

KIC 009655402

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})
009655402-01	OBS	No	2.802679	133.637540	34.0	12.708	10.7	10.6	1.66	6917	1.09	3082.18
009655402-02	OBS	No	2.802232	132.300460	29.2	18.192	11.2	11.9	1.66	6917	1.04	3082.83

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655402-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009655402-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD

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

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

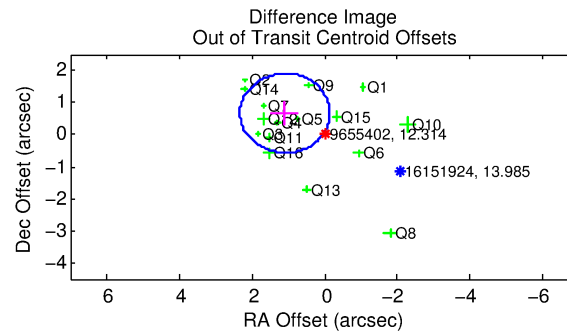
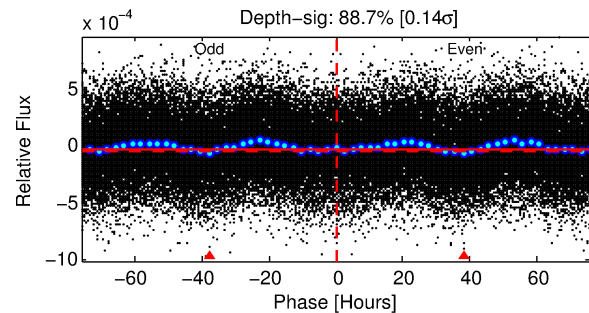
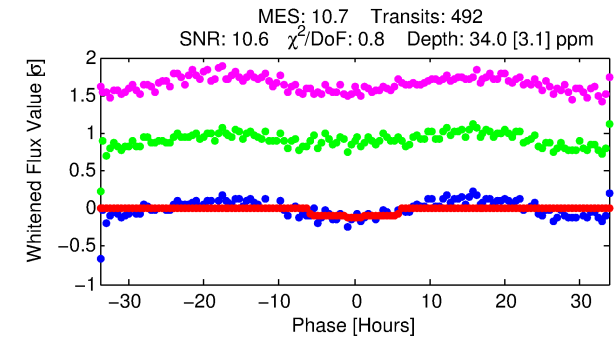
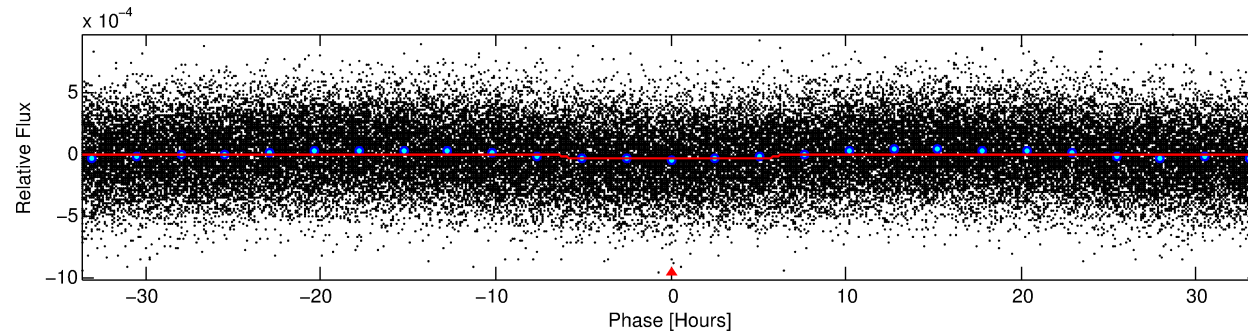
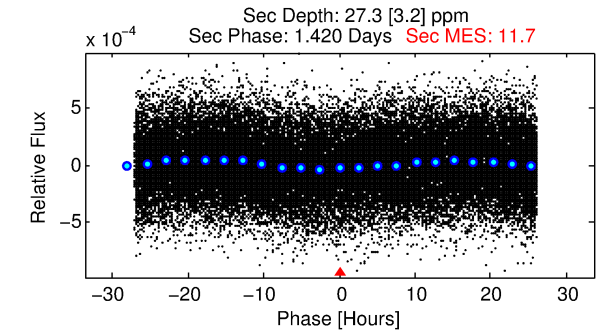
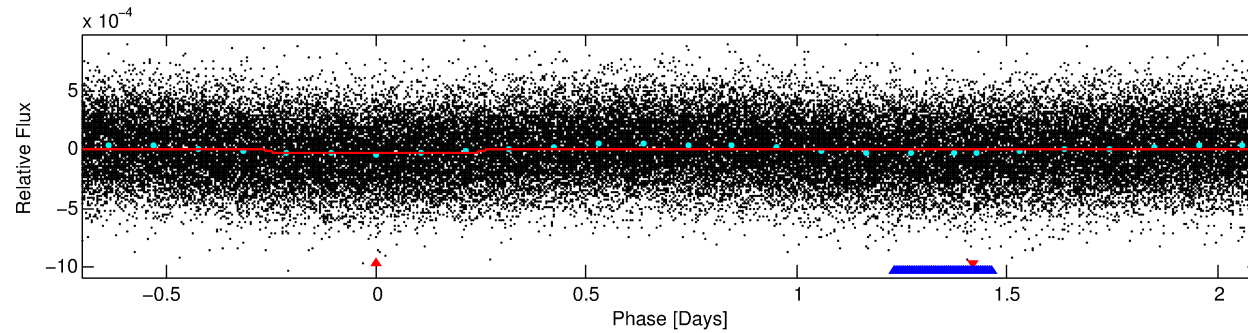
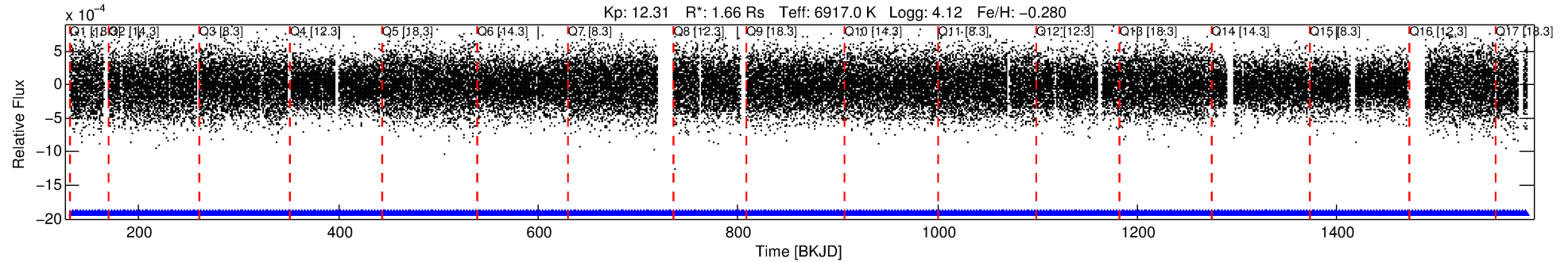
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009655402-01

No Significant Match Found

DV One-Page Summary

KIC: 9655402 Candidate: 1 of 2 Period: 2.803 d



DV Fit Results:

Period = 2.80268 [0.00004] d
Epoch = 133.6375 [0.0084] BKJD
Rp/R* = 0.0060 [0.0013]
a/R* = 1.28 [0.66]
b = 0.85 [0.43]
Seff = 3082.17 [1217.22]
Teq = 1900 [188] K
Rp = 1.09 [0.40] Re
a = 0.0428 [0.0104] AU
Ag = 23.11 [13.25] [1.67σ]
Teffp = 6441 [785] K [5.63σ]

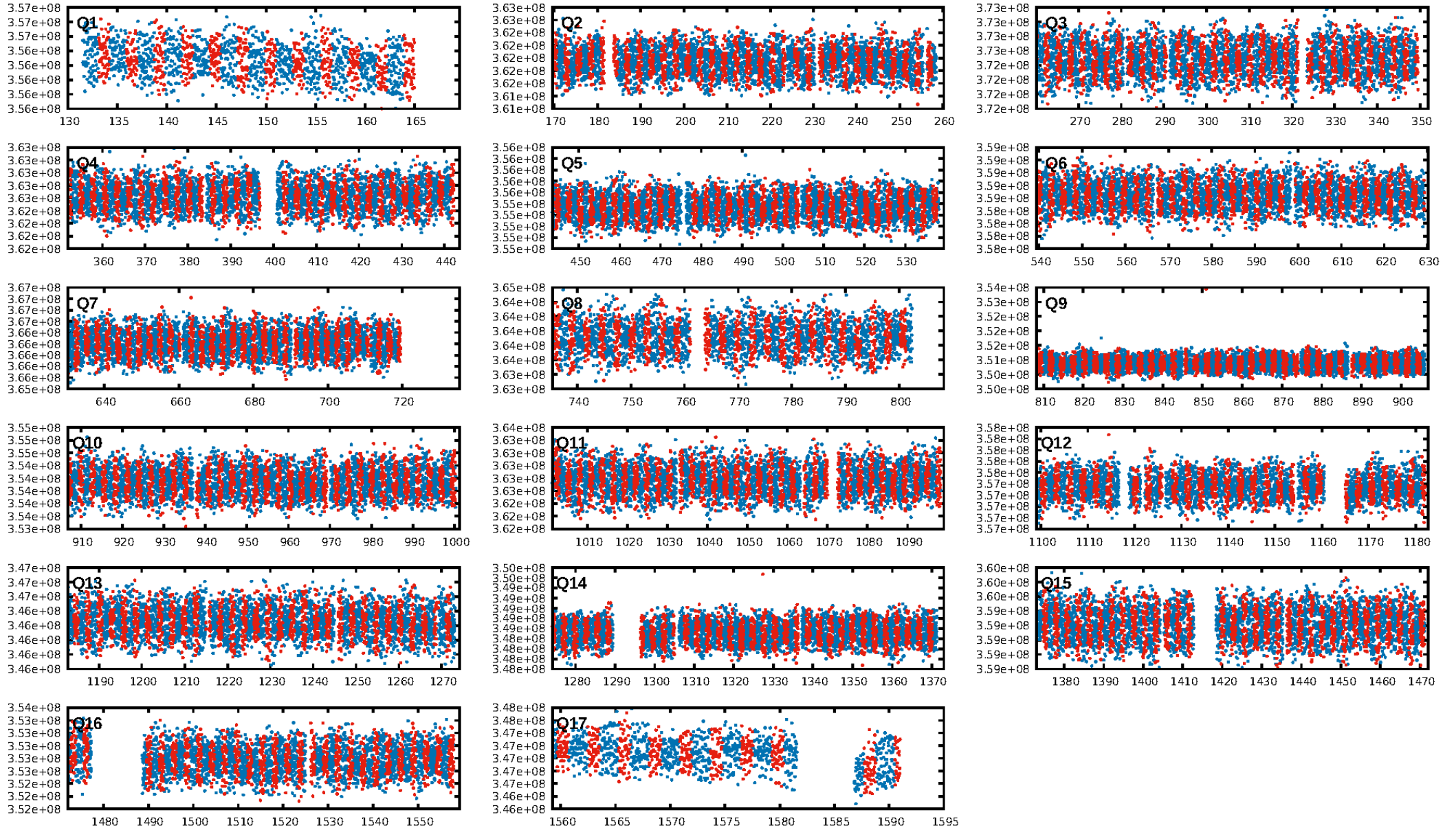
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [470/470]
GhostDiagnostic-chr: -14.09
Centroid-sig: 13.4%
Centroid-so: 0.389 arcsec [1.22σ]
OotOffset-rm: 1.283 arcsec [3.12σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-rm: 0.879 arcsec [2.32σ]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 0.94 [15/16]
DiffImageOverlap-fno: 0.71 [12/17]

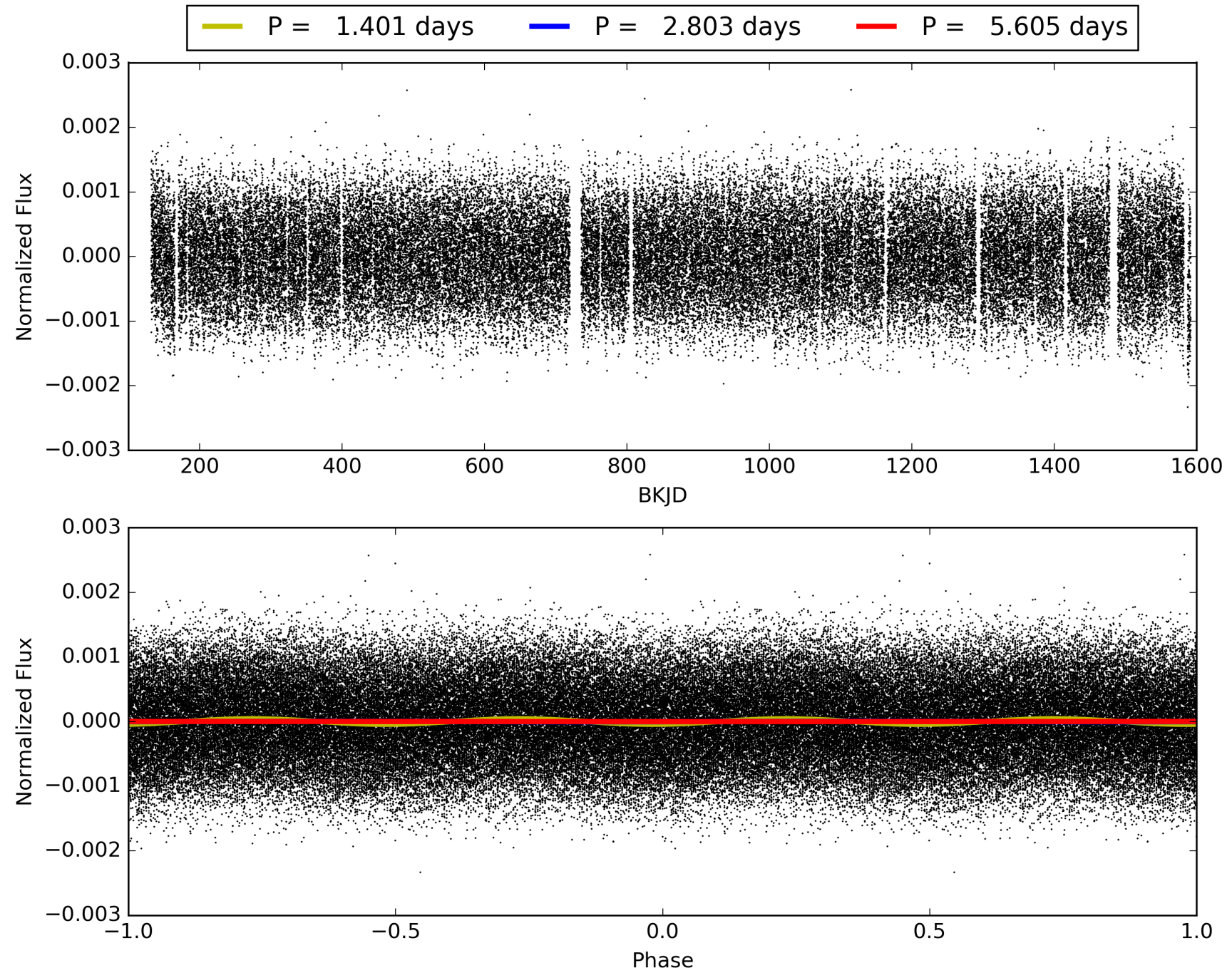
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009655402-01, PDC Light Curves

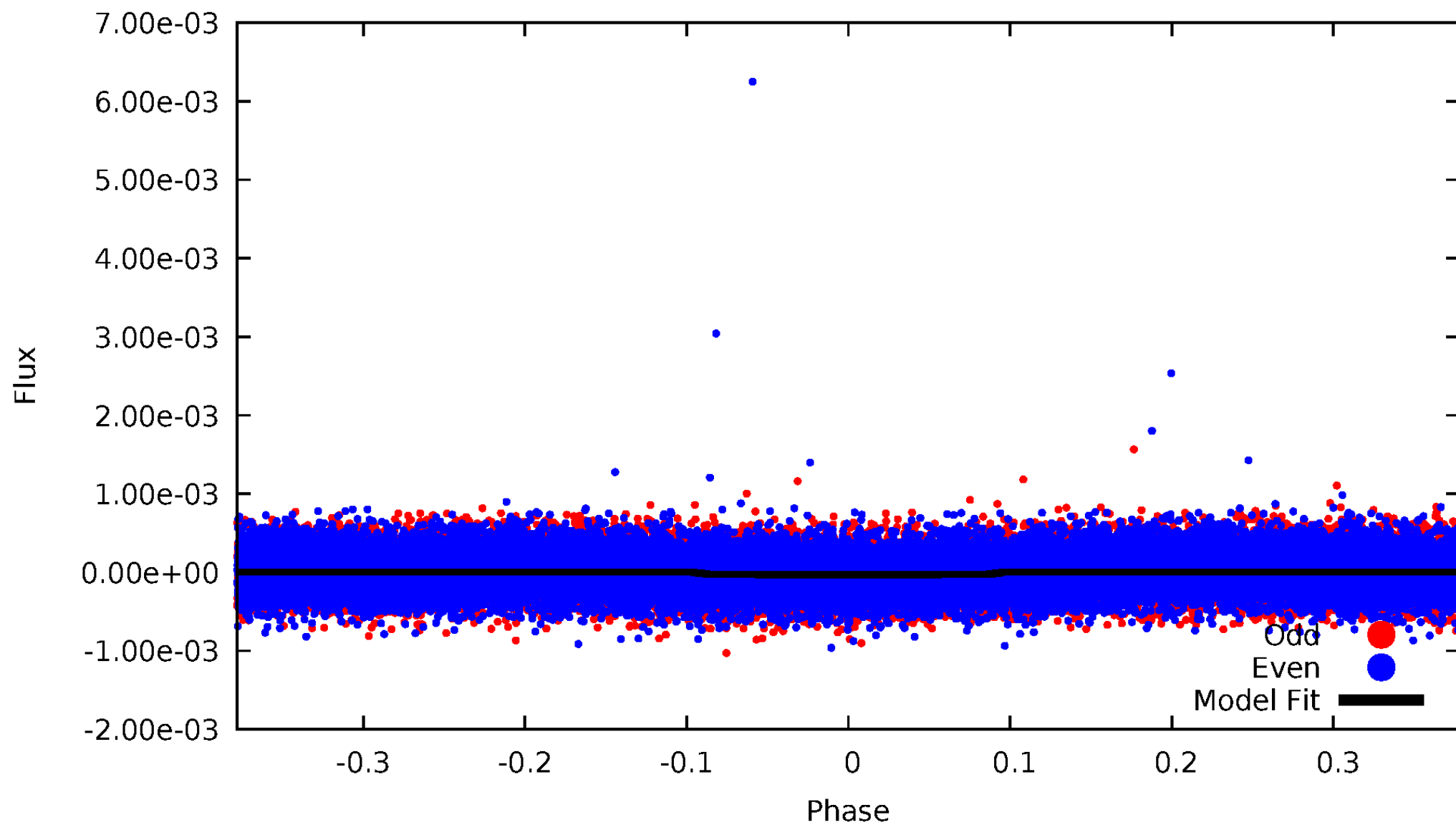


TCE 009655402-01



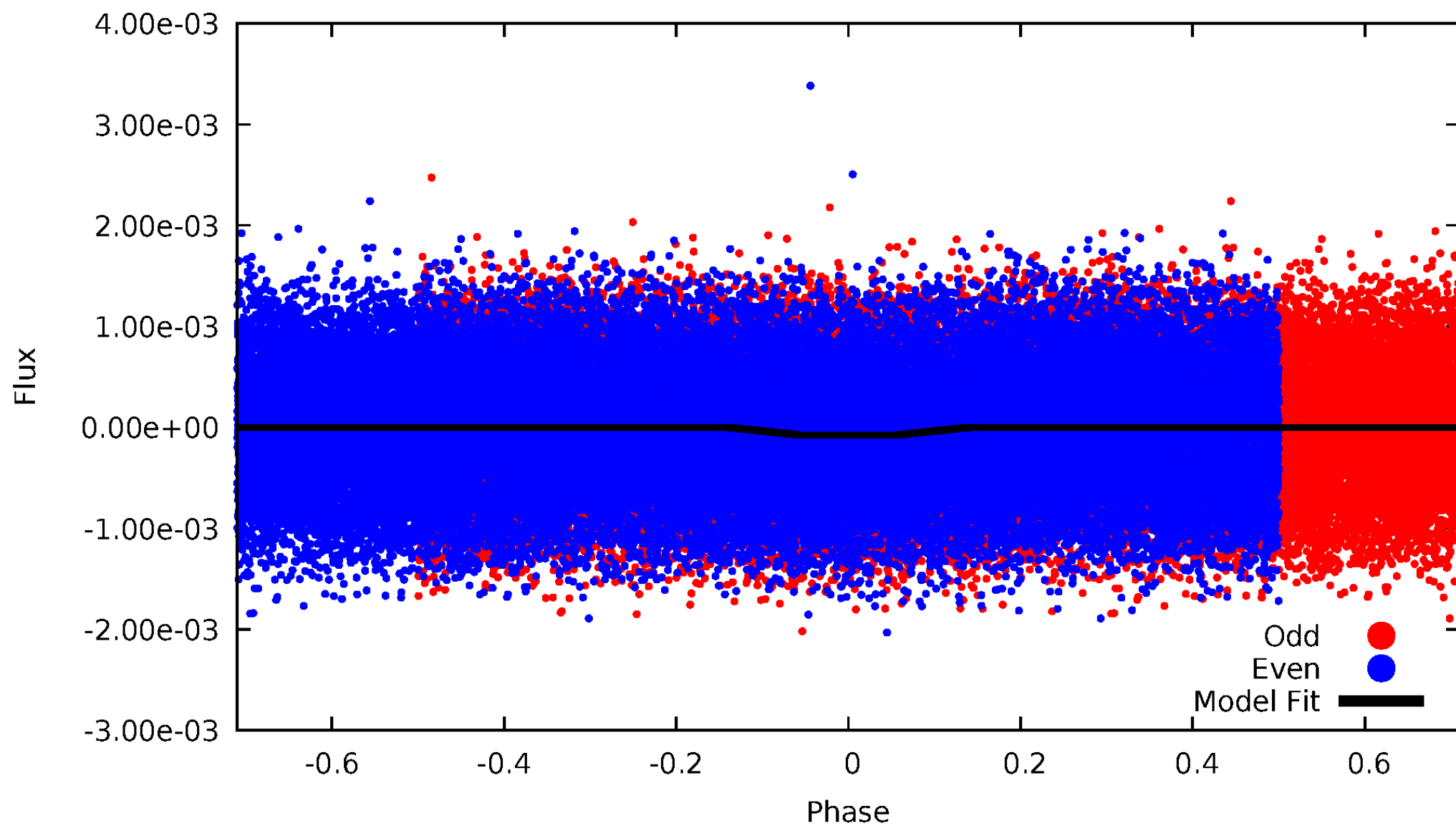
DV Odd/Even

TCE 009655402-01

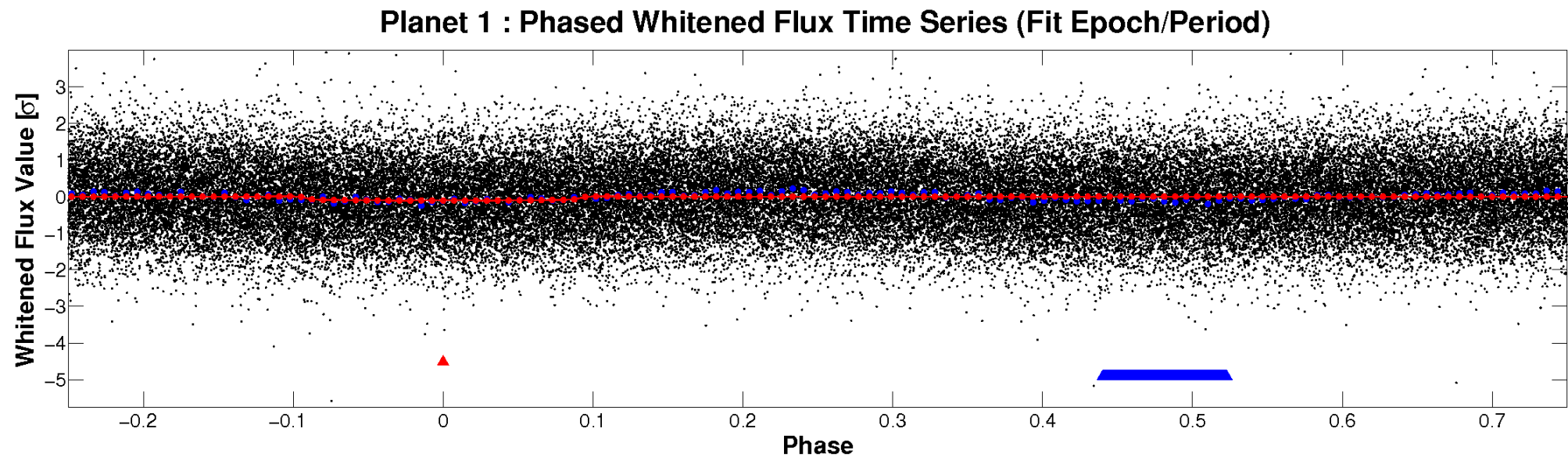
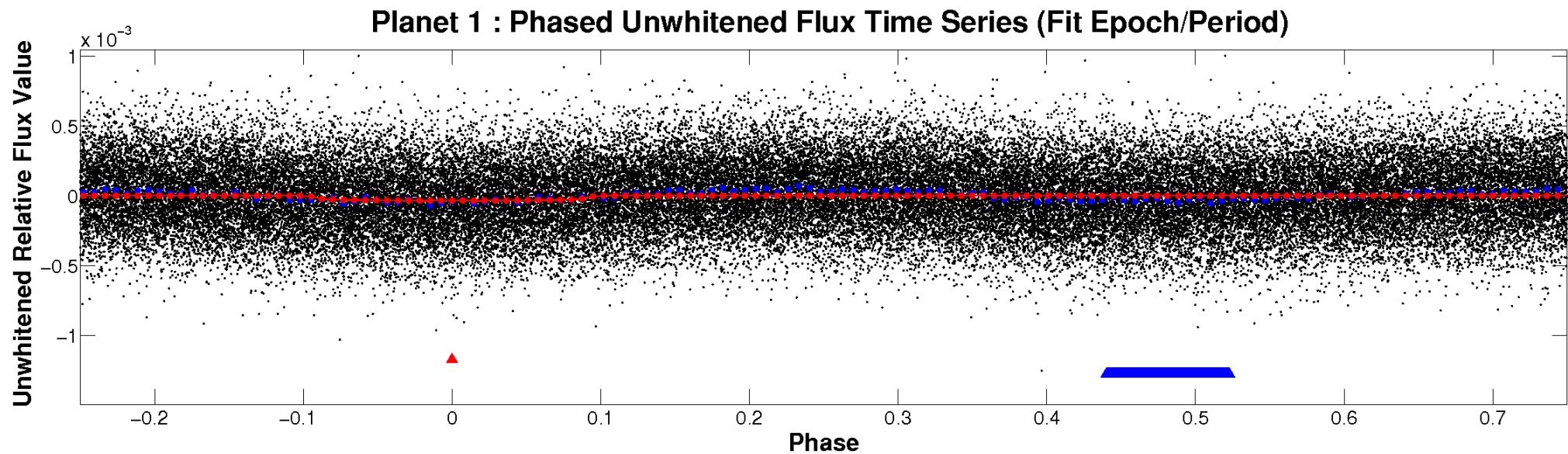


ALT Odd/Even

TCE 009655402-01

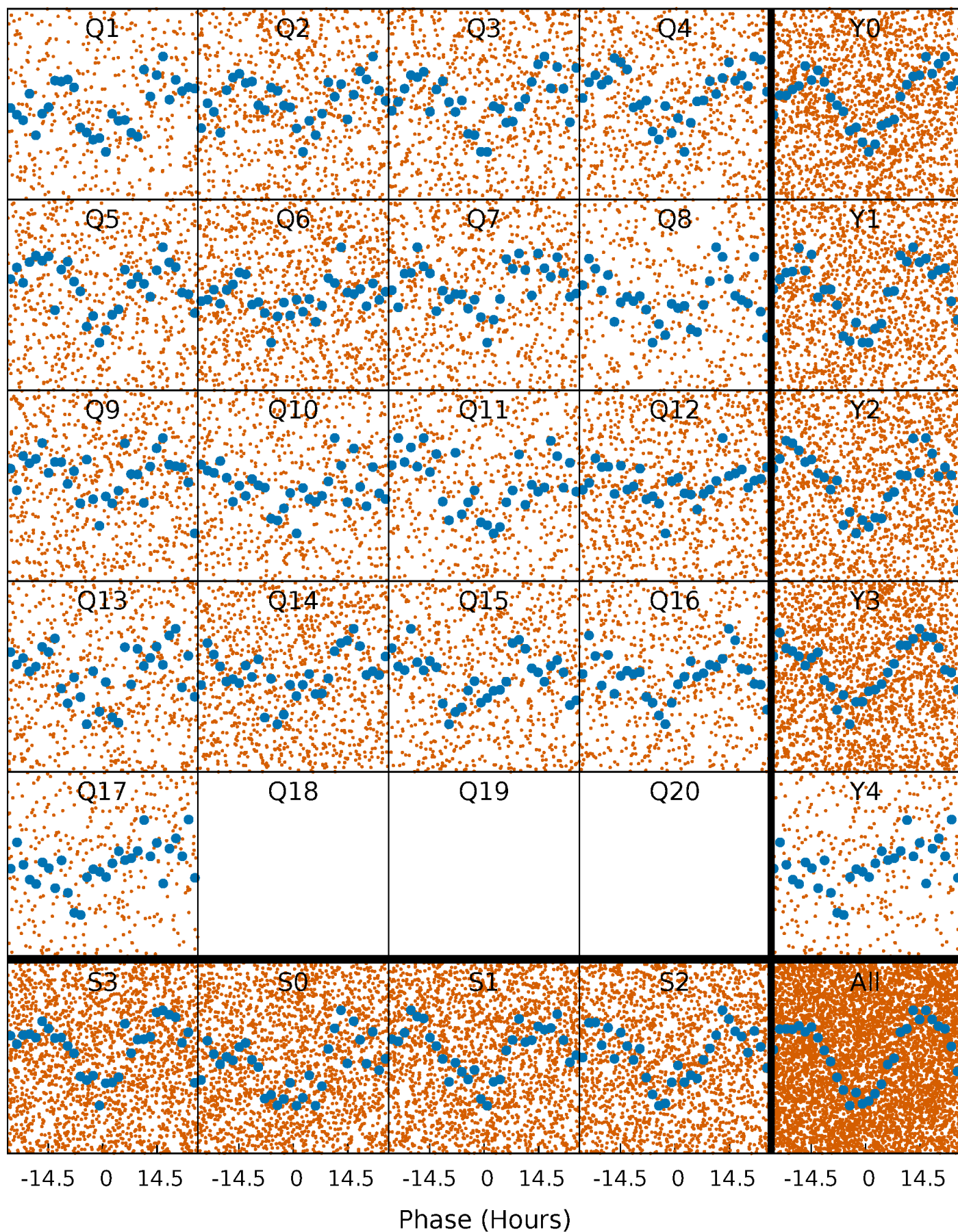


Non-Whitened Vs. Whitened Light Curve



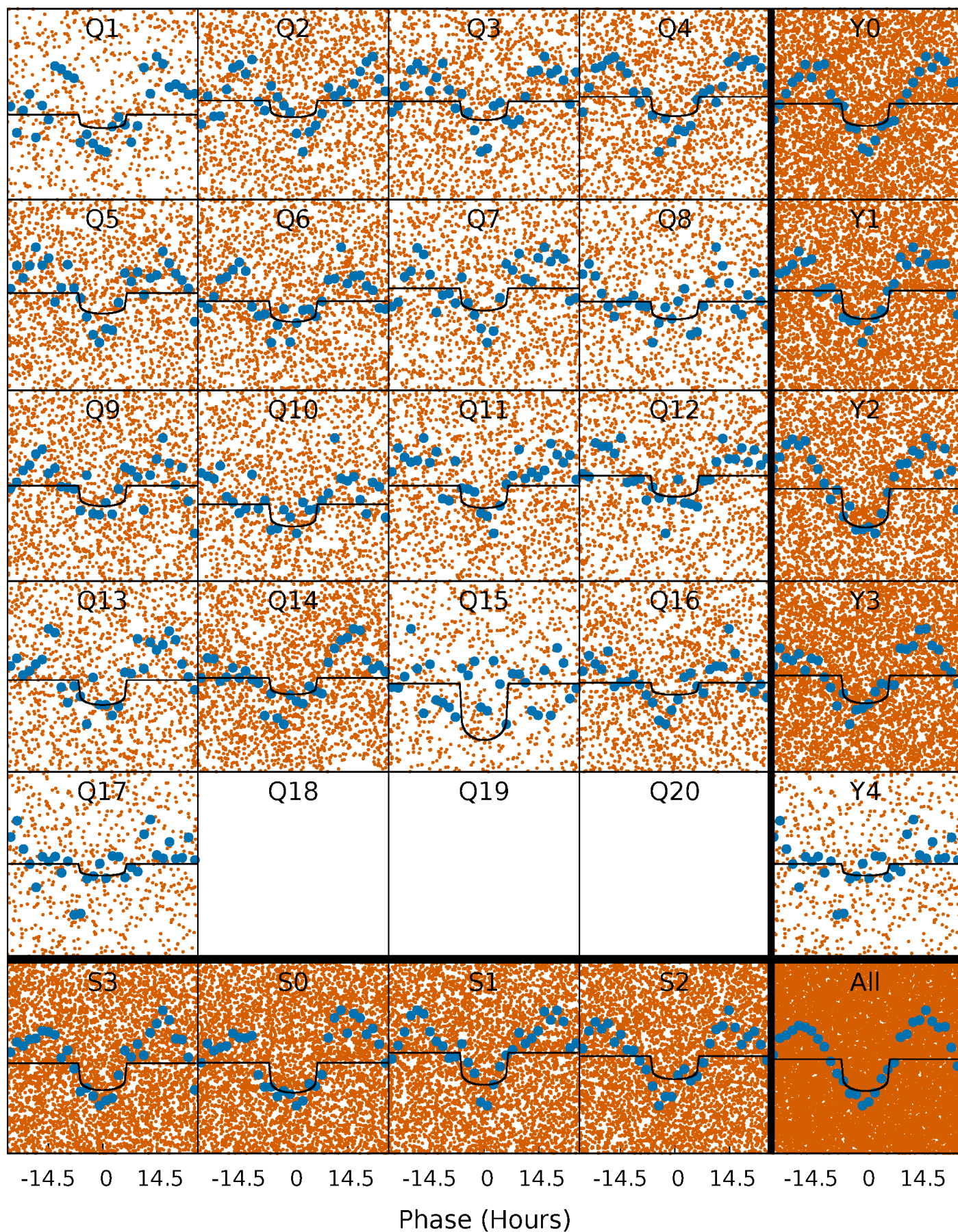
PDC Quarter-Phased Transit Curves

TCE 009655402-01 P= 2.802679 Days $T_0=133.637540$ (BKJD)



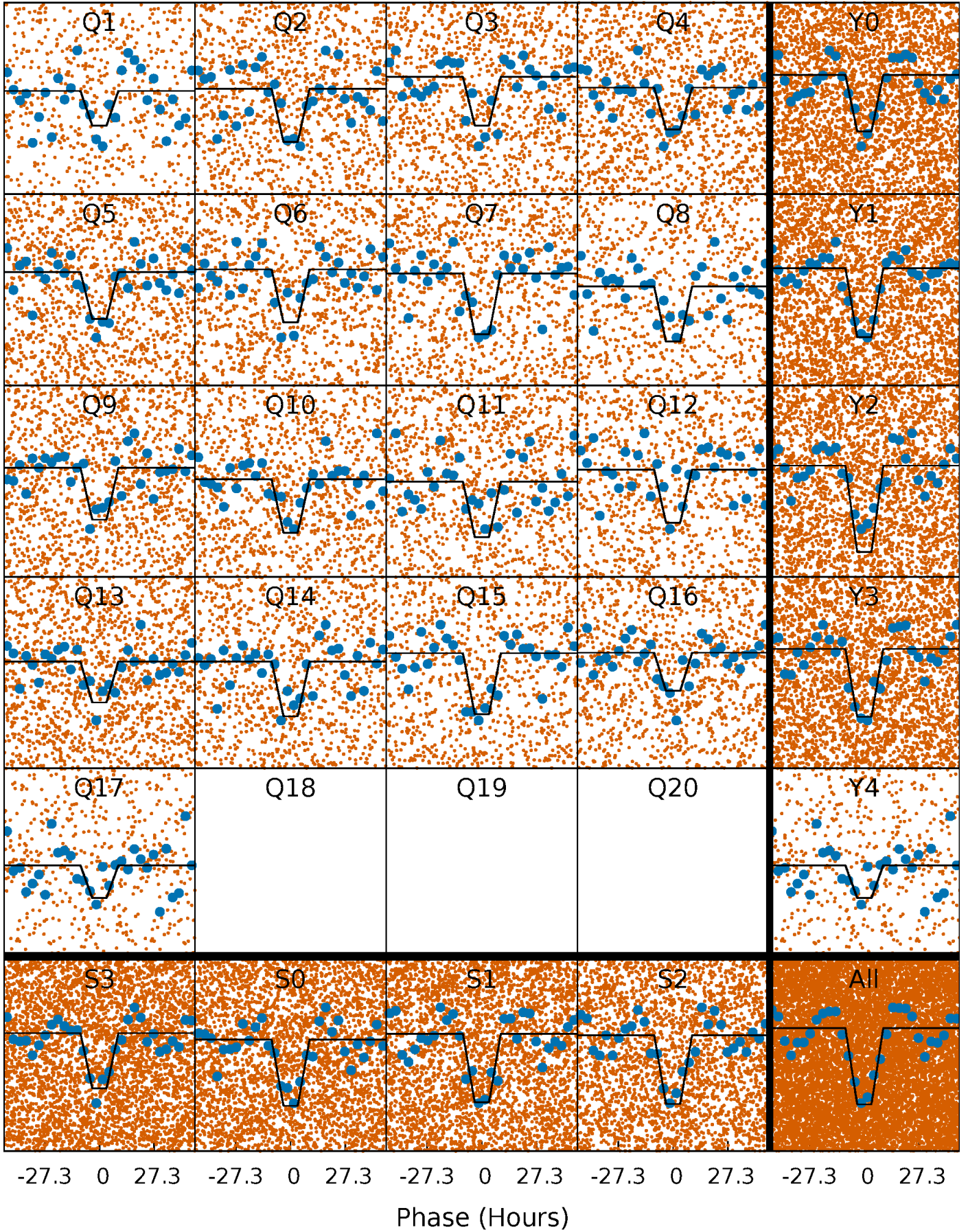
DV Quarter-Phased Transit Curves

TCE 009655402-01 P= 2.802679 Days $T_0=133.637540$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

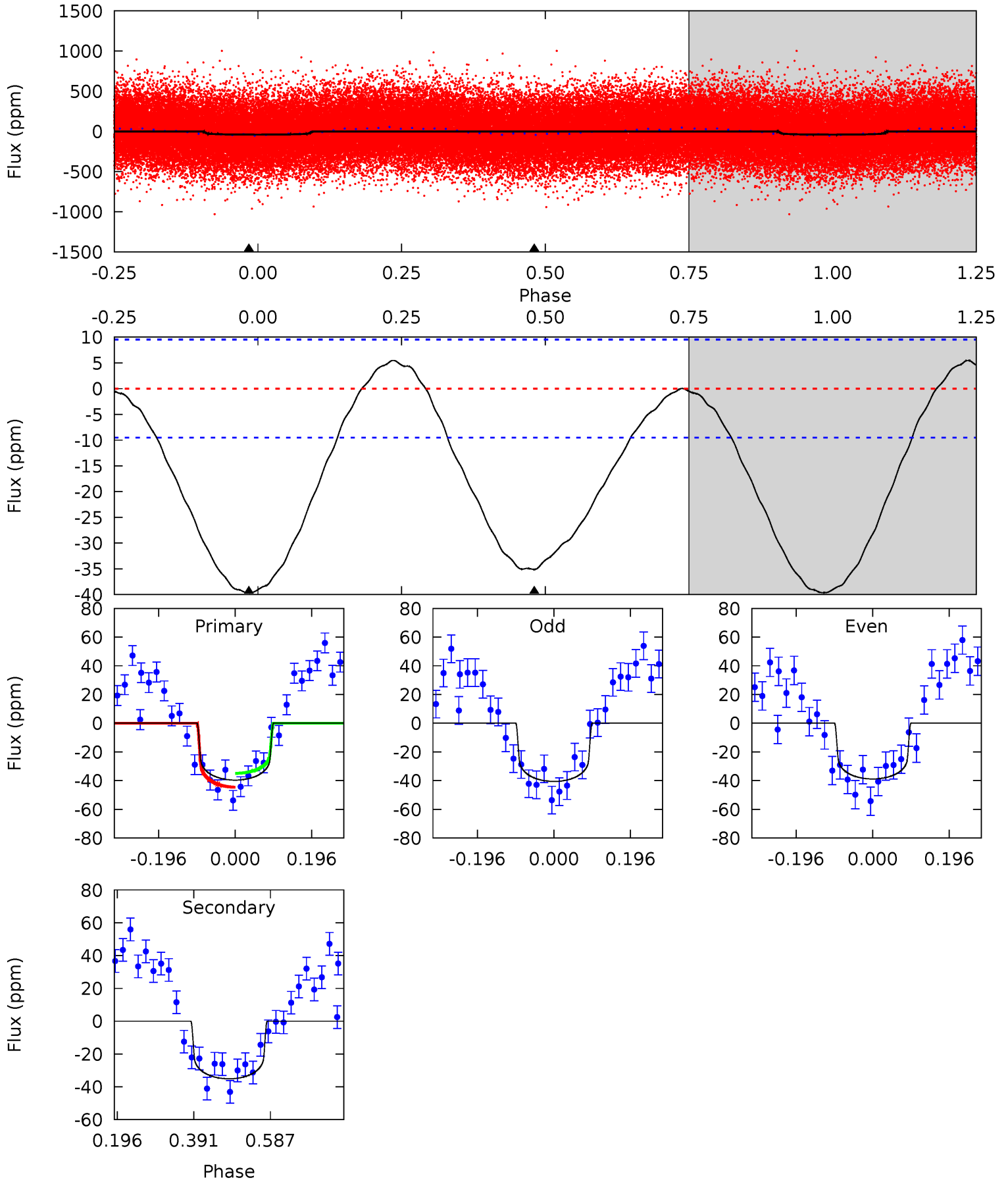
TCE 009655402-01 P= 2.802352 Days $T_0=133.671329$ (BKJD)



DV Model-Shift Uniqueness Test

009655402-01, P = 2.802679 Days, E = 130.834861 Days

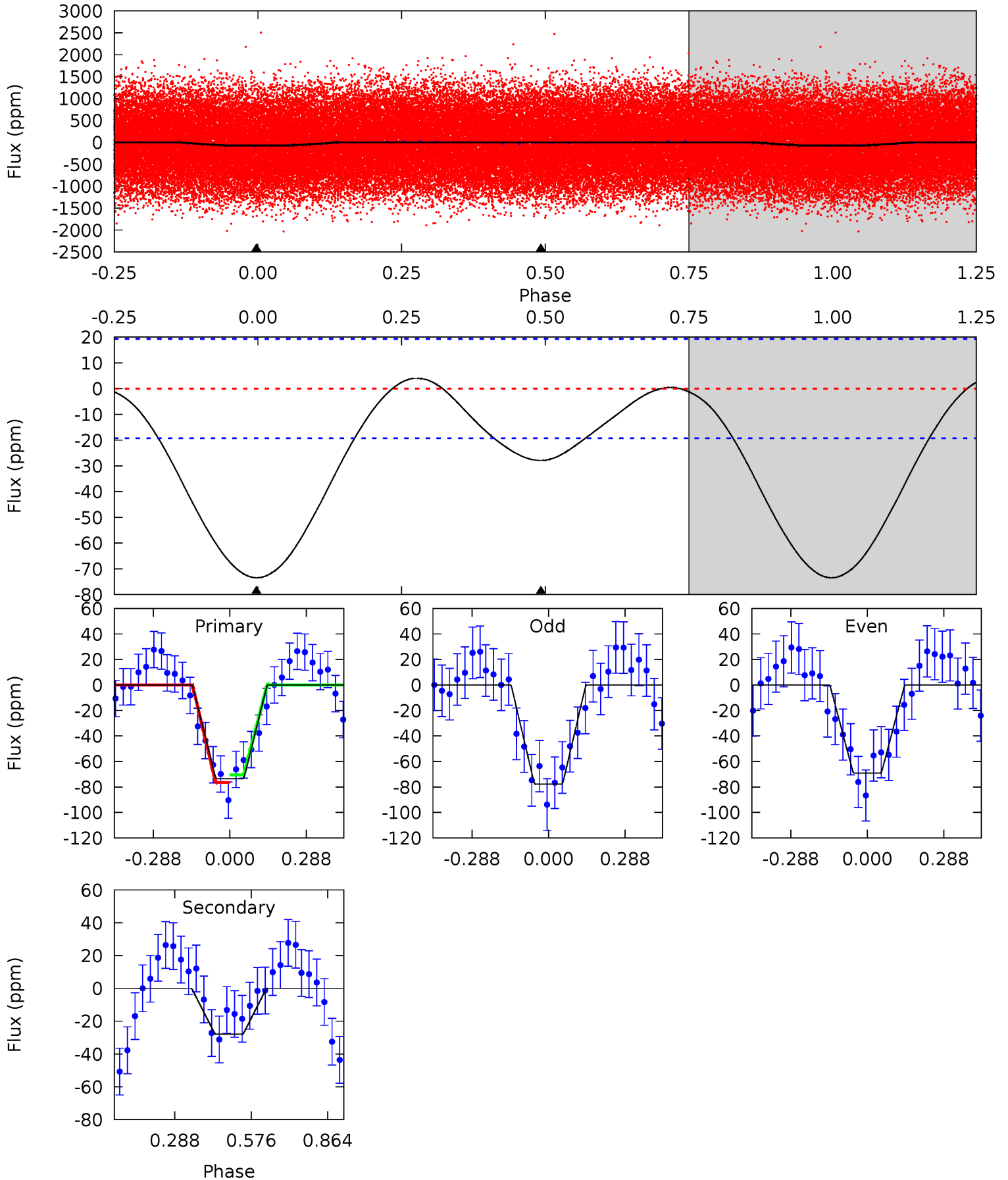
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.4	16.3	0	0	4.42	1.29	1.44	18.4	18.4	16.3	16.3	0.40	0.97	0.12	2.24



Alt Model-Shift Uniqueness Test

009655402-01, P = 2.802352 Days, E = 130.868977 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.6	6.28	0	0	4.34	1.06	0.47	16.6	16.6	6.28	6.28	0.98	1.20	0.05	0.68



Stellar Parameters For KIC 009655402

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6917^{+216}_{-312}	$4.122^{+0.190}_{-0.171}$	$-0.280^{+0.250}_{-0.300}$	$1.658^{+0.487}_{-0.443}$	$1.334^{+0.190}_{-0.232}$	$0.412^{+0.481}_{-0.194}$
	+3%/-5%	+5%/-4%	+89%/-107%	+29%/-27%	+14%/-17%	+117%/-47%
Source	KIC0	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 009655402-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-35 ± 2	$1.07^{+0.29}_{-0.27}$	2632^{+215}_{-203}	6793^{+1155}_{-719}	30^{+23}_{-11}
Alt.	-28 ± 4	$1.61^{+0.37}_{-0.32}$	2645^{+205}_{-195}	5277^{+451}_{-397}	11^{+6}_{-4}

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 $A_{obs} \gg 1.0$

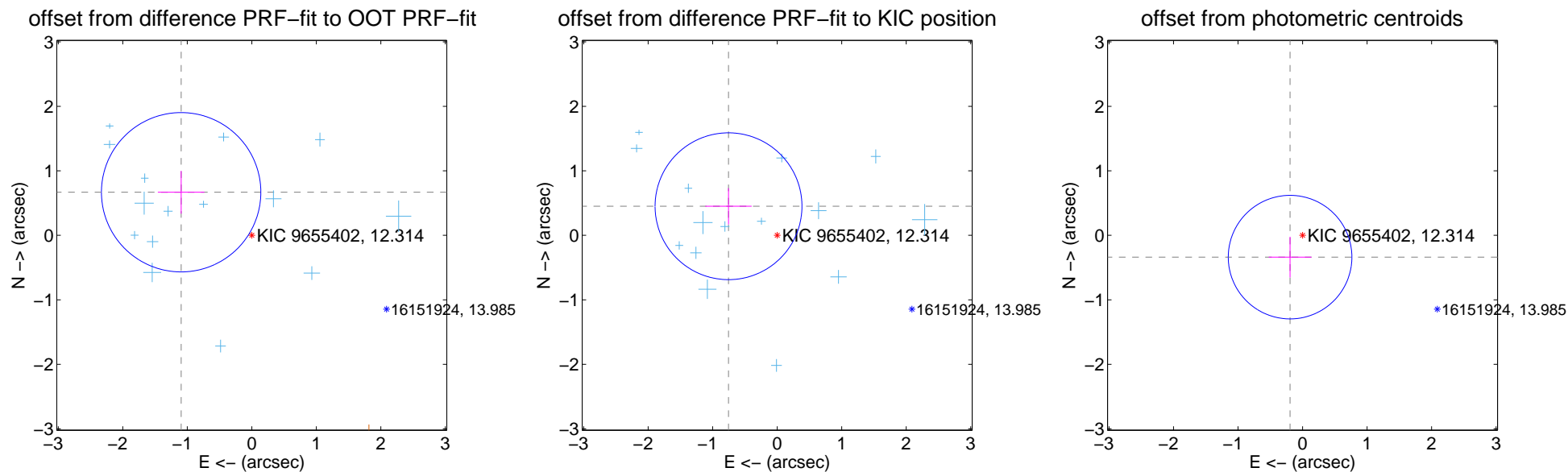
DV Centroid Data

Supplemental centroid analysis for 009655402-01. Kepler magnitude: 12.31. Transit SNR 10.57

There are 15 quarters with good PRF difference image offsets

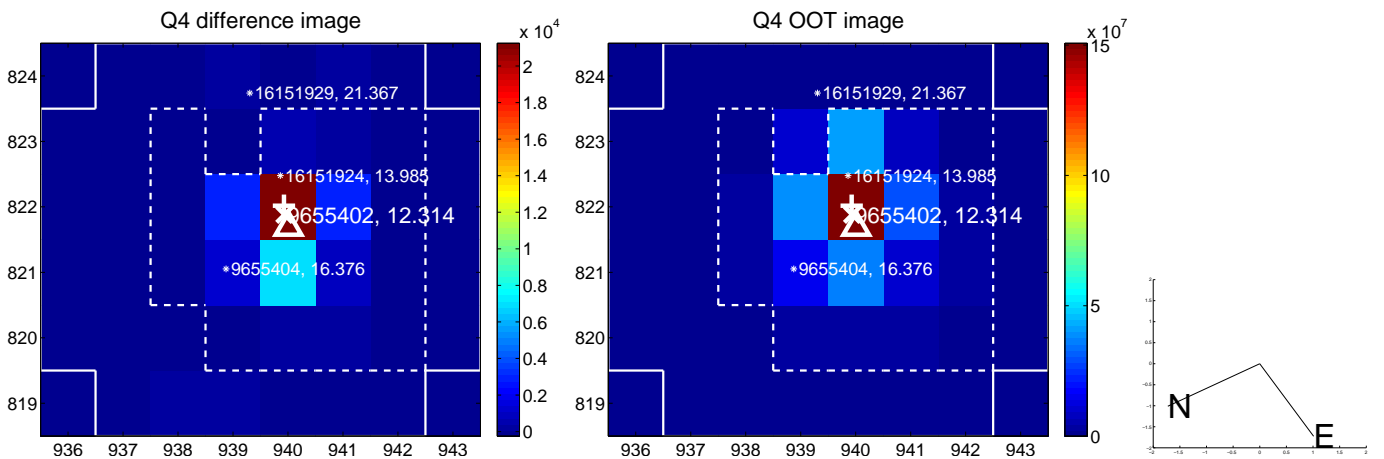
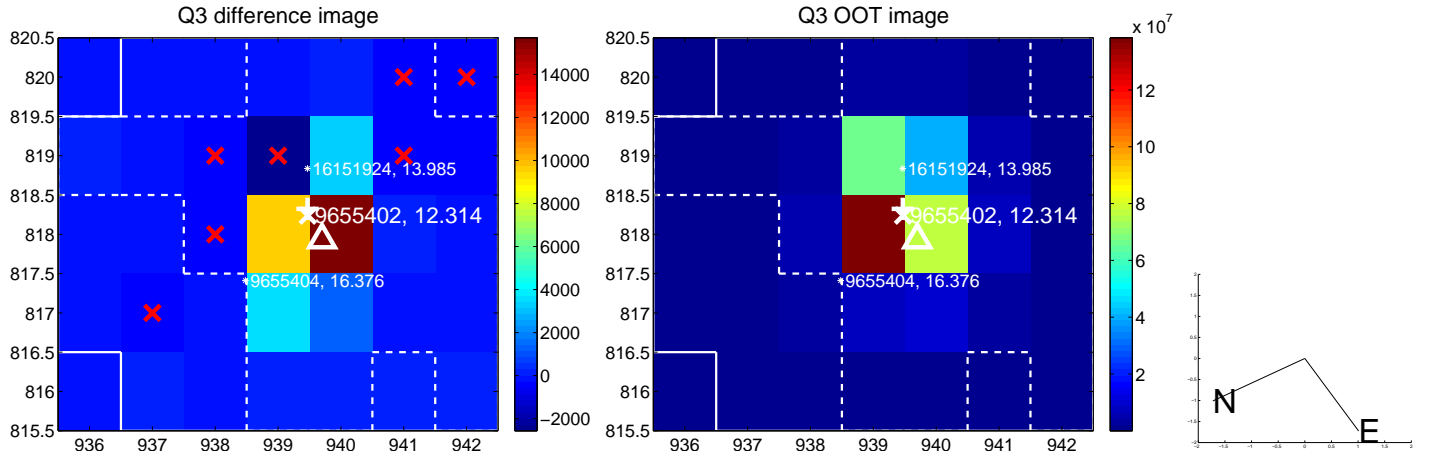
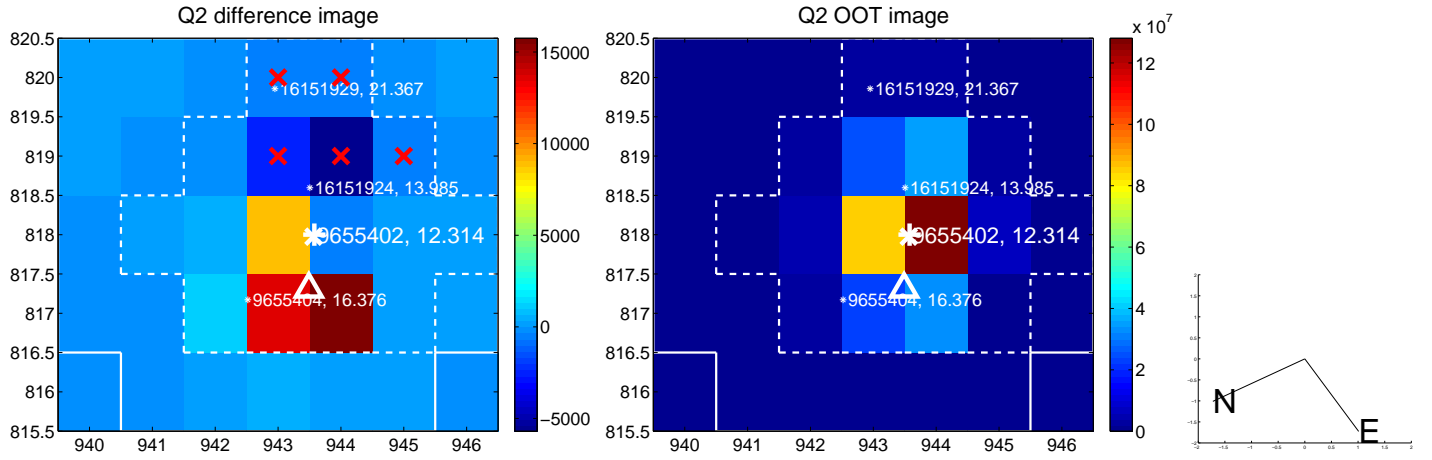
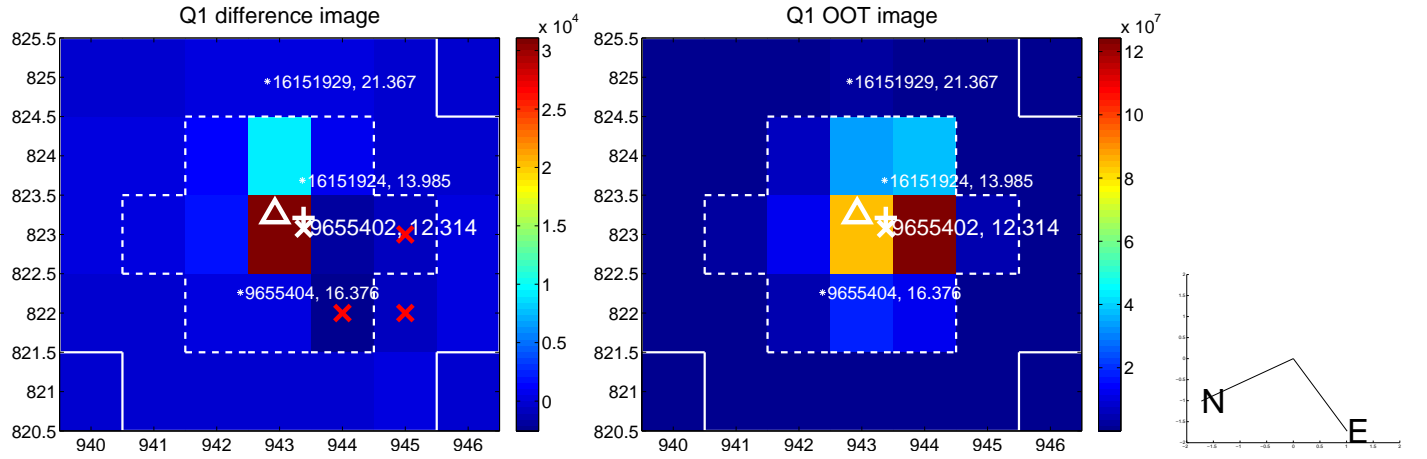
The direct PRF centroid is offset from the target star catalog position by about 0.53 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.283 ± 0.412	3.12	1.095 ± 0.362	0.668 ± 0.331
PRF-fit source offset from KIC position	0.879 ± 0.380	2.32	0.754 ± 0.359	0.451 ± 0.280
photometric centroid source offset	0.39 ± 0.32	1.22	0.19 ± 0.33	-0.34 ± 0.32

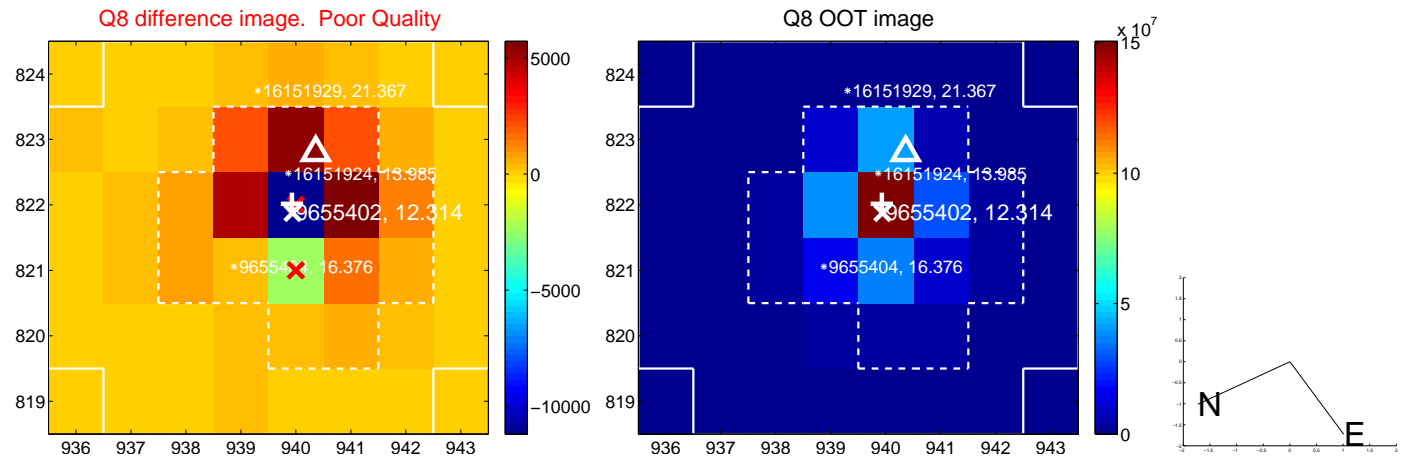
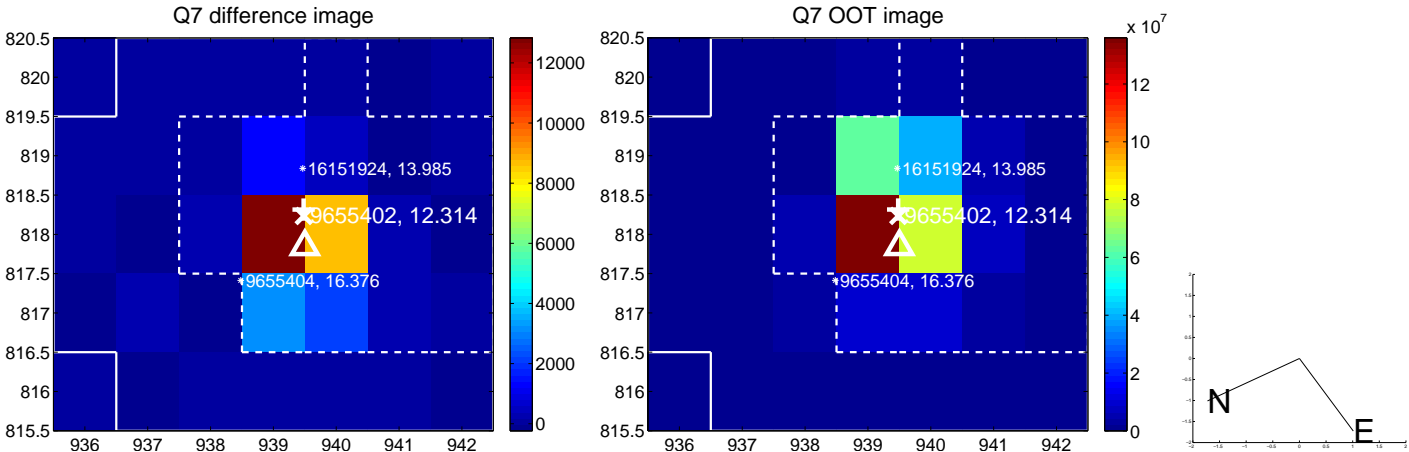
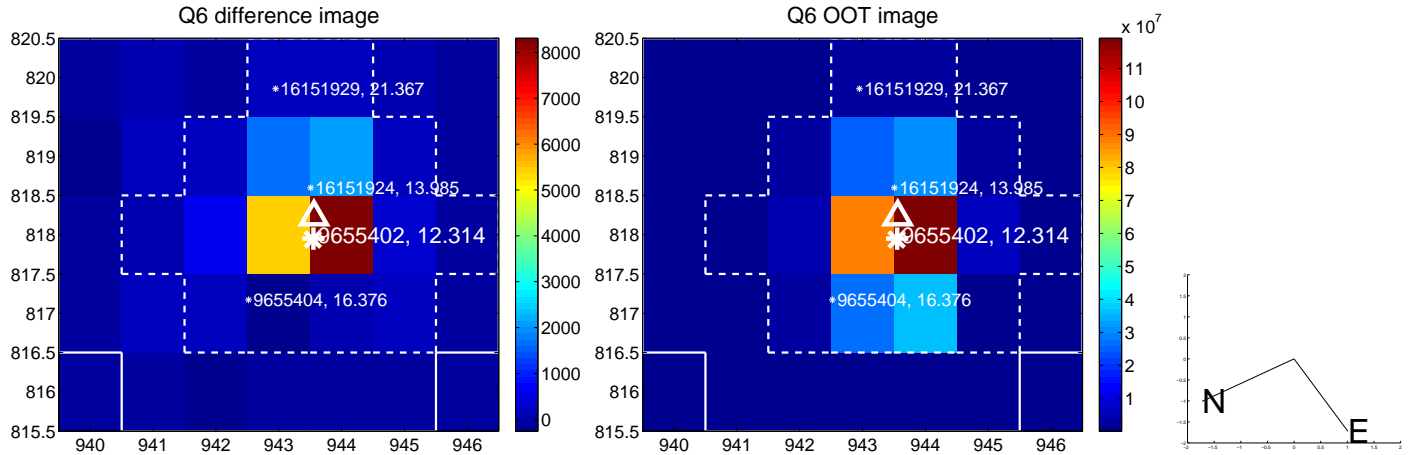
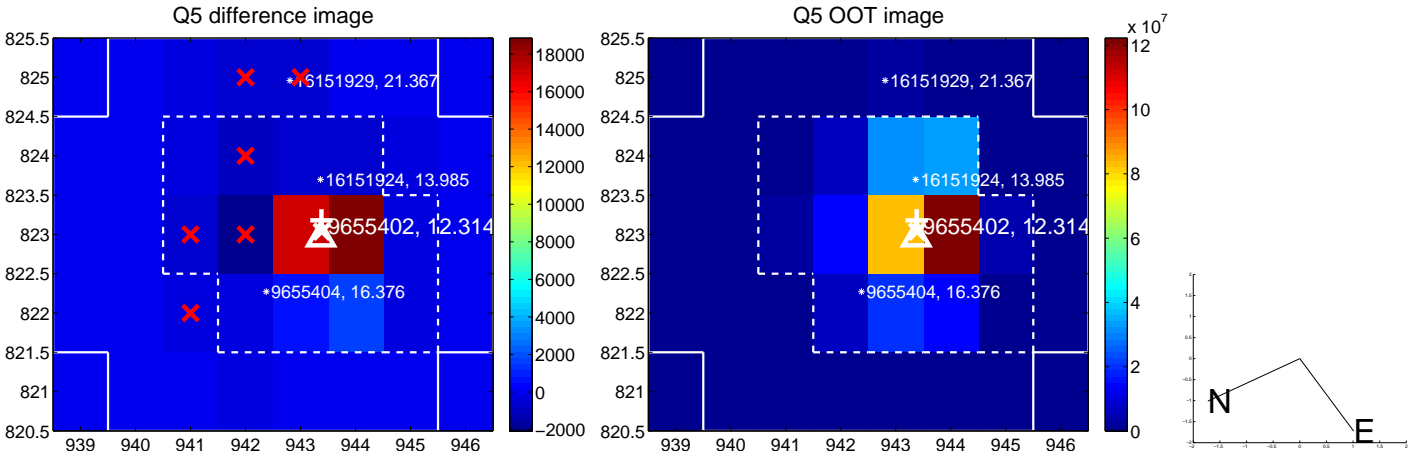


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

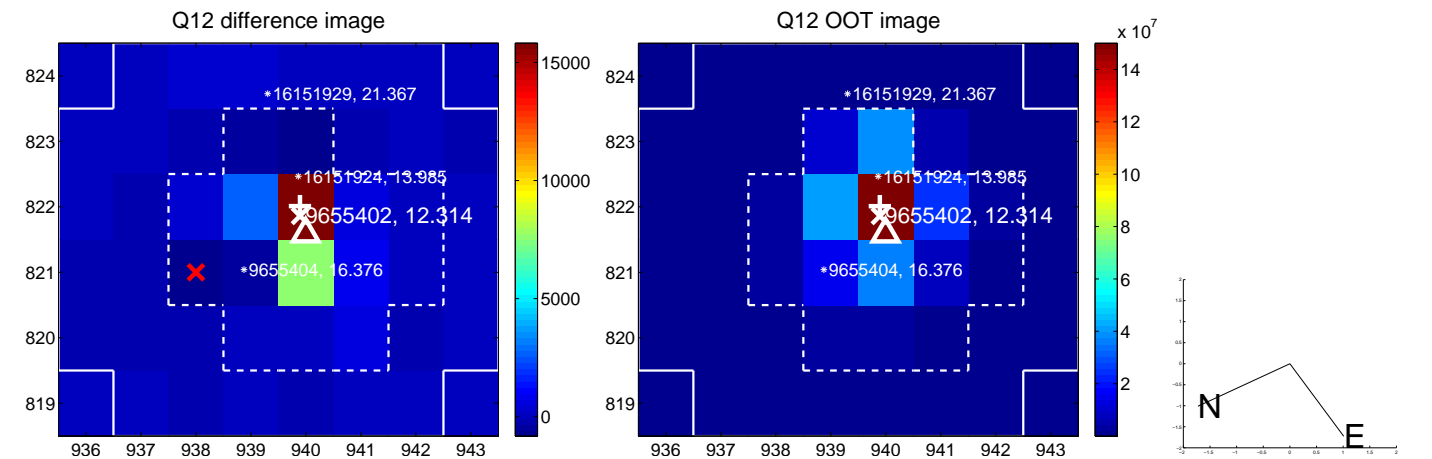
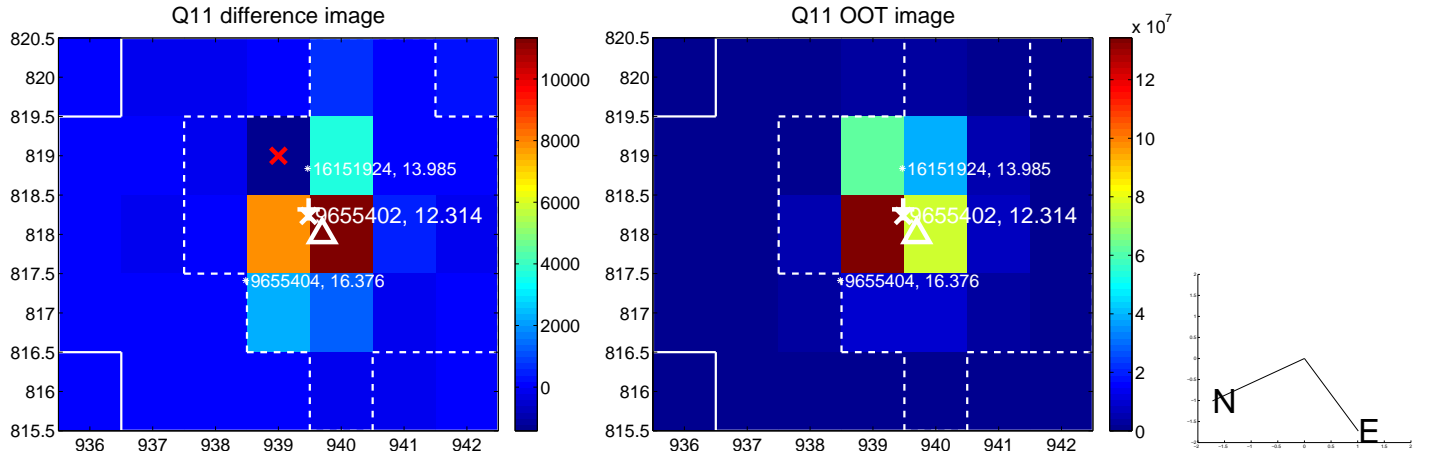
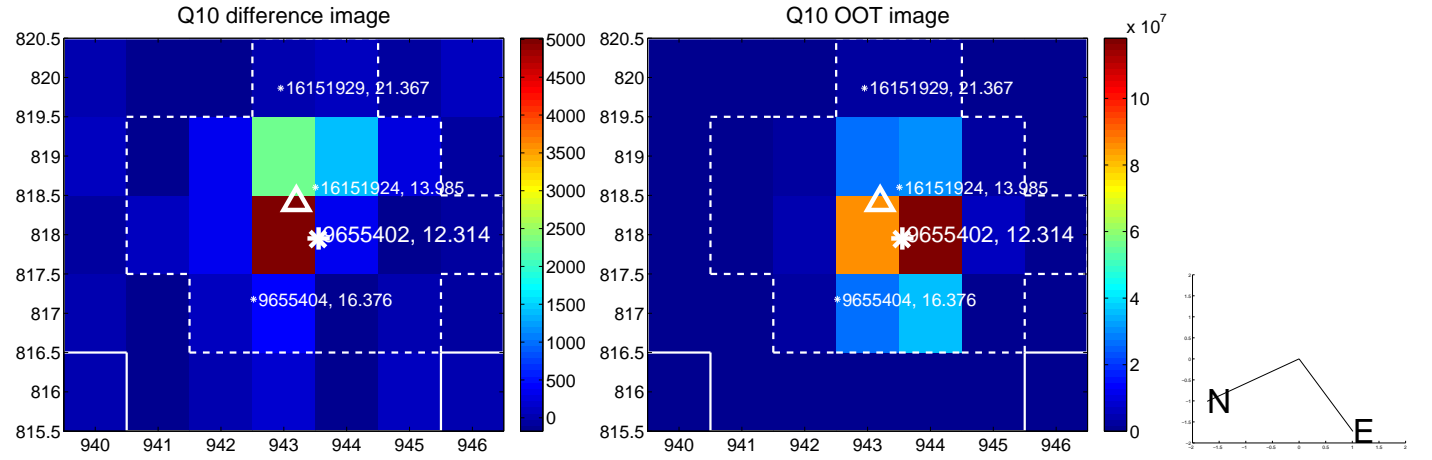
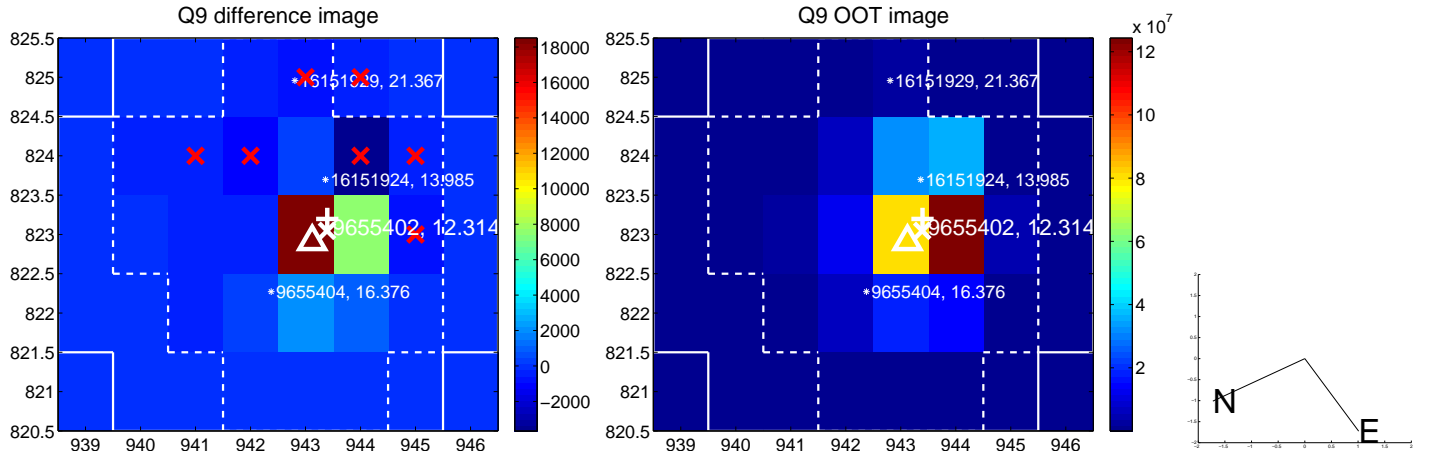
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



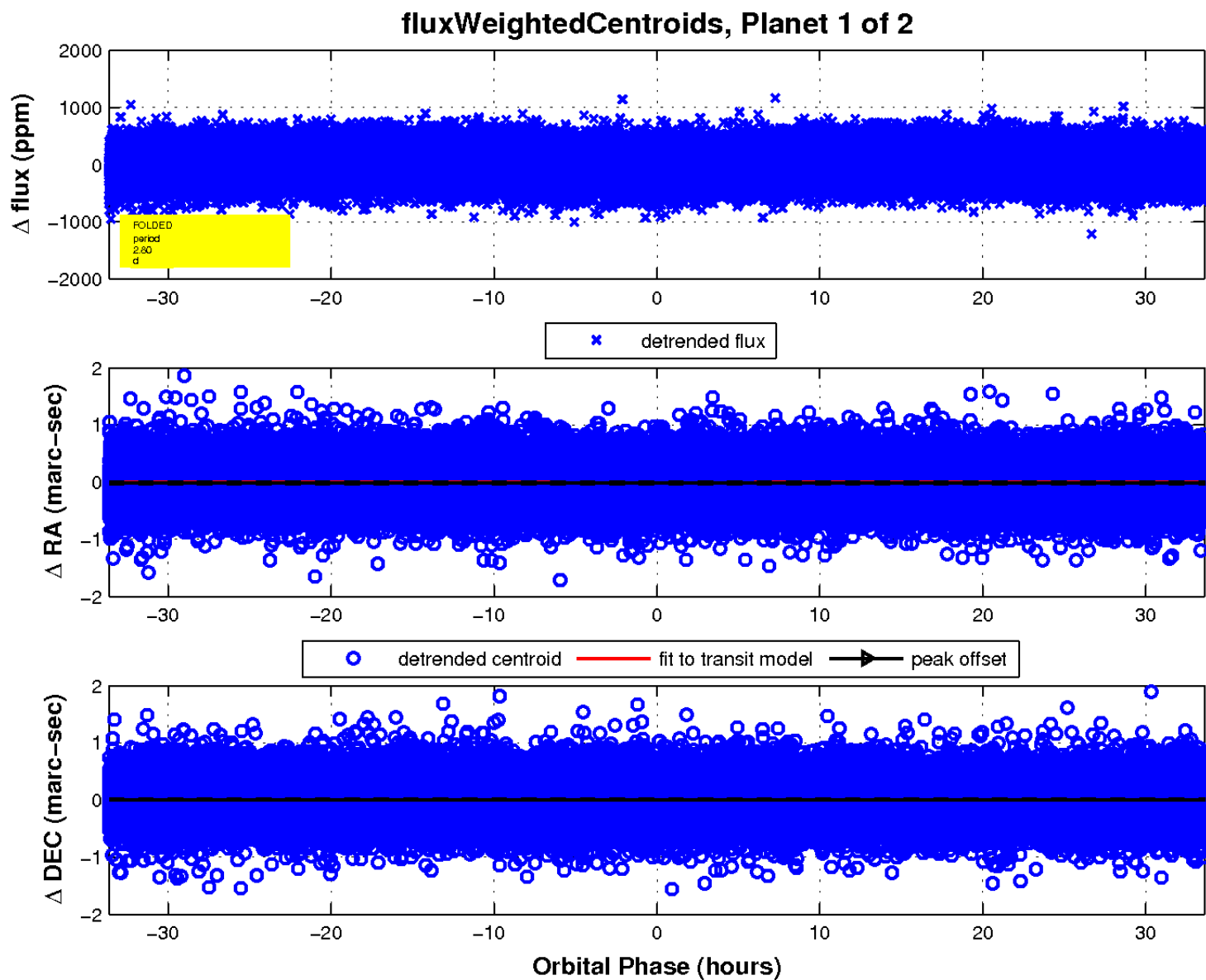
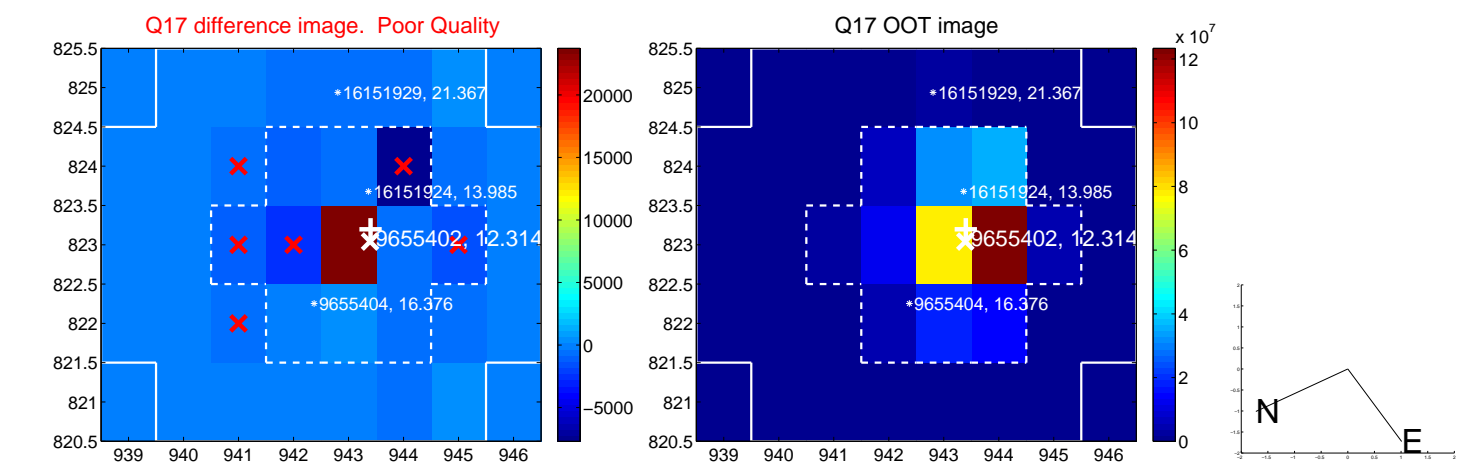
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



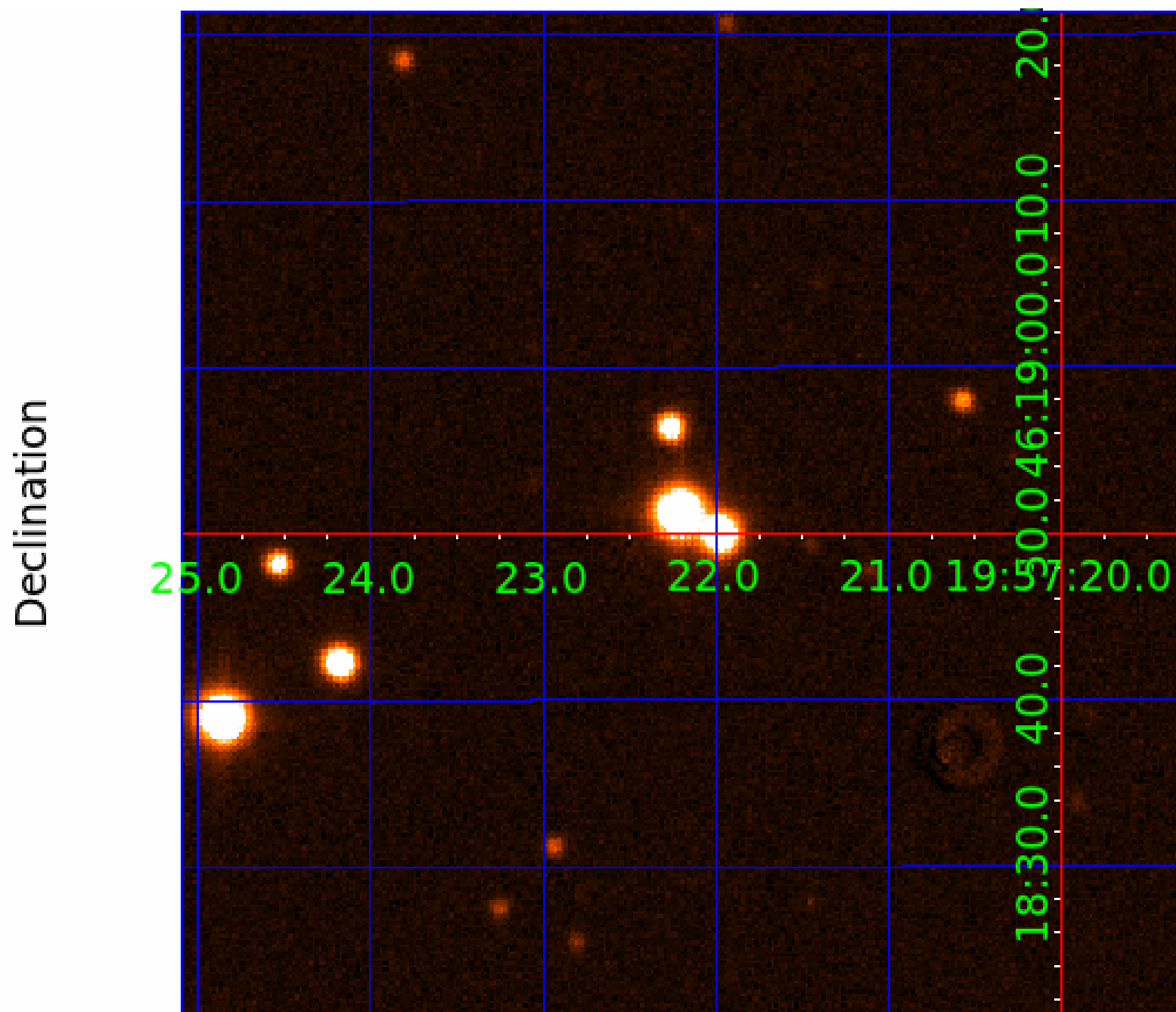
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image



KIC 009655402

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})
009655402-01	OBS	No	2.802679	133.637540	34.0	12.708	10.7	10.6	1.66	6917	1.09	3082.18
009655402-02	OBS	No	2.802232	132.300460	29.2	18.192	11.2	11.9	1.66	6917	1.04	3082.83

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009655402-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009655402-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—SAME_NTL_PERIOD

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

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

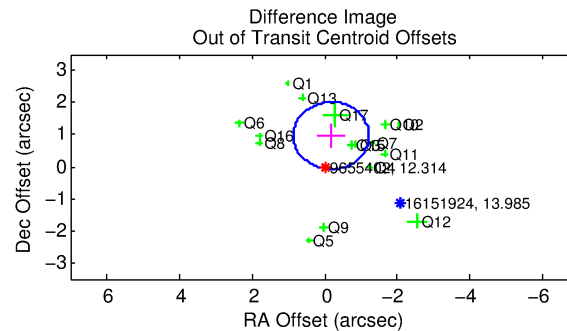
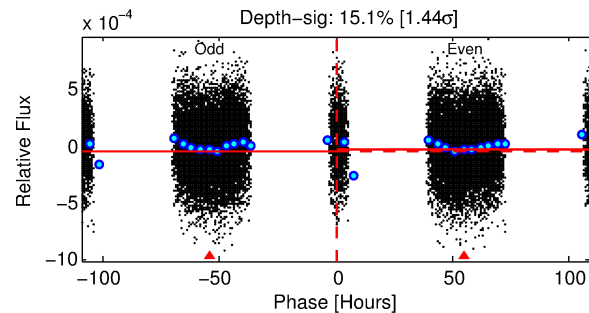
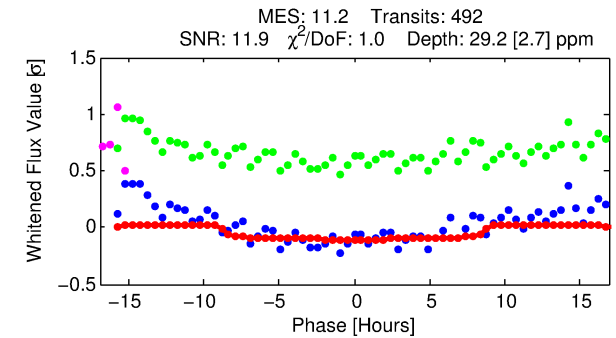
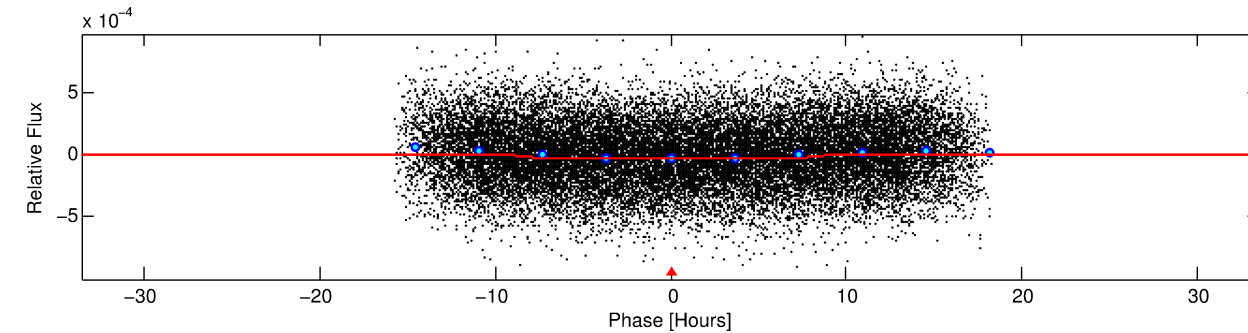
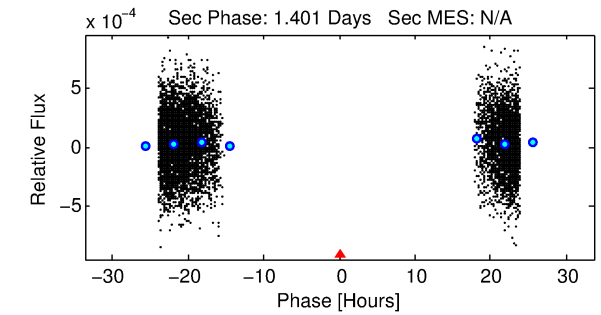
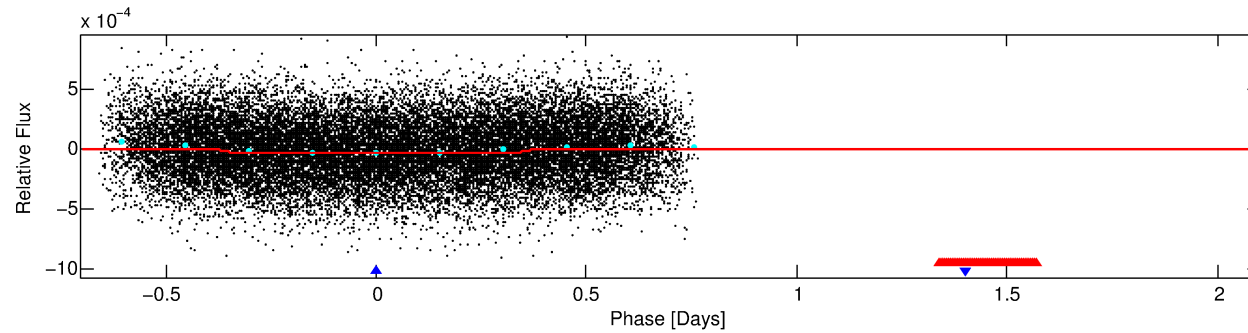
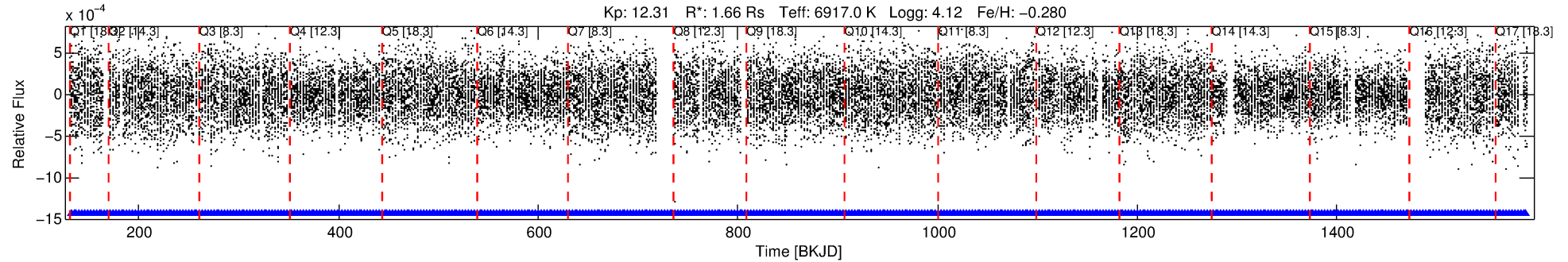
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009655402-02

No Significant Match Found

DV One-Page Summary

KIC: 9655402 Candidate: 2 of 2 Period: 2.802 d



DV Fit Results:

Period = 2.80223 [0.00006] d
Epoch = 132.3005 [0.0131] BKJD
Rp/R* = 0.0058 [0.0009]
a/R* = 1.08 [0.14]
b = 0.90 [0.19]
Seff = 3082.83 [1217.48]
Teq = 1900 [188] K
Rp = 1.04 [0.34] Re
a = 0.0428 [0.0104] AU

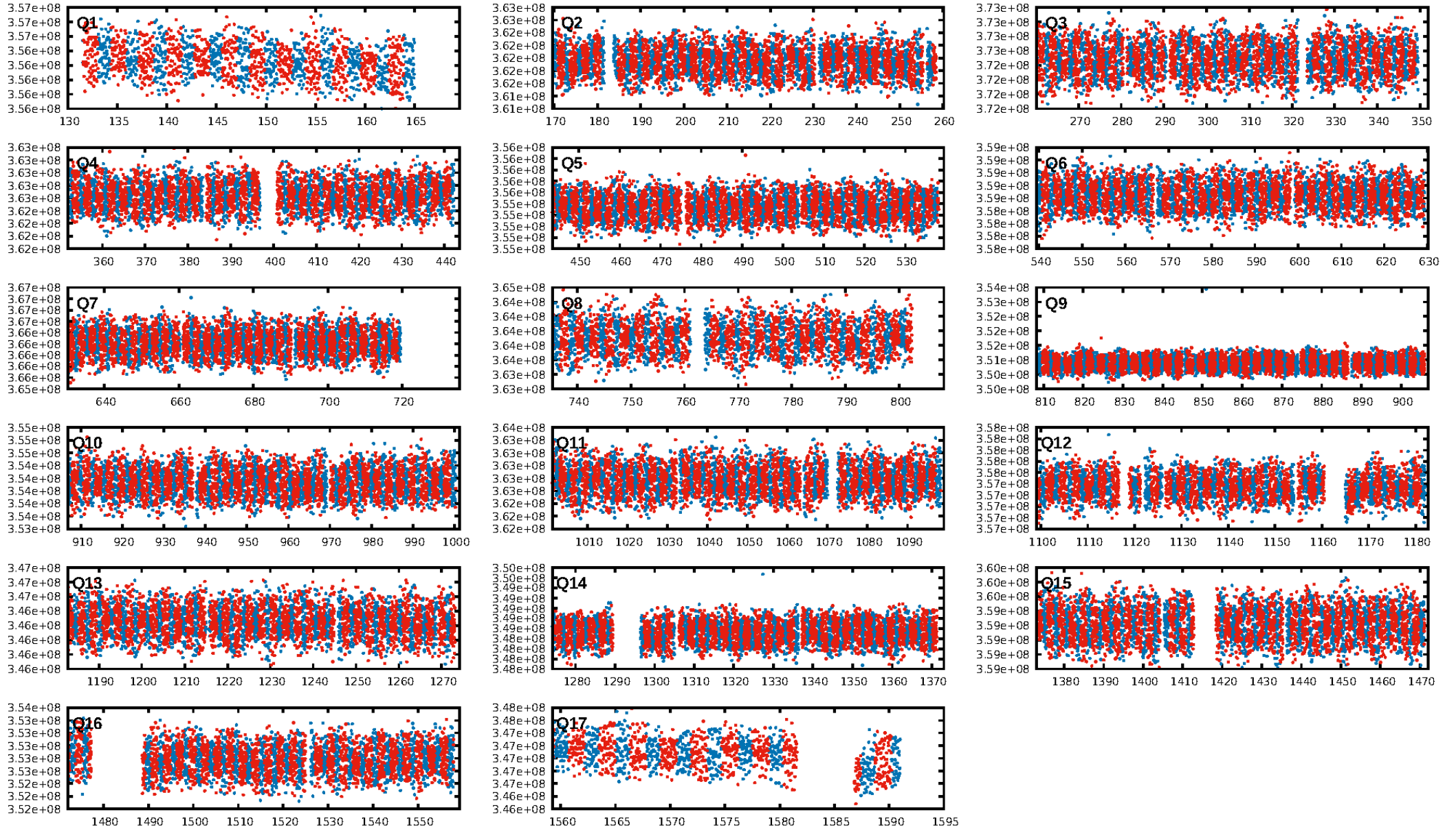
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [470/470]
GhostDiagnostic-chr: 1.787
Centroid-sig: 0.1%
Centroid-so: 0.685 arcsec [2.03σ]
OotOffset-rm: 0.982 arcsec [2.81σ]
KicOffset-rm: 0.989 arcsec [3.06σ]
OotOffset-st: 3/4/4/5 [16]
KicOffset-st: 3/4/4/5 [16]
DiffImageQuality-fgm: 0.69 [11/16]
DiffImageOverlap-fno: 0.00 [0/17]

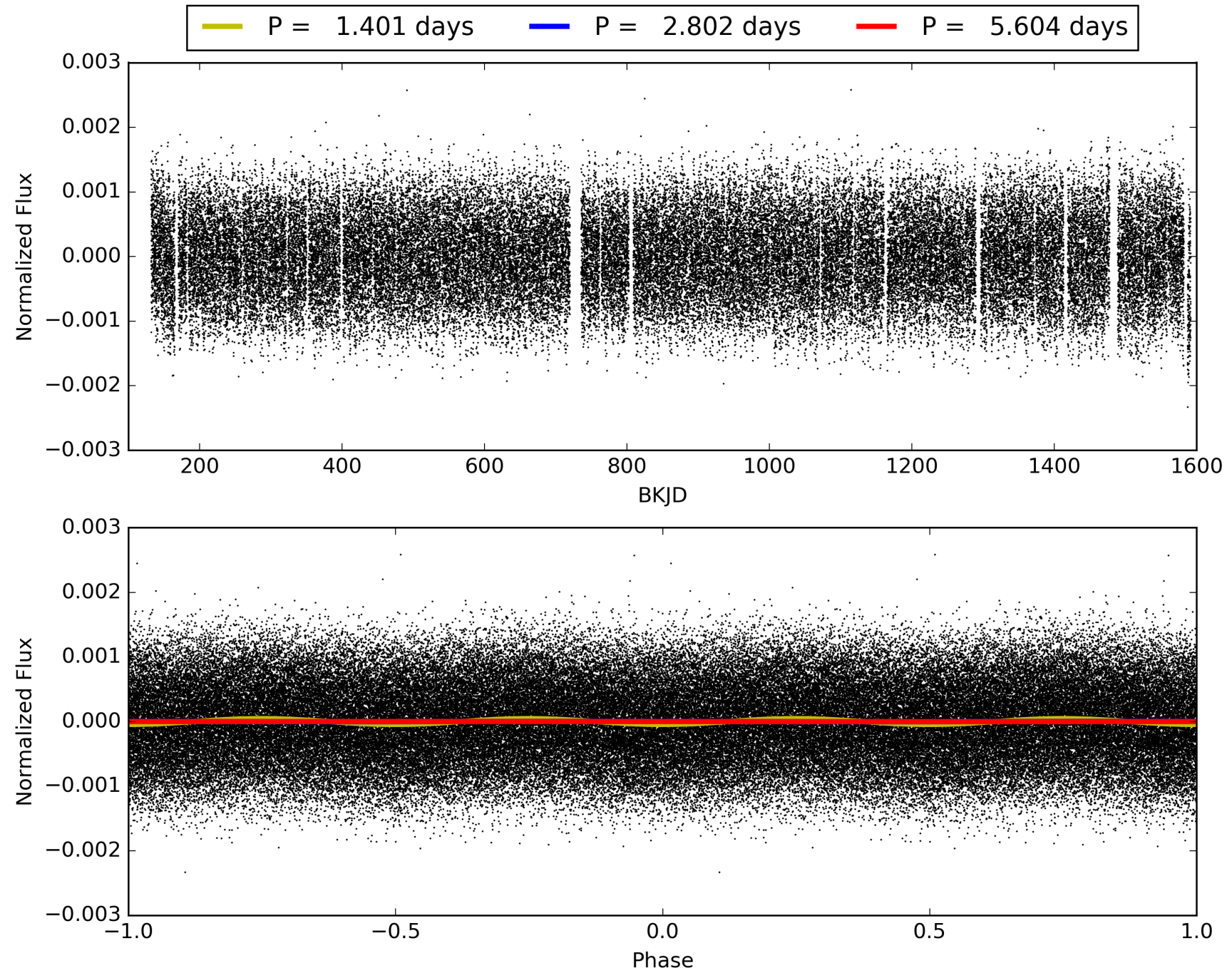
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009655402-02, PDC Light Curves

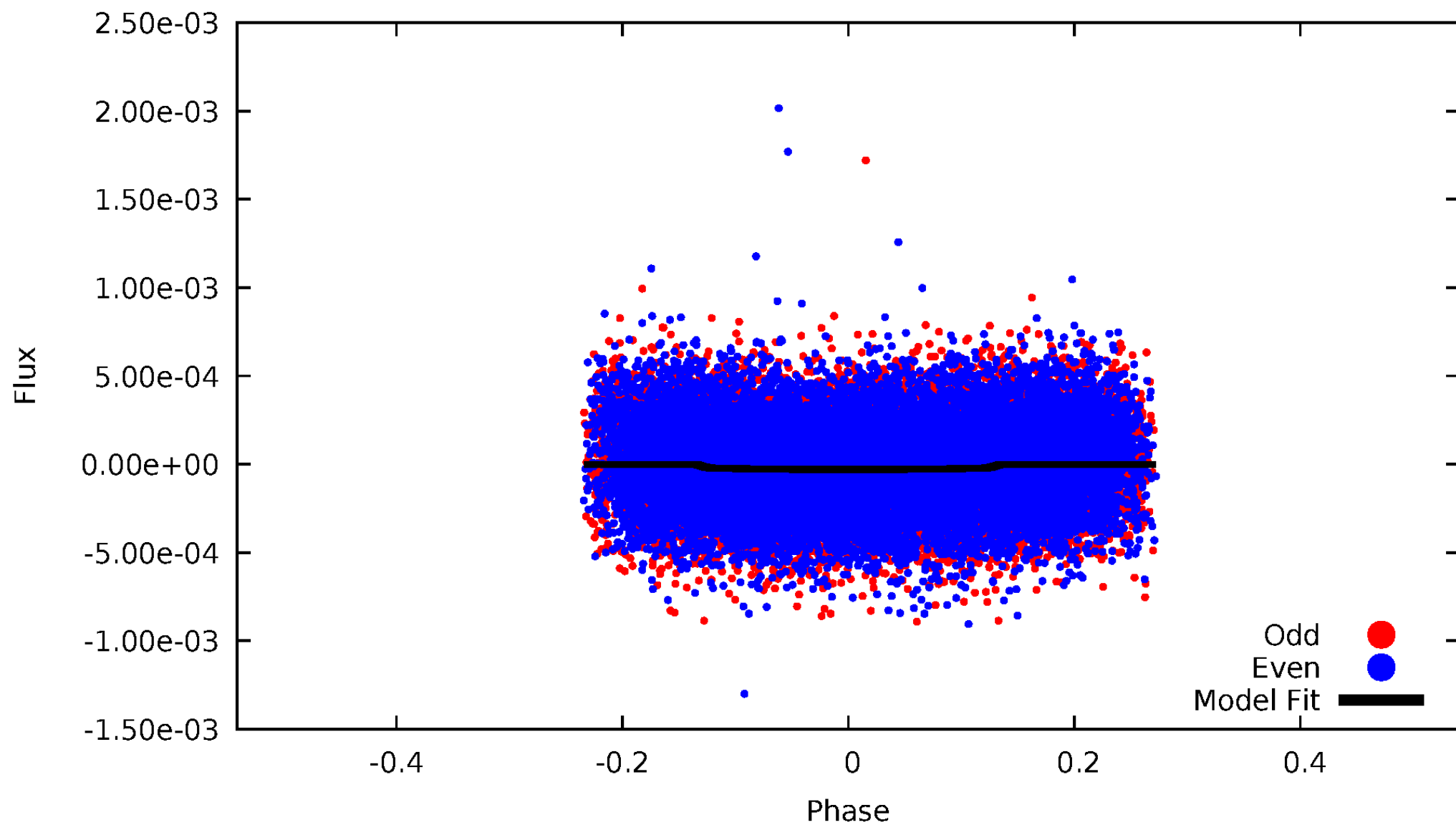


TCE 009655402-02



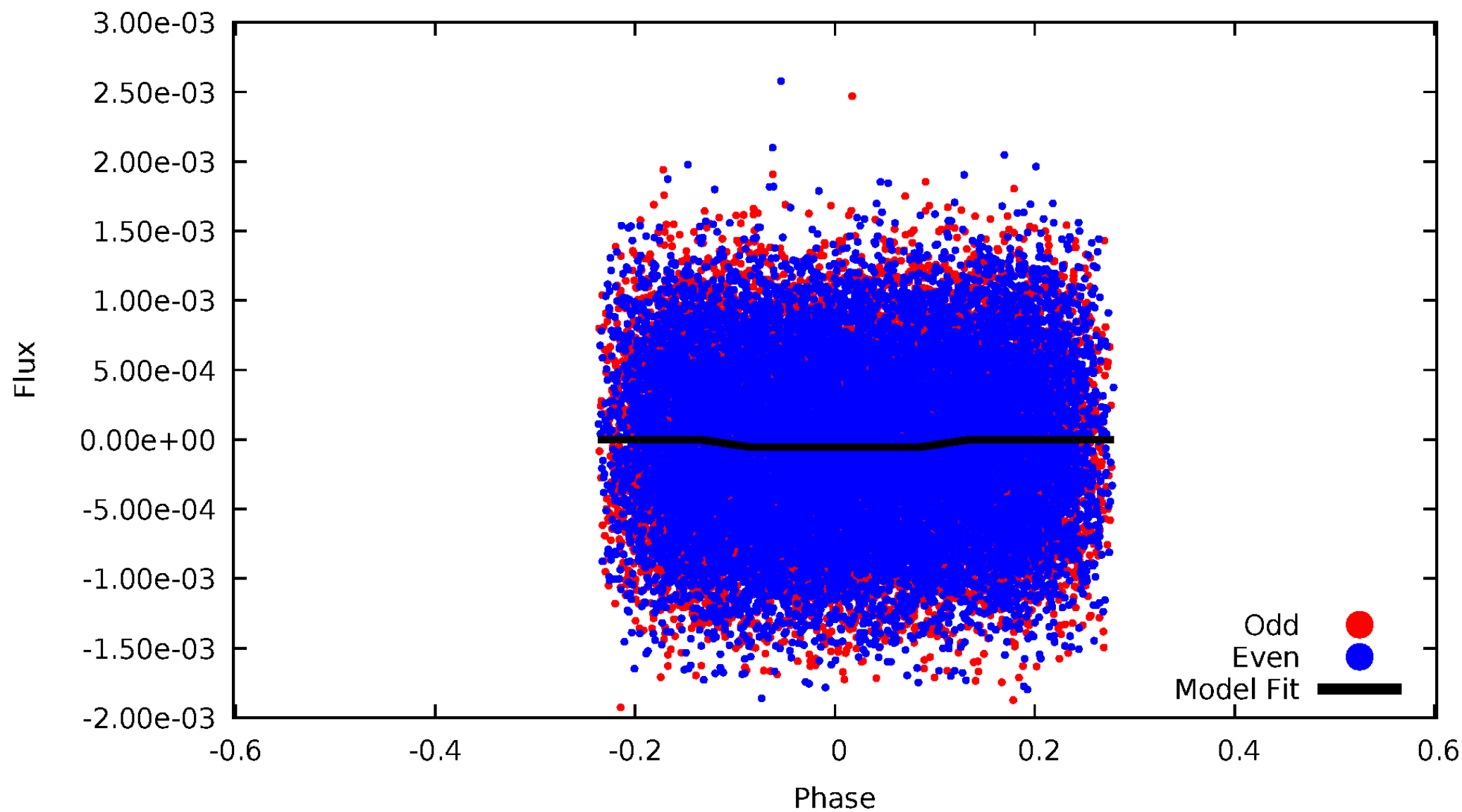
DV Odd/Even

TCE 009655402-02



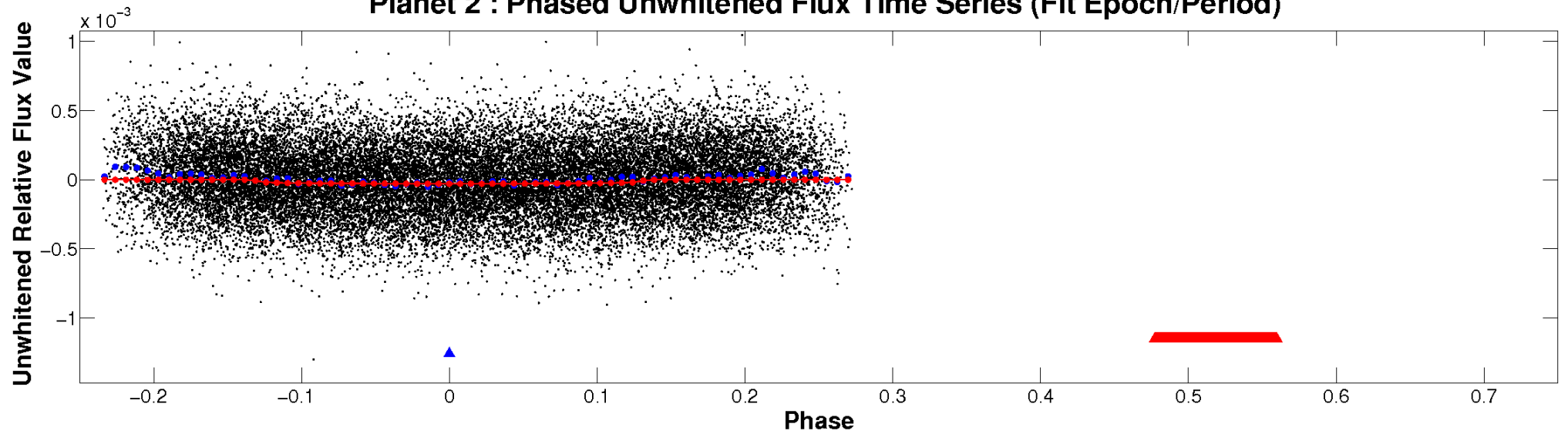
ALT Odd/Even

TCE 009655402-02

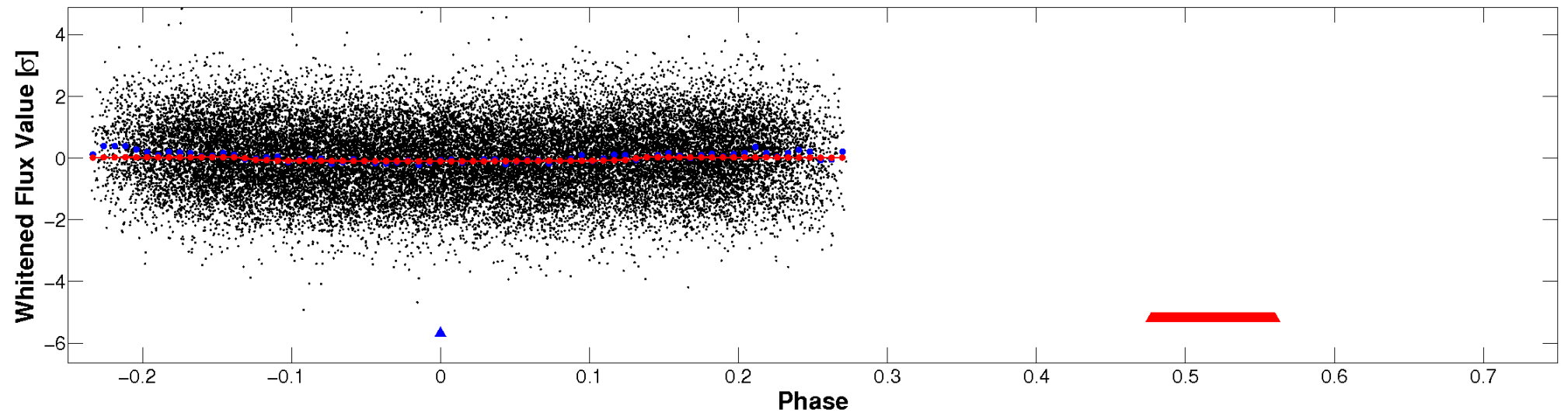


Non-Whitened Vs. Whitened Light Curve

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

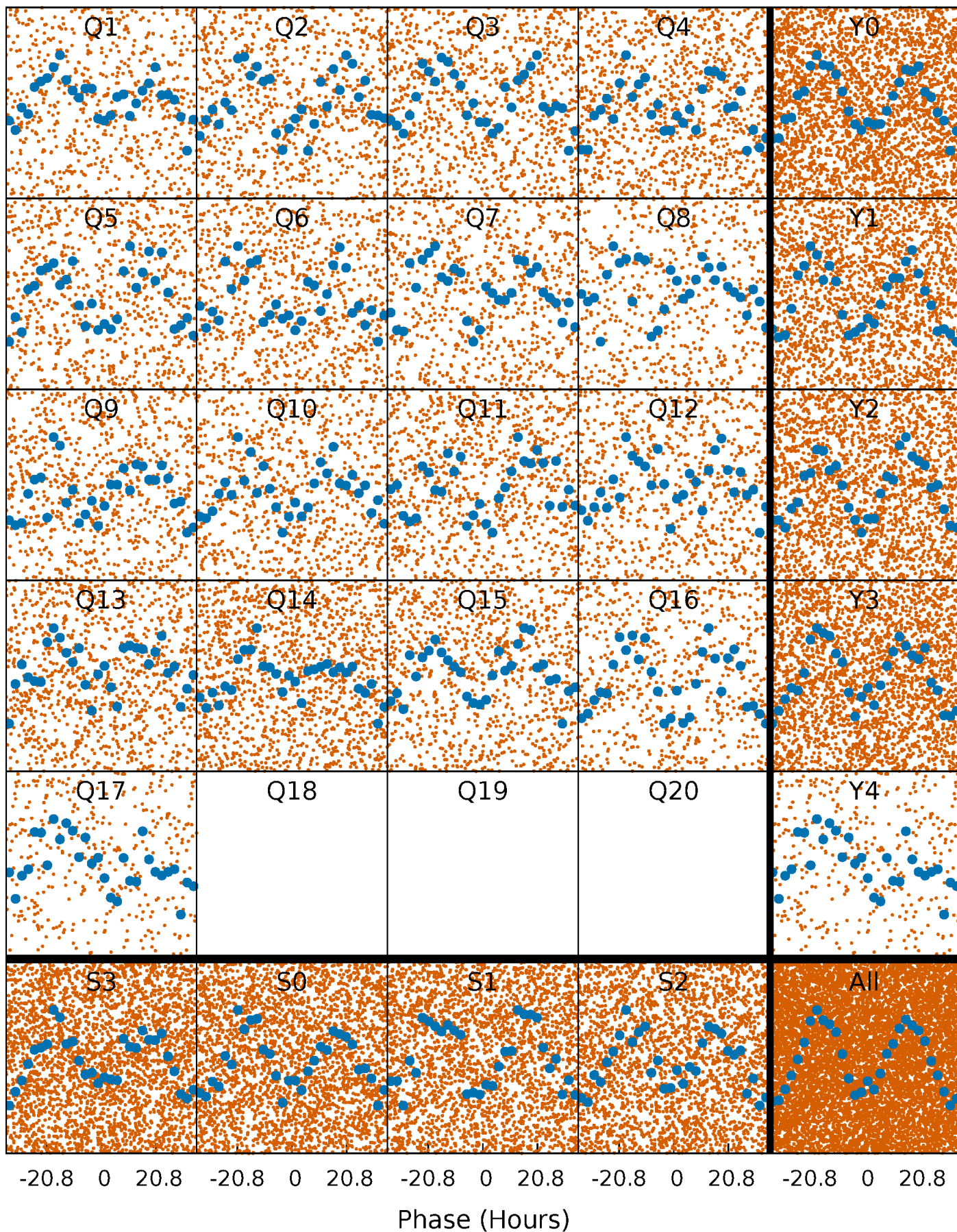


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



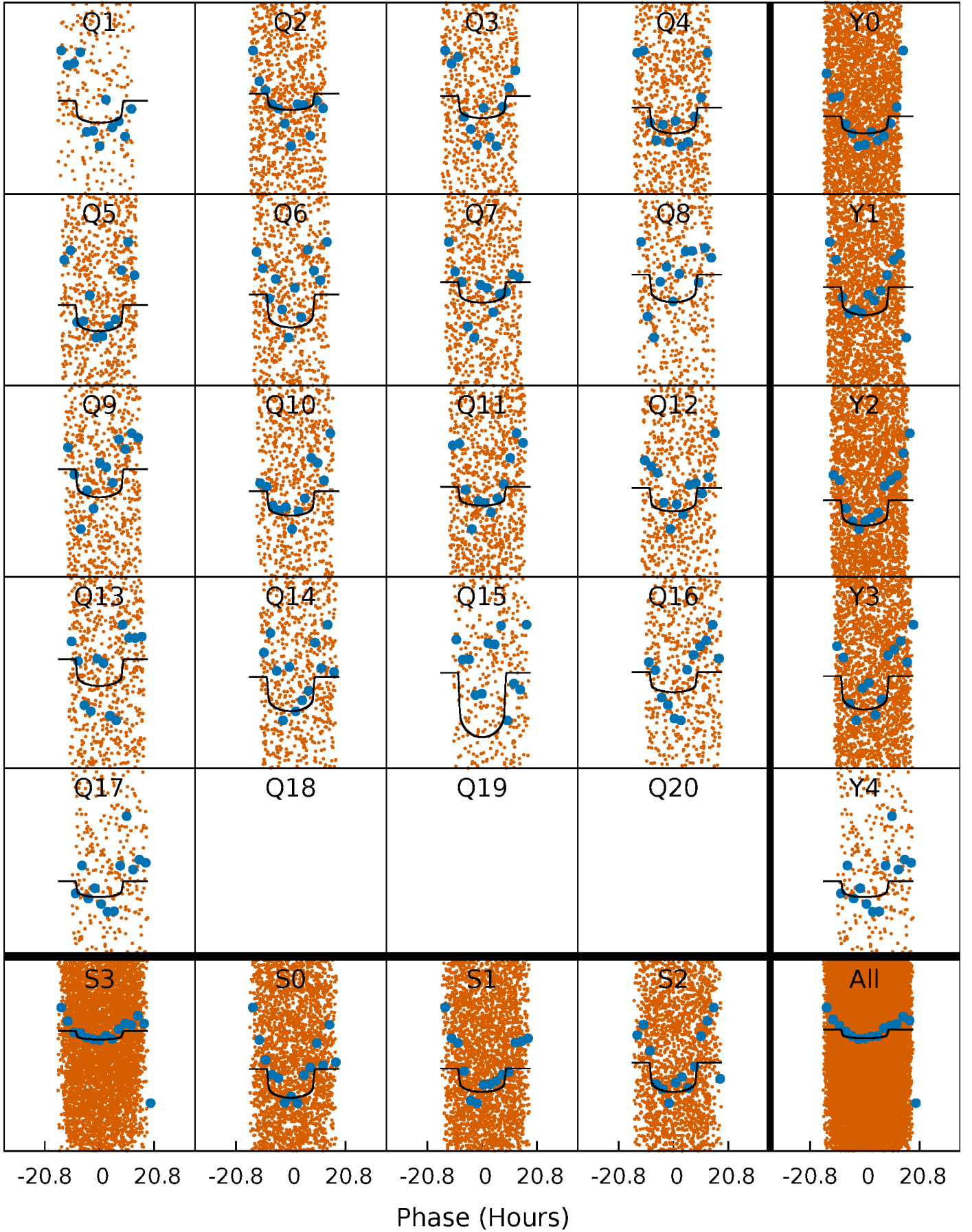
PDC Quarter-Phased Transit Curves

TCE 009655402-02 P= 2.802232 Days $T_0=132.300460$ (BKJD)



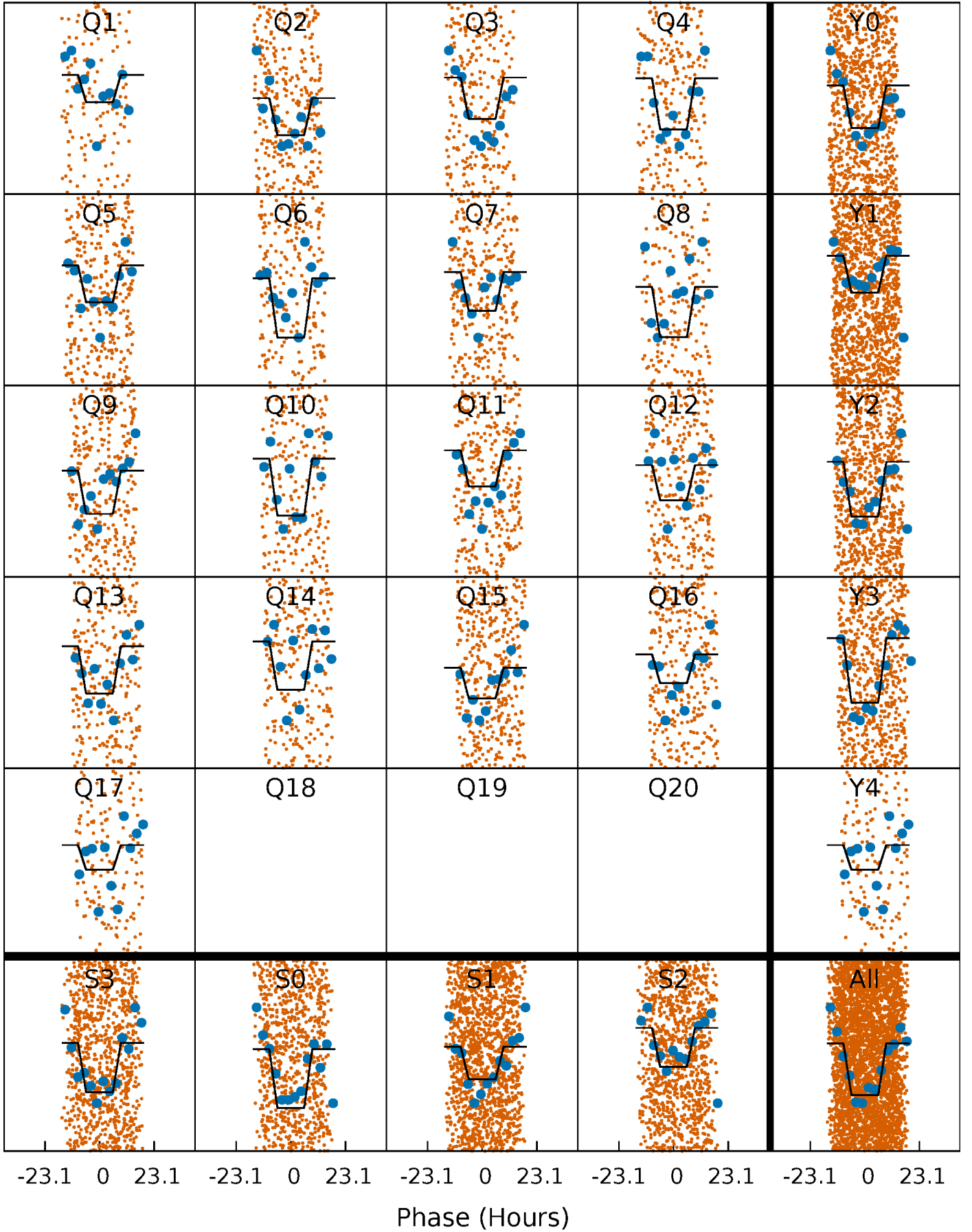
DV Quarter-Phased Transit Curves

TCE 009655402-02 $P = 2.802232$ Days $T_0 = 132.300460$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

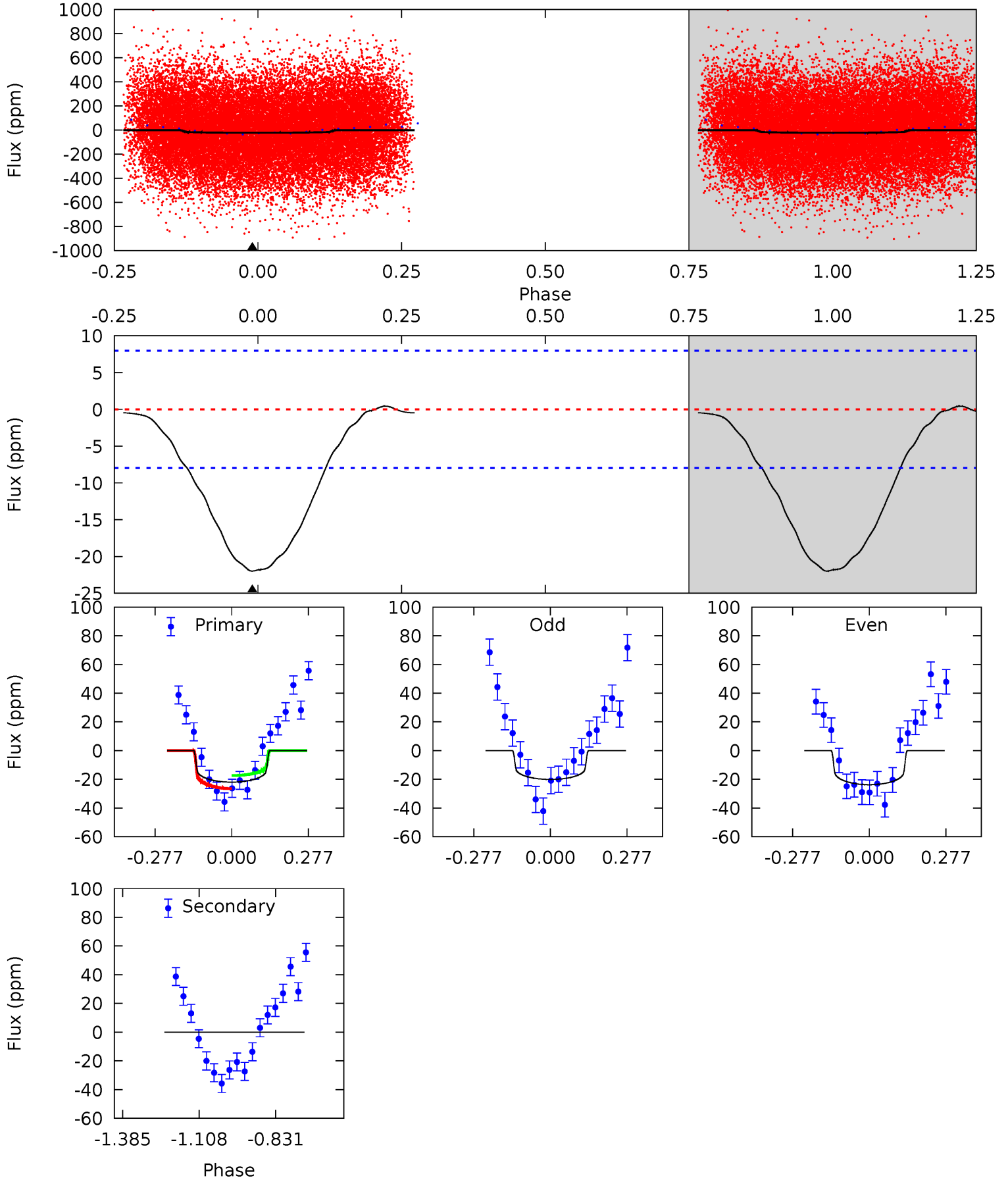
TCE 009655402-02 P= 2.802184 Days $T_0=132.307592$ (BKJD)



DV Model-Shift Uniqueness Test

009655402-02, P = 2.802232 Days, E = 129.498228 Days

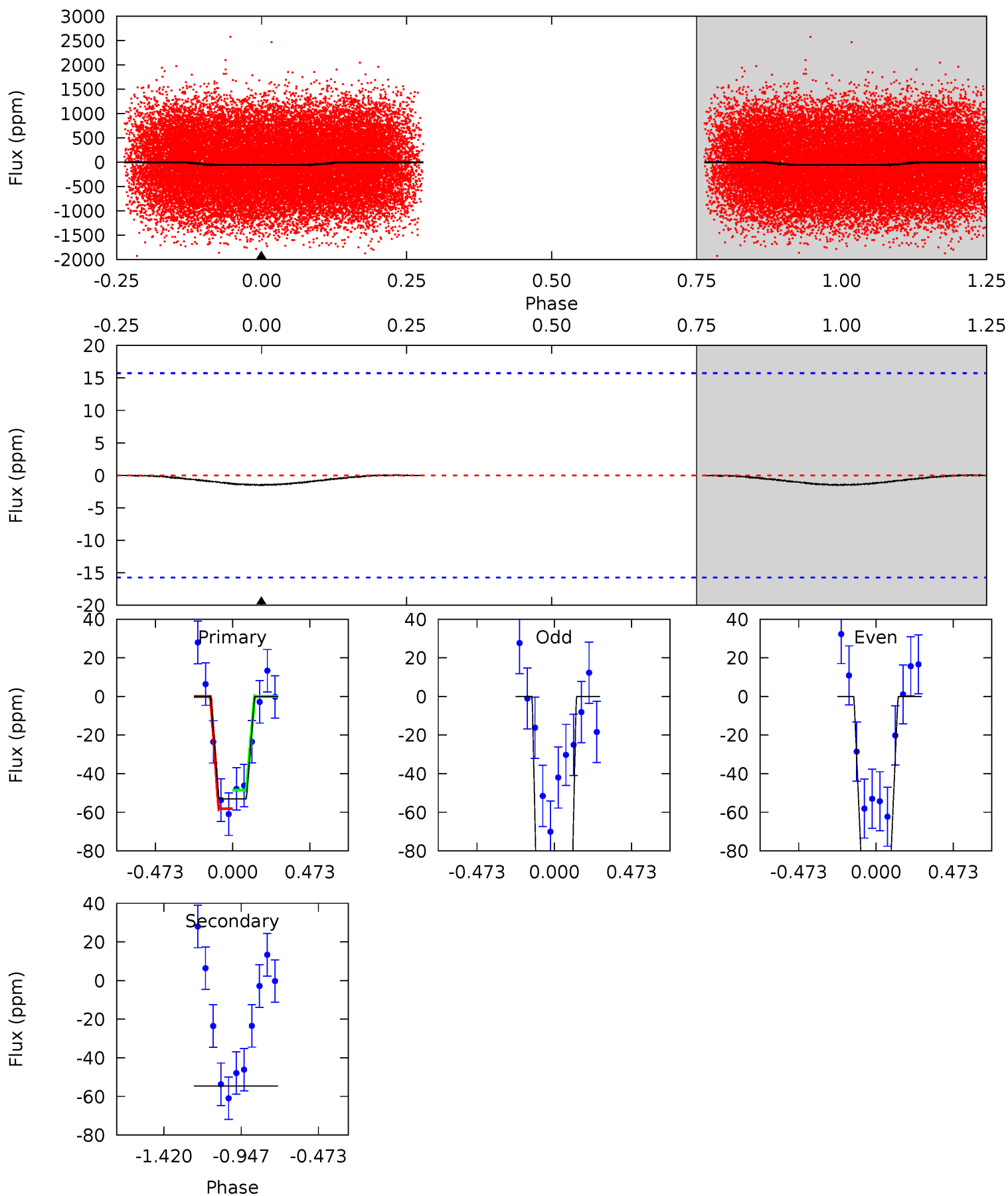
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.0	0	0	0	4.35	1.09	0.17	12.0	12.0	0	0	1.01	0.82	0.02	2.55



Alt Model-Shift Uniqueness Test

009655402-02, P = 2.802184 Days, E = 129.505408 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.40	0	0	0	4.23	0.72	0.01	0.40	0.40	0	0	0.37	0	0.03	0.35



Stellar Parameters For KIC 009655402

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6917^{+216}_{-312}	$4.122^{+0.190}_{-0.171}$	$-0.280^{+0.250}_{-0.300}$	$1.658^{+0.487}_{-0.443}$	$1.334^{+0.190}_{-0.232}$	$0.412^{+0.481}_{-0.194}$
	+3%/-5%	+5%/-4%	+89%/-107%	+29%/-27%	+14%/-17%	+117%/-47%
Source	KIC0	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 009655402-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 2	$1.04^{+0.23}_{-0.22}$	2635^{+206}_{-196}	-2937^{+6491}_{-924}	$0.001^{+1.649}_{-1.683}$
Alt.	0 ± 4	$1.35^{+0.28}_{-0.25}$	2653^{+218}_{-201}	-2684^{+6441}_{-1292}	$0.113^{+2.029}_{-2.160}$

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 $A_{obs} \gg 1.0$

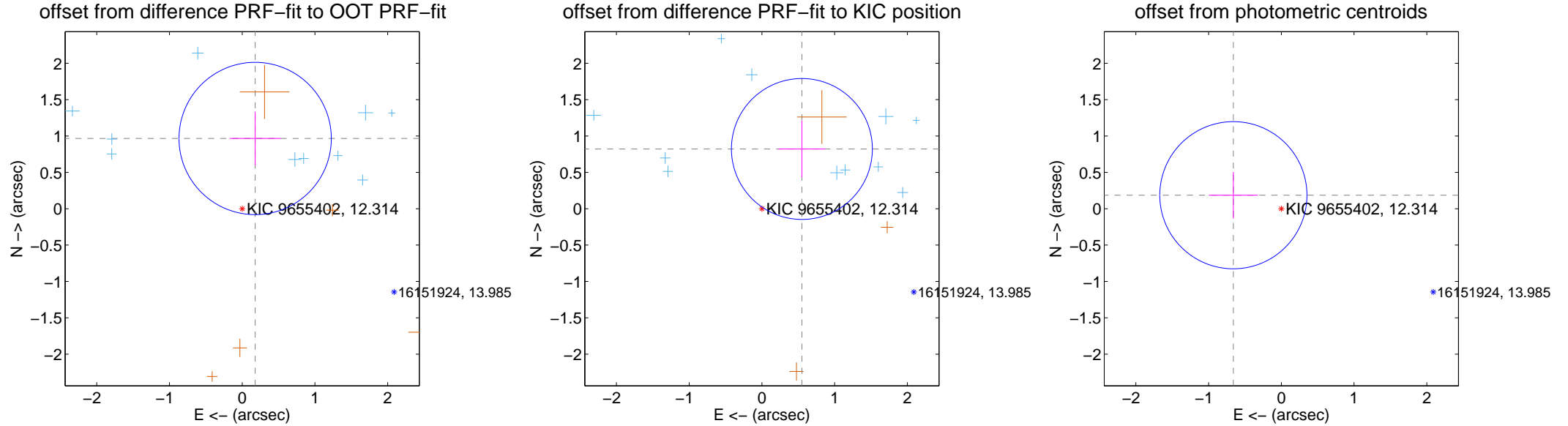
DV Centroid Data

Supplemental centroid analysis for 009655402-02. Kepler magnitude: 12.31. Transit SNR 11.89

There are 11 quarters with good PRF difference image offsets

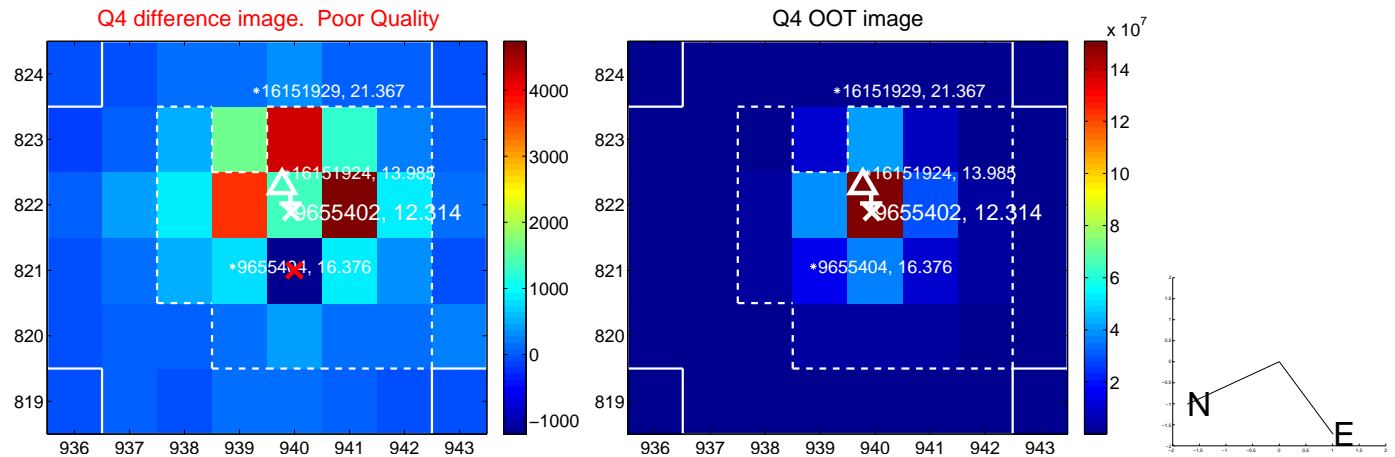
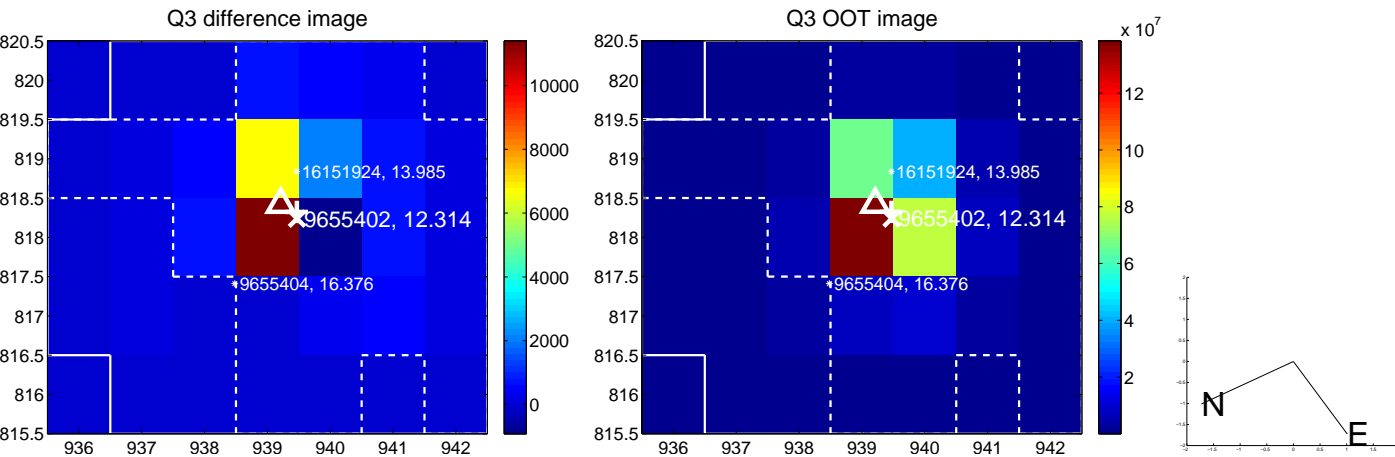
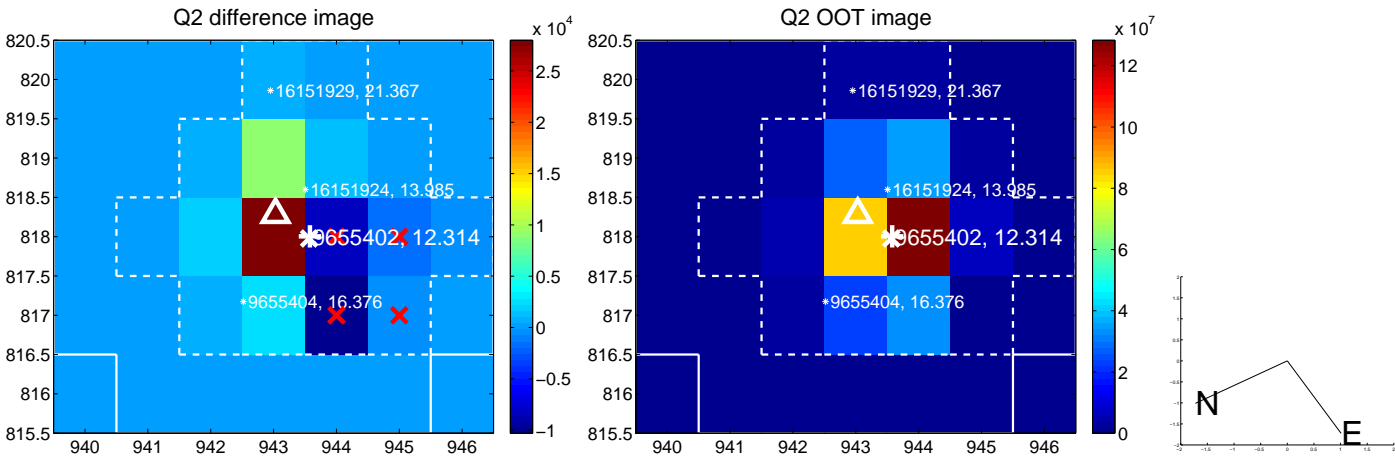
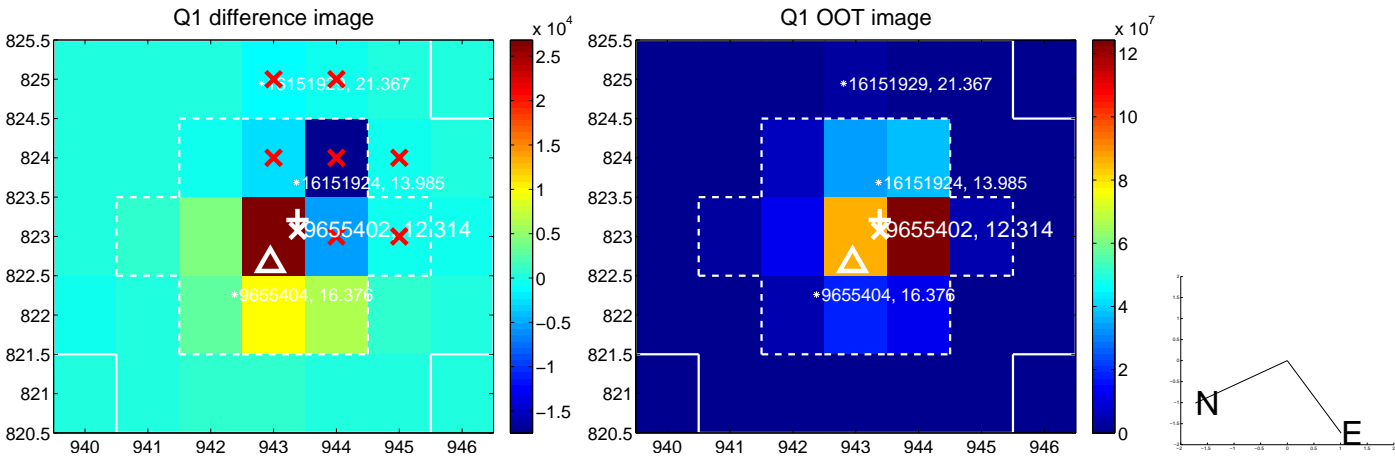
The direct PRF centroid is offset from the target star catalog position by about 0.62 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.982 ± 0.349	2.81	-0.178 ± 0.351	0.966 ± 0.369
PRF-fit source offset from KIC position	0.989 ± 0.323	3.06	-0.550 ± 0.322	0.822 ± 0.391
photometric centroid source offset	0.69 ± 0.34	2.03	0.66 ± 0.34	0.19 ± 0.32

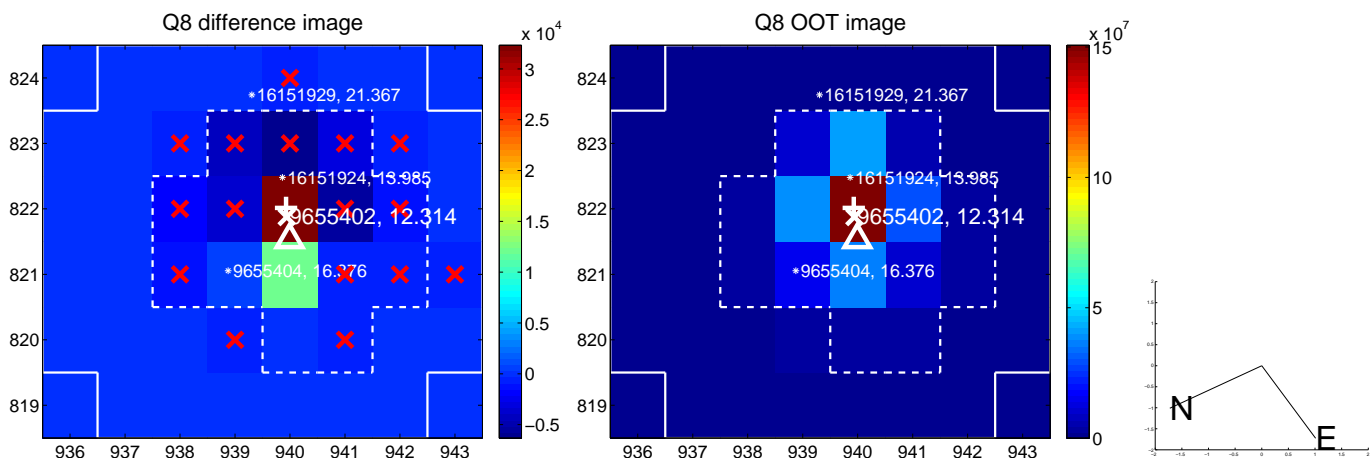
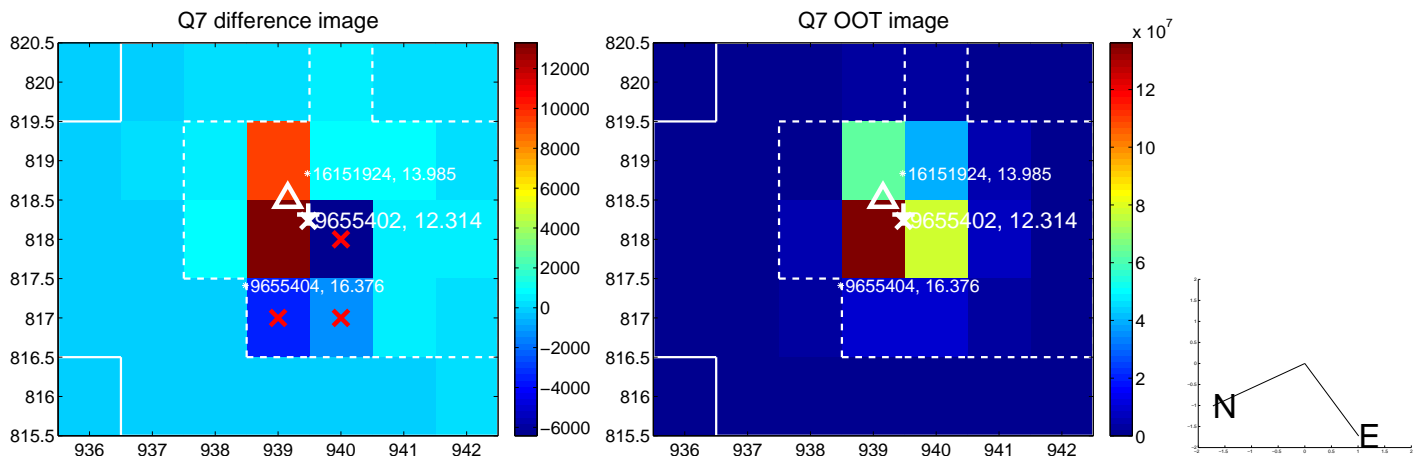
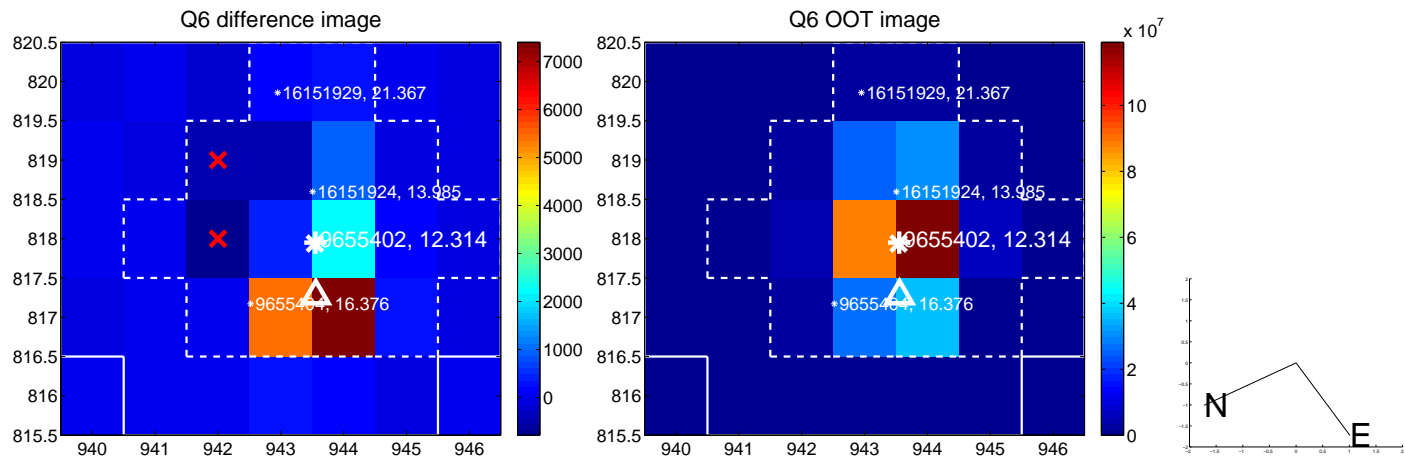
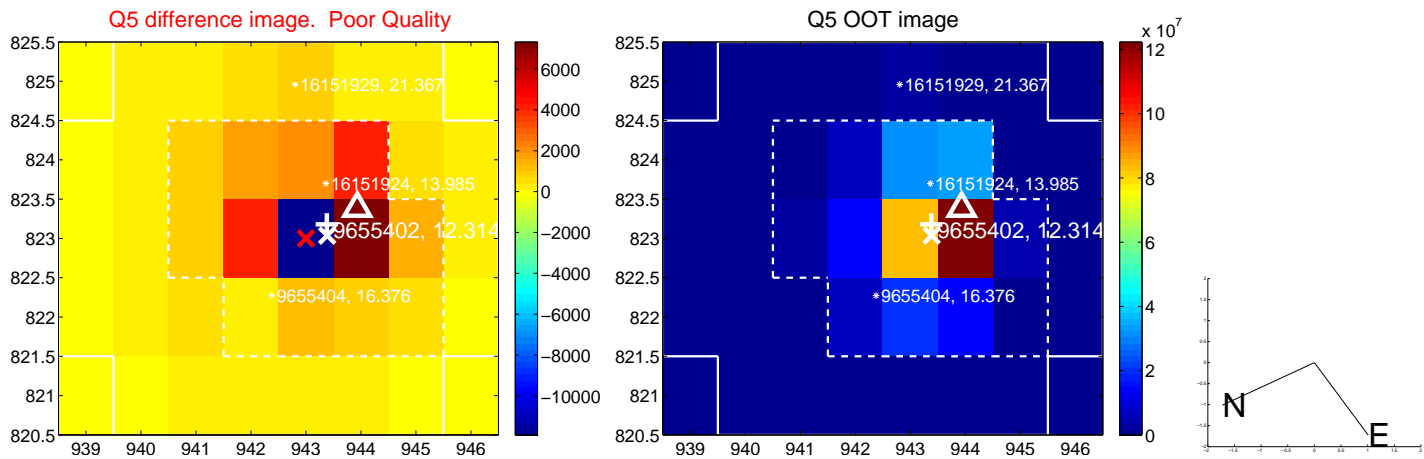


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

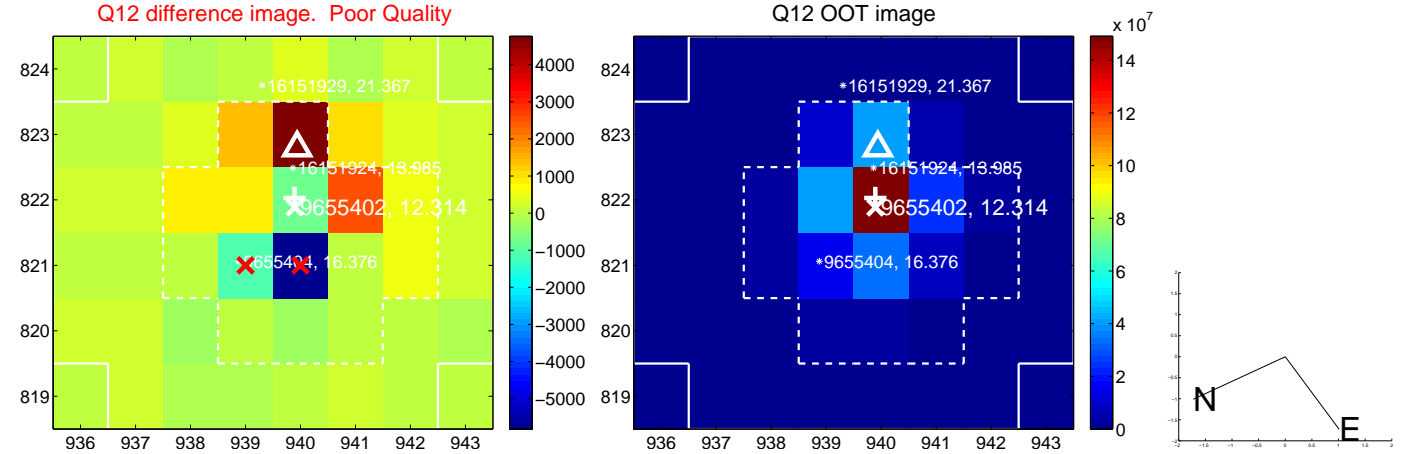
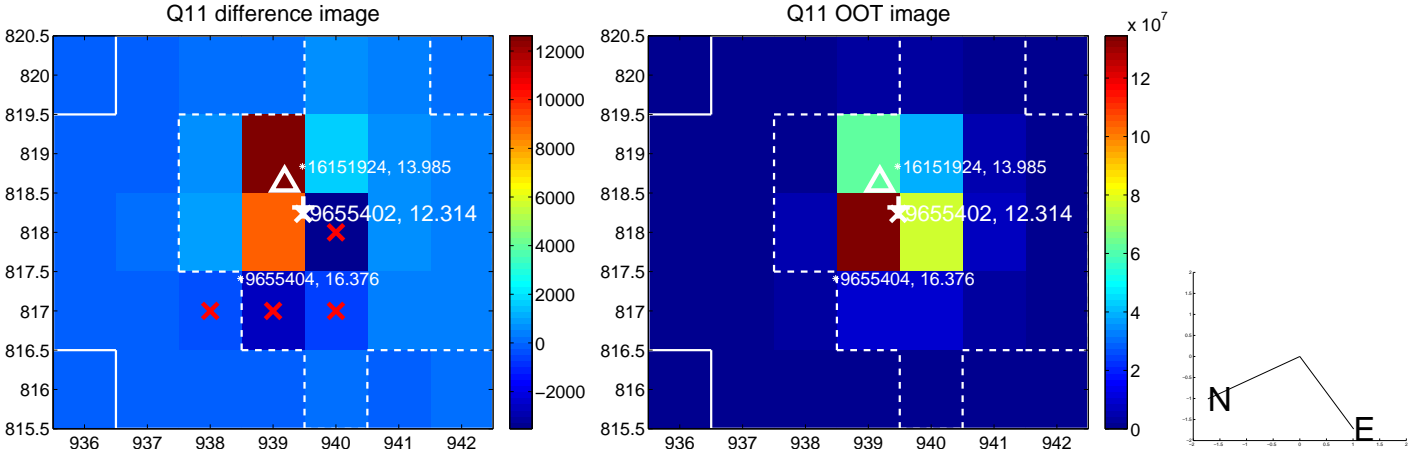
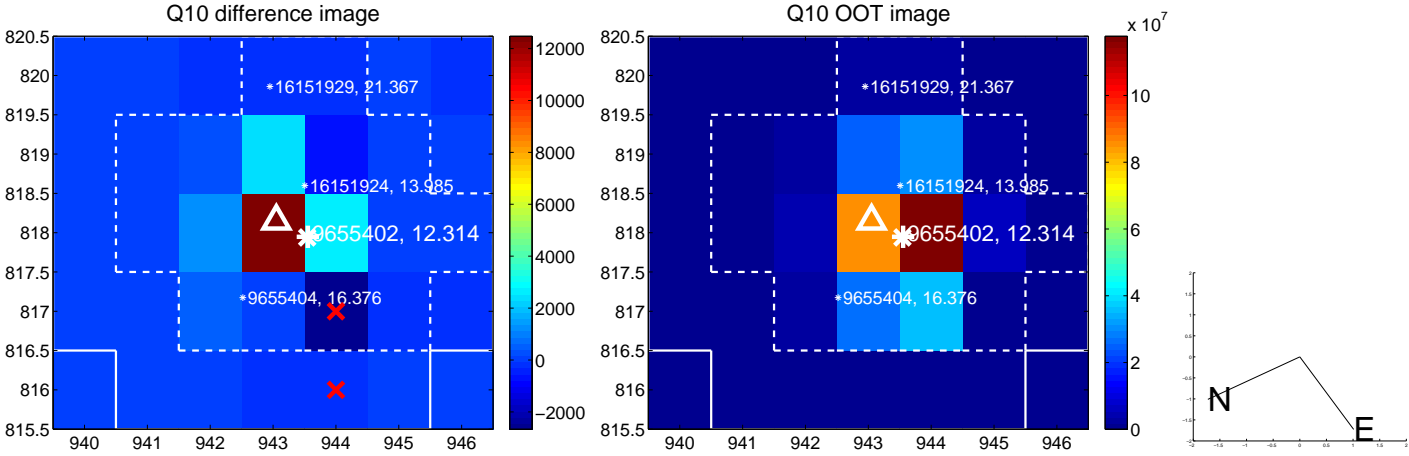
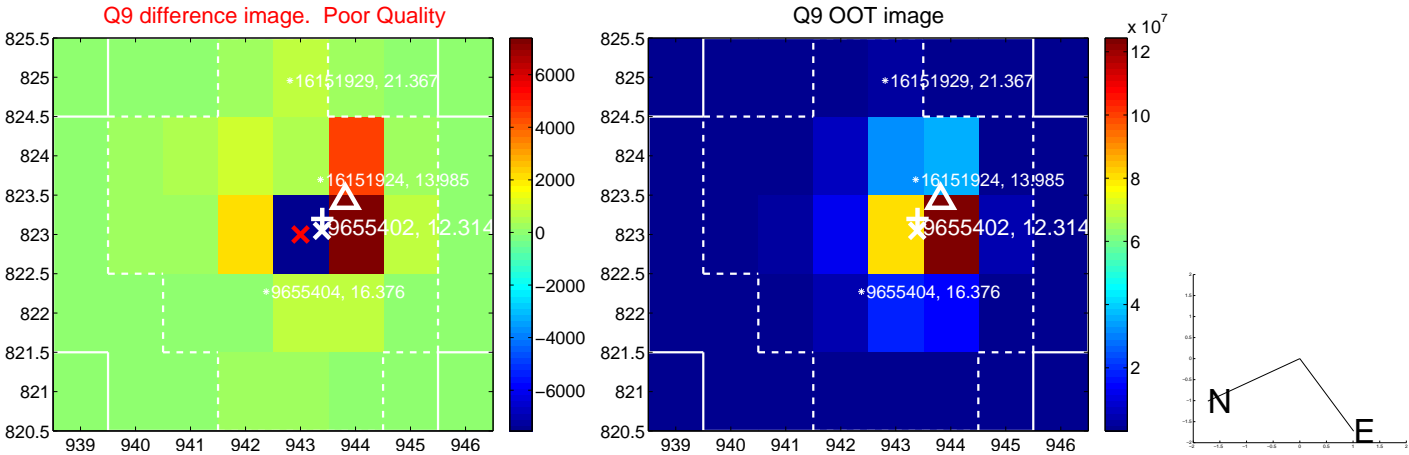
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



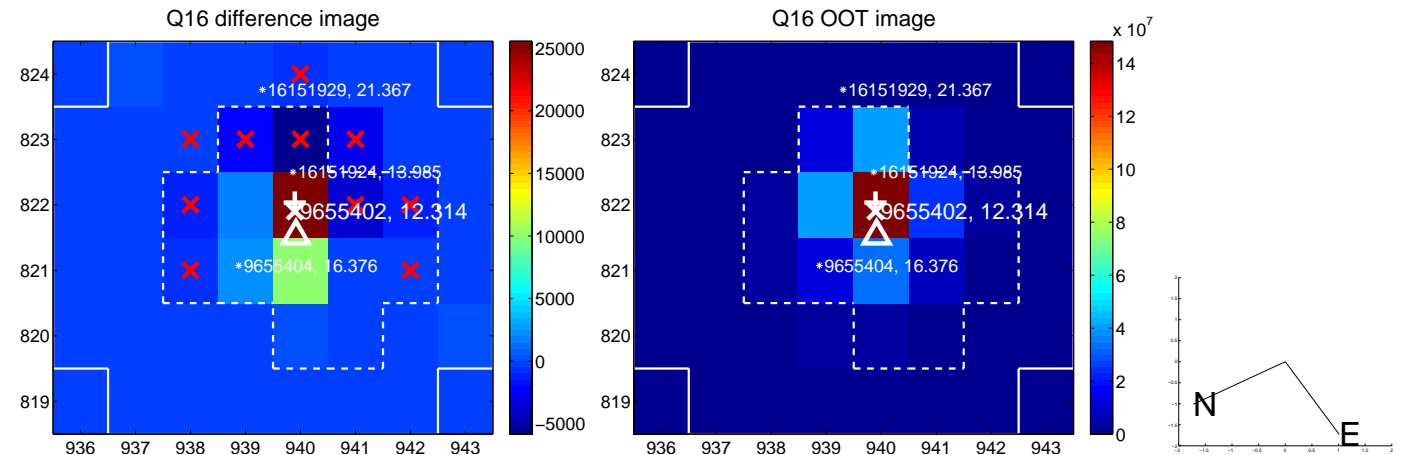
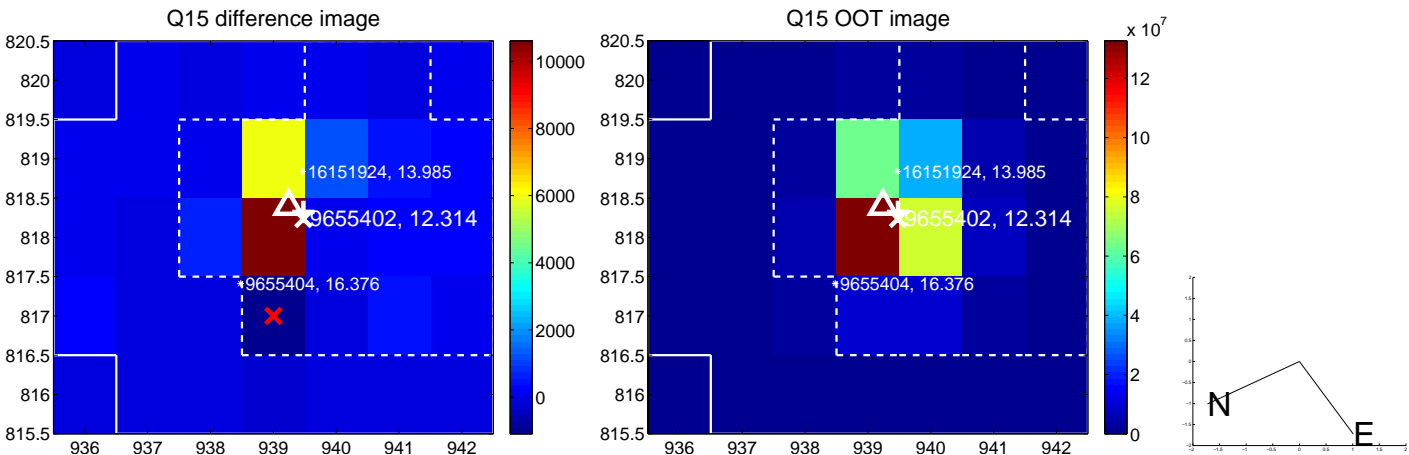
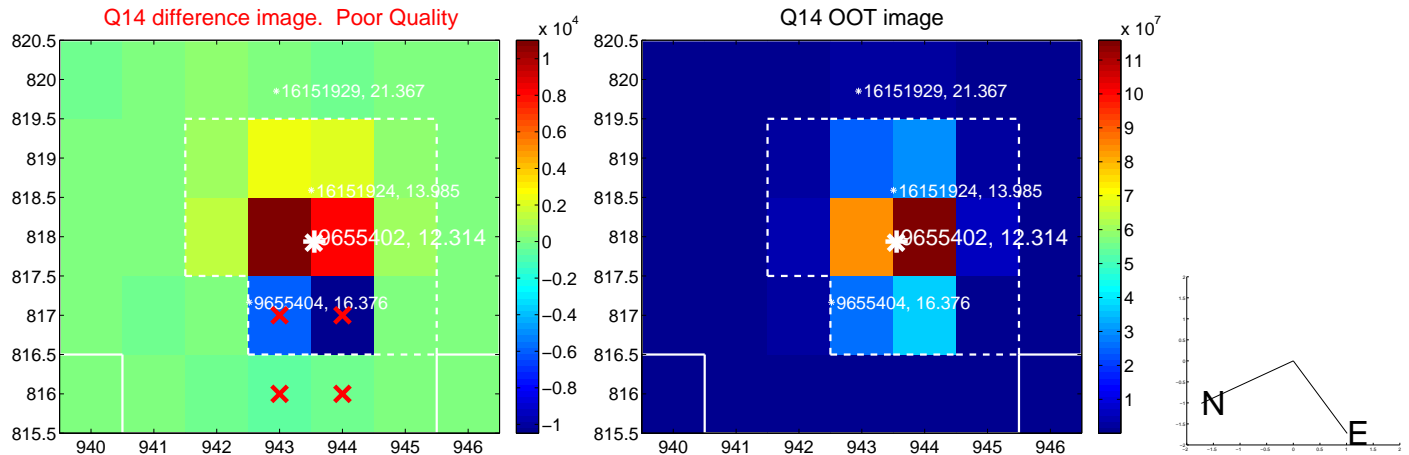
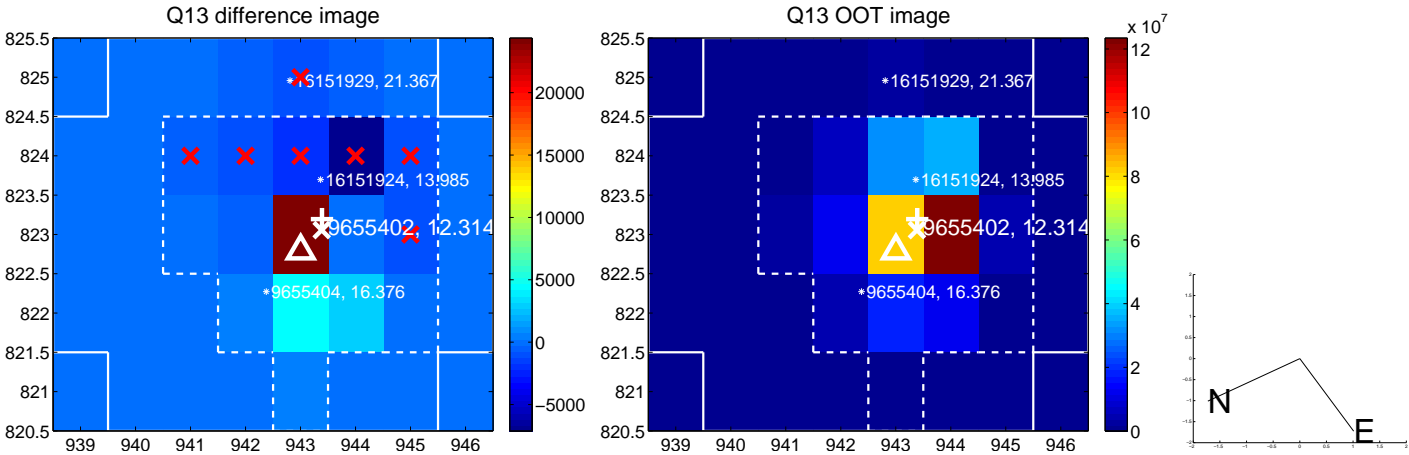
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



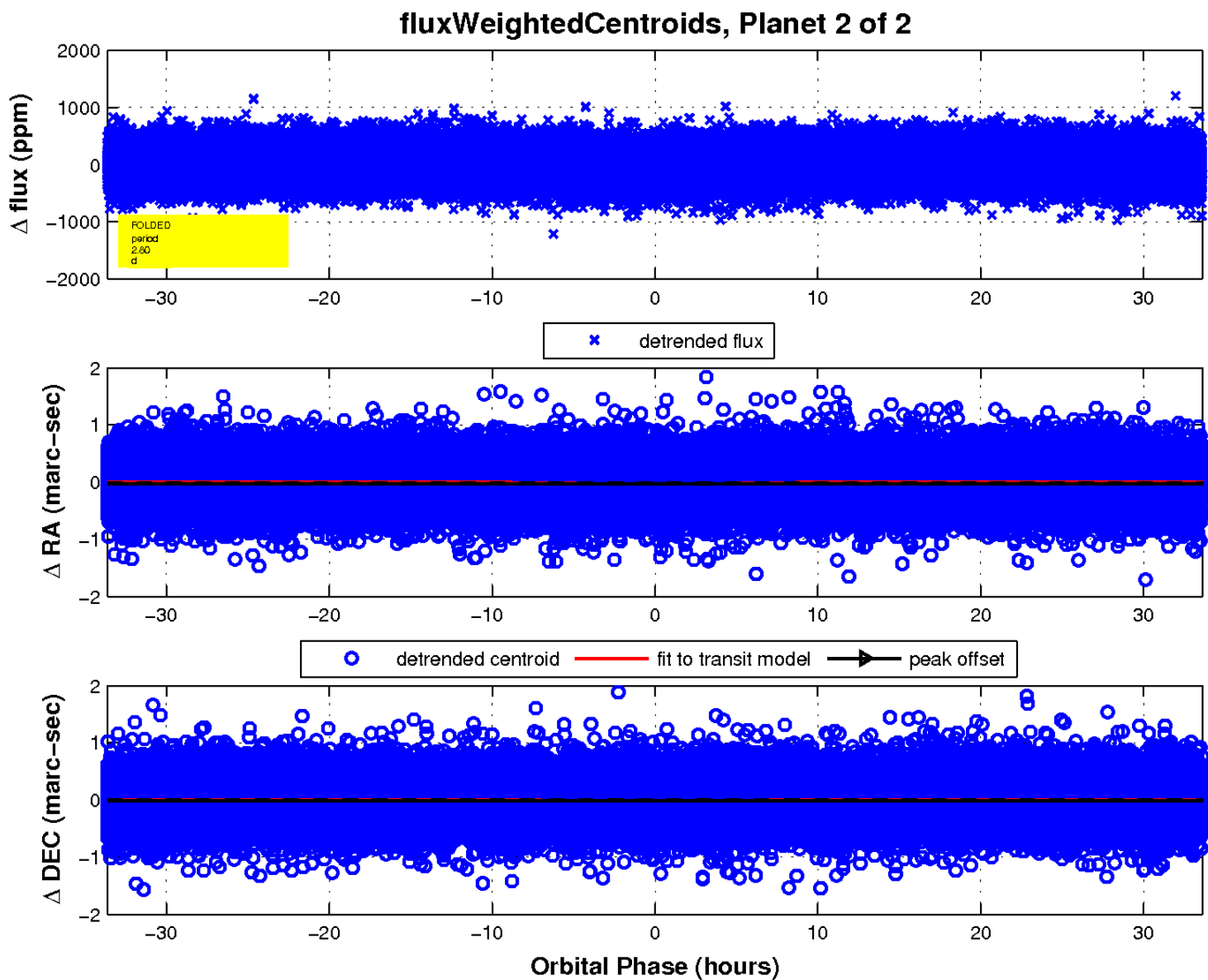
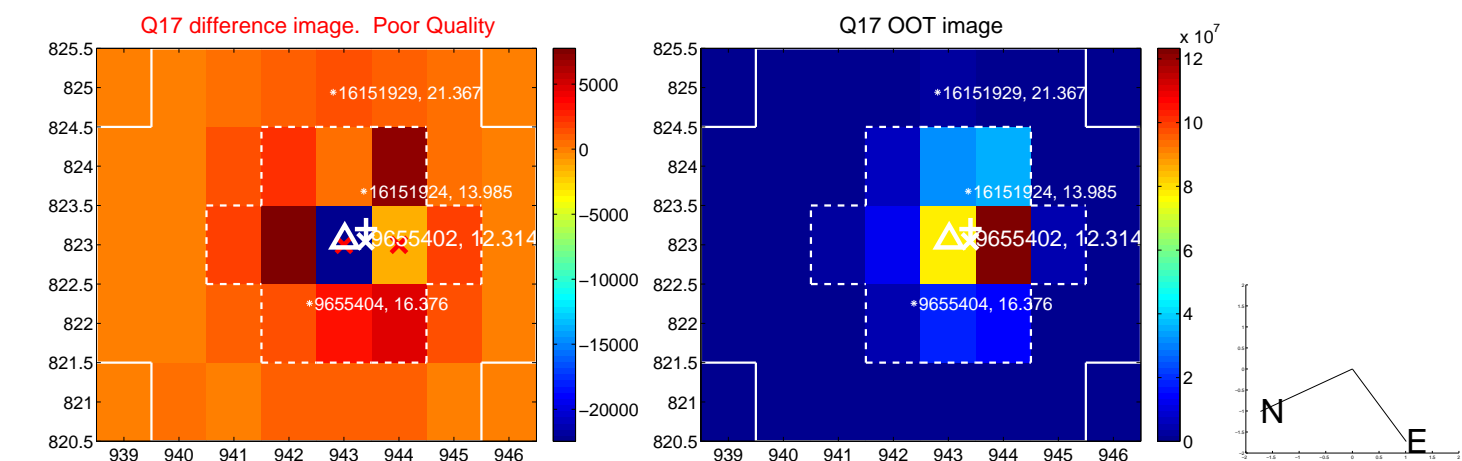
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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.



UKIRT Image

