

KIC 010656823

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})
010656823-01	OBS	0598.01	8.307842	137.940479	741.4	3.525	50.4	53.9	0.79	5320	2.57	75.19
010656823-02	OBS	0598.02	34.096850	153.816018	440.9	4.522	14.4	16.5	0.79	5320	2.10	11.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010656823-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
010656823-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

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.

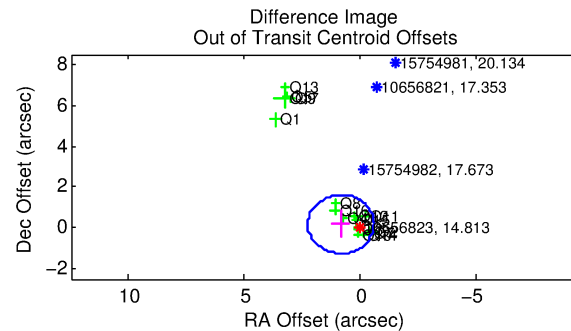
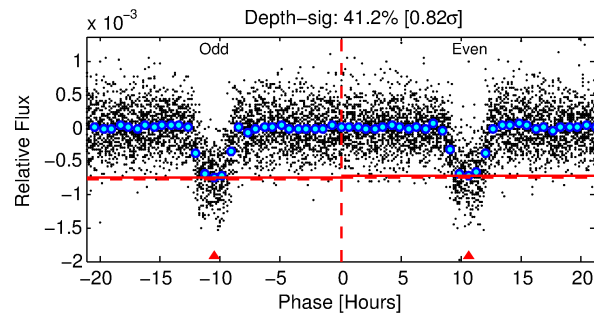
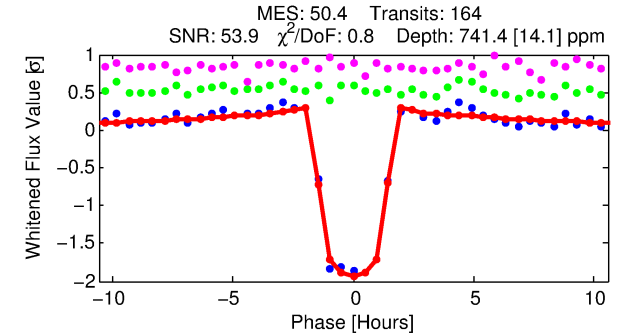
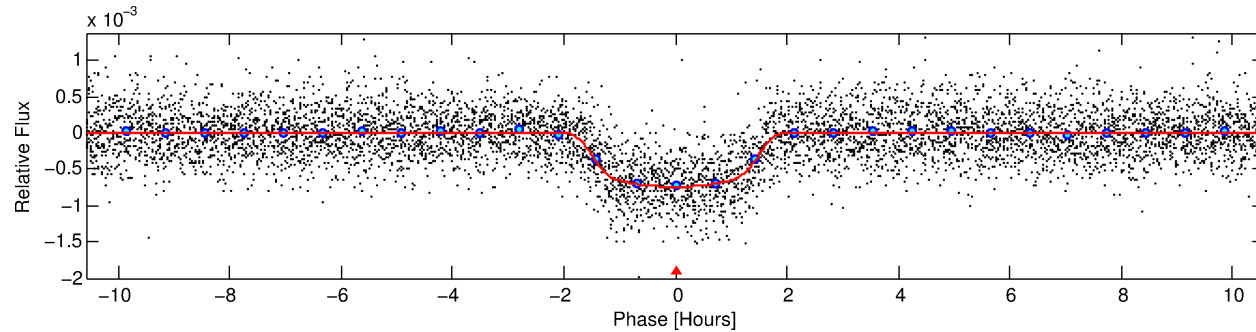
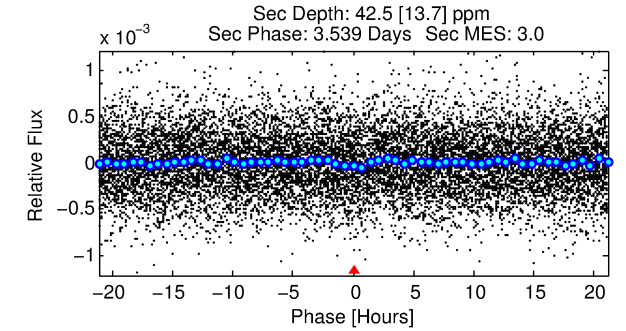
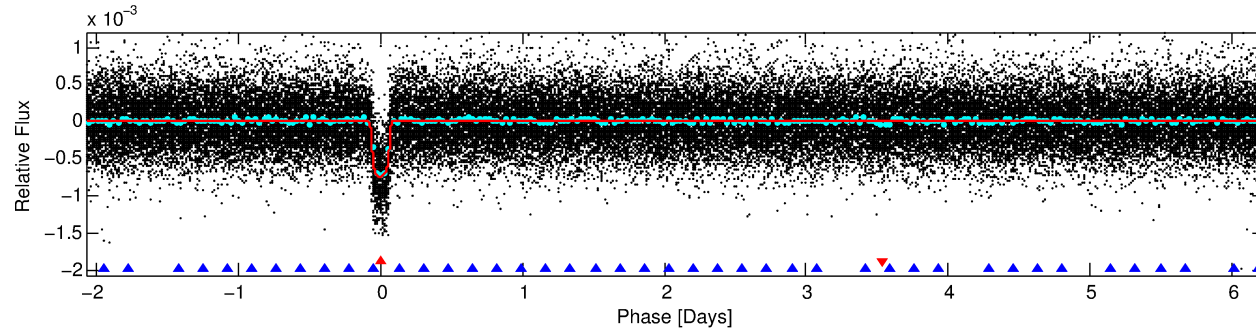
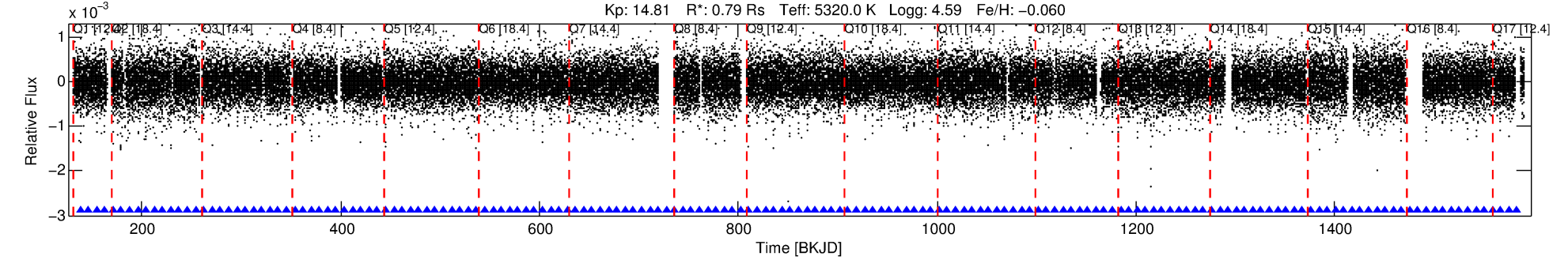
Ephemeris Match Information For 010656823-01

No Significant Match Found

DV One-Page Summary

KIC: 10656823 Candidate: 1 of 2 Period: 8.308 d
KOI: K00598.01 Name: Kepler-195b Corr: 0.952

Kp: 14.81 R*: 0.79 Rs Teff: 5320.0 K Logg: 4.59 Fe/H: -0.060



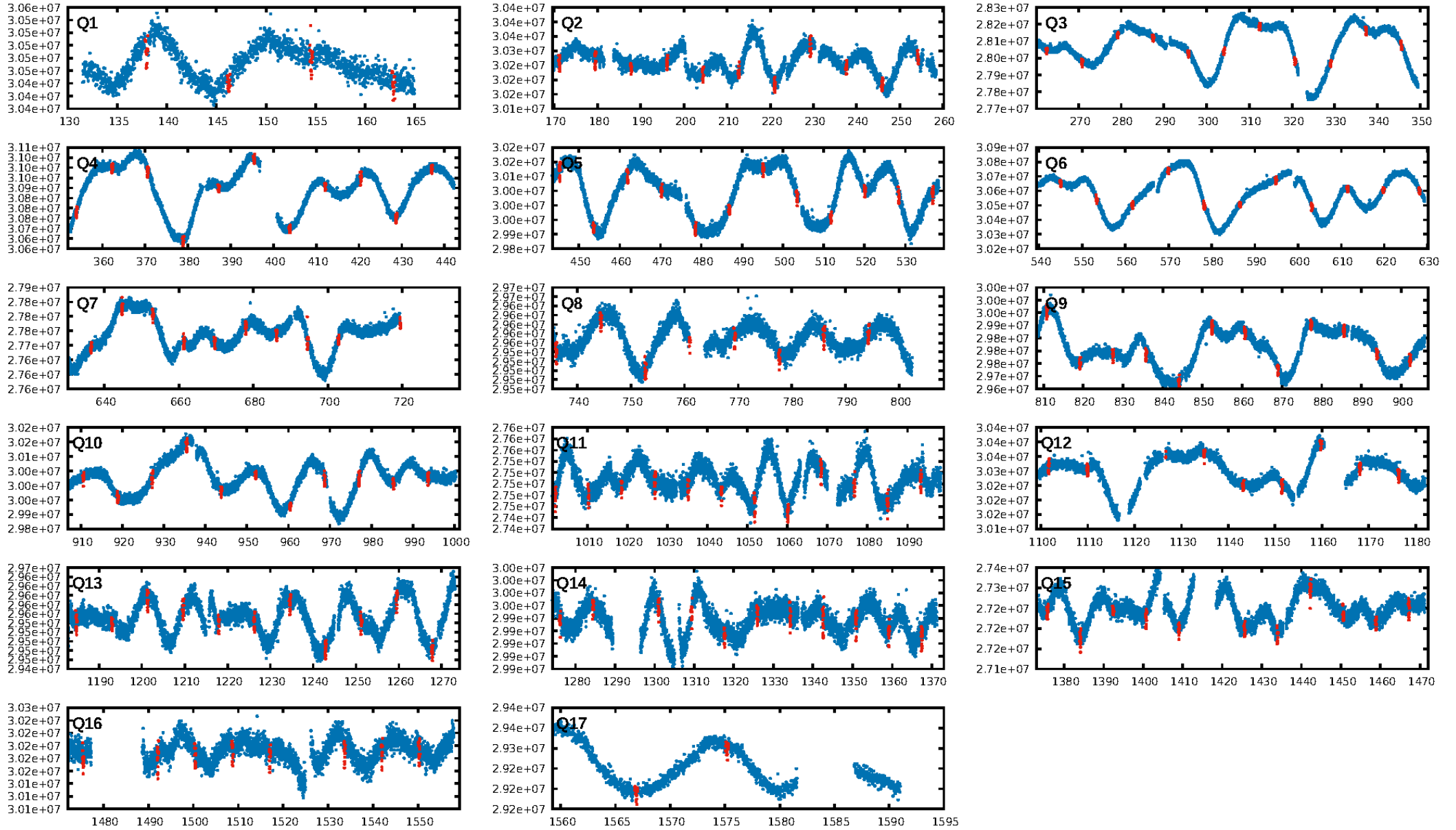
DV Fit Results:

Period = 8.30784 [0.00001] d
Epoch = 137.9405 [0.0012] BKJD
Rp/R* = 0.0300 [0.0013]
a/R* = 9.18 [1.57]
b = 0.90 [0.04]
Seff = 75.19 [17.28]
Teq = 751 [43] K
Rp = 2.57 [0.45] Re
a = 0.0768 [0.0106] AU
Ag = 20.87 [8.07] [2.46σ]
Teffp = 2481 [220] K [7.73σ]

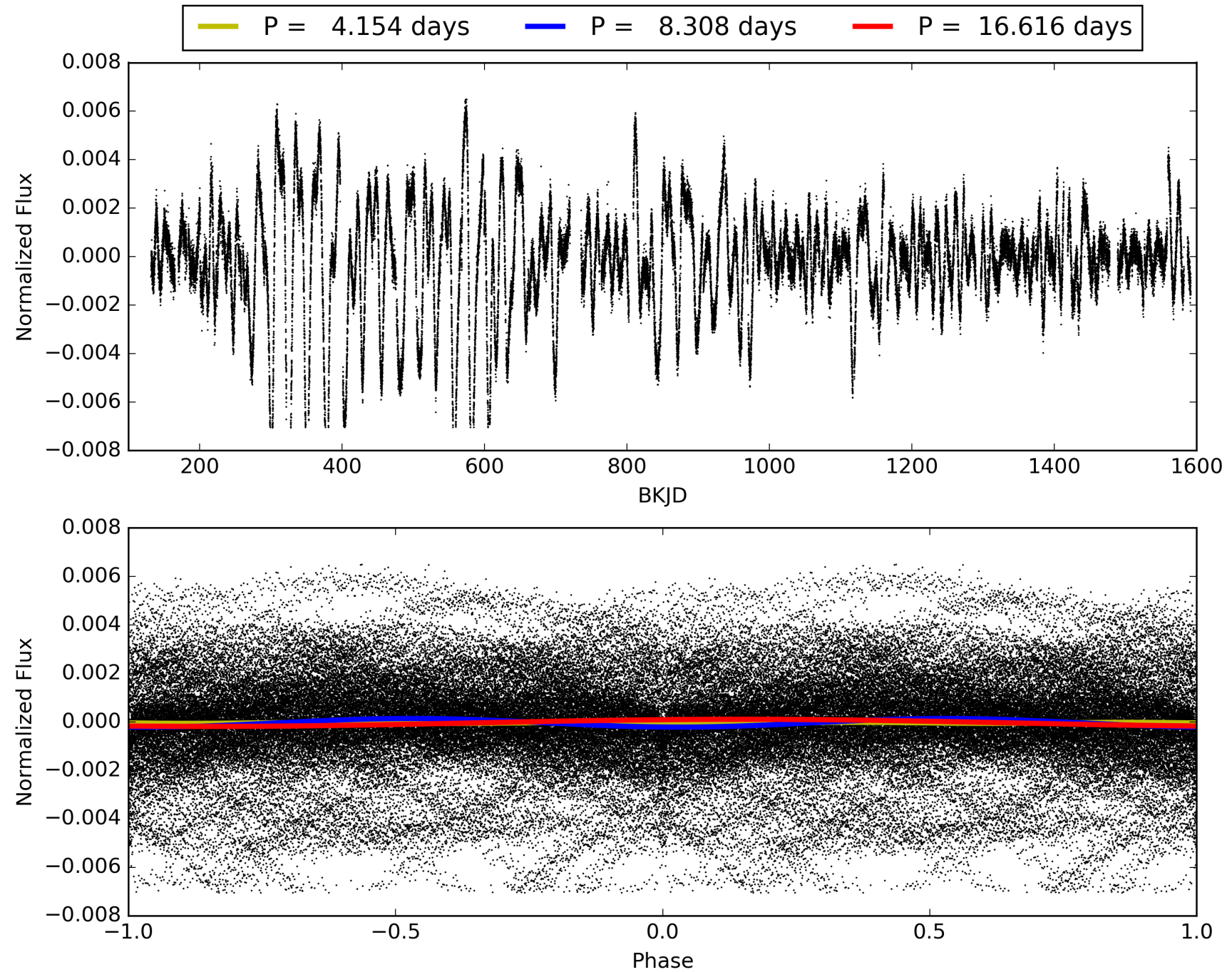
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [107.95σ]
ModelChiSquare2-sig: 99.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [158/158]
GhostDiagnostic-chr: 9.067
Centroid-sig: 0.0%
Centroid-so: 1.100 arcsec [6.35σ]
OotOffset-rm: 0.848 arcsec [1.78σ]
KicOffset-rm: 0.203 arcsec [1.85σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.94 [16/17]
DiffImageOverlap-fno: 1.00 [17/17]

TCE 010656823-01, PDC Light Curves

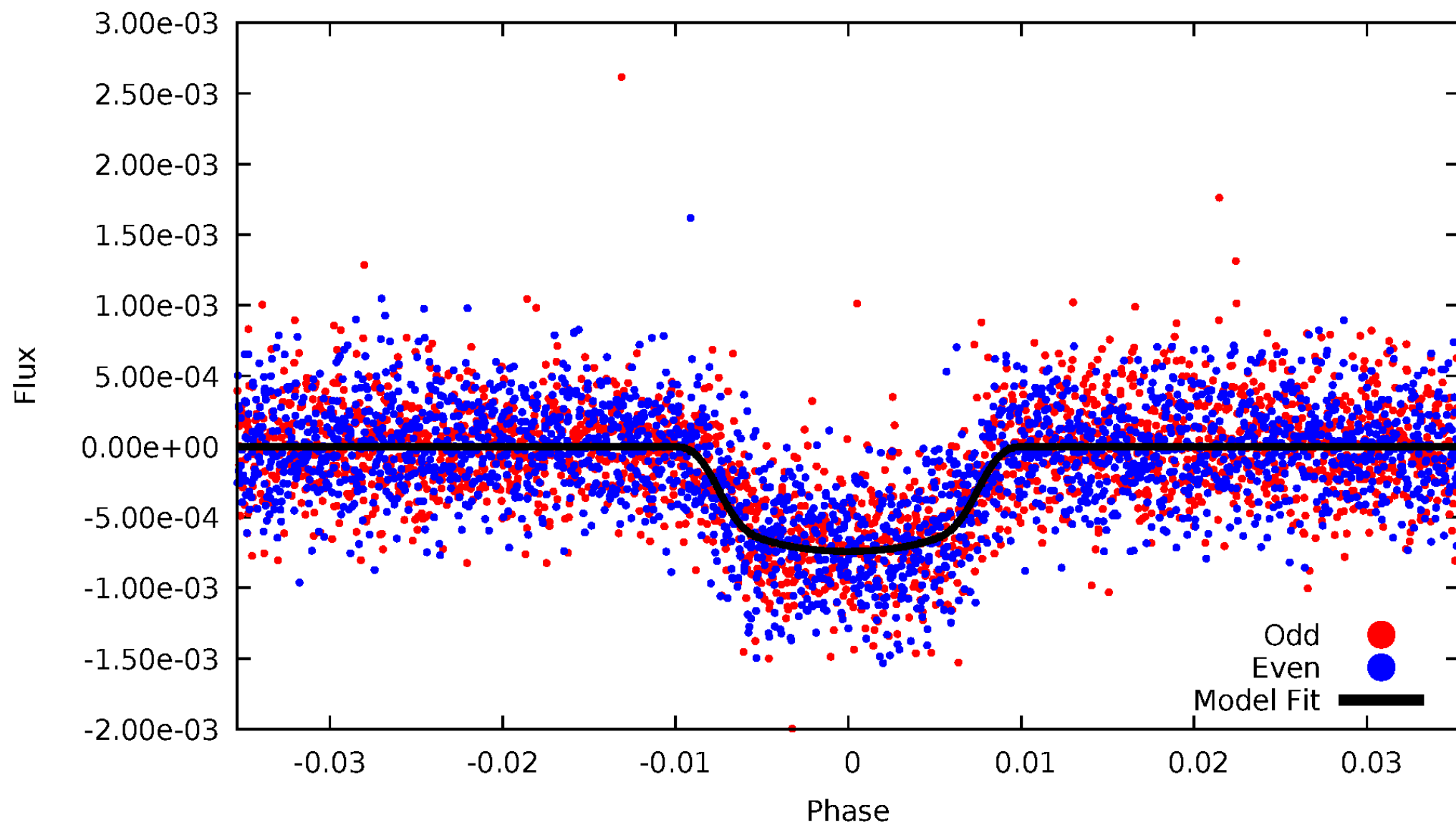


TCE 010656823-01



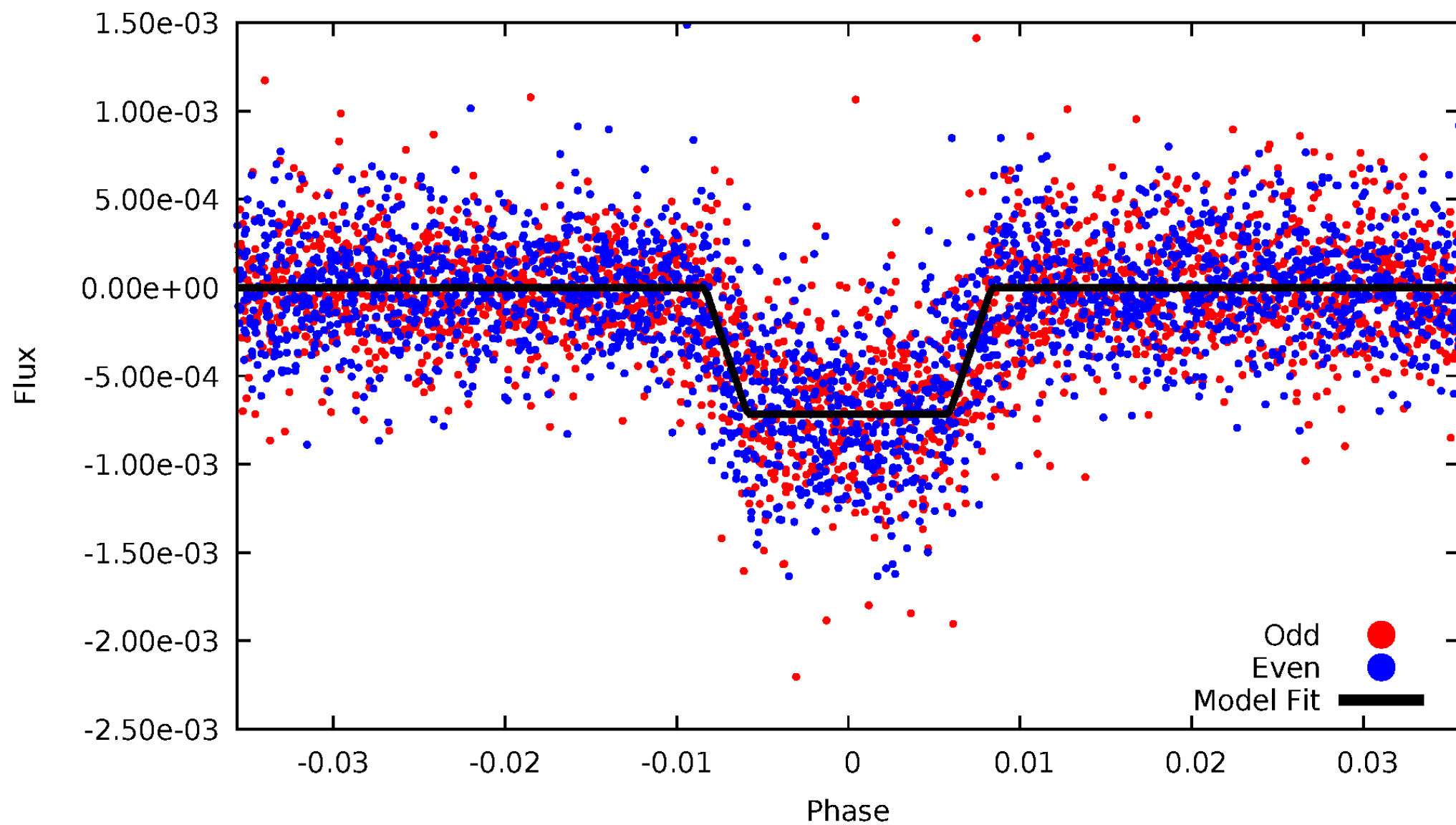
DV Odd/Even

TCE 010656823-01



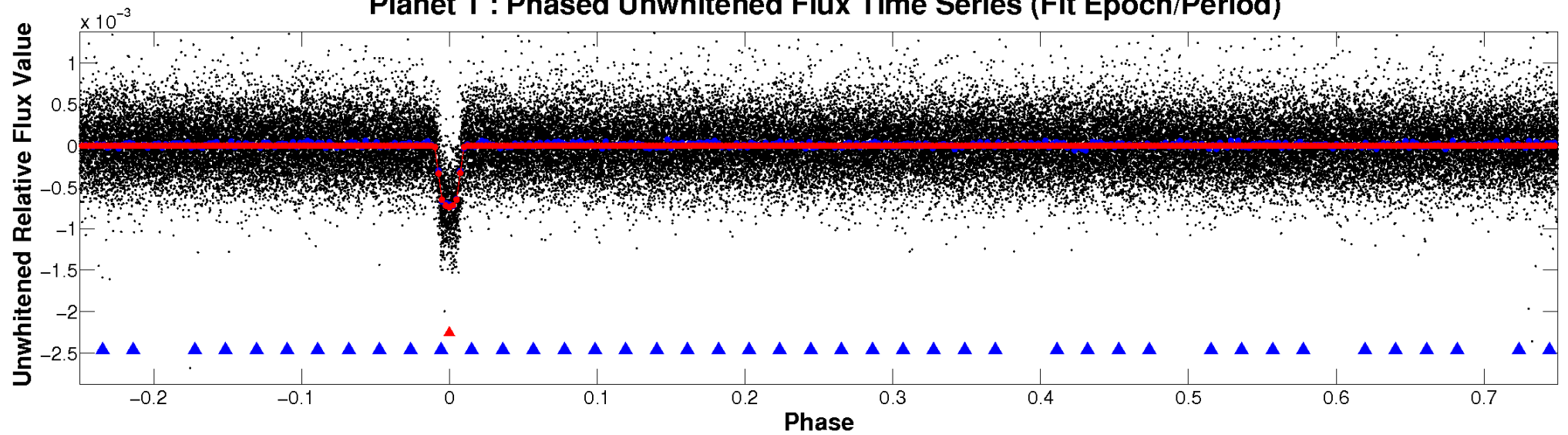
ALT Odd/Even

TCE 010656823-01

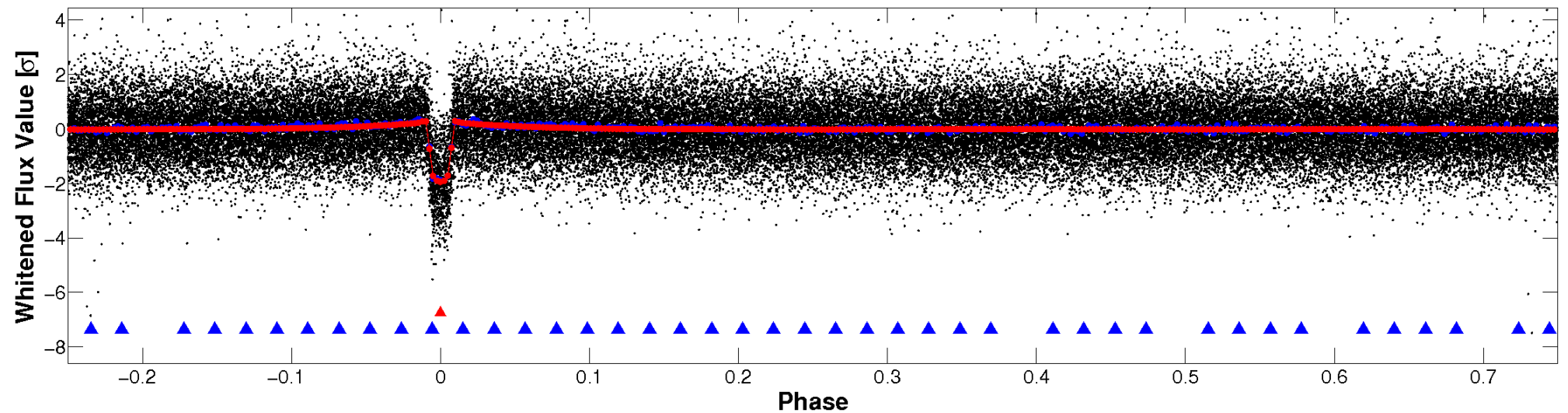


Non-Whitened Vs. Whitened Light Curve

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

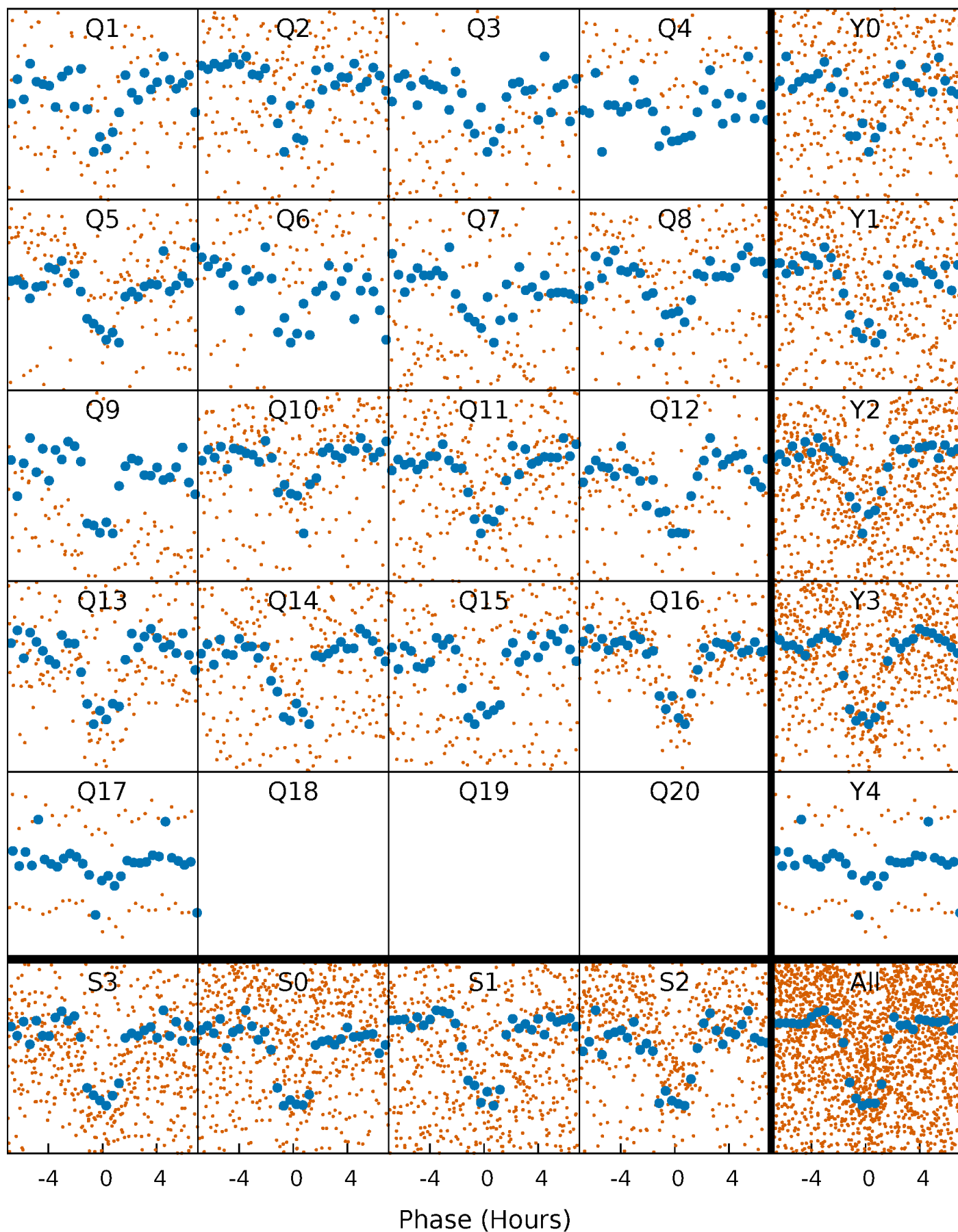


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



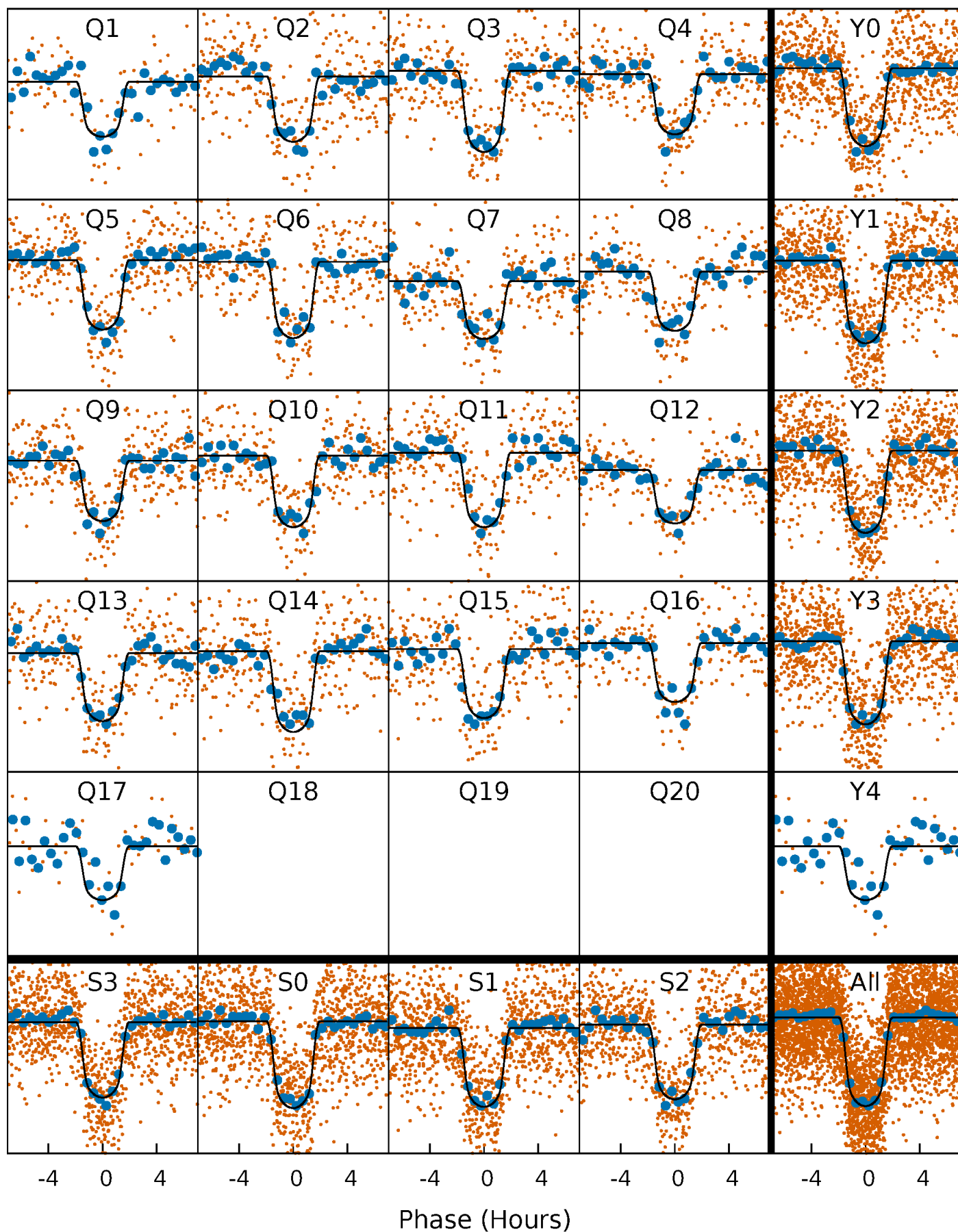
PDC Quarter-Phased Transit Curves

TCE 010656823-01 P= 8.307842 Days $T_0=137.940479$ (BKJD)



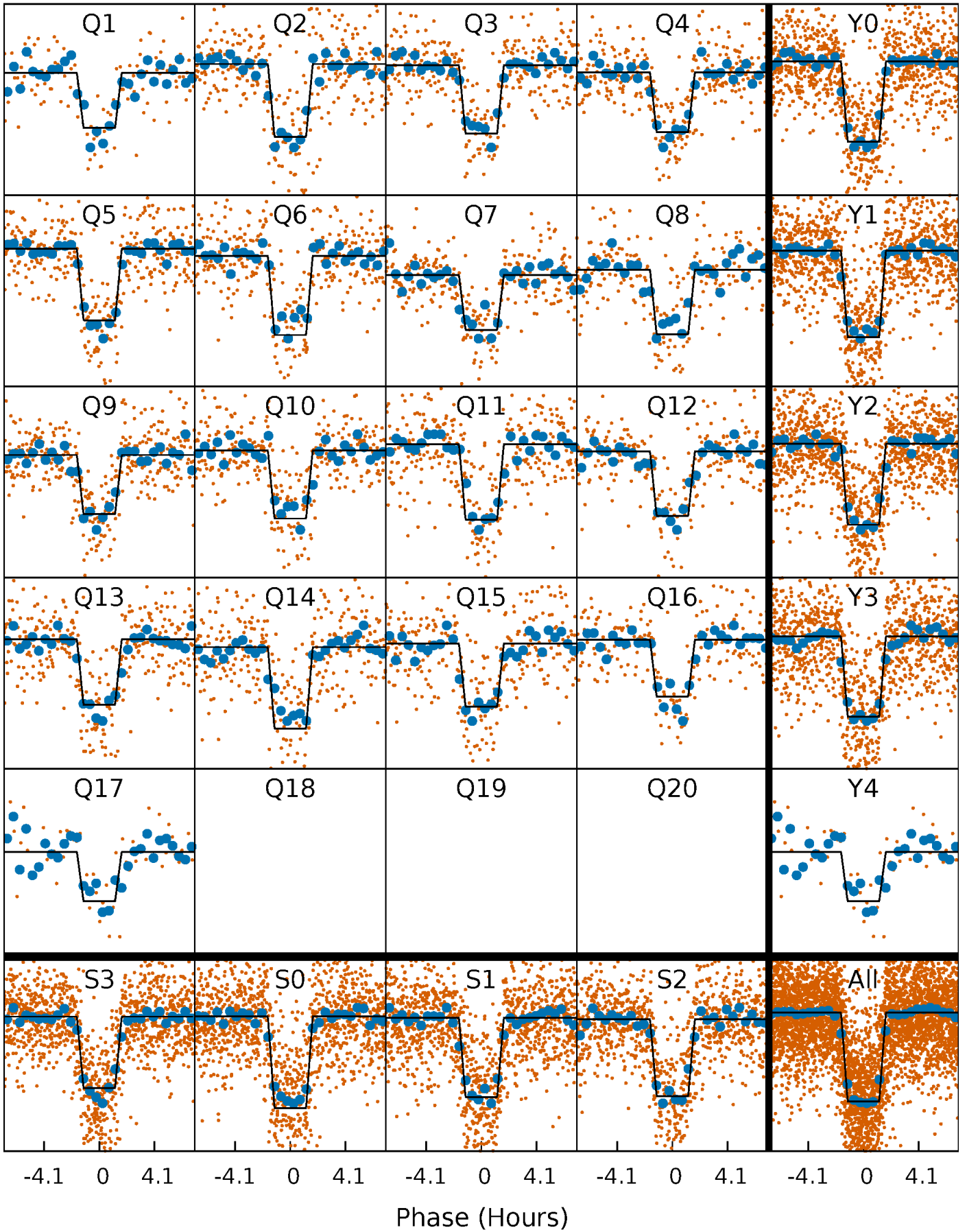
DV Quarter-Phased Transit Curves

TCE 010656823-01 P= 8.307842 Days $T_0=137.940479$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

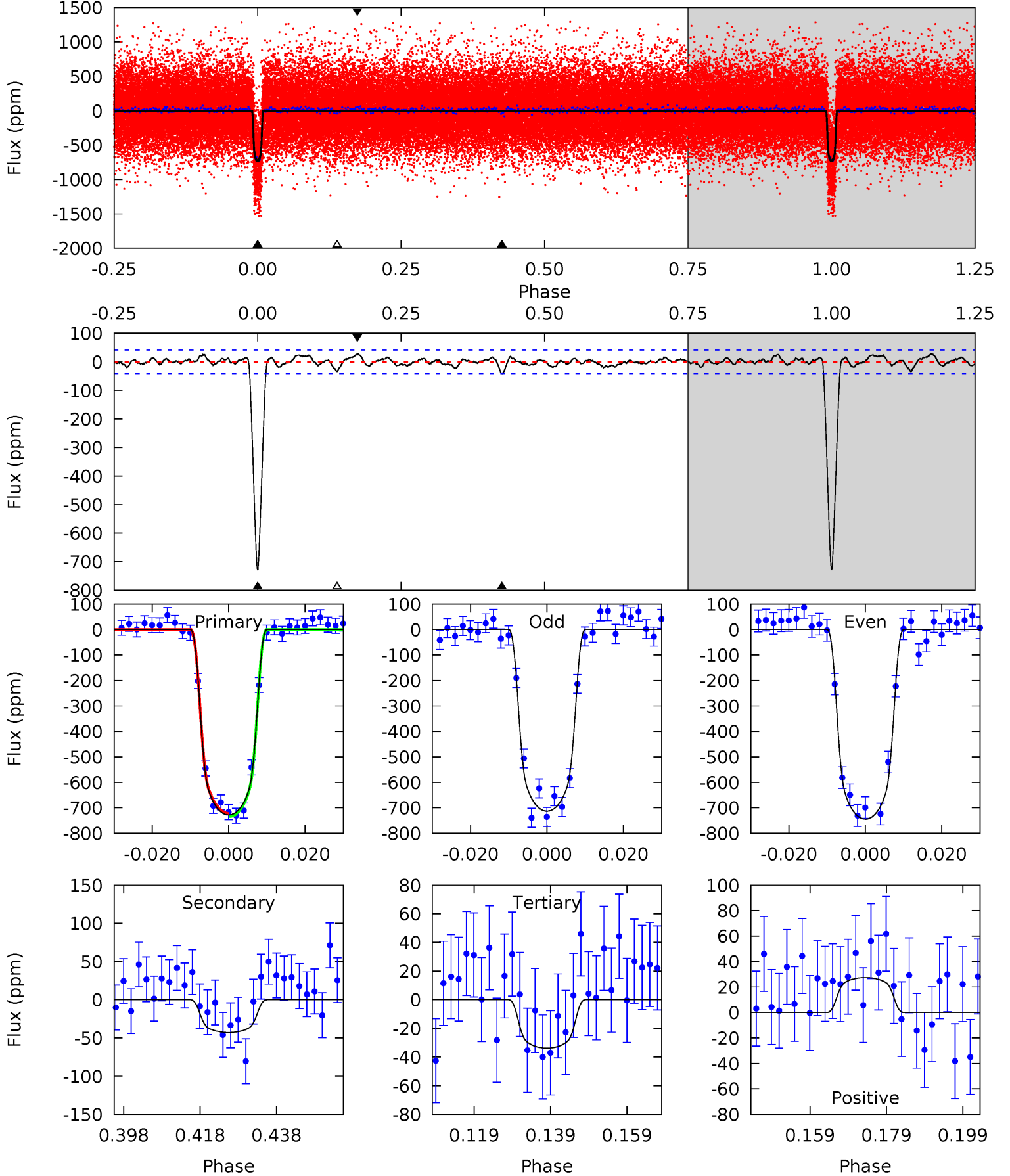
TCE 010656823-01 P= 8.307816 Days $T_0=137.942775$ (BKJD)



DV Model-Shift Uniqueness Test

010656823-01, P = 8.307842 Days, E = 129.632637 Days

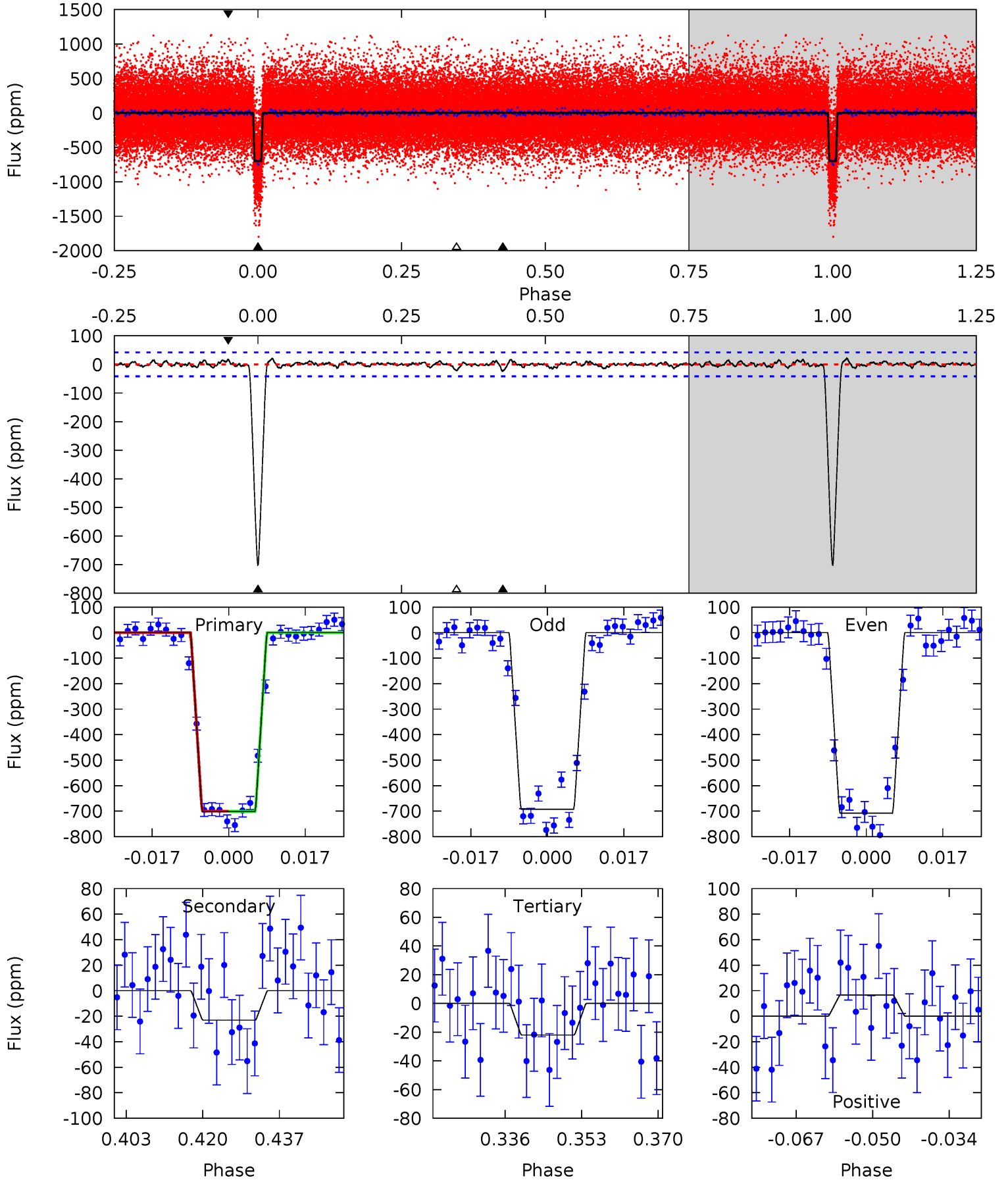
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
84.2	4.95	3.91	3.17	4.89	2.33	1.16	80.3	81.0	1.04	1.78	1.82	1.00	0.04	0.68



Alt Model-Shift Uniqueness Test

010656823-01, P = 8.307816 Days, E = 129.634959 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
82.6	2.72	2.59	1.97	4.93	2.39	0.71	80.1	80.7	0.13	0.75	0.88	1.00	0.03	0.05



Stellar Parameters For KIC 010656823

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5320^{+159}_{-143}	$4.589^{+0.028}_{-0.105}$	$-0.060^{+0.300}_{-0.300}$	$0.786^{+0.132}_{-0.066}$	$0.882^{+0.061}_{-0.104}$	$2.559^{+0.461}_{-0.820}$
	+3%/-3%	+1%/-2%	+500%/-500%	+17%/-8%	+7%/-12%	+18%/-32%
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 010656823-01 / KOI 0598.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-43 ± 9	$2.64^{+0.20}_{-0.20}$	1067^{+49}_{-38}	3102^{+103}_{-120}	20^{+5}_{-5}
Alt.	-23 ± 8	$2.35^{+0.22}_{-0.18}$	1064^{+50}_{-39}	2910^{+156}_{-201}	13^{+6}_{-5}

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

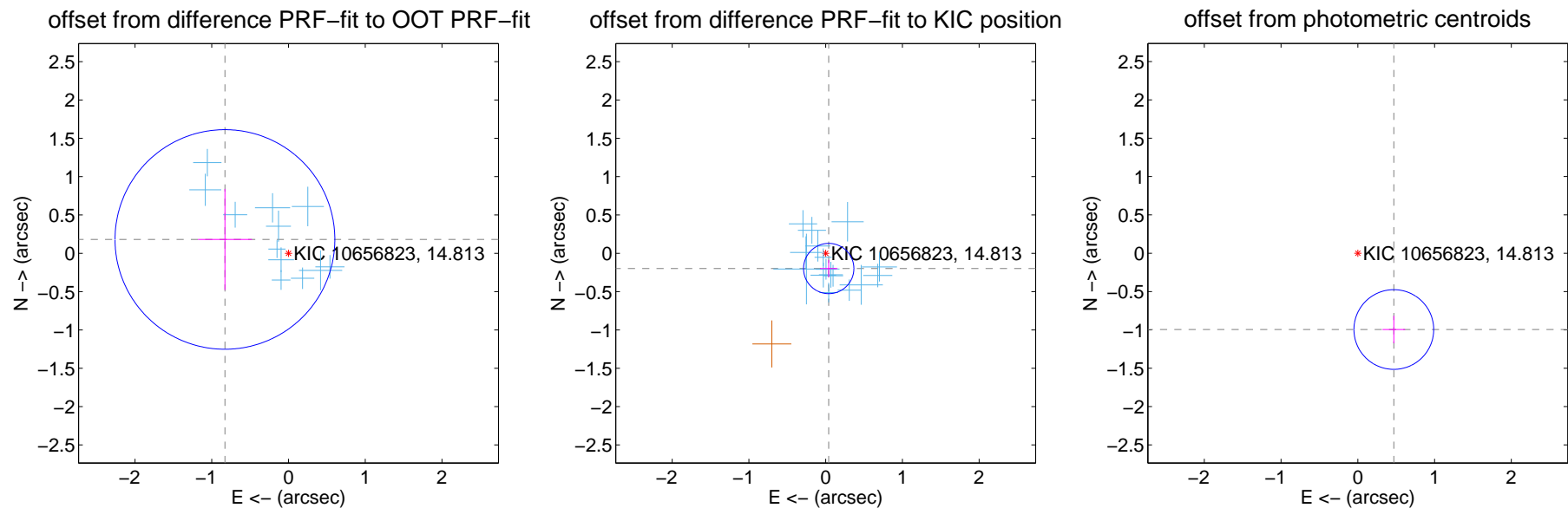
DV Centroid Data

Supplemental centroid analysis for 010656823-01. Kepler magnitude: 14.81. Transit SNR 53.95

There are 16 quarters with good PRF difference image offsets

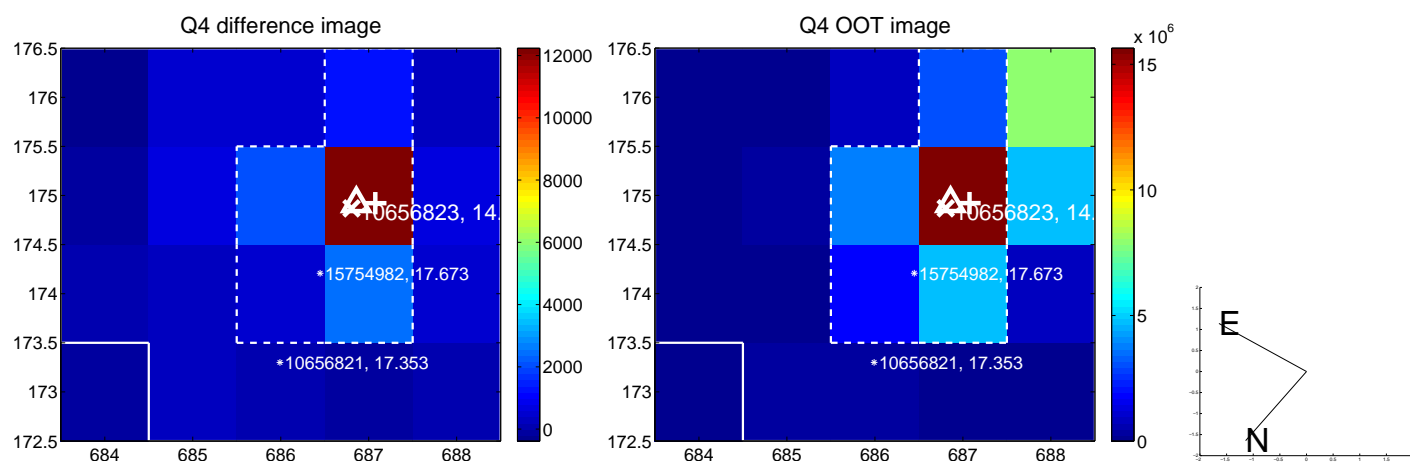
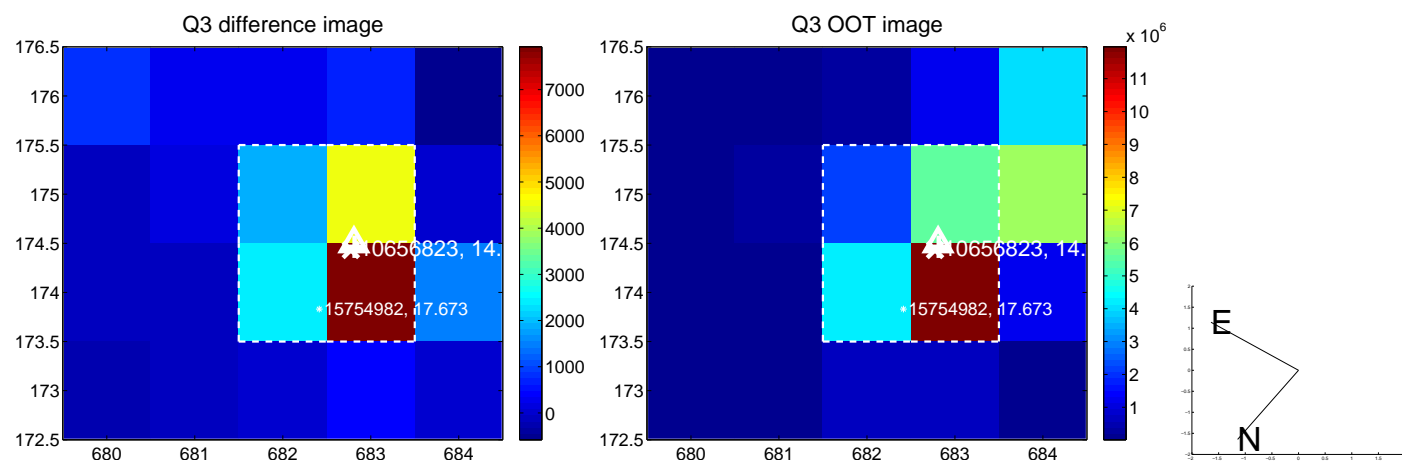
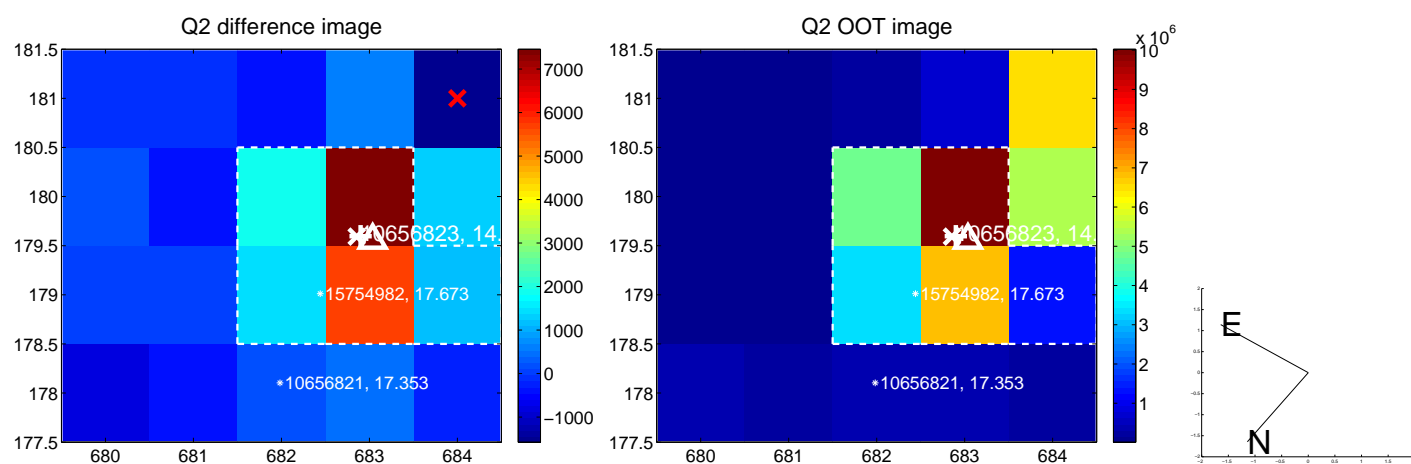
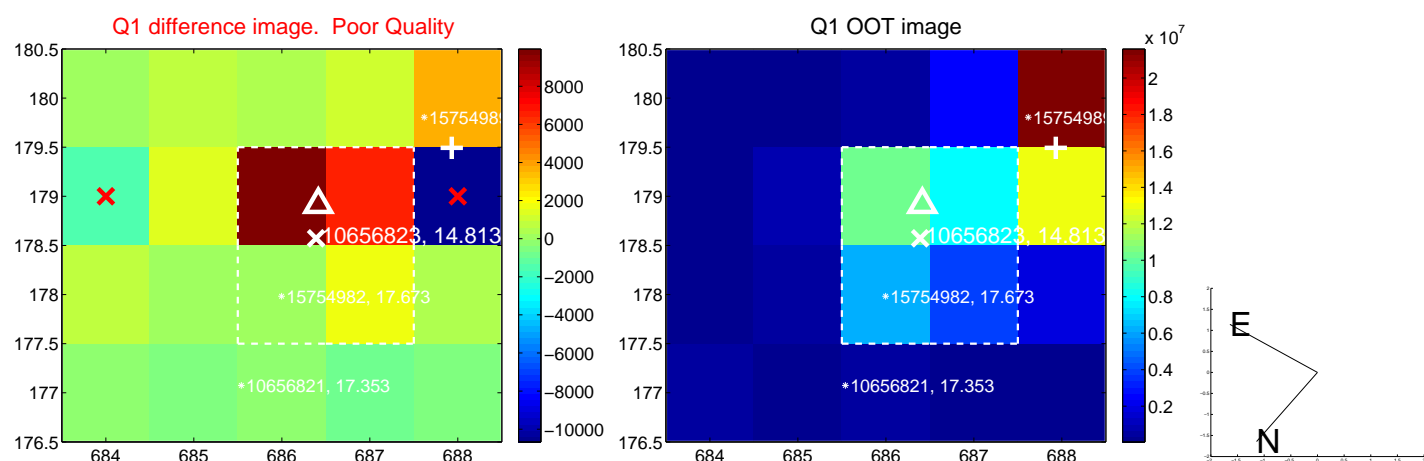
The OOT PRF centroid is offset from the target star catalog position by about 7.24 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.848 ± 0.477	1.78	0.828 ± 0.351	0.180 ± 0.659
PRF-fit source offset from KIC position	0.203 ± 0.109	1.85	-0.040 ± 0.113	-0.199 ± 0.112
photometric centroid source offset	1.10 ± 0.17	6.35	-0.47 ± 0.15	-0.99 ± 0.18

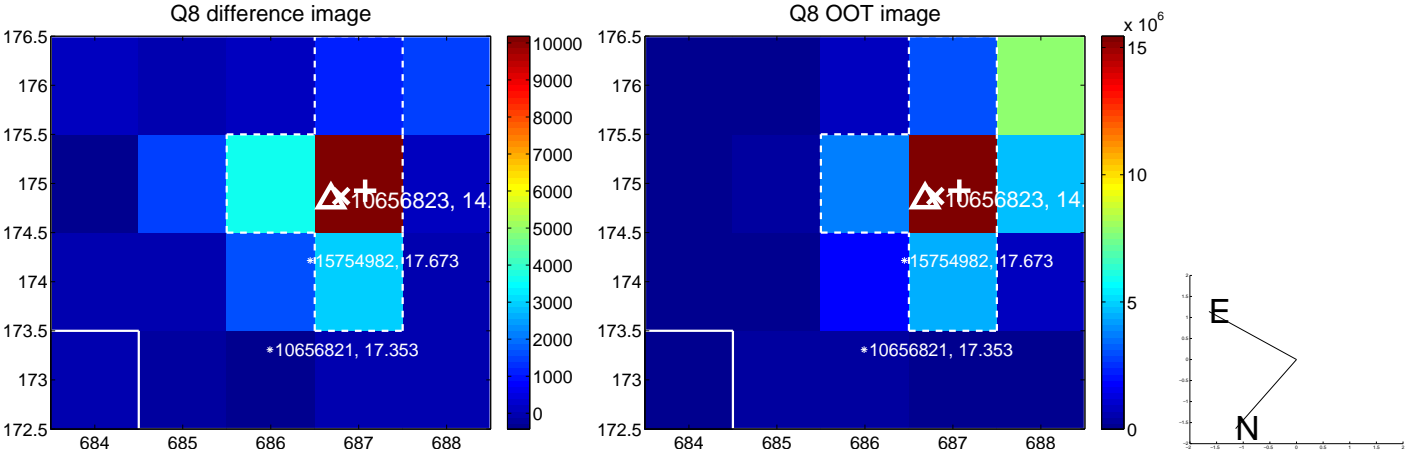
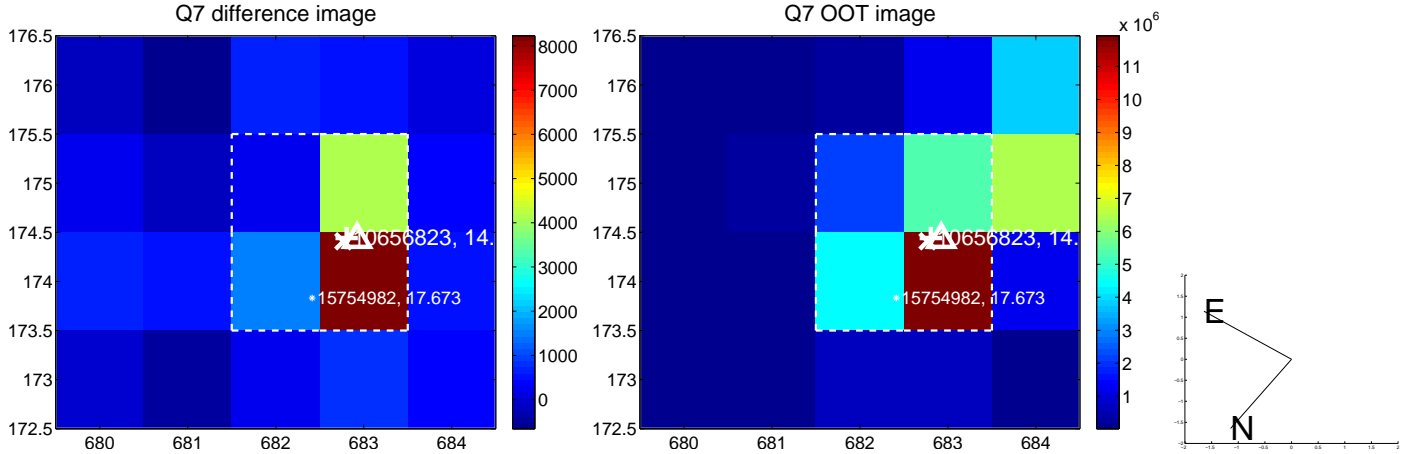
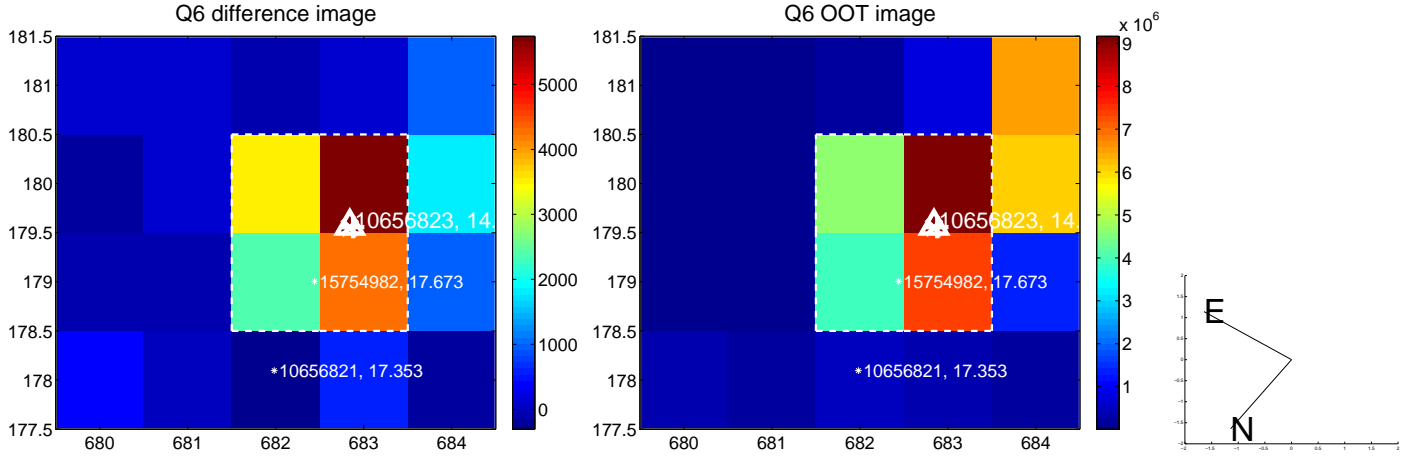
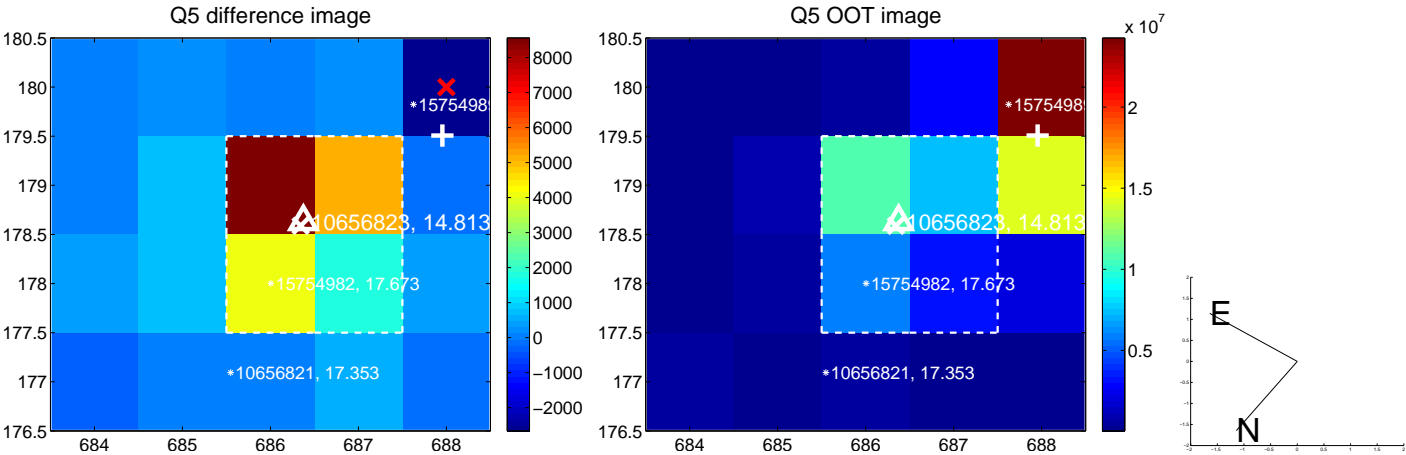


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

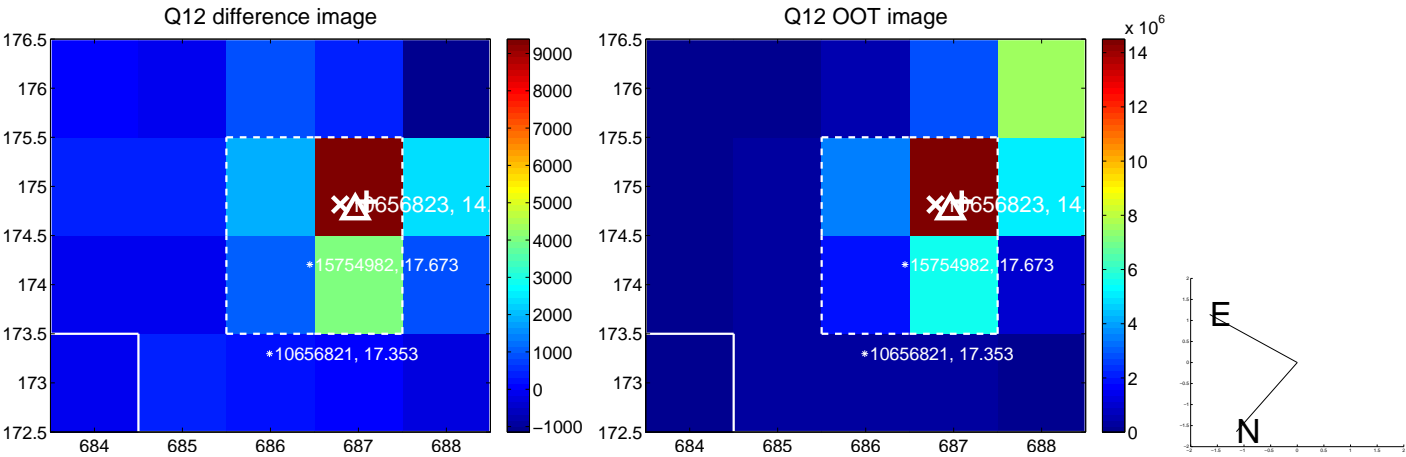
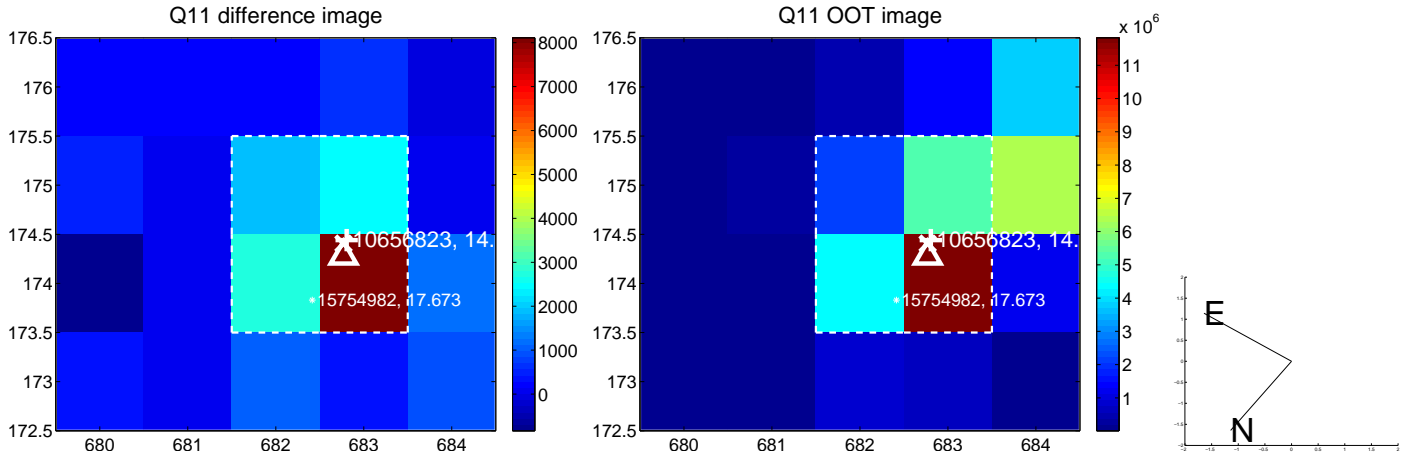
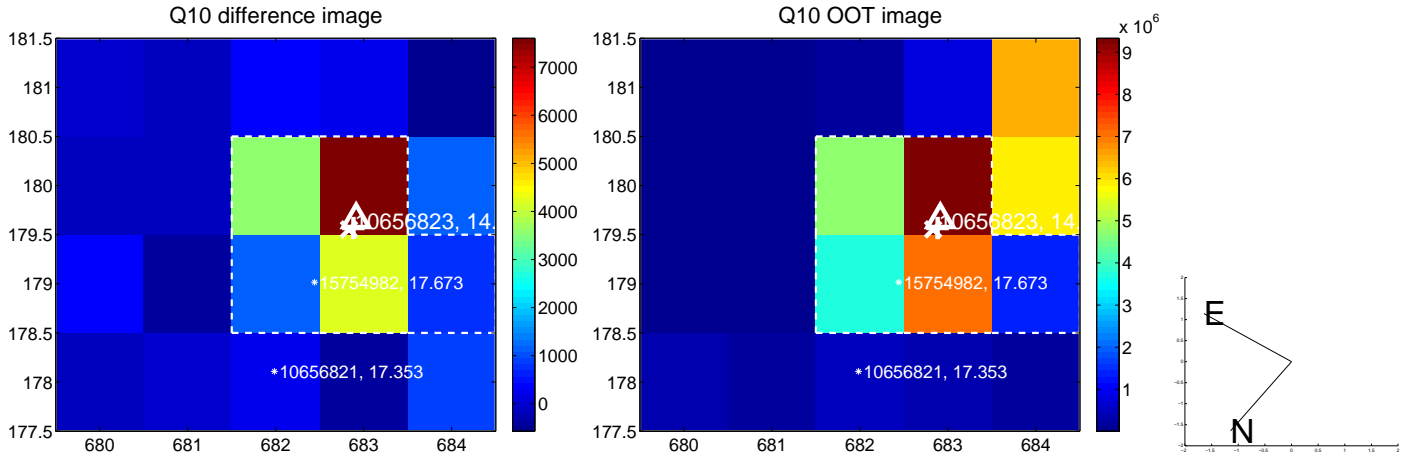
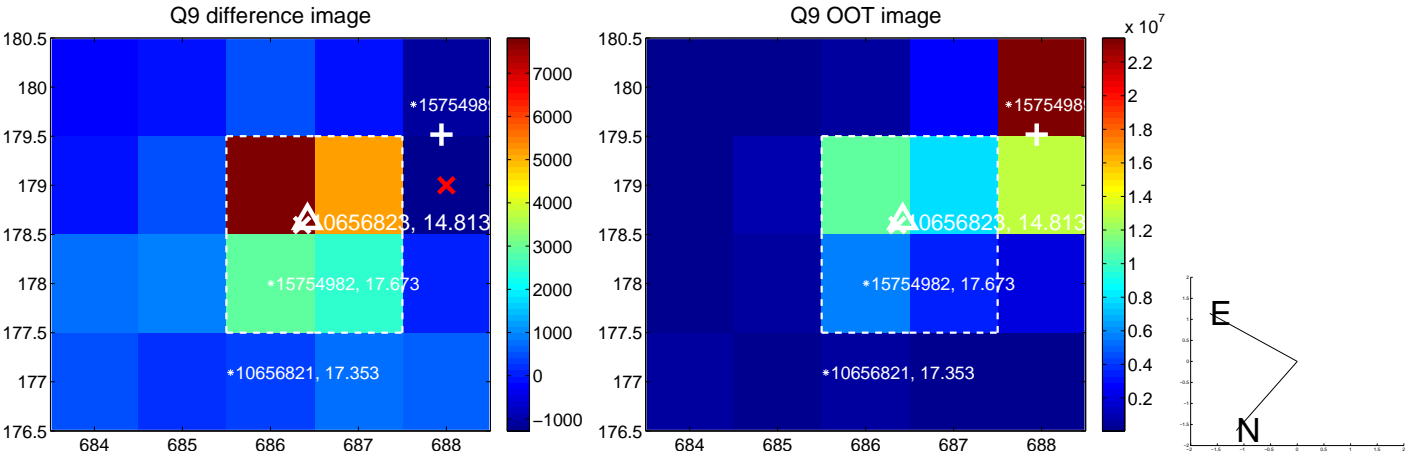
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



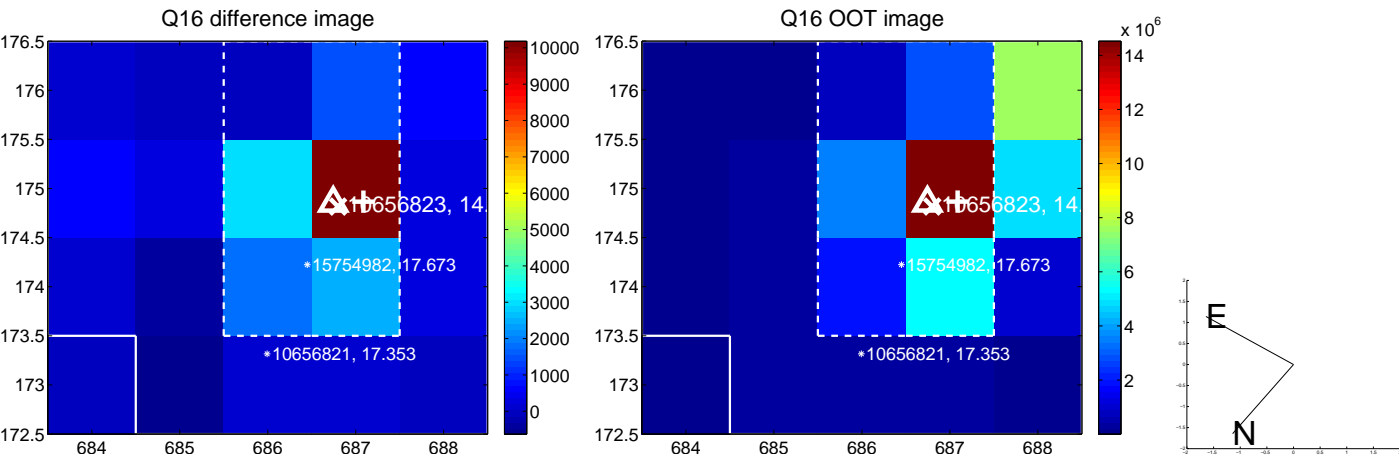
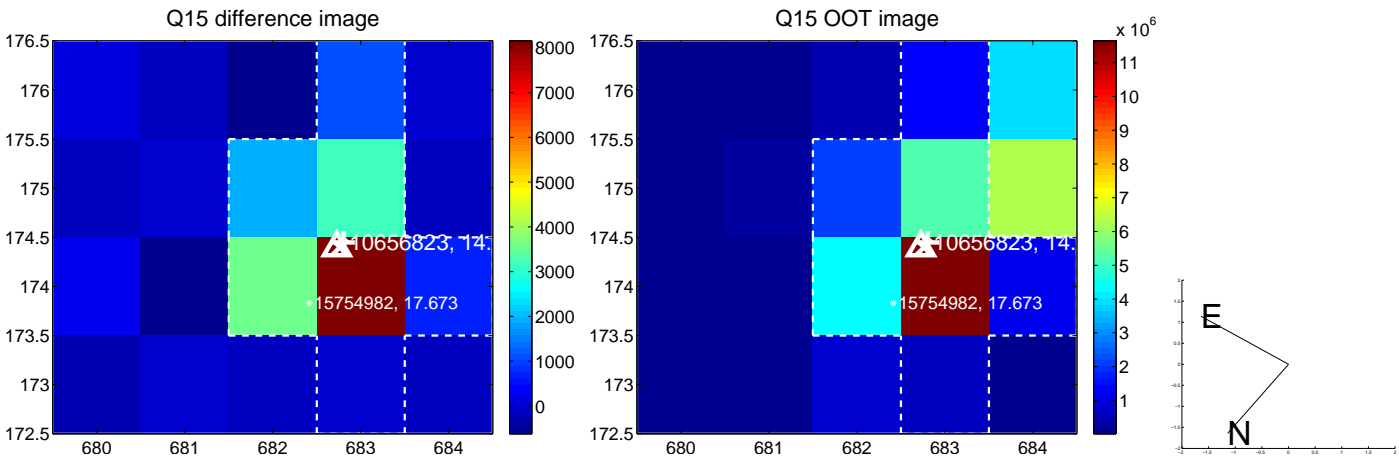
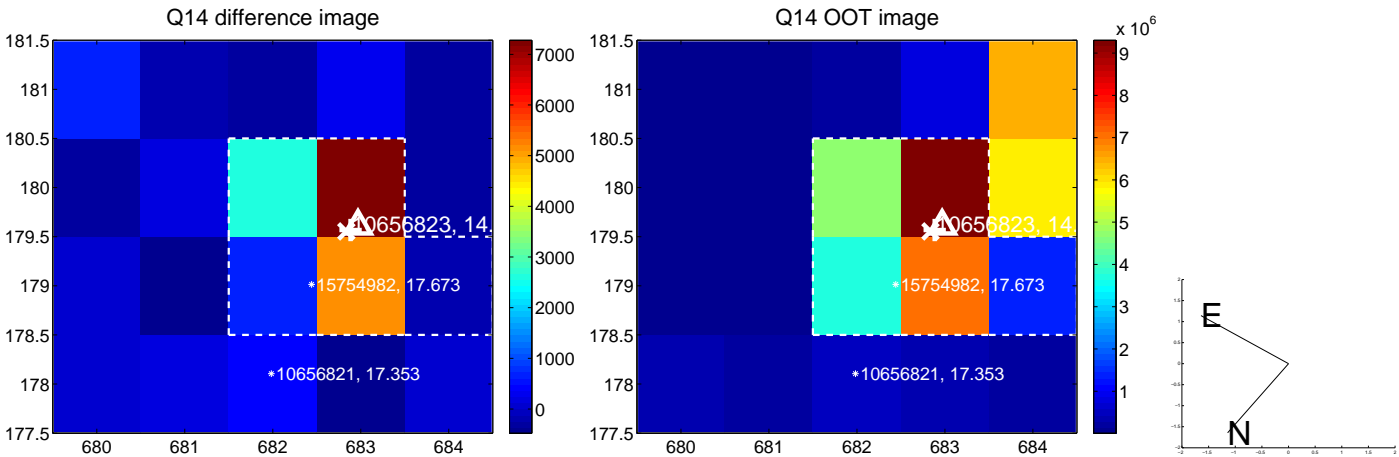
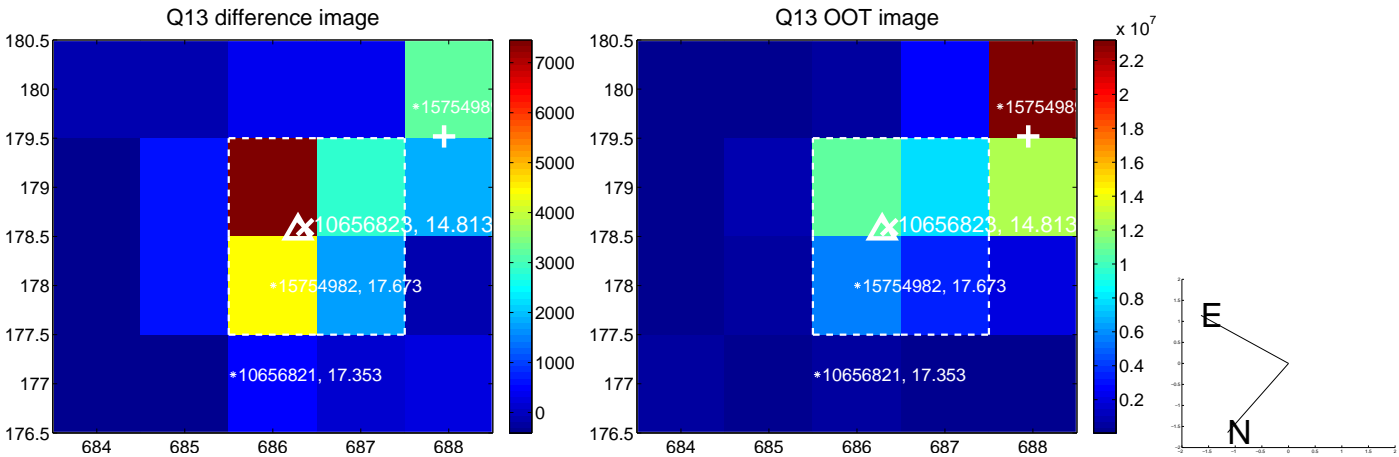
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



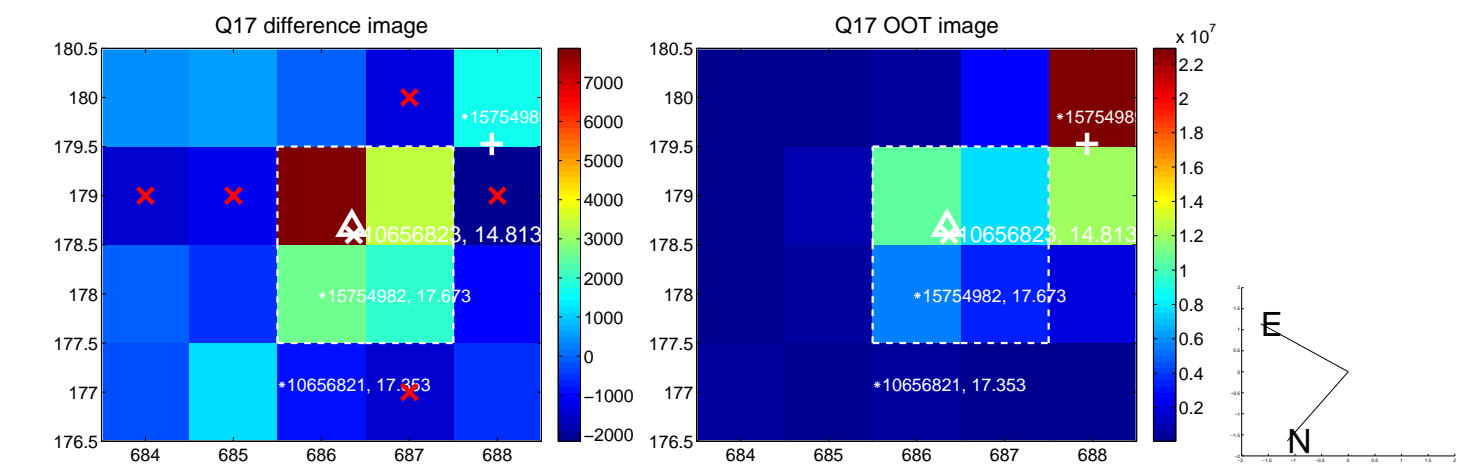
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



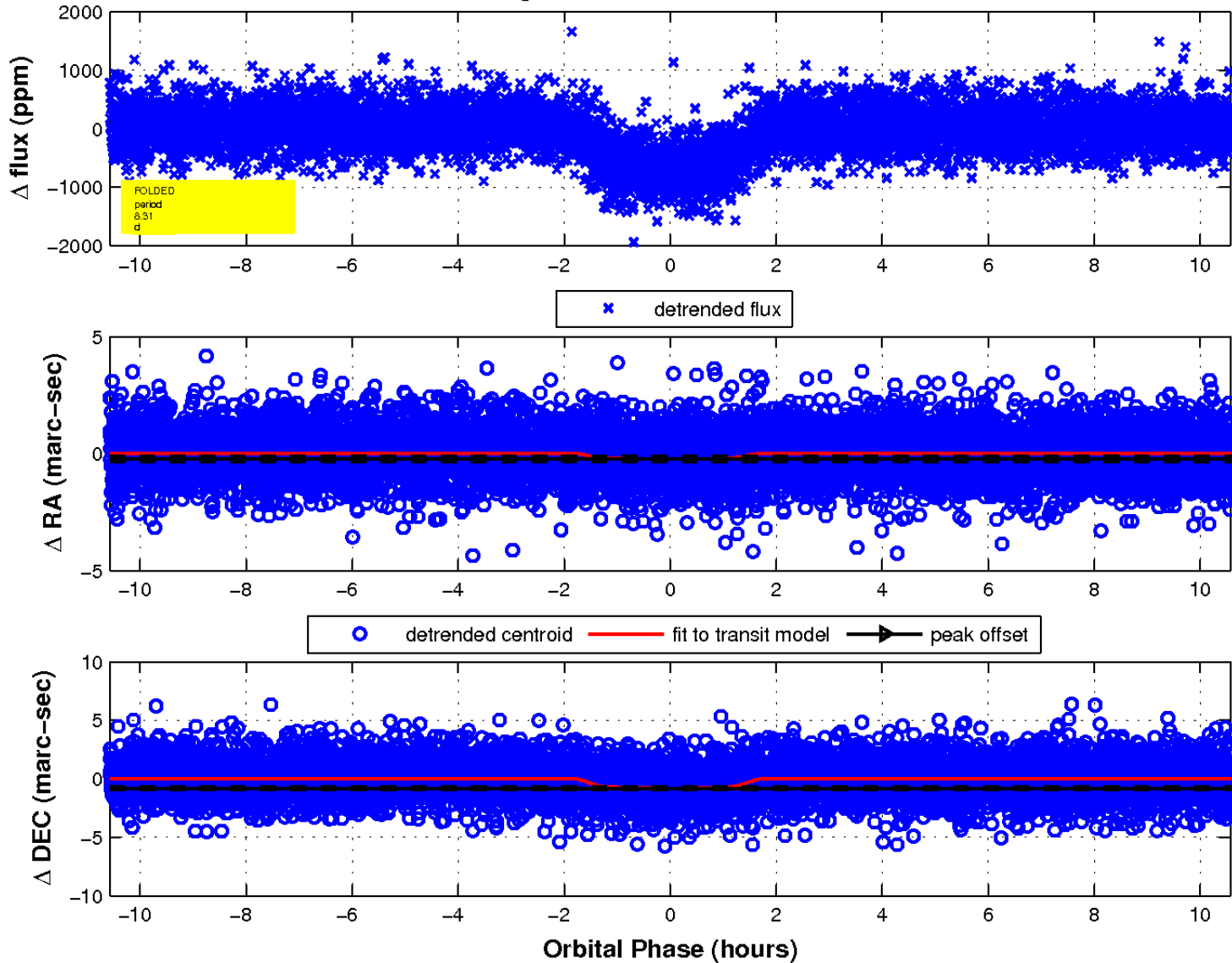
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

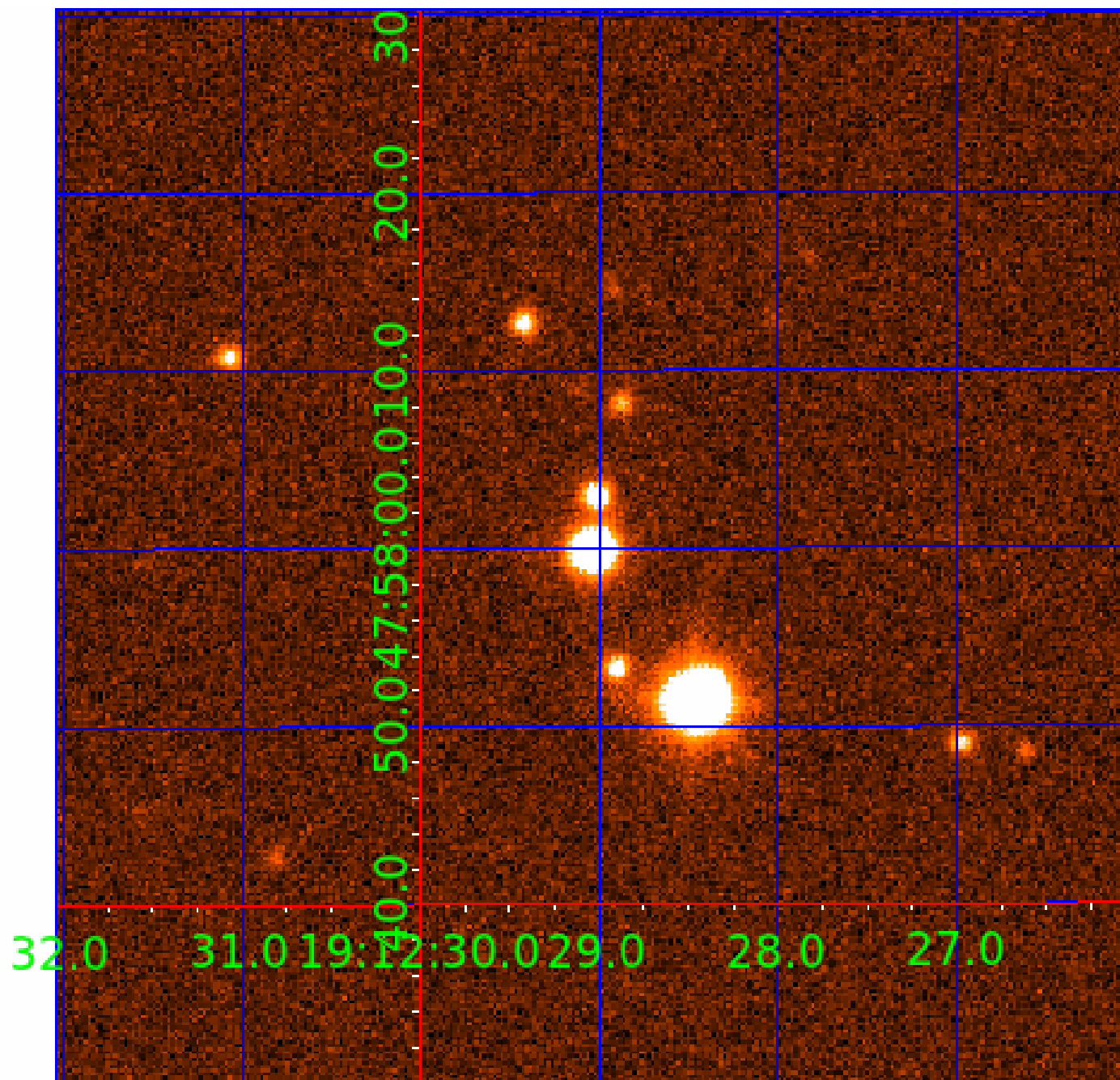


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 010656823

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})
010656823-01	OBS	0598.01	8.307842	137.940479	741.4	3.525	50.4	53.9	0.79	5320	2.57	75.19
010656823-02	OBS	0598.02	34.096850	153.816018	440.9	4.522	14.4	16.5	0.79	5320	2.10	11.44

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010656823-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
010656823-02	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

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.

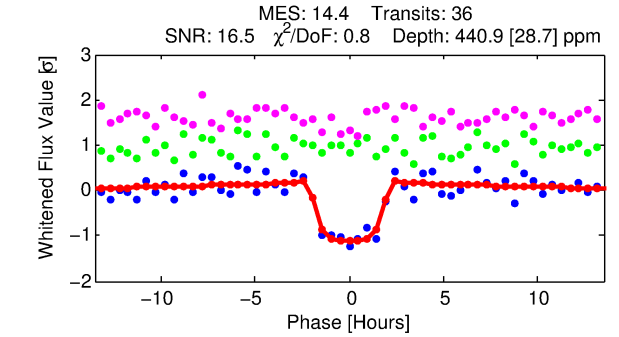
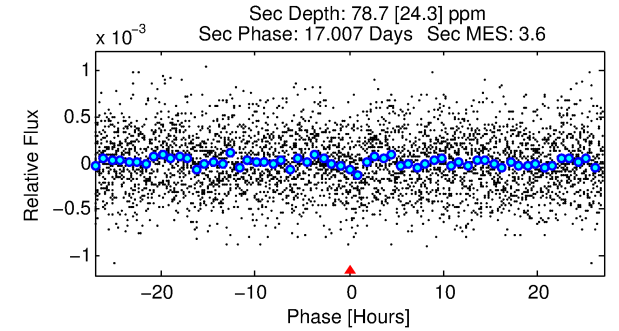
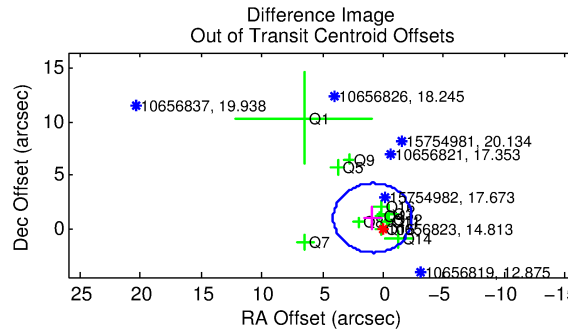
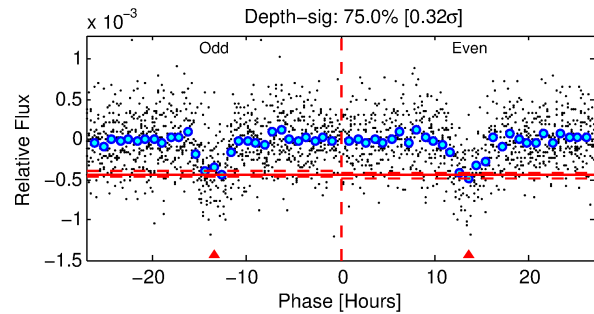
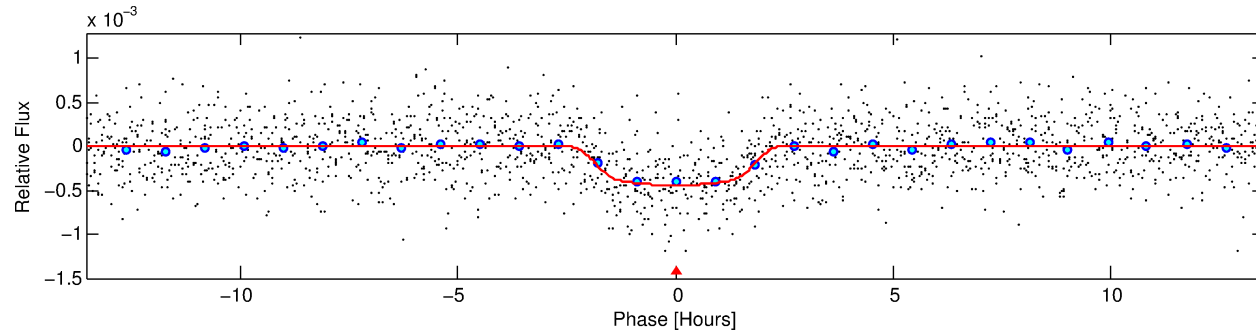
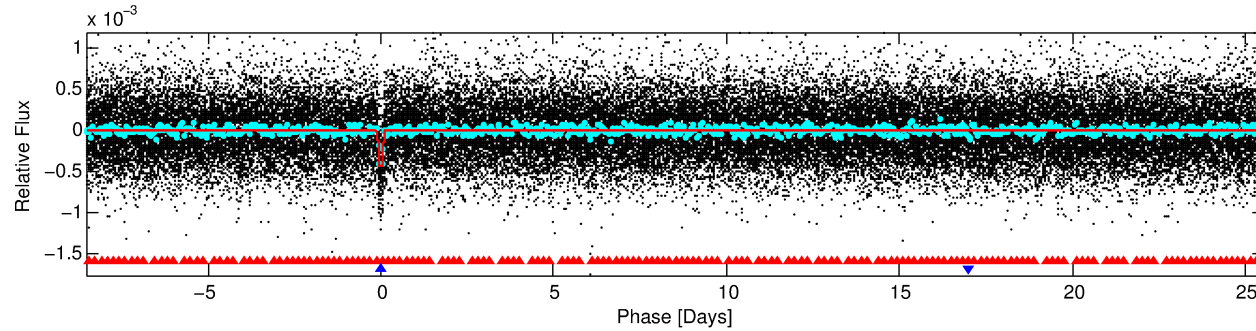
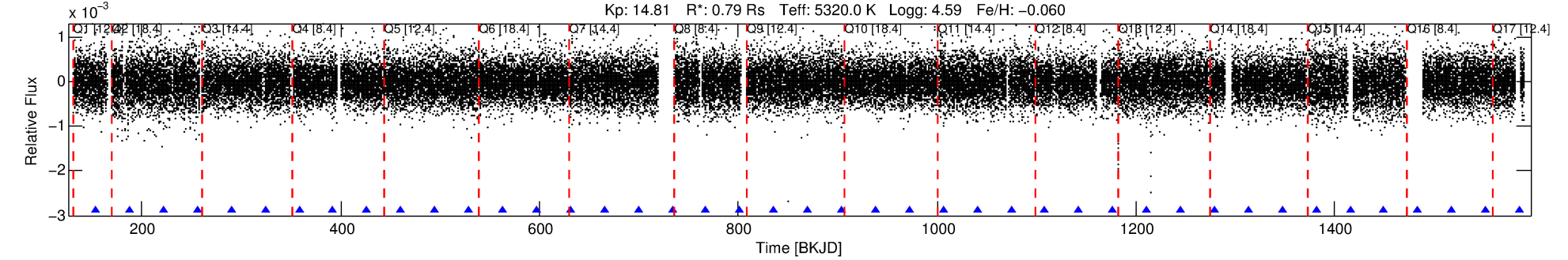
Ephemeris Match Information For 010656823-02

No Significant Match Found

DV One-Page Summary

KIC: 10656823 Candidate: 2 of 2 Period: 34.097 d
KOI: K00598.02 Name: Kepler-195c Corr: 0.943

Kp: 14.81 R*: 0.79 Rs Teff: 5320.0 K Logg: 4.59 Fe/H: -0.060



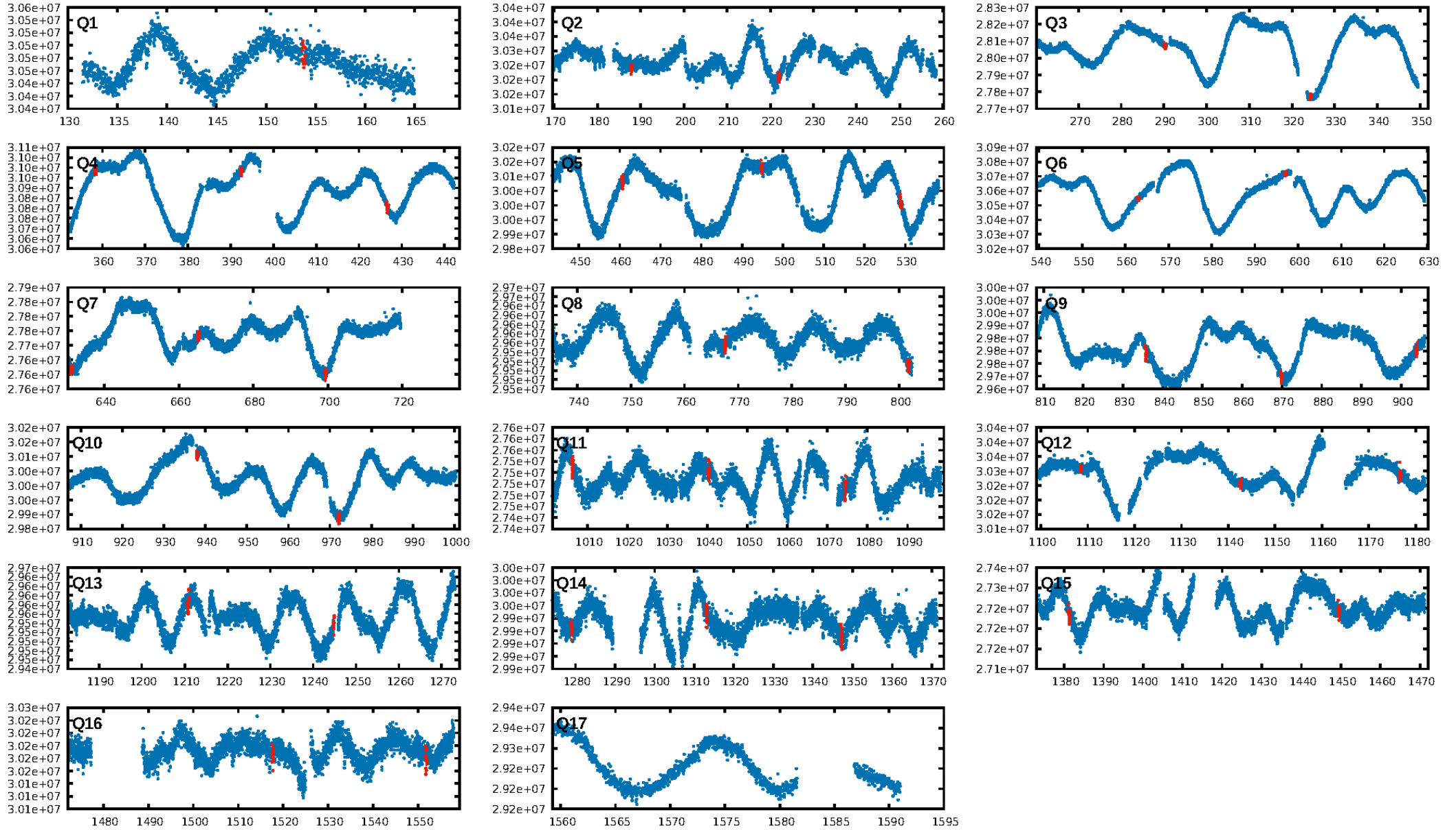
DV Fit Results:

Period = 34.09685 [0.00024] d
Epoch = 153.8160 [0.0057] BKJD
Rp/R* = 0.0244 [0.0018]
a/R* = 23.64 [6.33]
b = 0.94 [0.03]
Seff = 11.44 [2.63]
Teq = 469 [27] K
Rp = 2.10 [0.38] Re
a = 0.1968 [0.0272] AU
Ag = 381.96 [150.54] [2.53σ]
Teff = 3206 [290] K [9.39σ]

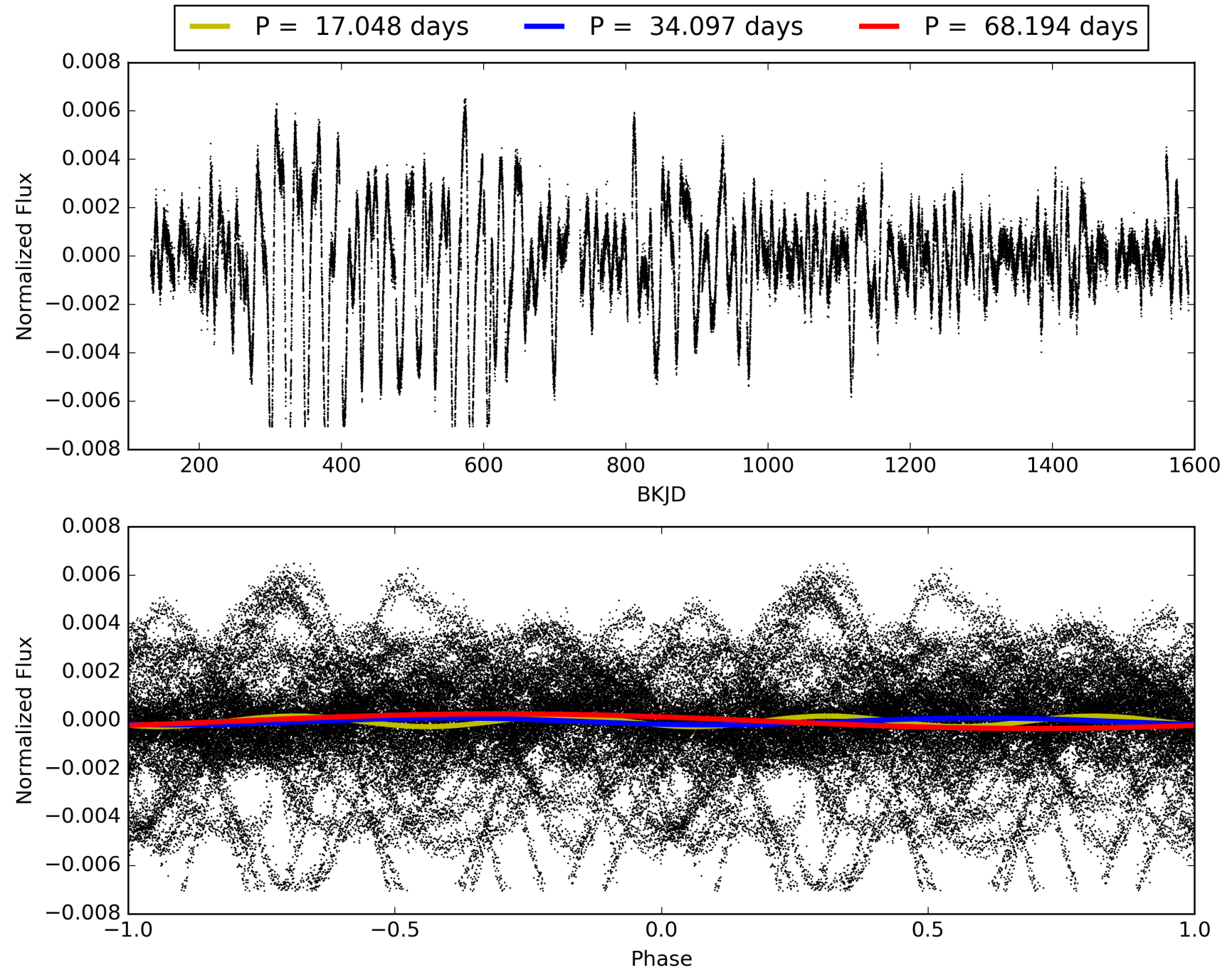
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [107.95σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 95.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.62e-45
RollingBand-fgt: 1.00 [35/35]
GhostDiagnostic-chr: 2.752
Centroid-sig: 0.2%
Centroid-so: 1.199 arcsec [2.08σ]
OotOffset-rm: 1.333 arcsec [1.23σ]
KicOffset-rm: 0.335 arcsec [0.58σ]
OotOffset-st: 1/4/4/3 [12]
KicOffset-st: 1/4/4/3 [12]
DiffImageQuality-fgm: 0.75 [9/12]
DiffImageOverlap-fno: 1.00 [16/16]

TCE 010656823-02, PDC Light Curves

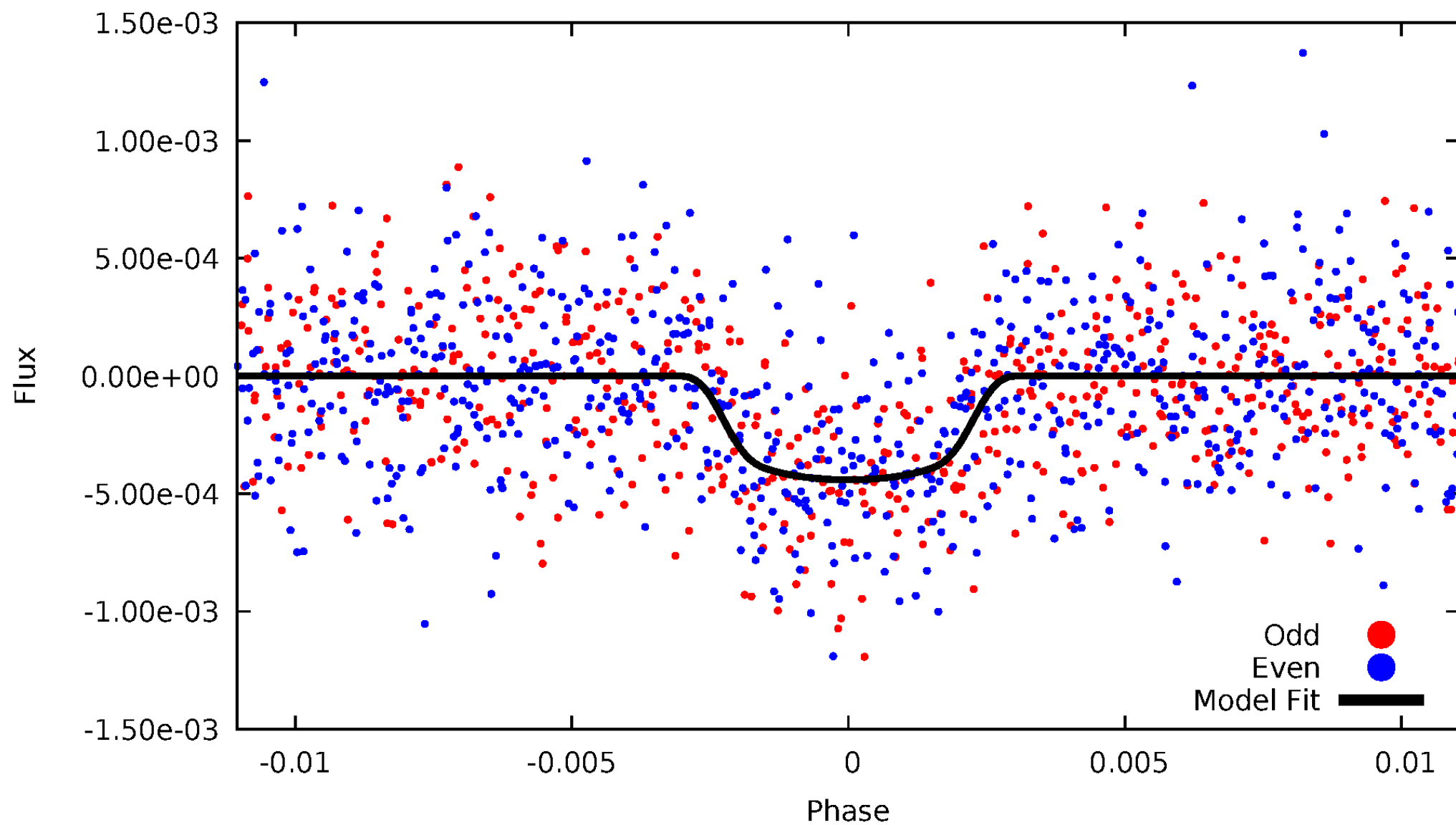


TCE 010656823-02



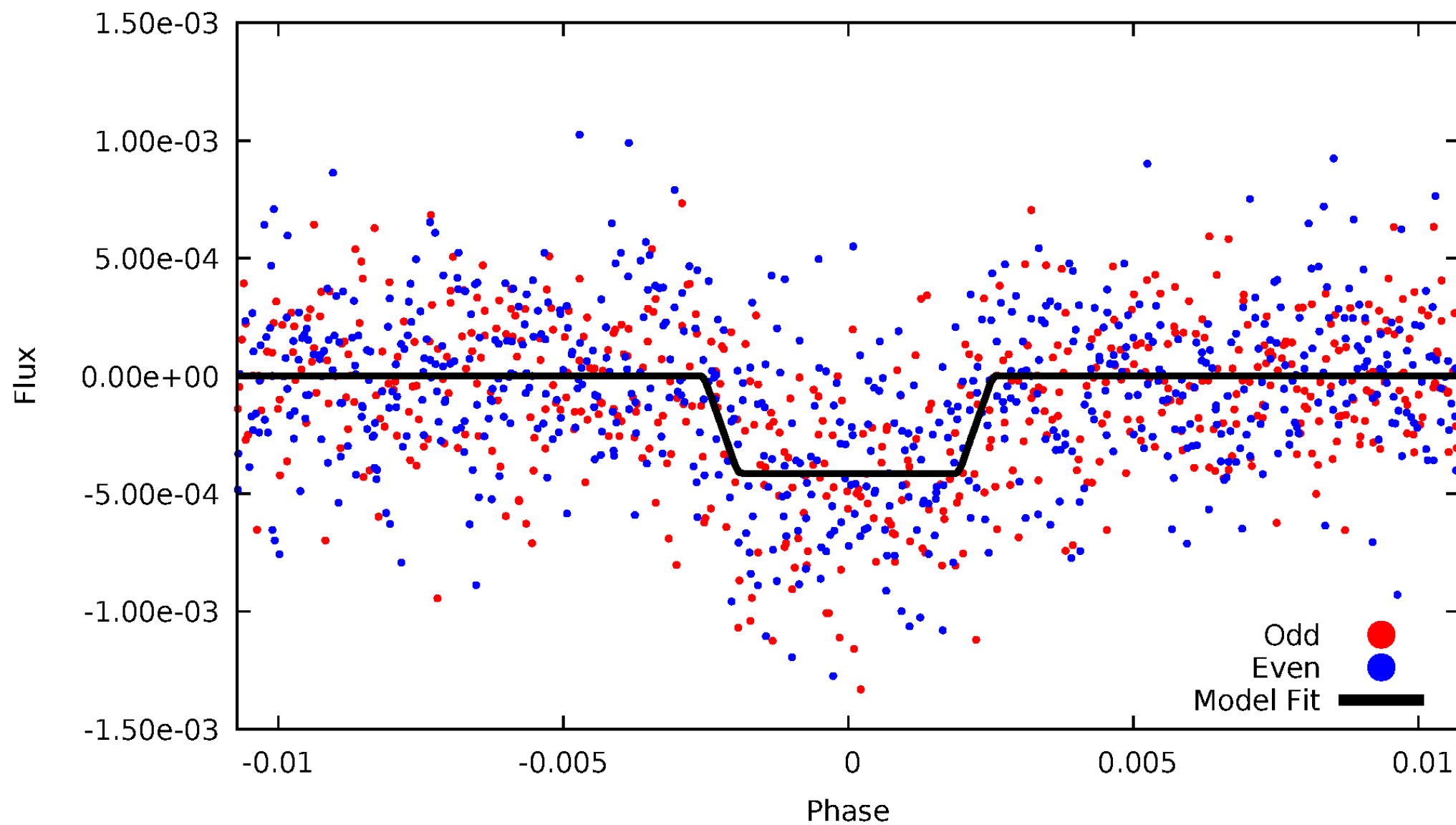
DV Odd/Even

TCE 010656823-02



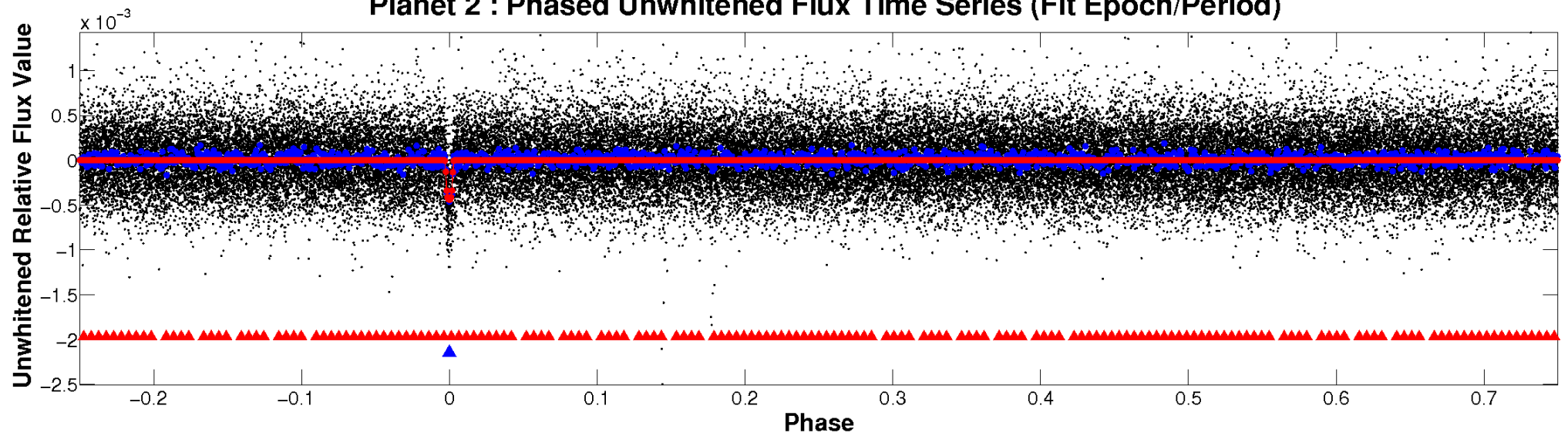
ALT Odd/Even

TCE 010656823-02

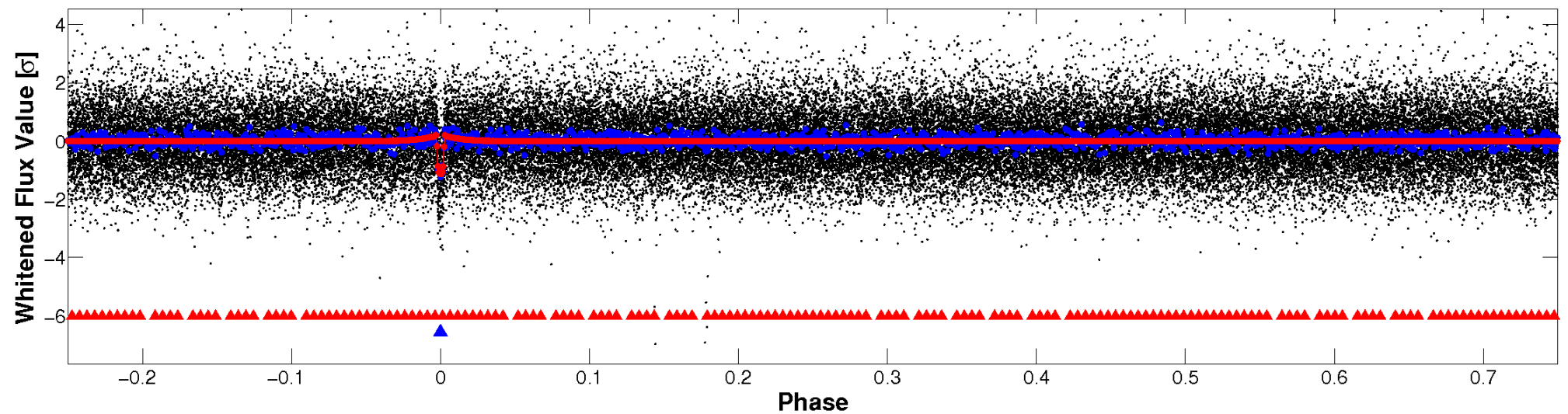


Non-Whitened Vs. Whitened Light Curve

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

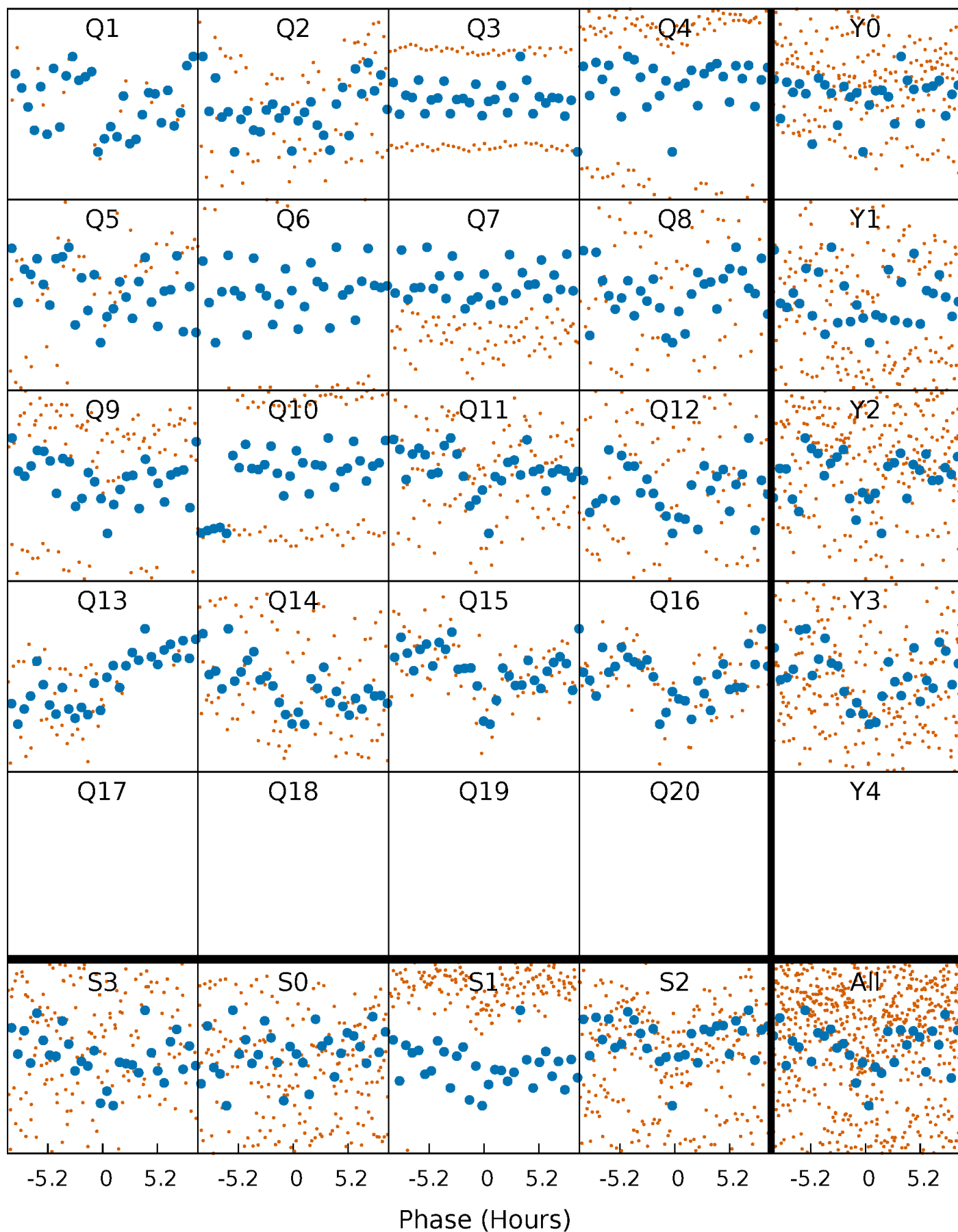


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



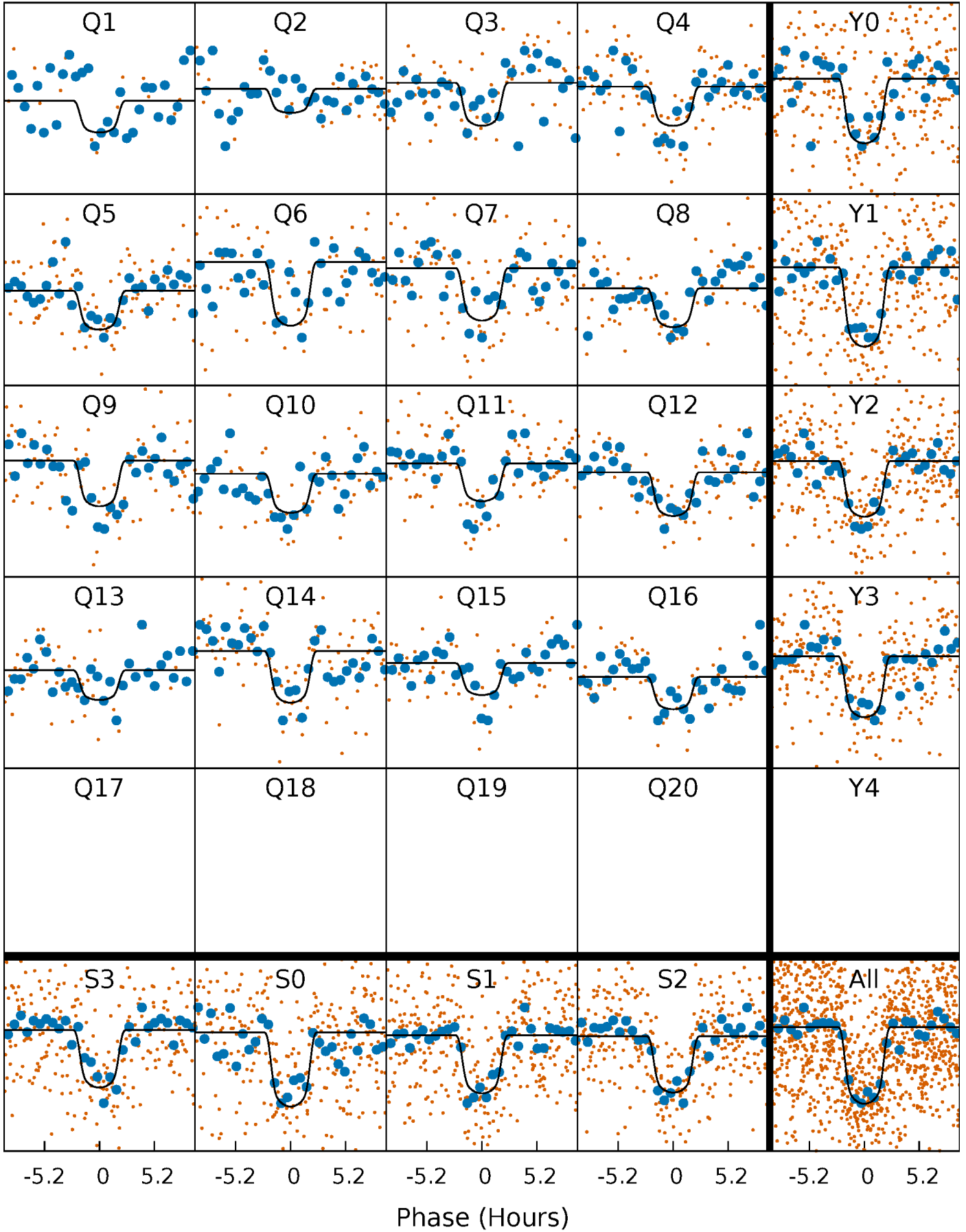
PDC Quarter-Phased Transit Curves

TCE 010656823-02 P= 34.096850 Days $T_0=153.816018$ (BKJD)



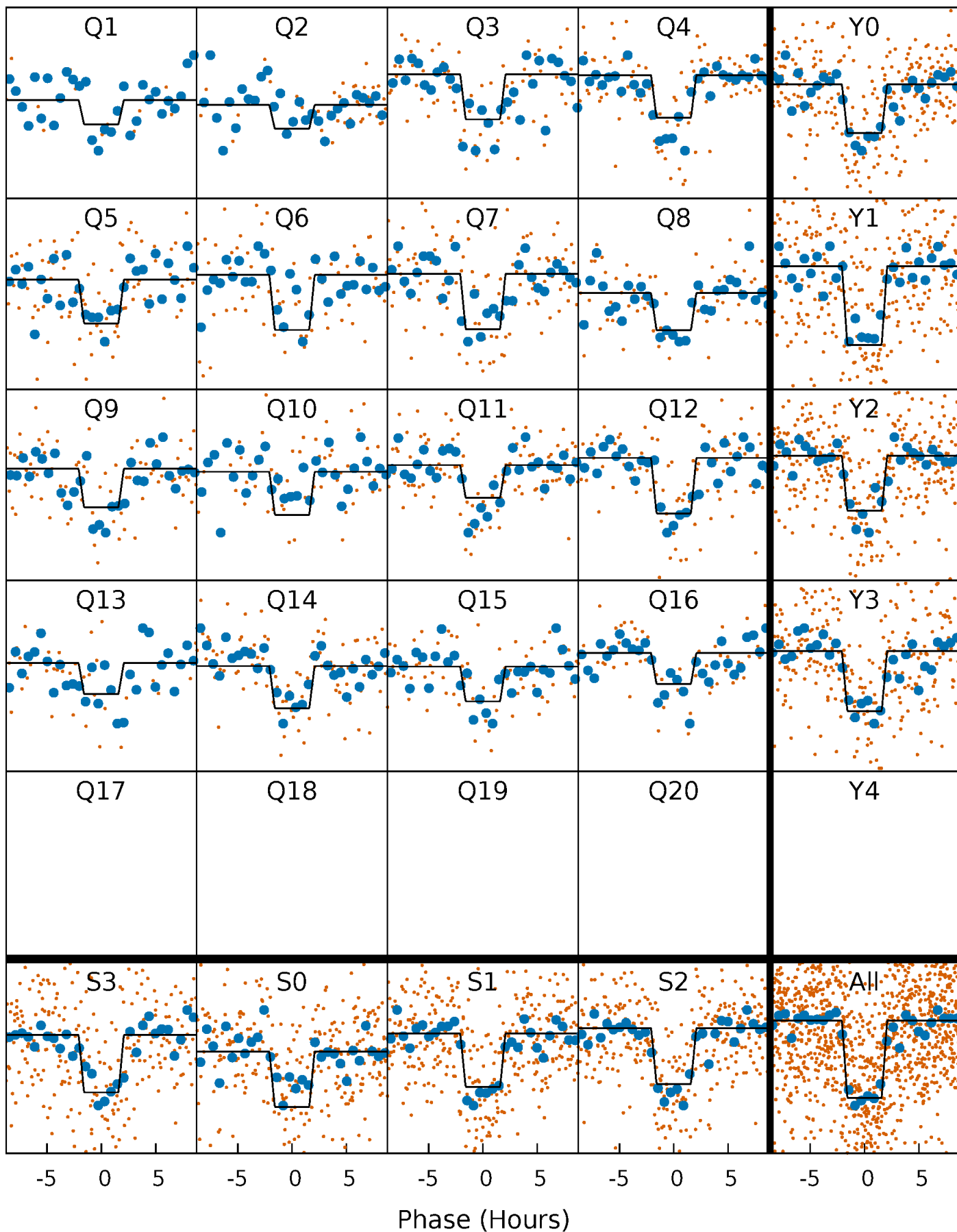
DV Quarter-Phased Transit Curves

TCE 010656823-02 P= 34.096850 Days $T_0=153.816018$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

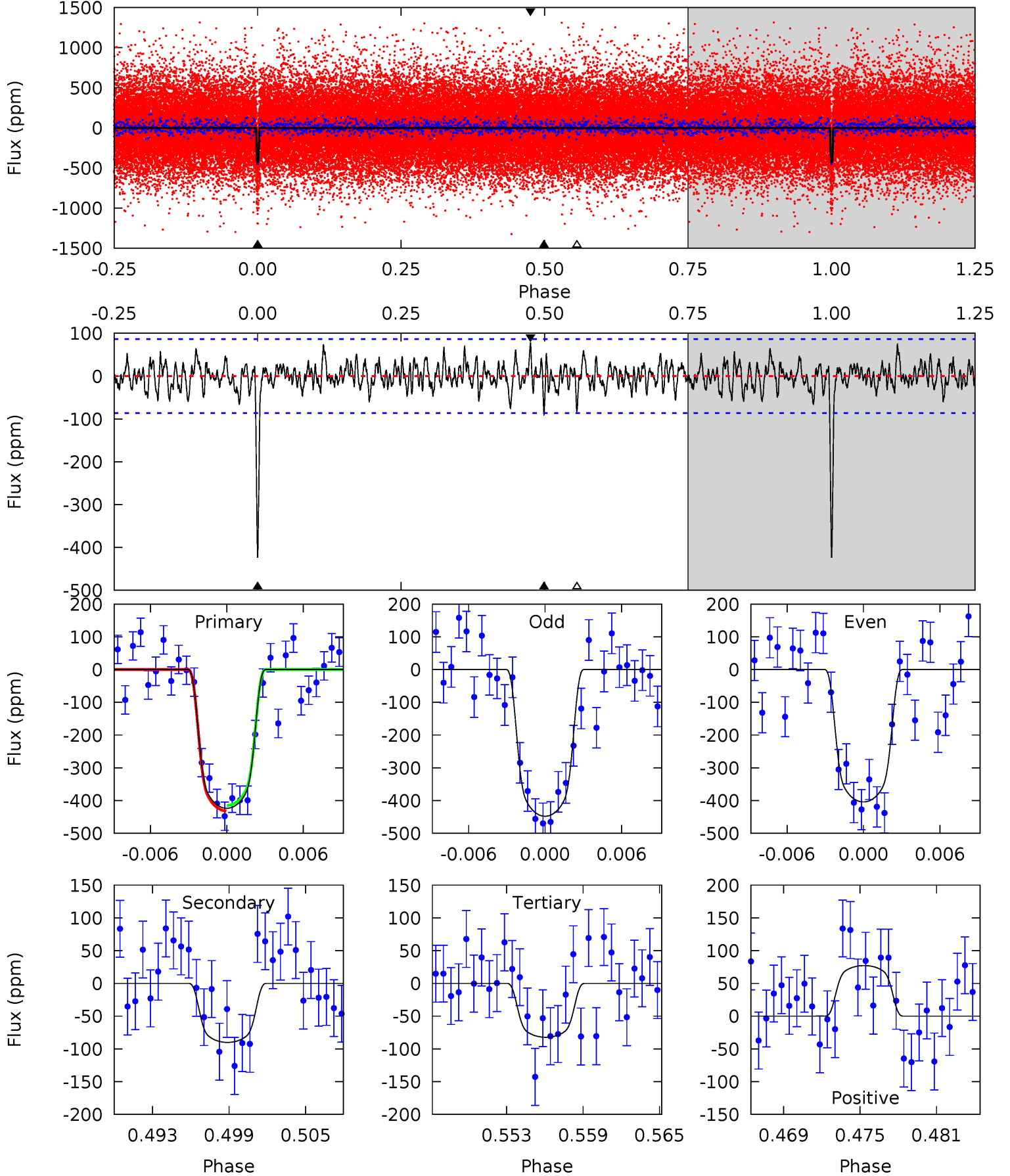
TCE 010656823-02 P= 34.096657 Days $T_0=153.822657$ (BKJD)



DV Model-Shift Uniqueness Test

010656823-02, $P = 34.096850$ Days, $E = 119.719168$ Days

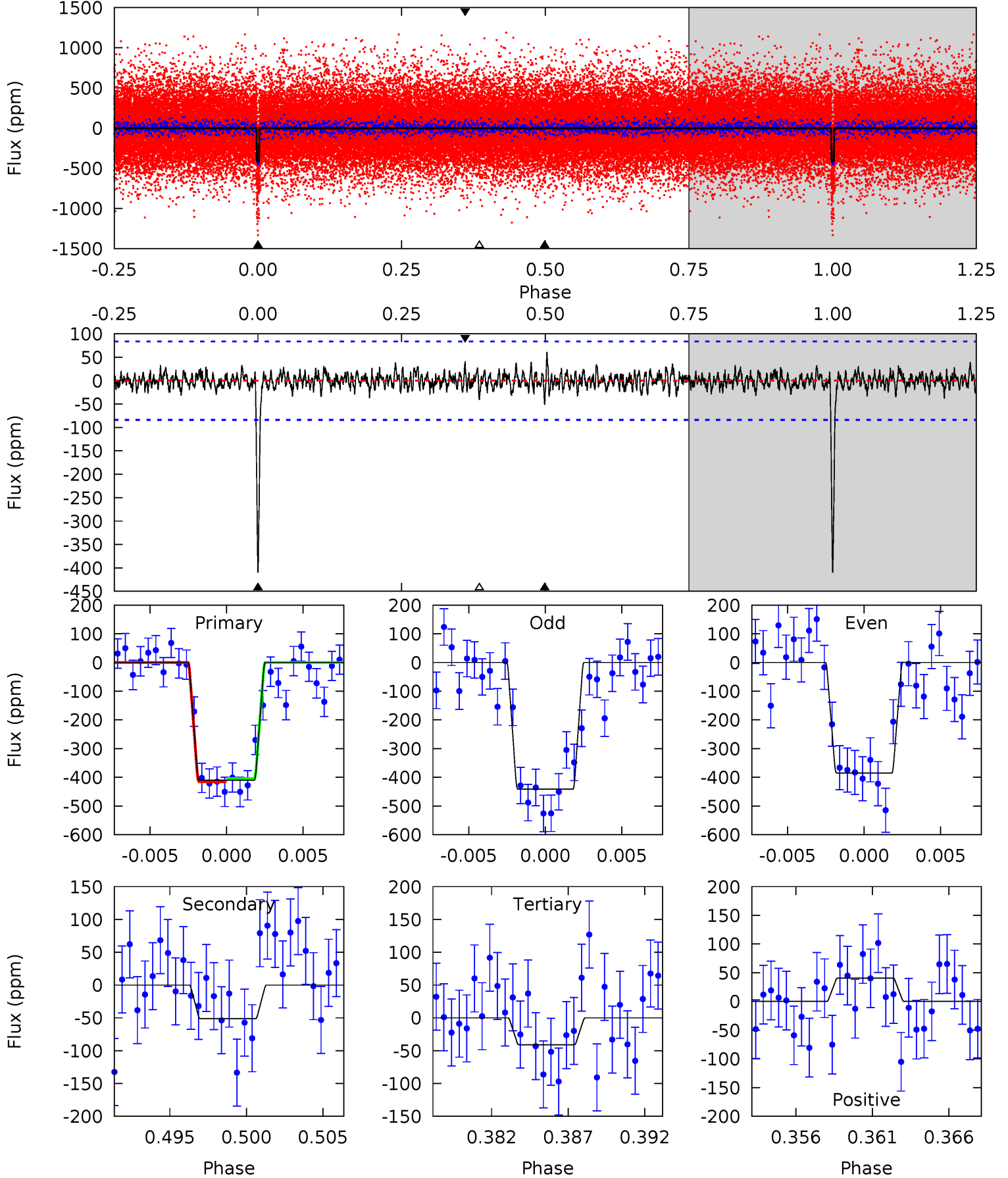
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.2	5.35	4.89	4.59	5.12	2.75	1.43	20.3	20.6	0.46	0.77	1.30	0.97	0.15	0.50



Alt Model-Shift Uniqueness Test

010656823-02, $P = 34.096657$ Days, $E = 119.726000$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.2	3.15	2.52	2.50	5.15	2.80	0.78	22.7	22.7	0.63	0.65	1.72	1.02	0.13	0.34



Stellar Parameters For KIC 010656823

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5320^{+159}_{-143}	$4.589^{+0.028}_{-0.105}$	$-0.060^{+0.300}_{-0.300}$	$0.786^{+0.132}_{-0.066}$	$0.882^{+0.061}_{-0.104}$	$2.559^{+0.461}_{-0.820}$
	+3%/-3%	+1%/-2%	+500%/-500%	+17%/-8%	+7%/-12%	+18%/-32%
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 010656823-02 / KOI 0598.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-90 ± 17	$2.15^{+0.23}_{-0.20}$	666^{+30}_{-25}	3707^{+155}_{-166}	409^{+110}_{-100}
Alt.	-51 ± 16	$1.78^{+0.21}_{-0.18}$	667^{+29}_{-25}	3581^{+216}_{-235}	335^{+135}_{-121}

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

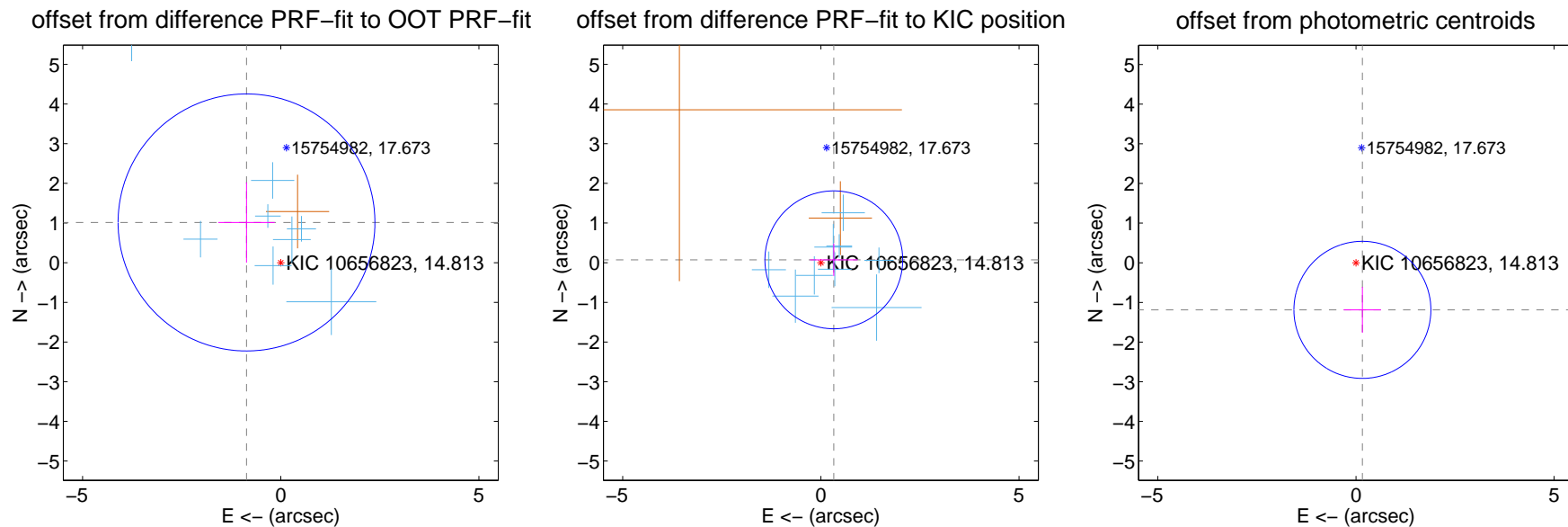
DV Centroid Data

Supplemental centroid analysis for 010656823-02. Kepler magnitude: 14.81. Transit SNR 16.47

There are 9 quarters with good PRF difference image offsets

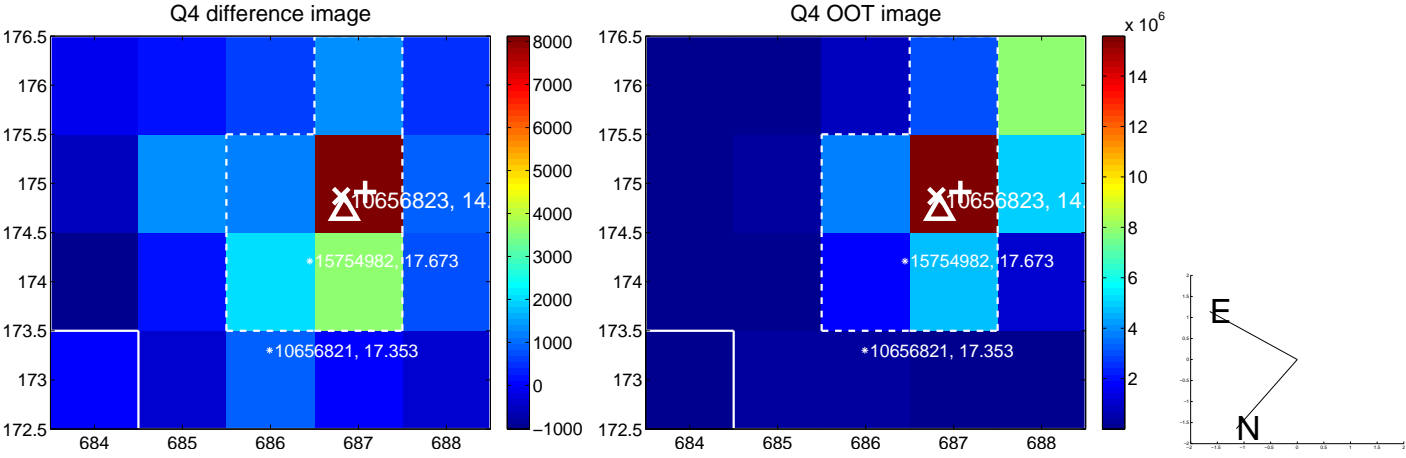
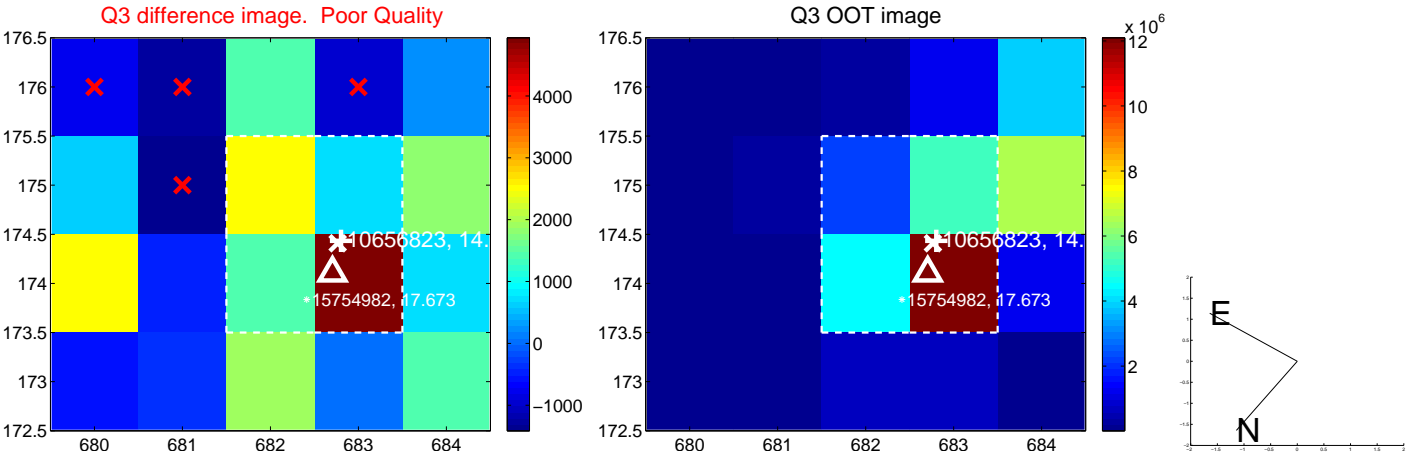
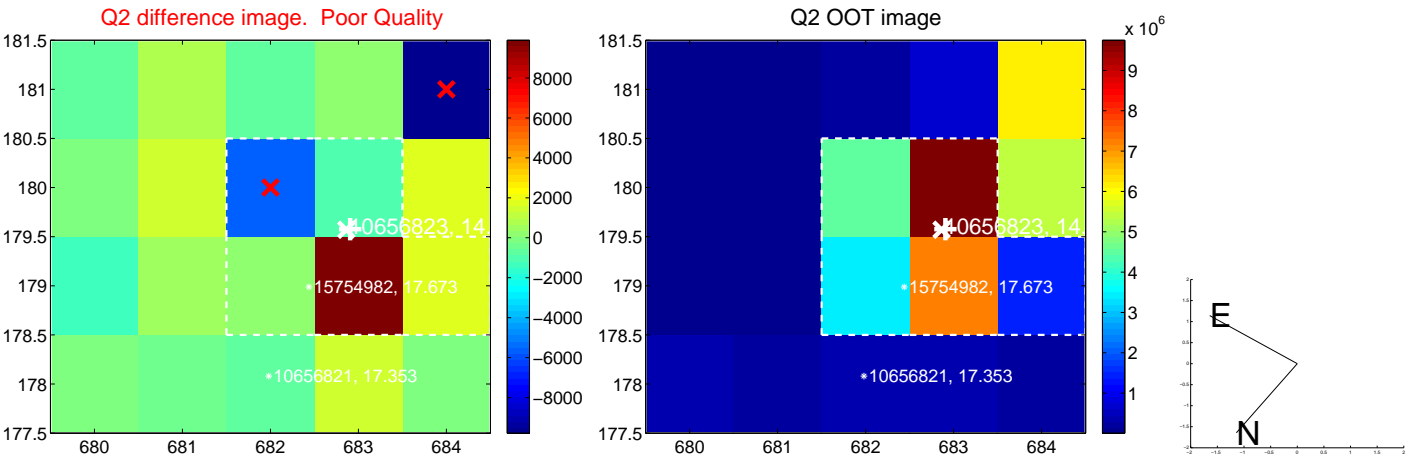
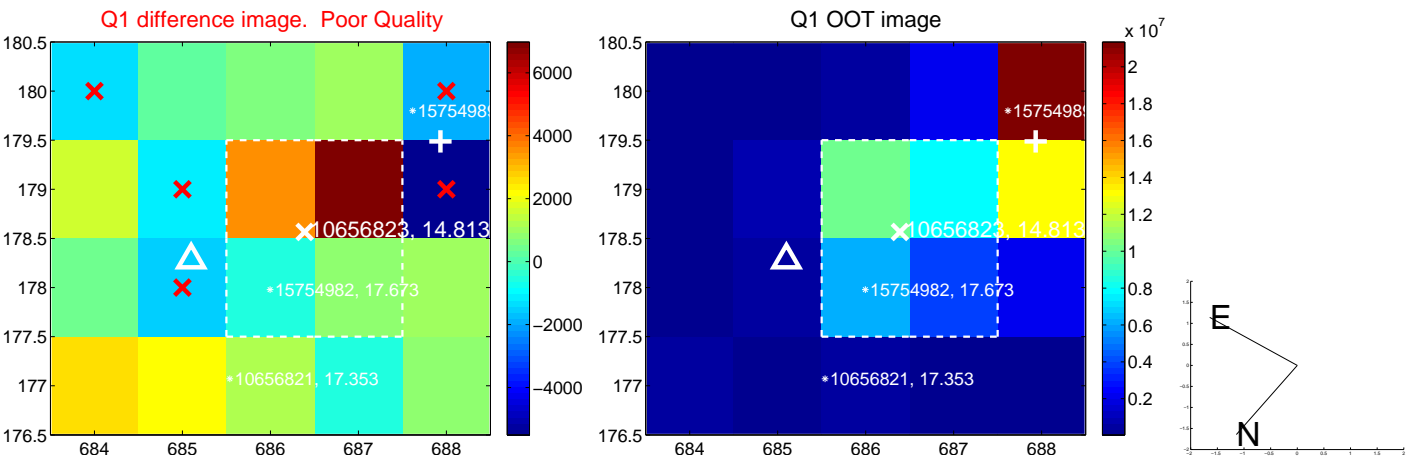
The direct PRF centroid is offset from the target star catalog position by about 1.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.333 ± 1.080	1.23	0.864 ± 0.713	1.015 ± 1.014
PRF-fit source offset from KIC position	0.335 ± 0.579	0.58	-0.327 ± 0.600	0.072 ± 0.409
photometric centroid source offset	1.20 ± 0.58	2.08	-0.16 ± 0.47	-1.19 ± 0.58

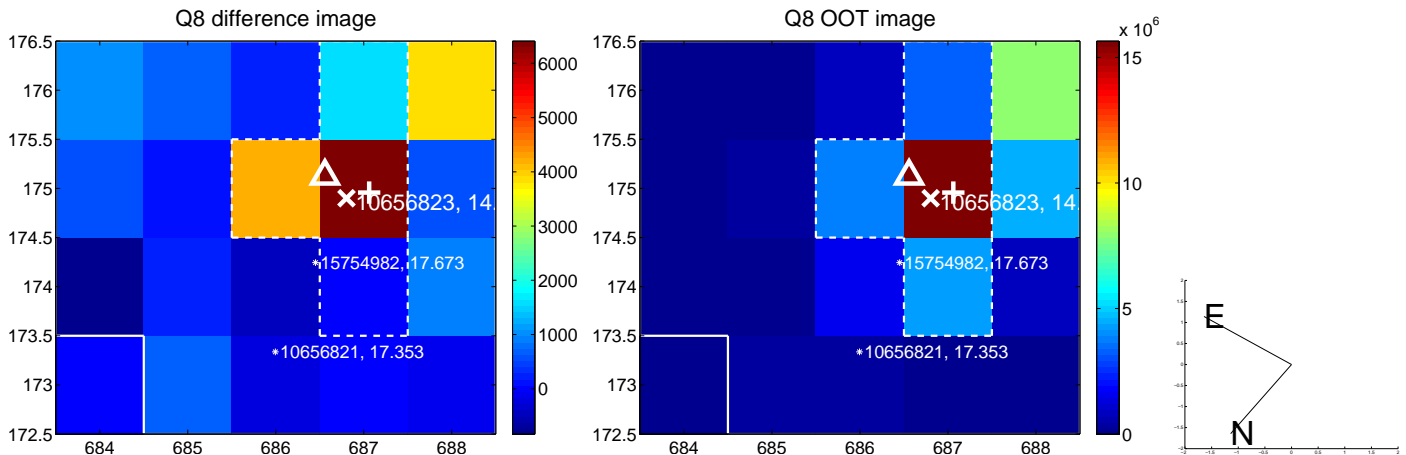
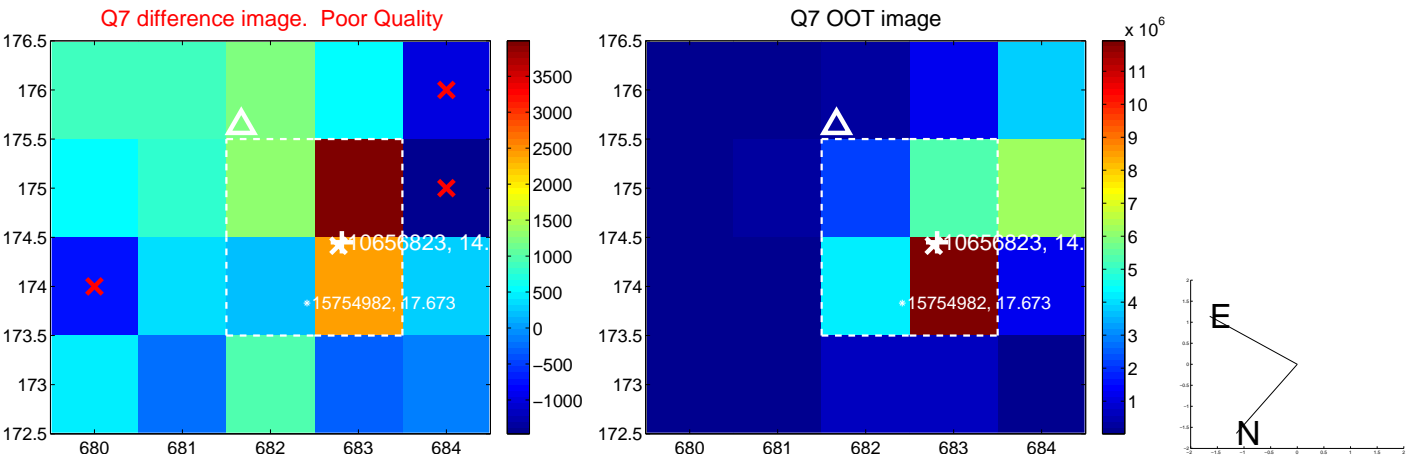
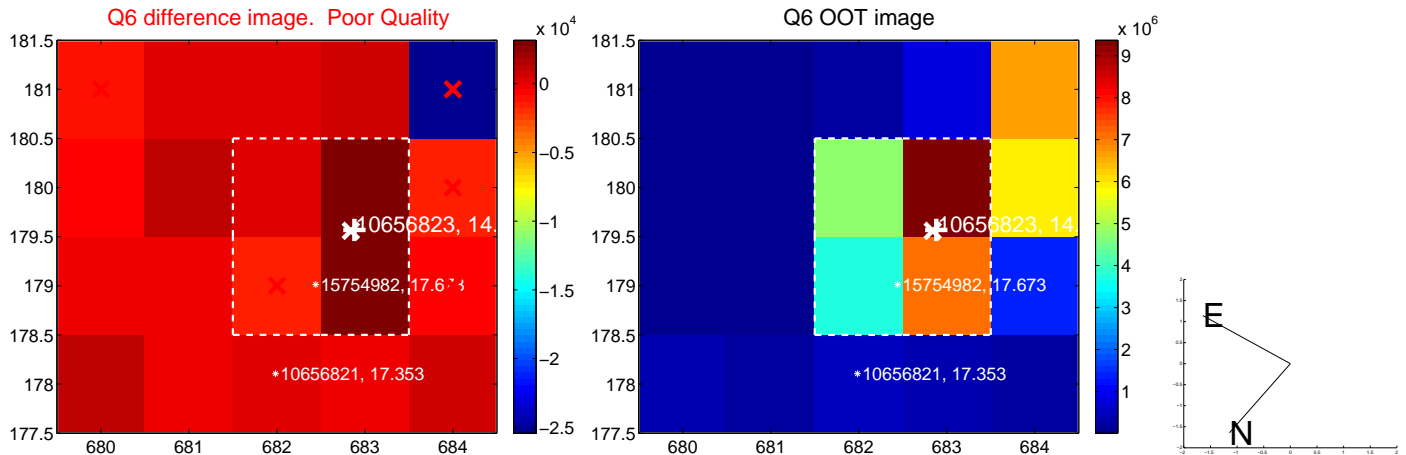
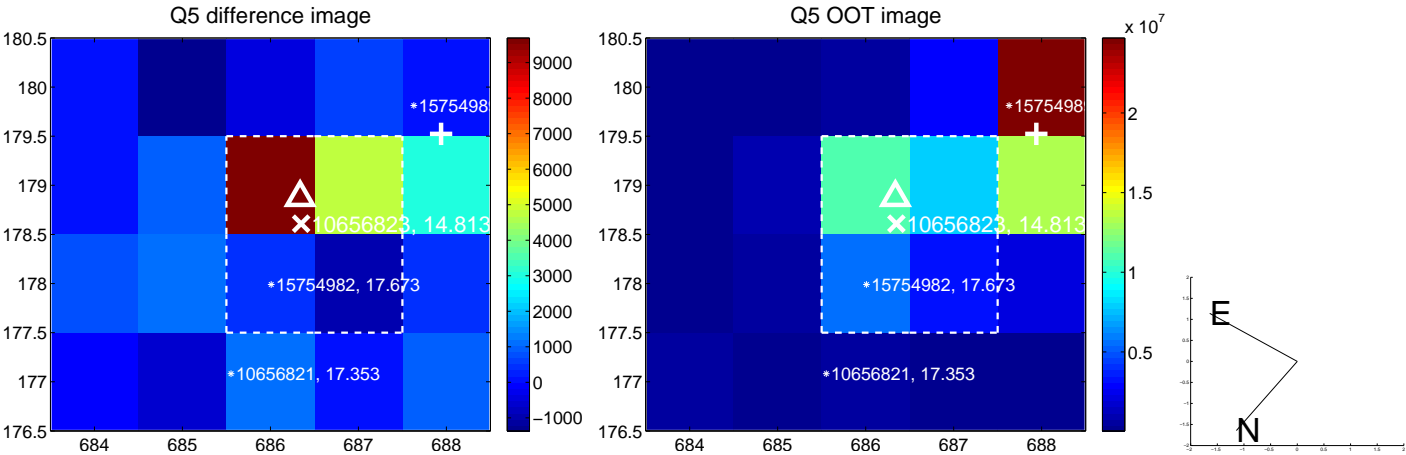


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

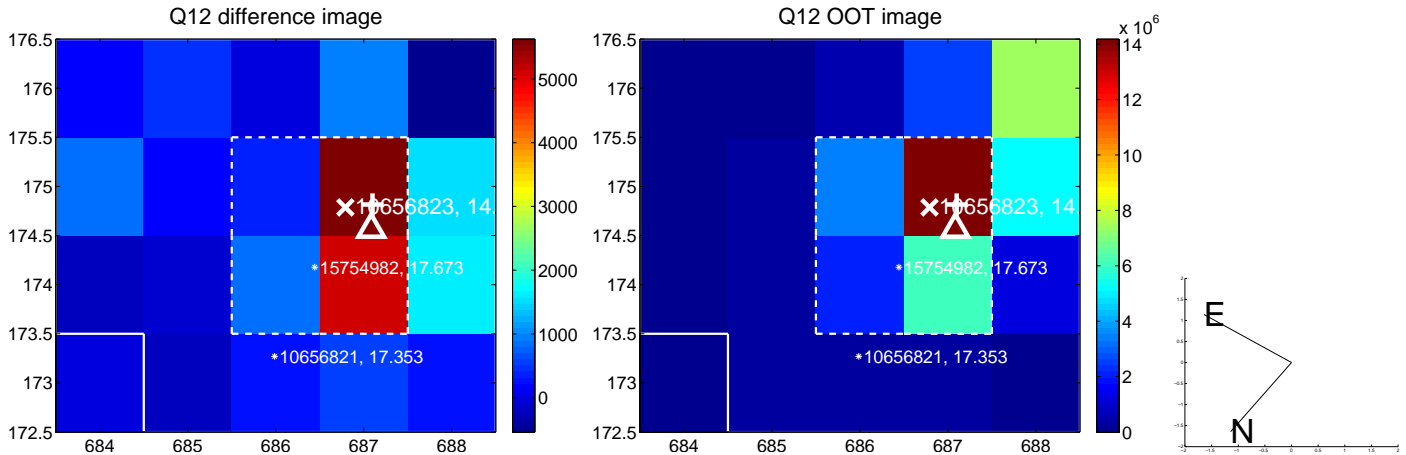
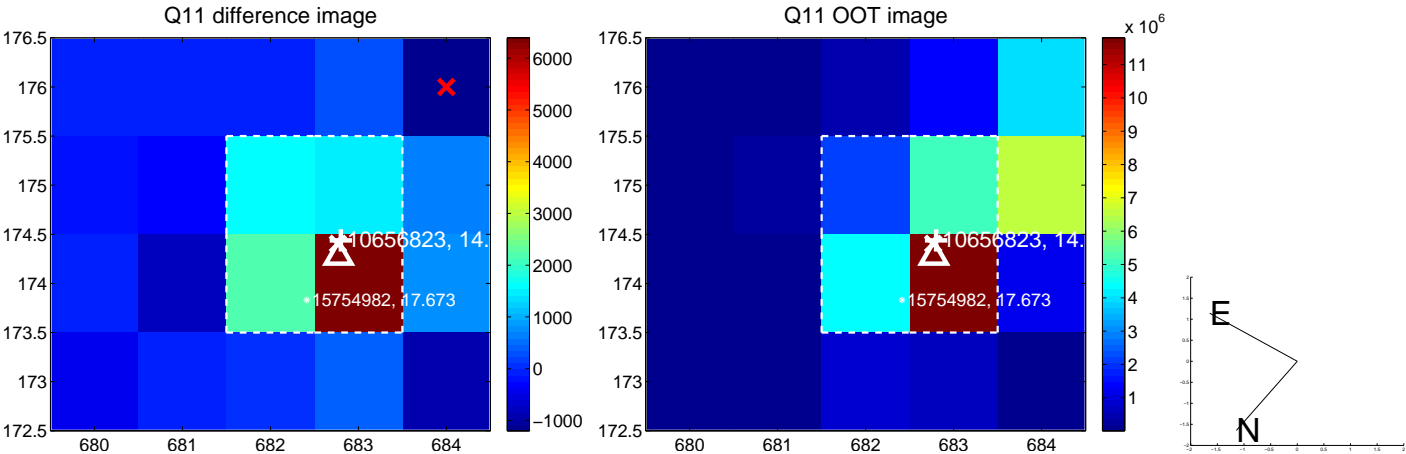
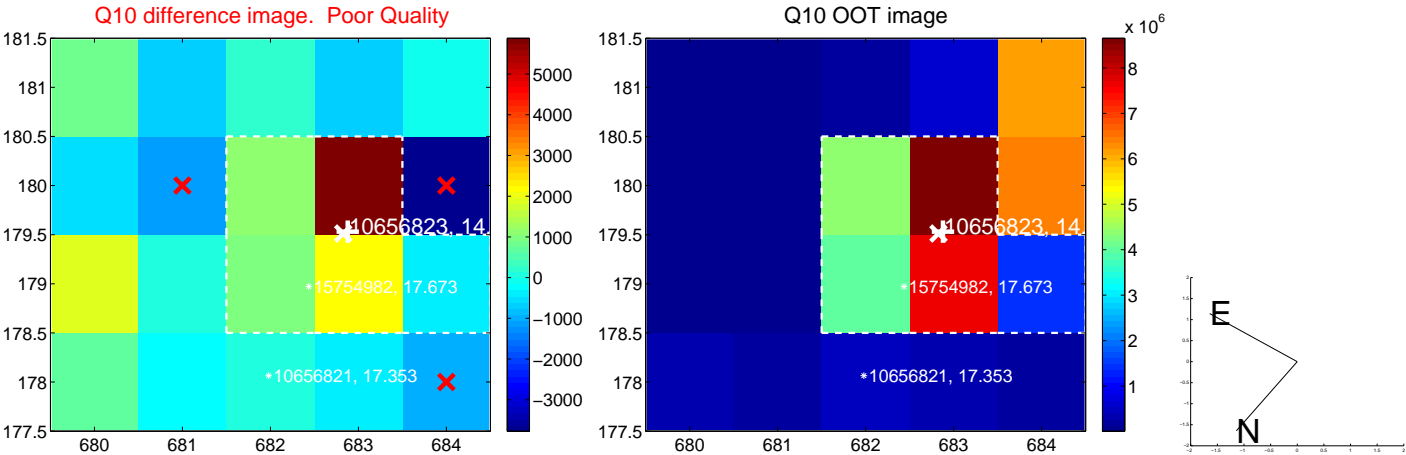
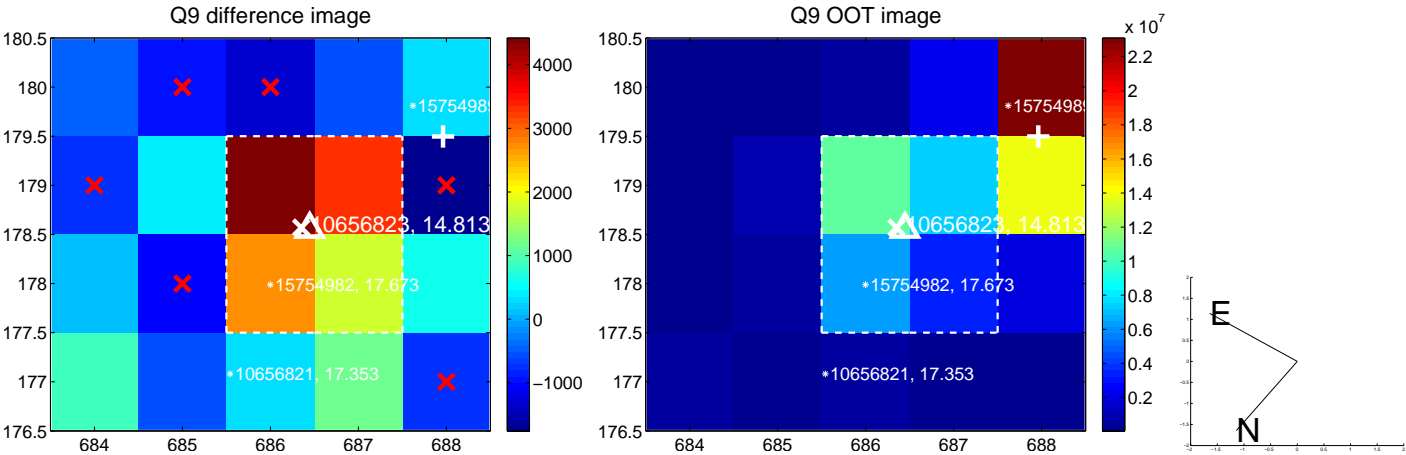
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



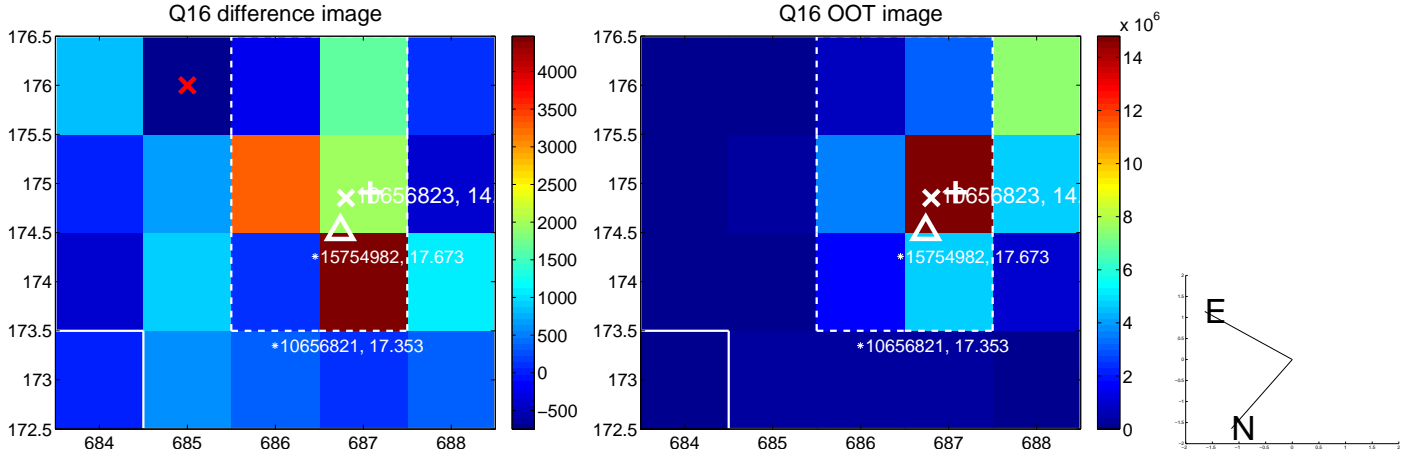
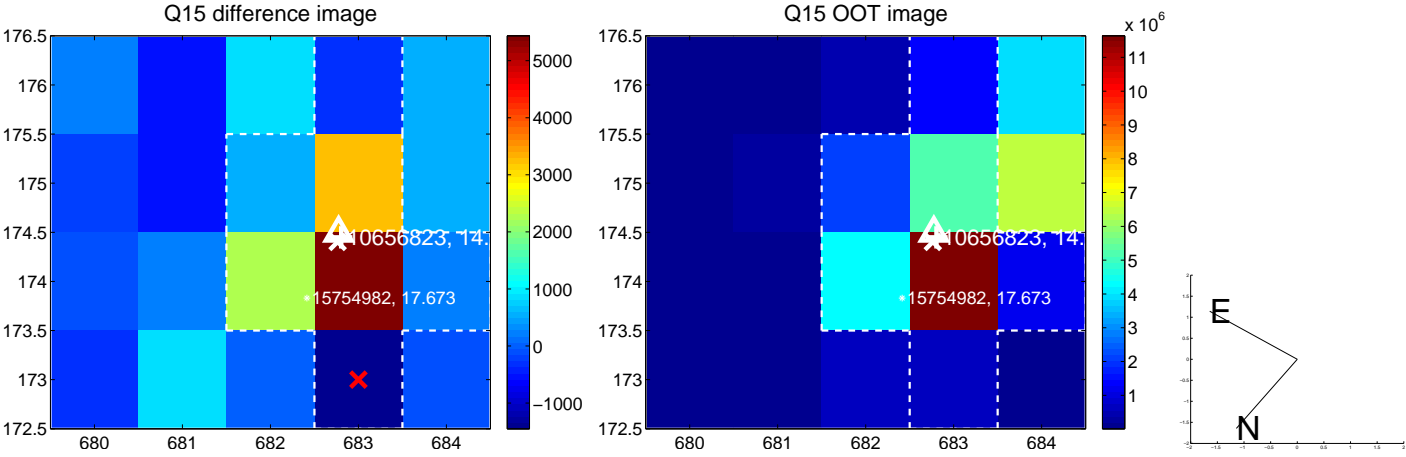
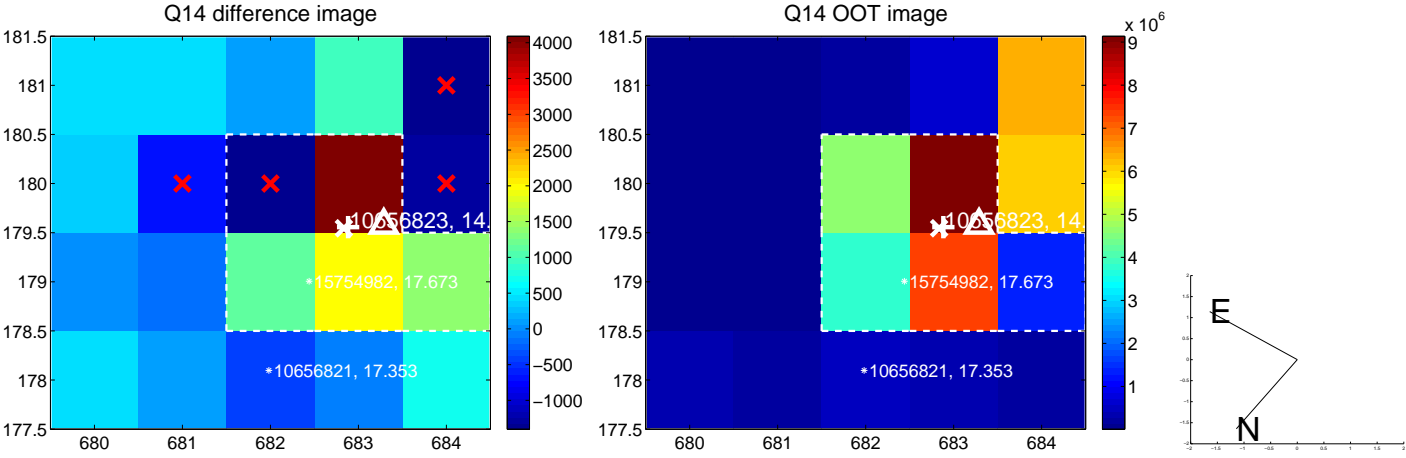
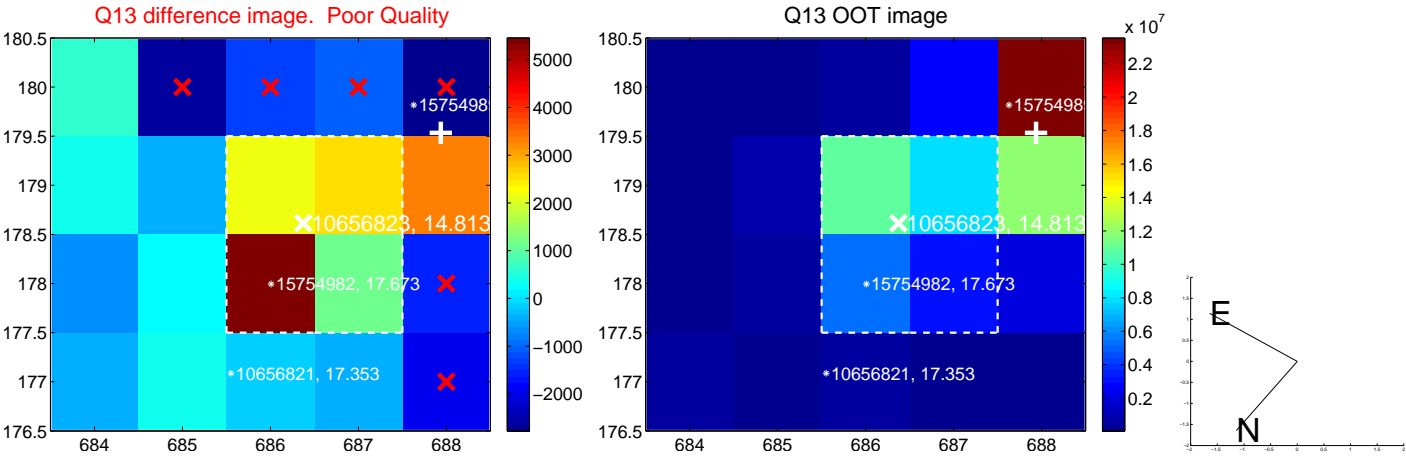
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



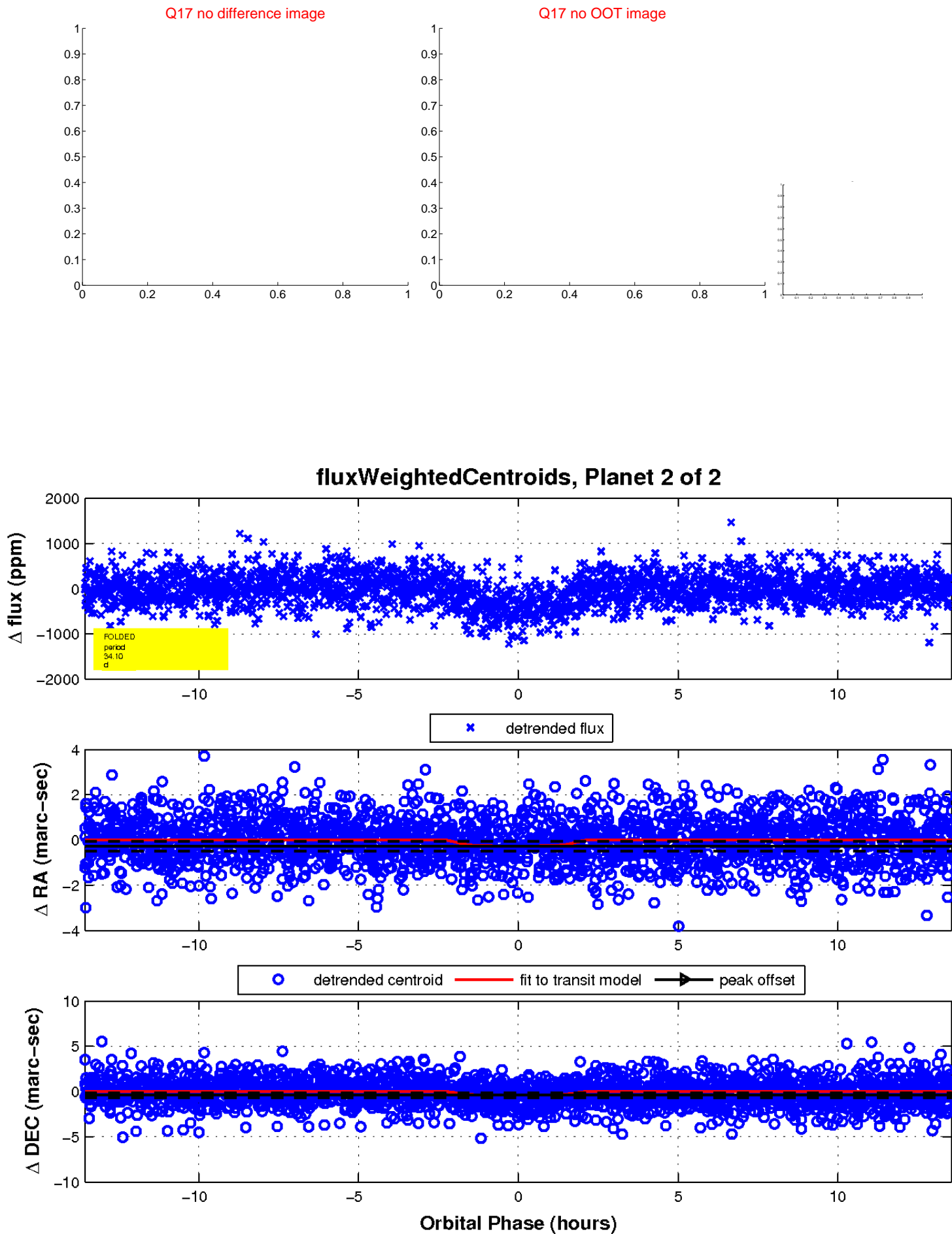
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

