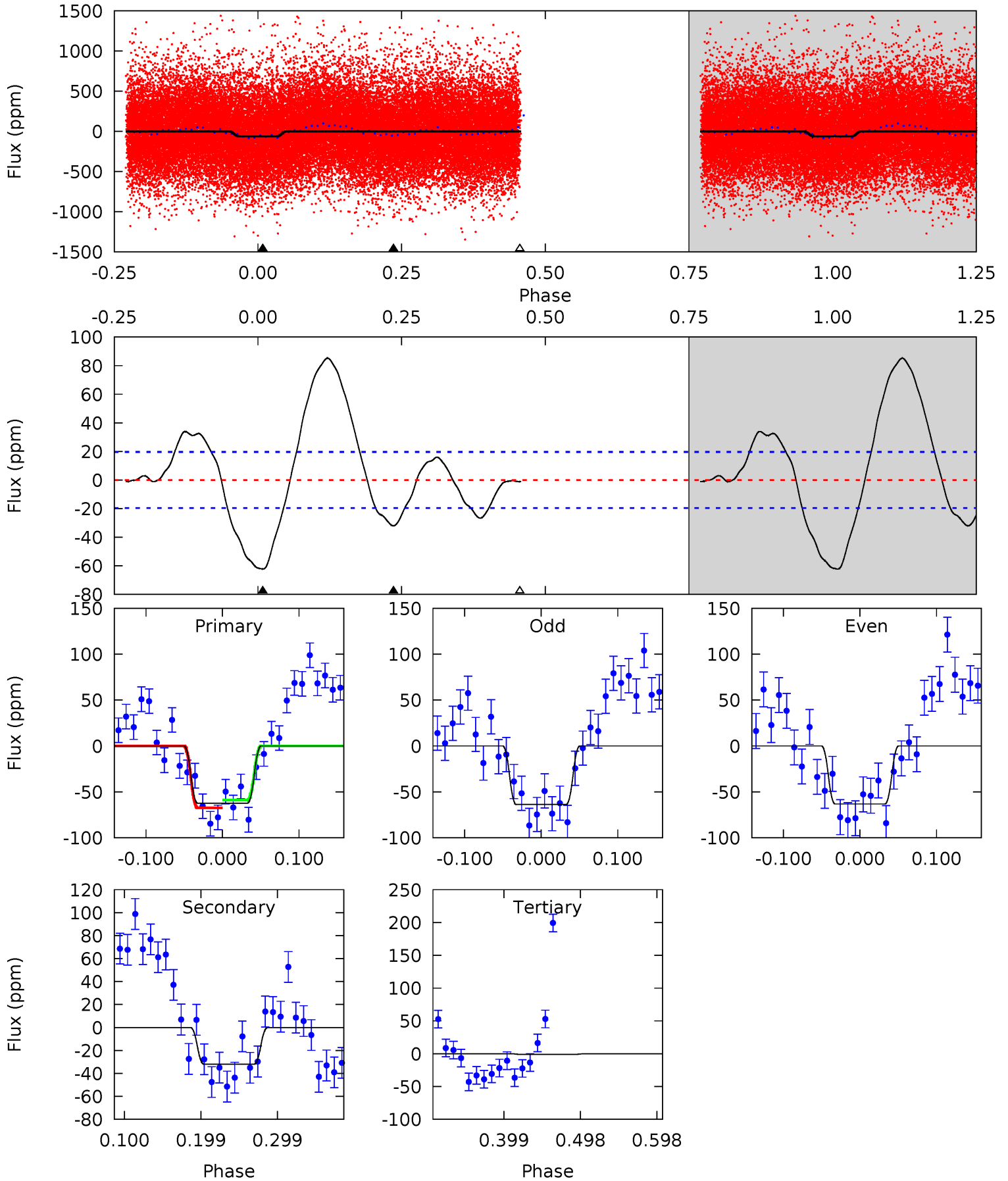
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.2	6.37	0	0	4.53	1.57	2.73	13.2	13.2	6.37	6.37	0.33	0.92	0.55	1.25



Alt Model-Shift Uniqueness Test

008222690-02, P = 2.491023 Days, E = 130.375707 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.5	7.48	0.26	0	4.57	1.65	6.81	14.3	14.5	7.22	7.48	0.07	0.97	0.58	0.99



Stellar Parameters For KIC 008222690

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6014^{+179}_{-179}	$4.444^{+0.101}_{-0.188}$	$-0.460^{+0.300}_{-0.300}$	$0.936^{+0.247}_{-0.133}$	$0.889^{+0.110}_{-0.090}$	$1.527^{+0.662}_{-0.742}$
	+3%/-3%	+2%/-4%	+65%/-65%	+26%/-14%	+12%/-10%	+43%/-49%
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 008222690-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-25 ± 4	$0.80^{+0.40}_{-0.35}$	1953^{+129}_{-108}	4940^{+1555}_{-723}	25^{+56}_{-14}
Alt.	-32 ± 4	$0.88^{+0.38}_{-0.36}$	1941^{+130}_{-97}	5023^{+1305}_{-700}	27^{+51}_{-14}

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

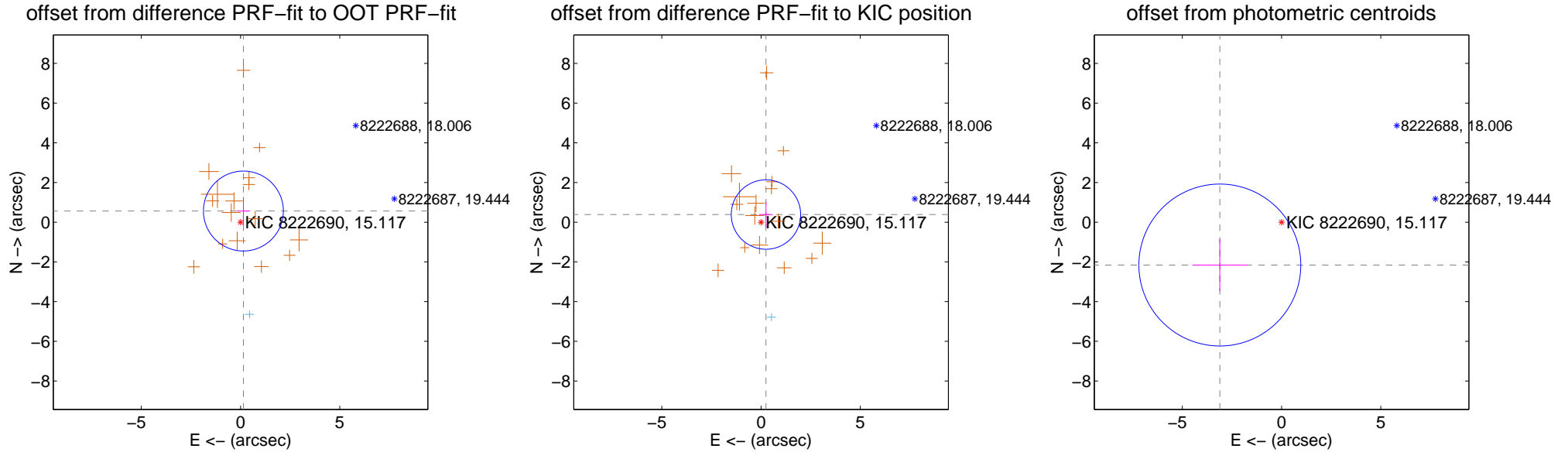
DV Centroid Data

Supplemental centroid analysis for 008222690-02. Kepler magnitude: 15.12. Transit SNR 10.55

There are 1 quarters with good PRF difference image offsets

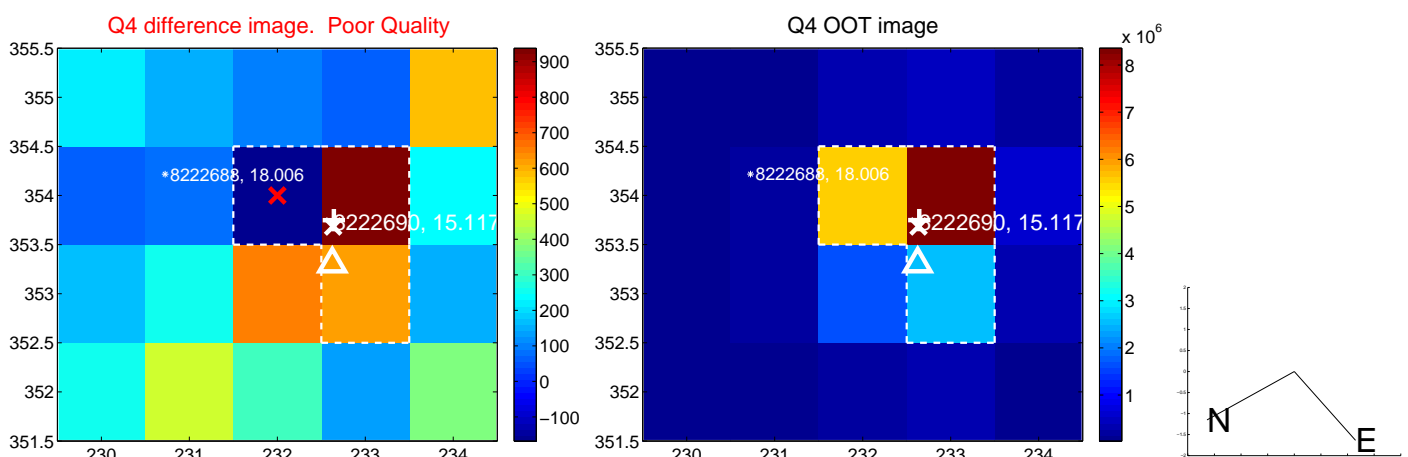
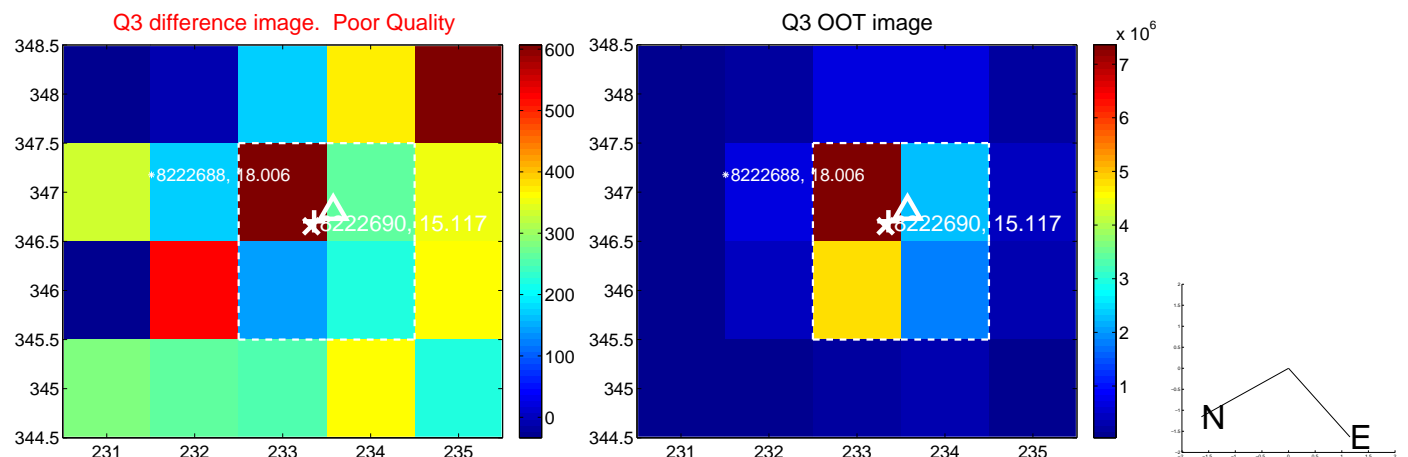
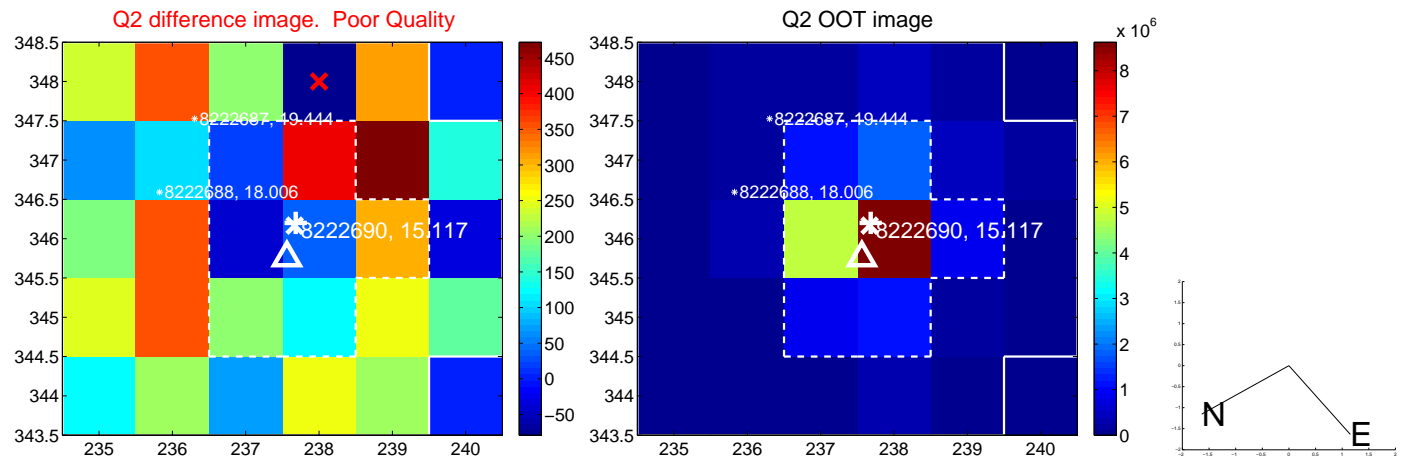
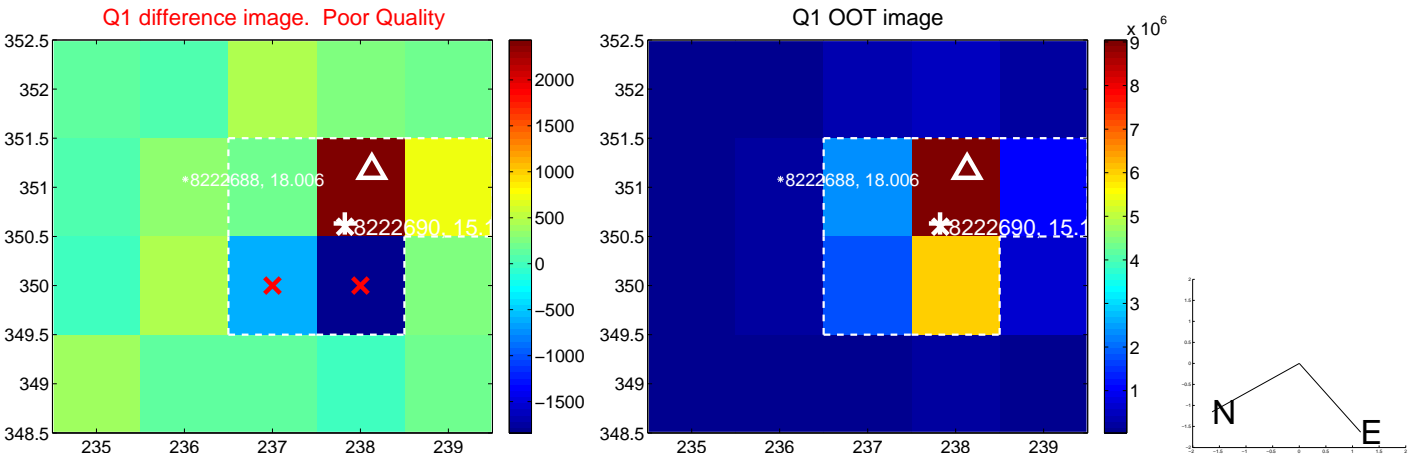
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.581 ± 0.671	0.87	-0.144 ± 0.332	0.563 ± 0.697
PRF-fit source offset from KIC position	0.458 ± 0.583	0.79	-0.247 ± 0.349	0.386 ± 0.655
photometric centroid source offset	3.78 ± 1.36	2.78	3.11 ± 1.38	-2.16 ± 1.32

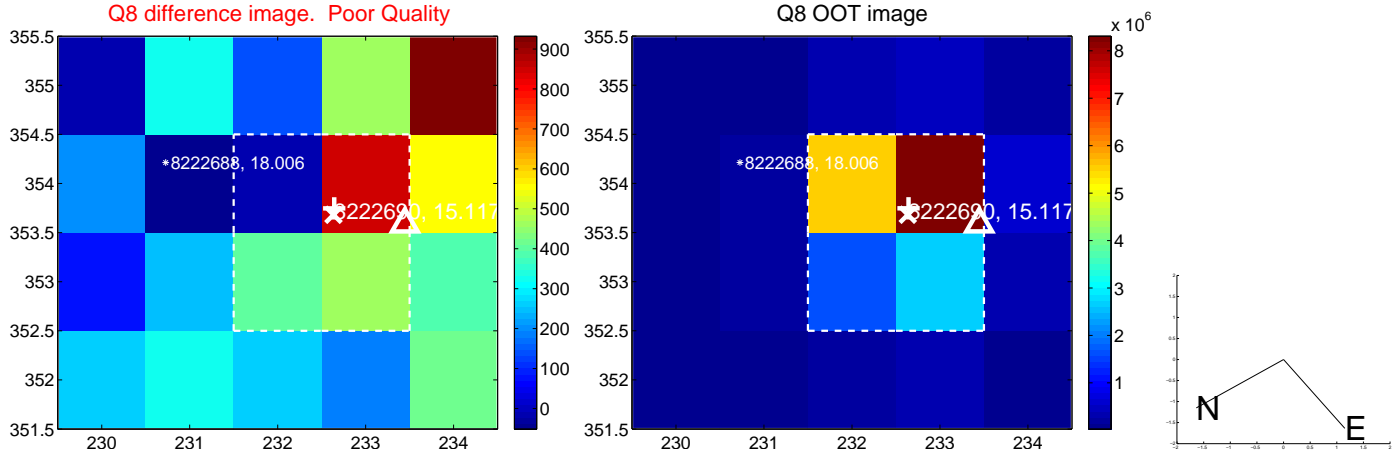
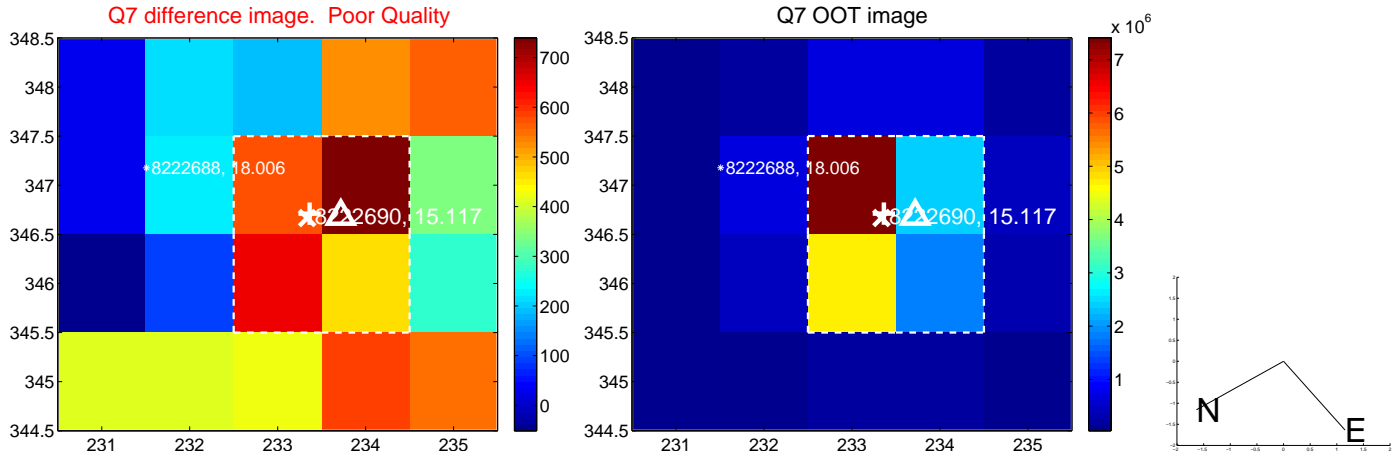
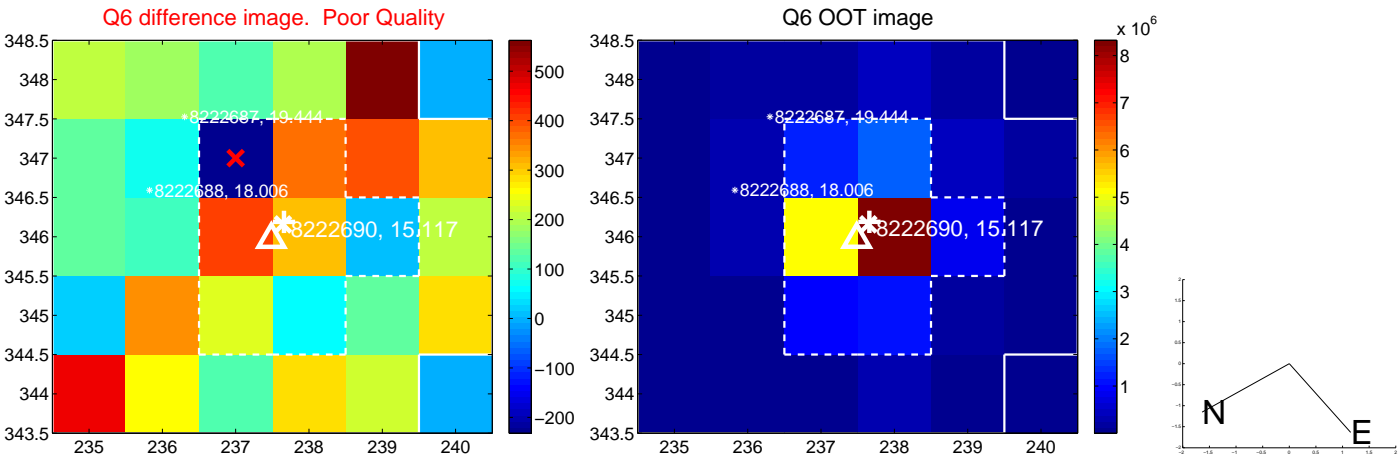
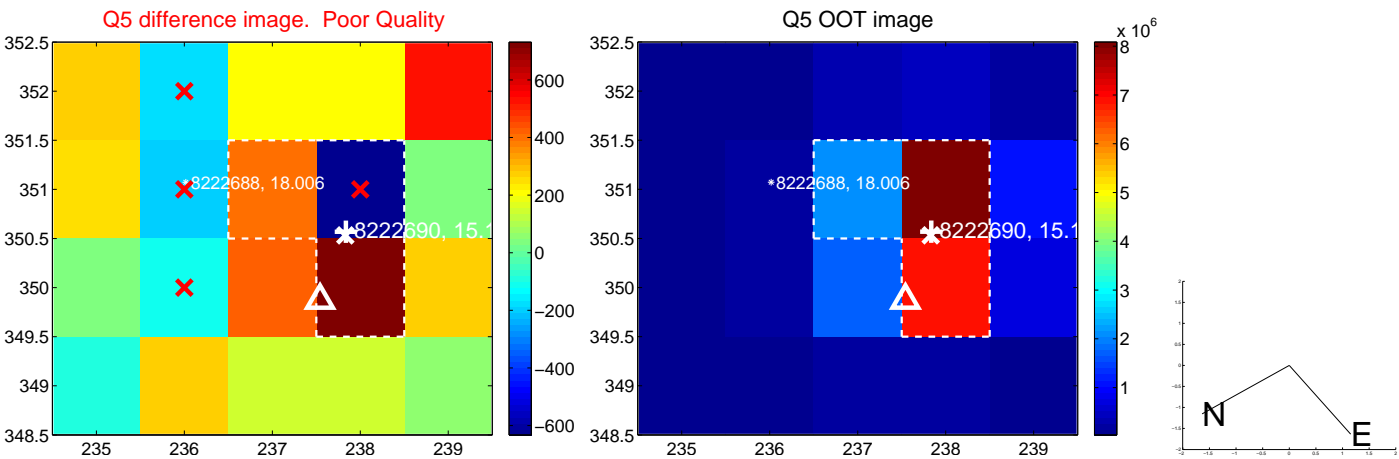


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

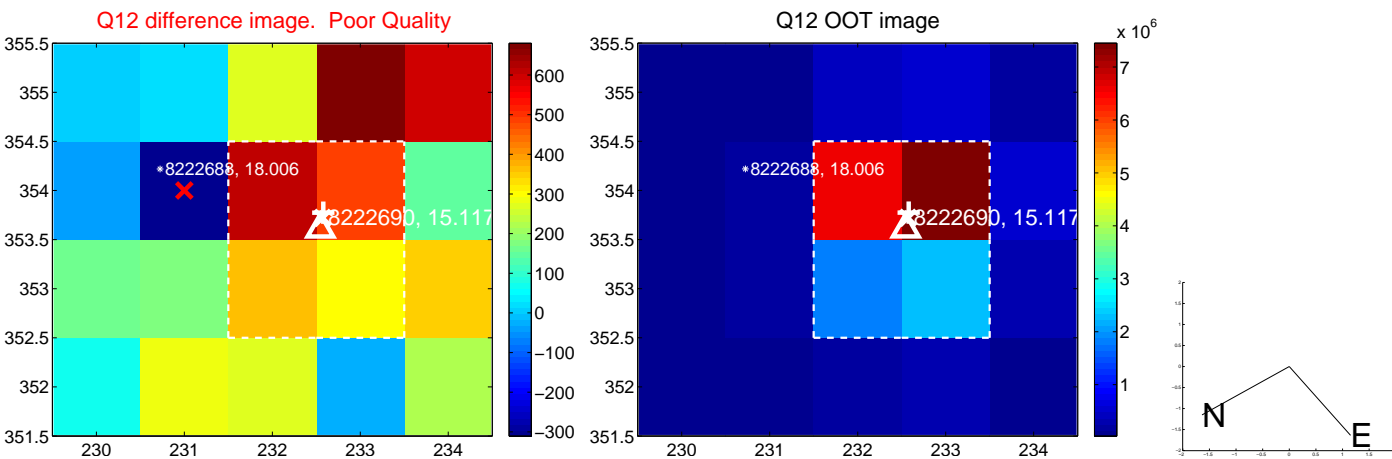
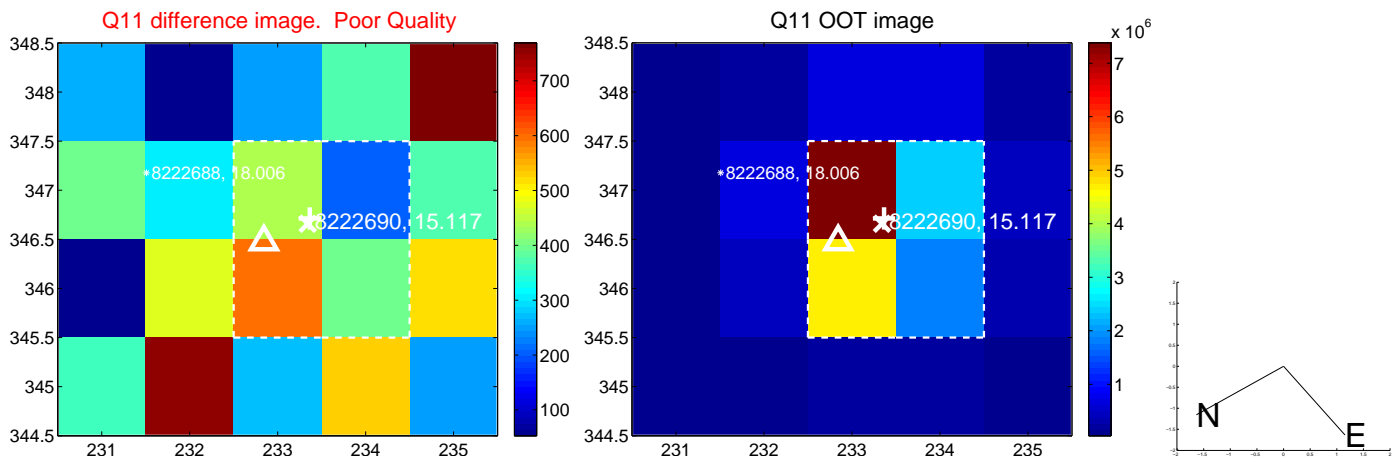
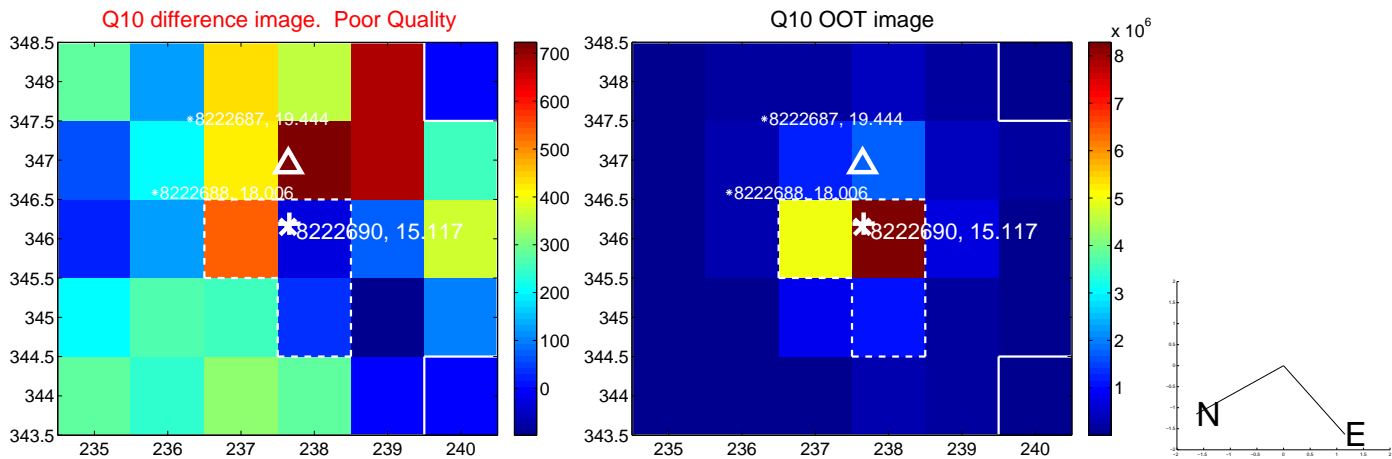
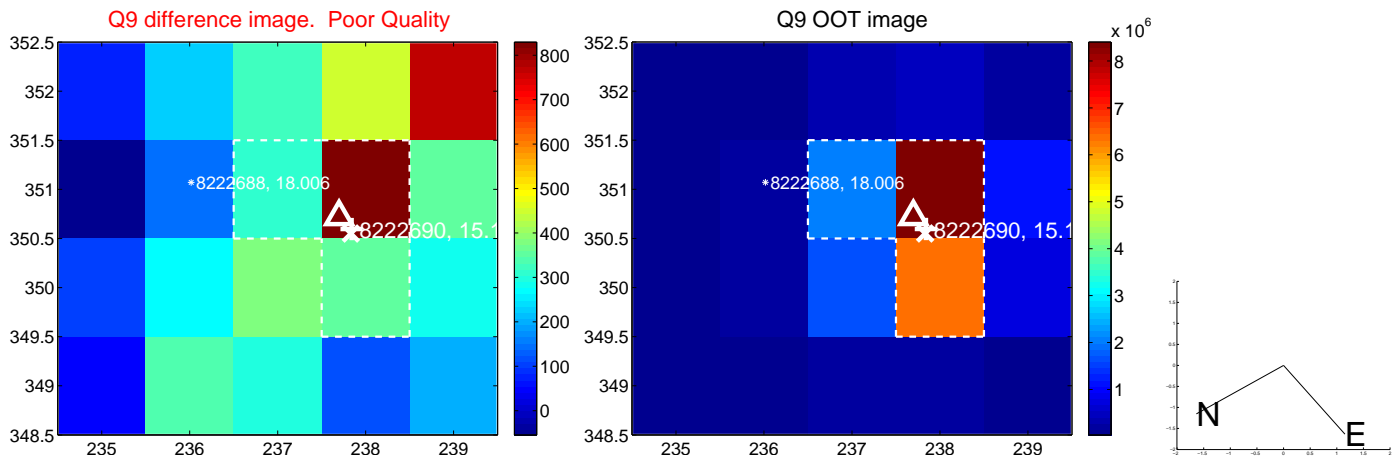
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



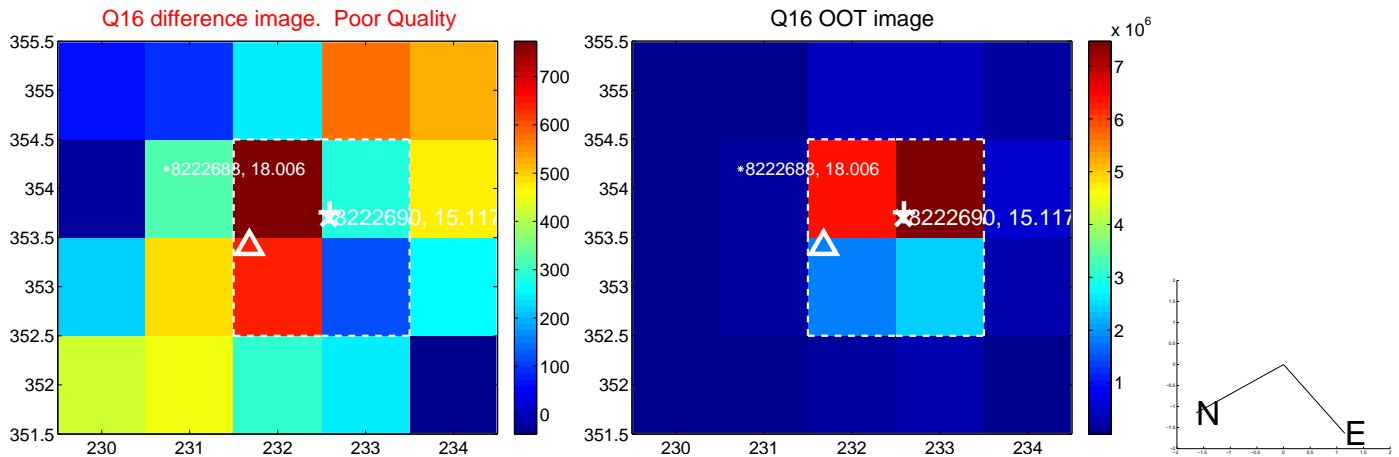
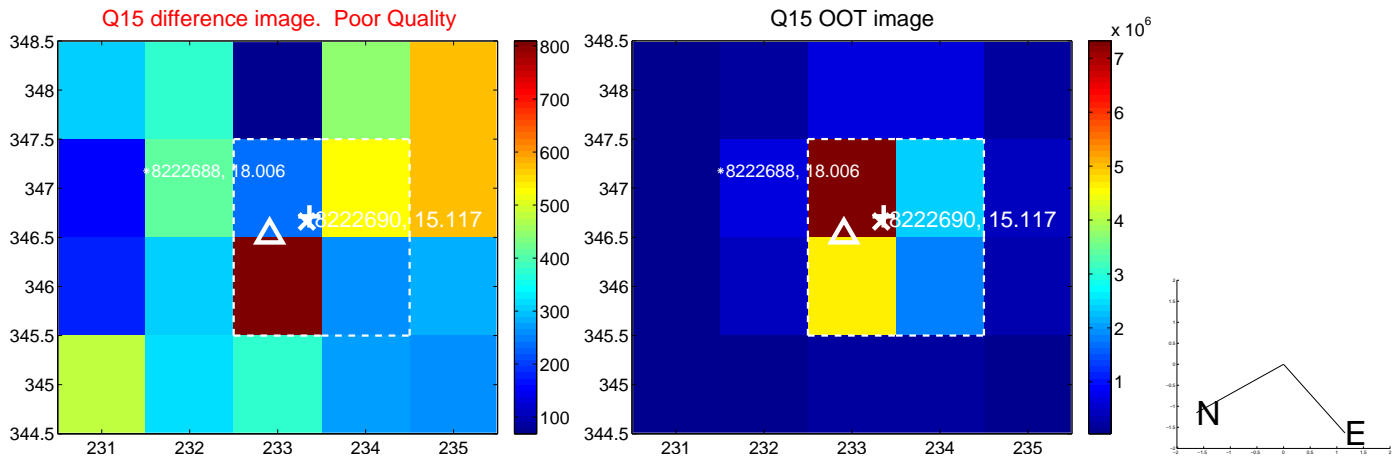
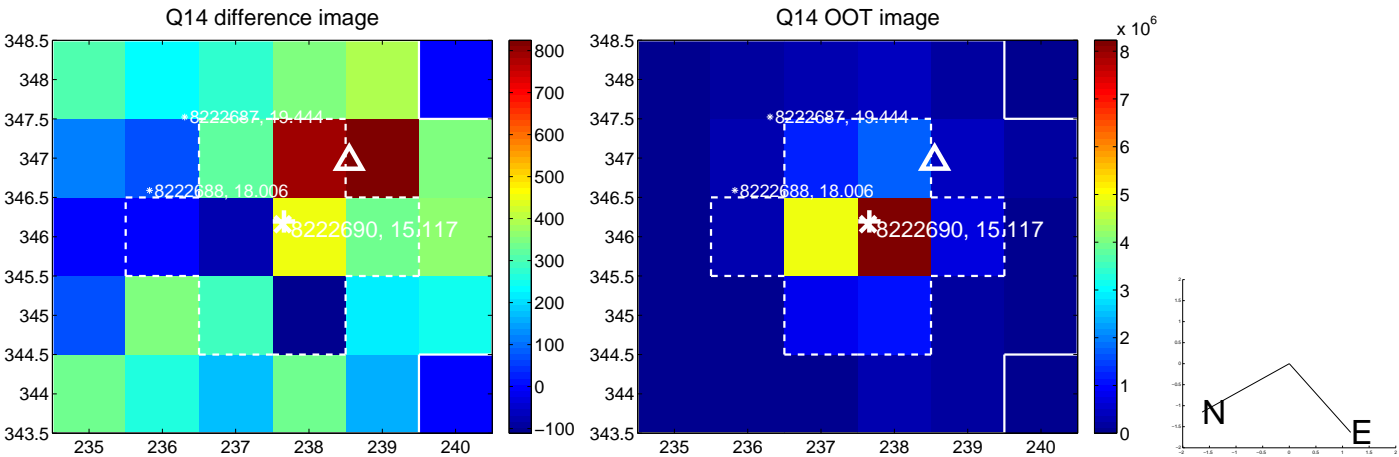
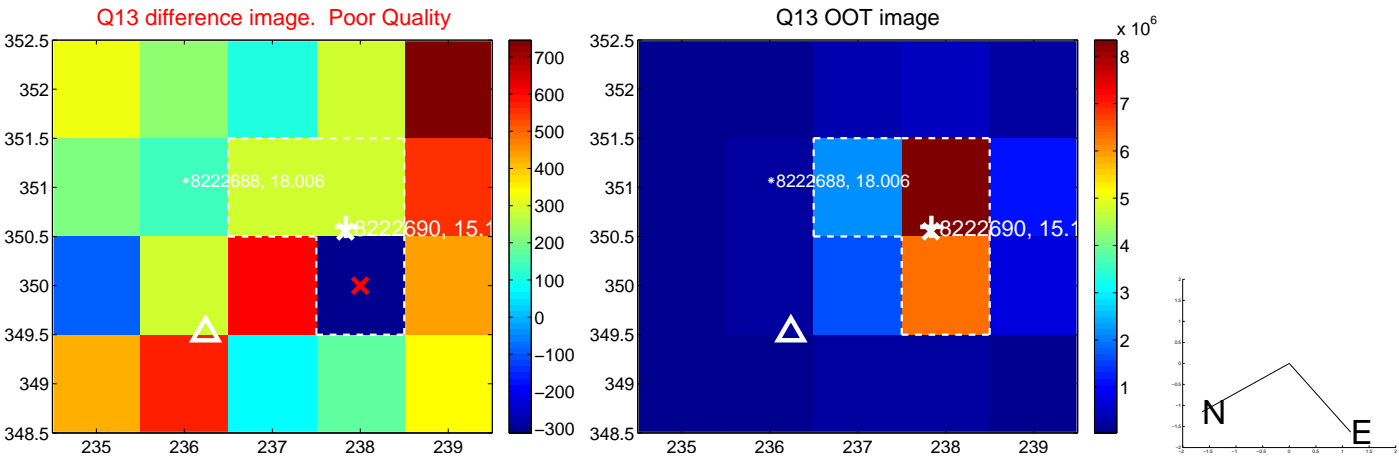
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



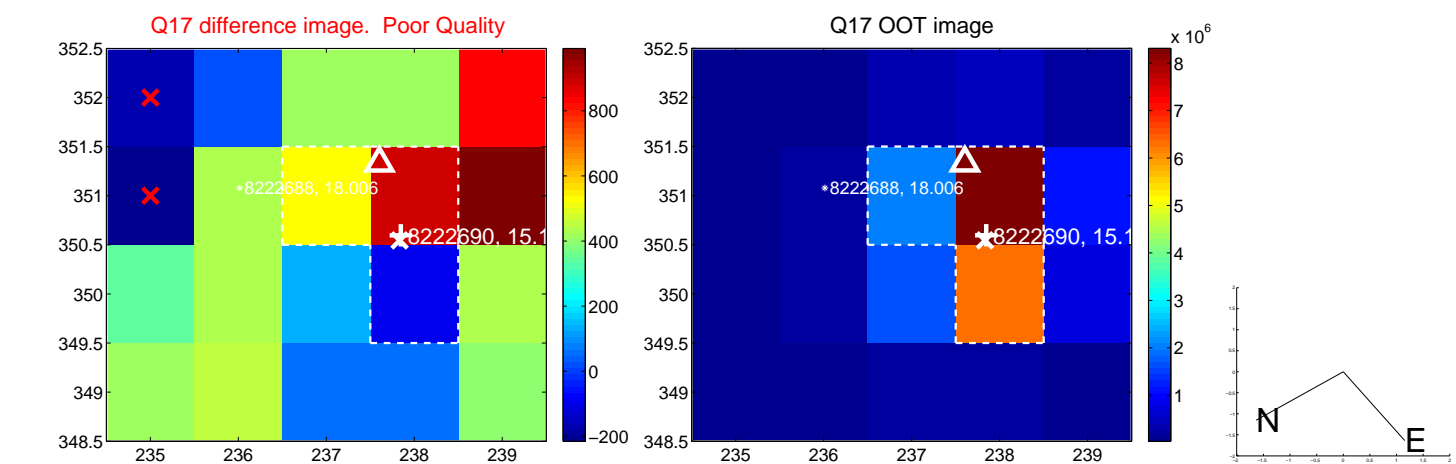
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



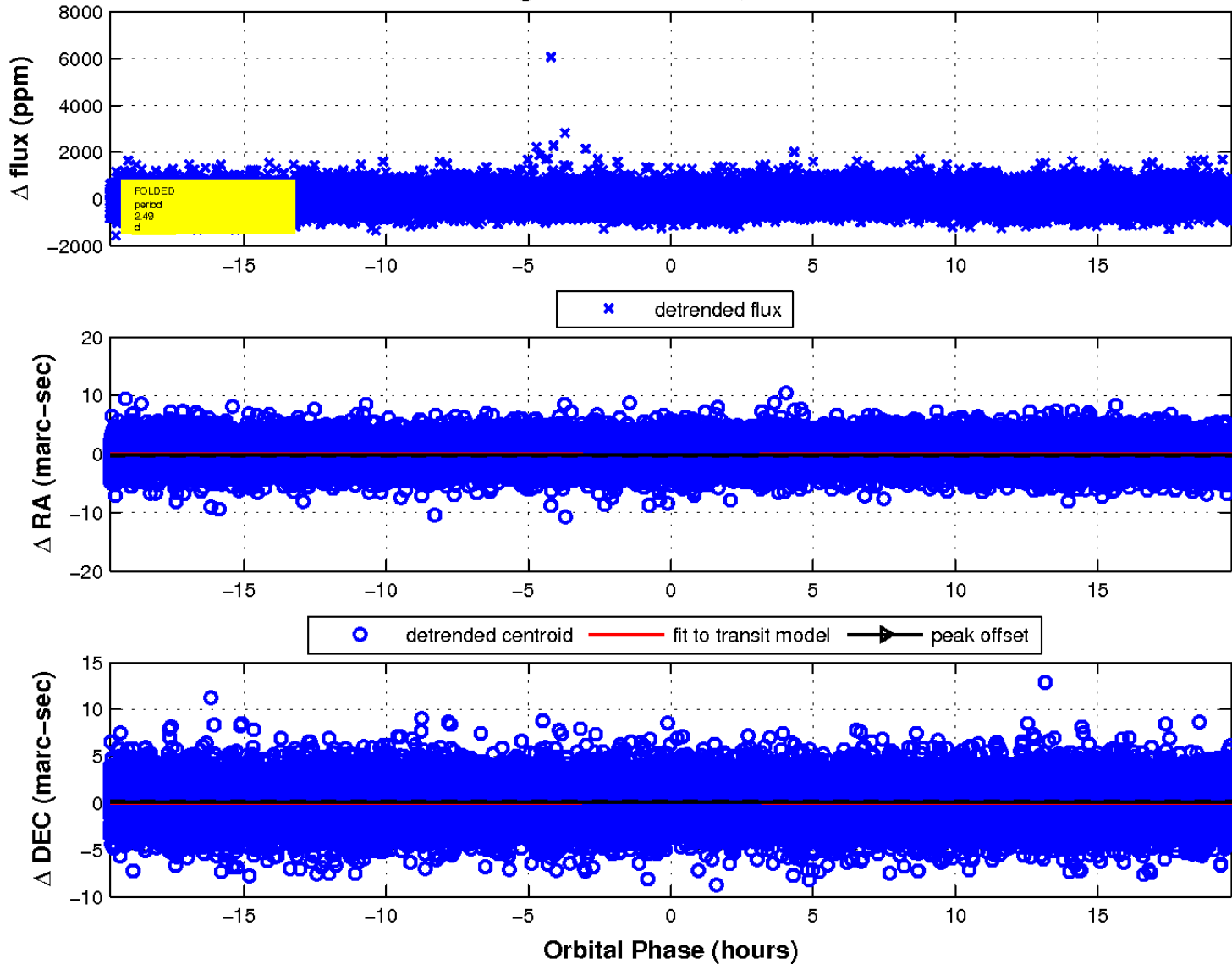
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

