

KIC 009651602

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})
009651602-01	OBS	7215.01	3.907215	133.773442	97.1	3.565	8.9	9.3	0.81	5497	0.93	243.34
009651602-02	OBS	No	674.191604	144.576022	517.6	17.230	8.0	8.1	0.81	5497	2.17	0.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009651602-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
009651602-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—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.

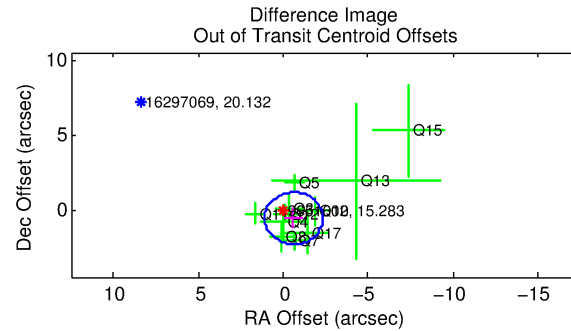
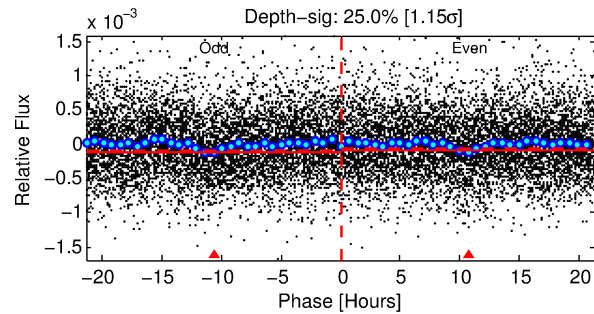
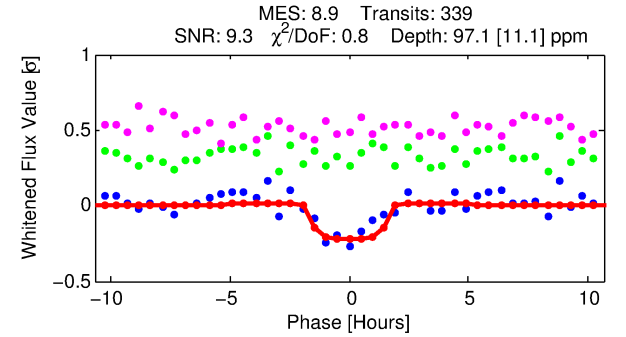
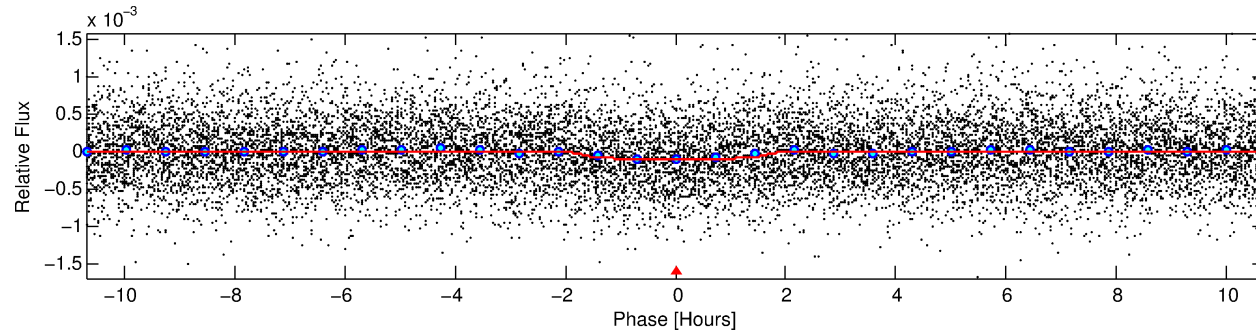
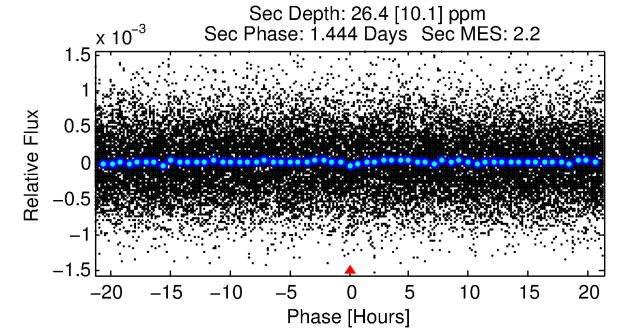
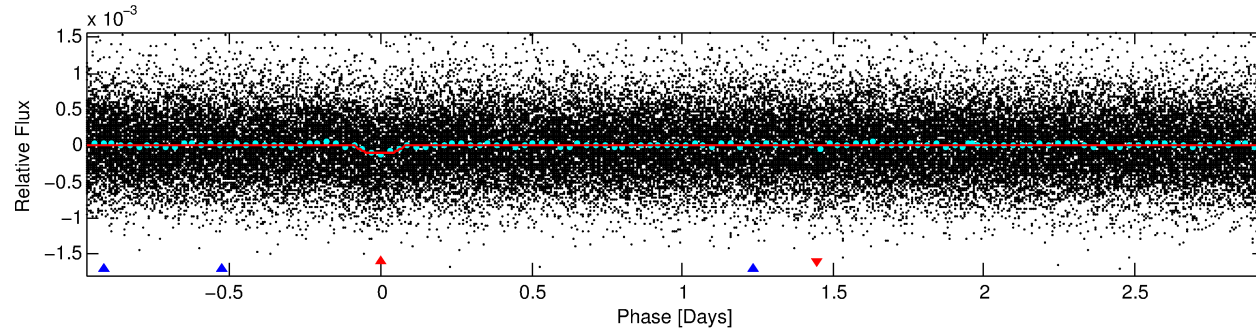
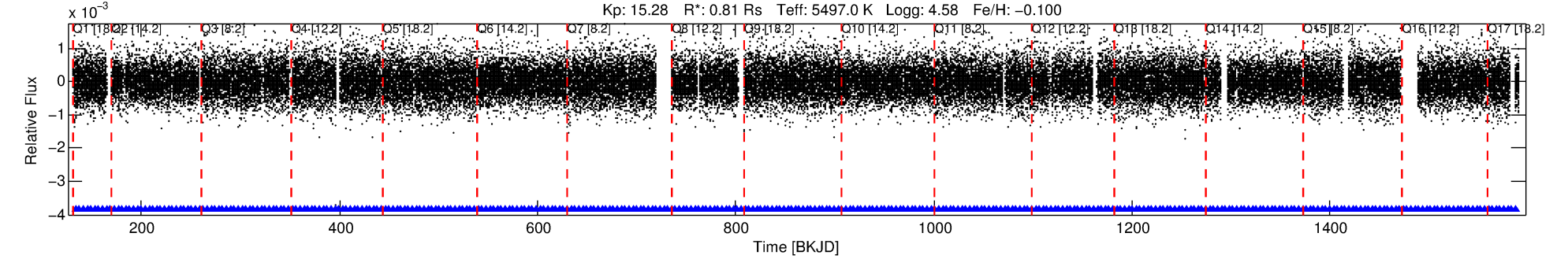
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009651602-01

No Significant Match Found

DV One-Page Summary

KIC: 9651602 Candidate: 1 of 2 Period: 3.907 d
KOI: K07215.01 Corr: 0.815



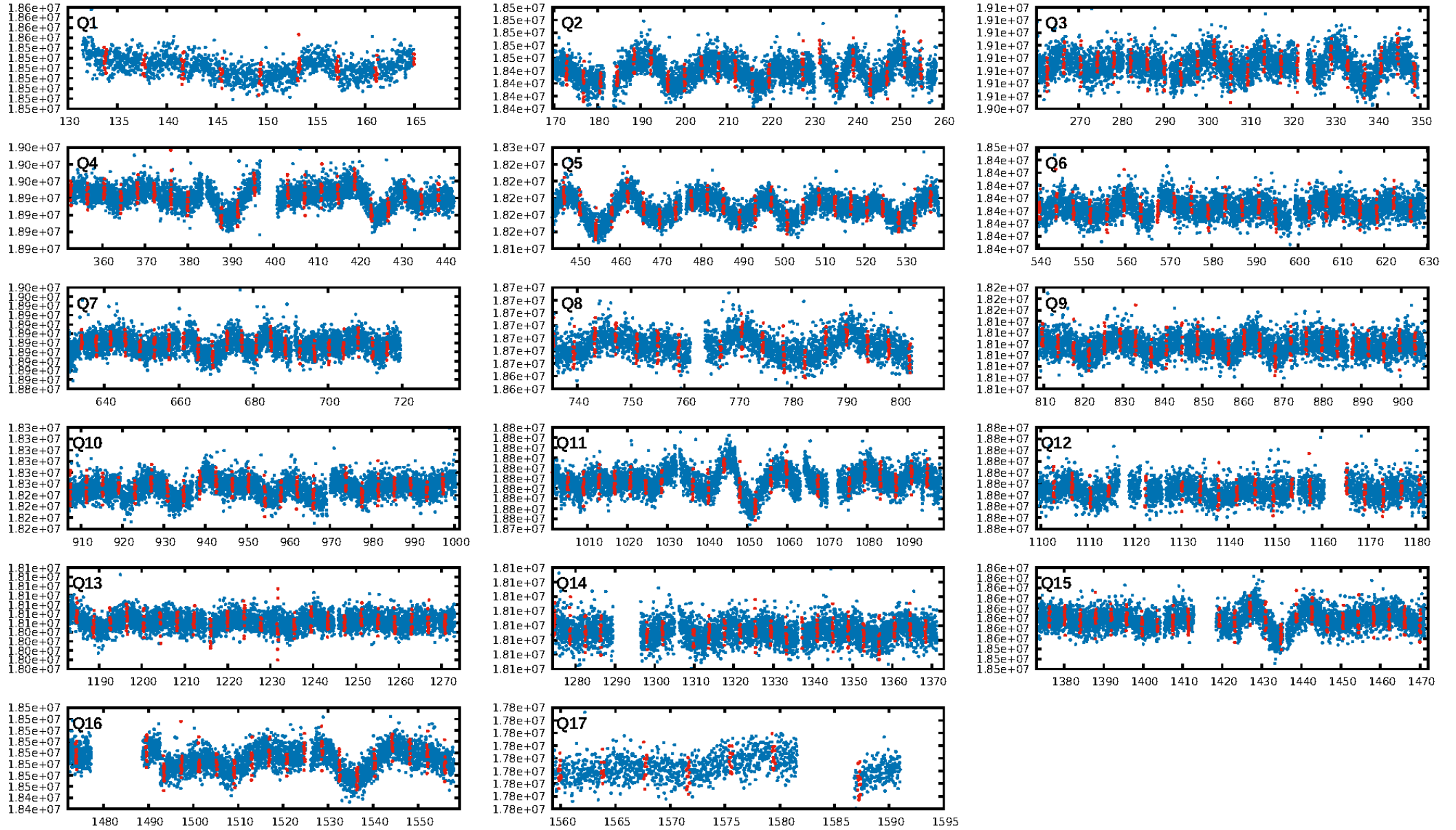
DV Fit Results:

Period = 3.90721 [0.00003] d
Epoch = 133.7734 [0.0061] BKJD
Rp/R* = 0.0105 [0.0087]
a/R* = 4.40 [15.30]
b = 0.87 [1.05]
Seff = 243.34 [65.98]
Teff = 1007 [68] K
Rp = 0.93 [0.79] Re
a = 0.0469 [0.0076] AU
Ag = 37.11 [63.56] [0.57σ]
Teffp = 3843 [1633] K [1.74σ]

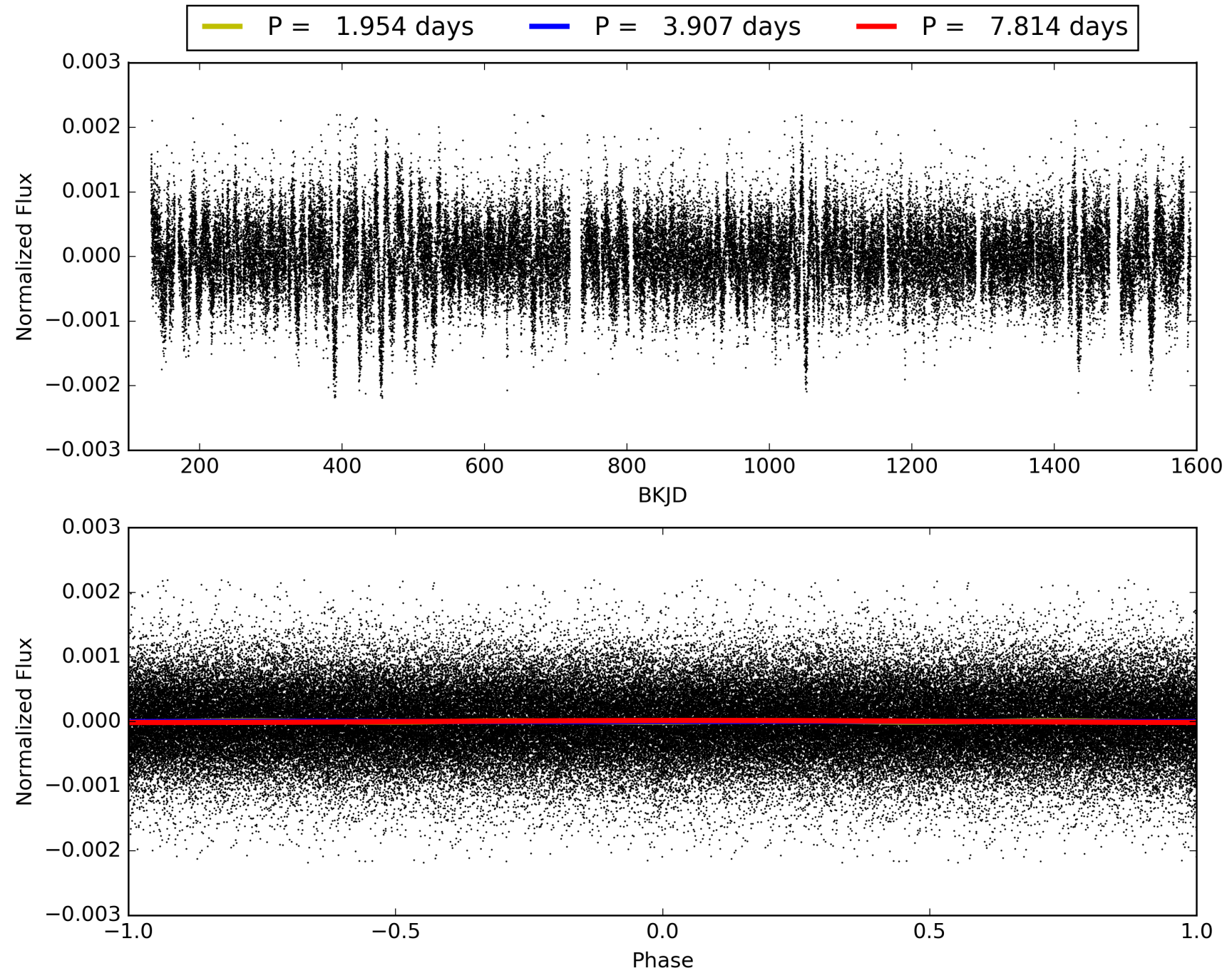
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [914.28σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 7.24e-19
RollingBand-fgt: 1.00 [323/323]
GhostDiagnostic-chr: -6.381
Centroid-sig: 1.9%
Centroid-so: 2.621 arcsec [1.59σ]
OotOffset-rm: 0.854 arcsec [1.48σ]
KicOffset-rm: 0.895 arcsec [1.56σ]
OotOffset-st: 1/4/3/3 [11]
KicOffset-st: 1/4/3/3 [11]
DiffImageQuality-fgm: 0.45 [5/11]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 009651602-01, PDC Light Curves

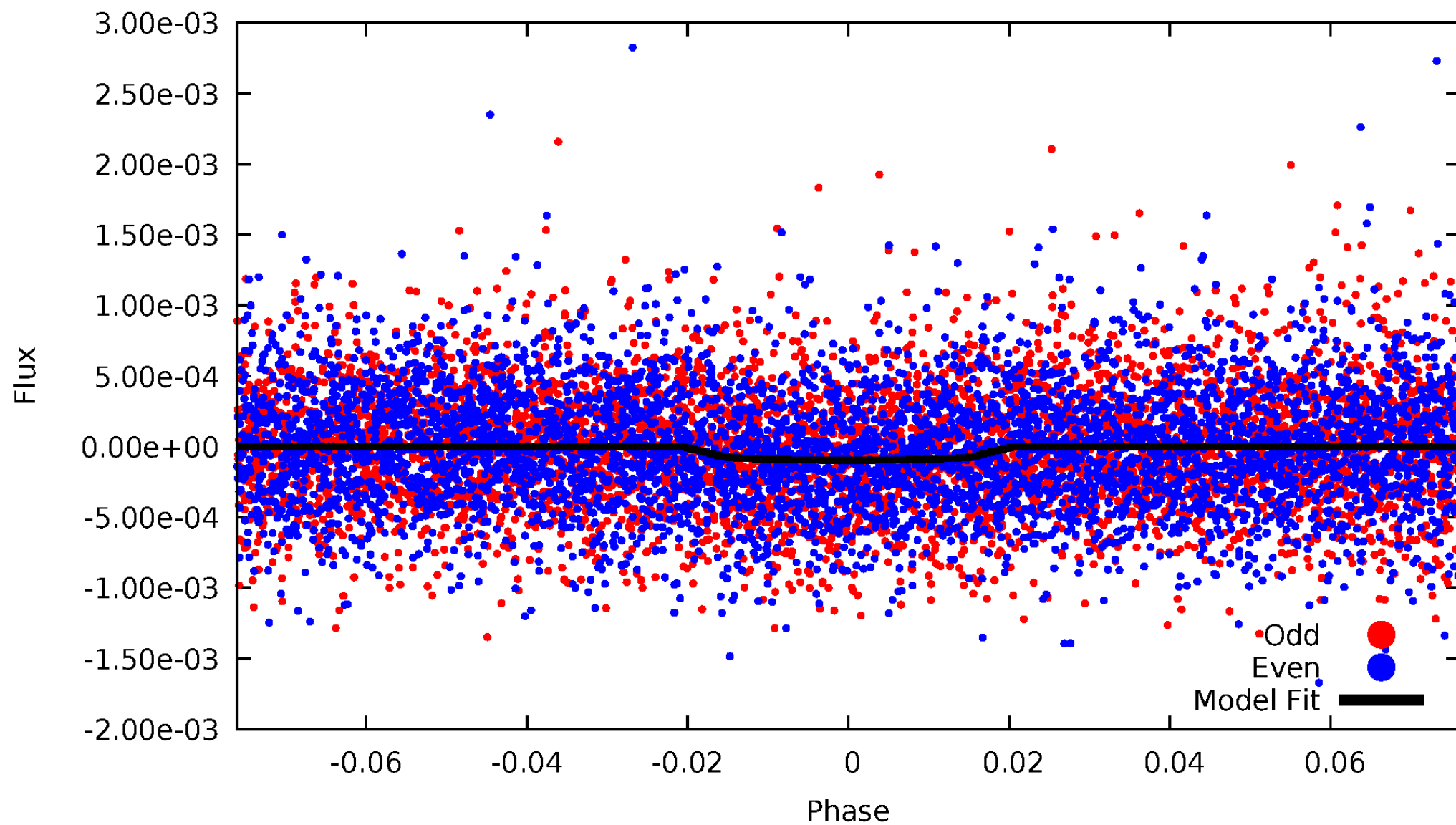


TCE 009651602-01



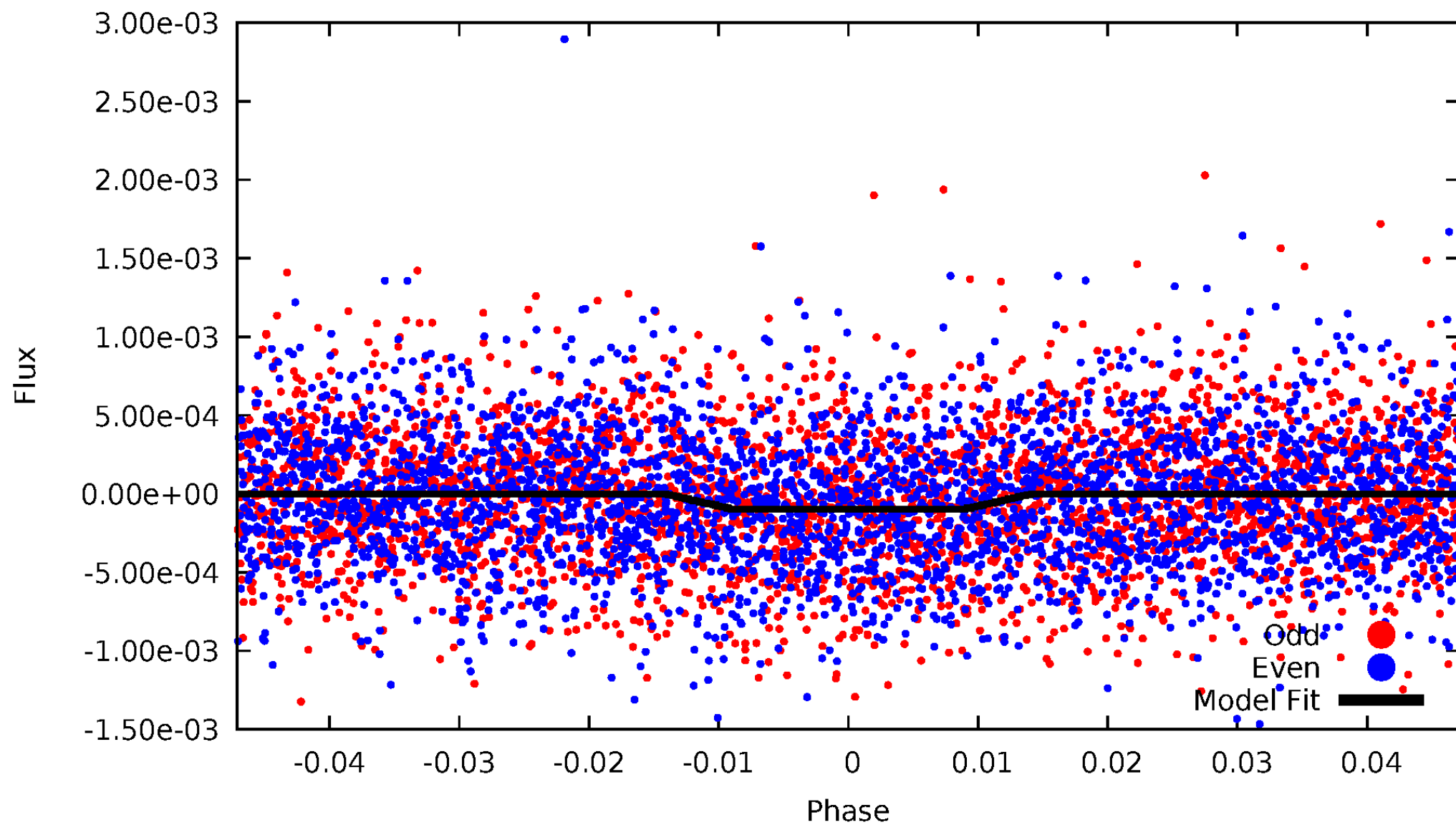
DV Odd/Even

TCE 009651602-01



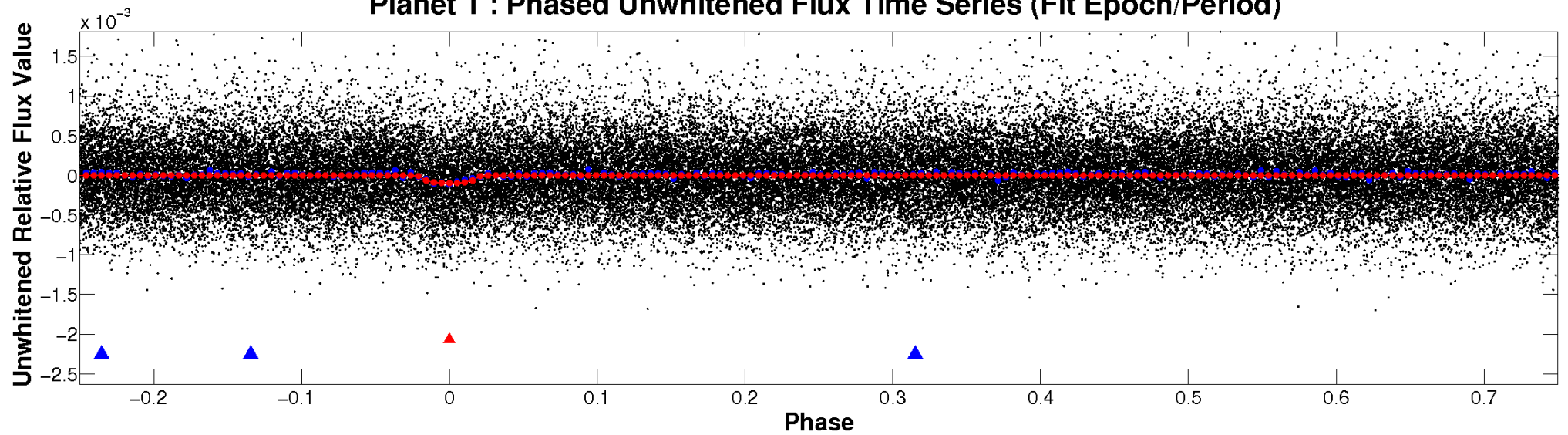
ALT Odd/Even

TCE 009651602-01

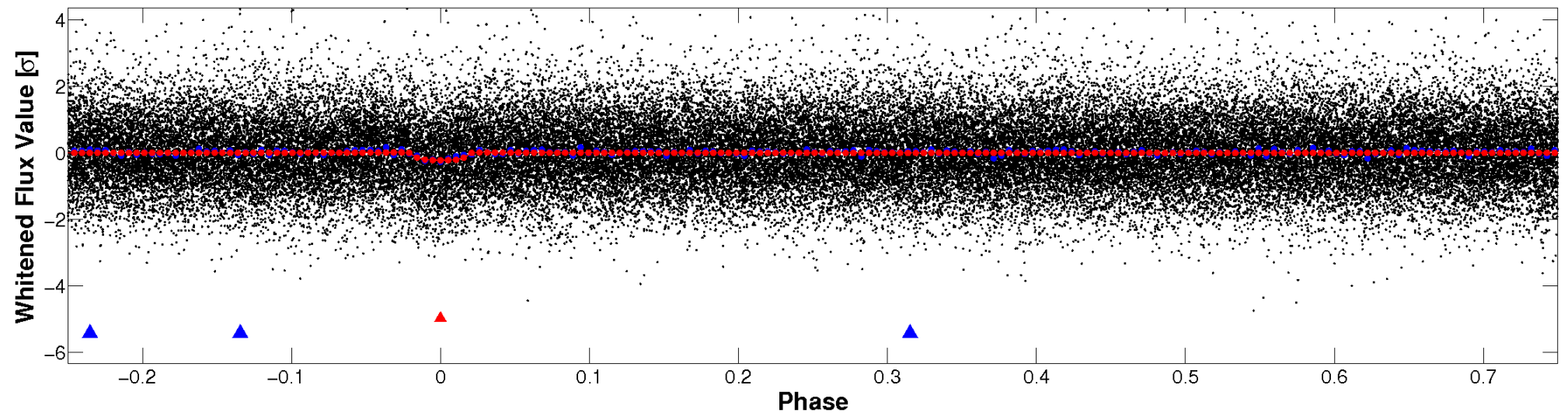


Non-Whitened Vs. Whitened Light Curve

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

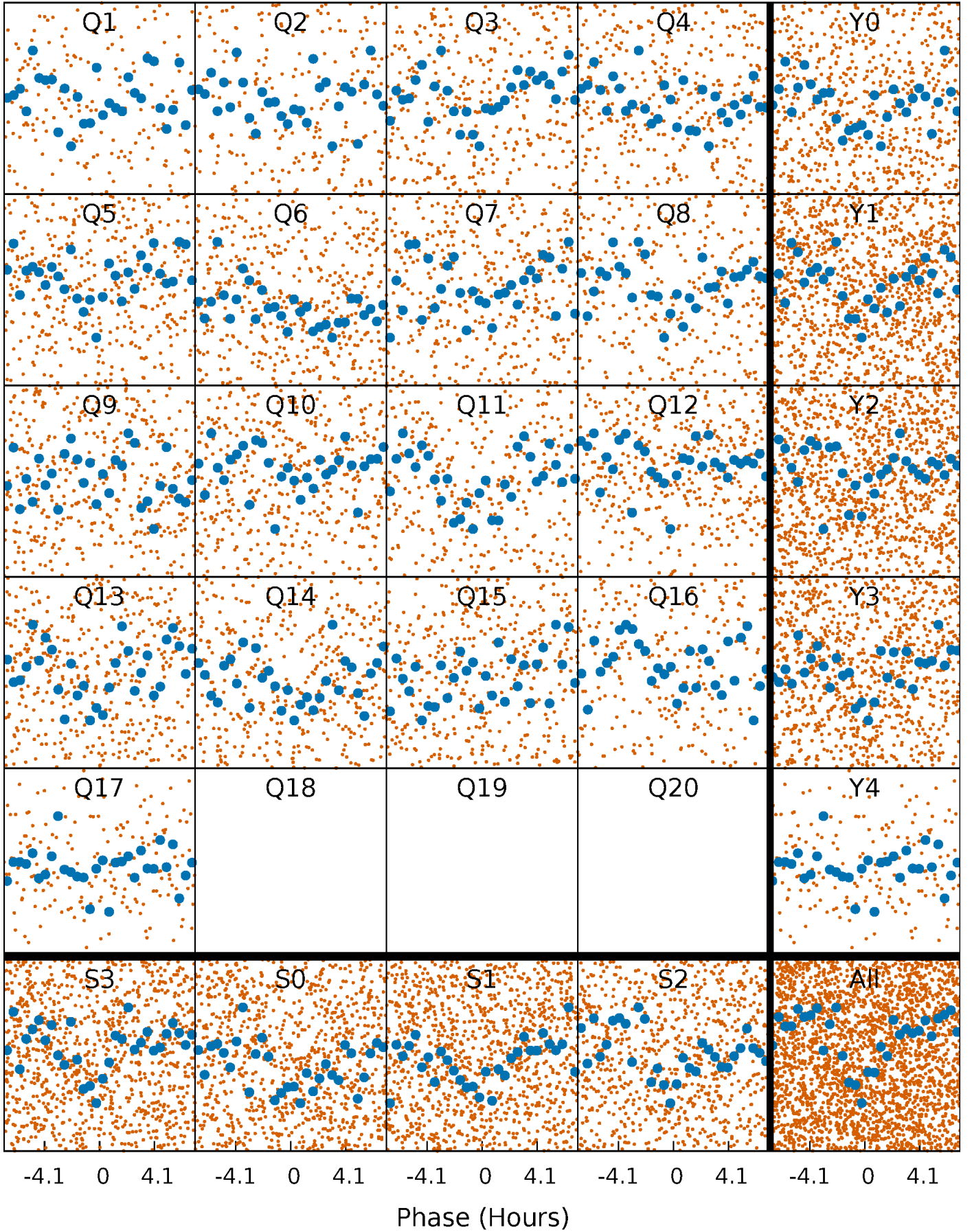


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



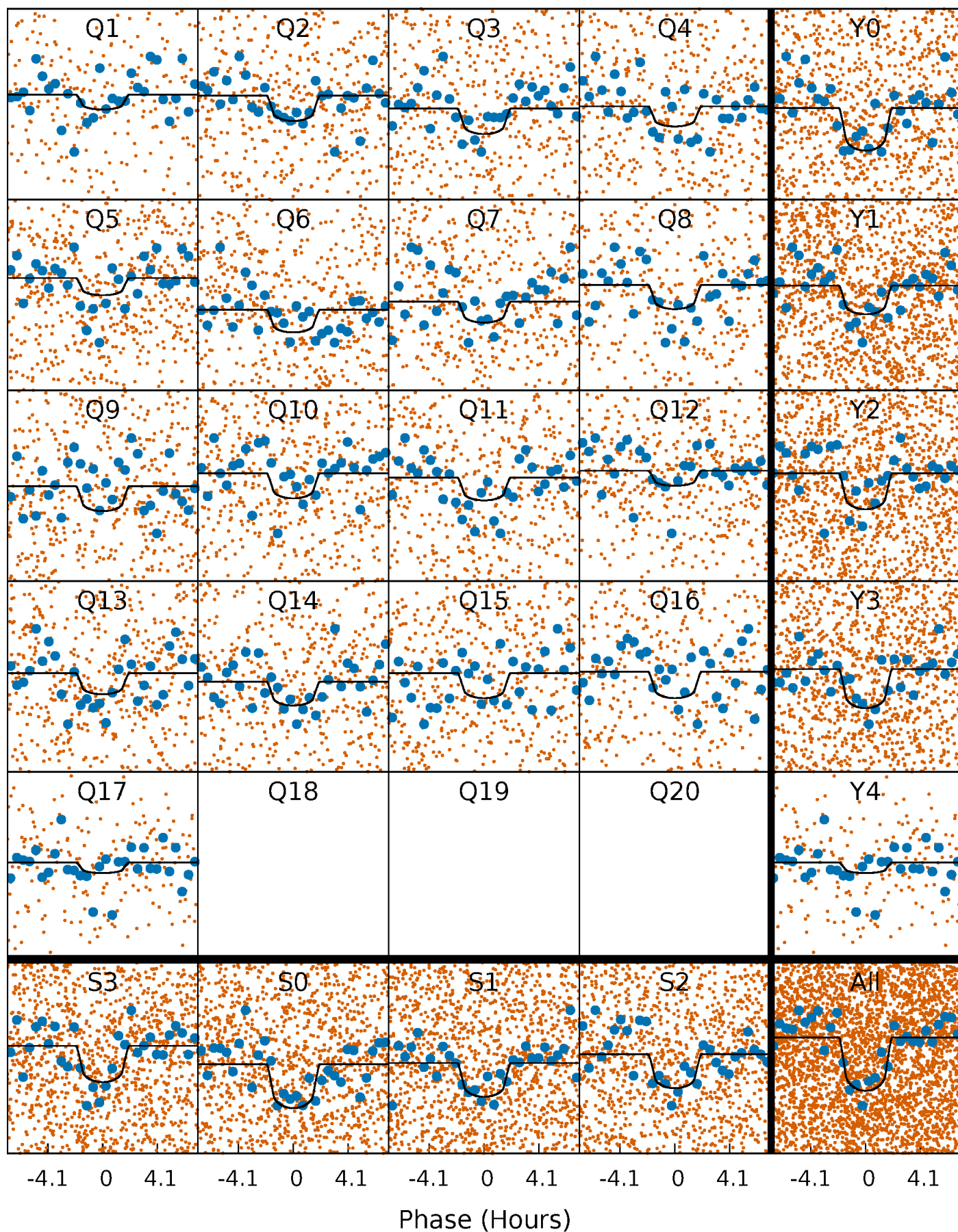
PDC Quarter-Phased Transit Curves

TCE 009651602-01 P= 3.907215 Days $T_0=133.773442$ (BKJD)



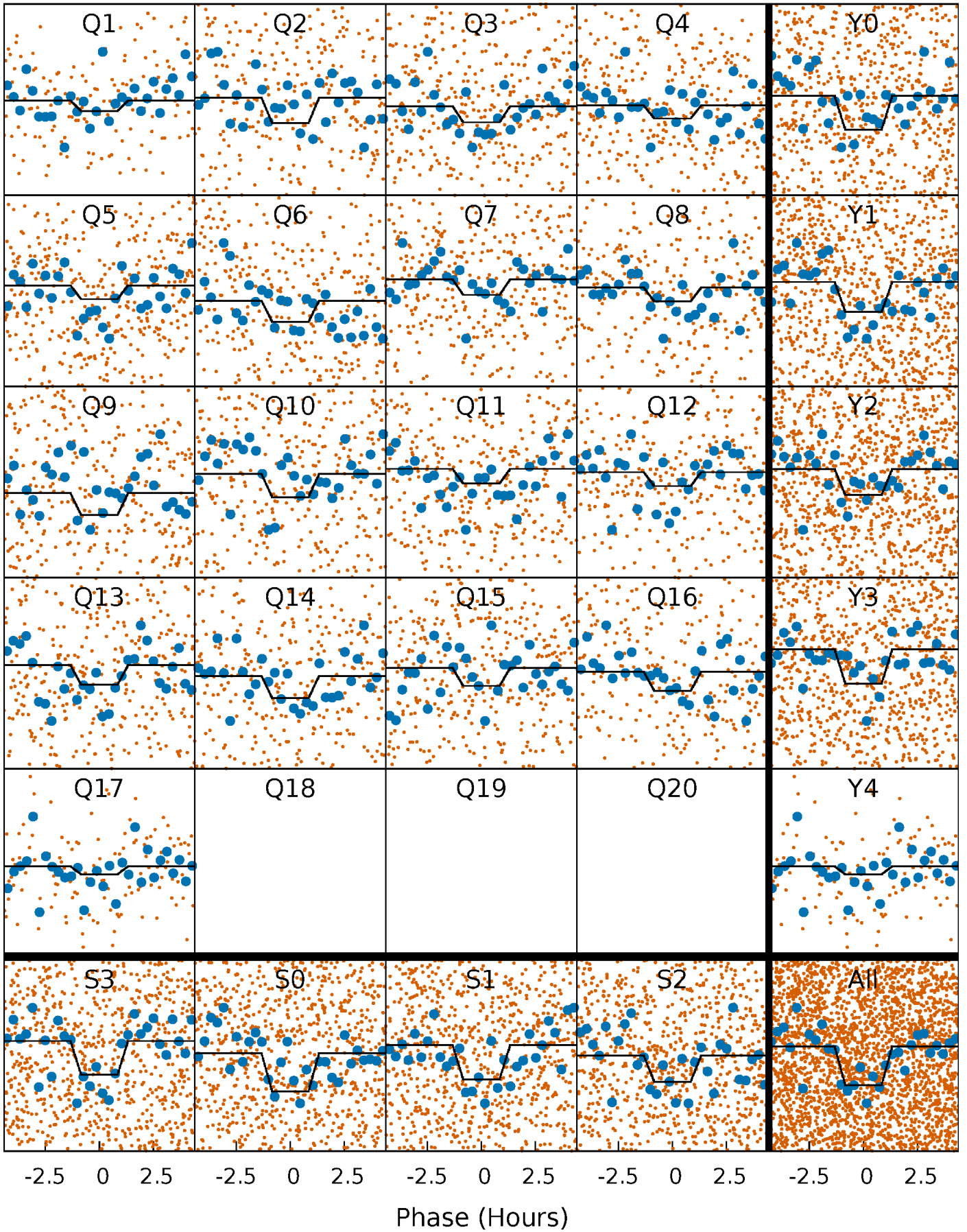
DV Quarter-Phased Transit Curves

TCE 009651602-01 P= 3.907215 Days $T_0=133.773442$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

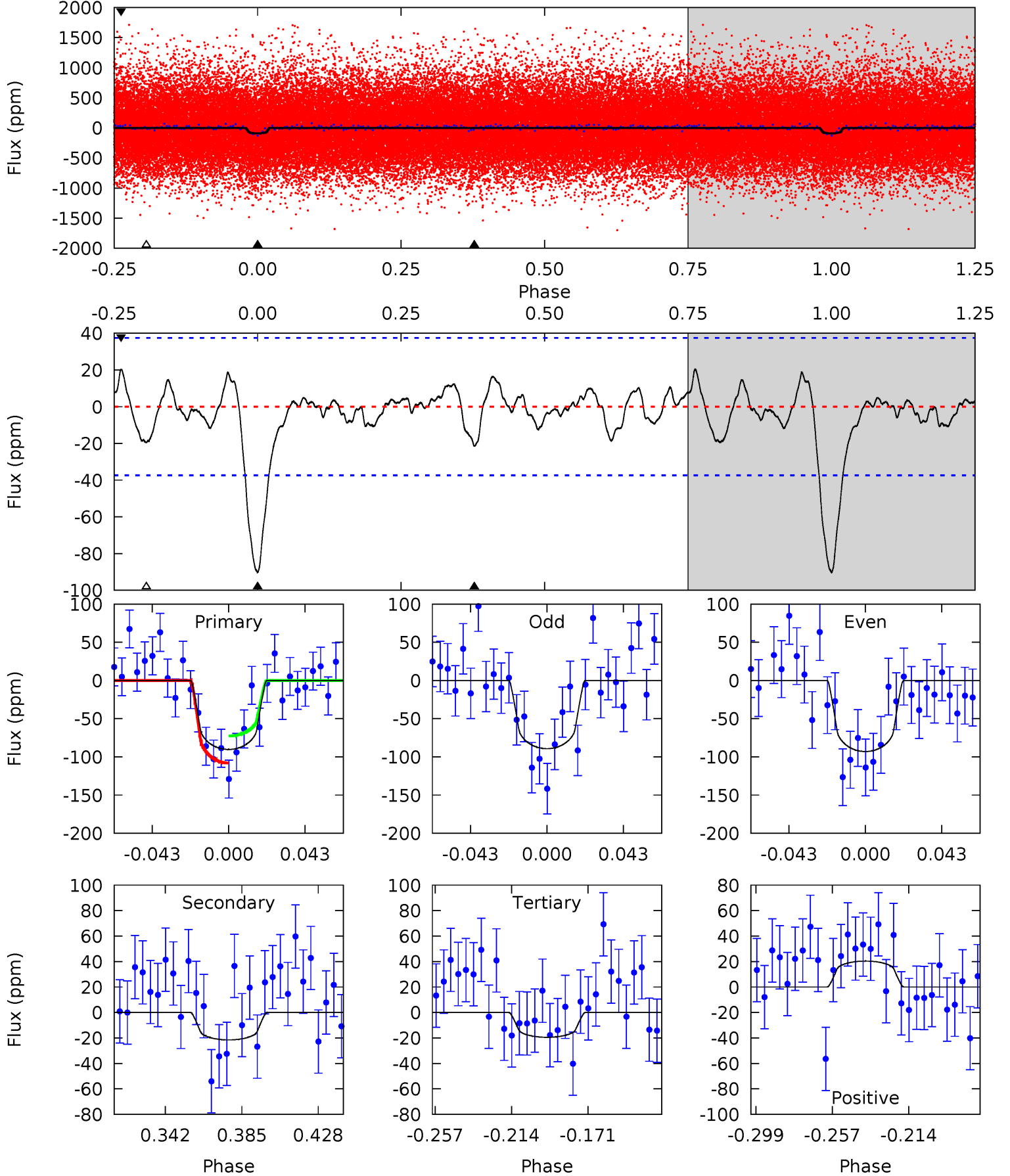
TCE 009651602-01 P= 3.907263 Days $T_0=133.751085$ (BKJD)



DV Model-Shift Uniqueness Test

009651602-01, P = 3.907215 Days, E = 129.866227 Days

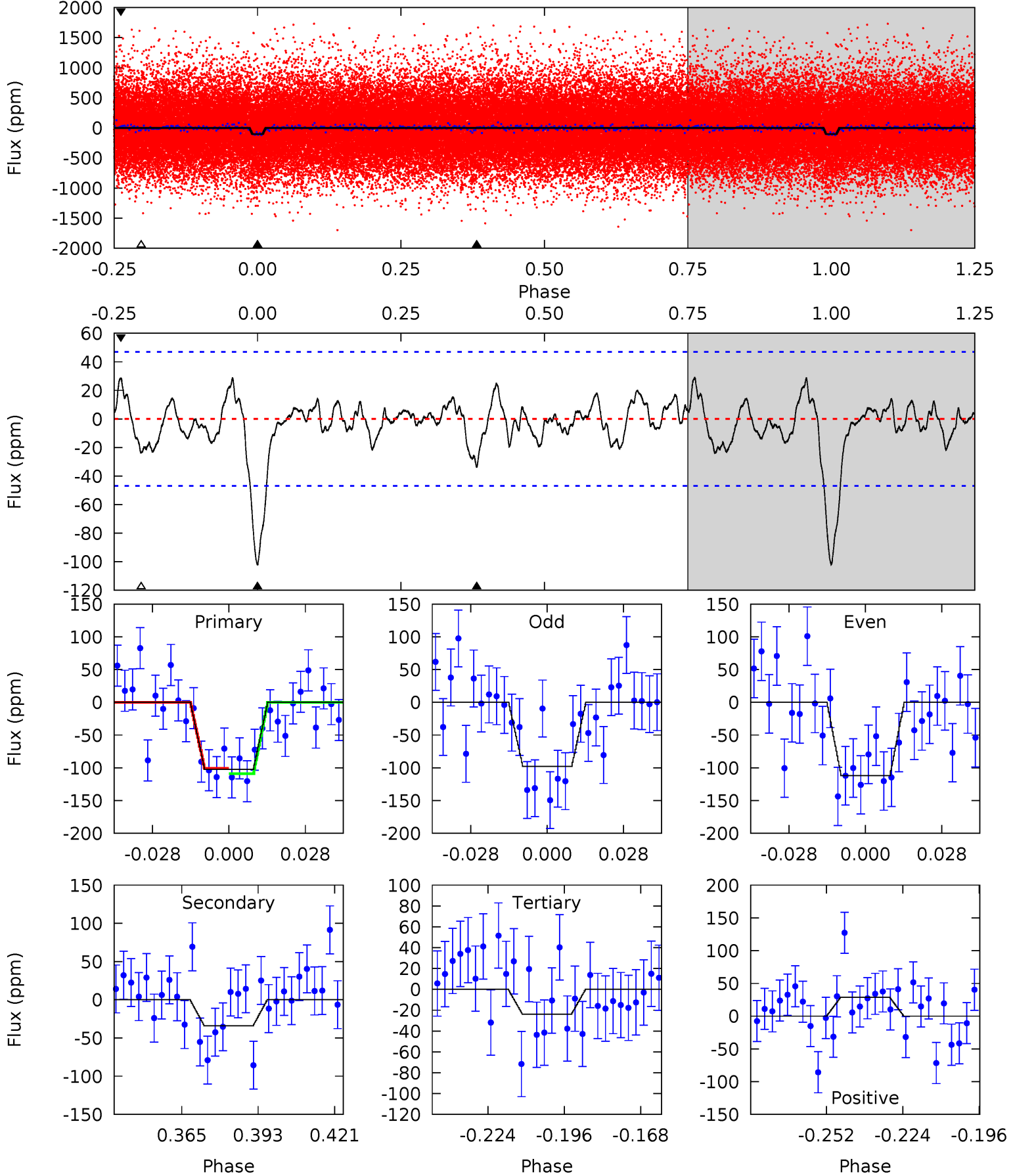
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.4	2.72	2.47	2.58	4.74	2.03	0.94	8.97	8.86	0.26	0.15	0.24	0.95	0.18	2.23



Alt Model-Shift Uniqueness Test

009651602-01, P = 3.907263 Days, E = 129.843822 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.5	3.49	2.46	2.97	4.82	2.20	1.08	8.06	7.55	1.03	0.53	0.72	1.03	0.22	0.42



Stellar Parameters For KIC 009651602

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5497^{+147}_{-164}	$4.577^{+0.032}_{-0.136}$	$-0.100^{+0.300}_{-0.300}$	$0.809^{+0.152}_{-0.065}$	$0.907^{+0.073}_{-0.110}$	$2.412^{+0.417}_{-0.914}$
	+3%/-3%	+1%/-3%	+300%/-300%	+19%/-8%	+8%/-12%	+17%/-38%
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 009651602-01 / KOI 7215.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-22 ± 8	$1.11^{+0.73}_{-0.63}$	1435^{+72}_{-58}	3776^{+1488}_{-672}	21^{+96}_{-14}
Alt.	-34 ± 10	$1.03^{+0.69}_{-0.56}$	1430^{+72}_{-53}	4160^{+1791}_{-712}	37^{+165}_{-25}

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

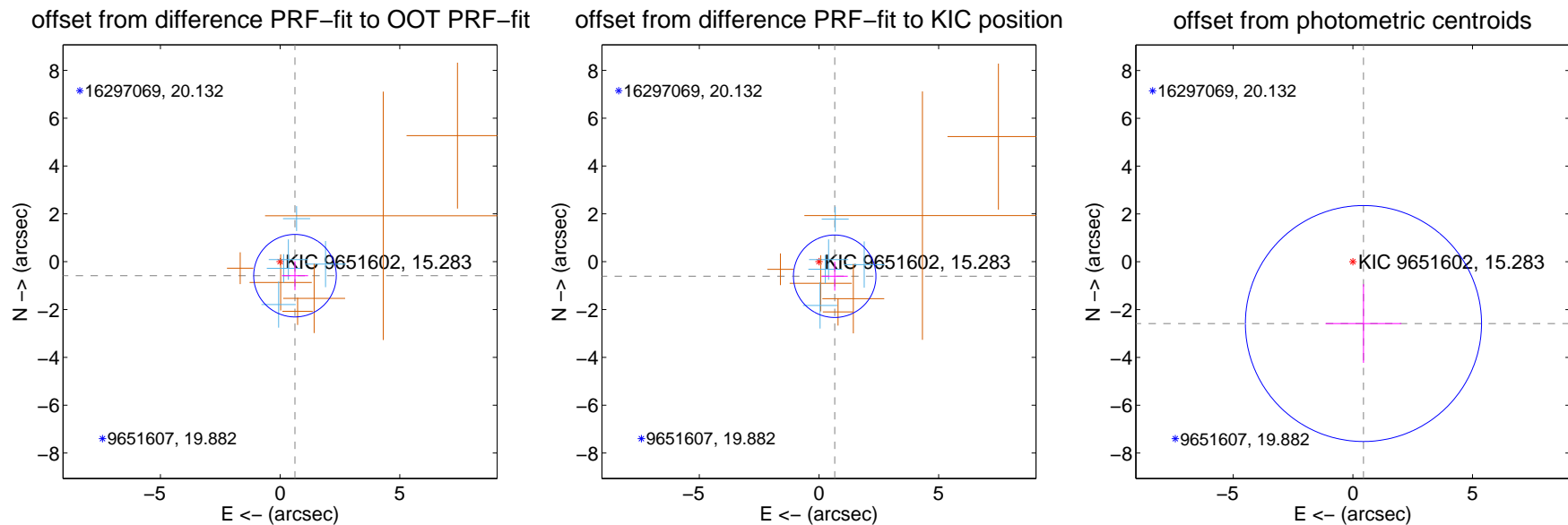
DV Centroid Data

Supplemental centroid analysis for 009651602-01. Kepler magnitude: 15.28. Transit SNR 9.25

There are 5 quarters with good PRF difference image offsets

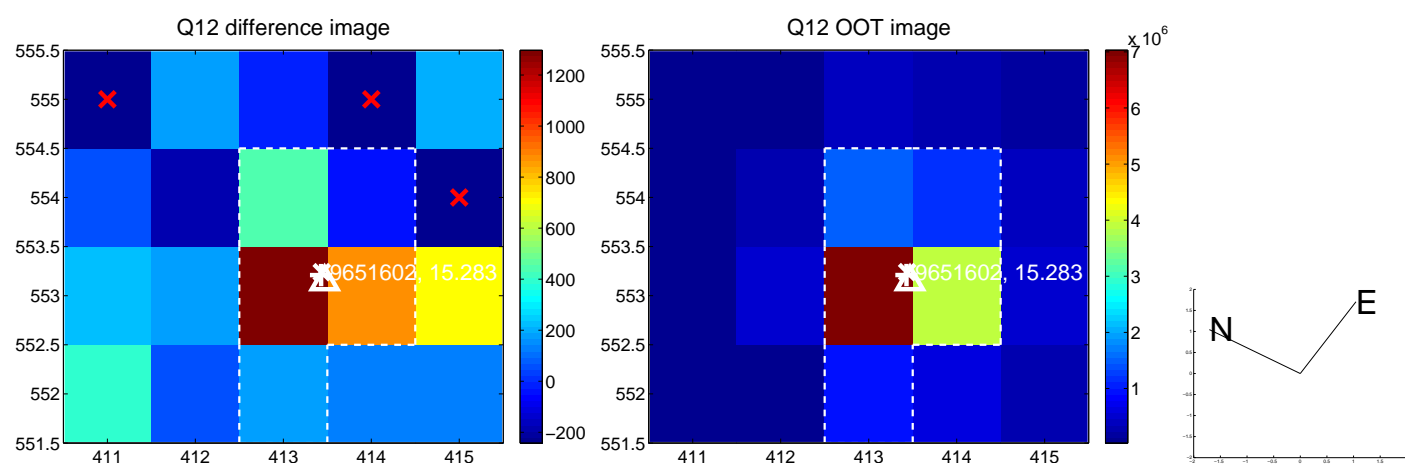
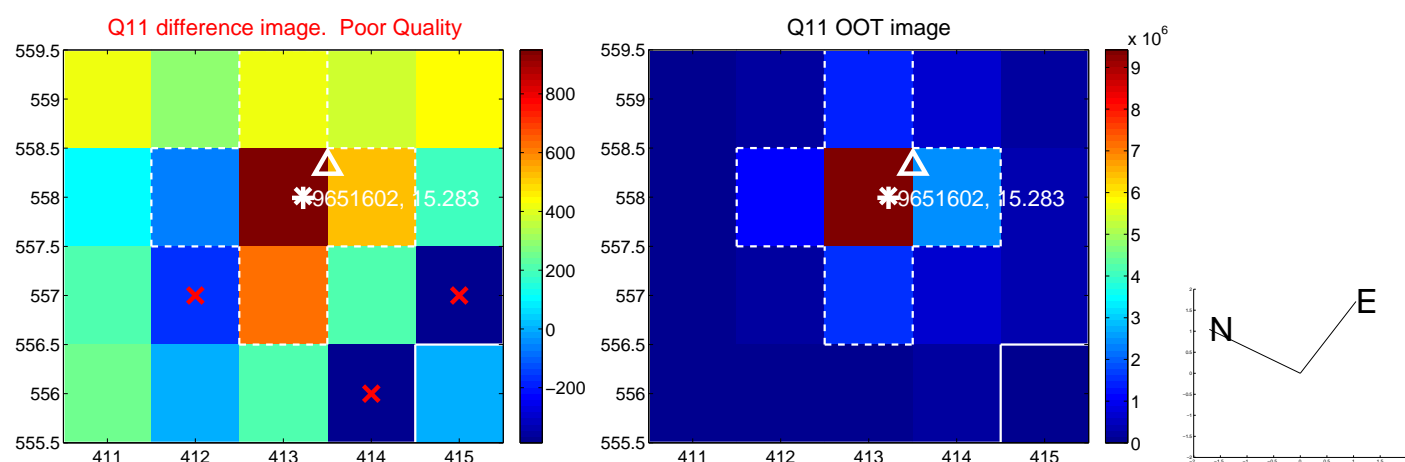
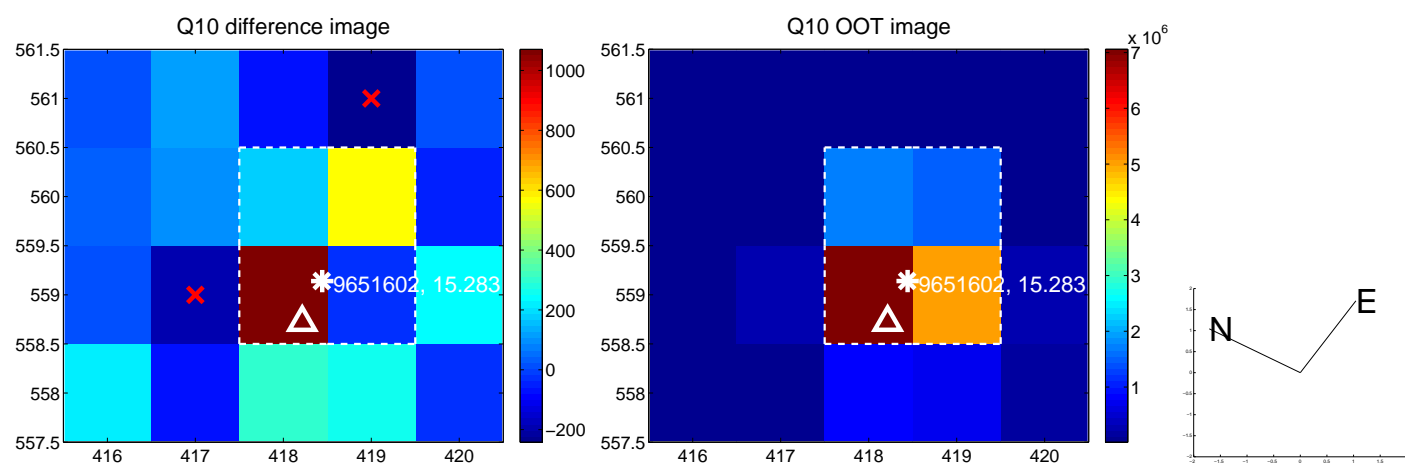
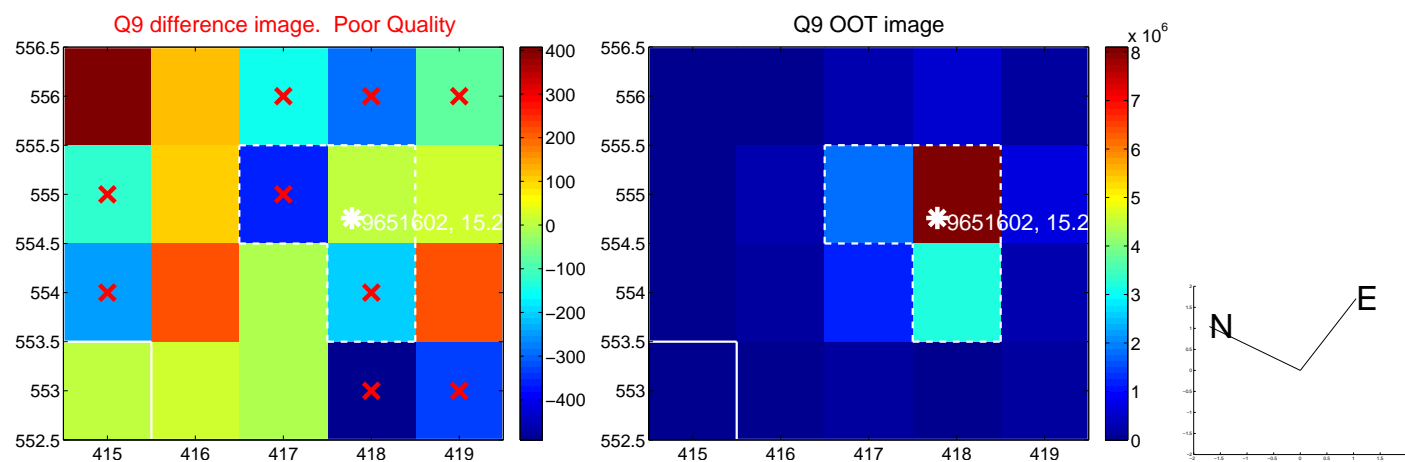
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.854 ± 0.575	1.48	-0.622 ± 0.547	-0.585 ± 0.605
PRF-fit source offset from KIC position	0.895 ± 0.575	1.56	-0.657 ± 0.547	-0.608 ± 0.605
photometric centroid source offset	2.62 ± 1.65	1.59	-0.44 ± 1.59	-2.58 ± 1.65

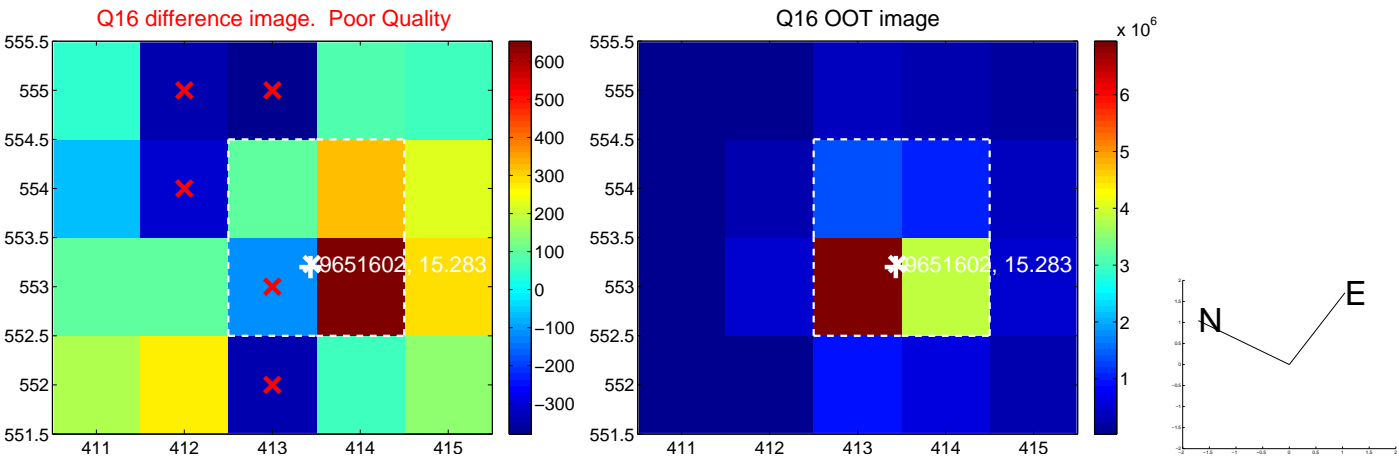
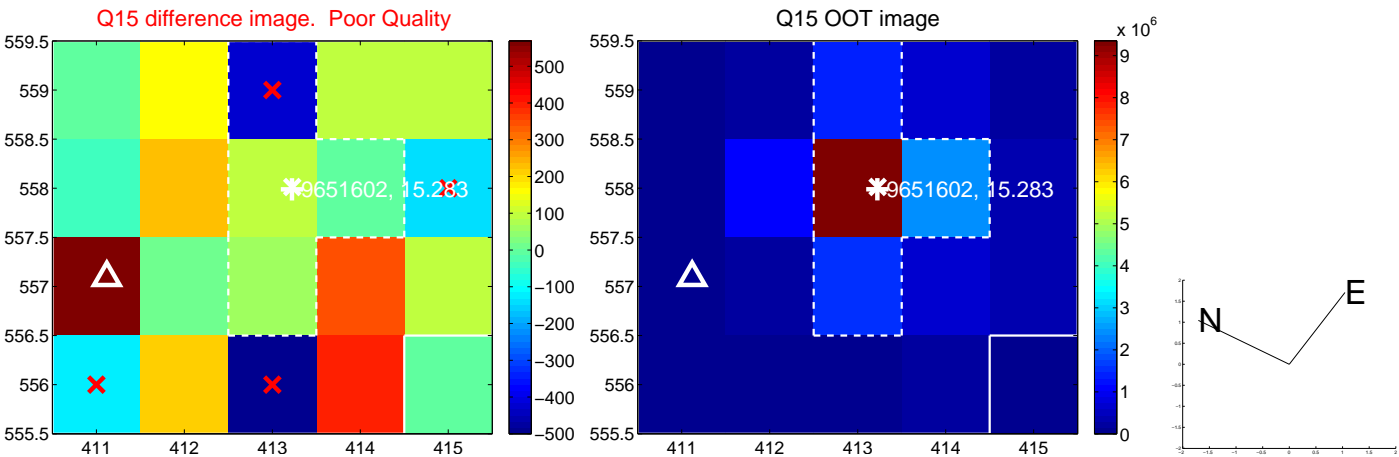
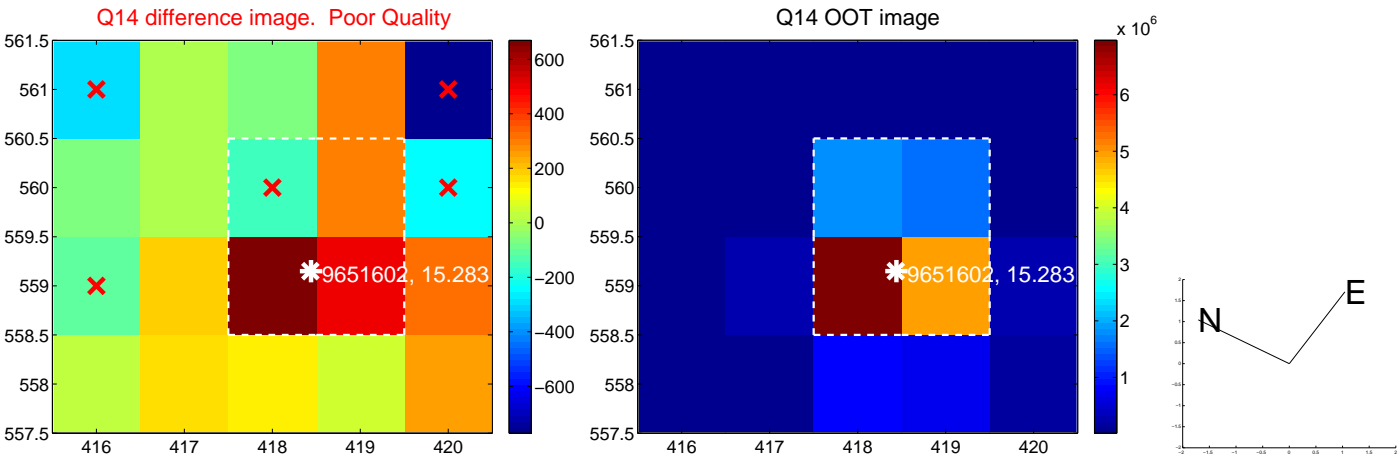
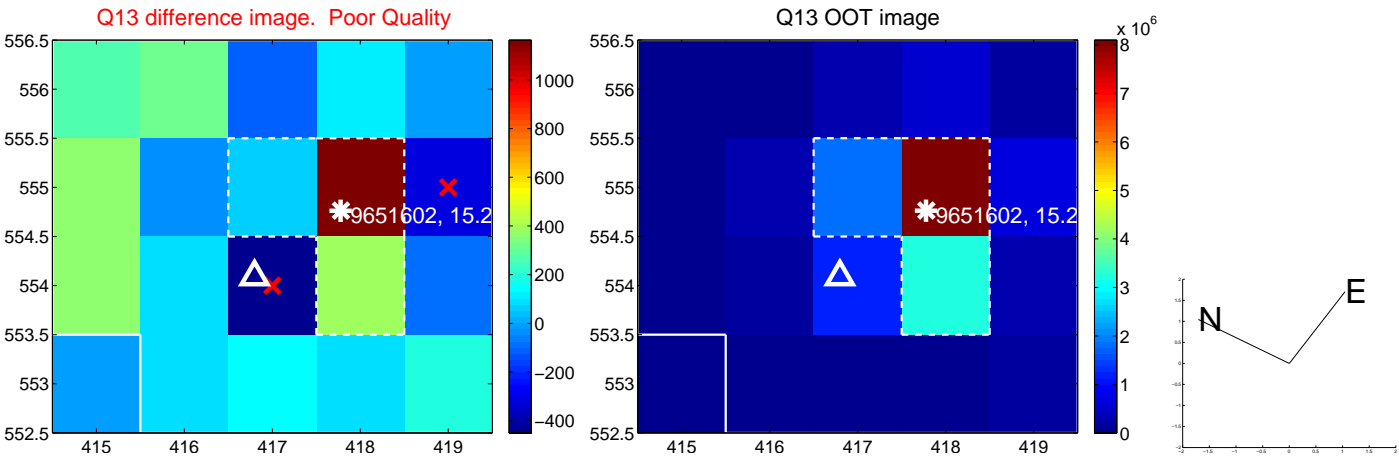


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

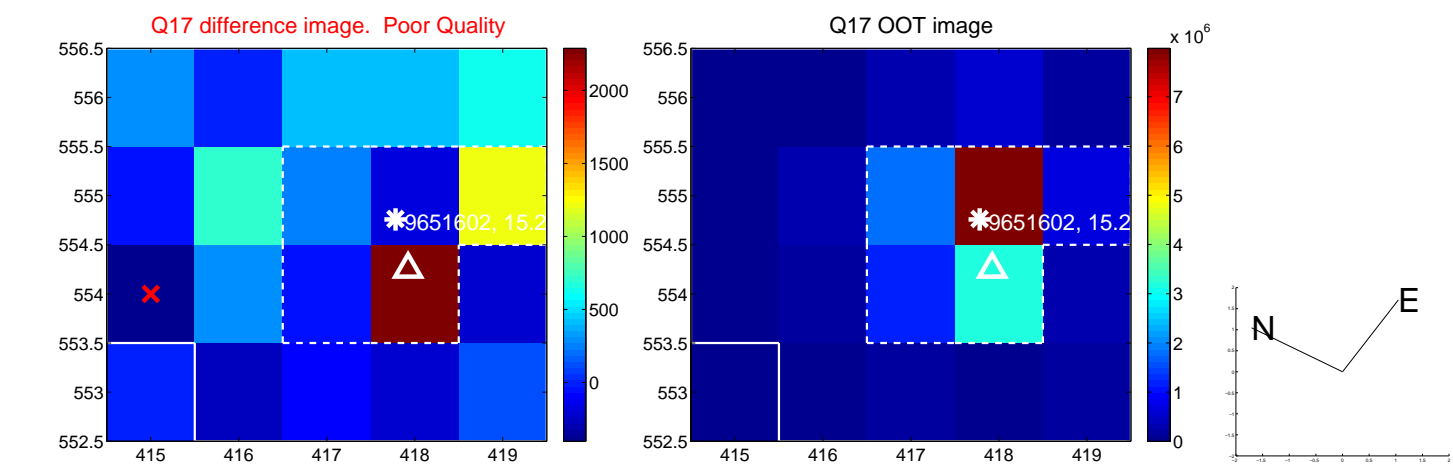
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



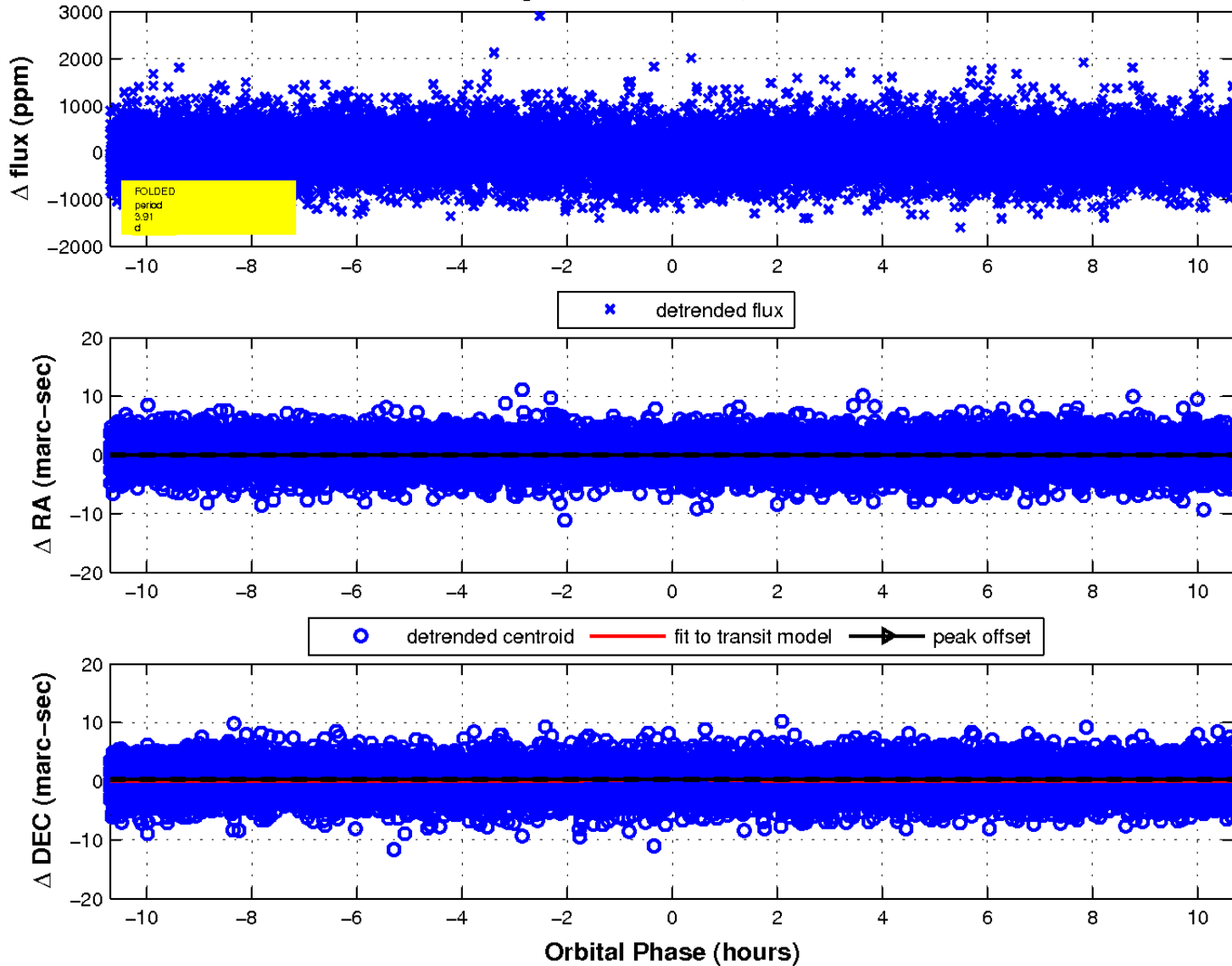
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



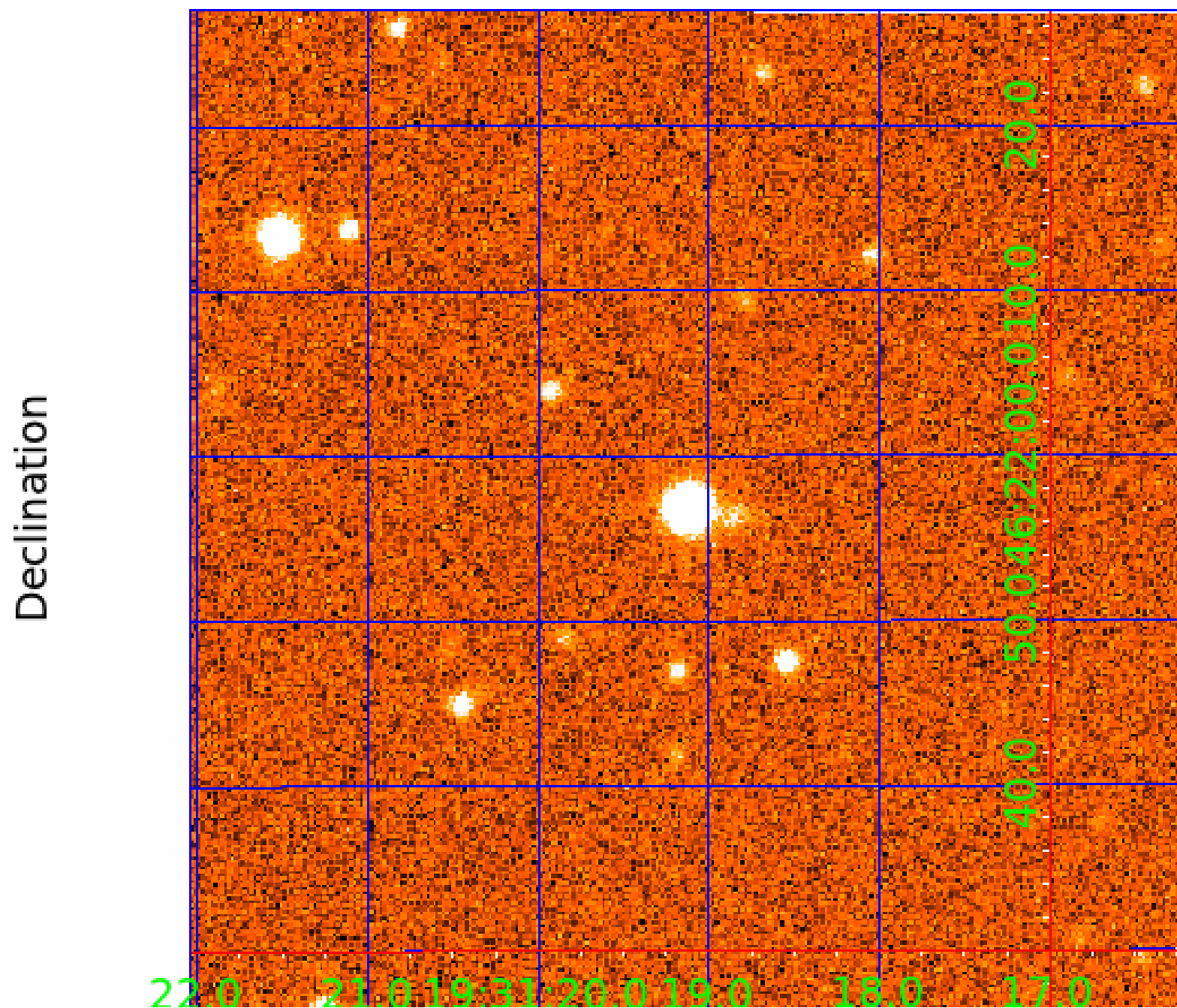
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image



KIC 009651602

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})
009651602-01	OBS	7215.01	3.907215	133.773442	97.1	3.565	8.9	9.3	0.81	5497	0.93	243.34
009651602-02	OBS	No	674.191604	144.576022	517.6	17.230	8.0	8.1	0.81	5497	2.17	0.25

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009651602-01	OBS	PC	0.97	0	0	0	0	NO_COMMENT
009651602-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—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 009651602-02

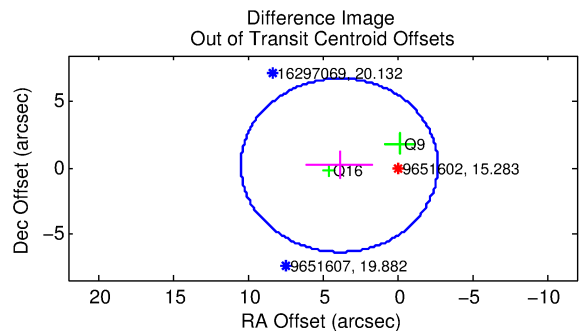
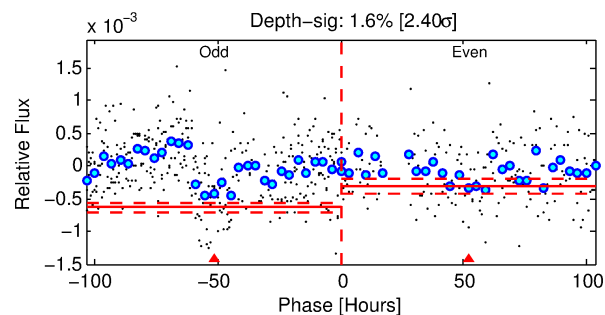
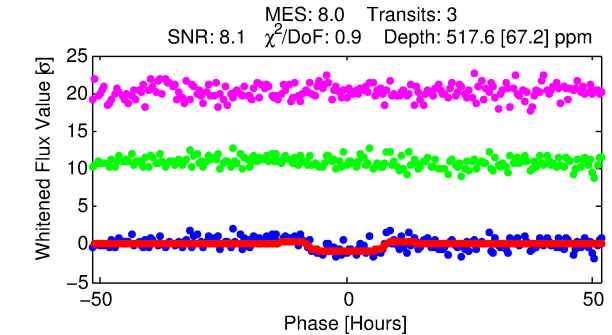
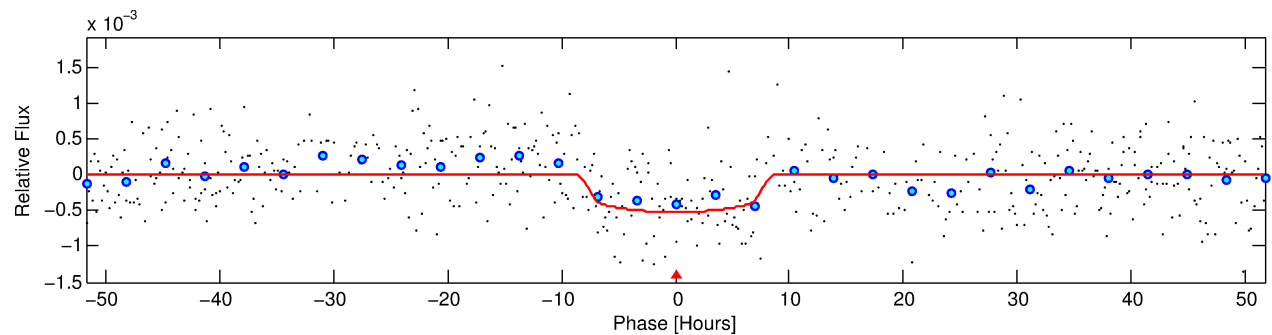
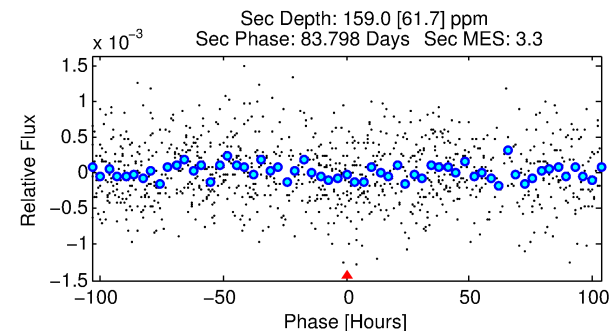
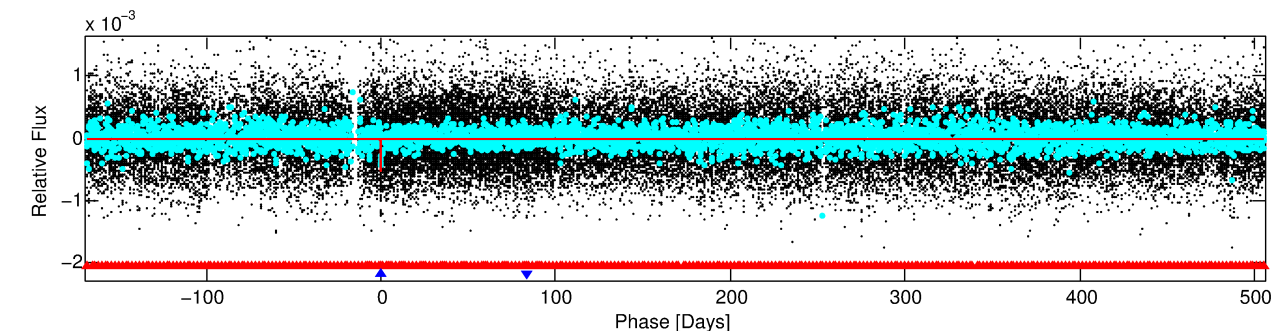
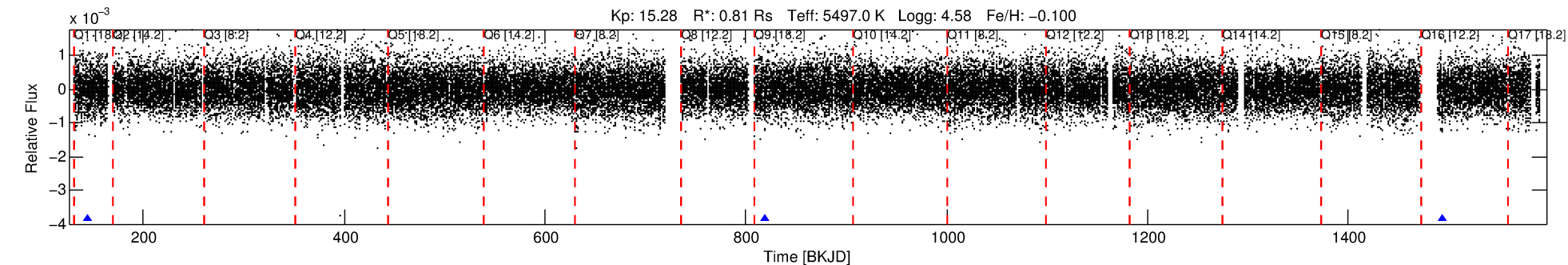
No Significant Match Found

DV One-Page Summary

KIC: 9651602 Candidate: 2 of 2 Period: 674.192 d

KOI: K07215 Corr: No Ephemeris Match

Kp: 15.28 R*: 0.81 Rs Teff: 5497.0 K Logg: 4.58 Fe/H: -0.100



DV Fit Results:

Period = 674.19160 [0.02708] d
Epoch = 144.5760 [0.0304] BKJD
Rp/R* = 0.0246 [0.0044]
a/R* = 154.62 [111.02]
b = 0.88 [0.18]
Seff = 0.25 [0.07]
Teq = 181 [12] K
Rp = 2.17 [0.56] Re
a = 1.4538 [0.2371] AU
Ag = 39280.68 [22834.01] [1.72σ]
Teffp = 3938 [533] K [7.05σ]

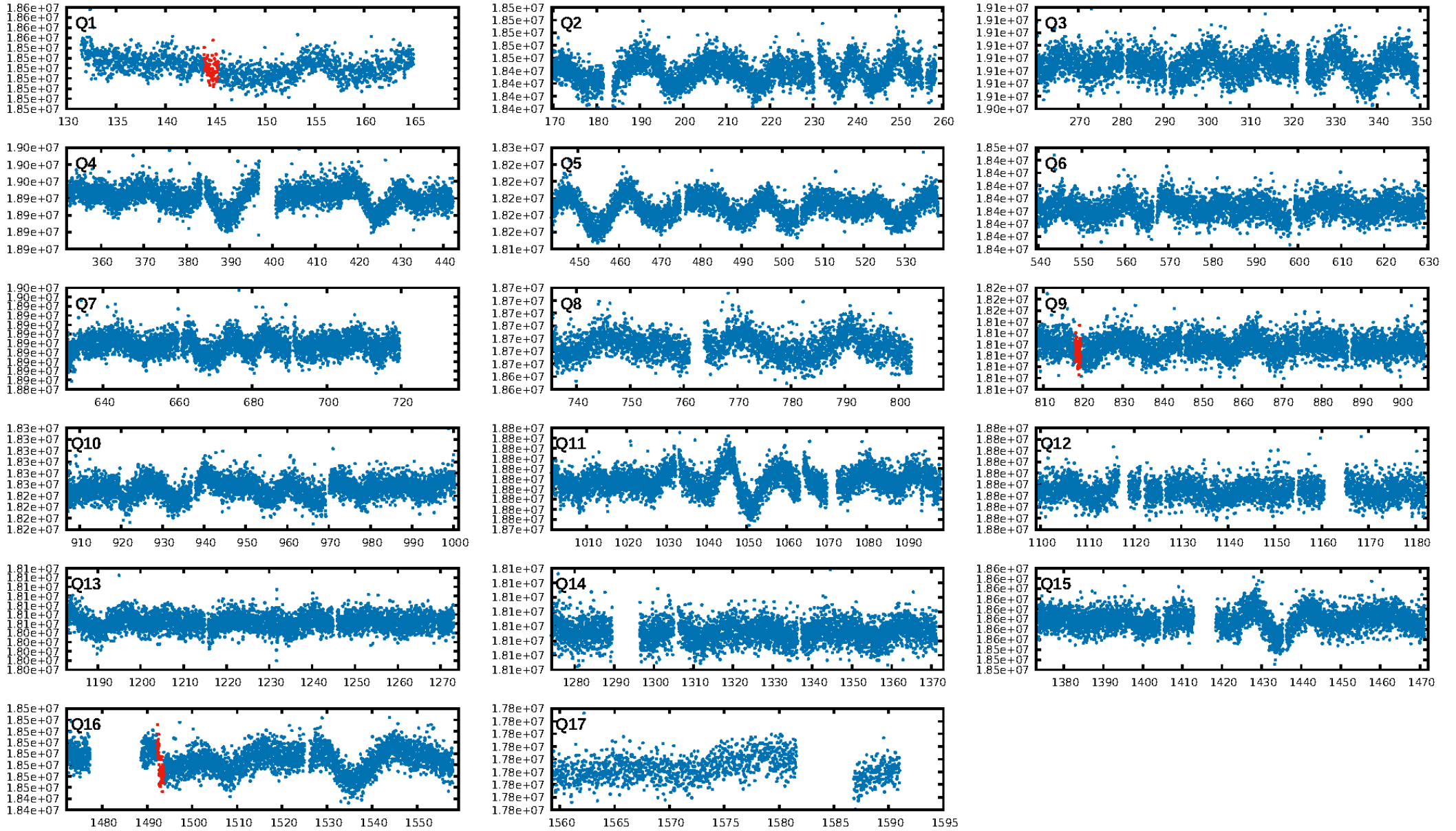
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [914.28σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 14.6%
ModelChiSquareGof-sig: 99.8%
Bootstrap-pfa: 1.90e-10
RollingBand-fgt: 1.00 [2/2]
GhostDiagnostic-chr: 2.973
Centroid-sig: 1.2%
Centroid-so: 3.809 arcsec [2.44σ]
OotOffset-rm: 3.872 arcsec [1.77σ]
KicOffset-rm: 3.755 arcsec [2.01σ]
OotOffset-st: 0/0/1/1 [2]
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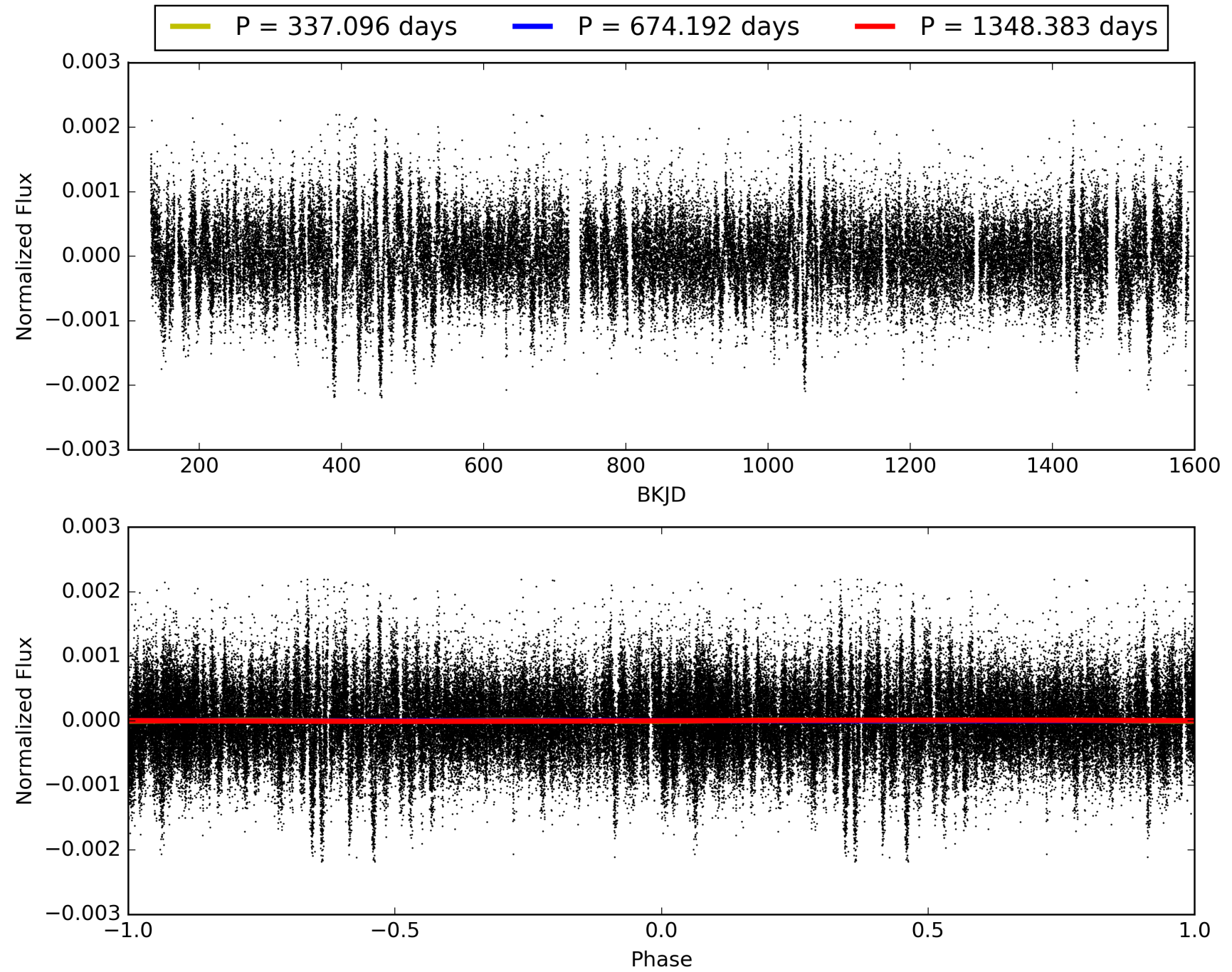
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 17:12:20 Z

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

TCE 009651602-02, PDC Light Curves

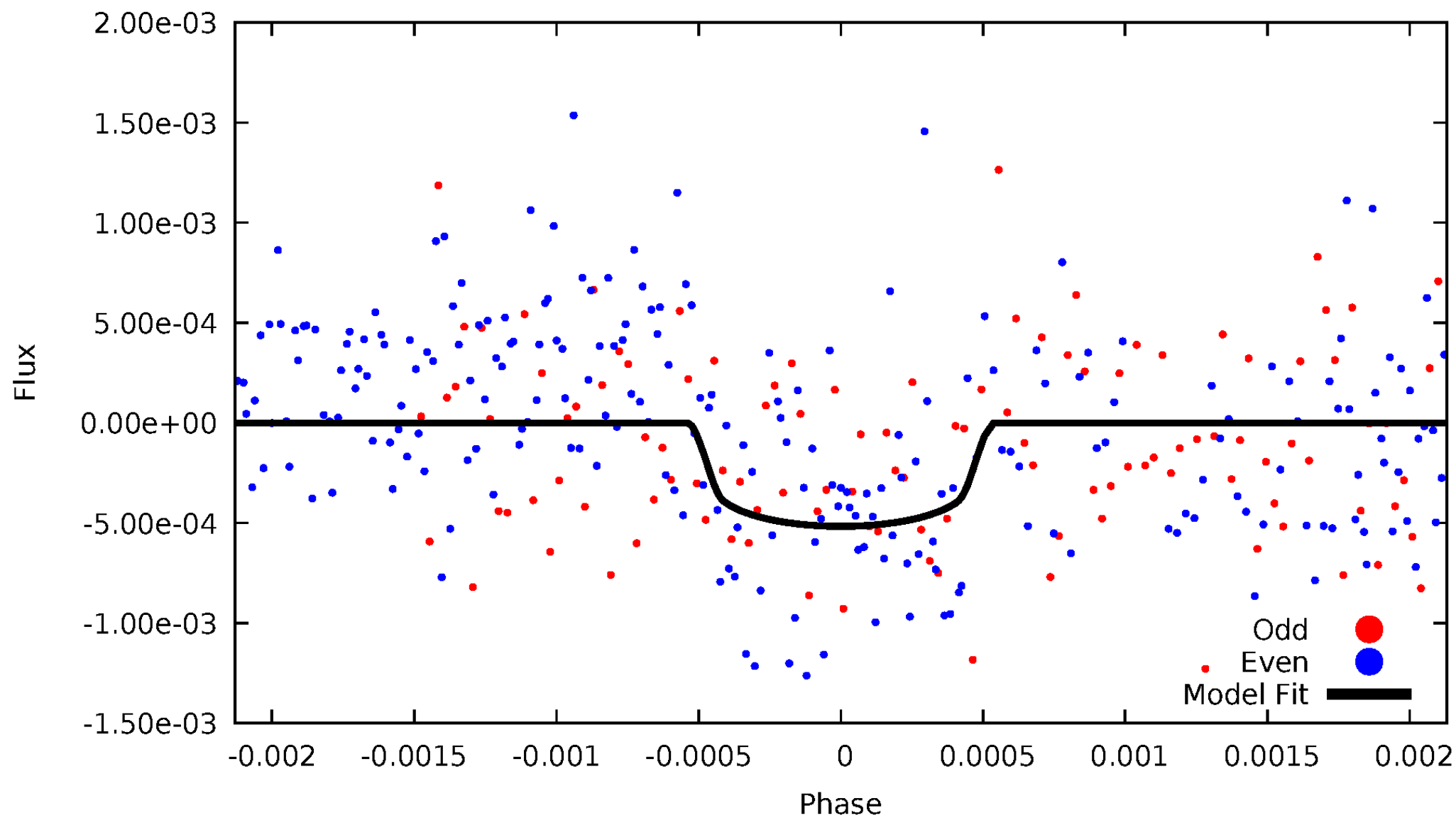


TCE 009651602-02



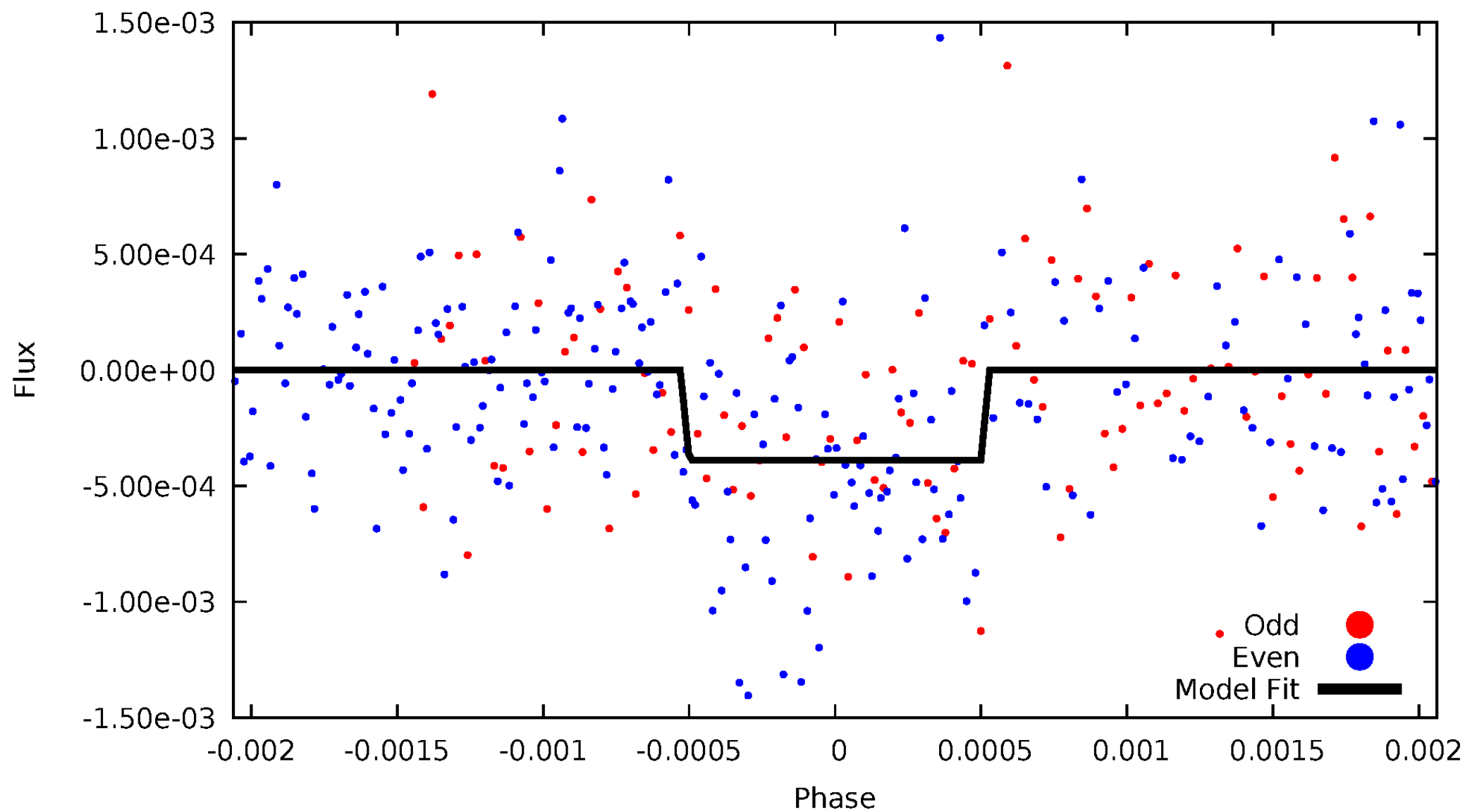
DV Odd/Even

TCE 009651602-02



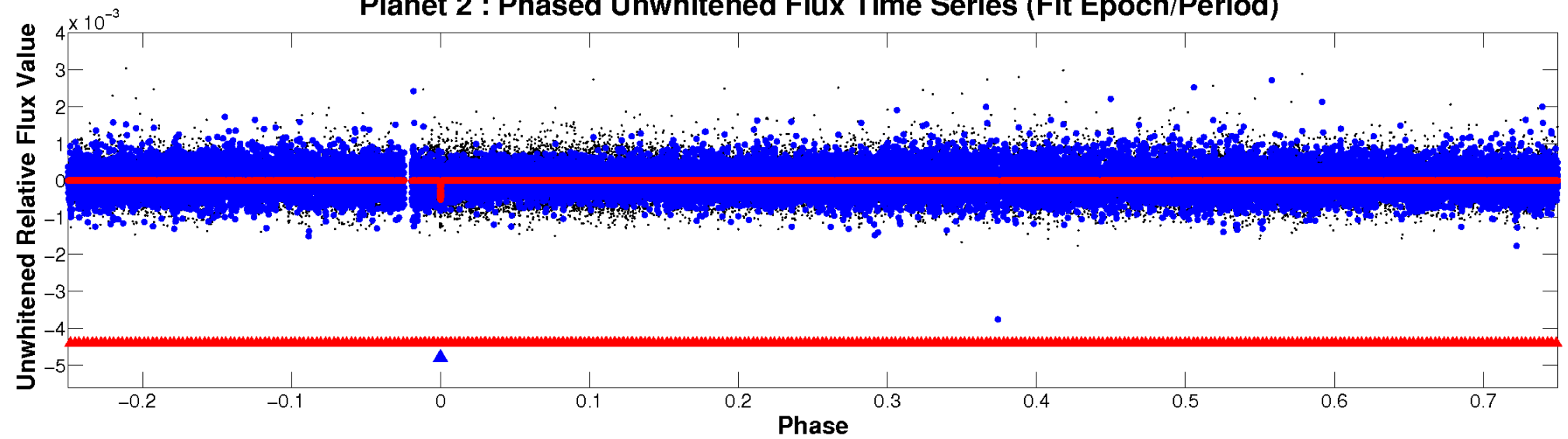
ALT Odd/Even

TCE 009651602-02

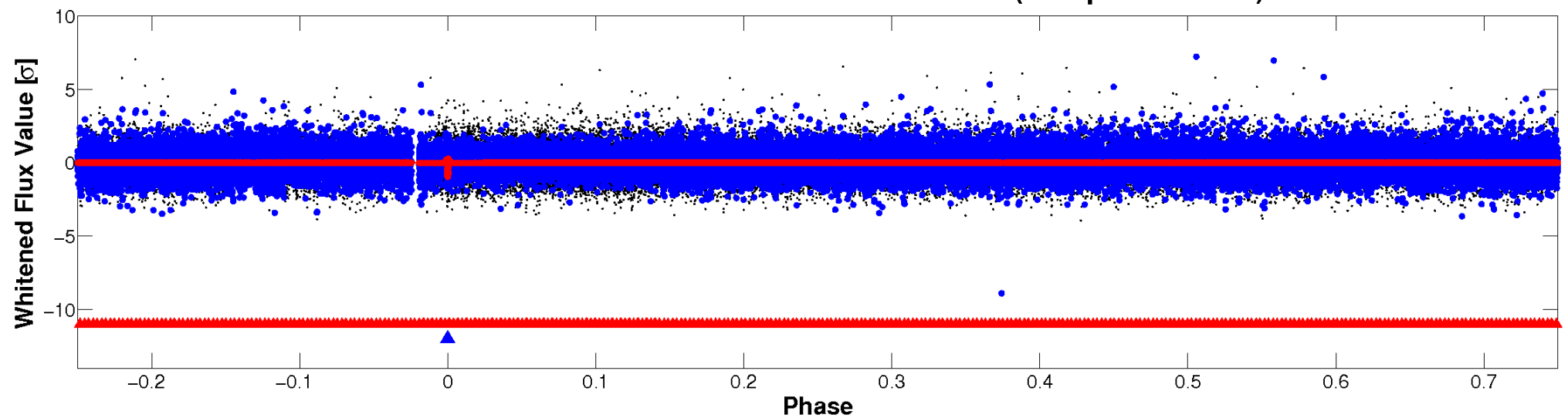


Non-Whitened Vs. Whitened Light Curve

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

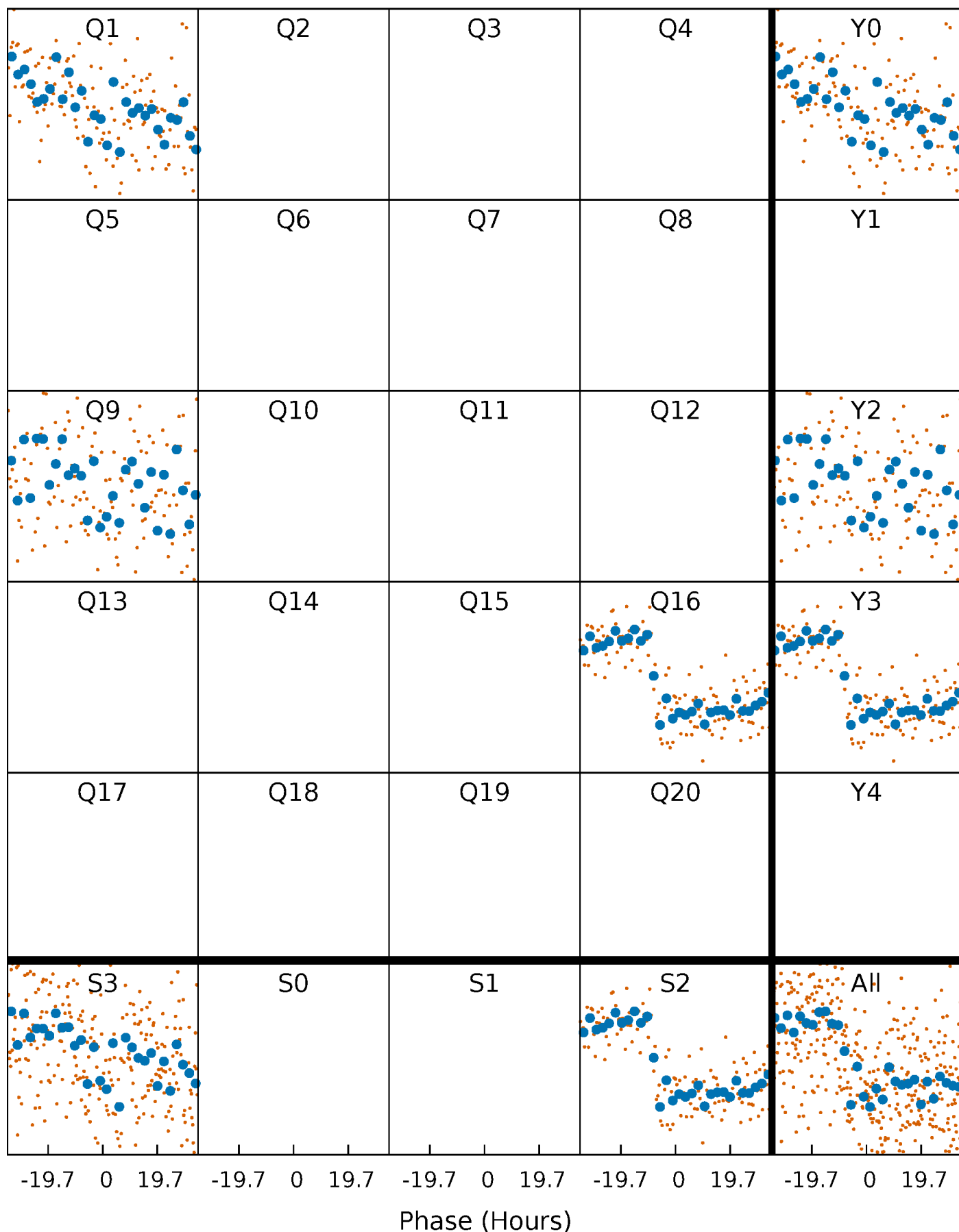


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



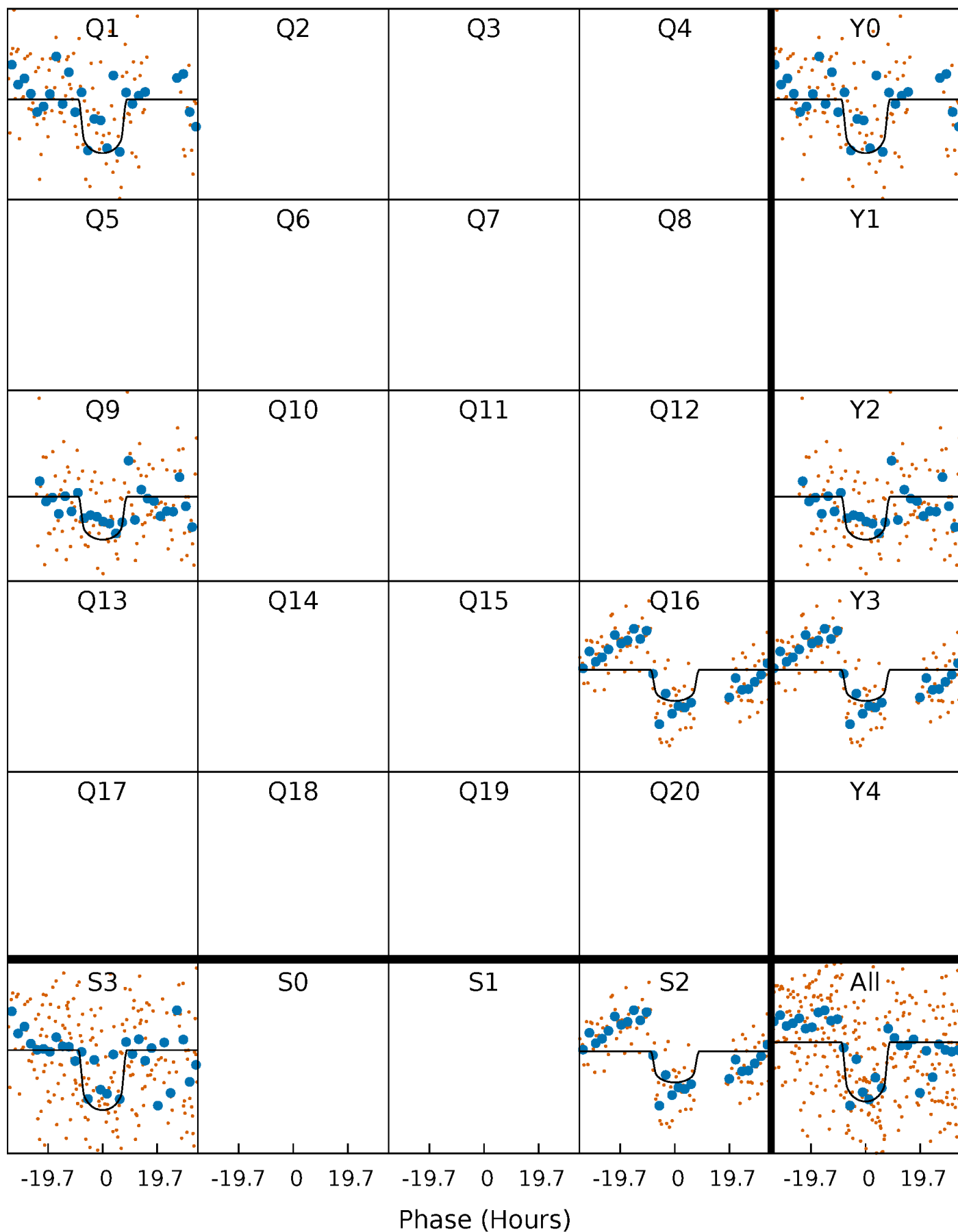
PDC Quarter-Phased Transit Curves

TCE 009651602-02 P=674.191604 Days $T_0=144.576022$ (BKJD)



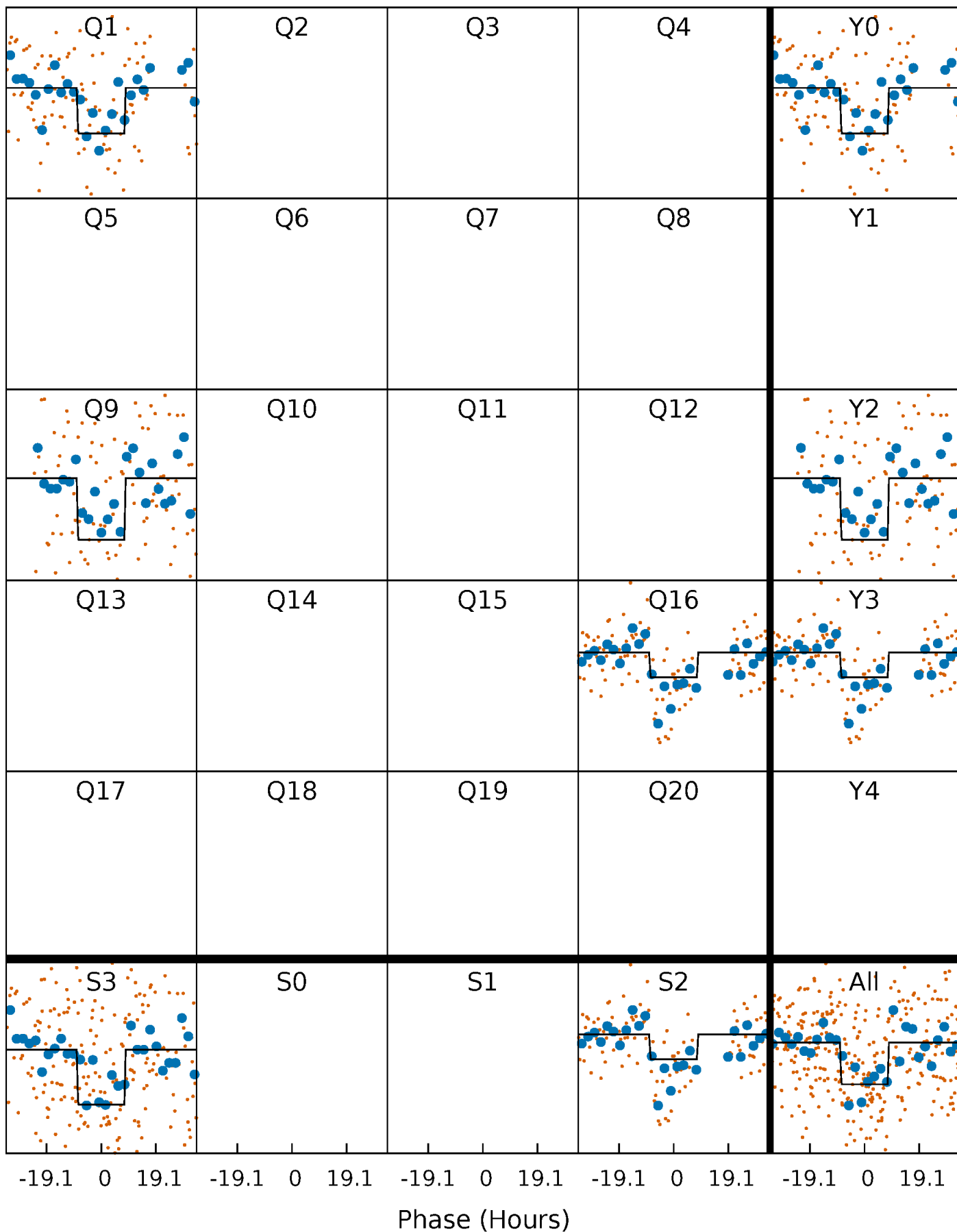
DV Quarter-Phased Transit Curves

TCE 009651602-02 $P=674.191604$ Days $T_0=144.576022$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

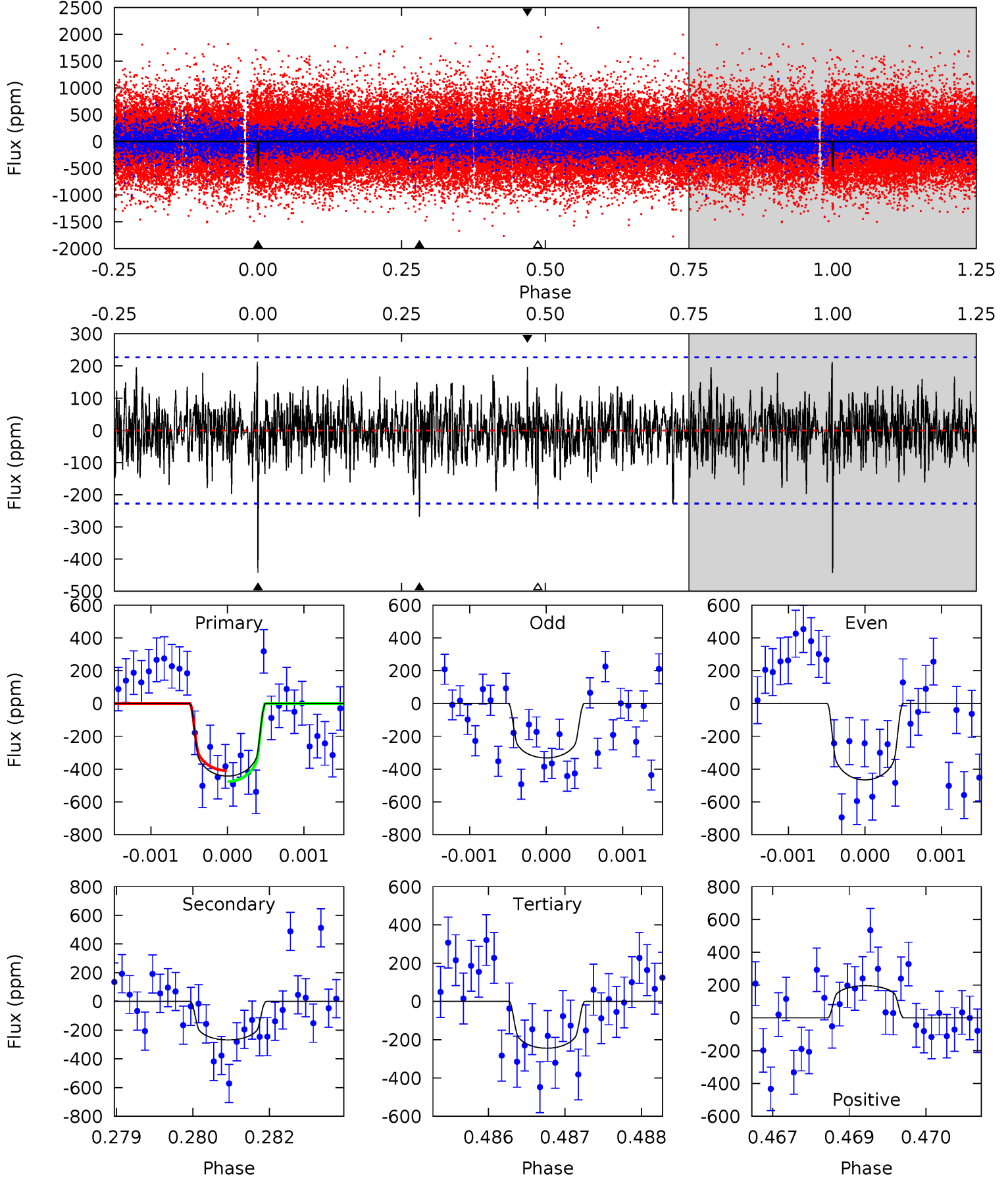
TCE 009651602-02 $P=674.212123$ Days $T_0=144.531604$ (BKJD)



DV Model-Shift Uniqueness Test

009651602-02, P = 674.191604 Days, E = 144.576022 Days

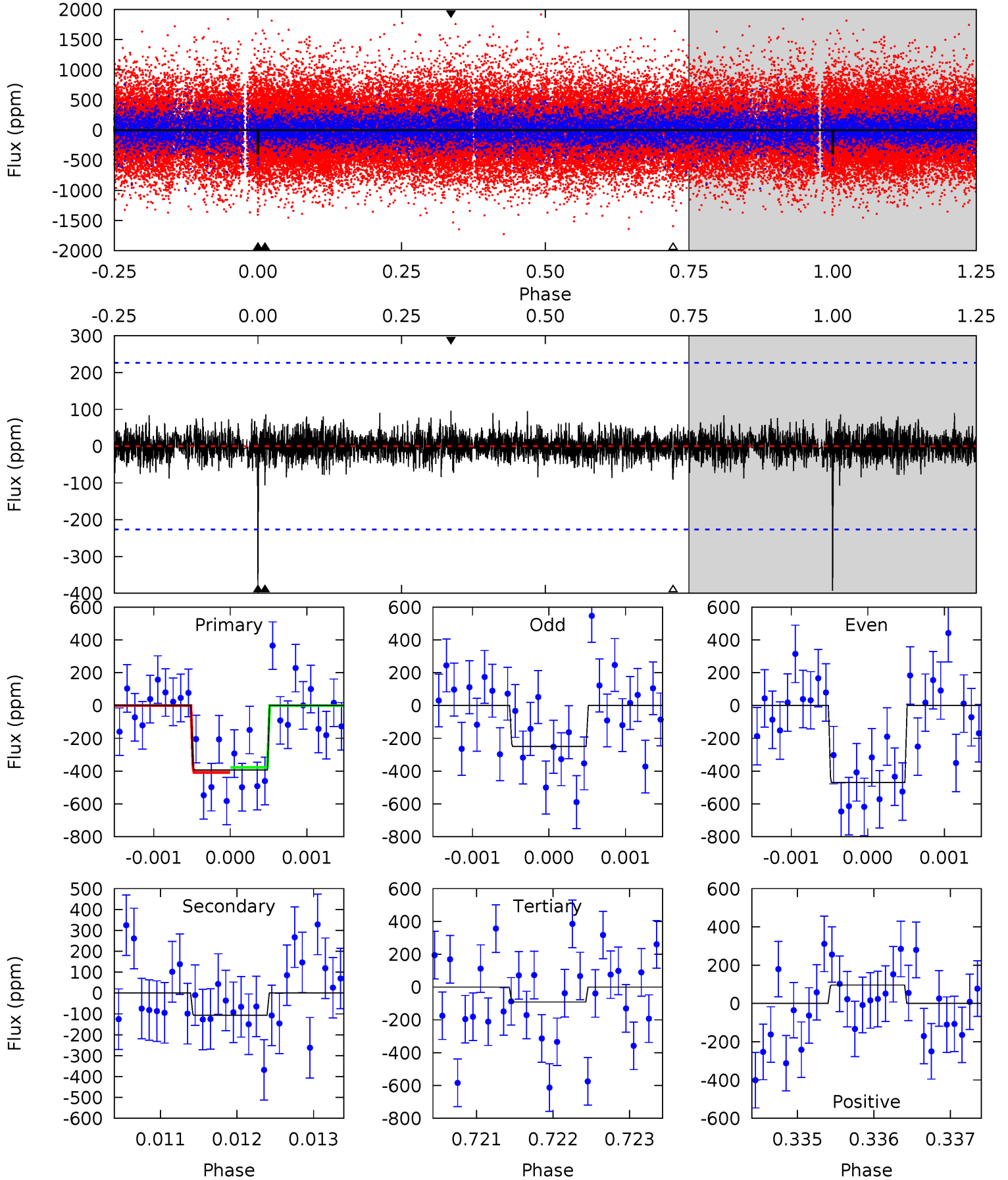
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	6.41	5.84	4.69	5.43	3.26	1.41	4.74	5.90	0.57	1.72	1.54	1.28	0.32	0.79



Alt Model-Shift Uniqueness Test

009651602-02, P = 674.212123 Days, E = 144.531604 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.44	2.56	2.18	2.31	5.45	3.28	0.58	7.26	7.13	0.38	0.25	2.53	1.33	0.20	0.36



Stellar Parameters For KIC 009651602

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5497^{+147}_{-164}	$4.577^{+0.032}_{-0.136}$	$-0.100^{+0.300}_{-0.300}$	$0.809^{+0.152}_{-0.065}$	$0.907^{+0.073}_{-0.110}$	$2.412^{+0.417}_{-0.914}$
	+3%/-3%	+1%/-3%	+300%/-300%	+19%/-8%	+8%/-12%	+17%/-38%
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 009651602-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-268 ± 42	$2.25^{+0.43}_{-0.43}$	256^{+13}_{-10}	4613^{+390}_{-335}	61115^{+31260}_{-20051}
Alt.	-107 ± 42	$1.81^{+0.42}_{-0.40}$	257^{+14}_{-10}	4173^{+502}_{-432}	36299^{+29670}_{-17511}

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

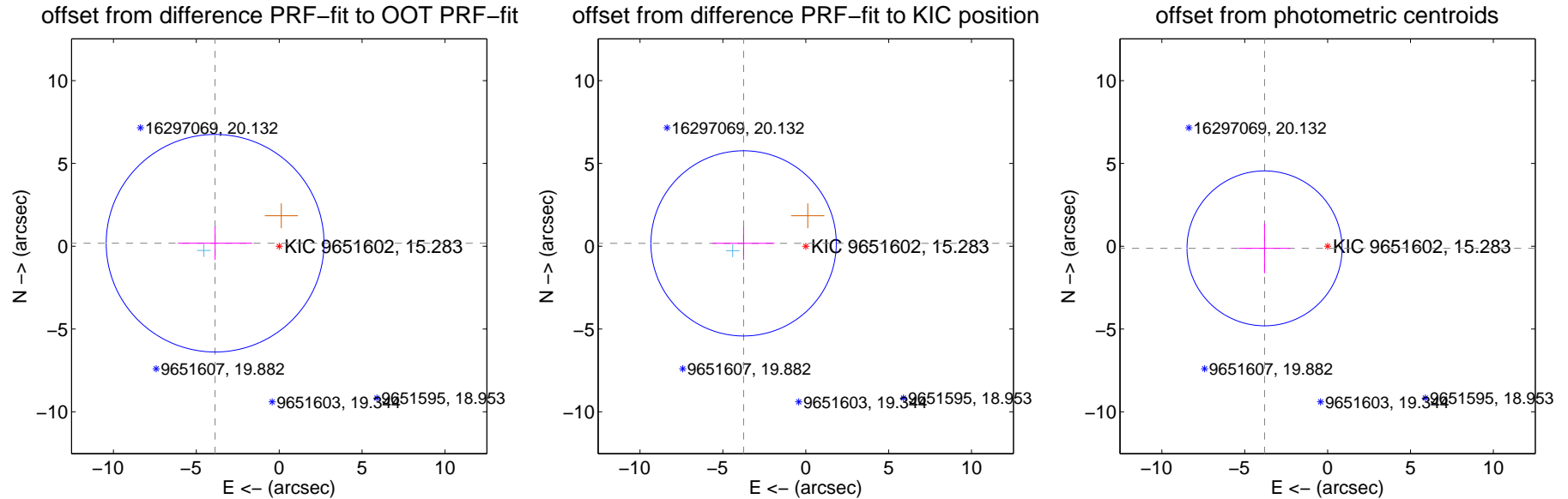
DV Centroid Data

Supplemental centroid analysis for 009651602-02. Kepler magnitude: 15.28. Transit SNR 8.13

There are 1 quarters with good PRF difference image offsets

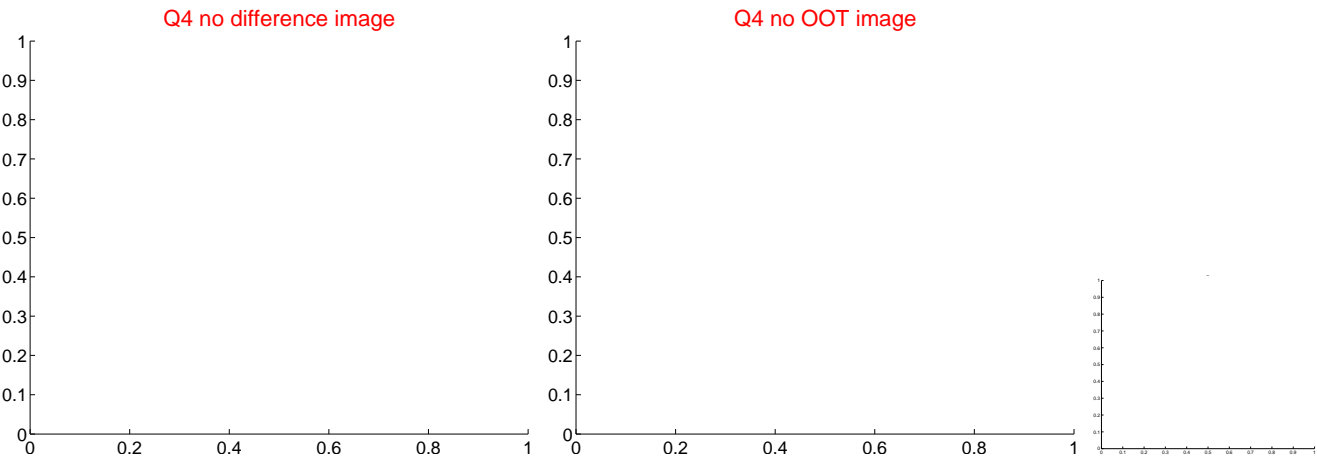
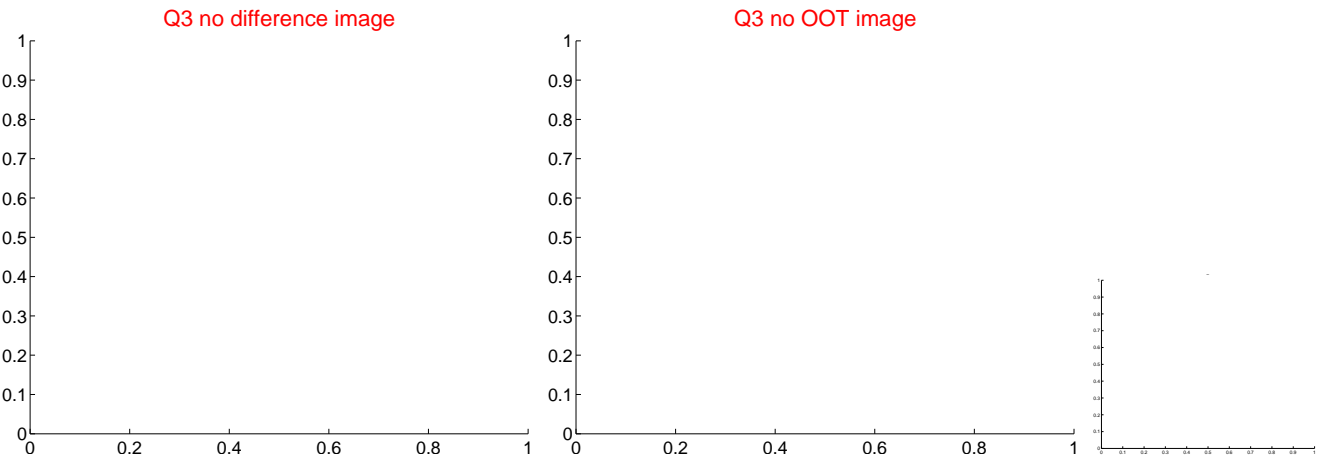
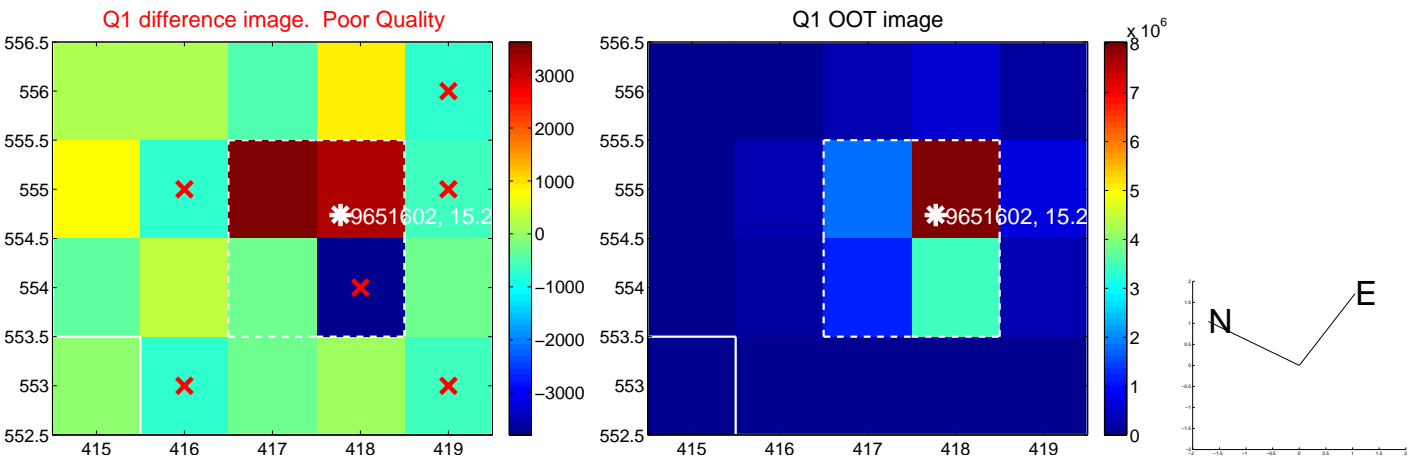
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.872 ± 2.190	1.77	3.867 ± 2.240	0.182 ± 1.006
PRF-fit source offset from KIC position	3.755 ± 1.865	2.01	3.751 ± 1.866	0.172 ± 1.004
photometric centroid source offset	3.81 ± 1.56	2.44	3.81 ± 1.56	-0.13 ± 1.51



Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

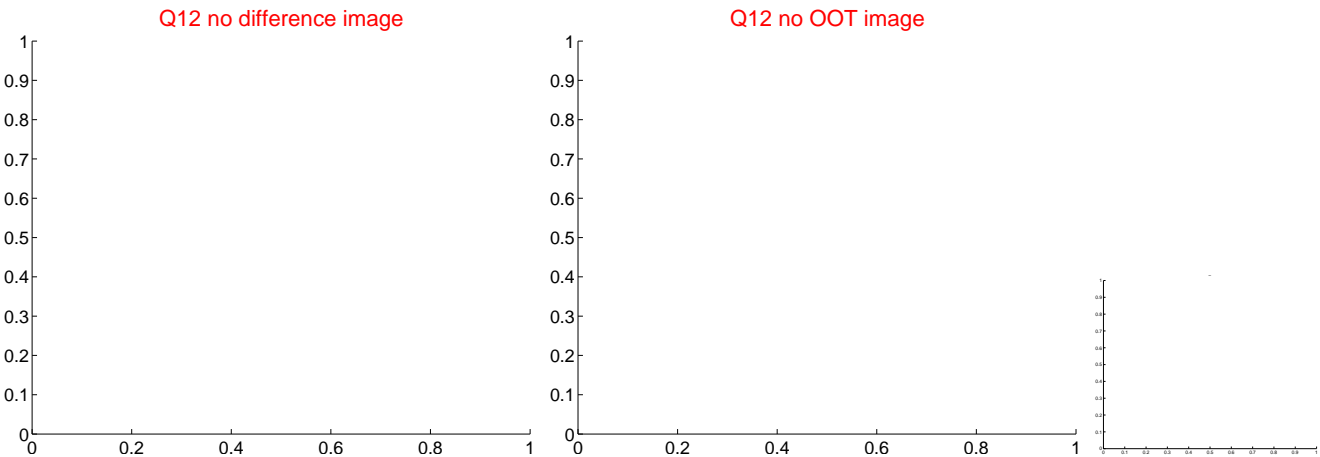
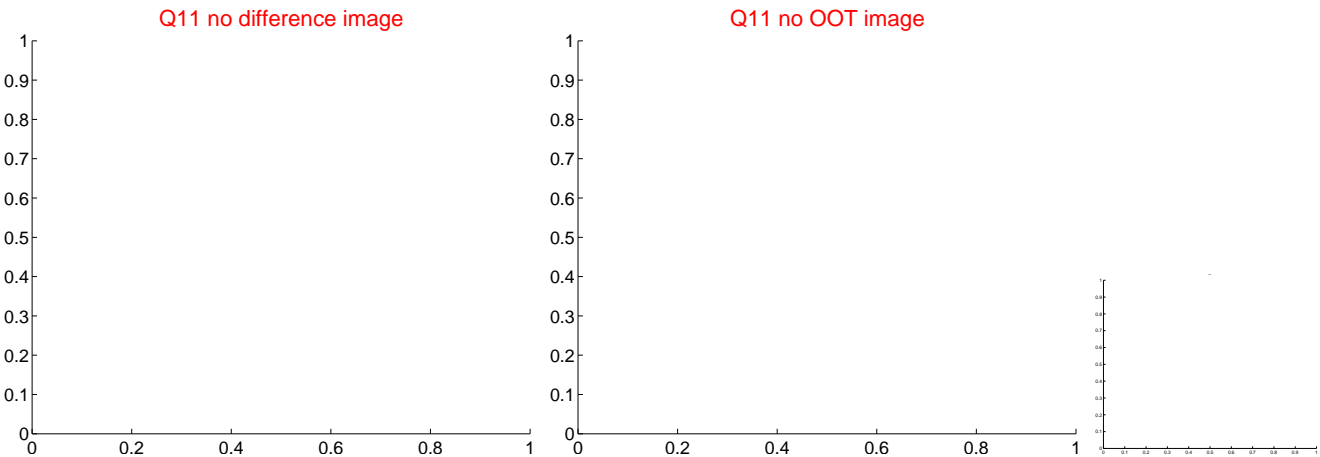
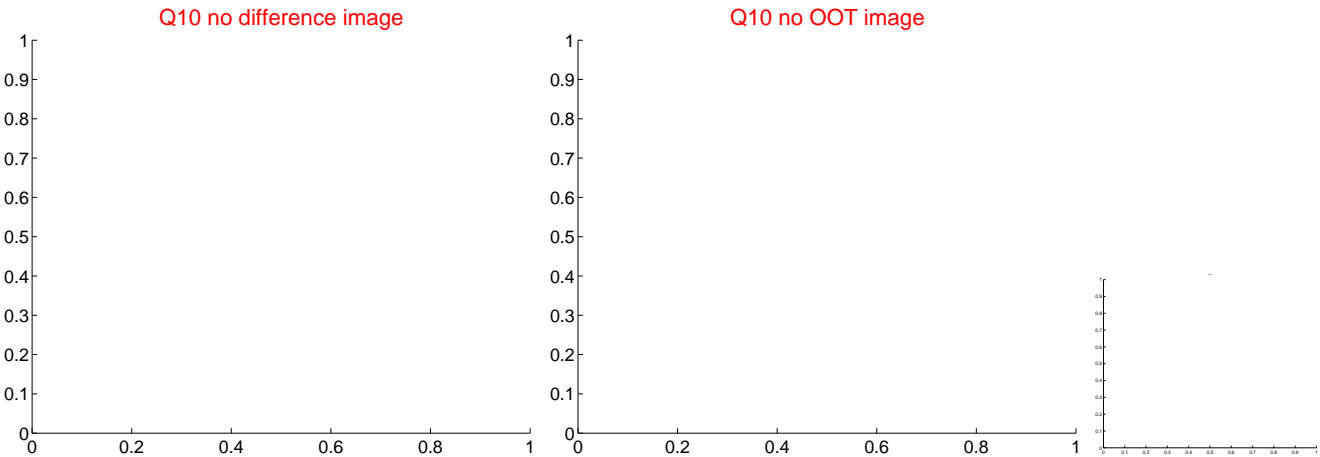
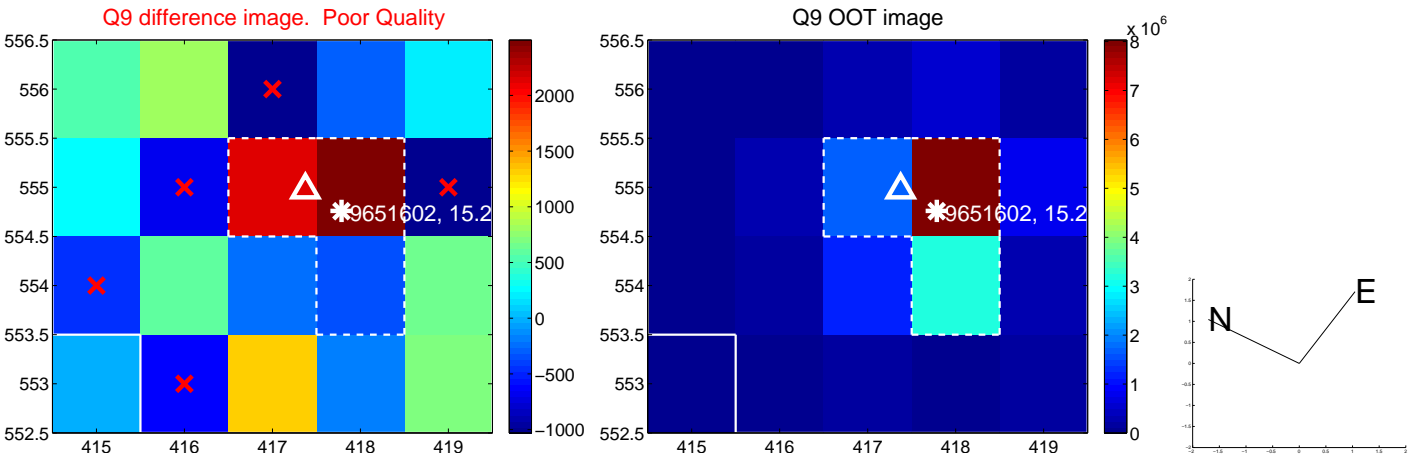
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



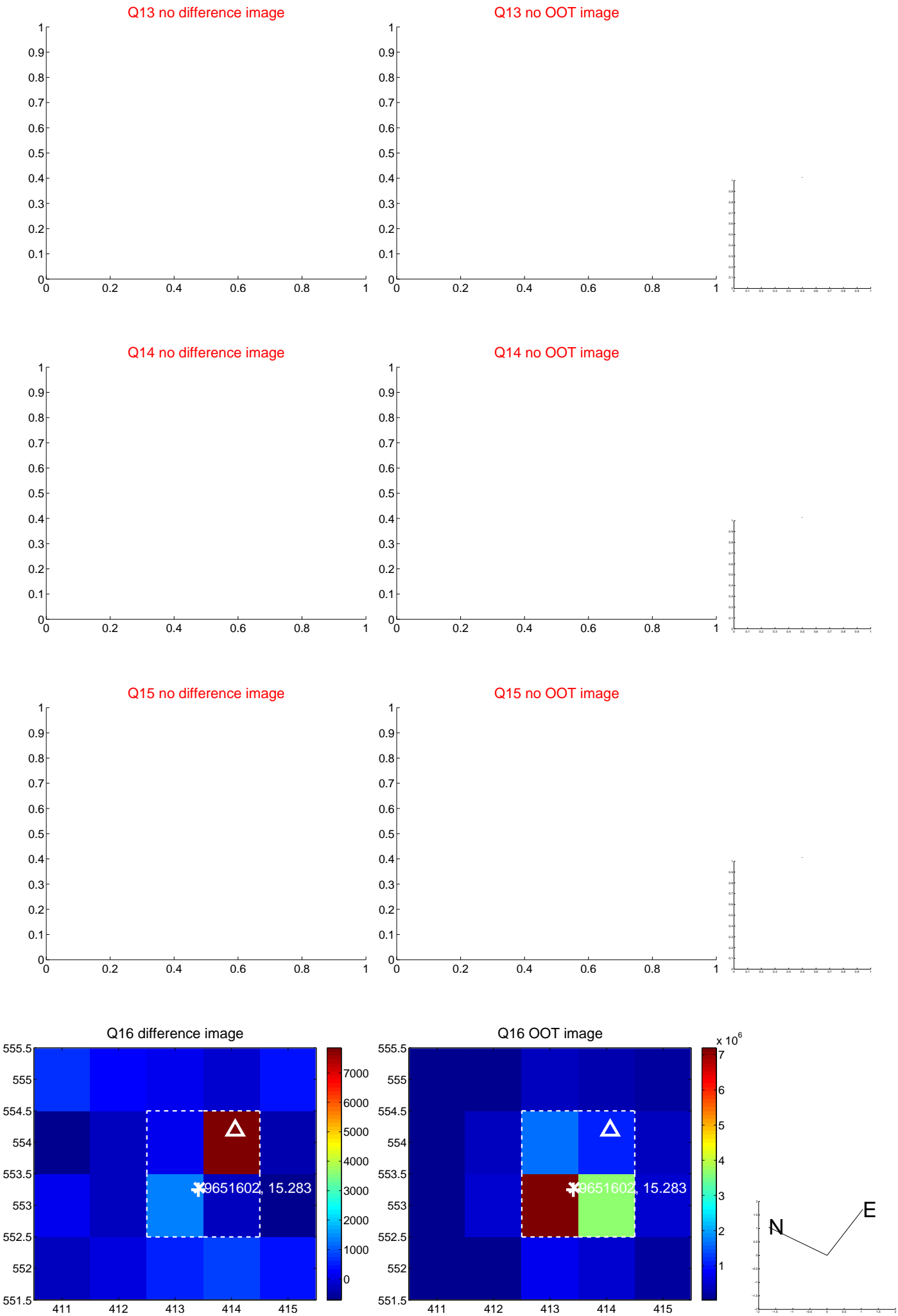
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



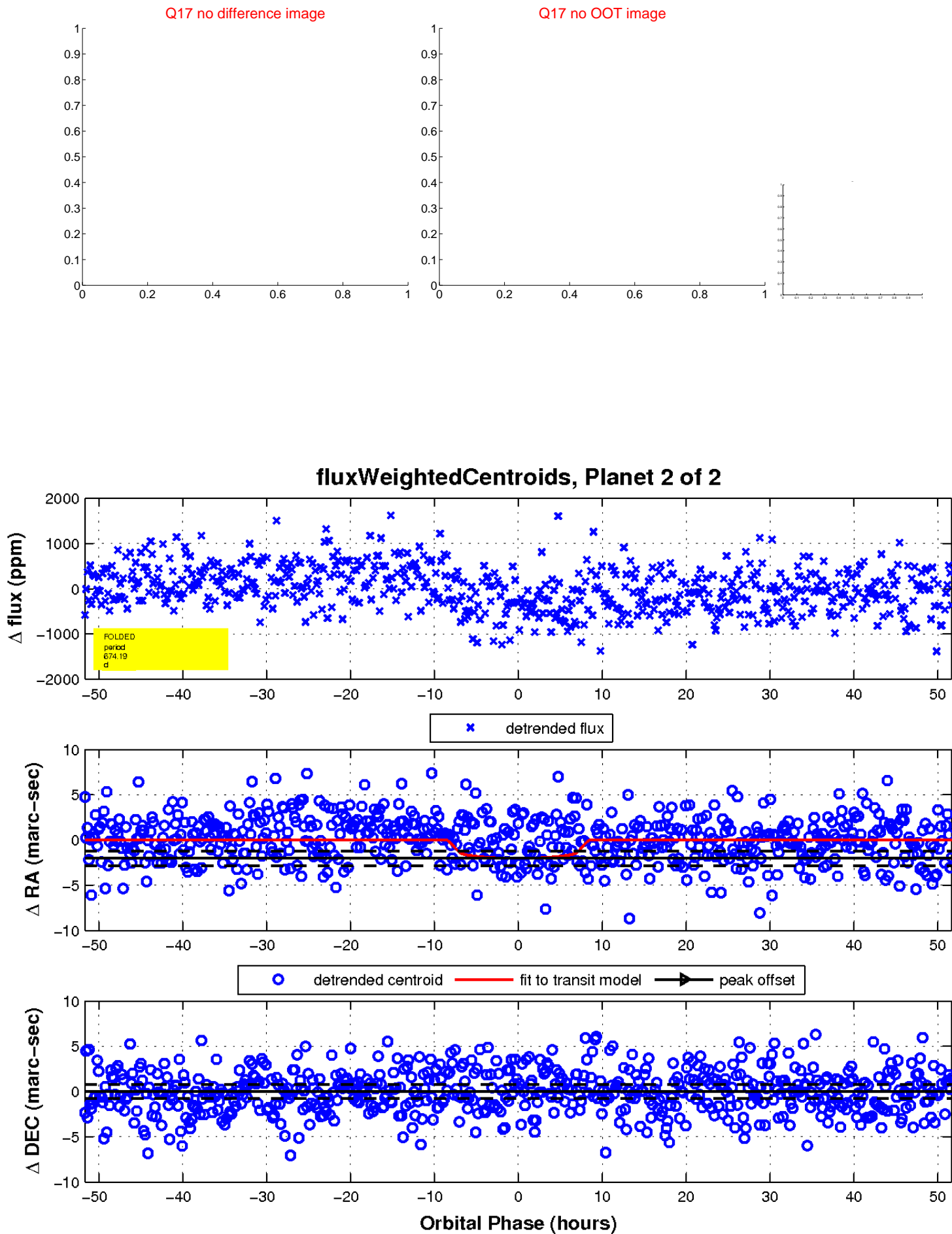
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

